WN3S40200CWT

Dual power Schottky diode

Rev.01 - 12 July 2024 Product data sheet

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO247 plastic package

2. Features and benefits

- High junction temperature up to 175°C
- Low forward voltage drop, negligible switching losses
- High efficiency

3. Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode
- Switched mode power supply rectifier

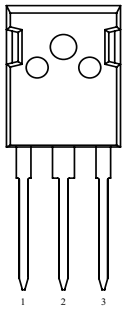
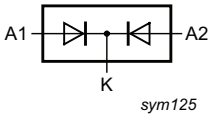
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage			200			V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		20			A
$I_{O(AV)}$	average output current	δ = 0.5 ; square-wave pulse; both diodes conducting		40			A
Symbol	**Parameter**	**Conditions**	**Notes**	**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 20 A; T_j = 25 °C; per diode; Fig. 6		-	0.85	0.92	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C; per diode; Fig. 7		-	0.1	5	µA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TO247	 sym125
2	K	cathode		
3	A2	anode 2		
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
WN3S40200CWT	TO247	WN3S40200CWTQ	Tube	30	TO247P	09-Mar-2023

7. Marking

Table 4. Marking codes

Type number	Marking codes
WN3S40200CWT	WN3S40 200CWT

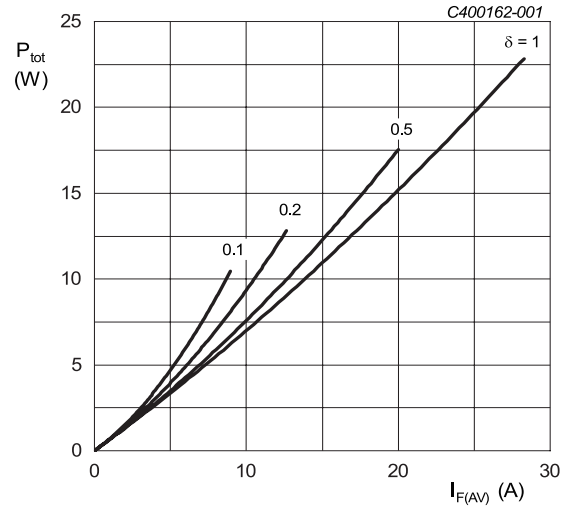
8. Limiting values

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			200	V
V_{RWM}	crest working reverse voltage			200	V
V_R	reverse voltage	DC		200	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		20	A
$I_{O(AV)}$	average output current	δ = 0.5 ; square-wave pulse; both diodes conducting		40	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		360	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode		396	A
T_{stg}	storage temperature			-40 to 175	°C
T_j	junction temperature		[1]	-40 to 175	°C

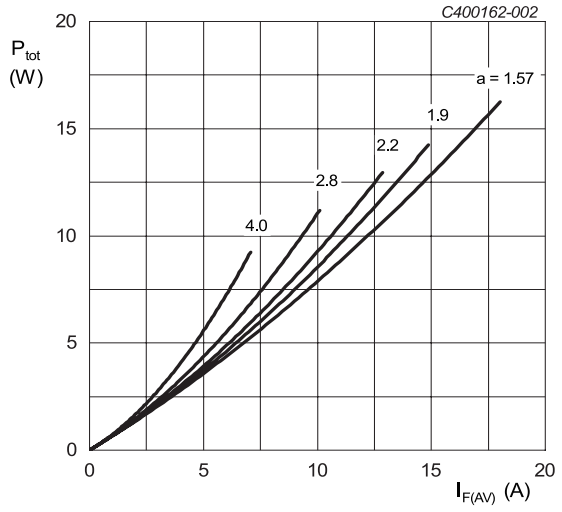
[1] The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_{tot}/dT_j < 1/R_{th(j-a)}$



