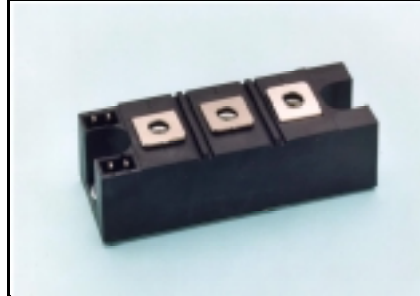
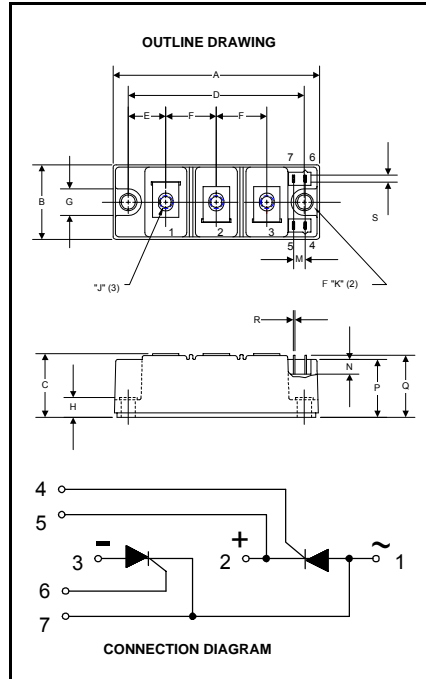


### POW-R-BLOK™ Dual SCR Isolated Module 150 Amperes / Up to 1600 Volts



**CD63\_\_15A**  
**Dual SCR Isolated**  
**POW-R-BLOK™ Module**  
150 Amperes / Up to 1600 Volts

#### Description:

Powerex Dual SCR 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
- Glass Passivated Chips
- Metal Baseplate
- Low Thermal Impedance for Improved Current Capability
- Quick Connect Gate Terminal with Provision for Keyed Mating Plug
- UL Recognized (E78240)

#### CD63\_15A Outline Dimensions

Dimension	Inches	Millimeters
A	3.70	94
B	1.38	35
C	1.18	30
D	3.15	80
E	0.67	17
F	0.91	23
G	0.57	14.5
H	0.35	9
J	M6	M6
K	0.26	6.5
M	.020	5
N	0.28	7
P	1.10	28
Q	1.14	29
R	0.03	0.8
S	0.11	2.8

Note: Dimensions are for reference only.

#### Ordering Information:

Select the complete nine digit module part number from the table below. Example: CD631615A is a 1600Volt, 150 Ampere Dual SCR Isolated POW-R-BLOK™ Module

Type	Voltage Volts (x100)	Current Amperes (x 10)
CD63	08 12 14 16	15

#### 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

**Absolute Maximum Ratings**

Characteristics	Conditions	Symbol		Units
Repetitive Peak Forward and Reverse Blocking Voltage		$V_{DRM}$ & $V_{RRM}$	up to 1600	V
Non-Repetitive Peak Reverse Blocking Voltage ( $t < 5$ msec)		$V_{RSM}$	$V_{RRM} + 100$	V
RMS Forward Current	180° Conduction, $T_C=85^\circ\text{C}$	$I_{T(RMS)}$	250	A
	180° Conduction, $T_C=85^\circ\text{C}$ (AC Switch)	$I_{T(RMS)}$	355	A
Average Forward Current	180° Conduction, $T_C=85^\circ\text{C}$	$I_{T(AV)}$	160	A
	180° Conduction, $T_C=90^\circ\text{C}$	$I_{T(AV)}$	150	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	4300	A
	60 Hz, No $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	5100	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	4100	A
	50 Hz, No $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	4870	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	3250	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	3150	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	2650	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I_{TSM}$	2550	A
$I^2t$ for Fusing for One Cycle	8.3 ms, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I^2t$	76,700	$\text{A}^2 \text{ sec}$
	8.3 ms, No $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I^2t$	108,000	$\text{A}^2 \text{ sec}$
	10 ms, 100% $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I^2t$	84,000	$\text{A}^2 \text{ sec}$
	10 ms, No $V_{RRM}$ reapplied, $T_J=125^\circ\text{C}$	$I^2t$	119,000	$\text{A}^2 \text{ sec}$
Maximum Rate-of-Rise of On-State Current, Non Repetitive	$T_J=125^\circ\text{C}$ , $V_D = V_{DRM}$ (Rated), $I_{TM}=400\text{A}$ , $I_G=0.5\text{A}$ , $T_r < 0.25\mu\text{s}$ , $t_p > 6\mu\text{s}$	$di/dt$	300	$\text{A}/\mu\text{s}$
Peak Gate Power Dissipation	$T_p < 5$ ms, $T_J = 125^\circ\text{C}$	$P_{GM}$	12	W
Average Gate Power Dissipation	$F = 50$ Hz, $T_J = 125^\circ\text{C}$	$P_{G(AV)}$	3	W
Peak Forward Gate Current	$T_p < 5$ ms, $T_J = 125^\circ\text{C}$	$I_{GFM}$	3	A
Peak Reverse Gate Voltage	$T_p < 5$ ms, $T_J = 125^\circ\text{C}$	$V_{GRM}$	10	V
Operating Temperature		$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature		$T_{stg}$	-40 to +150	$^\circ\text{C}$
Max. Mounting Torque, M6 Mounting Screw on Terminals			35 - 50	in.-Lb.
			4 - 6	Nm
Max. Mounting Torque, Module to Heatsink			35 - 50	in.-Lb.
			4 - 6	Nm
Module Weight, Typical			200	g
			7.1	oz.
V Isolation @ 25C		$V_{rms}$	3500	V

