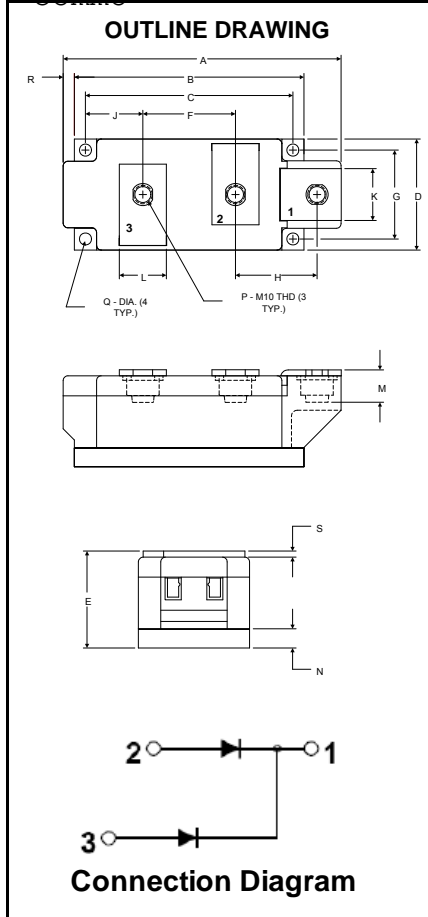


Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwr.com

POW-R-BLOK™
Fast Recovery Diode Isolated Module
Common Cathode: 240 Amperes / Up to 4000 Volts



LC814024
Fast Recovery Diode Pow-R-Blok™
Common Cathode
240 Amperes to 4000 Volts

LC81 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 ten-digit module part number from the table below.
Example: LC8140240A is a 4000V, 240 Ampere, Common Cathode, Fast Recovery Diode Isolated POW-R-BLOK™ Module.

Type	Voltage Volts (x100)	Current Amperes (x10)	Reverse Recovery Time Code
LC81	40 38 36	24	0A

Description:

Powerex Fast Recovery Common Cathode 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



LC814024

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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		$I_{F(RMS)}$	377	A
Average Forward Current	180° Conduction, $T_C=73^{\circ}C$	$I_{F(AV)}$	240	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	5,670	A
	50 Hz, No V_{RRM} reapplied	I_{FSM}	8,250	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	4,550	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied	I_{FSM}	3,575	A
I^2t for Fusing for One Cycle	8.3 milliseconds, 100% V_{RRM} reapplied	I^2t	133,950	$A^2 \text{ sec}$
	10 milliseconds, No V_{RRM} reapplied	I^2t	340,000	$A^2 \text{ sec}$
Operating Temperature		T_J	-40 to +130	$^{\circ}C$
Storage Temperature		T_{stg}	-40 to +150	$^{\circ}C$
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			1500 3.30	g 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_J=25°C unless otherwise specified

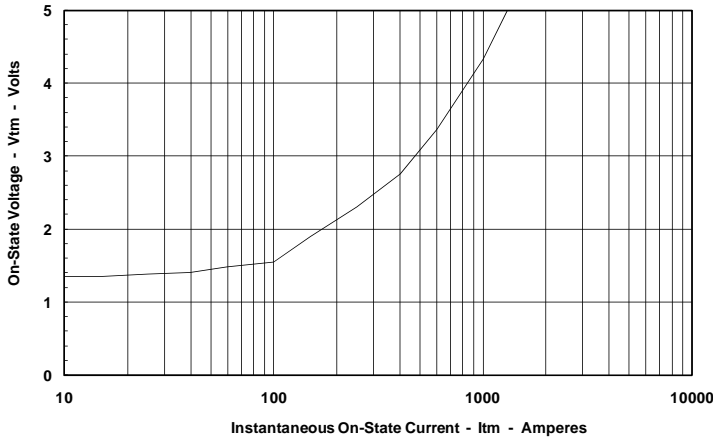
Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Reverse Leakage Current	I _{RRM}	Up to 4000V, T _J =130°C		50	mA
Peak On-State Voltage	V _{FM}	T _J = 25°C, I _{FM} = 625 A		3.00	V
Threshold Voltage, Low-level	V _{(TO)1}	T _J = 130°C, I = 15%I _{F(AV)} to πI _{F(AV)}		1.306	V
Slope Resistance, Low-level	r _{T1}			3.50	mΩ
Threshold Voltage, High-level	V _{(TO)2}	T _J = 130°C, I = πI _{F(AV)} to I _{FSM}		3.113	V
Slope Resistance, High-level	r _{T2}			1.40	mΩ
V _{TM} Coefficients, Full Range		T _J = 130°C, I = 15%I _{F(AV)} to I _{FSM}	A =	1.700	
			B =	-3.65E-01	
		V _{TM} = A+ B Ln I +C I + D Sqrt I	C =	4.14E-06	
			D =	1.63E-01	
Reverse Recovery Time	T _{rr}	T _J = 125°C, I = 1500A, di/dt = -2.5A/us		10	us
		T _J = 125°C, I = 600A, di/dt = -30A/us		6 (Typ.)	us
		T _J = 25°C, I = 600A, di/dt = -30A/us		4 (Typ.)	us
		T _J = 125°C, I = 600A, di/dt = -100A/us		5 (Typ.)	us
		T _J = 25°C, I = 600A, di/dt = -100A/us		3.5 (Typ.)	us

