Solid-State Relays
Panel Mount Package—VAC Input / VAC Output
OSSRA0007A thru OSSRA0012A

TT electronics
OPTEK Technology

Features:

- Molded Epoxy package
- Zero crossing circuit
- High Input/output Optical Isolation 4k Vrms
- Superior heat sink package
- Includes LED indicator
- Fast switching time
- Non-contact switch

Approval Agency:

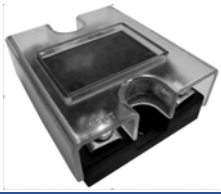
- UL Certification No: E321810

Description:

The OSSR Solid State Relay series are electronic controlled switches, they contain no moving parts. When voltage is applied to the input, a Light Emitting Diode or LED illuminates a Photosensor which controls the internal output circuit. The output circuit is utilized to drive high current loads. The input and output are optically isolated. The OSSR series incorporates a zero crossing circuit which minimizes current and noise surges due to resistive and inductive loads. Optek provides three different electrical configurations of the OSSR series: DC input – AC output, AC input – AC output and DC input – DC output. These configurations meet most industry applications.

The **OSSRA000XA** family comes in a standard panel mount package, commonly known as a “hockey puck” package. The package offers a robust molded epoxy body with exceptional thermal dissipation capability for a long reliable operational life.
The input circuit consists of a bridge rectifier circuit which features an AC range from 50 to 250 ADC. The output consists of a Double Triac circuit featuring load current ratings from 10 to 40 Amps and maximum load voltages from 250 to 480VAC with normally open output.

Protective plastic covers are included with shipment of OSSRA series.
Installation of the protection cover is necessary.



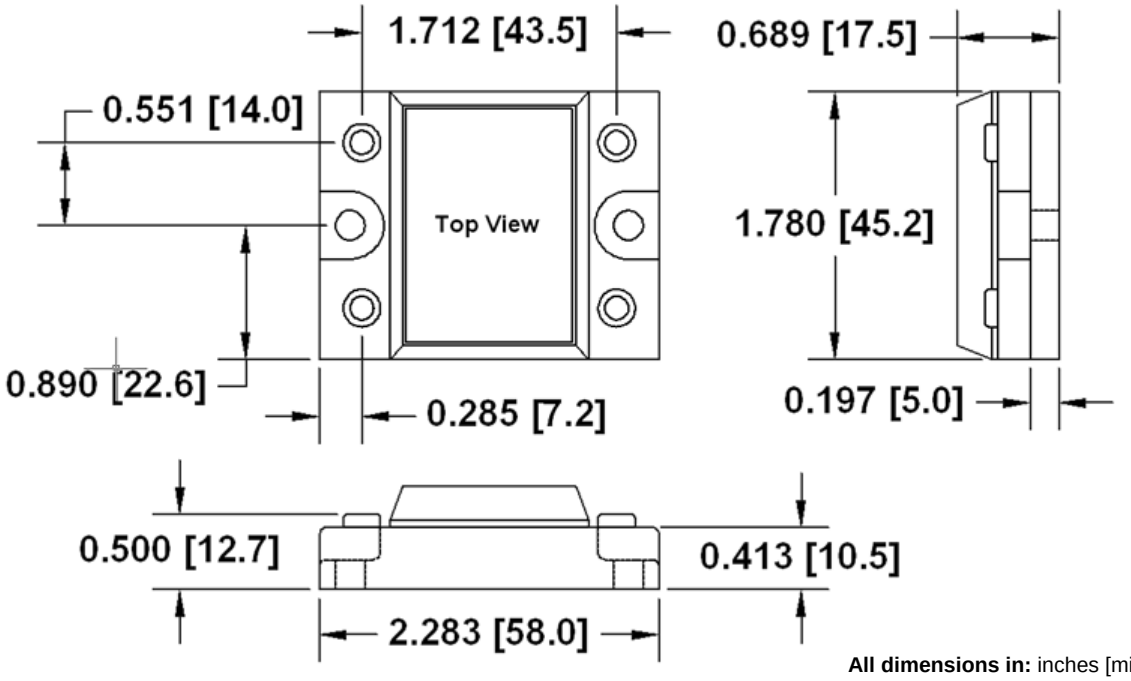
Applications:

- Temperature controlled systems
- Office equipment
- Motor controls
- Industrial Equipment
- Light controls systems
- Heater control
- Appliances
- HVAC temperature control
- Plastic molding
- Packaging industry
- Food processing temperature controls

Moisture

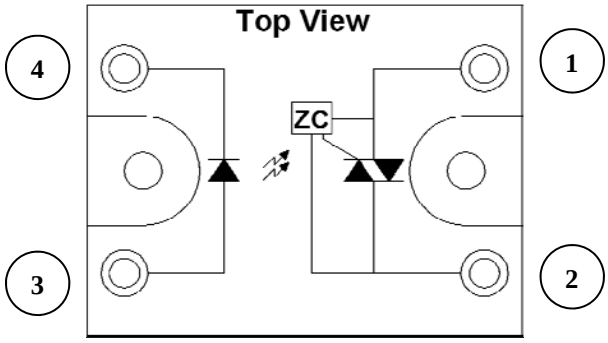
OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Package Outline Dimensions: Panel Mount



