



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

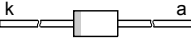
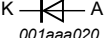
Table 1. Quick reference data

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; Fig. 1 ; Fig. 2	-	-	4	A
Static characteristics						
V_F	forward voltage	$I_F = 3\text{ A}$; $T_j = 150\text{ °C}$; Fig. 4	-	0.82	1.05	V
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $dI_F/dt = 100\text{ A}/\mu\text{s}$; $T_j = 25\text{ °C}$; Ramp Recovery; Fig. 5	-	35	-	ns
		$I_R = 1\text{ A}$; $I_F = 0.5\text{ A}$; $I_{R(meas)} = 0.25\text{ A}$; $T_j = 25\text{ °C}$; Step Recovery; Fig. 6	-	-	50	ns



5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 DO-201AD (SOD141)	 001aaa020
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	δ = 0.5 ; square-wave pulse; Fig. 1; Fig. 2	-	4	A
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t _p = 25 μs; square-wave pulse	-	8	A
I _{FSM}	non-repetitive peak forward current	t _p = 10 ms; T _{j(init)} = 25 °C; sine-wave pulse; Fig. 3	-	100	A
		t _p = 8.3 ms; T _{j(init)} = 25 °C; sine-wave pulse; Fig. 3	-	110	A
T _{stg}	storage temperature		-65	175	°C
T _j	junction temperature		-	175	°C

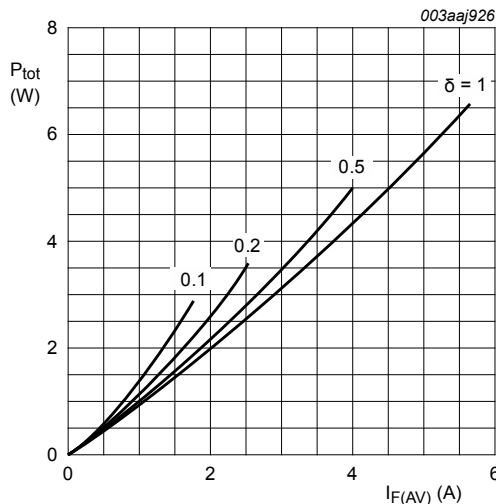


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$
$$V_O = 0.947 \text{ V}; R_S = 0.037 \text{ } \Omega$$

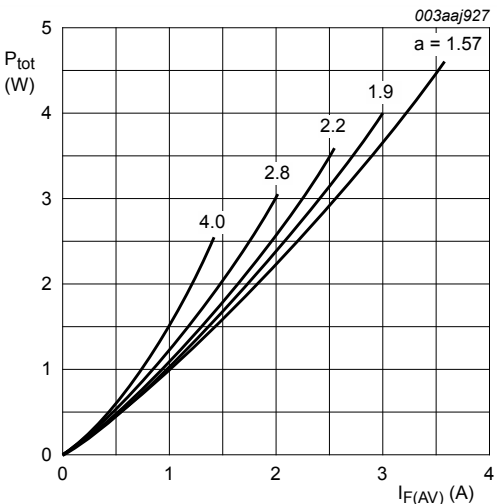


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

$$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$$
$$V_O = 0.947 \text{ V}; R_S = 0.037 \text{ } \Omega$$

