

PS2561D-1, PS2561DL-1, PS2561DL1-1, PS2561DL2-1

R08DS0181EJ0300
Rev.3.00
Jan. 13, 2026

DIP PHOTOCOUPLER OPERATING AMBIENT TEMPERATURE 110 °C

DESCRIPTION

The PS2561D-1 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon phototransistor.

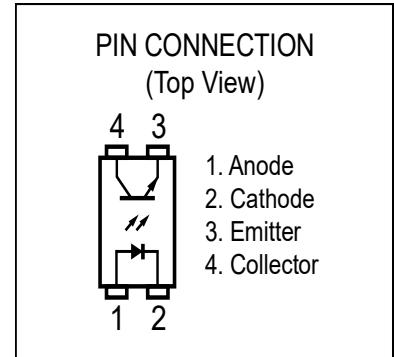
The PS2561D-1 is in a plastic DIP (Dual In-line Package) and the PS2561DL-1 is lead bending type (Gull-wing) for surface mount.

The PS2561DL1-1 is lead bending type for long creepage distance.

The PS2561DL2-1 is lead bending type for long creepage distance (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 = 160 % TYP.)
- High-speed switching (t_r = 3 µs TYP., t_f = 5 µs TYP.)
- Ordering number of taping product: PS2561DL-1-F3 : 2 000 pcs/reel
: PS2561DL2-1-F3 : 2 000 pcs/reel
- Pb-free product
- Safety standards
 - UL approved: UL 1577, Double protection
 - CSA approved: CSA C22.2 No. 62368-1, Reinforced insulation
 - BSI approved: BS EN IEC 62368-1, Reinforced insulation
 - SEMKO approved: EN IEC 62368-1, Reinforced insulation
 - NEMKO approved: EN IEC 62368-1, Reinforced insulation
 - FIMKO approved: EN IEC 62368-1, Reinforced insulation
 - DEMKO approved: EN IEC 62368-1, Reinforced insulation
 - CQC approved: GB 4943.1, Reinforced insulation
 - VDE approved: DIN EN IEC 60747-5-5 (Option)

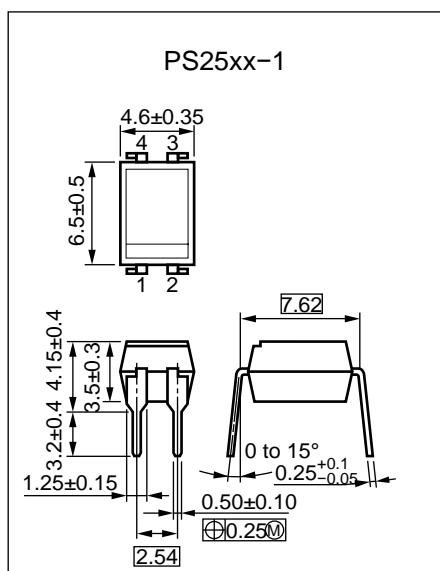


APPLICATIONS

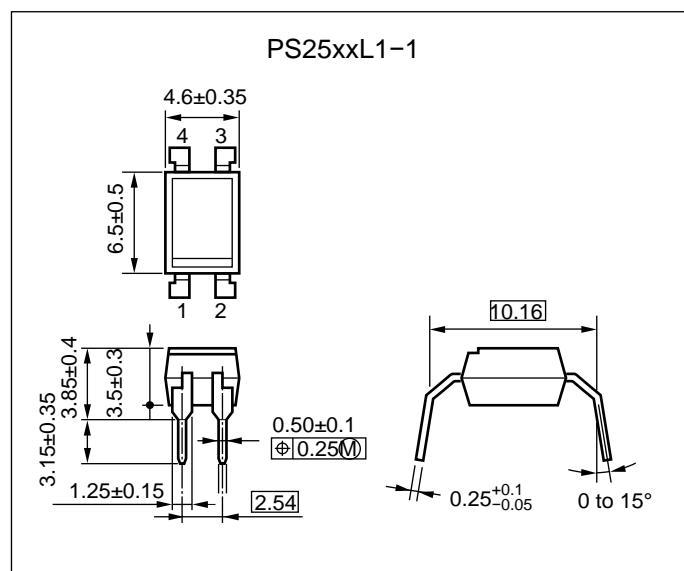
- Power supply
- Telephone/FAX.
- FA/OA equipment
- Programmable logic controllers

PACKAGE DIMENSIONS (UNIT: mm)

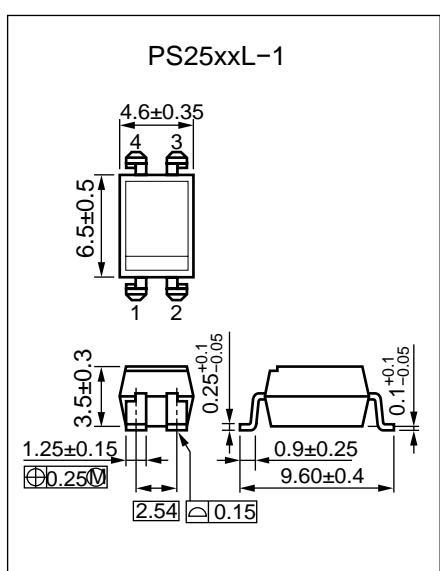
DIP Type



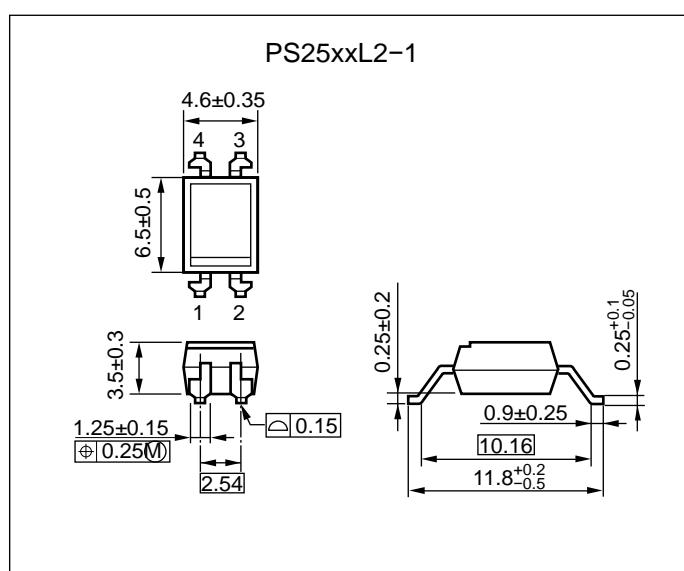
Long Creepage Distance



Lead Bending Type



Long Creepage Distance (Gull-Wing)

