

## 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

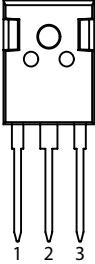
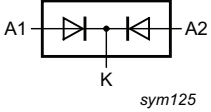
## 4. Quick reference data

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	$\delta = 0.5$ ; $T_{mb} \leq 129\text{ °C}$ ; 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>	20			A
$T_j$	junction temperature		175			°C
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 10\text{ A}$ ; $T_j = 25\text{ °C}$ ; per diode; <a href="#">Fig. 6</a>	-	1.4	1.6	V
		$I_F = 10\text{ A}$ ; $T_j = 150\text{ °C}$ ; per diode; <a href="#">Fig. 6</a>	-	1.85	2.3	V
		$I_F = 10\text{ A}$ ; $T_j = 175\text{ °C}$ ; per diode; <a href="#">Fig. 6</a>	-	2	2.6	V
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 10\text{ A}$ ; $V_R = 400\text{ V}$ ; $di_F/dt = 500\text{ A}/\mu\text{s}$ ; $T_j = 25\text{ °C}$ ; per diode; <a href="#">Fig. 8</a>	-	24	-	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
WNSC201200CW	TO-247	WNSC201200CWQ	Tube	30	TO-247N	20-Jul-2016

## 7. Marking

**Table 4. Marking codes**

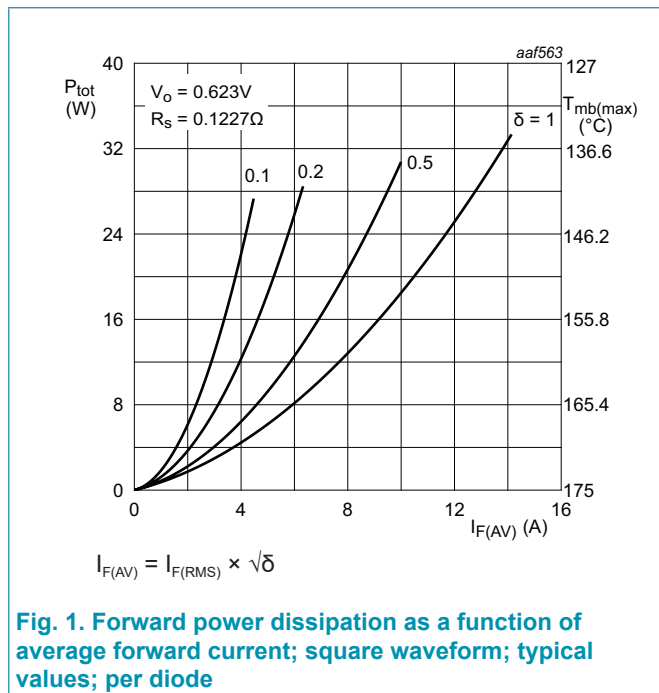
Type number	Marking codes
WNSC201200CW	WNSC201200CW

