

MITSUBISHI IGBT MODULES
CM75DU-24F

HIGH POWER SWITCHING USE

CM75DU-24F



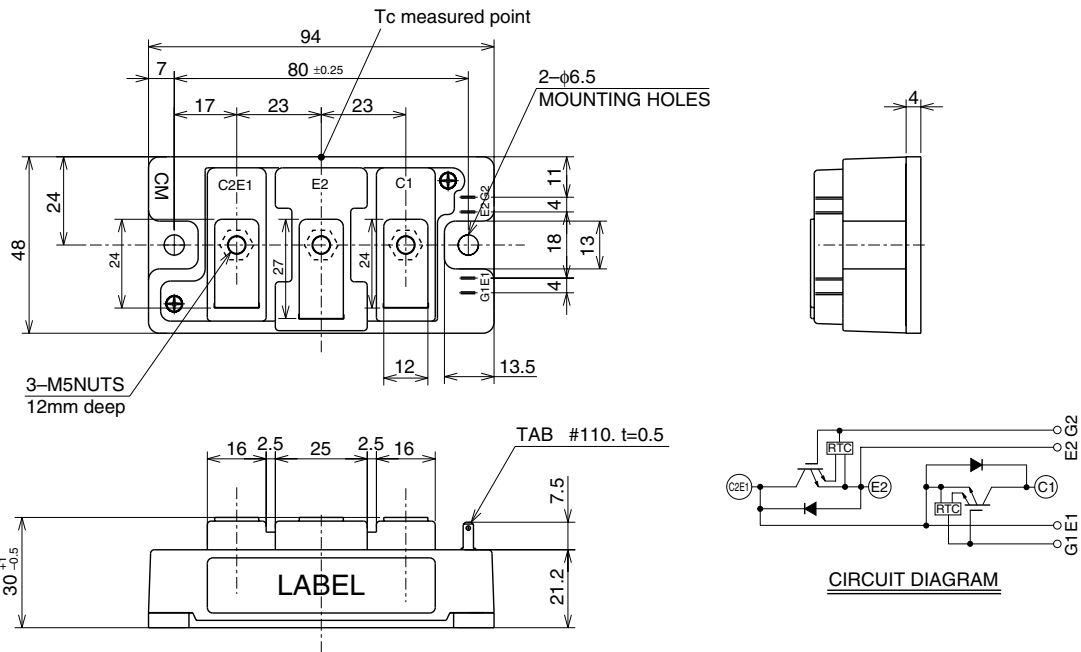
- IC 75A
- VCES 1200V
- Insulated Type
- 2-elements in a pack

APPLICATION

General purpose inverters & Servo controls, etc

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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HIGH POWER SWITCHING USE

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

| Symbol | Parameter | Conditions | Ratings | Unit |
|--------------|-------------------------------|---|------------|-------|
| VCES | Collector-emitter voltage | G-E Short | 1200 | V |
| VGES | Gate-emitter voltage | C-E Short | ±20 | V |
| IC | Collector current | Tc = 25°C | 75 | A |
| ICM | | Pulse (Note 2) | 150 | A |
| IE (Note 1) | Emitter current | Tc = 25°C | 75 | A |
| IEM (Note 1) | | Pulse (Note 2) | 150 | A |
| PC (Note 3) | Maximum collector dissipation | Tc = 25°C | 450 | W |
| Tj | Junction temperature | | -40 ~ +150 | °C |
| Tstg | Storage temperature | | -40 ~ +125 | °C |
| Viso | Isolation voltage | Charged part to base plate, f = 60Hz, AC 1 minute | 2500 | Vrms |
| — | Torque strength | Main terminals M5 screw | 2.5 ~ 3.5 | N • m |
| | | Mounting M6 screw | 3.5 ~ 4.5 | N • m |
| — | Weight | Typical value | 310 | g |

