



## Technical implementation

### Products

1- and 2-sided printed circuit boards	HF printed circuit boards
Multilayer	Metal core PCBs (IMS, MCS)
Flexible and rigid-flex printed circuits	Stretchable PCBs
HDI/SBU technology	

Base material	Standard	Special**
Circuit board format (max.) [mm]	459 x 264	459 x 428
Base material	FR4, Polyimid	on request, high Tg, Rogers, IMS
Base material thickness for rigid single and double sided circuit boards [mm]	0,5 / 0,8 / 1,0 / 1,2 / 1,55 / 2,0 / 2,4	on request
	conform to IPC-4101 class B/L; 1,55 mm class M ( $\pm 0,075$ mm)	
Thickness rigid multilayer [mm] tolerance	0,5 - 3,2	on request
	Nominal dimension $\pm 10\%$	Nominal dimension $\pm 5\%$
Inner layer thicknesses [ $\mu\text{m}$ ]	50 / 100 / 150 / 200 / 250 / 300 / 360 / 410 / 510 / 610 / 710	on request
Prepreg thickness [ $\mu\text{m}$ ] type	50   63   115   180	on request
	106   1080   2116   7628	
Thickness of flexible boards	Thickness of Polyimid (0.05 mm)	on request

Copper-thickness	Standard	Special**
Inner layer	18 $\mu\text{m}$ , 35 $\mu\text{m}$	70 $\mu\text{m}$ , 105 $\mu\text{m}$ , on request
Outer layer (tolerance depends on layout)	35 $\mu\text{m}$	18 - 105 $\mu\text{m}$
In holes	$\geq 20$ $\mu\text{m}$	on request

Finish	Standard	Special**
Solder resist	green	Varnish blue, red, black, yellow, white, amber, transparent; flexible varnish (green)
		Film Polyimid Coverlay (with glue) Photoflex Coverlay (62 $\mu\text{m}$ ) Vacrel (75 $\mu\text{m}$ )
Silk screen	white	yellow, green, blue, red, black
Finishing	ENIG; electroless tin; HAL lead free; OSP	ENEPIG; ISIG; HAL SnPb; electroplated gold; electroplated contact gold; Carbon; solder covering varnish

### Special technologies

Hole Plugging  
Cu-Micro-Via-Filling  
Stacked Vias

Layout guidelines	Standard	Special**
Smallest track width	125 $\mu\text{m}$	50 $\mu\text{m}$
Minimum track width	125 $\mu\text{m}$	50 $\mu\text{m}$
Padsizes to hole diameter (pad annulus left after drilling) note: drilled hole diameter > finished diameter!	Outer layer:	$\geq 50$ $\mu\text{m}$
	Inner layer:	$\geq 100$ $\mu\text{m}$
	Clearance on internal layer:	$\geq 150$ $\mu\text{m}$
Width residual tab solder mask (min.)	100 $\mu\text{m}$	60 $\mu\text{m}$
Stroke width assembly print (min.)	100 $\mu\text{m}$	75 $\mu\text{m}$



Hole/Mill	Standard	Special**
Smallest hole finished diameter (TPH)	0,10 mm	0,05 mm
TPH aspect ratio (ratio of trough plated hole diameter to board thickness)	$\geq 1 : 8$	$\geq 1 : 10$
Blind via aspect ratio (ratio of blind via diameter to hole depth)	$\geq 1 : 1$	on request
Tolerance range of finished hole diameter (HAL)	0,15 mm (-0,05 mm/+0,10 mm)	0,10 mm
Tolerance of outer dimensions (milled)	DIN 7168-m, DIN ISO 2768-m	DIN 7168-f, DIN ISO 2768-f
Smallest milled radius	1,00 mm	0,40 mm

Offset	Standard	Special**
Milling to hole pattern	$\leq 150 \mu\text{m}$	$\leq 100 \mu\text{m}$
Milling to track pattern	$\leq 150 \mu\text{m}$	$\leq 100 \mu\text{m}$
Scoring to hole pattern	$\leq 150 \mu\text{m}$	$\leq 100 \mu\text{m}$
Holes	$\leq 50 \mu\text{m}$	$\leq 50 \mu\text{m}$
Holes (second clamping)	$\leq 150 \mu\text{m}$	$\leq 100 \mu\text{m}$
Hole pattern to track pattern	$\leq 100 \mu\text{m}$	$\leq 50 \mu\text{m}$
Track pattern to solder resist	$\leq 75 \mu\text{m}$	$\leq 50 \mu\text{m}$
Tolerance of residual tab by scoring	$\leq 100 \mu\text{m}$	$\leq 75 \mu\text{m}$

Standards	Standard	Special**
Test standard	IPC-A-600 Klasse II	As specified by customer
Controlled impedance	$\pm 10 \%$	$\pm 5 \%$
UL listed (Filenumber E228204)	UL94V-0; UL796	Material listing on request

\*\*according to prior agreement with CONTAG

The details given here relate to a standard job. For special circuit designs or requirements, other values may be needed as a basis. Please discuss your special requirements with our team, before placing an order (+49 30 351 788 - 300 or team@contag.de).

The manufacture of printed circuits is subject to continuous improvement, which then leads to additional technical options. This data sheet is thus regularly updated. If necessary, please request the latest edition.