

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

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
1 DIF-Coated Microstrip Edg Cpld		.00400	2		100.00 Ω	+/- 10%	100.04 Ω	.01000	.00600		
1 SE-Coated Microstrip		.00550	2		50.00 Ω	+/- 10%	50.50 Ω				
3 DIF-Stripline Edg Cpld		.00400	2	4	100.00 Ω	+/- 10%	99.84 Ω	.00800	.00400		
3 SE-Stripline		.00600	2	4	50.00 Ω	+/- 10%	49.74 Ω				
6 DIF-Stripline Edg Cpld		.00400	7	5	100.00 Ω	+/- 10%	99.84 Ω	.00800	.00400		
6 SE-Stripline		.00600	7	5	50.00 Ω	+/- 10%	49.74 Ω				
8 DIF-Stripline Edg Cpld		.00400	9	7	100.00 Ω	+/- 10%	99.84 Ω	.00800	.00400		
8 SE-Stripline		.00600	9	7	50.00 Ω	+/- 10%	49.74 Ω				
10 DIF-Coated Microstrip Edg Cpld		.00400	9		100.00 Ω	+/- 10%	100.04 Ω	.01000	.00600		
10 SE-Coated Microstrip		.00550	9		50.00 Ω	+/- 10%	50.50 Ω				

Controlled Impedance Notes:

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

Target Post-Lam Thickness: 0.0580 +/- 0.0030
 Copper Oz Legend: H=1/2oz T=3/8oz Q=1/4oz E=1/8oz S=1/16oz

Stackup Notes:

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

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* 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: _____