



## 1-DCL | SERIES

PANEL MOUNT



### Features

- Ratings from 7 A to 40 A @ 200 VDC and from 7 A to 10 A @ 500VDC
- Mosfet Output
- UL Approved, CE Compliant to EN60950-1
- Improved SEMS screw and washer
- Redesigned housing with anti-rotation barriers
- DC control
- EMC Compliant to Level 3
- Epoxy Free Design



### PRODUCT SELECTION

Load Voltage	7 A	10 A	12 A	20 A	40 A
100 VDC	D1D07L		D1D12L	D1D20L	D1D40L
200 VDC	D2D07L		D2D12L		D2D40L
400 VDC	D4D07L		D4D12L		
500 VDC	D5D07L	D5D10L			



### OUTPUT SPECIFICATIONS <sup>2</sup>

Description	7 A	12 A	20 A	40 A	7 A	12 A	40 A	7 A	12 A	7 A	10 A
Recommended Operating Voltage [Vdc]	1-72	1-72	1-72	1-72	1-150	1-150	1-150	1-300	1-300	1-385	1-385
Absolute Maximum Rating [Vdc]	100	100	100	100	200	200	200	400	400	500	500
Maximum Off-State Leakage Current @ Rated Voltage [mA]	0.1	0.2	0.3	0.3	0.1	0.3	0.3	0.3	0.3	0.2	0.3
Maximum Load Current [Adc] <sup>3</sup>	7	12	20	40	7	12	40	7	12	7	10
Minimum Load Current [mA] <sup>4</sup>	1	1	1	1	1	1	1	1	1	1	1
Maximum Surge Current (10msec) [Adc]	23	28	42	106	22	31	106	18	36	19	29
Maximum On-State Voltage Drop @ Rated Current [Vdc]	0.5	0.9	0.8	1	1.5	0.7	0.8	2.3	2.6	3.5	3.3
Maximum On-State Resistance [RDS-ON] [Ohms]	0.07	0.072	0.039	0.025	0.21	0.062	0.021	0.33	0.22	0.5	0.33
Thermal Resistance Junction to Case (Rjc) [°C/W]	2	2	1.71	0.68	1.24	0.71	0.22	0.56	0.39	0.6	0.43
Minimum Heat Sink for Rated Current @ 40°C [°C/W]	5	3	2	1	3	3	0.7	2	1	1	0.7
Maximum Pulse Width Modulation Frequency [Hz] <sup>5</sup>	5000	4000	3500	2500	3500	2000	950	1200	900	1100	900



## INPUT SPECIFICATIONS <sup>2</sup>

Description	DC Control
Control Voltage Range	3.5-32 VDC
Maximum Reverse Voltage	-32 VDC
Minimum Turn-On Voltage <sup>6</sup>	3.5 VDC
Must Turn-Off Voltage	1 VDC
Minimum Input Current (for on-state)	10 mA
Maximum Input Current	15 mA
Nominal Input Impedance	Current Regulated
Maximum Turn-On Time [μsec]	100
Maximum Turn-Off Time [μsec]	100

