

HIGH ISOLATION VOLTAGE DARLINGTON TRANSISTOR TYPE 6 PIN OPTOCOUPLER

PS2603
PS2603L
PS2604
PS2604L

FEATURES

- **HIGH ISOLATION VOLTAGE**
BV: 5 k V_{r.m.s.} MIN
- **HIGH SPEED SWITCHING**
 $t_r, t_f = 100 \mu\text{s}$ TYP
- **ULTRA HIGH CURRENT TRANSFER RATIO**
CTR: 300% TYP

DESCRIPTION

PS2603, PS2604, PS2603L and PS2604L are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon Darlington-connected phototransistor. PS2603 and PS2604 are in a plastic DIP (Dual In-line Package). PS2603L and PS2604L are lead bending type (Gull-wing) for surface mount. PS2603 and PS2603L have a base pin, PS2604 and PS2604L have no base pin.

APPLICATIONS

Interface circuit for various instrumentations and control equipment.

- AC LINE / DIGITAL LOGIC
- DIGITAL LOGIC / DIGITAL LOGIC
- TWISTED PAIR LINE RECEIVER
- TELEPHONE / TELEGRAPH LINE RECEIVER
- HIGH FREQUENCY POWER SUPPLY
FEEDBACK CONTROL

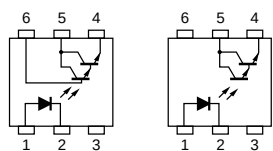
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER			PS2603, PS2603L, PS2604, PS2604L		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 10 mA		1.1	1.4
	I _R	Reverse Current, V _R = 5 V			5
	C	Junction Capacitance, V = 0, f = 1.0 MHz		30	
Transistor	I _{CEO}	Collector to Emitter Dark Current, V _{CE} = 40 V, I _F = 0			400
	BV _{CEO}	Collector to Emitter Breakdown Voltage, I _C = 1 mA, I _B = 0	40		
	BV _{ECO}	Emitter to Collector Breakdown Voltage, I _E = 100 μ A, I _B = 0	6		
Coupled	CTR	Current Transfer Ratio ¹ , I _F = 1 mA, V _{CE} = 2 V	200	2000	
	V _{CE(sat)}	Collector Saturation Voltage, I _F = 1 mA, I _C = 2 mA			1.0
	R ₁₋₂	Isolation Resistance, V _{IN-OUT} = 1.0 k V	10 ¹¹		
	C ₁₋₂	Isolation Capacitance, V = 0, f = 1.0 MHz		0.6	
	t _r	Rise Time ² , V _{CC} = 10 V, I _C = 10 mA		100	
	t _f	Fall Time ² , V _{CC} = 10 V, I _C = 10 mA		100	

Notes:

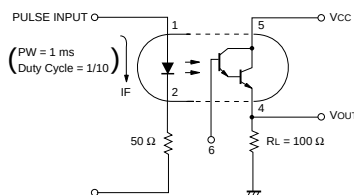
- CTR Rank
KD : 2000 to %
LD : 700 to 3400 %
MD : 200 to 1000 %

