fast SiC semiconductor

FC06004

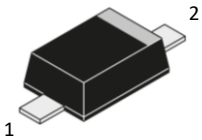
Product Datasheet

Silicon Carbide Merged PN-Schottky Diode

650V SiC MPS High Speed Rectifier – Cheetah Series

Product Information:

SMAF



SOD-123

Features

- Low Capacitive Charge (Q_C)
- Low Profile & Low Parasitic Inductance Packaging
- Zero Reverse Recovery and zero Forward Recovery
- Ultra-Low Switching Loss
- Optimized for High Speed Applications
- Compact SMT Package
- RoHS Compliant and Halogen Free

Terminal	Packaging Type	
	SMAF	SOD-123
Anode	1	1
Cathode	2	2

Benefits

- Higher System Efficiency
- Increase Parallel Device Convenience
- Enable High Temperature Application
- Allow High Frequency Operation
- Realize Compact and Lightweight Systems
- High Reliability

Potential Applications

- Switching Mode Power Supply
- Power Factor Correction
- Portable Adaptor
- Renewable Energy

Key Performance Parameters

Parameter	Symbol	Value	Unit
DC Blocking Voltage	V_R	650	V
Nominal Forward Current	$I_{F,NOM}$	4	A
Total Capacitive Charge	Q_C	6.2	nC
Capacitance Stored Energy	E_C	0.92	µJ
Junction & Storage Temperature	T_j, T_{stg}	-55 to 150	°C
Continuous Forward Current	$I_{F,max\ (cont.)}$	4.3	A
I^2t Value	$\int i^2dt$	0.53	A^2s
Power Dissipation	P_{tot}	8.3	W

Part Number	Package	Marking
FC06004Y	SMAF	C64
FC06004Z	SOD-123	C64

For further information about comparable products, please contact (www.fastsic.com).

Maximum Ratings:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Continuous Forward Current	I_F	--	--	3.1 4.0 4.3	A	T_c≤75°C, *Duty*=100% T_c≤35°C, *Duty*=100% T_c≤25°C, *Duty*=100%
Non-Repetitive Forward Surge Current, Sinusoidal Halfwave	$I_{F,SM}$	--	--	10		T_c=25°C, t_p=10ms
Non-Repetitive Peak Forward Surge Current	$I_{F,max}$	--	--	131		T_c=25°C, t_p=10µs
I^2t Value	$\int i^2dt$	--	--	0.53	A^2s	T_c=25°C, t_p=10ms
Repetitive Peak Reverse Voltage	V_{RRM}	--	--	650	V	T_c=25°C
Power Dissipation	P_{tot}	--	--	8.3	W	T_c=25°C
Junction Temperature	T_j	-55	--	150	°C	--
Storage Temperature	T_{stg}	-55	--	150		
Soldering Temperature	T_L	--	--	260		

Electrical Characteristics:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
DC Characteristics						
DC Blocking Voltage	V_{DC}	650	--	--	V	T_j=25°C
Forward Voltage	V_F	--	1.41 1.78	1.85 --		I_F=4A, T_j=25°C I_F=4A, T_j=175°C
Reverse Current	I_R	--	0.5 7	35 --	µA	V_R=520V, T_j=25°C V_R=520V, T_j=175°C
AC Characteristics						
Total Capacitive Charge	Q_C	--	6.2	--	nC	V_R=400V, T_j=25°C
Total Capacitance	C_j	--	98 12 9.5	--	pF	V_R=1V, f=1MHz, T_j=25°C V_R=200V, f=1MHz, T_j=25°C V_R=400V, f=1MHz, T_j=25°C
Capacitance Stored Energy	E_C	--	0.92	--	µJ	V_R=400V, T_j=25°C

Thermal Characteristics:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Thermal Impedance, junction – case	$R_{th\text{-}jc}$	--	15	--	K/W	--
Thermal Impedance, junction – ambient	$R_{th\text{-}ja}$	--	35	--		Device mounted on 2inch*2inch Al board.

