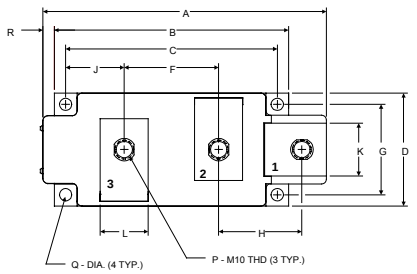
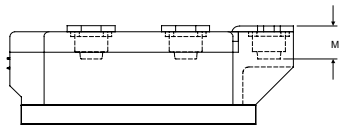
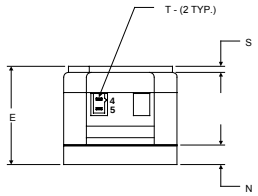
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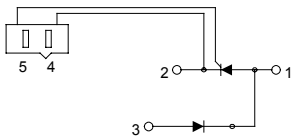
POW-R-BLOK™
Dual SCR/Diode Isolated Module
430 Amperes / Up to 2200 Volts

OUTLINE DRAWING









CONNECTION DIAGRAM



LD42__43
Dual SCR/Diode
POW-R-BLOK™ Module
430 Amperes / 1800-2200 Volts

LD42 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 SCR/Diode 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 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

Ordering Information:
Select the complete eight-digit module part number from the table below.
Example: LD421843 is a 1800 Volt, 430 Ampere Dual SCR Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes (x10)
LD42	18	43
	20	
	22	

Revision Date: 11/1/2001

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Absolute Maximum Ratings

Characteristics	Conditions	Symbol		Units
Repetitive Peak Forward and Reverse Blocking Voltage		V_{DRM} & V_{RRM}	up to 2200	V
Non-Repetitive Peak Blocking Voltage (t < 5 msec)		V_{RSM}	V_{RRM} + 100	V
RMS Forward Current	T_C=70°C	$I_{T(RMS)}$	800	A
Average Forward Current	180° Conduction, T_C=80°C	$I_{T(AV)}$	430	A
	180° Conduction, T_C=70°C	$I_{T(AV)}$	510	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied, T_j=25°C	I_{TSM}	14,000	A
	60 Hz, No V_{RRM} reapplied, T_j=25°C	I_{TSM}	16,000	A
	60 Hz, 100% V_{RRM} reapplied, T_j=125°C	I_{TSM}	12,000	A
	60 Hz, No V_{RRM} reapplied, T_j=125°C	I_{TSM}	14,000	A
	50 Hz, 100% V_{RRM} reapplied, T_j=25°C	I_{TSM}	12,000	A
	50 Hz, No V_{RRM} reapplied, T_j=25°C	I_{TSM}	14,000	A
	50 Hz, 100% V_{RRM} reapplied, T_j=125°C	I_{TSM}	10,000	A
	50 Hz, No V_{RRM} reapplied, T_j=125°C	I_{TSM}	12,000	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100%V_{RRM} reapplied, T_j=125C	I_{TSM}	8,600	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100%V_{RRM} reapplied,T_j=125C	I_{TSM}	7,500	A
I^2t for Fusing for One Cycle	8.3 milliseconds, T_j=25°C	I^2t	1.07×10^6	A^2 sec
	8.3 milliseconds, T_j=125°C	I^2t	0.82×10^6	A^2 sec
	10 milliseconds, T_j=25°C	I^2t	0.98×10^6	A^2 sec
	10 milliseconds, T_j=125°C	I^2t	0.72×10^6	A^2 sec
Maximum Rate-of-Rise of On-State Current, (Repetitive)	Per JEDEC Standard 397 5.2.2.6	di/dt	200	A/µs
Operating Temperature		T_J	-40 to +125	°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		V_{rms}	3000	V

