

**LOW (AC) INPUT CURRENT, HIGH CTR
4, 16-PIN SOP PHOTOCOUPLER**

–NEPOC Series–

DESCRIPTION

The PS2815-1 and PS2815-4 are optically coupled isolators containing GaAs light emitting diodes and an NPN silicon phototransistor in a plastic SOP for high density applications.

The package is an SOP (Small Outline Package) type for high density mounting applications.

FEATURES

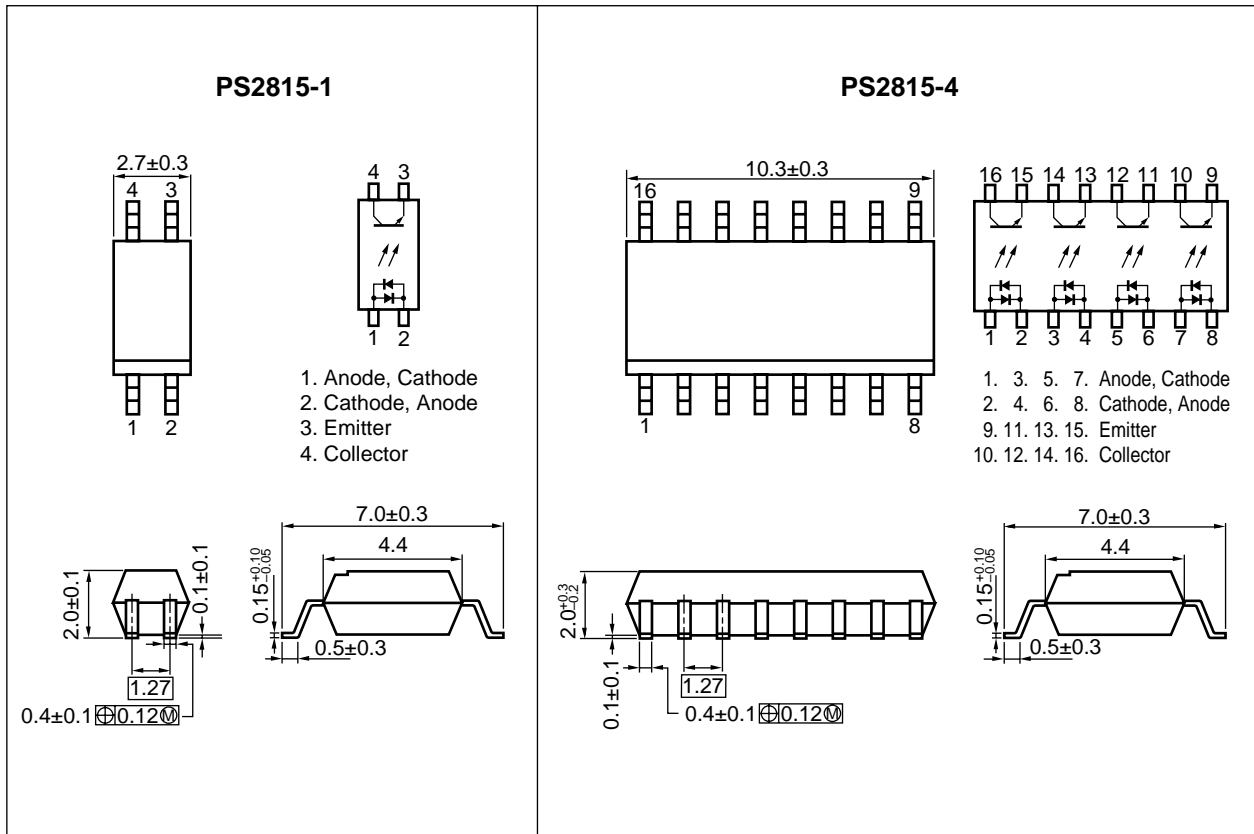
- AC input response
- High current transfer ratio (CTR = 200 % TYP. @ $I_F = \pm 1$ mA)
- High isolation voltage (BV = 2 500 Vr.m.s.)
- Small and thin package (4, 16-pin SOP, Pin pitch 1.27 mm)
- Ordering number of tape product: PS2815-1-F3, F4, PS2815-4-F3, F4
- Safety standards: PS2815-1, -4
 - UL approved: File No. E72422 (S)

