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PS2561F-1,PS2561FL-1

R08DS0033EJ0100
Rev.1.00
Jan 06, 2012

DIP PHOTOCOUPLER, OPERATING AMBIENT TEMPERATURE 110°C

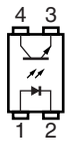
<R> DESCRIPTION

The PS2561F-1 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon phototransistor.
The PS2561F-1 is in a plastic DIP (Dual In-line Package) and the PS2561FL-1 is lead bending type (Gull-wing) for surface mount.

FEATURES

- Operating ambient temperature: 110°C
- High Isolation voltage (BV = 5 000 Vr.m.s.)
- High collector to emitter voltage (V_{CEO} = 80 V)
- High current transfer ratio (CTR = 450% TYP.)
- High-speed switching (t_r = 5 μs TYP., t_f = 7 μs TYP.)
- <R> Embossed tape product: PS2561FL-1-F3 : 2 000 pcs/reel
- Pb-Free product
- <R> Safety standard
  - UL approved: No. E72422

PIN CONNECTION
(Top View)



1. Anode
2. Cathode
3. Emitter
4. Collector

APPLICATIONS

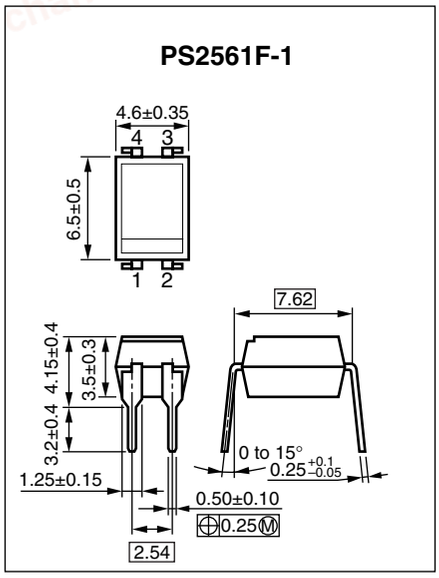
- <R> Power meter
- Telephone/FAX.
- FA/OA equipment
- Programmable logic controller

The mark <R> shows major revised points.
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

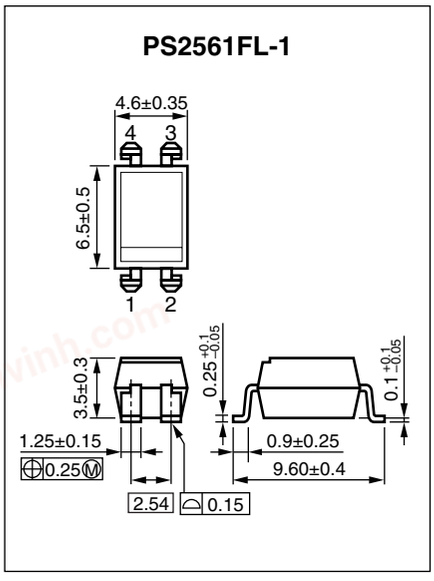
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<R> PACKAGE DIMENSIONS (UNIT: mm)

