NEC

PHOTOCOUPLER

PS2811-1,PS2811-4

LOW INPUT CURRENT, HIGH CTR 4, 16-PIN SOP PHOTOCOUPLER

–NEPOC Series–

DESCRIPTION

The PS2811-1 and PS2811-4 are optically coupled isolators containing a GaAs light emitting diode 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

- High current transfer ratio (CTR = 200 % TYP. @ I_F = ±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: PS2811-1-F3, F4, PS2811-4-F3, F4
- Safety standards: PS2811-1, -4
    - UL approved: File No. E72422 (S)

APPLICATIONS

- Programmable logic controllers
- Small power supply
- Hybrid IC
- Modem/FAX

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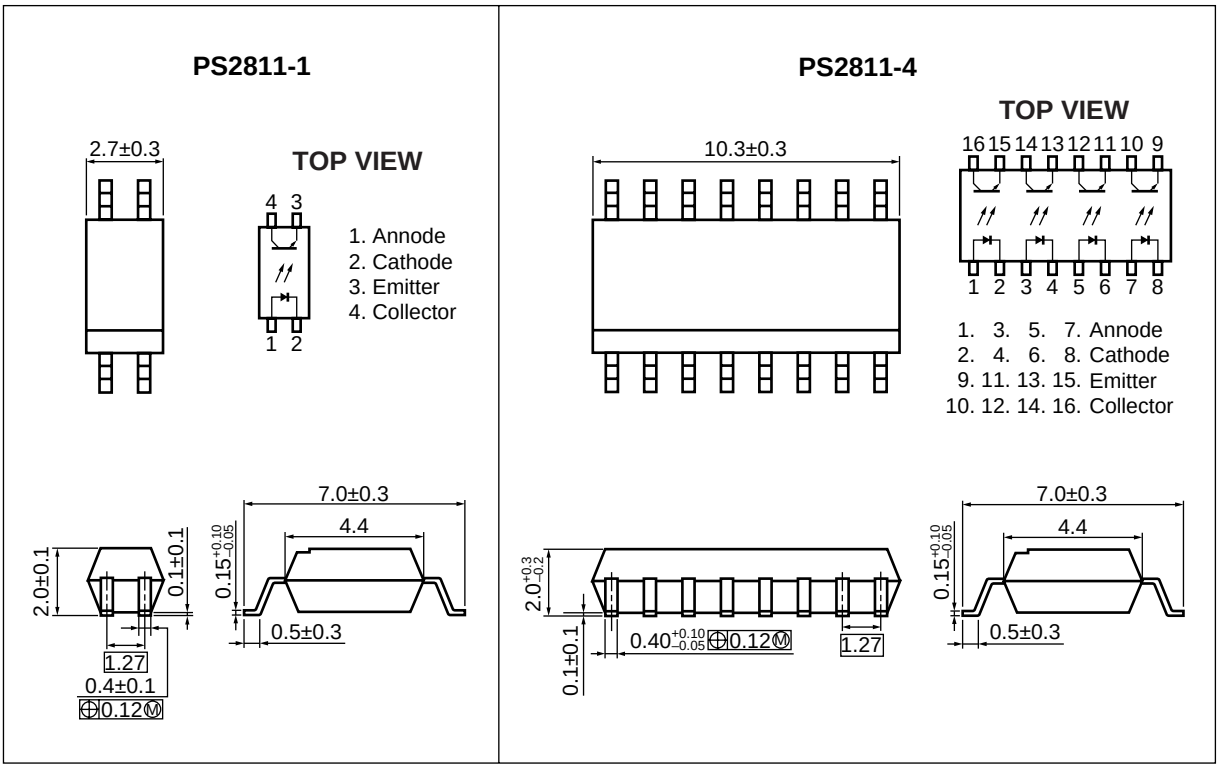
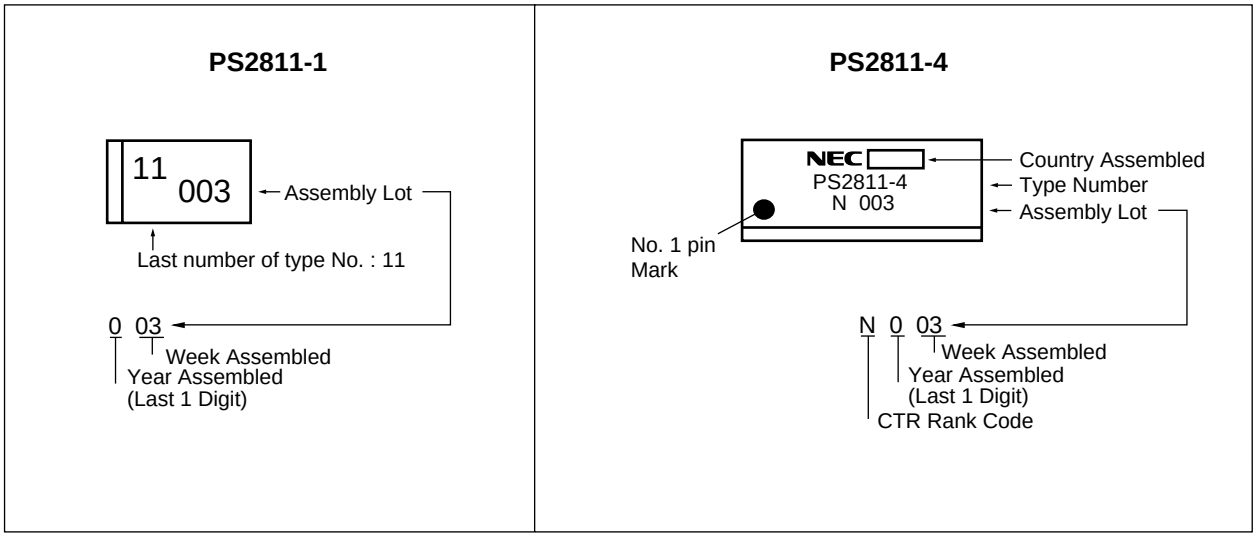
Date Published February 2003 CP(K)
Printed in Japan

