WNS40H100C

Dual power Schottky diode

27 August 2018 Product data sheet

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO-220 plastic package.

2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- High efficiency
- Low forward voltage drop, negligible switching losses

3. Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode

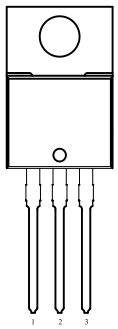
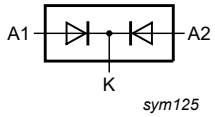
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	100	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; T_{mb} ≤ 133 °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		-	-	20	A
$I_{O(AV)}$	average output current	δ = 0.5 ; T_{mb} ≤ 130 °C; square-wave pulse; both diodes conducting		-	-	40	A
Static characteristics							
V_F	forward voltage	I_F = 10 A; T_j = 25 °C; Fig. 6; per diode		-	0.53	0.59	V
		I_F = 10 A; T_j = 125 °C; Fig. 6; per diode		-	0.49	0.56	V
		I_F = 20 A; T_j = 25 °C; Fig. 6; per diode		-	0.64	0.71	V
		I_F = 20 A; T_j = 125 °C; Fig. 6; per diode		-	0.61	0.68	V
I_R	reverse current	V_R = 100 V; T_j = 25 °C; Fig. 7; Fig. 8; per diode		-	-	50	μA
		V_R = 100 V; T_j = 125 °C; Fig. 7; Fig. 8; per diode		-	-	30	mA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TO-220E	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

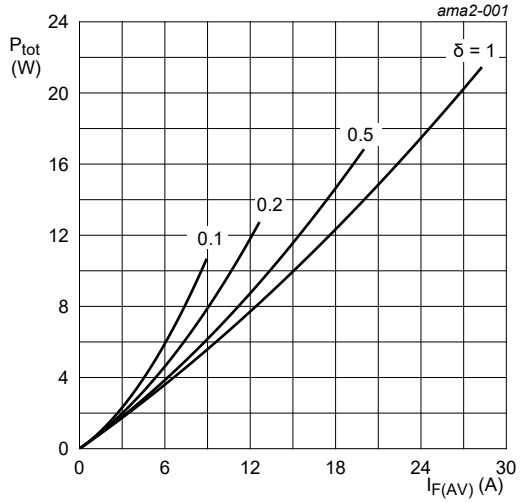
Type number	Package		
	Name	Description	Version
WNS40H100C	TO-220E	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	TO-220E

7. Limiting values

Table 4. Limiting values

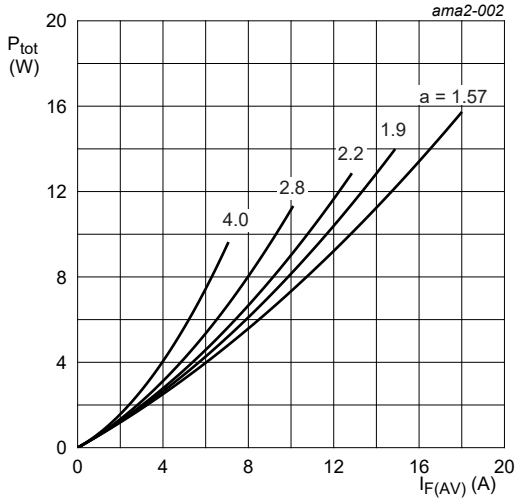
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	100	V
V_{RWM}	limiting crest working reverse voltage			-	100	V
V_R	limiting reverse voltage	DC		-	100	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_{mb} \leq 133$ °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		-	20	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 130$ °C; 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		-	380	A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode		-	418	A
T_{stg}	storage temperature			-40	150	°C
T_j	junction temperature			-	150	°C



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$
$V_o = 0.557$ V; $R_s = 0.0071$ Ω

