

PS2802-1, PS2802-4

R08DS0156EJ0200

Rev.2.00

HIGH ISOLATION VOLTAGE DARLINGTON TRANSISTOR TYPE SSOP PHOTOCOUPLER

Jan. 27, 2026

DESCRIPTION

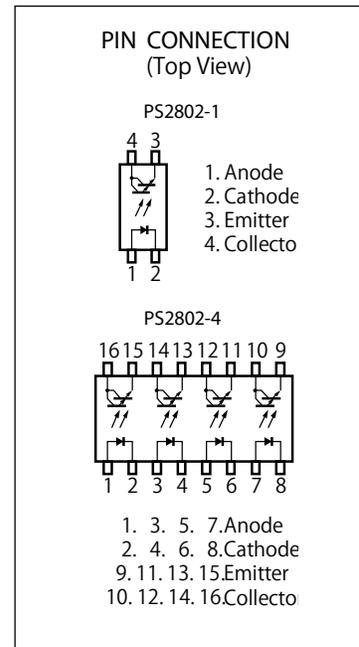
The PS2802-1 and PS2802-4 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon Darlington-connected phototransistor in a plastic SSOP for high density applications. This package has shield effect to cut off ambient light.

FEATURES

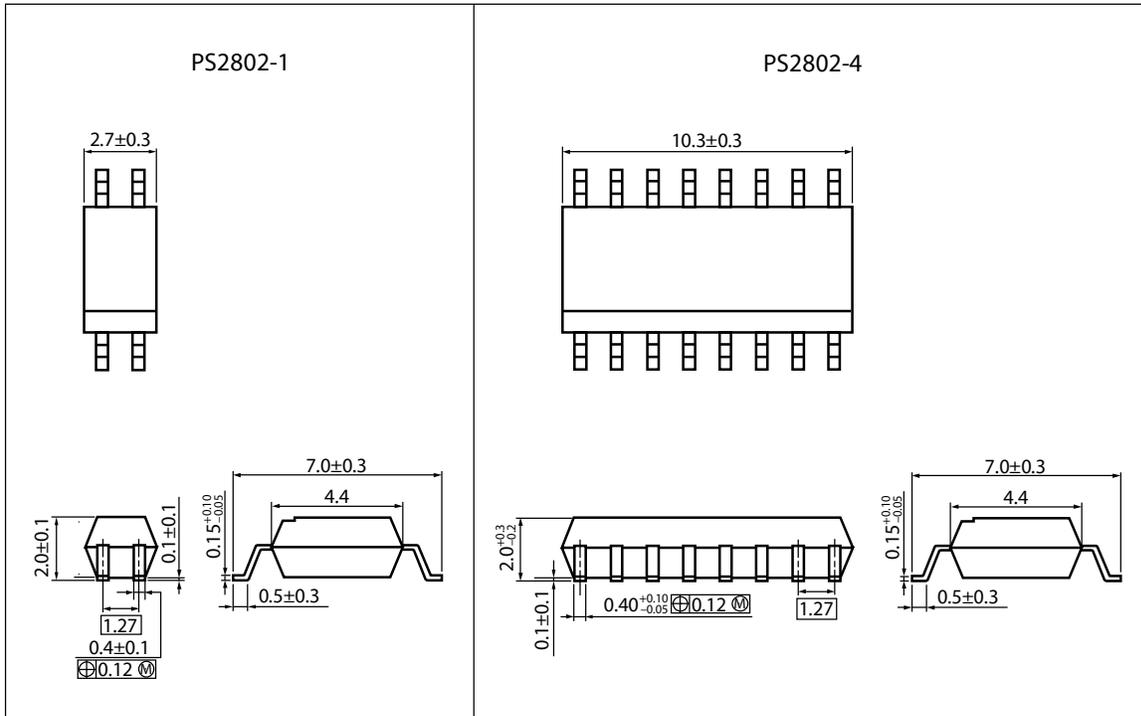
- High isolation voltage (BV = 2 500 Vr.m.s.)
- Small and thin package (4, 16-pin SSOP, Pin pitch 1.27 mm)
- High current transfer ratio (CTR = 2 000 % TYP. @ $I_F = 1 \text{ mA}$, $V_{CE} = 2 \text{ V}$)
- Embossed tape product : PS2802-1-F3: 3 500 pcs/reel
: PS2802-4-F3: 2 500 pcs/reel
- Pb-free product
- Safety standards
 - UL approved: UL 1577, Single protection
 - CSA approved: CSA-C22.2 No. 62368-1, Basic insulation
 - BSI approved: BS EN IEC 62368-1, Basic/Supplementary insulation
 - VDE approved: DIN EN IEC 60747-5-5 (Option)

APPLICATIONS

- Programmable logic controllers
- Measuring instruments
- Power supply
- Hybrid IC



PACKAGE DIMENSIONS (UNIT: mm)



Weight (4-pin SSOP) : 0.05 g (TYP.)

