

# **LTspice Model** Low-Power RS-485 transceiver **Texas Instruments SN65HVD3088E**

# **Model Information**

Model	A macro model					
Call Name	MDC_SN65HVD3088E_LT					
Pin Assign	1:R 2:_RE 3:DE 4:D 5:GND 6:A 7:B 8:Vcc					
File List	Model Library MDC_SN65HVD3088E_LT01.lib					
	Model Report MDC_SN65HVD3088E_LT.pdf(this file)					

**Verified Simulator Version** 

LTspice 17.1.14

Note

#### References

The information which was used for modeling is as follow:

[Data Sheet]

Date/Version	August 20
Product name	SN65HVD
Company name	Texas Inst

09 3088E truments

[Characteristics listed]
Characteristics

|Vod|, d|Vod|, Voc, dVoc, Ios Vit+, Vit-, Vhys, Voh, Vol, Ioz, Ii, Iih, Iil, Cdiff, Icc tPLH, tPHL, tr, tf, tsk(p), tPZH, tPZL, tPHZ, tPLZ

# Simulation Condition

This table shows the range of evaluated simulation range that was not occurs any convergence problems in this area.

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item	Min	Тур	Max	Unit
Supply Voltage	4.5	5.0	5.5	V
Temperature		25.0		deg C





Transceiver		O : Implemented × : Not Implemented		
Model Functions Table	RANK=1	— : Not applicable		
Functions	RANK	Implemented		
Truth Table	1	0		
Transmitter electrical characteristics	1	0		
Receiver electrical characteristics	1	0		
Driver switching characteristics	1	0		
Receiver switching characteristics	1	0		



