CEL

PHOTOCOUPLER

PS2832-1,-4,PS2833-1,-4

HIGH COLLECTOR TO EMITTER VOLTAGE 4, 16-PIN SOP PHOTOCOUPLER

–NEPOC Series–

DESCRIPTION

The PS2832-1, -4 and PS2833-1, -4 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon darlington-connected phototransistor.

The package is an SOP (Small Outline Package) type for high density mounting applications.

FEATURES

- High collector to emitter voltage (V_{CEO} = 300 V: PS2832-1, -4)
  (V_{CEO} = 350 V: PS2833-1, -4)
- Small and thin package (4, 16-pin SOP, Pin pitch 1.27 mm)
- High isolation voltage (BV = 2 500 Vr.m.s.)
- High current transfer ratio (CTR = 2 000 % TYP.)
- Ordering number of tape product: PS2832-1-F3, F4, PS2832-4-F3, F4
  PS2833-1-F3, F4, PS2833-4-F3, F4
- Safety standards: PS2832-1, -4
  - UL approved: File No. E72422 (S)
  - BSI approved: No. 8315, 8316
  - VDE0884 approved (Option)

  PS2833-1, -4

★
  - UL approved: File No. E72422 (S)

APPLICATIONS

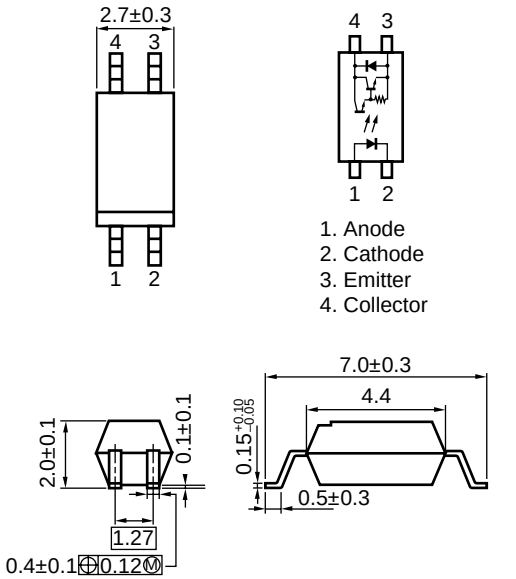
- Hybrid IC
- Telephone/Telegraph Receiver
- FAX

Document No. PN10257EJ01V0DS (1st edition)
(Previous No. P14023EJ3V0DS00)
Date Published February 2003 CP(K)

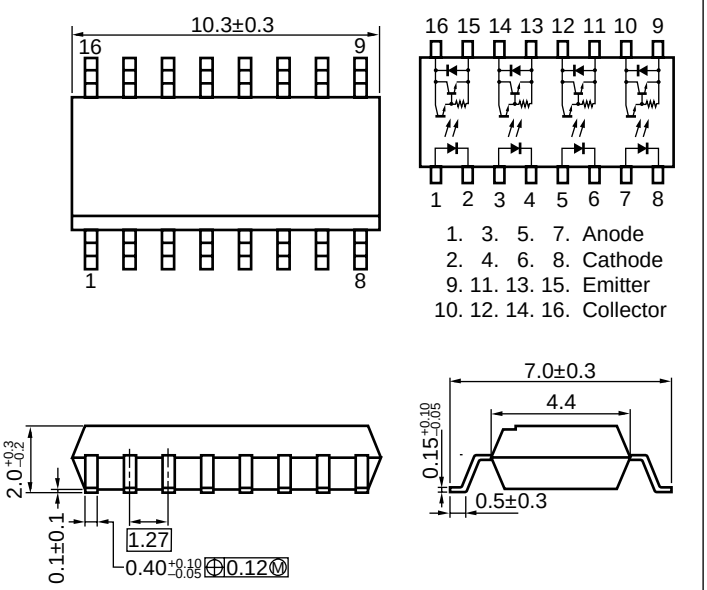
The mark ★ shows major revised points.

