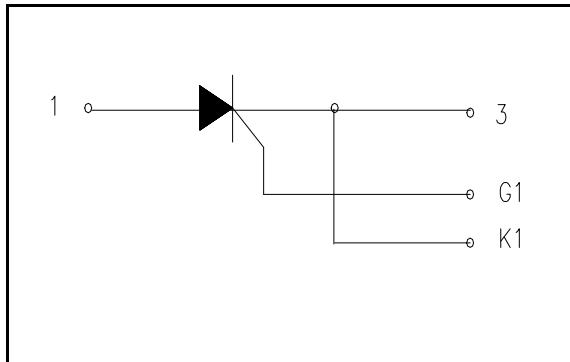


POW-R-BLOK™
Single SCR Isolated Module
1500 Amperes / Up to 2400 Volts



Ordering Information:

Select the complete eight-digit module part number from the table below.

Example: PS432415 is a 2400 Volt, 1500A Average Single SCR Isolated POW-R-BLOK™ Module

Type	Voltage Volts (x100)	Current Amperes (x100)
PS43	20	15
	22	
	24	

Description:

Powerex Single 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.

Features:

- Electrically Isolated Heatsinking
- Compression Bonded Elements
- Paralleled SCRs in Module for Increased Capacity
- Metal Baseplate
- Low Thermal Impedance for Improved Current Capability

Benefits:

- No Additional Insulation Components Required
- Easy Installation
- No Clamping Components Required
- Reduce Engineering Time

Applications:

- Bridge Circuits
- AC & DC Motor Drives
- Motor Soft Starters
- Battery Supplies
- Power Supplies
- Large IGBT Circuit Front Ends

Absolute Maximum Ratings

Characteristics	Conditions	Symbol	Units	
Repetitive Peak Forward and Reverse Blocking Voltage		V_{DRM} & V_{RRM}	Up to 2400	V
Non-Repetitive Peak Blocking Voltage ($t < 5$ msec)		V_{RSM}	$V_{RRM} + 100V$	V
RMS Current AC Switch Configuration (180° Conduction)	180° Conduction, $T_C=76^\circ C$	$I_{T(RMS)}$	3300	A
	180° Conduction, $T_C=81^\circ C$	$I_{T(RMS)}$	3080	A
(Two PS43__15 in AC Switch Configuration)	180° Conduction, $T_C=84^\circ C$	$I_{T(RMS)}$	2860	A
	180° Conduction, $T_C=89^\circ$	$I_{T(RMS)}$	2640	A
RMS Current (180° Conduction)	180° Conduction, $T_C=76^\circ C$	$I_{T(RMS)}$	2355	A
	180° Conduction, $T_C=81^\circ C$	$I_{T(RMS)}$	2200	A
	180° Conduction, $T_C=84^\circ C$	$I_{T(RMS)}$	2040	A
	180° Conduction, $T_C=89^\circ C$	$I_{T(RMS)}$	1885	A
Average Forward Current (180° Conduction)	180° Conduction, $T_C=76^\circ C$	$I_{T(AV)}$	1500	A
	180° Conduction, $T_C=81^\circ C$	$I_{T(AV)}$	1400	A
	180° Conduction, $T_C=84^\circ C$	$I_{T(AV)}$	1300	A
	180° Conduction, $T_C=89^\circ C$	$I_{T(AV)}$	1200	A
Peak One Cycle Surge Current, Non-Repetitive $T_j = 25C, V_r = 0$	60 Hz	I_{TSM}	94,960	A
	50 Hz	I_{TSM}	86,590	A
Peak One Cycle Surge Current, Non-Repetitive $T_j = 25C, V_r = V_{rrm}$	60 Hz	I_{TSM}	63,300	A
	50 Hz	I_{TSM}	57,720	A
Peak One Cycle Surge Current, Non-Repetitive $T_j = 125C, V_r = 0$	60 Hz	I_{TSM}	81,860	A
	50 Hz	I_{TSM}	74,640	A
Peak One Cycle Surge Current, Non-Repetitive $T_j = 125C, V_r = V_{rrm}$	60 Hz	I_{TSM}	54,570	A
	50 Hz	I_{TSM}	49,760	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, $T_j = 125C, V_r = V_{rrm}$	I_{TSM}	43,800	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, $T_j = 125C, V_r = V_{rrm}$	I_{TSM}	34,430	A
I^2t for Fusing for One Cycle $T_j = 125C, V_r = V_{rrm}$	8.3 milliseconds	I^2t	12.4×10^6	A ² sec
	10 milliseconds	I^2t	12.4×10^6	A ² sec
Maximum Rate-of-Rise of On-State Current, (Non-Repetitive)	Per JEDEC Standard 397 5.2.2.6	di/dt	400	A/ μ s
Maximum Rate-of-Rise of On-State Current, (Repetitive)	Per JEDEC Standard 397 5.2.2.6	di/dt	150	A/ μ s
Operating Temperature		T_J	-40 to +125	°C
Storage Temperature		T_{stg}	-40 to +150	°C
Max. Mounting Torque, M6 Mounting Screw			132	in. – Lb.
			15	Nm
Max. Mounting Torque, M10 Terminal Screw			106	in. – Lb.
			12	Nm
Module Weight, Typical			5.33	kg
			11.75	lb
V Isolation @ 25C	60 Hz, 60 sec	VAC_{rms}	3000	V