- Test Circuit for Switching Time

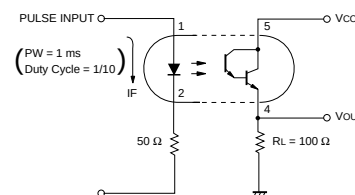


PS2603

PS2604



PS2603



PS2604

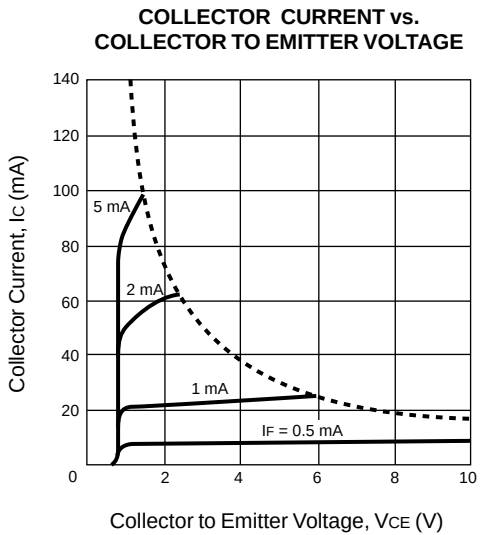
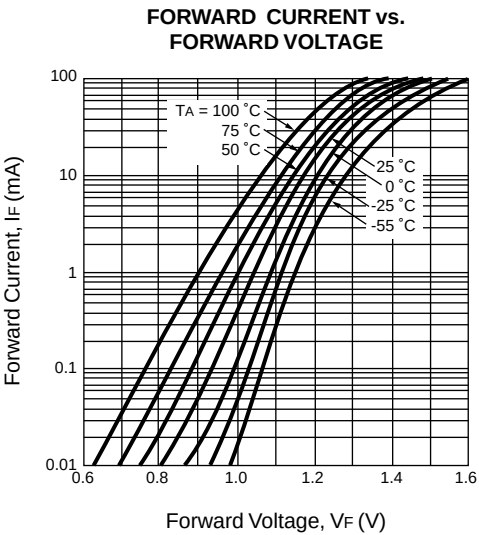
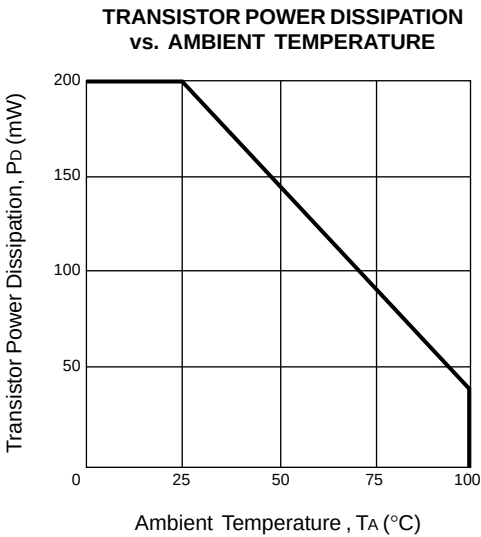
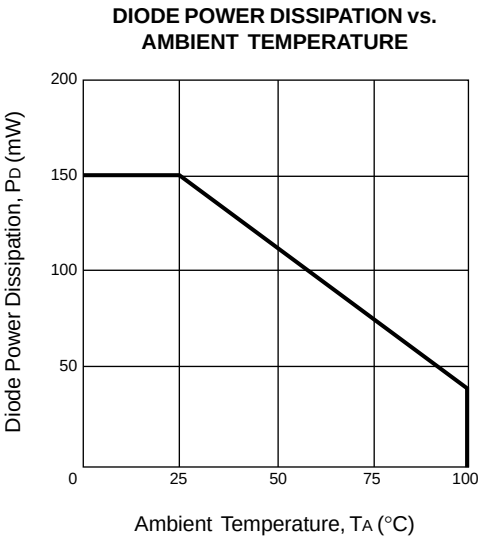
ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
V _R	Reverse Voltage	V	6
I _F	Forward Current (DC)	mA	80
P _D	Power Dissipation	mW	150
I _F (PEAK)	Peak Forward Current (P _W = 100 μs, Duty Cycle 1%)	A	1
Transistor			
V _{CEO}	Collector to Emitter Voltage	V	40
V _{ECO}	Emitter to Collector Voltage	V	6
I _C	Collector Current	mA	200
P _C	Power Dissipation	mW	200
Coupled			
BV	Isolation Voltage ²	V _{r.m.s.}	5000
T _{STG}	Storage Temperature	°C	-55 to +150
T _{OP}	Operating Temperature	°C	-55 to +100

Notes

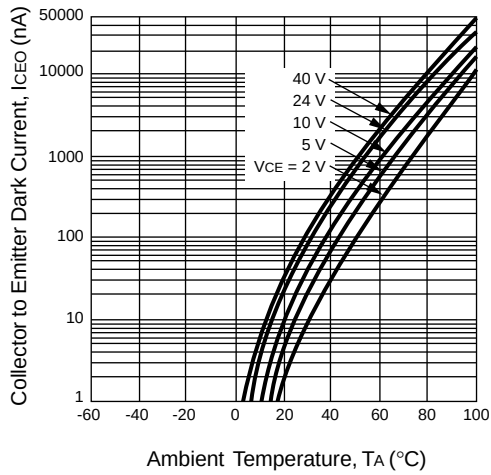
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at T_A = 25° C, RH = 60% between input (Pin No. 1, 2, 3 Common) and output (Pin No. 4, 5, 6 Common).

