

RJH60D7DPM

600V - 50A – 绝缘栅双极晶体管

应用: 逆变器

R07DS0176CJ0300

修订版本 3.00

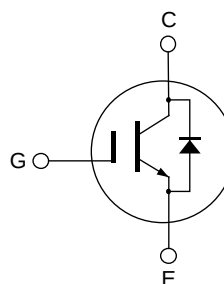
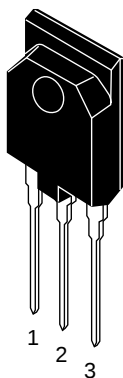
Aug 28, 2012

特点

- 短路承受时间 (5 μ s 典型值)
- 低集电极/发射极饱和电压
 $V_{CE(sat)} = 1.6$ V 典型值 ($I_C = 50$ A, $V_{GE} = 15$ V, $T_a = 25^\circ\text{C}$)
- 内置快速恢复二极管 (100 ns 典型值) 于一封装
- 沟槽栅与薄晶圆技术
- 快速开关时间
 $t_f = 50$ ns 典型值 ($V_{CC} = 300$ V, $V_{GE} = 15$ V, $I_C = 50$ A, $R_g = 5$ Ω , $T_a = 25^\circ\text{C}$, 感性负载)

封装形式

RENESAS 封装代码: PRSS0003ZA-A
(封装名称: TO-3PFM)



1. 栅极
2. 集电极
3. 发射极

绝对最大额定值

($T_a = 25^\circ\text{C}$)

参数		符号	额定值	单位
集电极/发射极电压 或 二极管反向电压		V_{CES} / V_R	600	V
栅极/发射极电压		V_{GES}	± 30	V
集电极电流	$T_c = 25^\circ\text{C}$	I_C	90	A
	$T_c = 100^\circ\text{C}$	I_C	50	A
集电极脉冲电流		$i_{c(peak)}$ 注1	200	A
集电极/发射极二极管正向电流		i_{DF}	30	A
集电极/发射极二极管正向脉冲电流		$i_{DF(peak)}$ 注1	120	A
集电极最大容许功率损耗		P_C 注2	55	W
结壳热阻 (绝缘栅双极晶体管)		θ_{j-c} 注2	2.27	$^\circ\text{C}/\text{W}$
结壳热阻 (二极管)		θ_{j-cd} 注2	3.95	$^\circ\text{C}/\text{W}$
结温		T_j	150	$^\circ\text{C}$
储存温度		T_{stg}	-55 to +150	$^\circ\text{C}$

注: 1. 在 $PW \leq 10$ μ s, 工作周期 $\leq 1\%$ 的容许值
2. 在 $T_c = 25^\circ\text{C}$ 的容许值

电特性

(Ta = 25°C)

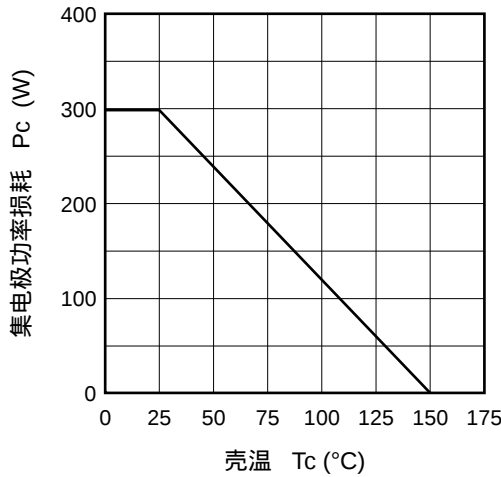
参数	符号	最小值	典型值	最大值	单位	测定条件
集电极/发射极破坏电压	$V_{BR(CES)}$	600	—	—	V	$I_C = 10 \mu A, V_{GE} = 0$
集电极/发射极短路电流 或 二极管反向电流	I_{CES} / I_R	—	—	5	μA	$V_{CE} = 600 V, V_{GE} = 0$
栅极/发射极漏泄电流	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 30 V, V_{CE} = 0$
栅极/发射极截止电压	$V_{GE(off)}$	4.0	—	6.0	V	$V_{CE} = 10 V, I_C = 1 mA$
集电极/发射极饱和电压	$V_{CE(sat)}$	—	1.6	2.2	V	$I_C = 50 A, V_{GE} = 15 V$ 注3
	$V_{CE(sat)}$	—	1.8	—	V	$I_C = 90 A, V_{GE} = 15 V$ 注3
输入电容	C_{ies}	—	3000	—	pF	$V_{CE} = 25 V$
输出电容	C_{oes}	—	160	—	pF	$V_{GE} = 0$
反向传输电容	C_{res}	—	85	—	pF	$f = 1 MHz$
栅极充电电荷量	Q_g	—	130	—	nC	$V_{GE} = 15 V$
栅极/发射极充电电荷量	Q_{ge}	—	20	—	nC	$V_{CE} = 300 V$
栅极/集电极充电电荷量	Q_{gc}	—	45	—	nC	$I_C = 50 A$
接通延迟时间	$t_{d(on)}$	—	60	—	ns	$V_{CC} = 300 V$
上升时间	t_r	—	46	—	ns	$V_{GE} = 15 V$
关断延迟时间	$t_{d(off)}$	—	190	—	ns	$I_C = 50 A$
下降时间	t_f	—	50	—	ns	$R_g = 5 \Omega$
接通能量	E_{on}	—	1.1	—	mJ	(感性负载)
关断能量	E_{off}	—	0.6	—	mJ	
总开关能量	E_{total}	—	1.7	—	mJ	
短路承受时间	t_{sc}	3.0	5.0	—	μs	$V_{CC} \leq 360 V, V_{GE} = 15 V$

