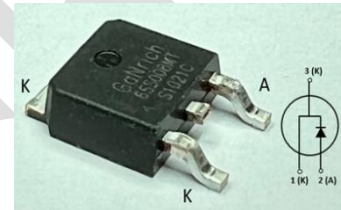


GR-65S004MT – SiC 650V 04A Schottky Barrier Diode

Features

- 650-Volt Schottky Rectifier
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF
- Product Summary

VR	650	V
I _F (T _j =175 °C)	4	A
Q _c	9	nC



GR-65S004MT, TO252

Potential Applications

- Boost Diodes in PFC or DC/DC Stages
- Switch Mode Power Supplies (SMPS)
- AC/DC Converters

Product Validation

- Qualified for industrial applications according to the relevant tests of JEDEC22

Production Name	Package
GR-65S004MT	DPAK- TO252

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1- Electrical Characteristics and Parameters

■ **Table 1 Absolute Maximum Ratings** ($T_j = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
VRRM	Repetitive Peak Reverse Voltage	650	V
VRSM	Surge Peak Reverse Voltage	650	V
I_F	Continuous Forward Current @ $T_C < 150^\circ\text{C}$	4	A
I_{FM}	Non-Repetitive Peak Forward Surge Current $T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave, $D=0.3$	15	A
I_{FSM}	Non-Repetitive Forward Surge Current (Half-Sine Pulse) $T_C = 25^\circ\text{C}$, $t_p = 10 \text{ ms}$, $D=0.3$	30	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55~175	$^\circ\text{C}$
P_{tot}	Total dissipation at $T_C = 25^\circ\text{C}$ Operation	58	W

■ **Table 2 Thermal Characteristics**

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	(*)Thermal resistance junction-ambient	1.32	$^\circ\text{C}/\text{W}$

(*) When Mounted on 1 inch² FR-4 board, 2 oz of Cu and $t = 10 \text{ sec}$.

■ **Table 3 Electrical Characteristics** ($T_j = 25^\circ\text{C}$ unless otherwise noted)

Static Characteristics

Symbol	Parameter	Test Conditions	Values			Unit
			Min.	Typ.	Max.	
VR	DC Blocking Voltage	$I_R=100\mu\text{A}$	650	-	-	V
VF	Forward Voltage	$I_F=10\text{A}$, $T_j = 25^\circ\text{C}$		1.4	1.7	V
		$I_F=10\text{A}$, $T_j = 175^\circ\text{C}$		1.8	2.2	V
IR	Reverse Current	$V_R=650\text{V}$ $T_j = 25^\circ\text{C}$		0.7	35	μA
		$V_R=650\text{V}$ $T_j = 175^\circ\text{C}$		10	100	μA

AC characteristics

Symbol	Parameter	Test Conditions	Values			Unit
			Min.	Typ.	Max.	
C _j	Total Capacitance	VR=0.1V, f=1MHz		160		pF
		VR=100V, f=1MHz		18		pF
		VR=400V, f=1MHz		15		pF
Q _c	Total Capacitive Charge	VR=400V, T _j =25°C $Q_c = \int_0^{V_R} C(V)dV$		9		nC
E _c	Capacitance Stored Energy	VR=400V		2.1		uJ

