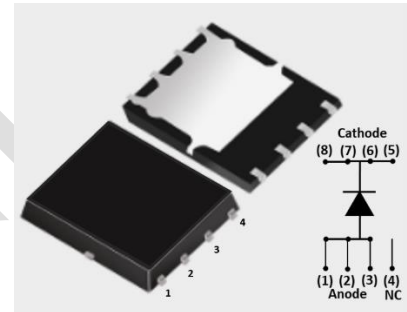


GR-65S004DD – SiC 650V 04A Schottky Barrier Diode

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-65S004DD, DFN-5X6

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-65S004DD	DFN5060

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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	57	W

■ **Table 2 Thermal Characteristics**

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	(*)Thermal resistance junction-ambient	1.50	$^\circ\text{C}/\text{W}$

(*) 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	IR=100uA	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	VR=650V $T_j = 25^\circ\text{C}$		0.7	35	uA
		VR=650V $T_j = 175^\circ\text{C}$		10	100	uA

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 $Q_c = \int_0^{VR} C(V)dV$		9		nC
E _c	Capacitance Stored Energy	VR=400V		2.1		uJ

2- Typical Characteristic Curves

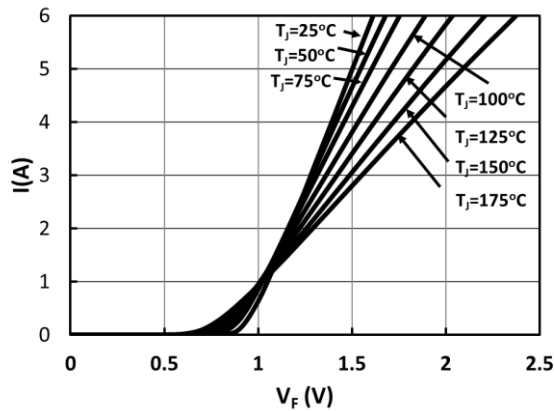


Figure 1: Forward Characteristics

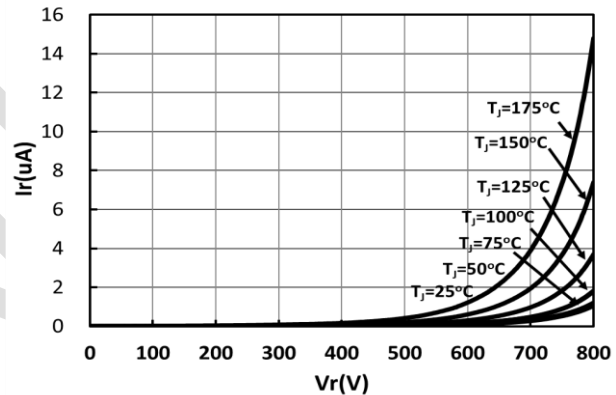


Figure 2: Reverse Characteristics

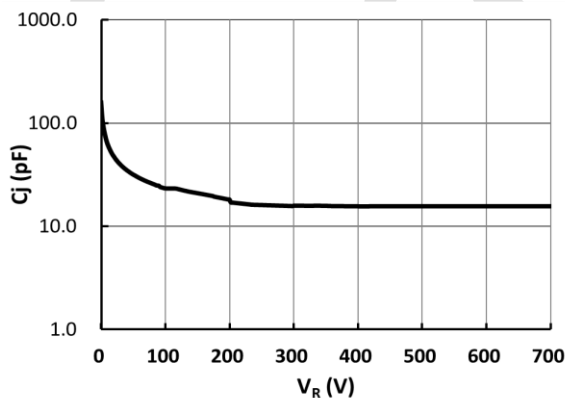


Figure 3: Capacitance vs. Reverse Voltage

