

Silicon Carbide Schottky Diode (SiC SBD)

1. Product Features:

- Revolutionary semiconductor material - Silicon Carbide
- Temperature independent switching behavior
- Low forward voltage even at high operating temperature
- Excellent thermal performance
- Specified dv/dt ruggedness
- Qualified according to JEDEC for target applications
- Pb-free lead plating; RoHS compliant

HDD10S120A

Pin 1 and backside – cathode
Pin 2 – anode

Package: TO-252-2

2. Product Applications

- Solar Inverters
- Uninterruptable Power Supplies (UPS)
- Motor drives
- Power Factor Correction (PFC)
- Switch Mode Power Supplies (SMPS)
- On Board Charger (OBC)

3. Typical Performance Parameters

Tab.1. Typical Performance Parameters

Type	V_{DC}	I_F	Q_C	T_{vjmax}	Marking	Package
HDD10S120A	1200V	10A	50nC	175°C	D10S120	TO-252-2

4. Maximum Ratings

Tab.2. Maximum Ratings

Parameters	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
Surge Peak Reverse Voltage	V_{RSM}	1200	V
Continuous Forward Current , $T_c = 25^\circ\text{C}$ $T_c = 125^\circ\text{C}$ $T_c = 140^\circ\text{C}$	I_F	20 15 10	A
Repetitive Peak Forward Surge Current $T_c = 25^\circ\text{C}, t_p = 10\text{ms}$	I_{FRM}	50	
Non-Repetitive Peak Forward Surge Current $T_c = 25^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Wave}$	I_{FSM}	70	
Non-Repetitive Peak Forward Current $T_c = 25^\circ\text{C}, t_p = 10\mu\text{s}$	$I_{F, max}$	600	
Power Dissipation $T_c = 25^\circ\text{C}$ $T_c = 110^\circ\text{C}$	P_{tot}	205 90	W
Operating Junction	T_j	-55 to +175	°C
Storage Temperature	T_{stg}	-55 to +175	

5. Thermal Properties

Tab.3. Thermal Properties

Parameters	Symbol	Conditions	Typ. value	Unit
Thermal resistance (junction - case)	$R_{th(j-c)}$		0.73	°C/W

6. Electrical Characteristics

Tab.4. Static Characteristic ($T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified)

Parameters	Symbol	Conditions	Min. value	Typ. value	Max. value	Unit
DC blocking voltage	V_{DC}	$T_j = 25^{\circ}\text{C}$	1200	-	-	V
Diode forward voltage	V_F	$I_F = 10\text{A}, T_j = 25^{\circ}\text{C}$ $I_F = 10\text{A}, T_j = 175^{\circ}\text{C}$	-	1.5 2.0	1.8 3.0	V
Reverse current	I_R	$V_R = 1200\text{V}, T_j = 25^{\circ}\text{C}$ $V_R = 1200\text{V}, T_j = 175^{\circ}\text{C}$	-	2 20	5 40	μA

Tab.5. Dynamic Characteristic ($T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified)

Parameters	Symbol	Conditions	Min. value	Typ. value	Max. value	Unit
Total capacitive charge	Q_C	$V_R = 600\text{V}, Q_C = \int_0^{V_R} C(V)dV$	-	50	-	nC
Total Capacitance	C	$V_R = 0\text{V}, f = 1\text{MHz}$ $V_R = 400\text{V}, f = 1\text{MHz}$ $V_R = 800\text{V}, f = 1\text{MHz}$	-	610 46 36	-	pF
Capacitance Stored Energy	E_C	$V_R = 800\text{V}$	-	23.8	-	μJ

