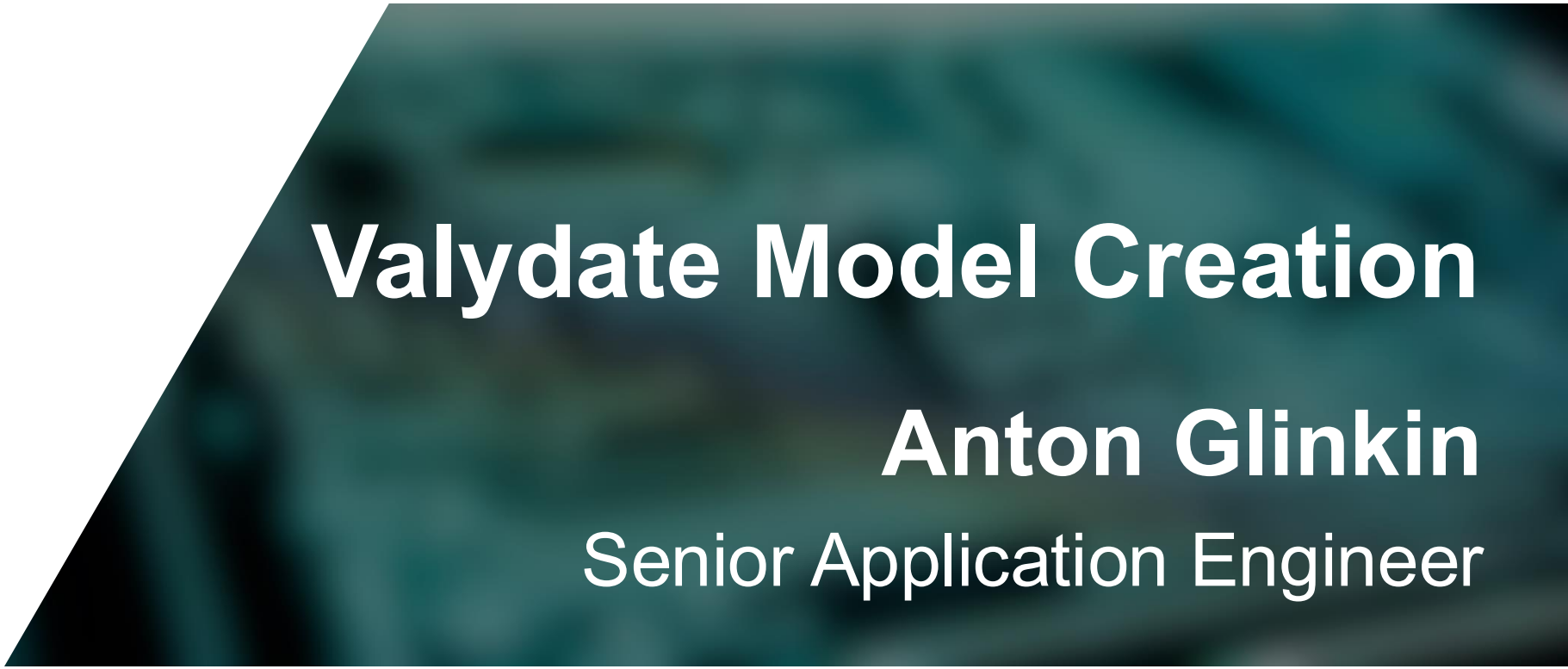
CDT TECH DAY

JUNE 11TH 2024

Anton Glinkin

Senior Application Engineer

CDT



Valydate Model Creation

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Basic modeling tips

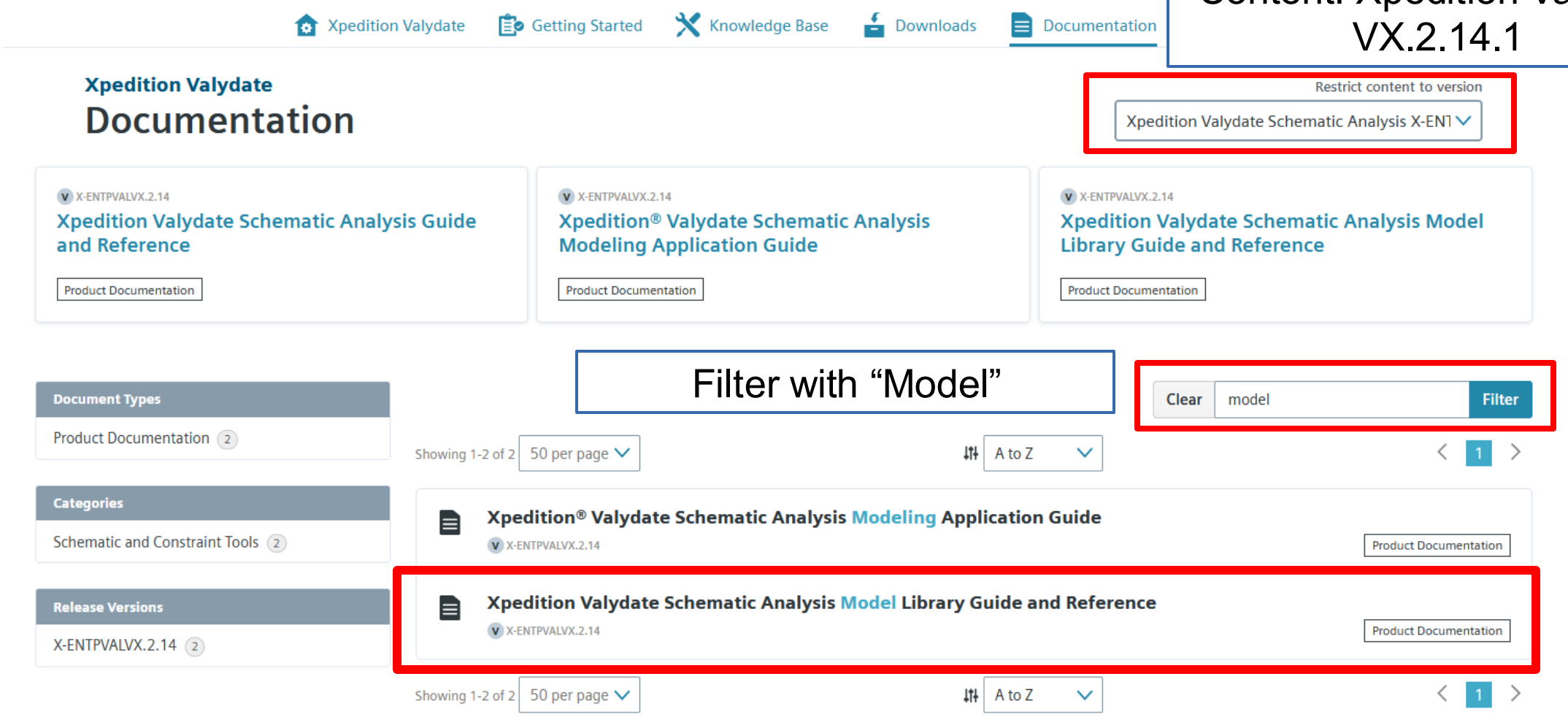
Modeling Requirements

- Component Manufacturing Part Number
- Component Datasheet
- Xpedition Valydate Model Creation Guide
- Design Schematic (Optional, but recommended)

Model Creation & Library Guide

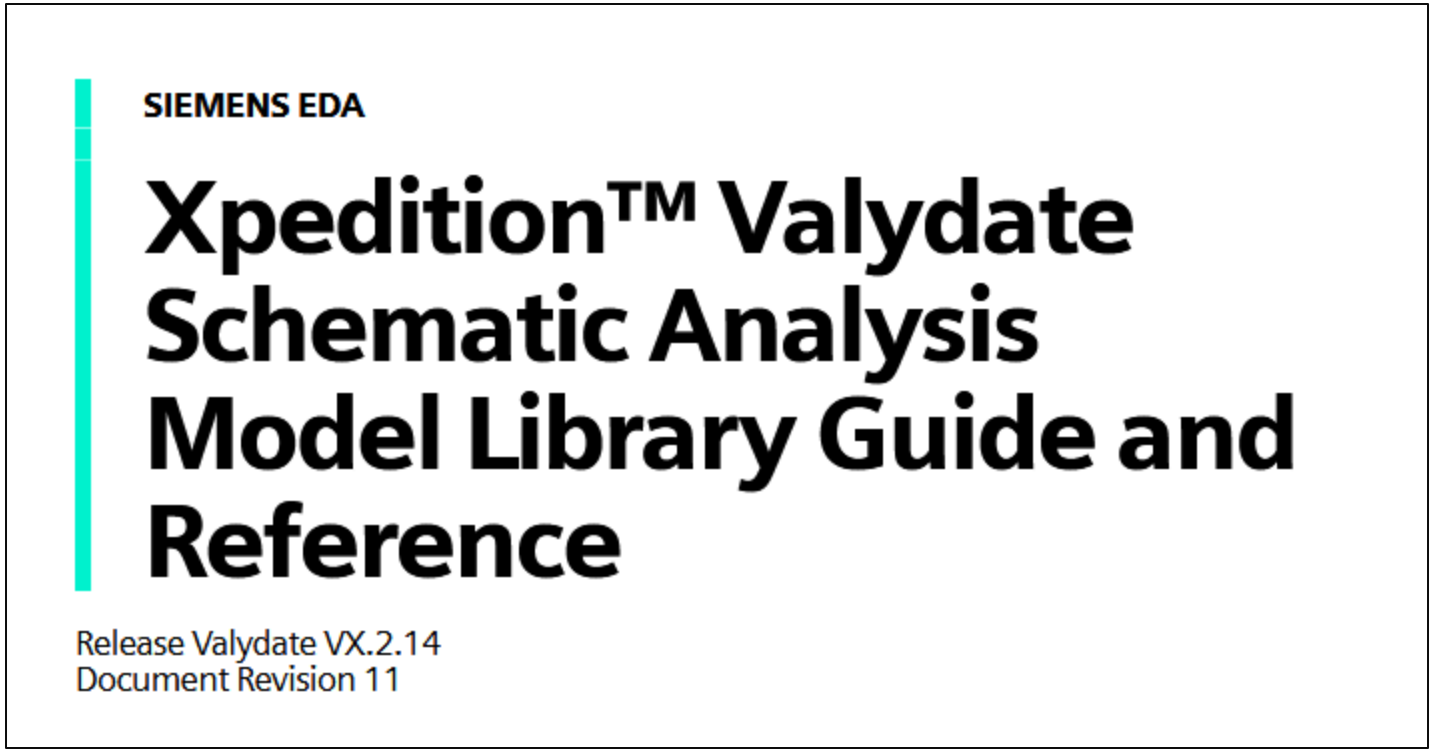
Found on Support Center: https://support.sw.siemens.com

