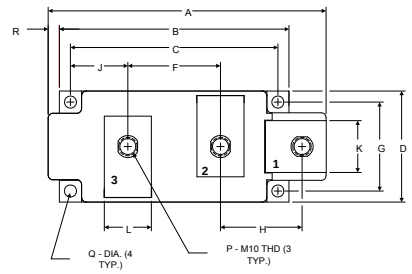
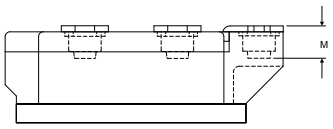
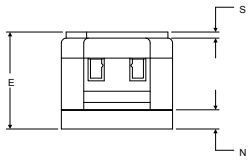
Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

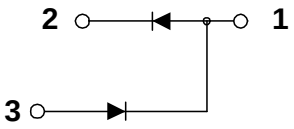
POW-R-BLOK™
Dual Diode Isolated Module
450 Amperes / Up to 4000 Volts

OUTLINE DRAWING

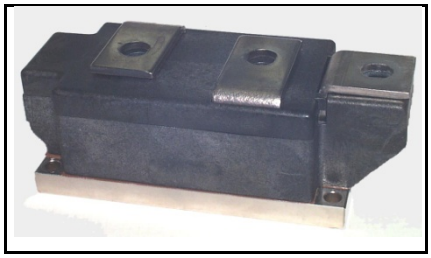








CONNECTION DIAGRAM



LD814045
Dual Diode POW-R-BLOK™ Module
450 Amperes / Up to 4000 Volts

LD81 Outline Dimensions

Dimension	Inches	Millimeters
A	5.91	150.0
B	4.88	124.0
C	4.41	112.0
D	2.36	60.0
E	2.05	52.0
F	1.97	50.0
G	1.89	48.0
H	1.73	44.0
J	1.22	31.0
K	1.10	28.0
L	1.00	25.4
M	0.69	17.5
N	0.39	10.0
P	M10 Metric	M10
Q	0.26 Dia.	6.5 Dia.
R	0.24	6.0
S	0.12	3.0
T	.110 x .032	2.5 x 0.8

Note: Dimensions are for reference only.

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:

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

Ordering Information:

Select the complete eight-digit module part number from the table below. Example: LD814045 is a 4000V, 450 Ampere Dual Diode Isolated *POW-R-BLOK™* Module.

Type	Voltage Volts (x100)	Current Amperes (x10)
LD81	40	45
	38	
	36	
	32	

Revision Date: 12/10/2008

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Absolute Maximum Ratings

Characteristics	Conditions	Symbol		Units
Repetitive Peak Reverse Blocking Voltage		V_{RRM}	up to 4000	V
Non-Repetitive Peak Reverse Blocking Voltage (t < 5 msec)		V_{RSM}	V_{RRM} + 100	V
RMS Forward Current	180° Conduction, T_C=107°C	$I_{F(RMS)}$	710	A
	180° Conduction, T_C=88°C	$I_{F(RMS)}$	900	A
Average Forward Current	180° Conduction, T_C=107°C	$I_{F(AV)}$	450	A
	180° Conduction, T_C=88°C	$I_{F(AV)}$	575	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, T_J=125°C,100% V_{RRM} reapplied	I_{FSM}	11,000	A
	60 Hz, T_J=25°C, No V_{RRM} reapplied	I_{FSM}	19,140	A
	50 Hz, T_J=125°C,100% V_{RRM} reapplied	I_{FSM}	10,040	A
	50 Hz, T_J=125°C, No V_{RRM} reapplied	I_{FSM}	15,050	A
	50 Hz, T_J=25°C, No V_{RRM} reapplied	I_{FSM}	17,450	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, T_J=125°C,100% V_{RRM} reapplied	I_{FSM}	8,830	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, T_J=125°C,100% V_{RRM} reapplied	I_{FSM}	6,940	A
I^2t for Fusing for One Cycle	60 Hz, T_J=125°C,100% V_{RRM} reapplied	I^2t	504,000	A^2 sec
	60 Hz, T_J=25°C, No V_{RRM} reapplied	I^2t	1.53×10^6	A^2 sec
	50 Hz, T_J=125°C,100% V_{RRM} reapplied	I^2t	504,000	A^2 sec
	50 Hz, T_J=125°C, No V_{RRM} reapplied	I^2t	1.13×10^6	A^2 sec
	50 Hz, T_J=25°C, No V_{RRM} reapplied	I^2t	1.52×10^6	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			55	in. – Lb.
			6	Nm
Max. Mounting Torque, M10 Terminal Screw			110	in. – Lb.
			12	Nm
Module Weight, Typical			1500	g
			3.30	lb
V Isolation @ 25C	60 Hz, t = 1 minute	V_{rms}	3600	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 the suitability of 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 4000V, T_J=150°C		50	mA
Peak On-State Voltage	V_{FM}	T_J= 150°C, I_{FM}= 1800 A		1.90	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 150°C, I = 15%$I_{F(AV)}$ to π$I_{F(AV)}$		0.85 0.55	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 150°C, I = π$I_{F(AV)}$ to I_{FSM}		0.85 0.55	V mΩ
V_{TM} Coefficients, Full Range		T_J = 150°C, I = 15%$I_{F(AV)}$ to I_{FSM} V_{TM} = A+ B Ln I +C I + D Sqrt I	A = B = C = D =	0.85 -1.517E-05 5.500E-04 1.702E-06	

