



Silicon Carbide Schottky Barrier Diode

650V, 10A SiC SBD

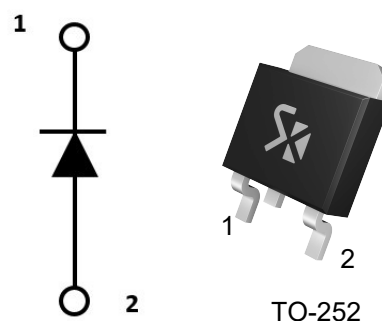
Features

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

V_{RRM}	650V
I_F	10A (TC=128°C)
Q_C	26.5nC

Applications

- Switch mode power supply
- Power factor correction
- Solar inverter
- Uninterruptible power supply



Marking	Package
Q-SSC1065	TO-252

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

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	650	V
Continuous Forward Current, D=1	I_F	23.2	A
		10	
Non-Repetitive Peak Forward Surge Current, Half Sine Wave, 10ms	$I_{F,SM}$	46	A
		38	
i^2t Value, 10ms	$\int i^2 dt$	10.7	A
Non-Repetitive Peak Forward Current, 10us	$I_{F,max}$	277	A
Power Dissipation	P_D	61.1	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}	T0-252	-	1.36	2.45	°C/W
Maximum Junction-to-Case ¹	R _{thJC}	T0-252	-	-	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	50	μA
		V _R =650V, T _J =150°C	-	9	90	
		V _R =650V, T _J =175°C	-	20	200	
DYNAMIC CHARACTERISTICS						
Total Capacitive Charge	Q _C	V _R =400V, T _J =25°C $Q_C = \int_0^{V_R} C(V) dV$	-	26.5	-	nC
Total Capacitance	C	V _R =0.1V, f=1MHz, T _J =25°C	-	462	-	pF
		V _R =200V, f=1MHz, T _J =25°C	-	50.4	-	
		V _R =400V, f=1MHz, T _J =25°C	-	43.8	-	
Capacitance Stored Energy	E _C	V _R =400V, f=1MHz, T _J =25°C	-	6.57	-	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

