

RJH60D3DPE

600V - 17A – 绝缘栅双极晶体管
应用: 逆变器

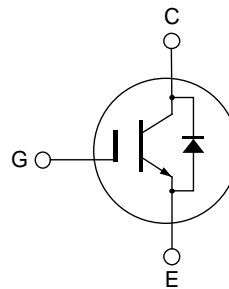
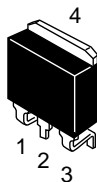
R07DS0161CJ0500
修订版本 5.00
May 11, 2012

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 ($I_C = 17$ 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
 $t_f = 70$ ns 典型值 ($V_{CC} = 300$ V, $V_{GE} = 15$ V, $I_C = 17$ A, $R_g = 5$ Ω , $T_a = 25^\circ\text{C}$, 感性负载)

封装形式

RENESAS 封装代码: PRSS0004AE-B
(封装名称: LDPAK (S)-(1))



1. 栅极
2. 集电极
3. 发射极
4. 集电极

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	35 A
	$T_c = 100^\circ\text{C}$	I_C	17 A
集电极脉冲电流	$i_{c(peak)}$ ^{注1}	70	A
集电极/发射极二极管正向电流	i_{DF}	17	A
集电极/发射极二极管正向脉冲电流	$i_{DF(peak)}$ ^{注1}	70	A
集电极最大容许功率损耗	P_C ^{注2}	113	W
结壳热阻 (绝缘栅双极晶体管)	θ_{j-c} ^{注2}	1.11	$^\circ\text{C}/\text{W}$
结壳热阻 (二极管)	θ_{j-cd} ^{注2}	2.8	$^\circ\text{C}/\text{W}$
结温	T_j	150	$^\circ\text{C}$
储存温度	T_{stg}	-55 to +150	$^\circ\text{C}$

- 注: 1. 在 $PW \leq 10 \mu\text{s}$, 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

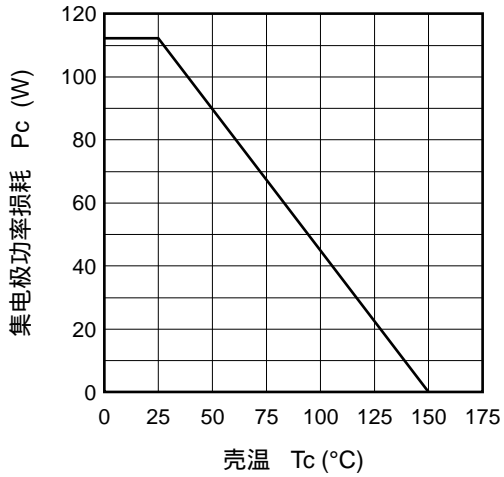
(Ta = 25°C)

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	$I_C = 17 A, V_{GE} = 15 V$ ^{注3}
	$V_{CE(sat)}$	—	2.0	—	V	$I_C = 35 A, V_{GE} = 15 V$ ^{注3}
输入电容	C_{ies}	—	900	—	pF	$V_{CE} = 25 V$
输出电容	C_{oes}	—	60	—	pF	$V_{GE} = 0$
反向传输电容	C_{res}	—	25	—	pF	$f = 1 MHz$
栅极充电电荷量	Q_g	—	37	—	nC	$V_{GE} = 15 V$
栅极/发射极充电电荷量	Q_{ge}	—	6	—	nC	$V_{CE} = 300 V$
栅极/集电极充电电荷量	Q_{gc}	—	16	—	nC	$I_C = 17 A$
接通延迟时间	$t_{d(on)}$	—	35	—	ns	$V_{CC} = 300 V$
上升时间	t_r	—	16	—	ns	$V_{GE} = 15 V$
关断延迟时间	$t_{d(off)}$	—	80	—	ns	$I_C = 17 A$
下降时间	t_f	—	70	—	ns	$R_g = 5 \Omega$ 感性负载
接通能量	E_{on}	—	0.20	—	mJ	
关断能量	E_{off}	—	0.21	—	mJ	
总开关能量	E_{total}	—	0.41	—	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	—	1.3	1.7	V	$I_F = 17 A$ ^{注3}
快速恢复二极管反向恢复时间	t_{rr}	—	100	—	ns	$I_F = 17 A$
快速恢复二极管反向恢复电荷	Q_{rr}	—	0.15	—	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	

