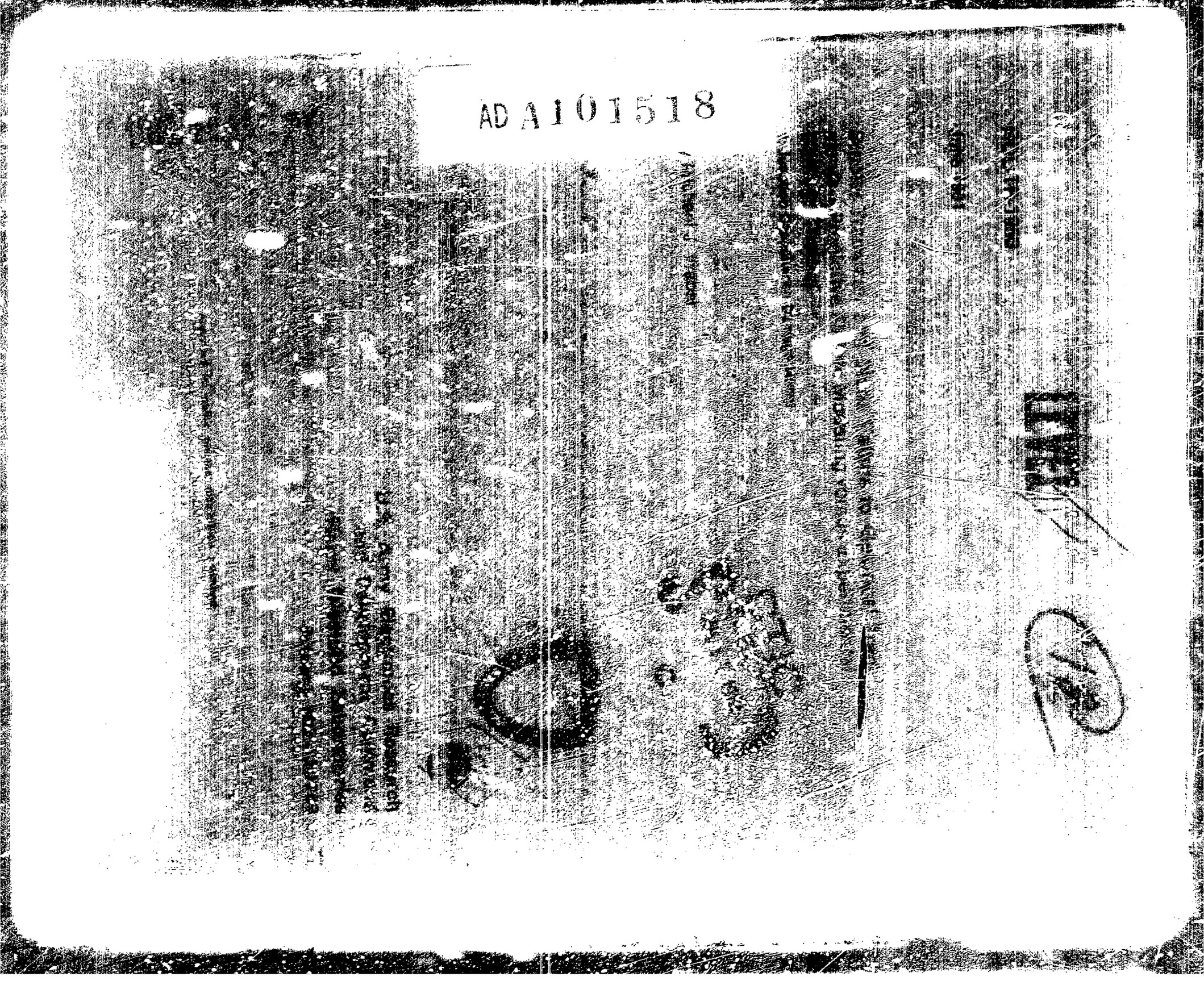

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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: HDL-TR-1959	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Bipolar Transistor and Diode Failure tc Electrical Transients—Predictive Failure Modeling versus Experimental Damage Testing, 1. Junction Capacitance Damage Model.	5. TYPE OF REPORT & PERIOD COVERED: Technical Report.
	6. PERFORMING ORG. REPORT NUMBER
7. Author: Michael J. Vrabel	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Harry Diamond Laboratories, 2800 Powder Mill Road, Adelphi, MD 20783	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Program Ele: 6.21.20.A
11. CONTROLLING OFFICE NAME AND ADDRESS: US Army Materiel Development and Readiness Command, Alexandria, VA 22333	12. REPORT DATE: June 1981
	13. NUMBER OF PAGES: 100
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report): UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

DRCMS Code: 612120.H.250011
DA Project: 1L162120AH25
HDL Project: X750E2

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Semiconductor damage
Semiconductor transient failure
Junction capacitance damage model
EMP
Electromagnetic pulse

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

For all the difficulties engendered in its use, semiconductor device damage data are an integral part of many programs of electromagnetic pulse vulnerability assessment and hardening. Experimental damage data, which are generated only as a result of dedicated efforts, can be expected to be available for only a minor fraction of all semiconductor devices. This limited supply has spurred efforts to develop

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predictive damage models, in order to bypass the tedious experimental requirements for generating damage data. The predictive ability of the best of these models, the junction capacitance damage model, is investigated in detail.

Central to this study is a library of experimental damage data for 46 silicon device types, comprising bipolar transistors and diodes tested at the 10-, 1-, and 0.1-μs pulse durations. These are devices from the front ends of a number of Army systems and represent radio, field wire, and cable functions with operating ranges in the direct current (dc) to microwave region. Of the 46 experimental devices comprising 68 junction types (collector-to-base and emitter-to-base junctions treated as distinct for all transistors), sufficient published manufacturers' data were available for the damage modeling of 11 junctions. These were supplemented with measured parameters for 27 junction types. No measurable difference was observed between the models' predictive capability by using the experimental parameters and that by using manufacturers' model parameters. The ratios of experimental power to damage (for all tested pulse durations) to predicted value span a range from 0.00077 to 18--a skewed distribution, with 59 percent of all predicted values being overestimates of the power to damage.

With only 16 percent of the test-device population having sufficient published parameters to allow the junction capacitance damage model to be used, it is a valuable exercise to develop alternative, simpler damage models--not so much as a substitute for the junction capacitance model, but rather as a standard for comparison. The first considered was the dc power rating model. It was bas on the supposition that there is some correlation between dc power ratings and transient power to damage. No distinction was made in the development of this model between forward or reverse dc ratings. The resultant model was applicable to 88 percent of the test-device population (based on published parameters) and demonstrated an agreement with the experimental power-to-damage data that was approximately two to four times poorer than the junction capacitance model. A second model was developed based on the manufacturers' rating of devices as high power or low power. This model considered the entire population of bipolar transistors and diodes (excluding microwave devices) as equatable to either of two devices with damage constants of 0.089 and 6.1 $W\text{-}s^{1/2}$. This model was applicable to 90 percent of the test population and demonstrated the same level of correlation with the experimental damage data as did the junction capacitance damage model.

A comparison of the predictive capability of the junction capacitance damage model with the scatter in the experimental damage data indicates that the use of the failure model requires an order of magnitude larger conservatism in the lower bounding of device failure than the use of an experimentally established damage curve.

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1. INTRODUCTION

Component transient damage data are an integral part of any comprehensive program of electromagnetic pulse (EMP) vulnerability assessment and hardening. In general, semiconductor devices represent the most vulnerable of components and are the devices that have received the most intensive study. With approximately 75,000 bipolar transistor and diode types alone (of which approximately 2000 have military specifications), experimental damage data, data available only as a result of dedicated efforts, can be expected to be available for only a minor fraction of semiconductor devices. This limitation has spurred efforts to bypass the tedious experimental requirements to generate damage data by developing predictive damage models. Three semiempirical damage models are presently in general use.[1] These are designed to predict the failure level of bipolar transistors and diodes under conditions of reverse bias. There is amassed in the literature much information on the predictive ability of these models, much of it sketchy with no well defined standards for drawing a comparison and some of it contradictory. Based on the most exhaustive of these studies, there appears no clearly superior model.[2]

The purpose of this study is to focus on one of these, the junction capacitance damage model, and to attempt to establish some standards whereby the user can judge its adequacy. Central to this examination is a library of experimental damage data for 59 device types generated for the Army's former Multiple Systems Evaluation Program. These represent transistors and diodes incorporated into the front ends of a number of tactical single and multichannel radios, associated with circuits operating from the direct current (dc) to the microwave region. These data are taken from the unpublished work of Bruno Kalab of the Harry Diamond Laboratories.

This study is a narrowly defined investigation of the predictive ability of the junction capacitance damage model. It must always be borne in mind that, when the adequacy of the model is judged, it must be considered within the context of all sources of error in a program of EMP vulnerability assessment and hardening. Since model accuracy is a subjective quantity to be measured by the particular needs of the user, no conclusions are to be drawn. Rather, a set of standards is to be developed whereby the effectiveness of the model for particular applications can be judged.

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[1] *DNA EMP (Electromagnetic Pulse) Handbook (U), Defense Nuclear Agency DNA 2114H (July 1979). (CONFIDENTIAL)*

[2] *D. R. Alexander, G. L. Brown, and J. B. Almassy, Electromagnetic Susceptibility of Semiconductor Components, Air Force Weapons Laboratory AFWL-TR-74-280 (September 1975).*

2. EXAMINATION

Most predictive failure models for semiconductors are based on the work by Wunsch and Bell.[3] Based on a thermal model for failure, Wunsch and Bell developed the expression

$$P_D = Kt^{-N} \quad , \tag{1}$$

where P_D is the power to failure for a square pulse, K is a constant characteristic of the device (damage constant), t is the duration of the power pulse, and, for the Wunsch-Bell form of equation (1), N = 0.5. This value for N is treated as valid for junction reverse bias in at least the 0.1- to 10-μs range. It was observed that there existed a measure of correlation between power to damage and P-N junction area. From this observation were developed three analytical models for predicting device failure (under reverse bias) based on manufacturers' specifications.[4] The first two are called thermal resistance models and are based on a simple resistance-capacitance (R-C) network for which heat flow from the junction area is treated as an analog of current, and temperature drop is treated as an analog of electric potential.

The thermal resistance models (incorporated into the Wunsch-Bell equation) are

$$P_D = A_1 \theta_{JC}^{-B_1} t^{-0.5} \quad , \tag{2}$$

$$P_D = A_2 \theta_{JA}^{-B_2} t^{-0.5} \quad , \tag{3}$$

where A_1, A_2, B_1, and B_2 are experimentally determined constants and

$$\theta_{JC} = \frac{T_{J(MAX)} - T_C}{P_D} \quad , \tag{4}$$

---

[3] *D. C. Wunsch and R. R. Bell, Determination of Threshold Failure Levels of Semiconductor Diodes and Transistors due to Pulse Voltages, IEEE Trans. Nucl. Sci., NS-15 (December 1968), 244-259.*

[4] *D. C. Wunsch, R. L. Cline, and G. R. Case, Semiconductor Vulnerability, Phase II Report, Theoretical Estimates of Failure Levels of Selected Semiconductor Diodes and Transistors, Braddock, Dunn and McDonald, Inc., Albuquerque, NM, BDM/A-42-69-R (August 1970).*

$$\theta_{JA} = \frac{T_{J(MAX)} - T_{AMB}}{P_D} \quad , \tag{5}$$

where $T_{J(MAX)}$ is the maximum operating junction temperature and P_D is the total power dissipation at case temperature T_C or ambient temperature T_{AMB}.

The junction capacitance model is based on the relationship between junction area and capacitance. The form of this model (incorporated into the Wunsch-Bell equation) is

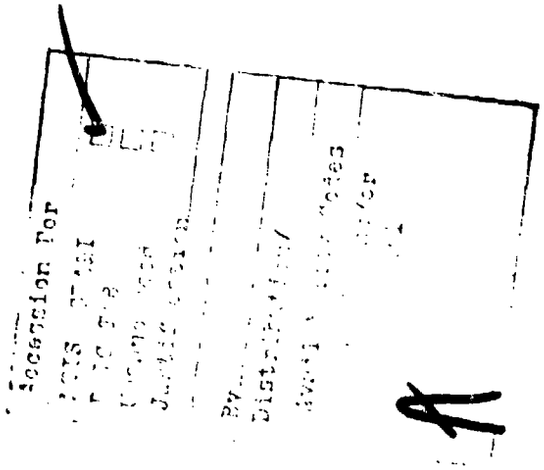
$$P_D = A_3 C_j V_{BD}^{B_3} t^{-0.5} \quad , \tag{6}$$

where A_3 and B_3 are experimentally established constants, C_j is junction capacitance, and V_{BD} is junction breakdown voltage.

To reasonably test model predictions, a representative sample of experimental data is essential. The term "representative" is used advisedly since a small sample taken from a large population must be chosen carefully. All devices are taken from the front ends of an array of Army communications systems. These interface circuits represent radio, field wire, and coaxial cable functions. No devices were prescreened. Instead, all devices were selected on the basis of their proximity to the EMP coupling source with no exclusion on the basis of potential power handling capability, and all devices were chosen without regard to previously published device data. This latter condition insured that all devices were tested employing the same methodology and the same standards. All devices were obtained from federal stocks over a number of years without regard to manufacturer, device lot, or supplier. To the extent that such a selection process defines a general device population selected from among the types of devices of most interest in a transient damage analysis, then the test population can be called representative.

3. RESULTS

This device population (to be referred to as the standard population) was employed in this study:



Silicon devices

2N328A(C-B)
2N328A(E-B)
2N335(C-B)
2N335(E-B)
2N336:JAN(C-B)
2N336:JAN(E-B)
2N2484(C-B)
2N2484(E-B)
2N3736(C-B)
2N3736(E-B)
2N930(C-B)
2N930(E-B)
2N2481(C-B)
2N2481(E-B)
2N2907A(C-B)
2N2907A(E-B)
2N2222A(C-B)
2N2222A(E-B)
1N4384
FS911-3465
1N816
1N21WE
1N914A
1N752A
PC115
1N3026B:JAN
1N3611
1N3995A
1N3016B
1N414?
10D2
2N2857(C-B)
2N2857(E-B)
2N3375(C-B)
2N3375(E-B)
2N1490:JAN(C-B)
2N1490:JAN(E-B)
2N3584(C-B)
2N3584(E-B)
2N2894(C-B)
2N2894(E-B)
2N5829(C-B)
2N5829(E-B)
2N3013:JAN(C-B)
2N3013:JAN(E-B)
CA3018(C-B)
CA3018(E-B)
SMB52617(C-B)
SMB52617(E-B)
2N1613:JAN(C-B)
2N1613:JAN(E-B)
2N1485:JAN(C-B)
2N1485:JAN(E-B)
2N3439(C-B)
2N3439(E-B)
2N706:JAN(C-B)
2N706:JAN(E-B)
1R-69-6735
1N2580
1N571A:JAN
1N485B:JAN
1N2991B:JAN
1N30?5B:JAN
MO1054
1N746A:JAN
1N645:JAN
1N1202RA:JAN
1N1731A:JAN

Germanium devices

2N404A(C-B)
2N404A(E-B)
2N297A(C-B)
2N297A(E-B)
2N526(C-B)
2N526(E-B)
1N270
2N396A(C-B)
2N396A(E-B)
2N428M:JAN(C-B)
2N428M:JAN(E-B)
2N393:JAN(C-B)
2N393:JAN(E-B)
2N501A:JAN(C-B)
2N501A:JAN(E-B)
2N705:JAN(C-B)
2N705:JAN(E-B)
2N466M:JAN(C-B)
2N466M:JAN(E-B)
2N1042RA:JAN(C-B)
2N1042RA:JAN(E-B)
1N277:JAN
MS1040

Separate collector-to-base (C-B) and emitter-to-base (E-B) damage characteristics for all transistors yield 91 P-N junction types. Power-to-failure curves are available for these devices in the 0.1- to 10-μs

range, with some exceptions. If, for the devices with damage data in the aforementioned range, a fit is made to equation (1), the histogram for N given in figure 1 results.

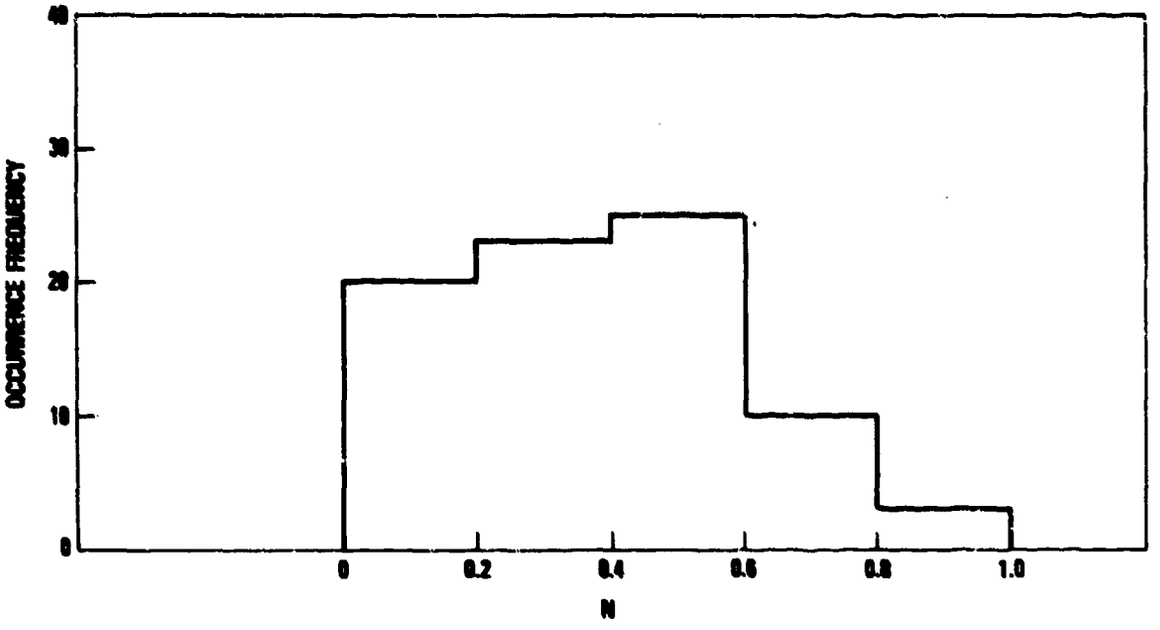


Figure 1. Histogram of N from damage equation $P_D = Kt^{-N}$ for standard population fitted in 0.1- to 10-μs range.

It will prove important for this study to consider the spread in the standard population power to damage and to have damage values for all tested devices. Because of test equipment limitations, some of the devices were undamageable, particularly for the shortest pulses. All testing was performed about the 0.1-, 1-, and 10-μs pulse durations. For devices with data missing at the 0.1-μs pulse duration, it becomes a simple matter to extrapolate from the 1- and 10-μs data. An examination of all data revealed that extrapolation could be done with a high level of confidence; as a consequence, no distinction is made between these extrapolated data and measured data. For devices with data missing at the 0.1- and 1-μs pulse durations, extrapolation becomes much less accurate. By relying on equation (1), data at 10 μs can be used to extrapolate to 0.1 and 1 μs:

$$\frac{P_D(1\ \mu s)}{P_D(10\ \mu s)} = \left(\frac{1}{10}\right)^{-N} \quad \text{and} \quad \frac{P_D(0.1\ \mu s)}{P_D(10\ \mu s)} = \left(\frac{1}{100}\right)^{-N} . \qquad (7)$$

The choice of N is critical. Figure 1 indicates a value anywhere between 0 and 1. If N = 0.5 is chosen, then this results in a maximum error at the 1-μs pulse duration of a factor of 3.16 and at the 10-μs pulse duration of a factor of 10. For some devices, the maximum no-damage pulse power is used to improve upon these potential error factors in the choice of extrapolated damage levels. The final situation is no power-to-damage data for any pulse duration. This occurred with a single device (1N3995A). For this device, the junction capacitance model was used to predict damage. The predicted value is compatible with the maximum no-damage power pulse. This compatibility represents the unusual situation of using a model to contribute to a distribution that is part of a test of the model. The predicted value was included since it was considered more important to achieve a complete set of data for the standard device distribution than to be concerned with a single anomalous point. Beyond this distribution, little further use is made of the 1N3995A damage data. The resultant distributions for the standard device population are given in figures 2 through 4. The power-to-damage values for the individual devices are given in appendix A. Sources of uncertainty in the experimental damage data can be classified as these:

a. The natural variability in the levels to failure in any population used to define a damage curve

b. The deviation in the makeup of the test population from that which is representative of a population of interest to the user

There is no way that a study can come to terms with the latter source of uncertainty, except to anticipate the interest of the greatest number of users and to select a population accordingly. The former source can be described by using standard error theory. In anticipation of a more detailed description of the level of variability in the test population later in the report, figure 5 presents as a histogram the range in the data defined as

$$V'/V \ , \quad \text{for } V' > V \ ,$$

or

$$V/V' \ , \quad \text{for } V > V' \ ,$$

where V' is the experimental damage data point with the largest deviation from the damage curve and V is the corresponding value from the damage curve. These are values for all device types of the standard test population under reverse bias. Figure 5 represents the maximum deviation from the experimentally defined damage curve for a typical population of 9 to 15 tested components.

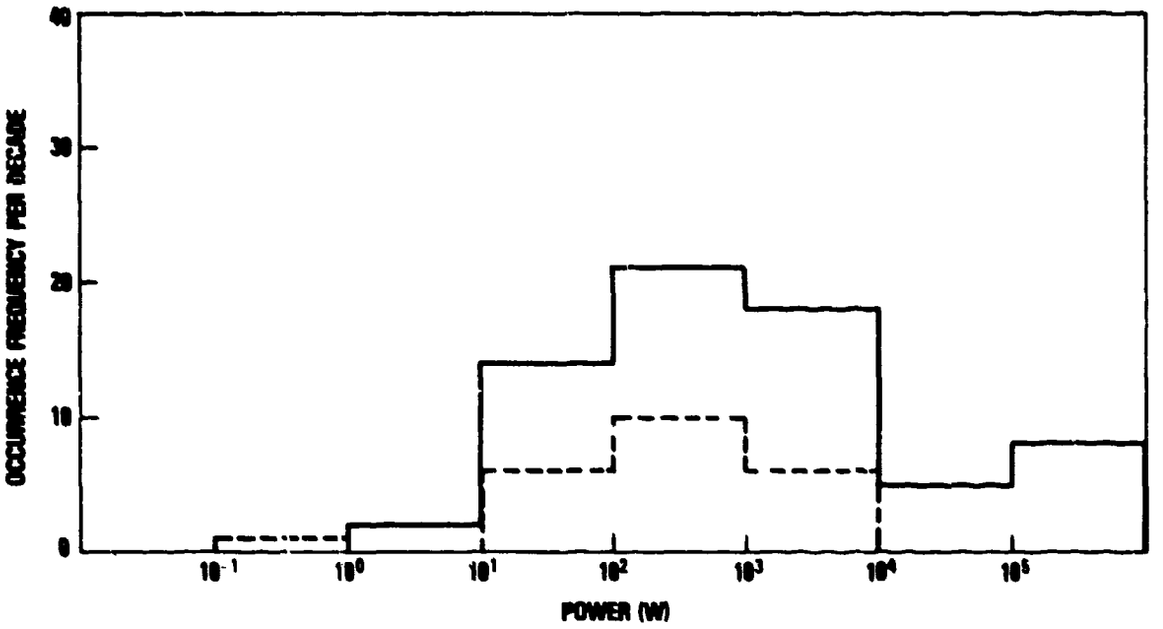


Figure 2. Histogram of experimental power to damage for pulse duration of 0.1 μs for silicon devices of standard population (solid curve) with superimposed curve for germanium devices (dashed curve).

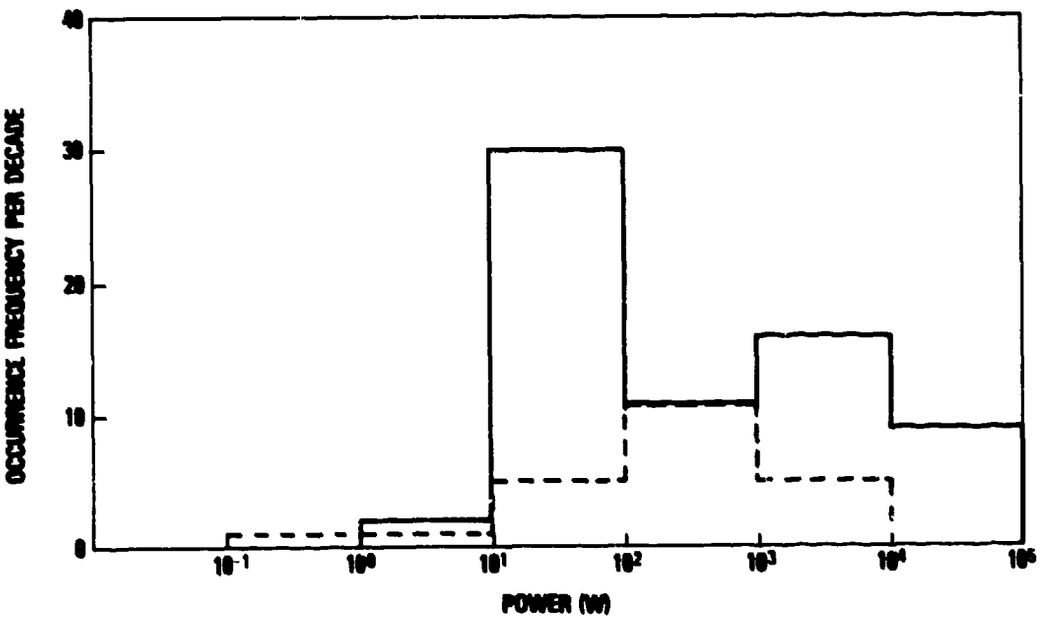


Figure 3. Histogram of experimental power to damage for pulse duration of 1 μs for silicon devices of standard population (solid curve) with superimposed curve for germanium devices (dashed curve).

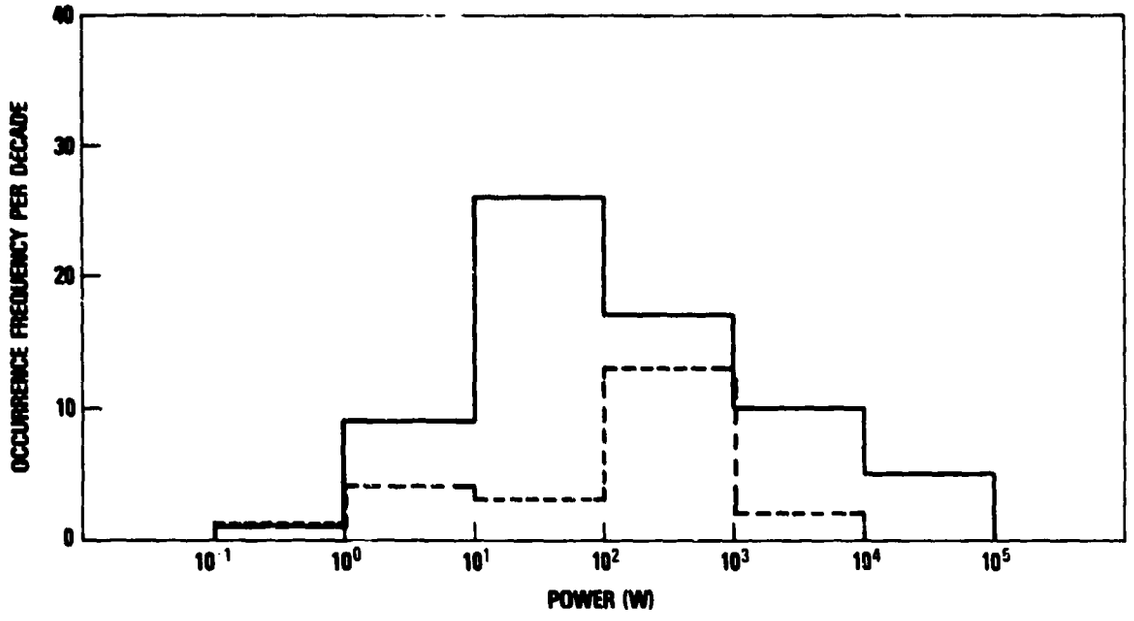


Figure 4. Histogram of experimental power to damage for pulse duration of 10 μs for silicon devices of standard population (solid curve) with superimposed curve for germanium devices (dashed curve).

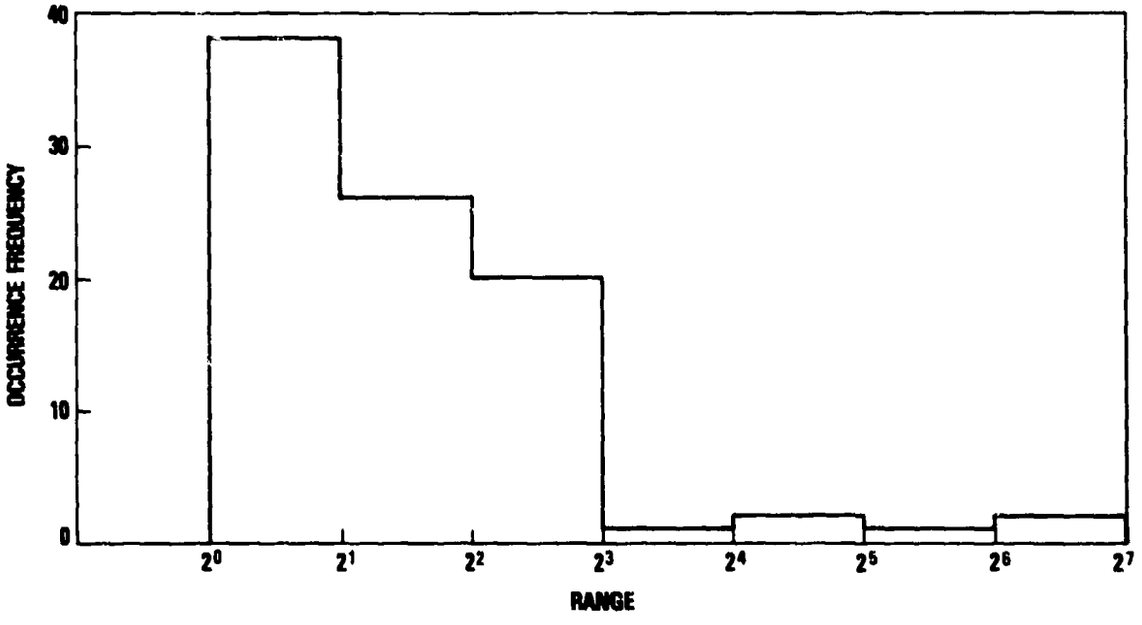


Figure 5. Histogram of maximum deviation of device damage from experimentally established damage curve for all devices of standard population defined as ratio with corresponding point on damage curve.

The most recent form of the junction capacitance damage model, including the experimentally established constants, is given in table 1. A number of difficulties are encountered in applying this model to the standard device population. The model is not applicable to germanium devices. For all silicon transistors, a knowledge of device construction is required--a quantity that is sometimes difficult to obtain from the literature. Similarly, junction capacitance and breakdown voltage are often unobtainable. For transistors, these parameters are rarely available for the base-to-emitter junction. The consequence is that the model, based on published device parameters, is applicable to only 12 percent of the standard device population. If germanium devices are excluded from the standard population, this figure increases to 16 percent. To supplement missing data, experimentally established parameters for junction capacitance and breakdown voltage were employed. These increased the size of the silicon standard population to which the model was applicable to 47 percent.

TABLE 1. JUNCTION CAPACITANCE DAMAGE MODEL

Devices	$K = Pt^{1/2}$
Diodes and nonplanar silicon transistors	$K = 4.97 \times 10^{-3} C_J V_{BD}^{0.57}$
Mesa and planar silicon transistors	$K = 1.66 \times 10^{-4} C_J V_{BD}^{0.992}$

Note: For transistors, $C_J = C_{ob}$ and $V_{BD} = BV_{cbo}$.

Source: DNA EMP (Electromagnetic Pulse) Handbook (U), Defense Nuclear Agency DNA 2114H (July 1979). (CONFIDENTIAL)

It has been reported in the literature that little improvement in the predictive capability of this junction capacitance damage model occurs when experimental input parameters are substituted for published values.[2] This study supports that conclusion. To compare the predictive capability of the model using experimental and published parameters, the data are presented in two formats. The quantities presented are not the predicted values, but rather the scatter in the

[2] *D. R. Alexander, G. L. Brown, and J. B. Almassy, Electromagnetic Susceptibility of Semiconductor Components, Air Force Weapons Laboratory AFWL-TR-74-280 (September 1975).*

predicted values defined as the ratio of the experimental power to damage to the predicted value. These data are presented as a histogram of the population distribution in figure 6. They are presented also as a function of the percentage confidence level. The percentage confidence level is defined as the percent of the subject population with a scatter less than or equal to the given value. For this mode of presentation, the scatter is given as the spread in the data without regard to whether the predicted value is greater or less than the experimental value. This means that for values of the predicted-to-experimental ratio for damage less than 1, the data presented are the inverse of this ratio. This mode of presentation provides a convenient way to judge the utility of the model based on the varying degrees of confidence required by the diversity of potential model users. The corresponding curves for the experimental and published model parameters are given in figure 7.

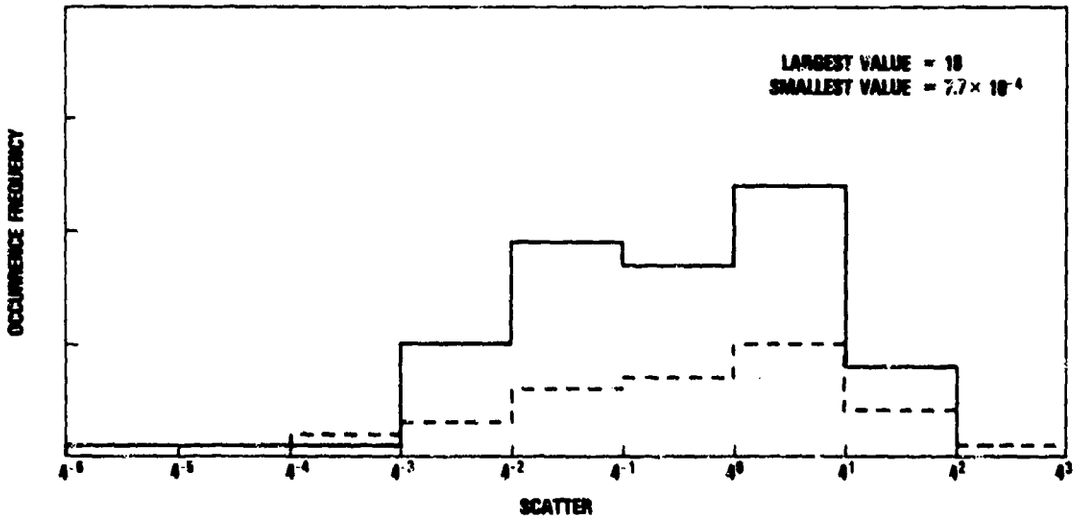


Figure 6. Superimposed histograms of ratio of experimental power to damage to predicted value based on junction capacitance damage model: experimental parameters for junction capacitance and breakdown voltage (solid curve) and manufacturers' parameters (dashed curve).

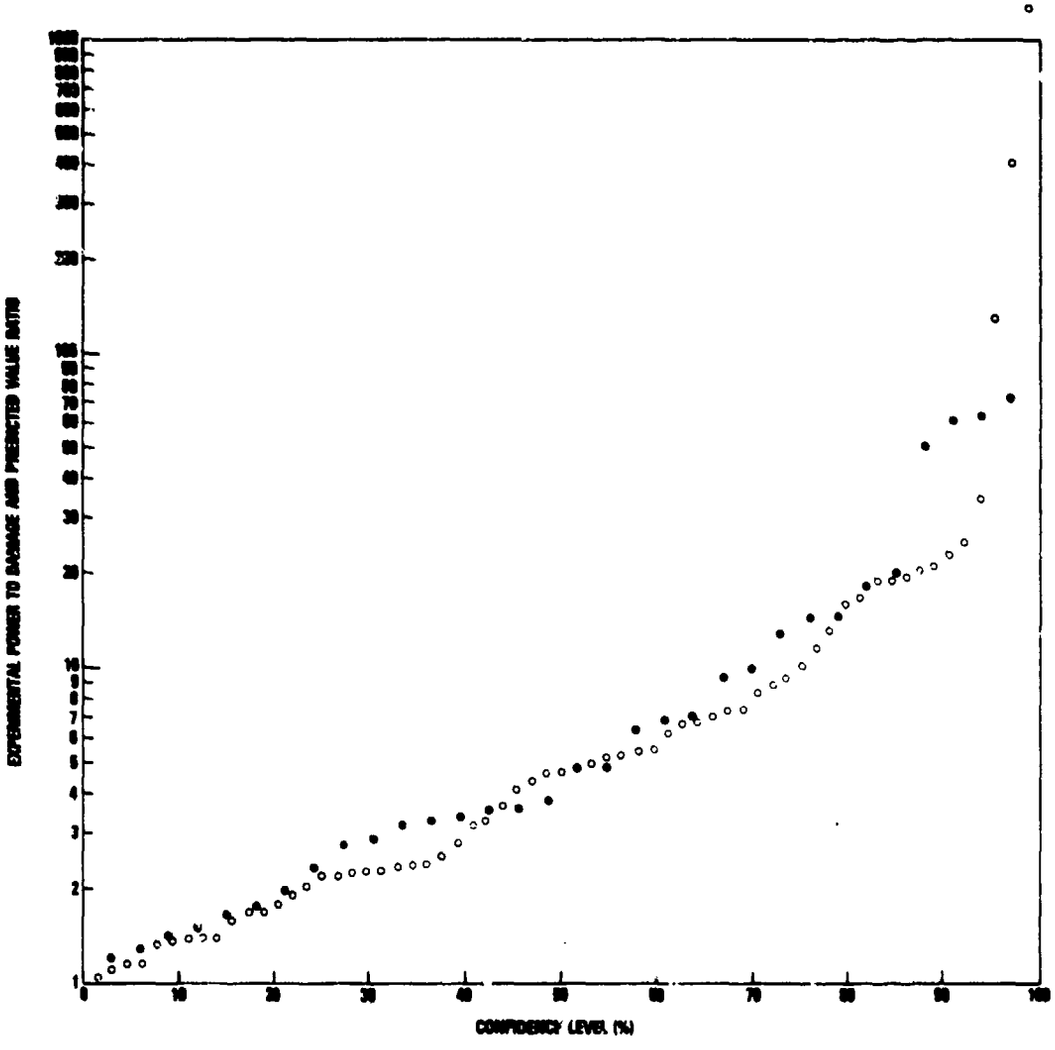


Figure 7. Confidence level for junction capacitance damage model test of standard population: published parameters (solid circles) and experimental values for junction capacitance and breakdown voltage (open circles); all extrapolated values for experimental damage data are excluded from standard population.

All further reference to the predictions of the junction capacitance damage model is to a composite of data corresponding to the model predictions based on experimental parameters plus those several devices not included in this lot for which sufficient published parameters were available. The device population can be ascertained from the data

presented in appendix A. This composite curve is presented in figure 8 for the standard population both including and excluding the extrapolated experimental damage values.

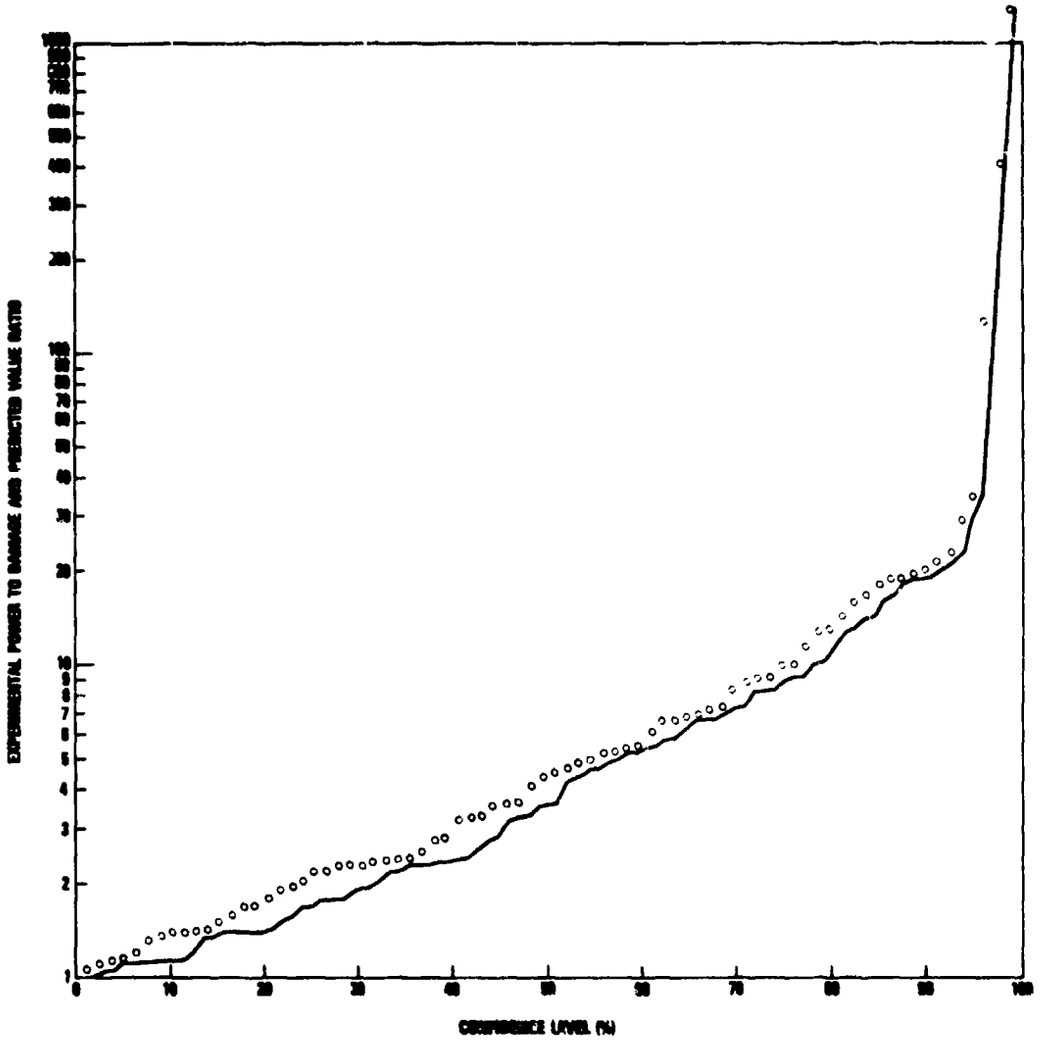


Figure 8. Confidence level for junction capacitance damage model test of composite standard population: all extrapolated values for experimental damage data are excluded from standard population (circles) and extrapolated values are included (solid curve).

