

RJH60D2DPE

600V - 12A – 绝缘栅双极晶体管

应用: 逆变器

R07DS0159CJ0400

修订版本 4.00

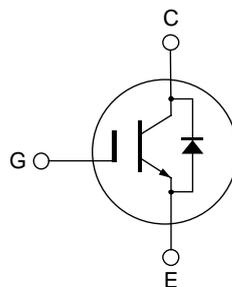
May 11, 2012

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
 $V_{CE(sat)} = 1.7$ V 典型值 ($I_C = 12$ 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
 $t_f = 80$ ns 典型值 ($V_{CC} = 300$ V, $V_{GE} = 15$ V, $I_C = 12$ 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 | 25 A |
| | $T_c = 100^\circ\text{C}$ | I_C | 12 A |
| 集电极脉冲电流 | $i_{c(peak)}$ ^{注1} | 50 | A |
| 集电极/发射极二极管正向电流 | i_{DF} | 12 | A |
| 集电极/发射极二极管正向脉冲电流 | $i_{D(peak)}$ ^{注1} | 50 | A |
| 集电极最大容许功率损耗 | P_C ^{注2} | 63 | W |
| 结壳热阻 (绝缘栅双极晶体管) | θ_{j-c} ^{注2} | 1.98 | $^\circ\text{C}/\text{W}$ |
| 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 $PW \leq 10$ μ s, 工作周期 $\leq 1\%$ 的容许值
 2. 在 $T_c = 25^\circ\text{C}$ 的容许值

