

650V Silicon Carbide Schottky Diode

V_{RRM}	650V
I_F	20A ($T_c=154^{\circ}\text{C}$)
Q_C	62nC

◇ Features

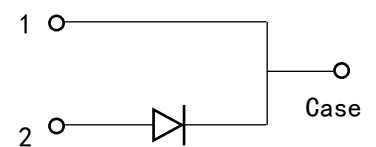
- High surge current capability
- No reverse recovery
- Positive Temperature Coefficient
- Easy to paralleling
- Halogen-free / RoHS compliant

◇ Benefits

- High-speed switching
- Low heat dissipation requirements
- Reduce size and cost of the system
- High-reliability
- System efficiency improvement

◇ Applications

- Solar inverter
- Power factor correction
- Data Center
- Switch mode power supply



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

Symbol	Parameter		Value	Unit	Note
V _{RRM}	Repetitive peak reverse voltage		650	V	
I _F	Continuous forward current	T _c =25°C	62	A	Figure 3
		T _c =135°C	29	A	
		T _c =154°C	20	A	
I _{FSM}	Non-repetitive forward surge current	T _c =25°C, t _p =10ms, Half sine pulse	172	A	
		T _c =110°C, t _p =10ms, Half sine pulse	156	A	
I _{FRM}	Repetitive Peak Forward Surge Current	T _c =25°C, t _p =10ms, Half sine pulse	164	A	
∫i ² dt	i ² t value	T _c =25°C, t _p =10ms	148	A ² S	
		T _c =110°C, t _p =10ms	121	A ² S	
P _{tot}	Power Dissipation	T _c =25°C	258	W	Figure 4
		T _c =110°C	112	W	
		T _c =150°C	43	W	
T _j , T _{stg}	Operating and Storage Temperature		-55 to +175	-55 to +175	

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

Symbol	Parameter	Test Conditions	Value			Unit	Note
			Min.	Typ.	Max.		
V _{DC}	DC blocking voltage		650	-	-	V	
V _F	Forward voltage	I _F =10A	-	1.16	-	V	Figure 1
		I _F =20A, T _c =25°C	-	1.35	1.6	V	
		I _F =20A, T _c =175°C		1.7		V	
I _R	Reverse current	V _R =650V, T _c =25°C	-	6	100	uA	Figure 2
		V _R =650V, T _c =175°C		15		uA	
Q _C	Total capacitive charge	V _R =400V	-	62	-	nC	Figure 6
C	Total capacitance	V _R =1V, f=1MHZ	-	906	-	pF	Figure 5
		V _R =200V, f=1MHZ	-	122	-	pF	
		V _R =400V, f=1MHZ	-	118	-	pF	
E _C	Capacitance Stored Energy	V _R =400V	-	10	-	uJ	Figure 7

Thermal Characteristics

Symbol	Parameter	Value		Unit	Note
		Typ.	Max.		
$R_{th(j-c)}$	Thermal resistance (Junction to case)	0.58	-	$^{\circ}\text{C}/\text{W}$	Figure 8

