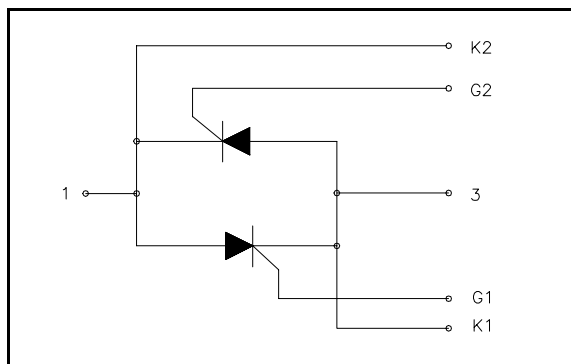


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

POW-R-BLOK™ AC Switch SCR Isolated Module 1330 Amps RMS, Up to 2400 Volts



Ordering Information:

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

Example: PA432406 is a 2400 Volt, 600A Average/SCR (1330 Ampere RMS/Switch) SCR AC Switch Isolated POW-R-BLOK™ Module

Type	Voltage Volts (x100)	Current Amperes (x100)
PA43	16	06
	18	Average
	20	Current
	22	Per SCR
	24	

Description:

Powerex AC Switch 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
- 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:

- Transfer Switches
- AC Welders
- Motor Soft Starters

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POW-R-BLOK™
AC Switch SCR Isolated Module
1330 Amps RMS, Up to 2400 Volts

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}	$V_{RRM} + 100$ V
RMS Current	180° Conduction, $T_C=66^\circ\text{C}$	$I_{T(RMS)}$	1665 A
(AC Switch, 180° Conduction)	180° Conduction, $T_C=71^\circ\text{C}$	$I_{T(RMS)}$	1550 A
	180° Conduction, $T_C=76^\circ\text{C}$	$I_{T(RMS)}$	1440 A
	180° Conduction, $T_C=81^\circ\text{C}$	$I_{T(RMS)}$	1330 A
	180° Conduction, $T_C=86^\circ\text{C}$	$I_{T(RMS)}$	1220 A
	180° Conduction, $T_C=90^\circ\text{C}$	$I_{T(RMS)}$	1110 A
Average Forward Current Per SCR (180° Conduction)	180° Conduction, $T_C=66^\circ\text{C}$	$I_{T(RMS)}$	750 A
	180° Conduction, $T_C=71^\circ\text{C}$	$I_{T(RMS)}$	700 A
	180° Conduction, $T_C=76^\circ\text{C}$	$I_{T(RMS)}$	650 A
	180° Conduction, $T_C=81^\circ\text{C}$	$I_{T(RMS)}$	600 A
	180° Conduction, $T_C=86^\circ\text{C}$	$I_{T(RMS)}$	550 A
	180° Conduction, $T_C=90^\circ\text{C}$	$I_{T(RMS)}$	500 A
Peak One Cycle Surge Current, Non-Repetitive $T_J = 25^\circ\text{C}$, $V_r = 0$	60 Hz	I_{TSM}	50,890 A
	50 Hz	I_{TSM}	46,400 A
Peak One Cycle Surge Current, Non-Repetitive $T_J = 25^\circ\text{C}$, $V_r = V_{rrm}$	60 Hz	I_{TSM}	33,925 A
	50 Hz	I_{TSM}	30,935 A
Peak One Cycle Surge Current, Non-Repetitive $T_J = 125^\circ\text{C}$, $V_r = 0$	60 Hz	I_{TSM}	44,250 A
	50 Hz	I_{TSM}	40,350 A
Peak One Cycle Surge Current, Non-Repetitive $T_J = 125^\circ\text{C}$, $V_r = V_{rrm}$	60 Hz	I_{TSM}	29,500 A
	50 Hz	I_{TSM}	26,900 A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, $T_J = 125^\circ\text{C}$, $V_r = V_{rrm}$	I_{TSM}	23,900 A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, $T_J = 125^\circ\text{C}$, $V_r = V_{rrm}$	I_{TSM}	18,615 A
I^2t for Fusing for One Cycle $T_J = 125^\circ\text{C}$, $V_r = V_{rrm}$	8.3 milliseconds	I^2t	3.63×10^6 A ² sec
	10 milliseconds	I^2t	3.62×10^6 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			455 g 11.75 lb
V Isolation @ 25C		V_{rms}	3000 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 2400V, $T_J=125^\circ\text{C}$		100	mA
Repetitive Peak Reverse Leakage Current	I_{RRM}	Up to 2400V, $T_J=125^\circ\text{C}$		100	mA
Peak On-State Voltage	V_{FM}	$I_{TM}=3000\text{A}$, $T_J=125^\circ\text{C}$		1.75	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}$, $I = 15\%I_{T(AV)}$ to $\pi I_{T(AV)}$		0.869	V
Slope Resistance, Low-level	r_{T1}			0.237	$m\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_J = 125^\circ\text{C}$, $I = \pi I_{T(AV)}$ to I_{TSM}		1.055	V
Slope Resistance, High-level	r_{T2}			0.175	$m\Omega$
V_{TM} Coefficients, Full Range		$T_J = 125^\circ\text{C}$, $I = 50\text{A}$ to 6kA $V_{TM} = A + B \ln I + C I + D \text{Sqrt } I$	A = B = C = D =	0.93159 -4.51 E-02 9.95 E-05 1.29 E-02	
Minimum dV/dt	dV/dt	Exponential to $0.67V_{DRM}$ $T_J=125^\circ\text{C}$, Gate Open	600 Typ.		$V/\mu\text{s}$
Gate Trigger Current	I_{GT}	$T_J=25^\circ\text{C}$, $V_D=12\text{V}$		200	mA
Gate Trigger Voltage	V_{GT}	$T_J=25^\circ\text{C}$, $V_D=12\text{V}$		3.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_J=125^\circ\text{C}$, $V_D= \frac{1}{2} V_{DRM}$		0.15	Volts
Holding Current	I_H			300	mA
Peak Forward Gate Current	I_{GTM}			4.0	Amp
Peak Reverse Gate Voltage	V_{GRM}			5	Volts
Maximum Average Gate Power Dissipation	$P_{GM(AVE)}$			16	Watts