快速恢复二极管正向电压	V_F	—	1.4	1.9	V	$I_F = 30 A$ 注3
快速恢复二极管反向恢复时间	t_{rr}	—	100	—	ns	$I_F = 30 A$
快速恢复二极管反向恢复电荷	Q_{rr}	—	0.18	—	μC	$di_F/dt = 100 A/\mu s$
快速恢复二极管反向恢复电流	I_{rr}	—	4.2	—	A	

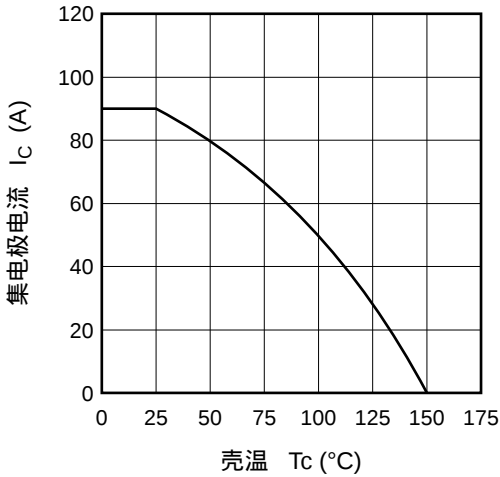
注: 3. 脉冲测试

主要特性

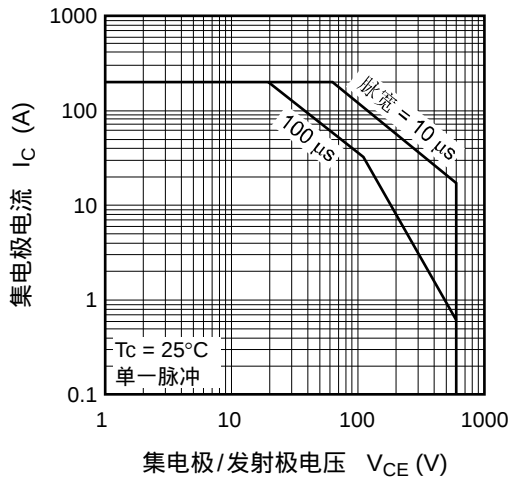
集电极功率损耗-壳温



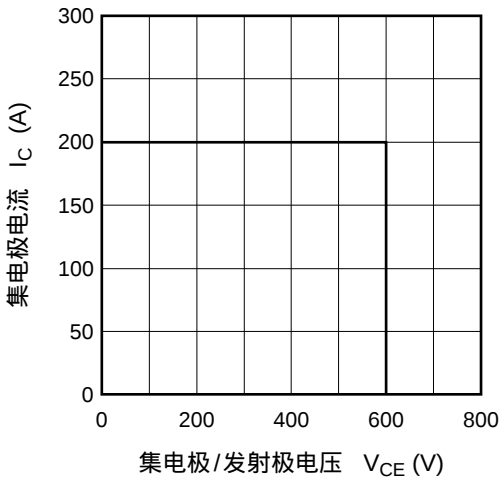
集电极最大直流电流-壳温



