Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

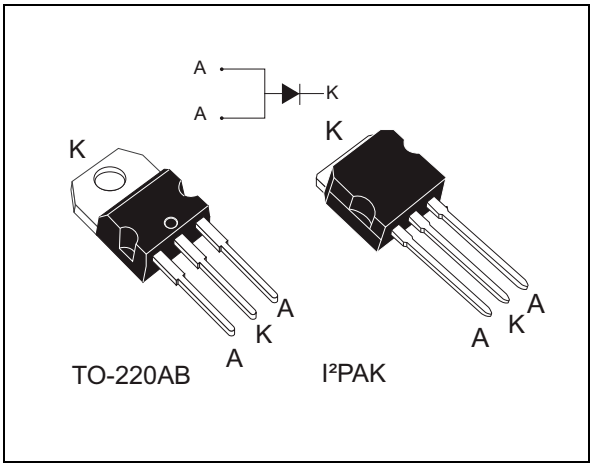
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

FERD20M60

Field effect rectifier

Datasheet - production data



Features

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

Description

This single rectifier is based on a proprietary technology, enabling to achieve the best in class V_F/I_R trade-off for a given silicon surface.

Packaged in TO-220AB and I²PAK, this device is intended to be used in rectification and freewheeling operations in switch-mode power supplies.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	20 A
V_{RRM}	60 V
T_j (max)	+175 °C
V_F(typ)	0.30 V

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		60	V
$I_{F(RMS)}$	Forward rms current		60	A
$I_{F(AV)}$	Average forward current, δ = 0.5	T_c = 150 °C	20	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	275	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 (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	V_R = 45 V			125	µA
		T_j = 125 °C			10	20	mA
		T_j = 25 °C	V_R = V_{RRM}			230	µA
		T_j = 125 °C			15	30	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 5 A		0.36		V
		T_j = 125 °C			0.30	0.35	
		T_j = 25 °C	I_F = 10A		0.42	0.47	
		T_j = 125 °C			0.39	0.44	
		T_j = 25 °C	I_F = 20 A		0.51	0.56	
		T_j = 125 °C			0.51	0.56	

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:

$P = 0.32 \times I_{F(AV)} + 0.012\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

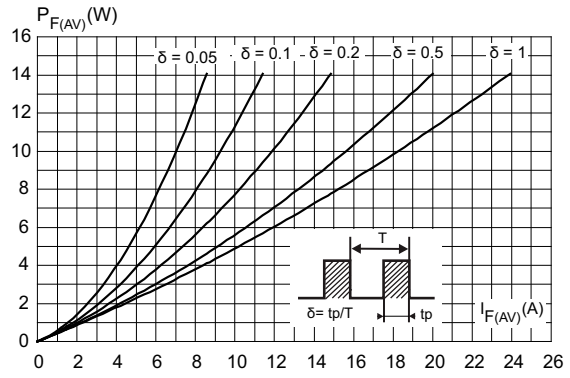


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

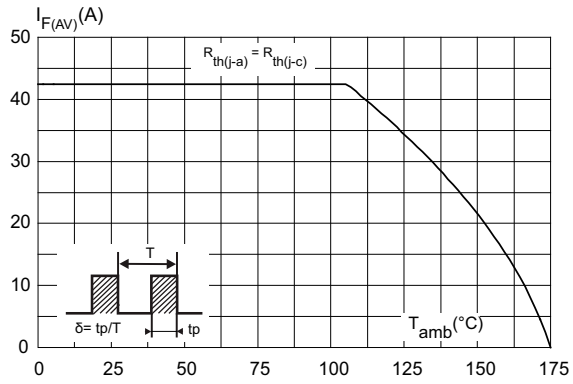


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

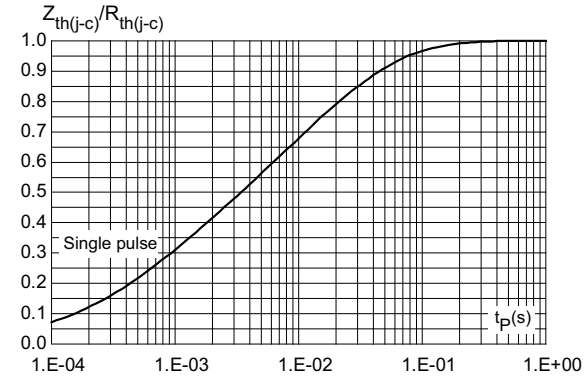


Figure 4. Reverse leakage current versus reverse voltage applied (typical values)

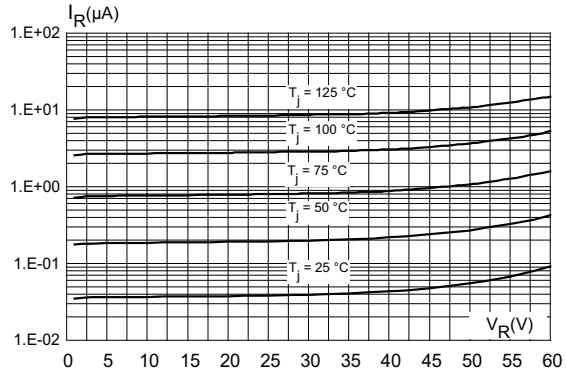


Figure 5. Junction capacitance versus reverse voltage applied (typical values)

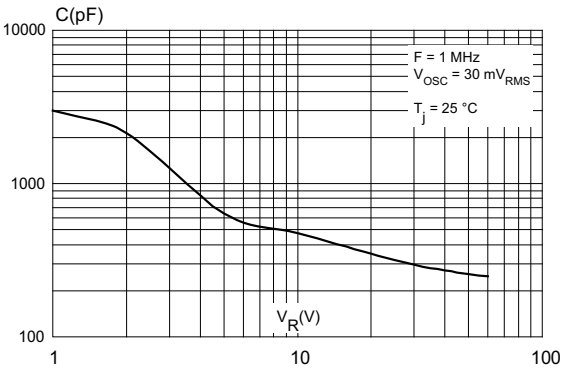
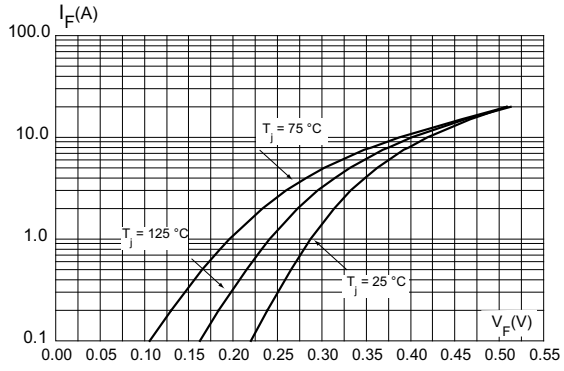


Figure 6. Forward voltage drop versus forward current (typical values)



