

PHOTOCOUPLER
PS2505-1,-2,-4,PS2505L-1,-2,-4**HIGH ISOLATION VOLTAGE
AC INPUT RESPONSE TYPE
MULTI PHOTOCOUPLER SERIES**

–NEPOC Series–

DESCRIPTION

The PS2505-1, -2, -4 and PS2505L-1, -2, -4 are optically coupled isolators containing GaAs light emitting diodes and an NPN silicon phototransistor.

The PS2505-1, -2, -4 are in a plastic DIP (Dual In-line Package) and the PS2505L-1, -2, -4 are lead bending type (Gull-wing) for surface mount.

FEATURES

- AC input response
- High isolation voltage ($BV = 5\,000\text{ V r.m.s.}$)
- High collector to emitter voltage ($V_{CEO} = 80\text{ V}$)
- High-speed switching ($t_r = 3\text{ }\mu\text{s TYP.}$, $t_f = 5\text{ }\mu\text{s TYP.}$)
- Ordering number of tape product: PS2505L-1-E3, E4, F3, F4, PS2505L-2-E3, E4
- Safety standards
 - UL approved: File No. E72422 (S)

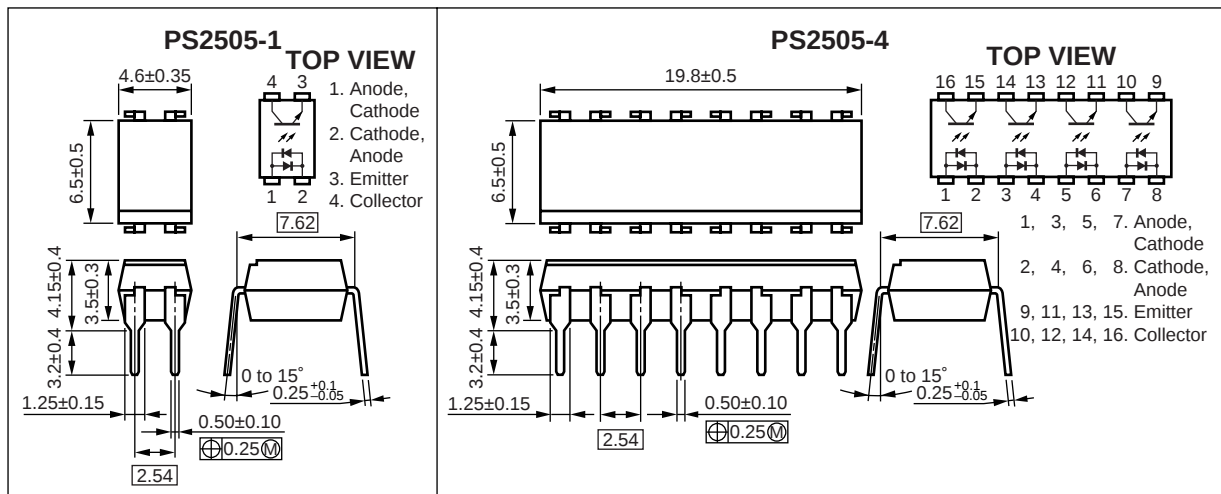
APPLICATIONS

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

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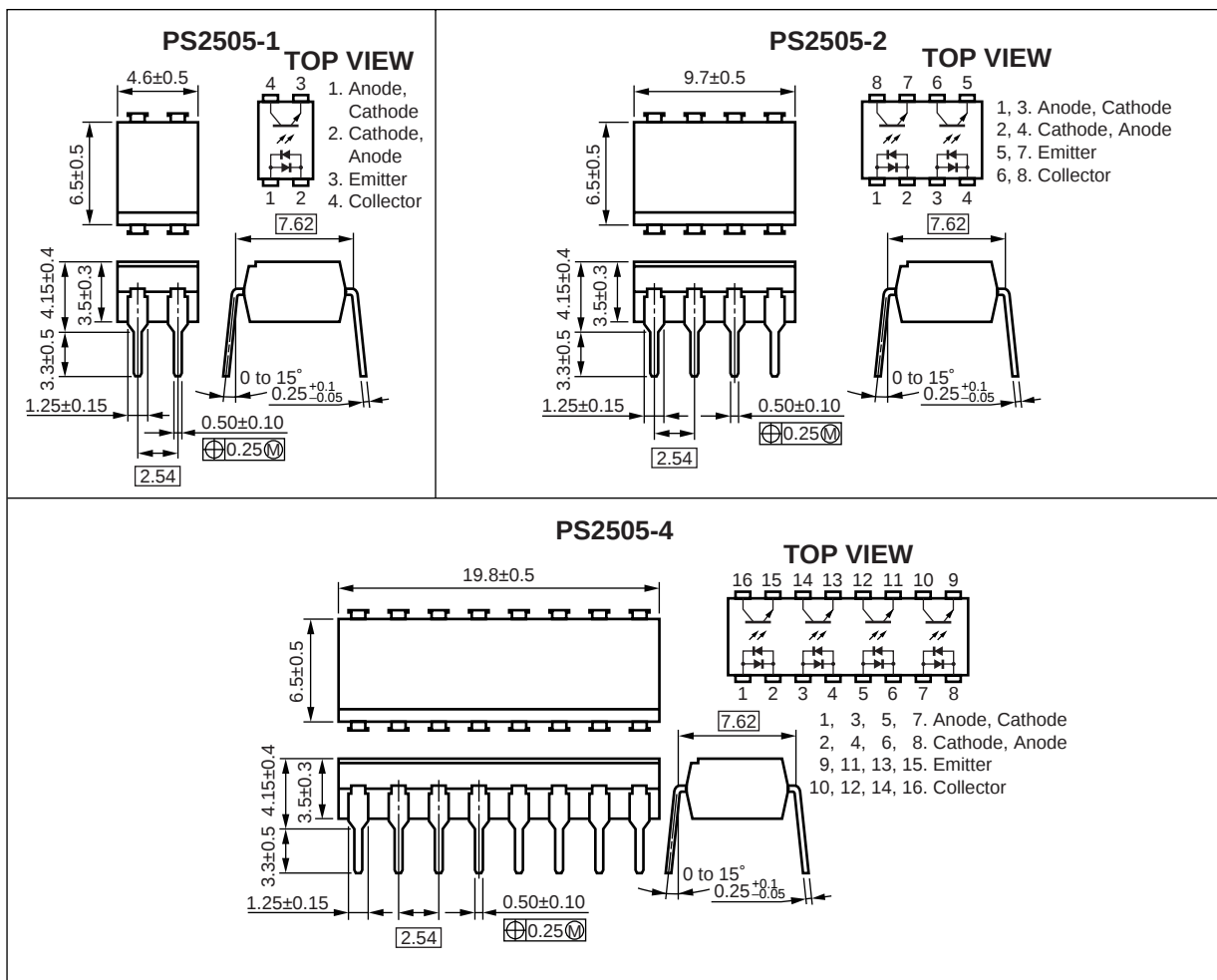
★ PACKAGE DIMENSIONS (UNIT : mm)

