

HIGH CTR, AC INPUT
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

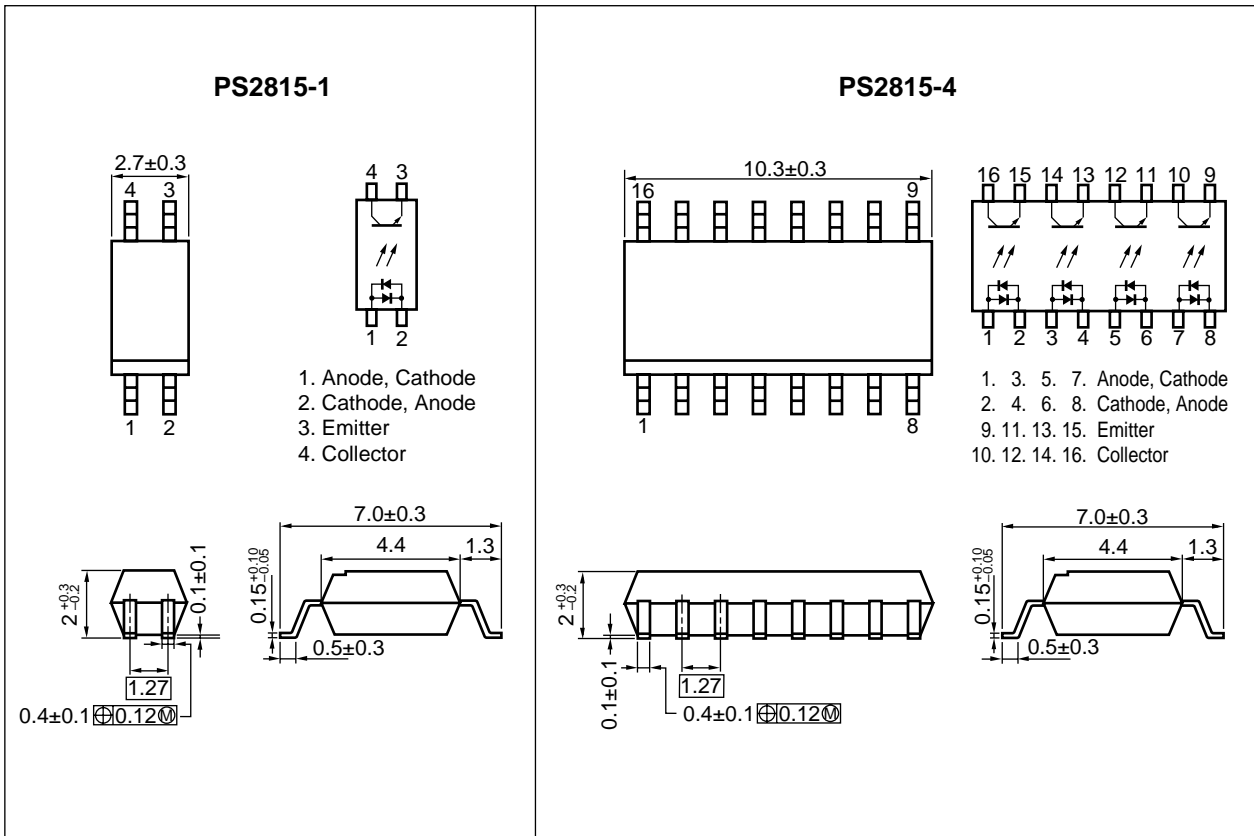
- AC input response
- High current transfer ratio (CTR = 200 % TYP. @ $I_F = \pm 1$ mA)
- High isolation voltage (BV = 2 500 Vr.m.s.)
- Small and thin package (4, 16-pin SOP, Pin pitch 1.27 mm)
- Ordering number of taping product: PS2815-1-F3, F4, PS2815-4-F3, F4

