

## HIGH ISOLATION VOLTAGE AC INPUT DARLINGTON TRANSISTOR TYPE SOP OPTOCOUPLER

**PS2806-1**  
**PS2806-4**

### FEATURES

- **HIGH ISOLATION VOLTAGE**  
BV: 2500 kVr.m.s.
- **SMALL THIN PACKAGE**  
4, 16 pin SOP, pin pitch 1.27 mm
- **AC INPUT RESPONSE**
- **HIGH CURRENT TRANSFER RATIO**  
CTR = 2000% TYP @  $I_F = \pm 1$  mA,  $V_{CE} = 2$  V
- **AVAILABLE IN TAPE AND REEL**  
PS2806-1-F3, PS2806-4-F3

### DESCRIPTION

PS2806-1 and PS2806-4 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon Darlington-connected phototransistor in a plastic SOP (Small Out-Line Package) for high density applications. This device has a shield effect to cut off ambient light.

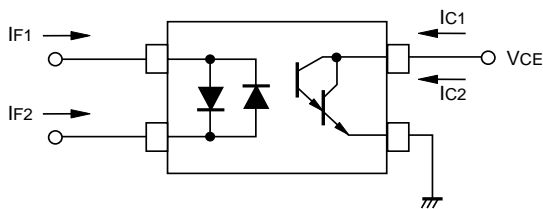
### APPLICATIONS

- PROGRAMMABLE LOGIC CONTROLLERS
- MEASURING INSTRUMENTS
- HYBRID IC

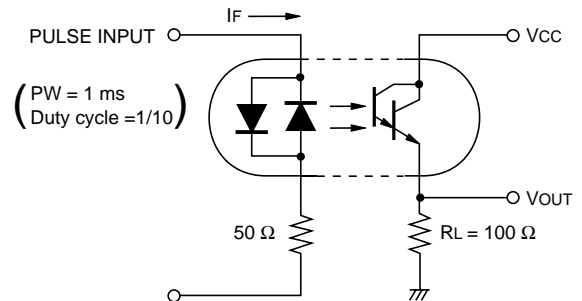
### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

PART NUMBER			PS2806-1, PS2806-4		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V <sub>F</sub>	Forward Voltage, I <sub>F</sub> = ± 5 mA	V	1.1	1.4
	C <sub>t</sub>	Terminal Capacitance, V = 0, f = 1 MHz	pF	30	
Transistor	I <sub>CEO</sub>	Collector to Emitter Dark Current V <sub>CE</sub> = 40 V, I <sub>F</sub> = 0	nA		400
Coupled	CTR	Current Transfer Ratio, (I <sub>C</sub> /I <sub>F</sub> ) I <sub>F</sub> = ± 1 mA, V <sub>CE</sub> = 2 V	%	200	2000
	CTR <sub>1</sub> /CTR <sub>2</sub>	CTR Ratio <sup>1</sup> , I <sub>F</sub> = 1 mA, V <sub>CE</sub> = 2 V	%	0.3	1.0
	V <sub>CE(sat)</sub>	Collector Saturation Voltage, I <sub>F</sub> = ± 1 mA, I <sub>C</sub> = 2 mA	V		1.0
	R <sub>I-O</sub>	Isolation Resistance, V <sub>in-out</sub> = 1.0 k VDC	Ω	10 <sup>11</sup>	
	C <sub>I-O</sub>	Isolation Capacitance, V = 0, f = 1 MHz	pF		0.4
	t <sub>r</sub>	Rise Time <sup>2</sup> , V <sub>CC</sub> = 5 V, I <sub>C</sub> = 2 mA, R <sub>L</sub> = 100 Ω	μs		200
t <sub>f</sub>	Fall Time <sup>2</sup> , V <sub>CC</sub> = 5 V, I <sub>C</sub> = 2 mA, R <sub>L</sub> = 100 Ω	μs		200	

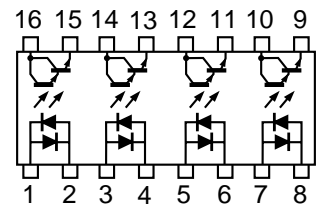
1.  $CTR_1 = \frac{I_{C1}}{I_{F1}}$ ,  $CTR_2 = \frac{I_{C2}}{I_{F2}}$



