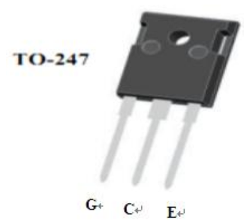
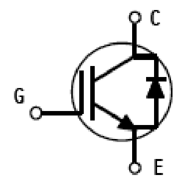
# Silicon FS Trench IGBT

## BT25T120 CKR

| | | |
|---|---|---|
| $V_{CES}$ | 1200 | V |
| $I_C$ | 25 | A |
| $P_{tot}$ ($T_C$=25℃) | 208 | W |
| $V_{CE(SAT)}$ | 1.95 | V |




## General Description:

Using HUAJING's proprietary trench design, advanced FS(field stop) technology and integrated with Free Wheeling Diode, the 1200V Trench FS IGBT offers superior conduction and switching performances, high avalanche ruggedness.

## Features:

- Trench FS Technology, Positive temperature coefficient
- Low saturation voltage: $V_{CE(sat)}$, typ =1.95V @ $I_C$ =25A
- Extremely enhanced avalanche capability

## Applications:

Power switch circuit of induction cooker(IH).

## Absolute Maximum Ratings

（$T_j$= 25℃ unless otherwise specified）:

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{CES}$ | Collector-Emitter Voltage | 1200 | V |
| $V_{GES}$ | Gate- Emitter Voltage | ±20 | V |
| $I_C$ | Collector Current@$T_C$ = 25 °C | 50 | A |
| | Collector Current @$T_C$ = 100 °C | 25 | A |
| $I_{CM}$ a1 | Pulsed Collector Current@$T_C$ = 25 °C | 75 | A |
| $I_F$ | Diode Continuous Forward Current @$T_C$ = 100 °C | 25 | A |
| $I_{FM}$ | Diode Maximum Forward Current@$T_C$ = 25 °C | 75 | A |
| $P_D$ | Power Dissipation @ $T_C$ = 25°C | 208 | W |
| | Power Dissipation @$T_C$ = 100 °C | 83 | W |
| $T_J$，$T_{stg}$ | Operating Junction and Storage Temperature Range | 150，-55 to +150 | ℃ |
| $T_L$ | Maximum Temperature for Soldering | 300 | ℃ |

a1：Repetitive rating; pulse width limited by maximum junction temperature

## Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Units |
|---|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance, Junction to case for IGBT | -- | 0.6 | ℃/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | -- | 40 | ℃/W |

**Electrical Characteristics of the IGBT**（$T_j$= 25℃ unless otherwise specified）:

**OFF Characteristics**

| Symbol | Parameter | Test Conditions | Rating | | | Units |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{CES}$ | Collector-Emitter Breakdown Voltage | $V_{GE}$=0V,$I_{CE}$=1mA | 1200 | -- | -- | V |
| $I_{CES}$ | Collector-Emitter Leakage Current | $V_{GE}$ =0V,$V_{CE}$=$V_{CES}$ | -- | -- | 1.0 | mA |
| $I_{GES(F)}$ | Gate to Emitter Forward Leakage | $V_{GE}$ =+20V | -- | -- | +250 | nA |
| $I_{GES(R)}$ | Gate to Source Reverse Leakage | $V_{GE}$ =-20V | -- | -- | -250 | nA |

**ON Characteristics**

| Symbol | Parameter | Test Conditions | Rating | | | Units |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$=25A,$V_{GE}$=15V | -- | 1.95 | 2.5 | V |
| $V_{FM}$ | Diode Forward Voltage | $I_F$=25A | -- | 2.7 | 3.2 | V |
| $V_{GE(TH)}$ | Gate Threshold Voltage | $I_C$=250uA,$V_{CE}$=$V_{GE}$ | 4.5 | 5.8 | 7.5 | V |
| Pulse width tp≤300μs,δ≤2% | | | | | | |

