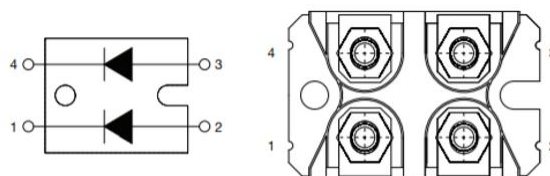


IVST12120DA1L – 1200V 60A*2 SiC MODULE

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



Applications

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

Part Number	Package
IVST12120DA1L	SOT 227

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 @Tamb=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^2t 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, $Q_C = \int_0^{V_R} C(V) dV$	Fig. 4
E _C	Capacitance Stored Energy	87		μJ	V _R = 800 V, T _J = 25°C, $E_C = \int_0^{V_R} C(V) \cdot V dV$	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

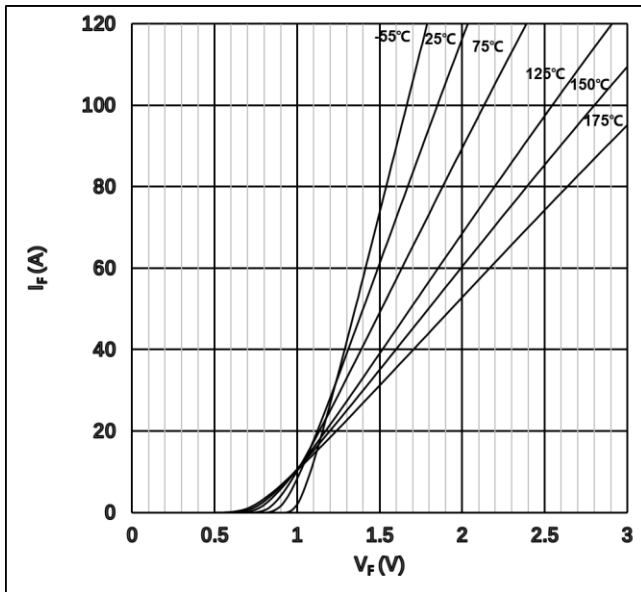


Figure 1. Typical Forward Characteristics

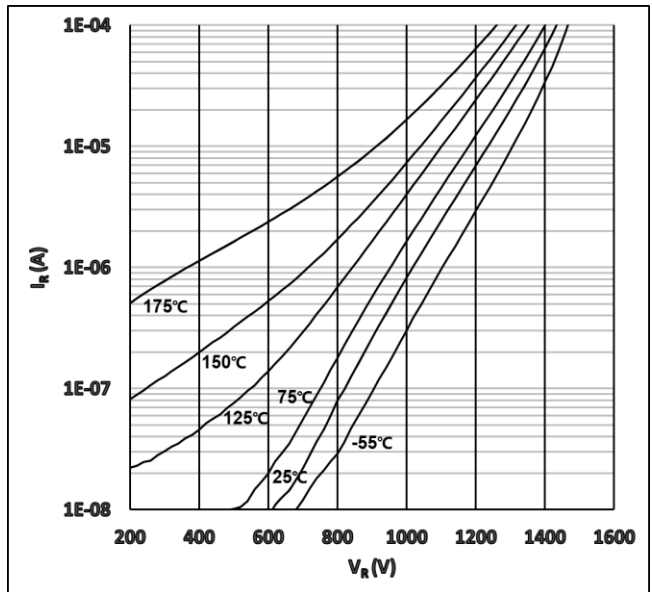


