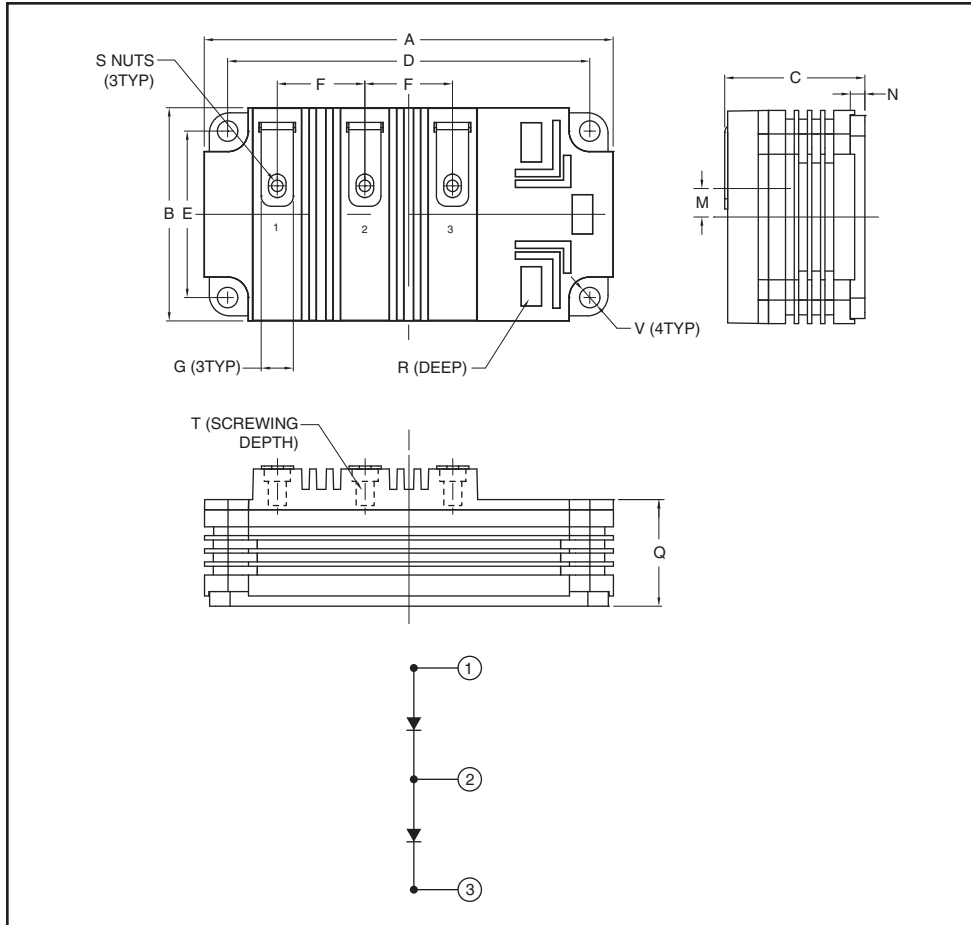


Dual Diode Isolated Module 180 Amperes/4500 Volts



Description:

High voltage diodes feature highly insulating housings that offer enhanced protection by means of greater creepage and strike clearance distance for many demanding applications like medium voltage drives and auxiliary traction applications.

Features:

- Aluminum Nitride (AlN) Ceramic Substrate for Low Thermal Impedance
- Copper Baseplate
- Industry Standard Packages Allow Common Bus Work to Complementary High Isolation Diodes
- No Additional Insulation Components Required

Applications:

- Diodes for 18-24 Pulse Front End Rectifiers in 10.2 KV Isolation
- High Voltage Power Supplies
- Medium Voltage Drives
- Motor Drives
- Traction

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^2sec
	10 Milliseconds	i^2t	151,000	A^2sec
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
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Electrical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