Much of the convenience of the junction capacitance model is lost because of the limited availability of the requisite published parameters. It is an informative exercise to test the performance of the junction capacitance model by constructing alternative, simpler damage models. The basis for the junction capacitance damage model was the observation that there appeared to be a correlation between junction area and transient power level to damage. It is not an unreasonable supposition to theorize some measure of correlation between device dc power rating and transient power level to failure. This model is to be referred to as the dc power rating model. Since this model is being proposed not so much as a potentially more accurate substitute, but rather as a standard for comparing the junction capacitance model, rigor is sacrificed for convenience of use and general applicability. Since devices such as rectifiers have power ratings for forward bias and devices such as reference diodes have power ratings for reverse bias, no distinction is to be made between forward or reverse bias in developing the model. For diodes without power ratings, but with a maximum rated current, a power rating is derived by selecting a reasonable corresponding junction potential. Similarly, power ratings for transistors are assumed to apply to the C-B and the E-B junctions. By these standards, sufficient published data are available to apply such a model to 88 percent of the standard silicon device population.

To develop and test the dc power rating model, the standard silicon device population is divided into two groups. Population A (containing approximately half the devices) is that segment lacking sufficient information to apply the junction capacitance damage model, but for which dc power ratings (as previously defined) exist. Population B is the same as population A, but contains those devices to which the junction capacitance damage model is applicable. By using population A to develop the dc power rating model and population B to test its predictive capability, a good comparison of the alternative damage models becomes possible. Since experimental data for constructing the model are available about the 0.1-, 1-, and 10-μs pulse durations, a particularly simple model to fit these data is of the form

$$P_D/P_{DC} = A_1 t^{-1} + A_2 t^{-1/2} + A_3 \quad , \tag{8}$$

where P_D is the average power to damage for population A devices at pulse duration t and P_{DC} is the corresponding average dc power rating. Although an equation of the form of equation (8) can be readily fitted to the device data, care must be used in extrapolating this relationship beyond the pulse durations used for the fit. For data at 0.1, 1, and 10 μs, constants A_1, A_2, and A_3 become (t in units of s)

$$A_1 = 5.1 \times 10^{-7} \frac{P_D(10\ \mu s)}{P_{DC}} - 6.7 \times 10^{-7} \frac{P_D(1\ \mu s)}{P_{DC}} + 1.6 \times 10^{-7} \frac{P_D(0.1\ \mu s)}{P_{DC}} \quad , \tag{9}$$

$$A_2 = -2.1 \times 10^{-3} \frac{P_D(10\ \mu s)}{P_{DC}} + 2.3 \times 10^{-3} \frac{P_D(1\ \mu s)}{P_{DC}} - 2.1 \times 10^{-4} \frac{P_D(0.1\ \mu s)}{P_{DC}} \quad , \tag{10}$$

$$A_3 = 1.6 \frac{P_D(10\ \mu s)}{P_{DC}} - 0.68 \frac{P_D(1\ \mu s)}{P_{DC}} + 0.052 \frac{P_D(0.1\ \mu s)}{P_{DC}} \quad . \tag{11}$$

The choice of the ratios of P_D/P_{DC} is based on the nature of the experimental device population. To choose as the ratios of P_D/P_{DC} the average of the selected population requires careful consideration of the definition to be applied to average. The device experimental damage data population is not a normal distribution, and included within this distribution are a number of devices with extrapolated powers to damage. If the average value for P_D/P_{DC} is taken as the arithmetic mean of the distribution, then the error inherent in the extrapolated values, values clustered at the high power end of the distribution, poses the possibility of an average value unrepresentative of the actual population. If the average value is taken as the median value of the distribution, then the uncertainty of the extrapolated values (if their number count is not too large) is eliminated, but at the risk that the median is not the value most representative of the population. Because of these uncertainties, both the arithmetic mean and the median are to be used for all modeling. The values developed to these standards for A_1, A_2, and A_3 for population A are given in table 2. The junction capacitance damage model and the dc power rating model applied to population B are compared in figure 9.

The correlation to be drawn between these curves is a function of the confidence level desired in the predictions. It is clearly beyond the scope of this study, being based on a limited data base, to approach the 100-percent level. Although all curves are extended to values approaching 100 percent, this extension is based on very few data

points. The consequence is that caution must be exercised in interpreting into the high confidence region. In the 50- to 90-percent confidence range, the dc power rating model yields a correlation with the experimental power to damage two to four times poorer than the junction capacitance damage model.

TABLE 2. CONSTANTS A_1, A_2, AND A_3 FOR DIRECT CURRENT POWER RATING MODEL $P_D/P_{DC} = A_1 t^{-1} + A_2 t^{-1/2} + A_3$

Statistic	A_1 (W-s)	A_2 ($W\text{-}s^{-/2}$)	A_3 (W)
Arithmetic mean	5.58×10^{-4}	0.309	34.2
Median	9.87×10^{-6}	0.101	22.7

An examination of the spread in the junction capacitance damage model predictions and the spread in the damage data of figures 2 to 4 indicates that it should be possible to define two power levels that cover the range of experimental damage data with a spread comparable to that of the junction capacitance model. As an attempt at such a model, which is called the power class model, all devices are classified as either high or low power devices based on published data.* Transistors are routinely classified as either high or low power--the dividing line, with some exceptions, is a power rating of 1 W. If the same 1-W standard is applied to diodes, then the semiconductor population can be divided into two classes. For model development for those diodes without a power rating, all rectifiers, silicon reference diodes, and varistors are considered high power, and the remaining devices are considered low power. This division results in a model applicable to 90 percent of the standard silicon device population.

The single exception in this model is microwave class devices. Because of their very low power rating, the preferred model is divided into three power categories. With few data available on transient failure of microwave devices (the standard silicon device population contains one microwave device, the 1N21WE), the best that can be done with the present study is to exclude this category.

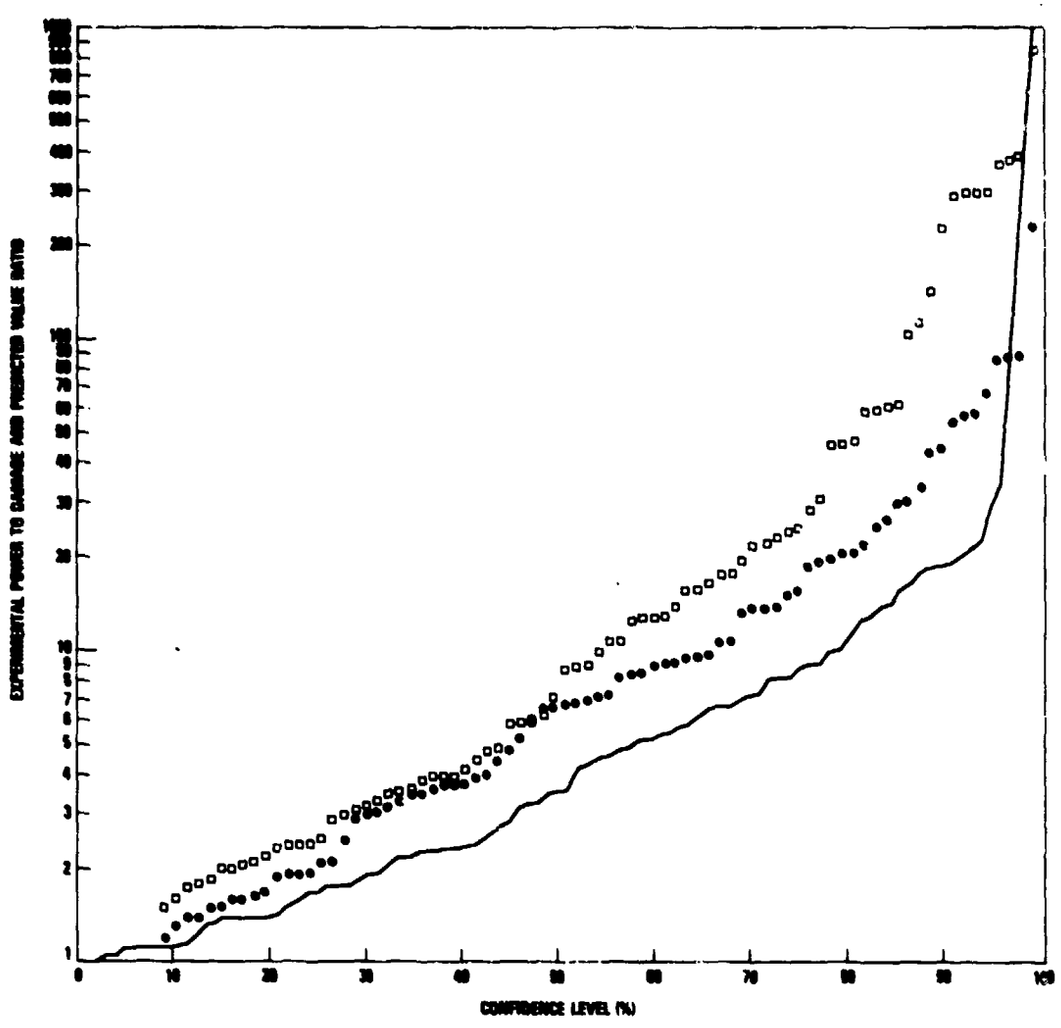


Figure 9. Confidence level for dc power rating model: arithmetic mean used as standard for developing model parameters (solid circles), median values employed (squares), and confidence level for junction capacitance damage model (solid curve).

In the development of this model, the same assumption on the power relation of equation (1) is employed as in the junction capacitance damage model (N = 0.5), despite the results of figure 1. In this way, the comparison between models minimizes this factor as a source of error and allows a better comparison between the basic damage models. The model is developed by averaging the experimental powers to damage at the 10-μs pulse duration for that segment of population A applicable to this

model as previously defined for the high power class and low power class of devices. The average is defined, as previously, as both the arithmetic mean and median values. The Wunsch-Bell relationship of equation (1) is used to calculate the effective damage constant for the high and low power devices.

$$K_H = 3.16 \times 10^{-3} P_H \tag{12}$$

and

$$K_L = 3.16 \times 10^{-3} P_L \quad , \tag{13}$$

where K_H and K_L are the damage constants for the high and low power class of devices and P_H and P_L are the corresponding average experimental power to damage at 10 μs for population A devices. The values for K_H and K_L are given in table 3. Using equations (12) and (13) with the damage constant values of table 3 on population B devices results in the confidence level curves of figure 10 (with the junction capacitance damage model curve included for comparison). There is no appreciable difference in the predictive capability of the junction capacitance damage model and the power class damage model. Included in figure 10 is a fourth curve that represents the scatter in the experimental damage data for all population B devices. This curve is the percentage confidence level that a device selected from among the population B test items has a scatter from the experimentally established damage curves less than or equal to the ordinate value.

TABLE 3. DAMAGE CONSTANTS FOR HIGH AND LOW POWER DEVICES FOR POWER CLASS DAMAGE MODEL

Statistic	Damage constant ($W\text{-}s^{1/2}$)	
	High power	Low power
Arithmetic mean	6.1	0.089
Median	2.2	0.063

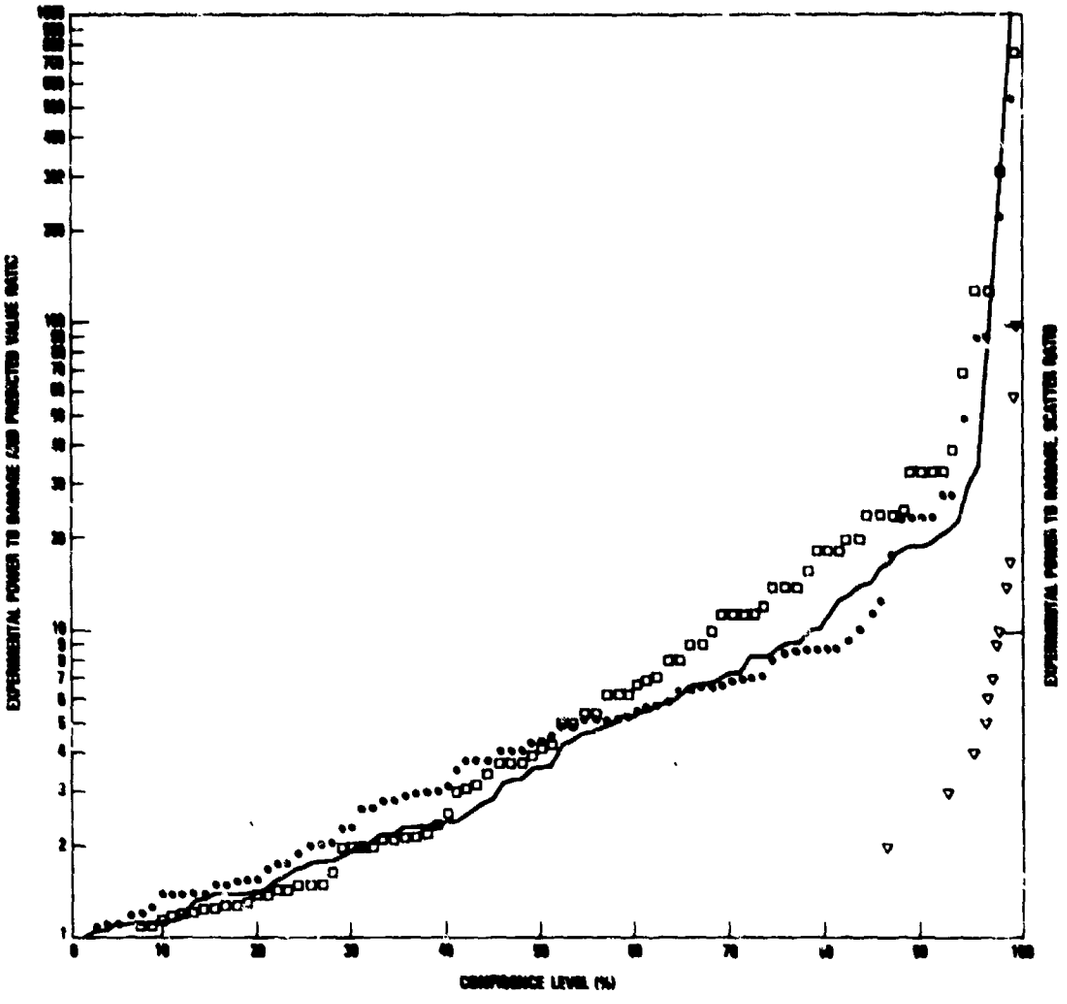


Figure 10. Confidence level for power class damage model: arithmetic mean used as standard for developing model parameters (solid circles), median value employed (squares), confidence level for experimentally established damage curves based on scatter in experimental data (triangles), and junction capacitance damage model confidence level (solid curve).

4. SUMMARY AND FINAL ANALYSIS

Two standards were used to analyze the predictive capability of the junction capacitance damage model. The first was a comparative test based on the development of two alternative, simpler models. Ease of use and general applicability were the criteria for the design of the dc power rating and power class models. These criteria resulted in models

applicable to 88 and 90 percent of the devices of the silicon standard population based on manufacturers' published data compared with 16 percent for the junction capacitance damage model. The dc power rating model was based on the assumption that there exists some measure of correlation between transient level to failure and dc power rating. Since certain classes of devices are rated for forward bias and others are rated for reverse bias, no distinction was made between these conditions for model development.

Despite this nonrigorous mixing of power rating standards, the resultant model provided a level of correlation with the experimental damage data only two to four times poorer than the junction capacitance damage model. The power class model was based on the assumption that all devices (excluding microwave diodes) could be equated to either a high power device with a damage constant of 6.1 $W\text{-}s^{1/2}$ (arithmetic mean) or a low power device with a damage constant of 0.089 $W\text{-}s^{1/2}$ (arithmetic mean). To establish the applicable class for transistors, the manufacturers' catalogings of devices as high or low power were used. Since the dividing line between high and low powers is a rating of 1 W (with some exceptions), the 1-W power rating was used to divide diodes into the applicable classes. The resultant model displayed a level of correlation with the experimental damage data comparable to the level of the junction capacitance damage model. These results do not bode well for the ostensibly more sophisticated junction capacitance damage model.

A second standard to test the predictive capability of the junction capacitance damage model is based on the uncertainty in the failure level of devices resulting from their spread about an experimentally established damage curve. This uncertainty compels the user to place error bars upon the experimental damage data. Also, this uncertainty gives an absolute standard for comparing the junction capacitance damage model. It is standard procedure to define a device failure curve and to bound the lower limit on this curve with a second curve. This lower limit insures a certain measure of confidence that the subject device does not have an actual failure level below the value used. To achieve this same measure of confidence by using predicted failure based on the junction capacitance damage model requires a spread in the low bound approximately one order of magnitude larger than that required of an experimentally determined failure relationship.

In the development of the dc power rating and power class models, some concern must be given to the possibility that the population selected and the standards used produced a fortuitous correlation with the capacitance model. Although the size of the population and the standards used would seem to minimize this possibility, it is a worthwhile exercise to redefine the population and the standards to observe the resultant variation in model predictions. An exhaustive

compendium of such results is given in the appendix. A rigorous comparison among the many predictions is difficult because of the varying standards. Nevertheless, the trend indicates a variation in model predictions, particularly for the power class model, that requires no qualification of the results given in the body of this report.

APPENDIX A.--DAMAGE MODELING COMPUTER CODE

APPENDIX A

Contained within this appendix is a code used to generate many of the data presented in the body of the report and a statistical study of the direct current power rating and power class models based on varying population standards. Included with the code is a single printout of resultant code data. The printout covers only those data for which the arithmetic mean was used for all modeling, and the extrapolated values for experimental power to damage were incorporated into the data base.

Although not indicated in the main body of the report, a study of the performance of the junction capacitance damage model for germanium devices is included. The germanium device model was taken from documentation receiving limited distribution based on a very limited germanium device population. Predictably, the results indicate a much poorer performance of the junction capacitance damage model for the germanium than for the silicon devices.

The nature of the populations and the results for the alternative tests of the proposed models are discernible from the information included in the data output. The quantity of the printed data is indicative of the mass of the data that must be handled in a study of this nature.

```
      SUBROUTINE SUBE(A,B,CONST1,CONST2,CONST3)
      CONST1=(-3.162*(B-A)**2*(C-B)/(61.54*10.**5)
      CONST2=(10.**(B-A)-C*B)/4676.
      CONST3=B-(10.**6)*CONST1-(10.**3)*CONST2
      RETURN
      END
      SUBROUTINE SUBA(KA,B,M,C,KC,PREDCT)
      DIMENSION B(91,3),D(92)
      KV=0
      DO 1 N=KC,KA
      IF(B(N,4).EQ.0.) GO TO 1
      KV=1+KV
      D(N)=ABS(B(N,M))
    1 CONTINUE
      KB=KV/2
      KK=92
      DO 2 N=1,KB
      BG=0.
      D(KK)=0.
      DO 3 K=KC,KA
      IF(D(K).LE.BG) GO TO 3
      BG=D(K)
      KK=K
    3 CONTINUE
    2 CONTINUE
      C=D(KK)
      RETURN
      END
      SUBROUTINE SUBB(NDD,NCC,E,NC,ND,PWR,PWRL,PWRH)
      DIMENSION A(92,1), PWR(91), E(92,1)
      DO 1 N=1,92
      A(N,1)=ABS(E(N,1))
    1 CONTINUE
      NZ=92
      DO 404 N=1,NDD
      BG=0.
      A(NZ,1)=0.
      DO 405 N=NC,ND
      IF(PWR(N).NE.1.) GO TO 405
      IF(A(N,1).LE.BG) GO TO 405
      BG=A(N,1)
      NZ=N
  405 CONTINUE
  404 CONTINUE
      PWRL=A(NZ,1)
      NZ=92
      DO 406 N=1,NCC
      BG=0.
      A(NZ,1)=0.
      DO 407 N=NC,ND
      IF(PWR(N).NE.2.) GO TO 407
      IF(A(N,1).LE.BG) GO TO 407
      BG=A(N,1)
      NZ=N
  407 CONTINUE
  406 CONTINUE
      PWRH=A(NZ,1)
```

```
      RETURN
      END
      DIMENSION PWRA(91), PWRB(91), PERCNT(300), CNT(600)
      DIMENSION B(91,3), S(273,25), D(92), PWR(91), U(92,1), V(92,81)
      DIMENSION SLOPE(91,4), A(92,81), VAL(3,10), C(3,10), DEVICE(400)
      DIMENSION TC328A(9), TE328A(9), TC335(9), TE335(9), TC336(9),
     &TE336(9), TC2857(9), TE2857(9), TC3375(9), TE3375(9),TC2484(9),
     &TE2484(9), TC3736(9), TE3736(9), TC930(9), TE930(9), TC1490(9),
     &TE1490(9), TC3584(9), TE3584(9), TC2894(9), TE2894(9), TC5829(9),
     &TE5829(9), TC3013(9), TE3013(9), TC3018(9), TE3018(9), TCSMB5(9),
     &TESMB5(9), TC1613(9), TE1613(9), TC2481(9), TE2481(9), TC2907(9),
     &TE2907(9), TC2222(9), TE2222(9), TC1485(9), TE1485(9), TC3439(9),
     &TE3439(9), TC706(9), TE706(9), DIR696(9), D2580(9), D751A(9),
     &D4384(9), DFS911(9), D816(9), D21WE(9), D914A(9), D752A(9),
     &DPC115(9), D485B(9), D2991B(9), D30258(9), D1054(9), D746A(9),
     &D30268(9), D3611(9), D3995A(9), D3016B(9), D4141(9),D10D2(9),
     &D645(9), D1202(9), D1731A(9),TC396A(9), TE396A(9),TC428M(9),
     &TE428M(9), TC404A(9), TE404A(9), TC393(9), TE393(9),TC501A(9),
     &TE501A(9), TC705(9), TE705(9), TC297A(9), TE297A(9), TC466M(9),
     &TE466M(9), TC1042(9), TE1042(9), TC526(9), TE526(9), D277(9),
     &D270(9), DS1040(9)
      NAMELIST/LISTA/TC328A,TE328A,TC335,TE335,TC336,TE336,TC2857,
     &TE2857,TC3375,TE3375,TC2484,TE2484,TC3736,TE3736,TC930,TE930,
     &TC1490,TE1490,TC3584,TE3584,TC2894,TE2894,TC5829,TE5829,TC3013,
     &TE3013,TC3018,TE3018,TCSMB5,TESMB5,TC1613,TE1613,TC2481,TE2481,
     &TC2907,TE2907,TC2222,TE2222,TC1485,TE1485,TC3439,TE3439,TC706,
     &TE706,DIR696,D2580,D751A,D4384,DFS911,D816,D21WE,D914A,D752A,
     &DPC115,D485B,D2991B,D3025B,D1054,D746A,D3026B,D3611,D3995A,
     &D3016B,D4141,D10D2,D645,D1202,D1731A,TC396A,TE396A,TC428M,
     &TE428M,TC404A,TE404A,TC393,TE393,TC501A,TE501A,TC705,TE705,
     &TC297A,TE297A,TC466M,TE466M,TC1042,TE1042,TC526,TE526,D277,D270,
     &DS1040,DEVICE,SWTCH,PWRA,PWRB,PREDCT
      READ(5,LISTA)
      DO 1 N=1,6
C  SI DEVICES
      A(1,N)=TC328A(N)
      A(2,N)=TE328A(N)
      A(3,N)=TC335(N)
      A(4,N)=TE335(N)
      A(5,N)=TC336(N)
      A(6,N)=TE336(N)
      A(7,N)=TC2484(N)
      A(8,N)=TE2484(N)
      A(9,N)=TC3736(N)
      A(10,N)=TE3736(N)
      A(11,N)=TC930(N)
      A(12,N)=TE930(N)
      A(13,N)=TC2481(N)
      A(14,N)=TE2481(N)
      A(15,N)=TC2907(N)
      A(16,N)=TE2907(N)
      A(17,N)=TC2222(N)
      A(18,N)=TE2222(N)
      A(19,N)=D4384(N)
      A(20,N)=DFS911(N)
      A(21,N)=D816(N)
      A(22,N)=D21WE(N)
      A(23,N)=D914A(N)
      S(24,N)=D752A(N)
      A(25,N)=DPC115(N)
```

```
      A(26,N)=D3026B(N)
      A(27,N)=D3611(N)
      A(28,N)=D3995A(N)
      A(29,N)=D3016B(N)
      A(30,N)=D4141(N)
      A(31,N)=D1002(N)
C     SI 145 DEVICES
      A(32,N)=TC2857(N)
      A(33,N)=TE2857(N)
      A(34,N)=TC3375(N)
      A(35,N)=TE3375(N)
      A(36,N)=TC1490(N)
      A(37,N)=TE1490(N)
      A(38,N)=TC3584(N)
      A(39,N)=TE3584(N)
      A(40,N)=TC2894(N)
      A(41,N)=TE2894(N)
      A(42,N)=TC5829(N)
      A(43,N)=TE5829(N)
      A(44,N)=TC3013(N)
      A(45,N)=TE3013(N)
      A(46,N)=TC3018(N)
      A(47,N)=TE3018(N)
      A(48,N)=TCSM85(N)
      A(49,N)=TESM85(N)
      A(50,N)=TC1613(N)
      A(51,N)=TE1613(N)
      A(52,N)=TC1485(N)
      A(53,N)=TE1485(N)
      A(54,N)=TC3439(N)
      A(55,N)=TE3439(N)
      A(56,N)=TC706(N)
      A(57,N)=TE706(N)
      A(58,N)=D1R696(N)
      A(59,N)=D2580(N)
      A(60,N)=D751A(N)
      A(61,N)=D4858(N)
      A(62,N)=D2991B(N)
      A(63,N)=D3025B(N)
      A(64,N)=D1054(N)
      A(65,N)=D746A(N)
      A(66,N)=D645(N)
      A(67,N)=D1202(N)
      A(68,N)=D1731A(N)
C     GE DEVICES
      A(69,N)=TC404A(N)
      A(70,N)=TE404A(N)
      A(71,N)=TC297A(N)
      A(72,N)=TE297A(N)
      A(73,N)=TC526(N)
      A(74,N)=TE526(N)
      A(75,N)=D270(N)
C     GE 145 DEVICES
      A(76,N)=TC396A(N)
      A(77,N)=TE396A(N)
      A(78,N)=TC428M(N)
      A(79,N)=TE428M(N)
      A(80,N)=TC393(N)
      A(81,N)=TE393(N)
      A(82,N)=TC501A(N)
```

```
      A(83,N)=TE501A(N)
      A(84,N)=TC705(N)
      A(85,N)=TE705(N)
      A(86,N)=TC466M(N)
      A(87,N)=TE466M(N)
      A(88,N)=TC1042(N)
      A(89,N)=TE1042(N)
      A(90,N)=0277(N)
      A(91,N)=DS1040(N)
    1 CONTINUE
C   A(N,1)=EXPERIMENTAL POWER TO DAMAGE AT 10 MICROSECONDS (WATTS)
C   A(N,2)=EXPERIMENTAL POWER TO DAMAGE AT 1 MICROSECOND (WATTS)
C   A(N,3)=EXPERIMENTAL POWER TO DAMAGE AT 0.1 MICROSECOND (WATTS)
C   A(N,4)=CAPACITANCE MODEL DAMAGE CONSTANT (W-S1/2) D.A.T.A. BOOK PARM.
C   A(N,5)=CAPACITANCE MODEL DAMAGE CONSTANT EXPERIMENTAL PARAMETERS
C   A(N,6)=MANUFACTURERS DC POWER RATING
      DO 200 N=1,91
      IF(A(N,3).NE.0.) GO TO 200
      IF(A(N,1).NE.0.) GO TO 204
      IF(A(N,5).EQ.0.) GO TO 201
      DAMK=A(N,5)
      GO TO 203
  201 IF(A(N,4).EQ.0.) GO TO 202
      DAMK=A(N,4)
      GO TO 203
  202 IF(A(N,6).EQ.0.) GO TO 200
      A(N,3)=-VAL(1,2)*A(N,6)*10.**7-VAL(2,2)*A(N,6)*3162.
     C-VAL(3,2)*A(N,6)
      A(N,2)=-VAL(1,2)*A(N,6)*10.**6-VAL(2,2)*A(N,6)*1000.
     C-VAL(3,2)*A(N,6)
      A(N,1)=-VAL(1,2)*A(N,6)*10.**5-VAL(2,2)*A(N,6)*316.2
     C-VAL(3,2)*A(N,6)
      GO TO 200
  203 A(N,3)=-DAMK*3162.
      A(N,2)=-DAMK*1000.
      A(N,1)=-DAMK*316.2
      GO TO 200
  204 A(N,3)=-10.*A(N,1)
      A(N,2)=-3.16*A(N,1)
  200 CONTINUE
      DO 206 N=1,91
      IF(A(N,2).LE.0.) GO TO 221
      SLOPE(N,1)=-ALOG10(A(N,1)/A(N,2))
      GO TO 222
  221 SLOPE(N,1)=-1.
  222 IF(A(N,3).LE.0.) GO TO 223
      SLOPE(N,2)=-ALOG10(A(N,2)/A(N,3))
      GO TO 224
  223 SLOPE(N,2)=-1.
  224 IF(A(N,3).LE.0.) GO TO 225
      SLOPE(N,3)=-ALOG10(A(N,1)/A(N,3))/2.
      GO TO 206
  225 SLOPE(N,3)=-1.
  206 CONTINUE
C  SLOPE CONTAINS THE POWER FUNCTION FOR THE TIME DEPENDENCY OF POWER TO DAM.
  909 FORMAT(2X////////////////)
      WRITE(6,808)
  808 FORMAT(2X,102HRATIO OF EXPERIMENTAL POWER TO DAMAGE TO DC POWER MO
     CDEL PREDICTED VALUE FOR FOLLOWING MODEL DATA BASE:///)
      WRITE(6,809)
```

```
809  FORMAT(6X,14HA..ALL DEVICES/6X,22HB..ALL SILICON DEVICES/
     &6X,24HC..ALL GERMANIUM DEVICES/
     &6X,45HD..ALL DEVICES WITHOUT CAPACITANCE MODEL DATA/
     &6X,53HE..ALL SILICON DEVICES WITHOUT CAPACITANCE MODEL DATA/
     &6X,55HF..ALL GERMANIUM DEVICES WITHOUT CAPACITANCE MODEL DATA/
     &6X,53HG..ALL SILICON DEVICES NOT INCLUDED WITHIN 145 REPORT/
     &6X,55HH..ALL GERMANIUM DEVICES NOT INCLUDED WITHIN 145 REPORT/
     &6X,49HI..ALL SILICON DEVICES INCLUDED WITHIN 145 REPORT/
     &6X,51HJ..ALL GERMANIUM DEVICES INCLUDED WITHIN 145 REPORT///)
      WRITE(6,810)
810  FORMAT(2X,120HFOR ALL CASES WHERE DATA BASE PERMITS, RATIOS ARE ON
     &LY FOR THE REMAINING SILICON OR GE DEVICES NOT INCLUDED IN DATA BA
     &SE/////)
      WRITE(6,951)
951  FORMAT(2X,97HA 0.0 ENTRY INDICATES NO DATA OR NO CALCULATION
     &     FOR ITEM K, -1 INDICATES NO CALCULATION////)
      WRITE(6,254)
254  FORMAT(2X,101HJUNCTION REVERSE BIAS CONDITIONS ONLY    NEGATIVE SI
     &GN INDICATES ESTIMATED VALUES FOR POWER TO DAMAGE////)
      IF(SWTCH.EQ.0.) GO TO 46
      WRITE(6,47)
47   FORMAT(2X,42HMEDIAN VALUE USED FOR ALL MODEL DATA BASES////)
      GO TO 48
46   WRITE(6,49)
49   FORMAT(2X,45HARITHMETIC MEAN USED FOR ALL MODEL DATA BASES////)
48   CONTINUE
      IF(PREDCT.NE.0.) GO TO 50
      WRITE(6,51)
51   FORMAT(2X,81HALL PREDICTED VALUES FOR EXP. POWER TO DAMAGE REMOVED
     & FROM DATA BASE CALCULATIONS//////)
      GO TO 52
50   WRITE(6,53)
53   FORMAT(2X,80HALL PREDICTED VALUES FOR EXP. POWER TO DAMAGE INCLUDE
     &D IN DATA BASE CALCULATIONS//////)
52   CONTINUE
      WRITE(6,909)
      WRITE(6,253)
253  FORMAT(25X,14H  EXP. POWER  ,14H  EXP. POWER  ,14H  EXP. POWER  ,
     &14H DAM. CONST.  ,14H DAM. CONST.  ,14H   DC POWER   ,14H   POWER
     &CLASS)
      WRITE(6,270)
270  FORMAT(25X,14H  TO DAMAGE   ,14H  TO DAMAGE   ,14H  TO DAMAGE   ,
     &14H  DATA BOOK   ,14H EXPERIMENTAL ,14H   RATING     ,14H        HI
     &GH=2 )
      WRITE(6,271)
271  FORMAT(25X,14H   AT 100S    ,14H    AT 1US    ,14H   AT 0.1US   ,
     &14H  PARAMETERS  ,14H  PARAMETERS  ,14X,14H         LOW=1 )
      WRITE(6,272)
272  FORMAT(25X,14H   (WATTS)    ,14H   (WATTS)    ,14H   (WATTS)    ,
     &14H (W*SEC**.5)  ,14H (W*SEC**.5)  ,14H   (WATTS)    ,14H   EXCLUD
     &ED=0 )
      WRITE(6,722)
722  FORMAT(2X,15HSILICON DEVICES)
      DO 209 N=1,91
      IF(N.NE.69) GO TO 723
      WRITE(6,724)
724  FORMAT(2X)
      WRITE(6,725)
725  FORMAT(2X,17HGERMANIUM DEVICES)
723  CONTINUE
```

```
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,208)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=1,6),PWRA(N)
  208 FORMAT(6X,4A4,3F14.3,3F14.4,F10.0)
  209 CONTINUE
      DO 413 N=1,92
      U(N,I)=A(N,1)
  413 CONTINUE
      DO 620 N=1,3
      DO 621 M=1,91
      IF(A(N,6).EQ.0.) GO TO 621
      IF(A(N,M).EQ.0.) GO TO 621
      IF(PREDCT.NE.0.) GO TO 90
      IF(A(N,M).GE.0.) GO TO 90
      B(N,M)=A(N,M)/A(N,6)
      A(N,M)=0.
      GO TO 621
   90 CONTINUE
      B(N,M)=A(N,M)/A(N,6)
  621 CONTINUE
  620 CONTINUE
      WRITE(6,214)
      WRITE(6,622)
  622 FORMAT(2X,63HRATIO OF EXPERIMENTAL POWER TO DAMAGE TO DEVICE DC PO
     &WER RATING//)
      WRITE(6,623)
  623 FORMAT(22X,11H  10 USEC  ,11H   1 USEC  ,11H  0.1 USEC //)
      DO 624 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,625)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(B(N,M),M=1,3)
  625 FORMAT(6X,4A4,3F11.1)
  624 CONTINUE
      DO 3 N=1,3
      IF(SWTCH.EQ.0.) GO TO 310
      KA=91
      KC=1
      CALL SUBA(KA,B,N,C(N,1),KC,PREDCT)
      GO TO 3
  310 DO 2 N=1,91
      IF(A(N,6).EQ.0.) GO TO 2
      IF(A(N,M).EQ.0.) GO TO 2
      A(N,M)=ABS(A(N,M))
      C(N,1)=A(N,M)/A(N,6)+C(N,1)
      PT=1.+PT
    2 CONTINUE
      C(N,1)=C(N,1)/PT
      PT=0.
    3 CONTINUE
      CALL SUBI(C(1,1),C(2,1),C(3,1),VAL(1,1),VAL(2,1),VAL(3,1))
      DO 22 N=1,3
      DO 23 M=1,91
      IF(A(N,M).EQ.0.) GO TO 23
      IF(A(N,6).EQ.0.) GO TO 23
```

```
      MM=M+6
      A(N,MM)=A(N,M)/(C(M,1)*A(N,6))
   23 CONTINUE
   22 CONTINUE
C  VAL(1,1)-(2,1)-(3,1) ARE THE CONSTANTS FOR THE EXPRESSION:
C     P=R1*T**(-1)+R2*T**(-.5)+R3     FOR ALL DEVICES
      PT=0.
      DO 4 M=1,3
      IF(SWTCH.EQ.0.) GO TO 311
      MA=68
      NC=1
      CALL SUBA(MA,B,M,C(M,2),NC,PREDCT)
      GO TO 4
  311 DO 5 N=1,68
      IF(A(N,6).EQ.0.) GO TO 5
      IF(A(N,M).EQ.0.) GO TO 5
      A(N,M)=ABS(A(N,M))
      C(N,2)=A(N,M)/A(N,6)+C(N,2)
      PT=1.+PT
    5 CONTINUE
      C(M,2)=C(M,2)/PT
      PT=0.
    4 CONTINUE
      DO 24 M=1,3
      DO 25 N=1,68
      IF(A(N,M).EQ.0.) GO TO 25
      IF(A(N,6).EQ.0.) GO TO 25
      MM=M+9
      A(N,MM)=A(N,M)/(C(M,2)*A(N,6))
   25 CONTINUE
   24 CONTINUE
      CALL SUB(C(1,2),C(2,2),C(3,2),VAL(1,2),VAL(2,2),VAL(3,2))
C  VAL(1,2)-(2,2)-(3,2) ARE CONSTANTS FOR ALL SILICON DEVICES
      PT=0.
      DO 6 M=1,3
      IF(SWTCH.EQ.0.) GO TO 312
      MA=91
      NC=69
      CALL SUBA(MA,B,M,C(M,3),NC,PREDCT)
      GO TO 6
  312 DO 7 N=69,91
      IF(A(N,6).EQ.0.) GO TO 7
      IF(A(N,M).EQ.0.) GO TO 7
      A(N,M)=ABS(A(N,M))
      C(N,3)=A(N,M)/A(N,6)+C(N,3)
      PT=1.+PT
    7 CONTINUE
      C(M,3)=C(M,3)/PT
      PT=0.
    6 CONTINUE
      CALL SUB(C(1,3),C(2,3),C(3,3),VAL(1,3),VAL(2,3),VAL(3,3))
C  VAL(1,3)-(2,3)-(3,3) ARE CONSTANTS FOR ALL GERMANIUM DEVICES
      DO 26 M=1,3
      DO 27 N=69,91
      IF(A(N,M).EQ.0.) GO TO 27
      IF(A(N,6).EQ.0.) GO TO 27
      MM=M+12
      A(N,MM)=A(N,M)/(C(M,3)*A(N,6))
   27 CONTINUE
   26 CONTINUE
```

```
      PT=0.
      DO 8 M=1,3
      IF(SWTCH.EQ.0.) GO TO 313
      NN=0
      DO 314 N=1,91
      IF(A(N,6).EQ.0.) GO TO 314
      IF(A(N,M).EQ.0.) GO TO 314
      IF(A(N,4).NE.0.) GO TO 314
      IF(A(N,5).NE.0.) GO TO 314
      NN=1+NN
      IF(PREDCT.NE.0.) GO TO 60
      IF(B(N,M).LT.0.) B(N,M)=0.
   60 CONTINUE
      D(N)=ABS(B(N,M))
  314 CONTINUE
      NNN=NN/2
      KK=92
      DO 315 K=1,NNN
      BG=0.
      D(KK)=0.
      DO 316 N=1,91
      IF(A(N,6).EQ.0.) GO TO 316
      IF(A(N,M).EQ.0.) GO TO 316
      IF(A(N,4).NE.0.) GO TO 316
      IF(A(N,5).NE.0.) GO TO 316
      IF(D(N).LE.BG) GO TO 316
      BG=D(N)
      KK=N
  316 CONTINUE
  315 CONTINUE
      C(M,4)=D(KK)
      GO TO 8
  313 DO 9 N=1,91
      IF(A(N,6).EQ.0.) GO TO 9
      IF(A(N,M).EQ.0.) GO TO 9
      IF(A(N,4).NE.0.) GO TO 9
      IF(A(N,5).NE.0.) GO TO 9
      A(N,M)=ABS(A(N,M))
      C(M,4)=A(N,M)/A(N,6)*C(M,4)
      PT=1.+PT
    9 CONTINUE
      C(M,4)=C(M,4)/PT
      PT=0.
    8 CONTINUE
      CALL SUB(C(1,4),C(2,4),C(3,4),VAL(1,4),VAL(2,4),VAL(3,4))
C  VAL(1,4)-(2,4)-(3,4) ARE CONSTANTS FOR ALL DEVICES WITHOUT CAPACITANCE MODEL
C  DATA
      DO 28 M=1,3
      DO 29 N=1,91
      IF(A(N,M).EQ.0.) GO TO 29
      IF(A(N,6).EQ.0.) GO TO 29
      IF(A(N,4).NE.0.) GO TO 30
      IF(A(N,5).EQ.0.) GO TO 29
   30 NN=M+15
      A(N,NN)=A(N,M)/(C(M,4)*A(N,6))
   29 CONTINUE
   28 CONTINUE
      DO 10 M=1,3
      IF(SWTCH.EQ.0.) GO TO 317
      NN=0
```

```
      DO 318 N=1,68
      IF(A(N,6).EQ.0.) GO TO 318
      IF(A(N,M).EQ.0.) GO TO 318
      IF(A(N,4).NE.0.) GO TO 318
      IF(A(N,5).NE.0.) GO TO 318
      NN=1+NN
      IF(PREDCT.NE.0.) GO TO 61
      IF(B(N,M).LT.0.) B(N,M)=0.
   61 CONTINUE
      D(N)=ABS(B(N,M))
  318 CONTINUE
      NNN=NN/2
      KK=92
      DO 319 K=1,NNN
      BG=0.
      D(KK)=0.
      DO 320 N=1,68
      IF(A(N,6).EQ.0.) GO TO 320
      IF(A(N,M).EQ.0.) GO TO 320
      IF(A(N,4).NE.0.) GO TO 320
      IF(A(N,5).NE.0.) GO TO 320
      IF(D(N).LE.BG) GO TO 320
      BG=D(N)
      KK=N
  320 CONTINUE
  319 CONTINUE
      C(M,5)=D(KK)
      GO TO 10
  317 DO 11 N=1,68
      IF(A(N,6).EQ.0.) GO TO 11
      IF(A(N,M).EQ.0.) GO TO 11
      IF(A(N,4).NE.0.) GO TO 11
      IF (A(N,5).NE.0.) GO TO 11
      A(N,M)=ABS(A(N,M))
      C(M,5)=A(N,M)/A(N,6)+C(M,5)
      PT=1.+PT
   11 CONTINUE
      C(M,5)=C(M,5)/PT
      PT=0.
   10 CONTINUE
      CALL SUB(C(1,5),C(2,5),C(3,5),VAL(1,5),VAL(2,5),VAL(3,5))
C  VAL(1,5)-(2,5)-(3,5) ARE CONSTANTS FOR SI DEVICES WITHOUT CAP. MODEL DATA
      DO 31 M=1,3
      DO 32 N=1,68
      IF(A(N,M).EQ.0.) GO TO 32
      IF(A(N,6).EQ.0.) GO TO 32
      IF(A(N,4).NE.0.) GO TO 33
      IF(A(N,5).EQ.0.) GO TO 32
   33 NN=N+10
      A(N,NN)=A(N,M)/(C(M,5)*A(N,6))
   32 CONTINUE
   31 CONTINUE
      DO 12 M=1,3
      IF(SWTCH.EQ.0.) GO TO 321
      NN=0
      DO 322 N=69,91
      IF(A(N,6).EQ.0.) GO TO 322
      IF(A(N,M).EQ.0.) GO TO 322
      IF(A(N,4).NE.0.) GO TO 322
      IF(A(N,5).NE.0.) GO TO 322
```

```
      NN=1+NN
      IF(PREDCT.NE.0.) GO TO 62
      IF(B(N,M).LT.0.) B(N,M)=0.
   62 CONTINUE
      D(N)=ABS(B(N,M))
  322 CONTINUE
      NNN=NN/2
      KK=92
      DO 323 N=1,NNN
      BG=0.
      D(KK)=0.
      DO 324 N=69,91
      IF(A(N,6).EQ.0.) GO TO 324
      IF(A(N,M).EQ.0.) GO TO 324
      IF(A(N,4).NE.0.) GO TO 324
      IF(A(N,5).NE.0.) GO TO 324
      IF(D(N).LE.BG) GO TO 324
      BG=D(N)
      KK=N
  324 CONTINUE
  323 CONTINUE
      C(M,6)=D(KK)
      GO TO 12
  321 DO 13 N=69,91
      IF(A(N,6).EQ.0.) GO TO 13
      IF(A(N,M).EQ.0.) GO TO 13
      IF(A(N,4).NE.0.) GO TO 13
      IF(A(N,5).NE.0.) GO TO 13
      A(N,M)=ABS(A(N,M))
      C(M,6)=A(N,M)/A(N,6)*C(M,6)
      PT=1.+PT
   13 CONTINUE
      C(M,6)=C(M,6)/PT
      PT=0.
   12 CONTINUE
      CALL SUB(C(1,6),C(2,6),C(3,6),VAL(1,6),VAL(2,6),VAL(3,6))
  VAL(1,6)-(2,6)-(3,6) ARE CONSTANTS FOR GE DEVICES WITHOUT CAP. MODEL DATA
      DO 34 M=1,3
      DO 35 N=69,91
      IF(A(N,M).EQ.0.) GO TO 35
      IF(A(N,6).EQ.0.) GO TO 35
      IF(A(N,4).NE.0.) GO TO 36
      IF(A(N,5).EQ.0.) GO TO 35
   36 MM=M+21
      A(N,MM)=A(N,M)/(C(M,6)*A(N,6))
   35 CONTINUE
   34 CONTINUE
      DO 14 M=1,3
      IF(SWTCH.EQ.0.) GO TO 325
      KA=31
      KC=1
      CALL SURA(KA,B,M,C(M,7),KC,SWTCH)
      GO TO 14
  325 DO 15 N=1,31
      IF(A(N,6).EQ.0.) GO TO 15
      IF(A(N,M).EQ.0.) GO TO 15
      A(N,M)=ABS(A(N,M))
      C(N,7)=A(N,M)/A(N,6)*C(N,7)
      PT=1.+PT
   15 CONTINUE
```

```
      C(M,7)=C(M,7)/PT
      PT=0.
   14 CONTINUE
      CALL SUB(C(1,7),C(2,7),C(3,7),VAL(1,7),VAL(2,7),VAL(3,7))
C  VAL(1,7)-(2,7)-(3,7) ARE CONSTANTS FOR SI DEVICES NOT IN 145 REPORT
      DO 37 M=1,3
      DO 38 N=32,68
      IF(A(N,M).EQ.0.) GO TO 38
      IF(A(N,6).EQ.0.) GO TO 38
      MM=M+24
      A(N,MM)=A(N,M)/(C(M,7)*A(N,6))
   38 CONTINUE
   37 CONTINUE
      DO 17 M=1,3
      IF(SWTCH.EQ.0.) GO TO 326
      KA=75
      KC=69
      CALL SUBA(KA,B,M,C(M,6),KC,SWTCH)
      GO TO 17
  326 DO 16 N=69,75
      IF(A(N,6).EQ.0.) GO TO 16
      IF(A(N,M).EQ.0.) GO TO 16
      A(N,M)=ABS(A(N,M))
      C(M,8)=A(N,M)/A(N,6)+C(M,8)
      PT=1.+PT
   16 CONTINUE
      C(M,8)=C(M,8)/PT
      PT=0.
   17 CONTINUE
      CALL SUB(C(1,8),C(2,8),C(3,8),VAL(1,8),VAL(2,8),VAL(3,8))
C  VAL(1,8)-(2,8)-(3,8) ARE CONSTANTS FOR GE DEVICES NOT IN 145 REPORT
      DO 39 M=1,3
      DO 40 N=76,91
      IF(A(N,M).EQ.0.) GO TO 40
      IF(A(N,6).EQ.0.) GO TO 40
      MM=M+27
      A(N,MM)=A(N,M)/(C(M,8)*A(N,6))
   40 CONTINUE
   39 CONTINUE
      DO 18 M=1,3
      IF(SWTCH.EQ.0.) GO TO 327
      KA=68
      KC=32
      CALL SUBA(KA,B,M,C(M,9),KC,SWTCH)
      GO TO 18
  327 DO 19 N=32,68
      IF(A(N,6).EQ.0.) GO TO 19
      IF(A(N,M).EQ.0.) GO TO 19
      A(N,M)=ABS(A(N,M))
      C(M,9)=A(N,M)/A(N,6)+C(M,9)
      PT=1.+PT
   19 CONTINUE
      C(M,9)=C(M,9)/PT
      PT=0.
   18 CONTINUE
      CALL SUB(C(1,9),C(2,9),C(3,9),VAL(1,9),VAL(2,9),VAL(3,9))
C  VAL(1,9)-(2,9)-(3,9) ARE CONSTANTS FOR SI DEVICES INCLUDED IN 145 REPORT
      DO 41 M=1,3
      DO 42 N=3,31
      IF(A(N,M).EQ.0.) GO TO 42
```

