

**HIGH ISOLATION VOLTAGE
AC INPUT, DARLINGTON TRANSISTOR TYPE
SOP PHOTOCOUPLER**

–NEPOC Series–

DESCRIPTION

The PS2806-1 and PS2806-4 are optically coupled isolators containing GaAs light emitting diodes and an NPN silicon darlington connected phototransistor in a plastic SOP for high density applications.

This package has shield effect to cut off ambient light.

FEATURES

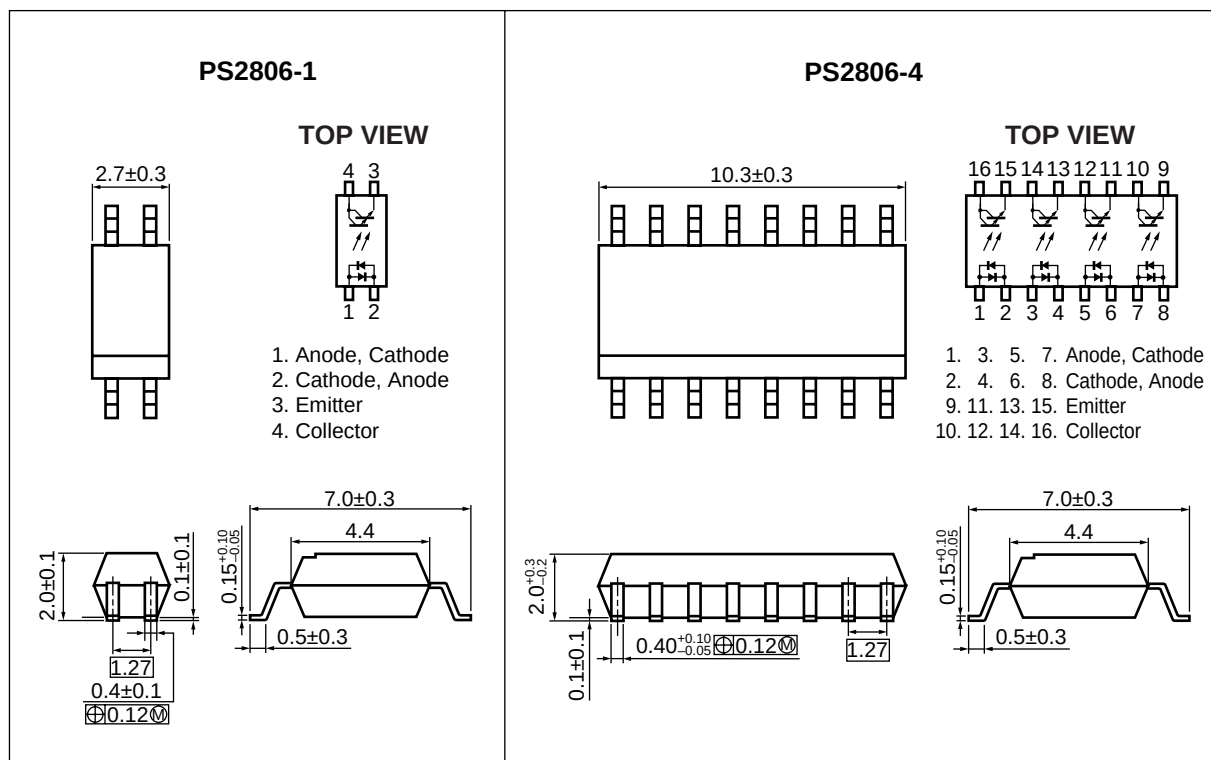
- High isolation voltage ($BV = 2\,500\text{ V r.m.s.}$)
- Small and thin package (4,16-pin SOP, Pin pitch 1.27 mm)
- AC input response
- High current transfer ratio ($CTR = 2\,000\%$ TYP. @ $I_F = \pm 1\text{ mA}$, $V_{CE} = 2\text{ V}$)
- Ordering number of tape product: PS2806-1-F3, F4, PS2806-4-F3, F4
- Safety standards: PS2806-1, -4
 - UL approved: File No. E72422 (S)
 - BSI approved: No. 8188, 8189
 - VDE0884 approved (Option): PS2806-4 only

