

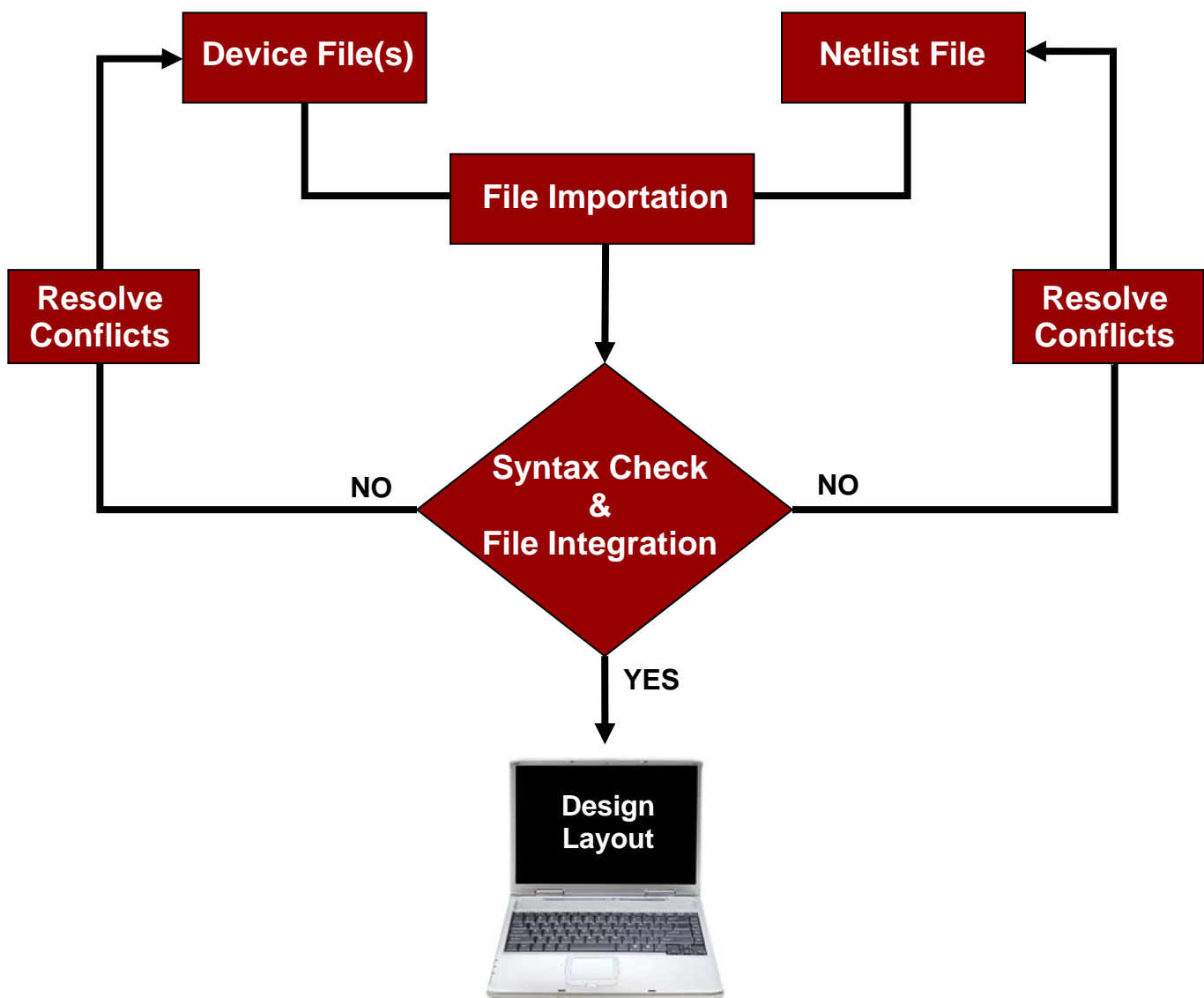
MCM NETLIST FORMAT

Download [MCM Netlist Template](#)

The standardization of the MCM design netlist format will enable Unisem designers to directly import the netlist in to the design database without manipulation. The benefits of utilizing this format are:

1. Reduce design cycle time by eliminating the need for netlist and die coordinate file formatting. The die and netlist connectivity will be created quickly and reduce database preparation time.
2. Eliminate the chance for netlist formatting errors. If the netlist is properly formatted, there will be no requirement for netlist manipulation in order to comply with required netlist format.

[PROCESS FLOW]





[TEMPLATE]

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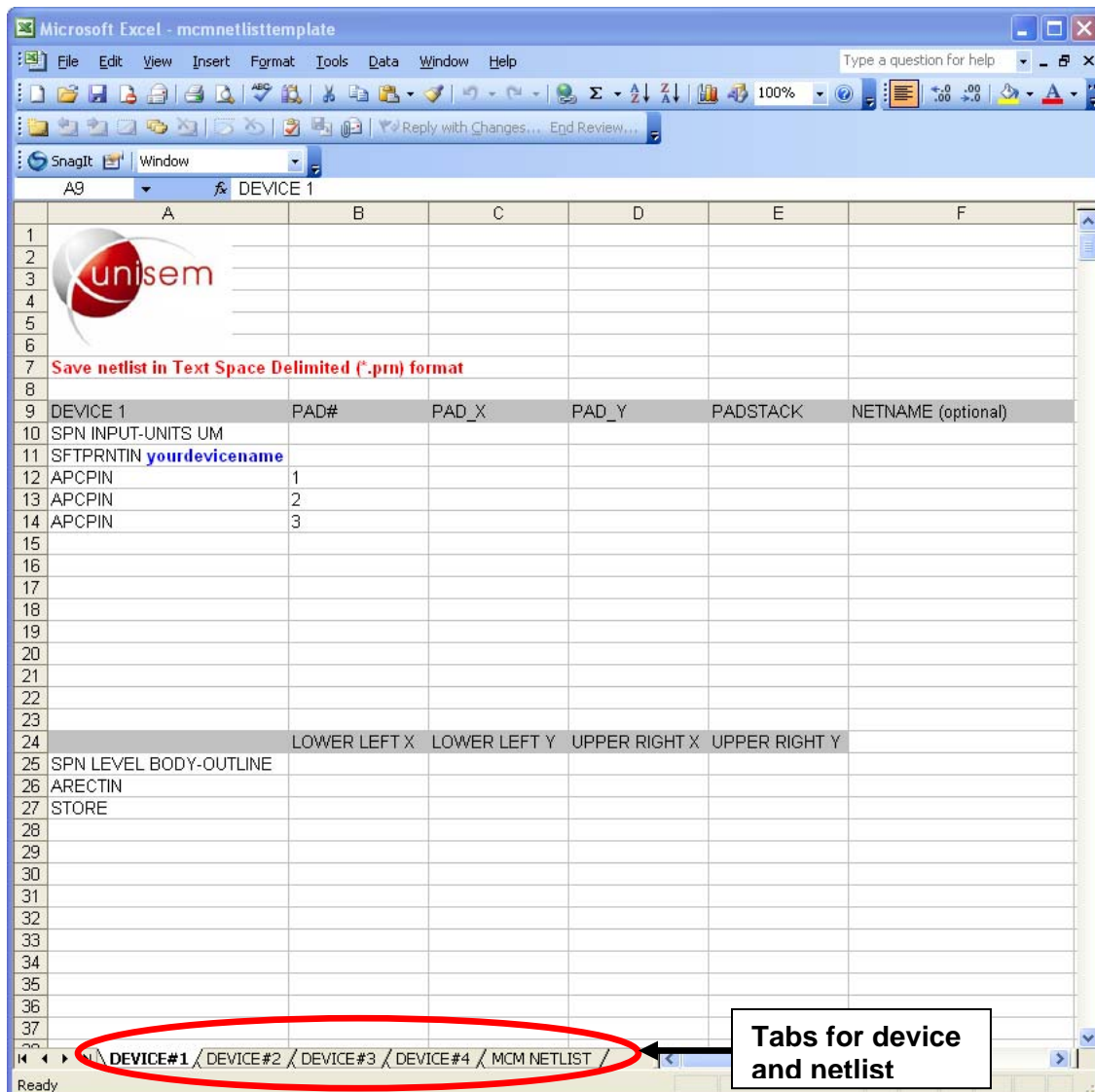
The template file has been created in a Microsoft Excel format and is available for download on the Unisem web site. The file provides the general formatting with the specific design information to be provided by the customer.

Due to the increased complexity of MCM designs, there are two main information sets required:

1. The Device Files

- a. Each device is to be defined separately by selecting the appropriate tab at the bottom of the template.
- b. Discrete component information must be supplied but does not need to be defined in a device file.

2. MCM Netlist File





[DEVICE FILES]


The file defines the device name, die pad number, X/Y coordinate of the die pad, shape of die pad, and optional net name. As an additional option, the device outline size can be defined as shown below in the body outline section.

Microsoft Excel - Unisem-MCM_example

File Edit View Insert Format Tools Data Window Help

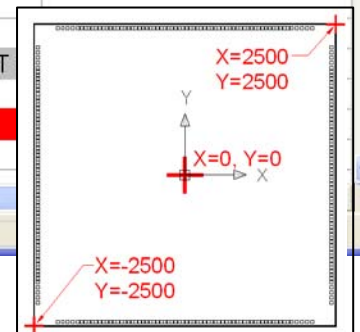
SnagIt Window

J19

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7	Save netlist in Text Space Delimited (*.prn) format					
8						
9	DEVICE 1	PAD#	PAD_X	PAD_Y	PADSTACK	NETNAME (optional)
10	SPN INPUT-UNITS UM					
11	SFTPRNTIN yourdevicename					
12	APCPIN	1	2434.50	2110.00	diepad_53	net1
13	APCPIN	2	2434.50	2025.00	diepad_53	net2
14	APCPIN	3	2434.50	1940.00	diepad_53	net3
15	APCPIN	4	2434.50	1855.00	diepad_53	net4
16	APCPIN	5	2434.50	1770.00	diepad_53	net5
17	APCPIN	6	2434.50	1710.00	diepad_53	net6
18	APCPIN	7	2434.50	1650.00	diepad_53	net7
19		:	:	:	:	:
20		:	:	:	:	:
21	APCPIN	266	1650.00	2434.50	diepad_53	net266
22	APCPIN	267	1710.00	2434.50	diepad_53	net267
23	APCPIN	268	1770.00	2434.50	diepad_53	net268
24	APCPIN	269	1855.00	2434.50	diepad_53	net269
25	APCPIN	270	1940.00	2434.50	diepad_53	net270
26	APCPIN	271	2025.00	2434.50	diepad_53	net271
27	APCPIN	272	2110.00	2434.50	diepad_53	net272
28						
29						
30		LOWER LEFT X	LOWER LEFT Y	UPPER RIGHT X	UPPER RIGHT	
31	SPN LEVEL BODY-OUTLINE					
32	ARECTIN	2500.00	-2500.00	2500.00	2500.00	
33	STORE					
34						

Ready

DEVICE#1 / DEVICE#2 / DEVICE#3 / DEVICE#4 / MCM NETLIST /





[NETLIST]

The netlist is the intelligence behind the design. This section defines the relationship between the signal name, package reference designator, package ball assignments, device reference designators and die pad numbers.

The screenshot shows a Microsoft Excel spreadsheet titled "Unisem-MCM_example". The spreadsheet contains a netlist table with columns: NETNAME, COMPONENT, COMP_PAD#, DIE, and DIE_PAD#. The table is divided into sections for Device#1, Device#2, Device#3, Discrete Component, and BGA Connectivity. A red text box in row 7 says "Save netlist in Text Space Delimited (*.prn) format".

NETNAME	COMPONENT	COMP_PAD#	DIE	DIE_PAD#
net1	bga1	N7	die1	1
net2	bga1	P7	die1	2
net3	bga1	R11	die1	3
net4	bga1	R10	die1	4
net5	bga1	N8	die1	5
:	:	:	:	:
net1	bga1	N7	die2	1
net2	bga1	P7	die2	2
net3	bga1	R11	die2	3
GND	bga1	P8	die2	10
VCC	bga1	R13	die2	11
:	:	:	:	:
net1	bga1	N7	die3	1
net2	bga1	P7	die3	2
net3	bga1	R11	die3	3
VCC	bga1	R12	die3	22
GND	bga1	A11	die3	23
:	:	:	:	:
net1	C1	1		
net2	C1	2		
net3	R1	1		
net4	R1	2		
net5	Q1	1		
:	:	:	:	:
GND	bga1	L1		
GND	bga1	N13		
VCC	bga1	N12		
VCC	bga1	N11		
VCC	bga1	P11		



Placeholder

If a particular data item is not present, the dash (-) should be used as a placeholder since the parser counts the number of entities per line to determine the context of the data.

Delimiter

Data items can be delimited by one or more spaces or a tab. Please do not use commas or colons.

Comment

The semicolon (;) indicates a comment. Anything after a semicolon is ignored. Good practice demands that at the top of the netlist a commented line indicates the heading of each column.

Netname Syntax Rules

The AIF format enforces a strict limit on the net name syntax, not because it would be difficult to support a more complex syntax, but because AIF is intended to support the movement of data between various design tools.

Valid Characters and Punctuation

A-Z a-z 0-9 _ - + / ? %

Not allowed

! (space) # \$ & ' ` ~ () ; . < > @ { } [] \ ^ | , " *

It is recommended that all netnames begin with a character - not a numeral. It is also recommended that the maximum length of a netname be 12 characters. Most systems support up to 32 characters but a few support 16 or even 12.

Upper and Lower Case Netnames

Some design systems do not differentiate between upper and lower case characters. Therefore you should not have two unique netnames that differ only by case:

e.g. Clock45 and clock45

The example above may or may not be considered the same net. It is best to make sure that no such ambiguities occur in the netlist names.

Pad Name Syntax Rules

The PADS section defines pads needed for the die and package. Pads can have any of the following shape types: Square, Rectangular, Oblong, Circular and Polygon. The pad insertion point is always defined as the center of the pad. In the case of the polygon, all polygon coordinates are relative to the center at 0, 0.

CIRCLE = **CIRCLE 100**

SQUARE = **SQ 50**

RECTANGLE = **RECT 100 200**

OBLONG = **OBLONG 100 300**

POLYGON = **POLY 1 0 6 -50, 50 50, 50 50, -20 0, -80 -50, -20 -50, 50**