

NGTB15N60R2FG

IGBT 600V, 14A, N-Channel



ON Semiconductor®

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主要特长

- 反向导通 IGBT
- IGBT $V_{CE(sat)}=1.85V$ typ. ($I_C=15A$, $V_{GE}=15V$)
- IGBT $t_f=75ns$ typ.
- Diode $V_F=1.7V$ typ. ($I_F=15A$)
- Diode $t_{rr}=95ns$ typ.
- $10\mu s$ 抗短路能力

应用

- 通用变频器 (Inverter)

规格

绝对最大额定值 / $T_a = 25^\circ C$ (除非特殊指定)

| 参数 | 记号 | 值 | 单位 | |
|-----------------------------------------------------------|------------|------------------------|------------|---|
| Collector - Emitter 电压 | V_{CES} | 600 | V | |
| Gate - Emitter 电压 | V_{GES} | ± 20 | V | |
| Collector 电流 (DC) | I_C^{*1} | @ $T_c=25^\circ C$ *2 | 24 | A |
| 受限于 T_{jmax} | | @ $T_c=100^\circ C$ *2 | 14 | A |
| Collector 电流 (Peak) 受限于 T_{jmax} 的脉宽 | I_{CP} | 60 | A | |
| Diode 平均输出电流 | I_O | 15 | A | |
| 功耗 (Power Dissipation) $T_c=25^\circ C$ (我司理想的功耗条件) *2 | P_D | 54 | W | |
| 结温 (Junction Temperature) | T_j | 175 | $^\circ C$ | |
| 储存温度 (Storage Temperature) | T_{stg} | -55 to +175 | $^\circ C$ | |

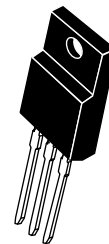
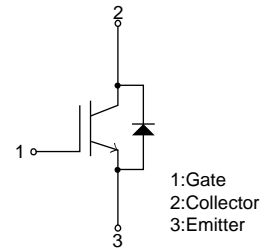
注: *1 Collector 电流由下式计算:

$$I_C(T_c) = \frac{T_{jmax} - T_c}{R_{th(j-c)} \times V_{CE(sat)}(I_C(T_c))}$$

*2 我司的条件为背面散热。

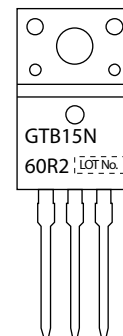
方法为:器件的背面涂上硅脂,然后将该器件贴在铝制的水冷散热器上。

电气连接 N-Channel



TO-220F-3FS

印刷图



Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

NGTB15N60R2FG

电气特性 / Ta = 25°C (除非特殊指定)

| 参数 | 记号 | 条件 | 值 | | | 单位 |
|---------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------|---------------------------|------|------|----|
| | | | min | typ | max | |
| 集电极-发射极击穿电压 (Collector to Emitter Breakdown Voltage) | V(BR)CES | IC=500μA, VGE=0V | 600 | | | V |
| 集电极-发射极截止电流 (Collector to Emitter Cutoff Current) | ICES | VCE=600V, VGE=0V | Tc=25°C | | 10 | μA |
| | | | Tc=125°C | | 1 | mA |
| 栅极-发射极漏电流 (Gate to Emitter Leakage Current) | IGES | VGE=±20V, VCE=0V | | | ±100 | nA |
| 栅极-发射极阈值电压 (Gate to Emitter threshold voltage) | VGE(th) | VCE=20V, IC=250μA | 4.5 | | 7.0 | V |
| 集电极-发射极饱和电压 (Collector to Emitter Saturated Voltage) | VCE(sat) | VGE=15V, IC=15A | | 1.85 | 2.1 | V |
| | | VGE=15V, IC=14A | | 2.0 | 2.3 | V |
| 正向二极管电压(Forward Diode Voltage) | VF | IF=15A | | 1.7 | 2.1 | V |
| 输入电容(Input Capacitance) | Cies | VCE=20V, f=1MHz | | 2000 | | pF |
| 输出电容(Output Capacitance) | Coes | | | 65 | | pF |
| 反向传输电容 (Reverse Transfer Capacitance) | Cres | | | 50 | | pF |
| 开启延迟时间(Turn-on delay time) | t _{d(on)} | VCC=300V, IC=15A RG=30Ω, L=500μH VGE=0V/15V Vclamp=400V Tc=25°C 参照 Fig.1, Fig.2 | | 70 | | ns |
| 上升时间(Rise Time) | t _r | | | 40 | | ns |
| 开启时间(Turn-ON Time) | ton | | | 200 | | ns |
| 关断延迟时间(Turn-OFF Delay Time) | t _{d(off)} | | | 190 | | ns |
| 下降时间(Fall Time) | t _f | | | 75 | | ns |
| 关断时间(Turn-OFF Time) | toff | | | 290 | | ns |
| 开启能量(Turn-ON Energy) | Eon | | | 550 | | μJ |
| 关断能量(Turn-OFF Energy) | Eoff | | | 220 | | μJ |
| 总栅极电荷(Total Gate Charge) | Qg | | | 80 | | nC |
| 栅极-发射极电荷(Gate to Emitter charge) | Qge | | VCE=300V, VGE=15V, IC=15A | | 16 | |
| 栅极-集电极米勒电荷 (Gate to Collector "Miller" Charge) | Qgc | | | 38 | | nC |
| 二极管反向恢复时间 (Diode Reverse Recovery Time) | t _{rr} | IF=15A, di/dt=300A/μs, VCC=300V, See Fig.3 | | 95 | | ns |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