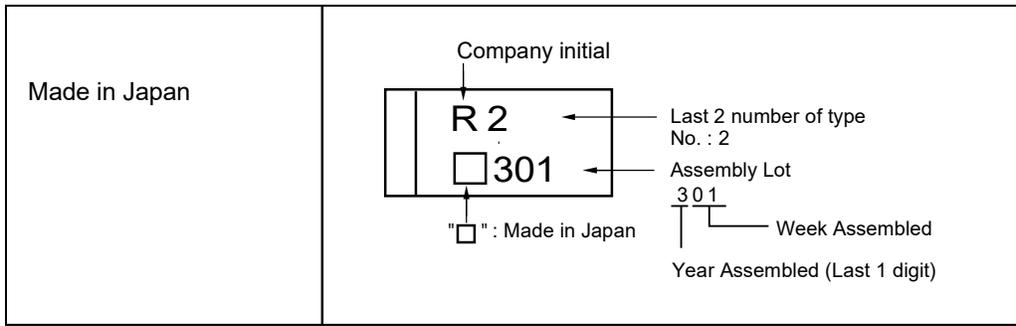
Weight (16-pin SSOP) : 0.2 g (TYP.)

PHOTOCOUPLER CONSTRUCTION

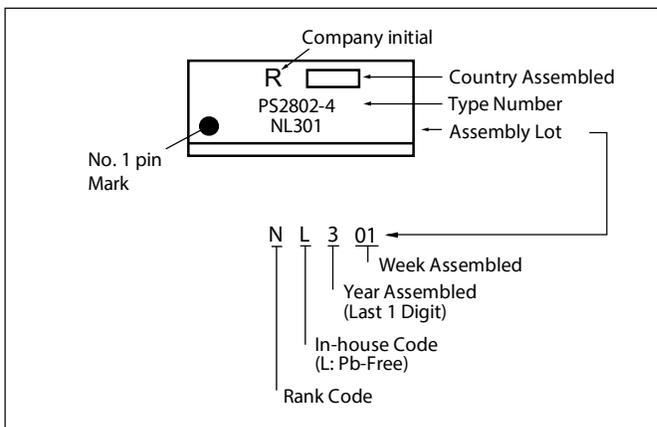
Parameter	MIN.
Air Distance	4.5 mm
Creepage Distance	4.5 mm
Isolation Distance	0.1 mm

MARKING EXAMPLE

PS2802-1



PS2802-4



ORDERING INFORMATION

Part Number	Order Number ^{*1}	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number ^{*2}
PS2802-1	PS2802-1-A	Pb-Free	Embossed Tape 50 pcs	Standard Products (UL, CSA, BSI Approved)	PS2802-1
PS2802-1-F3	PS2802-1-F3-A		Embossed Tape 3 500 pcs/reel		
PS2802-1-V	PS2802-1-V-A		Embossed Tape 50 pcs	UL, CSA, BSI, VDE Approved	
PS2802-1-V-F3	PS2802-1-V-F3-A		Embossed Tape 3 500 pcs/reel		
PS2802-4	PS2802-4-A	Pb-Free	Embossed Tape 10 pcs	Standard Products (UL, CSA, BSI, Approved)	PS2802-4
PS2802-4-F3	PS2802-4-F3-A		Embossed Tape 2 500 pcs/reel		
PS2802-4-V	PS2802-4-V-A		Embossed Tape 10 pcs	UL, CSA, BSI, VDE Approved	
PS2802-4-V-F3	PS2802-4-V-F3-A		Embossed Tape 2 500 pcs/reel		

Notes: *1. When specifying CTR rank, please add “-CTR rank” after Order Number.

ex. L rank : PS2802-1-A-L

Notes: *2. For the application of the safety standard, the following part number should be used.

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

Parameter		Symbol	Ratings		Unit
			PS2802-1	PS2802-4	
Diode	Forward Current (DC)	I _F	50		mA/ch
	Reverse Voltage	V _R	6		V
	Power Dissipation ^{*1}	P _D	60	80	mW/ch
	Peak Forward Current ^{*2}	I _{FP}	1		A/ch
Transistor	Collector to Emitter Voltage	V _{CEO}	40		V
	Emitter to Collector Voltage	V _{ECO}	6		V
	Collector Current	I _C	90	100	mA/ch
	Power Dissipation ^{*3}	P _C	120		mW/ch
Isolation Voltage ^{*4}		BV	2 500		Vr.m.s.
Operating Ambient Temperature		T _A	-55 to +100		°C
Storage Temperature		T _{stg}	-55 to +150		°C

Notes: *1. Reduced to 0.6 mW/°C at T_A = 25 °C or more.(PS2802-1)

Reduced to 0.8 mW/°C at T_A = 25 °C or more.(PS2802-4)

*2. PW = 100 μs, Duty Cycle = 1 %

*3. Reduced to 1.2 mW/°C at T_A = 25 °C or more.

*4. 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 (PS2802-1).

Pins 1-8 shorted together, 9-16 shorted together (PS2802-4).