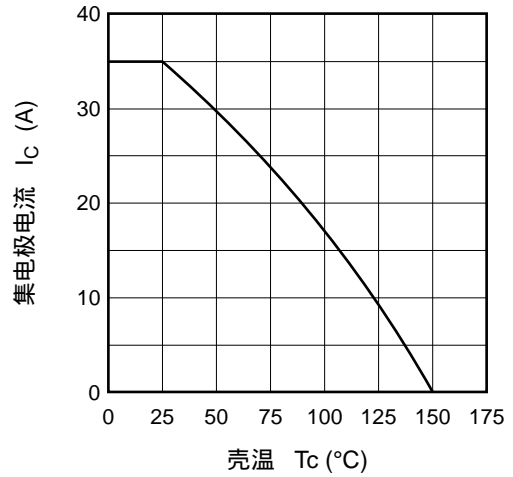
注: 3. 脉冲测试

主要特性

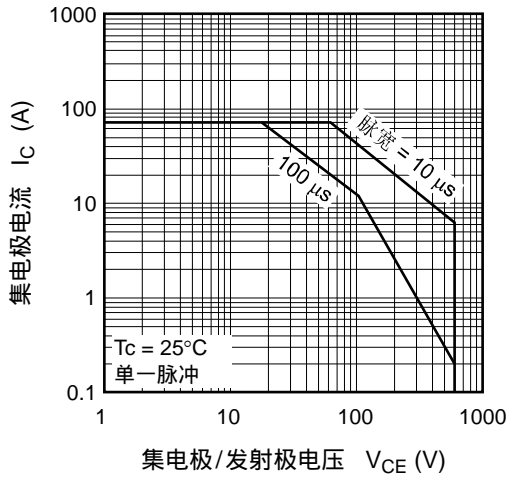
集电极功率损耗-壳温



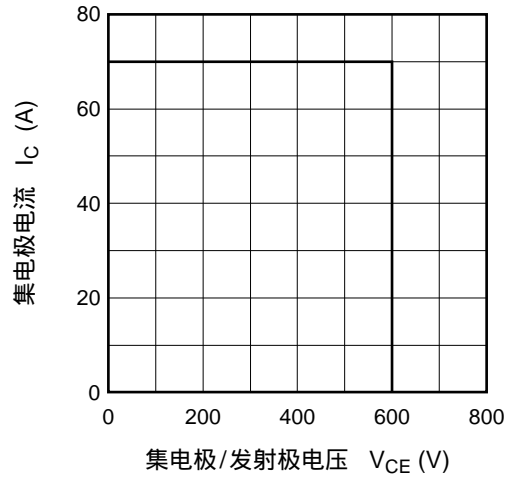
集电极最大直流电流-壳温



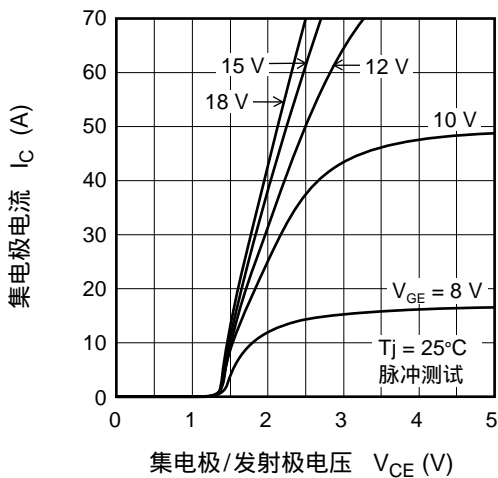
最大安全工作区域



