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2015年3月

FGPF4565 650 V 场截止沟槽 IGBT

特性

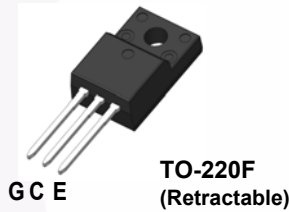
- 高电流能力
- 低饱和电压: $V_{CE(sat)} = 1.5 \text{ V}$ (典型值) @ $I_C = 30 \text{ A}$
- 高输入阻抗
- 符合 RoHS 标准

应用

- IPL (强脉冲光)

概述

通过利用创新型场截止 IGBT 技术, Fairchild 的新系列场截止槽 IGBT 可以为 IPL (强度脉冲光) 提供最优性能。



绝对最大额定值 $T_C = 25^\circ\text{C}$ 除非另有说明

符号	描述	额定值	单位
V_{CES}	集电极-发射极之间电压	650	V
V_{GES}	栅极-发射极间电压	± 25	V
$I_{C \text{ pulse (1)}}$ *	集电极脉冲电流 @ $T_C = 25^\circ\text{C}$	170	A
P_D	最大功耗 @ $T_C = 25^\circ\text{C}$	30	W
	最大功耗 @ $T_C = 100^\circ\text{C}$	12	W
T_J	工作结温	-55 至 +150	$^\circ\text{C}$
T_{stg}	存储温度范围	-55 至 +150	$^\circ\text{C}$
T_L	用于焊接的最大引脚温度, 距离外壳 1/8", 持续 5 秒	300	$^\circ\text{C}$

热性能

符号	参数	典型值	最大值	单位
$R_{\theta JC}$	结至外壳热阻最大值	-	4.1	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	结至环境热阻最大值	-	62.5	$^\circ\text{C}/\text{W}$

注:

1. 半正弦波: $D < 0.01$, 脉宽 $< 1 \mu\text{sec}$,

* I_C 脉宽 受限于最大 T_J

封装标识与订购信息

器件编号	顶标	封装	包装方法	卷尺寸	带宽	数量
FGPF4565	FGPF4565	TO-220F	塑料管	不适用	不适用	50

IGBT 电气特性 $T_C = 25^\circ\text{C}$ 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	$V_{GE} = 0\text{ V}, I_C = 1\text{ mA}$	650	-	-	V
$\Delta BV_{CES}/\Delta T_J$	击穿电压温度系数电压	$V_{GE} = 0\text{ V}, I_C = 1\text{ mA}$	-	0.65	-	V/ $^\circ\text{C}$
I_{CES}	集电极切断电流	$V_{CE} = V_{CES}, V_{GE} = 0\text{ V}$	-	-	250	μA
I_{GES}	G-E 漏电流	$V_{GE} = V_{GES}, V_{CE} = 0\text{ V}$	-	-	± 400	nA
导通特性						
$V_{GE(th)}$	G-E 阈值电压	$I_C = 250\ \mu\text{A}, V_{CE} = V_{GE}$	3.0	4.0	5.0	V
$V_{CE(sat)}$	集电极-发射极间饱和电压	$I_C = 20\text{ A}, V_{GE} = 15\text{ V}$	-	1.35	-	V
		$I_C = 30\text{ A}, V_{GE} = 15\text{ V}$	-	1.50	1.88	V
		$I_C = 30\text{ A}, V_{GE} = 15\text{ V}, T_C = 150^\circ\text{C}$	-	1.75	-	V
动态特性						
C_{ies}	输入电容	$V_{CE} = 30\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	-	1650	-	pF
C_{oes}	输出电容		-	34	-	pF
C_{res}	反向传输电容		-	17	-	pF
开关特性						
$t_{d(on)}$	导通延迟时间	$V_{CC} = 400\text{ V}, I_C = 30\text{ A}, R_G = 5\ \Omega, V_{GE} = 15\text{ V},$ 感性负载, $T_C = 25^\circ\text{C}$	-	11.2	-	ns
t_r	上升时间		-	44.8	-	ns
$t_{d(off)}$	关断延迟时间		-	40.8	-	ns
t_f	下降时间		-	153	-	ns
$t_{d(on)}$	导通延迟时间	$V_{CC} = 400\text{ V}, I_C = 30\text{ A}, R_G = 5\ \Omega, V_{GE} = 15\text{ V},$ 感性负载, $T_C = 150^\circ\text{C}$	-	12.8	-	ns
t_r	上升时间		-	59.2	-	ns
$t_{d(off)}$	关断延迟时间		-	40.8	-	ns
t_f	下降时间		-	202	-	ns
Q_g	总栅极电荷	$V_{CE} = 400\text{ V}, I_C = 30\text{ A}, V_{GE} = 15\text{ V}$	-	40.3	-	nC
Q_{ge}	栅极-发射极间电荷		-	8.8	-	nC
Q_{gc}	栅极-集电极间电荷		-	10.4	-	nC

