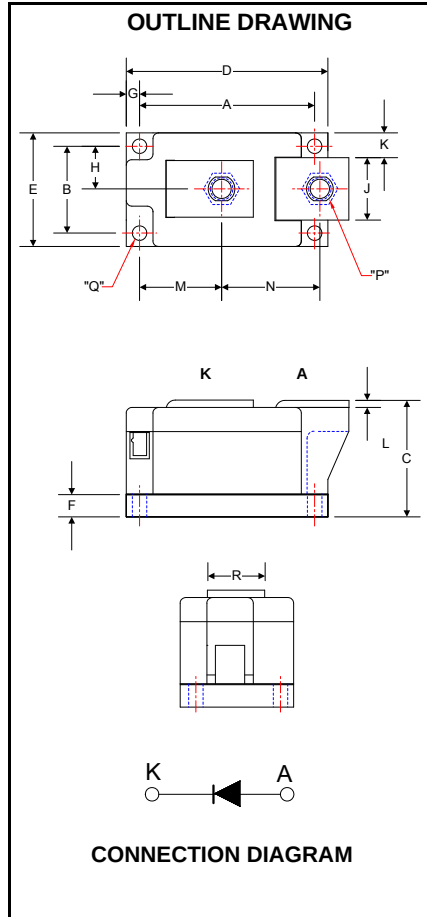


Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwr.com

POW-R-BLOK™ Single Diode Isolated Module 600 Amperes / Up to 2400 Volts



**LS41_60
Single Diode
POW-R-BLOK™ Module**
600 Amperes / 800-2400 Volts

LS41 Outline Dimensions

Dimension	Inches	Millimeters
A	3.15	80.0
B	1.50	38.0
C	2.05	52.1
D	3.62	92.0
E	1.97	50.0
F	0.39	9.9
G	0.24	6.1
H	0.75	19.0
J	0.99	25.1
K	0.48	12.2
L	0.12	3.1
M	1.45	36.8
N	1.76	44.7
P	M10 Metric	M10
Q	0.250 Dia.	6.35 Dia.
R	0.99	25.1

Note: Dimensions are for reference only.

Ordering Information:

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

Example: LS412460 is a 2400V, 600 Ampere Single Diode Isolated POW-R-BLOK™ Module.

Type	Voltage Volts (x100)	Current Amperes (x10)
LS41	08 10 12 Thru 24	60

Description:

Powerex Single 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

Absolute Maximum Ratings

Characteristics	Conditions	Symbol	Units	
Repetitive Peak Reverse Blocking Voltage		V_{RRM}	up to 2400	V
Non-Repetitive Peak Reverse Blocking Voltage ($t < 5$ msec)		V_{RSM}	$V_{RRM} + 100$	V
RMS Forward Current		$I_{F(RMS)}$	950	A
Average Forward Current	180° Conduction, $T_c=106^{\circ}\text{C}$	$I_{F(AV)}$	600	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	21000	A
	50 Hz, 100% V_{RRM} reapplied	I_{FSM}	19000	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	15,500	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	13,000	A
I^2t for Fusing for One Cycle	8.3 milliseconds	I^2t	1,840,000	A^2sec
	10 milliseconds	I^2t	1,810,000	A^2sec
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			55 6	in. – Lb. Nm
Max. Mounting Torque, M10 Terminal Screw			110 12	in. – Lb. Nm
Module Weight, Typical			816 1.80	g lb
V Isolation @ 25C		V_{rms}	3000	V

Electrical Characteristics, $T_J=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	Up to 2400V, $T_J=150^\circ\text{C}$		40	mA
Peak On-State Voltage	V_{FM}	$T_J=150^\circ\text{C}$, $I_{FM}=1800\text{A}$		1.19	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 150^\circ\text{C}$, $I = 15\%I_{F(AV)}$ to $\pi I_{F(AV)}$		0.747	V
Slope Resistance, Low-level	r_{T1}			0.243	$\text{m}\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_J = 150^\circ\text{C}$, $I = \pi I_{F(AV)}$ to I_{FSM}		0.914	V
Slope Resistance, High-level	r_{T2}			0.145	$\text{m}\Omega$
V_{TM} Coefficients, Full Range		$T_J = 150^\circ\text{C}$, $I = 15\%I_{F(AV)}$ to I_{FSM}	A =	5.05E-01	
			B =	3.44E-02	
			C =	8.13E-05	
			D =	6.57E-03	

