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NUR460

Ultrafast power diode

Rev. 2 — 20 July 2011

Product data sheet

1. Product profile

1.1 General description

Ultrafast epitaxial power diode in a SOD141 (DO-201AD) axial lead plastic package.

1.2 Features and benefits

- Axial leaded plastic package
- Fast switching
- High voltage capability
- Low forward voltage drop
- Low thermal resistance
- Soft recovery characteristic

1.3 Applications

- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)
- High frequency switched-mode power supplies

1.4 Quick reference data

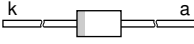

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	-	600	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; see Figure 1 ; see Figure 2	-	-	4	A
Static characteristics						
V_F	forward voltage	$I_F = 4$ A; $T_j = 25$ °C; see Figure 4	-	-	1.28	V
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $di_F/dt = 50$ A/ μ s; $T_j = 25$ °C; Ramp Recovery; see Figure 5	-	33	65	ns
		$I_R = 1$ A; $I_F = 0.5$ A; $I_{R(meas)} = 0.25$ A; $T_j = 25$ °C; Step Recovery; see Figure 6	-	25	50	ns



2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		

SOD141 (DO-201AD)

3. Ordering information

Table 3. Ordering information

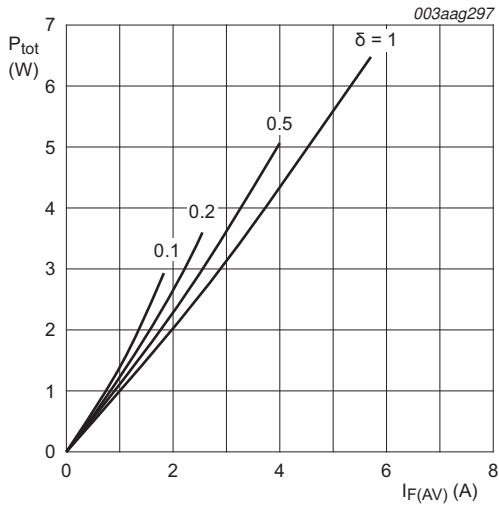
Type number	Package		
	Name	Description	Version
NUR460	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141

4. Limiting values

Table 4. Limiting values

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

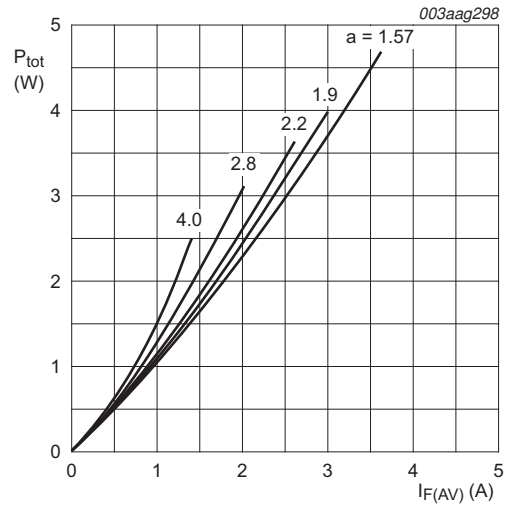
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	600	V
V_{RWM}	crest working reverse voltage		-	600	V
V_R	reverse voltage	DC	-	600	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; see Figure 1 ; see Figure 2	-	4	A
I_{FRM}	repetitive peak forward current	square-wave pulse; $\delta = 0.5$	-	8	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8.3$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; see Figure 3	-	110	A
		$t_p = 10$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; see Figure 3	-	100	A
T_{stg}	storage temperature		-40	150	°C
T_j	junction temperature		-	150	°C



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

$$V_O = 0.968 \text{ V}; R_S = 0.036 \Omega$$

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



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

$$V_O = 0.968 \text{ V}; R_S = 0.036 \Omega$$

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

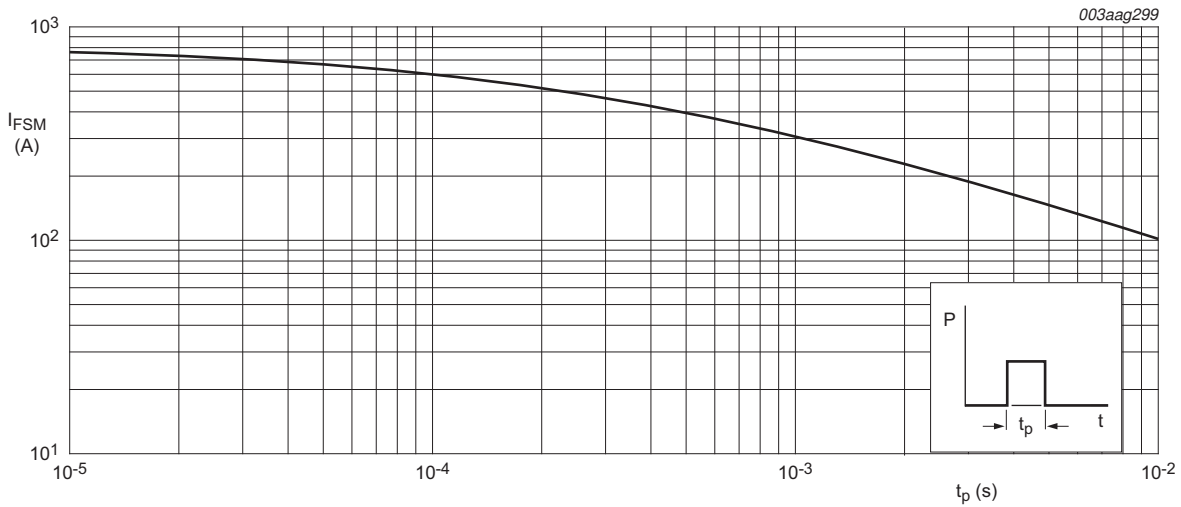


Fig 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

5. Thermal characteristics

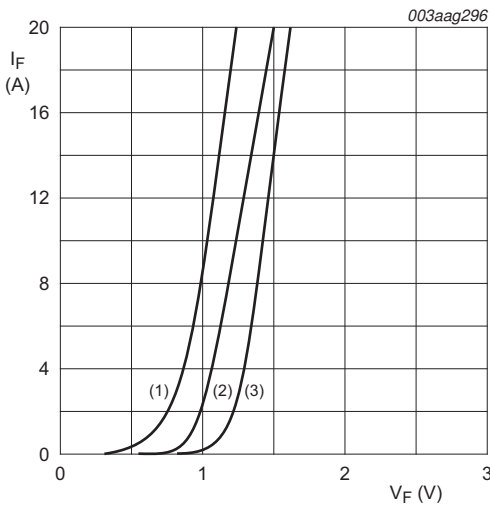
Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	55	-	K/W

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 4\text{ A}$; $T_j = 25\text{ °C}$; see Figure 4	-	-	1.28	V
		$I_F = 4\text{ A}$; $T_j = 150\text{ °C}$; see Figure 4	-	0.88	1.05	V
I_R	reverse current	$V_R = 600\text{ V}$; $T_j = 25\text{ °C}$	-	-	50	μA
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $dI_F/dt = 50\text{ A}/\mu\text{s}$; Ramp Recovery; $T_j = 25\text{ °C}$; see Figure 5	-	33	65	ns
		$I_F = 0.5\text{ A}$; $I_R = 1\text{ A}$; Step Recovery; $I_{R(meas)} = 0.25\text{ A}$; $T_j = 25\text{ °C}$; see Figure 6	-	25	50	ns



$V_o = 0.968\text{ V}$; $R_s = 0.036\Omega$;
 (1) $T_j = 150\text{ °C}$; typical value;
 (2) $T_j = 150\text{ °C}$; maximum value;
 (3) $T_j = 25\text{ °C}$; maximum value