**Dynamic Characteristics**

| Symbol | Parameter | Test Conditions | Rating | | | Units |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $C_{ies}$ | Input Capacitance | $V_{CE}$=30V,$V_{GE}$=0V f=1MHz | -- | 2370 | -- | pF |
| $C_{oes}$ | Output Capacitance | | -- | 59 | -- | |
| $C_{res}$ | Reverse Transfer Capacitance | | -- | 43 | -- | |

**Resistive Switching Characteristics**

| Symbol | Parameter | Test Conditions | Rating | | | Units |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $T_j$= 25℃ $V_{CE}$=600V,$I_C$=25A $V_{GE}$=0/15V, $R_g$=10Ω Inductive Load | -- | 34 | -- | ns |
| tr | Rise Time | | -- | 36 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | -- | 198 | -- | |
| $t_f$ | Fall Time | | -- | 75 | -- | |
| Eon | Turn-On Switching Loss | | -- | 1.88 | -- | mJ |
| Eoff | Turn-Off Switching Loss | | -- | 0.95 | -- | |
| Ets | Total Switching Loss | | -- | 2.83 | -- | |
| $Q_g$ | Total Gate Charge | $V_{CE}$=960V,$I_C$=25A $V_{GE}$=15V | -- | 142 | -- | nC |
| $Q_{ge}$ | Gate to Emitter Charge | | -- | 23 | -- | |
| $Q_{gc}$ | Gate to Collector Charge | | -- | 75 | -- | |