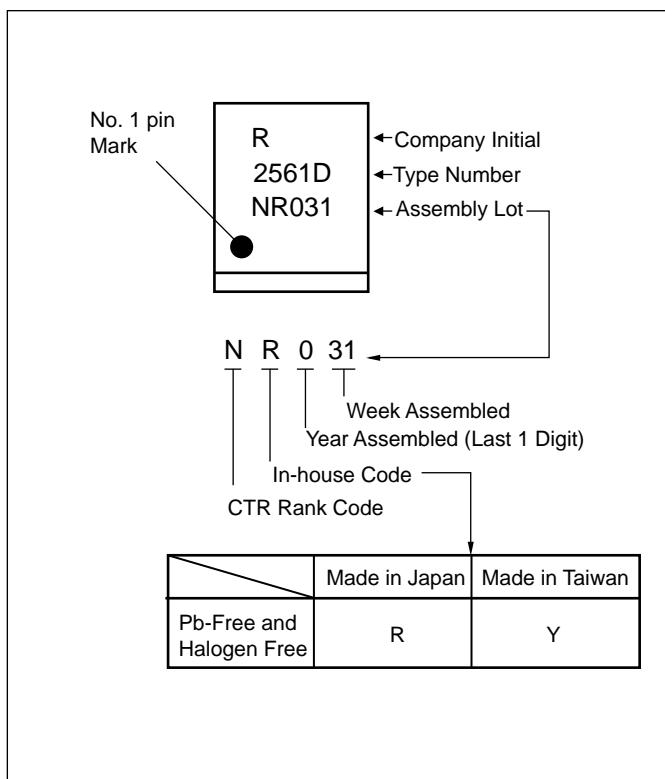


Weight (4-pin DIP) : 0.26 g (TYP.)

PHOTOCOUPLED CONSTRUCTION

Parameter	PS2561D-1, PS2561DL-1	PS2561DL1-1, PS2561DL2-1
Air Distance (MIN.)	7 mm	8 mm
Creepage Distance (MIN.)	7 mm	8 mm
Isolation Distance (MIN.)	0.4 mm	0.4 mm

MARKING EXAMPLE



ORDERING INFORMATION

Part Number	Order Number ^{*1}	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number ^{*2}
PS2561D-1	PS2561D-1Y-A	Pb-Free and Halogen Free	Magazine case 100 pcs	UL, CSA, BSI, SEMKO, NEMKO, FIMKO, DEMKO, CQC Approved	PS2561D-1
PS2561DL-1	PS2561DL-1Y-A				PS2561DL-1
PS2561DL1-1	PS2561DL1-1Y-A				PS2561DL1-1
PS2561DL2-1	PS2561DL2-1Y-A				PS2561DL2-1
PS2561DL-1-F3	PS2561DL-1Y-F3-A		Embossed Tape 2 000 pcs/reel		PS2561DL-1
PS2561DL2-1-F3	PS2561DL2-1Y-F3-A		Embossed Tape 2 000 pcs/reel		PS2561DL2-1
PS2561D-1-V	PS2561D-1Y-V-A		Magazine case 100 pcs	UL, CSA, BSI, SEMKO, NEMKO, FIMKO, DEMKO, CQC, VDE Approved	PS2561D-1
PS2561DL-1-V	PS2561DL-1Y-V-A				PS2561DL-1
PS2561DL1-1-V	PS2561DL1-1Y-V-A				PS2561DL1-1
PS2561DL2-1-V	PS2561DL2-1Y-V-A				PS2561DL2-1
PS2561DL-1-V-F3	PS2561DL-1Y-V-F3-A		Embossed Tape 2 000 pcs/reel		PS2561DL-1
PS2561DL2-1-V-F3	PS2561DL2-1Y-V-F3-A		Embossed Tape 2 000 pcs/reel		PS2561DL2-1

Notes: *1. If requested by Order Number in the table, all CTR rank (CTR = 50-400 % (@ $I_F = 5 \text{ mA}$, $V_{CE} = 5 \text{ V}$) & CTR = 10 % and larger (@ $I_F = 1 \text{ mA}$, $V_{CE} = 5 \text{ V}$) products will be shipped.

When specifying CTR rank, please add “-CTR rank” after Order Number.

ex. L rank : PS2561D-1Y-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
Diode	Reverse Voltage	V _R	6	V
	Forward Current (DC)	I _F	40	mA
	Power Dissipation *1	P _D	150	mW
	Peak Forward Current *2	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 *3	P _C	150	mW
Isolation Voltage *4		BV	5 000	Vr.m.s.
Operating Ambient Temperature		T _A	-55 to +110	°C
Storage Temperature		T _{stg}	-55 to +150	°C

Note: *1. Reduced to 1.5 mW/°C at T_A = 25 °C or more.

*2. PW = 100 µs, Duty Cycle = 1 %

*3. Reduced to 1.5 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.

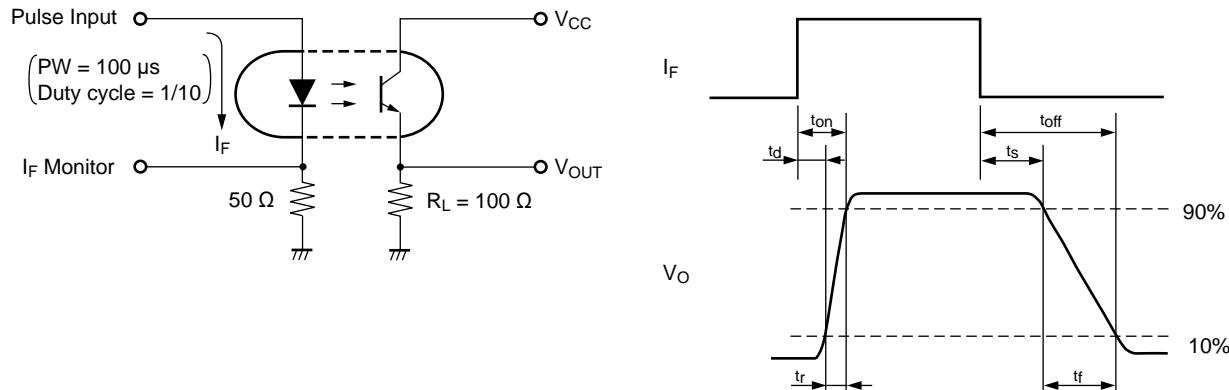
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

