

MITSUBISHI HVIGBT MODULES  
**CM600E2Y-34H**

HVIGBT (High Voltage Insulated Gate Bipolar Transistor) Modules

HIGH POWER SWITCHING USE  
 INSULATED TYPE

**CM600E2Y-34H**



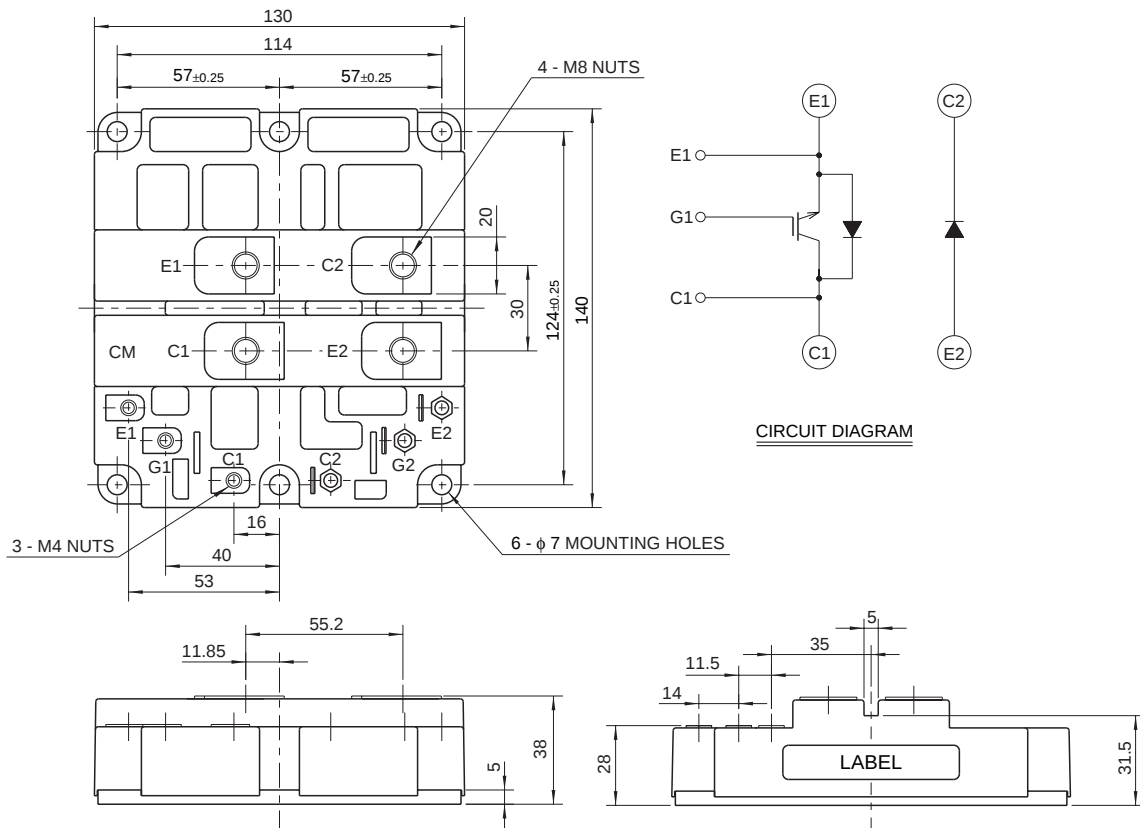
- IC ..... 600A
- VCES ..... 1700V
- Insulated Type
- 1-elements in a pack (for brake)

**APPLICATION**

DC choppers, Dynamic braking choppers.

**OUTLINE DRAWING & CIRCUIT DIAGRAM**

Dimensions in mm



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## MAXIMUM RATINGS (Tj = 25°C)

