H11L1, H11L1V

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.

FEATURES

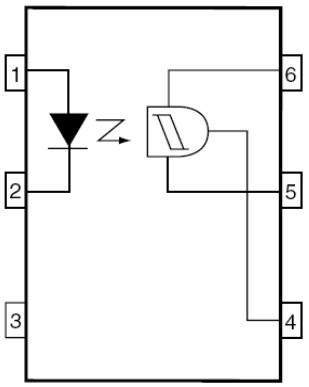
- High Data Rate, 1MHz typical (NRZ)
- Free from Latch Up and Oscillation
- Microprocessor Compatible Drive
- Logical Compatible Output sinks 16mA at 0.4V maximum
- Guaranteed On/Off Threshold Hysteresis
- Wide Supply Voltage Capability, compatible with all popular Logic Systems
- Operating Voltage Range V_{CC} 3V to 16V
- Operating Temperature Range - 55°C to +100°C
- High AC Isolation voltage 5000V_{RMS}
- 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



1 Anode
2 Cathode
3 NC
4 V_O
5 GND
6 V_{CC}

ABSOLUTE MAXIMUM RATINGS (T_A = 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_{RMS}
Total Power Dissipation	250mW
Operating Temperature	-55 to 100 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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Truth Table

LED	V_O
ON	LOW
OFF	HIGH

ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified. Typical Values at T_A = 25°C)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 10mA		1.15	1.5	V
Reverse Current	I_R	V_R = 5V			10	µA
Terminal Capacitance	C_{IN}	V = 0V, f = 1MHz		33		pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Operating Voltage	V_{CC}		3		15	V
Supply Current	$I_{CC(off)}$	V_{CC} = 5V, I_F = 0mA		1.6	5	mA
High Level Output Current	I_{OH}	I_F = 0mA, V_{CC} = V_O = 15V			100	µA

ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified, Typical Values at T_A = 25°C)

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Supply Current	$I_{CC(on)}$	V_{CC} = 5V, I_F = 10mA		1.6	5	mA
Low Level Output Voltage	V_{OL}	V_{CC} = 5V, I_F = $I_{F(on)}$ (max), R_L = 270Ω			0.4	V
Turn-On Threshold Current	$I_{F(on)}$	V_{CC} = 5V, R_L = 270Ω			1.6	mA
Turn-Off Threshold Current	$I_{F(off)}$	V_{CC} = 5V, R_L = 270Ω		1		mA
Hysteresis Rtio	$I_{F(off)}/I_{F(on)}$	V_{CC} = 5V, R_L = 270Ω	0.5		0.9	
Turn-On Time	$t_{(on)}$	V_{CC} = 5V, I_F = $I_{F(on)}$ (max), R_L = 270Ω			4	µs
Fall Time	t_f			0.1		
Turn-Off Time	$t_{(off)}$				4	
Rise Time	t_r			0.1		

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	R.H. = 40% to 60%, t = 1 min, Note 1	5000			V_{RMS}
Input - Output Resistance	R_{I-O}	V_{I-O} = 500VDC R.H. = 40% to 60%	10^{11}			Ω