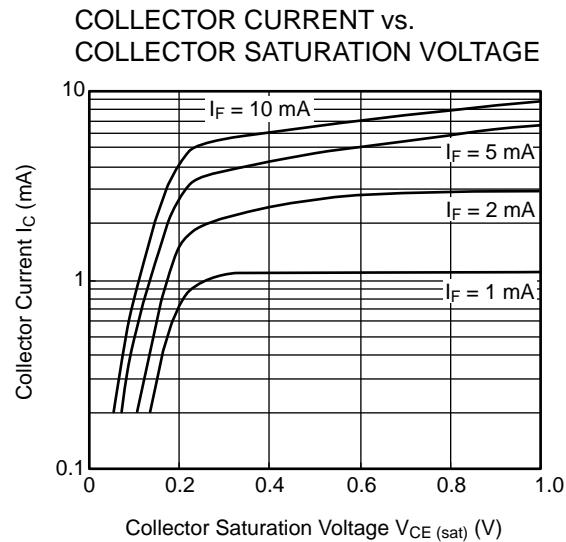
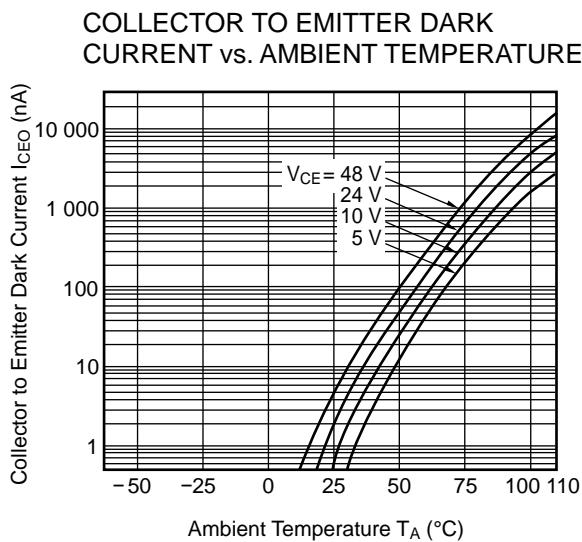
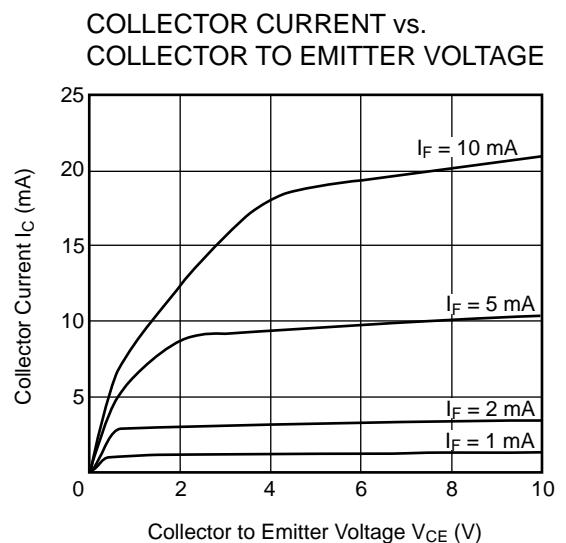
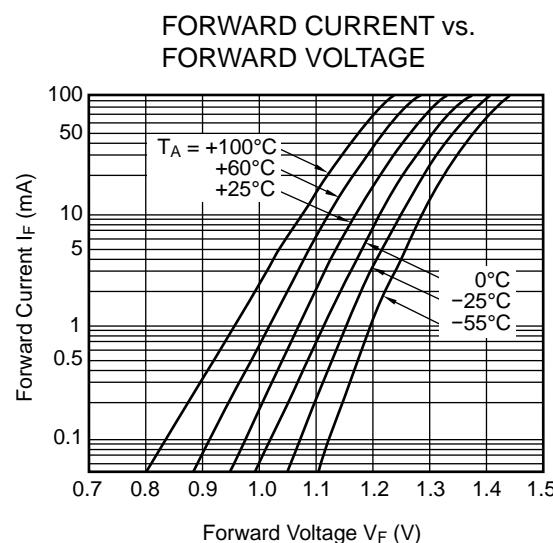
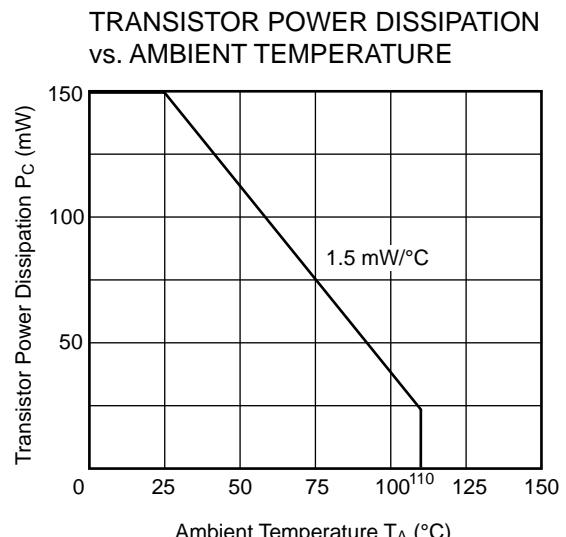
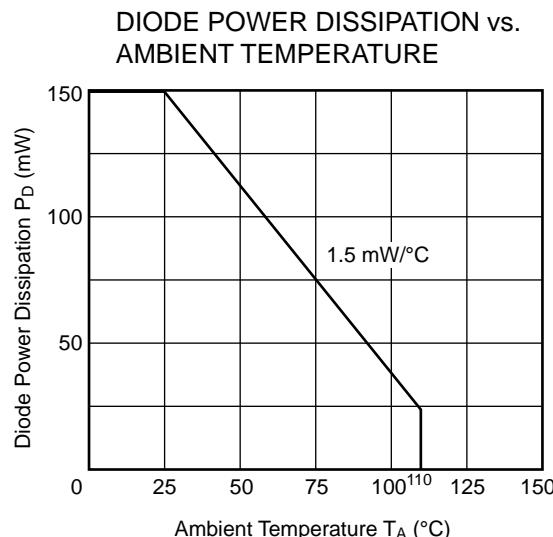
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = 10 mA		1.2	1.4	V
	Reverse Current	I _R	V _R = 5 V			5	μA
	Terminal Capacitance	C _t	V = 0 V, f = 1.0 MHz		10		pF
Transistor	Collector to Emitter Dark Current	I _{CEO}	V _{CE} = 48 V, I _F = 0 mA			100	nA
Coupled	Current Transfer Ratio (I _c /I _F) *1	CTR	I _F = 5 mA, V _{CE} = 5 V	50	160	400	%
			I _F = 1 mA, V _{CE} = 5 V	10	80		
	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, R _L = 100 Ω		3		μs
	Fall Time *2	t _f			5		

