



NEC's HIGH ISOLATION VOLTAGE SOP OPTOCOUPLER

PS2801-1
PS2801-4

FEATURES

- **HIGH ISOLATION VOLTAGE**
BV: 2.5 k V_{r.m.s.} MIN
- **HIGH COLLECTOR TO EMITTER VOLTAGE**
V_{CEO} = 80 V
- **SMALL THIN PACKAGE**
4, 16 Pin SOP, Lead pin pitch: 1.27 mm
- **HIGH SPEED SWITCHING**
t_r = 3 μs, t_f = 5 μs TYP
- **TAPING PRODUCT NUMBER**
PS2801-1-F3, PS2801-4-F3

DESCRIPTION

NEC's PS2801-1 and PS2801-4 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon phototransistor in a plastic SOP (Small Out-Line Package) for high density applications. Lead pin pitch is 1.27 mm. This package has a shield effect to cut off ambient light.

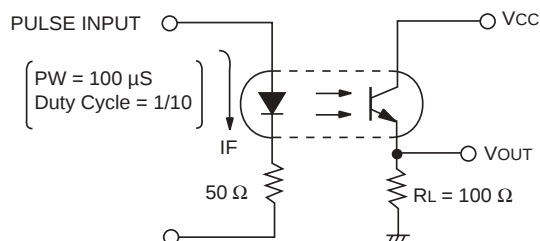
APPLICATIONS

- PROGRAMMABLE LOGIC CONTROLLERS
- MEASURING INSTRUMENTS
- POWER SUPPLY
- HYBRID IC

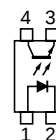
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER			PS2801-1, PS2801-4		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 5 mA	V	1.1	1.4
	I _R	Reverse Current, V _R = 5 V	μA		5
	C _t	Terminal Capacitance, V = 0, f = 1.0 MHz	pF	30	
Transistor	I _{CEO}	Collector to Emitter Dark Current, V _{CE} = 80 V, I _F = 0 mA	nA		100
Coupled	CTR	Current Transfer Ratio, I _F = 5 mA, V _{CE} = 5 V	%	80	600
	V _{CE(sat)}	Collector Saturation Voltage, I _F = 10 mA, I _C = 2 mA	V		0.3
	R _{I-O}	Isolation Resistance, V _{in-out} = 1.0 kVdc	Ω	10 ¹¹	
	C _{I-O}	Isolation Capacitance, V = 0, f = 1.0 MHz	pF	0.4	
	t _r	Rise Time ¹ , V _{CC} = 5 V, I _C = 2 mA, R _L = 100 Ω	μs	3	
	t _f	Fall Time ¹ , V _{CC} = 5 V, I _C = 2 mA, R _L = 100 Ω	μs	5	

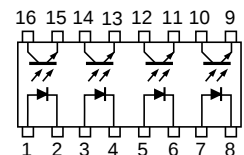
1. Test Circuit for Switching Time



PS2801-1



PS2801-4



PS2801-1, PS2801-4

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS2801-1	PS2801-4
Diode				
V _R	Reverse Voltage	V	6	6
I _F	Forward Current (DC)	mA	50	50
ΔP _D /°C	Power Dissipation Derating	mW/°C	0.6	0.8
P _D	Power Dissipation	mW/Ch	60	80
I _F (Peak)	Peak Forward Current PW = 100 μs, Duty Cycle 1%	A	1	1
Transistor				
V _{CEO}	Collector to Emitter Voltage	V	80	80
V _{ECO}	Emitter to Collector Voltage	V	6	6
I _C	Collector Current	mA/Ch	50	50
ΔP _C /°C	Power Dissipation Derating	mW/°C	1.2	1.2
P _C	Power Dissipation	mW/Ch	120	120
Coupled				
BV	Isolation Voltage ²	V _{r.m.s.}	2500	
T _{STG}	Storage Temperature	°C	-55 to +150	
T _{OP}	Operating Temperature	°C	-55 to +100	

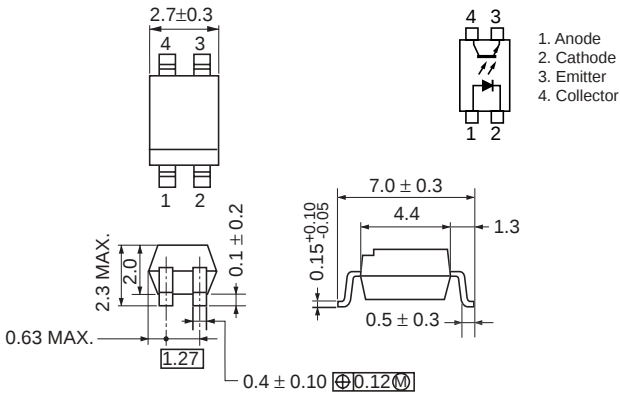
Notes:

