FAIRCHILD SEMICONDUCTOR®

2014 年 1 月

FCH22N60N

N 沟道 SupreMOS® MOSFET

600 V, 22 A, 165 mΩ

特性

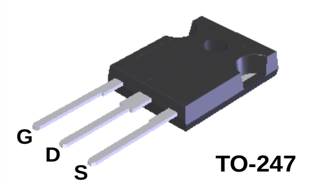
- 650 V @ T_J = 150°C
- $R_{DS(on)}$ = 140 mΩ (Typ.)@V_{GS} = 10 V, I_D = 11 A
- 超低栅极电荷 （典型值 Q_g = 45 nC）
- 低有效输出电容 （典型值 $C_{oss(eff.)}$= 196.4 pF）
- 100% 经过雪崩测试
- 符合 RoHS 标准

应用

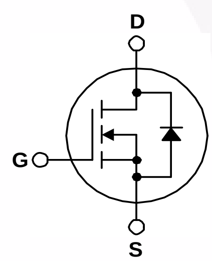
- PDP 电视
- 太阳能逆变器
- AC-DC 电源

说明

SupreMOS® MOSFET 是飞兆半导体的下一代高压超级结（SJ）技术，该技术采用区别于传统 SJ MOSFET 产品的深沟槽填充工艺。这项先进技术和精密的工艺控制提供了最低的 Rsp on-resistance （导通电阻规格），卓越的开关性能和耐用性。SupreMOS MOSFET 产品非常适合高频开关电源转换器应用，如功率因数校正 (PFC)、服务器 / 电信电源、平板电视电源、ATX 电源及工业电源应用。



TO-247



绝对最大额定值 T_C = 25°C 除非另有说明。

符号	参数		FCH22N60N	单位
V_{DSS}	漏极－源极电压		600	V
V_{GSS}	栅极－源极电压		±30	V
I_D	漏极电流	- 连续 (T_C = 25°C)	22	A
		- 连续 (T_C = 100°C)	13.8	
I_{DM}	漏极电流	- 脉冲 （注 1）	66	A
E_{AS}	单脉冲雪崩能量	（注 2）	672	mJ
I_{AR}	雪崩电流	（注 1）	7.3	A
E_{AR}	重复雪崩能量	（注 1）	2.75	mJ
dv/dt	MOSFET dv/dt		100	V/ns
	二极管恢复 dv/dt 峰值	（注 3）	20	
P_D	功耗	(T_C = 25°C)	205	W
		- 超过 25°C 时降额	1.64	W/°C
T_J, T_{STG}	工作和存储温度范围		-55 至 +150	°C
T_L	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	FCH22N60N	单位
$R_{\theta JC}$	结至外壳热阻最大值	0.61	°C/W
$R_{\theta JA}$	结至环境热阻最大值	40	

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
FCH22N60N	FCH22N60N	TO-247	塑料管	不适用	不适用	30 单元

