

FEATURES

- **Good CTR Linearity Depending on Forward Current**
- **Isolation Test Voltage, 3000 V_{RMS}**
- **High Collector-Emitter Voltage, V_{CEO}=30 V**
- **Low Saturation Voltage**
- **Fast Switching Times**
- **Field-Effect Stable by TRIOS***

DESCRIPTION

The IL352 is an optically coupled isolator that features a high current transfer ratio, low coupling capacitance and high isolation voltage. It has a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar phototransistor detector. The component is housed in a thin line package.

The coupling device is designed for signal transmission between two electrically separated circuits. The potential difference between the circuits to be coupled must not exceed the maximum permissible reference voltages.

Maximum Ratings
Emitter

Reverse Voltage 6.0 V
 DC Forward Current 60 mA
 Total Power Dissipation 50 mW
 Derate Linearly from 25°C 0.66 mW/°C

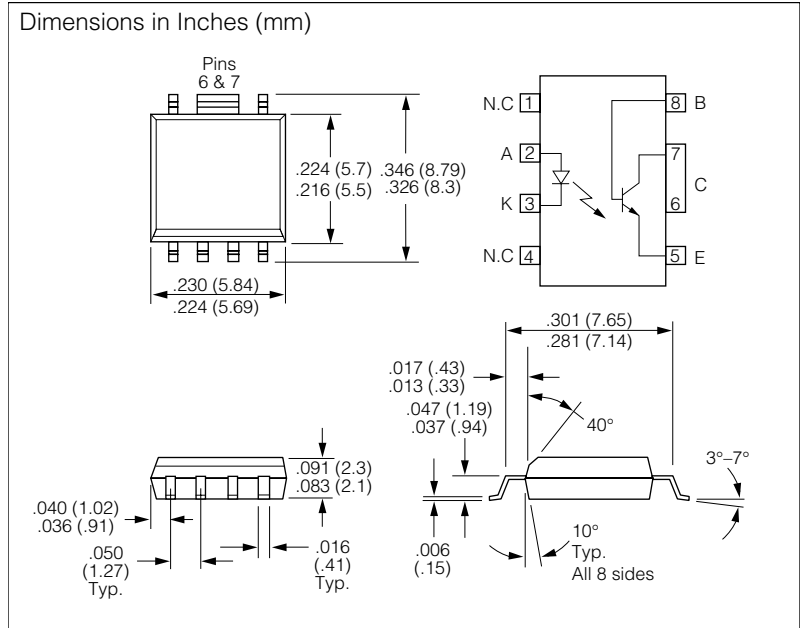
Detector

Collector-Emitter Voltage 70 V
 Emitter-Base Voltage 7.0 V
 Collector Current 50 mA
 Collector Current (t ≤ 1.0 ms) 100 mA
 Total Power Dissipation 150 mW
 Derate Linearly from 25°C 2.5 mW/°C

Package

Isolation Test Voltage (between emitter and detector referred to climate DIN 40046, part 2, Nov. 74)
 t = 1.0 sec 3000 V_{RMS}
 Isolation Resistance
 V_{IO} = 500 V, T_A = 25°C ≥ 10¹² Ω
 V_{IO} = 500 V, T_A = 100°C ≥ 10¹¹ Ω
 Storage Temperature Range -40°C to +150°C
 Ambient Temperature Range -40°C to +85°C
 Junction Temperature 100°C
 Soldering Temperature
 (max 10 s, Dip Soldering Distance to Seating Plane ≥ 1.5 mm) 260°C

***TR**ansparent **IO**n Shield


Characteristics T_A=25°C

Emitter	Sym.	Min.	Typ.	Max.	Units	Condition
Forward Voltage	V _F	—	1.3	1.5	V	I _F = 10 mA
Reverse Current	I _R	—	0.1	10	μA	V _R = 6.0 V
Capacitance	C _O	—	25	—	pF	V _R = 0 f = 1.0 MHz
Detector						
Breakdown Voltage Collector-Emitter Emitter-Collector	BV _{CEO} BV _{ECO}	30 7.0	—	—	V	I _C = 1.0 mA I _E = 100 μA
Collector-Emitter Leakage	I _{CEO}	—	5.0	50	nA	V _{CE} = 10 V I _F = 0 T _A = 25°C
		—	—	500	μA	V _{CE} = 30 V I _F = 0 T _A = 85°C
Collector to Base	BV _{CBO}	70	—	—	V	I _C = 100 μA
Capacitance Collector-Emitter	C _{CE}	—	6.0	—	pF	V _{CE} = 0

Characteristics $T_A=25^\circ\text{C}$ (continued)