## Characteristics Cure

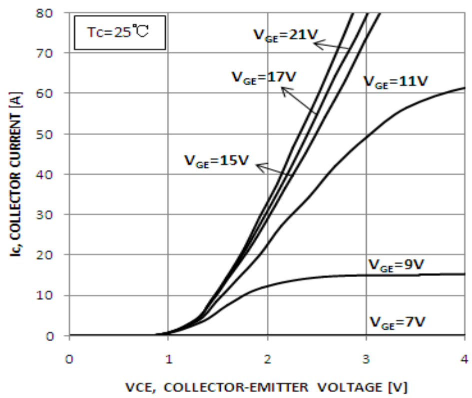



Figure 1. **Typical Output Characteristics**

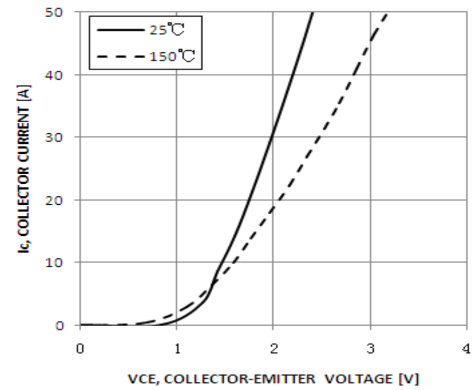



Figure 2. **Typical Output Characteristics**

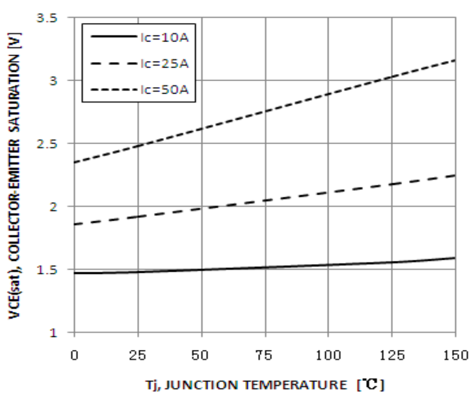



Figure 3. **Typical Saturation Voltage vs.Junction Temperature**

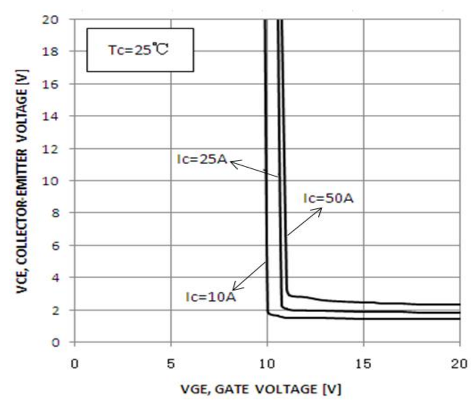



Figure 4. **Typical Saturation Voltage vs. Gate-Emitter Voltage**

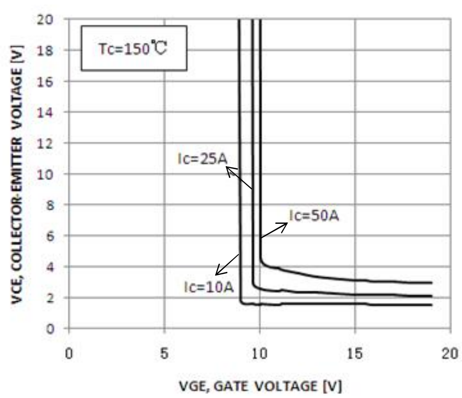



Figure 5. **Typical Saturation Voltage vs. Gate-Emitter Voltage**

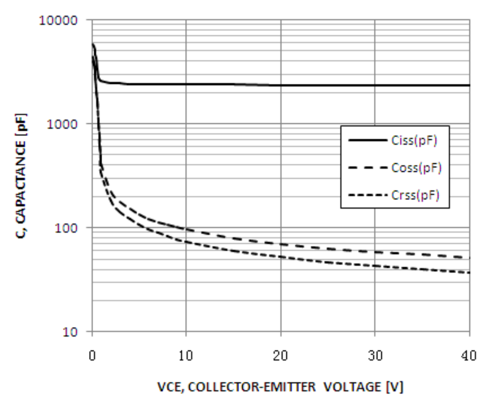



Figure 6. **Typical Capacitance Characteristics**

