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FAIRCHILD SEMICONDUCTOR®

2013 年 8 月

FGA15S125P

1250 V、 15 A 阳极短路 IGBT

特性

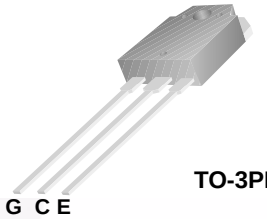
- 高速开关
- 低饱和电压：$V_{CE(sat)}$ =2.25 V @ I_C=15 A
- 高输入阻抗
- 符合 RoHS 标准

应用

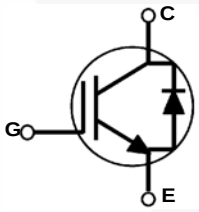
- 感应加热、微波炉

概述

飞兆半导体的短路阳极沟道 IGBT 系列采用先进的场截止沟道和短路阳极技术，为开关应用提供出色的导通和开关性能。该器件可并联配置，具有极佳的雪崩能力。该器件为感应加热和微波炉而设计。



TO-3PN



绝对最大额定值

符号	说明		额定值	单位
V_{CES}	集电极 - 发射极之间电压		1250	V
V_{GES}	栅极－发射极间电压		± 25	V
I_C	集电极电流	@ T_C=25°C	30	A
	集电极电流	@ T_C=100°C	15	A
$I_{CM\ (1)}$	集电极脉冲电流		45	A
I_F	二极管正向连续电流	@ T_C=25°C	30	A
	二极管正向连续电流	@ T_C=100°C	15	A
P_D	最大功耗	@ T_C=25°C	136	W
	最大功耗	@ T_C=100°C	68	W
T_J	工作结温		-55 至 +175	°C
T_{stg}	存储温度范围		-55 至 +175	°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	典型值	最大值	单位
$R_{\theta JC}$(IGBT)	结至外壳热阻最大值	-	1.1	°C/W
$R_{\theta JA}$	结至环境热阻最大值	-	40	°C/W

注意：

1: 受限于 Tjmax

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封装标识与定购信息

器件标识	器件	封装	卷尺寸	带宽	数量
FGA15S125P	FGA15S125P	TO-3PN	-	-	30

IGBT 的电气特性 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						
I_{CES}	集电极切断电流	V_{CE}=1250 V， V_{GE}=0 V	-	-	1	mA
I_{GES}	G-E 漏电流	V_{GE}=V_{GES}， V_{CE}=0 V	-	-	±500	nA
导通特性						
$V_{GE(th)}$	G-E 阈值电压	I_C=15 mA， V_{CE}=V_{GE}	4.5	6.0	7.5	V
$V_{CE(sat)}$	集电极 - 发射极间饱和电压	I_C =15 A， V_{GE}=15 V T_C=25°C	-	2.25	2.72	V
		I_C =15 A， V_{GE}=15 V T_C=125°C	-	2.5	-	V
		I_C =15 A， V_{GE}=15 V， T_C=175°C	-	2.75	-	V
V_{FM}	二极管正向电压	I_F =15 A， T_C=25°C	-	2	2.55	V
		I_F =15 A， T_C=175°C	-	2.55	-	V
动态特性						
C_{ies}	输入电容	V_{CE} =30 V， V_{GE}=0 V， f=1 MHz	-	1360	-	pF
C_{oes}	输出电容		-	40	-	pF
C_{res}	反向传输电容		-	20	-	pF
开关特性						
$t_{d(on)}$	导通延迟时间	V_{CC}=600 V， I_C=15 A， R_G=10 Ω， V_{GE} =15 V， 阻性负载， T_C =25°C	-	10	-	ns
t_r	上升时间		-	260	-	ns
$t_{d(off)}$	关断延迟时间		-	400	-	ns
t_f	下降时间		-	100	-	ns
E_{on}	导通开关损耗		-	0.74	-	mJ
E_{off}	关断开关损耗		-	0.50	-	mJ
E_{ts}	总开关损耗		-	1.24	-	mJ
$t_{d(on)}$	导通延迟时间	V_{CC}=600 V， I_C=15 A， R_G=10 Ω， V_{GE} =15 V， 阻性负载， T_C =175°C	-	11	-	ns
t_r	上升时间		-	320	-	ns
$t_{d(off)}$	关断延迟时间		-	420	-	ns
t_f	下降时间		-	250	-	ns
E_{on}	导通开关损耗		-	0.94	-	mJ
E_{off}	关断开关损耗		-	1.23	-	mJ
E_{ts}	总开关损耗		-	2.17	-	mJ
Q_g	总栅极电荷	V_{CE}=600 V， I_C=15 A， V_{GE}=15 V	-	129	-	nC
Q_{ge}	栅极－发射极间电荷		-	9	-	nC
Q_{gc}	栅极－发射极间电荷		-	66	-	nC