The mark ★ shows major revised points.

★ **PACKAGE DIMENSIONS (UNIT: mm)**



MARKING



ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number*1
PS2811-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	PS2811-1
PS2811-1-F3		Embossed Tape 3 500 pcs/reel	
PS2811-1-F4			
PS2811-4	16-pin SOP	Magazine Case 45 pcs	PS2811-4
PS2811-4-F3		Embossed Tape 2 500 pcs/reel	
PS2811-4-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
			PS2811-1	PS2811-4	
Diode	Forward Current (DC)	I_F	50		mA
	Reverse Voltage	V_R	6		V
	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
	Reverse Current	I_R	V_R = 5 V			5	μA
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz		15		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) *1	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 *2	t_r	V_{CC} = 5 V, I_C = 2 mA, R_L = 100 Ω		4		μs
	Fall Time *2	t_f			5		

***1** CTR rank

PS2811-1

N : 100 to 400 (%)

K : 200 to 400 (%)

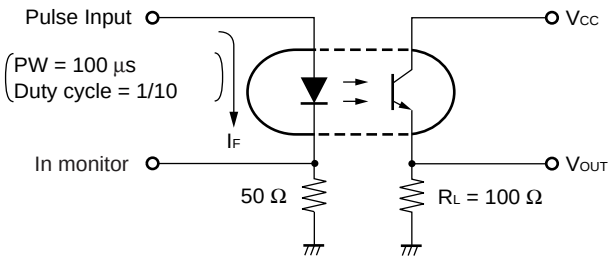
L : 150 to 300 (%)

M: 100 to 200 (%)

