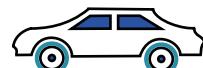


1. General description

Silicon Carbide Schottky diode in a TO263-2L plastic package, designed for high frequency, high efficiency systems.



AEC - Q101 Qualified



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 ($T_{j(max)} = 175^\circ\text{C}$)
- AEC-Q101 qualified

3. Applications

- EV on board chargers
- EV DC-DC converters
- Other EV HV systems

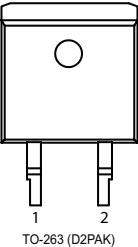
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage				1200		V
I_F	continuous forward current	$T_{mb} \leq 133^\circ\text{C}$; DC; Fig. 2			20		A
T_j	junction temperature				-55 to 175		°C
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	$I_F = 20\text{ A}; T_j = 25^\circ\text{C}$; Fig. 5		-	1.45	1.65	V
		$I_F = 20\text{ A}; T_j = 150^\circ\text{C}$; Fig. 5					
Dynamic characteristics							
Q_r	recovered charge	$I_F = 20\text{ A}; dI_F/dt = 500\text{ A}/\mu\text{s}; V_R = 400\text{ V}$ $T_j = 25^\circ\text{C}$; Fig. 7		-	45	-	nC

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
mb	K	mounting base; connected to cathode	 TO-263 (D2PAK)	

6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WNSC2D201200BT2-A	TO263-2L	WNSC2D201200BT2-A6J	Reel	800	TO263N-2L	14-Oct-2022

7. Marking

Table 4. Marking codes

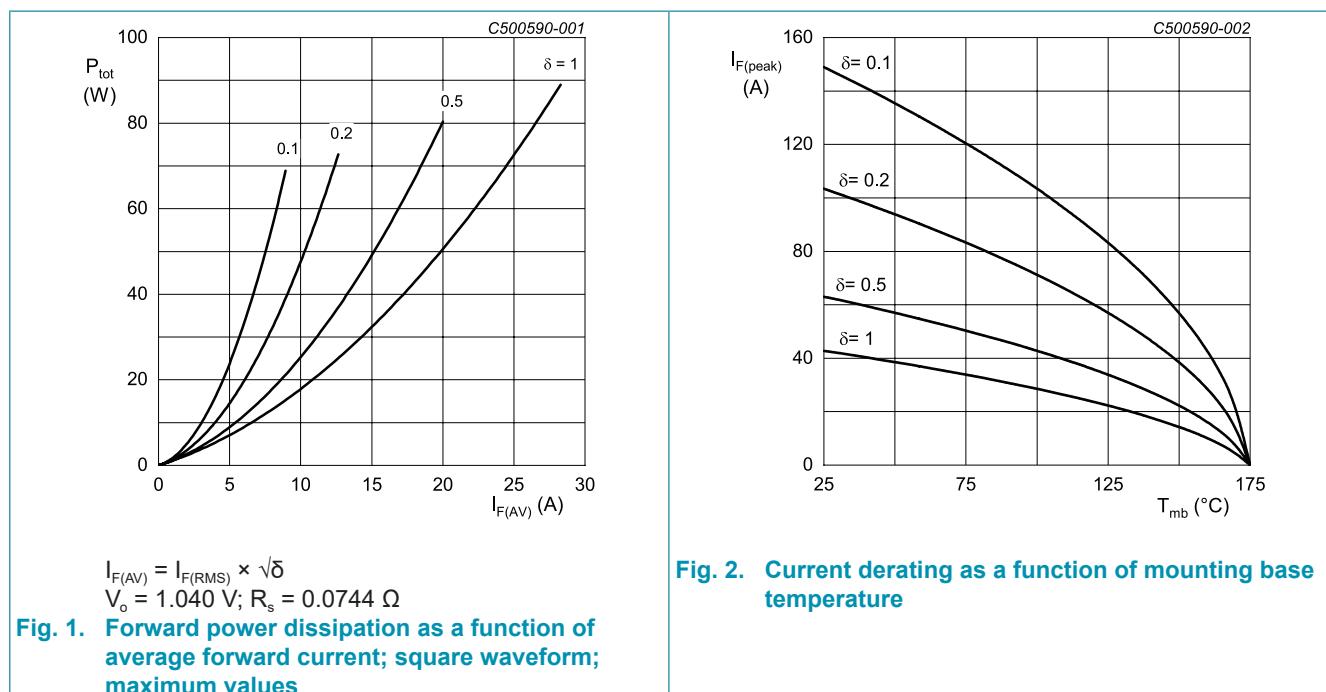
Type number	Marking codes
WNSC2D201200BT2-A	WNSC2D 201200BT2-A

