

MB80DU12ST



1200V SiC Power Module Dual Diode Pack

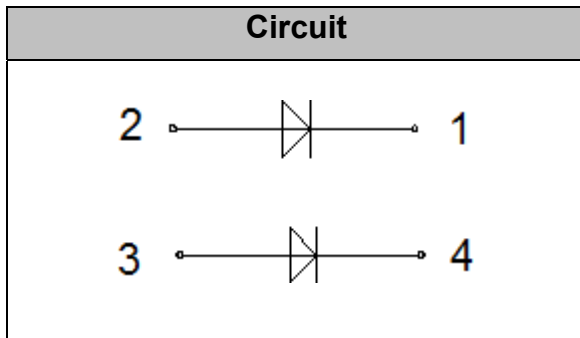
V_{DC}	1200V
I_F	2×40A
$T_{J,max}$	175°C

Applications

- Welding equipment
- Uninterruptible power supply (UPS)
- High frequency power supply
- Induction heating
- High speed rectifiers

Features

- SiC Schottky Diode
 - Zero reverse recovery
 - Zero forward recovery
 - Temperature independent switching behavior
 - Positive temperature coefficient on V_F
- Very low stray inductance
- Low forward voltage
- Isolated package (SOT-227)
- Low noise switching



Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ unless otherwise specified, per leg)

Parameter	Symbol	Test Conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	$T_J=25^\circ\text{C}$	1200	V
DC Blocking Voltage	V_{DC}	$T_J=25^\circ\text{C}$	1200	V
Continuous Forward Current	I_F	$T_C=25^\circ\text{C}, T_J=175^\circ\text{C}$	82	A
		$T_C=131^\circ\text{C}, T_J=175^\circ\text{C}$	40	
		$T_C=135^\circ\text{C}, T_J=175^\circ\text{C}$	37	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	$T_C=25^\circ\text{C}, T_P=10\text{ms}, \text{Half Sine Wave}$	306	A
I^2t Value	$\int I^2 dt$	$T_C=25^\circ\text{C}, T_P=10\text{ms}$	468	A^2s
Power Dissipation	P_{Tot}	$T_C=25^\circ\text{C}$	267	W
Junction Temperature	T_J		-55...175	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55...175	$^\circ\text{C}$

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Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified, per leg)

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Reverse Current	I_R	$V_R=1200\text{V}, T_J=25^\circ\text{C}$	--	7.1	100	μA
		$V_R=1200\text{V}, T_J=175^\circ\text{C}$	--	38	--	
Forward Voltage	V_F	$I_F=40\text{A}, T_J=25^\circ\text{C}$	--	1.36	1.7	V
		$I_F=40\text{A}, T_J=175^\circ\text{C}$	--	1.94	--	
Total Capacitance	C	$V_R=0\text{V}, f=1\text{MHz}$	--	2966	--	pF
		$V_R=400\text{V}, f=1\text{MHz}$	--	212	--	
		$V_R=800\text{V}, f=1\text{MHz}$	--	164	--	
Total Capacitive Charge	Q_C	$V_R=800\text{V}$	--	224	--	nC
Capacitance Stored Energy	E_C	$V_R=800\text{V}$	--	57	--	μJ

Thermal and Package Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Value	Unit
Thermal Resistance, Junction to Case	R_{thJC}	Per leg	0.56	$^\circ\text{C}/\text{W}$
Isolation Breakdown Voltage	V_{isol}	AC, 50Hz (R.M.S), T=3s	3600	V
Mounting Torque	M	Recommended (M4 screw)	1~1.5	Nm
Terminal Connection Torque		Recommended (M4 screw)	1~1.5	
Weight	W		29	g

Typical Performance Per Leg

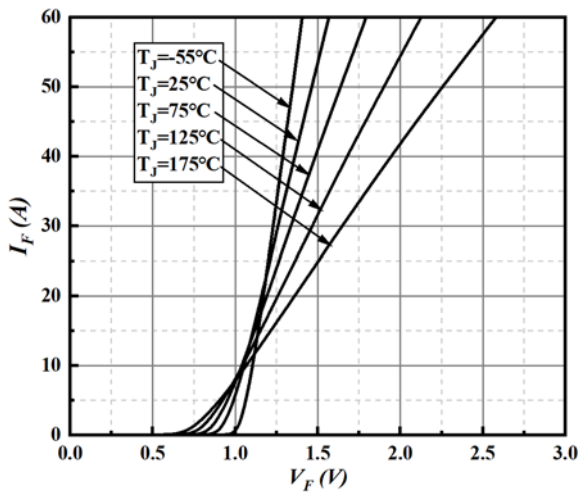


Fig.1. Forward Characteristics (parameterized on T_J)

