

# MSH20120G1

## 1200V Silicon Carbide Diode

### Features

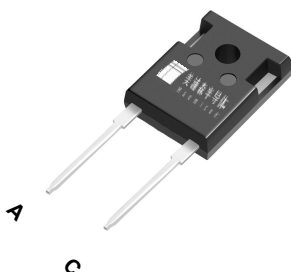
- 1200-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF

### 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

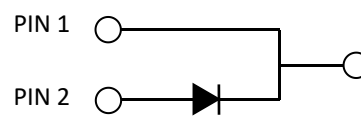
### Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- PD Power
- Charging Pile Power
- PV Inverter



### Package

Type : TO-247-2Lead



### Absolute Maximum Ratings

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

Symbol	Parameter	MSH20120G1	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 @ $T_c=25^\circ\text{C}$ , $t_P = 10\text{ ms}$ , Half Sine Wave	100	A
IFSM	Non-Repetitive Peak Forward Surge Current (Per Leg) @ $T_c=25^\circ\text{C}$ , $t_P = 10\text{ ms}$ , Half Sine Wave	140	A
IF,Max	Non-Repetitive Peak Forward Surge Current ;@ $T_c=25^\circ\text{C}$ , $t_P = 10\text{ }\mu\text{s}$ , Pulse	1200	A
Ptot	Power Dissipation (Per Leg/Device) @ $T_c=25^\circ\text{C}$ @ $T_c=110^\circ\text{C}$	272 118	W
TJ , Tstg	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

### Package Marking

Part Number	Top Marking	Package	Packing Method	MOQ	QTY
MSH20120G1	MSH20120G1	TO-247-2L	Tube	450	2250

### Electrical Characteristics

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

Symbol	Test Conditions	Test Conditions	Min	Typ	Max	Unit
VF	Forward Voltage(Per Lag)	IF=20A, TC=25° C IF=20A, TC=175° C	-	1.5 2.2	1.8 3.0	V
IR	Reverse Current	VR=1200V, TC=25° C VR=1200V, TC=175° C	-	10 20	50 100	μA
QC	Total Capacitive Charge	VR=800V, TJ = 25° C $Qc = \int_0^{t_c} C (V) dv$	-	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

