

**CD41\_\_99A, CS41\_\_99A  
CN41\_\_99A, CC41\_\_99A  
Dual & Single Diode Isolated  
POW-R-BLOK™ Module  
100 Amperes / Up to 1600 Volts**

#### Description:

Powerex Dual Diode & 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
- DBC Alumina (Al<sub>2</sub>O<sub>3</sub>) Insulator
- Copper Baseplate
- Low Thermal Impedance for Improved Current Capability
- UL Recognized (E78240)

#### 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
- Lighting Control
- Heat & Temperature Control
- Welders

#### Outline Dimensions

Dimension	Inches	Millimeters
A	3.62	92
B	0.83	21
C	3.15	80
D	1.18	30
F	0.59	15
G	0.79	20
H	0.79	20
M	1.14	29
N	0.25	6.3
P	0.94	24
R	0.71	18
T	0.25	6.3
U	M5	M5

Note: Dimensions are for reference only.

#### Ordering Information:

Select the complete nine digit module part number from the table below. Example: CD411699A is a 1600 Volt, 100 Ampere Dual Diode Isolated POW-R-BLOK™ Module

Type	Voltage Volts (x100)	Current Amperes (x1)
CD41	08	99 (100A)
CN41	12	
CC41	16	
CS41		

**Absolute Maximum Ratings**

Characteristics	Conditions	Symbol	Units	
Repetitive Peak Reverse Blocking Voltage		$V_{RRM}$	up to 1600	V
Non-Repetitive Peak Reverse Blocking Voltage		$V_{RSM}$	$V_{RRM} + 100$	V
<i>(t &lt; 5 msec)</i>				
RMS Forward Current	DC Conduction, $T_C=90^\circ\text{C}$	$I_{F(RMS)}$	157	A
Average Forward Current	180° Conduction, $T_C=100^\circ\text{C}$	$I_{F(AV)}$	100	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	1,780	A
	60 Hz, No $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	2,110	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	1,700	A
	50 Hz, No $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	2,020	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	1,310	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	1,250	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	940	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I_{FSM}$	900	A
$I^2t$ for Fusing for One Cycle	8.3 ms, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I^2t$	13,190	$\text{A}^2 \text{sec}$
	8.3 ms, No $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I^2t$	18,650	$\text{A}^2 \text{sec}$
	10 ms, 100% $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I^2t$	14,450	$\text{A}^2 \text{sec}$
	10 ms, No $V_{RRM}$ reapplied, $T_J = 150^\circ\text{C}$	$I^2t$	20,430	$\text{A}^2 \text{sec}$
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 on Terminals			25	in. – Lb.
			3	Nm
Max. Mounting Torque, Module to Heatsink			44	in. – Lb.
			5	Nm
Module Weight, Typical			110	g
			3.88	Oz
V Isolation @ 25C	50-60 Hz, 1 second	$V_{rms}$	3500	V
Circuit To Base, All Terminals Shorted Together				

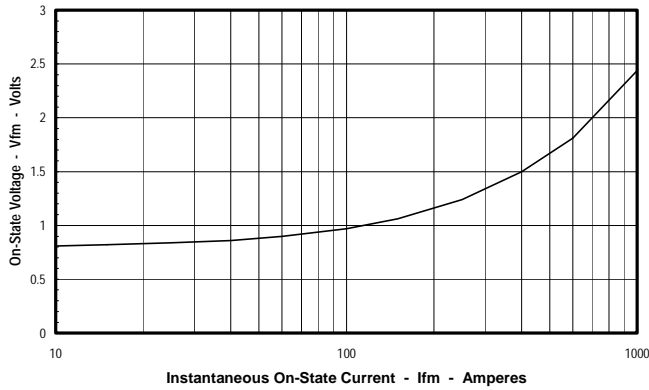
**Electrical Characteristics, T<sub>J</sub>=25°C unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Reverse Leakage Current	I <sub>RRM</sub>	Up to 1600V, T <sub>J</sub> =150°C		10	mA
Peak On-State Voltage	V <sub>FM</sub>	T <sub>J</sub> =25°C, I <sub>FM</sub> =315A, 180° Conduction		1.45	V
Threshold Voltage, Low-level	V <sub>(FO)1</sub>	T <sub>J</sub> = 150°C, I = 16.7% x πI <sub>F(AV)</sub> to πI <sub>F(AV)</sub>		0.79	V
Slope Resistance, Low-level	Γ <sub>T1</sub>			1.78	mΩ
Threshold Voltage, High-level	V <sub>(FO)2</sub>	T <sub>J</sub> = 150°C, I = πI <sub>F(AV)</sub> to I <sub>FSM</sub>		0.87	V
Slope Resistance, High-level	Γ <sub>T2</sub>			1.57	mΩ
V <sub>TM</sub> Coefficients, Full Range		T <sub>J</sub> = 150°C, I = 15%I <sub>F(AV)</sub> to I <sub>FSM</sub>	A =	7.72E-01	
			B =	1.22E-02	
		V <sub>TM</sub> = A + B Ln I + C I + D Sqrt I	C =	1.57E-03	
			D =	-2.76E-05	