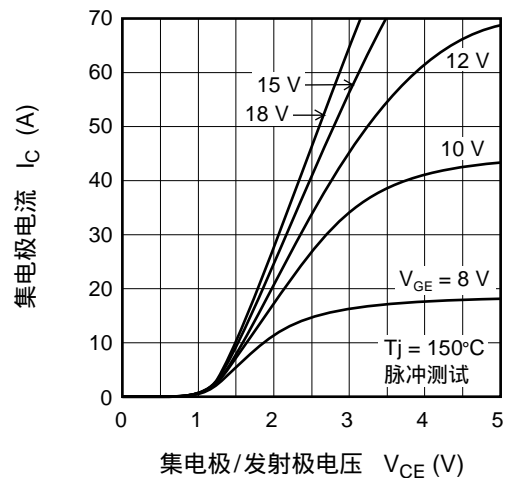
关断安全工作区域



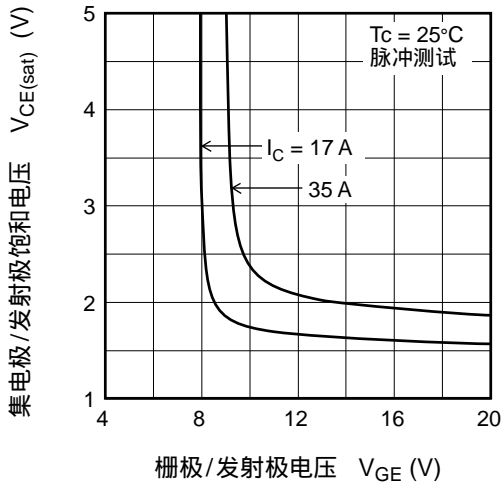
典型输出特性



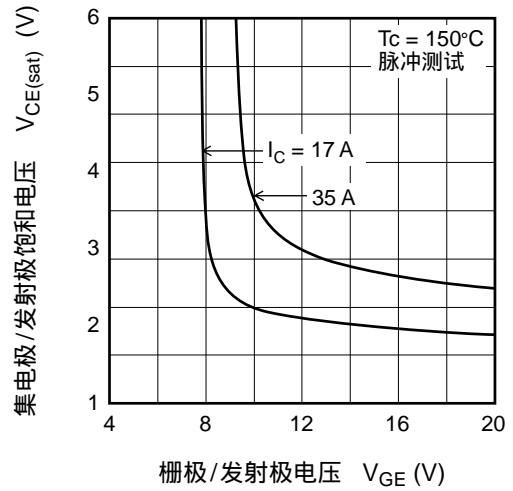
典型输出特性



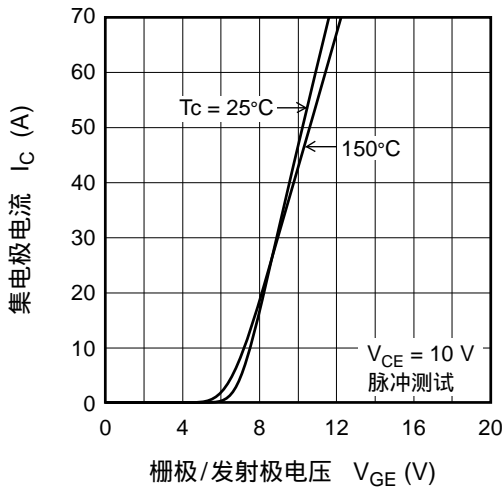
集电极/发射极饱和电压-栅极/发射极电压 (典型)