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

V_o = 0.641 V; R_s = 0.0059 Ω

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



a = form factor = $I_{F(RMS)} / I_{F(AV)}$

V_o = 0.641 V; R_s = 0.0059 Ω

Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values; per diode

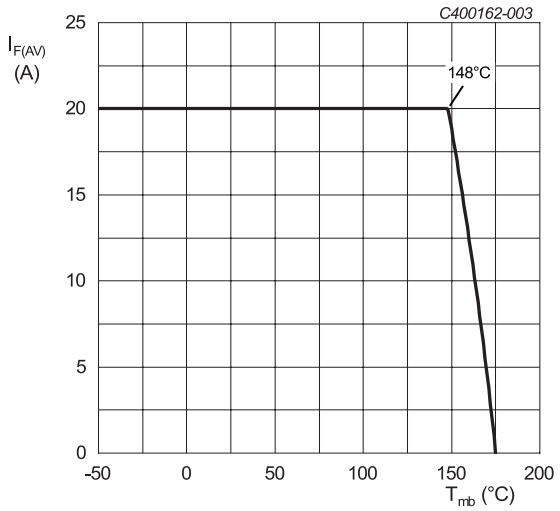


Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

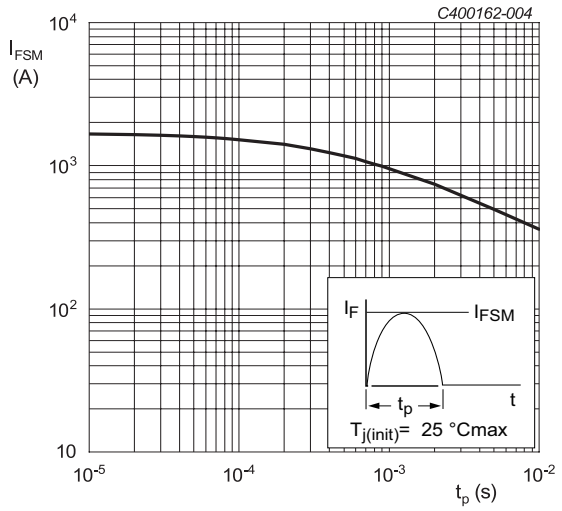


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-h)}$	thermal resistance from junction to heatsink	with heatsink compound; per diode; Fig. 5		-	-	1.54	K/W
		with heatsink compound; both diodes conducting		-	-	0.78	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	40	-	K/W

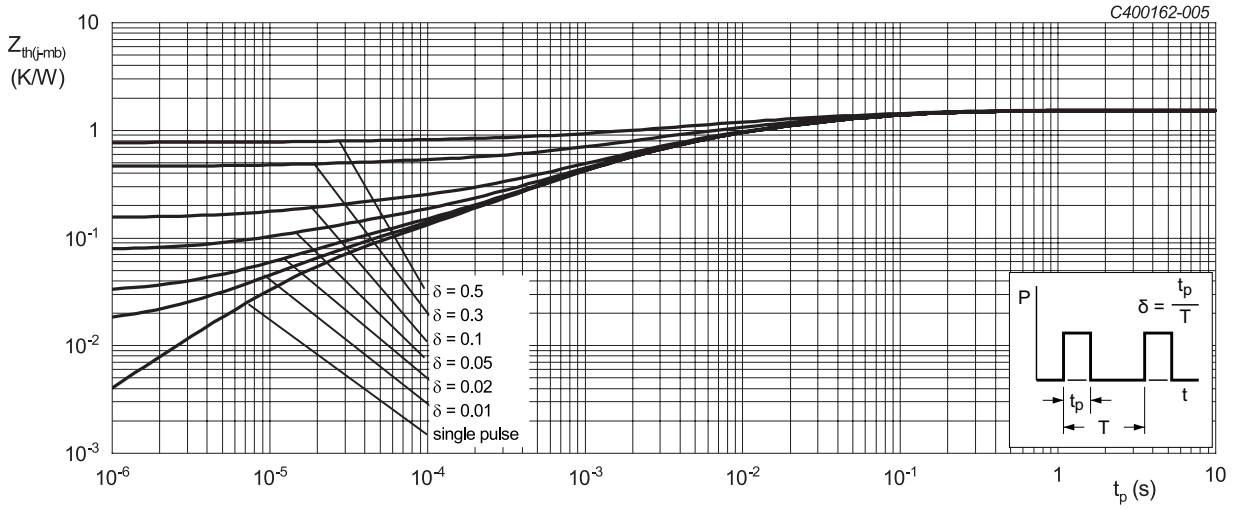
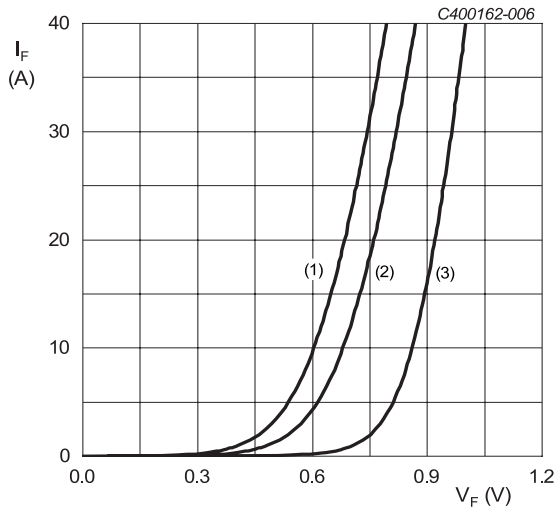


