

MS2H30065V1

650V Silicon Carbide 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

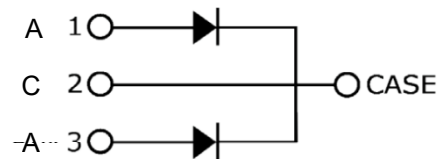
Applications

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

Package



Type : TO-247-3Lead



Absolute Maximum Ratings

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

Symbol	Parameter	MS2H30065V1	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 (Per Leg/Device) @Tc=25°C @Tc=135°C @Tc=145°C	37/74 18/36 15/30	A
IFRM	Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 ms, Half Sine Wave	105	A
IFSM	Non-Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 ms, Half Sine Wave	135	A
IF.MAX	Non-Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 us, Half Sine Wave	1200	A
Ptot	Power Dissipation (Per Leg/Device) @Tc=25°C @Tc=110°C	159/318 68/136	W
TJ , Tstg	Operating Junction and Storage Temperature	-55 to +175	°C

Electrical Characteristics

T_C = 25° C unless otherwise noted

Symbol	Test Conditions	Test Conditions	Min	Typ	Max	Unit
VF	Forward Voltage (Per Leg)	IF=15A, TC=25° C IF=15A, TC=175° C	-	1.5 2.0	1.8 2.4	V
IR	Reverse Current	VR=650V, TC=25° C VR=650V, TC=175° C	-	2 30	10 200	μA
QC	Total Capacitive Charge	VR =400V, IF =20A TJ = 25° C $Qc = \int_0^{Vr} C (V) dv$	-	41	-	nC
C	Total Capacitance	VR =0V, TJ = 25° C, f=1MHz VR =200V, TJ = 25° C, f=1MHz VR =400V, TJ = 25° C, f=1MHz	-	880 88 68	-	pF
EC	Capacitance Stored Energy	VR=400V	-	7.2	-	μJ

Thermal Characteristics

Symbol	Parameter	Typ	Unit
RθJC	Thermal Resistance from Junction to Case	0.94	°C/W

Typical Characteristics

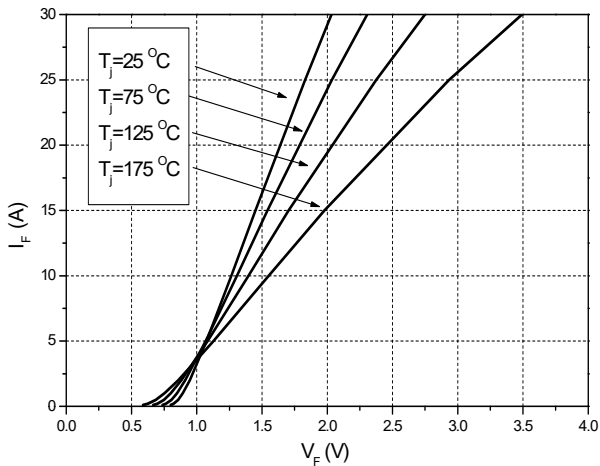


Figure 1. Forward Characteristics

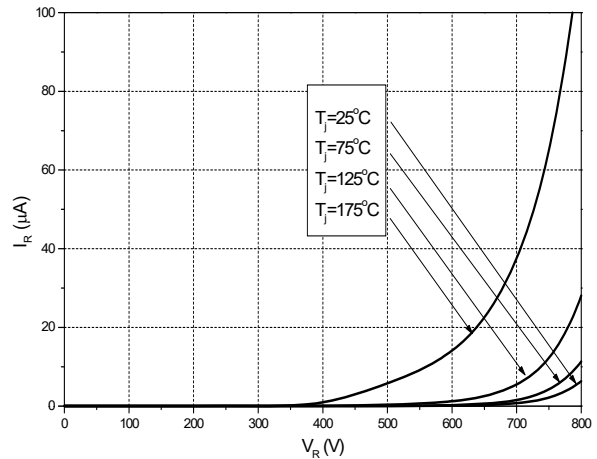


Figure 2. Reverse Characteristics

Typical Characteristics

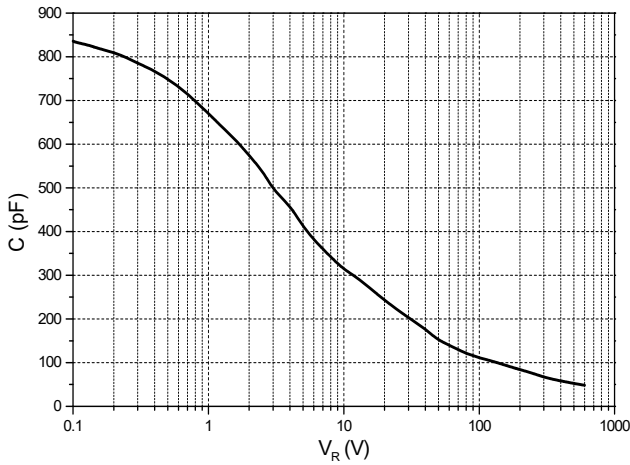


Figure 3. Capacitance vs. Reverse Voltage

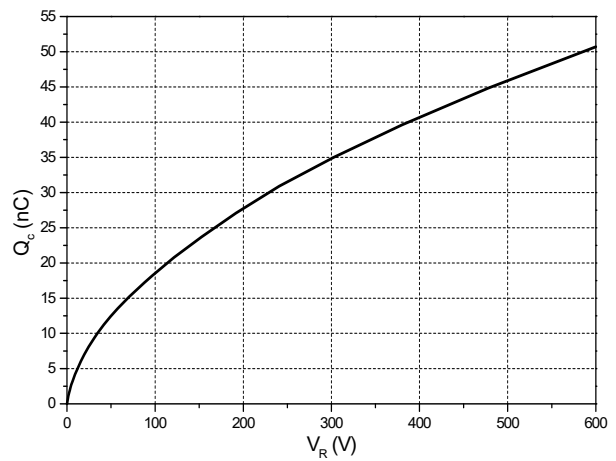


Figure 4. Total Capacitance Charge vs. Reverse Voltage

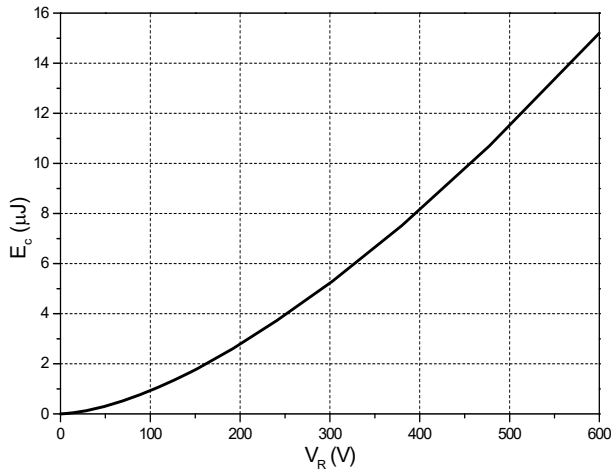


Figure 5. Capacitance Stored Energy

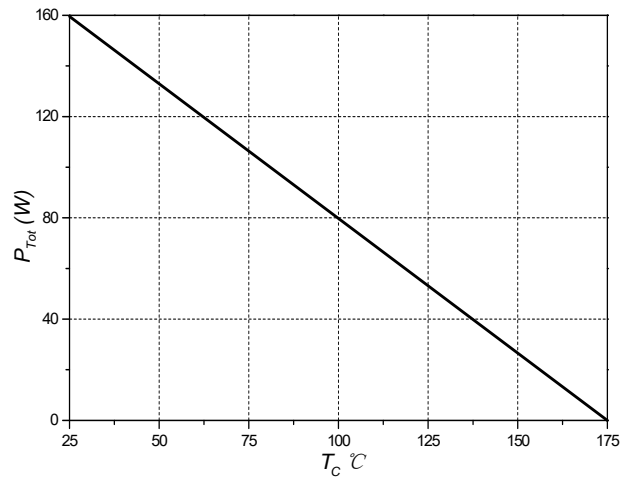


Figure 6. Power Derating

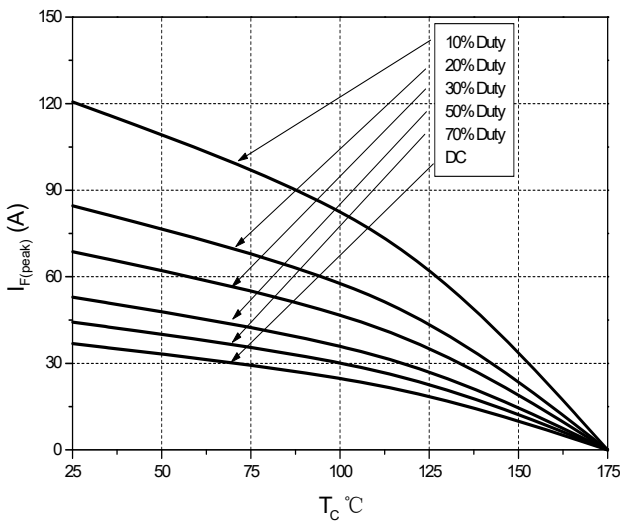


Figure 7. Current Derating

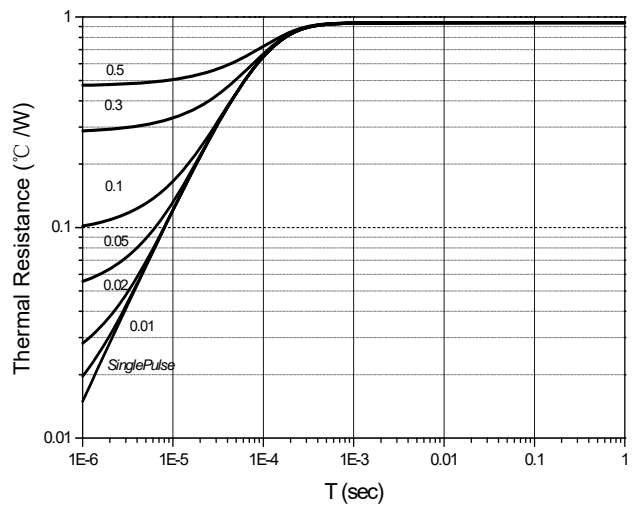
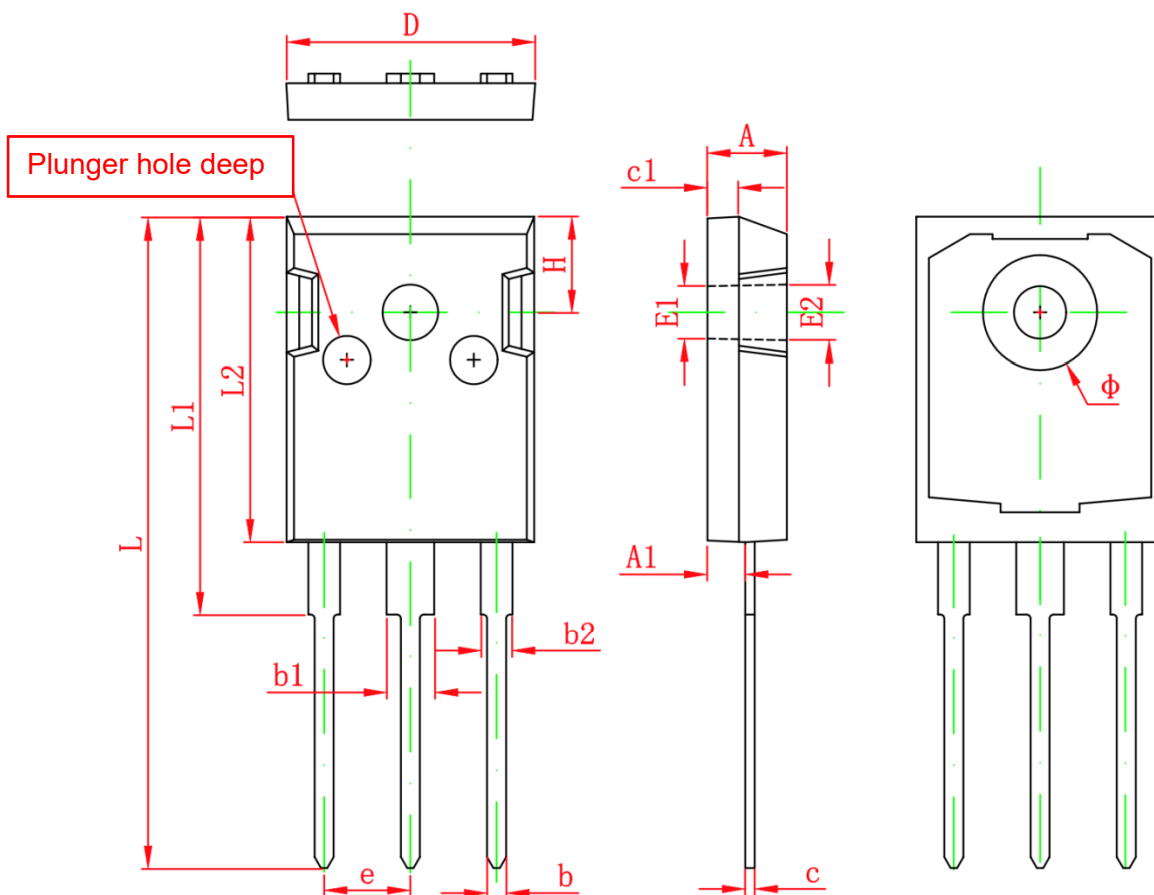


Figure 8. Transient Thermal Impedance

Package Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	
h	0.000	0.300	0.000	0.012