DIP Type



Lead Bending Type

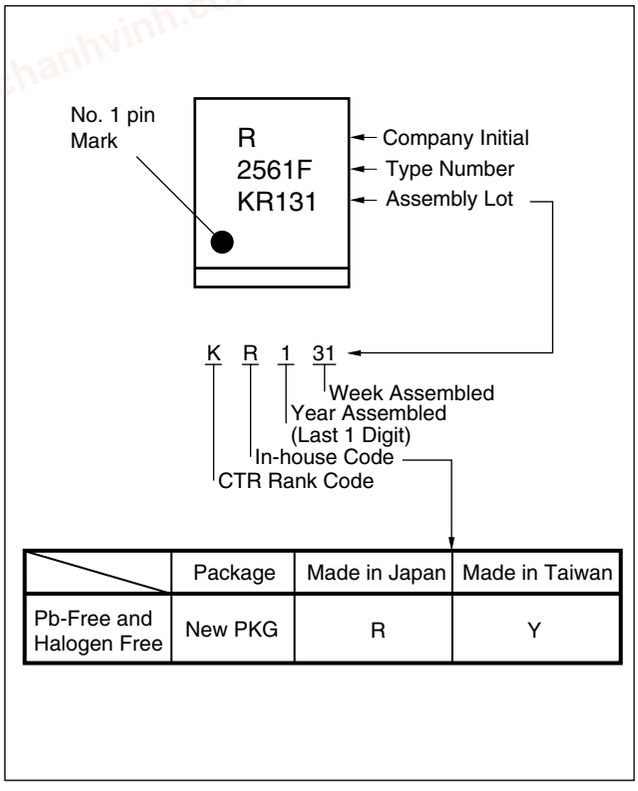


<R> PHOTOCOUPLER CONSTRUCTION

Parameter	PS2561F-1, PS2561FL-1
Air Distance (MIN.)	7 mm
Outer Creepage Distance (MIN.)	7 mm
Inner Creepage Distance (MIN.)	4 mm
Isolation Distance (MIN.)	0.4 mm

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<R> MARKING EXAMPLE



	Package	Made in Japan	Made in Taiwan
Pb-Free and Halogen Free	New PKG	R	Y

<R> ORDERING INFORMATION

Part Number	Order Number	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number*1
PS2561F-1	PS2561F-1Y-A	Pb-Free and Halogen Free	Magazine case 100 pcs	Standard products (UL approved)	PS2561F-1
PS2561FL-1	PS2561FL-1Y-A				PS2561FL-1
PS2561FL-1-F3	PS2561FL-1Y-F3-A		Embossed Tape 2 000 pcs/reel		

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

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

<R>

Parameter		Symbol	Ratings	Unit
Diode	Reverse Voltage	V_R	6	V
	Forward Current (DC)	I_F	30	mA
	Power Dissipation Derating	ΔP_D/°C	1.5	mW/°C
	Power Dissipation	P_D	150	mW
	Peak Forward Current*1	I_{FP}	1	A
Transistor	Collector to Emitter Voltage	V_{CEO}	80	V
	Emitter to Collector Voltage	V_{ECO}	7	V
	Collector Current	I_C	50	mA
	Power Dissipation Derating	ΔP_C/°C	1.5	mW/°C
	Power Dissipation	P_C	150	mW
Isolation Voltage *2		BV	5 000	Vr.m.s.
Operating Ambient Temperature		T_A	–55 to +110	°C
Storage Temperature		T_{stg}	–55 to +150	°C

Notes: *1. PW = 100 μs, Duty Cycle = 1%

*2. AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output.
Pins 1-2 shorted together, 3-4 shorted together.

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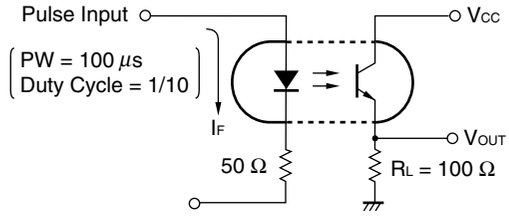
<R> ELECTRICAL CHARACTERISTICS (T_A = 25°C)

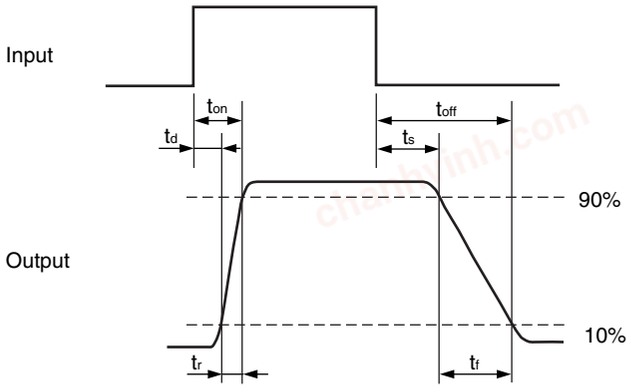
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
	Reverse Current	I_R	V_R = 5 V			5	μA
	Terminal Capacitance	C_t	V = 0 V, f = 1.0 MHz		10		pF
Transistor	Collector to Emitter Dark Current	I_{CEO}	I_F = 0 mA, V_{CE} = 80 V			100	nA
Coupled	Current Transfer Ratio (I_C/I_F)*1	CTR	I_F = 5 mA, V_{CE} = 5 V	300	450	600	%
			I_F = 1 mA, V_{CE} = 5 V	60			
	Collector Saturation Voltage	$V_{CE\ (sat)}$	I_F = 10 mA, I_C = 2 mA			0.3	V
	Isolation Resistance	R_{I-O}	V_{I-O} = 1.0 kV_{DC}	10^{11}			Ω
	Isolation Capacitance	C_{I-O}	V = 0 V, f = 1.0 MHz		0.5		pF
	Rise Time*2	t_r	V_{CC} = 10 V, I_C = 2 mA,		5	18	μs
	Fall Time*2	t_f	R_L = 100 Ω		7	18	

Notes: *1. CTR rank

CTR Rank	CTR (%)	Conditions
K	300 to 600	I_F = 5 mA, V_{CE} = 5 V
	60 and larger	I_F = 1 mA, V_{CE} = 5 V

*2. Test circuit for switching time

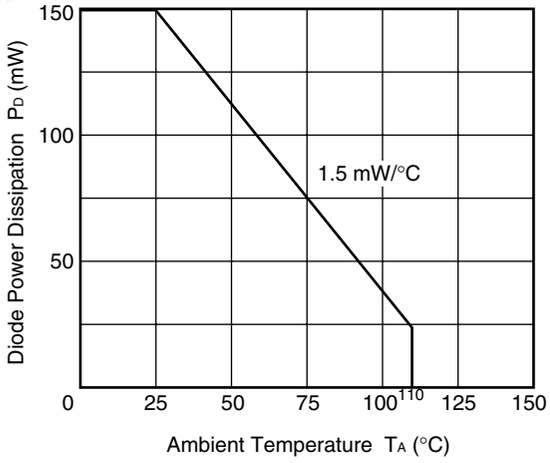




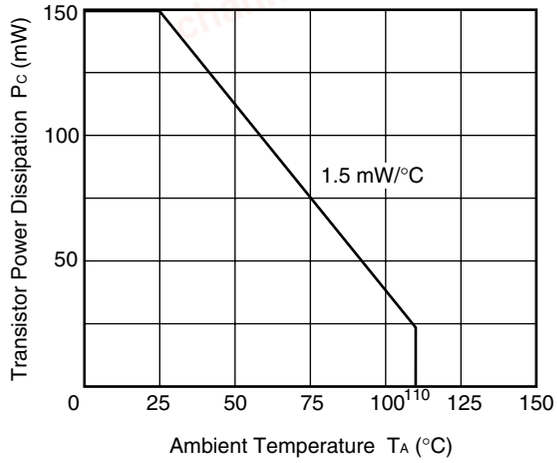
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<R> TYPICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

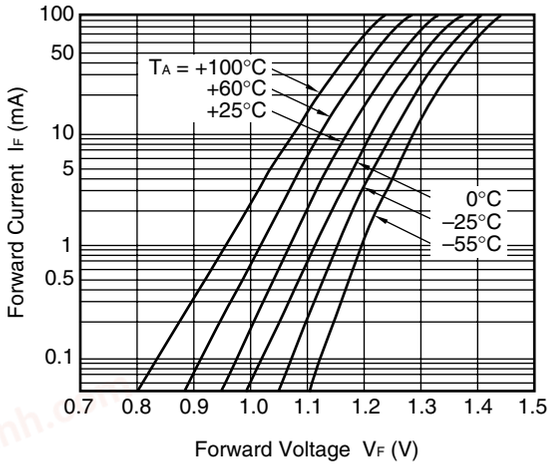
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



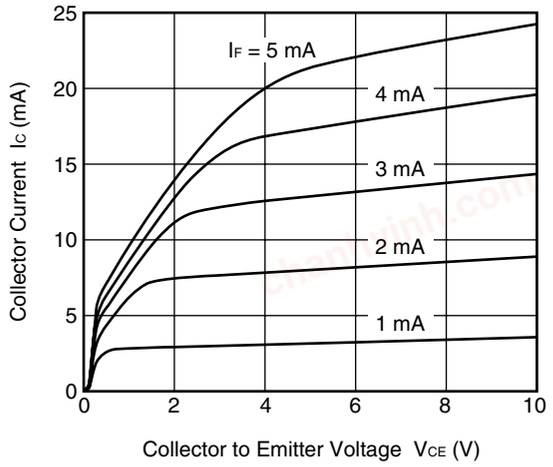
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



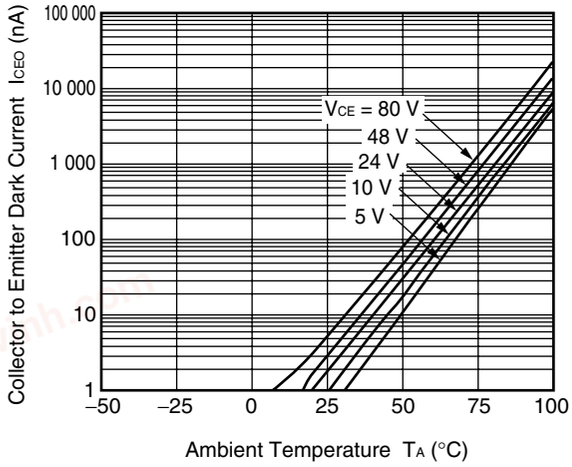
FORWARD CURRENT vs. FORWARD VOLTAGE



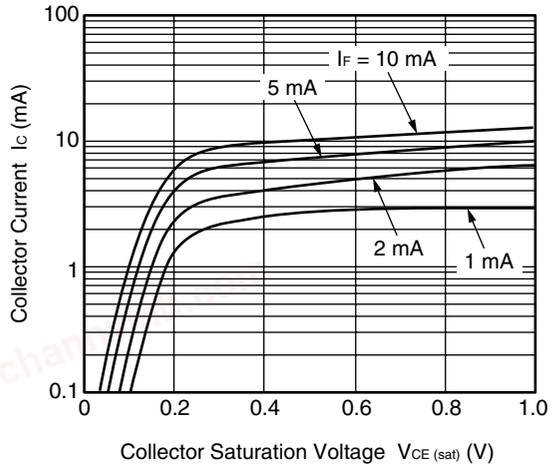
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



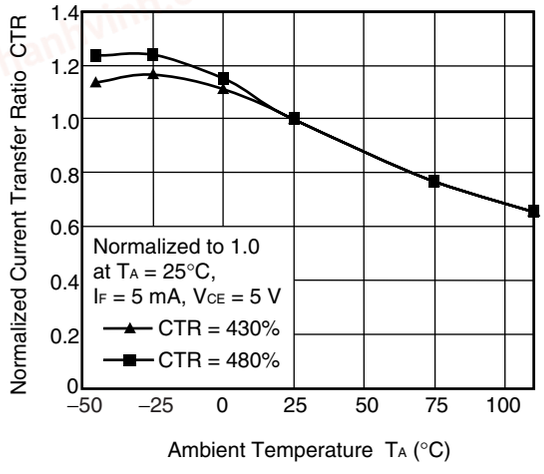
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



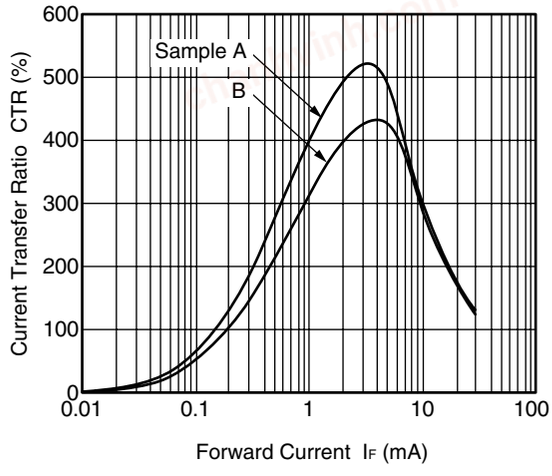
Remark The graphs indicate nominal characteristics.

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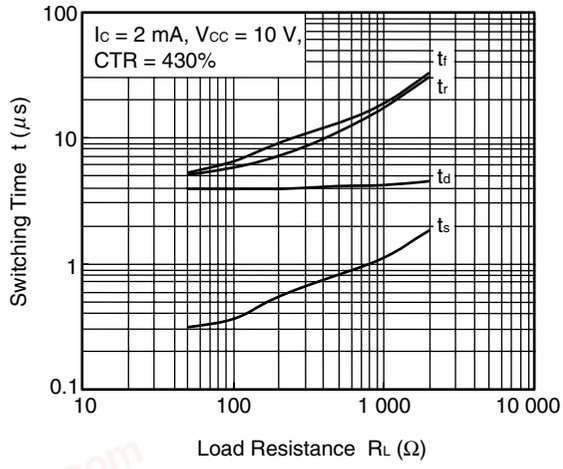
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



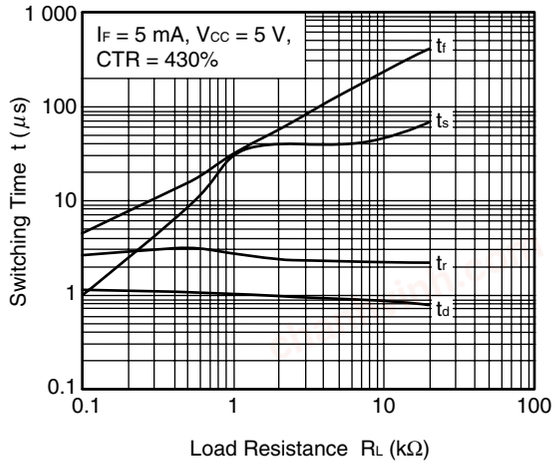
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



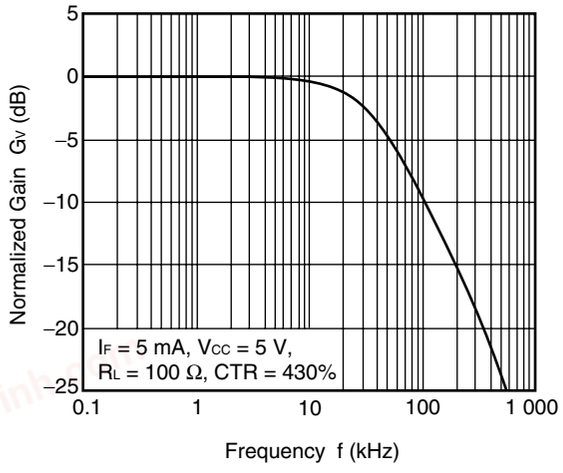
SWITCHING TIME vs. LOAD RESISTANCE



SWITCHING TIME vs. LOAD RESISTANCE



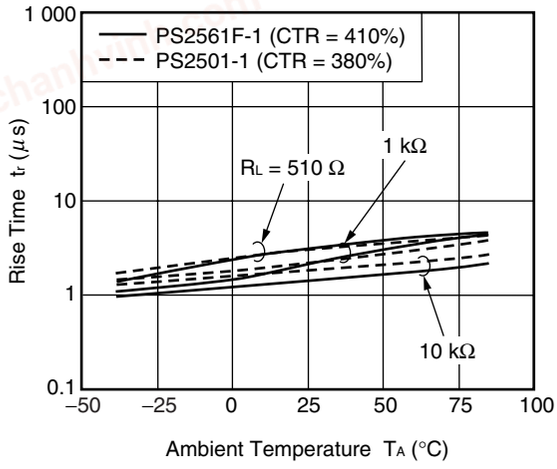
FREQUENCY RESPONSE



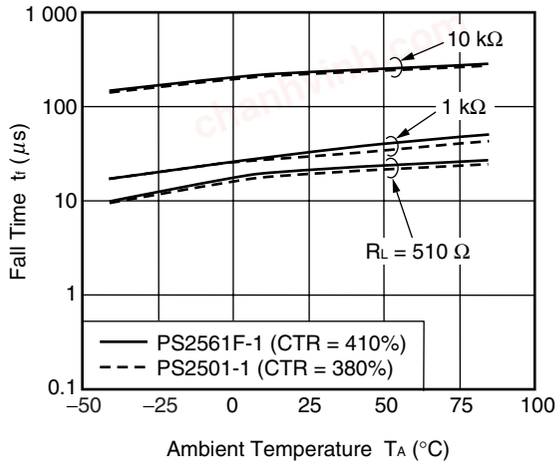
Remark The graphs indicate nominal characteristics.

