


**PRELIMINARY**  
 Notice: This is not a final specification.  
 Some parametric limits are subject to change.

MITSUBISHI INSULATED GATE BIPOLAR TRANSISTOR

**CT15SM-24**

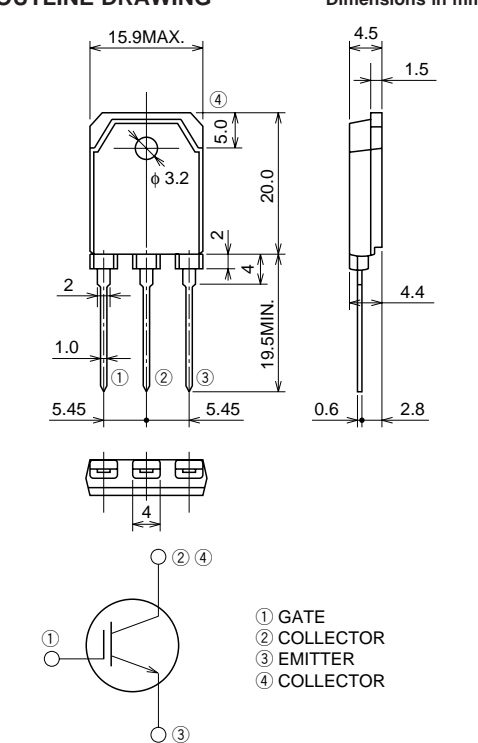
GENERAL INVERTER • UPS USE

**CT15SM-24**



- VCES ..... 1200V
- IC ..... 15A
- High Speed Switching
- Low VCE Saturation Voltage

**OUTLINE DRAWING** Dimensions in mm



① GATE  
 ② COLLECTOR  
 ③ EMITTER  
 ④ COLLECTOR

**TO-3P**

**APPLICATION**

AC & DC motor controls, General purpose inverters, UPS, Power supply switching, Servo controls, etc.

**MAXIMUM RATINGS** (Tc = 25°C)

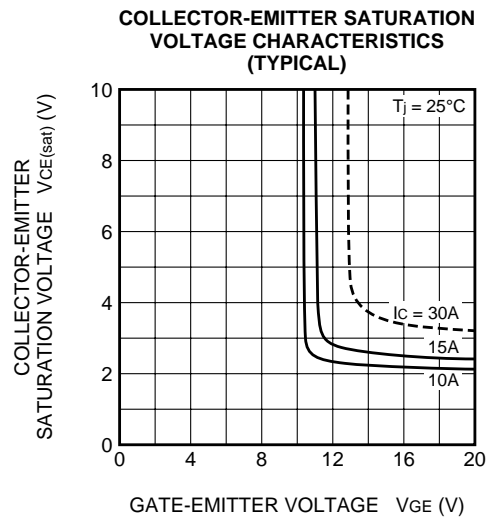
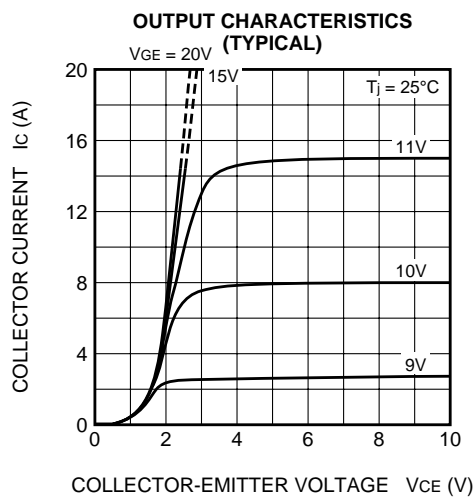
| Symbol            | Parameter                  | Conditions           | Ratings    | Unit |
|-------------------|----------------------------|----------------------|------------|------|
| V <sub>CE</sub> S | Collector-emitter voltage  | V <sub>GE</sub> = 0V | 1200       | V    |
| V <sub>GES</sub>  | Gate-emitter voltage       | V <sub>CE</sub> = 0V | ±20        | V    |
| V <sub>GEM</sub>  | Peak gate-emitter voltage  | V <sub>CE</sub> = 0V | ±30        | V    |
| I <sub>C</sub>    | Collector current          |                      | 15         | A    |
| I <sub>CM</sub>   | Collector current (Pulsed) |                      | 30         | A    |
| P <sub>C</sub>    | Maximum power dissipation  |                      | 250        | W    |
| T <sub>j</sub>    | Junction temperature       |                      | -40 ~ +150 | °C   |
| T <sub>stg</sub>  | Storage temperature        |                      | -40 ~ +150 | °C   |
| —                 | Weight                     | Typical value        | 4.8        | g    |

**PRELIMINARY**  
 Notice: This is not a final specification.  
 Some parametric limits are subject to change.

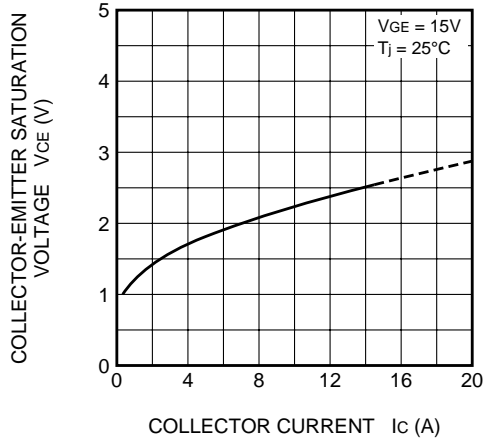
**ELECTRICAL CHARACTERISTICS** ( $T_j = 25^\circ\text{C}$ )

