The PS2561-1 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon phototransistor. The PS2561-1 is in a plastic DIP (Dual In-line Package) and the PS2561L-1 is lead bending type (Gull-w

RENESAS

The PS2561-1 is in a plastic DIP (Dual In-line Package) and the PS2561L-1 is lead bending type (Gull-wing) for surface mount.

The PS2561L1-1 is wide lead bending type.

PS2561-1, PS2561L-1,

PS2561L1-1, PS2561L2-1

HIGH ISOLATION VOLTAGE SINGLE TRANSISTOR TYPE

The PS2561L2-1 is wide lead bending type for surface mount.

FEATURES

DESCRIPTION

- High isolation voltage (BV = 5 000 Vr.m.s.)
- High collector to emitter voltage (V_{CEO} = 80 V)
- High current transfer ratio (CTR = 200% TYP.)
- High-speed switching (t_r = 3 μ s TYP., t_f = 5 μ s TYP.)
- Ordering number of taping product: PS2561L-1-F3 : 2 000 pcs/reel : PS2561L2-1-F3 : 2 000 pcs/reel
- Pb-Free product
- Safety standards

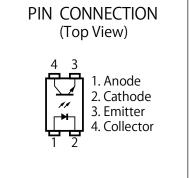
APPLICATIONS

Programmable logic controllers

Power supplyTelephone/FAX.FA/OA equipment

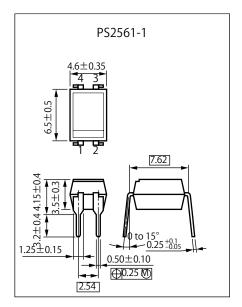
- UL approved: UL1577, Double protection
- CSA approved: CAN/CSA-C22.2 No. 62368-1, Reinforced insulation
- BSI approved: BS EN 62368-1, Reinforced insulation
- SEMKO approved: EN 62368-1, IEC 62368-1, Reinforced insulation
- NEMKO approved: EN 62368-1, Reinforced insulation
- FIMKO approved: EN 62368-1, Reinforced insulation
- DEMKO approved: EN 62368-1, Reinforced insulation
- VDE approved: DIN EN 60747-5-5 (Option)

R08DS0207EJ0100 Rev.1.00 Dec 25, 2020



PACKAGE DIMENSIONS (UNIT: mm)

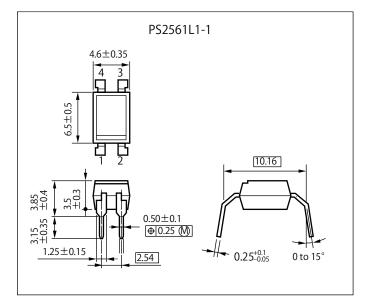




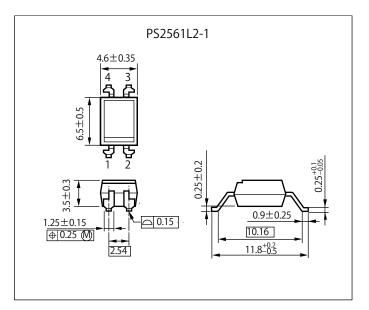
Lead Bending Type For Surface Mount

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

Wide Lead Bending Type



Wide Lead Bending Type For Surface Mount

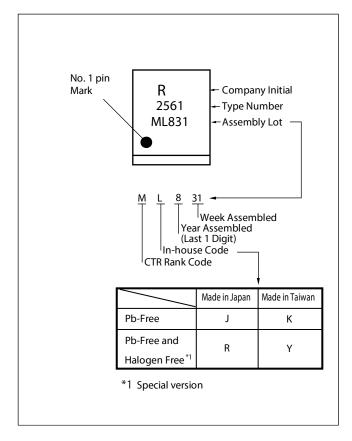




PHOTOCOUPLER CONSTRUCTION

Parameter	Unit (mm)
Air Distance (MIN.)	7
Creepage Distance (MIN.)	7
Isolation Distance (MIN.)	0.4