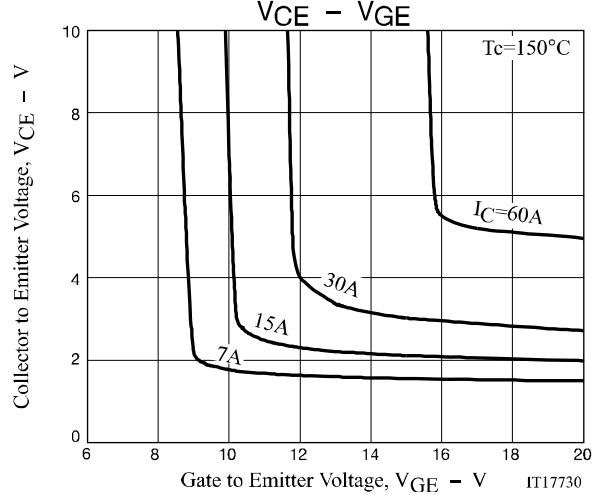
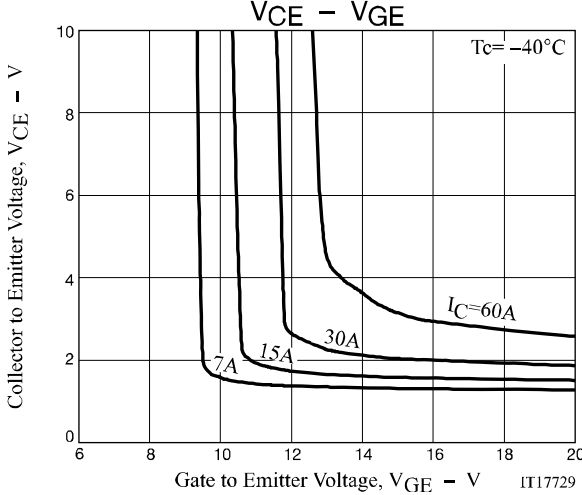
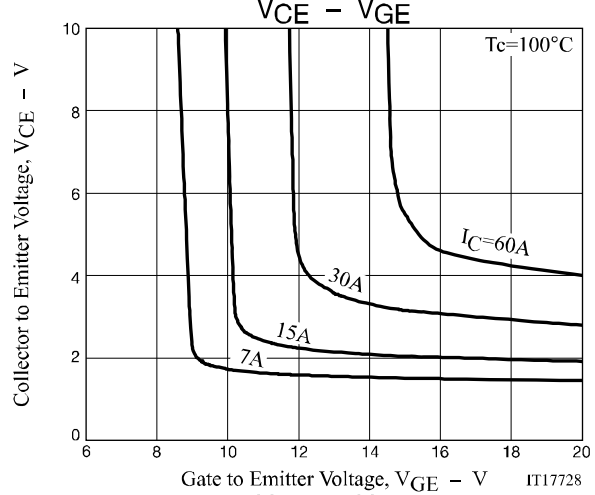
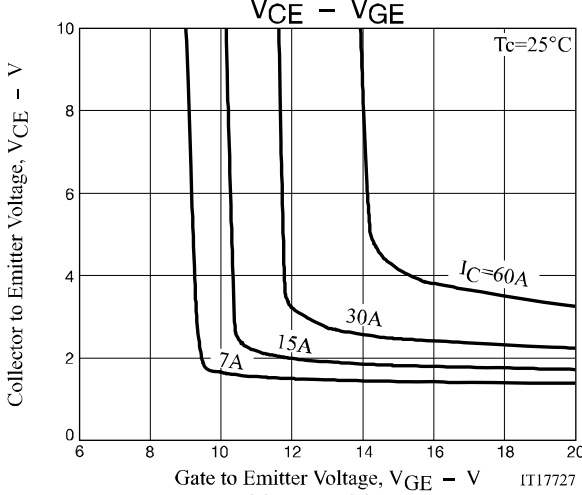
