

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.

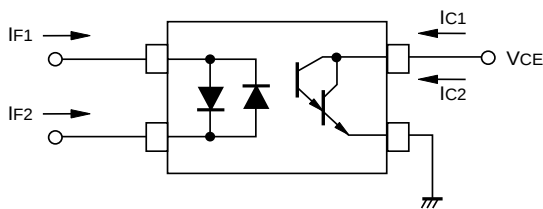
APPLICATIONS

- PROGRAMMABLE LOGIC CONTROLLERS
- MEASURING INSTRUMENTS
- HYBRID IC

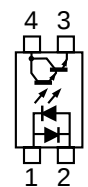
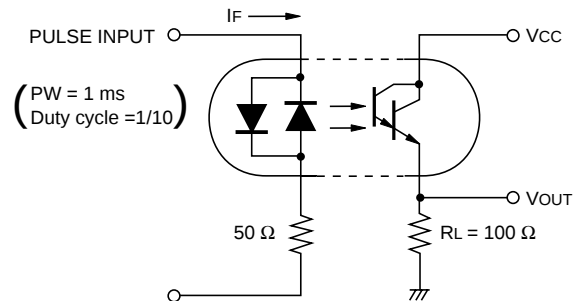
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

PART NUMBER			PS2806-1, PS2806-4		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, $I_F = \pm 5$ mA		1.1	1.4
	C_t	Terminal Capacitance, $V = 0$, $f = 1$ MHz		30	
Transistor	I_{CEO}	Collector to Emitter Dark Current $V_{CE} = 40$ V, $I_F = 0$			400
Coupled	CTR	Current Transfer Ratio, (I_C/I_F) $I_F = \pm 1$ mA, $V_{CE} = 2$ V	200	2000	
	CTR ₁ /CTR ₂	CTR Ratio ¹ , $I_F = 1$ mA, $V_{CE} = 2$ V	0.3	1.0	3.0
	$V_{CE(sat)}$	Collector Saturation Voltage, $I_F = \pm 1$ mA, $I_C = 2$ mA			1.0
	R _{I-O}	Isolation Resistance, $V_{in-out} = 1.0$ k VDC	10^{11}		
	C _{I-O}	Isolation Capacitance, $V = 0$, $f = 1$ MHz		0.4	
	t_r	Rise Time ² , $V_{CC} = 5$ V, $I_C = 2$ mA, $R_L = 100 \Omega$		200	
	t_f	Fall Time ² , $V_{CC} = 5$ V, $I_C = 2$ mA, $R_L = 100 \Omega$		200	

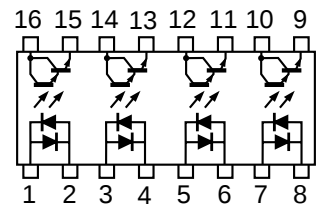
1. $CTR_1 = \frac{I_{C1}}{I_{F1}}$, $CTR_2 = \frac{I_{C2}}{I_{F2}}$