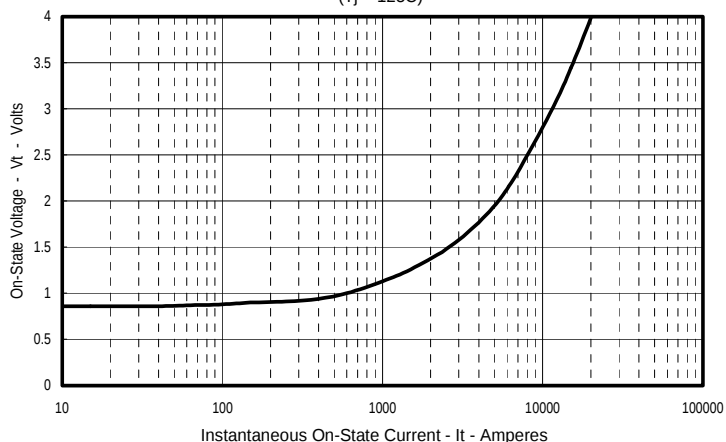
Thermal Characteristics

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	$R_{\Theta J-C}$	Per Module, both conducting Per Junction, both conducting	0.029 0.058	$^\circ\text{C/W}$ $^\circ\text{C/W}$
Thermal Impedance Coefficients	$Z_{\Theta J-C}$	$Z_{\Theta J-C} = K_1 (1 - \exp(-t/t_1))$ $+ K_2 (1 - \exp(-t/t_2))$ $+ K_3 (1 - \exp(-t/t_3))$ $+ K_4 (1 - \exp(-t/t_4))$	$K_1 = 5.04 \text{ E-}04$ $K_2 = 2.31 \text{ E-}03$ $K_3 = 2.83 \text{ E-}03$ $K_4 = 5.24 \text{ E-}02$	$t_1 = 2.47 \text{ E-}03$ $t_2 = 4.42 \text{ E-}02$ $t_3 = 1.370$ $t_4 = 9.668$
Thermal Resistance, Case to Sink Lubricated	$R_{\Theta C-S}$	Per Module	0.009	$^\circ\text{C/W}$

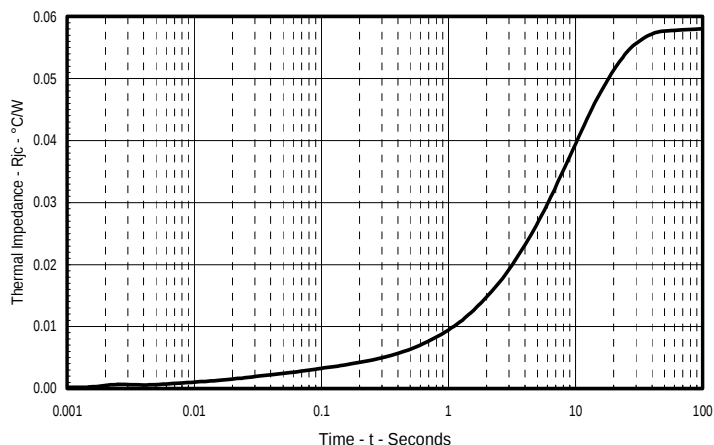
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AC Switch SCR Module 1330 Amps RMS, Up to 2400 Volts

