



## High Speed Optocoupler, 10 MBd

### DESCRIPTION

This 10 MBd family is an industry standard optocoupler, utilizing a high efficient input LED coupled with an integrated optical photodiode IC detector. The detector output is open drain NMOS-transistor.

The 6N137, VO2601, VO2611, VO0600, VO0601 and VO0611 are single channel. The detector has an enable function on pin 7 allows the detector to be strobed.

The VO0630, VO0631, VO0661, VO2630, VO2631, VO4661, SFH6755T, SFH6756T, and SFH6757T are dual channel without enable pin.

Their PSPICE models are written from device characterization data for simulation. All symbols are in the symbol library file VSH\_OPTO\_10M.olb. All model data are in the PSPICE model library file VSH\_OPTO\_10M.lib.

This document is intended as a PSPICE modeling guideline and does not constitute a commercial product, neither a substitute to datasheet.

PART	MODEL DESCRIPTION	SYMBOL FILE	MODEL FILE
6N137, VO2601, VO2611, VO0600, VO0601, VO0611	Single channel with enable function V <sub>E</sub> : pin 7	<p>VSH_OPTO_10M.olb <sup>(1)</sup></p>	VSH_OPTO_10M.lib
VO0630, VO0631, VO0661, VO2630, VO2631, VO4661, SFH6755T, SFH6756T, SFH6757T	Dual channel	<p>VSH_OPTO_10M.olb <sup>(1)</sup></p>	VSH_OPTO_10M.lib

### Note

<sup>(1)</sup> Applicable only with OrCAD16.3 or higher versions.

### RECOMMENDED USE OF THE MODEL

- This model is designed only for use at 25 °C and should be used as is.
- This model has been created and tested with OrCAD version 16.3.
- The olb file (symbol) is not down-compatible. Users of the earlier versions need to create the symbols on their platform and associate with relative PSPICE model data.

TRUTH TABLE (positive logic)		
LED	ENABLE (V <sub>E</sub> )	OUTPUT (V <sub>O</sub> ) <sup>(1)</sup>
On	H	L
Off	H	H
On	L	H
Off	L	H
On	NC	L
Off	NC	H

### Note

<sup>(1)</sup> With external pull-up resistor



SIMULATED PARAMETERS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	DATA	UNIT
<b>OUTPUT</b>				
Input threshold current	V <sub>E</sub> = V <sub>O</sub> = 5 V, R <sub>L</sub> = 350 Ω	I <sub>TH</sub>	5	mA
<b>SWITCHING</b>				
Propagation delay time to high output level <sup>(1)</sup>	R <sub>L</sub> = 350 Ω, C <sub>L</sub> = 15 pF	t <sub>pLH</sub>	70	ns
Propagation delay time to low output level <sup>(1)</sup>		t <sub>pHL</sub>	70	ns
Output rise time (10 % to 90 %)		t <sub>r</sub>	22	ns
Output fall time (90 % to 10 %)		t <sub>f</sub>	17	ns

**Note**

<sup>(1)</sup> See fig. 1 and timing simulation setup on page 3.

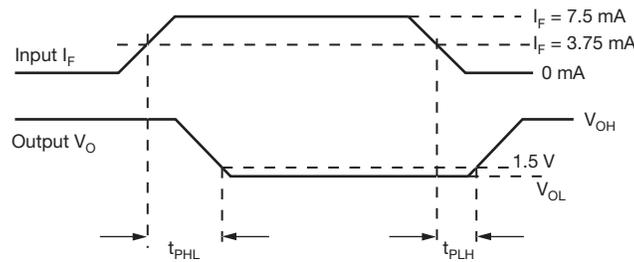


Fig. 1 - Switching Times



EXAMPLE SIMULATION PLOTS USING ORCAD

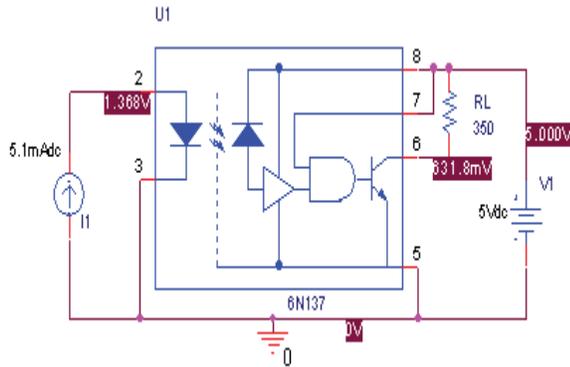


Fig. 2 - Simulation Setup for DC Characteristics

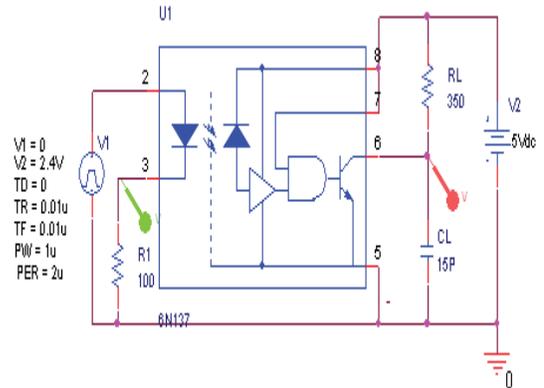


Fig. 4 - Timing Simulation Setup of 6N137 (V<sub>CC</sub> = 5 V, R<sub>L</sub> = 350 Ω, C<sub>L</sub> = 15 pF)

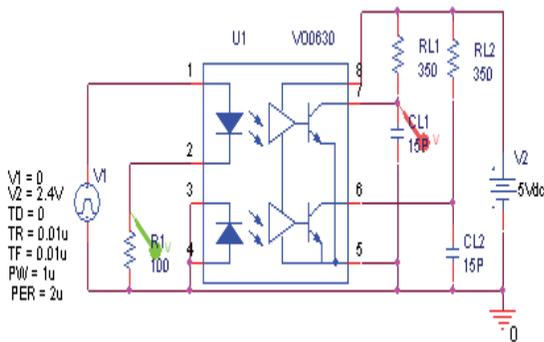


Fig. 3 - Timing Simulation Setup of VO0630 (V<sub>CC</sub> = 5 V, R<sub>L</sub> = 350 Ω, C<sub>L</sub> = 15 pF)

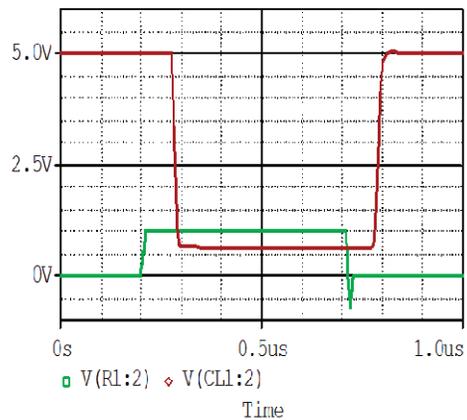


Fig. 5 - Timing Simulation Output of VO0630