★ PACKAGE DIMENSIONS (UNIT: mm)

PS2832-1
PS2833-1

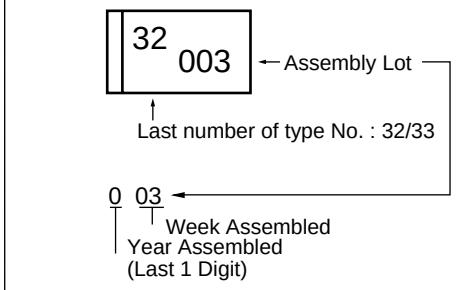


PS2832-4
PS2833-4

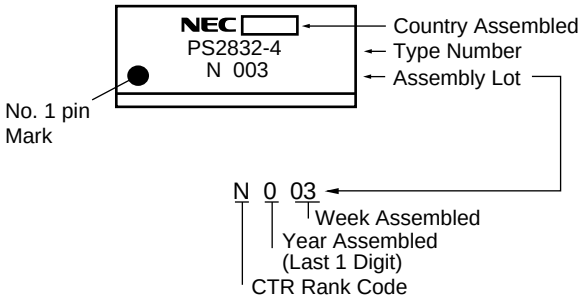


MARKING

PS2832-1
PS2833-1



PS2832-4
PS2833-4



ORDERING INFORMATION (Solder Contains Lead)

Part Number	Package	Packing Style	Safety Standards Approval	Application Part Number *1
PS2832-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	Approved products other than VDE	PS2832-1
PS2832-1-F3		Embossed Tape 3 500 pcs/reel		
PS2832-1-F4				
PS2832-4	16-pin SOP	Magazine Case 45 pcs		PS2832-4
PS2832-4-F3		Embossed Tape 2 500 pcs/reel		
PS2832-4-F4				
PS2832-1-V	4-pin SOP	50 pcs (Tape 50 pcs cut)	VDE0884 approved (Option)	PS2832-1
PS2832-1-V-F3		Embossed Tape 3 500 pcs/reel		
PS2832-1-V-F4				
PS2832-4-V	16-pin SOP	Magazine Case 45 pcs		PS2832-4
PS2832-4-V-F3		Embossed Tape 2 500 pcs/reel		
PS2832-4-V-F4				
PS2833-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	Approved products other than VDE	PS2833-1
PS2833-1-F3		Embossed Tape 3 500 pcs/reel		
PS2833-1-F4				
PS2833-4	16-pin SOP	Magazine Case 45 pcs		PS2833-4
PS2833-4-F3		Embossed Tape 2 500 pcs/reel		
PS2833-4-F4				

***1** For the application of the Safety Standard, following part number should be used.

ORDERING INFORMATION (Pb-Free)

Part Number	Package	Packing Style	Safety Standards Approval	Application Part Number *1
PS2832-1-A	4-pin SOP	50 pcs (Tape 50 pcs cut)	Approved products other than VDE	PS2832-1
PS2832-1-F3-A		Embossed Tape 3 500 pcs/reel		
PS2832-1-F4-A				
PS2832-4-A	16-pin SOP	Magazine Case 45 pcs		PS2832-4
PS2832-4-F3-A		Embossed Tape 2 500 pcs/reel		
PS2832-4-F4-A				
PS2832-1-V-A	4-pin SOP	50 pcs (Tape 50 pcs cut)	VDE0884 approved (Option)	PS2832-1
PS2832-1-V-F3-A		Embossed Tape 3 500 pcs/reel		
PS2832-1-V-F4-A				
PS2832-4-V-A	16-pin SOP	Magazine Case 45 pcs		PS2832-4
PS2832-4-V-F3-A		Embossed Tape 2 500 pcs/reel		
PS2832-4-V-F4-A				
PS2833-1-A	4-pin SOP	50 pcs (Tape 50 pcs cut)	Approved products other than VDE	PS2833-1
PS2833-1-F3-A		Embossed Tape 3 500 pcs/reel		
PS2833-1-F4-A				
PS2833-4-A	16-pin SOP	Magazine Case 45 pcs		PS2833-4
PS2833-4-F3-A		Embossed Tape 2 500 pcs/reel		
PS2833-4-F4-A				