2. Test Circuit for Switching Time



PS2806-1



PS2806-4

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS2806-1	PS2806-4
Diode				
IF	Forward Current	mA	±50	±50
ΔPd/°C	Power Dissipation Derating	mW/°C	0.6	0.8
Pd	Power Dissipation	mW/Ch	60	80
IF(Peak)	Forward Current PW = 100 μs, Duty Cycle 1%	A	±1	±1
Transistor				
VCEO	Collector to Emitter Voltage	V	40	40
VECO	Emitter to Collector Voltage	V	6	6
IC	Collector Current	mA/Ch	90	100
ΔPc/°C	Power Dissipation Derating	mW/°C	1.2	1.2
Pc	Power Dissipation	mW/Ch	120	120
Coupled				
BV	Isolation Voltage <sup>2</sup>	Vr.m.s.	2500	
TOP	Operating Temperature	°C	-55 to +100	
TSTG	Storage Temperature	°C	-55 to +150	

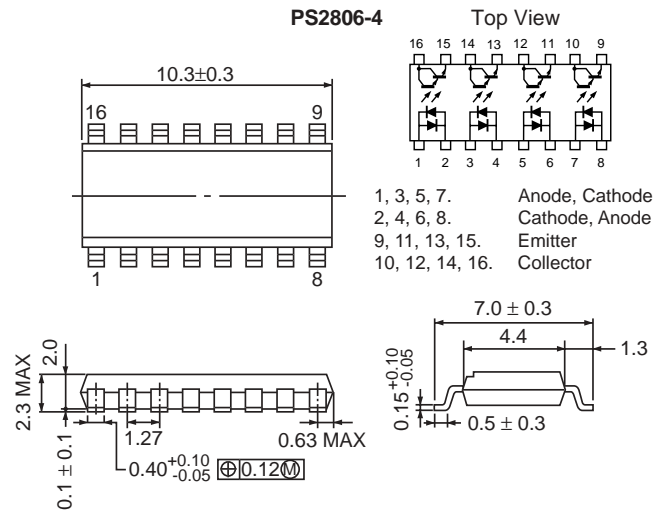
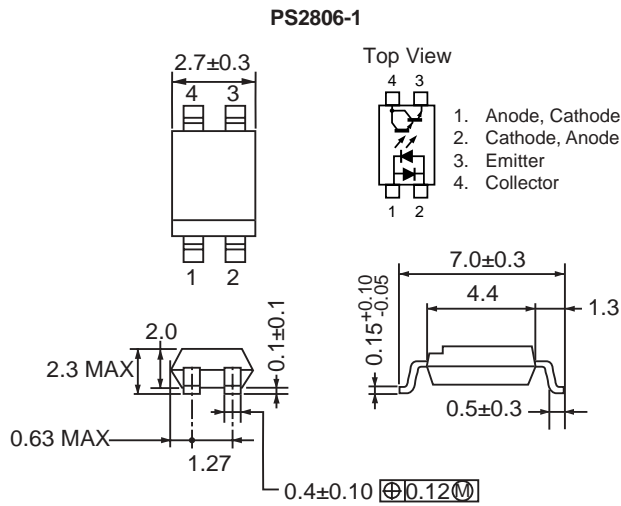
**ORDERING INFORMATION**

PART NUMBER	PACKAGE	PACKING STYLE
PS2806-1	4-Pin SOP	50 pcs (Tape 50 pcs cut)
PS2806-1-F3		Embossed Tape 3500 pcs/reel
PS2806-1-F4		
PS2806-4	16-Pin SOP	Magazine case 45 pcs
PS2806-4-F3		Embossed Tape 2500 pcs/reel
PS2806-4-F4		

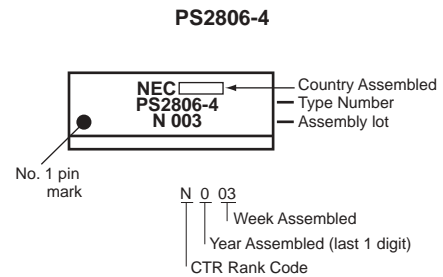
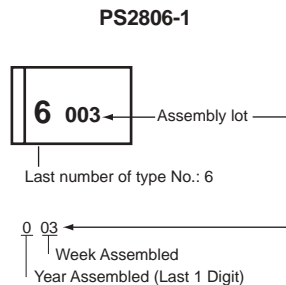
Notes:

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

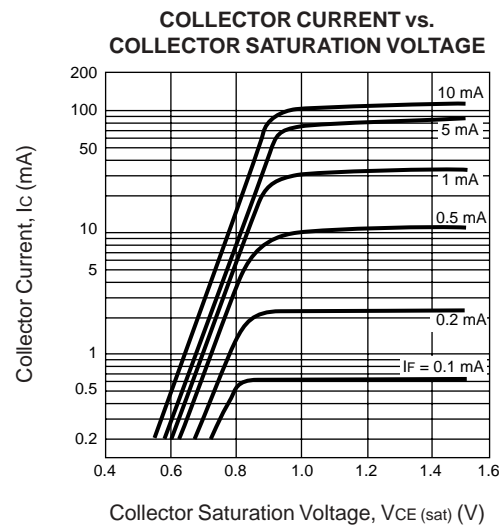
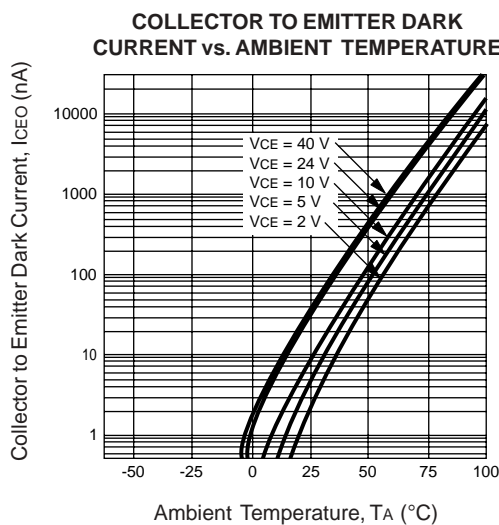
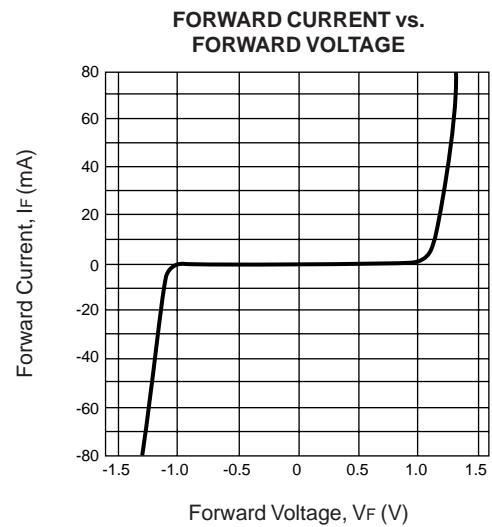
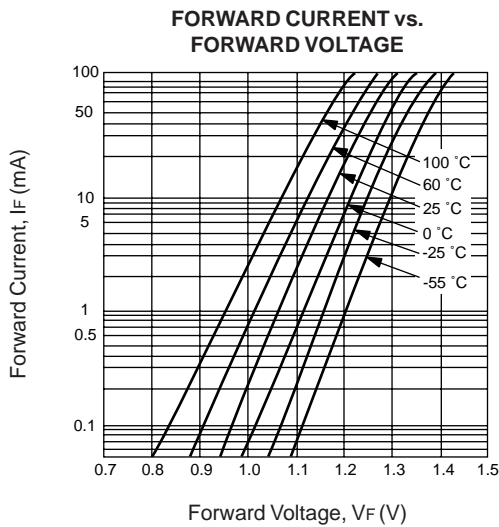
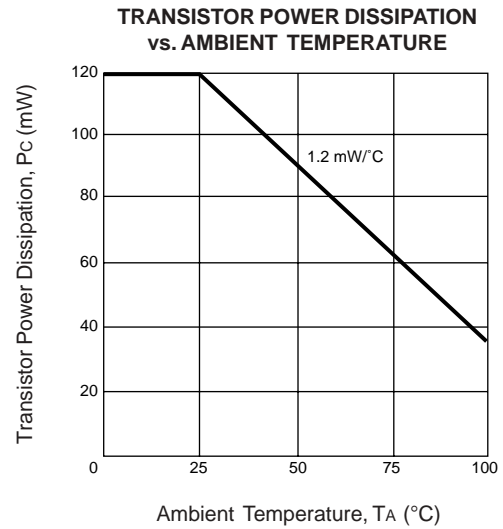
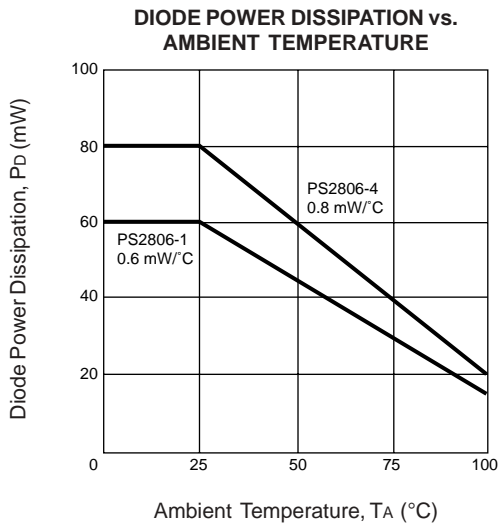
**OUTLINE DIMENSIONS** (Units in mm)