2. Test Circuit for Switching Time



PS2806-1



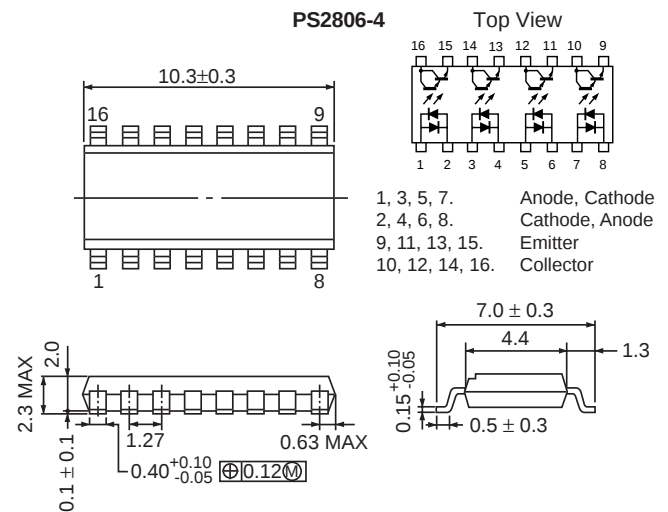
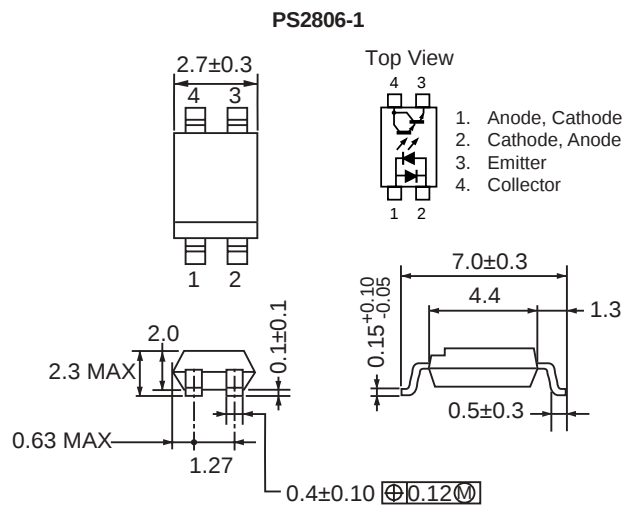
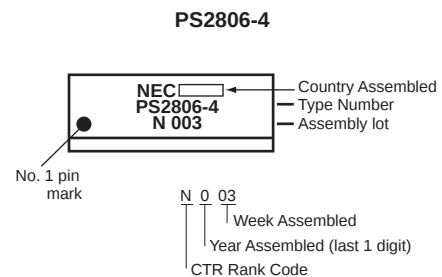
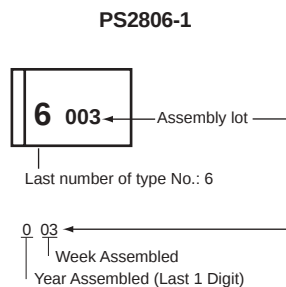
PS2806-4

ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

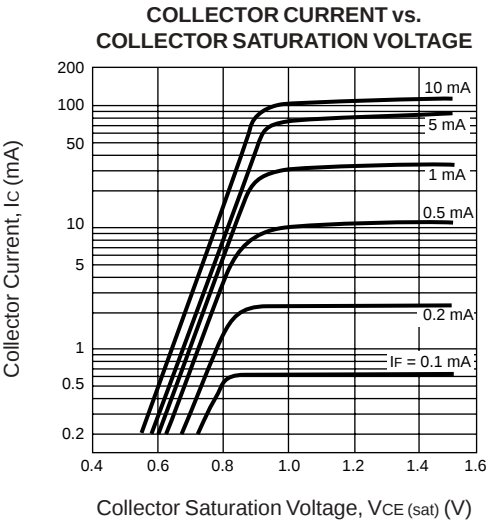
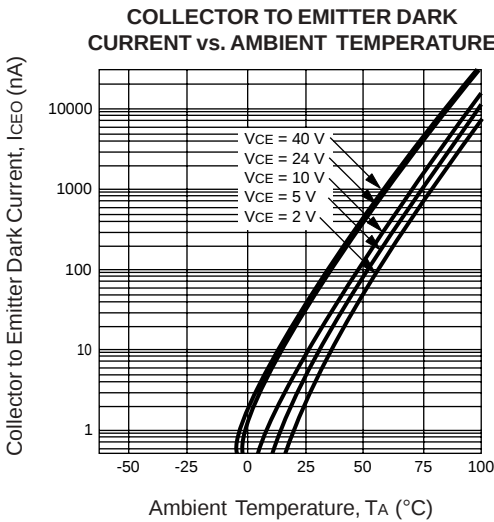
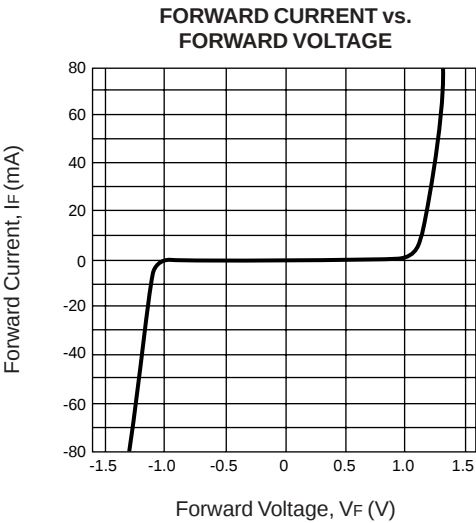
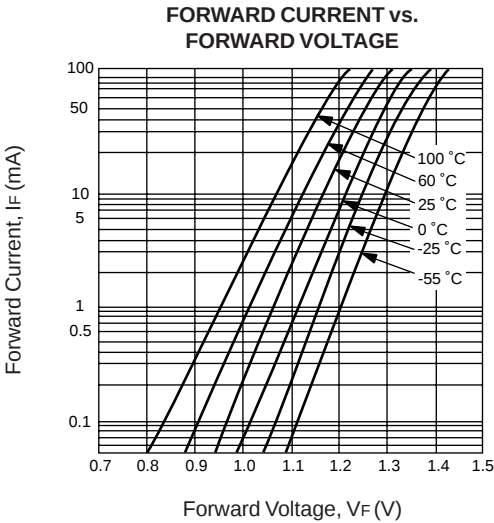
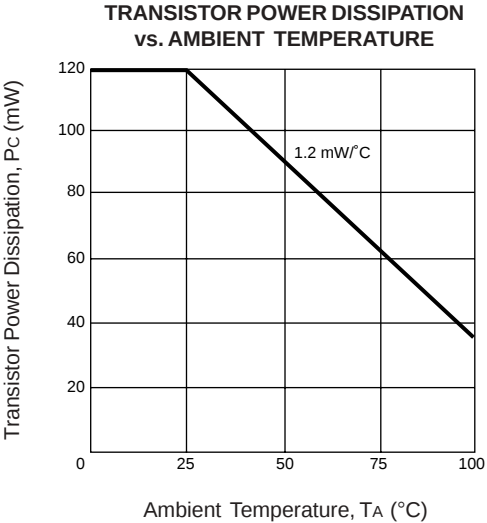
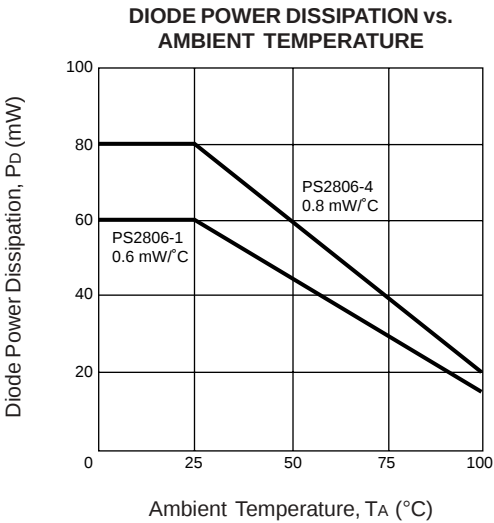
SYMBOLS	PARAMETERS	UNITS	RATINGS	
Diode			PS2806-1	PS2806-4
I_F	Forward Current	mA	± 50	± 50
$\Delta P_D/^\circ\text{C}$	Power Dissipation Derating	mW/ $^\circ\text{C}$	0.6	0.8
P_D	Power Dissipation	mW/Ch	60	80
$I_F(\text{Peak})$	Forward Current PW = 100 μs , Duty Cycle 1%	A	± 1	± 1
Transistor				
V_{CEO}	Collector to Emitter Voltage	V	40	40
V_{ECO}	Emitter to Collector Voltage	V	6	6
I_C	Collector Current	mA/Ch	90	100
$\Delta P_C/^\circ\text{C}$	Power Dissipation Derating	mW/ $^\circ\text{C}$	1.2	1.2
P_C	Power Dissipation	mW/Ch	120	120
Coupled				
BV	Isolation Voltage ²	$V_{r.m.s.}$	2500	
T_{OP}	Operating Temperature	$^\circ\text{C}$	-55 to +100	
T_{STG}	Storage Temperature	$^\circ\text{C}$	-55 to +150	

Notes:

