

1. General description

Dual Silicon Carbide Schottky diode in a TO247 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

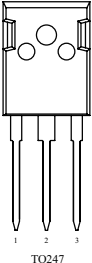
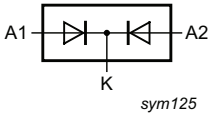
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V _{RRM}	repetitive peak reverse voltage			1200			V
I _F	continuous forward current	T _{mb} ≤ 136 °C; DC; both diodes		80			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 = 40 A; T _j = 25 °C; per diode; Fig. 5		-	1.42	1.60	V
		I _F = 40 A; T _j = 150 °C; per diode; Fig. 5		-	1.90	2.30	V
Dynamic characteristics							
Q _r	recovered charge	I _F = 40 A; dI _F /dt = 500 A/μs; V _R = 400 V; T _j = 25 °C; per diode; Fig. 7		-	99	-	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	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
WNSC2D801200CW	TO247	WNSC2D801200CW6Q	Tube	30	TO247P	09-Mar-2023

7. Marking

Table 4. Marking codes

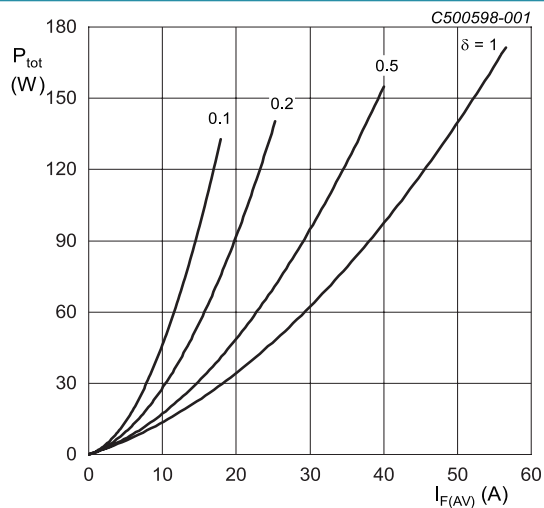
Type number	Marking codes
WNSC2D801200CW	WNSC2D 801200CW

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	$T_{mb} \leq 136\text{ °C}$; DC; both diodes		80	A
		$T_{mb} \leq 125\text{ °C}$; DC; both diodes		93	A
		$T_{mb} \leq 25\text{ °C}$; DC; both diodes		178	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 125\text{ °C}$; square-wave pulse; per diode		71	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ °C}$; sine-wave pulse; per diode		350	A
		$t_p = 10\text{ }\mu\text{s}$; $T_{j(\text{init})} = 25\text{ °C}$; square-wave pulse; per diode		2100	A
I^2t	I^2t for fusing	$t_p = 10\text{ ms}$; SIN		613	A ² s
T_{stg}	storage temperature			-55 to 175	°C
T_j	junction temperature			-55 to 175	°C



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

$$V_o = 0.995\text{ V}; R_s = 0.0360\text{ }\Omega$$

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

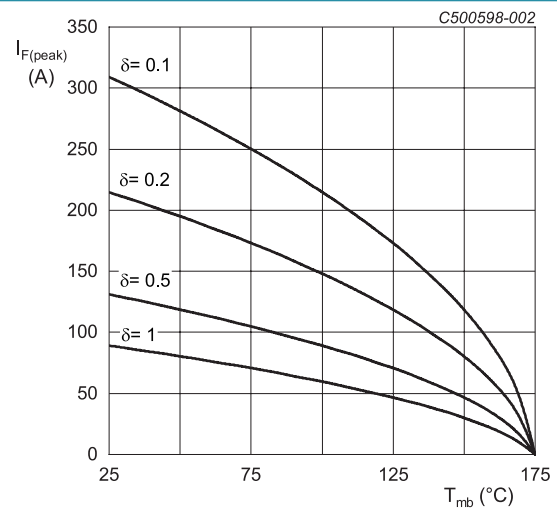


Fig. 2. Current derating as a function of mounting base temperature

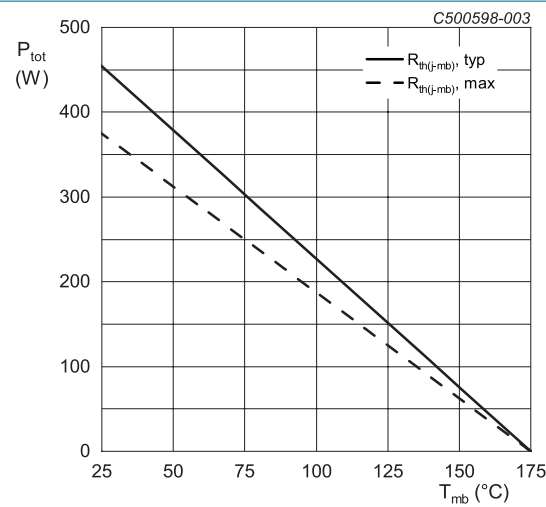


Fig. 3. Total power dissipation as a function of mounting base temperature

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; Fig. 4		-	0.33	0.4	K/W
		both diodes conducting		-	0.23	0.28	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	40	-	K/W

