

TIL111X, TIL114X, TIL116X, TIL117X  
TIL111, TIL114, TIL116, TIL117

**OPTICALLY COUPLED  
ISOLATOR  
PHOTOTRANSISTOR OUTPUT**



**APPROVALS**

- UL recognised, File No. E91231
- **'X' SPECIFICATION APPROVALS**
- TIL111X is VDE 0884 approved in 3 available lead forms : -
  - STD
  - G form
  - SMD approved to CECC 00802

TIL114X, TIL116X, TIL117X : -  
VDE 0884 pending

- TIL111X is certified to EN60950 by the following Test Bodies :-  
Nemko - Certificate No. P96101299  
Fimko - Registration No. 190469-01..22  
Semko - Reference No. 9620076 01  
Demko - Reference No. 305567  
TIL114X, TIL116X, TIL117X : -  
EN60950 pending

**DESCRIPTION**

The TIL111, TIL114, TIL116, TIL117 series of optically coupled isolators consist of infrared light emitting diode and NPN silicon photo transistor in a standard 6 pin dual in line plastic package.

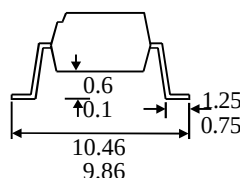
**FEATURES**

- Options :-  
10mm lead spread - add G after part no.  
Surface mount - add SM after part no.  
Tape&reel - add SMT&R after part no.
- High Isolation Voltage (5.3kV<sub>RMS</sub>, 7.5kV<sub>PK</sub>)

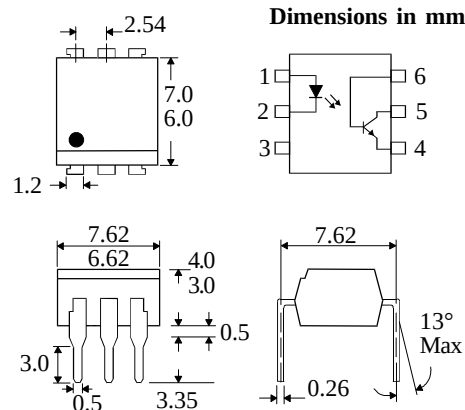
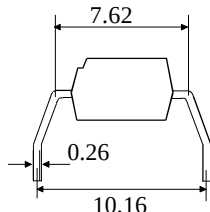
**APPLICATIONS**

- DC motor controllers
- Industrial systems controllers
- Signal transmission between systems of different potentials and impedances

**OPTION SM  
SURFACE MOUNT**



**OPTION G**



**ABSOLUTE MAXIMUM RATINGS  
(25°C unless otherwise specified)**

Storage Temperature \_\_\_\_\_ -55°C to + 150°C  
Operating Temperature \_\_\_\_\_ -55°C to + 100°C  
Lead Soldering Temperature  
(1/16 inch (1.6mm) from case for 10 secs) 260°C

**INPUT DIODE**

Forward Current \_\_\_\_\_ 60mA  
Reverse Voltage \_\_\_\_\_ 6V  
Power Dissipation \_\_\_\_\_ 105mW

**OUTPUT TRANSISTOR**

Collector-emitter Voltage  $BV_{CEO}$  \_\_\_\_\_ 30V  
Collector-base Voltage  $BV_{CBO}$  \_\_\_\_\_ 70V  
Emitter-collector Voltage  $BV_{ECO}$  \_\_\_\_\_ 6V  
Power Dissipation \_\_\_\_\_ 160mW

**POWER DISSIPATION**

Total Power Dissipation \_\_\_\_\_ 200mW  
(derate linearly 2.67mW/°C above 25°C)

**ISOCOM COMPONENTS LTD**

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**ISOCOM INC**

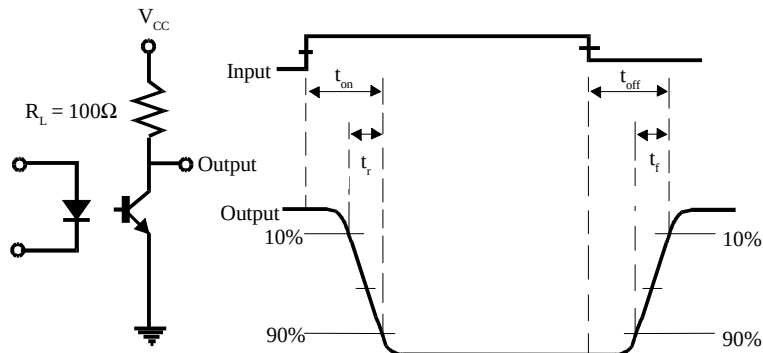
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**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