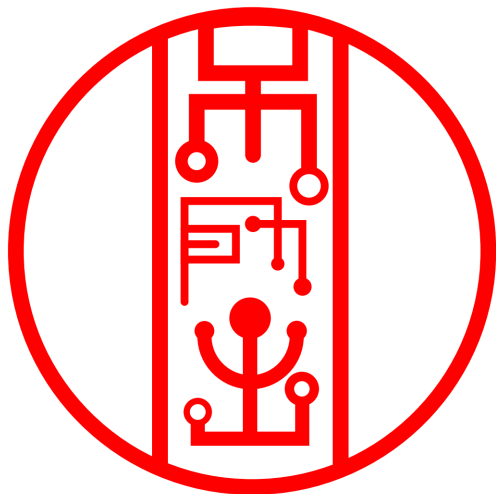


Figure 2: Typical Reverse Characteristics

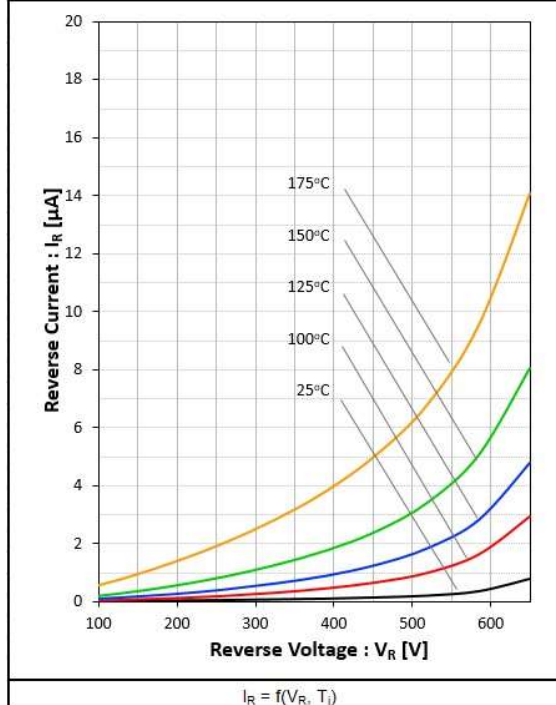


Figure 3: Power Derating Curves

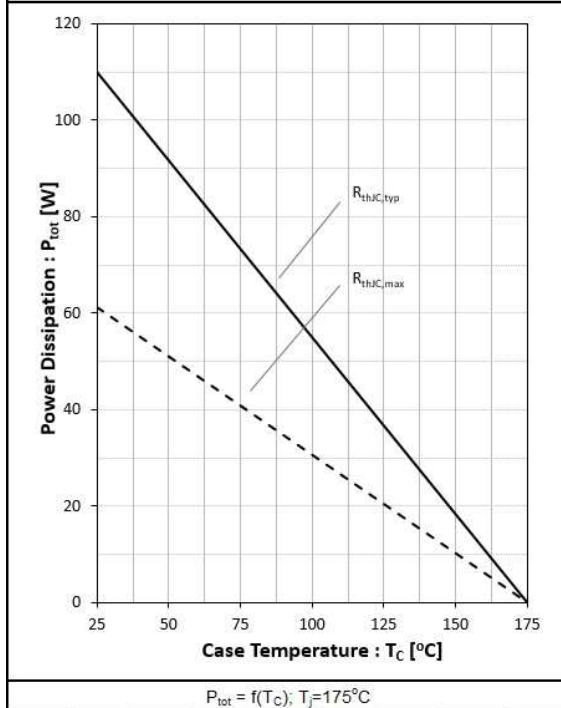
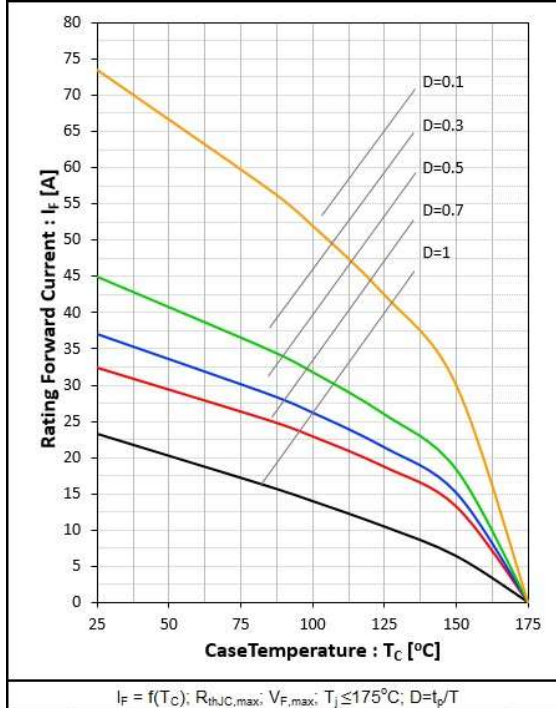


Figure 4: Current Derating Curves



Typical Operating Characteristics (Cont.)