Thermal Characteristics

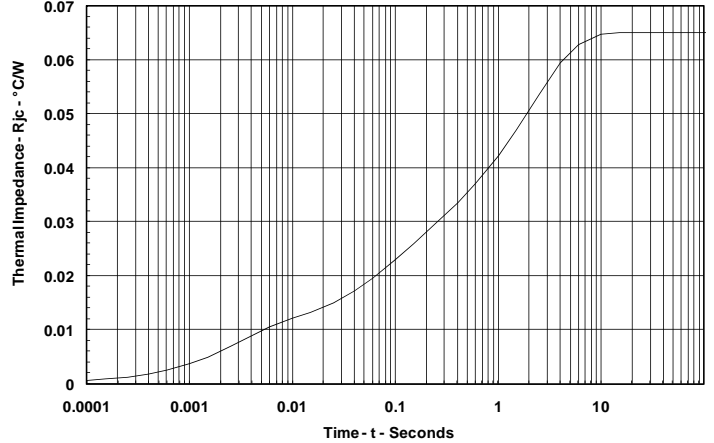
Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	R _{ΘJ-C}	Per Module, both conducting	0.0325	°C/W
		Per Junction, both conducting	0.0650	°C/W
Thermal Impedance Coefficients	Z _{ΘJ-C}	Z _{ΘJ-C} = K ₁ (1-exp(-t/τ ₁))	K ₁ = 8.03E-04	τ ₁ = 3.39E-04
		+ K ₂ (1-exp(-t/τ ₂))	K ₂ = 1.03E-02	τ ₂ = 3.15E-03
		+ K ₃ (1-exp(-t/τ ₃))	K ₃ = 1.64E-02	τ ₃ = 1.06E-01
		+ 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

Note: Curves shown below are for conduction losses only. They do not include switching losses.

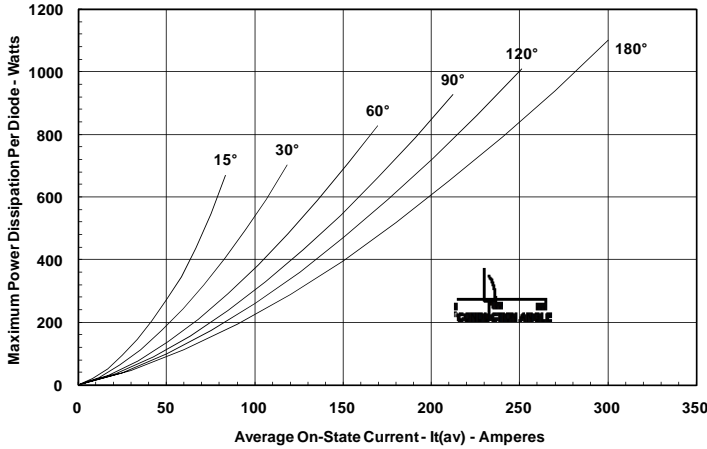
Maximum On-State Forward Voltage Drop
(T_j = 130 °C)



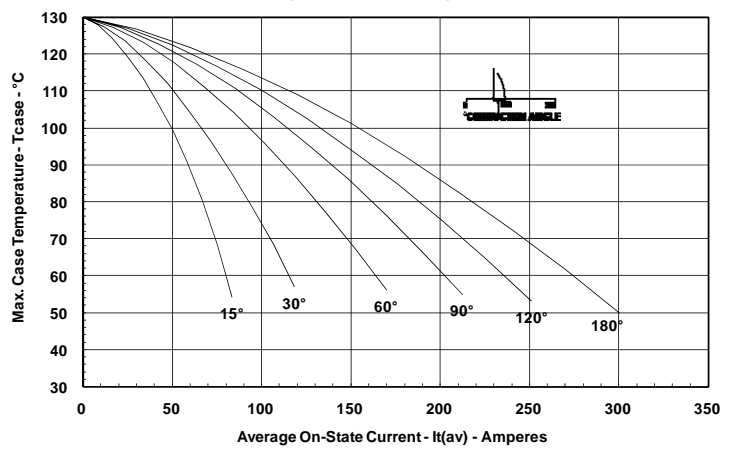
Maximum Transient Thermal Impedance
(Junction to Case)



