WN3S3045C

Dual power Schottky diode

Rev.01 - 08 July 2022 Product data sheet

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO220 plastic package.

2. Features and benefits

- Trench structure
- High junction temperature up to 150 °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

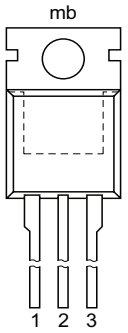
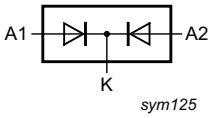
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage			45			V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 124$ °C; per diode; Fig. 1; Fig. 2; Fig. 3		15			A
$I_{O(AV)}$	average output current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 125$ °C; both diodes conducting		30			A
Symbol	**Parameter**	**Conditions**	**Notes**	**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 15 A; T_j = 25 °C; per diode; Fig. 6		-	0.53	0.60	V
I_R	reverse current	V_R = 45 V; T_j = 25 °C; per diode; Fig. 7; Fig. 8		-	30	100	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
WN3S3045C	TO220	WN3S3045CQ	Tube	50	SOT78	13-Jun-2008

7. Marking

Table 4. Marking codes

Type number	Marking codes
WN3S3045C	WN3S30 45C

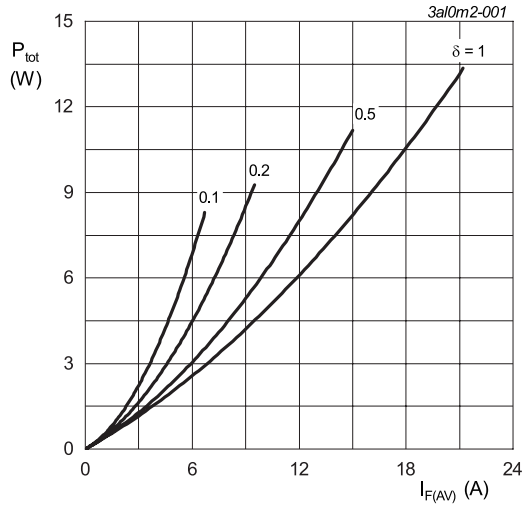
8. Limiting values

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			45	V
V_{RWM}	crest working reverse voltage			45	V
V_R	reverse voltage	DC		45	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 124$ °C; per diode; Fig. 1; Fig. 2; Fig. 3		15	A
$I_{O(AV)}$	average output current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 125$ °C; both diodes conducting		30	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		150	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode		165	A
T_{stg}	storage temperature			-40 to 150	°C
T_j	junction temperature		[1]	-40 to 150	°C

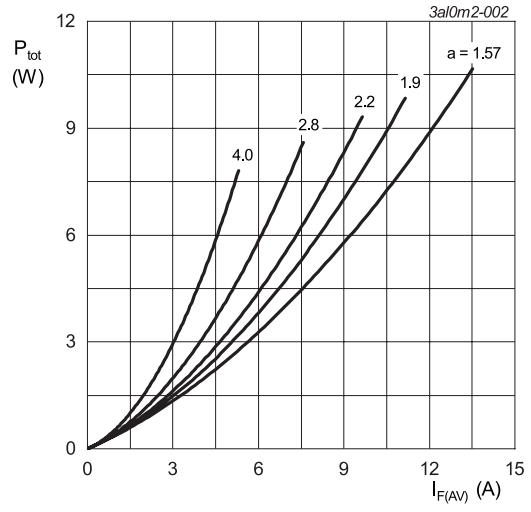
[1] The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_{tot}/dT_j < 1/R_{th(j-a)}$



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

V_o = 0.349 V; R_s = 0.0132 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 = 0.349 V; R_s = 0.0132 Ω

