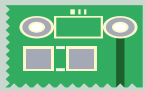
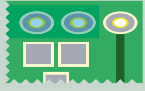
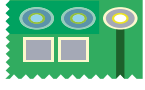
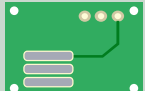


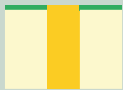
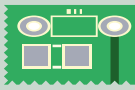
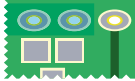
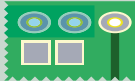
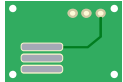
CAPABILITIES

ITEM		STANDARD	HDI	SPECIAL	TOLERANCE
TYPE OF CIRCUIT	-	Double sided, multilayer (4 to 12 layers)	Double sided, multilayer (4 to 32 layers)	Double side, multilayer, more options: Multilayer with blind / buried vias. Controlled impedance. IMS double sided + isolated and plated holes	NA
MATERIALS	-	FR4	FR4	FR4: High and medium Tg, High CTI, halogen free, high frequency, etc.	NA
SOLDERMASK	-	Green, White, Black	Green, White, Black	Red, Blue & other colours available upon request.	NA
SILKSCREEN	-	White, Black	White, Black	Yellow & other colours available upon request.	NA
BASE COPPER THICKNESS (INNER & OUTER)	-	18 – 35 – 70 µm	18 – 35 – 70 µm	105 – 140 – 210 – 400 µm	NA
FINISHING	Immersion tin	1.0 – 1.3 µm	1.0 – 1.3 µm	Other thickness upon request	-
	Immersion silver	0.15 – 0.50 µm	0.15 – 0.50 µm		
	HAL Sn/Pb	1.5 – 10 µm	1.5 – 10 µm		
	HAL Pb free	1.5 – 10 µm	1.5 – 10 µm		
	OSP	√	√		
	ENIG	Ni 4-7 µm, Au 0.05 - 0.12 µm	Ni 4-7 µm, Au 0.05 - 0.12 µm		
	Plated Au	Ni 4-7 µm, Au 0.5-1 µm	Ni 4-7 µm, Au 0.5-1 µm		
THICKNESS		0.6 - 3.2 mm	0.25 - 6 mm	0.25 - 6 mm	± 10%
MINIMUM HOLE DRILLED DIAMETER (PTH)		0.25 mm	0.10 mm	0.15 mm	± 0.05 mm or - 0.0 / + 0.1 mm
(PTH) MINIMUM HOLE FINISHED DIAMETER	-	0.15 mm	0.05 mm	0.05 mm	NA
MINIMUM NPTH		0.6 mm	0.25 mm	0.35 mm	± 0.05 mm
LAYER ALIGNMENT	-	± 0.1 mm	± 0.075 mm	± 0.08 mm	± 0.1 mm
HOLE-PAD ALIGNMENT	-	± 0.15 mm	± 0.10 mm	± 0.10 mm	± 0.05 mm
MINIMUM ANULAR RING (OUTER LAYER)		0.18 mm	0.15 mm	0.15 mm	± 15 % (18 µm)
MINIMUM ANULAR RING (INNER LAYERS)		0.3 mm	0.20 mm	0.20 mm	± 15 % (18 µm)
MINIMUM LINE/SPACE (OUTER LAYERS) – DEPENDING ON BASE Cu THICKNESS		18 µm – 0.12 mm	18 µm – 0.075 mm	105 µm – 0.4 mm	± 15 % (18 µm)
		35 µm – 0.15 mm	35 µm – 0.10 mm	210 µm – 0.6 mm	± 20 % (35 µm)
		70 µm – 0.19 mm	70 µm – 0.15 mm	400 µm – 0.8 mm	± 25 % (70 µm)

CAPABILITIES

ITEM		STANDARD	HDI	SPECIAL	TOLERANCE
MINIMUM LINE/SPACE (INNER LAYERS) – DEPENDING ON BASE Cu THICKNESS		18 μ m – 0.10 mm	18 μ m – 0.075 mm	105 μ m – 0.4 mm	$\pm$ 15 % (18 μ m)
		35 μ m – 0.12 mm	35 μ m – 0.10 mm	210 μ m – 0.6 mm	$\pm$ 20 % (35 μ m)
		70 μ m – 0.16 mm	70 μ m – 0.15 mm	400 μ m – 0.8 mm	$\pm$ 25 % (70 μ m)
ASPECT RATIO	-	8	12	12	NA
SOLDER MASK THICKNESS	-	> 20 μ m	> 20 μ m	> 40 μ m	NA
SOLDER MASK DAMM		0.2 mm	0.15 mm	0.18 mm	NA
PLUGGED VIAS	-	-	-	Yes	NA
MINIMUM SILKSCREEN LINE		0.2 mm	0.1 mm	0.1 mm	NA
CARBON – MINIMUM LINE/SPACE		0.45 mm	0.40 mm	0.40 mm	NA
MAXIMUM DIAMETER COVERED BY PEELABLE MASK		$\varnothing$: 2.5 mm	$\varnothing$: 2.5 mm	2.5 – 5 mm	NA
DISTANCE FROM PEELABLE TO OTHER PADS		1 mm	0.8 mm	0.8 mm	NA
MINIMUM CORE THICKNESS (SCORING)		0.5 mm	0.3 mm	0.3 mm	$\pm$ 0.1 mm
TOLERANCE POSITION SCORING	-	$\pm$ 0.5 mm			
TOLERANCE FOR ROUTING		$\leq$ 50 mm $\pm$ 0.1 > 50 mm / < 200 mm $\pm$ 0.15 $\geq$ 200 mm $\pm$ 0.2	$\pm$ 0.1 mm	$\pm$ 0.1 mm	-
WARPAGE	-	< 0.75 %	< 0.5 %	< 0.5 %	NA