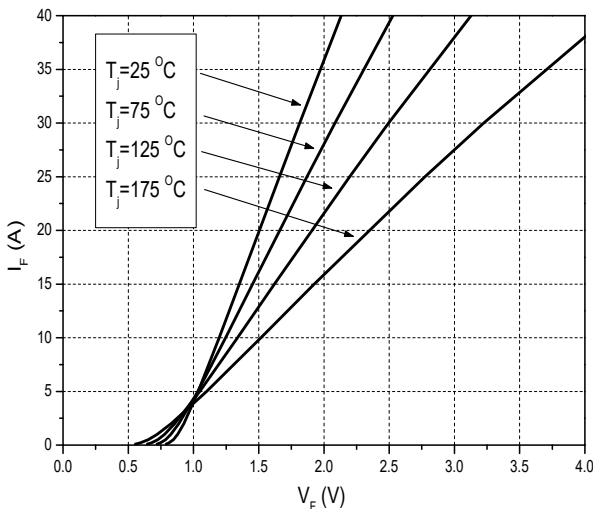


Figure 1. Forward Characteristics

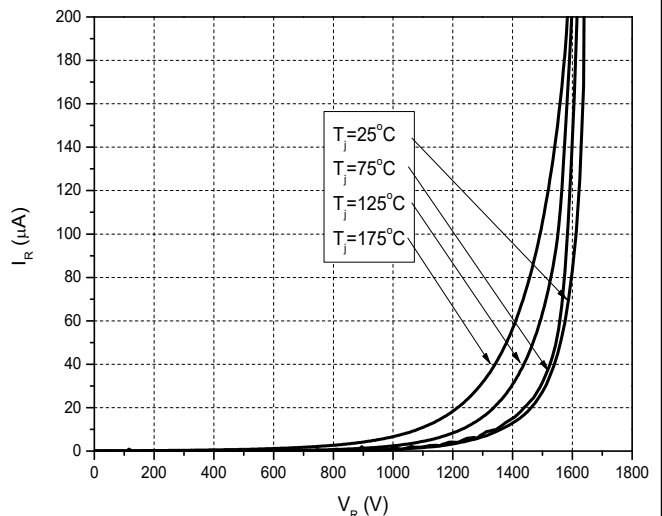


Figure 2. Reverse Characteristics

# Typical Characteristics

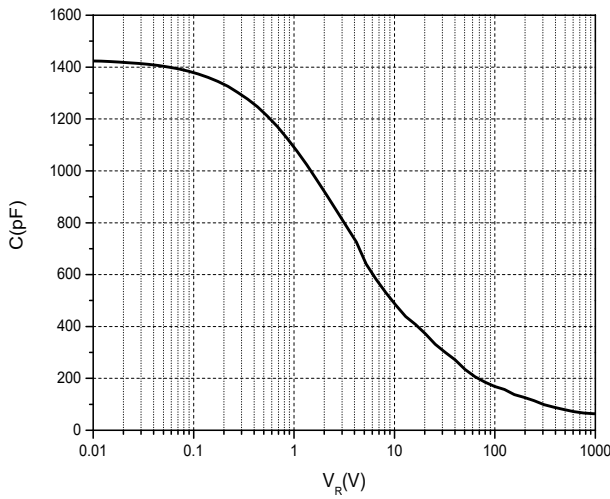


Figure 3. Capacitance vs. Reverse Voltage

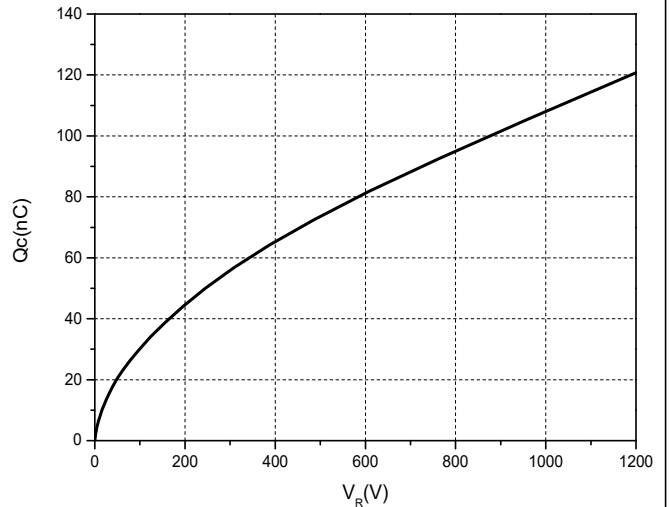


Figure 4. Total Capacitance Charge vs. Reverse Voltage

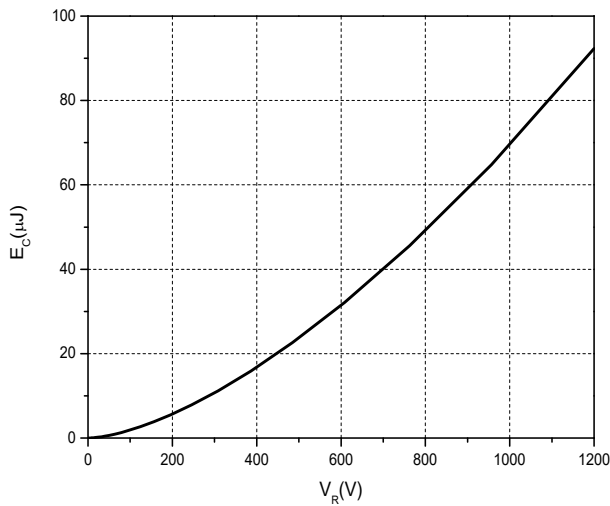


Figure 5. Capacitance Stored Energy

