

### DESCRIPTION

The H11L1 (UL Approval) and H11L1V (UL and VDE Approvals) devices each consist of a GaAs infrared emitting diode optically coupled to a high speed output integrated Microprocessor Compatible Schmitt trigger detector, which provides hysteresis for noise immunity and pulse shaping.

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### FEATURES

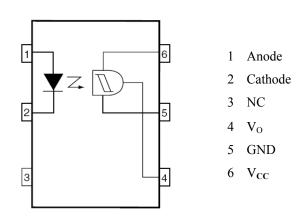
- High Data Rate, 1MHz typical (NRZ)
- Free from Latch Up and Oscillation
- Microprocessor Compatible Drive
- Logical Compatible Output sinks 16mA at 0.4V maximum
- Guaranteed On/Off Threshold Hysteresis
- Wide Supply Voltage Capability, compatible with all popular Logic Systems
- Operating Voltage Range
- V<sub>cc</sub> 3V to 16V
  Operating Temperature Range - 55°C to +100°C
- High AC Isolation voltage 5000V<sub>RMS</sub>
- Lead Free and RoHS Compliant
- UL Approval Certificate E91231
- VDE Approval Certificate 40044376

### **APPLICATIONS**

- Logic to Logic isolator
- Line Receiver eliminate noise and transient problems
- Programmable Current Level Sensor
- AC to TTL Conversion Square Wave Shaping
- Power Supply Digital Programming
- Computer Peripherals Interface

#### **ORDER INFORMATION**

- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

#### Input

Forward Current	60mA
Reverse Voltage	6V
Power Dissipation	120mW

#### Output

Output Current	50mA
Output Voltage	16V
Supply Voltage	16V
Power Dissipation	150mW

#### Total Package

Isolation Voltage	$5000V_{\text{RMS}}$
Total Power Dissipation	250mW
Operating Temperature	-55 to 100 $^\circ\text{C}$
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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### **Truth Table**

LED	Vo
ON	LOW
OFF	HIGH

# **ELECTRICAL CHARACTERISTICS** ( $T_A = 25^{\circ}C$ , unless otherwise specified. Typical Values at $T_A = 25^{\circ}C$ )

#### INPUT

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Forward Voltage	$\mathbf{V}_{\mathrm{F}}$	$I_F = 10 mA$		1.15	1.5	V
Reverse Current	I <sub>R</sub>	$V_R = 5V$			10	μΑ
Terminal Capacitance	C <sub>IN</sub>	V = 0V, f = 1MHz		33		pF

### OUTPUT

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Operating Voltage	V <sub>CC</sub>		3		15	V
Supply Current	I <sub>CC(off)</sub>	$V_{CC} = 5V, I_F = 0mA$		1.6	5	mA
High Level Output Current	I <sub>OH</sub>	$I_F = 0mA$ , $V_{CC} = V_0 = 15V$			100	μΑ

# **ELECTRICAL CHARACTERISTICS** ( $T_A = 25^{\circ}C$ , unless otherwise specified, Typical Values at $T_A = 25^{\circ}C$ )

#### COUPLED

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Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Supply Current	I <sub>CC(on)</sub>	$V_{CC} = 5V, I_F = 10mA$		1.6	5	mA
Low Level Output Voltage	V <sub>OL</sub>	$V_{CC} = 5V, I_F = I_{F(on)} \text{ (max)}, \\ R_L = 270\Omega$			0.4	V
Turn-On Threshold Current	$I_{F(on)}$	$V_{CC} = 5V, R_L = 270\Omega$			1.6	mA
Turn-Off Threshold Current	$I_{F(off)}$	$V_{CC} = 5V, R_L = 270\Omega$		1		mA
Hysteresis Rtio	$I_{F(off)}/I_{F(on)}$	$V_{CC} = 5V, R_L = 270\Omega$	0.5		0.9	
Turn-On Time	t <sub>(on)</sub>	$V_{CC} = 5V,$ $I_F = I_{F(on)}$ (max),			4	μs
Fall Time	t <sub>f</sub>	$R_L = 270\Omega$		0.1		
Turn-Off Time	$t_{(off)}$				4	
Rise Time	t <sub>r</sub>			0.1		

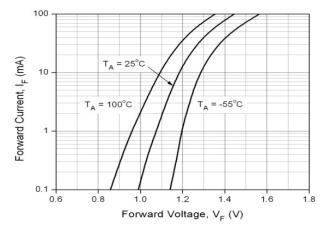
#### ISOLATION

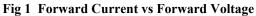
Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Isolation Voltage	V <sub>ISO</sub>	R.H. = 40% to 60%, t = 1 min, Note 1	5000			V <sub>RMS</sub>
Input - Output Resistance	R <sub>I-O</sub>	$V_{I-O} = 500 VDC$ R.H. = 40% to 60%	10 <sup>11</sup>			Ω

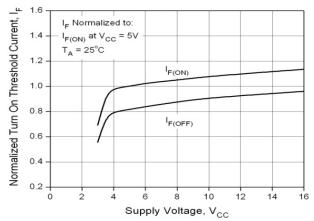
Note 1 : Measured with input leads shorted together and output leads shorted together.