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = 5 mA		1.1	1.4	V
	Reverse Current	I _R	V _R = 5 V			5	μA
	Terminal Capacitance	C _t	V = 0 V, f = 1.0 MHz		15		pF
Transistor	Collector to Emitter Dark Current	I _{CEO}	V _{CE} = 40 V, I _F = 0 mA			400	nA
Coupled	Current Transfer Ratio (I _C /I _F) ^{*1}	CTR	I _F = 1 mA, V _{CE} = 2 V	200	2 000		%
	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} = 1.0 kV _{DC}	10 ¹¹			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1.0 MHz		0.4		pF
	Rise Time ^{*2}	t _r	V _{CC} = 5 V, I _C = 2 mA, R _L = 100 Ω		200		μs
	Fall Time ^{*2}	t _f			200		

Notes: *1. CTR rank (PS2802-1 only)

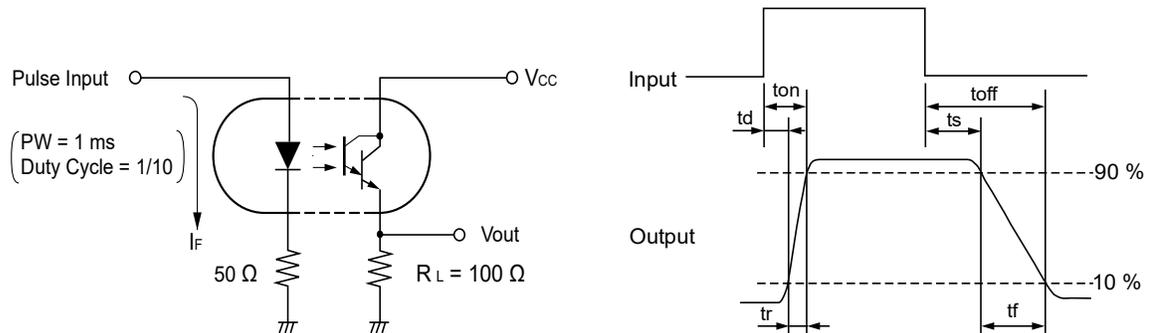
K : 2 000 to (%)

L : 700 to 3 400 (%)

M : 200 to 1 000 (%)

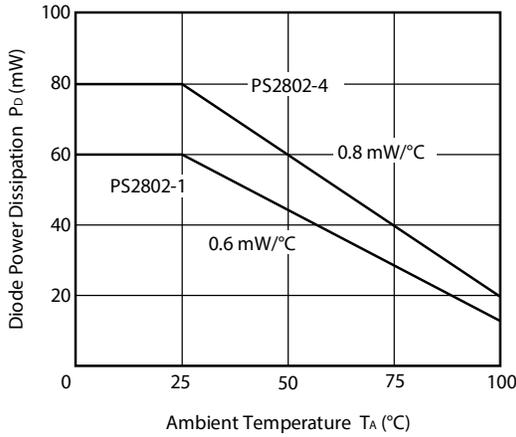
N : 200 to (%)

*2. Test circuit for switching time

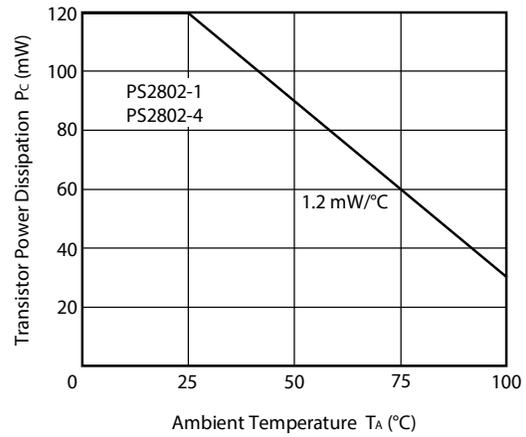


TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)

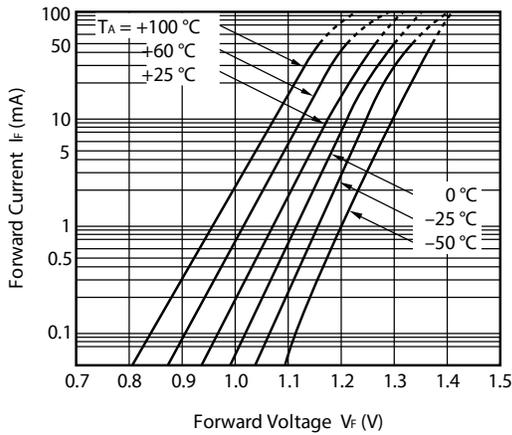
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



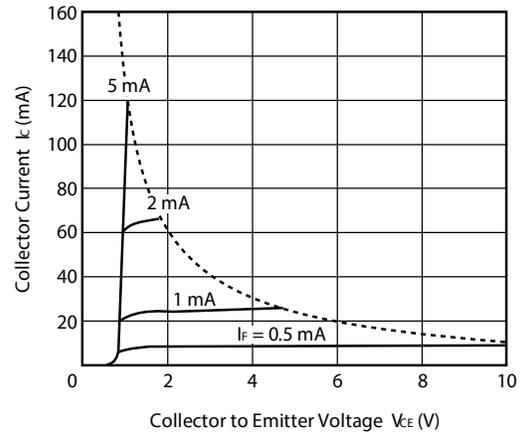
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



