

# BYT79X-600

Rectifier diode ultrafast

Rev. 01 — 29 October 2007

Product data sheet

## 1. Product profile

### 1.1 General description

Ultrafast, epitaxial rectifier diode in a SOD113 (TO-220F) plastic package.

### 1.2 Features

- Fast switching
- Soft recovery characteristics
- Low forward voltage drop
- Low thermal resistance
- Isolated package
- High thermal cycling performance

### 1.3 Applications

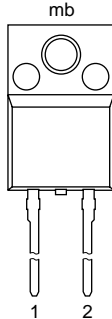

- Output rectifiers in high frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

### 1.4 Quick reference data

- $V_{RRM} \leq 600 \text{ V}$
- $V_F \leq 1.2 \text{ V}$
- $I_{F(AV)} \leq 15 \text{ A}$
- $t_{rr} \leq 60 \text{ ns}$

## 2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode (k)		 001aaa020
2	anode (a)		
mb	mounting base; isolated		

SOD113 (2-lead TO-220F)

### 3. Ordering information

**Table 2.** 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

### 4. Limiting values

**Table 3.** 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 waveform; $\delta = 1.0$ ; $T_h \leq 100\text{ }^{\circ}\text{C}$	-	600	V
$I_{F(AV)}$	average forward current	square waveform; $\delta = 0.5$ ; $T_h \leq 49\text{ }^{\circ}\text{C}$	-	15	A
$I_{FRM}$	repetitive peak forward current	$t = 25\text{ }\mu\text{s}$ ; square waveform; $\delta = 0.5$ ; $T_h \leq 49\text{ }^{\circ}\text{C}$	-	30	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10\text{ ms}$ ; sinusoidal waveform	-	130	A
		$t = 8.3\text{ ms}$ ; sinusoidal waveform	-	143	A
$T_{stg}$	storage temperature		-40	+150	$^{\circ}\text{C}$
$T_j$	junction temperature		-	150	$^{\circ}\text{C}$

5. Thermal characteristics

Table 4. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-h)}$	thermal resistance from junction to heatsink	with heatsink compound; see <a href="#">Figure 1</a>	-	-	4.8	K/W
		without heatsink compound	-	-	5.9	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	55	-	K/W

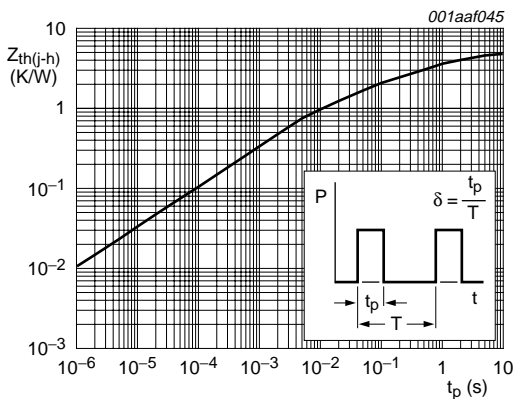


Fig 1. Transient thermal impedance from junction to heatsink as a function of pulse width

6. Isolation characteristics

Table 5. Isolation limiting values and characteristics

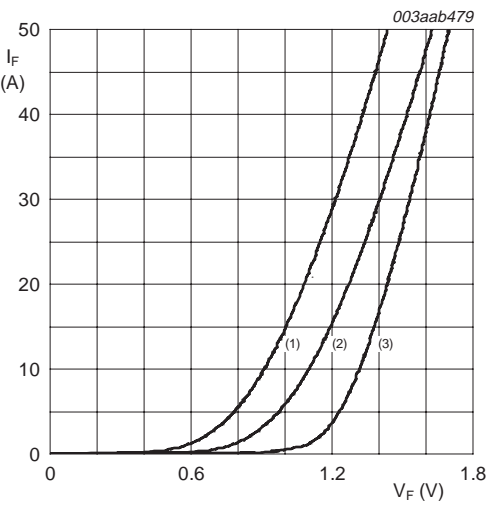
$T_h = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	from all terminals to external heatsink; $f = 50\text{ Hz to }60\text{ Hz}$ ; sinusoidal waveform; relative humidity $\leq 65\%$ ; clean and dust free	-	-	2500	V
$C_{isol}$	isolation capacitance	from cathode to external heatsink; $f = 1\text{ MHz}$	-	10	-	pF