APPLICATIONS

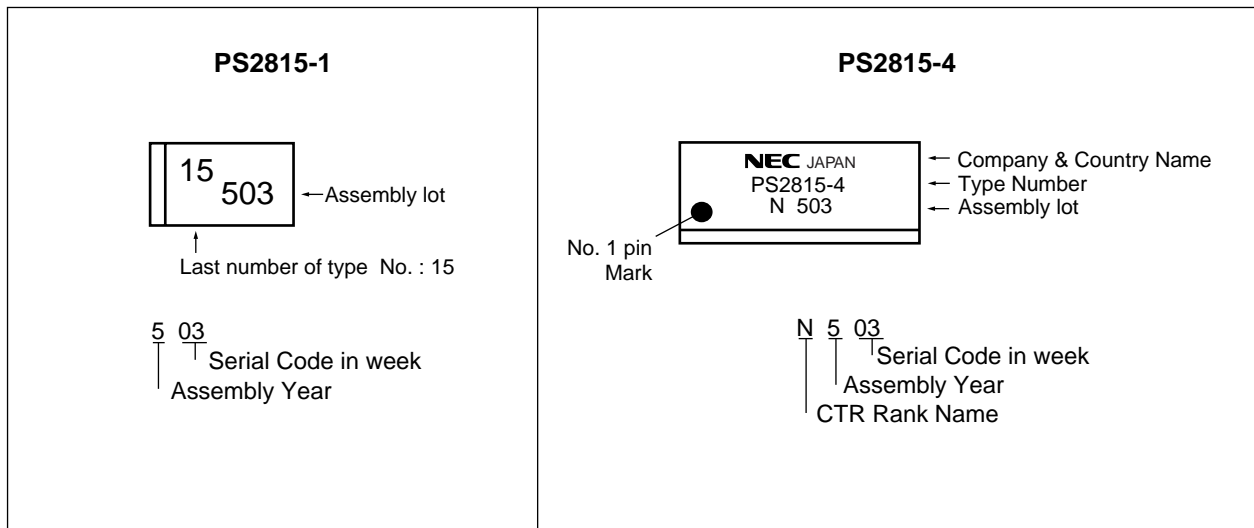
- Programmable logic controllers
- Modem/FAX

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

PACKAGE DIMENSIONS (in millimeters)



MARKING



ORDERING INFORMATION

Part Number	Package	Packing Style	Safety Standards Approval	Application Part Number ^{*1}
PS2815-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	UL, BSI approved	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}	±0.5		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

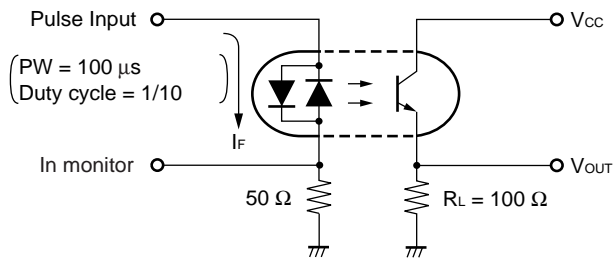
*1 PW = 100 μs, Duty Cycle = 1 %

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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

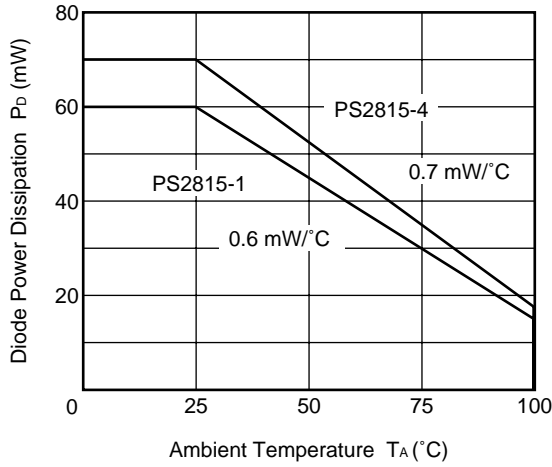
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = ±5 mA		1.15	1.4	V
	Terminal Capacitance	C _t	V = 0 V, f = 1 MHz		60		pF
Transistor	Collector to Emitter Current	I _{CEO}	I _F = 0 mA, V _{CE} = 40 V			100	nA
Coupled	Current Transfer Ratio (I _C /I _F)	CTR	I _F = ±1 mA, 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 kVDC	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