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      IF(A(N,6).EQ.0.) GO TO 42
      MM=M+30
      A(N,MM)=A(N,M)/(C(M,9)*A(N,6))
   42 CONTINUE
   41 CONTINUE
      DO 20 M=1,3
      IF(SWTCH.EQ.0.) GO TO 328
      KA=91
      KC=76
      CALL SUBA(KA,0,M,C(M,10),KC,SWTCH)
      GO TO 20
  328 DO 21 N=76,91
      IF(A(N,6).EQ.0.) GO TO 21
      IF(A(N,M).EQ.0.) GO TO 21
      A(N,M)=ABS(A(N,M))
      C(M,10)=A(N,M)/A(N,6)*C(M,10)
      PT=1.+PT
   21 CONTINUE
      C(M,10)=C(M,10)/PT
      PT=0.
   20 CONTINUE
      CALL SUB(C(1,10),C(2,10),C(3,10),VAL(1,10),VAL(2,10),VAL(3,10))
C  VAL(1,10)-(2,10)-(3,10) ARE CONSTANTS FOR GE DEVICES INCLUDED IN 145 REPORT
      DO 43 M=1,3
      DO 44 N=69,75
      IF(A(N,M).EQ.0.) GO TO 44
      IF(A(N,6).EQ.0.) GO TO 44
      MM=M+33
      A(N,MM)=A(N,M)/(C(M,10)*A(N,6))
   44 CONTINUE
   43 CONTINUE
      DO 337 M=1,3
      DO 338 N=1,9
      A(N,M)=ABS(A(N,M))
  338 CONTINUE
  337 CONTINUE
      DO 500 M=1,3
      CS=100.*3.162**M
      DO 501 N=1,91
      MM=M+36
      IF(A(N,4).EQ.0.) GO TO 501
      IF(A(N,M).EQ.0.) GO TO 501
      A(N,MM)=A(N,M)/(A(N,4)*CS)
  501 CONTINUE
  500 CONTINUE
      DO 502 M=1,3
      CS=100.*3.162**M
      DO 503 N=1,91
      MM=M+39
      IF(A(N,5).EQ.0.) GO TO 503
      IF(A(N,M).EQ.0.) GO TO 503
      A(N,MM)=A(N,M)/(A(N,5)*CS)
  503 CONTINUE
  502 CONTINUE
      DO 511 M=1,3
      CS=100.*3.162**M
      DO 512 N=1,91
      MM=M+42
      IF(A(N,5).EQ.0.) GO TO 513
      IF(A(N,M).EQ.0.) GO TO 512
```

```
      A(N,MM)=A(N,M)/(A(N,5)*C5)
      GO TO 512
  513 IF(A(N,4).EQ.0.) GO TO 512
      IF(A(N,M).EQ.0.) GO TO 512
      A(N,MM)=A(N,M)/(A(N,4)*C5)
  512 CONTINUE
  511 CONTINUE
      WRITE(6,214)
  214 FORMAT(2X/////)
      WRITE(6,260)
      WRITE(6,255)
  260 FORMAT(22X,11H      A      ,11H      A      ,11H      A      ,11H      B
     &      ,11H      B      ,11H      B      ,11H      C      ,11H      C      ,
     &11H      C      ,11H      D      )
  255 FORMAT(22X,11H   10 USEC  ,11H    1 USEC  ,11H  0.1 USEC ,11H   10 US
     &EC  ,11H    1 USEC  ,11H  0.1 USEC ,11H   10 USEC  ,11H    1 USEC  ,
     &11H  0.1 USEC ,11H   10 USEC  //)
      DO 211 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,210)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=7,16)
  210 FORMAT(6X,4A4,10F11.5)
  211 CONTINUE
      WRITE(6,214)
      WRITE(6,256)
  256 FORMAT(22X,11H      D      ,11H      D      ,11H      E      ,11H      E
     &      ,11H      E      ,11H      F      ,11H      F      ,11H      F      ,
     &11H      G      ,11H      G      )
      WRITE(6,257)
  257 FORMAT(22X,11H    1 USEC  ,11H  0.1 USEC ,11H   10 USEC  ,11H    1 US
     &EC  ,11H   0.1 USEC ,11H   10 USEC  ,11H    1 USEC  ,11H  0.1 USEC ,
     &11H   10 USEC  ,11H    1 USEC  //)
      DO 212 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,210)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=17,26)
  212 CONTINUE
      WRITE(6,214)
      WRITE(6,290)
  290 FORMAT(22X,11H      G      ,11H      H      ,11H      H      ,11H      H
     &      ,11H      I      ,11H      I      ,11H      I      ,11H      J      ,
     &11H      J      ,11H      J      )
      WRITE(6,291)
  291 FORMAT(22X,11H  0.1 USEC ,11H   10 USEC  ,11H    1 USEC  ,11H  0.1 U
     &SEC ,11H   10 USEC  ,11H    1 USEC  ,11H  0.1 USEC ,11H   10 USEC  ,
     &11H    1 USEC  ,11H  0.1 USEC //)
      DO 213 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,210)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=27,36)
  213 CONTINUE
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      WRITE(6,214)
      WRITE(6,888)
  888 FORMAT(2X,104HN VALUE FOR RELATIONSHIP: K=P*T**(-N) DERIVED FROM E
     EXPERIMENTAL DAMAGE DATA FOR TIME INTERVALS INDICATED//)
      WRITE(6,330)
  330 FORMAT(22X,11H      K      ,11H      K      ,11H      K      )
      WRITE(6,917)
  917 FORMAT(22X,11H 10-1 USEC ,11H 1-.1 USEC ,11H 10-.1 USEC//)
      DO 250 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,251)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     E(SLOPE(N,M),M=1,3)
  251 FORMAT(6X,4A4,3F11.5)
  250 CONTINUE
      WRITE(6,214)
      IF(SWTCH.EQ.0.) GO TO 415
      WRITE(6,416)
  416 FORMAT(2X,83HMEDIAN VALUES FOR QUANTITIES A THROUGH J FOR PULSE DU
     ERATIONS OF 10, 1, AND 0.1 USEC///)
      GO TO 417
  415 WRITE(6,418)
  418 FORMAT(2X,92HARITHMETIC MEAN VALUES FOR QUANTITIES A THROUGH J FOR
     E PULSE DURATIONS OF 10, 1, AND 0.1 USEC///)
  417 CONTINUE
      WRITE(6,1121)(C(M,1),M=1,3)
      WRITE(6,1121)(C(M,2),M=1,3)
      WRITE(6,1121)(C(M,3),M=1,3)
      WRITE(6,1121)(C(M,4),M=1,3)
      WRITE(6,1121)(C(M,5),M=1,3)
      WRITE(6,1121)(C(M,6),M=1,3)
      WRITE(6,1121)(C(M,7),M=1,3)
      WRITE(6,1121)(C(M,8),M=1,3)
      WRITE(6,1121)(C(M,9),M=1,3)
 1121 FORMAT(10X,3E12.2)
      WRITE(6,1121)(C(M,10),M=1,3)
      WRITE(6,306)
      WRITE(6,551)
  551 FORMAT(20X,76HPOWER TO DAMAGE EQUATION COEFFICIENTS FOR POPULATION
     ES DEFINED BY A THROUGH J///)
      WRITE(6,552)
  552 FORMAT(45X,21H         -1        -1/2)
      WRITE(6,553)
  553 FORMAT(45X,26HP = K1 T    + K2 T     + K3///)
      WRITE(6,554)
  554 FORMAT(10X,36H      K1           K2           K3      //)
      DO 556 N=1,10
      WRITE(6,557)VAL(1,N),VAL(2,N),VAL(3,N)
  557 FORMAT(10X,3E12.3)
  556 CONTINUE
      WRITE(6,214)
      WRITE(6,504)
      WRITE(6,509)
      WRITE(6,510)
  504 FORMAT(2X,124HRATIO OF EXPERIMENTAL POWER TO DAMAGE TO PREDICTED V
     ALUE BASED ON JUNCTION CAPACITANCE MODEL: L=MODEL BASED ON D.A.T.A
     E. (90K)
  509 FORMAT(2X,124HPARAMETERS     M=MODEL BASED ON EXPERIMENTAL PARAMETE
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     ERS    N=MODEL BASED ON EXPERIMENTAL PARAMETERS AND, WHERE DATA MIS
     ESING, )
  510  FORMAT(2X,33HBASED ON D.A.T.A. BOOK PARAMETERS)
       WRITE(6,505)
  505  FORMAT(22X,11H     L     ,11H     L     ,11H     L     ,11H     M
     E    ,11H     M     ,11H     M     ,11H     N     ,11H     N     ,
     E11H     N     //)
       WRITE(6,506)
  506  FORMAT(22X,11H  10 USEC  ,11H   1 USEC  ,11H  0.1 USEC ,11H  10 US
     EEC  ,11H   1 USEC  ,11H  0.1 USEC ,11H  10 USEC  ,11H   1 USEC  ,
     E11H  0.1 USEC //)
       DO 507 N=1,91
       KA=4*(N-1)+1
       KB=4*(N-1)+2
       KC=4*(N-1)+3
       KD=4*(N-1)+4
       WRITE(6,508)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     E(A(N,M),M=37,45)
  508  FORMAT(6X,4A4,9F11.5)
  507  CONTINUE
       DO 410 N=69,91
       DO 411 M=37,45
       A(N,M)=0.
  411  CONTINUE
  410  CONTINUE
       DO 375 KJ=1,2
       IF(KJ.EQ.1) GO TO 378
       DO 379 NZ=1,91
       PWR(NZ)=PWRB(NZ)
  379  CONTINUE
       GO TO 380
  378  DO 381 NZ=1,91
       PWR(NZ)=PWRA(NZ)
  381  CONTINUE
  380  IF(KJ.EQ.1) GO TO 376
       KD=18
       GO TO 377
  376  KD=0
  377  DO 360 KK=1,3
       DD=0.
       CC=0.
       PWRL=0.
       PWRH=0.
       PWRLA=0.
       PWRHA=0.
       PWRLB=0.
       PWRHB=0.
       IF(KK-2)361,362,363
  361  ND=91
       NC=1
       GO TO 364
  362  ND=68
       NC=1
       GO TO 364
  363  ND=91
       NC=69
  364  IF(SWITCH.EQ.0.) GO TO 400
       DO 401 N=NC,ND
       IF(PWR(N)-1.) 401,402,403
  402  DD=1.+DD
```

```
      GO TO 401
  403 CC=1.*CC
  401 CONTINUE
      NDD=DD/2.
      NCC=CC/2.
      NZ=92
      CALL SUBB(NDD,NCC,U,NC,ND,PWR,PWRL,PWRH)
      GO TO 408
  400 DO 340 N=NC,ND
      IF(PWR(N)-1.)340,341,342
  341 DD=1.*DD
      PWRL=A(N,1)*PWRL
      GO TO 340
  342 CC=1.*CC
      PWRH=A(N,1)*PWRH
  340 CONTINUE
      PWRL=PWRL/DD
      PWRH=PWRH/CC
  408 PWRLA=PWRL/(1.0E-05)**(-.4)
      PWRHA=PWRH/(1.0E-05)**(-.4)
      PWRLB=PWRL/(1.0E-05)**(-.5)
      PWRHB=PWRH/(1.0E-05)**(-.5)
      WRITE(6,4014)PWRLB,PWRHB
 4014 FORMAT(2X,2E14.3)
      DO 347 K=1,2
      DO 343 M=1,3
      IF(K.EQ.1) GO TO 348
      MM=48+M+(6*(KK-1))+KD
      EXP=100.**3.162**M
      PWL=PWRLB
      PWH=PWRHB
      GO TO 349
  348 MM=45+M+(6*(KK-1))+KD
      EXP=100.**2.512**(M-1)
      PWL=PWRLA
      PWH=PWRHA
  349 DO 344 N=NC,ND
      IF(KJ.EQ.1) GO TO 450
      IF(PWR(N).NE.0.) GO TO 344
      PWR(N)=PWRA(N)
  450 IF(PWR(N)-1.)344,345,346
  345 A(N,MM)=A(N,M)/(PWL**EXP)
      GO TO 344
  346 A(N,MM)=A(N,M)/(PWH**EXP)
  344 CONTINUE
      IF(KJ.EQ.1) GO TO 460
      DO 461 N=NC,ND
      PWR(N)=PWRB(N)
  461 CONTINUE
  460 CONTINUE
  343 CONTINUE
  347 CONTINUE
  340 CONTINUE
  375 CONTINUE
C   FOR PWRA: LOW POWER DEVICES=1, HIGH POWER=2, EXCLUDED=3
C    FOR PWRB: SAME AS PWRA EXCEPT LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE
C   MODEL DATA
      WRITE(6,214)
      WRITE(6,350)
  350 FORMAT(2X,125HD= EXPERIMENTAL POWER TO DAMAGE/KA*T**(-.4), WHERE K
```

```
     &A DAMAGE CONSTANT BASED ON HIGH POWER OR LOW POWER RATING FOR ALL
     &DEVICES)
      WRITE(6,351)
  351  FORMAT(2X,125HP= EXPERIMENTAL POWER TO DAMAGE/KA*T**(-.5), WHERE K
     &A DAMAGE CONSTANT BASED ON HIGH POWER OR LOW POWER RATING FOR ALL
     &DEVICES)
      WRITE(6,352)
  352  FORMAT(2X,,43HQ=SAME AS O EXCEPT FOR SILICON DEVICES ONLY)
      WRITE(6,353)
  353  FORMAT(2X,,43HR=SAME AS P EXCEPT FOR SILICON DEVICES ONLY)
      WRITE(6,354)
  354  FORMAT(2X,,45HS=SAME AS O EXCEPT FOR GERMANIUM DEVICES ONLY)
      WRITE(6,355)
  355  FORMAT(2X,,45HT=SAME AS P EXCEPT FOR GERMANIUM DEVICES ONLY//)
      WRITE(6,356)
  356  FORMAT(22X,11H      O      ,11H      O      ,11H      O      ,11H      P
     &      ,11H      P      ,11H      P      ,11H      Q      ,
     &11H      Q      ,11H      Q      //)
      WRITE(6,357)
  357  FORMAT(22X,11H   10 USEC  ,11H    1 USEC  ,11H  0.1 USEC ,
     &11H   10 USEC  ,11H    1 USEC  ,11H  0.1 USEC ,
     &11H   10 USEC  ,11H    1 USEC  ,11H  0.1 USEC //)
      DO 358 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,359)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=46,54)
  358  CONTINUE
      WRITE(6,214)
      WRITE(6,370)
  370  FORMAT(22X,11H      R      ,11H      R      ,11H      R      ,11H      S
     &      ,11H      S      ,11H      S      ,11H      T      ,
     &11H      T      ,11H      T      //)
      WRITE(6,357)
      DO 371 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,359)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=55,63)
  371  CONTINUE
  359  FORMAT(6X,4A4,9F11.3)
      WRITE(6,382)
  382  FORMAT(2X,,82HU= SAME AS O EXCEPT MODEL LIMITED TO DEVICES WITHOUT
     &CAPACITANCE DAMAGE MODEL DATA)
      WRITE(6,383)
  383  FORMAT(2X,,82HV= SAME AS P EXCEPT MODEL LIMITED TO DEVICES WITHOUT
     &CAPACITANCE DAMAGE MODEL DATA)
      WRITE(6,384)
  384  FORMAT(2X,,82HW= SAME AS O EXCEPT MODEL LIMITED TO DEVICES WITHOUT
     &CAPACITANCE DAMAGE MODEL DATA)
      WRITE(6,385)
  385  FORMAT(2X,,82HX= SAME AS R EXCEPT MODEL LIMITED TO DEVICES WITHOUT
     &CAPACITANCE DAMAGE MODEL DATA)
      WRITE(6,386)
  386  FORMAT(2X,,82HY= SAME AS S EXCEPT MODEL LIMITED TO DEVICES WITHOUT
     &CAPACITANCE DAMAGE MODEL DATA)
```

```
      WRITE(6,387)
  387 FORMAT(2X,82HZ= SAME AS T EXCEPT MODEL LIMITED TO DEVICES WITHOUT
     &CAPACITANCE DAMAGE MODEL DATA//)
      WRITE(6,388)
  388 FORMAT(22X,11H      U      ,11H      U      ,11H      U      ,
     &11H      V      ,11H      V      ,11H      V      ,
     &11H      W      ,11H      W      ,11H      W      //)
      WRITE(6,357)
      DO 389 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,359)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=64,72)
  389 CONTINUE
      WRITE(6,214)
      WRITE(6,391)
  391 FORMAT(22X,11H      X      ,11H      X      ,11H      X      ,
     &11H      Y      ,11H      Y      ,11H      Y      ,
     &11H      Z      ,11H      Z      ,11H      Z      //)
      WRITE(6,357)
      DO 392 N=1,91
      KA=4*(N-1)+1
      KB=4*(N-1)+2
      KC=4*(N-1)+3
      KD=4*(N-1)+4
      WRITE(6,359)DEVICE(KA),DEVICE(KB),DEVICE(KC),DEVICE(KD),
     &(A(N,M),M=73,81)
  392 CONTINUE
      DO 394 N=1,91
      DO 394 M=1,81
      A(N,M)=ABS(A(N,M))
      V(N,M)=A(N,M)
  394 CONTINUE
  423 DO 299 M=1,25
      KK=1
      BB=0.
      MA=3*M+4
      S(1,M)=A(1,MA)
  302 DO 300 K=1,3
      MAA=MA+K-1
      DO 301 N=1,91
      IF(A(N,MAA).LE.S(KK,M)) GO TO 301
      S(KK,M)=A(N,MAA)
      BB=1.
      NZ=N
      MAAZ=MAA
  301 CONTINUE
  300 CONTINUE
      IF(BB.EQ.0.) GO TO 299
      A(NZ,MAAZ)=0.
      BB=0.
      KK=1+KK
      GO TO 302
  299 CONTINUE
      WRITE(6,214)
      WRITE(6,280)
  280 FORMAT(5X,59HQUANTITIES A THROUGH J AND L THROUGH Z ORDERED BY MAG
     &NITUDE///)
```

```
      WRITE(6,412)
  412 FORMAT(5X,36HSILICON DEVICES ONLY FOR L, M, AND N///)
      IF(KABC.NE.1) GO TO 424
      WRITE(6,425)
  425 FORMAT(5X,106HFOR VALUES OF A THROUGH J AND L THROUGH Z LESS THAN
     &1, VALUE TABULATED IS INVERSE OF THE VALUE LESS THAN 1///)
  424 CONTINUE
      DO 304 M=1,25
      KK=0
      DO 484 K=1,273
      IF(S(K,M).EQ.0.) GO TO 485
      KK=1+KK
  484 CONTINUE
  485 CONTINUE
      WRITE(6,305)(S(N,M),N=1,KK)
  305 FORMAT(2X,10F13.5)
      IF(KABC.NE.1) GO TO 727
      WRITE(6,728)
  728 FORMAT(2X,57HPARAMETERS IMMEDIATELY ABOVE 95 PER CENT CONFIDENCE L
     &EVEL)
      DO 729 KL=1,KK
      AL=KL
      AK=KK
      PERCNT(KL)=((AK-AL)*100.)/AK
  729 CONTINUE
      KT=0
      KZ=0
      DO 730 KR=1,KK
      KT=1+KT
      KZ=1+KZ
      CNT(KZ)=S(KT,M)
      KZ=1+KZ
      CNT(KZ)=PERCNT(KT)
  730 CONTINUE
      WRITE(6,731)(CNT(LB),LB=1,KZ)
  731 FORMAT(2X,F9.2,F5.1,4X,F9.2,F5.1,4X,F9.2,F5.1,
     &4X,F9.2,F5.1,4X,F9.2,F5.1,4X,F9.2,F5.1,4X,F9.2,F5.1)
  727 CONTINUE
      WRITE(6,306)
  306 FORMAT(2X////)
  304 CONTINUE
      KABC=1+KABC
      IF(KABC.NE.1) GO TO 422
      DO 420 M=7,81
      DO 421 N=1,92
      IF(V(N,M).GE.1.) GO TO 482
      IF(V(N,M).EQ.0.) GO TO 482
      A(N,M)=1./V(N,M)
      GO TO 421
  482 A(N,M)=V(N,M)
  421 CONTINUE
  420 CONTINUE
      DO 480 M=1,25
      DO 481 N=1,273
      S(N,M)=0.
  481 CONTINUE
  480 CONTINUE
      GO TO 423
  422 CONTINUE
      STOP
```

```
      END
/*
//GO.SYSIN DD *
 ELISTA TC328A=20.,52.,140.,3.23,.837,.4,
 TE328A=9.,16.,30.,0.,.33,.4,
 TC335=20.,80.,300.,.305,1.85,.15,
 TE335=20.,44.,100.,0.,.293,.15,
 TC336=30.,70.,160.,.65,0.,.15,
 TE336=70.,112.,625.,0.,0.,.15,
 TC2484=42.,46.,50.,0.,0.,.36,
 TE2484=15.,48.,160.,0.,0.,.36,
 TC3736=44.,72.,115.,0.,0.,.5,
 TE3736=110.,255.,590.,0.,0.,.5,
 TC930=30.,74.,180.,.058,.209,.3,
 TE930=16.,60.,230.,0.,.0108,.3,
 TC2481=10.,10.,10.,.203,4.09,.36,
 TE2481=18.,30.,53.,0.,.124,.36,
 TC2907=20.,53.,135.,0.,0.,.4,
 TE2907=53.,78.,110.,0.,0.,.4,
 TC2222=32.,85.,220.,0.,0.,.5,
 TE2222=40.,135.,400.,0.,0.,.5,
 04384=2100.,2300.,2800.,0.,16.9,1.3,
 DFS911=1600.,2700.,4100.,0.,27.7,0.,
 0816=1400.,2700.,6400.,0.,1.93,0.,
 D21WE=1.1,2.0,3.4,0.,0.,0.,
 0914A=15.,80.,420.,.233,.423,.068,
 D752A=83.,340.,2300.,0.,.536,.4,
 DPE115=510.,1350.,3300.,.686,0.,0.,
 D30268=17000.,0.,0.,0.,59.5,1.,
 03611=3000.,3000.,3000.,0.,15.9,2.4,
 D3995A=0.,0.,0.,0.,83.,10.,
 D30168=13000.,0.,0.,0.,23.1,1.,
 04141=8000.,0.,0.,0.,18.1,3.,
 01002=670.,0.,0.,0.,17.7,.95,
 TC2857=12.4,16.,120.,0.,0.,.2,
 TE2857=.84,2.6,8.2,0.,0.,.2,
 TC3375=500.,1000.,1800.,0.,0.,11.,
 TE3375=230.,440.,1300.,0.,0.,11.,
 TC1490=700.,2300.,7000.,0.,0.,75.,
 TE1490=1300.,3800.,13000.,0.,0.,75.,
 TC3584=120.,370.,1200.0,0.,0.,2.5,
 TE3584=490.,2150.,10000.,0.,0.,2.5,
 TC2894=14.,50.,170.,0.,0.,.36,
 TE2894=12.,19.,30.,0.,0.,.36,
 TC5829=6.,17.,47.,0.,0.,.2,
 TE5829=4.3,10.,22.,0.,0.,.2,
 TC3013=4.3,21.,100.,0.,0.,.36,
 TE3013=20.,31.5,52.,0.,0.,.36,
 TC3018=5.8,20.,64.,.0056,0.,.3,
 TE3018=4.,10.,22.,.00069,0.,.3,
 TCSM85=26.,100.,320.,
 TESM85=20.,50.,130.,
 TC1613=1400.,2100.,3200.,.301,.888,.8,
 TE1613=160.,340.,750.,0.,.103,.8,
 TC1485=700.,1100.,1700.,0.,0.,1.7,
 TE1485=3100.,-30000.,-29000.,0.,0.,1.7,
 TC3439=10.,27.,78.,0.,0.,1.,
 TE3439=180.,620.,2200.,0.,0.,1.,
 TC706=2.8,17.,93.,.0243,0.,.3,
 TE706=6.8,18.,50.,0.,0.,.3,
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D3R696=750.,7500.,75000.,0.,0.,0.,
D2580=17000.,0.,0.,0.,0.,13.,
D751A=240.,2500.,25500.,0.,3.33,.4,
D485B=100.,435.,2000.,0.,.611,.25,
D2901=10000.,0.,0.,0.,20.,10.,
D4025B=1400.,-14000.,-14000.,0.,7.48,1.,
D1054=25.,33.5,44.,
D746A=2600.,-20000.,-15380.,0.,3.44,.4,
D645=500.,580.,1625.,0.,3.,.4,
D1202=100.,1900.,9000.,0.,0.,12.,
D1731A=800.,2000.,5700.,0.,0.,4.,
TC404A=120.,160.,230.,.92,1.,.15,
TE404A=100.,140.,175.,0.,.8,.15,
TC297A=200.,2700.,.9,6,35,
TE297A=1400.,3300.,.9.5,35,
TC526=130.,425.,.188,.39,.225,
TE526=160.,500.,0.,1.92,.225,
D270=19.,20.,23.,0.,1.38,.08,
TC396A=115.,170.,230.,.087,0.,.2,
TE396A=130.,205.,350.,0.,0.,.2,
TC420M=170.,260.,420.,.087,0.,.15,
TE420M=220.,280.,335.,0.,0.,.15,
TC393=300.,1100.,3400.,.0139,0.,.035,
TE393=93.,160.,700.,0.,0.,.035,
TC501A=3.,17.,86.,.0113,0.,.060,
TE501A=4.9,18.,79.,0.,0.,.060,
TC705=7.8,15.,30.,.0303,0.,.15,
TE705=3.6,6.6,12.,0.,0.,.15,
TC466M=470.,800.,1400.,.269,0.,.15,
TE466M=640.,790.,930.,0.,0.,.15,
TC1042=500.,1500.,4000.,0.,0.,20.,
TE1042=360.,1700.,7500.,0.,0.,20.,
D277=14.,18.,23.,0.,.0459,.08,
DS1040=.4,.44,.5,0.,.00719,.06,
DEVICE(1)=4M2N32,4M8A(C,4M-B),4M    ,
4M2N32,4M8A(E,4M-B),4M    ,
4M2N33,4M5(C-,4MB),4M    ,
4M2N33,4M5(E-,4MB),4M    ,
4M2N33,4M6SJA,4MM(C-,4MB),
4M2N33,4M6SJA,4MM(E-,4MB),
4M2M24,4M84(C,4M-B),4M    ,
4M2M24,4M84(E,4M-B),4M    ,
4M2M37,4M36(C,4M-B),4M    ,
4M2M37,4M36(E,4M-B),4M    ,
4M2M93,4MO(C-,4MB),4M    ,
4M2M93,4MO(E-,4MB),4M    ,
4M2M24,4M81(C,4M-B),4M    ,
4M2M24,4M81(E,4M-B),4M    ,
4M2M29,4MO7A(,4MC-B),4M    ,
4M2M29,4MO7A(,4ME-B),4M    ,
4M2M22,4M22A(,4MC-B),4M    ,
4M2M22,4M22A(,4ME-B),4M    ,
4M1M63,4M8    ,4M    ,4M    ,
4MF591,4M1-36,4M65,4M    ,
4M1N81,4M6    ,4M    ,4M    ,
4M1M21,4MWE   ,4M    ,4M    ,
4M1M91,4M4A   ,4M    ,4M    ,
4M1M75,4M2A   ,4M    ,4M    ,
4MPC11,4M5    ,4M    ,4M    ,
4M1M30,4M266E,4MJAN ,4M    ,
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4H1N36,4H11  ,4H    ,4H    ,
4H1N39,4H95A ,4H    ,4H    ,
4H1N30,4H168 ,4H    ,4H    ,
4H1N41,4H41  ,4H    ,4H    ,
4H1D92,4H    ,4H    ,4H    ,
4H2N28,4H57(C,4H-B) ,4H    ,
4H2N28,4H57(E,4H-B) ,4H    ,
4H2N33,4H75(C,4H-B) ,4H    ,
4H2N33,4H75(E,4H-B) ,4H    ,
4H2N14,4H90:J,4HAN(C,4H-B) ,
4H2N14,4K90:J,4HAN(E,4H-B) ,
4H2N35,4H84(C,4H-B) ,4H    ,
4H2N35,4H84(E,4H-B) ,4H    ,
4H2N28,4H94(C,4H-B) ,4H    ,
4H2N28,4H94(E,4H-B) ,4H    ,
4H2N58,4H29(C,4H-B) ,4H    ,
4H2N58,4H29(E,4H-B) ,4H    ,
4H2N30,4H13:J,4HAN(C,4H-B) ,
4H2N30,4H13:J,4HAN(E,4H-B) ,
4HCA30,4H18(C,4H-B) ,4H    ,
4HCA30,4H18(E,4H-B) ,4H    ,
4HSHB5,4H2651,4H7(C-,4HB) ,
4HSHB5,4H2651,4H7(E-,4HB) ,
4H2N16,4H13:J,4HAN(C,4H-B) ,
4H2N16,4H13:J,4HAN(E,4H-B) ,
4H2N14,4H85:J,4HAN(C,4H-B) ,
4H2N14,4H85:J,4HAN(E,4H-B) ,
4H2N34,4H39(C,4H-B) ,4H    ,
4H2N34,4H39(E,4H-B) ,4H    ,
4H2N70,4H6:JA,4HN(C-,4HB) ,
4H2N70,4H6:JA,4HN(E-,4HB) ,
4H1R-6,4H9-67,4H35  ,4H    ,
4H1N25,4H8D  ,4H    ,4H    ,
4H1N75,4H1A:J,4HAN  ,4H    ,
4H1N48,4H5B:J,4HAN  ,4H    ,
4H1N29,4H91D: 4HJAN ,4H    ,
4H1N30,4H25b:,4HJAN ,4H    ,
4HMbI0,4H54  ,4H    ,4H    ,
4H1N74,4H6A:J,4HAN  ,4H    ,
4H1N64,4H5:JA,4PN   ,4H    ,
4H1N12,4HO2RA,4HSJAN,4H    ,
4H1N17,4H31A:,4HJAN ,4H    ,
4H2N40,4H4A(C,4H-B) ,4H    ,
4H2N40,4H4A(E,4H-B) ,4H    ,
4H2N29,4H7A(C,4H-B) ,4H    ,
4H2N29,4H7A(E,4H-B) ,4H    ,
4H2N52,4H6(C-,4HB)  ,4H    ,
4H2N52,4H6(E-,4HB)  ,4H    ,
4H1N27,4HO   ,4H    ,4H    ,
4H2N39,4H6A(C,4H-B) ,4H    ,
4H2N39,4H6A(E,4H-B) ,4H    ,
4H2N42,4H8M:J,4HAN(C,4H-B) ,
4H2N42,4H8M:J,4HAN(E,4H-B) ,
4H2N39,4H3:JA,4HN(C-,4HB) ,
4H2N39,4H3:JA,4:N(E-,4HB) ,
4H2N50,4H1A:J,4HAN(C,4H-B) ,
4H2N50,4H1A:J,4HAN(E,4H-B) ,
4H2N70,4H5:JA,4HN(C-,4HB) ,
4H2N70,4H5:JA,4HN(E-,4HB) ,
4H2N46,4H6M:J,4HAN(C,4H-B) ,
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4H2N46,4H6MSJ,4HANIE,4H-B) ,
4H2N10,4H42RA,4HJANI,4HC-B),
4H2N10,4H42RA,4HJANI,4HE-B),
4H1N27,4H7EJA,4HM    ,4H     ,
4HMS10,4H40   ,4H     ,4H     ,
PWRA=1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,
2.,J.,2.,0.,1.,1.,2.,2.,2.,0.,2.,2.,1.,
1.,1.,2.,2.,2.,2.,2.,2.,1.,1.,1.,1.,1.,1.,1.,1.,0.,0.,
1.,1.,2.,2.,2.,2.,1.,1.,0.,2.,1.,1.,2.,2.,0.,1.,1.,2.,2.,
1.,1.,2.,2.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,2.,2.,1.,0.,
PWRB=0.0,0., 0.,0.,0.,1.,1.,1.,1.,1.,0.,0.,0.,0.,1.,1.,1.,1.,
0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,
1.,1.,2.,2.,2.,2.,2.,2.,1.,1.,1.,1.,1.,1.,0.,0.,0.,0.,0.,
0.,0.,2.,2.,2.,2.,2.,0.,1.,0.,2.,0.,0.,0.,0.,0.,0.,0.,0.,2.,2.,
0.,0.,0.,0.,0.,0.,0.,0.,0.,1.,0.,1.,0.,1.,0.,1.,0.,1.,
0.,1.,2.,2.,0.,0.,
PREDCT=1.,
SWTCH=0.,
&END.
/*
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RATIO OF EXPERIMENTAL POWER TO DAMAGE TO DC POWER MODEL PREDICTED VALUE FOR FOLLOWING MODEL DATA BASES:

A..ALL DEVICES
B..ALL SILICON DEVICES
C..ALL GERMANIUM DEVICES
D..ALL DEVICES WITHOUT CAPACITANCE MODEL DATA
E..ALL SILICON DEVICES WITHOUT CAPACITANCE MODEL DATA
F..ALL GERMANIUM DEVICES WITHOUT CAPACITANCE MODEL DATA
G..ALL SILICON DEVICES NOT INCLUDED WITHIN 145 REPORT
H..ALL GERMANIUM DEVICES NOT INCLUDED WITHIN 145 REPORT
I..ALL SILICON DEVICES INCLUDED WITHIN 145 REPORT
J..ALL GERMANIUM DEVICES INCLUDED WITHIN 145 REPORT

FOR ALL CASES WHERE DATA BASE PERMITS, RATIOS ARE ONLY FOR THE REMAINING SILICON OR GE DEVICES NOT INCLUDED IN DATA BASE

A 0.0 ENTRY INDICATES NO DATA OR NO CALCULATION FOR ITEM K, -1 INDICATES NO CALCULATION

JUNCTION REVERSE BIAS CONDITIONS ONLY NEGATIVE SIGN INDICATES ESTIMATED VALUES FOR POWER TO DAMAGE

ARITHMETIC MEAN USED FOR ALL MODEL DATA BASES

ALL PREDICTED VALUES FOR EXP. POWER TO DAMAGE INCLUDED IN DATA BASE CALCULATIONS

	EXP. POWER TO DAMAGE AT 10US (WATTS)	EXP. POWER TO DAMAGE AT 1US (WATTS)	EXP. POWER TO DAMAGE AT 0.1US (WATTS)	DAM. CONST. DATA BOOK PARAMETERS (W*SEC**.5)	DAM. CONST. EXPERIMENTAL PARAMETERS (W*SEC**.5)	DC POWER RATING (WATTS)	POWER CLASS HIGH=2 LOW=1 EXCLUDED=0
SILICON DEVICES							
2N328A(C-B)	20.000	52.000	140.000	3.2300	0.8370	0.4000	1.
2N328A(E-B)	9.00	16.000	30.000	0.0	0.3300	0.4000	1.
2N335(C-B)	20.000	80.000	300.000	0.3050	1.8500	0.1500	1.
2N335(E-B)	20.000	44.000	100.000	0.0	0.2930	0.1500	1.
2N336$JAN(C-B)	30.000	70.000	160.000	0.6500	0.0	0.1500	1.
2N336$JAN(E-B)	75.000	112.000	625.000	0.0	0.0	0.1500	1.
2N2484(C-B)	42.000	46.000	50.000	0.0	0.0	0.3600	1.
2N2484(E-B)	15.000	48.000	160.000	0.0	0.0	0.3600	1.
2N3736(C-B)	44.000	72.000	115.000	0.0	0.0	0.5000	1.
2N3736(E-B)	110.000	255.000	590.000	0.0	0.0	0.5000	1.
2N930(C-B)	30.000	74.000	180.000	0.0587	0.2090	0.3000	1.
2N930(E-B)	16.000	60.000	230.000	0.0	0.0108	0.3000	1.
2N2481(C-B)	10.000	10.000	10.000	0.2930	4.3930	0.3600	1.
2N2481(E-B)	18.000	30.000	53.000	0.0	0.1240	0.3600	1.
2N2907A(C-B)	20.000	53.000	135.000	0.0	0.0	0.4000	1.
2N2907A(E-B)	53.000	78.000	110.000	0.0	0.0	0.4000	1.
2N2222A(C-B)	32.000	85.000	220.000	0.0	0.0	0.5000	1.
2N2222A(E-B)	40.000	135.000	400.000	0.0	0.0	0.5000	1.
1N4384	2100.000	2300.000	2800.000	0.0	16.9000	1.3000	2.
FS911-3465	1600.000	2700.000	4100.000	0.0	27.7000	0.0	0.
1N816	1400.000	2700.000	6400.000	0.0	1.9300	0.0	2.
1N21WE	1.100	2.000	3.400	0.0	0.0	0.0	0.
1N914A	15.000	80.000	420.000	0.2330	0.4230	0.0680	1.
1N752A	83.000	340.000	2300.000	0.0	0.5360	0.4000	1.
PC115	510.000	1350.000	3300.000	0.6860	0.0	0.0	2.
1N3026B$JAN	17000.000	-53719.996	-170000.000	0.0	59.5000	1.0000	2.
1N3611	3000.000	3000.000	3000.000	0.0	15.9000	2.2000	2.
1N3995A	-26244.594	-83000.000	-262446.000	0.0	83.0000	10.0000	0.
1N3016B	13000.000	-41079.996	-130000.000	0.0	23.1000	1.0000	2.
1N4141	8000.000	-25279.996	-80000.000	0.0	18.1000	3.0000	2.
1002	670.000	-2117.200	-6700.000	0.0	17.7000	0.9500	1.
2N2857(C-B)	12.400	16.000	120.000	0.0	0.0	0.2000	1.
2N2857(E-B)	0.840	2.600	8.200	0.0	0.0	0.2000	1.
2N3375(C-B)	500.000	1000.000	1800.000	0.0	0.0	11.0000	2.
2N3375(E-B)	230.000	440.000	1300.000	0.0	0.0	11.0000	2.
2N1490$JAN(C-B)	700.000	2300.000	7000.000	0.0	0.0	75.0000	2.
2N1490$JAN(E-B)	1300.000	3800.000	13000.000	0.0	0.0	75.0000	2.
2N3584(C-B)	120.000	370.000	1200.000	0.0	0.0	2.5000	2.
2N3584(E-B)	490.000	2150.000	10000.000	0.0	0.0	2.5000	2.
2N2894(C-B)	14.000	50.000	170.000	0.0	0.0	0.3600	1.
2N2894(E-B)	12.000	19.000	30.000	0.0	0.0	0.3600	1.
2N5829(C-B)	6.000	17.000	47.000	0.0	0.0	0.2000	1.
2N5829(E-B)	4.300	10.000	22.000	0.0	0.0	0.2000	1.
2N3013$JAN(C-B)	4.300	21.000	100.000	0.0	0.0	0.3600	1.
2N3013$JAN(E-B)	20.000	31.500	52.000	0.0	0.0	0.3600	1.
CA3018(C-B)	5.800	20.000	64.000	0.00056	0.0	0.3000	1.
CA3018(E-B)	4.000	10.000	22.000	0.0007	0.0	0.3000	1.
SMB52651?(C-B)	26.000	100.000	320.000	0.0	0.0	0.0	0.
SMB52651?(E-B)	20.000	50.000	130.000	0.0	0.0	0.0	0.
2N1613$JAN(C-B)	1400.000	2100.000	3200.000	0.3010	0.8680	0.8000	1.
2N1613$JAN(E-B)	160.000	340.000	750.000	0.0	0.1030	0.8000	1.
2N1485$JAN(C-B)	700.000	1100.000	1700.000	0.0	0.0	1.7000	2.
2N1485$JAN(E-B)	3100.000	-33000.000	-297000.000	0.0	0.0	1.7000	2.

2N3439(C-B)	10.000	27.000	78.000	0.0	0.	1.0000	2.
2N3439(E-B)	180.000	620.000	2200.000	0.0	0.0	1.0000	2.
2N706:JAN(C-B)	2.800	17.000	93.000	0.0243	0.0	0.3000	1.
2N706:JAN(E-B)	6.800	18.000	50.000	0.0	0.0	0.3000	1.
IR-69-6735	750.000	7500.000	75000.000	0.0	0.0	0.0	0.
1N2580	17000.000	-53719.996	-170000.000	0.0	0.0	13.0000	2.
1N751A:JAN	240.000	2500.000	25500.000	0.0	3.3300	0.4000	1.
1N685B:JAN	100.000	435.000	2000.000	0.0	0.6110	0.2500	1.
1N2991B:JAN	10000.000	-31599.996	-100000.000	0.0	28.0000	10.0000	2.
1N3025B:JAN	1400.000	-14000.000	-140000.000	0.0	7.4800	1.0000	2.
MD1054	25.000	33.500	44.000	0.0	0.0	0.0	0.
1N746A:JAN	2600.000	-20000.000	-153800.000	0.0	3.4400	0.4000	1.
1N645:JAN	580.000	580.000	1625.000	0.0	3.6300	0.4000	1.
1N1202RA:JAN	100.000	1000.000	9000.000	0.0	0.0	12.0000	2.
1N1731A:JAN	800.000	2000.000	5700.000	0.0	0.0	4.0000	2.
GERMANIUM DEVICES							
2N404A(C-B)	120.000	160.000	230.000	0.0920	1.0000	0.1500	1.
2N404A(E-B)	104.000	140.000	175.000	0.0	0.6490	0.1500	1.
2N297A(C-B)	2000.000	2210.000	2700.000	0.0	55.6000	35.0000	2.
2N297A(E-B)	1400.000	2100.000	3300.000	0.0	39.5000	35.0000	2.
2N526(C-B)	130.000	225.000	425.000	0.1880	2.3900	0.2250	1.
2N526(E-B)	160.000	290.000	500.000	0.0	1.9200	0.2250	1.
1N270	19.000	20.000	23.000	0.0	1.3800	0.0800	1.
2N396A(C-B)	115.000	170.000	230.000	0.0870	0.0	0.2000	1.
2N396A(E-B)	134.000	205.000	350.000	0.0	0.0	0.2000	1.
2N428M:JAN(C-B)	170.000	260.000	420.000	0.0870	0.0	0.1500	1.
2N428M:JAN(E-B)	220.000	280.000	335.000	0.0	0.0	0.1500	1.
2N393:JAN(C-B)	300.000	1100.000	3400.000	0.0139	0.0	0.0350	1.
2N393:JAN(E-B)	330.000	1600.000	7000.000	0.0	0.0	0.0350	1.
2N501A:JAN(C-B)	3.000	17.000	86.000	0.0112	0.0	0.0600	1.
2N501A:JAN(E-B)	4.900	18.000	79.000	0.0	0.0	0.0600	1.
2N705:JAN(C-B)	7.800	15.000	30.000	0.0303	0.0	0.1500	1.
2N705:JAN(E-B)	3.600	6.600	12.000	0.0	0.0	0.1500	1.
2N466M:JAN(C-B)	470.000	800.000	1400.000	0.2690	0.0	0.1500	1.
2N466M:JAN(E-B)	640.000	790.000	930.000	0.0	0.0	0.1500	1.
2N1042RAJAN(C-B)	500.000	1500.000	4000.000	0.0	0.0	20.0000	2.
2N1042RAJAN(E-B)	360.000	1700.000	7500.000	0.0	0.0	20.0000	2.
1N277:JAN	14.000	18.000	23.000	0.0	0.0459	0.0800	1.
MS1040	0.400	0.440	0.500	0.0	0.0072	0.0600	0.

RATIO OF EXPERIMENTAL POWER TO DAMAGE TO DEVICE DC POWER RATING

	10 USEC	1 USEC	0.1 USEC
2N328A(C-B)	50.0	130.0	350.0
2N328A(E-B)	22.5	40.0	75.0
2N335(C-B)	133.3	533.3	2000.0
2N335(E-B)	133.3	293.3	666.7
2N336:JAN(C-B)	200.0	466.7	1066.7
2N336:JAN(E-B)	466.7	746.7	4166.7
2N2484(C-B)	116.7	127.8	138.9
2N2484(E-B)	41.7	133.3	444.4

2N3736(C-B)	88.0	144.0	230.0
2N3736(E-B)	220.0	510.0	1180.0
2N930(C-B)	100.0	246.7	600.0
2N930(E-B)	53.3	200.0	766.7
2N2481(C-B)	27.8	27.8	27.8
2N2481(E-B)	50.0	83.3	147.2
2N2907A(C-B)	50.0	132.5	337.5
2N2907A(E-B)	132.5	195.0	275.0
2N2222A(C-B)	64.0	170.0	440.0
2N2222A(E-B)	80.0	270.0	800.0
1N4384	1615.4	1769.2	2153.8
FS911-3465	0.0	0.0	0.0
1N816	0.0	0.0	0.0
1N21WE	0.0	0.0	0.0
1N914A	220.6	1176.5	6176.5
1N752A	207.5	850.0	5750.0
PC115	0.0	0.0	0.0
1N3026B:JAN	17000.0	-53720.0	-170000.0
1N3611	1363.6	1363.6	1363.6
1N3995A	-2624.5	-8300.0	-26244.6
1N3016B	13000.0	-41080.0	-130000.0
1N4141	2666.7	-8426.7	-26666.7
1OD2	705.3	-2228.6	-7052.6
2N2857(C-B)	62.0	80.0	600.0
2N2857(E-B)	4.2	13.0	41.3
2N3375(C-B)	45.5	90.9	163.6
2N3375(E-B)	20.9	40.0	118.2
2N1490:JAN(C-B)	9.3	30.7	93.3
2N1490:JAN(E-B)	17.3	50.7	173.3
2N3584(C-B)	48.0	148.0	480.0
2N3584(E-B)	196.0	860.0	4000.0
2N2894(C-B)	38.9	138.9	472.2
2N2894(E-B)	33.3	52.8	83.3
2N5829(C-B)	30.0	85.0	235.0
2N5829(E-B)	21.5	50.0	110.0
2N3013:JAN(C-B)	11.9	58.3	277.8
2N3013:JAN(E-B)	55.6	87.5	144.4
CA3018(C-B)	19.3	66.7	213.3
CA3018(E-B)	13.3	33.3	73.3
SMB52651T(C-B)	0.0	0.0	0.0
SMB52651T(E-B)	0.0	0.0	0.0
2N1613:JAN(C-B)	1750.0	2625.0	4000.0
2N1613:JAN(E-B)	200.0	425.0	937.5
2N1485:JAN(C-B)	411.8	647.1	1000.0
2N1485:JAN(E-B)	1823.5	-17647.1	-170588.2
2N3439(C-B)	10.0	27.0	78.0
2N3439(E-B)	180.0	620.0	2200.0
2N706:JAN(C-B)	9.3	56.7	310.0
2N706:JAN(E-B)	22.7	60.0	166.7
IR-69-6735	0.0	0.0	0.0
1N2580	1307.7	-4132.3	-13076.9
1N751A:JAN	600.0	6250.0	63750.0
1N485B:JAN	400.0	1740.0	8000.0
1N2991B:JAN	1000.0	-3160.0	-10000.0
1N3025B:JAN	1400.0	-14000.0	-140000.0
MD1054	0.0	0.0	0.0
1N746A:JAN	6500.0	-50000.0	-384500.0
1N645:JAN	1250.0	1450.0	4062.5
1N1202RA:JAN	8.3	83.3	750.0
1N1731A:JAN	200.0	500.0	1425.0

2N404A(C-B)	800.0	1066.7	1533.3
2N404A(E-B)	693.3	933.3	1166.7
2N297A(C-B)	57.1	62.9	77.1
2N297A(E-B)	40.0	60.0	94.3
2N526(C-B)	577.8	1000.0	1888.9
2N526(E-B)	711.1	1288.9	2222.2
IN270	237.5	250.0	287.5
2N396A(C-B)	575.0	850.0	1150.0
2N396A(E-B)	650.0	1025.0	1750.0
2N428M:JAN(C-B)	1133.3	1733.3	2800.0
2N428M:JAN(E-B)	1466.7	1866.7	2233.3
2N393:JAN(C-B)	8571.4	31428.6	97142.8
2N393:JAN(E-B)	942.9	4571.4	20000.0
2N501A:JAN(C-B)	50.0	283.3	1433.3
2N501A:JAN(E-B)	81.7	300.0	1316.7
2N705:JAN(C-B)	52.0	100.0	200.0
2N705:JAN(E-B)	24.0	44.0	80.0
2N486M:JAN(C-B)	3133.3	5333.3	9333.3
2N486M:JAN(E-B)	4266.7	5266.7	6200.0
2N1042RAJAN(C-B)	25.0	75.0	200.0
2N1042RAJAN(E-B)	18.0	85.0	375.0
1N277:JAN	175.0	225.0	287.5
MS1040	6.7	7.3	8.3

	A 10 USEC	A 1 USEC	A 0.1 USEC	B 10 USEC	B 1 USEC	B 0.1 USEC	C 10 USEC	C 1 USEC	C 0.1 USEC	D 10 USEC
2N328A(C-B)	0.04975	0.03766	0.02147	0.05073	0.03411	0.01748	0.0	0.0	0.0	0.14670
2N328A(E-B)	0.02239	0.01159	0.00460	0.02283	0.01050	0.00375	0.0	0.0	0.0	0.06601
2N335(C-B)	0.13266	0.15449	0.12269	0.13529	0.13994	0.09990	0.0	0.0	0.0	0.39119
2N335(E-B)	0.13266	0.08497	0.04090	0.13529	0.07697	0.03330	0.0	0.0	0.0	0.39119
2N336:JAN(C-B)	0.19899	0.13518	0.06543	0.20293	0.12245	0.05328	0.0	0.0	0.0	0.58679
2N336:JAN(E-B)	0.46431	0.21629	0.25560	0.47350	0.19591	0.20812	0.0	0.0	0.0	0.0
2N2484(C-B)	0.11608	0.03701	0.00852	0.11838	0.03353	0.00694	0.0	0.0	0.0	0.0
2N2484(E-B)	0.04146	0.03862	0.02726	0.04228	0.03498	0.02220	0.0	0.0	0.0	0.0
2N3736(C-B)	0.08755	0.04171	0.01411	0.08929	0.03778	0.01149	0.0	0.0	0.0	0.0
2N3736(E-B)	0.21889	0.14773	0.07239	0.22322	0.13382	0.05894	0.0	0.0	0.0	0.0
2N930(C-B)	0.09949	0.07145	0.03681	0.10147	0.06472	0.02997	0.0	0.0	0.0	0.29339
2N930(E-B)	0.05306	0.05793	0.04703	0.05411	0.05248	0.03829	0.0	0.0	0.0	0.15648
2N2481(C-B)	0.02764	0.00805	0.00170	0.02818	0.00729	0.00139	0.0	0.0	0.0	0.08150
2N2481(E-B)	0.04975	0.02414	0.00903	0.05073	0.02187	0.00735	0.0	0.0	0.0	0.14670
2N2907A(C-B)	0.04975	0.03838	0.02070	0.05073	0.03477	0.01686	0.0	0.0	0.0	0.0
2N2907A(E-B)	0.13183	0.05649	0.01687	0.13444	0.05116	0.01374	0.0	0.0	0.0	0.0
2N2222A(C-B)	0.06368	0.04924	0.02699	0.06494	0.04461	0.02198	0.0	0.0	0.0	0.0
2N2222A(E-B)	0.07960	0.07821	0.04908	0.08117	0.07084	0.03996	0.0	0.0	0.0	0.0
1N4384	1.60721	0.51250	0.13213	1.63905	0.46422	0.10758	0.0	0.0	0.0	4.73942
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.21947	0.34079	0.37889	0.22382	0.31869	0.30850	0.0	0.0	0.0	0.64719
1N752A	0.20645	0.24622	0.35273	0.21054	0.22303	0.28720	0.0	0.0	0.0	0.60879
PC115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3026B:JAN	16.91402	15.56127	10.42856	17.24905	14.09522	8.49121	0.0	0.0	0.0	49.87672
1N3611	1.35674	0.39501	0.08365	1.38361	0.35780	0.06811	0.0	0.0	0.0	4.00081

1N3995A	2.61119	2.40429	1.60996	2.66291	2.17778	1.31087	0.0	0.0	0.0	7.69997
1N3016B	12.93426	11.89980	7.97478	13.19046	10.77870	6.49328	0.0	0.0	0.0	38.14102
1N4141	2.65318	2.44098	1.63585	2.70573	2.21101-	1.33195	0.0	0.0	0.0	7.82380
10D2	0.70170	0.64558	0.43264	0.71560	0.58476	0.35227	0.0	0.0	0.0	2.06919
2N2857(C-B)	0.06169	0.02317	0.03681	0.06291	0.02099	0.02997	0.0	0.0	0.0	0.0
2N2857(E-B)	0.00418	0.00377	0.00252	0.00426	0.00341	0.00205	0.0	0.0	0.0	0.0
2N3375(C-B)	0.04522	0.02633	0.01004	0.04612	0.02385	0.00817	0.0	0.0	0.0	0.0
2N3375(E-B)	0.02080	0.01159	0.00725	0.02122	0.01050	0.00590	0.0	0.0	0.0	0.0
2N1490:JAN(C-B)	0.00929	0.00888	0.00573	0.00947	0.00805	0.00466	0.0	0.0	0.0	0.0
2N1490:JAN(E-B)	0.01725	0.01468	0.01063	0.01759	0.01329	0.00866	0.0	0.0	0.0	0.0
2N3584(C-B)	0.04776	0.04287	0.02945	0.04870	0.03883	0.02398	0.0	0.0	0.0	0.0
2N3584(E-B)	0.19501	0.24912	0.24538	0.19887	0.22565	0.19979	0.0	0.0	0.0	0.0
2N2894(C-B)	0.03869	0.04023	0.02897	0.03946	0.03644	0.02359	0.0	0.0	0.0	0.0
2N2894(E-B)	0.03316	0.01529	0.00511	0.03382	0.01385	0.00416	0.0	0.0	0.0	0.0
2N5829(C-B)	0.02985	0.02462	0.01442	0.03044	0.02230	0.01174	0.0	0.0	0.0	0.0
2N5829(E-B)	0.02139	0.01448	0.00675	0.02181	0.01312	0.00549	0.0	0.0	0.0	0.0
2N3013:JAN(C-B)	0.01188	0.01690	0.01704	0.01212	0.01531	0.01387	0.0	0.0	0.0	0.0
2N3013:JAN(E-B)	0.05527	0.02535	0.00886	0.05637	0.02296	0.00721	0.0	0.0	0.0	0.05672
CA3018(C-B)	0.01924	0.01931	0.01309	0.01962	0.01749	0.01066	0.0	0.0	0.0	0.03912
CA3018(E-B)	0.01327	0.00966	0.00450	0.01353	0.00875	0.00366	0.0	0.0	0.0	0.0
SMB52651?(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB52651?(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.13437
2N1613:JAN(C-B)	1.74115	0.76039	0.24538	1.77564	0.68876	0.19979	0.0	0.0	0.0	0.58679
2N1613:JAN(E-B)	0.19899	0.12311	0.05751	0.20293	0.11151	0.04683	0.0	0.0	0.0	0.0
2N1485:JAN(C-B)	1.40968	0.18744	0.06134	0.41780	0.16978	0.04995	0.0	0.0	0.0	0.0
2N1485:JAN(E-B)	1.81431	5.11189	10.46465	1.85024	4.63029	8.52059	0.0	0.0	0.0	0.0
2N3439(C-B)	0.00995	0.00782	0.00478	0.01015	0.00708	0.00390	0.0	0.0	0.0	0.0
2N3439(E-B)	0.17909	0.17960	0.13496	0.18264	0.16268	0.10989	0.0	0.0	0.0	0.0
2N706:JAN(C-B)	0.00929	0.01641	0.01902	0.00947	0.01487	0.01548	0.0	0.0	0.0	0.02738
2N706:JAN(E-B)	0.02255	0.01738	0.01022	0.02300	0.01574	0.00832	0.0	0.0	0.0	0.0
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	1.30108	1.19702	0.80220	1.32685	1.08425	0.65317	0.0	0.0	0.0	1.76035
1N751A:JAN	0.59697	1.81046	3.91071	0.60879	1.63989	3.18421	0.0	0.0	0.0	1.17357
1N485B:JAN	0.39798	0.50403	0.49076	0.40586	0.45655	0.39959	0.0	0.0	0.0	2.93392
1N2991B:JAN	0.99494	0.91537	0.61344	1.01465	0.82913	0.49948	0.0	0.0	0.0	4.10749
1N3025B:JAN	1.39292	4.05543	8.58823	1.42051	3.67336	6.99276	0.0	0.0	0.0	0.0
MD1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.07051
1N746A:JAN	6.46713	14.48369	23.58696	6.59523	13.11916	19.20512	0.0	0.0	0.0	3.66741
1N645:JAN	1.24368	0.42003	0.24921	1.26831	0.38046	0.20292	0.0	0.0	0.0	0.0
1N1202RA:JAN	0.00829	0.02414	0.04601	0.00846	0.02187	0.03746	0.0	0.0	0.0	0.0
1N1731A:JAN	0.19899	0.14484	0.08742	0.20293	0.13119	0.07118	0.0	0.0	0.0	0.0
2N404A(C-B)	0.79595	0.30899	0.09406	0.0	0.0	0.0	0.75756	0.42404	0.23235	2.34714
2N404A(E-B)	0.68983	0.27036	0.07157	0.0	0.0	0.0	0.65655	0.37103	0.17679	2.03419
2N297A(C-B)	0.05685	0.01821	0.00473	0.0	0.0	0.0	0.05411	0.02499	0.01169	0.16765
2N297A(E-B)	0.03983	0.01738	0.00578	0.0	0.0	0.0	0.03788	0.02385	0.01429	0.11736
2N526(C-B)	0.57486	0.28967	0.11587	0.0	0.0	0.0	0.54713	0.39754	0.28623	1.69516
2N526(E-B)	0.70751	0.37336	0.13632	0.0	0.0	0.0	0.67339	0.51238	0.33674	2.08635
1N270	0.23630	0.07242	0.01764	0.0	0.0	0.0	0.22490	0.09938	0.04357	0.69681
2N396A(C-B)	0.57209	0.24622	0.07055	0.0	0.0	0.0	0.54450	0.33791	0.17427	1.68701
2N396A(E-B)	0.64671	0.29692	0.10735	0.0	0.0	0.0	0.61552	0.40747	0.26519	0.0
2N428M:JAN(C-B)	1.12760	0.50210	0.17176	0.0	0.0	0.0	1.07321	0.68906	0.42430	3.32512
2N428M:JAN(E-B)	1.45925	0.54072	0.13700	0.0	0.0	0.0	1.38886	0.74207	0.33843	0.0
2N393:JAN(C-B)	8.52808	9.10403	5.95918	0.0	0.0	0.0	8.11673	12.49399	14.72055	25.14792
2N393:JAN(E-B)	0.93809	1.32422	1.22689	0.0	0.0	0.0	0.89284	1.81731	3.03070	0.0
2N501A:JAN(C-B)	0.04975	0.08207	0.08793	0.0	0.0	0.0	0.04735	0.11264	0.21720	0.14670
2N501A:JAN(E-B)	0.08125	0.08690	0.08077	0.0	0.0	0.0	0.07733	0.11926	0.19952	0.0
2N705:JAN(C-B)	0.05174	0.02897	0.01227	0.0	0.0	0.0	0.04924	0.03975	0.03031	0.15256
2N705:JAN(E-B)	0.02388	0.01275	0.00491	0.0	0.0	0.0	0.02273	0.01749	0.01212	0.0
2N466M:JAN(C-B)	3.11749	1.54493	0.57255	0.0	0.0	0.0	2.96712	2.12019	1.41433	9.19297
2N466M:JAN(E-B)	4.24509	1.52561	0.38034	0.0	0.0	0.0	4.04033	2.09369	0.93952	0.0

2N1042RAJAN(C-B)	0.02487	0.02173	0.01227	0.0	0.0	0.0	0.02367	0.02982	0.03031	0.0
2N1042RAJAN(E-B)	0.01791	0.02462	0.02300	0.0	0.0	0.0	0.01705	0.03379	0.05683	0.0
1N277*JAN	0.17412	0.06518	0.01764	0.0	0.0	0.0	0.16572	0.08945	0.04357	0.51344
MS1040	0.00663	0.00212	0.00051	0.0	0.0	0.0	0.00631	0.00292	0.00126	0.01956

	D 1 USEC	D 0.1 USEC	E 10 USEC	E 1 USEC	E 0.1 USEC	F 10 USEC	F 1 USEC	F 0.1 USEC	G 10 USEC	G 1 USEC
2N328A(C-B)	0.12316	0.05773	0.26642	0.14428	0.05311	0.0	0.0	0.0	0.0	0.0
2N328A(E-B)	0.03790	0.01237	0.11989	0.04439	0.01138	0.0	0.0	0.0	0.0	0.0
2N335(C-B)	0.50528	0.32989	0.71045	0.59192	0.30349	0.0	0.0	0.0	0.0	0.0
2N335(E-B)	0.27790	0.10996	0.71045	0.32556	0.10116	0.0	0.0	0.0	0.0	0.0
2N336*JAN(C-B)	0.44212	0.17594	1.06567	0.51793	0.16166	0.0	0.0	0.0	0.0	0.0
2N336*JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N930(C-B)	0.23369	0.09897	0.53284	0.27376	0.09105	0.0	0.0	0.0	0.0	0.0
2N930(E-B)	0.18948	0.12646	0.28418	0.22197	0.11634	0.0	0.0	0.0	0.0	0.0
2N2481(C-B)	0.02632	0.00458	0.14801	0.03083	0.00422	0.0	0.0	0.0	0.0	0.0
2N2481(E-B)	0.07895	0.02423	0.26642	0.09249	0.02234	0.0	0.0	0.0	0.0	0.0
2N2907A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N4384	1.67616	0.35526	8.60734	1.96358	0.32684	0.0	0.0	0.0	0.0	0.0
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	1.11458	1.01877	1.17537	1.30570	0.93725	0.0	0.0	0.0	0.0	0.0
1N752A	0.80529	0.94843	1.10563	0.94337	0.87254	0.0	0.0	0.0	0.0	0.0
PC115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3026B*JAN	50.89406	28.04044	90.58205	59.62102	25.79674	0.0	0.0	0.0	0.0	0.0
1N3611	1.29190	0.22492	7.26594	1.51343	0.20853	0.0	0.0	0.0	0.0	0.0
1N5995A	7.86338	4.32884	13.98406	9.21174	3.98250	0.0	0.0	0.0	0.0	0.0
1N3016B	38.91898	21.44269	69.26862	45.59254	19.72691	0.0	0.0	0.0	0.0	0.0
1N4141	7.98338	4.39850	14.20895	9.35232	4.04655	0.0	0.0	0.0	0.0	0.0
1002	2.11139	1.16329	3.75769	2.47344	1.07020	0.0	0.0	0.0	0.0	0.0
2N2857(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04040	0.01751
2N2857(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00274	0.00285
2N3375(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02962	0.01990
2N3375(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01363	0.00875
2N1490*JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00608	0.00671
2N1490*JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01130	0.01109
2N3584(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03128	0.03239
2N3584(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.12772	0.18822
2N2894(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02534	0.03040
2N2894(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02172	0.01155
2N5829(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01955	0.01860
2N5829(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01401	0.01094
2N3013*JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00778	0.01277
2N3013*JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03620	0.01915
CA3018(C-B)	0.06316	0.03519	0.10301	0.07399	0.03237	0.0	0.0	0.0	0.01260	0.01459

CA3018(E-B)	0.03158	0.01210	0.07104	0.03699	0.01113	0.0	0.0	0.0	0.00869	0.00730
SMB526517(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB526517(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613:JAN(C-B)	2.48691	0.65978	9.32462	2.91335	0.60698	0.0	0.0	0.0	1.14039	0.57452
2N1613:JAN(E-B)	0.40264	0.15463	1.06567	0.47169	0.16226	0.0	0.0	0.0	0.13033	0.09302
2N1485:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.26833	0.14162
2N1485:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.18830	3.86229
2N3439(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00652	0.00591
2N3439(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.11730	0.13570
2N706:JAN(C-B)	0.05369	0.05113	0.04973	0.06289	0.04704	0.0	0.0	0.0	0.00608	0.01240
2N706:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01477	0.01313
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IA2580	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.85216	0.90441
1N751A:JAN	5.92122	10.51517	3.19701	6.93655	9.67378	0.0	0.0	0.0	0.39099	1.36789
1N485B:JAN	1.64847	1.31955	2.13134	1.93114	1.21396	0.0	0.0	0.0	0.26066	0.38082
1N2991B:JAN	2.99377	1.64944	5.32836	3.50712	1.51746	0.0	0.0	0.0	0.65165	0.69161
1N3025B:JAN	13.26353	23.09212	7.45970	15.53787	21.24437	0.0	0.0	0.0	0.91231	3.06408
MD1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N746A:JAN	47.36977	63.42088	34.63432	55.49240	58.34615	0.0	0.0	0.0	4.23573	10.94316
1N645:JAN	1.37372	0.67008	6.66045	1.60928	0.61647	0.0	0.0	0.0	0.81456	0.31735
1N1202RA:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06543	0.01824
1N1731A:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.13033	0.10943
2N404A(C-B)	1.01035	0.25291	0.0	0.0	0.0	0.85620	0.64482	0.38149	0.0	0.0
2N404A(E-B)	0.88424	0.19243	0.0	0.0	0.0	0.74204	0.56421	0.29026	0.0	0.0
2N2907A(C-B)	0.05955	0.01272	0.0	0.0	0.0	0.06116	0.03800	0.01919	0.0	0.0
2N2907A(E-B)	0.05664	0.01555	0.0	0.0	0.0	0.04281	0.03627	0.02346	0.0	0.0
2N526(C-B)	0.94739	0.31156	0.0	0.0	0.0	0.61837	0.60451	0.46995	0.0	0.0
2N526(E-B)	1.22109	0.36654	0.0	0.0	0.0	0.76107	0.77915	0.55288	0.0	0.0
1N270	0.23685	0.04742	0.0	0.0	0.0	0.25419	0.15113	0.07153	0.0	0.0
2N596A(C-B)	0.80529	0.18969	0.0	0.0	0.0	0.61540	0.51384	0.28611	0.0	0.0
2N396A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N428M:JAN(C-B)	1.64215	0.46184	0.0	0.0	0.0	1.21296	1.04783	0.69663	0.0	0.0
2N428M:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N393:JAN(C-B)	29.77527	16.02310	0.0	0.0	0.0	9.17362	18.99904	24.16864	0.0	0.0
2N393:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N501A:JAN(C-B)	0.26843	0.73642	0.0	0.0	0.0	0.05351	0.17128	0.35661	0.0	0.0
2N501A:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N705:JAN(C-B)	0.09474	0.03299	0.0	0.0	0.0	0.05565	0.06045	0.04976	0.0	0.0
2N705:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N466M:JAN(C-B)	5.05277	1.53948	0.0	0.0	0.0	3.35347	3.22408	2.32209	0.0	0.0
2N466M:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N277:JAN	0.21316	0.04742	0.0	0.0	0.0	0.18729	0.13602	0.07153	0.0	0.0
MS1040	0.00695	0.00137	0.0	0.0	0.0	0.00714	0.00443	0.00207	0.0	0.0

	G 0.1 USEC	H 10 USEC	H 1 USEC	H 0.1 USEC	I 10 USEC	I 1 USEC	I 0.1 USEC	J 10 USEC	J 1 USEC	J 0.1 USEC
2N328A(C-B)	0.0	0.0	0.0	0.0	0.09322	0.04074	0.01422	0.0	0.0	0.0
2N328A(E-B)	0.0	0.0	0.0	0.0	0.04195	0.01253	0.00305	0.0	0.0	0.0
2N335(C-B)	0.0	0.0	0.0	0.0	0.24858	0.16713	0.08127	0.0	0.0	0.0
2N335(E-B)	0.0	0.0	0.0	0.0	0.24858	0.09192	0.02709	0.0	0.0	0.0
2N336:JAN(E-B)	0.0	0.0	0.0	0.0	0.37287	0.14624	0.04334	0.0	0.0	0.0

2N336:JAN(E-B)	0.0	0.0	0.0	0.0	0.87004	0.23398	0.16931	0.0	0.0	0.0
2N2484(C-B)	0.0	0.0	0.0	0.0	0.21751	0.04004	0.00564	0.0	0.0	0.0
2N2484(E-B)	0.0	0.0	0.0	0.0	0.07768	0.04178	0.01806	0.0	0.0	0.0
2N3736(C-B)	0.0	0.0	0.0	0.0	0.16406	0.04512	0.00935	0.0	0.0	0.0
2N3736(E-B)	0.0	0.0	0.0	0.0	0.41016	0.15982	0.04795	0.0	0.0	0.0
2N930(C-B)	0.0	0.0	0.0	0.0	0.18644	0.07730	0.02438	0.0	0.0	0.0
2N930(E-B)	0.0	0.0	0.0	0.0	0.09943	0.06267	0.03115	0.0	0.0	0.0
2N2481(C-B)	0.0	0.0	0.0	0.0	0.05179	0.00870	0.00113	0.0	0.0	0.0
2N2481(E-B)	0.0	0.0	0.0	0.0	0.09322	0.02611	0.00598	0.0	0.0	0.0
2N2907A(C-B)	0.0	0.0	0.0	0.0	0.09322	0.04152	0.01371	0.0	0.0	0.0
2N2907A(E-B)	0.0	0.0	0.0	0.0	0.24703	0.06111	0.01117	0.0	0.0	0.0
2N2222A(C-B)	0.0	0.0	0.0	0.0	0.11932	0.05327	0.01788	0.0	0.0	0.0
2N2222A(E-B)	0.0	0.0	0.0	0.0	0.14915	0.08461	0.03251	0.0	0.0	0.0
1N4084	0.0	0.0	0.0	0.0	3.01166	0.55441	0.08752	0.0	0.0	0.0
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.0	0.0	0.0	0.0	0.41126	0.36866	0.25098	0.0	0.0	0.0
1N752A	0.0	0.0	0.0	0.0	0.38686	0.26636	0.23365	0.0	0.0	0.0
PC115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3026B:JAN	0.0	0.0	0.0	0.0	31.69415	16.83386	6.90781	0.0	0.0	0.0
IN3611	0.0	0.0	0.0	0.0	2.54231	0.42731	0.05541	0.0	0.0	0.0
1N3995A	0.0	0.0	0.0	0.0	4.89295	2.60091	1.06643	0.0	0.0	0.0
1N3026B	0.0	0.0	0.0	0.0	24.23669	12.87296	5.28245	0.0	0.0	0.0
1N4141	0.0	0.0	0.0	0.0	4.97163	2.64061	1.08358	0.0	0.0	0.0
1002	0.0	0.0	0.0	0.0	1.31487	0.69837	0.28658	0.0	0.0	0.0
2N2857(C-B)	0.04163	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(E-B)	0.00284	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(C-B)	0.01135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(E-B)	0.00820	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490:JAN(C-B)	0.00648	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490:JAN(E-B)	0.01203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(C-B)	0.03331	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(E-B)	0.27755	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(C-B)	0.03277	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(E-B)	0.00578	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(C-B)	0.01634	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(E-B)	0.00783	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013:JAN(C-B)	0.01927	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013:JAN(E-B)	0.01002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(C-B)	0.01480	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(E-B)	0.00509	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265171(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265171(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613:JAN(C-B)	0.27755	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613:JAN(E-B)	0.06505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1485:JAN(C-B)	0.06939	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1485:JAN(E-B)	11.83666	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(C-B)	0.00541	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(E-B)	0.15265	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N706:JAN(C-B)	0.02151	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N706:JAN(E-B)	0.01156	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IR-69-4735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	0.90737	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N751A:JAN	4.42344	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N485B:JAN	0.55551	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2991B:JAN	0.69387	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3025B:JAN	9.71422	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MD1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N746A:JAN	26.67943	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1N645:JAN	0.28189	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N1202RA:JAN	0.05204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N1731A:JAN	0.09888	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N404A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.60458	0.32083	0.16977
2N404A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.52397	0.28073	0.12917
2N297A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04318	0.01891	0.00854
2N297A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03023	0.01805	0.01044
2N526(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.43664	0.30078	0.20914
2N526(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.53741	0.38767	0.24604
1N270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.17949	0.07520	0.03183
2N396A(C-B)	0.0	1.29136	1.27635	1.10728	0.0	0.0	0.0	0.0	0.0	0.0
2N396A(E-B)	0.0	1.45980	1.53912	1.68500	0.0	0.0	0.0	0.0	0.0	0.0
2N428M:JAN(C-B)	0.0	2.54529	2.60275	2.69600	0.0	0.0	0.0	0.0	0.0	0.0
2N428M:JAN(E-B)	0.0	3.29391	2.80296	2.15038	0.0	0.0	0.0	0.0	0.0	0.0
2N393:JAN(C-B)	0.0	19.25011	47.19267	93.53462	0.0	0.0	0.0	0.0	0.0	0.0
2N393:JAN(E-B)	0.0	2.11751	6.86439	19.25713	0.0	0.0	0.0	0.0	0.0	0.0
2N501A:JAN(C-B)	0.0	0.11229	0.42545	1.38009	0.0	0.0	0.0	0.0	0.0	0.0
2N501A:JAN(E-B)	0.0	0.18341	0.45048	1.26776	0.0	0.0	0.0	0.0	0.0	0.0
2N705:JAN(C-B)	0.0	0.11678	0.15016	0.19257	0.0	0.0	0.0	0.0	0.0	0.0
2N705:JAN(E-B)	0.0	0.05390	0.06607	0.07703	0.0	0.0	0.0	0.0	0.0	0.0
2N466M:JAN(C-B)	0.0	7.03699	8.00845	8.98666	0.0	0.0	0.0	0.0	0.0	0.0
2N466M:JAN(E-B)	0.0	9.58228	7.90835	5.96971	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(C-B)	0.0	0.05615	0.11242	0.19257	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(E-B)	0.0	0.04043	0.12763	0.36107	0.0	0.0	0.0	0.0	0.0	0.0
1N277:JAN	0.0	0.39312	0.33786	0.27682	0.0	0.0	0.0	0.0	0.0	0.0
MS1040	0.0	0.01497	0.01101	0.00802	0.0	0.0	0.0	0.0	0.0	0.0