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

| Symbol | Parameter | Test conditions | Limits | | | Unit | |
|--------------|--------------------------------------|---|------------|------|--------|------|---|
| | | | Min. | Typ. | Max. | | |
| ICES | Collector cutoff current | VCE = VCES, VGE = 0V | — | — | 1 | mA | |
| VGE(th) | Gate-emitter threshold voltage | IC = 7.5mA, VCE = 10V | 5 | 6 | 7 | V | |
| IGES | Gate leakage current | ±VGE = VGES, VCE = 0V | — | — | 20 | µA | |
| VCE(sat) | Collector-emitter saturation voltage | IC = 75A, VGE = 15V | Tj = 25°C | — | 1.8 | 2.4 | V |
| | | | Tj = 125°C | — | 1.9 | — | |
| Cies | Input capacitance | VCE = 10V VGE = 0V | — | — | 29 | nF | |
| Coes | Output capacitance | | — | — | 1.3 | nF | |
| Cres | Reverse transfer capacitance | | — | — | 0.75 | nF | |
| QG | Total gate charge | VCC = 600V, IC = 75A, VGE = 15V | — | 825 | — | nC | |
| td(on) | Turn-on delay time | VCC = 600V, IC = 75A VGE = ±15V RG = 4.2Ω, Inductive load IE = 75A | — | — | 100 | ns | |
| tr | Turn-on rise time | | — | — | 50 | ns | |
| td(off) | Turn-off delay time | | — | — | 400 | ns | |
| tf | Turn-off fall time | | — | — | 300 | ns | |
| trr (Note 1) | Reverse recovery time | | — | — | 150 | ns | |
| Qrr (Note 1) | Reverse recovery charge | | — | 3.1 | — | µC | |
| VEC(Note 1) | Emitter-collector voltage | IE = 75A, VGE = 0V | — | — | 3.2 | V | |
| Rth(j-c)Q | Thermal resistance*1 | IGBT part (1/2 module) | — | — | 0.28 | K/W | |
| Rth(j-c)R | | FWDi part (1/2 module) | — | — | 0.47 | K/W | |
| Rth(c-f) | Contact thermal resistance | Case to heat sink, Thermal compound applied*2 (1/2 module) | — | 0.07 | — | K/W | |
| Rth(j-c)Q | Thermal resistance | Case temperature measured point is just under the chips | — | — | 0.22*3 | K/W | |
| RG | External gate resistance | | 4.2 | — | 42 | Ω | |

Note 1. IE, VEC, trr, Qrr & die/dt represent characteristics of the anti-parallel, emitter-collector free-wheel diode (FWDi).

2. Pulse width and repetition rate should be such that the device junction temperature (Tj) does not exceed Tjmax rating.