Package	Symbol	Min.	Typ.	Max.	Units	Condition
DC Current Transfer Ratio	CTR	100	—	—	%	$I_F=10\text{ mA}$ $V_{CE}=10\text{ V}$
DC Current Transfer Ratio	CTR	34	—	—	%	$I_F=1.0\text{ mA}$ $V_{CE}=10\text{ V}$
Saturation Voltage Collector-Emitter	V_{CEsat}	—	—	0.3	V	$I_F=10\text{ mA}$, $I_C=0.5\text{ mA}$
Coupling Capacitance	C_{IO}	—	0.5	—	pF	$f=1.0\text{ MHz}$
Switching Time, Non-Saturated	t_{on} , t_{off}	—	10	—	μs	$I_C=2.0\text{ mA}$ $R_E=100\ \Omega$ $V_{CC}=10\text{ V}$ $RH\leq 50\%$

Figure 1. Switching waveform

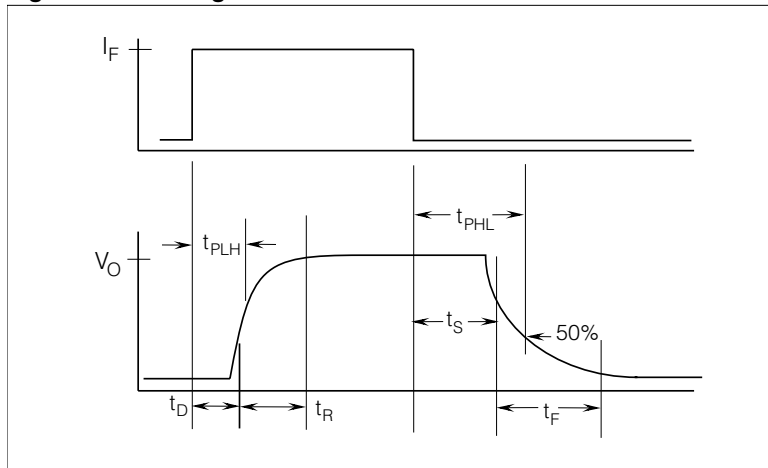


Figure 2. Switching schematic

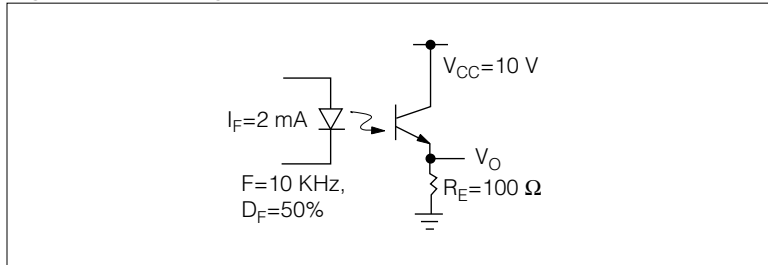


Figure 3. Forward voltage versus forward current

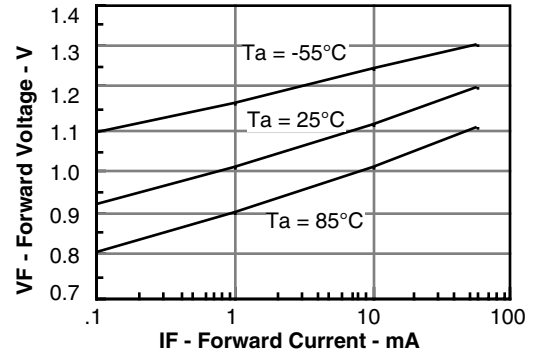


Figure 4. Normalized non-saturated and saturated CTR at $T_A=25^\circ\text{C}$ versus LED current

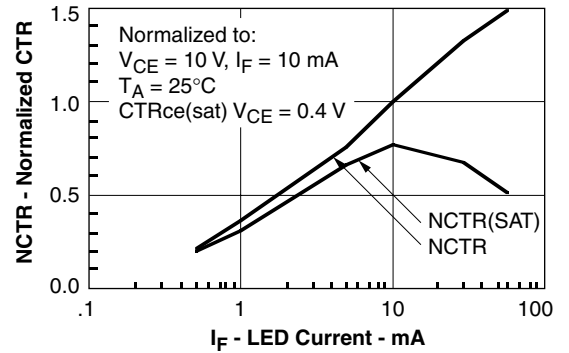


Figure 5. Normalized non-saturated and saturated CTR at $T_A=50^\circ\text{C}$ versus LED current

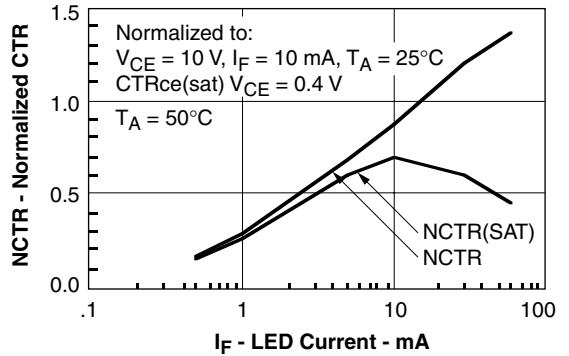


Figure 6. Normalized non-saturated and saturated CTR at $T_A=70^\circ\text{C}$ versus LED current