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

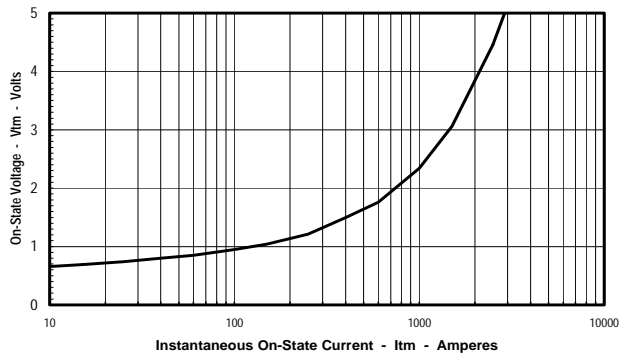
Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Forward Leakage Current	$I_{DRM}$	Up to 1600V, $T_J=125^\circ\text{C}$		50	mA
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Up to 1600V, $T_J=125^\circ\text{C}$		50	mA
Peak On-State Voltage	$V_{TM}$	$I_{TM}=500\text{A}$		1.54	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}$ , $I = 16.7\% \times \pi I_{T(AV)}$ to $\pi I_{T(AV)}$		0.80	V
Slope Resistance, Low-level	$r_{T1}$			1.67	$m\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_J = 125^\circ\text{C}$ , $I = \pi I_{T(AV)}$ to $I_{TSM}$		0.98	V
Slope Resistance, High-level	$r_{T2}$			1.38	$m\Omega$
$V_{TM}$ Coefficients, Full Range		$T_J = 125^\circ\text{C}$ , $I = 15\% \times I_{T(AV)}$ to $I_{TSM}$	A =	0.5926	
			B =	-1.10E-03	
		$V_{TM} = A + B \ln I + C I + D \text{ Sqrt } I$	C =	1.03E-03	
			D =	0.0241	
Minimum $dV/dt$	$dV/dt$	Exponential to $2/3 V_{DRM}$ $T_J=125^\circ\text{C}$ , Gate Open	1000		V/ $\mu\text{s}$
Turn-On Time (Typical)	$t_{on}$	$I_{TM} = 300\text{A}$ , $V_D = 2/3 V_{DRM}$ $dI/dt = 1\text{A}/\mu\text{s}$	3	(Typical)	$\mu\text{s}$
Turn-Off Time (Typical)	$t_{off}$	$T_J = 125^\circ\text{C}$ , $I_T = 300\text{A}$ , $R_{gk} = 100\Omega$ $V_r = 50\text{V}$ , $-dI/dt = 15\text{A}/\mu\text{s}$ Re-Applied $dV/dt = 20\text{V}/\mu\text{s}$ , Linear to $2/3 V_{DRM}$	50 - 200	(Typical)	$\mu\text{s}$
Gate Trigger Current	$I_{GT}$	$T_J = -40^\circ\text{C}$ , $V_D=6\text{V}$ , $R_a=1\Omega$ Resistive Load		270	mA
		$T_J = 25^\circ\text{C}$ , $V_D=6\text{V}$ , $R_a=1\Omega$ Resistive Load		150	mA
		$T_J=125^\circ\text{C}$ , $V_D=6\text{V}$ , $R_a=1\Omega$ Resistive Load		80	mA
Gate Trigger Voltage	$V_{GT}$	$T_J = -40^\circ\text{C}$ , $V_D=6\text{V}$ , $R_a=1\Omega$ Resistive Load		4.0	Volts
		$T_J = 25^\circ\text{C}$ , $V_D=6\text{V}$ , $R_a=1\Omega$ Resistive Load		2.5	Volts
		$T_J=125^\circ\text{C}$ , $V_D=6\text{V}$ , $R_a=1\Omega$ Resistive Load		1.7	Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J=125^\circ\text{C}$ , $V_D=V_{DRM}$		0.30	Volts
Non-Triggering Gate Current	$I_{GDM}$	$T_J=125^\circ\text{C}$ , $V_D=V_{DRM}$		10	mA

