

# HCA120S20D1

## SiC Silicon Carbide Schottky Diode

1200V, 20A

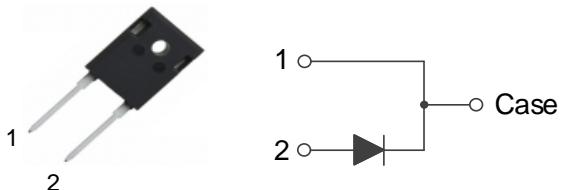
### Description

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

$V_{RRM}$	$I_F$	$T_{J,max}$	$Q_C$
1200 V	20 A	175 °C	121 nC

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



### Applications

- Solar inverter, UPS
- EV charging station
- Power Factor Correction

### Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage		1200	V
$I_F$	Forward Current	$T_C = 150^\circ\text{C}$	20	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 25^\circ\text{C}, t_p = 10 \text{ ms}$	135	A
		$T_C = 150^\circ\text{C}, t_p = 10 \text{ ms}$	115	A
$I_{F,Max}$	Non-Repetitive Peak Forward Current	$T_C = 25^\circ\text{C}, t_p = 10 \mu\text{s}$	1180	A
		$T_C = 150^\circ\text{C}, t_p = 10 \mu\text{s}$	980	A
$\int I^2 dt$ value	$\int I^2 dt$	$T_C = 25^\circ\text{C}, t_p = 10 \text{ ms}$	91	$\text{A}^2\text{s}$
		$T_C = 150^\circ\text{C}, t_p = 10 \text{ ms}$	66	$\text{A}^2\text{s}$
$P_{tot}$	Power Dissipation	$T_C = 25^\circ\text{C}$	273	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature		-55 to +175	°C

### Thermal Characteristics

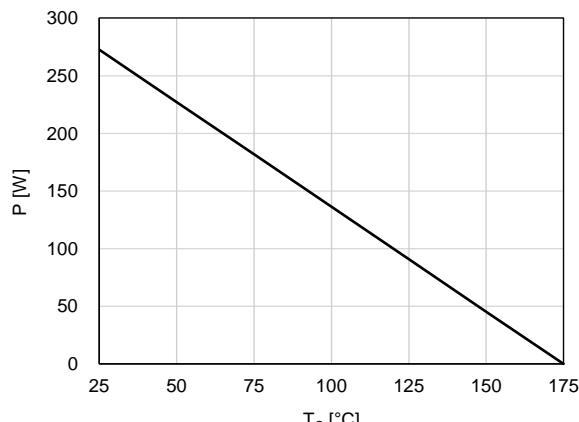
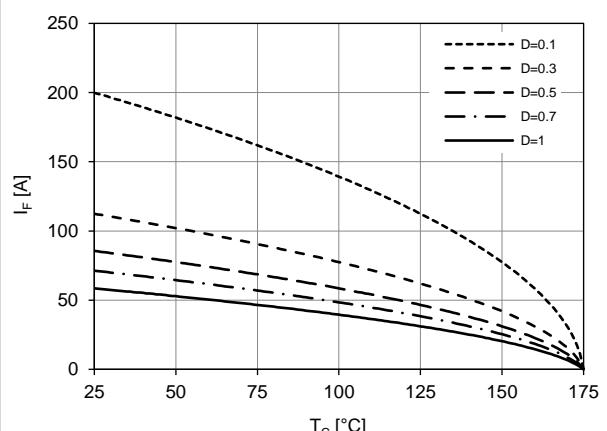
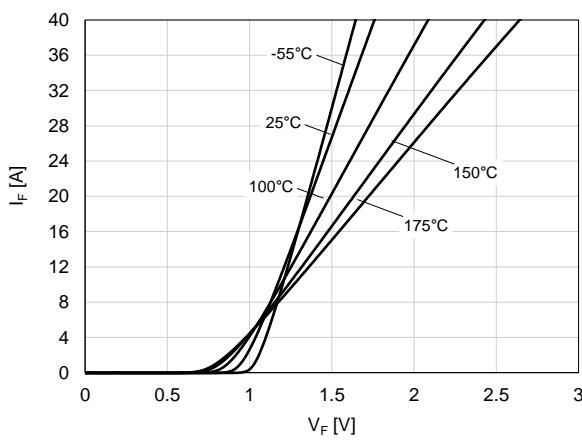
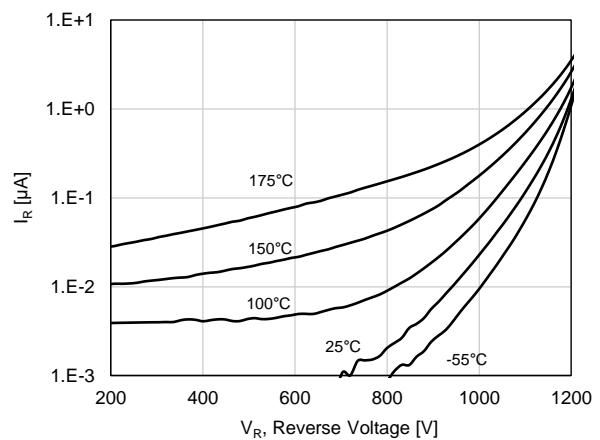
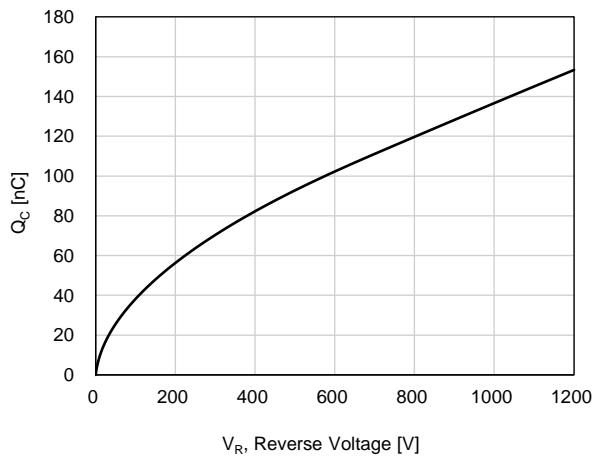
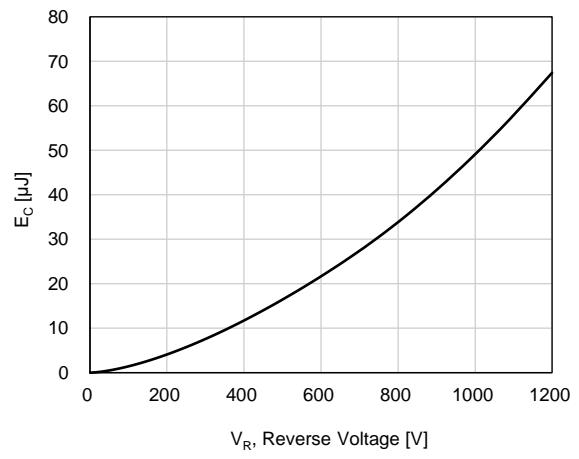
Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.55	°C/W