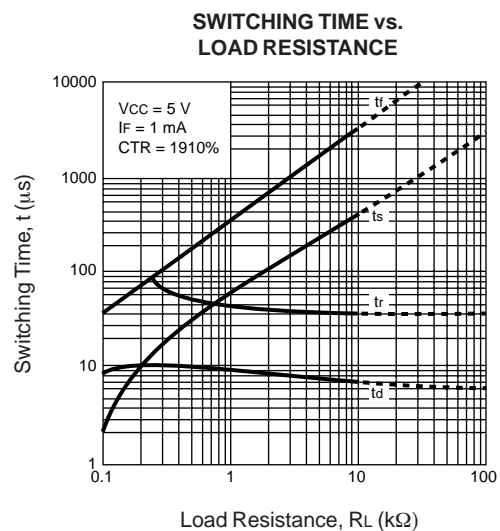
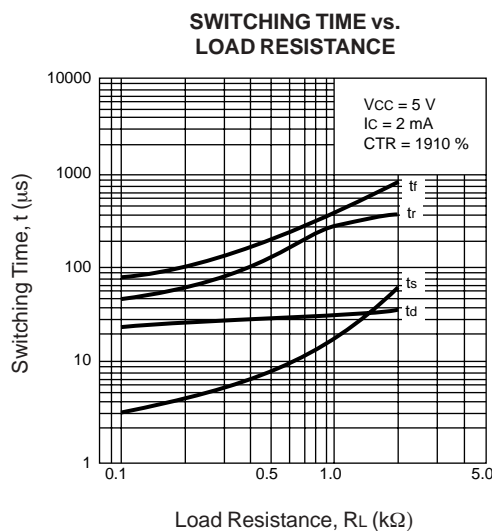
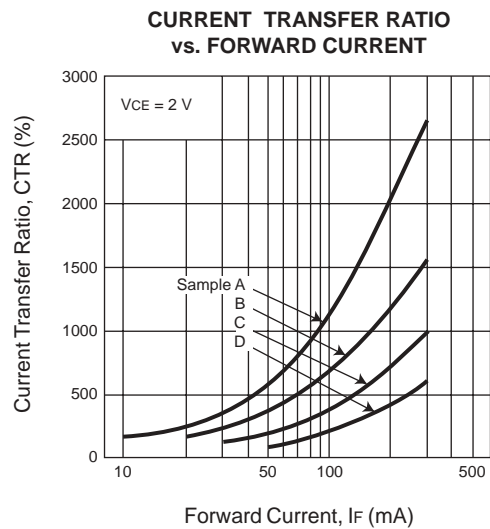
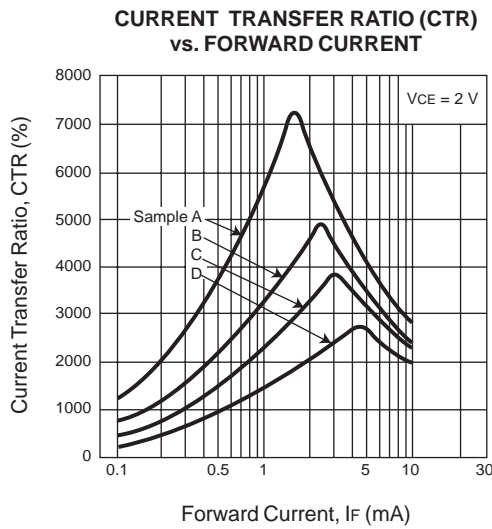
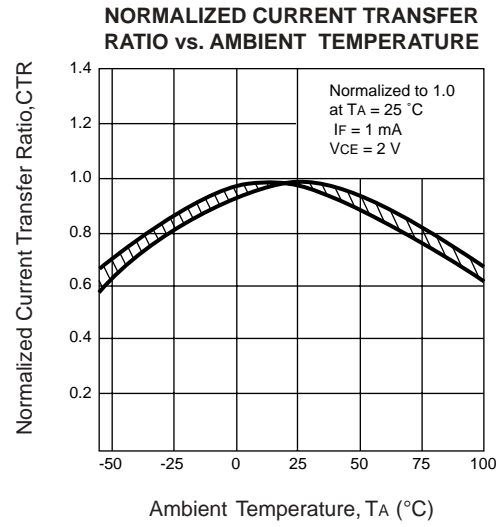
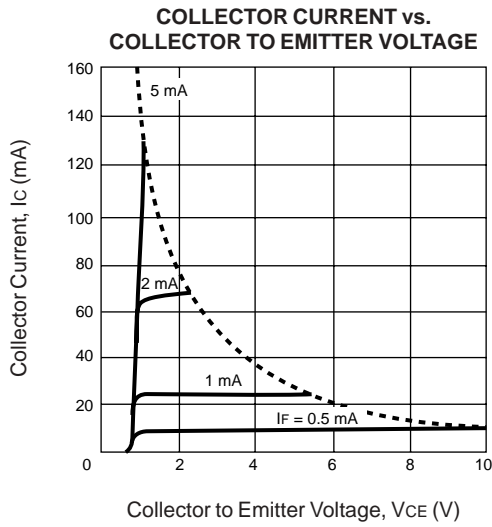
**MARKINGS**



