



Silicon Carbide Schottky Barrier Diode

650V, 15A SiC SBD

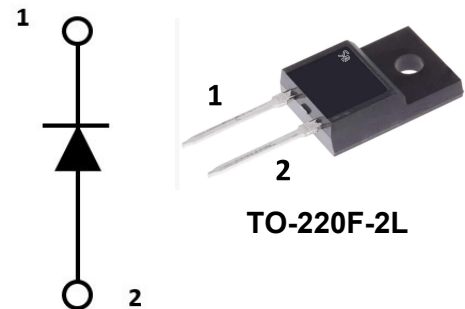
Features

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

V_{RRM}	650V
I_F	15A (TC=112°C)
Q_C	37.9nC

Applications

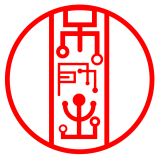
- Switch mode power supply
- Power factor correction
- Solar inverter
- Uninterruptible power supply



Marking	Package
Q-SSC1565-TF	TO-220F-2L

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	T _C =25°C	I_F	29.1	A
	T _C =112°C		15	
Non-Repetitive Peak Forward Surge Current, Half Sine Wave, 10ms	T _C =25°C	$I_{F,SM}$	63	A
	T _C =150°C		52	
i ² t Value, 10ms		∫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	°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-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:

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

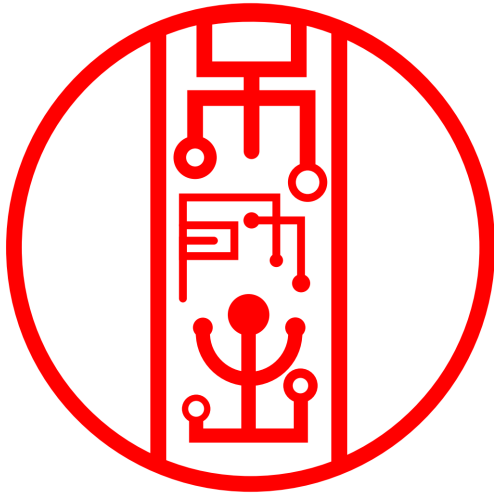


Figure 2: Typical Reverse Characteristics

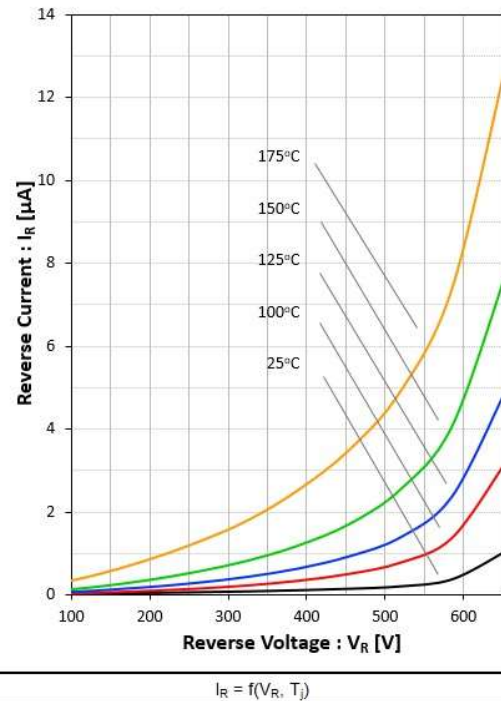


Figure 3: Power Derating Curves

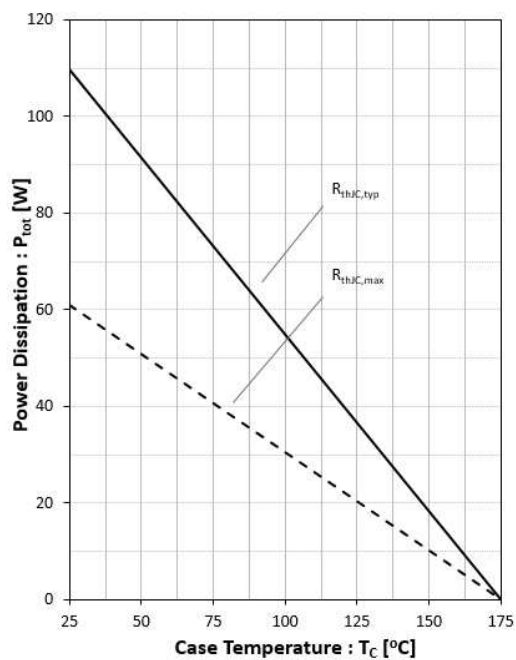
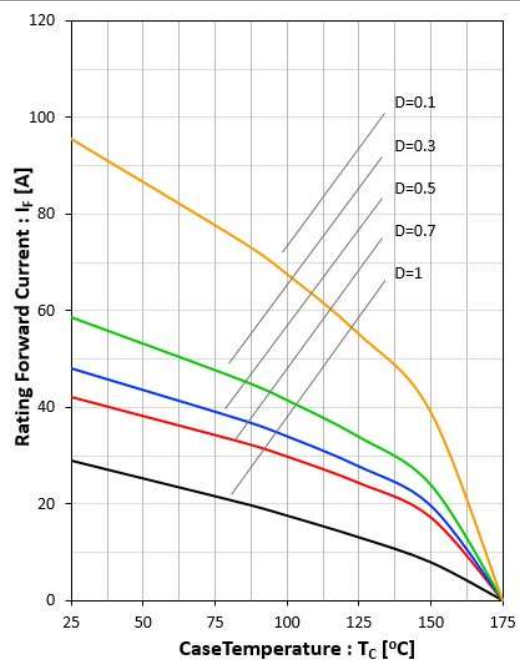


Figure 4: Current Derating Curves



Typical Operating Characteristics (Cont.)

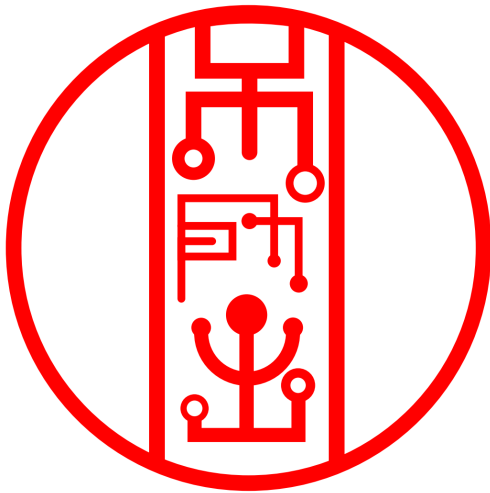
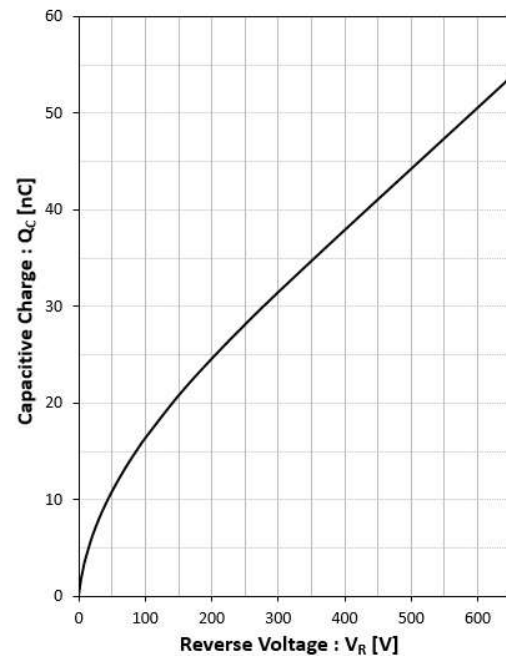
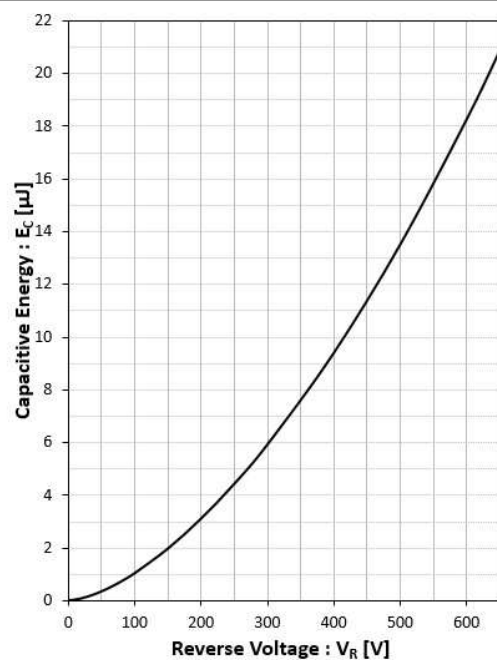


