

# MSB20120G1

## Automotive 1200V Silicon Carbide Schottky Diode

### Features

- 1200-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF

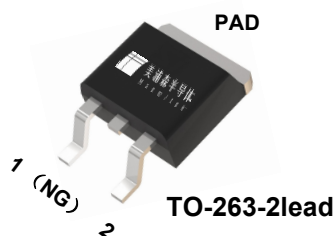
### Benefits

- Higher safety margin against overvoltage
- Improved efficiency all load conditions
- Increased efficiency compared to Silicon Diode alternatives
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

### Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- HID Lighting

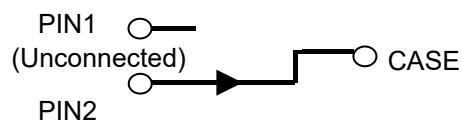
### Package



Type : TO-263 -2lead

PAD、Cathode

PIN2、Anode



### Absolute Maximum Ratings

$T_c = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	MSB20120G1	Units
VRRM	Repetitive Peak Reverse Voltage	1200	V
VRSM	Surge Peak Reverse Voltage	1200	V
VDC	DC Blocking Voltage	1200	V
IF	Continuous Forward Current @ $T_c=150^\circ\text{C}$	20	A
IFRM	Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ $t_p = 10$ ms, Half Sine Wave	100	A
IFSM	Non-Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ $t_p = 10$ ms, Half Sine Wave	140	A
IFSM	Non-Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ , $t_p = 10$ us, pulse	1200	A
Ptot	Power Dissipation @ $T_c=25^\circ\text{C}$ @ $T_c=110^\circ\text{C}$	272 118	W
$\int i^2 dt$	$I^2t$ value @ $T_c=25^\circ\text{C}$	50	$\text{A}^2\text{S}$
$T_J, T_{stg}$	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

**Package Marking**

Part Number	Top Marking	Package	Packing Method	MOQ	QTY
MSB20120G1	MSB20120G1	T0-263	Tape	800	4000

**Electrical Characteristics**T<sub>C</sub> = 25° C unless otherwise noted

Symbol	Test Conditions	Test Conditions	Min	Typ	Max	Unit
VF	Forward Voltage	IF=20 A, TC=25° C IF= 20 A, TC=175° C	-	1.5 1.8	2.2 3.00	V
IR	Reverse Current	VR=1200V, TC=25° C VR=1200V, TC=175° C	-	2 20	5 40	μA
QC	Total Capacitive Charge	VR =800V, TJ = 25° C $Q_c = \int_0^{V_r} C(V) dv$	-	95	-	nC
C	Total Capacitance	VR =0V, TJ = 25° C, f=1MHz VR =400V, TJ = 25° C, f=1MHz VR =800V, TJ = 25° C, f=1MHz	-	1430 89 65	-	pF
EC	Capacitance Stored Energy	VR=800V	-	50	-	μJ

**Thermal Characteristics**

Symbol	Parameter	Typ	Unit
RθJC	Thermal Resistance from Junction to Case	0.55	°C/W