***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
			PS2832-1	PS2833-1	PS2832-4	PS2833-4	
Diode	Forward Current (DC)	I_F	50				mA
	Reverse Voltage	V_R	6				V
	Power Dissipation Derating	ΔP_D/°C	0.6		0.8		mW/°C
	Power Dissipation	P_D	60		80		mW/ch
	Peak Forward Current *1	I_{FP}	1				A
Transistor	Collector to Emitter Voltage	V_{CEO}	300	350	300	350	V
	Emitter to Collector Voltage	V_{ECO}	0.3				V
	Collector Current	I_C	60				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

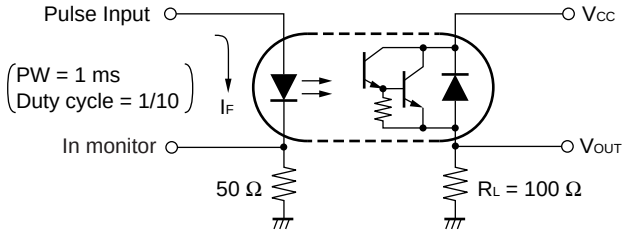
***1** PW = 100 μs, Duty Cycle = 1 %

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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

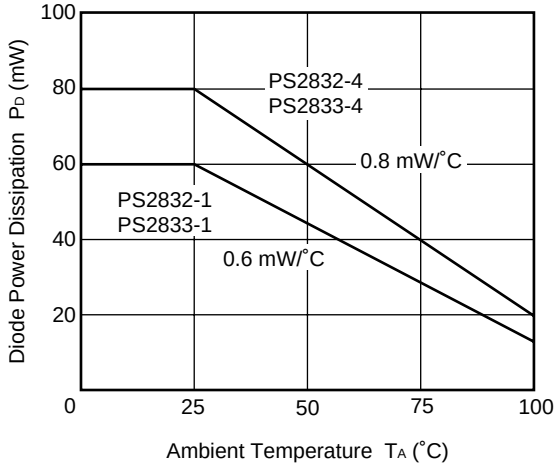
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
	Reverse Current	I_R	V_R = 5 V			5	μA
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz		15		pF
Transistor	Collector to Emitter Dark Current	I_{CEO}	I_F = 0 mA, V_{CE} = 300 V			400	nA
Coupled	Current Transfer Ratio (I_C/I_F)	CTR	I_F = 1 mA, V_{CE} = 2 V	400	2 000	4 500	%
	Collector Saturation Voltage	$V_{CE (sat)}$	I_F = 1 mA, I_C = 2 mA			1.0	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*1	t_r	V_{CC} = 5 V, I_C = 10 mA, R_L = 100 Ω		20		μs
	Fall Time*1	t_f			5		

