

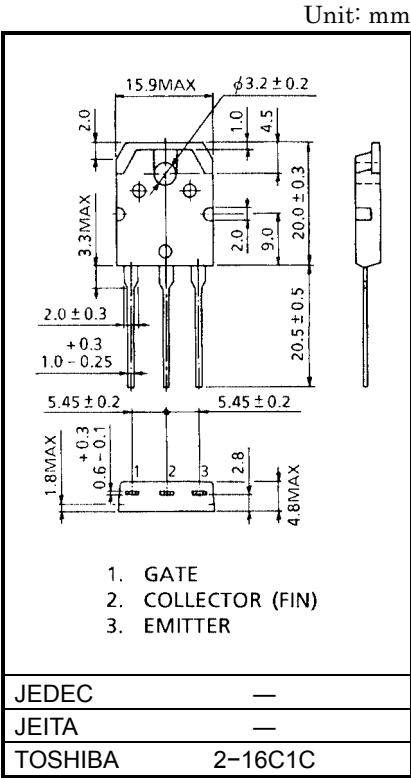
GT20J301

HIGH POWER SWITCHING APPLICATIONS  
MOTOR CONTROL APPLICATIONS

- The 3rd Generation
- Enhancement-Mode
- High Speed :  $t_f = 0.30\mu s$  (Max.)
- Low Saturation Voltage :  $V_{CE(sat)} = 2.7V$  (Max.)
- FRD included between Emitter and Collector

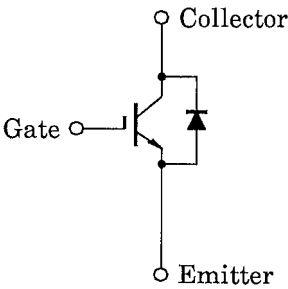
MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                          |     | SYMBOL    | RATING   | UNIT |
|-----------------------------------------|-----|-----------|----------|------|
| Collector-Emitter Voltage               |     | $V_{CES}$ | 600      | V    |
| Gate-Emitter Voltage                    |     | $V_{GES}$ | $\pm 20$ | V    |
| Collector Current                       | DC  | $I_C$     | 20       | A    |
|                                         | 1ms | $I_{CP}$  | 40       | A    |
| Emitter-Collector Forward Current       | DC  | $I_F$     | 20       | A    |
|                                         | 1ms | $I_{FM}$  | 40       | A    |
| Collector Power Dissipation (Tc = 25°C) |     | $P_C$     | 130      | W    |
| Junction Temperature                    |     | $T_j$     | 150      | °C   |
| Storage Temperature Range               |     | $T_{stg}$ | -55~150  | °C   |



Weight: 4.6g

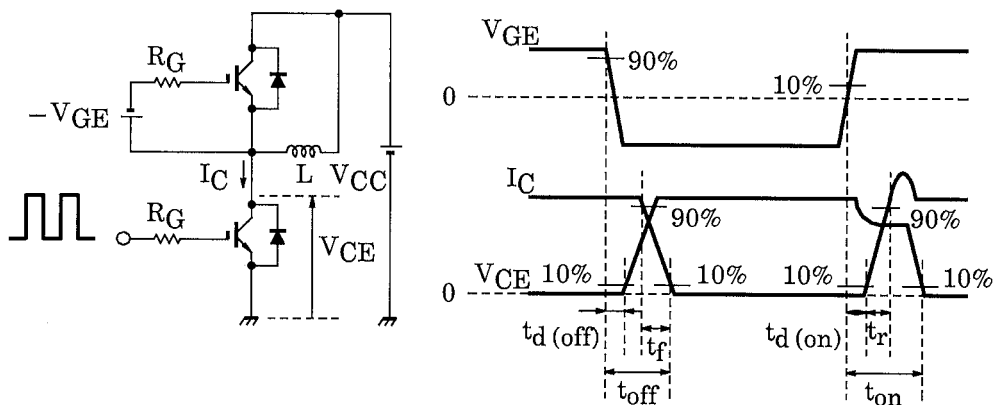
EQUIVALENT CIRCUIT



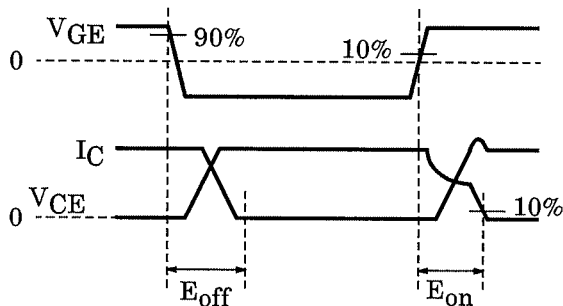
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

