

**HIGH ISOLATION VOLTAGE
DARLINGTON TRANSISTOR TYPE
MULTI PHOTOCOUPLER SERIES**

–NEPOC™ Series–

DESCRIPTION

The PS2502-1, -2, -4 and PS2502L-1, -2, -4 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon darlington connected phototransistor.

The PS2502-1, -2, -4 are in a plastic DIP (Dual In-line Package) and the PS2502L-1, -2, -4 are lead bending type (Gull-wing) for surface mount.

FEATURES

- High isolation voltage ($BV = 5\,000\text{ V r.m.s.}$)
- High current transfer ratio ($CTR = 2\,000\% \text{ TYP.}$)
- High-speed switching ($t_r, t_f = 100\text{ }\mu\text{s TYP.}$)
- Taping product number (PS2502L-1-E3, E4, F3, F4)
(PS2502L-2-E3, E4)
- UL approved (File No. E72422 (S))

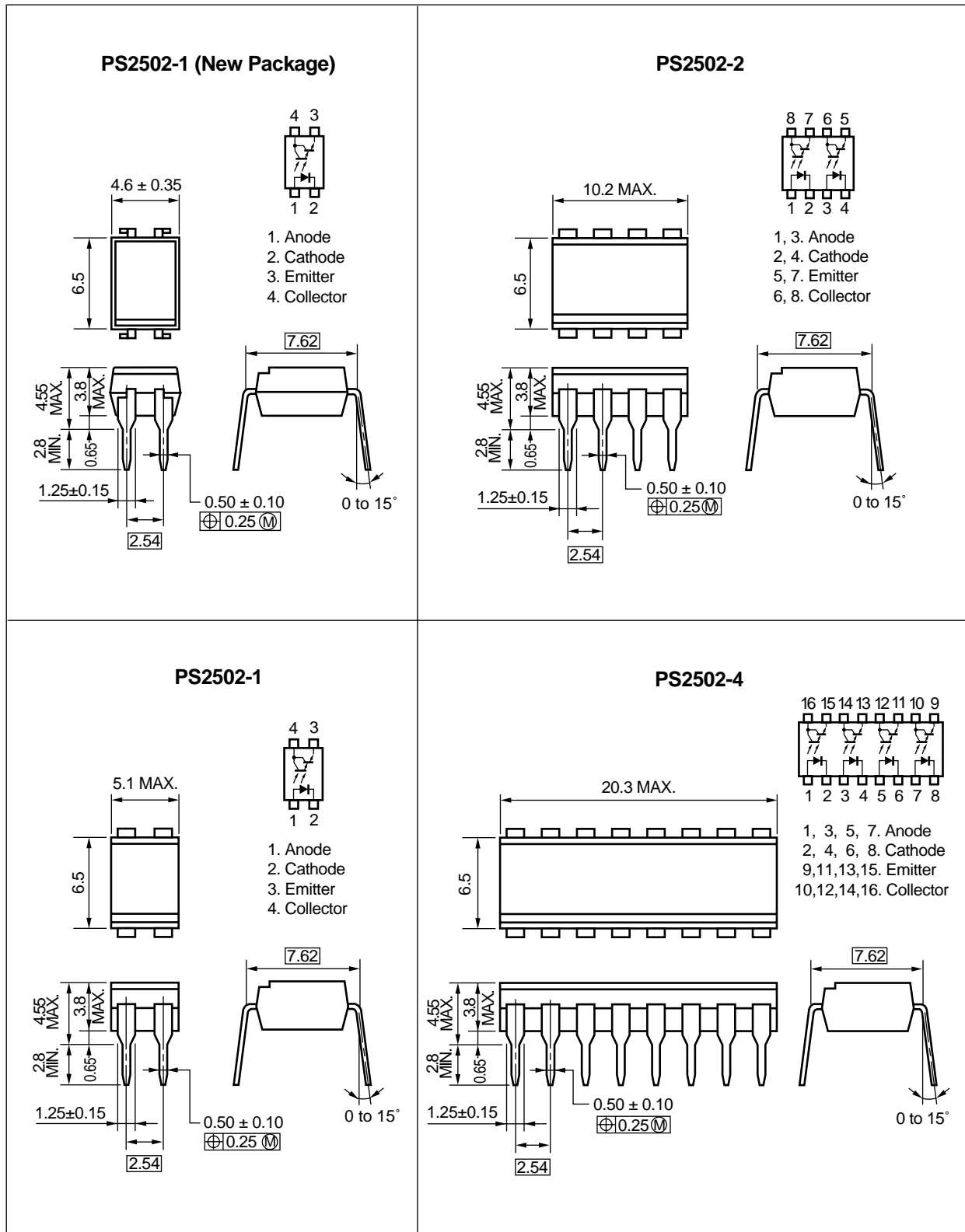
APPLICATIONS

- Power supply
- Telephone/FAX.
- FA/OA equipment
- Programmable logic controller