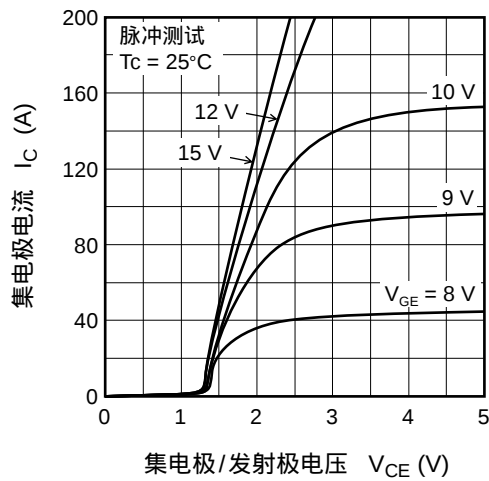
最大安全工作区域



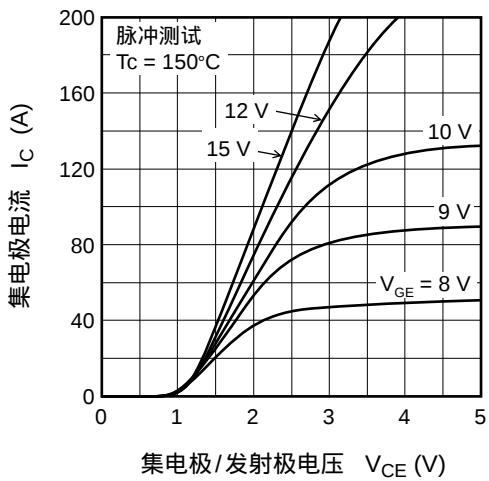
关断安全工作区域



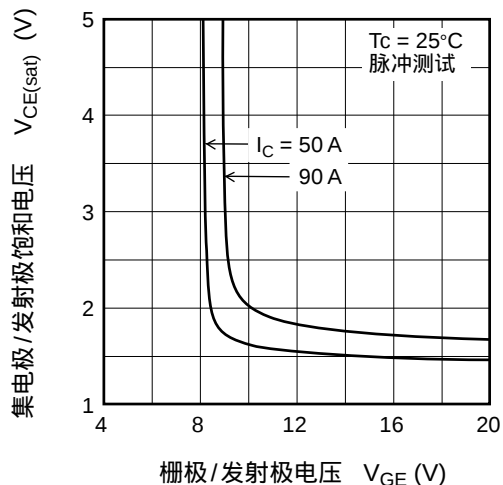
典型输出特性



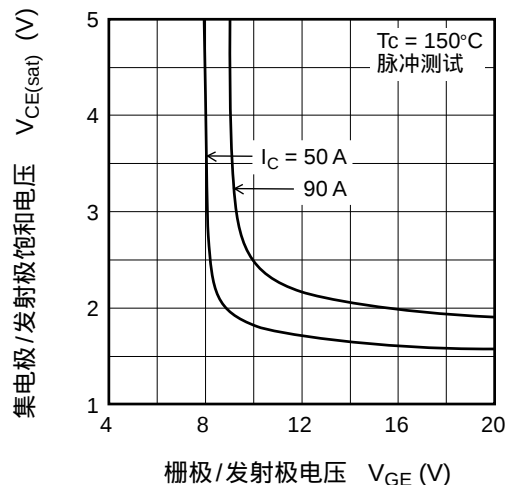
典型输出特性



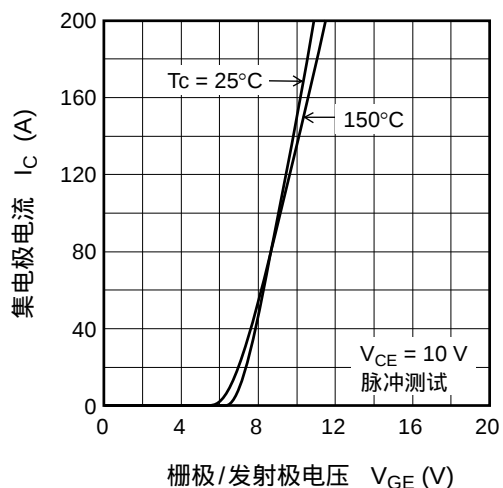
集电极/发射极饱和电压-
栅极/发射极电压 (典型)



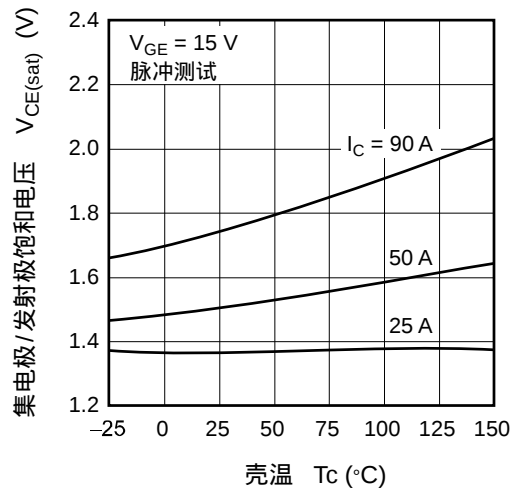
集电极/发射极饱和电压-
栅极/发射极电压 (典型)



