

FEATURES

- **HIGH ISOLATION VOLTAGE**
BV: 5 k V_{r.m.s.} MIN
- **LONG CREEPAGE AND CLEARANCE DISTANCE**
8 mm MIN
- **HIGH COLLECTOR TO EMITTER VOLTAGE**
V_{CEO} = 40 V MIN
- **HIGH SPEED SWITCHING**
t_r, t_f = 100 μs TYP
- **HIGH CURRENT TRANSFER RATIO**
CTR: 2000% TYP
- **6 PIN DUAL IN-LINE PACKAGE**
- **TAPING IS AVAILABLE**

DESCRIPTION

PS2653 and PS2654 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon Darlington-connected phototransistor in a plastic DIP (Dual In-Line Package). PS2653 has a base pin and PS2654 has no base pin. Creepage distance and clearance of leads are over 8 millimeters. PS2653L2 and PS2654L2 are surface mount type.

APPLICATIONS

Interface circuit for various instrumentations and control equipment.

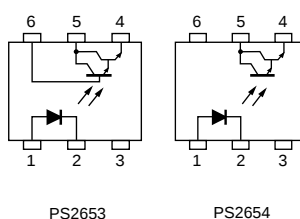
- AC LINE/DIGITAL LOGIC
- DIGITAL LOGIC INTERFACE
- TWISTED PAIR LINE RECEIVER
- TELEPHONE/TELEGRAPH LINE RECEIVER
- HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL
- RELAY CONTACT MONITOR
- POWER SUPPLY MONITOR

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

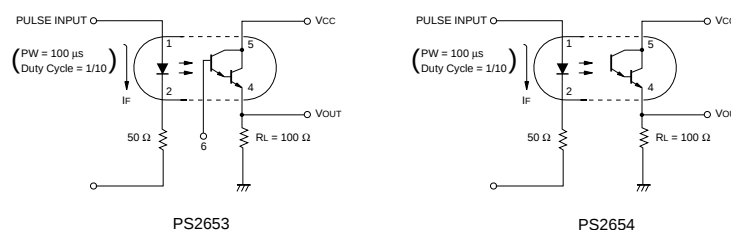
PART NUMBER				PS2653, PS2653L2, PS2654, PS2654L2		
SYMBOLS		PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 10 mA	V		1.1	1.4
	I _R	Reverse Current, V _R = 5 V	μA			5
	C	Junction Capacitance, V = 0, f = 1.0 MHz	pF		30	
Transistor	I _{CEO}	Collector to Emitter Dark Current, V _{CE} = 40 V, I _F = 0	nA			400
	BV _{CEO}	Collector to Emitter Breakdown Voltage, I _C = 1 mA, I _B = 0	V	40		
	BV _{ECO}	Emitter to Collector Breakdown Voltage, I _E = 100 μA, I _B = 0	V	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	V			1.0
	R ₁₋₂	Isolation Resistance, V _{in-out} = 1.0 k V	Ω	10 ¹¹		
	C ₁₋₂	Isolation Capacitance, V = 0, f = 1.0 MHz	pF		0.6	
	t _r	Rise Time ² , V _{CC} = 10 V, I _C = 10 mA	μs		3	
	t _f	Fall Time ² , V _{CC} = 10 V, I _C = 10 mA	μs		5	

1. CTR rank

KD : 2300 to (%)
LD : 700 to 3400 (%)
MD : 200 to 1000 (%)