Content: Xpedition Valydate VX.2.14.1



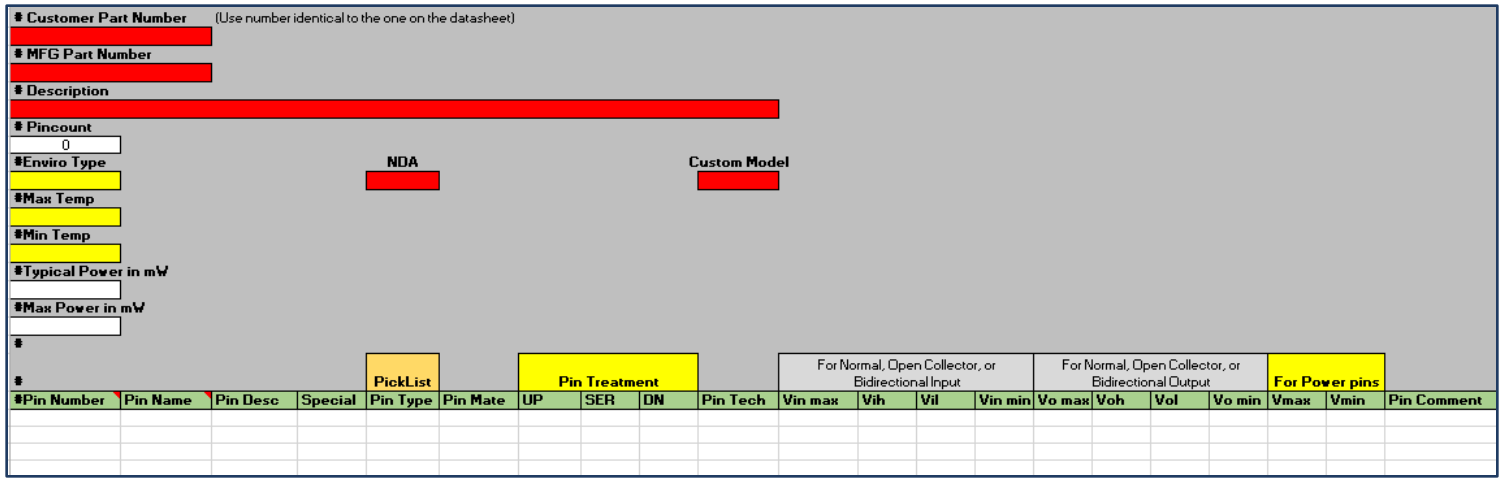
Model Creation & Library Guide

Your Go-To Guide for Valydate Models

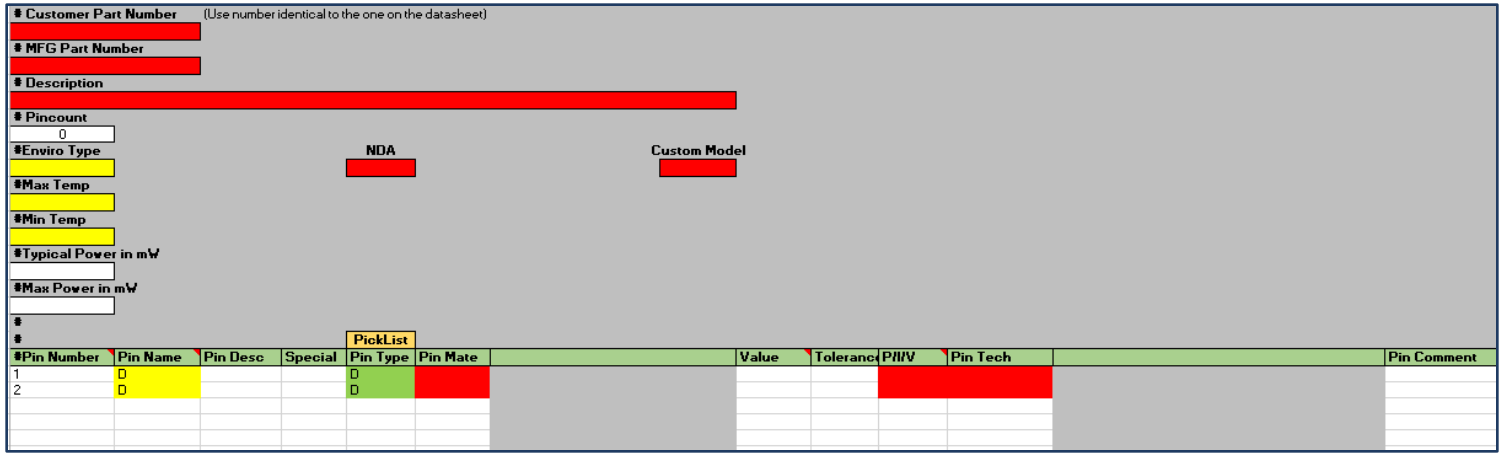


Model Templates – Version 9

Active Model Template: for active components/ICs

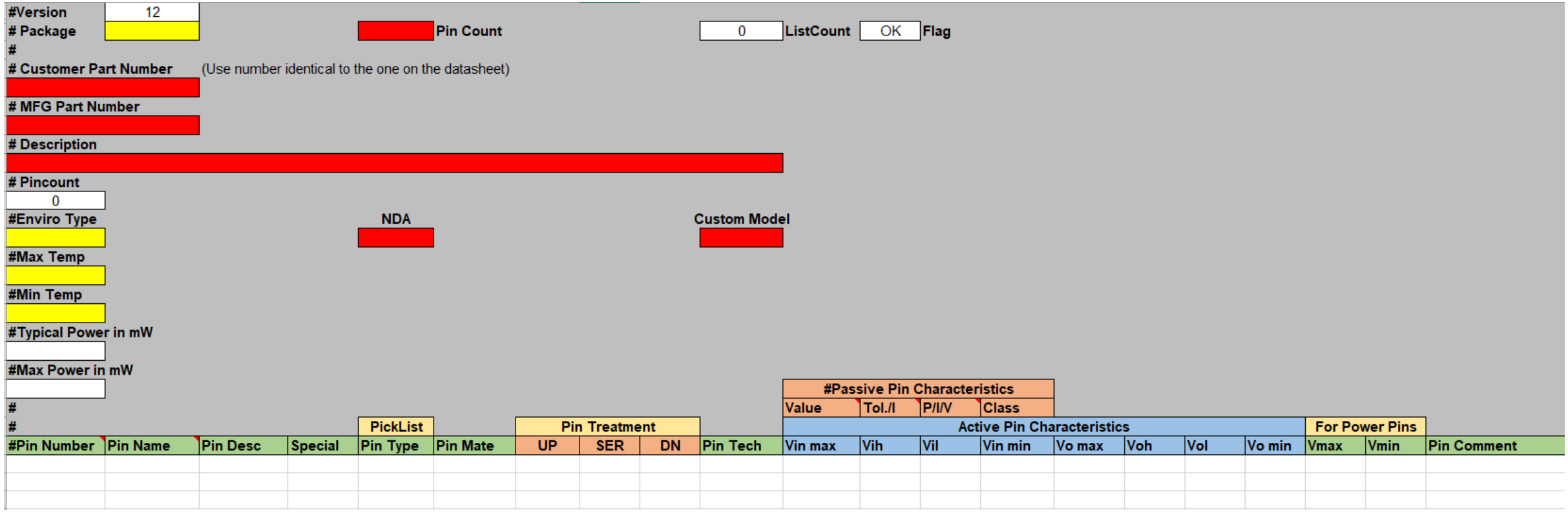


Passive Model Template: for resistors, capacitors, inductors, fuses



Model Templates – Version 12

Intelligent Model Template for active and passive components

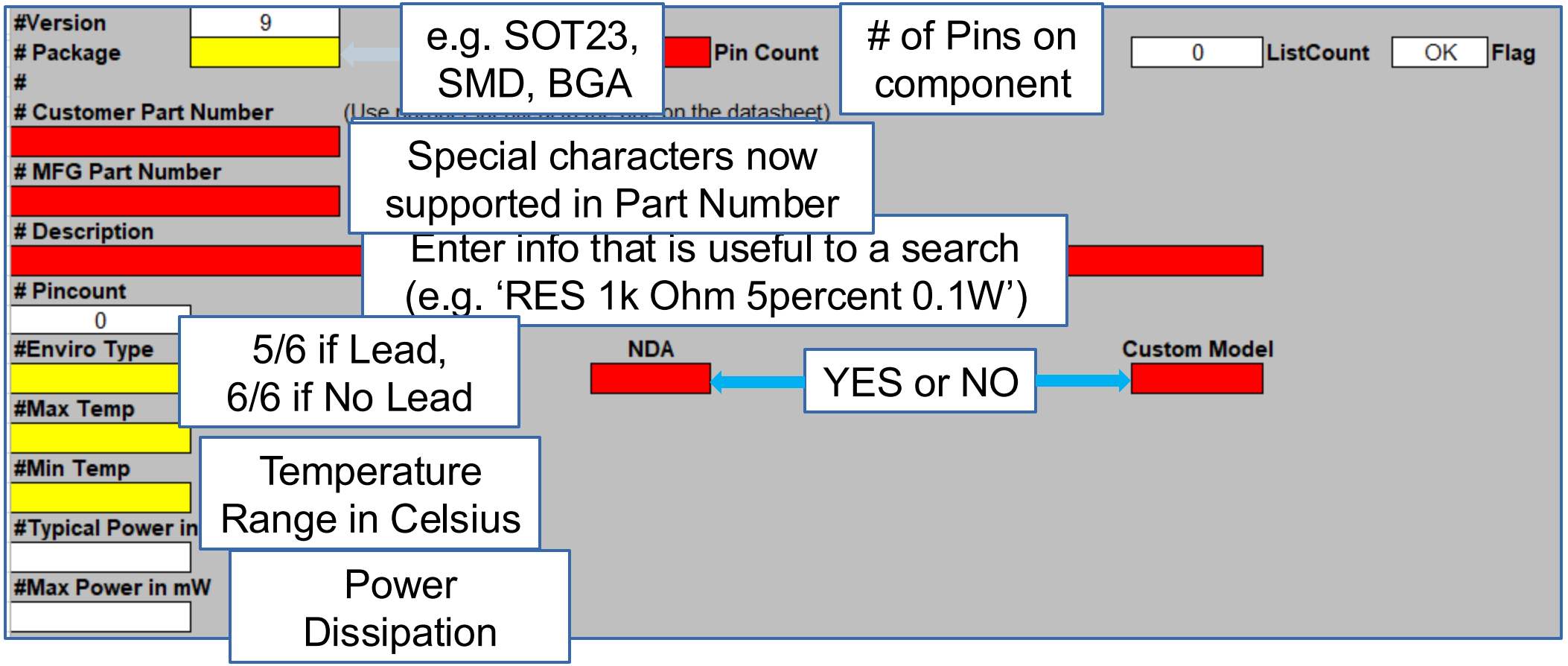


#Version 12
Package
Pin Count
0 ListCount
OK Flag
#
Customer Part Number (Use number identical to the one on the datasheet)
MFG Part Number
Description
Pincount
0
#Enviro Type
NDA
Custom Model
#Max Temp
#Min Temp
#Typical Power in mW
#Max Power in mW
#
#

										#Passive Pin Characteristics										
										Value	Tol./I	P/I/V	Class							
				PickList		Pin Treatment				Active Pin Characteristics								For Power Pins		
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min	Vo max	Voh	Vol	Vo min	Vmax	Vmin	Pin Comment

Model Header

Red cells are REQUIRED; yellow are optional but recommended



Model Data

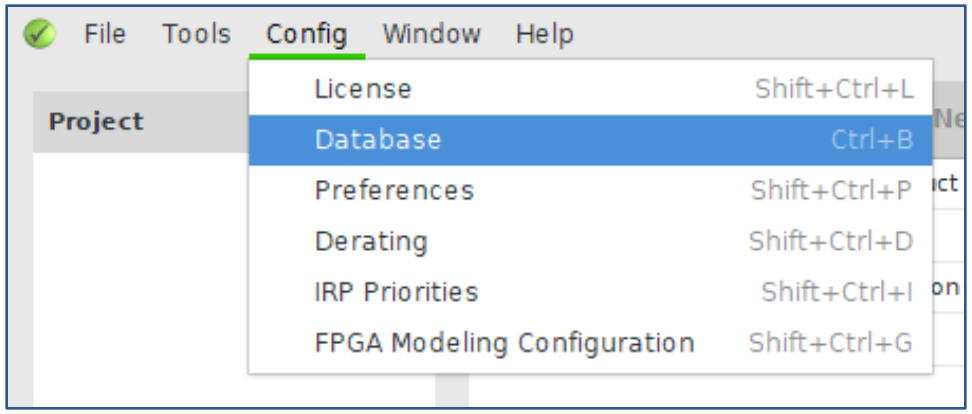
Models use conditional formatting
Depending on what is entered, different data entries are required

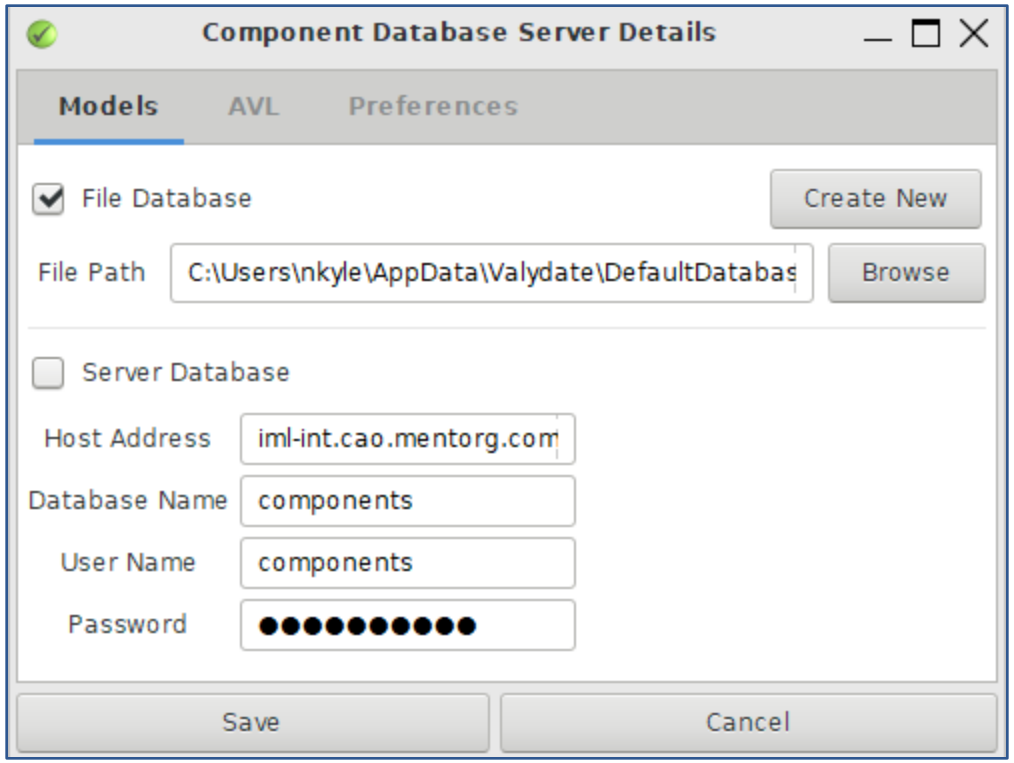
#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
1	GATE			FETG									
2	SOURCE			FETS									
3	DRAIN			FETD									

