

Silicon Carbide Schottky Barrier Diode

1200V, 10A SiC SBD

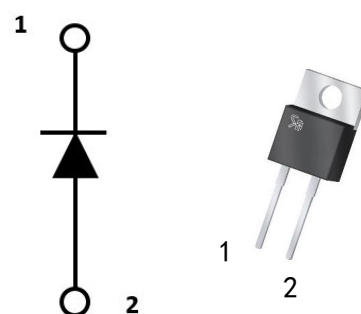
Features

- 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	I_F	31	A
		10	
Non-Repetitive Peak Forward Surge Current, Half Sine Wave, 10ms	$I_{F,SM}$	94	A
		78	
i^2t 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

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)

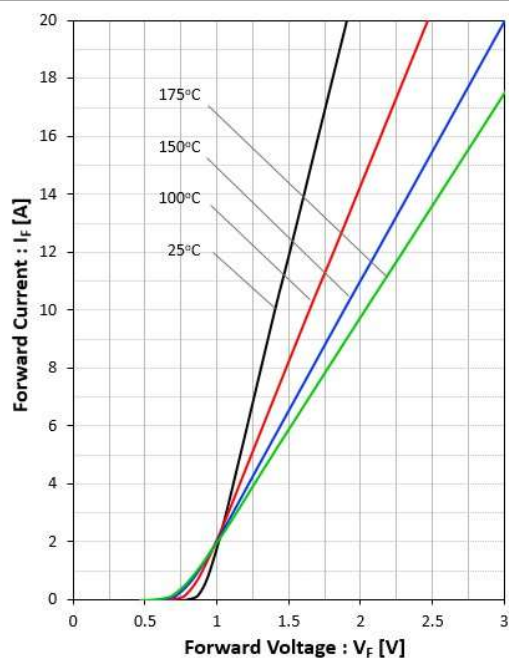
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC CHARACTERISTICS						
DC Blocking Voltage	V _R	I _R =100uA, T _J =25°C	1200	-	-	V
		I _R =100uA, T _J =175°C	1200	-	-	
Forward Voltage	V _F	I _F =10A, T _J =25°C	-	1.4	1.8	V
		I _F =10A, T _J =150°C	-	1.8	2.2	
		I _F =10A, T _J =175°C	-	2.0	2.4	
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 $Q_C = \int\limits_0^{V_R} C(V)dV$	-	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:

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

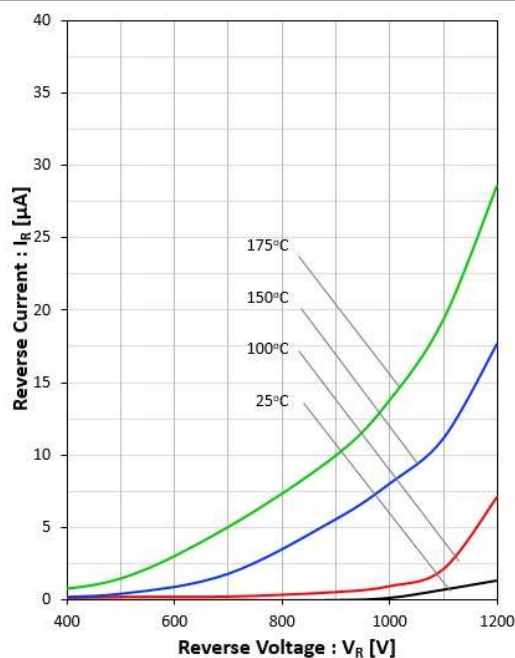
Typical Operating Characteristics

Figure 1: Typical Forward Characteristics



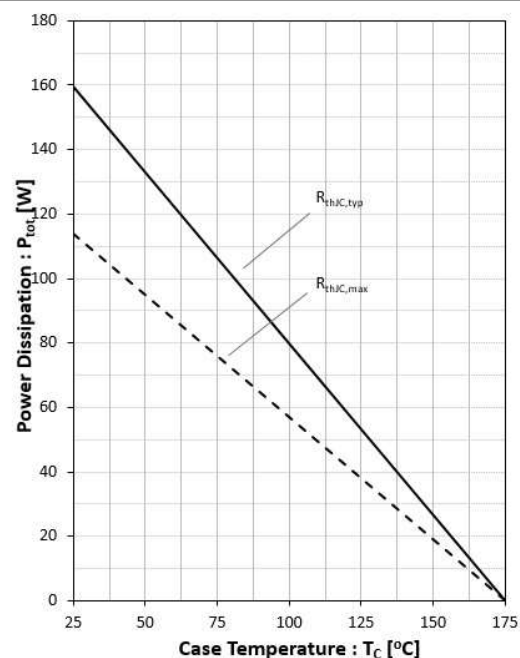
$$I_F = f(V_F, T_j)$$

Figure 2: Typical Reverse Characteristics



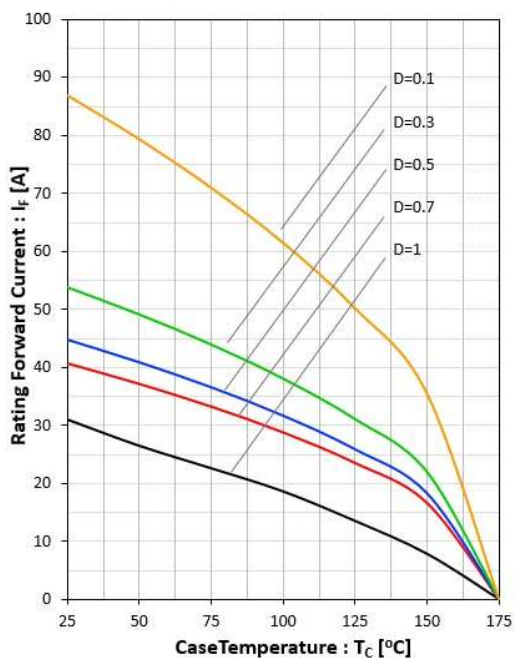
$$I_R = f(V_R, T_j)$$

Figure 3: Power Derating Curves



$$P_{tot} = f(T_C); T_j = 175^\circ\text{C}$$

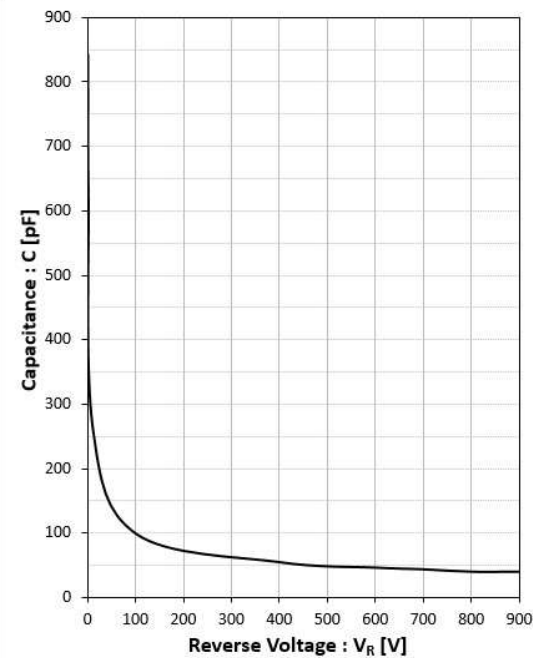
Figure 4: Current Derating Curves



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

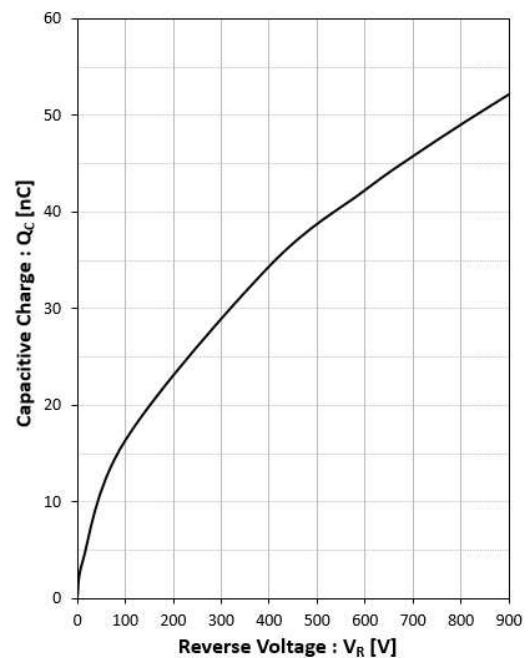
Typical Operating Characteristics (Cont.)

Figure 5: Typical Junction Capacitance



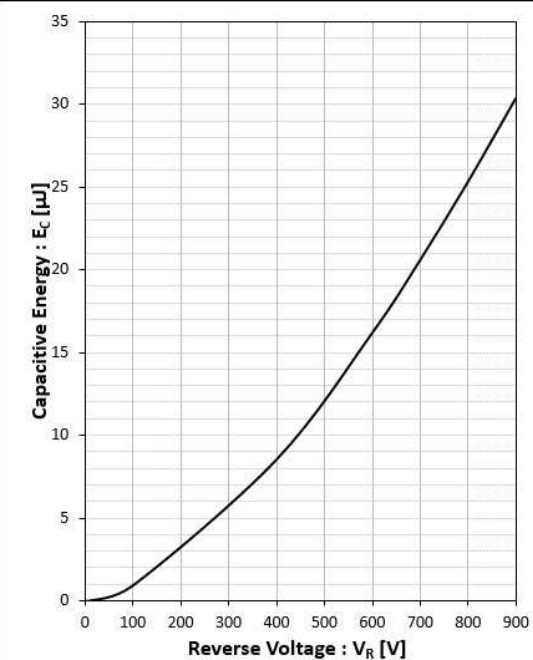
$$C = f(V_R); f=1\text{MHz}$$

Figure 6: Typical Capacitive Charge



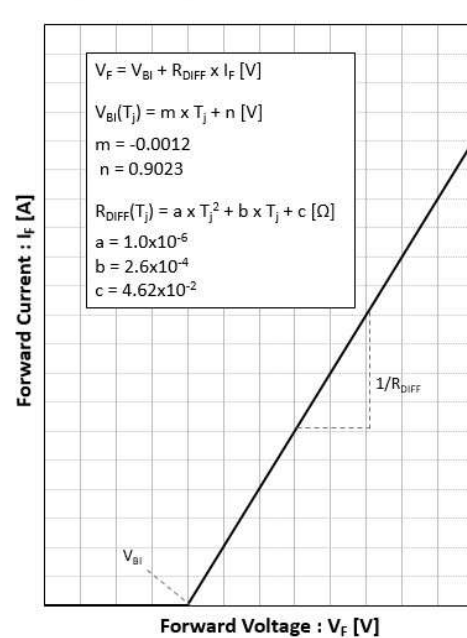
$$Q_C = f(V_R); f=1\text{MHz}$$

Figure 7: Typical Capacitive Energy



$$E_C = f(V_R); f=1\text{MHz}$$

Figure 8: Forward Curve Model



$$I_F = f(V_F, T_j)$$

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC

