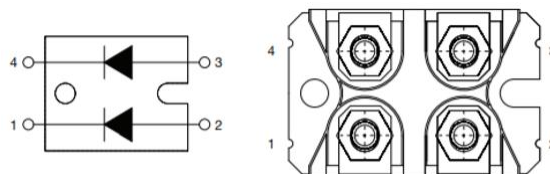## IVST12120DA1L – 1200V 60A*2 SiC MODULE

Features

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Extremely Fast Reverse Recovery Time
- Reduced Losses in Associated MOSFET
- High-Frequency Operation
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient on V_F

Outline

Part Number	Package
IVST12120DA1L	SOT 227

Applications

- Inverter Free Wheeling Diodes
- Snubber Diodes
- Rectifiers in Switch Mode Power Supplies
- UPS Application

Absolute Maximum Ratings (Per SBD/Tc=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{RRM}	Reverse voltage (repetitive peak)	1200	V
V_{DC}	DC blocking voltage	1200	V
I_F	Forward current (continuous) @Tc=25°C	88*	A
	Forward current (continuous) @Tc=98°C	60*	A
I_{FSM}	Surge non-repetitive forward current sine halfwave @Tc=25°C tp=10ms	450	A
I_{FRM}	Surge repetitive forward current (Freq=0.1Hz, 100cycles) sine halfwave @T$_{amb}$=25°C tp=10ms	360	A
P_{tot}	Total power dissipation @ Tc=25°C	257*	W
	Total power dissipation @ Tc=150°C	42*	
$\int i^2 dt$	I^{2}t value @Tc=25°C tp=10ms	1012	A^{2}s
Tstg	Storage temperature range	-55 to 175	°C
Tj	Operating junction temperature range	-55 to 175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

* By simulation

Electrical Characteristics (Per SBD)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.48	1.80	V	I_F = 60 A T_J=25°C	Fig. 1
		2.20	3.00		I_F = 60 A T_J=175°C	
I_R	Reverse Current	24	450	μA	V_R = 1200 V T_J=25°C	Fig. 2
		150	2000		V_R = 1200 V T_J=175°C	
C	Total Capacitance	3000		pF	V_R = 1 V, T_J = 25°C, f = 1 MHz	Fig. 3
		267			V_R = 400 V, T_J = 25°C, f = 1 MHz	
		198			V_R = 800 V, T_J = 25°C, f = 1 MHz	
Q_C	Total Capacitive Charge	292		nC	V_R = 800 V, T_J = 25°C, $Q_c = \int_0^{VR} C(V)dV$	Fig. 4
E_C	Capacitance Stored Energy	87		μJ	V_R = 800 V, T_J = 25°C, $E_c = \int_0^{VR} C(V) \cdot V dV$	Fig. 5

Thermal Characteristics (Per SBD)

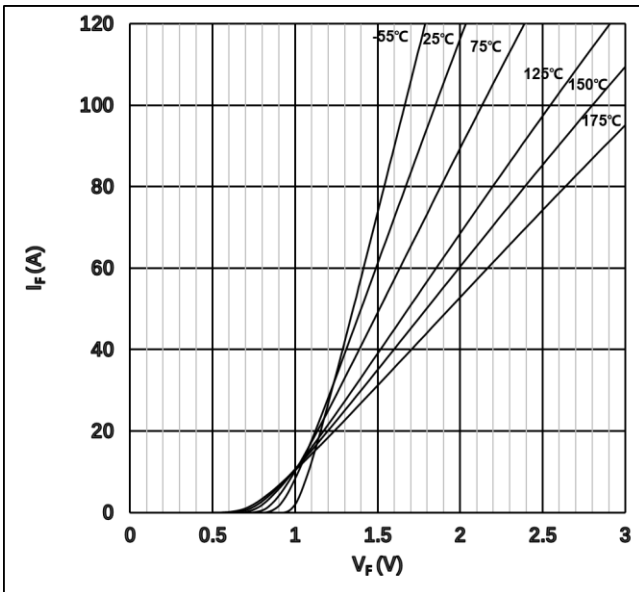| Symbol	Parameter	Typ.	Unit	Note
$R_{th(j-c)}$	Thermal Resistance from Junction to Case	0.583*	°C/W	Fig.7

