DATA SHEET

NEC

PHOTO TRIAC COUPLERS

PS3641,PS3641L,PS3642,PS3642L

PHOTO TRIAC OUTPUT TYPE
5-PIN PHOTOCOUPLER

DESCRIPTION

The PS3641, PS3642 and PS3641L, PS3642L are optically coupled isolators containing a GaAs light emitting diode and photo triac.

The PS3641, PS3642 are in a plastic DIP (Dual In-line Package) and the PS3641L, PS3642L are lead bending type (Gull-wing) for surface mounting.

FEATURES

- High critical rate of rise of off-state voltage (dV/dt = 500 V/μs TYP.)
- High repetitive peak off-state voltage (PS3641, PS3641L: V_{DRM} = 600 V MIN.)
  (PS3642, PS3642L: V_{DRM} = 400 V MIN.)
- High Isolation voltage (BV = 5 000 Vr.m.s. MIN.)
★ • Taping product name (PS3641L-E3, E4, PS3642L-E3, E4)
- Clearance distance of pin to opposite type (PS3641L1, PS3641L2, PS3642L1, PS3642L2)

APPLICATIONS

- For triggering triac
- Controller for miniature motor

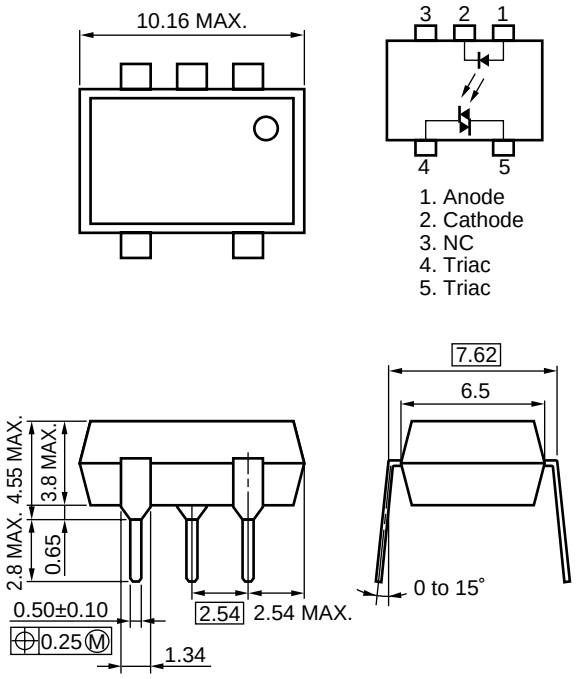
The information in this document is subject to change without notice.

Document No. P10122EJ2V0DS00 (2nd edition)
Date Published June 1997 NS
Printed in Japan

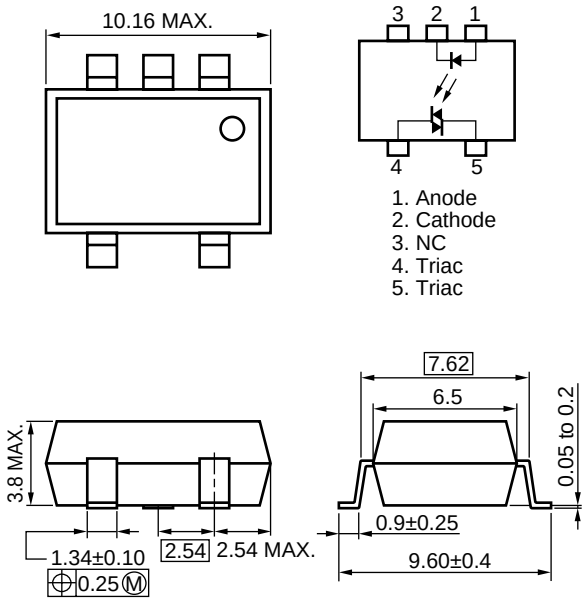
The mark ★ shows major revised points.

