SIEMENS

IL215/216/217

PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

FEATURES

- **High Current Transfer Ratios, I_F=1 mA**
  IL215, 20% Minimum
  IL216, 50% Minimum
  IL217, 100% Minimum
- **Isolation Voltage, 2500 VRMS**
- **Electrical Specifications Similar to Standard 6 Pin Coupler**
- **Industry Standard SOIC-8 Surface Mountable Package**
- **Standard Lead Spacing, .05"**
- **Available in Tape and Reel Option (Conforms to EIA Standard RS481A)**
- **Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering**
- **Underwriters Lab File #E52744 (Code Letter P)**

DESCRIPTION

The IL215/216/217 are optically coupled pairs with 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 IL215/216/217 come in a standard SOIC-8 small outline package for surface mounting which makes it ideally suited for high density applications with limited space. In addition to eliminating through-holes requirements, this package conforms to standards for surface mounted devices.

The high CTR at low input current is designed for low power consumption requirements such as CMOS microprocessor interfaces.

Maximum Ratings

Emitter

Peak Reverse Voltage ..... 6.0 V
Continuous Forward Current ..... 60 mA
Power Dissipation at 25°C ..... 90 mW
Derate Linearly from 25°C ..... 1.2 mW/°C

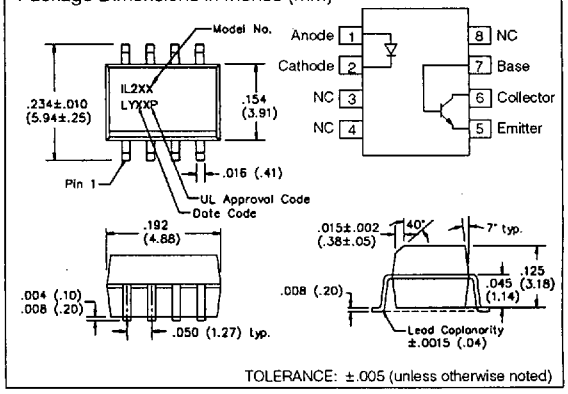
Detector

Collector-Emitter Breakdown Voltage ..... 30 V
Emiter-Collector Breakdown Voltage ..... 7 V
Collector-Base Breakdown Voltage ..... 70 V
Power Dissipation ..... 150 mW
Derate Linearly from 25°C ..... 2.0 mW/°C

Package

Total Package Dissipation at 25°C Ambient (LED + Detector) ..... 280 mW
Derate Linearly from 25°C ..... 3.3 mW/°C
Storage Temperature ..... -55°C to +150°C
Operating Temperature ..... -55°C to +100°C
Soldering Time at 260°C ..... 10 sec.

Package Dimensions in Inches (mm)



TOLERANCE: ±.005 (unless otherwise noted)

Characteristics (T_A=25°C)

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.3	1.5	V	I_F=1 mA
Reverse Current	I_R		0.1	100	µA	V_R=6.0 V
Capacitance	C_O		25		pF	V_R=0
Detector						
Breakdown Voltage						
Collector-Emitter	BV_{CEO}	30			V	I_C=10 µA
Emitter-Collector	BV_{ECO}	7			V	I_E=10 µA
Collector-Emitter						V_{CE}=10 V,
Dark Current	$I_{CEOdark}$		5	50	nA	I_F=0
Collector-Emitter						
Capacitance	C_{CE}		10		pF	V_{CE}=0
Package						
DC Current Transfer	CTR_{DC}				%	I_F=1 mA,
IL215		20	50			V_{CE}=5 V
IL216		50	80			
IL217		100	130			
Collector-Emitter						I_C=0.1 mA,
Saturation Voltage	$V_{CE\,sat}$			0.4		I_F=1 mA
Withstand Test						
Voltage	WTV	2500			VAC_{RMS}	t=1 min.
Equivalent DC						
Isolation Voltage		3535			VDC	
Capacitance,						
Input to Output	C_{IO}		0.5		pF	
Resistance,						
Input to Output	R_{IO}		100		GΩ	
Switching Time	t_{ON}, t_{OFF}		3.0		µs	I_C=2 mA, R_E=100 Ω, V_{CE}=10 V

See Application Note 39 for solderability information.

Optocouplers (Optoisolators)

