

IL215A/216A/217A PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

- **FEATURES**
- **High Current Transfer Ratio, $I_F=1$ mA**
IL215A—20% Minimum
IL216A—50% Minimum
IL217A—100% Minimum
- **Isolation Voltage, 2500 VAC_{RMS}**
- **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 IL215A/216A/217A 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 IL215A/216A/217A comes 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

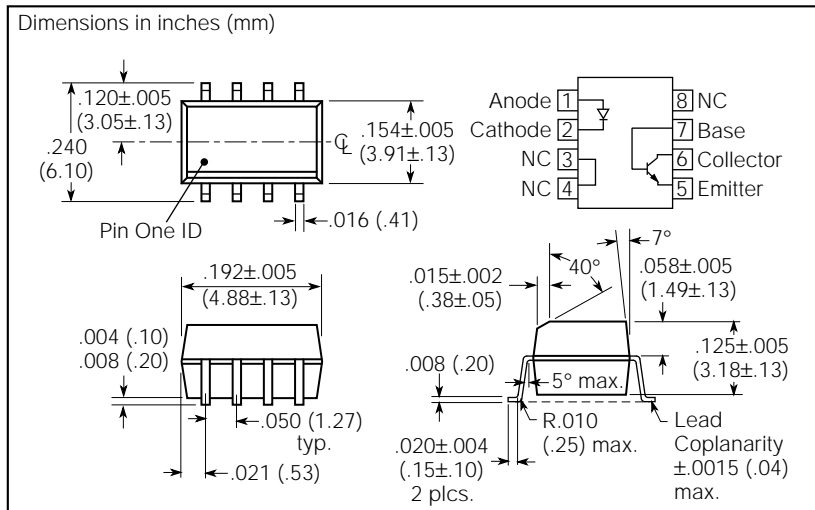
Peak Reverse Voltage6.0 V
 Continuous Forward Current 60 mA
 Power Dissipation at 25°C90 mW
 Derate Linearly from 25°C1.2 mW/°C

Detector

Collector-Emitter Breakdown Voltage30 V
 Emitter-Collector Breakdown Voltage7 V
 Collector-Base Breakdown Voltage70 V
 Power Dissipation150 mW
 Derate Linearly from 25°C2.0 mW/°C

Package

Total Package Dissipation at 25°C Ambient (LED + Detector)280 mW
 Derate Linearly from 25°C3.3 mW/°C
 Storage Temperature -55°C to +150°C
 Operating Temperature -55°C to +100°C
 Soldering Time at 260°C 10 sec.



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

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.0	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 Emitter-Collector	$B_{V_{CE0}}$ $B_{V_{ECO}}$		30 7		V V	$I_C=10$ μA $I_E=10$ μA
Dark Current, Collector-Emitter	$I_{CE0\text{dark}}$		5	50	nA	$V_{CE}=10$ V $I_F=0$
Capacitance, Collector-Emitter	C_{CE}		10		pF	$V_{CE}=0$
Package						
DC Current Transfer Ratio IL215A IL216A IL217A	CTR_{DC}		20 50 100	50 80 130	%	$I_F=10$ mA, $V_{CE}=5$ V
Saturation Voltage, Collector-Emitter	$V_{CE\text{sat}}$			0.5		$I_F=1$ mA, $I_C=0.1$ mA
Isolation Test Voltage	V_{IO}	2500			VAC _{RMS}	
Capacitance, Input to Output	C_{IO}		0.5		pF	
Resistance, Input to Output	R_{IO}		100		G Ω	
Switching Time	t_{on}, t_{off}		3.0		μs	$I_C=2$ mA, $R_E=100$ Ω , $V_{CE}=10$ V

