WND90P20W

Standard power diode

Rev.01 - 23 April 2025 Product data sheet

1. General description

Standard reverse recovery power diode in a TO247-2L package.

2. Features and benefits

- Low forward voltage drop
- Low leakage current
- High voltage capability
- High inrush current capability
- Package meets UL94V0 which guaranteed by Epoxy Mold Compound

3. Applications

- Input rectifier
- Bypass diode
- Off-board EV/HEV battery chargers

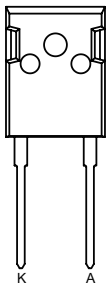
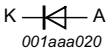
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values				Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage		2000				V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; T_{mb} ≤ 129 °C; Fig. 1; Fig. 2; Fig. 3	90				A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4	1440				A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse	1584				A
Symbol	**Parameter**	**Conditions**	**Notes**	**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 90 A; T_j = 25 °C; Fig. 6		-	1.07	1.15	V
		I_F = 90 A; T_j = 150 °C; Fig. 6		-	1.00	-	V

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 TO247-2L	 001aaa020
2	A	anode		
mb	mb	mounting base; connected to cathod		

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WND90P20W	TO247-2L	WND90P20WQ	Tube	30	TO247L-2L	12-Nov-2020

7. Marking

Table 4. Marking codes

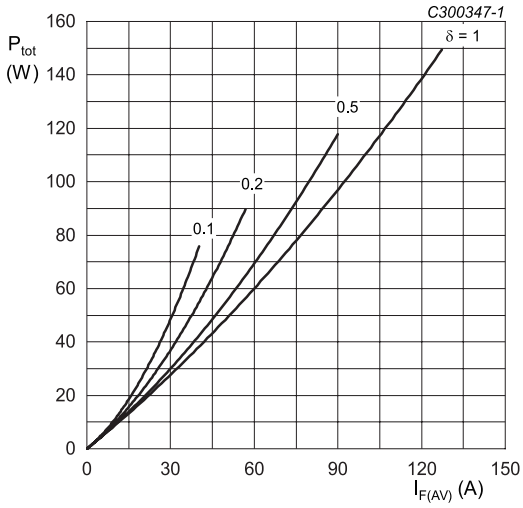
Type number	Marking codes
WND90P20W	D90P20 2000 PJLxxxx xx

8. Limiting values

Table 5. Limiting values

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

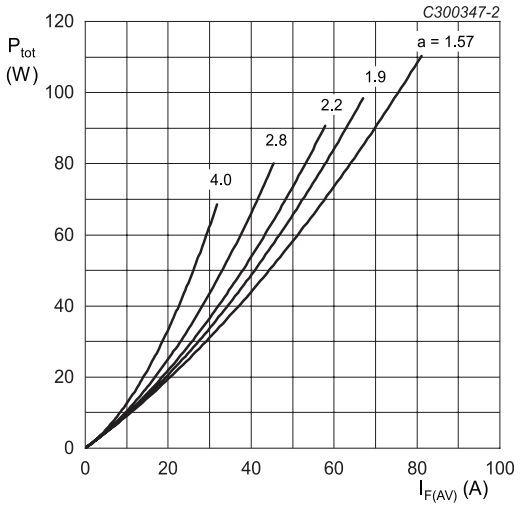
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		2000	V
V_{RWM}	crest working reverse voltage		2000	V
V_R	reverse voltage	DC	2000	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 129$ °C; Fig. 1; Fig. 2; Fig. 3	90	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4	1440	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse	1584	A
I^2t	I^2t for fusing	SIN; t_p = 10 ms	10368	A^2s
T_{stg}	storage temperature		-55 to 150	°C
T_j	junction temperature		-55 to 150	°C



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

V_o = 0.846 V; R_s = 0.0026 Ω

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



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

V_o = 0.846 V; R_s = 0.0026 Ω

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

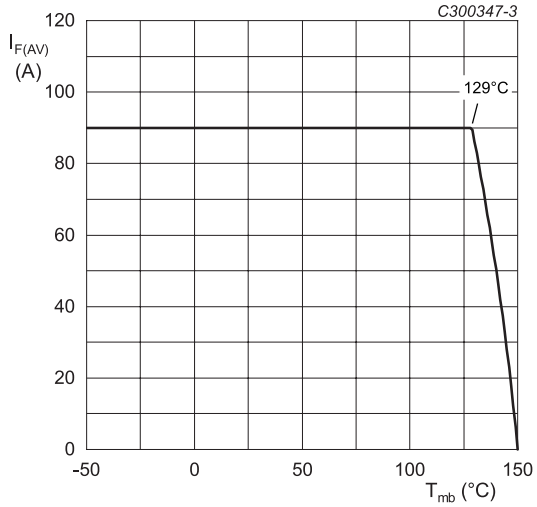


Fig. 3. Forward current as a function of mounting base temperature; maximum values

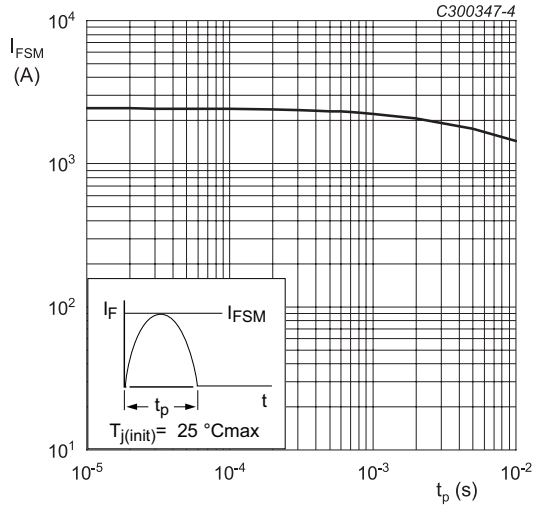


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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	Fig. 5		-	-	0.18	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	40	-	K/W

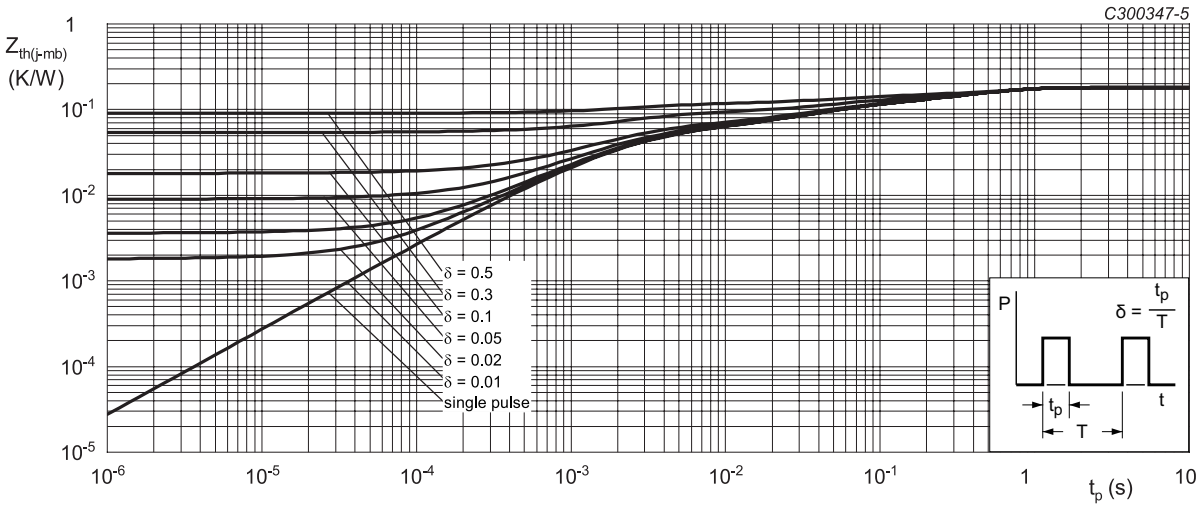
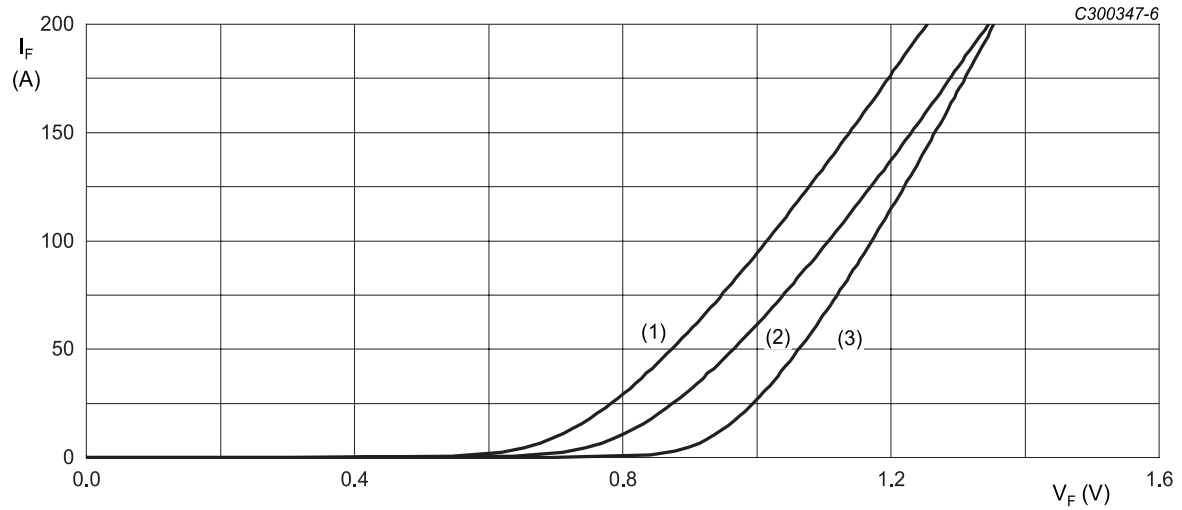