电气特性 T_C = 25°C 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 = 1 mA, V_{GS} = 0 V,T_J = 25°C	600	-	-	V
		I_D = 1 mA, V_{GS} = 0 V, T_J = 150°C	650	-	-	
$\Delta BV_{DSS} / \Delta T_J$	击穿电压温度系数	I_D = 1 mA，参考 25°C	-	0.68	-	V/°C
I_{DSS}	零栅极电压漏极电流	V_{DS} = 480 V, V_{GS} = 0 V	-	-	10	μA
		V_{DS} = 480 V, T_J = 125°C	-	-	100	
I_{GSS}	栅极 - 体漏电流	V_{GS} = ±50 V, V_{DS} = 0 V	-	-	±100	nA
导通特性						
$V_{GS(th)}$	栅极阈值电压	V_{GS} = V_{DS}, I_D = 250 μA	2.0	3	4.0	V
$R_{DS(on)}$	漏极至源极静态导通电阻	V_{GS} = 10 V, I_D = 11 A	-	0.140	0.165	Ω
g_{FS}	正向跨导	V_{DS} = 20 V, I_D = 11 A	-	22	-	S
动态特性						
C_{iss}	输入电容	V_{DS} = 100 V, V_{GS} = 0 V f = 1 MHz	-	1950	-	pF
C_{oss}	输出电容		-	75.9	-	pF
C_{rss}	反向传输电容		-	3	-	pF
C_{oss}	输出电容	V_{DS} = 380 V, V_{GS} = 0 V, f = 1 MHz	-	43.2	-	pF
$C_{oss(eff.)}$	有效输出电容	V_{DS} = 0 V 至 480 V, V_{GS} = 0 V	-	196.4	-	pF
$Q_{g(tot)}$	10 V 的栅极电荷总量	V_{DS} = 380 V, I_D = 11 A, V_{GS} = 10 V （说明 4）	-	45	-	nC
Q_{gs}	栅极 - 源极栅极电荷		-	8.7	-	nC
Q_{gd}	栅极 - 漏极 " 密勒 " 电荷		-	14.5	-	nC
ESR	等效串联电阻 (G-S)	f = 1 MHz	-	1	-	Ω
开关特性						
$t_{d(on)}$	导通延迟时间	V_{DD} = 380 V, I_D = 11 A R_G = 4.7 Ω （说明 4）	-	16.9	-	ns
t_r	开通上升时间		-	16.7	-	ns
$t_{d(off)}$	关断延迟时间		-	49	-	ns
t_f	关断下降时间		-	4	-	ns
漏极 - 源极二极管特性						
I_S	漏极 - 源极二极管最大正向连续电流		-	-	22	A
I_{SM}	漏极 - 源极二极管最大正向脉冲电流		-	-	66	A
V_{SD}	漏极 - 源极二极管正向电压	V_{GS} = 0 V, I_{SD} = 11 A	-	-	1.2	V
t_{rr}	反向恢复时间	V_{GS} = 0 V, I_{SD} = 11 A dI_F/dt = 100 A/μs	-	350	-	ns
Q_{rr}	反向恢复电荷		-	6	-	μC

注意：
1. 重复额定值：脉冲宽度受限于最大结温。
2. I_{AS} = 7.3 A， R_G = 25 Ω，启动 T_J = 25°C。
3. I_{SD} ≤ 22 A， di/dt ≤ 200 A/μs， V_{DD} ≤ 380 V，启动 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