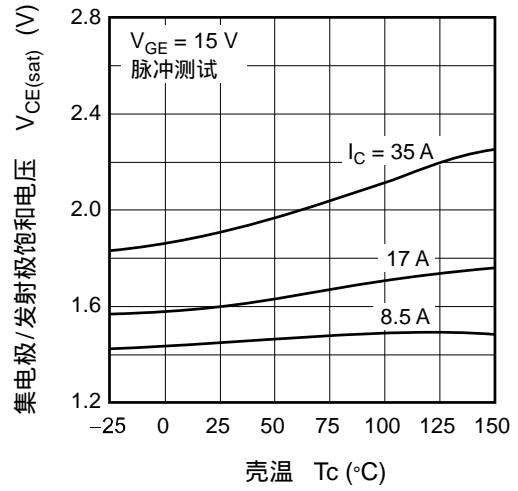
集电极/发射极饱和电压-栅极/发射极电压 (典型)



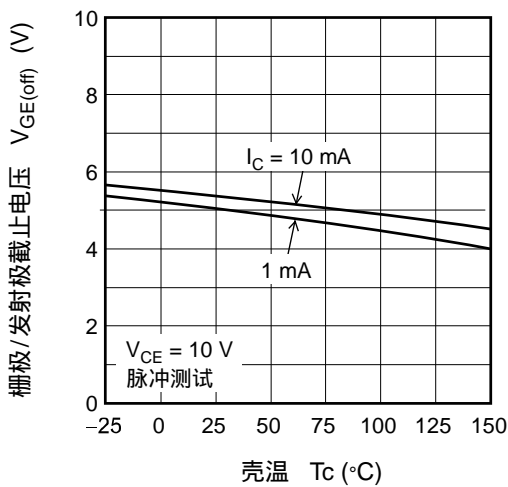
典型传输特性



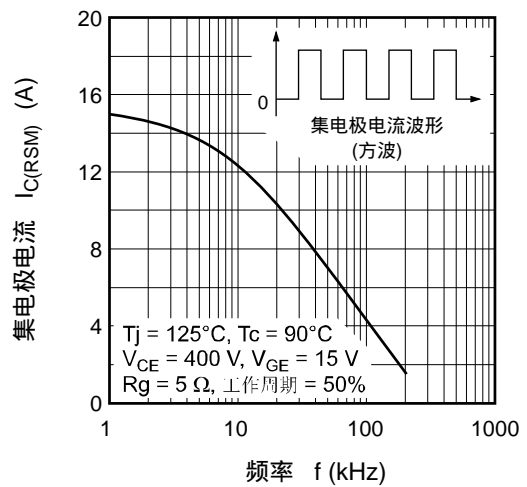
集电极/发射极饱和电压-壳温 (典型)



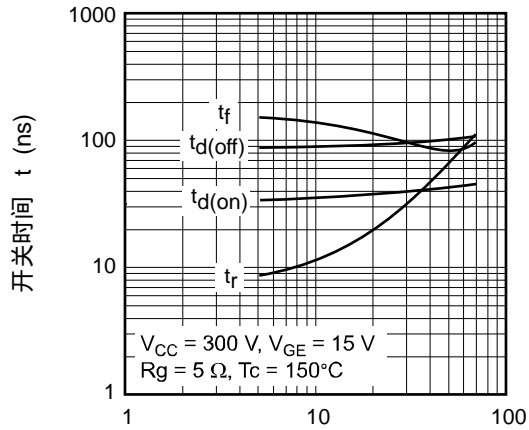
栅极/发射极截止电压-壳温 (典型)



频率特性 (典型)

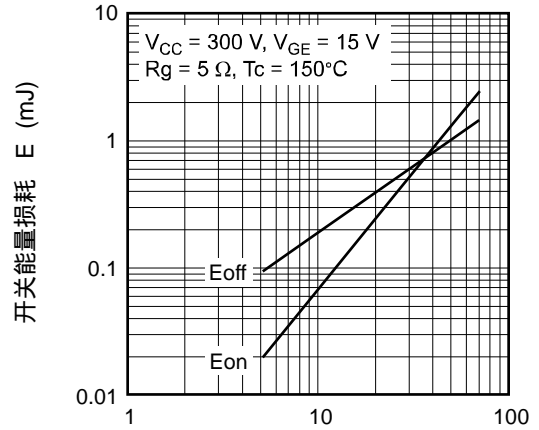


开关特性 (典型) (1)



