



# THE DATASHEET OF NUR460P/L05U





# NUR460P

Ultrafast power diode

3 January 2014

Product data sheet

## 1. General description

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

## 2. Features and benefits

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

## 3. Applications

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

## 4. Quick reference data

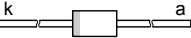
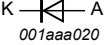
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	-	600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>	-	-	4	A
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 3$ A; $T_j = 150$ °C; <a href="#">Fig. 4</a>	-	0.82	1.05	V
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $dI_F/dt = 100$ A/ $\mu$ s; $T_j = 25$ °C; Ramp Recovery; <a href="#">Fig. 5</a>	-	35	-	ns
		$I_R = 1$ A; $I_F = 0.5$ A; $I_{R(meas)} = 0.25$ A; $T_j = 25$ °C; Step Recovery; <a href="#">Fig. 6</a>	-	-	50	ns



## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 DO-201AD (SOD141)	
2	A	anode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
NUR460P	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L01	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L02	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L03	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L04	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L05	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L06	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141
NUR460P/L07	DO-201AD	Hermetically sealed plastic package; axial leaded; 2 leads	SOD141

## 7. Marking

Table 4. Marking codes

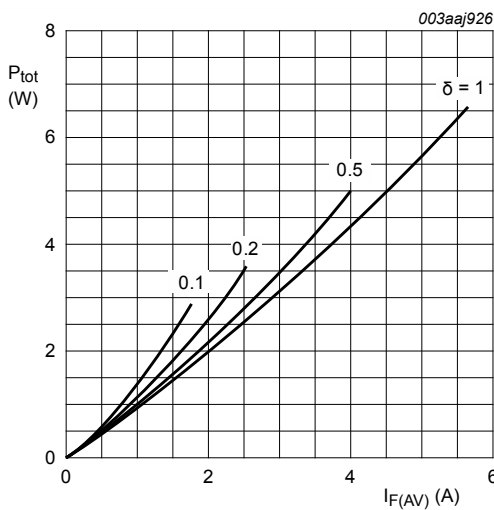
Type number	Marking code
NUR460P	NXPNU460P
NUR460P/L01	
NUR460P/L02	
NUR460P/L03	
NUR460P/L04	
NUR460P/L05	
NUR460P/L06	
NUR460P/L07	

## 8. Limiting values

**Table 5. Limiting values**

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

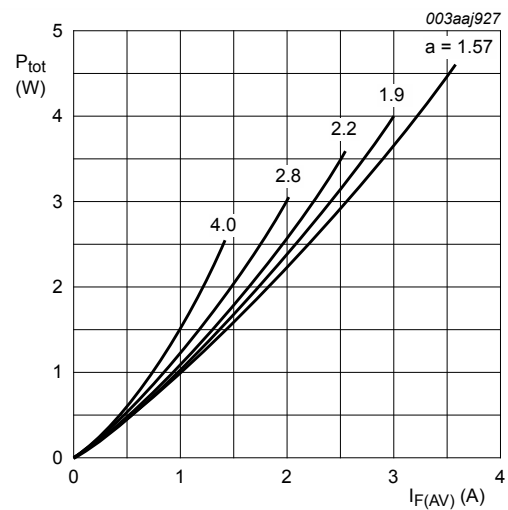
Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	600	V
$V_{RWM}$	crest working reverse voltage		-	600	V
$V_R$	reverse voltage	DC	-	600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; square-wave pulse; Fig. 1; Fig. 2	-	4	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25 \mu s$ ; square-wave pulse	-	8	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10 ms$ ; $T_{j(init)} = 25 \text{ }^\circ C$ ; sine-wave pulse; Fig. 3	-	100	A
		$t_p = 8.3 ms$ ; $T_{j(init)} = 25 \text{ }^\circ C$ ; sine-wave pulse; Fig. 3	-	110	A
$T_{stg}$	storage temperature		-65	175	$^\circ C$
$T_j$	junction temperature		-	175	$^\circ C$