2. Test Circuit for Switching Time

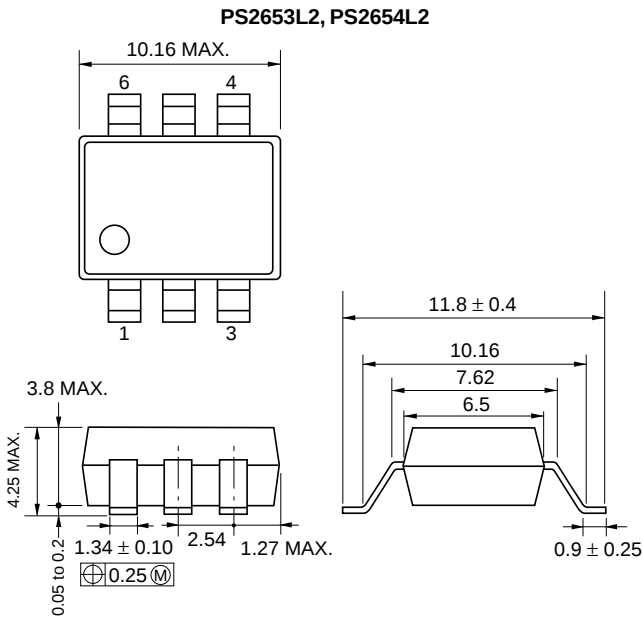
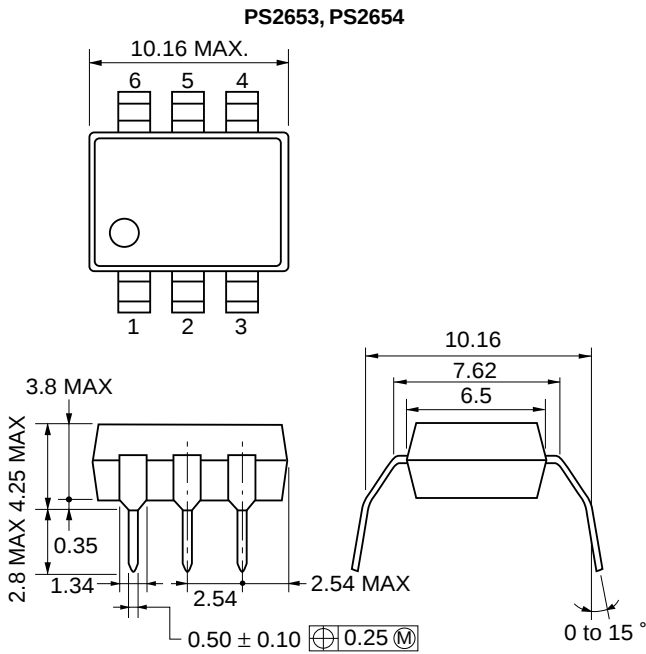


ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

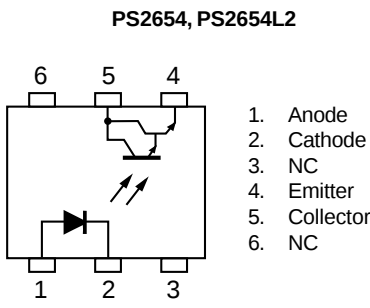
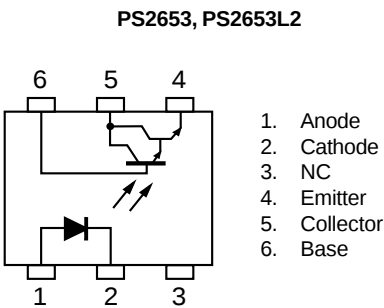
SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
V _R	Reverse Voltage	V	6
I _F	Forward Current (DC)	mA	80
P _D	Power Dissipation	mW	150
I _F (Peak)	Peak Forward Current PW = 100 μs, Duty Cycle 1%	A	1
Transistor			
V _{CEO}	Collector to Emitter Voltage	V	40
V _{ECO}	Emitter to Collector Voltage	V	6
I _C	Collector 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).

OUTLINE DIMENSIONS (Units in mm)

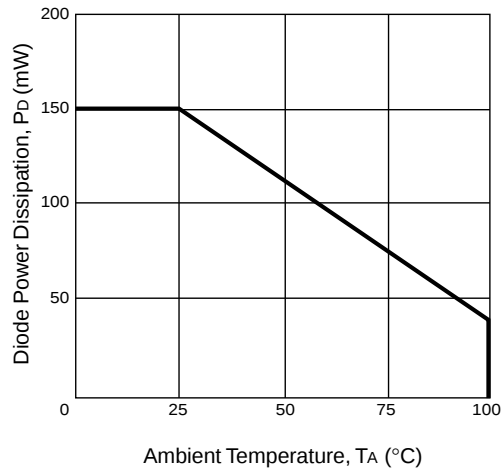


PIN CONNECTION (Top View)

