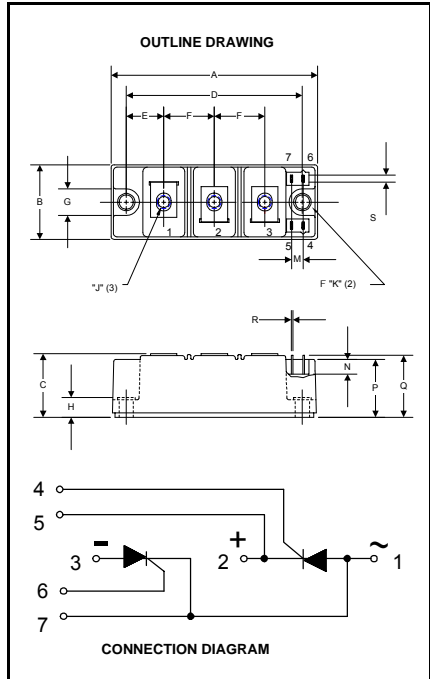


**POW-R-BLOK™**  
**Dual SCR Isolated Module**  
**150 Amperes / Up to 1600 Volts**



**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	15
	12	
	14	
	16	

**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<sub>J</sub>=25°C unless otherwise specified**

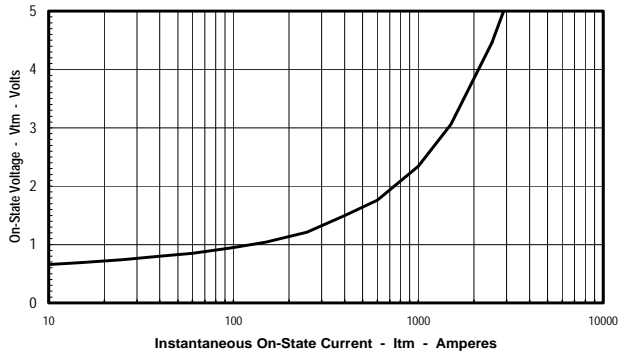
Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Forward Leakage Current	I <sub>DRM</sub>	Up to 1600V, T <sub>J</sub> =125°C		50	mA
Repetitive Peak Reverse Leakage Current	I <sub>RRM</sub>	Up to 1600V, T <sub>J</sub> =125°C		50	mA
Peak On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> =500A		1.54	V
Threshold Voltage, Low-level	V <sub>(TO)1</sub>	T <sub>J</sub> = 125°C, I = 16.7% x I <sub>T(AV)</sub> to I <sub>T(AV)</sub>		0.80	V
Slope Resistance, Low-level	r <sub>T1</sub>			1.67	mΩ
Threshold Voltage, High-level	V <sub>(TO)2</sub>	T <sub>J</sub> = 125°C, I = I <sub>T(AV)</sub> to I <sub>TSM</sub>		0.98	V
Slope Resistance, High-level	r <sub>T2</sub>			1.38	mΩ
V <sub>TM</sub> Coefficients, Full Range		T <sub>J</sub> = 125°C, I = 15% x I <sub>T(AV)</sub> to I <sub>TSM</sub> V <sub>TM</sub> = A + B Ln I + C I + D Sqrt I	A = B = C = D =	0.5926 -1.10E-03 1.03E-03 0.0241	
Minimum dV/dt	dV/dt	Exponential to 2/3 V <sub>DRM</sub> T <sub>J</sub> =125°C, Gate Open	1000		V/μs
Turn-On Time (Typical)	t <sub>on</sub>	I <sub>TM</sub> = 300A, V <sub>D</sub> = 2/3 V <sub>DRM</sub> dI/dt = 1A/μs	3	(Typical)	μs
Turn-Off Time (Typical)	t <sub>off</sub>	T <sub>J</sub> = 125°C, I <sub>T</sub> = 300A, R <sub>gk</sub> = 100Ω V <sub>r</sub> = 50V, -dI/dt = 15 A/μs Re-Applied dV/dt = 20V/μs, Linear to 2/3 V <sub>DRM</sub>	50 - 200	(Typical)	μs
Gate Trigger Current	I <sub>GT</sub>	T <sub>J</sub> = -40°C, V <sub>D</sub> =6V, R <sub>a</sub> =1Ω, Resistive Load T <sub>J</sub> = 25°C, V <sub>D</sub> =6V, R <sub>a</sub> =1Ω, Resistive Load T <sub>J</sub> =125°C, V <sub>D</sub> =6V, R <sub>a</sub> =1Ω, Resistive Load		270 150 80	mA mA mA
Gate Trigger Voltage	V <sub>GT</sub>	T <sub>J</sub> = -40°C, V <sub>D</sub> =6V, R <sub>a</sub> =1Ω, Resistive Load T <sub>J</sub> = 25°C, V <sub>D</sub> =6V, R <sub>a</sub> =1Ω, Resistive Load T <sub>J</sub> =125°C, V <sub>D</sub> =6V, R <sub>a</sub> =1Ω, Resistive Load		4.0 2.5 1.7	Volts Volts Volts
Non-Triggering Gate Voltage	V <sub>GDM</sub>	T <sub>J</sub> =125°C, V <sub>D</sub> =V <sub>DRM</sub>		0.30	Volts
Non-Triggering Gate Current	I <sub>GDM</sub>	T <sub>J</sub> =125°C, V <sub>D</sub> =V <sub>DRM</sub>		10	mA