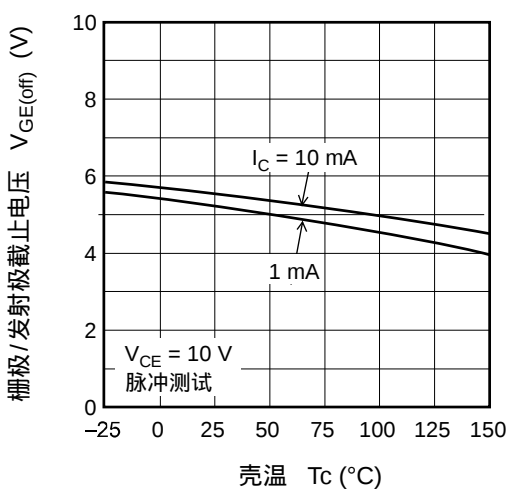
典型传输特性



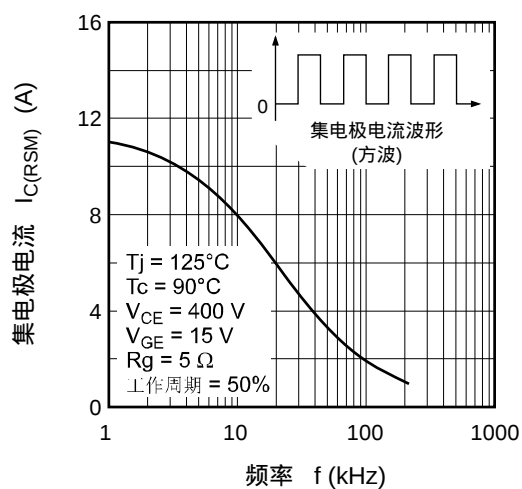
集电极/发射极饱和电压-壳温 (典型)



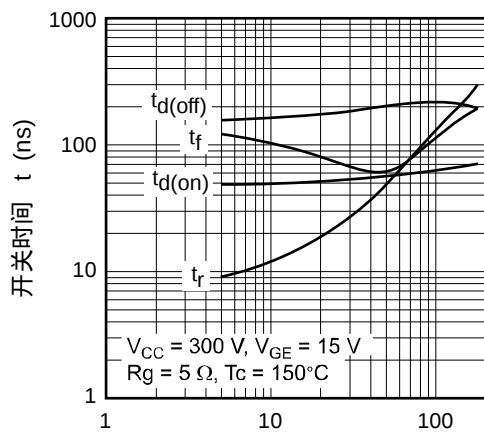
栅极/发射极截止电压-壳温 (典型)



频率特性 (典型)

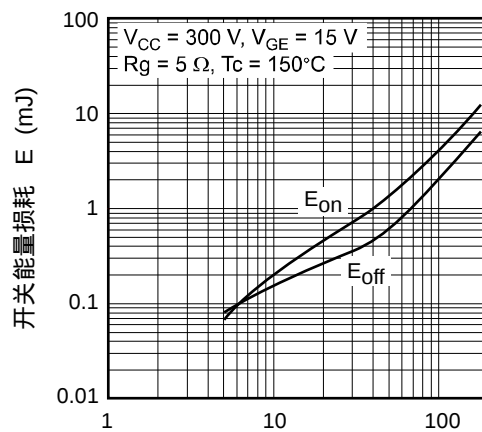


开关特性 (典型) (1)



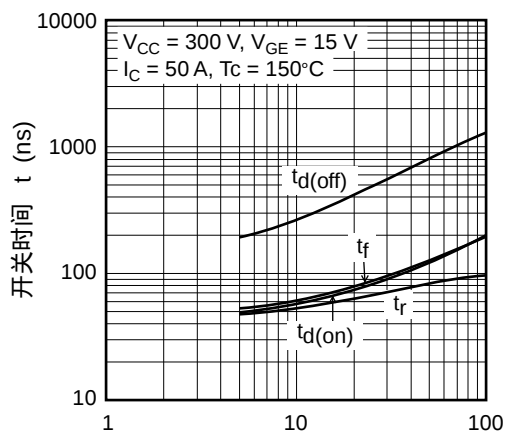
集电极电流 I_C (A)
(感性负载)

开关特性 (典型) (2)



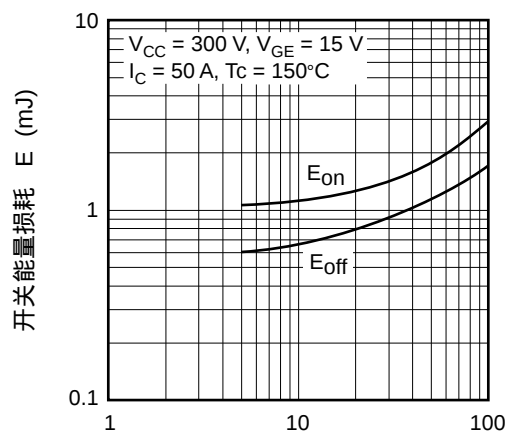
集电极电流 I_C (A)
(感性负载)