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POW-R-BLOK™
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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 2200V, T_J=125°C		80	mA
Repetitive Peak Reverse Leakage Current	I_{RRM}	Up to 2200V, T_J=125°C		80	mA
Peak On-State Voltage	V_{TM} / V_{FM}	I_{TM} / I_{FM} =1500A		1.77	V
Threshold Voltage, Low-level	$V_{(TO)1}$	T_J = 125°C, I = 15%$I_{T(AV)}$ to π$I_{T(AV)}$		0.88	V
Slope Resistance, Low-level	r_{T1}	V_{TM} = $V_{(TO)1}$ + r_{T1} I		0.66	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_J = 125°C, I = π$I_{T(AV)}$ to I_{TSM}		1.34	V
Slope Resistance, High-level	r_{T2}	V_{TM} = $V_{(TO)2}$ + r_{T2} I		0.32	mΩ
V_{TM} Coefficients, Full Range		T_J = 125°C, I = 10A to 6kA	A =	0.766	
			B =	-1.046E-02	
		V_{TM} / V_{TM} = A+ B Ln I +C I + D Sqrt I	C =	1.805E-04	
			D =	2.00E-02	
Minimum dV/dt	dV/dt	Exponential to V_{DRM} T_j=125°C, Gate Open	1000 Typ.		V/µs
Gate Trigger Current	I_{GT}	T_j=25°C, V_D=12V		200	mA
Gate Trigger Voltage	V_{GT}	T_j=25°C, V_D=12V		3.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_j=125°C, V_D= ½ V_{DRM}		0.25	Volts
Peak Forward Gate Current	I_{GTM}			4.0	Amp
Peak Reverse Gate Voltage	V_{GRM}			5	Volts

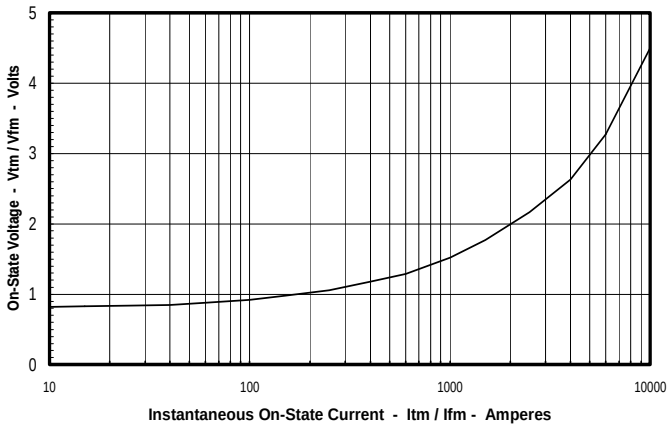
Thermal Characteristics

Characteristics	Symbol				Max.	Units
Thermal Resistance, Junction to Case	$R_{ΘJ-C}$	Per Module, both conducting			0.0325	°C/W
		Per Junction, both conducting			0.0650	°C/W
Thermal Impedance Coefficients	$Z_{ΘJ-C}$	$Z_{ΘJ-C}$= K_1 (1-exp(-t/τ_1))	K_1 = 8.03E-04	τ_1 = 3.39E-04		
		+ K_2 (1-exp(-t/τ_2))	K_2 = 1.03E-02	τ_2 = 3.15E-03		
		+ K_3 (1-exp(-t/τ_3))	K_3 = 1.64E-02	τ_3 = 0.106		
		+ K_4 (1-exp(-t/τ_4))	K_4 = 3.75E-02	τ_4 = 2.066		
Thermal Resistance, Case to Sink Lubricated	$R_{ΘC-S}$	Per Module			0.01	°C/W