The information in this document is subject to change without notice.

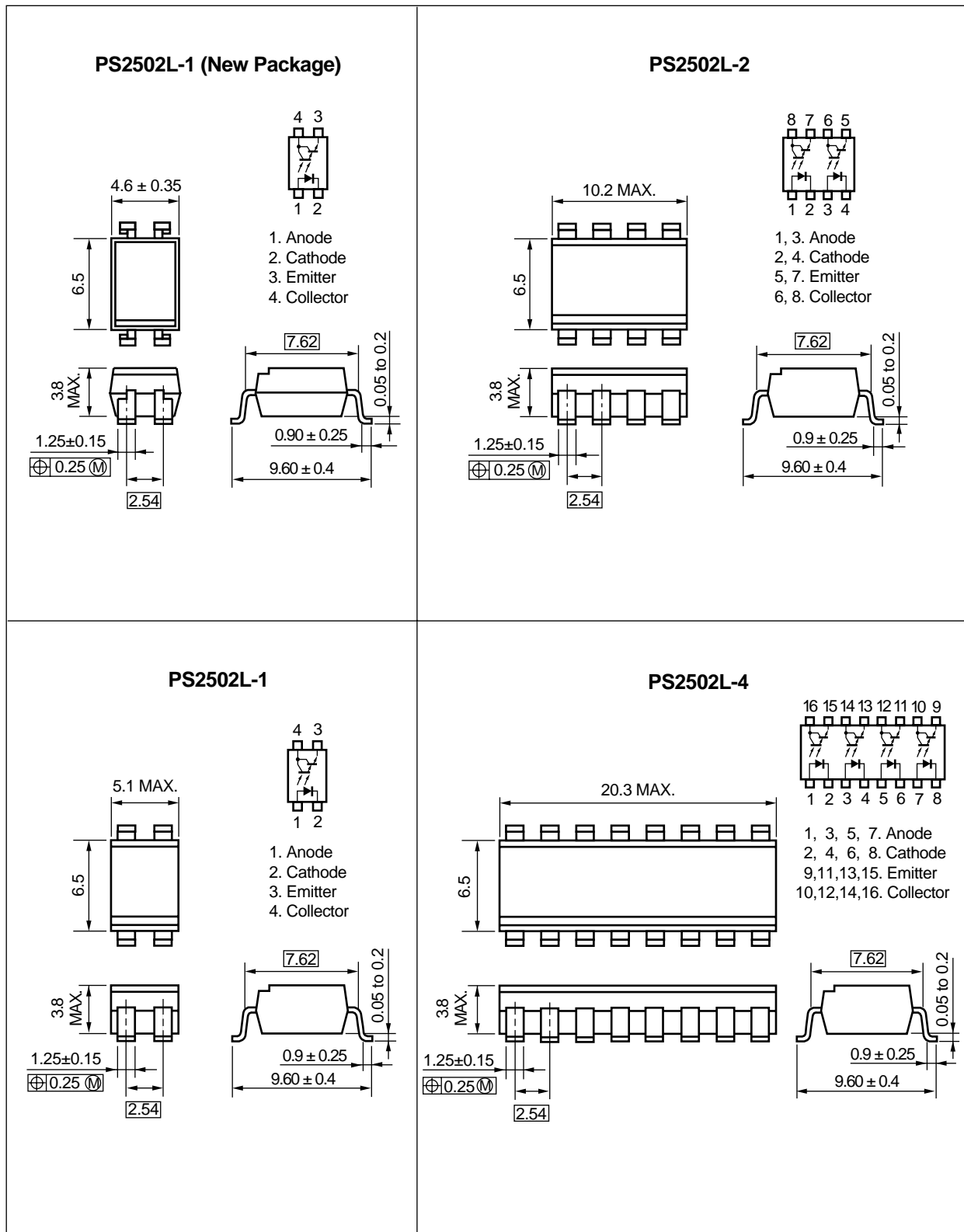
★ PACKAGE DIMENSIONS (in millimeters)

