

## General Description

The MY25T120GBT uses Trench Field Stop technology, have Low gate charge ,Low Switching losses and Low  $V_{CEsat}$ , With anti-parallel fast recove diode , Positive temperature coefficient .

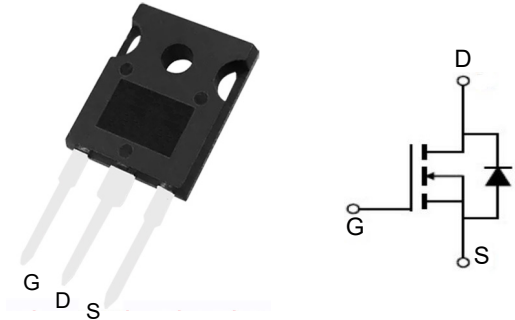


## Features

|                       |      |   |
|-----------------------|------|---|
| $V_{DSS}$             | 1200 | V |
| $I_D$                 | 25   | A |
| $P_D(T_C=25^\circ C)$ | 375  | W |
| PV Inverter           | 1.78 | V |

## Application

- UPS
- Welding Machines
- PV Inverter



## Package Marking and Ordering Information

| Product ID  | Pack   | Marking     | Qty(PCS) |
|-------------|--------|-------------|----------|
| MY25T120GBT | TO-247 | MY25T120GBT | 600      |

## Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise noted)

| 项目<br>parameter                                             | 符号<br>Symbol   | 数值<br>Value                                           | 单位<br>Unit |
|-------------------------------------------------------------|----------------|-------------------------------------------------------|------------|
| 最高集电极—发射极直流电压<br>Collector-Emmitter Voltage                 | $V_{CE}$       | 1200                                                  | V          |
| 连续集电极极电流<br>Collector Current-continuous                    | $I_C$          | $(T_C=25^\circ C)$<br>50<br>$(T_C=100^\circ C)$<br>25 | A          |
| 最大脉冲集电极极电流 (注1)<br>Collector Current – pulse (note 1)       | $I_{CM}$       | 75                                                    | A          |
| 二极管连续正向电流<br>Diode Continuous Forward Current               | $I_F$          | $(T_C=25^\circ C)$<br>30<br>$(T_C=100^\circ C)$<br>15 | A          |
| 二极管最大正向电流<br>Diode Maximum Forward Current                  | $I_{FM}$       | 45                                                    | A          |
| 最高栅极发射极电压<br>Gate-Emmitter Voltage                          | $V_{GE}$       | $\pm 30$                                              | V          |
| 耗散功率<br>Power Dissipation ( $T_C=25^\circ C$ )              | $P_D$          | 375                                                   | W          |
| 最高结温及存储温度<br>Operating and Storage Temperature Range        | $T_J, T_{STG}$ | $-50 \sim +150$                                       | $^\circ C$ |
| 引线最高焊接温度<br>Maximum Lead Temperature for Soldering Purposes | TL             | 260                                                   | $^\circ C$ |