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward current	I_F = 90 A; T_j = 25 °C; Fig. 6		-	1.07	1.15	V
		I_F = 90 A; T_j = 150 °C; Fig. 6		-	1.00	-	V
I_R	reverse current	V_R = 2000 V; T_j = 25 °C		-	-	50	µA
		V_R = 2000 V; T_j = 150 °C		-	-	2	mA

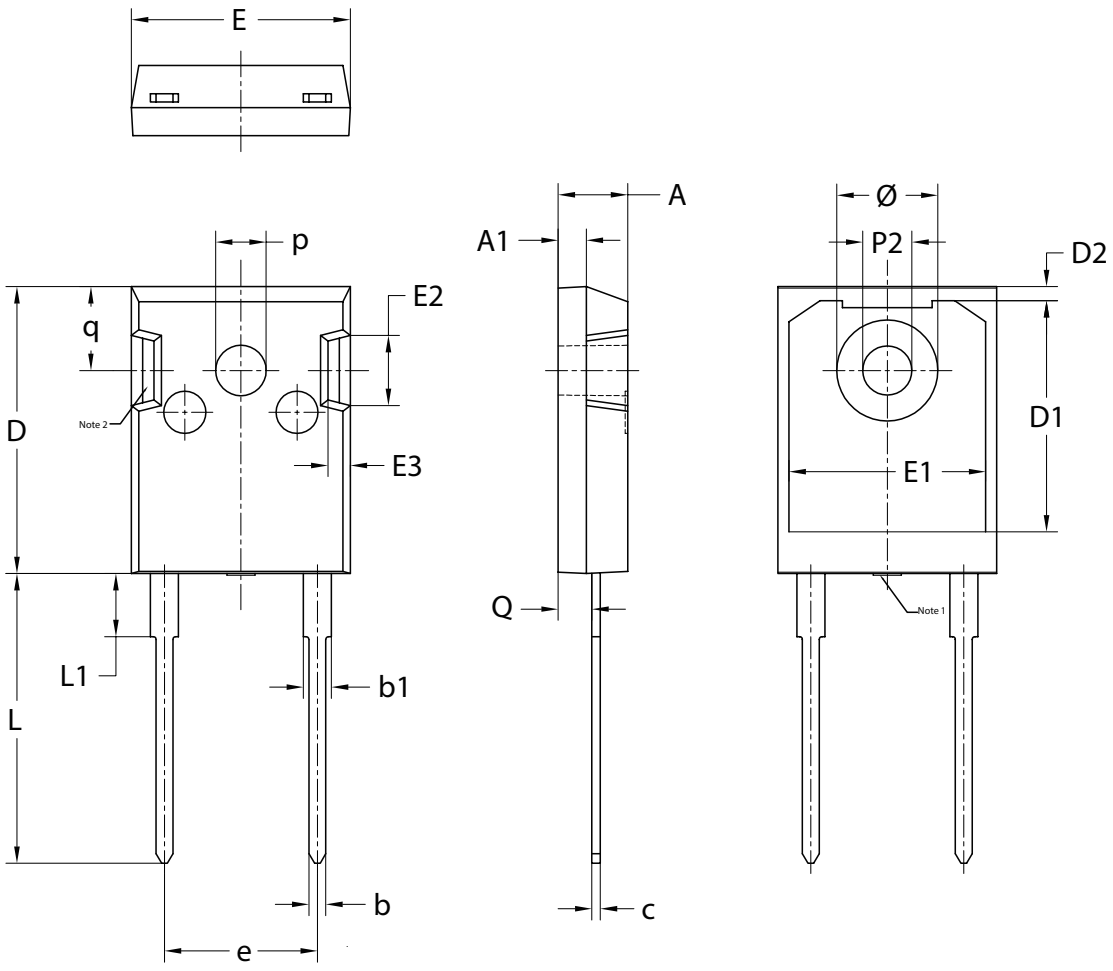


V_o = 0.846 V; R_s = 0.0026 Ω
(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

Fig. 6. Forward current as a function of forward voltage

11. Package outline

Plastic single-ended through-hole package; heatsink mounted;1 mounting hole; 2 leads TO-247 TO247-2L



UNIT	A	A_1	b	b_1	c	D	D_1 (2)	D_2	E	E_1	E_2	E_3	e	L	L_1	P_2	p	Q	q	Ø
mm	5.20 4.70	2.10 1.90	1.40 1.00	2.20 1.80	0.70 0.50	20.60 20.30	16.20 16.87	1.20 0.80	15.75 15.45	14.22 13.82	5.20 4.80	1.80 1.40	10.90 BSC	20.72 20.22	4.75 4.25	3.60 3.40	3.70 3.50	2.60 2.20	6.18 5.78	7.30 7.10

Note:
1. Mold resin protrusion max 0.127mm.
2. Metal exposed with Sn plating.

12. Legal information

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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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