



# 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

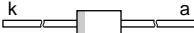

Table 1. Quick reference data

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 <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a>	-	-	4	A
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 4$ A; $T_j = 25$ °C; see <a href="#">Figure 4</a>	-	-	1.28	V
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $di_F/dt = 50$ A/ $\mu$ s; $T_j = 25$ °C; Ramp Recovery; see <a href="#">Figure 5</a>	-	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 <a href="#">Figure 6</a>	-	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

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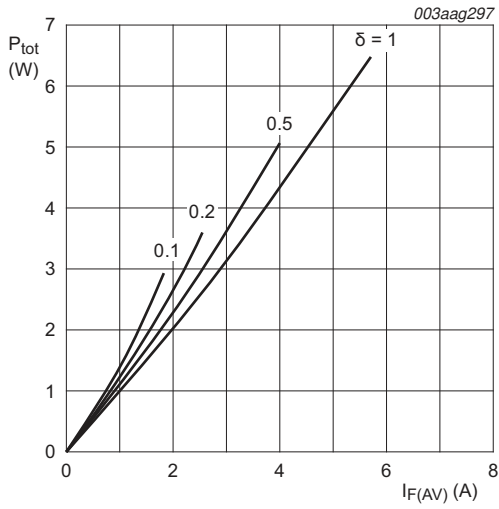
Type number	Package		
	Name	Description	Version
NUR460	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141

## 4. Limiting values

Table 4. Limiting values

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

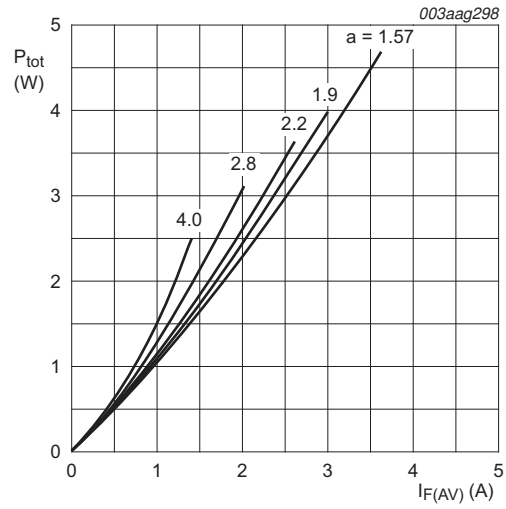
Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	600	V
$V_{RWM}$	crest working reverse voltage		-	600	V
$V_R$	reverse voltage	DC	-	600	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$ ; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a>	-	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 <a href="#">Figure 3</a>	-	110	A
		$t_p = 10$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; see <a href="#">Figure 3</a>	-	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

