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2016 年 3 月

FGA50S110P

1100 V、 50 A 阳极短路 IGBT

特性

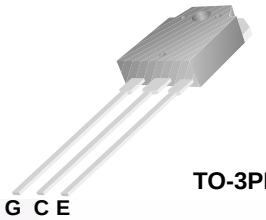
- 内置反并联二极管，用于软开关应用
- 大开关频率范围：10 kHz 至 50 kHz
- 高温稳定性能 （T_{jmax} = 175°C）
- 低饱和压降：$V_{CE(sat)}$ = 2.06 V，I_C = 50 A
- 耐用锅炉检测噪声抗扰度
- 符合 RoHS 标准 （无铅引脚电镀）

概述

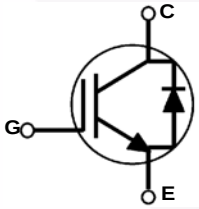
飞兆半导体的短路阳极沟道 IGBT 系列采用先进的场截止沟道和短路阳极技术，为开关应用提供出色的导通和开关性能。该器件为电磁炉和微波炉量身定制。

应用

- 电磁炉、电饭煲和微波炉
- 软开关应用



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	1100	V
V_{GES}	栅极 - 发射极间电压	± 25	V
I_C	集电极电流 @ T_C = 25°C	50	A
	集电极电流 @ T_C = 100°C	30	A
$I_{CM\ (1)}$	集电极脉冲电流	120	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	30	A
P_D	最大功耗 @ T_C = 25°C	300	W
	最大功耗 @ T_C = 100°C	150	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	-	0.5	°C/W
$R_{\theta JA}$	结至环境热阻最大值	-	40	°C/W

注意：

1: 受限于 T_{jmax}

封装标识与定购信息

器件标识	器件	封装	卷尺寸	带宽	数量
FGA50S110P	FGA50S110P	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} = 1100 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 = 50 mA，V_{CE} = V_{GE}	4.5	5.6	7.5	V
$V_{CE(sat)}$	集电极 - 发射极间饱和电压	I_C = 50 A， V_{GE} = 15 V T_C = 25°C	-	2.06	2.6	V
		I_C = 50 A， V_{GE} = 15 V T_C = 125°C	-	2.54	-	V
		I_C = 50 A， V_{GE} = 15 V， T_C = 175°C	-	2.7	-	V
V_{FM}	二极管正向电压	I_F = 50 A， T_C = 25°C	-	1.96	2.6	V
		I_F = 50 A， T_C = 175°C	-	2.67	-	V
动态特性						
C_{ies}	输入电容	V_{CE} = 30 V， V_{GE} = 0 V， f = 1 MHz	-	2056	-	pF
C_{oes}	输出电容		-	47.8	-	pF
C_{res}	反向传输电容		-	35.8	-	pF
开关特性						
$t_{d(on)}$	导通延迟时间	V_{CC} = 600 V， I_C = 50 A， R_G = 10 Ω， V_{GE} = 15 V， 阻性负载， T_C = 25°C	-	24	-	ns
t_r	上升时间		-	294	-	ns
$t_{d(off)}$	关断延迟时间		-	280	-	ns
t_f	下降时间		-	95	-	ns
E_{on}	导通开关损耗		-	2240	-	μJ
E_{off}	关断开关损耗		-	990	-	μJ
E_{ts}	总开关损耗		-	3230	-	μJ
$t_{d(on)}$	导通延迟时间	V_{CC} = 600 V， I_C = 50 A， R_G = 10 Ω， V_{GE} = 15 V， 阻性负载， T_C = 175°C	-	24	-	ns
t_r	上升时间		-	346	-	ns
$t_{d(off)}$	关断延迟时间		-	308	-	ns
t_f	下降时间		-	184	-	ns
E_{on}	导通开关损耗		-	2640	-	μJ
E_{off}	关断开关损耗		-	1820	-	μJ
E_{ts}	总开关损耗		-	4460	-	μJ
Q_g	总栅极电荷	V_{CE} = 600 V， I_C = 50 A， V_{GE} = 15 V	-	195	-	nC
Q_{ge}	栅极－发射极间电荷		-	15.4	-	nC
Q_{gc}	栅极－发射极间电荷		-	99.9	-	nC