09

N VALUE FOR RELATIONSHIPS K=P*T**(-N) DERIVED FROM EXPERIMENTAL DAMAGE DATA FOR TIME INTERVALS INDICATED

	K 10-1 USEC	K 1-.1 USEC	K 10-.1 USEC
2N328A(C-B)	0.41497	0.43012	0.42255
2N328A(E-B)	0.24988	0.27300	0.26144
2N335(C-B)	0.60206	0.57403	0.58805
2N335(E-B)	0.34242	0.35655	0.34949
2N336:JAN(C-B)	0.36798	0.35902	0.36350
2N336:JAN(E-B)	0.20412	0.74666	0.47539
2N2484(C-B)	0.03951	0.03621	0.03786
2N2484(E-B)	0.50515	0.52288	0.51401
2N3736(C-B)	0.21388	0.20337	0.20862
2N3736(E-B)	0.36515	0.36431	0.36473
2N930(C-B)	0.39211	0.38604	0.38908
2N930(E-B)	0.57403	0.58358	0.57880
2N2481(C-B)	0.0	0.0	0.0
2N2481(E-B)	0.22185	0.24715	0.23450
2N2907A(C-B)	0.42325	0.40606	0.41465
2N2907A(E-B)	0.16782	0.14930	0.15856
2N2222A(C-B)	0.42427	0.41300	0.41864
2N2222A(E-B)	0.52827	0.47173	0.50000
1N4384	0.03951	0.08543	0.06247
FS911-3465	0.22724	0.18142	0.20433
1N816	0.28524	0.37482	0.33003

1N21WE	0.25964	0.23045	0.24504
1N914A	0.72700	0.72016	0.72358
1N752A	0.81240	0.83025	0.72132
PC115	0.42276	0.38818	0.40547
1N3026B:JAN	-1.00000	-1.00000	-1.00000
1N3611	0.0	0.0	0.0
1N3995A	-1.00000	-1.00000	-1.00000
1N3016B	-1.00000	-1.00000	-1.00000
1N4141	-1.00000	-1.00000	-1.00000
10D2	-1.00000	-1.00000	-1.00000
2N2857(C-B)	0.11070	0.87506	0.49288
2N2857(E-B)	0.49069	0.49884	0.49477
2N3375(C-B)	0.30103	0.25527	0.27815
2N3375(E-B)	0.28172	0.47049	0.37611
2N1490:JAN(C-B)	0.51663	0.48337	0.50000
2N1490:JAN(E-B)	0.46584	0.53416	0.50000
2N3584(C-B)	0.48902	0.51098	0.50000
2N3584(E-B)	0.64224	0.66756	0.65490
2N2894(C-B)	0.55284	0.53148	0.54216
2N2894(E-B)	0.19957	0.19837	0.19897
2N5829(C-B)	0.45230	0.44165	0.44697
2N5829(E-B)	0.36653	0.34242	0.35448
2N3013:JAN(C-B)	0.68875	0.67778	0.68327
2N3013:JAN(E-B)	0.19728	0.21769	0.20749
CA3018(C-B)	0.53760	0.50515	0.52138
CA3018(E-B)	0.39794	0.34242	0.37018
SMB5265176(C-B)	0.58503	0.50515	0.54509
SMB5265176(E-B)	0.39794	0.41497	0.40646
2N1613:JAN(C-B)	0.17609	0.18293	0.17951
2N1613:JAN(E-B)	0.32736	0.34358	0.33547
2N1485:JAN(C-B)	0.19629	0.18906	0.19268
2N1485:JAN(E-B)	-1.00000	-1.00000	-1.00000
2N3439(C-B)	0.43136	0.46073	0.44605
2N3439(E-B)	0.53712	0.55003	0.54357
2N706:JAN(C-B)	0.78329	0.73803	0.76066
2N706:JAN(E-B)	0.42276	0.44370	0.43323
IR-69-6735	1.00000	1.00000	1.00000
1N2580	-1.00000	-1.00000	-1.00000
1N751A:JAN	1.01773	1.00860	1.01316
1N485B:JAN	0.63849	0.66254	0.65051
1N2991B:JAN	-1.00000	-1.00000	-1.00000
1N3025B:JAN	-1.00000	-1.00000	-1.00000
MD1054	0.12710	0.11841	0.12276
1N746A:JAN	-1.00000	-1.00000	-1.00000
1N645:JAN	0.06446	0.44743	0.25594
1N1202RA:JAN	1.00000	0.95424	0.97712
1N1731A:JAN	0.39794	0.45484	0.42639
2N404A(C-B)	0.12494	0.15761	0.14127
2N404A(E-B)	0.12909	0.09691	0.11300
2N297A(C-B)	0.04139	0.08894	0.06517
2N297A(E-B)	0.17609	0.19629	0.18619
2N526(C-B)	0.23824	0.27621	0.25722
2N526(E-B)	0.25828	0.23657	0.24742
1N270	0.02228	0.06070	0.04149
2N396A(C-B)	0.16975	0.13128	0.15052
2N396A(E-B)	0.19781	0.23231	0.21506
2N428M:JAN(C-B)	0.18452	0.20828	0.19640
2N428M:JAN(E-B)	0.10474	0.07789	0.09131
2N393:JAN(C-B)	0.56427	0.49009	0.52718
2N393:JAN(E-B)	0.68561	0.64098	0.66329

2N501A:JAN(C-B)	0.75333	0.70405	0.72869
2N501A:JAN(E-B)	0.56508	0.64235	0.60372
2N705:JAN(C-B)	0.28400	0.30103	0.29251
2N705:JAN(E-B)	0.26324	0.25964	0.26144
2N466M:JAN(C-B)	0.23099	0.24304	0.23702
2N466M:JAN(E-B)	0.09145	0.07086	0.08115
2N1042RAJAN(C-B)	0.47712	0.42597	0.45154
2N1042RAJAN(E-B)	0.67415	0.64461	0.65938
1N277:JAN	0.10914	0.10646	0.10780
MS1040	0.04139	0.05552	0.04845

ARITHMETIC MEAN VALUES FOR QUANTITIES A THROUGH J FOR PULSE DURATIONS OF 10, 1, AND 0.1 USEC

0.10E+04	0.35E+04	0.16E+05
0.99E+03	0.38E+04	0.20E+05
0.11E+04	0.25E+04	0.66E+04
0.34E+03	0.11E+04	0.61E+04
0.19E+03	0.90E+03	0.66E+04
0.93E+03	0.17E+04	0.40E+04
0.15E+04	0.46E+04	0.14E+05
0.45E+03	0.87E+03	0.10E+04
0.34E+03	0.32E+04	0.25E+05
0.13E+04	0.33E+04	0.90E+04

POWER TO DAMAGE EQUATION COEFFICIENTS FOR POPULATIONS DEFINED BY A THROUGH J

$$P = K1\,T^{-1} + K2\,T^{-1/2} + K3$$

K1	K2	K3
0.821E-03	0.249E+01	0.136E+03
0.118E-02	0.258E+01	0.527E+02
-0.863E-04	0.225E+01	0.354E+03
0.446E-03	0.458E+00	0.152E+03
0.558E-03	0.309E+00	0.342E+02
0.145E-04	0.103E+01	0.606E+03
0.403E-04	0.438E+01	0.144E+03
-0.528E-04	0.392E+00	0.327E+03
0.212E-02	0.110E+01	-0.222E+02
-0.101E-03	0.306E+01	0.366E+03

RATIO OF EXPERIMENTAL POWER TO DAMAGE TO PREDICTED VALUE BASED ON JUNCTION CAPACITANCE MODEL: L=MODEL BASED ON D.A.T.A. BOOK PARAMETERS M=MODEL BASED ON EXPERIMENTAL PARAMETERS N=MODEL BASED ON EXPERIMENTAL PARAMETERS AND, WHERE DATA MISSING, BASED ON D.A.T.A. BOOK PARAMETERS

	L	L	L	M	M	M	N	N	N
	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC
2N328A(C-B)	0.01958	0.01610	0.01371	0.07557	0.06214	0.05291	0.07557	0.06214	0.05291
2N328A(E-B)	0.0	0.0	0.0	0.08625	0.04849	0.02876	0.08625	0.04849	0.02876
2N335(C-B)	0.20738	0.26234	0.31113	0.03419	0.04325	0.05129	0.03419	0.04325	0.05129
2N335(E-B)	0.0	0.0	0.0	0.21587	0.15020	0.10796	0.21587	0.15020	0.10796
2N336*JAN(C-B)	0.14596	0.10771	0.07786	0.0	0.0	0.0	0.14596	0.10771	0.07786
2N336*JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N930(C-B)	1.63581	1.27609	0.98166	0.45396	0.35413	0.27242	0.45396	0.35413	0.27242
2N930(E-B)	0.0	0.0	0.0	4.68527	5.55653	6.73626	4.68527	5.55653	6.73626
2N2481(C-B)	0.15579	0.04927	0.01558	0.00773	0.00245	0.00077	0.00773	0.00245	0.00077
2N2481(E-B)	0.0	0.0	0.0	0.45908	0.24198	0.13520	0.45908	0.24198	0.13520
2N2907A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N4384	0.0	0.0	0.0	0.39298	0.13612	0.05241	0.39298	0.13612	0.05241
FS911-3465	0.0	0.0	0.0	0.18267	0.09749	0.04682	0.18267	0.09749	0.04682
1N814	0.0	0.0	0.0	2.29408	1.39921	1.04891	2.29408	1.39921	1.04891
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.20360	0.34341	0.57017	0.11215	0.18916	0.31407	0.11215	0.18916	0.31407
1N752A	0.0	0.0	0.0	0.48972	0.63444	1.35731	0.48972	0.63444	1.35731
PC115	2.35117	1.96828	1.52161	0.0	0.0	0.0	2.35117	1.96828	1.52161
1N3026B:JAN	0.0	0.0	0.0	0.90359	0.90302	0.90375	0.90359	0.90302	0.90375
1N3611	0.0	0.0	0.0	0.59671	0.18871	0.05968	0.59671	0.18871	0.05968
1N3995A	0.0	0.0	0.0	1.00000	1.00018	1.00018	1.00000	1.00018	1.00018
1N3016B	0.0	0.0	0.0	1.77979	1.77867	1.78011	1.77979	1.77867	1.78011
1N4141	0.0	0.0	0.0	1.39781	1.39693	1.39806	1.39781	1.39693	1.39806
10D2	0.0	0.0	0.0	0.11971	0.11964	0.11973	0.11971	0.11964	0.11973
2N2857(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490*JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490*JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013*JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013*JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(C-B)	3.27550	3.57206	3.61499	0.0	0.0	0.0	3.27550	3.57206	3.61499
CA3018(E-B)	18.33365	14.49531	10.08529	0.0	0.0	0.0	18.33365	14.49531	10.08529
SMB5265171(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265171(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2N1613:JAN(C-B)	14.70956	6.97798	3.36278	4.98601	2.36528	1.13986	4.98601	2.36528	1.13986
2N1613:JAN(E-B)	0.0	0.0	0.0	4.91271	3.30155	2.30324	4.91271	3.30155	2.30324
2N1485:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1485:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N706:JAN(C-B)	0.36441	0.69971	1.21057	0.0	0.0	0.0	0.36441	0.69971	1.21057
2N706:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N751A:JAN	0.0	0.0	0.0	0.22793	0.75088	2.42220	0.22793	0.75088	2.42220
1N4258:JAN	0.0	0.0	0.0	0.51760	0.71207	1.03539	0.51760	0.71207	1.03539
1N2991B:JAN	0.0	0.0	0.0	1.12948	1.12877	1.12968	1.12948	1.12877	1.12968
1N6025:JAN	0.0	0.0	0.0	2.59192	1.87199	5.92027	2.59192	1.87199	5.92027
MD1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N74[illegible]JAN	0.0	0.0	0.0	2.39030	5.81498	14.14205	2.39030	5.81498	14.14206
1N54[illegible]JAN	0.0	0.0	0.0	0.43924	0.16114	0.14278	0.43924	0.16114	0.14278
1N[illegible]RA:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N1[illegible]JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N4033(C-B)	4.12507	1.73944	0.79078	0.37951	0.16003	0.07275	0.37951	0.16003	0.07275
2N4033(E-B)	0.0	0.0	0.0	0.50679	0.21575	0.08529	0.50679	0.21575	0.08529
2N2973(C-B)	0.0	0.0	0.0	0.11376	0.03958	0.01536	0.11376	0.03958	0.01536
2N2973(E-B)	0.0	0.0	0.0	0.11209	0.05317	0.02643	0.11209	0.05317	0.02643
2N5262(C-B)	.18667	1.19702	0.71507	0.17202	0.09416	0.05625	0.17202	0.09416	0.05625
2N5262(E-B)	0.0	0.0	0.0	0.26355	0.15107	0.08237	0.26355	0.15107	0.08237
[illegible]	[illegible]	[illegible]	[illegible]	0.04354	0.01450	0.00527	0.04354	0.01450	0.00527
2N3963(C-B)	4.18039	1.95437	0.83623	0.0	0.0	0.0	4.18039	1.95437	0.83623
2N3963(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N[illegible]JAN(C-B)	6.17971	2.98903	1.52702	0.0	0.0	0.0	6.17971	2.98903	1.52702
2N[illegible]JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3[illegible]JAN(C-B)	6.[illegible]	[illegible].15062	77.37111	0.0	0.0	0.0	68.25661	79.15062	77.37111
2N393[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N501[illegible]	[illegible]	[illegible].50469	2.40732	0.0	0.0	0.0	0.83962	1.50469	2.40732
2N50[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N705[illegible]	[illegible]	0.49514	0.31318	0.0	0.0	0.0	0.81412	0.49514	0.31318
2N705[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N566[illegible]	[illegible]	[illegible].97450	1.64623	0.0	0.0	0.0	5.52566	2.97450	1.64623
[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N277:JAN	0.0	0.0	0.0	0.96461	0.39223	0.15850	0.96461	0.39223	0.15850
MS1040	.0	0.0	0.0	0.17594	0.06121	0.02200	0.17594	0.06121	0.02200

0.505E+00	0.[illegible]E+02
0.524E+0[illegible]	.[illegible]E+02
0.465E+00	0.[illegible]E+01
0.2[illegible]E+00	.[illegible]E+01
0.890E-01	0.[illegible]
0.544E+00	.[illegible]E+01

D= EXPERIMENTAL POWER TO [illegible] , WHERE KA DAMAGE CONSTANT BASED ON HIGH POWER OR LOW POWER RATING FOR ALL DEVICES
P= EXPERIMENTAL POWER TO [illegible] , WHERE KA DAMAGE CONSTANT BASED ON HIGH POWER OR LOW POWER RATING FOR ALL DEVICES
G=SAME AS D EXCEPT FOR SILICON DEVICES ONLY
R=SAME AS P EXCEPT FOR SILICON DEVICES ONLY
S=SAME AS D EXCEPT FOR GERMANIUM DEVICES ONLY
T=SAME AS P EXCEPT FOR GERMANIUM DEVICES ONLY

	O	O	O	P	P	P	Q	Q	Q
	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC
2N328A(C-B)	0.125	0.130	0.134	0.125	0.103	0.089	0.121	0.125	0.134
2N328A(E-B)	0.056	0.040	0.030	0.056	0.032	0.019	0.054	0.038	0.029
2N335(C-B)	0.125	0.199	0.298	0.125	0.158	0.188	0.121	0.192	0.287
2N335(E-B)	0.125	0.110	0.099	0.125	0.087	0.063	0.121	0.106	0.096
2N336*JAN(C-B)	0.188	0.174	0.159	0.188	0.139	0.100	0.181	0.168	0.153
2N336*JAN(E-B)	0.438	0.279	0.621	0.438	0.222	0.391	0.423	0.269	0.598
2N2484(C-B)	0.263	0.115	0.050	0.263	0.091	0.031	0.256	0.111	0.048
2N2484(E-B)	0.094	0.120	0.159	0.094	0.095	0.100	0.091	0.115	0.152
2N3736(C-B)	0.275	0.179	0.114	0.275	0.143	0.072	0.266	0.173	0.110
2N3736(E-B)	0.689	0.636	0.585	0.689	0.505	0.369	0.664	0.615	0.564
2N930(C-B)	0.188	0.184	0.179	0.188	0.147	0.113	0.181	0.178	0.172
2N930(E-B)	0.100	0.150	0.228	0.100	0.119	0.144	0.097	0.144	0.220
2N2481(C-B)	0.063	0.025	0.010	0.063	0.020	0.006	0.060	0.024	0.010
2N2481(E-B)	0.113	0.075	0.053	0.113	0.059	0.033	0.109	0.072	0.051
2N2907A(C-B)	0.125	0.132	0.134	0.125	0.105	0.085	0.121	0.127	0.129
2N2907A(E-B)	0.332	0.194	0.109	0.332	0.154	0.069	0.320	0.187	0.105
2N2222A(C-B)	0.200	0.212	0.218	0.200	0.168	0.138	0.193	0.204	0.210
2N2222A(E-B)	0.250	0.336	0.387	0.250	0.267	0.250	0.241	0.324	0.383
1N4384	0.636	0.277	0.134	0.636	0.220	0.085	0.566	0.247	0.120
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.424	0.325	0.307	0.424	0.258	0.194	0.377	0.290	0.274
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.094	0.199	0.417	0.094	0.158	0.263	0.091	0.192	0.402
1N752A	0.520	0.847	2.282	0.520	0.673	1.440	0.501	0.817	2.200
PC115	0.154	0.163	0.158	0.154	0.129	0.100	0.137	0.145	0.141
1N3026B*JAN	5.146	6.473	8.154	5.146	5.143	5.147	4.581	5.763	7.260
1N3611	0.908	0.361	0.144	0.908	0.287	0.091	0.808	0.322	0.128
1N3995A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3016B	3.935	4.950	6.236	3.935	3.933	3.936	3.503	4.407	5.553
1N4141	2.421	3.046	3.837	2.422	2.420	2.422	2.156	2.712	3.416
1OD2	4.195	5.277	6.647	4.195	4.192	4.196	4.045	5.088	6.410
2N2857(C-B)	0.078	0.040	0.119	0.078	0.032	0.075	0.075	0.038	0.115
2N2857(E-B)	0.005	0.006	0.008	0.005	0.005	0.005	0.005	0.006	0.008
2N3375(C-B)	0.151	0.120	0.086	0.151	0.096	0.054	0.135	0.107	0.077
2N3375(E-B)	0.070	0.053	0.062	0.070	0.042	0.039	0.062	0.047	0.056
2N1490*JAN(C-B)	0.212	0.277	0.336	0.212	0.220	0.212	0.189	0.247	0.299
2N1490*JAN(E-B)	0.393	0.458	0.624	0.394	0.364	0.394	0.350	0.408	0.555
2N3584(C-B)	0.036	0.045	0.058	0.036	0.035	0.036	0.032	0.040	0.051
2N3584(E-B)	0.143	0.259	0.480	0.148	0.206	0.303	0.132	0.231	0.427
2N2894(C-B)	0.088	0.125	0.169	0.088	0.099	0.106	0.085	0.120	0.163
2N2894(E-B)	0.075	0.047	0.030	0.075	0.036	0.019	0.072	0.046	0.029
2N5829(C-B)	0.038	0.042	0.047	0.038	0.034	0.029	0.036	0.041	0.045
2N5829(E-B)	0.027	0.025	0.022	0.027	0.020	0.014	0.026	0.024	0.021
2N3013*JAN(C-B)	0.027	0.052	0.099	0.027	0.042	0.083	0.026	0.050	0.096
2N3013*JAN(E-B)	0.125	0.079	0.052	0.125	0.062	0.033	0.121	0.076	0.050
CA3018(C-B)	0.036	0.050	0.063	0.036	0.040	0.040	0.035	0.048	0.061
CA3018(E-B)	0.025	0.025	0.022	0.025	0.020	0.014	0.024	0.024	0.021
SMB5265171(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265171(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613*JAN(C-B)	8.765	5.234	3.175	8.766	4.158	2.004	8.452	5.047	3.061
2N1613*JAN(E-B)	1.002	0.847	0.744	1.002	0.673	0.470	0.966	0.817	0.718
2N1485*JAN(C-B)	0.212	0.133	0.082	0.212	0.105	0.051	0.189	0.118	0.073

2N1485:JAN(E-B)	0.938	3.615	13.910	0.938	2.872	8.780	0.835	3.218	12.384
2N3439(C-B)	0.003	0.003	0.004	0.003	0.003	0.002	0.003	0.003	0.003
2N3439(E-B)	0.054	0.075	0.106	0.054	0.059	0.067	0.049	0.067	0.094
2N706:JAN(C-B)	0.018	0.042	0.092	0.018	0.034	0.058	0.017	0.041	0.089
2N706:JAN(E-B)	0.043	0.045	0.050	0.043	0.036	0.031	0.041	0.043	0.048
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	5.146	6.473	8.154	5.146	5.143	5.147	4.581	5.763	7.260
1N751A:JAN	1.503	6.231	25.300	1.503	4.950	15.969	1.449	6.008	24.396
1N485B:JAN	0.626	1.084	1.984	0.626	0.861	1.252	0.604	1.045	1.913
1N2991B:JAN	3.027	3.808	4.797	3.027	3.025	3.028	2.695	3.390	4.271
1N3025B:JAN	0.424	1.687	6.715	0.424	1.340	4.239	0.377	1.502	5.979
MD1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N746A:JAN	16.278	49.846	152.593	16.279	39.603	96.314	15.696	48.065	147.141
1N645:JAN	3.130	1.446	1.612	3.131	1.148	1.018	3.018	1.394	1.555
1N1202RA:JAN	0.030	0.120	0.432	0.030	0.096	0.272	0.027	0.107	0.384
1N1731A:JAN	0.242	0.241	0.273	0.242	0.191	0.173	0.216	0.215	0.243
2N404A(C-B)	0.751	0.399	0.228	0.751	0.317	0.144	0.0	0.0	0.0
2N404A(E-B)	0.651	0.349	0.174	0.651	0.277	0.110	0.0	0.0	0.0
2N297A(C-B)	0.605	0.265	0.130	0.605	0.211	0.082	0.0	0.0	0.0
2N297A(E-B)	0.424	0.253	0.158	0.424	0.201	0.100	0.0	0.0	0.0
2N526(C-B)	0.814	0.561	0.422	0.814	0.446	0.266	0.0	0.0	0.0
2N526(E-B)	1.002	0.723	0.496	1.002	0.574	0.313	0.0	0.0	0.0
1N270	0.119	0.050	0.023	0.119	0.040	0.014	0.0	0.0	0.0
2N396A(C-B)	0.720	0.424	0.228	0.720	0.337	0.144	0.0	0.0	0.0
2N396A(E-B)	0.614	0.511	0.347	0.814	0.406	0.219	0.0	0.0	0.0
2N428M:JAN(C-B)	1.064	0.648	0.417	1.064	0.515	0.263	0.0	0.0	0.0
2N428M:JAN(E-B)	1.377	0.698	0.332	1.377	0.554	0.210	0.0	0.0	0.0
2N393:JAN(C-B)	1.878	2.742	3.373	1.878	2.178	2.129	0.0	0.0	0.0
2N393:JAN(E-B)	0.207	0.399	0.695	0.207	0.317	0.438	0.0	0.0	0.0
2N501A:JAN(C-B)	0.019	0.042	0.085	0.019	0.034	0.054	0.0	0.0	0.0
2N501A:JAN(E-B)	0.031	0.045	0.078	0.031	0.036	0.049	0.0	0.0	0.0
2N705:JAN(C-B)	0.049	0.037	0.030	0.049	0.030	0.019	0.0	0.0	0.0
2N705:JAN(E-B)	0.023	0.016	0.012	0.023	0.013	0.008	0.0	0.0	0.0
2N486M:JAN(C-B)	2.942	1.994	1.389	2.943	1.584	0.877	0.0	0.0	0.0
2N486M:JAN(E-B)	4.007	1.969	0.923	4.007	1.564	0.582	0.0	0.0	0.0
2N1042RAJAN(C-B)	0.151	0.181	0.192	0.151	0.144	0.121	0.0	0.0	0.0
2N1042RAJAN(E-B)	0.109	0.205	0.360	0.109	0.163	0.227	0.0	0.0	0.0
1N277:JAN	0.088	0.045	0.023	0.088	0.036	0.014	0.0	0.0	0.0
MS1040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	R	R	R	S	S	S	T	T	T
	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC
2N328A(C-B)	0.121	0.099	0.085	0.0	0.0	0.0	0.0	0.0	0.0
2N328A(E-B)	0.054	0.031	0.018	0.0	0.0	0.0	0.0	0.0	0.0
2N335(C-B)	0.121	0.153	0.181	0.0	0.0	0.0	0.0	0.0	0.0
2N335(E-B)	0.121	0.084	0.060	0.0	0.0	0.0	0.0	0.0	0.0
2N336:JAN(C-B)	0.181	0.134	0.097	0.0	0.0	0.0	0.0	0.0	0.0
2N336:JAN(E-B)	0.423	0.214	0.377	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(C-B)	0.254	0.088	0.030	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(E-B)	0.091	0.092	0.097	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(C-B)	0.266	0.137	0.069	0.0	0.0	0.0	0.0	0.0	0.0

2N3736(E-B)	0.664	0.487	0.356	0.0	0.0	0.0	0.0	0.0	0.0
2N930(C-B)	0.181	0.141	0.109	0.0	0.0	0.0	0.0	0.0	0.0
2N930(E-B)	0.097	0.115	0.139	0.0	0.0	0.0	0.0	0.0	0.0
2N2481(C-B)	0.060	0.019	0.006	0.0	0.0	0.0	0.0	0.0	0.0
2N2481(E-B)	0.109	0.057	0.032	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(C-B)	0.121	0.101	0.082	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(E-B)	0.320	0.149	0.066	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(C-B)	0.193	0.162	0.133	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(E-B)	0.241	0.258	0.242	0.0	0.0	0.0	0.0	0.0	0.0
1N4384	0.566	0.196	0.075	0.0	0.0	0.0	0.0	0.0	0.0
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.377	0.230	0.173	0.0	0.0	0.0	0.0	0.0	0.0
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.091	0.153	0.254	0.0	0.0	0.0	0.0	0.0	0.0
1N752A	0.501	0.649	1.389	0.0	0.0	0.0	0.0	0.0	0.0
PC115	0.137	0.115	0.089	0.0	0.0	0.0	0.0	0.0	0.0
1N3026B*JAN	4.581	4.579	4.582	0.0	0.0	0.0	0.0	0.0	0.0
1N3611	1.808	0.256	0.081	0.0	0.0	0.0	0.0	0.0	0.0
1N3995A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3016B	3.503	3.501	3.504	0.0	0.0	0.0	0.0	0.0	0.0
1N4141	2.156	2.155	2.156	0.0	0.0	0.0	0.0	0.0	0.0
1002	4.045	4.043	4.046	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(C-B)	0.075	0.031	0.072	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(E-B)	0.005	0.005	0.005	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(C-B)	0.135	0.085	0.049	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(E-B)	0.062	0.038	0.035	0.0	0.0	0.0	0.0	0.0	0.0
2N1490*JAN(C-B)	0.189	0.196	0.189	0.0	0.0	0.0	0.0	0.0	0.0
2N1490*JAN(E-B)	0.350	0.324	0.350	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(C-B)	0.032	0.032	0.032	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(E-B)	0.322	0.183	0.270	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(C-B)	0.085	0.095	0.103	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(E-B)	0.072	0.036	0.018	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(C-B)	0.036	0.032	0.028	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(E-B)	0.024	0.019	0.013	0.0	0.0	0.0	0.0	0.0	0.0
2N3013*JAN(C-B)	0.026	0.040	0.060	0.0	0.0	0.0	0.0	0.0	0.0
2N3013*JAN(E-B)	0.121	0.060	0.031	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(C-B)	0.035	0.038	0.039	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(E-B)	0.024	0.019	0.013	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265176(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265176(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613*JAN(C-B)	8.452	4.010	1.932	0.0	0.0	0.0	0.0	0.0	0.0
2N1613*JAN(E-B)	0.966	0.649	0.453	0.0	0.0	0.0	0.0	0.0	0.0
2N1485*JAN(C-B)	0.189	0.094	0.046	0.0	0.0	0.0	0.0	0.0	0.0
2N1485*JAN(E-B)	7.835	2.557	7.817	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(C-B)	0.003	0.002	0.002	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(E-B)	0.049	0.053	0.059	0.0	0.0	0.0	0.0	0.0	0.0
2N706*JAN(C-B)	0.017	0.032	0.056	0.0	0.0	0.0	0.0	0.0	0.0
2N706*JAN(E-B)	0.041	0.034	0.030	0.0	0.0	0.0	0.0	0.0	0.0
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	4.581	4.579	4.582	0.0	0.0	0.0	0.0	0.0	0.0
1N751A*JAN	1.449	4.773	15.398	0.0	0.0	0.0	0.0	0.0	0.0
1N485B*JAN	0.604	0.831	1.208	0.0	0.0	0.0	0.0	0.0	0.0
1N2991B*JAN	2.695	2.693	2.695	0.0	0.0	0.0	0.0	0.0	0.0
1N3025B*JAN	0.377	1.193	3.774	0.0	0.0	0.0	0.0	0.0	0.0
MD1C54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N746A*JAN	15.697	38.188	92.873	0.0	0.0	0.0	0.0	0.0	0.0
1N645*JAN	3.019	1.107	0.981	0.0	0.0	0.0	0.0	0.0	0.0
1N1202RA*JAN	0.027	0.085	0.243	0.0	0.0	0.0	0.0	0.0	0.0
1N1731A*JAN	0.216	0.170	0.154	0.0	0.0	0.0	0.0	0.0	0.0
2N404A(C-B)	0.0	0.0	0.0	0.817	0.434	0.248	0.817	0.344	0.157

2N404A(E-B)	0.0	0.0	0.0	0.708	0.379	0.189	0.708	0.301	0.119
2N297A(C-B)	0.0	0.0	0.0	1.878	0.822	0.402	1.878	0.653	0.254
2N297A(E-B)	0.0	0.0	0.0	1.315	0.785	0.491	1.315	0.624	0.310
2N526(C-B)	0.0	0.0	0.0	0.885	0.610	0.458	0.885	0.484	0.289
2N526(E-B)	0.0	0.0	0.0	1.089	0.786	0.539	1.089	0.624	0.340
1N270	0.0	0.0	0.0	0.129	0.054	0.025	0.129	0.043	0.016
2N396A(C-B)	0.0	0.0	0.0	0.783	0.461	0.248	0.783	0.366	0.157
2N396A(E-B)	0.0	0.0	0.0	0.885	0.556	0.378	0.885	0.441	0.238
2N428MSJAN(C-B)	0.0	0.0	0.0	1.157	0.705	0.453	1.157	0.560	0.286
2N428MSJAN(E-B)	0.0	0.0	0.0	1.498	0.759	0.361	1.498	0.603	0.228
2N393SJAN(C-B)	0.0	0.0	0.0	2.042	2.981	3.668	2.042	2.368	2.315
2N393SJAN(E-B)	0.0	0.0	0.0	0.225	0.434	0.755	0.225	0.344	0.477
2N501ASJAN(C-B)	0.0	0.0	0.0	0.020	0.046	0.093	0.020	0.037	0.059
2N501ASJAN(E-B)	0.0	0.0	0.0	0.033	0.049	0.085	0.033	0.039	0.054
2N705SJAN(C-B)	0.0	0.0	0.0	0.053	0.041	0.032	0.053	0.032	0.020
2N705SJAN(E-B)	0.0	0.0	0.0	0.025	0.018	0.013	0.025	0.014	0.008
2N466MSJAN(C-B)	0.0	0.0	0.0	3.199	2.168	1.510	3.200	1.722	0.953
2N466MSJAN(E-B)	0.0	0.0	0.0	4.357	2.141	1.003	4.357	1.701	0.633
2N1042RAJAN(C-B)	0.0	0.0	0.0	0.469	0.561	0.595	0.470	0.445	0.376
2N1042RAJAN(E-B)	0.0	0.0	0.0	0.338	0.635	1.116	0.338	0.505	0.704
1N277SJAN	0.0	0.0	0.0	0.095	0.049	0.025	0.095	0.039	0.016
MS1040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

U= SAME AS O EXCEPT MODEL LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE MODEL DATA
V= SAME AS P EXCEPT MODEL LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE MODEL DATA
W= SAME AS Q EXCEPT MODEL LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE MODEL DATA
X= SAME AS R EXCEPT MODEL LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE MODEL DATA
Y= SAME AS S EXCEPT MODEL LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE MODEL DATA
Z= SAME AS T EXCEPT MODEL LIMITED TO DEVICES WITHOUT CAPACITANCE DAMAGE MODEL DATA

	U	U	U	V	V	V	W	W	W
	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC
2N328A(C-B)	0.312	0.323	0.346	0.312	0.257	0.219	0.711	0.735	0.788
2N328A(E-B)	0.140	0.099	0.074	0.140	0.079	0.047	0.320	0.226	0.169
2N335(C-B)	0.312	0.497	0.742	0.312	0.395	0.468	0.711	1.131	1.689
2N335(E-B)	0.312	0.273	0.247	0.312	0.217	0.156	0.711	0.622	0.563
2N336SJAN(C-B)	0.468	0.435	0.396	0.468	0.345	0.250	1.066	0.990	0.901
2N336SJAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N930(C-B)	0.468	0.460	0.445	0.468	0.365	0.281	1.066	1.047	1.013
2N930(E-B)	0.250	0.373	0.569	0.250	0.296	0.359	0.568	0.849	1.295
2N2481(C-B)	0.156	0.062	0.025	0.156	0.049	0.016	0.355	0.141	0.056
2N2481(E-B)	0.281	0.186	0.131	0.281	0.148	0.083	0.640	0.424	0.298
2N2907A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N4384	1.207	0.526	0.255	1.207	0.418	0.161	1.082	0.472	0.229
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.805	0.618	0.583	0.805	0.491	0.368	0.721	0.554	0.523
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.234	0.497	1.039	0.234	0.395	0.656	0.533	1.131	2.365
1N752A	1.295	2.112	5.687	1.295	1.678	3.590	2.949	4.809	12.950

PC115	0.293	0.309	0.301	0.293	0.245	0.190	0.263	0.277	0.269
1N3026B:JAN	9.774	12.295	15.489	9.775	9.769	9.772	8.555	11.019	13.881
1N3611	1.725	0.687	0.273	1.725	0.546	0.173	1.546	0.615	0.245
1N3995A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3016B	7.474	9.402	11.845	7.475	7.470	7.476	6.698	8.426	10.615
1N4141	4.599	5.786	7.289	4.600	4.597	4.601	4.122	5.185	6.532
10D2	10.454	13.151	16.567	10.455	10.449	10.457	23.804	29.944	37.723
2N2857(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(C-B)	0.090	0.124	0.158	0.091	0.099	0.100	0.206	0.283	0.360
CA3018(E-B)	0.062	0.062	0.054	0.062	0.049	0.034	0.142	0.141	0.124
SMB526517(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB526517(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613:JAN(C-B)	21.845	13.044	7.913	21.847	10.364	4.994	49.740	29.701	18.017
2N1613:JAN(E-B)	2.497	2.112	1.855	2.497	1.678	1.171	5.685	4.809	4.223
2N1485:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1485:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N706:JAN(C-B)	0.044	0.106	0.230	0.044	0.084	0.145	0.099	0.240	0.524
2N706:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N751A:JAN	3.745	15.529	63.055	3.745	12.338	39.799	8.527	35.359	143.574
1N465B:JAN	1.560	2.702	4.945	1.560	2.147	3.121	3.553	6.152	11.261
1N2991B:JAN	5.749	7.232	9.111	5.750	5.746	5.751	5.153	6.482	8.166
1N3025B:JAN	0.805	3.204	12.756	0.805	2.546	8.051	0.721	2.872	11.432
MO1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N746A:JAN	40.568	124.230	380.305	40.572	98.701	240.042	92.373	282.868	865.946
1N645:JAN	7.802	3.603	4.018	7.802	2.862	2.536	17.764	8.203	9.149
1N1202RA:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N1731A:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N404A(C-B)	1.872	0.994	0.569	1.873	0.790	0.359	0.0	0.0	0.0
2N404A(E-B)	1.623	0.870	0.433	1.623	0.691	0.273	0.0	0.0	0.0
2N297A(C-B)	1.150	0.504	0.246	1.150	0.400	0.155	0.0	0.0	0.0
2N297A(E-B)	0.805	0.481	0.301	0.805	0.382	0.190	0.0	0.0	0.0
2N526(C-B)	2.028	1.398	1.051	2.029	1.110	0.663	0.0	0.0	0.0
2N526(E-B)	2.497	1.801	1.236	2.497	1.431	0.780	0.0	0.0	0.0
1N270	0.296	0.124	0.057	0.296	0.099	0.036	0.0	0.0	0.0
2N396A(C-B)	1.794	1.056	0.569	1.795	0.839	0.359	0.0	0.0	0.0
2N396A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N428M:JAN(C-B)	2.653	1.615	1.039	2.653	1.283	0.656	0.0	0.0	0.0
2N428M:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N393:JAN(C-B)	4.681	6.833	8.467	4.681	5.429	5.307	0.0	0.0	0.0
2N393:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N501A:JAN(C-B)	0.047	0.106	0.213	0.047	0.084	0.134	0.0	0.0	0.0
2N501A:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N705:JAN(C-B)	0.122	0.093	0.074	0.122	0.074	0.047	0.0	0.0	0.0