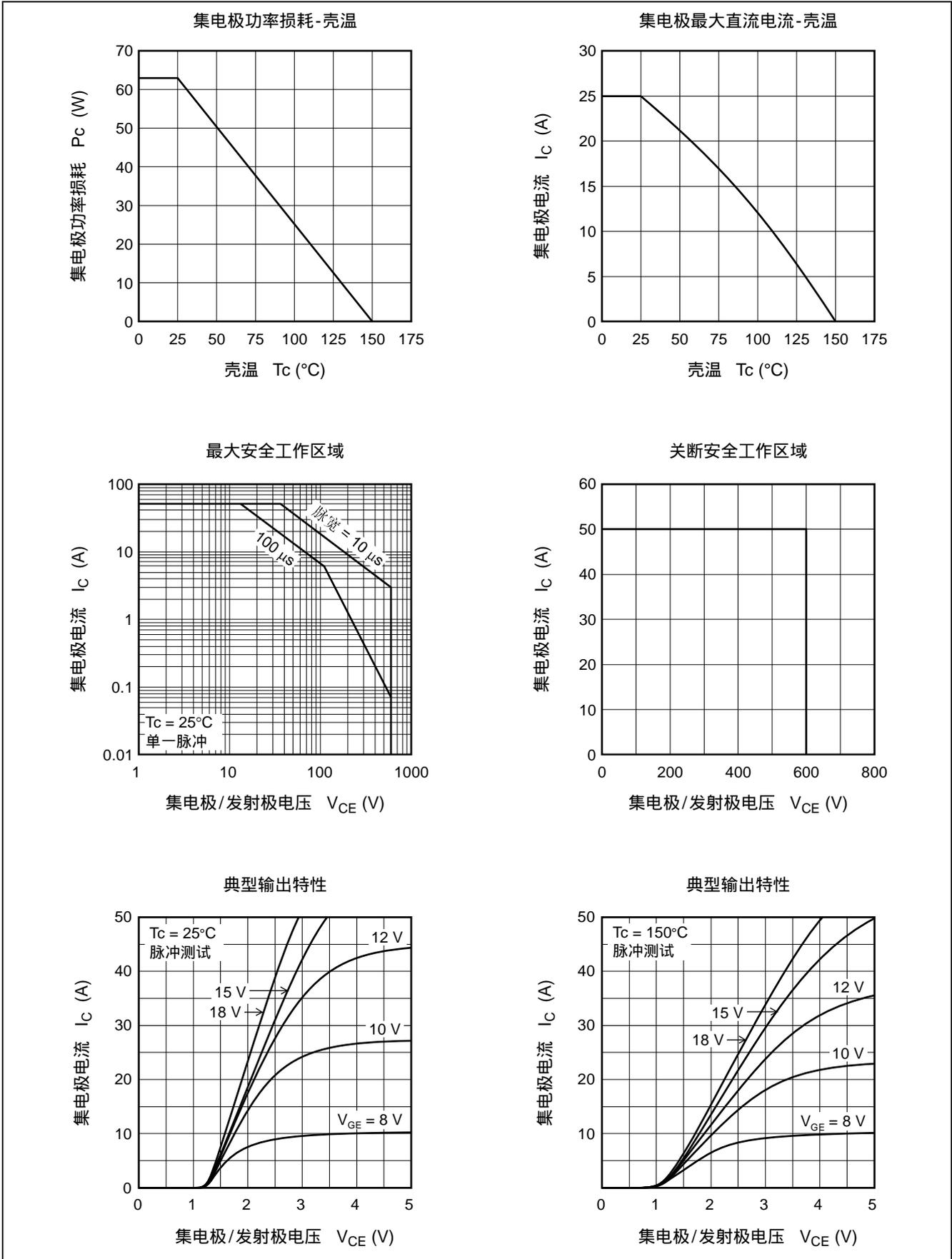
电特性

(Ta = 25°C)

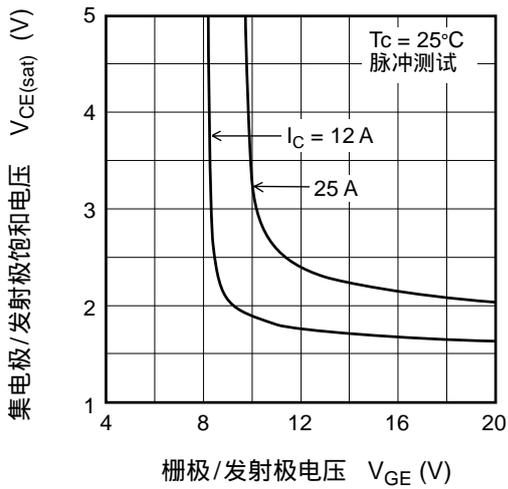
| 参数 | 符号 | 最小值 | 典型值 | 最大值 | 单位 | 测定条件 |
|--------------------------|-----------------|-----|------|---------|---------|-------------------------------------------|
| 集电极/发射极破坏电压 | $V_{BR(CES)}$ | 600 | — | — | V | $I_C = 10 \mu A, V_{GE} = 0$ |
| 集电极/发射极短路电流 或 二极管反向电流 | I_{CES} / I_R | — | — | 5 | 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 | $V_{CE(sat)}$ | — | 1.7 | 2.2 | V | $I_C = 12 A, V_{GE} = 15 V$ ^{注3} |
| | $V_{CE(sat)}$ | — | 2.2 | — | V | $I_C = 25 A, V_{GE} = 15 V$ ^{注3} |
| 输入电容 | C_{ies} | — | 430 | — | pF | $V_{CE} = 25 V$ |
| 输出电容 | C_{oes} | — | 40 | — | pF | $V_{GE} = 0$ |
| 反向传输电容 | C_{res} | — | 12 | — | pF | $f = 1 MHz$ |
| 栅极充电电荷量 | Q_g | — | 19 | — | nC | $V_{GE} = 15 V$ |
| 栅极/发射极充电电荷量 | Q_{ge} | — | 4 | — | nC | $V_{CE} = 300 V$ |
| 栅极/集电极充电电荷量 | Q_{gc} | — | 7 | — | nC | $I_C = 12 A$ |
| 接通延迟时间 | $t_{d(on)}$ | — | 32 | — | ns | $V_{CC} = 300 V$ |
| 上升时间 | t_r | — | 13 | — | ns | $V_{GE} = 15 V$ |
| 关断延迟时间 | $t_{d(off)}$ | — | 85 | — | ns | $I_C = 12 A$ |
| 下降时间 | t_f | — | 80 | — | ns | $R_g = 5 \Omega$ 感性负载 |
| 接通能量 | E_{on} | — | 0.10 | — | mJ | |
| 关断能量 | E_{off} | — | 0.16 | — | mJ | |
| 总开关能量 | E_{total} | — | 0.26 | — | 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 | — | 1.2 | 1.6 | V | $I_F = 12 A$ ^{注3} |
| 快速恢复二极管反向恢复时间 | t_{rr} | — | 100 | — | ns | $I_F = 12 A$ |
| 快速恢复二极管反向恢复电荷 | Q_{rr} | — | 0.2 | — | μC | $di_F/dt = 100 A/\mu s$ |
| 快速恢复二极管反向恢复电流 | I_{rr} | — | 5.0 | — | A | |