典型性能特征

图 1. 典型输出特性

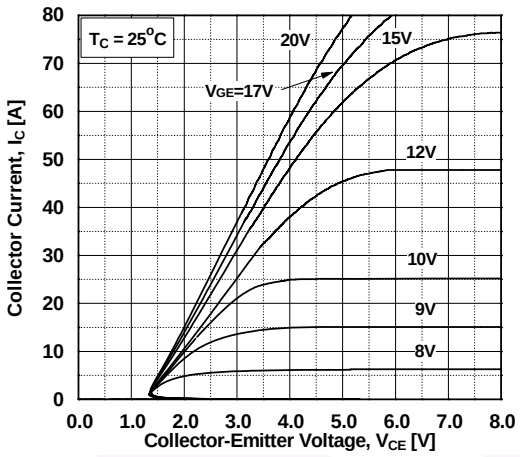


图 2. 典型输出特性

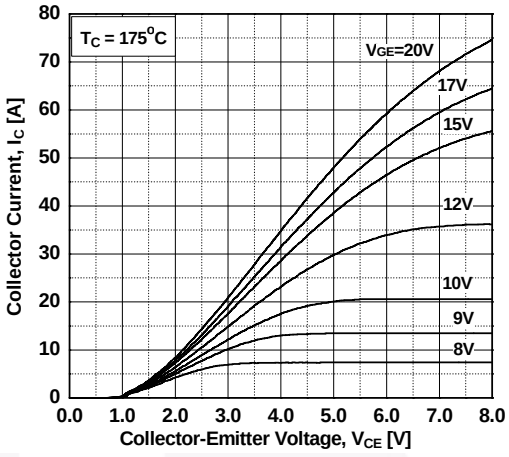


图 3. 典型饱和电压特性

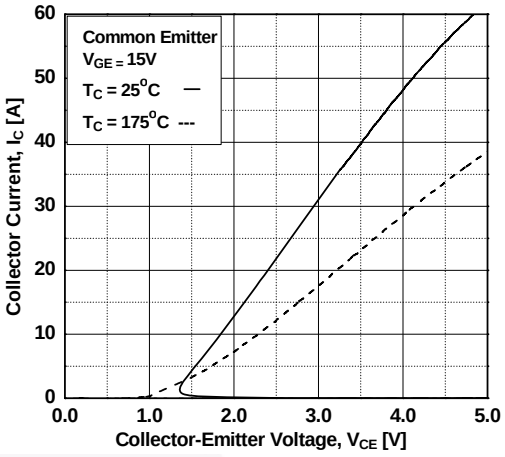


图 4. 传输特性

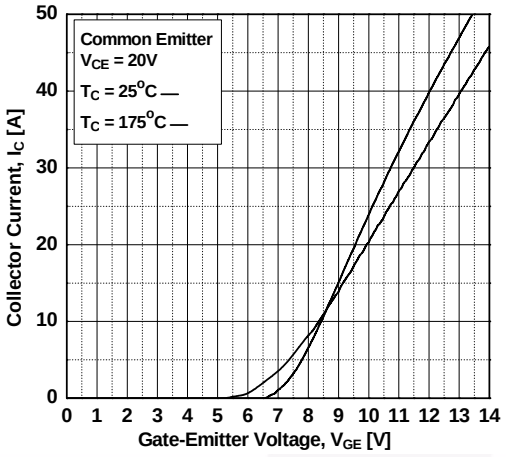


图 5. 饱和电压与壳温的关系 （在可变电流强度下）

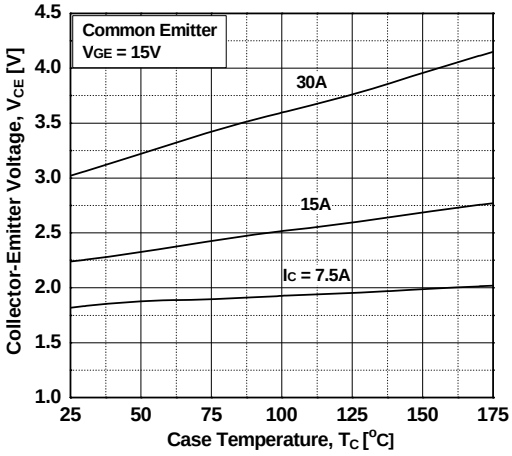
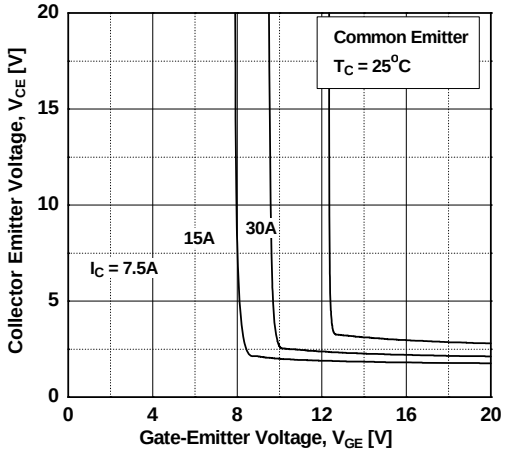