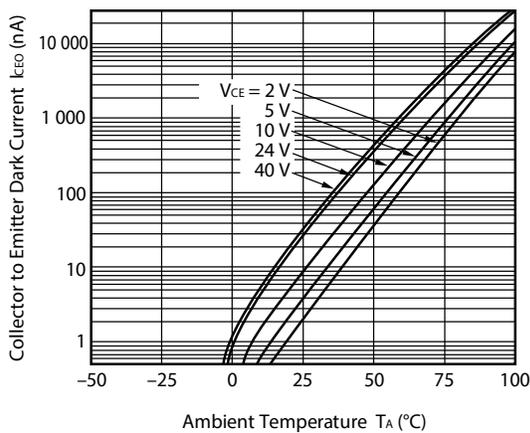
FORWARD CURRENT vs. FORWARD VOLTAGE



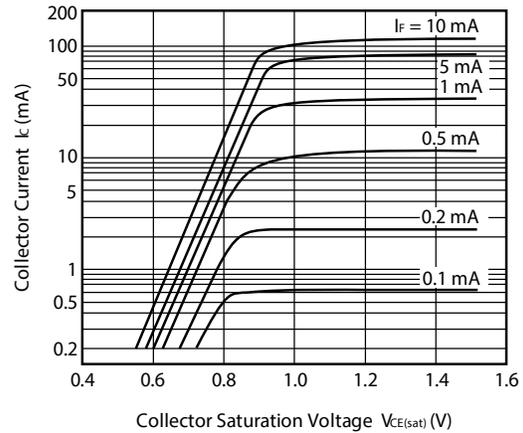
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



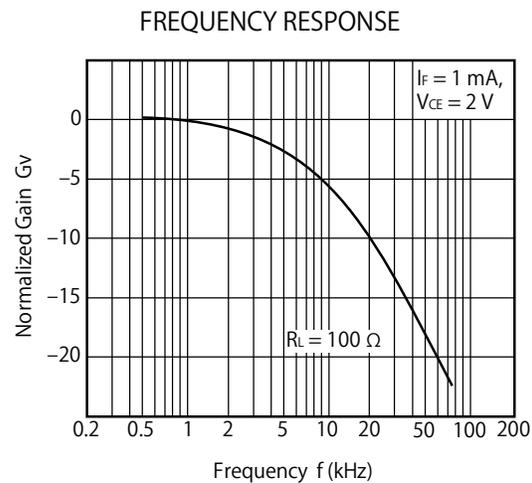
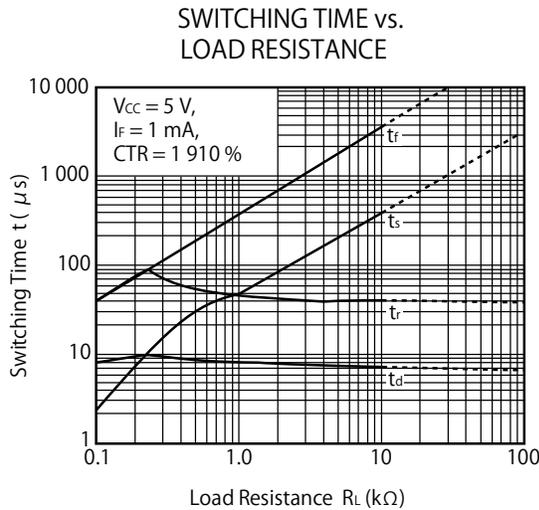
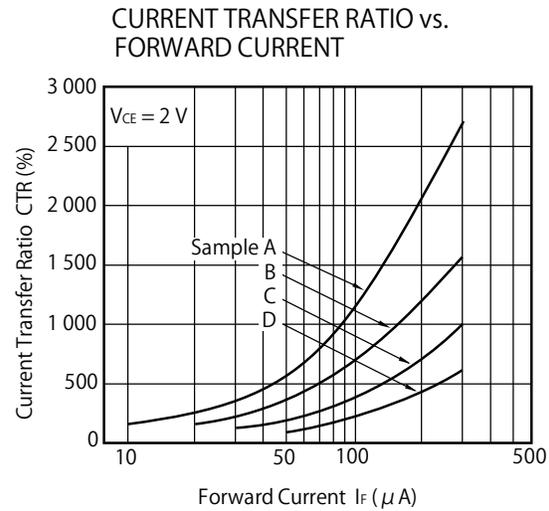
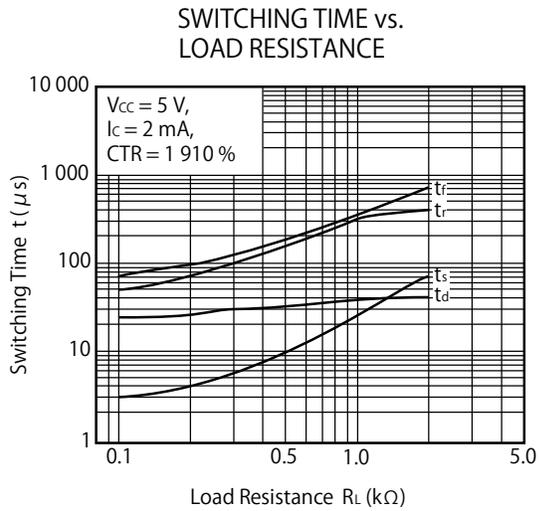
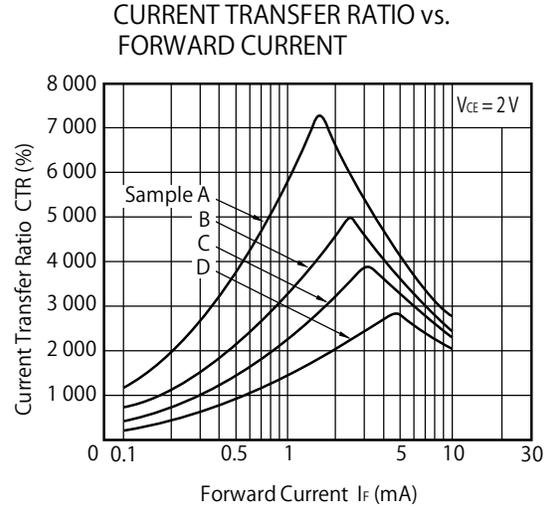
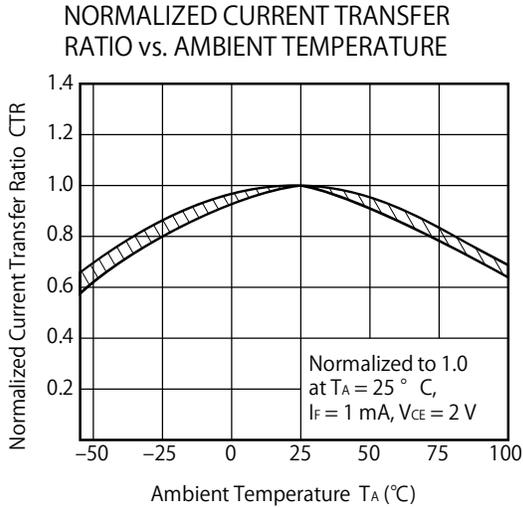
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