Figure 1. Forward voltage versus forward current

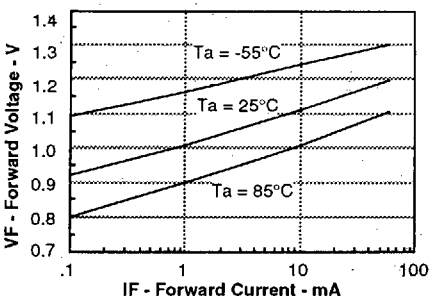


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

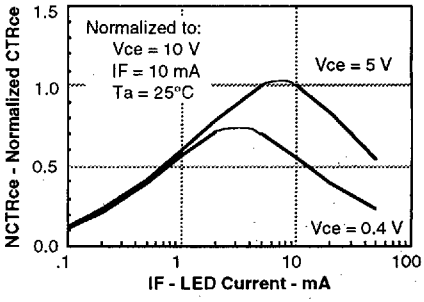


Figure 3. Collector-emitter current versus LED current

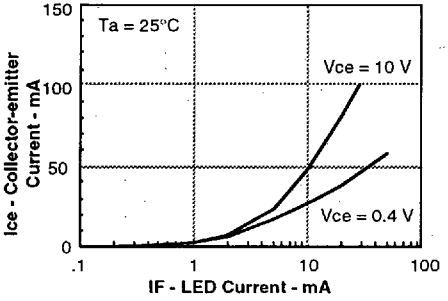


Figure 4. Normalized collector-base photocurrent versus LED current

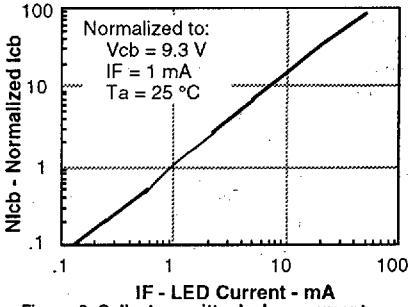


Figure 5. Collector-base photocurrent versus LED current

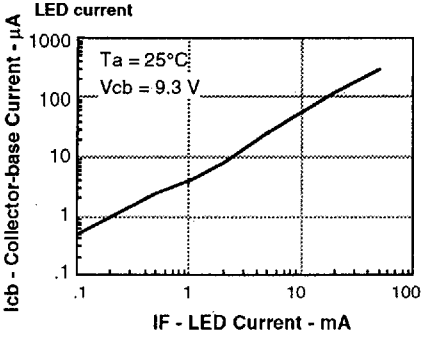


Figure 6. Collector-emitter leakage current versus temperature

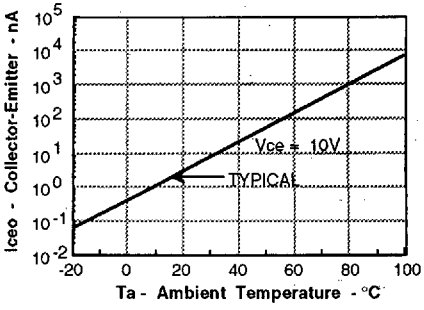


Figure 7. Normalized saturated HFE versus base current and temperature

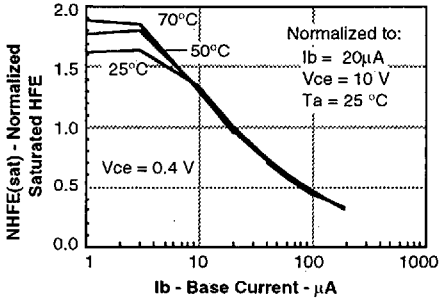


Figure 8. Normalized non-saturated and saturated CTRce versus LED current

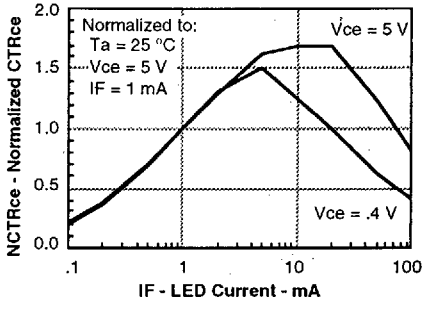


Figure 9. Normalized non-saturated and saturated collector-emitter current versus LED current

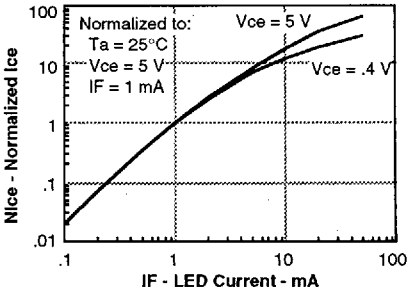


Figure 10. Normalized collector-base photocurrent versus LED current

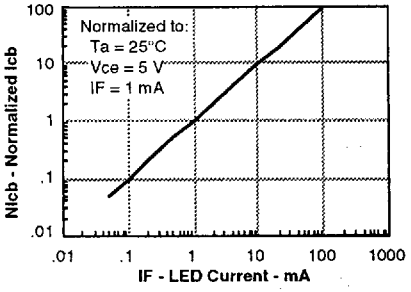


Figure 11. Collector-base photocurrent versus LED current

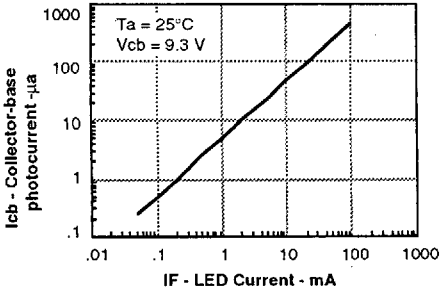


Figure 12. High to low propagation delay versus LED current and load resistor

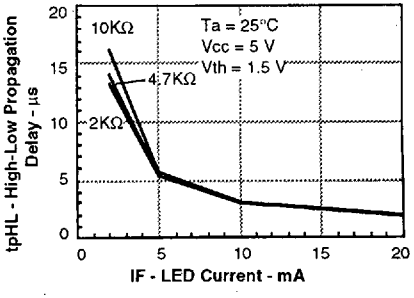


Figure 13. Low to high propagation delay versus LED current and load resistor

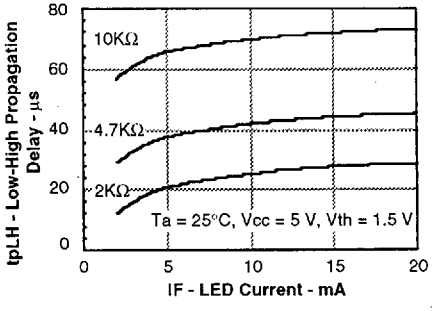


Figure 14. Normalized non-saturated HFE versus base current and temperature