Electrical Characteristics Diagrams

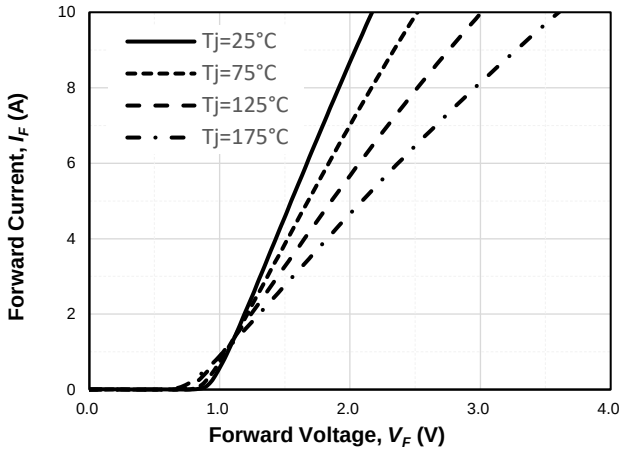


Fig. 1 Forward Characteristics

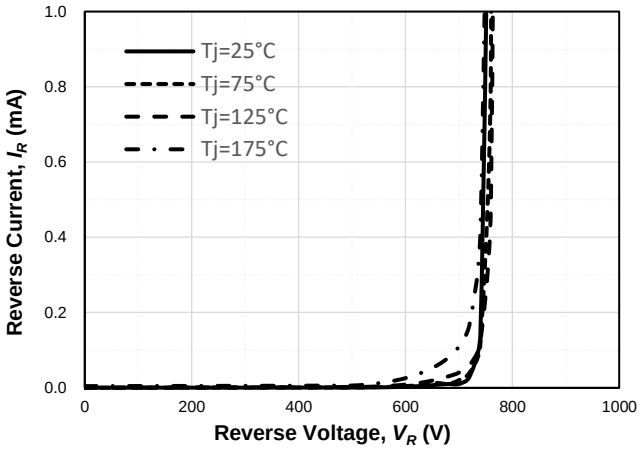


Fig. 2 Reverse Characteristics

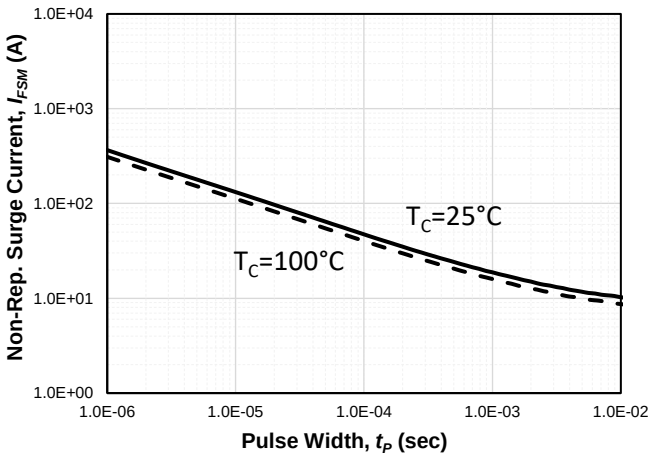


Fig. 3 Non-repetitive Peak Forward Surge Current vs. Pulse Width

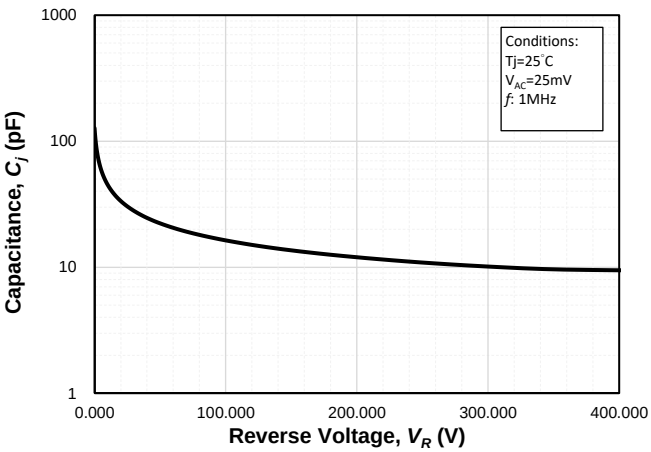


Fig. 4 Capacitance vs. Reverse Voltage

