SIEMENS

IL201/IL202/IL203
PHOTOTRANSISTOR OPTOCOUPLER

FEATURES

- **High Current Transfer Ratio, 75% to 450%**
- **Minimum Current Transfer Ratio, 10% Guaranteed at I_F = 1mA**
- **High Collector-Emitter Voltage, BV_{CEO} = 70V**
- **Long Term Stability**
- **Industry Standard DIP Package**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option 1**

DESCRIPTION

The IL201/202/203 are optically coupled pairs employing a Gallium Arsenide infrared LED and a Silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. The IL201/202/203 can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

Maximum Ratings

Emitter

Peak Reverse Voltage ..... 6 V
Continuous Forward Current ..... 60 mA
Power Dissipation at 25°C ..... 100 mW
Derate Linearly from 25°C ..... 1.33 mW/°C

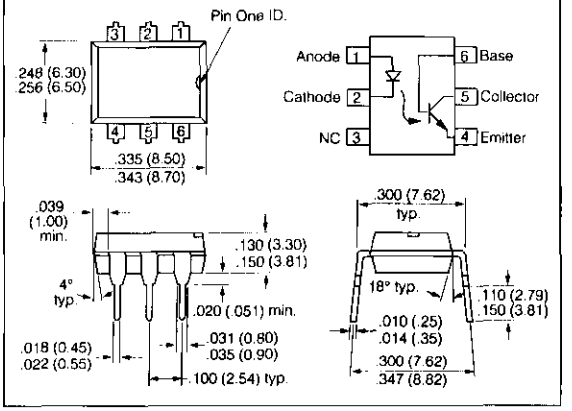
Detector

Collector-Emitter Breakdown Voltage, BV_{CEO} ..... 70 V
Emitter-Collector Breakdown Voltage, BV_{ECO} ..... 7 V
Collector-Base Breakdown Voltage, BV_{CBO} ..... 70 V
Power Dissipation ..... 200 mW
Derate Linearly from 25°C ..... 2.6 mW/°C

Package

Isolation Test Voltage (t=1 sec.) ..... 5300 VAC_{RMS}
Total Package Dissipation at 25°C A (LED + Detector) ..... 250 mW
Derate Linearly from 25°C ..... 3.3 mW/°C
Creepage ..... 7 min mm
Clearance ..... 7 min mm
Storage Temperature ..... -55°C to +150°C
Operating Temperature ..... -55°C to +100°C
Lead Soldering Time at 260°C ..... 10 sec.

Package Dimensions in Inches (mm)



Characteristics (0°C to 70°C unless otherwise specified)

	Symbol	Min.	Typ.	Max.	Unit	
Emitter						
Forward Voltage	V_F		1.2	1.5	V	I_F=20 mA
Forward Voltage	V_F		1.0	1.2	V	I_F=1 mA
Breakdown Voltage	V_R	6	20		V	I_R=10 µA
Reverse Current	I_R		0.1	10	µA	V_R=6 V, T_A=25°C
Detector						
	HFE	100	200			V_{CE}=5 V, I_C=100 µA
	BV_{CEO}	70			V	I_C=100 µA
	BV_{ECO}	7	10		V	I_E=100 µA
	BV_{CBO}	70	90		V	I_C=10 µA
	I_{CEO}		5	50	nA	V_{CE}=10 V, T_A=25°C
Package						
Base Current Transfer Ratio	CTR_{CB}	0.15			%	I_F=10 mA, V_{CB}=10 V
	V_{CEsat}			0.4	V	I_F=10 mA, I_C=2 mA
DC Current Transfer Ratio						
IL201	CTR	75	100	150	%	I_F=10 mA, V_{CE}=10 V
IL202	CTR	125	200	250	%	
IL203	CTR	225	300	450	%	
DC Current Transfer Ratio						
IL201	CTR	10			%	I_F=1 mA, V_{CE}=10 V
IL202	CTR	30			%	
IL203	CTR	50			%	

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Figure 1. Forward voltage versus forward current

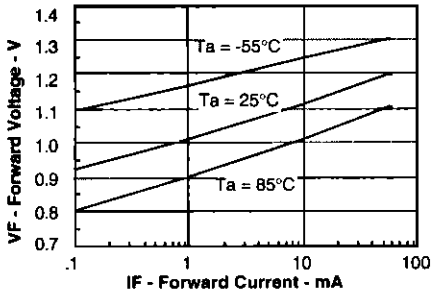

Figure 2. Normalized non-saturated and saturated CTR at Ta = 25°C versus LED current

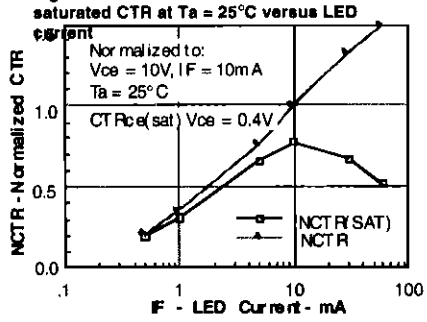

Figure 3. Normalized non-saturated and saturated CTR at Ta = 50°C versus LED current

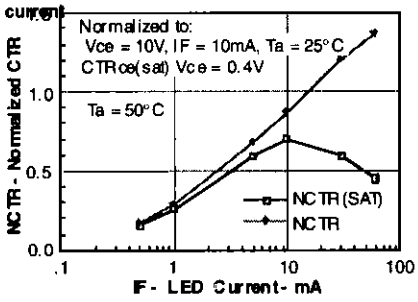

Figure 4. Normalized non-saturated and saturated CTR at Ta = 70°C versus LED current