APPLICATIONS

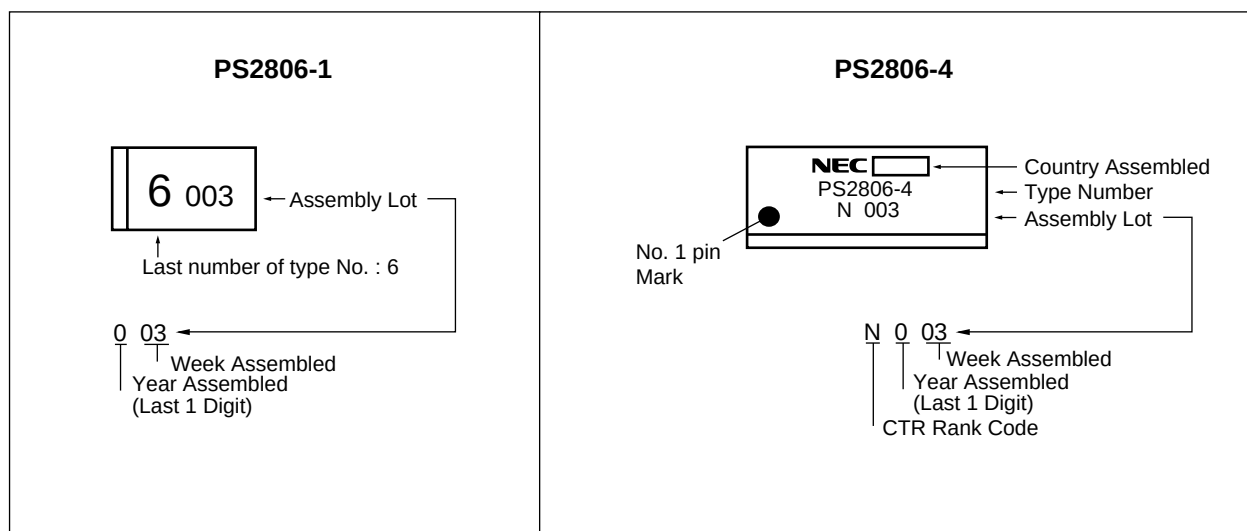
- Programmable logic controllers
- Measuring instruments
- Hybrid IC

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★ PACKAGE DIMENSIONS (UNIT: mm)



MARKING



ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number ^{*1}
PS2806-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	PS2806-1
PS2806-1-F3		Embossed Tape 3 500 pcs/reel	
PS2806-1-F4			
PS2806-4	16-pin SOP	Magazine Case 45 pcs	PS2806-4
PS2806-4-F3		Embossed Tape 2 500 pcs/reel	
PS2806-4-F4			

^{*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
			PS2806-1	PS2806-4	
Diode	Forward Current (DC)	I _F	±50		mA
	Power Dissipation Derating	ΔP _D /°C	0.6	0.8	mW/°C
	Power Dissipation	P _D	60	80	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	90	100	mA/ch
	Power Dissipation Derating	ΔP _C /°C	1.2		mW/°C
	Power Dissipation	P _C	120		mW/ch
Isolation Voltage ^{*2}		BV	2 500		Vr.m.s.
Operating Ambient Temperature		T _A	-55 to +100		°C
Storage Temperature		T _{stg}	-55 to +150		°C

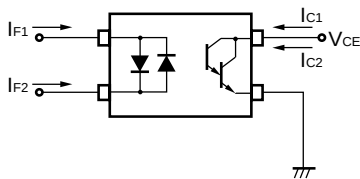
^{*1} PW = 100 μs, Duty Cycle = 1 %

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

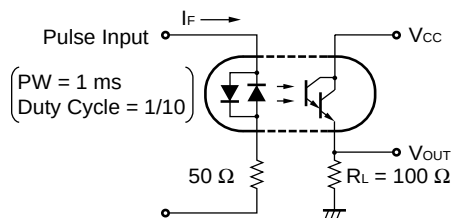
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = ±5 mA		1.1	1.4	V
	Terminal Capacitance	C _t	V = 0 V, f = 1.0 MHz		30		pF
Transistor	Collector to Emitter Dark Current	I _{CEO}	V _{CE} = 40 V, I _F = 0 mA			400	nA
Coupled	Current Transfer Ratio (I _c /I _F)	CTR	I _F = ±1 mA, V _{CE} = 2 V	200	2 000		%
	CTR Ratio *1	CTR1/ CTR2	I _F = 1 mA, V _{CE} = 2 V	0.3	1.0	3.0	
	Collector Saturation Voltage	V _{CE(sat)}	I _F = ±1 mA, I _c = 2 mA			1.0	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		0.4		pF
	Rise Time *2	t _r	V _{CC} = 5 V, I _c = 2 mA, R _L = 100 Ω		200		μs
	Fall Time *2	t _f			200		