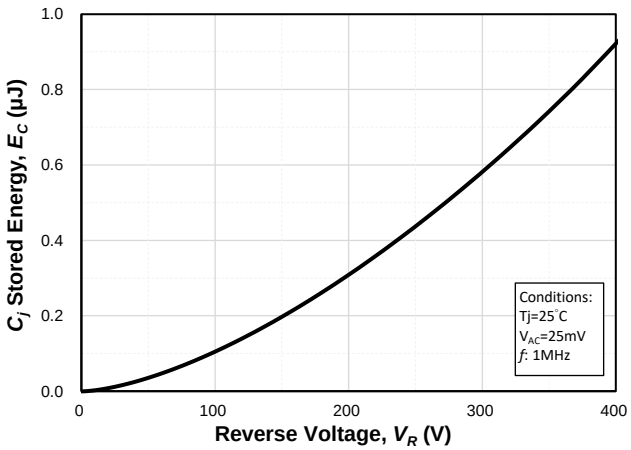


Fig. 5 Capacitance Stored Energy vs. Reverse Voltage

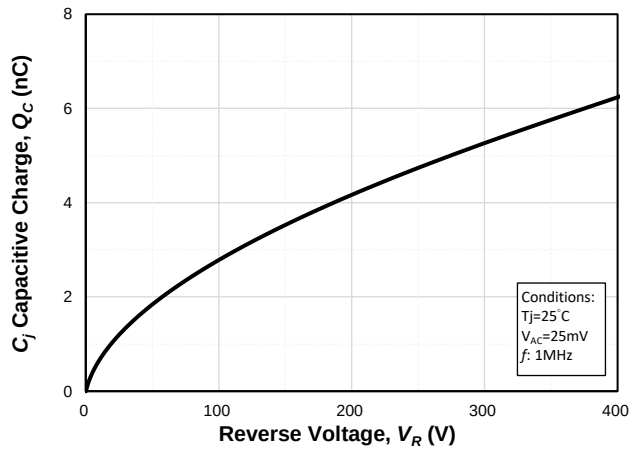


Fig. 6 Capacitive Charge vs. Reverse Voltage

Electrical Characteristics Diagrams

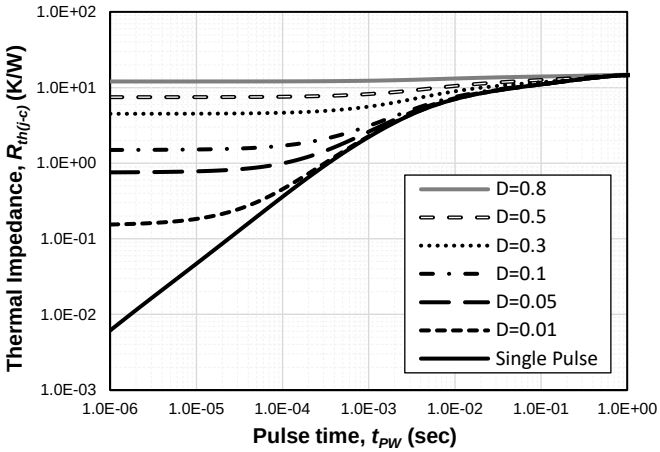


Fig. 7 Typ. Transient Thermal Impedance $R_{th\text{-}jc}$

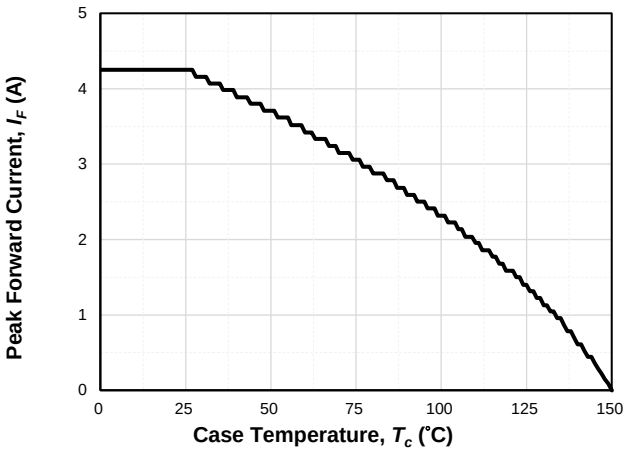


Fig. 8 Continuous I_F De-rating