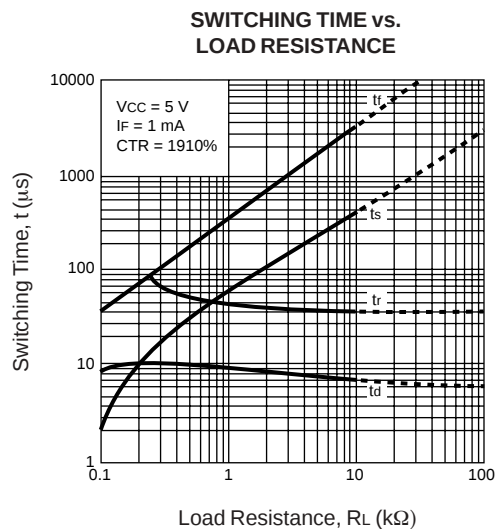
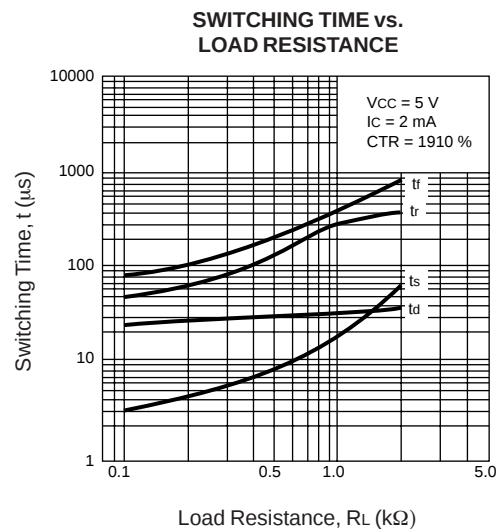
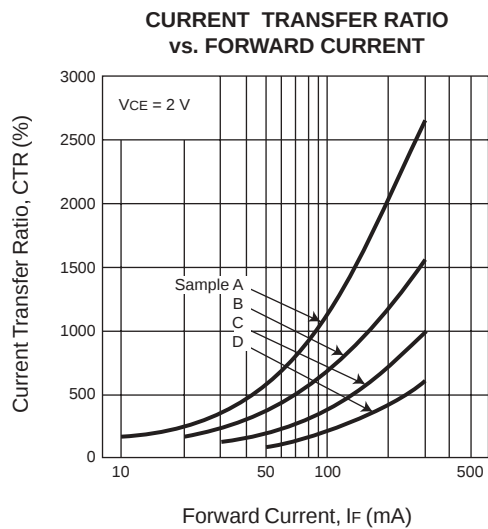
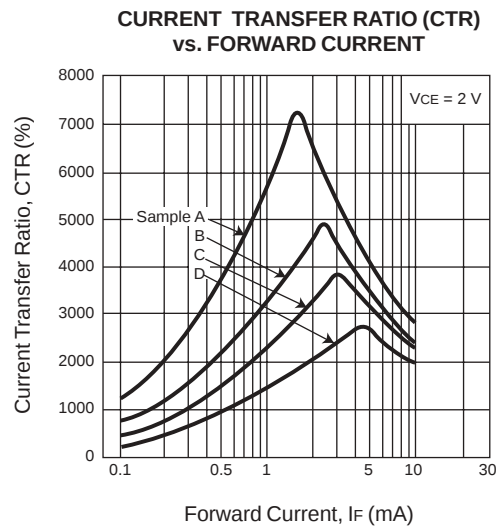
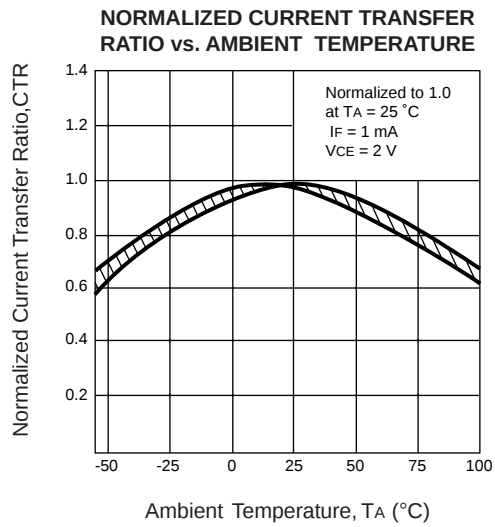
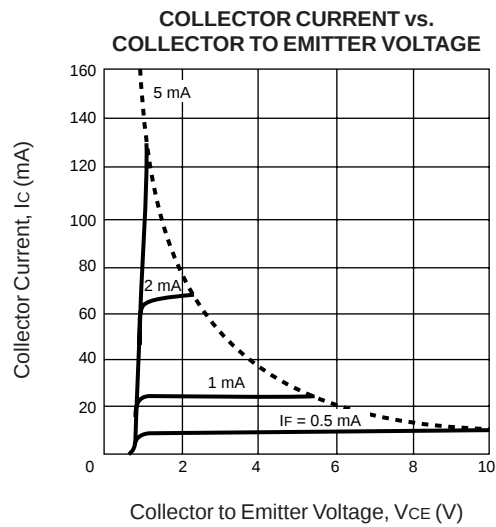
- Operation in excess of any one of these parameters may result in permanent damage.
- AC voltage for 1 minute at $T_A = 25^\circ\text{C}$, RH = 60 % between input and output.