| Symbol       | Item                          | Conditions                                                 | Ratings      | Unit |
|--------------|-------------------------------|------------------------------------------------------------|--------------|------|
| VCES         | Collector-emitter voltage     | VGE = 0V                                                   | 1700         | V    |
| VGES         | Gate-emitter voltage          | VCE = 0V                                                   | ±20          | V    |
| IC           | Collector current             | Tc = 25°C                                                  | 600          | A    |
| ICM          |                               | Pulse (Note 1)                                             | 1200         | A    |
| IE (Note 2)  | Emitter current               | Tc = 25°C                                                  | 600          | A    |
| IEM (Note 2) |                               | Pulse (Note 1)                                             | 1200         | A    |
| PC (Note 3)  | Maximum collector dissipation | Tc = 25°C, IGBT part                                       | 6200         | W    |
| Tj           | Junction temperature          | —                                                          | −40 ~ +150   | °C   |
| Tstg         | Storage temperature           | —                                                          | −40 ~ +125   | °C   |
| Viso         | Isolation voltage             | Charged part to base plate, rms, sinusoidal, AC 60Hz 1min. | 4000         | V    |
| —            | Mounting torque               | Main terminals screw M8                                    | 6.67 ~ 13.00 | N·m  |
| —            |                               | Mounting screw M6                                          | 2.84 ~ 6.00  | N·m  |
| —            |                               | Auxiliary terminals screw M4                               | 0.88 ~ 2.00  | N·m  |
| —            | Mass                          | Typical value                                              | 1.5          | kg   |

## ELECTRICAL CHARACTERISTICS (Tj = 25°C)

| Symbol       | Item                                 | Conditions                                              | Limits |       |       | Unit |
|--------------|--------------------------------------|---------------------------------------------------------|--------|-------|-------|------|
|              |                                      |                                                         | Min    | Typ   | Max   |      |
| ICES         | Collector cutoff current             | VCE = VCES, VGE = 0V                                    | —      | —     | 12    | mA   |
| VGE(th)      | Gate-emitter threshold voltage       | IC = 60mA, VCE = 10V                                    | 4.5    | 5.5   | 6.5   | V    |
| IGES         | Gate-leakage current                 | VGE = VGES, VCE = 0V                                    | —      | —     | 0.5   | μA   |
| VCE(sat)     | Collector-emitter saturation voltage | Tj = 25°C                                               | —      | 2.75  | 3.58  | V    |
|              |                                      | Tj = 125°C                                              | —      | 3.30  | —     |      |
| Cies         | Input capacitance                    | VCE = 10V<br>VGE = 0V                                   | —      | 70    | —     | nF   |
| Coes         | Output capacitance                   |                                                         | —      | 10.0  | —     | nF   |
| Cres         | Reverse transfer capacitance         |                                                         | —      | 3.8   | —     | nF   |
| QG           | Total gate charge                    | VCC = 850V, IC = 600A, VGE = 15V                        | —      | 3.3   | —     | μC   |
| td (on)      | Turn-on delay time                   | VCC = 850V, IC = 600A                                   | —      | —     | 1.20  | μs   |
| tr           | Turn-on rise time                    | VGE1 = VGE2 = 15V                                       | —      | —     | 1.50  | μs   |
| td (off)     | Turn-off delay time                  | RG = 3.3Ω                                               | —      | —     | 2.00  | μs   |
| tf           | Turn-off fall time                   | Resistive load switching operation                      | —      | —     | 0.60  | μs   |
| VEC (Note 2) | Emitter-collector voltage            | IE = 600A, VGE = 0V                                     | —      | 2.40  | 3.12  | V    |
| trr (Note 2) | Reverse recovery time                | IE = 600A                                               | —      | —     | 2.00  | μs   |
| Qrr (Note 2) | Reverse recovery charge              | die / dt = −1200A / μs                                  | —      | 100   | —     | μC   |
| Rth(j-c)Q    | Thermal resistance                   | Junction to case, IGBT part                             | —      | —     | 0.020 | K/W  |
| Rth(j-c)R    |                                      | Junction to case, FWDi part                             | —      | —     | 0.064 | K/W  |
| Rth(c-f)     | Contact thermal resistance           | Case to fin, conductive grease applied (Per 1/2 module) | —      | 0.016 | —     | K/W  |
| VFM          | Forward voltage                      | IF = 600A, Clamp diode part                             | —      | 2.50  | 3.25  | V    |
| trr          | Reverse recovery time                | IF = 600A                                               | —      | —     | 2.00  | μs   |
| Qrr          | Reverse recovery charge              | di / dt = −1200A / μs, Clamp diode part                 | —      | 100   | —     | μC   |
| Rth(j-c)     | Thermal resistance                   | Junction to case, Clamp diode part                      | —      | —     | 0.064 | K/W  |
| Rth(c-f)     | Contact thermal resistance           | Case to fin, conductive grease applied (Per 1/2 module) | —      | 0.016 | —     | K/W  |

Note 1. Pulse width and repetition rate should be such that the device junction temp. (Tj) does not exceed Tjmax rating.