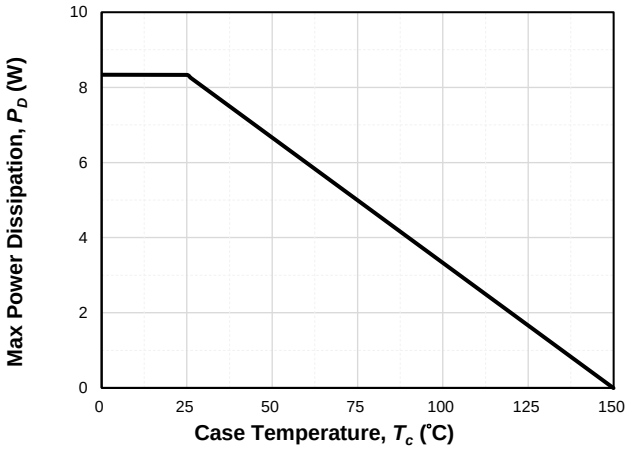
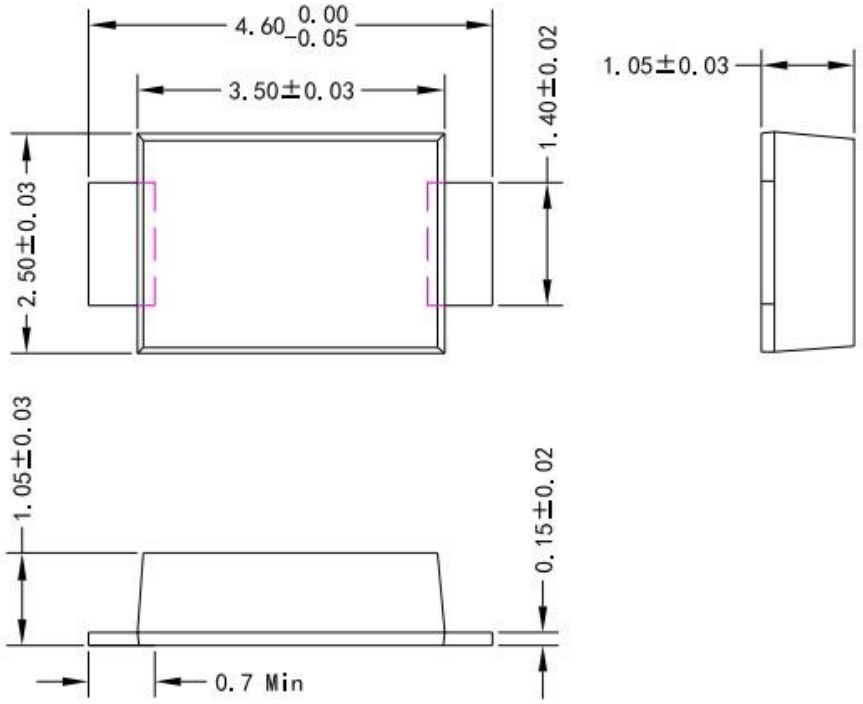
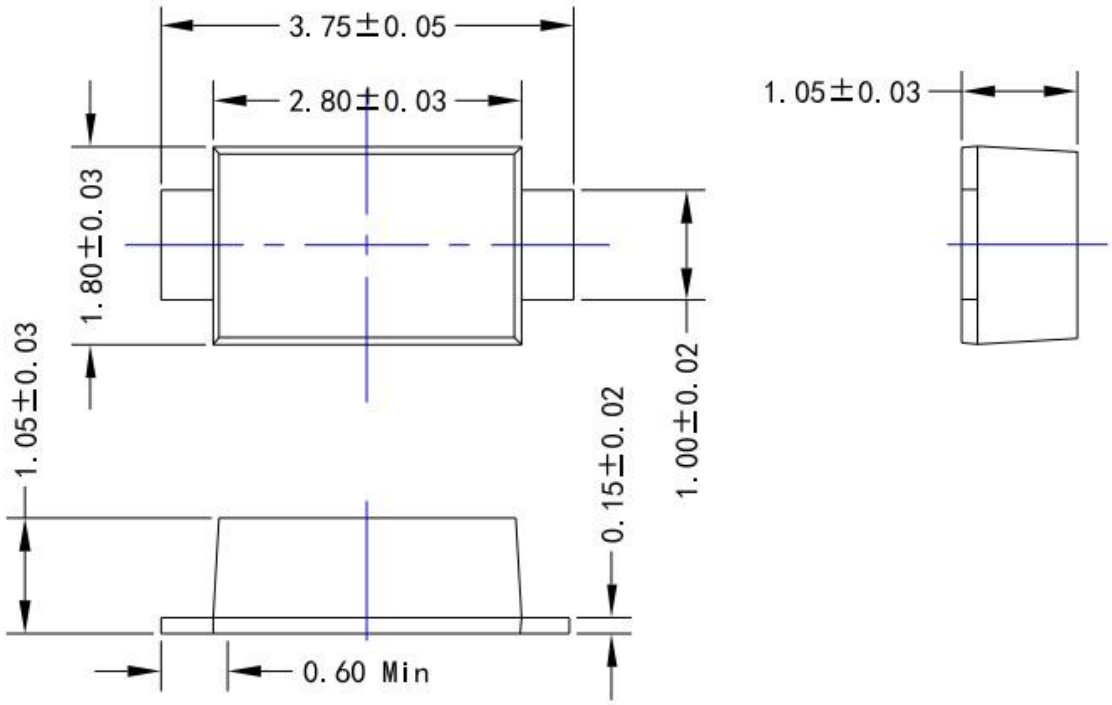


Fig. 9 Power Dissipation

Package Outline (SMAF)



Package Outline (SOD-123)



Revision History

Date	Revision	Changes
10.22	Tentative	Minor revision
07.24	Preliminary	Revision and Update the data

Important Note (Disclaimer)

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