**Thermal Characteristics**

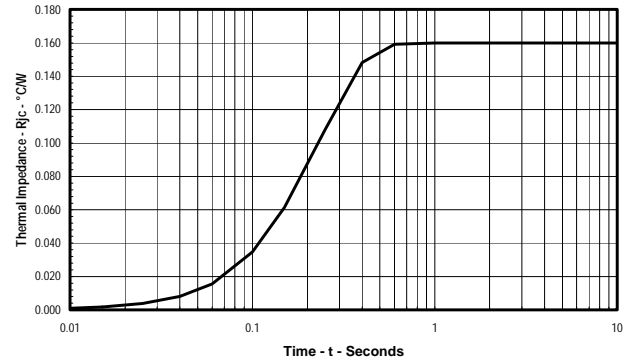
Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	$R_{\theta J-C}$	Per Module, both conducting	0.08	$^\circ\text{C}/\text{W}$
DC Operation		Per Junction, both conducting	0.16	$^\circ\text{C}/\text{W}$
Thermal Impedance Coefficients	$Z_{\theta J-C}$	$Z_{\theta J-C} = K_1 (1-\exp(-t/\tau_1))$	$K_1 = 5.45334\text{E}-3$	$\tau_1 = 4.511\text{E}-5$
(Per Junction)		+ $K_2 (1-\exp(-t/\tau_2))$	$K_2 = 3.8509\text{E}+1$	$\tau_2 = 1.3558\text{E}-1$
		+ $K_3 (1-\exp(-t/\tau_3))$	$K_3 = -3.5154\text{E}+1$	$\tau_3 = 1.3311\text{E}-1$
		+ $K_4 (1-\exp(-t/\tau_4))$	$K_4 = -3.20$	$\tau_4 = 1.5936\text{E}-1$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta C-S}$	Per Module	0.05	$^\circ\text{C}/\text{W}$

### POW-R-BLOK™ Dual SCR Isolated Module 150 Amperes / Up to 1600 Volts

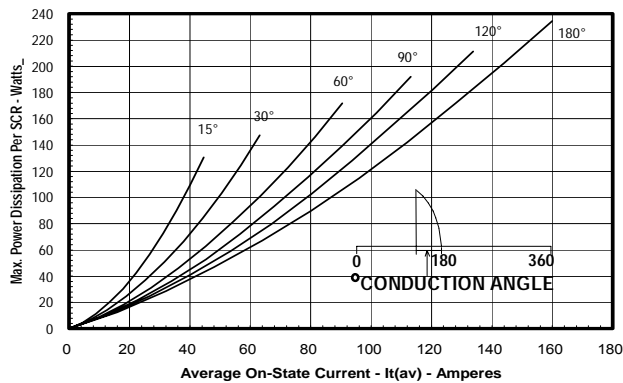
Maximum On-State Forward Voltage Drop  
( $T_j = 125^\circ\text{C}$ )



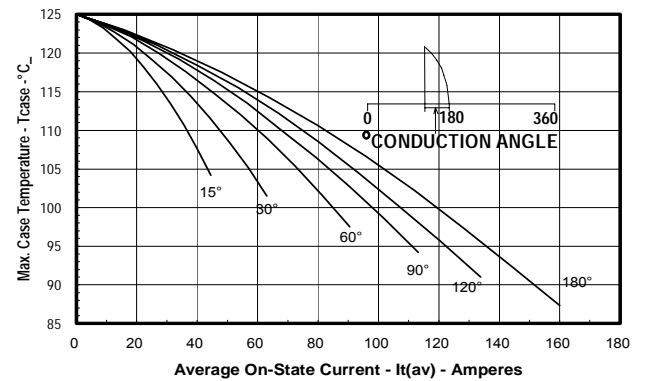
Maximum Transient Thermal Impedance  
(Junction to Case)



