

PS8101

1 Mbps, HIGH CMTI ANALOG OUTPUT TYPE

R08DS0138EJ0200

Rev.2.00

5-PIN SOP (SO-5) PHOTOCOUPLER

Feb. 17, 2026

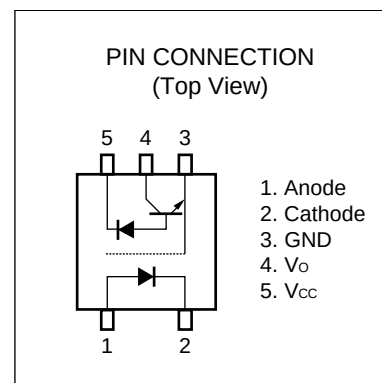
DESCRIPTION

The PS8101 is an optically coupled isolator containing an AlGaAs LED on the light emitting diode (input side) and a PIN photodiode and a high-speed amplifier transistor on the output side on one chip.

This is a plastic SOP (Small Out-line Package) type for high density applications.

FEATURES

- High common mode transient immunity ($|CM_H|$, $|CM_L|$ = 15 kV/ μ s MIN.)
- Small package (SO-5)
- High supply voltage (V_{CC} = 35 V)
- High isolation voltage (BV = 3 750 Vr.m.s.)
- High-speed response (t_{PHL} = 0.8 μ s MAX., t_{PLH} = 1.2 μ s MAX.)
- Embossed tape product : PS8101-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
 - VDE approved: DIN EN IEC 60747-5-5 (Option)

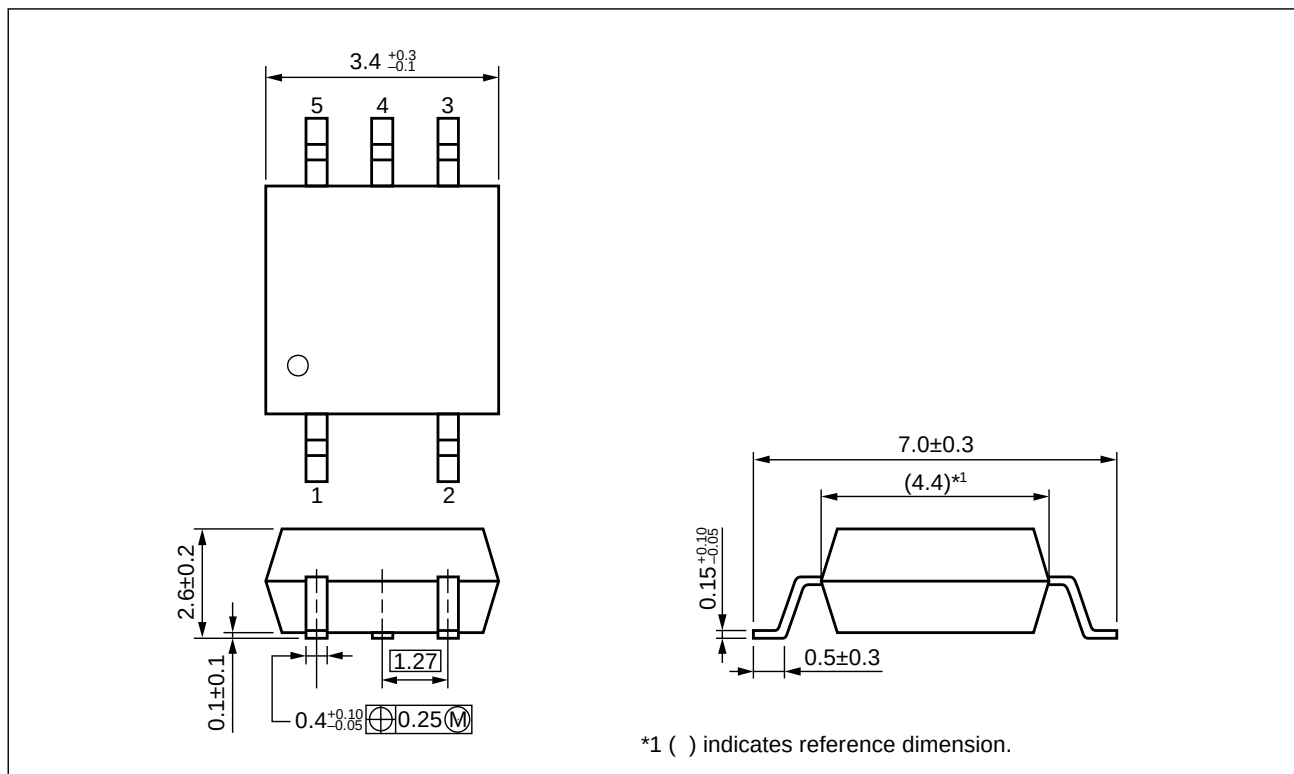


APPLICATIONS

- Computer and peripheral manufactures
- General purpose inverter
- Substitutions for relays and pulse transformers
- Power supply