All dimensions in: inches [millimeters]
Tolerance: ±0.004" [0.10mm]

Schematic: Top View



OSSRA0007A thru OSSRA0012A

Pin Configuration

Part Number	Pin #			
	1	2	3	4
OSSRA0007A	A (-)	A (+)	A	K
OSSRA0008A	A (-)	A (+)	A	K
OSSRA0009A	A (-)	A (+)	A	K
OSSRA0010A	A (-)	A (+)	A	K
OSSRA0011A	A (-)	A (+)	A	K
OSSRA0012A	A (-)	A (+)	A	K

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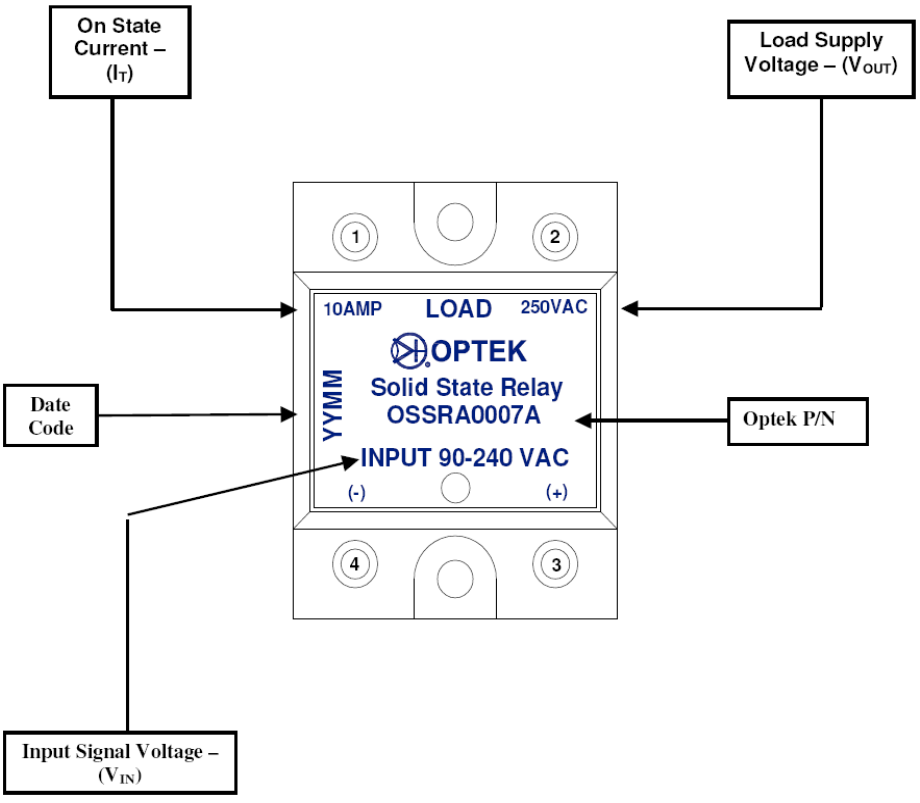
VAC Input / VAC Output Devices Ordering Information

Part Number	Input	Min. Tgr Current Ift	Max. Output Current	Min. Ouput Current	Max. Vout	Min. Vout	Output Type	Br. Vol. Input to Output	Configuration
OSSRA0007A	100-240VAC	50mA	10A	0.05A	250VAC	50VAC	AC	4000VAC	A K —A1(+) A2(-)
OSSRA0008A	100-240VAC	50mA	15A	0.05A	250VAC	50VAC	AC	4000VAC	A K —A1(+) A2(-)
OSSRA0009A	100-240VAC	50mA	25A	0.05A	250VAC	50VAC	AC	4000VAC	A K —A1(+) A2(-)
OSSRA0010A	100-240VAC	50mA	40A	0.05A	250VAC	50VAC	AC	4000VAC	A K —A1(+) A2(-)
OSSRA0011A	100-240VAC	50mA	25A	0.05A	480VAC	75VAC	AC	4000VAC	A K —A1(+) A2(-)
OSSRA0012A	100-240VAC	50mA	40A	0.05A	480VAC	75VAC	AC	4000VAC	A K —A1(+) A2(-)

Configuration: Definition of Terms LED Identification—Sensor Identification		
Configuration Information	LED	A = Anode , K = Cathode
	Sensor	A1(+) and A2(-) = Main Terminals of Double Triac

Part Number Symbolization



Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage Temperature OSSRA0007A thru OSSRA0012A	-30° C to +100° C
Operating Temperature OSSRA0007A thru OSSRA0012A	-30° C to +80° C
Isolation Voltage (Input to Output) OSSRA0007A thru OSSRA0012A	4,000 Vrms

