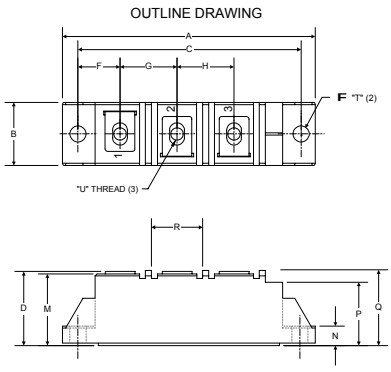
CD41__99, CS41__99
CN41__99, CC41__99

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

POW-R-BLOK™
Dual & Single Diode Isolated Module
100 Amperes / Up to 1600 Volts



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Outline Dimensions

Dimension	Inches	Millimeters
A	3.62	92
B	0.81	20.5
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	0.24	6.1
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 eight digit module part number from the table below.
Example: CD411699 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		

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_2O_3) Insulator
- Glass Passivated Chips
- DBC Alumina (Al_2O_3) 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

Revision Date: 11/1/2001

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Absolute Maximum Ratings

Characteristics	Conditions	Symbol		Units
Repetitive Peak Reverse Blocking Voltage		V_{RRM}	up to 1600	V
Non-Repetitive Peak Reverse Blocking Voltage (t < 5 msec)		V_{RSM}	V_{RRM} + 100	V
RMS Forward Current	DC Conduction, T_C=90°C	$I_{F(RMS)}$	157	A
Average Forward Current	180° Conduction, T_C=100°C	$I_{F(AV)}$	100	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied, T_J = 150°C	I_{FSM}	1,780	A
	60 Hz, No V_{RRM} reapplied, T_J = 150°C	I_{FSM}	2,110	A
	50 Hz, 100% V_{RRM} reapplied, T_J = 150°C	I_{FSM}	1,700	A
	50 Hz, No V_{RRM} reapplied, T_J = 150°C	I_{FSM}	2,020	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied, T_J = 150°C	I_{FSM}	1,310	A
	50 Hz, 100% V_{RRM} reapplied, T_J = 150°C	I_{FSM}	1,250	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} reapplied, T_J = 150°C	I_{FSM}	940	A
	50 Hz, 100% V_{RRM} reapplied, T_J = 150°C	I_{FSM}	900	A
I^2t for Fusing for One Cycle	8.3 ms, 100% V_{RRM} reapplied, T_J = 150°C	I^2t	13,190	A^2 sec
	8.3 ms, No V_{RRM} reapplied, T_J = 150°C	I^2t	18,650	A^2 sec
	10 ms, 100% V_{RRM} reapplied, T_J = 150°C	I^2t	14,450	A^2 sec
	10 ms, No V_{RRM} reapplied, T_J = 150°C	I^2t	20,430	A^2 sec
Operating Temperature		T_J	-40 to +150	°C
Storage Temperature		T_{stg}	-40 to +150	°C
Max. Mounting Torque, M6 Mounting Screw on Terminals			25 3	in. – Lb. Nm
Max. Mounting Torque, Module to Heatsink			44 5	in. – Lb. Nm
Module Weight, Typical			83 3	g Oz
V Isolation @ 25C Circuit To Base, All Terminals Shorted Together	50-60 Hz, 1 second	V_{rms}	3500	V

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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 $\pi I_{F(AV)}$ to $\pi I_{F(AV)}$		0.79	V
Slope Resistance, Low-level	r_{T1}			1.78	mΩ
Threshold Voltage, High-level	$V_{(FO)2}$	T_J = 150°C, I = $\pi I_{F(AV)}$ to I_{FSM}		0.87	V
Slope Resistance, High-level	r_{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	$R_{\Theta J-C}$	Per Module, both conducting			0.175	°C/W
		Per Junction, both conducting			0.35	°C/W
Thermal Impedance Coefficients	$Z_{\Theta J-C}$	$Z_{\Theta J-C}$= K_1 (1-exp(-t/τ_1))	K_1 = 9.82 E+1	τ_1 = 4.60 E-3		
		+ K_2 (1-exp(-t/τ_2))	K_2 = -1.11 E+2	τ_2 = 4.65 E-3		
		+ K_3 (1-exp(-t/τ_3))	K_3 = 1.32 E+1	τ_3 = 5.05 E-3		
		+ K_4 (1-exp(-t/τ_4))	K_4 = 2.72 E-1	τ_4 = 0.1398		
Thermal Resistance, Case to Sink Lubricated	$R_{\Theta C-S}$	Per Module			0.1	°C/W