Start of mass production
Jul.2007

PACKAGE DIMENSIONS (UNIT: mm)

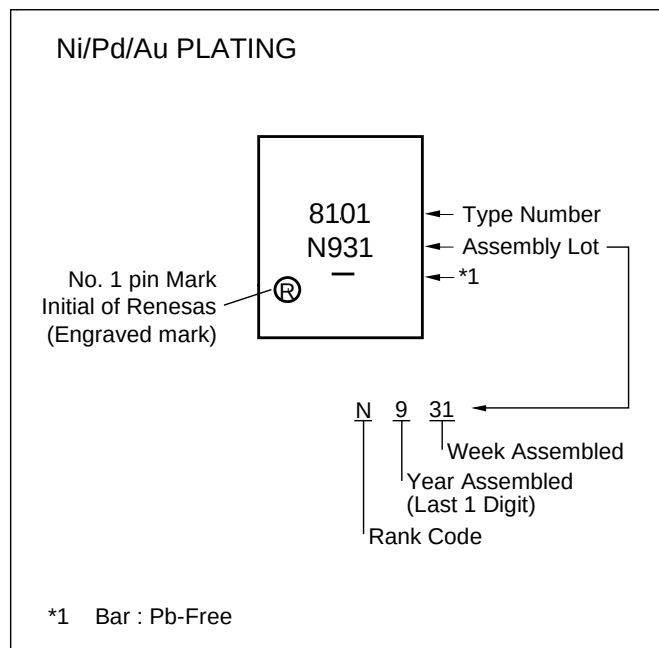


Weight: 0.08 g (TYP.)

PHOTOCOUPLER CONSTRUCTION

Parameter	MIN.
Air Distance	4.2 mm
Creepage Distance	4.2 mm
Isolation Distance	0.2 mm

MARKING EXAMPLE



ORDERING INFORMATION

Part Number	Order Number *1	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number *2
PS8101	PS8101-AX	Pb-Free (Ni/Pd/Au)	Embossed Tape 20 pcs	Standard products (UL, CSA Approved)	PS8101
PS8101-F3	PS8101-F3-AX		Embossed Tape 2 500 pcs/reel		
PS8101-V	PS8101-V-AX		Embossed Tape 20 pcs	UL, CSA, VDE Approved	
PS8101-V-F3	PS8101-V-F3-AX		Embossed Tape 2 500 pcs/reel		

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

ex. K rank : PS8101-AX-K

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

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Diode	Forward Current	I_F	25	mA
	Reverse Voltage	V_R	5.0	V
	Power Dissipation *1	P_D	45	mW
Detector	Supply Voltage	V_{CC}	35	V
	Output Voltage	V_O	35	V
	Output Current	I_O	8.0	mA
	Power Dissipation *2	P_C	100	mW
Isolation Voltage *3		BV	3 750	Vr.m.s.
Operating Ambient Temperature		T_A	-55 to +100	$^{\circ}\text{C}$
Storage Temperature		T_{stg}	-55 to +125	$^{\circ}\text{C}$

Notes: *1. Reduced to 0.45 mW/ $^{\circ}\text{C}$ at $T_A = 25\text{ }^{\circ}\text{C}$ or more.

*2. Reduced to 1.00 mW/ $^{\circ}\text{C}$ at $T_A = 25\text{ }^{\circ}\text{C}$ or more.

*3. AC voltage for 1 minute at $T_A = 25\text{ }^{\circ}\text{C}$, RH = 60% between input and output.

Pins 1-2 shorted together, 3-5 shorted together.