Figure 6: Typical Capacitive Charge



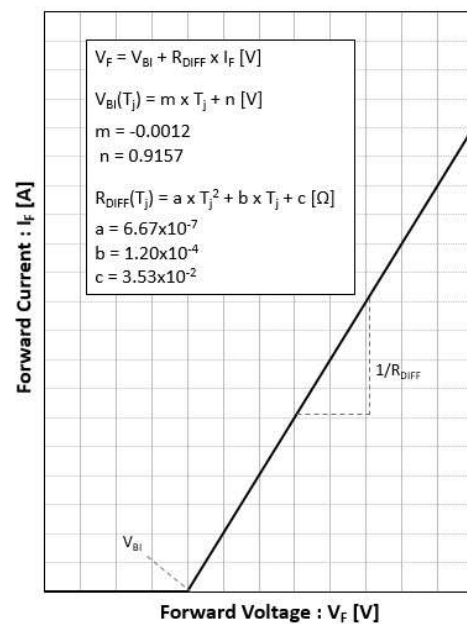
$$Q_C = f(V_R); f=1\text{MHz}$$

Figure 7: Typical Capacitive Energy



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

Figure 8: Forward Curve Model

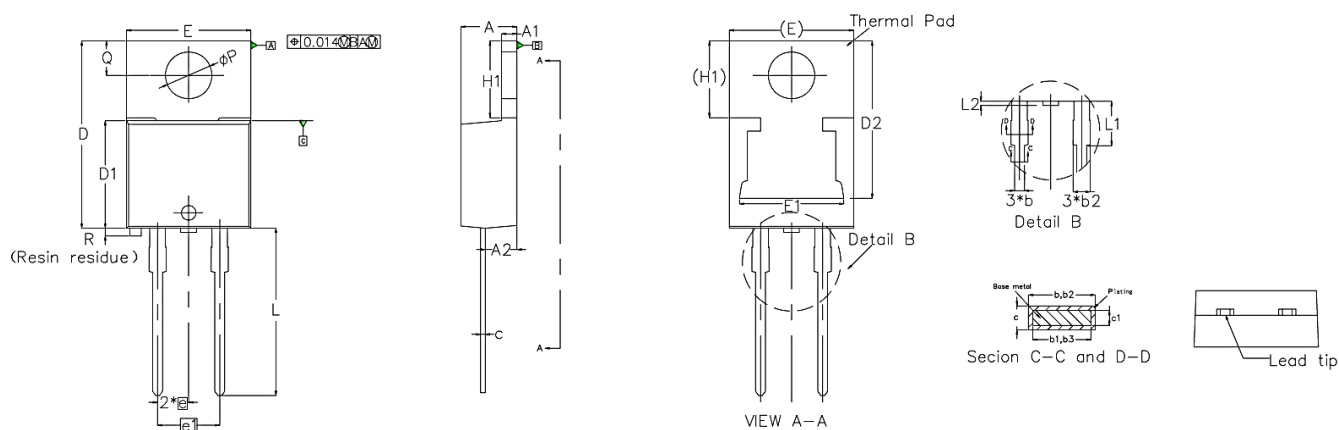


$$I_F = f(V_F, T_j)$$



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							