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



a = form factor = $I_{F(RMS)} / I_{F(AV)}$
$V_o = 0.570$ V; $R_s = 0.0071$ Ω

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

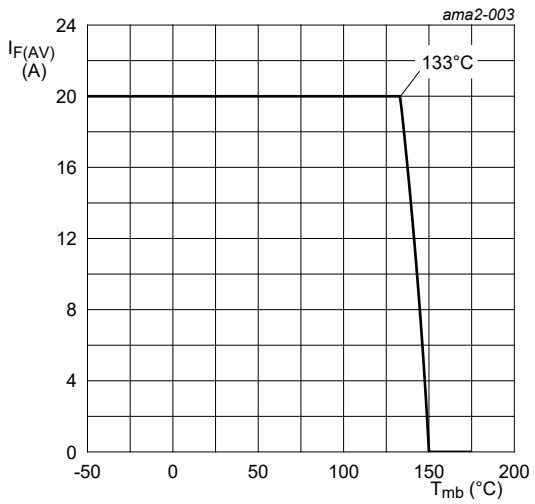


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

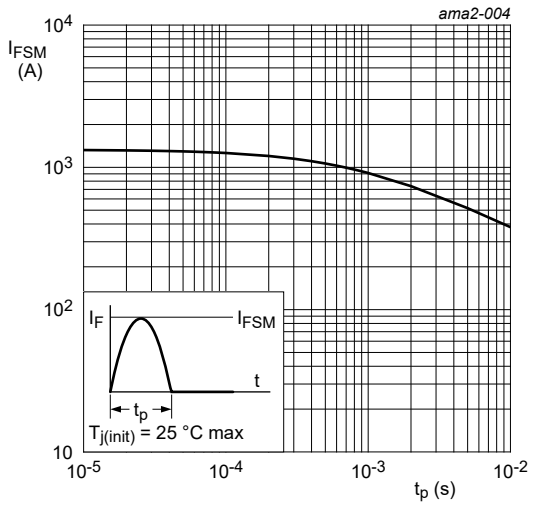


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; Fig. 5		-	-	1	K/W
		both diodes conducting		-	-	0.6	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	60	-	K/W

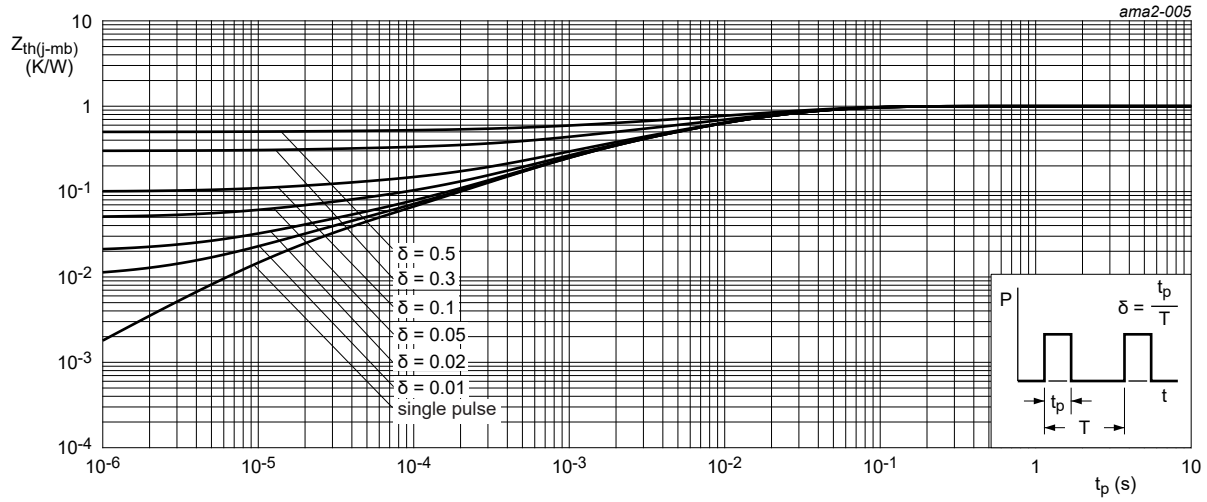
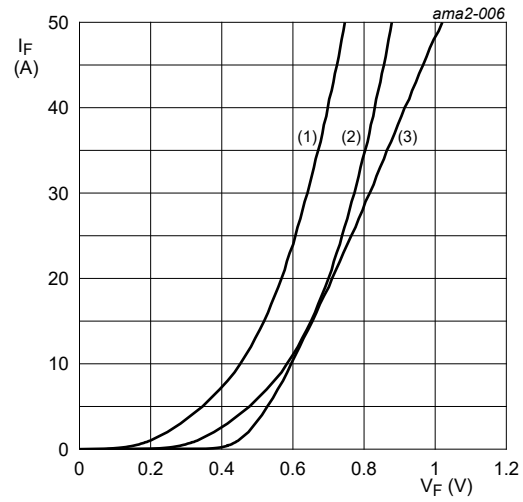


