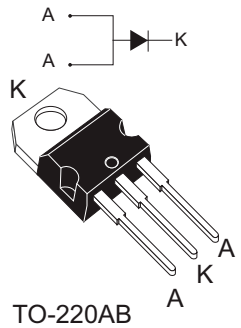
FERD30SM100S

Field effect rectifier

Datasheet - production data



TO-220AB

Features

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

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

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, δ = 0.5	T_c = 130 °C	30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	250	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j(1)	Maximum operating junction temperature		175	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ 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	°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 °C	$V_R = V_{RRM}$	-	-	150	µA
		T_j = 125 °C		-	8	16	mA
		T_j = 125 °C	V_R = 70 V	-	-	9	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 5 A	-	-	0.475	V
		T_j = 125 °C		-	0.39	0.43	
		T_j = 25 °C	I_F = 10A	-	-	0.585	
		T_j = 125 °C		-	0.50	0.545	
		T_j = 25 °C	I_F = 30 A	-		0.95	
		T_j = 125 °C		-	0.64	0.71	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

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

Figure 1. Average forward power dissipation versus average forward current

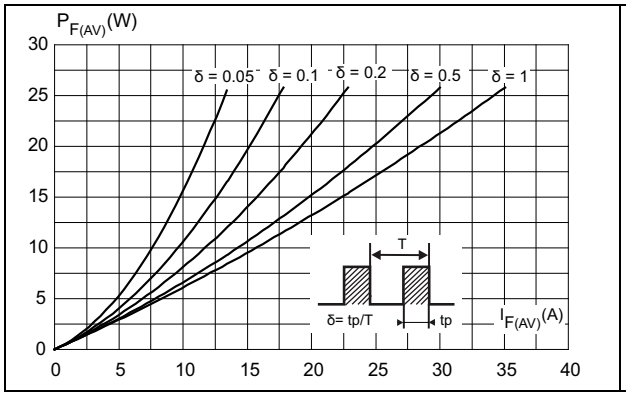


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

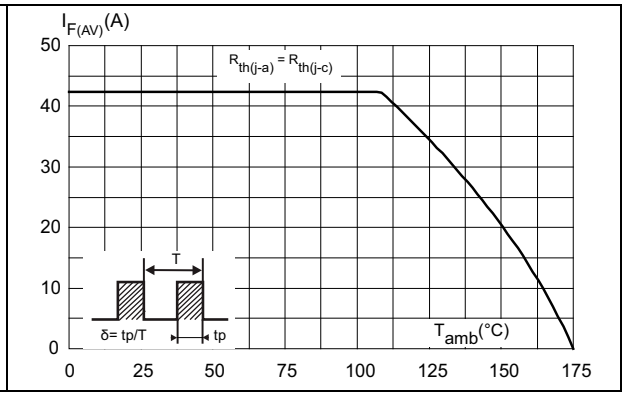


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

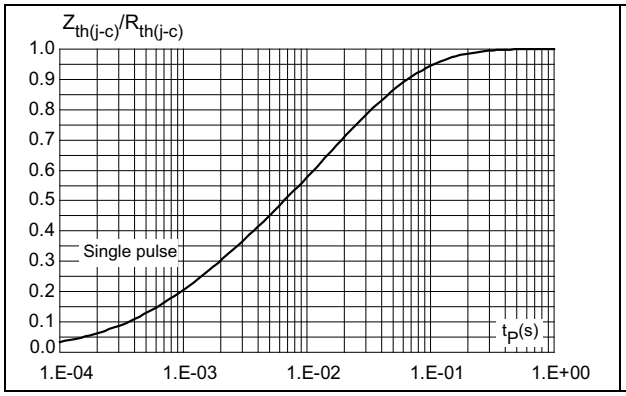


Figure 4. Reverse leakage current versus reverse voltage applied (typical values)

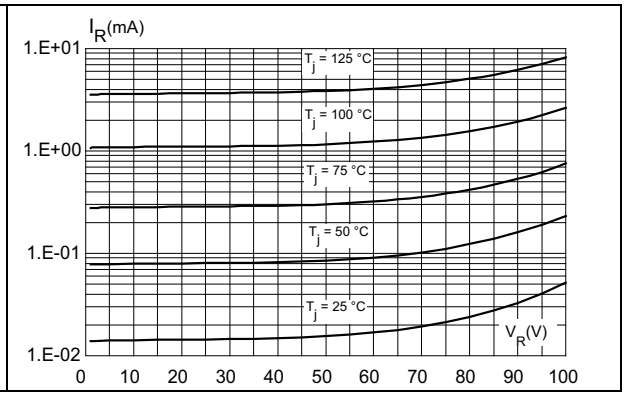


Figure 5. Junction capacitance versus reverse voltage applied (typical values)

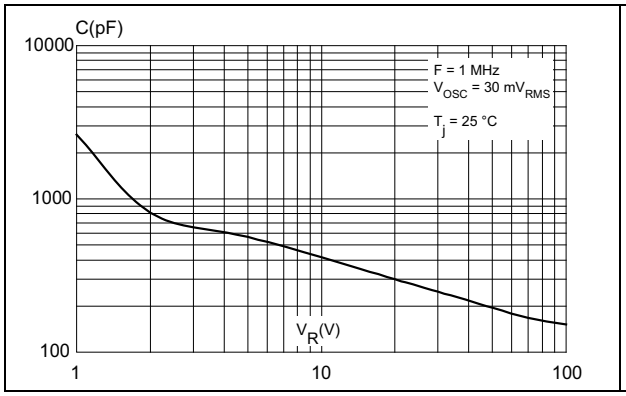
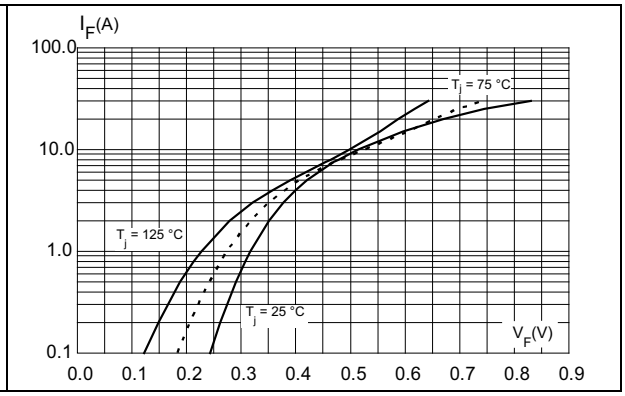


Figure 6. Forward voltage drop versus forward current (typical values)



2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N·m
- Maximum torque value: 0.77 N·m

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

Figure 7. TO-220AB dimension definitions

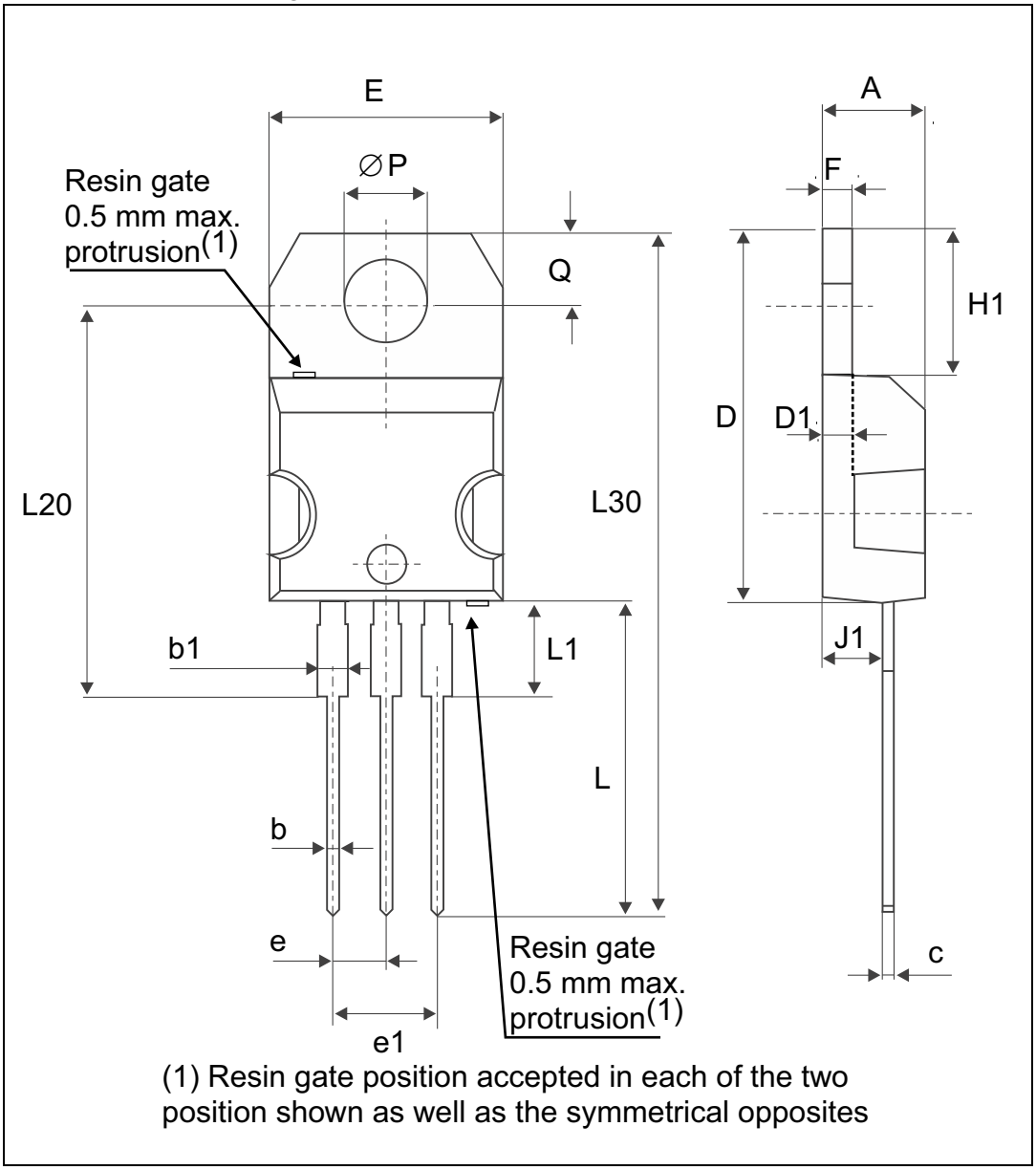


Table 5. TO-220AB dimension values

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.17	0.18
b	0.61	0.88	0.024	0.035
b1	1.14	1.70	0.045	0.067
c	0.48	0.70	0.019	0.027
D	15.25	15.75	0.60	0.62
D1	1.27 typ.		0.05 typ.	
E	10	10.40	0.39	0.41
e	2.40	2.70	0.094	0.106
e1	4.95	5.15	0.19	0.20
F	1.23	1.32	0.048	0.052
H1	6.20	6.60	0.24	0.26
J1	2.40	2.72	0.094	0.107
L	13	14	0.51	0.55
L1	3.50	3.93	0.137	0.154
L20	16.40 typ.		0.64 typ.	
L30	28.90 typ.		1.13 typ.	
∅P	3.75	3.85	0.147	0.151
Q	2.65	2.95	0.104	0.116

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

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
12-Jan-2015	1	Initial release.