* By simulation

Typical Performance

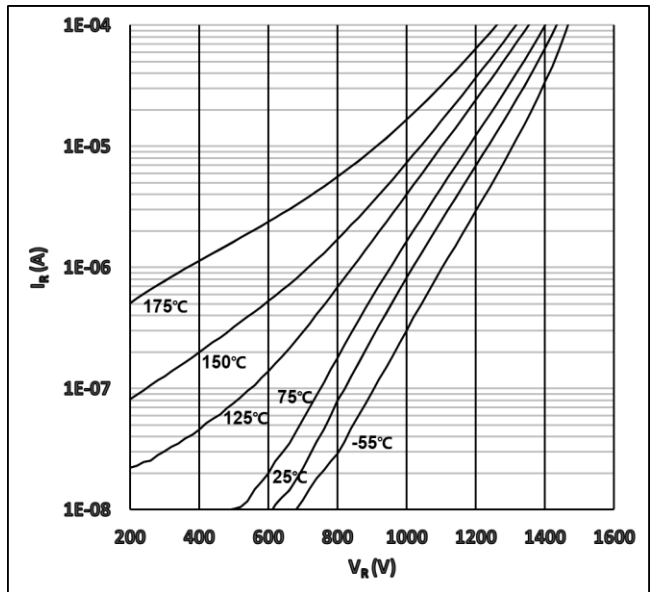Figure 1. Typical Forward Characteristics
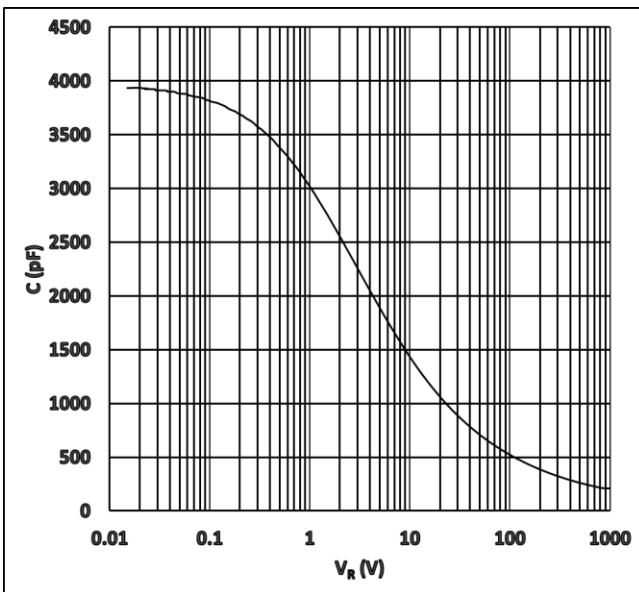

Figure 2. Typical Reverse Characteristics

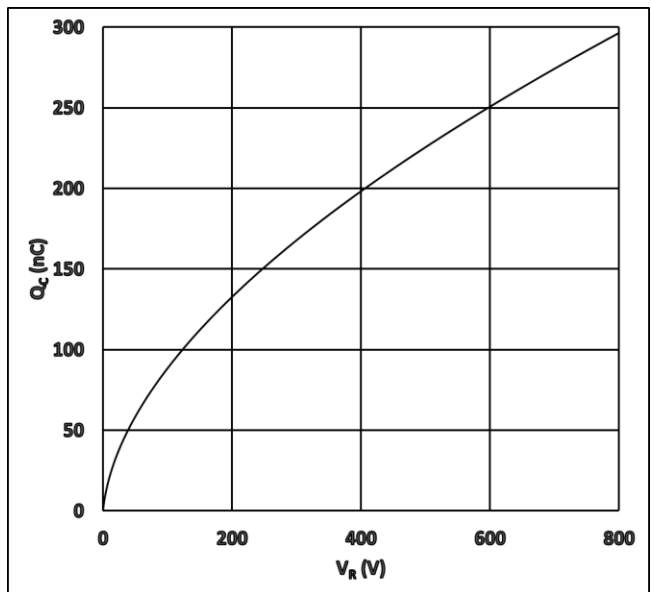Figure 3. Capacitance vs. Reverse Voltage
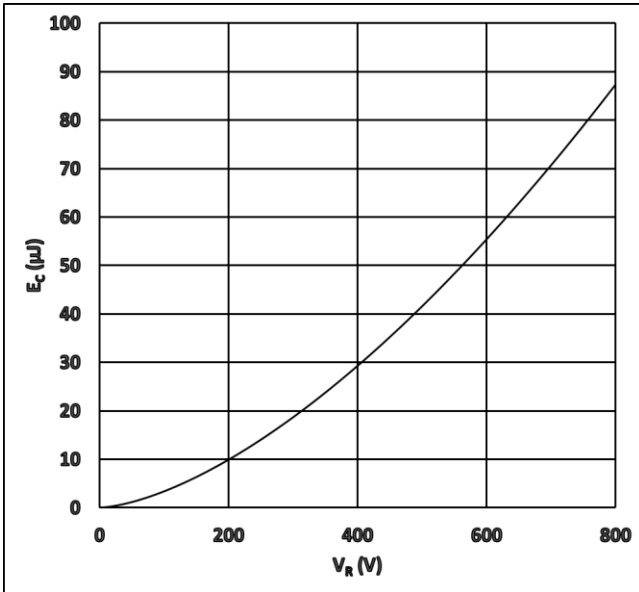

