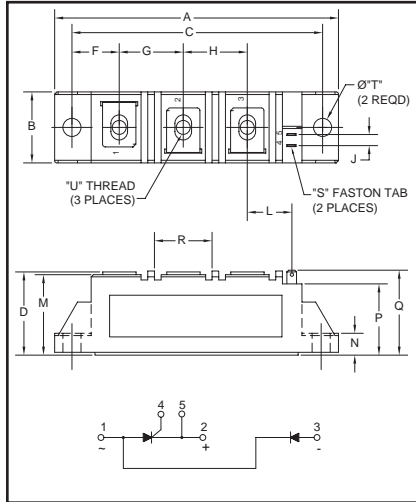


**SCR/Diode  
POW-R-BLOK™ Module  
90 Amperes/1600 Volts**



**Outline Drawing**

Dimension	Inches		Metric	
	Min.	Max.	Min.	Max.
A	3.602	3.64	91.49	92.45
B	3.146	3.154	79.91	80.11
C	2.705	2.735	68.71	69.47
D	1.24	1.28	31.5	32.51
E	1.125	1.165	28.58	29.59
F	0.975	0.805	20.19	20.45
G	0.788	0.798	19.76	20.27
H	0.608	0.628	15.44	15.95
J	0.585	0.605	14.86	15.36
K	0.48	0.52	12.19	13.21
L	0.43	0.47	10.92	11.94
M	0.36	0.4	9.14	10.16
N	0.265	0.285	6.73	7.24
P	0.245	0.255	6.22	6.58
Q	—	—	M5 x 0.8	



**CD42\_\_90, CD47\_\_90  
SCR/Diode POW-R-BLOK™ Module  
90 Amperes/1600 Volts**

**Description:**

Powerex SCR/Diode Modules are designed for use in applications requiring phase (half) 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 (QQX2 Power Semiconductors).

**Features:**

- Electrically Isolated Heatsinking
- Metal Baseplate
- Low Thermal Impedance
- Quick Connect Gate Terminal
- UL Recognized

**Applications:**

- Battery Supplies
- Bridge Circuits
- AC and DC Motor Control
- Tap Changers
- Lighting Control

**Ordering Information:**

Select the complete eight digit module part number you desire from the table below. Example: CD421690 is a 1600 Volt, 90 Ampere SCR/Diode POW-R-BLOK™ Module.

Type	Voltage Volts (x100)	Current Rating Amperes
CD42	08	90
CD47	12	
	14	
	16	



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

CD42\_90, CD47\_90  
 SCR/Diode POW-R-BLOK™ Module  
 90 Amperes/1600 Volts

**Absolute Maximum Ratings**

Characteristics	Symbol	Conditions	CD42_90/CD47_90		Units
			1200	1400-1600	
Repetitive Peak Forward Blocking Voltage	$V_{DRM}$	—	1200	1400-1600	Volts
Repetitive Peak Reverse Blocking Voltage	$V_{RRM}$	—	1200	1400-1600	Volts
Non-Repetitive Peak Forward Blocking Voltage	$V_{DSM}$	—	$V_{DRM} + 100$		Volts
Non-Repetitive Peak Reverse Blocking Voltage	$V_{RSM}$	—	$V_{RRM} + 100$		Volts
RMS Forward Current	$I_{T(RMS)}, I_{F(RMS)}$	—	141		Amperes
Average Forward Current	$I_{T(AV)}$	$T_C = 84^\circ\text{C}, 180^\circ\text{ Conduction}$	90	—	Amperes
	$I_{F(AV)}$				
	$I_{T(AV)}$	$T_C = 82^\circ\text{C}, 180^\circ\text{ Conduction}$	—	90	Amperes
	$I_{F(AV)}$				
Peak Half-Cycle Surge (Non-Repetitive)	$I_{TSM}$	$t = 8.3\text{ms},$	1570	1500	Amperes
On-State Current	$I_{FSM}$	100% $V_{RRM}$ Reapplied			
	$I_{TSM}$	$t = 10\text{ms},$	1500	1435	Amperes
	$I_{FSM}$	100% $V_{RRM}$ Reapplied			
$I^2t$ (for Fusing) for One-Cycle	$I^2t$	$t = 8.3\text{ms},$	10270	9400	$A^2\text{sec}$
		100% $V_{RRM}$ Reapplied			
		$t = 10\text{ms},$	11250	10300	$A^2\text{sec}$
		100% $V_{RRM}$ Reapplied			
Maximum Rate-of-Rise of On-State Current (Non-Repetitive)*	$di/dt$	$I_{TM} = \pi I_{T(AV)}, t_r < 0.5\mu\text{s}, t_p > 6\mu\text{s}$	150		Amperes/ $\mu\text{s}$
Storage Temperature	$T_{STG}$	—	-40 to 125		$^\circ\text{C}$
Operating Temperature	$T_j$	—	-40 to 125		$^\circ\text{C}$
Maximum Mounting Torque M5 Mounting Screw	—	—	4.5 to 5.5		Nm
Maximum Mounting Torque M5 Terminal Screw	—	—	2.7 to 3.3		Nm
Module Weight (Typical)	—	—	140		Grams
			5		oz.
V Isolation	$V_{RMS}$	—	3500		Volts