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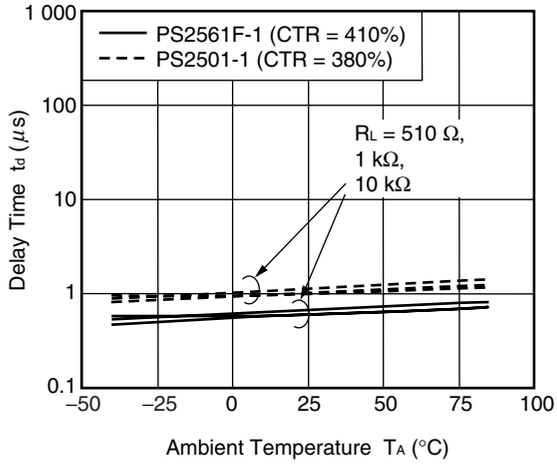
RISE TIME vs. AMBIENT TEMPERATURE*1



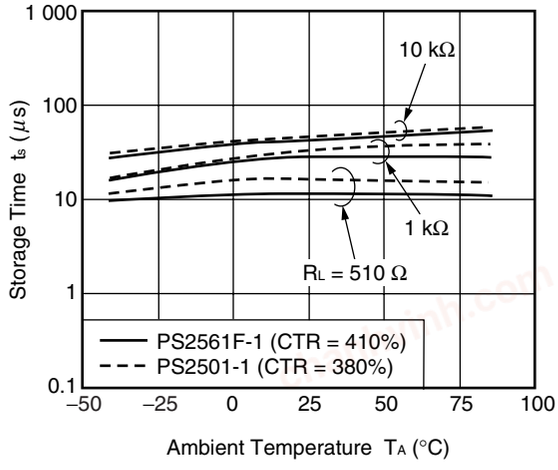
FALL TIME vs. AMBIENT TEMPERATURE*1



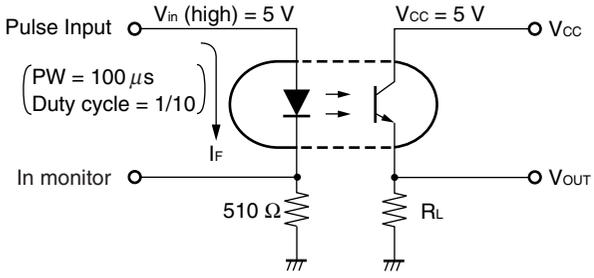
DELAY TIME vs. AMBIENT TEMPERATURE*1

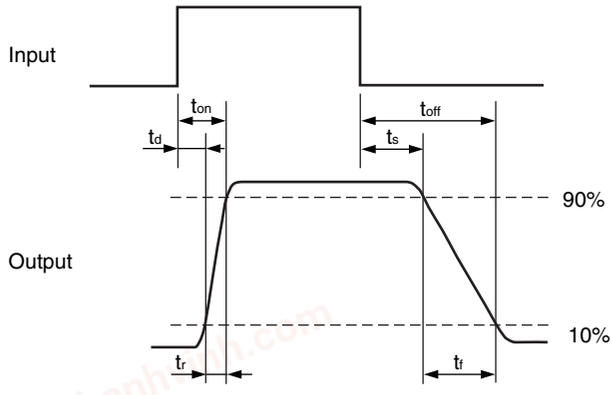


STORAGE TIME vs. AMBIENT TEMPERATURE*1



***1** Test circuit for switching time above



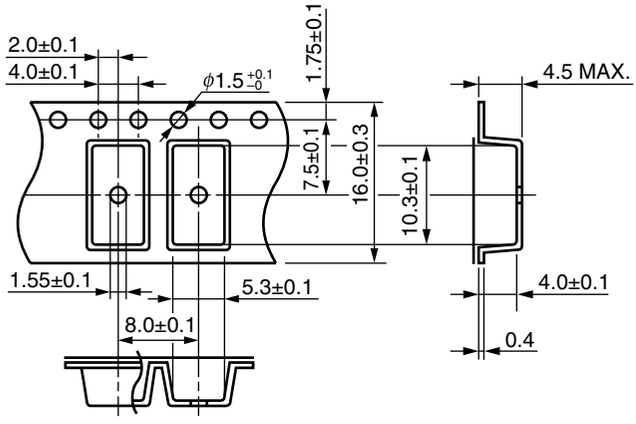


Remark The graphs indicate nominal characteristics.