- 1. Operation in excess of any one of these parameters may result in permanent damage.
- 2. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

OUTLINE DIMENSIONS (Units in mm)

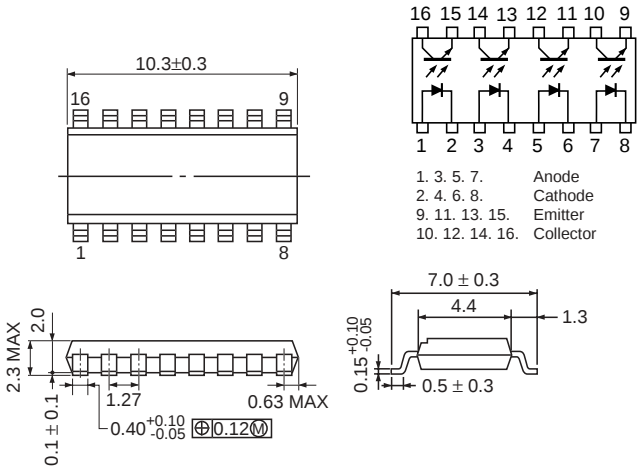
PS2801-1

PIN CONNECTION (Top View)



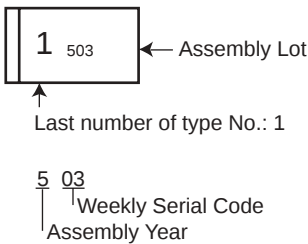
PS2801-4

PIN CONNECTION (Top View)

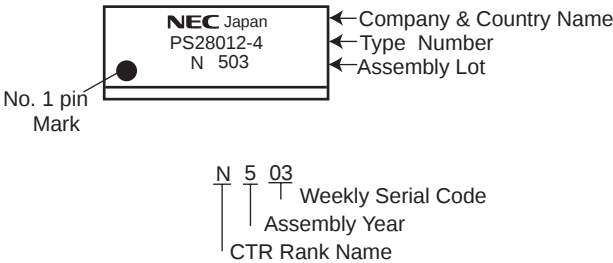


PACKAGE MARKING

PS2801-1



PS2801-4



CHANGE TO CARRIER TAPE DIMENSIONS

NEC plans to change the carrier tape material used for the taping of NEC's photocoupler PS28XX Series and PS874X due to environmental considerations. The change of the material of NEC's other photocouplers from vinyl chloride to polystyrene (Non-PVC) has been completed.

1. Affected products:

PS28XX-1, PS28XX-4, PS874X

2. Description of change:

Change of dimensions in correspondence with change of carrier tape material from vinyl chloride to polystyrene (non-PVC).

For dimensions, see below.

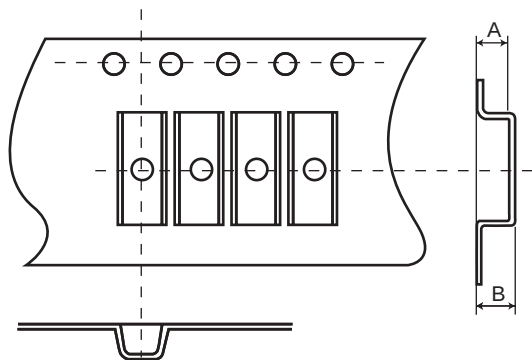
3. Reason for change:

Environmental considerations (non-PVC).

4. Implementation period:

This change will be implemented in products shipped from January 2001.