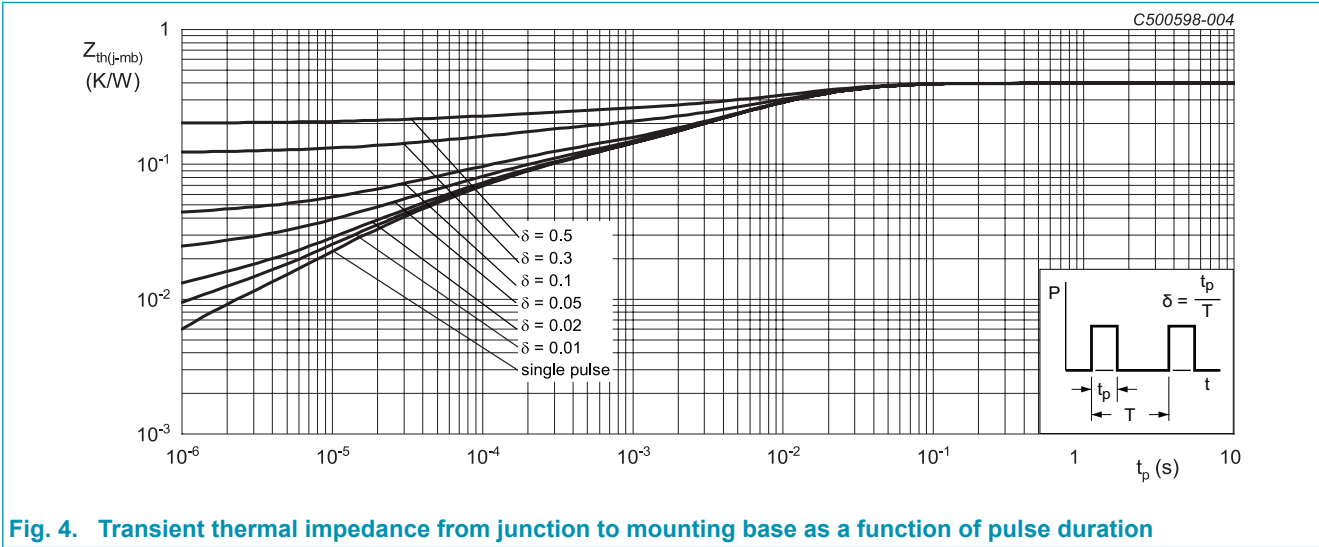
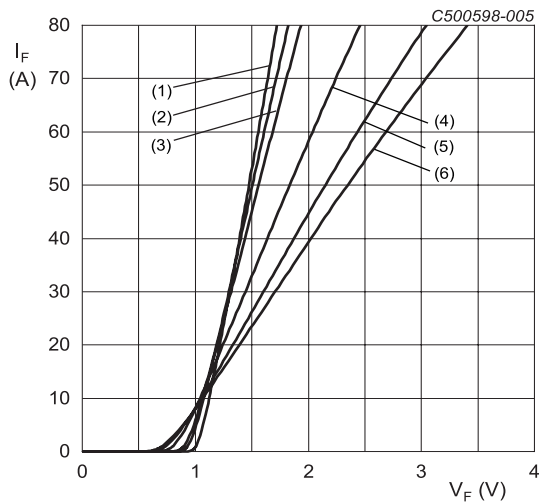


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 40 A; T _J = 25 °C; per diode; Fig. 5		-	1.42	1.60	V
		I _F = 40 A; T _J = 150 °C; per diode; Fig. 5		-	1.90	2.30	V
		I _F = 40 A; T _J = 175 °C; per diode; Fig. 5		-	2.00	2.50	V
I _R	reverse current	V _R = 1200 V; T _J = 25 °C; per diode; Fig. 6		-	1	200	μA
		V _R = 1200 V; T _J = 175 °C; per diode; Fig. 6		-	50	-	μA
Dynamic characteristics							
Q _r	recovered charge	I _F = 40 A; V _R = 400 V; dI _F /dt = 500 A/μs; T _J = 25 °C; per diode; Fig. 7		-	99	-	nC
C _d	diode capacitance	f = 1 MHz; V _R = 1 V; T _J = 25 °C; per diode		-	2068	-	pF
		f = 1 MHz; V _R = 400 V; T _J = 25 °C; per diode		-	175	-	pF
		f = 1 MHz; V _R = 800 V; T _J = 25 °C; per diode		-	126	-	pF
E _{as}	non-repetitive avalanche energy	I _R = 10 A; L = 10 mH; T _J (init) = 25 °C; per diode		465	-	-	mJ



