**Product data sheet** 

## 1. General description

Silicon Carbide Schottky diode in a TO247-2L plastic package, designed for high frequency switched-mode power supplies.





### 2. Features and benefits

- · Highly stable switching performance
- High forward surge capability I<sub>FSM</sub>
- · 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<sub>i(max)</sub> = 175 °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	
Absolute	maximum rating						
$V_{RRM}$	repetitive peak reverse 1200 voltage						V
I <sub>F(AV)</sub>	average forward current	$δ = 0.5$ ; square-wave pulse; $T_{mb} \le 138$ °C; Fig. 1; Fig. 2; Fig. 3; Fig. 4	10			А	
T <sub>j</sub>	junction temperature		175			°C	
Symbol	Parameter	Conditions		Min	Тур	Max	Unit
Static ch	aracteristics		·				
$V_{F}$	forward voltage	I <sub>F</sub> = 10 A; T <sub>j</sub> = 25 °C; <u>Fig. 6</u>		-	1.4	1.6	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 150 °C; <u>Fig. 6</u>		-	1.85	2.3	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 175 °C; <u>Fig. 6</u>		-	2	2.6	V
Dynamic	characteristics						
Q <sub>r</sub>	recovered charge	$I_F = 10 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A/}\mu\text{s};$ $T_j = 25 \text{ °C}; Fig. 8$		-	24	-	nC

# 5. Pinning information

#### **Table 2. Pinning information**

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		K — A 001aaa020
2	А	anode		001aaa020
mb	К	mounting base; connected to cathode	K A TO247-2L	

# 6. Ordering information

**Table 3. Ordering information** 

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WNSC101200W	TO247-2L	WNSC101200WQ	Tube	30	TO247L-2L	28-Aug-2018

# 7. Marking

### **Table 4. Marking codes**

Type number	Marking codes
WNSC101200W	WNSC101200W

# 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 <sub>F(AV)</sub>	average forward current	$δ = 0.5$ ; square-wave pulse; $T_{mb} \le 138$ °C; Fig. 1; Fig. 2; Fig. 3; Fig. 4	10	А
I <sub>FRM</sub>	repetitive peak forward current	$\delta$ = 0.5 ; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 138 °C; square-wave pulse	20	А
I <sub>FSM</sub>	non-repetitive peak	$t_p$ = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse	110	А
	forward current	t <sub>p</sub> = 10 μs; T <sub>j(init)</sub> = 25 °C; sine-wave pulse	720	А
T <sub>stg</sub>	storage temperature		-55 to 175	°C
T <sub>j</sub>	junction temperature		175	°C

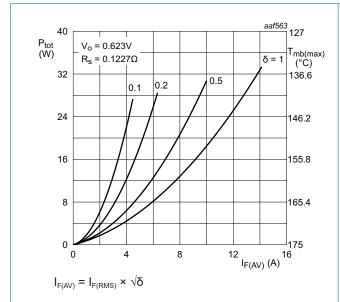


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; typical values

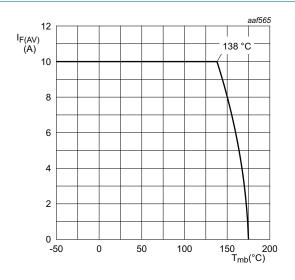


Fig. 2. Forward current as a function of mounting base temperature; typical values

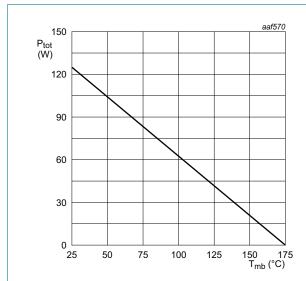


Fig. 3. Total power dissipation as a function of mounting base temperature

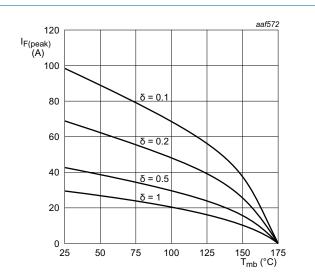


Fig. 4. Current derating as a function of mounting base temperature

## 9. Thermal characteristics

**Table 6. Thermal characteristics** 

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
R <sub>th(j-mb)</sub>	thermal resistance from junction to mounting base	Fig. 5	-	-	1.2	K/W
$R_{\text{th(j-a)}}$	thermal resistance from junction to ambient free air	in free air	-	40	-	K/W