Note: *1. CTR rank

CTR Rank	CTR (%)	Conditions
H	80 to 160	I _F = 5 mA, V _{CE} = 5 V
	16 and larger	I _F = 1 mA, V _{CE} = 5 V
Q	100 to 200	I _F = 5 mA, V _{CE} = 5 V
	20 and larger	I _F = 1 mA, V _{CE} = 5 V
W	130 to 260	I _F = 5 mA, V _{CE} = 5 V
	26 and larger	I _F = 1 mA, V _{CE} = 5 V
L	200 to 400	I _F = 5 mA, V _{CE} = 5 V
	40 and larger	I _F = 1 mA, V _{CE} = 5 V
N	50 to 400	I _F = 5 mA, V _{CE} = 5 V
	10 and larger	I _F = 1 mA, V _{CE} = 5 V

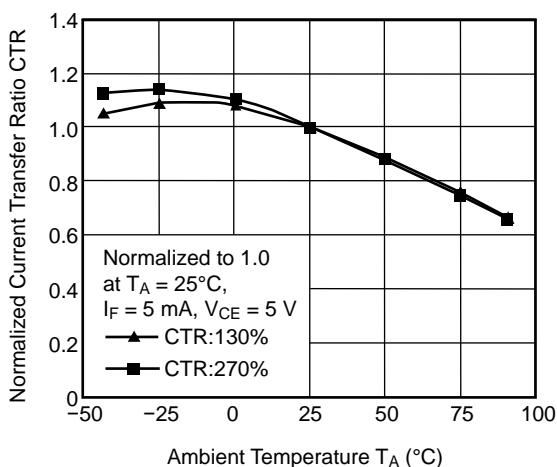
*2. Test Circuit for Switching Time



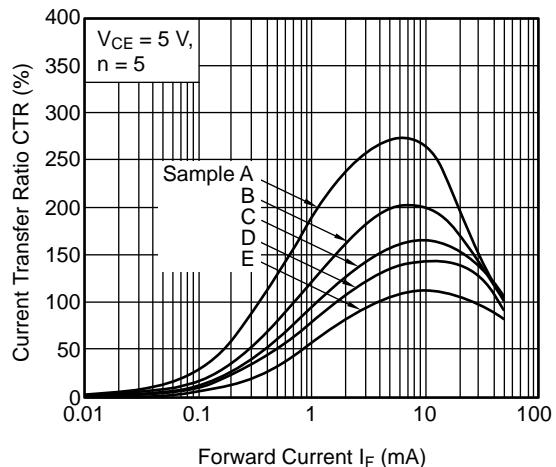
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

Remark The graphs indicate nominal characteristics.

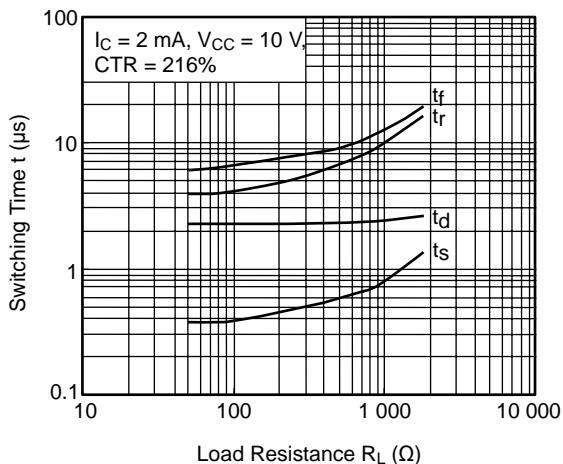
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



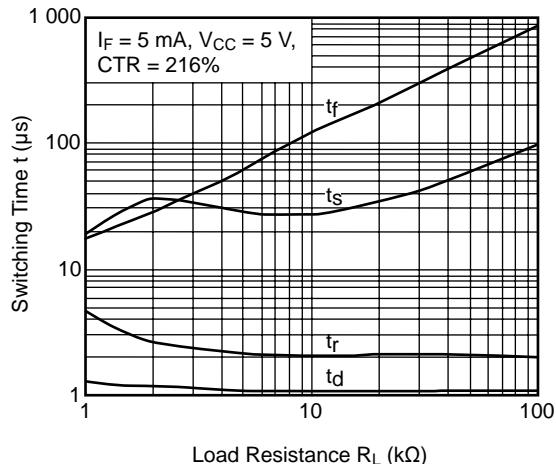
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



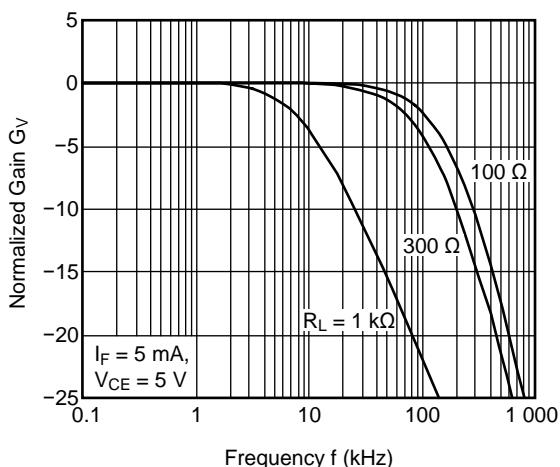
SWITCHING TIME vs. LOAD RESISTANCE



SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE

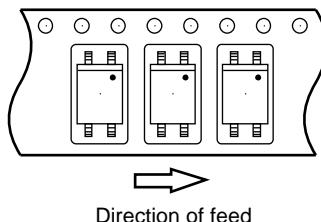


Remark The graphs indicate nominal characteristics.