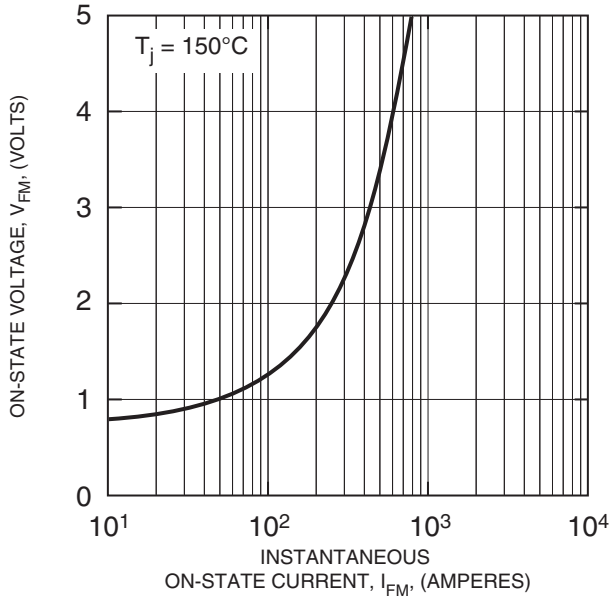
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	$V_{RRM} = 4500\text{V}$, $T_j = 150^\circ\text{C}$	—	—	30	mA
Peak On-State Voltage	VFM	$T_j = 150^\circ\text{C}$, $I_{FM} = 180\text{A}$	—	—	1.35	Volts
Threshold Voltage (Low-Level)	$V_{(TO)1}$	$T_j = 150^\circ\text{C}$, $I = 15\% I_{F(AV)}$ 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

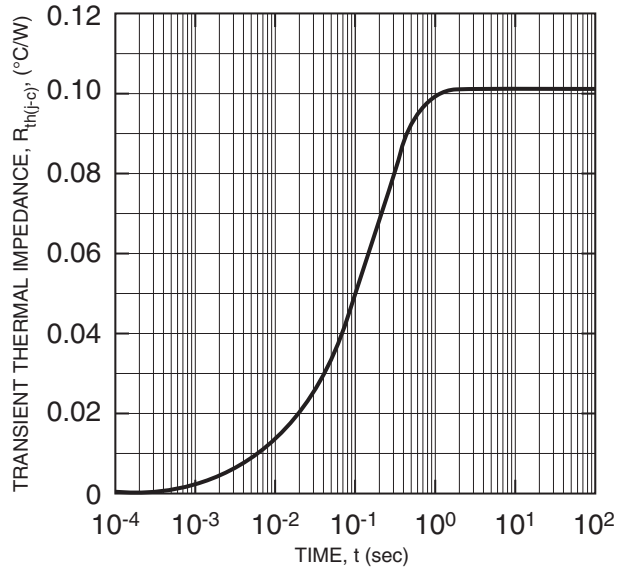
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per Diode	—	—	0.099	$^\circ\text{C/W}$
Thermal Impedance Coefficients	$Z_{th(j-c)}$	$Z_{th(j-c)} = K_1 (1 - \exp(-t/\tau_1))$ + $K_2 (1 - \exp(-t/\tau_2))$ + $K_3 (1 - \exp(-t/\tau_3))$ + $K_4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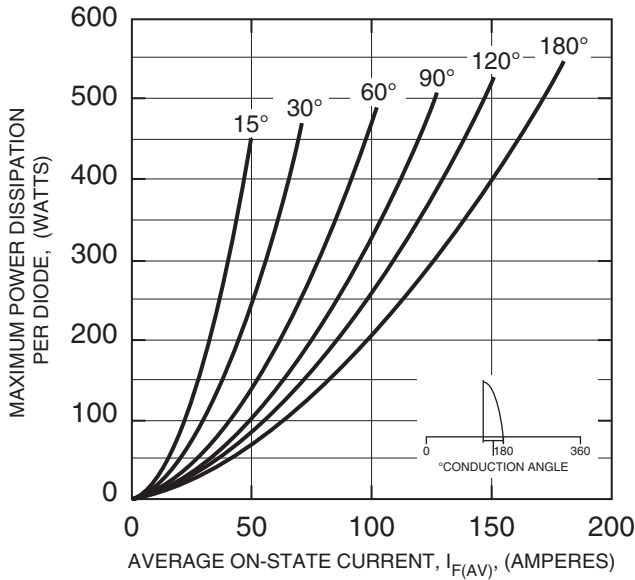
MAXIMUM ON-STATE FORWARD VOLTAGE DROP