注: 3. 脉冲测试

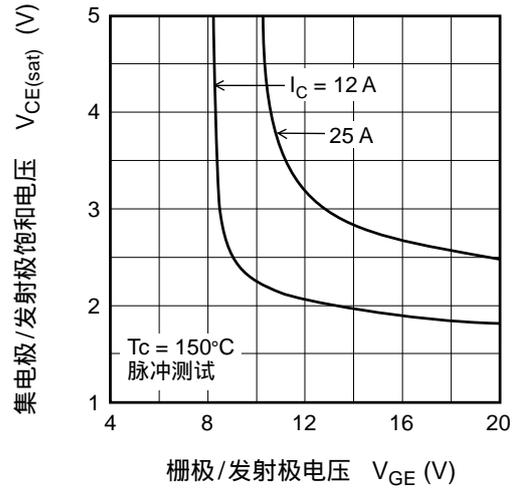
主要特性



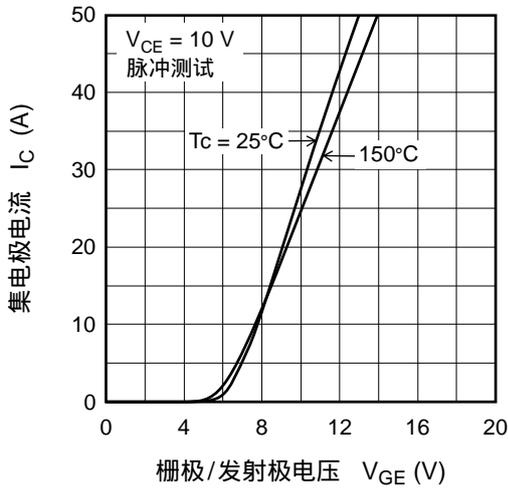
集电极/发射极饱和电压-
栅极/发射极电压 (典型)



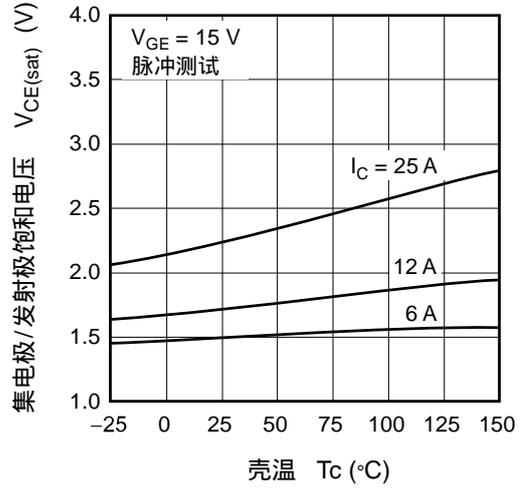
集电极/发射极饱和电压-
栅极/发射极电压 (典型)