Information presented is based upon manufacturers testing and projected capabilities.
 This information is subject to change without notice.
 The manufacturer makes no claim as to suitability for use, reliability, capability,
 or future availability of this product.

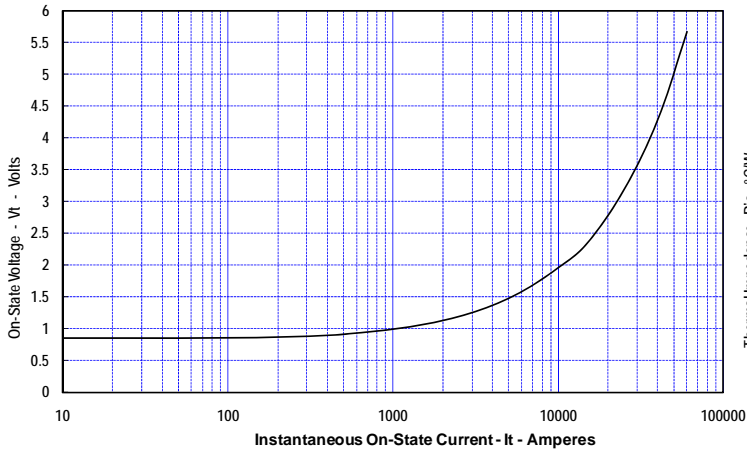
Electrical Characteristics, T_J=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Forward Leakage Current	I _{DRM}	Up to 2400V, T _J =125°C		300	mA
Repetitive Peak Reverse Leakage Current	I _{RRM}	Up to 2400V, T _J =125°C		300	mA
Peak On-State Voltage	V _{TM}	I _{TM} =3000A, T _J =25°C		1.50	V
Threshold Voltage, Low-level	V _{(TO)1}	T _J = 125°C, I = 15%I _{T(AV)} to π I _{T(AV)}		0.849	V
Slope Resistance, Low-level	r _{T1}			0.130	mΩ
Threshold Voltage, High-level	V _{(TO)2}	T _J = 125°C, I = π I _{T(AV)} to I _{TSM}		1.070	V
Slope Resistance, High-level	r _{T2}			0.084	mΩ
V _{TM} Coefficients, Full Range		T _J = 125°C, I = 50A to 15kA V _{TM} = A + B Ln I + C I + D Sqrt I	A = B = C = D =	0.9066 -3.16 E-02 5.30 E-05 7.99 E-03	
Minimum dV/dt	dV/dt	Exponential to 0.67V _{DRM} T _J =125°C, Gate Open	300		V/μs
Gate Trigger Current	I _{GT} I _G Required	T _J =25°C, V _D =12V Min I _G Required to Ensure Turn-On of Paralleled SCRs in Module		400 800mA	mA
Gate Trigger Voltage	V _{GT}	T _J =25°C, V _D =12V		4.5	Volts
Non-Triggering Gate Voltage	V _{GDM}	T _J =125°C, V _D = ½ V _{DRM}		0.15	Volts
Holding Current	I _H			600	mA
Peak Forward Gate Current	I _{GTM}			8.0	Amp
Peak Reverse Gate Voltage	V _{GRM}			5	Volts
Maximum Average Gate Power Dissipation	P _{GM(AVE)}			60	Watts