DIMENSIONS OF PS28XX-1 CARRIER TAPE

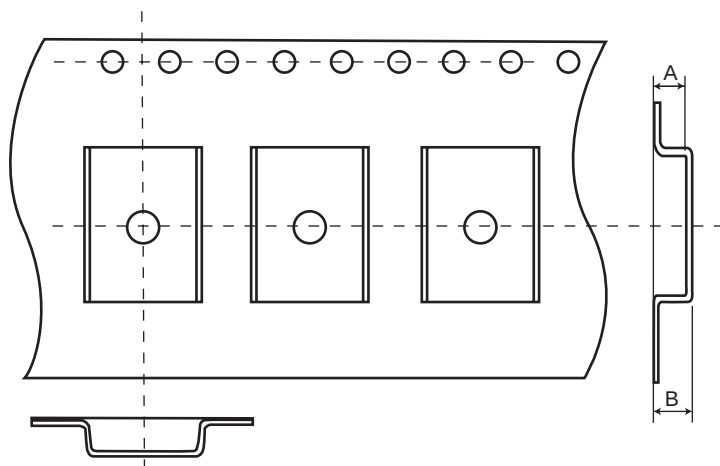


Portions A and B in the figure above will be changed as follows in correspondence with the change in material (non-PVC):

A: $2.5 \pm 0.1 \rightarrow 2.3 \pm 0.1$

B: $2.9 \text{ MAX} \rightarrow 2.8 \text{ MAX}$

CARRIER TAPE DIMENSIONS OF PS28XX-1, PS874X

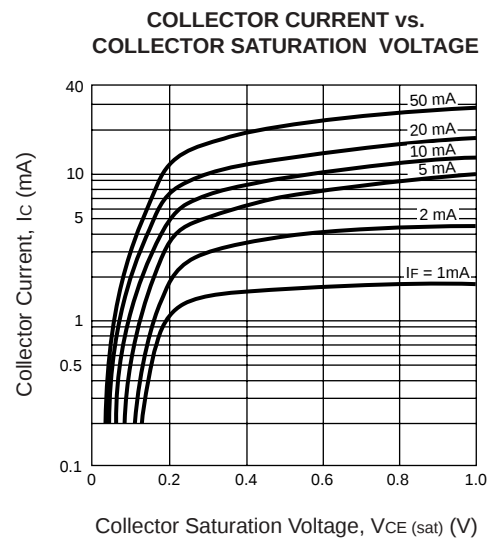
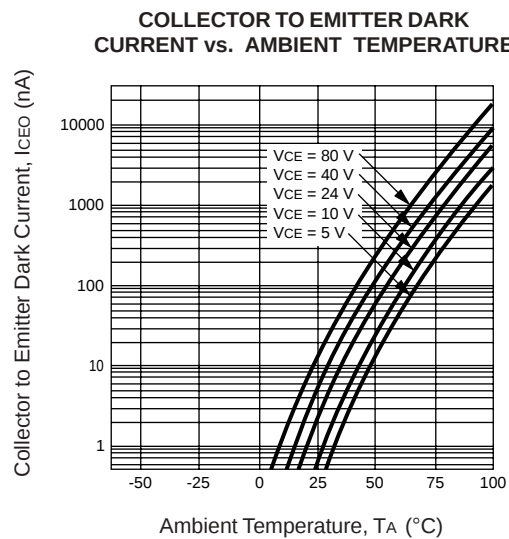
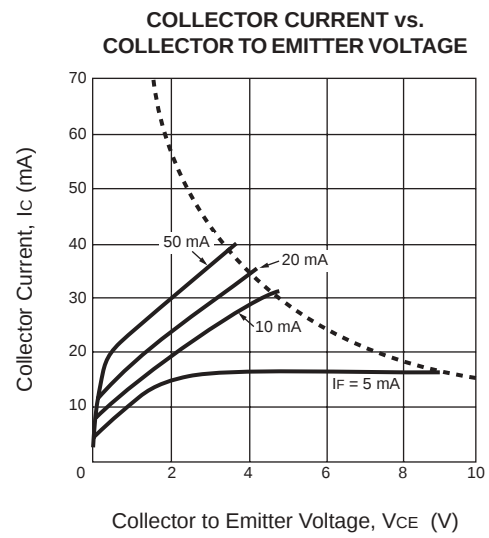
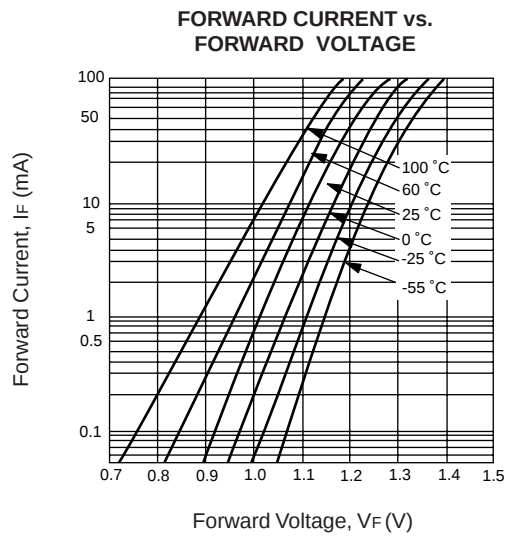
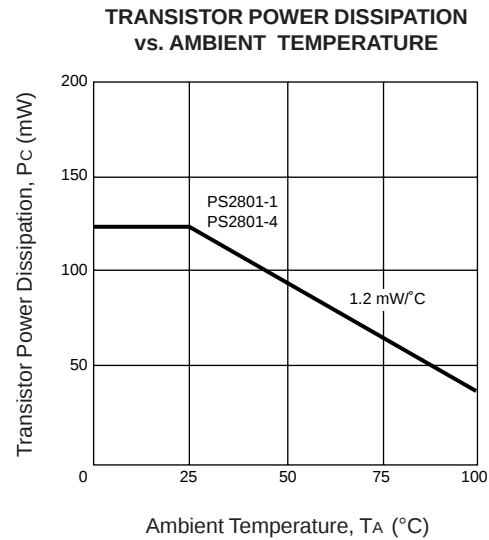
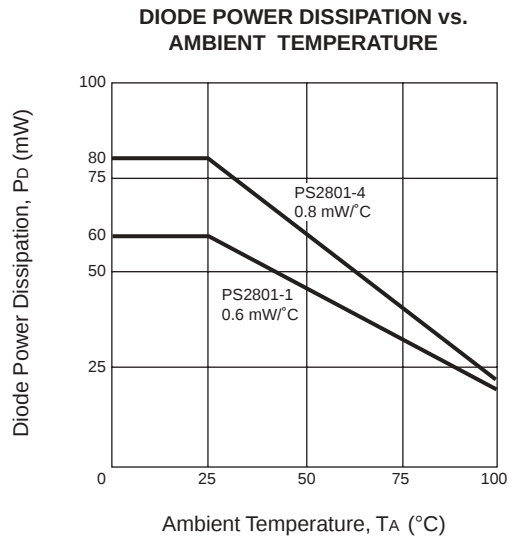