| Symbol        | Parameter                            | Test conditions                                                                                          | Limits |      |           | Unit               |
|---------------|--------------------------------------|----------------------------------------------------------------------------------------------------------|--------|------|-----------|--------------------|
|               |                                      |                                                                                                          | Min.   | Typ. | Max.      |                    |
| V (BR) CES    | Collector-emitter breakdown voltage  | $I_C = 1\text{mA}, V_{GE} = 0\text{V}$                                                                   | 1200   | —    | —         | V                  |
| IGES          | Collector-emitter leakage current    | $V_{GE} = \pm 30\text{V}, V_{CE} = 0\text{V}$                                                            | —      | —    | $\pm 0.5$ | $\mu\text{A}$      |
| ICES          | Gate-emitter leakage current         | $V_{CE} = 1200\text{V}, V_{GE} = 0\text{V}$                                                              | —      | —    | 1         | mA                 |
| $V_{GE(th)}$  | Gate-emitter threshold voltage       | $I_C = 1.5\text{mA}, V_{CE} = 10\text{V}$                                                                | 4.5    | 6.0  | 7.5       | V                  |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_C = 15\text{A}, V_{GE} = 15\text{V}$                                                                  | —      | 2.7  | 3.6       | V                  |
| $C_{ies}$     | Input capacitance                    | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$                                               | —      | 1600 | —         | pF                 |
| $C_{oes}$     | Output capacitance                   |                                                                                                          | —      | 150  | —         | pF                 |
| $C_{res}$     | Reverse transfer capacitance         |                                                                                                          | —      | 45   | —         | pF                 |
| $t_d(on)$     | Turn-on delay time                   | $V_{CC} = 600\text{V}, \text{Resistance load}, I_C = 15\text{A}, V_{GE} = 15\text{V}, R_{GE} = 20\Omega$ | —      | 50   | —         | ns                 |
| $t_r$         | Rise time                            |                                                                                                          | —      | 150  | —         | ns                 |
| $t_d(off)$    | Turn-off delay time                  |                                                                                                          | —      | 150  | —         | ns                 |
| $t_f$         | Fall time                            |                                                                                                          | —      | 250  | —         | ns                 |
| $R_{th(j-c)}$ | Thermal resistance                   | Junction to case                                                                                         | —      | —    | 0.50      | $^\circ\text{C/W}$ |

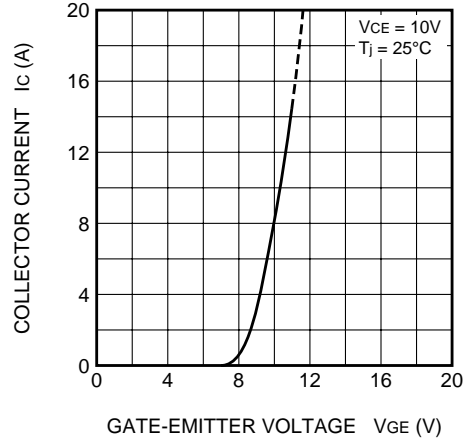
**PERFORMANCE CURVES**



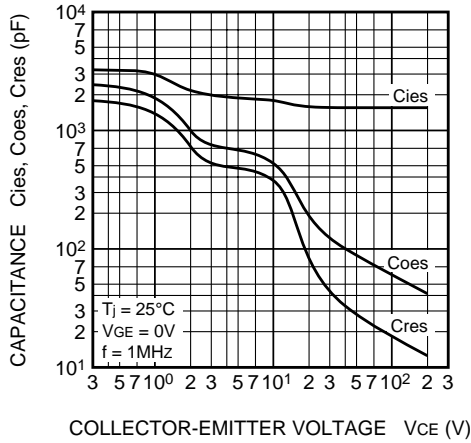
**COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)**



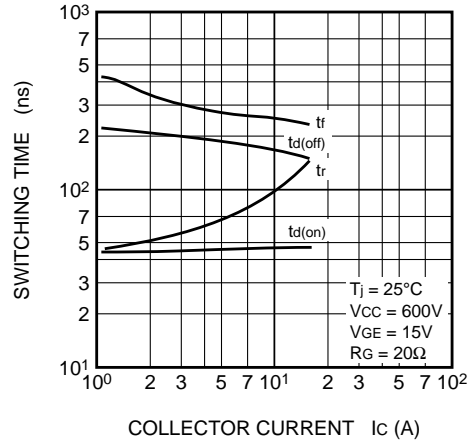
**COLLECTOR CURRENT VS. GATE EMITTER VOLTAGE CHARACTERISTIC (TYPICAL)**



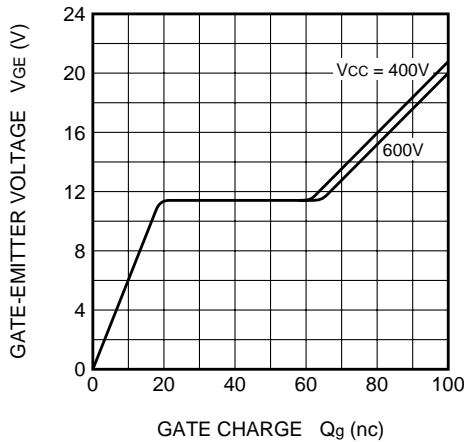
**CAPACITANCE VS. COLLECTOR-EMITTER VOLTAGE CHARACTERISTIC (TYPICAL)**



**SWITCHING TIME-COLLECTOR CURRENT CHARACTERISTIC (TYPICAL)**



**GATE-EMITTER VOLTAGE VS. GATE CHARGE CHARACTERISTIC (TYPICAL)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TYPICAL)**

