

**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 (Al₂O₃) 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
(t < 5 msec)				
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	A^2sec
	8.3 ms, No V_{RRM} reapplied, $T_J = 150^\circ\text{C}$	I^2t	18,650	A^2sec
	10 ms, 100% V_{RRM} reapplied, $T_J = 150^\circ\text{C}$	I^2t	14,450	A^2sec
	10 ms, No V_{RRM} reapplied, $T_J = 150^\circ\text{C}$	I^2t	20,430	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 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				

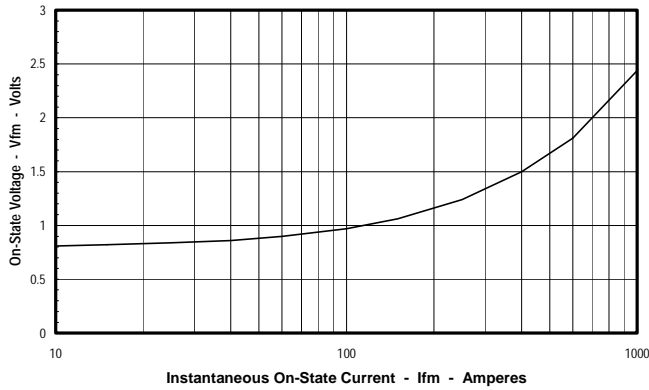
Electrical Characteristics, T_J=25°C unless otherwise specified

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

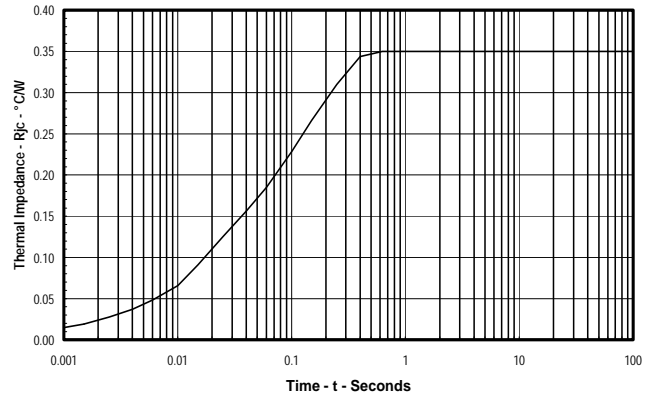
Thermal Characteristics

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

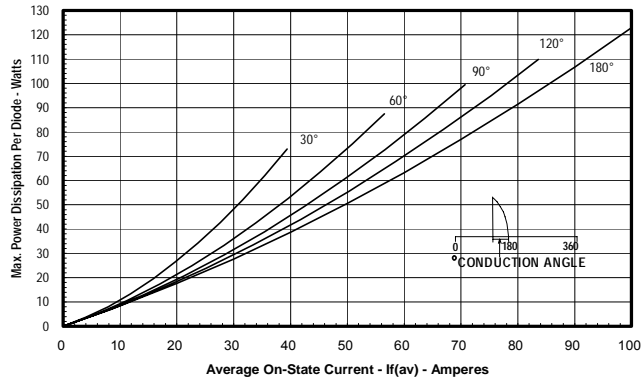
Maximum On-State Forward Voltage Drop
($T_j = 150^\circ\text{C}$)



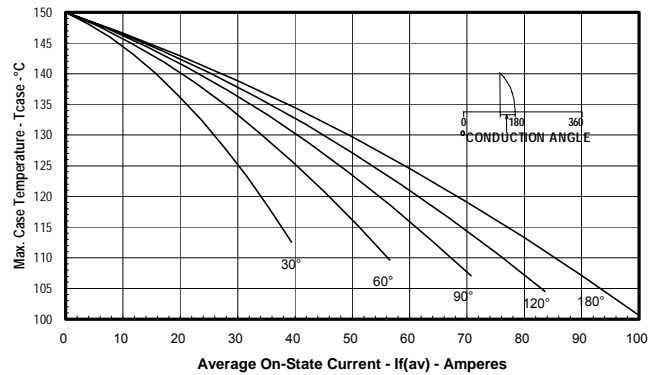
Maximum Transient Thermal Impedance
(Junction to Case)



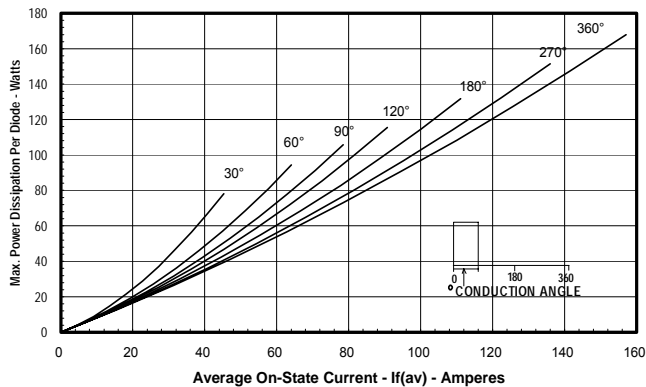
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