注1：集电极电流由最高结温限制

Note1:Collector current limited by maximum junction temperature

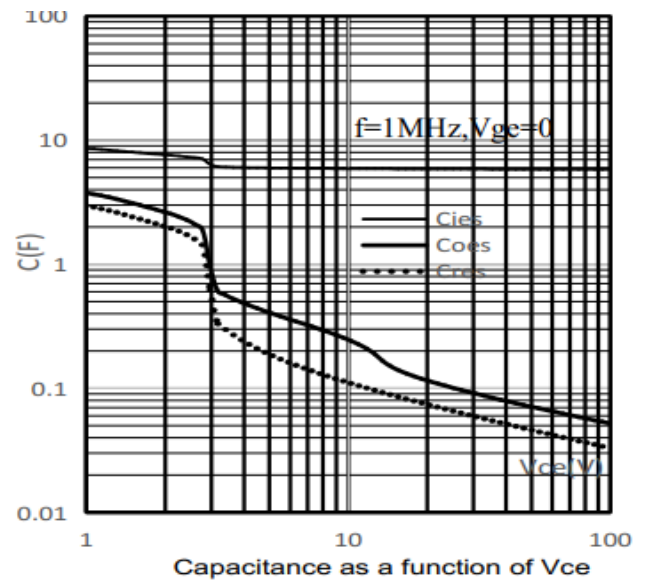
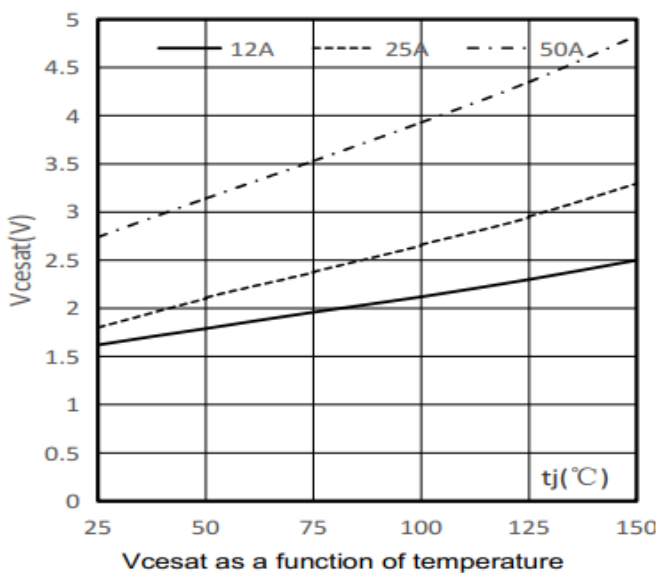
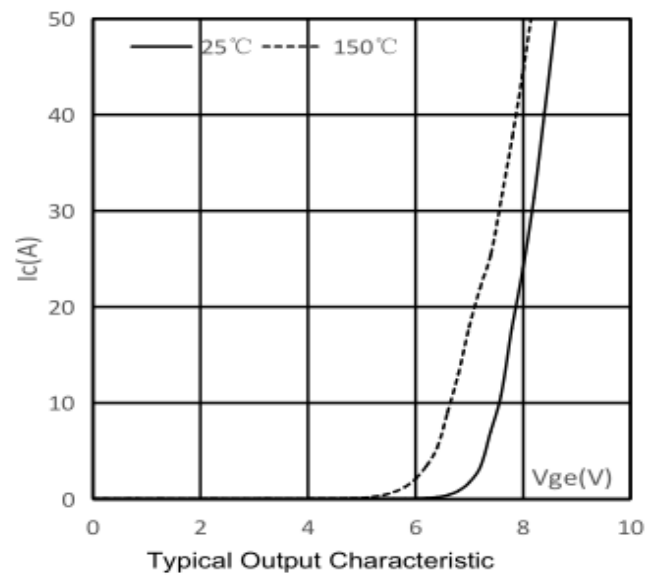
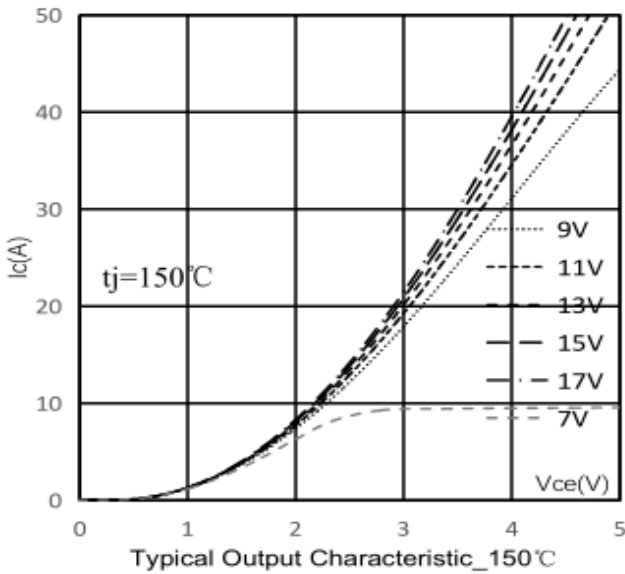
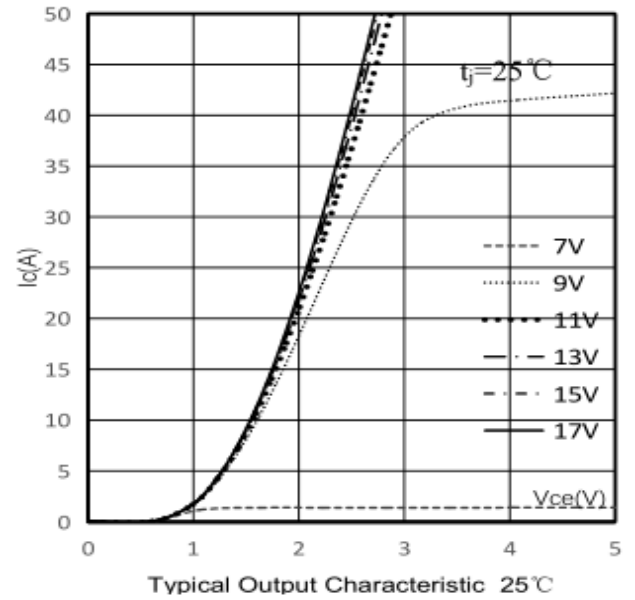
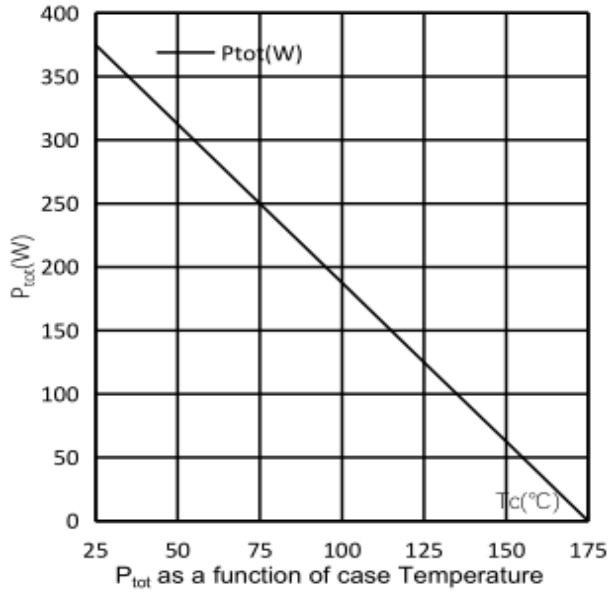
**Electrical Characteristics (T<sub>C</sub>=25 °C, unless otherwise noted)**