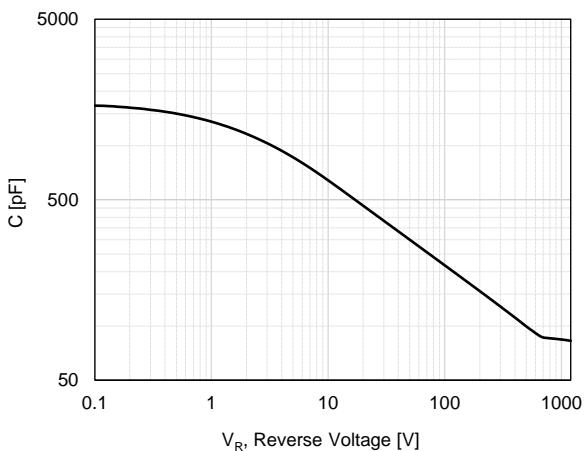
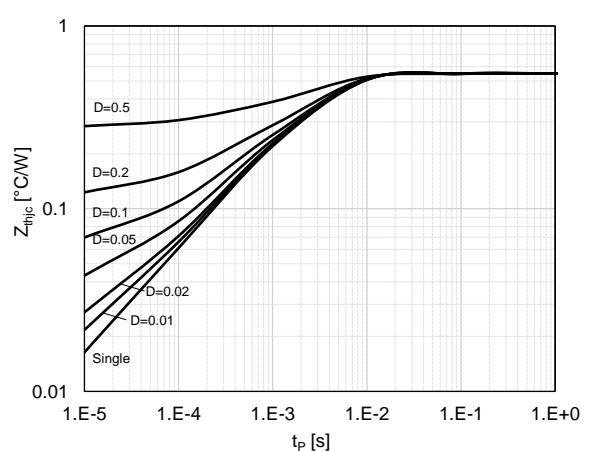
## Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
HCA120S20D1	HCA120S20D1	TO-247	Tube	30 units

