

HCA170S25D1

eSiC Silicon Carbide Schottky Diode

1700V, 25A

Description

The 1700V *e*SiC Diode 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 *e*SiC Diode is suitable for application requiring high power efficiency.

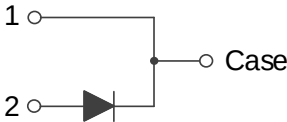
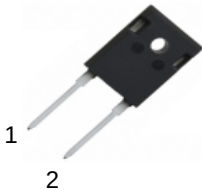
Applications

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

Features

V_{RRM}	I_F	$T_{J,max}$	Q_C
1700 V	25 A	175 °C	173 nC

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



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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1700	V
I_F	Forward Current	$T_C = 151^{\circ}\text{C}$	25	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 25^{\circ}\text{C}, t_p = 10\text{ ms}$	191	A
		$T_C = 150^{\circ}\text{C}, t_p = 10\text{ ms}$	162	A
$I_{F,Max}$	Non-Repetitive Peak Forward Current	$T_C = 25^{\circ}\text{C}, t_p = 10\text{ us}$	1377	A
		$T_C = 150^{\circ}\text{C}, t_p = 10\text{ us}$	1170	A
$I^2dt\text{ value}$	$\int i^2 dt$	$T_C = 25^{\circ}\text{C}, t_p = 10\text{ ms}$	182	A^2s
		$T_C = 150^{\circ}\text{C}, t_p = 10\text{ ms}$	131	A^2s
P_{tot}	Power Dissipation	$T_C = 25^{\circ}\text{C}$	294	W
T_J, T_{STG}	Operating Junction and Storage Temperature		-55 to +175	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.51	$^{\circ}\text{C/W}$

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
HCA170S25D1	HCA170S25D1	TO-247-2L	Tube	30 units

Electrical Characteristics (Per Leg, T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V _F	Forward Voltage	I _F =25 A, T _C =25°C		1.5	1.8	V
		I _F =25 A, T _C =175°C		2.1	-	
I _R	Reverse Current	V _R =1700 V, T _C =25°C		-	100	μA
		V _R =1700 V, T _C =175°C		-	300	
Q _C	Total Capacitive Charge	V _R =800 V, T _C =25°C		173		nC
C	Total Capacitance	V _R =1 V, f=100 kHz		2005		pF
		V _R =800 V, f=100 kHz		114		
E _C	Capacitance Stored Energy	V _R =800 V, T _C =25°C		48.6		μJ