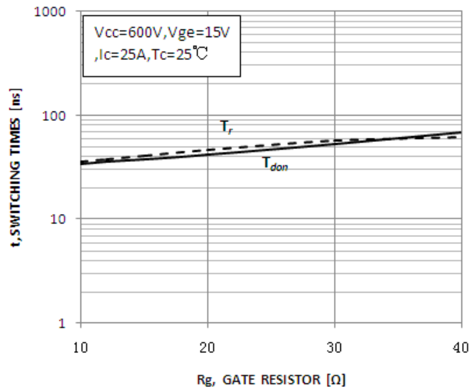



Figure 7. **Typical Turn-On Characteristics vs. Gate Resistance**

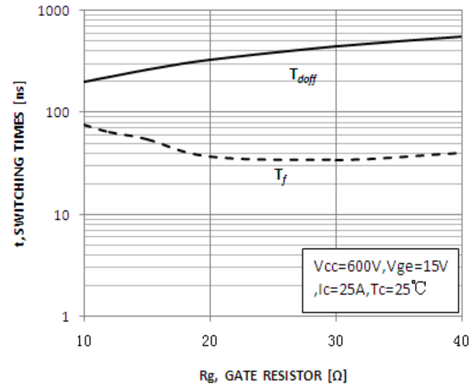



Figure 8. **Typical Turn-Off Characteristics vs.Gate Resistance**

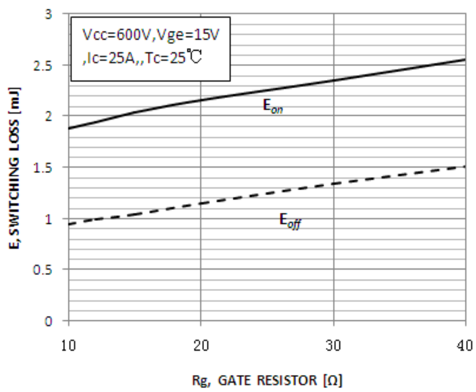



Figure 9. **Typical Switching Losses vs. Gate Resistance**

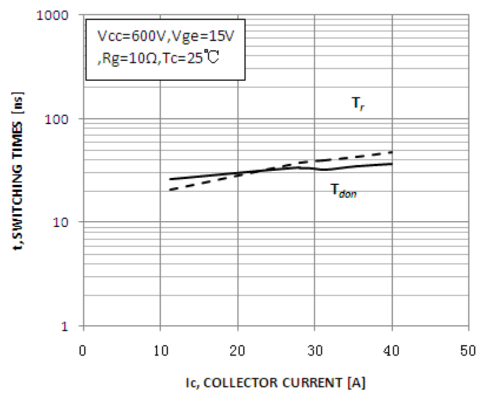



Figure 10. **Typical Turn-On Characteristics vs. Collector Current**

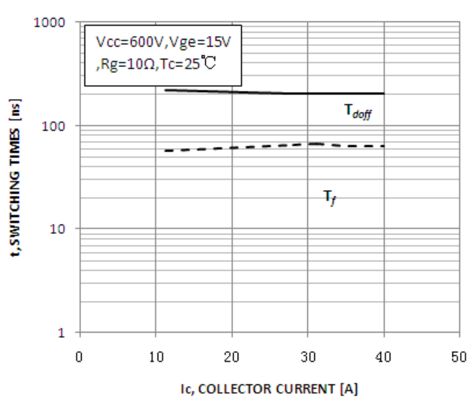



Figure 11. **Typical Turn-Off Characteristics vs. Collector Current**

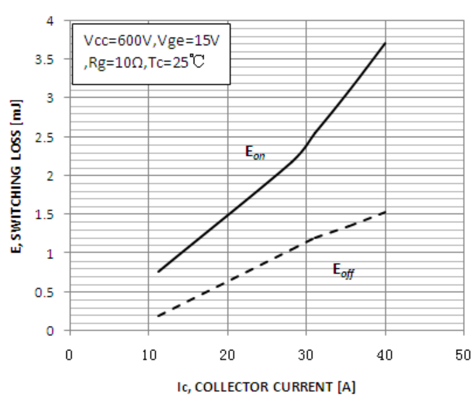