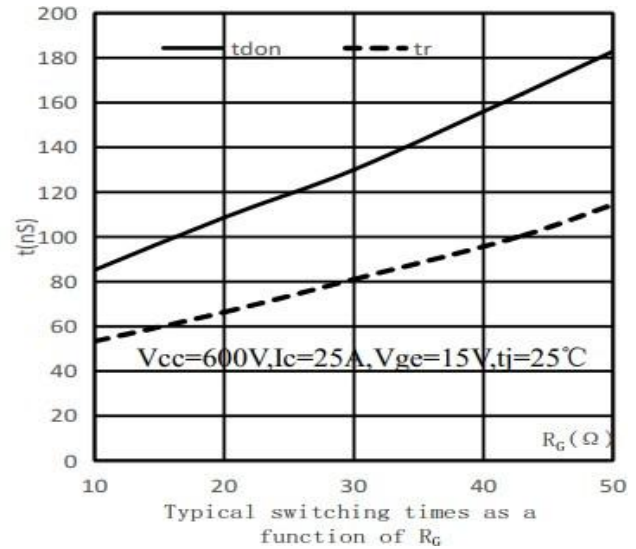
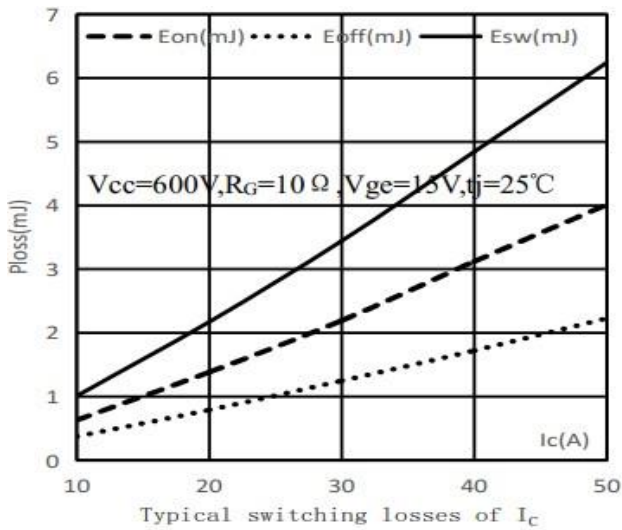
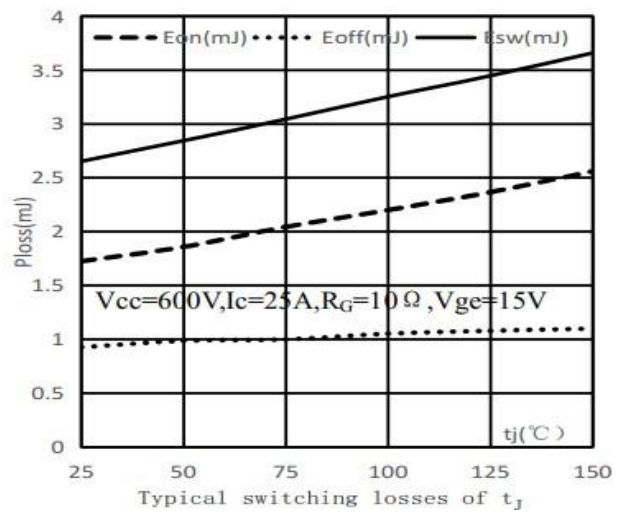
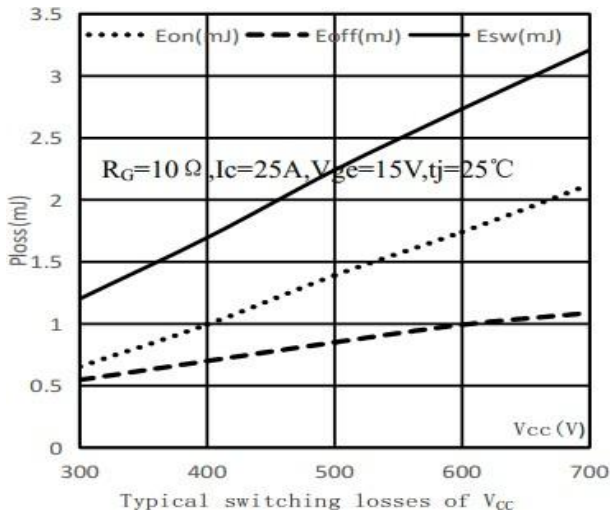
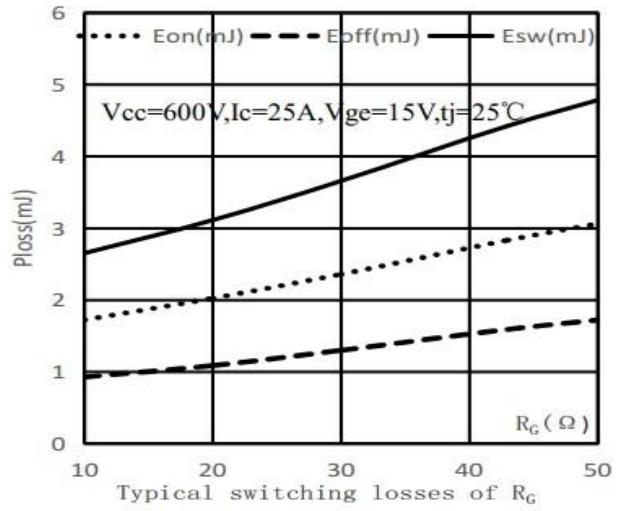
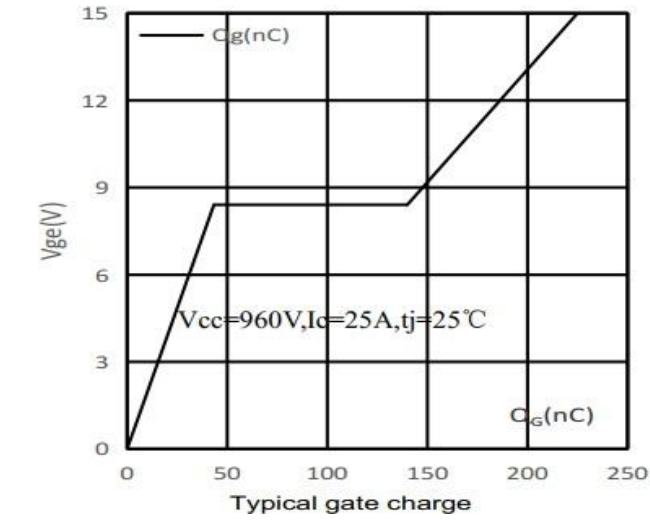
| 项目<br>Parameter                           | 符号<br>Symbol                        | 测试条件<br>Tests conditions                                                                                                                               | 最小<br>Min | 典型<br>Typ   | 最大<br>Max | 单位<br>Units |
|-------------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|-----------|-------------|
| <b>关态特性 Off –Characteristics</b>          |                                     |                                                                                                                                                        |           |             |           |             |
| 集电极-发射极击穿电压<br>Collector-Emmitter Voltage | BV <sub>CES</sub>                   | V <sub>GE</sub> =0V, I <sub>C</sub> =250uA                                                                                                             | 1200      | -           | -         | V           |
| 击穿电压温度特性<br>Breakdown Voltage Temperature | ΔBV <sub>CES</sub> /ΔT <sub>J</sub> | I <sub>C</sub> =1mA, referenced<br>to=25 °C                                                                                                            | -         | 1.2         | -         | V/ °C       |
| 零栅压下集电极漏电流<br>Zero Gate Voltage Collector | I <sub>CES</sub>                    | V <sub>CE</sub> =1200V, V <sub>GE</sub> =0V                                                                                                            | -         | -           | 5         | uA          |
| 栅极体漏电流                                    | I <sub>GES(F/R)</sub>               | V <sub>CE</sub> =0V, V <sub>GE</sub> =±30V                                                                                                             | -         | -           | ±200      | nA          |
| <b>通态特性 On-Characteristics</b>            |                                     |                                                                                                                                                        |           |             |           |             |
| 阈值电压 Gate-Emmitter<br>Threshold Voltage   | V <sub>GE(th)</sub>                 | V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> =1mA                                                                                                | 4.8       | 5.4         | 5.9       | V           |
| 饱和压降<br>Collector-Emmitter saturation     | V <sub>CESAT</sub>                  | V <sub>GE</sub> =15V, I <sub>C</sub> =25A, T <sub>J</sub><br>=25°C, T <sub>J</sub> =150°C                                                              | -<br>-    | 1.78<br>3.3 | 2.2<br>-  | V           |
| <b>动态特性 Dynamic Characteristics</b>       |                                     |                                                                                                                                                        |           |             |           |             |
