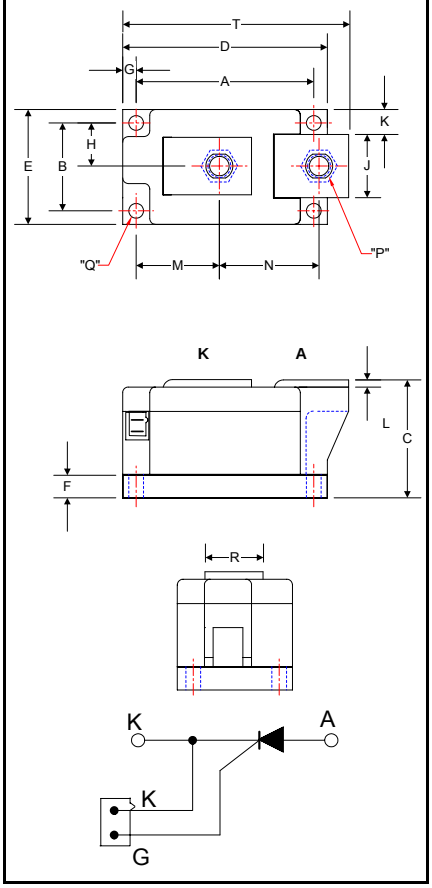
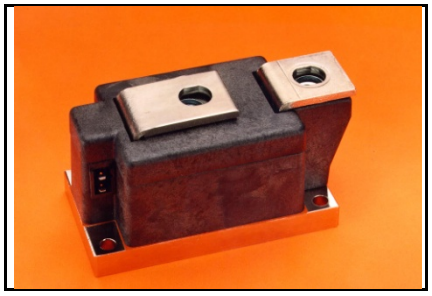
LS43__50

Powerex, Inc.,173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

POW-R-BLOK™
Single SCR Isolated Module
500 Amperes / Up to 1600 Volts

OUTLINE DRAWING





LS43__50
Single SCR
POW-R-BLOK™ Module
500 Amperes / Up to 1600 Volts

LS43 Outline Dimensions

Dimension	Inches	Millimeters
A	3.15	80.0
B	1.50	38.0
C	2.05	52.1
D	3.62	92.0
E	1.97	50.0
F	0.39	9.9
G	0.24	6.1
H	0.75	19.0
J	0.99	25.1
K	0.48	12.2
L	0.12	3.1
M	1.45	36.8
N	1.76	44.7
P	M10 Metric	M10
Q	0.250 Dia.	6.35 Dia.
R	0.99	25.1
S	0.110 x .032	2.5 x 0.8

Note: Dimensions are for reference only.

Description:

Powerex Single SCR Modules are designed for use in applications requiring rectification 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
- Aluminum Nitride Insulator
- Compression Bonded Elements
- Metal Baseplate
- Low Thermal Impedance for Improved Current Capability
- Quick Connect Gate Terminal with Provision for Keyed Mating Plug
- UL Recognized

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

Ordering Information:

Select the complete eight-digit module part number from the table below.
Example: LS431650 is a 1600 Volt, 500 Ampere Single SCR Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes (x10)
LS43	08	50
	10	
	12	
	14	
	16	