## 8. Limiting values

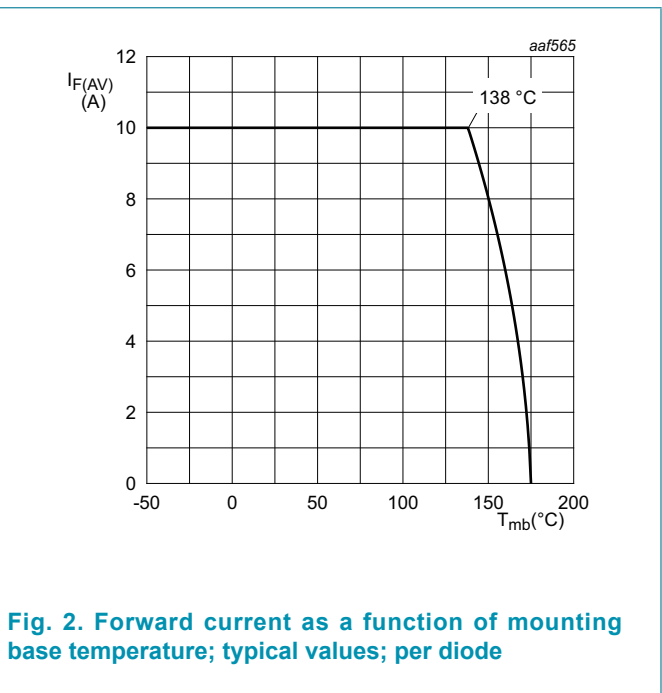
**Table 5. Limiting values**

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	$\delta = 0.5$ ; $t_p = 25 \mu s$ ; $T_{mb} \leq 138 \text{ }^\circ\text{C}$ ; square-wave pulse; per diode	20	A
$I_{O(AV)}$	limiting average output current	$\delta = 0.5$ ; $T_{mb} \leq 129 \text{ }^\circ\text{C}$ ; 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>	20	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10 \text{ ms}$ ; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse; per diode	110	A
		$t_p = 10 \mu s$ ; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse; per diode	720	A
$T_{stg}$	storage temperature		-55 to 175	$^\circ\text{C}$
$T_j$	junction temperature		175	$^\circ\text{C}$



**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**

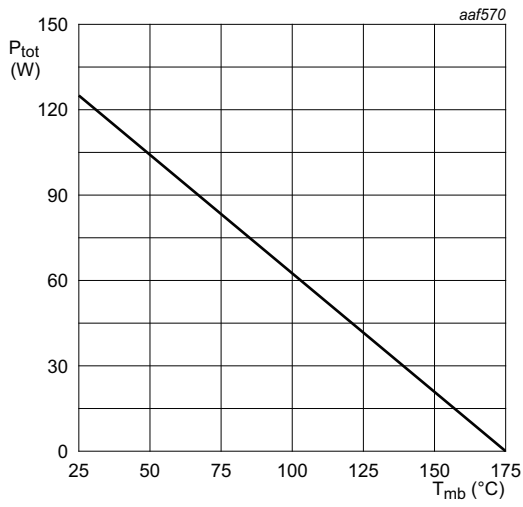


Fig. 3. Total power dissipation as a function of mounting base temperature; per diode

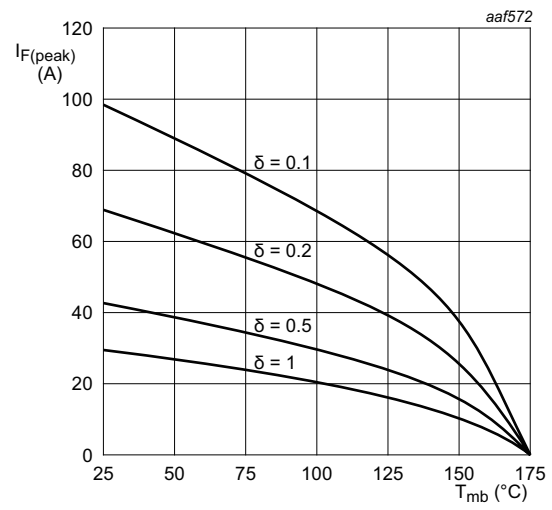


Fig. 4. Current derating as a function of mounting base temperature; per diode

## 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>	-	-	1.2	K/W
		both diodes conducting	-	-	0.75	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	40	-	K/W