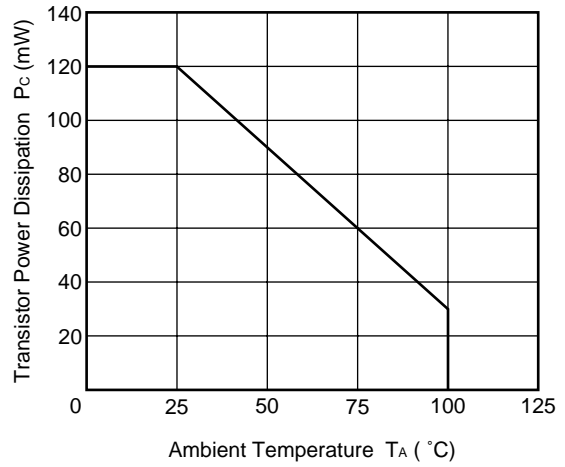


TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

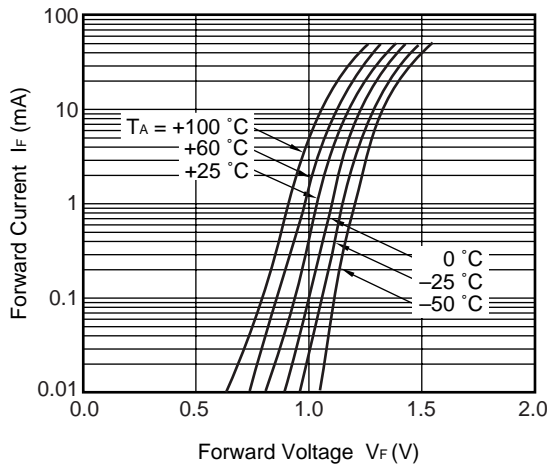
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



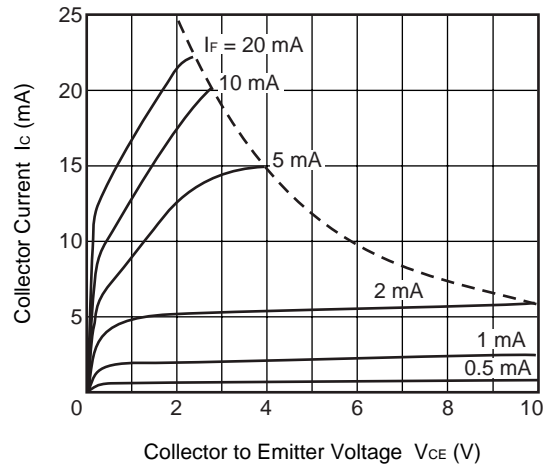
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



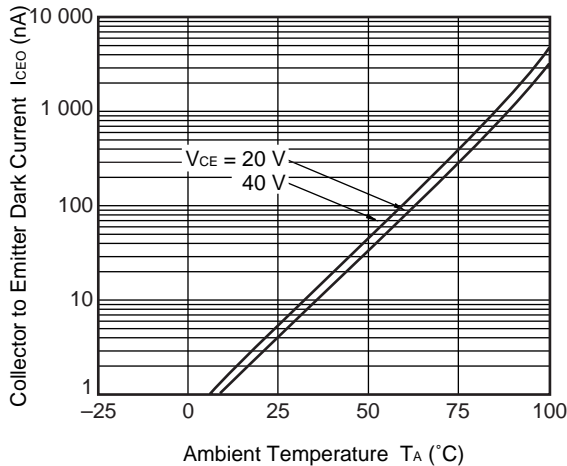
FORWARD CURRENT vs. FORWARD VOLTAGE



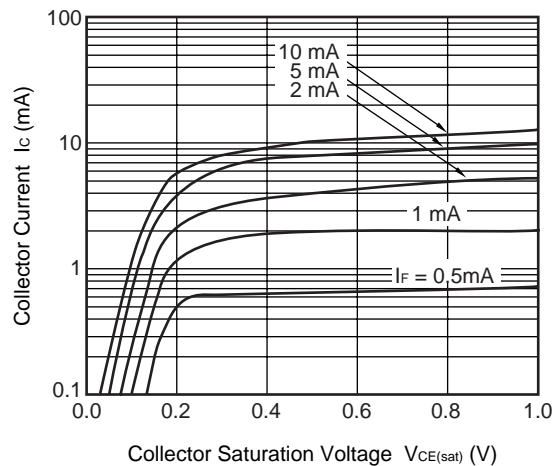
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



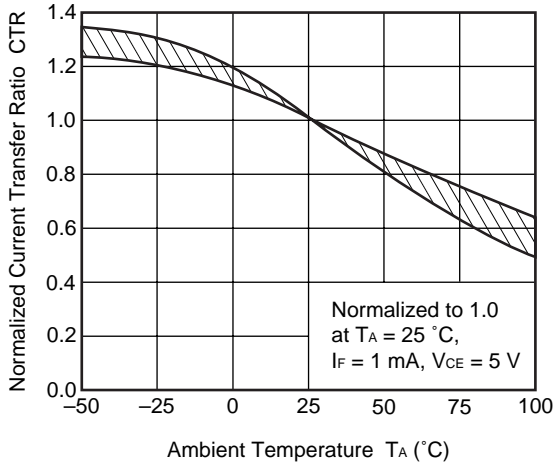
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