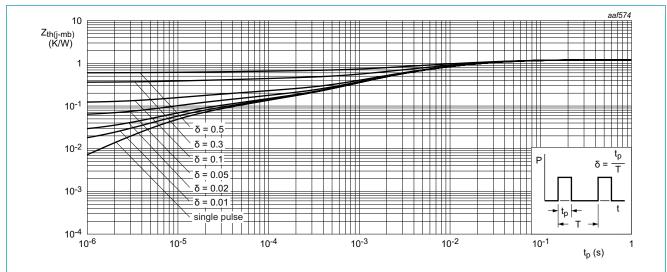
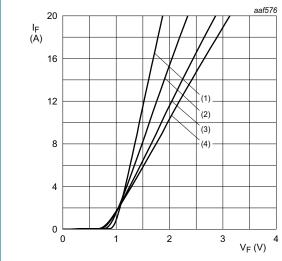


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static cha	racteristics					'
V <sub>F</sub>	forward current	I <sub>F</sub> = 10 A; T <sub>j</sub> = 25 °C; <u>Fig. 6</u>	-	1.4	1.6	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 150 °C; <u>Fig. 6</u>	-	1.85	2.3	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 175 °C; <u>Fig. 6</u>	-	2	2.6	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 1200 V; T <sub>j</sub> = 25 °C; <u>Fig. 7</u>	-	-	200	μA
		V <sub>R</sub> = 1200 V; T <sub>j</sub> = 175 °C; <u>Fig. 7</u>	-	-	1	mA
Dynamic	characteristics					
Q <sub>r</sub>	recovered charge	$I_F = 10 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A/µs};$ $T_j = 25 \text{ °C}; Fig. 8$	-	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>i</sub> = 25 °C; typical values

(2) T<sub>j</sub> = 100 °C; typical values

(3) T<sub>i</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

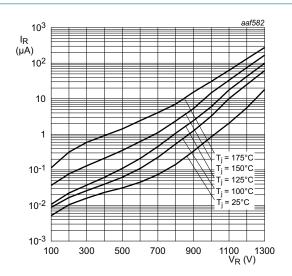


Fig. 7. Reverse leakage current as a function of reverse voltage; typical value

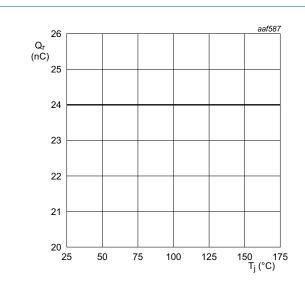
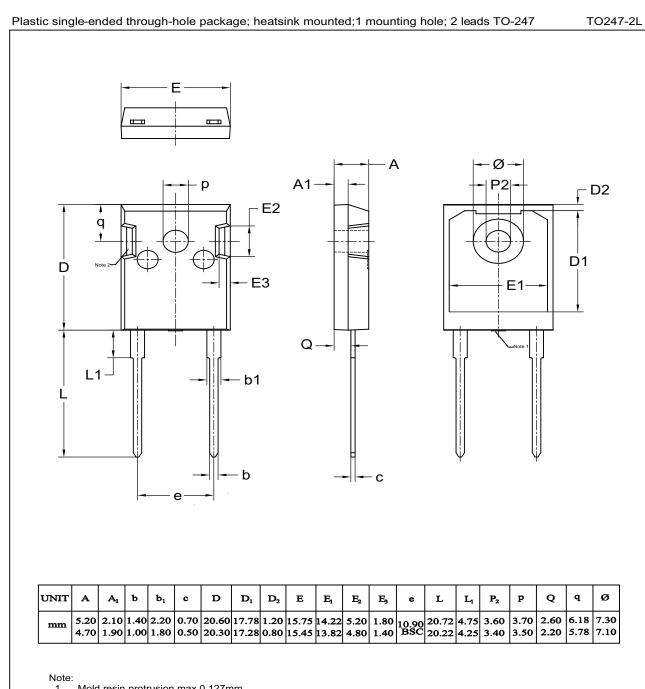


Fig. 8. Recovered charge as a function of junction temperature

# 11. Package outline



- Mold resin protrusion max 0.127mm. Metal exposed with Sn plating.

### 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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