

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

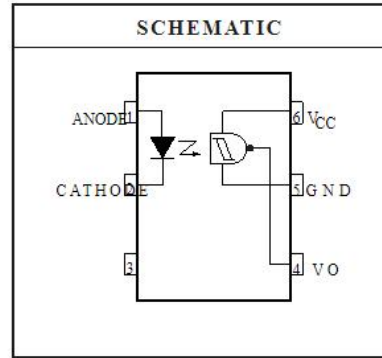
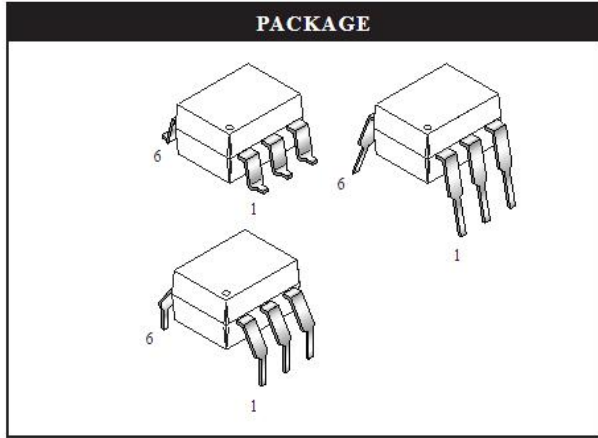
FAIRCHILD
 SEMICONDUCTOR®

**6-PIN DIP
 HIGH SPEED LOGIC OPTOCOUPLERS**

H11N1-M

H11N2-M

H11N3-M



DESCRIPTION

The H11NX-M series has a high speed integrated circuit detector optically coupled to an AlGaAs infrared emitting diode. The output incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping. The detector circuit is optimized for simplicity of operation and utilizes an open collector output for maximum application flexibility.

Truth Table

Input	Output
HL	
LH	

FEATURES

- High data rate, 5 MHz typical (NRZ)
- Free from latch up and oscillation throughout voltage and temperature ranges.
- Microprocessor compatible drive
- Logic compatible output sinks 16 mA at 0.5 V maximum
- Guaranteed on/off threshold hysteresis
- Wide supply voltage capability, compatible with all popular logic systems
- High common mode transient immunity, 2000 V/μs minimum
- Fast switching $t_r = 7.5\text{ns}$ typical, $t_f = 12\text{ns}$ typical
- Underwriter Laboratory (UL) recognized—file #E90700
- VDE recognized – File#102497 – Add option V (e.g., H11N1VM)

APPLICATIONS

- Logic to logic isolator
- Programmable current level sensor
- Line receiver—eliminate noise and transient problems
- A.C. to TTL conversion—square wave shaping
- Interfaces computers with peripherals
- Isolated power MOS driver for power supplies

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ABSOLUTE MAXIMUM RATINGS				
Parameters	Symbol	Device	Value	Units
TOTAL DEVICE				
Storage Temperature	T STG	All	-55 to +150	°C
Operating Temperature	T OPR	All	-40 to +85	°C
Lead Solder Temperature	T SOL	All	260 for 10 sec	°C
Total Device Power Dissipation @ 25°C	PD	All	250	mW
Derate Above 25°C			2.94	mW/°C
EMITTER				
Continuous Forward Current	IF	All	30	mA
Reverse Voltage	VR	All	6	V
Forward Current - Peak (1 μs pulse, 300 pps)	IF(pk)	All	1.0	A
LED Power Dissipation 25°C Ambient	PD	All	120	mW
Derate Linearly From 25°C			1.41	mW/°C
DETECTOR				
Detector Power Dissipation @ 25°C	PD	All	150	mW
Derate Linearly from 25°C			1.76	mW/°C
V45 Allowed Range	VO	All	0 to 16	V
V65 Allowed Range	V CC	All	0 to 16	V
I4 Output Current	IO	All	50	mA

ELECTRICAL CHARACTERISTICS (TA = 0-70°C Unless otherwise specified.)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameters	Test Conditions	Symbol	Device	Min	Typ *	Max	Units
EMITTER							
Input Forward Voltage	IF = 10 mA	VF	All		1.4	2	V
	IF = 0.3 mA			0.75	1.25		
Reverse Current	VR = 5 V	IR	All			10	μA
Capacitance	V = 0, f = 1.0 MHz	CJ	All			100	pF
DETECTOR							
Operating Voltage Range		V CC	All	4		15	V
Supply Current	IF = 0, VCC = 5V	ICC(off)	All		6	10	mA
Output Current, High	IF = 0.3mA, VCC = VO = 15V	I OH	All			100	μA

