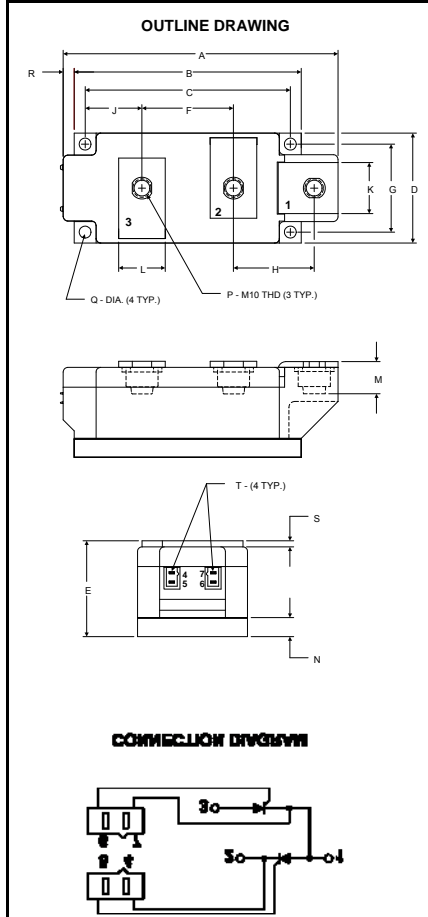


Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272  
www.pwr.com

**POW-R-BLOK™**  
**Dual SCR Isolated Module**  
**240 Amperes / Up to 4000 Volts**



**LD83\_24**  
**Dual SCR**  
**POW-R-BLOK™ Module**  
240 Amperes / 4000 Volts

**LD83 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.

**Ordering Information:**

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

Example: LD834024 is a 4000V, 240 Ampere Dual SCR Isolated POW-R-BLOK™ Module.

Type	Voltage Volts (x100)	Current Amperes (x10)
LD83	40 38 36	24

**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.

**Features:**

- Electrically Isolated Heatsinking
- Aluminum Nitride Isolator
- 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:**

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

**Absolute Maximum Ratings**

Characteristics	Conditions	Symbol		Units
Repetitive Peak Forward and Reverse Blocking Voltage		$V_{DRM}$ & $V_{RRM}$	up to 4000	V
Non-Repetitive Peak Blocking Voltage ( $t < 5$ msec)		$V_{RSM}$	$V_{RRM} + 100$	V
RMS Forward Current		$I_{T(RMS)}$	377	A
Average Forward Current	180° Conduction, $T_C=74^\circ\text{C}$	$I_{T(AV)}$	240	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_{jmax}$	$I_{TSM}$	5500	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_{jmax}$	$I_{TSM}$	5019	A
	60 Hz, No $V_{RRM}$ reapplied, $T_{jmax}$	$I_{TSM}$	8250	A
	50 Hz, No $V_{RRM}$ reapplied, $T_{jmax}$	$I_{TSM}$	7528	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied	$I_{TSM}$	4416	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied	$I_{TSM}$	3470	A
$I^2t$ for Fusing for One Cycle	60 Hz, 100% $V_{RRM}$ reapplied, $T_{jmax}$	$I^2t$	126,000	$\text{A}^2\text{sec}$
	50 Hz, 100% $V_{RRM}$ reapplied, $T_{jmax}$	$I^2t$	105,000	$\text{A}^2\text{sec}$
	60 Hz, No $V_{RRM}$ reapplied, $T_{jmax}$	$I^2t$	283,000	$\text{A}^2\text{sec}$
	50 Hz, No $V_{RRM}$ reapplied, $T_{jmax}$	$I^2t$	236,000	$\text{A}^2\text{sec}$
Maximum Rate-of-Rise of On-State Current, (Repetitive)	Per JEDEC Standard 397 5.2.2.6	$di/dt$	150	$\text{A}/\mu\text{s}$
Operating Temperature		$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature		$T_{stg}$	-40 to +150	$^\circ\text{C}$
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		$V_{rms}$	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.