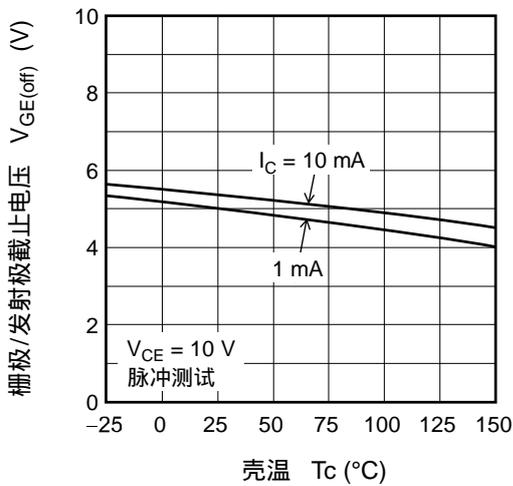
典型传输特性



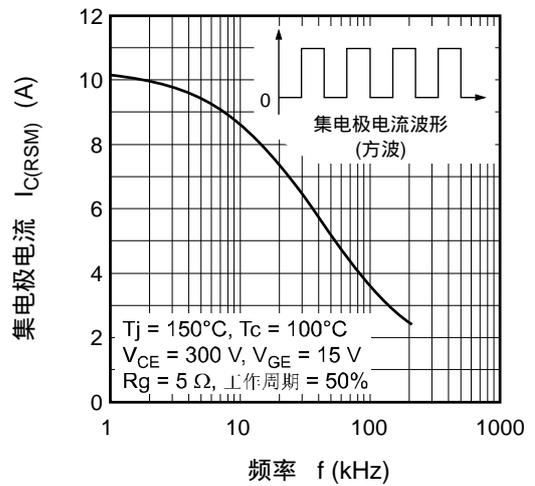
集电极/发射极饱和电压-壳温 (典型)



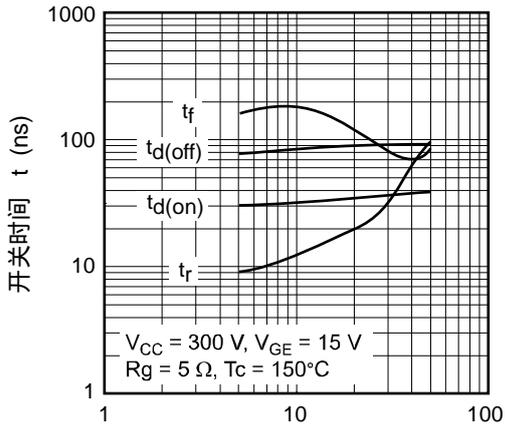
栅极/发射极截止电压-壳温 (典型)



频率特性 (典型)

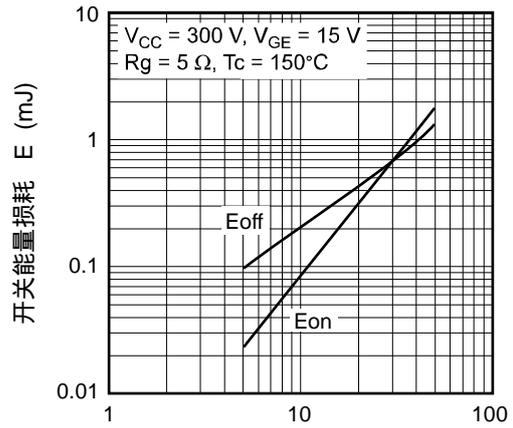


开关特性 (典型) (1)



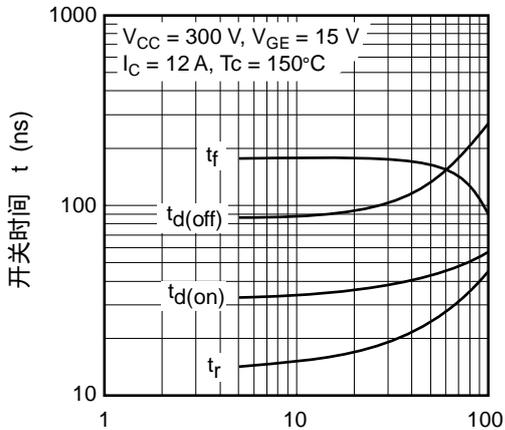
集电极电流 I_C (A)
(感性负载)

