

CD42__40B, CD47__40B
Dual SCR/Diode Isolated
POW-R-BLOK™ Module
40 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 (Al₂O₃) 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: CD421640B is a 1600Volt, 40 Ampere Dual SCR/Diode Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes	Version
CD42	08	40	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, $T_C=85^\circ\text{C}$	$I_{T(RMS)}$	63 A
Average Forward Current	180° Conduction, $T_C=85^\circ\text{C}$	$I_{T(AV)}$	40 A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I_{TSM}	750 A
	60 Hz, No V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I_{TSM}	890 A
	60 Hz, No V_{RRM} reapplied, $T_j=25^\circ\text{C}$	I_{TSM}	985 A
	50 Hz, 100% V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I_{TSM}	715 A
	50 Hz, No V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I_{TSM}	850 A
	50 Hz, No V_{RRM} reapplied, $T_j=25^\circ\text{C}$	I_{TSM}	940 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	2,330 A^2sec
	8.3 ms, No V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I^2t	3,300 A^2sec
	8.3 ms, No V_{RRM} reapplied, $T_j=25^\circ\text{C}$	I^2t	4,030 A^2sec
	10 ms, 100% V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I^2t	2,560 A^2sec
	10 ms, No V_{RRM} reapplied, $T_j=125^\circ\text{C}$	I^2t	3,610 A^2sec
	10 ms, No V_{RRM} reapplied, $T_j=25^\circ\text{C}$	I^2t	4,420 A^2sec
Maximum Rate-of-Rise of On-State Current, (Non-Repetitive)	$T_j=125^\circ\text{C}$	di/dt	150 A/ μs
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

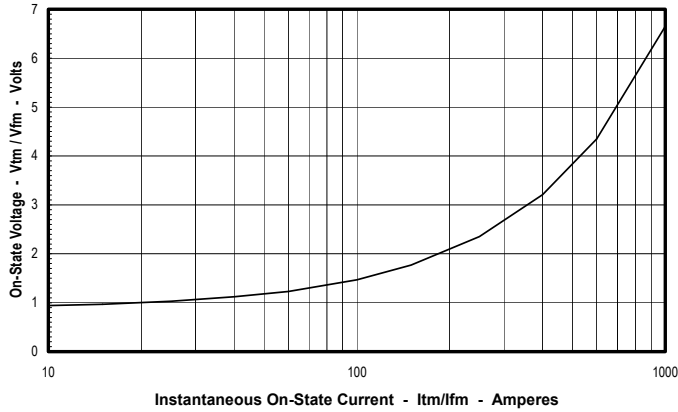
Electrical Characteristics, $T_J=25^\circ\text{C}$ unless otherwise specified

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}	$I_{TM} / I_{FM} = 200\text{A}$		1.95	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}$, $I = 16.7\% \times \pi I_{T(AV)}$ to $\pi I_{T(AV)}$		1.0	V
Slope Resistance, Low-level	r_{T1}			4.5	$\text{m}\Omega$
Minimum dV/dt	dV/dt	$T_J=125^\circ\text{C}$, Up to 800V $T_J=125^\circ\text{C}$, 1200V – 1800V	500 1000		V/ μs V/ μs
Turn-Off Time (Typical)	t_{off}	$T_J = 125^\circ\text{C}$	40 - 100	(Typical)	μs
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	$T_J = 25^\circ\text{C}$		150	mA
Latching Current	I_L	$T_J = 25^\circ\text{C}$		300	mA

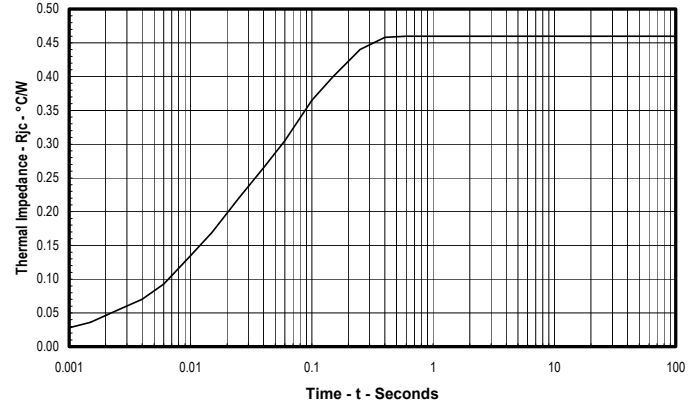
Thermal Characteristics

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	$R_{\theta J-C}$	Per Module, both conducting	0.33	$^\circ\text{C/W}$
DC Operation		Per Junction, both conducting	0.65	$^\circ\text{C/W}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta C-S}$	Per Module	0.1	$^\circ\text{C/W}$

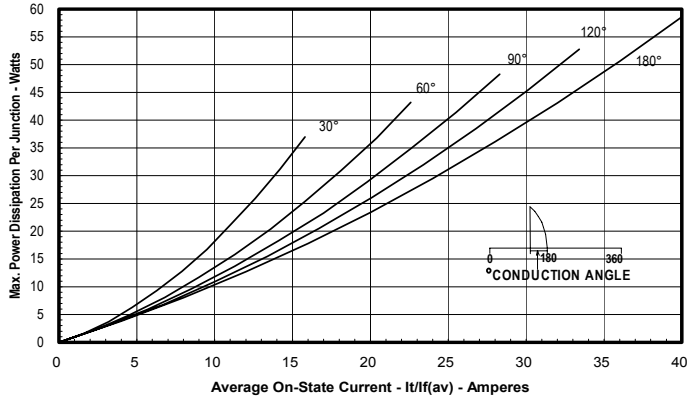
Maximum On-State Forward Voltage Drop
($T_J = 125^\circ\text{C}$)



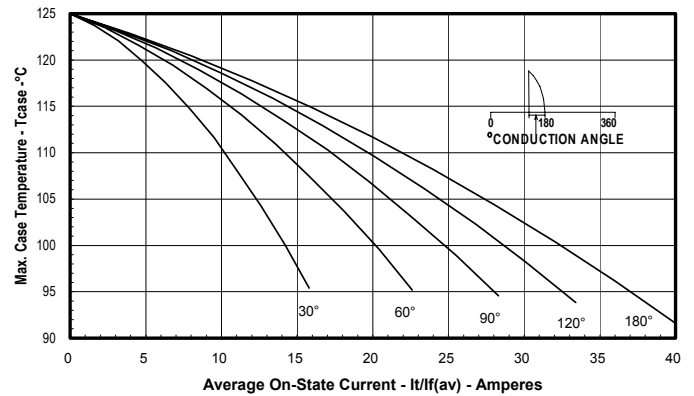
Maximum Transient Thermal Impedance
(Junction to Case)



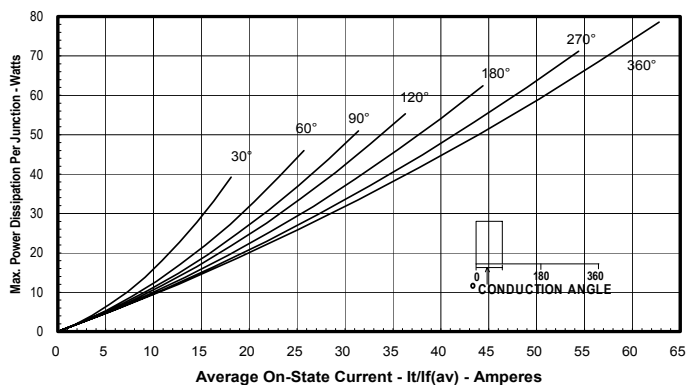
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