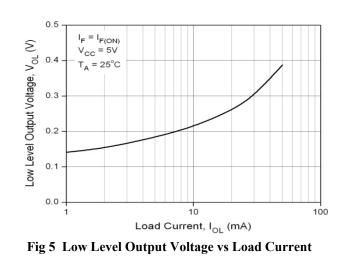
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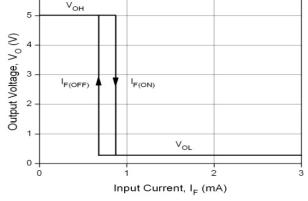


Fig 2 Transfer Characteristics

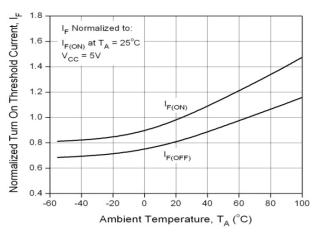


Fig 4 Normalized Turn-On Current vs Ambient temperature

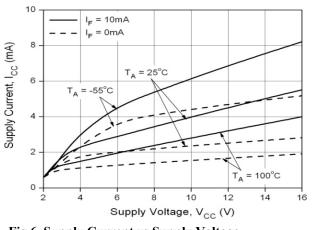
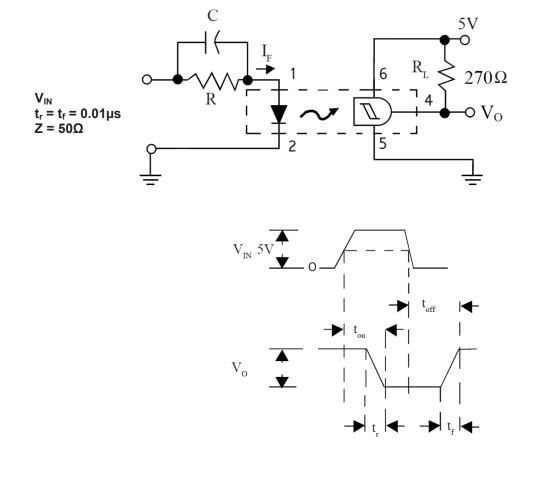


Fig 6 Supply Current vs Supply Voltage





Switching Time Test Circuit and Waveform



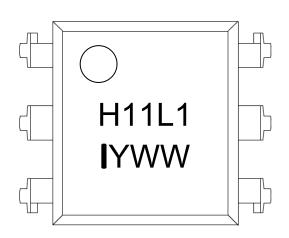
### **ORDER INFORMATION**

	H11L1 (UL Approval)						
After PN	PN	Description	Packing quantity				
None	H11L1	Standard DIP6	65 pcs per tube				
G	H11L1G	10mm Lead Spacing	65 pcs per tube				
SM	H11L1SM	Surface Mount	65 pcs per tube				
SMT&R	H11L1SMT&R	Surface Mount Tape & Reel	1000 pcs per reel				

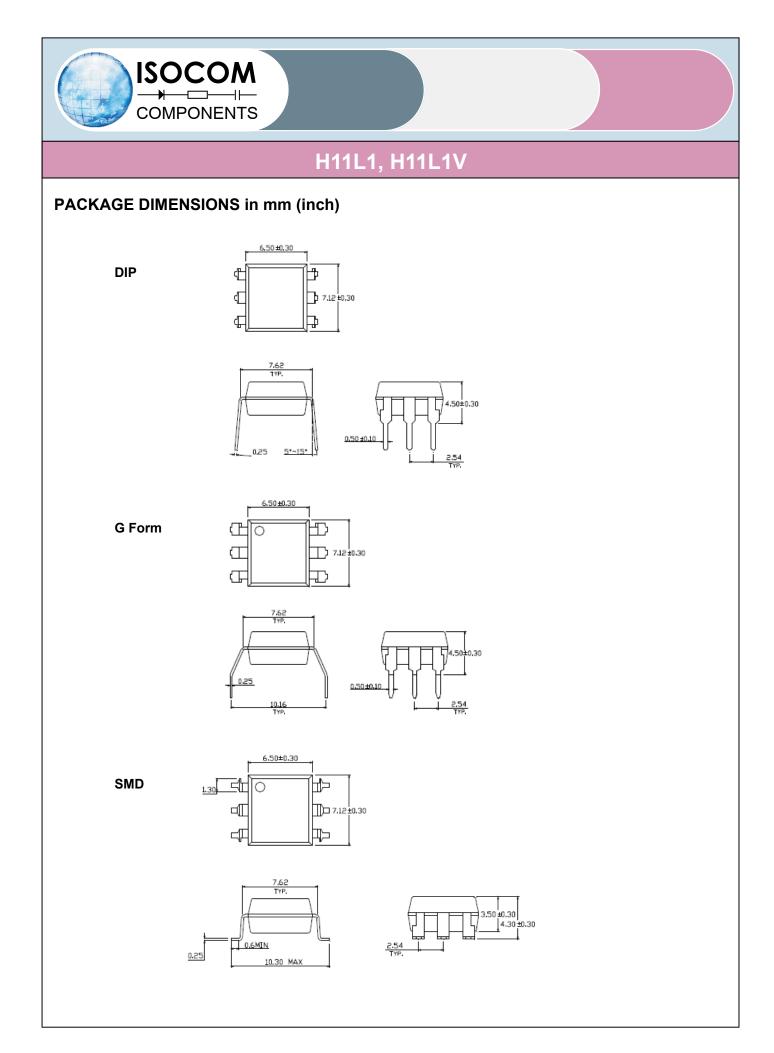
	H11L1V (UL Approval and VDE Approvals)						
After PN	PN	Description	Packing quantity				
None	H11L1V	Standard DIP6	65 pcs per tube				
G	H11L1VG	10mm Lead Spacing	65 pcs per tube				
SM	H11L1VSM	Surface Mount	65 pcs per tube				
SMT&R	H11L1VSMT&R	Surface Mount Tape & Reel	1000 pcs per reel				