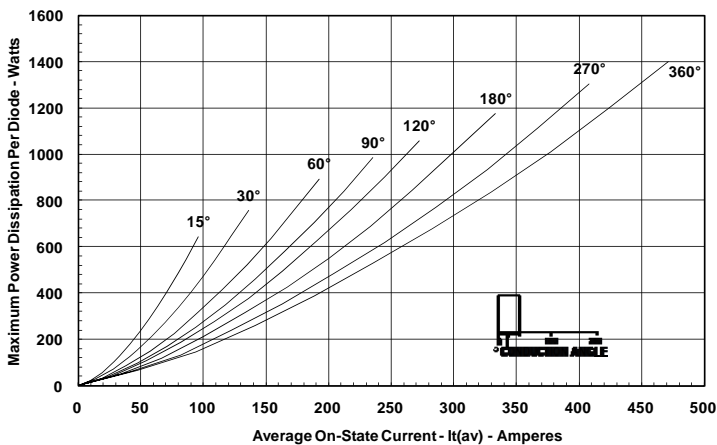
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



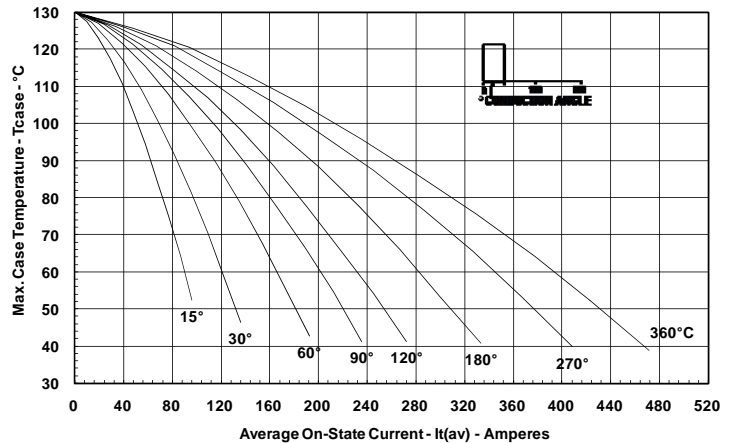
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



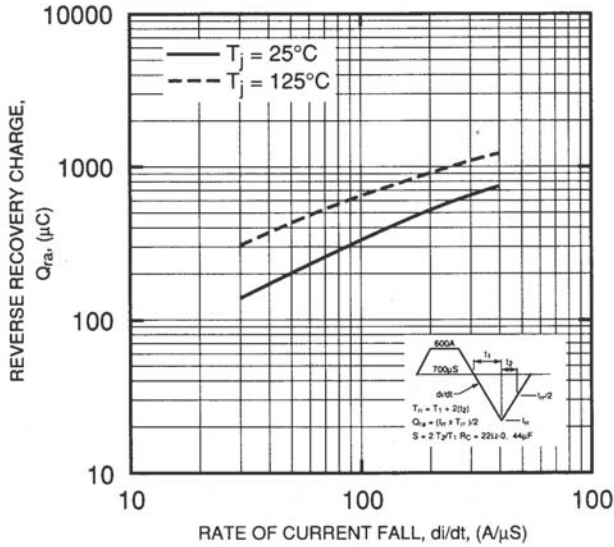
Maximum On-State Power Dissipation
(Rectangular Waveform)



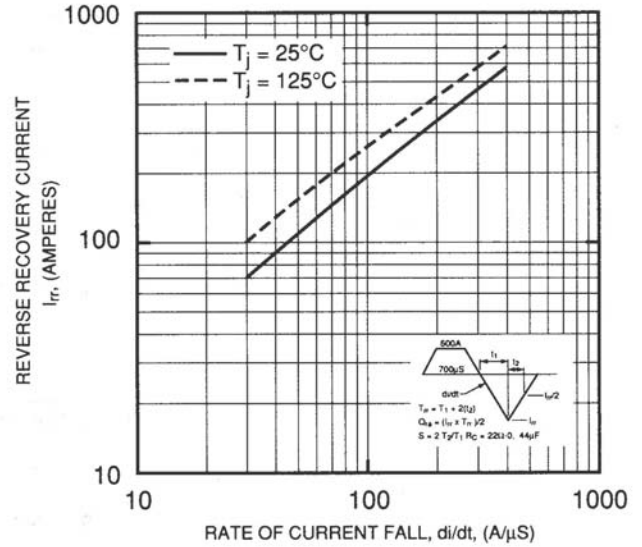
Maximum Allowable Case Temperature
(Rectangular Waveform)



Q_{rr} PERFORMANCE CURVES (TYPICAL)



I_{rr} PERFORMANCE CURVES (TYPICAL)



T_{rr} PERFORMANCE CURVES (TYPICAL)