PACKAGE DIMENSIONS (in millimeters)

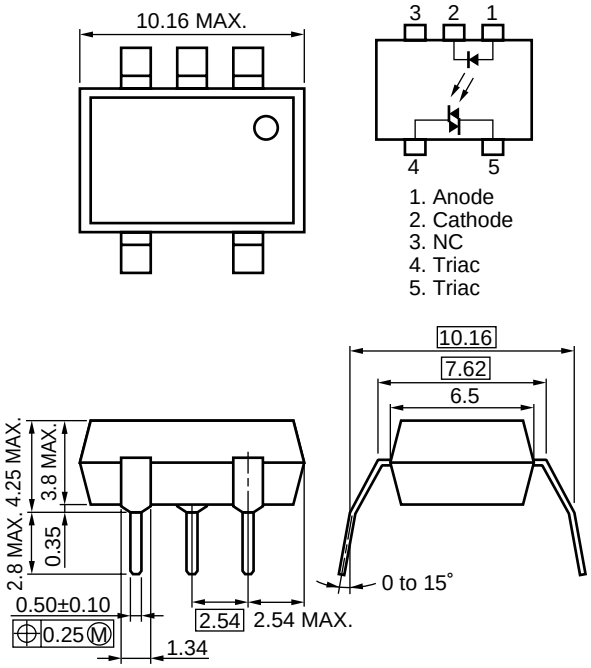
PS3641, PS3642
DIP (Dual In-line Package)



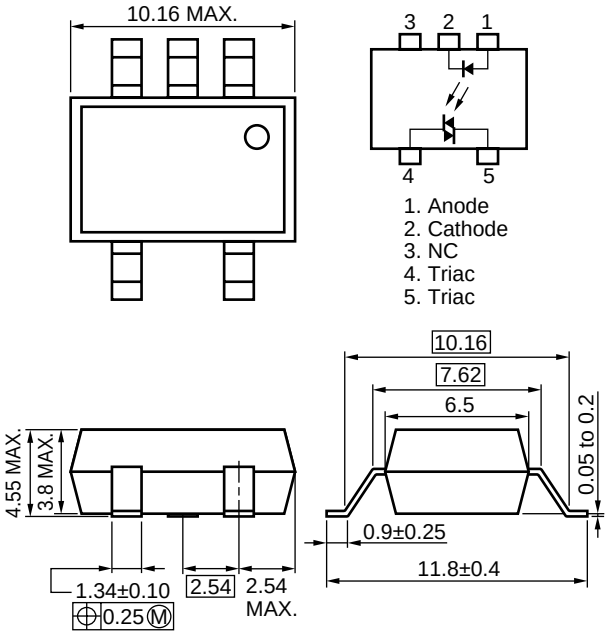
PS3641L, PS3642L
Lead bending type (Gull-wing)



PS3641L1, PS3642L1
DIP (Dual In-line Package)



PS3641L2, PS3642L2
Lead bending type (for long distance)



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

Parameter		Symbol	Ratings		Unit
			PS3641, PS3641L	PS3642, PS3642L	
Diode	Forward Current (DC)	I_F	80		mA
	Reverse Voltage	V_R	6.0		V
	Power Dissipation Derating	ΔP_D/°C	1.5		mW/°C
	Power Dissipation	P_D	150		mW
	Peak Forward Current*1	I_{FP}	1		A
Detector	Repetitive Peak Off-state Voltage	V_{DRM}	600	400	V
	RMS On-state Current*2	$I_{T\ (RMS)}$	100		mA
	Peak 1 Cycle Surge On Current*3	I_{TSM}	0.5		A
	Power Dissipation Derating	ΔP_C/°C	1.5		mW/°C
	Power Dissipation	P_C	150		mW
Isolation Voltage*4		BV	5 000		Vr.m.s.
Operating Ambient Temperature		T_A	–40 to +100		°C
Storage Temperature		T_{stg}	–55 to +125		°C

***1** PW = 100 μs, Duty Cycle = 1 %

★ ***2** Current for operation of this device differs depending on conditions such as load, operating temperature, and supply voltage