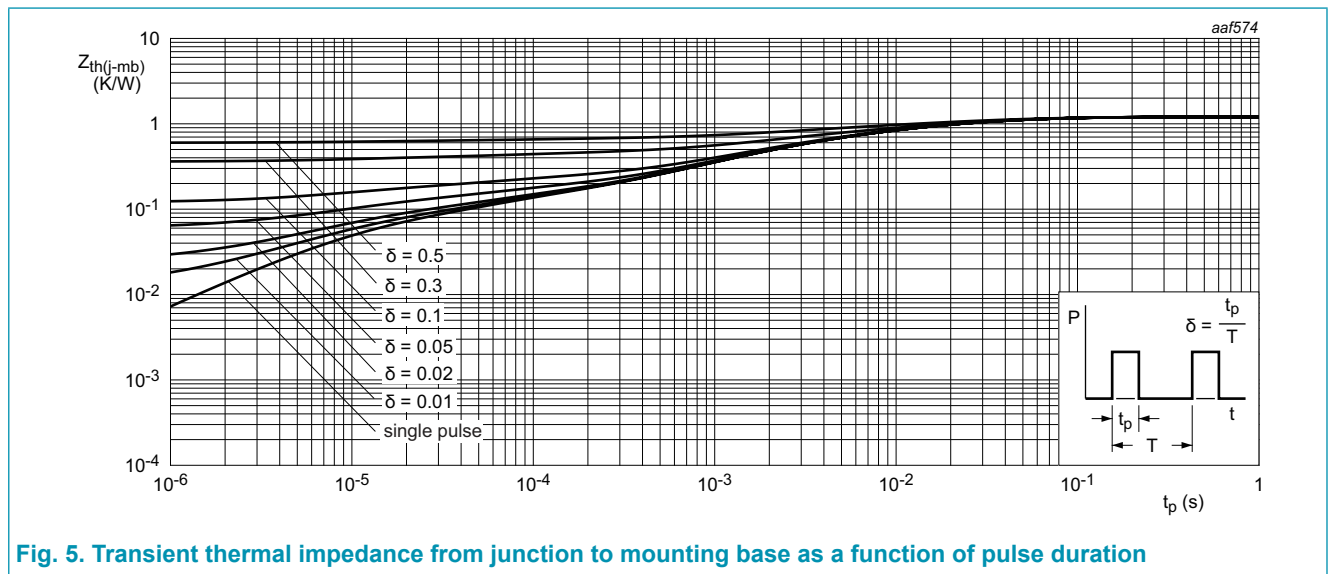
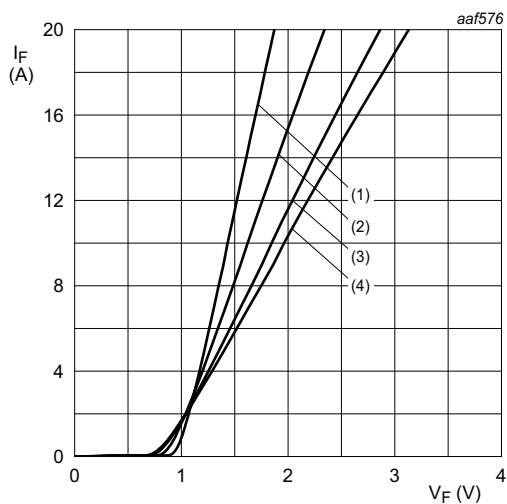


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

### 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> = 10 A; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 6</a>	-	1.4	1.6	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 150 °C; per diode; <a href="#">Fig. 6</a>	-	1.85	2.3	V
		I <sub>F</sub> = 10 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>	-	-	400	μA
		V <sub>R</sub> = 1200 V; T <sub>j</sub> = 175 °C; per diode; <a href="#">Fig. 7</a>	-	-	1	mA
<b>Dynamic characteristics</b>						
Q <sub>r</sub>	recovered charge	I <sub>F</sub> = 10 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>	-	24	-	nC
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 1 V; T <sub>j</sub> = 25 °C	-	510	-	pF
		f = 1 MHz; V <sub>R</sub> = 400 V; T <sub>j</sub> = 25 °C	-	48	-	pF
		f = 1 MHz; V <sub>R</sub> = 800 V; T <sub>j</sub> = 25 °C	-	41	-	pF



- (1) T<sub>j</sub> = 25 °C; typical values
- (2) T<sub>j</sub> = 100 °C; typical values
- (3) T<sub>j</sub> = 150 °C; typical values
- (4) T<sub>j</sub> = 175 °C; typical values

Fig. 6. Forward current as a function of forward voltage; typical values; per diode

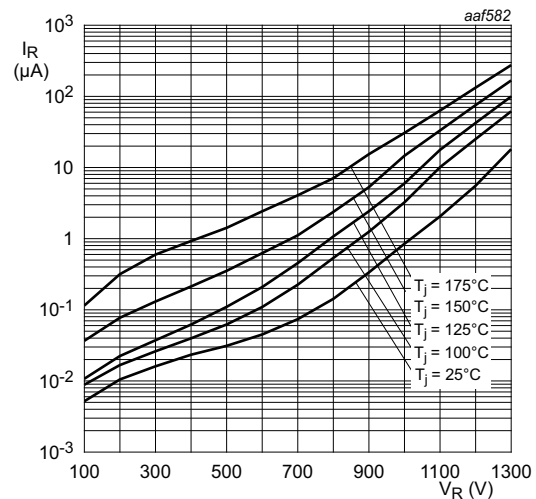


Fig. 7. Reverse leakage current as a function of reverse voltage; typical value; per diode