Input Diode

Input Signal Voltage—(V_{IN}) OSSRA0007A thru OSSRA0012A	100– 240 VAC
Drop-out Voltage—(Vdo) OSSRA0007A thru OSSRA0012A	10 VAC

Output Triac

RMS On-State Current - (I_T) OSSRA0007A OSSRA0008A OSSRA0009A, OSSRA0011A OSSRA0010A, OSSRA0012A	 10 Arms 15 Arms 25 Arms 40 Arms
Peak One Cycle Surge Current - (I surge) OSSRA0007A OSSRA0008A OSSRA0009A, OSSRA0011A OSSRA0010A, OSSRA0012A	 100 A 150 A 250 A 400 A
Repetitive Peak-Off State Voltage—(V_{DRM}) OSSRA0007A thru OSSRA0010A OSSRA0011A, OSSRA0012A	 600 V 800 V
Operating Frequency—(f) OSSRA0007A thru OSSRA0012A	 47—70 Hz
Critical Rate of Rise of On-State Current—(di/dt) OSSRA0007A thru OSSRA0012A	 50 A/µS 50 V/µS
Load Supply Voltage—(V_{OUT}) OSSRA0007A thru OSSRA0010A OSSRA0011A, OSSRA0012A	 250 Vrms AC 480 Vrms AC

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Electrical Characteristics

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_{PU}	**Pick-up Voltage** OSSRA0007A thru OSSRA0012A	-	-	100	VAC	R_{IN} = 11KΩ
R_{IN}	**Input Resistance** OSSRA0007A thru OSSRA0012A	-	11	-	KΩ	
Output Triac						
V_T	**On-State Voltage** OSSRA0007A thru OSSRA0012A	-	-	1.5	Vrms	I_T = 1Arms
I_{OP}	**Operating Current** OSSRA0007A thru OSSRA0010A OSSRA0011A, OSSRA0012A	50 50	- -	- -	mArms	Vout = 240Vrms Vout = 480Vrms
I_{LEAK}	**Leakage Current** OSSRA0007A thru OSSRA0010A OSSRA0011A, OSSRA0012A	- -	3.5 -	8 14	mArms	Vout = 240Vrms Vout = 480Vrms
dv/dt	**Critical Rate of Rise of Off-State Voltage** OSSRA0011A, OSSRA0012A OSSRA0007A thru OSSRA0010A	50 100	150 -	- -	V/µs	See Note 1.
-	**Zero-Cross Voltage** OSSRA0007A thru OSSRA0012A	-	Yes	-	-	-
V_{OUT}	**Load Voltage Rating** OSSRA0007A thru OSSRA0010A OSSRA0011A, OSSRA0012A	50 75	- -	280 480	VAC	I_T = 50mArms MIN
I_{FT}	**Minimum Trigger Current** OSSRA0007A, thru OSSRA0009A OSSRA0010A thru OSSRA0012A	- -	- -	25 25	mA	V_{DRM} = 600 V V_{DRM} = 800 V
Riso	**Isolation resistance Input to Output** OSSRA0007A thru OSSRA0012A	10^10	-	-	Ω	DC500 V
T_{ON}	**Turn-on Time** OSSRA0007A thru OSSRA0012A	-	-	8.3	mS	60Hz AC
T_{OFF}	**Turn-off Time** OSSRA0007A thru OSSRA0012A	-	-	8.3	mS	60Hz AC
Rth (j-C) l	**Thermal Resistance (between junction and case)**	-	1.3	-	° C/W	–

Note1: Output (dv/dt) protection is provided in all models, and they are designed to switch resistive or inductive loads to 0.2 factor. The dv/dt rating is based on source impedance of 50 ohms.