***3** Sine Wave f = 50 Hz

***4** AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output

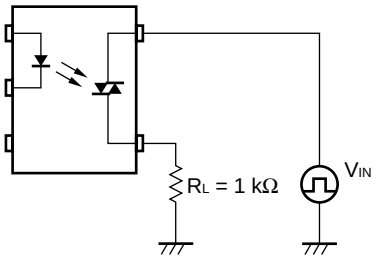
RECOMMENDED OPERATING CONDITIONS

Parameter		Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	PS3641	V_{AC}			240	V_{AC}
	PS3642				120	
Forward Current		I_F	15	20	30	mA
Operating Ambient Temperature		T_A	–25		+85	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

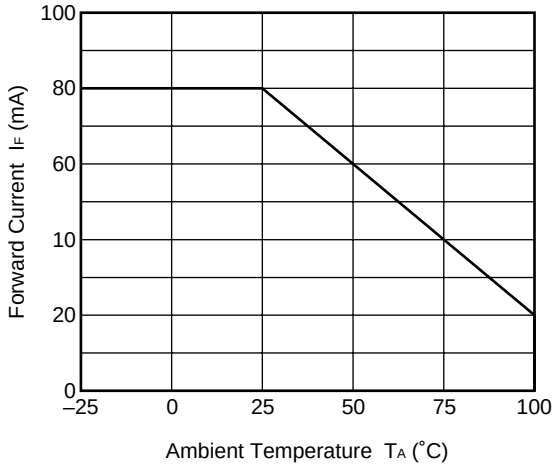
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.1	1.4	V
	Reverse Current	I_R	V_R = 5 V			5	μA
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz		30		pF
Photo Triac	Peak Off-state Current	I_{DRM}	V_{DRM} = ±Rated			100	nA
	Peak On-state Voltage	V_{TM}	I_{TM} = ±Rated		2.5	3.0	V
	Holding Current	I_H			0.8		mA
	Critical Rate of Rise of Off-state Voltage*1	dV/dt	V_{IN} = ±1/√2 Rated	200	500		V/μs
Coupled	Trigger Input Current	I_{FT}	V_{TM} = ±6 V		6	10	mA
	Isolation Resistance	R_{I-O}	V_{I-O} = 1 kV_{DC}	10^{11}			Ω
	Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		0.4		pF

