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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

FAIRCHILD SEMICONDUCTOR®

2013 年 9 月

FGH25T120SMD

1200 V、 25 A 场截止沟道 IGBT

特性

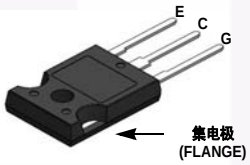
- FS 沟道技术，正温度系数
- 高速开关
- 低饱和电压：$V_{CE(sat)}$ = 1.8 V @ I_C = 25 A
- I_{LM}(1) 部件 100% 检测
- 高输入阻抗
- 符合 RoHS 标准

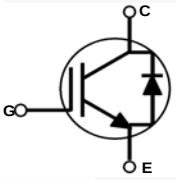
概述

通过采用创新的场截止沟道 IGBT 技术，飞兆半导体新型系列的场截止沟道 IGBT 可为光伏逆变器、 UPS、焊机和 PFC 等硬开关应用提供最佳性能。

应用

- 光伏逆变器、焊机、 UPS 和 PFC 应用





绝对最大额定值 T_C = 25°C 除非另有说明

符号	说明		额定值	单位
V_{CES}	集电极 - 发射极之间电压		1200	V
V_{GES}	栅极 - 发射极间电压		±25	V
	瞬态栅极 - 发射极间电压		±30	V
I_C	集电极电流	@ T_C = 25°C	50	A
	集电极电流	@ T_C = 100°C	25	A
I_{LM} (1)	箝位感性负载电流	@ T_C = 25°C	100	A
I_{CM} (2)	集电极脉冲电流		100	A
I_F	二极管正向连续电流	@ T_C = 25°C	50	A
	二极管正向连续电流	@ T_C = 100°C	25	A
I_{FM}	二极管最大正向电流		200	A
P_D	最大功耗	@ T_C = 25°C	428	W
	最大功耗	@ T_C = 100°C	214	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)	结点 - 壳体的热阻	--	0.35	°C/W
$R_{\theta JC}$（二极管）	结点 - 壳体的热阻	--	1.4	°C/W
$R_{\theta JA}$	结至环境热阻	--	40	°C/W

注意：
1. Vcc = 600 V, V_{GE} = 15 V， I_C = 100 A， R_G = 23 Ω， 感性负载
2. 受限于 Tjmax

封装标识与定购信息

器件标识	器件	封装	卷尺寸	带宽	数量
FGH25T120SMD	FGH25T120SMD_F155	TO-247G03	-	-	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						
BV_{CES}	集电极 - 发射极击穿电压	V_{GE} = 0 V，I_C = 250 μA	1200	-	-	V
I_{CES}	集电极切断电流	V_{CE} = V_{CES}，V_{GE} = 0 V	-	-	250	μA
I_{GES}	G-E 漏电流	V_{GE} = V_{GES}，V_{CE} = 0 V	-	-	±400	nA
导通特性						
$V_{GE(th)}$	G-E 阈值电压	I_C = 25 mA，V_{CE} = V_{GE}	4.9	6.2	7.5	V
$V_{CE(sat)}$	集电极 - 发射极间饱和电压	I_C = 25 A，V_{GE} = 15 V T_C = 25°C	-	1.8	2.4	V
		I_C = 25 A，V_{GE} = 15 V， T_C = 175°C	-	1.9	-	V
动态特性						
C_{ies}	输入电容	V_{CE} = 30 V，V_{GE} = 0 V， f = 1 MHz	-	2800	-	pF
C_{oes}	输出电容		-	105	-	pF
C_{res}	反向传输电容		-	60	-	pF
开关特性						
$t_{d(on)}$	导通延迟时间	V_{CC} = 600 V，I_C = 25 A， R_G = 23 Ω，V_{GE} = 15 V， 感性负载，T_C = 25°C	-	40	-	ns
t_r	上升时间		-	45	-	ns
$t_{d(off)}$	关断延迟时间		-	490	-	ns
t_f	下降时间		-	12	-	ns
E_{on}	导通开关损耗		-	1.74	-	mJ
E_{off}	关断开关损耗		-	0.56	-	mJ
E_{ts}	总开关损耗		-	2.30	-	mJ
$t_{d(on)}$	导通延迟时间	V_{CC} = 600 V，I_C = 25 A， R_G = 23 Ω，V_{GE} = 15 V， 感性负载，T_C = 175°C	-	40	-	ns
t_r	上升时间		-	48	-	ns
$t_{d(off)}$	关断延迟时间		-	520	-	ns
t_f	下降时间		-	64	-	ns
E_{on}	导通开关损耗		-	2.94	-	mJ
E_{off}	关断开关损耗		-	1.09	-	mJ
E_{ts}	总开关损耗		-	4.03	-	mJ
Q_g	总栅极电荷	V_{CE} = 600 V，I_C = 25 A， V_{GE} = 15 V	-	225	-	nC
Q_{ge}	栅极－发射极间电荷		-	20	-	nC
Q_{gc}	栅极－发射极间电荷		-	128	-	nC

