

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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PS2571-1,-4,PS2571L-1,-4

HIGH ISOLATION VOLTAGE SAFETY STANDARD TYPE MULTI PHOTOCOUPLER SERIES

–NEPOC Series–

DESCRIPTION

The PS2571-1, -4 and PS2571L-1, -4 are optically coupled isolators containing GaAs light emitting diodes and NPN silicon phototransistors.

The PS2571-1, -4 are in a plastic DIP (Dual In-line Package) and the PS2571L-1, -4 are lead bending type (Gull-wing) for surface mount.

FEATURES

- High isolation voltage (BV = 5 000 Vr.m.s.)
- High current transfer ratio (CTR = 200 % TYP.)
- High-speed switching ($t_r = 3 \mu s$ TYP., $t_f = 5 \mu s$ TYP.)
- Ordering number of taping product : PS2571L-1-E3, E4, F3, F4
- ★ • Safety standards
 - UL approved: File No. E72422
 - BSI approved: No. 8343/8344
 - CSA approved: No. CA 101391
 - NEMKO approved: No. P98102650
 - DEMKO approved: No. 308152
 - SEMKO approved: No. 0143094/01
 - FIMKO approved: No. FI 11899
 - DIN EN60747-5-2 (VDE0884 Part2) approved (Option)

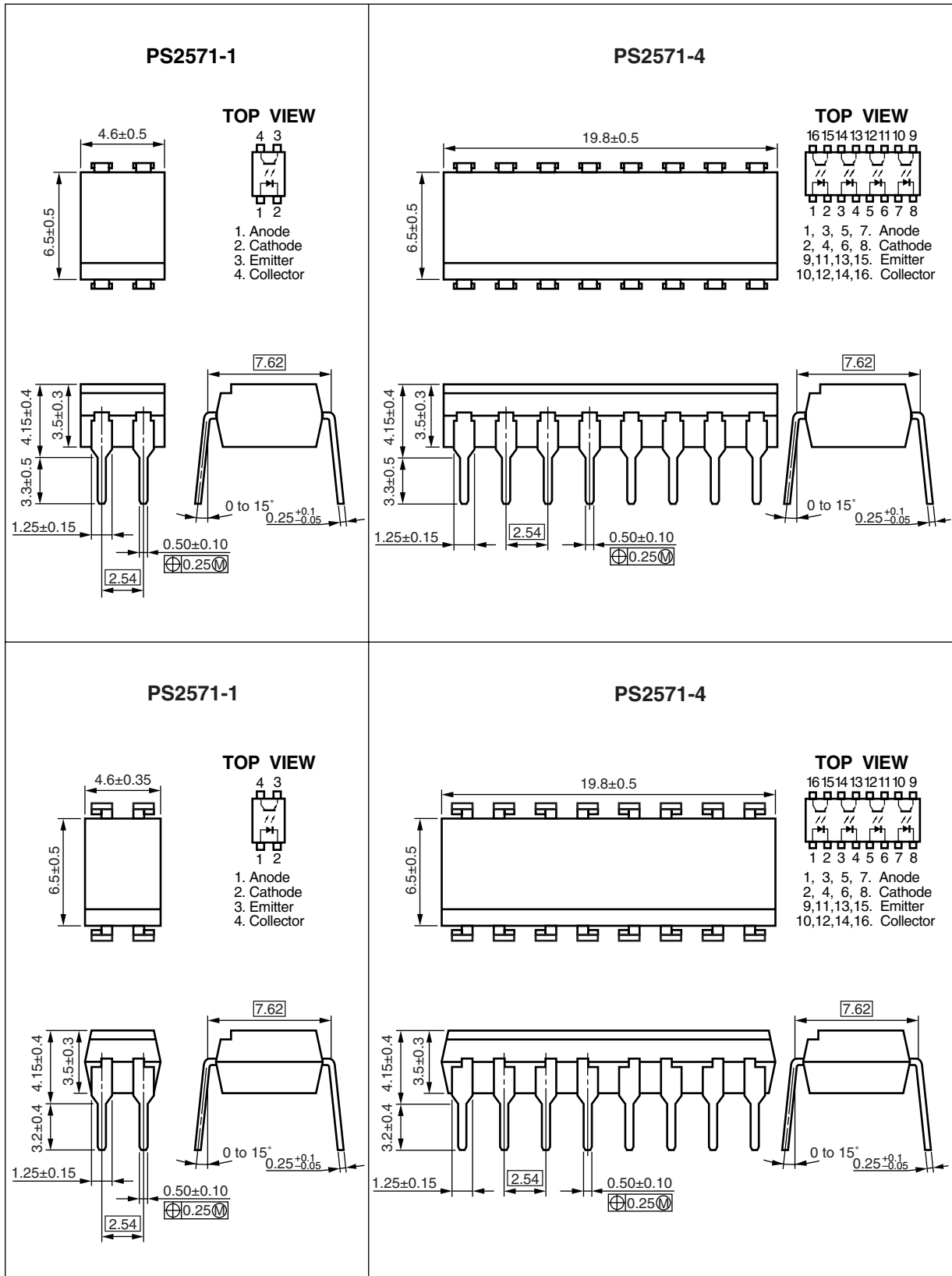
APPLICATIONS

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

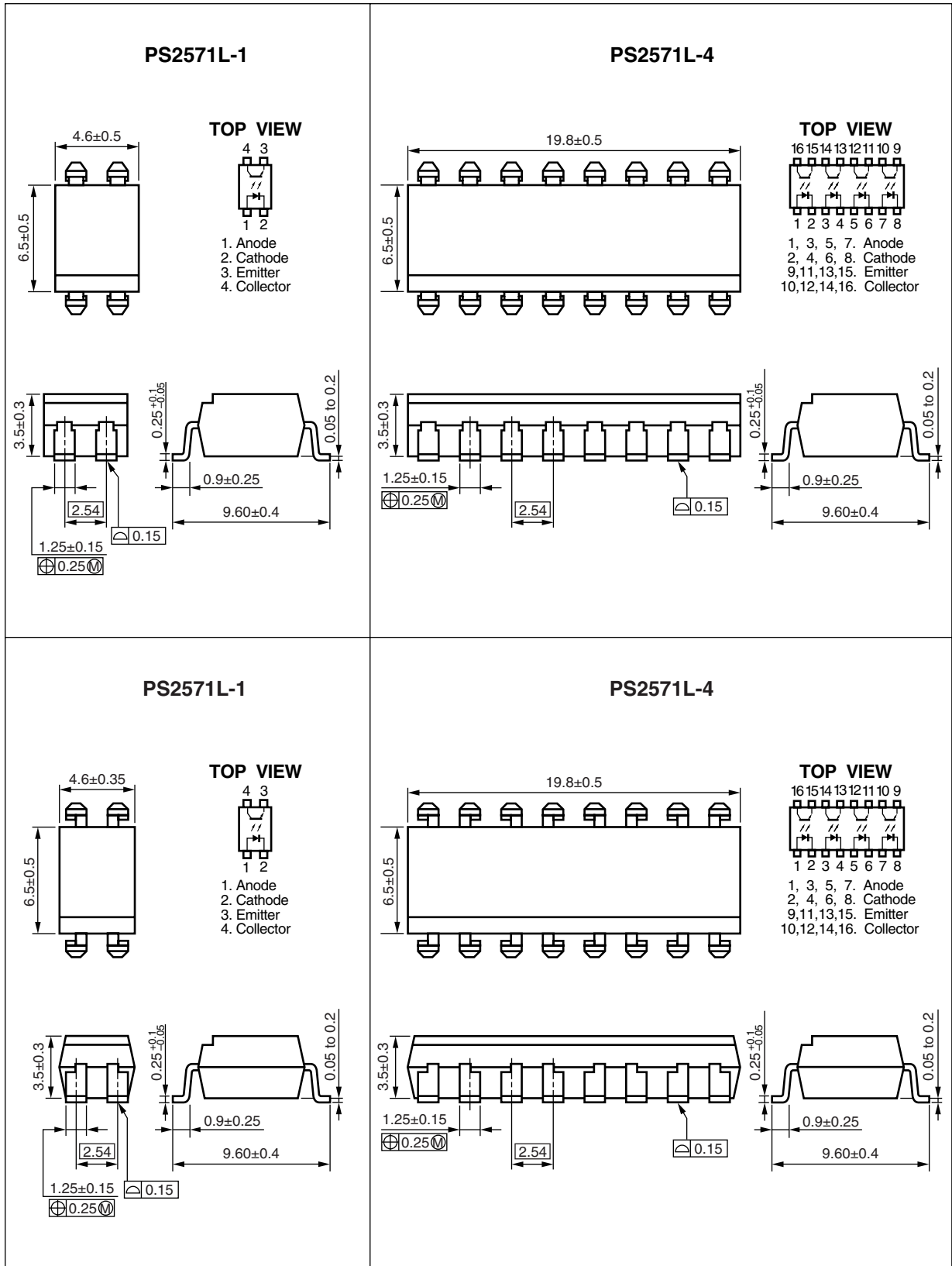
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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PACKAGE DIMENSIONS (in millimeters)

