

## 1. General description

Dual Silicon Carbide Schottky diode in a 3-lead TO-247 plastic package, designed for high frequency switched-mode power supplies.



**Lead-Free**

## 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
- High junction operating temperature capability ( $T_{j(max)} = 175\text{ °C}$ )

## 3. Applications

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

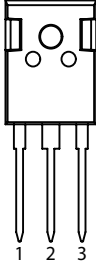
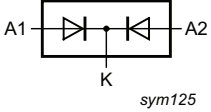
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
<b>Absolute maximum rating</b>						
$V_{RRM}$	repetitive peak reverse voltage		1200			V
$I_{O(AV)}$	limiting average output current	$\delta = 0.5$ ; $T_{mb} \leq 147\text{ °C}$ ; square-wave pulse; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a> ; <a href="#">Fig. 4</a>	10			A
$T_j$	junction temperature		175			°C
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 5\text{ A}$ ; $T_j = 25\text{ °C}$ ; per diode; <a href="#">Fig. 6</a>	-	1.4	1.6	V
		$I_F = 5\text{ A}$ ; $T_j = 150\text{ °C}$ ; per diode; <a href="#">Fig. 6</a>	-	1.85	2.3	V
		$I_F = 5\text{ A}$ ; $T_j = 175\text{ °C}$ ; per diode; <a href="#">Fig. 6</a>	-	2	2.6	V
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 5\text{ A}$ ; $V_R = 400\text{ V}$ ; $dI_F/dt = 500\text{ A}/\mu\text{s}$ ; $T_j = 25\text{ °C}$ ; per diode; <a href="#">Fig. 8</a>	-	12	-	nC

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode		
2	K	cathode		
3	A2	anode		
mb	K	mounting base; connected to cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WNSC101200CW	TO-247	WNSC101200CWQ	Tube	30	TO-247N	20-Jul-2016

## 7. Marking

Table 4. Marking codes

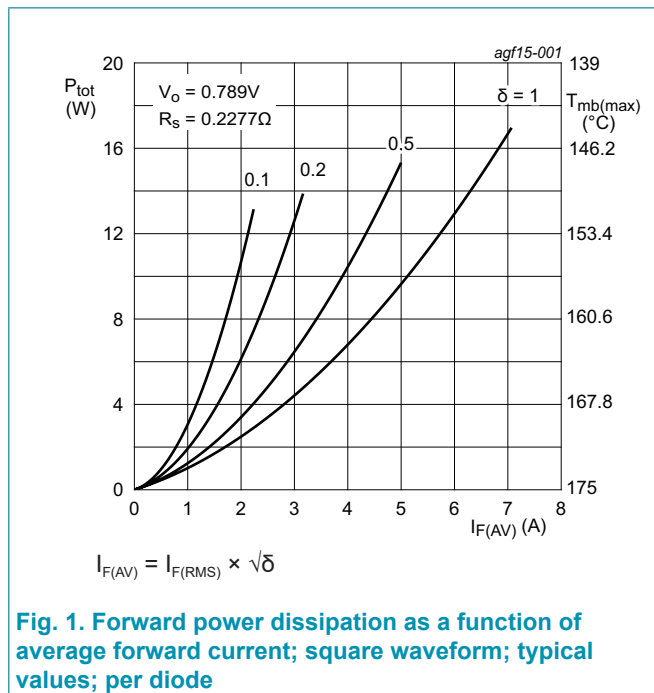
Type number	Marking codes
WNSC101200CW	WNSC101200CW

