NAME OF CONTRACTOR: Paul M. Raccah

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**NVL - SAMPLE DATA**

Plasma Conditions: 60 watts RF power
+40 VDC sample bias
.5 torr O\textsubscript{2}

Samples:

**#1** 488\textgreek{A} Plasma oxide on LPE
6 min. growth time
Rockwell #5-271B LPE - (111), \( \lambda = 3.87 \ \mu\text{m}, 25-28 \ \mu\text{m} \) thick
p-type, \( 4.8 \times 10^{15}/\text{cm}^{3} \) @ 77K
mobility \( 238 \text{cm}^{2}\text{v}^{-1}\text{s}^{-1} \) @ 77K
\( x = 0.32 \pm 0.01 \) (by EER)

**#2** 445\textgreek{A} Plasma oxide on Bulk
5 min. growth time
Cominco #15(321)-10B - (111), Bulk
n-type, \( -2.7 \times 10^{15}/\text{cm}^{3} \) @ 300K
\( -1.7 \times 10^{14}/\text{cm}^{3} \) @ 77K
mobility \( 5.6 \times 10^{3} \text{cm}^{2}\text{v}^{-1}\text{s}^{-1} \) @ 300K
\( 6.4 \times 10^{4} \text{cm}^{2}\text{v}^{-1}\text{s}^{-1} \) @ 77K
\( x = 0.295 \pm 0.05 \)

**#3 a** 237\textgreek{A} Plasma oxide on LPE
2 min. growth time

**b** 363\textgreek{A} Plasma oxide on LPE
6 min growth time
Fermionics #4318 LPE - (111), \( \lambda = 12.5 \ \mu\text{m}, 20 \ \mu\text{m} \) thick
n-type, \( -1.1 \times 10^{14}/\text{cm}^{3} \) @ 77K
mobility \( 1.4 \times 10^{5} \text{cm}^{2}\text{v}^{-1}\text{s}^{-1} \) @ 77K
\( x = 0.2 \)
SIMS DATA
Control - only native surface oxide
Sample #1

488K Plasma oxide on LPE (by ellipsometry)
6 min. growth time
Rockwell #5-271B LPE - (111), λ = 3.87 μm, 25-28 μm thick
p-type, $4.8 \times 10^{16} \text{cm}^{-3} @ 77K$
mobility 238 cm$^2$/V·s @ 77K
x = .32 ± .01 (by EER)

\[ 488K \text{ Plasma oxide on LPE (by ellipsometry)} \]

\[ 6 \text{ min. growth time} \]

\[ \text{Rockwell #5-271B LPE - (111), } \lambda = 3.87 \mu \text{m, 25-28 } \mu \text{m thick} \]

\[ \text{p-type, } 4.8 \times 10^{16} \text{ cm}^{-3} @ 77K \]

\[ \text{mobility 238 cm}^2/\text{V·s @ 77K} \]

\[ x = .32 \pm .01 \text{ (by EER)} \]
Sample 2

445\textsuperscript{R} Plasma oxide on Bulk (by ellipsometry)

5 min. growth time

Cominco 015(321)-10B - (111), Bulk

- n-type, $-2.7 \times 10^{15}/\text{cm}^3$ @ 300K
  - $1.7 \times 10^{14}/\text{cm}^3$ @ 77K
- Mobility 5.6 $\times 10^{3}$ cm$^2$/V·s @ 300K
  - 6.4 $\times 10^{4}$ cm$^2$/V·s @ 77K
- $x = 0.295 \pm 0.05$
a. 237Å Plasma oxide on LPE (by ellipsometry)
2 min. growth time

b. 363Å Plasma oxide on LPE (by ellipsometry)
6 min growth time

Fermionics #4318 LPE - (111), λ = 12.5 μm, 20 μm thick
n-type, -1.1 x 10^14 /cm³ @ 77K
mobility 1.4 x 10^2 cm²/v·s @ 77K
x = .2
Sample #3B

237\(\alpha\) Plasma oxide on LPE (by ellipsometry)
2 min. growth time

363\(\alpha\) Plasma oxide on LPE (by ellipsometry)
6 min growth time

Ferromics #4318 LPE - (111), \(\lambda = 12.5 \, \mu\text{m}\), 20,\,\mu\text{m} thick
n-type, \(-1.1 \times 10^{14} / \text{cm}^3\) \(\text{cm}^{-3}\) @ 77K
mobility \(1.4 \times 10^5 \, \text{cm}^2 / \text{V} \cdot \text{s}\) @ 77K
\(x = 0.2\)