| PARAMETER |                                                    | MIN                | TYP | MAX | UNITS         | TEST CONDITION                             |
|-----------|----------------------------------------------------|--------------------|-----|-----|---------------|--------------------------------------------|
| Input     | Forward Voltage ( $V_F$ )                          |                    | 1.2 | 1.4 | V             | $I_F = 16\text{mA}$                        |
|           | Reverse Voltage ( $V_R$ )                          | 6                  |     |     | V             | $I_R = 10\mu\text{A}$                      |
|           | Reverse Current ( $I_R$ )                          |                    |     | 10  | $\mu\text{A}$ | $V_R = 6\text{V}$                          |
| Output    | Collector-emitter Breakdown ( $BV_{CEO}$ )         | 30                 |     |     | V             | $I_C = 1\text{mA}$ ( note 2 )              |
|           | Collector-base Breakdown ( $BV_{CBO}$ )            | 70                 |     |     | V             | $I_C = 100\mu\text{A}$                     |
|           | Emitter-collector Breakdown ( $BV_{ECO}$ )         | 6                  |     |     | V             | $I_E = 100\mu\text{A}$                     |
|           | Collector-emitter Dark Current ( $I_{CEO}$ )       |                    |     | 50  | nA            | $V_{CE} = 10\text{V}$                      |
|           | Collector-base Dark Current ( $I_{CBO}$ )          |                    |     | 20  | nA            | $V_{CE} = 10\text{V}$                      |
|           | Transistor Static Gain ( $h_{FE}$ )                | 200                |     |     |               | 10mA $I_C$ , 5V $V_{CE}$                   |
| Coupled   | On-state Collector Current ( $I_{C(on)}$ )         |                    |     |     |               |                                            |
|           | TIL111, TIL114                                     | 20                 |     |     | %             | 16mA $I_F$ , 0.4V $V_{CE}$                 |
|           | TIL116                                             | 20                 |     |     | %             | 10mA $I_F$ , 10V $V_{CE}$                  |
|           | TIL117                                             | 50                 |     |     | %             | 10mA $I_F$ , 10V $V_{CE}$                  |
|           | Collector-emitter Saturation Voltage $V_{CE(SAT)}$ |                    |     |     |               |                                            |
|           | TIL111, TIL114                                     |                    |     | 0.4 | V             | 16mA $I_F$ , 2mA $I_C$                     |
|           | TIL116                                             |                    |     | 0.4 | V             | 15mA $I_F$ , 2.2mA $I_C$                   |
|           | TIL117                                             |                    |     | 0.4 | V             | 10mA $I_F$ , 0.5mA $I_C$                   |
|           | Input to Output Isolation Voltage $V_{ISO}$        | 5300               |     |     | $V_{RMS}$     | See note 1                                 |
|           |                                                    | 7500               |     |     | $V_{PK}$      | See note 1                                 |
|           | Input-output Isolation Resistance $R_{ISO}$        | $5 \times 10^{10}$ |     |     | $\Omega$      | $V_{IO} = 500\text{V}$ (note 1)            |
|           | Output Rise Time $t_r$                             |                    |     | 10  | $\mu\text{s}$ | $V_{CC} = 10\text{V}$ , $I_C = 2\text{mA}$ |
|           | Output Fall Time $t_f$                             |                    |     | 10  | $\mu\text{s}$ | $R_L = 100\Omega$ fig 1                    |

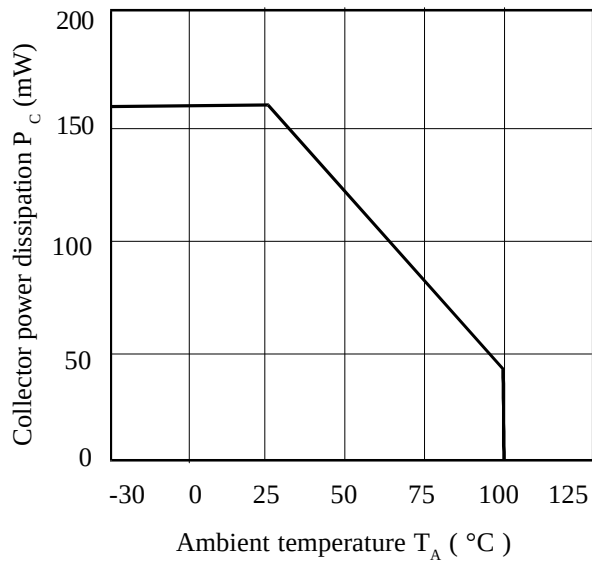
Note 1 Measured with input leads shorted together and output leads shorted together.

Note 2 Special Selections are available on request. Please consult the factory.