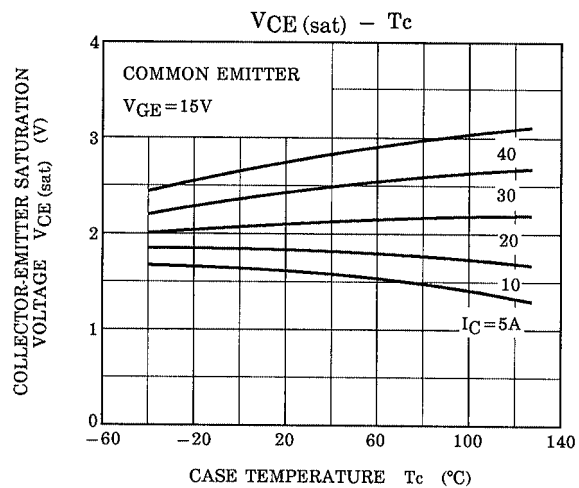
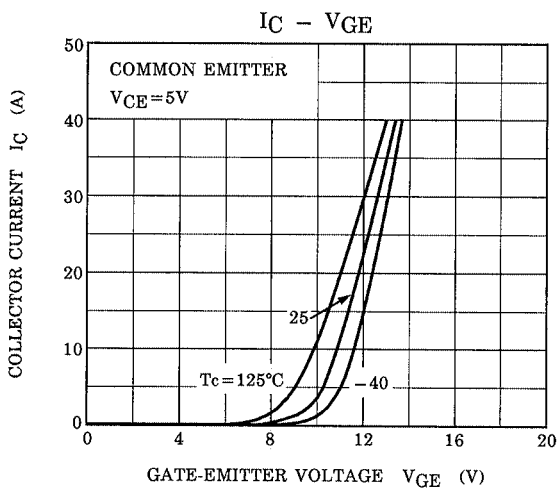
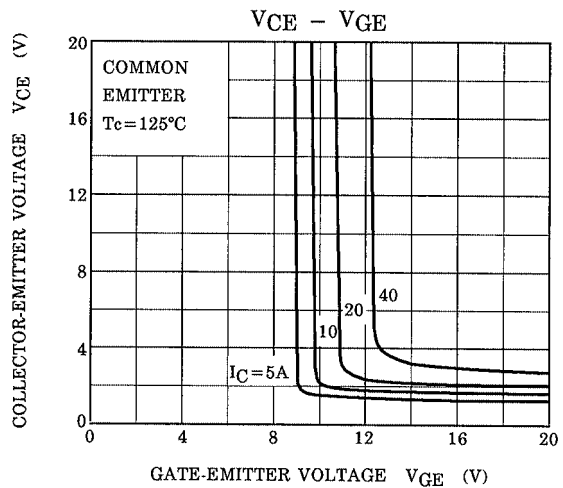
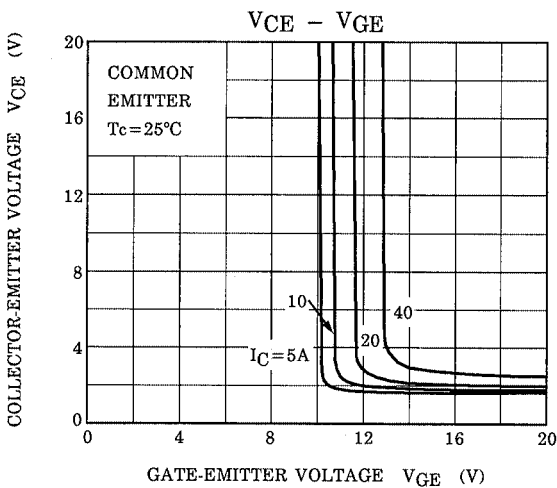
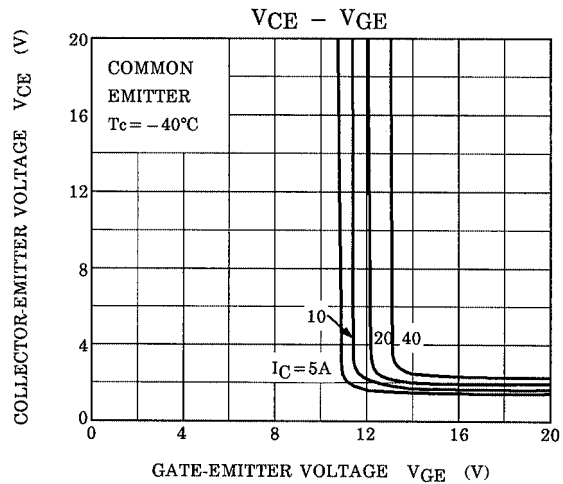
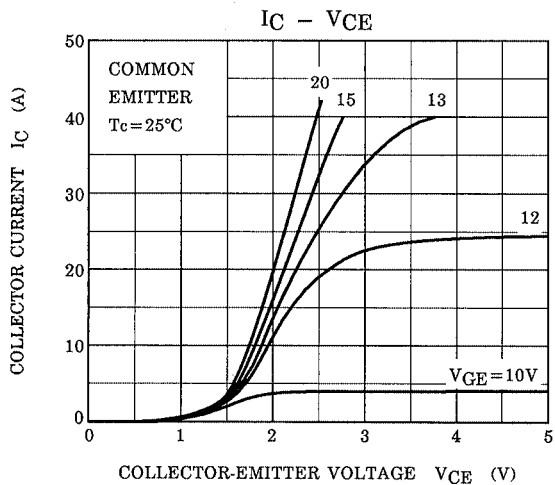
| CHARACTERISTIC                       |               | SYMBOL         | TEST CONDITION                                                                               | MIN | TYP. | MAX       | UNIT          |
|--------------------------------------|---------------|----------------|----------------------------------------------------------------------------------------------|-----|------|-----------|---------------|
| Gate Leakage Current                 |               | $I_{GES}$      | $V_{GE} = \pm 20V, V_{CE} = 0$                                                               | —   | —    | $\pm 500$ | nA            |
| Collector Cut-Off Current            |               | $I_{CES}$      | $V_{CE} = 600V, V_{GE} = 0$                                                                  | —   | —    | 1.0       | mA            |
| Gate-Emitter Cut-Off Voltage         |               | $V_{GE (OFF)}$ | $I_C = 2mA, V_{CE} = 5V$                                                                     | 5.0 | —    | 8.0       | V             |
| Collector-Emitter Saturation Voltage |               | $V_{CE (sat)}$ | $I_C = 20A, V_{GE} = 15V$                                                                    | —   | 2.1  | 2.7       | V             |
| Input Capacitance                    |               | $C_{ies}$      | $V_{CE} = 20V, V_{GE} = 0, f = 1MHz$                                                         | —   | 1450 | —         | pF            |