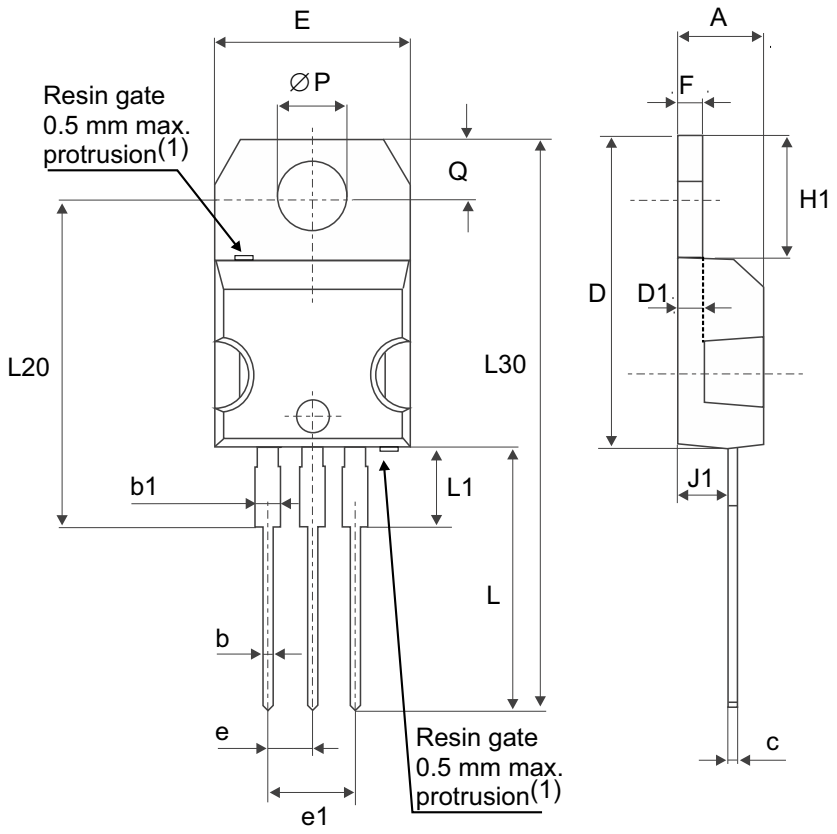
2 Package information

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

2.1 TO-220AB package information

Figure 7. TO-220AB package outline



(1) Resin gate position accepted in each of the two position shown as well as the symmetrical opposites

Table 5. TO-220AB package mechanical data

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

2.2 I²PAK package information

Figure 8. I²PAK package outline

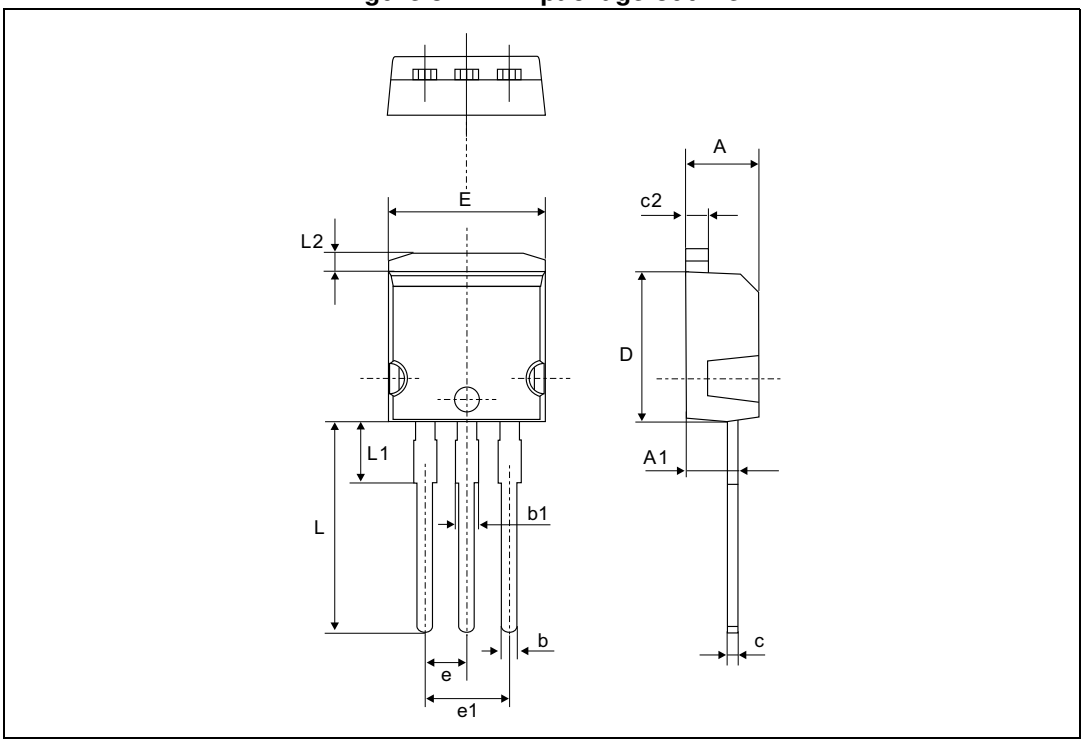


Table 6. I²PAK package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	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
c	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
e	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 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
FERD20M60ST	FERD20M60ST	TO-220AB	1.9 g	50	Tube
FERD20M60SR	FERD20M60SR	I²PAK	1.4 g	50	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
20-Nov-2014	1	Initial release.
17-Jun-2015	2	Added I²PAK package information.