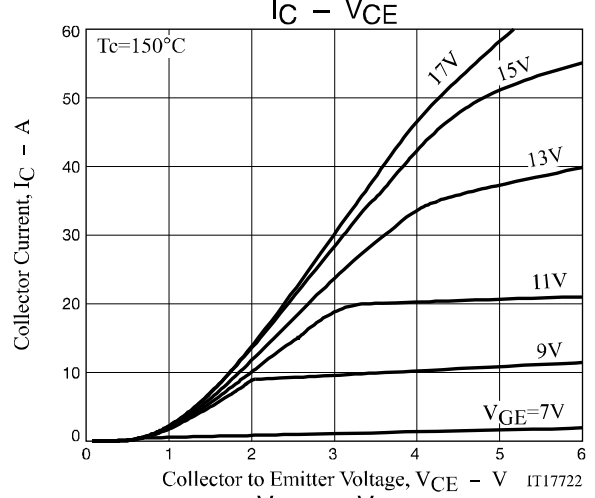
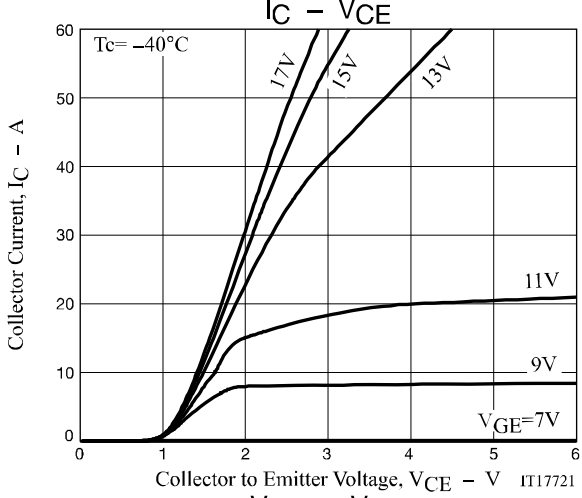
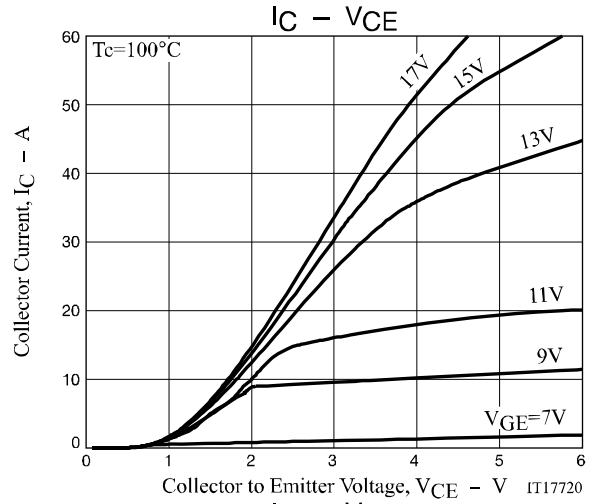
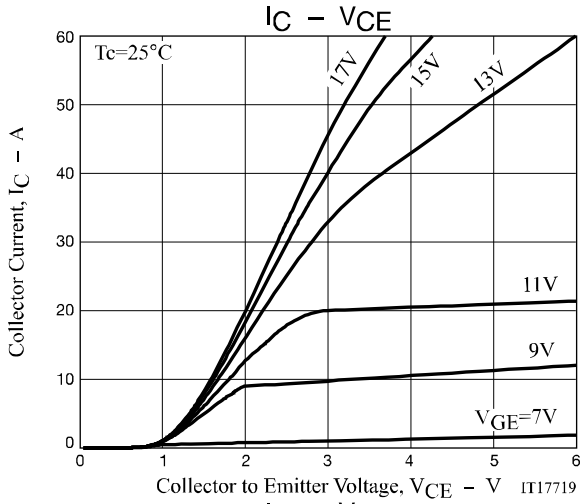
热特性 / Ta = 25°C(除非特殊指定)

