

Silicon Carbide Diode 6 March 2019

Product data sheet

1. General description

Silicon Carbide Schottky diode designed for high frequency switched mode power supplies in a TO252 (DPAK) plastic package.

2. Features and benefits

- Highly stable switching performance
- High forward surge capability I_{FSM}
- Extremely fast reverse recovery time
- Superior in efficiency to Silicon Diode alternatives
- Reduced losses in associated MOSFET
- Reduced EMI
- Reduced cooling requirements
- RoHS compliant

3. Applications

- Power factor correction
- Telecom/Server SMPS
- UPS
- PV inverter
- PC Silverbox
- LED/OLED TV
- Motor Drives

4. Quick reference data

Table 1. Qui	ck reference data					
Symbol	Parameter	Conditions	Mi	n Typ	Мах	Unit
V _{RRM}	repetitive peak reverse voltage		-	-	650	V
I _{F(AV)}	average forward current	$\delta = 0.5$; T _{mb} \leq 113 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3; Fig. 4	-	-	10	A
Static chara	acteristics					
V _F	forward voltage	I _F = 10 A; T _j = 25 °C; <u>Fig. 6</u>	-	1.5	1.7	V
		I _F = 10 A; T _j = 150 °C; <u>Fig. 6</u>	-	1.8	2.1	V

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5. Pinning information

Table 2.	Pinning in	formation		
Pin	Symbol	Description	Simplified outline	Graphic symbol
1	n.c.	not connected	[]	K – K – A
2	К	cathode[1]		001aaa020
3	А	anode		
mb	К	mounting base; connected to cathode	DPAK (TO252NS)	

[1] It is not possible to connect to pin 2 of the TO252 package.

6. Ordering information

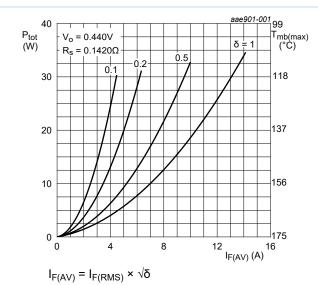
Table 3. Ordering inform	mation					
Type number	Package					
	Name	Description	Version			
NXPSC10650D	DPAK	plastic single-ended surface-mounted package (DPAK); 3 leads (one lead cropped)	TO252NS			

7. Limiting values

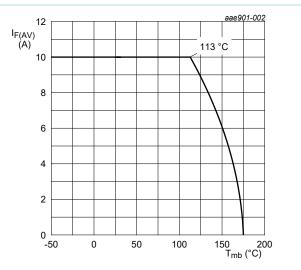
Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Mir	Max	Unit
V _{RRM}	repetitive peak reverse voltage		-	650	V
V _{RWM}	crest working reverse voltage		-	650	V
V _R	reverse voltage	DC	-	650	V
I _{F(AV)}	average forward current	$\delta = 0.5$; T _{mb} \leq 113 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3; Fig. 4	-	10	A
I _{FRM}	repetitive peak forward current	δ = 0.5 $\ ; t_p$ = 25 $\mu s;$ square-wave pulse	-	20	A
I _{FSM}	non-repetitive peak	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse	-	50	А
	forward current	t _p = 10 μs; T _{j(init)} = 25 °C; square-wave pulse	-	450	A
T _{stg}	storage temperature		-55	175	°C
Tj	junction temperature		-	175	°C





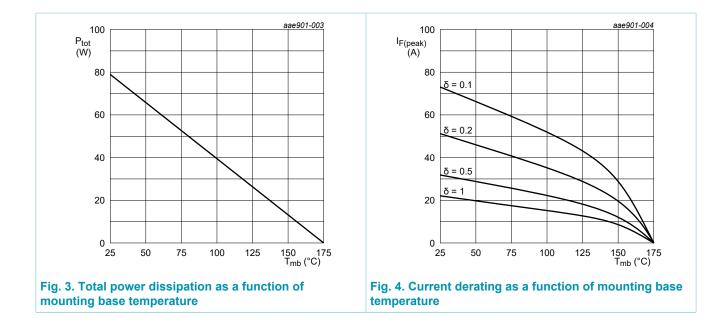




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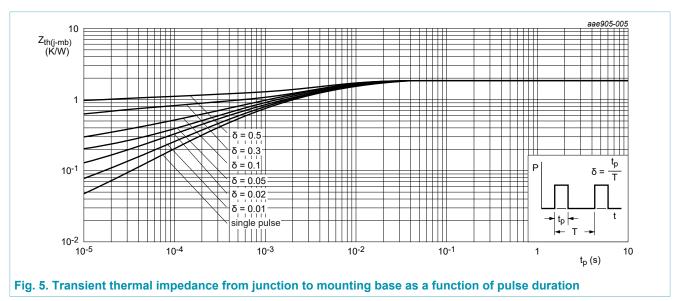