**Electrical Characteristics, T<sub>J</sub>=25°C unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Forward Leakage Current	I <sub>DRM</sub>	Up to 4000V, T <sub>J</sub> =125°C		75	mA
Repetitive Peak Reverse Leakage Current	I <sub>RDM</sub>	Up to 4000V, T <sub>J</sub> =125°C		75	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>TM</sub> =1000A		3.5	V
Threshold Voltage, Low-level	V <sub>(TO)1</sub>	T <sub>J</sub> = 125°C, I = 15% I <sub>T(AV)</sub> to π I <sub>T(AV)</sub>		1.563	V
Slope Resistance, Low-level	r <sub>T1</sub>			2.141	mΩ
V <sub>TM</sub> Coefficients, Full Range		T <sub>J</sub> = 125°C, I = 10A to 6kA V <sub>TM</sub> = A + B Ln I + C I + D Sqrt I	A = B = C = D =	0.9479 0.03929 3.980 E-04 0.06093	
Minimum dV/dt	dV/dt	Exponential to V <sub>DRM</sub> T <sub>J</sub> =125°C, Gate Open	1000 Typ.		V/μs
Typical Turn-off Time	t <sub>q</sub>	V <sub>R</sub> = 100 V, di <sub>R</sub> /dt= 5 A/μs Reapplied dv/dt= 20V/μs Linear to 50% V <sub>DRM</sub>	250 Typ		μs
Gate Trigger Current	I <sub>GT</sub>	T <sub>J</sub> =25°C, V <sub>b</sub> =12V		200	mA
Gate Trigger Voltage	V <sub>GT</sub>	T <sub>J</sub> =25°C, V <sub>b</sub> =12V		3.0	Volts
Non-Triggering Gate Voltage	V <sub>GDM</sub>	T <sub>J</sub> =125°C, V <sub>b</sub> = ½ V <sub>DRM</sub>		0.25	Volts
Peak Forward Gate Current	I <sub>GTM</sub>			4.0	Amp
Peak Reverse Gate Voltage	V <sub>GDM</sub>			5	Volts

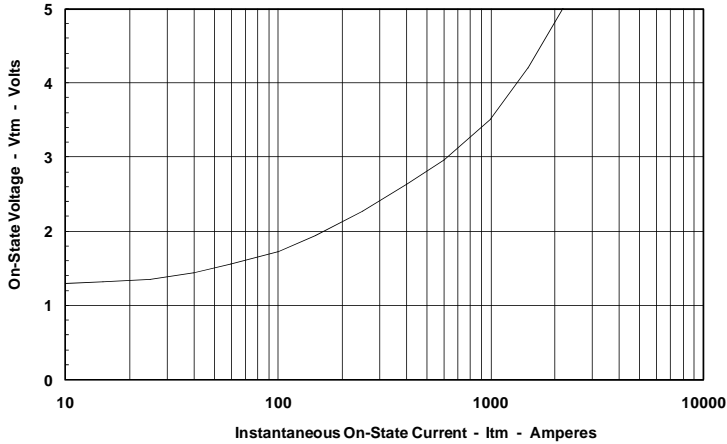
**Thermal Characteristics**

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	R <sub>ΘJ-C</sub>	Per Module, both conducting Per Junction, both conducting	0.0325 0.0650	°C/W °C/W
Thermal Impedance Coefficients	Z <sub>ΘJ-C</sub>	Z <sub>ΘJ-C</sub> = K <sub>1</sub> (1-exp(-t/τ <sub>1</sub> )) + K <sub>2</sub> (1-exp(-t/τ <sub>2</sub> )) + K <sub>3</sub> (1-exp(-t/τ <sub>3</sub> )) + K <sub>4</sub> (1-exp(-t/τ <sub>4</sub> ))	K <sub>1</sub> = 8.03E-04 K <sub>2</sub> = 1.03E-02 K <sub>3</sub> = 1.64E-02 K <sub>4</sub> = 3.75E-02	τ <sub>1</sub> = 3.39E-04 τ <sub>2</sub> = 3.15E-03 τ <sub>3</sub> = 0.106 τ <sub>4</sub> = 2.066
Thermal Resistance, Case to Sink Lubricated	R <sub>ΘC-S</sub>	Per Module	0.01	°C/W

