

HFS22/PM150A120(SA)(555)

IGBT MODULE



File No.: E314528



Features

- Half-bridge (two IGBTs)
- SPT⁺ IGBT
- Including fast free-wheeling diodes
- DCB insulated base plate
- Terminals embeded plastic case

Typical Applications

Welding power supplies, UPS

DESCRIPTION

HFS22 IGBT modules are designed for applications such as motor control,uninterrupted power supplies(UPS) and welding machines.Each module consists of two IGBTs in a half bridge configuration. All components and interconnects are isolated from the heat sinking baseplate.

PRECAUTIONS

1. In order to get effective heat dissipation, heat sink flatness should be between -50 μ m and 100 μ m. It's the same importation to apply thermally-conductive grease with 100 to 200 μ m over the contact surface between a module and a heat sink.
2. Keep the module from being damaged by the static electricity.

MAXIMUM RATINGS (T_j=25°C, unless otherwise specified)

| Symbol | Item | Condition | Rating | Unit |
|------------------|----------------------------|---|-----------|------|
| V _{CES} | Collector-emitter voltage | G、E short | 1200 | V |
| V _{GES} | Gate-emitter voltage | G、E short | ±20 | V |
| I _c | Collector current | T _c =80°C | 140 | A |
| I _{CP} | Peak collector current | T _c =80°C | 300 | A |
| V _{iso} | Isolation voltage | | 2500 | VAC |
| T _j | Junction temperature | | -40 ~ 150 | °C |
| T _{stg} | Storage temperature | | -40 ~ 125 | °C |
| I _F | Diode forward current | T _c =25°C(80°C), T _j =150°C | 140(95) | A |
| I _{FM} | Diode peak forward current | T _c =25°C, T _j =150°C | 300 | A |



HONGFA RELAY

ISO9001、ISO/TS16949、ISO14001、OHSAS18001 CERTIFIED

2007 Rev. 1.00

ELECTRICAL CHARACTERISTICS (T_j=25°C, unless otherwise specified)

| Symbol | Item | Condition | Min. | Typ. | Max. | Units |
|----------------------|--------------------------------------|---|------|------|------|-------|
| V _{GE(th)} | Gate threshold voltage | I _c =3mA, V _{CE} =V _{GE} , T _j =25°C | 5 | 6.2 | 7 | V |
| V _{CE(sat)} | Collector-emitter saturation voltage | I _c =75A, V _{GE} =15V, T _j =25°C | | 1.9 | | V |
| | | I _c =75A, V _{GE} =15V, T _j =125°C | | 2.1 | | V |
| I _{CES} | Zero gate voltage collector current | V _{GE} =0V, V _{CE} =1200V, T _j =25°C | | 0.1 | 1.0 | mA |
| I _{CES} | Gate-emitter leakage current | V _{GE} =±20V, V _{CE} =0V, T _j =125°C | -200 | | 200 | μA |
| C _{ies} | Input capacitance | V _{CE} =25V, V _{GE} =0V, f=1MHz | | 15 | | nF |
| C _{oes} | Output capacitance | V _{CE} =25V, V _{GE} =0V, f=1MHz | | 1 | | nF |
| C _{res} | Reverse transfer capacitance | V _{CE} =25V, V _{GE} =0V, f=1MHz | | 0.8 | | nF |
| Q _G | Total gate charge | | | 1530 | | nC |
| T _{d(on)} | Turn-on delay time | V _{CC} =600V, I _c =75A, | | 220 | | ns |
| T _r | Rise time | R _G =15Ω, V _{GE} =±15V, | | 60 | | ns |
| T _{d(off)} | Turn-off delay time | L _σ =60nH, inductive load | | 530 | | ns |
| T _f | Fall time | | | 75 | | ns |
| E _{on} | Turn on energy | V _{CC} =600V, I _c =75A, R _G =15Ω, V _{GE} =±15V, | | 16.7 | | mJ |
| E _{off} | Turn off energy | L _σ =60nH, inductive load | | 15.3 | | mJ |
| V _{EC} | Diode forward voltage | | | | 2.2 | V |
| T _{rr} | Reverse recovery time | | | | 250 | ns |