| 开启延迟时间<br>Turn-On delay time              | td(on)                              | V <sub>GE</sub> =15V,<br>V <sub>CC</sub> =600V,<br>I <sub>C</sub> =25A,<br>R <sub>G</sub> =10Ω,<br>T <sub>J</sub> =25°C,<br>Inductive<br>Load L=200uH  | -         | 85.2        | -         | ns          |
| 上升时间<br>Turn-On rise time                 | tr                                  |                                                                                                                                                        | -         | 53.3        | -         | ns          |
| 关断延迟时间<br>Turn-Off delay time             | td(off)                             |                                                                                                                                                        | -         | 289         | -         | ns          |
| 下降时间<br>Turn-Off Fall time                | tf                                  |                                                                                                                                                        | -         | 66.9        | -         | ns          |
| 开启损耗<br>Turn-on energy                    | Eon                                 |                                                                                                                                                        | -         | 1.73        | -         | mJ          |
| 关断损耗<br>Turn-off energy                   | Eoff                                |                                                                                                                                                        | -         | 0.93        | -         |             |
| 总的开关损耗<br>Total switching energy          | Etotal                              |                                                                                                                                                        | -         | 2.66        | -         |             |
| 开启延迟时间<br>Turn-On delay time              | td(on)                              | V <sub>GE</sub> =15V,<br>V <sub>CC</sub> =600V,<br>I <sub>C</sub> =25A,<br>R <sub>G</sub> =10Ω,<br>T <sub>J</sub> =150°C,<br>Inductive<br>Load L=200uH | -         | 76.4        | -         | ns          |
| 上升时间<br>Turn-On rise time                 | tr                                  |                                                                                                                                                        | -         | 50.8        | -         | ns          |
| 关断延迟时间<br>Turn-Off delay time             | td(off)                             |                                                                                                                                                        | -         | 319         | -         | ns          |