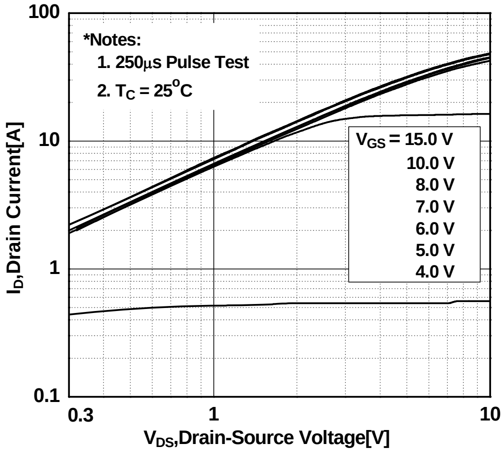


图 2. 传输特性

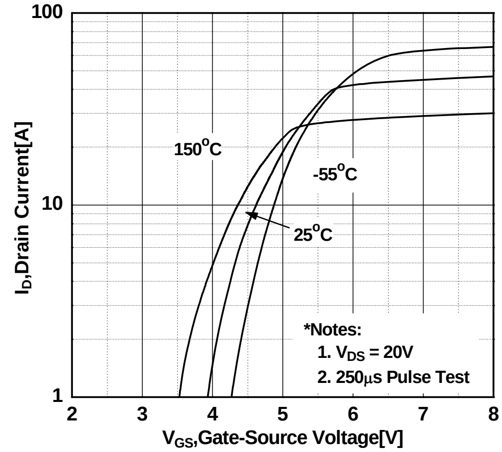


图 3. 导通电阻变量与漏极电流和栅极电压

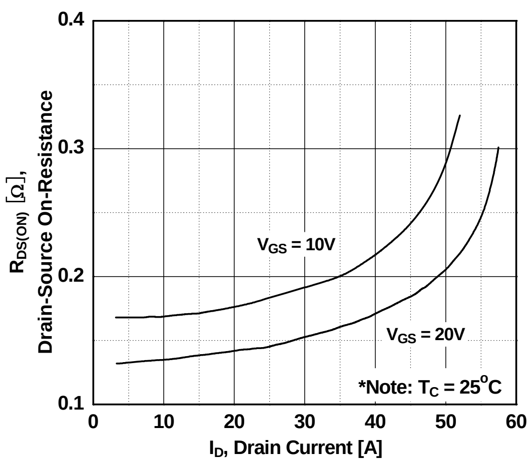


图4. 体二极管正向电压变化与源极电流和温度

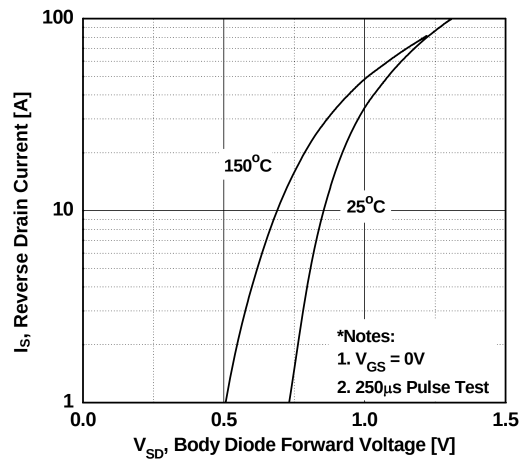


图 5. 电容特性

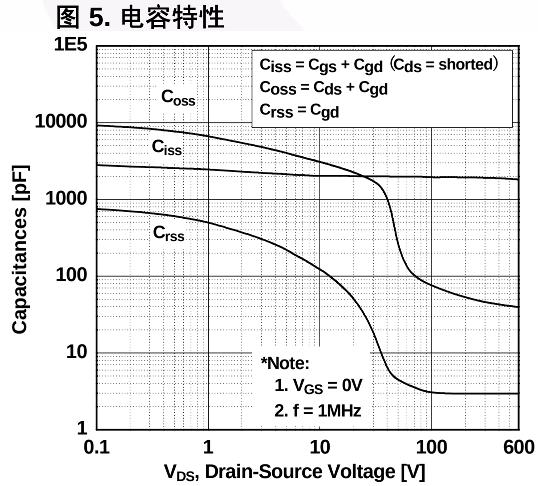
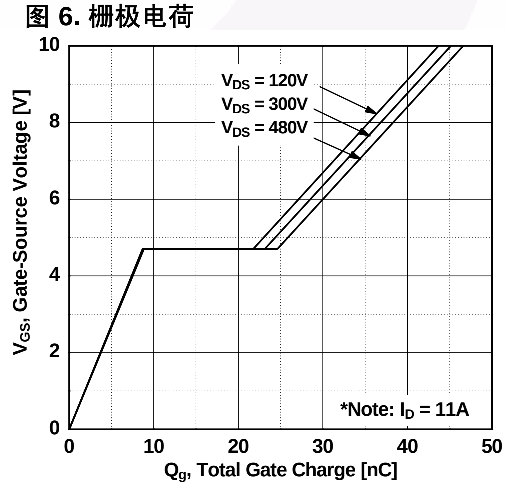