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; maximum values; per diode

10. Characteristics

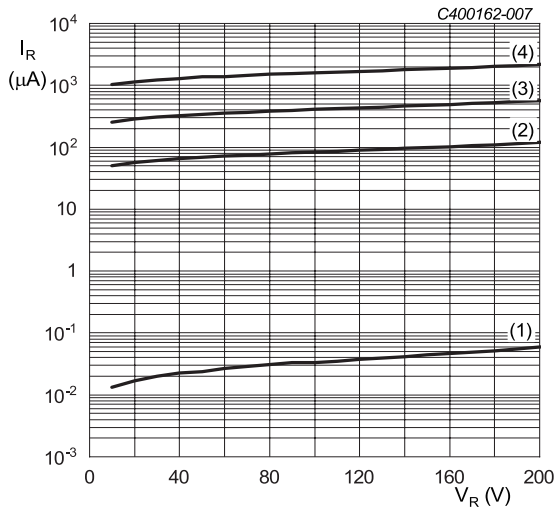
Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 20 A; T_j = 25 °C; per diode; Fig. 6		-	0.85	0.92	V
		I_F = 20 A; T_j = 125 °C; per diode		-	0.74	-	V
		I_F = 20 A; T_j = 175 °C; per diode; Fig. 6		-	0.69	0.76	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C; per diode; Fig. 7		-	0.1	5	µA
		V_R = 200 V; T_j = 125 °C; per diode; Fig. 7		-	0.2	-	mA