## 8. Limiting values

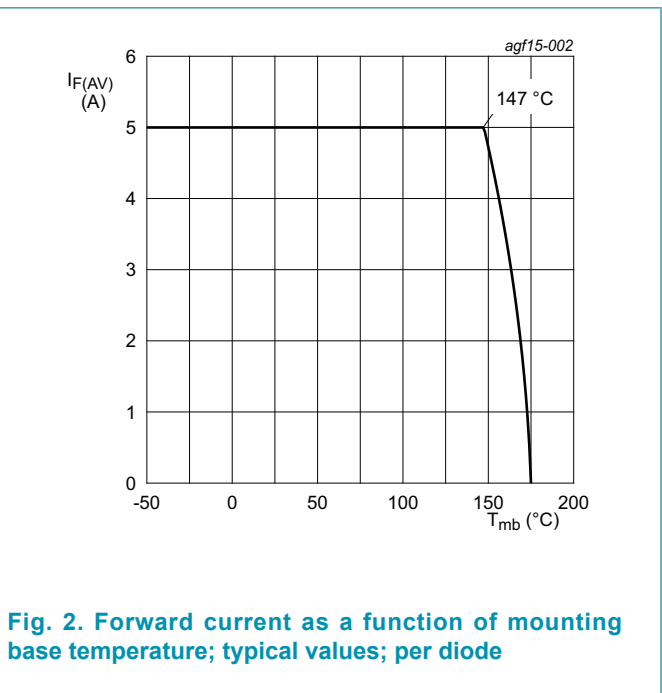
**Table 5. Limiting values**

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

Symbol	Parameter	Conditions	Values	Unit
$V_{RRM}$	repetitive peak reverse voltage		1200	V
$V_{RWM}$	crest working reverse voltage		1200	V
$V_R$	reverse voltage	DC	1200	V
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25 \mu s$ ; $T_{mb} \leq 147^\circ C$ ; square-wave pulse; per diode	10	A
$I_{O(AV)}$	limiting average output current	$\delta = 0.5$ ; $T_{mb} \leq 144^\circ C$ ; square-wave pulse; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a> ; <a href="#">Fig. 4</a>	10	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10 ms$ ; $T_{j(init)} = 25^\circ C$ ; sine-wave pulse; per diode	65	A
		$t_p = 10 \mu s$ ; $T_{j(init)} = 25^\circ C$ ; sine-wave pulse; per diode	525	A
$T_{stg}$	storage temperature		-55 to 175	$^\circ C$
$T_j$	junction temperature		175	$^\circ C$



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



**Fig. 2. Forward current as a function of mounting base temperature; typical values; per diode**

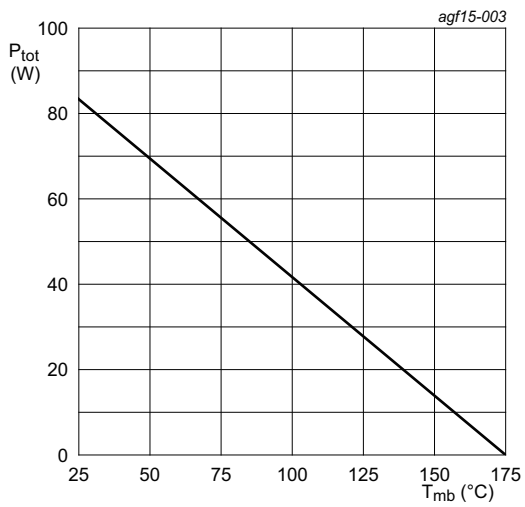


Fig. 3. Total power dissipation as a function of mounting base temperature; per diode

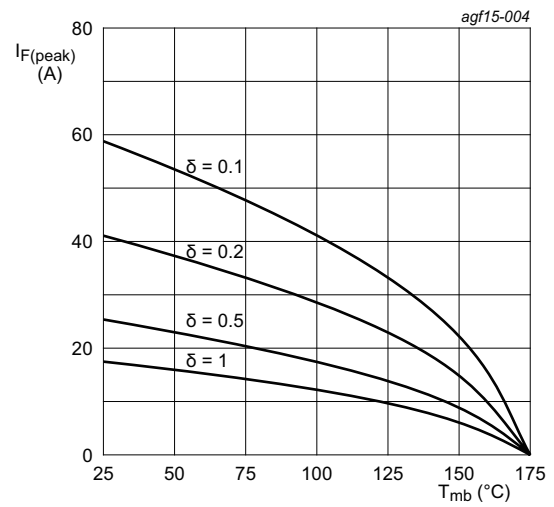


Fig. 4. Current derating as a function of mounting base temperature; per diode

### 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; <a href="#">Fig. 5</a>	-	-	1.8	K/W
		both diodes conducting	-	-	1	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	40	-	K/W

