

All figures & information are design dependant & may not be achievable in combination.

In the event scaling data is not available for all materials/ constructions, a test press may be required in order to obtain scaling figures.

Products, Processes & Panel Sizes

Product Range

Single & Double sided rigid
Single & Double sided flexibles
Multilayer
Multilayer with blind &/or buried vias
Multilayer flexi rigid
Mixed dielectric multilayer
Mixed dielectric multilayer with blind &/ or buried vias
Stretchable & Pliable (Capability/ Technical Information can be provided separate to this document)

Additional Processes

Blind &/ or buried Vias (May require resin fill)
Blind &/or buried micro- vias (Laser or Mechanical)
Copper filled micro- vias
Resin filled micro- vias
Sequential build up (Laser or Mechanical)
Staggered & stacked micro- vias
Bonded Heat sinks
Back drilled holes
Embedded Chip/ Components
Controlled Impedance

Panel Sizes (All Panels require 25mm boarder for manufacturing tooling)

457mm x 304mm (18" x 12")- Preferred
457mm x 406mm (18" x 16")
608mm x 457mm (24" x 18")- Preferred
608mm x 533mm (24" x 21")

Materials Range

Rigid		Flexible	
HiTg FR4 (UL APPROVED)	VENTEC VT47, VT481 ISOLA 370HR ELITE MATERIALS EM827	POLYIMIDE FLEXIBLE LAMINATE	DUPONT AP THINFLEX A SERIES (ADHESIVELESS) RA COPPER
HALOGEN FREE (HF)	PANASONIC R 1561, 62, 66, 67, 68 (UL APPROVED)	COVERLAY	DUPONT FR- PREFERRED DUPONT LF
HIGH SPEED DIGITAL	VENTEC TECHSPEED RANGE (HF)- TS3 UK STOCKED ELITE MATERIALS EM370Z (HF) NELCO N4000 SERIES ISOLA FR408HR	FLEXIBLE ADHESIVE MATERIAL	DUPONT LF- NON PREFERRED DUPONT FR- BOND PLY ONLY 3M VHB (STIFFENER ATTACHMENT ONLY)
RF- ULTRA LOW LOSS	PANASONIC MEGTRON 6, 7 ROGERS 4000 SERIES, 3003 VENTEC TECHSPEED RANGE (HF)- TS6 UK STOCKED ELITE MATERIALS EM890K ISOLA I-TERA MT40, ASTRA MT77, TACHYON 100G	Stretchable & Plyable	
POLYIMIDE	VENTEC VT901- (PREFERRED) NELCO N7000- 2 ISOLA P96/26 ARLON 85N	STRETCHABLE	THERMO PLASTIC URATHANE (TPU)
ALL OTHER LAMINATES CONSIDERED: PLEASE CONTACT TO DISCUSS POTENTIAL ALTERNATIVES IF REQUIRED		PLIABLE	MONO FILAMENT FABRIC (PEEK)

ALL MATERIALS ARE SUBJECT TO SUPPLIER AVAILABILITY

Core Thickness, Construction, Controls & Approvals

Material	Development	Advanced	Standard
Rigid	≤ 0.050mm	0.050mm- 0.100mm	Above 0.100mm
PTFE (Single, double sided & Hybrid construction only)	Design Dependant		
High Speed/ Low Loss Ceramic Thermoset Resin & Poly Phenylene Ether	All Available Thicknesses		
Polyimide Film (Flexible material) Adhesiveless	-	0.025mm	0.050mm- 0.15mm
Ultra Flexible/ Plyable PEEK	-	0.050mm	0.050mm
Stretchable TPU	-	0.050mm	0.100mm

Construction	Development	Advanced	Standard
Finished Board Thickness	-	4.60mm- 5.00mm	≤ 4.50mm
Maximum Layer Count	≥ 33	32	18
Maximum Buried Single Assembly without Resin Fill	-	≥ 1.60mm	≤ 1.50mm
Maximum Buried Multiple Assembly without Resin Fill	-	≥ 1.30mm	≤ 1.20mm
Minimum Panel Thickness For Resin Fill	-	0.50mm	≥ 0.60mm

Controlled Impedance	Development	Advanced	Standard
TDR MEASUREMENT CITS 500 S4	-	5%	10%

Electrical Test	Development	Advanced	Standard
Maximum Test Voltage	-	500v	10v
Maximum Isolation Threshold	-	500 Mega Ohms	10 Mega Ohms
Minimum Continuity Threshold	-	1 Ohm	10 Ohms
Minimum Test Point Pitch	0.10mm		
Minimum Testable Feature Size	0.050mm		
Maximum Test Area	620mm x 609mm		