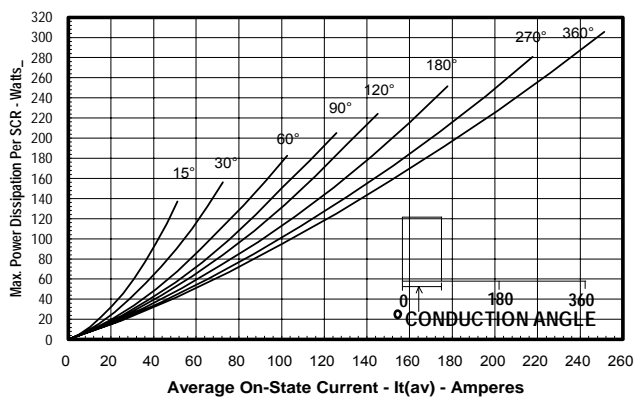
Maximum On-State Power Dissipation  
(Sinusoidal Waveform)



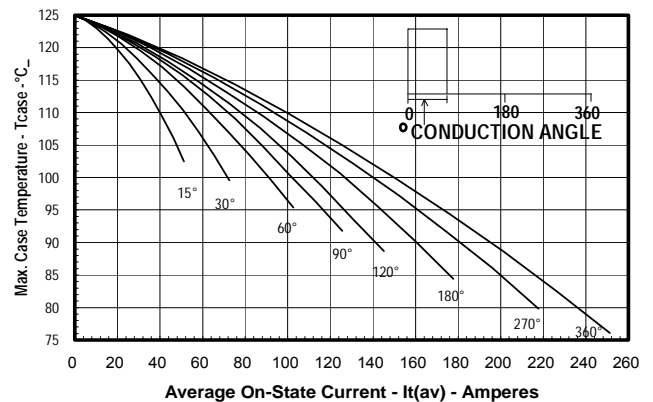
Maximum Allowable Case Temperature  
(Sinusoidal Waveform)

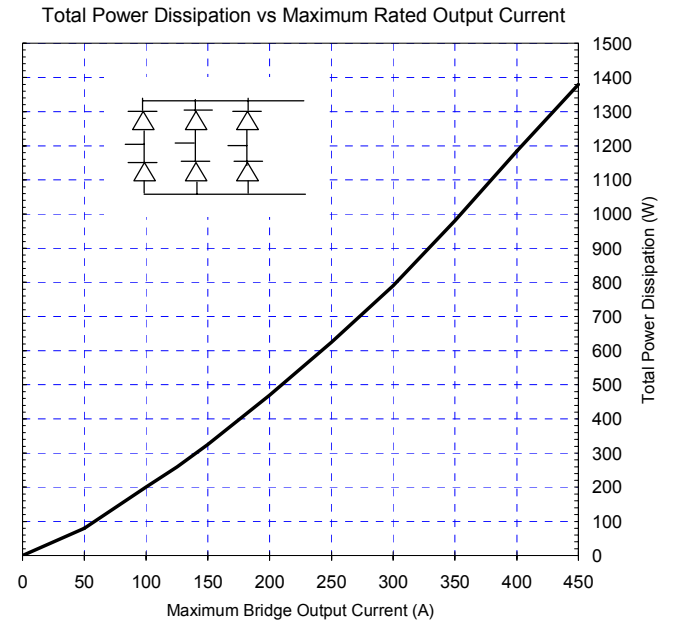
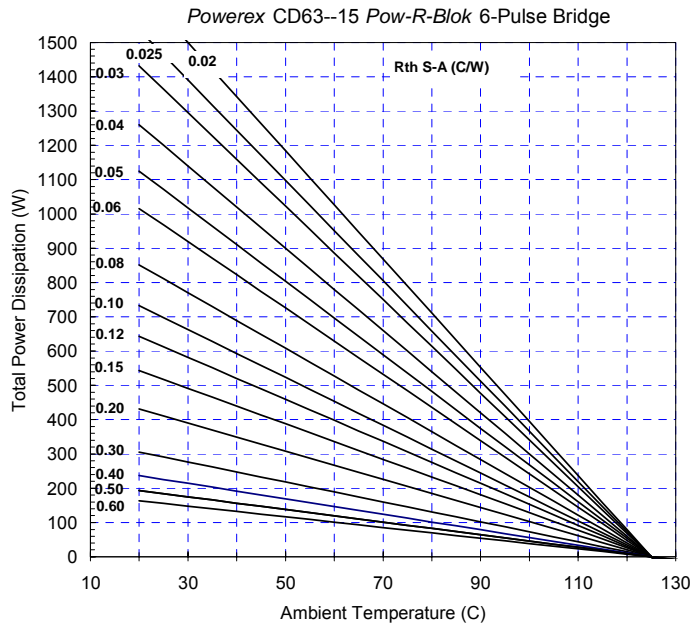


Maximum On-State Power Dissipation  
(Rectangular Waveform)



Maximum Allowable Case Temperature  
(Rectangular Waveform)





Six-Pulse Bridge Circuit Total Power Dissipation & Maximum Rated Output Current With Sink to Ambient Resistance of Heatsink as a Parameter.