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

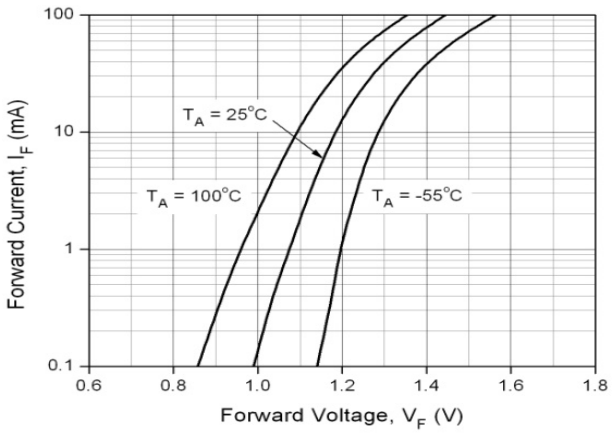


Fig 1 Forward Current vs Forward Voltage

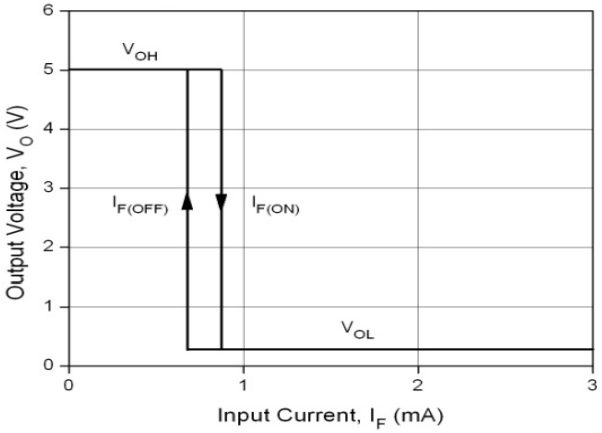


Fig 2 Transfer Characteristics

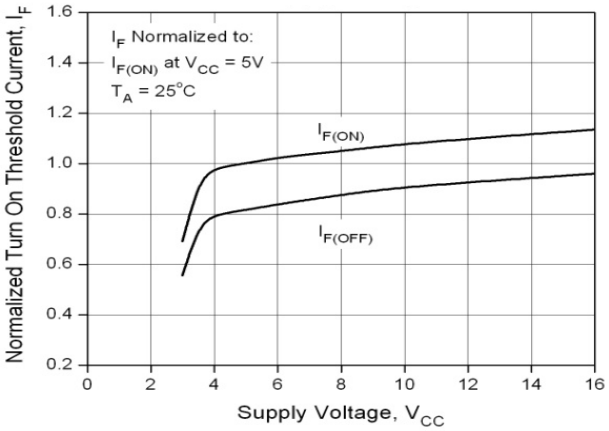


Fig 3 Normalized Turn-On Current vs Supply Voltage

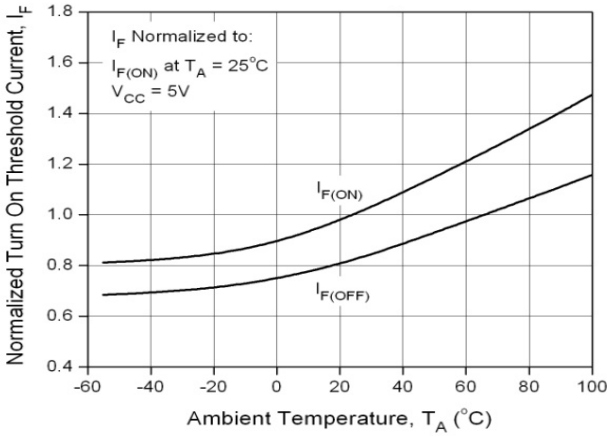