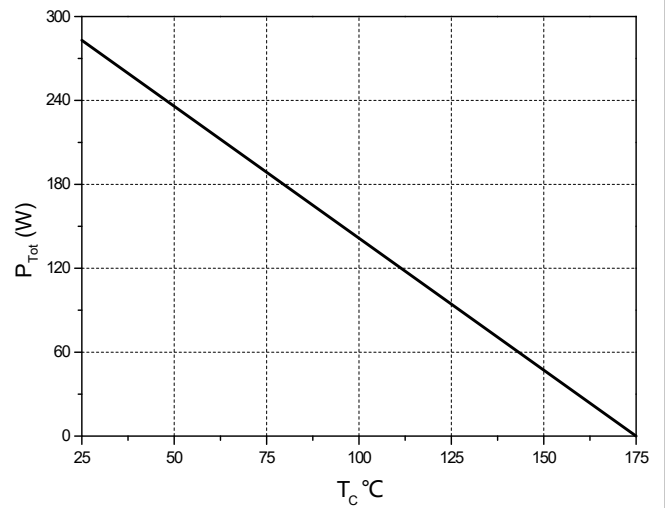


Figure 6. Power Derating

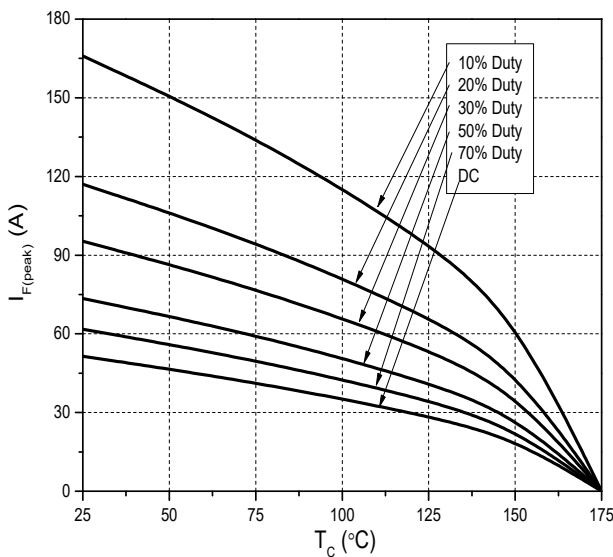


Figure 7. Current Derating

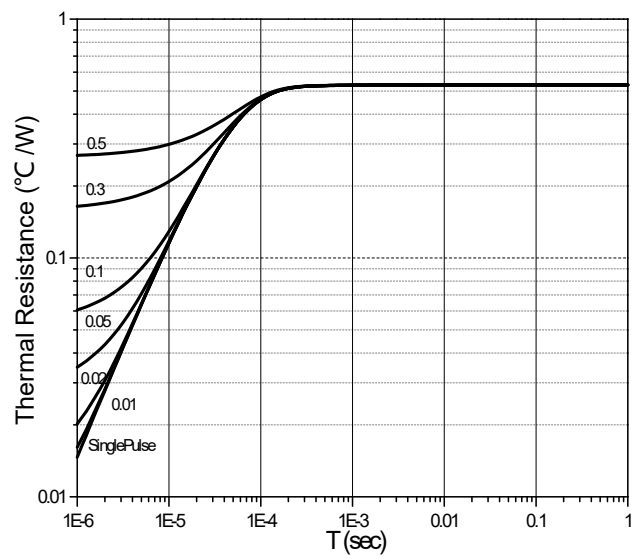
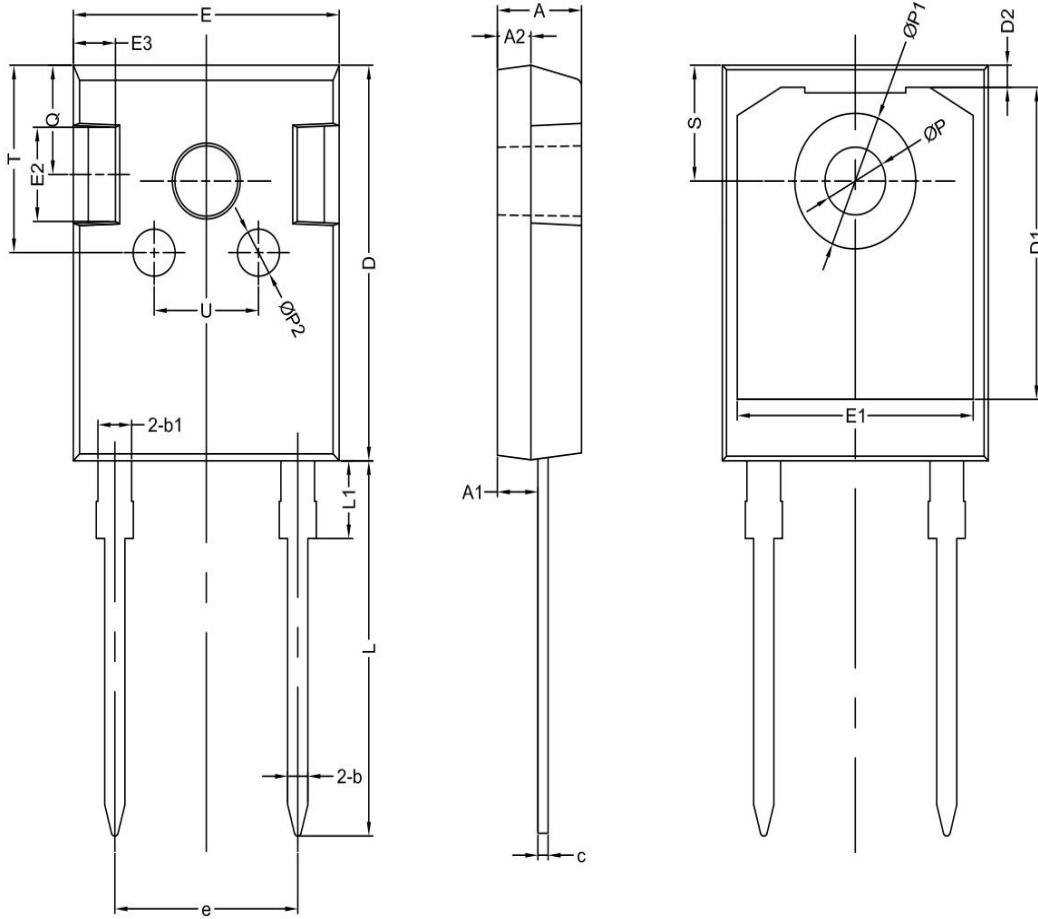


Figure 8. Transient Thermal Impedance

# Package Dimensions TO-247-2Lead



SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX						MIN	NOM	MAX
A	4.80	5.00	5.20	D1	-	16.55	-	L1	-	4.13	-
A1	2.21	2.41	2.61	D2	-	1.17	-	Ø P	3.4	3.6	3.8
A2	1.90	2.00	2.10	E	15.50	15.80	16.10	Ø P1	-	7.19	-
b	1.05	1.20	1.35	E1		14.02		Ø P2	-	2.50	-
b1	-	2.00	-	E2		5.0		Q	-	5.8	-
c	0.55	0.60	0.75	e	10.88			S	6.00	6.15	6.25
D	20.65	21.00	21.20	L	19.22	19.92	20.42	T	-	10.0	-

**NOTE:**

- 1The plastic package is not marked as smooth surfaceRa=0.1;Subglossy surfaceRa=0.8
- 2.Undeclared tolerance ±0.15,Unmarked filletRmax=0.25

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