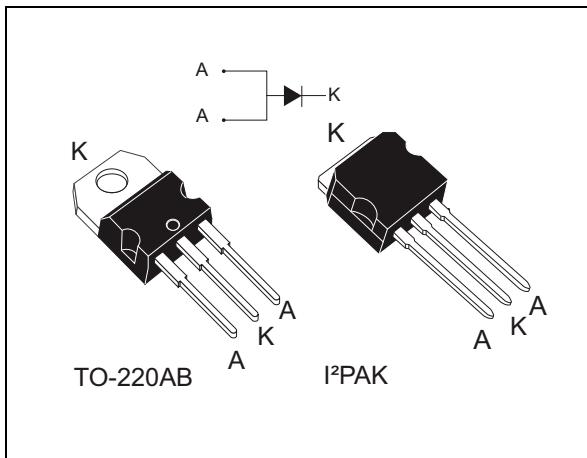


## Field effect rectifier

Datasheet - production data



## Features

- ST proprietary process
- Stable leakage current over reverse voltage
- Low forward voltage drop
- High frequency operation

## Description

This single rectifier is based on a proprietary technology, enabling to achieve the best in class  $V_F/I_R$  trade-off for a given silicon surface.

Packaged in TO-220AB and I<sup>2</sup>PAK, this device is intended to be used in rectification and freewheeling operations in switch-mode power supplies.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	20 A
$V_{RRM}$	60 V
$T_j$ (max)	+175 °C
$V_F$ (typ)	0.30 V

# 1 Characteristics

**Table 2. Absolute ratings (limiting values, per diode, at 25 °C, unless otherwise specified)**

Symbol	Parameter	Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage	60	V	
$I_{F(RMS)}$	Forward rms current	60	A	
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	20	A	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	275	A
$T_{stg}$	Storage temperature range		-65 to + 175 °C	
$T_j^{(1)}$	Maximum operating junction temperature	175	°C	

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-c)}}$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 3. Thermal resistance**

Symbol	Parameter	Value (max)	Unit
$R_{th(j-c)}$	Junction to case	1.6	°C/W

**Table 4. Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25 \text{ °C}$			125	µA
		$T_j = 125 \text{ °C}$		10	20	mA
		$T_j = 25 \text{ °C}$			230	µA
		$T_j = 125 \text{ °C}$		15	30	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25 \text{ °C}$		0.36		V
		$T_j = 125 \text{ °C}$		0.30	0.35	
		$T_j = 25 \text{ °C}$		0.42	0.47	
		$T_j = 125 \text{ °C}$		0.39	0.44	
		$T_j = 25 \text{ °C}$		0.51	0.56	
		$T_j = 125 \text{ °C}$		0.51	0.56	

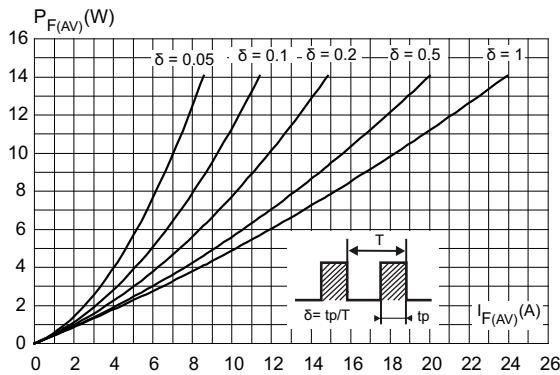
1. Pulse test:  $t_p = 5 \text{ ms}$ ,  $\delta < 2\%$

