



Q-SSC20120-T

1200V Silicon Carbide Schottky Diode

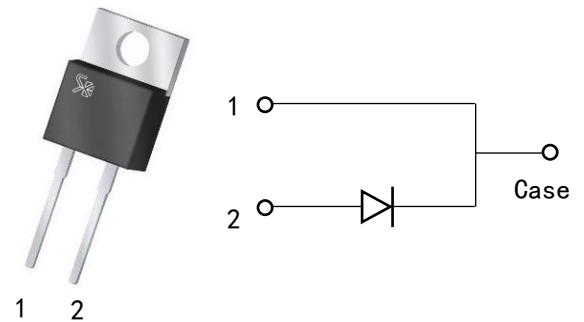
Features

- Negligible reverse recovery
- Positive Temperature Coefficient
- Temperature-Independent Switching
- Fast switching
- Pb-free / RoHS compliant

V_{RRM}	1200V
I_F	20A (TC=159°C)
Q_C	98nC

Benefits

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



Applications

- Solar inverters
- Uninterruptable power supplies
- Motor drives
- Power Factor Correction

Marking	Package
Q-SSC20120-T	TO-220-2

Thermal Characteristics

Symbol	Parameter	Value		Unit	Note
		Typ.	Max.		
$R_{th(j-c)}$	Thermal resistance (Junction to case)	0.43	-	°C/W	Figure 8



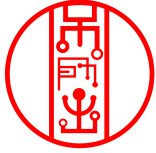
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Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter		Value	Unit	Note
V_{RRM}	Repetitive peak reverse voltage		1200	V	
I_F	Continuous forward current	Tc=25°C	73	A	Figure 3
		Tc=135°C	35	A	
		Tc=159°C	20	A	
I_{FSM}	Non-repetitive forward surge current	Tc=25°C, $t_p=10ms$, Half sine pulse	120	A	
		Tc=110°C, $t_p=10ms$, Half sine pulse	94	A	
I_{FRM}	Repetitive Peak Forward Surge Current	Tc=25°C, $t_p=10ms$, Half sine pulse	105	A	
		Tc=110°C, $t_p=10ms$, Half sine pulse	80	A	
$\int i^2 dt$	i^2t value	Tc=25°C, $t_p=10ms$	72	A ² S	
		Tc=110°C, $t_p=10ms$	44	A ² S	
P_{tot}	Power Dissipation	Tc=25°C	348	W	Figure 4
		Tc=110°C	151	W	
		Tc=150°C	58	W	
T_j, T_{stg}	Operating and Storage Temperature		-55 to +175	°C	

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

Symbol	Parameter	Test Conditions	Value			Unit	Note
			Min.	Typ.	Max.		
V_{DC}	DC blocking voltage		1200	-	-	V	
V_F	Forward voltage	$I_F=10A$	-	1.22	-	V	Figure 1
		$I_F=20A, T_c=25^\circ C$	-	1.45	1.7	V	
		$I_F=20A, T_c=150^\circ C$	-	1.8	-	V	
		$I_F=20A, T_c=175^\circ C$	-	1.9	-	V	
I_R	Reverse current	$V_R=1200V, T_c=25^\circ C$	-	5	200	uA	Figure 2
		$V_R=1200V, T_c=150^\circ C$	-	110	-	uA	
		$V_R=1200V, T_c=175^\circ C$	-	160	-	uA	
Q_C	Total capacitive charge	$V_R=800V$	-	98	-	nC	Figure 6
C	Total capacitance	$V_R=1V, f=1MHZ$	-	1100	-	pF	Figure 5
		$V_R=400V, f=1MHZ$	-	92	-	pF	
		$V_R=800V, f=1MHZ$	-	78	-	pF	
E_C	Capacitance Stored Energy	$V_R=800V$	-	30	-	uJ	Figure 7



