

## 1. General description

Silicon Carbide Schottky diode in a TO247-2L plastic package, designed for high frequency, high efficiency systems.



## 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

- Switching mode power supplies
- UPS & energy storage systems
- PV inverter and MPPT circuit
- Battery formation systems
- EV chargers
- Motor Drives

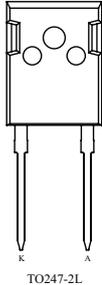
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
<b>Absolute maximum rating</b>							
$V_{RRM}$	repetitive peak reverse voltage			1200			V
$I_F$	continuous forward current	$T_{mb} \leq 137\text{ °C}$ ; DC; <a href="#">Fig. 2</a>		25			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	$I_F = 25\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 5</a>		-	1.42	1.60	V
		$I_F = 25\text{ A}$ ; $T_j = 150\text{ °C}$ ; <a href="#">Fig. 5</a>		-	1.90	2.30	V
<b>Dynamic characteristics</b>							
$Q_r$	recovered charge	$I_F = 25\text{ A}$ ; $di_F/dt = 500\text{ A}/\mu\text{s}$ ; $V_R = 400\text{ V}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 7</a>		-	54	-	nC

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
mb	mb	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
WNSC2D251200W	TO247-2L	WNSC2D251200W6Q	Tube	30	TO247P-2L	09-Mar-2023

## 7. Marking

Table 4. Marking codes

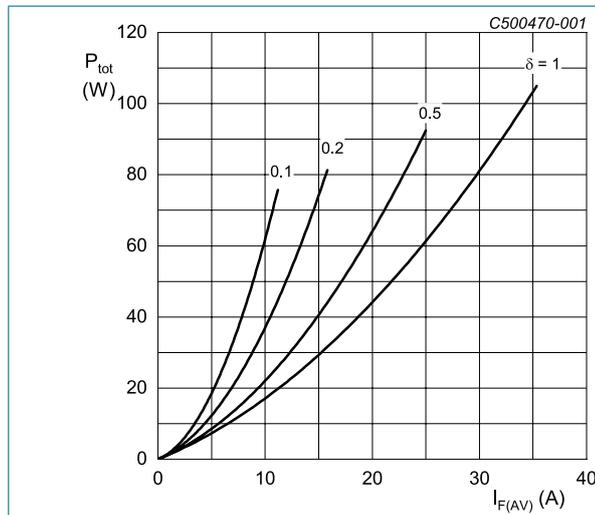
Type number	Marking codes
WNSC2D251200W	WNSC2D 251200W

## 8. Limiting values

**Table 5. Limiting values**

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

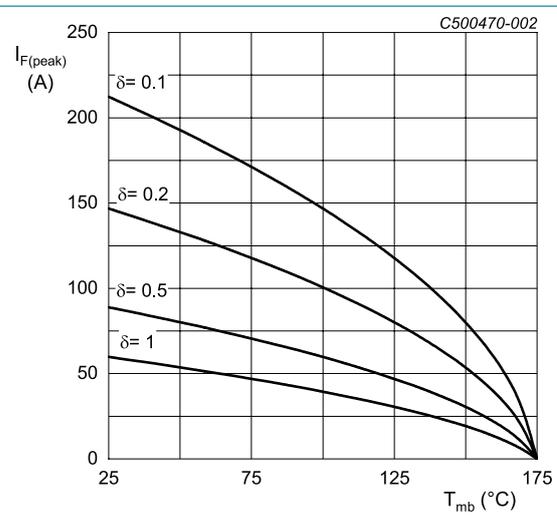
Symbol	Parameter	Conditions	Notes	Values	Unit
$V_{RRM}$	repetitive peak reverse voltage			1200	V
$V_{RWM}$	crest working reverse voltage			1200	V
$V_R$	reverse voltage	DC		1200	V
$I_F$	continuous forward current	$T_{mb} \leq 137\text{ °C}$ ; DC; <a href="#">Fig. 2</a>		25	A
		$T_{mb} \leq 125\text{ °C}$ ; DC; <a href="#">Fig. 2</a>		31	A
		$T_{mb} \leq 25\text{ °C}$ ; DC; <a href="#">Fig. 2</a>		60	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\ \mu\text{s}$ ; $T_{mb} \leq 125\text{ °C}$ ; square-wave pulse		47	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; sine-wave pulse		225	A
		$t_p = 10\ \mu\text{s}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square-wave pulse		1200	A
$I^2t$	$I^2t$ for fusing	$t_p = 10\text{ ms}$ ; SIN		253	$\text{A}^2\text{s}$
$T_{stg}$	storage temperature			-55 to 175	$^{\circ}\text{C}$
$T_j$	junction temperature			-55 to 175	$^{\circ}\text{C}$