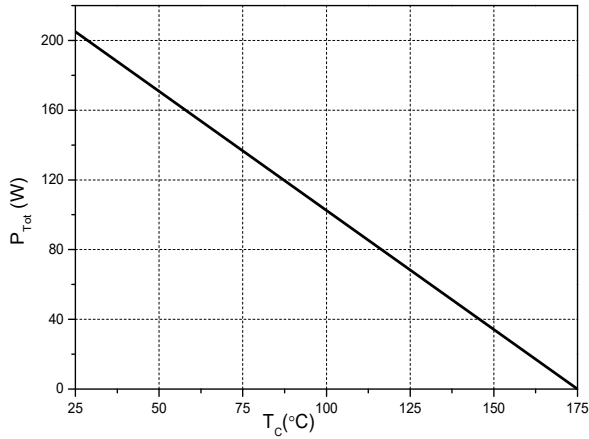


Fig.1. Power dissipation as a function of case temperature

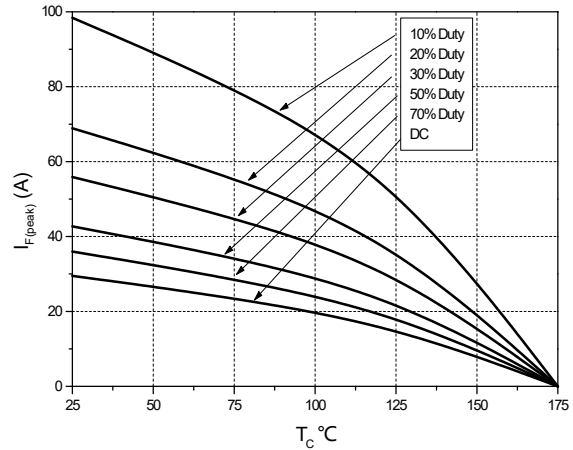


Fig.2. Diode forward current as function of case temperature

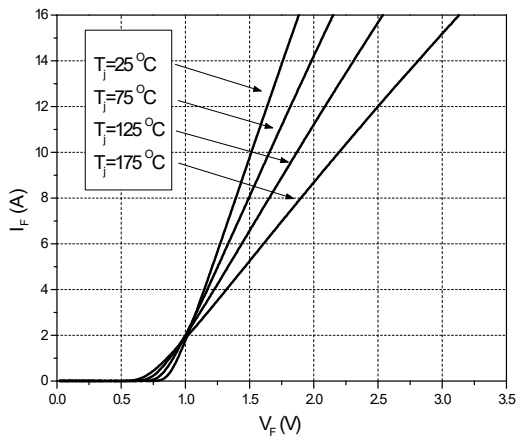


Fig.3. Typical forward characteristics

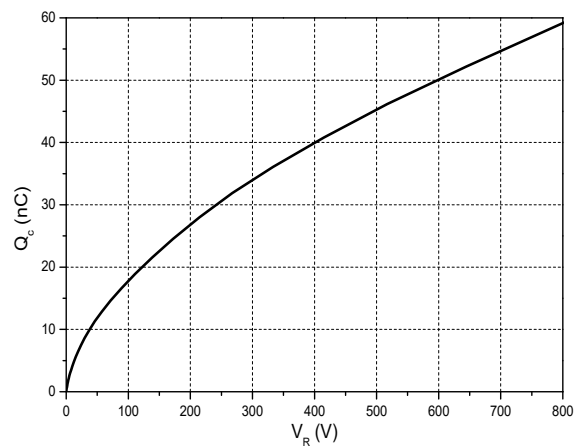


Fig.4. Typical capacitance charge as function of reverse voltage

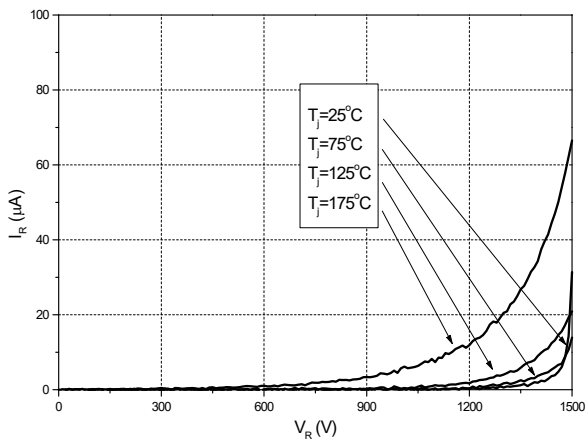


Fig.5. Typical reverse current as function of reverse

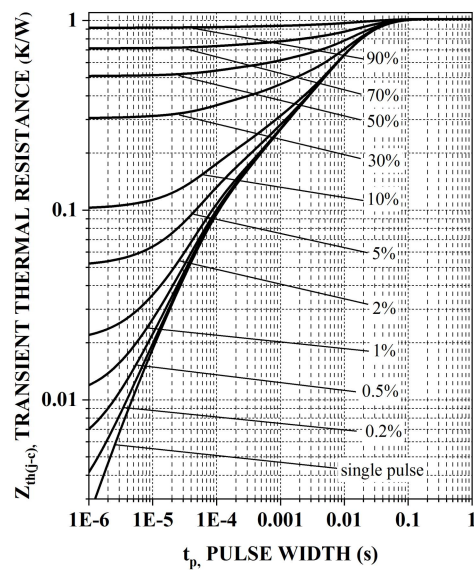


Fig.6. Max. transient thermal impedance