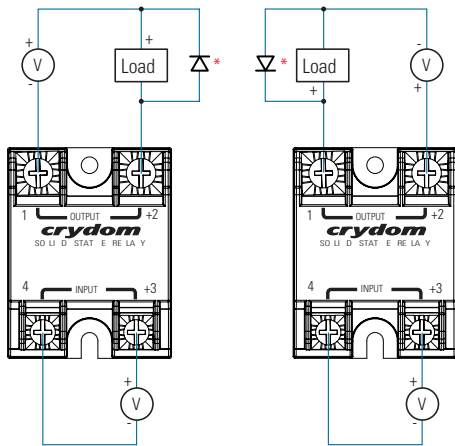


## GENERAL SPECIFICATIONS <sup>2</sup>

Description	Parameters
Dielectric Strength, Input/Output/Base (50/60Hz)	3750 Vrms
Minimum Insulation Resistance (@ 500 VDC)	109 Ohms
Maximum Capacitance, Input/Output	8 pF
Ambient Operating Temperature Range <sup>7</sup>	-40 to 100 °C
Ambient Storage Temperature Range	-40 to 125 °C
Weight (typical)	2.66 oz (75.5 g)
Housing Material	UL94 V-0
Baseplate Material	Aluminum
Input Terminal Screw Torque Range (in-lb/Nm)	13-15 / 1.5-1.7
Load Terminal Screw Torque Range (in-lb/Nm)	18-20 / 2-2.2
SSR Mounting Screw Torque Range (in-lb/Nm)	18-20 / 2-2.2
Input/Load Terminal Screw Torque Range (in-lb/Nm) <sup>1</sup>	w/"K" option 8-10 / 0.9-1.13
Input/Output Terminal Screw Thread Size	#6-32 UNC / #8-32 UNC
Humidity per IEC60068-2-78	93% non-condensing
