WNSC6D02650P

Silicon Carbide Diode

Rev.01 - 23 February 2024 Product data sheet

1. General description

Silicon Carbide Schottky diode in a SOD123 plastic package, designed for high voltage, high frequency, and ultra compact designs.

RoHS Halogen-Free Lead-Free

2. Features and benefits

- New 6th Generation Technology
- Low Forward Voltage Drop
- Low Reverse Leakage Current
- High Forward Surge Capability I_{FSM}
- Reduced Losses in Associated MOSFET
- Reduced EMI
- Reduced Cooling Requirements
- RoHS Compliant

3. Applications

- Low power SMPS
- LED driver
- Gate driver bootstrap charger
- Noise snubber

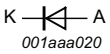
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage			700			V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; Fig. 1		2			A
T_j	junction temperature			-55 to 175			°C
Symbol	**Parameter**	**Conditions**	**Notes**	**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 2 A; T_j = 25 °C; Fig. 2		-	1.26	1.40	V
		I_F = 2 A; T_j = 150 °C; Fig. 2		-	1.35	1.55	V
Dynamic characteristics							
Q_r	recovered charge	I_F = 2 A; dI_F/dt = 500 A/µs; V_R = 400 V; T_j = 25 °C; Fig. 4		-	4	-	nC

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WNSC6D02650P	SOD123	WNSC6D02650P6X	Reel	3000	SOD123L	4-Feb-2024

7. Marking

Table 4. Marking codes

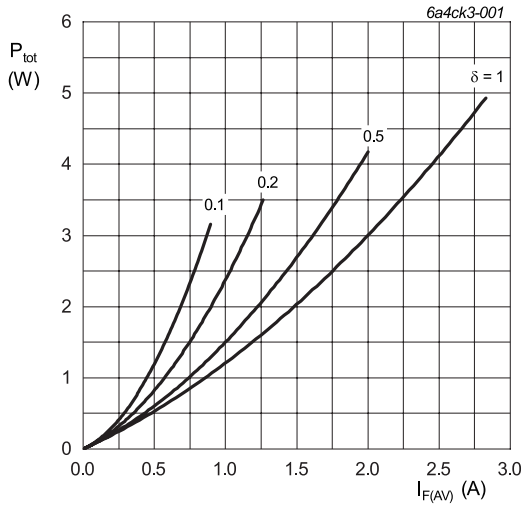
Type number	Marking codes
WNSC6D02650P	Axxx

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions	Notes	Values	Unit
V_{RRM}	repetitive peak reverse voltage			700	V
V_{RWM}	crest working reverse voltage			700	V
V_R	reverse voltage	DC		700	V
$I_{F(AV)}$	average forward current	δ = 0.5; square-wave pulse; Fig. 1		2	A
I_{FRM}	repetitive peak forward current	δ = 0.5; t_p = 25 µs; square-wave pulse		4	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse		14	A
		t_p = 10 µs; $T_{j(init)}$ = 25 °C; sine-wave pulse		240	A
I^2t	I^2t for fusing	sine-wave pulse; $T_{j(init)}$ = 25 °C; t_p = 10 ms		0.98	A^2s
T_{stg}	storage temperature			-55 to 175	°C
T_j	junction temperature			-55 to 175	°C



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$

V_o = 0.916 V; R_s = 0.2923 Ω

Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

9. Thermal characteristics

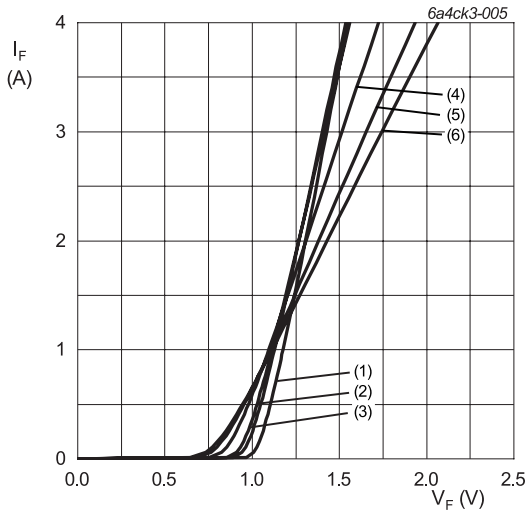
Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	mounted on a minimum footprint printed-circuit board (FR4)		-	160	-	K/W

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward current	I_F = 2 A; T_j = 25 °C; Fig. 2		-	1.26	1.40	V
		I_F = 2 A; T_j = 150 °C; Fig. 2		-	1.35	1.55	V
		I_F = 2 A; T_j = 175 °C; Fig. 2		-	1.40	1.60	V
I_R	reverse current	V_R = 650 V; T_j = 25 °C; Fig. 3		-	0.2	10	µA
		V_R = 650 V; T_j = 175 °C; Fig. 3		-	3	40	µA
Dynamic characteristics							
Q_r	recovered charge	I_F = 2 A; V_R = 400 V; dI_F/dt = 500 A/µs; T_j = 25 °C; Fig. 4		-	4	-	nC
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; T_j = 25 °C		-	103	-	pF
		f = 1 MHz; V_R = 300 V; T_j = 25 °C		-	12	-	pF
		f = 1 MHz; V_R = 600 V; T_j = 25 °C		-	10	-	pF
E_{as}	non-repetitive avalanche energy	I_R = 1.5 A; L = 5 mH; $T_{j(init)}$ = 25 °C		5	-	-	mJ



