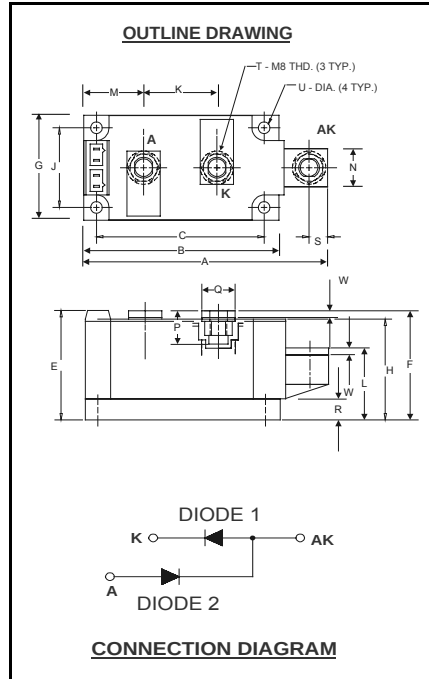


POW-R-BLOK™

Dual Diode Isolated Module
Up to 320 Amperes & 2000 Volts



ND41__32
Dual Diode Isolated
POW-R-BLOK™ Module
200-320 Amperes / 600-2000 Volts

Description:

Powerex Dual Diode 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 Isolator
- Compression Bonded Elements
- Metal Baseplate
- Low Thermal Impedance for Improved Current Capability
- 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

ND41 Outline Dimensions

Dimension	Inches	Millimeters
A	4.57	116
B	3.66	93
C	3.15	80.0
E	2.06	52.3
F	2.05	52.0
G	1.97	50.0
H	1.90	48.3
J	1.50	38.1
K	1.38	35.0
L	1.35	34.3
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	.22 Dia.	5.6 Dia.
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: ND412032 is a 2000Volt, 320 Ampere Dual Diode Isolated POW-R-BLOK™ Module

Type	Voltage Volts (x100)	Current Amperes (x10)
ND41	06	20
	08	22
	10	24
	12	26
	14	28
	16	30
	18	32
	20	

Absolute Maximum Ratings

Characteristics	Conditions	Symbol		Units
Repetitive Peak Reverse Blocking Voltage		V_{RRM}	up to 2000	V
Non-Repetitive Peak Reverse Blocking Voltage ($t < 5$ msec)		V_{RSM}	$V_{RRM} + 200$	V
RMS Forward Current	180° Conduction, $T_C=101^\circ\text{C}$	$I_{F(RMS)}$	502	A
	180° Conduction, $T_C=105^\circ\text{C}$	$I_{F(RMS)}$	470	A
	180° Conduction, $T_C=109^\circ\text{C}$	$I_{F(RMS)}$	440	A
	180° Conduction, $T_C=112^\circ\text{C}$	$I_{F(RMS)}$	408	A
Average Forward Current	180° Conduction, $T_C=101^\circ\text{C}$	$I_{F(AV)}$	320	A
	180° Conduction, $T_C=105^\circ\text{C}$	$I_{F(AV)}$	300	A
	180° Conduction, $T_C=109^\circ\text{C}$	$I_{F(AV)}$	280	A
	180° Conduction, $T_C=112^\circ\text{C}$	$I_{F(AV)}$	260	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	8000	A
Initial $T_j = T_j \text{ max}$	60 Hz, No V_{RRM} reapplied	I_{FSM}	10,000	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	5750	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	4975	A
I^2t for Fusing for One Cycle, 8.3 milliseconds		I^2t	266,000	$\text{A}^2 \text{ sec}$
Operating Temperature		T_J	-40 to +150	$^\circ\text{C}$
Storage Temperature		T_{stg}	-40 to +150	$^\circ\text{C}$
Max. Mounting Torque, M6 Mounting Screw			45	in.-Lb.
			5	Nm
Max. Mounting Torque, M8 Terminal Screw			95	in.-Lb.
			11	Nm
Module Weight, Typical			840	g
			1.85	lb.
V Isolation @ 25C		V_{rms}	2500	V

Electrical Characteristics, T_J=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Reverse Leakage Current	I _{RRM}	Up to 2000V, T _J =150°C		50	mA
Peak On-State Voltage	V _{FM}	I _{FM} =1500A		1.35	V
Threshold Voltage, Low-level	V _{(TO)1}	T _J = 150°C, I = 15%I _{F(AV)} to π I _{F(AV)}		0.764	V
Slope Resistance, Low-level	r _{T1}			0.360	mΩ
Threshold Voltage, High-level	V _{(TO)2}	T _J = 150°C, I = π I _{F(AV)} to I _{FSM}		0.710	V
Slope Resistance, High-level	r _{T2}			0.420	mΩ
V _{TM} Coefficients, Full Range		T _J = 150°C, I = 15%I _{F(AV)} to I _{FSM}	A =	0.7144	
			B =	0.0232	
		V _{FM} = A+ B Ln I +C I + D Sqrt I	C =	4.72 E-4	
			D =	-6.71 E-3	
Diode Reverse Recovery Time (Typical)	t _{rr}	I _{fm} = 1500A, T _p = 190 μs di/dt = -25A/μs		10	μs