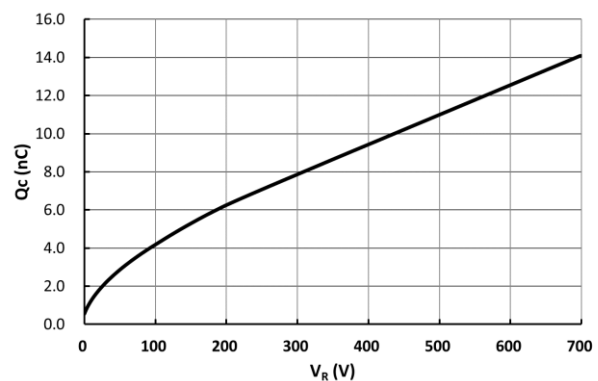


Figure 4: Total Capacitance Charge vs. Reverse Voltage

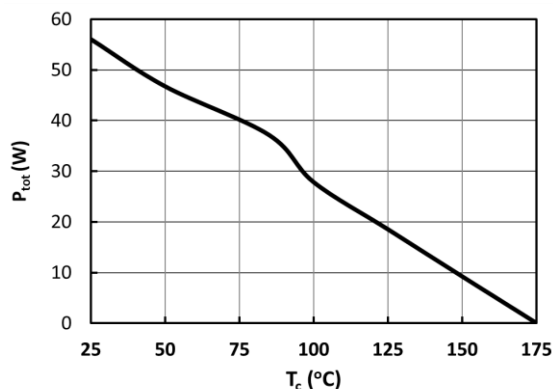


Figure 5: Power Derating

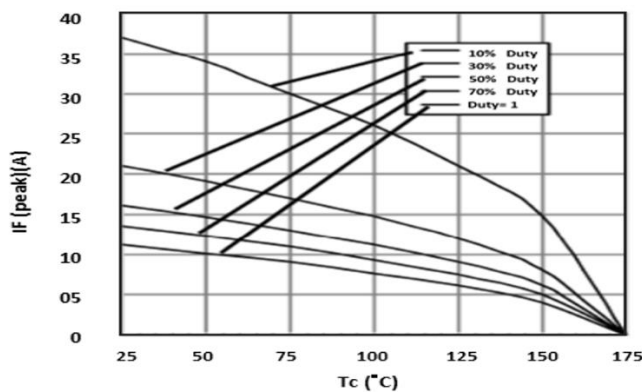


Figure 6: Current Derating

3- Package Outline

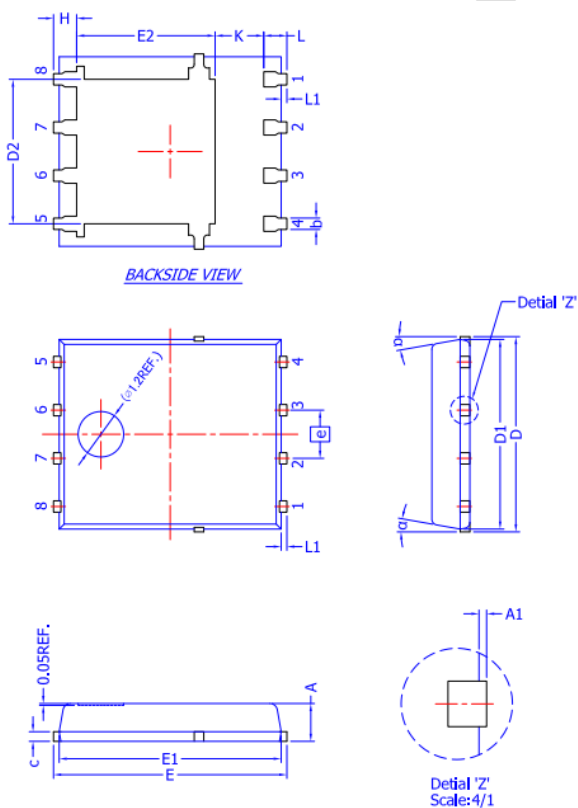


Figure 7 Package Outline of GR-65S004DD

DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.30	0.40	0.50
c	0.20	0.25	0.30
D	5.15 BSC		
D1	5.00 BSC		
D2	3.76	3.81	3.86
E	6.15 BSC		
E1	5.80	5.85	5.90
E2	3.45	3.65	3.85
e	1.27 BSC		
H	0.51	0.61	0.71
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.08	0.15	0.23
α	10°	11°	12°

- Note:
1. All Dimension Are In mm;
 2. Package Body Sizes Exclude Mold Flash, Protrusion Or Gate Burrs. Mold Flash, Protrusion Or Gate Burrs Shall Not Exceed 0.10mm Per Side.
 3. Package Body Sizes Determined At The Outermost Extremes Of The Plastic Body Exclusive Of Mold Flash, Tie Bar, Tie Bar Burrs Gate Burrs And Interlead Flash, But Including Any Mismatch Between The Top And Bottom Of The Plastic Body.
 4. The Package Top May Be Smaller Than The Package Bottom.

Table 4 Dimension of GR-65S004DD

GR DFN5060 Footprint:

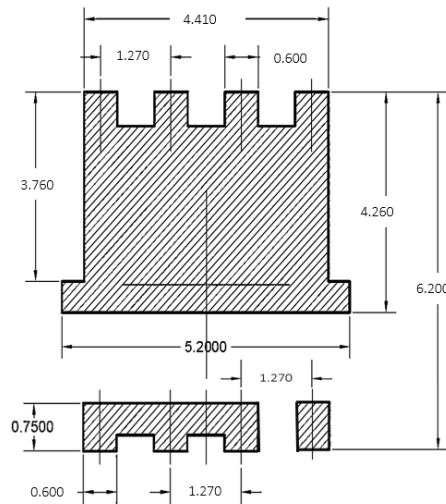


Figure 8 Recommended PCB Solder Pad

4- Reflow Soldering Profile

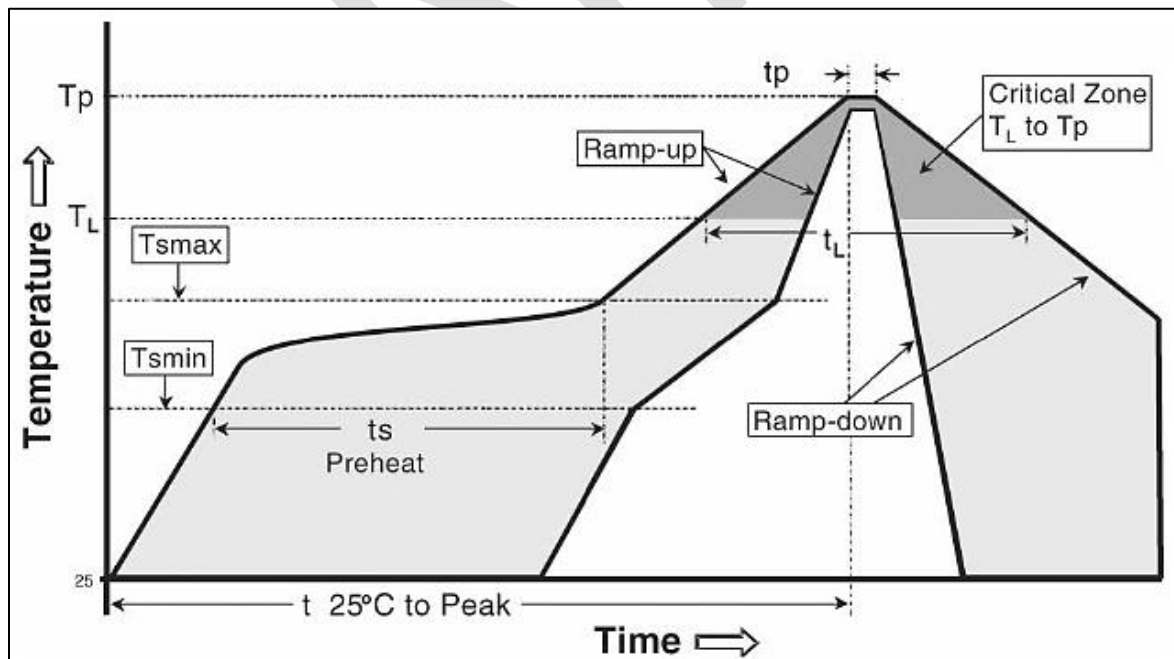


Figure 9 Recommended Reflow Soldering Condition (IPC/JEDEC J-STD-020 Revision C)

