

# MAX3885ECB Input Model

SPICE I/O Macromodels aid in understanding signal integrity issues in electronic systems. Most of Maxim's High Frequency/Fiber Communication ICs utilize input and output (I/O) circuits with Current Mode Logic (CML), Positive Emitter Coupled Logic (PECL), and Low Voltage Differential Signal (LVDS) formats to transfer data into and out of an IC. These models are based on simplified circuit expressions that may include replacement of active circuit elements with ideal controlled voltage and current sources. As such, simulation with macromodels should be treated as 'typical' performance and not relied upon as final proof-of-design. Use of macromodel descriptions is not a substitute for worst-case design analysis, nor for testing real circuits over temperature, supply, and other operating limits.

The output format is provided as ASCII text netlists suitable for generic SPICE. This format is compatible with most versions of SPICE such as PSPICE and HSPICE. Additional information is found in HFAN 6.1 *Input/Output Models for Maxim Fiber Components*.

To extract the circuit netlists using the Adobe Acrobat Reader follow these instructions. Select the "Text Select Tool" by clicking the left mouse button on this icon of the menu bar (a capital T with a small dashed box to the lower right). Highlight the desired netlist text with the cursor. Use the copy command from the edit menu to capture the selected lines. Then paste the selected lines into a text file editor and save the file with an extension compatible with the simulator.

Version A1 Nov 28, 2005

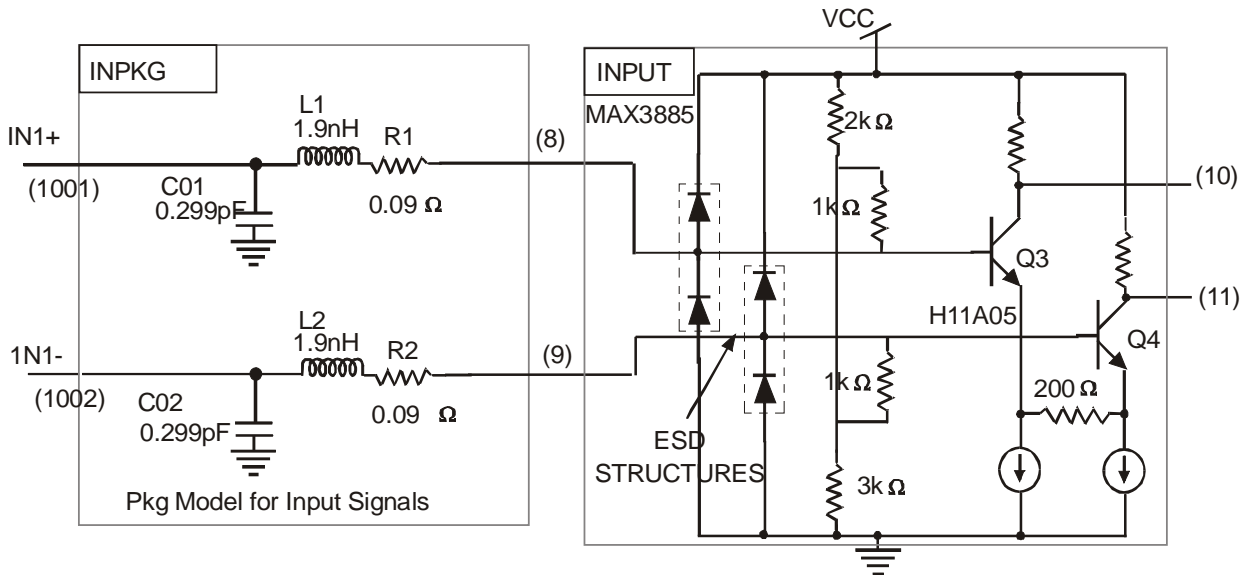


Figure 1 Input model of the MAX3885.

# Notes:

## MAX3885 Input Model

The input model of the MAX3885 consists of a RLC package model and a input IC network consisting of pad, ESD, resistors and transistor buffers.

The input pins are nodes 1001 (IN+) and 1002 (IN-).

**Text File Format:** This model is shipped in “pdf” format. Models and netlists can be copied to text format in the Acrobat Reader by holding the left mouse button on the “Text Select Tool.” Then the user can “select” what netlist and/or subcircuit with the mouse. Then use the copy command from the “edit” menu to capture the selected lines. These lines can then be “pasted” into the user’s text file. Make sure to save the text tile as plain text without any formatting.