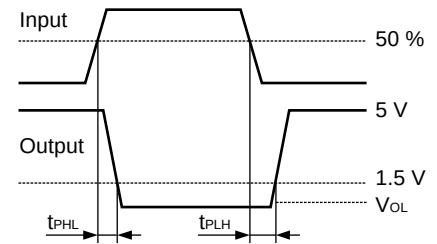
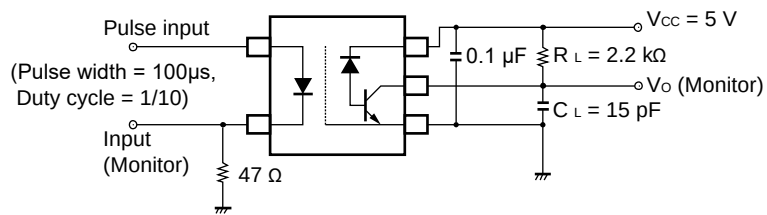
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = 16 mA		1.7	2.2	V
	Reverse Current	I _R	V _R = 3 V			10	μA
	Forward Voltage Temperature Coefficient	ΔV _F /ΔT _A	I _F = 16 mA		-2.1		mV/°C
	Terminal Capacitance	C _t	V = 0 V, f = 1 MHz		30		pF
Detector	High Level Output Current	I _{OH} (1)	I _F = 0 mA, V _{CC} = V _O = 5.5 V		3	500	nA
	High Level Output Current	I _{OH} (2)	I _F = 0 mA, V _{CC} = V _O = 30 V			100	μA
	Low Level Output Voltage	V _{OL}	I _F = 16 mA, V _{CC} = 4.5 V, I _O = 1.2 mA		0.1	0.4	V
	Low Level Supply Current	I _{CC} L	I _F = 16 mA, V _O = open, V _{CC} = 30 V		50		μA
	High Level Supply Current	I _{CC} H	I _F = 0 mA, V _O = open, V _{CC} = 30 V		0.01	2	
Coupled	Current Transfer Ratio *1	CTR	I _F = 16 mA, V _{CC} = 4.5 V, V _O = 0.4 V	15	20	35	%
	Isolation Resistance	R _{I-O}	V _{I-O} = 1 kV _{DC} , RH = 40 to 60 %	10 ¹¹			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1 MHz		0.4		pF
	Propagation Delay Time (H → L) *2	t _{PHL}	I _F = 16 mA, V _{CC} = 5 V, R _L = 2.2 kΩ, C _L = 15 pF		0.5	0.8	μs
	Propagation Delay Time (L → H) *2	t _{PLH}			0.6	1.2	
	Common Mode Transient Immunity at High Level Output *3	C _{MH}	I _F = 0 mA, V _{CC} = 5 V, R _L = 4.1 kΩ, V _{CM} = 1.5 kV	15			kV/μs
	Common Mode Transient Immunity at Low Level Output *3	C _{ML}	I _F = 16 mA, V _{CC} = 5 V, R _L = 4.1 kΩ, V _{CM} = 1.5 kV	15			

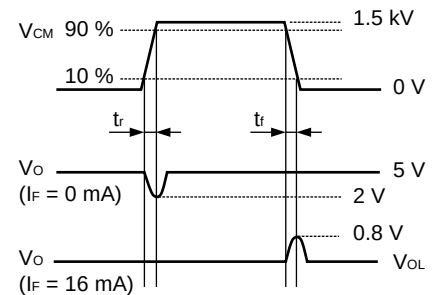
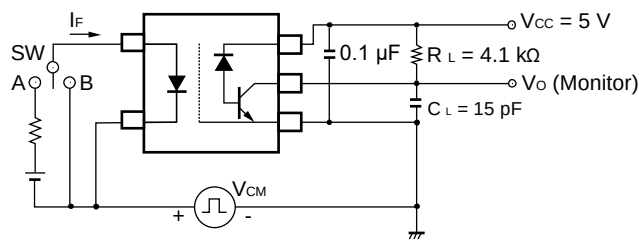
Notes: *1. CTR rank

K : 20 to 35 (%)

N : 15 to 35 (%)