开关特性 (典型) (3)



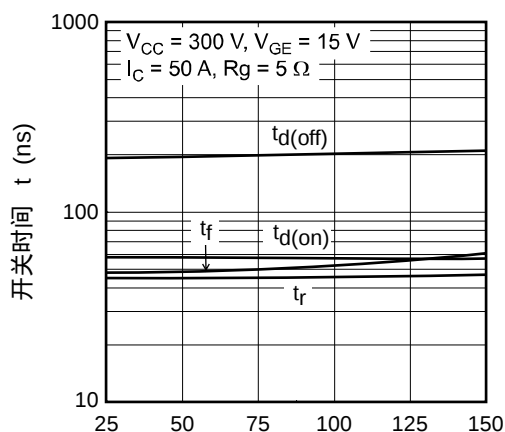
栅极电阻 R_g (Ω)
(感性负载)

开关特性 (典型) (4)



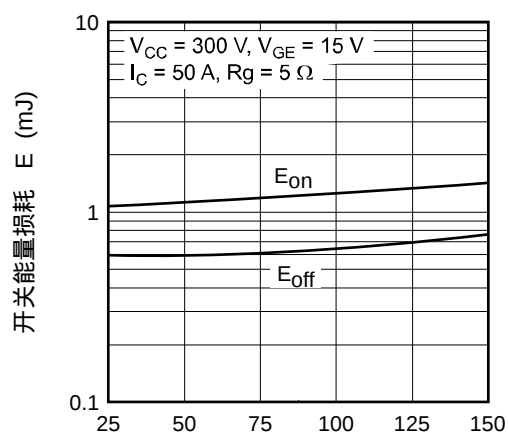
栅极电阻 R_g (Ω)
(感性负载)

开关特性 (典型) (5)



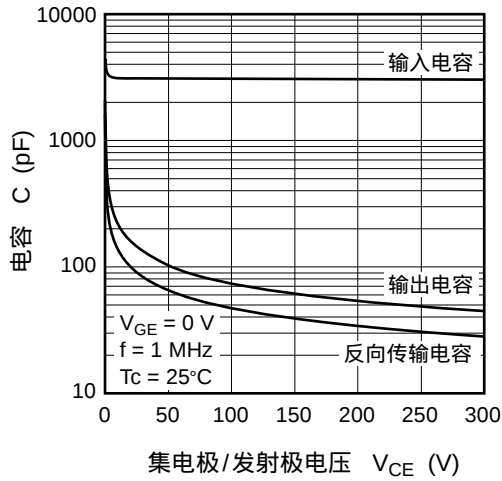
壳温 T_c ($^\circ\text{C}$)
(感性负载)

开关特性 (典型) (6)

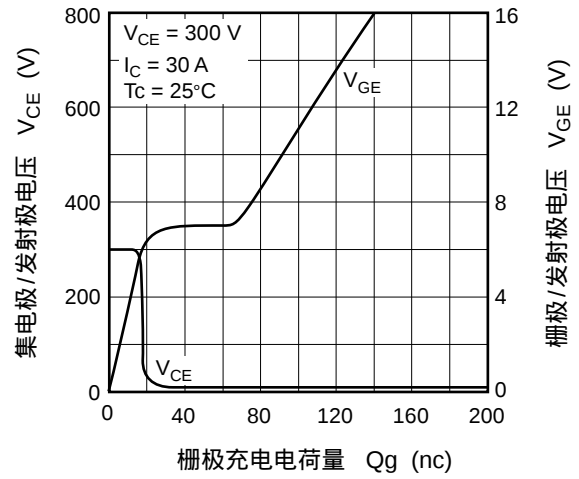


壳温 T_c ($^\circ\text{C}$)
(感性负载)