Fig 4. Forward current as a function of forward voltage

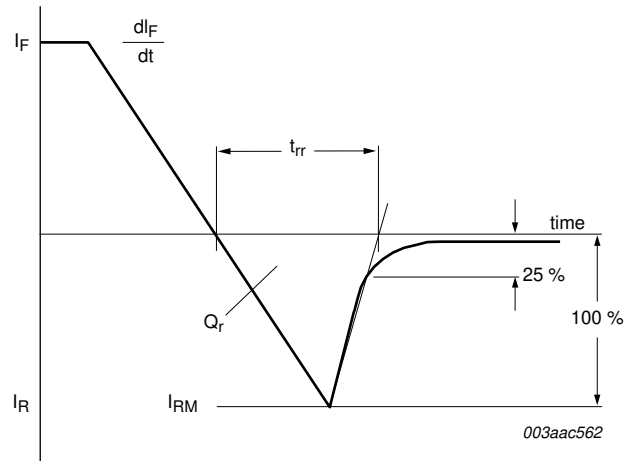


Fig 5. Reverse recovery definitions; ramp recovery

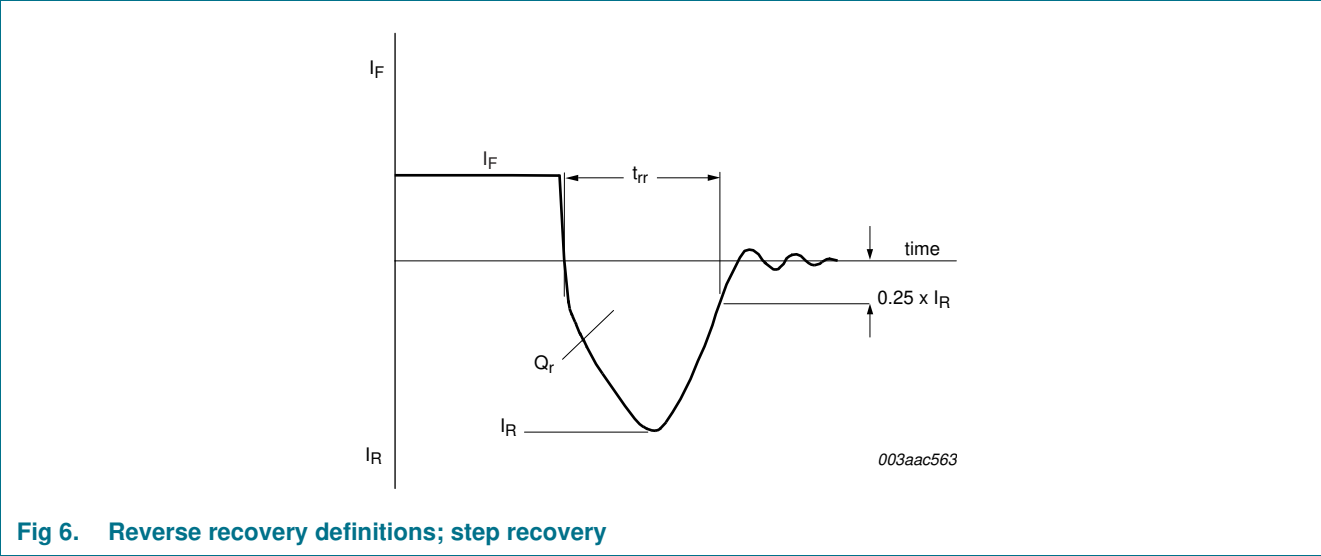


Fig 6. Reverse recovery definitions; step recovery

7. Package outline

Hermetically sealed plastic package; axial leaded; 2 leads

SOD141

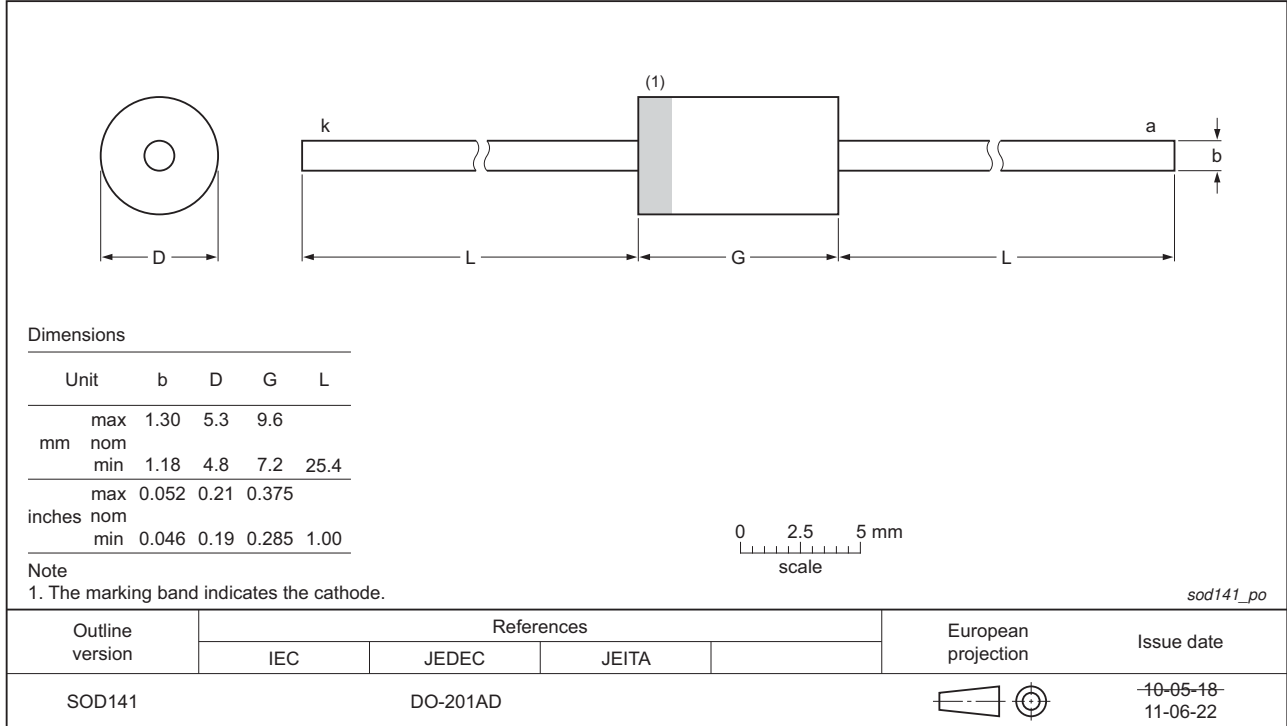


Fig 7. Package outline SOD141 (DO-201AD)

8. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NUR460 v.2	20110720	Product data sheet	-	NUR460 v.1
Modifications:	• Various changes to content.			
NUR460 v.1	20110704	Product data sheet	-	-

9. Legal information

9.1 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.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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