TYPICAL PERFORMANCE CURVES (T<sub>A</sub> = 25 °C)

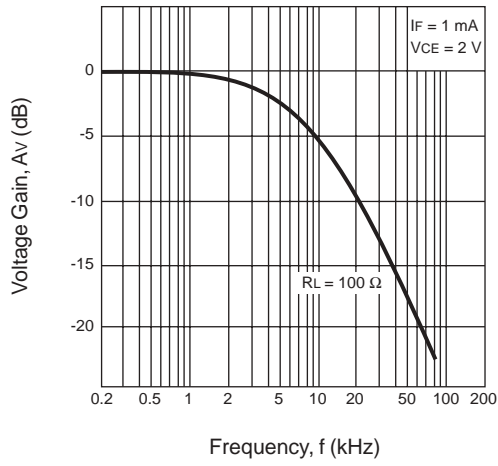


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

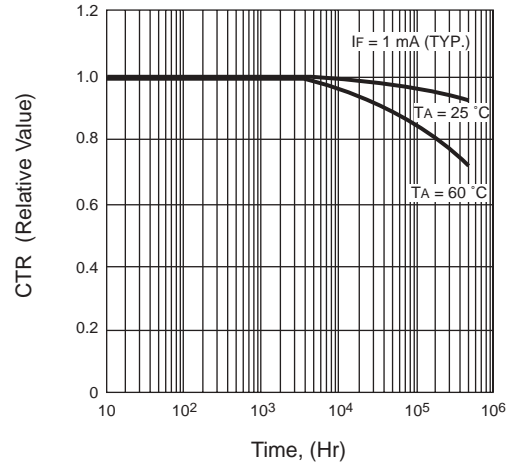


TYPICAL PERFORMANCE CURVES (T<sub>A</sub> = 25 °C)