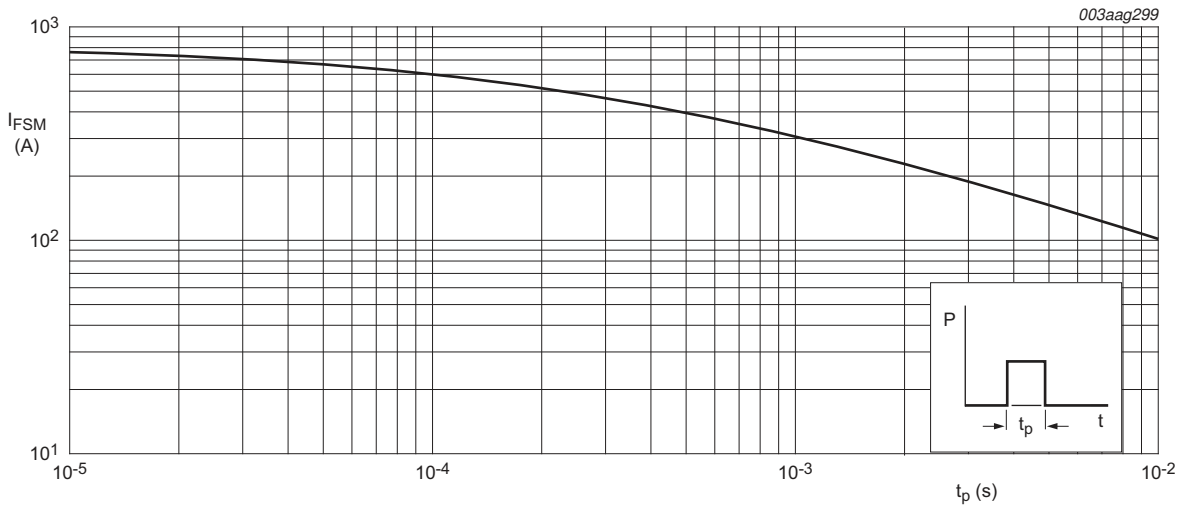


Fig 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

## 5. Thermal characteristics

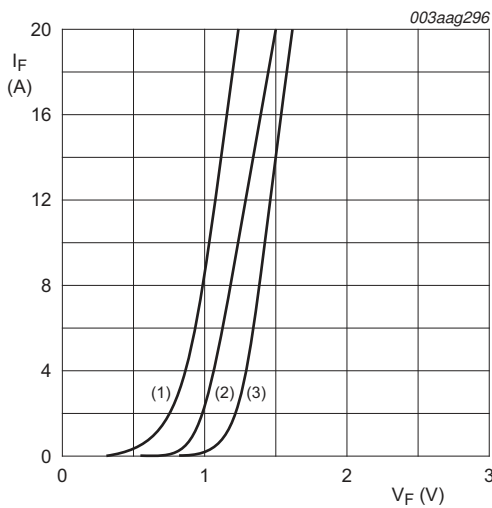
Table 5. Thermal characteristics

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
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 4 \text{ A}$ ; $T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 4</a>	-	-	1.28	V
		$I_F = 4 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 4</a>	-	0.88	1.05	V
$I_R$	reverse current	$V_R = 600 \text{ V}$ ; $T_j = 25 \text{ }^\circ\text{C}$	-	-	50	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}$ ; $V_R = 30 \text{ V}$ ; $dI_F/dt = 50 \text{ A}/\mu\text{s}$ ; Ramp Recovery; $T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 5</a>	-	33	65	ns
		$I_F = 0.5 \text{ A}$ ; $I_R = 1 \text{ A}$ ; Step Recovery; $I_{R(\text{meas})} = 0.25 \text{ A}$ ; $T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 6</a>	-	25	50	ns



