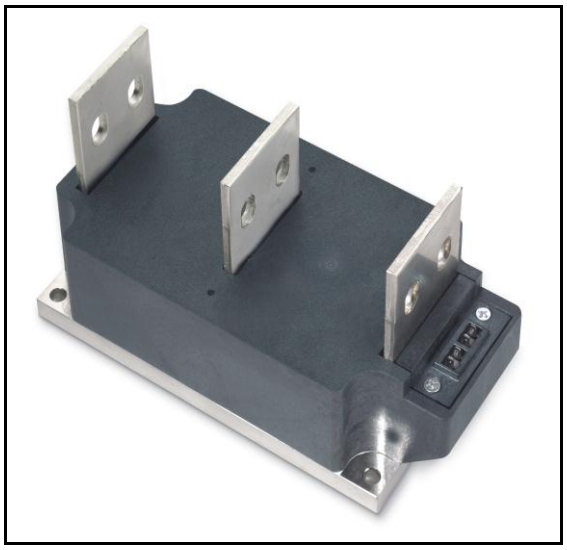
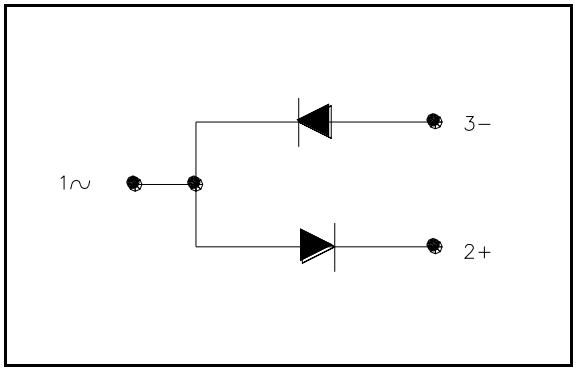
Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

POW-R-BLOK™
Dual Diode Isolated Module
1100 Amperes / Up to 2400 Volts





Ordering Information:
Select the complete eight-digit module part number from the table below.
Example: PD412411 is a 2400 Volt, 1100A Average Dual Diode Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes (x100)
PD41	18 20 22 24	11

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.

Features:
- Electrically Isolated Heatsinking
- Compression Bonded Elements
- Metal Baseplate
- Low Thermal Impedance for Improved Current Capability
- UL Recognized (E78240)

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

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Absolute Maximum Ratings

Characteristics	Conditions	Symbol		Units
Repetitive Peak Reverse Blocking Voltage		V_{RRM}	Up to 2400	V
Non-Repetitive Peak Blocking Voltage (t < 5 msec)		V_{RSM}	V_{RRM} + 100V	V
RMS Current Per Diode	180° Conduction, T_C=80°C	$I_{F(RMS)}$	1885	A
(180° Conduction)	**180° Conduction, T_C=87°C**	$I_{F(RMS)}$	**1725**	A
	180° Conduction, T_C=95°C	$I_{F(RMS)}$	1570	A
	180° Conduction, T_C=98°C	$I_{F(RMS)}$	1415	A
Average Forward Current Per Diode	180° Conduction, T_C=80°C	$I_{F(AV)}$	1200	A
(180° Conduction)	**180° Conduction, T_C=87°C**	$I_{F(AV)}$	**1100**	A
	180° Conduction, T_C=95°C	$I_{F(AV)}$	1000	A
	180° Conduction, T_C=98°C	$I_{F(AV)}$	900	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz	I_{FSM}	50,890	A
Tj = 25°C, Vr = 0	50 Hz	I_{FSM}	46,400	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz	I_{FSM}	33,925	A
Tj = 25°C, Vr = Vrrm	50 Hz	I_{FSM}	30,935	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz	I_{FSM}	44,250	A
Tj = 125°C, Vr = 0	50 Hz	I_{FSM}	40,350	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz	I_{FSM}	29,500	A
Tj = 125°C, Vr = Vrrm	50 Hz	I_{FSM}	26,900	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, Tj = 125°C, Vr = Vrrm	I_{FSM}	23,690	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, Tj = 125°C, Vr = Vrrm	I_{FSM}	18,615	A
I^2t for Fusing for One Cycle	8.3 milliseconds	I^2t	3.63×10^6	A^2 sec
Tj = 125°C, Vr = Vrrm	10 milliseconds	I^2t	3.62×10^6	A^2 sec
Operating Temperature		T_J	-40 to +150	°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 @ 25°C		V_{rms}	4000	V

Information 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.

