

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_{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

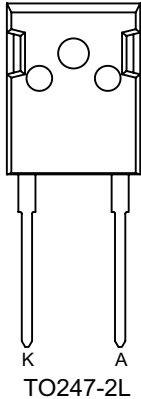

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values				Unit
Absolute maximum rating							
V _{RRM}	repetitive peak reverse voltage		1200				V
I _{F(AV)}	average forward current	δ = 0.5 ; square-wave pulse; T _{mb} ≤ 138 °C; Fig. 1 ; Fig. 2 ; Fig. 3 ; Fig. 4	10				A
T _j	junction temperature		175				°C
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 10 A; T _j = 25 °C; Fig. 6		-	1.4	1.6	V
		I _F = 10 A; T _j = 150 °C; Fig. 6		-	1.85	2.3	V
		I _F = 10 A; T _j = 175 °C; Fig. 6		-	2	2.6	V
Dynamic characteristics							
Q _r	recovered charge	I _F = 10 A; V _R = 400 V; dI _F /dt = 500 A/μs; T _i = 25 °C; Fig. 8		-	24	-	nC

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 <p>K A TO247-2L</p>	 <p>K A 001aaa020</p>
2	A	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
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
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 138\text{ }^{\circ}\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3 ; Fig. 4	10	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 138\text{ }^{\circ}\text{C}$; square-wave pulse	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	110	A
		$t_p = 10\text{ }\mu\text{s}$; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse	720	A
T_{stg}	storage temperature		-55 to 175	$^{\circ}\text{C}$
T_j	junction temperature		175	$^{\circ}\text{C}$

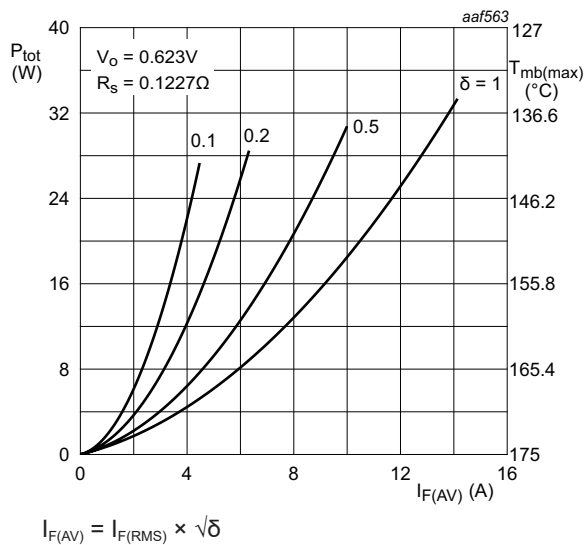


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; typical values

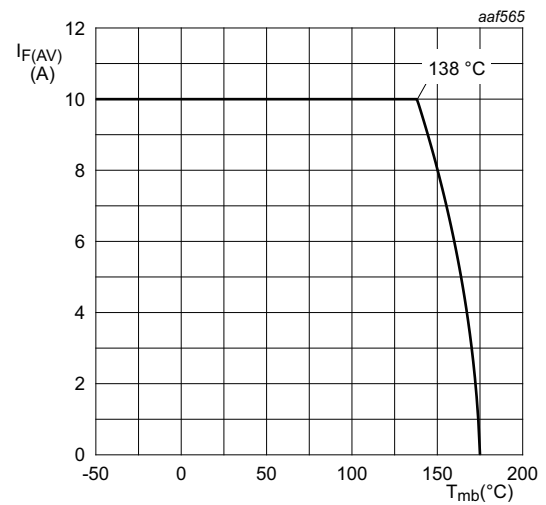


Fig. 2. Forward current as a function of mounting base temperature; typical values