***1** Test circuit for switching time

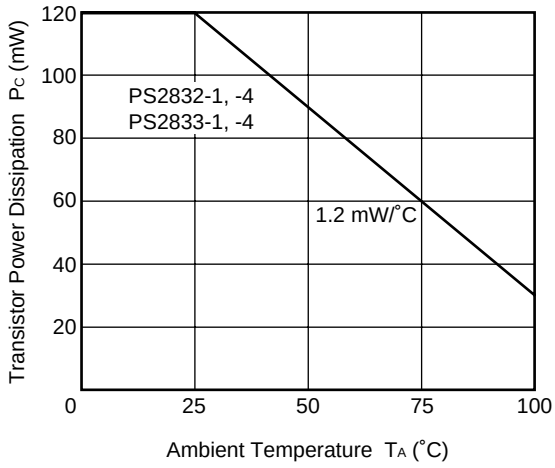


TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

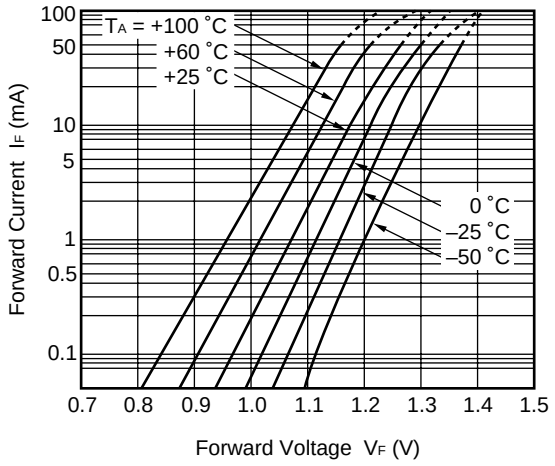
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



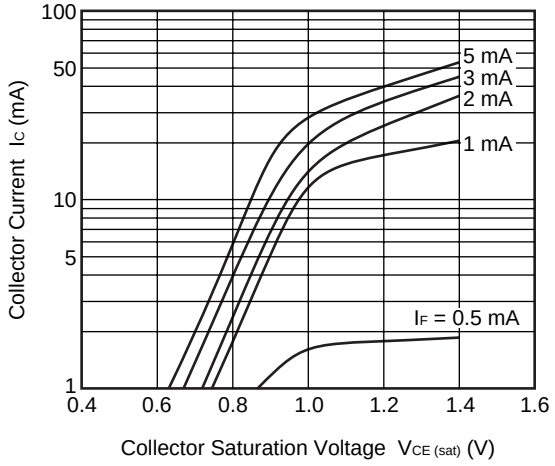
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



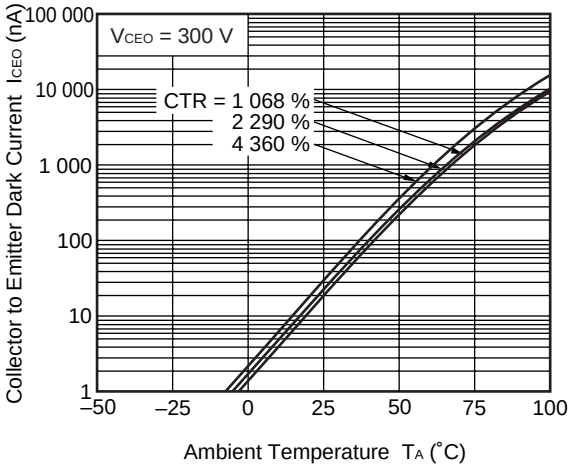
FORWARD CURRENT vs. FORWARD VOLTAGE



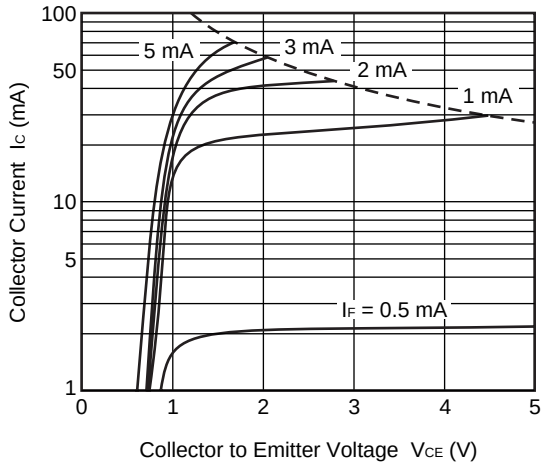
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