| 下降时间<br>Turn-Off Fall time                | tf                                  |                                                                                                                                                        | -         | 60.0        | -         | ns          |
| 开启损耗<br>Turn-on energy                    | Eon                                 |                                                                                                                                                        | -         | 2.56        | -         | mJ          |
| 关断损耗<br>Turn-off energy                   | Eoff                                |                                                                                                                                                        | -         | 1.06        | -         |             |
| 总的开关损耗<br>Total switching energy          | Etotal                              |                                                                                                                                                        | -         | 3.62        | -         |             |
| 栅极电荷总量<br>Total Gate Charge               | Qg                                  | V <sub>CE</sub> =960V,<br>I <sub>C</sub> =40A,<br>V <sub>GE</sub> =15V                                                                                 | -         | 226         | -         | nC          |
| 栅极-发射极电荷<br>Gate-emitter charge           | Qge                                 |                                                                                                                                                        | -         | 45.1        | -         |             |
| 栅极-集电极电荷<br>Gate-collector charge         | Qgc                                 |                                                                                                                                                        | -         | 95.1        | -         |             |
| 栅极电阻<br>Gate Resistance                   | Rg                                  | f=1.0MHz, V <sub>CE</sub> OPEN                                                                                                                         | -         | 0.95        | -         | Ω           |
| 输入电容<br>Input capacitance                 | Cies                                | V <sub>CE</sub> =30V,<br>V <sub>GE</sub> =0V,<br>f=1.0MHz                                                                                              | -         | 5990        | -         | pF          |
| 输出电容<br>Output capacitance                | Coes                                |                                                                                                                                                        | -         | 92.7        | -         |             |
| 反向传输电容<br>Reverse transfer capacitance    | Cres                                |                                                                                                                                                        | -         | 67.3        | -         |             |