APPLICATIONS

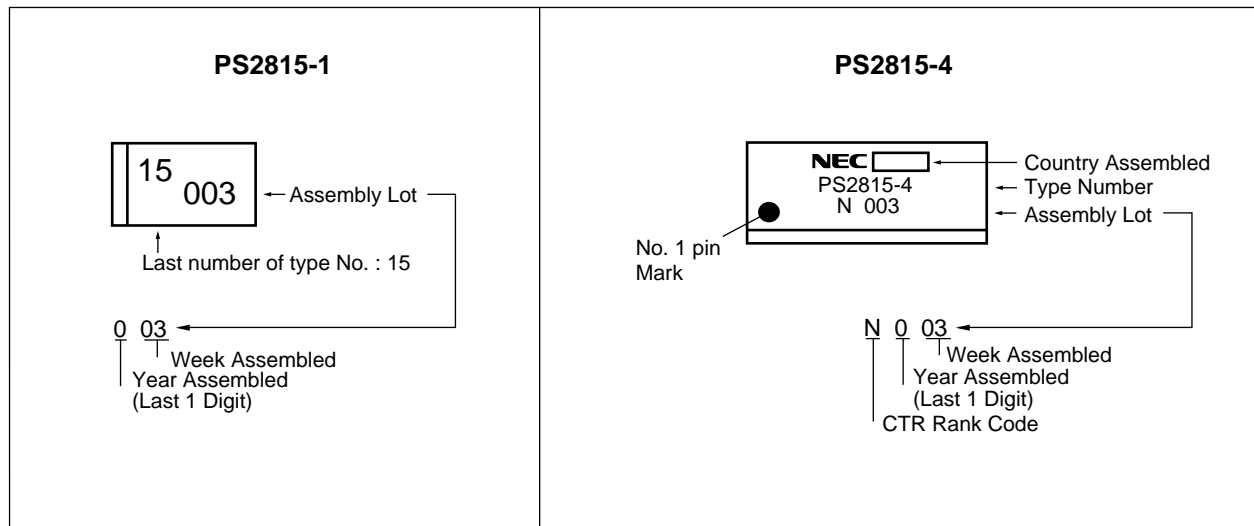
- Programmable logic controllers
- Modem/FAX

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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 (UNIT: mm)



MARKING



ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number ^{*1}
PS2815-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	PS2815-1
PS2815-1-F3		Embossed Tape 3 500 pcs/reel	
PS2815-1-F4			
PS2815-4	16-pin SOP	Magazine Case 45 pcs	PS2815-4
PS2815-4-F3		Embossed Tape 2 500 pcs/reel	
PS2815-4-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
			PS2815-1	PS2815-4	
Diode	Forward Current (DC)	I _F	±50		mA
	Power Dissipation Derating	ΔP _D /°C	0.6	0.7	mW/°C
	Power Dissipation	P _D	60	70	mW/ch
	Peak Forward Current ^{*1}	I _{FP}	±1.0		A
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	1.2		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

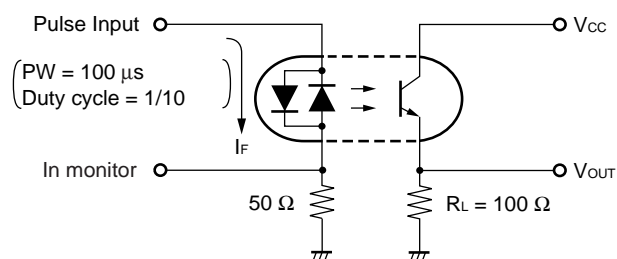
*1 PW = 100 μs, Duty Cycle = 1 %

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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

