

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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COMPONENTS

FEATURES

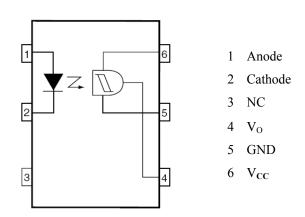
- High Data Rate, 1MHz typical (NRZ)
- Free from Latch Up and Oscillation
- Microprocessor Compatible Drive
- Logical Compatible Output sinks 16mA at 0.4V maximum
- Guaranteed On/Off Threshold Hysteresis
- Wide Supply Voltage Capability, compatible with all popular Logic Systems
- Operating Voltage Range
- 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



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 | $5000V_{\text{RMS}}$ |
|----------------------------------|-----------------------------|
| 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}_{F} | $I_F = 10 mA$ | | 1.15 | 1.5 | V |
| Reverse Current | I _R | $V_R = 5V$ | | | 10 | μΑ |
| Terminal Capacitance | C _{IN} | V = 0V, f = 1MHz | | 33 | | pF |

OUTPUT

| Parameter | Symbol | Test Condition | Min | Тур. | 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} | $I_F = 0mA$, $V_{CC} = V_0 = 15V$ | | | 100 | μΑ |

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

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| Parameter | Symbol | Test Condition | Min | Тур. | Max | Unit |
|-------------------------------|------------------------|--|-----|------|-----|------|
| Supply Current | I _{CC(on)} | $V_{CC} = 5V, I_F = 10mA$ | | 1.6 | 5 | mA |
| Low Level Output Voltage | V _{OL} | $V_{CC} = 5V, I_F = I_{F(on)} \text{ (max)}, \\ R_L = 270\Omega$ | | | 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 _(on) | $V_{CC} = 5V,$ $I_F = I_{F(on)}$ (max), | | | 4 | μs |
| Fall Time | t _f | $R_L = 270\Omega$ | | 0.1 | | |
| Turn-Off Time | $t_{(off)}$ | | | | 4 | |
| Rise Time | t _r | | | 0.1 | | |

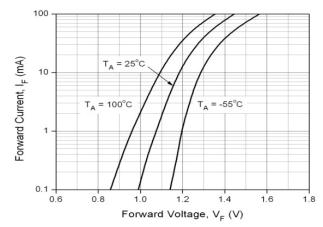
ISOLATION

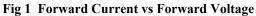
| Parameter | Symbol | Test Condition | Min | Тур. | Max | Unit |
|------------------------------|------------------|--|------------------|------|-----|------------------|
| Isolation Voltage | V _{ISO} | R.H. = 40% to 60%, t = 1 min, Note 1 | 5000 | | | V _{RMS} |
| Input - Output Resistance | R _{I-O}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

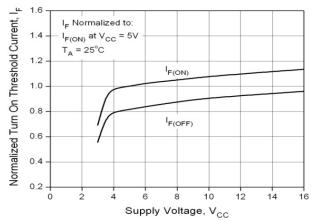
Note 1 : Measured with input leads shorted together and output leads shorted together.



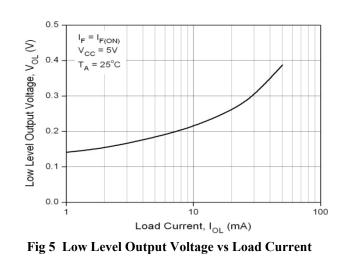
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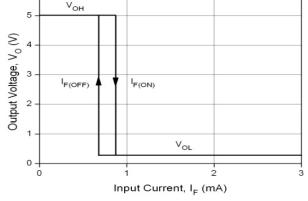


Fig 2 Transfer Characteristics

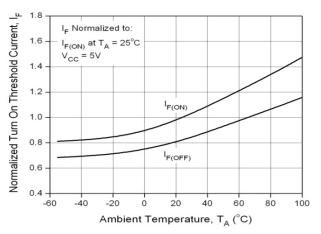


Fig 4 Normalized Turn-On Current vs Ambient temperature

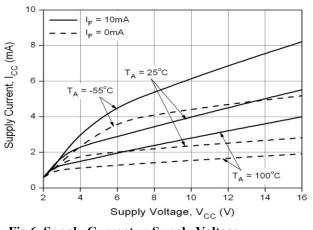
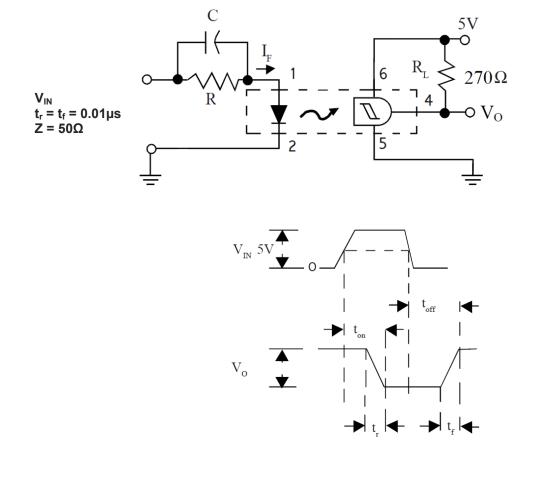


