

## 1. General description

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



## 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


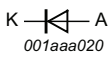
## 4. Quick reference data

Table 1. Quick reference data

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

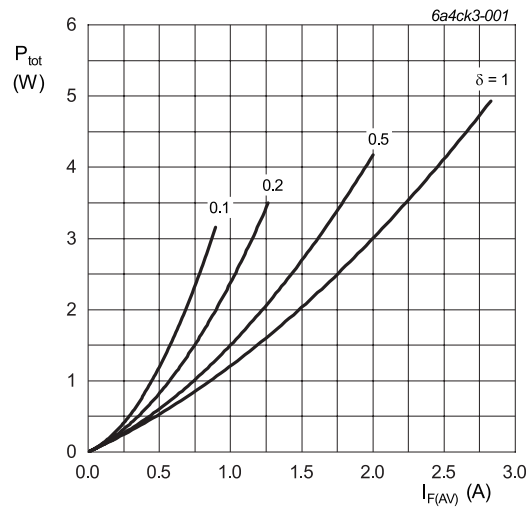
Type number	Marking codes
WNSC6D02650P	Axxx

## 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	$\delta = 0.5$ ; square-wave pulse; <a href="#">Fig. 1</a>		2	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25 \mu s$ ; square-wave pulse		4	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10 ms$ ; $T_{j(init)} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse		14	A
		$t_p = 10 \mu s$ ; $T_{j(init)} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse		240	A
$I^2t$	$I^2t$ for fusing	sine-wave pulse; $T_{j(init)} = 25 \text{ }^\circ\text{C}$ ; $t_p = 10 ms$		0.98	$A^2s$
$T_{stg}$	storage temperature			-55 to 175	$^\circ\text{C}$
$T_j$	junction temperature			-55 to 175	$^\circ\text{C}$



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

$$V_o = 0.916 \text{ V}; R_s = 0.2923 \text{ } \Omega$$

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

## 9. Thermal characteristics

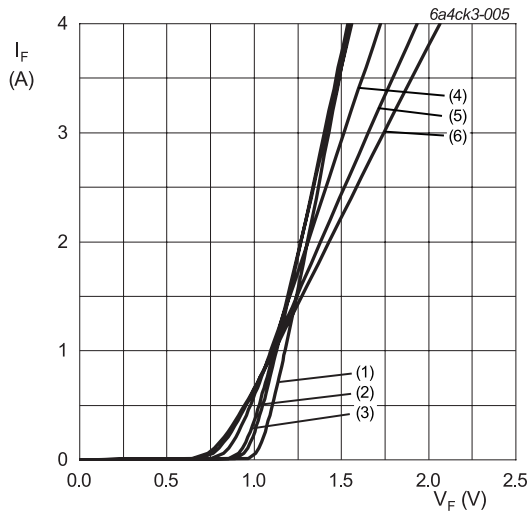
Table 6. Thermal characteristics

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

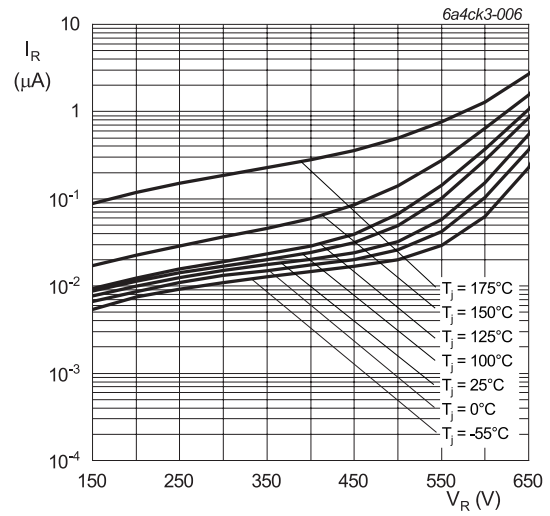
Table 7. Characteristics

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

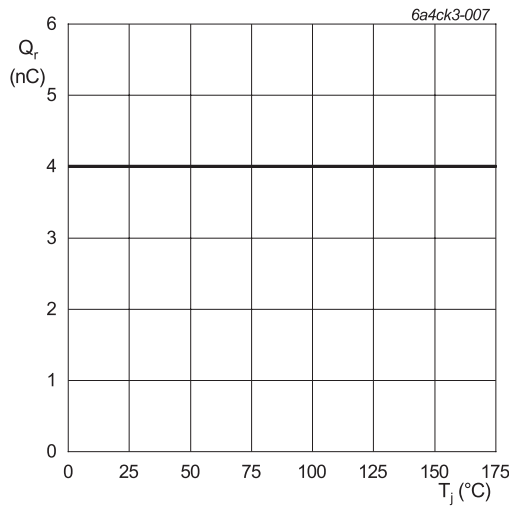


$V_o = 0.916 \text{ V}$ ;  $R_s = 0.2923 \ \Omega$   
 (1)  $T_j = -55 \text{ }^\circ\text{C}$ ; typical values  
 (2)  $T_j = 0 \text{ }^\circ\text{C}$ ; typical values  
 (3)  $T_j = 25 \text{ }^\circ\text{C}$ ; typical values  
 (4)  $T_j = 100 \text{ }^\circ\text{C}$ ; typical values  
 (5)  $T_j = 150 \text{ }^\circ\text{C}$ ; typical values  
 (6)  $T_j = 175 \text{ }^\circ\text{C}$ ; typical values

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

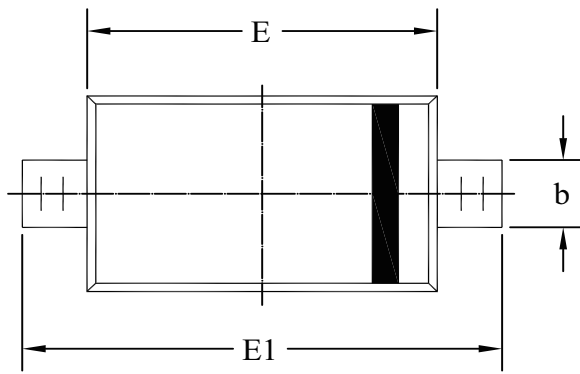


**Fig. 3. Reverse leakage current as a function of reverse voltage; typical value**

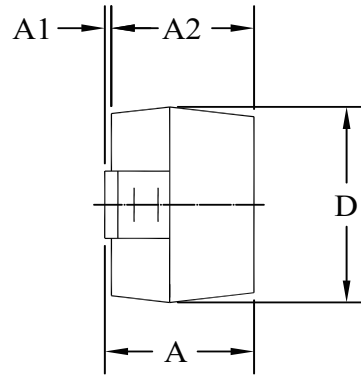


**Fig. 4. Recovered charge as a function of junction temperature**

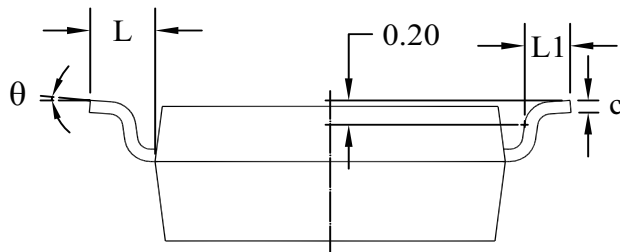
### 11. Package outline



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:

- 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.
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Product [short] data sheet	Production	This document contains the product specification.

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