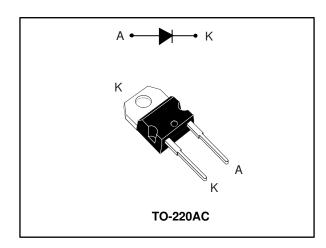
life.augmented

FERD30M45D

Field-effect rectifier

Datasheet - production data



Features

- ST advanced rectifier process
- Stable leakage current over reverse voltage
- Reduced leakage current
- Low forward voltage drop
- High frequency operation

Description

This single field effect rectifier provides stable leakage current over the full range of reverse voltage and low forward voltage drop.

Packaged in TO-220AC, this device is intended to be used in solar bypass junction boxes and in switch mode power supplies.

Table 1: Device summary

Symbol	Value
I _{F(AV)}	30 A
V_{RRM}	45 V
V _F (typ.)	0.44 V
T _j (max.)	175 °C (up to 200 °C forward mode)

Characteristics FERD30M45D

1 Characteristics

Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage		45	٧
I _{F(RMS)}	Forward rms current		60	Α
I _{F(AV)}	Average forward current δ = 0.5, square wave $T_C = 150 ^{\circ}C$		30	Α
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$		250	Α
T _{stg}	Storage temperature range	-65 to +175	°C	
Tj	Maximum operating junction temperature	+175	°C	
Tj	Non repetitive operating junction temperature (DC forward current without reverse bias, $t=1\ \text{hour}$)		200	ô

Notes:

Table 3: Thermal resistance parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	1.05	°C/W

Table 4: Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	$V_R = V_{RRM}$	-		1.2	mA
IR ^(*)		T _j = 125 °C		-	50	100	
		T _j = 125 °C	I _F = 7.5 A	-	0.26	0.31	
V _F (2)	Commend weltone draw	T _j = 25 °C	I _F = 15 A	-	0.37	0.42	V
VF(=)	Forward voltage drop	T _j = 125 °C		-	0.33	0.38	
		T _j = 125 °C	I _F = 30 A	-	0.44	0.49	

Notes:

 $^{(1)}$ Pulse test: t_p = 5 ms, δ < 2%

 $^{(2)}$ Pulse test: t_p = 380 μ s, δ < 2%

To evaluate the conduction losses, use the following equation:

$$P = 0.27 \text{ x } I_{F(AV)} + 0.007 \text{ x } I_{F^{2}(RMS)}$$

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

FERD30M45D Characteristics

Characteristics (curves) 1.1

δ=

0

Figure 1: Average forward current versus ambient temperature ($\delta = 0.5$) $I_{F(AV)}(A)$ 40 20 10 T_{amb}(°C)

100

125

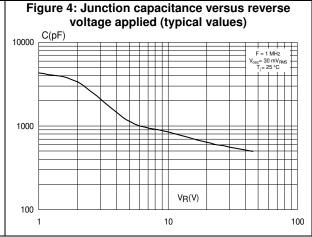
150

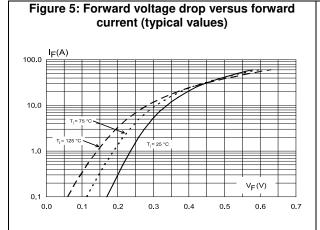
175

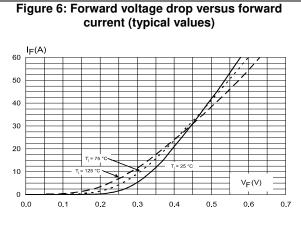
junction to case versus pulse duration $Z_{th(j-c)}/R_{th(j-c)}$ 1.0 0.8 0.7 0.6 0.5 0.4 0.3 0.1 0.0 1.E-04 1.E-03 1.E-02 1.E-01 1.E+00

Figure 2: Relative variation of thermal impedance

Figure 3: Reverse leakage current versus reverse voltage applied (typical values) I_R(mA) 1.E+03 1.E+02 1.E+01 T_i = 75 °C 1.E+00 1.E-01 10







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.

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N·m
- Maximum torque value: 0.7 N·m

2.1 TO-220AC package information

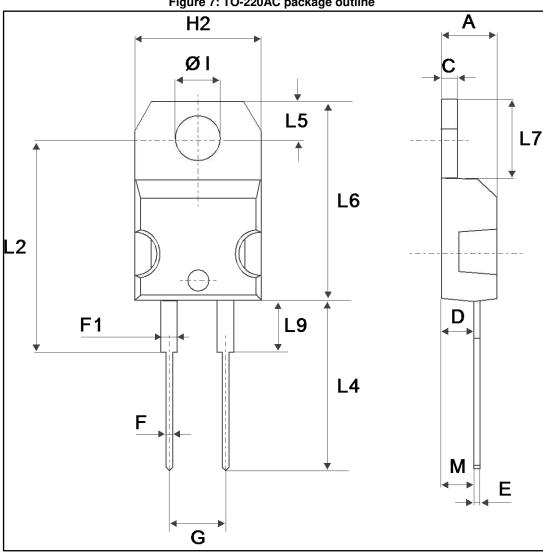


Figure 7: TO-220AC package outline

Table 5: TO-220AC package mechanical data

	Dimensions					
Ref.	Millim	neters	Inches			
	Min.	Max.	Min.	Max.		
A	4.40	4.60	0.173	0.181		
С	1.23	1.32	0.048	0.051		
D	2.40	2.72	0.094	0.107		
Е	0.49	0.70	0.019	0.027		
F	0.61	0.88	0.024	0.034		
F1	1.14	1.70	0.044	0.066		
G	4.95	5.15	0.194	0.202		
H2	10.00	10.40	0.393	0.409		
L2	16.40 typ.		0.645 typ.			
L4	13.00	14.00	0.511	0.551		
L5	2.65	2.95	0.104	0.116		
L6	15.25	15.75	0.600	0.620		
L7	6.20	6.60	0.244	0.259		
L9	3.50	3.93	0.137	0.154		
М	2.6 typ.		0.102 typ.			
Diam	3.75	3.85	0.147	0.151		

Ordering information FERD30M45D

3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
FERD30M45D	FERD30M45D	TO-220AC	1.86 g	50	Tube

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
02-May-2016	1	Initial release.
07-Oct-2016	2	Updated Table 2: "Absolute ratings (limiting values at 25 °C, unless otherwise specified)".

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