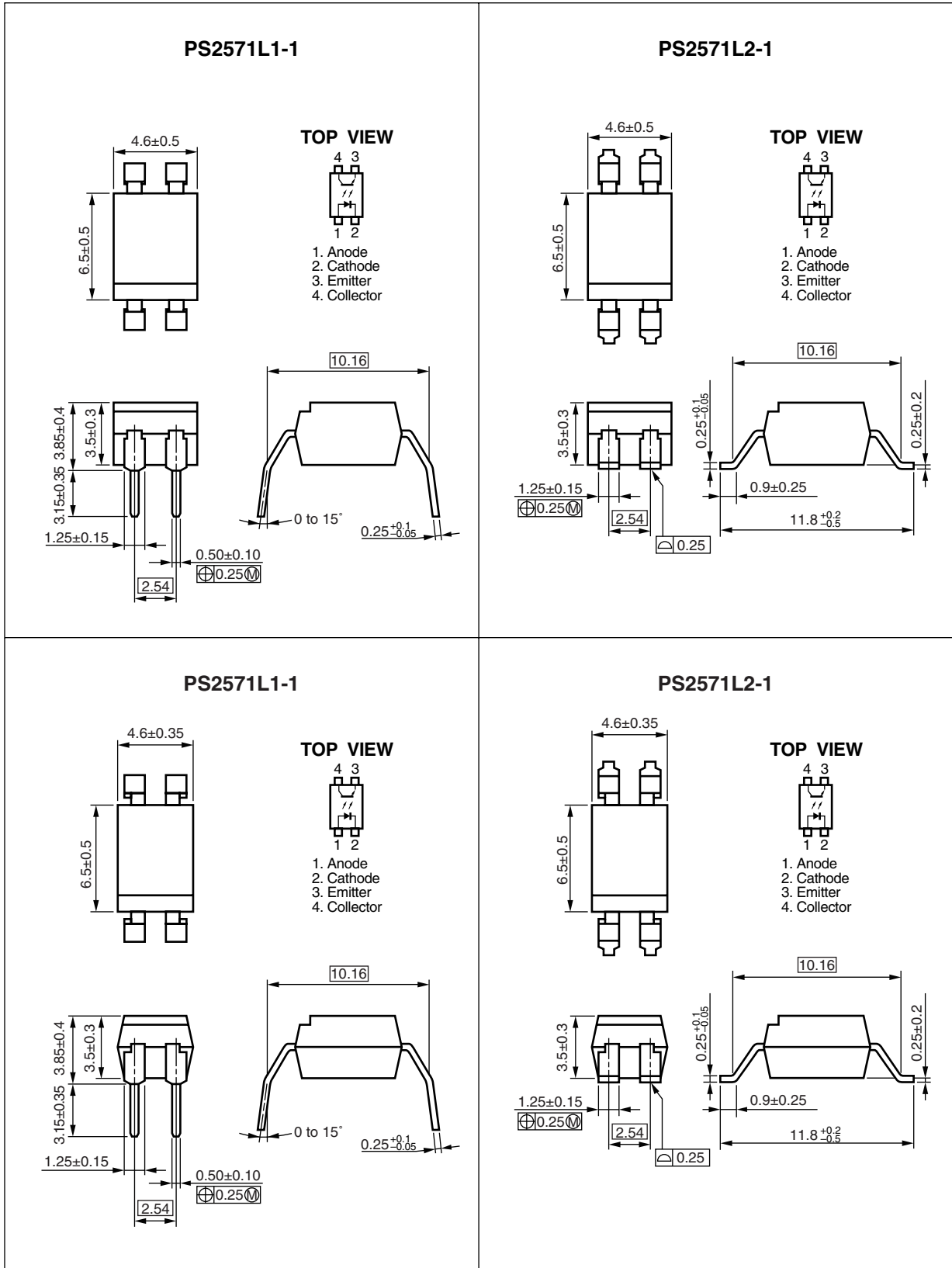
DIP type



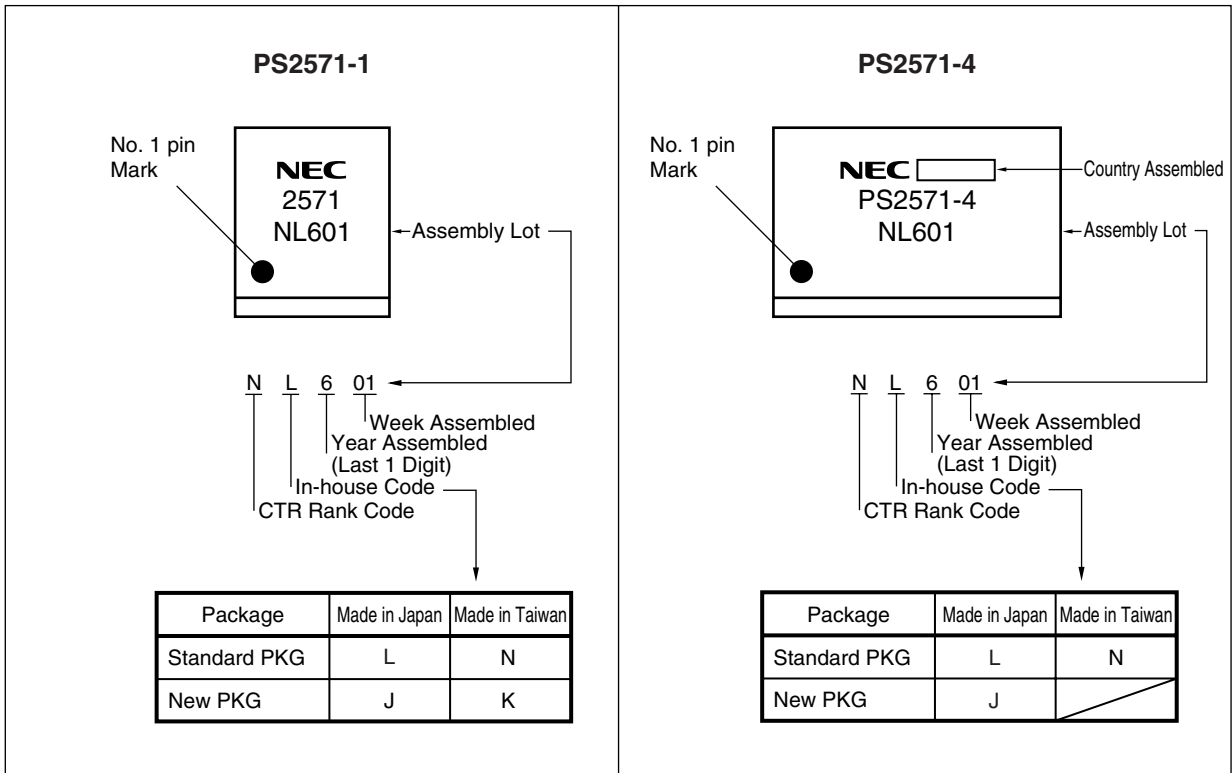
Lead bending type



Lead bending type for long distance



★ MARKING EXAMPLE



PHOTOCOUPLER CONSTRUCTION

Parameter	Unit (MIN.)
Air Distance	7 mm
Outer Creepage Distance	7 mm
Inner Creepage Distance	4 mm
Isolation Distance	0.4 mm

★ ORDERING INFORMATION

Part Number	Order Number	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number ^{*1}
PS2571-1	PS2571-1-A	Pb-Free	Magazine case 100 pcs	Standard products (UL, CSA, BSI, NEMKO, SEMKO, DEMKO, FIMKO approved)	PS2571-1
PS2571L-1	PS2571L-1-A		Embossed Tape 1 000 pcs/reel		
PS2571L-1-E3	PS2571L-1-E3-A				
PS2571L-1-E4	PS2571L-1-E4-A				
PS2571L-1-F3	PS2571L-1-F3-A		Embossed Tape 2 000 pcs/reel		
PS2571L-1-F4	PS2571L-1-F4-A				
PS2571-4	PS2571-4-A		Magazine case 20 pcs		PS2571-4
PS2571L-4	PS2571L-4-A				
PS2571-1-V	PS2571-1-V-A		Magazine case 100 pcs	DIN EN60747-5-2 (VDE0884 Part2) Approved (Option)	PS2571-1
PS2571L-1-V	PS2571L-1-V-A		Embossed Tape 1 000 pcs/reel		