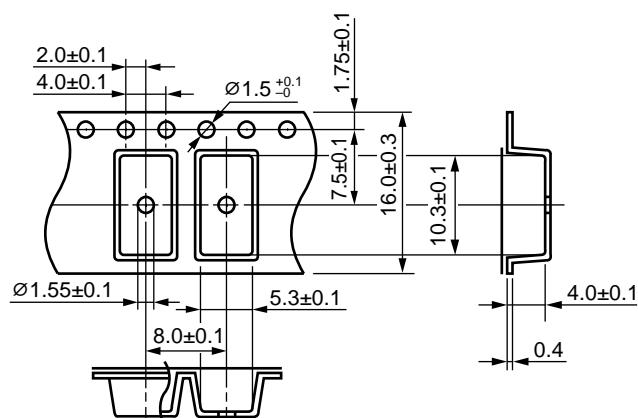
TAPING SPECIFICATIONS (UNIT: mm)

Tape Direction

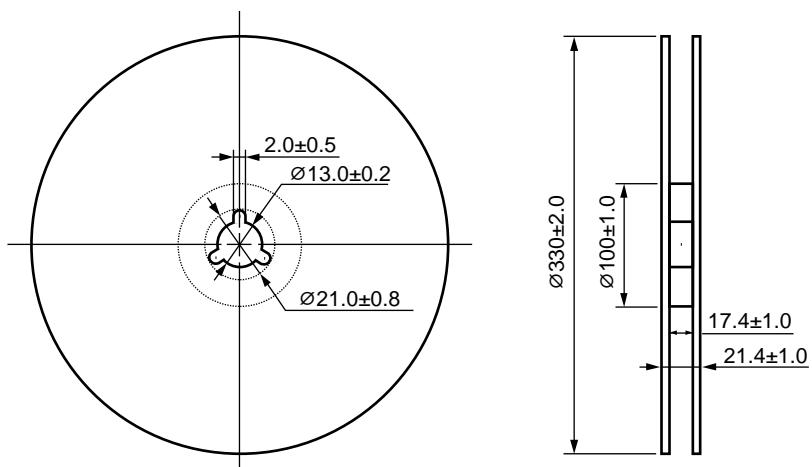
PS2561DL-1-F3



Outline and Dimensions (Tape)

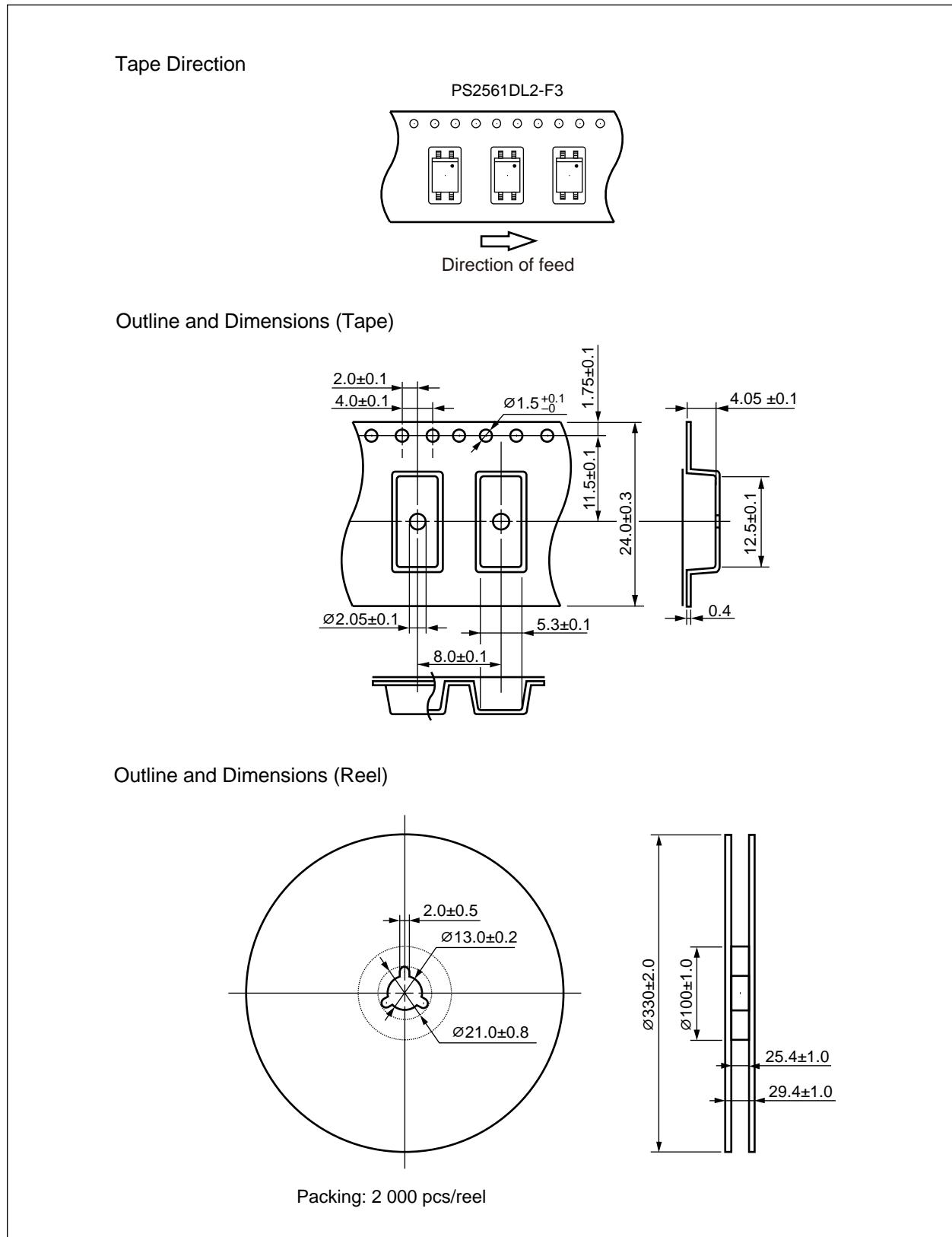


Outline and Dimensions (Reel)