典型性能特征

图 1. 典型输出特性

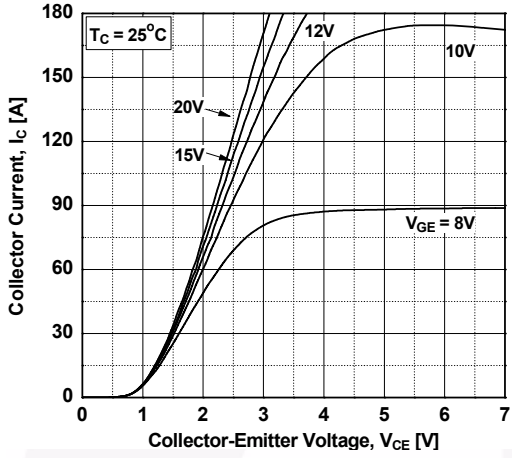


图 2. 典型输出特性

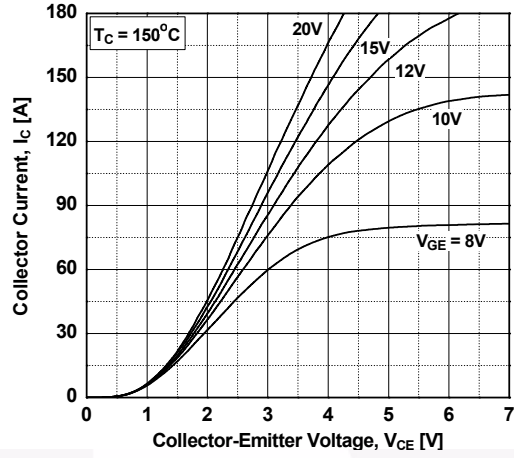


图 3. 典型饱和电压特性

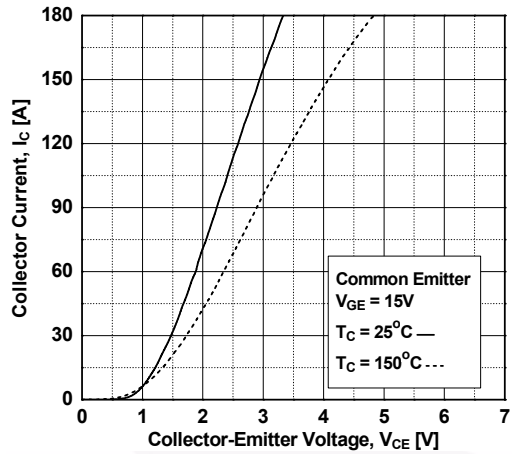


图 4. 饱和电压与可变电流强度下壳温的关系

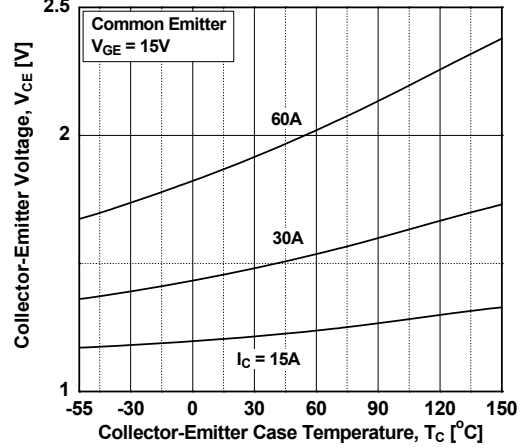


图 5. 饱和电压与 Vge 的关系

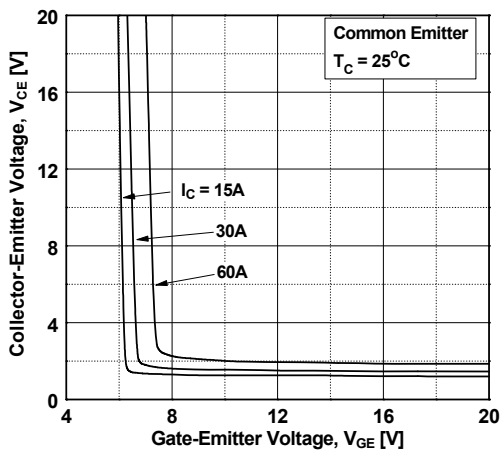
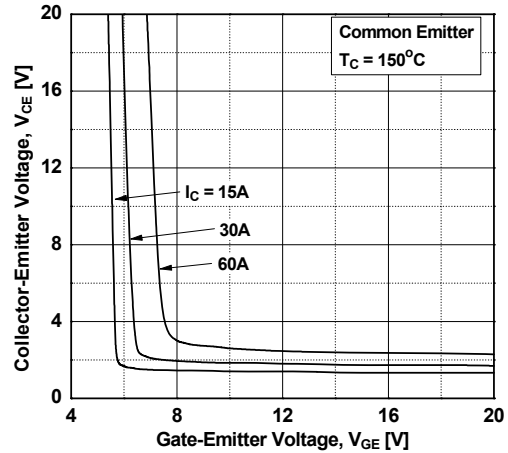


