

1. Data Transfer

1.1 Interfaces for production data transfer

Existing data interfaces:

PPC Electronic AG currently makes four interfaces available for production data transfer, these are:

- FTP Server via the Internet
- PPC Mailbox via analog or ISDN modem
- CD-ROM
- 3½-inch and 5¼-inch drives (MS-DOS / HP-UNIX)

- Please note: for safety reasons, we do not process any data that is delivered via e-mail!

Remote data transmission interfaces

Interface	Telephone numbers / addresses	Notes
Internet	FTP Server: ftp.ppc-electronic.ch	User name and password required
PPC Mailbox	Modem: +41 (0)41 743 13 72	User name and password required

Registration

On request, your contact person at PPC Electronic AG will issue you with a unique User ID (user name and password).

- For further information, please ask for our information sheet on “Data Transfer Interfaces”.



1.2 Data formats for PCB manufacture

Preferred data formats:

Track pattern data	ODB++ GERBER GERBER-X DPF	(other data formats may only be used after consulting PPC Electronic AG)
Drilling data	EXCELLON	
Translation code	ASCII	
Units	INCH	
Co-ordinates	ABSOLUTE	(absolute dimensioning)
Zero suppression	LEADING	(leading zeroes are suppressed)
Number format	2.4	(two places before the point, four places after the point)
End of block character	*	

You can provide information about the data formats you use on the Data Transfer Specification Sheet (please refer to the appendix1), or directly on the data carrier in an information file. By providing

complete information, you will make our work easier

MANY THANKS!

- For more details see also Appendix 1

1.3 Aperture list for the GERBER data format

General

In order to permit rational data processing and to avoid unnecessary costs, a standard aperture list should be specified which can be used for different layouts.

Changes to an existing aperture list should be avoided. For this reason, once D-codes have been assigned, they should not then be changed. New or additional apertures should be assigned to previously unused D-codes.

- Any changes or additions to the aperture list must be notified to us immediately!

D-Code range:

D-Codes allowed for apertures:

- D10 ... D999
- (D04 - D09 should not be used if possible)

Standard apertures:

The following information is required for standard apertures (round / square / rectangular):

- shape
- X- / Y-dimensions, including the measurement units (mm / mil)
- D-Code assignment

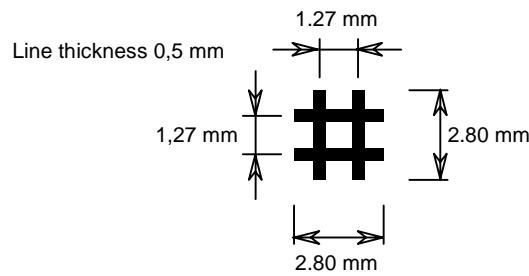


Special apertures:

- Special apertures comprise all apertures which are specially defined by the customer, such as fiducials, register marks and heat traps, etc.
- For special apertures, a fully dimensioned drawing must be supplied as well as the information on shape, dimensions and D-Code assignment.

Example:

Special aperture 1: Fiducial



1.4 Drilling data

General

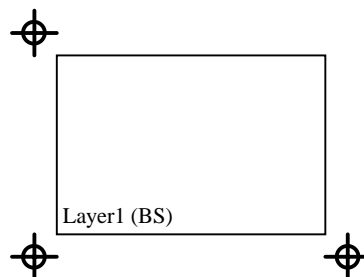
You should provide a list of the drilling data with the following information:

- Tool number (T command)
- Finished hole diameter, including the tolerance
- Designations of the through-plated (PTH) and non-through-plated (NPTH) holes
- Number of holes per T-command (for control purposes)

1.5 Layout tip

Alignment marks

To make it easier to align the individual layers to one another in the CAM system, it is advisable to position 3 register marks inside or outside the board outline.



2 Manufacturing Documents

We process your orders as quickly and rationally as possible. To prevent any misunderstandings, the

following information should be provided for every order, in addition to the CAM data:

Data Transfer Specification Sheet (see appendix 1)

Layer build-up

The layer positioning sequence should be shown unambiguously in the documents.