Red Cell = Data is required

Adding a Model to your Library

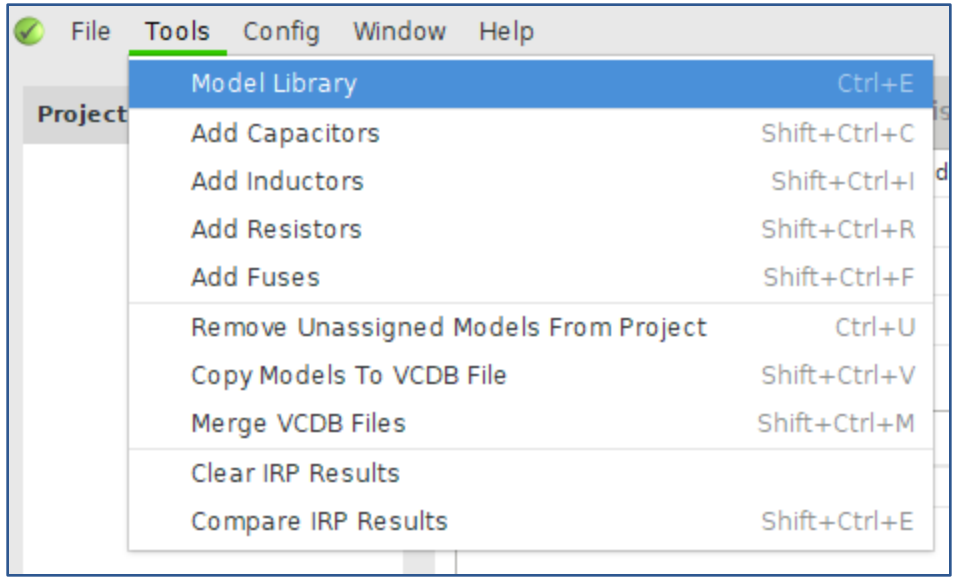
1. Configure Component Database

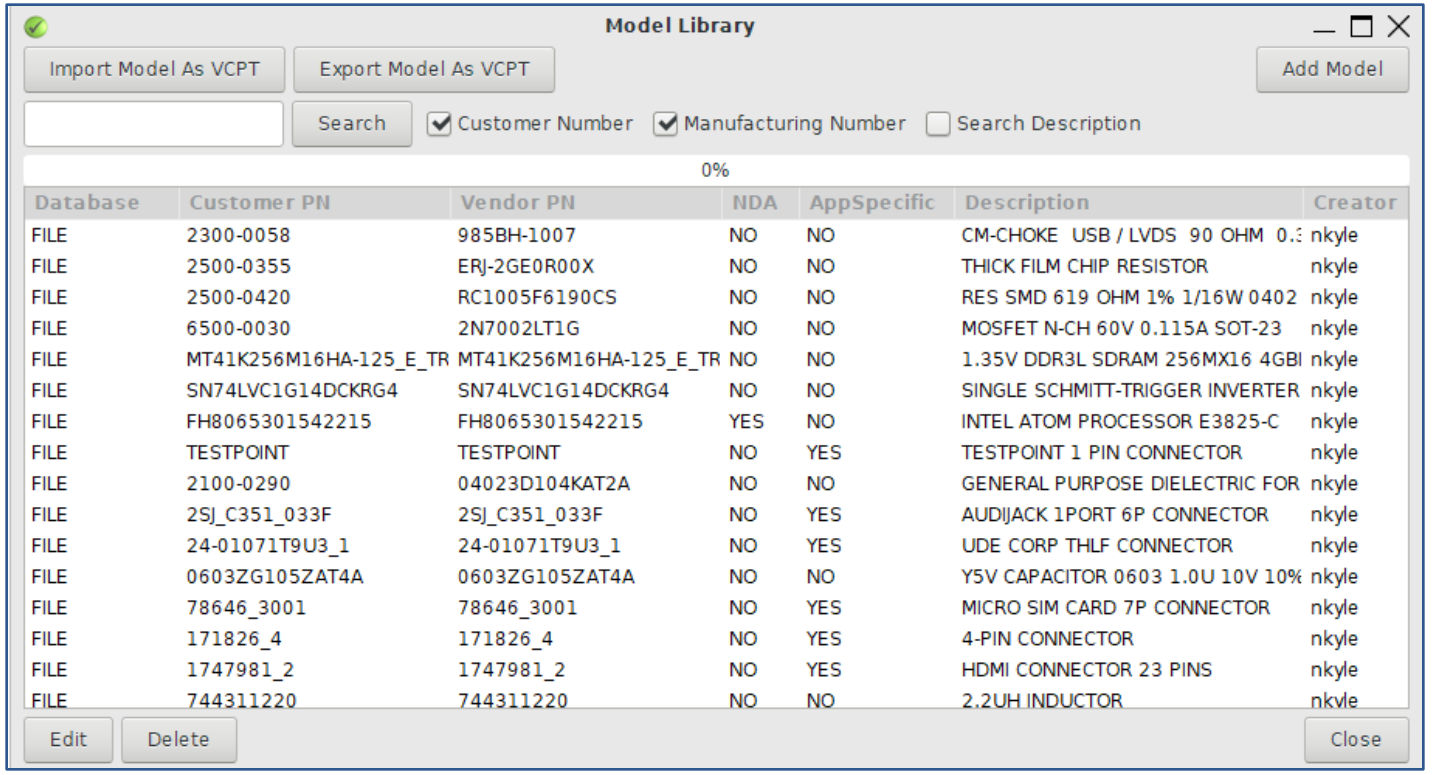




Adding a Model to your Library

2. Open Model Library

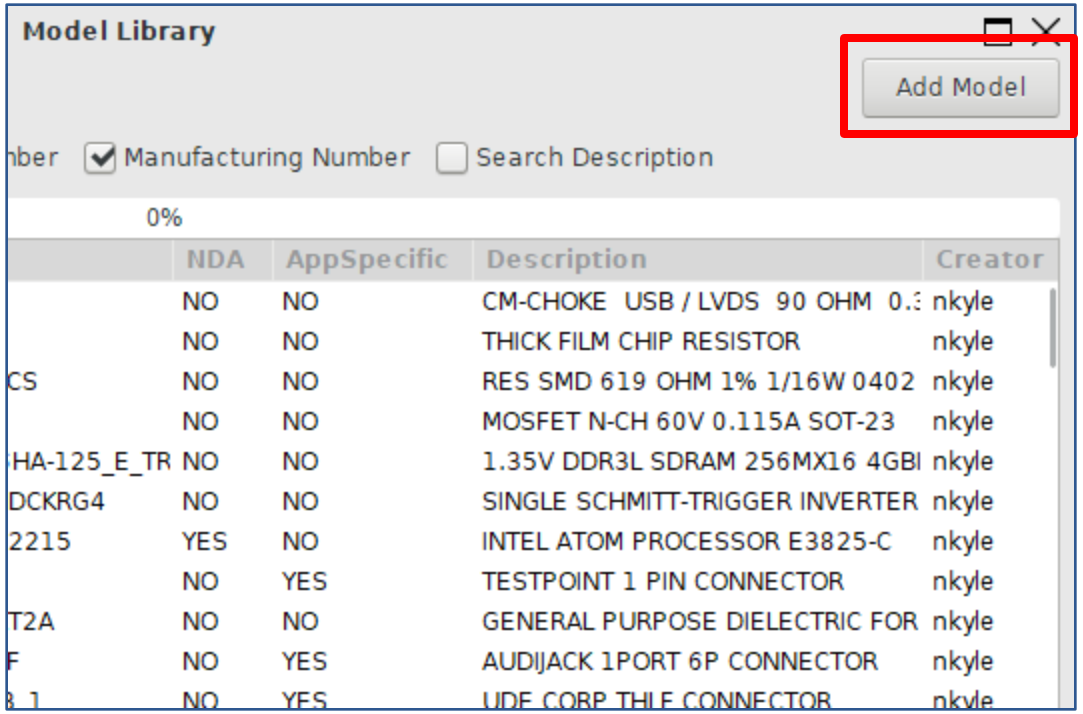


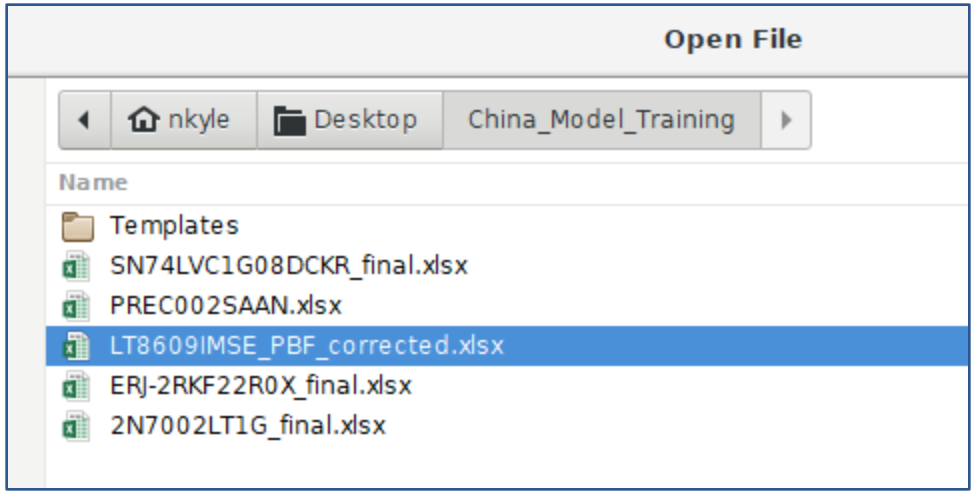


Database	Customer PN	Vendor PN	NDA	AppSpecific	Description	Creator
FILE	2300-0058	985BH-1007	NO	NO	CM-CHOKE USB / LVDS 90 OHM 0.3	nkyle
FILE	2500-0355	ERJ-2GE0R00X	NO	NO	THICK FILM CHIP RESISTOR	nkyle
FILE	2500-0420	RC1005F6190CS	NO	NO	RES SMD 619 OHM 1% 1/16W 0402	nkyle
FILE	6500-0030	2N7002LT1G	NO	NO	MOSFET N-CH 60V 0.115A SOT-23	nkyle
FILE	MT41K256M16HA-125_E_TR	MT41K256M16HA-125_E_TR	NO	NO	1.35V DDR3L SDRAM 256MX16 4GBI	nkyle
FILE	SN74LVC1G14DCKRG4	SN74LVC1G14DCKRG4	NO	NO	SINGLE SCHMITT-TRIGGER INVERTER	nkyle
FILE	FH8065301542215	FH8065301542215	YES	NO	INTEL ATOM PROCESSOR E3825-C	nkyle
FILE	TESTPOINT	TESTPOINT	NO	YES	TESTPOINT 1 PIN CONNECTOR	nkyle
FILE	2100-0290	04023D104KAT2A	NO	NO	GENERAL PURPOSE DIELECTRIC FOR	nkyle
FILE	2SJ_C351_033F	2SJ_C351_033F	NO	YES	AUDIJACK 1PORT 6P CONNECTOR	nkyle
FILE	24-01071T9U3_1	24-01071T9U3_1	NO	YES	UDE CORP THLF CONNECTOR	nkyle
FILE	0603ZG105ZAT4A	0603ZG105ZAT4A	NO	NO	Y5V CAPACITOR 0603 1.0U 10V 10%	nkyle
FILE	78646_3001	78646_3001	NO	YES	MICRO SIM CARD 7P CONNECTOR	nkyle
FILE	171826_4	171826_4	NO	YES	4-PIN CONNECTOR	nkyle
FILE	1747981_2	1747981_2	NO	YES	HDMI CONNECTOR 23 PINS	nkyle
FILE	744311220	744311220	NO	NO	2.2UH INDUCTOR	nkyle