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

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

$$V_O = 0.947 \text{ V}; R_S = 0.037 \text{ } \Omega$$



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

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

$$V_O = 0.947 \text{ V}; R_S = 0.037 \text{ } \Omega$$

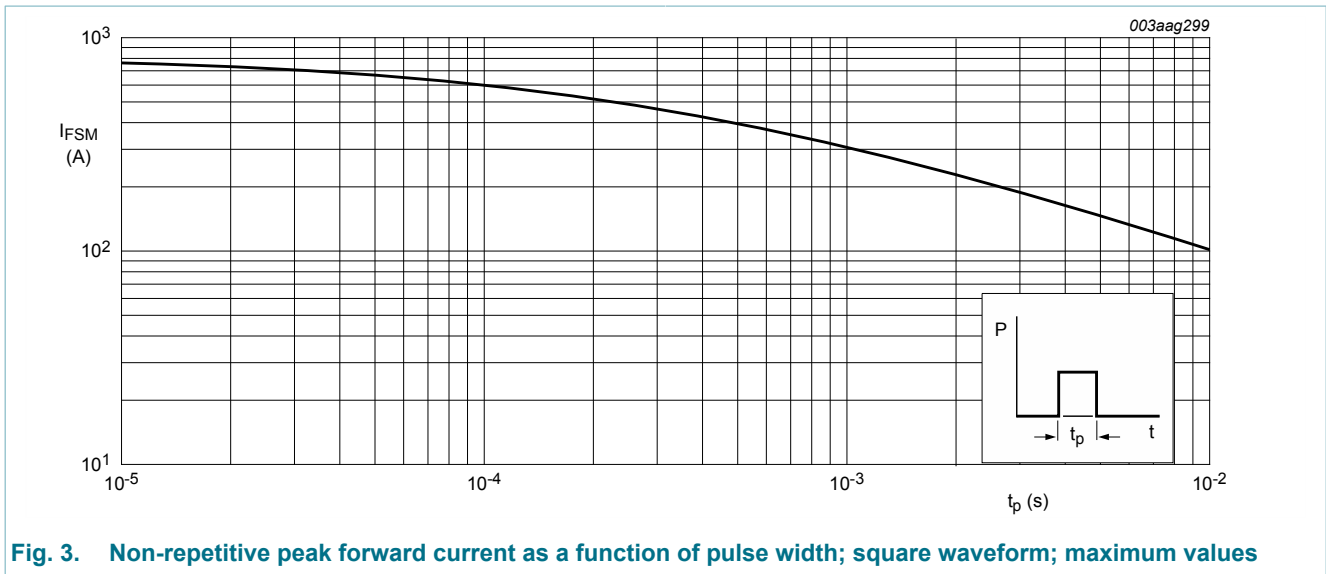


Fig. 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

## 9. Thermal characteristics

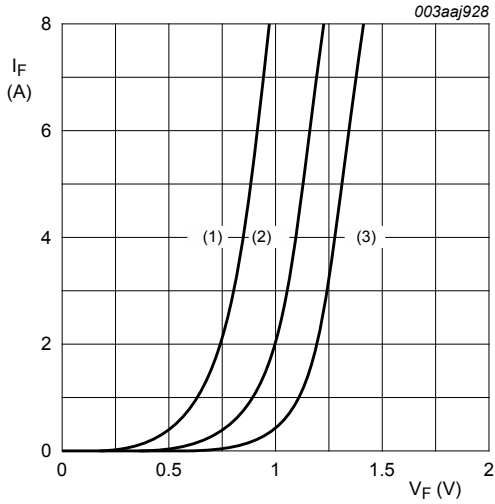
Table 6. Thermal characteristics

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

## 10. Characteristics

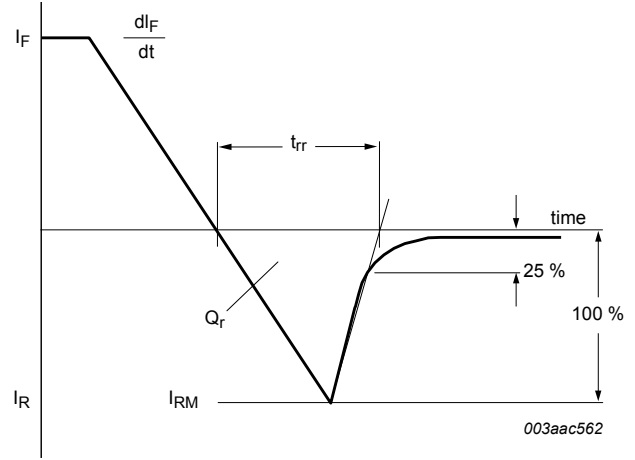
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 3\text{ A}; T_j = 25\text{ °C};$ Fig. 4	-	-	1.25	V
		$I_F = 3\text{ A}; T_j = 150\text{ °C};$ Fig. 4	-	0.82	1.05	V
		$I_F = 4\text{ A}; T_j = 25\text{ °C};$ Fig. 4	-	-	1.28	V
$I_R$	reverse current	$V_R = 600\text{ V}; T_j = 25\text{ °C}$	-	-	10	$\mu\text{A}$
		$V_R = 600\text{ V}; T_j = 150\text{ °C}$	-	-	250	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 50\text{ A}/\mu\text{s}; T_j = 25\text{ °C};$ Ramp Recovery; Fig. 5	-	-	75	ns
		$I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 100\text{ A}/\mu\text{s}; T_j = 25\text{ °C};$ Ramp Recovery; Fig. 5	-	35	-	ns
		$I_F = 0.5\text{ A}; I_R = 1\text{ A}; I_{R(meas)} = 0.25\text{ A}; T_j = 25\text{ °C};$ Step Recovery; Fig. 6	-	-	50	ns

