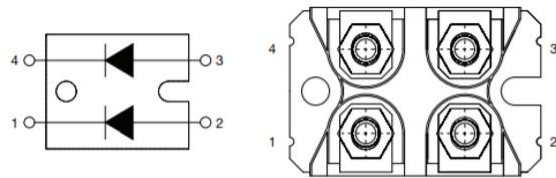


IVST12040DA1L – 1200V 20A*2 SiC MODULE

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

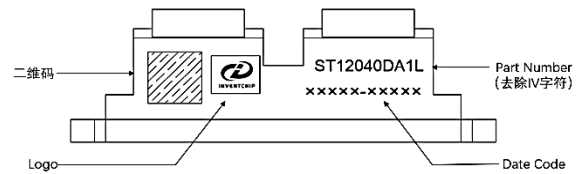
Outline



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	48.5	A
	Forward current (continuous) @Tc=142°C	20	A
I_{FSM}	Surge non-repetitive forward current sine halfwave @Tc=25°C tp=10ms	140	A
I_{FRM}	Surge repetitive forward current (Freq=0.1Hz, 100cycles) sine halfwave @Tamb=25°C tp=10ms	115	A
P_{TOT}	Total power dissipation @ Tc=25°C	185	W
	Total power dissipation @ Tc=150°C	30.9	
$\int i^2 dt$	I^2t value @Tc=25°C tp=10ms	98	A ² s
T_{STG}	Storage temperature range	-55 to 175	°C
T_j	Operating junction temperature range	-55 to 175	°C

Electrical Characteristics (Per SBD)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V _F	Forward Voltage	1.48	1.80	V	I _F = 20 A T _J =25°C	Fig. 1
		2.20	3.00		I _F = 20 A T _J =175°C	
I _R	Reverse Current	8	150	μA	V _R = 1200 V T _J =25°C	Fig. 2
		50	800		V _R = 1200 V T _J =175°C	
C	Total Capacitance	1180		pF	V _R = 1 V, T _J = 25°C, f = 1 MHz	Fig. 3
		144			V _R = 400 V, T _J = 25°C, f = 1 MHz	
		117			V _R = 800 V, T _J = 25°C, f = 1 MHz	
Q _C	Total Capacitive Charge	142		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	44		μJ	V _R = 800 V, T _J = 25°C, $E_C = \int_0^{V_R} C(V) \cdot VdV$	Fig. 5

Thermal Characteristics (Per SBD)

Symbol	Parameter	Typ.	Unit	Note
R _{th(j-c)}	Thermal Resistance from Junction to Case	0.809	°C/W	Fig.7

Module Characteristics

Symbol	Parameter	Conditions	Value			Unit
			Min.	Typ.	Max.	
V _{ISOL}	Isolation test voltage	RMS, f=50Hz, t=10sec, I _{ISOL} ≤ 10mA*	3			kV
T _{STG}	Storage temperature		-40		150	°C
M	Terminal connection torque	Screw M4	1.1		1.5	N·m
	Mounting torque	Screw M4	1.1		1.5	N·m
G	Weight of module			27		g
	Creepage distance	Terminal to heatsink		10.61		mm
		Terminal to terminal		10.37		mm
	Clearance distance	Terminal to heatsink		6.7		mm
		Terminal to terminal		4.05		mm

*: 1. Isolation voltages are between terminals and baseplate.

2. All terminals are connected together during the test.

Typical Performance (Per SBD)