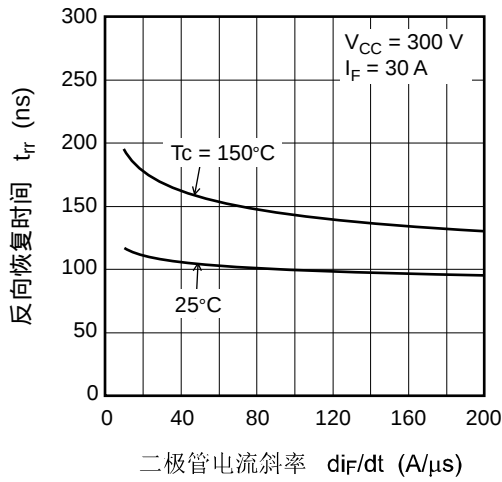
典型电容-集电极/发射极电压



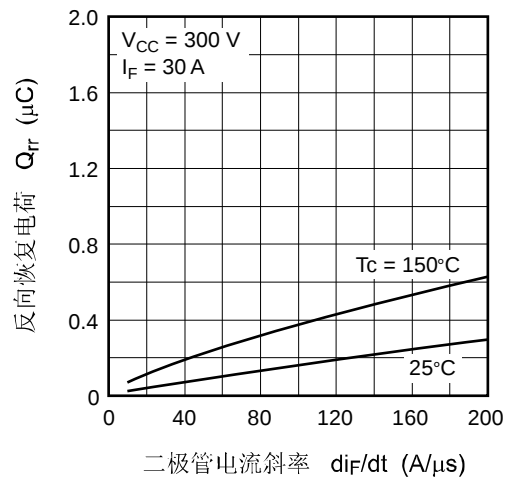
输入时序特性 (典型)



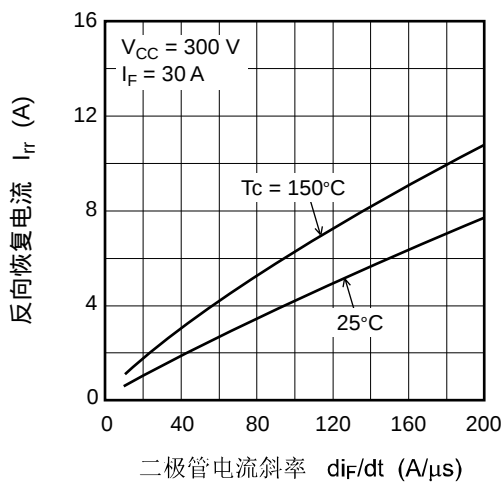
反向恢复时间-二极管电流斜率 (典型)



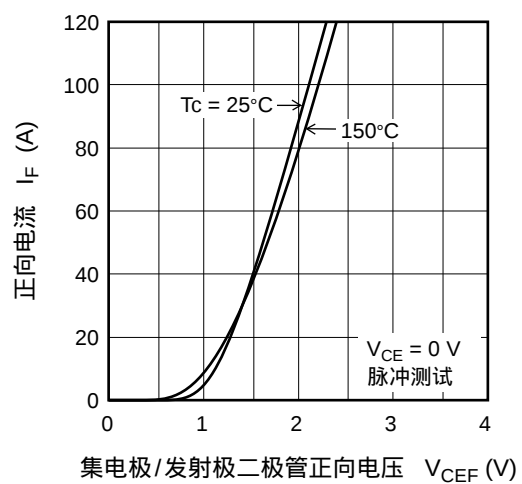
反向恢复电荷-二极管电流斜率 (典型)



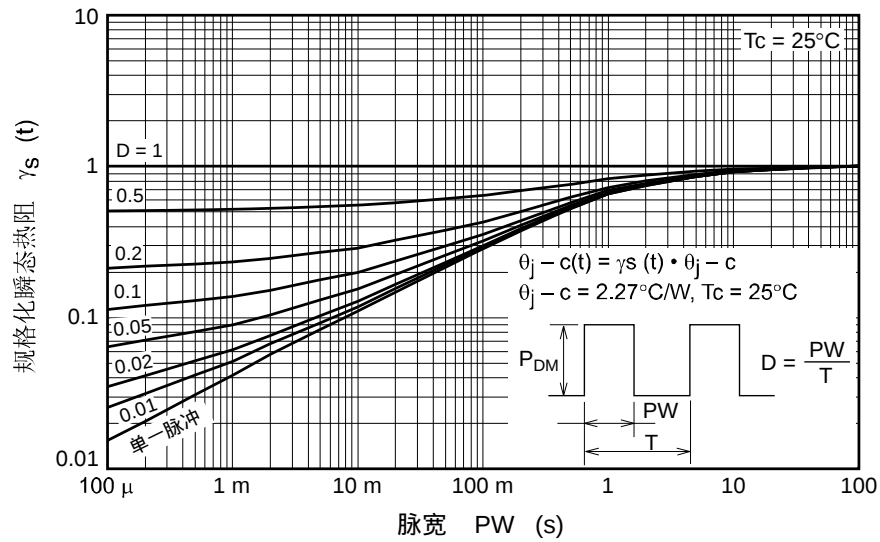
反向恢复电流-二极管电流斜率 (典型)



