

Q-SSC10120-T

Silicon Carbide Schottky Barrier Diode

1200V, 10A SiC SBD

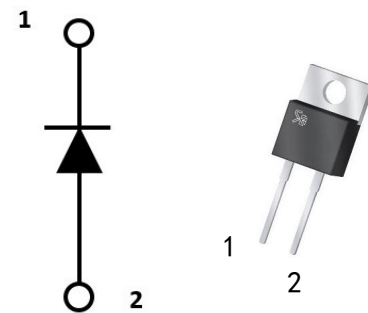
Features

- Temperature independent switching behavior
- No reverse recovery current / No forward recovery
- Excellent thermal performances
- High surge current capability

V_{RRM}	1200V
I_F	10A (TC=140°C)
Q_C	49nC

Benefits

- Higher frequency
- Low heat dissipation requirements
- Reduce size and cost of the system
- High-reliability



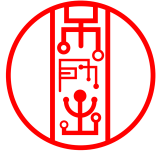
Applications

- Solar inverter / Renewable energy applications
- Uninterruptible power supply
- Power factor correction
- Motor drives

Marking	Package
Q-SSC10120-T	TO-220AC

Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Repetitive Peak Reverse Voltage		V_{RRM}	1200	V
Continuous Forward Current, D=1	T _C =25°C	I_F	31	A
	T _C =140°C		10	
Non-Repetitive Peak Forward Surge Current, Half Sine Wave, 10ms	T _C =25°C	$I_{F,SM}$	94	A
	T _C =150°C		78	
i ² t Value, 10ms		$\int i^2 dt$	44.1	A
Non-Repetitive Peak Forward Current, 10us		$I_{F,max}$	564	A
Power Dissipation		P_D	114	W
Storage Temperature Range		T _{STG}	-55 to 150°C	°C
Operating Junction Temperature Range		T _J	-55 to 175°C	°C



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Thermal Characteristics

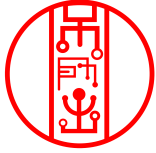
Parameter	Symbol	Conditions	Min.	Typ	Max	Unit
Maximum Junction-to-Ambient ¹	R _{thJA}	TO-220AC	-	0.94	1.32	°C/W
Maximum Junction-to-Case ¹	R _{thJC}	TO-220AC	-	-	60	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC CHARACTERISTICS						
DC Blocking Voltage	V _R	I _R =100uA, T _j =25°C	1200	-	-	V
		I _R =100uA, T _j =175°C	1200	-	-	
Forward Voltage	V _F	I _F =10A, T _j =25°C	-	1.4	1.8	V
		I _F =10A, T _j =150°C	-	1.8	2.2	
		I _F =10A, T _j =175°C	-	2.0	2.4	
Reverse Current	I _R	V _R =1200V, T _j =25°C	-	1.2	60	μA
		V _R =1200V, T _j =150°C	-	15	120	
		V _R =1200V, T _j =175°C	-	25	250	
DYNAMIC CHARACTERISTICS						
Total Capacitive Charge	Q _C	V _R =800V, T _j =25°C $Q_C = \int_0^{V_R} C(V)dV$	-	49	-	nC
Total Capacitance	C	V _R =0.1V, f=1MHz, T _j =25°C	-	810	-	pF
		V _R =400V, f=1MHz, T _j =25°C	-	54.7	-	
		V _R =800V, f=1MHz, T _j =25°C	-	40	-	
Capacitance Stored Energy	E _C	V _R =800V, f=1MHz, T _j =25°C	-	25.3	-	μJ

Notes:

1. Heat sink size: 25 x 17 x 4 cm³
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. The power dissipation is limited by 175°C junction temperature.
4. The data is theoretically the same as I_F and I_{FSM} in real applications, should be limited by total power dissipation.