***1** Test circuit for critical rate of rise of off-state voltage

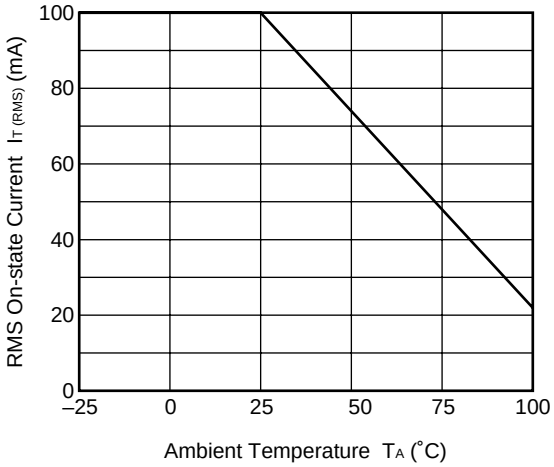


TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

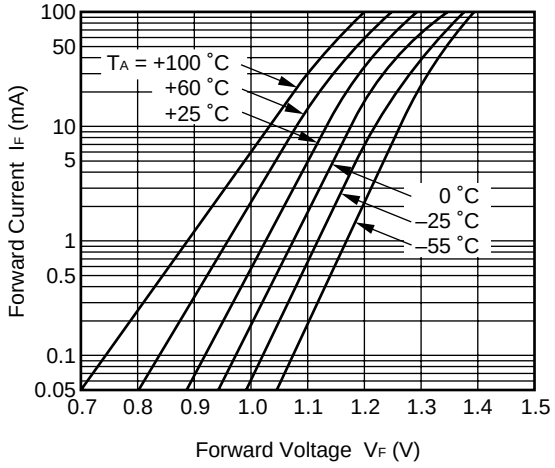
FORWARD CURRENT vs.
AMBIENT TEMPERATURE



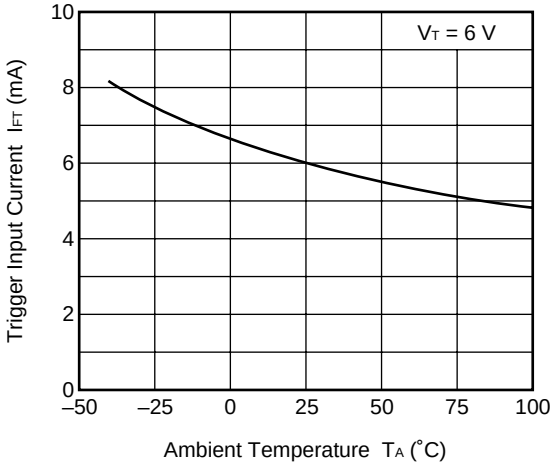
RMS ON-STATE CURRENT vs.
AMBIENT TEMPERATURE



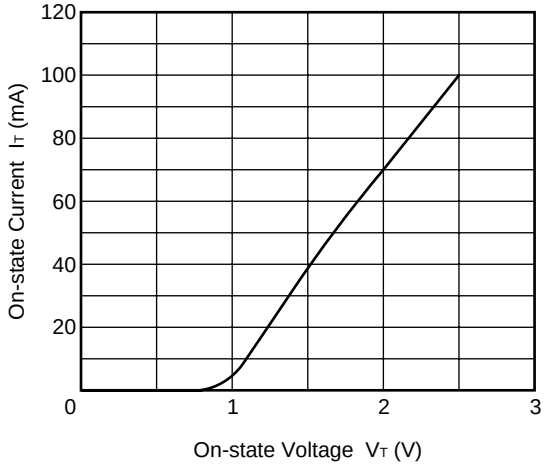
FORWARD CURRENT vs.
FORWARD VOLTAGE



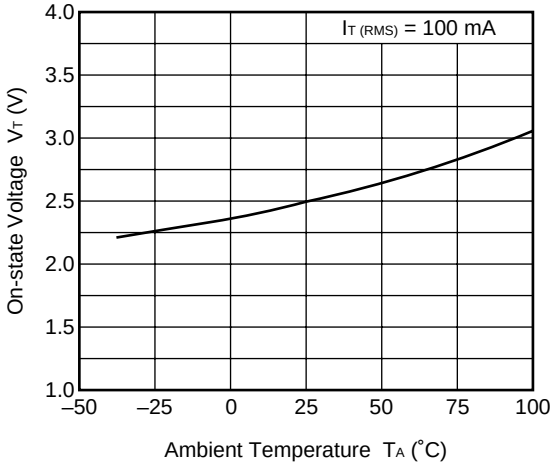
TRIGGER INPUT CURRENT vs.
AMBIENT TEMPERATURE



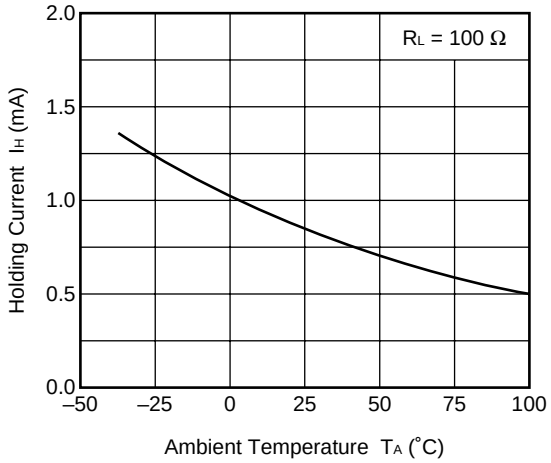
ON-STATE CURRENT vs.
ON-STATE VOLTAGE



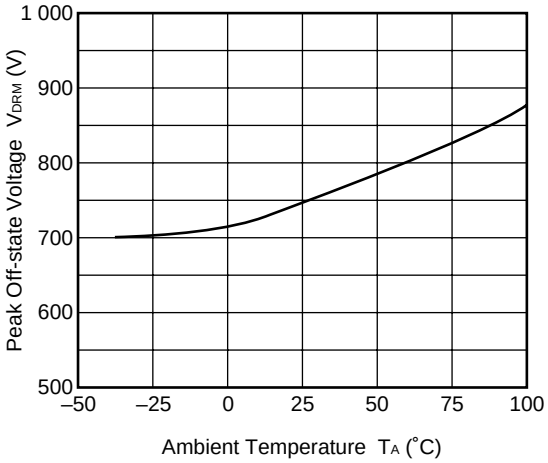
ON-STATE VOLTAGE vs.
AMBIENT TEMPERATURE