OUTLINE DIMENSIONS (Units in mm)**MARKINGS**

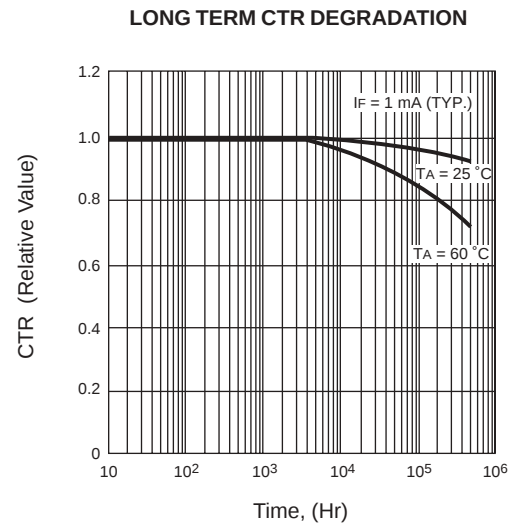
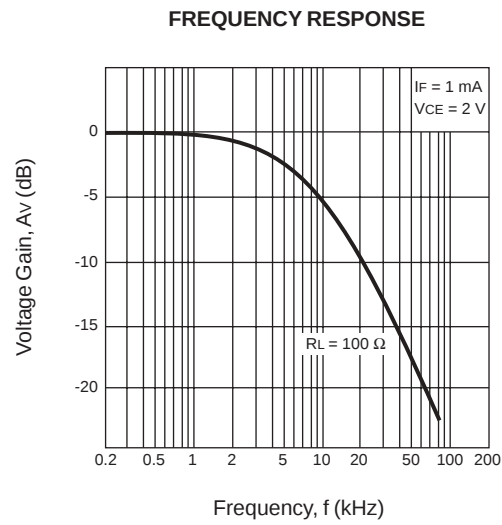
TYPICAL PERFORMANCE CURVES (T_A = 25 °C)



TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

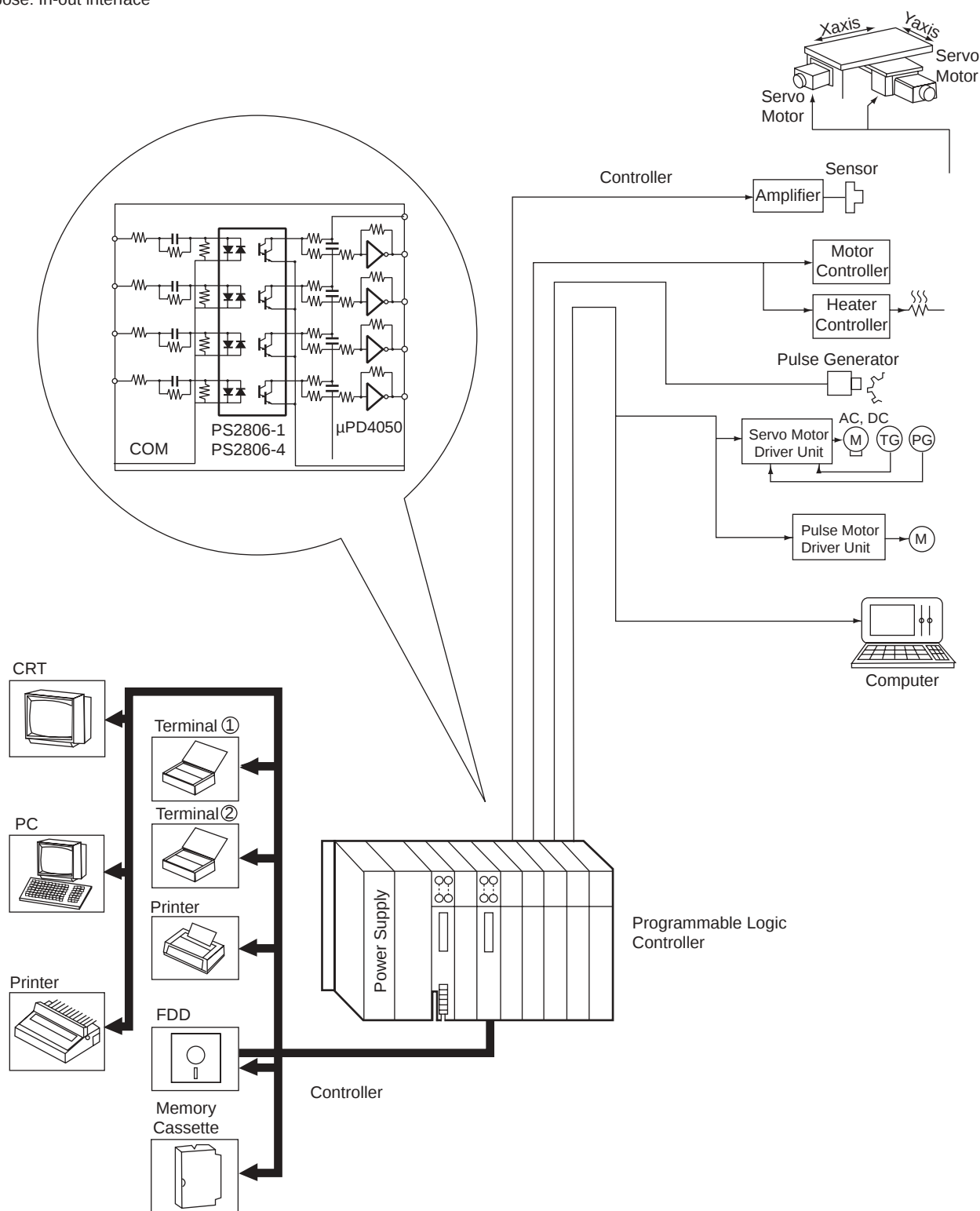


TYPICAL PERFORMANCE CURVES (T_A = 25 °C)



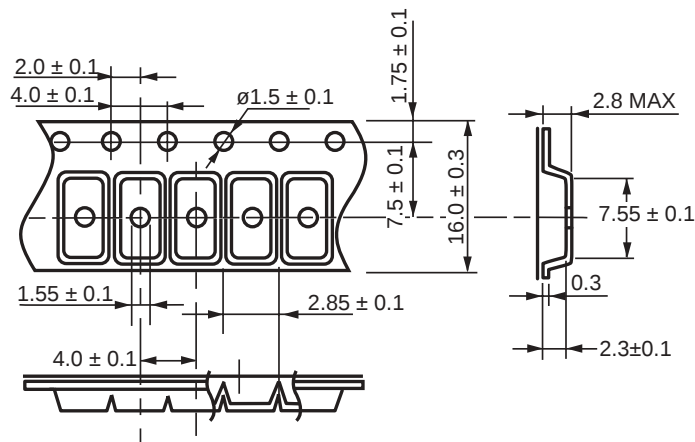
PROGRAMMABLE LOGIC CONTROLLER EXAMPLE

Purpose: In-out interface

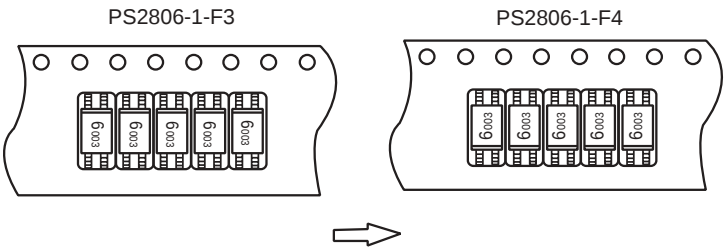


TAPING SPECIFICATIONS (Units in mm)