OSSRA0007A thru OSSRA0010A

Characteristic Data Curves

Fig.1 RMS On-state Current vs. Ambient Temperature

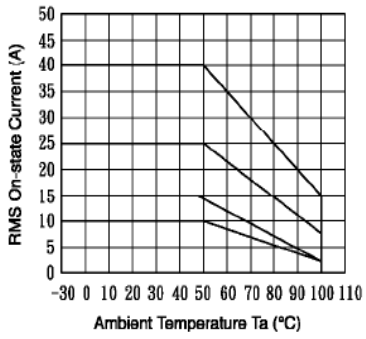


Fig.2 Surge Current vs. Time

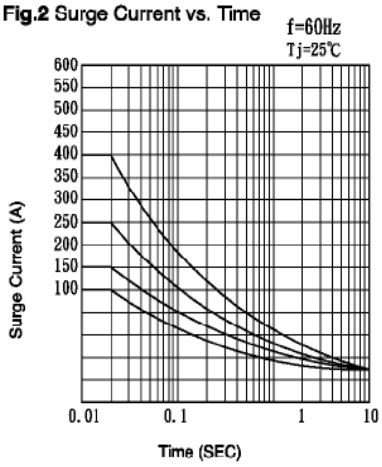


Fig.3 Open Circuit Leak Current vs. Supply Voltage

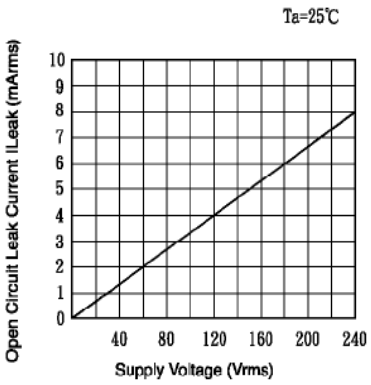


Fig.4 RMS On-state Current vs. CaseTemperature

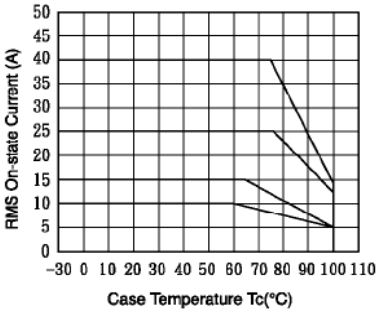


Fig.5 Input Voltage vs. Ambient Temperature

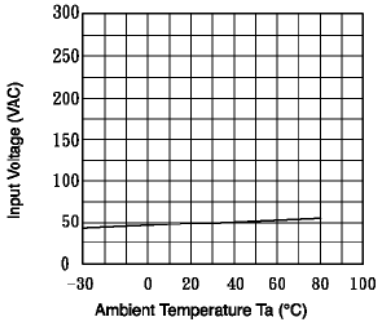


Fig.6 Input Current vs. Input voltage

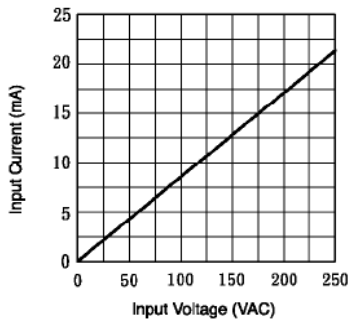


Fig.7 Action waveform

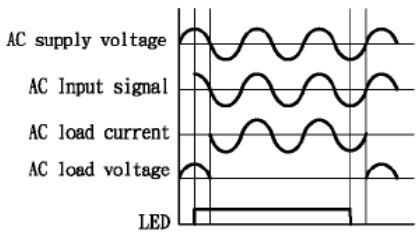
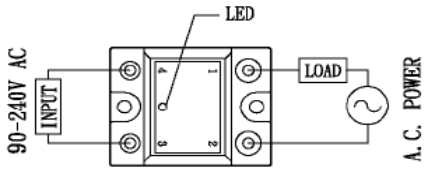


Fig.8 WIRING DIAGRAM



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OSSRA0011A

Characteristic Data Curves

Fig.1 RMS On-state Current vs. Ambient Temperature

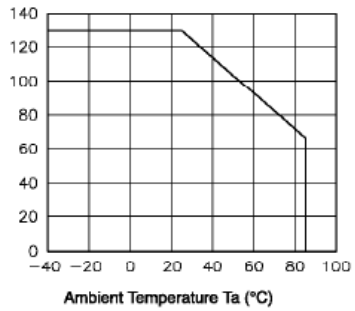
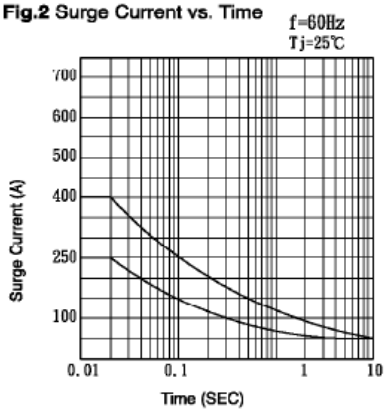


Fig.2 Surge Current vs. Time



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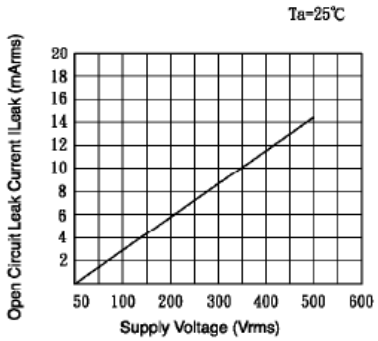


Fig.4 RMS On-state Current vs. CaseTemperature

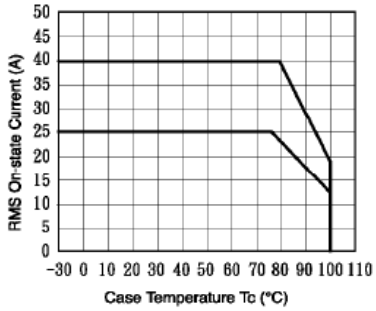
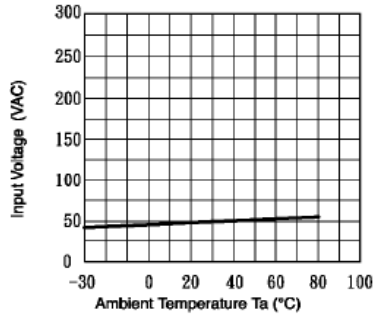


