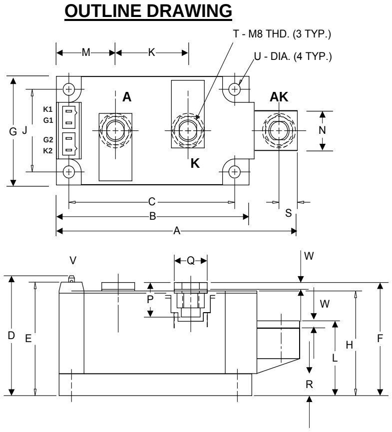
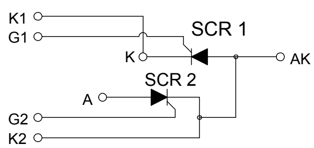
ND432025

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

POW-R-BLOK™
Dual SCR Isolated Module
250 Amperes / 2000 Volts

OUTLINE DRAWING





CONNECTION DIAGRAM

ND432025
Dual SCR Isolated
POW-R-BLOK™ Module
250 Amperes / 2000 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
- 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

ND43 Outline Dimensions

Dimension	Inches	Millimeters
A	4.57	116
B	3.66	93
C	3.15	80.0
D	2.17	55.1
E	2.06	52.3
F	2.07	52.0
G	1.97	50.0
H	1.90	48.3
J	1.50	38.1
K	1.38	35.0
L	1.26	32.0
M	1.122	28.5
N	.71	18.0
P	.57	14.5
Q	.625	15.9
R	.394	10.00
S	.350	8.9
T	M8 Metric	M8
U	.250 Dia.	6.35 Dia.
V	.110 x .032	2.8 x 0.8
W	.12	3.0

Note: Dimensions are for reference only.

Ordering Information:

Select the complete eight digit module part number from the table below.
Example: ND432025 is a 2000Volt, 250 Ampere Dual SCR Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes (x 10)
ND43	20	25

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

Revision Date: 05/17/2010

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

POW-R-BLOK™
Dual SCR Isolated Module
250 Amperes / 2000 Volts

Absolute Maximum Ratings

Characteristics	Conditions	Symbol		Units
Repetitive Peak Forward and Reverse Blocking Voltage		V_{DRM} & V_{RRM}	up to 2000	V
Non-Repetitive Peak Reverse Blocking Voltage (t < 5 msec)		V_{RSM}	2100	V
RMS Forward Current	180° Conduction, T_C=83°C	$I_{T(RMS)}$	393	A
Average Forward Current	180° Conduction, T_C=83°C	$I_{T(AV)}$	250	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied,Tj=130C	I_{TSM}	8800	A
	60 Hz, No V_{RRM} reapplied,Tj=130C	I_{TSM}	10,420	A
	60 Hz, 100% V_{RRM} reapplied,Tj=25C	I_{TSM}	10,120	A
	60 Hz, No V_{RRM} reapplied,Tj=25C	I_{TSM}	11,900	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied,Tj=130C	I_{TSM}	4400	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied,Tj=130C	I_{TSM}	3925	A
I^2t for Fusing for One Cycle, 8.3 milliseconds	60 Hz, 100% V_{RRM} reapplied,Tj=130C	I^2t	320,000	A^2 sec
	60 Hz, 100% V_{RRM} reapplied,Tj=25C	I^2t	426,720	A^2 sec
Maximum Rate-of-Rise of On-State Current, (Non-Repetitive)	T_j=25°C, I_G=500mA, V_D=0.67 $V_{DRM\ (Rated)}$, I_{TM}= $\pi I_{T(AV)}$, T_r < 0.5μS, t_p > 6μs	di/dt	800	A/μs
Peak Gate Power Dissipation		P_{GM}	16	W
Average Gate Power Dissipation		$P_{G(AV)}$	3	W
Peak Forward Gate Current		I_{GFM}	4	A
Peak Forward Gate Voltage		V_{GFM}	10	V
Peak Reverse Gate Voltage		V_{GRM}	5	V
Operating Temperature		T_J	-40 to +130	°C
Storage Temperature		T_{stg}	-40 to +150	°C
Max. Mounting Torque, M6 Mounting Screw			45 5	in.-Lb. Nm
Max. Mounting Torque, M8 Terminal Screw			110 12	in.-Lb. Nm
Module Weight, Typical			840 1.85	G lb
V Isolation @ 25C		V_{rms}	2500	V