| 参数 | 记号 | 条件 | 值 | 单位 |
|-------------------------------------------------------------|-----------------|--------------------------|------|------|
| 热阻 IGBT(结到外壳) Thermal Resistance IGBT (Junction to Case) | Rth(j-c) (IGBT) | Tc=25°C (我司理想的散热条件)*2 | 2.78 | °C/W |
| 热阻(结到环境) Thermal Resistance (Junction to Ambient) | Rth(j-a) | | 69 | °C/W |

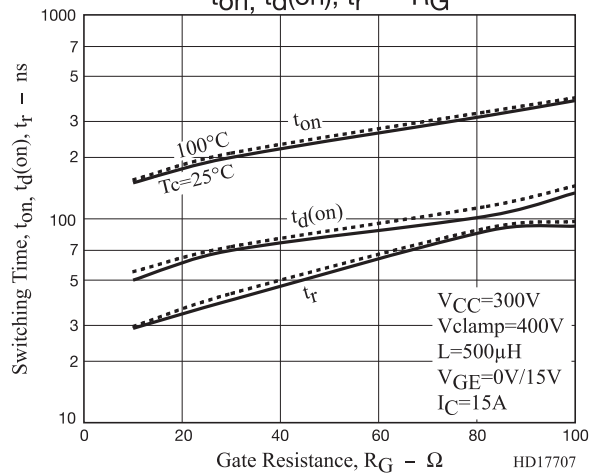
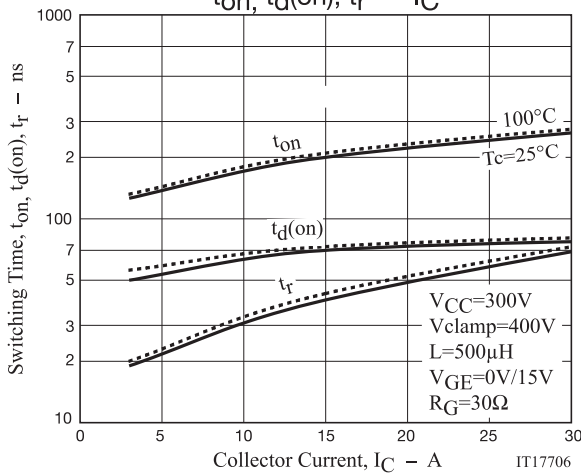
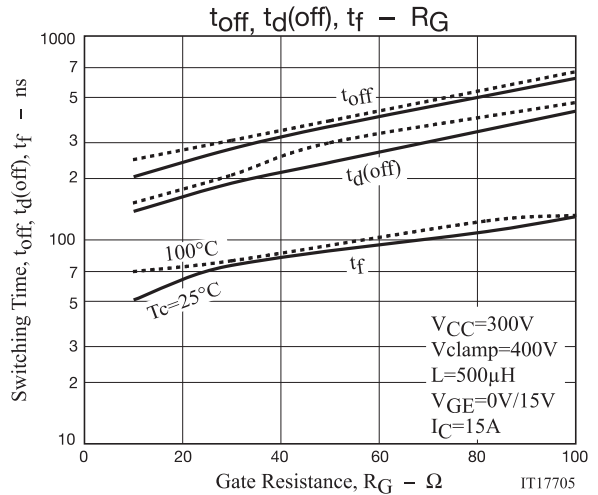
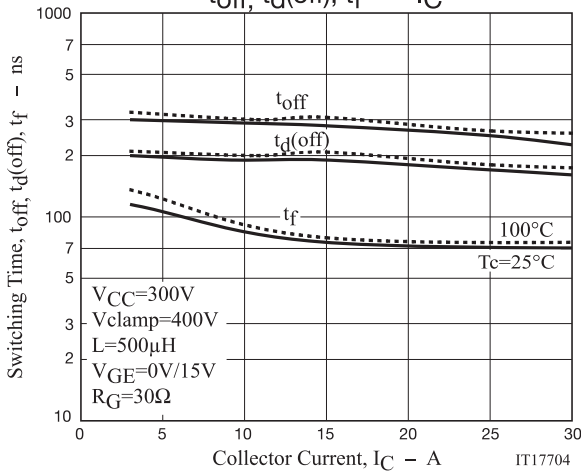
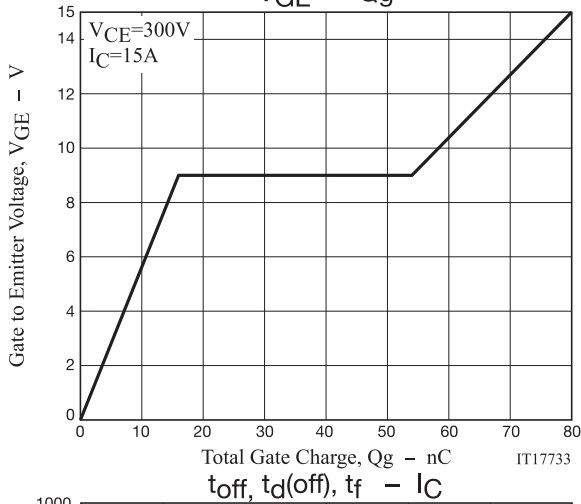
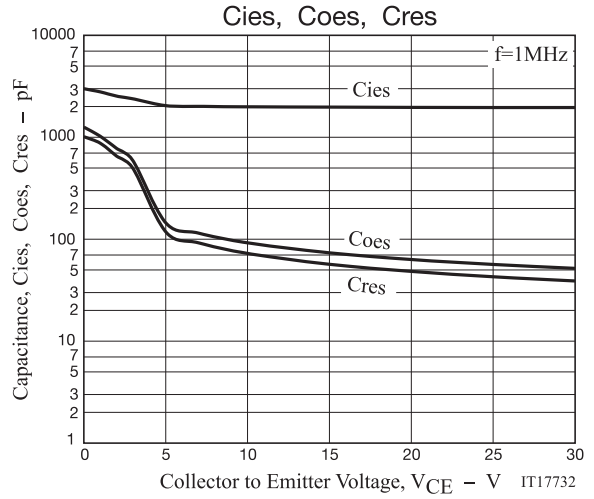
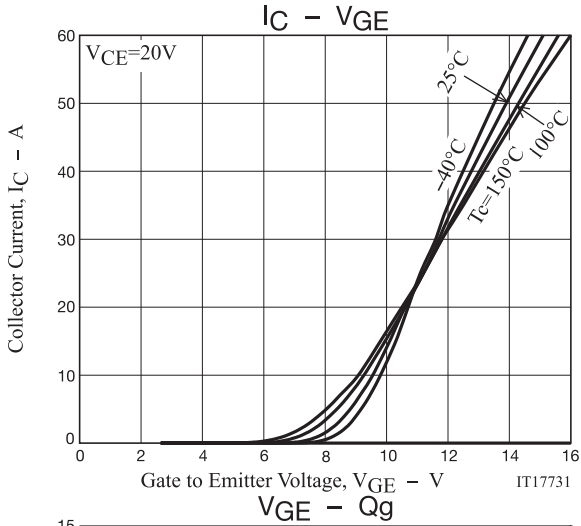
注: *2 我司的条件为背面散热。