DIP Type



Caution New package 1-ch only

Lead Bending Type



Caution New package 1-ch only

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Ratings		Unit
			PS2502-1, PS2502L-1	PS2502-2,-4 PS2502L-2,-4	
Diode	Reverse Voltage	V_R	6		V
	Forward Current (DC)	I_F	80		mA
	Power Dissipation Derating	$\Delta P_D/^{\circ}\text{C}$	1.5	1.2	mW/ $^{\circ}\text{C}$
	Power Dissipation	P_D	150	120	mW/ch
	Peak Forward Current ^{*1}	I_{FP}	1		A
Transistor	Collector to Emitter Voltage	V_{CEO}	40		V
	Emitter to Collector Voltage	V_{ECO}	6		V
	Collector Current	I_C	200	160	mA/ch
	Power Dissipation Derating	$\Delta P_C/^{\circ}\text{C}$	2.0	1.6	mW/ $^{\circ}\text{C}$
	Power Dissipation	P_C	200	160	mW/ch
Isolation Voltage ^{*2}		BV	5 000		Vr.m.s.
Operating Ambient Temperature		T_A	-55 to +100		$^{\circ}\text{C}$
Storage Temperature		T_{stg}	-55 to +150		$^{\circ}\text{C}$

*1 $PW = 100\text{ }\mu\text{s}$, Duty Cycle = 1 %

*2 AC voltage for 1 minute at $T_A = 25\text{ }^{\circ}\text{C}$, RH = 60 % between input and output

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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	$I_F = 10\text{ mA}$		1.17	1.4	V
	Reverse Current	I_R	$V_R = 5\text{ V}$			5	μA
	Terminal Capacitance	C_t	$V = 0\text{ V}$, $f = 1.0\text{ MHz}$		50		pF
Transistor	Collector to Emitter Dark Current	I_{CEO}	$V_{CE} = 40\text{ V}$, $I_F = 0\text{ mA}$			400	nA
Coupled	Current Transfer Ratio ^{*1}	CTR	$I_F = 1\text{ mA}$, $V_{CE} = 2\text{ V}$	200	2 000		%
	Collector Saturation Voltage	$V_{CE(sat)}$	$I_F = 1\text{ mA}$, $I_C = 2\text{ mA}$			1.0	V
	Isolation Resistance	R_{I-O}	$V_{I-O} = 1.0\text{ kV}$	10^{11}			Ω
	Isolation Capacitance	C_{I-O}	$V = 0\text{ V}$, $f = 1.0\text{ MHz}$		0.5		pF
	Rise Time ^{*2}	t_r	$V_{CC} = 10\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$		100		μs
	Fall Time ^{*2}	t_f			100		

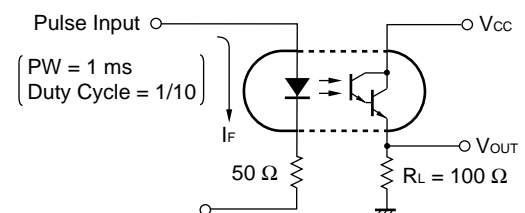
*1 CTR rank (only PS2502-1, PS2502L-1)

K : 2 000 to (%)