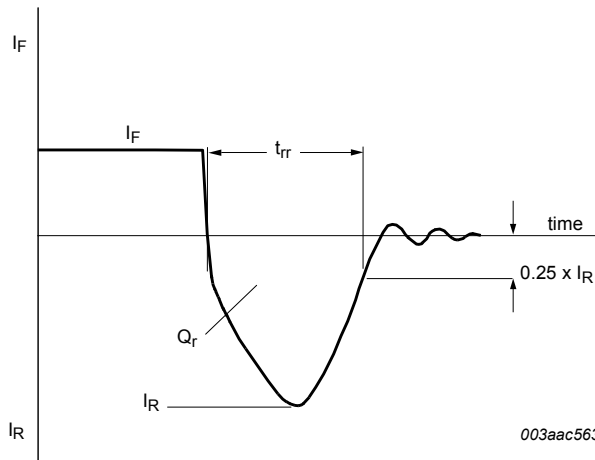


**Fig. 4. Forward current as a function of forward voltage**

- (1)  $T_j = 150\text{ }^\circ\text{C}$ ; typical values;
  - (2)  $T_j = 150\text{ }^\circ\text{C}$ ; maximum values;
  - (3)  $T_j = 25\text{ }^\circ\text{C}$ ; maximum values;
- $V_O = 0.947\text{ V}$ ;  $R_S = 0.037\text{ }\Omega$



**Fig. 5. Reverse recovery definitions; ramp recovery**



**Fig. 6. Reverse recovery definitions; step recovery**

### 11. Package outline

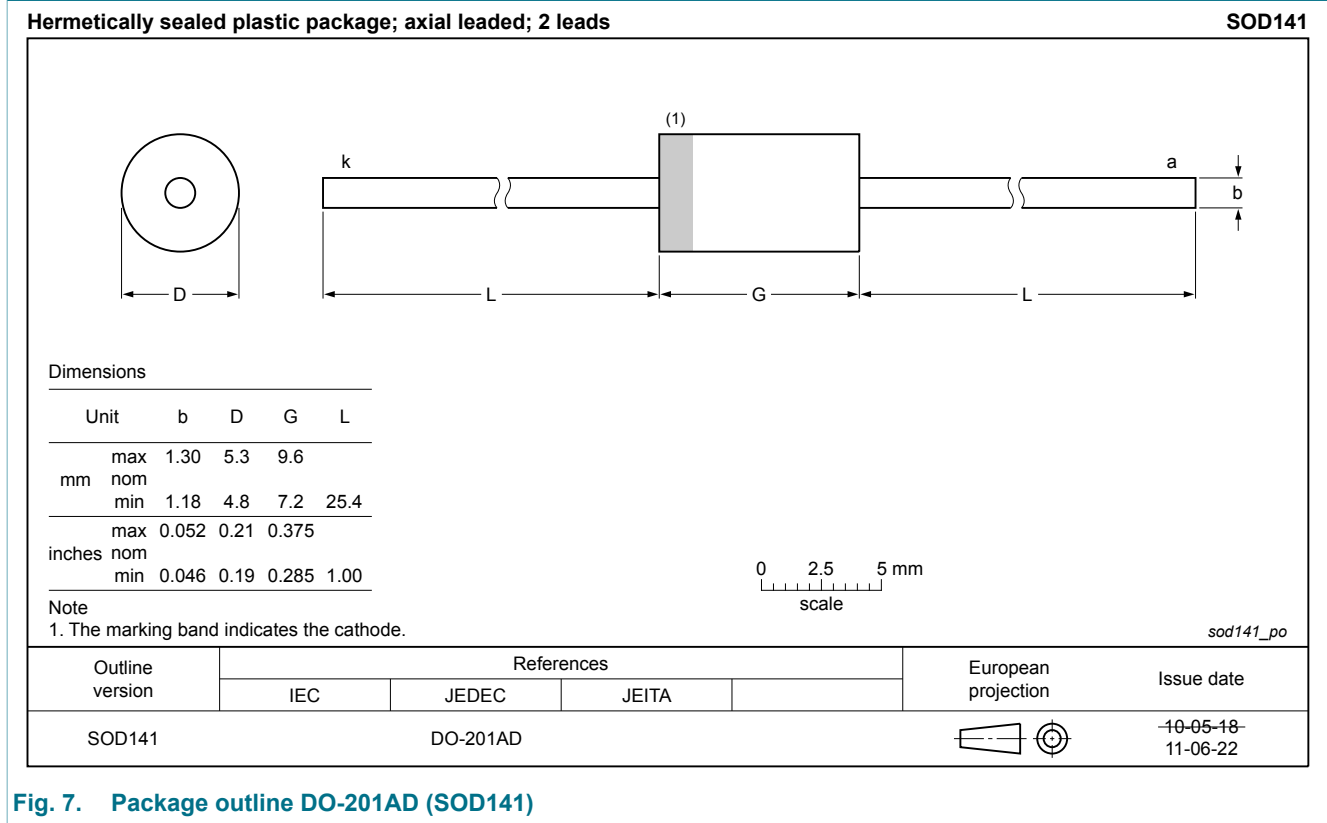


Fig. 7. Package outline DO-201AD (SOD141)

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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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