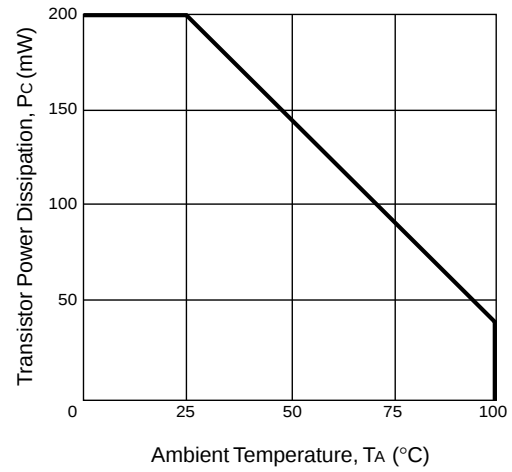


TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)

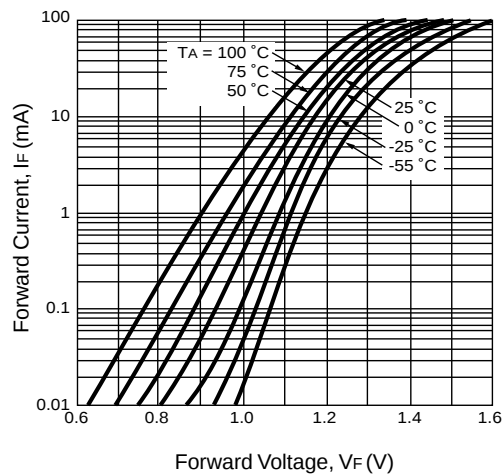
**DIODE POWER DISSIPATION
vs. AMBIENT TEMPERATURE**



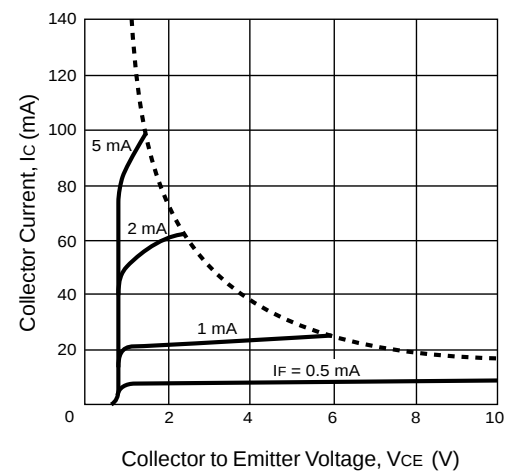
**TRANSISTOR POWER DISSIPATION
vs. AMBIENT TEMPERATURE**



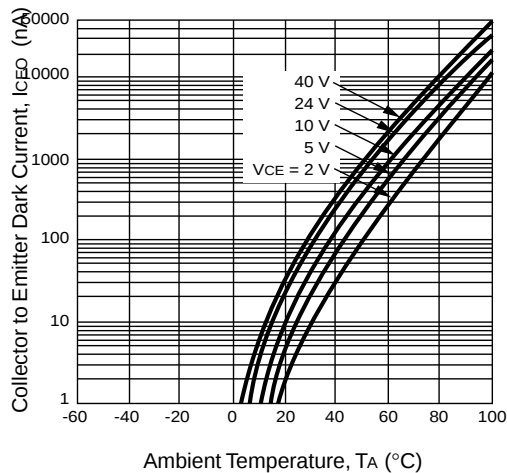
**FORWARD CURRENT vs.
FORWARD VOLTAGE**



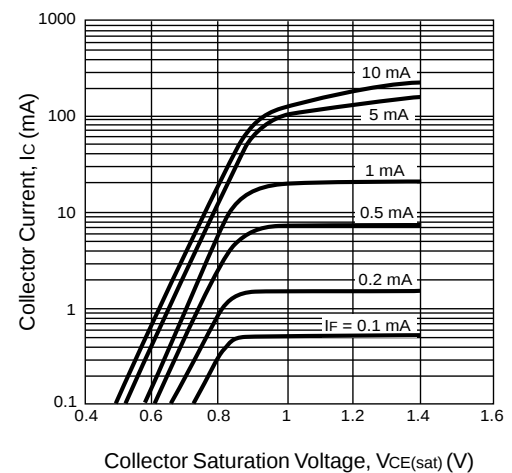
**COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE**