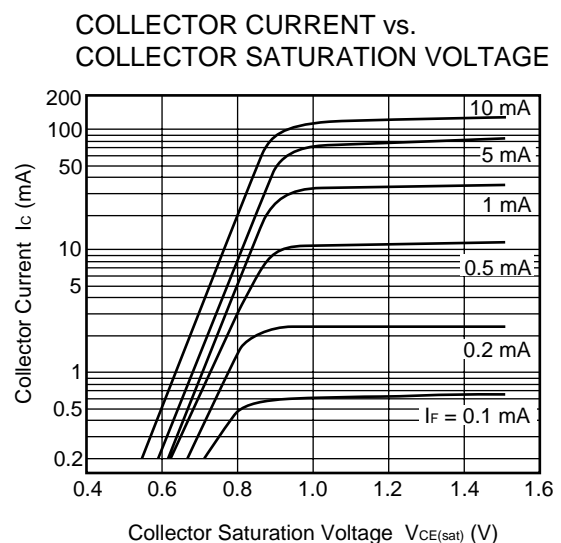
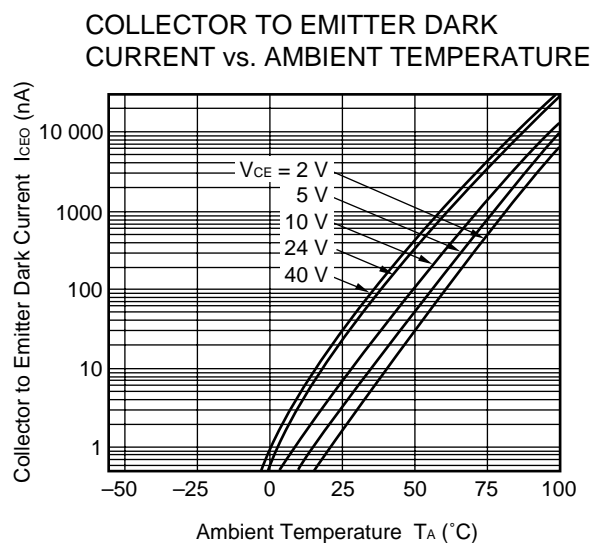
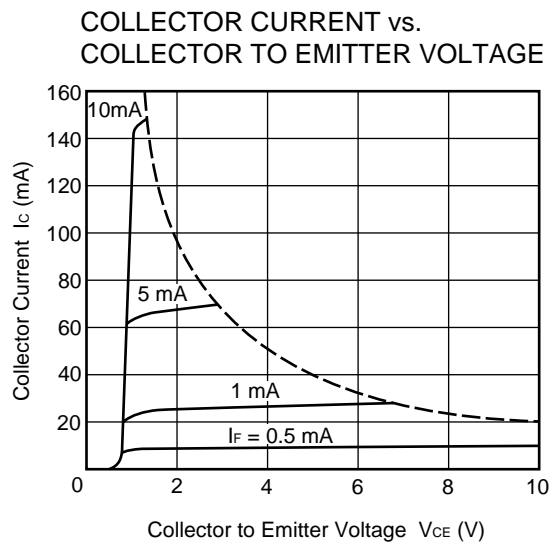
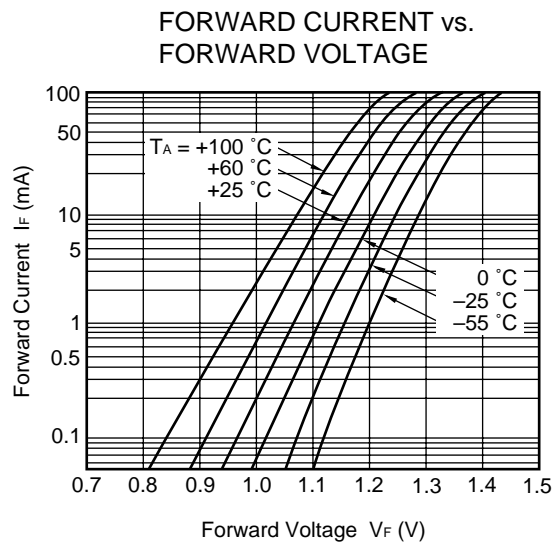
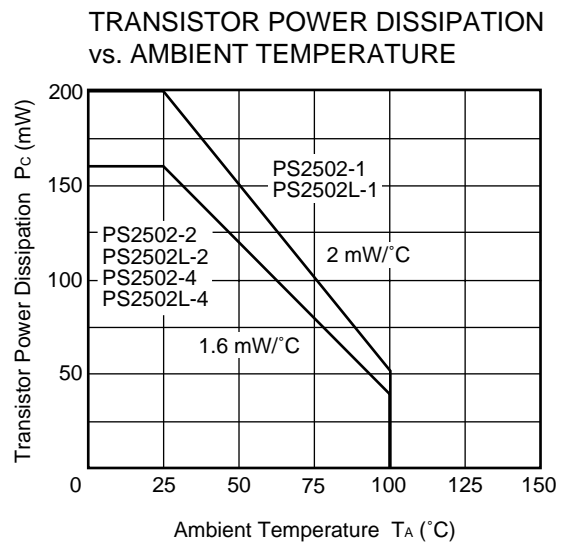
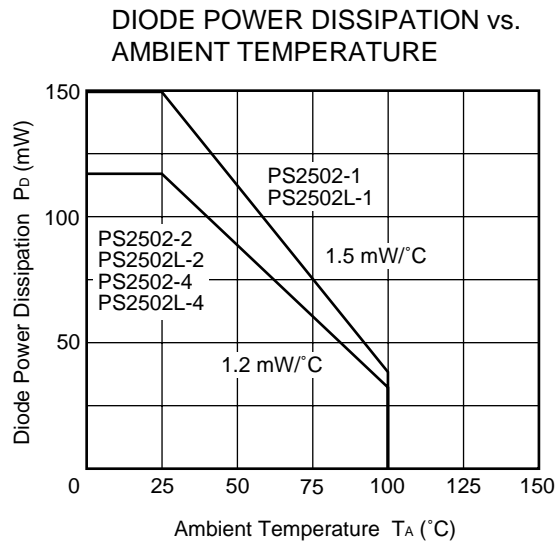
L : 700 to 3 400 (%)