Fig.5 Input Voltage vs. Ambient Temperature



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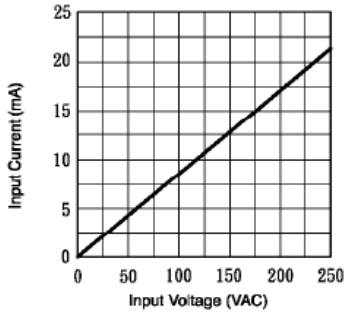

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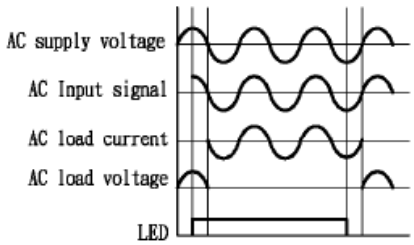

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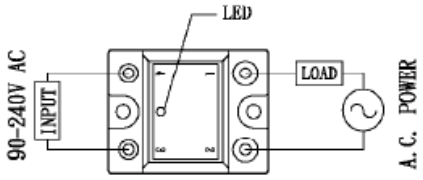
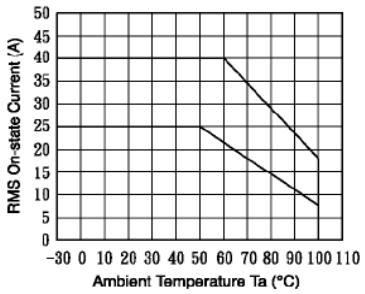


OSSRA0012A

Characteristic Data Curves

Fig.1 RMS On-state Current vs. Ambient Temperature



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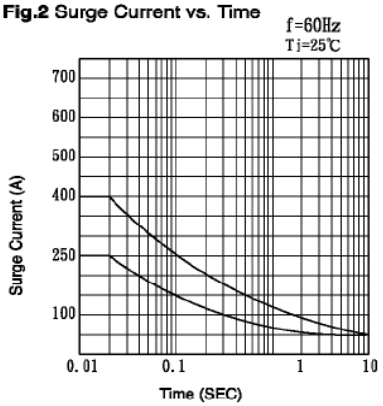

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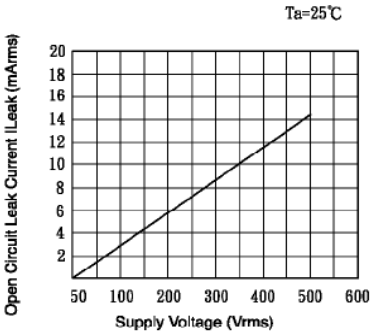

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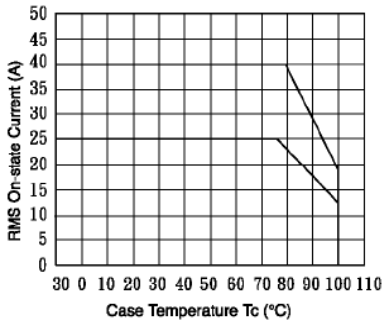


Fig.5 Input Voltage vs. Ambient Temperature

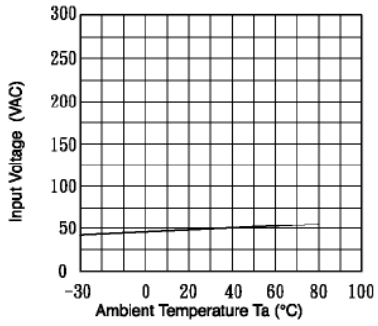


Fig.6 Input Current vs. Input voltage

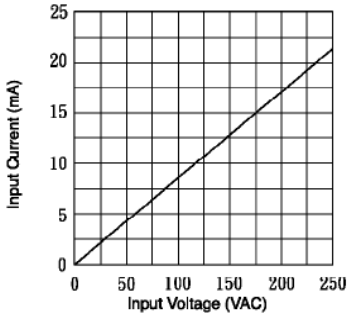


Fig.7 Action waveform

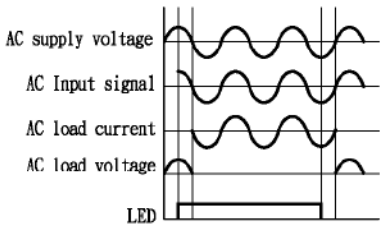
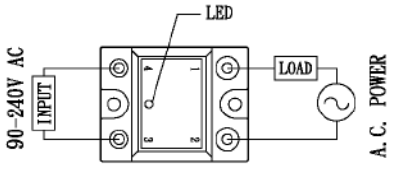


Fig.8 WIRING DIAGRAM



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Quality and Reliability Requirements:

Parameter	Failure Criteria	Test Conditions
Room Temperature Operating Life (for light emitting diodes only)	± 20%	T_A = 25°C, I_F = 60mA or max. rated, Time = 1000 hours
High Humidity, High Temperature Reverse Bias	± 20%	JEDEC, Method A101-B T_A = 85°C, Humidity = 85%RH, Time = 1000 hours,
High Temperature Forward Bias	± 20%	JEDEC, Method A108-A T_A = 70°C, I_F = 20mA, Time = 1000 hours
Autoclave	0 Fail	T_A = 121°C, Pressure = 15psi, Humidity = 100%
IR Reflow / Solderability Test	0 Fail	JEDEC (J-STD-020) / MIL-STD-883E, Method 2003.7
MTTF @ 90% confidence	150,000 Min.	@ 25°C, 25mADC
Moisture Sensitivity Level	MSL 1	per JDEC stnd J-STD-020B
Glass Transition of body	125°C Min.	DSC test method
Temperature Humidity-Bias	± 20%	85°C, 85%RH, 500Hrs, 80% min Iceo
Temperature Cycle	± 20%	per Method 1010.7 of MIL-STD-883E
High Temperature Storage	± 20%	85°C, 500Hrs

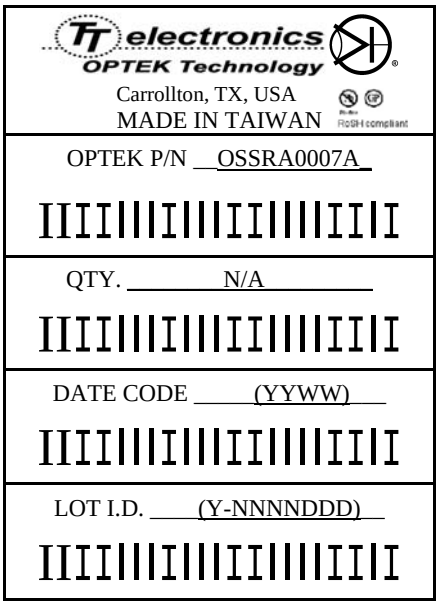
Label Identification:

DESCRIPTION:

Size: 3” (7.4 cm) X 2.2” (5.5 cm)
Lettering shall be black on white background.
Format shall be as:

Notes:

1. The DATE CODE is a 4-digit code for date of manufacture where YY is the last two digits of the year, and WW is week number of manufacture.
2. The LOT I.D. is the manufacturing location lot identification where Y is the year of manufacture, NNNN is a sequential lot identifier, and DDD is the day of the year of manufacture. – or use equivalent label format.



Packaging Information:

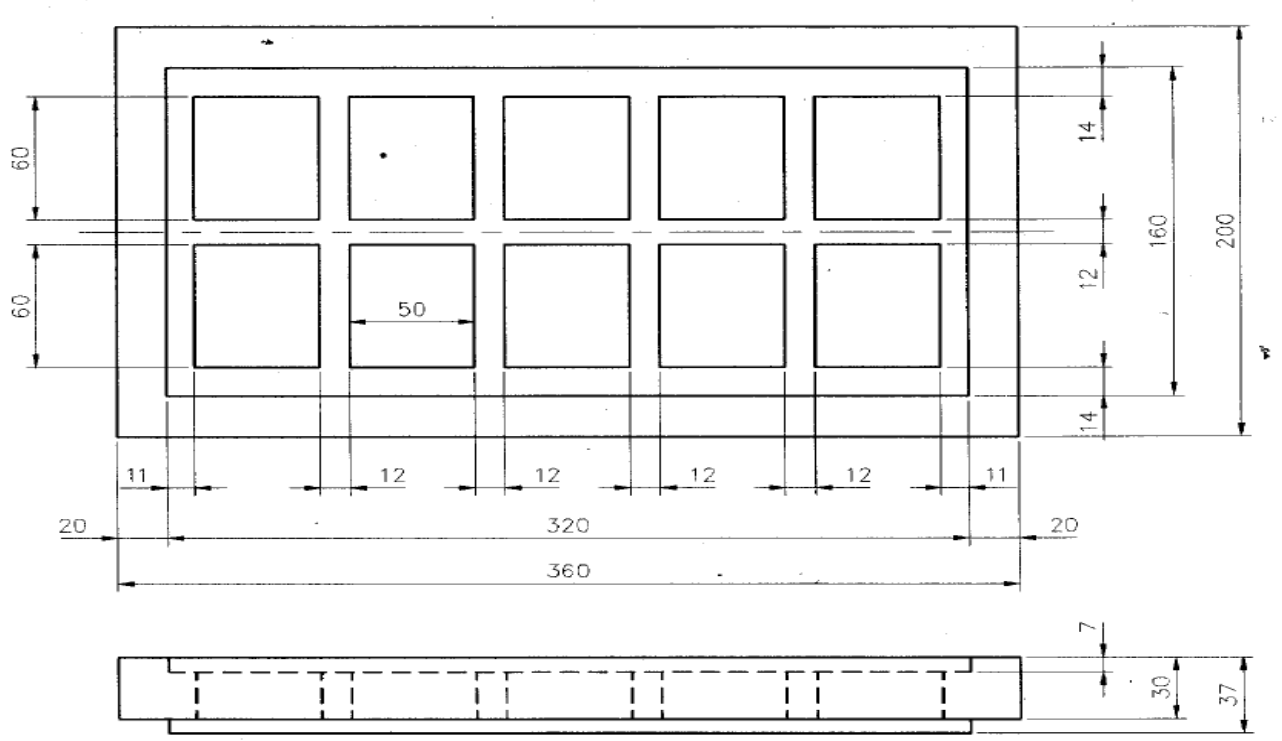
Optek's Solid-State Relays Part Numbers (4-Pin SIP)		Packaging Quantities / Package Type	Tubes Qty	Tubes Weight (g)	Inner 53.5 x 7.0 x 7.5 cm Qty	Inner Weight (kg)	Medium Carton 55.5 x 30.7 x 16.5 cm Qty	Medium Carton Net Weight (kg)	Medium Carton Gross Weight (kg)	Large Carton 55.5 x 30.7 x 23.5 cm Qty	Large Carton Net Weight (kg)	Large Carton Gross Weight (kg)
SSR	OSSRD2001D, OSSRD2002A	4 Pin SIP (24mm x 37mm)	10	213	80	1.80	640	14.4	15.4	960	21.6	22.9
SSR	OSRRD1001A - OSSRD1006A	4 Pin SIP (32mm x 24mm)	20	421	80	1.90	640	15.2	16.2	960	22.8	24.1

