

Schematic

**Description:**

The Powerex Single Fast Diode Series Modules utilize field proven super fast H-series FWD chips necessary for fast switching applications. Two (2) terminal heights are available (30 and 36mm) to facilitate matching existing power modules, making bussbar connections fast and economical. As with all Powerex modules, the series are electrically isolated for easy mounting with other components on common heatsinks.

**Features:**

Powerex FLEX-TERM terminals

Isolated Mounting 2500Vacrms

H-Series Planar Chips

**Applications:**

Inverters

Choppers

Welding Power Supplies

High Frequency Rectifiers

Switching Power Supplies

Free Wheeling Diode

Regenerative Braking



Absolute Max. Ratings											
Characteristics	Symbol	QRS0620 T30	QRS0640 T30	QRS0660 T30	QRS1220 T30	QRS1240 T30	QRS1260 T30	QRS1420 T30	QRS1440 T30	QRS1460 T30	Units
Peak Reverse Blocking Voltage	$V_{RRM}$	600	600	600	1200	1200	1200	1400	1400	1400	Volts
DC Current @ $T_c=80^\circ\text{C}$	$I_F$	200	400	600	200	400	600	200	400	600	Amps
Surge Current	$I_{FSM}$	1200	2400	3600	1600	3200	5000	1300	2600	4000	Amps
Junction Temperature	$T_j$	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	-40 to 150	$^\circ\text{C}$
Maximum Mounting Torque M6 Mounting Screw		20-30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	kg-cm
Maximum Terminal Torque M6 Terminal Screw		20-30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	kg-cm
Module Weight		200	200	200	200	200	200	200	200	200	gm
V Isolation	$V_{RMS}$	2500	2500	2500	2500	2500	2500	2500	2500	2500	Volts

600 Volt / 200 Amp Devices				
Electrical and Thermal Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS0620T30	Units
Reverse Leakage Current, Peak	$I_{RRM}$	$T_j=150^\circ\text{C}$ , $V_{RRM} = \text{Rated}$	1.0 max.	mA
Peak On-State Voltage	$V_{FM}$	$I_{FM}=200\text{A}$	2.8 max.	Volts
Reverse Recovery Time	$t_{rr}$	$I_{FM}=200\text{A}$ , $di_{FM}/dt=-400\text{A}/\mu\text{S}$	110	nS
Reverse Recovery Charge	$Q_{rr}$	$I_{FM}=200\text{A}$ , $di_{FM}/dt=-400\text{A}/\mu\text{S}$	0.54	$\mu\text{C}$
Thermal Maximums				
Thermal Resistance Junction-to-Case	$R(J-C)$	Per Module	.35 max.	$^\circ\text{C}/\text{Watt}$
Thermal Resistance Case-to-Sink	$R(C-S)$	Per Module	.04 max.	$^\circ\text{C}/\text{watt}$
600 Volt / 400 Amp Devices				
Electrical and Thermal Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS0640T30	Units
Reverse Leakage Current, Peak	$I_{RRM}$	$T_j=150^\circ\text{C}$ , $V_{RRM} = \text{Rated}$	1.0 max.	mA
Peak On-State Voltage	$V_{FM}$	$I_{FM}=400\text{A}$	2.8 max.	Volts
Reverse Recovery Time	$t_{rr}$	$I_{FM}=400\text{A}$ , $di_{FM}/dt=-800\text{A}/\mu\text{S}$	110	nS
Reverse Recovery Charge	$Q_{rr}$	$I_{FM}=400\text{A}$ , $di_{FM}/dt=-800\text{A}/\mu\text{S}$	1.08	$\mu\text{C}$
Thermal Maximums				
Thermal Resistance Junction-to-Case	$R(J-C)$	Per Module	.18 max.	$^\circ\text{C}/\text{Watt}$
Thermal Resistance Case-to-Sink	$R(C-S)$	Per Module	.04 max.	$^\circ\text{C}/\text{watt}$
600 Volt / 600 Amp Devices				
Electrical and Thermal Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS0660T30	Units
Reverse Leakage Current, Peak	$I_{RRM}$	$T_j=150^\circ\text{C}$ , $V_{RRM} = \text{Rated}$	1.0 max.	mA
Peak On-State Voltage	$V_{FM}$	$I_{FM}=600\text{A}$	2.8 max.	Volts
Reverse Recovery Time	$t_{rr}$	$I_{FM}=600\text{A}$ , $di_{FM}/dt=-1200\text{A}/\mu\text{S}$	110	nS
Reverse Recovery Charge	$Q_{rr}$	$I_{FM}=600\text{A}$ , $di_{FM}/dt=-1200\text{A}/\mu\text{S}$	1.62	$\mu\text{C}$
Thermal Maximums				
Thermal Resistance Junction-to-Case	$R(J-C)$	Per Module	.12 max.	$^\circ\text{C}/\text{Watt}$
Thermal Resistance Case-to-Sink	$R(C-S)$	Per Module	.04 max.	$^\circ\text{C}/\text{Watt}$

