NEC

HIGH ISOLATION VOLTAGE LARGE FORWARD AC INPUT TYPE MULTI OPTOCOUPLER SERIES

PS2525-1, -2, -4
PS2525L-1, -2, -4

FEATURES

- **HIGH ISOLATION VOLTAGE**
  BV: 5 k Vr.m.s. MIN
- **LARGE FORWARD INPUT CURRENT**
  IF = ±150% mA MAX
- **HIGH SPEED SWITCHING**
  tr = 3 μs, tf = 5 μs TYP
- **AC INPUT**
- **HIGH COLLECTOR TO EMITTER VOLTAGE**
  VCEO: 80 V MIN
- **GULL-WING & LEAD BENDING OPTIONS**
  PS2525L1, PS2525L2
- **TAPING PRODUCTS**
  PS2525L-1-E3, E4, PS2525L-2-E3, E4

DESCRIPTION

PS2525-1, -2 and -4 and PS2525L-1, -2 and -4 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon phototransistor. PS2525-1, -2 and -4 are in a plastic DIP (Dual In-line Package) and PS2525L-1, -2 and -4 are lead bending type (Gull-wing) for surface mount.

APPLICATIONS

- **AC LINE / DIGITAL LOGIC**
- **TWISTED PAIR LINE RECEIVER**
- **TELEPHONE / TELEGRAPH LINE RECEIVER**
- **SEQUENCE CONTROLLERS**

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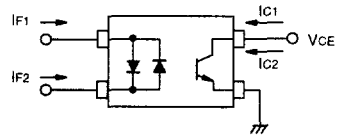
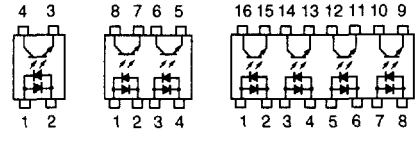
ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER				PS2525-1, -2, -4, PS2525L-1, -2, -4		
SYMBOLS		PARAMETERS	UNITS	MIN	TYP	MAX
Diode	VF	Forward Voltage, IF = ±100 mA	V		1.3	1.7
	C	Junction Capacitance, V = 0, f = 1.0 MHz	pF		70	
Transistor	ICEO	Collector to Emitter Dark Current, VCE = 80 V, IF = 0	nA			100
	BVCEO	Collector to Emitter Breakdown Voltage, IC = 1 mA, IB = 0	V	80		
	BVECO	Emitter to Collector Breakdown Voltage, IE = 100 μA, IB = 0	V	6		
Coupled	CTR	Current Transfer Ratio, IF = ±100 mA, VCE = 3 V	%	20		80
	CTR1 / CTR2	CTR [1] (Ratio), IF = 100 mA, VCE = 3 V		0.3	1.0	3.0
	VCE (sat)	Collector Saturation Voltage, IF = ±100 mA, IC = 4 mA	V			0.3
	R1-2	Isolation Resistance, Vin-out = 1.0 kV	Ω	10^{11}		
	C1-2	Isolation Capacitance, V = 0, f = 1.0 MHz	pF		0.6	
	tr	Rise Time [2], VCC = 10 V, IC = 2 mA	μs		3	
	tf	Fall Time [2], VCC = 10 V, IC = 2 mA	μs		5	

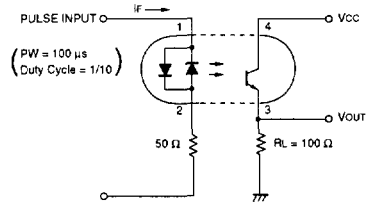
Notes:

1. $CTR_1 = \frac{I_{C1}}{I_{F1}}$, $CTR_2 = \frac{I_{C2}}{I_{F2}}$





2. Test Circuit for Switching Time



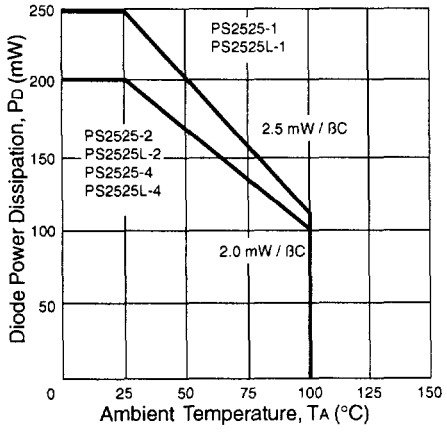
ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS2525-1 PS2525L-1	PS2525-2,-4 PS2525L-2,-4
Diode				
I_F	Forward Current	mA	±150	±150
P_D	Power Dissipation	mW	250	200
$I_{F(PEAK)}$	Peak Forward Current (PW = 100 μs, Duty Cycle 1%)	A	±1	±1
Transistor				
V_{CEO}	Collector to Emitter Voltage	V	80	80
V_{ECO}	Emitter to Collector Voltage	V	6	6
I_C	Collector Current	mA	50	50
P_C	Power Dissipation	mW	150	120
Coupled				
BV	Isolation Voltage[1]	$V_{r.m.s.}$	5000	5000
T_{STG}	Storage Temperature	°C	-55 to +150	-55 to +150
T_{OPT}	Operating Temperature	°C	-55 to +100	-55 to +100

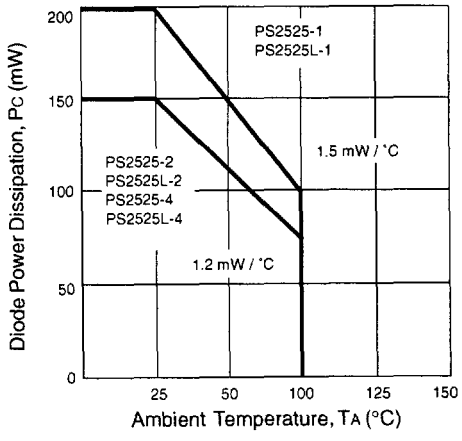
Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

TYPICAL PERFORMANCE CURVES (T_A = 25°C)

DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE

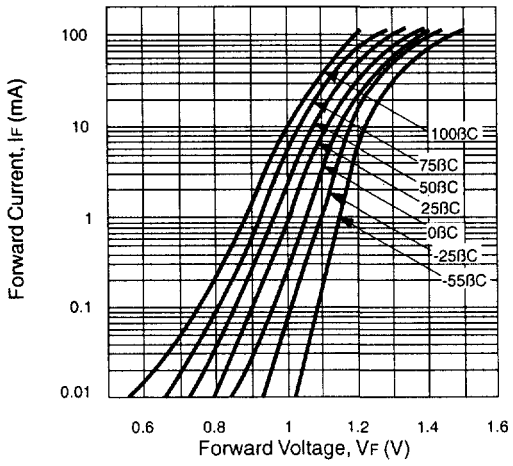


TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE

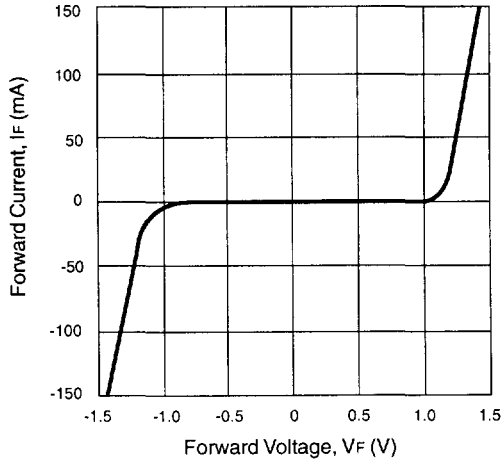


TYPICAL PERFORMANCE CURVES (TA = 25°C)