DIP Type (New package)

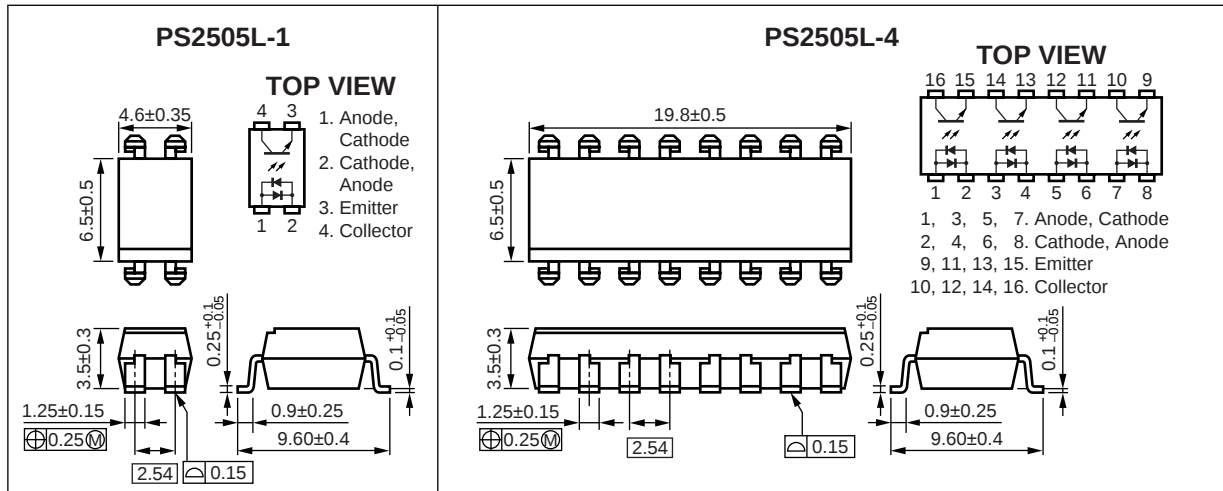


Caution New package 1-ch, 4-ch only

DIP Type

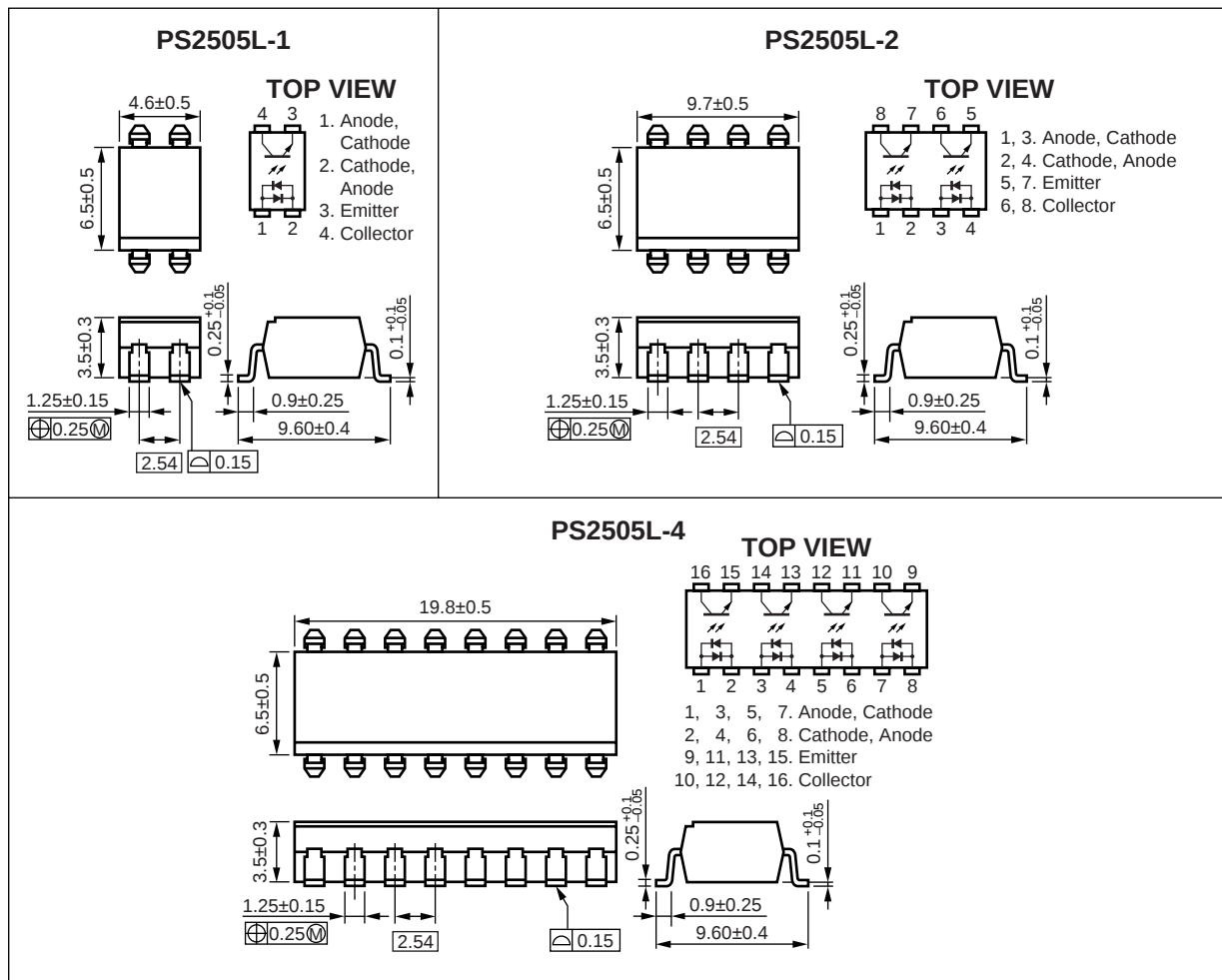


Lead Bending Type (New package)



Caution New package 1-ch, 4-ch only

Lead Bending Type



★ MARKING EXAMPLE

PS2505-1

No. 1 pin Mark

NEC
2505
MD003

← Assembly Lot

M

D

0

03

←

Week Assembled
Year Assembled
(Last 1 Digit)
In-house Code
CTR Rank Code

Package	Made in Japan	Made in Taiwan
Standard PKG	D	F
New PKG	E	H

PS2505-2, -4

No. 1 pin Mark

NEC

Country Assembled

PS2505-2
MD003

← Type Number
← Assembly Lot

M

D

0

03

←

Week Assembled
Year Assembled
(Last 1 Digit)
In-house Code
CTR Rank Code

Package	Made in Japan	Made in Taiwan
Standard PKG	D	F
New PKG	E ^{*1}	

*1 PS2505-4 only

ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number ^{*1}
PS2505-1	4-pin DIP	Magazine case 100 pcs	PS2505-1
PS2505L-1			
PS2505L-1-E3		Embossed Tape 1 000 pcs/reel	
PS2505L-1-E4			
PS2505L-1-F3		Embossed Tape 2 000 pcs/reel	
