

CM600DU-5F

HIGH POWER SWITCHING USE

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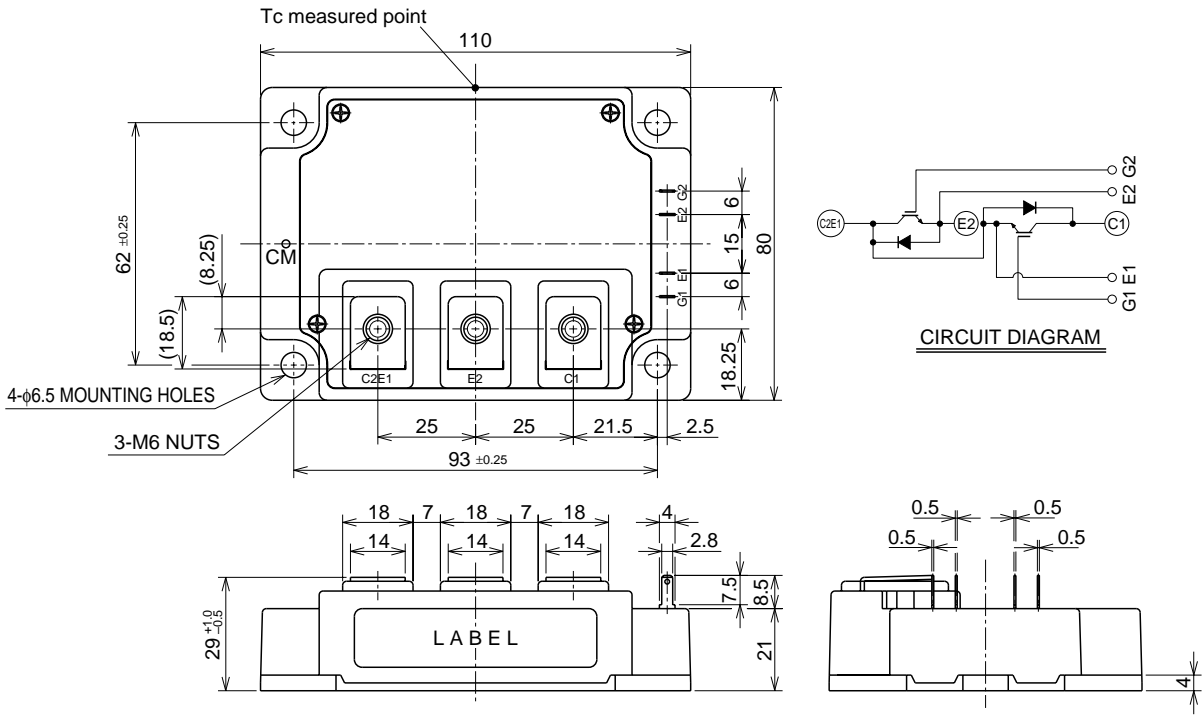
- Ic 600A
- VCES 250V
- Insulated Type
- 2-elements in a pack

APPLICATION

AC motor control of forklift (battery power source)

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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MAXIMUM RATINGS (T_j = 25°C)

| Symbol | Parameter | Conditions | Ratings | Unit |
|------------------------------|-------------------------------|--|------------|--------------------|
| V _{CES} | Collector-emitter voltage | G-E Short | 250 | V |
| V _{GES} | Gate-emitter voltage | C-E Short | ±20 | V |
| I _C | Collector current | T _C = 25°C | 600 | A |
| I _{C(rms)} | | | 350 | A _(rms) |
| I _{CM} | | Pulse (Note 2) | 1200 | A |
| I _E (Note 1) | Emitter current | T _C = 25°C | 600 | A |
| I _{E(rms)} (Note 1) | | | 350 | A _(rms) |
| I _{EM} (Note 1) | | Pulse (Note 2) | 1200 | A |
| P _C (Note 3) | Maximum collector dissipation | T _C = 25°C | 1100 | W |
| T _j | Junction temperature | | -40 ~ +150 | °C |
| T _{stg} | Storage temperature | | -40 ~ +125 | °C |
| V _{iso} | Isolation voltage | Main terminal to base plate, AC 1 min. | 2500 | V |
| — | Mounting torque | Main Terminal M6 | 3.5 ~ 4.5 | N • m |
| | | Mounting holes M6 | 3.5 ~ 4.5 | N • m |
| — | Weight | Typical value | 580 | g |

ELECTRICAL CHARACTERISTICS (T_j = 25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|--------------------------|---|---|-----------------------|------|------|------|
| | | | Min. | Typ. | Max. | |
| I _{CES} | Collector cutoff current | V _{CE} = V _{CES} , V _{GE} = 0V | — | — | 1 | mA |
| V _{GE(th)} | Gate-emitter threshold voltage | I _C = 60mA, V _{CE} = 10V | 3.0 | 4.0 | 5.0 | V |
| I _{GES} | Gate leakage current | V _{GE} = V _{CES} , V _{CE} = 0V | — | — | 0.5 | μA |
| V _{CE(sat)} | Collector to emitter saturation voltage | T _j = 25°C | — | 1.2 | 1.7 | V |
| | | T _j = 125°C | — | 1.1 | — | |
| C _{ies} | Input capacitance | V _{CE} = 10V V _{GE} = 0V | — | — | 170 | nF |
| C _{oes} | Output capacitance | | — | — | 11 | |
| C _{res} | Reverse transfer capacitance | | — | — | 5.7 | |
| Q _G | Total gate charge | V _{CC} = 100V, I _C = 600A, V _{GE} = 10V | — | 2200 | — | nC |
| t _{d(on)} | Turn-on delay time | V _{CC} = 100V, I _C = 600A V _{GE1} = V _{GE2} = 10V R _G = 4.2Ω, Inductive load switching operation | — | — | 850 | ns |
| t _r | Turn-on rise time | | — | — | 600 | |
| t _{d(off)} | Turn-off delay time | | — | — | 1100 | |
| t _f | Turn-off fall time | | — | — | 500 | |
| t _{rr} (Note 1) | Reverse recovery time | | I _E = 600A | — | — | |
| Q _{rr} (Note 1) | Reverse recovery charge | | — | 20.0 | — | μC |
| V _{EC} (Note 1) | Emitter-collector voltage | I _E = 600A, V _{GE} = 0V | — | — | 2 | V |
| R _{th(j-c)Q} | Thermal resistance*1 | IGBT part (1/2 module) | — | — | 0.11 | °C/W |
| R _{th(j-c)R} | | FWDi part (1/2 module) | — | — | 0.20 | |
| R _{th(c-f)} | Contact thermal resistance | Case to fin, Thermal compound applied*2 (1/2 module) | — | 0.02 | — | |
| R _{th(j-c)Q} | Thermal resistance*3 | T _c measured point is just under the chips | — | — | 0.05 | |

Note 1. I_E, V_{EC}, t_{rr}, Q_{rr} and die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode. (FWDi).

2. Pulse width and repetition rate should be such that the device junction temp. (T_j) does not exceed T_{jmax} rating.

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

4. Pulse width and repetition rate should be such as to cause negligible temperature rise.

*1 : T_c measured point is indicated in OUTLINE DRAWING.

*2 : Typical value is measured by using Shin-etsu Silicone "G-746".

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