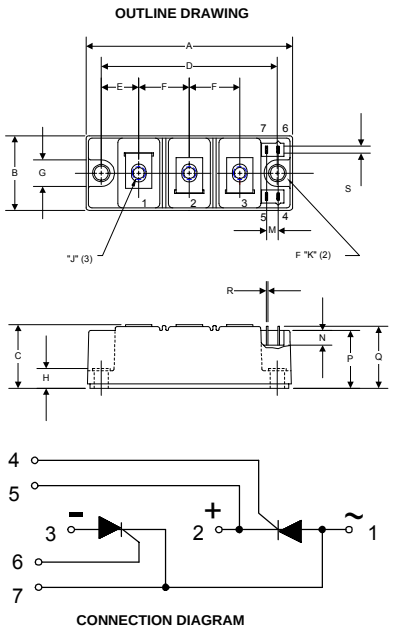
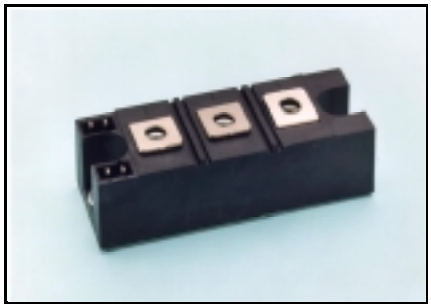
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

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





CD63__15A
Dual SCR Isolated
POW-R-BLOK^{TM} 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^{TM}* has been tested and recognized by the Underwriters Laboratories.

Features:

- Electrically Isolated Heatsinking
- DBC Alumina (Al_2O_3) 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)

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

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^{TM}* Module

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

Revision Date: 12/04/2002

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

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Electrical Characteristics, T_J=25°C unless otherwise specified

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

Thermal Characteristics

Characteristics	Symbol				Max.	Units
Thermal Resistance, Junction to Case DC Operation	$R_{ΘJ-C}$	Per Module, both conducting Per Junction, both conducting			0.08 0.16	°C/W °C/W
Thermal Impedance Coefficients (Per Junction)	$Z_{ΘJ-C}$	Z_{QJ-C}= K_1 (1-exp(-t/τ_1)) + K_2 (1-exp(-t/τ_2)) + K_3 (1-exp(-t/τ_3)) + K_4 (1-exp(-t/τ_4))	K_1 =5.45334E-3 K_2 =3.8509E+1 K_3 = -3.5154E+1 K_4 = -3.20	τ_1 =4.511E-5 τ_2 =1.3558E-1 τ_3 =1.3311E-1 τ_4=1.5936E-1		
Thermal Resistance, Case to Sink Lubricated	$R_{ΘC-S}$	Per Module			0.05	°C/W

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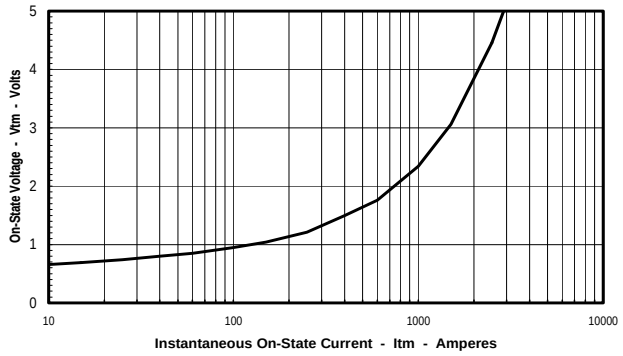
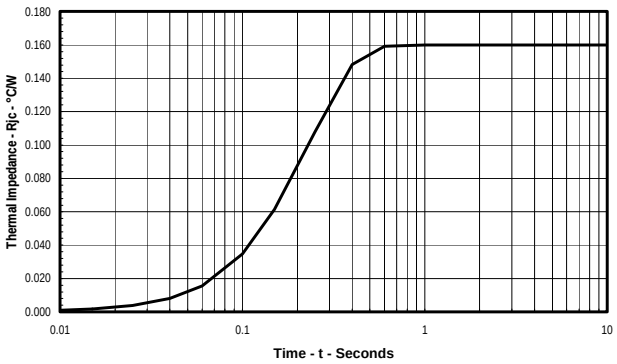
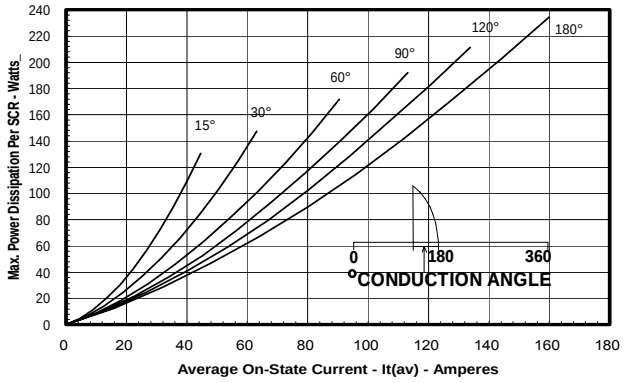
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