图 6. 饱和电压与 V_{GE} 的关系



典型性能特征

图 7. 饱和电压与 V_{GE} 的关系

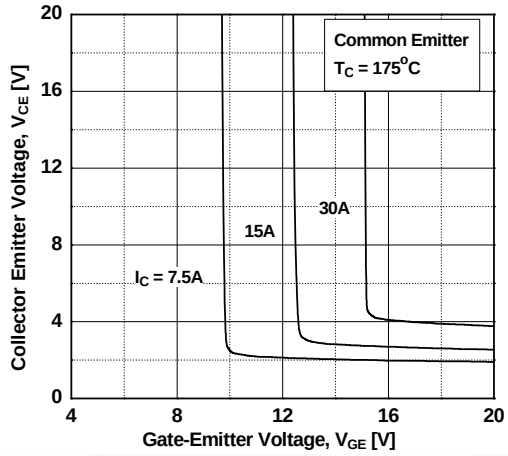


图 8. 电容特性

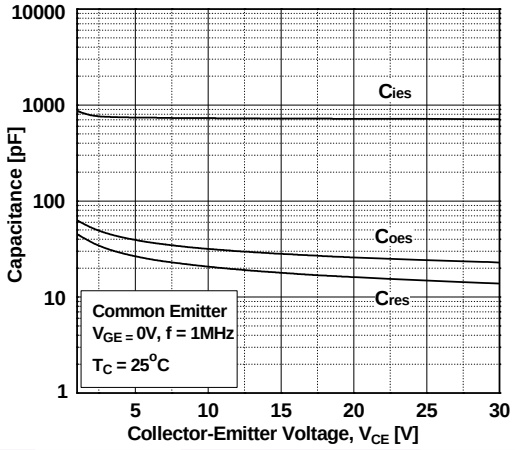


图 9. 栅极电荷特性

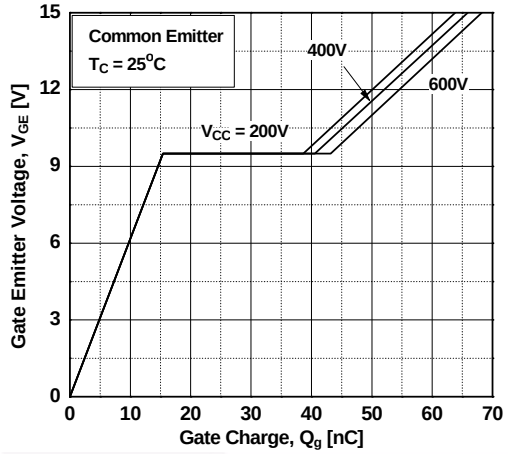


图 10. SOA 特性

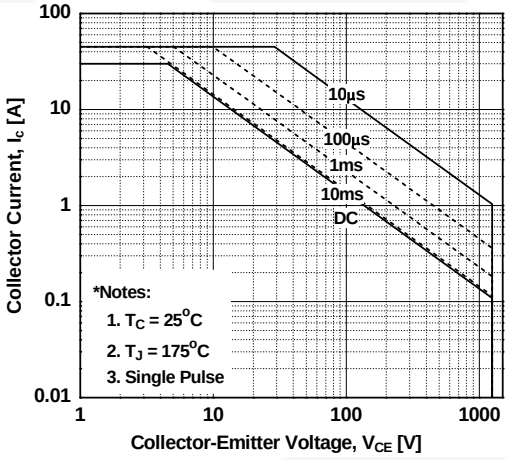


图 11. 导通特性与栅极电阻的关系

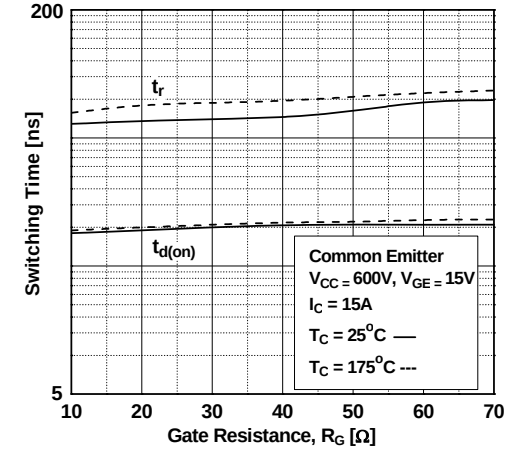
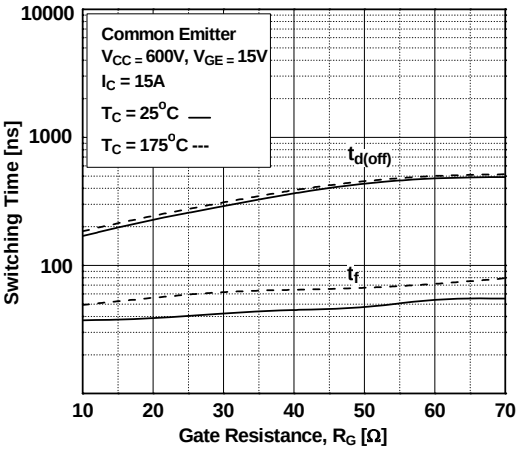


