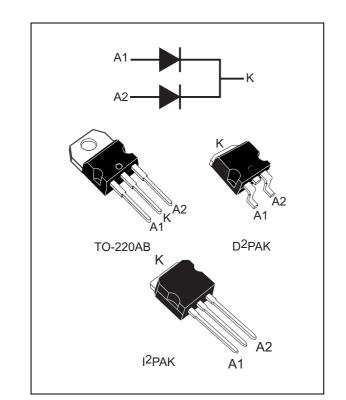


FERD30M45C

Field effect rectifier

Datasheet - production data



Features

- Advanced rectifier proprietary process
- Stable leakage current over reverse voltage
- Reduce leakage current
- 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, I²PAK 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 only on D ² PAK)
V _F (typ)	0.35 V

This is information on a product in full production.

1 Characteristics

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

Symbol	Parame		Value	Unit	
V _{RRM}	Repetitive peak reverse voltage			45	V
I _{F(RMS)}	Forward rms current			30	А
	Average forward current, $\delta = 0.5$	T _c = 155 °C	Per diode	15	А
I _{F(AV)}	Average forward current, 0 = 0.5	T _c = 155 °C	Per device	30	~
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$				А
T _{stg}	Storage temperature range				°C
Т _ј	Maximum operating junction temperature			175	°C
Тj	Maximum operating temperature on D ² PAK (DC forward current without reverse bias, t = 1 hour) ⁽¹⁾			200	°C

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

Table 3. Thermal resistance

Symbol	Parameter	Parameter			
Б	Junction to case	Per diode	1.6		
R _{th(j-c)}		Total	1.05	°C/W	
R _{th(c)}	Coupling		0.5		

When diodes 1 and 2 are used simultaneously:

 $T_j(diode 1) = P(diode1) \times R_{th(j-c)}(per diode) + P(diode2) \times R_{th}(c)$



Symbol	Parameter	Test co	nditions	Min.	Тур.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V - V			600	μA
'R` ′	Reverse leakage current	T _j = 125 °C	$V_R = V_{RRM}$		25	50	mA
		T _j = 125 °C	I _F = 7.5 A		0.305	0.350	
V (2)	V _F ⁽²⁾ Forward voltage drop	T _j = 125 °C	I _F = 10 A		0.350	0.395	V
V F ()		T _j = 25 °C	I _F = 15 A		0.420	0.470	v
	T _j = 125 °C	1 _F – 13 A		0.420	0.450		

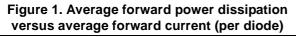
Table 4. Static electrical characteristics (per diode)

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

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

To evaluate the conduction losses use the following equation:

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



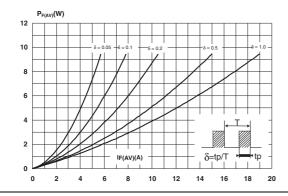
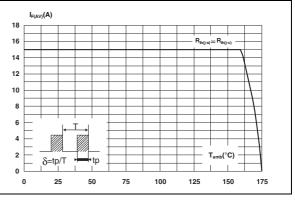


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, per diode)



voltage applied (typical values, per diode)

Figure 3. Junction capacitance versus reverse Figure 4. Forward voltage drop versus forward current (per diode)

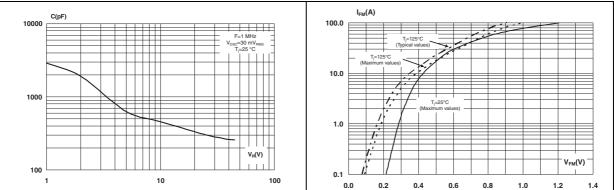
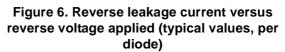
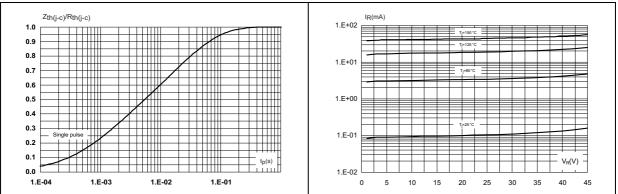




Figure 5. Relative variation of thermal impedance junction to case versus pulse duration



