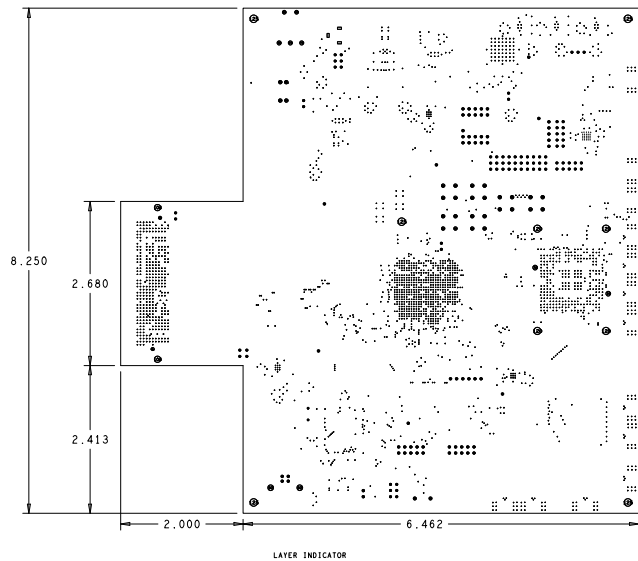


- FAB NOTES:
1. MATERIAL: SP 4080-A U. 344-D.  
TOTAL MATERIAL THICKNESS OVER MASK: .002 INCHES +/- .010  
COPPER WEIGHT: SEE STACKUP REPORT P22200A.
  2. NUMBER OF LAYERS: 10
  3. COPPER PLATE THICKNESS: 18.0 INCHES
  4. FINISH: HARD (ELECTROLYTIC) NICKELLING MICRO INCHES) & GOLD BONDING-10 MICRO INCHES PLATED OVER COPPER SURFACE.
  5. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  6. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  7. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  8. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  9. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  10. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  11. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  12. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  13. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).
  14. HOLE DRILLING: 80% DIA. WITH 10% TOLERANCE (HOLE DIA. 1.00).



| DRILL CHART: TOP & BOTTOM |           |            |      |
|---------------------------|-----------|------------|------|
| ALL UNITS ARE IN MILS     |           |            |      |
| FIGURE                    | SIZE      | PLATED     | QTY  |
| -                         | 9.84      | PLATED     | 351  |
| -                         | 10.0      | PLATED     | 25   |
| -                         | 10.0      | PLATED     | 1356 |
| -                         | 13.0      | PLATED     | 569  |
| *                         | 31.0      | PLATED     | 2    |
| *                         | 36.0      | PLATED     | 67   |
| *                         | 37.0      | PLATED     | 10   |
| *                         | 40.0      | PLATED     | 65   |
| *                         | 51.0      | PLATED     | 2    |
| *                         | 59.0      | PLATED     | 24   |
| *                         | 60.0      | PLATED     | 3    |
| *                         | 60.0      | PLATED     | 1    |
| *                         | 65.0      | PLATED     | 2    |
| *                         | 70.0      | PLATED     | 3    |
| *                         | 92.0      | PLATED     | 2    |
| ⊙                         | 106.0     | PLATED     | 2    |
| ⊙                         | 120.0     | PLATED     | 4    |
| ⊙                         | 125.0     | PLATED     | 5    |
| *                         | 51.0      | NON-PLATED | 2    |
| *                         | 78.0      | NON-PLATED | 2    |
| =                         | 64.0x36.0 | PLATED     | 2    |
| =                         | 64.0x36.0 | PLATED     | 1    |

|                                        |               |                                              |  |                         |  |                                 |  |
|----------------------------------------|---------------|----------------------------------------------|--|-------------------------|--|---------------------------------|--|
| Cust: <b>DDI - Milpitas</b>            |               |                                              |  | Total Layers: <b>10</b> |  |                                 |  |
| Part #: <b>NATIONAL SEMI 10 LAYERS</b> | Rev: <b>-</b> | Finished Thickness: <b>0.0620 +/- 0.0060</b> |  |                         |  | Finished Over: <b>All</b>       |  |
|                                        |               | Lam Thickness: <b>0.0580 +/- 0.0030</b>      |  |                         |  | Material Type: <b>NP 4000-6</b> |  |

