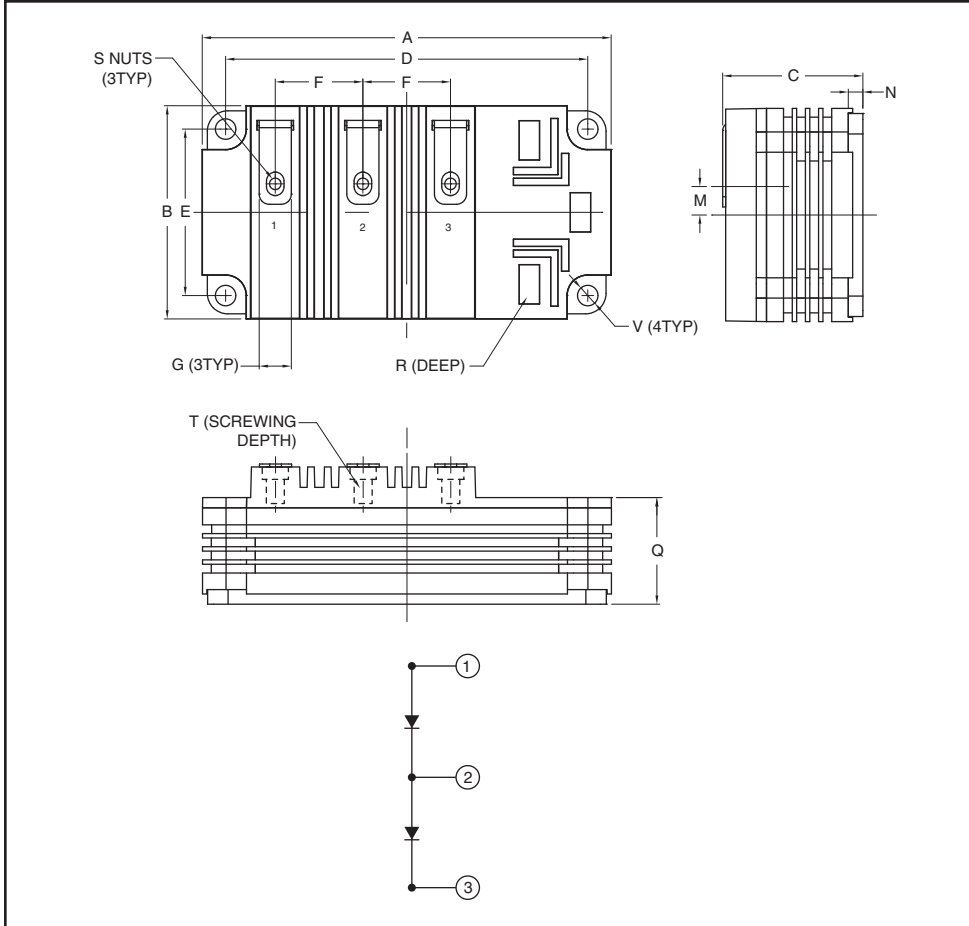


**Dual Diode
 Isolated Module
 180 Amperes/4500 Volts**



Description:

Powerex Dual 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.

Features:

- High Blocking Voltage
- High Isolation to Baseplate
- Copper Baseplate

Benefits:

- No Additional Insulation Components Required
- Easy Installation
- No Clamping Components Required
- Reduced Engineering Time

Applications:

- Medium Voltage Drives
- High Power Converters

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.51	140.0
B	2.87	73.0
C	1.89	48.0
D	4.88±0.01	124.0±0.25
E	2.24±0.01	57.0±0.25
F	1.18	30.0
G	0.43	11.0

Dimensions	Inches	Millimeters
M	0.38	9.75
N	0.20	5.0
Q	1.44	36.5
R	0.16	4.0
S	M6 Metric	M6
T	0.63 Min.	16.0 Min.
V	0.28 Dia.	7.0 Dia.



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

QRD4518001
Dual Diode Isolated Module
 180 Amperes/4500 Volts

Absolute Maximum Ratings, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Ratings		Symbol	QRD4518001	Units
Repetitive Peak Reverse Blocking Voltage		V_{RRM}	4500	Volts
Non-Repetitive Peak Reverse Blocking Voltage ($t < 5\text{ msec}$)		V_{RSM}	$V_{RRM} + 100$	Volts
RMS Forward Current		$I_{F(RMS)}$	282	Amperes
Average Forward Current (180° Conduction, $T_C = 95^\circ\text{C}$)		$I_{F(AV)}$	180	Amperes
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% V_{RRM} Reapplied	I_{FSM}	3860	Amperes
	50 Hz, 100% V_{RRM} Reapplied	I_{FSM}	3475	Amperes
	60 Hz, No V_{RRM} Reapplied	I_{FSM}	5800	Amperes
	50 Hz, No V_{RRM} Reapplied	I_{FSM}	5215	Amperes
i^2t for Fusing for One Cycle	8.3 Milliseconds	i^2t	140,000	$A^2\text{sec}$
	10 Milliseconds	i^2t	151,000	$A^2\text{sec}$
Operating Temperature		T_j	-40 to 150	$^\circ\text{C}$
Storage Temperature		T_{stg}	-40 to 150	$^\circ\text{C}$
Maximum Mounting Torque, M6 Mounting Screws		—	44	in-lb
			5.0	Nm
Maximum Mounting Torque, M6 Terminal Screws		—	44	in-lb
			5.0	Nm
Module Weight (Typical)		—	750	Grams
			1.65	Pounds
Isolation Voltage (@ 25°C, 60Hz, 1 min.)		V_{rms}	10.2	kV