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- Package Information

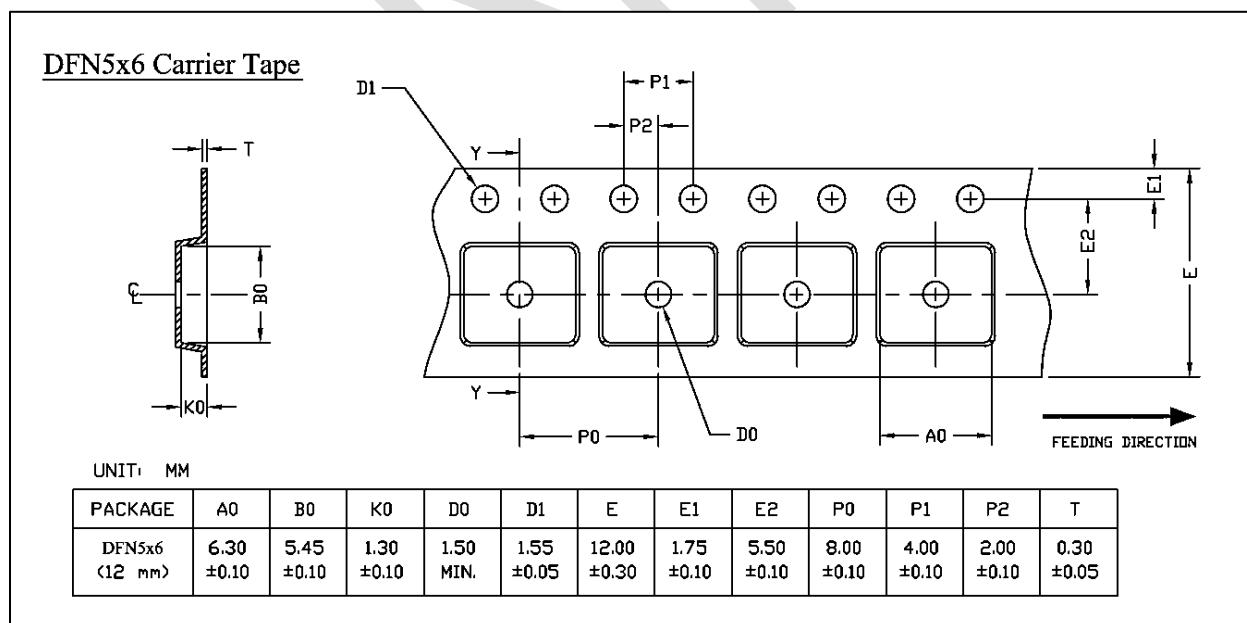


Figure 10 GR DFN-5X6 tape

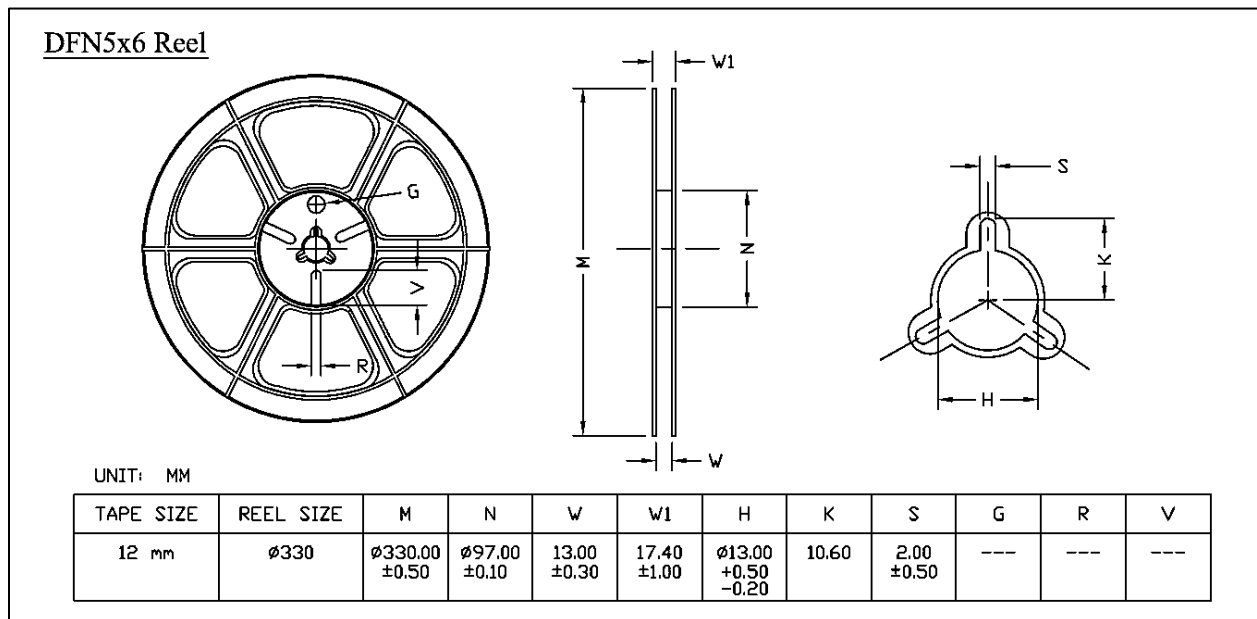


Figure 11 GR DFN-5X6 reel

6- Revision History

Date	Revision	Changes
21-Feb.-22	1	First issue