PS2571L-1-V-E3	PS2571L-1-V-E3-A				
PS2571L-1-V-E4	PS2571L-1-V-E4-A				
PS2571L-1-V-F3	PS2571L-1-V-F3-A		Embossed Tape 2 000 pcs/reel		
PS2571L-1-V-F4	PS2571L-1-V-F4-A				
PS2571-4-V	PS2571-4-V-A		Magazine case 20 pcs		PS2571-4
PS2571L-4-V	PS2571L-4-V-A				

*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
			PS2571-1, PS2571L-1	PS2571-4, PS2571L-4	
Diode	Forward Current (DC)	I _F	50		mA/ch
	Reverse Voltage	V _R	6		V
	Power Dissipation Derating	ΔP _D /°C	0.7	0.55	mW/°C
	Power Dissipation	P _D	70	55	mW/ch
	Peak Forward Current ^{*1}	I _{FP}	1		A/ch
Transistor	Collector to Emitter Voltage	V _{CEO}	40		V
	Emitter to Collector Voltage	V _{ECO}	5		V
	Collector Current	I _C	40		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%

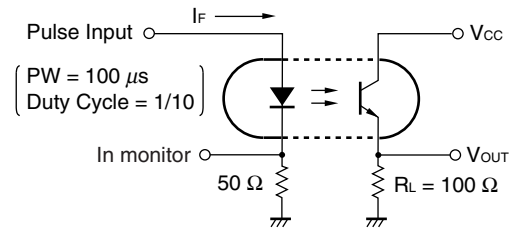
*2 AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output
 Pins 1-2 shorted together, 3-4 shorted together (PS2571-1, PS2571L-1).
 Pins 1-8 shorted together, 9-16 shorted together (PS2571-4, PS2571L-4).