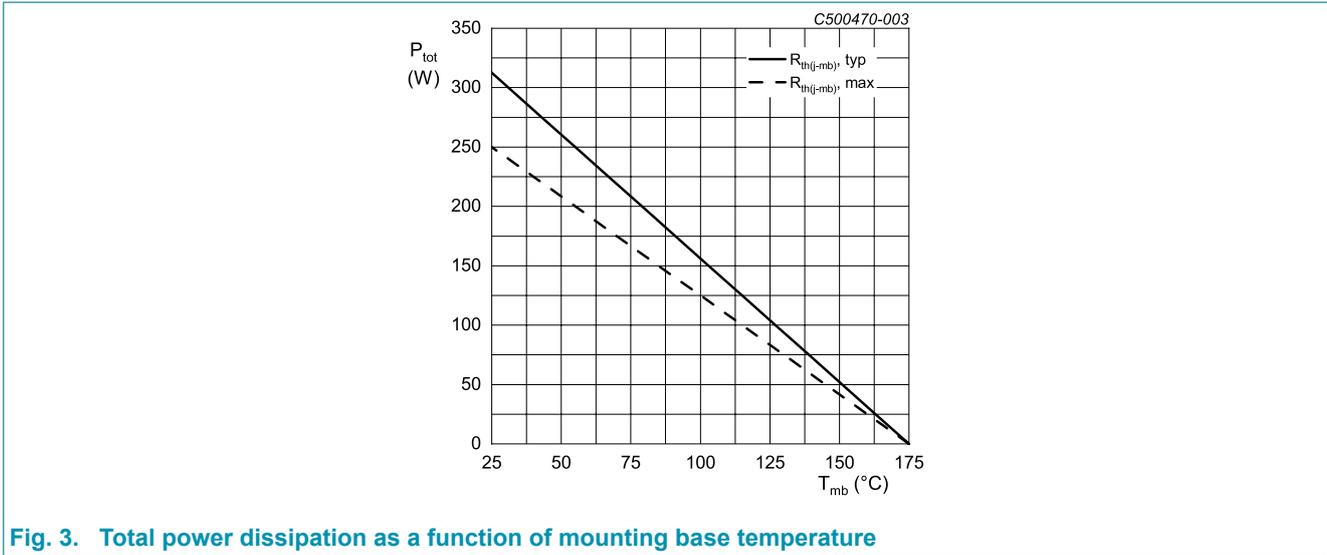
$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$

$$V_o = 1.209\text{ V}; R_s = 0.0498\ \Omega$$

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



**Fig. 2. Current derating as a function of mounting base temperature**



## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	<a href="#">Fig. 4</a>		-	0.48	0.6	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	40	-	K/W