PS2811-4

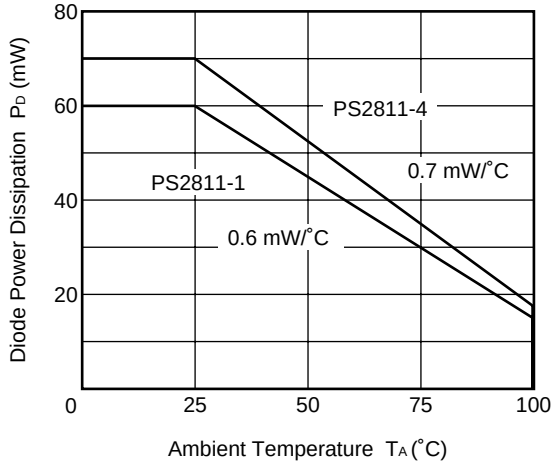
N : 100 to 400 (%)

***2** Test circuit for switching time

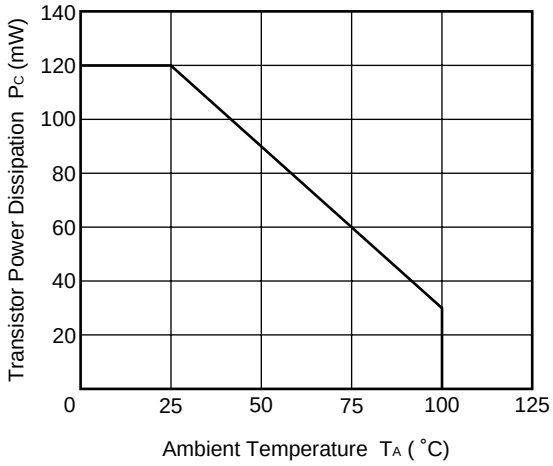


TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

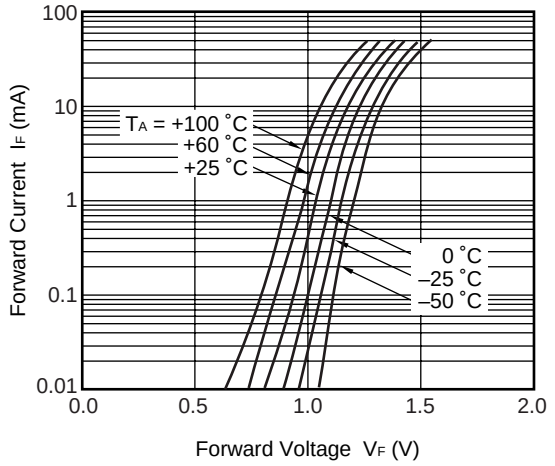
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



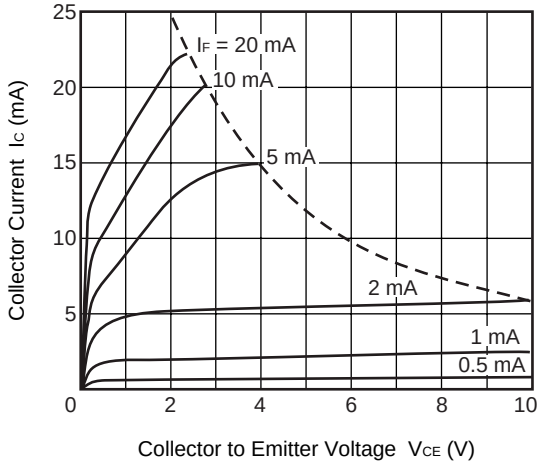
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