MARKING EXAMPLE





ORDERING INFORMATION

Part Number	Order Number*1	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number *2
PS2561-1	PS2561-1-A	Pb-Free	Magazine case 100 pcs	Standard products	PS2561-1
PS2561L-1	PS2561L-1-A	UL, CSA, BSI, NEMKO, SEMKO, DEMKO, FIMKO		PS2561L-1	
PS2561L1-1	PS2561L1-1-A				
PS2561L2-1	PS2561L2-1-A			approved)	PS2561L2-1
PS2561L-1-F3	PS2561L-1-F3-A		Embossed Tape 2 000 pcs/reel		PS2561L-1
PS2561L2-1-F3	PS2561L2-1-F3-A				PS2561L2-1
PS2561-1-V	PS2561-1-V-A		Magazine case 100 pcs	UL, CSA, BSI,	PS2561-1
PS2561L-1-V	PS2561L-1-V-A			SEMKO, NEMKO, FIMKO, DEMKO,	PS2561L-1
PS2561L1-1-V	PS2561L1-1-V-A			DIN EN 60747-5-5	PS2561L1-1
PS2561L2-1-V	PS2561L2-1-V-A			approved	PS2561L2-1
PS2561L-1-V-F3	PS2561L-1-V-F3-A		Embossed Tape 2 000 pcs/reel		PS2561L-1
PS2561L2-1-V-F3	PS2561L2-1-V-F3-A				PS2561L2-1
PS2561-1	PS2561-1Y-A	Special version	Magazine case 100 pcs	Standard products	PS2561-1
PS2561L-1	PS2561L-1Y-A	(Pb-Free and		(UL, CSA, BSI, NEMKO, SEMKO, DEMKO, FIMKO	PS2561L-1
PS2561L1-1	PS2561L1-1Y-A	Halogen Free)			PS2561L1-1
PS2561L2-1	PS2561L2-1Y-A			approved)	PS2561L2-1
PS2561L-1-F3	PS2561L-1Y-F3-A		Embossed Tape 2 000 pcs/reel		PS2561L-1
PS2561L2-1-F3	PS2561L2-1Y-F3-A				PS2561L2-1
PS2561-1-V	PS2561-1Y-V-A		Magazine case 100 pcs	UL, CSA, BSI,	PS2561-1
PS2561L-1-V	PS2561L-1Y-V-A		SEMKO, NEMKO, FIMKO, DEMKO,	PS2561L-1	
PS2561L1-1-V	PS2561L1-1Y-V-A			DIN EN 60747-5-5	PS2561L1-1
PS2561L2-1-V	PS2561L2-1Y-V-A			approved	PS2561L2-1
PS2561L-1-V-F3	PS2561L-1Y-V-F3-A		Embossed Tape 2 000 pcs/reel		PS2561L-1
PS2561L2-1-V-F3	PS2561L2-1Y-V-F3-A				PS2561L2-1

Notes: *1. When specifying CTR rank, please add "/CTR rank" after Order Number.

ex. L rank : PS2561-1-A/L

Notes: *2. 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	
Diode	Reverse Voltage	VR	6	V	
	Forward Current (DC)	lF	80	mA	
	Power Dissipation Derating	⊿P₀/°C	1.5	mW/°C	
	Power Dissipation	PD	150	mW	
	Peak Forward Current*1	IFP	1	А	
Transistor	Collector to Emitter Voltage	VCEO	80	V	
	Emitter to Collector Voltage	Veco	7	V	
	Collector Current	lc	50	mA	
	Power Dissipation Derating	⊿Pc/°C	1.5	mW/°C	
	Power Dissipation	Pc	150	mW	
Isolation Voltage*2		BV	5 000	Vr.m.s.	
Operating Ambient Temperature		TA	–55 to +100	°C	
Storage Temperature		T _{stg}	–55 to +150	°C	

Note: *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.