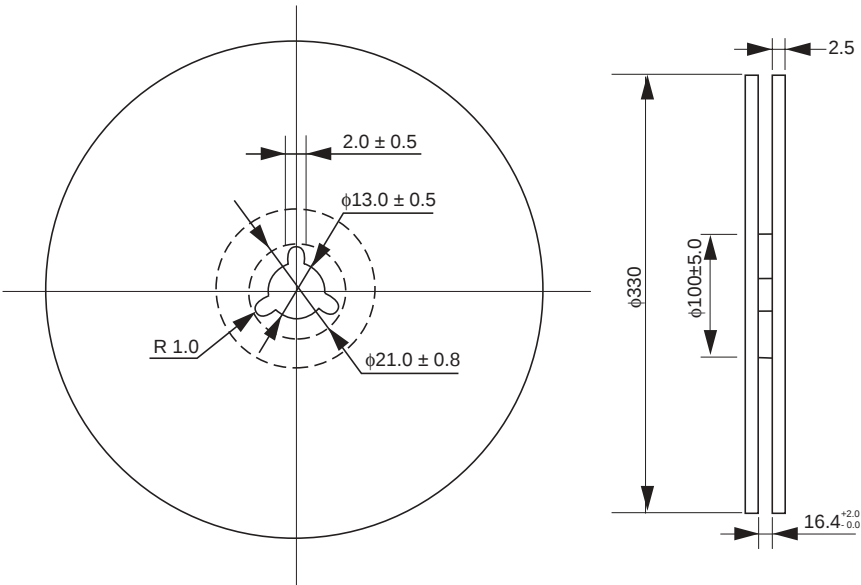
TAPE OUTLINE AND DIMENSIONS



TAPE DIRECTION



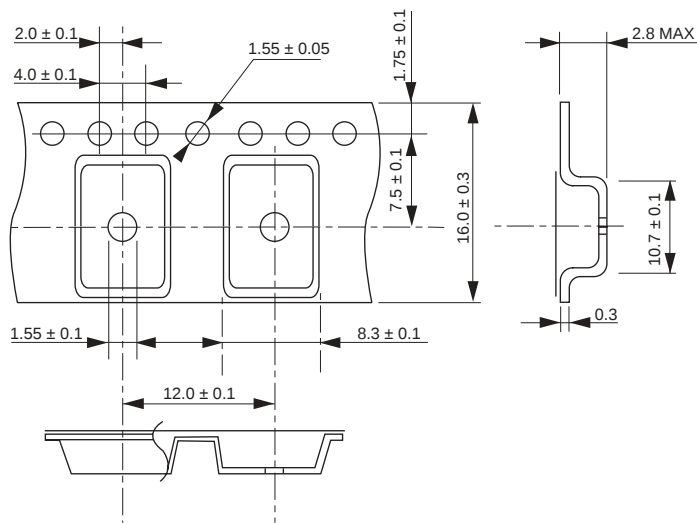
REEL OUTLINE DIMENSIONS



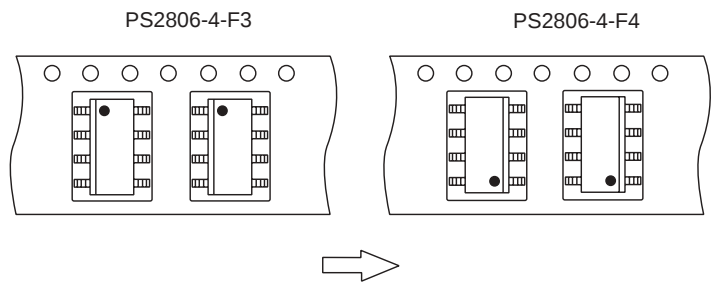
Packing: 3500 pcs/Reel

TAPING SPECIFICATIONS (Units in mm)