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

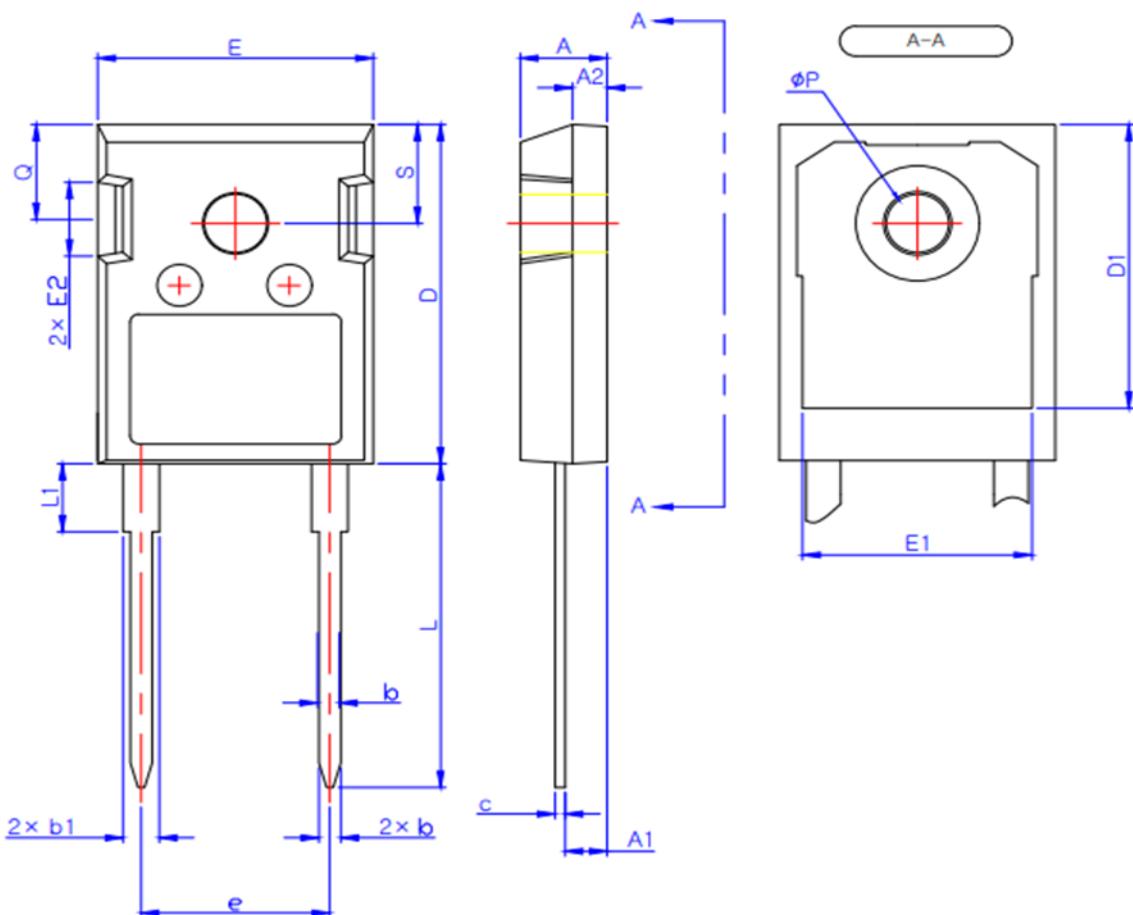
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_F$	Forward Voltage	$I_F = 20 \text{ A}, T_C = 25^\circ\text{C}$		1.39	1.70	V
		$I_F = 20 \text{ A}, T_C = 175^\circ\text{C}$		1.8	-	
$I_R$	Reverse Current	$V_R = 1200 \text{ V}, T_C = 25^\circ\text{C}$		-	100	$\mu\text{A}$
		$V_R = 1200 \text{ V}, T_C = 175^\circ\text{C}$		-	300	
$Q_C$	Total Capacitive Charge	$V_R = 800 \text{ V}, T_C = 25^\circ\text{C}$		121		nC
$C$	Total Capacitance	$V_R = 1 \text{ V}, f = 100 \text{ kHz}$		1357		pF
		$V_R = 800 \text{ V}, f = 100 \text{ kHz}$		85		
$E_C$	Capacitance Stored Energy	$V_R = 800 \text{ V}, T_C = 25^\circ\text{C}$		34		$\mu\text{J}$

**Typical Performance Characteristics****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****Figure 7. Capacitance Characteristics****Figure 8. Transient Thermal Response Curve**

## Package Outlines

## TO-247-2L



SYMBOL	MIN	MAX
A	4.80	5.20
A1	2.29	2.54
A2	1.90	2.10
b	1.10	1.30
b1	1.91	2.20
c	0.50	0.70
D	20.80	21.34
D1	17.43	17.83
E	15.75	16.13
E1	13.06	13.46
E2	4.32	4.83
e	10.90 BSC	
L	19.85	20.25
L1	-	4.49
φP	3.55	3.65
Q	5.59	6.19
S	6.15 BSC	

\* Dimensions in millimeters