QRD4518001
Dual Diode Isolated Module
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Electrical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

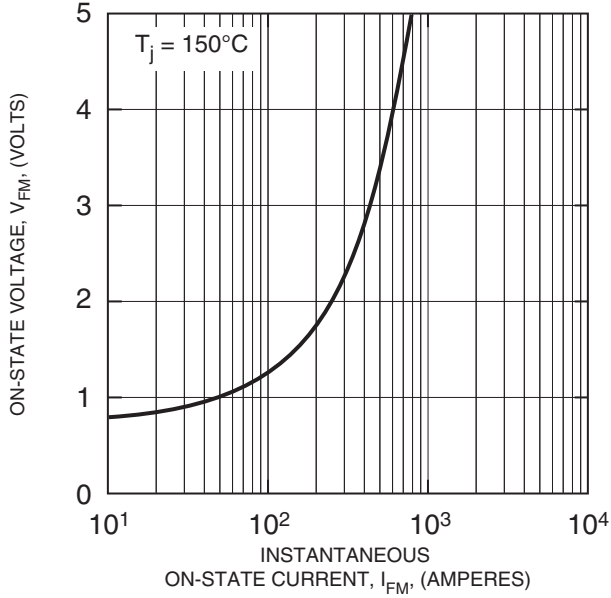
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	$V_{RRM} = 4500\text{V}$, $T_j = 150^\circ\text{C}$	—	—	3	mA
Peak On-State Voltage	VFM	$T_j = 150^\circ\text{C}$, $I_{FM} = 180\text{A}$	—	—	1.35	Volts
Threshold Voltage (Low-Level)	$V_{(TO)1}$	$T_j = 150^\circ\text{C}$, $I = 15\% I_{F(AV)}$ to $\Pi I_{F(AV)}$	—	—	0.27	Volts
Slope Resistance (Low-Level)	r_{T1}		—	—	5.216	m Ω
Threshold Voltage (High-Level)	$V_{(TO)2}$	$T_j = 150^\circ\text{C}$, $I = \Pi I_{F(AV)}$ to I_{FSM}				Volts
Slope Resistance (High-Level)	r_{T2}					m Ω
V_{TM} Coefficients (Full Range)		$T_j = 150^\circ\text{C}$, $I = 15\% I_{F(AV)}$ to I_{FSM}		A = 0.726 B = -577E-07 C = 5.22E-03 D = -3.08E-07		
		$V_{TM} = A + B \ln I + C I + D \text{Sqrt } I$				

Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

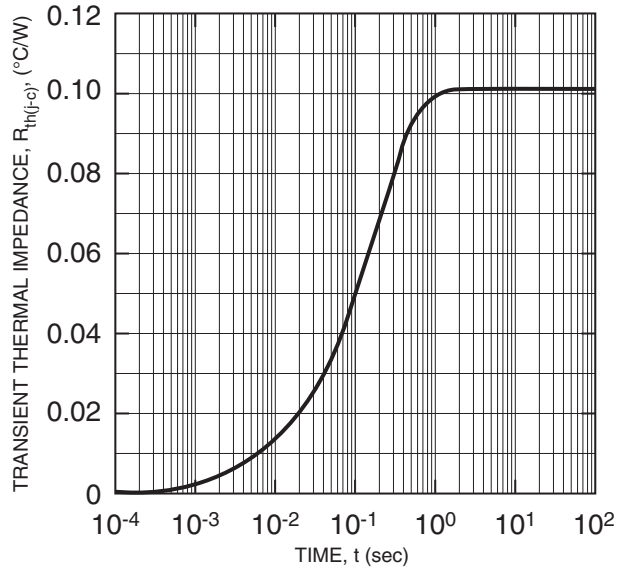
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per Diode	—	—	0.099	$^\circ\text{C/W}$
Thermal Impedance Coefficients	$Z_{th(j-c)}$	$Z_{th(j-c)} = K_1 (1 - \exp(-t/\tau_1))$ + $K_2 (1 - \exp(-t/\tau_2))$ + $K_3 (1 - \exp(-t/\tau_3))$ + $K_4 (1 - \exp(-t/\tau_4))$	$K_1 = 1.34\text{E-}04$ $K_2 = 8.29\text{E-}03$ $K_3 = 1.36\text{E-}02$ $K_4 = 7.89\text{E-}02$	$\tau_1 = 1.95\text{E-}03$ $\tau_2 = 4.90\text{E-}03$ $\tau_3 = 5.18\text{E-}02$ $\tau_4 = 0.221$		
Thermal Resistance, Case to Sink Lubricated	$R_{th(c-s)}$	Thermal Grease Applied $\lambda_{grease} = 1\text{ W/mK}$	—	—	0.018	$^\circ\text{C/W}$