Electrical Characteristic Curves

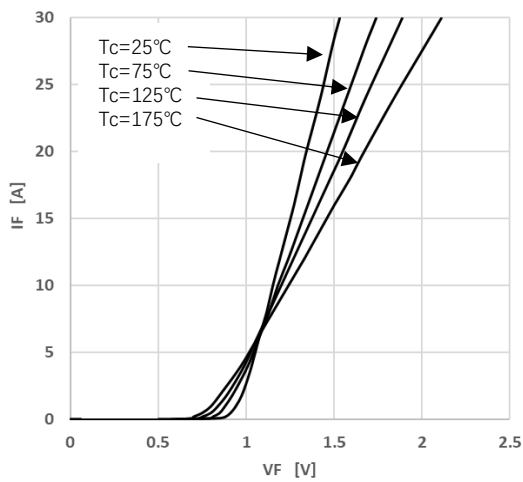


Figure 1 Forward Characteristics

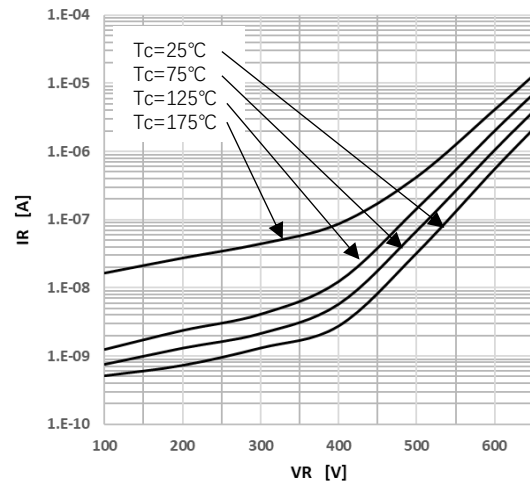


Figure 2 Reverse Characteristics

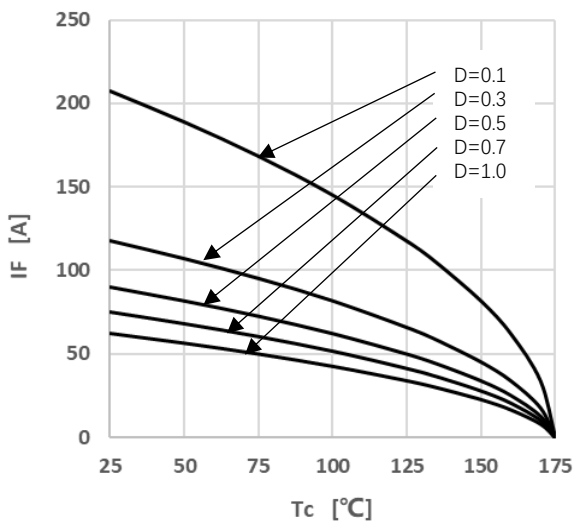


Figure 3 Peak Forward Current Derating

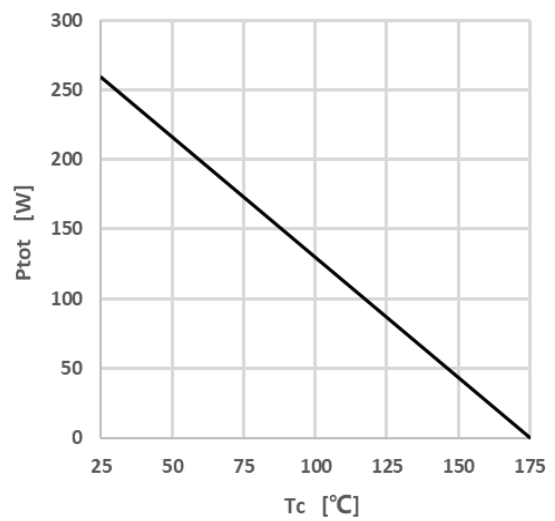


Figure 4 Power Dissipation

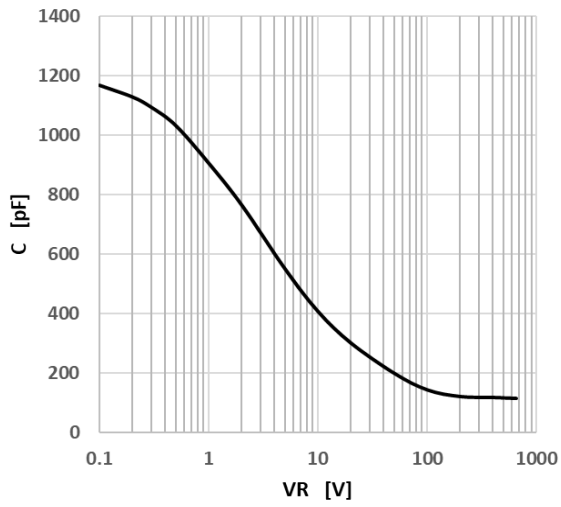


Figure 5 Capacitance vs. Reverse Voltage

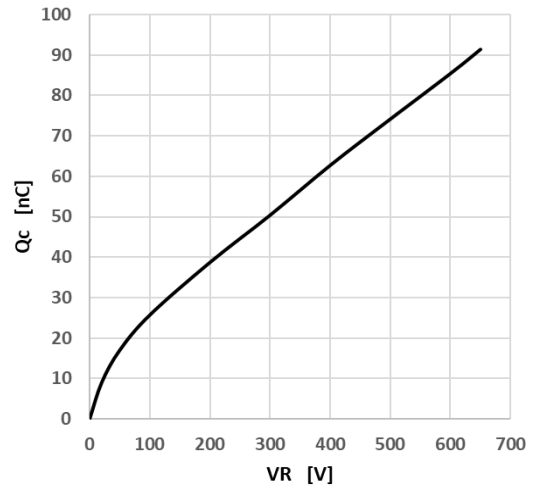