二极管电气特性 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
V_{FM}	二极管正向电压	I_F = 25 A， T_C = 25°C	-	2.8	3.7	V
		I_F = 25 A， T_C = 175°C	-	2.1	-	V
t_{rr}	二极管反向恢复时间	V_R = 600 V， I_F = 25 A， di_F/dt = 200 A/μs， T_C = 25°C	-	60	-	ns
I_{rr}	二极管反向恢复峰值电流		-	6.6	-	A
Q_{rr}	二极管反向恢复电荷		-	197	-	nC
E_{rec}	反向恢复电能	V_R = 600 V， I_F = 25 A， di_F/dt = 200 A/μs， T_C = 175°C	-	330	-	μJ
t_{rr}	二极管反向恢复时间		-	325	-	ns
I_{rr}	二极管反向恢复峰值电流		-	13	-	A
Q_{rr}	二极管反向恢复电荷		-	2113	-	nC

典型性能特征

图 1. 典型输出特性

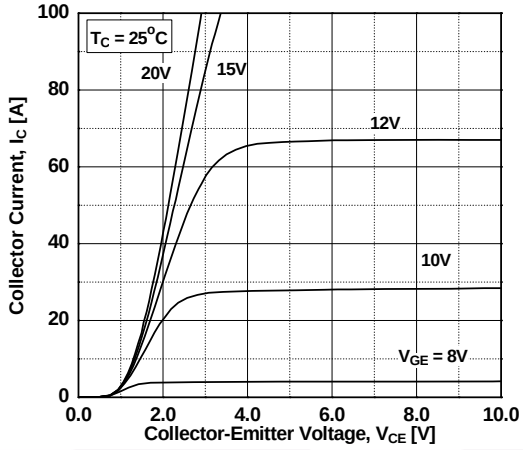


图 2. 典型输出特性

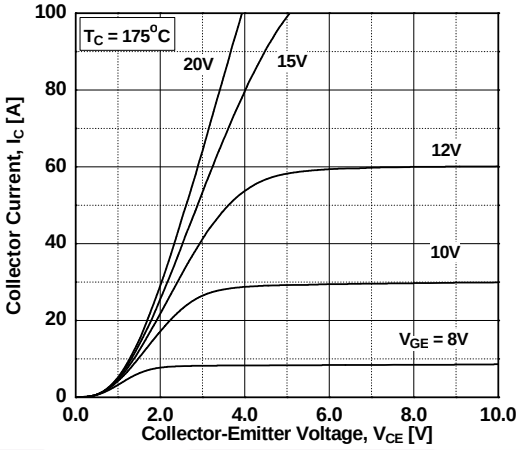


图 3. 典型饱和电压特性

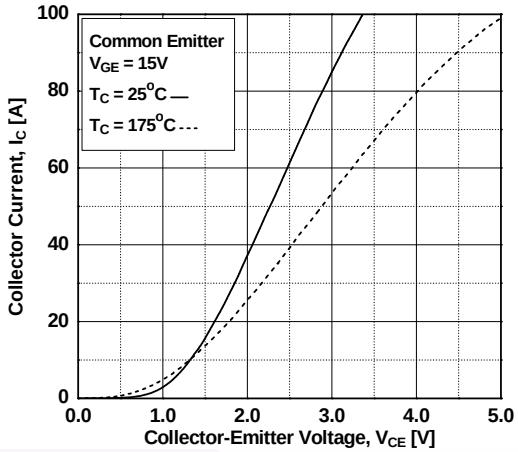


图 4. 饱和电压与壳温的关系 （在可变电流强度下）

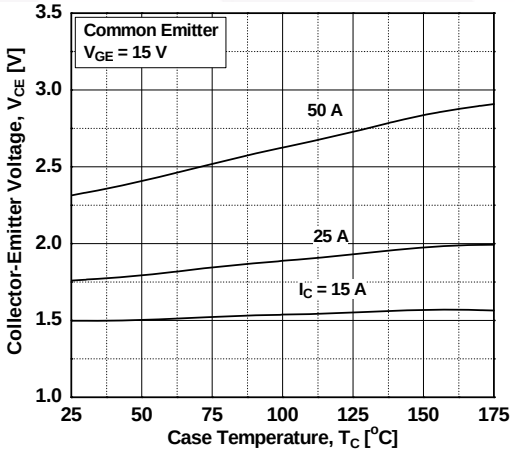


图 5. 饱和电压与 V_{GE} 的关系

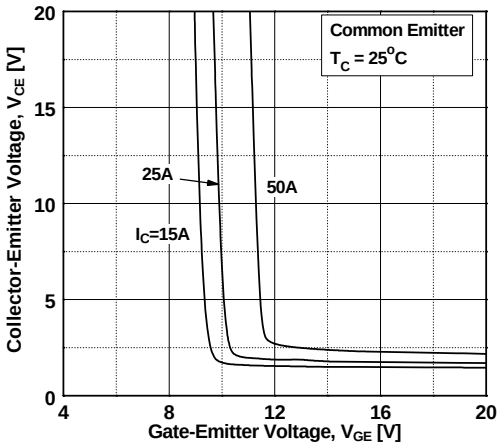
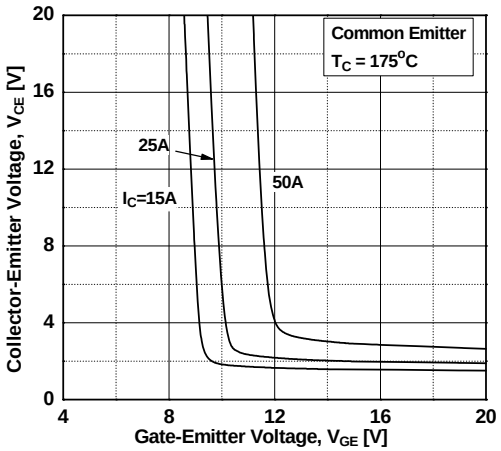