Example:

Layer1	Component side	(CS)
Layer2		VCC
Layer3		GND
Layer4	Soldered side	(SS)

Outline drawing

The outline drawing should contain the following information (please see chapters 6, 8 and 14):

- dimensioning (including indication of tolerances) for the outer dimensions (length, width, thickness) cut-outs and notches, with indication of the routing (corner) radius chamfers and coding slots for gold edge connectors counterbores for NPTH drill holes
- dimensioning for an NPTH drill hole, in relation to the edge of the PCB
- drawing number or PCB type with index and date / compiler
- note to indicate “component side view” or “soldered side view”
- layer build-up (if there is no basic rule).

Manufacturer’s identification and date of manufacture (Shop Date):

PPC Electronic AG marks each PCB with a manufacturer’s identification and date of manufacture.

PCB’s manufactured to the UL Standard are also given a UL identification marking.

You must provide the following minimum areas for these identification markings:

date of manufacture	4.5 mm x 22 mm
UL approval	4.5 mm x 30 mm

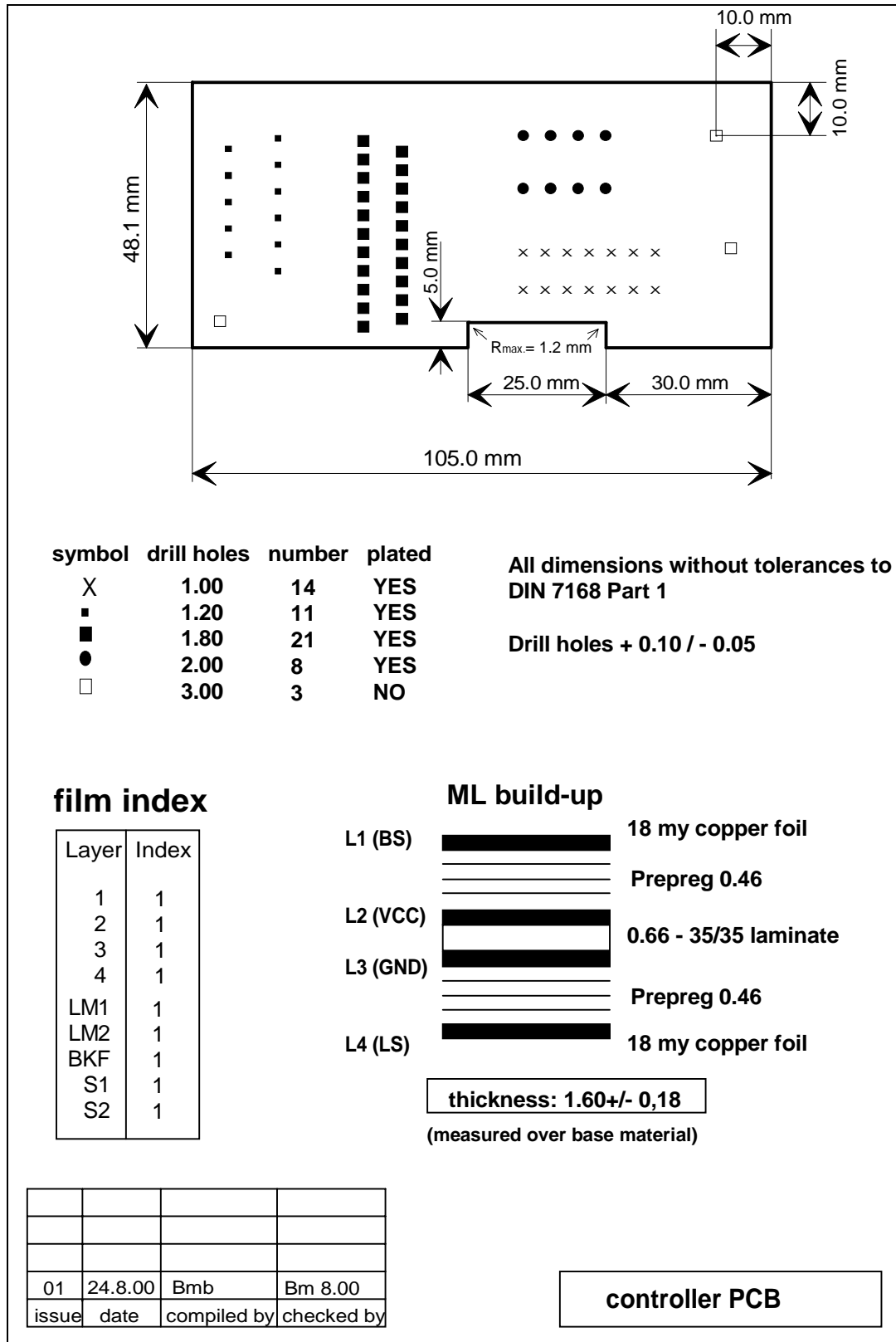
If you have your own Works Standards, we shall manufacture your PCB’s to your own specifications.