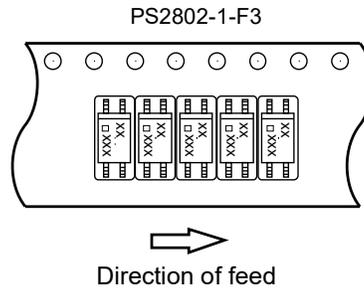
Remark The graphs indicate nominal characteristics.



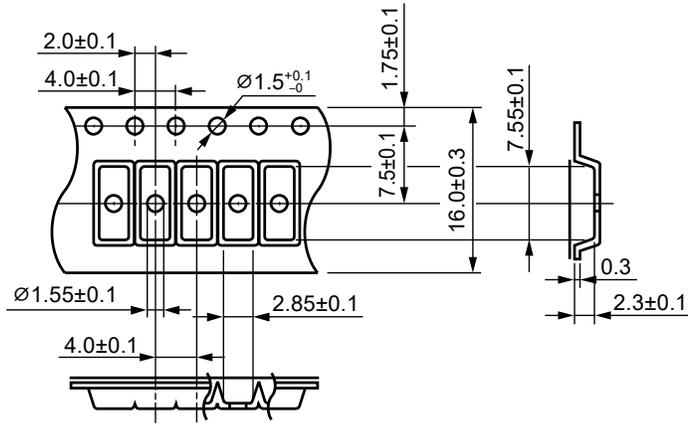
Remark The graphs indicate nominal characteristics.

TAPING SPECIFICATIONS (UNIT: mm)

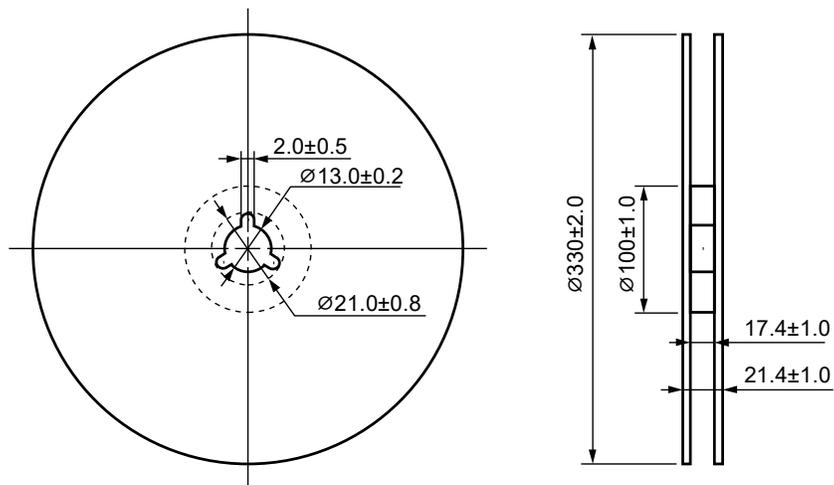
Taping Direction



Outline and Dimensions (Tape)

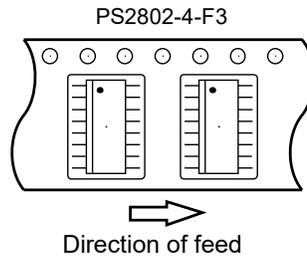


Outline and Dimensions (Reel)