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = 10 mA		1.2	1.4	V
	Reverse Current	I _R	V _R = 5 V			5	μA
	Terminal Capacitance	C _t	V = 0 V, f = 1.0 MHz		50		pF
Transistor	Collector to Emitter Dark Current	I _{CEO}	V _{CE} = 40 V, I _F = 0 mA			100	nA
Coupled	Current Transfer Ratio (I _c /I _F) ^{*1}	CTR	I _F = 5 mA, V _{CE} = 5 V	80	200	400	%
	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		

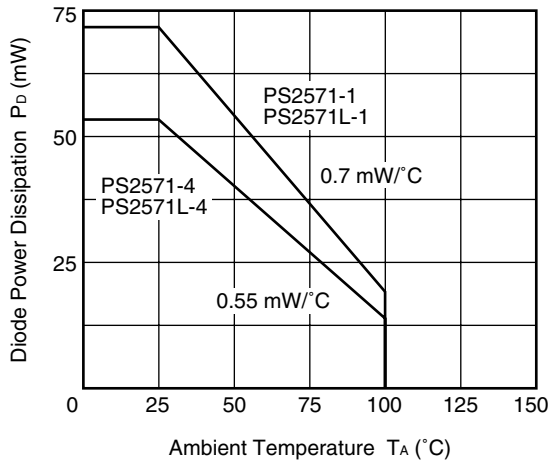
*1 CTR rank (PS2571-1,PS2571L-1 only)
D : 100 to 300 %

*2 Test Circuit for Switching Time

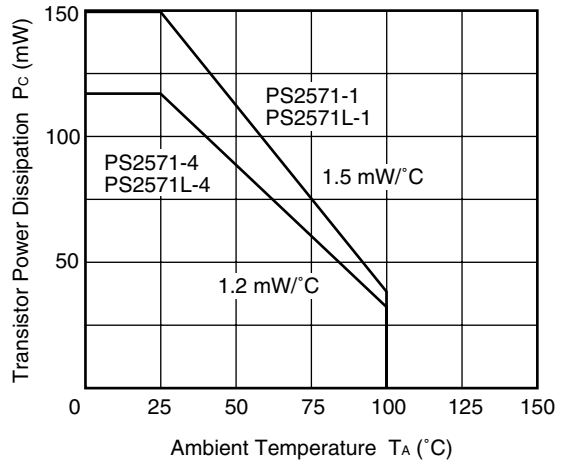


TYPICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

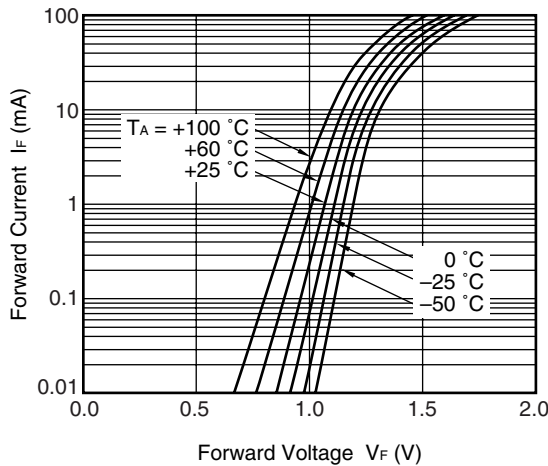
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



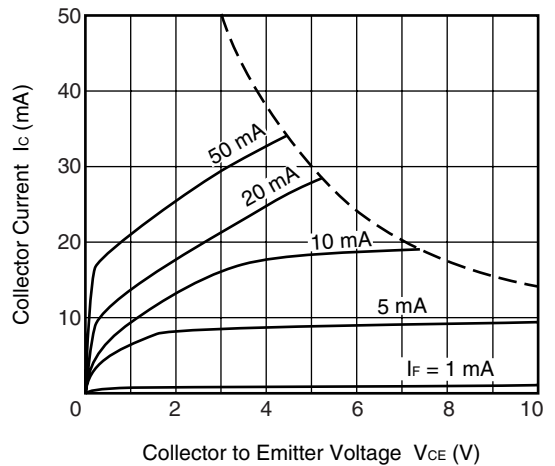
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



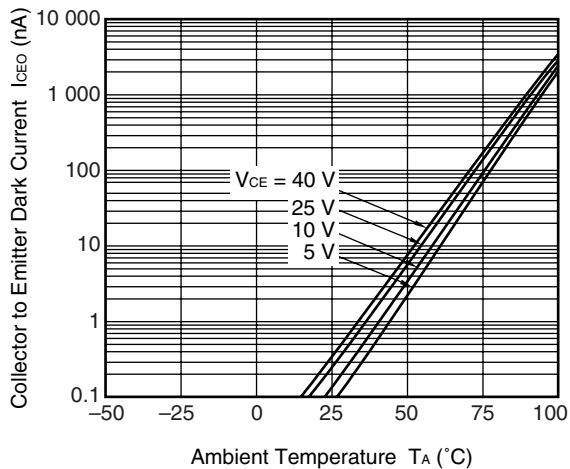
FORWARD CURRENT vs. FORWARD VOLTAGE



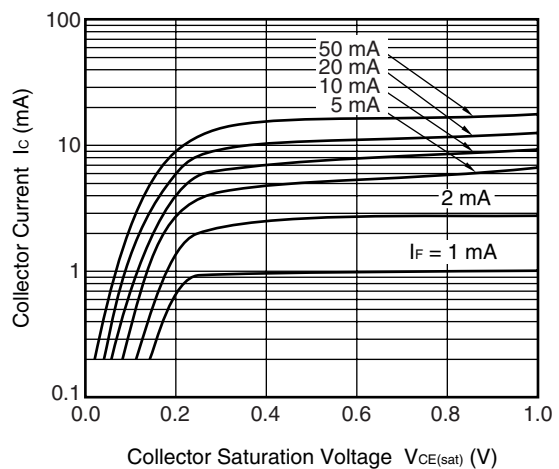
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE

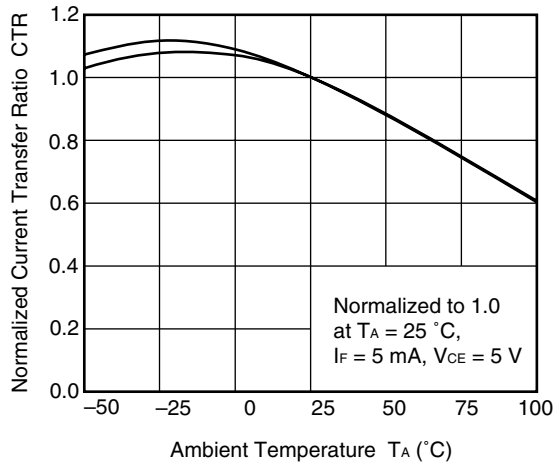


COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE

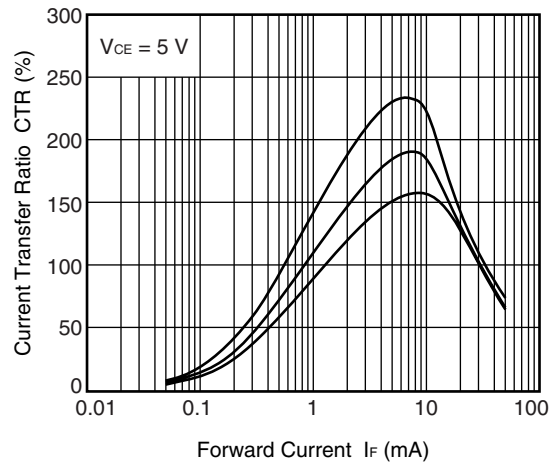


Remark The graphs indicate nominal characteristics.

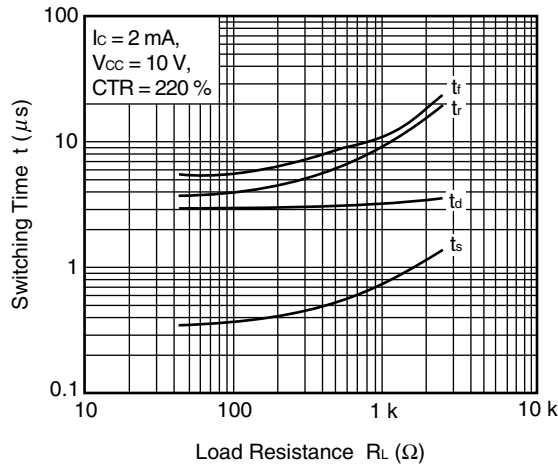
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



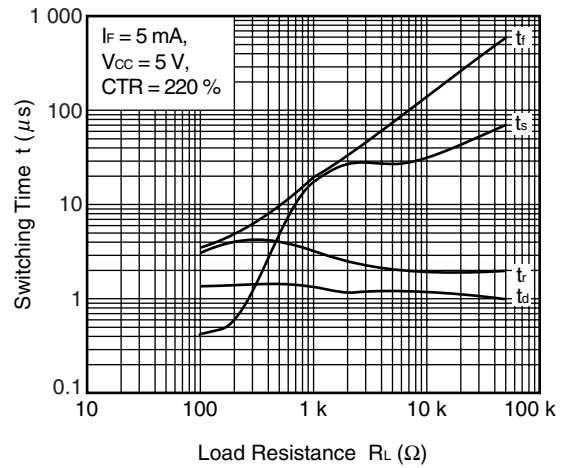
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



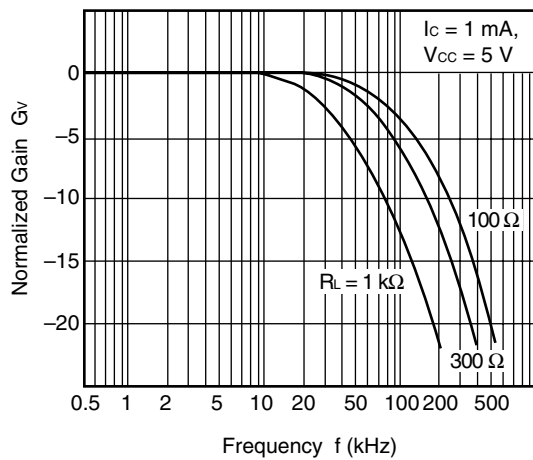
SWITCHING TIME vs. LOAD RESISTANCE



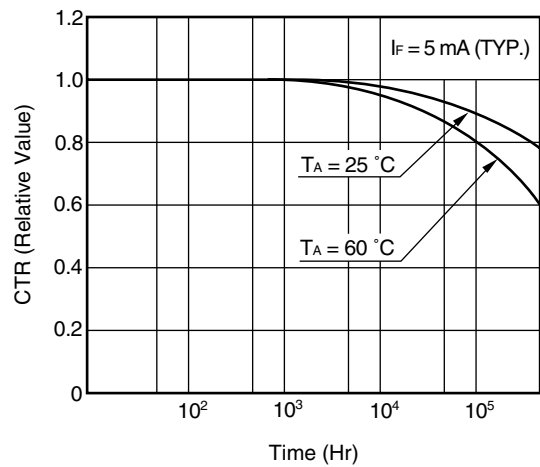
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



