



Building Tomorrow's Technology ... Today

Customer : ALTERA
Part Num : ARRIA V STARTER KIT
Part Rev :

Job Name : P6211
Engineer : Tim Kuntz
Facility : Milpitas

Layer	Cust Thickness	Calc Thickness	Primary Stack	Description
Layer - 1		0.0005 0.0020		Taiyo 4000-BN 1/2oz Sig (Std Plt)
Layer - 2		0.0051 0.0012		FR408HR 1oz P/G
Layer - 3		0.0020 0.0027		FR408HR 2oz Mix
Layer - 4		0.0067 0.0006		FR408HR 1/2oz Sig
Layer - 5		0.0030 0.0012		FR408HR 1oz P/G
Layer - 6		0.0028 0.0006		FR408HR 1/2oz Sig
Layer - 7		0.0050 0.0006		FR408HR 1/2oz Sig
Layer - 8		0.0028 0.0012		FR408HR 1oz P/G
Layer - 9		0.0030 0.0006		FR408HR 1/2oz Sig
Layer - 10		0.0067 0.0027		FR408HR 2oz Mix
Layer - 11		0.0020 0.0012		FR408HR 1oz P/G
Layer - 12		0.0051 0.0020 0.0005		FR408HR 1/2oz Sig (Std Plt) Taiyo 4000-BN

Requirement	Req. Thickness	Tol +	Tol -	Calc Thick
Incl. Plating & Mask	0.0620	0.0062	0.0062	0.0618
Incl. Mask over Laminate	0.0580	0.0058	0.0058	0.0578
Incl. Plating	0.0610	0.0061	0.0061	0.0608
After Lamination	0.0582	0.0029	0.0029	0.0580
Over Laminate	0.0570	0.0057	0.0057	0.0568

Impedance Type	Layer	Design	Actual	Pitch	Plane	tpd ps Atten	Rdc Rac	L ph C pf	Target	Tol (ohms)	Predict
1 Surface MS	L1	-	0.00925	-	-	144.8	0.038	7183	50	5	49.61
	-	-	-	-	L2	0.08	-	2.9			
2 Surface MS	L1	-	0.0035	-	-	141.7	0.105	10530	75	7.5	74.34
	-	-	-	-	L2	0.09	-	1.9			
3 EC Microstrip	L1	-	0.0070	0.0110	-	146.4	0.050	7970	85	8.5	84.5
	-	-	0.0070	-	L2	0.09	-	2.7			

Impedance Type	Layer	Design	Actual	Pitch	Plane	tpd ps Atten	Rdc Rac	L ph C pf	Target	Tol (ohms)	Predict
4  EC Microstrip	L1	-	0.00425	0.0083	-	146.3	0.085	9712	100	10	99.47
	-	-	0.00425	-	L2	0.09	-	2.2			
5  Stripline	L3	-	0.00425	-	L2	155.4	0.151	7858	50	5	50.56
	-	-	-	-	L5	0.10	-	3.1			
6  EC Stripline	L3	0.0040	0.0035	0.0085	L2	155.9	0.189	8588	100	10	99.3
	-	0.0040	0.0035	-	L5	0.10	-	2.8			
7  Stripline	L4	-	0.0045	-	L2	156.4	0.266	7898	50	5	50.49
	-	-	-	-	L5	0.10	-	3.1			
8  EC Stripline	L4	0.0040	0.00375	0.0085	L2	157.1	0.323	8619	100	10	99.03
	-	0.0040	0.00375	-	L5	0.11	-	2.9			
9  Stripline	L6	-	0.00425	-	L5	156.6	0.283	7786	50	5	49.73
	-	-	-	-	L8	0.11	-	3.1			
10  EC Stripline	L6	-	0.00375	0.0100	L5	156.8	0.323	8293	100	10	100.02
	-	-	0.00375	-	L8	0.11	-	3.0			
11  EC Stripline	L7	-	0.00375	0.0100	L5	156.8	0.323	8293	100	10	100.02
	-	-	0.00375	-	L8	0.11	-	3.0			
12  Stripline	L7	-	0.00425	-	L5	-	-	-	50	5	49.73
	-	-	-	-	L8	-	-	-			
13  Stripline	L9	-	0.0045	-	L8	156.4	0.266	7898	50	5	50.49
	-	-	-	-	L11	0.10	-	3.1			
14  EC Stripline	L9	0.0040	0.00375	0.0085	L8	157.1	0.323	8619	100	10	99.03
	-	0.0040	0.00375	-	L11	0.11	-	2.9			
15  Stripline	L10	-	0.00425	-	L8	155.4	0.151	7858	50	5	50.56
	-	-	-	-	L11	0.10	-	3.1			
16  EC Stripline	L10	0.0040	0.0035	0.0085	L8	155.9	0.189	8588	100	10	99.3
	-	0.0040	0.0035	-	L11	0.10	-	2.8			
17  Surface MS	L12	-	0.00925	-	L11	144.8	0.038	7183	50	5	49.61
	-	-	-	-	-	0.08	-	2.9			
18  Surface MS	L12	-	0.0035	-	L11	141.7	0.105	10530	75	7.5	74.34
	-	-	-	-	-	0.09	-	1.9			
19  EC Microstrip	L12	-	0.0070	0.0110	L11	146.4	0.050	7970	85	8.5	84.5
	-	-	0.0070	-	-	0.09	-	2.7			
20  EC Microstrip	L12	-	0.00425	0.0083	L11	146.3	0.085	9712	100	10	99.47
	-	-	0.00425	-	-	0.09	-	2.2			



Bill Of Materials

Material	Material Description	Qty per Panel
FR408HR 0.0020 (1-106) 1 2	Isola - High Speed High-Tg FR4	2
FR408HR 0.0050 (2-1080) H H	Isola - High Speed High-Tg FR4	1
FR408HR 0.0030 (1-1080) H 1	Isola - High Speed High-Tg FR4	2
HTE6P	Copper Foil HTESHINY6%	2
FR408HR 1080	Isola - High Speed High-Tg FR4	4
FR408HR 2113	Isola - High Speed High-Tg FR4	2
FR408HR 2116	Isola - High Speed High-Tg FR4	2