Figure 12. **Typical Switching Losses vs. Collector Current**

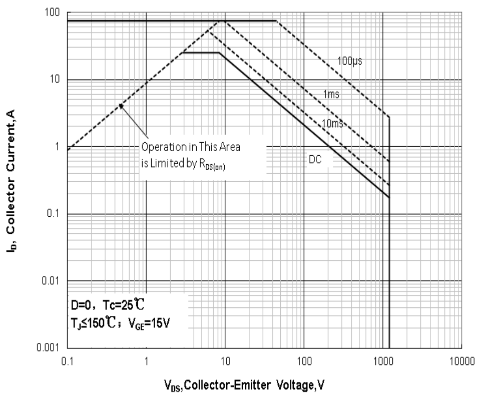



Figure 13. **Typical IGBT Forward Safe Operating Area**

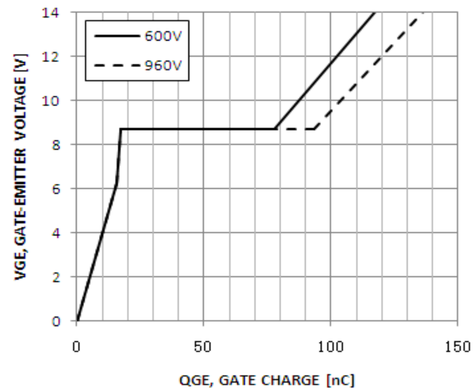



Figure 14. **Typical Gate Charge**

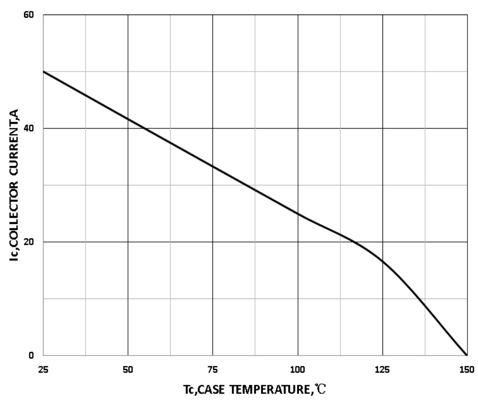



Figure 15. **Collector Current vs.Case Temperature**

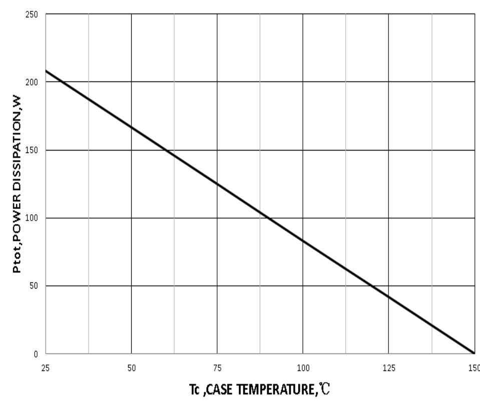



Figure 16. **Power Dissipation vs.Case Temperature**

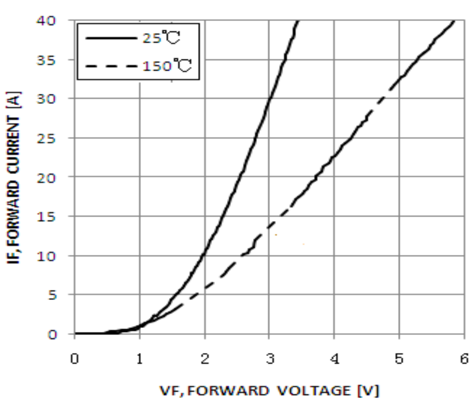



Figure 17. **Typical Diode Forward Characteristics**

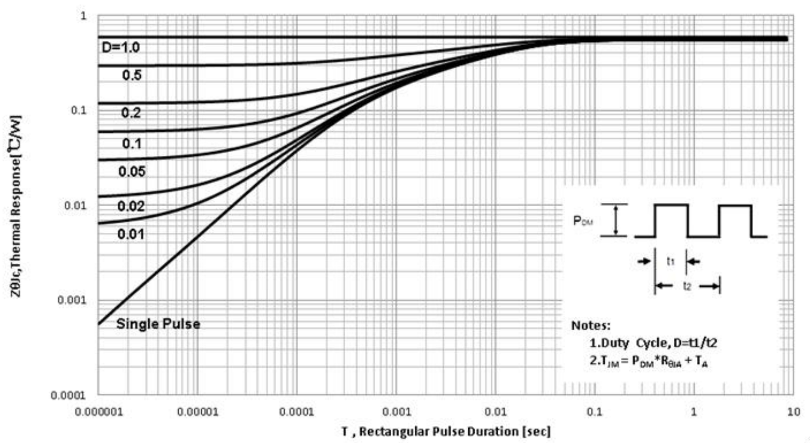
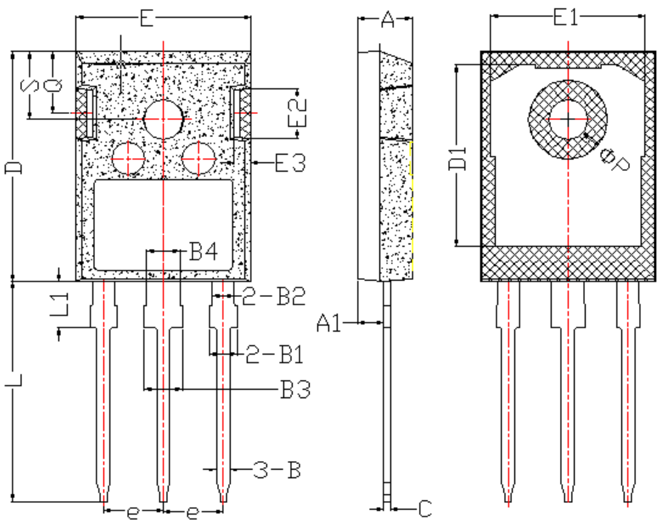