典型性能特征

图 1. 典型输出特性

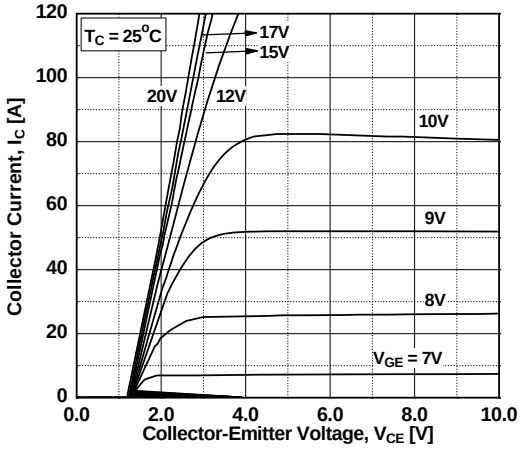


图 2. 典型输出特性

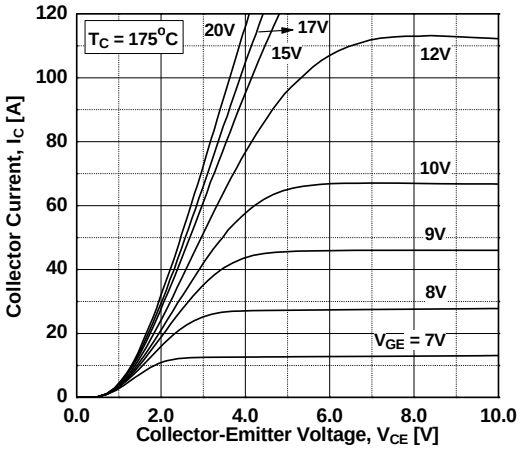


图 3. 典型饱和电压特性

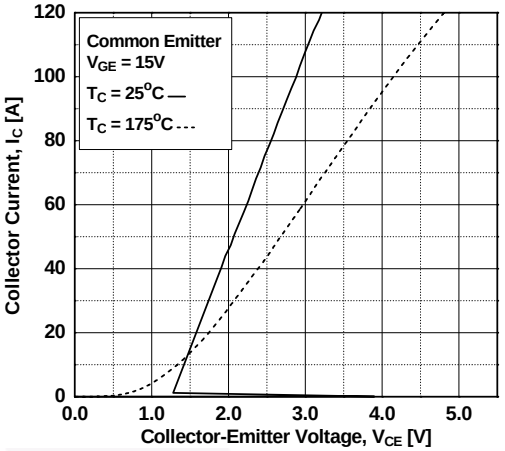


图 4. 传输特性

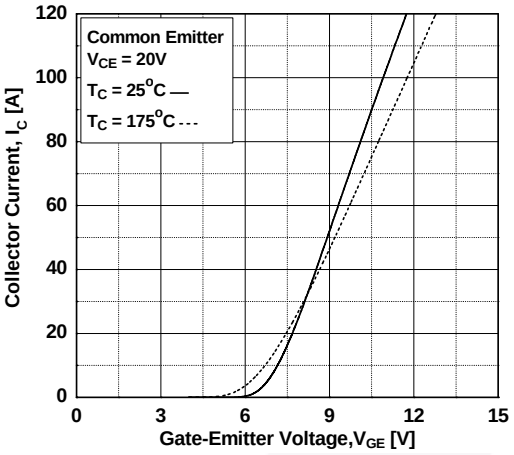


图 5. 饱和电压与壳温的关系 （在可变电流强度下）

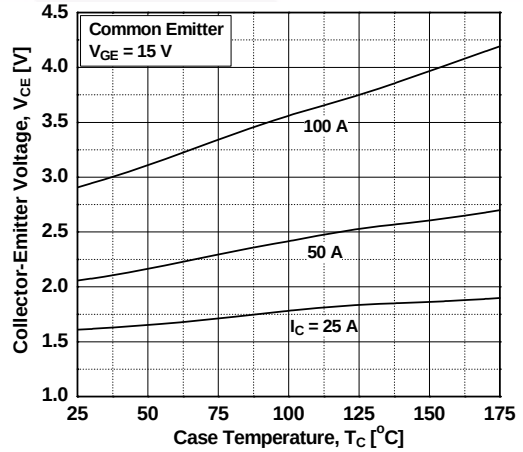
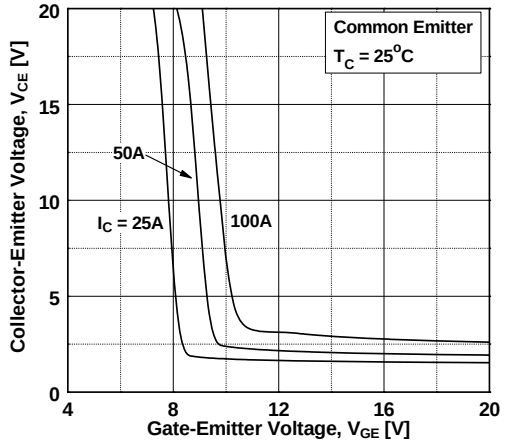


图 6. 饱和电压与 V_{GE} 的关系



典型性能特征

图 7. 饱和电压与 V_{GE} 的关系

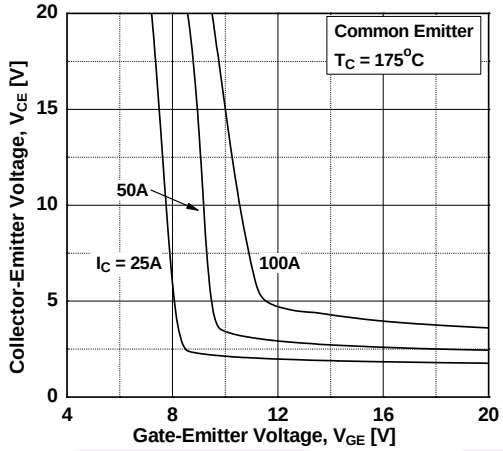


图 8. 电容特性

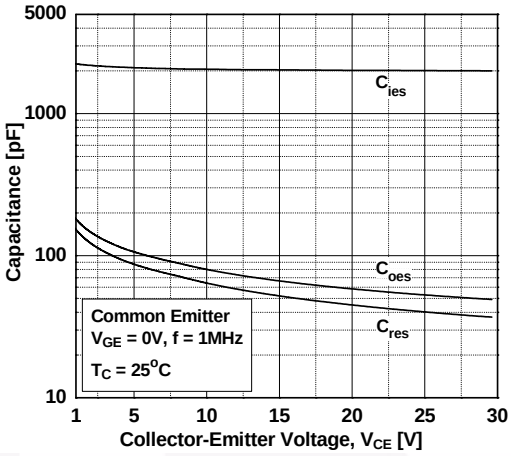


图 9. 栅极电荷特性

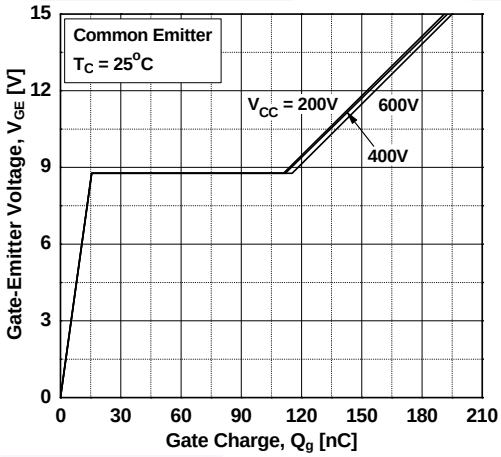


图 10. SOA 特性

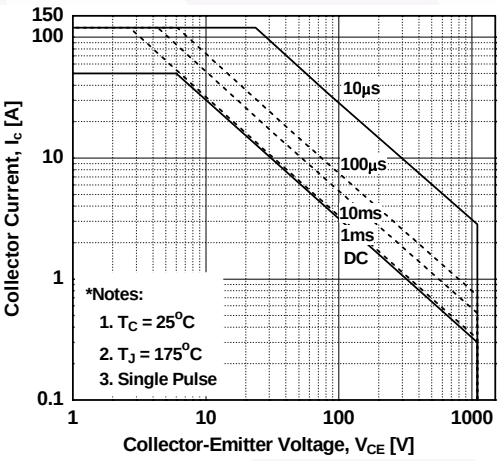


图 11. 导通特性与栅极电阻的关系

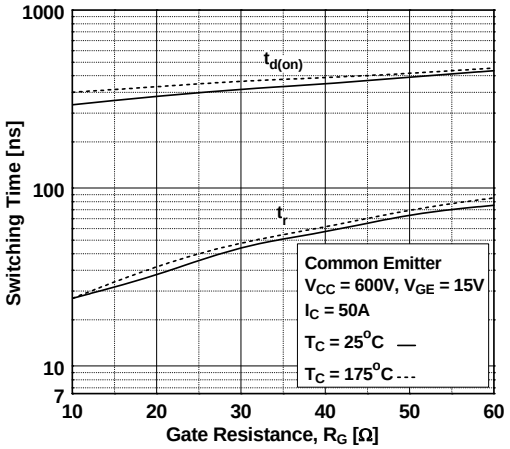
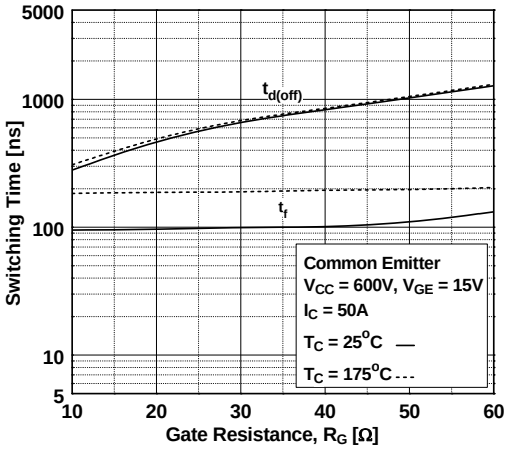


图 12. 关断特性与栅极电阻的关系



典型性能特征

图 13. 导通特性与集电极电流的关系

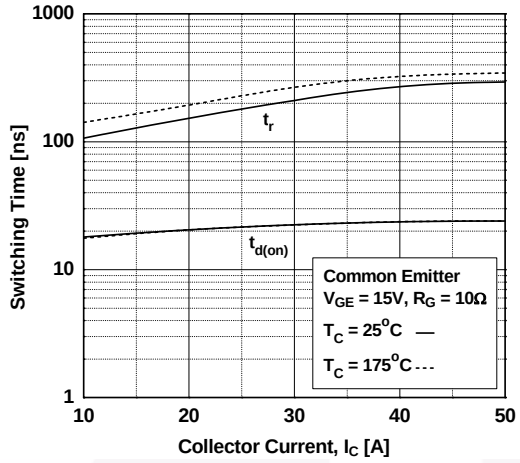


图 14. 关断特性与集电极电流的关系

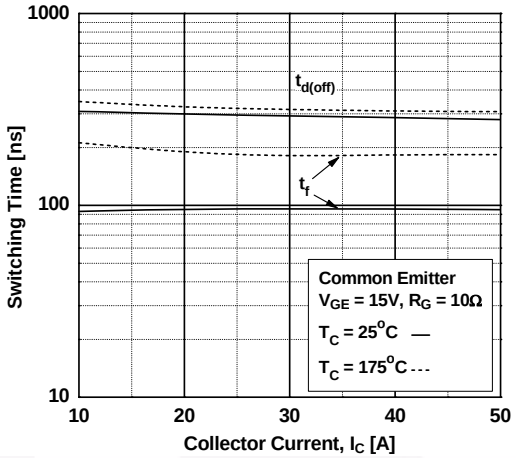


图 15. 开关损耗与栅极电阻的关系

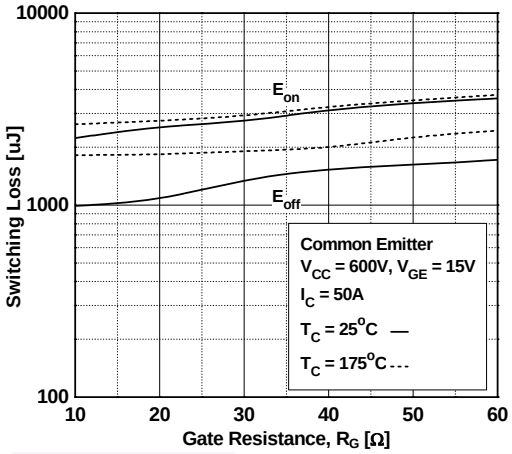