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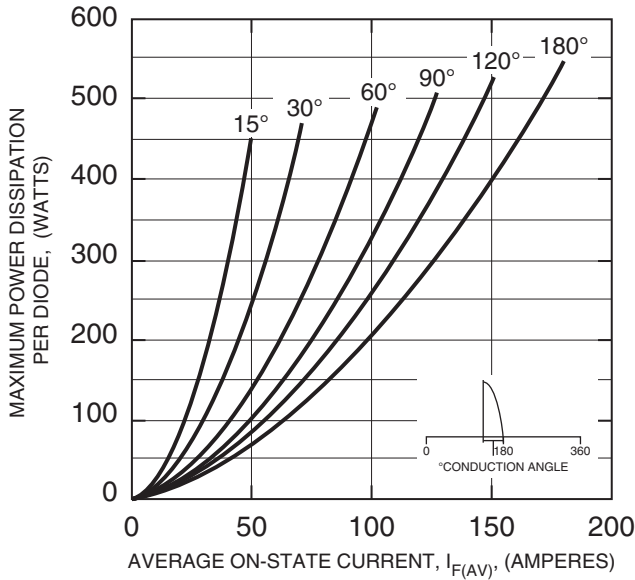
MAXIMUM ON-STATE FORWARD VOLTAGE DROP



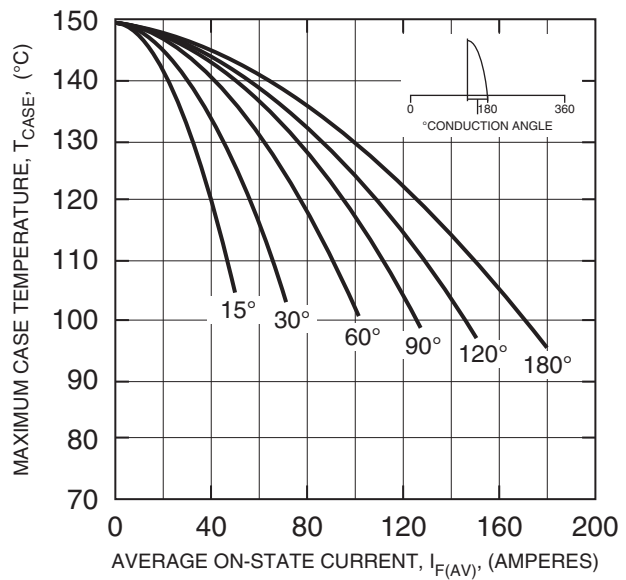
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)

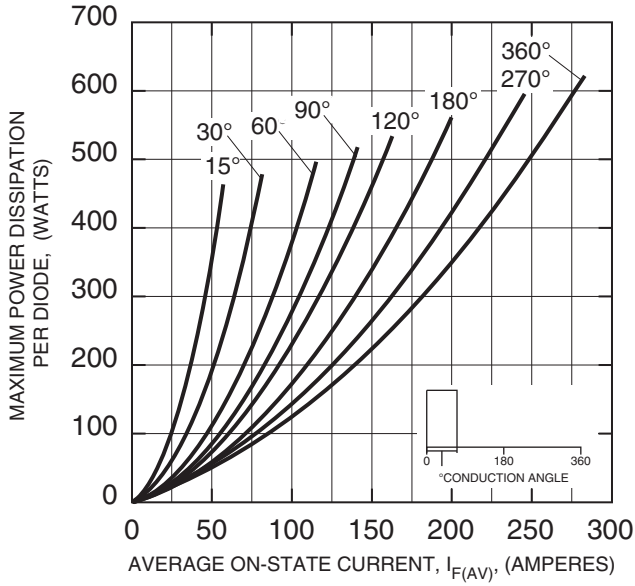


MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



QRD4518001
Dual Diode Isolated Module
 180 Amperes/4500 Volts

**MAXIMUM ON-STATE
 POWER DISSIPATION
 (RECTANGULAR WAVEFORM)**



**MAXIMUM ALLOWABLE
 CASE TEMPERATURE
 (RECTANGULAR WAVEFORM)**

