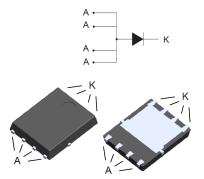


FERD30SM100DJF

Datasheet

100 V, 30 A field effect rectifier



PowerFLAT™ 5x6 (non-contractual)

Features

- ST patented rectifier process
- Stable leakage current over reverse voltage
- Low forward voltage drop
- High frequency operation
- ECOPACK[®]2 compliant

Applications

- Switching diode
- Notebook adapter
- LED lighting
- DC / DC converter

Description

The FERD30SM100DJF is based on a proprietary technology that achieves the best in class V_F / I_R trade-off for a given silicon surface.

Packaged in PowerFLAT[™] 5x6, the FERD30SM100DJF is optimized for use in confined applications where both efficiency and thermal performance are key.

Product status				
FERD30SM100DJF				
Product summary				
Symbol Value				
I _{F(AV)}	30 A			
V _{RRM}	100 V			
T _{j(max.)}	175 °C			
V _{F(typ.)}	0.665 V			



1 Characteristics

Table 1. 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	45	Α	
I _{F(AV)}	Average forward current, δ = 0.5, square wave T_{C} = 100 °C		30	Α
I _{FSM}	Surge non repetitive forward current	180	Α	
T _{stg}	Storage temperature range			°C
Тј	Maximum operating junction temperature ⁽¹⁾	+175	°C	

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

Table 2. Thermal resistance parameter

Sy	/mbol	Parameter	Max. value	Unit
R	th(j-c)	Junction to case	2.6	°C/W

For more information, please refer to the following application note :

AN5046 : Printed circuit board assembly recommendations for STMicroelectronics PowerFLAT™ packages

Table 3. Static electrical characteristics (anode terminals short-circuited)
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Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
	Reverse leakage current	T _j = 25 °C	V _R = V _{RRM} V _R = 70 V	-	-	150	μA
I _R ⁽¹⁾		T _j = 125 °C		-	8	16	mA
		T _j = 125 °C		-	-	9	
		T _j = 25 °C	-		0.480		
	- Forward voltage drop	T _j = 125 °C	I _F = 5 A	-	0.395	0.435	- V
N (2)		T _j = 25 °C	$I_{F} = 10 \text{ A} - \frac{-}{-}$ $I_{F} = 30 \text{ A} - \frac{-}{-}$	-		0.595	
VF ⁽²⁾		T _j = 125 °C		-	0.510	0.555	
		T _j = 25 °C			0.970		
		T _j = 125 °C		-	0.665	0.735	

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

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

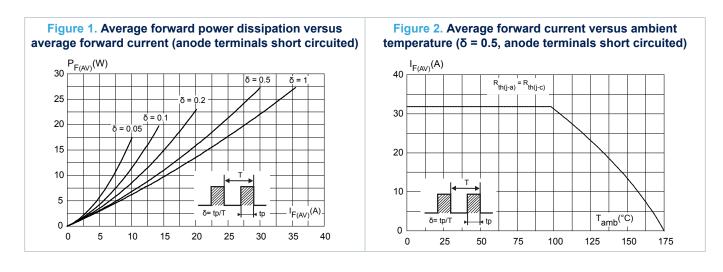
To evaluate the conduction losses, use the following equation:

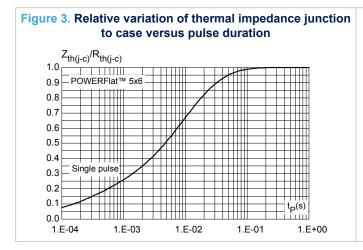
 $P = 0.562 \text{ x } I_{F(AV)} + 0.0057 \text{ x } I_{F}^{2}(RMS)$

For more information, please refer to the following application notes related to the power losses :

