

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.

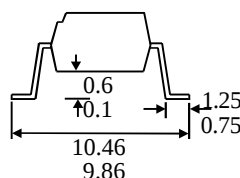
FEATURES

- 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_{RMS}, 7.5kV_{PK})

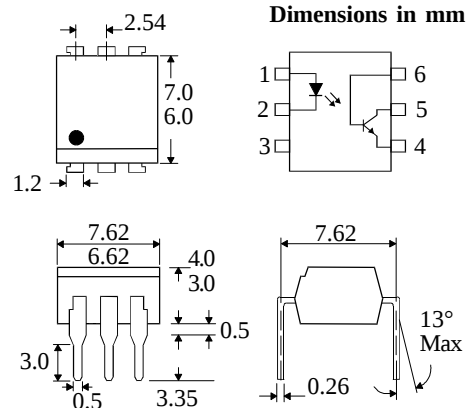
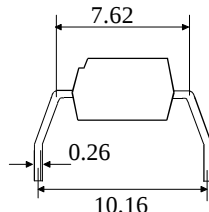
APPLICATIONS

- 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)

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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	μA	$V_R = 6\text{V}$
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				$10\text{mA } I_C, 5\text{V } V_{CE}$
	Transistor Static Gain (h_{FE})	200				$10\text{mA } I_C, 5\text{V } V_{CE}$
Coupled	On-state Collector Current ($I_{C(on)}$)					
	TIL111, TIL114	20			%	$16\text{mA } I_F, 0.4\text{V } V_{CE}$
	TIL116	20			%	$10\text{mA } I_F, 10\text{V } V_{CE}$
	TIL117	50			%	$10\text{mA } I_F, 10\text{V } V_{CE}$
	Collector-emitter Saturation Voltage $V_{CE(SAT)}$					
	TIL111, TIL114		0.4		V	$16\text{mA } I_F, 2\text{mA } I_C$
	TIL116		0.4		V	$15\text{mA } I_F, 2.2\text{mA } I_C$
	TIL117		0.4		V	$10\text{mA } I_F, 0.5\text{mA } I_C$
	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}	5×10^{10}			Ω	$V_{IO} = 500\text{V}$ (note 1)
	Output Rise Time t_r			10	μs	$V_{CC} = 10\text{V}, I_C = 2\text{mA}$
	Output Fall Time t_f			10	μs	$R_L = 100\Omega$ 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.

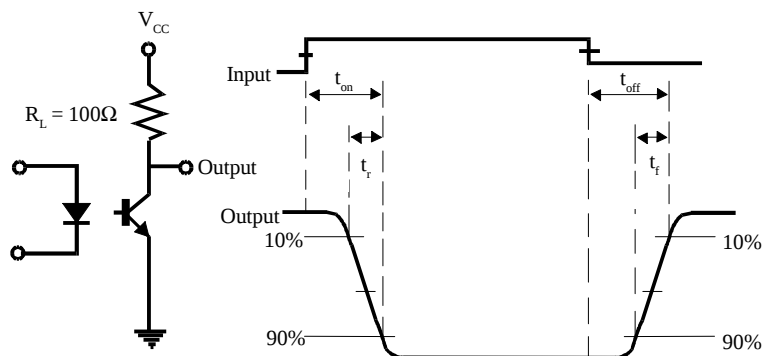
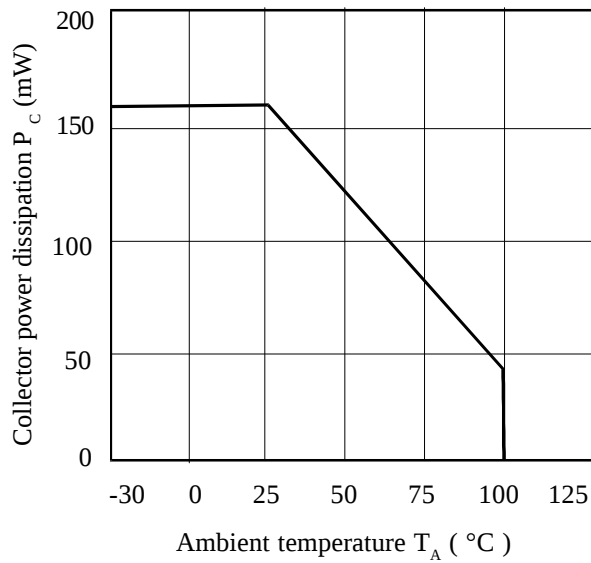
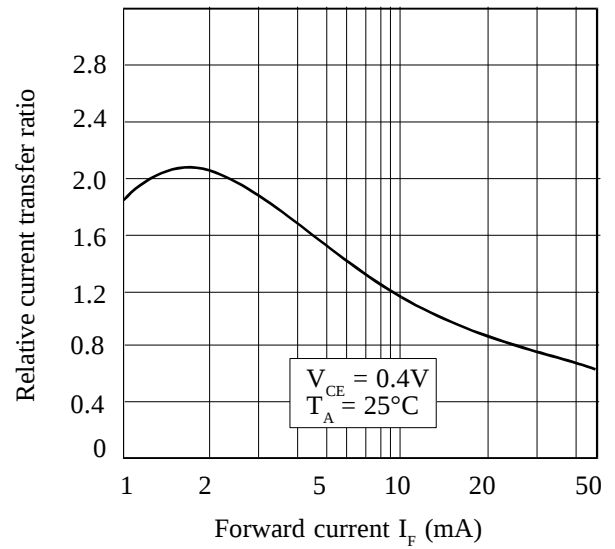