开关特性 (典型) (2)



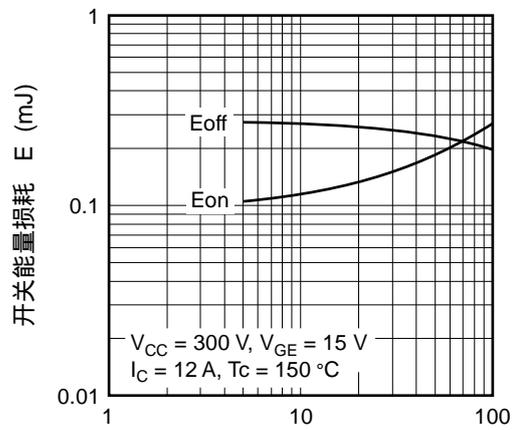
集电极电流 I_C (A)
(感性负载)

开关特性 (典型) (3)



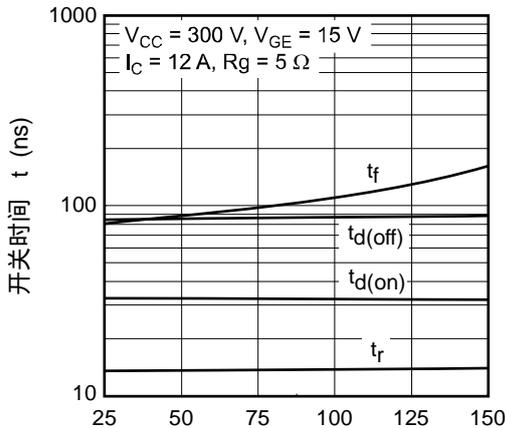
栅极电阻 R_g (Ω)
(感性负载)

开关特性 (典型) (4)



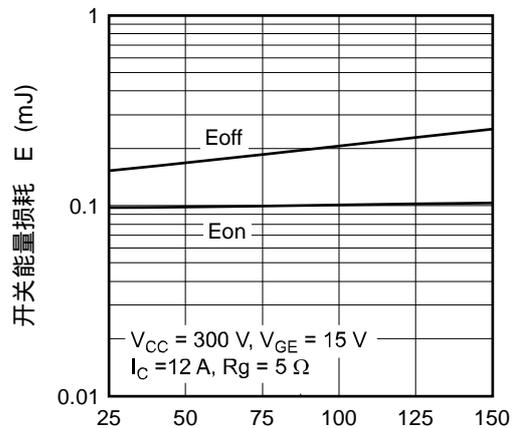
栅极电阻 R_g (Ω)
(感性负载)

开关特性 (典型) (5)



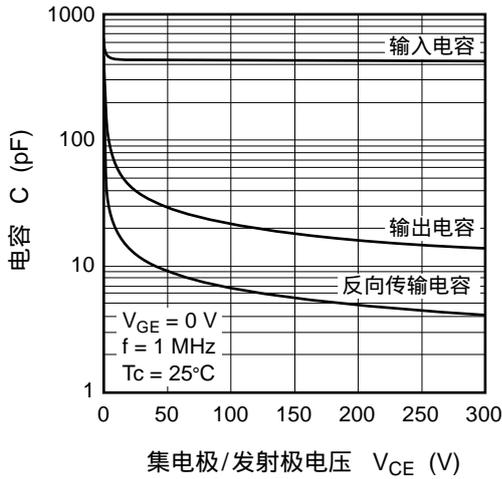
壳温 T_c ($^\circ\text{C}$)
(感性负载)

开关特性 (典型) (6)

