

HCW120D20D1A

SiC Automotive Silicon Carbide Schottky Diode

1200V, 20A

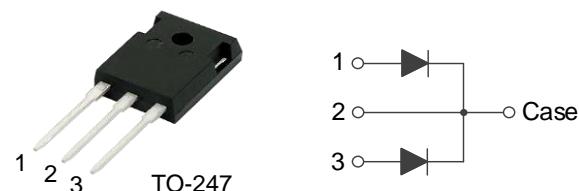
Description

The 1200V SiC is an advanced Power Master Semiconductor's silicon carbide diode family. This technology combines the benefits of excellent low forward voltage and robustness. Consequently, the SiC family is suitable for application requiring high power efficiency.

Features (Per Leg/Device)

V _{RRM}	I _F	T _{J,max}	Q _C
1200 V	10 / 20 A	175 °C	63 nC

- No reverse recovery current
- Low forward voltage
- 175°C Max junction temperature
- High surge current capability
- Switching behavior independent of temperature
- AEC Q101 Qualified
- Pb-Free, Halogen Free and RoHS compliant



Applications

- OBC (On Board Charger)
- DC/DC Converter for EV/HEV
- Wireless Charger

Absolute Maximum Ratings (Per Leg / Device, Per Leg unless otherwise specified)

Symbol	Parameter	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Forward Current	10 / 20	A
I _{F,SM}	Non-Repetitive Forward Surge Current	79	A
		67	A
I _{F,Max}	Non-Repetitive Peak Forward Current	810	A
		690	A
I ² dt value	$\int I^2 t$	31	A ² s
		23	A ² s
P _{tot}	Power Dissipation	147	W
T _J , T _{STG}	Operating Junction and Storage Temperature	-55 to +175	°C

Thermal Characteristics

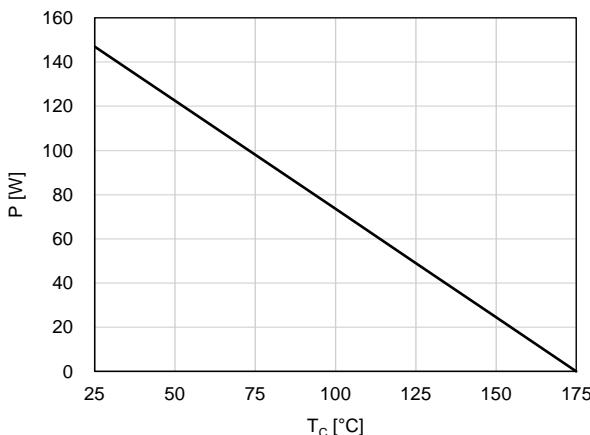
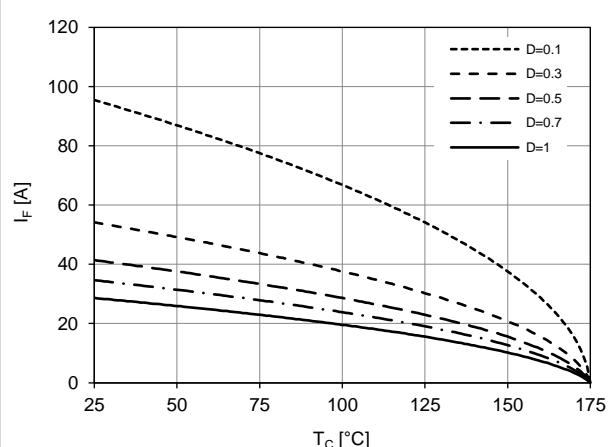
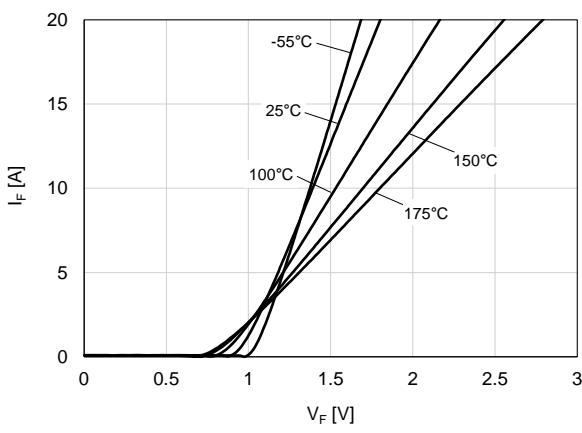
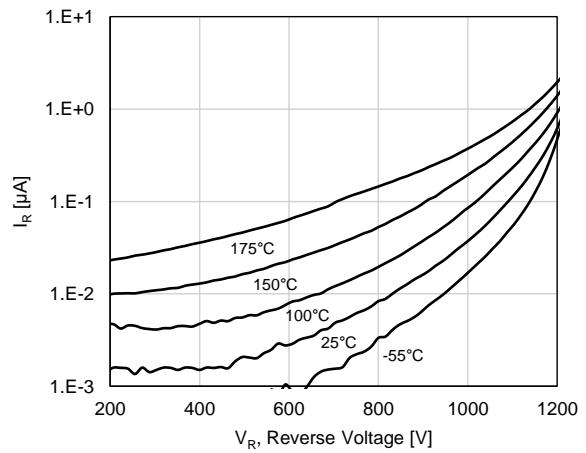
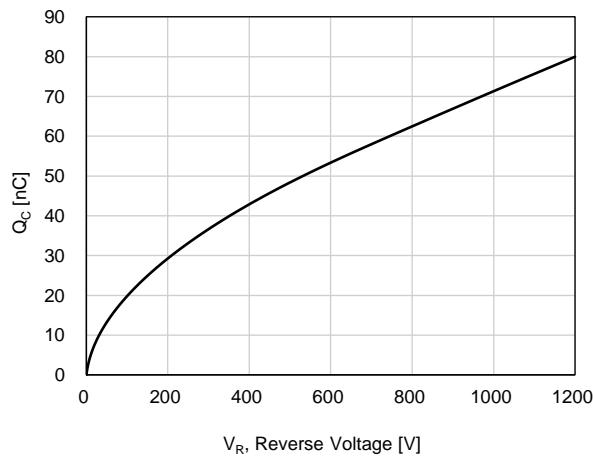
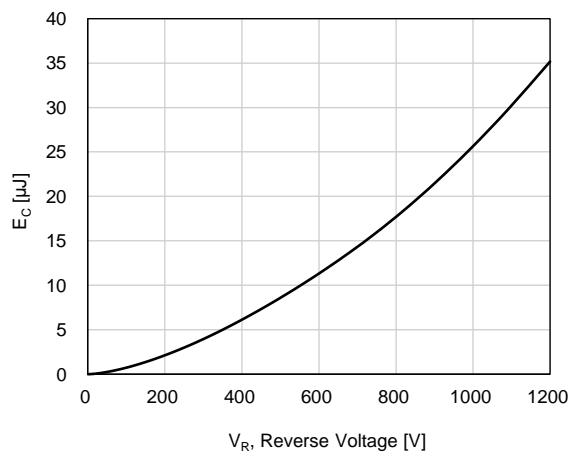
Symbol	Parameter	Value	Unit
R _{θJC}	Thermal Resistance, Junction to Case, Max.(Per Leg / Per Device)	1.02 / 0.45	°C/W