### **DEVICE MARKING**

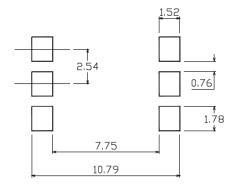


- H11L1 denotes Device Part Number (H11L1 as example)
- I denotes Isocom
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code

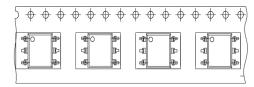




## **RECOMMENDED PAD LAYPUT FOR SMD (mm)**

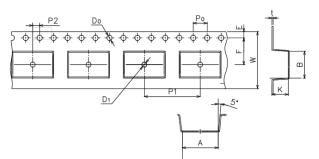


# TAPE AND REEL PACKAGING

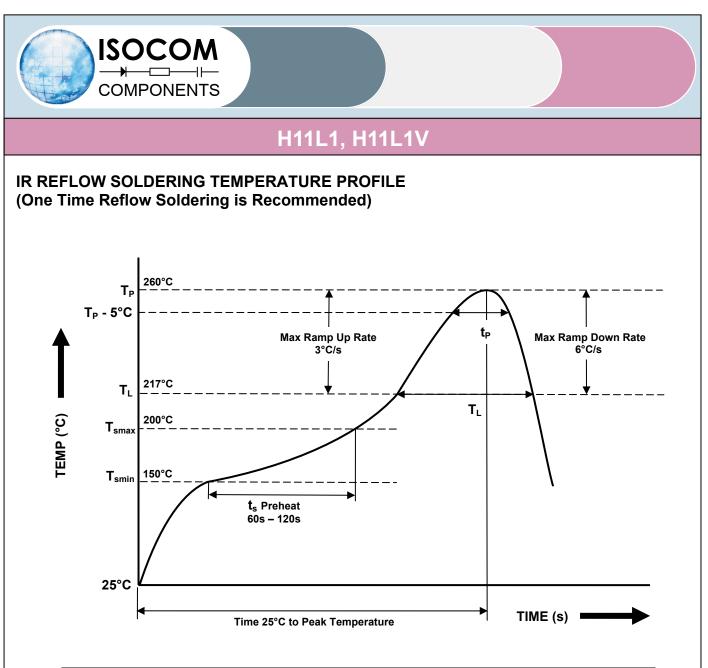


#### Direction of feed from reel





Dimension No.	А	В	Do	D1	E	F
Dimension( mm)	10.4±0.1	7.5±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1
Dimension No.	Ро	P1	P2	t	W	к
Dimension (mm)	4.0±0.15	12.0±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1



Profile Details	Conditions
Preheat - Min Temperature (T <sub>SMIN</sub> ) - Max Temperature (T <sub>SMAX</sub> ) - Time T <sub>SMIN</sub> to T <sub>SMAX</sub> (t <sub>s</sub> )	150°C 200°C 60s - 120s
$\label{eq:solution} \begin{array}{l} \textbf{Soldering Zone} \\ & - \text{Peak Temperature } (T_{\text{P}}) \\ & - \text{Time at Peak Temperature} \\ & - \text{Liquidous Temperature } (T_{\text{L}}) \\ & - \text{Time within 5°C of Actual Peak Temperature } (T_{\text{P}} - 5^{\circ}\text{C}) \\ & - \text{Time maintained above } T_{\text{L}} (t_{\text{L}}) \\ & - \text{Ramp Up Rate } (T_{\text{L}} \text{ to } T_{\text{P}}) \\ & - \text{Ramp Down Rate } (T_{\text{P}} \text{ to } T_{\text{L}}) \end{array}$	260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate $(T_{smax}$ to $T_P)$	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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- Do not immerse device body in solder paste.

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