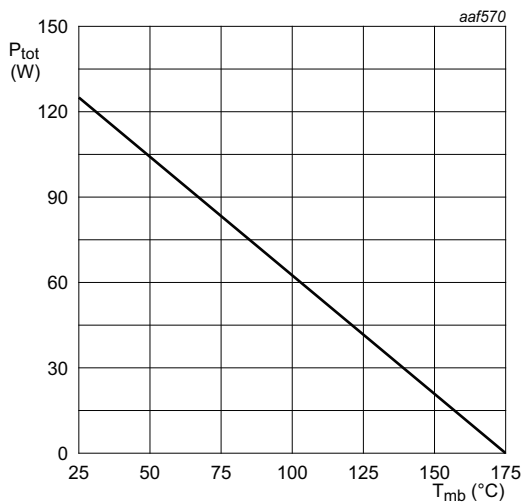


Fig. 3. Total power dissipation as a function of mounting base temperature

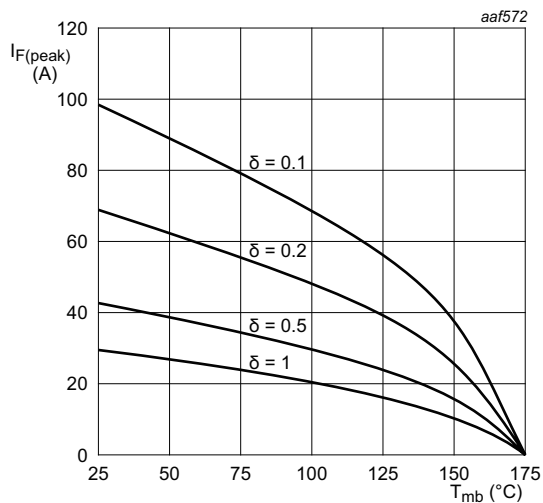


Fig. 4. Current derating as a function of mounting base temperature