Optek's Solid-State Relays Part Numbers (Panel Mounts)		Packaging Quantities / Package Type	Trays 36 x 20 x 37 cm Qty	Trays Weight (g)	Small Carton 37 x 21 x 11 cm Qty	Small Carton Net Weight (kg)	Small Carton Gross Weight (kg)	Medium Carton 37 x 21 x 17 cm Qty	Medium Carton Net Weight (kg)	Medium Carton Gross Weight (kg)	Large Carton 37 x 21 x 32 cm Qty	Large Carton Net Weight (kg)	Large Carton Gross Weight (kg)
SSR	OSSRD0001A - OSSRD0006A OSSRA0007A - OSSRA0012A	Panel Mounts (42.5mm x 58mm)	10	920	30	2.80	3.3	50	4.7	5.4	100	9.5	10.5

Tray and Carton Packaging Specifications:

Tray Packaging Dimensions

All dimensions in centimeters (mm)



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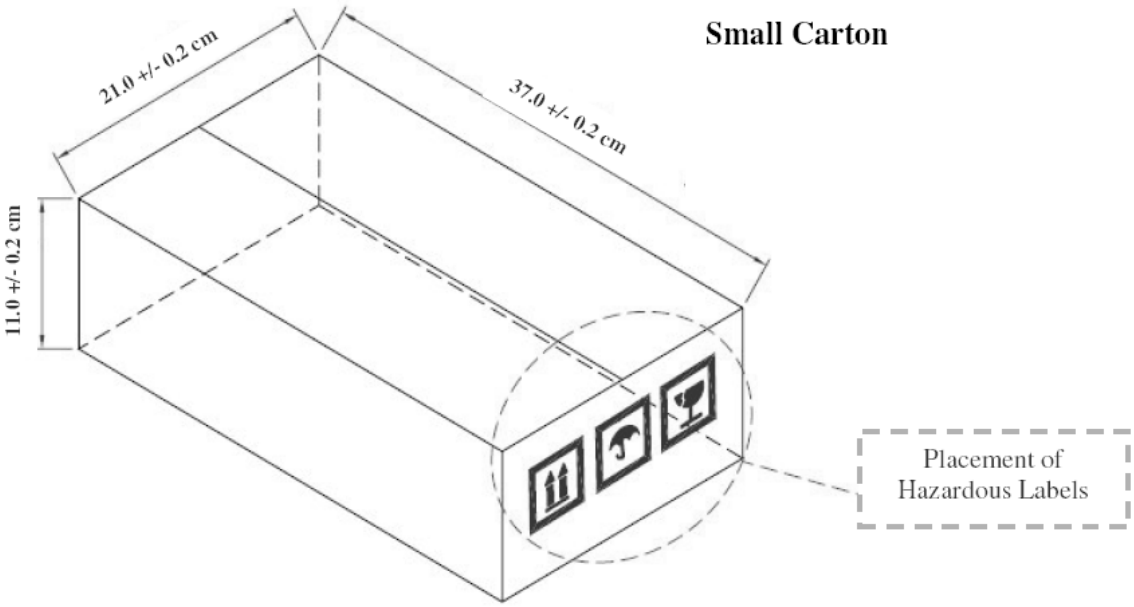
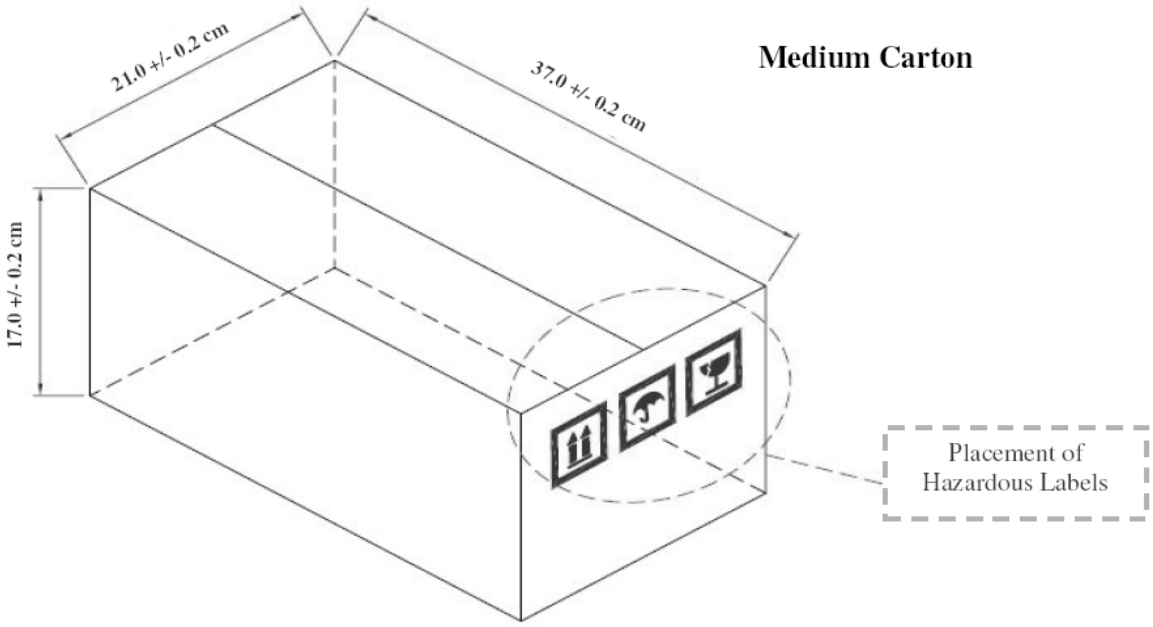
Tray and Carton Packaging Specifications (Cont.):