Typical Performance Characteristics

Figure 1. Power Derating

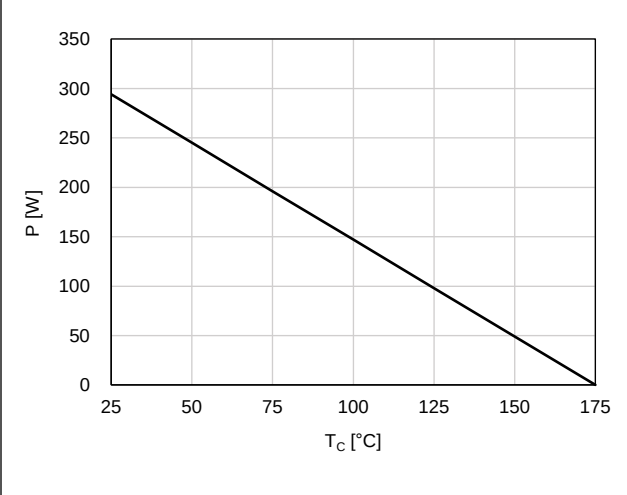


Figure 2. Current Derating

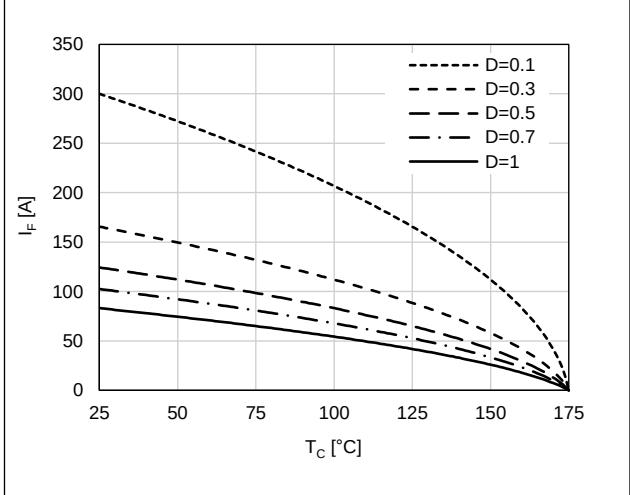


Figure 3. Forward Characteristics

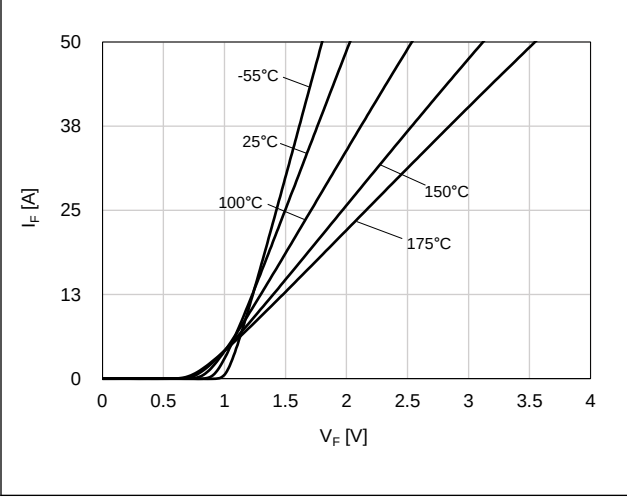


Figure 4. Reverse Characteristics

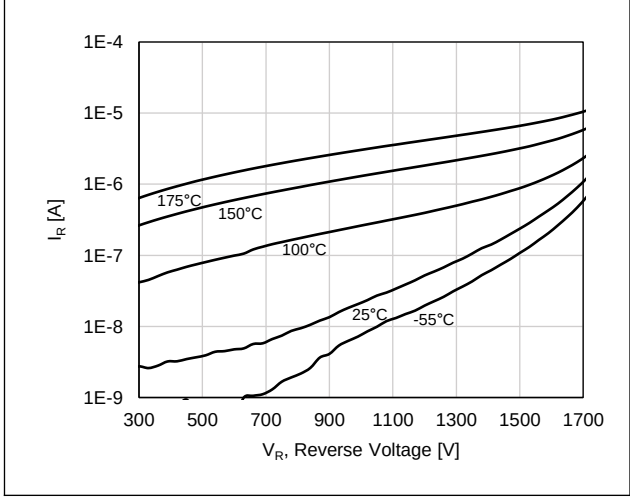


Figure 5. Capacitive Charge Characteristics

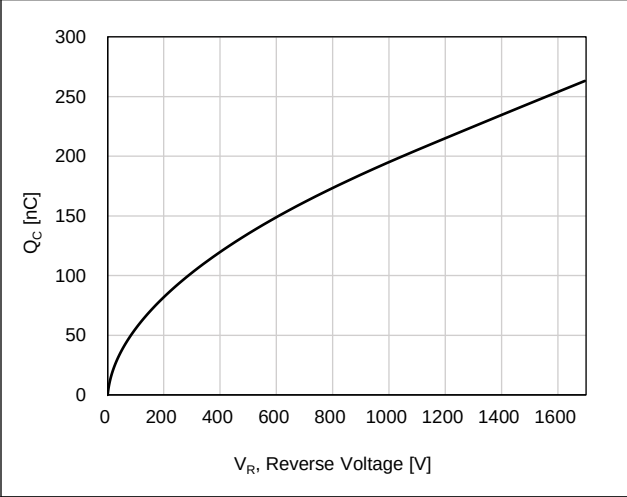
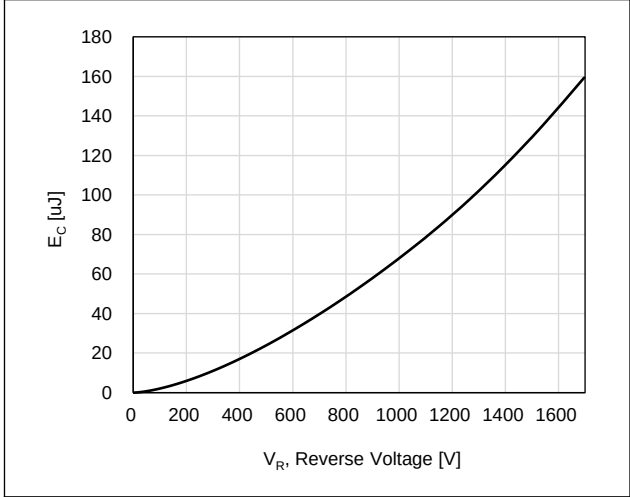