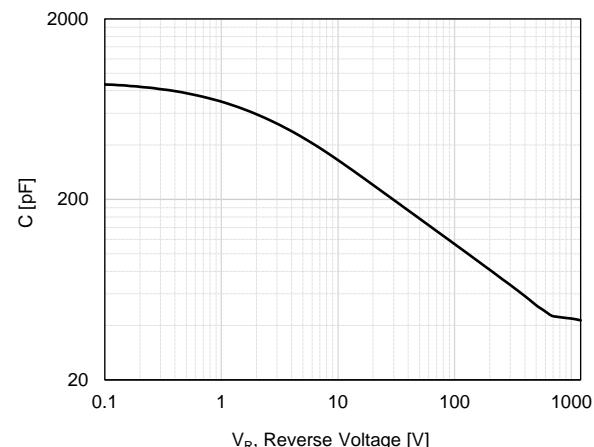
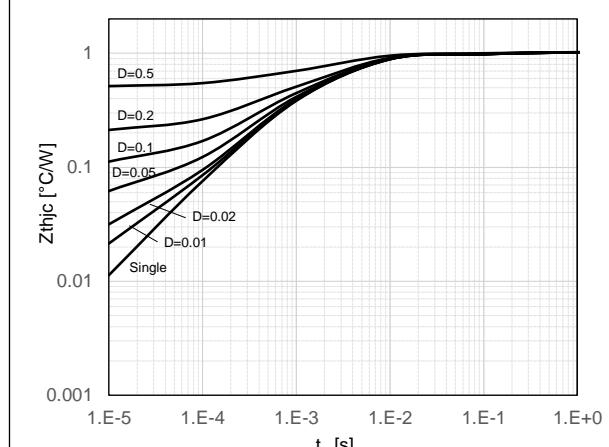
Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
HCW120D20D1A	HCW120D20D1A	TO-247	Tube	30 units

Electrical Characteristics (Per Leg, $T_C = 25^\circ\text{C}$ unless otherwise noted)