Adding a Model to your Library

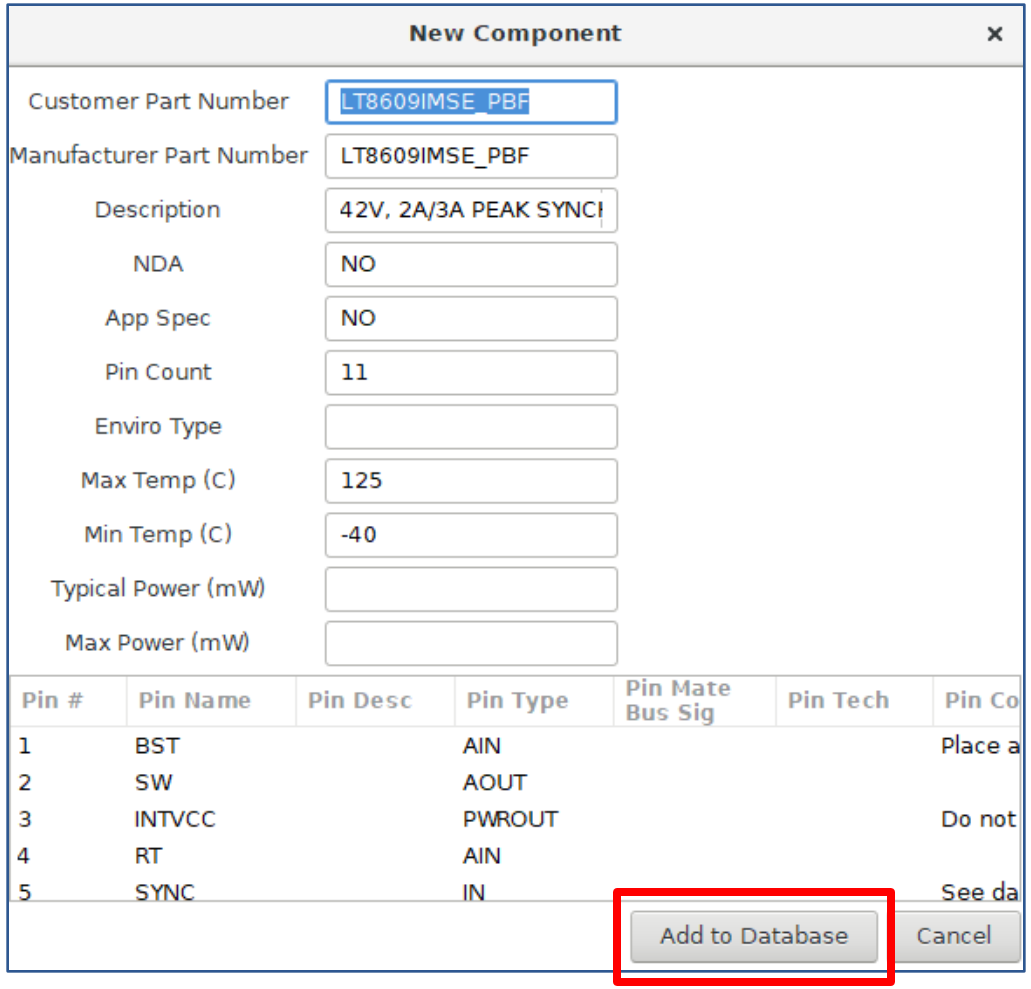
3. Add Model(s) to Library

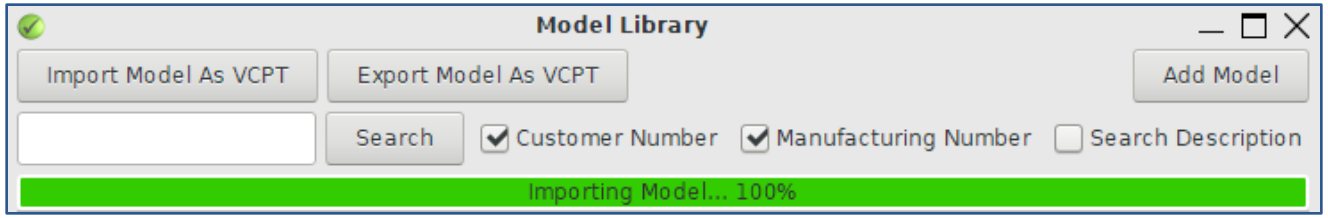




Adding a Model to your Library

3. Add Model(s) to Library



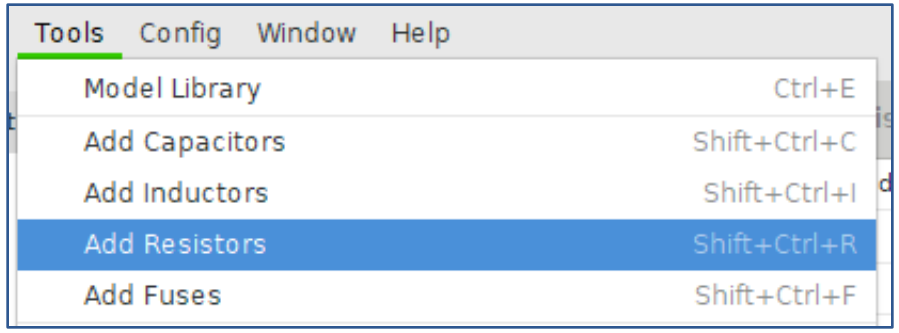


Using the Bulk Passive Templates

Resistor Bulk Template:

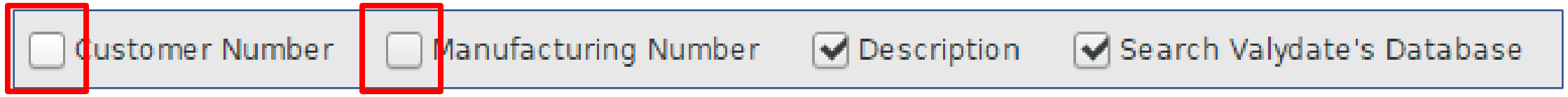
#Cust Part No	MFG Part No	Description	Value	Tol	Pwr(mW)
RK73H1ETTD2491F	RK73H1ETTD2491F	Res Thick Film 2.49K-Ohm 0.1 percent 1/16W 0402	2.49K	1	62.5
RK73B1ETTP106J	RK73B1ETTP106J	Res 0402 10M OHM 5percent 0.063W	10M	5	62.5
RK73B1ETTP510J	RK73B1ETTP510J	RES 51 OHMS 5percent 0.0625WATTS THICK FILM 0402 PKG	51	5	62.5
RK73B1ETTP682J	RK73B1ETTP682J	RES SMT 6.8K OHM 1/16 5percent 0402	6.8K	5	62.5
RK73H1ETTD4O22F	RK73H1ETTD4O22F	RES D 0402 40.2K 1 Percent 1/16W	40.2K	1	62.5
RK73H1ETTP1130F	RK73H1ETTP1130F	Res Thick Film 113-Ohm 1percent 1/16W 0402	113	1	62.5
RK73B1ETTP204J	RK73B1ETTP204J	RES 200K 1/16W 5percent THKFLM 0402	200K	5	62.5

Import into Valydate:



Model Searching Tips

- Remove packaging numbers at the end of the part number
- Change special characters (-*#%$) to underscore (_), or remove them
- When searching by Description, uncheck Part Number



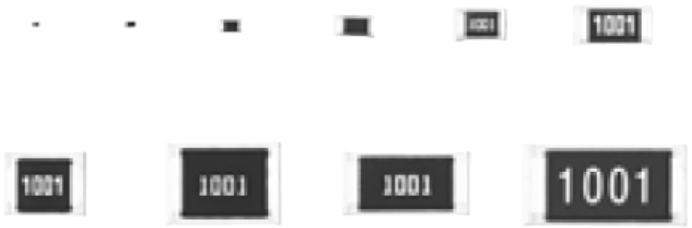
Modeling a Resistor

Resistor Datasheet: ERJ-2RKF22R0X

Panasonic Precision Thick Film Chip Resistors

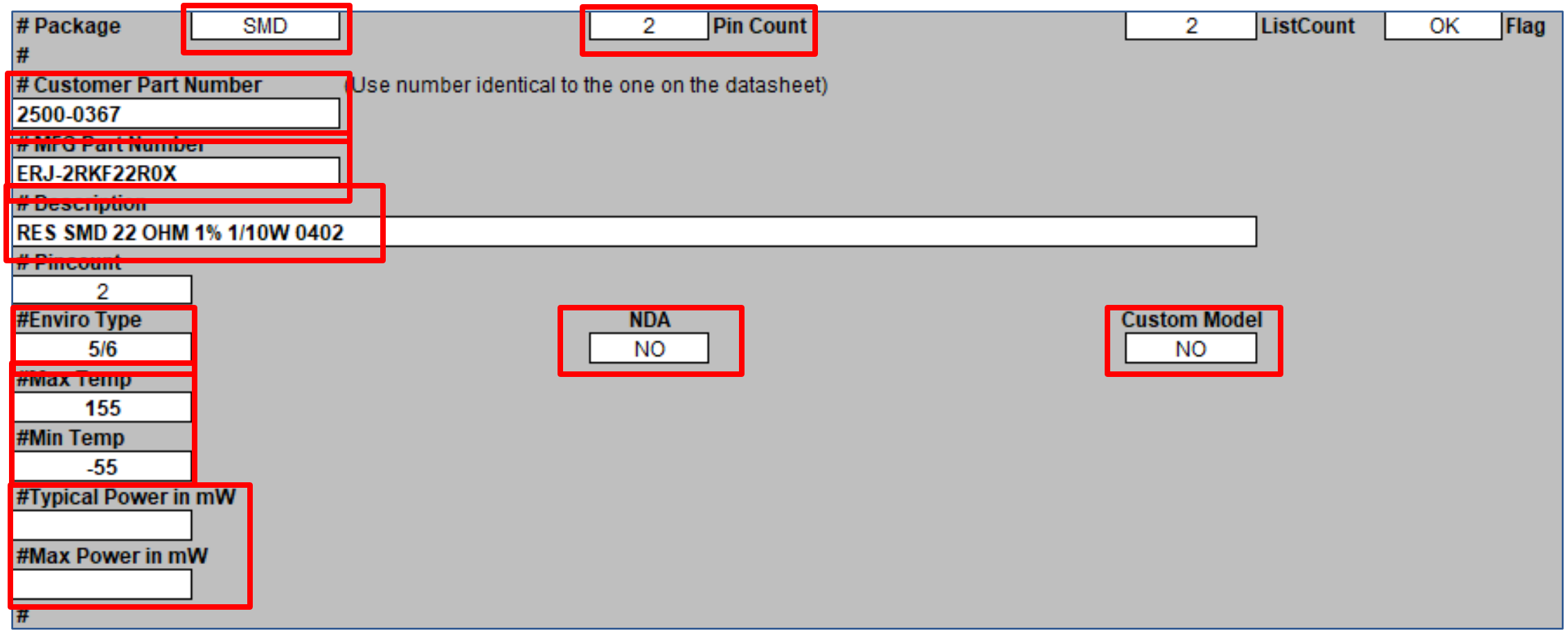
Precision Thick Film Chip Resistors
ERJ G : 01005, 0201
ERJ R : 0201, 0402, 0603, 0805
ERJ E : 0603, 0805, 1206,
1210, 1812, 2010, 2512

Type: **ERJ XG, 1G**
ERJ 1R, 2R, 3R, 6R
ERJ 3E, 6E, 8E, 14, 12, 1T

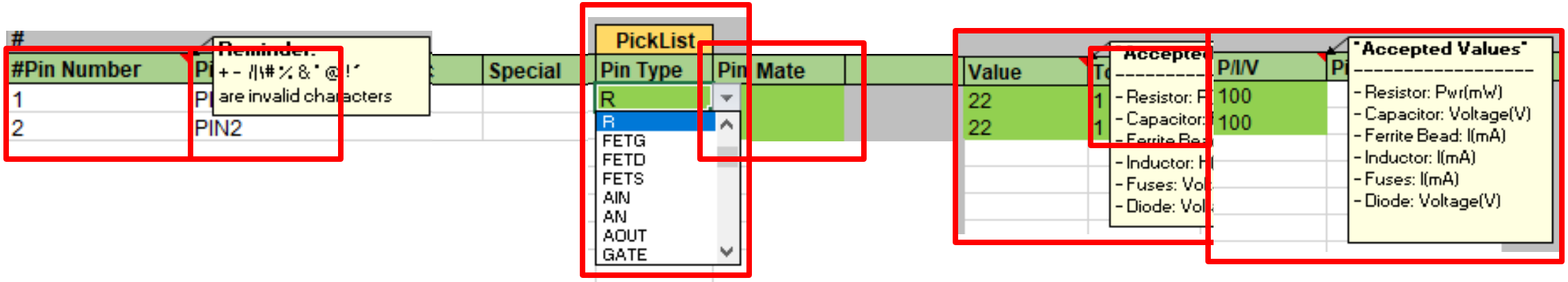


■ Features
- Small size and lightweight
- High reliability
  Metal glaze thick film resistive element and three layers of electrodes
- Compatible with placement machines
  Taping packaging available
- Suitable for both reflow and flow soldering
- Low Resistance Tolerance
  ERJXG, 1G, 2R, 3E, 6E, 8E, 14, 12, 1T Series ····· ±1 %
  ERJ1R, 2R, 3R, 6R Series ····· ±0.5 %
- Reference Standards
  IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified (Exemption ERJXG, ERJ1R)
- RoHS compliant

Resistor Header



Resistor Pin Data



Completed Resistor Model ✓

#Version	9				
# Package	SMD	2 Pin Count	2 ListCount	OK Flag	
#					
# Customer Part Number	(Use number identical to the one on the datasheet)				
2500-0367					
# MFG Part Number					
ERJ-2RKF22R0X					
# Description					
RES SMD 22 OHM 1% 1/10W 0402					
# Pincount					
2					
#Enviro Type		NDA	Custom Model		
5/6		NO	NO		
#Max Temp					
155					
#Min Temp					
-55					
#Typical Power in mW					
#Max Power in mW					
#					
#		PickList			

#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate		Value	Tolerance	P/I/V	Pin Tech	
1	PIN1			R	2		22	1	100		
2	PIN2			R	1		22	1	100		

Modeling a Connector

Connector Models

- Only Pin Numbers are needed (schematic is helpful)
- Pin Type: J

Completed 2-Pin Connector Model ✓

#Version	9								
# Package		2	Pin Count		2	ListCount	OK	Flag	
#									
# Customer Part Number	(Use number identical to the one on the datasheet)								
PREC002SAAN-RC									
# MFG Part Number									
4100-0096									
# Description									
CONN HEADER .100 SNGLE STR 2POS									
# Pincount									
2									
#Enviro Type		NDA		Custom Model					
		NO		NO					
#Max Temp									
105									
#Min Temp									
-40									
#Typical Power in mW									
#Max Power in mW									
#									
#		PickList							

#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate		Value	Tolerance	P/I/V
1	1			J					
2	2			J					

Modeling a MOSFET

MOSFET Datasheet: 2N7002LT1G

2N7002L, 2V7002L

Small Signal MOSFET

60 V, 115 mA, N−Channel SOT−23

Features

- 2V Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable (2V7002L)
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

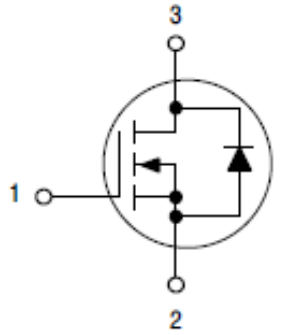
Rating	Symbol	Value	Unit
Drain−Source Voltage	V_{DSS}	60	Vdc
Drain−Gate Voltage (R_{GS} = 1.0 MΩ)	V_{DGR}	60	Vdc
Drain Current − Continuous T_C = 25°C (Note 1) T_C = 100°C (Note 1) − Pulsed (Note 2)	I_D I_D I_{DM}	±115 ±75 ±800	mAdc
Gate−Source Voltage − Continuous − Non−repetitive ($t_p \leq 50\ \mu s$)	V_{GS} V_{GSM}	±20 ±40	Vdc Vpk

ON Semiconductor®

www.onsemi.com

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
60 V	7.5 Ω @ 10 V, 500 mA	115 mA

N−Channel



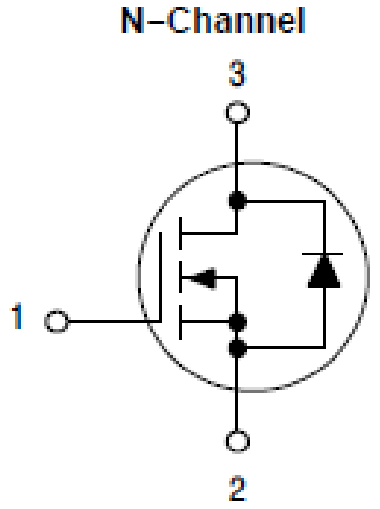
MARKING

MOSFET Header: 2N7002LT1G

#Version	9						
# Package	SOT-23	3	Pin Count	3	ListCount	OK	Flag
#							
# Customer Part Number	(Use number identical to the one on the datasheet)						
6500-0030							
# MFG Part Number							
2N7002LT1G							
# Description							
MOSFET 60-V N-CHANNEL							
# Pincount							
3							
#Enviro Type		NDA		Custom Model			
6/6		NO		NO			
#Max Temp							
150							
#Min Temp							
-55							
#Typical Power in mW							
#Max Power in mW							
225							

MOSFET Pin Types: 2N7002LT1G

#				PickList	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	
1	GATE			FETG	
2	SOURCE			FETS	
3	DRAIN			FETD	



STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

(from datasheet)

Model Creation Guide: MOSFET

Table 5.3: The threshold definitions for the MOSFET input gate terminal.