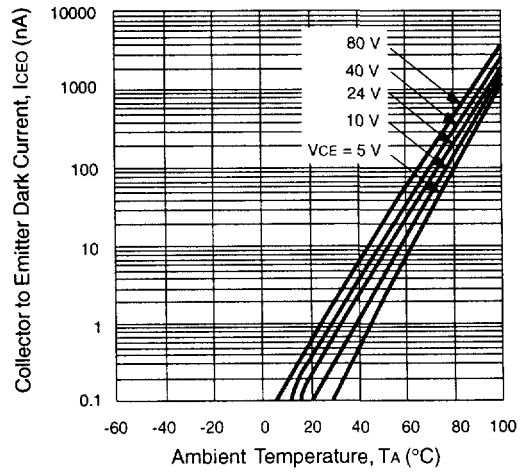
FORWARD CURRENT vs. FORWARD VOLTAGE



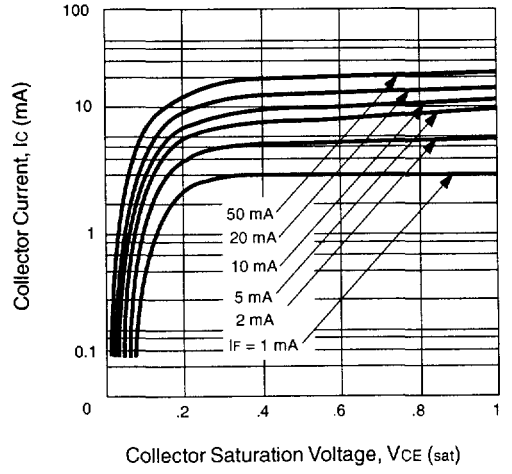
FORWARD CURRENT vs. FORWARD VOLTAGE



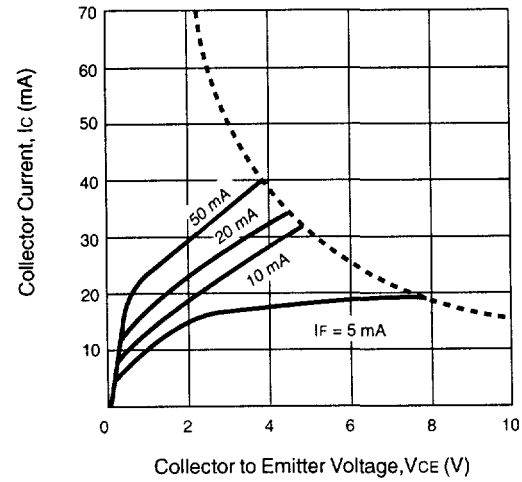
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



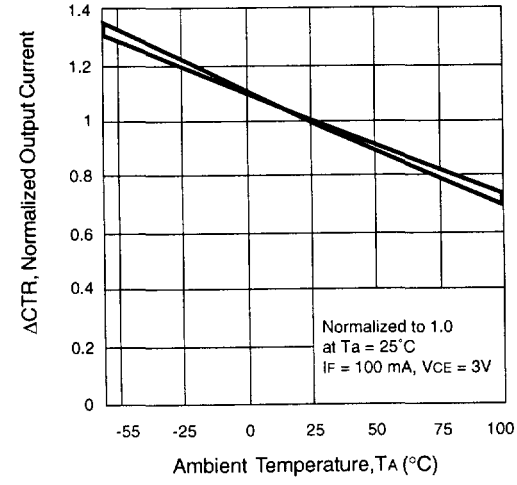
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