V_o = 0.916 V; R_s = 0.2923 Ω
(1) T_j = -55 °C; typical values
(2) T_j = 0 °C; typical values
(3) T_j = 25 °C; typical values
(4) T_j = 100 °C; typical values
(5) T_j = 150 °C; typical values
(6) T_j = 175 °C; typical values

Fig. 2. Forward current as a function of forward voltage; typical values

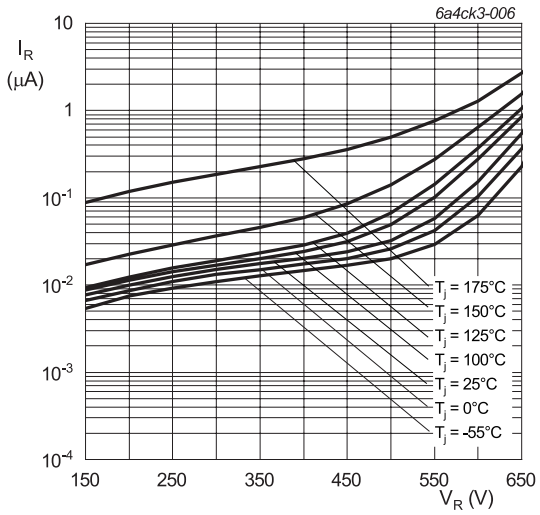


Fig. 3. Reverse leakage current as a function of reverse voltage; typical value

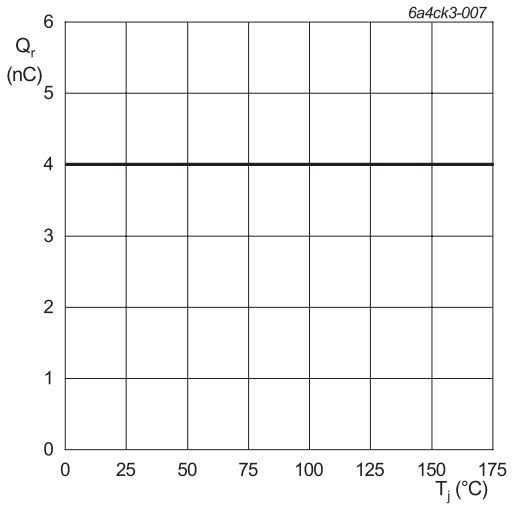
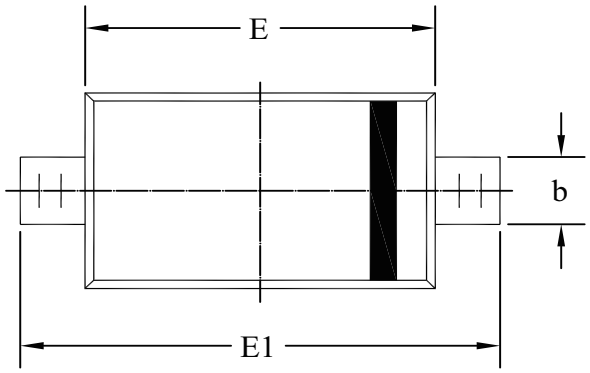
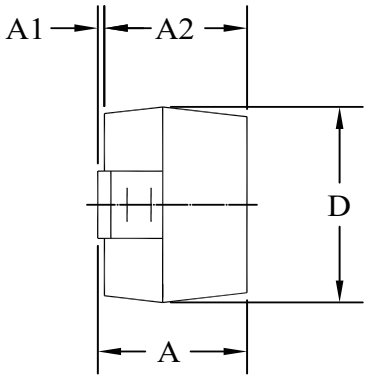


Fig. 4. Recovered charge as a function of junction temperature

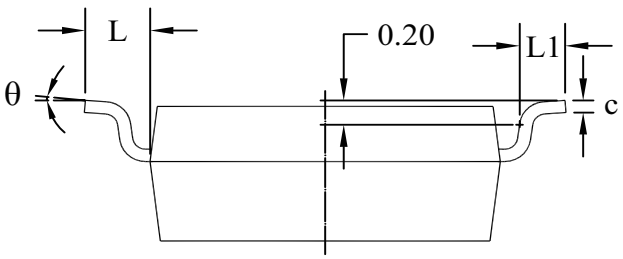
11. Package outline



TOP VIEW



SIDE VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.450	0.650
c	0.090	0.150
D	1.500	1.700
E	2.600	2.800
E1	3.550	3.850
L	0.500 REF.	
L1	0.250	0.450
θ	0°	8°

Note:
1. All dimensions don't include mold flash and metal protrusion.

12. Legal information

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Document status [1][2]	Product status [3]	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.

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