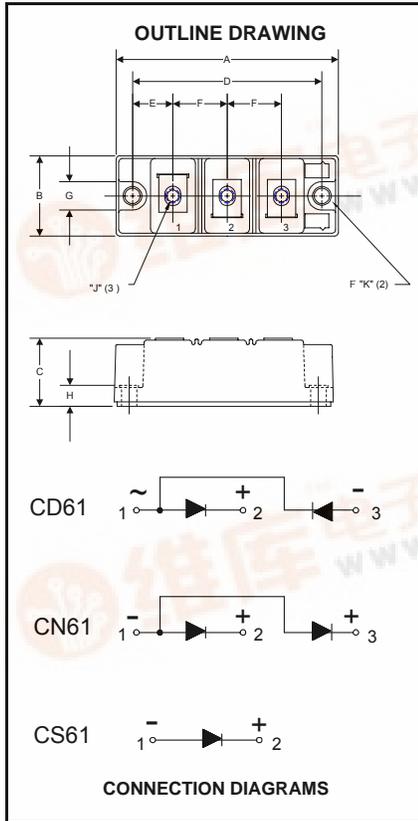


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

**POW-R-BLOK™**  
Dual & Single Diode Isolated Module  
160 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.

**CD61\_\_16A, CS61\_\_16A  
CN61\_\_16A, CC61\_\_16A  
Dual & Single Diode Isolated  
POW-R-BLOK™ Module  
160 Amperes / Up to 1600 Volts**

**Features:**

- Electrically Isolated Heatsinking
- DBC Alumina Insulator
- Glass Passivated Chips
- Metal 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

**Ordering Information:**

Select the complete nine digit module part number from the table below.  
Example: CD611616A is a 1600 Volt, 160 Ampere Dual Diode Isolated POW-R-BLOK™ Module

**Outline Dimensions**

Dimension	Inches	Millimeters
A	3.70	94
B	1.38	35
C	1.18	30
D	3.15	80
E	0.67	17
F	0.91	23
G	0.57	14.5
H	0.35	9
J	M6	M6
K	0.26	6.5

Note: Dimensions are for reference only.

Type	Voltage Volts (x100)	Current Amperes (x10)
CD61	08	16
CN61	12	
CC61	14	
CS61	16	

**Applications:**

- Power Supplies
- Bridge Circuits
- AC & DC Motor Drives
- Battery Supplies
- Large IGBT Circuit Front Ends
- Welders



**CD61\_\_16A, CS61\_\_16A**  
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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	180° Conduction, $T_C=100^\circ\text{C}$	$I_{F(RMS)}$	260	A
Average Forward Current	180° Conduction, $T_C=100^\circ\text{C}$	$I_{F(AV)}$	165	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	3,500	A
	60 Hz, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	4,200	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	3,350	A
	50 Hz, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	4,000	A
Peak Three Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	2,600	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	2,480	A
Peak Ten Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	1,750	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I_{FSM}$	1,820	A
$I^2t$ for Fusing for One Cycle	8.3ms, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I^2t$	52,000	$\text{A}^2 \text{ sec}$
	8.3ms, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I^2t$	73,000	$\text{A}^2 \text{ sec}$
	10ms, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I^2t$	56,000	$\text{A}^2 \text{ sec}$
	10ms, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$	$I^2t$	80,000	$\text{A}^2 \text{ sec}$
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			35 - 50	in.-Lb.
			4 - 6	Nm
Max. Mounting Torque, M8 Terminal Screw			35 - 50	in.-Lb.
			4 - 6	Nm
Module Weight, Typical			200	g
			7.1	lb.
V Isolation @ 25C, $V_{rms}$ for 1 sec		$V_{rms}$	3500	V



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**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		20	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =520A, 180 Deg Conduction		1.43	V
Threshold Voltage, Low-level	V <sub>(TO)1</sub>	T <sub>J</sub> = 150°C, I = 16.7% I <sub>F(AV)</sub> to I <sub>F(AV)</sub>		0.73	V
Slope Resistance, Low-level	r <sub>T1</sub>			1.5	mΩ
Threshold Voltage, High-level	V <sub>(TO)2</sub>	T <sub>J</sub> = 150°C, I = I <sub>F(AV)</sub> to I <sub>FSM</sub>		0.88	V
Slope Resistance, High-level	r <sub>T2</sub>			1.26	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 =	0.563	
			B =	0.0392	
		V <sub>FM</sub> = A + B Ln I + C I + D Sqrt I	C =	1.31 E-3	
			D =	-8.25 E-5	