Track & Gap (Based on release in accordance with IPC class II)

Starting Foil- 5um	Development	Advanced	Standard
Conductor width/ Spacing for plated layers (Nominal finished Cu- 20um)	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Conductor width/ spacing for print & etch layers	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Starting Foil- 9um	Development	Advanced	Standard
Conductor width/ Spacing for plated layers (Nominal finished Cu- 32um)	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Conductor width/ spacing for print & etch layers	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Starting Foil- 12um	Development	Advanced	Standard
Conductor width/ Spacing for plated layers (Nominal finished Cu- 35um)	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Conductor width/ spacing for print & etch layers	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Starting Foil- 17um	Development	Advanced	Standard
Conductor width/ Spacing for plated layers (Nominal finished Cu- 40um)	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Conductor width/ spacing for print & etch layers	0.050mm/ 0.050mm	0.062mm/ 0.062mm	0.075mm/ 0.075mm
Starting Foil- 35um	Development	Advanced	Standard
Conductor width/ Spacing for plated layers (Nominal finished Cu- 55um)	-	0.125mm/ 0.150mm	0.150mm/ 0.200mm
Conductor width/ spacing for print & etch layers	-	0.100mm/ 0.100mm	0.125mm/ 0.125mm
Starting Foil- 70um	Development	Advanced	Standard
Conductor width/ Spacing for plated layers (Nominal finished Cu- 85um)	-	0.200mm/ 0.250mm	0.250mm/ 0.300mm
Conductor width/ spacing for print & etch layers	-	0.150mm/ 0.150mm	0.200mm/ 0.200mm
Anti Pad Clearance/ Spacing	Development	Advanced	Standard
Anti Pad Clearance & spacing for Thermals (Plated)	-	0.100mm	0.125mm
Anti Pad Clearance & spacing for Thermals (Print & Etch)	-	0.087mm	0.100mm
Anti Pad Clearance & spacing for Thermals (Electrolytic Gold Plate)	0.100mm	0.125mm	0.150mm

Feature Sizes

Micro- Via Pads	Development	Advanced	Standard
Blind Micro-Via Stop Pad	0.175mm (75um Via)	≥ 0.200mm (130um Via)	≥ 0.250mm (130um Via)
Blind Micro-Via Top Pad	≥ 0.175mm (75um Via)	≥ 0.200mm (130um Via)	≥ 0.250mm (130um Via)

Feature Sizes Cont..

Minimum Design Tolerance for Component Holes (Rigid Single/Multi Bonds, Same Material)	Development	Advanced	Standard
Minimum Design Annular Ring	-	≥ 0.075mm	≥ 0.100mm
Clearance- PTH to Copper (Construction dependant)	≥ 0.100mm	≥ 0.150mm	≥ 0.175mm
Minimum Design Tolerance for Component Holes (Multi bond Rigid/ flex Rigid Mix Materials)	Development	Advanced	Standard
Minimum Design Annular Ring	-	≥ 0.075mm	≥ 0.100mm
Clearance- PTH to Copper (Construction dependant)	≥ 0.125mm	≥ 0.150mm	≥ 0.200mm
Minimum Design Tolerance for Via Holes (Rigid Single/ Multi Bonds, Same Material)	Development	Advanced	Standard
Minimum Design Annular Ring	-	≥ 0.050mm	≥ 0.075mm
Clearance- PTH to Copper (Construction dependant)	≥ 0.100mm	≥ 0.150mm	≥ 0.175mm
Minimum Design Tolerance for Via Holes (Multi bond Rigid/ flex Rigid Mix Materials)	Development	Advanced	Standard
Minimum Design Annular Ring	-	≥ 0.075mm	≥ 0.100mm
Clearance- PTH to Copper (Construction dependant)	≥ 0.125mm	≥ 0.150mm	≥ 0.200mm