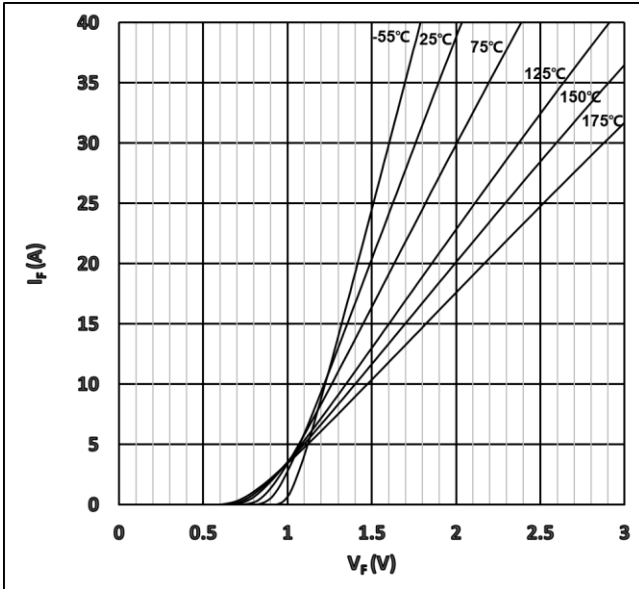


Figure 1. Typical Forward Characteristics

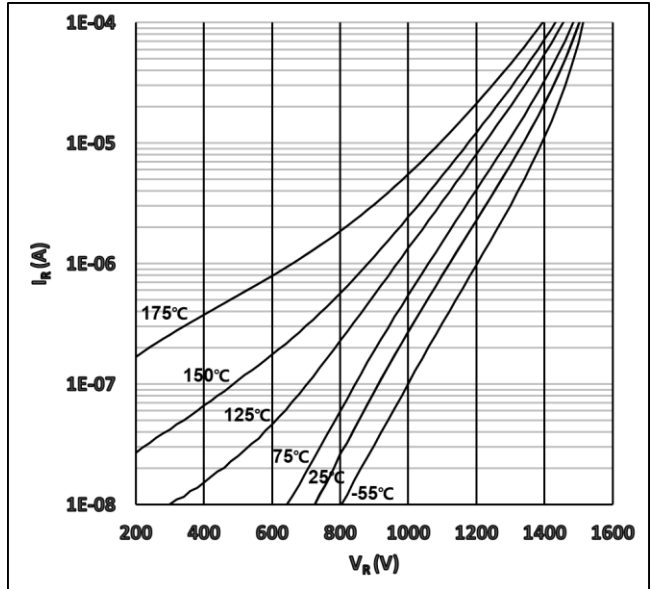


Figure 2. Typical Reverse Characteristics

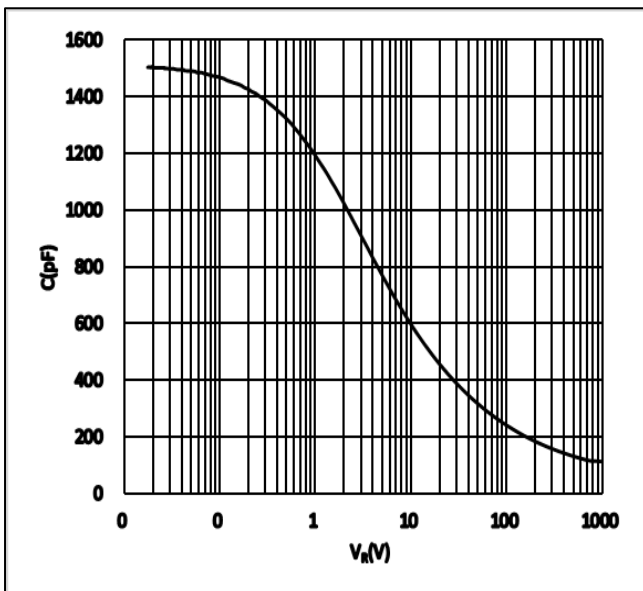


Figure 3. Capacitance vs. Reverse Voltage

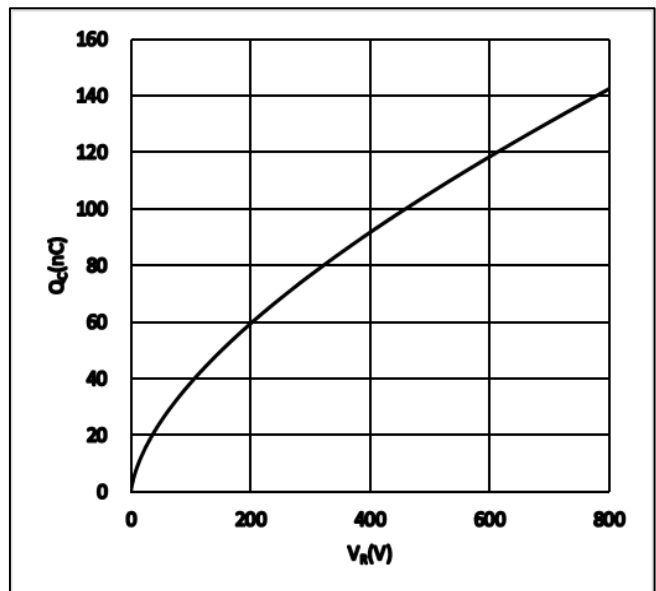


