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FGA30S120P

1300 V、 30 A 阳极短路 IGBT

特性

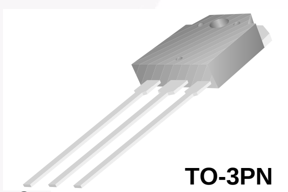
- 高速开关
- 低饱和电压：$V_{CE(sat)}$ =1.75 V @ I_C=30 A
- 高输入阻抗
- 符合 RoHS 标准

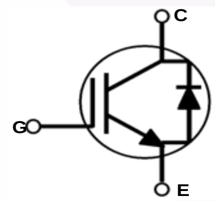
应用

- 感应加热，微波炉

概述

飞兆半导体的阳极短路沟道 IGBT 采用先进的场截止沟道和阳极短路技术，为软开关应用提供卓越的导通和开关性能。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。





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		1300	V
V_{GES}	栅极一发射极间电压		±25	V
I_C	集电极电流	@ T_C = 25°C	60	A
	集电极电流	@ T_C = 100°C	30	A
$I_{CM\ (1)}$	集电极脉冲电流		150	A
I_F	二极管正向连续电流	@ T_C = 25°C	60	A
I_F	二极管正向连续电流	@ T_C = 100°C	30	A
P_D	最大功耗	@ T_C = 25°C	348	W
	最大功耗	@ T_C = 100°C	174	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	--	0.43	°C/W
$R_{\theta JA}$	结至环境热阻	--	40	°C/W

注意：
1: 受限于最大结温

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
FGA30S120P	FGA30S120P	TO-3P	塑料管	不适用	不适用	30

IGBT 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}	Collector to Emitter Breakdown Voltage	V_{GE} = 0 V, I_C = 1 mA	1300	-	-	V
ΔBV_{CES} / ΔT_J	Temperature Coefficient of Breakdown Voltage	V_{GE} = 0 V, I_C = 1 mA	-	1.3	-	V/°C
I_{CES}	集电极切断电流	V_{CE} = 1300, 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 = 30 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 = 30 A, V_{GE} = 15 V T_C = 25°C	-	1.75	2.3	V
		I_C = 30 A, V_{GE} = 15 V, T_C = 125°C	-	1.85	-	V
		I_C = 30 A, V_{GE} = 15 V, T_C = 175°C	-	1.9	-	V
V_{FM}	二极管正向电压	I_F = 30 A, T_C = 25°C	-	1.7	2.2	V
		I_F = 30 A, T_C = 175°C	-	2.1	-	V
动态特性						
C_{ies}	输入电容	V_{CE} = 30 V, V_{GE} = 0 V, f = 1 MHz	-	3345	-	pF
C_{oes}	输出电容		-	75	-	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 = 30 A, R_G = 10 Ω, V_{GE} = 15 V, 感性负载 , T_C =25°C	-	39	-	ns
t_r	上升时间		-	360	-	ns
$t_{d(off)}$	关断延迟时间		-	620	-	ns
t_f	下降时间		-	160	-	ns
E_{on}	导通开关损耗		-	1.3	-	mJ
E_{off}	关断开关损耗		-	1.22	-	mJ
E_{ts}	总开关损耗		-	2.52	-	mJ
$t_{d(on)}$	导通延迟时间	V_{CC} = 600 V, I_C = 30 A, R_G = 10 Ω, V_{GE} = 15 V, 电阻性负载， T_C =175°C	-	38	-	ns
t_r	上升时间		-	375	-	ns
$t_{d(off)}$	关断延迟时间		-	635	-	ns
t_f	下降时间		-	270	-	ns
E_{on}	导通开关损耗		-	1.59	-	mJ
E_{off}	关断开关损耗		-	1.78	-	mJ
E_{ts}	总开关损耗		-	3.37	-	mJ
Q_g	总栅极电荷	V_{CE} = 600 V, I_C = 30 A, V_{GE} = 15 V	-	78	-	nC
Q_{ge}	栅极一发射极间电荷		-	4.2	-	nC
Q_{gc}	栅极一集电极间电荷		-	33.3	-	nC