# Typical Characteristics

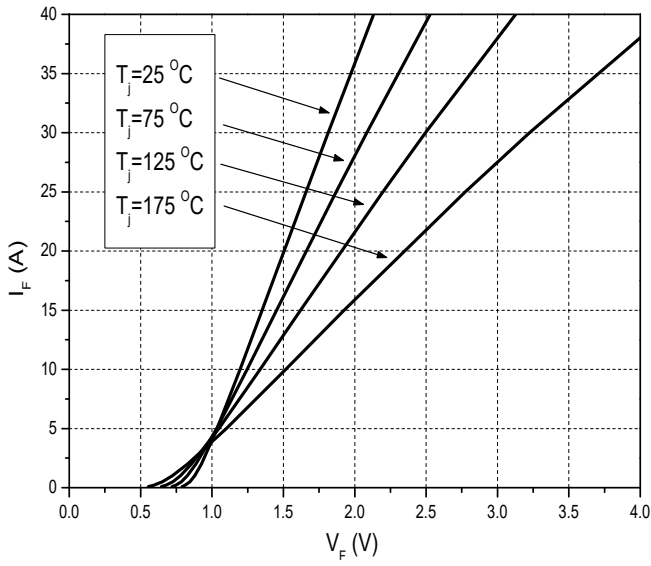


Figure 1. Forward Characteristics

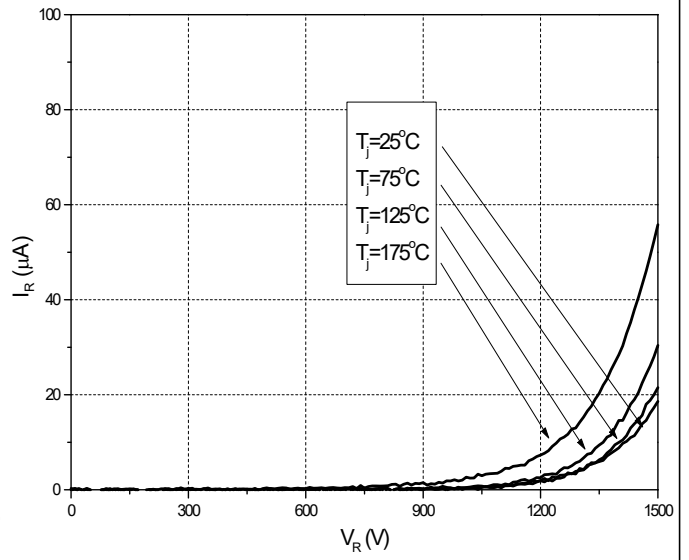


Figure 2. Reverse Characteristics

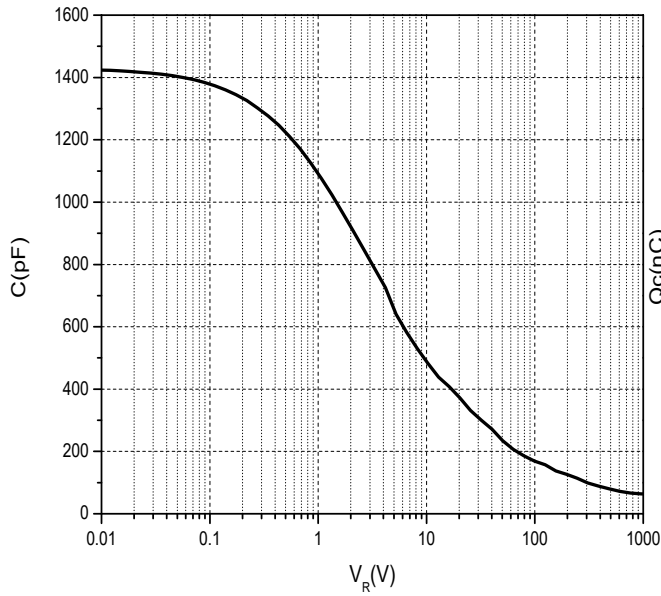


Figure 3. Capacitance vs. Reverse Voltage

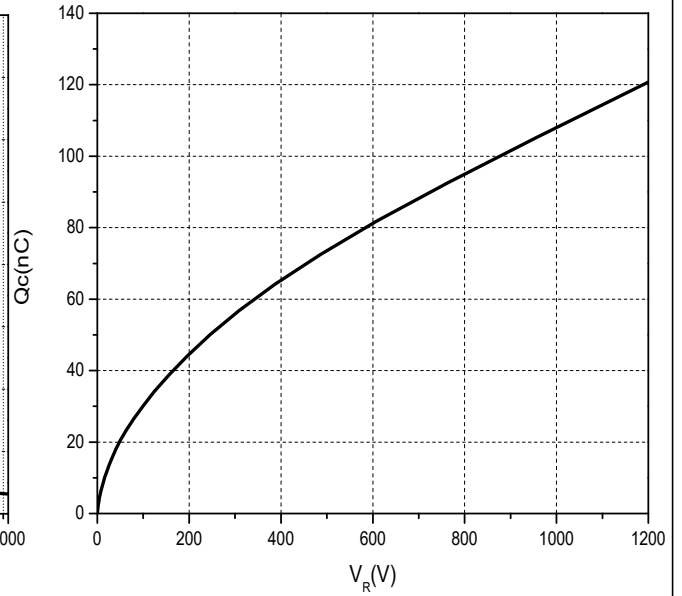