图 6. 栅极电荷



典型性能特征 （接上页）

图 7. 击穿电压变化与温度

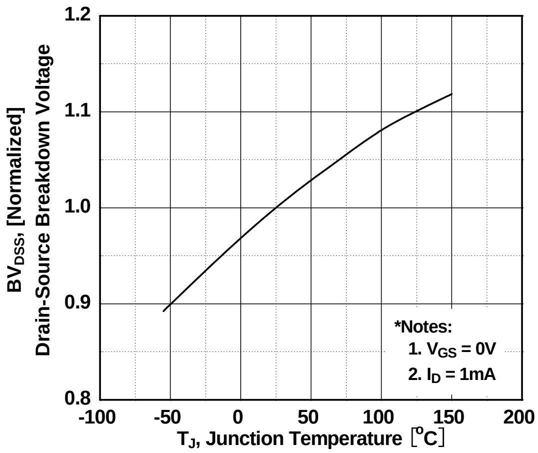


图 8. 导通电阻变化与温度

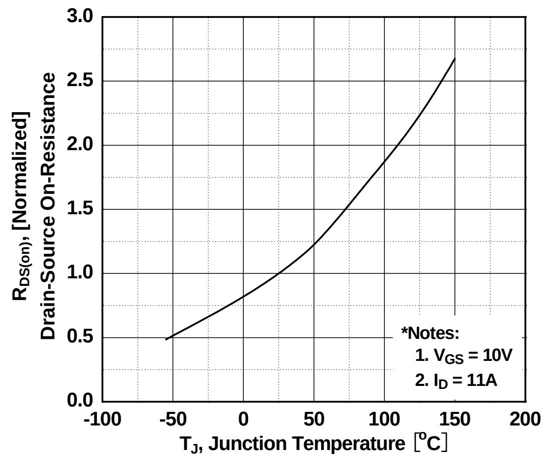


图 9. 最大安全工作区

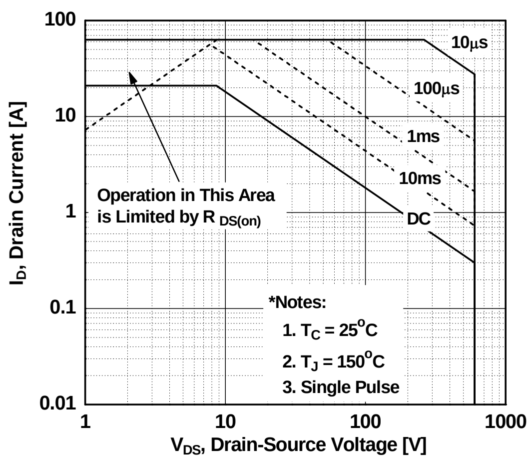


图 10. 最大漏极电流与壳体温度

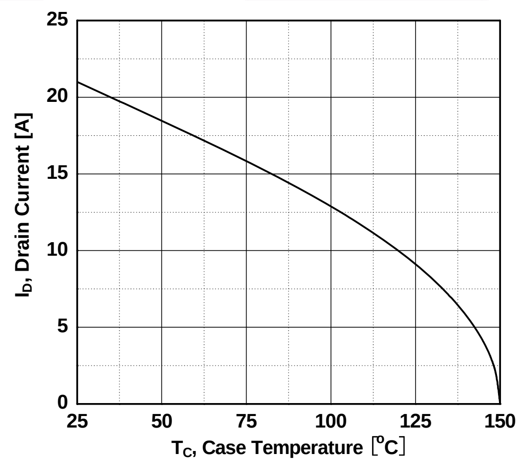
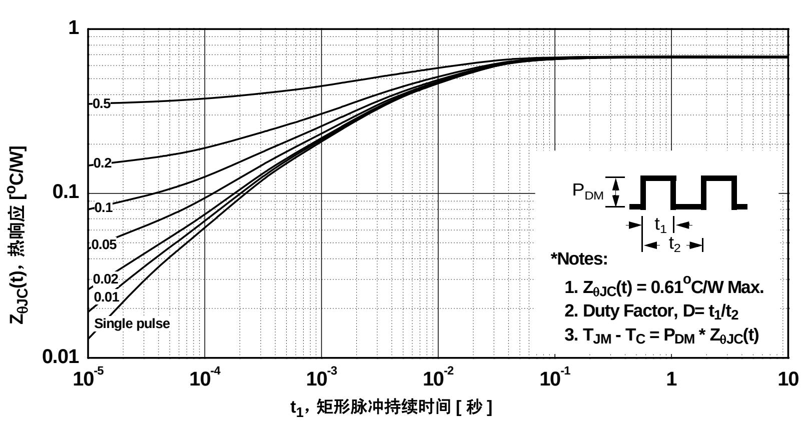