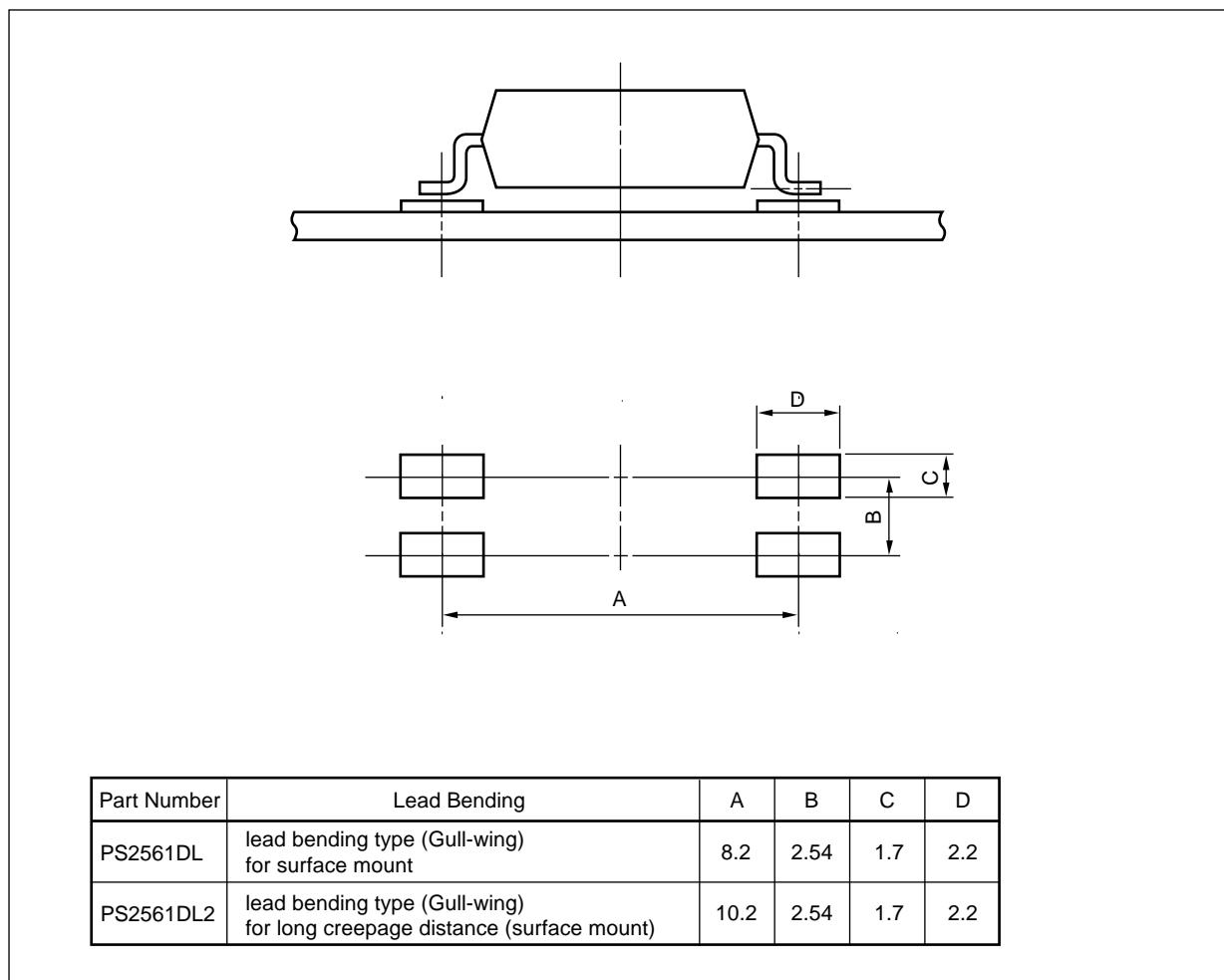


Packing: 2 000 pcs/reel

TAPING SPECIFICATIONS (UNIT: mm)



RECOMMENDED MOUNT PAD DIMENSIONS (UNIT: mm)



The diagram illustrates the recommended mount pad dimensions for the PS2561D-1, PS2561DL-1, PS2561DL1-1, and PS2561DL2-1 components. The top part shows a top-down view of the component with four pads and a cross-sectional view of a lead being bent over a pad. The bottom part shows a cross-sectional view of the component with dimensions A, B, C, and D indicated.

Part Number	Lead Bending	A	B	C	D
PS2561DL	lead bending type (Gull-wing) for surface mount	8.2	2.54	1.7	2.2
PS2561DL2	lead bending type (Gull-wing) for long creepage distance (surface mount)	10.2	2.54	1.7	2.2

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

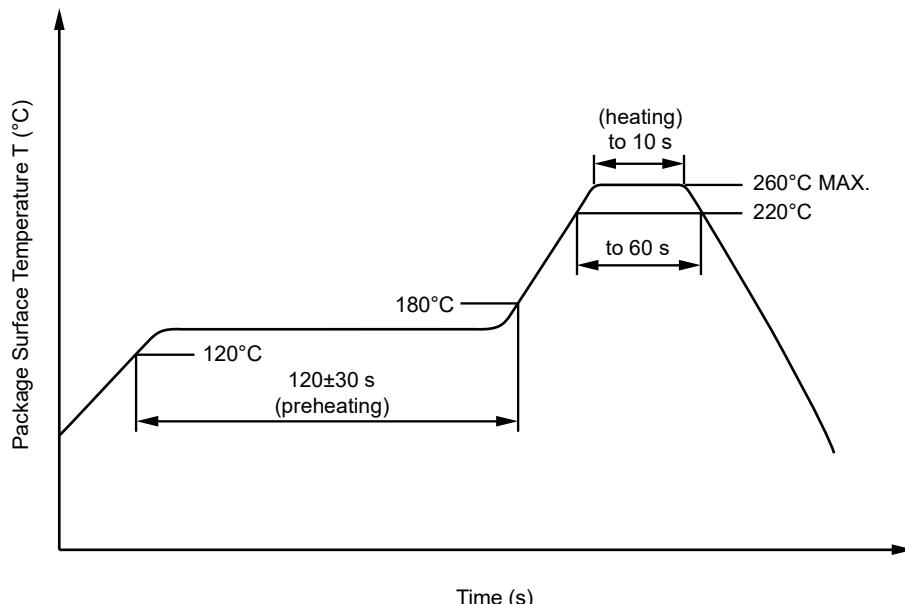
NOTES ON HANDLING

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

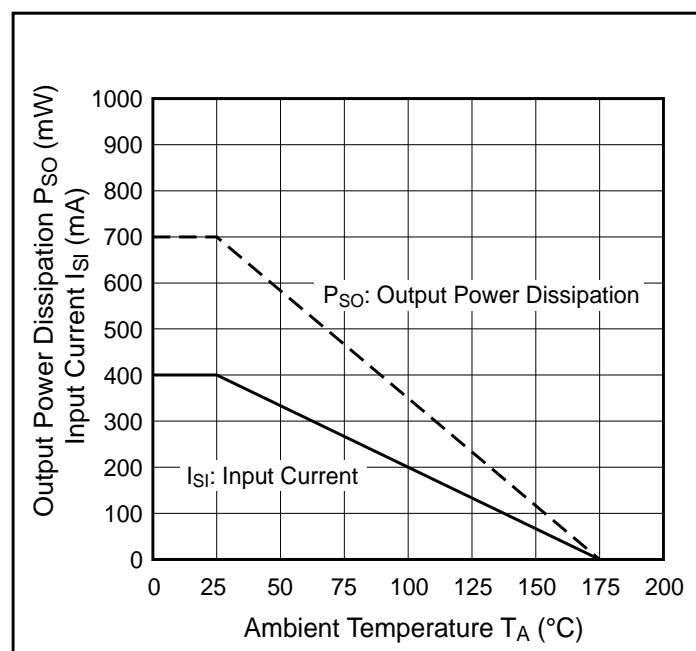
USAGE CAUTIONS

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 (1/2)
(PS2561D-1, PS2561DL-1)