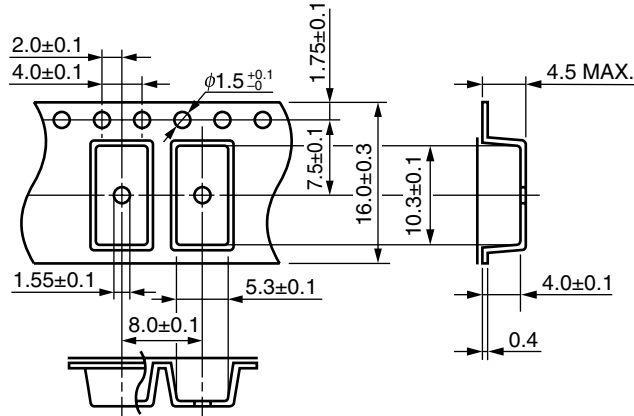
LONG TERM CTR DEGRADATION



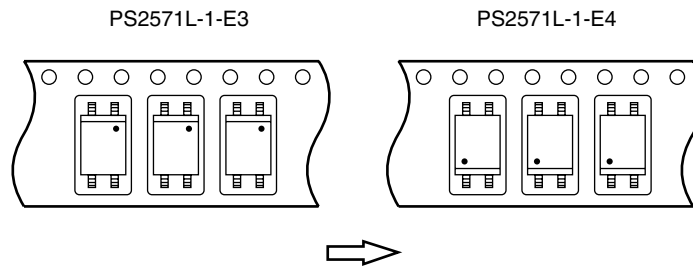
Remark The graphs indicate nominal characteristics.

TAPING SPECIFICATIONS (in millimeters)

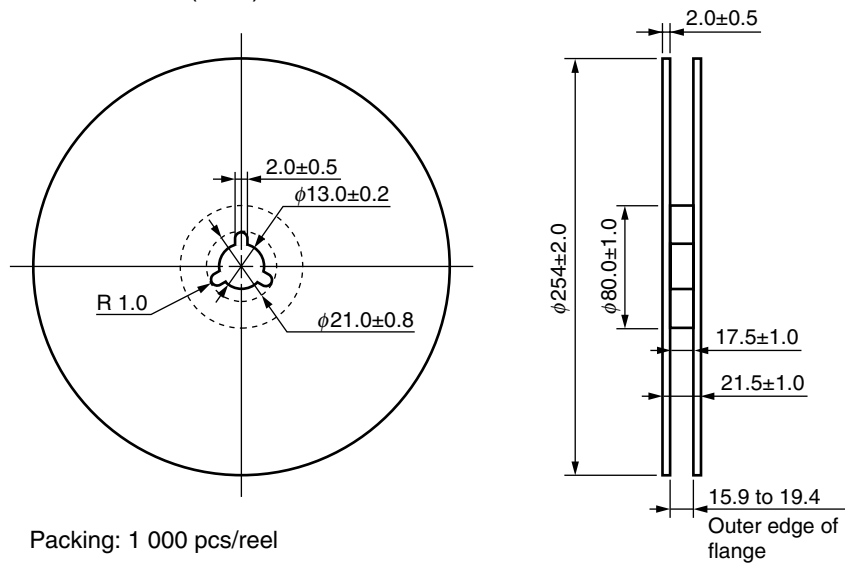
Outline and Dimensions (Tape)



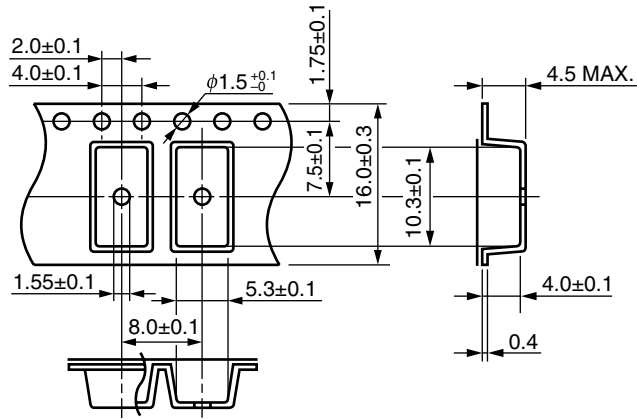
Tape Direction



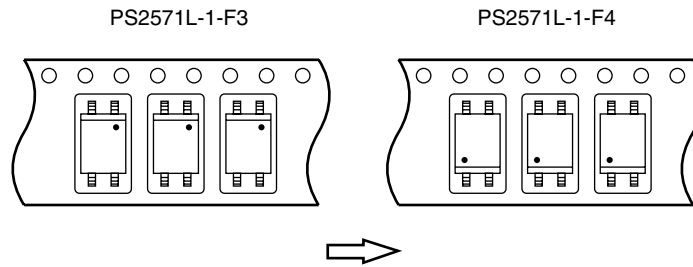
Outline and Dimensions (Reel)