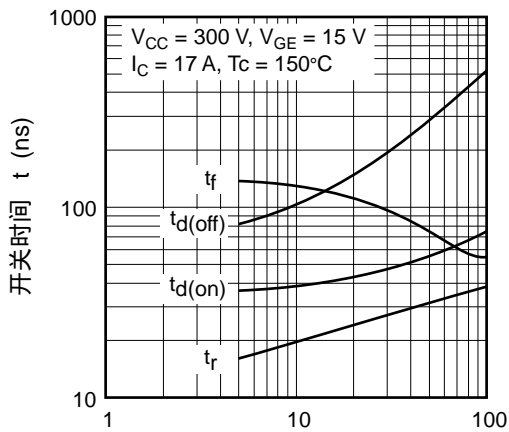
集电极电流 I_C (A)
(感性负载)

开关特性 (典型) (2)



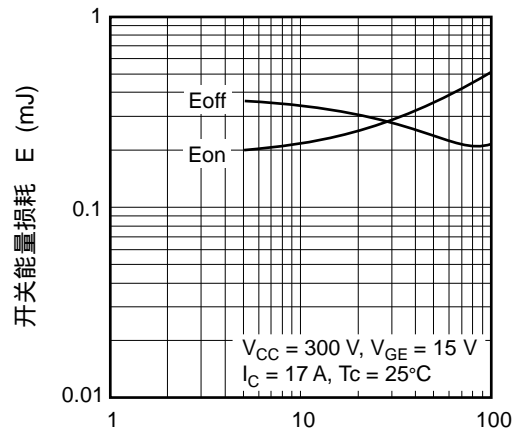
集电极电流 I_C (A)
(感性负载)

开关特性 (典型) (3)



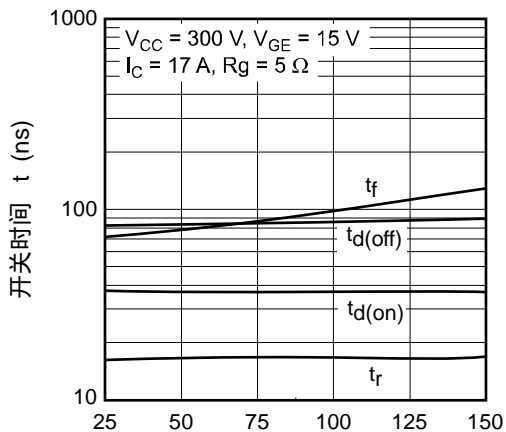
栅极电阻 R_g (Ω)
(感性负载)

开关特性 (典型) (4)



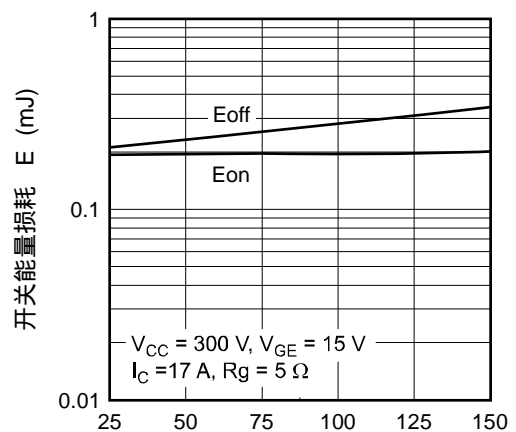
栅极电阻 R_g (Ω)
(感性负载)

开关特性 (典型) (5)



