

**CD42\_\_90B, CD47\_\_90B**  
**Dual SCR/Diode Isolated**  
**POW-R-BLOK™ Module**  
90 Amperes / Up to 1800 Volts

**Description:**

Powerex SCR/Diode Modules are designed for use in applications requiring phase control and isolated packaging. The modules are isolated for easy mounting with other components on a common heatsink. *POW-R-BLOK™* has been tested and recognized by the Underwriters Laboratories.

**Features:**

- Electrically Isolated Heatsinking
- DBC Alumina (Al<sub>2</sub>O<sub>3</sub>) Insulator
- Copper Baseplate
- Low Thermal Impedance for Improved Current Capability
- UL Recognition Pending

**Benefits:**

- No Additional Insulation Components Required
- Easy Installation
- No Clamping Components Required
- Reduce Engineering Time

**Applications:**

- Bridge Circuits
- AC & DC Motor Drives
- Battery Supplies
- Power Supplies
- Large IGBT Circuit Front Ends
- Lighting Control
- Heat & Temperature Control
- Welders

**CD42, CD47 Outline Dimensions**

Dimension	Inches	Millimeters
A	3.66	93
B	0.79	20
C	3.15	80
D	1.18	30
F	0.61	15.5
G	0.79	20
H	0.79	20
J	0.16	4
K	0.22	5.7
L	0.59	15
M	1.10	28
N	0.31	8
P	0.94	24
Q	1.16	29.4
S	0.11 x .03	2.8 x 0.8
T	0.25	6.4
U	M5	M5

Note: Dimensions are for reference only.

**Ordering Information:**

Select the complete nine digit module part number from the table below. Example: CD421690B is a 1600Volt, 90 Ampere Dual SCR/Diode Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes	Version
CD42	08	90	B
CD47	12		
	14		
	16		
	18		

**Absolute Maximum Ratings**

Characteristics	Conditions	Symbol	Units
Repetitive Peak Forward and Reverse Blocking Voltage		$V_{DRM}$ & $V_{RRM}$	up to 1800 V
Non-Repetitive Peak Reverse Blocking Voltage (t < 5 msec)		$V_{RSM}$	$V_{RRM} + 100$ V
RMS Forward Current	180° Conduction, $T_C=85^\circ\text{C}$	$I_{T(RMS)}$	150 A
Average Forward Current	180° Conduction, $T_C=85^\circ\text{C}$	$I_{T(AV)}$	95 A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1570 A
	60 Hz, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1870 A
	60 Hz, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I_{TSM}$	2100 A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1500 A
	50 Hz, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1785 A
	50 Hz, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I_{TSM}$	2000 A
$I^2t$ for Fusing for One Cycle, 8.3 milliseconds	8.3 ms, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	10,270 A <sup>2</sup> sec
	8.3 ms, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	14,520 A <sup>2</sup> sec
	8.3 ms, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I^2t$	18,300 A <sup>2</sup> sec
	10 ms, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	11,250 A <sup>2</sup> sec
	10 ms, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	15,910 A <sup>2</sup> sec
	10 ms, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I^2t$	20,000 A <sup>2</sup> sec
Maximum Rate-of-Rise of On-State Current, (Non-Repetitive)	$T_j=25^\circ\text{C}$	di/dt	150 A/ $\mu\text{s}$
Operating Temperature		$T_J$	-40 to +125 °C
Storage Temperature		$T_{stg}$	-40 to +125 °C
Max. Mounting Torque, M5 Mounting Screw on Terminals			25 in.-Lb.
			3 Nm
Max. Mounting Torque, Module to Heatsink			44 in.-Lb.
			5 Nm
Module Weight, Typical			95 g
			3.35 oz.
V Isolation @ 25C	50 – 60 Hz, 1 minute	$V_{rms}$	3000 V
Circuit to base, all terminals shorted together	50 – 60 Hz, 1 second	$V_{rms}$	3500 V

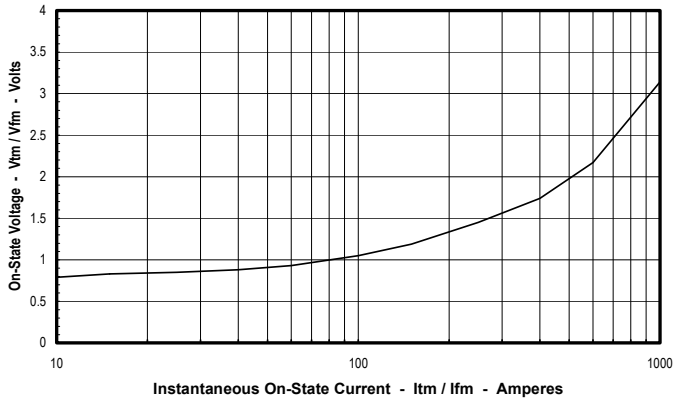
**Electrical Characteristics,  $T_J=25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Forward Leakage Current	$I_{DRM}$	Up to 1800V, $T_J=125^\circ\text{C}$		20	mA
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Up to 1800V, $T_J=125^\circ\text{C}$		20	mA
Peak On-State Voltage	$V_{TM} / V_{FM}$	$I_{TM} / I_{FM} = 300\text{A}$		1.65	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}$ , $I = 16.7\% \times \pi I_{T(AV)}$ to $\pi I_{T(AV)}$		0.9	V
Slope Resistance, Low-level	$r_{T1}$			2.0	$\text{m}\Omega$
Minimum dV/dt	dV/dt	$T_J=125^\circ\text{C}$ , Up to 800V $T_J=125^\circ\text{C}$ , 1200 - 1800V	500 1000		V/ $\mu\text{s}$ V/ $\mu\text{s}$
Turn-Off Time (Typical)	$t_{off}$	$T_J = 25^\circ\text{C}$	40 - 100	(Typical)	$\mu\text{s}$
Gate Trigger Current	$I_{GT}$	$T_J = 25^\circ\text{C}$ , $V_D=6\text{V}$ , Resistive Load		150	mA
Gate Trigger Voltage	$V_{GT}$	$T_J = 25^\circ\text{C}$ , $V_D=6\text{V}$ , Resistive Load		3.0	Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J=125^\circ\text{C}$ , $V_D=V_{DRM}$		0.25	Volts
Non-Triggering Gate Current	$I_{GDM}$	$T_J=125^\circ\text{C}$ , $V_D=V_{DRM}$		6	mA
Holding Current	$I_H$	$T_J = 25^\circ\text{C}$		250	mA
Latching Current	$I_L$	$T_J = 25^\circ\text{C}$		600	mA