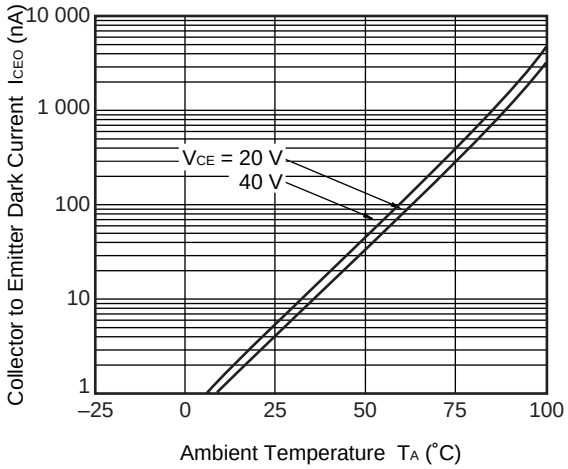
FORWARD CURRENT vs. FORWARD VOLTAGE



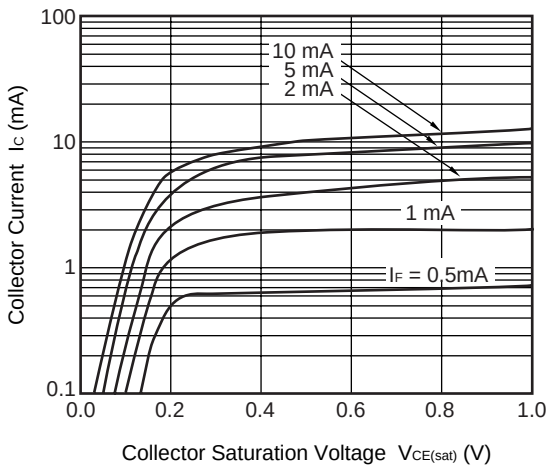
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



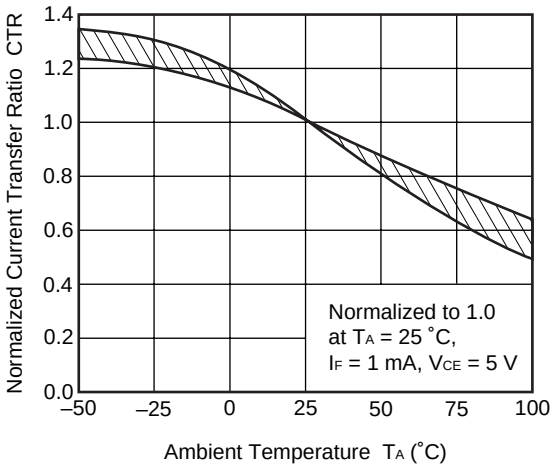
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



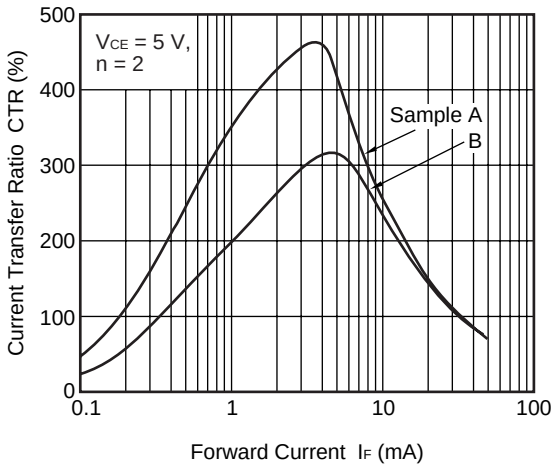
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



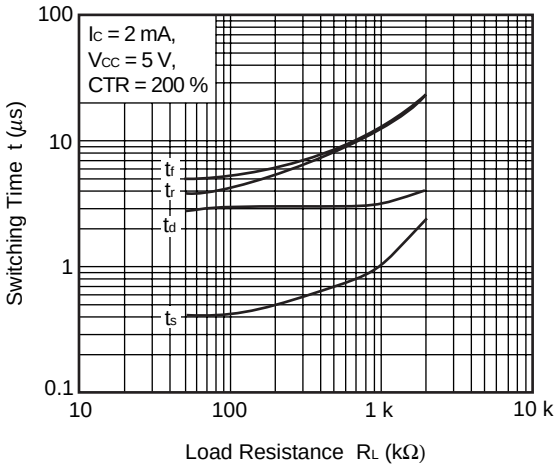
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