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	$T_{mb} \leq 133^\circ\text{C}$; DC; Fig. 2		20	A
		$T_{mb} \leq 125^\circ\text{C}$; DC; Fig. 2		22.3	A
		$T_{mb} \leq 25^\circ\text{C}$; DC; Fig. 2		42.8	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\ \mu\text{s}$; $T_{mb} \leq 125^\circ\text{C}$; square-wave pulse		33.8	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\ \text{ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; sine-wave pulse		190	A
		$t_p = 10\ \mu\text{s}$; $T_{j(\text{init})} = 25^\circ\text{C}$; square-wave pulse		1170	A
I^2t	I^2t for fusing	$t_p = 10\ \text{ms}$; SIN		181	A^2s
T_{stg}	storage temperature			-55 to 175	$^\circ\text{C}$
T_j	junction temperature			-55 to 175	$^\circ\text{C}$



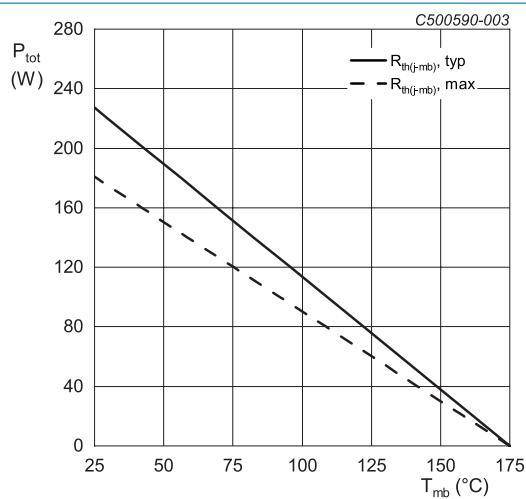


Fig. 3. Total power dissipation as a function of mounting base temperature

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j\text{-mb})}$	thermal resistance from junction to mounting base	Fig. 4		-	0.66	0.83	K/W
$R_{th(j\text{-a})}$	thermal resistance from junction to ambient free air	in free air		-	40	-	K/W