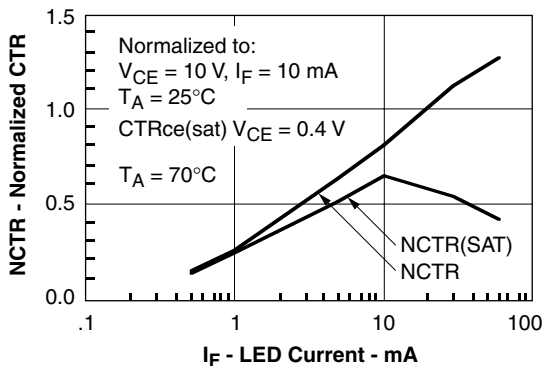


Figure 7. Normalized non-saturated and saturated CTR at $T_A=85^\circ\text{C}$ versus LED current

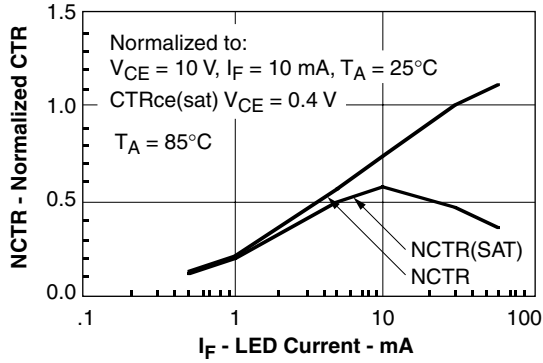


Figure 8. Collector-emitter current versus temperature and LED current

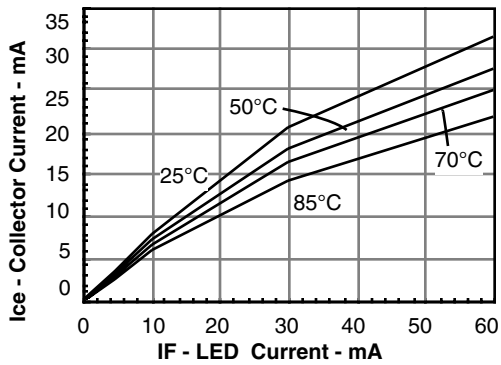


Figure 9. Collector-emitter leakage current versus temperature

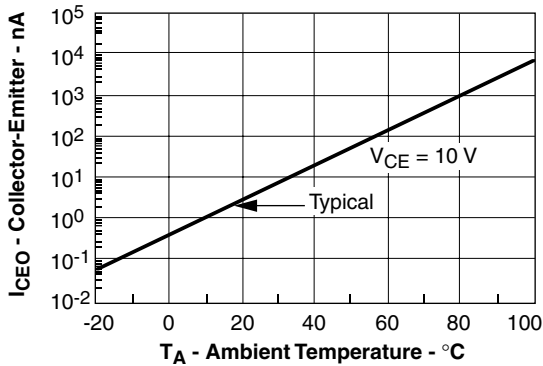


Figure 10. Normalized CTR_{cb} versus LED current and temperature

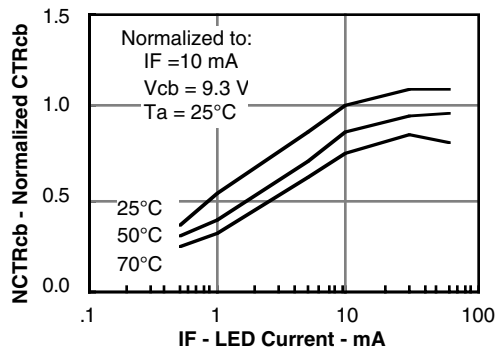


Figure 11. Collector base photocurrent versus LED current

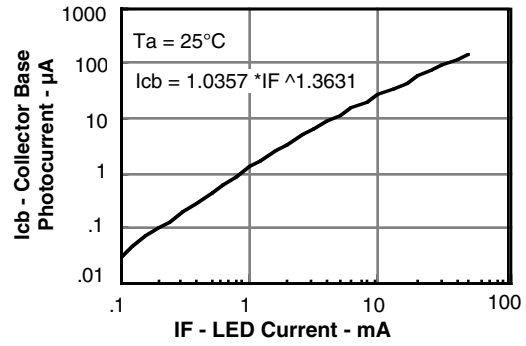


Figure 12. Normalized photocurrent versus I_F and temperature

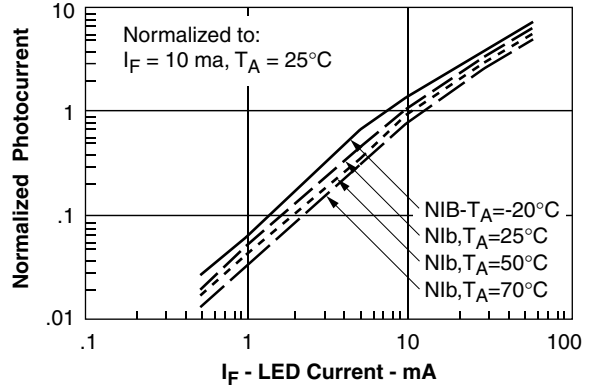


Figure 13. Propagation delay versus collector load resistor