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

1.1 Characteristics (curves)





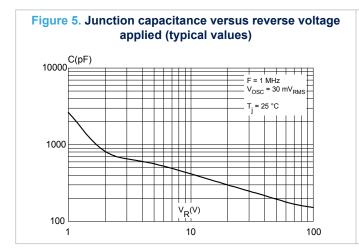


Figure 4. Reverse leakage current versus reverse voltage applied (typical values)

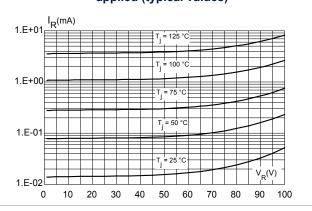
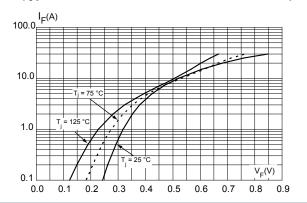


Figure 6. Forward voltage drop versus forward current (typical values, anode terminals short circuited)



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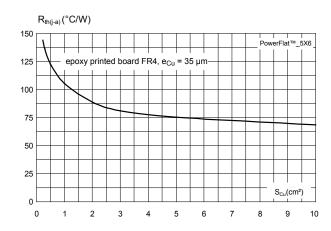


Figure 7. Thermal resistance junction to ambient versus copper surface under tab (typical values)

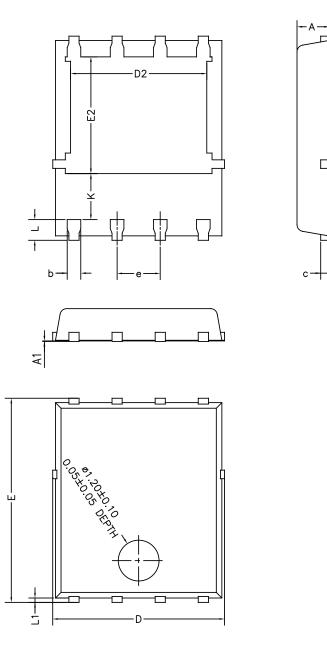
2 Package information

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.

2.1 PowerFLAT[™] 5x6 package information

- Epoxy meets UL 94,V0
- Cooling method: by conduction (C)





Bottom view

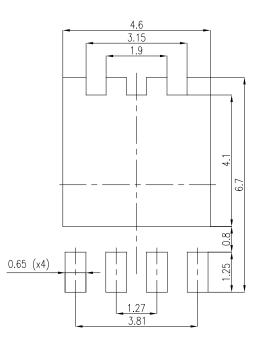


Top view

Dimensions						
Def	Millimeters			Inches (for reference only)		
Ref	Min.	Тур.	Max.	Min.	Тур.	Max.
A	0.80		1.00	0.031		0.039
A1	0.00		0.05	0.000		0.002
b	0.30		0.50	0.01		0.02
С		0.25			0.010	
D	4.80		5.40	0.189		0.212
D2	3.91		4.45	0.154		0.175
e		1.27			0.050	
E	5.90		6.35	0.232		0.250
E2	3.34		3.70	0.138		0.146
L	0.50		0.80	0.020		0.031
К	1.10		1.575	0.015		0.023
L1	0.05	0.15	0.25	0.002	0.006	0.009

Table 4. PowerFLAT™ 5x6 mechanical data

Figure 9. PowerFLAT™ 5x6 recommended footprint (dimensions are in mm)





3 Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
FERD30SM100DJFTR	F30SM 100	PowerFLAT™ 5x6	95 mg	3000	Tape and reel

Revision history

Date	Version	Changes
09-Jan-2015	1	Initial release.
29-Nov-2018	2	Updated Section Cover image and Section 2.1 PowerFLAT™ 5x6 package information. Added Section Applications.
08-Feb-2019	3	Updated Figure 8. PowerFLAT™ 5x6 package outline (non-contractual) and Table 4. PowerFLAT™ 5x6 mechanical data.

Table 6. Document revision history



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