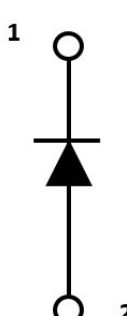


Silicon Carbide Schottky Barrier Diode

650V, 15A SiC SBD

General Description			
The Q-SSC1565-TF uses a completely new technology and designs to provide superior switching performances and higher reliability. This device is suitable for use in power factor correction (PFC), switch mode power supplies (SMPS) and general purpose applications.			
Product Summary			TO-220F-2L
V_{RRM}	650	V	
$I_F @ T_C=112^\circ\text{C}$	15	A	
$Q_C @ V_R=400\text{V}$	37.9	nC	
$E_C @ V_R=400\text{V}$	9.36	μJ	
Features			Graphic Symbol
<ul style="list-style-type: none"> • Temperature independent switching behavior • No reverse recovery current / No forward recovery • Excellent thermal performances • High surge current capability 			
Applications			
<ul style="list-style-type: none"> • Switch mode power supply • Power factor correction • Solar inverter • Uninterruptible power supply 			

Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	650	V
Continuous Forward Current, $D=1$	I_F	$T_C=25^\circ\text{C}$	29.1
		$T_C=112^\circ\text{C}$	15
Non-Repetitive Peak Forward Surge Current, Half Sine Wave, 10ms	$I_{F,SM}$	$T_C=25^\circ\text{C}$	63
		$T_C=150^\circ\text{C}$	52
i^2t Value, 10ms	$\int i^2 dt$	19.8	A
Non-Repetitive Peak Forward Current, 10us	$I_{F,max}$	378	A
Power Dissipation	P_D	60.9	W
Storage Temperature Range	T_{STG}	-55 to 150°C	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to 175°C	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Conditions	Min.	Typ	Max	Unit
Maximum Junction-to-Ambient ¹	R _{thJA}	TO-220F-2L	-	1.36	2.46	°C/W
Maximum Junction-to-Case ¹	R _{thJC}	TO-220F-2L	-	-	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	650	-	-	V
		I _R =100uA, T _J =175°C	650	-	-	
Forward Voltage	V _F	I _F =10A, T _J =25°C	-	1.4	1.7	V
		I _F =10A, T _J =150°C	-	1.8	2.2	
		I _F =10A, T _J =175°C	-	1.9	2.4	
Reverse Current	I _R	V _R =650V, T _J =25°C	-	1.1	55	μA
		V _R =650V, T _J =150°C	-	11	110	
		V _R =650V, T _J =175°C	-	25	250	
DYNAMIC CHARACTERISTICS						
Total Capacitive Charge	Q _C	V _R =400V, T _J =25°C $Q_C = \int_0^{V_R} C(V) dV$	-	37.9	-	nC
Total Capacitance	C	V _R =0.1V, f=1MHz, T _J =25°C	-	668	-	pF
		V _R =200V, f=1MHz, T _J =25°C	-	72.7	-	
		V _R =400V, f=1MHz, T _J =25°C	-	63.2	-	
Capacitance Stored Energy	E _C	V _R =400V, f=1MHz, T _J =25°C	-	9.36	-	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