2- Typical Characteristic Curves

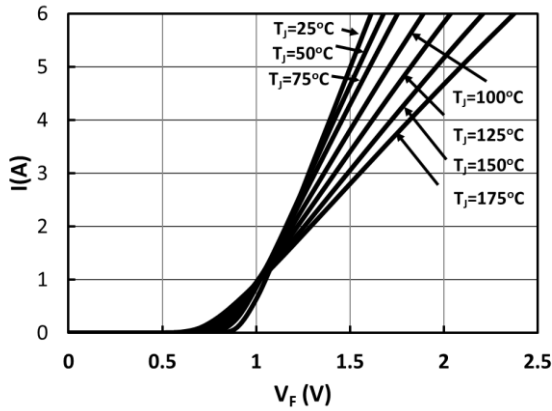


Figure 1: Forward Characteristics

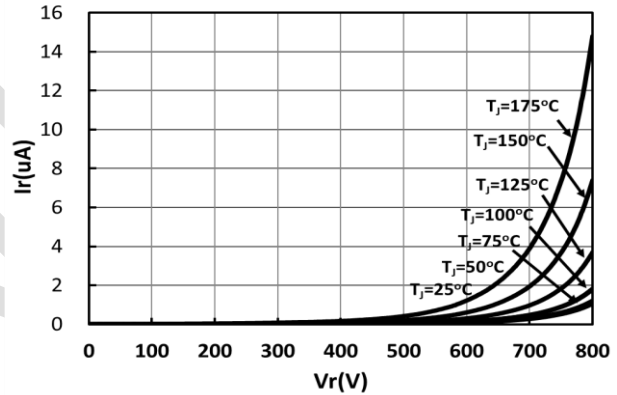


Figure 2: Reverse Characteristics

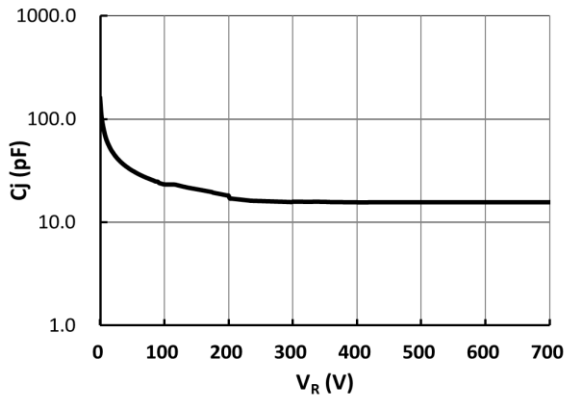


Figure 3: Capacitance vs. Reverse Voltage

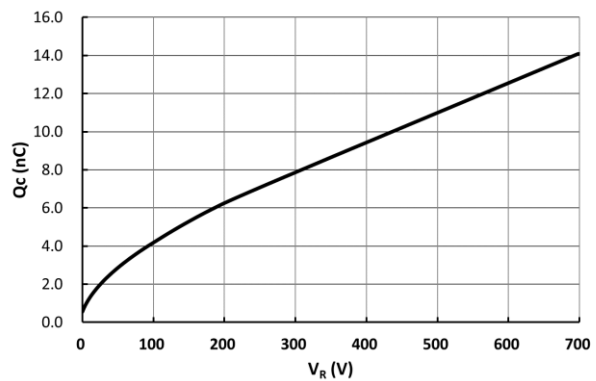


Figure 4: Total Capacitance Charge vs. Reverse Voltage

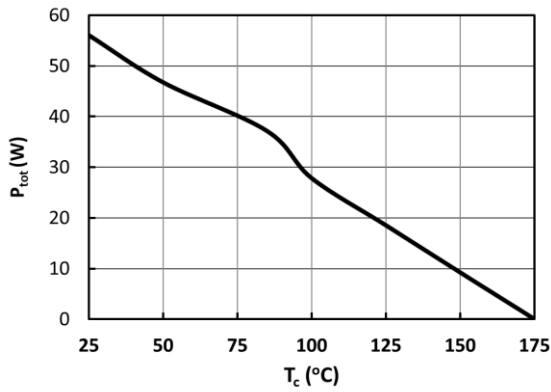


Figure 5: Power Derating

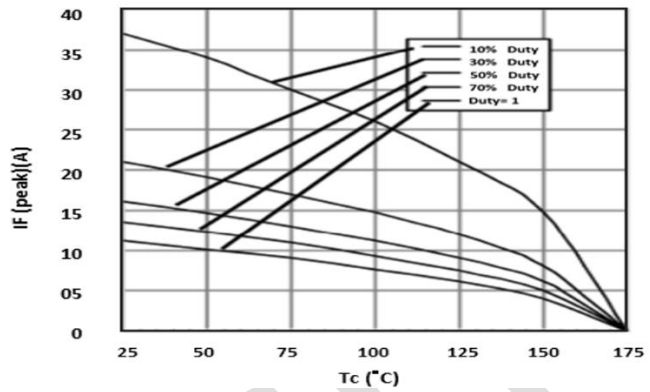
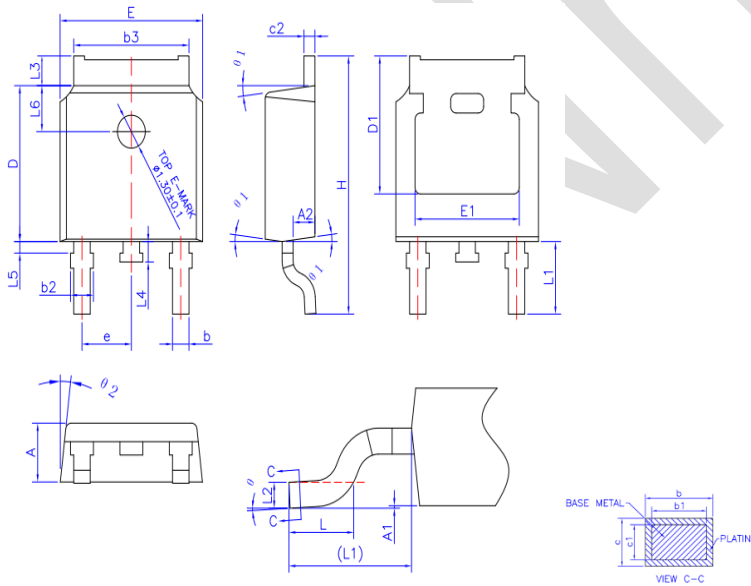


Figure 6: Current Derating

3- Package Outline



COMMON DIMENSIONS
(UNITS OF MEASURE =MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	---	0.10
A2	0.90	1.01	1.10
b	0.72	---	0.85
b1	0.71	0.76	0.81
b2	0.72	---	0.90
b3	5.13	5.33	5.46
c	0.47	---	0.60
c1	0.46	0.51	0.56
c2	0.47	---	0.60
D	6.00	6.10	6.20
D1	5.25	---	---
E	6.50	6.60	6.70
E1	4.70	---	---
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90 REF		
L2	0.508 BSC		
L3	0.90	---	1.25
L4	0.60	0.80	1.00
L5	0.15	---	0.75
L6	1.80 REF		
θ	0°	---	8°
θ1	5°	7°	9°
θ2	5°	7°	9°