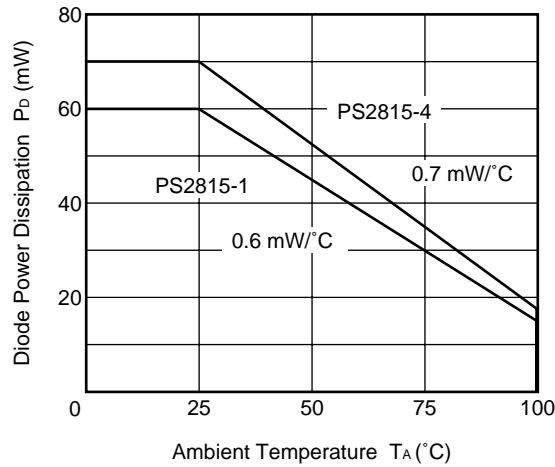
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = ±5 mA		1.15	1.4	V
	Terminal Capacitance	C _t	V = 0 V, f = 1 MHz		30		pF
Transistor	Collector to Emitter Dark Current	I _{CEO}	I _F = 0 mA, V _{CE} = 40 V			100	nA
Coupled	Current Transfer Ratio (I _c /I _F)	CTR	I _F = ±1 mA, V _{CE} = 5 V	100	200	400	%
	Collector Saturation Voltage	V _{CE(sat)}	I _F = ±1 mA, I _c = 0.2 mA			0.3	V
	Isolation Resistance	R _{I-O}	V _{I-O} = 1 kV _{DC}	10 ¹¹			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1 MHz		0.4		pF
	Rise Time ^{*1}	t _r	V _{CC} = 5 V, I _c = 2 mA, R _L = 100 Ω		4		μs
	Fall Time ^{*1}	t _f			5		

*1 Test circuit for switching time

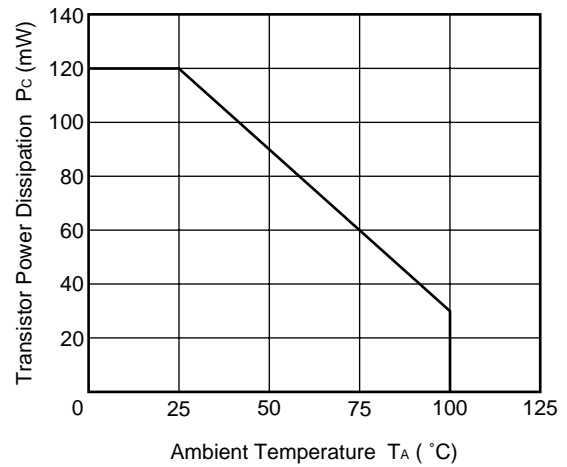


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

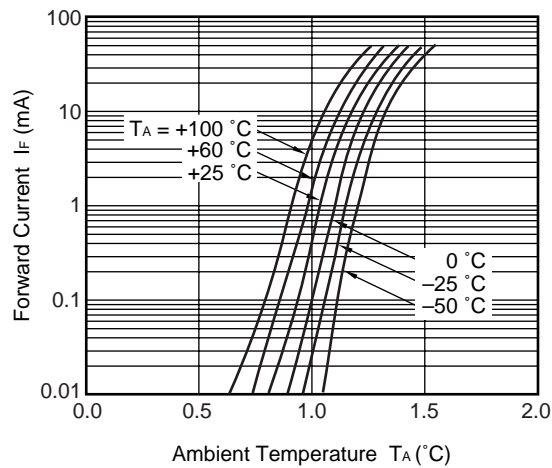
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



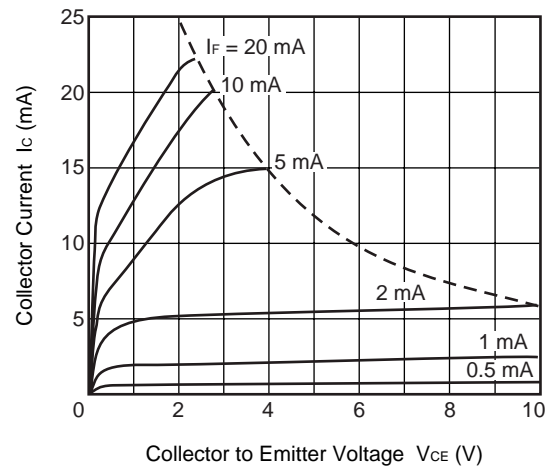
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