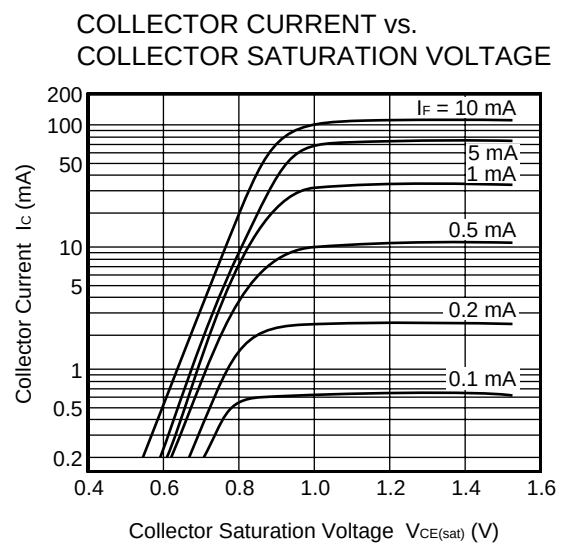
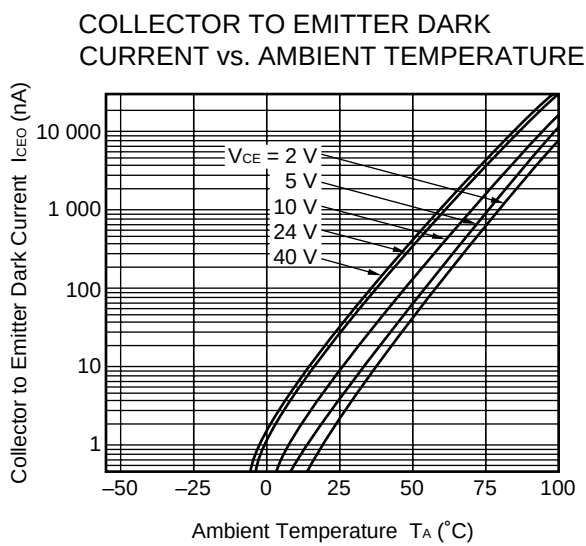
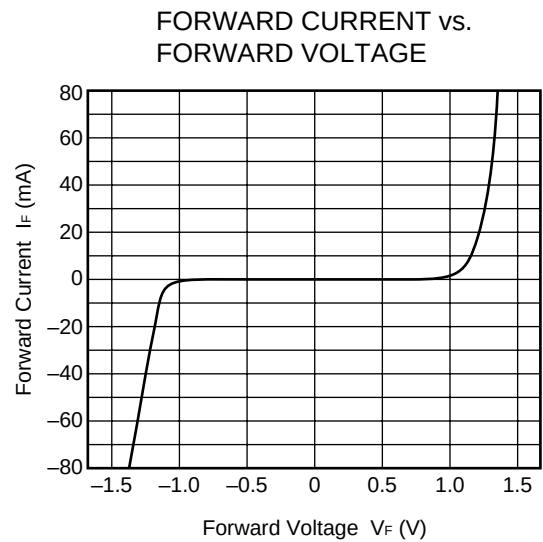
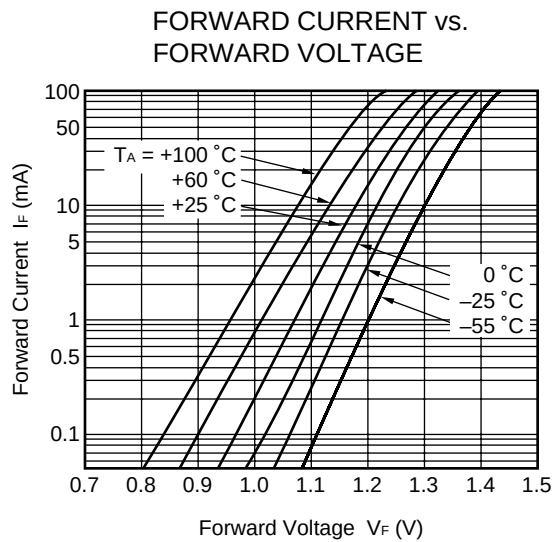
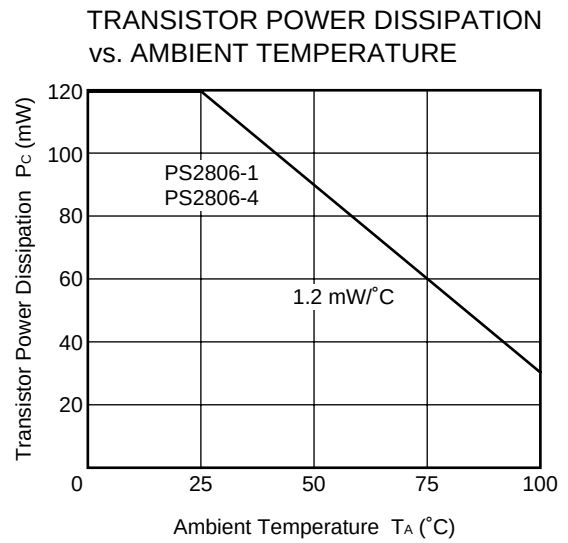
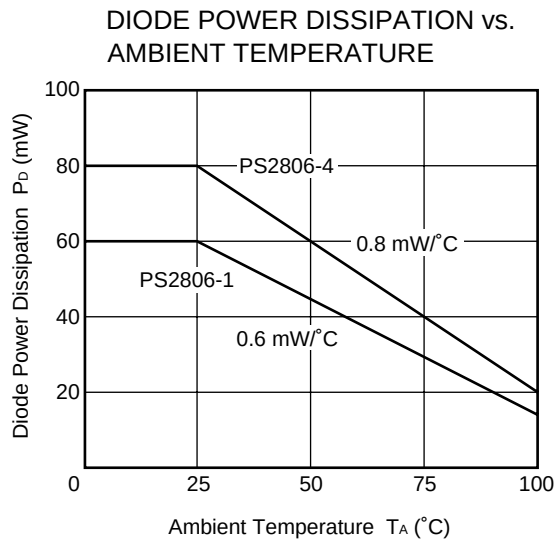
*1 CTR1 = I_{c1}/I_{F1}, CTR2 = I_{c2}/I_{F2}