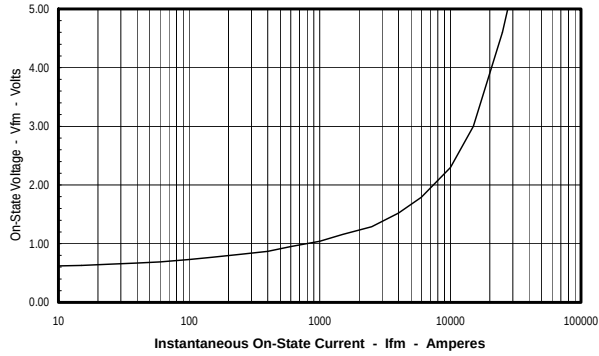
Thermal Characteristics

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	$R_{\theta J-C}$	Per Module / Junction	0.0650	$^\circ\text{C/W}$
Thermal Impedance Coefficients	$Z_{\theta J-C}$	$Z_{\theta J-C} = K_1 (1-\exp(-t/\tau_1))$	$K_1 = 8.03\text{E-}04$	$\tau_1 = 3.39\text{E-}04$
		+ $K_2 (1-\exp(-t/\tau_2))$	$K_2 = 1.03\text{E-}02$	$\tau_2 = 3.15\text{E-}03$
		+ $K_3 (1-\exp(-t/\tau_3))$	$K_3 = 1.64\text{E-}02$	$\tau_3 = 1.06\text{E-}01$
		+ $K_4 (1-\exp(-t/\tau_4))$	$K_4 = 3.75\text{E-}02$	$\tau_4 = 2.066$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta C-S}$	Per Module	0.02	$^\circ\text{C/W}$

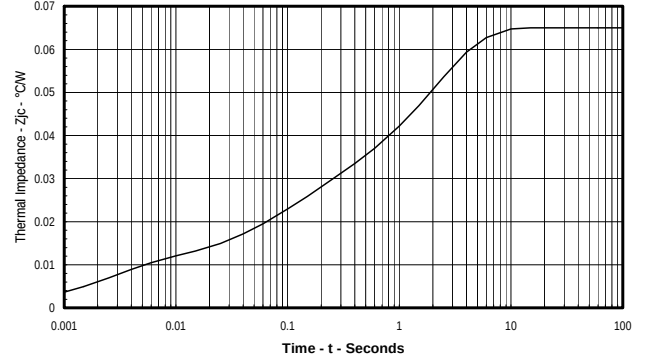
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POW-R-BLOCK™ Single Diode Isolated Module 600 Amperes / Up to 2400 Volts

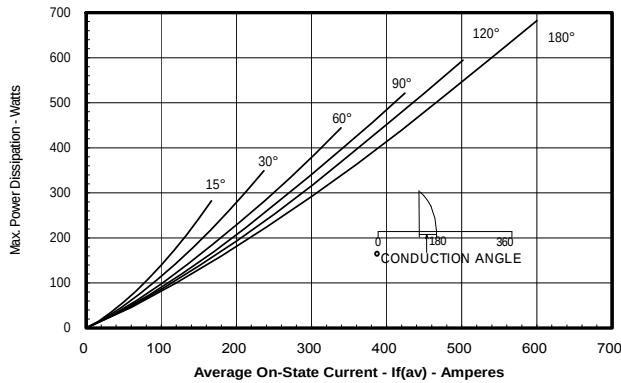
Maximum On-State Forward Voltage Drop
($T_J = 150^\circ\text{C}$)



