**CM400DY-24A** B

HIGH POWER SWITCHING USE

| Pre. | Furuie,J.Yamada | Rev | B | H.Hanada, |
|---|---|---|---|---|
| Apr. | M.Tabata 28-Feb-'03 | | | M.Tabata 9-May-'03 |

CM400DY-24A

- Ic ····· 400A
- $V_{CES}$ ····· 1200V
- Insulated Type
- 2-elements in a pack

APPLICATION

AC drive inverters & Servo controls,etc

ABSOLUTE MAXIMUM RATINGS ($T_j$ = 25 °C)

| Symbol | Item | Conditions | Ratings | Units | |
|---|---|---|---|---|---|
| $V_{CES}$ | Collector-emitter voltage | G-E Short | 1200 | V | |
| $V_{GES}$ | Gate-emitter voltage | C-E Short | ±20 | V | |
| $I_C$ | Collector current | DC, Tc=87 °C *1 | 400 | A | B |
| $I_{CM}$ | | Pulse ② | 800 | | |
| $I_E$ ① | Emitter current | | 400 | A | |
| $I_{EM}$ ① | | Pulse ② | 800 | | |
| Pc ③ | Maximum collector dissipation | Tc= 25 °C *1 | 2710 | W | B |
| Tj | Junction temperature | | −40~+150 | °C | |
| Tstg | Storage temperature | | −40~+125 | °C | |
| Viso | Isolation voltage | Main terminal to base plate,AC 1 min. | 2500 | V | |
| — | Torque strength | Main terminal M6 | 3.5 ~ 4.5 | N·m | |
| — | Torque strength | Mounting holes M6 | 3.5 ~ 4.5 | N·m | |
| — | Weight | Typical value | 580 | g | |

ELECTRICAL CHARACTERISTICS ($T_j$ = 25 °C)

| Symbol | Item | Conditions | | Min. | Typ. | Max. | Units | |
|---|---|---|---|---|---|---|---|---|
| $I_{CES}$ | Collector cutoff current | $V_{CE}=V_{CES}, V_{GE}=$ 0V | | — | — | 1 | mA | |
| $V_{GE(th)}$ | Gate-emitter threshold voltage | $I_C$=40mA, $V_{CE}=$ 10V | | 6 | 6.8 | 7.5 | V | |
| $I_{GES}$ | Gate leakage current | $V_{GE}=V_{GES}$, $V_{CE}=$ 0V | | — | — | 0.5 | μA | |
| $V_{CE(sat)}$ | Collector to emitter saturation voltage | $T_j=$ 25 °C | $I_C$ = 400A | — | 2.1 | 3.0 | V | |
| | | $T_j=$ 125 °C | $V_{GE}=$ 15V | — | 2.4 | — | | |
| Cies | Input capacitance | $V_{CE}=$ 10V | | — | — | 70 | nF | |
| Coes | Output capacitance | $V_{GE}=$ 0V | | — | — | 6 | | |
| Cres | Reverse transfer capacitance | | | — | — | 1.4 | | |
| $Q_G$ | Total gate charge | $V_{CC}$=600V, Ic=400A, $V_{GE}$=15V | | — | 2000 | — | nC | |
| td(on) | Turn-on delay time | $V_{CC}$=600V, Ic=400A | | — | — | 550 | ns | |
| tr | Turn-on rise time | $V_{GE1}=V_{GE2}$=15V | | — | — | 180 | | |
| td(off) | Turn-off delay time | $R_G$=0.78Ω, Inductive load | | — | — | 600 | | |
| tf | Turn-off fall time | switching operation | | — | — | 350 | | |
| trr ① | Reverse recovery time | $I_E$=400A | | — | — | 250 | ns | |
| Qrr ① | Reverse recovery charge | | | — | 16 | — | μC | |
| $V_{EC}$ ① | Emitter-collector voltage | $I_E$=400A, $V_{GE}=$ 0V | | — | — | 3.8 | V | |
| Rth(j-c)Q | Thermal resistance | IGBT part (1/2 module) *1 | | — | — | 0.046 | °C/W | B |
| Rth(j-c)R | | FWDi part(1/2 module) *1 | | — | — | 0.085 | | |
| Rth(c-f) | Contact thermal resistance | Case to fin, Thermal compound Applied (1/2module) *2 | | — | 0.02 | — | | A |
| RG | External gate resistance | | | 0.78 | — | 10 | Ω | |

*1: Tc, Tf measured point is just under the chips. B

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

① $I_E$, $V_{EC}$, trr & Qrr 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.($T_j$) dose not exceed Tjmax rating.