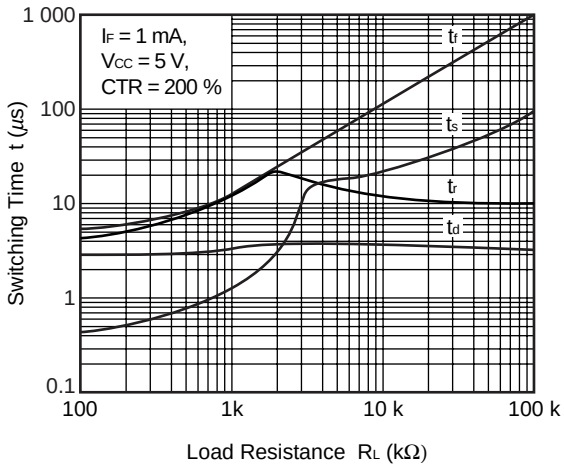
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



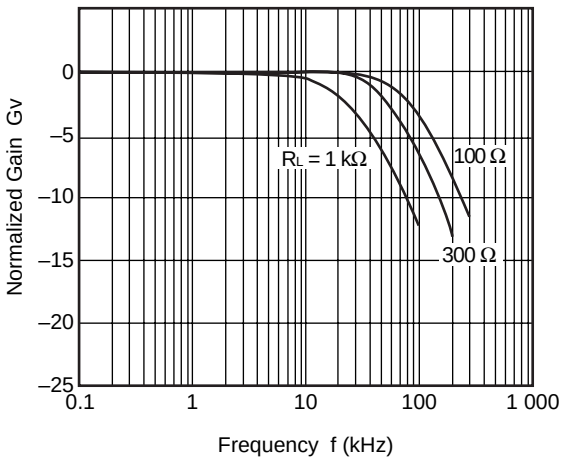
SWITCHING TIME vs. LOAD RESISTANCE



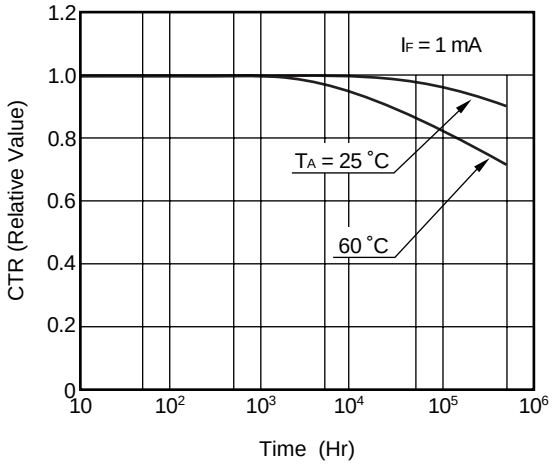
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