图 11. 瞬态热响应曲线



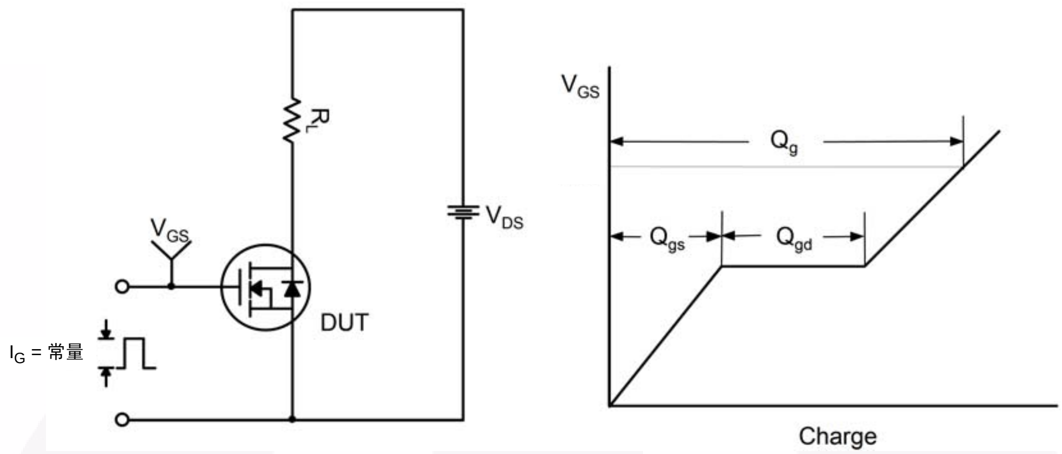


图 12. 栅极电荷测试电路与波形

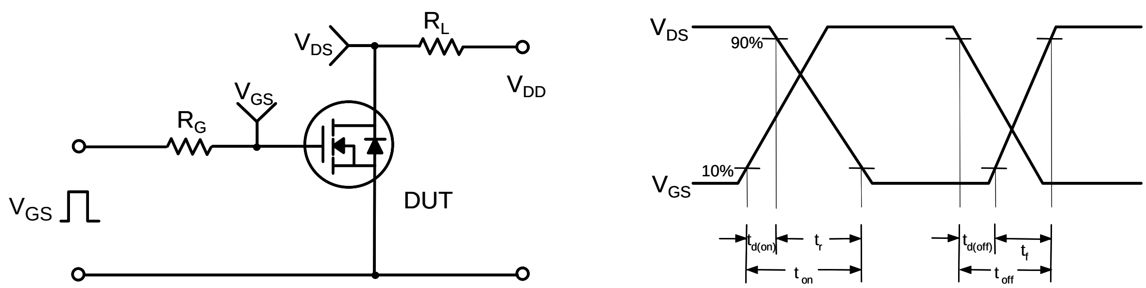


图 13. 阻性开关测试电路与波形