典型性能特征

图 1. 典型输出特性

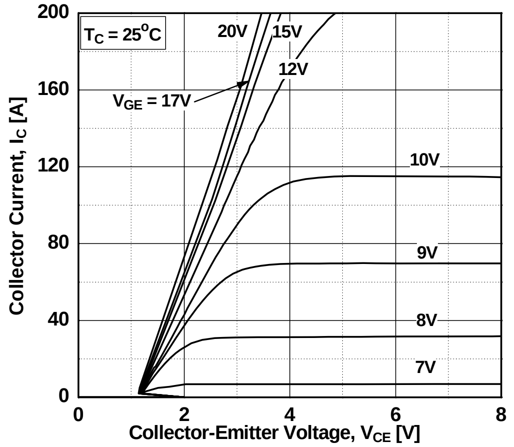


图 2. 典型输出特性

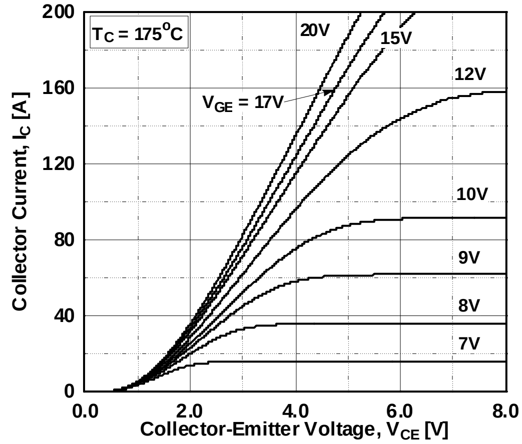


图 3. 典型饱和电压特性

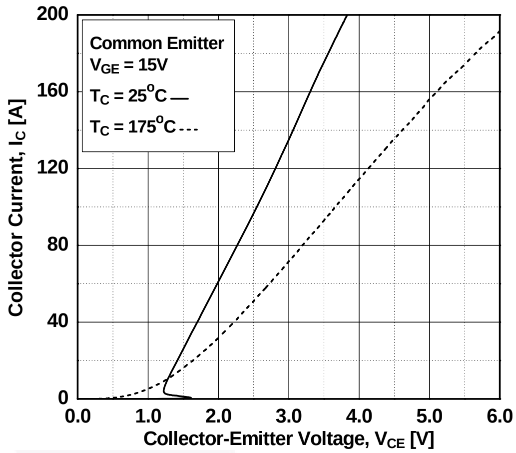


图 4. 传输特性

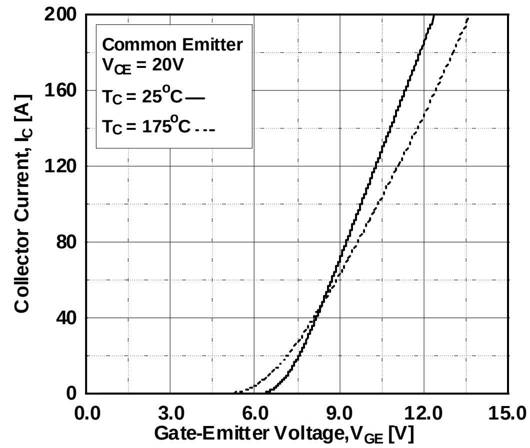


图 5. 饱和电压与壳温的关系 （不同电流强度下）

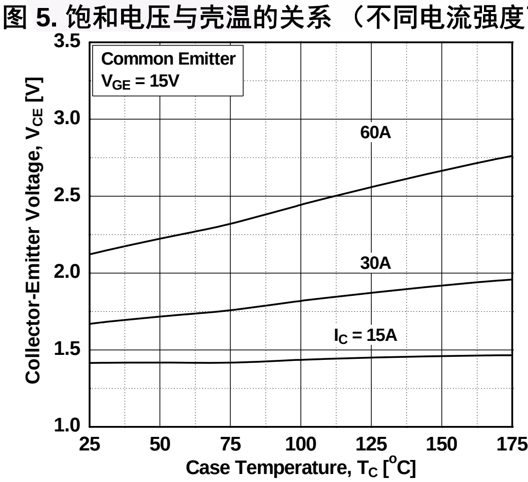
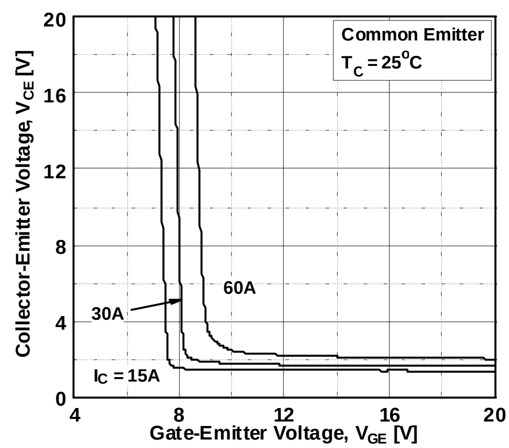