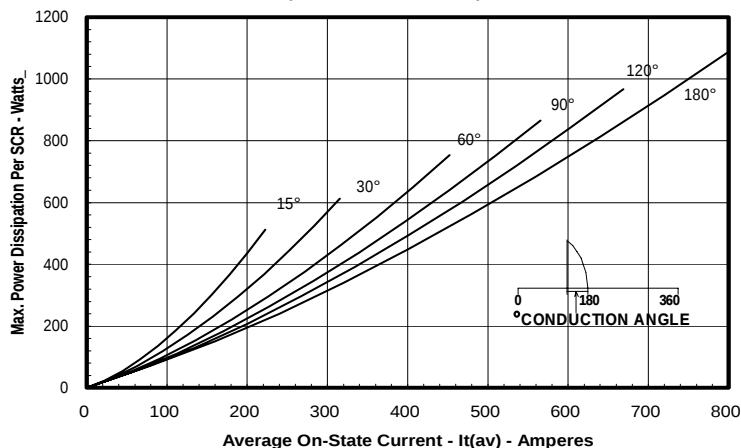
Typical On-State Forward Voltage Drop
($T_j = 125^\circ\text{C}$)



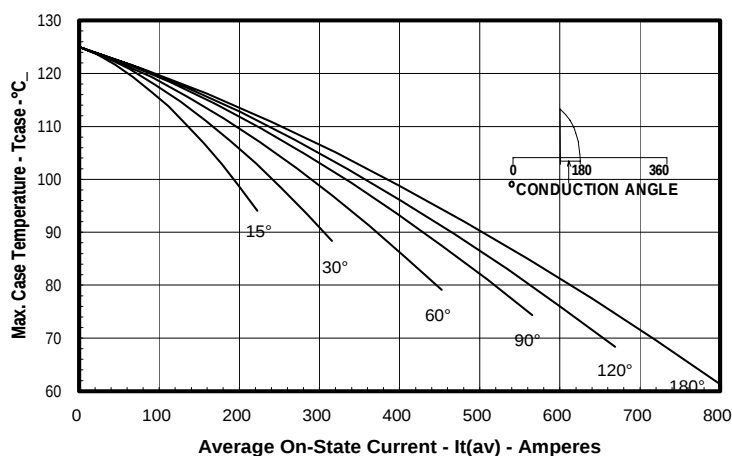
Maximum Transient Thermal Impedance
(Junction To Case)



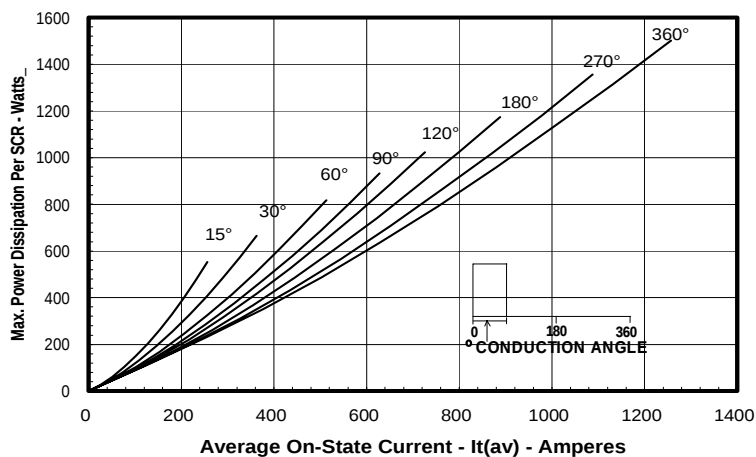
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



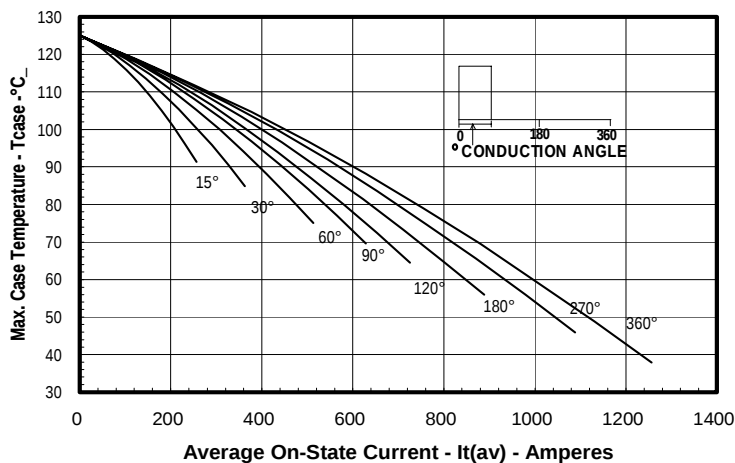
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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AC Switch SCR Module
1330 Amps RMS / 1800 Volts

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