Parameter	Symbol	Rating	Unit
Climatic test class (IEC 60068-1/DIN EN 60068-1)		55/110/21	
Dielectric strength maximum operating isolation voltage Test voltage (partial discharge test, procedure a for type test and random test) $V_m = 1.6 \times V_{IORM}$, $q_{pd} < 5 \text{ pC}$	V_{IORM} V_m	890 1 424	V_{peak} V_{peak}
Test voltage (partial discharge test, procedure b for all devices) $V_m = 1.875 \times V_{IORM}$, $q_{pd} < 5 \text{ pC}$	V_m	1 669	V_{peak}
Highest permissible overvoltage	V_{IOTM}	8 000	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 +110	°C
Isolation resistance, minimum value $V_{I-O} = 500 \text{ V dc}$, $T_A = 25 \text{ °C}$ $V_{I-O} = 500 \text{ V dc}$, $T_A = \text{maximum temperature of rating, at least } 100 \text{ °C}$	$R_{I-O} \text{ MIN.}$ $R_{I-O} \text{ MIN.}$	10^{12} 10^{11}	Ω
Safety maximum ratings (maximum permissible in case of fault, see thermal derating curve) Maximum ambient temperature Maximum input current Maximum output power dissipation Isolation resistance, minimum value at $V_{I-O} = 500 \text{ V dc}$, $T_A = T_S$	T_S I_{SI} P_{SO} $R_{I-O} \text{ MIN.}$	175 400 700 10^9	°C mA mW Ω

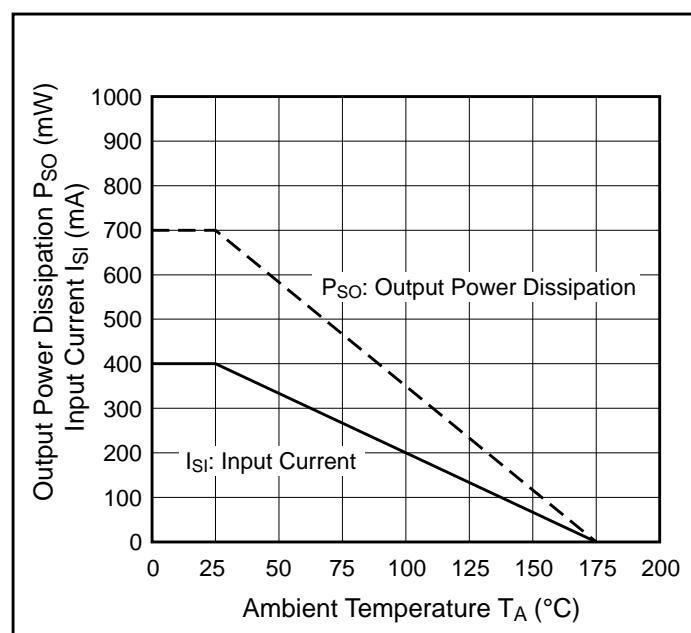
Dependence of maximum safety ratings on ambient temperature



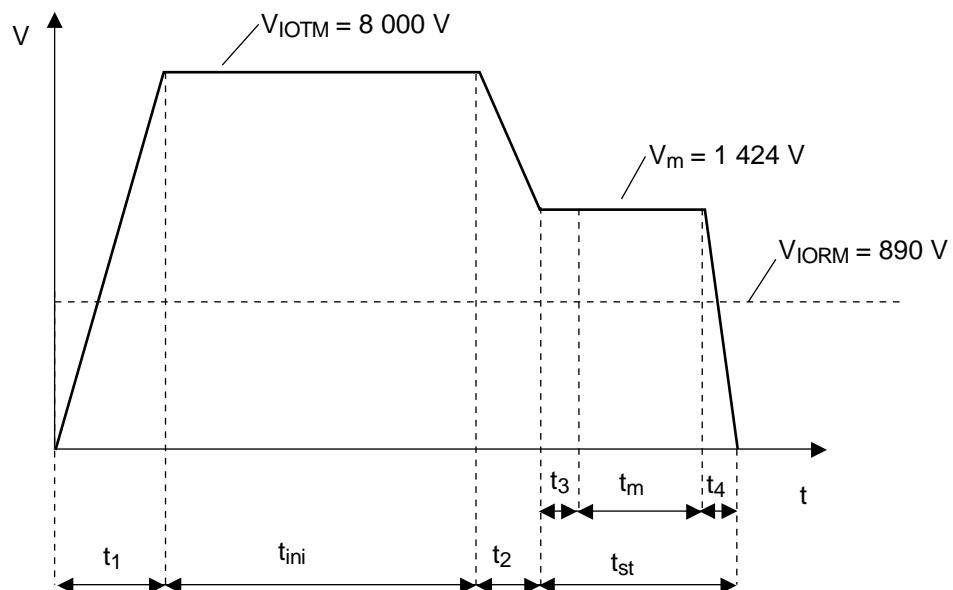
SPECIFICATION OF VDE MARKS LICENSE DOCUMENT (2/2)
(PS2561DL1-1, PS2561DL2-1)

Parameter	Symbol	Rating	Unit
Climatic test class (IEC 60068-1/DIN EN 60068-1)		55/110/21	
Dielectric strength maximum operating isolation voltage Test voltage (partial discharge test, procedure a for type test and random test) $V_m = 1.6 \times V_{IORM}$, $q_{pd} < 5 \text{ pC}$	V_{IORM} V_m	1 130 1 808	V_{peak} V_{peak}
Test voltage (partial discharge test, procedure b for all devices) $V_m = 1.875 \times V_{IORM}$, $q_{pd} < 5 \text{ pC}$	V_m	2 119	V_{peak}
Highest permissible overvoltage	V_{IOTM}	8 000	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 +110	°C
Isolation resistance, minimum value $V_{I-O} = 500 \text{ V dc}$, $T_A = 25 \text{ °C}$ $V_{I-O} = 500 \text{ V dc}$, $T_A = \text{maximum temperature of rating, at least } 100 \text{ °C}$	$R_{I-O} \text{ MIN.}$ $R_{I-O} \text{ MIN.}$	10^{12} 10^{11}	Ω
Safety maximum ratings (maximum permissible in case of fault, see thermal derating curve) Maximum ambient temperature Maximum input current Maximum output power dissipation Isolation resistance, minimum value at $V_{I-O} = 500 \text{ V dc}$, $T_A = T_S$	T_S I_{SI} P_{SO} $R_{I-O} \text{ MIN.}$	175 400 700 10^9	°C mA mW Ω