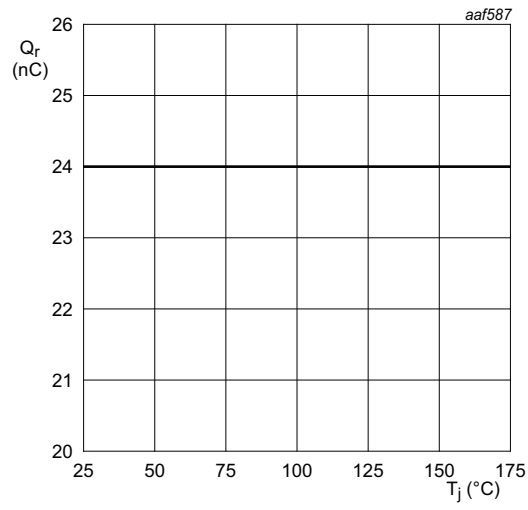
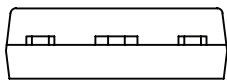
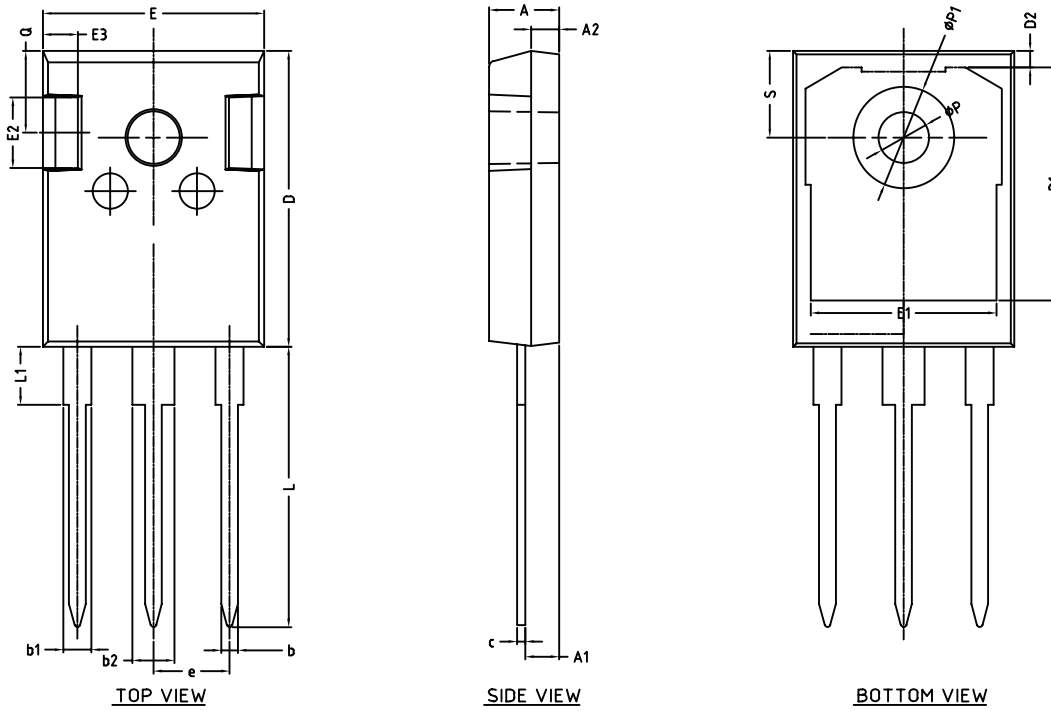


Fig. 8. Recovered charge as a function of junction temperature; per diode

### 11. Package outline

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

SOT429N



SIDE VIEW

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

### Data sheet status

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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Date of release: 22 April 2019