FETG	Comment
VIN max	is the maximum value of the gate-source voltage VGS in the Absolute Maximum Ratings section.
VIH	is the *lowest* gate-source voltage specified in the RDS(on) test conditions.
VIL	is the *minimum* gate threshold voltage VGS(th) specified in the Recommended Operating Conditions.
VIN min	is automatically filled at 0 Volts.

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
1	GATE			FETG									
2	SOURCE			FETS									
3	DRAIN			FETD									

MOSFET Datasheet: 2N7002LT1G

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain−Source Voltage	V_{DSS}	60	Vdc
Drain−Gate Voltage (R_{GS} = 1.0 MΩ)	V_{DGR}	60	Vdc
Drain Current − Continuous T_C = 25°C (Note 1) T_C = 100°C (Note 1) − Pulsed (Note 2)	I_D I_D I_{DM}	±115 ±75 ±800	mAdc
Gate−Source Voltage − Continuous − Non−repetitive ($t_p \leq 50$ μs)	V_{GS} V_{GSM}	±20 ±40	Vdc Vpk

VinMax = 20 V

MOSFET Datasheet: 2N7002LT1G

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μAdc)		$V_{GS(th)}$	1.0	–	2.5	Vdc
On−State Drain Current ($V_{DS} \geq 2.0\ V_{DS(on)}$, V_{GS} = 10 Vdc)		$I_{D(}$		–	–	mA
Static Drain−Source On−State Voltage (V_{GS} = 10 Vdc, I_D = 500 mAdc) (V_{GS} = 5.0 Vdc, I_D = 50 mAdc)		$V_{DS(on)}$	– –	– –	3.75 0.375	Vdc
Static Drain−Source On−State Resistance (V_{GS} = 10 V, I_D = 500 mAdc) (V_{GS} = 5.0 Vdc, I_D = 50 mAdc)	T_C = 25°C T_C = 125°C T_C = 25°C T_C = 125°C	$r_{DS(on)}$	– – – –	– – – –	7.5 13.5 7.5 13.5	Ohms
Forward Transconductance ($V_{DS} \geq 2.0\ V_{DS(on)}$, I_D = 200 mAdc)		g_{FS}	80	–	–	mS

VIL = 1.0 V

VIH = 5 V

VinMin = 0

MOSFET Pin Data: 2N7002LT1G

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
1	GATE			FETG						20	5	1	0
2	SOURCE			FETS									
3	DRAIN			FETD									

Completed MOSFET Model ✓

#Version	9				
# Package	SOT-23	3	Pin Count	3	ListCount	OK	Flag
#					
# Customer Part Number	(Use number identical to the one on the datasheet)				
6500-0030					
# MFG Part Number					
2N7002LT1G					
# Description					
MOSFET 60-V N-CHANNEL					
# Pincount					
3					
#Enviro Type		NDA		Custom Model	
6/6		NO		NO	
#Max Temp					
150					
#Min Temp					
-55					
#Typical Power in mW					
#Max Power in mW					
225					
#					

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input				For Normal, Open Collector, or Bidirectional Output				For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min	Vo max	Voh	Vol	Vo min	Vmax	Vmin
1	GATE			FETG						20	5	1	0						
2	SOURCE			FETS															
3	DRAIN			FETD															

Modeling a Logic Gate

Part Datasheet: SN74LVC1G08DCKR

SN74LVC1G08 Single 2-Input Positive-AND Gate

1 Features

- Available in the Ultra Small 0.64-mm^2 Package (DPW) With 0.5-mm Pitch
- Supports 5-V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Provides Down Translation to V_{CC}
- Max t_{pd} of 3.6 ns at 3.3 V
- Low Power Consumption, 10-µA Max I_{CC}
- ±24-mA Output Drive at 3.3 V
- I_{off} Supports Live Insertion, Partial-Power-Down Mode, and Back Drive Protection
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

2 Applications

- ATCA Solutions
- Active Noise Cancellation (ANC)
- Barcode Scanner
- Blood Pressure Monitor
- CPAP Machine
- Cable Solutions
- DLP 3D Machine Vision, Hyperspectral Imaging, Optical Networking, and Spectroscopy

3 Description

This single 2-input positive-AND gate is designed for 1.65-V to 5.5-V V_{CC} operation.

The SN74LVC1G08 device performs the Boolean function or $Y = A \bullet B$ or $Y = \overline{\overline{A} + \overline{B}}$ in positive logic.

The CMOS device has high output drive while maintaining low static power dissipation over a broad V_{CC} operating range.

The SN74LVC1G08 is available in a variety of packages, including the ultra-small DPW package with a body size of 0.8 mm × 0.8 mm.

Device Information(1)

DEVICE NAME	PACKAGE	BODY SIZE
SN74LVC1G08	SOT-23 (5)	2.9mm × 1.6mm
	SC70 (5)	2.0mm × 1.25mm
	X2SON (4)	0.8mm × 0.8mm
	SON (6)	1.45mm × 1.0mm
	SON (6)	1.0mm × 1.0mm

(1) For all available packages, see the orderable addendum at the end of the datasheet.

AND Gate Header: SN74LVC1G08DCKR

#Version	9						
# Package	SC70	5	Pin Count	14	ListCount	OK	Flag
#							
# Customer Part Number	(Use number identical to the one on the datasheet)						
6200-0201							
# MFG Part Number							
SN74LVC1G08DCKR							
# Description							
Single 2-Input Positive-And Gate							
# Pincount							
5							
#Enviro Type		NDA		Custom Model			
6/6		NO		NO			
#Max Temp							
125							
#Min Temp							
-40							
#Typical Power in mW							
#Max Power in mW							

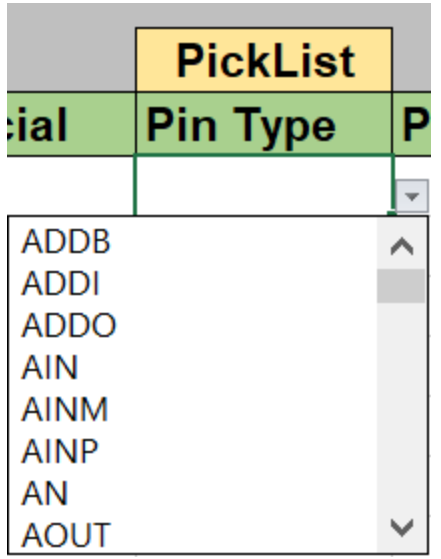
Model Guide: Pin Types

Can be found in Manual or in Template

Pin Type	Definition
ADDB	Address Bidirectional
ADDI	Address Input
ADDO	Address Output
AIN	Analog Input
AINM	Analog Input -ve
AINP	Analog Input +ve
AN	Analog Bidirectional
AOUT	Analog Output
BI	Digital Bi-Directional
BJTB	BJT Base
BJTC	BJT Collector
BJTE	BJT Emitter
C	Capacitor
CM	Capacitor
CP	Capacitor
D	Diode
DA	Diode
DK	Diode
DATA	Data Bidirectional
DATI	Data Input
DATO	Data Output
DBIM	Differential Bidirectional -ve
DBIP	Differential Bidirectional +ve
DINM	Differential Input -ve
DINP	Differential Input +ve
DOUTM	Differential Output -ve
DOUTP	Differential Output +ve
FB	Feedback Pin
FETD	MOSFET Drain
FETG	MOSFET Gate
FETS	MOSFET Source
FUSE	Fuse
GATE	Analog Switch
GATEIN	Both GATE and IN
GATEOD	Both GATE and OD
GND	Ground
GNDOUT	Power Supply GND Output
I	Inductor
IN	Digital Input
J	Connector
NC	No Connect
OC	Open Collector
OCOUT	Open Collector Output only
OD	Open Drain
ODOUT	Open Drain Output only
OUT	Digital Output
PWR	Power (Positive)
PWRN	Power (Negative). Used for op-amps with dual supply or single supply. It can connect to GND if the voltage range includes 0V.
PWROUT	Fixed voltage output (ie LDO)
R	Resistor with mate pin (for r-nets)
UNDEF	FPGA Unused Pins
XTAL	Crystal with mate pin
XFMR	Transformer Tap (Turns Ratio)
CTAP	Transformer Center Tap

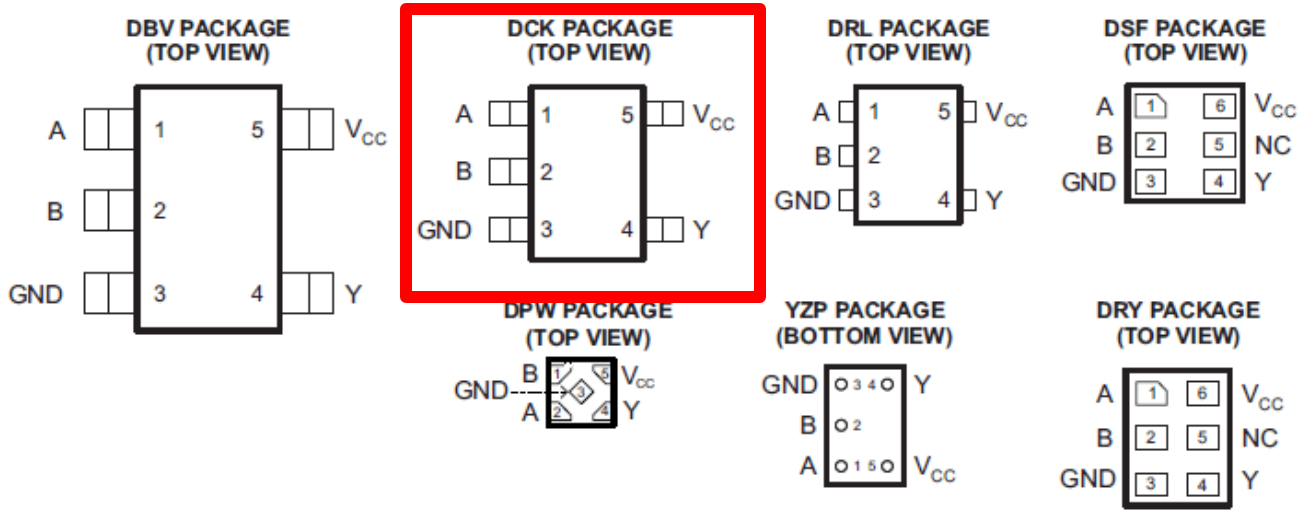
Diode	Capacitor	Inductor
LED	AL	BEAD
RECT	ALO	IND
SCHOTTKY	CER	
SWITCH	METP	
TVS	TANTP	
ZENER	TANTS	
	SCAP	

PickList in Template:



Part Datasheet: SN74LVC1G08DCKR Pin Info

5 Pin Configuration and Functions



NC – No internal connection

See mechanical drawings for dimensions.