M : 200 to 1 000 (%)

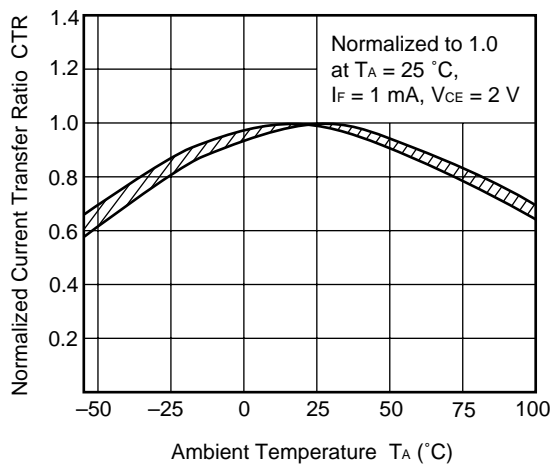
*2 Test circuit for switching time



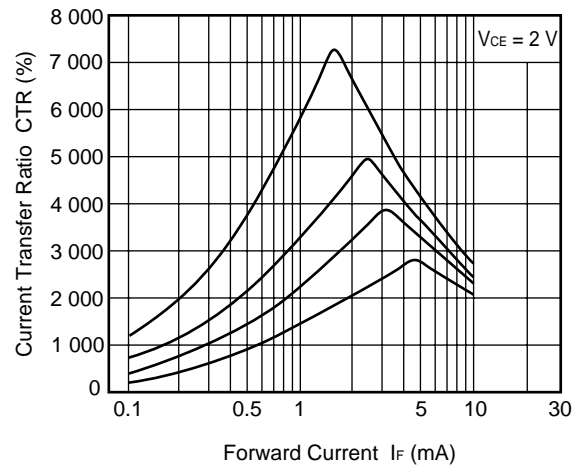
★ TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)



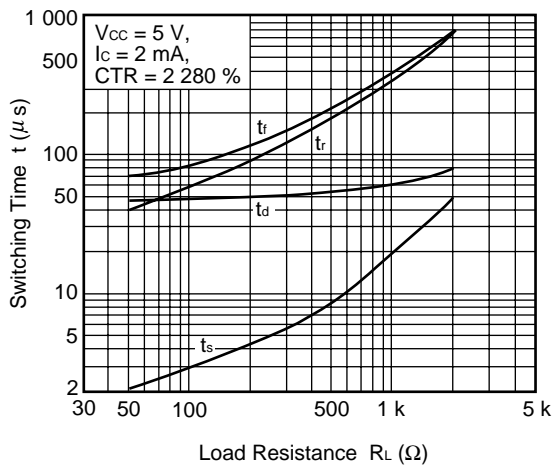
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