Revision Date: 08/23/2007

Powerex, Inc.,173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

POW-R-BLOK™
Single SCR Isolated Module
500 Amperes / Up to 1600 Volts

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 Blocking Voltage (t < 5 msec)		V_{RSM}	V_{RRM} + 100	V
RMS Forward Current	180° Conduction, T_C=78°C	$I_{T(RMS)}$	900	A
Average Forward Current	180° Conduction, T_C=86°C 180° Conduction, T_C=78°C	$I_{T(AV)}$ $I_{T(AV)}$	500 575	A A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied 50 Hz, 100% V_{RRM} reapplied	I_{TSM} I_{TSM}	17,000 16,300	A A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100%V_{RRM} reapplied	I_{TSM}	12,250	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{TSM}	10,500	A
I^2t for Fusing for One Cycle	8.3 milliseconds 10 milliseconds	I^2t I^2t	1.20×10^6 1.33×10^6	A^2 sec A^2 sec
Maximum Rate-of-Rise of On-State Current, (Repetitive)	Per JEDEC Standard 397 5.2.2.6	di/dt	200	A/µs
Operating Temperature		T_J	-40 to +130	°C
Storage Temperature		T_{stg}	-40 to +150	°C
Max. Mounting Torque, M6 Mounting Screw			55 6	in. – Lb. Nm
Max. Mounting Torque, M10 Terminal Screw			110 12	in. – Lb. Nm
Module Weight, Typical			816 1.80	g lb
V Isolation @ 25C		V_{rms}	3000	V

Powerex, Inc.,173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

POW-R-BLOK™
Single SCR Isolated Module
500 Amperes / Up to 1600 Volts

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=130°C		80	mA
Repetitive Peak Reverse Leakage Current	I_{RRM}	Up to 1600V, T_J=130°C		80	mA
Peak On-State Voltage	V_{FM}	I_{TM}=1500A		1.30	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 130°C, I = 15%$I_{T(AV)}$ to $\pi I_{T(AV)}$		0.81 0.32	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 130°C, I = $\pi I_{T(AV)}$ to I_{TSM}		0.90 0.26	V mΩ
V_{TM} Coefficients, Full Range		T_J = 130°C, I = 10A to 6kA V_{TM} = A+ B Ln I +C I + D Sqrt I	A = B = C = D =	0.8824 -4.46E-02 8.12E-05 1.54E-02	
Minimum dV/dt	dV/dt	Exponential to V_{DRM} T_j=130°C, Gate Open	1000 Typ.		V/µs
Gate Trigger Current	I_{GT}	T_j=25°C, V_D=12V		200	mA
Gate Trigger Voltage	V_{GT}	T_j=25°C, V_D=12V		3.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_j=130°C, V_D= ½ V_{DRM}		0.25	Volts
Peak Forward Gate Current	I_{GTM}			4.0	Amp
Peak Reverse Gate Voltage	V_{GRM}			5	Volts

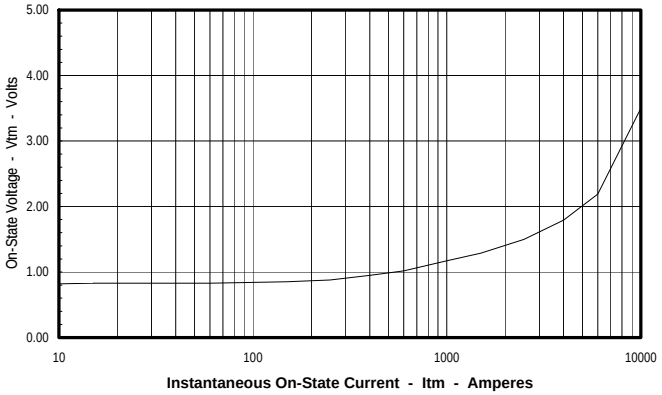
Thermal Characteristics

Characteristics	Symbol				Max.	Units
Thermal Resistance, Junction to Case	$R_{\Theta J-C}$	Per Module/Junction			0.0650	°C/W
Thermal Impedance Coefficients	$Z_{\Theta J-C}$	$Z_{\Theta J-C}$= K_1 (1-exp(-t/τ_1))	K_1 = 8.03E-04	τ_1 = 3.39E-04		
		+ K_2 (1-exp(-t/τ_2))	K_2 = 1.03E-02	τ_2 = 3.15E-03		
		+ K_3 (1-exp(-t/τ_3))	K_3 = 1.64E-02	τ_3 = 0.106		
		+ K_4 (1-exp(-t/τ_4))	K_4 = 3.75E-02	τ_4 = 2.066		
Thermal Resistance, Case to Sink Lubricated	$R_{\Theta C-S}$	Per Module			0.02	°C/W