MTBF (Mean Time Between Failures) at 40°C ambient temperature <sup>8</sup>	21,395,130 hours (2,441 years)
MTBF (Mean Time Between Failures) at 60°C ambient temperature <sup>8</sup>	11,545,504 hours (1,317 years)

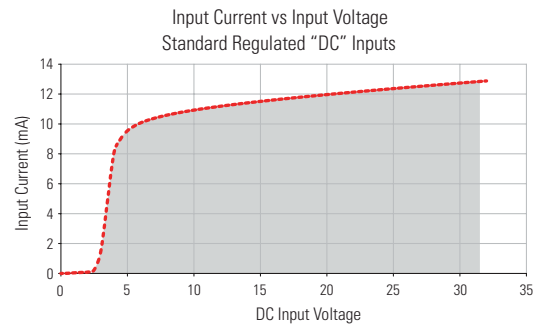
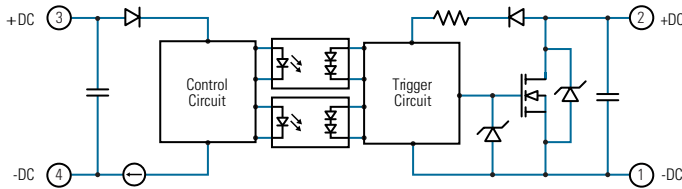
# WIRING DIAGRAM

\* Inductive loads must be diode suppressed.



Recommended Wire Sizes		
Terminals	Wire Size (Solid / Stranded)	Wire Pull-Out Strength (lbs)[N]
Input	24 AWG (0.2 mm <sup>2</sup> ) / 0.2 [minimum]	10 [44.5]
	2 x 12 AWG (3.3 mm <sup>2</sup> ) / 3.3 [maximum]	90 [400]
Output	20 AWG (0.5 mm <sup>2</sup> ) / 0.518 [minimum]	30 [133]
	2 x 10 AWG (5.3 mm <sup>2</sup> ) / 5.3	110 [490]
	2 x 8 AWG (8.4 mm <sup>2</sup> ) / 8.4 [maximum]	90 [400]

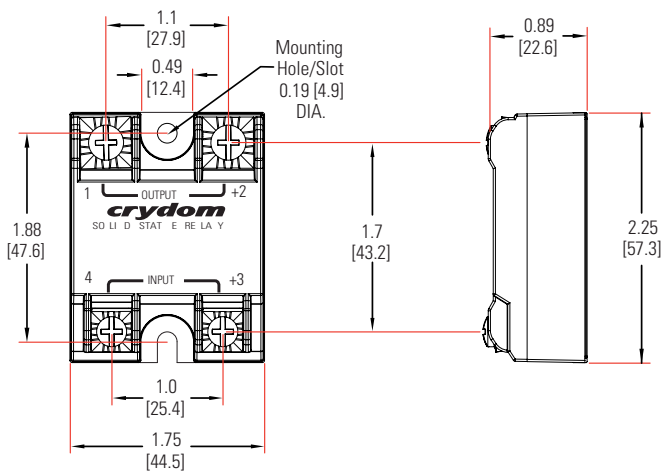
# EQUIVALENT CIRCUIT BLOCK DIAGRAMS



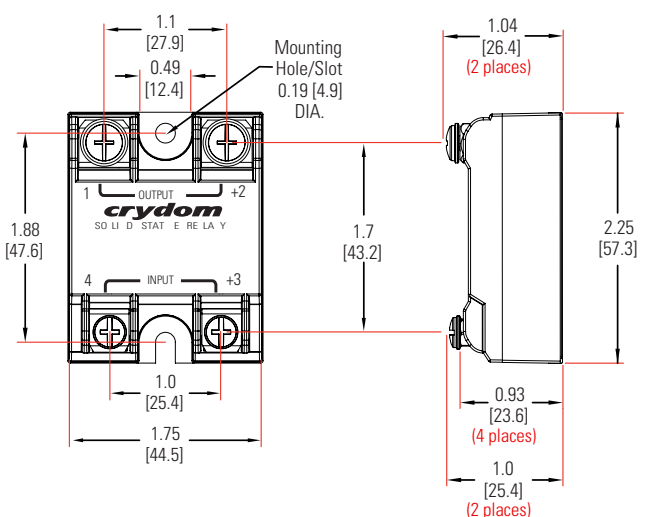
# MECHANICAL SPECIFICATIONS <sup>2</sup>