图 6. 饱和电压与 V_{GE} 的关系



典型性能特征

图 7. 电容特性

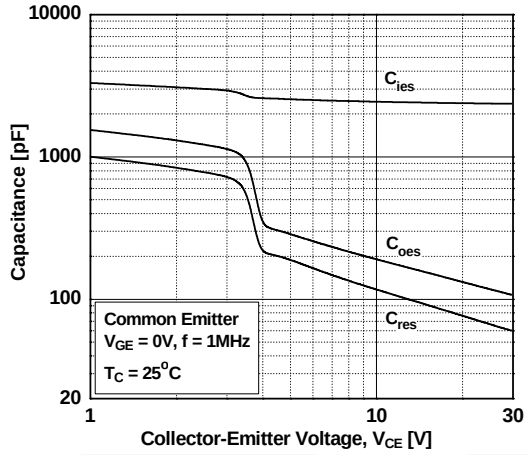


图 8. 栅极电荷特性

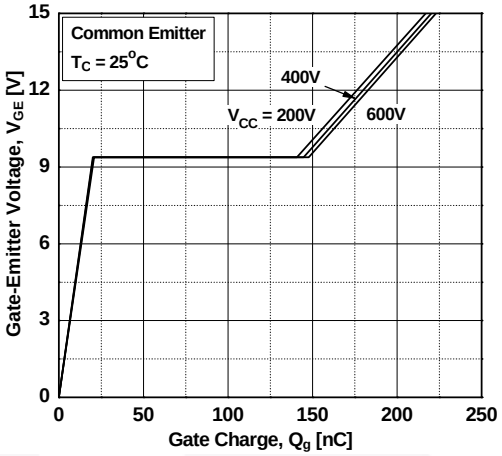


图 9. 导通特性与栅极电阻的关系

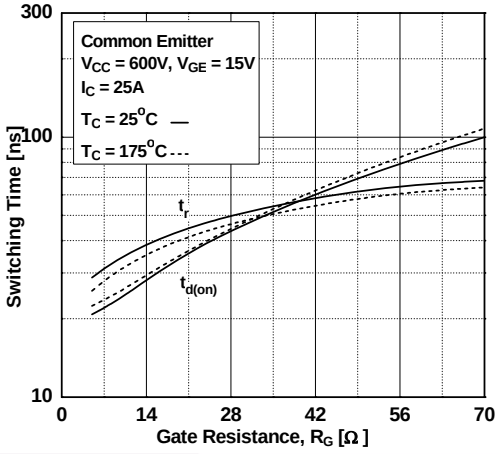


图 10. 关断特性与栅极电阻的关系

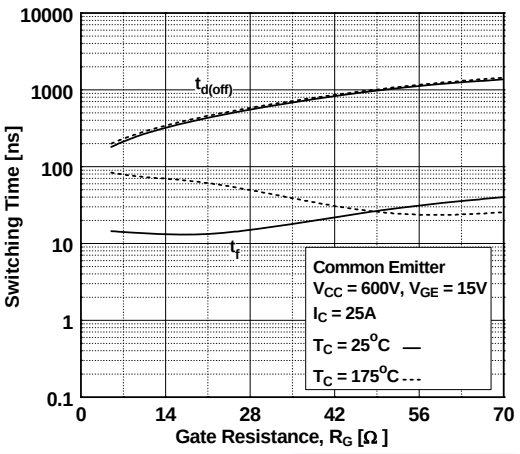


图 11. 开关损耗与栅极电阻的关系

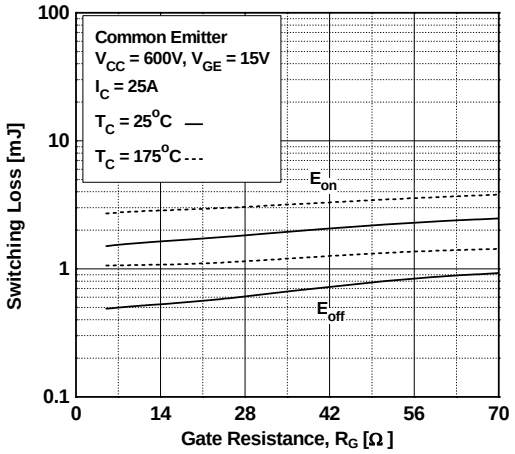
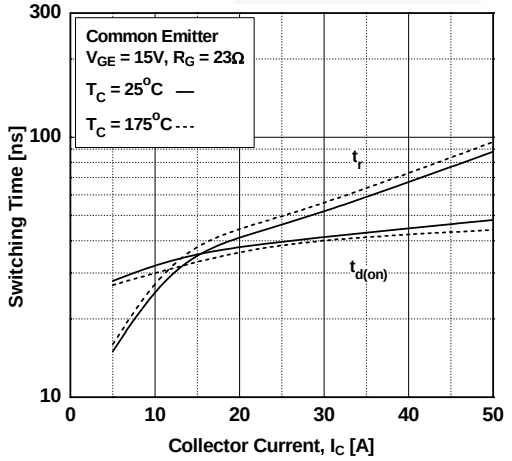