Figure 4. Total Capacitance Charge vs. Reverse Voltage

# Typical Characteristics

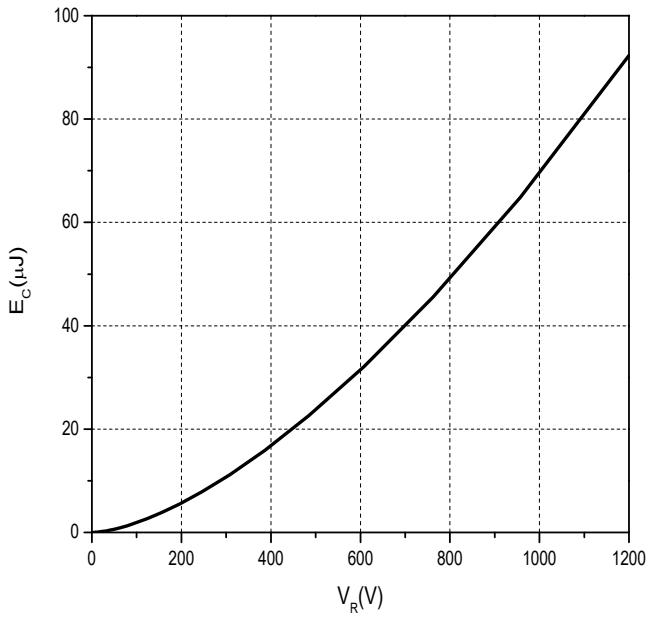


Figure 5. Capacitance Stored Energy

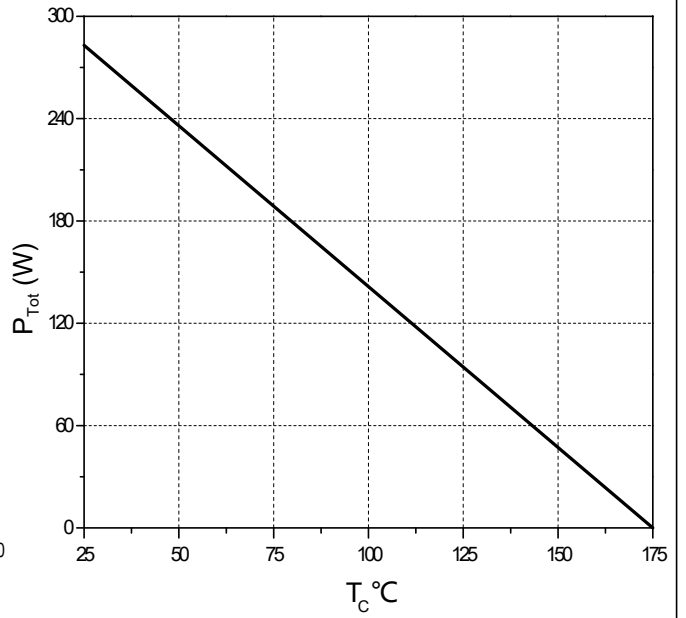


Figure 6. Power Derating

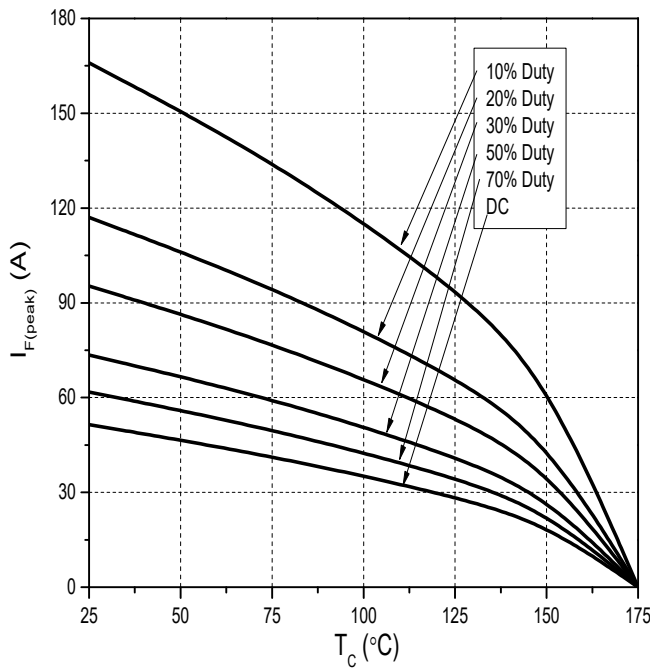


Figure 7. Current Derating

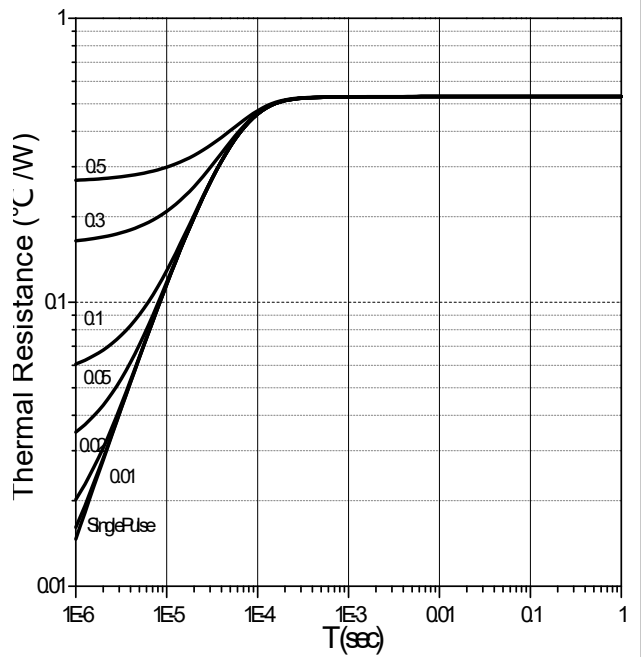