Typical Operating Characteristics

Figure 1: Typical Forward Characteristics

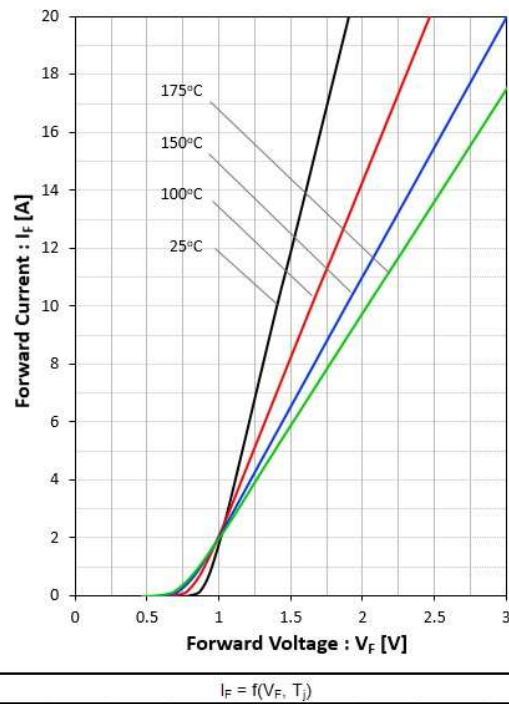


Figure 2: Typical Reverse Characteristics

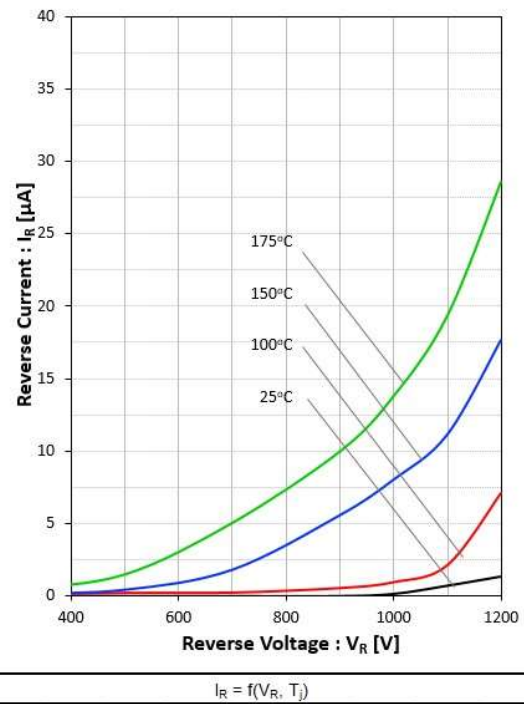


Figure 3: Power Derating Curves

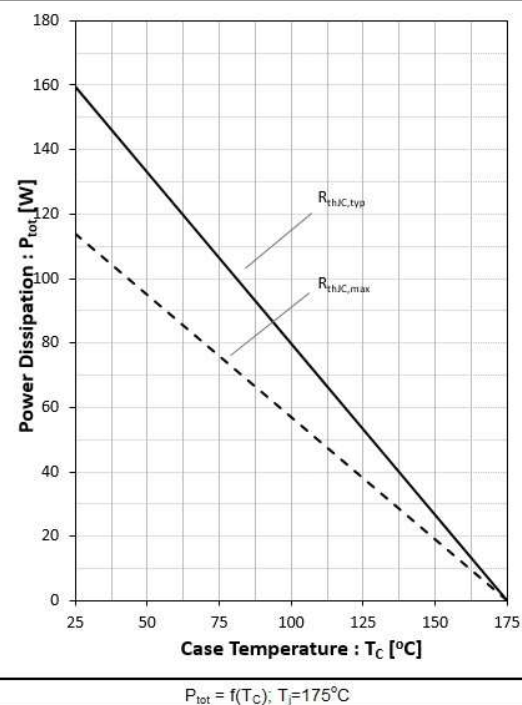
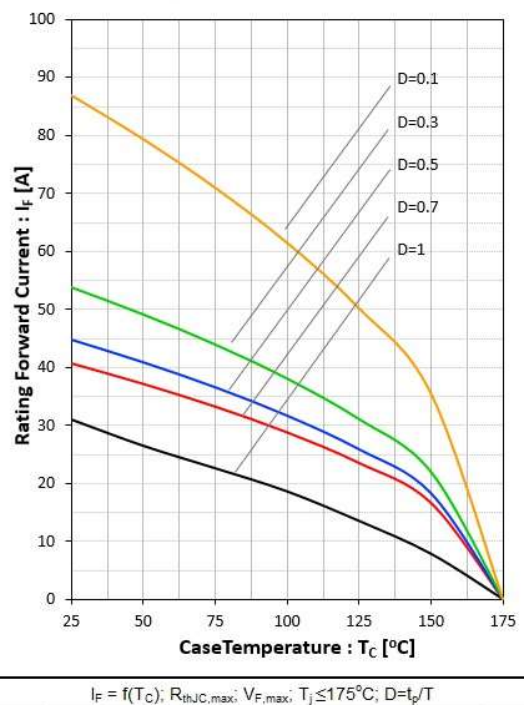
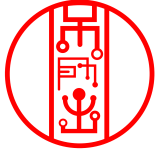


Figure 4: Current Derating Curves





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Typical Operating Characteristics (Cont.)