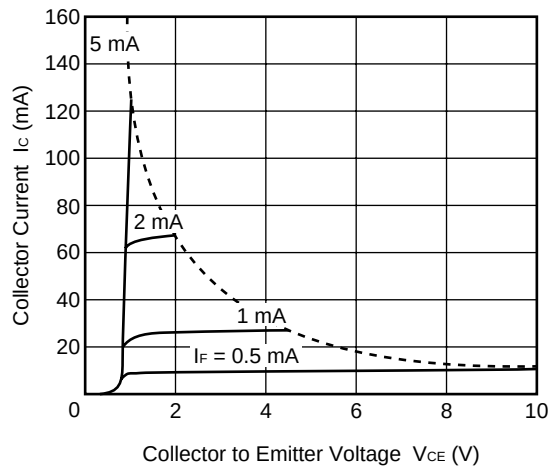
*2 Test circuit for switching time



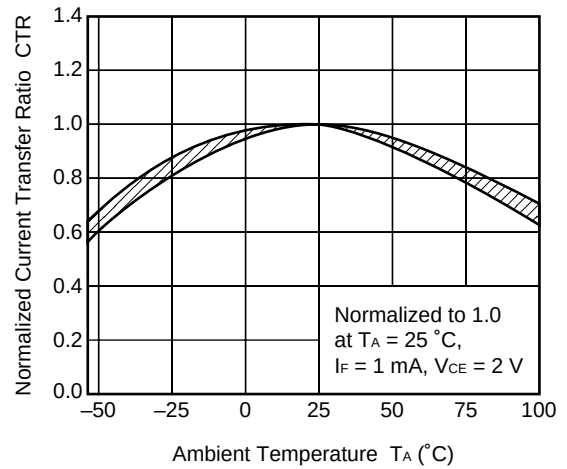
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)



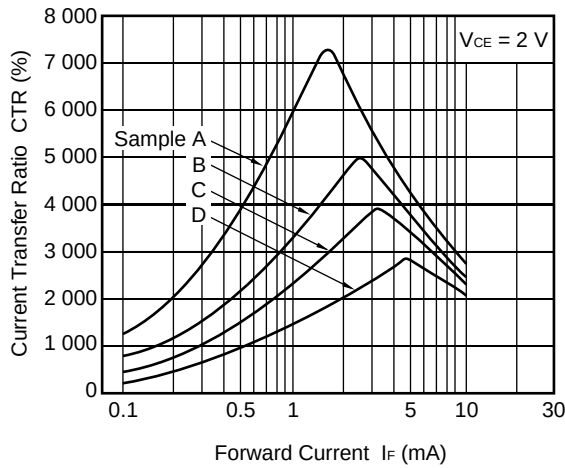
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