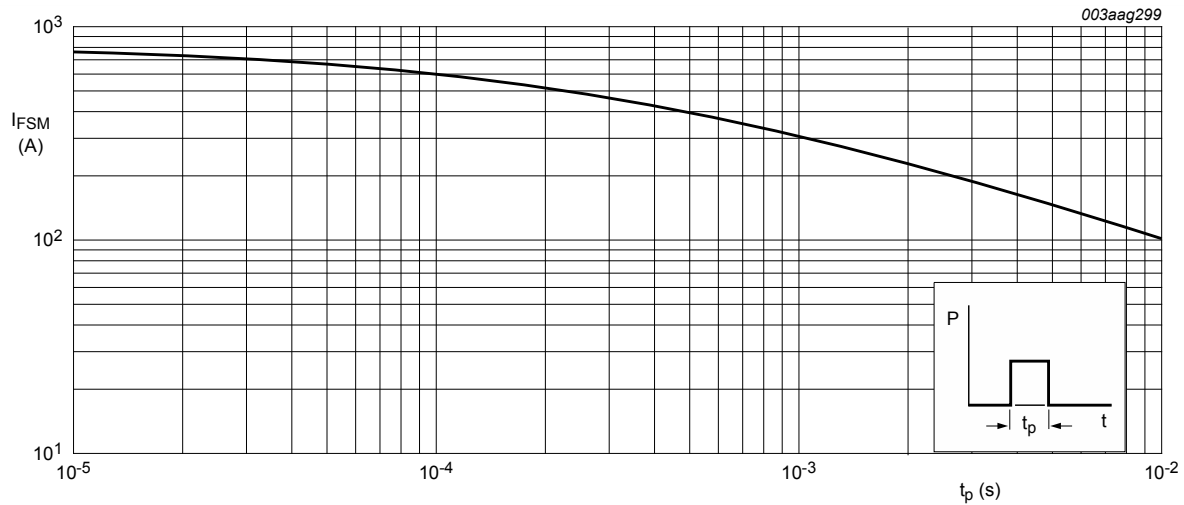


Fig. 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

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
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 = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Ramp Recovery; Fig. 5		-	35	-	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