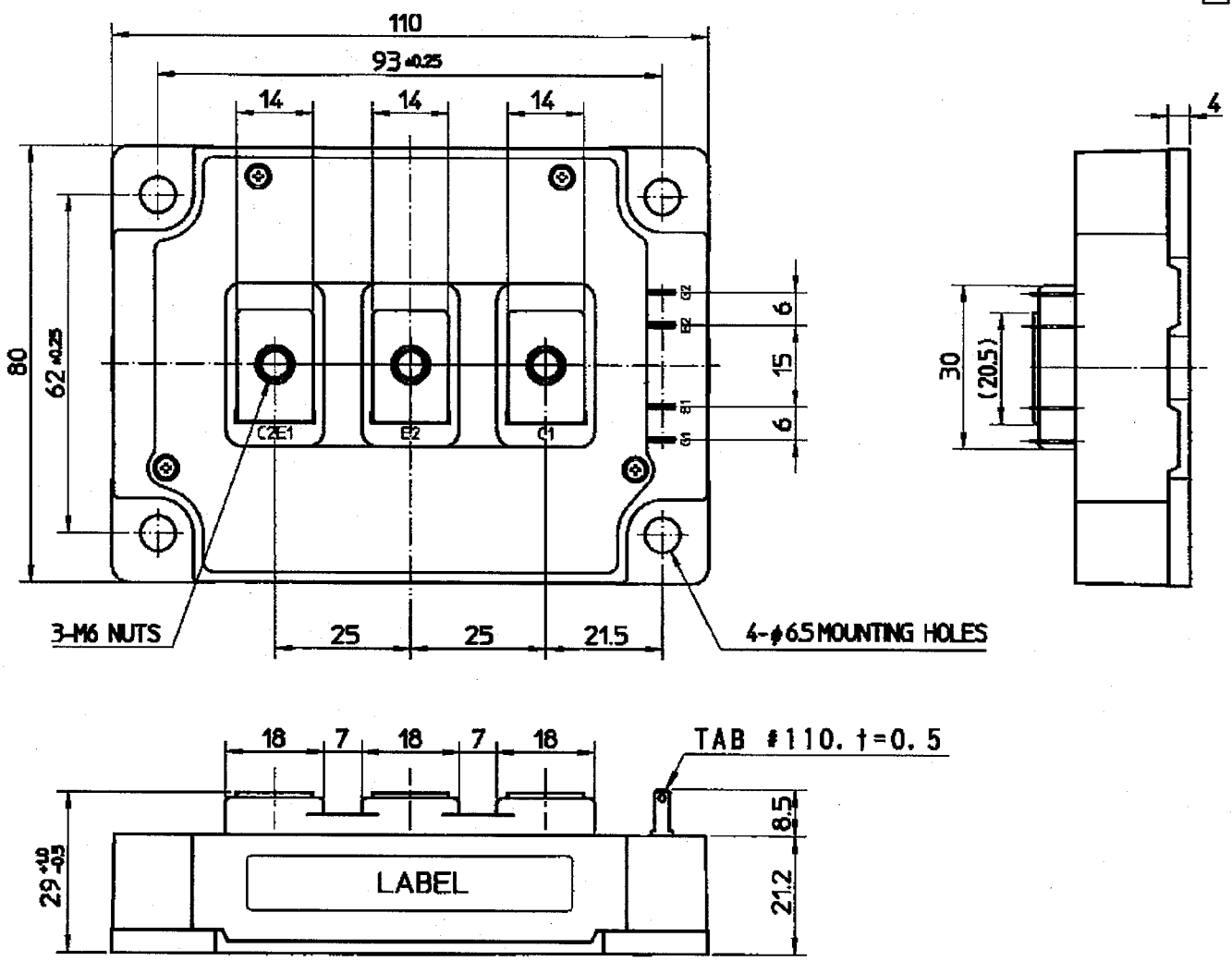
③ Junction temperature ($T_j$) should not increase beyond 150°C.

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

OUTLINE DRAWING

Dimensions in mm

B




CIRCUIT DIAGRAM