Electrical Characteristic Curves

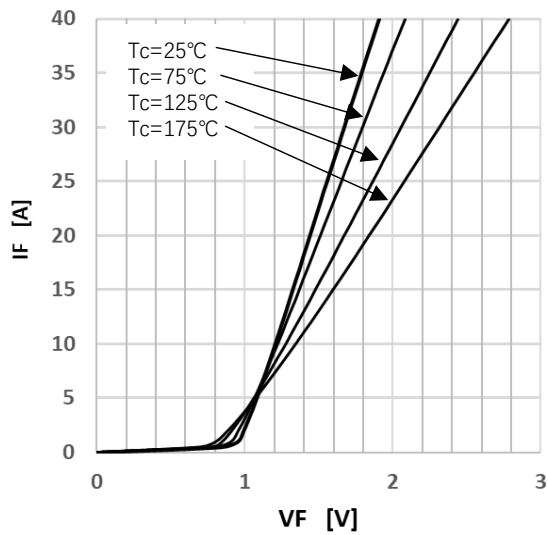


Figure 1 Forward Characteristics

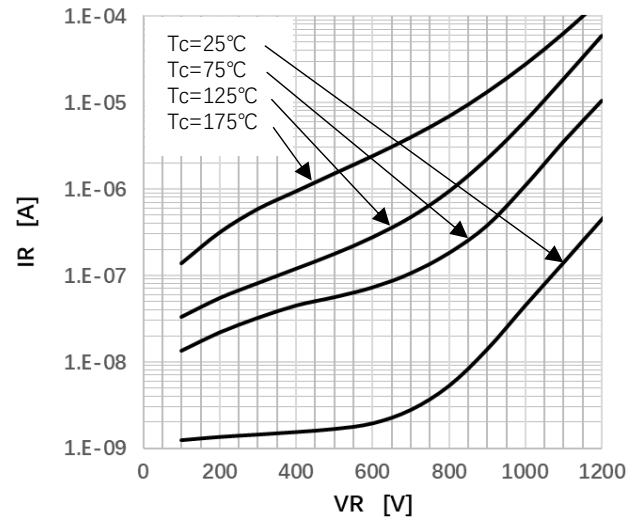


Figure 2 Reverse Characteristics

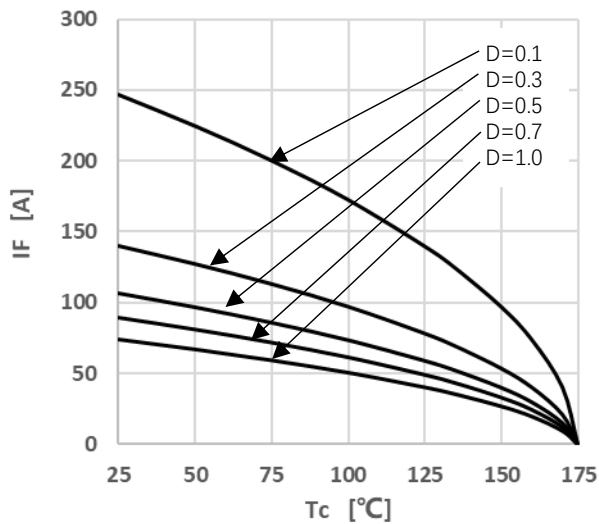


Figure 3 Peak Forward Current Derating

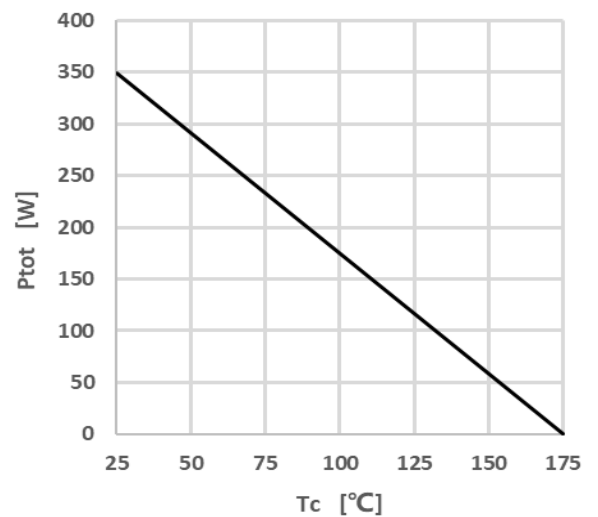
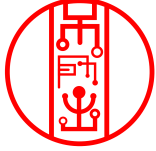