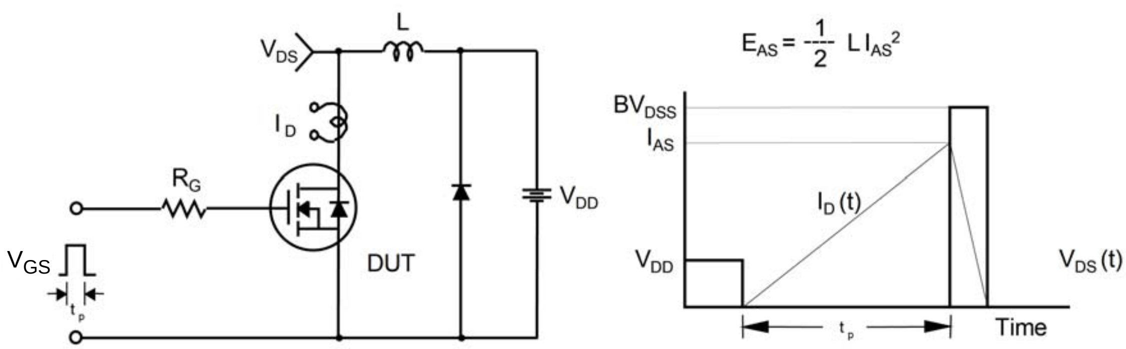


图 14. 非箝位感性开关测试电路与波形

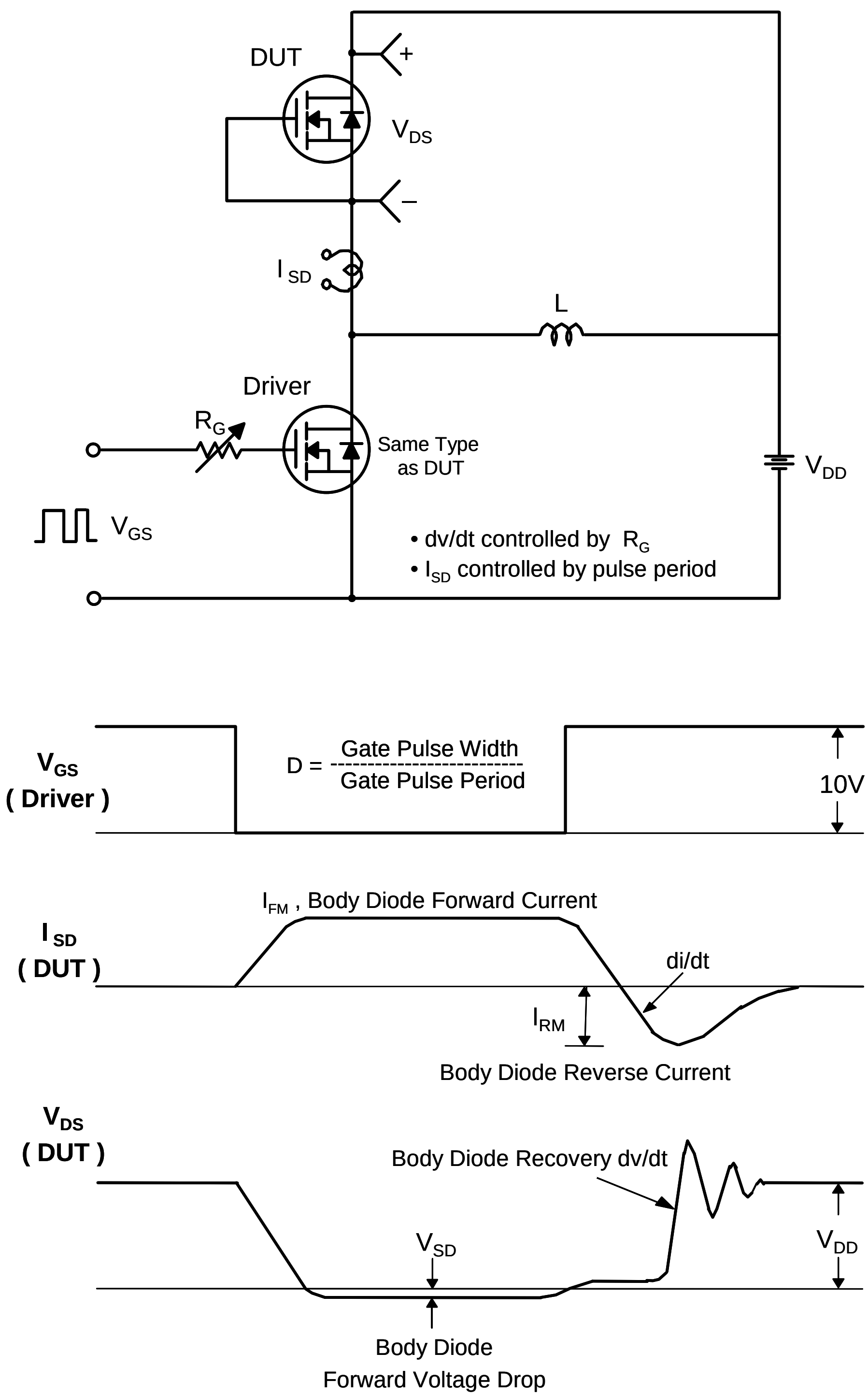


图 15. 二极管恢复 dv/dt 峰值测试电路与波形