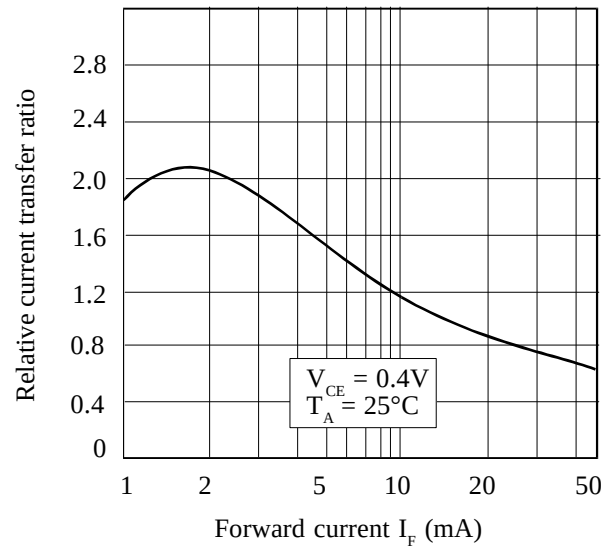


**FIG 1**

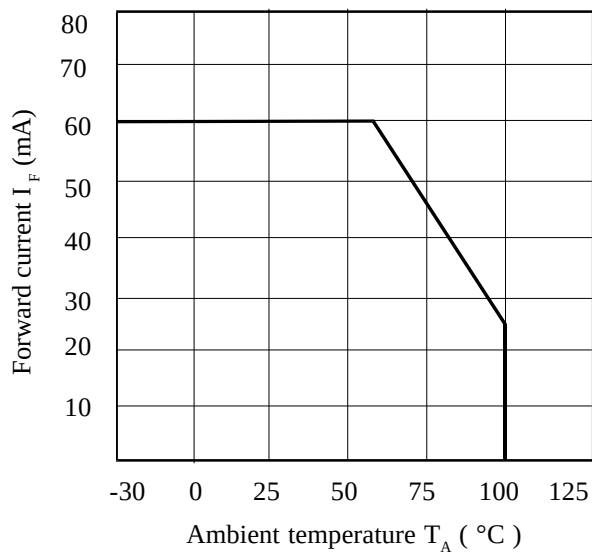
**Collector Power Dissipation vs. Ambient Temperature**



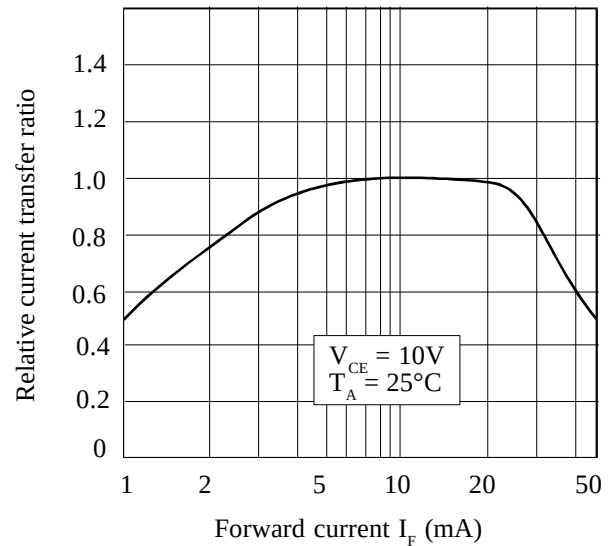
**Relative Current Transfer Ratio vs. Forward Current ( TIL111, TIL114 )**



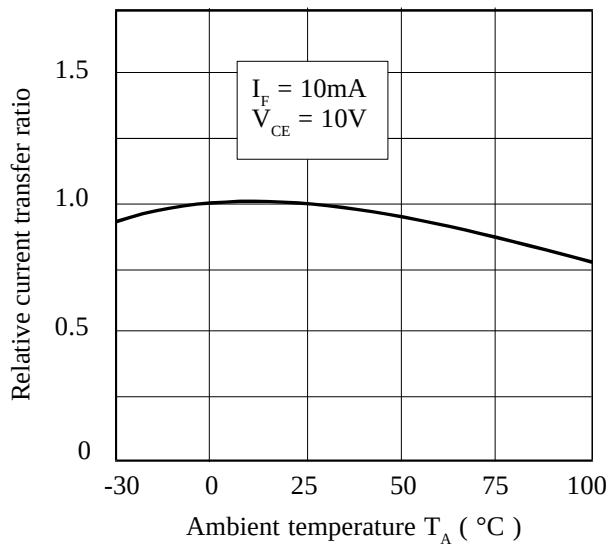
**Forward Current vs. Ambient Temperature**



**Relative Current Transfer Ratio vs. Forward Current ( TIL116, TIL117 )**



**Relative Current Transfer Ratio vs. Ambient Temperature ( TIL116, TIL117 )**



**Relative Current Transfer Ratio vs. Ambient Temperature ( TIL111, TIL114 )**