THERMAL RESISTANCE (T_j=25°C, unless otherwise specified)

| Symbol | Item | Condition | Min. | Typ. | Max. | Units |
|----------------------|----------------------------|-----------|------|------|------|--------|
| R _{th(j-c)} | Thermal resistance, | per IGBT | — | — | 0.24 | °C / W |
| R _{th(j-c)} | Junction to case | per DIODE | — | — | 0.52 | |
| R _{th(c-t)} | contact thermal resistance | — | — | — | 0.08 | °C / W |

MECHANICAL CHARACTERISTICS (T_j=25°C, unless otherwise specified)

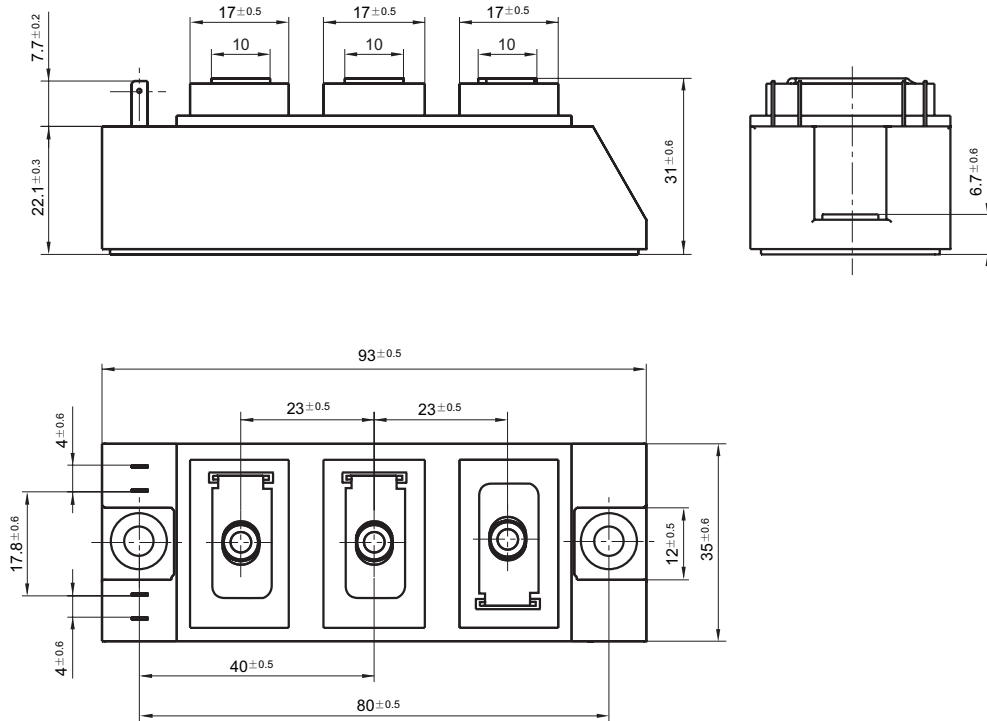
| Symbol | Item | Condition | Min. | Typ. | Max. | Units |
|--------|--------------|-----------|------|------|------|-------|
| — | Screw torque | — | 1.47 | 1.7 | 1.96 | N·m |
| — | Weight | — | — | 190 | — | g |

ORDERING INFORMATION

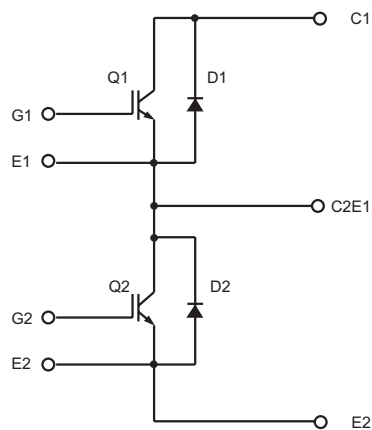
| | |
|-------------------------------|---|
| Type | HFS22 / PM 150 D 120 (SA) (XXX) |
| Module | PM: IGBT module |
| Output rating current | 150: 150A |
| Unit numbers | D: Dual(half bridge) |
| IGBT V _{ces} voltage | 120: 1200V |
| IGBT type | (SA): SPT ⁺ |
| Customer special code | Only for special requirements, e.g. (555) stands for RoHS compliant |

Notes: HFS22 is an environmental friendly product, please mark special code (555) when order.