TYPICAL PERFORMANCE CURVES (T_A = 25°)

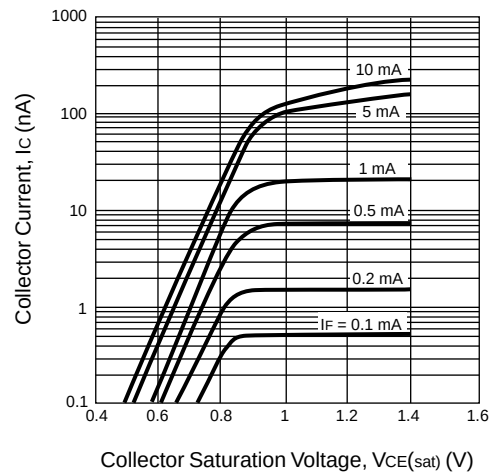


TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ$)

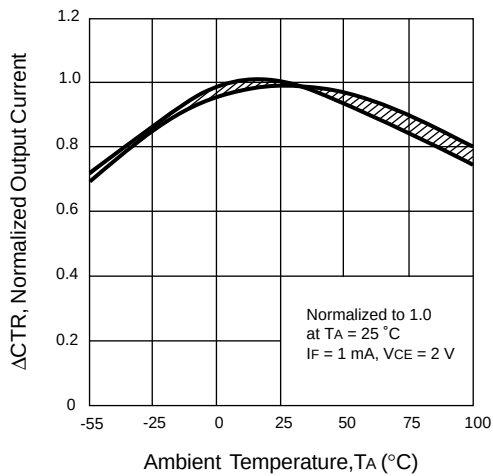
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



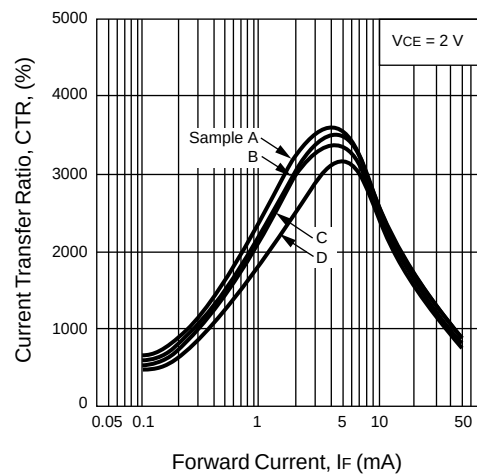
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



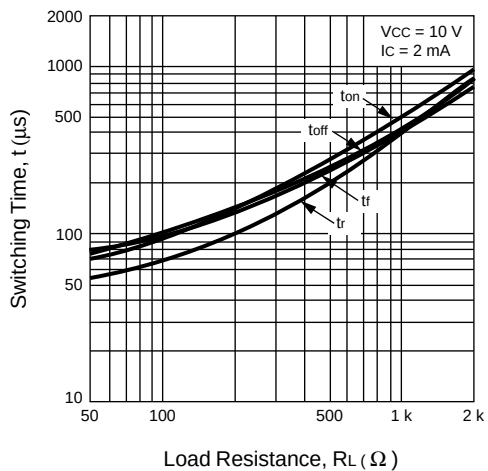
NORMALIZED OUTPUT CURRENT vs. AMBIENT TEMPERATURE



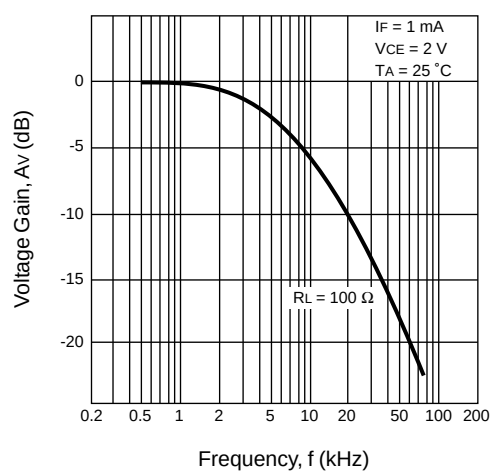
CURRENT TRANSFER RATIO (CTR) vs. FORWARD CURRENT