**Thermal Characteristics**

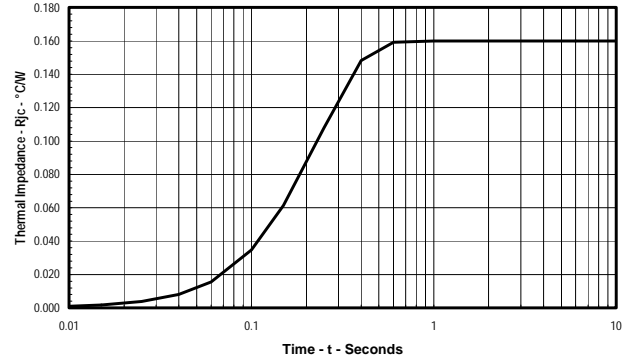
Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case DC Operation	R <sub>ΘJ-C</sub>	Per Module, both conducting Per Junction, both conducting	0.08 0.16	°C/W °C/W
Thermal Impedance Coefficients (Per Junction)	Z <sub>ΘJ-C</sub>	Z <sub>ΘJ-C</sub> = K <sub>1</sub> (1-exp(-t/τ <sub>1</sub> )) + K <sub>2</sub> (1-exp(-t/τ <sub>2</sub> )) + K <sub>3</sub> (1-exp(-t/τ <sub>3</sub> )) + K <sub>4</sub> (1-exp(-t/τ <sub>4</sub> ))	K <sub>1</sub> = 5.45334E-3 K <sub>2</sub> = 3.8509E+1 K <sub>3</sub> = -3.5154E+1 K <sub>4</sub> = -3.20	τ <sub>1</sub> = 4.511E-5 τ <sub>2</sub> = 1.3558E-1 τ <sub>3</sub> = 1.3311E-1 τ <sub>4</sub> = 1.5936E-1
Thermal Resistance, Case to Sink Lubricated	R <sub>ΘC-S</sub>	Per Module	0.05	°C/W

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

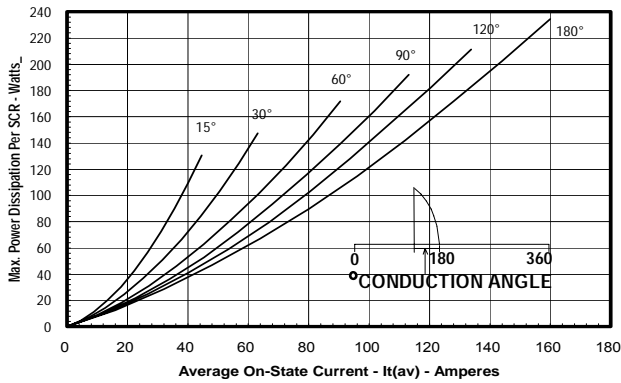
**Maximum On-State Forward Voltage Drop**  
( $T_j = 125^\circ\text{C}$ )



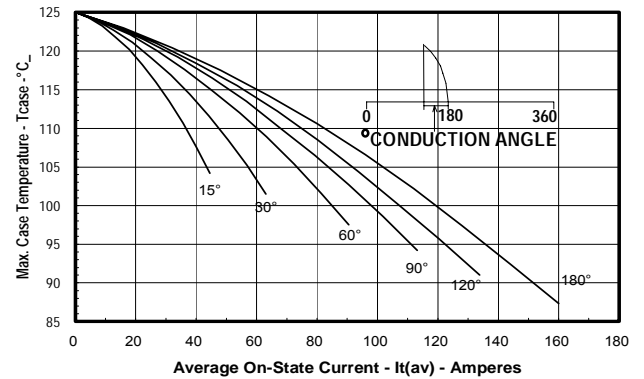
**Maximum Transient Thermal Impedance**  
(Junction to Case)