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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 2400V, T_J=150°C		200	mA
Peak On-State Voltage	V_{FM}	I_{FM}=3000A, T_J=25°C		1.25	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 150°C, I = 15%$I_{T(AV)}$ to $\pi I_{T(AV)}$		0.663 0.113	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 150°C, I = $\pi I_{T(AV)}$ to I_{TSM}		.642 0.116	V mΩ
V_{FM} Coefficients, Full Range		T_J = 150°C, I = 50A to 6kA V_{FM} = A+ B Ln I +C I + D Sqrt I	A = B = C = D =	0.6418 1.08 E-02 1.18 E-04 -1.57 E-03	
Typical Reverse Recovery Time	t_{rr}	T_J = 25°C, I_{fm} = 1500A. dI_r/dt = 25 A/us, t_p = 190 us		22	µs

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	°C/W °C/W
Thermal Impedance Coefficients	$Z_{\Theta J-C}$	$Z_{\Theta J-C}$= 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 = 5.04 E-04 K_2 = 2.31 E-03 K_3 = 2.83 E-03 K_4 =5.24 E-02	τ_1 = 2.47 E-03 τ_2 = 4.42 E-02 τ_3 = 1.370 τ_4 = 9.668		
Thermal Resistance, Case to Sink Lubricated	$R_{\Theta C-S}$	Per Module			0.009	°C/W

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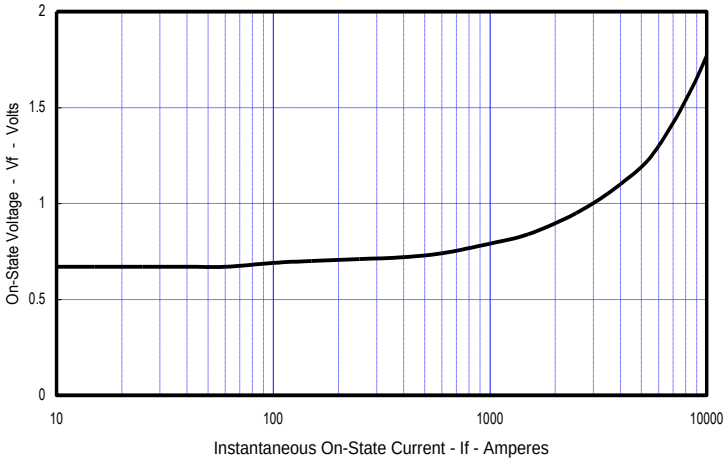
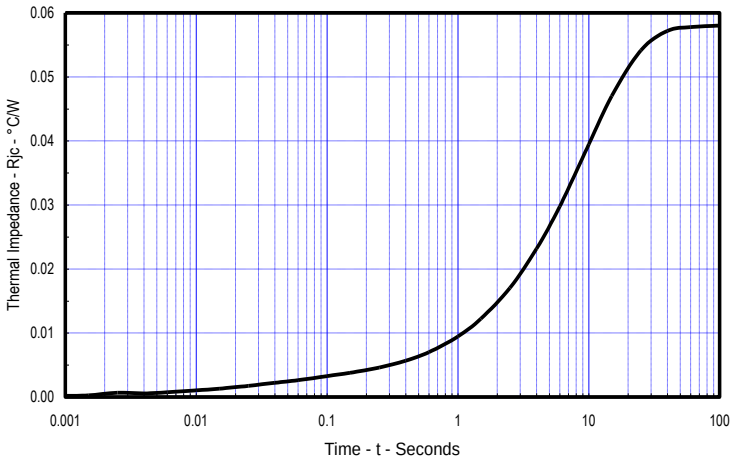
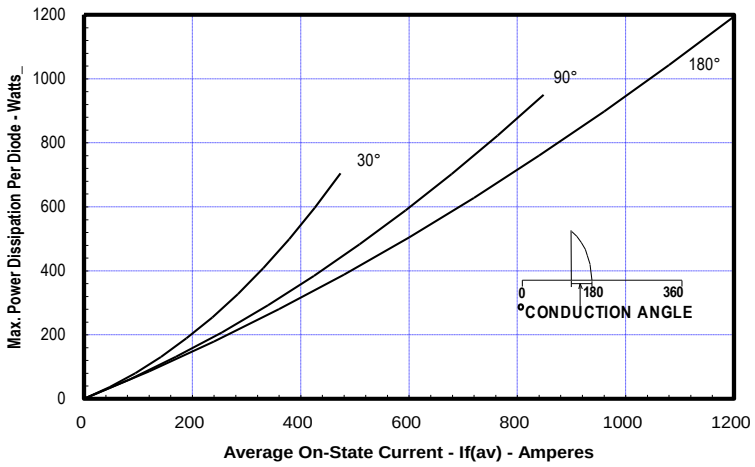
Typical On-State Forward Voltage Drop
(Tj = 150C)