方法为:器件的背面涂上硅脂,然后将该器件贴在 铝制的水冷散热器上。

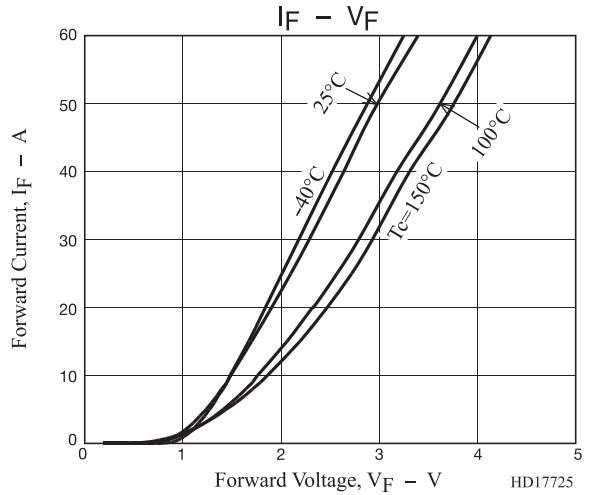
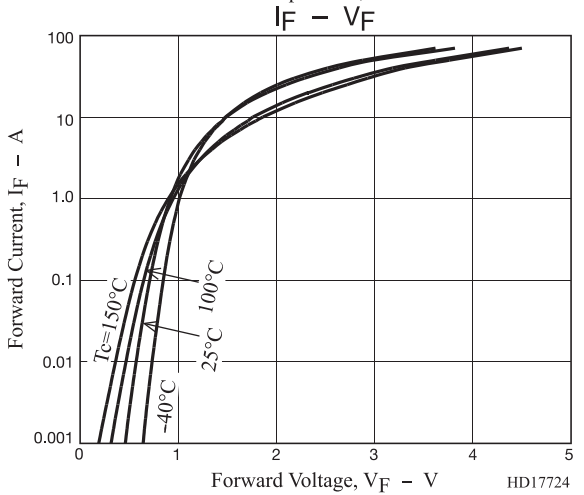
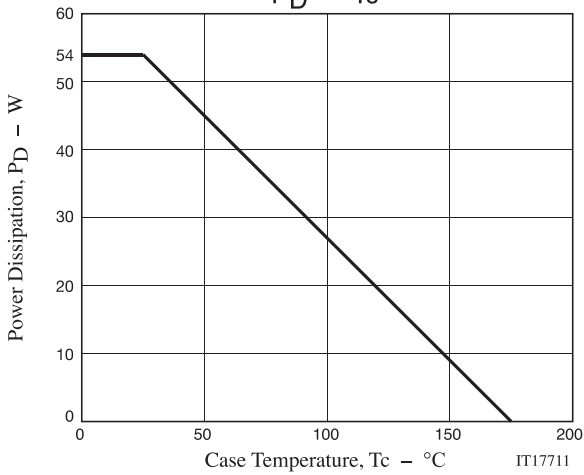
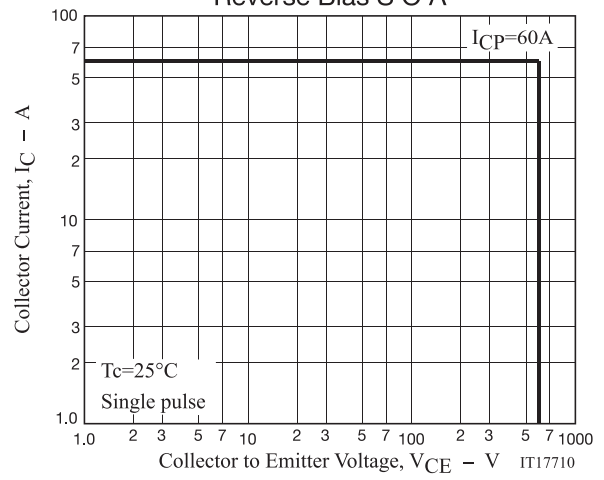
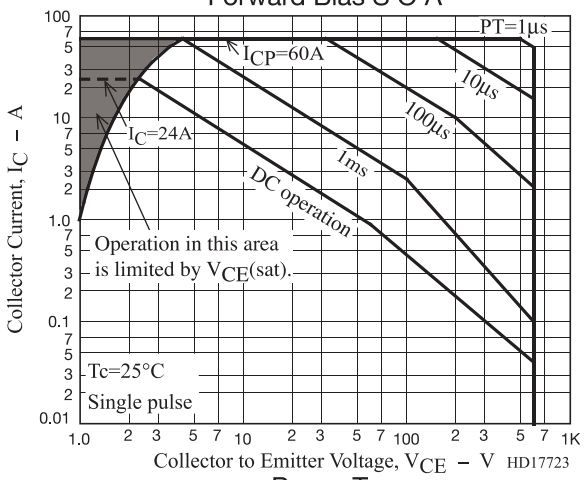