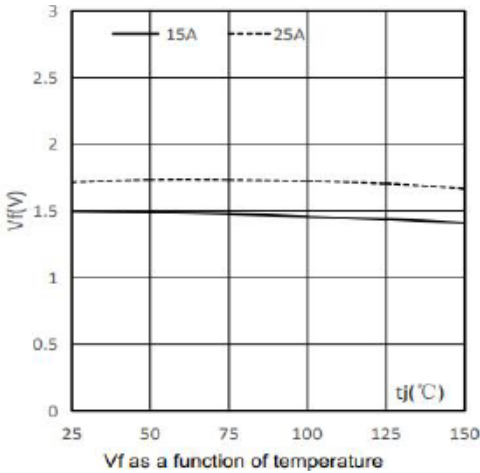
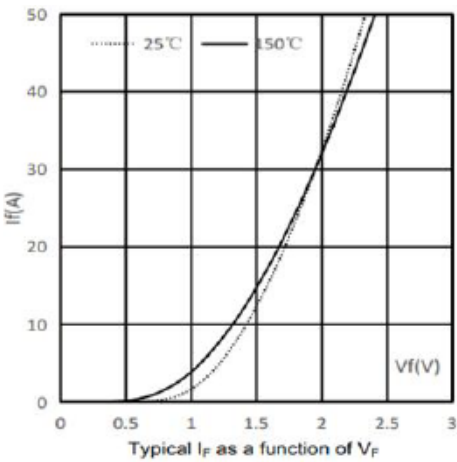
| 二极管特性Diode characteristics         |              |                                                                                        |           |           |           |             |
|------------------------------------|--------------|----------------------------------------------------------------------------------------|-----------|-----------|-----------|-------------|
| 项目<br>Parameter                    | 符号<br>Symbol | 测试条件<br>Tests                                                                          | 最小<br>Min | 典型<br>Typ | 最大<br>Max | 单位<br>Units |
| 正向压降<br>Diode Forward Voltage      | $V_F$        | $I_F=15A$                                                                              | -         | 1.5       | 1.85      | V           |
|                                    |              | $I_F=25A$                                                                              | -         | 1.7       | 2.2       |             |
| 反向恢复时间<br>Reverse recovery time    | trr          | $I_F=25A$ ,<br>$V_R=600V$ ,<br>$V_{GE}=15V$ ,<br>$R_G=10\Omega$ ,<br>$T_J=25^\circ C$  | -         | 157       | -         | ns          |
| 反向恢复电流<br>Reverse recovery current | Irrm         |                                                                                        | -         | 27.2      | -         | A           |
| 反向恢复电荷<br>Reverse recovery charge  | Qrr          |                                                                                        | -         | 2370      | -         | nC          |
| 反向恢复时间<br>Reverse recovery time    | trr          | $I_F=25A$ ,<br>$V_R=600V$ ,<br>$V_{GE}=15V$ ,<br>$R_G=10\Omega$ ,<br>$T_J=150^\circ C$ | -         | 270       | -         | ns          |
| 反向恢复电流<br>Reverse recovery current | Irr          |                                                                                        | -         | 33        | -         | A           |
| 反向恢复电荷<br>Reverse recovery charge  | Qrr          |                                                                                        | -         | 4260      | -         | nC          |