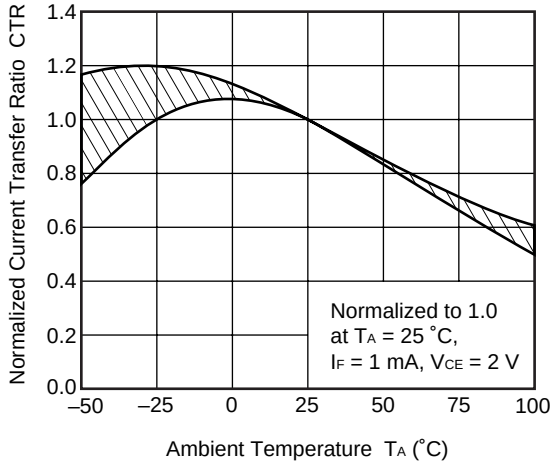
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



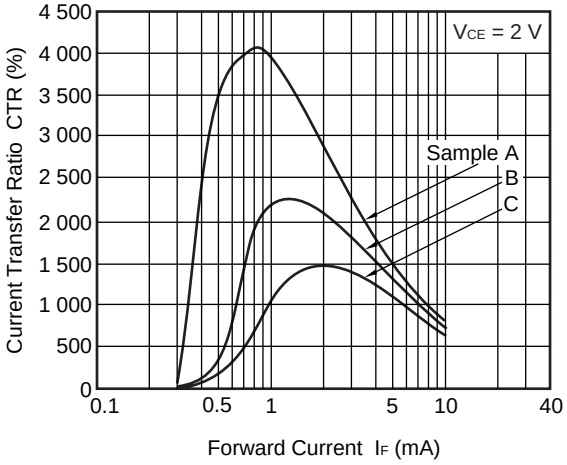
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



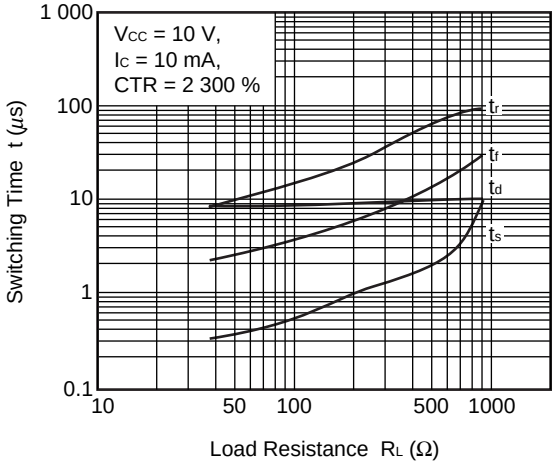
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



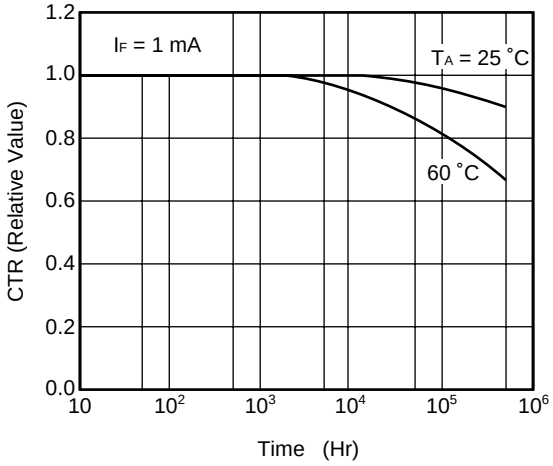
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



SWITCHING TIME vs. LOAD RESISTANCE



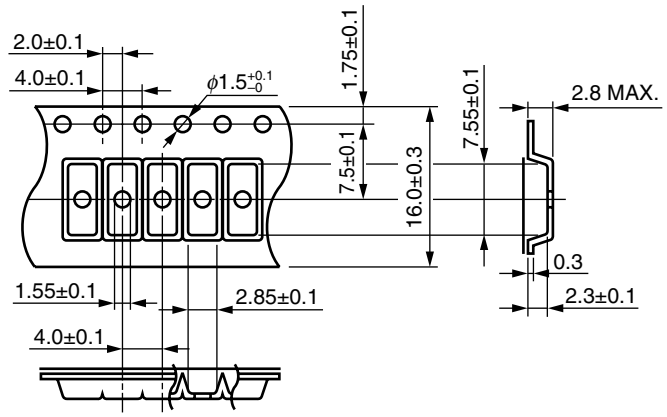
LONG TERM CTR DEGRADATION



Remark The graphs indicate nominal characteristics.