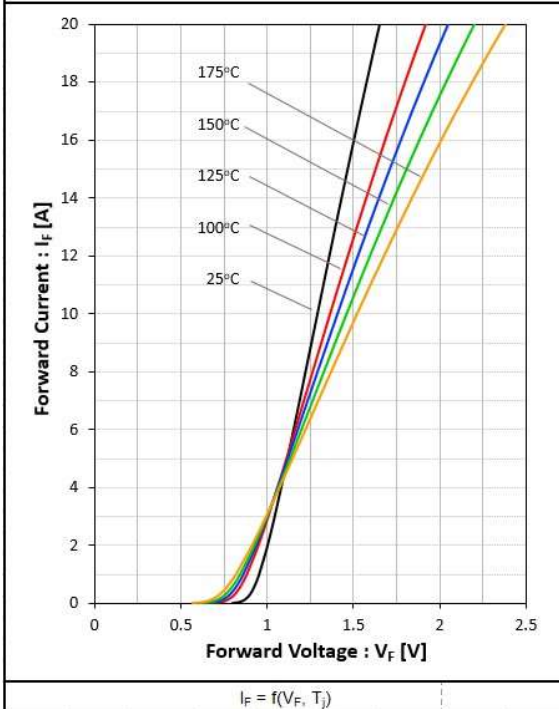


Figure 2: Typical Reverse Characteristics

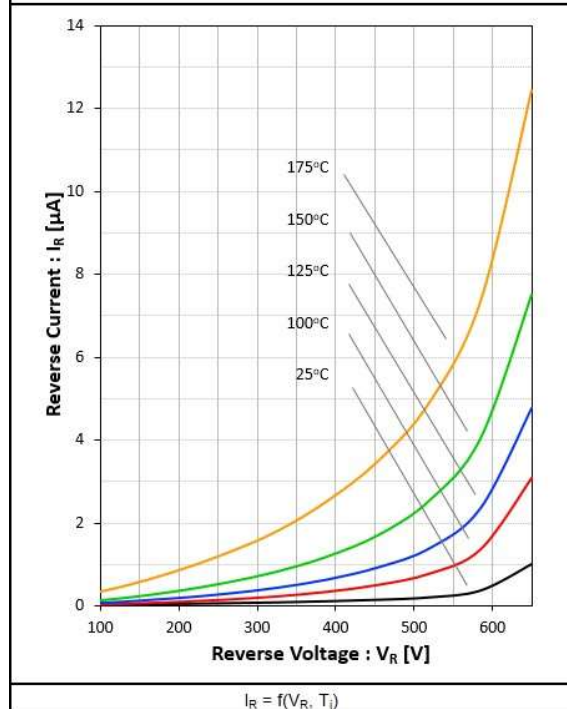


Figure 3: Power Derating Curves

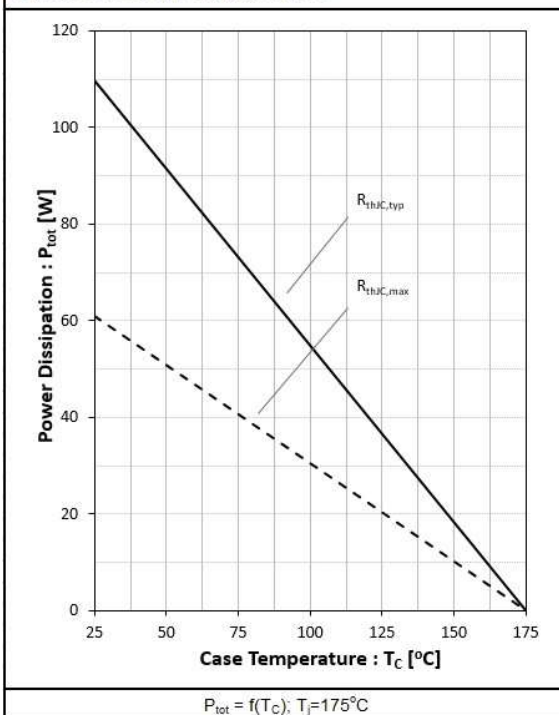
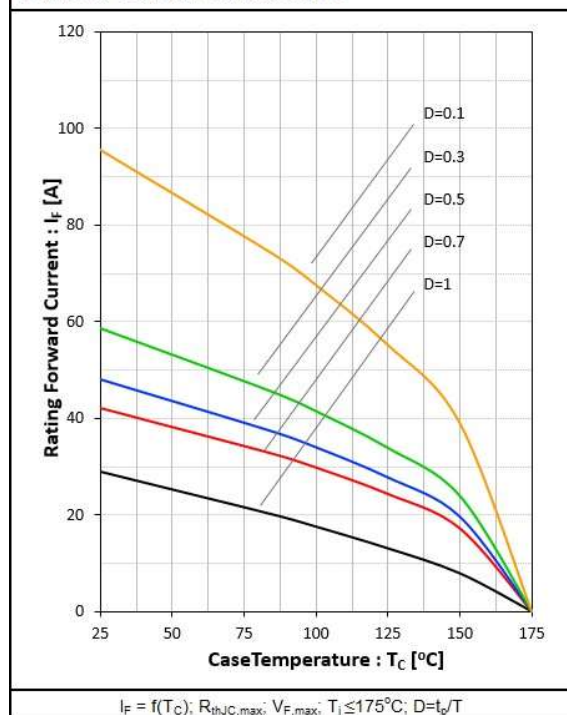


Figure 4: Current Derating Curves



Typical Operating Characteristics (Cont.)