Figure 18. **IGBT Transient Thermal Impedance**

## Package Information




| Items | Values(mm) | |
|---|---|---|
| | MIN | MAX |
| A | 4.6 | 5.2 |
| A1 | 2,2 | 2.6 |
| B | 0.9 | 1.4 |
| B1 | 1.75 | 2.35 |
| B2 | 1.75 | 2.15 |
| B3 | 2.8 | 3.35 |
| B4 | 2.8 | 3.15 |
| C | 0.5 | 0.7 |
| D | 20.60 | 21.30 |
| D1 | 16 | 18 |
| E | 15.5 | 16.10 |
| E1 | 13 | 14.7 |
| E2 | 3.80 | 5.3 |
| E3 | 0.8 | 2.60 |
| e | 5.2 | 5.7 |
| L | 19 | 20.5 |
| L1 | 3.9 | 4.6 |
| ΦP | 3.3 | 3.70 |
| Q | 5.2 | 6.00 |
| S | 5.8 | 6.6 |

TO-247 Package

## The name and content of poisonous and harmful material in products

| Part's Name | Hazardous Substance | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pb | Hg | Cd | Cr(VI) | PBB | PBDE | DIBP | DEHP | DBP | BBP |
| Limit | ≤ 0.1% | ≤ 0.1% | ≤ 0.01% | ≤0.1% | ≤0.1% | ≤0.1% | ≤0.1% | ≤0.1% | ≤0.1% | ≤0.1% |
| Lead Frame | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Molding | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Chip | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Wire Bonding | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Solder | × | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Note | ○: Means the hazardous material is under the criterion of 2011/65/EU.<br>×: Means the hazardous material exceeds the criterion of 2011/65/EU.<br>The plumbum element of solder exist in products presently, but within the allowed range of Eurogroup's RoHS. | | | | | | | | | |

## Warnings

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. It is suggested to be used under 80 percent of the maximum ratings of the device.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. IGBTs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. This publication is made by Huajing Microelectronics and subject to regular change without notice.

**WUXI CHINA RESOURCES HUAJING MICROELECTRONICS CO., LTD.**

**Add: No.14 Liangxi RD. Wuxi, Jiangsu, China Mail: 214061 http://www. crhj.com.cn**
**Tel: 0510-85807228 Fax: 0510-85800864**

**Marketing Part: Post: 214061 Tel / Fax: 0510-85807228-3663/5508**
**0510-85800360（Fax）**

**Application and Service: Post: 214061 Tel / Fax: 0510-85807228-3399 / 2227**

# X-ON Electronics

Largest Supplier of Electrical and Electronic Components

***Click to view similar products for*** IGBT Transistors ***category:***

***Click to view products by*** Huajing ***manufacturer:***

Other Similar products are found below :

748152A FGH60T65SHD_F155 APT100GT60B2RG APT13GP120BG APT20GN60BG APT20GT60BRDQ1G APT25GN120B2DQ2G APT35GA90BD15 APT36GA60BD15 APT40GP60B2DQ2G APT40GP90B2DQ2G APT50GN120B2G APT50GT60BRG APT64GA90B2D30 APT70GR120J NGTB10N60FG NGTB30N60L2WG NGTG25N120FL2WG IGP30N60H3XKSA1 STGB15H60DF STGFW20V60DF STGFW30V60DF STGFW40V60F STGWA25H120DF2 FGB3236_F085 APT25GN120BG APT25GR120S APT30GN60BDQ2G APT30GN60BG APT30GP60BG APT30GS60BRDQ2G APT30N60BC6 APT35GP120JDQ2 APT36GA60B APT45GR65B2DU30 APT50GP60B2DQ2G APT68GA60B APT70GR65B APT70GR65B2SCD30 GT50JR22(STA1ES) TIG058E8-TL-H IDW40E65D2 SGB15N120ATMA1 NGTB50N60L2WG STGB10H60DF STGB20V60F STGB40V60F STGFW80V60F IGW40N120H3FKSA1 RJH60D7BDPQ-E0#T2