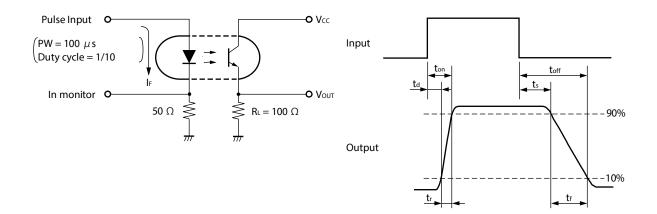
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	VF	IF = 10 mA		1.17	1.4	V
	Reverse Current	lr	VR = 5 V			5	μA
	Terminal Capacitance	Ct	V = 0 V, f = 1.0 MHz		50		pF
Transistor	Collector to Emitter Dark Current	ICEO	Vce = 80 V, IF = 0 mA			100	nA
Coupled	Current Transfer Ratio (Ic/IF)*1	CTR	IF = 5 mA, Vce = 5 V	80	200	400	%
	Collector Saturation Voltage	VCE (sat)	I⊧ = 10 mA, Ic = 2 mA			0.3	V
	Isolation Resistance	RI-0	VI-0 = 1.0 kVDC	10 ¹¹			Ω
	Isolation Capacitance	Сі-о	V = 0 V, f = 1.0 MHz		0.5		pF
	Rise Time ^{*2}	tr	Vcc = 10 V, Ic = 2 mA, R∟ = 100 Ω		3		μs
	Fall Time ^{*2}	tr			5		

Note: *1. CTR rank

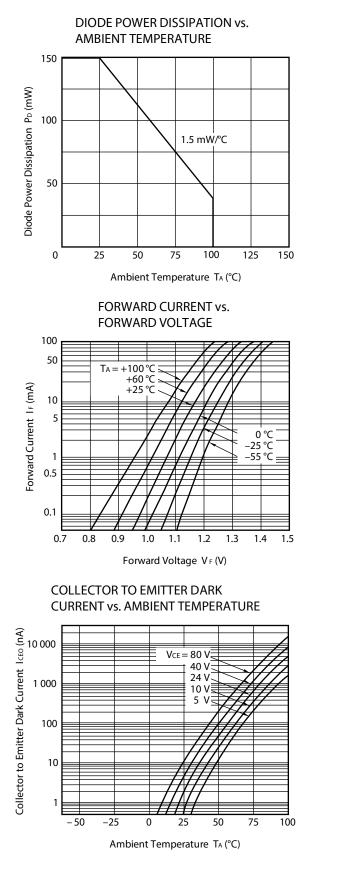
- L : 200 to 400 (%)
- M : 80 to 240 (%)
- D : 100 to 300 (%)
- H : 80 to 160 (%)
- W : 130 to 260 (%)