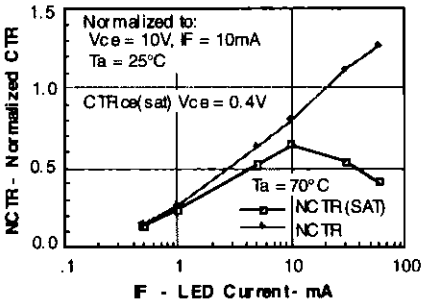

Figure 5. Normalized non-saturated and saturated CTR at Ta = 85°C versus LED current

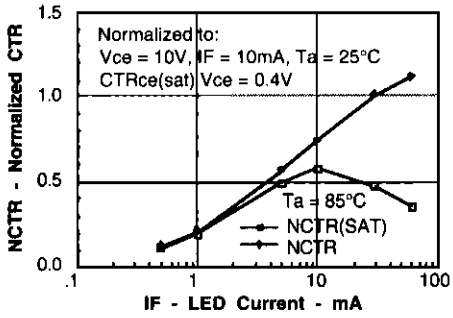

Figure 6. Collector-emitter current versus temperature and LED current

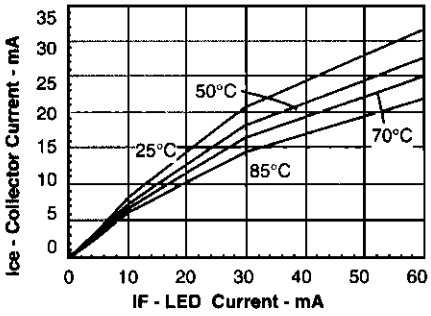

Figure 7. Collector-emitter leakage current versus temperature

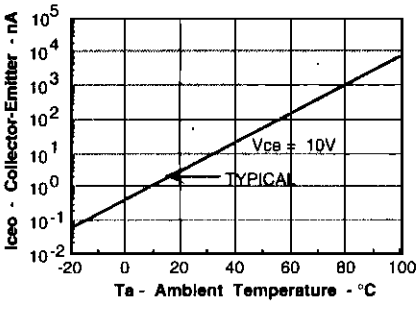

Figure 8. Normalized CTRcb versus LED current and temperature

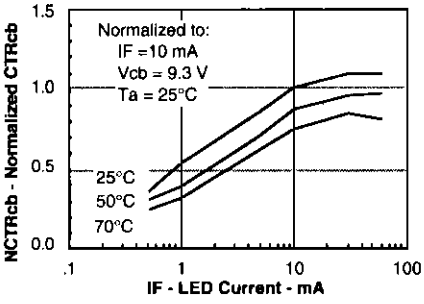

Figure 9. Collector base photocurrent versus LED current

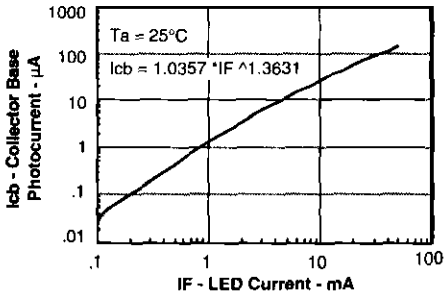

Figure 10. Normalized photocurrent versus If and temperature

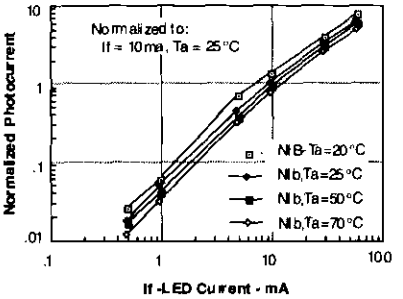

Figure 11. Normalized saturated HFE versus base current and temperature

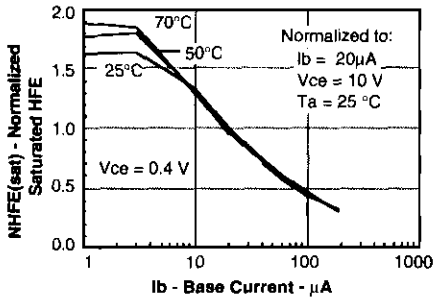

Figure 12. Propagation delay versus collector load resistor

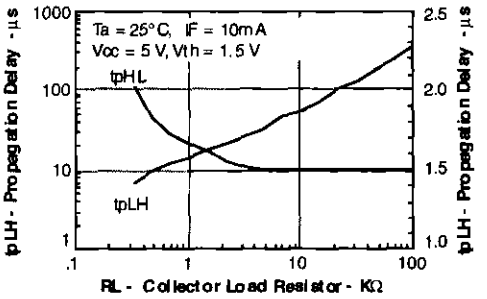

Figure 13. Normalized non-saturated and saturated CTRce versus LED current

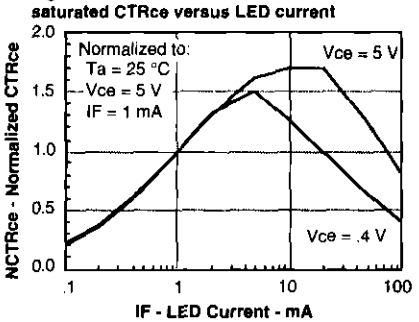

Figure 14. Normalized non-saturated HFE versus base current and temperature