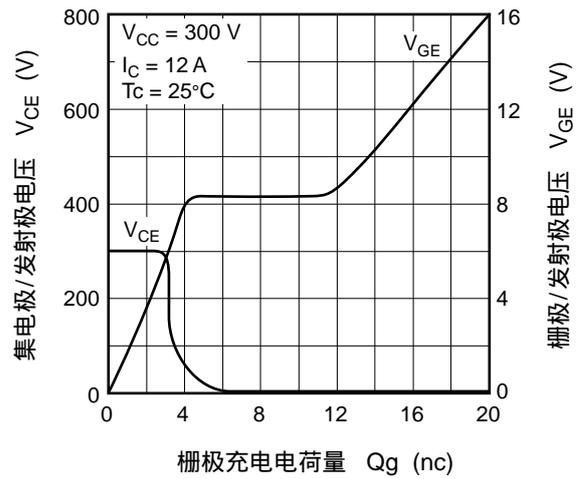


壳温 T_c ($^\circ\text{C}$)
(感性负载)

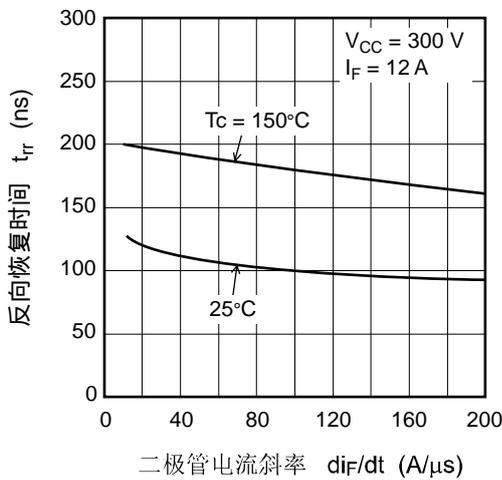
典型电容-集电极/发射极电压



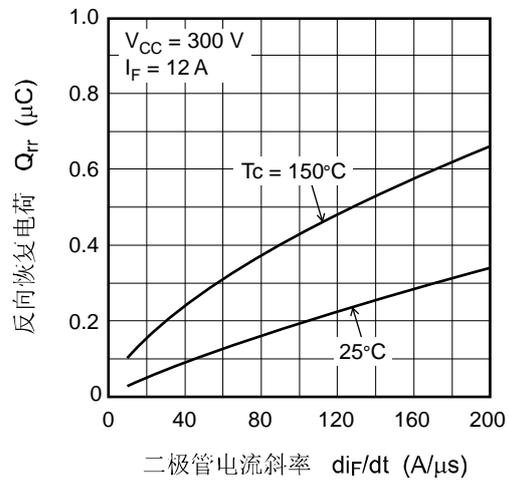
输入时序特性 (典型)



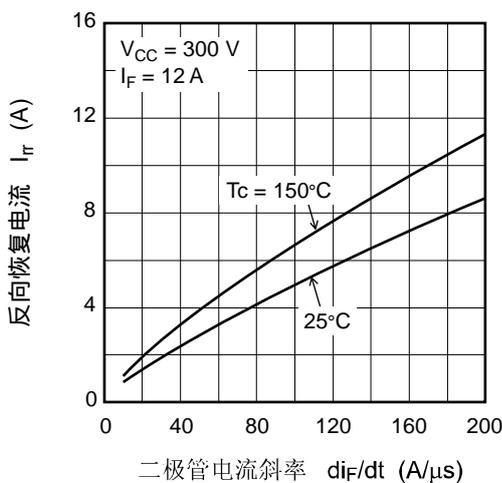
反向恢复时间-二极管电流斜率 (典型)



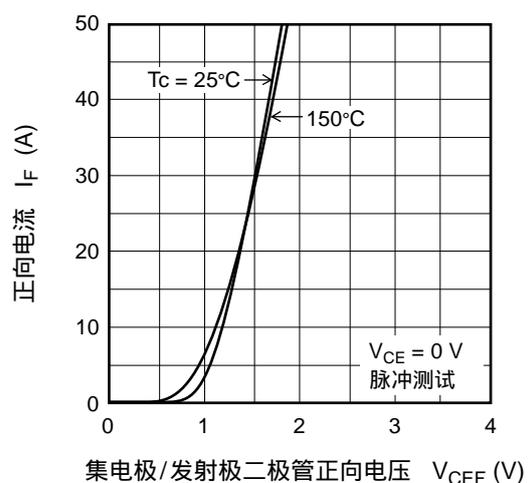
反向恢复电荷-二极管电流斜率 (典型)