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

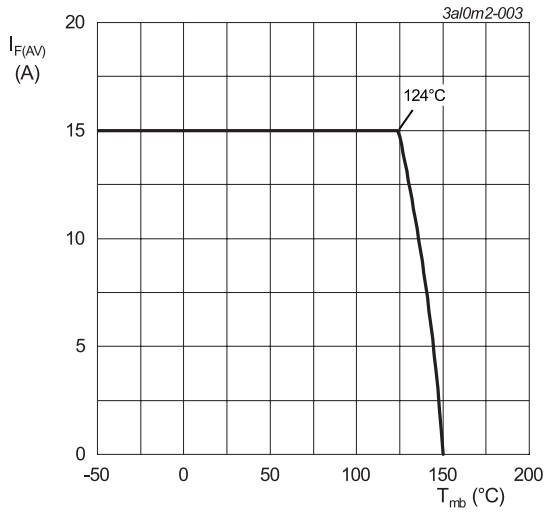


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

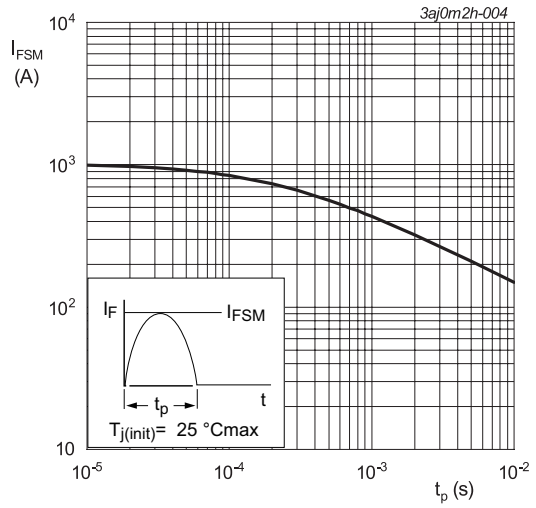


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; Fig. 5		-	-	2.3	K/W
		both diodes conducting		-	-	1.1	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	60	-	K/W

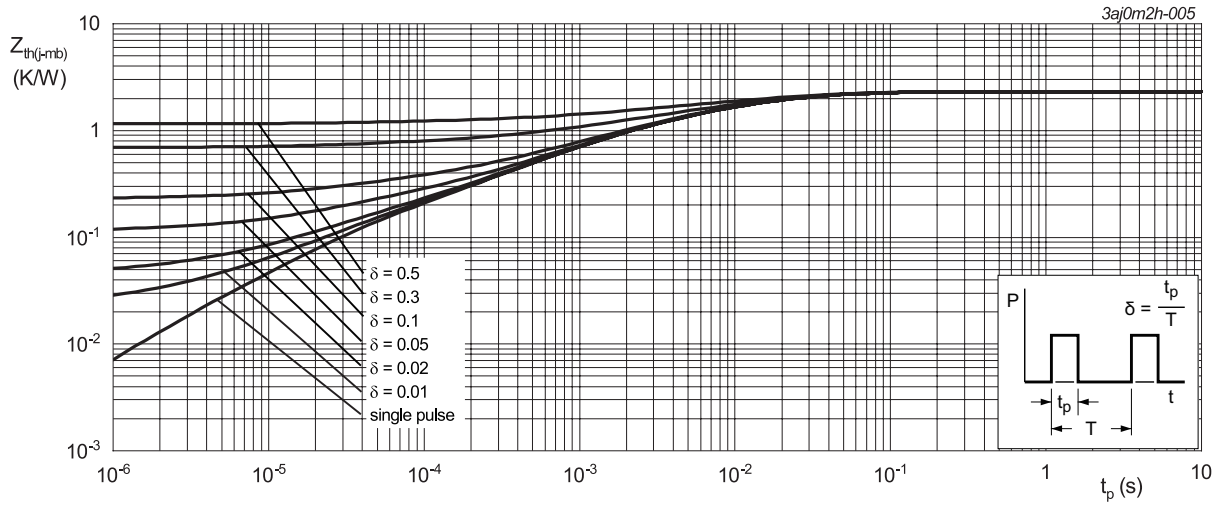
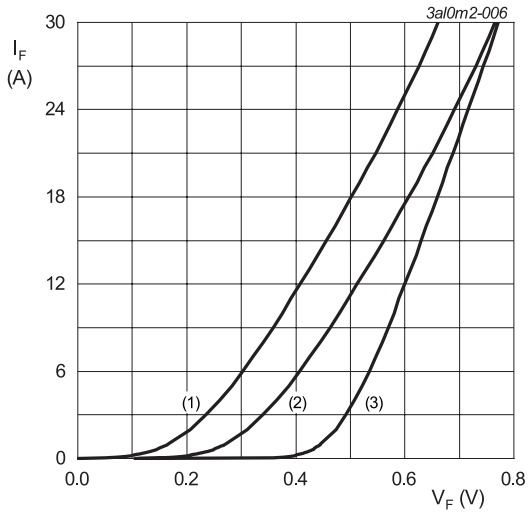