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

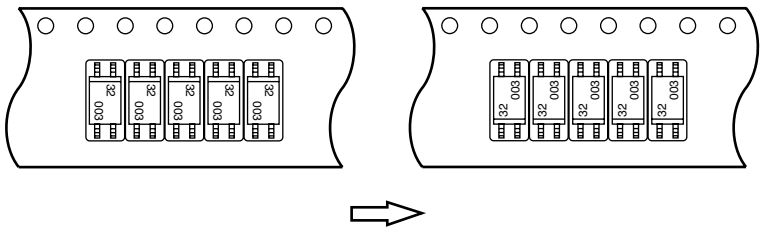
Outline and Dimensions (Tape)



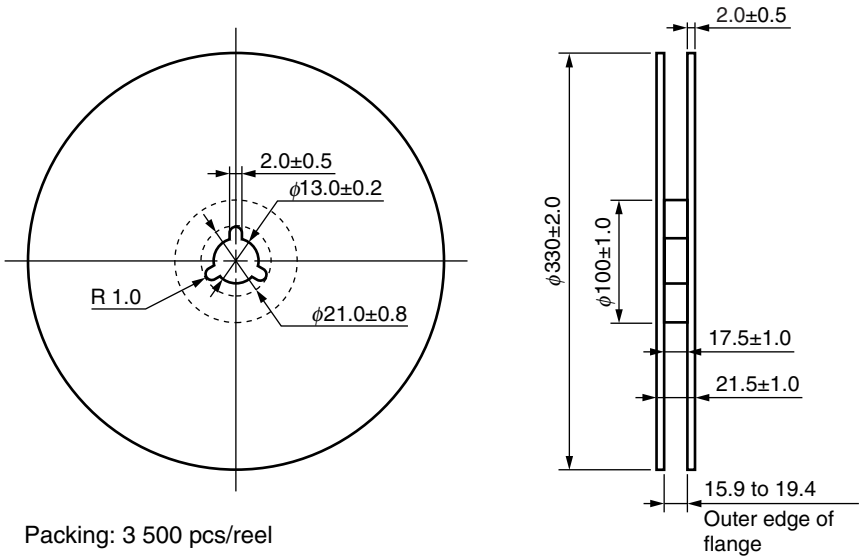
Tape Direction

PS2832-1-F3
PS2833-1-F3

PS2832-1-F4
PS2833-1-F4

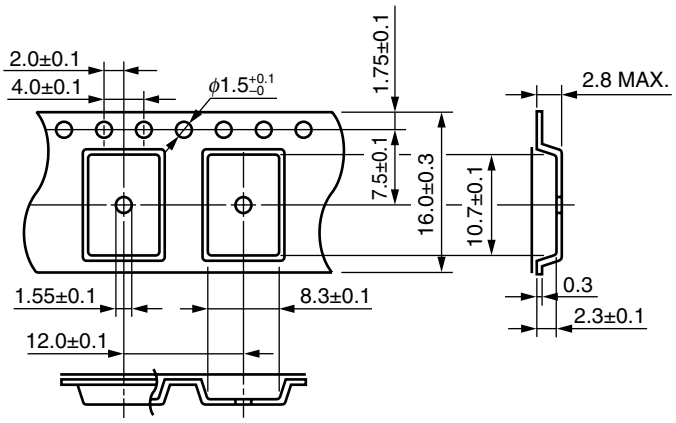


Outline and Dimensions (Reel)