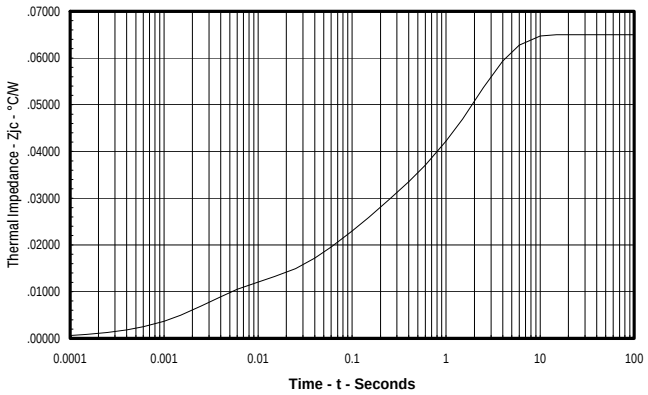
Powerex, Inc.,173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

POW-R-BLOK™
Single SCR Isolated Module
500 Amperes / Up to 1600 Volts

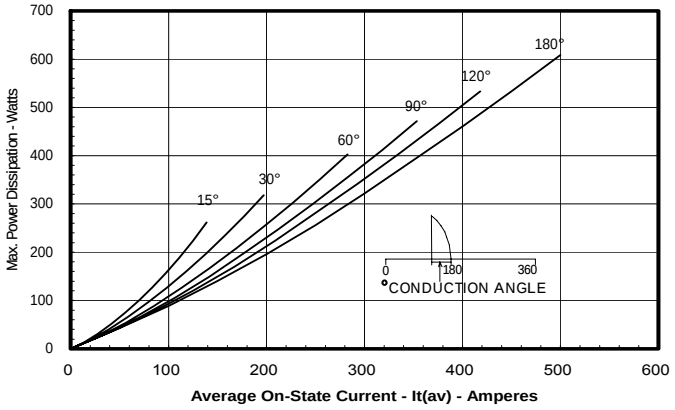
Maximum On-State Forward Voltage Drop
(Tj = 130 °C)



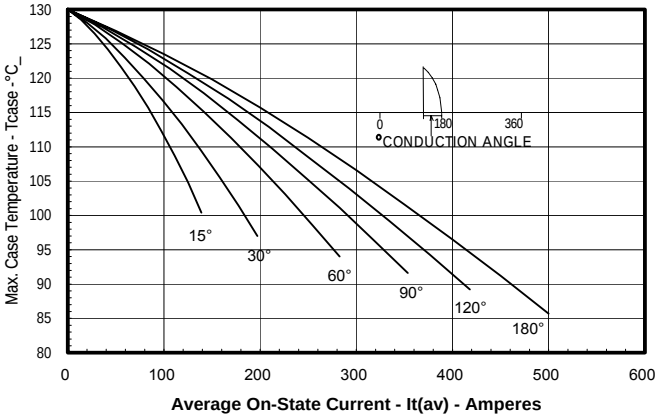
Maximum Transient Thermal Impedance
(Junction to Case)



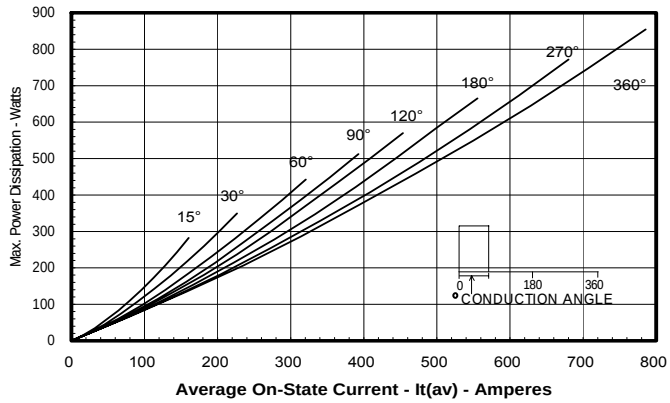
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)