

# HCW120D10D1A

## SiC Automotive Silicon Carbide Schottky Diode

1200V, 10A

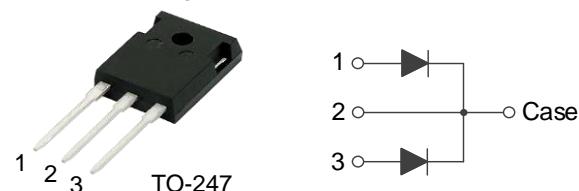
### Description

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 <sub>RRM</sub>	I <sub>F</sub>	T <sub>J,max</sub>	Q <sub>C</sub>
1200 V	5 / 10 A	175 °C	32 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 <sub>RRM</sub>	Repetitive Peak Reverse Voltage	1200	V	
I <sub>F</sub>	Forward Current	5 / 10	A	
I <sub>F,SM</sub>	Non-Repetitive Forward Surge Current	T <sub>C</sub> = 25°C, t <sub>p</sub> = 10 ms	40	A
		T <sub>C</sub> = 150°C, t <sub>p</sub> = 10 ms	34	A
I <sub>F,Max</sub>	Non-Repetitive Peak Forward Current	T <sub>C</sub> = 25°C, t <sub>p</sub> = 10 µs	440	A
		T <sub>C</sub> = 150°C, t <sub>p</sub> = 10 µs	370	A
I <sup>2</sup> dt value	J I <sup>2</sup> t	T <sub>C</sub> = 25°C, t <sub>p</sub> = 10 ms	8	A <sup>2</sup> s
		T <sub>C</sub> = 150°C, t <sub>p</sub> = 10 ms	5.8	A <sup>2</sup> s
P <sub>tot</sub>	Power Dissipation	87	W	
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature	-55 to +175	°C	