| Impedance Requirements: |                                | Orig Line | Fin. Line | Ref Pln | 2nd Ref Pln | Targeted Desired Impedance | Impedance Tolerance | Actual Calculated Impedance | Diff Line Centers | Diff Line Space | Original Coplanar Spacing | Finished Coplanar Spacing |
|-------------------------|--------------------------------|-----------|-----------|---------|-------------|----------------------------|---------------------|-----------------------------|-------------------|-----------------|---------------------------|---------------------------|
| L#                      | Impedance Type                 |           |           |         |             |                            |                     |                             |                   |                 |                           |                           |
| 1                       | DIF-Coated Microstrip Edg Cpld |           | .00400    | 2       |             | 100.00 $\Omega$            | +/- 10%             | 100.04 $\Omega$             | .01000            | .00600          |                           |                           |
| 1                       | SE-Coated Microstrip           |           | .00550    | 2       |             | 50.00 $\Omega$             | +/- 10%             | 50.50 $\Omega$              |                   |                 |                           |                           |
| 3                       | DIF-Stripline Edg Cpld         |           | .00400    | 2       | 4           | 100.00 $\Omega$            | +/- 10%             | 99.84 $\Omega$              | .00800            | .00400          |                           |                           |
| 3                       | SE-Stripline                   |           | .00600    | 2       | 4           | 50.00 $\Omega$             | +/- 10%             | 49.74 $\Omega$              |                   |                 |                           |                           |
| 6                       | DIF-Stripline Edg Cpld         |           | .00400    | 7       | 5           | 100.00 $\Omega$            | +/- 10%             | 99.84 $\Omega$              | .00800            | .00400          |                           |                           |
| 6                       | SE-Stripline                   |           | .00600    | 7       | 5           | 50.00 $\Omega$             | +/- 10%             | 49.74 $\Omega$              |                   |                 |                           |                           |
| 8                       | DIF-Stripline Edg Cpld         |           | .00400    | 9       | 7           | 100.00 $\Omega$            | +/- 10%             | 99.84 $\Omega$              | .00800            | .00400          |                           |                           |
| 8                       | SE-Stripline                   |           | .00600    | 9       | 7           | 50.00 $\Omega$             | +/- 10%             | 49.74 $\Omega$              |                   |                 |                           |                           |
| 10                      | DIF-Coated Microstrip Edg Cpld |           | .00400    | 9       |             | 100.00 $\Omega$            | +/- 10%             | 100.04 $\Omega$             | .01000            | .00600          |                           |                           |
| 10                      | SE-Coated Microstrip           |           | .00550    | 9       |             | 50.00 $\Omega$             | +/- 10%             | 50.50 $\Omega$              |                   |                 |                           |                           |

|                                    |
|------------------------------------|
| <b>Controlled Impedance Notes:</b> |
|                                    |