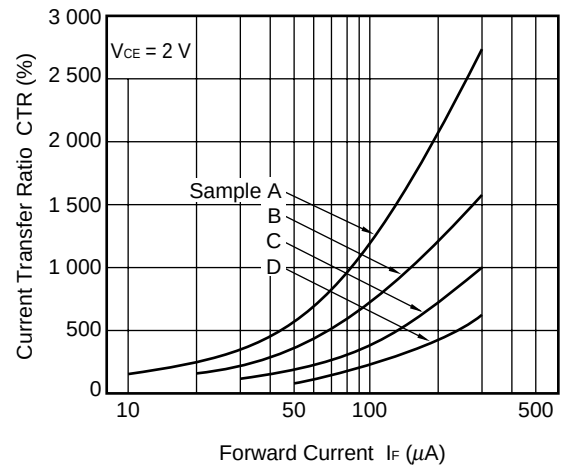
NORMALIZED CURRENT TRANSFER
RATIO vs. AMBIENT TEMPERATURE



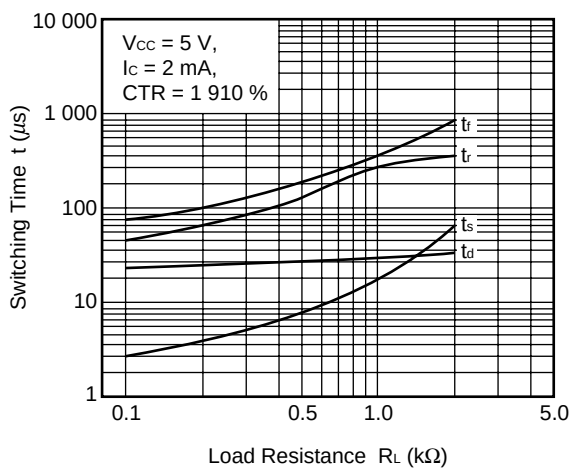
CURRENT TRANSFER RATIO vs.
FORWARD CURRENT



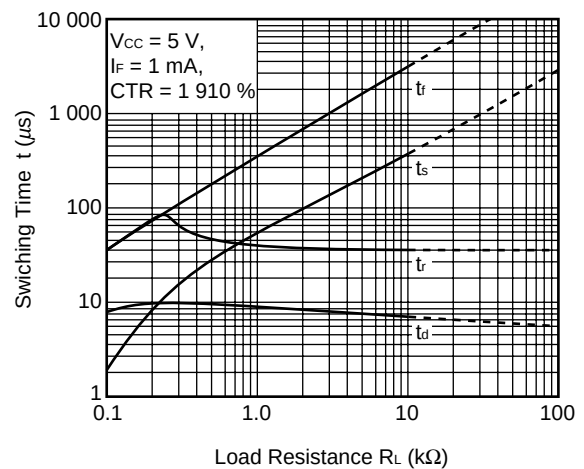
CURRENT TRANSFER RATIO vs.
FORWARD CURRENT

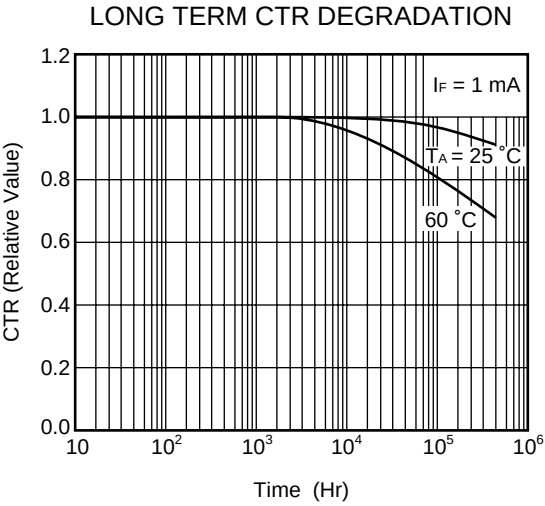
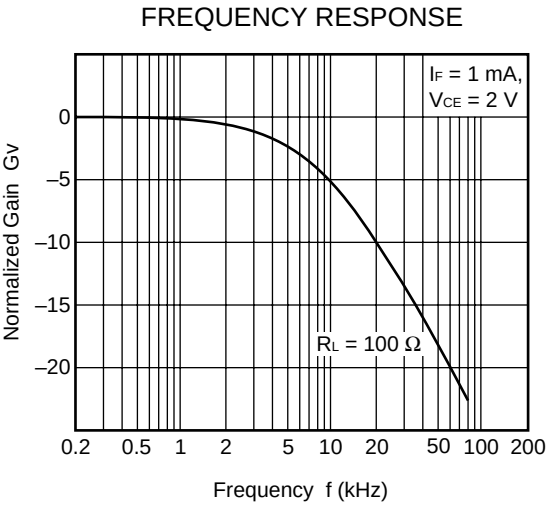