***2. Test circuit for propagation delay time**

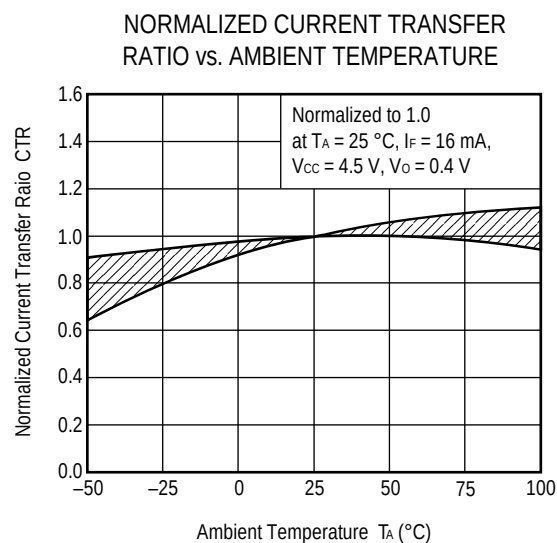
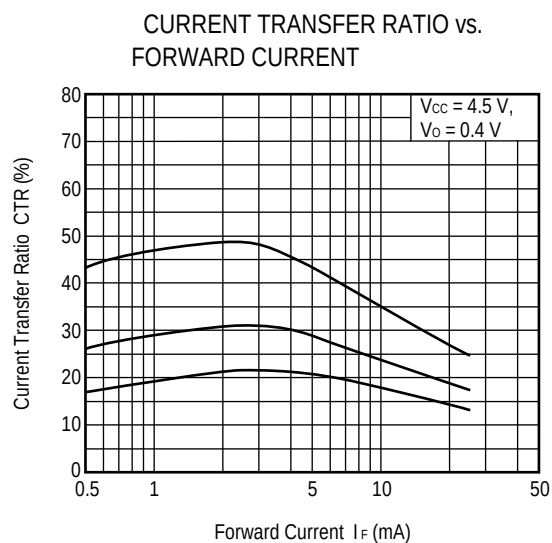
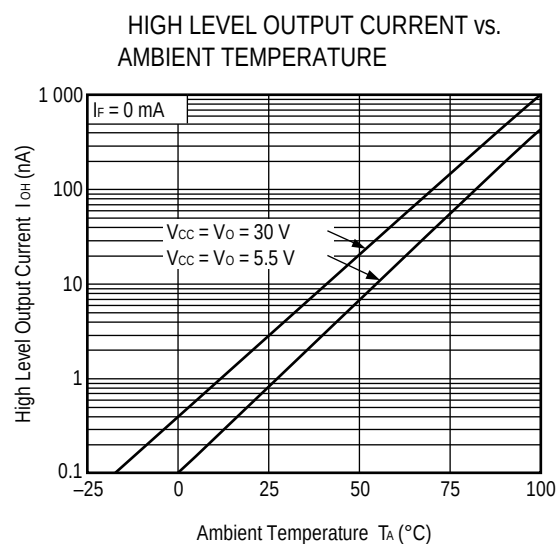
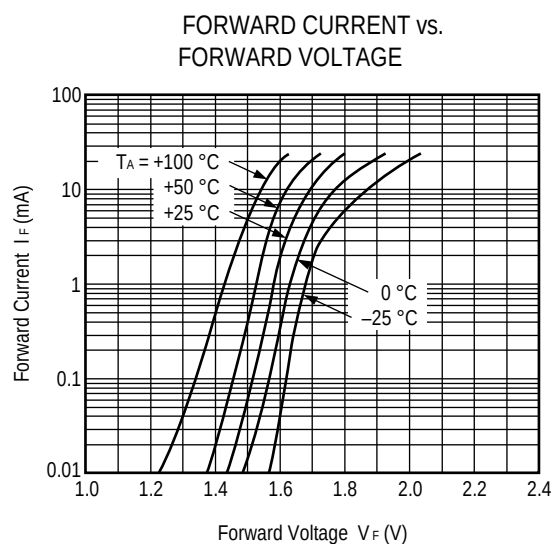
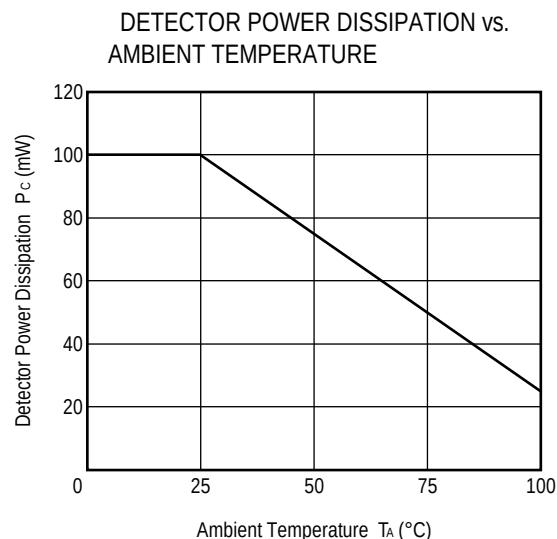
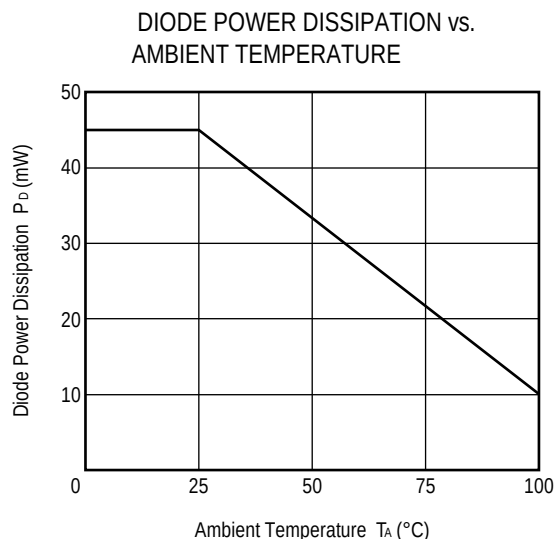
Remark C_L includes probe and stray wiring capacitance.

***3. Test circuit for common mode transient immunity**

Remark C_L includes probe and stray wiring capacitance.