| Lamination Stackup: |                       | Thickness and Tolerances: |                   | Base Material Rqmts: |              | Dk @ 1Ghz |
|---------------------|-----------------------|---------------------------|-------------------|----------------------|--------------|-----------|
| L#/Type             | Description:          | Cu+:                      | Laminate/PrePreg: | Type:                | Description: |           |
| 1 Sig               | Foil ( H oz )         | .00060                    |                   |                      |              |           |
|                     | Pre-Preg ( 1 x 2113 ) |                           | .0036 +/- 0.0004  |                      | NP 4000-6    | 4.11      |
| 2 Pln               | Core 0.0060 1/H       | .00120                    | .0060             |                      | NP 4000-6    |           |
| 3 Sig               |                       | .00060                    |                   |                      |              | 4.1       |
|                     | Pre-Preg ( 2 x 2113 ) |                           | .0070 +/- 0.0007  |                      | NP 4000-6    | 4.14      |
| 4 Pln               | Core 0.0030 1/1       | .00120                    | .0030             |                      | NP 4000-6    |           |
| 5 Pln               |                       | .00120                    |                   |                      |              | 4.35      |
|                     | Pre-Preg ( 2 x 2113 ) |                           | .0070 +/- 0.0007  |                      | NP 4000-6    | 4.14      |
| 6 Sig               | Core 0.0060 H/1       | .00060                    | .0060             |                      | NP 4000-6    |           |
| 7 Pln               |                       | .00120                    |                   |                      |              | 4.1       |
|                     | Pre-Preg ( 2 x 2113 ) |                           | .0070 +/- 0.0007  |                      | NP 4000-6    | 4.14      |
| 8 Sig               | Core 0.0060 H/1       | .00060                    | .0060             |                      | NP 4000-6    |           |
| 9 Pln               |                       | .00120                    |                   |                      |              | 4.1       |
|                     | Pre-Preg ( 1 x 2113 ) |                           | .0036 +/- 0.0004  |                      | NP 4000-6    | 4.11      |
| 10 Sig              | Foil ( H oz )         | .00060                    |                   |                      |              |           |

|                                                                                                                   |                       |
|-------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Target Post-Lam Thickness: 0.0580 +/- 0.0030</b><br>Copper Oz Legend: H=1/2oz T=3/8oz Q=1/4oz E=1/8oz S=1/16oz | <b>Stackup Notes:</b> |
|-------------------------------------------------------------------------------------------------------------------|-----------------------|

**APPROVED STACKUP MUST BE INCLUDED WITH THE DATA PACKAGE PRIOR TO MANUFACTURING**

|                                        |              |                                              |                                 |
|----------------------------------------|--------------|----------------------------------------------|---------------------------------|
| Cust: <b>DDI - Milpitas</b>            |              | Total Layers: <b>10</b>                      |                                 |
| Part #: <b>NATIONAL SEMI 10 LAYERS</b> | Rev <b>-</b> | Finished Thickness: <b>0.0620 +/- 0.0060</b> | Finished Over: <b>All</b>       |
|                                        |              | Lam Thickness: <b>0.0580 +/- 0.0030</b>      | Material Type: <b>NP 4000-6</b> |

\* The Controlled Impedance Stackup and tables were calculated utilizing ApsimRLGC from Applied Simulation Technology  
 \* Impedance value tolerances shall be +/- 10% or customer required tolerance.

Designed Artwork Spacing Requirements: (Based On Starting Copper Weight)

External Layers:

- \* 1/4 oz. Copper = .003 Min.
- \* 3/8 oz. Copper = .0035 Min.
- \* 1/2 oz. Copper = .004 Min.
- \* 1 oz. Copper = .005 Min.
- \* 2 oz. Copper = .007 Min.

Internal Layers:

- \* 3/8 oz. Copper = .00325 Min.
- \* 1/2 oz. Copper = .0035 Min.
- \* 1 oz. Copper = .004 Min.
- \* 2 oz. Copper = .006 Min.

Note: Min. spacing outside of the parameters above will require DDI's engineering approval.

Finished Copper Thickness On External Layers:

Conductor thickness calculated in RLGC includes base copper and additional copper plating (*assuming hole plating requirement is .001 min.*) - Finished surface conductor thickness is as follows:

- \* 1/4 oz. Base Copper + Copper Plating = .0016
- \* 3/8 oz. Base Copper + Copper Plating = .0017
- \* 1/2 oz. Base Copper + Copper Plating = .0019
- \* 1 oz. Base Copper + Copper Plating = .0024
- \* 2 oz. Base Copper + Copper Plating = .0036

Note: Soldermask thickness over the conductor calculated on RLGC is .8 mils.

\* If written authorization is required, please sign below and Fax back to (408) 956-2072

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_