voltage

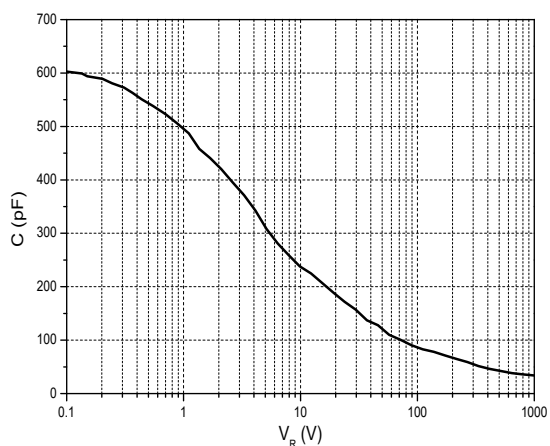


Fig.7. Typical capacitance as function of reverse voltage

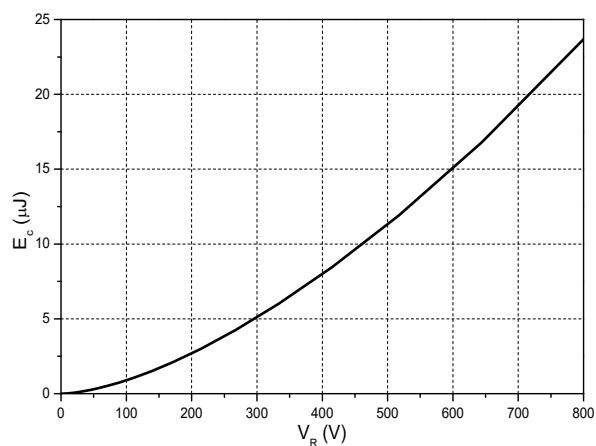
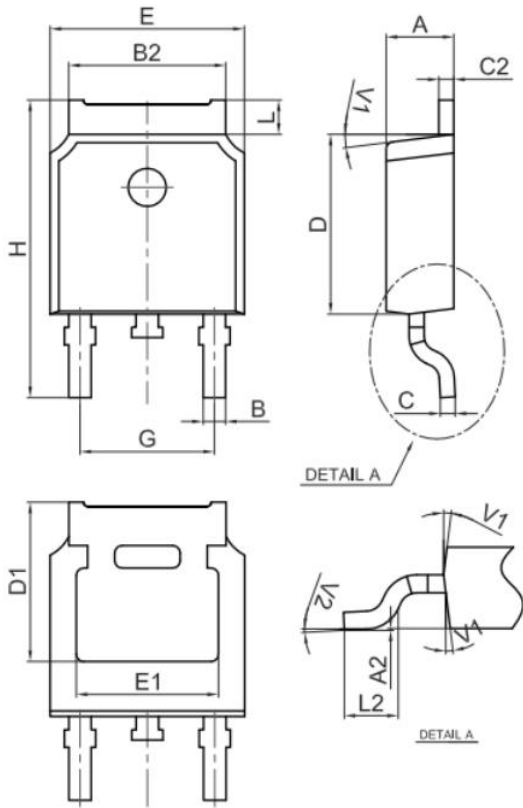


Fig.8. Typical capacitance stored energy as function of reverse voltage

7. Package Dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

8. Version Information

Version No.	Status	Date changed	Version revision record
V1.0	Preview edition	2021/06	
V1.1	Preview edition	2021/07	Change Part # from HDE10S120HEA to HDD10S120A
V1.2	Preview edition	2021/08	
V1.3	Preview edition	2022/01	