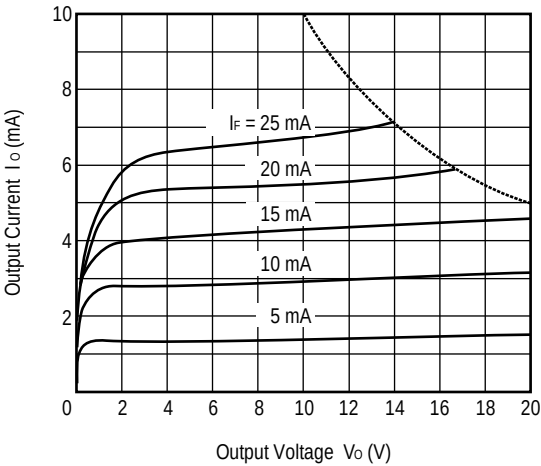
USAGE CAUTIONS

1. This product is weak for static electricity by designed with high-speed integrated circuit so protect against static electricity when handling.
2. By-pass capacitor of more than 0.1 µF is used between V_{CC} and GND near device. Also, ensure that the distance between the leads of the photocoupler and capacitor is no more than 10 mm.
3. Avoid storage at a high temperature and high humidity.
4. Do not use adhesives or coating materials including halogens to fix this device.

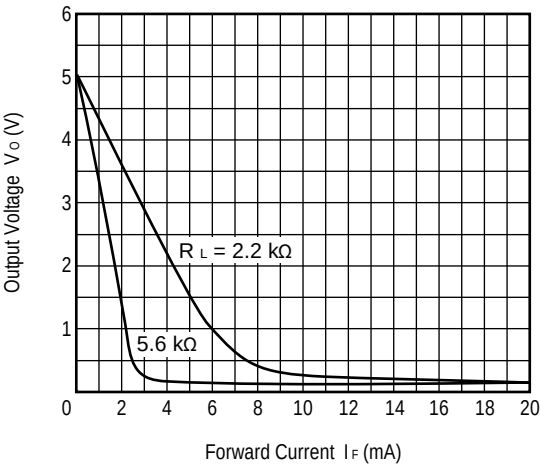
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Remark The graphs indicate nominal characteristics.

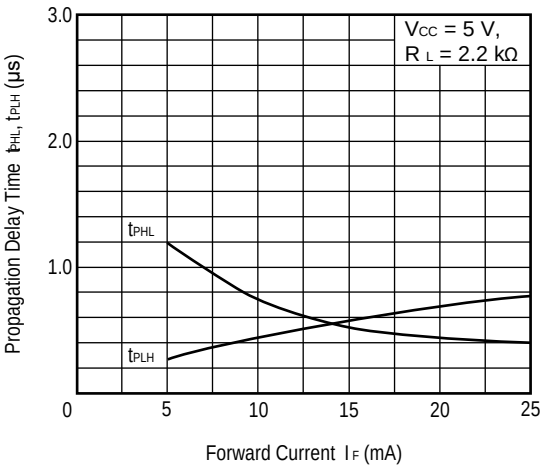
OUTPUT CURRENT vs.
OUTPUT VOLTAGE



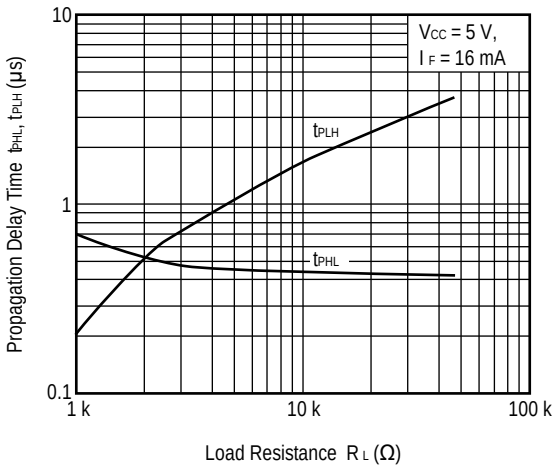
OUTPUT VOLTAGE vs.
FORWARD CURRENT



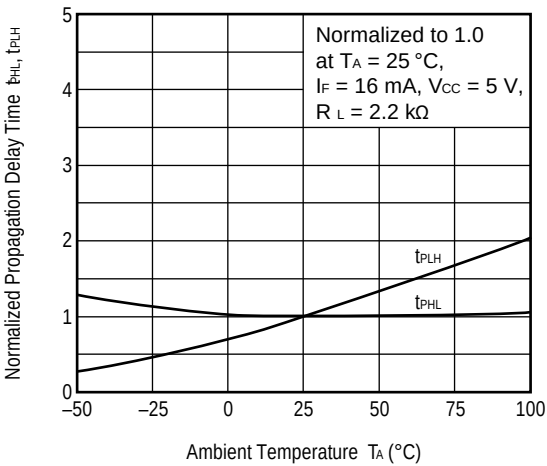
PROPAGATION DELAY TIME vs.
FORWARD CURRENT



PROPAGATION DELAY TIME vs.
LOAD RESISTANCE



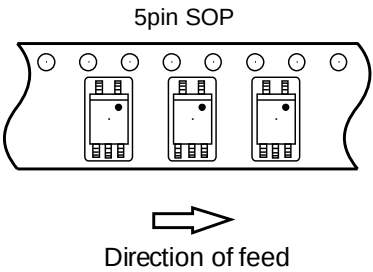
NORMALIZED PROPAGATION DELAY TIME
vs. AMBIENT TEMPERATURE



Remark The graphs indicate nominal characteristics.