FIG 1

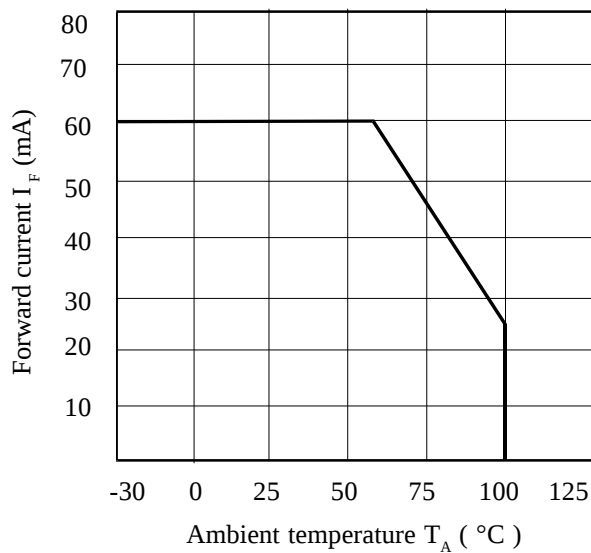
Collector Power Dissipation vs. Ambient Temperature



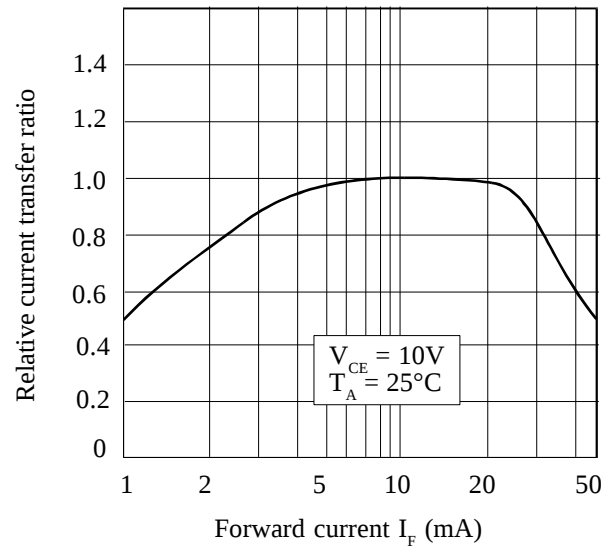
Relative Current Transfer Ratio vs. Forward Current (TIL111, TIL114)



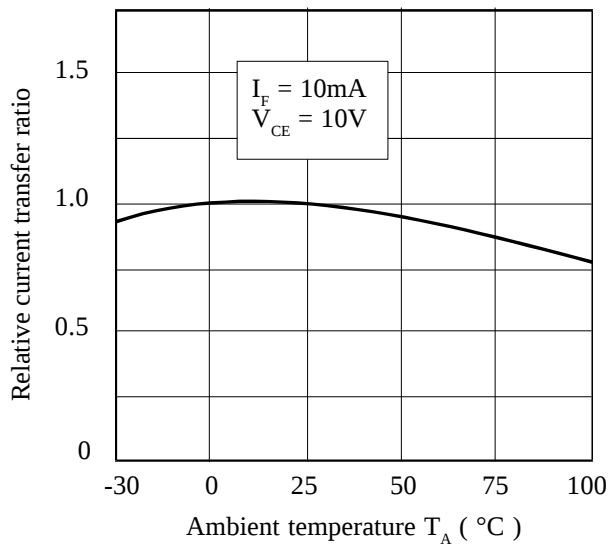
Forward Current vs. Ambient Temperature



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)

