SHIKUES

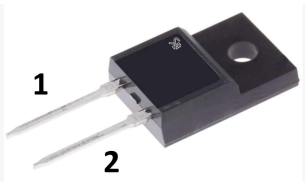
Q-SSC10120-T

Silicon Carbide Schottky Barrier Diode

1200V, 10A SiC SBD

General Description

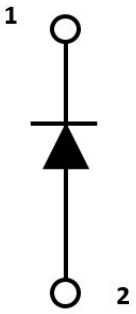
The Q-SSC10120-T uses a completely new technology and designs to provide superior switching performances and higher reliability. This device is suitable for use in solar inverter, renewable energy applications, uninterruptible power supply (UPS), and general purpose applications.

Product Summary			TO-220AC
V_{RRM}	1200	V	
I_F @ T_C=140°C	10	A	
Q_C @ VR=800V	49	nC	
E_C @ VR=800V	25.3	μJ	

Features

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

Graphic Symbol



Applications

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

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^2t Value, 10ms		$\int i^2dt$	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

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

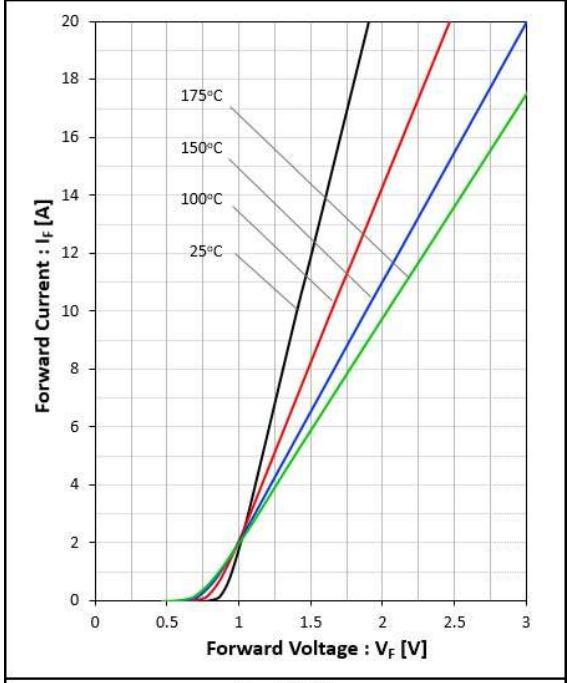
Electrical Characteristics (T_A=25°C unless otherwise noted)