Figure 7 Package Outline of GR-65S004MT

Table 4 Dimension of GR-65S004MT

GR-65S004MT DAPK-TO252 Footprint:

All units are in millimeters

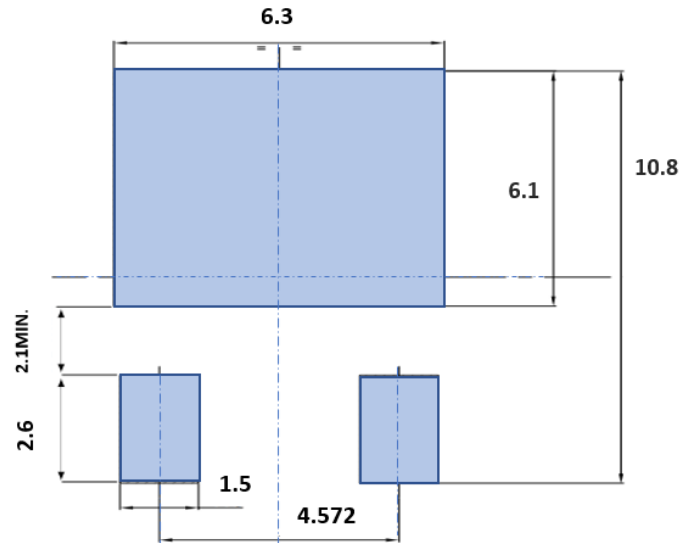


Figure 8 Recommended PCB Solder Pad

4- Reflow Soldering Profile

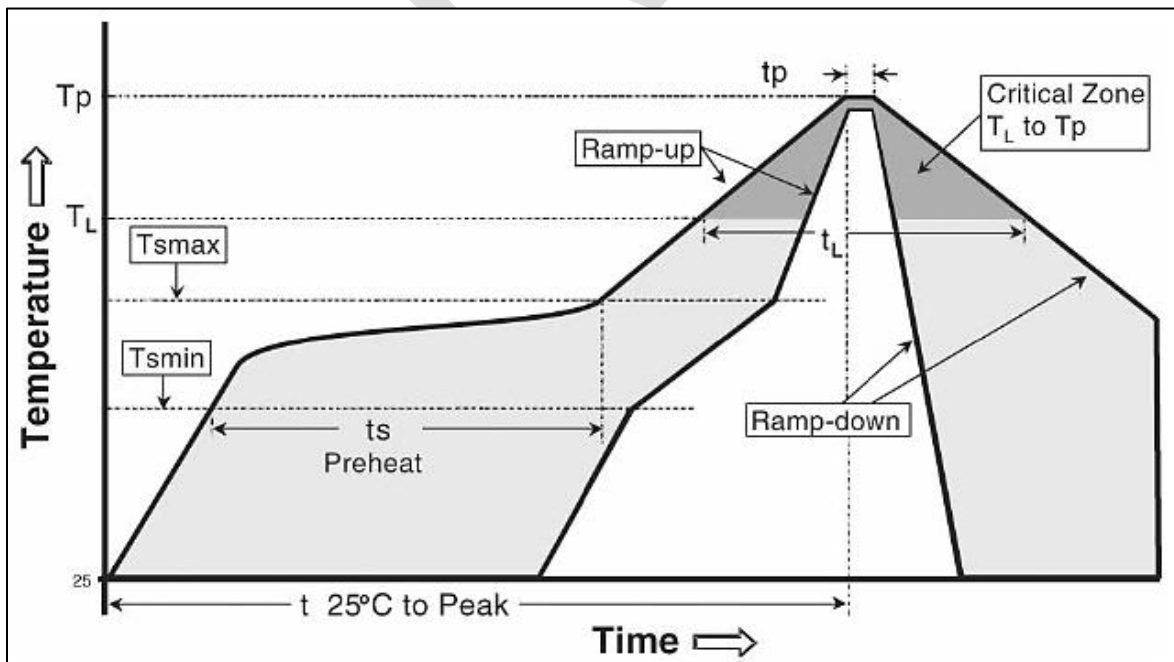


Figure 9 Recommended Reflow Soldering Condition (IPC/JEDEC J-STD-020 Revision C)

Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate (T _{smax} to T _p)		3 °C/second max.
Preheat	Temperature Min (T _{smin})	150 °C
	Preheat: Temperature Max (T _{smax})	200 °C
	Time (t _{smin} to t _{smax})	60-180 seconds
Time Maintained Above	Temperature (T _L)	217 °C
	Time (t _L)	60-150 seconds
Peak Temperature (T _p)		260 °C
Time Within 5 °C of Actual Peak Temperature (t _p)		20-40 seconds
Ramp-Down Rate		6 °C/second max.
Time 25 °C to Peak Temperature		8 minutes max.

Note: All temperatures refer to the topside of the package, measured on the package body surface.

5- Revision History

Date	Revision	Changes
7-Mar.-22	1	First issue