Portions A and B in the figure above will be changed as follows in correspondence with the change in material (non-PVC):

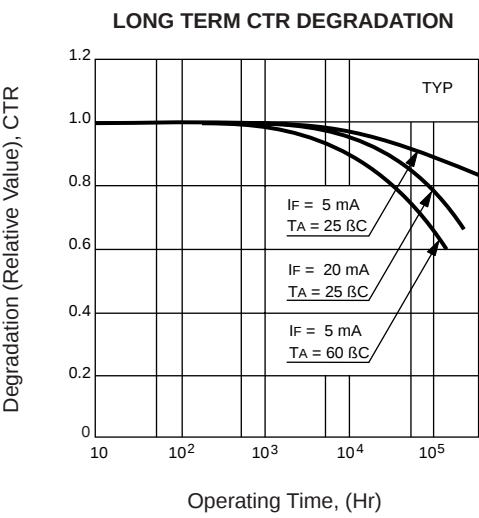
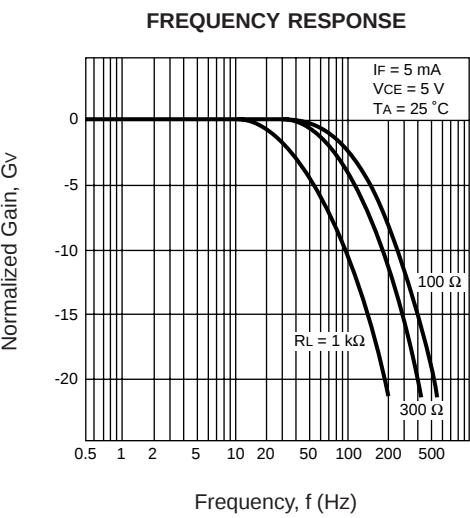
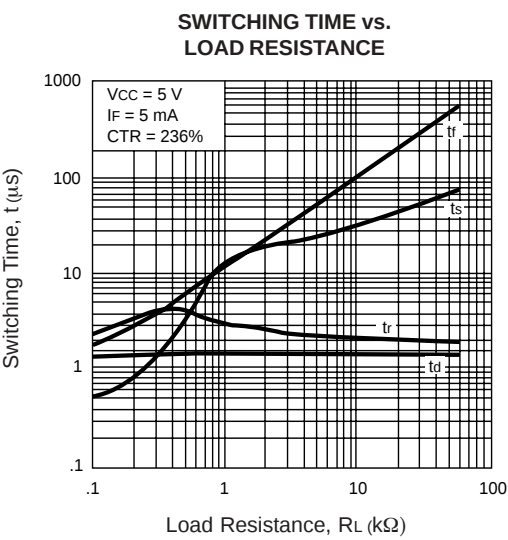
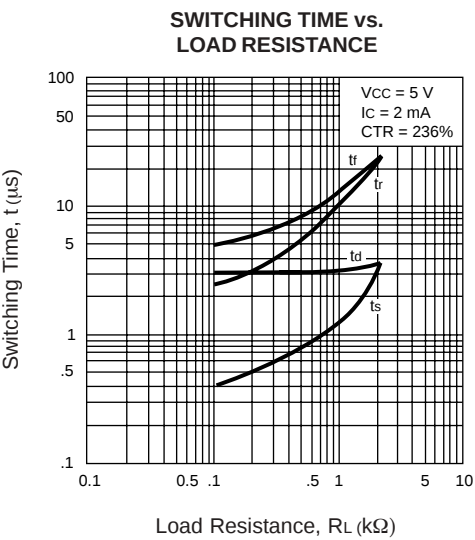
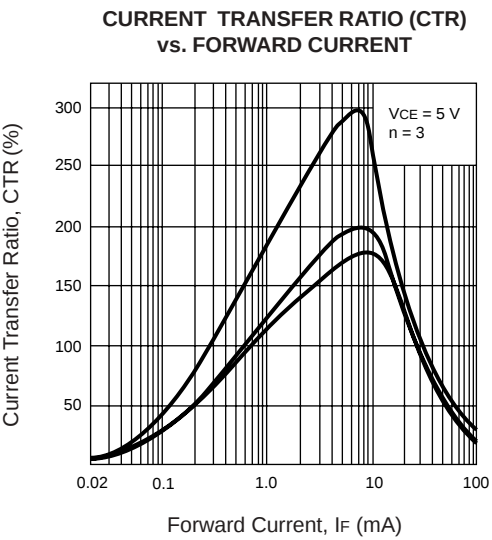
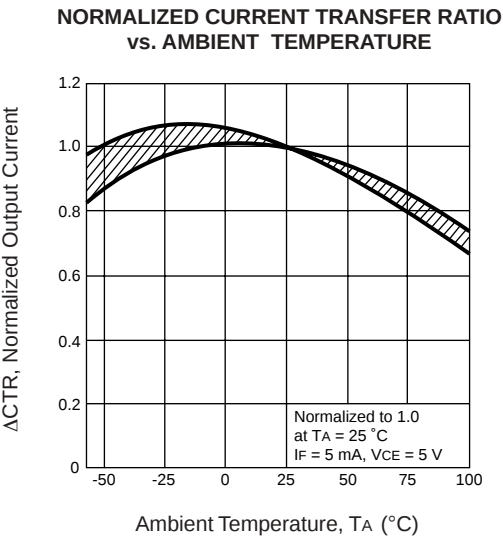
