

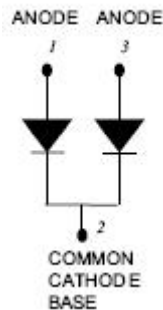
## 503CNQ600 ULTRAFAST RECTIFIER



### Features

- 175 °C T<sub>J</sub> operation
- Center tap module
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Base plate: Nickel plated; Terminals: Nickel plated
- This is a Pb – Free Device
- All SMC parts are traceable to the wafer lot
- Additional testing can be offered upon request

### Circuit Diagram



### Applications

- High current switching power supply
- Plating power supply
- Free-Wheeling diodes
- Reverse battery protection
- Converters
- UPS System
- Welding

### Maximum Ratings(limiting values, at 25 °C unless otherwise specified)

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	-	600	V
Average Rectified Forward Current	I <sub>F(AV)</sub>	50% duty cycle @T <sub>C</sub> = 117°C, rectangular wave form	250(Per leg) 500(Per device)	A
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM</sub>	8.3 ms, half Sine pulse	2000	A

**Electrical Characteristics:**

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	$V_{F1}$	@ 250A, Pulse, $T_J = 25\text{ }^\circ\text{C}$	1.11	2.0	V
Reverse Current *	$I_{R1}$	@ $V_R = \text{rated } V_R$ $T_J = 25\text{ }^\circ\text{C}$	0.4	100	$\mu\text{A}$
Reverse Recovery Time	$t_{rr}$	IF=500mA, IR=1A, and Irm=250mA	150	200	ns

\* Pulse width < 300  $\mu\text{s}$ , duty cycle < 2%

**Thermal-Mechanical Specifications:**

Characteristics	Symbol	Condition	Specification		Units
Junction Temperature	$T_J$	-	-55 to +175		$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-	-55 to +175		$^\circ\text{C}$
Typical Thermal Resistance Junction to Case(per leg)	$R_{\theta JC}$	DC operation	0.40		$^\circ\text{C/W}$
Typical Thermal Resistance, Case to Heat Sink	$R_{\theta CS}$	Mounting surface, smooth and greased	0.20		$^\circ\text{C/W}$
Approximate Weight	wt	-	91		g
Mounting Torque	$T_M$	-	Mounting Torque	24 (min) 35 (max)	Kg-cm
			Terminal Torque	35(min) 46 (max)	
Case Style	PRM4 Non-Isolated				