图 6. 饱和电压与 Vge 的关系



典型性能特征

图 7. 电容特性

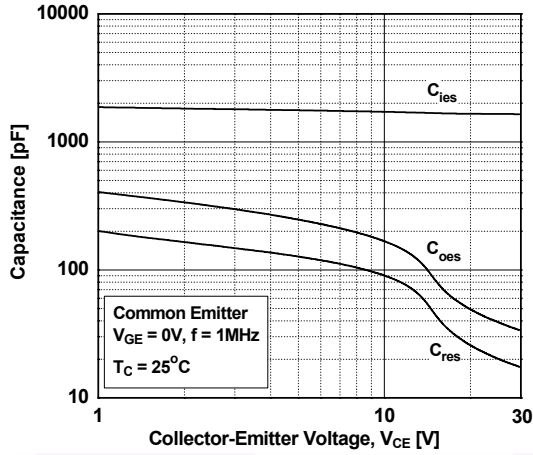


图 8. 栅极电荷特性

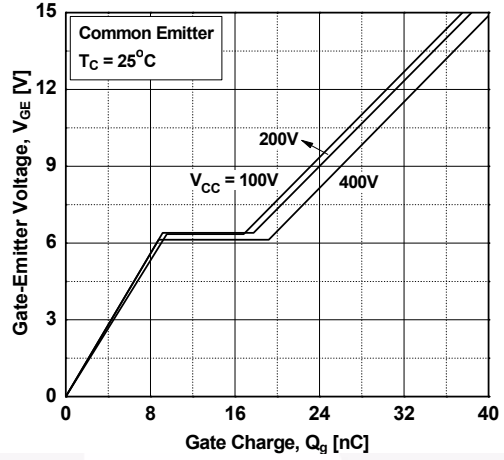


图 9. 关断特性与栅极电阻的关系

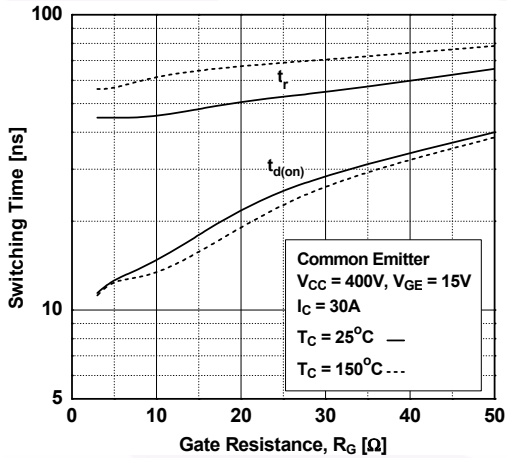


图 10. 导通特性与栅极电阻的关系

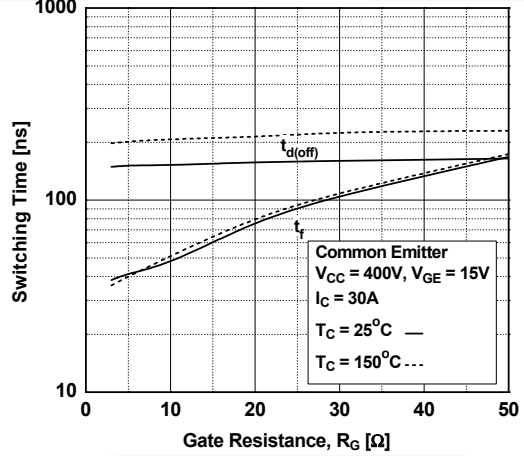


图 11. 开关损耗与栅极电阻的关系

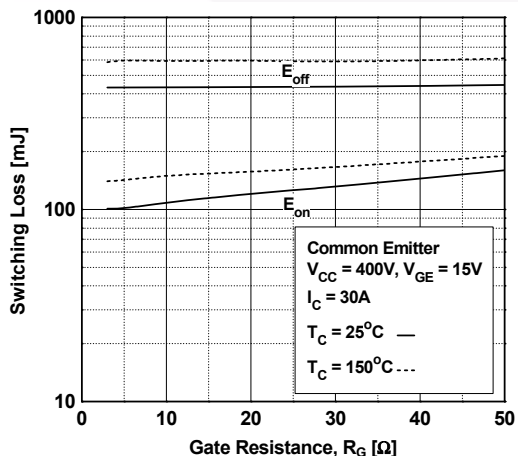