图 12. 导通特性与集电极电流的关系



典型性能特征

图 13. 关断特性与集电极电流的关系

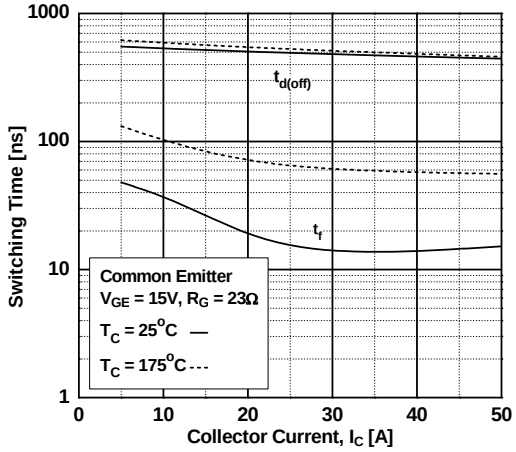


图 14. 开关损耗与集电极电流的关系

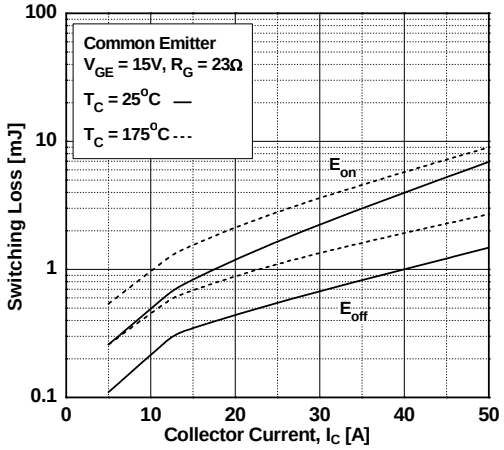


图 15. 负载电流与频率的关系

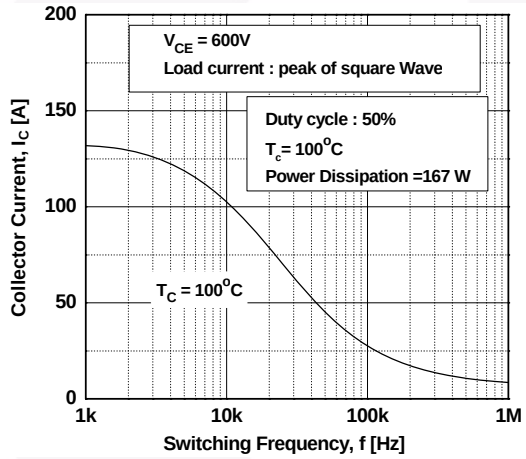


图 16. SOA 特性

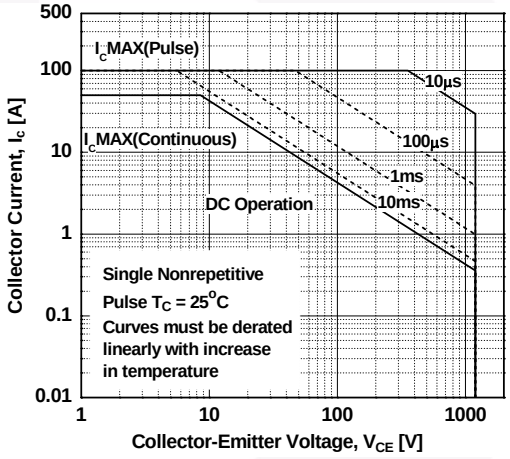


图 17. 正向特性

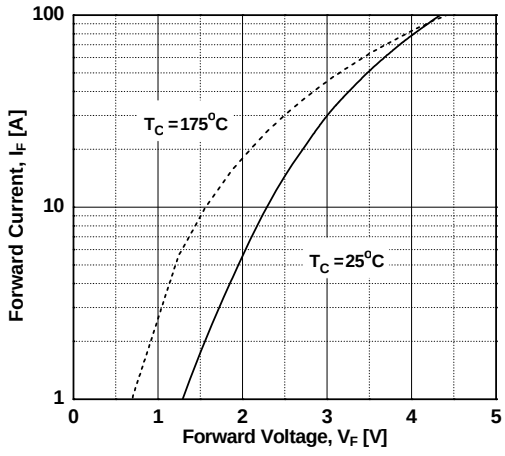
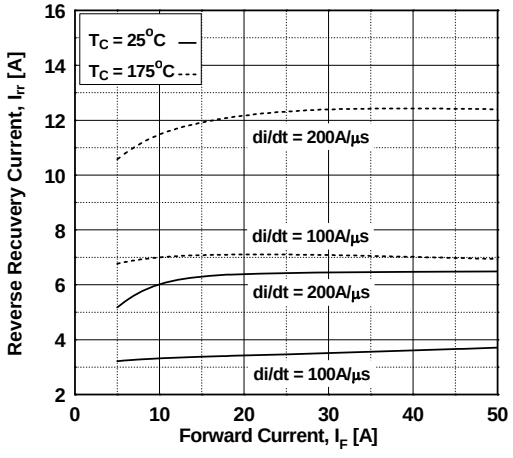