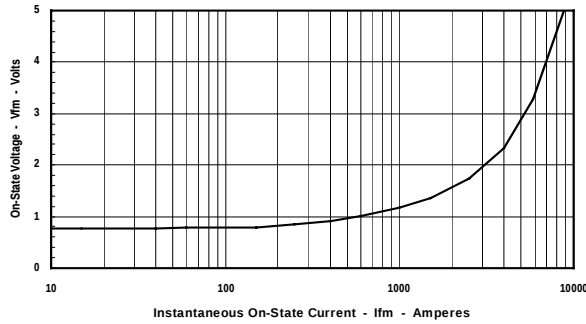
Thermal Characteristics

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	R _{ΘJ-C}	Per Module, both conducting Per Junction both conducting	0.07 0.14	°C/W °C/W
Thermal Impedance Coefficients	Z _{ΘJ-C}	Z _{ΘJ-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 _{ΘC-S}	Per Module	0.03	°C/W

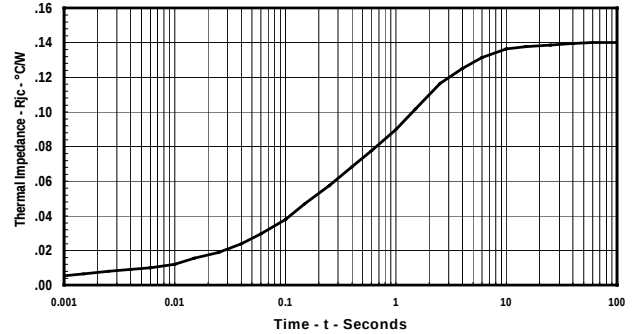
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

POW-R-BLOK™ Dual Diode Isolated Module Up to 320 Amperes & 2000 Volts

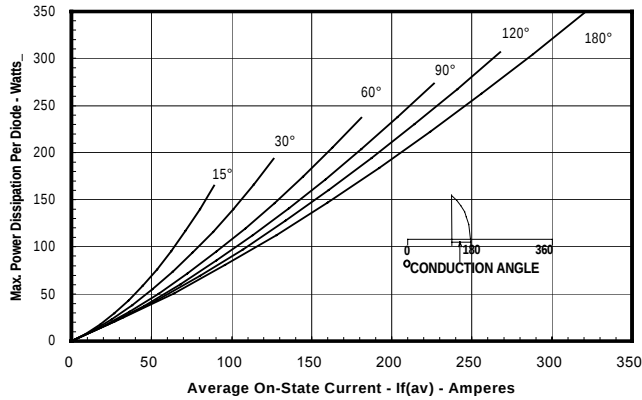
Maximum On-State Forward Voltage Drop
($T_J = 150^\circ\text{C}$)



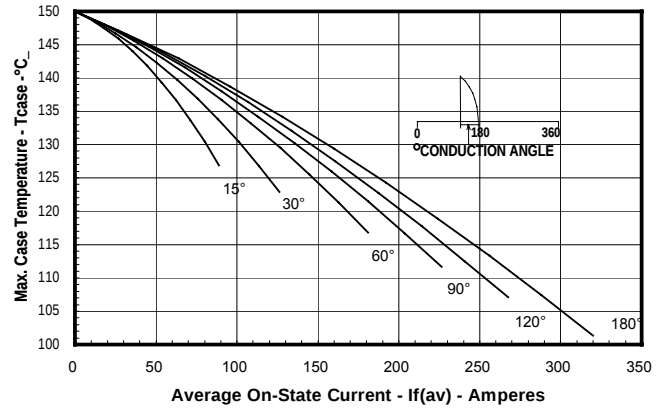
Maximum Transient Thermal Impedance
(Junction to Case)



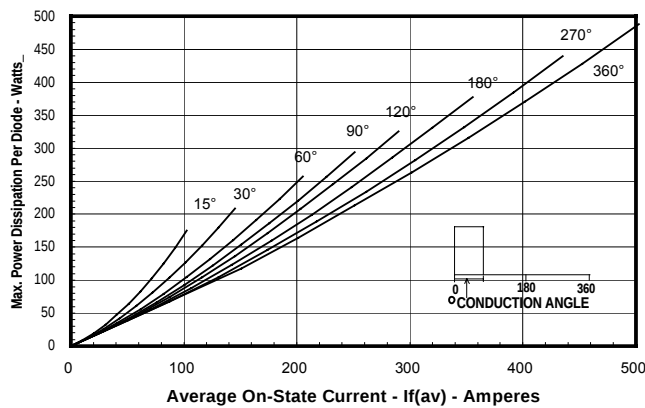
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