图 12. 关断特性与栅极电阻



典型性能特征

图 13. 导通特性与集电极电流的关系

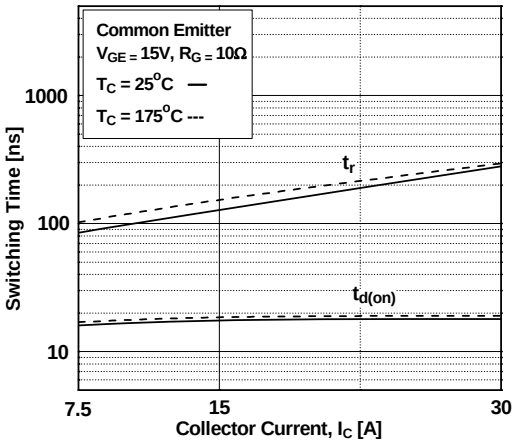


图 14. 关断特性与集电极电流的关系

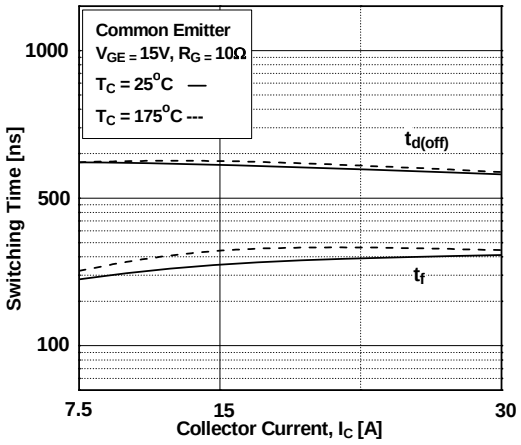


图 15. 开关损耗与栅极电阻的关系

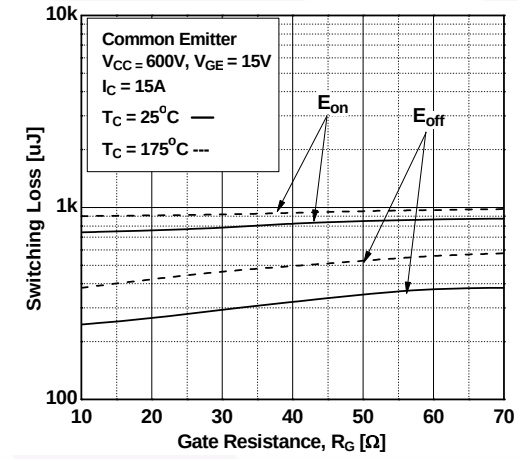