Tolerances: ±0.02 in / 0.5 mm All dimensions are in: inches [millimeters]

## Screw Termination



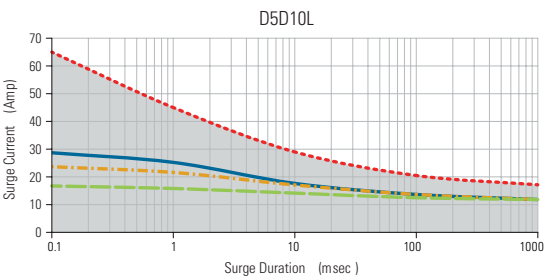
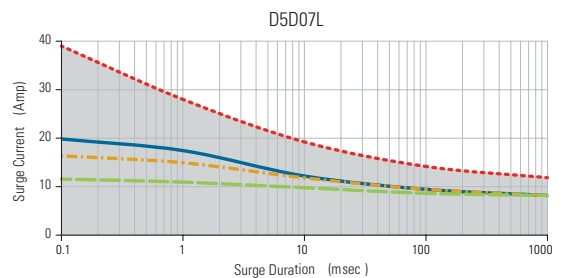
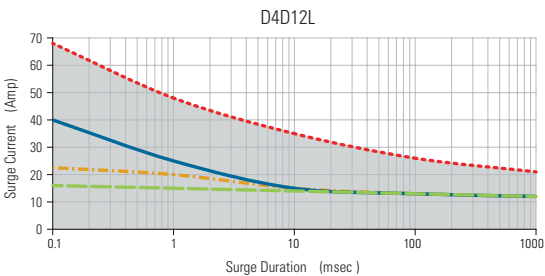
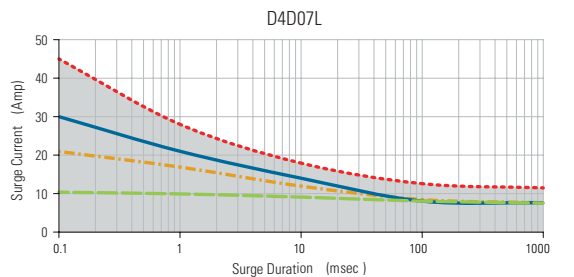
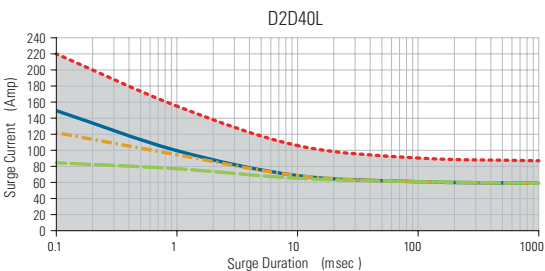
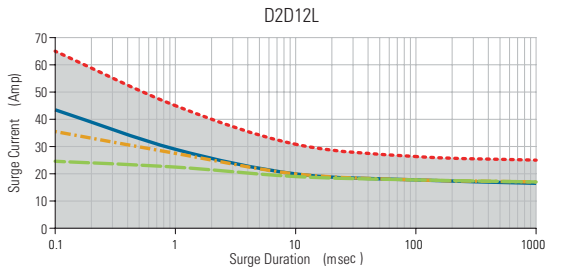
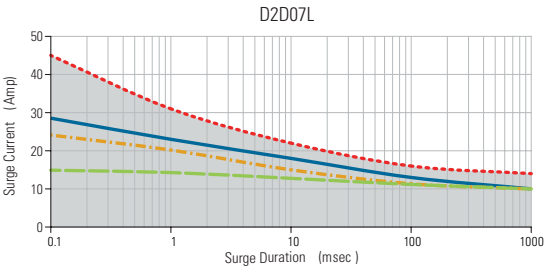
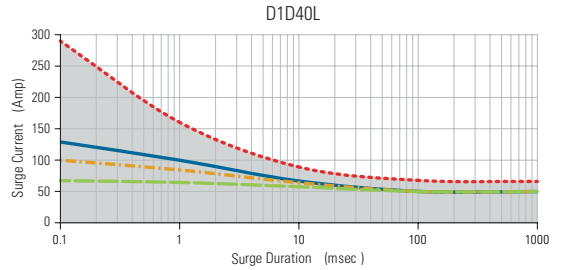
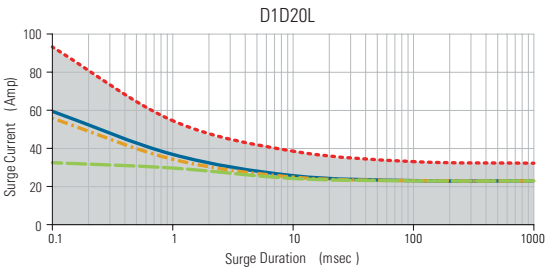
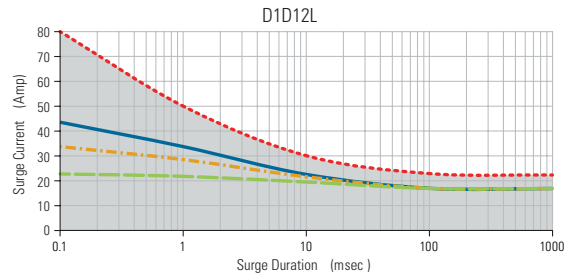
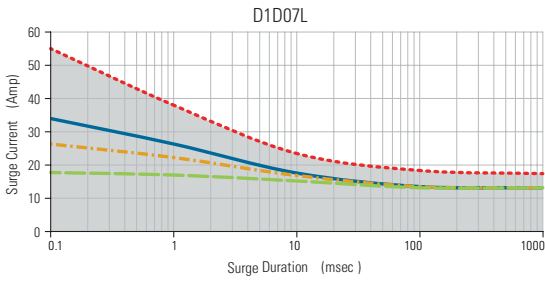
## Hex Standoff Termination ("K" Option) <sup>1</sup>