Pin Functions

PIN				DESCRIPTION
NAME	DBV, DCK, DRL, YZP	DRY, DSF	DPW	
A	1	1	2	Input
B	2	2	1	Input
GND	3	3	3	Ground
Y	4	4	4	Output
V_{CC}	5	6	5	Power pin
NC		5		Not connected

Pin Data: SN74LVC1G08DCKR

#				PickList	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	P
1	A	Input		IN	
2	B	Input		IN	
3	GND	Ground		GND	
4	Y	Output		OUT	
5	VCC	Power		PWR	

Model Guide: Pin Treatments

Pin Treatment columns are required if the pin needs special attributes depending on its design topology

Available Pin Treatment Options

(a): SUBJECTIVE PIN TREATMENT				
TYPE	UP	SER	DN	COMMENT
A	VALID		VALID	Active High or Active Low pin, where UP/DN refers to pulling the pin high or low to enable the device to its normal mode of operation
N	VALID	VALID	VALID	Treatment for unused pins, where UP/DN refers to pulling the pin high or low, and SER refers to leaving the pin unconnected
X	VALID	VALID	VALID	There must be No Connection to this pin
Y		VALID		This pin must have a Driven Signal connection

(b): INTERNAL and EXTERNAL PASSIVE COMPONENTS				
TYPE	UP	SER	DN	COMMENT
R	VALID	@	VALID	External unknown value resistor
K	VALID	@	VALID	Internal unknown value resistor
C	VALID	VALID	VALID	External unknown value capacitor
U	VALID	VALID	VALID	Internal unknown value capacitor
L	VALID	@	VALID	External unknown value inductor
H	VALID	@	VALID	Internal unknown value inductor
D	VALID	@	VALID	External diode

Logic Gate Pin Treatments

For this IC, unterminated inputs should be pulled UP or DOWN

#				PickList		Pin Treatment		
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN
1	A	Input		IN		N		N
2	B	Input		IN		N		N
3	GND	Ground		GND				
4	Y	Output		OUT				
5	VCC	Power		PWR				

Part Datasheet: SN74LVC1G08DCKR Voltages

Power voltage range:
1.65 – 5.5 V

6.3 Recommended Operating Conditions[1]

			MIN	MAX	UNIT
V_{CC}	Supply voltage	Operating	1.65	5.5	V
		Data retention only	1.5		
V_{IH}	High-level input voltage	V_{CC} = 1.65 V to 1.95 V	0.65 × V_{CC}		V
		V_{CC} = 2.3 V to 2.7 V	1.7		
		V_{CC} = 3 V to 3.6 V	2		
		V_{CC} = 4.5 V to 5.5 V	0.7 × V_{CC}		
V_{IL}	Low-level input voltage	V_{CC} = 1.65 V to 1.95 V		0.35 × V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V		0.7	
		V_{CC} = 3 V to 3.6 V		0.8	
		V_{CC} = 4.5 V to 5.5 V		0.3 × V_{CC}	
V_I	Input voltage		0	5.5	V
V_O	Output voltage		0	V_{CC}	V

Part Datasheet: SN74LVC1G08DCKR Voltages

6.3 Recommended Operating Conditions[1]

			MIN	MAX	UNIT
V_{CC}	Supply voltage	Operating	1.65	5.5	V
		Data retention only	1.5		
V_{IH}	High-level input voltage	V_{CC} = 1.65 V to 1.95 V	0.65 × V_{CC}		V
		V_{CC} = 2.3 V to 2.7 V	1.7		
		V_{CC} = 3 V to 3.6 V	2		
		V_{CC} = 4.5 V to 5.5 V	0.7 × V_{CC}		
V_{IL}	Low-level input voltage	V_{CC} = 1.65 V to 1.95 V		0.35 × V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V		0.7	
		V_{CC} = 3 V to 3.6 V		0.8	
		V_{CC} = 4.5 V to 5.5 V		0.3 × V_{CC}	
V_I	Input voltage				
V_O	Output voltage				

Different Logic Thresholds

Voltage Instantiation

Valydate supports multiple voltage functions
Datasheet example:

V_{IH}	High-level input voltage	V_{CC} = 1.65 V to 1.95 V	0.65 × V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V	1.7	
		V_{CC} = 3 V to 3.6 V	2	
		V_{CC} = 4.5 V to 5.5 V	0.7 × V_{CC}	

Pin voltage varies based on input voltage

Variables in Valydate Models

- Valydate supports variables in Valydate models
- Power pin voltage must be specified first

#				PickList		For Normal, Open Collector, or Bidirectional Output				For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	Vo max	Voh	Vol	Vo min	Vmax	Vmin
5	VCC	Power		PWR						5.5	1.65

- Then that power pin name may be used as a variable
  - Must follow following format: [VARIABLE][space][operation][numeric value]
  - Examples: 'VCC * 0.5' or 'VCC - 0.2'
  - Second space is optional, but first space is required

For Normal, Open Collector, or Bidirectional Input			
Vin max	Vih	Vil	Vin min
5.5	VCC *0.65	VCC * 0.35	0

Voltage Instantiation

Model Example:

If VCC = [Vmax], then previous voltages are applied to circuit

#				PickList	For Normal, Open Collector, or Bidirectional Input				For Normal, Open Collector, or Bidirectional Output				For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Vin max	Vih	Vil	Vin min	Vo max	Voh	Vol	Vo min	Vmax	Vmin
1	A	Input		IN	5.5	VCC *0.65	VCC * 0.35	0					1.8	VCC
1	A	Input		IN	5.5	1.7	0.7	0					2.5	VCC
1	A	Input		IN	5.5	2	0.8	0					3.3	VCC
1	A	Input		IN	5.5	VCC * 0.7	VCC * 0.3	0					5	VCC

Mult

Yellow highlights to warn you of the same pin being used

Different volta functions for eac

Variable goes under “Vmin”

Pin Data: SN74LVC1G08DCKR Voltages

#				PickList	For Normal, Open Collector, or Bidirectional Input				For Normal, Open Collector, or Bidirectional Output				For Power pins		
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Vin max	Vih	Vil	Vin min	Vo max	Voh	Vol	Vo min	Vmax	Vmin	P
1	A	Input		IN	5.5	VCC *0.65	VCC * 0.35	0					1.8	VCC	
1	A	Input		IN	5.5	1.7	0.7	0					2.5	VCC	
1	A	Input		IN	5.5	2	0.8						3	VCC	
1	A	Input		IN	5.5	VCC * 0.7	VCC							VCC	
2	B	Input		IN	5.5	VCC * 0.65	VCC						1.8	VCC	
2	B	Input		IN	5.5	1.7	0.7	0					2.5	VCC	
2	B	Input		IN	5.5	2	0.8	0					3.3	VCC	
2	B	Input		IN	5.5	VCC * 0.7	VCC * 0.3	0					5	VCC	
3	GND	Ground		GND									0		
4	Y	Output		OUT					VCC	1.2	0.45	0	1.65	VCC	
4	Y	Output		OUT									2.3	VCC	
4	Y	Output		OUT									3	VCC	
4	Y	Output		OUT					VCC	3.8	0.55	0	4.5	VCC	
5	VCC	Power		PWR									5.5	1.65	

Variable functions used

Voltage instantiations

Completed AND-Gate Model ✓

#Version	9																			
# Package	SC70		5	Pin Count			14	ListCount	OK	Flag										
#																				
# Customer Part Number	(Use number identical to the one on the datasheet)																			
6200-0201																				
# MFG Part Number																				
SN74LVC1G08DCKR																				
# Description																				
Single 2-Input Positive-And Gate																				
# Pincount																				
5																				
#Enviro Type			NDA				Custom Model													
6/6			NO				NO													
#Max Temp																				
125																				
#Min Temp																				
-40																				
#Typical Power in mW																				
#Max Power in mW																				
#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input				For Normal, Open Collector, or Bidirectional Output				For Power pins		
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min	Vo max	Voh	Vol	Vo min	Vmax	Vmin	Pin Comment
1	A	Input		IN		N		N		5.5	VCC *0.65	VCC * 0.35	0					1.8	VCC	
1	A	Input		IN		N		N		5.5	1.7	0.7	0					2.5	VCC	
1	A	Input		IN		N		N		5.5	2	0.8	0					3.3	VCC	
1	A	Input		IN		N		N		5.5	VCC * 0.7	VCC * 0.3	0					5	VCC	
2	B	Input		IN		N		N		5.5	VCC * 0.65	VCC * 0.35	0					1.8	VCC	
2	B	Input		IN		N		N		5.5	1.7	0.7	0					2.5	VCC	
2	B	Input		IN		N		N		5.5	2	0.8	0					3.3	VCC	
2	B	Input		IN		N		N		5.5	VCC * 0.7	VCC * 0.3	0					5	VCC	
3	GND	Ground		GND														0		
4	Y	Output		OUT										VCC	1.2	0.45	0	1.65	VCC	
4	Y	Output		OUT										VCC	1.9	0.3	0	2.3	VCC	
4	Y	Output		OUT										VCC	2.3	0.55	0	3	VCC	
4	Y	Output		OUT										VCC	3.8	0.55	0	4.5	VCC	
5	VCC	Power		PWR														5.5	1.65	

Modeling a Voltage Regulator

Model Guide: Pin Treatment

Table 4.2: A summary of the available Pin Treatment options in Version 9.

(c): ADDITIONAL SYNTAX				
TYPE	**UP**	**SER**	**DN**	**COMMENT**
"|" (PIPE)	VALID	VALID	VALID	Separates multiple pin treatment entries in a cell. i.e. "A|K" in the UP column refers to Active High with an internal unknown value resistor
@[PIN #]		VALID		Appends to any of the pin treatment options in cases where a pin-to-pin connection is required on the same device. i.e. "C@B16" refers to an external capacitor tied to pin B16
N[value]K	VALID	@	VALID	External known value resistor in kΩ for Unused pin treatment
R[value]K	VALID	@	VALID	External known value resistor in kΩ
[value]K	VALID	@	VALID	Internal known value resistor in kΩ
C[value]U	VALID	@	VALID	External known value capacitor in μFarads
[value]U	VALID	@	VALID	Internal known value capacitor in μFarads
L[value]H	VALID	@	VALID	External known value inductor in Henries
[value]H	VALID	@	VALID	Internal known value inductor in Henries

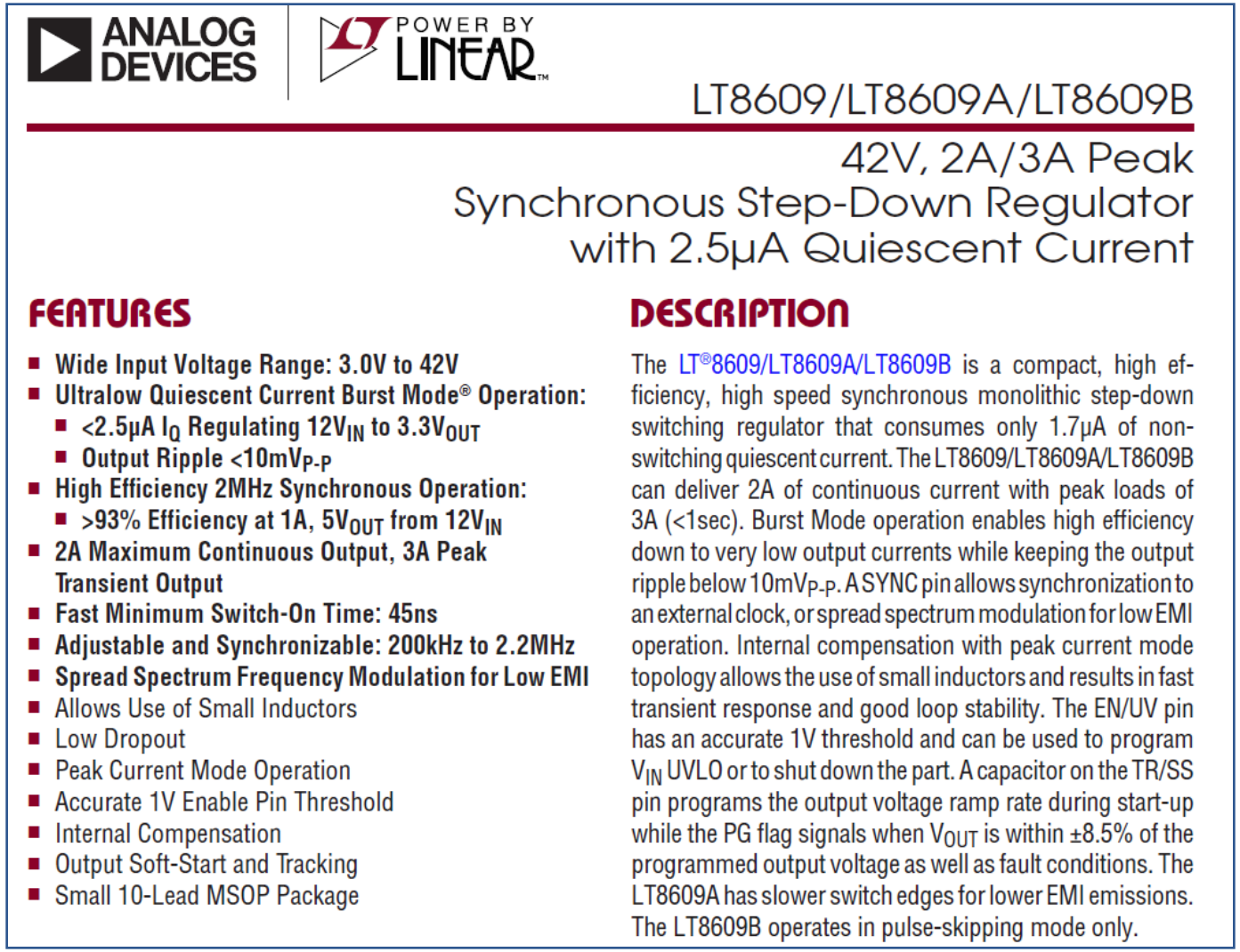
Model Guide: Pin Treatment

Examples:

Table 4.3: An example of mandatory pin treatment information.

PIN TREATMENT			
UP	**SER**	**DN**	**COMMENT**
A	R10K@B12	50K	Pin is active high (enabling the operation of the device), must connect to pin B12 with a 10K resistor and has an INTERNAL 50K pulldown resistor.
N		A|R10K	If pin is not used, pull this pin to VDD. Pin is active low (enabling the operation of the device) and has an EXTERNAL 10k pullup.