SWITCHING TIME vs.
LOAD RESISTANCE



SWITCHING TIME vs.
LOAD RESISTANCE

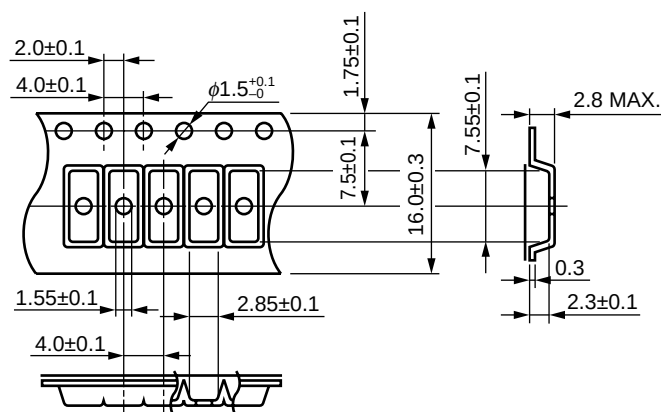




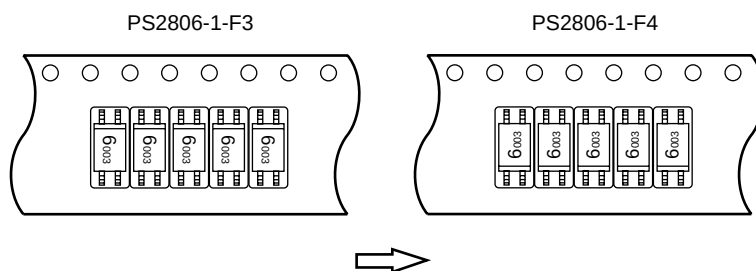
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (UNIT: mm)

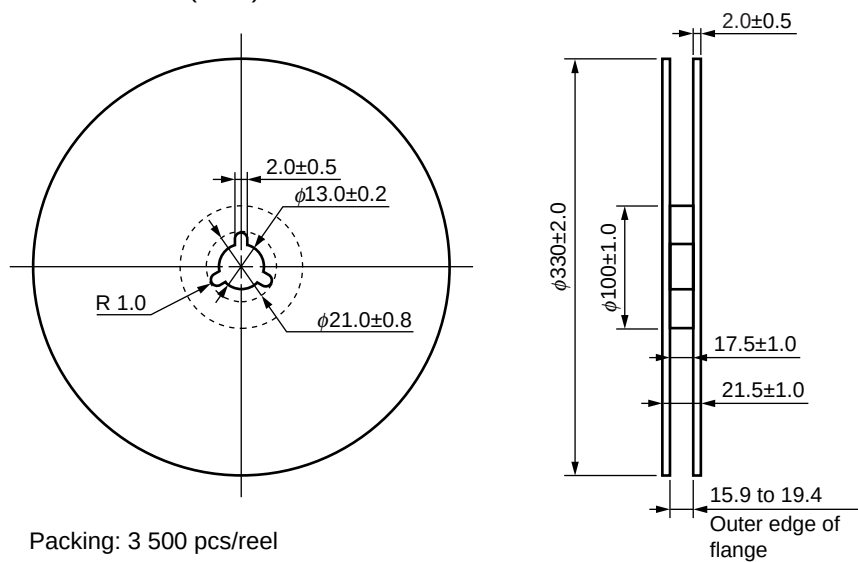
Outline and Dimensions (Tape)



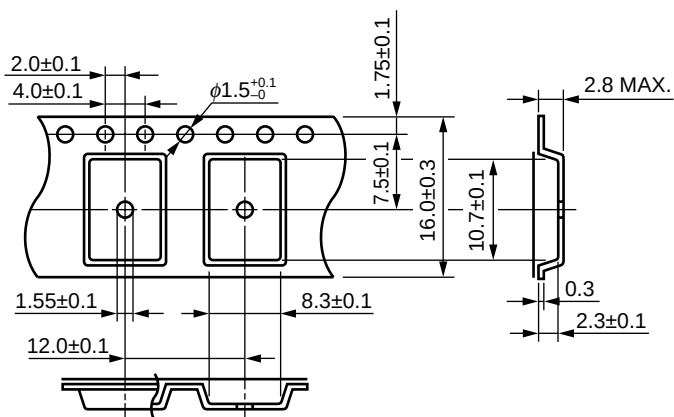
Tape Direction



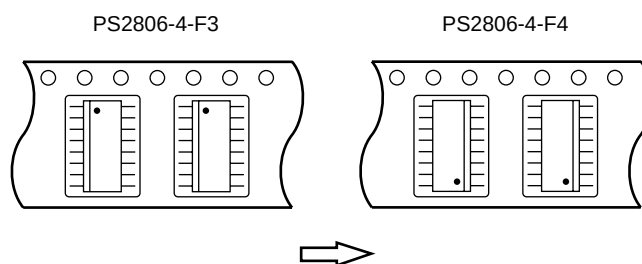
Outline and Dimensions (Reel)



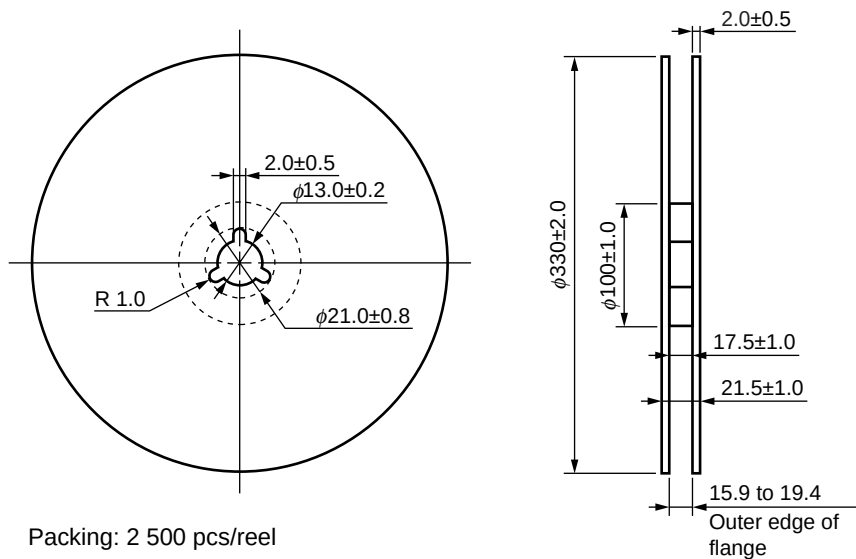
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