**Thermal Characteristics**

Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case	R <sub>ΘJ-C</sub>	Per Module, both conducting Per Junction both conducting	0.1 0.2	°C/W °C/W
Thermal Impedance Coefficients	Z <sub>ΘJ-C</sub>	Z <sub>ΘJ-C</sub> = K <sub>1</sub> (1-exp(-t/τ <sub>1</sub> )) + K <sub>2</sub> (1-exp(-t/τ <sub>2</sub> )) + K <sub>3</sub> (1-exp(-t/τ <sub>3</sub> )) + K <sub>4</sub> (1-exp(-t/τ <sub>4</sub> ))	K <sub>1</sub> = 1.84E-2 K <sub>2</sub> = 4.68E-2 K <sub>3</sub> = 8.25E-2 K <sub>4</sub> = 5.23E-2	τ <sub>1</sub> = 2.53E-6 τ <sub>2</sub> = 6.44E-2 τ <sub>3</sub> = 3.11E-1 τ <sub>4</sub> = 1.32
Thermal Resistance, Case to Sink Lubricated	R <sub>ΘC-S</sub>	Per Module	0.05	°C/W

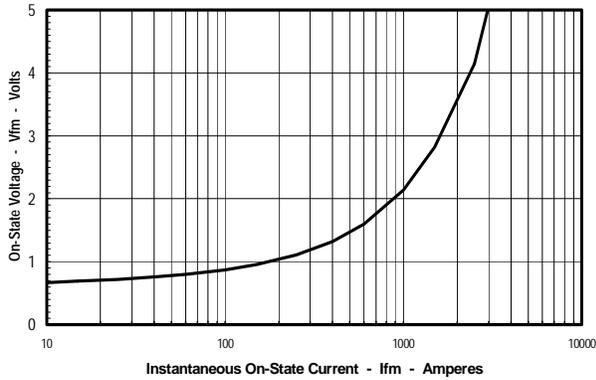


CD61\_\_16A, CS61\_\_16A  
CN61\_\_16A, CC61\_\_16A

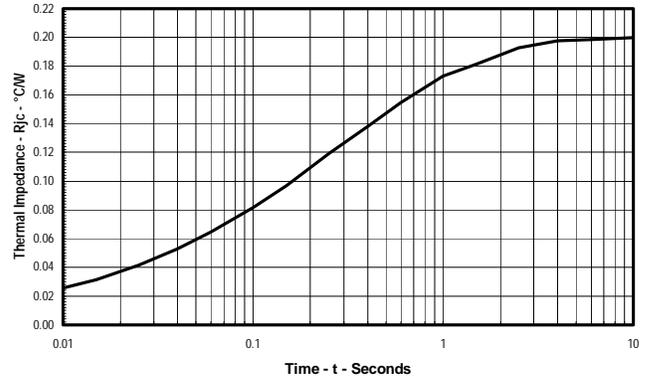
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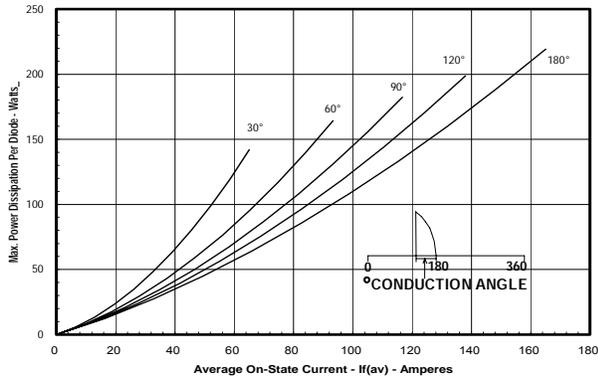
Maximum On-State Forward Voltage Drop  
( $T_J = 150^\circ\text{C}$ )



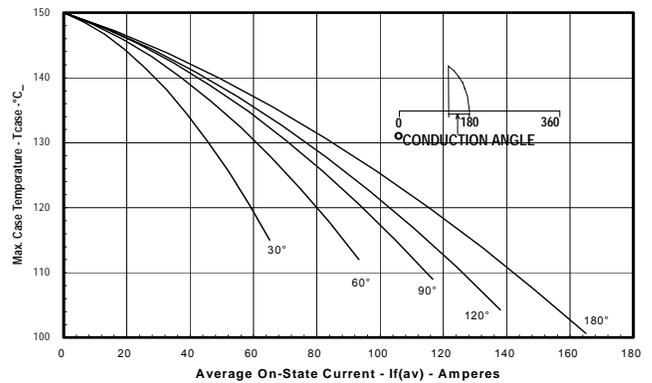
Maximum Transient Thermal Impedance  
(Junction to Case, Per Diode)