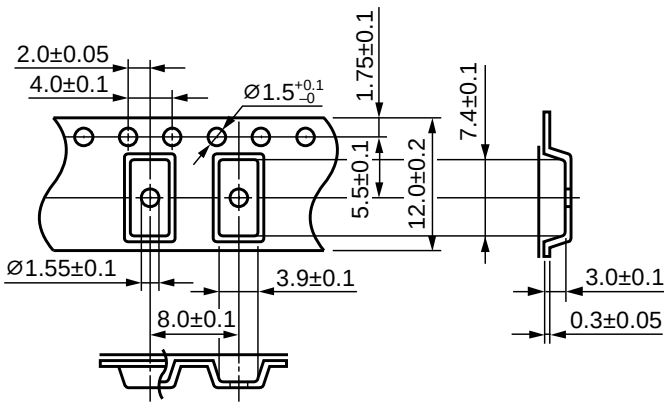
TAPING SPECIFICATIONS (UNIT: mm)

Tape Direction



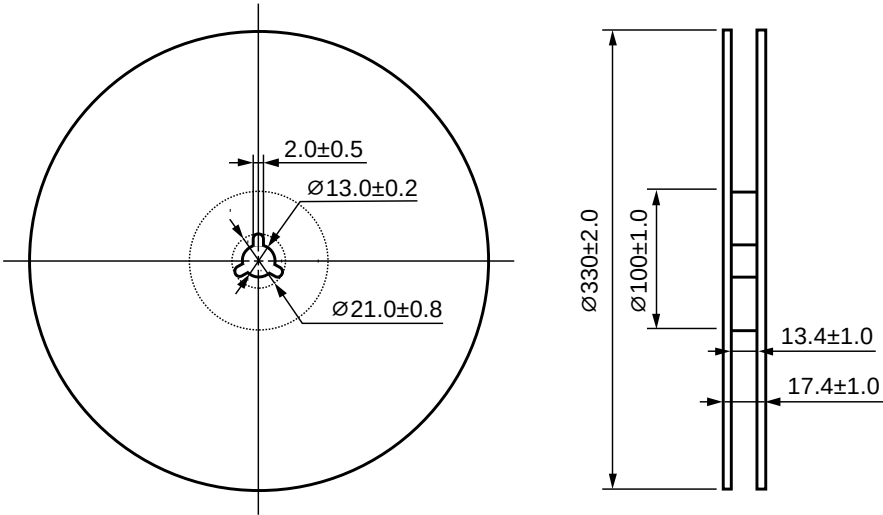
Outline and Dimensions (Tape)

(Unit:mm)