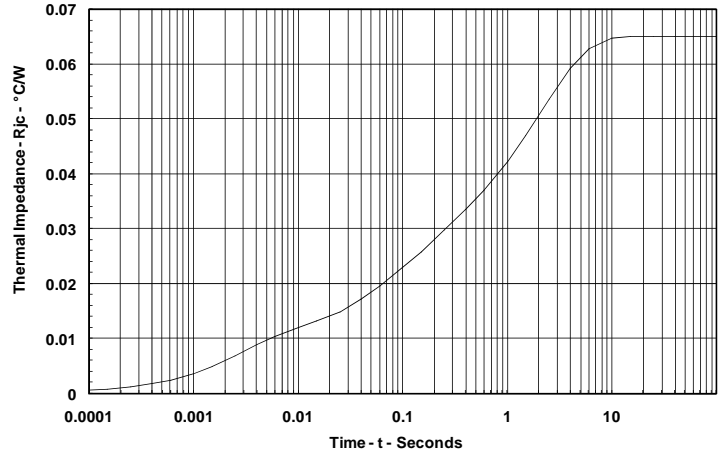
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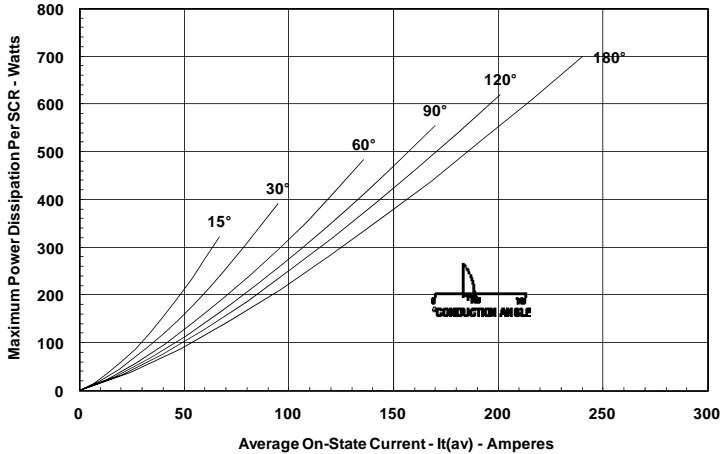
**Maximum On-State Forward Voltage Drop**  
(T<sub>j</sub> = 125 °C)



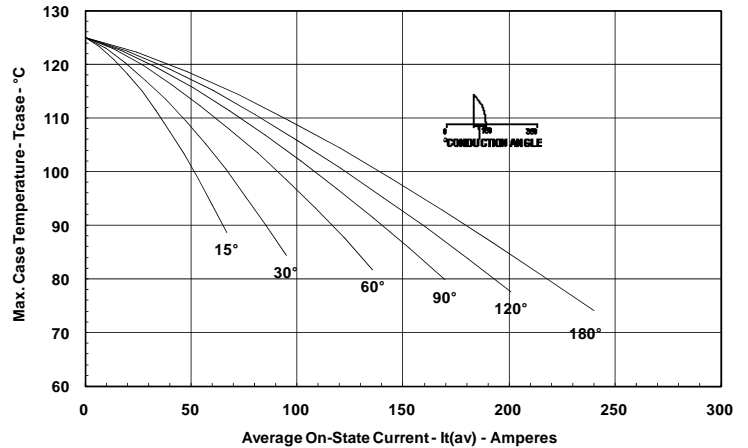
**Maximum Transient Thermal Impedance**  
(Junction to Case)



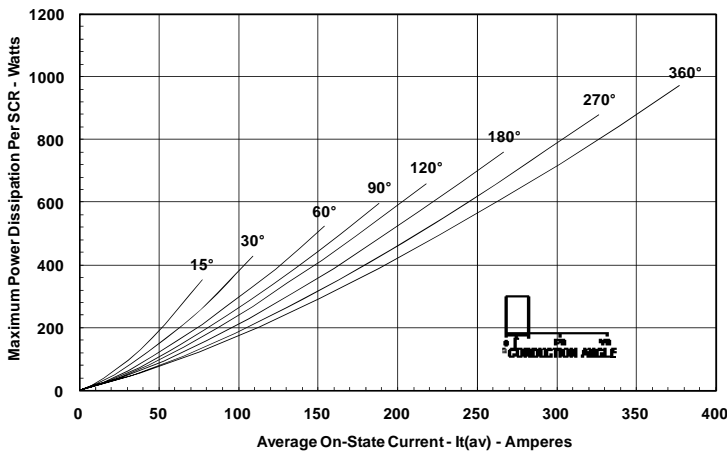
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
(Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
(Rectangular Waveform)



**Maximum Allowable Case Temperature**  
(Rectangular Waveform)