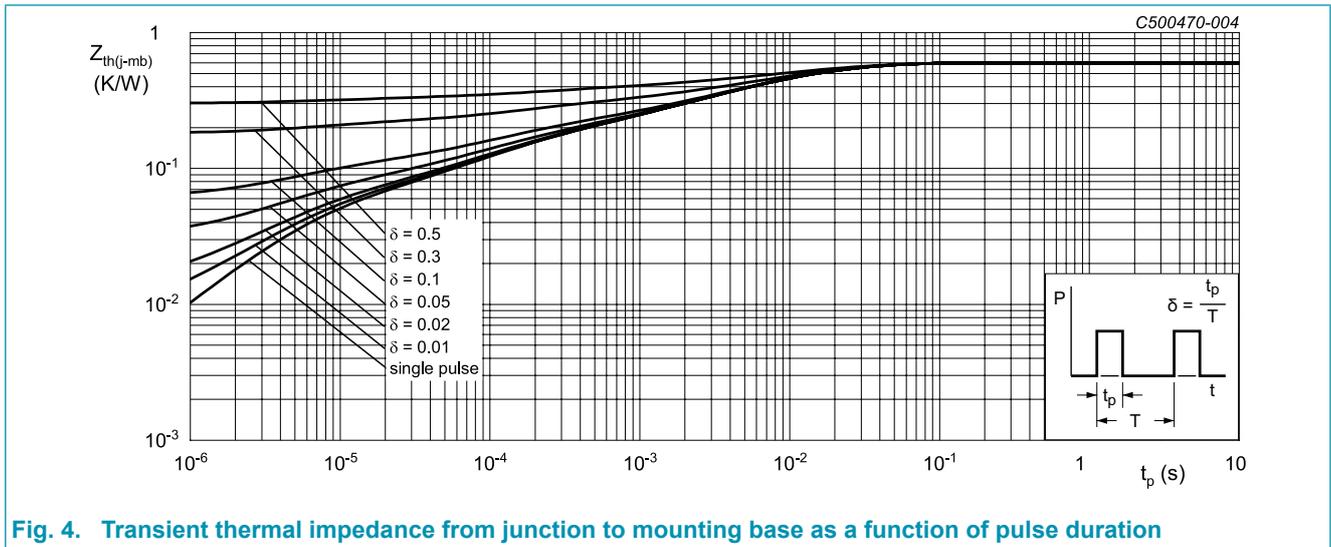
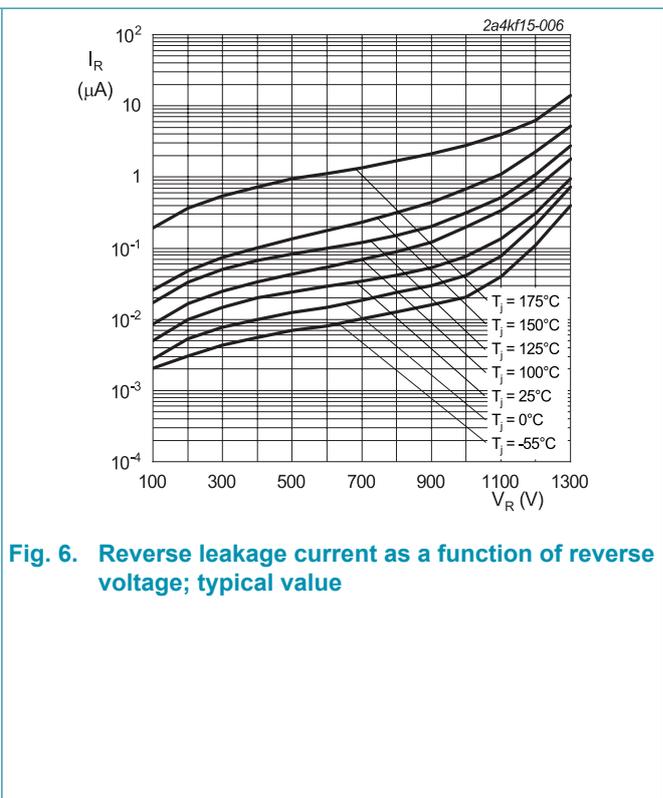
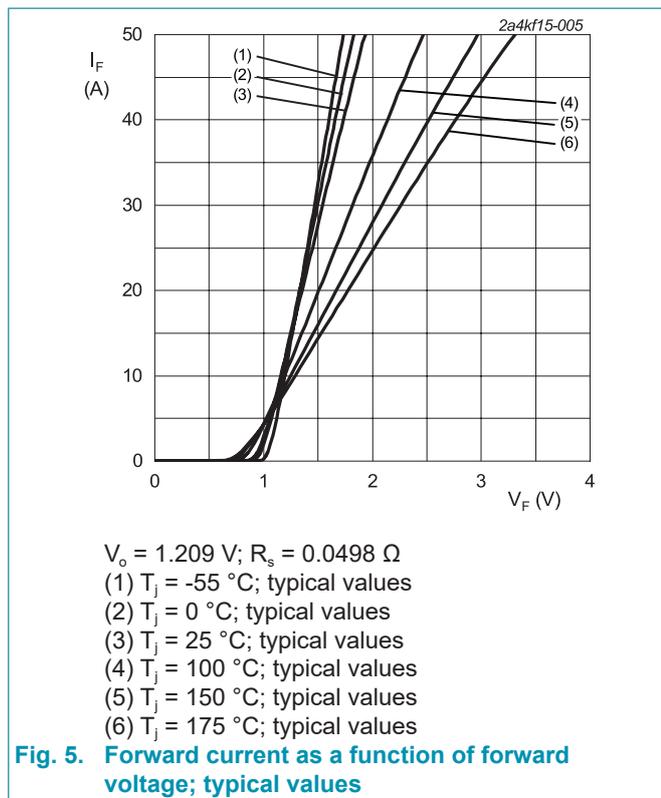