Carton Packaging Dimensions



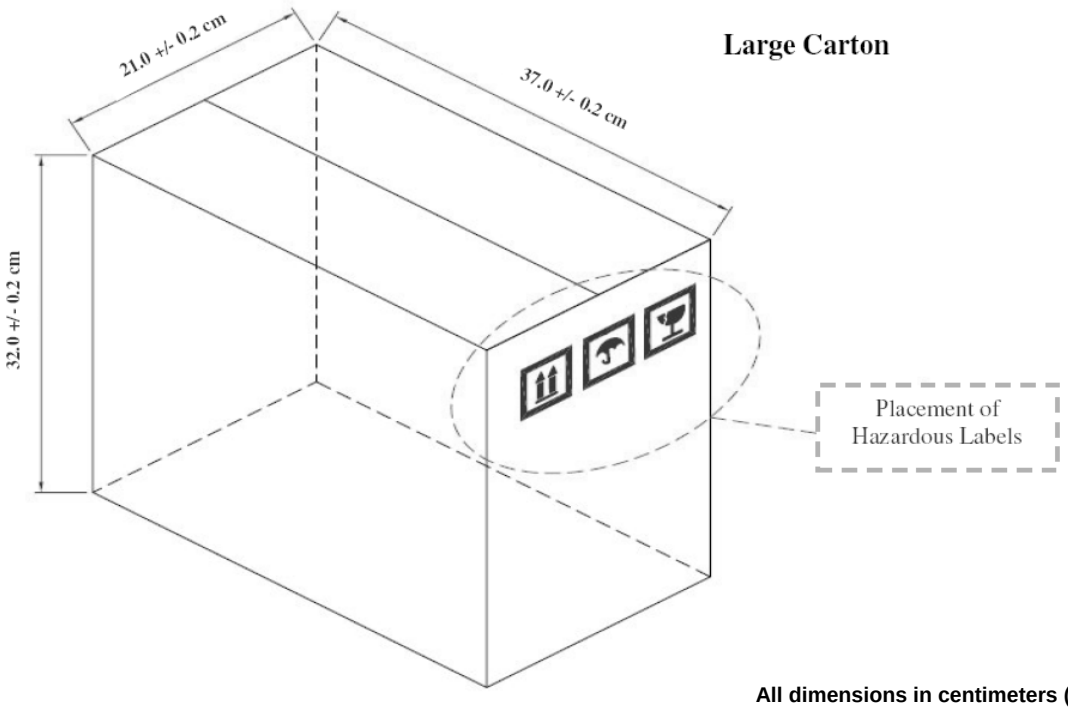
All dimensions in centimeters (cm)



All dimensions in centimeters (cm)

Tray and Carton Packaging Specifications (Cont.):

Carton Packaging Dimensions



All dimensions in centimeters (cm)

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