Figure 5: Typical Junction Capacitance

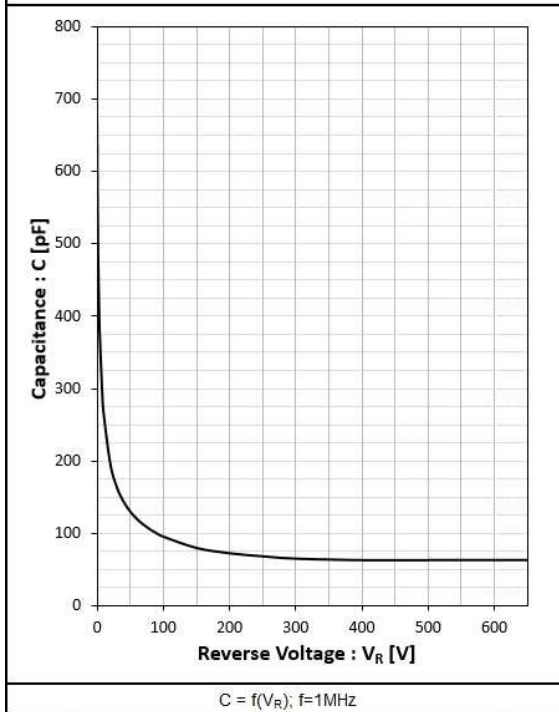


Figure 6: Typical Capacitive Charge

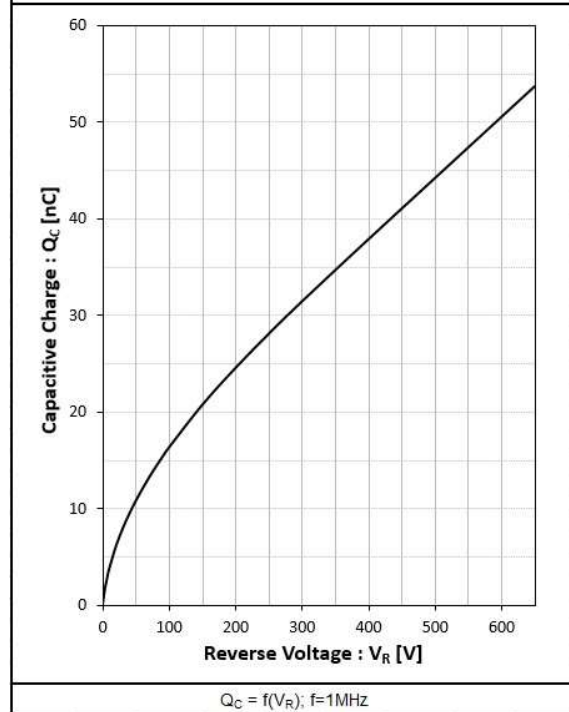


Figure 7: Typical Capacitive Energy

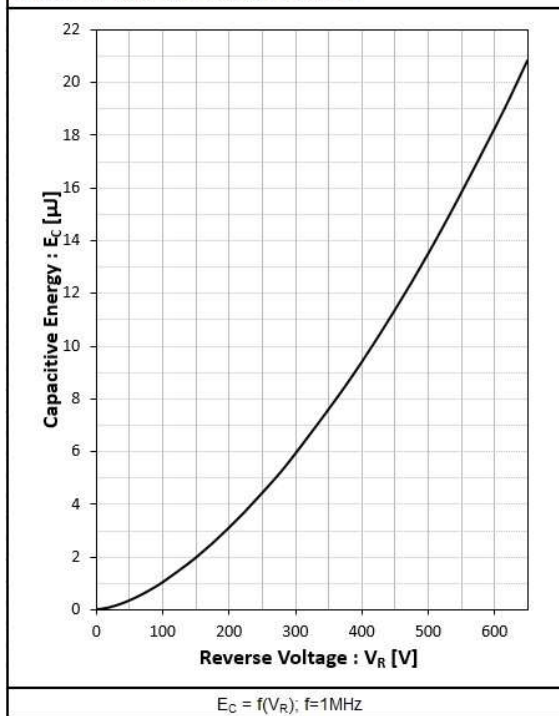
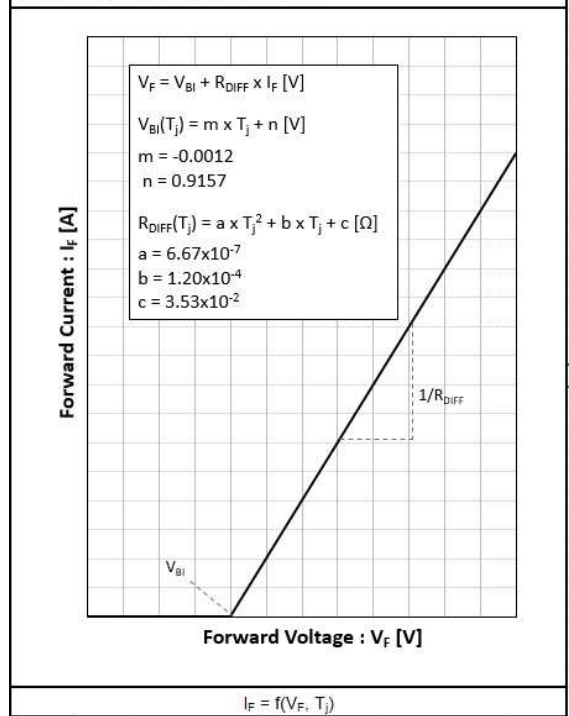


Figure 8: Forward Curve Model



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