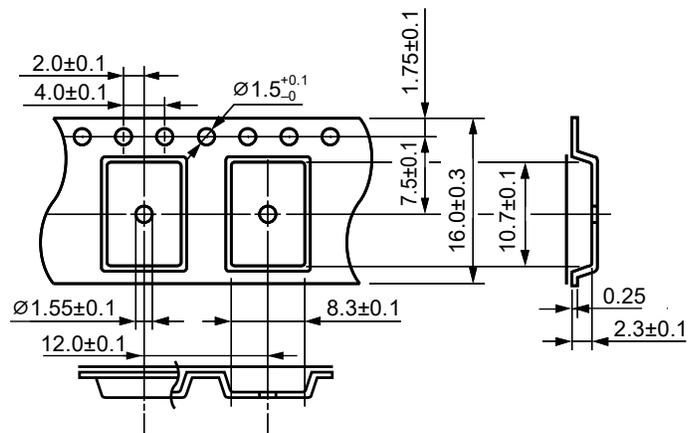


Packing : 3 500 pcs/reel

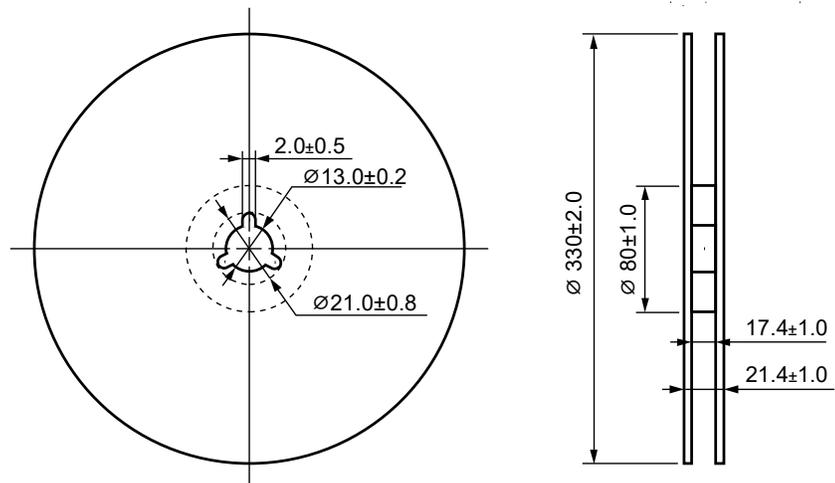
Tape Direction



Outline and Dimensions (Tape)

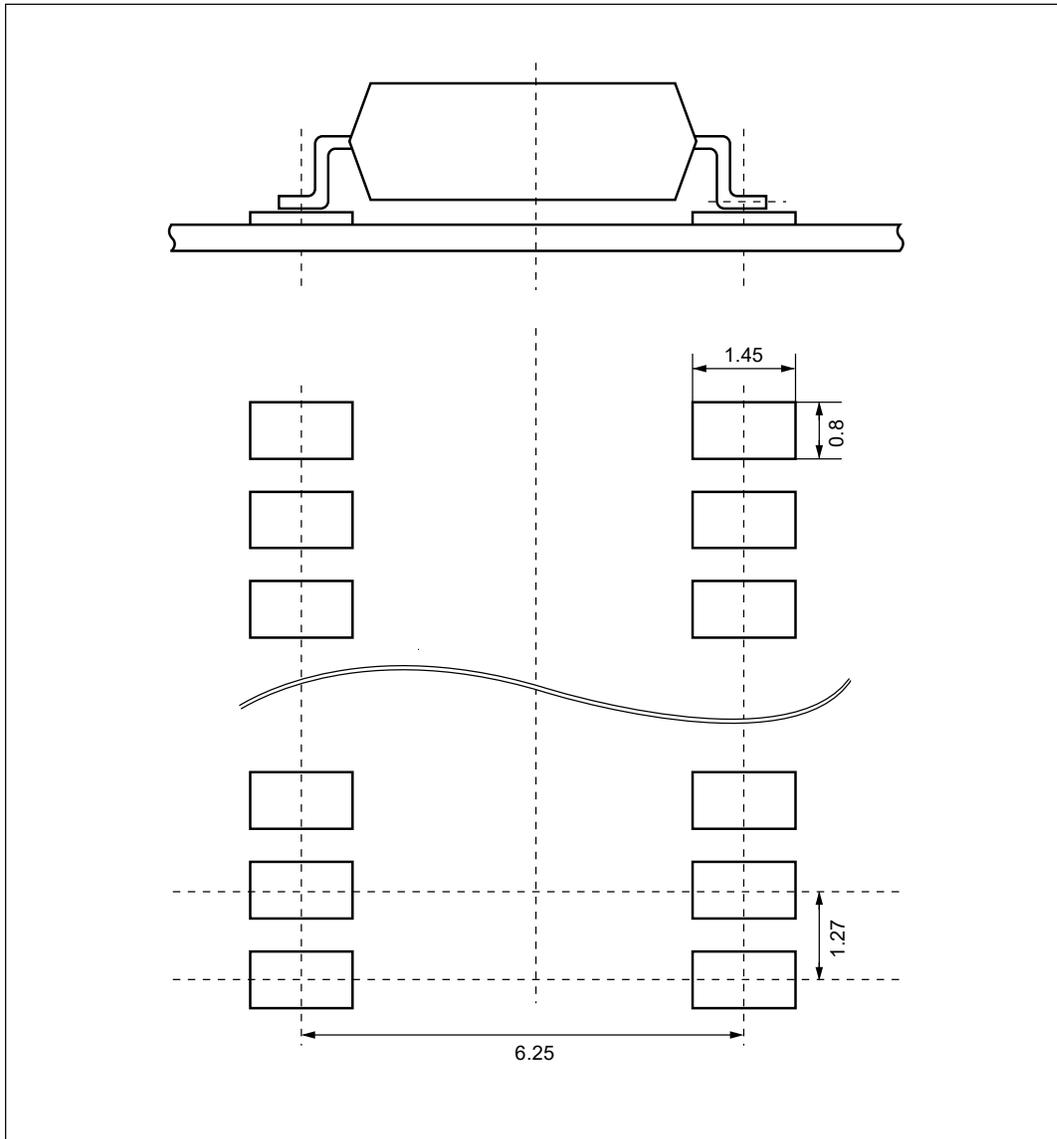


Outline and Dimensions (Reel)



Packing : 2 500 pcs/reel

RECOMMENDED MOUNT PAD DIMENSIONS (UNIT: mm)



Remark All dimensions in this figure must be evaluated before use.