图 16. 开关损耗与集电极电流的关系

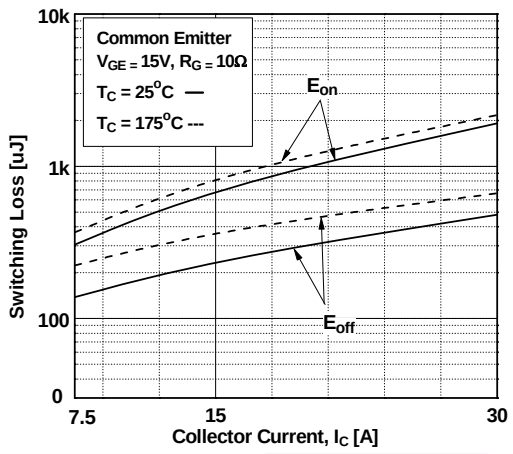


图 17. 关断开关 SOA 特性

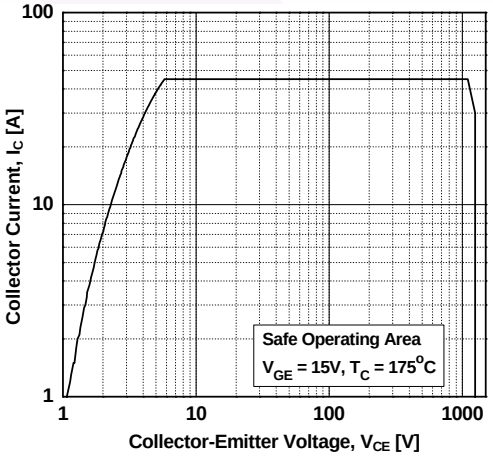
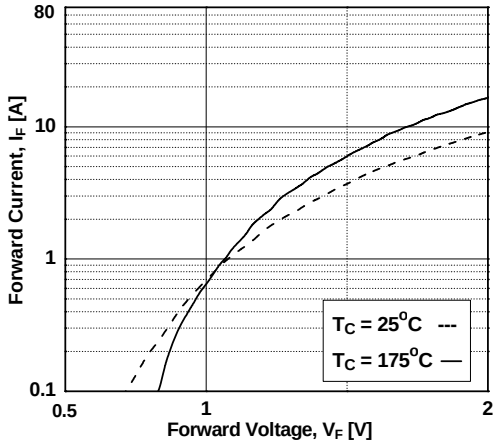
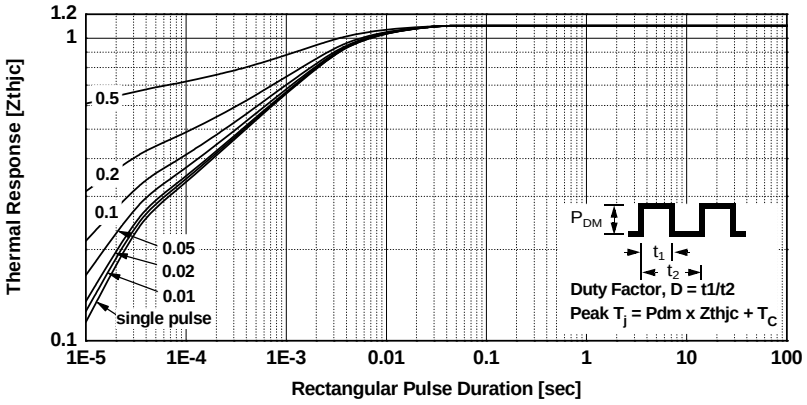