Figure 4. Recovery Charge vs. Reverse Voltage
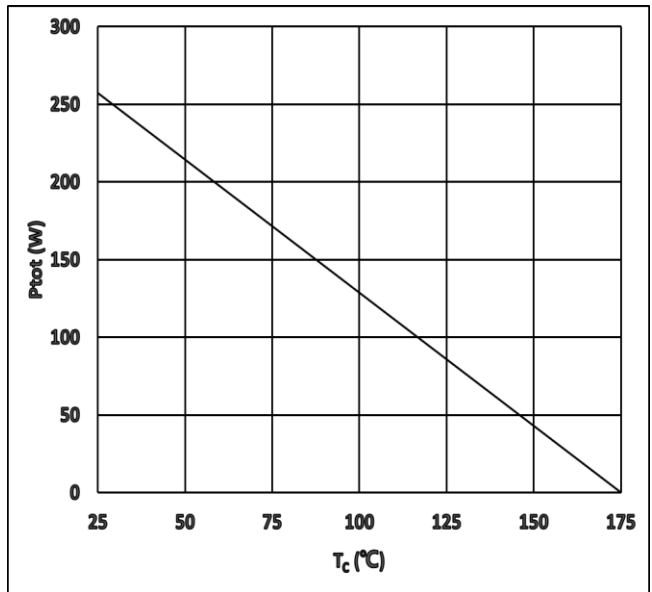
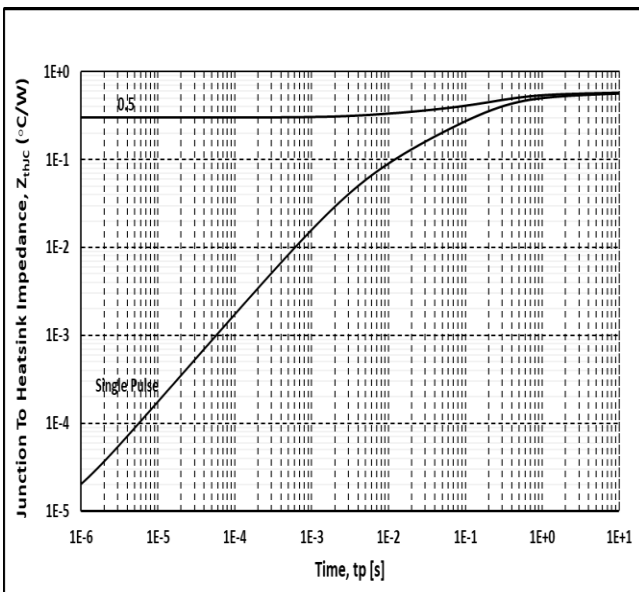Figure 5. Capacitance Stored Energy

