IMPORTANT NOTICE

10 December 2015

1. Global joint venture starts operations as WeEn Semiconductors

Dear customer,

As from November 9th, 2015 NXP Semiconductors N.V. and Beijing JianGuang Asset Management Co. Ltd established Bipolar Power joint venture (JV), **WeEn Semiconductors**, which will be used in future Bipolar Power documents together with new contact details.

In this document where the previous NXP references remain, please use the new links as shown below.

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If you have any questions related to this document, please contact our nearest sales office via e-mail or phone (details via salesaddresses@ween-semi.com).

Thank you for your cooperation and understanding,

WeEn Semiconductors

founded by NXP

BYT79X-600

Rectifier diode ultrafast

27 May 2015 Product data sheet

1. General description

Ultrafast power diode in a SOD113 (2-lead TO-220F) plastic package

2. Features and benefits

- Fast switching
- Low thermal resistance
- Soft recovery characteristic
- Low forward voltage drop
- Low switching loss
- High thermal cycling performance

3. Application information

- Output rectifiers in high frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

4. Quick reference data

Table 1. Quick reference data

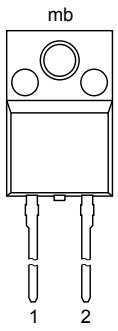
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_h \leq 49$ °C; Square-wave; Fig. 1; Fig. 2		-	-	15	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25$ µs; $T_h \leq 49$ °C; Square-wave		-	-	30	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sinusoidal waveform		-	-	143	A
		$t_p = 10$ ms; $T_{j(init)} = 25$ °C; sinusoidal waveform		-	-	130	A
Static characteristics							
V_F	forward voltage	$I_F = 15$ A; $T_j = 25$ °C; Fig. 4		-	1.16	1.38	V
		$I_F = 15$ A; $T_j = 150$ °C		-	1.01	1.2	V

Scan or click this QR code to view the latest information for this product

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Dynamic characteristics							
t_{rr}	reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; dI_F/dt = 100 A/µs; T_j = 25 °C; Fig. 5		-	50	60	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 **TO-220F (SOD113)**	
2	A	anode		
mb	n.c.	mounting base; isolated		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYT79X-600	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 2-lead TO-220 "full pack"	SOD113

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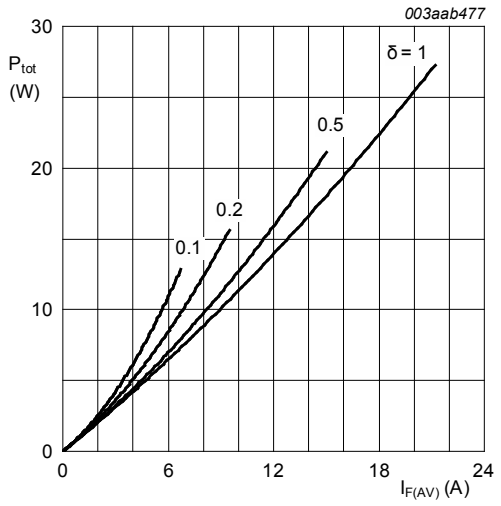
7. Limiting values

Table 4. Limiting values

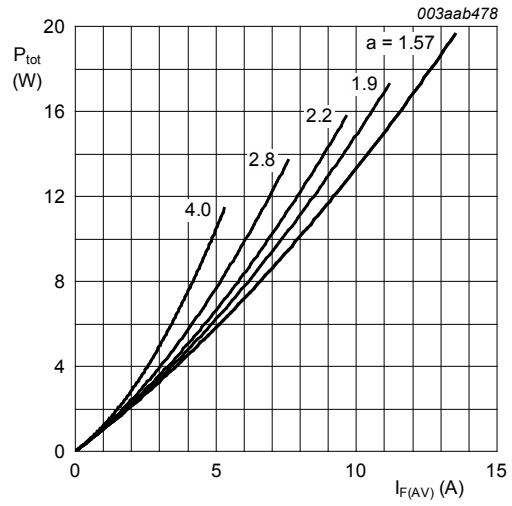
In accordance with the Absolute Maximum Rating System (IEC 60134).

