Silicon Valley Division

Pre-Release Stackup Report

Pre-Release #: **P22464B**

Cust: **DDI - Milpitas** | Total Layers: **12**

Part #: **ALTERA CYCLONE III HOST**	Rev **-**	Finished Thickness: **0.0730 +/- 0.0060**	Finished Over: **All**
		Lam Thickness: **0.0680 +/- 0.0030**	Material Type: **Isola 370HR**

Impedance Requirements: L#	Impedance Type	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%	99.42 Ω	.01900	.01500		
1	SE-Coated Microstrip		.00425	2		50.00 Ω	+/- 10%	49.64 Ω				
3	DIF-Stripline Edg Cpld		.00400	2	4	100.00 Ω	+/- 10%	101.01 Ω	.01200	.00800		
3	SE-Stripline		.00450	2	4	50.00 Ω	+/- 10%	49.24 Ω				
6	DIF-Dual Stripline Edg Cpld		.00400	5	8	100.00 Ω	+/- 10%	100.35 Ω	.01400	.01000		
6	SE-Dual Stripline		.00450	5	8	50.00 Ω	+/- 10%	49.60 Ω				
7	DIF-Dual Stripline Edg Cpld		.00400	8	5	100.00 Ω	+/- 10%	100.35 Ω	.01400	.01000		
7	SE-Dual Stripline		.00450	8	5	50.00 Ω	+/- 10%	49.60 Ω				
10	DIF-Stripline Edg Cpld		.00400	11	9	100.00 Ω	+/- 10%	101.01 Ω	.01200	.00800		
10	SE-Stripline		.00450	11	9	50.00 Ω	+/- 10%	49.24 Ω				
12	DIF-Coated Microstrip Edg Cpld		.00400	11		100.00 Ω	+/- 10%	99.42 Ω	.01900	.01500		
12	SE-Coated Microstrip		.00425	11		50.00 Ω	+/- 10%	49.64 Ω				

Controlled Impedance Notes:

Lamination Stackup: L#/Type	Description:	Thickness and Tolerances: Cu+:	Laminate/PrePreg:		Base Material Rqmts: Type:	Description:	Dk @ 1Ghz
1 Mix	Foil (H oz)	.00060					
	Pre-Preg (1 x 1080)		.0027	+/- 0.0003		Isola 370HR	3.9
2 Pln	Core 0.0040 1/H	.00120	.0040			Isola 370HR	
3 Sig		.00060					4.37
	Pre-Preg (1 x 1080)		.0060	+/- 0.0006		Isola 370HR	4.07
	Pre-Preg (1 x 2113)						
4 Pln	Core 0.0040 1/1	.00120	.0040			Isola 370HR	
5 Pln		.00120					4.37
	Pre-Preg (2 x 106)		.0030	+/- 0.0003		Isola 370HR	3.81
6 Sig	Core 0.0180 H/H	.00060	.0180			Isola 370HR	
7 Sig		.00060					4.4
	Pre-Preg (2 x 106)		.0030	+/- 0.0003		Isola 370HR	3.81
8 Pln	Core 0.0040 1/1	.00120	.0040			Isola 370HR	
9 Pln		.00120					4.37
	Pre-Preg (1 x 2113)		.0060	+/- 0.0006		Isola 370HR	4.07
	Pre-Preg (1 x 1080)						
10 Sig	Core 0.0040 H/1	.00060	.0040			Isola 370HR	
11 Pln		.00120					4.37
	Pre-Preg (1 x 1080)		.0027	+/- 0.0003		Isola 370HR	3.9
12 Mix	Foil (H oz)	.00060					

Target Post-Lam Thickness: 0.0680 +/- 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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Part #: **ALTERA CYCLONE III HOST**	Rev **-**	Finished Thickness: **0.0730 +/- 0.0060**	Finished Over: **All**
		Lam Thickness: **0.0680 +/- 0.0030**	Material Type: **Isola 370HR**

* 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: _____