Figure 2. Typical Reverse Characteristics

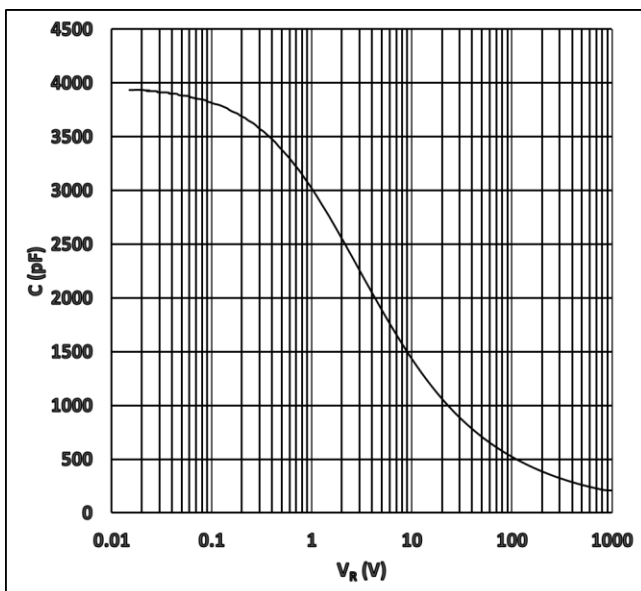


Figure 3. Capacitance vs. Reverse Voltage

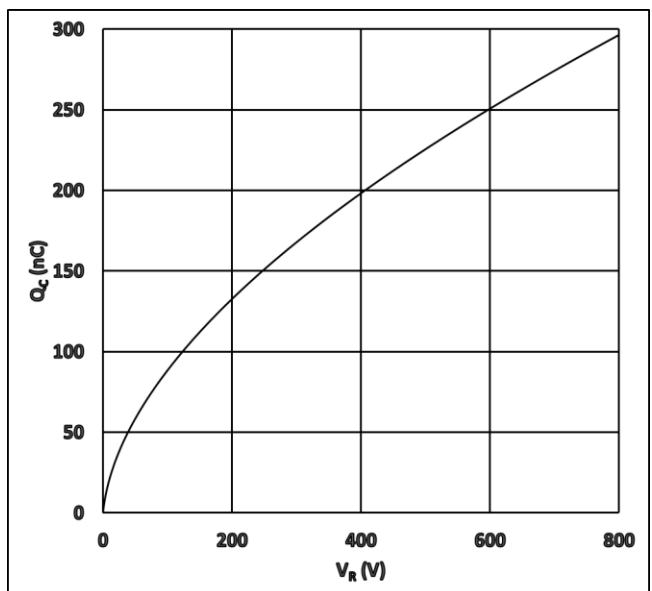


Figure 4. Recovery Charge vs. Reverse Voltage

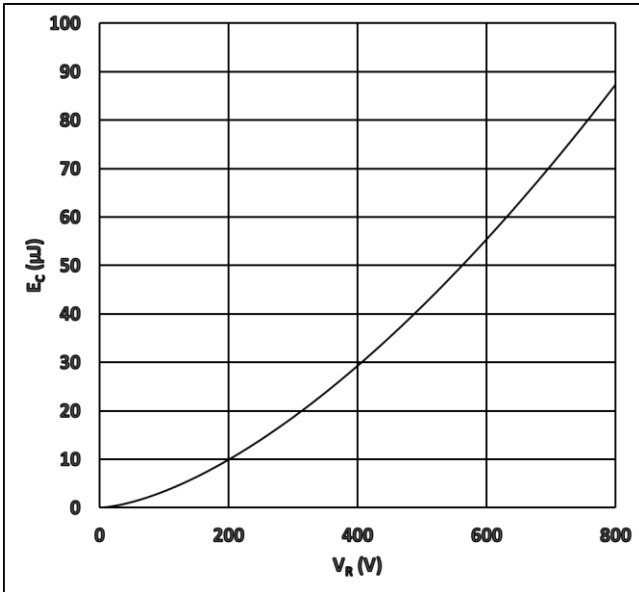


Figure 5. Capacitance Stored Energy

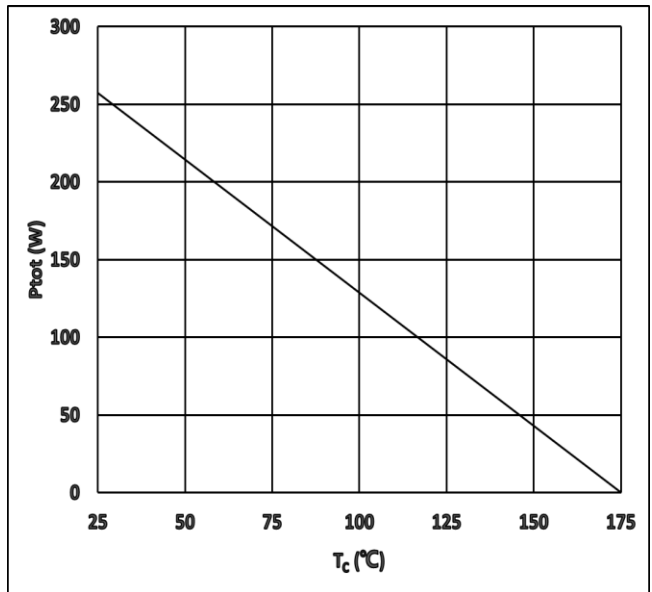