$V_o = 0.995\text{ V}$; $R_s = 0.0360\text{ }\Omega$
 (1) $T_J = -55\text{ °C}$; typical values
 (2) $T_J = 0\text{ °C}$; typical values
 (3) $T_J = 25\text{ °C}$; typical values
 (4) $T_J = 100\text{ °C}$; typical values
 (5) $T_J = 150\text{ °C}$; typical values
 (6) $T_J = 175\text{ °C}$; typical values

Fig. 5. Forward current as a function of forward voltage; typical values

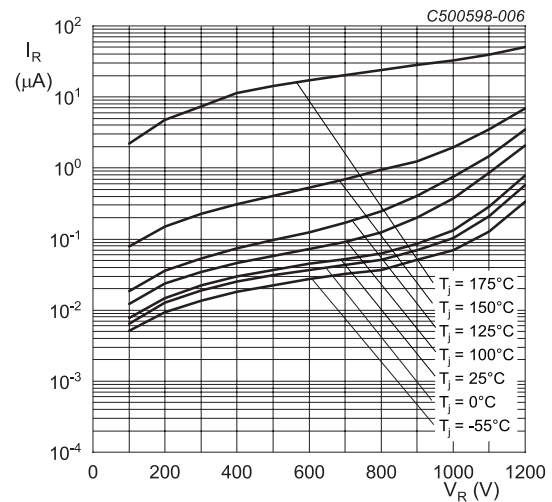


Fig. 6. Reverse leakage current as a function of reverse voltage; typical value

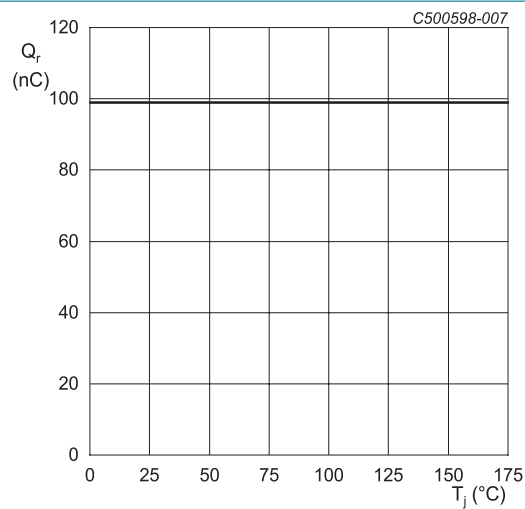
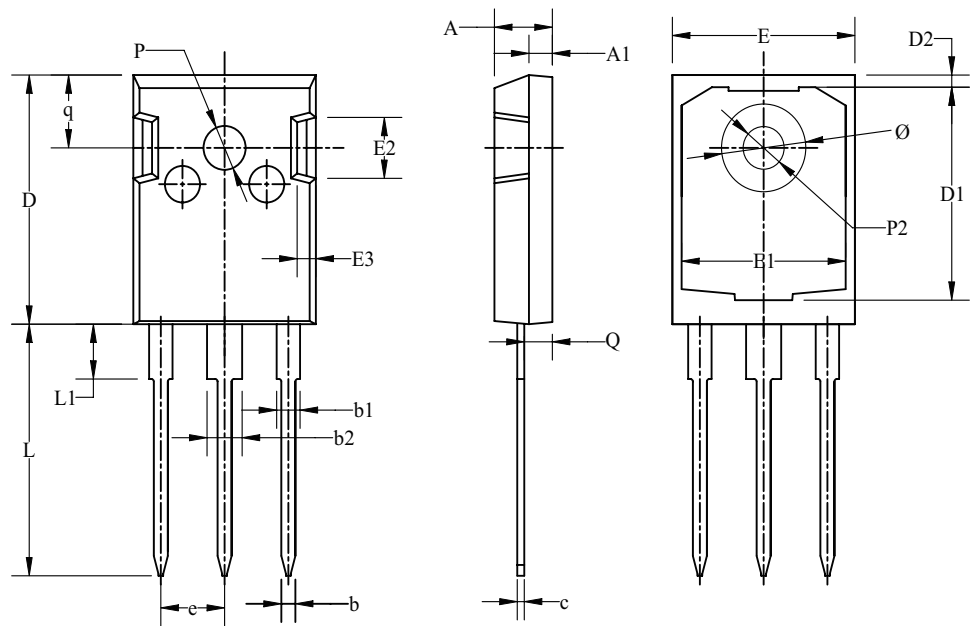


Fig. 7. Recovered charge as a function of junction temperature

11. Package outline

Plastic single-ended through-hole package; headsink mounted; 1 mounting hole; 3 leads TO-247

TO247



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
b2	2.80	3.00	3.20
c	0.50	0.60	0.70
D	20.30	20.45	20.60
D1	17.28	17.48	17.68
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	5.45 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.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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