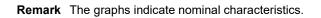
*2. Test Circuit for Switching Time

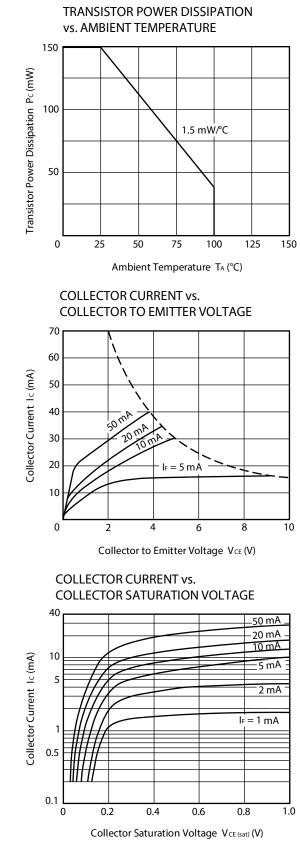


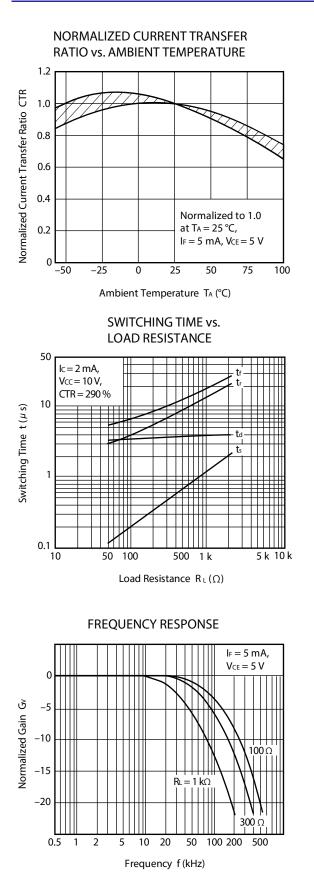


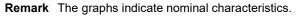
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