2. Pulse test:  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

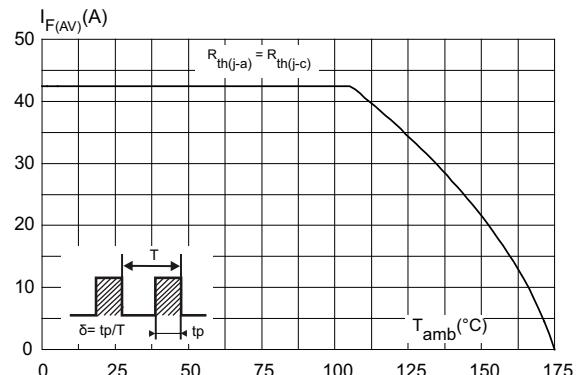
To evaluate the conduction losses use the following equation:

$$P = 0.32 \times I_{F(AV)} + 0.012 I_{F(RMS)}^2$$

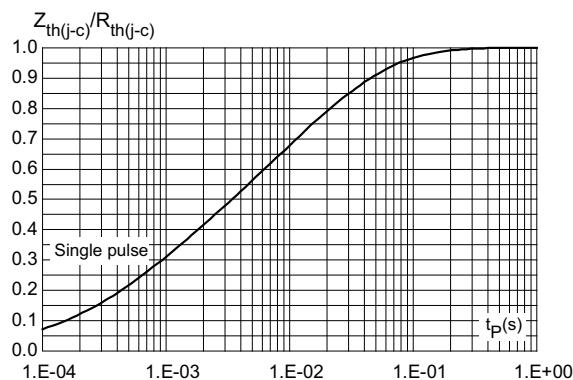
**Figure 1. Average forward power dissipation versus average forward current**



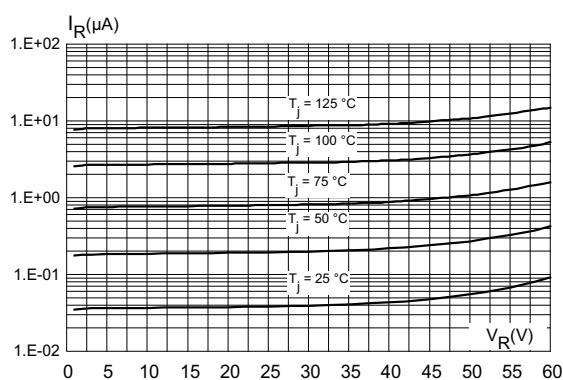
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



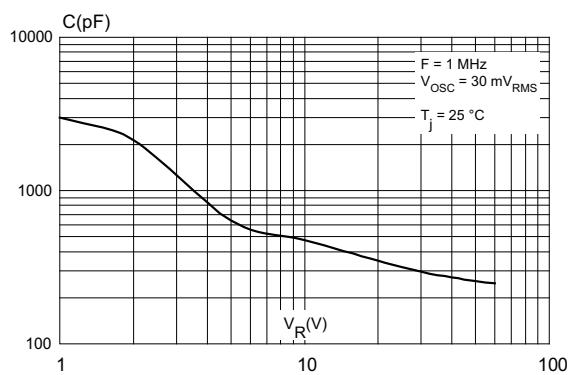
**Figure 3. Relative variation of thermal impedance junction to case versus pulse duration**



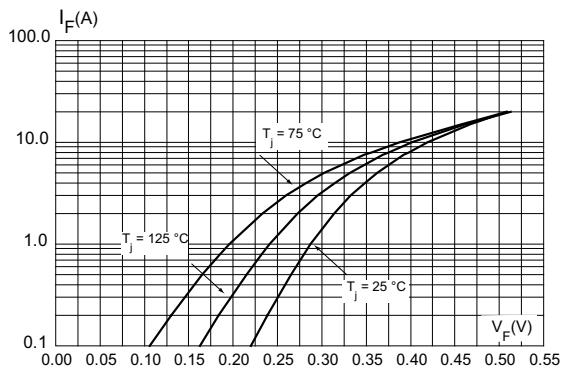
**Figure 4. Reverse leakage current versus reverse voltage applied (typical values)**



**Figure 5. Junction capacitance versus reverse voltage applied (typical values)**



**Figure 6. Forward voltage drop versus forward current (typical values)**



### 3 Ordering information

**Table 7. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
FERD20M60ST	FERD20M60ST	TO-220AB	1.9 g	50	Tube
FERD20M60SR	FERD20M60SR	I <sup>2</sup> PAK	1.4 g	50	Tube

### 4 Revision history

**Table 8. Document revision history**

Date	Revision	Changes
20-Nov-2014	1	Initial release.
17-Jun-2015	2	Added I <sup>2</sup> PAK package information.