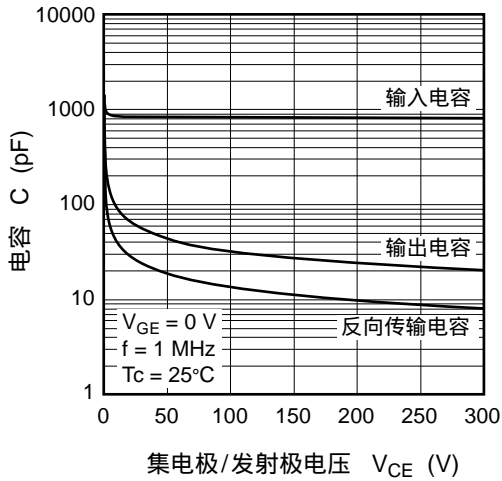
壳温 T_c ($^{\circ}\text{C}$)
(感性负载)

开关特性 (典型) (6)

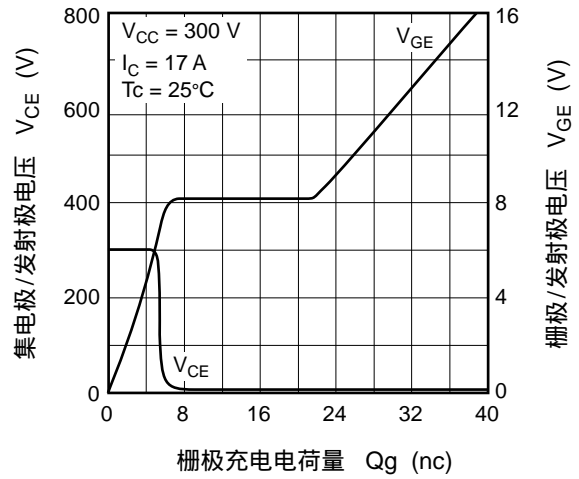


壳温 T_c ($^{\circ}\text{C}$)
(感性负载)

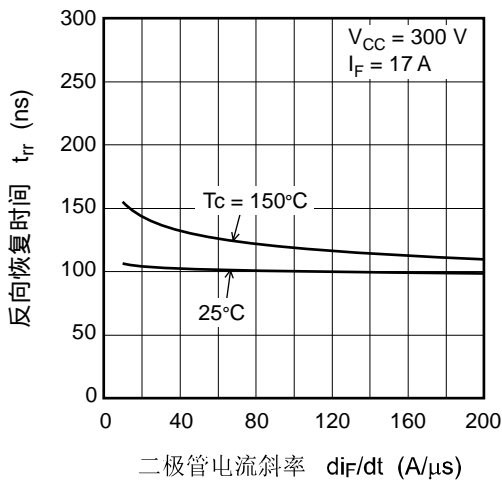
典型电容-集电极/发射极电压



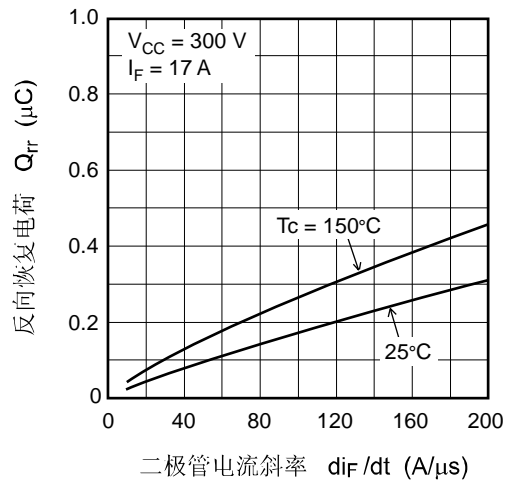
输入时序特性 (典型)



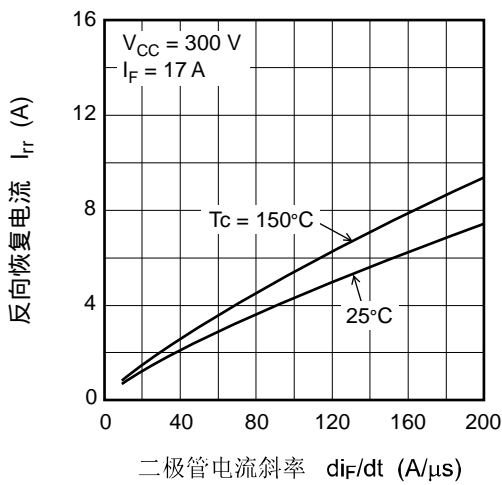
反向恢复时间-二极管电流斜率 (典型)