*Typical values at TA = 25°C

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TRANSFER CHARACTERISTICS							
DC Characteristics	Test Conditions	Symbol	Device	Min	Typ*	Max	Units
Supply Current	IF = 10mA, VCC = 5V	ICC(on)	All		6.5	10	mA
Output Voltage, low	RL=270Ω, VCC=5V, IF=IF(on) max.	V OL	All			0.5	V
Turn-On Threshold Current	RL=270Ω, VCC = 5V note 1	IF(on)	H11N1-M	0.8		3.2	mA
			H11N2-M	2.3		5	
			H11N3-M	4.1		10	
Turn-Off Threshold Current	RL=270Ω, VCC = 5V	IF(off)	All	0.3			mA
Hysteresis Ratio	RL=270Ω, VCC = 5V	IF(off)/IF(on)	All	0.65		0.95	
AC Characteristics	Test Conditions	Symbol	Device	Min	Typ	Max	Units
SWITCHING SPEED							
Propagation delay time High to Low	C=120pF, tP=1μs, RE: Note 2 Fig. 1	tPHL	All		100	330	ns
Rise Time	C=120pF, tP=1μs, RE: Note 2 Fig. 1	tr	All		7.5		ns
Propagation delay time Low to High	C=120pF, tP=1μs, RE: Note 2 Fig. 1	tPLH	All		150	330	ns
Fall time	C=120pF, tP=1μs, RE: Note 2 Fig. 1	tf	All		12		ns
Data Rate			All		5		MHz

ISOLATION CHARACTERISTICS						
Parameters	Test Conditions	Symbol	Min	Typ*	Max	Units
Input-Output Isolation Voltage	f = 60 Hz, t = 1 sec.	V ISO	7500			V PEAK
Isolation Capacitance	VI-O = 0V, f = 1 MHz	C ISO		0.4	0.6	pF
Isolation Resistance	VI-O = ±500 VDC	R ISO	1 0 11			Ω

*Typical values at TA = 25°C

NOTES:

- Maximum IF(ON) is the maximum current required to trigger the output. For example, a 3.2mA maximum trigger current would require the LED to be driven at a current greater than 3.2mA to guarantee the device will turn on. A 10% guard band is recommended to account for degradation of the LED over its lifetime. The maximum allowable LED drive current is 30mA.
- H11N1: RE = 910Ω
 H11N2: RE = 560Ω
 H11N3: RE = 240Ω

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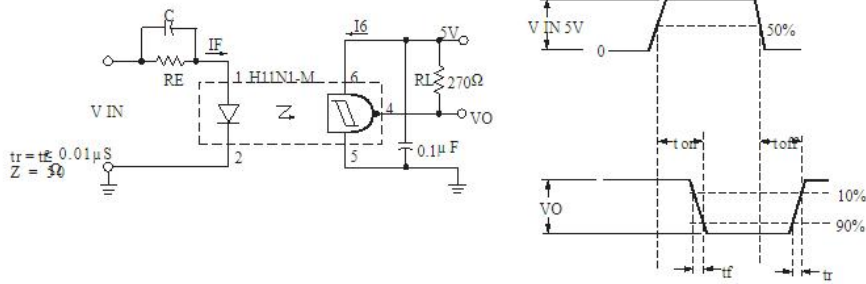