**COLLECTOR TO EMITTER DARK
CURRENT vs. AMBIENT TEMPERATURE**

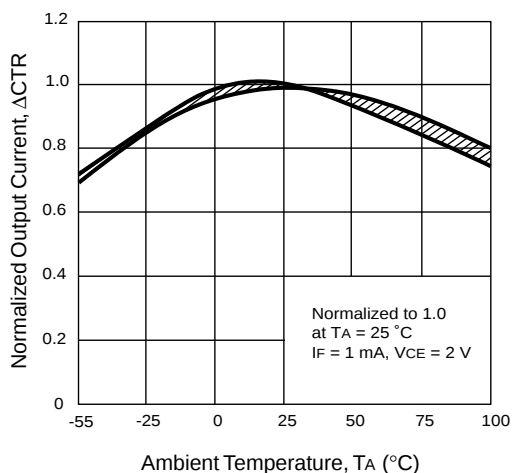


**COLLECTOR CURRENT vs.
COLLECTOR SATURATION VOLTAGE**

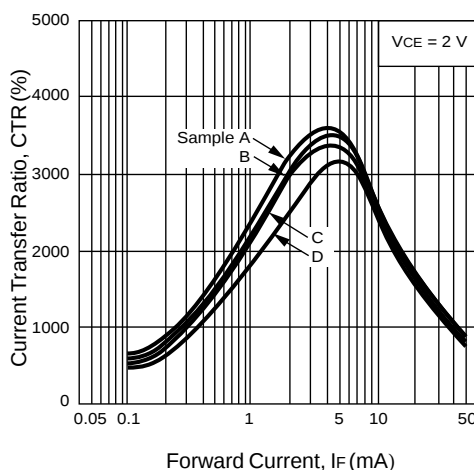


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

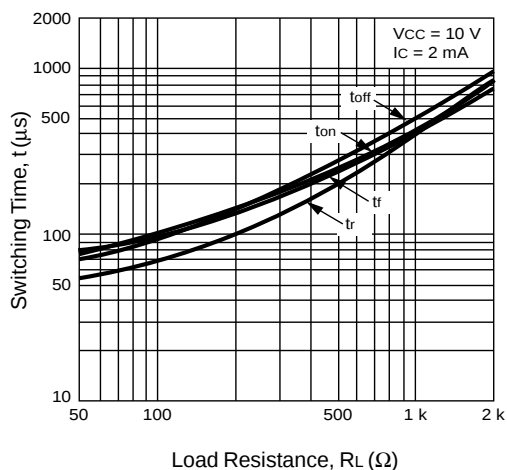
**NORMALIZED OUTPUT CURRENT
vs. AMBIENT TEMPERATURE**



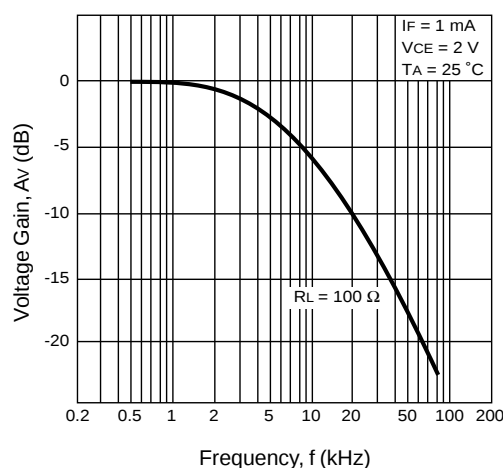
**CURRENT TRANSFER RATIO (CTR)
vs. FORWARD CURRENT**



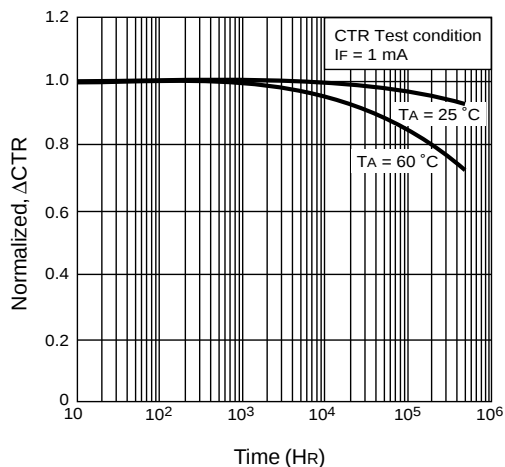
**SWITCHING TIME
vs. LOAD RESISTANCE**



FREQUENCY RESPONSE



CTR DEGRADATION



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