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values; per diode

10. Characteristics

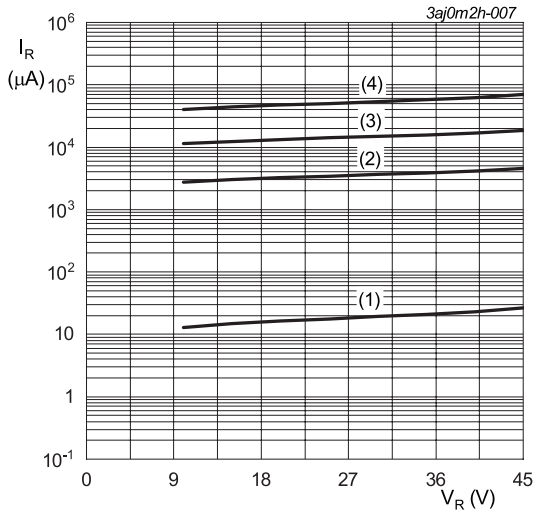
Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 15 A; T_j = 25 °C; per diode; Fig. 6		-	0.53	0.60	V
		I_F = 15 A; T_j = 125 °C; per diode; Fig. 6		-	0.48	-	V
		I_F = 5 A; T_j = 25 °C; per diode; Fig. 6		-	0.43	-	V
		I_F = 5 A; T_j = 125 °C; per diode; Fig. 6		-	0.33	-	V
I_R	reverse current	V_R = 45 V; T_j = 25 °C; per diode; Fig. 7; Fig. 8		-	30	100	µA
		V_R = 45 V; T_j = 125 °C; per diode; Fig. 7; Fig. 8		-	20	75	mA



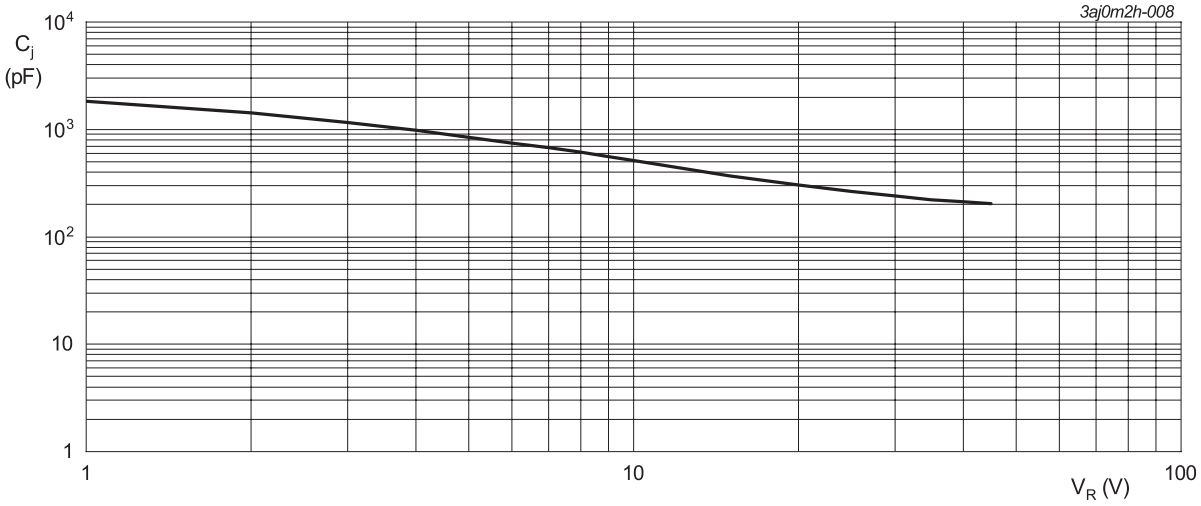
V_o = 0.349 V; R_s = 0.0132 Ω
(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

