



data exchange required data

bill of material (BOM)

format	:	Excel or Ascii	
content	:	part number	mandatory
		reference designators	mandatory
		description**	mandatory
		quantity	mandatory
		manufacturer	optional
		manufacturer part number	optional
		ATEX certified yes / no	optional
		UL/CSA certified yes / no	optional

**) If there is no information about manufacturer and manufacturer part number the description field must be unambiguous in selecting the correct component e.g.
 For a resistor we need value, power, package and tolerance like "SMT RES 4k7 1/8W 0603 1%".
 For a capacitor we need value, voltage, package, material and tolerance like "SMT CAP 220nF 50V 1206 X7R 10%"

approved vendors list (AVL)

format	:	Excel or Ascii	
content	:	part number	mandatory
		vendor name	mandatory
		vendor code	mandatory
		vendor website	optional

CAD DATA

ODB++/ODB-XML format (required format)

This Data Exchange document (data exchange.pdf) defines the requirements and procedures for translating PCB design data and producing ODB++ files. Next table gives an overview of design tools with possibility to generate ODB++ output format.

<i>vendor</i>	<i>CAD tool</i>	<i>versions supported</i>
Cadence	Allegro	11.0 and higher
	Orcad-Layout	6.4.2 and higher
Mentor Graphics	Board Station	B2 and higher
	PADS (formerly PowerPCB)	2.0 and higher
	Expedition	WG2002
	Supermax ECAD	9.0 and higher
Zuken	Visula	CADExpert 3.5 (CADIF4) and higher
	Board Designer (CR5000)	6.02 and higher
	PWS (CR3000)	12.0 and higher
Altium	Cadstar	Cadstar 6 (CADIF 4) and higher
	P-CAD	2.2 (v12) and higher
	Protel	99SE & DXP (Ascii v3 & 4)
Number One Systems	Designer	6.0 and higher
	Easy-PC for Windows	8.0 and higher
Pulsonix	Pulsonix	3.0 and higher
Valor	Enterprise 3000	all



system specific format

<i>vendor</i>	<i>CAD tool</i>	<i>versions supported</i>
Cadence	Allegro	.out file
Mentor Graphics	Orcad-layout Board Stations	.max, .min file minimum required: geoms_ascii + neutral file
Zuken	PADS (formerly PowerPCB) Expedition Visula Board Designer (CR5000) PWS (CR3000)	.asc file .gen file .paf (cadif.file) .pcf, .pnf file directory structure
Altium	P-CAD	.pcb file (Ascii)
CadSoft	Protel Eagle	.pcv (Ascii advanced) Gencad (script)

Gerber based formats (not recommended)

PCB plot data	format	Gerber (274D or 274X) HPGL DPF DXF
Drill info	format	... Gerber Excellon Sieb & Meier
Netlist	format	... IPC-356/356D GenCad FATF Mentor Netlist
CPL (Component Placement List)	format minimum content	... Excel or Ascii Refdes X-Y coordinates component rotation Side

Data content

Component layers	mandatory
Solder paste layers	highly recommended
Silkscreen layers	whenever applied
Solder mask layers	mandatory
Peelable mask layers	highly recommended
Copper layers	mandatory
Drill layers	mandatory



PB build-up drawings

format : drawing or text
content : PB stack up, board thickness, board finish, board dimensions

PBA assembly drawings

format : included in CAD data preferred
document (.pdf, .hpgl,)
content : component orientations and polarity markers for each side

(3D) mechanical assembly drawings (if applicable)

format : STEP file
included in CAD data
document (.pdf, .hpgl,)
content : special assemblies like heat sinks, brackets or boxes

multipanel data (if applicable)

format : included in CAD data preferred
document (.pdf, .hpgl,)
content : Ascii file with offsets and orientation of single PB's not preferred
Mul dimensions
offsets and orientation of single PB's

electrical schematics (required for structural test coverage analysis)

format : searchable pdf preferred
document (.pdf,)

data content programmable devices

format : many formats of electronic data are supported
any format needs to be investigated to programmer
compatibility master PROM
content : full data content
checksum
special program requirements (e.g. sector protection, shall be documented)

functional test requirements

format : document (.pdf, .doc,)
content : all functional test requirements
if applicable, calibration requirements

bsdl files (required for structural test coverage analysis)

format : document (.bsdl, .bsd,)
content : description of the boundary scan capabilities of the component