PS2505L-1-F4			
PS2505-2	8-pin DIP	Magazine case 45 pcs	PS2505-2
PS2505L-2			
PS2505L-2-E3		Embossed Tape 1 000 pcs/reel	
PS2505L-2-E4			
PS2505-4	16-pin DIP	Magazine case 20 pcs	PS2505-4
PS2505L-4			

***1** For the application of the Safety Standard, following part number should be used.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise specified)

Parameter		Symbol	Ratings		Unit
			PS2505-1, PS2505L-1	PS2505-2,-4 PS2505L-2,-4	
Diode	Forward Current (DC)	I _F	±80		mA
	Power Dissipation Derating	ΔP _D /°C	1.5	1.2	mW/°C
	Power Dissipation	P _D	150	120	mW/ch
	Peak Forward Current ^{*1}	I _{FP}	±1		A
Transistor	Collector to Emitter Voltage	V _{CEO}	80		V
	Emitter to Collector Voltage	V _{ECO}	7		V
	Collector Current	I _C	50		mA/ch
	Power Dissipation Derating	ΔP _C /°C	1.5	1.2	mW/°C
	Power Dissipation	P _C	150	120	mW/ch
Isolation Voltage ^{*2}		BV	5 000		Vr.m.s.
Operating Ambient Temperature		T _A	-55 to +100		°C
Storage Temperature		T _{stg}	-55 to +150		°C