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



(1) T_j = 25 °C; typical values
(2) T_j = 100 °C; typical values
(3) T_j = 125 °C; typical values
(4) T_j = 150 °C; typical values

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

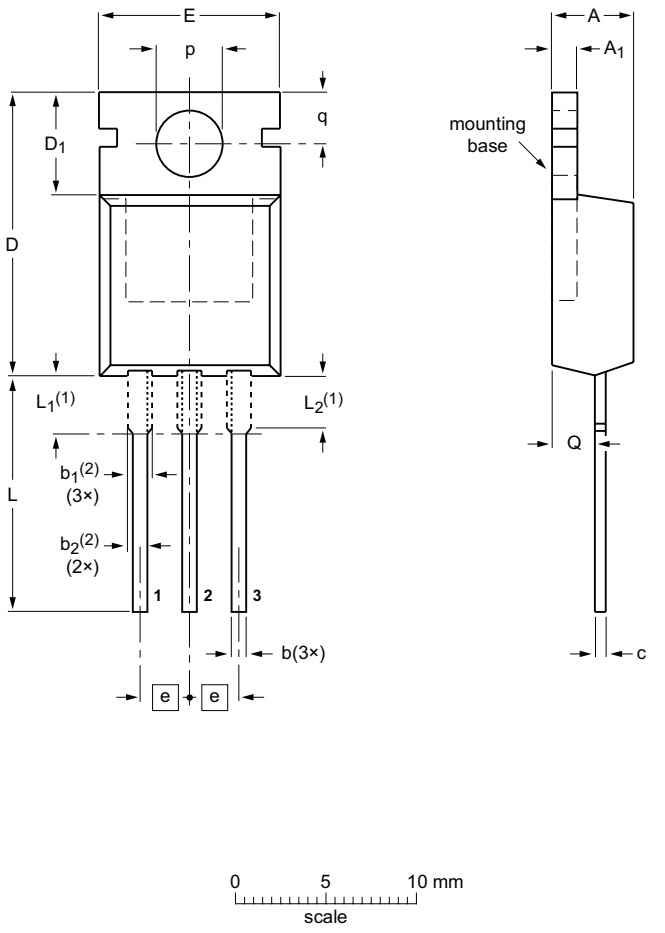


f = 1 MHz; T_j = 25 °C

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

11. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB **SOT78**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	b_1(2)	b_2(2)	c	D	D_1	E	e	L	L_1(1)	L_2(1) max.	p	q	Q
mm	4.7 4.1	1.40 1.25	0.9 0.6	1.6 1.0	1.3 1.0	0.7 0.4	16.0 15.2	6.6 5.9	10.3 9.7	2.54	15.0 12.8	3.30 2.79	3.0	3.8 3.5	3.0 2.7	2.6 2.2

Notes

1. Lead shoulder designs may vary.
2. Dimension includes excess dambar.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT78		3-lead TO-220AB	SC-46			~~08-04-23~~ 08-06-13

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.
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