Figure 4. Recovery Charge vs. Reverse Voltage

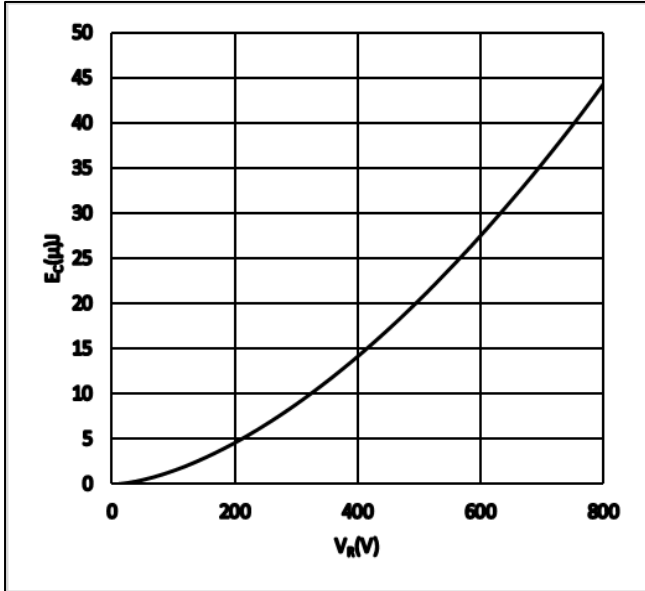


Figure 5. Capacitance Stored Energy

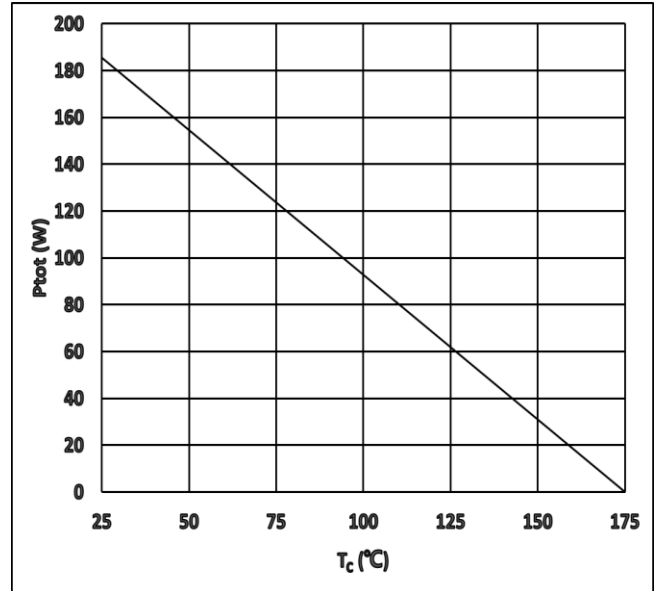


Figure 6. Power Derating

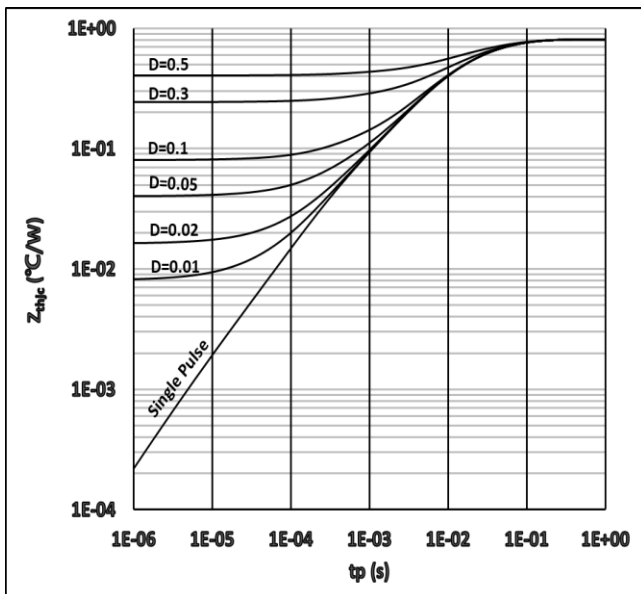


Figure 7. Transient Thermal Impedance