## 热特性 THERMAL CHARACTERISTIC

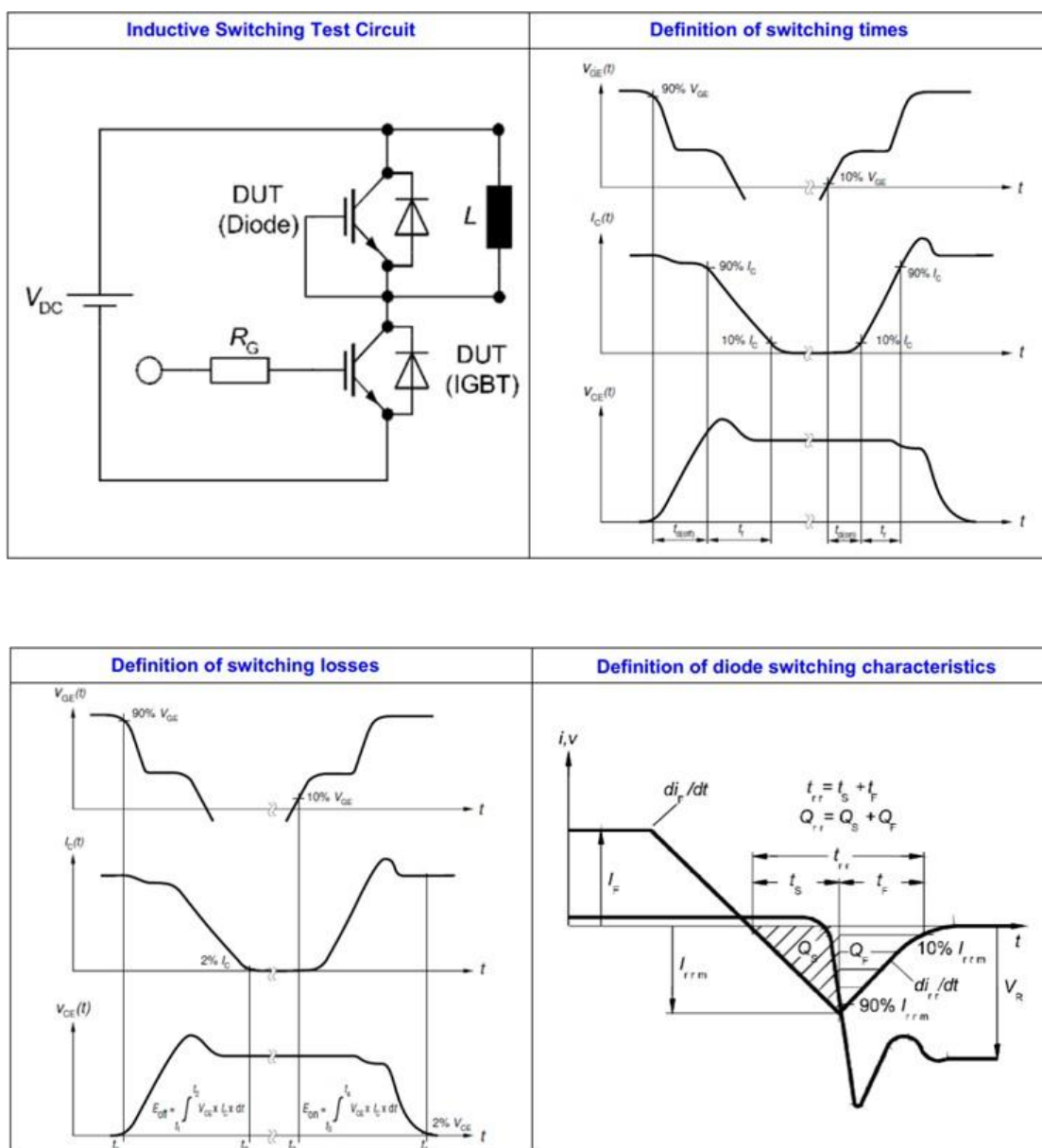
| 项目<br>Parameter                                               | 符号<br>Symbol | 数 值<br>Value | 单位<br>Unit   |
|---------------------------------------------------------------|--------------|--------------|--------------|
| 结到管壳的热阻 (IGBT)<br>Thermal Resistance, Junction to Case (IGBT) | Rth(j-c)     | 0.40         | $^\circ C/W$ |
| 结到管壳的热阻 (FRD)<br>Thermal Resistance, Junction to Case (Diode) | Rth(j-c)     | 1.32         | $^\circ C/W$ |
| 结到环境的热阻<br>Thermal Resistance, Junction to Ambient            | Rth(j-A)     | 40           | $^\circ C/W$ |