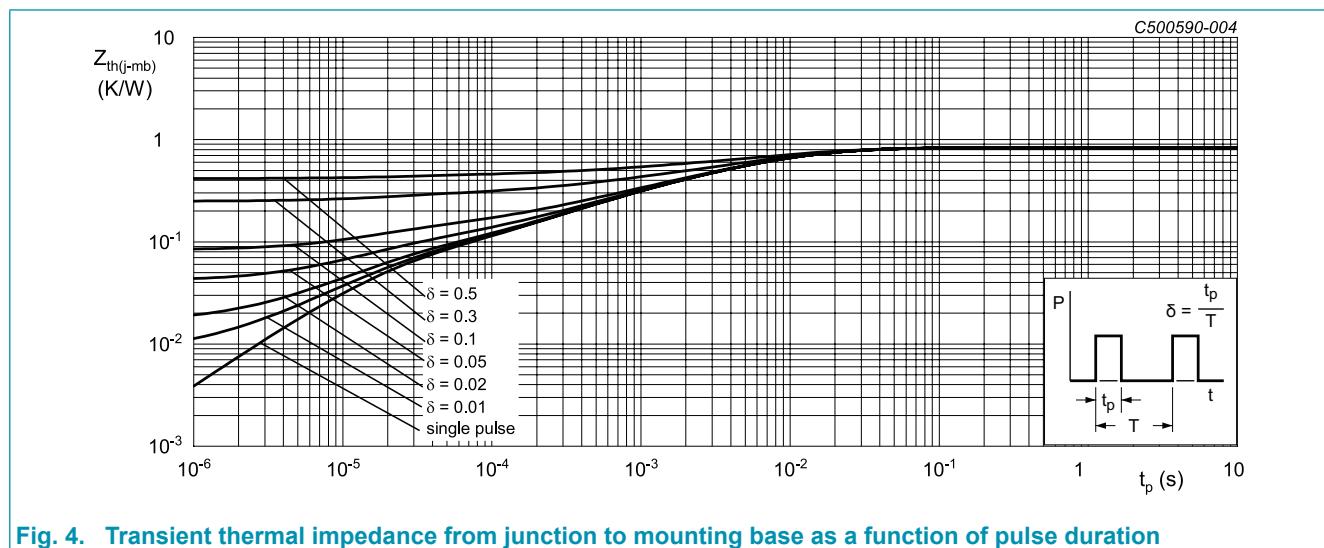
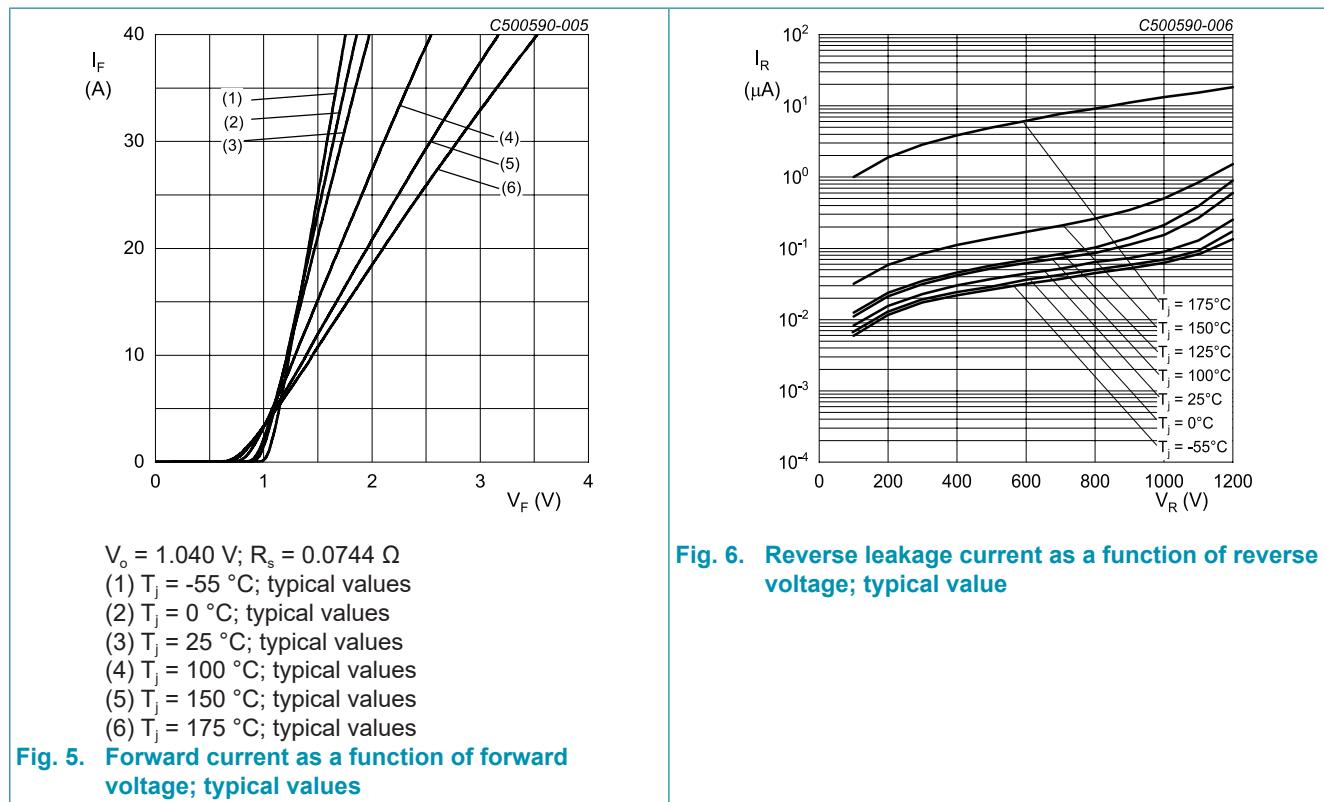


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	$I_F = 20 \text{ A}; T_j = 25 \text{ }^\circ\text{C}$; Fig. 5		-	1.45	1.65	V
		$I_F = 20 \text{ A}; T_j = 150 \text{ }^\circ\text{C}$; Fig. 5		-	1.95	2.30	V
		$I_F = 20 \text{ A}; T_j = 175 \text{ }^\circ\text{C}$; Fig. 5		-	2.10	2.60	V
I_R	reverse current	$V_R = 1200 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$; Fig. 6		-	1	100	μA
		$V_R = 1200 \text{ V}; T_j = 175 \text{ }^\circ\text{C}$; Fig. 6		-	25	-	μA
Dynamic characteristics							
Q_r	recovered charge	$I_F = 20 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A}/\mu\text{s}$; $T_j = 25 \text{ }^\circ\text{C}$; Fig. 7		-	45	-	nC
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 1 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	950	-	pF
		$f = 1 \text{ MHz}; V_R = 400 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	86	-	pF
		$f = 1 \text{ MHz}; V_R = 800 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	64	-	pF
E_{as}	non-repetitive avalanche energy	$I_R = 5.3 \text{ A}; L = 10 \text{ mH}; T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		140	-	-	mJ