POWEREX

ND432025

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

POW-R-BLOK™
Dual SCR Isolated Module
250 Amperes / 2000 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 2000V, T_J=130°C		50	mA
Repetitive Peak Reverse Leakage Current	I_{RRM}	Up to 2000V, T_J=130°C		50	mA
Peak On-State Voltage	V_{FM}	I_{TM}=625A		1.40	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 130°C, I = 15%$I_{T(AV)}$ to $\pi I_{T(AV)}$		0.813 0.810	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}		0.947 0.641	V mΩ
V_{TM} Coefficients, Full Range		T_J = 130°C, I = 15%$I_{T(AV)}$ to I_{TSM} V_{TM} = A+ B Ln I +C I + D Sqrt I	A = B = C = D =	0.7324 9.80 E-3 5.83 E-4 6.02 E-3	
Minimum dV/dt	dV/dt	Exponential to 2/3 V_{DRM} T_j=130°C, Gate Open	500		V/µs
Turn-On Time (Typical)	t_{on}	I_{TM} = 100A, V_D = 100V	7	(Typical)	µs
Turn-Off Time (Typical)	t_{off}	T_J = 130°C, I_T= 250A Re-Applied dV/dt = 20V/µs Linear to 0.8 V_{DRM}	150	(Typical)	µs
Gate Trigger Current	I_{GT}	T_j=25°C, V_D=12V		150	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}		0.15	Volts

Thermal Characteristics

Characteristics	Symbol			Max.	Units
Thermal Resistance, Junction to Case	$R_{\Theta J\text{-}C}$	Per Module, both conducting Per Junction both conducting		0.07 0.14	°C/W °C/W
Thermal Impedance Coefficients	$Z_{\Theta J\text{-}C}$	$Z_{\Theta J\text{-}C}$= 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 = 5.27E-3 K_2 = 1.17E-2 K_3 = 5.26E-2 K_4 = 6.97E-2	τ_1 = 1.69E-4 τ_2 = 2.07E-2 τ_3 = 2.37E-1 τ_4 = 2.46	
Thermal Resistance, Case to Sink Lubricated	$R_{\Theta C\text{-}S}$	Per Module		0.03	°C/W

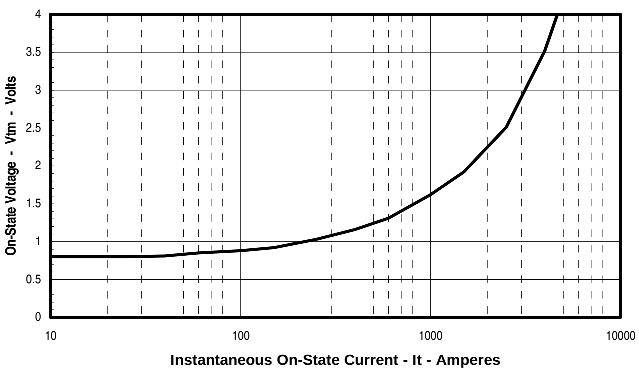
POWEREX

ND432025

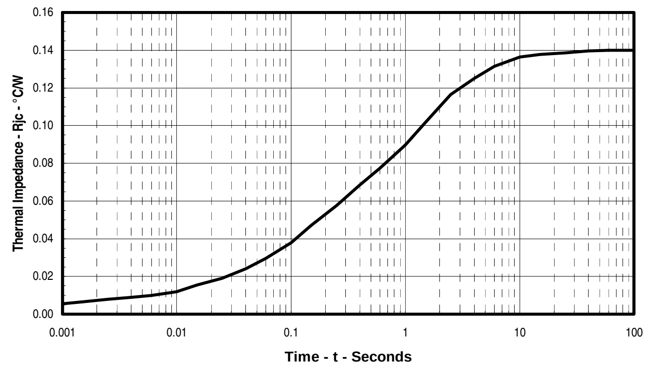
Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