FREQUENCY RESPONSE

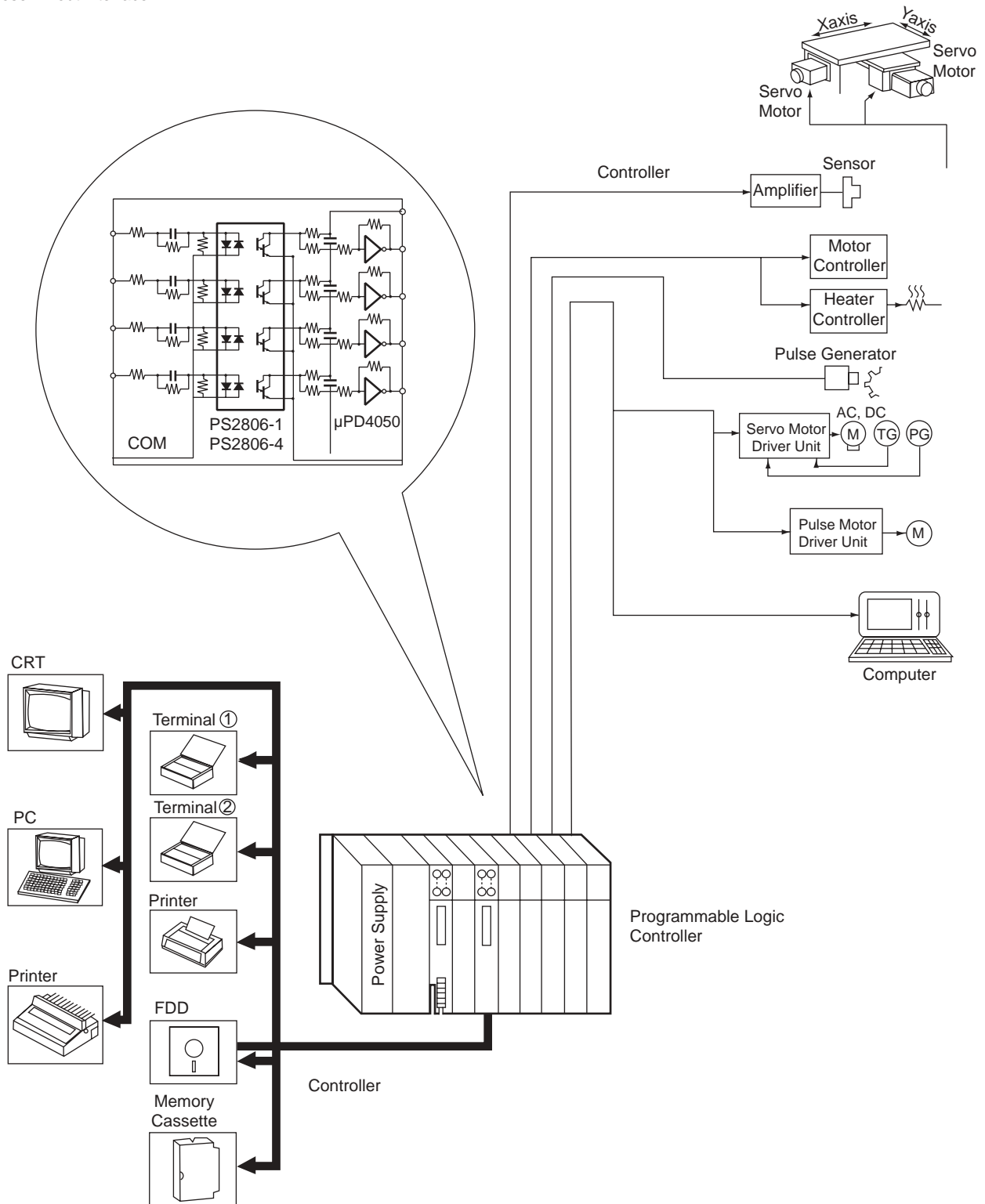


LONG TERM CTR DEGRADATION



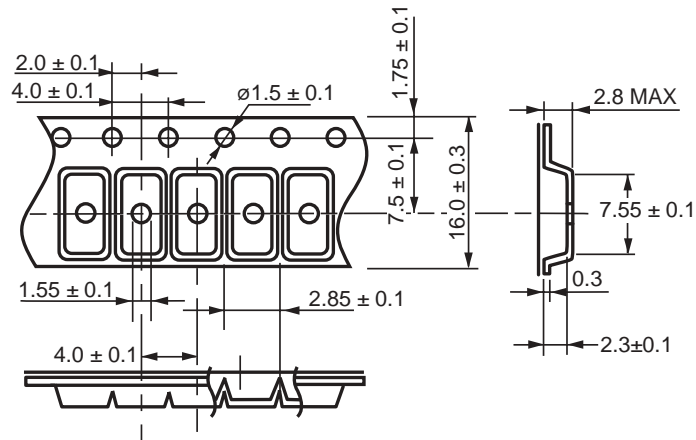
# PROGRAMMABLE LOGIC CONTROLLER EXAMPLE

Purpose: In-out interface

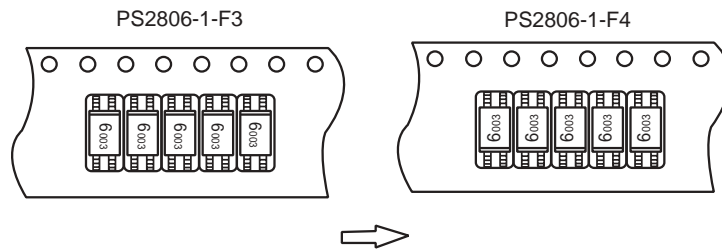


**TAPING SPECIFICATIONS** (Units in mm)

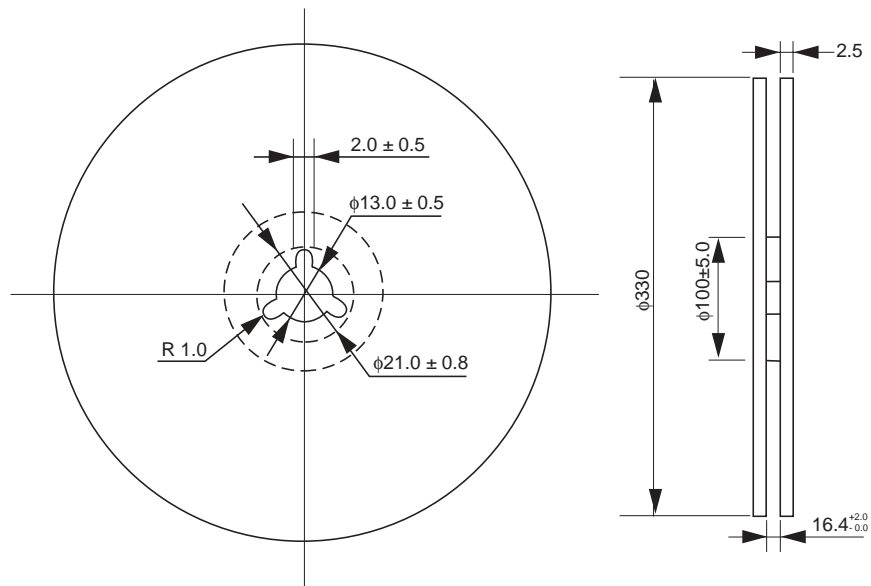