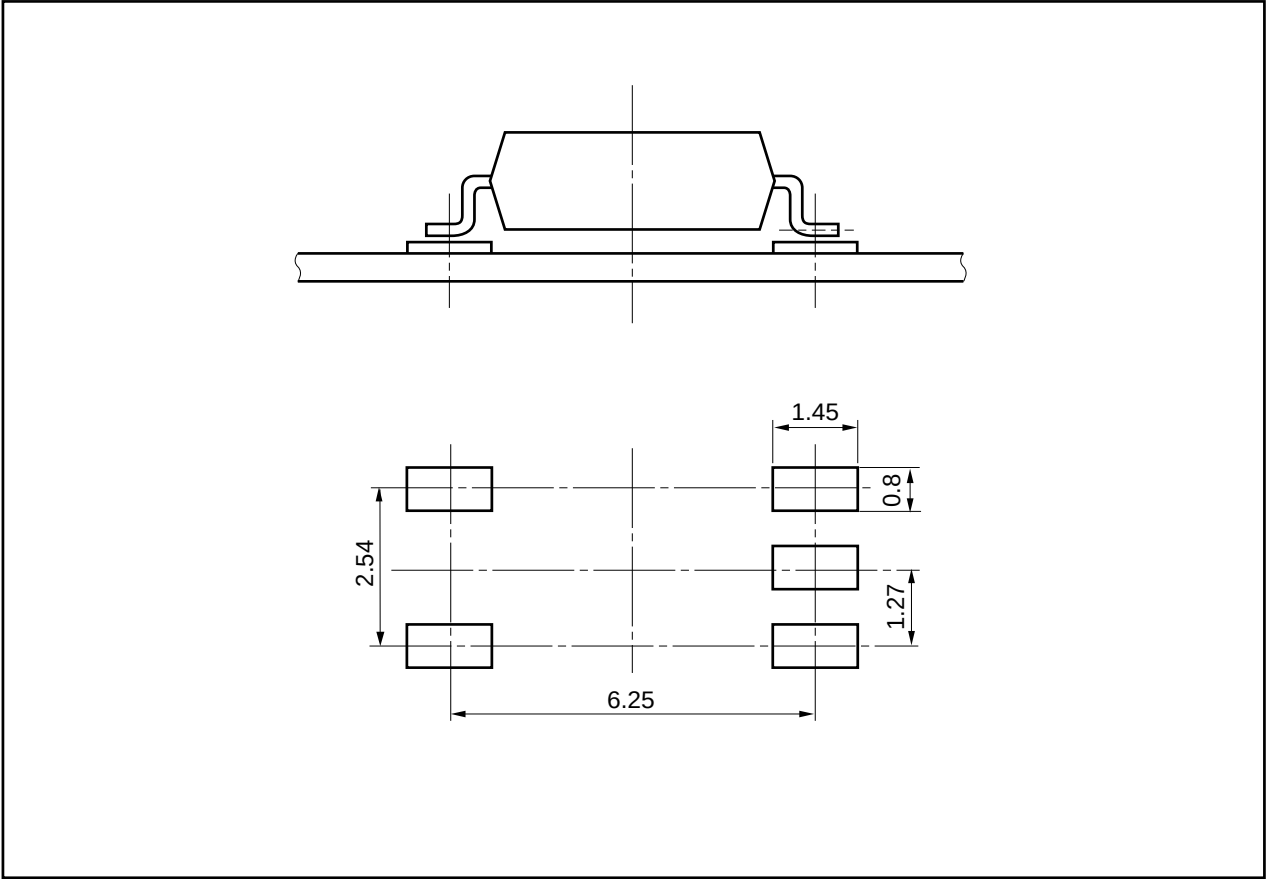
Outline and Dimensions (Reel)

(Unit:mm)



Packing: 2 500 pcs/reel

RECOMMENDED MOUNT PAD DIMENSIONS (UNIT: mm)



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

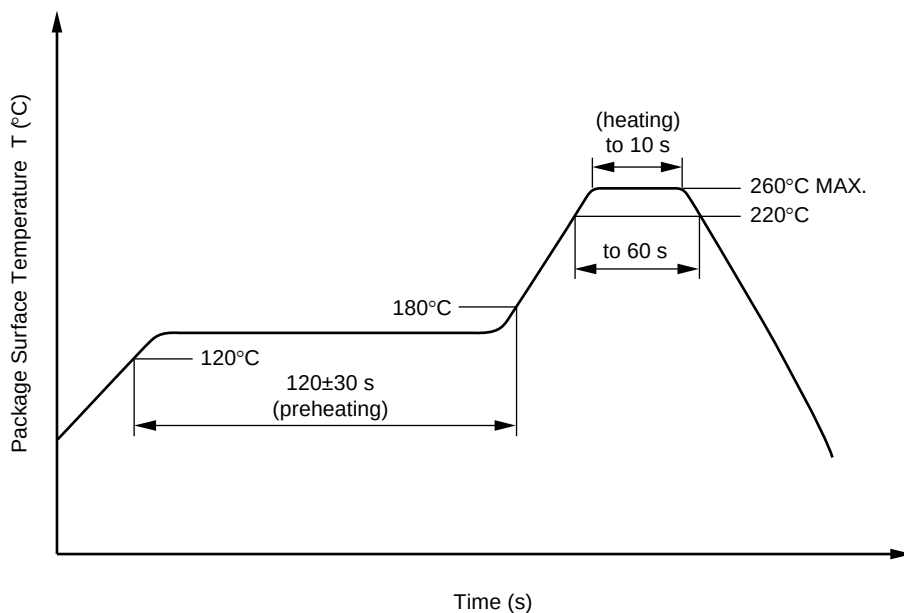
NOTES ON HANDLING

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.)
- Place 1.5 to 2.0 mm or more away from the root of the lead

(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.