Thermal Characteristics

Characteristics	Symbol				Max.	Units
Thermal Resistance, Junction to Case	$R_{ΘJ-C}$	Per Module, both conducting Per Junction, both conducting			0.0325 0.0650	°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 = 8.03E-04 K_2 = 1.03E-02 K_3 = 1.64E-02 K_4 = 3.75E-02	τ_1 = 3.39E-04 τ_2 = 3.15E-03 τ_3 = 1.06E-01 τ_4 = 2.066		
Thermal Resistance, Case to Sink Lubricated	$R_{ΘC-S}$	Per Module			0.01	°C/W

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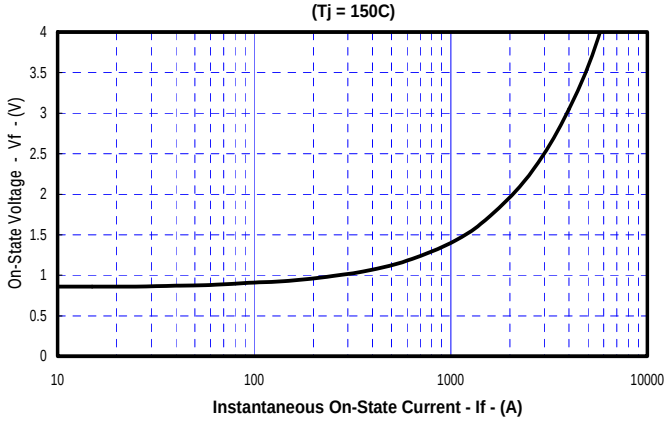
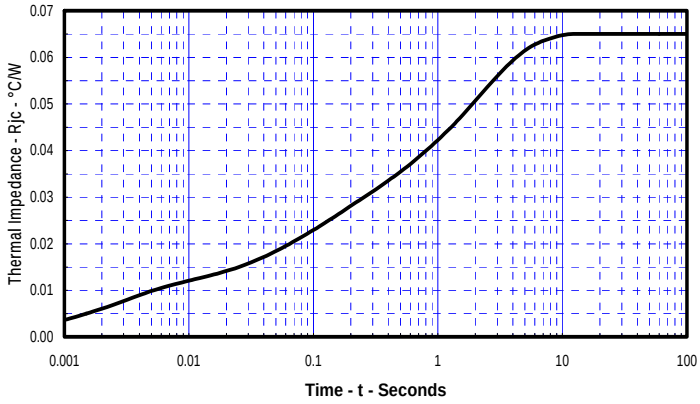
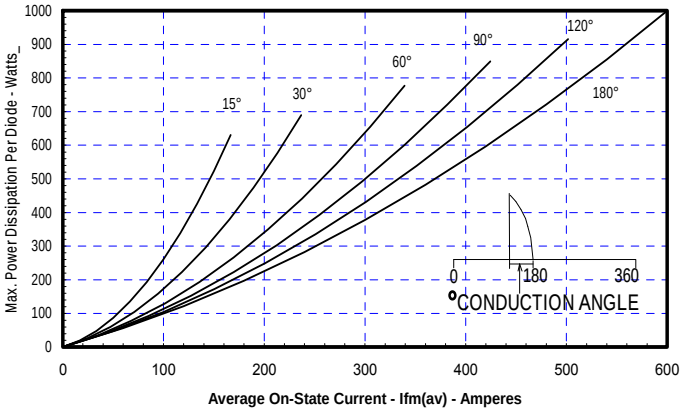
Maximum On-State Forward Voltage Drop
(Tj = 150C)