Part Datasheet: LT8609IMSE_PBF



ANALOG DEVICES | POWER BY LINEAR™

LT8609/LT8609A/LT8609B

42V, 2A/3A Peak
Synchronous Step-Down Regulator
with 2.5µA Quiescent Current

FEATURES

- **Wide Input Voltage Range: 3.0V to 42V**
- **Ultralow Quiescent Current Burst Mode® Operation:**
  - **<2.5µA I_Q Regulating $12V_{IN}$ to $3.3V_{OUT}$**
  - **Output Ripple <10mV_{P-P}**
- **High Efficiency 2MHz Synchronous Operation:**
  - **>93% Efficiency at 1A, $5V_{OUT}$ from $12V_{IN}$**
- **2A Maximum Continuous Output, 3A Peak Transient Output**
- **Fast Minimum Switch-On Time: 45ns**
- **Adjustable and Synchronizable: 200kHz to 2.2MHz**
- **Spread Spectrum Frequency Modulation for Low EMI**
- Allows Use of Small Inductors
- Low Dropout
- Peak Current Mode Operation
- Accurate 1V Enable Pin Threshold
- Internal Compensation
- Output Soft-Start and Tracking
- Small 10-Lead MSOP Package

DESCRIPTION

The LT®8609/LT8609A/LT8609B is a compact, high efficiency, high speed synchronous monolithic step-down switching regulator that consumes only 1.7µA of non-switching quiescent current. The LT8609/LT8609A/LT8609B can deliver 2A of continuous current with peak loads of 3A (<1sec). Burst Mode operation enables high efficiency down to very low output currents while keeping the output ripple below 10mV_{P-P}. A SYNC pin allows synchronization to an external clock, or spread spectrum modulation for low EMI operation. Internal compensation with peak current mode topology allows the use of small inductors and results in fast transient response and good loop stability. The EN/UV pin has an accurate 1V threshold and can be used to program V_{IN} UVLO or to shut down the part. A capacitor on the TR/SS pin programs the output voltage ramp rate during start-up while the PG flag signals when V_{OUT} is within ±8.5% of the programmed output voltage as well as fault conditions. The LT8609A has slower switch edges for lower EMI emissions. The LT8609B operates in pulse-skipping mode only.

Regulator Header: LT8609IMSE_PBF

# Package	MSOP	11	Pin Count	11	ListCount	OK	Flag

#

Customer Part Number (Use number identical to the one on the datasheet)

LT8609IMSE_PBF

MFG Part Number

LT8609IMSE_PBF

Description

42V, 2A/3A Peak Synchronous Step-Down Regulator with 2.5µA Quiescent Current

Pincount

11

#Enviro Type	NDA	Custom Model
	NO	NO

#Max Temp

125

#Min Temp

-40

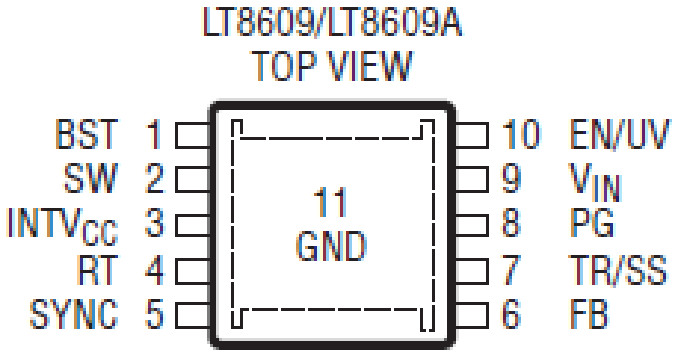
#Typical Power in mW

#Max Power in mW

#

Part Datasheet: LT8609IMSE_PBF Pin Info

PIN CONFIGURATION

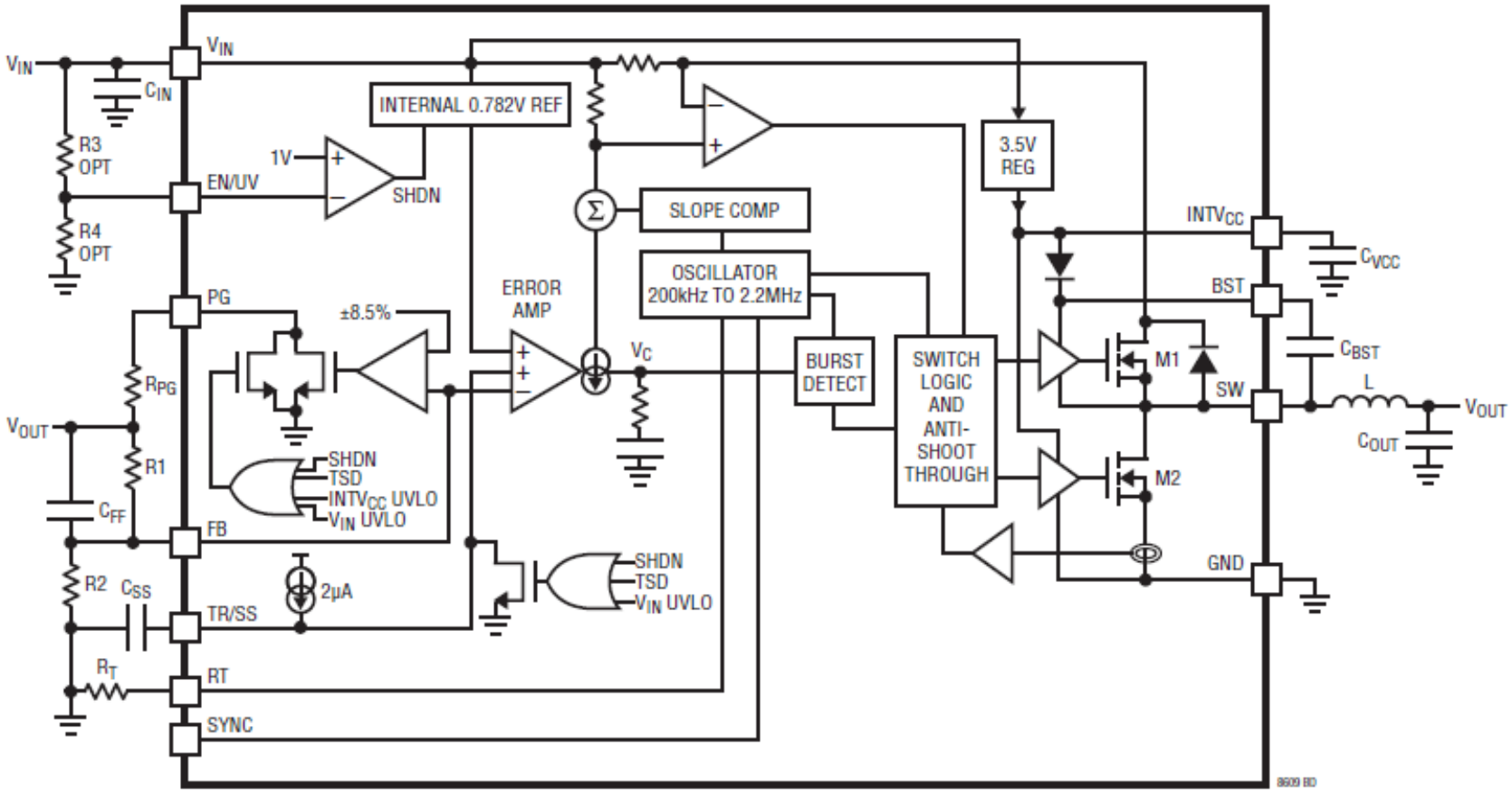


MSE PACKAGE
10-LEAD PLASTIC MSOP

θ_{JA} = 40°C/W
EXPOSED PAD (PIN 11) IS GND, MUST BE SOLDERED TO PCB

Part Datasheet: LT8609IMSE_PBF Pin Info

BLOCK DIAGRAM



LT8609IMSE_PBF Pin Data: Pin 1

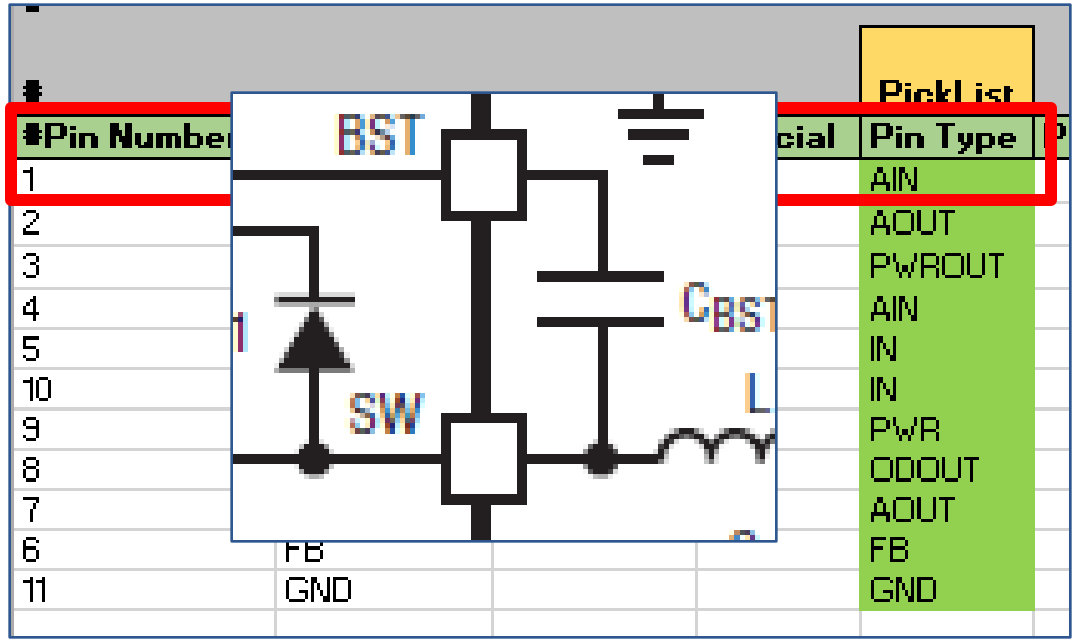
LT8609/LT8609A/LT8609B

PIN FUNCTIONS

BST (Pin 1): This pin is used to provide a drive voltage, higher than the input voltage, to the topside power switch. Place a 0.1µF boost capacitor as close as possible to the IC. Do not place a resistor in series with this pin.

Pin Treatment Needed

Pin Treatment			
UP	SER	DN	P
	C0.1U@2		



#	Pin Name	Pin Type
1		AIN
2		AOUT
3		PWROUT
4		AIN
5		IN
10		IN
9		PWR
8		ODOUT
7		AOUT
6	FB	FB
11	GND	GND

LT8609IMSE_PBF Pin Data: Pin 1

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

BST (Pin 1): This pin is used to provide a drive voltage, higher than the input voltage, to the topside power switch. Place a 0.1µF boost capacitor as close as possible to the IC. Do not place a resistor in series with this pin.

Vmax for INTVCC = 3.5 V

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
1	BST			AIN			C0.1U@2			VIN +3.5			0

LT8609IMSE_PBF Pin Data: Pin 2

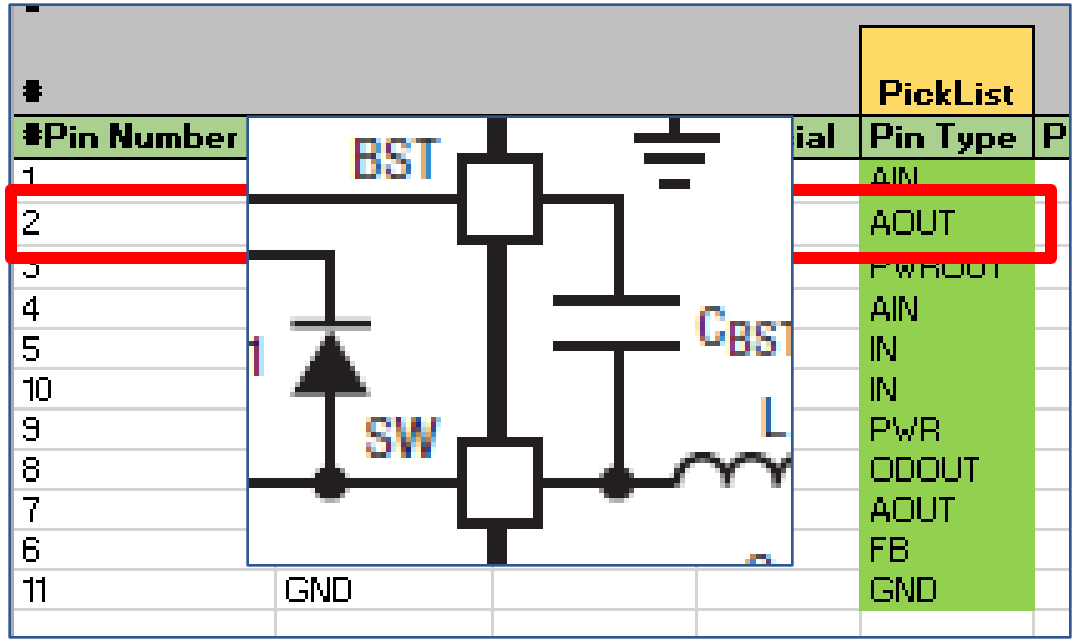
LT8609/LT8609A/LT8609B

PIN FUNCTIONS

SW (Pin 2): The SW pin is the output of the internal power switches. Connect this pin to the inductor and boost capacitor. This node should be kept small on the PCB for good performance.