- If you do not have your own standards, we shall manufacture according to our PPC standard specifications.



2.1 Sample drawing

To give you an example of our idea of the production documents, we have reproduced a sample drawing here. The drawing should contain the following information



Appendix 1

MEDIA DATA SPECIFICATION

Date

Customer:	Customer Contact:	PPC ID-Nr.
	Tel.:	
	Fax.:	
		Internal Use Only

PCB Identification No.	Rev.
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Data Transfer
 We prefer data transfer by modem or Internet (FTP-Server).
 For further detailed information please contact our Information Services group.

Aperture Wheel	D10 Round	eg; 0.50 mm dia.	<input type="checkbox"/>
D-Codes D10 thru D999	D11 Rect.	eg; 0.50 x 0.90 mm	
Customer Specific Apertures			<input type="checkbox"/>
Dimensioned Drawing of each Aperture			
Drill Data	T01	eg; 0.60mm (end Ø)	<input type="checkbox"/>
T01 thru T30	T02	eg; 0.90mm (end Ø)	
For each end dia. we need the following information: Tolerance, plated or non pl., quantity			

Data Format	<input type="checkbox"/>	Design Data	<input type="checkbox"/>	Drill Data
① These formats are preferred	<input type="checkbox"/>	ODB++ ①	<input type="checkbox"/>	Excellon-2 ②
② Excellon-2 is preferred	<input type="checkbox"/>	Gerber (RS274D) ①	<input type="checkbox"/>	Excellon-1
	<input type="checkbox"/>	Ex. Gerber (RS274X) ①	<input type="checkbox"/>	Trudrill
	<input type="checkbox"/>	DPF ①	<input type="checkbox"/>	(Sieb & Meyer)
	<input type="checkbox"/>	(IPC 350)		
	<input type="checkbox"/>	(Pentax)		
	<input type="checkbox"/>	(S-500)		
	<input type="checkbox"/>	(S-1400)		
	<input type="checkbox"/>	(Emma)		
Data Code	<input type="checkbox"/>	ASCII	<input type="checkbox"/>	ASCII
	<input type="checkbox"/>	ISO-ASCII	<input type="checkbox"/>	ISO-ASCII
	<input type="checkbox"/>	EBCDIC	<input type="checkbox"/>	EBCDIC
	<input type="checkbox"/>	BCD	<input type="checkbox"/>	BCD
	<input type="checkbox"/>	EIA	<input type="checkbox"/>	EIA
Zeros Omitted	<input type="checkbox"/>	Leading	<input type="checkbox"/>	Leading
	<input type="checkbox"/>	Trailing	<input type="checkbox"/>	Trailing
	<input type="checkbox"/>	None	<input type="checkbox"/>	None
Units	<input type="checkbox"/>	MM	<input type="checkbox"/>	MM
	<input type="checkbox"/>	Inch	<input type="checkbox"/>	Inch
Coordinate World	<input type="checkbox"/>	Absolute	<input type="checkbox"/>	Absolute
	<input type="checkbox"/>	Incremental	<input type="checkbox"/>	Incremental
Coordinate Format		<input type="text" value="eg; 2.4"/>		<input type="text" value="eg; 3.2"/>
eg; mmm.nn = 3.2				
End of Block Character (EOB)	<input type="checkbox"/>	<CR>		
	<input type="checkbox"/>	<LF>		
	<input type="checkbox"/>	*		
	<input type="checkbox"/>	\$		
	<input type="checkbox"/>	&		