A: $2.0 \pm 0.1 \rightarrow 2.3 \pm 0.1$

B: $2.5 \text{ MAX} \rightarrow 2.8 \text{ MAX}$

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

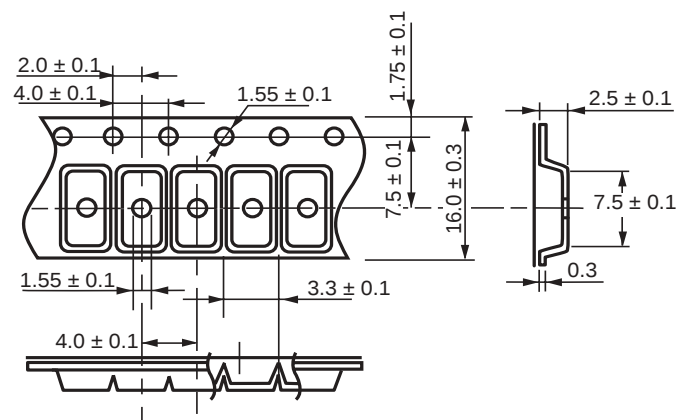


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

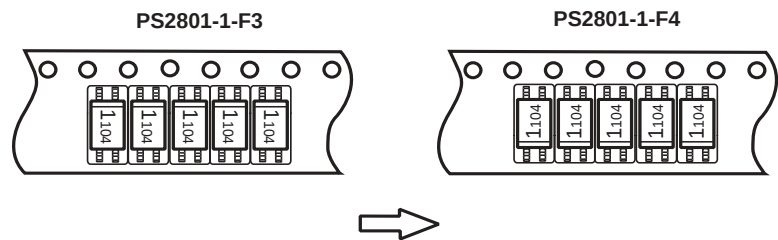


PS2801-1 TAPING SPECIFICATIONS (Units in mm)