Figure 1. Forward voltage versus forward current

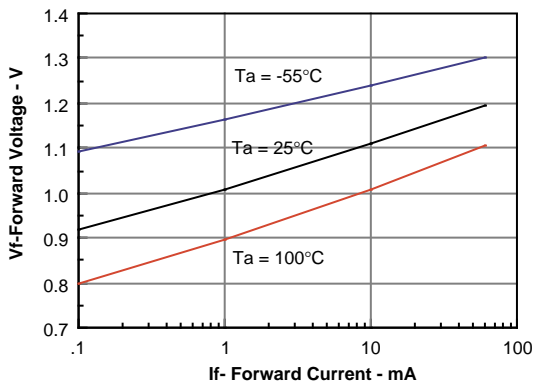


Figure 5. Collector-base photocurrent versus LED current

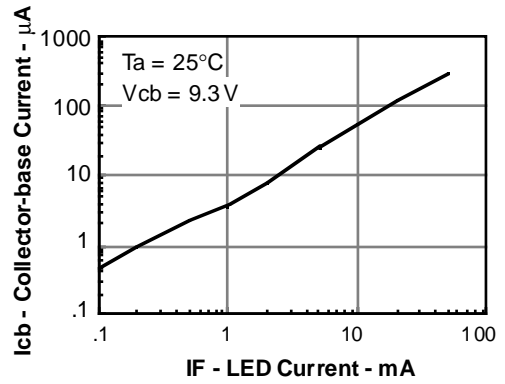


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

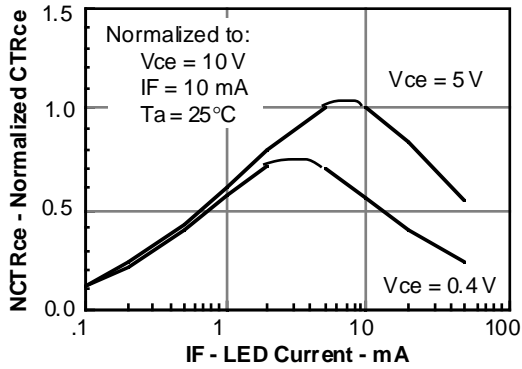


Figure 6. Collector-emitter leakage current versus temperature

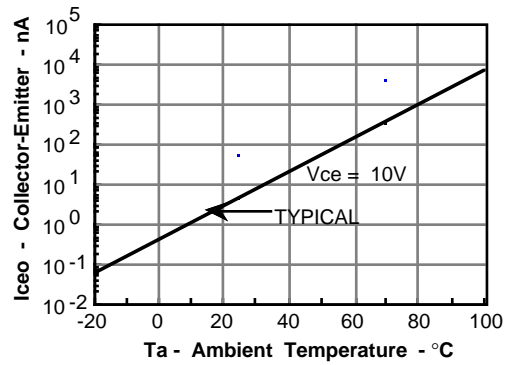


Figure 3. Collector-emitter current versus LED current

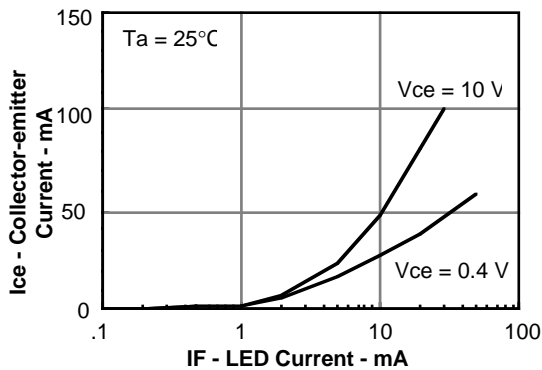


Figure 7. Normalized saturated HFE versus base current and temperature

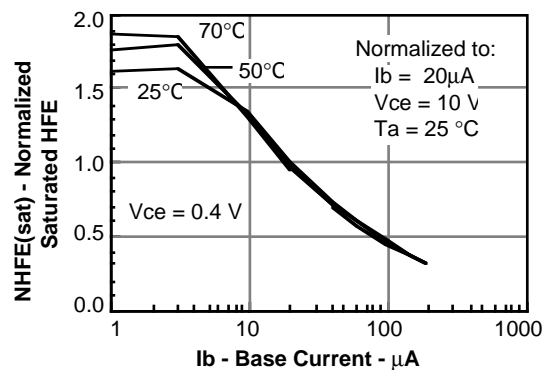


Figure 4. Normalized collector-base photocurrent versus LED current

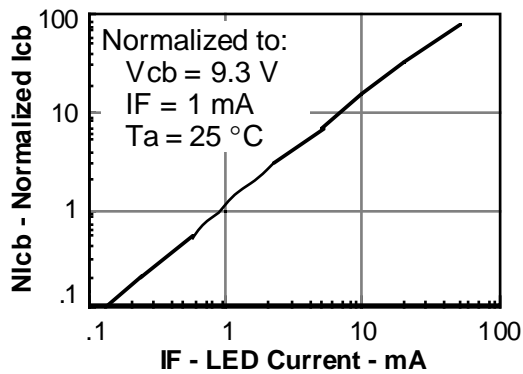


Figure 8. Normalized non-saturated and saturated CTRce versus LED current

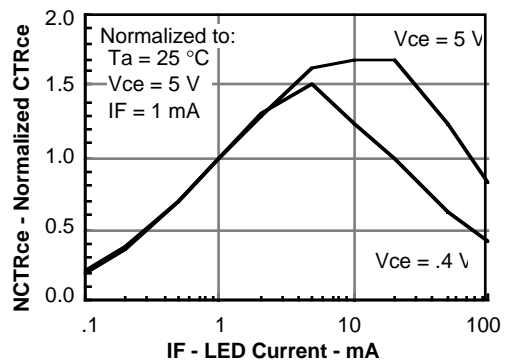


Figure 9. Normalized non-saturated and saturated collector-emitter current versus LED current