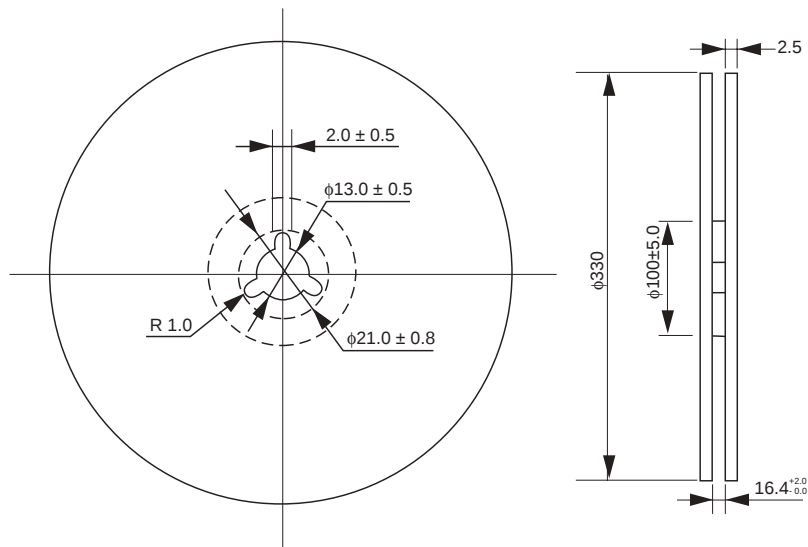
TAPE OUTLINE AND DIMENSIONS



TAPE DIRECTION



REEL OUTLINE DIMENSIONS

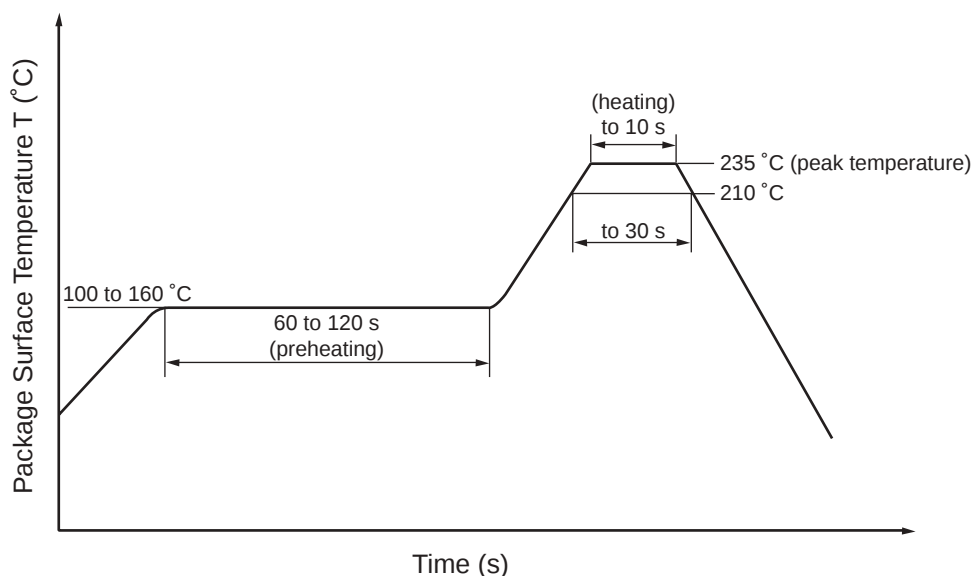


Packing: 2500 ppcs/reel

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

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.



EXCLUSIVE NORTH AMERICAN AGENT FOR NEC RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS
 CALIFORNIA EASTERN LABORATORIES • Headquarters • 4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • Telex 34-6393 • FAX (408) 988-0279
 DATA SUBJECT TO CHANGE WITHOUT NOTICE

Internet: <http://WWW.CEL.COM>

02/06/2002