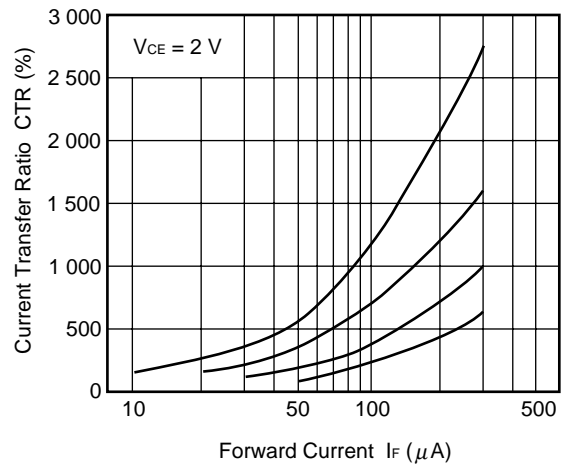
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



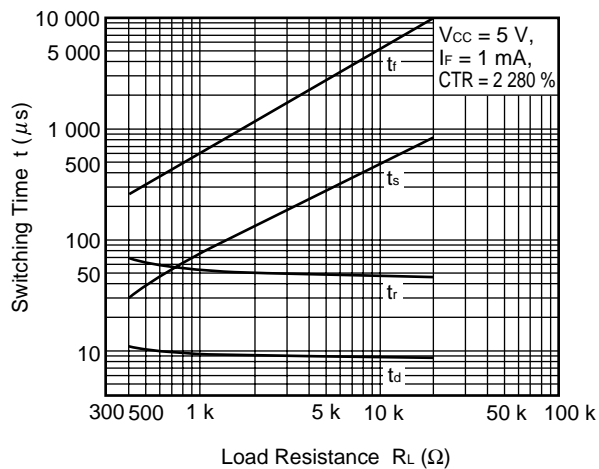
SWITCHING TIME vs. LOAD RESISTANCE



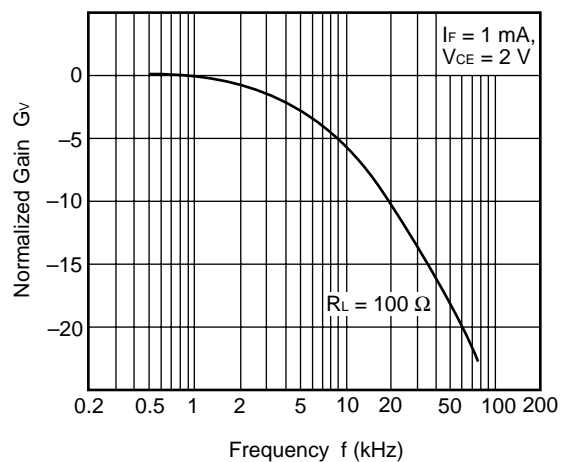
CURRENT TRANSFER RATIO vs. FORWARD CURRENT