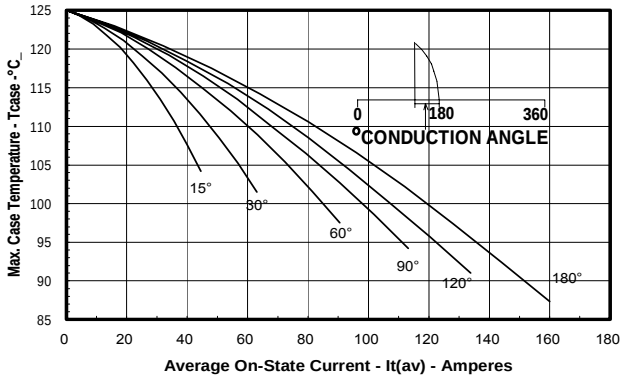
Maximum Transient Thermal Impedance
(Junction to Case)



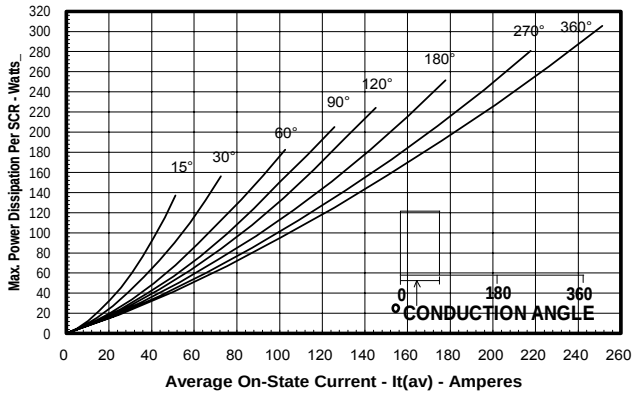
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



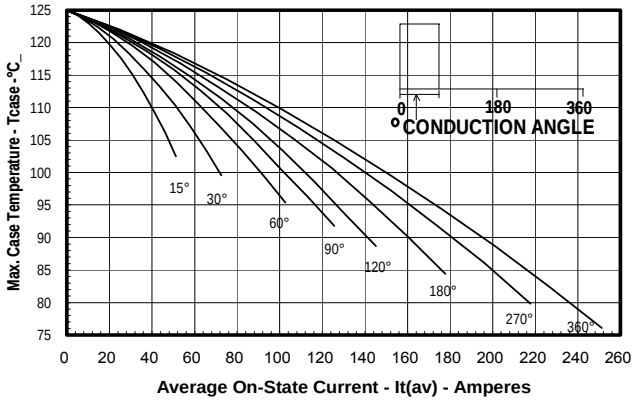
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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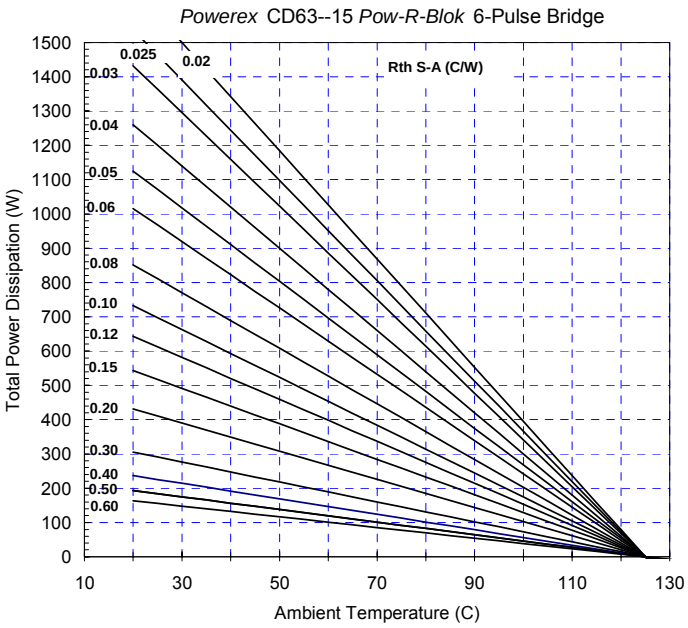

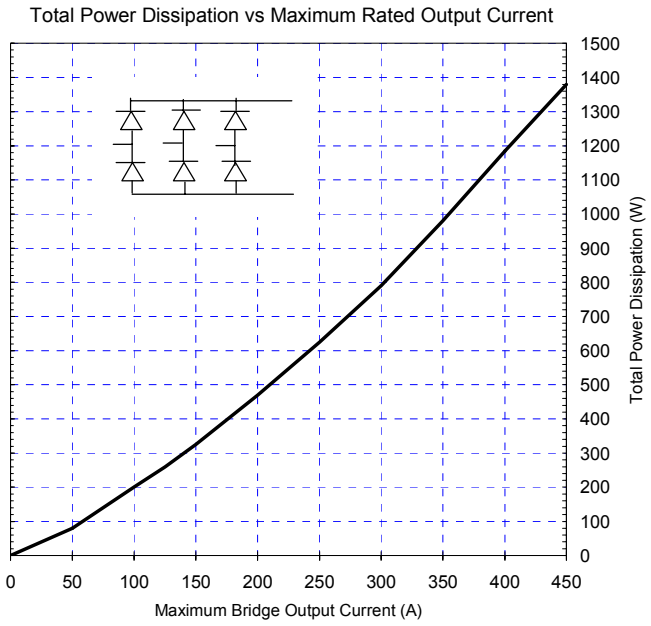

Six-Pulse Bridge Circuit Total Power Dissipation & Maximum Rated Output Current With Sink to Ambient Resistance of Heatsink as a Parameter.