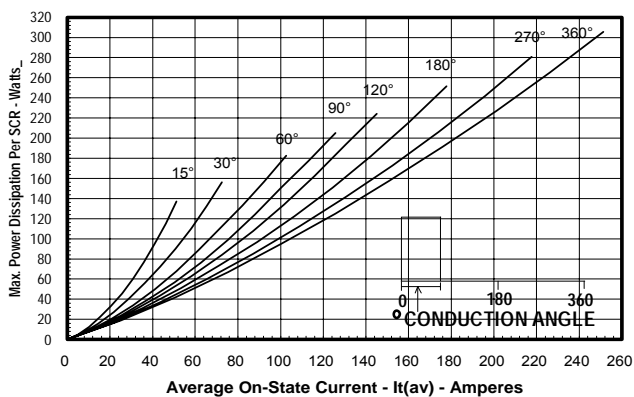
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



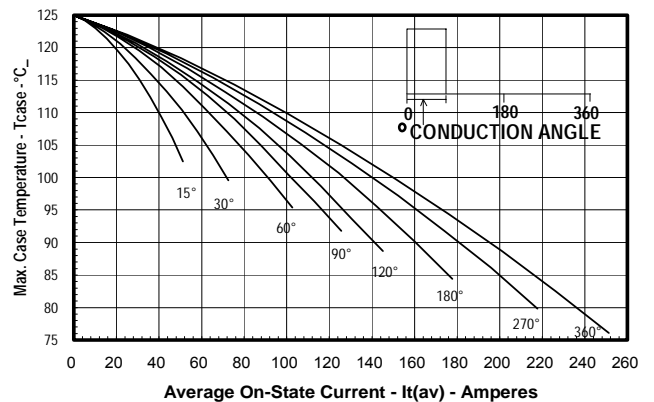
**Maximum Allowable Case Temperature**  
(Sinusoidal Waveform)

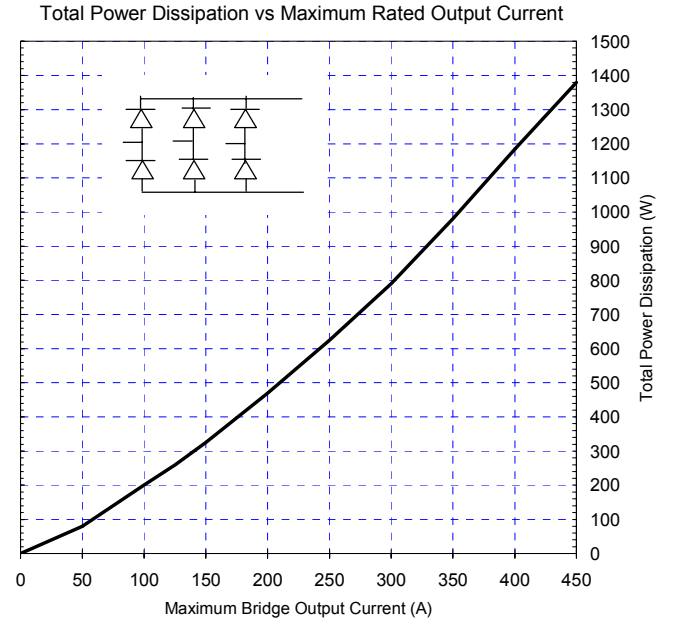
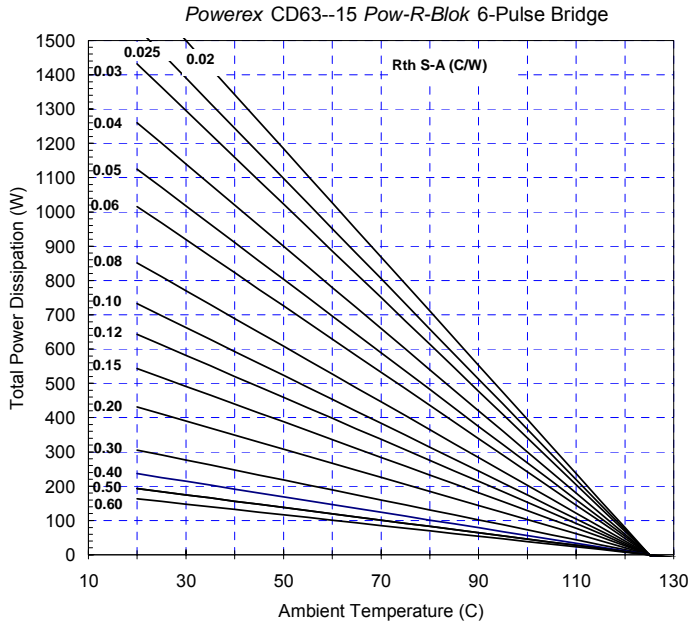


**Maximum On-State Power Dissipation**  
(Rectangular Waveform)



**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.