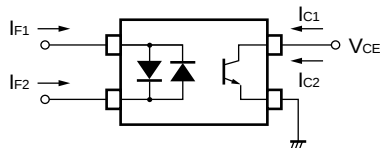
***1** PW = 100 μs, Duty Cycle = 1 %

***2** AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output

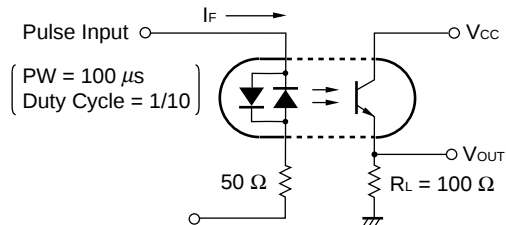
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = ±10 mA		1.17	1.4	V
	Terminal Capacitance	C _t	V = 0 V, f = 1.0 MHz		100		pF
Transistor	Collector to Emitter Dark Current	I _{CEO}	V _{CE} = 80 V, I _F = 0 mA			100	nA
Coupled	Current Transfer Ratio (I _c /I _F)	CTR	I _F = ±5 mA, V _{CE} = 5 V	80	300	600	%
	CTR Ratio ^{*1}	CTR1/ CTR2	I _F = 5 mA, V _{CE} = 5 V	0.3	1.0	3.0	
	Collector Saturation Voltage	V _{CE(sat)}	I _F = ±10 mA, I _c = 2 mA			0.3	V
	Isolation Resistance	R _{I-O}	V _{I-O} = 1.0 kV _{DC}	10 ¹¹			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1.0 MHz		0.5		pF
	Rise Time ^{*2}	t _r	V _{CC} = 10 V, I _c = 2 mA, R _L = 100 Ω		3		μs
	Fall Time ^{*2}	t _f			5		

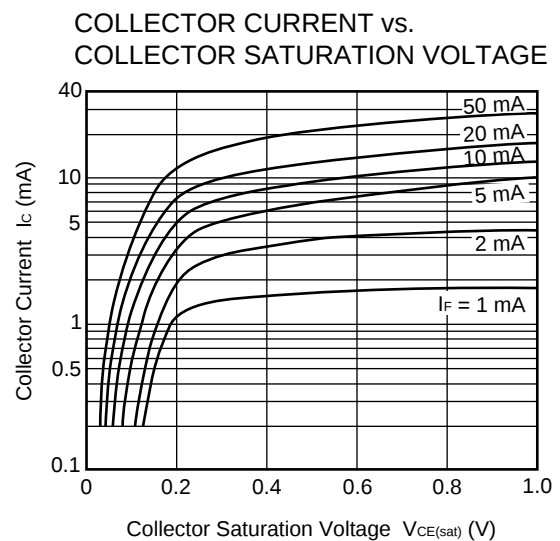
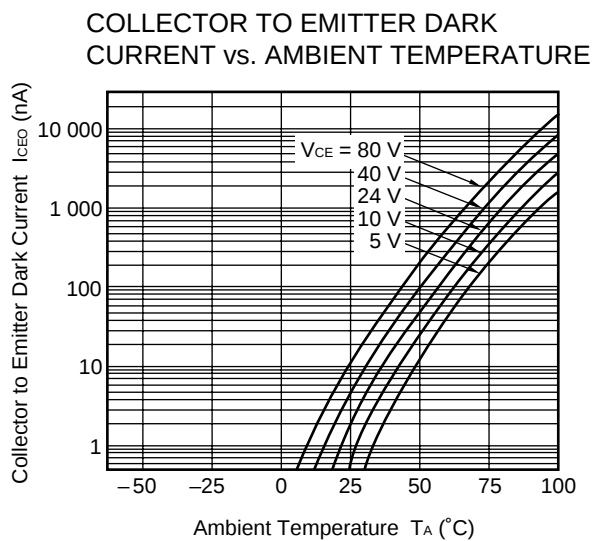
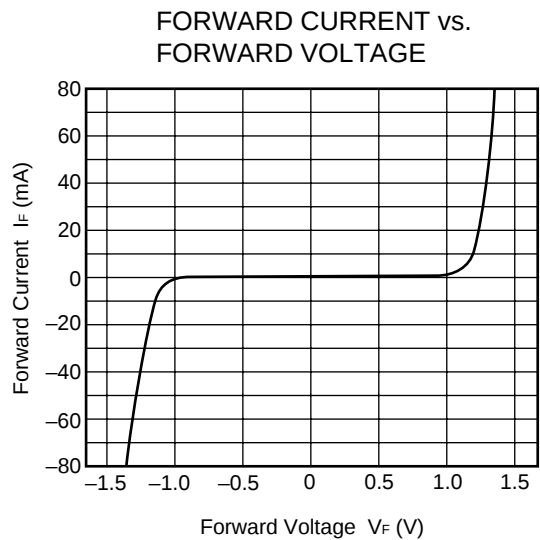
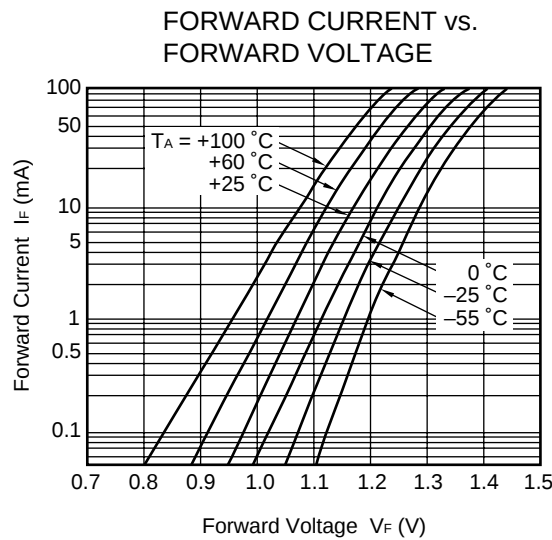
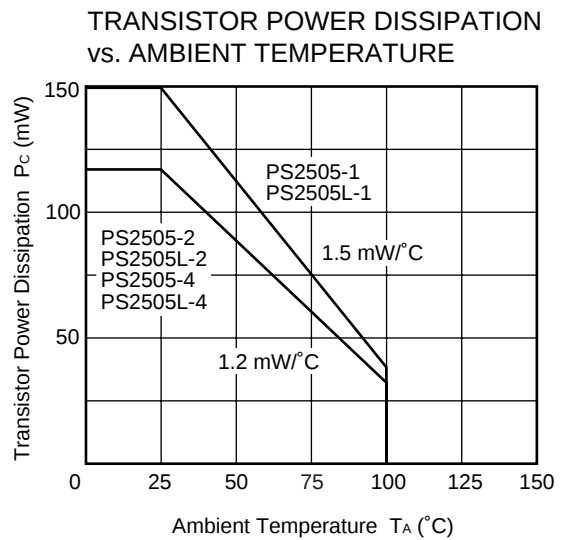
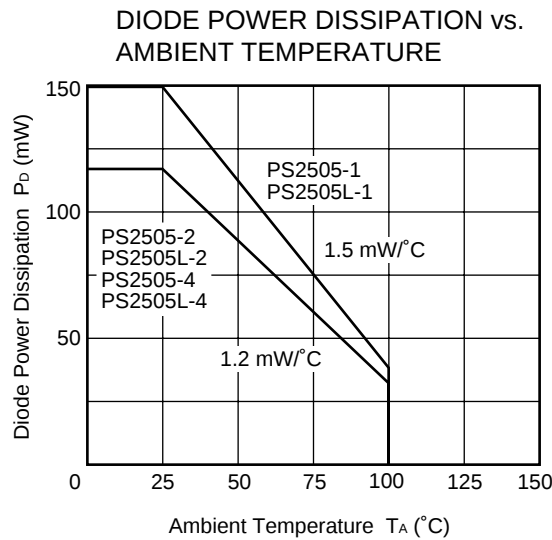
*1 CTR1 = I_{c1}/I_{F1}, CTR2 = I_{c2}/I_{F2}