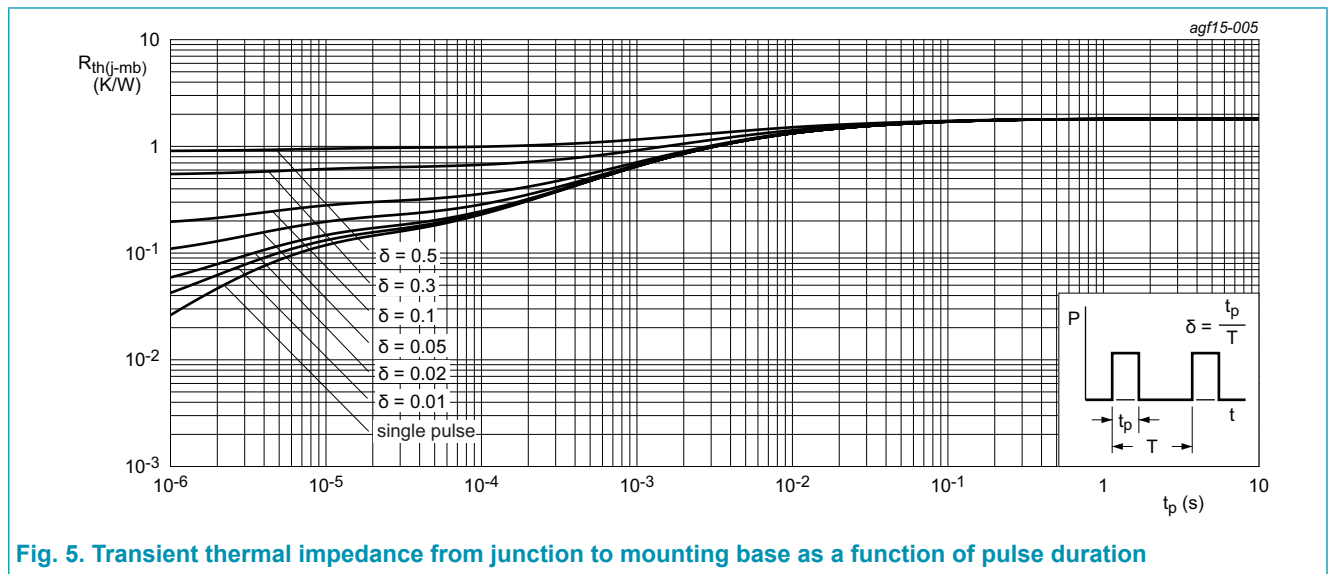
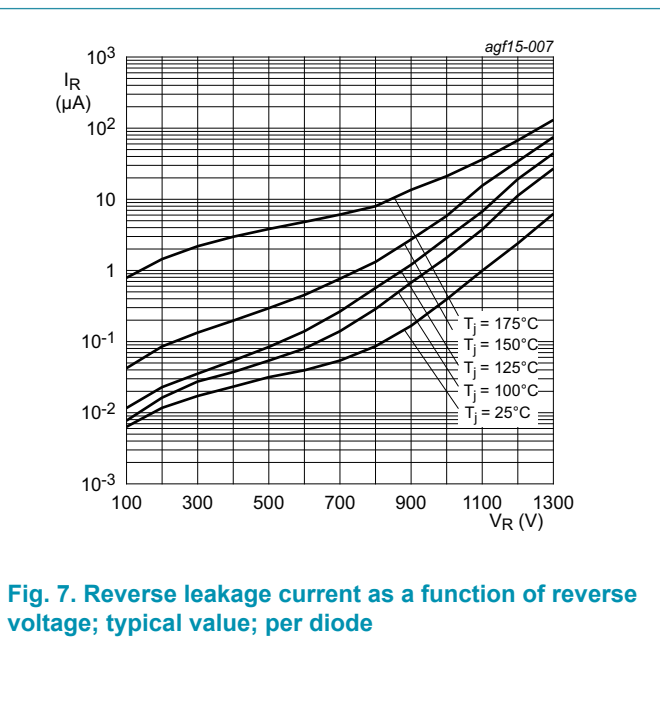