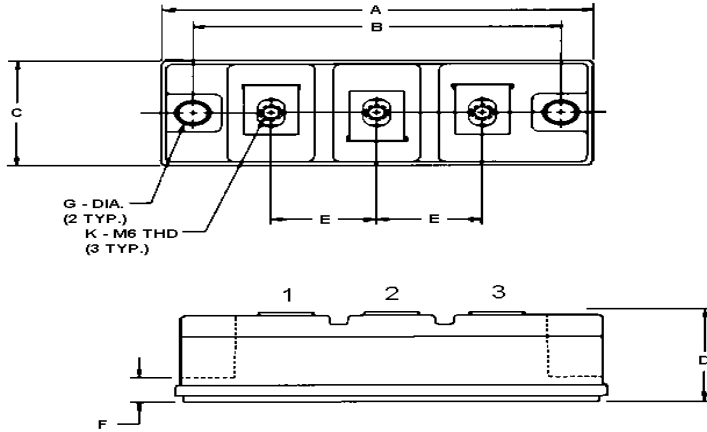


1200 Volt / 200 Amp Devices				
Electrical and Thermal Characteristics, T <sub>j</sub> = 25°C unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS1220T30	Units
Reverse Leakage Current, Peak	I <sub>RRM</sub>	T <sub>j</sub> =150°C, V <sub>RRM</sub> = Rated	1.0 max.	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =200A	3.5 max.	Volts
Reverse Recovery Time	t <sub>rr</sub>	I <sub>FM</sub> =200A, di <sub>FM</sub> /dt=-400A/uS	250	nS
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>FM</sub> =200A, di <sub>FM</sub> /dt=-400A/uS	1.49	uC
Thermal Maximums				
Thermal Resistance Junction-to-Case	R(J-C)	Per Module	.18 max.	°C/Watt
Thermal Resistance Case-to-Sink	R(C-S)	Per Module	.04 max.	°C/Watt
1200 Volt / 400 Amp Devices				
Electrical and Thermal Characteristics, T <sub>j</sub> = 25°C unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS1240T30	Units
Reverse Leakage Current, Peak	I <sub>RRM</sub>	T <sub>j</sub> =150°C, V <sub>RRM</sub> = Rated	1.0 max.	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =400A	3.5 max	Volts
Reverse Recovery Time	t <sub>rr</sub>	I <sub>FM</sub> =400A, di <sub>FM</sub> /dt=-800A/uS	250	nS
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>FM</sub> =400A, di <sub>FM</sub> /dt=-800A/uS	2.97	uC
Thermal Maximums				
Thermal Resistance Junction-to-Case	R(J-C)	Per Module	.09 max.	°C/Watt
Thermal Resistance Case-to-Sink	R(C-S)	Per Module	.04 max.	°C/Watt
1200 Volt / 600 Amp Devices				
Electrical and Thermal Characteristics, T <sub>j</sub> = 25°C unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS1260T30	Units
Reverse Leakage Current, Peak	I <sub>RRM</sub>	T <sub>j</sub> =150°C, V <sub>RRM</sub> = Rated	1.0 max.	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =600A	3.5 max.	Volts
Reverse Recovery Time	t <sub>rr</sub>	I <sub>FM</sub> =600A, di <sub>FM</sub> /dt=-1200A/uS	250	nS
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>FM</sub> =600A, di <sub>FM</sub> /dt=-1200A/uS	4.46	uC
Thermal Maximums				
Thermal Resistance Junction-to-Case	R(J-C)	Per Module	.06 max.	°C/Watt
Thermal Resistance Case-to-Sink	R(C-S)	Per Module	.04 max.	°C/Watt