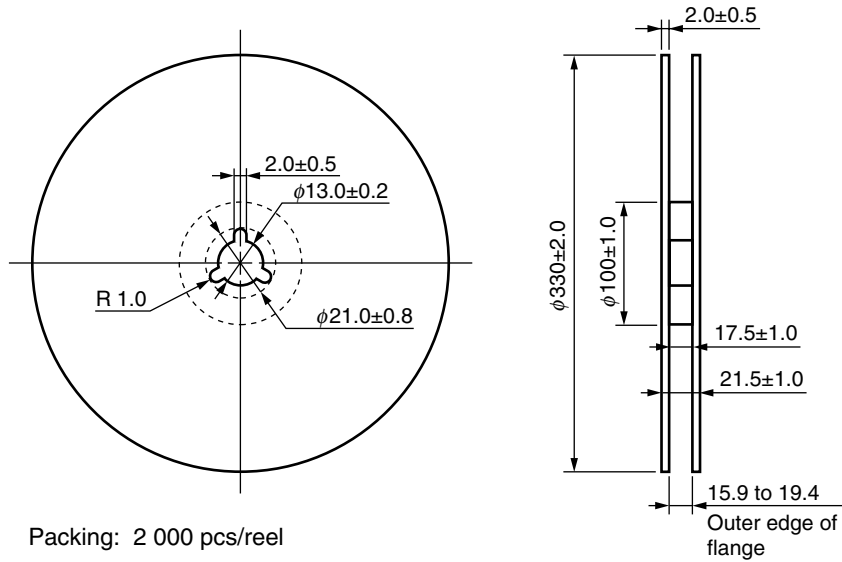
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



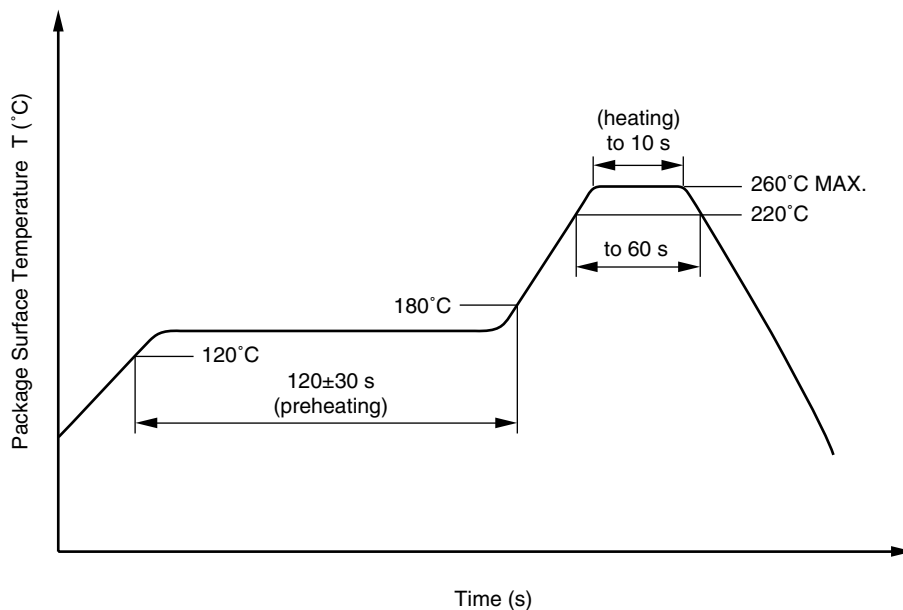
NOTES ON HANDLING

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) Soldering by soldering iron**

- Peak temperature (lead part temperature) 350°C or below
- Time (each pins) 3 seconds or less
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(a) Soldering of leads should be made at the point 1.5 to 2.0 mm from the root of the lead.

(b) Please be sure that the temperature of the package would not be heated over 100°C.

(4) 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 transistor may enter the on state, even if the voltage is within the absolute maximum ratings.

★ 3. Measurement conditions of current transfer ratios (CTR), which differ according to photocoupler

Check the setting values before use, since the forward current conditions at CTR measurement differ according to product.

When using products other than at the specified forward current, the characteristics curves may differ from the standard curves due to CTR value variations or the like. This tendency may sometimes be obvious, especially below $I_F = 1$ mA.

Therefore, check the characteristics under the actual operating conditions and thoroughly take variations or the like into consideration before use.

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

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► For further information, please contact

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