

FERD30M45C

ST advanced rectifier

Datasheet - production data

Features

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

Description

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

Packaged in TO-220AB or D²PAK, this device is intended to be used in solar bypass junction boxes and in switch mode power supplies.

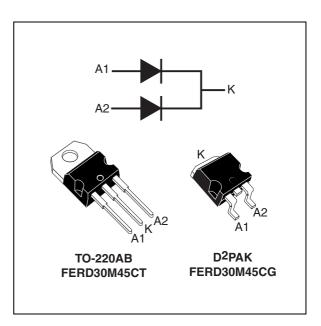


Table 1. Device summary

Symbol	Value
I _{F(AV)}	2 x 15 A
V_{RRM}	45 V
T _{j (max)}	+175 °C up to 200 °C forward mode
V _F (typ)	0.35 V

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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			45	V
I _{F(RMS)}	Forward rms current			30	Α
1	$I_{F(AV)}$ Average forward current, $\delta = 0.5$	T _c = 155 °C	Per diode	15	Α
'F(AV)		$T_c = 155$ °C	Per device	30	
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$			250	Α
T _{stg}	Storage temperature range			-65 to + 175	°C
T _j	Maximum operating junction temperature			175	°C
T _j	Maximum operating temperature (DC forward current without reverse bias, $t = 1 \text{ hour})^{(1)}$		200	°C	

 $^{1. \}quad \frac{dPtot}{dTj} < \frac{1}{Rth(j-a)} \ condition \ to \ avoid \ thermal \ runaway \ for \ a \ diode \ on \ its \ own \ heatsink.$

Table 3. Thermal resistance

Symbol	Parameter	Value (max)	Unit	
D	Junction to case	er diode	1.6	
R _{th(j-c)}		otal	1.05	°C/W
R _{th(c)}	Coupling		0.5	

When diodes 1 and 2 are used simultaneously:

 $T_j(diode\ 1) = P(diode\ 1)\ x\ R_{th(j-c)}(per\ diode) + P(diode\ 2)\ x\ R_{th}(c)$

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Table 4.	Static electrical	characteristics ((per diode)
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Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _B ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V - V			600	μΑ
'R` ′	IR' / neverse leakage current	T _j = 125 °C	$V_R = V_{RRM}$		25	50	mA
	V _F ⁽²⁾ Forward voltage drop	T _j = 125 °C	I _F = 7.5 A		0.305	0.350	V
V (2)		T _j = 125 °C	I _F = 10 A		0.350	0.395	V
V _F ` ′		T _j = 25 °C	L _ 15 A		0.420	0.470	
		T _j = 125 °C	I _F = 15 A		0.420	0.450	

- 1. Pulse test: $t_p = 5$ ms, $\delta < 2\%$
- 2. Pulse test: t_p = 380 μ s, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.27 \text{ x } I_{F(AV)} + 0.012 I_{F(RMS)}^{2}$$

Figure 1. Average forward power dissipation Figure 2. versus average forward current (per diode)

Average forward current versus ambient temperature (δ = 0.5, per diode)

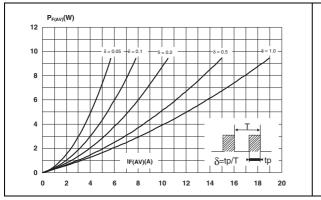
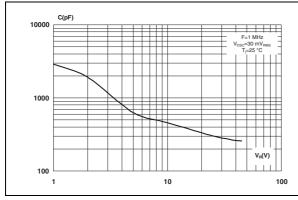
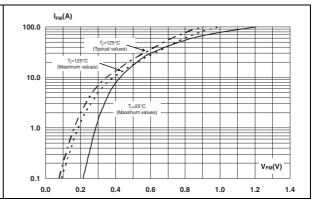


Figure 3. Junction capacitance versus reverse voltage applied (typical values, per diode)

Figure 4. Forward voltage drop versus forward current (per diode)





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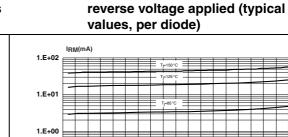
Figure 6.

1.E-01

1.E-02

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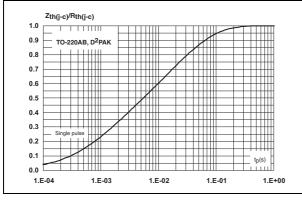
Figure 5. Relative variation of thermal impedance junction to case versus pulse duration



10 15 20 25 30 35

Reverse leakage current versus

40 45



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FERD30M45C Package information

2 Package information

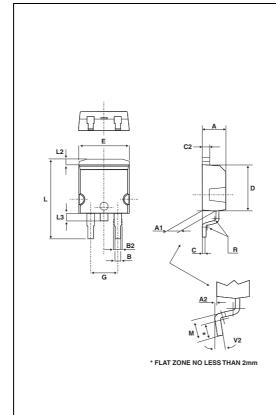
Epoxy meets UL94, V0

Cooling method: by conduction (C)

Recommended torque value: 0.8 to 1.0 N⋅m

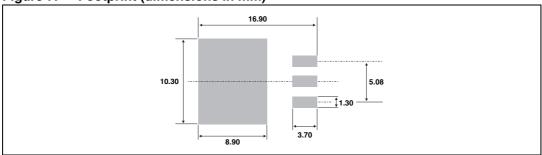
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Table 5. D²PAK dimensions



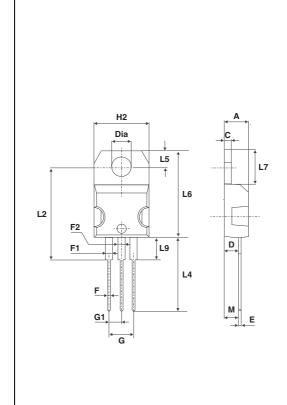
	Dimensions				
Ref.	Millimeters		Inc	hes	
	Min.	Max.	Min.	Max.	
Α	4.40	4.60	0.173	0.181	
A1	2.49	2.69	0.098	0.106	
A2	0.03	0.23	0.001	0.009	
В	0.70	0.93	0.027	0.037	
B2	1.14	1.70	0.045	0.067	
С	0.45	0.60	0.017	0.024	
C2	1.23	1.36	0.048	0.054	
D	8.95	9.35	0.352	0.368	
Е	10.00	10.40	0.393	0.409	
G	4.88	5.28	0.192	0.208	
L	15.00	15.85	0.590	0.624	
L2	1.27	1.40	0.050	0.055	
L3	1.40	1.75	0.055	0.069	
М	2.40	3.20	0.094	0.126	
R	0.40 typ.		0.010	6 typ.	
V2	0°	8°	0°	8°	

Figure 7. Footprint (dimensions in mm)



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Table 6. TO-220AB dimensions



	Dimensions				
Ref.	Millimeters		Inc	hes	
	Min.	Max.	Min.	Max.	
Α	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	
F2	1.14	1.70	0.044	0.066	
G	4.95	5.15	0.194	0.202	
G1	2.40	2.70	0.094	0.106	
H2	10	10.40	0.393	0.409	
L2	16.4	typ.	0.645 typ.		
L4	13	14	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	2 typ.	
Diam.	3.75	3.85	0.147	0.151	

3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
FERD30M45CT	FERD30M45CT	TO-220AB	2.2 g	50	Tube
FERD30M45CG-TR	FERD30M45CG	D ² PAK	1.5 g	1000	Tape and reel

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
12-Nov-2012	1	Initial release.

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