

## 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

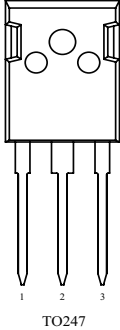
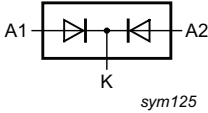
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V <sub>RRM</sub>	repetitive peak reverse voltage			170			V
I <sub>F(AV)</sub>	average forward current	δ = 0.5 ; square-wave pulse; per diode; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>		30			A
I <sub>O(AV)</sub>	average output current	δ = 0.5 ; square-wave pulse; both diodes conducting		60			A
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30 A; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 6</a>		-	0.83	0.89	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 170 V; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>		-	0.2	10	μA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		
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
WN3S61170CWT	TO247	WN3S61170CWTQ	Tube	30	TO247P	09-Mar-2023

7. Marking

Table 4. Marking codes

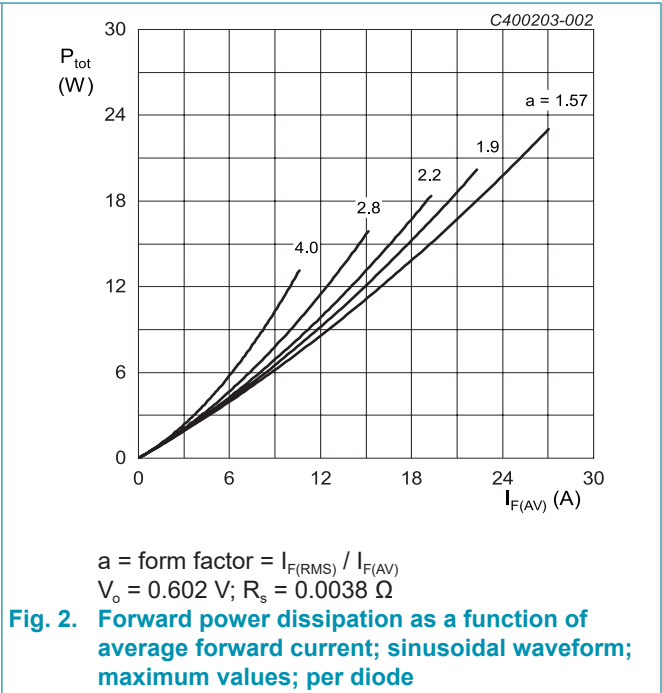
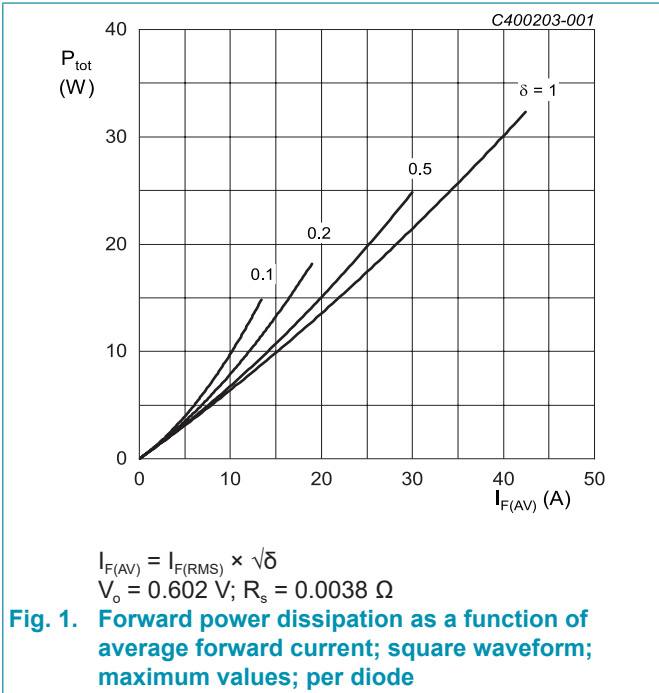
Type number	Marking codes
WN3S61170CWT	WN3S61 170CWT