7. Characteristics

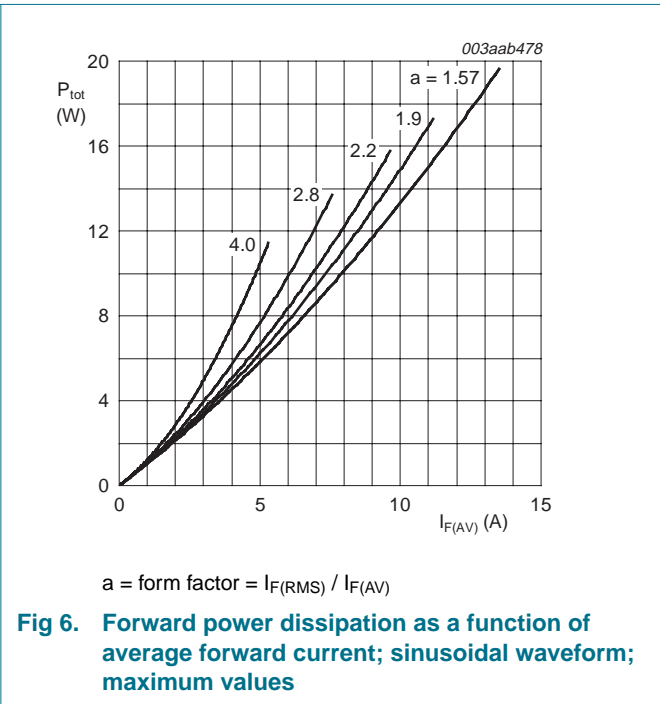
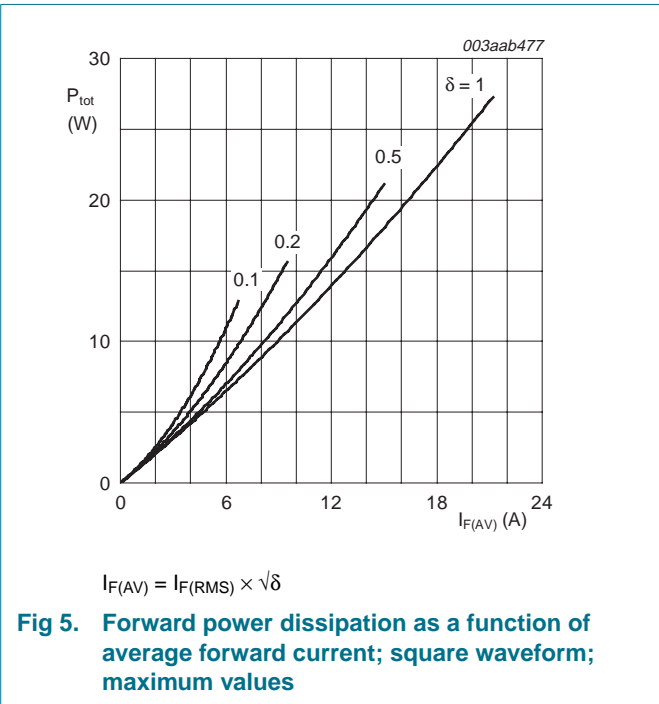
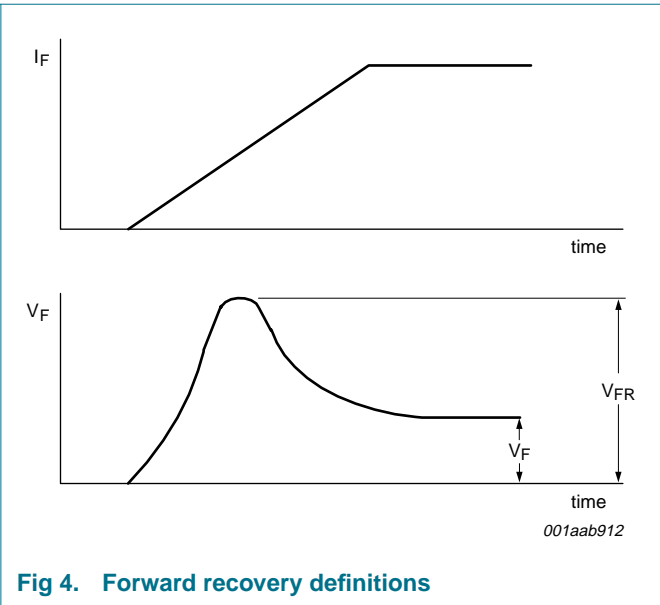
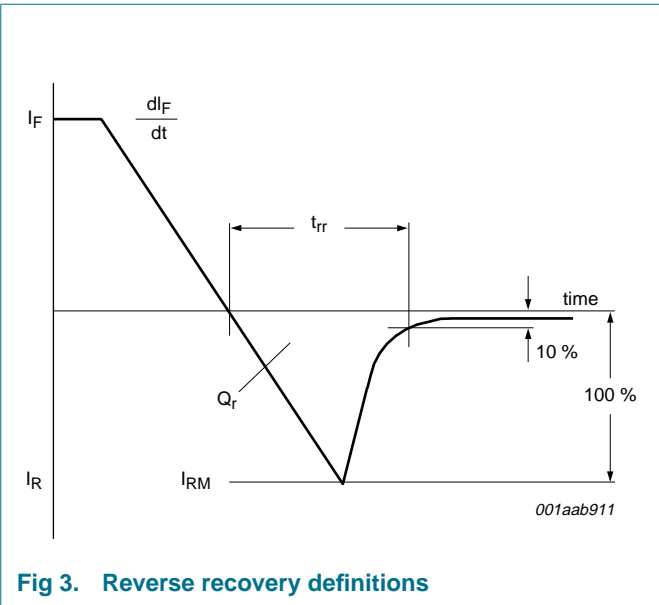
Table 6. Characteristics  
*T<sub>j</sub> = 25 °C unless otherwise specified.*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 15 A; T <sub>j</sub> = 150 °C; see <a href="#">Figure 2</a>	-	1.01	1.20	V
		I <sub>F</sub> = 15 A; see <a href="#">Figure 2</a>	-	1.16	1.38	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 600 V	-	5	50	μA
		V <sub>R</sub> = 600 V; T <sub>j</sub> = 100 °C	-	0.2	0.8	mA
Dynamic characteristics						
Q <sub>r</sub>	recovered charge	I <sub>F</sub> = 2 A to V <sub>R</sub> ≥ 30 V; dI <sub>F</sub> /dt = 20 A/μs; see <a href="#">Figure 3</a>	-	40	70	nC
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A to V <sub>R</sub> ≥ 30 V; dI <sub>F</sub> /dt = 100 A/μs; see <a href="#">Figure 3</a>	-	50	60	ns
I <sub>RM</sub>	peak reverse recovery current	I <sub>F</sub> = 10 A to V <sub>R</sub> ≥ 30 V; dI <sub>F</sub> /dt = 50 A/μs; T <sub>j</sub> = 100 °C; see <a href="#">Figure 3</a>	-	3.0	5.2	A
V <sub>FR</sub>	forward recovery voltage	I <sub>F</sub> = 10 A; dI <sub>F</sub> /dt = 10 A/μs; see <a href="#">Figure 4</a>	-	3.2	-	V