图 6. 饱和电压与 V_{GE} 的关系



典型性能特征

图 7. 饱和电压与 V_{GE} 的关系

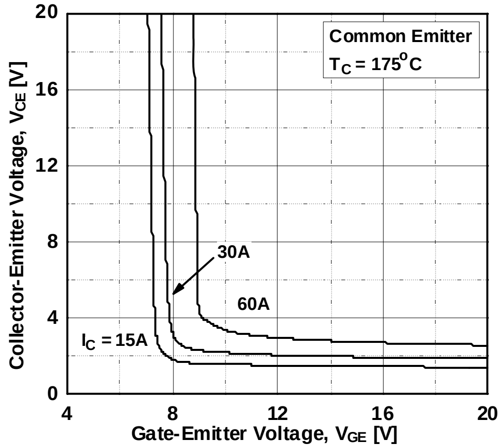


图 8. 电容特性

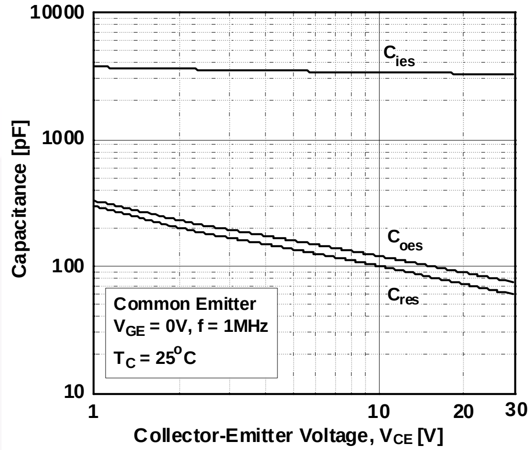


图 9. 栅极电荷特性

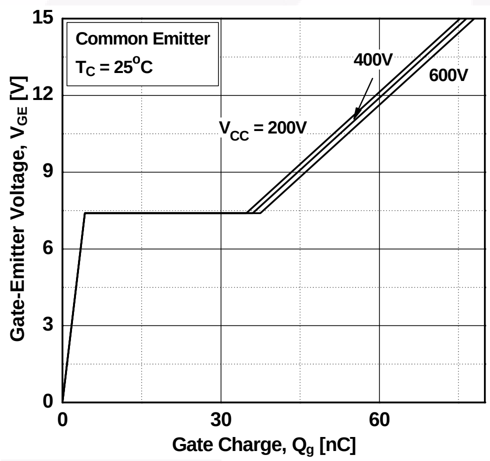


图 10. SOA 特性

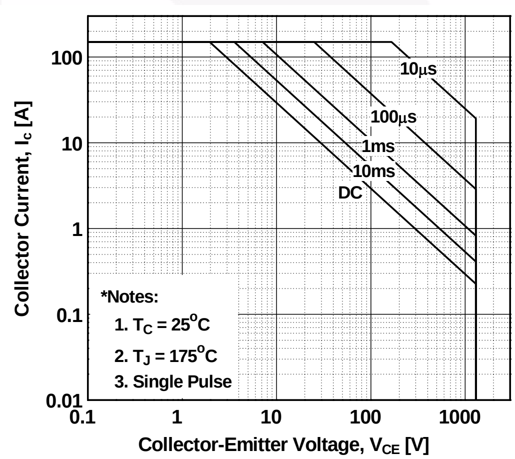


图 11. 导通特性与栅极电阻的关系

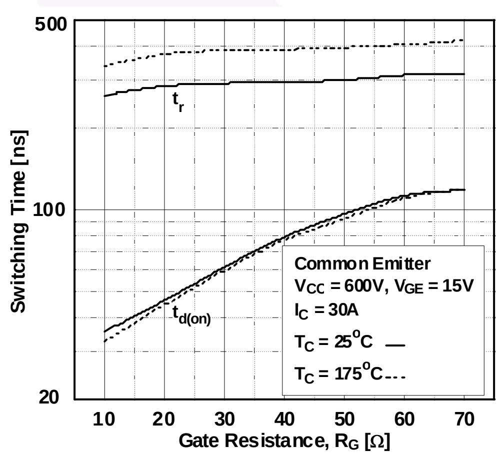
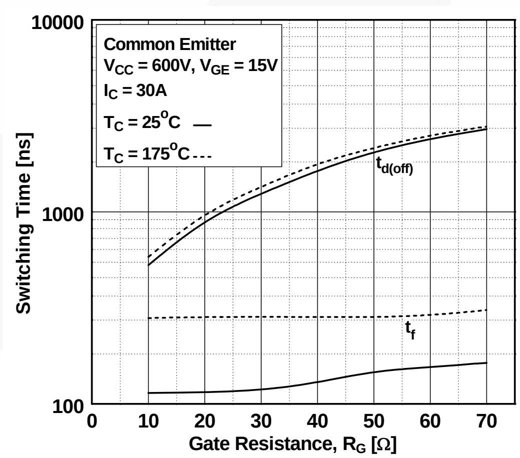