2N705:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N466M:JAN(C-B)	7.334	4.969	3.462	7.334	3.948	2.185	0.0	0.0	0.0
2N466M:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N277:JAN	0.218	0.112	0.057	0.218	0.089	0.036	0.0	0.0	0.0
MSI640	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	X	X	X	Y	Y	Y	Z	Z	Z
	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC	10 USEC	1 USEC	0.1 USEC
2N328A(C-B)	0.711	0.584	0.498	0.0	0.0	0.0	0.0	0.0	0.0
2N328A(E-B)	0.320	0.180	0.107	0.0	0.0	0.0	0.0	0.0	0.0
2N335(C-B)	0.711	0.899	1.066	0.0	0.0	0.0	0.0	0.0	0.0
2N335(E-B)	0.711	0.494	0.355	0.0	0.0	0.0	0.0	0.0	0.0
2N336:JAN(C-B)	1.066	0.787	0.569	0.0	0.0	0.0	0.0	0.0	0.0
2N336:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2484(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3736(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N930(C-B)	1.066	0.832	0.640	0.0	0.0	0.0	0.0	0.0	0.0
2N930(E-B)	0.569	0.674	0.817	0.0	0.0	0.0	0.0	0.0	0.0
2N2481(C-B)	0.355	0.112	0.036	0.0	0.0	0.0	0.0	0.0	0.0
2N2481(E-B)	0.640	0.337	0.188	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2907A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2222A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N4384	1.082	0.375	1.144	0.0	0.0	0.0	0.0	0.0	0.0
FS911-3465	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N816	0.721	0.440	0.330	0.0	0.0	0.0	0.0	0.0	0.0
1N21WE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N914A	0.533	0.899	1.493	0.0	0.0	0.0	0.0	0.0	0.0
1N752A	2.949	3.821	8.174	0.0	0.0	0.0	0.0	0.0	0.0
PC115	0.263	0.220	0.170	0.0	0.0	0.0	0.0	0.0	0.0
1N3026B:JAN	8.760	8.755	8.762	0.0	0.0	0.0	0.0	0.0	0.0
1N3611	1.546	0.489	0.155	0.0	0.0	0.0	0.0	0.0	0.0
1N3995A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N3016B	6.699	6.695	6.700	0.0	0.0	0.0	0.0	0.0	0.0
1N4141	4.122	4.120	4.123	0.0	0.0	0.0	0.0	0.0	0.0
1002	23.806	23.791	23.810	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2857(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3375(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1490:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3584(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N2894(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2N5829(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N5829(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3013:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(C-B)	0.206	0.225	0.227	0.0	0.0	0.0	0.0	0.0	0.0
CA3018(E-B)	0.142	0.112	0.078	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265171(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMB5265171(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1613:JAN(C-B)	49.744	23.598	11.372	0.0	0.0	0.0	0.0	0.0	0.0
2N1613:JAN(E-B)	5.685	3.821	2.665	0.0	0.0	0.0	0.0	0.0	0.0
2N1485:JAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1485:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N3439(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N706:JAN(C-B)	0.099	0.191	0.331	0.0	0.0	0.0	0.0	0.0	0.0
2N706:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IR-69-6735	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N2580	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N751A:JAN	8.528	28.092	90.621	0.0	0.0	0.0	0.0	0.0	0.0
1N485B:JAN	3.553	4.888	7.108	0.0	0.0	0.0	0.0	0.0	0.0
1N2991B:JAN	5.153	5.150	5.154	0.0	0.0	0.0	0.0	0.0	0.0
1N3025B:JAN	0.721	2.282	7.216	0.0	0.0	0.0	0.0	0.0	0.0
MD1054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N746A:JAN	92.382	224.740	546.569	0.0	0.0	0.0	0.0	0.0	0.0
1N645:JAN	17.766	6.517	5.775	0.0	0.0	0.0	0.0	0.0	0.0
1N1202RA:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N1731A:JAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N404A(C-B)	0.0	0.0	0.0	0.698	0.370	0.212	0.698	0.294	0.134
2N404A(E-B)	0.0	0.0	0.0	0.605	0.324	0.161	0.605	0.258	0.102
2N297A(C-B)	0.0	0.0	0.0	4.651	2.037	0.995	4.652	1.618	0.628
2N297A(E-B)	0.0	0.0	0.0	3.256	1.944	1.216	3.256	1.545	0.768
2N526(C-B)	0.0	0.0	0.0	0.756	0.521	0.392	0.756	0.414	0.247
2N526(E-B)	0.0	0.0	0.0	0.931	0.672	0.461	0.931	0.534	0.291
1N270	0.0	0.0	0.0	0.111	0.046	0.021	0.111	0.037	0.013
2N396A(C-B)	0.0	0.0	0.0	0.669	0.394	0.212	0.669	0.313	0.134
2N396A(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N428M:JAN(C-B)	0.0	0.0	0.0	0.989	0.602	0.387	0.989	0.478	0.244
2N428M:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N393:JAN(C-B)	0.0	0.0	0.0	1.745	2.547	3.134	1.745	2.024	1.978
2N393:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N501A:JAN(C-B)	0.0	0.0	0.0	0.017	0.039	0.079	0.017	0.031	0.050
2N501A:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N705:JAN(C-B)	0.0	0.0	0.0	0.045	0.035	0.028	0.045	0.028	0.017
2N705:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N466M:JAN(C-B)	0.0	0.0	0.0	2.734	1.852	1.291	2.734	1.472	0.815
2N466M:JAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(C-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2N1042RAJAN(E-B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1N277:JAN	0.0	0.0	0.0	0.081	0.042	0.021	0.081	0.033	0.013
MS1040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

QUANTITIES A THROUGH J AND L THROUGH Z ORDERED BY MAGNITUDE

APPENDIX A

SILICON DEVICES ONLY FOR L, M, AND N

23.58696	16.91402	15.56127	14.48369	12.93426	11.89980	10.46465	10.42856	9.10403	8.58823
8.52808	7.97478	6.46713	5.95910	5.11189	4.24509	4.05543	3.91071	3.11749	2.65318
2.61119	2.44098	2.40429	1.81431	1.81046	1.74115	1.63585	1.60994	1.60721	1.54493
1.52561	1.45925	1.39292	1.35674	1.32422	1.30108	1.24268	1.22689	1.19702	1.12760
0.99494	0.93809	0.91537	0.80220	0.79595	0.76039	0.70751	0.70170	0.68983	0.64571
0.64558	0.61344	0.59697	0.57486	0.57255	0.57209	0.54072	0.51250	0.50403	0.50210
0.49076	0.46431	0.43264	0.42003	0.40968	0.39798	0.39501	0.38034	0.37889	0.37336
0.35273	0.34079	0.30899	0.29692	0.28967	0.27036	0.25560	0.24921	0.24912	0.24622
0.24622	0.24538	0.24538	0.23630	0.21947	0.21889	0.21679	0.20645	0.19899	0.19899
0.19859	0.19501	0.18744	0.17963	0.17909	0.17412	0.17176	0.15449	0.14773	0.14484
0.13700	0.13632	0.13518	0.13496	0.13266	0.13266	0.13213	0.13183	0.12311	0.12269
0.11608	0.11587	0.10735	0.09949	0.09406	0.08793	0.08755	0.08742	0.08690	0.08497
0.08365	0.08207	0.08125	0.08077	0.07960	0.07821	0.07242	0.07239	0.07157	0.07145
0.07055	0.06543	0.06518	0.06368	0.06169	0.06134	0.05793	0.05751	0.05685	0.05649
0.05527	0.05306	0.05174	0.04975	0.04975	0.04975	0.04975	0.04924	0.04908	0.04776
0.04703	0.04601	0.04522	0.04287	0.04171	0.04146	0.04090	0.04023	0.03980	0.03869
0.03862	0.03838	0.03766	0.03701	0.03681	0.03681	0.03318	0.02985	0.02945	0.02897
0.02897	0.02764	0.02726	0.02699	0.02633	0.02535	0.02487	0.02462	0.02462	0.02414
0.02414	0.02388	0.02317	0.02300	0.02255	0.02239	0.02173	0.02147	0.02139	0.02080
0.02070	0.01931	0.01924	0.01902	0.01821	0.01791	0.01764	0.01764	0.01738	0.01738
0.01725	0.01704	0.01690	0.01687	0.01641	0.01529	0.01468	0.01448	0.01442	0.01411
0.01327	0.01309	0.01275	0.01227	0.01227	0.01188	0.01159	0.01159	0.01063	0.01022
0.01004	0.00995	0.00966	0.00929	0.00929	0.00903	0.00883	0.00886	0.00852	0.00829
0.00805	0.00782	0.00725	0.00675	0.00663	0.00578	0.00573	0.00511	0.00491	0.00478
0.00473	0.00460	0.00450	0.00418	0.00377	0.00252	0.00212	0.00170	0.00051	

19.20512	17.24905	14.09522	13.19046	13.11916	10.77875	8.52059	8.49124	6.99276	6.59523
6.49328	4.63029	3.67336	3.18421	2.70573	2.66291	2.21101	2.17778	1.85024	1.77564
1.63989	1.63905	1.42051	1.38361	1.33195	1.32685	1.31087	1.26831	1.08425	1.01465
0.82913	0.71560	0.68876	0.65317	0.60879	0.58476	0.49948	0.47350	0.46422	0.45655
0.41780	0.40586	0.39959	0.38046	0.35780	0.35227	0.30869	0.30850	0.28720	0.22565
0.22582	0.22322	0.22303	0.21054	0.20812	0.20293	0.20293	0.20293	0.20292	0.19979
0.19979	0.19887	0.19591	0.18264	0.16978	0.16268	0.13994	0.13529	0.13529	0.13444
0.13382	0.13119	0.12245	0.11838	0.11151	0.10989	0.10758	0.10147	0.09990	0.08929
0.08117	0.07697	0.07118	0.07084	0.06611	0.06494	0.06472	0.06291	0.05894	0.05637
0.05411	0.05328	0.05248	0.05116	0.05073	0.05073	0.05073	0.04995	0.04870	0.04683
0.04612	0.04461	0.04228	0.03996	0.03946	0.03883	0.03829	0.03778	0.03746	0.03644
0.03498	0.03477	0.03411	0.03382	0.03353	0.03330	0.03044	0.02997	0.02997	0.02818
0.02398	0.02385	0.02359	0.02300	0.02296	0.02263	0.02230	0.02220	0.02198	0.02187
0.02187	0.02181	0.02122	0.02099	0.01962	0.01759	0.01749	0.01748	0.01686	0.01574
0.01548	0.01531	0.01487	0.01387	0.01385	0.01374	0.01353	0.01329	0.01312	0.01212
0.01174	0.01149	0.01066	0.01050	0.01050	0.01015	0.00947	0.00947	0.00875	0.00866
0.00846	0.00832	0.00817	0.00805	0.00735	0.00729	0.00721	0.00708	0.00694	0.00590
0.00549	0.00466	0.00426	0.00416	0.00390	0.00375	0.00366	0.00341	0.00205	0.00139

14.72055	12.49399	8.11673	4.04033	3.03070	2.96712	2.12019	2.09369	1.81731	1.41433
1.38886	1.07321	0.93952	0.89284	0.75756	0.74207	0.68906	0.67339	0.65655	0.61552
0.54713	0.54450	0.51238	0.42430	0.42404	0.40747	0.39754	0.37103	0.33843	0.33791

0.33674	0.28623	0.26519	0.23235	0.22490	0.21720	0.19952	0.17679	0.17427	0.16572
0.11926	0.11264	0.09938	0.08945	0.07733	0.05683	0.05411	0.04924	0.04735	0.04357
0.04357	0.03975	0.03788	0.03379	0.02031	0.03031	0.02982	0.02499	0.02385	0.02357
0.02273	0.01749	0.01705	0.01429	0.01212	0.01169	0.00631	0.00292	0.00126	

63.42088	50.89406	49.87672	47.36977	38.91898	38.14102	29.77527	28.04044	25.16792	23.09212
21.44269	18.47051	16.02310	13.26353	10.51517	9.19297	7.98338	7.86338	7.82380	7.69997
5.97122	5.13437	5.05277	4.73942	4.39850	4.32888	4.10749	4.00081	3.66741	3.32512
2.99377	2.93392	2.48691	2.34714	2.11139	2.08635	2.06919	2.03419	1.76035	1.69516
1.68701	1.67616	1.64944	1.64847	1.64215	1.53948	1.37372	1.31955	1.29190	1.22109
1.17377	1.16329	1.11458	1.01877	1.01055	0.94843	0.94739	0.88424	0.80529	0.80529
0.66681	0.67008	0.65978	0.64719	0.60879	0.58679	0.58679	0.51344	0.50528	0.46184
0.44212	0.40264	0.39119	0.39119	0.38654	0.35526	0.32989	0.31156	0.29039	0.27790
0.26843	0.25291	0.23685	0.23642	0.23369	0.22492	0.21316	0.19243	0.18969	0.18548
0.17594	0.16765	0.15648	0.15463	0.15256	0.14670	0.14670	0.14670	0.12646	0.12316
0.11736	0.10996	0.09897	0.09474	0.08150	0.07895	0.06601	0.06316	0.05955	0.05773
0.05684	0.05672	0.05369	0.05113	0.04742	0.04742	0.03912	0.03790	0.03519	0.03299
0.03158	0.02738	0.02632	0.02428	0.01956	0.01555	0.01272	0.01237	0.01210	0.00695
0.00458	0.00137								

90.58205	69.26862	59.62102	58.34615	55.49240	45.59254	34.63432	25.79674	21.24437	19.72691
15.53767	14.21895	13.98406	9.67378	9.35232	9.32462	9.21174	8.60734	7.45970	7.26594
6.93655	6.66045	5.32836	4.04655	3.98250	3.75789	3.50712	3.19701	2.91335	2.47344
2.13124	1.96358	1.93114	1.60928	1.51746	1.51343	1.30570	1.21396	1.17537	1.10563
1.07020	1.06567	1.06567	0.94337	0.93725	0.87254	0.71045	0.71045	0.61647	0.60698
0.59192	0.53284	0.51793	0.47169	0.32684	0.32556	0.30349	0.28418	0.27376	0.26642
0.26642	0.22197	0.20693	0.16186	0.14801	0.14428	0.14226	0.11989	0.11634	0.10301
0.10116	0.09249	0.09105	0.07399	0.07104	0.06289	0.05311	0.04973	0.04704	0.04439
0.03699	0.03237	0.03083	0.02234	0.01138	0.01113	0.00422			

24.16864	18.99904	9.17362	3.35347	3.22408	2.32209	1.31296	1.04783	0.85620	0.77915
0.76107	0.74204	0.69663	0.64482	0.61837	0.61540	0.60451	0.56421	0.55288	0.51384
0.46995	0.38149	0.35661	0.29028	0.28611	0.25419	0.18729	0.17128	0.15113	0.13602
0.07153	0.07153	0.06116	0.06045	0.05565	0.05351	0.04976	0.04281	0.03800	0.03627
0.02346	0.01919	0.00714	0.00443	0.00207					

26.67943	11.83666	10.94316	9.71422	4.42344	4.23573	3.86229	3.06408	1.36789	1.18830
1.14039	0.91231	0.90737	0.90441	0.85216	0.81456	0.69387	0.69161	0.65165	0.57452
0.55510	0.39099	0.38082	0.31735	0.28189	0.27755	0.27755	0.26833	0.26066	0.18822
0.15265	0.14162	0.13570	0.13033	0.13033	0.12772	0.11730	0.10943	0.09888	0.09302
0.06939	0.06515	0.05254	0.04163	0.04040	0.03620	0.03331	0.03277	0.03239	0.03128
0.03040	0.02962	0.02534	0.02172	0.02151	0.01990	0.01955	0.01927	0.01915	0.01860
0.01824	0.01751	0.01631	0.01460	0.01477	0.01459	0.01401	0.01363	0.01313	0.01277
0.01260	0.01240	0.01203	0.01156	0.01155	0.01135	0.01130	0.01109	0.01094	0.01002

APPENDIX A

0.00875	0.00869	0.00820	0.00778	0.00763	0.00733	0.00671	0.00652	0.00648	0.00608
0.00608	0.00591	0.00578	0.00543	0.00541	0.00509	0.00285	0.00284	0.00274	
93.53462	47.19267	19.25713	19.25011	9.58228	8.98666	8.00845	7.90835	7.03699	6.86439
5.96971	3.29391	2.80296	2.69600	2.60275	2.54529	2.15038	2.11751	1.68500	1.53912
1.45980	[illegible]	1.29136	1.27635	1.26776	1.10728	0.45048	0.42545	0.39302	0.36107
0.33786	0.27682	0.19257	0.19257	0.18341	0.15016	0.12763	0.11678	0.11262	0.11229
0.07703	[illegible]	0.05615	0.05390	0.04043	0.01497	0.01101	0.00802		
31.69415	24.23669	16.83386	12.87296	6.90781	5.28245	4.97163	4.89295	3.01166	2.64061
2.60091	2.54231	1.31487	1.08358	1.06643	0.87004	0.69837	0.55441	0.42731	0.41126
0.41016	0.38686	0.37287	0.36866	0.28658	0.26636	0.25098	0.24858	0.24858	0.24703
0.23398	0.23365	0.21751	0.18644	0.16931	0.16713	0.16406	0.15982	0.14915	0.14624
0.11932	0.09943	0.09322	0.09322	0.09322	0.09192	0.08752	0.08461	0.08127	0.07768
0.07773	0.06267	0.06111	0.05541	0.05327	0.05179	0.04795	0.04512	0.04334	0.04195
0.04178	0.04152	0.04074	0.04004	0.03251	0.03115	0.02709	0.02611	0.02438	0.01806
0.01788	0.01422	0.01371	0.01253	0.01117	0.00935	0.00870	0.00598	0.00564	0.00305
0.00113									
0.60458	0.53741	0.52397	0.43664	0.38767	0.32083	0.30078	0.28073	0.24604	0.20914
0.17949	0.16977	0.12917	0.07520	0.04318	0.03183	0.03023	0.01891	0.01805	0.01044
0.00854									
18.33365	14.70956	14.49531	10.08529	6.97798	3.61499	3.57206	3.36278	3.27550	2.35117
1.96828	1.63581	1.52161	1.27609	1.21057	0.98166	0.69971	0.57017	0.36441	0.34341
0.31113	0.26234	0.20738	0.21360	0.15579	0.14596	0.10771	0.07786	0.04927	0.01958
0.01610	0.01558	0.01371							
14.14206	6.73626	5.92027	5.81498	5.55653	4.98601	4.91271	4.68527	3.30155	2.42220
2.39030	2.36528	2.30324	2.29408	1.87199	1.78011	1.77979	1.77867	1.39921	1.39806
1.39781	1.39693	1.35731	1.13986	1.12968	1.12948	1.12877	1.04891	1.03539	1.00018
1.00018	1.00000	0.90375	0.90359	0.90302	0.75088	0.71207	0.63444	0.59671	0.59192
0.51761	0.48972	0.45908	0.45396	0.43924	0.39298	0.35413	0.31407	0.27242	0.24198
0.22793	0.21587	0.18916	0.18871	0.18267	0.16114	0.15020	0.14278	0.13612	0.13520
0.11973	0.11971	0.11964	0.11215	0.10796	0.09749	0.08625	0.07557	0.06214	0.05968
0.05291	0.05241	0.05129	0.04849	0.04682	0.04325	0.03419	0.02876	0.00773	0.00245
0.00077									

18.33365	14.49531	14.14206	10.08529	6.73626	5.92027	5.81498	5.55653	4.98601	4.91271
4.68527	3.61499	3.57206	3.30155	3.27550	2.42220	2.39030	2.36528	2.35117	2.30324
2.29408	1.96828	1.67199	1.78011	1.77979	1.77867	1.52161	1.39921	1.39806	1.39781
1.39693	1.35731	1.21057	1.13986	1.12968	1.12948	1.12877	1.04891	1.03539	1.00018
1.00018	1.00000	0.90375	0.90359	0.90302	0.75088	0.71207	0.69971	0.63444	0.59671
0.59192	0.5176	0.48972	0.45908	0.45396	0.43924	0.39298	0.36441	0.35413	0.31407
0.27242	0.24198	0.22793	0.21587	0.18916	0.18871	0.18267	0.16114	0.15020	0.14596
0.14278	0.13612	0.13520	0.11973	0.11971	0.11964	0.11215	0.10796	0.10771	0.09749
0.08625	0.07786	0.07557	0.06214	0.05968	0.05291	0.05241	0.05129	0.04849	0.04682
0.04325	0.03419	0.02876	0.00773	0.00245	0.00077				

152.59288	49.84566	25.29985	16.27759	13.91037	8.76486	8.15436	8.15436	6.71535	6.64741
6.47286	6.47286	6.23568	6.23071	5.27666	5.23379	5.14551	5.14551	4.96983	4.79668
4.19461	4.00679	3.93480	3.83734	3.80756	3.61478	3.37331	3.17488	3.13031	3.04605
3.02677	2.94249	2.74151	2.42142	2.28195	1.99383	1.98430	1.96890	1.87818	1.68690
1.61225	1.50255	1.44552	1.38901	1.37733	1.08414	1.06430	1.00170	1.00170	0.93830
0.92270	0.90803	0.84738	0.84738	0.81388	0.81388	0.75127	0.74411	0.72276	0.71997
0.69764	0.69451	0.68867	0.65110	0.64799	0.63562	0.63553	0.62606	0.62357	0.62009
0.60535	0.58537	0.56076	0.51963	0.51092	0.49608	0.47967	0.45787	0.43824	0.43170
0.42375	0.42375	0.42375	0.42369	0.42166	0.41670	0.41670	0.39877	0.39877	0.39686
0.39348	0.36148	0.35975	0.34892	0.34725	0.33646	0.33577	0.33237	0.33161	0.32533
0.30699	0.29765	0.27914	0.27713	0.27713	0.27547	0.27341	0.26508	0.26295	0.25906
0.25303	0.25042	0.24214	0.24095	0.22819	0.22819	0.22819	0.21827	0.21187	0.21187
0.21184	0.20661	0.20484	0.20034	0.19938	0.19938	0.19440	0.19187	0.18782	0.18782
0.18443	0.18074	0.17944	0.17859	0.17446	0.17363	0.16867	0.16266	0.15874	0.15874
0.15829	0.15829	0.15437	0.15134	0.15134	0.14954	0.14831	0.14390	0.13890	0.13431
0.13394	0.13254	0.13209	0.12960	0.12951	0.12521	0.12521	0.12521	0.12521	0.12521
0.12461	0.12049	0.12049	0.11963	0.11908	0.11895	0.11465	0.11410	0.11269	0.10966
0.10914	0.10896	0.10553	0.10017	0.09922	0.09922	0.09391	0.09391	0.09227	0.08765
0.08765	0.08634	0.08533	0.08154	0.07851	0.07838	0.07763	0.07513	0.07477	0.07471
0.08962	0.06350	0.06261	0.06238	0.05756	0.05635	0.05448	0.05302	0.05258	0.05234
0.05159	0.04985	0.04985	0.04961	0.04961	0.04883	0.04735	0.04663	0.04486	0.04486
0.04486	0.04458	0.04257	0.04237	0.04237	0.04237	0.03988	0.03988	0.03756	0.03738
0.03632	0.03631	0.03068	0.03027	0.02976	0.02976	0.02976	0.02692	0.02692	0.02504
0.02492	0.02492	0.02492	0.02282	0.02282	0.02254	0.02183	0.02183	0.01878	0.01753
0.01645	0.01191	0.00992	0.00814	0.00648	0.00526	0.00374	0.00325	0.00303	

96.31378	39.60262	16.27904	15.96880	8.77997	8.76564	5.14688	5.14688	5.14597	5.14597
5.14272	5.14272	4.95033	4.23861	4.19572	4.19498	4.19233	4.15827	4.00715	3.93585
3.93515	3.93267	3.13056	3.02757	3.02704	3.02513	2.94275	2.87196	2.42206	2.42163
2.42010	2.17814	2.12917	2.00393	1.87835	1.58410	1.56430	1.50268	1.44032	1.37746
1.34025	1.25245	1.14848	1.06440	1.01762	1.00179	1.00179	0.93838	0.90811	0.87672
0.86136	0.81395	0.81395	0.75134	0.72003	0.68873	0.67324	0.67324	0.65116	0.63568
0.62612	0.60541	0.58239	0.57424	0.55444	0.51968	0.51483	0.50493	0.46967	0.44553
0.43836	0.43828	0.42379	0.42379	0.42379	0.40593	0.39358	0.39352	0.39139	0.36947
0.36378	0.33662	0.33184	0.31682	0.31682	0.31311	0.30276	0.28720	0.27722	0.27549
0.27248	0.26732	0.26615	0.26302	0.26302	0.26297	0.25848	0.25049	0.25045	0.24216
0.22707	0.22177	0.22018	0.22018	0.21918	0.21193	0.21189	0.21189	0.21061	0.20979
0.20662	0.20582	0.20104	0.20036	0.19376	0.19146	0.18787	0.18784	0.18784	0.17257
0.16831	0.16214	0.15841	0.15841	0.15445	0.15438	0.15135	0.15135	0.14833	0.14653

0.14403	0.14403	0.14403	0.14360	0.14257	0.13861	0.13777	0.12924	0.12522	0.12522
0.12522	0.12522	0.12522	0.12110	0.11896	0.11881	0.11272	0.11270	0.10959	0.10897
0.10646	0.10531	0.10495	0.10297	0.10020	0.10020	0.10018	0.09991	0.09991	0.09901
0.09573	0.09573	0.09505	0.09392	0.09392	0.09109	0.09083	0.08767	0.08766	0.08766
0.08713	0.08477	0.08454	0.08174	0.07764	0.07515	0.07513	0.07202	0.06962	0.06888
0.06661	0.06262	0.06262	0.06261	0.06237	0.05940	0.05935	0.05824	0.05635	0.05450
0.05449	0.05386	0.05147	0.04947	0.04884	0.04258	0.04212	0.04158	0.04008	0.03960
0.03960	0.03936	0.03762	0.03757	0.03633	0.03632	0.03631	0.03564	0.03564	0.03564
0.03542	0.03366	0.03366	0.03366	0.03319	0.03256	0.03168	0.03168	0.03131	0.03131
0.03068	0.03027	0.02970	0.02943	0.02692	0.02692	0.02504	0.02254	0.01980	0.01980
0.01980	0.01879	0.01879	0.01879	0.01878	0.01753	0.01440	0.01440	0.01378	0.01378
0.01307	0.00751	0.00626	0.00526	0.00515	0.00514	0.00303	0.00258	0.00236	

147.14079	48.06470	24.39590	15.69601	12.38450	8.45170	7.25988	7.25988	6.40990	6.00809
5.97872	5.76283	5.76283	5.55167	5.08813	5.04679	4.58108	4.58108	4.40687	4.27052
4.04474	3.50318	3.41641	3.38990	3.21826	3.06145	3.01846	2.71192	2.69476	2.20041
2.15580	1.91340	1.55464	1.50185	1.44886	1.39388	1.04541	0.96591	0.83537	0.81710
0.81710	0.80843	0.71753	0.66406	0.61283	0.60369	0.59794	0.56590	0.56445	0.55517
0.50106	0.42705	0.42258	0.40765	0.40181	0.38435	0.38268	0.37727	0.37727	0.35032
0.32444	0.32183	0.31996	0.29894	0.28964	0.28701	0.27331	0.26916	0.26562	0.25355
0.24673	0.24673	0.24342	0.24148	0.23064	0.22004	0.21558	0.21455	0.21047	0.20428
0.19318	0.19226	0.19226	0.18863	0.18863	0.18745	0.18111	0.18111	0.17784	0.17303
0.17221	0.16823	0.16264	0.15307	0.15307	0.14482	0.14419	0.14093	0.13743	0.13474
0.13394	0.13204	0.12915	0.12812	0.12737	0.12497	0.12074	0.12074	0.12074	0.12074
0.12074	0.12016	0.11957	0.11800	0.11536	0.11480	0.11055	0.11002	0.10866	0.10728
0.10728	0.10574	0.10524	0.09659	0.09567	0.09567	0.09395	0.09055	0.09055	0.08897
0.08452	0.07687	0.07570	0.07486	0.07260	0.07244	0.07210	0.06651	0.06198	0.06123
0.06037	0.05552	0.05433	0.05125	0.05071	0.05047	0.04975	0.04851	0.04806	0.04784
0.04764	0.04720	0.04566	0.04497	0.04326	0.04105	0.04086	0.04086	0.03969	0.03845
0.03845	0.03622	0.03551	0.03234	0.02870	0.02870	0.02695	0.02596	0.02596	0.02415
0.02403	0.02403	0.02403	0.02105	0.02105	0.01690	0.00957	0.00784	0.00625	0.00567
0.00333	0.00290	0.00269							

92.87251	36.18762	15.69740	15.39824	6.45245	7.81686	4.77345	4.58230	4.58230	4.58149
4.58149	4.57863	4.57863	4.04581	4.04510	4.04254	4.00970	3.77366	3.50411	3.50249
3.50128	3.01873	2.69547	2.69499	2.69329	2.55692	2.15638	2.15600	2.15463	1.93233
1.44849	1.38886	1.20770	1.19323	1.10744	0.98126	0.96599	0.83545	0.83058	0.80850
0.66412	0.64919	0.64919	0.60375	0.56595	0.50111	0.48689	0.45289	0.42262	0.37741
0.37730	0.37737	0.35627	0.35041	0.35035	0.32388	0.31999	0.26955	0.26565	0.25777
0.25569	0.25362	0.25357	0.24259	0.24154	0.24150	0.23012	0.21560	0.21385	0.19603
0.19603	0.19327	0.18868	0.18865	0.18865	0.18325	0.18116	0.18112	0.18112	0.17251
0.17046	0.16230	0.15364	0.15275	0.15275	0.14893	0.14129	0.13889	0.13748	0.13744
0.13475	0.13366	0.13285	0.13205	0.12075	0.12075	0.12075	0.12075	0.12075	0.11506
0.11456	0.10869	0.10867	0.10265	0.10120	0.09929	0.09662	0.09662	0.09660	0.09547
0.09375	0.09165	0.09056	0.09056	0.08895	0.08783	0.08523	0.08523	0.08454	0.08452
0.08401	0.08152	0.08086	0.07547	0.07486	0.07246	0.07245	0.06944	0.06642	0.06198
0.06039	0.06039	0.06037	0.06015	0.05930	0.05728	0.05616	0.05434	0.05284	0.04852
0.04851	0.04582	0.04105	0.04010	0.03865	0.03819	0.03750	0.03628	0.03622	0.03504
0.03502	0.03437	0.03246	0.03246	0.03235	0.03234	0.03200	0.03154	0.03140	0.03055
0.03055	0.03019	0.03019	0.02838	0.02695	0.02596	0.02596	0.02415	0.01909	0.01909
0.01909	0.01812	0.01812	0.01690	0.01328	0.01328	0.00604	0.00507	0.00496	0.00495
0.00269	0.00230	0.00210							

4.35654	3.66776	3.19933	2.98081	2.16786	2.14077	2.04213	1.87793	1.51026	1.49756
1.31455	1.15721	1.11602	1.08913	1.00324	0.88492	0.88492	0.82234	0.81685	0.78585
0.78496	0.78282	0.75875	0.75513	0.70794	0.70456	0.63545	0.60971	0.59521	0.56069
0.55552	0.53938	0.49105	0.46948	0.46067	0.45847	0.45308	0.43357	0.43357	0.40177
0.37938	0.37756	0.36138	0.33803	0.24811	0.24811	0.22463	0.18878	0.12933	0.09530
0.09277	0.08522	0.05420	0.05310	0.04878	0.04878	0.04607	0.04065	0.03335	0.03236
0.02491	0.02481	0.02451	0.02042	0.01788	0.01295				
4.35693	3.19962	2.36827	2.31502	2.04231	1.87810	1.72238	1.70085	1.49769	1.31467
1.15731	1.08923	0.95325	0.88500	0.88500	0.81692	0.78289	0.70800	0.70441	0.65336
0.63223	0.62436	0.62366	0.60283	0.55977	0.50487	0.48442	0.47662	0.46952	0.44547
0.44136	0.37569	0.36691	0.34448	0.34448	0.34044	0.33806	0.30994	0.30142	0.28938
0.28597	0.25359	0.23831	0.22810	0.22465	0.15660	0.15660	0.12935	0.11916	0.09531
0.05856	0.05379	0.05310	0.04306	0.03875	0.03875	0.03660	0.03336	0.03229	0.02451
0.02043	0.02042	0.01566	0.01566	0.01421	0.00817				
380.30542	124.22978	63.05457	40.56848	21.84456	16.56728	15.52672	15.48913	13.15096	13.04413
12.75575	12.29514	11.84463	10.45419	9.77386	9.40216	9.11125	8.40728	7.91273	7.80163
7.47412	7.33353	7.28900	7.23243	6.83264	5.78595	5.74933	5.68727	4.96919	4.94546
4.68098	4.59946	4.01818	3.74478	3.60266	3.46182	3.20424	2.70200	2.65255	2.49652
2.49652	2.11191	2.11191	2.02842	1.87239	1.85455	1.80133	1.79437	1.72480	1.62274
1.61499	1.56033	1.39758	1.29507	1.23636	1.20736	1.14987	1.05595	1.05091	1.03855
1.03855	0.99384	0.86961	0.80491	0.80491	0.80491	0.74182	0.68662	0.61796	0.58312
0.56873	0.56873	0.56873	0.52641	0.50352	0.49692	0.49692	0.48064	0.46810	0.46810
0.45965	0.44509	0.43480	0.43273	0.39564	0.37269	0.34618	0.32300	0.31207	0.31207
0.31207	0.30898	0.30067	0.30067	0.29646	0.29322	0.28786	0.27334	0.27331	0.25511
0.24965	0.24721	0.24600	0.23405	0.22996	0.21845	0.21265	0.18634	0.15825	0.15603
0.14043	0.13105	0.12423	0.12423	0.12171	0.11181	0.10560	0.10560	0.09938	0.09317
0.09050	0.07418	0.07418	0.06241	0.06211	0.06211	0.05687	0.05687	0.05440	0.04681
0.04369	0.02473								
240.04181	96.70116	40.57208	39.79886	21.84651	12.33765	10.45696	10.45512	10.44850	10.36362
9.77644	9.77472	9.76854	8.05119	7.80233	7.47610	7.47474	7.47006	7.33419	5.75085
5.74984	5.74620	5.42856	5.30652	4.99437	4.68140	4.60068	4.59987	4.59696	3.94805
3.74512	3.58971	3.12148	2.86233	2.65279	2.54578	2.53620	2.49674	2.49674	2.18504
2.14675	2.02860	1.87256	1.79453	1.72495	1.67792	1.67792	1.62288	1.56046	1.43117
1.29519	1.28311	1.22747	1.17055	1.14997	1.11039	0.83896	0.80498	0.80498	0.80498
0.78961	0.78037	0.69091	0.66331	0.65551	0.65551	0.54553	0.49097	0.46822	0.46814
0.46814	0.41824	0.40005	0.39480	0.39480	0.38187	0.36805	0.36519	0.35897	0.35897
0.35897	0.34545	0.31209	0.31209	0.31209	0.29649	0.29610	0.29324	0.28093	0.28088
0.27313	0.25662	0.24972	0.24967	0.24549	0.23407	0.21850	0.21847	0.21714	0.18978
0.18978	0.17253	0.16102	0.15607	0.15605	0.15527	0.14805	0.14515	0.14044	0.13422
0.12172	0.09989	0.09870	0.09870	0.09051	0.08883	0.08390	0.08390	0.08272	0.07896

1.17413	0.06242	0.04935	0.04935	0.04682	0.04682	0.04681	0.04369	0.03590	0.03590
0.03434	0.01561								
865.94580	282.86792	143.57362	92.37343	49.73953	37.72325	35.35851	29.94441	29.70214	23.80391
18.01707	17.76411	13.88148	12.94978	11.43181	11.26068	11.01901	10.61525	9.14930	8.75941
8.52678	8.42630	8.20317	8.16558	6.69837	6.53246	6.48177	6.15238	5.68452	5.18542
4.15259	4.80876	4.80876	4.22275	4.12208	3.55282	2.94884	2.87167	2.36474	1.68910
[illegible]	1.29498	1.13147	1.13147	1.08204	1.06585	1.06585	1.04661	1.01346	0.99004
[illegible]	0.84860	0.78825	0.73546	0.72136	0.72136	0.71056	0.71056	0.71056	0.63951
[illegible]	0.61536	0.56845	0.56303	0.55382	0.53292	0.52362	0.52260	0.47177	0.42430
[illegible]	0.35528	0.31975	0.29841	0.28287	0.27691	0.26946	0.26278	0.24497	0.24044
[illegible]	0.22629	0.20606	0.16891	0.14211	0.14143	0.14143	0.12387	0.09948	0.05630
[illegible]	224.74005	92.38164	90.62103	49.74396	28.09250	23.81023	23.80803	23.79097	23.59770
[illegible]	11.33270	8.76173	8.76019	8.75465	8.52754	8.17366	7.21554	7.10753	6.70015
[illegible]	[illegible]	6.51746	5.77487	5.68502	5.15396	5.15305	5.14979	4.88810	4.12317
[illegible]	[illegible]	3.82058	3.82058	3.55314	2.94911	2.66532	2.28155	1.54591	1.49258
1.08215	[illegible]	[illegible]	1.06594	0.89896	0.89896	0.83154	0.81737	0.78659	0.72143
0.73343	[illegible]	0.71063	0.71063	0.67422	0.63968	0.63957	0.58432	0.56860	0.56850
0.53297	0.49702	[illegible]	0.48849	0.44001	0.37483	0.35538	0.35531	0.33711	0.33050
0.32985	0.31578	[illegible]	0.22744	0.22474	0.22001	0.20608	0.19103	0.18835	0.17979
0.17008	0.15462	[illegible]	0.14213	0.11237	0.11237	0.10661	0.09949	0.07818	0.03554
4.65116	3.25581	3.13416	2.73378	2.54715	[illegible]	[illegible]	1.85247	1.74503	1.29054
1.21620	0.99508	0.98885	0.93066	0.75618	[illegible]	0.47152	0.46893	0.60494	0.60205
0.52101	[illegible]	0.39365	0.39177	0.38716	0.378[illegible]	0.32418	0.21207	0.21202	0.16132
0.11052	0.08143	0.07928	0.04631	0.04537	0.04168	[illegible]	0.03473	0.02765	0.02120
0.02120	0.01745								
4.65158	3.25610	2.73412	2.02272	1.91822	1.74518	1.61820	1.54464	1.47180	0.98854
0.93077	0.81456	0.76765	0.75625	0.69801	0.66899	0.62807	0.60500	0.53353	0.47823
0.41394	0.31276	0.29436	0.29092	0.25756	0.24728	0.24437	0.13382	0.13382	0.11053
0.10182	0.08144	0.05004	0.04537	0.03679	0.03312	0.03128	0.02760	0.01745	0.01745
0.01338	0.01338								

QUANTITIES A THROUGH J AND L THROUGH Z ORDERED BY MAGNITUDE

SILICON DEVICES ONLY FOR L, M, AND N

FOR VALUES OF A THROUGH J AND L THROUGH Z LESS THAN 1, VALUE TABULATED IS INVERSE OF THE VALUE LESS THAN 1

1956.16553	586.84961	470.34878	397.59448	265.55054	239.30551	222.29169	217.35172	211.31424	208.99220
203.76726	195.61659	174.65759	172.89368	150.76247	148.19438	137.93478	127.85776	124.27774	120.60995
117.36996	112.85571	112.57042	110.72635	107.68741	107.68738	103.56477	100.50829	99.61955	97.80829
94.04640	86.30399	86.30399	84.14642	81.50691	81.50691	78.45815	76.41272	75.38116	70.87558
69.36758	69.04317	68.13472	65.40935	60.92046	59.27774	59.17987	58.68497	57.98553	57.53598
57.53598	56.70045	56.70045	55.83792	54.92072	52.58510	51.98700	51.76238	48.30037	48.06917
46.74003	46.57536	46.02878	44.67032	44.34186	43.47034	43.15198	41.87843	41.42590	41.42590
40.61363	40.61362	40.29329	39.45325	37.97374	37.04860	36.67810	36.18295	34.52158	34.52055
33.96121	33.50275	30.35247	27.16896	27.16896	27.01689	26.55507	26.05402	25.89119	25.84497
25.12706	24.85555	24.45206	24.12196	23.97333	23.58698	23.32539	22.11182	21.73517	21.26266
20.93922	20.37672	20.30681	20.10165	20.10164	20.10164	20.10164	19.32851	18.84529	18.09148
17.70337	17.58894	17.38814	17.26079	16.91402	16.30138	16.21100	15.70442	15.56127	15.34293
15.28255	14.48369	14.17512	13.99524	13.97262	13.81474	13.80863	12.93426	12.78578	12.56353
12.38080	12.30714	12.18409	11.95435	11.89980	11.76873	11.50720	11.43957	11.42139	11.37306
10.63134	10.46465	10.42856	10.05082	9.31508	9.10403	8.63015	8.61499	8.58823	8.52808
8.15069	8.12273	7.97478	7.58553	7.56850	7.53812	7.53812	7.40972	7.39748	7.33562
7.29913	6.94432	6.76894	6.47280	6.46713	5.95918	5.82192	5.74333	5.58379	5.56800
5.33515	5.12797	5.11189	5.02541	5.02541	5.02541	4.84377	4.62343	4.58856	4.55638
4.24509	4.23193	4.07535	4.07535	4.06136	4.06136	4.05543	4.01414	4.01265	3.91233
3.91071	3.69874	3.45216	3.36796	3.23640	3.11749	2.93434	2.83302	2.67840	2.65318
2.63927	2.62925	2.61119	2.53158	2.51271	2.44098	2.44091	2.40429	2.38080	2.31139
2.15375	2.03767	1.99163	1.98400	1.95122	1.84937	1.81431	1.81046	1.74797	1.74658
1.74115	1.73957	1.67514	1.63585	1.63014	1.60996	1.60721	1.54900	1.54628	1.54493
1.52561	1.45925	1.44964	1.42512	1.41340	1.39292	1.35674	1.32422	1.31511	1.30108
1.25635	1.24658	1.24368	1.22689	1.19702	1.12760	1.09245	1.06600	1.00508	