### Thermal Characteristics

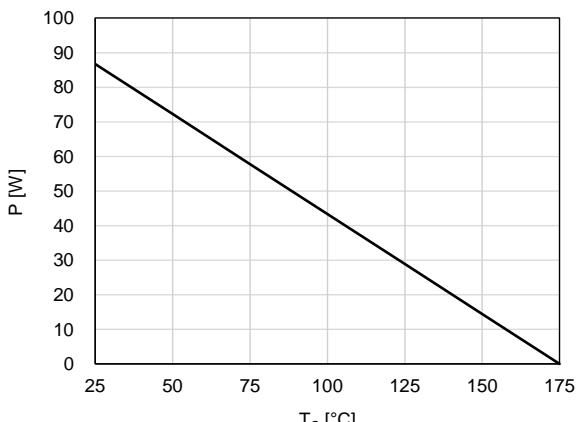
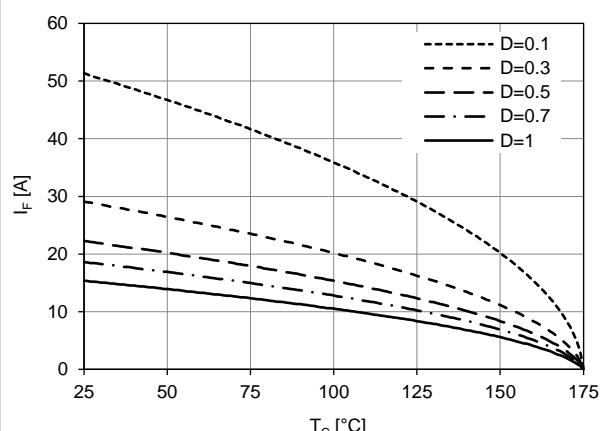
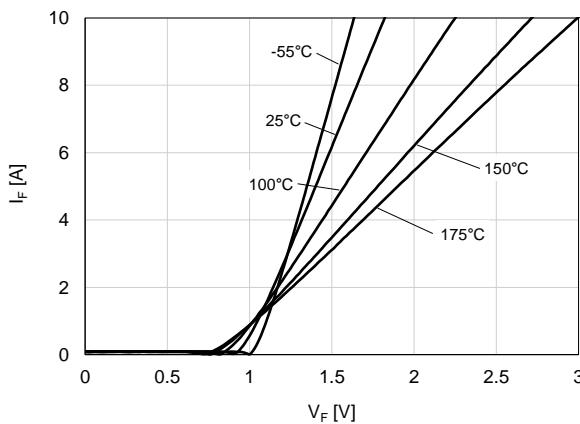
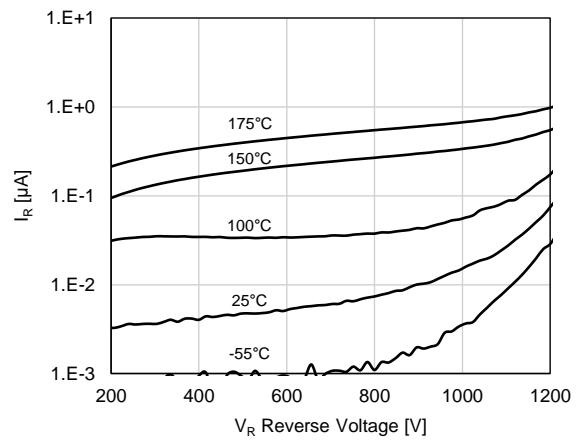
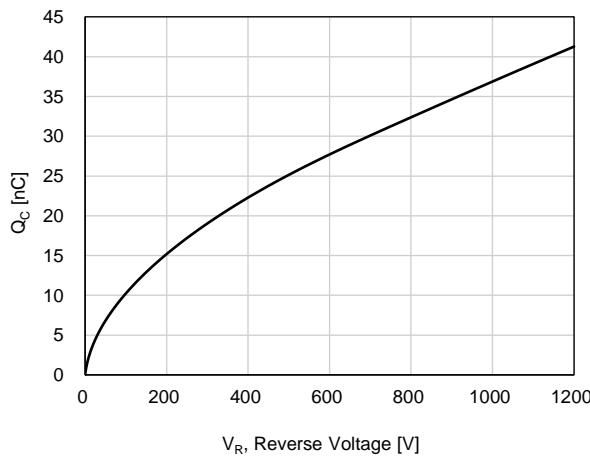
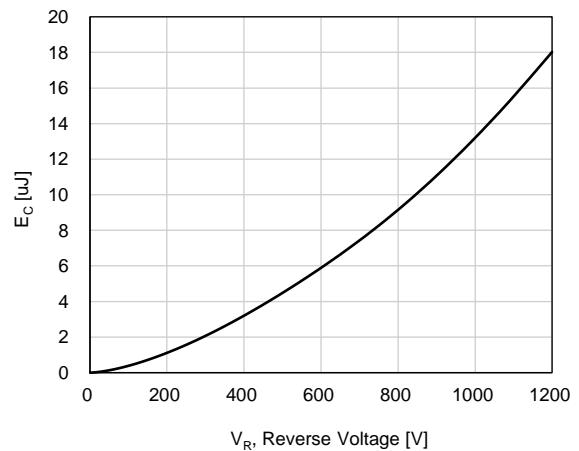
Symbol	Parameter	Value	Unit
R <sub>θJC</sub>	Thermal Resistance, Junction to Case, Max. (Per Leg / Device)	1.73 / 0.67	°C/W

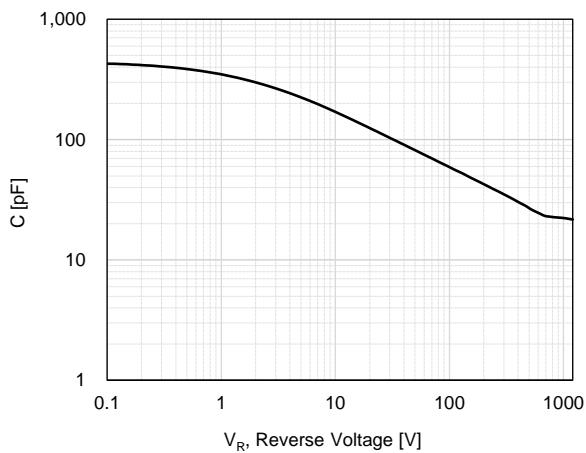
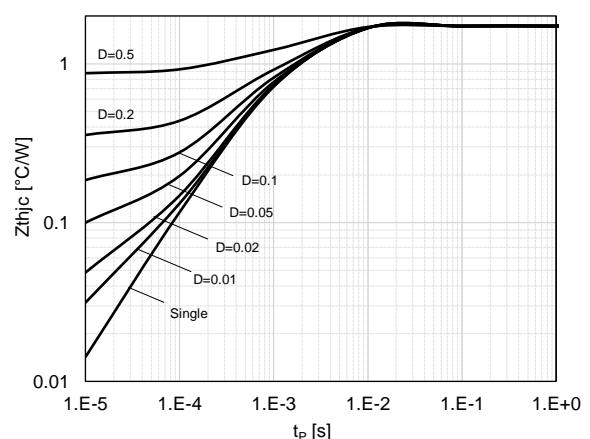
## Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
HCW120D10D1A	HCW120D10D1A	TO-247	Tube	30 units