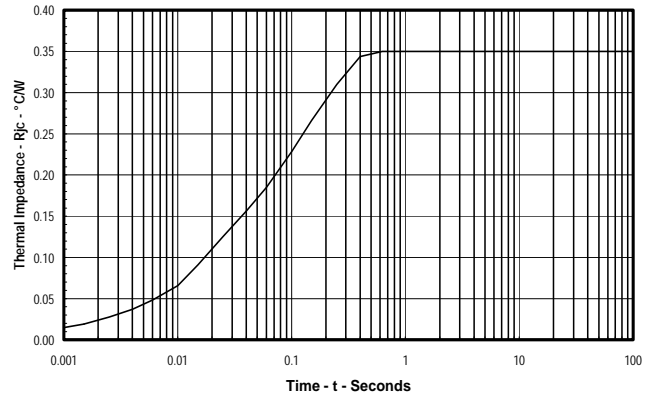
**Thermal Characteristics**

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	R <sub>θJ-C</sub>	Per Module, both conducting Per Junction, both conducting	0.175 0.35	°C/W °C/W
Thermal Impedance Coefficients	Z <sub>θJ-C</sub>	$Z_{\theta J-C} = K_1 (1 - \exp(-t/\tau_1))$ + $K_2 (1 - \exp(-t/\tau_2))$ + $K_3 (1 - \exp(-t/\tau_3))$ + $K_4 (1 - \exp(-t/\tau_4))$	K <sub>1</sub> = 9.82 E+1 K <sub>2</sub> = -1.11 E+2 K <sub>3</sub> = 1.32 E+1 K <sub>4</sub> = 2.72 E-1	τ <sub>1</sub> = 4.60 E-3 τ <sub>2</sub> = 4.65 E-3 τ <sub>3</sub> = 5.05 E-3 τ <sub>4</sub> = 0.1398
Thermal Resistance, Case to Sink Lubricated	R <sub>θC-S</sub>	Per Module	0.1	°C/W

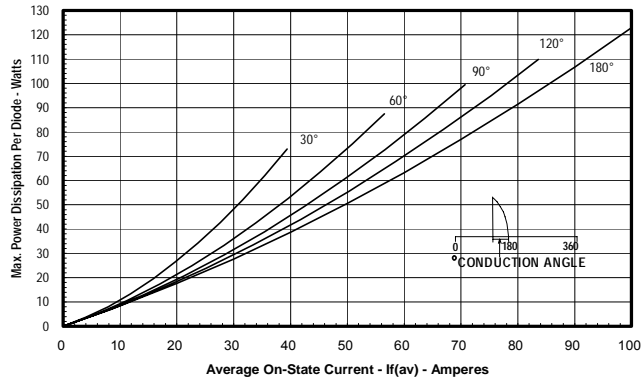
**Maximum On-State Forward Voltage Drop**  
( $T_j = 150^\circ\text{C}$ )



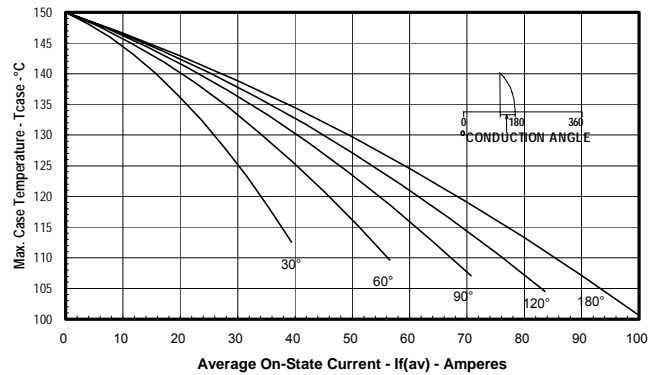
**Maximum Transient Thermal Impedance**  
(Junction to Case)



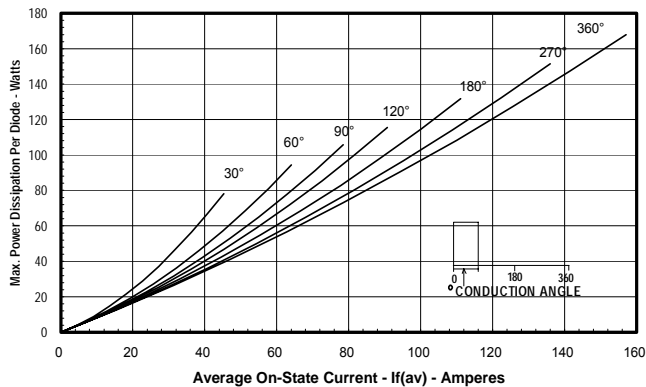
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



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



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



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