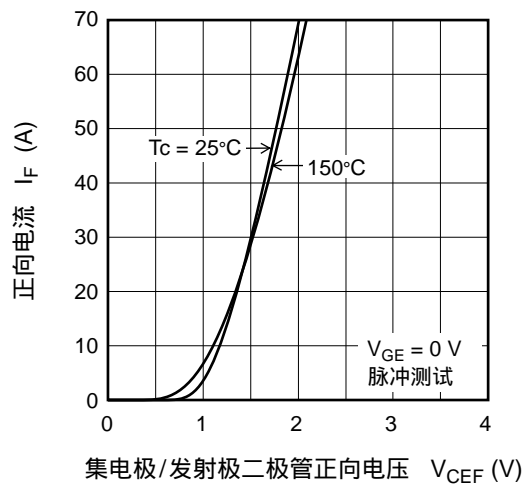
反向恢复电荷-二极管电流斜率 (典型)



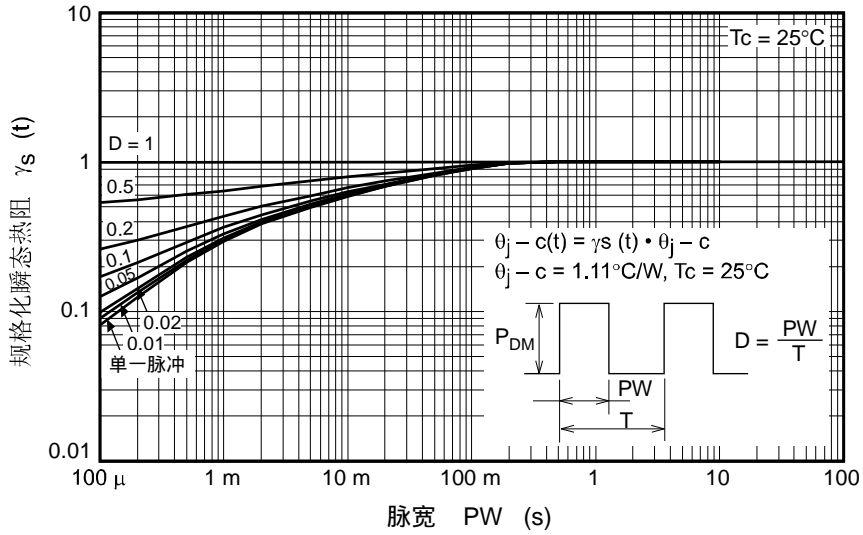
反向恢复电流-二极管电流斜率 (典型)



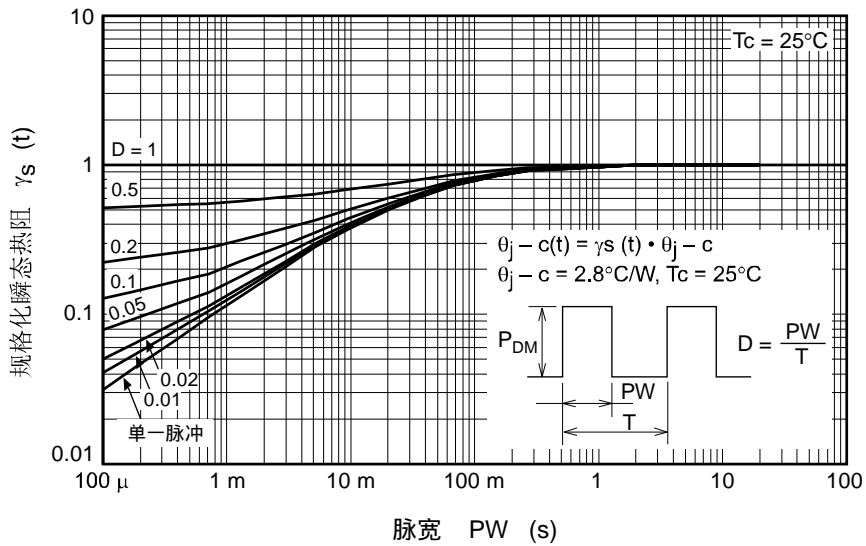
正向电流-正向电压 (典型)



