

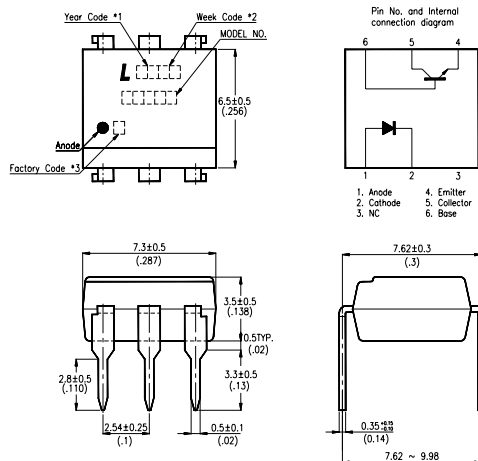
### Features

- High input-output isolation voltage  
(  $V_{ISO} = 5,000V_{rms}$  )
- Current transfer ratio  
( CTR : MIN. 10% at  $I_F = 10mA$ ,  $V_{CE} = 10V$  )
- UL approved ( No. E113898 )
- VDE approved ( No. 094722 )
- FIMKO approved ( No.209049 )
- SEMKO approved ( No. 9943380/01-20 )
- NEMKO approved ( No. P99102464 )
- DEMKO approved ( No. 99-04182 )
- CSA approve in progress
- Options Available :
  - Leads with 0.4" (10.16mm) Spacing (M Type)
  - Lead Bends for Surface Mounting (S Type)
  - Tape and Reel of Type I for SMD (Add "-TA" Suffix)
  - Tape and Reel of Type II for SMD (Add "-TA1" Suffix)
  - VDE 0884 Approvals (Add "-V" Suffix)

### Applications

1. General Purpose Switching Circuits
2. Interfacing and coupling systems of different potentials and impedances
3. Monitor and detection circuits

### Package Dimensions



### NOTES :

1. Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4. Model No.: H11A1 ; H11A2 ; H11A3 ; H11A4 ; H11A5
5. All dimensions are in millimeters (inches).
6. Tolerance is  $\pm 0.25mm$  (.010") unless otherwise noted.
7. Specifications are subject to change without notice.

## Ordering Information

| Part Number                                                  | Package                                                                                                                                                                         | Safety Standard Approval                                                                                                                                                                                   | Application part number |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| H11A1<br>H11A1M<br>H11A1S<br>H11A1S-TA<br>H11A1S-TA1         | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) | <ul style="list-style-type: none"> <li>• UL approved</li> <li>• FIMKO approved</li> <li>• SEMKO approved</li> <li>• DEMKO approved</li> <li>• NEMKO approved</li> <li>• CSA approve in progress</li> </ul> | H11A1                   |
| H11A2<br>H11A2M<br>H11A2S<br>H11A2S-TA<br>H11A2S-TA1         | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A2                   |
| H11A3<br>H11A3M<br>H11A3S<br>H11A3S-TA<br>H11A3S-TA1         | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A3                   |
| H11A4<br>H11A4M<br>H11A4S<br>H11A4S-TA<br>H11A4S-TA1         | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A4                   |
| H11A5<br>H11A5M<br>H11A5S<br>H11A5S-TA<br>H11A5S-TA1         | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A5                   |
| H11A1-V<br>H11A1M-V<br>H11A1S-V<br>H11A1STA-V<br>H11A1STA1-V | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) | <ul style="list-style-type: none"> <li>• VDE approved</li> </ul>                                                                                                                                           | H11A1                   |
| H11A2-V<br>H11A2M-V<br>H11A2S-V<br>H11A2STA-V<br>H11A2STA1-V | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A2                   |
| H11A3-V<br>H11A3M-V<br>H11A3S-V<br>H11A3STA-V<br>H11A3STA1-V | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A3                   |
| H11A4-V<br>H11A4M-V<br>H11A4S-V<br>H11A4STA-V<br>H11A4STA1-V | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A4                   |
| H11A5-V<br>H11A5M-V<br>H11A5S-V<br>H11A5STA-V<br>H11A5STA1-V | 6-pin DIP<br>6-pin (leads with 0.4" spacing)<br>6-pin (lead bends for surface mount)<br>6-pin (tape and reel packaging of type I)<br>6-pin (tape and reel packaging of type II) |                                                                                                                                                                                                            | H11A5                   |