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values; per diode

9. Characteristics

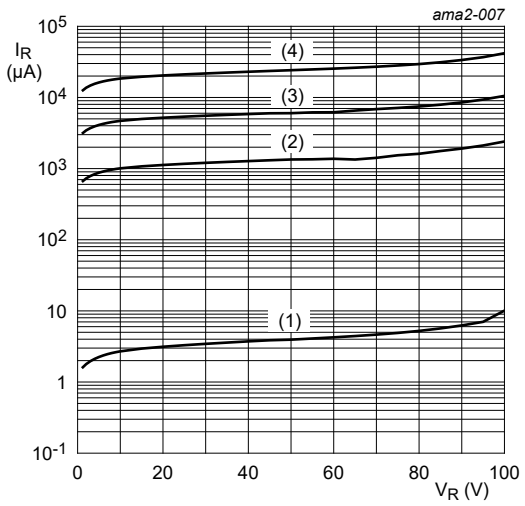
Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 10 A; T_j = 25 °C; Fig. 6; per diode		-	0.53	0.59	V
		I_F = 10 A; T_j = 125 °C; Fig. 6; per diode		-	0.49	0.56	V
		I_F = 20 A; T_j = 25 °C; Fig. 6; per diode		-	0.64	0.71	V
		I_F = 20 A; T_j = 125 °C; Fig. 6; per diode		-	0.61	0.68	V
I_R	reverse current	V_R = 100 V; T_j = 25 °C; Fig. 7; Fig. 8; per diode		-	-	50	µA
		V_R = 100 V; T_j = 125 °C; Fig. 7; Fig. 8; per diode		-	-	30	mA



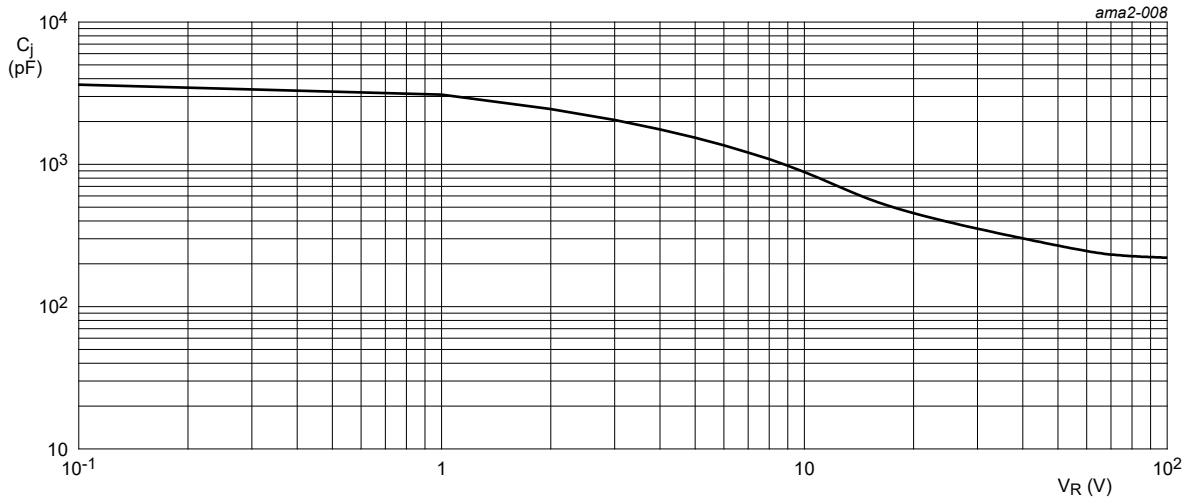
V_o = 0.557 V; R_s = 0.0071 Ω
(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