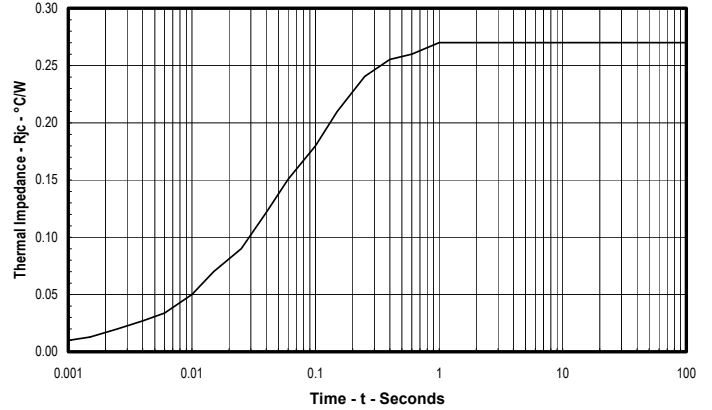
**Thermal Characteristics**

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	$R_{\theta J-C}$	Per Module, both conducting	0.14	$^\circ\text{C/W}$
DC Operation		Per Junction, both conducting	0.28	$^\circ\text{C/W}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta C-S}$	Per Module	0.1	$^\circ\text{C/W}$

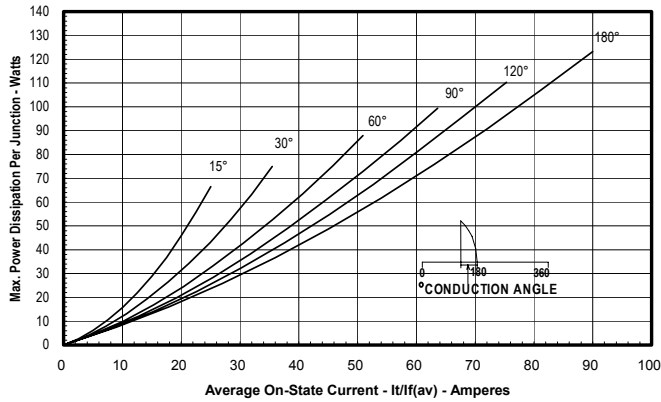
**Maximum On-State Forward Voltage Drop**  
( $T_J = 125^\circ\text{C}$ )



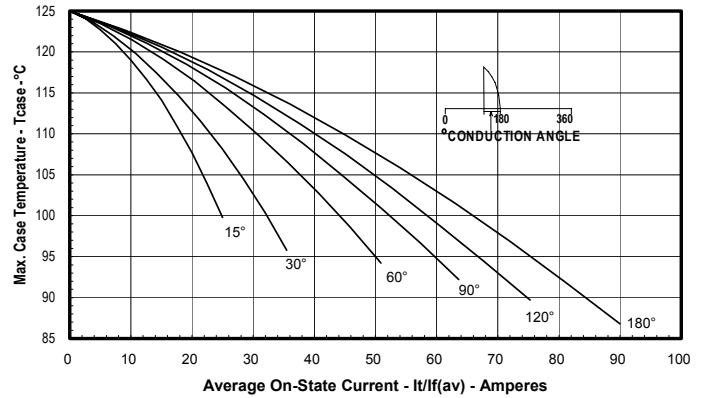
**Maximum Transient Thermal Impedance**  
(Junction to Case)



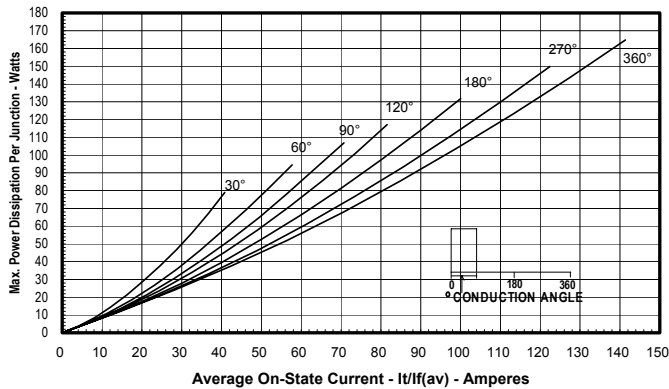
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
(Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
(Rectangular Waveform)



**Maximum Allowable Case Temperature**  
(Rectangular Waveform)