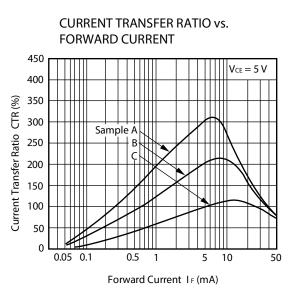




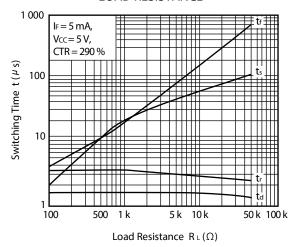




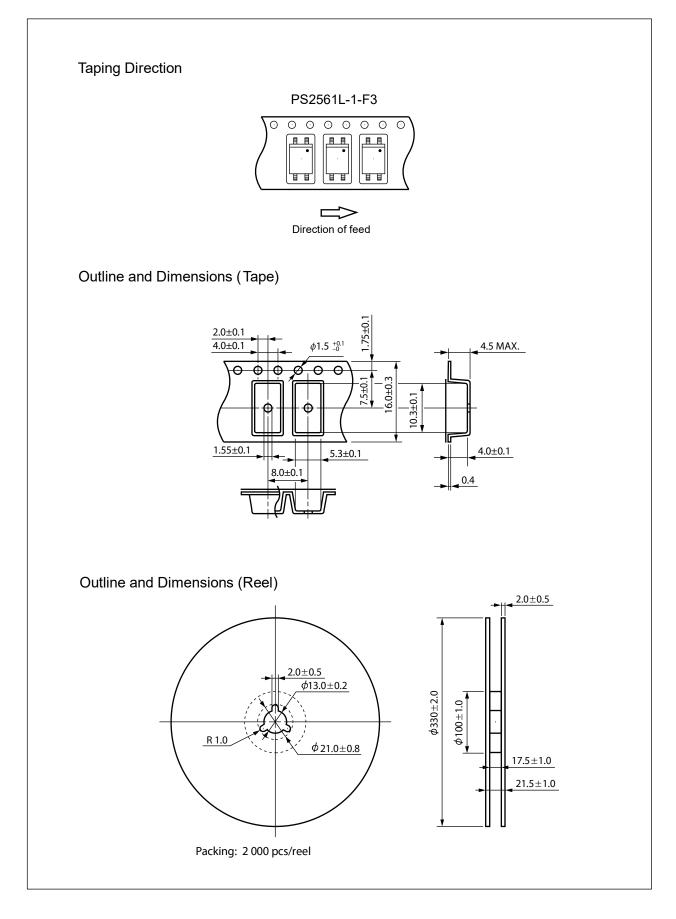






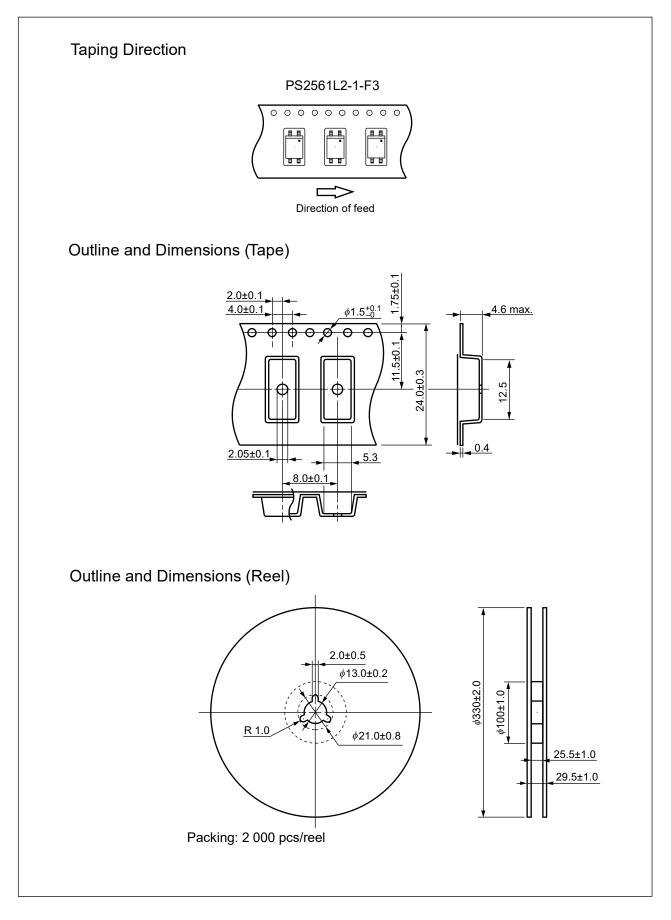


TAPING SPECIFICATIONS (UNIT: mm)



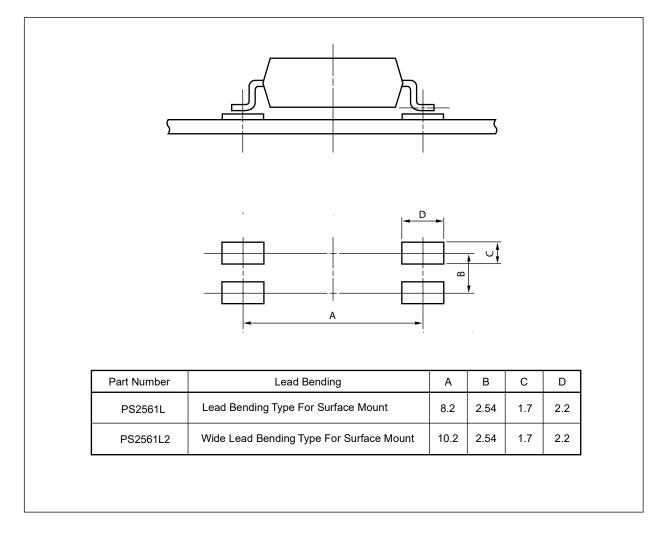


TAPING SPECIFICATIONS (UNIT: mm)





RECOMMENDED MOUNT PAD DIMENSIONS (UNIT: mm)



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



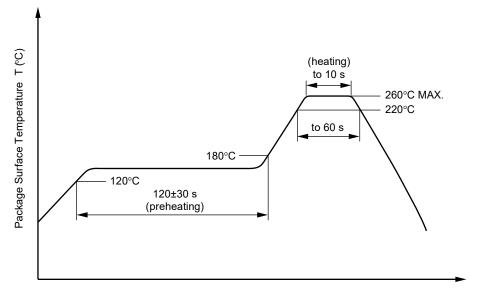
NOTES ON HANDLING

- 1. Recommended soldering conditions
 - (1) Infrared reflow soldering
 - Peak reflow temperature
 - Time of peak reflow temperature
 - Time of temperature higher than 220°C
 - Time to preheat temperature from 120 to 180°C
 - Number of reflows
 - Flux

260°C or below (package surface temperature) 10 seconds or less 60 seconds or less 120±30 s Three 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



Time (s)

- (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.)
 - 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

3 seconds or less

Time (each pins)Flux

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 based or halogen-based (chlorinated etc.) solvents.
 - 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.