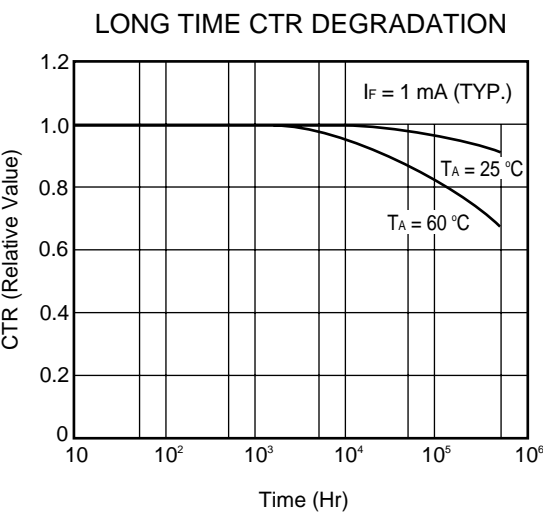


SWITCHING TIME vs. LOAD RESISTANCE



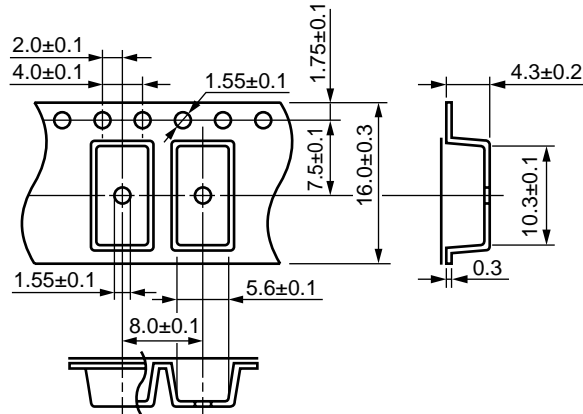
FREQUENCY RESPONSE



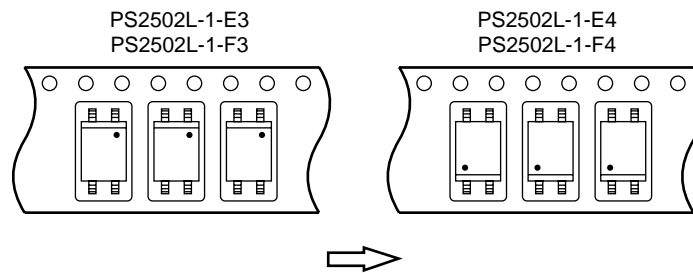


★ TAPING SPECIFICATIONS (in millimeters)

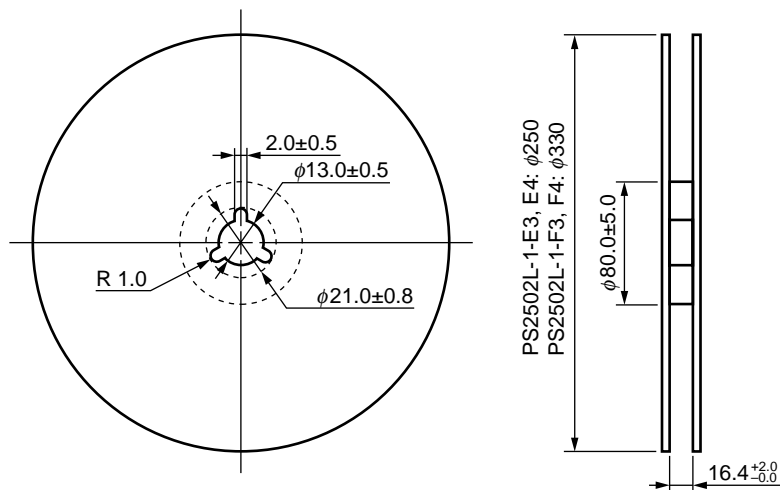
Outline and Dimensions (Tape)



Taping Direction

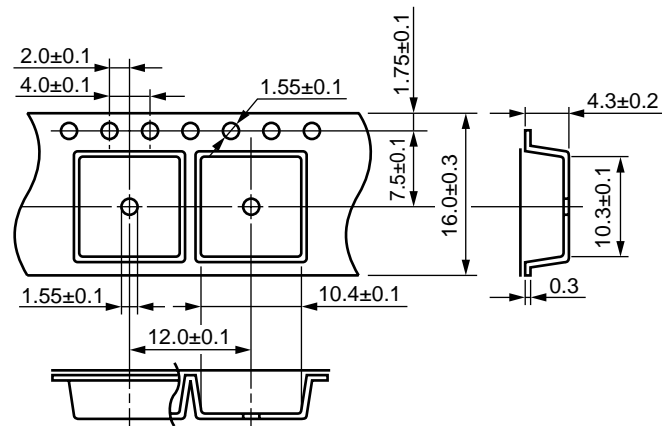


Outline and Dimensions (Reel)