Figure 5: Typical Junction Capacitance

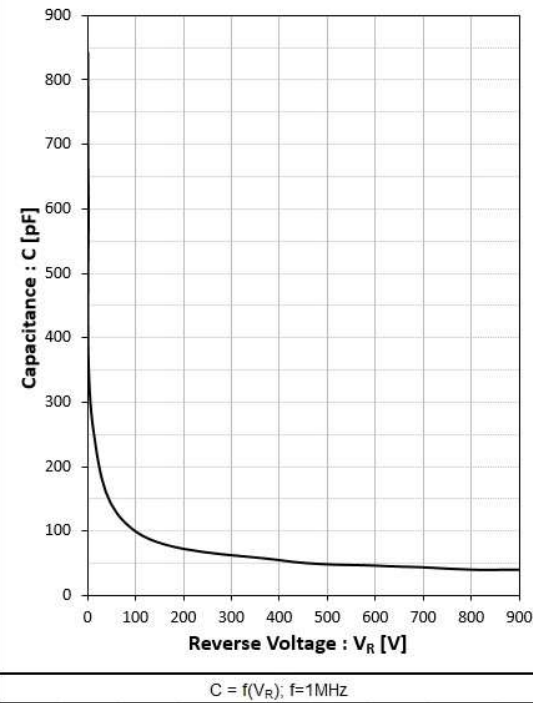


Figure 6: Typical Capacitive Charge

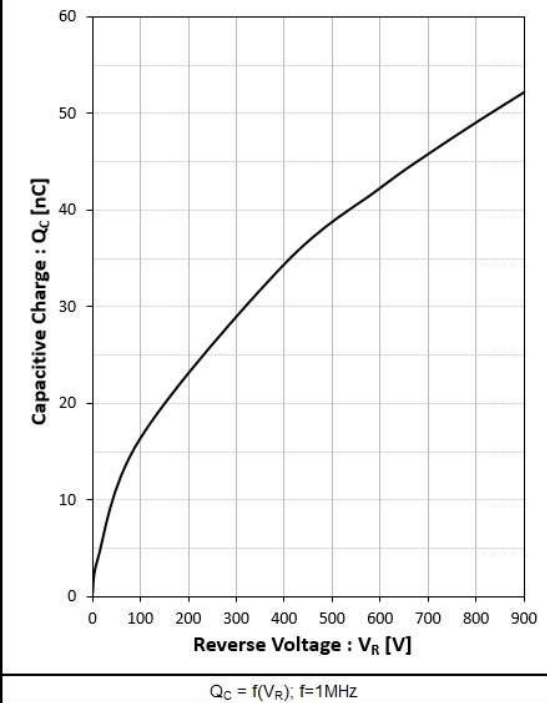


Figure 7: Typical Capacitive Energy

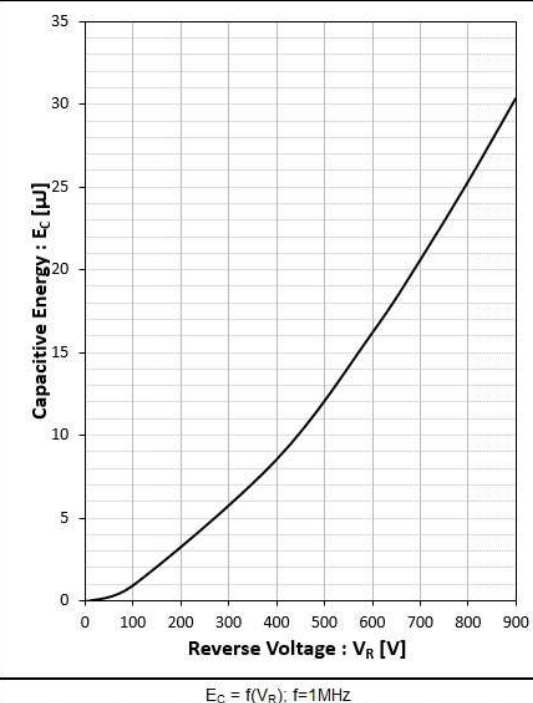
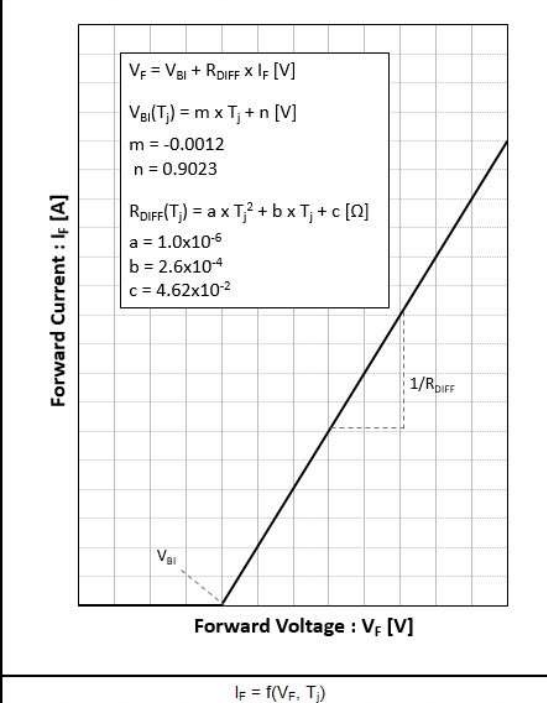
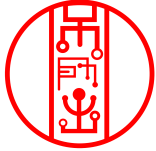


Figure 8: Forward Curve Model





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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC