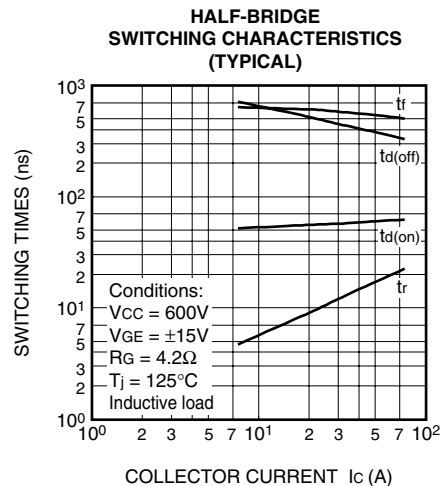
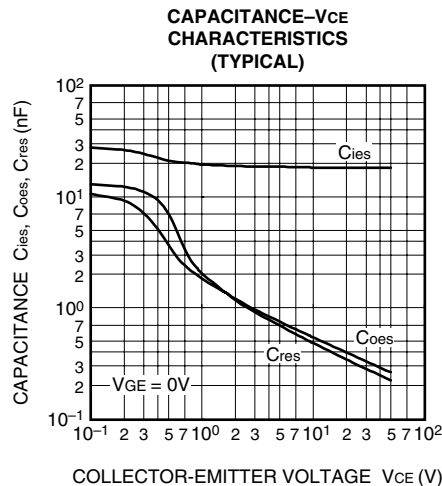
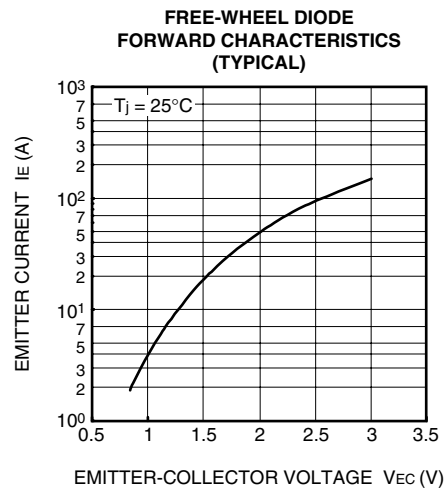
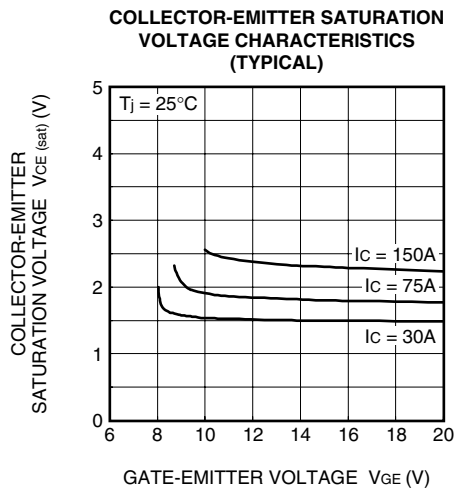
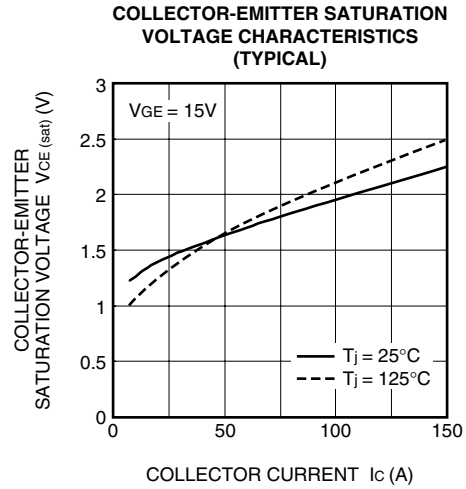
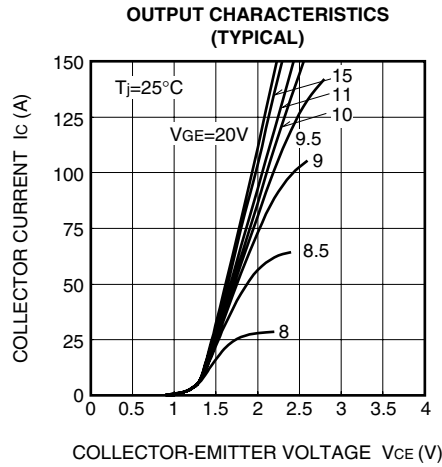
3. Junction temperature (Tj) should not increase beyond 150°C.

*1 : Case temperature (Tc) measured point is indicated in OUTLINE DRAWING.

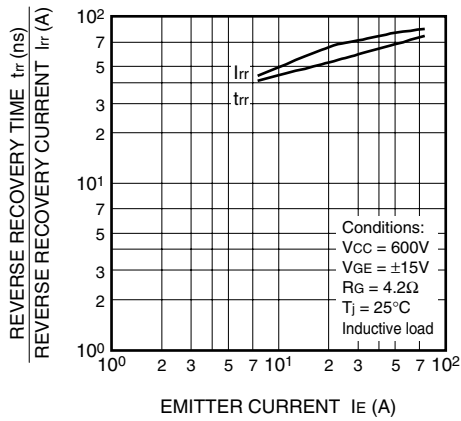
*2 : Typical value is measured by using thermally conductive grease of λ = 0.9[W/(m • K)].

*3 : If you use this value, Rth(f-a) should be measured just under the chips.

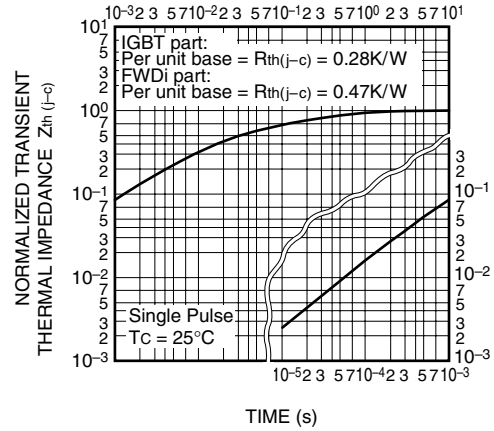
PERFORMANCE CURVES



REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT part & FWDi part)



GATE CHARGE CHARACTERISTICS (TYPICAL)