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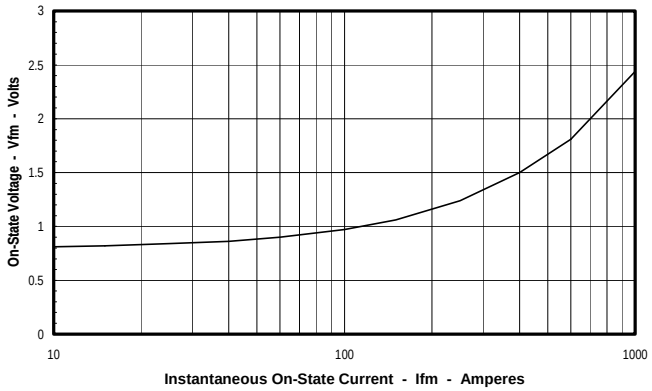
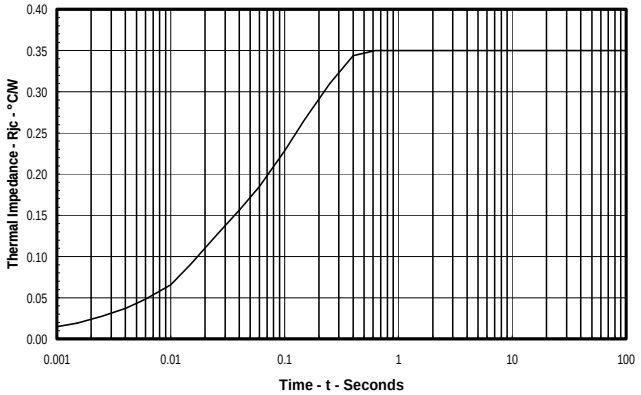
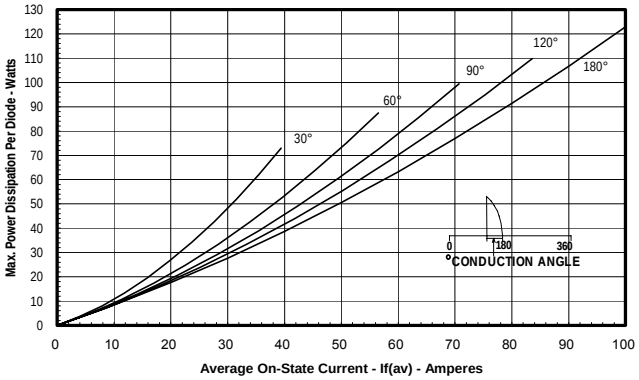
Maximum On-State Forward Voltage Drop
(Tj = 150 °C)



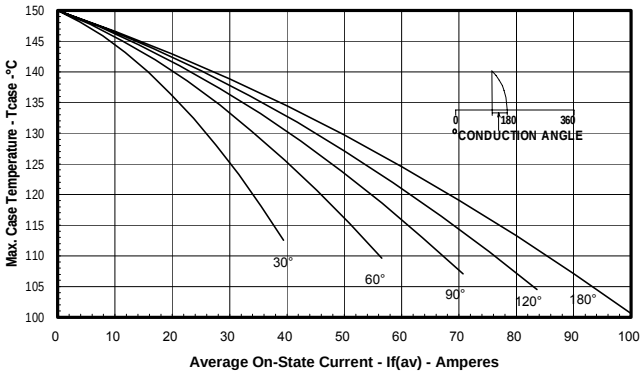
Maximum Transient Thermal Impedance
(Junction to Case)



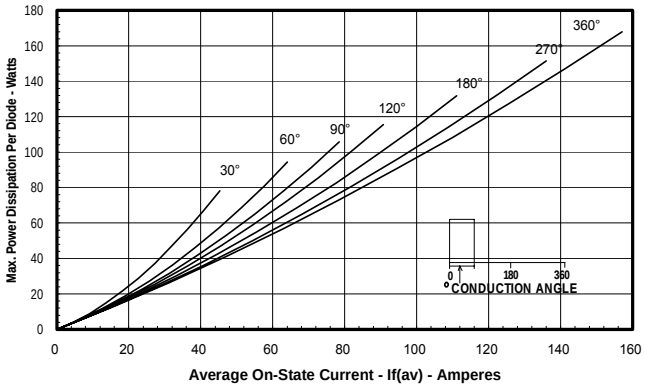
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)