Fig 4 Normalized Turn-On Current vs Ambient temperature

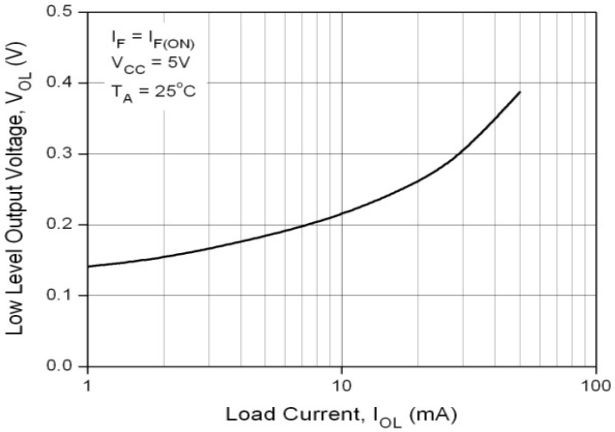


Fig 5 Low Level Output Voltage vs Load Current

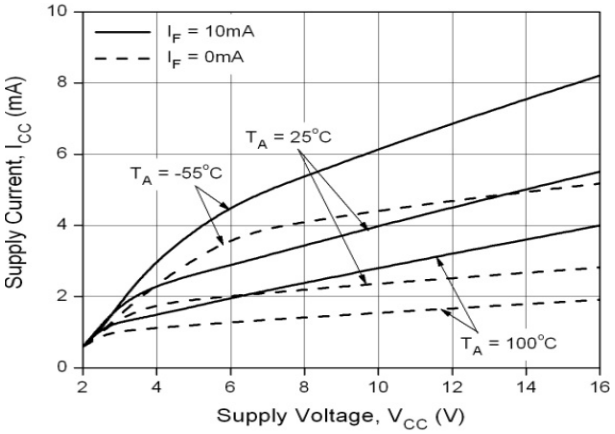
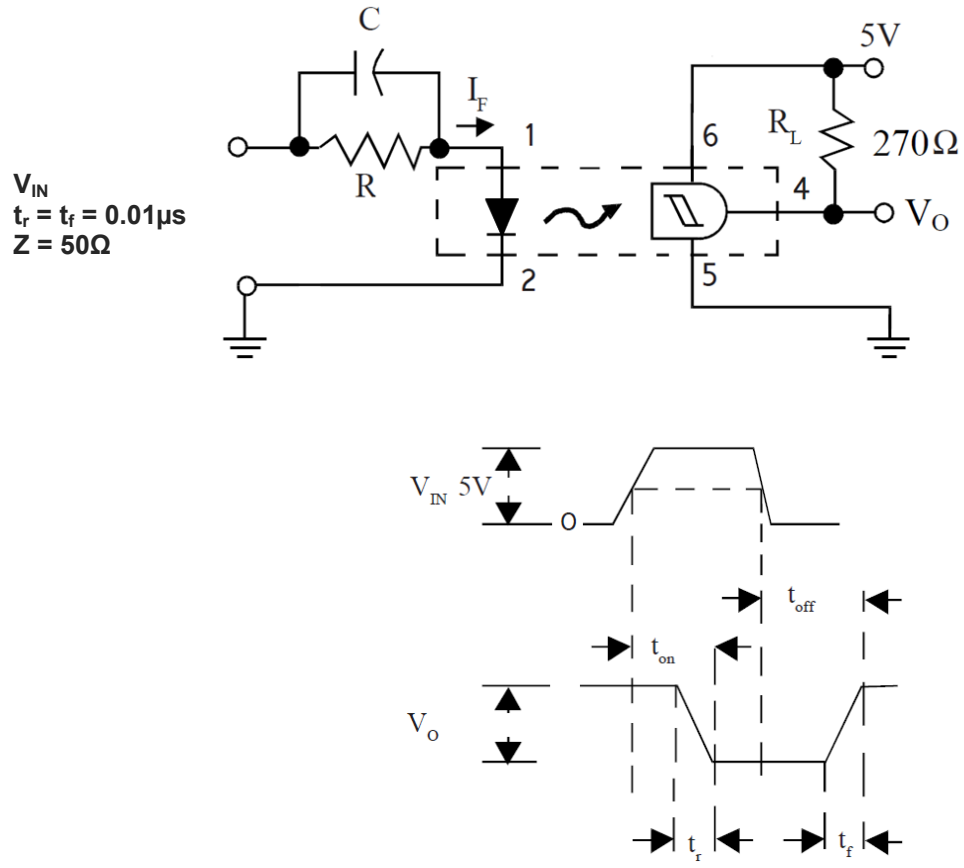


Fig 6 Supply Current vs Supply Voltage



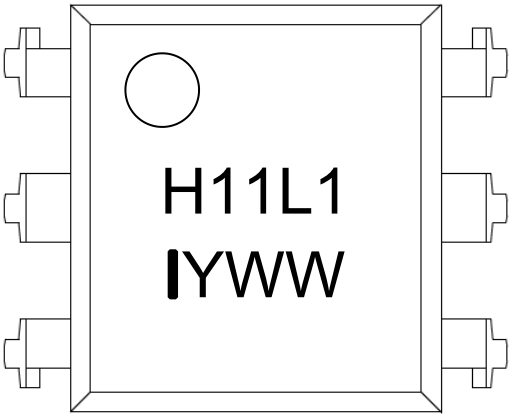
Switching Time Test Circuit and Waveform