## Ratings and Characteristics

### Absolute Maximum Ratings

(Ta=25°C)

| Parameter                |                             | Symbol           | Rating   | Unit             |
|--------------------------|-----------------------------|------------------|----------|------------------|
| Input                    | Forward Current             | I <sub>F</sub>   | 60       | mA               |
|                          | Reverse Voltage             | V <sub>R</sub>   | 6        | V                |
|                          | Power Dissipation           | P                | 100      | mW               |
| Output                   | Collector-Emitter Voltage   | V <sub>CEO</sub> | 30       | V                |
|                          | Emitter-Collector Voltage   | V <sub>ECO</sub> | 7        | V                |
|                          | Collector-Base Voltage      | V <sub>CBO</sub> | 70       | V                |
|                          | Collector Current           | I <sub>C</sub>   | 150      | mA               |
|                          | Collector Power Dissipation | P <sub>C</sub>   | 150      | mW               |
| Total Power Dissipation  |                             | P <sub>tot</sub> | 250      | mW               |
| *1.Isolation Voltage     |                             | V <sub>iso</sub> | 5,000    | V <sub>rms</sub> |
| Operating Temperature    |                             | T <sub>opr</sub> | -55~+100 | °C               |
| Storage Temperature      |                             | T <sub>stg</sub> | -55~+150 | °C               |
| *2.Soldering Temperature |                             | T <sub>sol</sub> | 260      | °C               |

\*1. AC for 1 minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

- (1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side.
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave.

\*2. For 10 seconds

### Absolute Maximum Ratings

(Ta=25°C)

| Parameter                |                                      |       | Symbol               | Min. | Typ. | Max. | unit | Conditions                                   |
|--------------------------|--------------------------------------|-------|----------------------|------|------|------|------|----------------------------------------------|
| Input                    | Forward Voltage                      |       | V <sub>F</sub>       | —    | 1.2  | 1.5  | V    | I <sub>F</sub> =10mA                         |
|                          | Reverse Current                      |       | I <sub>R</sub>       | —    | —    | 10   | μA   | V <sub>R</sub> =6V                           |
|                          | Terminal Capacitance                 |       | C <sub>t</sub>       | —    | 18   | —    | pF   | V=0, f=1MHz                                  |
| Output                   | Collector Dark Current               |       | I <sub>CEO</sub>     | —    | —    | 50   | nA   | V <sub>CE</sub> =10V, I <sub>F</sub> =0      |
|                          | Collector-Emitter Breakdown Voltage  |       | BV <sub>CER</sub>    | 30   | —    | —    | V    | I <sub>C</sub> =0.1mA, I <sub>F</sub> =0     |
|                          | Emitter-Collector Breakdown Voltage  |       | BV <sub>ECO</sub>    | 7    | —    | —    | V    | I <sub>E</sub> =10 μA, I <sub>F</sub> =0mA   |
|                          | Collector-Base Breakdown Voltage     |       | BV <sub>ECO</sub>    | 70   | —    | —    | V    | I <sub>C</sub> =0.1mA, I <sub>F</sub> =0     |
|                          | Collector-Emitter Capacitance        |       | C <sub>CE</sub>      | —    | 12   | —    | pF   | V=0V, f=1MHz                                 |
|                          | Collector-Base Capacitance           |       | C <sub>CB</sub>      | —    | 17   | —    | pF   | V <sub>CB</sub> =0V, f=1MHz                  |
|                          | Emitter-Base Capacitance             |       | C <sub>EB</sub>      | —    | 25   | —    | pF   | V <sub>EB</sub> =0V, f=1MHz                  |
| Transfer Characteristics | *1 Current Transfer Ratio            | H11A1 | CTR                  | 50   | —    | —    | %    | I <sub>F</sub> =10mA<br>V <sub>CE</sub> =10V |
|                          |                                      | H11A2 |                      | 20   | —    | —    |      |                                              |
|                          |                                      | H11A3 |                      | 20   | —    | —    |      |                                              |
|                          |                                      | H11A4 |                      | 10   | —    | —    |      |                                              |
|                          |                                      | H11A5 |                      | 30   | —    | —    |      |                                              |
|                          | Collector-emitter Saturation Voltage |       | V <sub>CE(sat)</sub> | —    | 0.15 | 0.4  | V    | I <sub>F</sub> =10mA, I <sub>C</sub> =0.5mA  |
|                          | Isolation Resistance                 |       | R <sub>iso</sub>     | 100  | —    | —    | G Ω  | DC500V<br>40~60% R.H.                        |
|                          | Floating Capacitance                 |       | C <sub>f</sub>       | —    | 0.3  | —    | pF   | V=0, f=1MHz                                  |
|                          | Response Time (Rise)                 |       | t <sub>r</sub>       | —    | 2.8  | —    | μs   | V <sub>CC</sub> =10V, I <sub>C</sub> =10mA   |
|                          | Response Time (Fall)                 |       | t <sub>f</sub>       | —    | 4.5  | —    | μs   | R <sub>L</sub> =100 Ω                        |

\*1. CTR=  $\frac{I_C}{I_F} \times 100\%$

Typical Electrical/Optical Characteristic Curves  
(25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Forward Current vs.  
Ambient Temperature