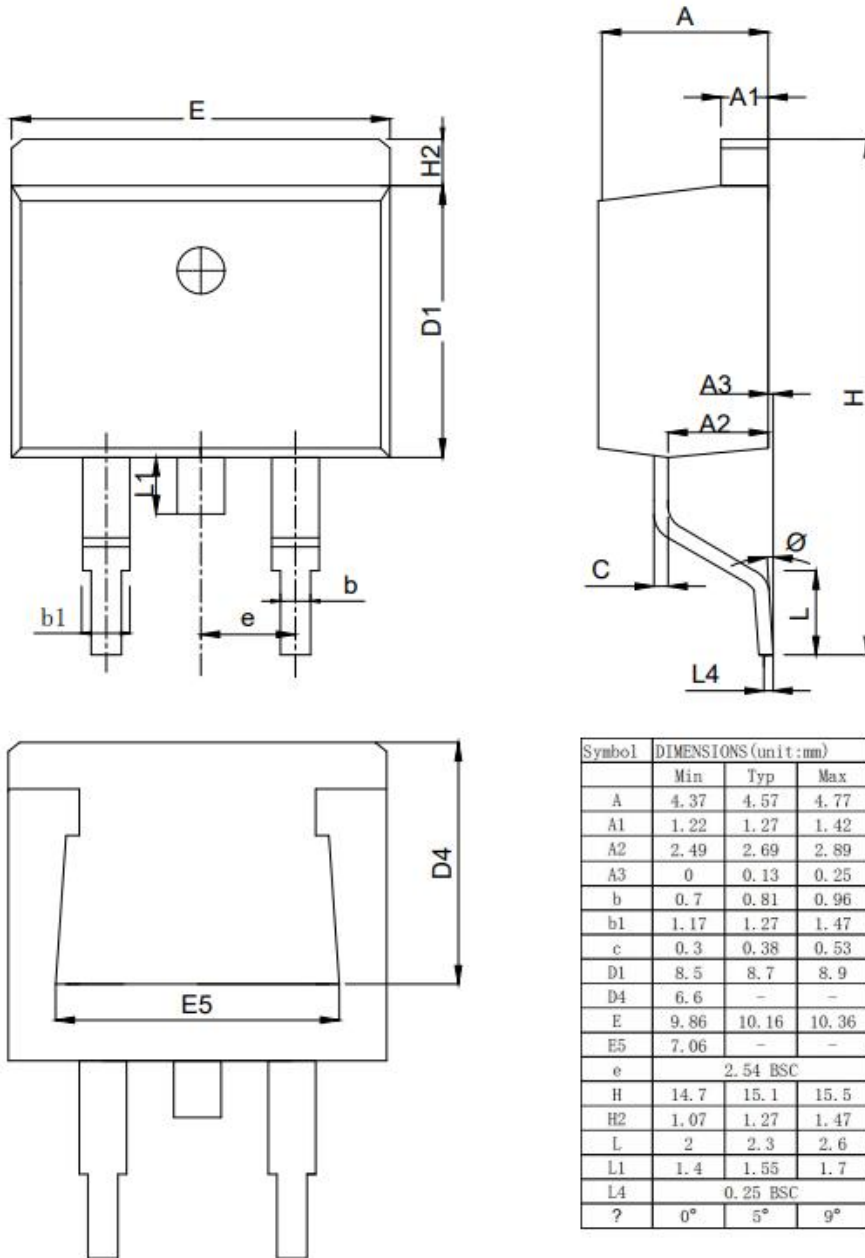


Figure 8. Transient Thermal Impedance

## TO-263 OUTLINE



## NOTE:

- 1The plastic package is not marked as smooth surface $R_a=0.1$ ;Subglossy surface $R_a=0.8$
- 2.Undeclared tolerance $\pm 0.25$ ,Unmarked fillet $R_{max}=0.25$

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