9. Thermal characteristics

Table 6. Thermal characteristics

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

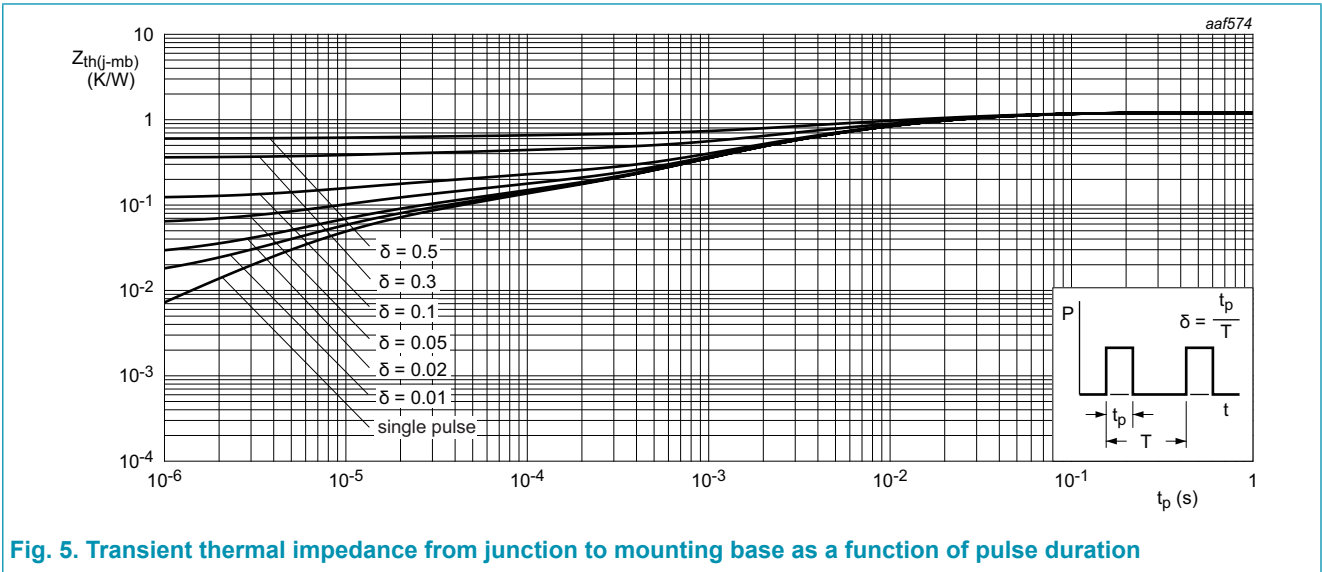
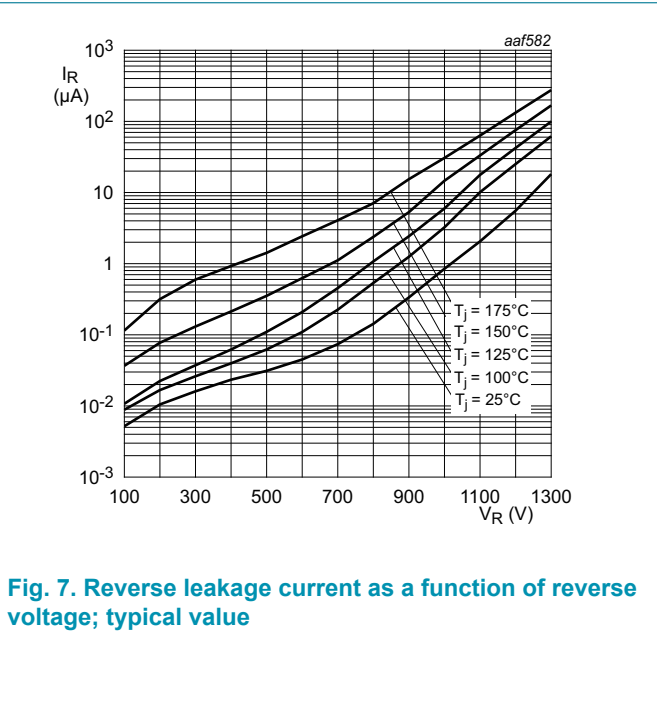
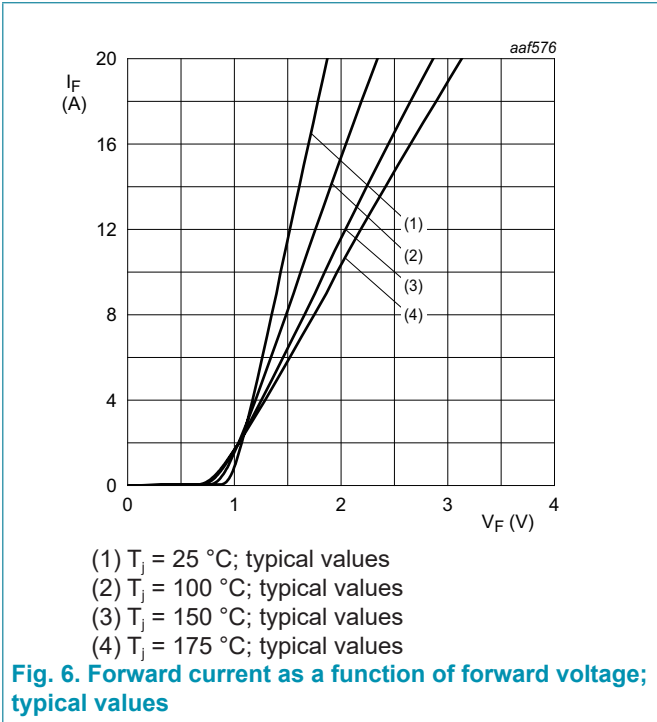