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.**

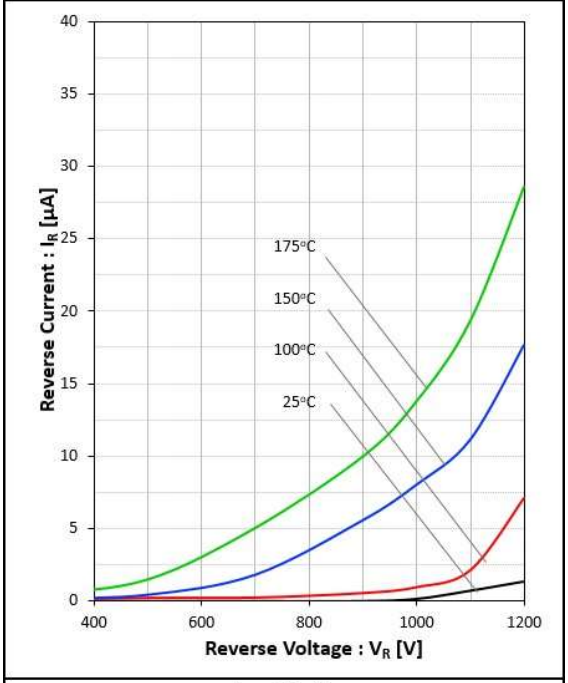
Typical Operating Characteristics

Figure 1: Typical Forward Characteristics



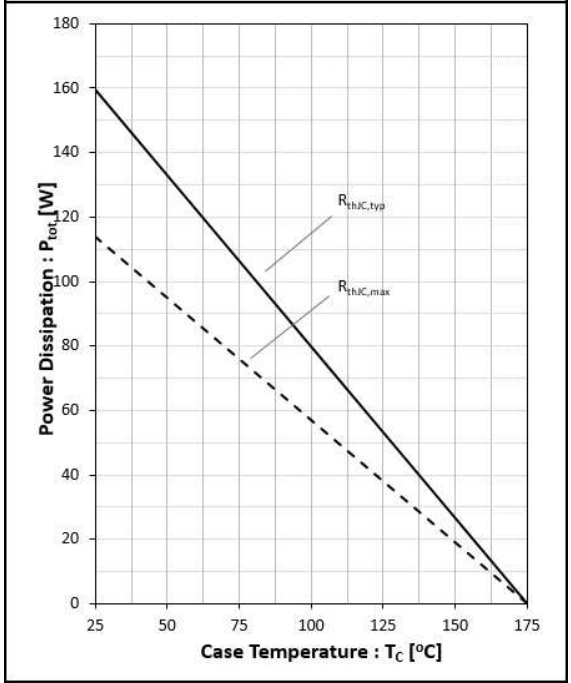
$I_F = f(V_F, T_j)$

Figure 2: Typical Reverse Characteristics



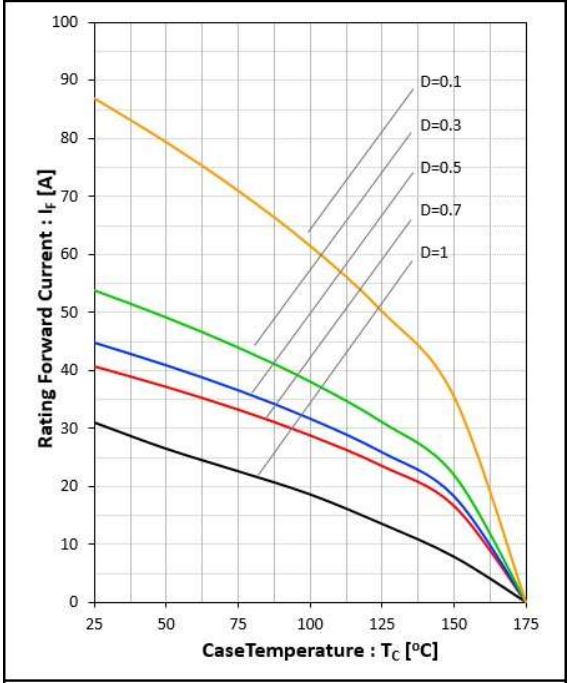
$I_R = f(V_R, T_j)$

Figure 3: Power Derating Curves



$P_{tot} = f(T_C)$; T_j=175°C

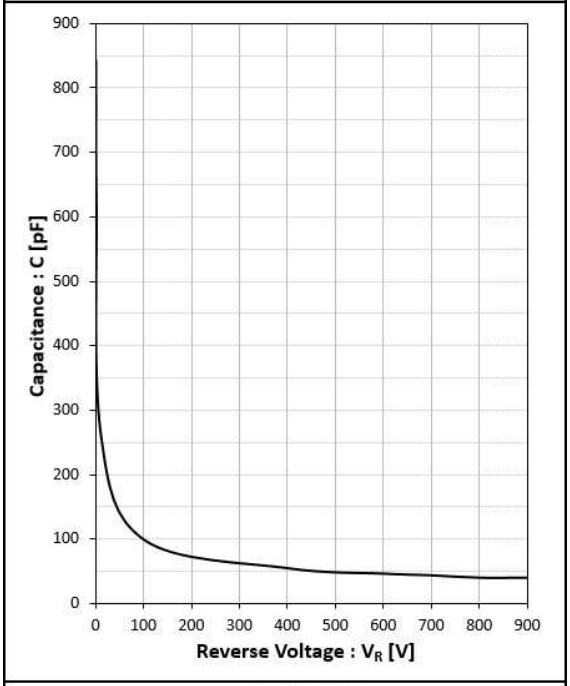
Figure 4: Current Derating Curves