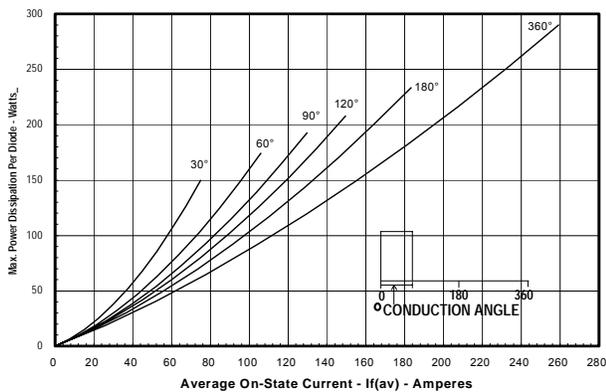
Maximum On-State Power Dissipation  
(Sinusoidal Waveform)



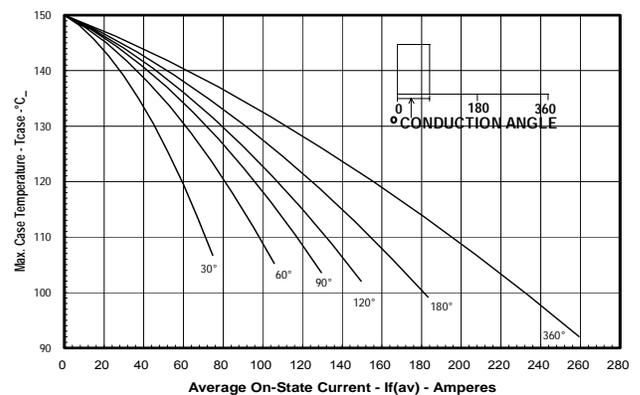
Maximum Allowable Case Temperature  
(Sinusoidal Waveform)



Maximum On-State Power Dissipation  
(Rectangular Waveform)



Maximum Allowable Case Temperature  
(Rectangular Waveform)

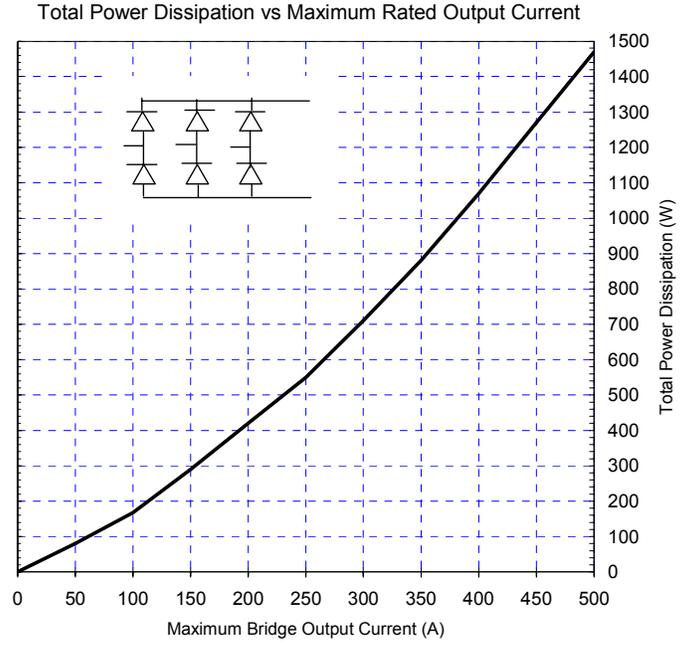
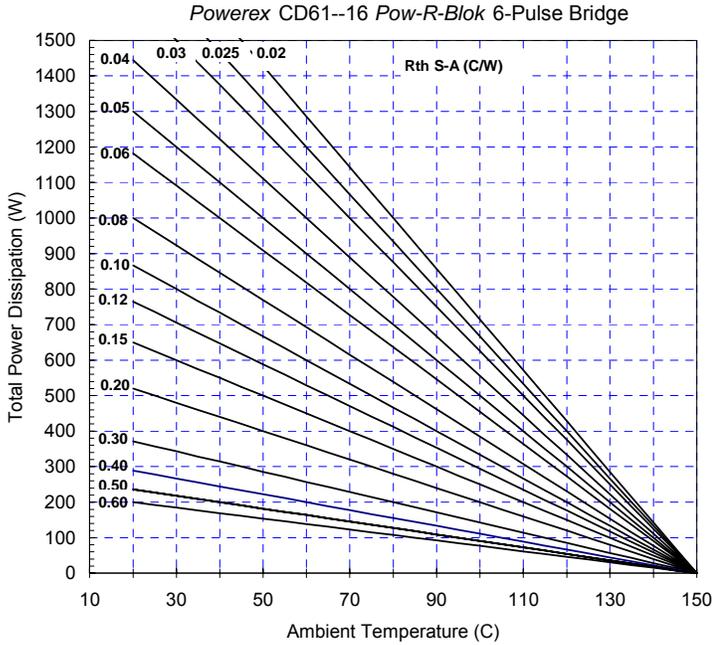




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Six-Pulse Bridge Circuit Total Power Dissipation & Maximum Rated Output Current With Sink to Ambient Resistance of Heatsink as a Parameter.