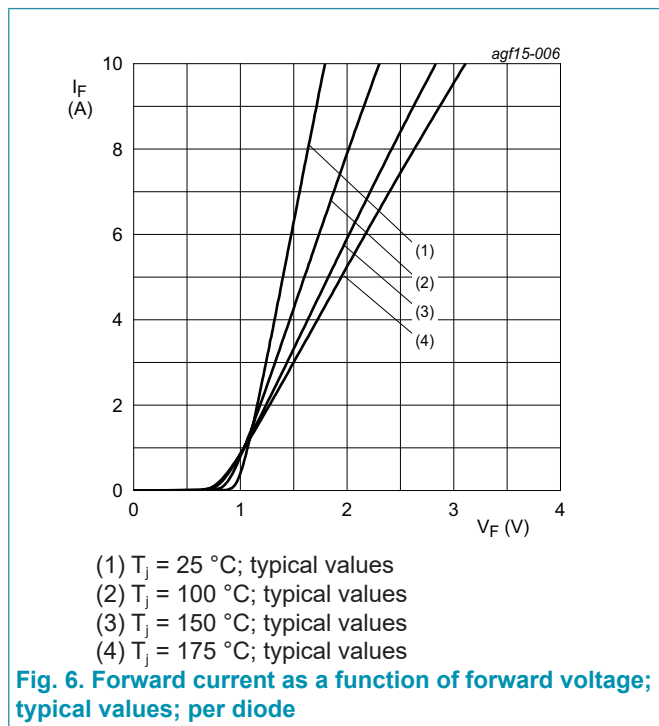