Fig 6 Supply Current vs Supply Voltage





Switching Time Test Circuit and Waveform



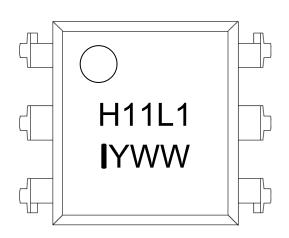
ORDER INFORMATION

| | 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 | | | | |

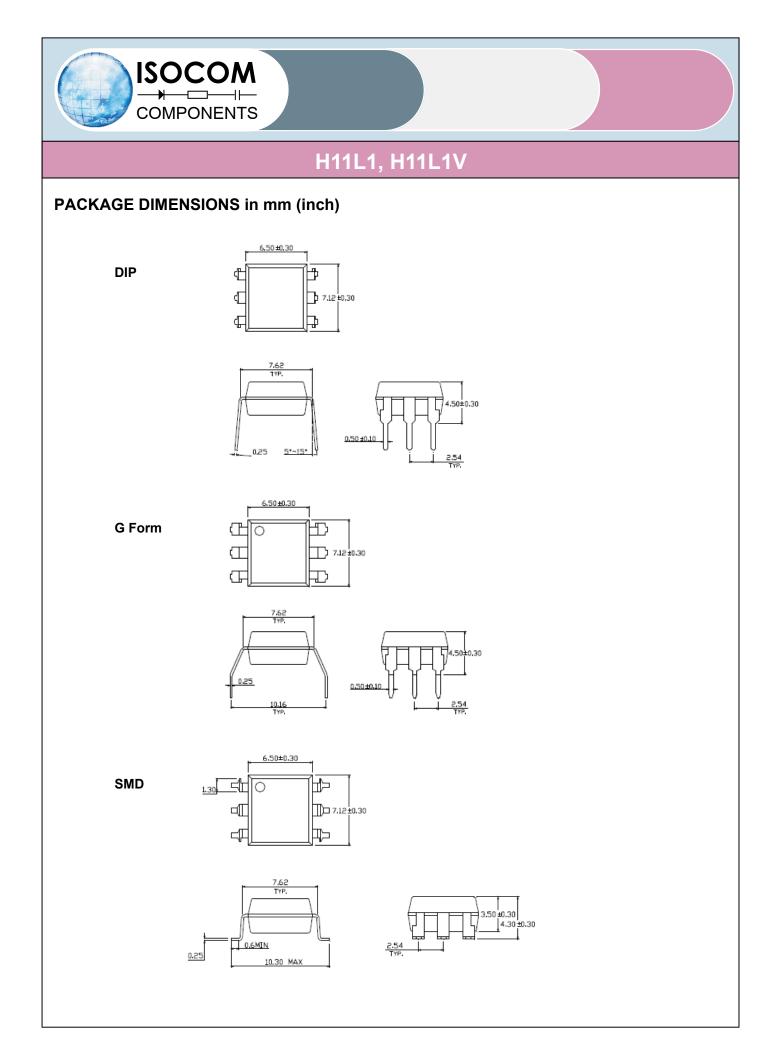
| | H11L1V (UL Approval and VDE Approvals) | | | | | | |
|----------|--|---------------------------|-------------------|--|--|--|--|
| After PN | PN | Description | Packing quantity | | | | |
| None | H11L1V | Standard DIP6 | 65 pcs per tube | | | | |
| G | H11L1VG | 10mm Lead Spacing | 65 pcs per tube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



DEVICE MARKING

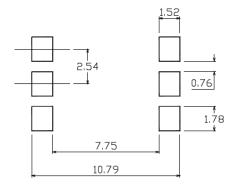


- H11L1 denotes Device Part Number (H11L1 as example)
- I denotes Isocom
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code

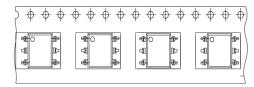




RECOMMENDED PAD LAYPUT FOR SMD (mm)

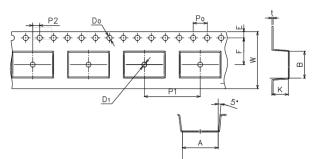


TAPE AND REEL PACKAGING

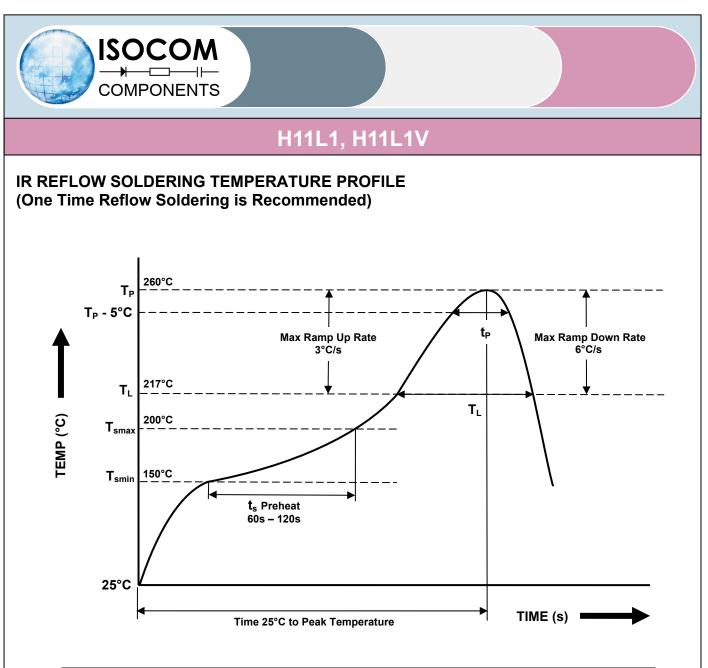


Direction of feed from reel





| 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 _{SMIN}) - Max Temperature (T _{SMAX}) - Time T _{SMIN} to T _{SMAX} (t _s) | 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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