8. Limiting values

Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Notes	Values	Unit
V <sub>RRM</sub>	repetitive peak reverse voltage			170	V
V <sub>RWM</sub>	crest working reverse voltage			170	V
V <sub>R</sub>	reverse voltage	DC		170	V
I <sub>F(AV)</sub>	average forward current	δ = 0.5 ; square-wave pulse; per diode; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>		30	A
I <sub>O(AV)</sub>	average output current	δ = 0.5 ; square-wave pulse; both diodes conducting		60	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 10 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse; per diode; <a href="#">Fig. 4</a>		500	A
		t <sub>p</sub> = 8.3 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse; per diode		550	A
T <sub>stg</sub>	storage temperature			-40 to 175	°C
T <sub>j</sub>	junction temperature		<a href="#">[1]</a>	-40 to 175	°C

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



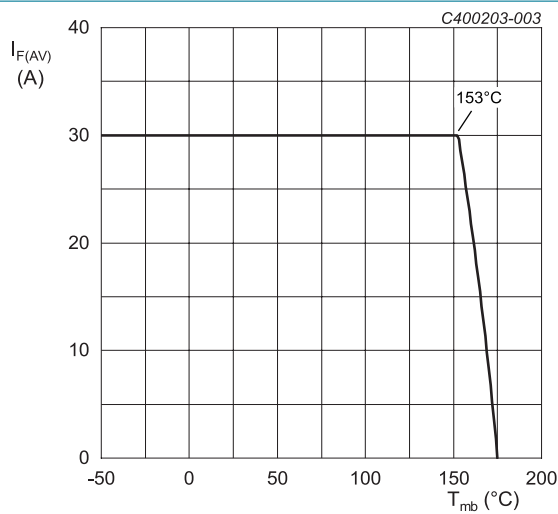


Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

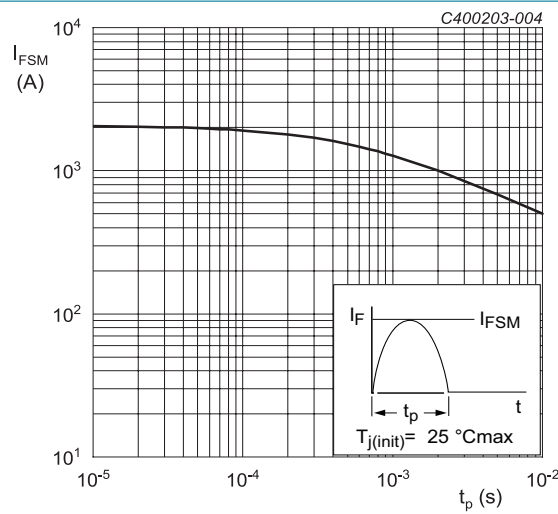


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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; <a href="#">Fig. 5</a>		-	-	0.9	K/W
		with heatsink compound; both diodes conducting		-	-	0.6	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	40	-	K/W