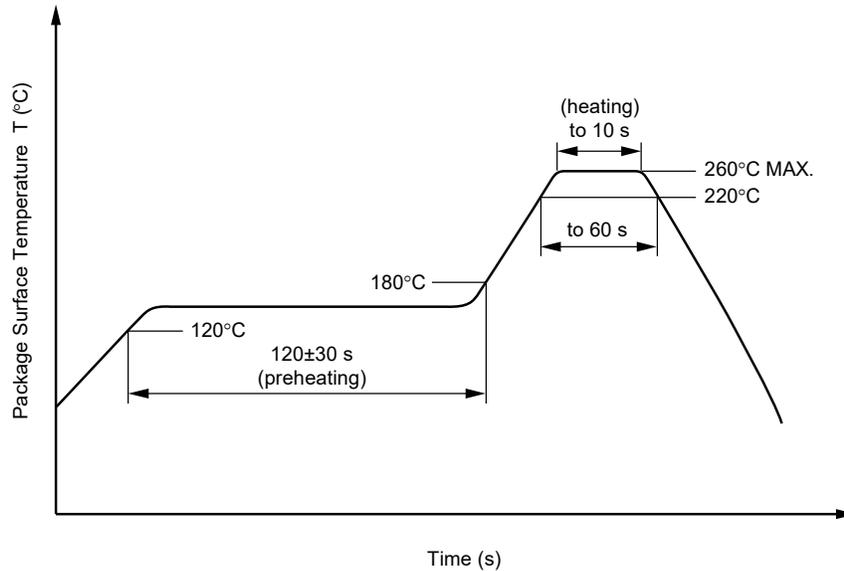
NOTES ON HANDLING

1. Recommended soldering conditions

(1) Infrared reflow soldering

- Peak reflow temperature 260 °C or below (package surface temperature)
- Time of peak reflow temperature 10 s or less
- Time of temperature higher than 220 °C 60 s 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 s 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 (per one side) 3 s 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

(b) Please be sure that the temperature of the package would not be heated over 100°C

(4) Cautions

- Flux cleaning Avoid cleaning with Freon- or halogen-based (chlorinated etc.) solvents.
- Fixing/Coating Do not use fixing agents or coatings containing halogen-based substances.

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 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. This tendency may sometimes be obvious, especially below $I_F = 1$ mA.

Therefore, check the characteristics under the actual operating conditions and thoroughly take variations or the like into consideration before use.

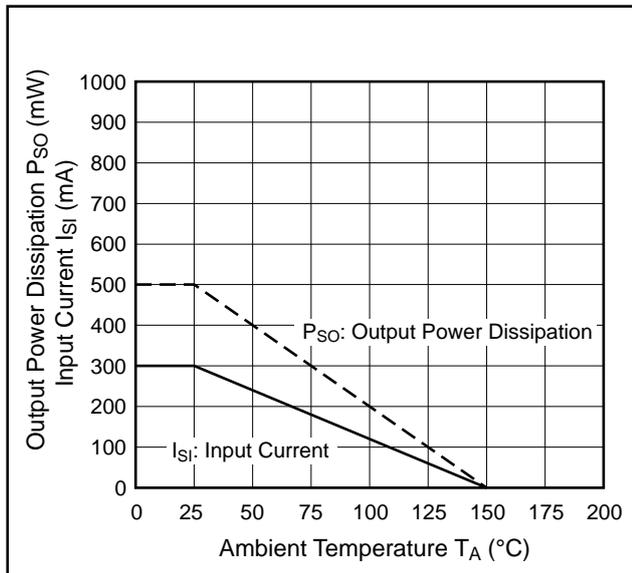
USAGE CAUTIONS

1. Protect against static electricity when handling.
2. Avoid storage at a high temperature and high humidity.
3. Avoid cleaning with Freon based or halogen-based (chlorinated etc.) solvents.
4. Do not use fixing agents or coatings containing halogen-based substances.