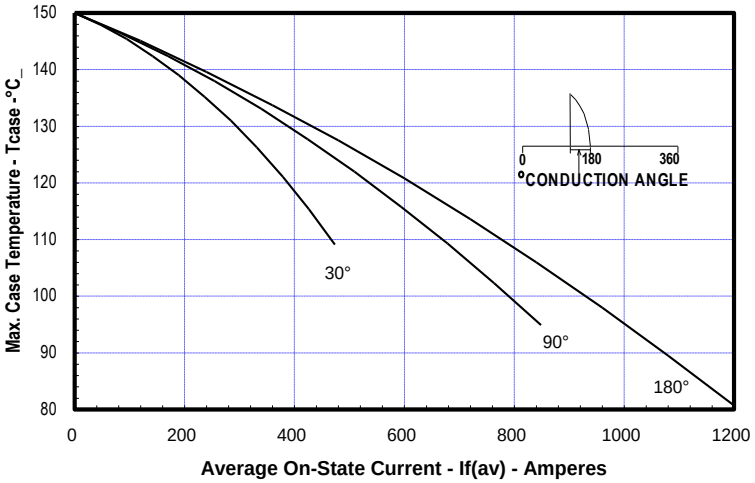
Maximum Transient Thermal Impedance
(Junction To Case)



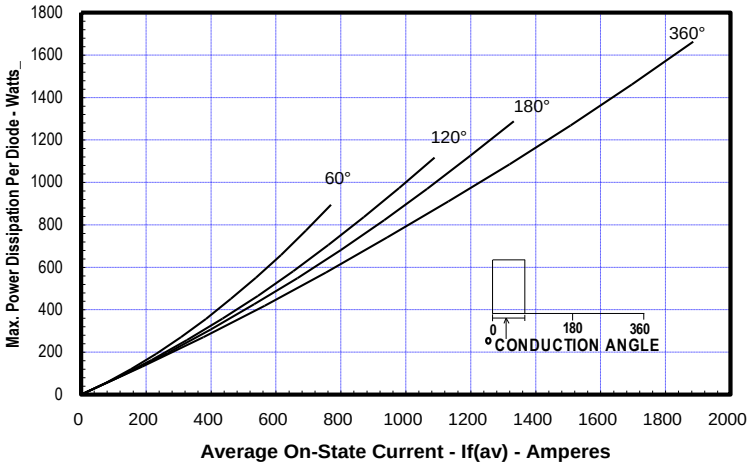
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



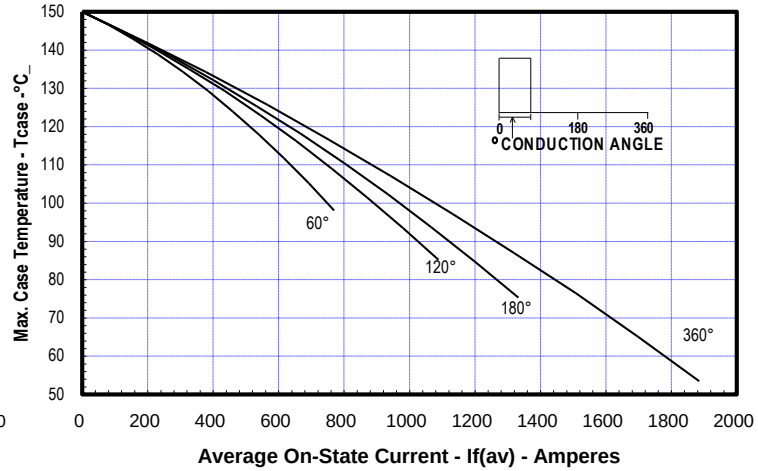
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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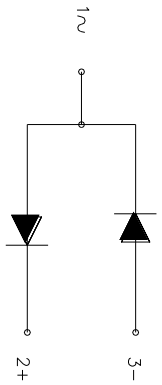

DIM.	INCHES	MILLIMETERS
A	7.80	198.1
B	4.00	101.6
C	2.68	68.1
D	6.44	163.6
E	3.44	87.4
F	.28	7.1
G	7.31	185.7
H	7.00	177.8
M	.281	7.1
N	.45	11.4
P	.54	13.7
Q	5.93	150.6
R	.19	4.8
T	.48	12.2
U	2.28	58
W	4.93	125.2
X	3.81	96.8
Z	2.00	50.8
AA	1.00	25.4
BB	.50	12.7
CC	1.00	25.4
DD	.406	10.3
EE	2.87	72.9
FF	.66	16.8