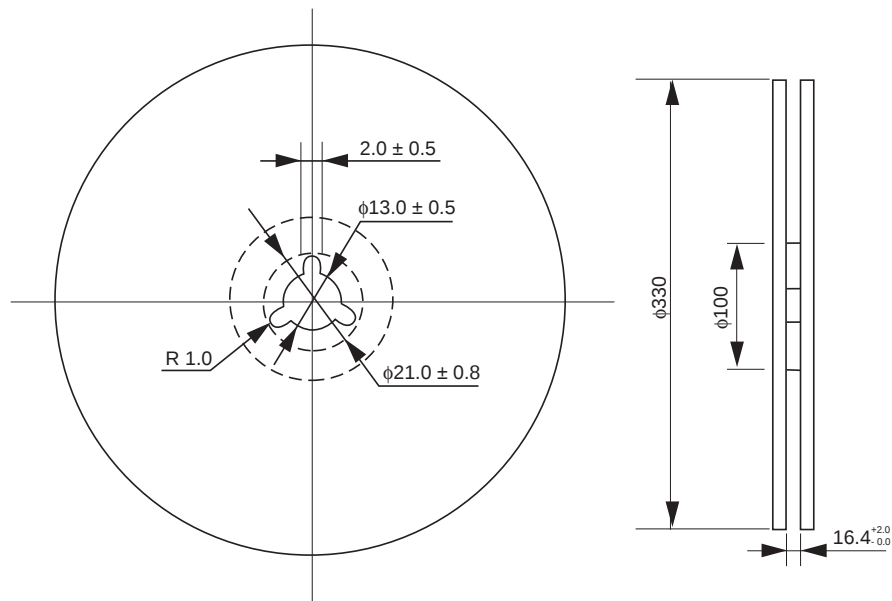
TAPE OUTLINE AND DIMENSIONS



TAPE DIRECTION



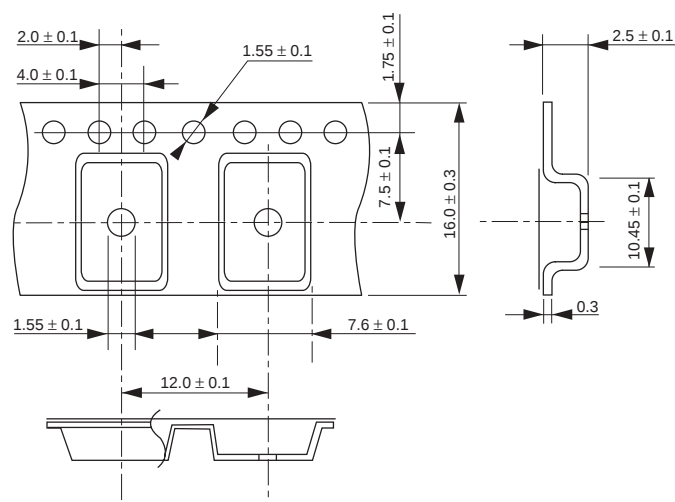
REEL OUTLINE AND DIMENSIONS



Packing: 3500 pcs/reel

PS2801-4 TAPING SPECIFICATIONS (Units in mm)