Mechanical Drill/ Profile

Minimum Mechanical Drill Size	Development	Advanced	Standard
0.105mm Drill Bit	1.20mm panel	1.00mm Ppanel	0.60mm panel
0.150mm Drill Bit	1.60mm panel	1.00mm panel	0.80mm panel
0.200mm Drill Bit	-	2.00mm panel	1.60mm panel
0.250mm Drill Bit	-	2.50mm panel	2.00mm panel
0.300mm Drill Bit	-	3.00mm panel	2.40mm panel
Aspect Ratio, Positional Accuracy & Drill Diameter for Resin Fill	Development	Advanced	Standard
Aspect Ratio PTH Vias (> 0.5mm Overall Board Thickness)	12 To 1	10 To 1	8 To 1
Aspect Ratio Blind Vias (< 0.12mm Dielectric spacing)	1 To 1	0.8 To 1	0.68 To 1
Hole To Hole	0.050mm		
Image to Edge Profile (Where Required Tracks Can Run to Board Edge)	0.125mm	0.150mm	0.200mm
Maximum Through Hole Drill Diameter For Resin Fill (Aspect Ratio Dependant)	-	1.000mm	0.400mm
Minimum Through Hole Drill Diameter For Resin Fill (Aspect Ratio Dependant)	-	0.150mm	0.200mm
Profile & Scoring	Development	Advanced	Standard
Profile Tolerance	-	± 0.10mm	± 0.20mm

Minimum Panel Thickness for Scoring

0.80mm



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+pcb design
+pcb manufacture
+pcb assembly

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Coverlays & Kapton

Clearance & Webs	Development	Advanced	Standard
Coverlay Radial Clearance To Pad (min)	-	0.15mm	0.25mm
Coverlay Minimum Web (min)	-	0.20mm	0.25mm

Surface Finishes, Soldermasks & Ident

Surface Finishes (Sub Contract Finishes Are Subject To Increased Lead Time)	In House	Sub Contract
Electroless Nickel, Immersion Gold (ENIG)	√	
Immersion Silver	√	
Hard Gold (Edge Connector)	√	
All Over Hard Gold (Including Thin/ Thick)	√	
OSP (Copper Coat)	√	
Electroless Nickel, Immersion Palladium, Immersion Gold (ENIPIG)		√
Electroless Palladium, Immersion Gold (EPIG)		√
Immersion Tin		√
Hot Air Solder Level (RoHS Compliant)		√
Hot Air Solder Level (SnPb non RoHS Compliant)		√
Direct Gold (ISIG replacement)		√

Soldermask & Ident Features	Development	Advanced	Standard
Soldermask Defined Features	0.090mm	0.100mm	0.150mm
Soldermask Radial Clearance	-	1 To 1	0.050mm
Soldermask Alignment of Minimum Clearance around Critical Feature	-	0.010mm	Relevant IPC
Soldermask Plugged Hole (Maximum Drill Size)	0.800mm	0.600mm	0.500mm
Soldermask Minimum Web	0.050mm	0.075mm	0.100mm
Photoimageable Ident Minimum Line Width	-	0.075mm	0.100mm
Ink Jet Ident Minimum Line Width	-	0.100mm	0.125mm

Ident/ Legend Colours	Ink Jet	Liquid Photoimageable
Taiyo White (Serialisation Available)	√	
Electra White (Serialisation Not Available)		√

Electra Black or Yellow (Serialisation Not Available)		√
Electra Multiple Ident Colours (Serialisation Not Available)		√



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+pcb design
+pcb manufacture
+pcb assembly

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Surface Finishes, Soldermasks & Ident Cont..

Soldermask Colours (Manufacturers used- Electra (UL), Sun Chemicals)	Liquid Photoimageable
Green	√
Red	√
Blue	√
Black	√
Yellow	√
White	√
Orange	√
Purple	√
Mixed to Colour Chart (May Be Subject To Additional Cost & Lead Time)	√

Approvals, Release Reports, Data Formats & Handling Quality & Release Approvals

	Approval Body & Certificate No.
BS EN9100 (Latest Revision)	BSI- FM30315
ISO9001 (Latest Revision)	BSI- FM30315
IPC/ IECQ Release Class II & III (Design Dependant)	IECQ- C BSI 14.0052/ IECQ- P BSI 14.0016
UL Release (Material/ Finish Dependant)	UL- E136644

Additional Reports/ Release	Added Cost/ Leadtime	Standard
IPC6012 Class II & III (Design dependant)	Full Release	In Accordance
First Article Inspection Report	Full AS9102	Hole size/ Dimensional Only
Additional Reports- Microsection, Build, Ionic Contamination, Solderability etc	√	
Critical Feature Measurement & Analysis Report	√	

Acceptable Data Formats

ODB++ (Preferred)
Extended Gerber- RS274X
Standard Gerber- RS274D

Net List Data

IPC-D-356 Or Mentor Neutral File

Data Exchange

FTP, Email, CD ROM