Dependence of maximum safety ratings on ambient temperature

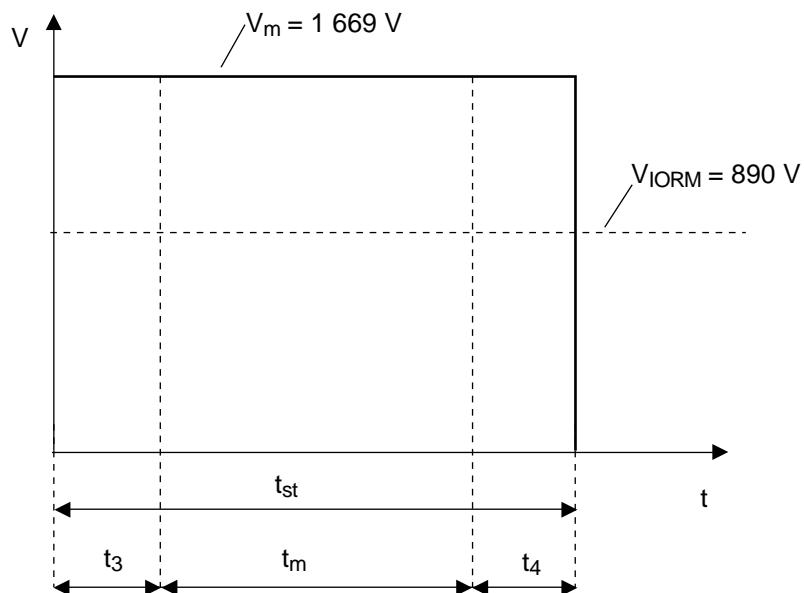


Method a) Destructive Test, Type and Sample Test (PS2561D-1, PS2561DL-1)



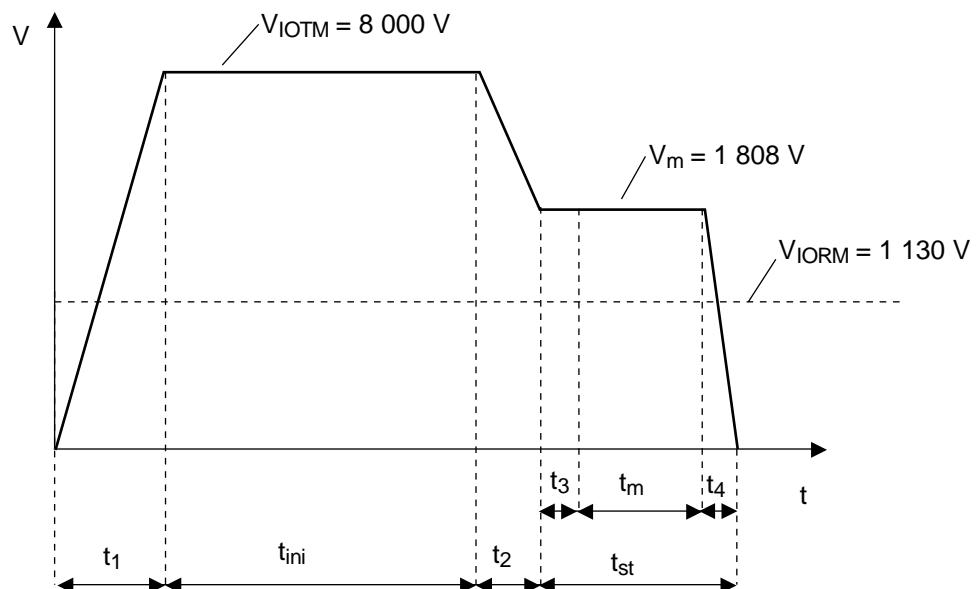
$t_1, t_2 = 1 \text{ to } 10 \text{ sec}$
 $t_3, t_4 = 1 \text{ sec}$
 $t_m = 10 \text{ sec}$
 $t_{st} = 12 \text{ sec}$
 $t_{ini} = 60 \text{ sec}$

Method b) Non-destructive Test, 100 % Production Test (PS2561D-1, PS2561DL-1)



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

Method a) Destructive Test, Type and Sample Test (PS2561DL1-1, PS2561DL2-1)



$$t_1, t_2 = 1 \text{ to } 10 \text{ sec}$$

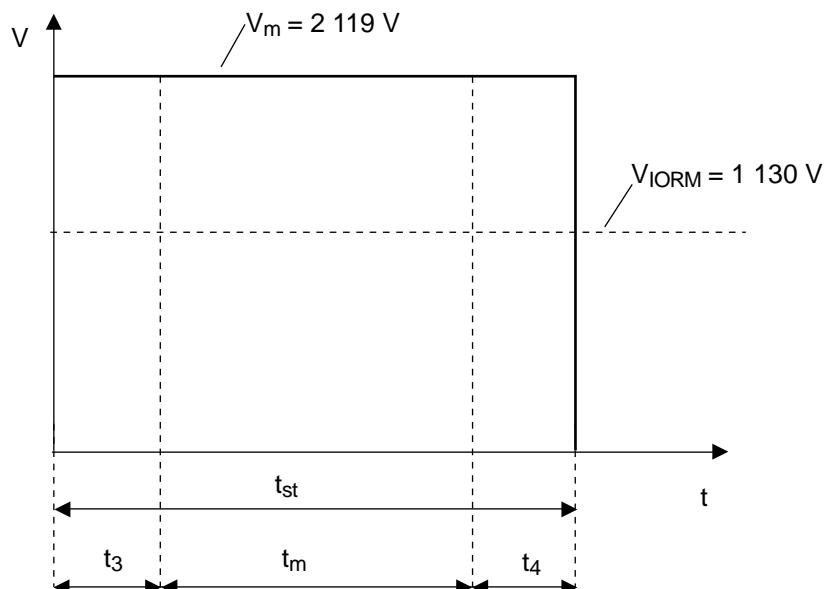
$$t_3, t_4 = 1 \text{ sec}$$

$$t_m = 10 \text{ sec}$$

$$t_{st} = 12 \text{ sec}$$

$$t_{ini} = 60 \text{ sec}$$

Method b) Non-destructive Test, 100% Production Test (PS2561DL1-1, PS2561DL2-1)



$$t_3, t_4 = 0.1 \text{ sec}$$

$$t_m = 1.0 \text{ sec}$$

$$t_{st} = 1.2 \text{ sec}$$

Caution	<p>GaAs Products</p> <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.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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