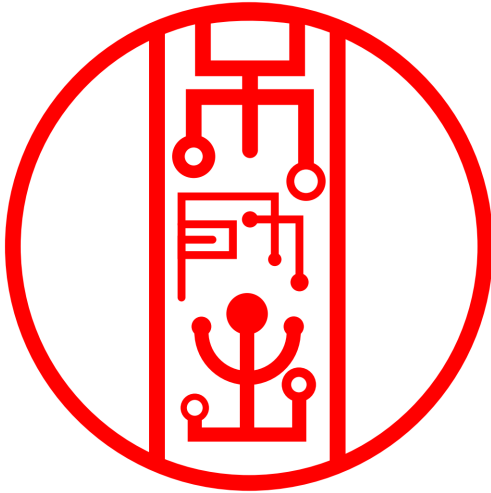
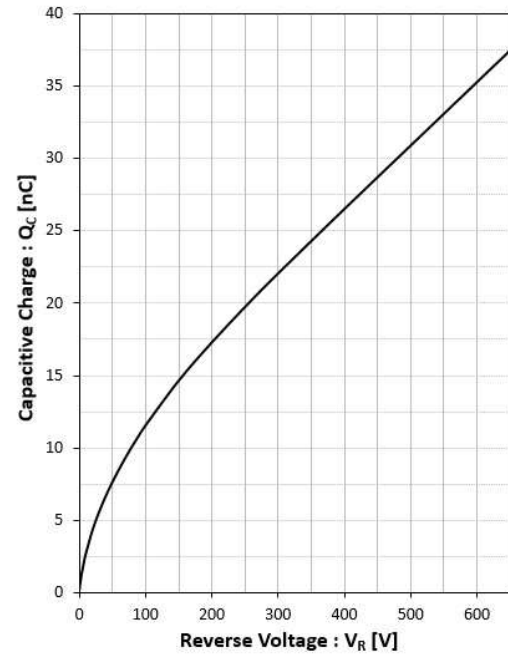
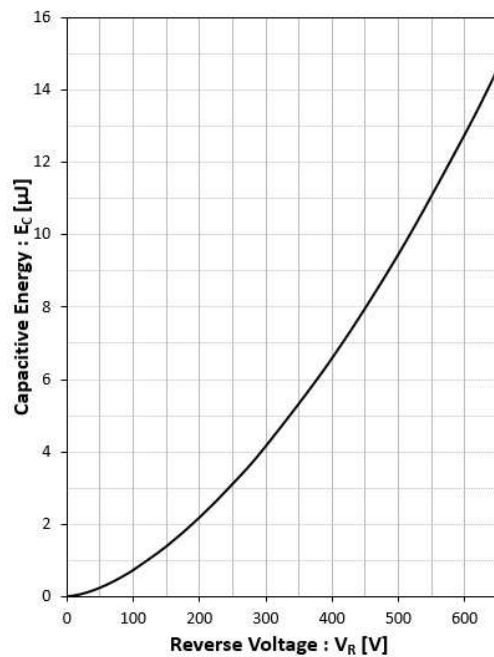