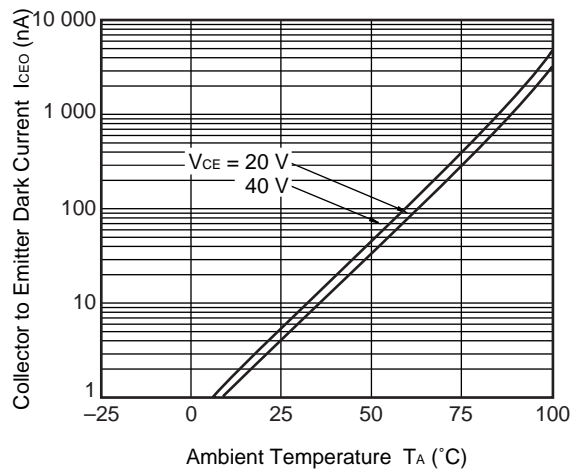
FORWARD CURRENT vs. AMBIENT TEMPERATURE



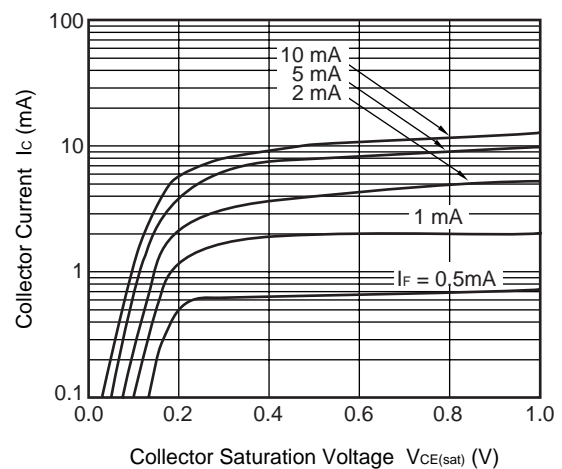
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



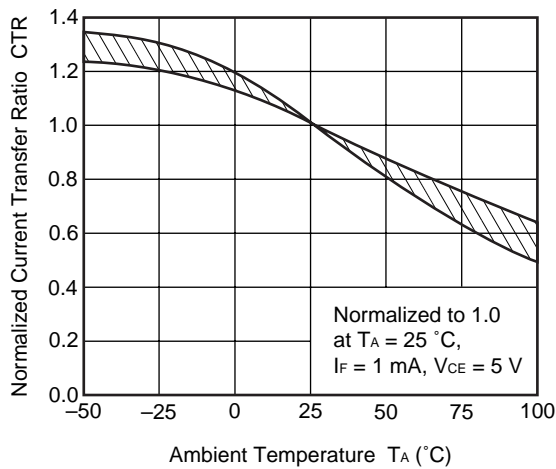
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



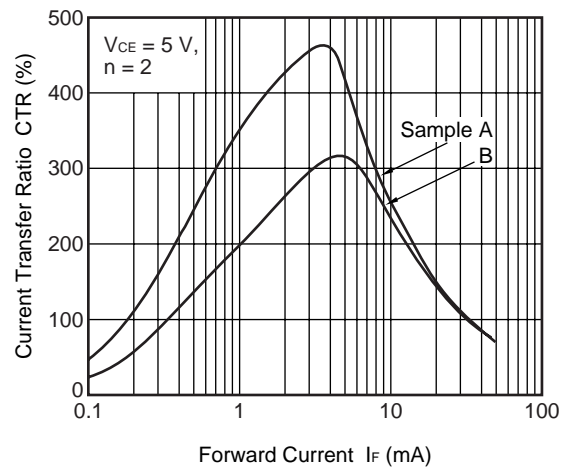
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