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

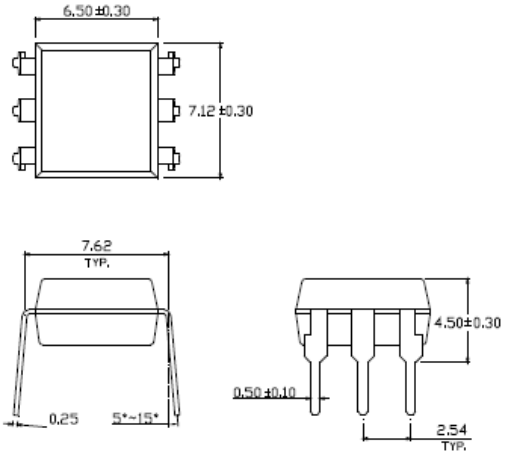
DEVICE MARKING



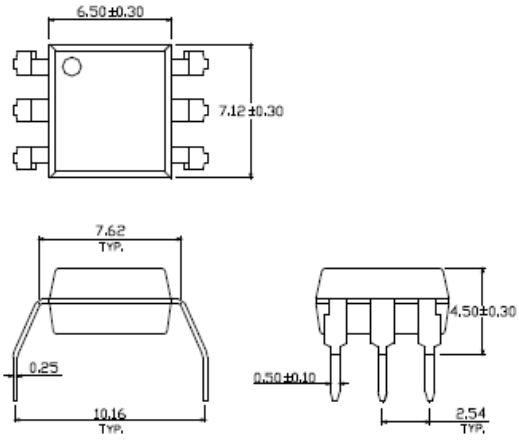
H11L1	denotes Device Part Number (H11L1 as example)
I	denotes Isocom
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code

PACKAGE DIMENSIONS in mm (inch)

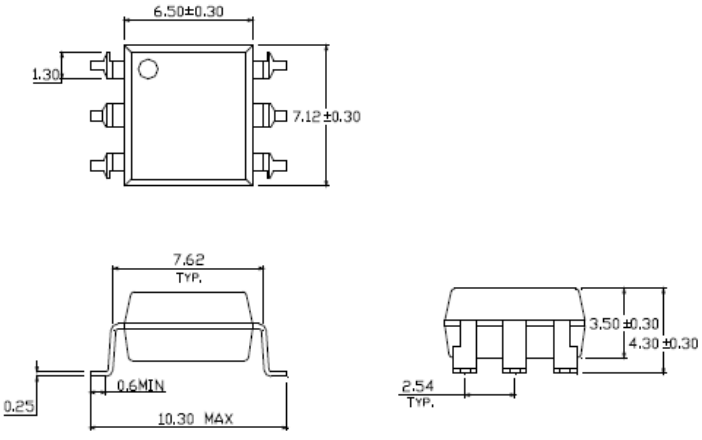
DIP



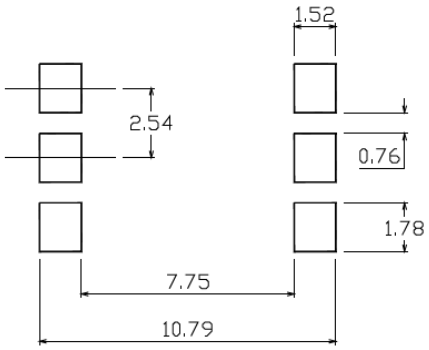
G Form



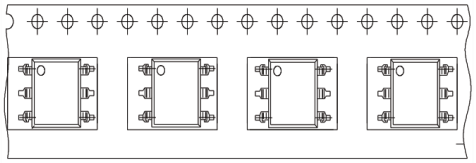
SMD



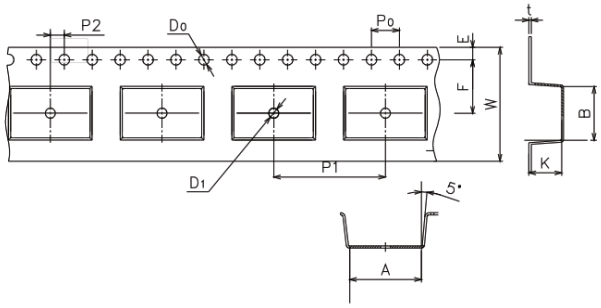
RECOMMENDED PAD LAYPUT FOR SMD (mm)