**TAPE OUTLINE AND DIMENSIONS**



**TAPE DIRECTION**



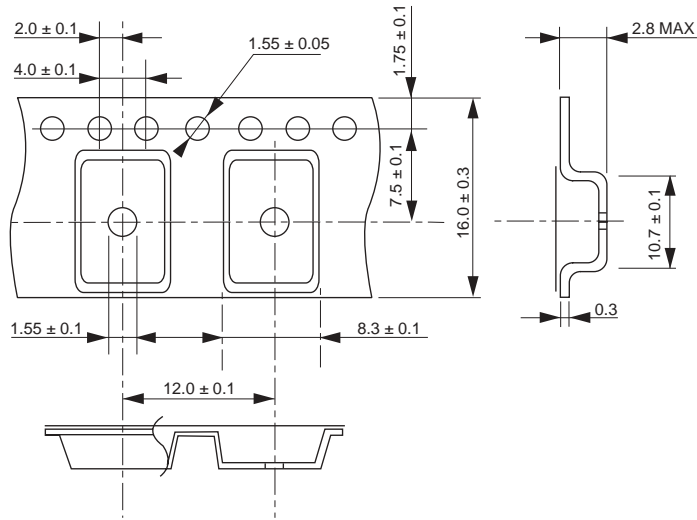
**REEL OUTLINE DIMENSIONS**



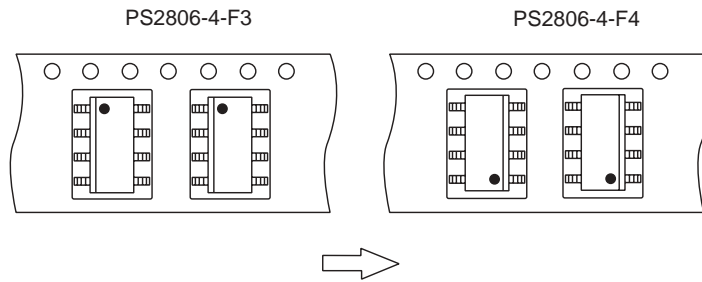
Packing: 3500 pcs/Reel

**TAPING SPECIFICATIONS** (Units in mm)

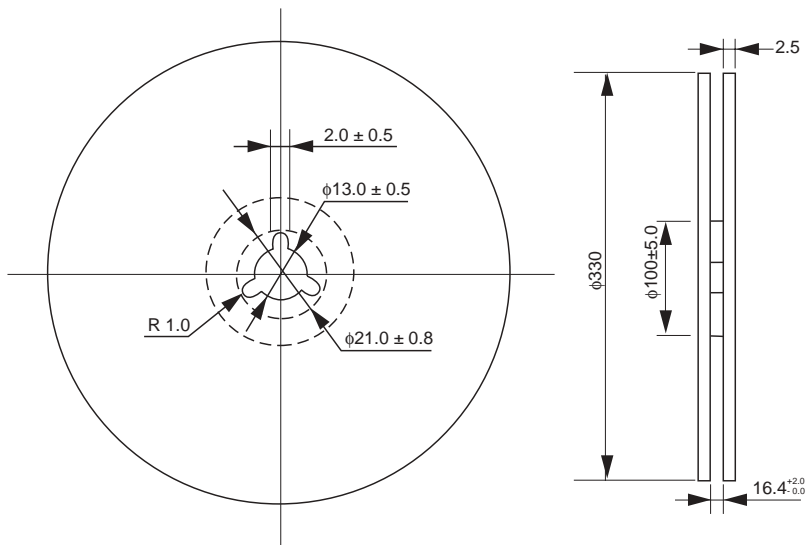
**TAPE OUTLINE AND DIMENSIONS**



**TAPE DIRECTION**



**REEL OUTLINE DIMENSIONS**



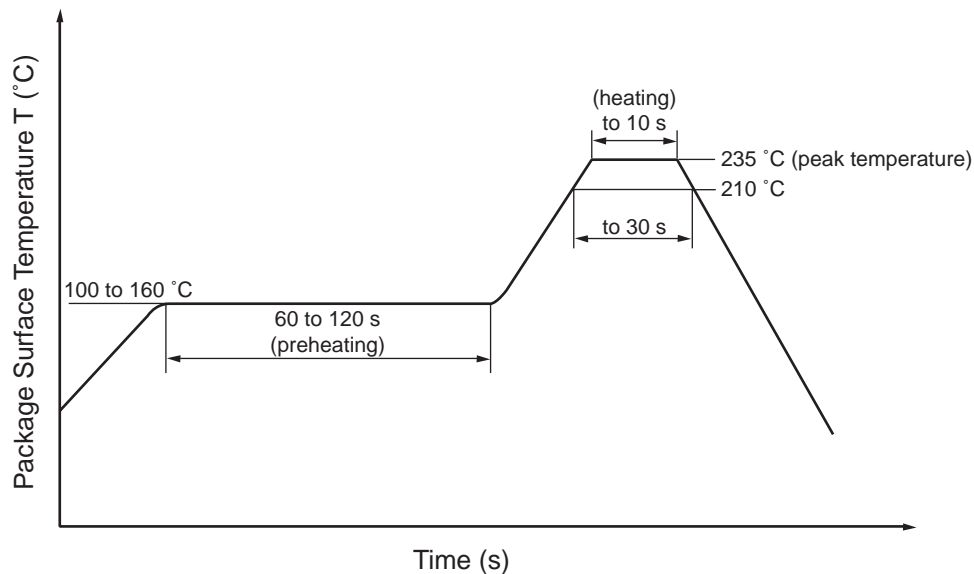
Packing: 2500 ppcs/reel



## 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).



### (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 chlorine-based cleaning solvent after a reflow process.

### CAUTIONS REGARDING NOISE

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

#### Life Support Applications

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