## Circuit Netlist – Input circuit

```
INPUT - MAX3885 INPUT CIRCUIT
*
* This example is the input circuit for the MAX3885
*
.OPT ACCT NOMOD NOPAGE RELTOL=.001 LIMPTS=1001

.WIDTH OUT=80

* TEMP = 27 + 290mW/18.9 = 42
.TEMP 42
.OP
.TRAN 1PS 2ns
VCC 101 0 DC 3.3

VINP 2 0 PULSE (1.3V .8V 0.2N 100p 100p 300p 800p)
VINN 3 0 PULSE (0.8V 1.3V 0.2N 100p 100p 300p 800p)

RLOAD1 2 1001 50
CLOAD1 101 1001 0.2p
RLOAD2 3 1002 50
CLOAD2 101 1002 0.2p

XPK1 1001 1002 8 9 INPKG

XCIROUT 10 11 8 9 101 INPUT

.SUBCKT INPUT 10 11 8 9 101

* The power supply is 5 Volts.

RB1 8 3003 100
RB2 9 3004 100

XESD1 8 0 0 HDE072021
XESD2 9 0 0 HDE072021

XQ3 10 3003 4 0 H11A05
XQ4 11 3004 5 0 H11A05

R9 10 101 200
R10 11 101 200

RB11 8 4001 1000
RB21 9 4001 1000
C4001 4001 10pF

RB41 4001 101 2000
RB42 4001 0 3000
```

IE1 4 0 0.80M  
IE2 5 0 0.80M  
RE45 4 5 200

XPAD1 8 0 HPAD3  
XPAD2 9 0 HPAD3

.ENDS INPUT

\*

.SUBCKT HPAD3 1 3  
CPAD 1 10 86.407F  
REPI 10 20 149.204M TC=4.800M,5U  
CTRENCH 21 20 79.795F  
DS 21 20 DSUB  
RS 3 21 369.115  
\*XREPORT1 0 REPORTERLIN94  
.MODEL DSUB D( IS=98.719F CJO=555.750F M=400M VJ=650M )  
.ENDS HPAD3

.SUBCKT HDE072021 1 2 21  
CP1EPI 1 4 20.699F  
QD 5 4 1 5 QESD  
RS 4 2 9.056 TC=3.090M,2.439U  
RSUB 5 21 7.145K  
CTRENCH 2 5 12.437F  
\*XREPORT1 0 REPORTERLIN66  
\*XREPORT2 0 REPORTERLIN67  
.MODEL QESD PNP( IS=2.591E-018 NF=1.050 BF=800M BR=600U CJE=34.006F  
+ VJE=600M MJE=400M CJC=18.342F VJC=650M MJC=400M )  
.ENDS HDE072021

\*.SUBCKT INPKG 101 102 201 202 401 402 403

.SUBCKT INPKG 201 202 101 102

\*

\* resistors

\*

RB01 201 301 0.09  
RB02 202 302 0.09

\*

\* inductors

\*

LLAP\_1\_3 101 301 1.9N  
LLAP\_2\_4 102 302 1.9N  
\*K02\_03 LLAP\_1\_3 LLAP\_2\_4 0.294

\*LB03 PADT PADBOT 23P

\*

\* capacitors

\*

```
C01 101 0 143F
C02 102 0 143F
*
* mutual capacitors
*
*C01_02 101 102 43.800F
.ENDS INPKG

.SUBCKT H11A05 1 2 3 21
CP1EPI 1 2 3.949F
CP1P2 12 3 6.473F
CTRENCH 1 20 8.610F
RBX 2 12 61.077 TC=2.649M
RCX 1 10 40.300 TC=2.883M,1.658U
RCI 10 11 2.121 TC=2.883M,1.658U
REX 13 3 8.656 TC=182.441U
RSUB 20 21 11.846K
QP 20 10 12 20 TXP OFF
QN 11 12 13 11 TX
*XREPORT1 0 REPORTERLIN7
*XREPORT2 0 REPORTERLIN8
.MODEL TX NPN( IS=1.151E-017 XTI=3 EG=1.140 BF=223.719 BR=20 XTB=450M
+ VAF=29 VAR=3.500 NF=1.010 NR=1.020 NE=1.650 NC=1.560 IKF=44.016M
+ IKR=806.400U ISE=5.444E-021 ISC=7.000E-030 RB=61.077 RBM=45.808
+ IRB=7M CJE=37.151F MJE=490M VJE=940M FC=990M CJC=7.359F MJC=470M
+ VJC=850M TF=3.814P TR=19N XTF=1 VTF=1K ITF=20.430M PTF=5 KF=1.500F
+ AF=1 )
.MODEL TXP PNP( IS=6.540E-019 CJE=7.359F MJE=470M VJE=850M CJC=9.940F
+ MJC=400M VJC=650M BF=10K BR=672.167U TF=1N FC=900M )
.ENDS H11A05

.PRINT TRAN V(1001) V(1002)
.PROBE
.END
```