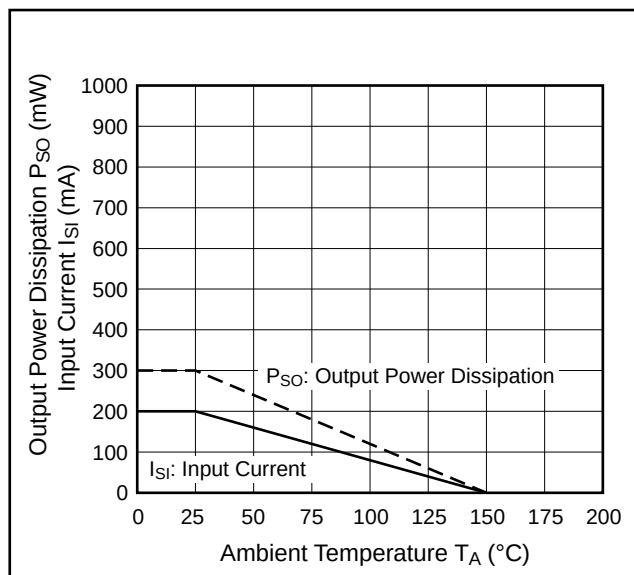
2. Cautions regarding noise

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

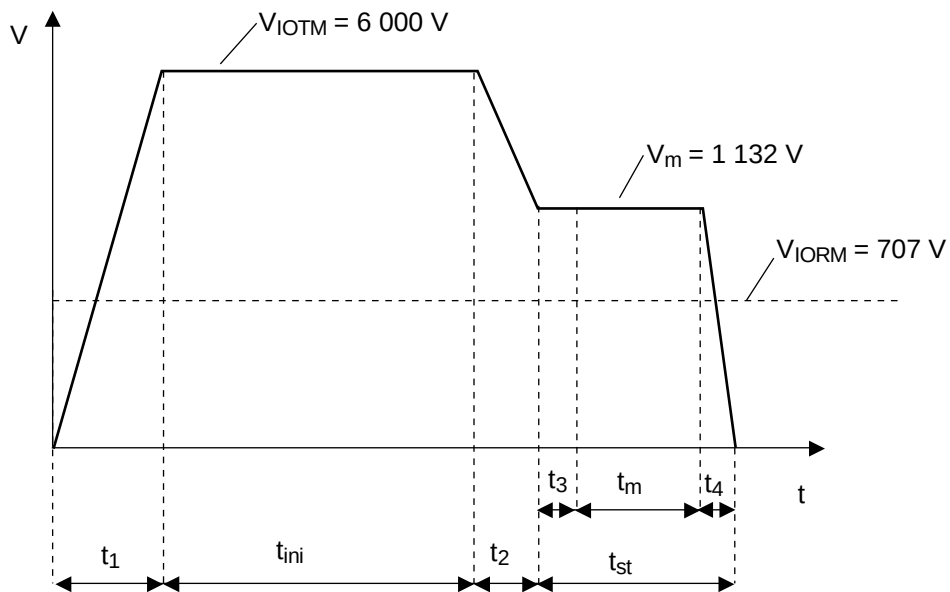
SPECIFICATION OF VDE MARKS LICENSE DOCUMENT

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}	707	V_{peak}
Test voltage (partial discharge test, procedure a for type test and random test)	V_m	1 132	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	1 326	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 +125	°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}	200	mA
Maximum output power dissipation	P_{SO}	300	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

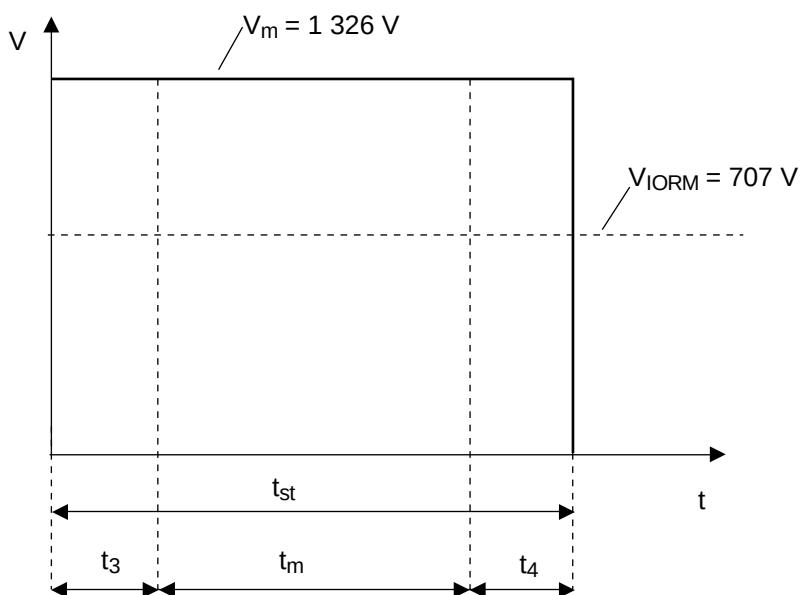
Dependence of maximum safety ratings on ambient temperature



Method a) Destructive Test, Type and Sample Test



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



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 i any way allow it to enter the mouth.
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