Figure 6 Capacitance Charge vs. Reverse Voltage

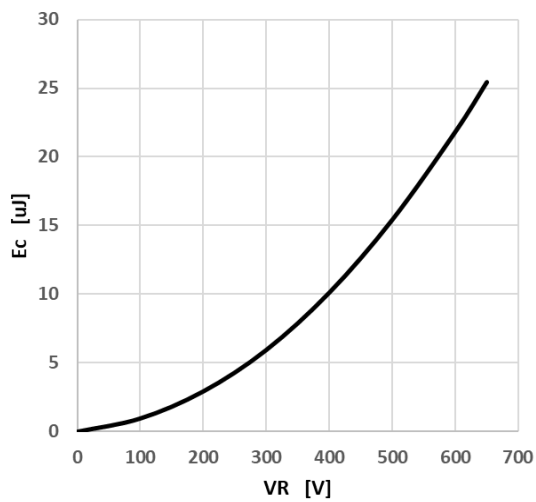


Figure 7 Capacitance Stored Energy

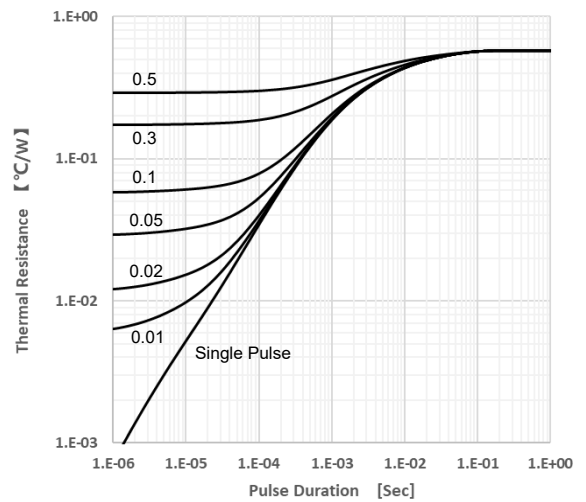
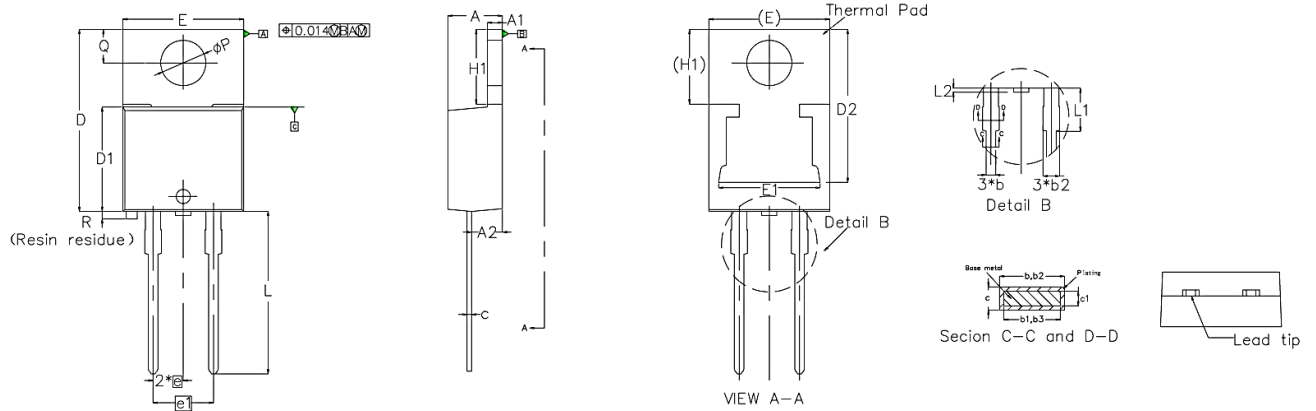


Figure 8 Transient Thermal Impedance

Package Dimensions

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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		øP	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						