Creating Custom MOSFETs with Multisim's

Component Wizard

N Channel Enhancement Mode MOSFET

Start the Component Wizard from Tools or the icon with the pencil. Select Simulation Only and provide a Component Name.

Component Wizard - Step 1 of 7 🛛 🔀				
Enter Component Information				
Component Name:	Function:			
CD4007N	<u>^</u>			
Author Name:	~			
Tom Brewer	< >			
Component Type:				
Analog				
C I will use this component for both simulation and layout (model and footprint)				
 Simulation only (model) 				
 Layout only (footprint) 				
N	ext > Cancel Help			

Click Next. Change the number of pins from the default 2 to 3.

Component Wizard - Step 2 of 7	
Enter Footprint Information	
Footprint Manufacturer:	Select a Footprint
Footprint Type:	
Single Section Component Multi-Section	on Component
Number of Pins:	
< Back Next > 0	Cancel Help

Click Next. Select copy from DB, transistors, MOS_3TEN, select the last transistor ZN3306F, OK, and Next. This bring up step 4 of 7, select Next. This bring up step 5 of 7

where the SPICE parameters are specified. Enter the code as shown using the desired SPICE parameters for the N Channel Enhancement Mode MOSFET. As shown this specifies the drain as pin 1, the gate as pin 2, and the source as pin 3. The body and source are connected in the model because both are specified as pin 3.

Component Wizard - Step 5 of 7	X
Select Simulation Model	Select from DB
	Copy to
Model Name: CD 4007N	Model Maker
Model Data:	Load from File
M 1 2 3 3 CD4007N MODEL CD4007N NMOS (KP=500E-6 VTO=1 LAMBDA=0.005 +CGS0=2.5E-9 CGD0=2.5E-9) .ENDS CD4007	
< Back Next > Cance	I Help

Click Next. This brings up step 6 of 7. Change the mapping of the Symbol Pins to the Model Nodes as shown. This makes it jibe with the previous step.

Component V	Vizard - Step 6 of	7 🔀			
Set Mapping Information Between Symbol and Simulation Model (The symbol must contain at least as many pins as the model has connection points)					
Pin Mapping Table:	Symbol Pins	Model Nodes			
	S	3			
	D	1			
	G	2			
	<back next=""></back>	Cancel Help			
_					

Click Next. The brings up the last step where the new part will be stored in the data base. Select the User Data base, transistors, and add a family known as MOSFETs.

	— New Family Name]
	Select Family Group:	ransistors		
	Enter Family Name: 🛛 🕅	IOSFETS		
		<u></u>	K <u>C</u> ancel	.:
🐡 Col	mponent Wizard - Ste	p 7 of 7		
Family Tr	ree:	Dat	abase: User Database	
	🔁 User Database		Group: Transistors	
	+ Sources		Family:	
	Annie Basic		Family	
=	-N- Diodes			
	pl plodes			
	Transistors			
			G ANSI	
	→ → Analog		ANSI	C DIN
			© ANSI	
			ANSI Add Fe	C DIN
	Image: First State Image:		ANSI Add Fe	C DIN amily
~	Image: Process Image		I ANSI Add Fe	C DIN
~	Image: Transistors Image: TTL		© ANSI Add Fo	C DIN

Click OK and Finish. When this part is needed for a circuit it will be found in the User data base in the MOSFET family with the part name CD4007N.

P Channel Enhancement Mode MOSFET

To create a P Channel Enhancement Mode MOSFET follow the same procedure as for the N Channel device. Select as the symbol for the part from the data base a 3 terminal P Channel Device such as

Select a S	ym	bol			
Database:		Component:		Symbol (ANSI)	
Master Database	•	ZVP4424A			UK
Master Database Group: K Transistors Family: K TRANSISTO K BJT_NPN K BJT_NPN K BJT_PNP DARLINGT DARLINGT K BJT_ARRAY K BJT_ARRAY K IGBT IE MOS_3TDN IE MOS_3TEN IE MOS_3TEP K JFET_P		ZVP4424A IRF9530 IRF15210 IRF15305 IRFM9140 IRFP5210 MMSF3P02HD MTD10P06HDLC MTD2955E MTD4P06 MTP12P10 MTP2P50 MTP2P50 MTP8P10 PHP125 PHP225 ZVP2106A ZVP2106A ZVP3306 ZVP3306		Function: Model manuf./ID: Zetex/ZVP4424A Footprint manuf./Type: Generic / TO-92 Hyperlink:	Close Search Detail Report Model Help
PUWER_M	*	<	J		
Components: 28		Searching:			//

Enter the SPICE code. Note that the zero bias threshold voltage is entered as a negative number.

Compone	ent Wizard - Step 5 of 7	×
Select Simulatio	n Model	Select from DB
		Copy to
Model Name:	CD 4007P	Model Maker
Model Data:		Load from File
M 1 2 3 3 CD4 M 1 2 3 3 CD4 +CGS0=2.5E-9 .ENDS CD400	007P 007P 07P PMOS (KP=500E-6 VTO=-1 LAMBDA=0.005 CGD0=2.5E-9) 7P	~
	< Back Next > Cance	el Help

The next step is to match the Symbol Pins to the Model Nodes. As before pin 1 is the drain, pin 2 the gate, and pin 3 the source. Finally store the part is the User Data base under Transistor under the MOSFET family.



These two MOSFETs may now be used in circuits such as