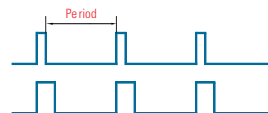


# SURGE CURRENT INFORMATION

--- Single Pulse (i) --- Duty Factor (10%) (ii) --- Duty Factor (20%) (ii) --- Duty Factor (50%) (ii)



Duty Factor 10%



Duty Factor 20%



Duty Factor 50%



For Pulse Wide Modulation applications select the curve according duty factor and pulse duration as following.

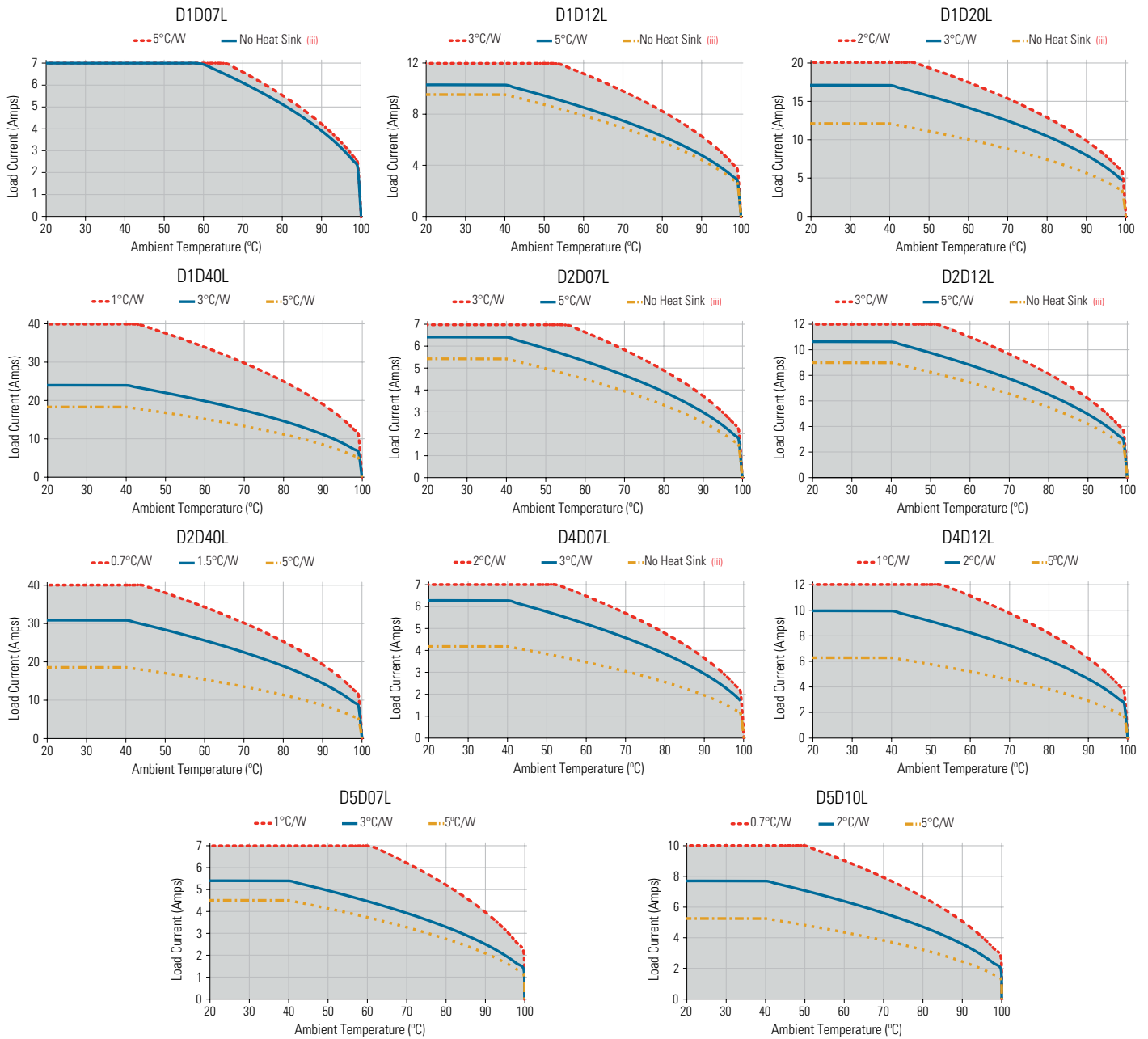
=Duty Factor  $\frac{\text{Pulse Wide}}{\text{Period}} \times 100 (\%)$

(i) for Single Surge Pulse  $T_c=40^\circ\text{C}; T_j 175^\circ\text{C}$   
(ii) for Repetitive Surge Pulse  $T_c=40^\circ\text{C}; T_j 130^\circ\text{C}$



# THERMAL DERATE INFORMATION

(iii) SSR metal base plate acting as heat sink, it must be exposed to free ambient air.





**New Accessories! Protective Cover & Hardware Kits**

**Protective Cover** Part number: KS101

**Hardware Kit** Part number: HK4

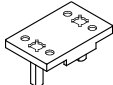

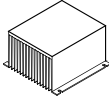
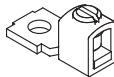
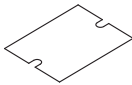


Clear plastic cover compatible with all new S1 designs. Safety covers provide added protection from electric shock when installing or checking equipment.