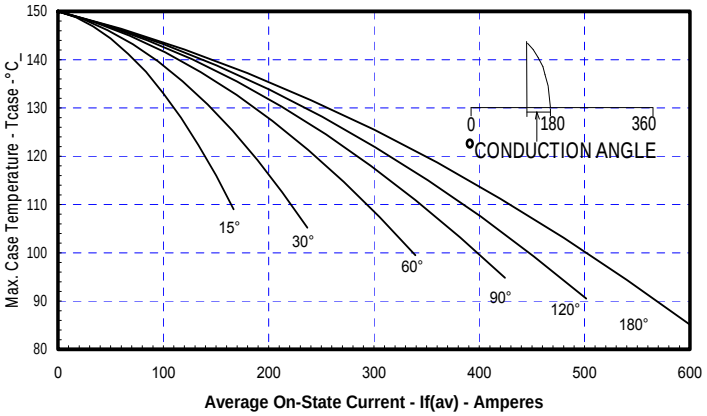
Maximum Transient Thermal Impedance
(Junction To Case)



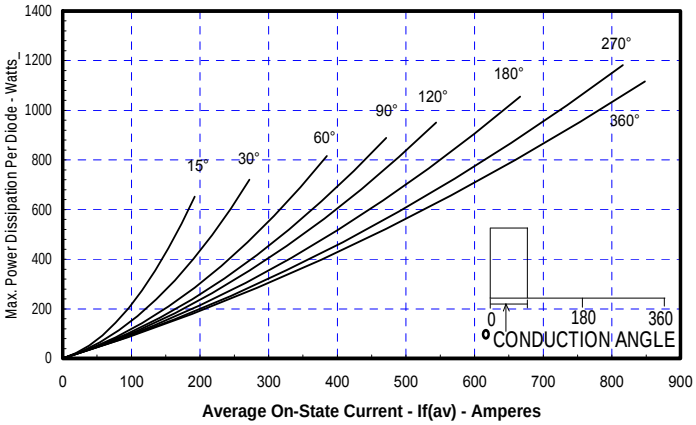
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



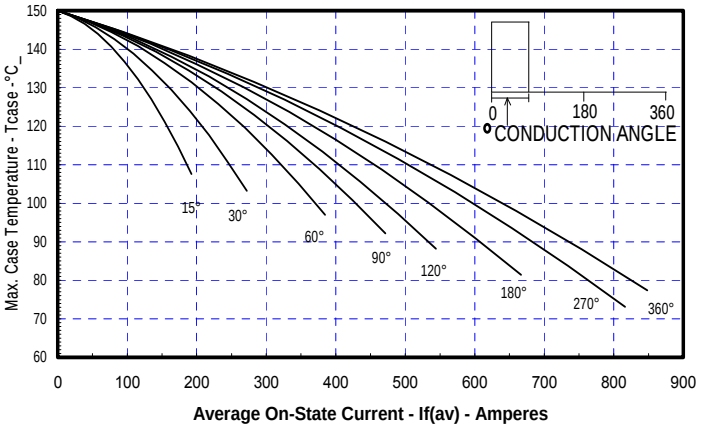
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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