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

1956.17	99.6	586.85	99.2	470.75	98.8	397.59	98.4	265.55	98.0	239.31	97.6	222.29	97.2		
217.35	96.8	211.31	96.4	208.99	96.0	203.77	95.6	195.62	95.2	174.66	94.8	172.89	94.4		
150.76	94.0	148.19	93.6	137.93	93.2	127.86	92.8	124.28	92.4	120.61	92.0	117.37	91.6		
112.86	91.2	112.57	90.8	110.73	90.4	107.69	90.0	107.69	89.6	103.56	89.2	100.51	88.8		
99.62	88.4	97.81	88.0	94.05	87.6	86.30	87.1	86.30	86.7	84.15	86.3	81.51	85.9		
81.51	85.5	78.46	85.1	76.41	84.7	75.38	84.3	70.86	83.9	69.37	83.5	69.04	83.1		
68.13	82.7	65.41	82.3	60.92	81.9	59.28	81.5	59.18	81.1	58.68	80.7	57.99	80.3		
57.54	79.9	57.54	79.5	56.70	79.1	56.70	78.7	55.84	78.3	54.92	77.9	52.59	77.5		
51.99	77.1	51.78	76.7	48.30	76.3	48.07	75.9	46.75	75.5	46.58	75.1	46.03	74.7		
44.67	74.3	44.34	73.9	43.47	73.5	43.15	73.1	41.88	72.7	41.43	72.3	41.43	71.9		
40.61	71.5	40.61	71.1	40.29	70.7	39.45	70.3	37.97	69.9	37.05	69.5	36.68	69.1		
36.18	68.7	34.52	68.3	34.52	67.9	33.96	67.5	33.50	67.1	30.15	66.7	27.17	66.3		
27.17	65.9	27.02	65.5	26.56	65.1	26.05	64.7	25.89	64.3	25.84	63.9	25.13	63.5		
24.86	63.1	24.45	62.7	24.12	62.2	23.97	61.8	23.59	61.4	23.33	61.0	22.11	60.6		
21.74	60.2	21.26	59.8	20.94	59.4	20.38	59.0	20.31	58.6	20.10	58.2	20.10	57.8		
20.10	57.4	20.10	57.0	19.33	56.6	18.85	56.2	18.09	55.8	17.70	55.4	17.59	55.0		
17.39	54.6	17.26	54.2	16.91	53.8	16.30	53.4	16.21	53.0	15.70	52.6	15.56	52.2		
15.34	51.8	15.28	51.4	14.48	51.0	14.18	50.6	14.00	50.2	13.97	49.8	13.81	49.4		
13.81	49.0	12.93	48.6	12.79	48.2	12.56	47.8	12.38	47.4	12.31	47.0	12.18	46.6		
11.95	46.2	11.90	45.8	11.77	45.4	11.51	45.0	11.44	44.6	11.42	44.2	11.37	43.8		
10.63	43.4	10.46	43.0	10.43	42.6	10.05	42.2	9.32	41.8	9.10	41.4	8.63	41.0		

8.61 40.6	8.59 40.2	8.53 39.8	8.15 39.4	8.12 39.0	7.97 38.6	7.59 38.2
7.57 37.8	7.54 37.3	7.54 36.9	7.41 36.5	7.40 36.1	7.34 35.7	7.30 35.3
6.90 34.9	6.77 34.5	6.47 34.1	6.47 33.7	5.96 33.3	5.82 32.9	5.74 32.5
5.58 32.1	5.57 31.7	5.34 31.3	5.13 30.9	5.11 30.5	5.03 30.1	5.03 29.7
5.03 29.3	4.84 28.9	4.62 28.5	4.57 28.1	4.56 27.7	4.25 27.3	4.23 26.9
4.08 26.5	4.08 26.1	4.06 25.7	4.06 25.3	4.06 24.9	4.01 24.5	4.01 24.1
3.91 23.7	3.91 23.3	3.70 22.9	3.45 22.5	3.37 22.1	3.24 21.7	3.12 21.3
2.93 20.9	2.84 20.5	2.68 20.1	2.65 19.7	2.64 19.3	2.63 18.9	2.61 18.5
2.53 18.1	2.51 17.7	2.44 17.3	2.44 16.9	2.40 16.5	2.38 16.1	2.31 15.7
2.15 15.3	2.04 14.9	1.99 14.5	1.98 14.1	1.95 13.7	1.85 13.3	1.81 12.9
1.81 12.4	1.75 12.0	1.75 11.6	1.74 11.2	1.74 10.8	1.68 10.4	1.64 10.0
1.63 9.6	1.61 9.2	1.61 8.8	1.55 8.4	1.55 8.0	1.54 7.6	1.53 7.2
1.46 6.8	1.45 6.4	1.43 6.0	1.41 5.6	1.39 5.2	1.36 4.8	1.32 4.4
1.32 4.0	1.30 3.6	1.26 3.2	1.25 2.8	1.24 2.4	1.23 2.0	1.20 1.6
1.13 1.2	1.09 0.8	1.07 0.4	1.01 0.0			

720.74487	485.30957	293.17065	273.00928	266.94238	256.67554	240.24832	234.65744	214.50742	182.00642
169.40596	144.14902	141.15633	138.60484	137.20396	135.98967	124.27895	122.34872	120.12416	118.26730
115.50400	114.33664	105.59581	105.59581	98.55612	95.28052	95.28052	93.84700	87.04651	85.19447
82.51204	76.22440	75.22145	73.91707	72.80252	72.21259	72.07451	67.25684	65.33521	64.58287
63.52034	59.32057	57.20198	57.16832	56.85927	56.97728	47.64024	47.13551	45.84004	45.73465
45.73465	45.50157	45.04655	44.83788	43.80270	43.55679	43.48062	42.39676	41.92342	41.70978
35.48016	33.36783	33.36781	32.85202	30.03104	29.82693	29.56680	29.31708	28.76392	28.58415
27.44078	26.69426	26.46680	26.11394	25.75148	25.34297	25.02586	23.65344	22.41895	21.68233
21.35541	20.53252	20.02069	19.71121	19.71121	19.71120	19.54471	19.20512	19.05609	18.76939
18.47926	17.74008	17.24905	16.96669	15.89816	15.45090	15.39940	14.68185	14.11564	14.09522
14.04961	13.19046	13.11916	12.99279	12.31952	11.19956	10.77870	10.01035	9.85561	9.29532
9.10032	8.96758	8.52059	8.49121	8.44766	8.16690	7.62244	7.47298	7.43820	7.39171
7.39171	7.14604	6.99276	6.59523	6.49328	6.14713	5.89307	5.47534	5.10431	5.02837
5.10517	5.00517	4.92817	4.92780	4.92780	4.92780	4.80497	4.74969	4.63029	4.48379
4.47982	4.46788	4.43165	3.67336	3.48186	3.24145	3.23954	3.18421	2.83876	2.79489
2.70573	2.66291	2.62843	2.50259	2.46390	2.39350	2.21101	2.19036	2.17778	2.15417
2.11192	2.00207	1.85024	1.77564	1.71012	1.64260	1.63989	1.63905	1.53099	1.45189
1.42151	1.39744	1.36361	1.33195	1.32685	1.31087	1.26831	1.20608	1.08425	1.01465

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

720.74 99.4	488.31 98.9	293.17 98.4	273.01 97.8	266.94 97.2	256.66 96.7	240.25 96.1
234.66 95.6	214.51 95.0	182.01 94.4	169.41 93.9	144.15 93.3	141.16 92.8	138.60 92.2
137.20 91.7	135.99 91.1	124.28 90.6	122.35 90.0	120.12 89.4	118.27 88.9	115.50 88.3
114.34 87.8	105.60 87.2	105.60 86.7	98.56 86.1	95.28 85.6	95.28 85.0	93.85 84.4
87.05 83.9	85.19 83.3	82.51 82.8	76.22 82.2	75.22 81.7	73.92 81.1	72.80 80.6
72.21 80.0	72.07 79.4	67.26 78.9	65.34 78.3	64.58 77.8	63.52 77.2	59.32 76.7
57.20 76.1	57.17 75.6	56.86 75.0	50.98 74.4	47.64 73.9	47.14 73.3	45.84 72.8
45.73 72.2	45.73 71.7	45.50 71.1	45.05 70.6	44.84 70.0	43.80 69.4	43.56 68.9
43.48 68.3	42.40 67.8	41.92 67.2	41.71 66.7	35.48 66.1	33.37 65.6	33.37 65.0
32.85 64.4	30.03 63.9	29.83 63.3	29.57 62.8	29.32 62.2	28.76 61.7	28.58 61.1
27.44 63.6	26.69 60.0	26.47 59.4	26.11 58.9	25.75 58.3	25.34 57.8	25.03 57.2
23.65 56.7	22.42 56.1	21.68 55.6	21.36 55.	20.53 54.4	20.02 53.9	19.71 53.3
19.71 52.8	19.71 52.2	19.54 51.7	19.21 51.1	19.06 50.6	18.77 50.0	18.48 49.4
17.74 48.9	17.25 48.3	16.97 47.8	15.90 47.2	15.45 46.7	15.40 46.1	14.68 45.6
14.12 45.	14.10 44.4	14.05 43.9	13.19 43.3	13.12 42.8	12.99 42.2	12.32 41.7
11.20 41.1	10.76 40.6	10.01 40.0	9.86 39.4	9.3 38.9	9.10 38.3	8.97 37.8
8.52 37.2	8.49 36.7	8.45 36.1	8.17 35.6	7.62 35.0	7.47 34.4	7.44 33.9
7.39 33.3	7.39 32.8	7.15 32.2	6.99 31.7	6.6 31.1	6.49 30.6	6.15 30.0
5.89 29.4	5.48 28.9	5.10 28.3	5.03 27.8	5.01 27.2	5.01 26.7	4.93 26.1
4.93 25.6	4.93 25.0	4.93 24.4	4.80 23.9	4.75 23.3	4.63 22.8	4.48 22.2
4.48 21.7	4.47 21.1	4.43 20.6	3.67 20.0	3.48 19.4	3.24 18.9	3.24 18.3

3.18 17.8	2.84 17.2	2.79 16.7	2.71 16.1	2.66 15.6	2.63 15.0	2.50 14.4
2.46 13.9	2.39 13.3	2.21 12.8	2.19 12.2	2.18 11.7	2.15 11.1	2.11 10.6
2.00 10.0	1.85 9.4	1.78 8.9	1.71 8.3	1.64 7.8	1.64 7.2	1.64 6.7
1.53 6.1	1.45 5.6	1.42 5.0	1.40 4.4	1.38 3.9	1.33 3.3	1.33 2.8
1.31 2.2	1.27 1.7	1.21 1.1	1.08 0.6	1.01 0.0		

791.89551	343.02197	158.40302	85.54433	82.48915	69.99080	58.66777	57.17033	44.00081	42.24078
41.92491	40.01923	33.53993	32.99565	32.99565	29.59406	26.40050	25.15494	22.95349	22.95349
21.12039	20.30806	18.48035	17.59767	14.72055	12.93087	12.49399	11.17998	10.06198	8.87822
8.38498	8.11673	6.03440	5.73838	5.65640	5.01200	4.60414	4.44640	4.30378	4.04033
3.77093	3.49366	3.03070	2.96961	2.96712	2.95940	2.95483	2.69517	2.51549	2.45414
2.35828	2.35683	2.12019	2.09369	1.95168	1.83656	1.82773	1.81731	1.62465	1.52310
1.48503	1.45125	1.41433	1.38886	1.34759	1.32002	1.12002	1.07321	1.06438	

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

791.90 98.6	343.02 97.1	158.40 95.7	85.54 94.2	82.49 92.8	69.99 91.3	58.67 89.9			
57.17 88.4	44.00 87.0	42.24 85.5	41.92 84.1	40.02 82.6	33.54 81.2	33.00 79.7			
33.00 78.3	29.59 76.8	26.40 75.4	25.15 73.9	22.95 72.5	22.95 71.0	21.12 69.6			
20.31 68.1	18.48 66.7	17.60 65.2	14.72 63.8	12.93 62.3	12.49 60.9	11.18 59.4			
10.06 58.0	8.88 56.5	8.38 55.1	8.12 53.6	6.03 52.2	5.74 50.7	5.66 49.3			
5.01 47.8	4.60 46.4	4.45 44.9	4.30 43.5	4.04 42.0	3.77 40.6	3.49 39.1			
3.03 37.7	2.97 36.2	2.97 34.8	2.96 33.3	2.95 31.9	2.70 30.4	2.52 29.0			
2.45 27.5	2.36 26.1	2.36 24.6	2.12 23.2	2.09 21.7	1.95 20.3	1.84 18.8			
1.83 17.4	1.82 15.9	1.62 14.5	1.52 13.0	1.49 11.6	1.45 10.1	1.41 8.7			
1.39 7.2	1.35 5.8	1.32 4.3	1.12 2.9	1.07 1.4	1.06 0.0				

727.52051	216.25616	143.93538	82.67279	80.83562	78.59019	64.30106	63.42088	51.12602	50.89406
49.87672	47.36977	41.18043	38.91898	38.14102	37.99892	36.51860	31.66577	30.31335	29.77527
28.41876	28.04044	26.38814	25.56302	25.14792	23.09212	21.44269	21.08754	21.08754	19.55699
19.07051	18.62692	17.62967	17.59209	17.32191	16.79245	16.02310	15.83289	15.14847	13.26353
12.66691	12.27025	10.55526	10.51517	10.10445	9.19297	9.09401	8.52101	8.11943	7.98338
7.90764	7.86338	7.82380	7.69997	6.81681	6.81681	6.81680	6.55462	6.46685	6.39076
5.96471	5.92122	5.68375	5.27763	5.27189	5.19658	5.13437	5.05277	4.73942	4.69123
4.44596	4.39855	4.32888	4.27916	4.22977	4.22210	4.10749	4.00081	3.95392	3.72538
3.66741	3.59838	3.40840	3.32512	3.20965	3.03133	2.99377	2.93392	2.81481	2.72820
2.55631	2.55630	2.48691	2.48359	2.34714	2.26184	2.16524	2.11139	2.08635	2.06919
2.03419	1.97911	1.94766	1.76035	1.70420	1.70420	1.69516	1.68701	1.67616	1.64944
1.64847	1.64261	1.64215	1.54514	1.53948	1.51567	1.49235	1.43512	1.37372	1.31955
1.29190	1.24179	1.24179	1.22109	1.17357	1.16329	1.13092	1.11458	1.05553	1.05438
1.01877	1.01055								

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

727.52 99.2	218.26 98.5	143.94 97.7	82.67 97.0	80.84 96.2	78.59 95.5	64.30 94.7			
63.42 93.9	51.13 93.2	50.89 92.4	49.88 91.7	47.37 90.9	41.18 90.2	38.92 89.4			
38.14 88.6	38.00 87.9	36.52 87.1	31.67 86.4	30.31 85.6	29.78 84.8	28.42 84.1			
28.04 83.3	26.39 82.6	25.56 81.8	25.15 81.1	23.09 80.3	21.44 79.5	21.09 78.8			
21.09 78.0	19.56 77.3	19.07 76.5	18.63 75.8	17.63 75.0	17.59 74.2	17.32 73.5			
16.79 72.7	16.02 72.0	15.83 71.2	15.15 70.5	13.26 69.7	12.67 68.9	12.27 68.2			
13.56 67.4	13.52 66.7	10.11 65.9	9.19 65.2	9.09 64.4	8.52 63.6	8.12 62.9			
7.98 62.1	7.91 61.4	7.86 60.6	7.82 59.8	7.70 59.1	6.82 58.3	6.82 57.6			
6.82 56.8	6.55 56.1	6.47 55.3	6.39 54.5	5.96 53.8	5.92 53.0	5.68 52.3			
5.28 51.5	5.27 50.8	5.20 50.0	5.13 49.2	5.05 48.5	4.74 47.7	4.69 47.0			
4.65 46.2	4.47 45.5	4.33 44.7	4.28 43.9	4.23 43.2	4.22 42.4	4.11 41.7			
4.00 40.9	3.95 40.2	3.73 39.4	3.67 38.6	3.60 37.9	3.41 37.1	3.33 36.4			

3.21	35.6	3.03	34.8	2.99	34.1	2.93	33.3	2.81	32.6	2.73	31.8	2.56	31.1
2.56	30.3	2.49	29.5	2.48	28.8	2.35	28.0	2.26	27.3	2.17	26.5	2.11	25.8
2.09	25.0	2.07	24.2	2.03	23.5	1.98	22.7	1.95	22.0	1.76	21.2	1.70	20.5
1.73	19.7	1.71	18.9	1.69	18.2	1.68	17.4	1.65	16.7	1.65	15.9	1.64	15.2
1.64	14.4	1.55	13.6	1.54	12.9	1.52	12.1	1.49	11.4	1.44	10.6	1.37	9.8
1.32	9.1	1.29	8.3	1.24	7.6	1.24	6.8	1.22	6.1	1.17	5.3	1.16	4.5
1.13	3.8	1.11	3.0	1.06	2.3	1.05	1.5	1.02	0.8	1.01	0.0		

237.23941	90.58205	89.86336	87.86639	69.26862	59.62102	58.34615	55.49240	45.59254	44.76213
36.63432	32.43688	30.89053	27.03070	25.79674	22.52560	21.25800	21.24437	20.10803	19.72691
18.82851	15.90043	15.53787	14.20895	14.07564	13.98406	13.51536	10.98330	10.81229	9.88497
9.70733	9.67378	9.35232	9.32462	9.21174	8.60734	8.59563	8.34112	7.45970	7.26594
7.02931	6.93655	6.93095	6.75630	6.66045	6.17811	5.32836	4.83265	4.50512	4.04655
3.98250	3.75789	3.75350	3.75350	3.65280	3.51891	3.50712	3.29499	3.19701	3.07167
3.05963	2.91335	2.47344	2.13134	2.12006	1.96358	1.93114	1.93077	1.87675	1.68942
1.64749	1.62215	1.60928	1.51746	1.51343	1.40756	1.40756	1.30570	1.21396	1.17537
1.14608	1.10563	1.07020	1.06695	1.06567	1.06567	1.06003			

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

237.24	98.9	90.58	97.7	89.86	96.6	87.87	95.4	69.27	94.3	59.62	93.1	58.35	92.0
55.49	90.8	45.59	89.7	44.76	88.5	34.63	87.4	32.44	86.2	30.89	85.1	27.03	83.9
25.80	82.8	22.53	81.6	21.26	80.5	21.24	79.3	20.11	78.2	19.73	77.0	18.83	75.9
15.90	74.7	15.54	73.6	14.21	72.4	14.08	71.3	13.98	70.1	13.52	69.0	10.98	67.8
10.81	66.7	9.88	65.5	9.71	64.4	9.67	63.2	9.35	62.1	9.32	60.9	9.21	59.8
8.61	58.6	8.61	57.5	8.34	56.3	7.46	55.2	7.27	54.0	7.03	52.9	6.94	51.7
6.93	50.6	6.76	49.4	6.66	48.3	6.18	47.1	5.33	46.0	4.93	44.8	4.51	43.7
4.05	42.5	3.98	41.4	3.76	40.2	3.75	39.1	3.75	37.9	3.65	36.8	3.52	35.6
3.51	34.5	3.29	33.3	3.20	32.2	3.07	31.0	3.06	29.9	2.91	28.7	2.47	27.6
2.13	26.4	2.12	25.3	1.96	24.1	1.93	23.	1.93	21.8	1.88	20.7	1.69	19.5
1.65	18.4	1.62	17.2	1.61	16.1	1.52	14.9	1.51	13.8	1.41	12.6	1.41	11.5
1.31	10.3	1.21	9.2	1.18	8.0	1.15	6.9	1.11	5.7	1.07	4.6	1.07	3.4
1.07	2.3	1.07	1.1	1.06	0.0								

482.32471	225.57544	140.15343	52.10298	42.62971	27.57031	26.31712	24.16864	23.35890	20.09686
18.99904	18.68712	17.96838	16.54218	16.35123	13.98043	13.98043	9.17362	7.35209	6.61688
5.83842	5.33918	3.93413	3.49511	3.44518	3.35347	3.22408	2.80421	2.62133	2.32209
2.12790	1.94614	1.80872	1.77238	1.65422	1.62497	1.61716	1.55083	1.43549	1.34763
1.31394	1.28345	1.21296	1.16794	1.04783					

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

482.32	97.8	225.58	95.6	140.15	93.3	52.10	91.1	42.63	88.9	27.57	86.7	26.32	84.4
24.17	82.2	23.36	80.0	20.10	77.8	19.00	75.6	18.69	73.3	17.97	71.1	16.54	68.9
16.35	66.7	13.98	64.4	13.98	62.2	9.17	60.0	7.35	57.8	6.62	55.6	5.84	53.3
5.34	51.1	3.93	48.9	3.50	46.7	3.45	44.4	3.35	42.2	3.22	40.0	2.80	37.8
2.62	35.6	2.32	33.3	2.13	31.1	1.95	28.9	1.81	26.7	1.77	24.4	1.65	22.2
1.62	20.0	1.62	17.8	1.55	15.6	1.44	13.3	1.35	11.1	1.31	8.9	1.28	6.7
1.21	4.4	1.17	2.2	1.05	0.0								

365.37231	351.50854	351.46631	196.52527	184.76741	184.14784	172.94226	169.22473	164.41772	164.41762
154.41275	153.45657	148.99133	137.07204	131.01691	128.47520	121.94649	115.09236	114.22668	99.77437

91.38132	90.17892	88.53259	88.07243	86.57178	86.47110	83.14532	80.63058	79.37402	78.32684
76.15112	73.39224	71.37598	68.53690	67.70139	67.55556	61.32764	57.11331	54.82880	53.75371
52.21790	51.38266	51.15213	50.25974	46.48984	46.03694	39.46024	33.76042	32.89726	31.97011
30.87206	30.51921	30.02469	27.62216	26.67943	24.75104	24.01974	19.21581	15.37265	14.41186
11.83666	11.94316	10.75074	10.11359	9.71422	9.13814	8.52536	7.82942	7.67283	7.67282
7.36946	7.06128	6.55084	5.31287	4.42344	4.22573	3.86229	3.83641	3.72680	3.60296
3.60296	3.54753	3.15168	3.06408	2.62590	2.55761	1.88148	1.74060	1.52456	1.44591
1.44118	1.36789	1.22765	1.18830	1.17349	1.14039	1.10569	1.10208	1.09612	

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

365.37	99.0	351.51	98.0	351.47	97.0	196.53	96.0	184.77	94.9
169.22	91.9	164.42	90.9	164.42	89.9	154.41	88.9	153.46	87.9
131.02	84.8	128.48	83.8	121.95	82.8	115.09	81.8	114.23	80.8
99.18	77.8	88.53	76.8	88.07	75.8	86.57	74.7	86.47	73.7
79.37	70.7	78.33	69.7	76.15	68.7	73.39	67.7	71.38	66.7
67.56	63.6	61.33	62.6	57.11	61.6	54.83	60.6	53.75	59.6
51.15	56.6	50.26	55.6	46.49	54.5	46.04	53.5	39.46	52.5
31.97	49.5	30.87	48.5	30.52	47.5	30.02	46.5	27.62	45.5
24.62	42.4	19.22	41.4	15.37	40.4	14.41	39.4	11.84	38.4
10.11	35.4	9.71	34.3	9.14	33.3	8.53	32.3	7.83	31.3
7.37	28.3	7.06	27.3	6.55	26.3	5.31	25.3	4.42	24.2
3.84	21.2	3.73	20.2	3.60	19.2	3.60	18.2	3.55	17.2
2.63	14.1	2.56	13.1	1.80	12.1	1.74	11.1	1.53	10.1
1.37	7.1	1.23	6.1	1.19	5.1	1.17	4.0	1.14	3.0
1.10	0.0								

124.02918	93.53462	90.81313	66.78993	47.19267	24.73700	19.25713	19.25011	18.55275	17.81064
15.13553	12.98221	9.58228	8.98666	8.90533	8.87951	8.56281	8.00845	7.90835	7.83486
7.13699	6.86439	6.65963	5.96971	5.45224	5.19288	5.19288	3.61244	3.29391	2.95984
2.80296	2.76954	2.69600	2.60275	2.54529	2.54438	2.35046	2.21988	2.15038	2.11751
1.69530	1.53912	1.45980	1.38009	1.29136	1.27635	1.26776	1.10728		

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

124.63	97.9	93.53	95.8	90.81	93.8	66.79	91.7	47.19	89.6
19.25	83.3	16.55	81.3	17.81	79.2	15.14	77.1	12.98	75.0
8.91	68.8	8.88	66.7	8.56	64.6	8.01	62.5	7.91	60.4
6.86	54.2	6.66	52.1	5.97	50.0	5.45	47.9	5.19	45.8
3.29	39.6	2.96	37.5	2.80	35.4	2.77	33.3	2.70	31.3
2.54	25.0	2.35	22.9	2.22	20.8	2.15	18.8	2.12	16.7
1.46	10.4	1.38	8.3	1.29	6.3	1.28	4.2	1.27	2.1

24.74	87.5	19.26	85.4						
9.58	72.9	8.99	70.8						
7.83	58.3	7.04	58.3						
5.19	43.8	3.61	41.7						
2.60	29.2	2.55	27.1						
1.68	14.4	1.54	12.5						
1.11	0.0								

885.95264	328.13062	177.19061	167.16096	114.88268	106.99916	99.49017	79.77963	72.91792	70.31371
55.93138	55.37204	41.01634	38.29422	36.91470	32.09975	31.69415	30.76225	24.97449	24.54758
24.23669	24.08441	23.93388	23.83894	23.07169	22.16101	20.85576	19.30954	18.77167	18.04718
16.83386	16.36505	15.95593	12.93724	12.87304	12.87296	12.30490	11.81921	11.42598	10.87904
10.72753	10.72753	10.72753	10.05706	8.38088	6.90781	6.83625	6.70471	6.25723	6.09519
5.98347	5.90635	5.38377	5.28245	4.97163	4.89295	4.59751	4.27996	4.27391	4.04812
4.02282	4.02282	3.58445	3.75434	3.48945	3.01166	2.71251	2.68188	2.64061	2.60091
2.58495	2.54231	2.43807	2.43157	2.34020	1.80371	1.43190	1.31487	1.14938	1.08358
1.06643									

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

885.95	98.6	328.13	97.5	177.19	96.3	167.16	95.1	114.88	93.8
79.78	90.1	72.92	88.9	70.31	87.7	55.93	86.4	55.37	85.2
36.91	81.5	32.13	80.2	31.69	79.0	30.76	77.8	24.97	76.5

107.00	92.6	89.49	91.4						
41.02	84.0	38.29	82.7						
24.55	75.3	24.24	74.1						

24.08 72.8	23.93 71.6	23.84 71.4	23.07 69.1	22.16 67.9	20.86 66.7	19.31 65.4
18.77 64.2	18.05 63.0	16.83 61.7	16.37 60.5	15.96 59.3	12.94 58.0	12.87 56.8
12.87 55.6	12.30 54.3	11.82 53.1	11.43 51.9	10.88 50.6	10.73 49.4	10.73 48.1
10.73 46.9	10.06 45.7	8.38 44.4	6.91 43.2	6.84 42.0	6.70 40.7	6.26 39.5
6.10 38.3	5.98 37.0	5.91 35.8	5.36 34.6	5.28 33.3	4.97 32.1	4.89 30.9
4.60 29.6	4.28 28.4	4.27 27.2	4.05 25.9	4.02 24.7	4.02 23.5	3.98 22.2
3.75 21.0	3.49 19.8	3.01 18.5	2.71 17.3	2.68 16.0	2.64 14.8	2.60 13.6
2.58 12.3	2.54 11.1	2.44 9.9	2.43 8.6	2.34 7.4	1.80 6.2	1.43 4.9
1.31 3.7	1.15 2.5	1.08 1.2	1.07 0.0			

117.07997	95.79268	55.41107	52.89238	33.08063	31.41522	23.15643	13.29866	7.74161	5.89036
5.57148	4.78158	4.06435	3.56214	3.32467	3.11687	2.57948	2.29020	1.90850	1.86078
1.65403									

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

117.08 95.2	95.79 90.5	55.41 85.7	52.89 81.0	33.08 76.2	31.42 71.4	23.16 66.7
13.30 61.9	7.74 57.1	5.89 52.4	5.57 47.6	4.78 42.9	4.06 38.1	3.56 33.3
3.32 28.6	3.12 23.8	2.58 19.0	2.29 14.3	1.91 9.5	1.86 4.8	1.65 0.0

72.93898	64.17728	62.10443	51.06628	20.29642	18.33365	14.70956	14.49531	12.84336	10.08529
9.68408	6.97798	6.85100	6.41886	4.91164	4.82205	3.81183	3.61499	3.57206	3.36278
3.27550	3.21413	2.91199	2.74416	2.35117	1.96828	1.75385	1.63581	1.52161	1.42916
1.27609	1.21057	1.01869							

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

72.94 97.1	64.18 93.9	62.10 90.9	51.07 87.9	20.30 84.8	18.33 81.8	14.71 78.8
14.50 75.8	12.84 72.7	10.09 69.7	9.28 66.7	6.98 63.6	6.85 60.6	6.42 57.6
4.91 54.5	4.82 51.5	3.81 48.5	3.61 45.5	3.57 42.4	3.36 39.4	3.28 36.4
3.21 33.3	2.91 30.3	2.74 27.3	2.35 24.2	1.97 21.2	1.75 18.2	1.64 15.2
1.52 12.1	1.43 9.1	1.28 6.1	1.21 3.0	1.02 0.0		

1293.02979	408.92798	129.32578	34.77586	29.24849	23.12093	21.35901	20.62137	19.49556	19.08154
18.90589	16.75563	16.09331	14.14206	13.23296	11.59400	10.25745	9.26303	8.91684	8.35863
8.35334	8.35187	7.39658	7.34653	7.00381	6.73626	6.65792	6.20581	5.92027	5.81498
5.55653	5.47421	5.29937	5.28657	4.98601	4.91271	4.68527	4.63233	4.38727	4.13261
3.67078	3.30155	3.18402	2.82383	2.54465	2.42220	2.39030	2.36528	2.30324	2.29408
2.27864	2.20286	2.17827	2.04197	1.93198	1.87199	1.78011	1.77979	1.77867	1.68941
1.67586	1.57619	1.40435	1.39921	1.39806	1.39781	1.39693	1.35731	1.33177	1.13986
1.12968	1.12948	1.12877	1.10740	1.10670	1.10650	1.04891	1.03539	1.00018	1.00018
1.00000									

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

1293.03 98.8	408.93 97.5	129.33 96.3	34.78 95.1	29.25 93.8	23.12 92.6	21.36 91.4
2.62 93.1	19.51 88.9	19.08 87.7	18.90 86.4	16.76 85.2	16.09 84.0	14.14 82.7
13.23 81.5	11.59 80.2	10.26 79.0	9.26 77.8	8.92 76.5	8.36 75.3	8.35 74.1
8.35 74.8	7.40 71.6	7.35 70.4	7.00 69.1	6.74 67.9	6.66 66.7	6.21 65.4
5.92 64.2	5.81 63.0	5.56 61.7	5.47 60.5	5.30 59.3	5.29 58.0	4.99 56.8
4.91 55.6	4.69 54.3	4.63 53.1	4.39 51.9	4.13 50.6	3.67 49.4	3.30 48.1
3.18 46.9	2.82 45.7	2.54 44.4	2.42 43.2	2.39 42.0	2.37 40.7	2.30 39.5
2.29 38.3	2.28 37.0	2.21 35.8	2.18 34.6	2.04 33.3	1.93 32.1	1.87 30.9
1.78 29.6	1.76 28.4	1.78 27.2	1.69 25.9	1.68 24.7	1.58 23.5	1.40 22.2

1.40 21.0	1.40 19.8	1.40 18.5	1.40 17.3	1.36 16.0	1.33 14.8	1.14 13.6			
1.13 12.3	1.13 11.1	1.13 9.9	1.11 8.6	1.11 7.4	1.11 6.2	1.05 4.9			
1.04 3.7	1.00 2.5	1.00 1.2	1.00 0.0						

1293.02979	408.92798	129.32578	34.77586	29.24849	23.12093	21.35901	20.62137	19.49556	19.08154
18.90089	16.33365	16.75563	16.09331	14.49531	14.14208	13.23296	12.84336	11.59400	10.25745
10.08529	9.28408	9.26303	8.91684	8.35863	8.35334	8.35187	7.39658	7.34653	7.00381
6.85100	6.73626	6.65792	6.20581	5.92027	5.81498	5.55653	5.47421	5.29907	5.28657
4.96601	4.91271	4.68527	4.63233	4.38727	4.13261	3.67078	3.61499	3.57206	3.30155
3.27550	3.18492	2.82383	2.74416	2.54465	2.42220	2.39030	2.36528	2.35117	2.30324
2.29408	2.27664	2.20286	2.17827	2.04197	1.96828	1.93198	1.87199	1.78011	1.77979
1.77867	1.68941	1.67586	1.57619	1.52161	1.42916	1.40435	1.39921	1.39806	1.39781
1.39693	1.35731	1.33177	1.21057	1.13986	1.12968	1.12948	1.12877	1.10740	1.10670
1.10657	1.04891	1.03539	1.00018	1.00018	1.00000				

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

1293.03 99.	408.93 97.9	129.33 96.9	34.78 95.8	29.25 94.8	23.12 93.8	21.36 92.7	
20.62 91.7	19.50 90.6	19.08 89.6	18.90 88.5	18.33 87.5	16.76 86.5	16.09 85.4	
14.50 84.4	14.14 83.3	13.23 82.3	12.84 81.3	11.59 80.2	10.26 79.2	10.09 78.1	
9.28 77.1	9.26 76.0	8.92 75.0	8.36 74.0	8.35 72.9	8.35 71.9	7.40 70.8	
7.35 69.8	7.34 68.8	6.85 67.7	6.74 66.7	6.66 65.6	6.21 64.6	5.92 63.5	
5.81 62.5	5.56 61.5	5.47 60.4	5.30 59.4	5.29 58.3	4.99 57.3	4.91 56.3	
4.69 55.2	4.63 54.2	4.39 53.1	4.13 52.1	3.67 51.0	3.61 50.0	3.57 49.0	
3.30 47.9	3.28 46.9	3.18 45.8	2.82 44.8	2.74 43.8	2.54 42.7	2.42 41.7	
2.39 40.6	2.37 39.6	2.35 38.5	2.30 37.5	2.29 36.5	2.28 35.4	2.20 34.4	
2.18 33.3	2.04 32.3	1.97 31.3	1.93 30.2	1.87 29.2	1.78 28.1	1.78 27.1	
1.78 26.0	1.69 25.0	1.68 24.0	1.58 22.9	1.52 21.9	1.43 20.8	1.40 19.8	
1.40 18.8	1.40 17.7	1.40 16.7	1.40 15.6	1.36 14.6	1.33 13.5	1.21 12.5	
1.14 11.5	1.13 10.4	1.13 9.4	1.13 8.3	1.11 7.3	1.11 6.3	1.11 5.2	
1.05 4.2	1.04 3.1	1.00 2.1	1.00 1.0	1.00 0.0			

338.38477	307.38013	267.27881	190.15332	154.32256	152.59288	122.91597	100.79106	83.99255	60.79372
57.04596	53.24290	49.84566	45.81412	45.81412	44.36908	43.82220	43.82220	40.12386	40.12386
40.12386	39.93217	37.14621	37.14621	33.59702	33.59702	33.59702	33.03843	32.59769	27.53943
27.53206	26.74922	26.62144	25.29985	25.07741	25.07741	23.60226	23.60226	23.60226	23.48952
22.43144	22.29102	22.29102	22.29102	21.44490	21.11781	20.47803	20.15820	20.15820	20.06192
20.06192	19.38289	19.10658	19.01718	18.86195	18.35471	17.74763	17.37312	16.27759	16.03673
15.97289	15.74861	14.36456	13.91037	13.38592	13.37462	13.31073	12.88135	12.75837	12.73774
12.26338	11.71989	11.58208	11.40920	11.40920	10.83775	10.64858	10.64858	10.07911	10.07911
9.98394	9.47625	9.17736	9.16262	9.11906	8.87382	8.76486	8.76444	8.72258	8.40677
8.39926	8.35914	8.29927	8.29927	8.15436	8.15436	8.02477	7.98644	7.98644	7.98644
7.98644	7.98644	7.72139	7.71613	7.57054	7.54479	7.46601	7.44563	7.19936	6.94925
6.74255	6.71535	6.68731	6.64741	6.60770	6.60770	6.47813	6.47286	6.47286	6.31750
6.31751	6.29944	6.29944	6.23568	6.23071	6.14760	5.92889	5.75949	5.73198	5.59950
5.57276	5.53284	5.42214	5.32429	5.32429	5.27666	5.23379	5.21194	5.14551	5.14551
5.14408	5.01548	5.01548	4.99152	4.94983	4.88192	4.84026	4.79668	4.72045	4.71978
4.71978	4.58141	4.38222	4.38222	4.38222	4.19461	4.14963	4.12981	4.00679	3.99322
3.95283	3.9346	3.86012	3.83734	3.80756	3.80306	3.77239	3.65750	3.63020	3.61478
3.60838	3.60838	3.56249	3.37331	3.35970	3.25746	3.17488	3.13031	3.07380	3.04605
3.02677	3.01375	3.00869	2.97825	2.97214	2.94249	2.87974	2.86599	2.77970	2.76642
2.74151	2.54142	2.51978	2.50774	2.50774	2.42142	2.39979	2.39979	2.37155	2.36023
2.35969	2.35989	2.35989	2.31642	2.28195	2.28184	2.18402	2.08477	2.01582	1.99383
1.98430	1.96890	1.95726	1.92444	1.87818	1.78328	1.78832	1.68690	1.65192	1.61266

1.61225	1.60367	1.59729	1.57348	1.57326	1.54322	1.53585	1.50255	1.45208	1.44552
1.43987	1.43299	1.38901	1.38894	1.38358	1.37733	1.34388	1.33107	1.22868	1.22868
1.18011	1.18011	1.10128	1.08414	1.08377	1.06576	1.06430	1.00170	1.00170	

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

330.38	99.6	307.38	99.2	267.28	98.8	190.15	98.4	154.32	98.0	152.59	97.6	122.92	97.2						
100.79	96.8	83.99	96.4	60.79	96.0	57.05	95.6	53.24	95.2	49.85	94.8	45.81	94.4						
45.81	94.0	44.37	93.6	43.82	93.2	43.82	92.8	40.12	92.4	40.12	92.0	40.12	91.6						
39.93	91.2	37.15	90.8	37.15	90.4	33.60	90.0	33.60	89.6	33.60	89.2	33.04	88.8						
32.60	88.4	27.54	88.0	27.53	87.6	26.75	87.1	26.62	86.7	25.30	86.3	25.08	85.9						
25.08	85.5	23.60	85.1	23.60	84.7	23.60	84.3	23.49	83.9	22.43	83.5	22.29	83.1						
22.29	82.7	22.29	82.3	21.44	81.9	21.12	81.5	20.48	81.1	20.16	80.7	20.16	80.3						
20.06	79.9	20.06	79.5	19.38	79.1	19.11	78.7	19.02	78.3	18.86	77.9	18.35	77.5						
17.75	77.1	17.37	76.7	16.28	76.3	16.04	75.9	15.97	75.5	15.75	75.1	14.36	74.7						
13.91	74.3	13.39	73.9	13.37	73.5	13.31	73.1	12.88	72.7	12.76	72.3	12.74	71.9						
12.26	71.5	11.72	71.1	11.58	70.7	11.41	70.3	11.41	69.9	10.84	69.5	10.65	69.1						
10.65	68.7	10.08	68.3	10.08	67.9	9.98	67.5	9.48	67.1	9.18	66.7	9.16	66.3						
9.12	65.9	8.87	65.5	8.76	65.1	8.76	64.7	8.72	64.3	8.41	63.9	8.40	63.5						
8.36	63.1	8.30	62.7	8.30	62.2	8.15	61.8	8.15	61.4	8.02	61.0	7.99	60.6						
7.99	60.2	7.99	59.8	7.99	59.4	7.99	59.0	7.72	58.6	7.72	58.2	7.57	57.8						
7.54	57.4	7.47	57.0	7.45	56.6	7.20	56.2	6.95	55.8	6.74	55.4	6.72	55.0						
6.69	54.6	6.65	54.2	6.61	53.8	6.61	53.4	6.48	53.0	6.47	52.6	6.47	52.2						
6.32	51.8	6.32	51.4	6.30	51.0	6.30	50.6	6.24	50.2	6.23	49.8	6.15	49.4						
5.93	49.0	5.76	48.6	5.73	48.2	5.60	47.8	5.57	47.4	5.53	47.0	5.42	46.6						
5.32	46.2	5.32	45.8	5.28	45.4	5.23	45.0	5.21	44.6	5.15	44.2	5.15	43.8						
5.14	43.4	5.02	43.0	5.02	42.6	4.99	42.2	4.95	41.8	4.88	41.4	4.84	41.0						
4.80	40.6	4.72	40.2	4.72	39.8	4.72	39.4	4.58	39.0	4.38	38.6	4.38	38.2						
4.38	37.8	4.19	37.3	4.15	36.9	4.13	36.5	4.01	36.1	3.99	35.7	3.95	35.3						
3.93	34.9	3.86	34.5	3.84	34.1	3.81	33.7	3.80	33.3	3.77	32.9	3.66	32.5						
3.63	32.1	3.61	31.7	3.61	31.3	3.61	30.9	3.58	30.5	3.37	30.1	3.36	29.7						
3.26	29.3	3.17	28.9	3.13	28.5	3.07	28.1	3.05	27.7	3.03	27.3	3.01	26.9						
3.01	26.5	2.98	26.1	2.97	25.7	2.94	25.3	2.88	24.9	2.87	24.5	2.78	24.1						
2.77	23.7	2.74	23.3	2.54	22.9	2.52	22.5	2.51	22.1	2.51	21.7	2.42	21.3						
2.40	20.9	2.40	20.5	2.37	20.1	2.36	19.7	2.36	19.3	2.36	18.9	2.36	18.5						
2.32	18.1	2.28	17.7	2.28	17.3	2.18	16.9	2.08	16.5	2.02	16.1	1.99	15.7						
1.98	15.3	1.97	14.9	1.96	14.5	1.92	14.1	1.88	13.7	1.76	13.3	1.71	12.9						
1.69	12.4	1.65	12.0	1.61	11.6	1.61	11.2	1.60	10.8	1.60	10.4	1.57	10.0						
1.57	9.6	1.54	9.2	1.54	8.8	1.50	8.4	1.45	8.0	1.45	7.6	1.44	7.2						
1.43	6.8	1.39	6.4	1.39	6.0	1.38	5.6	1.38	5.2	1.34	4.8	1.33	4.4						
1.23	4.0	1.23	3.6	1.18	3.2	1.18	2.8	1.10	2.4	1.08	2.0	1.08	1.6						
1.07	1.2	1.06	0.8	1.00	0.4	1.00	0.0												