\* $T_j = 25^\circ\text{C}, I_G = 500\text{mA}, V_D = 0.67V_{DRM}$  (Rated)

CD42\_90, CD47\_90  
 SCR/Diode POW-R-BLOK™ Module  
 90 Amperes/1600 Volts

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

Characteristics	Symbol	Test Conditions	CD42_90/CD47_90		Units
			1200	1400-1600	
<b>Blocking State Maximums</b>					
Forward Off-State Current, Peak	$I_{DRM}$	$T_j = 125^\circ\text{C}$	15	20	mA
Reverse Off-State Current, Peak	$I_{RRM}$	$T_j = 125^\circ\text{C}$	15	20	mA
<b>Conducting State Maximums</b>					
Peak On-State Voltage	$V_{TM}$ $V_{FM}$	$I_{TM}/I_{FM} = 283\text{A}$	1.55	1.62	Volts
Peak On-State Voltage Coefficients, Full Range	$V_{TM}$	$T_j = 125^\circ\text{C}$ , $I = 15\% I_{T(AV)}$ to $I_{TSM}$ or $I_{FSM}$ $V_{TM}$ or $V_{FM} = A + B$ $\text{Ln } I + C I + D \text{ Sqrt } I$	$A = 0.964$ $B = -0.205$ $C = -0.00043$ $D = 0.117$	$A = 0.982$ $B = -0.159$ $C = 0.0000023$ $D = 0.0965$	
Threshold Voltage, Low-Level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}$ ,	0.849	0.989	Volts
Slope Resistance, Low-Level	$r_{T1}$	$I = 15\% I_{T(AV)}$ to $\pi I_{T(AV)}$	2.596	2.38	$\text{m}\Omega$
Threshold Voltage, High-Level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}$ ,	1.645	1.61	Volts
Slope Resistance, High-Level	$r_{T2}$	$I = \pi I_{T(AV)}$ to $I_{TSM}$	1.03	1.22	$\text{m}\Omega$
<b>Switching Minimums</b>					
Critical Rate-of-Rise of Off-State Voltage	$dv/dt$	$T_j = 125^\circ\text{C}$ , Gate Open, Linear to $0.67 V_{DRM}$	500	500	Volts/ $\mu\text{s}$
<b>Gate Parameters Maximums</b>					
Gate Current-to-Trigger	$I_{GT}$	$T_j = 25^\circ\text{C}$ , $V_D = 12\text{V}$	120	120	mA
Gate Voltage-to-Trigger	$V_{GT}$	$T_j = 25^\circ\text{C}$ , $V_D = 12\text{V}$	2.5	2.5	Volts
Non-Triggerring Gate Voltage	$V_{GDM}$	$T_j = 125^\circ\text{C}$ , $V_D = V_{DRM}$	0.25	0.25	Volts
Peak Forward Gate Current	$I_{GTM}$	—	3.0	3.0	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$	—	10	10	Volts



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

CD42\_ \_90, CD47\_ \_90  
SCR/Diode POW-R-BLOK™ Module  
90 Amperes/1600 Volts

### Thermal Characteristics

Characteristics	Symbol	Test Conditions	CD42_ _90/CD47_ _90	Units
<b>Thermal Maximums</b>				
Thermal Resistance, Junction-to-Case	$R_{\theta(J-C)}$	Per Module, Both Conducting	0.145	°C/Watt
		Per Junction, Both Conducting	0.290	°C/Watt
Thermal Resistance, Case-to-Sink (Lubricated)	$R_{\theta(C-S)}$	Per Module	0.1	°C/Watt