- (1) T<sub>j</sub> = 150 °C; typical values
- (2) T<sub>j</sub> = 150 °C; maximum values
- (3) T<sub>j</sub> = 25 °C; maximum values

Fig 2. Forward current as a function of forward voltage



8. Package outline

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

SOD113

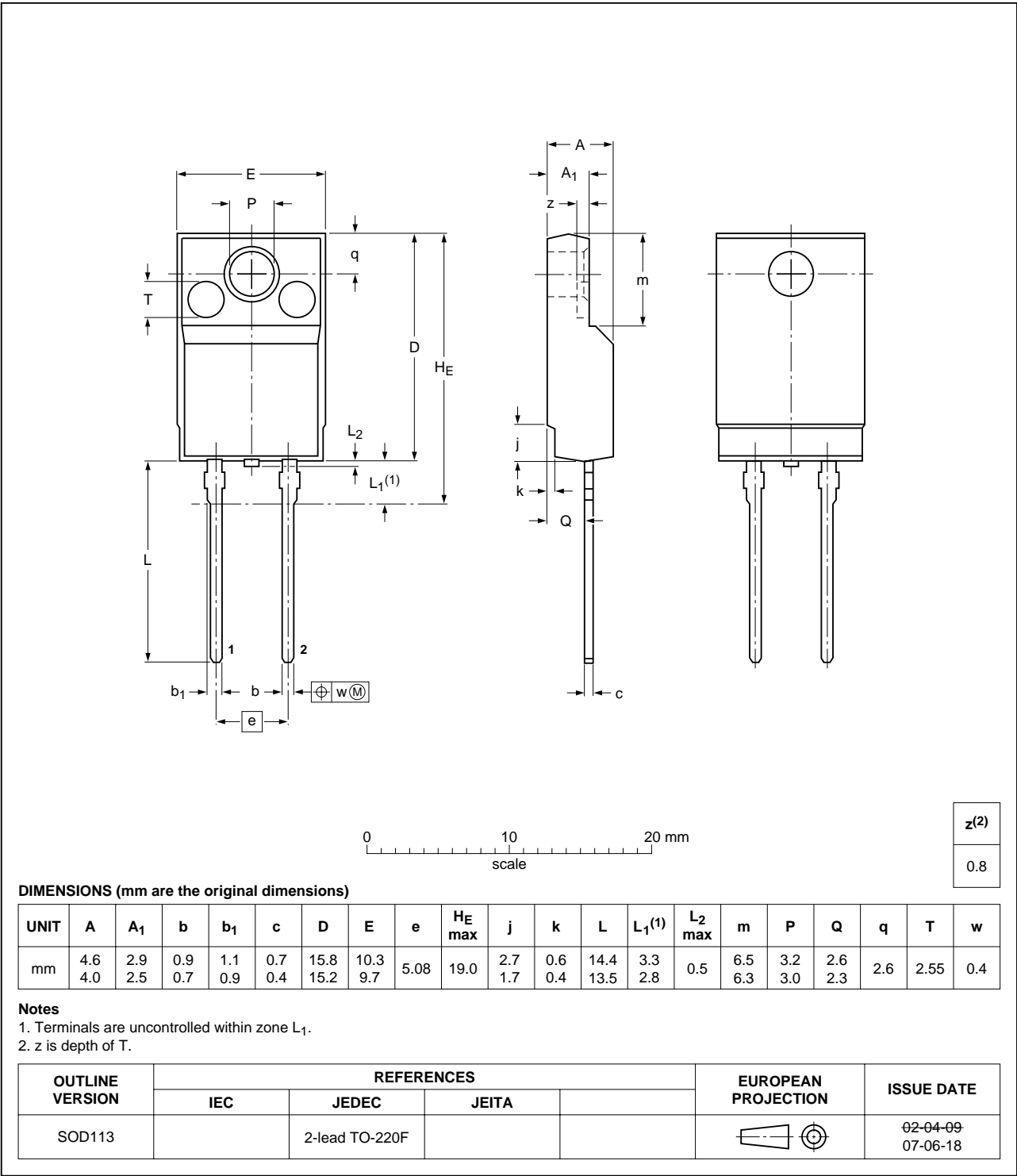


Fig 7. Package outline SOD113 (2-lead TO-220F)

9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYT79X-600_1	20071029	Product data sheet	-	-

## 10. Legal information

### 10.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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