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8. Thermal characteristics

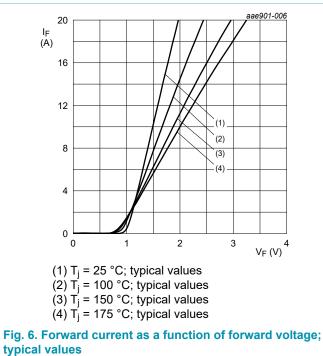
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
R _{th(j-mb)}	thermal resistance from junction to mounting base	<u>Fig. 5</u>	-	-	1.9	K/W
R _{th(j-a)}	thermal resistance from junction to ambient free air	Device mounted on an FR4 Printed- Circuit Board	-	50	-	K/W



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9. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static chara	acteristics		· · · ·			
V _F	forward voltage	I _F = 10 A; T _j = 25 °C; <u>Fig. 6</u>	-	1.5	1.7	V
		I _F = 10 A; T _j = 150 °C; <u>Fig. 6</u>	-	1.8	2.1	V
I _R	reverse current	V _R = 650 V; T _j = 25 °C; <u>Fig. 7</u>	-	-	60	μA
		V _R = 650 V; T _j = 150 °C; <u>Fig. 7</u>	-	-	240	μA
Dynamic ch	naracteristics					
Q _r	recovered charge	I _F = 10 A; dI _F /dt = 500 A/μs; V _R = 400 V; T _j = 25 °C; <u>Fig. 8</u>	-	16	-	nC
C _d	diode capacitance	f = 1 MHz; V _R = 1 V; T _j = 25 °C	-	328	-	pF
		f = 1 MHz; V _R = 300 V; T _j = 25 °C	-	44	-	pF
		f = 1 MHz; V _R = 600 V; T _i = 25 °C	-	42	-	pF



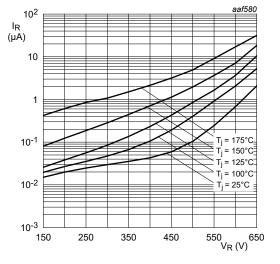


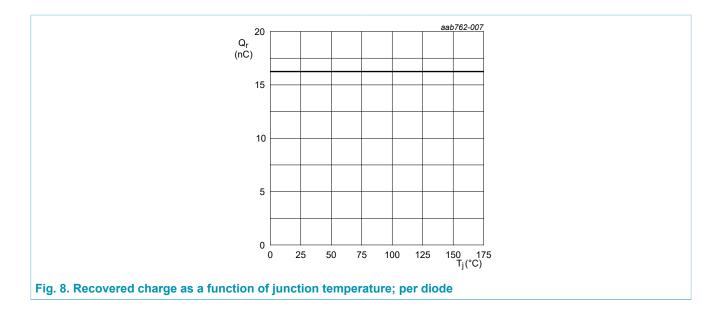
Fig. 7. Reverse leakage current as a function of reverse voltage; typical value; per diode

typical values

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10. Package outline

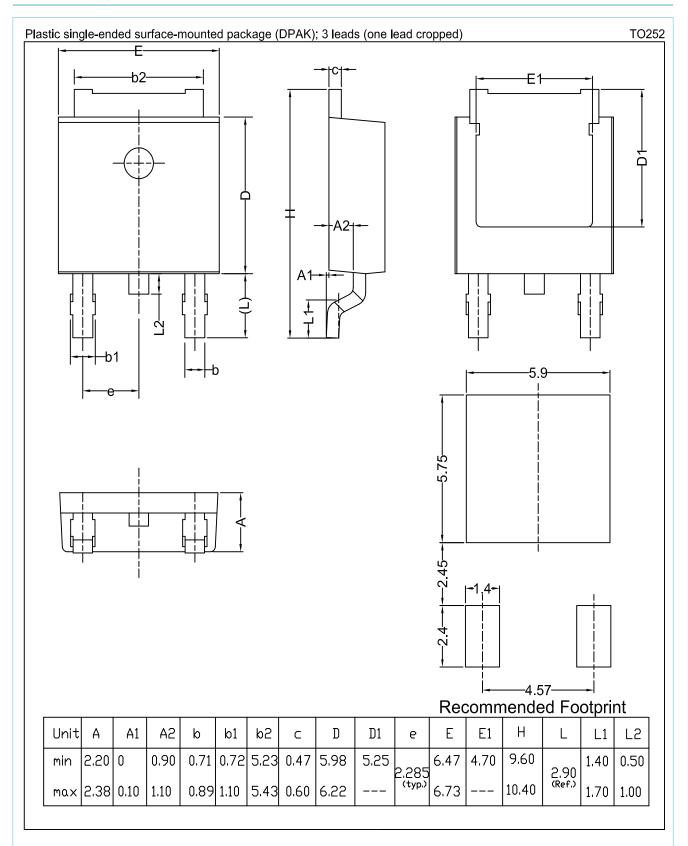


Fig. 9. Package outline DPAK (TO252NS)

Product data sheet

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11. Legal information

Data sheet status

Document status [1][2]	Product status [<u>3]</u>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

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