

NUR460P

Ultrafast power diode

27 August 2012

Product data sheet

1. Product profile

1.1 General description

Ultrafast 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 leakage current
- 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	$\delta = 0.5$; square-wave pulse; Fig. 1 ; Fig. 2	-	-	4	A
Static characteristics						
V_F	forward voltage	$I_F = 3\text{ A}$; $T_J = 150\text{ }^\circ\text{C}$; Fig. 4	-	0.82	1.05	V
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $dI_F/dt = 50\text{ A}/\mu\text{s}$; $T_J = 25\text{ }^\circ\text{C}$; Ramp Recovery; Fig. 5	-	-	75	ns
		$I_R = 1\text{ A}$; $I_F = 0.5\text{ A}$; $I_{R(meas)} = 0.25\text{ A}$; $T_J = 25\text{ }^\circ\text{C}$; Step Recovery; Fig. 6	-	-	50	ns

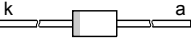
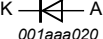


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2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 DO-201AD (SOD141)	 001aaa020
2	A	anode		

3. 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

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	$\delta = 0.5$; 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	$t_p = 10 ms$; $T_{j(init)} = 25 ^\circ C$; sine-wave pulse; Fig. 3	-	100	A
		$t_p = 8.3 ms$; $T_{j(init)} = 25 ^\circ C$; sine-wave pulse; Fig. 3	-	110	A
T_{stg}	storage temperature		-65	175	$^\circ C$
T_j	junction temperature		-	175	$^\circ C$

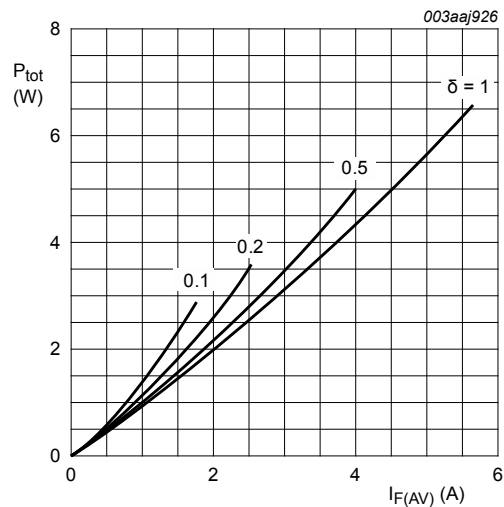


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

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

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

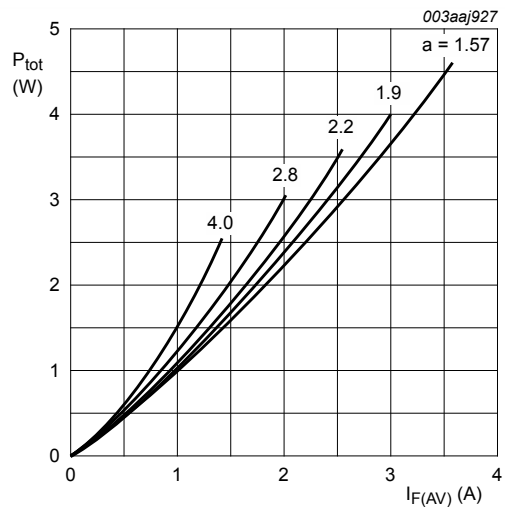


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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