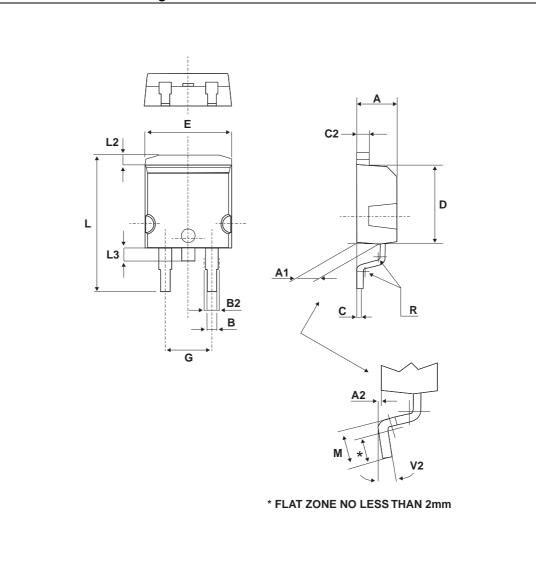




2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 to 1.0 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.







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		Dime	nsions	
Ref.	Millim	Millimeters		ies
	Min.	Max.	Min.	Max.
А	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
E	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	0.40 typ.		typ.
V2	0°	8°	0°	8°

Table 5. D²PAK dimension values

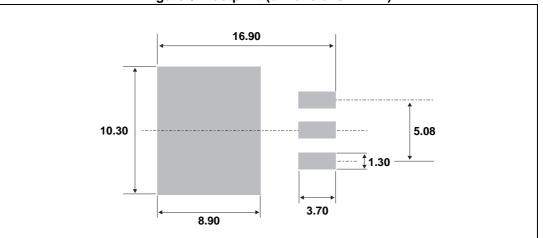


Figure 8. Footprint (dimensions in mm)



D

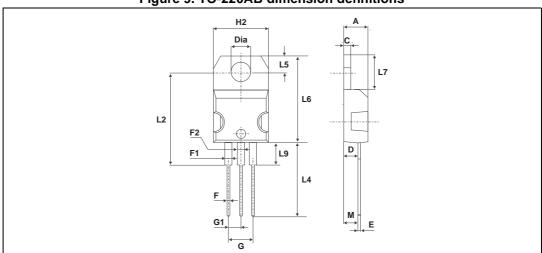


Figure 9. TO-220AB dimension definitions

1	Table 6.	TO-220AB dimens	sion values	
		Dimen	sions	
Ref.	Millim	neters	Inches	
F	Min.	Max.	Min.	Max.
А	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
E	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	5 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





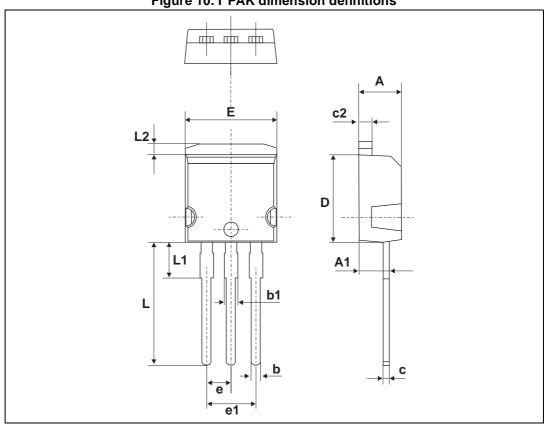
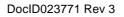


Figure 10. I²PAK dimension definitions

Table 7. I²PAK dimension values

	Dimensions				
Ref.	Millim	neters	Inc	hes	
	Min.	Max.	Min.	Max.	
А	4.40	4.60	0.173	0.181	
A1	2.40	2.72	0.094	0.107	
b	0.61	0.88	0.024	0.035	
b1	1.14	1.70	0.044	0.067	
с	0.49	0.70	0.019	0.028	
c2	1.23	1.32	0.048	0.052	
D	8.95	9.35	0.352	0.368	
е	2.40	2.70	0.094	0.106	
e1	4.95	5.15	0.195	0.203	
E	10	10.40	0.394	0.409	
L	13	14	0.512	0.551	
L1	3.50	3.93	0.138	0.155	
L2	1.27	1.40	0.050	0.055	





3 Ordering information

Table 8. Ordering information	Table 8	. Ordering	information
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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
FERD30M45CR	FERD30M45CR	I ² PAK	1.4 g	50	Tube

4 Revision history

Date	Revision	Changes
12-Nov-2012	1	Initial release.
12-Nov-2013	2	Updated title.
11-Jul-2014	3	Added I ² PAK package.

Table 9. Document revision history



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