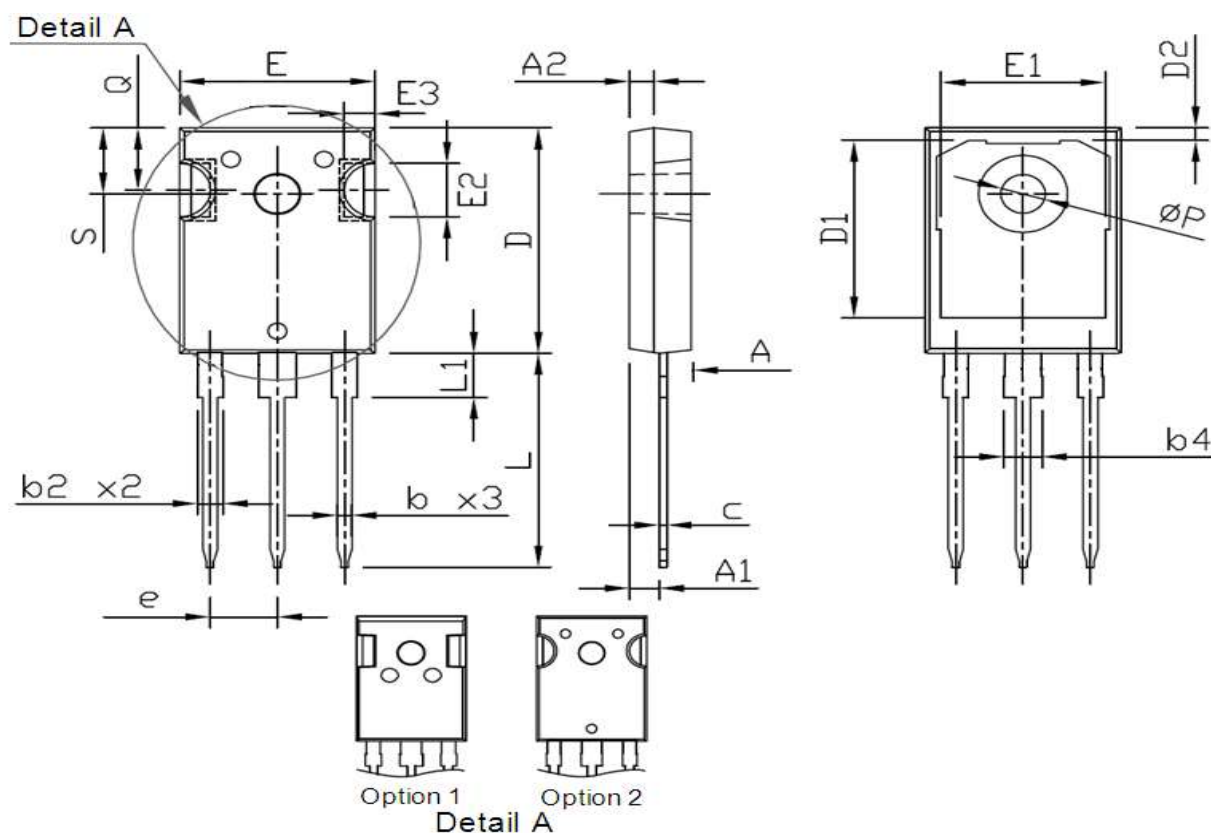




## Test Circuit and Waveform



**Package Mechanical Data-TO-247 Single**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 4.70                      | 5.30  | 0.185                | 0.209 |
| A1     | 2.20                      | 2.60  | 0.087                | 0.102 |
| A2     | 1.50                      | 2.49  | 0.059                | 0.098 |
| b      | 1.04                      | 1.33  | 0.041                | 0.052 |
| b2     | 1.90                      | 2.41  | 0.075                | 0.095 |
| b4     | 2.87                      | 3.43  | 0.113                | 0.135 |
| c      | 0.55                      | 0.70  | 0.022                | 0.028 |
| D      | 20.70                     | 21.30 | 0.815                | 0.839 |
| D1     | 16.25                     | 17.65 | 0.640                | 0.695 |
| D2     | 0.51                      | 1.40  | 0.020                | 0.055 |
| e      | 5.44 BSC.                 |       | 0.214 BSC.           |       |
| E      | 15.50                     | 16.30 | 0.610                | 0.642 |
| E1     | 13.08                     | 14.16 | 0.515                | 0.557 |
| E2     | 3.80                      | 5.49  | 0.150                | 0.216 |
| E3     | 1.00                      | 2.75  | 0.039                | 0.108 |
| L      | 19.72                     | 20.32 | 0.776                | 0.800 |
| L1     | 3.85                      | 4.50  | 0.152                | 0.177 |
| Q      | 5.25                      | 6.25  | 0.207                | 0.246 |
| P      | 3.50                      | 3.70  | 0.138                | 0.146 |
| S      | 6.04                      | 6.30  | 0.238                | 0.248 |