$I_F = f(T_C)$; $R_{thJC,max}$; $V_{F,max}$; $T_j \leq 175°C$; $D=t_p/T$

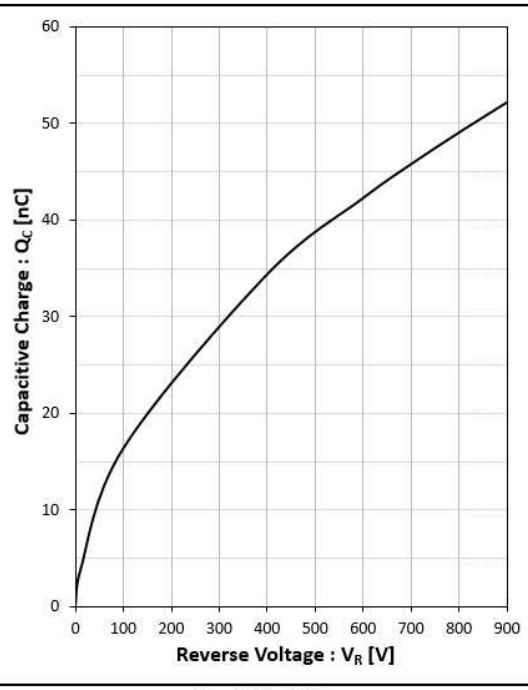
Typical Operating Characteristics (Cont.)

Figure 5: Typical Junction Capacitance



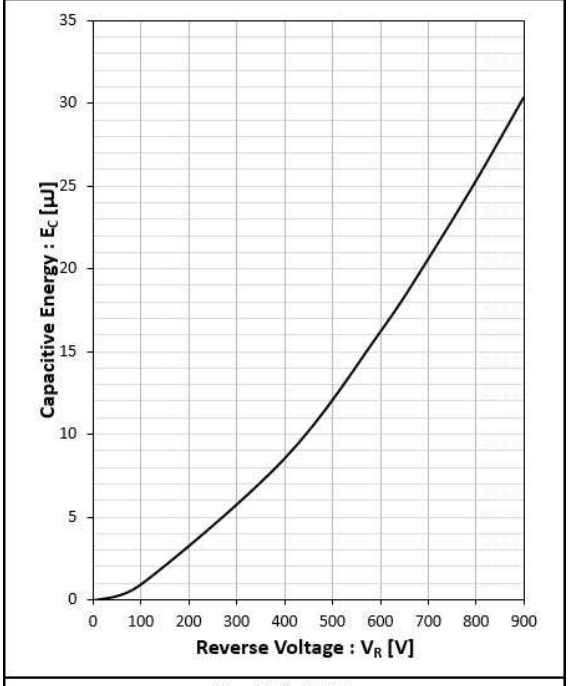
C = f(V_R); f=1MHz

Figure 6: Typical Capacitive Charge



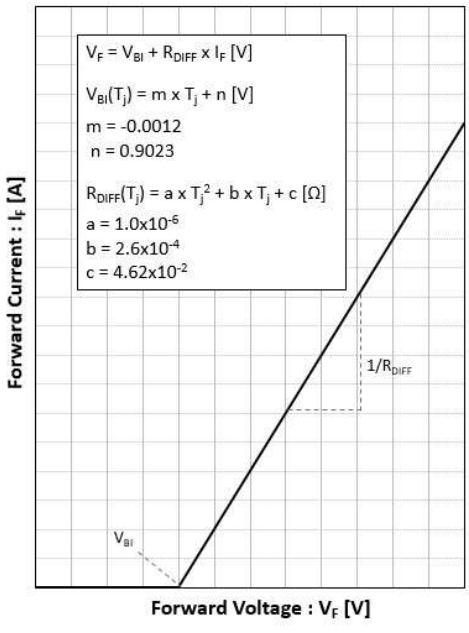
Q_C = f(V_R); f=1MHz

Figure 7: Typical Capacitive Energy



E_C = f(V_R); f=1MHz

Figure 8: Forward Curve Model



I_F = f(V_F, T_j)

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC