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2014年1月

FDP030N06

N 沟道 PowerTrench[®] MOSFET 60 V,193 A,3.2 mΩ

特性

- $R_{DS(on)} = 2.6 \text{ m}\Omega \text{ (Typ.)}@V_{GS} = 10 \text{ V, } I_D = 75 \text{ A}$
- 快速开关速度
- 低栅极电荷
- 高性能沟道技术可实现极低的 R_{DS(on)}
- 高功率和高电流处理能力
- 符合 RoHS 标准

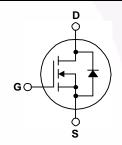
说明

此 N 沟道 MOSFET 采用飞兆半导体先进的 PowerTrench[®] 工艺 生产,这一先进工艺是专为最大限度地降低通态电阻并保持卓越 开关性能而定制的。

应用

- 用于 ATX/ 服务器 / 通信 PSU 的同步整流
- 电池保护电路
- 电机驱动和不间断电源
- 可再生系统





MOSFET 最大额定值 T_C=25℃ 除非另有说明。

符号		参数		FDP030N06	单位
V_{DSS}	漏极一源极电压			60	V
V _{GSS}	栅极一源极电压			±20	V
		- 连续 (T _C =25°C, 硅片受限)		193	
I_D	漏极电流	- 连续 (T _C =100°C,硅片受限)		136	Α
		- 连续 (T _C =25°C,封装受限)		120	
I _{DM}	漏极电流	- 脉冲	说明 1)	772	Α
E _{AS}	单脉冲雪崩能量	(-	说明 2)	1434	mJ
dv/dt	峰值二极管恢复 dv/dt	(·	说明 3)	6.0	V/ns
D	TL ±1	(T _C = 25°C)		231	W
P_D	功耗	- 降额 25°C 以上		1.54	W/°C
T _J , T _{STG}	工作和存储温度范围			-55 至 +175	°C
TL	用于焊接的最大引脚温度,	距离外壳 1/8",持续 5 秒		300	°C

热性能

符号	参数	FDP030N06	单位
$R_{\theta JC}$	结至外壳热阻最大值	0.65	°C/W
$R_{\theta JA}$	结至环境热阻最大值	62.5	*C/VV

封装标识与定购信息

器件编号	顶标	封装	包装方法	卷尺寸	带宽	数量
FDP030N06	FDP030N06	TO-220	塑料管	不适用	不适用	50 个

电气特性 T_C =25℃ 除非另有说明。

符号	参数	测试条件	最小值	典型值	最大值	单位
关断特性						
BV _{DSS}	漏极一源极击穿电压	$I_D = 250 \mu A, V_{GS} = 0 V, T_C = 25^{\circ}C$	60	-	-	V
ΔBV _{DSS} / ΔT _J	击穿电压温度系数	I _D = 1 mA,参考条件为 25°C	-	0.05	-	V/°C
I _{DSS}	零栅极电压漏极电流	V _{DS} = 48 V, V _{GS} = 0 V V _{DS} = 48 V, T _C = 150°C	-	-	1 500	μА
I _{GSS}	栅极 - 体漏电流	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	±100	nA

导通特性

V _{GS(th)}	栅极阈值电压	$V_{GS} = V_{DS}, I_{D} = 250 \mu A$	2.5	3.5	4.5	V
R _{DS(on)}	漏极至源极静态导通电阻	$V_{GS} = 10 \text{ V}, I_D = 75 \text{ A}$	-	2.6	3.2	mΩ
9 _{FS}	正向跨导	$V_{DS} = 10 \text{ V}, I_{D} = 75 \text{ A}$	-	154	-	S

动态特性

C _{iss}	输入电容	V 25 V V 0 V	-	7380	9815	pF
C _{oss}	输出电容	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	-	1095	1455	pF
C _{rss}	反向传输电容	1 - 1 1/11/2	-	415	625	pF
Q _{g(tot)}	10V 的栅极电荷总量	$V_{DS} = 48 \text{ V}, I_{D} = 75 \text{ A},$	-	116	151	nC
Q_{gs}	栅极 - 源极栅极电荷	V _{GS} = 10 V	-	40	-	nC
Q _{gd}	栅漏极"米勒"电荷	(说明 4)	-	35	-	nC