图 16. 开关损耗与集电极电流的关系

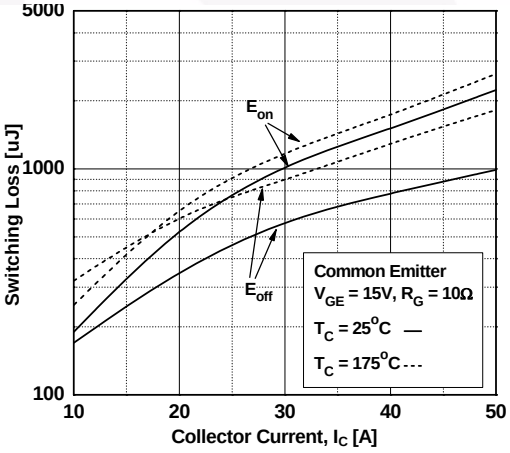


图 17. 关断开关 SOA 特性

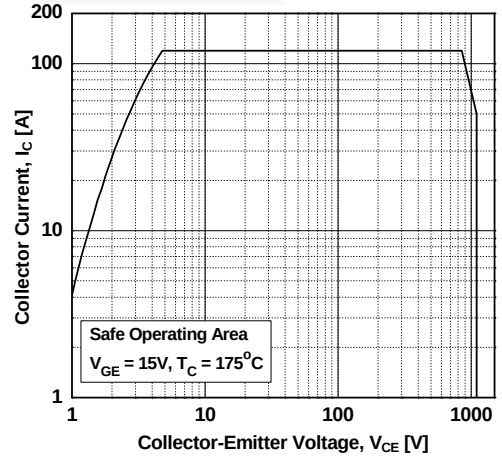
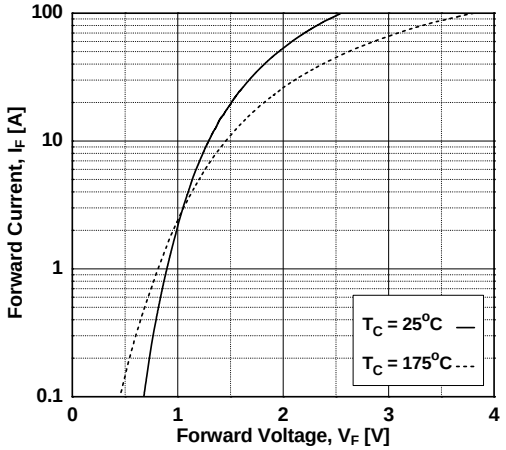
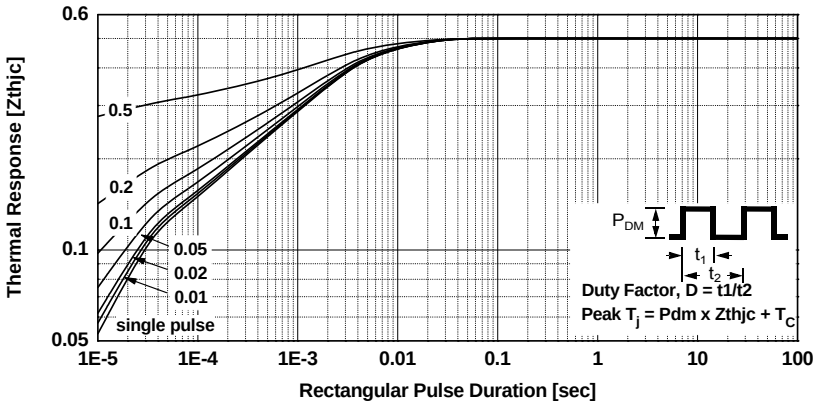