Pin Treatment Needed

Pin Treatment		
UP	SER	DN
	C0.1U@1	



LT8609IMSE_PBF Pin Data: Pin 2

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

SW (Pin 2): The SW pin is the output of the internal power switches. Connect this pin to the inductor and boost capacitor. This node should be kept small on the PCB for good performance.

#				PickList		Pin Treatment			For Normal, Open Collector, or Bidirectional Output			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Vo max	Voh	Vol	Vo min
2	SW			AOUT			C0.1U@1		VIN			0

LT8609IMSE_PBF Pin Data: Pin 3

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

$INTV_{CC}$ (Pin 3) Internal 3.5V Regulator Bypass Pin. The internal power drivers and control circuits are powered from this voltage. $INTV_{CC}$ max output current is 20mA. Voltage on $INTV_{CC}$ will vary between 2.8V and 3.5V. Decouple this pin to power ground with at least a 1µF low ESR ceramic capacitor. Do not load the $INTV_{CC}$ pin with external circuitry.

Voltage range: 2.8V – 3.5V

For Power pins	
Vmax	Vmin
3.5	2.8

#				PickList	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	P
1	BST			AIN	
2	SW			AOUT	
3	INTVCC			PWROUT	
4	RT			AIN	
5	SYNC			IN	
10	EN_UV			IN	
9	VIN			PWR	
8	PG			ODOUT	
7	TR_SS			AOUT	
6	FB			FB	
11	GND			GND	

LT8609IMSE_PBF Pin Data: Pin 3

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

$INTV_{CC}$ (Pin 3) Internal 3.5V Regulator Bypass Pin. The internal power drivers and control circuits are powered from this voltage. $INTV_{CC}$ max output current is 20mA. Voltage on $INTV_{CC}$ will vary between 2.8V and 3.5V. Decouple this pin to power ground with at least a 1µF low ESR ceramic capacitor. Do not load the $INTV_{CC}$ pin with external circuitry.

#				PickList		Pin Treatment			For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Vmax	Vmin
3	INTVCC			PWROUT					3.5	2.8

LT8609IMSE_PBF Pin Data: Pin 4

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

RT (Pin 4): A resistor is tied between RT and ground to set the switching frequency.

External Pin Treatment

Pin Treatment		
UP	SER	DN
		R

#				PickList	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	P
1	BST			AIN	
2	SW			AOUT	
3	INTVCC			PWROUT	
4	RT			AIN	
5	SYNC			IN	
10	EN_UV			IN	
9	VIN			PWR	
8	PG			ODOUT	
7	TR_SS			AOUT	
6	FB			FB	
11	GND			GND	

LT8609IMSE_PBF Pin Data: Pin 4

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
4	RT			AIN				R		VIN			0

LT8609IMSE_PBF Pin Data: Pin 5

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

SYNC (Pin 5): External Clock Synchronization Input. Ground this pin for low ripple Burst Mode operation at low output loads. Tie to a clock source for synchronization to an external frequency. Leave floating for pulse-skipping mode with no spread spectrum modulation. Tie to $INTV_{CC}$ or tie to a voltage between 3.2V and 5.0V for pulse-skipping mode with spread spectrum modulation. When in pulse-skipping mode, the I_Q will increase to several mA. In the LT8609B, the SYNC pin is replaced with a no connect; the LT8609B operates in pulse-skipping mode without spread spectrum.

#				PickList	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	P
1	BST			AIN	
2	SW			AOUT	
3	INTVCC			PWROUT	
4	RT			AIN	
5	SYNC			IN	
10	EN_UV			IN	
9	VIN			PWR	
8	PG			ODOUT	
7	TR_SS			AOUT	
6	FB			FB	
11	GND			GND	

LT8609IMSE_PBF Pin Data: Pin 5

ABSOLUTE MAXIMUM RATINGS

(Note 1)

V_{IN}, EN/UV, PG.....42V
FB, TR/SS 4V
SYNC Voltage 6V

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
5	SYNC			IN						6	2.7	0.9	0

LT8609IMSE_PBF Pin Data: Pin 5

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C.

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Sync Low Input Voltage	LT8609/LT8609A	●	0.4	0.9		V
Sync High Input Voltage	LT8609/LT8609A: $INTV_{CC}$ = 3.5V	●		2.7	3.2	V

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
5	SYNC			IN						6	2.7	.9	0

LT8609IMSE_PBF Pin Data: Pin 6

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

FB (Pin 6): The LT8609/LT8609A/LT8609B regulates the FB pin to 0.782V. Connect the feedback resistor divider tap to this pin.

#				PickList
#Pin Number	Pin Name	Pin Desc	Special	Pin Type
1	BST			AIN
2	SW			AOUT
3	INTVCC			PWROUT
4	RT			AIN
5	SYNC			IN
6	FB			FB
7	TR_SS			AOUT
8	PG			ODOUT
9	VIN			PWR
10	EN_UV			IN
11	GND			GND

LT8609IMSE_PBF Pin Data: Pin 6

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C.

Feedback Reference Voltage	LT8609/LT8609A: V_{IN} = 6V, I_{LOAD} = 100mA V_{IN} = 6V, I_{LOAD} = 100mA	 ●	0.778 0.770	0.782 0.782	0.786 0.794	V V

#				PickList		For Normal, Open Collector, or Bidirectional Output				For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	Vo max	Voh	Vol	Vo min	Vmax	Vmin
6	FB			FB						0.794	0.77

LT8609IMSE_PBF Pin Data: Pin 7

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

TR/SS (Pin 7): Output Tracking and Soft-Start Pin. This pin allows user control of output voltage ramp rate during start-up. A TR/SS voltage below 0.782V forces the LT8609/LT8609A/LT8609B to regulate the FB pin to equal the TR/SS pin voltage. When TR/SS is above 0.782V, the tracking function is disabled and the internal reference resumes control of the error amplifier. An internal 2µA pull-up current from $INTV_{CC}$ on this pin allows a capacitor to program output voltage slew rate. This pin is pulled to ground with a 300Ω MOSFET during shutdown and fault conditions; use a series resistor if driving from a low impedance output.

External Pin Treatment

#				PickList
#Pin Number	Pin Name	Pin Desc	Special	Pin Type
1	BST			AIN
2	SW			AOUT
3	INTVCC			PWROUT
4	RT			AIN
5	SYNC			IN
6	FB			FB
7	TR_SS			AOUT
8	PG			ODOUT
9	VIN			PWR
10	EN_UV			IN
11	GND			GND

Pin Treatment		
UP	SER	DN
		C

LT8609IMSE_PBF Pin Data: Pin 7

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Output			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vo max	Voh	Vol	Vo min
7	TR_SS			AOUT				C		INTVCC			0

LT8609IMSE_PBF Pin Data: Pin 8

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

PG (Pin 8): The PG pin is the open-drain output of an internal comparator. PG remains low until the FB pin is within ±8.5% of the final regulation voltage, and there are no fault conditions. PG is valid when V_{IN} is above 3.2V, regardless of EN/UV pin state.

#				PickList
#Pin Number	Pin Name	Pin Desc	Special	Pin Type
1	BST			AIN
2	SW			AOUT
3	INTVCC			PWROUT
4	RT			AIN
5	SYNC			IN
6	FB			FB
7	TR_SS			AOUT
8	PG			ODOUT
9	VIN			PWR
10	EN_UV			IN
11	GND			GND

LT8609IMSE_PBF Pin Data: Pin 8

ABSOLUTE MAXIMUM RATINGS

(Note 1)

V_{IN}, EN/UV, PG.....42V
FB, TR/SS 4V
SYNC Voltage 6V

#				PickList		For Normal, Open Collector, or Bidirectional Output			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	Vo max	Voh	Vol	Vo min
8	PG			ODOUT		42	42	0.1	0

LT8609IMSE_PBF Pin Data: Pin 8

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C.

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
PG Lower Threshold Offset from V_{FB}	LT8609/LT8609A: V_{FB} Falling	●	5.0	8.5	13.0	%
	LT8609B: V_{FB} Falling	●	4.0	8.5	14.0	%
PG Hysteresis				0.5		%
PG Leakage	V_{PG} = 42V	●			±200	nA
PG Pull-Down Resistance	V_{PG} = 0.1V			550	1200	Ω

#				PickList		For Normal, Open Collector, or Bidirectional Output			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	Vo max	Voh	Vol	Vo min
8	PG			ODOUT		42	42	.1	0

LT8609IMSE_PBF Pin Data: Pin 9

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

V_{IN} (Pin 9): The V_{IN} pin supplies current to the LT8609/LT8609A/LT8609B internal circuitry and to the internal topside power switch. This pin must be locally bypassed. Be sure to place the positive terminal of the input capacitor as close as possible to the V_{IN} pins, and the negative capacitor terminal as close as possible to the GND pins.

#				PickList
#Pin Number	Pin Name	Pin Desc	Special	Pin Type
1	BST			AIN
2	SW			AOUT
3	INTVCC			PWROUT
4	RT			AIN
5	SYNC			IN
6	FB			FB
7	TR_SS			AOUT
8	PG			ODOUT
9	VIN			PWR
10	EN_UV			IN
11	GND			GND

LT8609IMSE_PBF Pin Data: Pin 9

ABSOLUTE MAXIMUM RATINGS

(Note 1)

V_{IN}, EN/UV, PG.....42V
FB, TR/SS 4V
SYNC Voltage 6V

#				PickList		For Normal, Open Collector, or Bidirectional Output				For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	Vo max	Voh	Vol	Vo min	Vmax	Vmin
9	VIN			PWR						42	2.7

LT8609IMSE_PBF Pin Data: Pin 9

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C.

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Minimum Input Voltage		●		2.7	3.0 3.2	V

#				PickList		For Normal, Open Collector, or Bidirectional Output				For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	Vo max	Voh	Vol	Vo min	Vmax	Vmin
9	VIN			PWR						42	2.7

LT8609IMSE_PBF Pin Data: Pin 10

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

EN/UV (Pin 10): The LT8609/LT8609A/LT8609B is shut down when this pin is low and active when this pin is high. The hysteretic threshold voltage is 1.05V going up and 1.00V going down. Tie to V_{IN} if the shutdown feature is not used. An external resistor divider from V_{IN} can be used to program a V_{IN} threshold below which the LT8609/LT8609A/LT8609B will shut down.

External Pin Treatment

				PickList
#Pin Number	Pin Name	Pin Desc	Special	Pin Type
1	BST			AIN
2	SW			AOUT
3	INTVCC			PWROUT
4	RT			AIN
5	SYNC			IN
6	FB			FB
7	TR_SS			AOUT
8	PG			ODOUT
9	VIN			PWR
10	EN_UV			IN
11	GND			GND

Pin Treatment		
UP	SER	DN
N		

"N" signifies treatment for an unused pin

LT8609IMSE_PBF Pin Data: Pin 10

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C.

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
EN/UV Pin Threshold	EN/UV Rising	●	0.99	1.05	1.11	V
EN/UV Pin Hysteresis				50		mV

#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input			
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min
10	EN_UV			IN			N			VIN	1.11	0.99	0

LT8609IMSE_PBF Pin Data: Pin 11

LT8609/LT8609A/LT8609B

PIN FUNCTIONS

GND (Pin 11): Exposed Pad Pin. The exposed pad must be connected to the negative terminal of the input capacitor and soldered to the PCB in order to lower the thermal resistance.

#				PickList
#Pin Number	Pin Name	Pin Desc	Special	Pin Type
1	BST			AIN
2	SW			AOUT
3	INTVCC			PWROUT
4	RT			AIN
5	SYNC			IN
6	FB			FB
7	TR_SS			AOUT
8	PG			ODOUT
9	VIN			PWR
10	EN_UV			IN
11	GND			GND

#				PickList		Pin Treatment			For Power pins	
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Vmax	Vmin
11	GND			GND					0	

Completed Regulator Model ✓

#Version	9																		
# Package	MSOP		11	Pin Count			11	ListCount	OK	Flag									
#																			
# Customer Part Number	(Use number identical to the one on the datasheet)																		
LT8609IMSE_PBF																			
# MFG Part Number																			
LT8609IMSE_PBF																			
# Description																			
42V, 2A/3A Peak Synchronous Step-Down Regulator with 2.5µA Quiescent Current																			
# Pincount																			
11																			
#Enviro Type			NDA				Custom Model												
			NO				NO												
#Max Temp																			
125																			
#Min Temp																			
-40																			
#Typical Power in mW																			
#Max Power in mW																			
#																			
#				PickList		Pin Treatment				For Normal, Open Collector, or Bidirectional Input				For Normal, Open Collector, or Bidirectional Output				For Power pins		
#Pin Number	Pin Name	Pin Desc	Special	Pin Type	Pin Mate	UP	SER	DN	Pin Tech	Vin max	Vih	Vil	Vin min	Vo max	Voh	Vol	Vo min	Vmax	Vmin	Pin Comment
1	BST			AIN			C0.1U@2			VIN +3.5			0							Place a 0.1uF boost cap as close as
2	SW			AOUT			C0.1U@1							VIN			0			
3	INTVCC			PWROUT														3.5	2.8	Do not load the INTVCC pin with ext
4	RT			AIN				R		VIN			0							
5	SYNC			IN						6	2.7	0.9	0							See datasheet for different pin treatr
6	FB			FB														0.794	0.77	Connect the feedback resistor divide
7	TR_SS			AOUT				C						INTVCC			0			
8	PG			ODOUT										42	42	0.1	0			
9	VIN			PWR														42	2.7	This pin must be locally bypast.
10	EN_UV			IN		N				VIN	1.11	0.99	0							
11	GND			GND														0		

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