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
<b>Static characteristics</b>							
$I_F$	forward current	$I_F = 25 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 5}$		-	1.42	1.60	V
		$I_F = 25 \text{ A}; T_j = 150 \text{ }^\circ\text{C}; \text{ Fig. 5}$		-	1.90	2.30	V
		$I_F = 25 \text{ A}; T_j = 175 \text{ }^\circ\text{C}; \text{ Fig. 5}$		-	2.00	2.50	V
$I_R$	reverse current	$V_R = 1200 \text{ V}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}$		-	1	125	$\mu\text{A}$
		$V_R = 1200 \text{ V}; T_j = 175 \text{ }^\circ\text{C}; \text{ Fig. 6}$		-	25	-	$\mu\text{A}$
<b>Dynamic characteristics</b>							
$Q_r$	recovered charge	$I_F = 25 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$		-	54	-	nC
$C_d$	diode capacitance	$f = 1 \text{ MHz}; V_R = 1 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	1226	-	pF
		$f = 1 \text{ MHz}; V_R = 400 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	111	-	pF
		$f = 1 \text{ MHz}; V_R = 800 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	79	-	pF
$E_{as}$	non-repetitive avalanche energy	$I_R = 7 \text{ A}; L = 10 \text{ mH}; T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		245	-	-	mJ