Figure 6. Power Derating

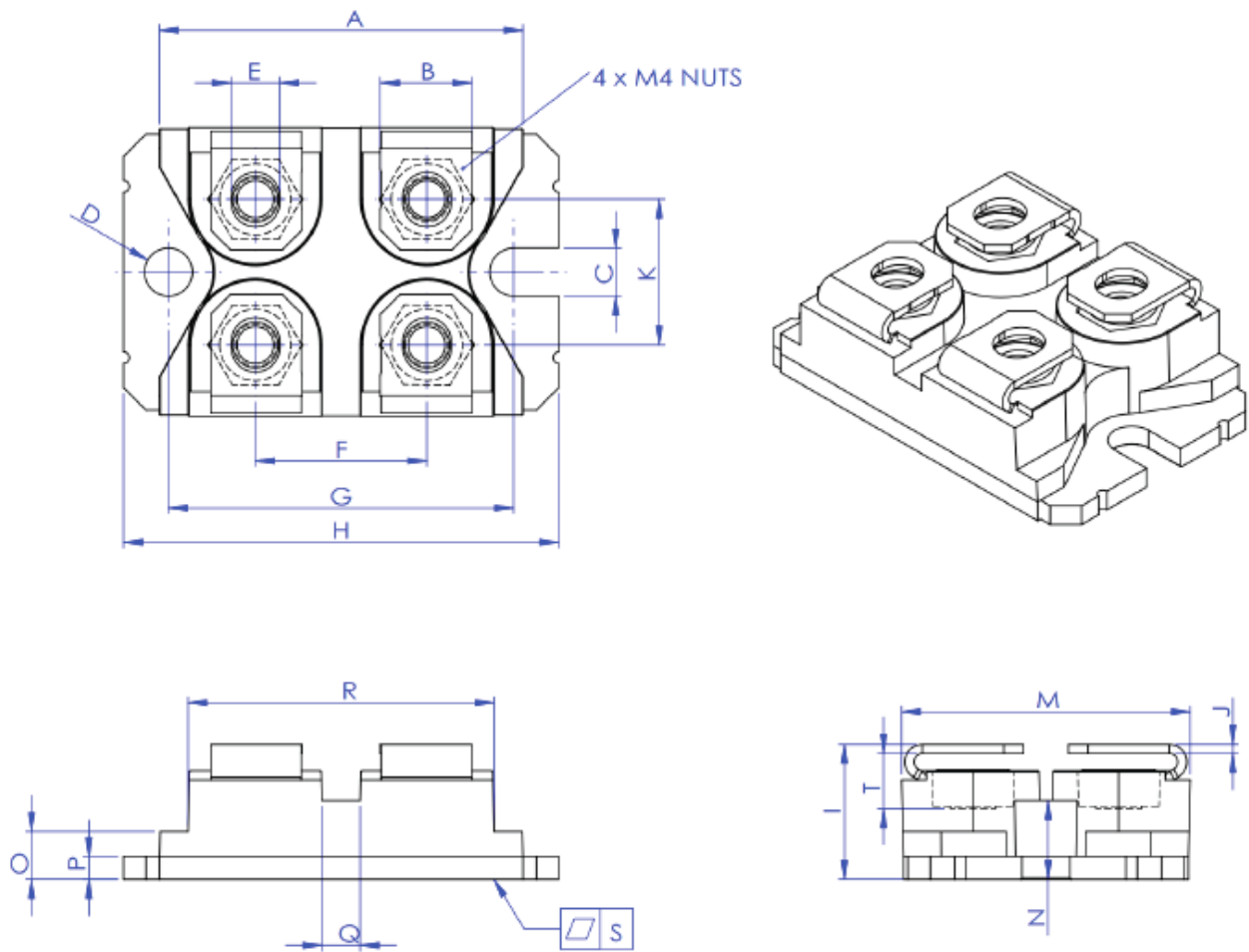Figure 7. Transient Thermal Impedance
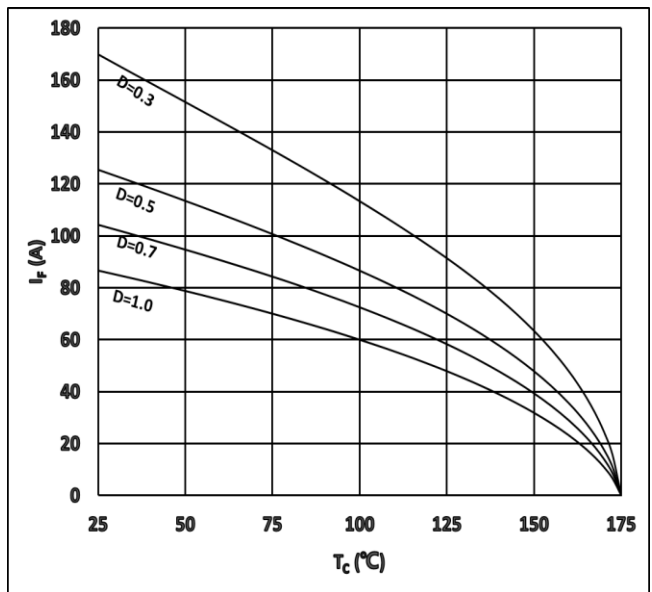
Figure 8. I$_F$ as a Function of Temp.

Package Dimensions

Dimension	Millmeter		Typical
	Min	Max	
A	31.50	32.00	31.70
B	7.70	8.30	8.00
C	4.10	4.30	4.20
D	4.10	4.30	4.20
E	4.10	4.30	4.20
F	14.90	15.15	15.0
G	29.80	30.40	30.10
H	37.80	38.30	38.05
I	11.80	12.30	12.05
J	0.75	0.85	0.80
K	12.50	13.00	12.75
M	25.00	25.50	25.30
N	6.75	7.10	6.90
O	4.00	4.40	4.20
P	1.90	2.10	2.00
Q	3.20	3.60	3.40
R	26.60	27.00	26.80
S	-0.03	0.10	0.01
T	4.85	5.25	5.05

Notes

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