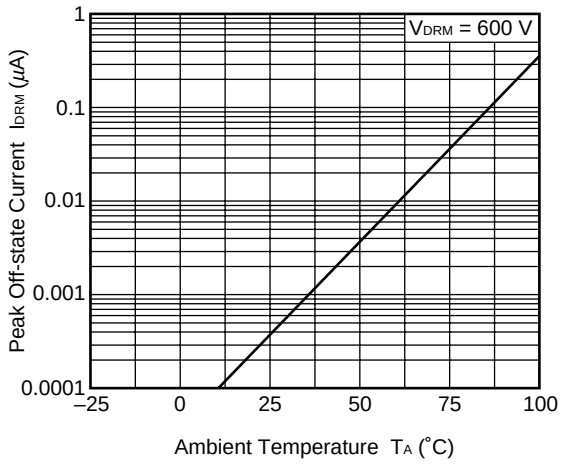
HOLDING CURRENT vs.
AMBIENT TEMPERATURE



PEAK OFF-STATE VOLTAGE vs.
AMBIENT TEMPERATURE



PEAK OFF-STATE CURRENT vs.
AMBIENT TEMPERATURE

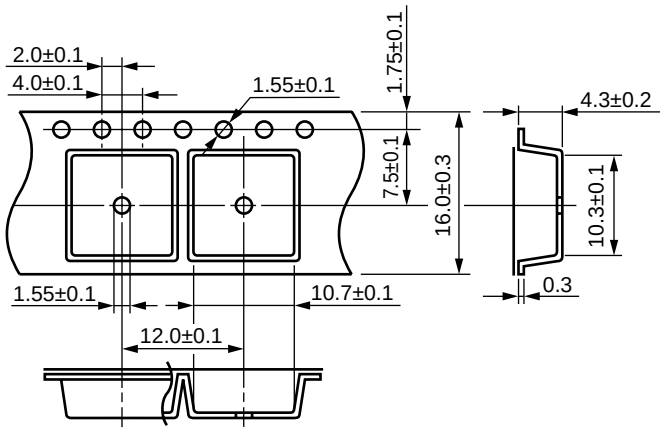


PRECAUTION FOR USER

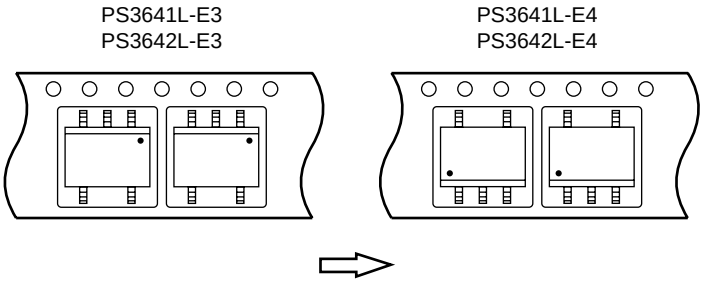
1. Mount all pin for improvement heat sink.
2. Be sure to connect a circuit for surge absorbent.
   An appropriate circuit must be chosen according to the load (for CR, chose its constant). This must be carefully done especially for an inductive load.