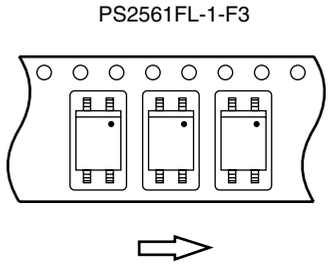
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<R> TAPING SPECIFICATIONS (UNIT: mm)

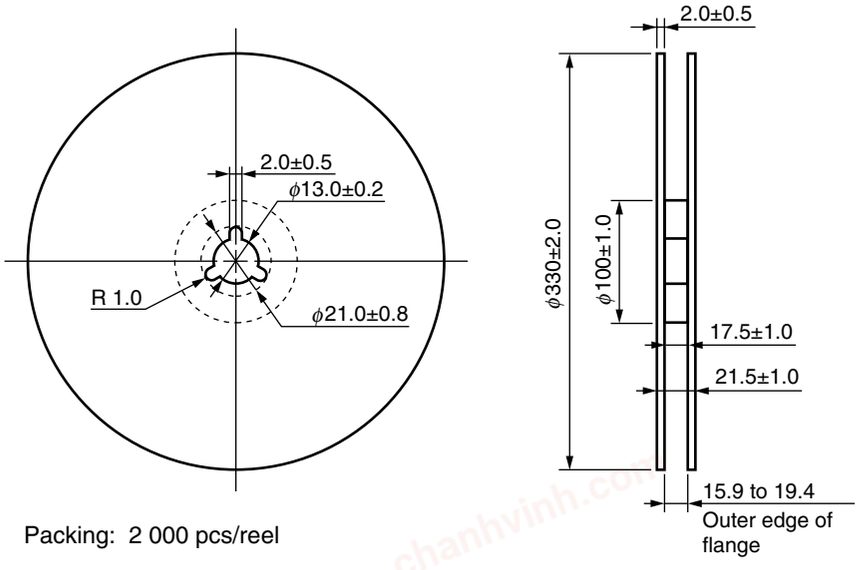
Outline and Dimensions (Tape)



Tape Direction



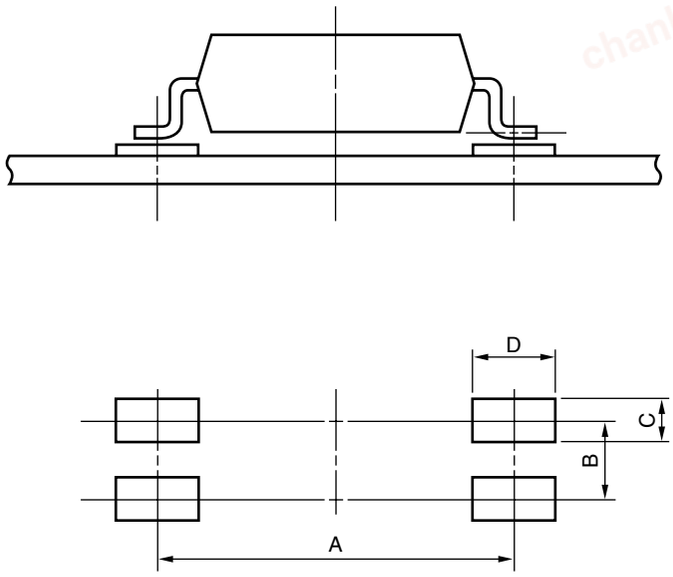
Outline and Dimensions (Reel)



Packing: 2 000 pcs/reel

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<R> RECOMMENDED MOUNT PAD DIMENSIONS (UNIT: mm)