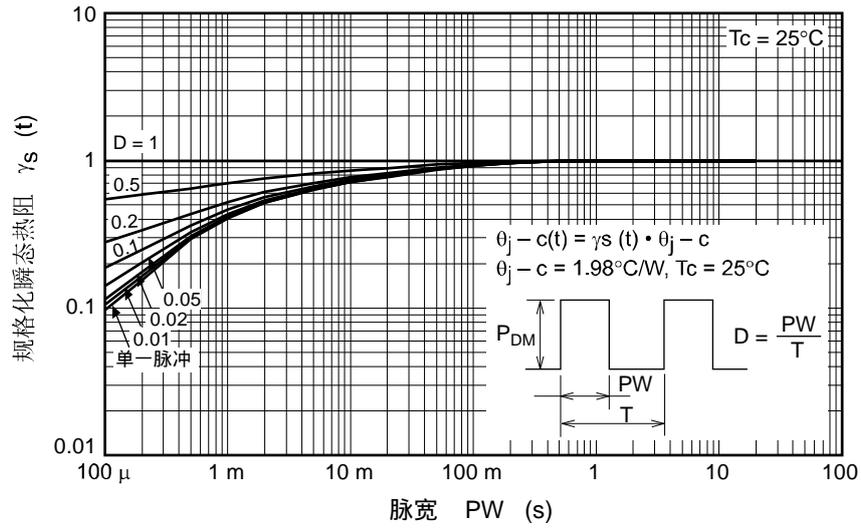
反向恢复电流-二极管电流斜率 (典型)



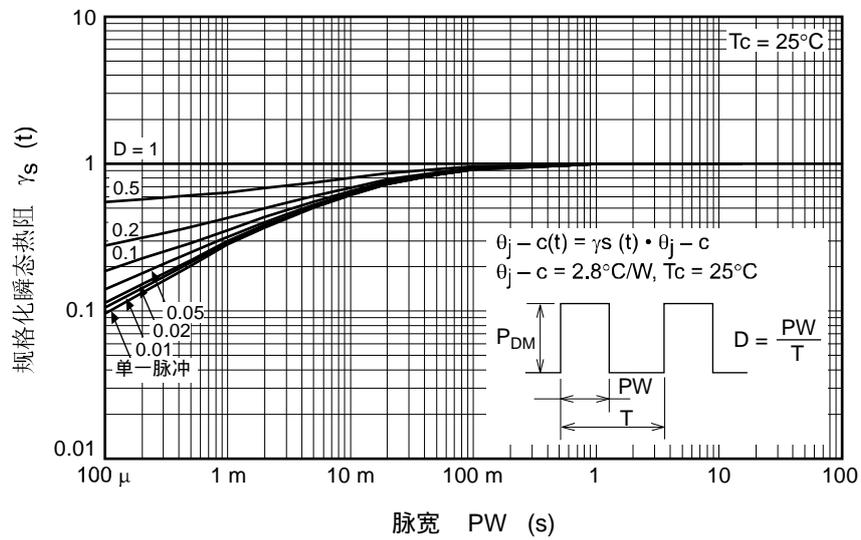
正向电流-正向电压 (典型)



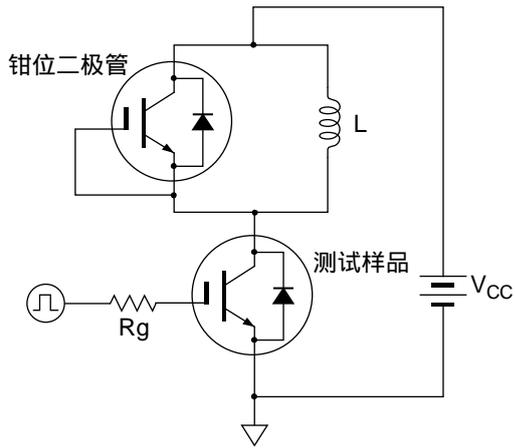
瞬态热阻特性规格化 (绝缘栅双极晶体管)