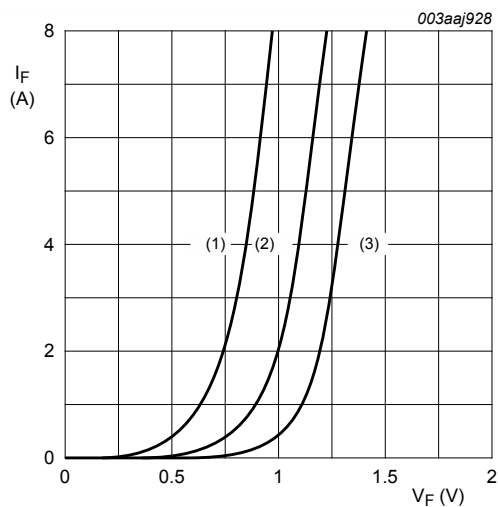


Fig. 4. Forward current as a function of forward voltage

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

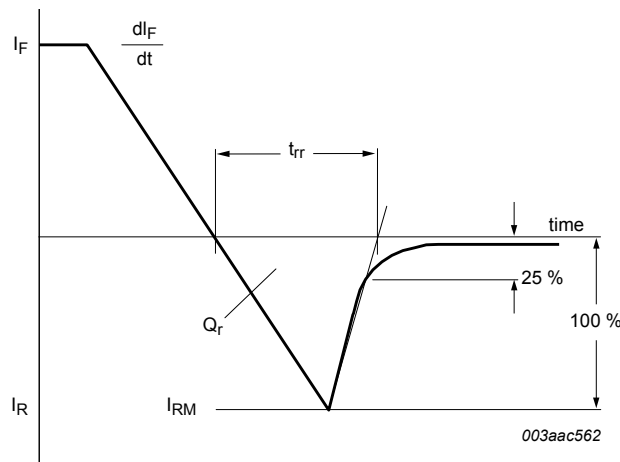


Fig. 5. Reverse recovery definitions; ramp recovery

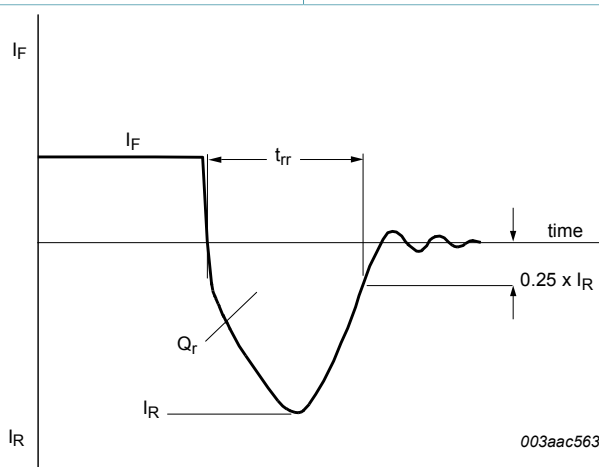


Fig. 6. Reverse recovery definitions; step recovery

11. Package outline

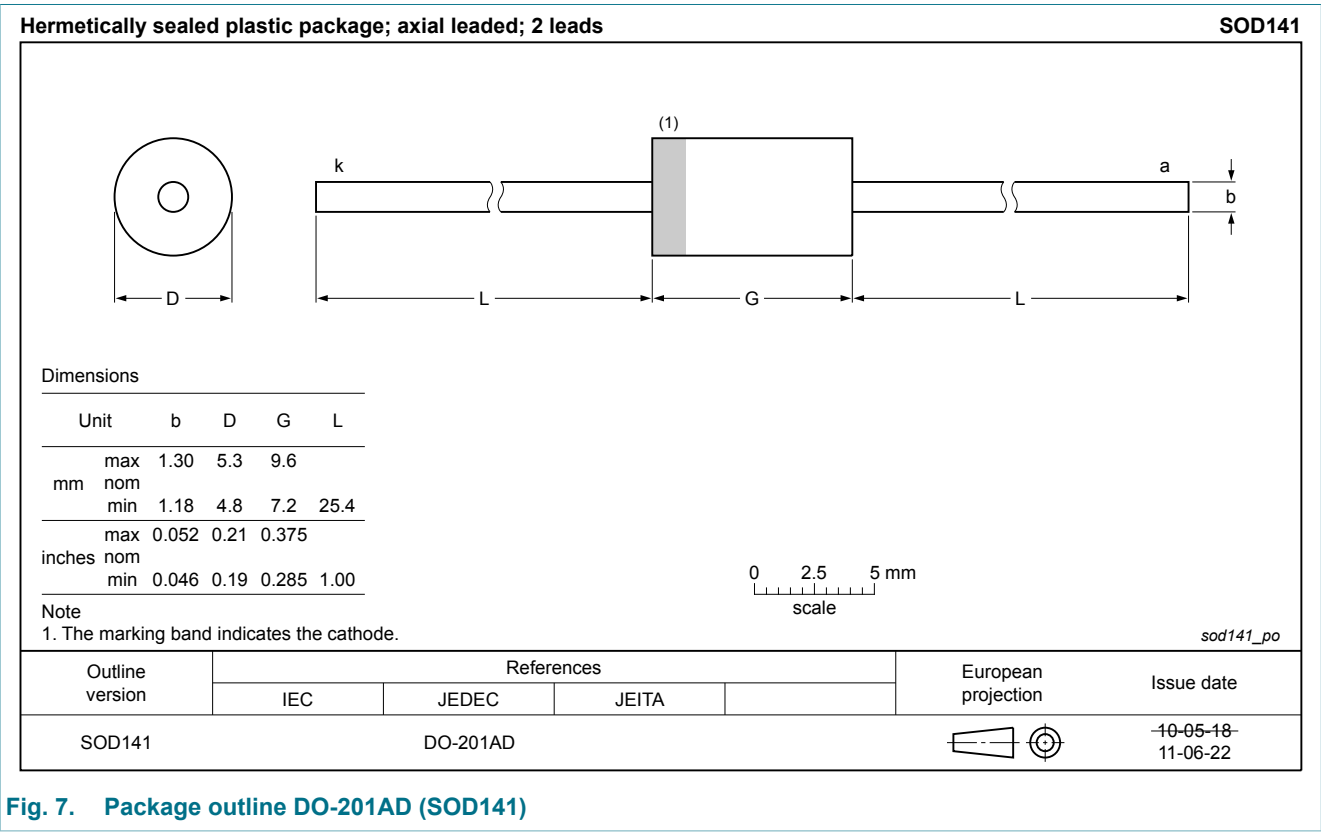


Fig. 7. Package outline DO-201AD (SOD141)

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.
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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Date of release: 3 January 2014