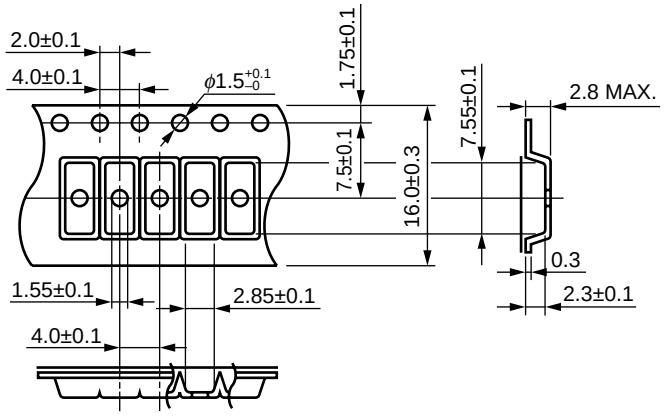
LONG TERM CTR DEGRADATION



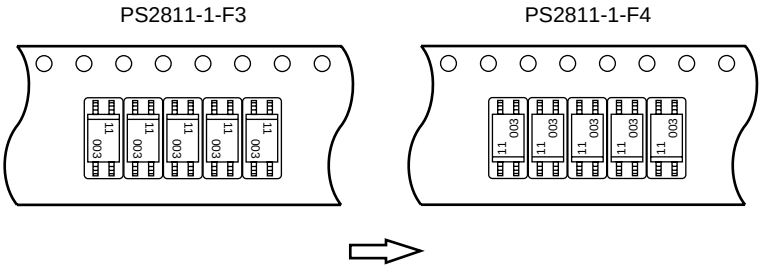
Remark The graphs indicate nominal characteristics.

★ **TAPING SPECIFICATIONS (UNIT: mm)**

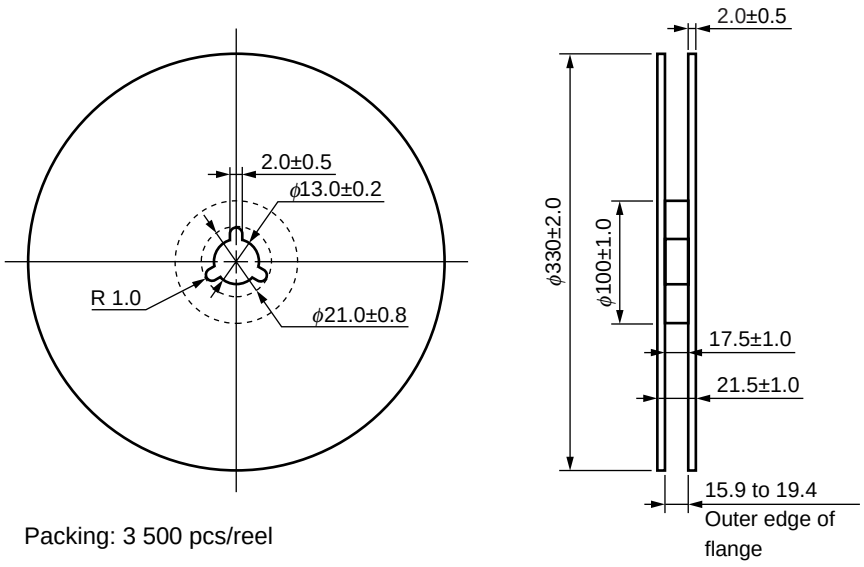
Outline and Dimensions (Tape)



Tape Direction

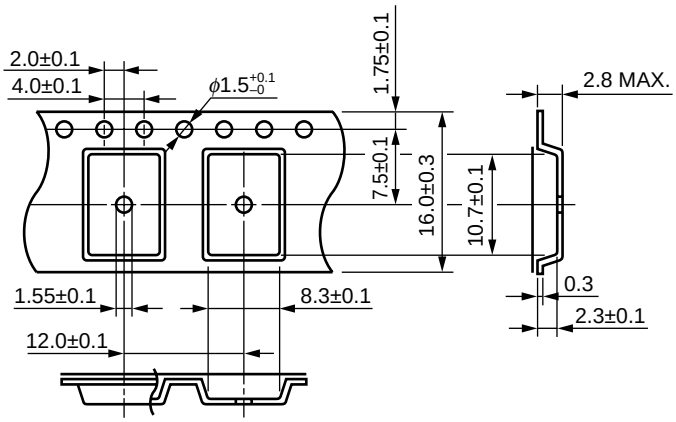


Outline and Dimensions (Reel)