**Ratings and Characteristics Curves**

Figure 1  
Typical Forward Characteristics

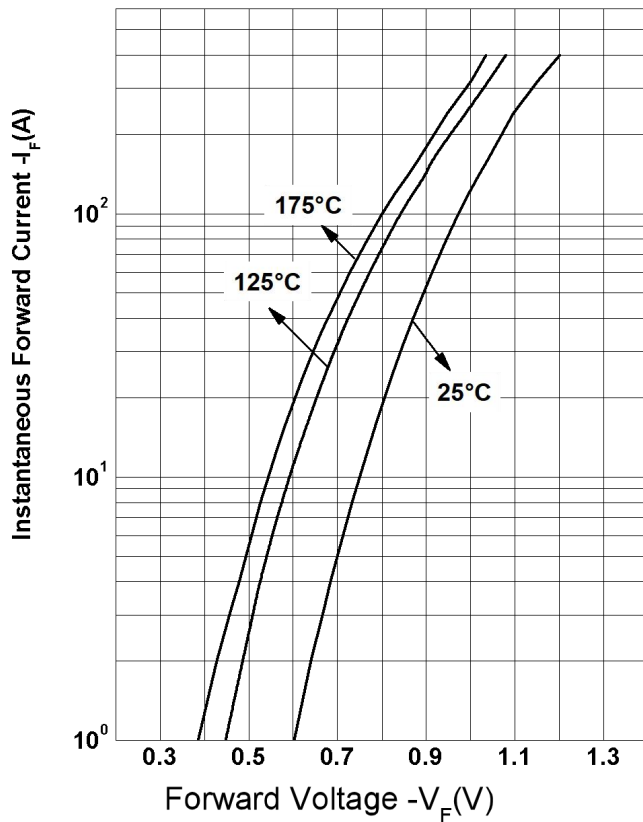


Figure 2  
Typical Reverse Characteristics

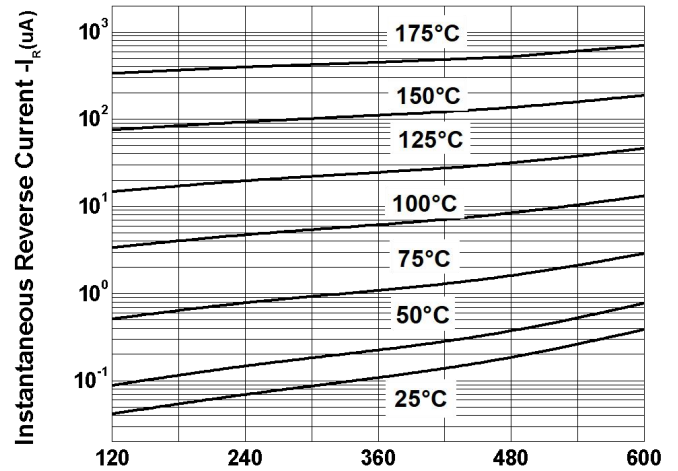
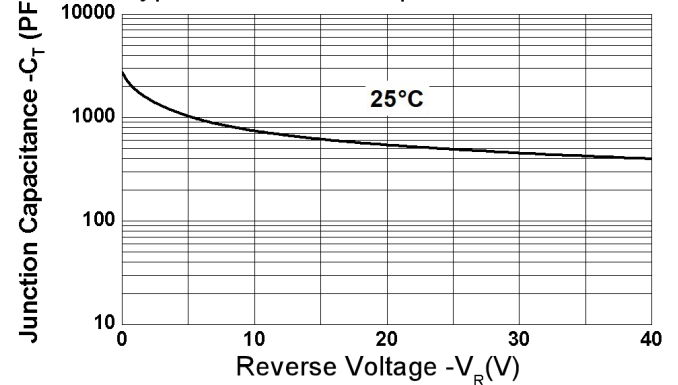


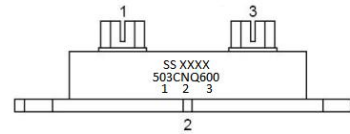
Figure 3  
Typical Junction Capacitance



**Ordering Information**

Device	Package	Shipping
503CNQ600	PRM4 (Pb-Free)	9pcs/ box

**Marking Diagram**

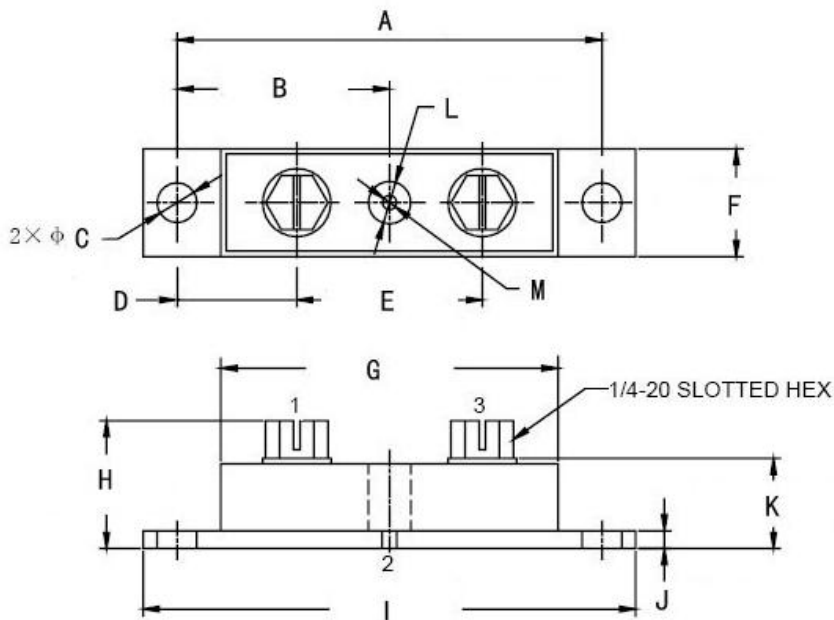


Where XXXX is YYWW

1st row SS YYWW  
2nd row 503CNQ600  
SS = SS  
YY = Year  
WW = Week

**Cautions:** Molding resin  
Epoxy resin UL:94V-0

**Mechanical Dimensions PRM4 Non-Isolated(Millimeters/Inches)**



SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	78.74	81.28	3.100	3.200
B	37.47	42.55	1.475	1.675
C	6.89	7.69	0.271	0.303
D	19.51	24.59	0.768	0.968
E	33.02	38.10	1.300	1.500
F	17.78	20.32	0.700	0.800
G	60.96	64.77	2.400	2.550
H	17.26	23.25	0.680	0.915
I	90.17	92.71	3.550	3.650
J	3.02	3.68	0.119	0.145
K	14.30	16.15	0.563	0.636
L	9.27	10.79	0.365	0.425
M	4.37	5.28	0.172	0.208

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