

### Description

The FERD30SM100S is based on a proprietary technology that achieves the best in class  $V_F/I_R$  trade-off for a given silicon surface.

This 100 V rectifier has been optimized for use in confined applications where both efficiency and thermal performance are key.

**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	30 A
$V_{RRM}$	100 V
$T_j$ (max)	+175 °C
$V_F$ (typ)	0.39 V

### Features

- ST proprietary process
- Reduce leakage current
- Low forward voltage drop
- High frequency operation
- ECOPACK®2 compliant component

# 1 Characteristics

**Table 2. Absolute ratings (limiting values, at 25 °C, unless otherwise specified, anode terminals short-circuited)**

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	100	V
$I_{F(RMS)}$	Forward rms current	60	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 130 \text{ }^\circ\text{C}$	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	250
$T_{stg}$	Storage temperature range	-65 to + 175	$^\circ\text{C}$
$T_j^{(1)}$	Maximum operating junction temperature	175	$^\circ\text{C}$

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  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	$^\circ\text{C/W}$

**Table 4. Static electrical characteristics (anode terminals short-circuited)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25 \text{ }^\circ\text{C}$	$V_R = V_{RRM}$	-	-	150	$\mu\text{A}$
		$T_j = 125 \text{ }^\circ\text{C}$		-	8	16	mA
		$T_j = 125 \text{ }^\circ\text{C}$	$V_R = 70 \text{ V}$	-	-	9	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 5 \text{ A}$	-	-	0.475	V
		$T_j = 125 \text{ }^\circ\text{C}$		-	0.39	0.43	
		$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 10 \text{ A}$	-	-	0.585	
		$T_j = 125 \text{ }^\circ\text{C}$		-	0.50	0.545	
		$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 30 \text{ A}$	-	-	0.95	
		$T_j = 125 \text{ }^\circ\text{C}$		-	0.64	0.71	

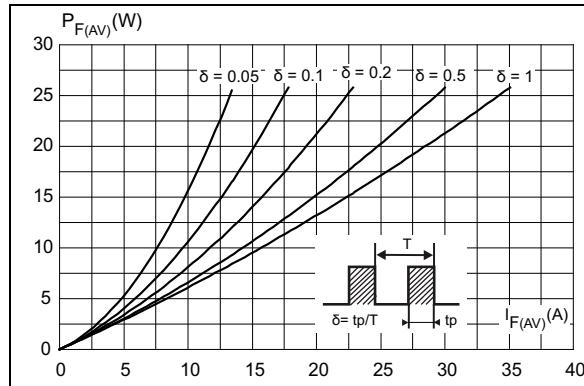
1. Pulse test:  $t_p = 5 \text{ ms}$ ,  $\delta < 2\%$

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

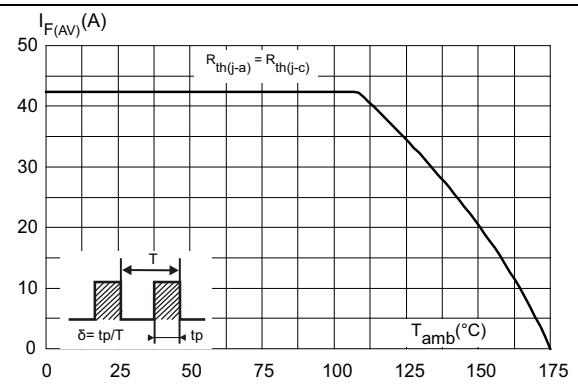
To evaluate the conduction losses use the following equation:

$$P = 0.56 \times I_{F(AV)} + 0.005 I_{F(RMS)}^2$$

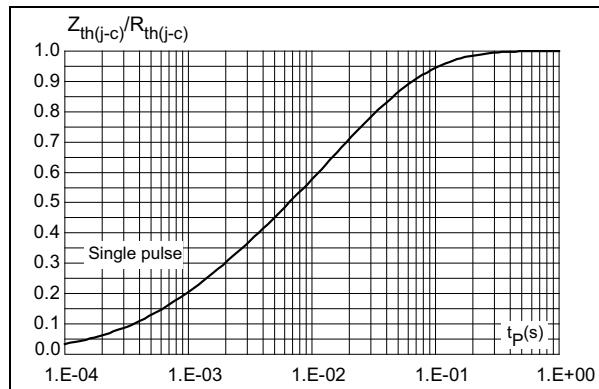
**Figure 1. Average forward power dissipation versus average forward current**



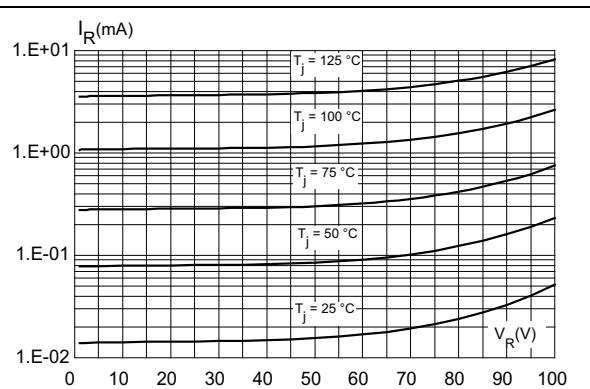
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



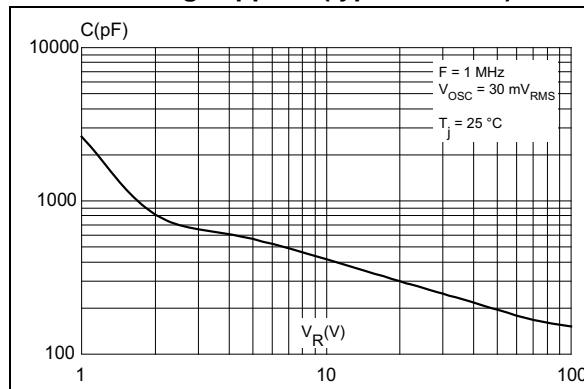
**Figure 3. Relative variation of thermal impedance junction to case versus pulse duration**



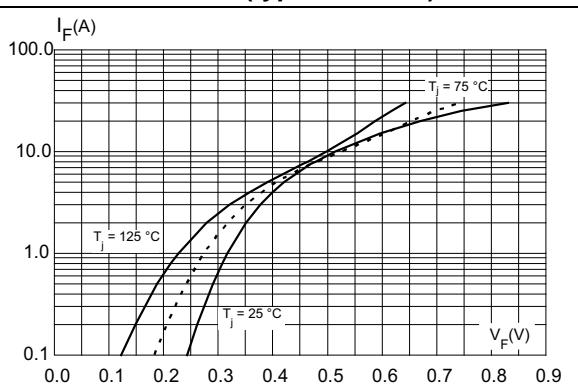
**Figure 4. Reverse leakage current versus reverse voltage applied (typical values)**



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



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



### 3 Ordering information

**Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
FERD30SM100ST	FERD30SM100ST	TO-220AB	1.9 g	50	Tube