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

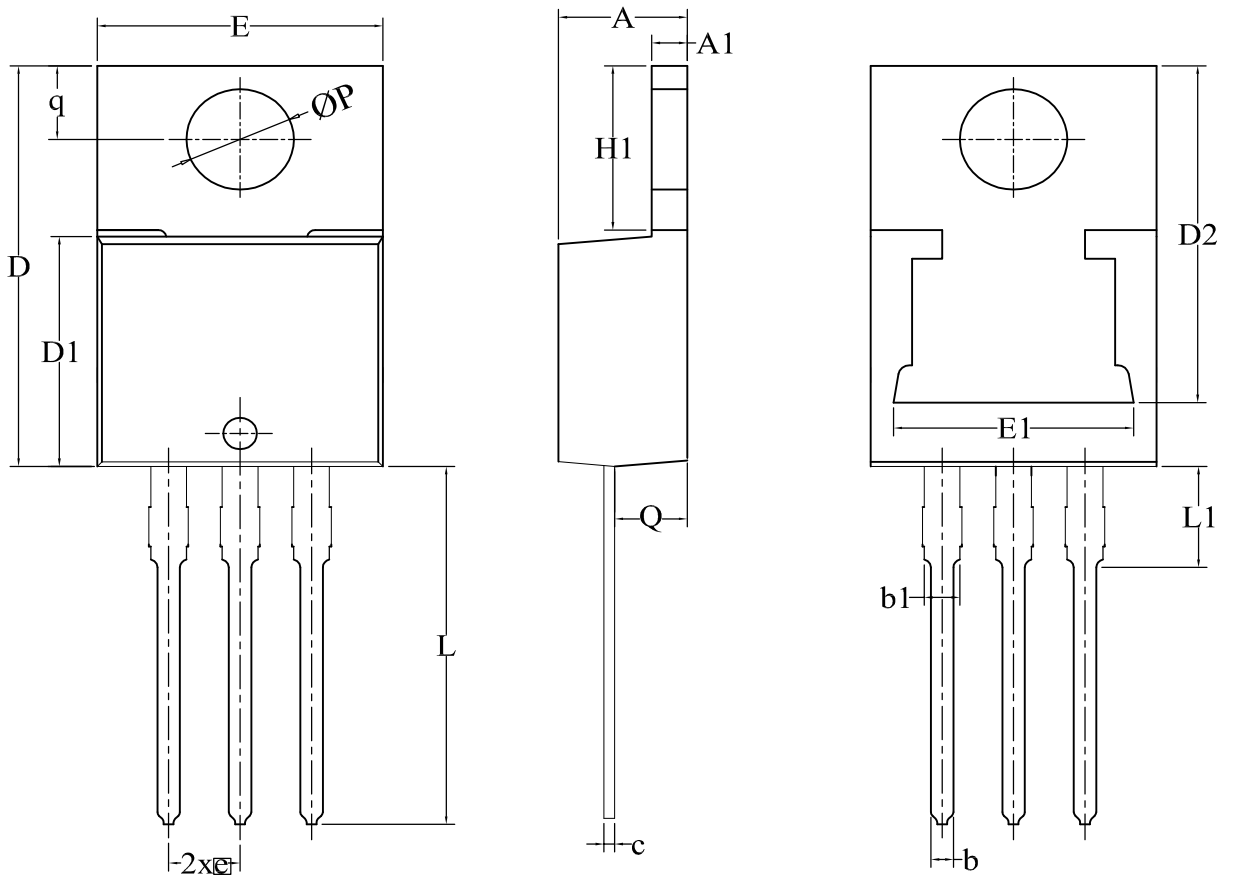


f = 1 MHz; T_j = 25 °C

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

10. Package outline

Plastic single-ended package;heatsink mounted;1 mounting hole; 3 leads TO-220AB TO220



Unit		A	A1	b	b1	c	D	D1	D2	E	E1	e	H1	L	L1	P	Q	q
MM	min	4.35	1.14	0.69	1.08	0.36	14.95	8.50	12.20	10.00	8.25	2.54 (BSC)	6.00	13.00	3.40	3.70	2.40	2.60
	max	4.75	1.40	1.01	1.67	0.61	15.55	9.02	12.88	10.40	8.89		6.40	14.00	3.80	3.95	2.80	3.00

Fig. 9. Package outline TO-220E

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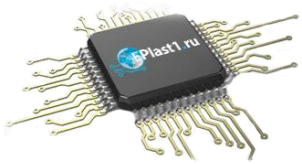

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