Figure 1. Switching Test Circuit and Waveforms

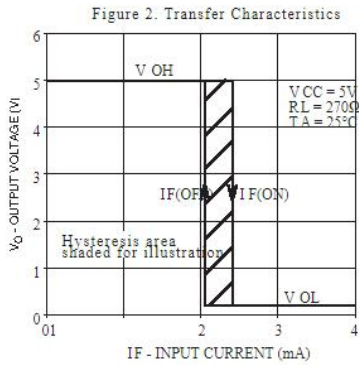


Figure 2. Transfer Characteristics

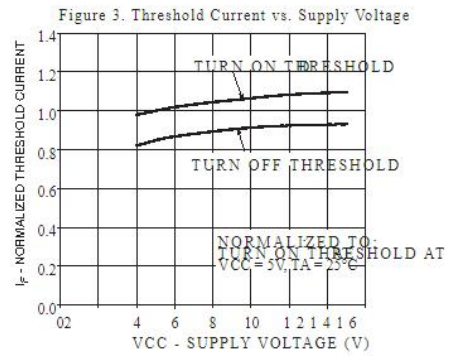


Figure 3. Threshold Current vs. Supply Voltage

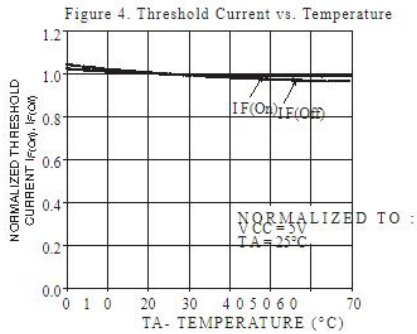


Figure 4. Threshold Current vs. Temperature

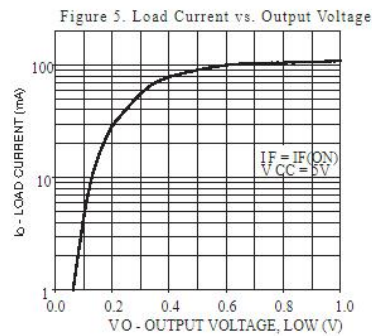


Figure 5. Load Current vs. Output Voltage

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Figure 6. Supply Current vs. Supply Voltage

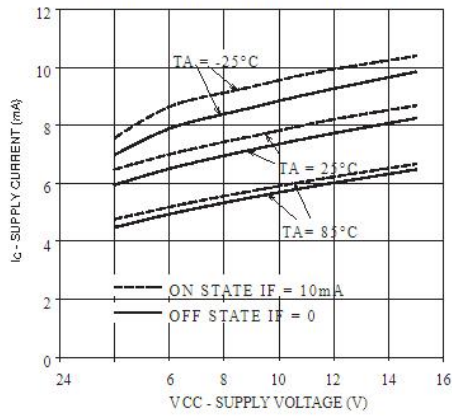
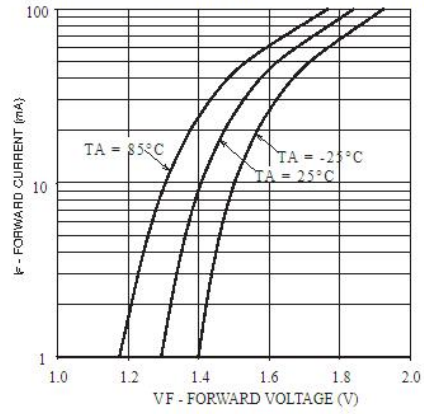


Figure 7. LED Forward Voltage vs. Forward Current

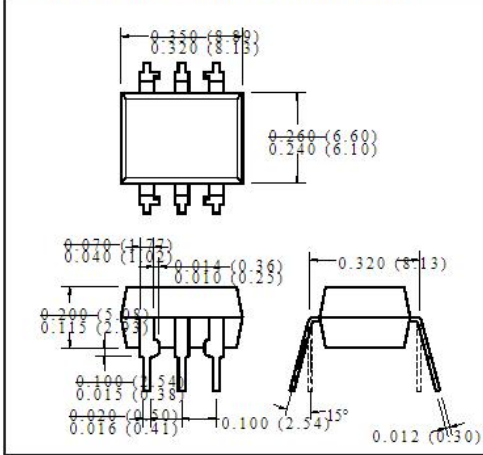


H11N1-M

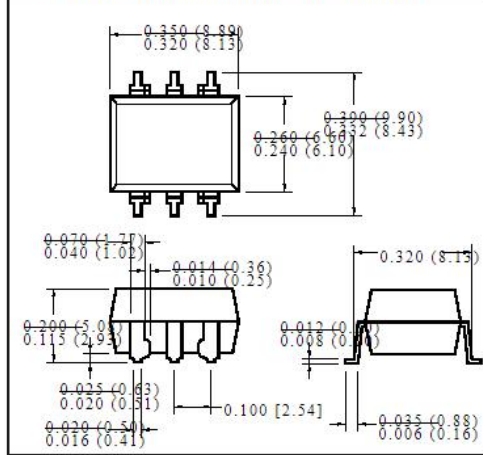
H11N2-M

H11N3-M

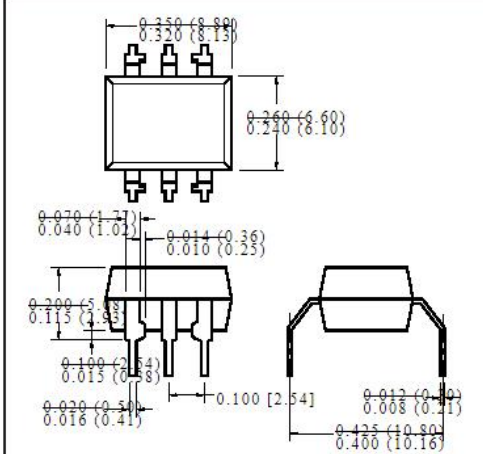
Package Dimensions (Through Hole)



Package Dimensions (Surface Mount)



Package Dimensions (0.4" Lead Spacing)



Recommended Pad Layout for Surface Mount Leadform