★ **TAPING SPECIFICATIONS (in millimeters)**

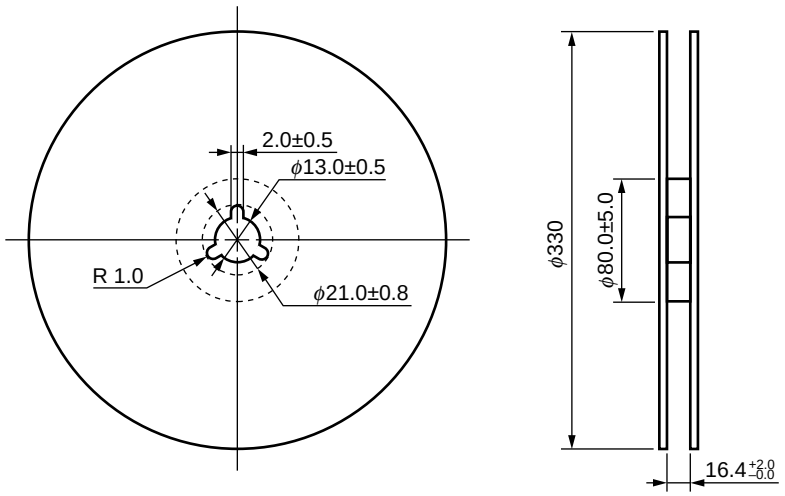
Outline and Dimensions (Tape)



Taping Direction



Outline and Dimensions (Reel)



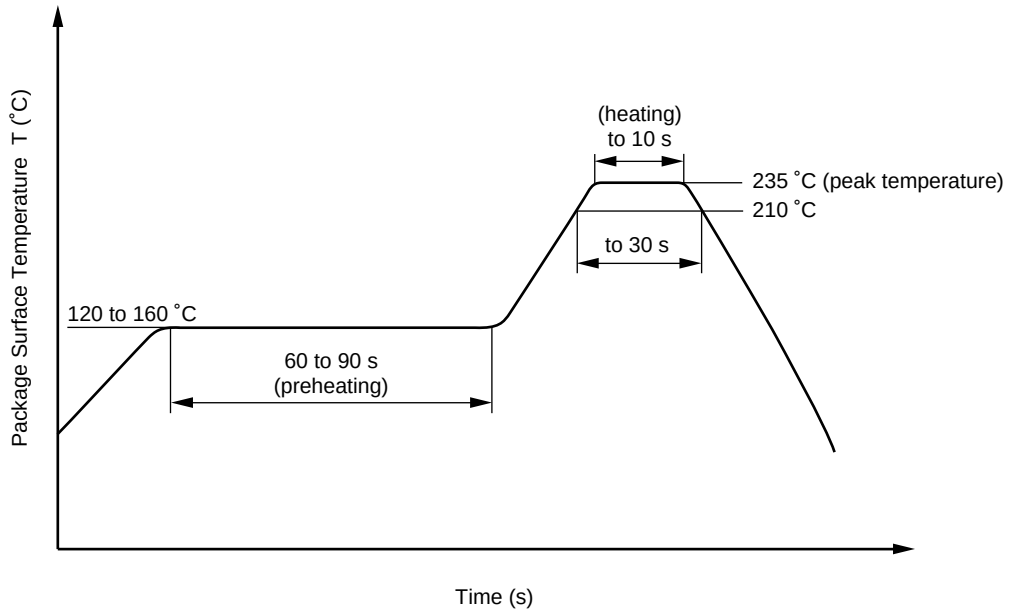
Packing: 1 000 pcs/reel

RECOMMENDED SOLDERING CONDITIONS

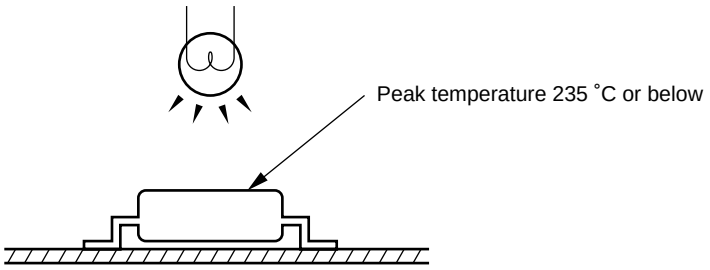
(1) Infrared reflow soldering

• Peak reflow temperature	235 °C (package surface temperature)
• Time of temperature higher than 210 °C	30 seconds or less
★ • 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



Caution Please avoid to removed the residual flux by water after the first reflow processes.



(2) Dip soldering

• Temperature	260 °C or below (molten solder temperature)
• Time	10 seconds or less
• Number of times	One
• Flux	Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

[MEMO]

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CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

M4 96.5