Figure 6. Capacitance Stored Energy



Typical Performance Characteristics

Figure 7. Capacitance Characteristics

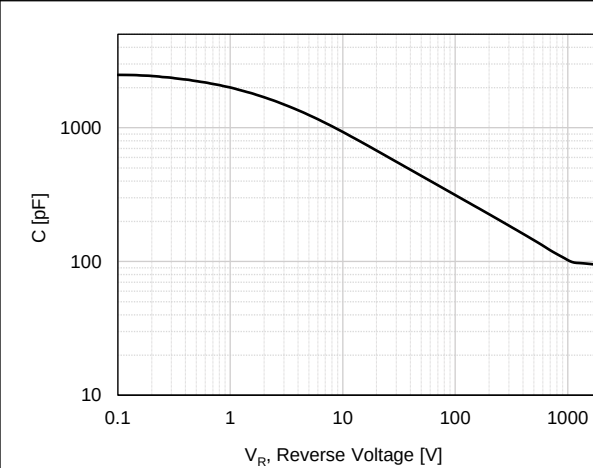
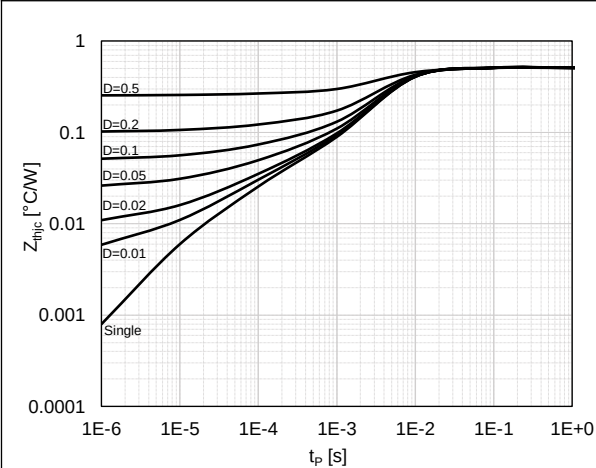
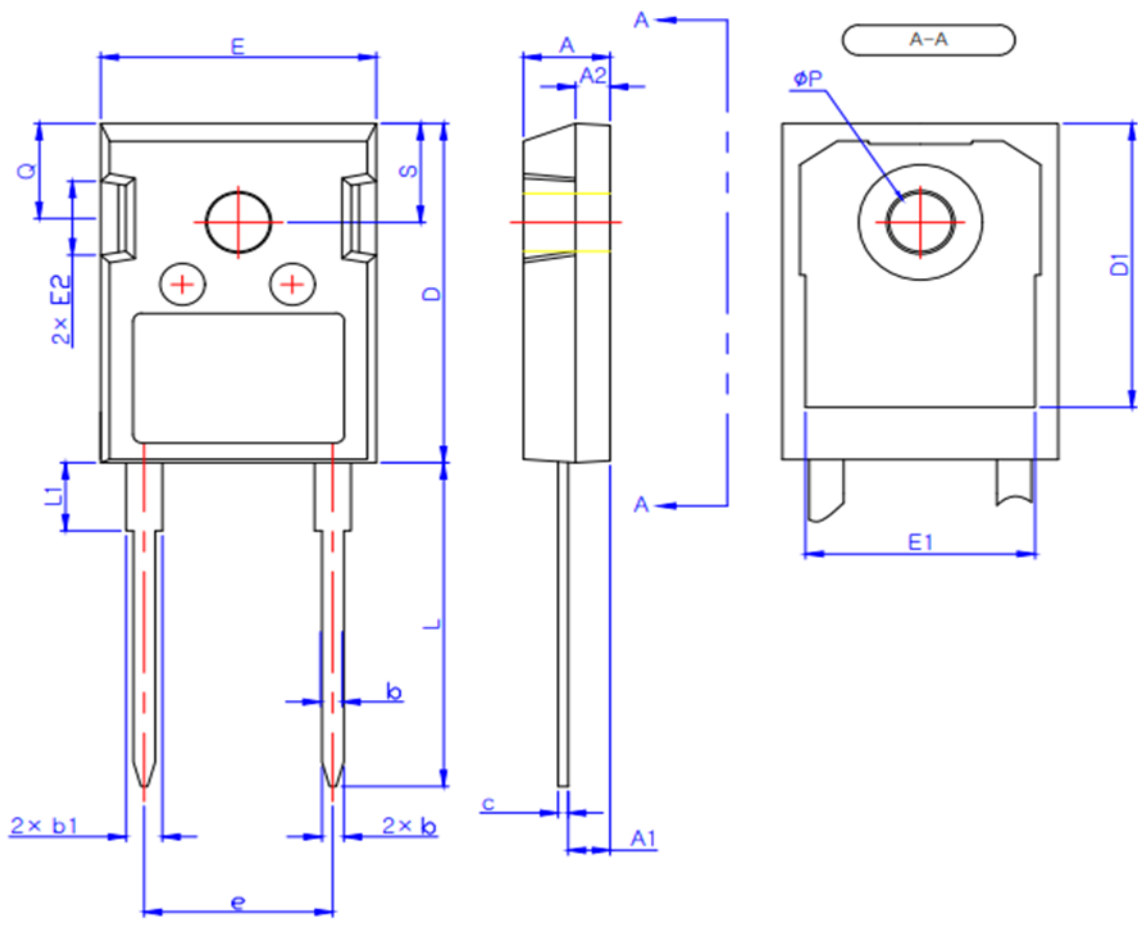


Figure 8. Transient Thermal Response Curve



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