Silicon Carbide Schottky Diode 1200 V, 40 A, 178 nC

General Description

This product family is CRM's second generation SiC JBS, with lower VF and offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required. It is qualified and manufactured on the productive 6 inch SiC line in China fully owned by CR MICRO.

Product Summary

V_{RRM}	1200 V
I_F (T_C=159℃)	40 A
Q_C	178 nC

Features

- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_C
- Highly rugged due to better surge current
- Industrial standard quality and reliability

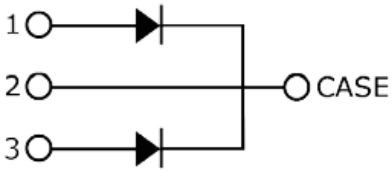
Applications

- Solar inverter
- EV charge
- High performance SMPS
- Power factor correction

TO-247



Equivalent circuit



Package Marking and Ordering Information

Part #	Marking	Package
CRXQ40D120G2	CRXQ40D120G2	TO-247

Maximum Ratings (at Tc = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
Surge Peak Reverse Voltage	V_{RSM}	1200	V
DC Peak Reverse Voltage	V_R	1200	V
Continuous Forward Current (Per leg/Device) T_C = 25°C T_C = 135°C T_C = 159°C	I_F	 63/126 32/64 20/40	A
Non-Repetitive Forward Surge Current (Per leg) T_C = 25°C,t_p=8.3ms,Half Sine Pulse T_C = 110°C,t_p=8.3ms,Half Sine Pulse	I_{FSM}	 160 140	A
Non-Repetitive Forward Surge Current (Per leg) T_C = 25°C,t_p=8.3ms,Half Sine Pulse T_C = 110°C,t_p=8.3ms,Half Sine Pulse	$\int i^2dt$	 106 81	A^2s
Power dissipation (Per leg/Device) T_C = 25°C T_C = 110°C	P_{tot}	 214/428 93/186	W
Operating junction Range	T_j	-55 to +175	°C
Storage temperature Range	T_{stg}	-55 to +150	°C

Thermal Resistance

Parameter	Symbol	Max.	Unit
Thermal resistance, junction – case.	R_{thJC}	0.7* 0.35**	°C/W

* Per leg, ** Device

Electrical Characteristic (Per leg at Tc = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V_F	- -	1.4 2	1.7 -	V	I_F=20A T_j=25°C T_j=175°C
Reverse Current	I_R	- -	5 50	100 -	μA	V_R=1200V T_j=25°C T_j=175°C
Total Capacitive Charge	Q_C	-	89	-	nC	V_R=800V，T_j=25℃ $Q_C = \int_0^{V_R} C(V)dV$
Total Capacitance	C	- - -	1320 86 69	- - -	pF	T_j=25℃, f=1MHz V_R=0V V_R=400V V_R=800V

Characteristics Curve:

Fig 1: Forward Characteristics

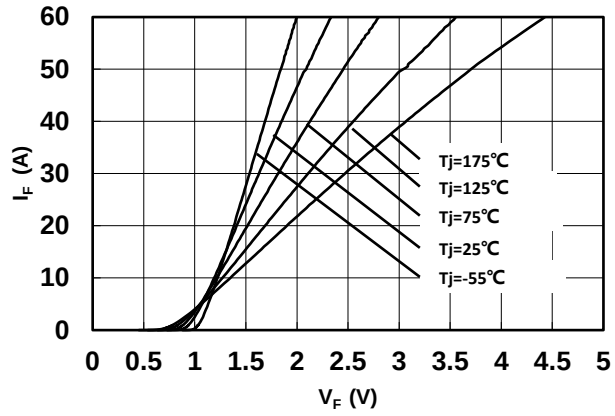


Fig 2: Reverse Characteristics

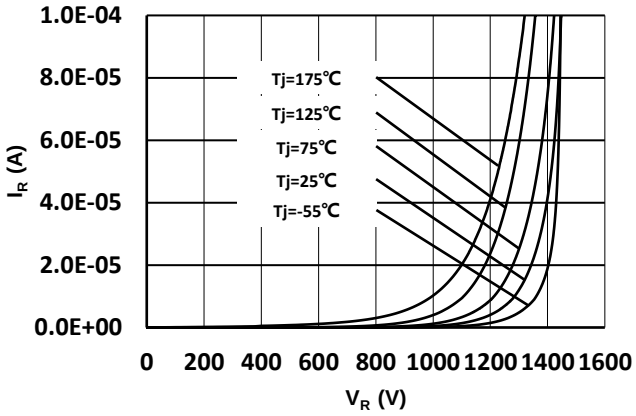


Fig 3: Current Derating

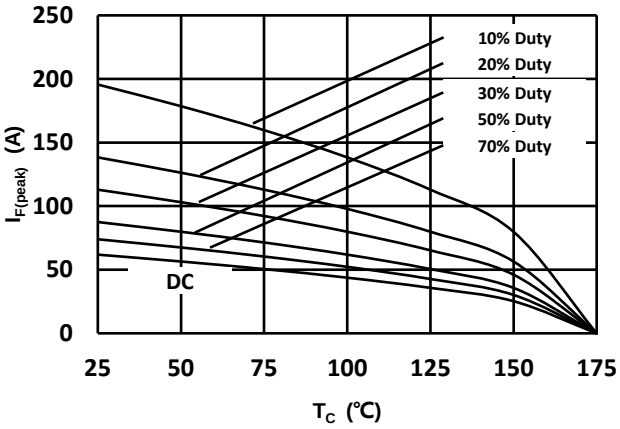


Fig 4: Power Derating

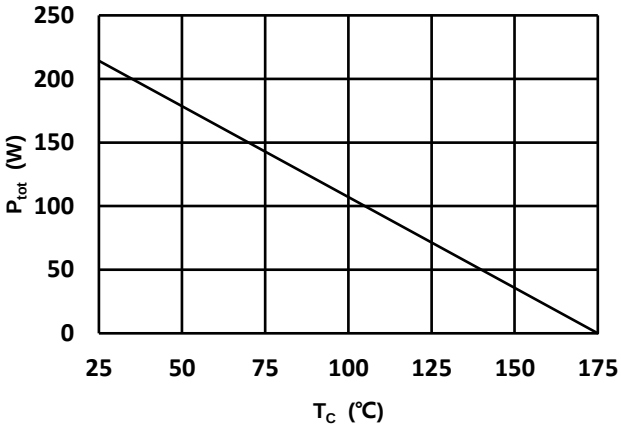


Fig 5: Capacitance vs. Reverse Voltage

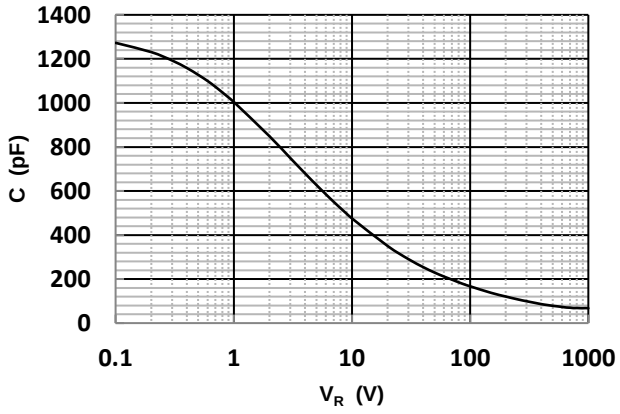


Fig 6: Reverse Charge vs. Reverse Voltage

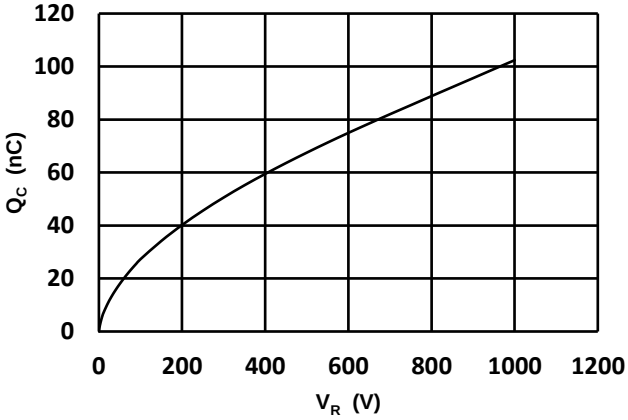


Fig 7: Typical Capacitance Stored Energy

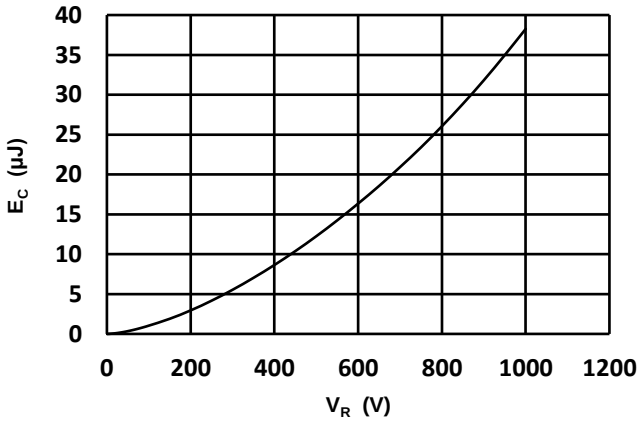
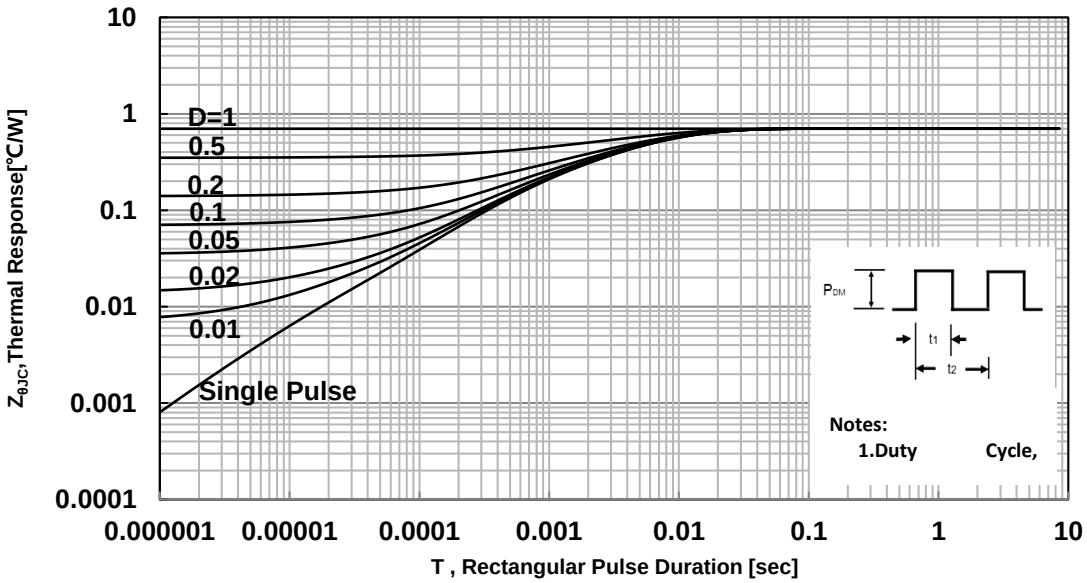
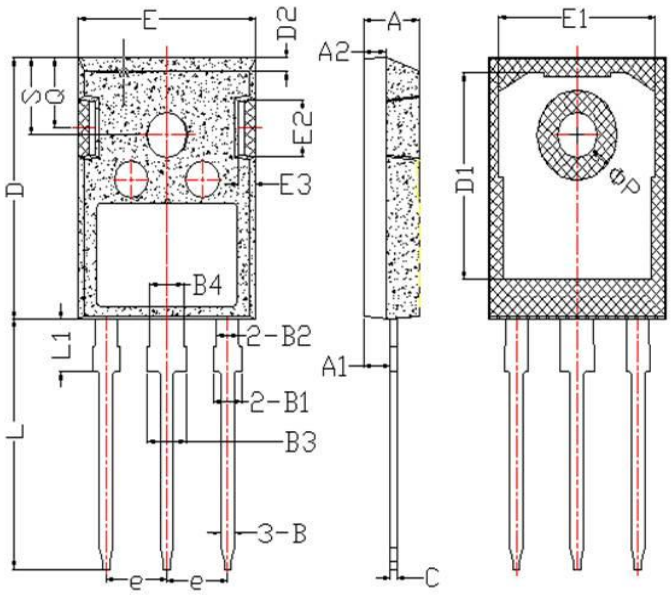


Fig 8: Transient Thermal Impedance



Package Outline: TO-247



Items	Values(mm)	
	MIN	MAX
A	4.85	5.15
A1	2.25	2.55
A2	1.85	2.15
B	1.04	1.33
B1	1.90	2.35
B2	1.90	2.15
B3	2.90	3.35
B4	2.90	3.15
C	0.55	0.68
D	20.80	21.10
D1	16.25	17.65
D2	0.95	1.35
E	15.70	16.10
E1	13.50	14.20
E2	3.58	5.00
E3	1.00	2.60
e	5.44	
L	19.80	20.30
L1	4.00	4.50
Φp	3.50	3.70
Q	5.40	6.00
S	6.00	6.40

Revision History

Revison	Date	Major changes
1.0		Release of formal version.

Warnings

Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. It is suggested to be used under 80 percent of the maximun ratings of the device.

1. When installing the heatsink, please pay attention to the torsional moment and the smoothness of the heatsink.
2. This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.