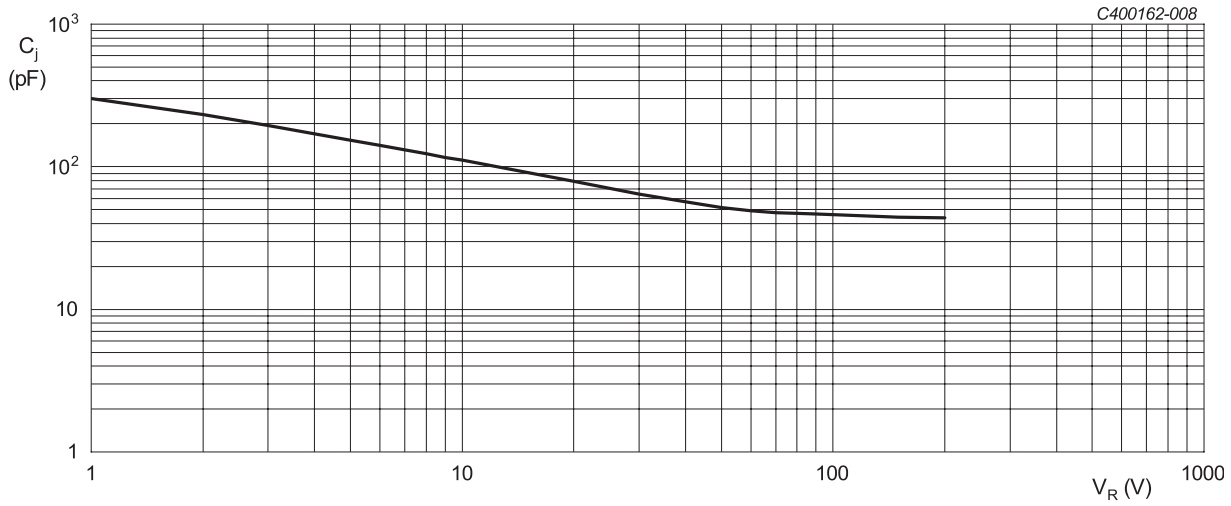
V_o = 0.641 V; R_s = 0.0059 Ω
(1) T_j = 175 °C; typical values
(2) T_j = 175 °C; maximum values
(3) T_j = 25 °C; maximum values

Fig. 6. Forward current as a function of forward voltage; per diode



(1) T_j = 25 °C; typical values
(2) T_j = 125 °C; typical values
(3) T_j = 150 °C; typical values
(4) T_j = 175 °C; typical values

Fig. 7. Reverse leakage current as a function of reverse voltage; per diode; typical values

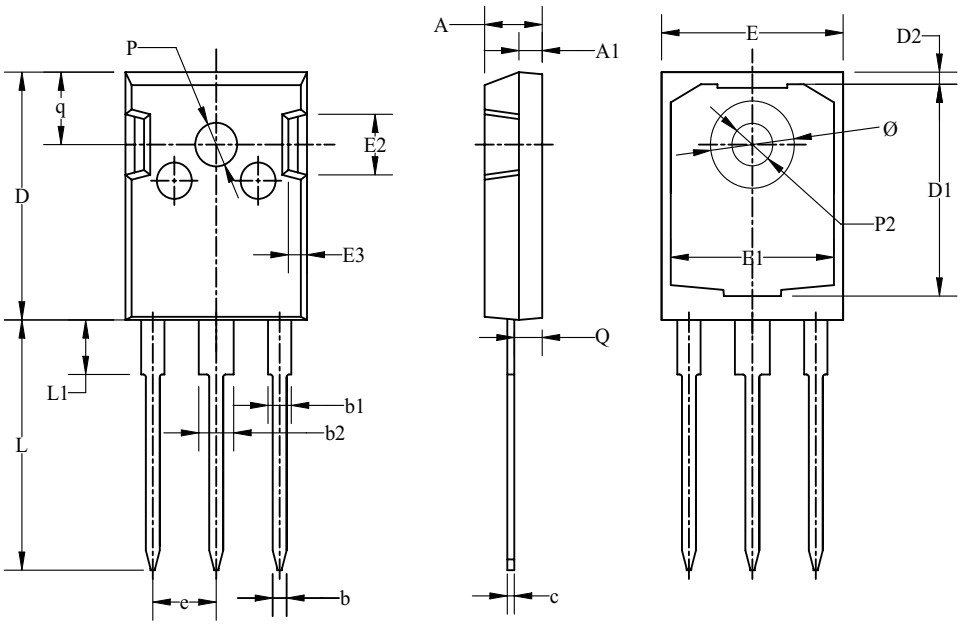


f = 1 MHz; T_j = 25 °C

Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

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

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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.
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Date of release: 12 July 2024

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