Figure 6: Typical Capacitive Charge



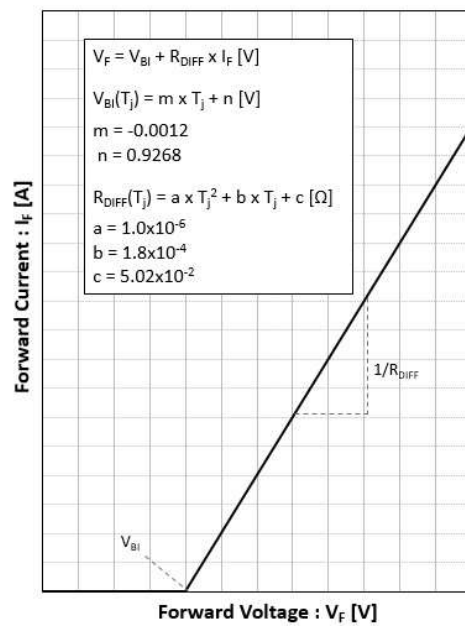
$$Q_C = f(V_R); f=1\text{MHz}$$

Figure 7: Typical Capacitive Energy



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

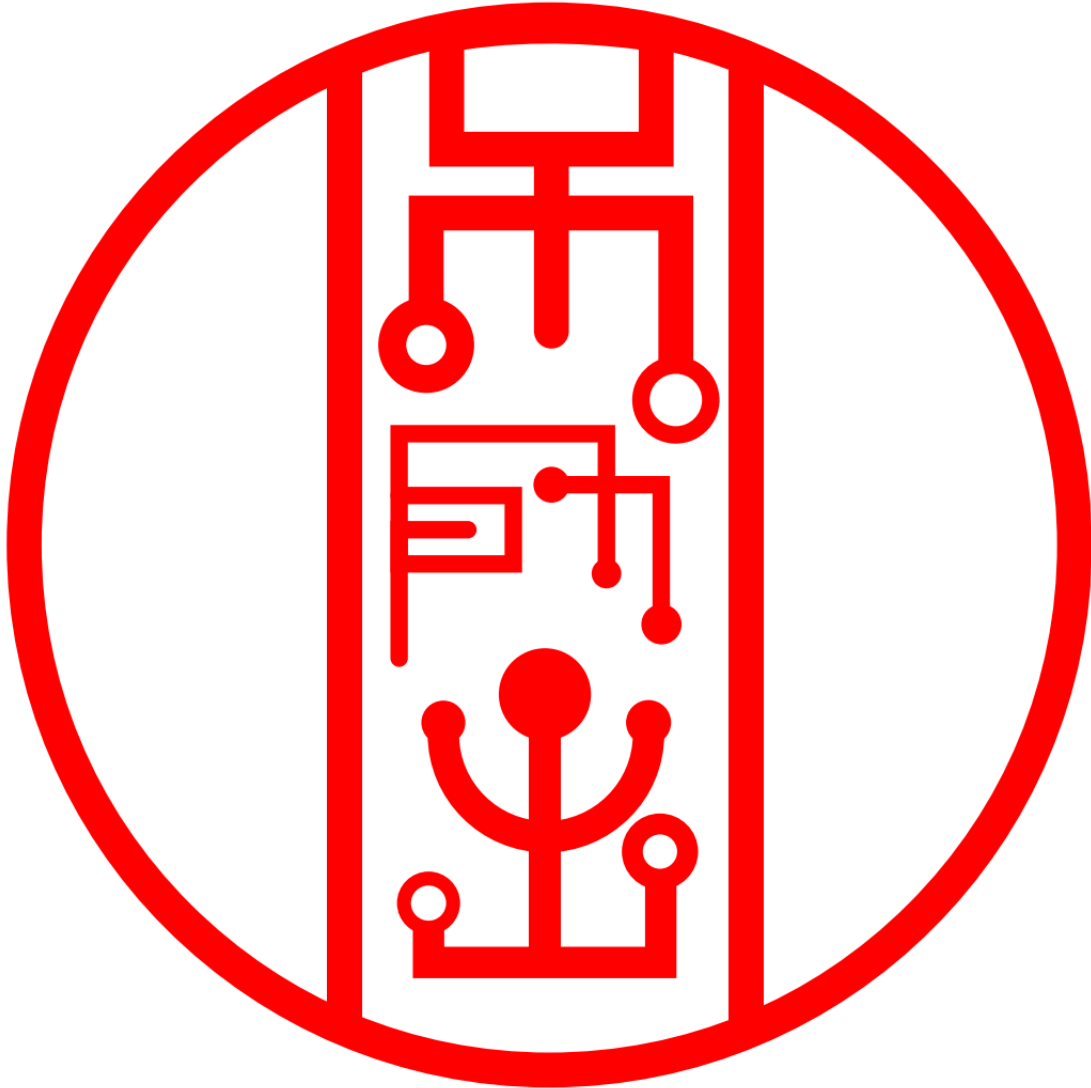
Figure 8: Forward Curve Model



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

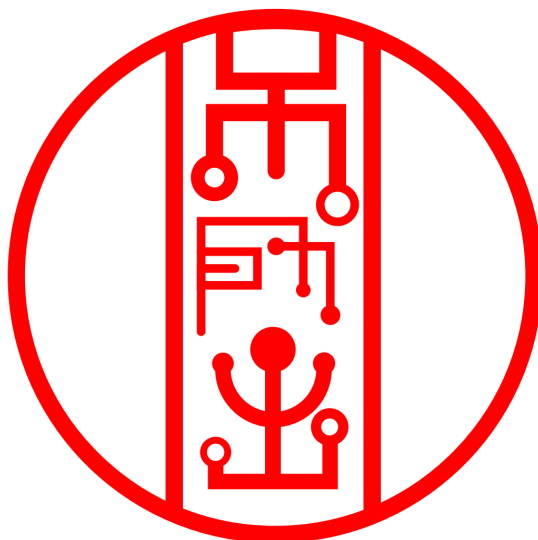
Soldering Methods for CW Product

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices



PACKAGE OUTLINE

TO-252(D-PAK)



TO-252(D-PAK) mechanical data

UNIT		A	B	b	C	D	E	F	G	H	L	L1	L2	L3	S	M	N	J	K	T
mm	max	6.7	5.5	0.8	2.5	6.3	0.6	1.8	2.29	0.55	3.1	1.2	1.0	1.75	0.1	1.8	1.3	3.16	1.80	4.83
	min	6.3	5.1	0.3	2.1	5.9	0.4	1.3	TYPICAL	0.45	2.7	0.8	0.6	1.40	0.0	TYPICAL	TYPICAL	ref.	ref.	ref.
mil	max	264	217	31	98	248	24	71	90	22	122	47	39	69	4	71	51	124	71	190
	min	248	201	12	83	232	16	51	TYPICAL	18	106	31	24	55	0	TYPICAL	TYPICAL	ref.	ref.	ref.