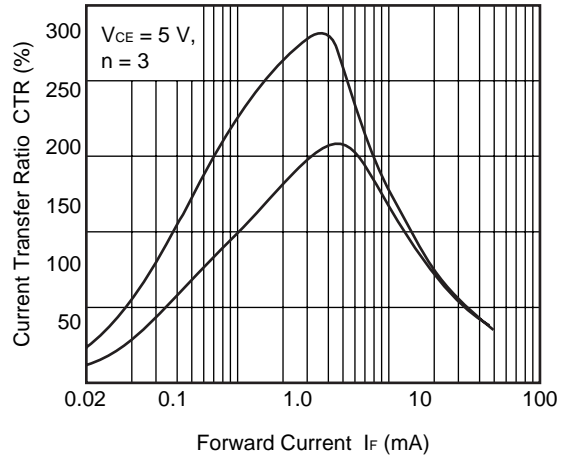
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



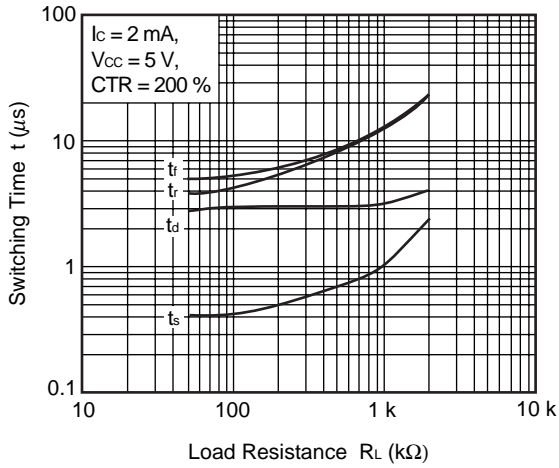
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



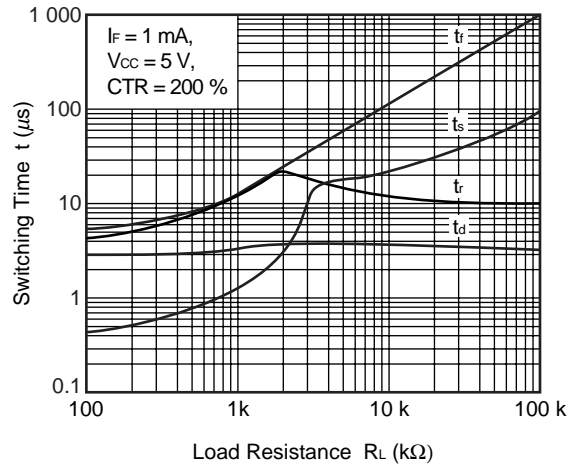
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



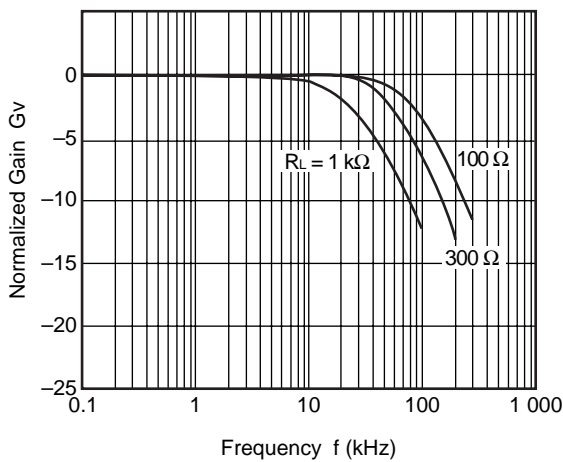
SWITCHING TIME vs. LOAD RESISTANCE



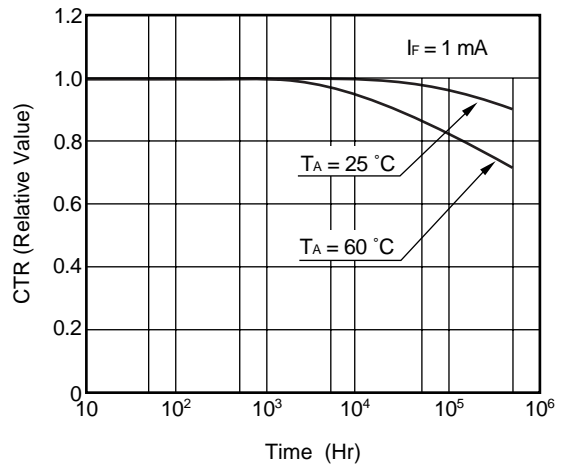
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



LONG TERM CTR DEGRADATION

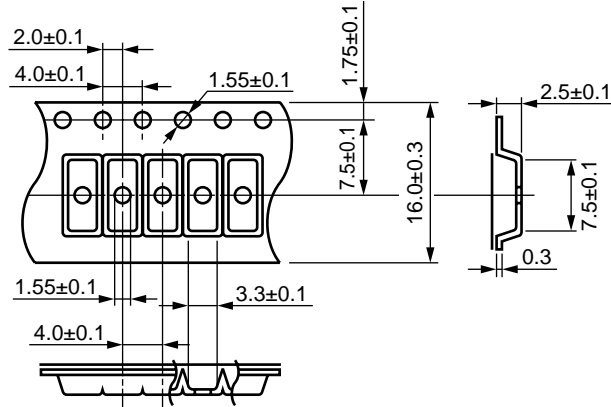


Remark The graphs indicate nominal characteristics.

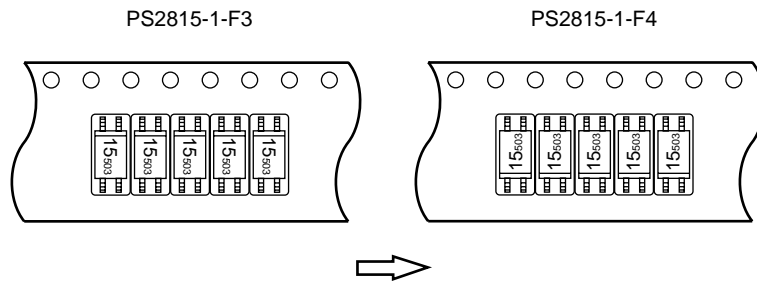
TAPING SPECIFICATIONS (in millimeters)

PS2815-1

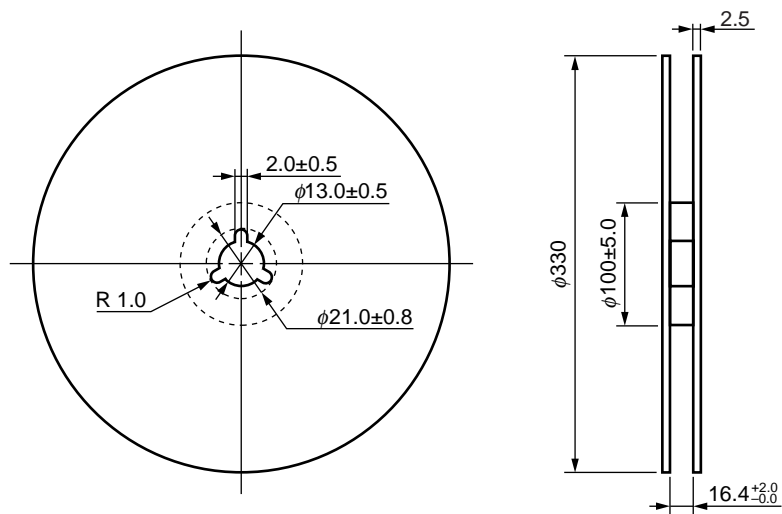
Outline and Dimensions (Tape)



Tape Direction



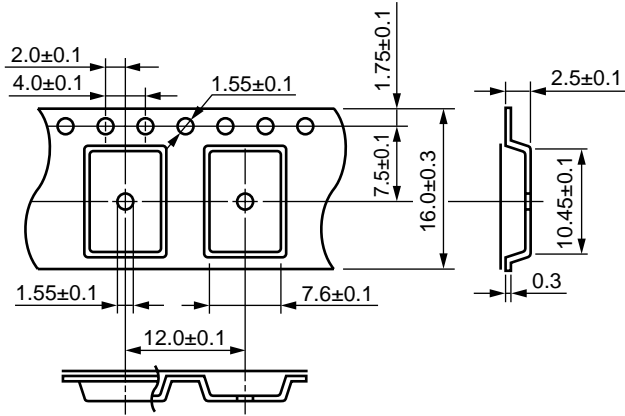
Outline and Dimensions (Reel)



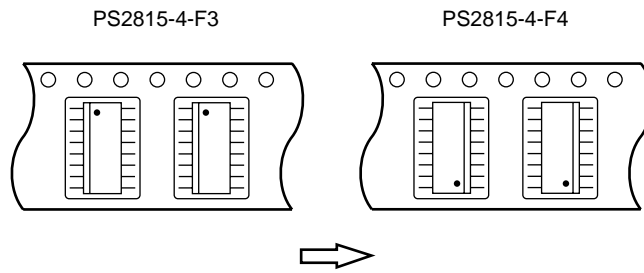
Packing: 3 500 pcs/reel

PS2815-4

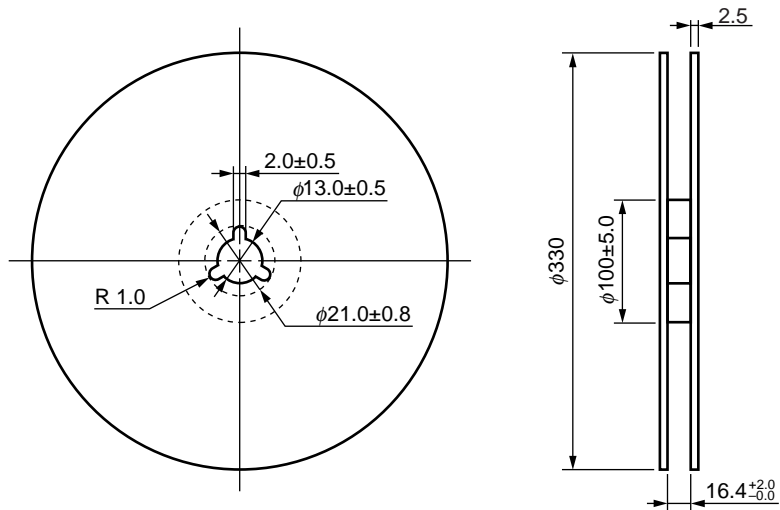
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



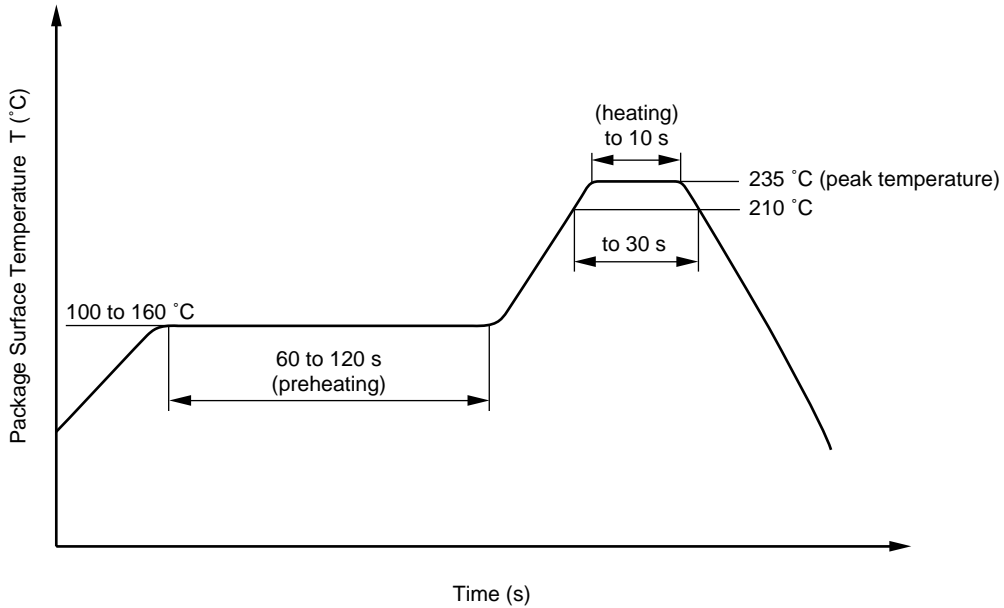
Packing: 2 500 pcs/reel

RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

- Peak reflow temperature 235 °C or below (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



(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.)

(3) Cautions

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

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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