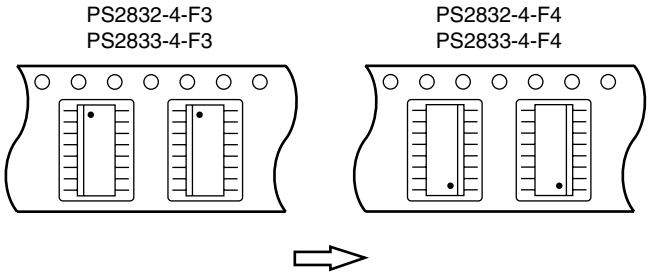


Packing: 3 500 pcs/reel

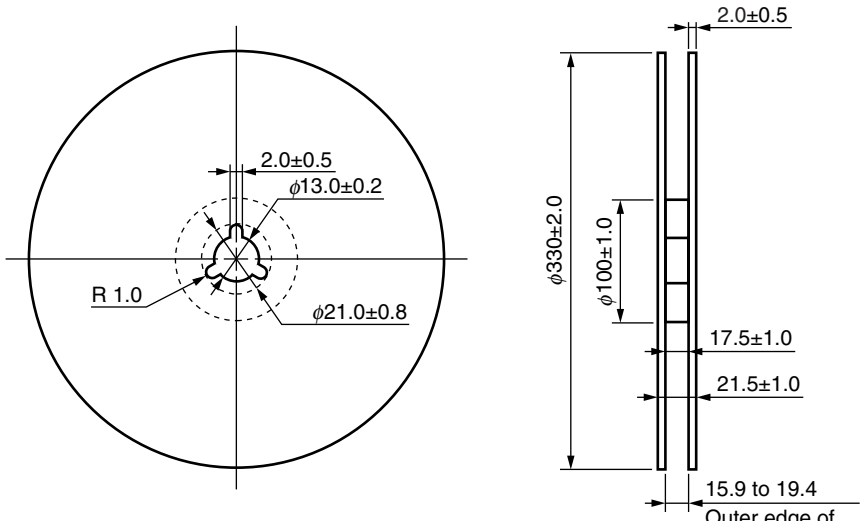
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



Packing: 2 500 pcs/reel

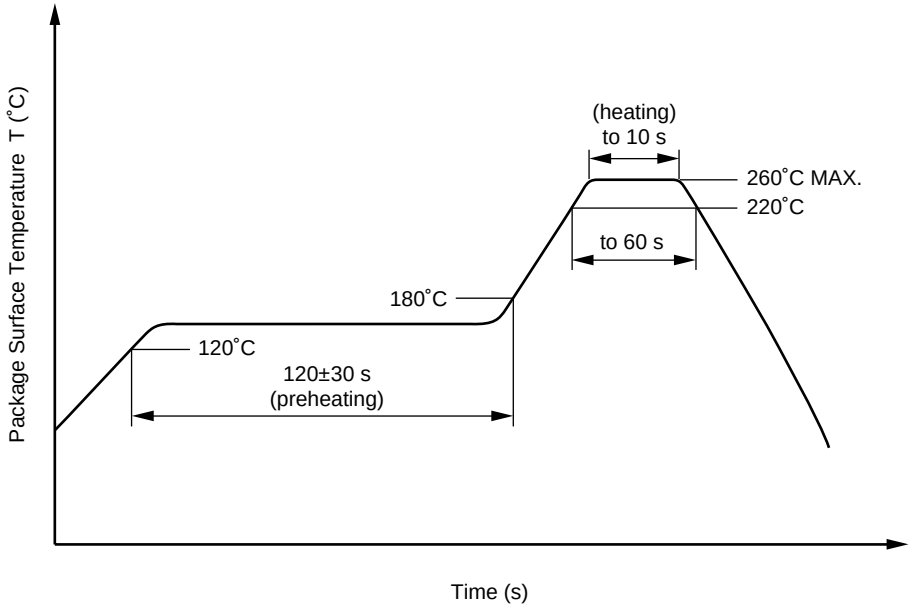
★ NOTES ON HANDLING

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.

CEL California Eastern Laboratories

4590 Patrick Henry Drive
Santa Clara, CA 95054-1817
Telephone: (408) 919-2500
Facsimile: (408) 988-0279

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.