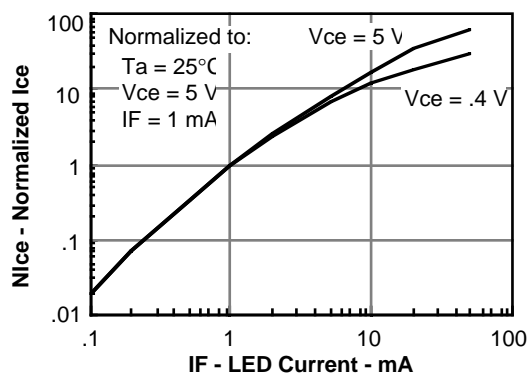


Figure 10. Normalized collector-base photocurrent versus LED current

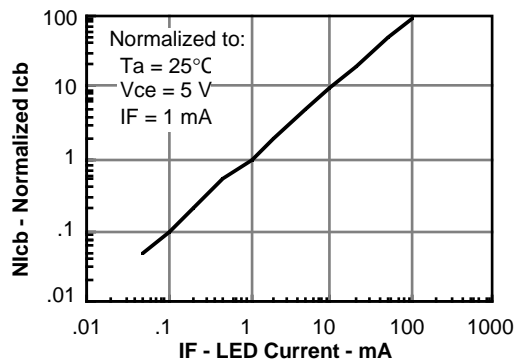


Figure 11. Collector-base photocurrent versus LED current

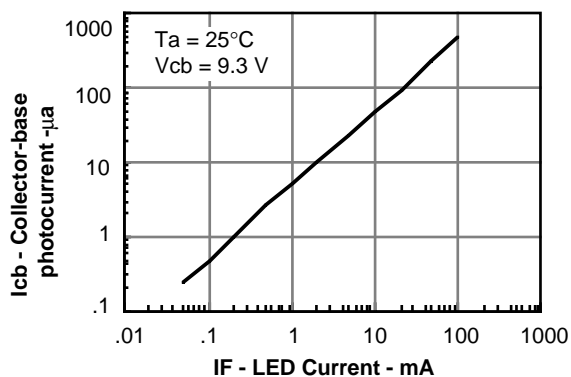


Figure 12. High to low propagation delay versus LED current and load resistor

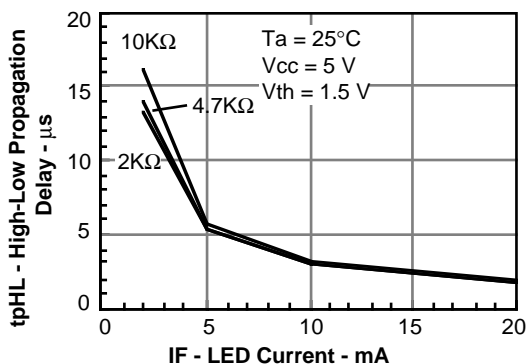


Figure 13. Low to high propagation delay versus LED current and load resistor

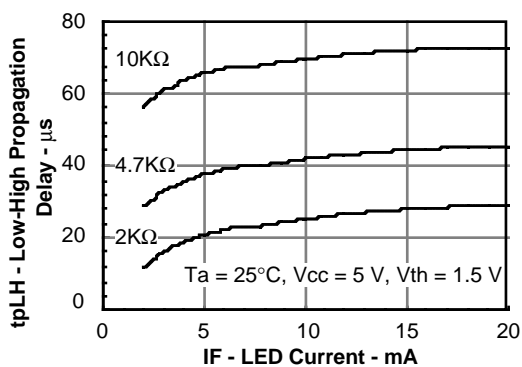


Figure 14. Normalized non-saturated HFE versus base current and temperature

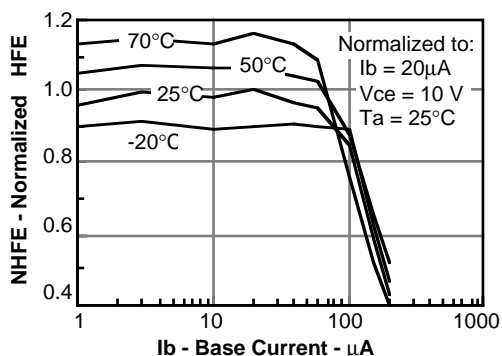


Figure 15. Typical switching characteristics versus base resistance (saturated operation)

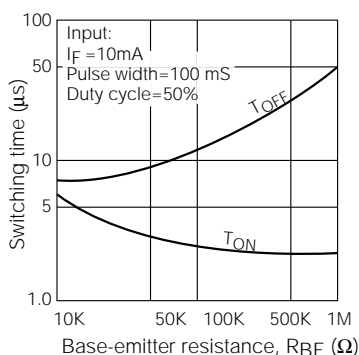


Figure 16. Typical switching times versus load resistance

