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	δ = 0.5 ; square-wave pulse; Fig. 1; Fig. 2		-	-	4	A
Static characteristics							
V_F	forward voltage	I_F = 3 A; T_j = 150 °C; Fig. 4		-	0.82	1.05	V
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_R = 1 A; I_F = 0.5 A; $I_{R(meas)}$ = 0.25 A; T_j = 25 °C; Step Recovery; Fig. 6		-	-	50	ns

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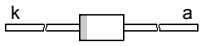
2. Pinning information

Table 2. Pinning information

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

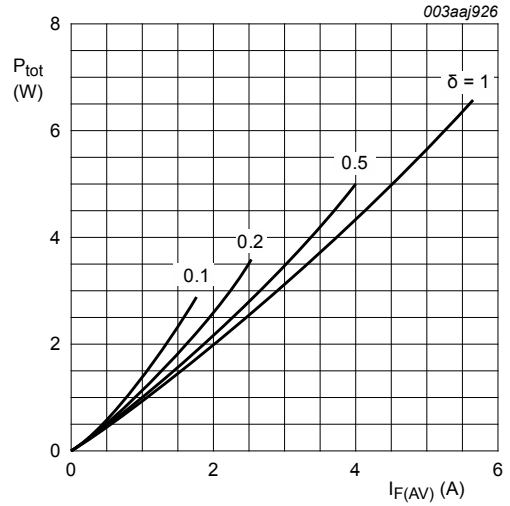


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

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

$$V_O = 0.947\ V;\ R_S = 0.037\ \Omega$$

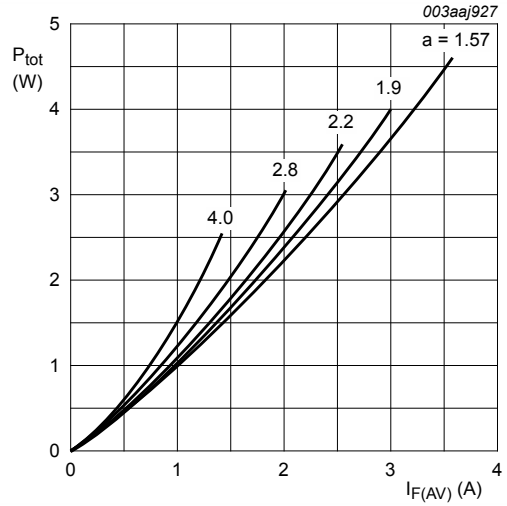


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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