开关特性

t _{d(on)}	导通延迟时间		-	39	87	ns
t _r	开通上升时间	$V_{DD} = 30 \text{ V}, I_D = 75 \text{ A},$	-	178	366	ns
t _{d(off)}	关断延迟时间	$V_{GS} = 10 \text{ V}, R_G = 4.7 \Omega$	-	54	118	ns
t _f	关断下降时间	(说明 4)	-	33	76	ns

漏源极二极管特性

Is	漏源极二极管最大正向连续电流		/-	-	193	Α
I _{SM}	漏源极二极管最大正向脉冲电流		-	-	772	Α
V_{SD}	漏源极二极管正向电压	$V_{GS} = 0 \text{ V}, I_{SD} = 75 \text{ A}$	-	-	1.3	V
t _{rr}	反向恢复时间	V _{GS} = 0 V, I _{SD} = 75 A,	-	46	-	ns
Q _{rr}	反向恢复电荷	$dI_F/dt = 100 A/\mu s$	-	50	-	nC

注意:

- 1. 重复额定值: 脉冲宽度受限于最大结温。
- 2. L=0.51 mH, I_{AS} =75 A, V_{DD} =50 V, R_{G} =25 W,开始 T_{J} =25°C。 3. I_{SD} \leq 75 A, di/dt \leq 450 A/ms, V_{DD} \leq BV $_{DSS}$,开始 T_{J} =25°C。
- 4. 本质上独立于工作温度的典型特性。

典型性能特征

图 1. 导通区域特性

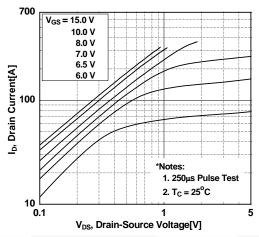


图 3. 导通电阻变量与漏极电流和 栅极电压的关系

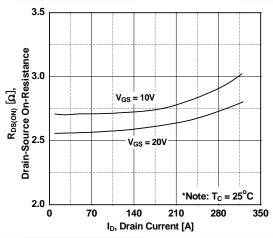


图 5. 电容特性

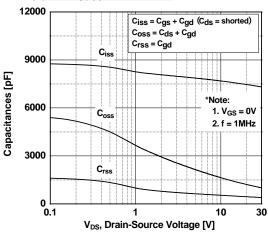


图 2. 传输特性

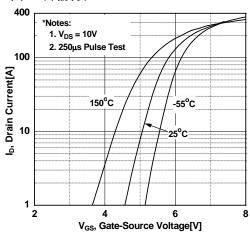


图 4. 体二极管正向电压变量与源电流的 关系和温度

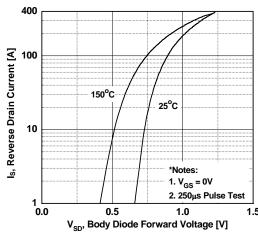
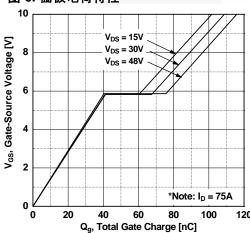
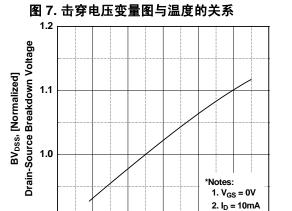


图 6. 栅极电荷特性



典型性能特征 (接上页)



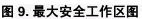
50

T_J, Junction Temperature [°C]

100

150

图 8. 导通电阻变量与温度的关系 **Drain-Source On-Resistance** R_{DS(on)}, [Normalized] *Notes: 1. V_{GS} = 10V 2. I_D = 75A 0.5 └ -100



0.9 L -100

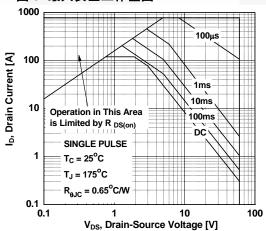


图 10. 最大漏极电流与壳体温度的关系

50

T_J, Junction Temperature [°C]