图 12. 关断特性与栅极电阻的关系



典型性能特征

图 13. 导通特性与集电极电流的关系

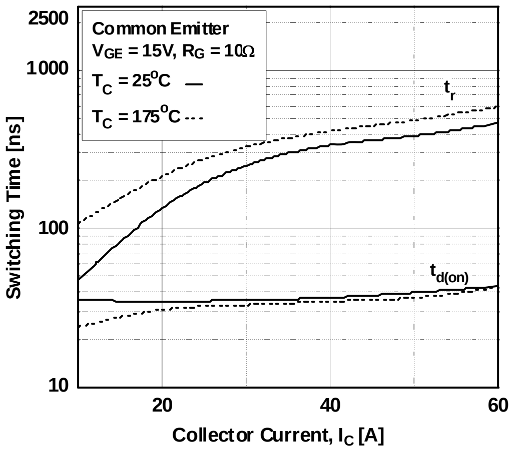


图 14. 关断特性与集电极电流的关系

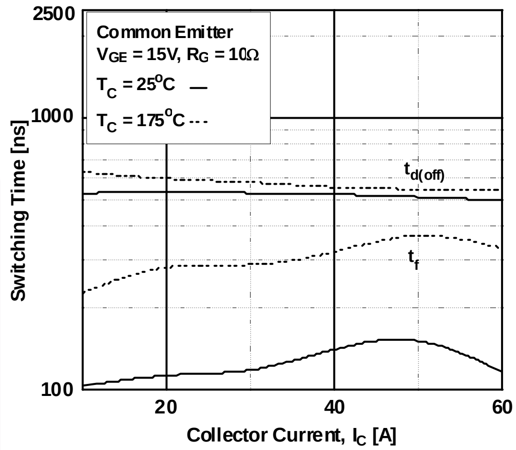


图 15. 开关损耗与栅极电阻的关系

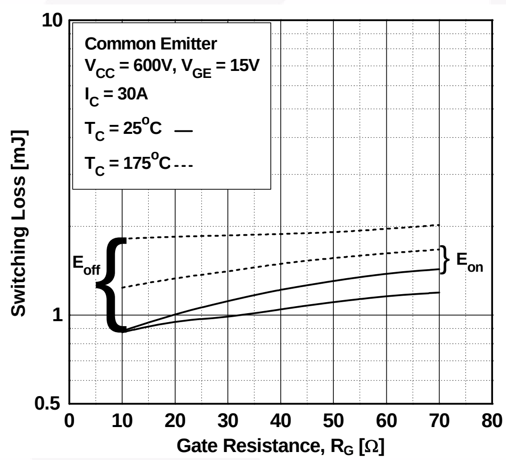


图 16. 开关损耗与集电极电流的关系

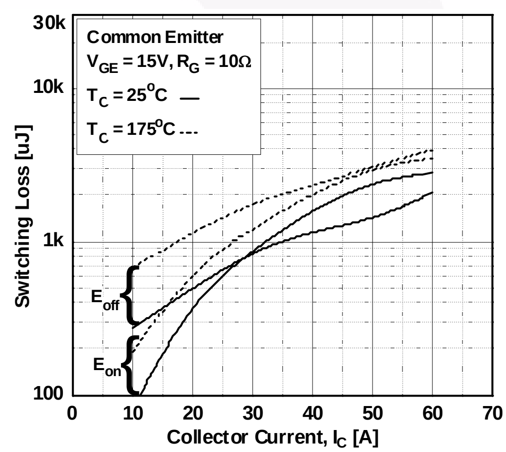


图 17. 关断开关 SOA 特性

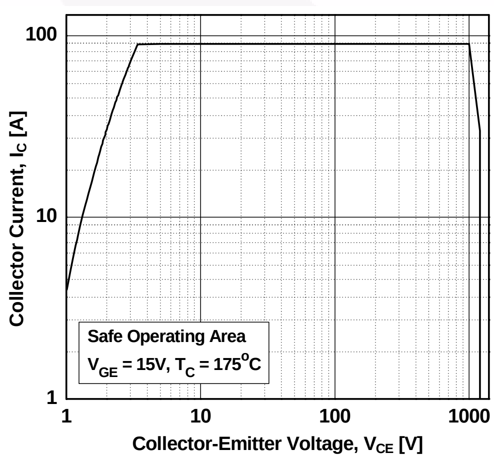


图 18. 正向特性

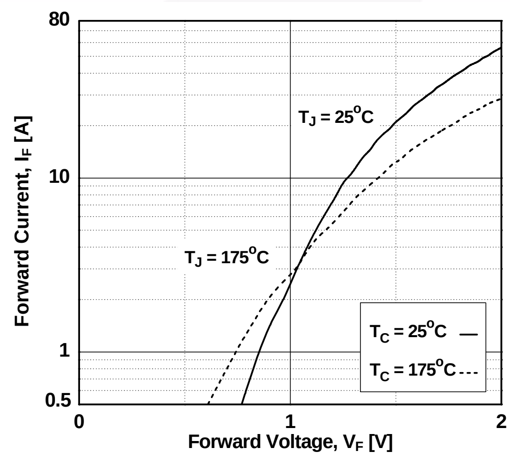