Figure 4 Power Dissipation



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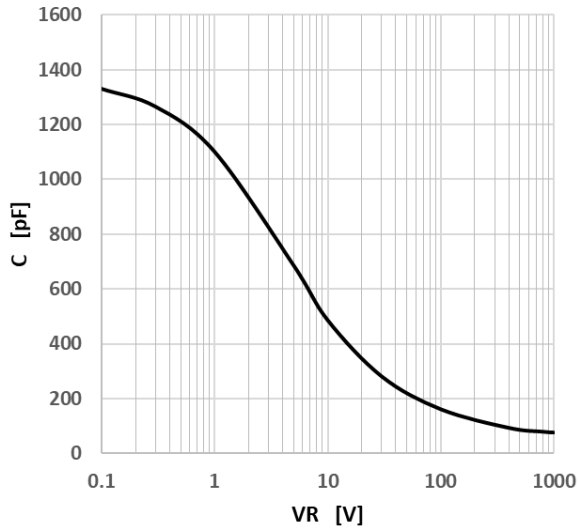


Figure 5 Capacitance vs. Reverse Voltage

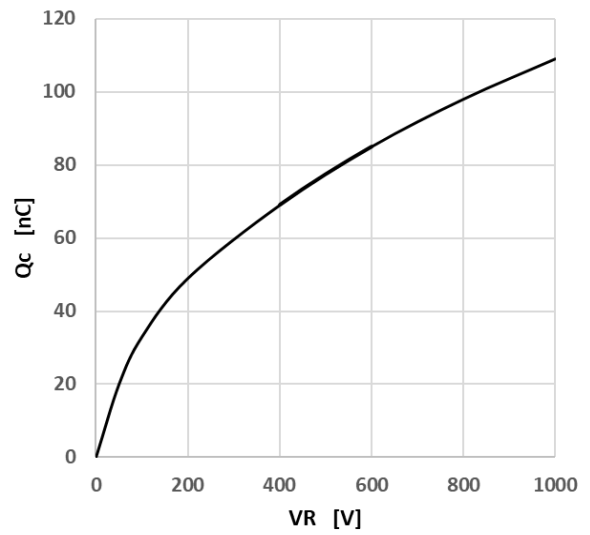


Figure 6 Capacitance Charge vs. Reverse Voltage

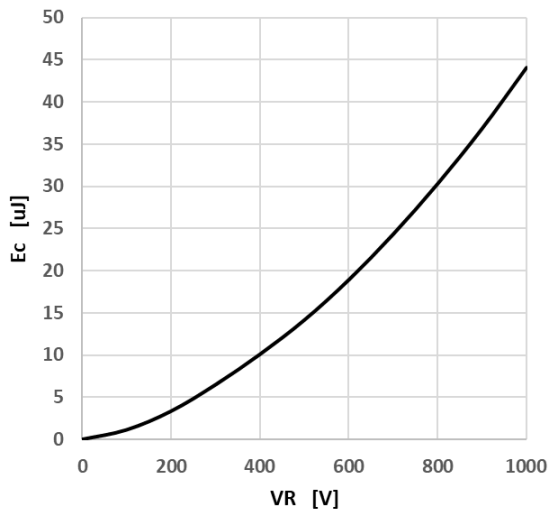


Figure 7 Capacitance Stored Energy

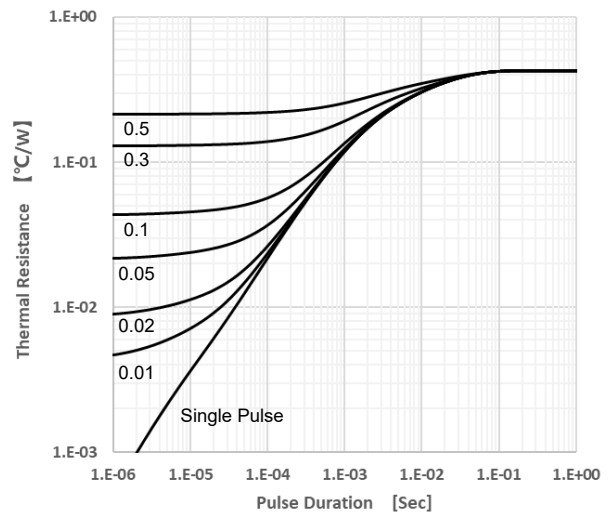
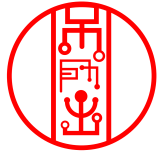


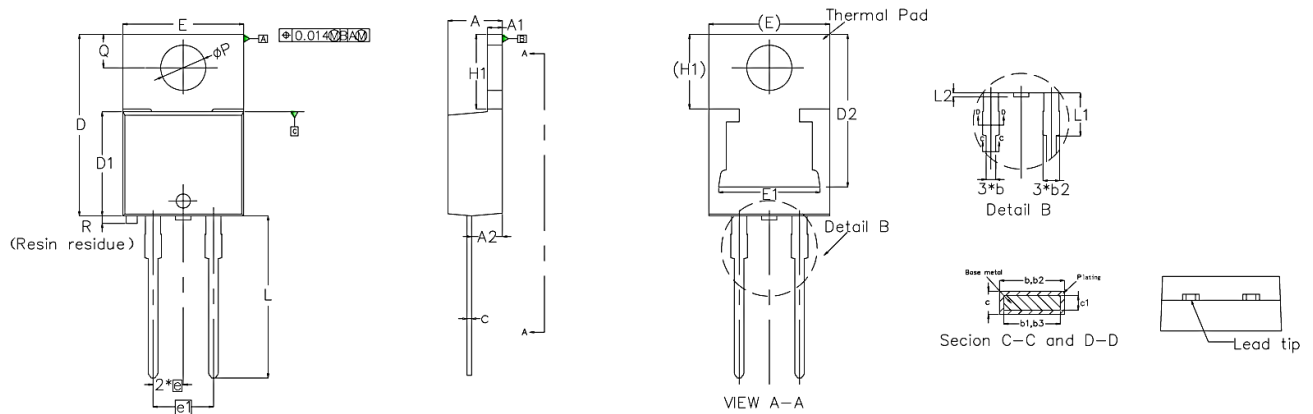
Figure 8 Transient Thermal Impedance



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Package Dimensions

To-220-2



SYMBOL	MILLIMETERS			NOTES		SYMBOL	MILLIMETERS			NOTES
	Normal	MIN.	MAX.				Normal	MIN.	MAX.	
A	4.55	4.44	4.65			E1	8.57	8.25	8.89	
A1	1.27	1.14	1.39			e	2.54	2.41	2.67	
A2	2.60	2.54	2.79			e1	5.08	4.95	5.20	
b	0.85	0.69	0.94			H1	6.20	6.09	6.40	
b1	0.83	0.38	0.97			L	13.60	13.52	14.00	
b2	1.33	1.20	1.45			L1	3.60	3.56	3.80	
b3	1.33	1.20	1.45			L2	—	0	0.35	
c	0.50	0.36	0.56			ϕP	3.80	3.70	3.91	
c1	0.48	0.36	0.56			Q	2.80	2.62	2.87	
D	15.25	14.95	15.32			R			0.2	
D1	8.75	8.50	8.89							
D2	12.85	12.20	13.30							
E	10.18	10.11	10.40							