$$V_O = 0.947\ V;\ R_S = 0.037\ \Omega$$

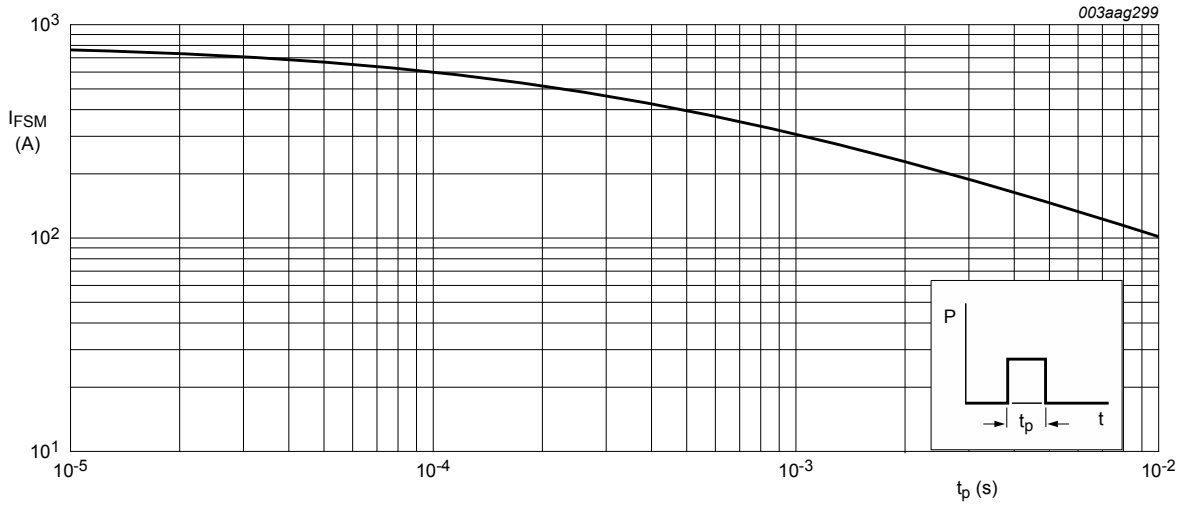


Fig. 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

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

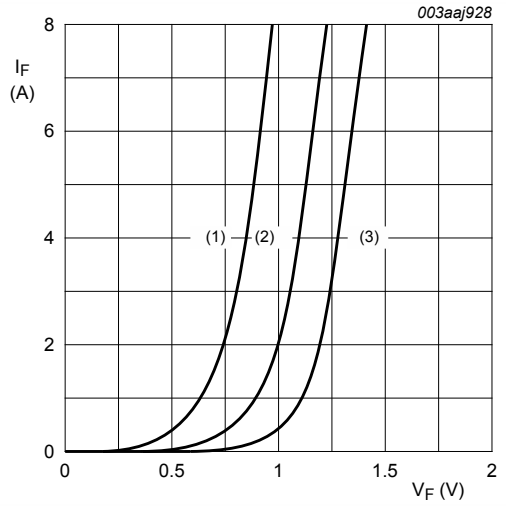


Fig. 4. Forward current as a function of forward voltage

(1) T_j = 150 °C; typical values;
(2) T_j = 150 °C; maximum values;
(3) T_j = 25 °C; maximum values;
V_O = 0.947 V; R_S = 0.037 Ω

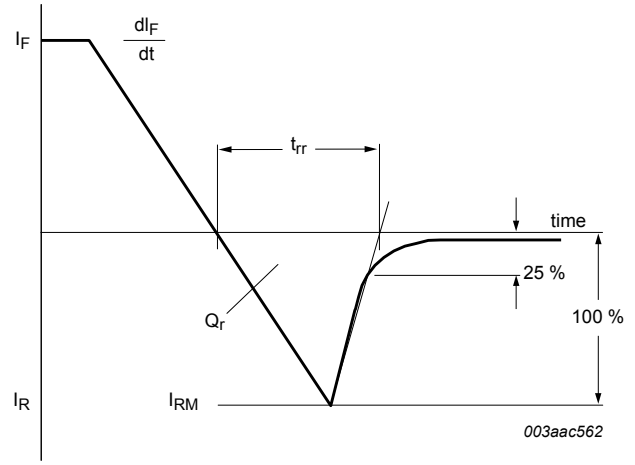


Fig. 5. Reverse recovery definitions; ramp recovery

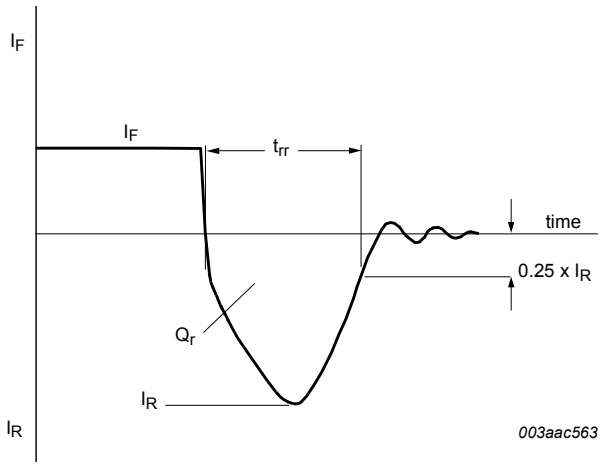
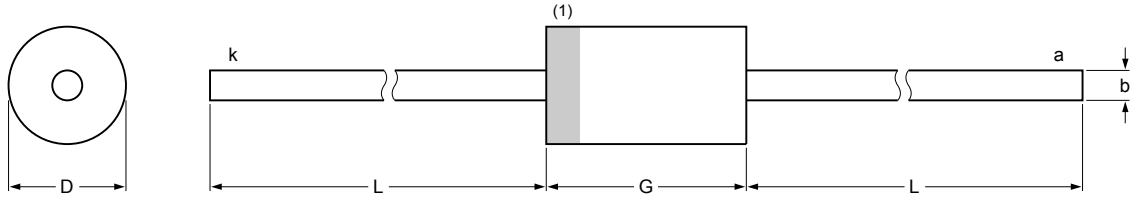


Fig. 6. Reverse recovery definitions; step recovery

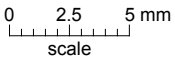
7. Package outline

Hermetically sealed plastic package; axial leaded; 2 leads **SOD141**



Dimensions

Unit		b	D	G	L
mm	max	1.30	5.3	9.6	
	nom				
	min	1.18	4.8	7.2	25.4
inches	max	0.052	0.21	0.375	
	nom				
	min	0.046	0.19	0.285	1.00



Note
1. The marking band indicates the cathode.

sod141_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD141		DO-201AD				~~10-05-18~~ 11-06-22

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

8. Legal information

8.1 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.
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Product [short] data sheet	Production	This document contains the product specification.

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Date of release: 27 August 2012