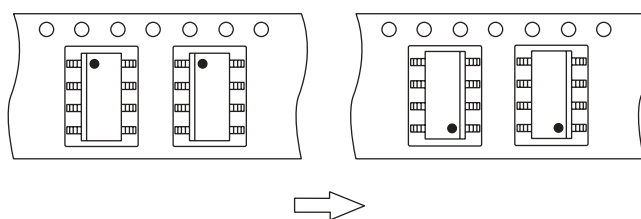
TAPE OUTLINE AND DIMENSIONS



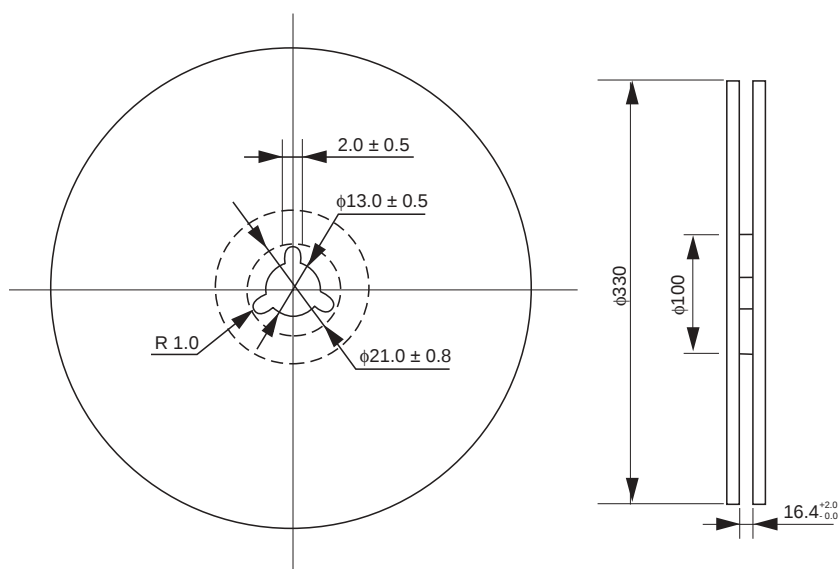
TAPE DIRECTION

PS2801-4-F3

PS2801-4-F4



REEL OUTLINE AND DIMENSIONS

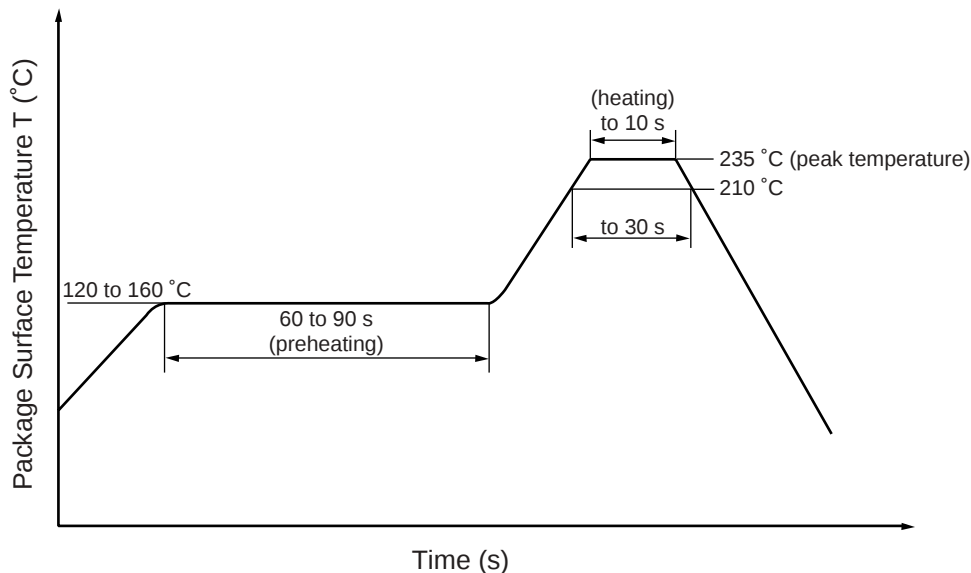


Packing: 2500 pcs/reel

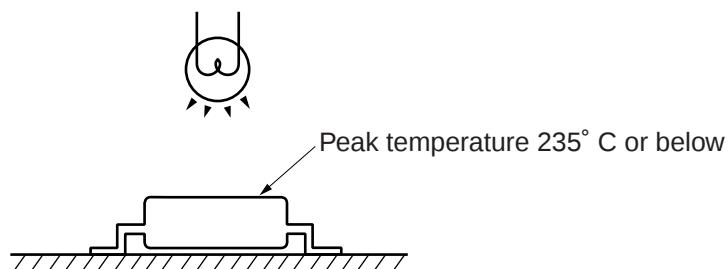
RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

- Peak reflow temperature 235 °C (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).



CAUTION: Avoid removing the residual flux with chlorine-based cleaning solvent after a reflow process.



(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).

Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

CEL California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.

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10/14/2003

NEC

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