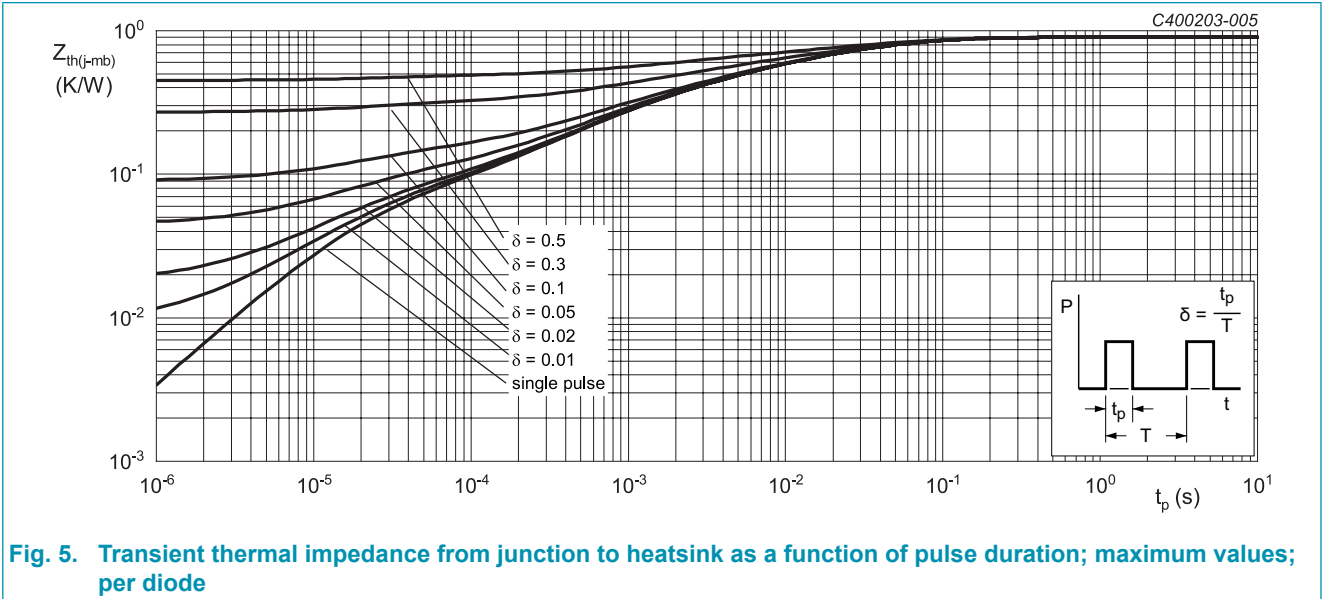
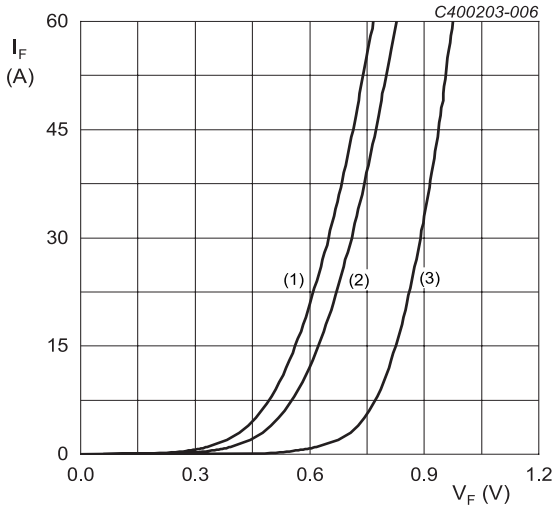


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; maximum values; per diode

10. Characteristics

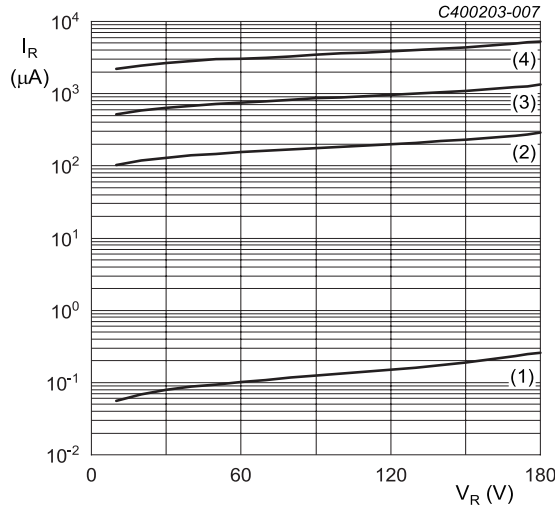
Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30 A; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 6</a>		-	0.83	0.89	V
		I <sub>F</sub> = 30 A; T <sub>j</sub> = 125 °C; per diode		-	0.71	-	V
		I <sub>F</sub> = 30 A; T <sub>j</sub> = 175 °C; per diode; <a href="#">Fig. 6</a>		-	0.65	0.71	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 170 V; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>		-	0.2	10	μA
		V <sub>R</sub> = 170 V; T <sub>j</sub> = 125 °C; per diode; <a href="#">Fig. 7</a>		-	0.3	-	mA