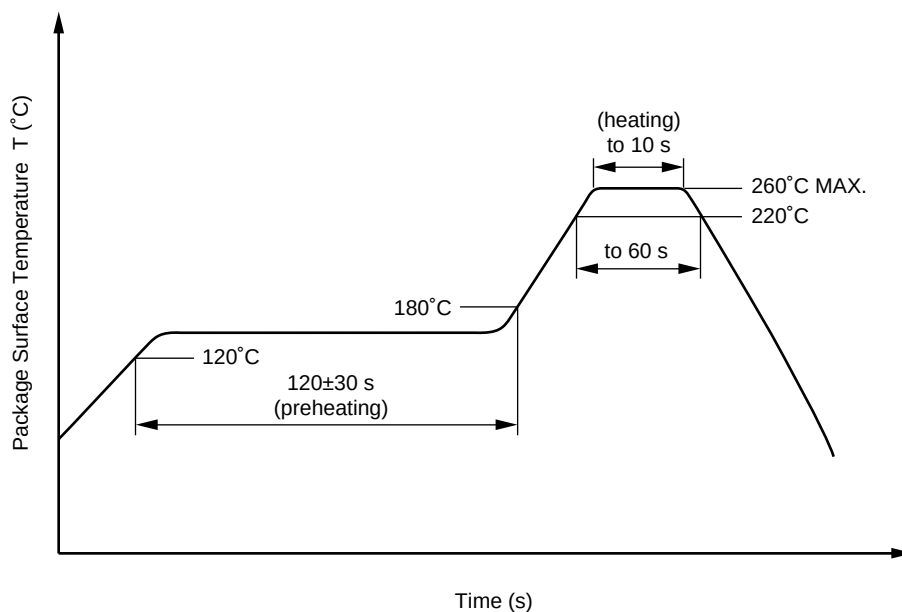
★ NOTES ON HANDLING

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

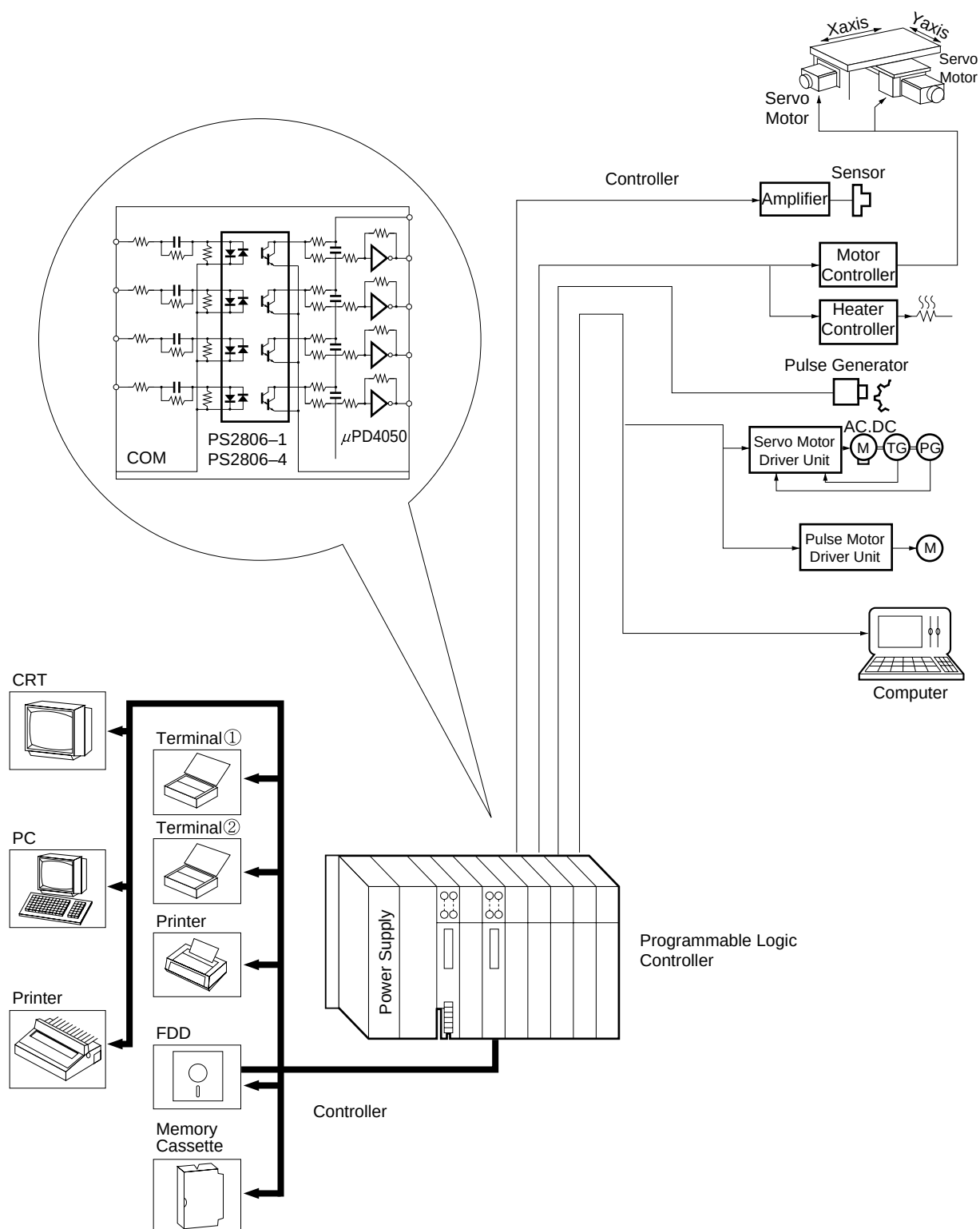
Be aware that when voltage is applied suddenly between the photocoupler's input and output or between collector-emitters at startup, the output side may enter the on state, even if the voltage is within the absolute maximum ratings.

★ USAGE CAUTIONS

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

PROGRAMMABLE LOGIC CONTROLLERS EXAMPLE

Purpose: In-out interface



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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

NEC Compound Semiconductor Devices, Ltd.

5th Sales Group, Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579 E-mail: salesinfo@csd-nec.com

NEC Compound Semiconductor Devices Hong Kong Limited

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309
Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859
Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH <http://www.ee.nec.de/>

TEL: +49-211-6503-01 FAX: +49-211-6503-487

California Eastern Laboratories, Inc. <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279