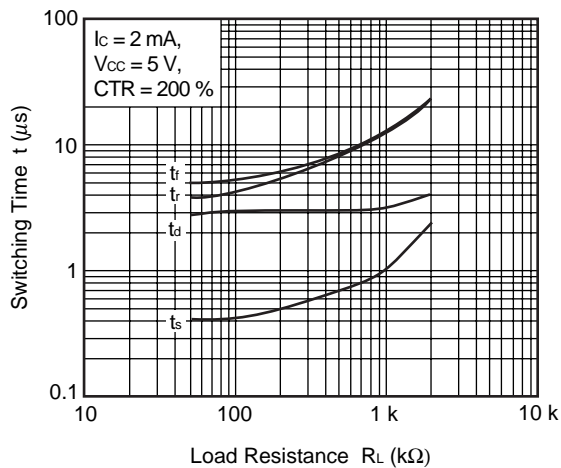
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



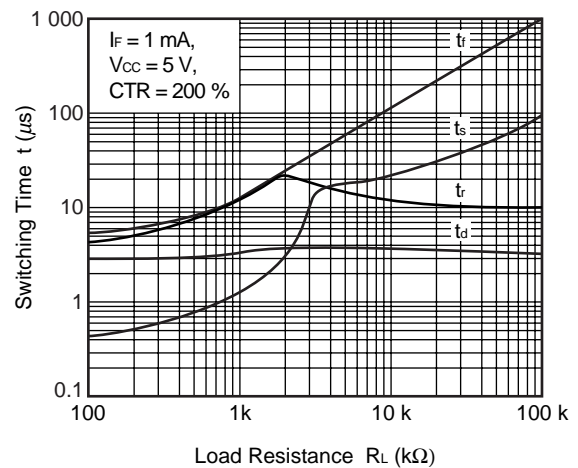
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



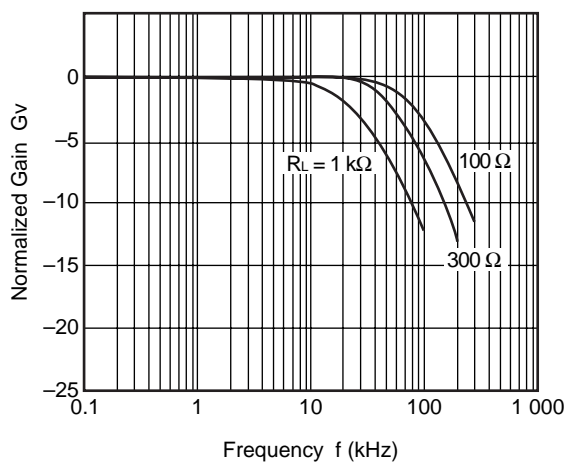
SWITCHING TIME vs. LOAD RESISTANCE



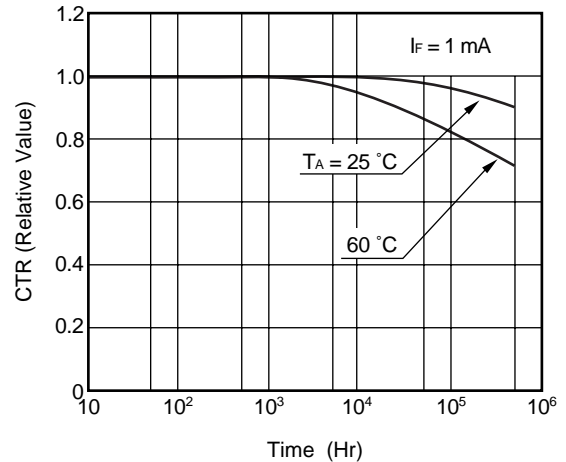
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