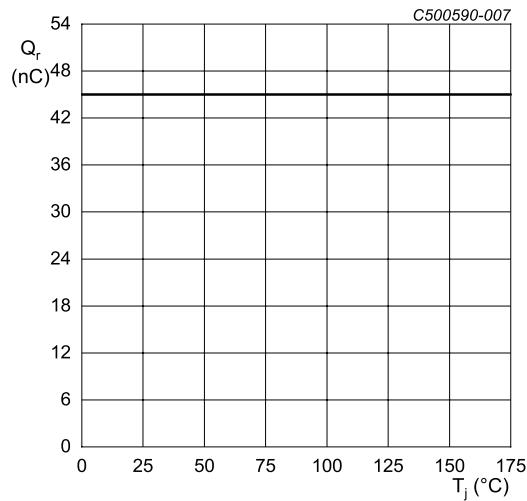
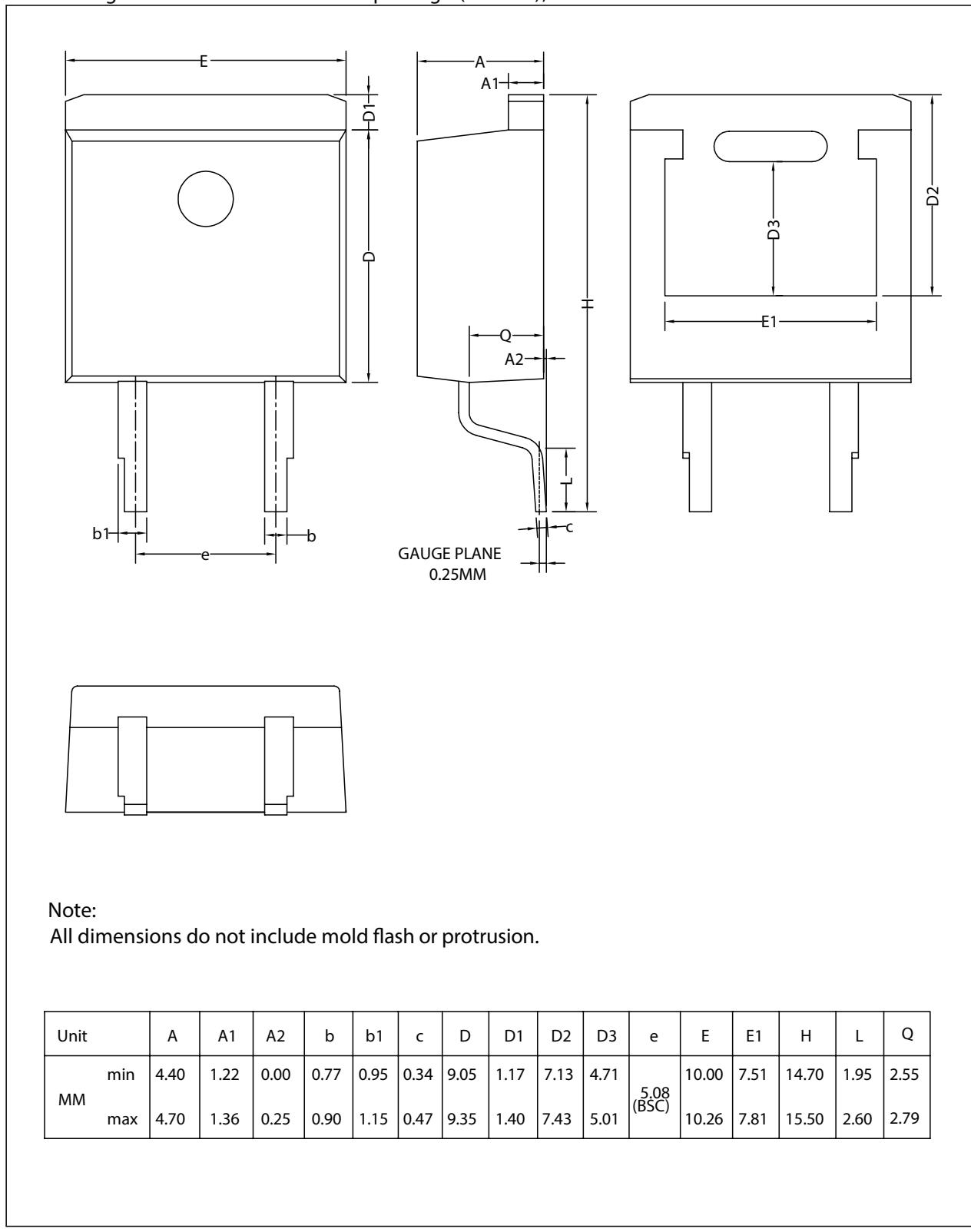


Fig. 7. Recovered charge as a function of junction temperature

11. Package outline

Plastic single-ended surface-mounted package (D2PAK); 2 leads

TO263-2L



Note:

All dimensions do not include mold flash or protrusion.

Unit	A	A1	A2	b	b1	c	D	D1	D2	D3	e	E	E1	H	L	Q
MM	4.40	1.22	0.00	0.77	0.95	0.34	9.05	1.17	7.13	4.71	5.08 (BSC)	10.00	7.51	14.70	1.95	2.55
max	4.70	1.36	0.25	0.90	1.15	0.47	9.35	1.40	7.43	5.01	10.26	7.81	15.50	2.60	2.79	

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.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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