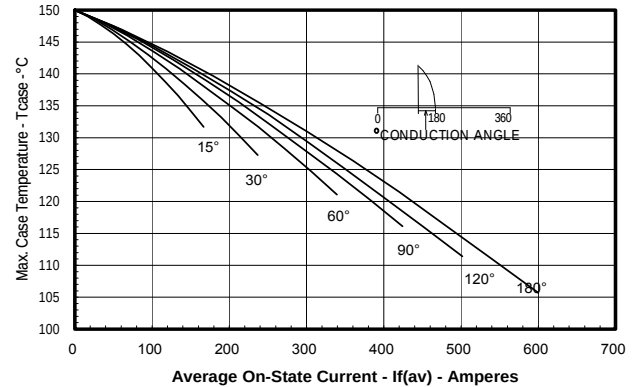
Maximum Transient Thermal Impedance
(Junction to Case)



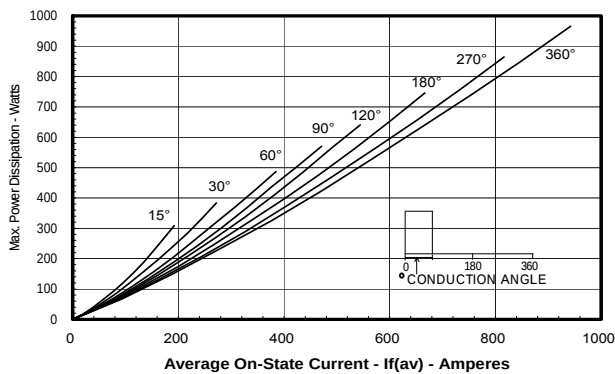
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



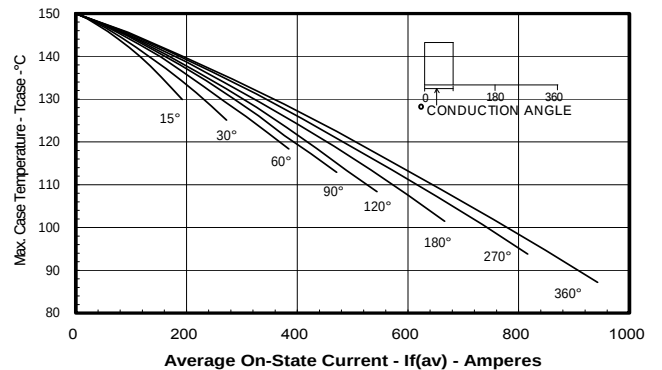
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



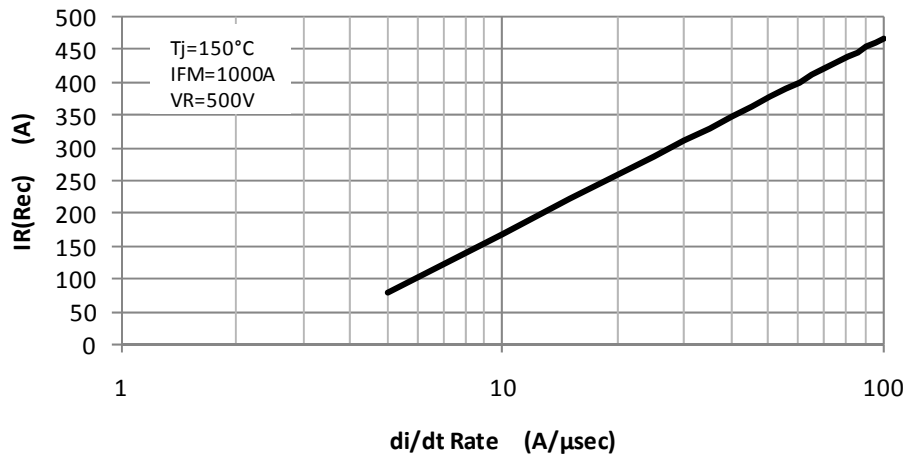
Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



LS41__60 Reverse Recovery Current



LS41__60 Reverse Recovery Charge

