

## MS2TH60065G1

### 650V Silicon Carbide Schottky Diode

#### Features

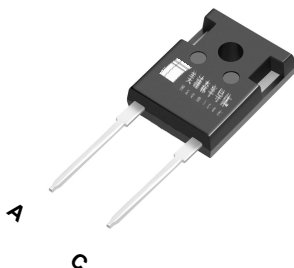
- 650-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF

#### 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

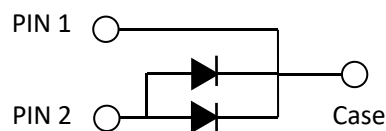
#### Applications

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



#### Package

Type : TO-247-2Lead



#### Absolute Maximum Ratings

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

Symbol	Parameter	MS2TH60065G1	Units
VRRM	Repetitive Peak Reverse Voltage	650	V
VRSM	Surge Peak Reverse Voltage	650	V
VDC	DC Blocking Voltage	650	V
IF	Continuous Forward Current @ $T_C=150^\circ\text{C}$	60	A
IFRM	Repetitive Peak Forward Surge Current @ $T_C=25^\circ\text{C}$ , $t_P = 10$ ms, Half Sine Wave	350	A
IFSM	Non-Repetitive Peak Forward Surge Current @ $T_C=25^\circ\text{C}$ , $t_P = 10$ ms, Half Sine Wave	450	A
IF,Max	Non-Repetitive Peak Forward Surge Current, $T_C=25^\circ\text{C}$ , $t_P= 10$ $\mu\text{s}$ , Pulse	2500	A
Ptot	Power Dissipation @ $T_C=25^\circ\text{C}$ @ $T_C=110^\circ\text{C}$	555 240	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
MS2TH60065G1	MS2TH60065G1	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	IF=60A, T <sub>J</sub> =25° C IF=60A, T <sub>J</sub> =175° C	-	1.45 1.95	1.8 2.4	V
IR	Reverse Current	VR=650V, T <sub>J</sub> =25° C VR=650V, T <sub>J</sub> =175° C	-	2 40	20 200	μA
QC	Total Capacitive Charge	VR=400V, IF=10A T <sub>J</sub> =25° C $Q_c = \int_0^{t_r} I_C (V) dv$	-	170	-	nC
C	Total Capacitance	VR=0V, T <sub>J</sub> =25° C, f=1MHz VR=200V, T <sub>J</sub> =25° C, f=1MHz VR=400V, T <sub>J</sub> =25° C, f=1MHz	-	4100 325 274	-	pF
EC	Capacitance Stored Energy	VR=400V	-	42	-	μJ

## Thermal Characteristics

Symbol	Parameter	Typ	Unit
RθJC	Thermal Resistance from Junction to Case	0.27	°C/W

## Typical Characteristics

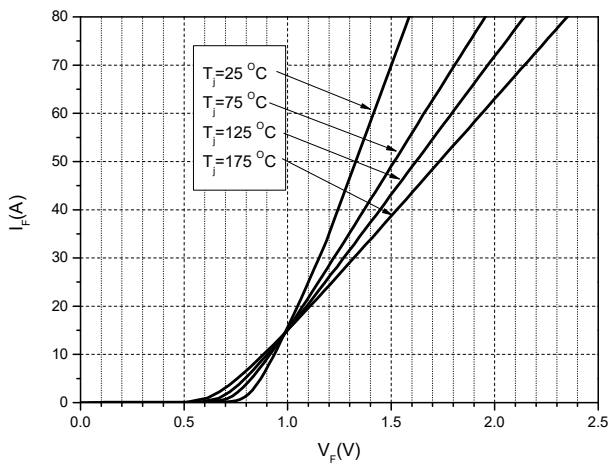


Figure 1. Forward Characteristics

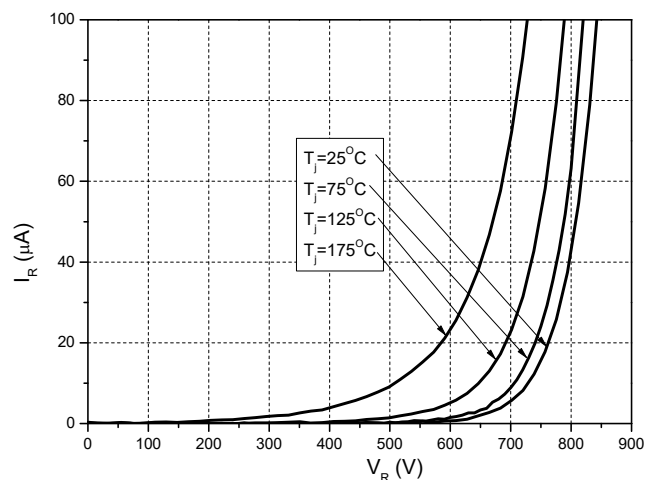


Figure 2. Reverse Characteristics

# Typical Characteristics

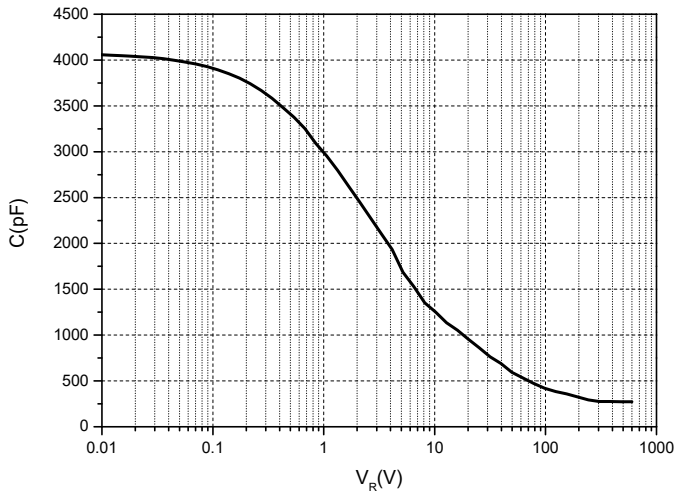


Figure 3. Capacitance vs. Reverse Voltage

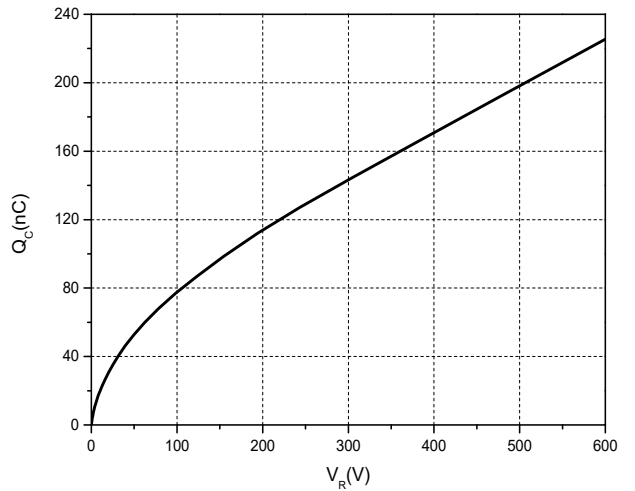


Figure 4. Total Capacitance Charge vs. Reverse Voltage

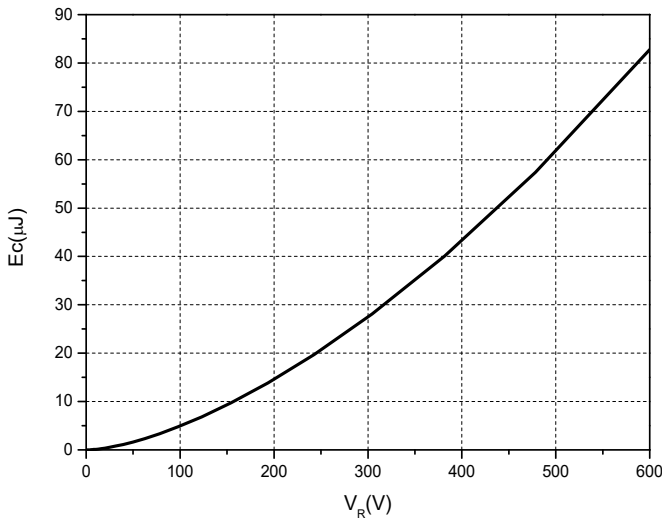


Figure 5. Capacitance Stored Energy

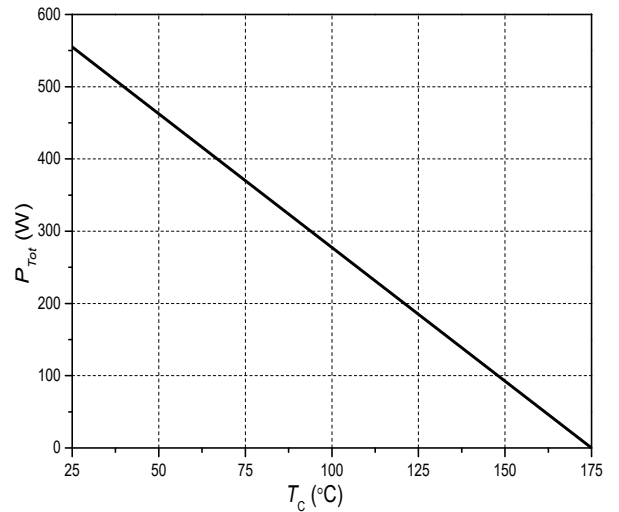


Figure 6. Power Derating

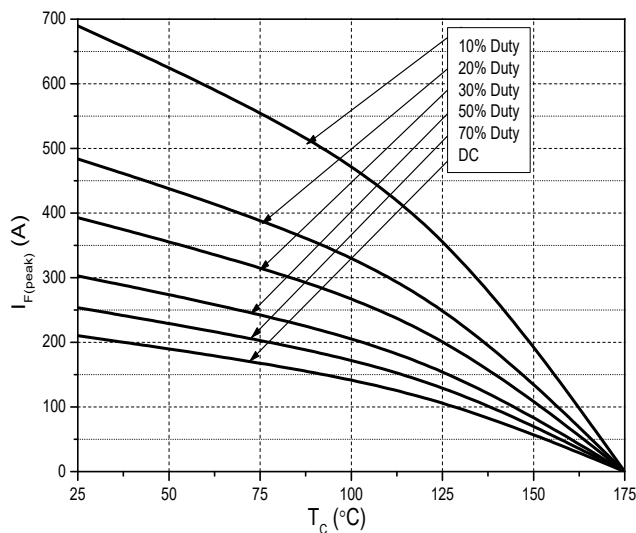


Figure 7. Current Derating

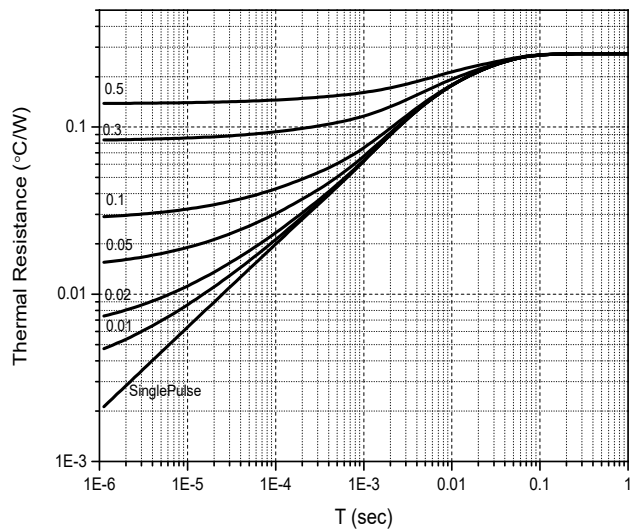
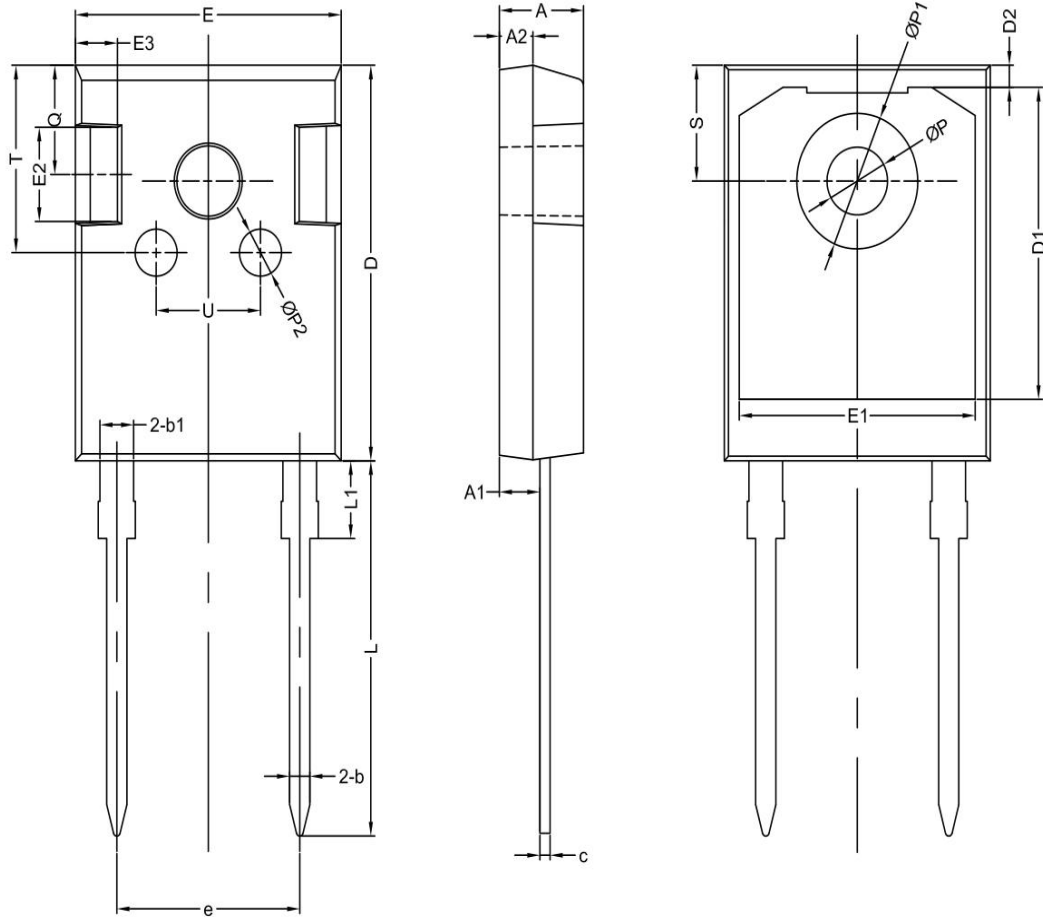


Figure 8. Transient Thermal Impedance

## 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	-	∅ P	3.4	3.6	3.8
A2	1.90	2.00	2.10	E	15.50	15.80	16.10	∅ P1	-	7.19	-
b	1.05	1.20	1.35	E1		14.02		∅ 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:

- The plastic package is not marked as smooth surface  $R_a=0.1$ ; Subglossy surface  $R_a=0.8$
- Undeclared tolerance  $\pm 0.15$ , Unmarked fillet  $R_{max}=0.25$

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