Part Number	Lead Bending	A	B	C	D
PS2561FL	lead bending type (Gull-wing) for surface mount	9.2	2.54	1.7	2.2

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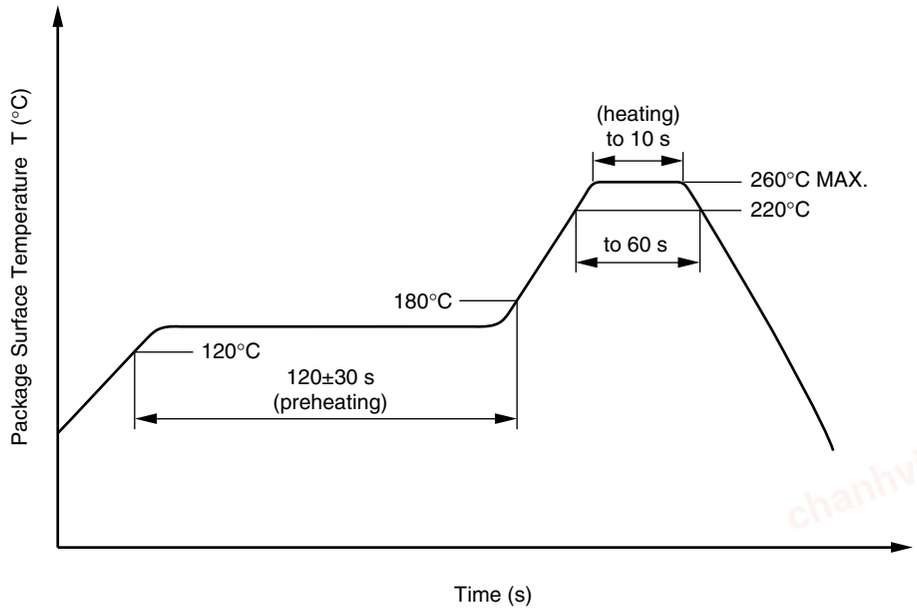
<R> NOTES ON HANDLING

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) Soldering by Soldering Iron

• Peak Temperature (lead part temperature)	350°C or below
• Time (each pins)	3 seconds or less
• Flux	Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(a) Soldering of leads should be made at the point 1.5 to 2.0 mm from the root of the lead

(4) Cautions

• Fluxes	Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.

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2. Cautions regarding noise

Be aware that when voltage is applied suddenly between the photocoupler's input and output at startup, the output transistor may enter the on state, even if the voltage is within the absolute maximum ratings.

3. Measurement conditions of current transfer ratios (CTR), which differ according to photocoupler

Check the setting values before use, since the forward current conditions at CTR measurement differ according to product.

When using products other than at the specified forward current, the characteristics curves may differ from the standard curves due to CTR value variations or the like. Therefore, check the characteristics under the actual operating conditions and thoroughly take variations or the like into consideration before use.

USAGE CAUTIONS

1. Protect against static electricity when handling.
2. Avoid storage at a high temperature and high humidity.

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Caution GaAs Products	This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points. • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.

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Revision History	PS2561F-1,PS2561FL-1 Data Sheet

Rev.	Date	Description	
		Page	Summary
0.01	Dec 22, 2010	–	First edition issued
1.00	Jan 06, 2012	Throughout	Preliminary Data Sheet -> Data Sheet
		Throughout	Safety standards approved
		Throughout	Deletion of the descriptions for PS2561FL1-1,PS2561FL2-1
		p.1	Modification of **APPLICATIONS**
		p.3	Modification of **MARKING EXAMPLE**
		p.3	Addition of **ORDERING INFORMATION**
		p.4	Modification of **ABSOLUTE MAXIMUM RATINGS** I_C
		p.5	Modification of **ELECTRICAL CHARACTERISTICS** t_r, t_f
		pp.6 to 8	Addition of **TYPICAL CHARACTERISTICS**
		p.9	Addition of **TAPING SPECIFICATIONS**
		p.10	Modification of **RECOMMENDED MOUNT PAD DIMENSIONS**
		p.11	Modification of **NOTES ON HANDLING**

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