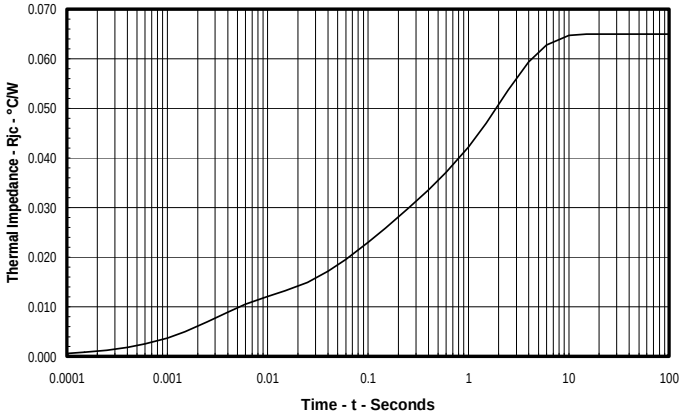
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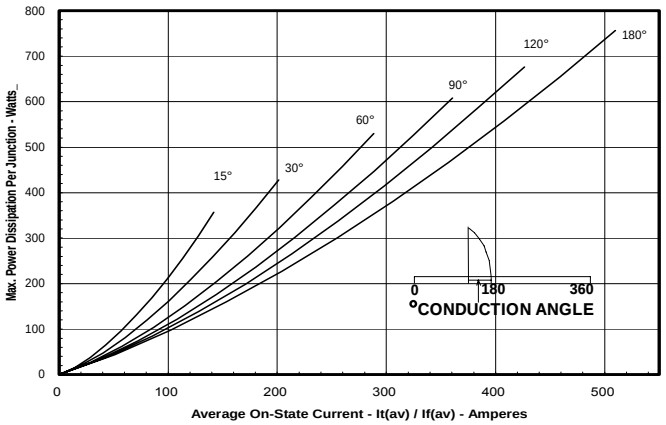
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



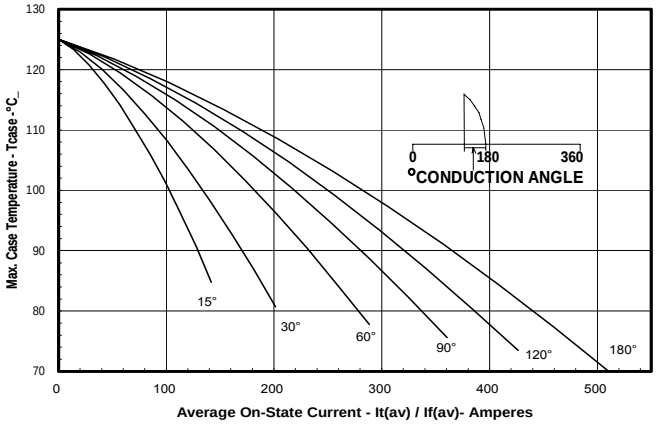
Maximum Transient Thermal Impedance
(Junction to Case, Per Junction)



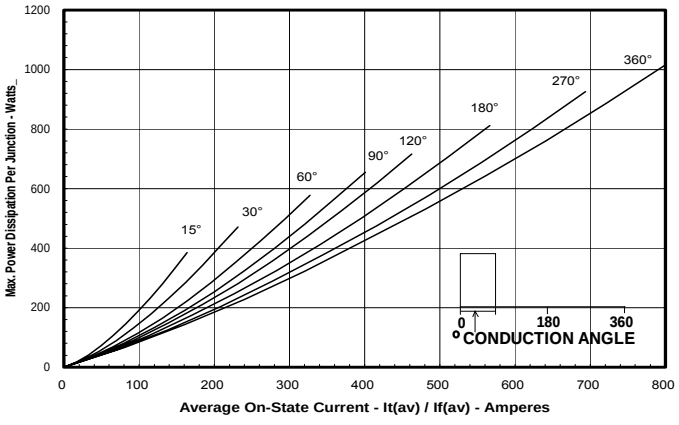
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



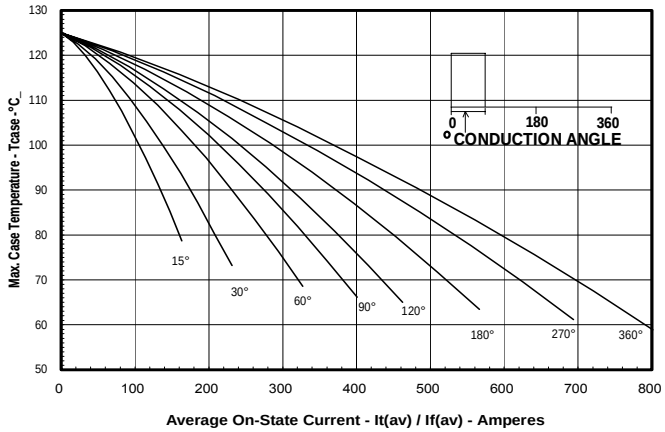
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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