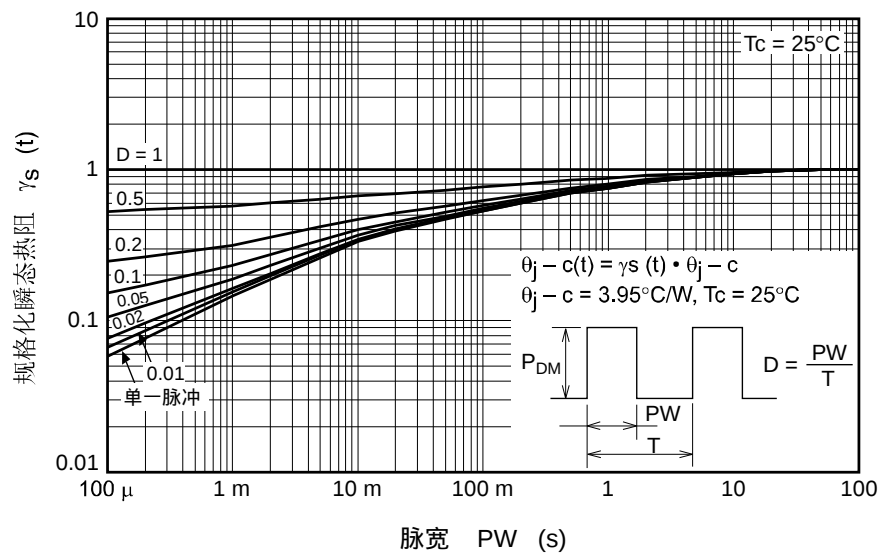
正向电流-正向电压 (典型)



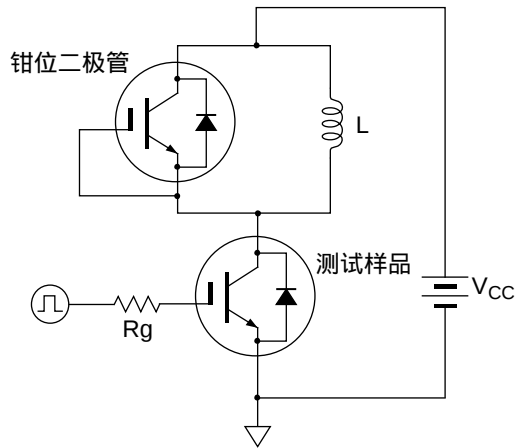
瞬态热阻特性规格化 (绝缘栅双极晶体管)



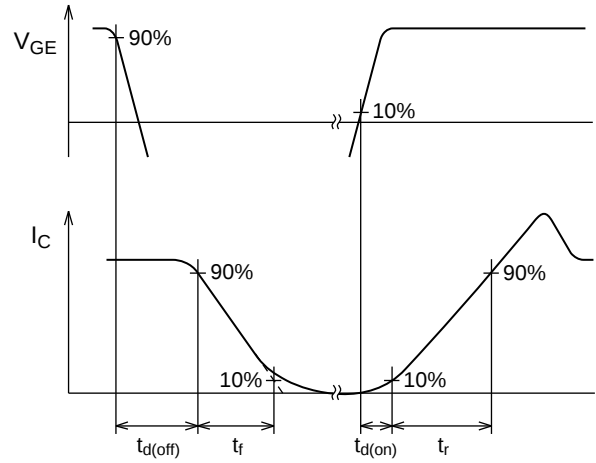
瞬态热阻特性规格化 (二极管)