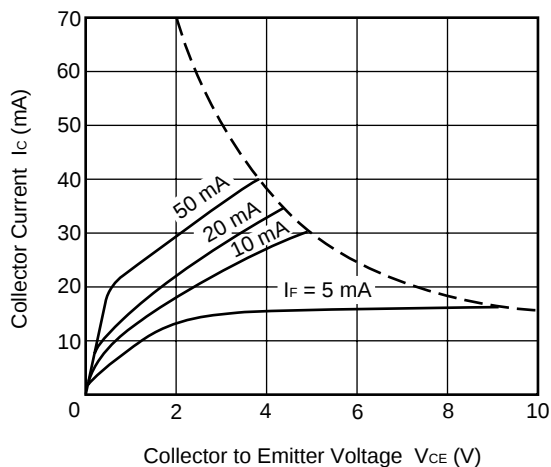
*2 Test circuit for switching time



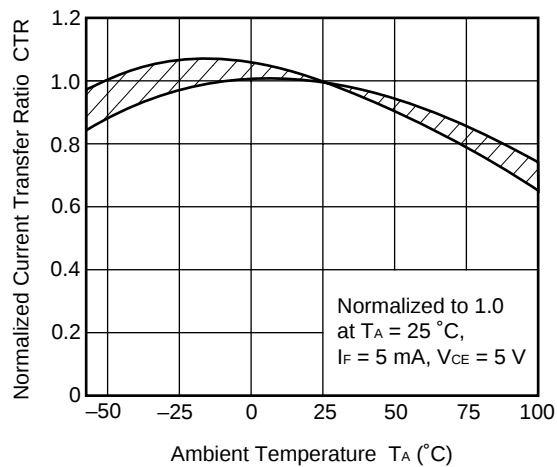
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)



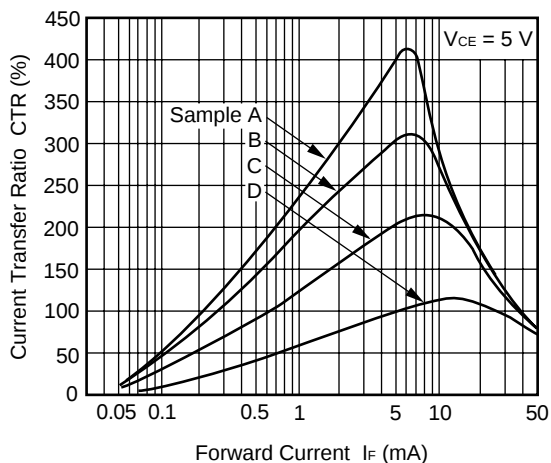
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



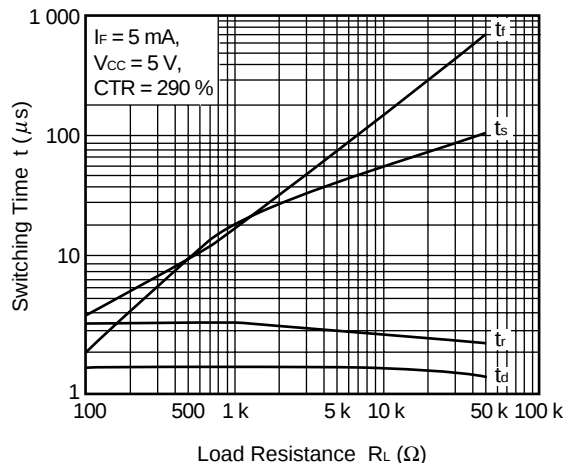
NORMALIZED CURRENT TRANSFER
RATIO vs. AMBIENT TEMPERATURE