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	Square-wave; δ = 1.0		-	600	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; T_h ≤ 49 °C; Square-wave; Fig. 1; Fig. 2		-	15	A
I_{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; T_h ≤ 49 °C; Square-wave		-	30	A
I_{FSM}	non-repetitive peak forward current	t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sinusoidal waveform		-	143	A
		t_p = 10 ms; $T_{j(init)}$ = 25 °C; sinusoidal waveform		-	130	A
T_{stg}	storage temperature			-55	150	°C
T_j	junction temperature			-	150	°C



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

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



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

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

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8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-h)}$	thermal resistance from junction to heatsink	with heatsink compound; Fig. 3		-	-	4.8	K/W
		without heatsink compound		-	-	5.9	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	55	-	K/W

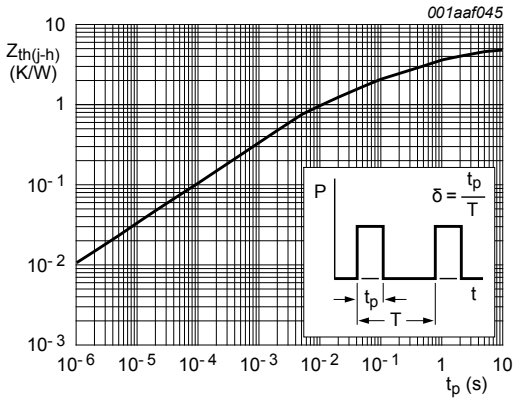

Fig. 3. Transient thermal impedance from junction to heatsink as a function of pulse width

9. Isolation characteristics

Table 6. Isolation characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	50 Hz ≤ f ≤ 60 Hz; RH ≤ 65 %; from all pins to external heatsink; sinusoidal waveform; clean and dust free		-	-	2500	V
C_{isol}	isolation capacitance	from cathode to external heatsink		-	10	-	pF

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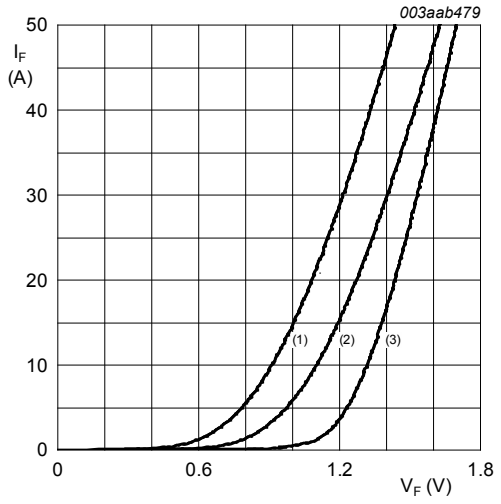
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 15 A; T_j = 25 °C; Fig. 4		-	1.16	1.38	V
		I_F = 15 A; T_j = 150 °C		-	1.01	1.2	V
I_R	reverse current	V_R = 600 V; T_j = 25 °C		-	5	50	µA
		V_R = 600 V; T_j = 100 °C		-	0.2	0.8	mA
Dynamic characteristics							
Q_r	recovered charge	I_F = 2 A; V_R ≥ 30 V; dI_F/dt = 20 A/µs; Fig. 5		-	40	70	nC
t_{rr}	reverse recovery time	I_F = 1 A; V_R ≥ 30 V; dI_F/dt = 100 A/µs; T_j = 25 °C; Fig. 5		-	50	60	ns
I_{RM}	peak reverse recovery current	I_F = 10 A; V_R ≥ 30 V; dI_F/dt = 50 A/µs; T_j = 100 °C; Fig. 5		-	3	5.2	A
V_{FR}	forward recovery voltage	I_F = 10 A; dI_F/dt = 10 A/µs; Fig. 6		-	3.2	-	V