NORMALIZED OUTPUT CURRENT vs. AMBIENT TEMPERATURE



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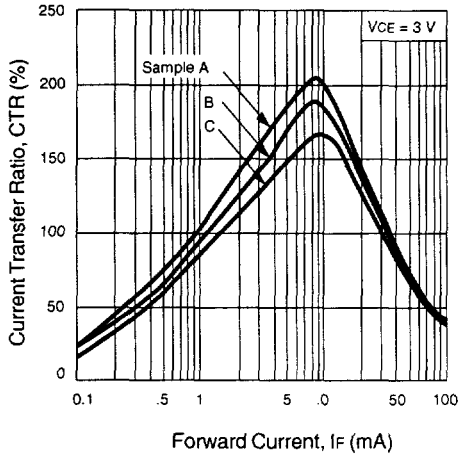
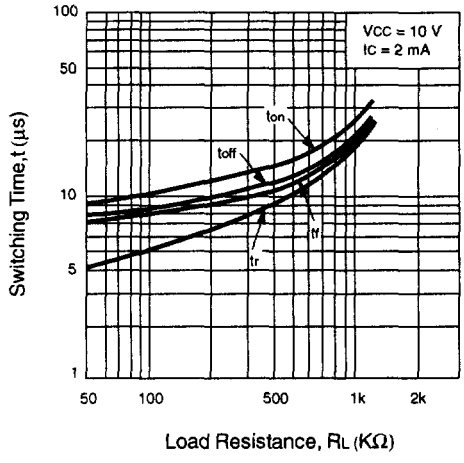
TYPICAL PERFORMANCE CURVES (T_A = 25°C)

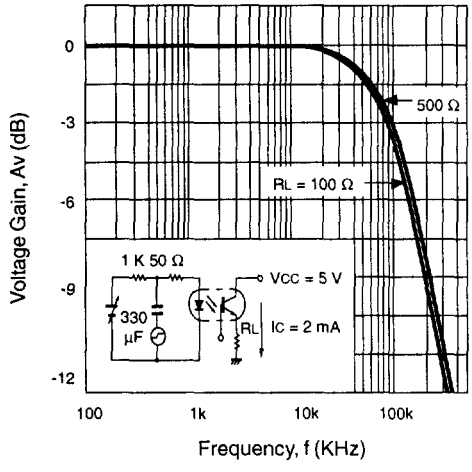
CURRENT TRANSFER RATIO (CTR) vs. FORWARD CURRENT



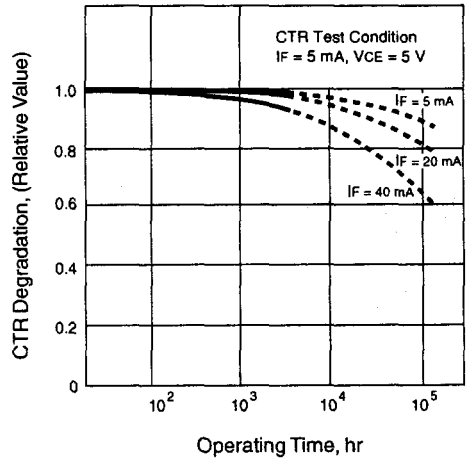
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE

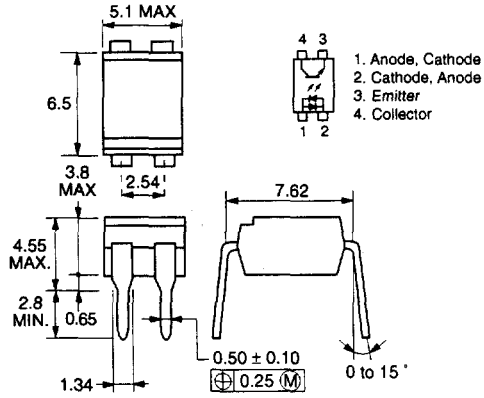


LONG TERM CTR DEGRADATION

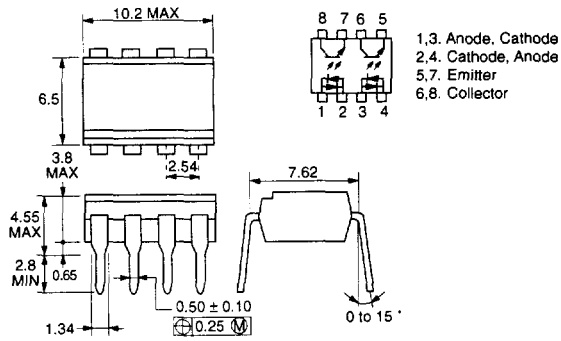


OUTLINE DIMENSIONS (Units in mm) DIP (Dual In-Line Package)