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward current	I _F = 10 A; T _J = 25 °C; Fig. 6		-	1.4	1.6	V
		I _F = 10 A; T _J = 150 °C; Fig. 6		-	1.85	2.3	V
		I _F = 10 A; T _J = 175 °C; Fig. 6		-	2	2.6	V
I _R	reverse current	V _R = 1200 V; T _J = 25 °C; Fig. 7		-	-	200	μA
		V _R = 1200 V; T _J = 175 °C; Fig. 7		-	-	1	mA
Dynamic characteristics							
Q _r	recovered charge	I _F = 10 A; V _R = 400 V; dI _F /dt = 500 A/μs; T _J = 25 °C; Fig. 8		-	24	-	nC
C _d	diode capacitance	f = 1 MHz; V _R = 1 V; T _J = 25 °C		-	510	-	pF
		f = 1 MHz; V _R = 400 V; T _J = 25 °C		-	48	-	pF
		f = 1 MHz; V _R = 800 V; T _J = 25 °C		-	41	-	pF



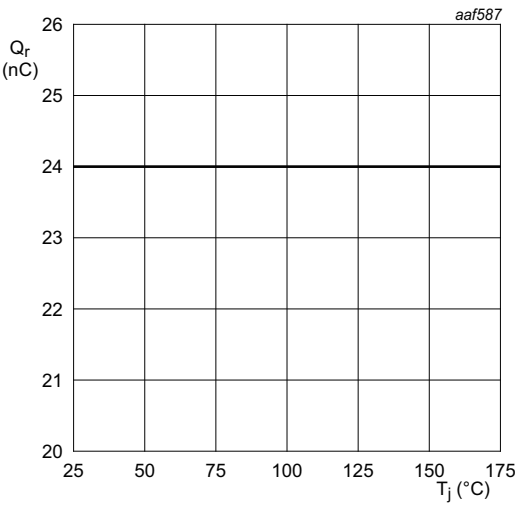
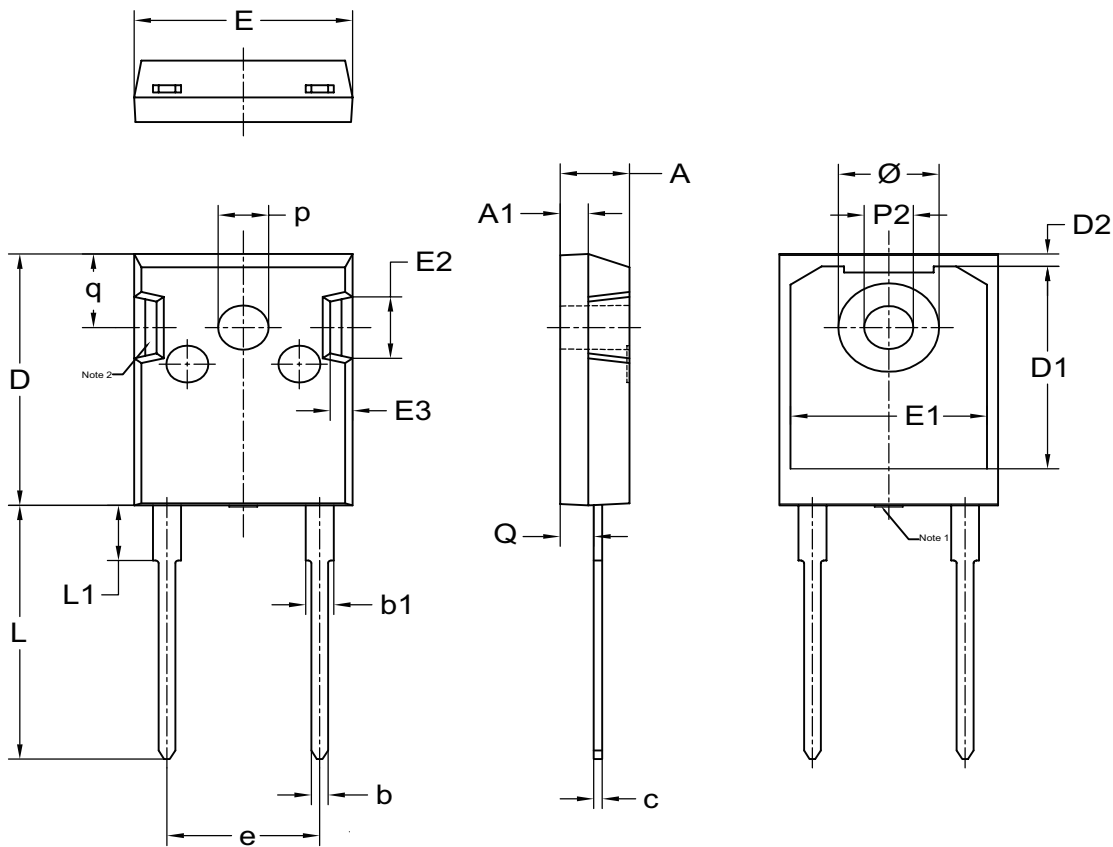


Fig. 8. Recovered charge as a function of junction temperature

11. Package outline

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

TO247-2L



UNIT	A	A ₁	b	b ₁	c	D	D ₁	D ₂	E	E ₁	E ₂	E ₃	e	L	L ₁	P ₂	p	Q	q	Ø
mm	5.20 4.70	2.10 1.90	1.40 1.00	2.20 1.80	0.70 0.50	20.60 20.30	17.78 17.28	1.20 0.80	15.75 15.45	14.22 13.82	5.20 4.80	1.80 1.40	10.90 BSC	20.72 20.22	4.75 4.25	3.60 3.40	3.70 3.50	2.60 2.20	6.18 5.78	7.30 7.10

Note:
1. Mold resin protrusion max 0.127mm.
2. Metal exposed with Sn plating.

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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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Date of release: 22 April 2019

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