Outline Dimensions

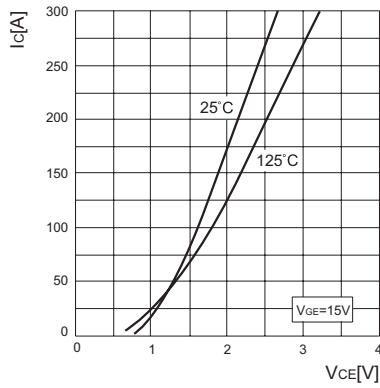


Circuit Diagram

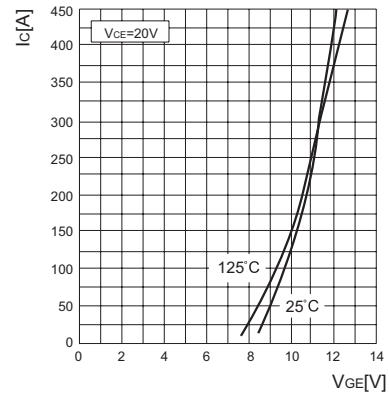


CHARACTERISTIC CURVES

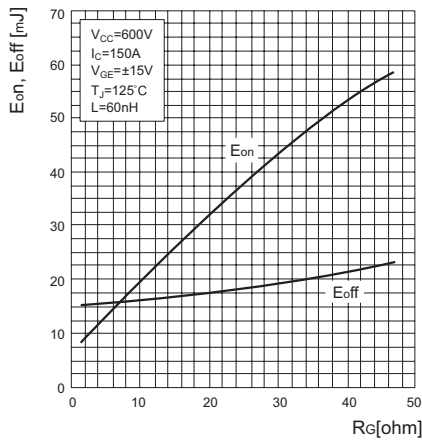
Collector-emitter voltage(V_{CE}) VS collector current(I_c)



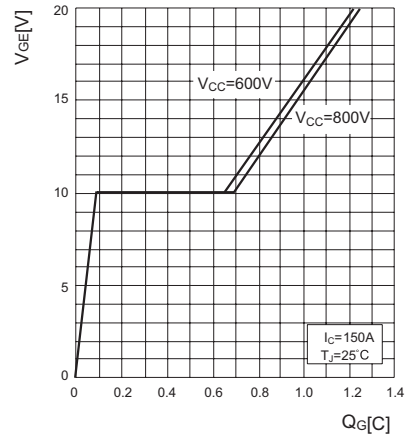
Typ. transfer characteristic



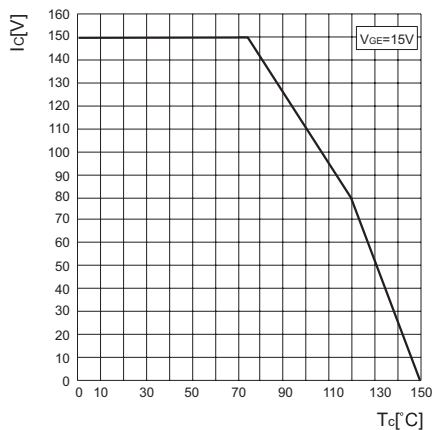
Typ. turn off energy and switching times versus gate resistor



Gate charge curve



Case temperature(T_c)VS collector current(I_c)



Disclaimer

This datasheet is for the customers' reference. All the specifications are subject to change without notice.

We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.