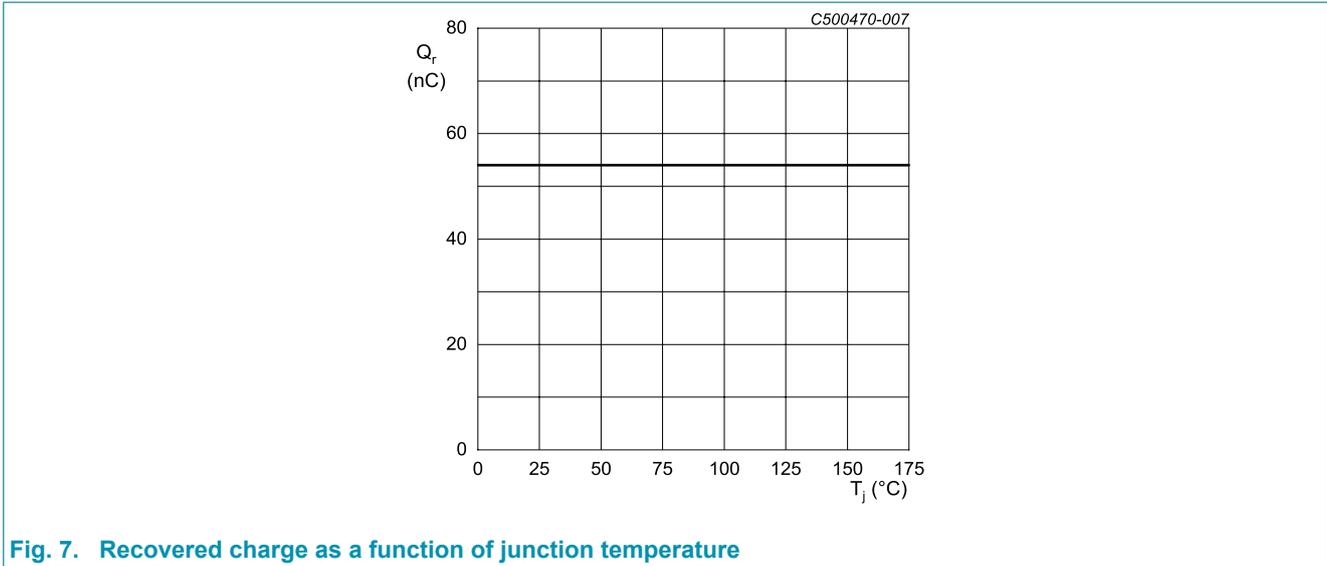
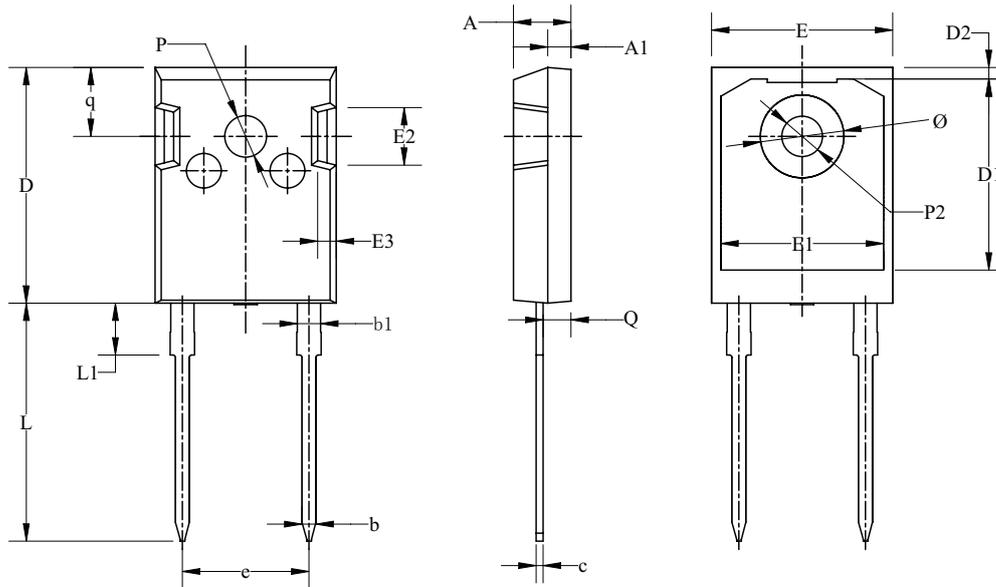


Fig. 7. Recovered charge as a function of junction temperature

### 11. Package outline

Plastic single-ended through-hole package; headsink mounted; 1 mounting hole; 2 leads TO-247

TO247-2L



Dim	All Dimensions in Millimeters		
	Min	Typ	Max
A	4.70	4.95	5.20
A1	1.90	2.00	2.10
b	1.00	1.20	1.40
b1	1.80	2.00	2.20
c	0.50	0.60	0.70
D	20.30	20.45	20.60
D1	16.20	16.58	16.87
D2	0.80	1.00	1.20
E	15.45	15.60	15.75
E1	13.82	14.02	14.22
E2	4.80	5.00	5.20
E3	1.40	1.60	1.80
e	10.90 BSC		
L	20.40	20.65	20.90
L1	4.25	4.50	4.75
P2	3.40	3.50	3.60
P	3.50	3.60	3.70
Q	2.20	2.40	2.60
q	5.78	5.98	6.18
Ø	7.10	7.19	7.30

## 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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