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

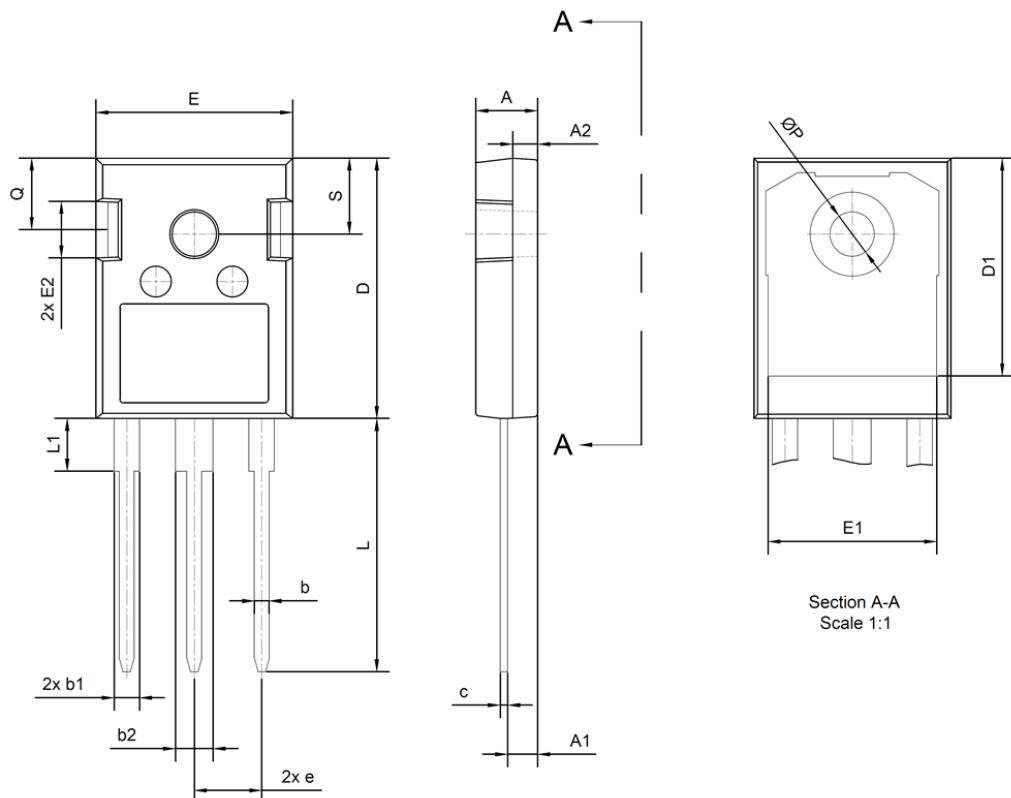
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_F$	Forward Voltage	$I_F = 5 \text{ A}, T_C = 25^\circ\text{C}$		1.39	1.70	V
		$I_F = 5 \text{ A}, T_C = 175^\circ\text{C}$		1.8	-	
$I_R$	Reverse Current	$V_R = 1200 \text{ V}, T_C = 25^\circ\text{C}$		-	100	$\mu\text{A}$
		$V_R = 1200 \text{ V}, T_C = 175^\circ\text{C}$		-	300	
$Q_C$	Total Capacitive Charge	$V_R = 800 \text{ V}, T_C = 25^\circ\text{C}$		32		nC
$C$	Total Capacitance	$V_R = 1 \text{ V}, f = 100 \text{ kHz}$		349		pF
		$V_R = 800 \text{ V}, f = 100 \text{ kHz}$		22.7		
$E_C$	Capacitance Stored Energy	$V_R = 800 \text{ V}, T_C = 25^\circ\text{C}$		9.2		$\mu\text{J}$

**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		