423.45801	386.88281	330.35547	194.73956	194.23735	190.13647	159.68643	133.07204	96.31378	76.51775
72.58472	72.58472	69.42886	69.42886	57.04091	53.23817	53.22879	53.22879	53.22879	50.50171
50.50171	50.50171	44.36514	39.92863	39.60262	37.14291	37.14291	33.97581	33.66780	33.03554
32.59480	31.93727	31.93727	31.56357	31.56357	30.70891	30.12950	29.70688	29.70688	29.70688
28.23198	28.05650	28.05650	28.05650	27.53699	27.52962	27.52477	26.61908	26.57983	25.40749
25.25085	25.25085	24.95099	24.04843	23.74052	23.48743	23.47621	20.21346	19.42924	18.56818
18.35307	18.34984	17.74605	17.17058	16.84811	16.83389	16.27904	16.03229	15.97146	15.96880
15.96864	15.96864	15.01352	14.51695	14.36329	13.88578	13.30955	13.30720	12.88021	12.23324
11.82863	11.79633	11.47767	11.40818	11.40818	11.40617	11.00991	10.97864	10.64764	10.64764
10.52119	10.44584	10.44584	10.10034	10.00901	10.00901	9.98216	9.98040	9.98040	9.71187
9.52863	9.49622	9.39332	9.17654	9.12494	8.87303	8.87147	8.77997	8.76564	8.41695
8.40603	8.25743	7.98573	7.98573	7.98573	7.98573	7.98573	7.73766	7.25847	7.21453
7.01413	6.96389	6.94289	6.94289	6.94289	6.82456	6.74195	6.60711	6.60711	6.47756
6.47458	6.31272	6.31272	6.14461	5.94138	5.79469	5.32382	5.32382	5.32288	5.22292
5.16090	5.14689	5.14688	5.14597	5.14597	5.14272	5.14272	4.99108	4.97401	4.95033

4.85853	4.83983	4.76676	4.74811	4.71937	4.71937	4.71853	4.56247	4.54167	4.54167
4.50908	4.40396	4.23861	4.19572	4.19498	4.19233	4.15827	4.12944	4.00715	3.99286
3.99216	3.93585	3.93515	3.93267	3.86883	3.80273	3.80206	3.80206	3.75733	3.74087
3.66997	3.62988	3.60727	3.48195	3.30297	3.19373	3.15636	3.15636	3.13058	3.02757
3.02704	3.02513	3.01348	2.97069	2.94275	2.87196	2.74891	2.70655	2.55498	2.54120
2.54075	2.46350	2.42206	2.42163	2.42030	2.35968	2.35968	2.35968	2.28164	2.28123
2.24452	2.17814	2.12917	2.12915	2.00393	1.98046	1.94237	1.92427	1.87835	1.80363
1.74144	1.71706	1.65178	1.59715	1.58410	1.57312	1.56430	1.53572	1.50268	1.48534
1.48534	1.45195	1.44032	1.38882	1.37746	1.34025	1.33095	1.25245	1.22857	1.22857
1.16096	1.14848	1.14062	1.10118	1.08566	1.06440	1.01762	1.00179	1.00179	

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

423.46	99.6	386.88	99.2	330.36	98.8	194.74	98.4	194.24	98.0	190.14	97.6	159.69	97.2
133.07	96.8	96.31	96.4	76.52	96.0	72.58	95.6	72.58	95.2	69.43	94.8	69.43	94.4
57.04	94.0	53.24	93.6	53.23	93.2	53.23	92.8	53.23	92.4	50.50	92.0	50.50	91.6
50.50	91.2	44.37	90.8	39.93	90.4	39.60	90.0	37.14	89.6	37.14	89.2	33.98	88.8
33.67	88.4	33.04	88.0	32.59	87.6	31.94	87.1	31.94	86.7	31.56	86.3	31.56	85.9
30.71	85.5	30.13	85.1	29.71	84.7	29.71	84.3	29.71	83.9	28.23	83.5	28.06	83.1
28.06	82.7	28.06	82.3	27.54	81.9	27.53	81.5	27.52	81.1	26.62	80.7	26.58	80.3
25.41	79.9	25.25	79.5	25.25	79.1	24.95	78.7	24.05	78.3	23.74	77.9	23.49	77.5
20.48	77.1	20.21	76.7	19.43	76.3	18.57	75.9	18.35	75.5	18.35	75.1	17.75	74.7
17.17	74.3	16.85	73.9	16.83	73.5	16.28	73.1	16.13	72.7	15.97	72.3	15.97	71.9
15.97	71.5	15.97	71.1	15.01	70.7	14.52	70.3	14.36	69.9	13.89	69.5	13.31	69.1
13.31	68.7	12.88	68.3	12.23	67.9	11.83	67.5	11.80	67.1	11.48	66.7	11.41	66.3
11.41	65.9	11.41	65.5	11.01	65.1	10.98	64.7	10.65	64.3	10.65	63.9	10.52	63.5
10.45	63.1	10.45	62.7	10.10	62.2	10.01	61.8	10.01	61.4	9.98	61.0	9.98	60.6
9.98	60.2	9.71	59.8	9.53	59.4	9.50	59.0	9.39	58.6	9.18	58.2	9.12	57.8
8.87	57.4	8.87	57.0	8.78	56.6	8.77	56.2	8.42	55.8	8.41	55.4	8.26	55.0
7.99	54.6	7.99	54.2	7.99	53.8	7.99	53.4	7.99	53.0	7.74	52.6	7.26	52.2
7.21	51.8	7.21	51.4	6.96	51.0	6.94	50.6	6.94	50.2	6.94	49.8	6.82	49.4
6.74	49.0	6.61	48.6	6.61	48.2	6.48	47.8	6.47	47.4	6.31	47.0	6.31	46.6
6.14	46.2	5.94	45.8	5.79	45.4	5.32	45.0	5.32	44.6	5.32	44.2	5.22	43.8
5.16	43.4	5.15	43.0	5.15	42.6	5.15	42.2	5.15	41.8	5.14	41.4	5.14	41.0
4.99	40.6	4.97	40.2	4.95	39.8	4.86	39.4	4.84	39.0	4.77	38.6	4.75	38.2
4.72	37.8	4.72	37.3	4.72	36.9	4.56	36.5	4.54	36.1	4.54	35.7	4.51	35.3
4.40	34.9	4.24	34.5	4.23	34.1	4.19	33.7	4.19	33.3	4.16	32.9	4.13	32.5
4.01	32.1	3.99	31.7	3.99	31.3	3.94	30.9	3.94	30.5	3.93	30.1	3.87	29.7
3.80	29.3	3.80	28.9	3.81	28.5	3.76	28.1	3.74	27.7	3.67	27.3	3.63	26.9
3.61	26.5	3.48	26.1	3.30	25.7	3.19	25.3	3.16	24.9	3.16	24.5	3.13	24.1
3.03	23.7	3.03	23.3	3.03	22.9	3.01	22.5	2.97	22.1	2.94	21.7	2.87	21.3
2.75	20.9	2.71	20.5	2.55	20.1	2.54	19.7	2.54	19.3	2.46	18.9	2.42	18.5
2.42	16.1	2.42	17.7	2.36	17.3	2.36	16.9	2.36	16.5	2.28	16.1	2.28	15.7
2.24	15.3	2.18	14.9	2.13	14.5	2.13	14.1	2.00	13.7	1.98	13.3	1.94	12.9
1.92	12.4	1.88	12.0	1.80	11.6	1.74	11.2	1.72	10.8	1.65	10.4	1.60	10.0
1.58	9.6	1.57	9.2	1.56	8.8	1.54	8.4	1.50	8.0	1.49	7.6	1.49	7.2
1.45	6.8	1.44	6.4	1.39	6.0	1.38	5.6	1.34	5.2	1.33	4.8	1.25	4.4
1.23	4.0	1.23	3.6	1.16	3.2	1.15	2.8	1.14	2.4	1.10	2.0	1.07	1.6
1.06	1.2	1.02	0.8	1.01	0.4	1.00	0.0						

371.09106	345.25195	300.20972	197.19920	160.04068	147.14079	127.47046	104.52576	59.15971	48.06470
47.51169	47.51169	41.61057	41.61057	41.61057	41.41180	38.52260	38.52260	37.10910	34.84190
34.84190	30.92426	28.55986	27.60786	26.00661	26.00661	25.19409	24.47681	24.47681	24.39590
24.35988	23.11697	22.23952	21.90030	21.13593	20.90514	20.90514	20.80528	20.61617	20.10209
19.81454	19.72183	19.51364	18.40524	18.01259	16.56471	16.33214	16.13438	15.69601	15.03518
13.87019	13.80394	13.77434	13.35865	13.20971	13.00910	12.38450	11.83195	11.23933	11.04315
11.04315	10.64381	10.45258	10.45258	10.35295	9.50234	9.45695	9.32181	9.32181	9.20263
9.08920	9.04578	8.71048	8.66887	8.47437	8.45170	8.36299	8.32211	8.28236	8.28236

8.28236	8.28236	8.28236	8.00203	7.85105	7.80546	7.74265	7.57329	7.46613	7.42182
7.27630	7.25988	7.25988	7.09587	6.93509	6.90504	6.53286	6.53286	6.40990	6.14857
6.00809	5.97872	5.94437	5.80699	5.77925	5.76283	5.76283	5.62305	5.55167	5.52157
5.52157	5.33469	5.30130	5.30130	5.20132	5.20132	5.17648	5.08813	5.04679	4.89536
4.75117	4.66090	4.63864	4.58108	4.58108	4.54460	4.40687	4.33572	4.27052	4.14118
4.10814	4.05296	4.05296	4.04474	3.94398	3.76471	3.71523	3.65881	3.50318	3.48419
3.45252	3.41641	3.38990	3.36520	3.21826	3.12542	3.10727	3.08226	3.06145	3.01846
2.85455	2.71192	2.69476	2.65065	2.65065	2.61314	2.60182	2.48871	2.45311	2.38639
2.34164	2.20041	2.15580	1.99575	1.91340	1.80126	1.77162	1.76710	1.67241	1.65647
1.63179	1.55464	1.50588	1.50185	1.44886	1.39388	1.39368	1.23697	1.22384	1.22384
1.19707	1.04541	1.03529							

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

371.09	99.5	345.25	98.9	300.21	98.4	197.20	97.8	160.04	97.3	147.14	96.7	127.47	96.2						
104.53	95.6	59.16	95.1	48.06	94.5	47.51	94.7	47.51	93.4	41.61	92.9	41.61	92.3						
41.61	91.8	41.41	91.3	38.52	90.7	38.52	90.2	37.11	89.6	34.84	89.1	34.84	88.5						
30.92	88.0	28.56	87.4	27.61	86.9	26.01	86.3	26.01	85.8	25.19	85.2	24.48	84.7						
24.48	84.2	24.40	83.6	24.36	83.1	23.12	82.5	22.24	82.0	21.90	81.4	21.19	80.9						
20.91	80.3	20.91	79.8	20.81	79.2	20.62	78.7	20.10	78.1	19.81	77.6	19.72	77.0						
19.51	76.5	18.41	76.0	18.01	75.4	16.56	74.9	16.33	74.3	16.13	73.8	15.70	73.2						
15.04	72.7	13.87	72.1	13.8	71.6	13.77	71..	13.36	70.5	13.21	69.9	13.01	69.4						
12.36	68.9	11.83	68.3	11.24	67.8	11.04	67.2	11.04	66.7	10.64	66.1	10.45	65.6						
10.45	65.0	10.35	64.5	9.50	63.9	9.46	63.4	9.32	62.8	9.32	62.3	9.20	61.7						
9.09	61.2	9.05	60.7	8.71	60.1	8.67	59.6	8.47	59.0	8.45	58.5	8.36	57.9						
8.32	57.4	8.28	56.8	8.28	56.3	8.28	55.7	8.28	55.2	8.28	54.6	8.00	54.1						
7.85	53.6	7.81	53.0	7.74	52.5	7.57	51.9	7.47	51.4	7.42	50.8	7.28	50.3						
7.26	49.7	7.26	49.2	7.1	48.6	6.94	48.1	6.91	47.5	6.53	47.0	6.53	46.4						
6.41	45.9	6.15	45.4	6.01	44.8	5.98	44.3	5.94	43.7	5.81	43.2	5.78	42.6						
5.76	42.1	5.76	41.5	5.62	41.0	5.55	40.4	5.52	39.9	5.52	39.3	5.33	38.8						
5.30	38.3	5.30	37.7	5.20	37.2	5.20	36.6	5.18	36.1	5.09	35.5	5.05	35.0						
4.90	34.4	4.75	33.9	4.66	33.3	4.64	32.8	4.58	32.2	4.58	31.7	4.54	31.1						
4.41	30.6	4.34	30.1	4.27	29.5	4.14	29..	4.11	28.4	4.05	27.9	4.05	27.3						
4.04	26.8	3.94	26.2	3.76	25.7	3.72	25.1	3.66	24.6	3.50	24.0	3.48	23.5						
3.45	23.0	3.42	22.4	3.39	21.9	3.35	21.3	3.22	20.8	3.13	20.2	3.11	19.7						
3.08	19.1	3.06	18.6	3.02	18.0	2.85	17.5	2.71	16.9	2.69	16.4	2.65	15.8						
2.65	15.3	2.61	14.8	2.60	14.2	2.49	13.7	2.45	13.1	2.37	12.6	2.34	12.0						
2.20	11.5	2.16	10.9	2.0	10.4	1.91	9.8	1.8	9.3	1.77	8.7	1.77	8.2						
1.67	7.7	1.66	7.1	1.63	6.6	1.55	6.0	1.51	5.5	1.50	4.9	1.45	4.4						
1.39	3.8	1.39	3.3	1.24	2.7	1.22	2.2	1.22	1.6	1.20	1.1	1.05	0.5						
1.04	0.0																		

475.63159	434.55005	371.05811	201.95537	201.43451	197.18167	165.60336	92.87251	75.27425	75.27425
59.15446	55.20111	55.20111	52.37297	52.37297	52.37297	41.40813	38.51918	38.51918	38.18762
37.10582	35.23474	33.12067	33.12067	32.73311	32.73311	31.84679	31.71042	31.24591	30.92151
30.91606	30.80763	30.60763	29.99608	28.55733	28.53790	27.60541	27.56471	26.66557	26.18648
25.87552	24.93950	24.35771	21.82310	20.61433	20.61070	18.92395	18.40361	17.80681	17.45766
16.86330	16.62633	16.56325	16.56033	16.56033	16.13297	15.69740	15.39824	15.05485	14.40030
13.80272	13.80029	13.35746	13.24975	12.36643	12.26692	11.90296	11.83090	11.82881	11.73286
11.73286	11.38543	11.24221	11.04217	11.04217	10.91104	10.66623	10.47460	10.35204	10.35021
10.35021	10.07173	9.88170	9.74138	9.20181	9.20019	8.72883	8.69101	8.45245	8.28163
8.28163	8.28163	8.28163	8.28163	7.81686	7.57262	7.52742	7.48186	7.42117	7.27565
7.27403	7.20015	7.07743	6.71449	6.54662	6.54662	6.50865	6.16153	5.86643	5.79676
5.52109	5.52109	5.52011	5.45714	5.30083	5.30083	5.29990	5.17602	5.10124	5.10124
4.77345	4.67616	4.63823	4.58230	4.58230	4.58149	4.58149	4.57860	4.57860	4.34550
4.14081	4.14008	4.12214	4.04581	4.04510	4.04254	4.00970	3.94363	3.94294	3.91095
3.87948	3.77366	3.76457	3.70993	3.50411	3.50349	3.50128	3.12514	3.08759	3.01873
2.85429	2.85379	2.84684	2.69547	2.69499	2.69329	2.65042	2.65042	2.64965	2.55692

2.36618	2.20834	2.15638	2.15600	2.15463	2.05384	1.99557	1.93233	1.76694	1.65633
1.54038	1.54038	1.50575	1.44899	1.38886	1.23686	1.20770	1.20398	1.19696	1.19323
1.10744	1.03521	1.01910							

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

475.63	99.5	434.55	98.9	371.06	98.4	201.96	97.8	201.43	97.3	197.18	96.7	165.60	96.2						
92.67	95.6	75.27	95.1	75.27	94.5	59.15	94.0	55.20	93.4	55.20	92.9	52.37	92.3						
52.37	91.8	52.37	91.3	41.41	90.7	38.52	90.2	38.52	89.6	38.19	89.1	37.11	88.5						
35.23	88.0	33.12	87.4	33.12	86.9	32.73	86.3	32.73	85.8	31.85	85.2	31.71	84.7						
31.25	84.2	30.92	83.6	30.92	83.1	30.81	82.5	30.81	82.0	29.10	81.4	28.56	80.9						
28.54	80.3	27.61	79.8	27.56	79.2	26.67	78.7	26.19	78.1	25.88	77.6	24.94	77.0						
24.36	76.5	21.87	76.3	20.61	75.4	20.61	74.9	18.92	74.3	18.40	73.8	17.81	73.2						
17.46	72.7	16.86	72.1	16.63	71.6	16.56	71.0	16.56	70.5	16.56	69.9	16.13	69.4						
15.79	68.9	15.45	68.3	15.05	67.8	14.40	67.2	13.80	66.7	13.80	66.1	13.36	65.6						
13.25	65.0	12.37	64.5	12.27	63.9	11.90	63.4	11.83	62.8	11.83	62.3	11.73	61.7						
11.73	61.2	11.39	60.7	11.24	60.1	11.04	59.6	11.04	59.0	10.91	58.5	10.67	57.9						
10.47	57.4	10.35	56.8	10.35	56.3	10.35	55.7	10.07	55.2	9.88	54.6	9.74	54.1						
9.20	53.6	9.20	53.0	8.73	52.5	8.69	51.9	8.45	51.4	8.28	50.8	8.28	50.3						
8.28	49.7	8.28	49.2	8.28	48.6	7.82	48.1	7.57	47.5	7.53	47.0	7.48	46.4						
7.42	45.9	7.28	45.4	7.27	44.8	7.20	44.3	7.08	43.7	6.71	43.2	6.55	42.6						
6.55	42.1	6.51	41.5	6.16	41.0	5.87	40.4	5.8	39.9	5.52	39.3	5.52	38.8						
5.52	38.3	5.46	37.7	5.30	37.2	5.30	36.6	5.30	36.1	5.18	35.5	5.10	35.0						
5.10	34.4	4.77	33.9	4.68	33.3	4.64	32.8	4.58	32.2	4.58	31.7	4.58	31.1						
4.58	30.6	4.58	30.1	4.58	29.5	4.35	29.0	4.14	28.4	4.14	27.9	4.12	27.3						
4.05	26.6	4.05	26.2	4.04	25.7	4.01	25.1	3.94	24.6	3.94	24.0	3.91	23.5						
3.88	23.1	3.77	22.5	3.76	21.9	3.71	21.3	3.50	20.8	3.50	20.2	3.50	19.7						
3.13	19.1	3.09	18.6	3.02	18.0	2.85	17.5	2.85	16.9	2.81	16.4	2.70	15.8						
2.69	15.3	2.69	14.8	2.65	14.2	2.65	13.7	2.65	13.1	2.56	12.6	2.37	12.0						
2.21	11.5	2.16	10.9	2.16	10.4	2.15	9.8	2.05	9.3	2.00	8.7	1.93	8.2						
1.77	7.7	1.66	7.1	1.54	6.6	1.54	6.0	1.51	5.5	1.45	4.9	1.39	4.4						
1.24	3.8	1.21	3.3	1.20	2.7	1.20	2.2	1.19	1.6	1.11	1.1	1.04	0.5						
1.02	0.0																		

77.24963	55.91315	48.96854	40.80717	40.30414	40.30414	30.89983	29.98073	24.60178	21.70746
20.50148	20.50148	18.83405	18.45134	11.73412	10.77902	10.49326	7.73187	5.29712	4.45169
4.35654	4.03341	4.03041	3.66776	3.19933	2.98681	2.95833	2.76715	2.64856	2.63591
2.48900	2.30642	2.30642	2.20713	2.18116	2.17075	2.16786	2.14077	2.13000	2.04213
2.03648	1.87793	1.85399	1.80013	1.78352	1.68008	1.64812	1.57370	1.51026	1.49756
1.41933	1.41255	1.32428	1.31795	1.31455	1.27744	1.27594	1.27251	1.22421	1.21604
1.15721	1.13014	1.13014	1.11612	1.08913	1.00324				

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

77.25	98.5	55.91	97.0	48.97	95.5	40.81	93.9	40.31	92.4	40.30	90.9	30.90	89.4						
29.98	87.9	24.60	86.4	21.71	84.8	20.50	83.3	20.50	81.8	18.83	80.3	18.45	78.8						
11.73	77.3	10.78	75.8	10.49	74.2	7.73	72.7	5.30	71.2	4.45	69.7	4.36	68.2						
4.03	66.7	4.03	65.2	3.67	63.6	3.20	62.1	2.98	60.6	2.96	59.1	2.77	57.6						
2.65	56.1	2.64	54.5	2.49	53.0	2.31	51.5	2.31	50.0	2.21	48.5	2.18	47.0						
2.17	45.5	2.17	43.9	2.14	42.4	2.13	40.9	2.04	39.4	2.04	37.9	1.88	36.4						
1.85	34.8	1.81	33.3	1.76	31.8	1.68	30.3	1.64	28.8	1.57	27.3	1.51	25.8						
1.50	24.2	1.42	22.7	1.41	21.2	1.32	19.7	1.32	18.2	1.31	16.7	1.28	15.2						
1.27	13.6	1.27	12.1	1.22	10.6	1.22	9.1	1.16	7.6	1.13	6.1	1.13	4.5						
1.12	3.0	1.09	1.5	1.03	0.0														

122.38891	7 .37486	63.85507	63.85507	48.96419	48.95555	40.80348	30.96494	29.97807	27.32201

25.80411	25.80411	23.22369	18.83237	18.59071	17.07751	10.49233	8.39238	7.73119	6.38551
6.38551	4.45129	4.38478	4.35693	4.19619	3.94347	3.49683	3.45569	3.31767	3.22642
3.19962	2.95807	2.93733	2.90296	2.90296	2.73220	2.66180	2.36827	2.31502	2.26573
2.24482	2.12981	2.09809	2.06433	2.04231	1.98072	1.87810	1.78644	1.72238	1.70085
1.65884	1.60344	1.60163	1.57921	1.53056	1.49769	1.41962	1.41243	1.31467	1.27733
1.22410	1.15731	1.12994	1.12994	1.08923	1.04905				

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

122.39	98.5	70.37	97.0	63.86	95.5	63.86	93.9	48.96	92.4	48.96	90.9	40.80	89.4		
30.96	87.9	29.98	86.4	27.32	84.8	25.80	83.3	25.80	81.8	23.22	80.3	18.83	78.8		
18.59	77.3	17.88	75.8	10.49	74.2	8.39	72.7	7.73	71.2	6.39	69.7	6.39	68.2		
4.45	66.7	4.38	65.2	4.36	63.6	4.20	62.1	3.94	60.6	3.50	59.1	3.46	57.6		
3.32	56.1	3.23	54.5	3.20	53.0	2.96	51.5	2.94	50.0	2.90	48.5	2.90	47.0		
2.73	45.5	2.66	43.9	2.37	42.4	2.32	40.9	2.27	39.4	2.24	37.9	2.13	36.4		
2.10	34.8	2.06	33.3	2.04	31.8	1.98	30.3	1.88	28.8	1.79	27.3	1.72	25.8		
1.70	24.2	1.66	22.7	1.60	21.2	1.60	19.7	1.58	18.2	1.53	16.7	1.50	15.2		
1.42	13.6	1.41	12.1	1.31	10.6	1.28	9.1	1.22	7.6	1.16	6.1	1.13	4.5		
1.13	3.0	1.09	1.5	1.05	0.0										

380.30542	124.22978	63.05457	40.56848	40.44116	22.88898	21.84456	21.36305	18.38234	17.58311
17.58311	16.56728	16.09920	16.09920	16.02228	15.52872	15.48913	13.48040	13.48040	13.15096
13.04413	12.75575	12.29514	11.84463	11.04985	10.73280	10.45419	10.06200	9.77386	9.47012
9.47012	9.40216	9.11125	8.94400	8.40728	8.21656	8.04960	8.04960	7.91273	7.80163
7.63141	7.47412	7.33353	7.28990	7.23243	7.12102	6.83264	6.40892	6.31893	5.78595
5.74933	5.68727	5.36640	4.96919	4.94546	4.70246	4.68098	4.59946	4.57780	4.34851
4.27261	4.26498	4.24412	4.01818	4.00557	3.91980	3.74478	3.65891	3.65848	3.60286
3.56051	3.46182	3.41046	3.37311	3.32589	3.32589	3.23645	3.20446	3.20446	3.20446
3.20424	3.09811	2.88865	2.73200	2.68320	2.65255	2.52757	2.49652	2.49652	2.31092
2.29986	2.24673	2.17557	2.13630	2.13630	2.11191	2.11191	2.08057	2.02842	2.01240
2.01240	1.98611	1.89965	1.87239	1.85455	1.80133	1.79437	1.75831	1.75831	1.75831
1.72480	1.71491	1.62274	1.61822	1.61499	1.56033	1.45640	1.39758	1.34804	1.29507
1.24238	1.24238	1.24238	1.23636	1.20736	1.14994	1.14987	1.05595	1.05091	1.03855
1.03855	1.00620								

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

380.31	99.2	124.23	98.5	63.05	97.7	40.57	97.0	40.44	96.2	22.89	95.5	21.84	94.7		
21.36	93.9	18.38	93.2	17.58	92.4	17.58	91.7	16.57	90.9	16.10	90.2	16.10	89.4		
16.02	88.6	15.53	87.9	15.49	87.1	13.48	86.4	13.48	85.6	13.15	84.8	13.04	84.1		
12.76	83.3	12.31	82.6	11.84	81.8	11.05	81.1	10.73	80.3	10.45	79.5	10.06	78.8		
9.77	78.0	9.47	77.3	9.47	76.5	9.40	75.8	9.11	75.0	8.94	74.2	8.41	73.5		
.22	72.7	8.15	72.0	8.05	71.2	7.91	70.5	7.80	69.7	7.63	68.9	7.47	68.2		
.33	67.4	7.29	66.7	7.23	65.9	7.12	65.2	6.83	64.4	6.41	63.6	6.32	62.9		
5.79	62.1	5.75	61.4	5.69	60.6	5.37	59.8	4.97	59.1	4.95	58.3	4.70	57.6		
4.68	56.8	4.60	56.1	4.58	55.3	4.35	54.5	4.27	53.8	4.06	53.0	4.04	52.3		
4.02	51.5	4.01	50.8	3.92	50.0	3.74	49.2	3.66	48.5	3.66	47.7	3.60	47.0		
3.56	46.2	3.46	45.5	3.41	44.7	3.37	43.9	3.33	43.2	3.33	42.4	3.24	41.7		
3.21	41.4	3.21	40.2	3.20	39.4	3.20	38.6	3.10	37.9	2.89	37.1	2.70	36.4		
2.68	35.6	2.65	34.8	2.53	34.1	2.50	33.3	2.50	32.6	2.31	31.8	2.30	31.1		
2.25	30.3	2.18	29.5	2.14	28.8	2.14	28.0	2.13	27.3	2.11	26.5	2.08	25.8		
2.03	25.0	2.01	24.2	2.01	23.5	1.99	22.7	1.90	22.0	1.87	21.2	1.85	20.5		
1.81	19.7	1.79	18.9	1.76	18.2	1.76	17.4	1.76	16.7	1.72	15.9	1.71	15.2		
1.62	14.4	1.62	13.6	1.61	12.9	1.56	12.1	1.46	11.4	1.40	10.6	1.35	9.8		
1.3	9.1	1.24	8.3	1.24	7.6	1.24	6.8	1.24	6.1	1.21	5.3	1.15	4.5		
1.15	3.8	1.06	3.0	1.05	2.3	1.04	1.5	1.04	0.8	1.01	0.0				

240.04181	98.70116	64.07217	40.57208	39.79886	29.12370	27.85745	27.85745	22.88693	21.84651
21.36115	21.35738	21.35738	20.26318	20.26318	16.02086	13.50879	12.66450	12.33765	12.08909
11.91952	11.91952	11.25733	11.04887	10.45696	10.45512	10.44850	10.36362	10.13160	10.13160
10.01128	9.77644	9.17472	9.76854	8.21583	8.05119	7.80233	7.47610	7.47479	7.47006
7.45025	7.33419	7.12039	6.88948	6.75440	6.44027	6.40835	6.40722	6.21026	5.79625
5.75085	5.74984	5.74620	5.42856	5.30652	5.26931	5.26931	4.99437	4.68140	4.60527
4.60768	4.59987	4.59696	4.57739	4.57658	4.27223	4.07354	4.00522	4.00451	3.94805
3.89677	3.74512	3.66127	3.58970	3.56019	3.55956	3.41016	3.37720	3.37281	3.20417
3.20417	3.20417	3.12148	2.89474	2.88233	2.78575	2.78575	2.78575	2.73827	2.71699
2.65279	2.61871	2.56578	2.53620	2.53290	2.53290	2.49967	2.49674	2.49674	2.39099
2.18504	2.14675	2.13612	2.13612	2.13574	2.03677	2.02860	1.87256	1.83309	1.79453
1.72495	1.67792	1.67792	1.62288	1.56046	1.52553	1.52553	1.50758	1.44737	1.43117
1.29519	1.28311	1.28144	1.26645	1.24227	1.24227	1.24227	1.20747	1.19195	1.17055
1.14997	1.11039								

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

240.04 99.2	98.70 98.5	64.07 97.7	40.57 97.0	39.80 96.2	29.12 95.5	27.86 94.7			
27.86 93.9	22.89 93.2	21.85 92.4	21.36 91.7	21.36 90.9	21.36 90.2	20.26 89.4			
20.26 88.6	16.02 87.9	13.51 87.1	12.66 86.4	12.34 85.6	12.09 84.8	11.92 84.1			
11.92 83.3	11.26 82.6	11.05 81.8	10.46 81.1	10.46 80.3	10.45 79.5	10.36 78.8			
10.13 78.0	10.13 77.3	10.01 76.5	9.78 75.8	9.77 75.0	9.77 74.2	8.22 73.5			
8.05 72.7	7.80 72.0	7.48 71.2	7.47 70.5	7.47 69.7	7.45 68.9	7.33 68.2			
7.12 67.4	6.89 66.7	6.75 65.9	6.44 65.2	6.41 64.4	6.41 63.6	6.21 62.9			
5.81 62.1	5.75 61.4	5.75 60.6	5.75 59.8	5.43 59.1	5.31 58.3	5.27 57.6			
5.27 56.8	4.99 56.1	4.68 55.3	4.61 54.5	4.60 53.8	4.60 53.0	4.60 52.3			
4.58 51.5	4.58 50.8	4.27 50.0	4.07 49.2	4.01 48.5	4.00 47.7	3.95 47.0			
3.90 46.2	3.75 45.5	3.66 44.7	3.59 43.9	3.56 43.2	3.56 42.4	3.41 41.7			
3.38 40.9	3.37 40.2	3.21 39.4	3.20 38.6	3.20 37.9	3.12 37.1	2.89 36.4			
2.86 35.6	2.79 34.8	2.79 34.1	2.79 33.3	2.74 32.6	2.72 31.8	2.65 31.1			
2.62 30.3	2.55 29.5	2.54 28.8	2.53 28.0	2.53 27.3	2.50 26.5	2.50 25.8			
2.50 25.0	2.39 24.2	2.19 23.5	2.15 22.7	2.14 22.0	2.14 21.2	2.14 20.5			
2.04 19.7	2.03 18.9	1.87 18.2	1.83 17.4	1.79 16.7	1.72 15.9	1.68 15.2			
1.68 14.4	1.62 13.6	1.56 12.9	1.53 12.1	1.53 11.4	1.51 10.6	1.45 9.8			
1.43 9.1	1.31 8.3	1.28 7.6	1.28 6.8	1.27 6.1	1.24 5.3	1.24 4.5			
1.24 3.8	1.21 3.0	1.19 2.3	1.17 1.5	1.15 0.8	1.11 0.0				

865.94580	282.86792	143.57362	92.37343	49.73953	37.72325	35.35851	29.94441	29.70114	23.80391
18.01707	17.76411	17.76091	13.88148	12.94978	11.43181	11.26168	11.01901	10.61525	10.05236
9.14930	8.75941	8.52678	8.42630	8.20317	8.16558	8.07315	7.07043	7.07043	7.03666
6.69837	6.53246	6.48177	6.15238	5.92031	5.68452	5.18542	5.15259	4.85287	4.80876
4.80876	4.41902	4.37376	4.22275	4.15908	4.12208	4.08218	3.80543	3.71107	3.61127
3.55282	3.53522	3.35112	3.12740	2.94884	2.87167	2.81466	2.77514	2.36474	2.35681
2.11966	1.91352	1.90978	1.87644	1.80563	1.77609	1.75916	1.68910	1.62507	1.60692
1.56370	1.54578	1.40733	1.40733	1.40733	1.38626	1.38626	1.35970	1.29498	1.26864
1.17840	1.13147	1.13147	1.11006	1.08204	1.06585	1.06585	1.04661	1.01346	1.01006

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

865.95 98.9	282.87 97.8	143.57 96.7	92.37 95.6	49.74 94.4	37.72 93.3	35.36 92.2			
29.94 91.1	29.70 90.0	23.81 88.9	18.02 87.8	17.76 86.7	17.76 85.6	13.88 84.4			
12.95 83.3	11.43 82.2	11.26 81.1	11.02 80.0	10.62 78.9	10.05 77.8	9.15 76.7			
8.76 75.6	8.53 74.4	8.43 73.3	8.20 72.2	8.17 71.1	8.07 70.0	7.07 68.9			
7.07 67.8	7.04 66.7	6.70 65.6	6.53 64.4	6.48 63.3	6.15 62.2	5.92 61.1			
5.68 60.0	5.19 58.9	5.15 57.8	4.85 56.7	4.81 55.6	4.81 54.4	4.42 53.3			
4.37 52.2	4.22 51.1	4.16 50.0	4.12 48.9	4.08 47.8	3.81 46.7	3.71 45.6			
3.61 44.4	3.55 43.3	3.54 42.2	3.35 41.1	3.13 40.0	2.95 38.9	2.87 37.8			
2.81 36.7	2.78 35.6	2.36 34.4	2.36 33.3	2.12 32.2	1.91 31.1	1.91 30.0			
1.88 28.9	1.81 27.8	1.78 26.7	1.76 25.6	1.69 24.4	1.63 23.3	1.61 22.2			

1.56 21.1	1.55 20.0	1.41 18.9	1.41 17.8	1.41 16.7	1.39 15.6	1.39 14.4			
1.36 13.3	1.29 12.2	1.27 11.1	1.18 10.0	1.13 8.9	1.13 7.8	1.11 6.7			
1.08 5.6	1.07 4.4	1.07 3.3	1.05 2.2	1.01 1.1	1.01 0.0				

546.56909	224.74005	92.38164	90.62103	49.74396	28.13916	28.09250	23.81023	23.80603	23.7909
23.59770	17.76569	12.79053	11.37205	10.05147	9.37972	8.89917	8.89917	8.76173	8.76019
8.75465	8.52754	8.17366	7.21554	7.10753	7.03603	6.92949	6.70015	6.69897	6.69473
6.51746	6.46752	5.87957	5.77487	5.68502	5.56198	5.30928	5.23481	5.15396	5.15305
5.[illegible]79	4.88810	4.85243	4.54531	4.44958	4.39674	4.12317	4.12244	4.11983	3.82058
3.[illegible]058	3.80509	3.55314	3.12712	3.03165	3.02572	2.96639	2.94911	2.81441	2.81392
2.66790	2.66532	2.28155	2.27265	2.04539	2.02254	2.00994	1.87627	1.75901	1.75870
1.71138	1.56356	1.56329	1.54591	1.49258	1.48319	1.40721	1.40721	1.40721	1.38614
1.38614	1.27131	1.22344	1.20259	1.11240	1.11240	1.08214	1.06613	1.06594	1.06594

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

546.57 98.9	224.74 97.8	92.38 96.7	90.62 95.6	49.74 94.4	28.14 93.3	28.09 92.2			
23.81 91.1	23.81 90.0	23.79 88.9	23.60 87.8	17.77 86.7	12.79 85.6	11.37 84.4			
10.05 83.3	9.38 82.2	8.90 81.1	8.90 80.0	8.76 78.9	8.76 77.8	8.75 76.7			
8.53 75.6	8.17 74.4	7.22 73.3	7.11 72.2	7.04 71.1	6.93 70.0	6.70 68.9			
6.70 67.8	6.69 66.7	6.52 65.6	6.47 64.4	5.88 63.3	5.77 62.2	5.69 61.1			
5.56 60.0	5.31 58.9	5.23 57.8	5.15 56.7	5.15 55.6	5.15 54.4	4.89 53.3			
4.85 52.2	4.55 51.1	4.45 50.0	4.40 48.9	4.12 47.8	4.12 46.7	4.12 45.6			
3.82 44.4	3.82 43.3	3.81 42.2	3.55 41.1	3.13 40.0	3.03 38.9	3.03 37.8			
2.97 36.7	2.95 35.6	2.81 34.4	2.81 33.3	2.67 32.2	2.67 31.1	2.28 30.0			
2.27 28.9	2.05 27.8	2.02 26.7	2.01 25.6	1.88 24.4	1.76 23.3	1.76 22.2			
1.71 21.1	1.56 20.0	1.56 18.9	1.55 17.8	1.49 16.7	1.48 15.6	1.41 14.4			
1.41 13.3	1.41 12.2	1.39 11.1	1.39 10.0	1.27 8.9	1.22 7.8	1.20 6.7			
1.11 5.6	1.11 4.4	1.08 3.3	1.07 2.2	1.07 1.1	1.07 0.0				

57.30559	47.16605	47.16605	36.16063	28.79031	25.40321	23.99193	22.04060	21.59273	12.61418
12.27977	9.[illegible]4825	8.19897	4.71661	4.71661	4.65116	3.25581	3.13416	3.08468	2.73388
2.69909	2.58290	2.55252	2.54715	2.54032	2.16964	2.03673	1.94415	1.91935	1.85247
1.74503	1.66098	1.65305	1.49493	1.48915	1.43264	1.32244	1.29054	1.21620	1.07448
1.03127	1.00495								

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

57.31 97.6	47.17 95.2	47.17 92.9	36.16 90.5	28.79 88.1	25.40 85.7	23.99 83.3			
22.04 81.0	21.59 78.6	12.61 76.2	12.28 73.8	9.05 71.4	6.20 69.0	4.72 66.7			
4.72 64.3	4.65 61.9	3.26 59.5	3.13 57.1	3.06 54.8	2.73 52.4	2.70 50.0			
2.58 47.6	2.55 45.2	2.55 42.9	2.54 40.5	2.17 38.1	2.04 35.7	1.94 33.3			
1.92 31.0	1.85 28.6	1.75 26.2	1.66 23.8	1.65 21.4	1.49 19.0	1.49 16.7			
1.43 14.3	1.32 11.9	1.29 9.5	1.22 7.1	1.07 4.8	1.01 2.4	1.00 0.0			

74.72659	74.72659	57.30051	57.29041	36.23682	31.97365	30.19734	27.17761	22.03865	19.98502
12.27869	9.82121	9.04745	7.47266	7.47266	4.65158	4.09217	4.04403	3.88252	3.43742
3.39720	3.25610	3.19737	2.73412	2.41579	2.09059	2.02372	1.97822	1.87432	1.74518
1.65290	1.61820	1.59217	1.54464	1.49479	1.47180	1.43251	1.32232	1.30268	1.22765
1.07438	1.01118								

PARAMETERS IMMEDIATELY ABOVE VS PER CENT CONFIDENCE LEVEL

74.73 97.6	74.73 95.2	57.30 92.9	57.29 90.5	36.24 88.1	31.97 85.7	30.20 83.3			

27.18 81.[illegible]	22.[illegible]4 78.6	19.99 76.2	12.28 73.8	9.82 71.4	9.05 69.0	7.47 66.7
7.47 64.3	4.65 61.9	4.09 59.5	4.04 57.1	3.88 54.8	3.44 52.4	3.40 50.0
3.26 47.6	3.20 45.2	2.73 42.9	2.42 40.5	2.09 38.1	2.02 35.7	1.98 33.3
1.87 31.0	1.75 28.6	1.65 26.2	1.62 23.8	1.59 21.4	1.54 19.0	1.49 16.7
1.47 14.3	1.43 11.9	1.32 9.5	1.30 7.1	1.23 4.8	1.07 2.4	1.01 0.0

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