2. IE, VEC, trr, Qrr & die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode.

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

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

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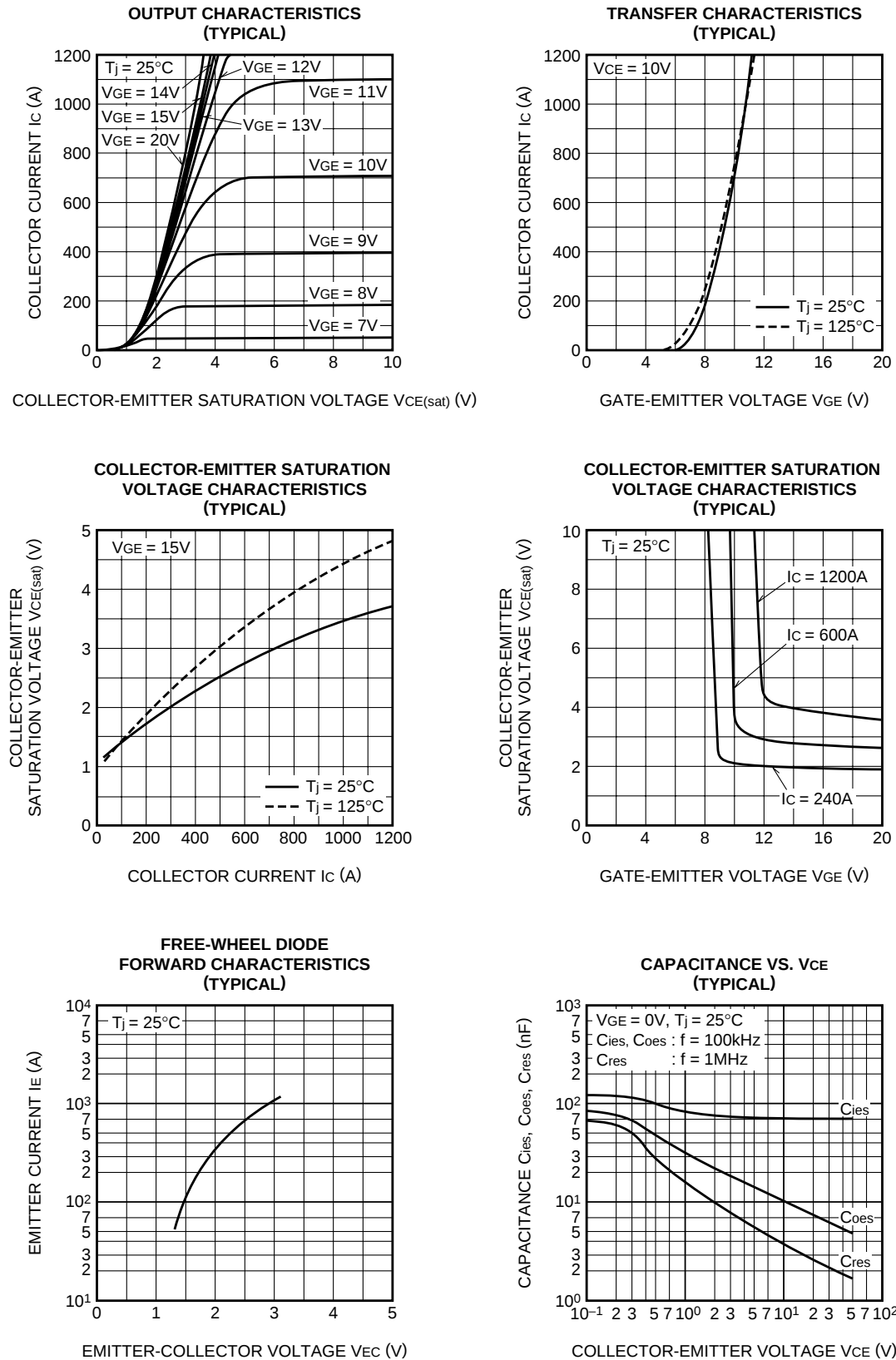
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## PERFORMANCE CURVES



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