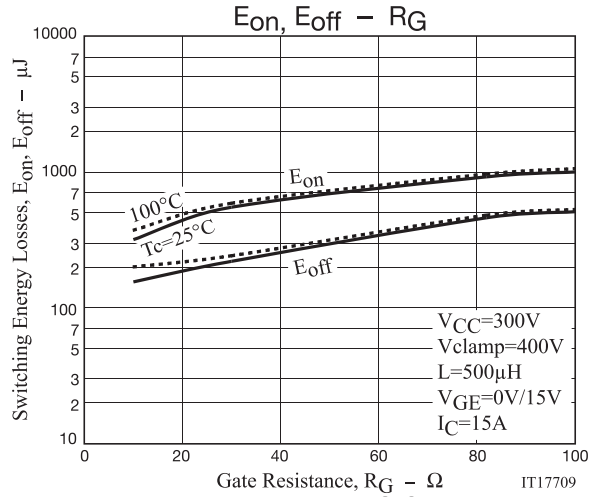
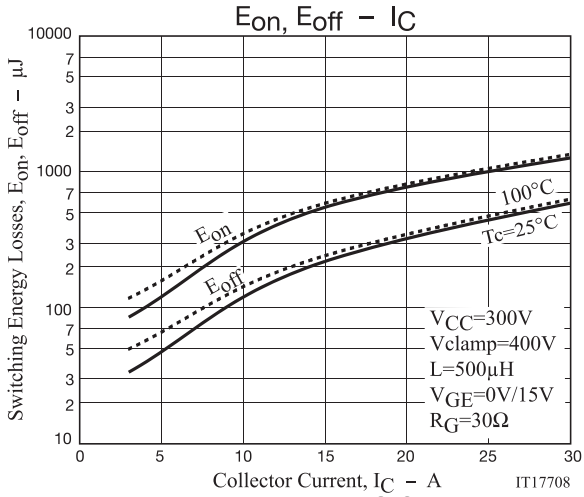
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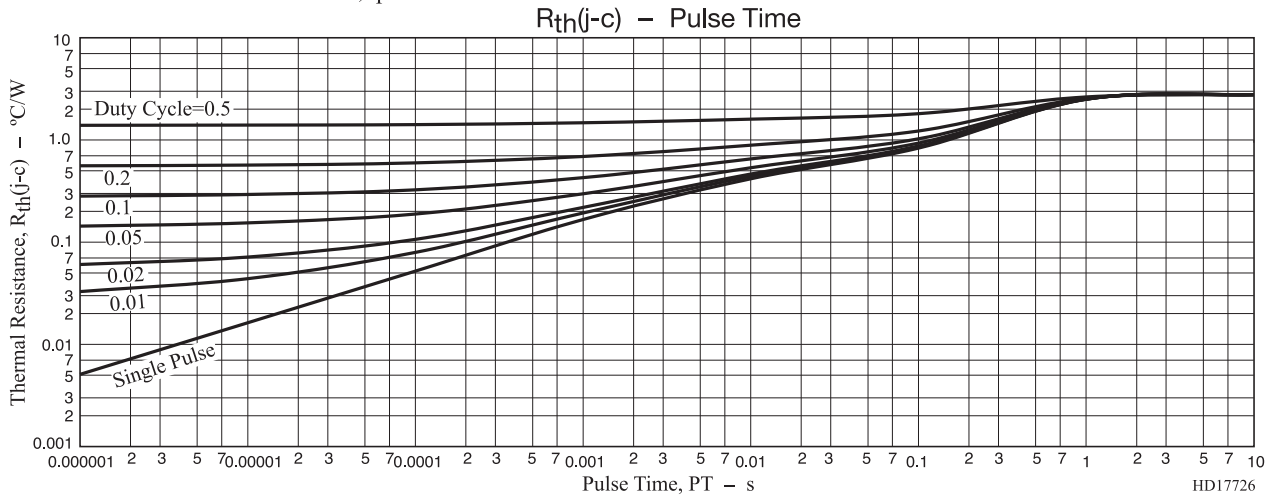
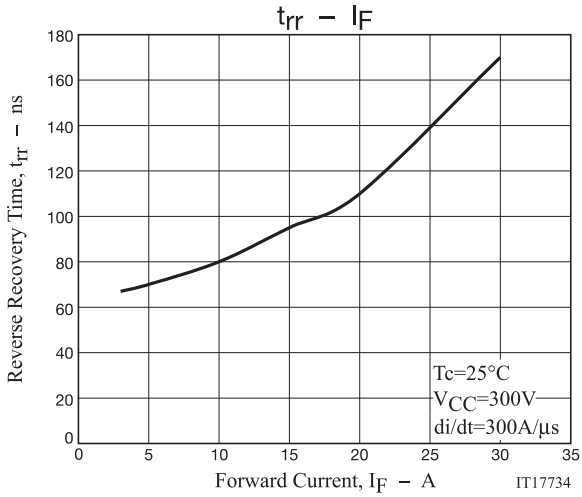