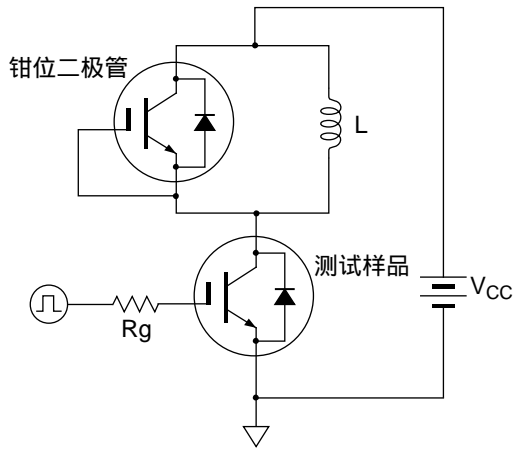
瞬态热阻特性规格化 (绝缘栅双极晶体管)



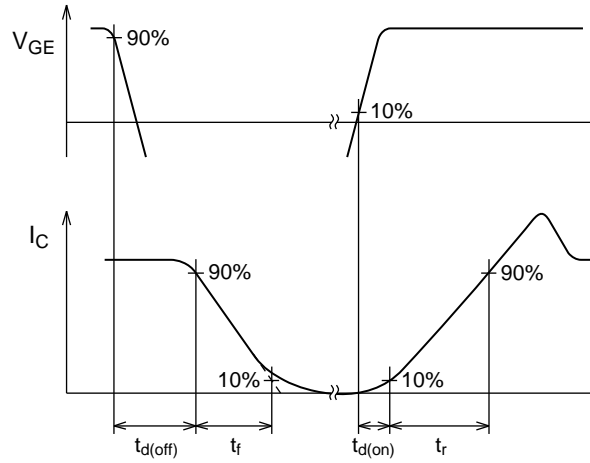
瞬态热阻特性规格化 (二极管)



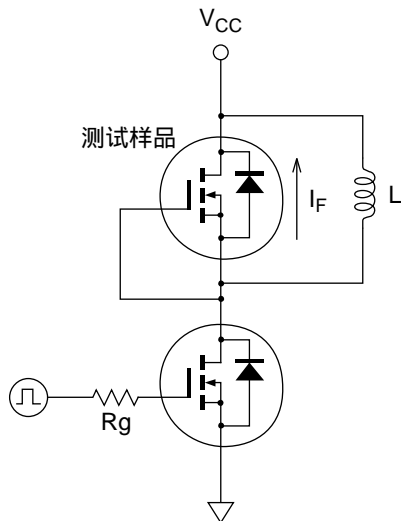
开关时间测定电路



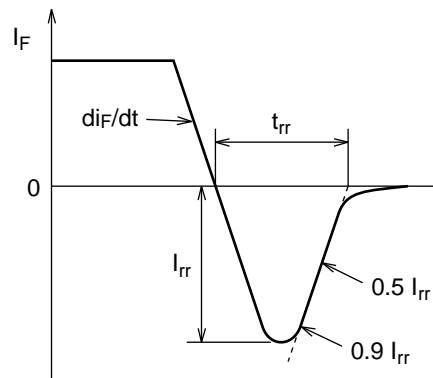
波形



二极管反向恢复时间测定电路



波形



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