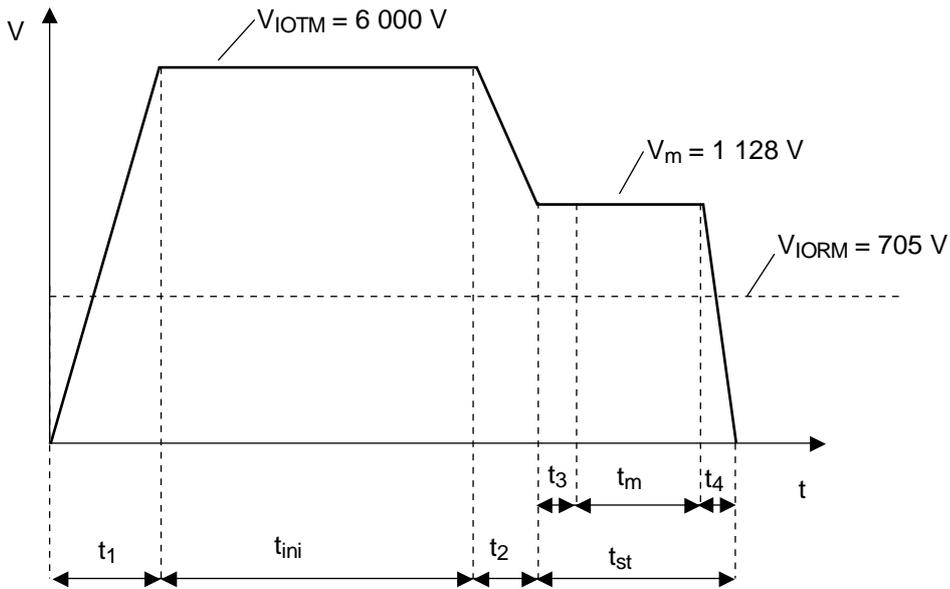
SPECIFICATION OF VDE MARKS LICENSE DOCUMENT

Parameter	Symbol	Rating	Unit
Climatic test class (IEC 60068-1/DIN EN 60068-1)		55/100/21	
Dielectric strength			
maximum operating isolation voltage	V_{IORM}	705	V_{peak}
Test voltage (partial discharge test, procedure a for type test and random test)	V_m	1 128	V_{peak}
$V_m = 1.6 \times V_{IORM}, q_{pd} < 5 \text{ pC}$			
Test voltage (partial discharge test, procedure b for all devices)	V_m	1 322	V_{peak}
$V_m = 1.875 \times V_{IORM}, q_{pd} < 5 \text{ pC}$			
Highest permissible overvoltage	V_{IOTM}	6 000	V_{peak}
Degree of pollution (IEC 60664-1/DIN EN 60664-1 (VDE 0110-1))		2	
Comparative tracking index (IEC 60112/DIN EN 60112 (VDE 0303-11))	CTI	175	
Material group (IEC 60664-1/DIN EN 60664-1 (VDE 0110-1))		III a	
Storage temperature range	T_{stg}	-55 to +150	°C
Operating temperature range	T_A	-55 to +100	°C
Isolation resistance, minimum value			
$V_{I-O} = 500 \text{ V dc}, T_A = 25 \text{ °C}$	$R_{I-O \text{ MIN.}}$	10^{12}	Ω
$V_{I-O} = 500 \text{ V dc}, T_A = \text{maximum temperature of rating, at least } 100 \text{ °C}$	$R_{I-O \text{ MIN.}}$	10^{11}	Ω
Safety maximum ratings (maximum permissible in case of fault, see thermal derating curve)			
Maximum ambient temperature	T_s	150	°C
Maximum input current	I_{SI}	300	mA
Maximum output power dissipation	P_{SO}	500	mW
Isolation resistance, minimum value at $V_{I-O} = 500 \text{ V dc}, T_A = T_s$	$R_{I-O \text{ MIN.}}$	10^9	Ω

Dependence of maximum safety ratings with ambient temperature

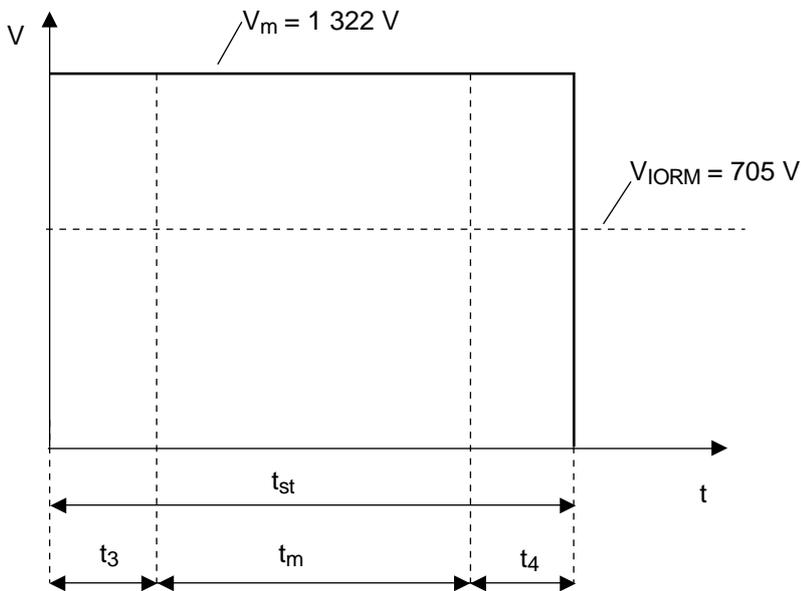


Method a) Destructive Test, Type and Sample Test



$t_1, t_2 = 1 \text{ to } 10 \text{ sec}$
 $t_3, t_4 = 1 \text{ sec}$
 $t_m = 10 \text{ sec}$
 $t_{st} = 12 \text{ sec}$
 $t_{ini} = 60 \text{ sec}$

Method b) Non-destructive Test, 100% Production Test



$t_3, t_4 = 0.1 \text{ sec}$
 $t_m = 1.0 \text{ sec}$
 $t_{st} = 1.2 \text{ sec}$

Caution	GaAs Products	<p>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.</p> <ul style="list-style-type: none">• 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.<ol style="list-style-type: none">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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