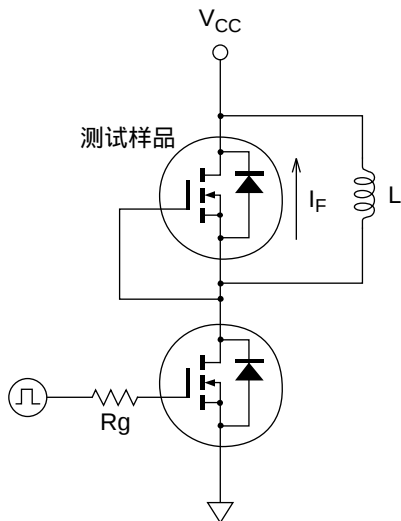
开关时间测定电路



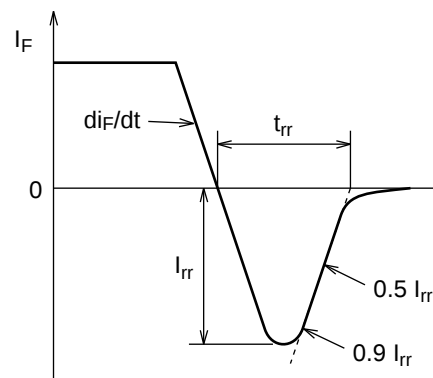
波形



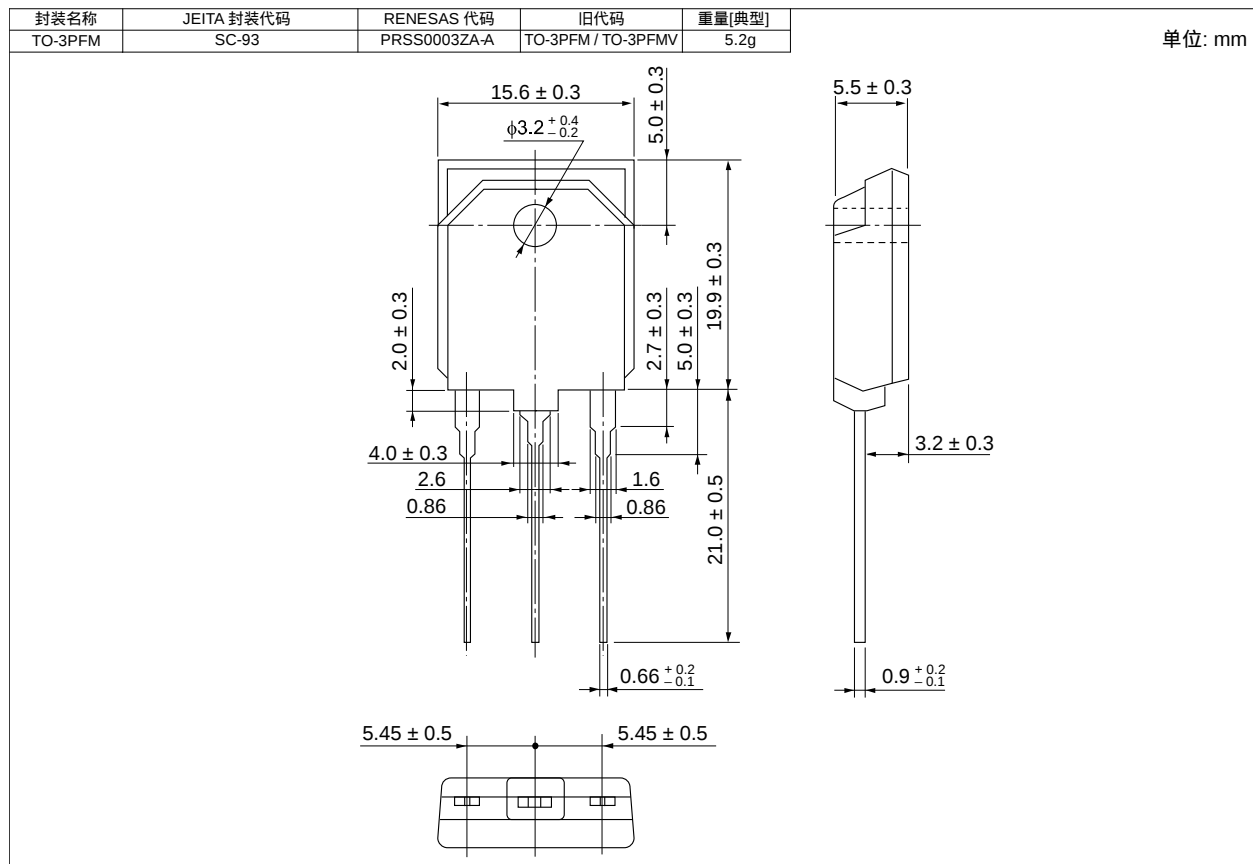
二极管反向恢复时间测定电路



波形



封装尺寸



订购信息

订购型号	数量	运输包装
RJH60D7DPM-00#T1	360 枚	纸盒包装 (管状容器)

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 6. 使用本文档中记载的瑞萨电子产品时，应在瑞萨电子指定的范围内，特别是在最大额定值、电源工作电压范围、移动电源电压范围、热辐射特性、安装条件以及其他产品特性的范围内使用。对于在上述指定范围之外使用瑞萨电子产品而产生的故障或损失，瑞萨电子不承担任何责任。
 7. 虽然瑞萨电子一直致力于提高瑞萨电子产品的质量和可靠性，但是，半导体产品有其自身的具体特性，如一定的故障发生率以及在某些使用条件下会发生故障等。此外，瑞萨电子产品均未进行防辐射设计。所以请采取安全保护措施，以避免当瑞萨电子产品在发生故障而造成火灾时导致人身事故、伤害或损害的事故。例如进行软硬件安全设计（包括但不限于冗余设计、防火控制以及故障预防等）、适当的老化处理或其他适当的措施等。由于难于对微机软件单独进行评估，所以请用户自行对最终产品或系统进行安全评估。
 8. 关于环境保护方面的详细内容，例如每种瑞萨电子产品的环境兼容性等，请与瑞萨电子的营业部门联系。使用瑞萨电子产品时，请遵守对管制物质的使用或含量进行管理的所有相关法律法规（包括但不限于《欧盟RoHS指令》）。对于因用户未遵守相关法律法规而导致的损害或损失，瑞萨电子不承担任何责任。
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