 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

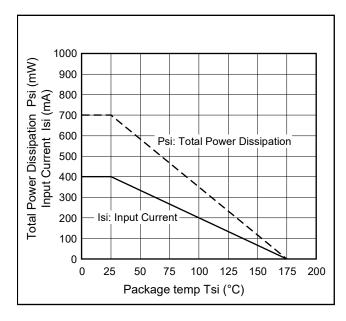
- 1. Protect against static electricity when handling.
- 2. Avoid storage at a high temperature and high humidity.
- 3. Avoid cleaning with Freon based or halogen-based (chlorinated etc.) solvents.
- 4. Do not use fixing agents or coatings containing halogen-based substances.



SPECIFICATION OF VDE MARKS LICENSE DOCUMENT

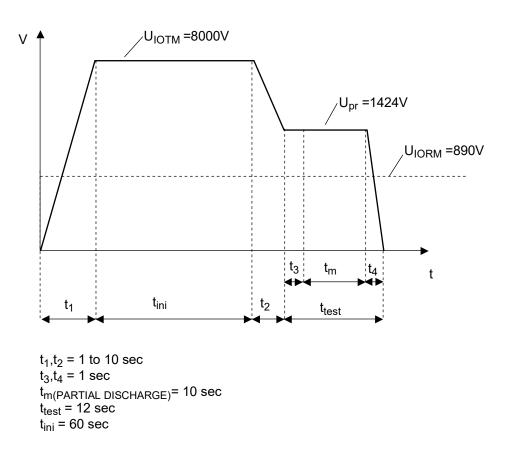
Parameter	Symbol	Rating	Unit
Climatic test class (IEC 60068-1/DIN EN 60068-1)		55/100/21	
Dielectric strength maximum operating isolation voltage Test voltage (partial discharge test, procedure a for type test and random test) $U_{pr} = 1.6 \times U_{IORM}, P_d < 5 \text{ pC}$	Uiorm Upr	890 1 424	V _{peak} V _{peak}
Test voltage (partial discharge test, procedure b for all devices) U_{pr} = 1.875 \times $U_{IORM},~P_d < 5~pC$	Upr	1 669	V_{peak}
Highest permissible overvoltage	UIOTM	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))	СТІ	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	TA	-55 to +100	°C
Isolation resistance, minimum value $V_{IO} = 500 \text{ V dc at } T_A = 25^{\circ}\text{C}$ $V_{IO} = 500 \text{ V dc at } T_A \text{ MAX. at least } 100^{\circ}\text{C}$	Ris MIN. Ris MIN.	10 ¹² 10 ¹¹	Ω Ω
Safety maximum ratings (maximum permissible in case of fault, see thermal derating curve) Package temperature Current (input current I _F , Psi = 0) Power (output or total power dissipation)	Tsi Isi Psi	175 400 700	°C mA mW
Isolation resistance $V_{IO} = 500 \text{ V dc at } T_A = Tsi$	Ris MIN.	10 ⁹	Ω

Dependence of maximum safety ratings with package temperature

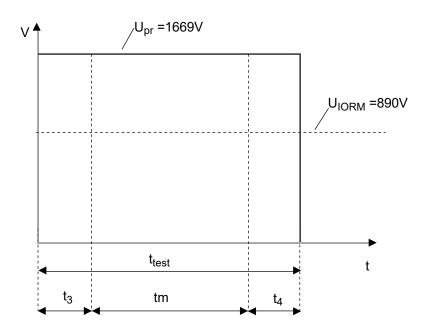




Method a) Destructive Test, Type and Sample Test



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



 $\begin{array}{l} t_{3}, t_{4} = 0.1 \; \text{sec} \\ t_{m}(\text{PARTIAL DISCHARGE})^{=} \; 1.0 \; \text{sec} \\ t_{test} = 1.2 \; \text{sec} \end{array}$



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.
	 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.
	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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