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

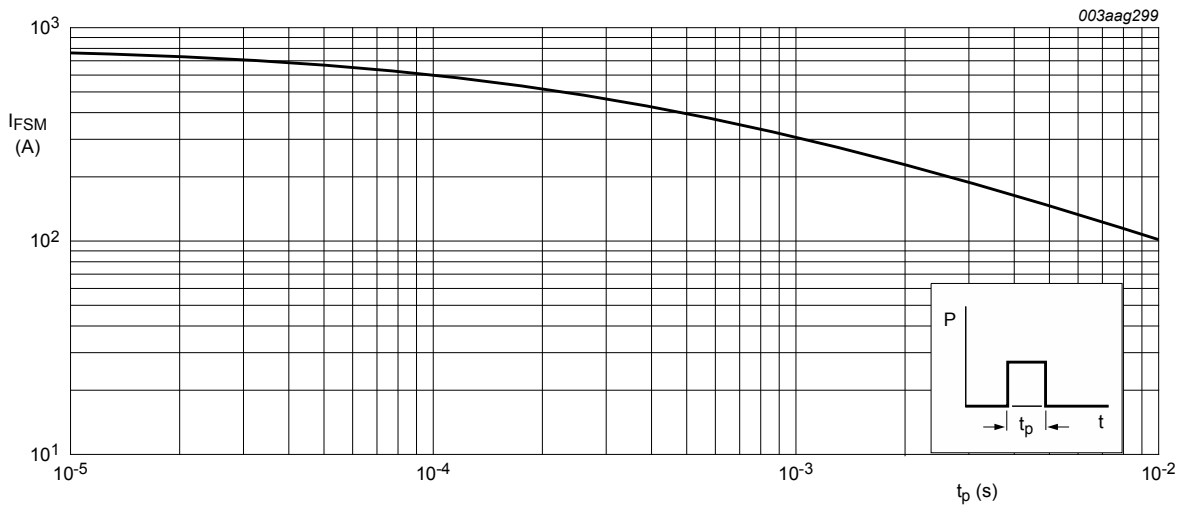


Fig. 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

5. Thermal characteristics

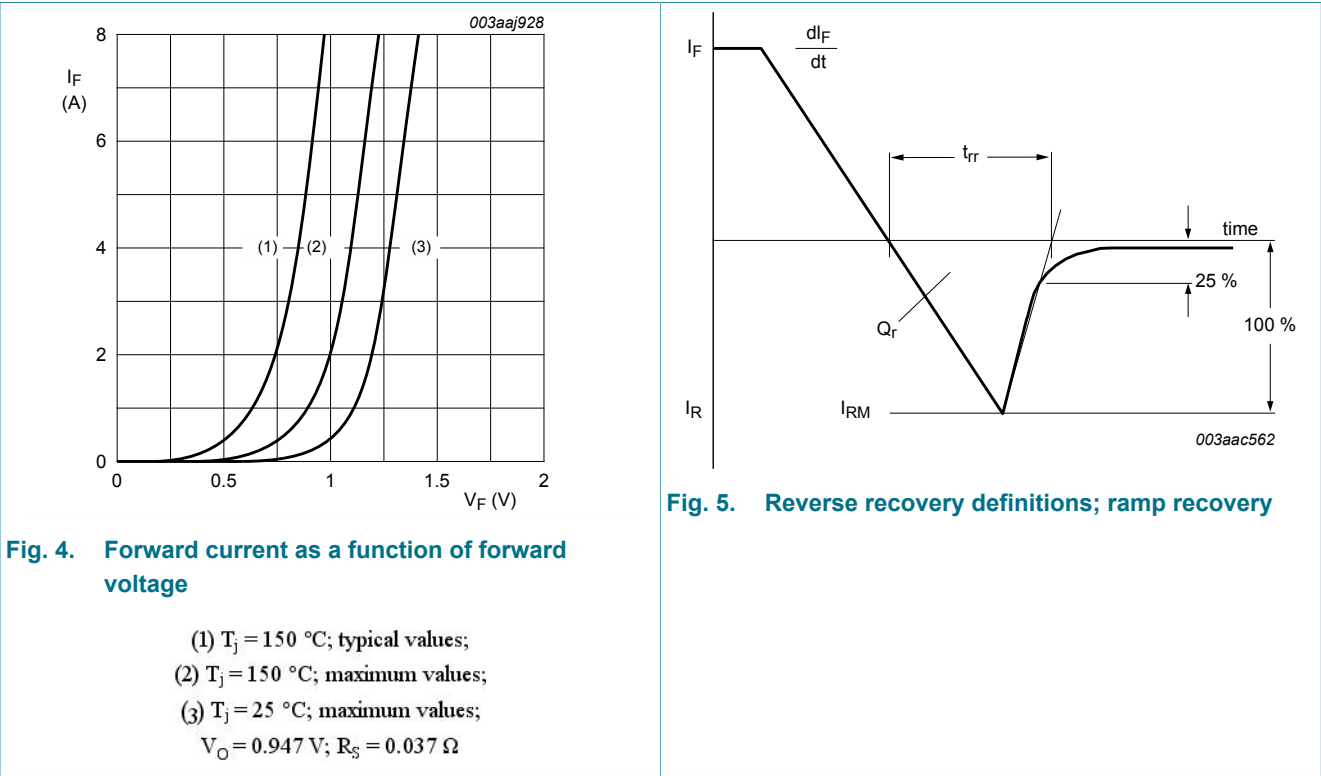
Table 5. Thermal characteristics

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 = 3 A; T _J = 25 °C; Fig. 4		-	-	1.25	V
		I _F = 3 A; T _J = 150 °C; Fig. 4		-	0.82	1.05	V
		I _F = 4 A; T _J = 25 °C; Fig. 4		-	-	1.28	V
I _R	reverse current	V _R = 600 V; T _J = 25 °C		-	-	10	μA
		V _R = 600 V; T _J = 150 °C		-	-	250	μA
Dynamic characteristics							
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 50 A/μs; T _J = 25 °C; Ramp Recovery; Fig. 5		-	-	75	ns
		I _F = 0.5 A; I _R = 1 A; I _{R(meas)} = 0.25 A; T _J = 25 °C; Step Recovery; Fig. 6		-	-	50	ns