机械尺寸

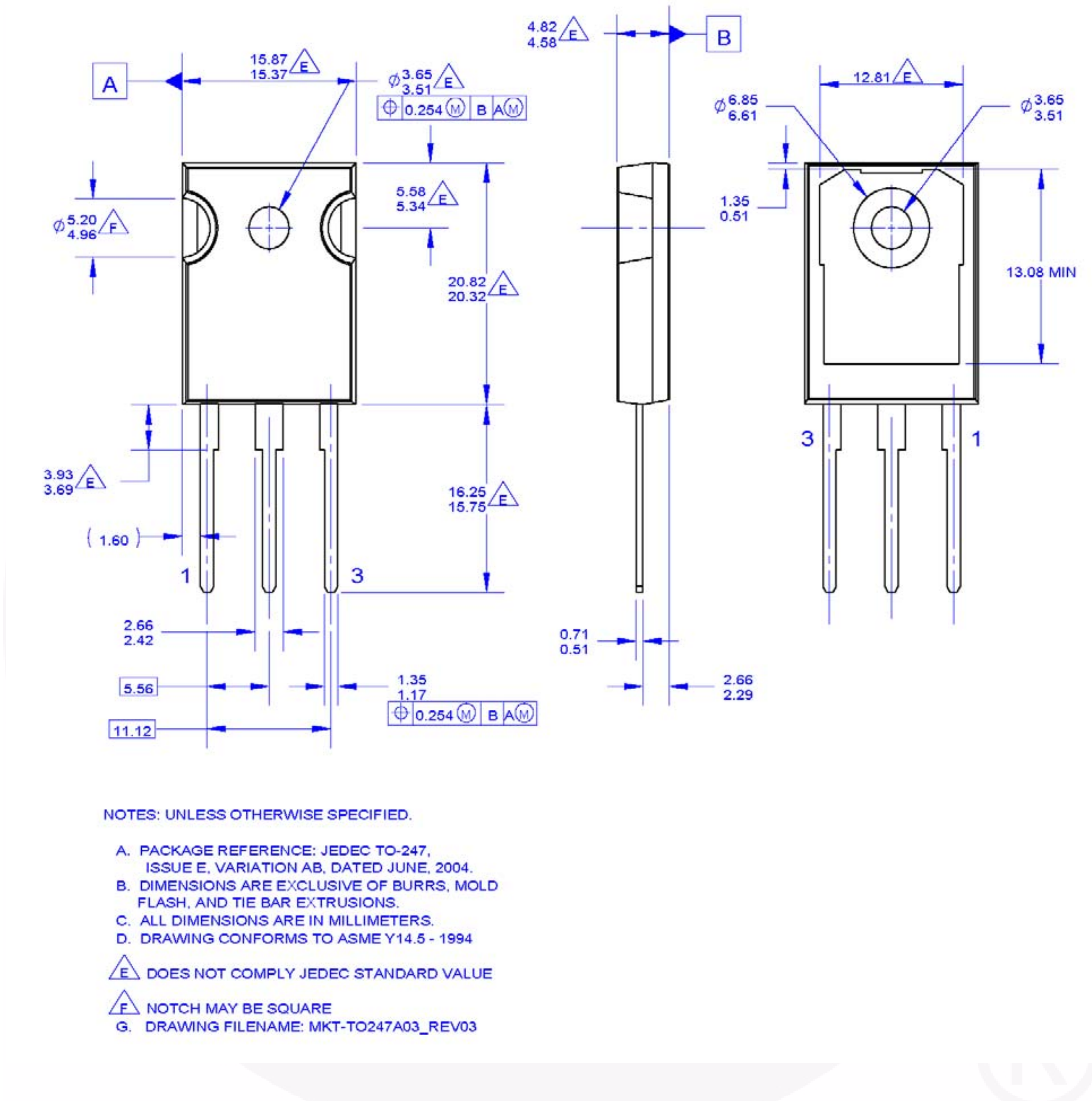


图 16. TO-247，模塑， 3 引脚， Jedec 变体 AB

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