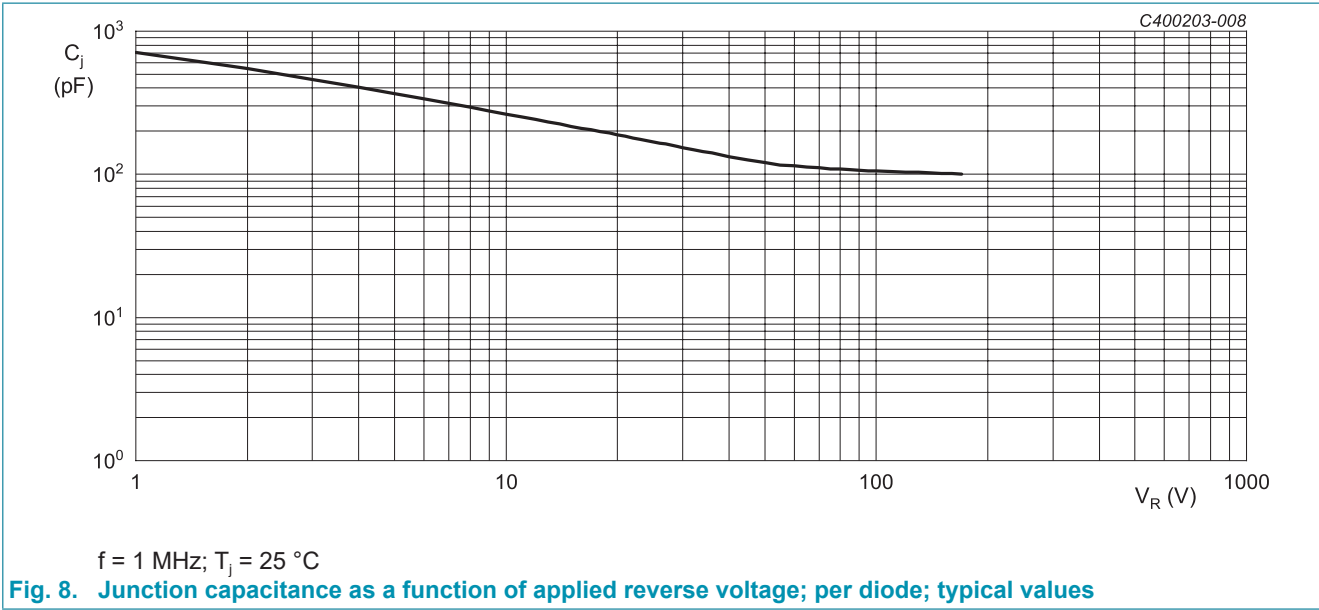
V<sub>o</sub> = 0.602 V; R<sub>s</sub> = 0.0038 Ω  
(1) T<sub>j</sub> = 175 °C; typical values  
(2) T<sub>j</sub> = 175 °C; maximum values  
(3) T<sub>j</sub> = 25 °C; maximum values

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



(1) T<sub>j</sub> = 25 °C; typical values  
(2) T<sub>j</sub> = 125 °C; typical values  
(3) T<sub>j</sub> = 150 °C; typical values  
(4) T<sub>j</sub> = 175 °C; typical values

Fig. 7. Reverse leakage current as a function of 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

The technical drawing illustrates the TO247 package outline from three perspectives: top, side, and front. The top view shows a rectangular body with a central circular mounting hole of diameter Ø. Three leads extend from the bottom, with dimensions E1, E2, and E3 indicating lead widths and E indicating the total lead width. The side view shows the package height D and lead length L. The front view shows the lead spacing e and lead widths b, b1, and b2. Other dimensions include A and A1 for the body width, P and P2 for the mounting hole diameter, Q for the lead thickness, and D1 and D2 for the body height.

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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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For sales office addresses, please send an email to: [salesaddresses@ween-semi.com](mailto:salesaddresses@ween-semi.com)

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