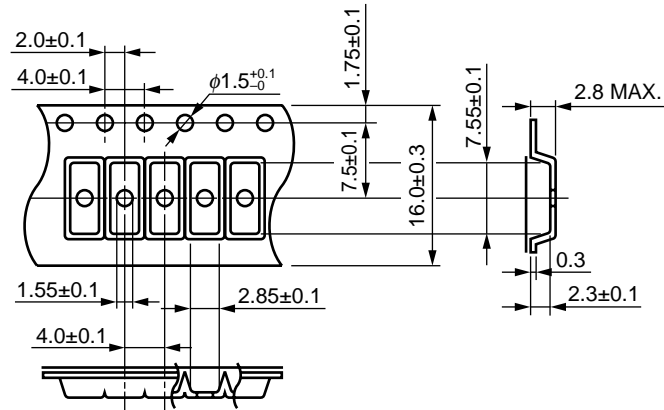
LONG TERM CTR DEGRADATION



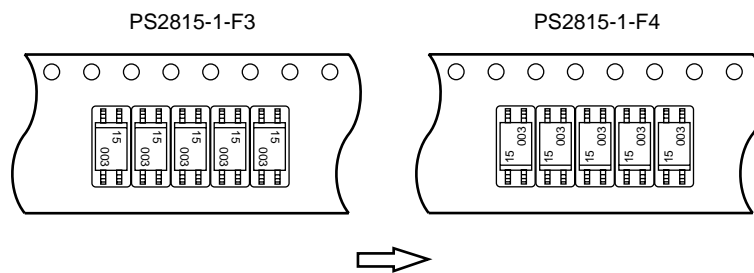
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (UNIT: mm)

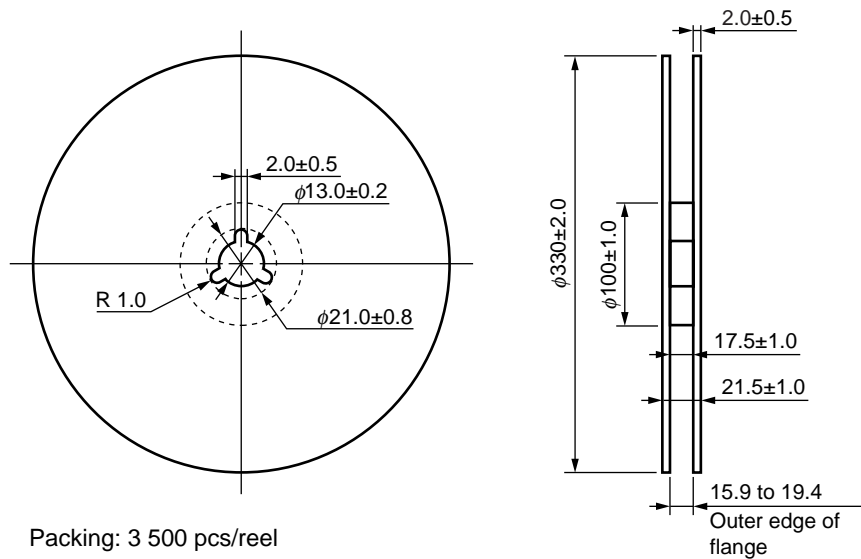
Outline and Dimensions (Tape)



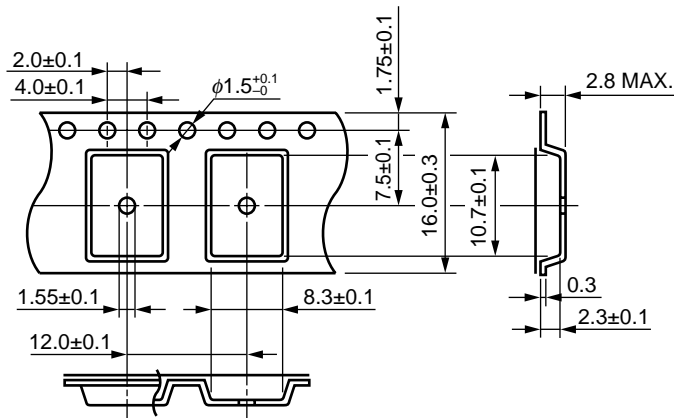
Tape Direction



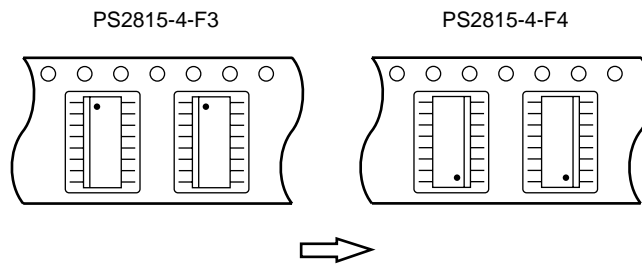
Outline and Dimensions (Reel)



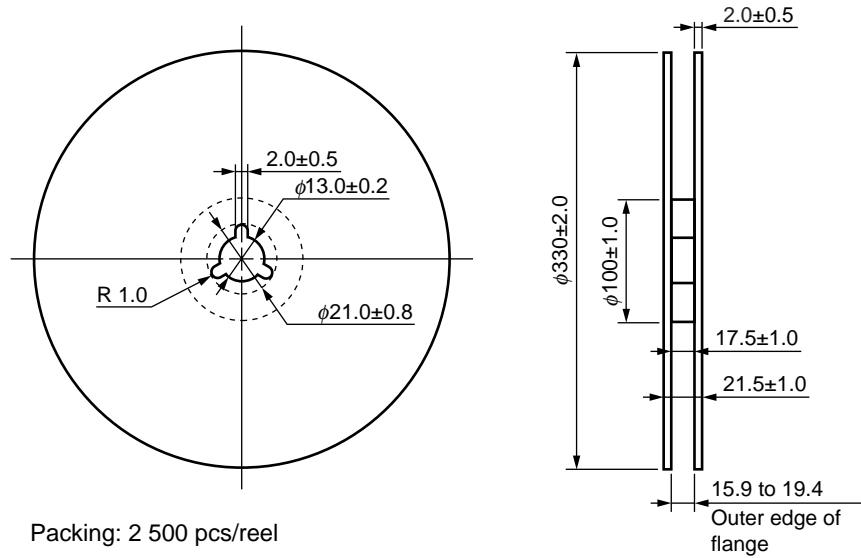
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



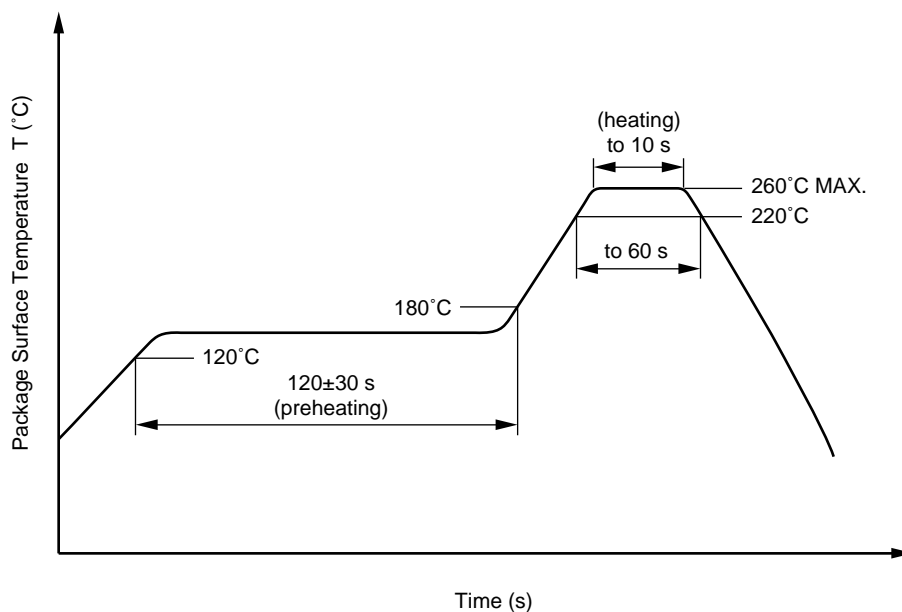
★ NOTES ON HANDLING

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.

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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT

Caution	GaAs Products	<p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • 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. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p>
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