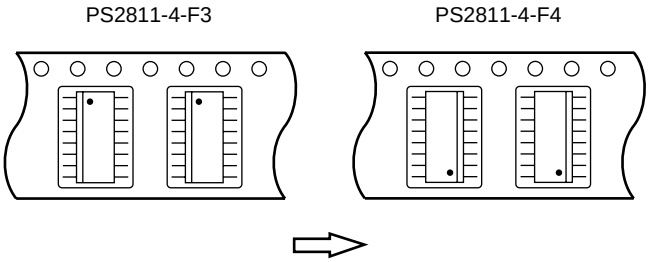


Packing: 3 500 pcs/reel

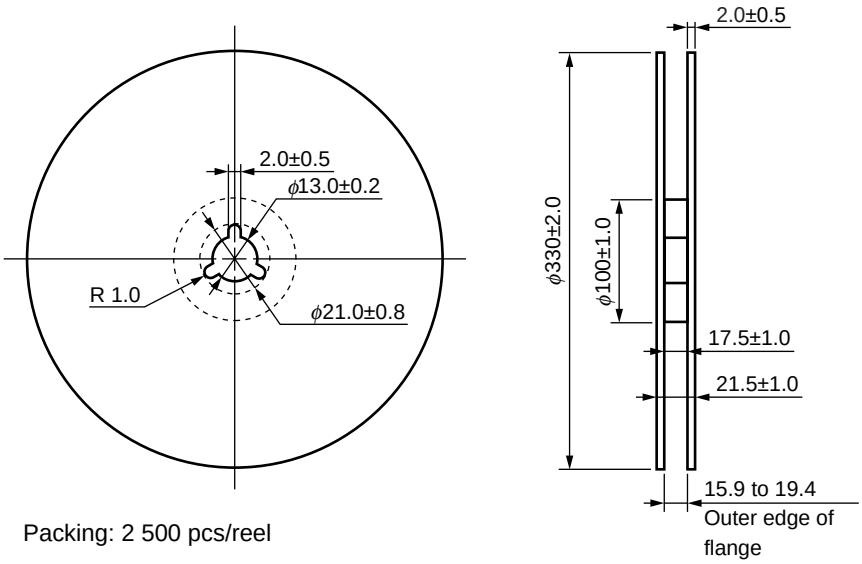
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



Packing: 2 500 pcs/reel

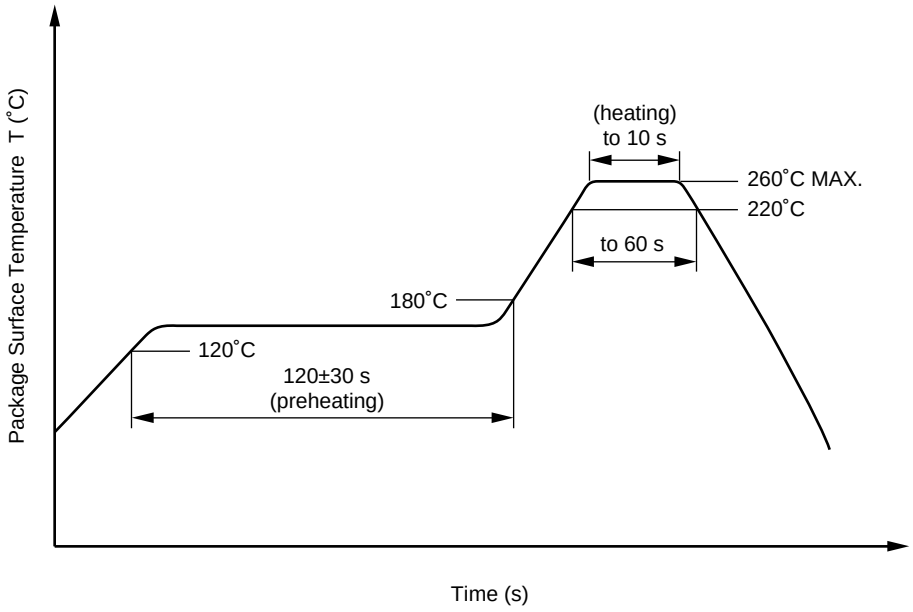
★ NOTES ON HANDLING

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

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▶For further information, please contact

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