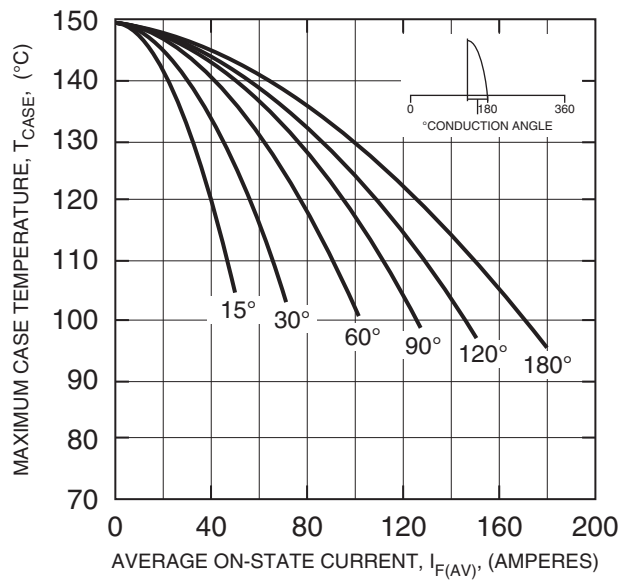
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)

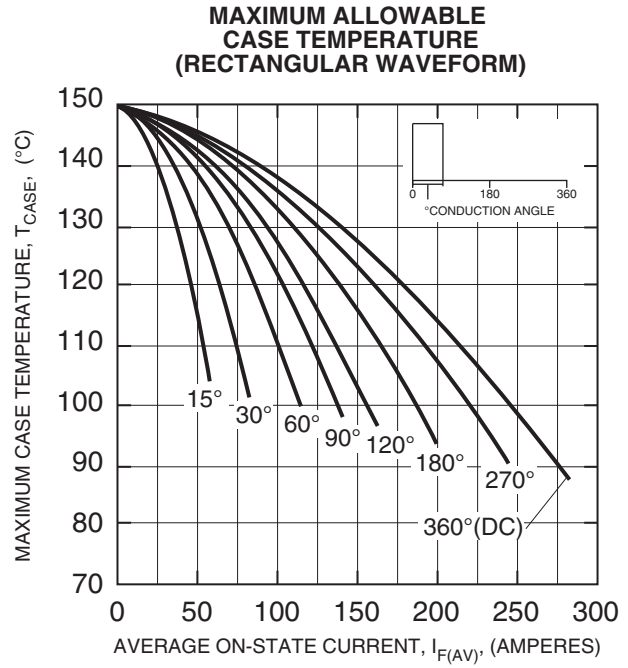
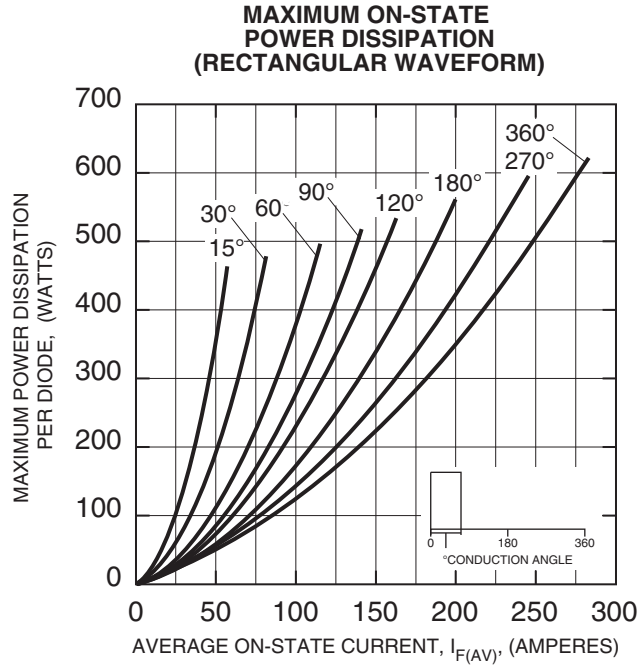


MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



Information presented is based upon manufacturers testing and projected capabilities. This information is subject to change without notice. The manufacturer makes no claim as to the suitability of use, reliability, capability, or future availability of this product.

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