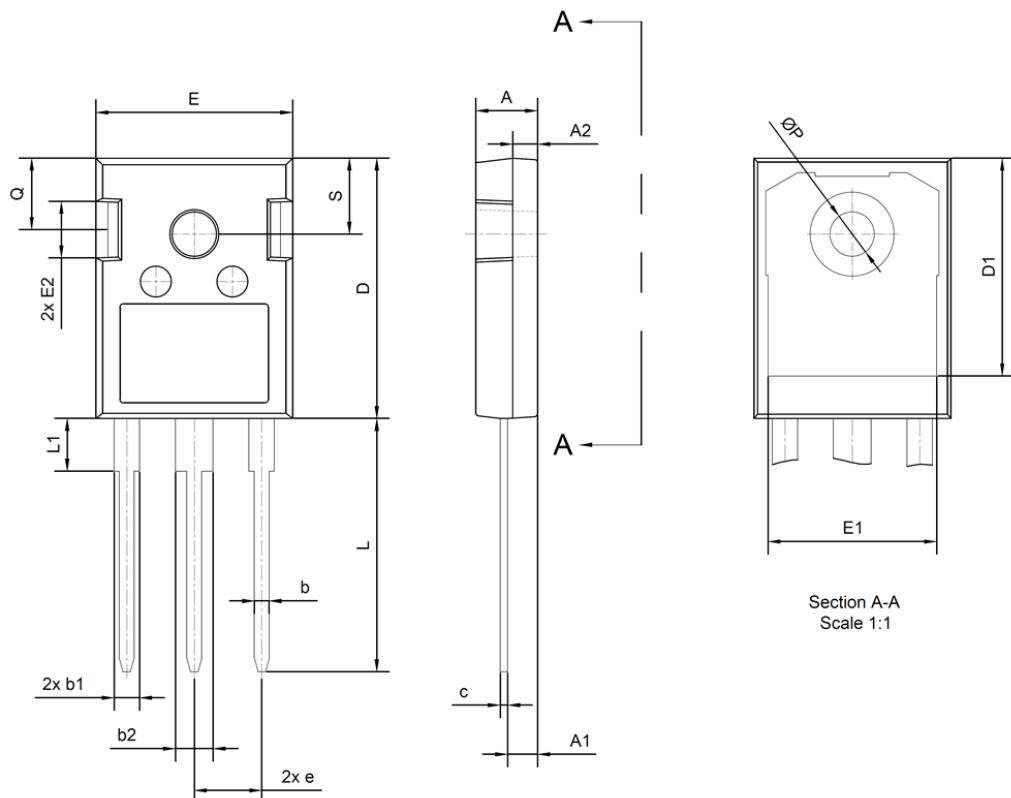
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_F	Forward Voltage	$I_F = 10 \text{ A}, T_C = 25^\circ\text{C}$		1.39	1.70	V
		$I_F = 10 \text{ A}, T_C = 175^\circ\text{C}$		1.8	-	
I_R	Reverse Current	$V_R = 1200 \text{ V}, T_C = 25^\circ\text{C}$		-	100	μA
		$V_R = 1200 \text{ V}, T_C = 175^\circ\text{C}$		-	300	
Q_C	Total Capacitive Charge	$V_R = 800 \text{ V}, T_C = 25^\circ\text{C}$		63		nC
C	Total Capacitance	$V_R = 1 \text{ V}, f = 100 \text{ kHz}$		697		pF
		$V_R = 800 \text{ V}, f = 100 \text{ kHz}$		44		
E_C	Capacitance Stored Energy	$V_R = 800 \text{ V}, T_C = 25^\circ\text{C}$		18		μJ

Typical Performance Characteristics (Per Leg)**Figure 1. Power Derating****Figure 2. Current Derating****Figure 3. Forward Characteristics****Figure 4. Reverse Characteristics****Figure 5. Capacitive Charge Characteristics****Figure 6. Capacitance Stored Energy**

Typical Performance Characteristics (Per Leg)**Figure 7. Capacitance Characteristics****Figure 8. Transient Thermal Response Curve**

Package Outlines

TO-247



Section A-A
Scale 1:1

SYMBOL	Common		
	DIMENSIONS MILLIMETER		
	MIN.	NOM.	MAX.
A	4.80	5.00	5.20
A1	2.29	2.42	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.06	2.20
b2	2.92	3.06	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.23	17.63	18.03
E	15.75	15.94	16.13
E1	13.46	13.66	13.86
E2	4.32	4.58	4.83
e	5.46 BSC		
L	19.85	20.05	20.25
L1	4.05	4.27	4.48
ØP	3.56	3.61	3.66
Q	5.38	5.79	6.20
S	6.15 BSC		