POW-R-BLOK™
Dual SCR Isolated Module
250 Amperes / 2000 Volts

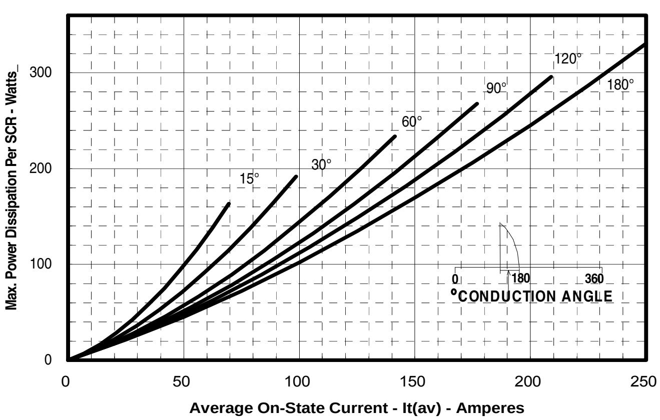
Maximum On-State Forward Voltage Drop
(Tj = 130C)



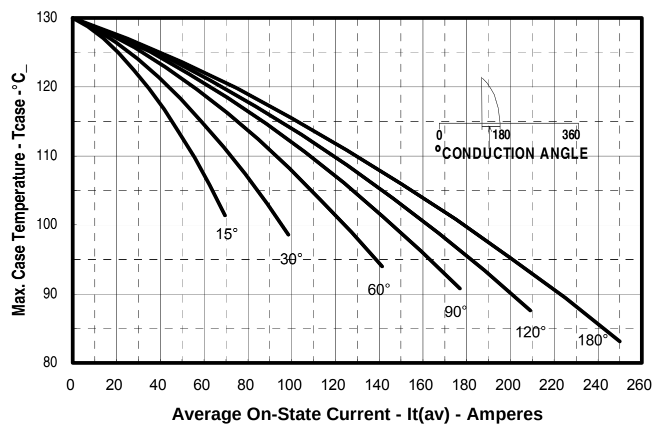
Maximum Transient Thermal Impedance
(Junction To Case)



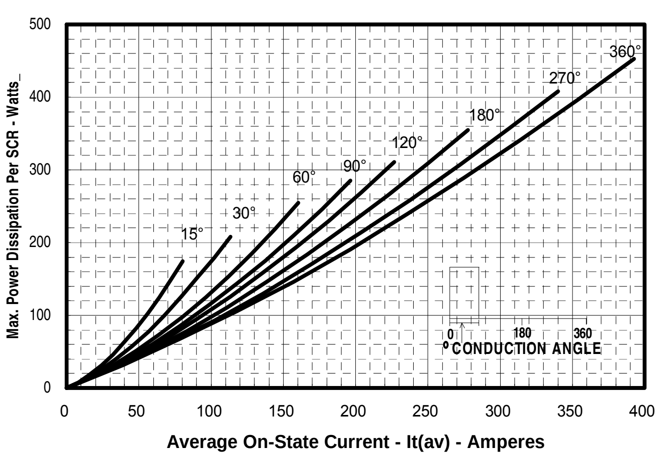
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



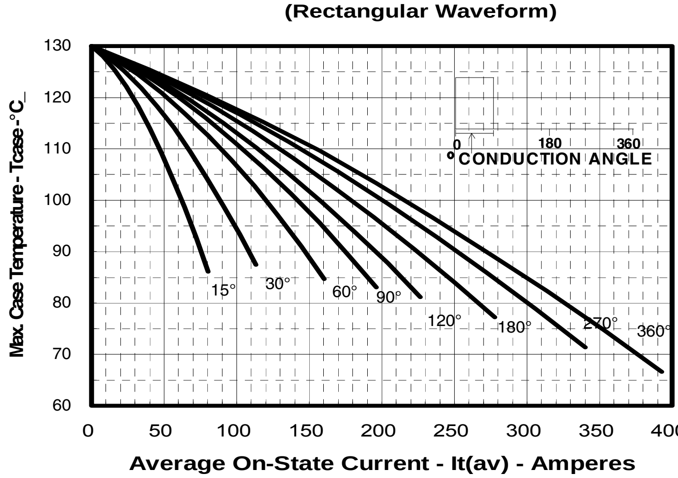
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



Revision Date: 05/17/2010