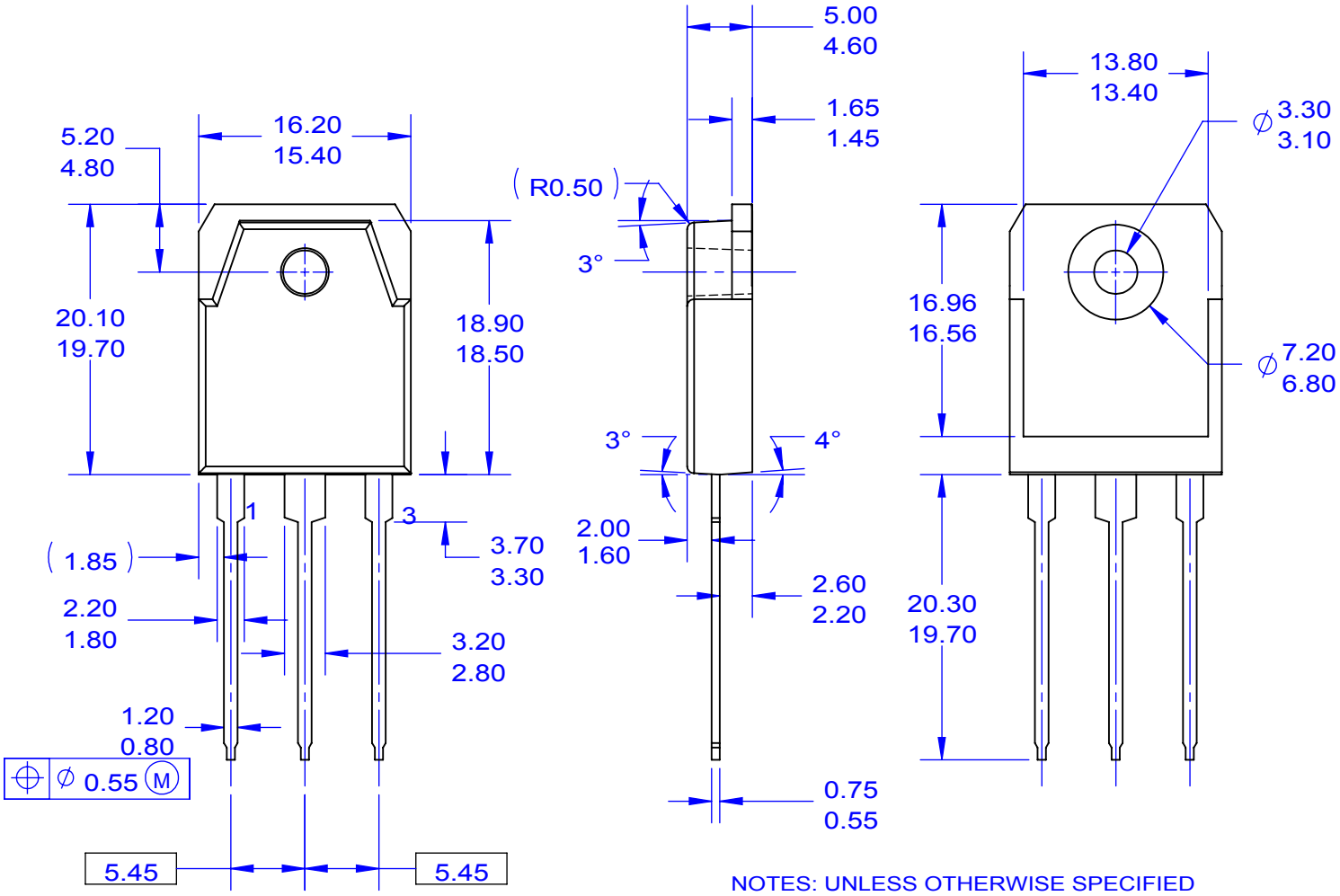
图 18. 正向特性

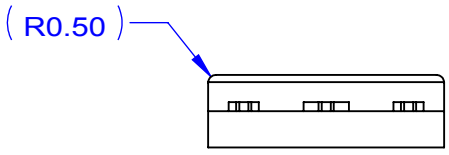


典型性能特征

图 19. IGBT 瞬态热阻







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D) DIMENSIONS ARE EXCLUSSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSSIONS.
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