图 18. 正向特性



典型性能特征

图 19. IGBT 瞬态热阻



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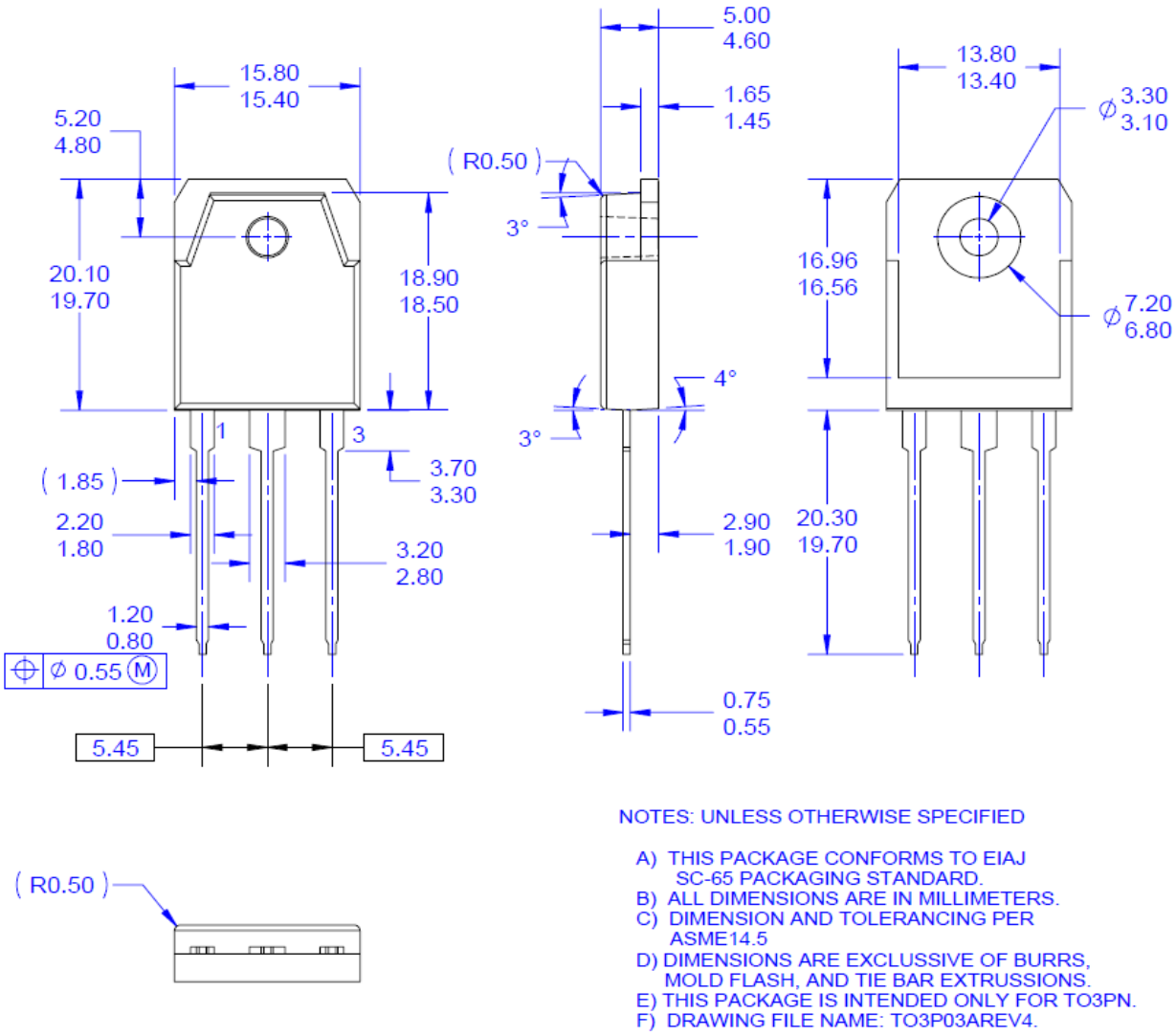

图 20. TO-3P 3L - 3LD， T03， PLASTIC， EIAJ SC-65

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