图 18. 反向恢复电流



典型性能特征

图 19. 反向恢复时间

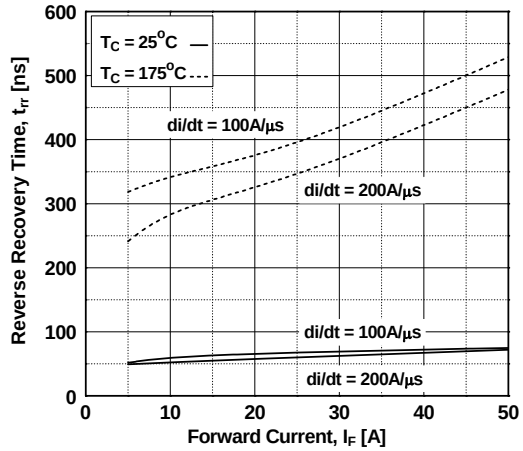


图 20. 存储电荷

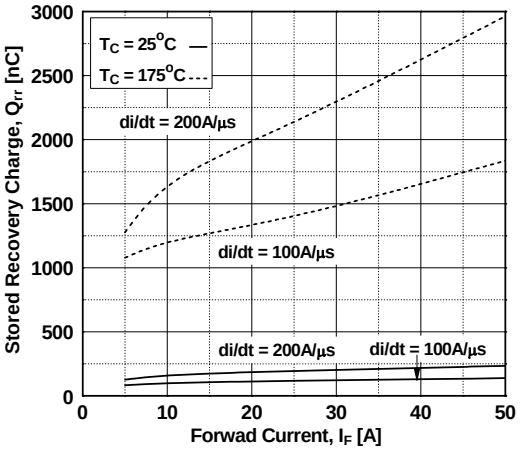


图 21. IGBT 瞬态热阻抗

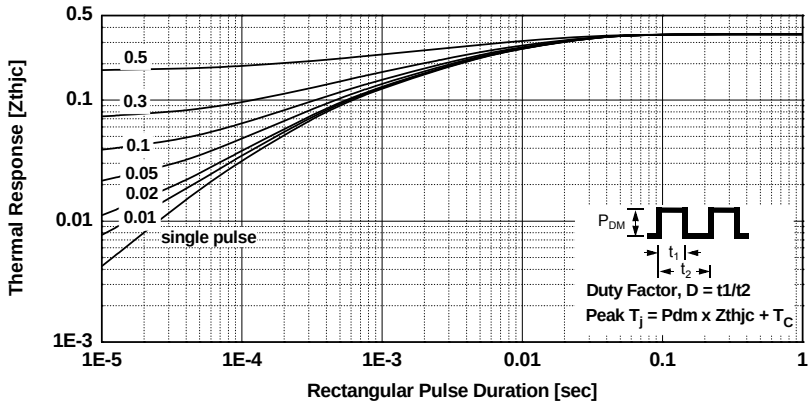
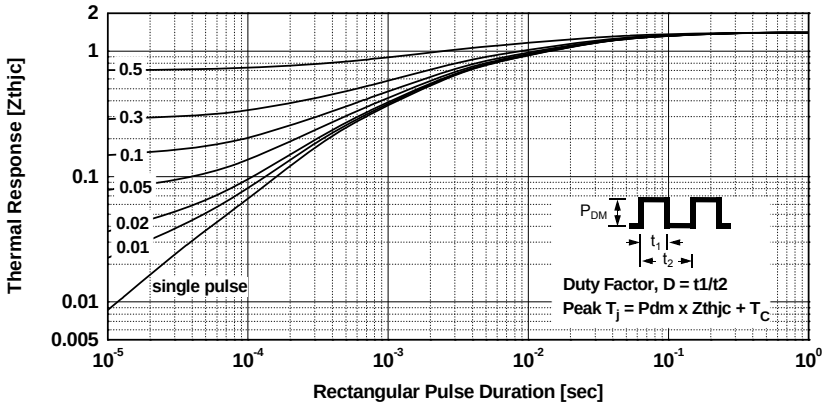