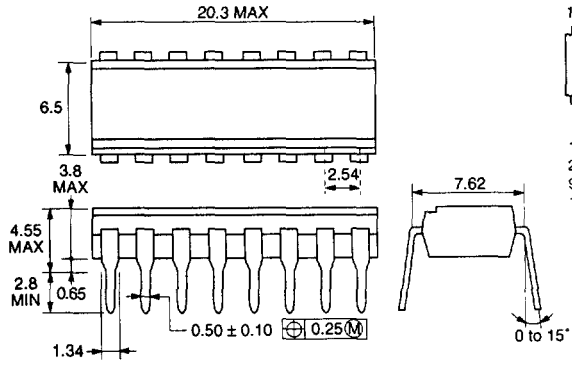
PS2525-1



PS2525-2

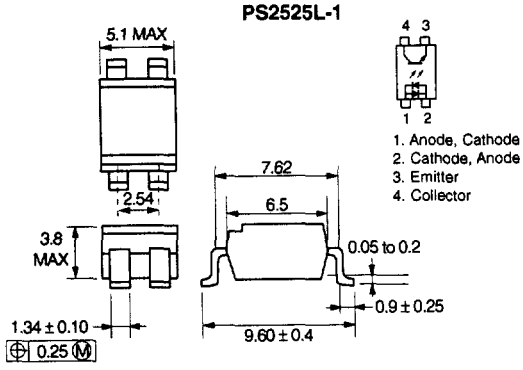


PS2525-4

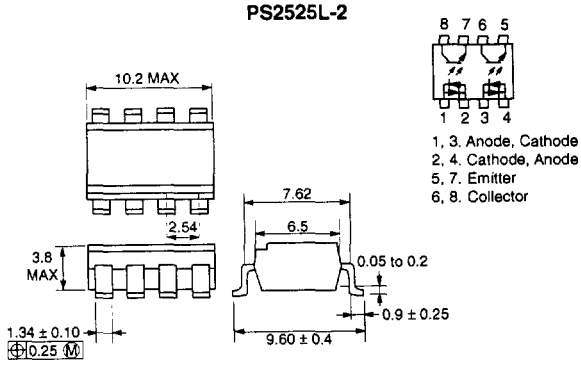


OUTLINE DIMENSIONS (Units in mm) Lead Bending type (Gull-wing)

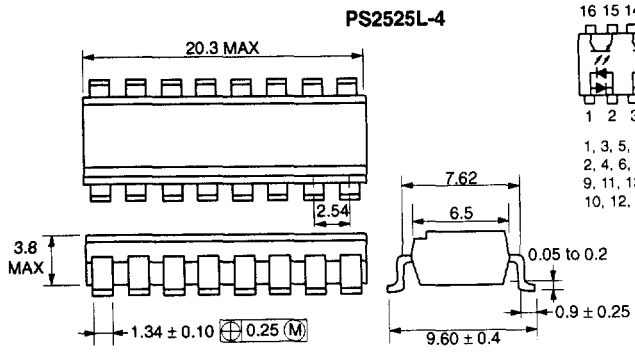
PS2525L-1



PS2525L-2

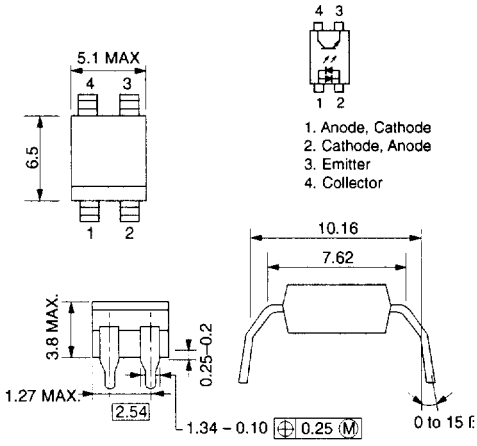


PS2525L-4



OUTLINE DIMENSIONS (Units in mm) Lead Bending type

PS2525L1



PS2525L2