TAPE AND REEL PACKAGING

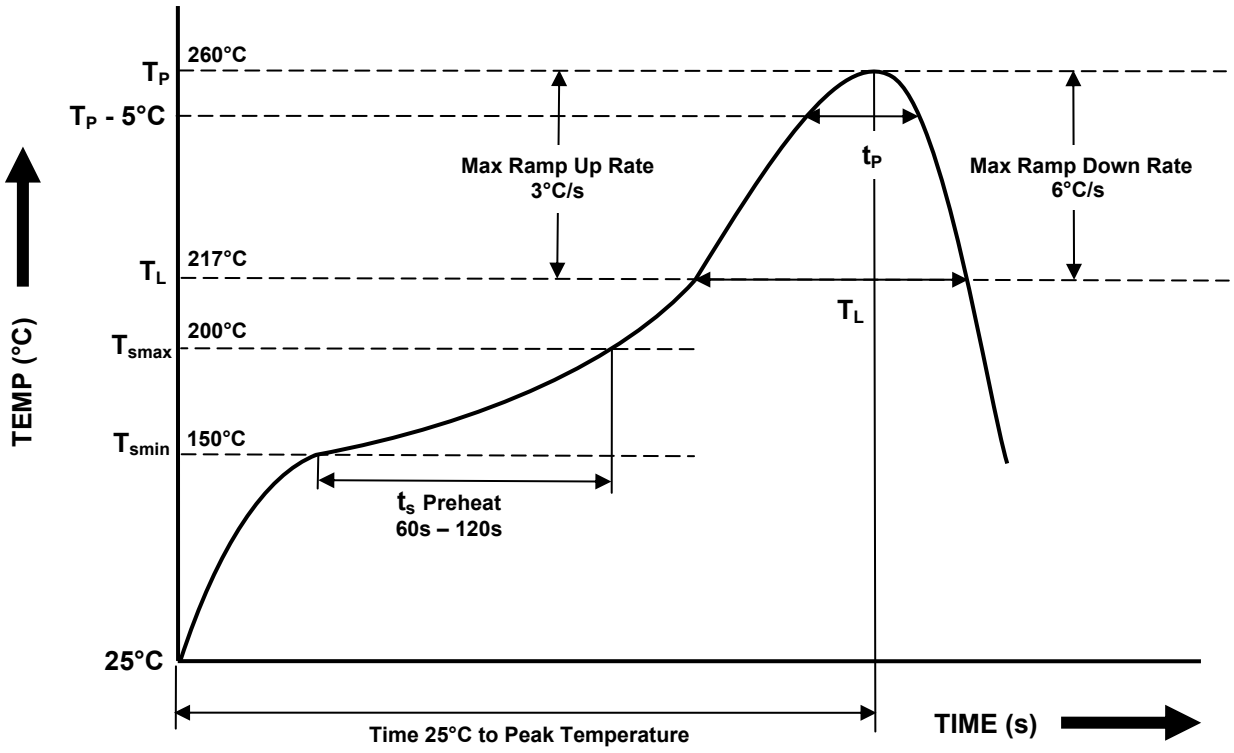


Direction of feed from reel



Dimension No.	A	B	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.	Po	P1	P2	t	W	K
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

IR REFLOW SOLDERING TEMPERATURE PROFILE
(One Time Reflow Soldering is Recommended)



Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	 150°C 200°C 60s - 120s
Soldering Zone - Peak Temperature (T_P) - Time at Peak Temperature - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature (T_P – 5°C) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L)	 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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