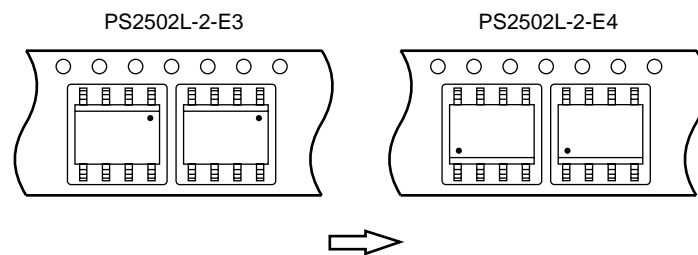


Packing: PS2502L-1-E3, E4 1 000 pcs/reel
PS2502L-1-F3, F4 2 000 pcs/reel

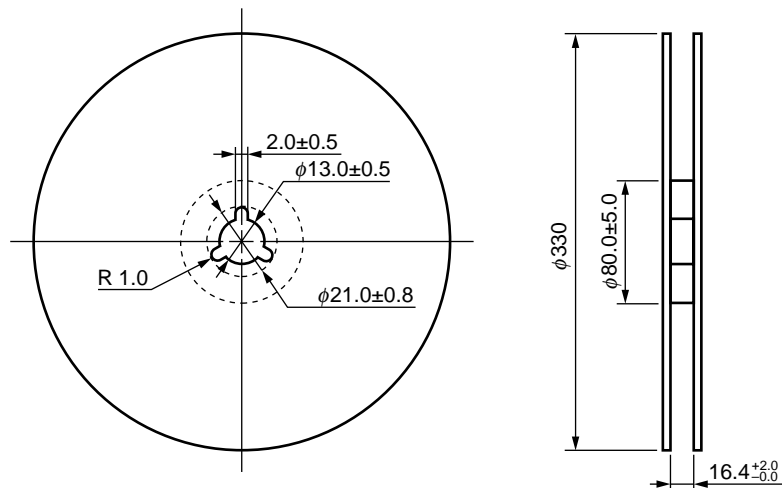
Outline and Dimensions (Tape)



Taping Direction



Outline and Dimensions (Reel)



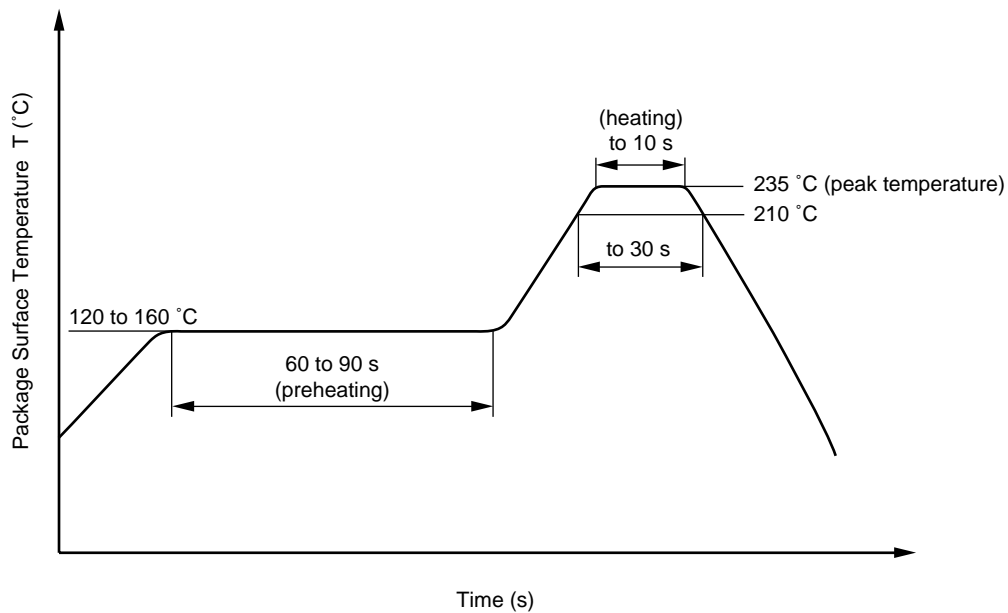
Packing: 1 000 pcs/reel

★ **RECOMMENDED SOLDERING CONDITIONS**

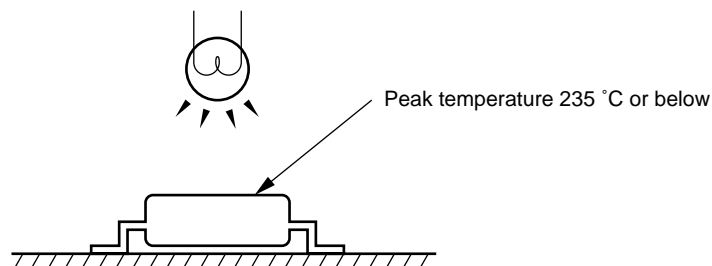
(1) Infrared reflow soldering

- Peak reflow temperature 235 °C (package surface temperature)
- Time of temperature higher than 210 °C 30 seconds or less
- Number of reflows Three
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

Recommended Temperature Profile of Infrared Reflow



Caution Please avoid to removed the residual flux by water after the first reflow processes.



(2) Dip soldering

- Temperature 260 °C or below (molten solder temperature)
- Time 10 seconds or less
- Number of times One
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

[MEMO]

CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

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Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.