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

Fig 4. Forward current as a function of forward voltage

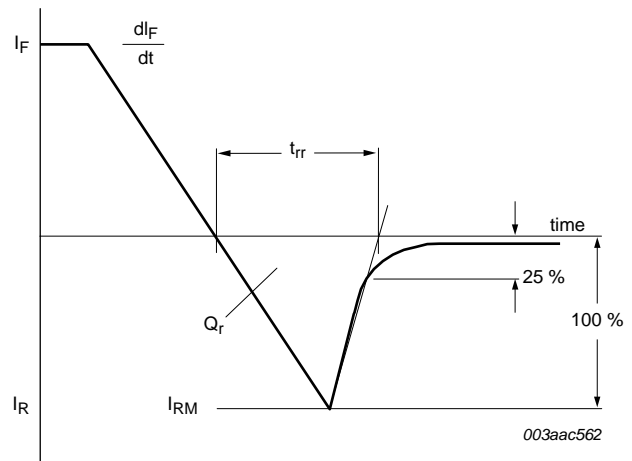


Fig 5. Reverse recovery definitions; ramp recovery

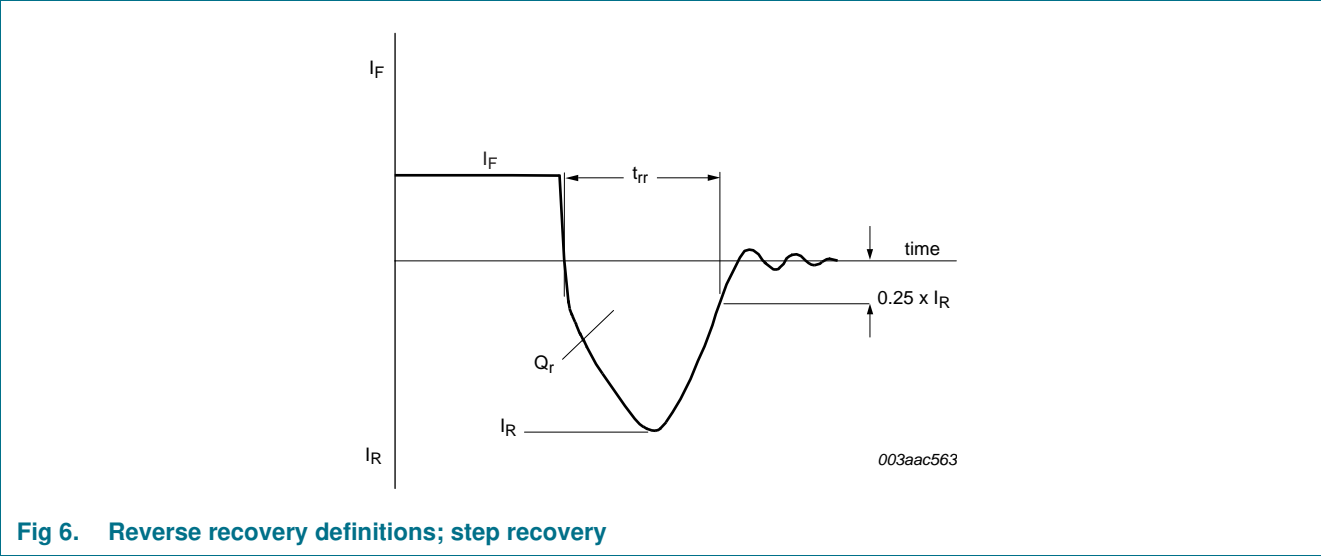


Fig 6. Reverse recovery definitions; step recovery

## 7. Package outline

Hermetically sealed plastic package; axial leaded; 2 leads

SOD141

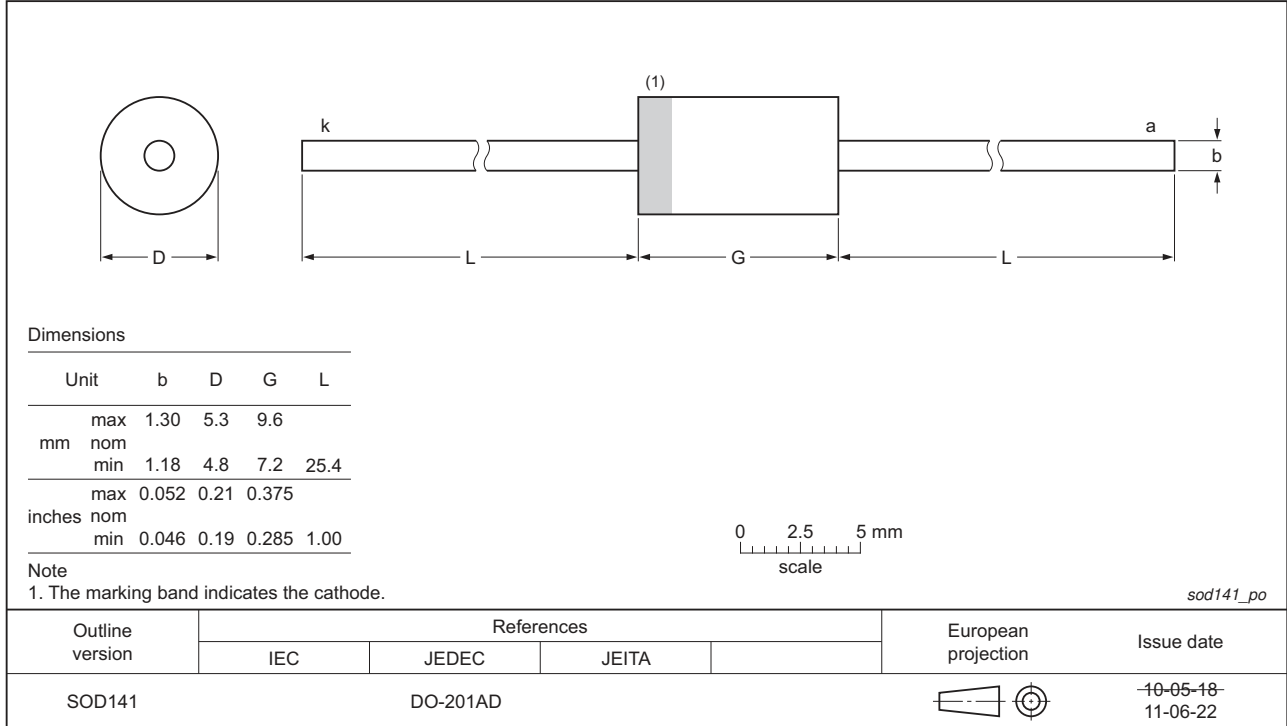


Fig 7. Package outline SOD141 (DO-201AD)

## 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 <sup>[1]</sup> <sup>[2]</sup>	Product status <sup>[3]</sup>	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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