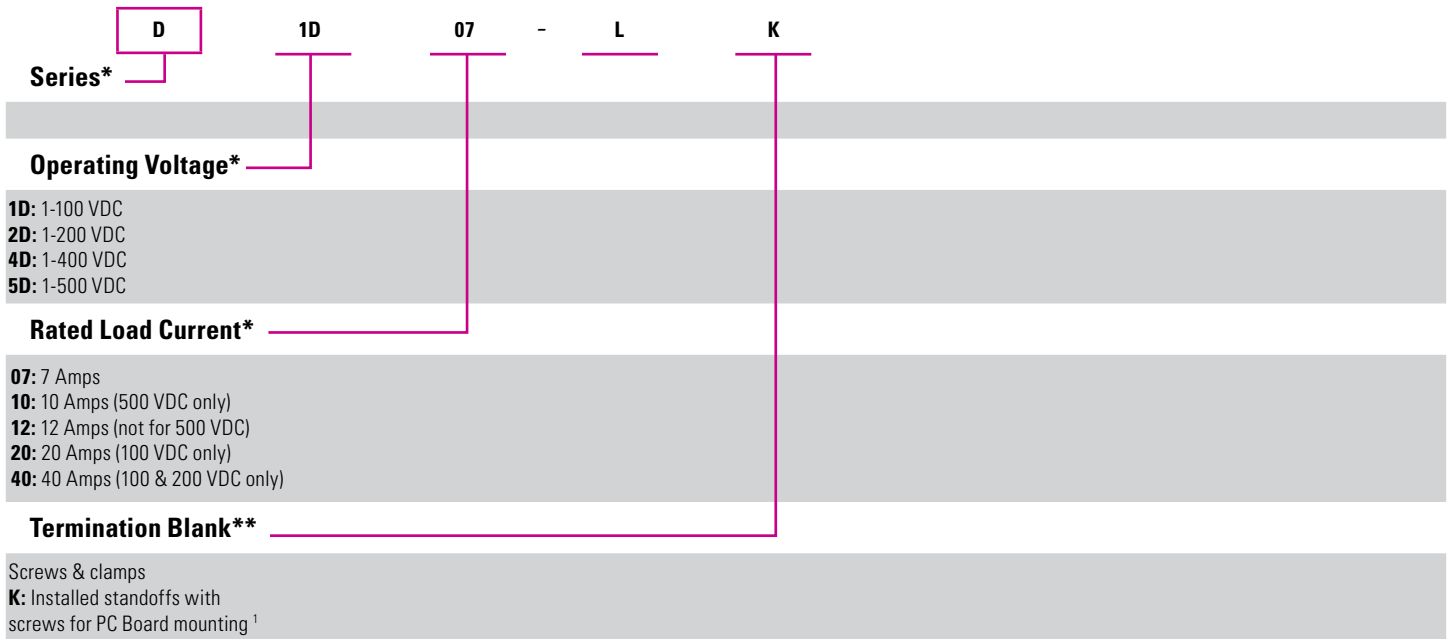
Bag with 2 square brass accessories and 2 screw 8-32 x 5/8 for output. Used to mount TMR1 lug terminals.

**Recommended Accessories**

					
<b>Cover</b>	<b>Hardware Kit</b>	<b>Heat Sink Part No.</b>	<b>Thermal Resistance [°C/W]</b>	<b>Lug Terminal</b>	<b>Thermal Pad</b>
KS101	HK1 HK4	HS501DR HS301 / HS301DR HS251 HS201 / HS201DR HS202 / HS202DR HS172 HS151 / HS151DR HS122 / HS122DR HS103 / HS103DR HS101 HS073 HS072 HS053 HS033 HS023	5.0 3.0 2.5 2.0 2.0 1.7 1.5 1.2 1.0 1.0 0.7 0.7 0.5 0.36 0.25	TRM1 TRM6	HSP-1 HSP-2



Not all part number combinations are available. Contact Crydom Technical Support for information on the availability of a specific part number.



\* Required for valid part number

\*\*For options only and not required for valid part number

## GENERAL NOTES

- (1) Option "K" is designed and tested for use with printed circuit boards or ring/fork terminals having a thickness between 0.031 and 0.093 inches (0.79 to 2.36 mm).**
- (2) All parameters at Tc=25°C unless otherwise specified.**
- (3) Heat sinking required, see derating curves.**
- (4) Low current loads and high ambient temperature can affect turn-on time.**
- (5) 8VDC Minimum control voltage. Resistive loads only. Consider switching losses; at maximum frequency reduce to 75% output current.**
- (6) Increase minimum voltage by 1V for operations from -20 to -40°C.**
- (7) Decrease maximum control voltage 1.35V/°C above 80°C ambient temperature.**
- (8) All parameters at 50% power rating and 100% duty cycle (contact Crydom tech support for detailed report).**

For additional information or specific questions, contact Crydom Technical Support

## AGENCY APPROVALS & CERTIFICATIONS

EN60950-1: Meets the requirements of sections 1.5: 1.7: 2.9: 2.10.5.3: 4.2: 4.5: 4.7:  
IEC 61000-4-2 Electrostatic Discharge Level 3  
IEC 61000-4-4 Electrically Fast Transients Level 3  
IEC 61000-4-5 Electrical Surges Level 3



## WARNINGS



### RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

**Failure to follow these instructions can result in serious injury, or equipment damage.**



### HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

**Failure to follow these instructions will result in death or serious injury.**

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