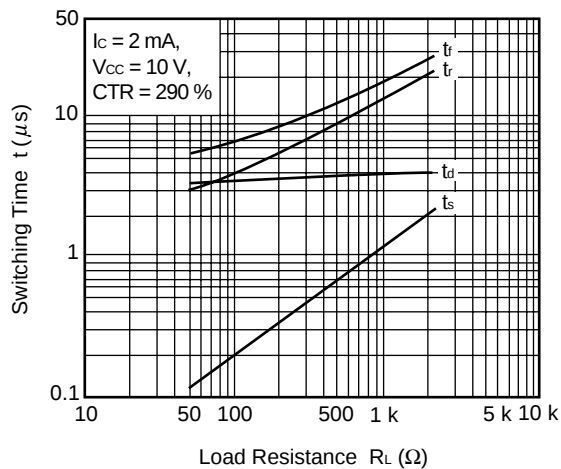
CURRENT TRANSFER RATIO vs.
FORWARD CURRENT



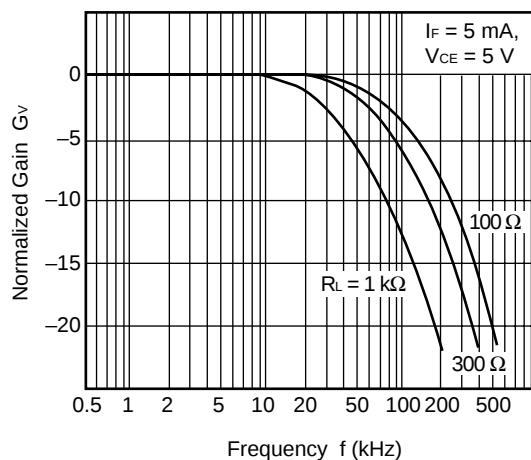
SWITCHING TIME vs.
LOAD RESISTANCE

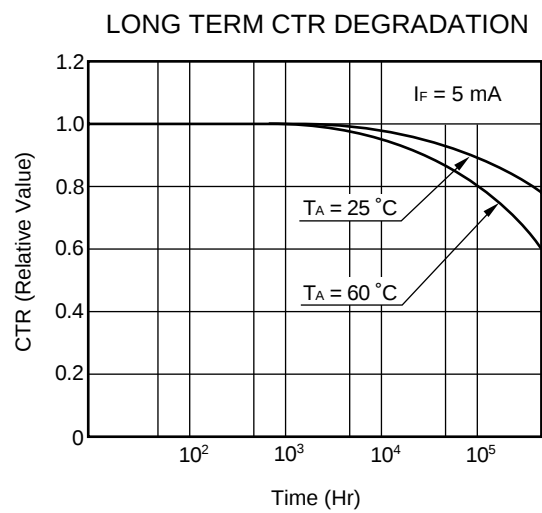


SWITCHING TIME vs.
LOAD RESISTANCE



FREQUENCY RESPONSE

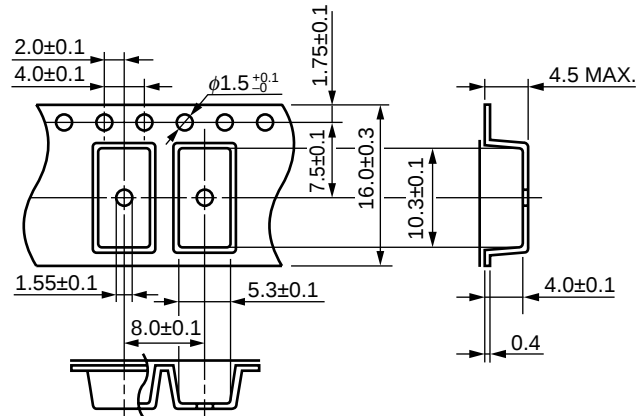




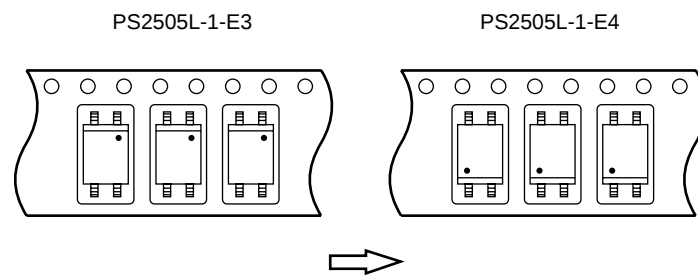
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (UNIT : mm)