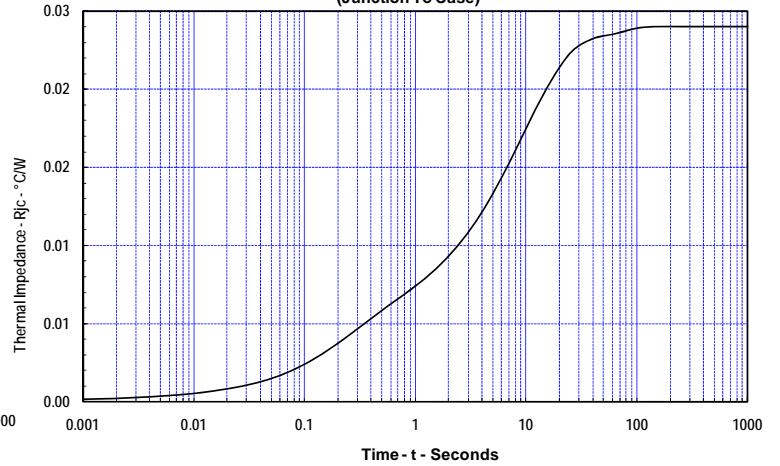
Thermal Characteristics

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	R _{ΘJ-C}	Per Module, both conducting	0.024	°C/W
Thermal Impedance Coefficients	Z _{ΘJ-C}	Z _{ΘJ-C} = K ₁ (1-exp(-t/t ₁)) + K ₂ (1-exp(-t/t ₂)) + K ₃ (1-exp(-t/t ₃)) + K ₄ (1-exp(-t/t ₄))	K ₁ = 4.05 E-04 K ₂ = 5.19 E-03 K ₃ = 1.63 E-02 K ₄ = 2.12 E-03	t ₁ = 6.24 E-03 t ₂ = 2.46 E-01 t ₃ = 8.20 t ₄ = 35.33
Thermal Resistance, Case to Sink Lubricated	R _{ΘC-S}	Per Module	0.009	°C/W

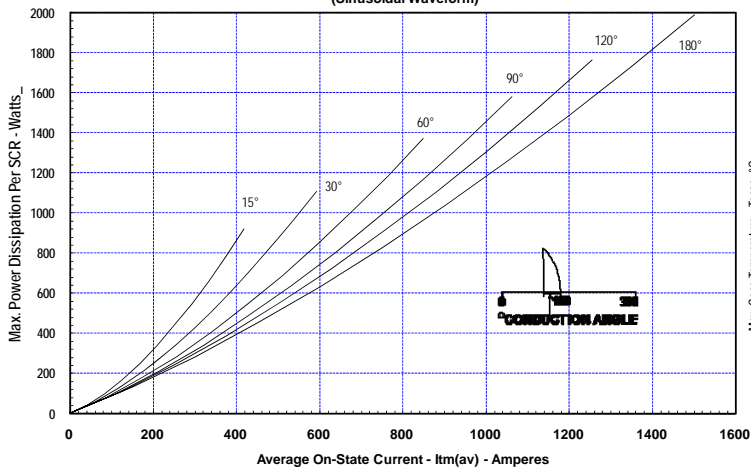
Maximum On-State Forward Voltage Drop
(Tj = 125C)