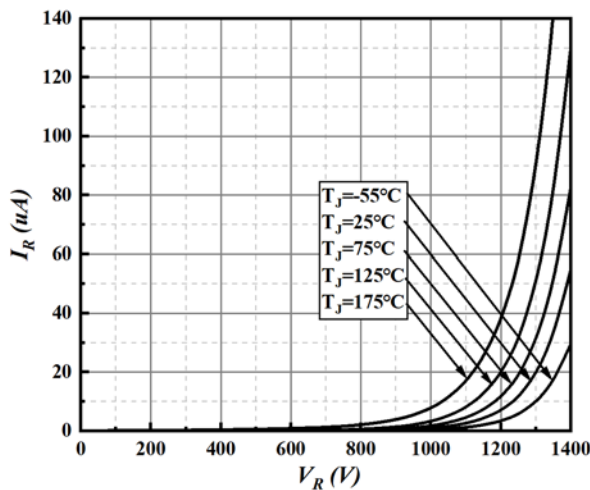


Fig.2. Reverse Characteristics (parameterized on T_J)

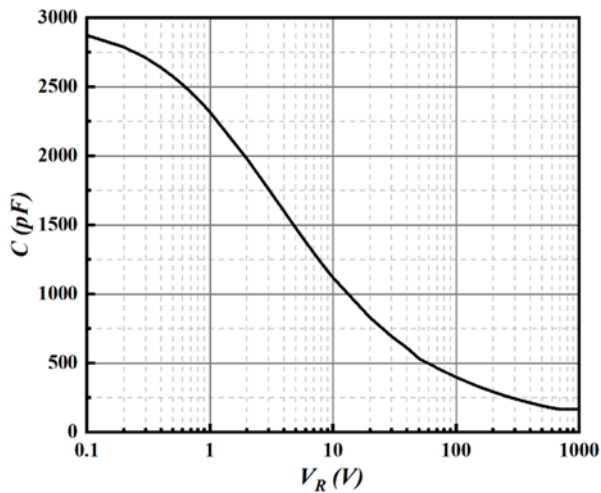


Fig3. Total Capacitance

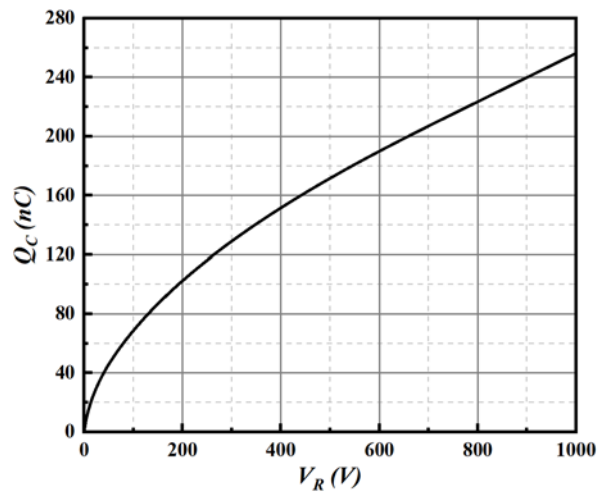


Fig4. Total Capacitive Charge

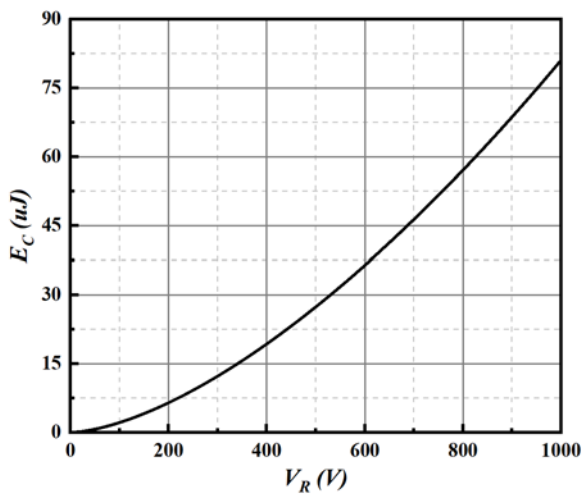


Fig5. Capacitance Stored Energy

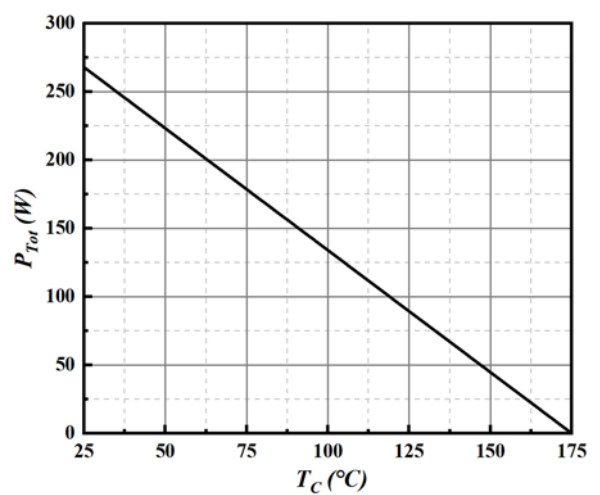


Fig6. Power Derating

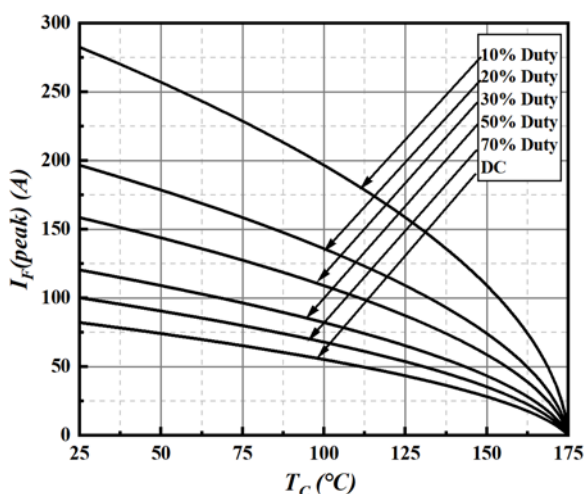


Fig7. Current Derating

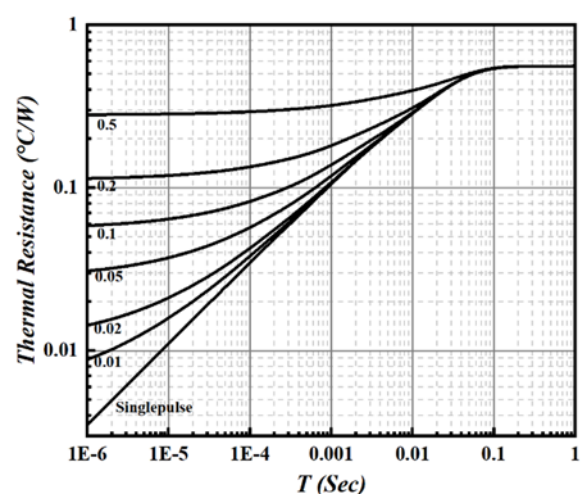
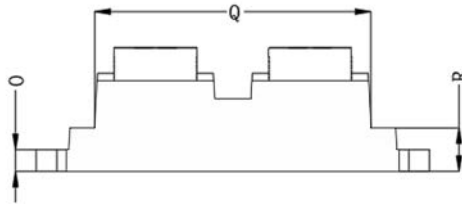
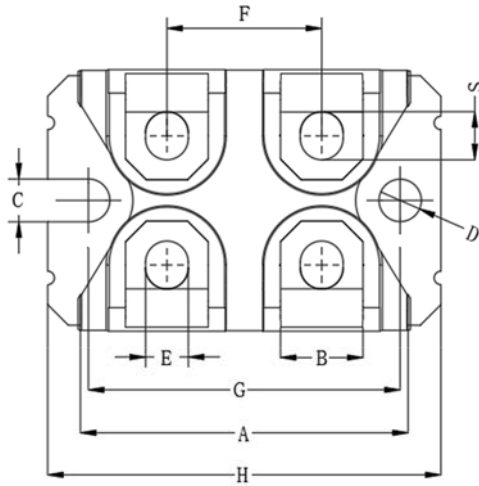
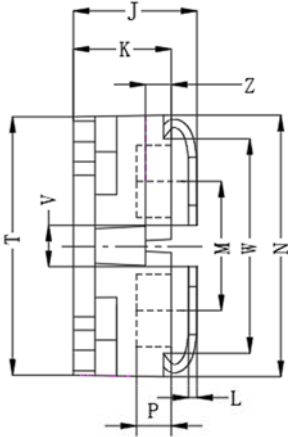


Fig8. Transient Thermal Impedance

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Package Outline Information

CASE: ST



DIM	Millimeter	
	min	max
A	31.60	31.80
B	7.70	8.10
C	4.20	4.40
D	4.20	4.40
E	4.10	4.40
F	14.90	15.10
G	30.10	30.30
H	37.70	38.20
J	12.00	12.60
K	9.35	9.65
L	0.74	0.84
M	12.40	12.80
N	24.80	25.60
O	1.90	2.10
P	2.92	3.32
Q	26.60	27.00
R	3.80	4.20
S	4.95	5.45
T	23.70	24.30
V	3.50	5.50
W	20.55	20.85
Z	2.50	2.70

Dimensions in mm

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