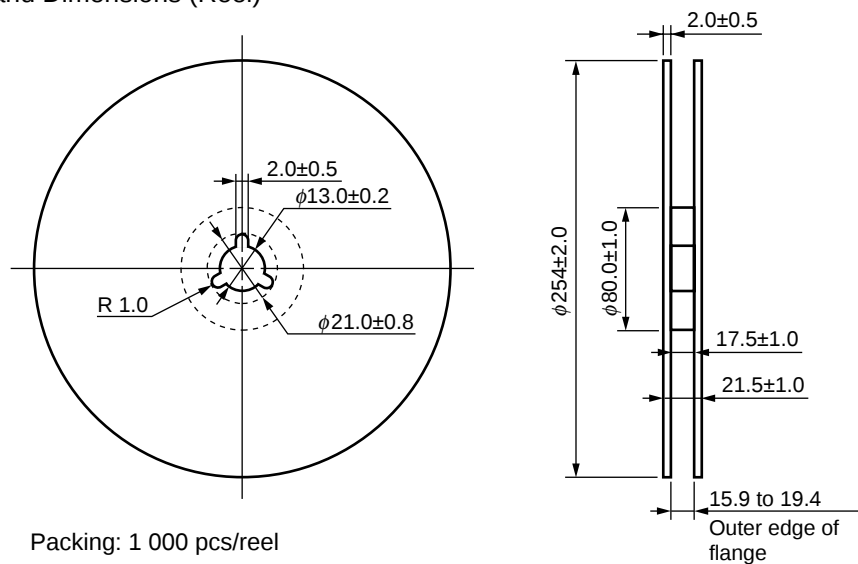
Outline and Dimensions (Tape)



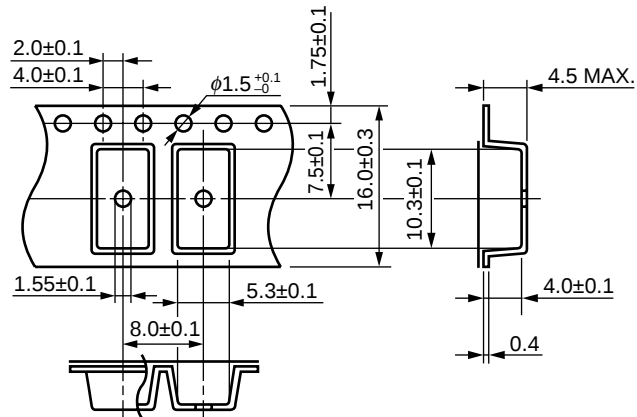
Tape Direction



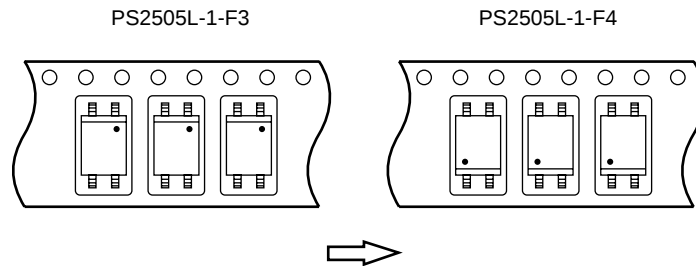
Outline and Dimensions (Reel)



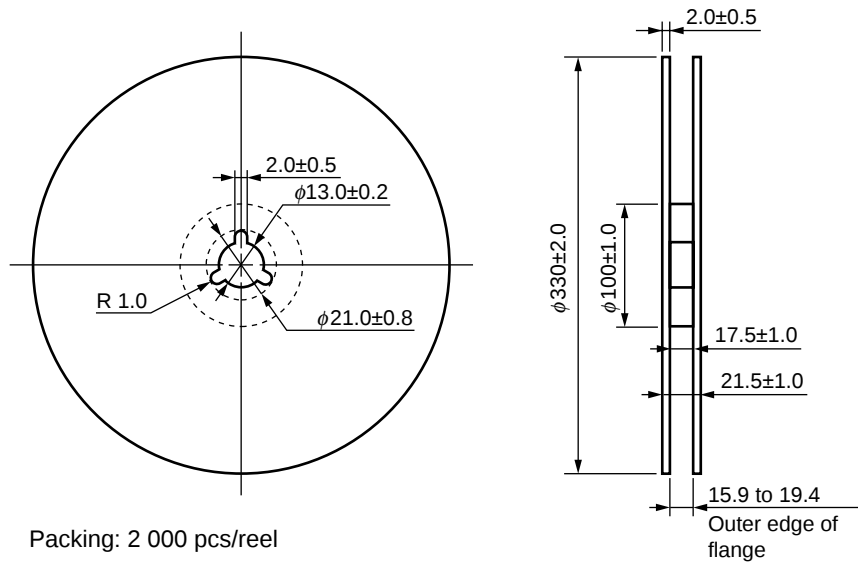
Outline and Dimensions (Tape)