图 1 : 开关时间测试电路

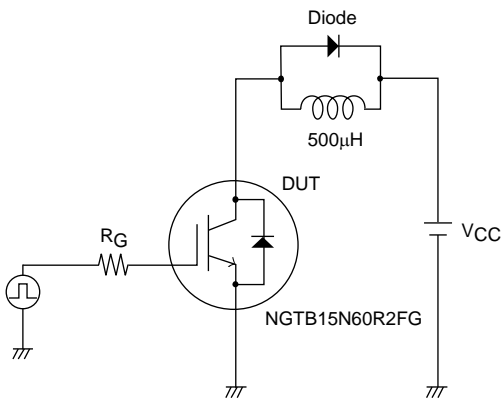


图 2 : 时间图

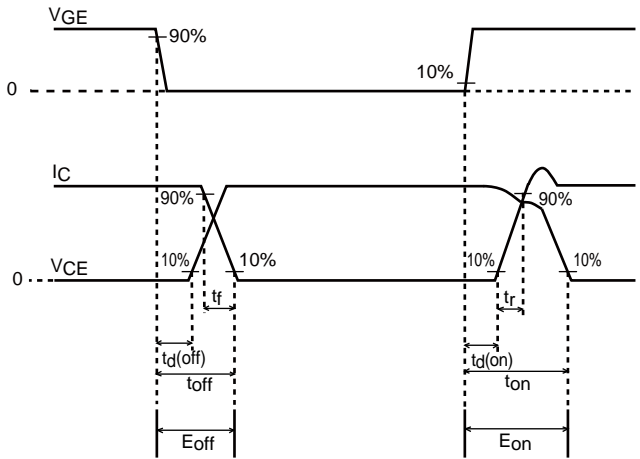
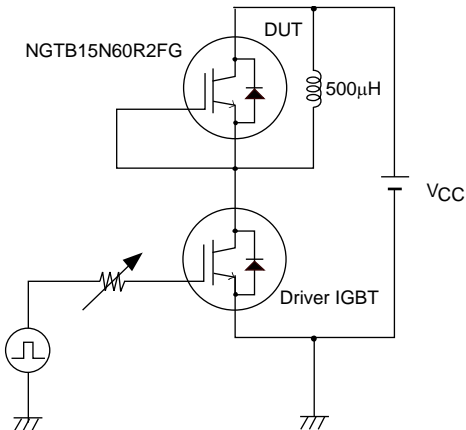


图 3 : 反向恢复时间测试电路



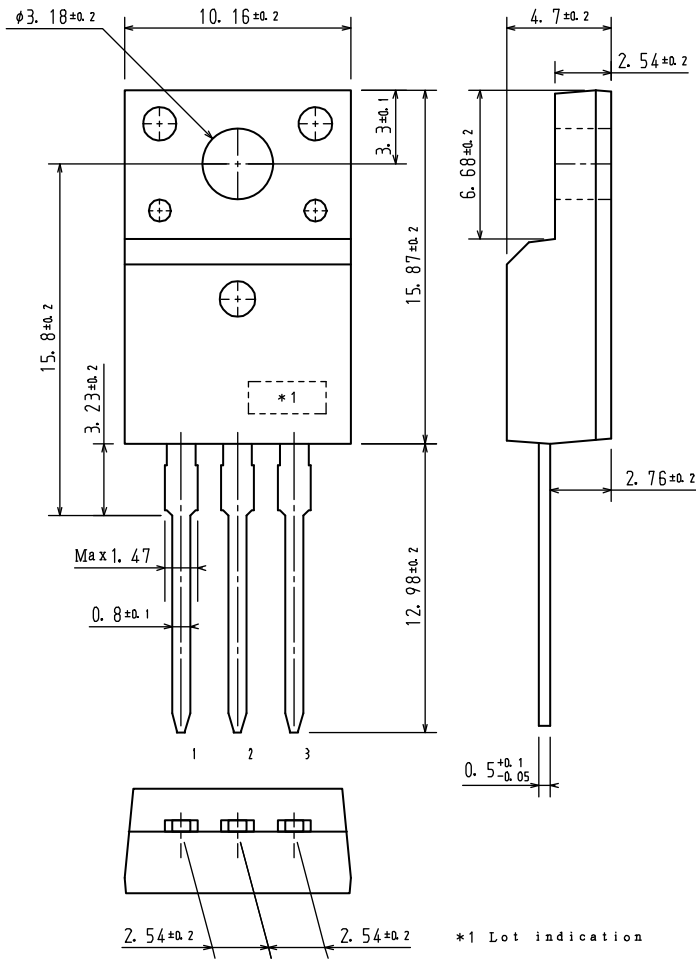
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封装尺寸

单位: mm

TO-220F-3FS
CASE 221AM
ISSUE O

- 1 : 栅极(Gate)
- 2 : 集电极(Collector)
- 3 : 发射极(Emitter)



订单情况

| 器件名称 | 封装 | 出货包装 | 注解 |
|---------------|-------------|-------------------|-------|
| NGTB15N60R2FG | TO-220F-3FS | 50 pcs. / tube | 不含铅和卤 |

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