CAPABILITIES

ITEM		STANDARD		TOLERANCE
TYPE OF CIRCUIT	-	Single sided	Single sided	NA
MATERIALS	-	FR4, CEM1, CEM3	IMS aluminium	NA
SOLDERMASK	-	Green, White, Black	Green, White, Black	NA
SILKSCREEN	-	White, Black	White, Black	NA
BASE COPPER THICKNESS	-	18 - 35 - 70 - 105 µm	35 - 70 - 105 µm	NA
FINISHINGS	Immersion tin	1.0 - 1.3 µm	NA	-
	Immersion silver	0.15 - 0.5 µm	0.15 - 0.5 µm	
	HAL Pb free	1.5 - 10 µm	1.5 - 10 µm	
	OSP	✓	✓	
	ENiG	Ni 4-7 µm, Au 0.05 - 0.12 µm	Ni 4-7 µm, Au 0.05 - 0.12 µm	
	Plated Gold	Ni 4-7 µm, Au 0.5 - 1 µm	NA	
PCB THICKNESS		0.3 – 3.2 mm	0.5 – 2.5 mm	± 10%
MINIMUM DIAMETER NPTH		0.6 mm	1 mm	± 0.05 mm
MINIMUM ANULAR RING		0.18 mm	NA	± 15% (18 µm)
MINIMUM WITH/SPACE OF TRACK – DEPENDING UPON BASE Cu T.		18 µm - 0.12 mm	-	± 15% (18 µm)
		35 µm - 0.15 mm	35 µm - 0.18 mm	± 20% (35 µm)
		70 µm - 0.19 mm	70 µm - 0.21 mm	± 25% (70 µm)
SOLDERMASK THICKNESS	-	> 10 µm	> 10 µm	NA
MINIMUM SOLDERMASK DAM		0.2 mm	0.2 mm	NA
MINIMUM SILKSCREEN LINE		0.2 mm	0.2 mm	NA
MAXIMUM DIAMETER COVERED BY PEELABLE MASK		Ø : 2.5 mm	NA	NA
DISTANCE FROM PEELABLE TO OTHER PADS		1 mm	NA	NA
MINIMUM CORE THICKNESS (SCORING)		0.5 mm	0.35 mm (asymmetric)	± 0.1 mm
TOLERANCE POSITION SCORING	-	± 0.5 mm		
TOLERANCE ROUTING		≤ 50 mm ± 0.1 > 50 mm / < 200 mm ± 0.15 ≥ 200 mm ± 0.2		
WARPAGE	-	< 0.75%	< 0.75%	NA

TYPES OF CIRCUITS

	MINIMUM HOLE DIAMETER FOR A: thickness 1.6 mm ϕ final (ϕ initial)	MINIMUM PAD SIZE Outer layers mm (mils)	MINIMUM PAD SIZE Inner layers mm (mils)	MINIMUM INSULATION FOR Inner layers power & ground mm (mils)	MINIMUM DISTANCE FROM SOLDERMASK TO COPPER PAD mm (mils)	MINIMUM WIDTH FOR TRACKS Outer layers (Cu base) / mm	MINIMUM WIDTH FOR TRACKS Inner layers (Cu base) / mm	MINIMUM DISTANCE BETWEEN TRACKS Outer layers (Cu base) / mm	MINIMUM DISTANCE BETWEEN TRACKS Inner layers (Cu base) / mm	MINIMUM DISTANCE BETWEEN TRACK AND PCB EDGE mm (mils)	
										Scoring	Routing
CLASS IV	0.40 (0.55)	0.20 (8)	0.30 (12)	0.40 (16)	0.15 (6)	0.20 (8)	0.25 (10)	0.20 (8)	0.25 (10)	0.50 (20)	0.30 (12)
CLASS V	0.25 (0.40)	0.20 (8)	0.25 (10)	0.30 (12)	0.10 (4)	18 μ m 0.15	18 μ m 0.14	18 μ m 0.15	18 μ m 0.14	0.50 (20)	0.30 (12)
						35 μ m 0.18	35 μ m 0.17	35 μ m 0.18	35 μ m 0.17		
						70 μ m 0.21	70 μ m 0.20	70 μ m 0.21	70 μ m 0.20		
CLASS VI	0.15 (0.30)	0.19 (7.6)	0.20 (8)	0.20 (8)	0.075 (3)	18 μ m 0.12	18 μ m 0.11	18 μ m 0.12	18 μ m 0.11	0.45 (18)	0.25 (10)
						35 μ m 0.17	35 μ m 0.16	35 μ m 0.17	35 μ m 0.16		
						70 μ m 0.20	70 μ m 0.18	70 μ m 0.20	70 μ m 0.18		
CLASS VII	0.10 (0.20)	0.18 (7.2)	0.20 (8)	0.20 (8)	0.075 (3)	18 μ m 0.10	18 μ m 0.10	18 μ m 0.11	18 μ m 0.10	0.40 (16)	0.20 (8)
						35 μ m 0.15	35 μ m 0.13	35 μ m 0.15	35 μ m 0.13		
						70 μ m 0.19	70 μ m 0.16	70 μ m 0.19	70 μ m 0.16		
DIAGRAM	