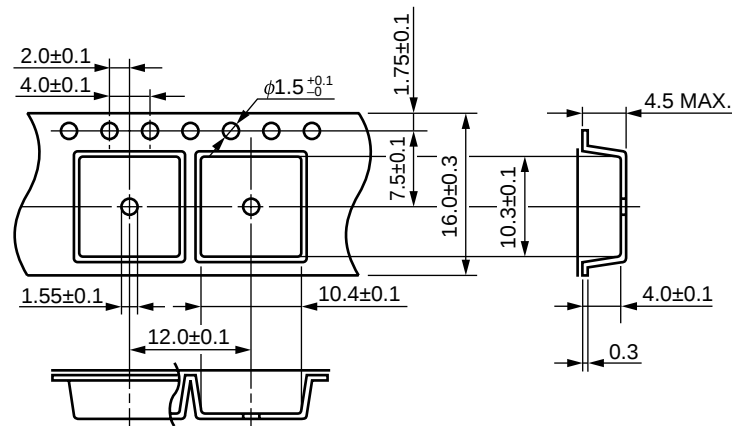
Tape Direction



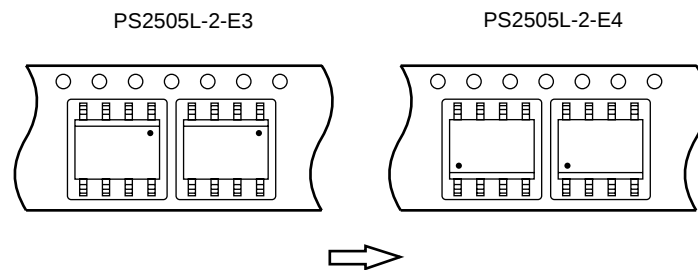
Outline and Dimensions (Reel)



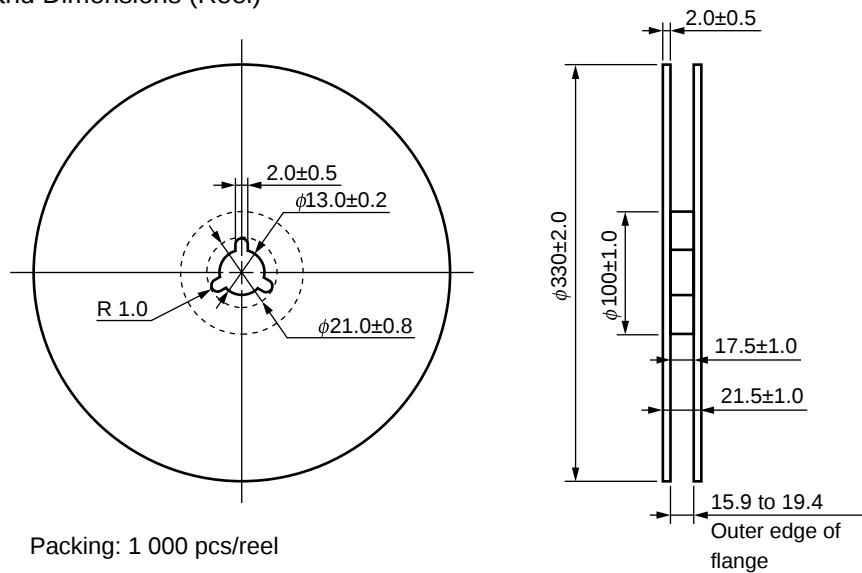
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



Packing: 1 000 pcs/reel

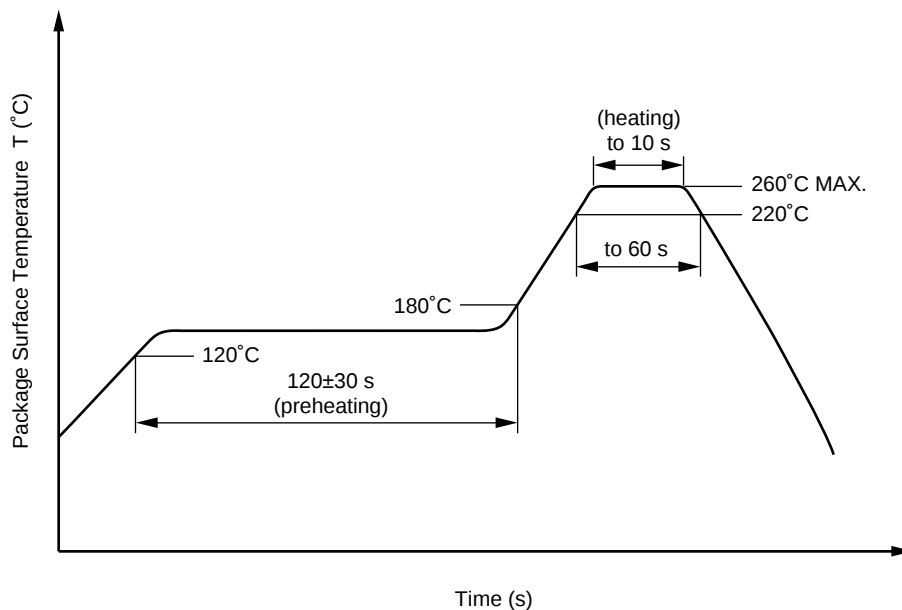
★ NOTES ON HANDLING

1. Recommended soldering conditions

(1) Infrared reflow soldering

- Peak reflow temperature 260°C or below (package surface temperature)
- Time of peak reflow temperature 10 seconds or less
- Time of temperature higher than 220°C 60 seconds or less
- Time to preheat temperature from 120 to 180°C 120±30 s
- 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



(2) Wave soldering

- Temperature 260°C or below (molten solder temperature)
- Time 10 seconds or less
- Preheating conditions 120°C or below (package surface temperature)
- Number of times One (Allowed to be dipped in solder including plastic mold portion.)
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(3) Cautions

- Fluxes
Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.

2. Cautions regarding noise

Be aware that when voltage is applied suddenly between the photocoupler's input and output or between collector-emitters at startup, the output side may enter the on state, even if the voltage is within the absolute maximum ratings.

★ USAGE CAUTIONS

1. Protect against static electricity when handling.
2. Avoid storage at a high temperature and high humidity.

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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT

Caution	GaAs Products	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested. • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.
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► For further information, please contact

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