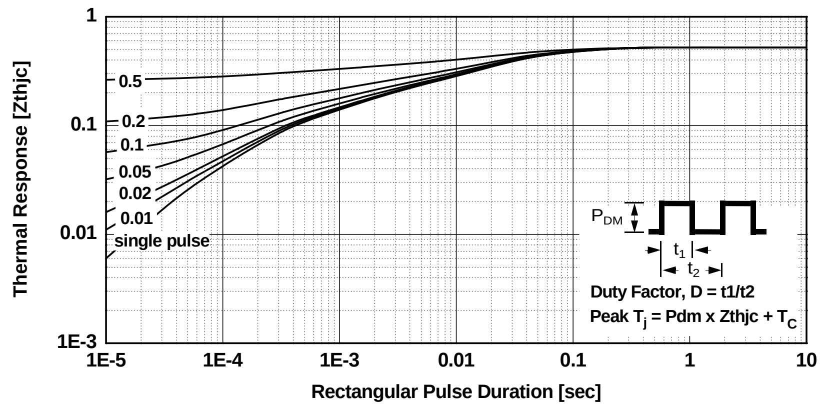
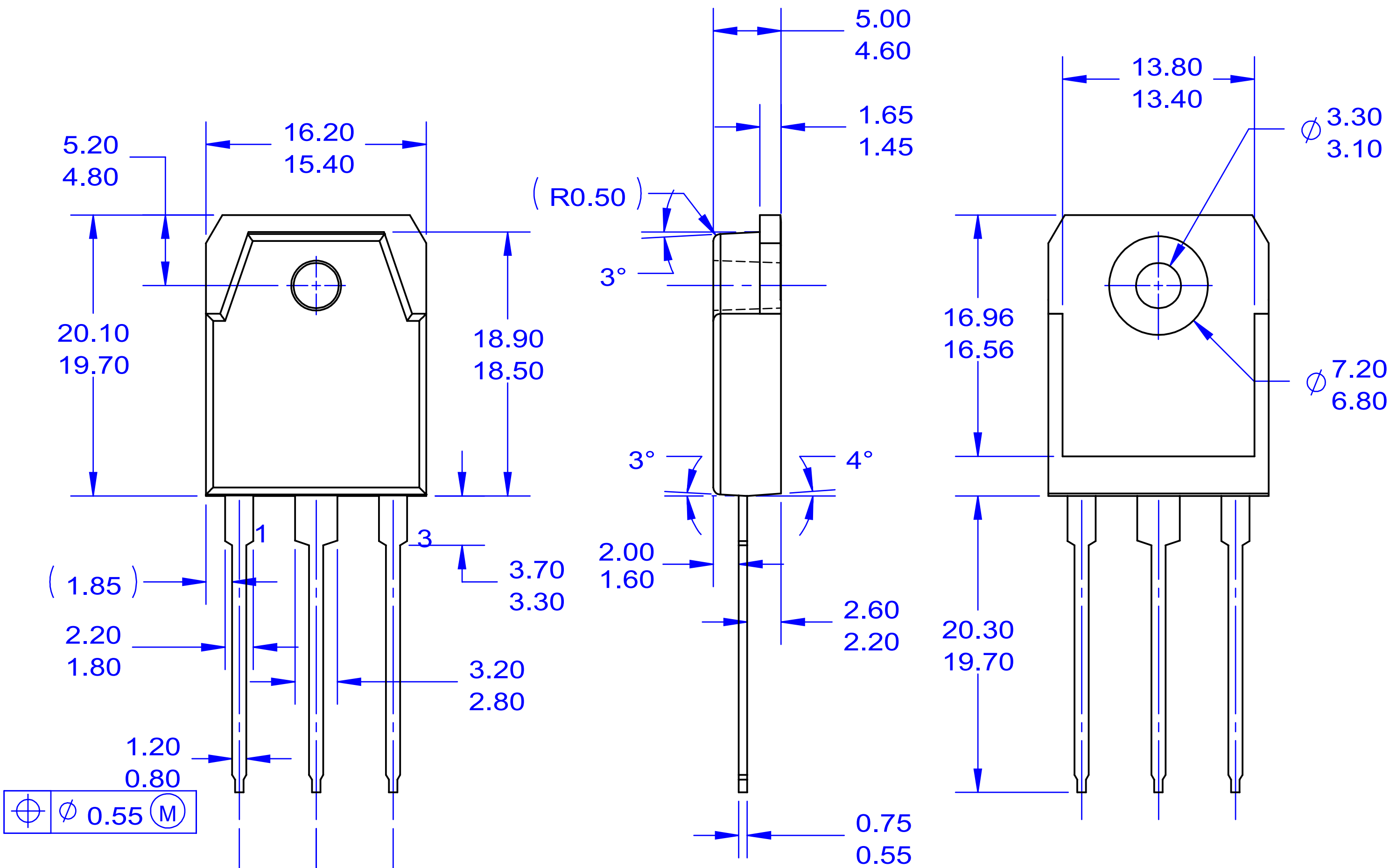
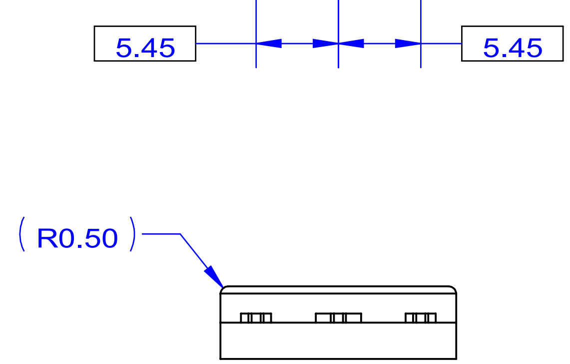


图 19.IGBT 的瞬态热阻抗







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