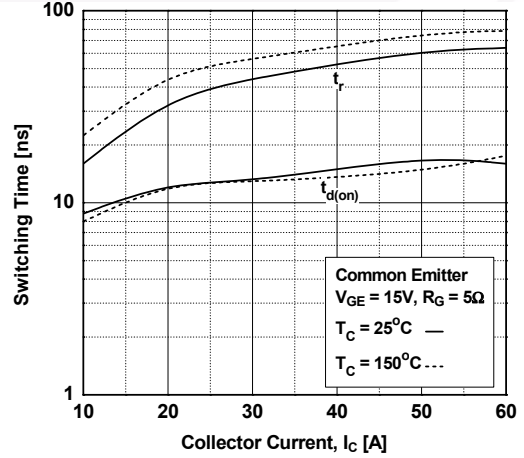


图 12. 导通特性与集电极电流的关系



典型性能特征

图 13. 关断特性与集电极电流的关系

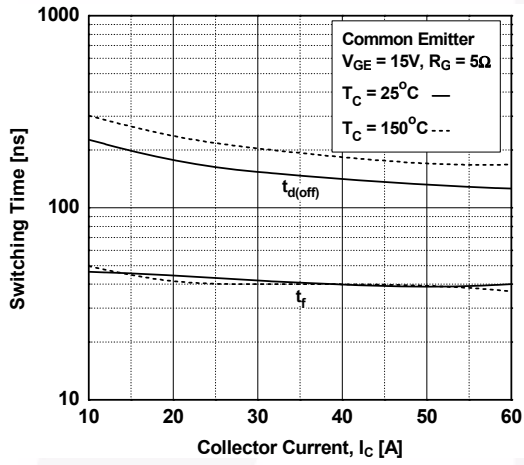


图 14. 开关损耗与集电极电流的关系

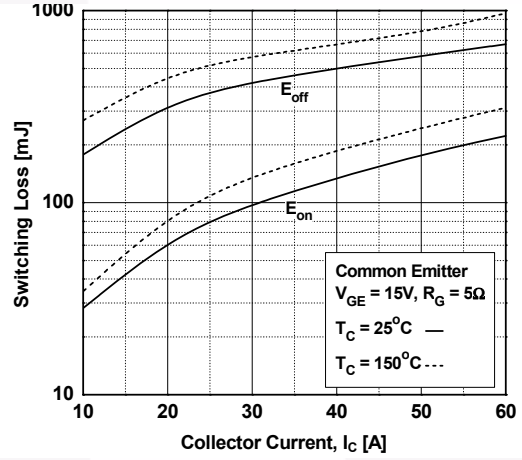
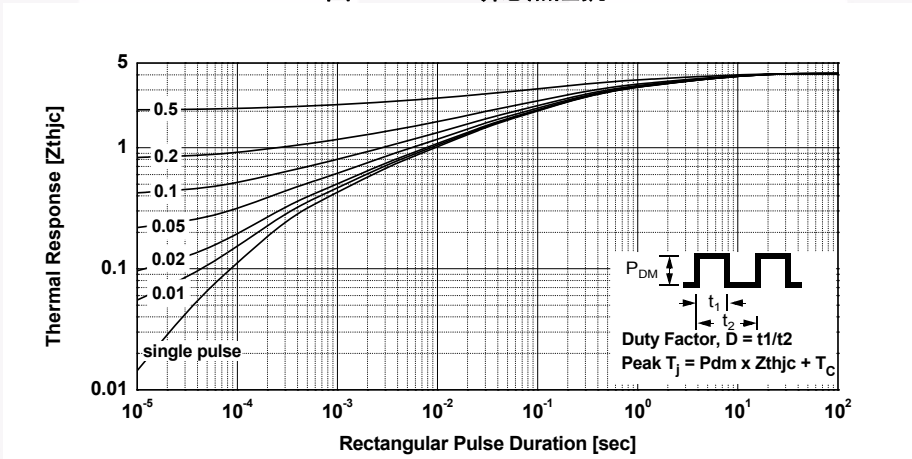


图 25. IGBT 瞬态热阻抗



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