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
V <sub>F</sub>	forward current	I <sub>F</sub> = 5 A; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 6</a>	-	1.4	1.6	V
		I <sub>F</sub> = 5 A; T <sub>j</sub> = 150 °C; per diode; <a href="#">Fig. 6</a>	-	1.85	2.3	V
		I <sub>F</sub> = 5 A; T <sub>j</sub> = 175 °C; per diode; <a href="#">Fig. 6</a>	-	2	2.6	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 1200 V; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	-	100	μA
		V <sub>R</sub> = 1200 V; T <sub>j</sub> = 175 °C; per diode; <a href="#">Fig. 7</a>	-	-	300	μA
<b>Dynamic characteristics</b>						
Q <sub>r</sub>	recovered charge	I <sub>F</sub> = 5 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 500 A/μs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 8</a>	-	12	-	nC
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 1 V; T <sub>j</sub> = 25 °C	-	250	-	pF
		f = 1 MHz; V <sub>R</sub> = 400 V; T <sub>j</sub> = 25 °C	-	24.5	-	pF
		f = 1 MHz; V <sub>R</sub> = 800 V; T <sub>j</sub> = 25 °C	-	22	-	pF



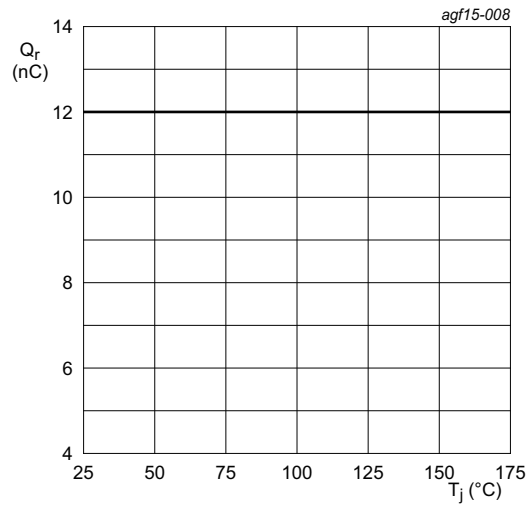
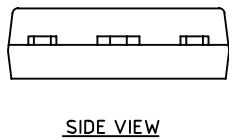
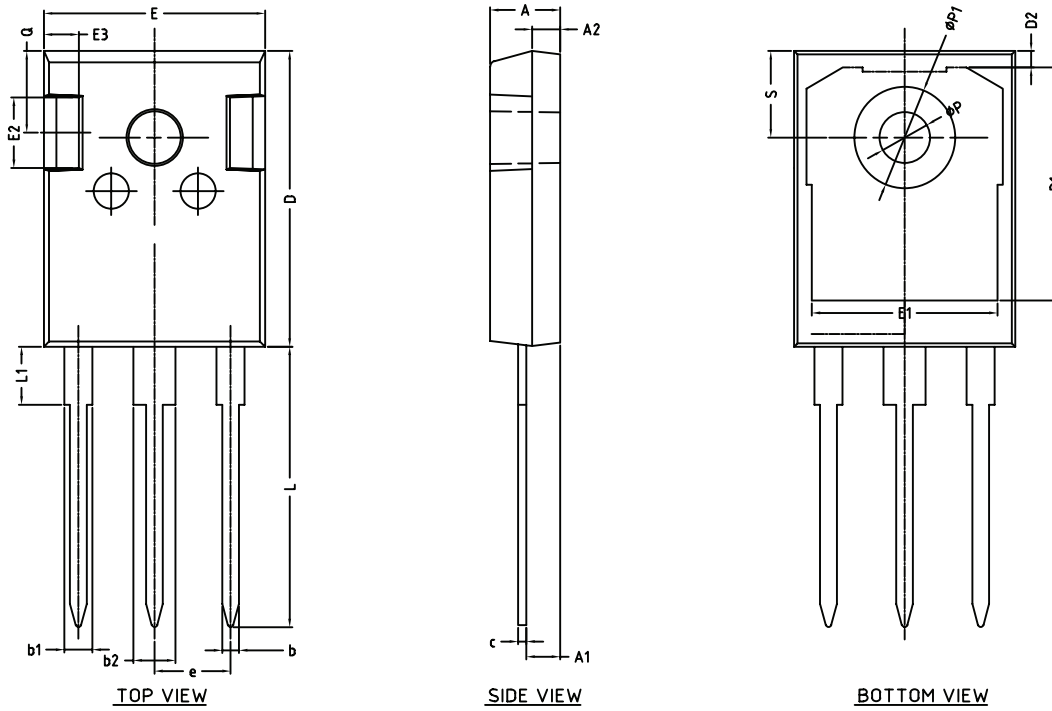


Fig. 8. Recovered charge as a function of junction temperature; per diode

### 11. Package outline

Plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 3-lead TO-247

SOT429N



UNIT	A	A1	A2	b	b1	b2	c	D	D1	D2	E	E1	E2	E3	e	L	L1	P	P1	Q	S
mm	MAX	5.20	2.60	2.10	1.40	2.20	3.20	0.70	21.10	16.85	1.35	15.90	13.50	5.20	2.60	20.10	4.75	3.70	7.40	6.00	6.25
	MIN	4.70	2.20	1.90	1.00	1.80	2.80	0.50	20.90	16.25	1.05	15.70	13.10	4.80	2.40	19.80	-	3.50	-	5.60	6.05

OUTLINE VERSION	REFERENCES			PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT429N		TO-247			



## 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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