Figure 6. Power Derating

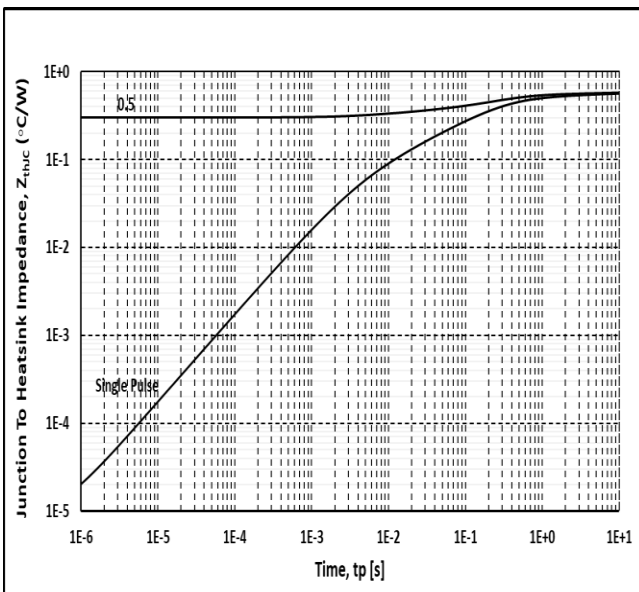


Figure 7. Transient Thermal Impedance

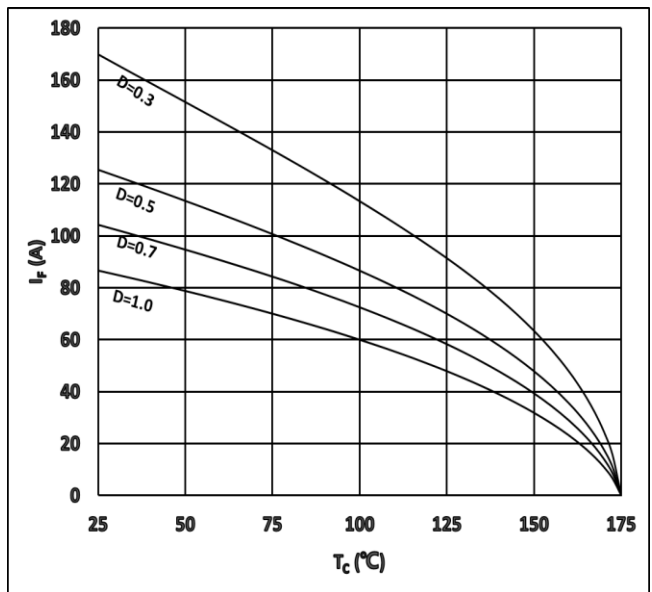
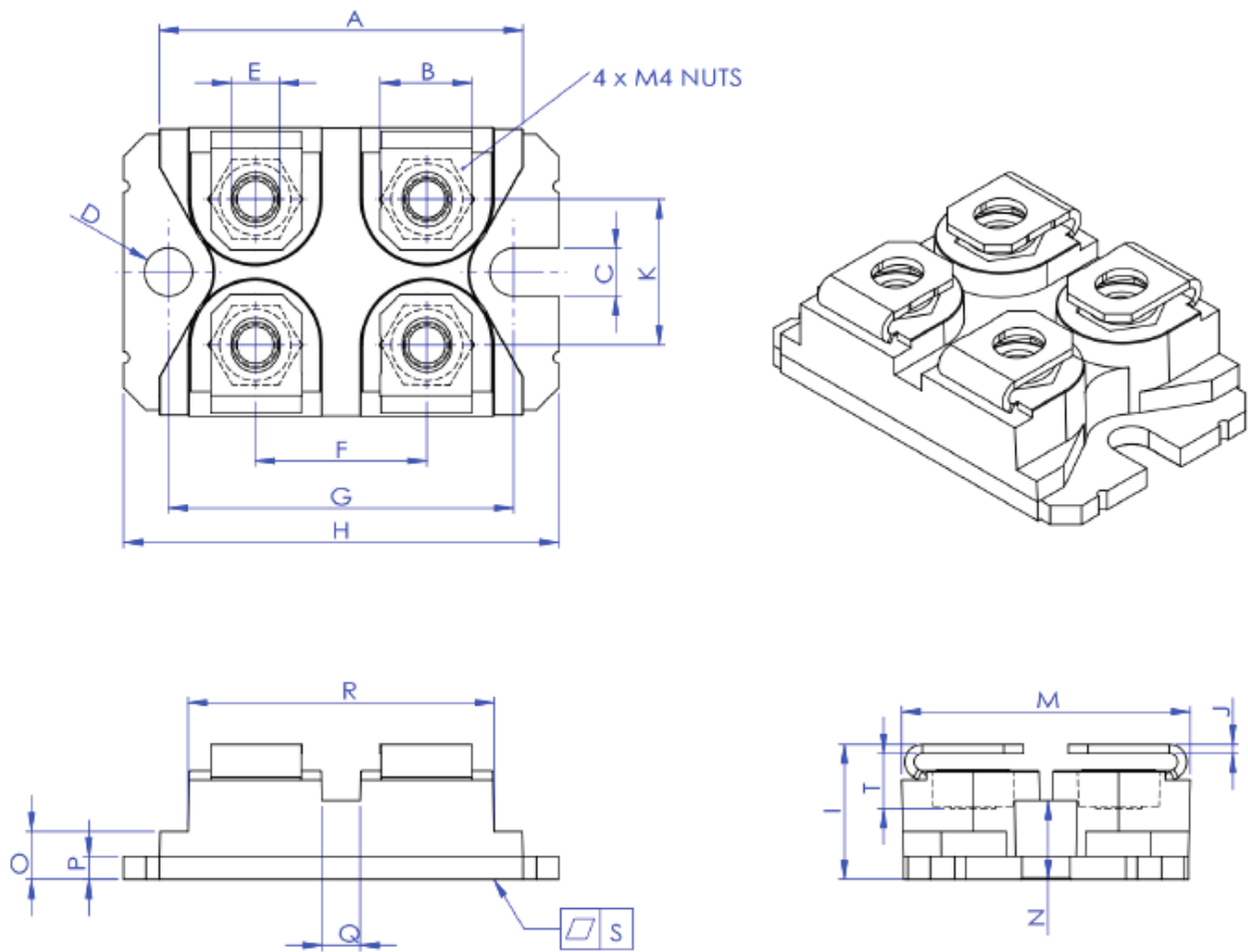


Figure 8. I_F as a Function of Temp.

Package Dimensions



Dimension	Millimeter		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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