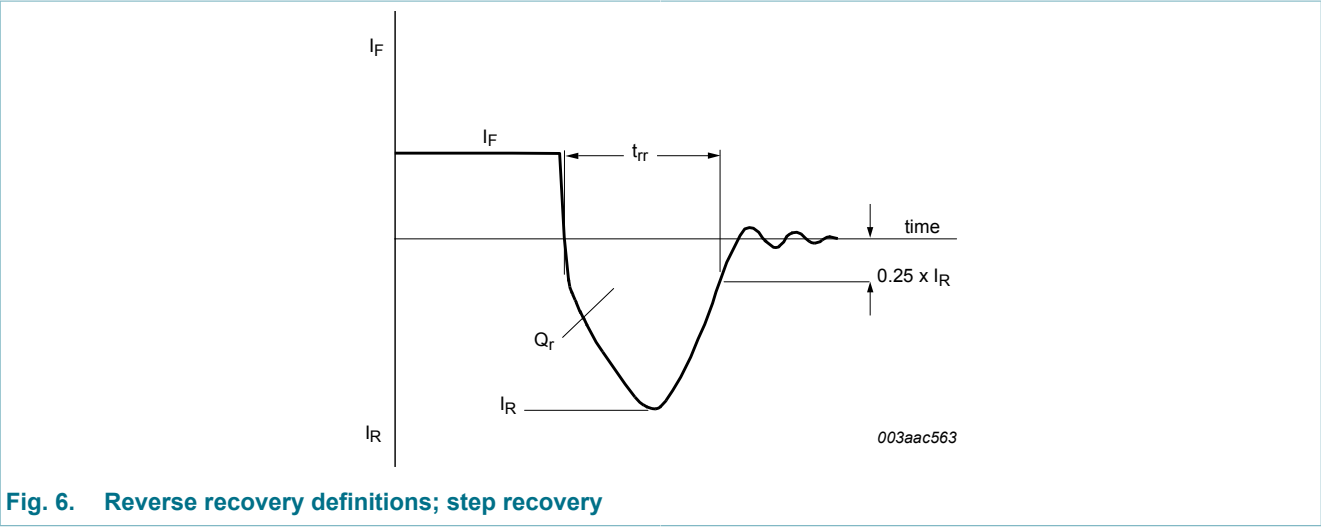


Fig. 6. Reverse recovery definitions; step recovery

7. Package outline

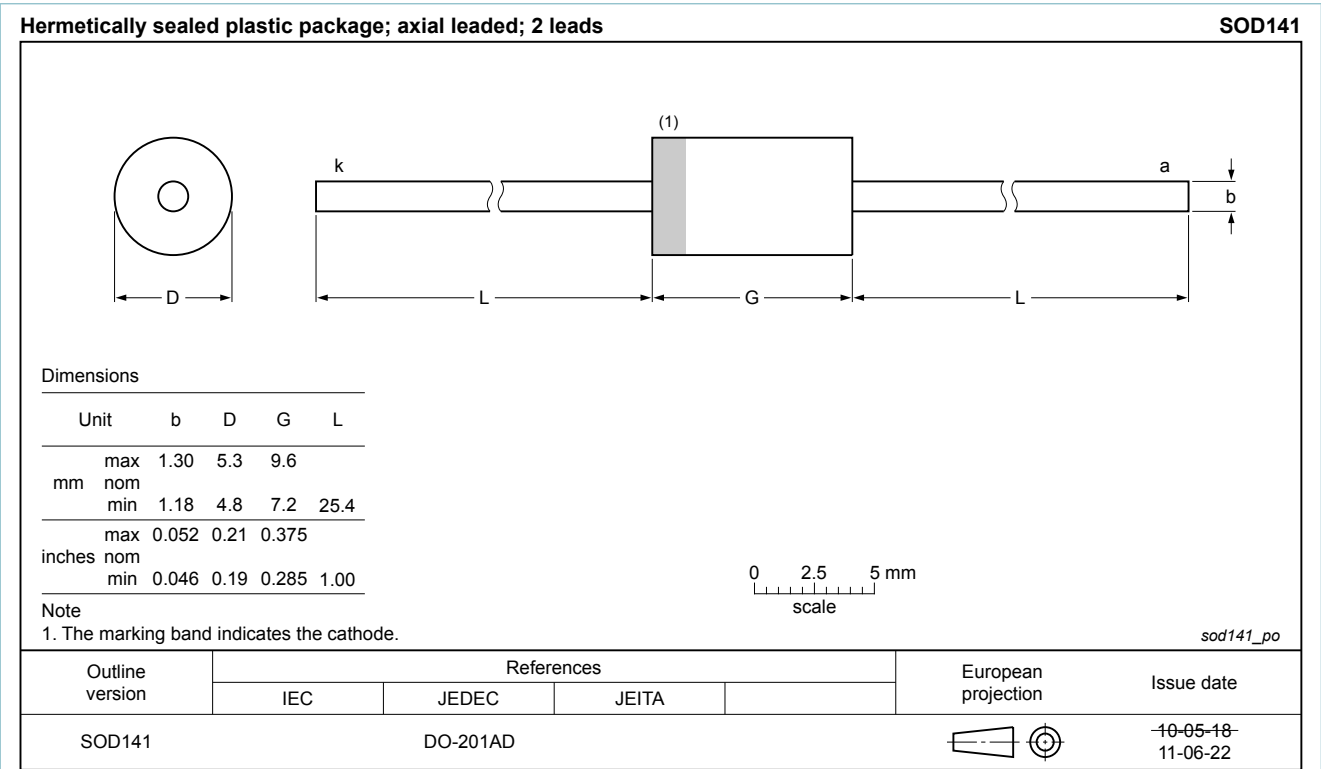


Fig. 7. Package outline DO-201AD (SOD141)

8. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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