150

0

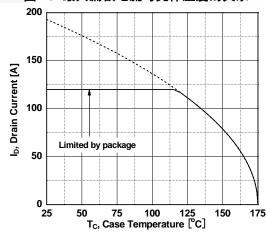
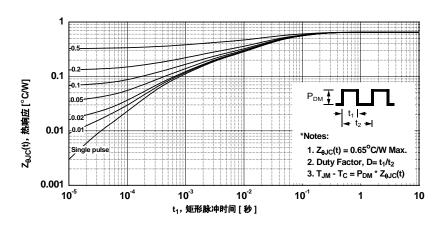


图 11. 瞬态热响应曲线



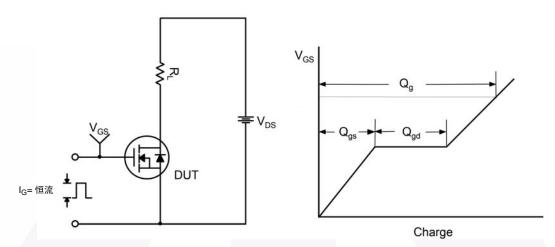


图 12. 栅极电荷测试电路与波形

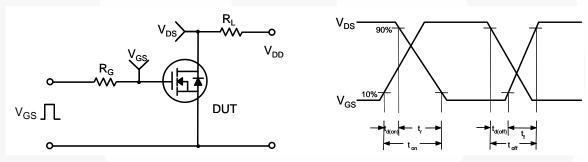


图 13. 阻性开关测试电路与波形

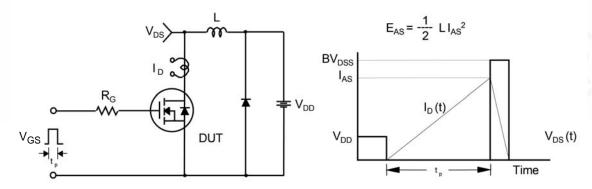


图 14. 非箝位感性开关测试电路与波形

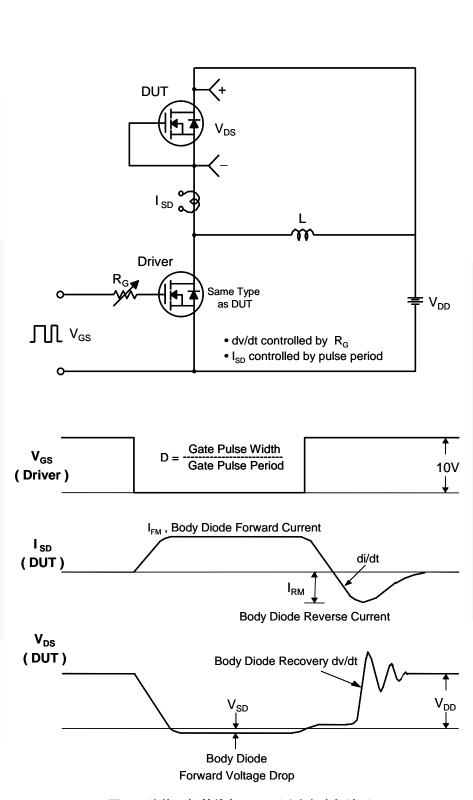
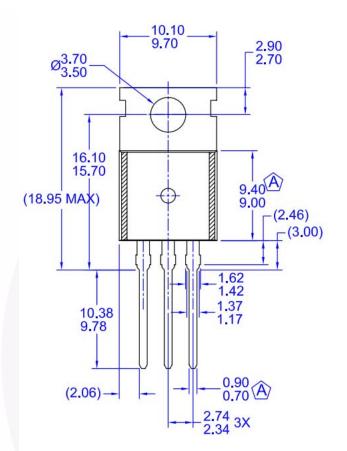
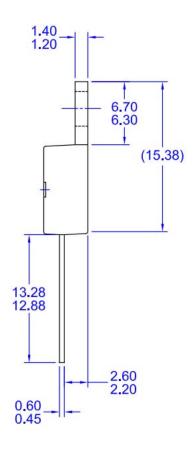
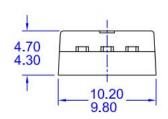


图 15. 峰值二极管恢复 dv/dt 测试电路与波形

机械尺寸







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- (A) CONFORMS TO JEDEC TO-220 VARIATION AB EXCEPT WHERE NOTED
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- D) DRAWING FILE/REVISION: MKT-TO220Y03REV1

图 16. TO220,模塑, 3 引脚,非 Jedec 变量 AB

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