图 22. 二极管瞬态热阻抗



机械尺寸

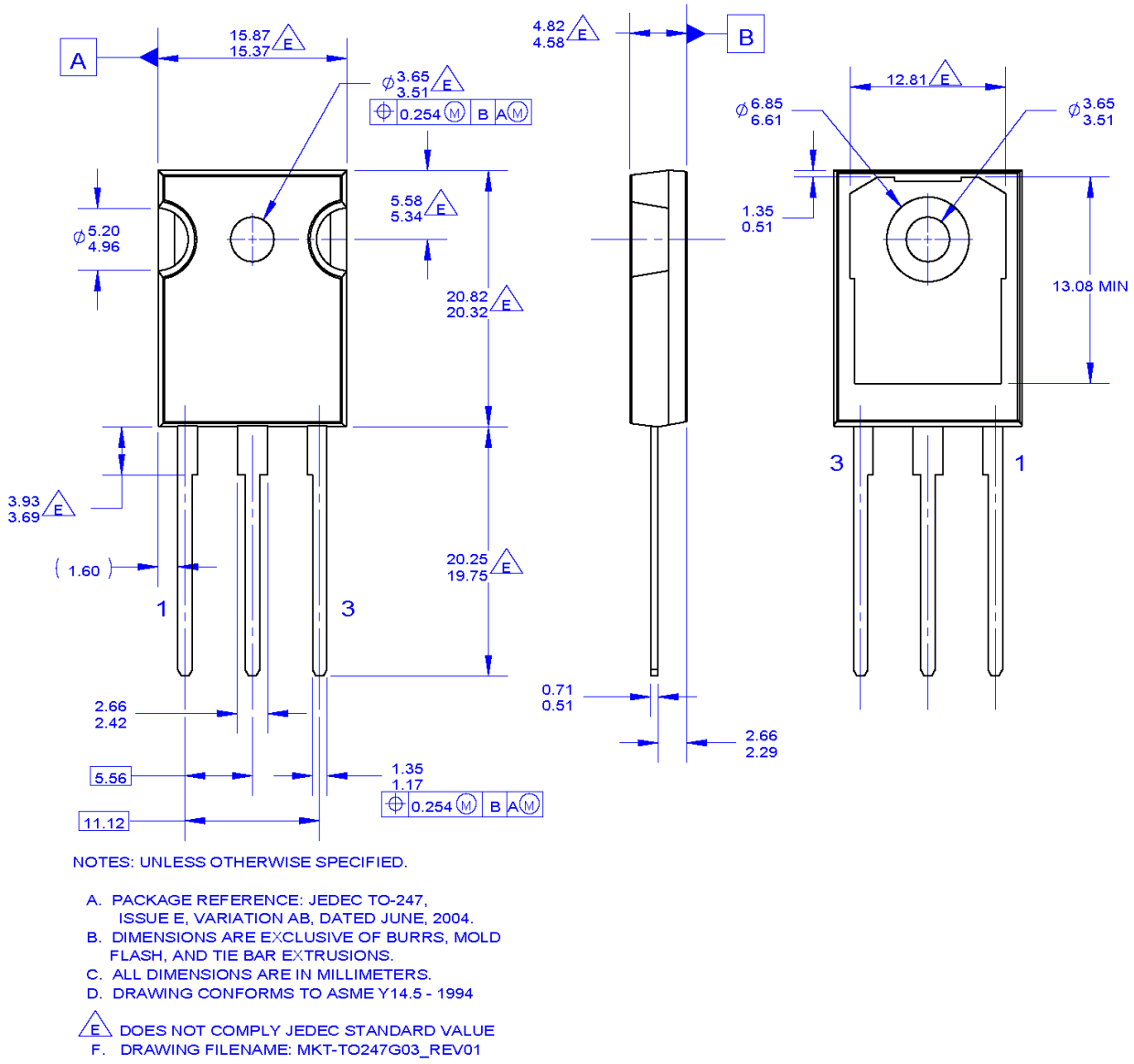


图 23. TO-247，模塑， 3 引脚， JEDEC 变体 AB （有效）

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http://www.fairchildsemi.com/package/packageDetails.html?id=PN_TO247-0A3

尺寸单位为毫米

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2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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