(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

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

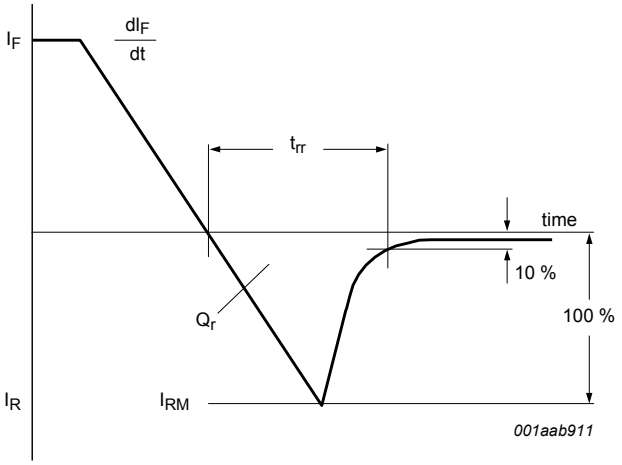


Fig. 5. Forward recovery definitions

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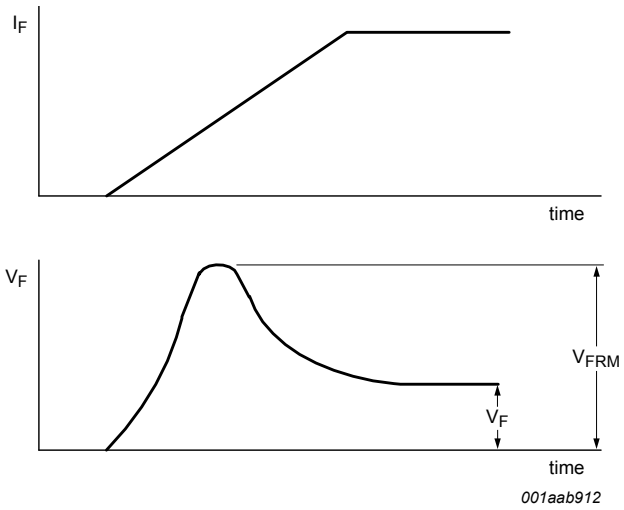

Fig. 6. Forward recovery definitions

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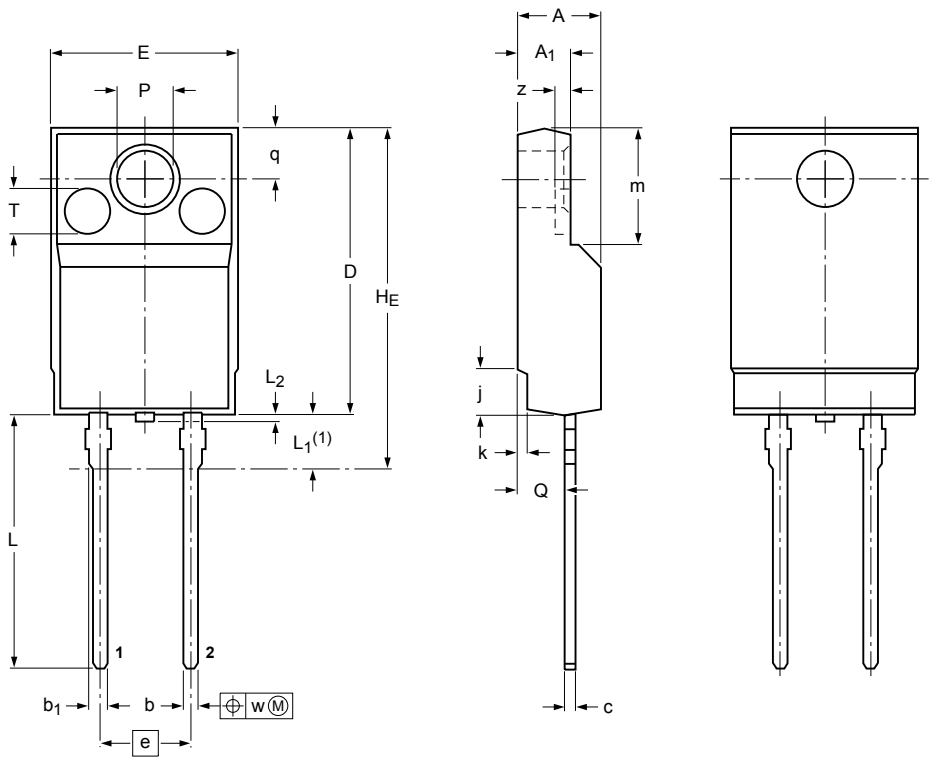
11. Package outline

Plastic single-ended package; isolated heatsink mounted;
1 mounting hole; 2-lead TO-220 'full pack' **SOD113**



z(2)
0.8

DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	b_1	c	D	E	e	H_E max	j	k	L	L_1(1)	L_2 max	m	P	Q	q	T	w
mm	4.6 4.0	2.9 2.5	0.9 0.7	1.1 0.9	0.7 0.4	15.8 15.2	10.3 9.7	5.08	19.0	2.7 1.7	0.6 0.4	14.4 13.5	3.3 2.8	0.5	6.5 6.3	3.2 3.0	2.6 2.3	2.6	2.55	0.4

Notes
1. Terminals are uncontrolled within zone L_1.
2. z is depth of T.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD113		2-lead TO-220F				~~02-04-09~~ 07-06-18

Fig. 7. Package outline TO-220F (SOD113)

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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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