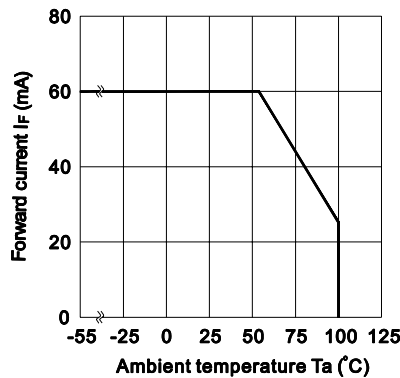


Fig.2 Collector Power Dissipation vs.  
Ambient Temperature

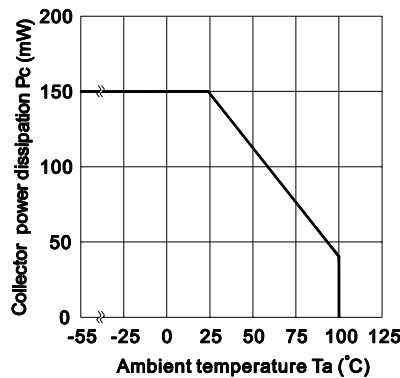


Fig.3 Collector-emitter saturation  
Voltage vs. Forward current

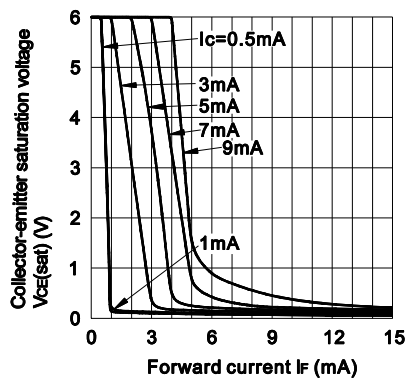


Fig.4 Turn-On Switching Times

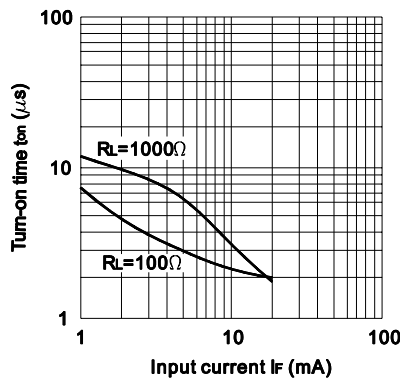


Fig.5 Current Transfer Ratio vs.  
Forward Current

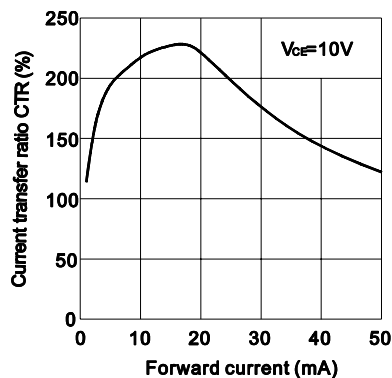


Fig.6 Collector Current vs.  
Collector-emitter Voltage

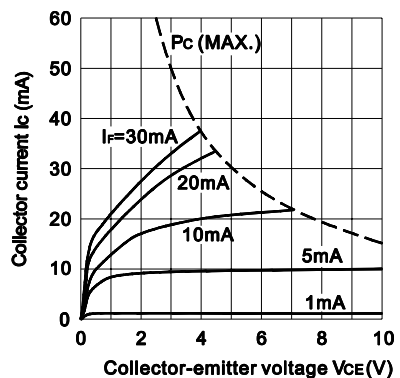


Fig.7 Rise and Fall Times

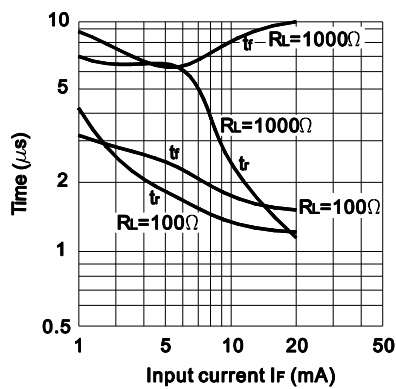
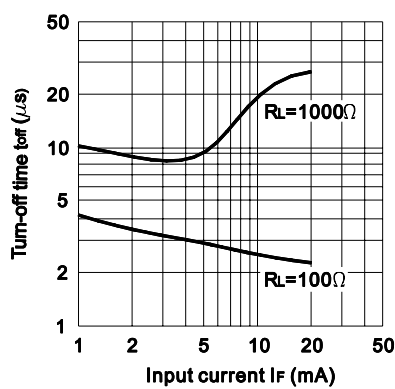
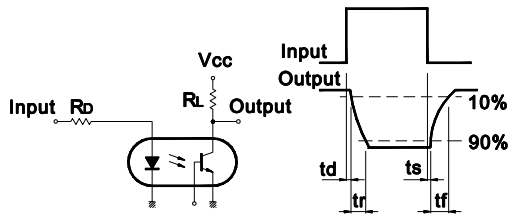


Fig.8 Turn-off Switching Times



Test Circuit for Response Time



Test Circuit for Frequency Response