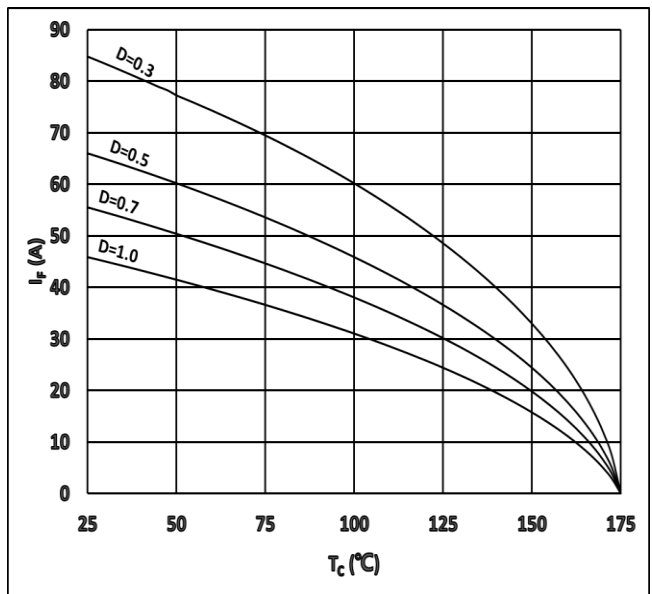
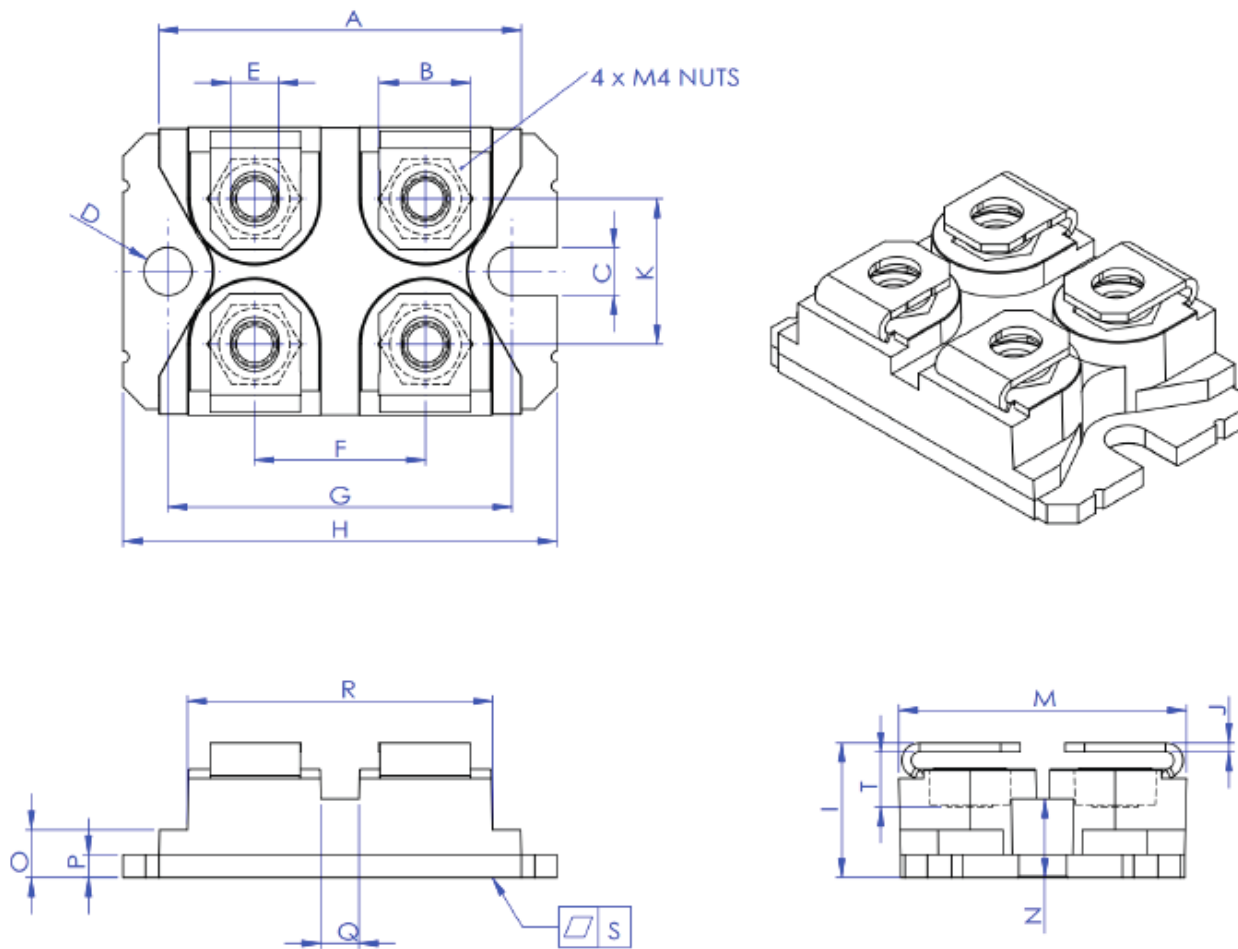


Figure 8. I_F as a Function of Temp.

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

For further information please contact IVCT's Office.

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