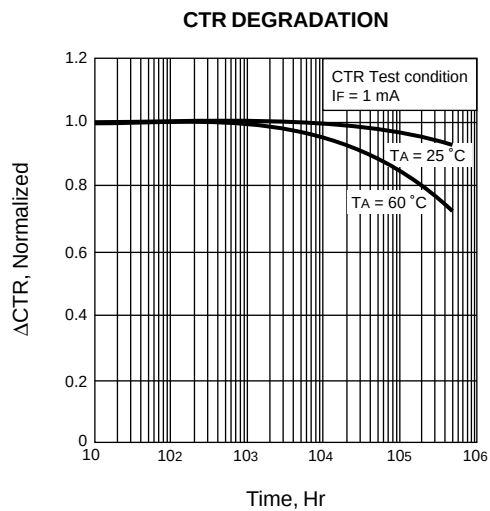
SWITCHING TIME vs. LOAD RESISTANCE



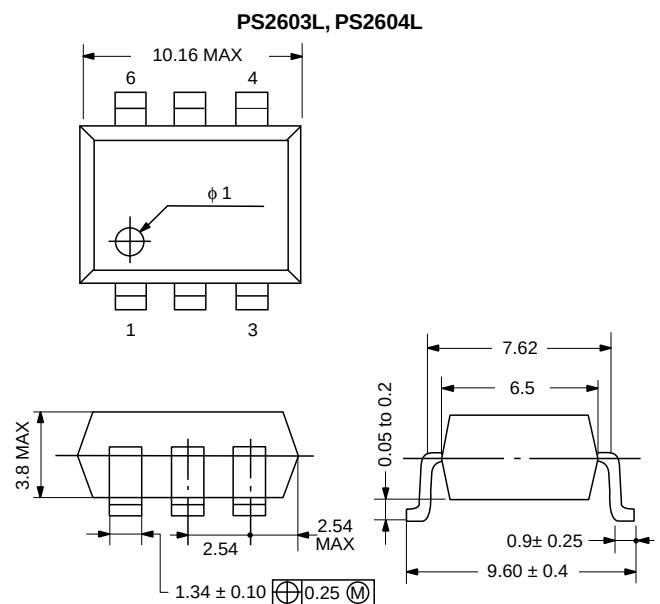
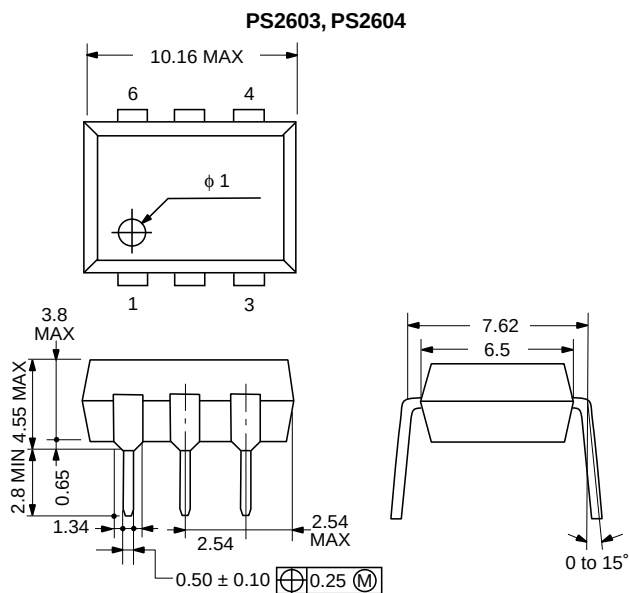
FREQUENCY RESPONSE



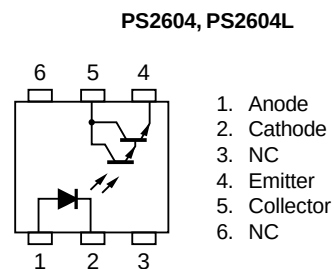
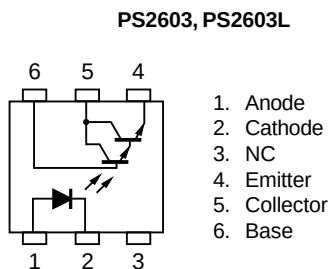
TYPICAL PERFORMANCE CURVES (T_A = 25°)



OUTLINE DIMENSIONS (Units in mm)



PIN CONNECTIONS (Top View)



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