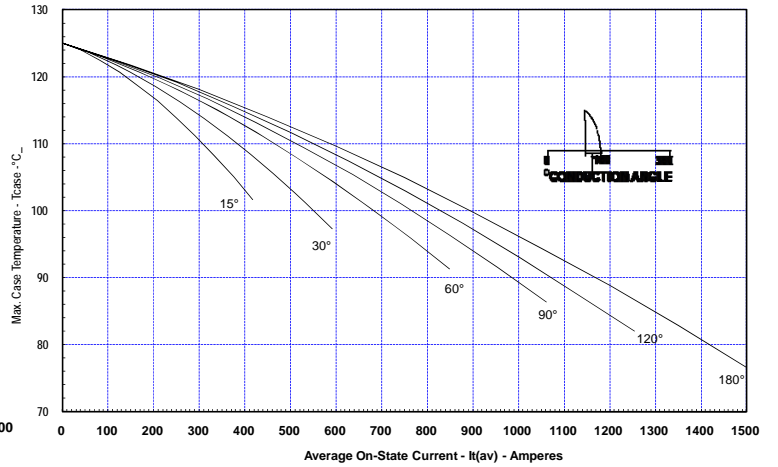
Maximum Transient Thermal Impedance
(Junction To Case)



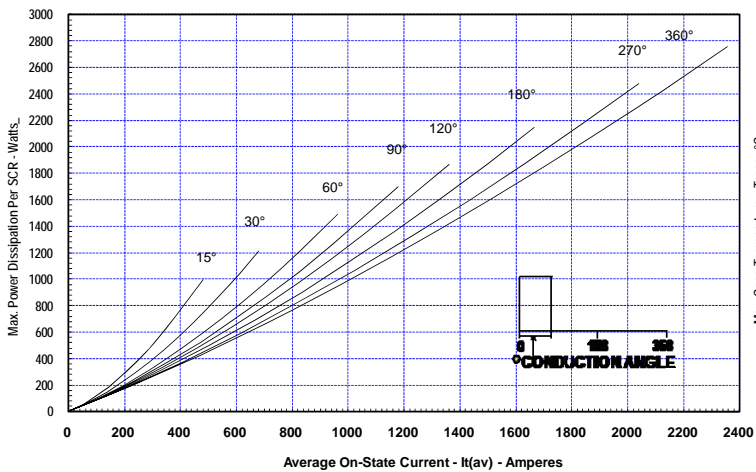
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



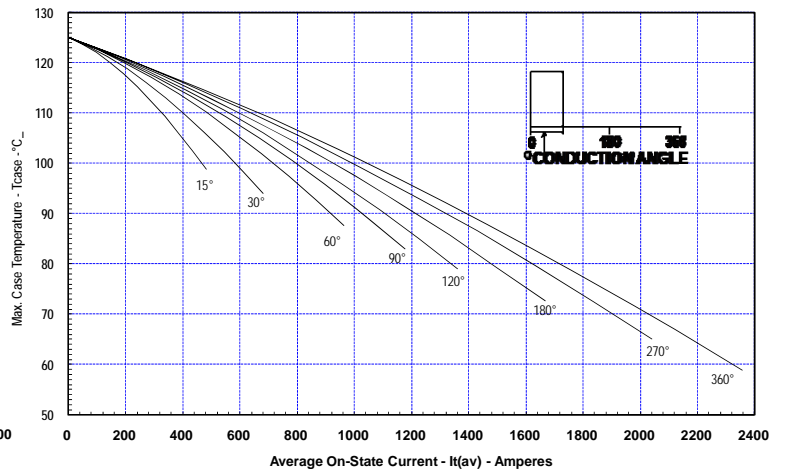
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



DIM.	INCHES	MILLIMETERS
A	7.80	198.1
B	4.00	101.6
C	2.68	68.1
D	6.44	163.6
E	3.44	87.4
F	.28	7.1
G	7.31	185.7
H	7.00	177.8
J	1.65	42
K	.21	5.3
L	.28	7.1
M	.281	7.1
N	.45	11.4
P	.54	13.7
Q	5.93	150.6
R	.19	4.8
S	.11	2.8
T	.48	12.2
U	2.28	58
V	2.54	64.5
W	4.93	125.2
X	3.81	96.8
Y	.03	8
Z	2.00	50.8
AA	1.00	25.4
BB	.50	12.7
CC	1.00	25.4
DD	.406	10.3
FF	.66	16.8