1400 Volt / 200 Amp Devices				
Electrical and Thermal Characteristics, T <sub>j</sub> = 25°C unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS1420T30	Units
Reverse Leakage Current, Peak	I <sub>RRM</sub>	T <sub>j</sub> =150°C, V <sub>RRM</sub> = Rated	1.0 max.	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =200A	3.8 max.	Volts
Reverse Recovery Time	t <sub>rr</sub>	I <sub>FM</sub> =200A, di <sub>FM</sub> /dt=-400A/uS	300	nS
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>FM</sub> =200A, di <sub>FM</sub> /dt=-400A/uS	2.0	uC
Thermal Maximums				
Thermal Resistance Junction-to-Case	R(J-C)	Per Module	.18 max.	°C/Watt
Thermal Resistance Case-to-Sink	R(C-S)	Per Module	.04 max.	°C/Watt
1400 Volt / 400 Amp Devices				
Electrical and Thermal Characteristics, T <sub>j</sub> = 25°C unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS1440T30	Units
Reverse Leakage Current, Peak	I <sub>RRM</sub>	T <sub>j</sub> =150°C, V <sub>RRM</sub> = Rated	1.0 max.	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =400A	3.8 max	Volts
Reverse Recovery Time	t <sub>rr</sub>	I <sub>FM</sub> =400A, di <sub>FM</sub> /dt=-800A/uS	300	nS
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>FM</sub> =400A, di <sub>FM</sub> /dt=-800A/uS	4.0	uC
Thermal Maximums				
Thermal Resistance Junction-to-Case	R(J-C)	Per Module	.09 max.	°C/Watt
Thermal Resistance Case-to-Sink	R(C-S)	Per Module	.04 max.	°C/Watt
1400 Volt / 600 Amp Devices				
Electrical and Thermal Characteristics, T <sub>j</sub> = 25°C unless otherwise specified				
Characteristics	Symbol	Test Conditions	QRS1460T30	Units
Reverse Leakage Current, Peak	I <sub>RRM</sub>	T <sub>j</sub> =150°C, V <sub>RRM</sub> = Rated	1.0 max.	mA
Peak On-State Voltage	V <sub>FM</sub>	I <sub>FM</sub> =600A	3.8 max.	Volts
Reverse Recovery Time	t <sub>rr</sub>	I <sub>FM</sub> =600A, di <sub>FM</sub> /dt=-1200A/uS	300	nS
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>FM</sub> =600A, di <sub>FM</sub> /dt=-1200A/uS	6.0	uC
Thermal Maximums				
Thermal Resistance Junction-to-Case	R(J-C)	Per Module	.06 max.	°C/Watt
Thermal Resistance Case-to-Sink	R(C-S)	Per Module	.04 max.	°C/Watt

**Outline Drawing**



Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	3.68	3.72	93.5	94.5
B	3.145	3.155	79.88	80.14
C	1.33	1.35	33.8	34.3
D (T36)	1.40	1.44	35.50	36.5
D* (T30)	1.16	1.20	29.5	30.5
E	.901	.911	22.88	23.14
F	.31	.33	7.9	8.4
G $\phi$	.251	.261	6.38	6.63
K	-----	-----	M6 x 1.0	