# Testbench for Vih, Vil of RE, DE, R (Vcc = 5V)





#### Testbench for |Vod| without common-mode loading (Vcc = 5V)





# Testbench for |Vod| without common-mode loading (Vcc = 5V, Rload = 54[ohm])





# Testbench for |Vod| with common-mode loading (Vcc = 5V, Rload = 100[ohm])





## Testbench for |Vod| without common-mode loading (Vcc = 5V, Vtest = -7 to 12[V])





# Testbench for Vod - Io (Vcc = 5V)





#### Testbench for Voc (Vcc = 5[V], Rload = 27[ohm], Cload = 50[pF])





# Testbench for li of D, DE (Vcc = 5V)





# Testbench for los of D, DE (Vcc = 5V)





# Testbench for Vit+, Vit-, Vhys (Vcc = 5V)





# Testbench for Voh, Vol (Vcc = 5V)





# Testbench for loz (Vcc = 5V)





# Testbench for li (Vcc = 5V)





# Testbench for lih, lil (Vcc = 5V)





# Testbench for Cdiff (Vcc = 5V, Fin = 2[MHz])





# Testbench for Icc (Vcc = 5V)

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	70 1			aan. ama M dil	s TRAN ICC3 FIND [VVVC3) AT 0.5m s TRAN ICC4 FIND [VVVC4) AT 0.5m IDC_SN65HVD3088E_LT01.lib							572
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<b>₩</b> 6-8_0 700uA	11_TB_lcc.raw	I(Vvcc1)		I(Vvcc2	e TRAN ICCE FIND LIVECE) AT G.Sm TRAN ICCE FIND LIVECE) AT G.Sm OC_SHEAVY DOBBEL_LTOLLID		I(Vvcc3)			l(Vvcc4)		×
₩ 6-8_0 700uA <b>-</b>	ILIA	I(Vvcc1)		I(Vvc2	INAN ECCIPIER INVECTATIONS DC_SWORMDOWER_LITULED	I(Vcc)	I(Vvcc3) = 665[u/	A] (DE =	5[V],	I(Vvcc4) RE	= 0[V])	23
G-8_0     700uA     G30uA     G30uA     G30uA     G40uA     G40uA	ITB_cc.raw	I(Vvcc1)		I(Vvc2	I MARICE I PRO ELVICE JA 16 San Do _SWOHYDDOBE_LITULID	I(Vcc)	I(Vvcc3) = 665[u/	A] (DE =	5[V],	I(Vvcc4) RE	= 0[V])	8
<ul> <li>▲ 6-8_0</li> <li>700uA=</li> <li>630uA=</li> <li>560uA=</li> <li>490uA=</li> <li>420uA=</li> </ul>	I_TB_cc.raw	I(Vvcc1)		I(Vvc2	TRAN ECCI PRO ENVECTA 14 8 200     OC_SWORWDOWNEL_LTDL.ID	I(Vcc) I(Vcc) I(Vcc) I(Vcc)	I(Vvcc3) = 665[u/ = 665[u/ = 330[u/	A] (DE = A] (DE = A] (DE =	5[V], 5[V], 0[V],	I(Vvcc4) RE RE RE	= 0[V]) = 5[V]) = 0[V])	
<ul> <li>★ 6-8_0</li> <li>700uA=</li> <li>630uA=</li> <li>560uA=</li> <li>490uA=</li> <li>420uA=</li> <li>350uA=</li> </ul>	I(Vcc)	I(Vvcc1)			TRANECCI PRO ENVECTA I P 230     OC SWEENVOOR LITULIO	I(Vcc) I(Vcc) I(Vcc)	I(Vvcc3) = 665[u/ = 665[u/ = 330[u/	A] (DE = A] (DE = A] (DE =	5[V], 5[V], 0[V],	I(Vvcc4) RE RE RE	= 0[V]) = 5[V]) = 0[V])	22
<ul> <li>280uA=</li> <li>280uA=</li> </ul>	I_TB_lcc.raw	I(Vvcc1)			TRANECCI PRO ENVOCED AT 828     OC_SMEDIFICIONE LITELIO	I(Vcc) I(Vcc) I(Vcc)	(/vcc3) = 665[u/ = 665[u/ = 330[u/	A] (DE = A] (DE = A] (DE =	5[∨], 5[∨], 0[∨],	I(Vvcc4) RE RE RE	= 0[V]) = 5[V]) = 0[V])	22
<ul> <li>★ 6-8_0</li> <li>700uA=</li> <li>630uA=</li> <li>560uA=</li> <li>490uA=</li> <li>420uA=</li> <li>350uA=</li> <li>280uA=</li> <li>210uA=</li> </ul>	I_TB_cc.raw	I(Vvcc1)			TRANECCI PRO ENVOCED AT 6 320     OC_SMEDIFICATION	I(Vcc) I(Vcc) I(Vcc)	I(Vvcc3) = 665[u/ = 665[u/ = 330[u/	A] (DE = A] (DE = A] (DE =	5[V], 5[V], 0[V],	I(Vvcc4)RERE	= 0[V]) = 5[V]) = 0[V])	
★ 6-8_0       700uA=       630uA=       560uA=       490uA=       420uA=       350uA=       280uA=       210uA=       140uA=	I_TB_cc.raw	I(Vvcc1)			TRANECCI PRO ENVOCED AT 638     OC_SMONTONEME_LITELEO	I(Vcc) I(Vcc) I(Vcc)	((vvc3) = 665[u/ = 665[u/ = 330[u/	A] (DE = A] (DE = A] (DE =	5[V], 5[V], 0[V],	I(Vvcc4) RE RE	= 0[V]) = 5[V]) = 0[V])	
<ul> <li>★ 6-8.0</li> <li>700uA=</li> <li>630uA=</li> <li>490uA=</li> <li>420uA=</li> <li>350uA=</li> <li>280uA=</li> <li>210uA=</li> <li>140uA=</li> <li>70uA=</li> <li>0uA=</li> </ul>	ITALCC.raw	I(Vvcc1)				I(Vcc) I(Vcc) I(Vcc) I(Vcc)	I(Vvcc3) = 665[u/ = 330[u/ = 0.25[u	A] (DE = A] (DE = A] (DE = A] (DE =	5[V], 5[V], 0[V], 0[V],	I(Vvcc4)RERERE	= 0[V]) = 5[V]) = 0[V]) = 5[V])	
<ul> <li>280uA=</li> <li>280uA=</li> <li>210uA=</li> <li>140uA=</li> <li>140uA=</li> <li>0uA=</li> <li>0uA=</li> <li>0uA=</li> <li>0uA=</li> <li>0uA=</li> <li>0uA=</li> </ul>	л <u>ТВ_сс.raw</u> 	I(Vvcc1)	2ms (	I(Vvc2	THAT ESCHOOL INCOME LATE AND INCOMENTATION OF A DECEMBER O	I(Vcc) I(Vcc) I(Vcc) I(Vcc)	I(Vvcc3) = 665[u/ = 330[u/ = 0.25[u	A] (DE = A] (DE = A] (DE = A] (DE =	5[V], 5[V], 0[V], 0[V],	I(Vvcc4)RERERE	= 0[V]) = 5[V]) = 0[V]) = 5[V])	23



#### Testbench for tPLH, tPHL, tr, tf, tsk(p) of Driver (Vcc = 5V)





# Testbench for tPZH, tPHZ of Driver (Vcc = 5V)





# Testbench for tPZL, tPLZ of Driver (Vcc = 5V)





#### Testbench for tPLH, tPHL, tsk(p), tr, tf of Receiver (Vcc = 5V)





#### Testbench for tPZH, tPHZ of Receiver (Vcc = 5V)





#### Testbench for tPZL, tPLZ of Receiver (Vcc = 5V)





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