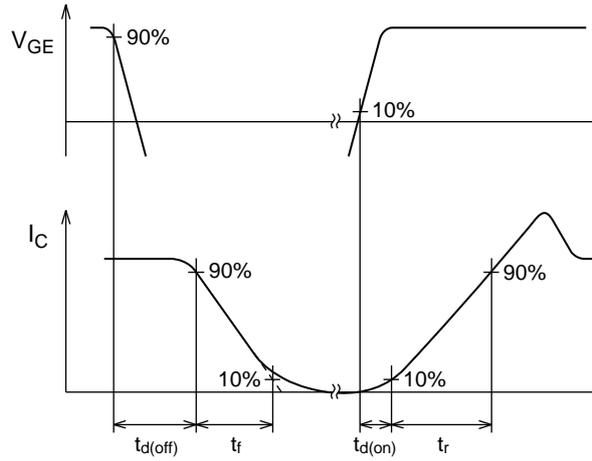
瞬态热阻特性规格化 (二极管)



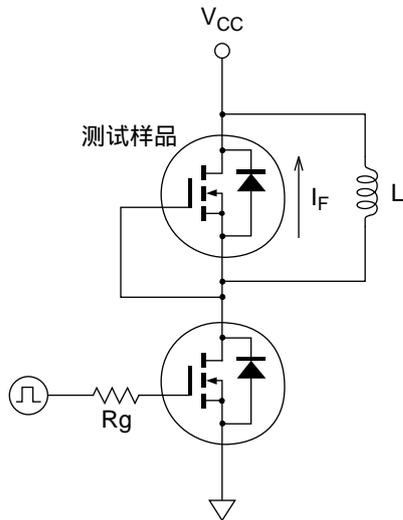
开关时间测定电路



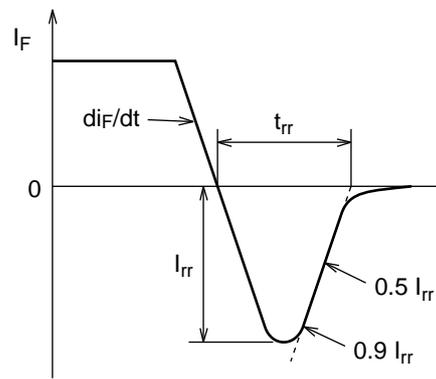
波形



二极管反向恢复时间测定电路



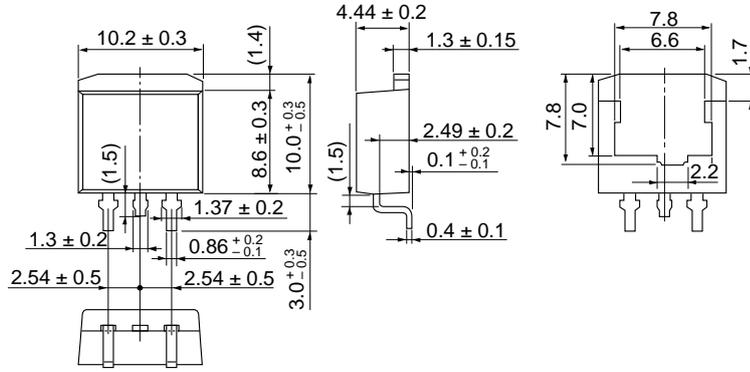
波形



封装尺寸

| 封装名称 | JEITA 封装代码 | RENESAS 代码 | 旧代码 | 重量[典型] |
|---------------|------------|--------------|--------------------------------|--------|
| LDBPAK(S)-(1) | SC-83 | PRSS0004AE-B | LDBPAK(S)-(1) / LDBPAK(S)-(1)V | 1.30g |

单位: mm



订购信息

| 订购型号. | 数量 | 运输包装 |
|------------------|--------|------|
| RJH60D2DPE-00#J3 | 1000 枚 | 带卷包装 |

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