| Switching Time                       | Rise Time     | $t_r$          | Inductive Load<br>$V_{CC} = 300V, I_C = 20A$<br>$V_{GG} = \pm 15V, R_G = 56\Omega$<br>(Note) | —   | 0.12 | —         | $\mu s$       |
|                                      | Turn-On Time  | $t_{on}$       |                                                                                              | —   | 0.40 | —         |               |
|                                      | Fall Time     | $t_f$          |                                                                                              | —   | 0.15 | 0.30      |               |
|                                      | Turn-Off Time | $t_{off}$      |                                                                                              | —   | 0.70 | —         |               |
| Peak Forward Voltage                 |               | $V_F$          | $I_F = 20A, V_{GE} = 0$                                                                      | —   | —    | 2.0       | V             |
| Reverse Recovery Time                |               | $t_{rr}$       | $I_F = 20A, di/dt = -100A/\mu s$                                                             | —   | —    | 200       | ns            |
| Thermal Resistance (IGBT)            |               | $R_{th (j-c)}$ | —                                                                                            | —   | —    | 0.96      | $^{\circ}C/W$ |
| Thermal Resistance (Diode)           |               | $R_{th (j-c)}$ | —                                                                                            | —   | —    | 2.5       | $^{\circ}C/W$ |

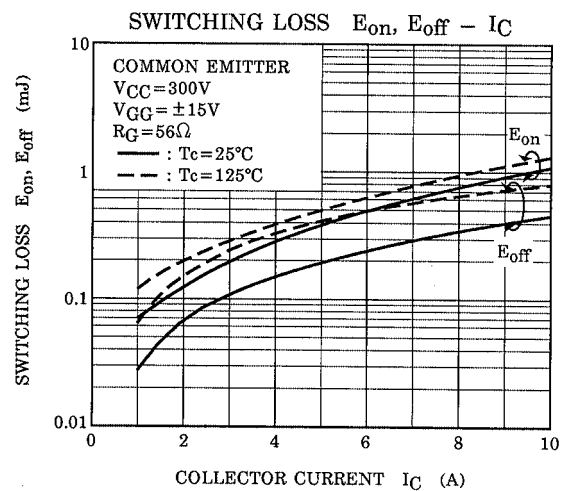
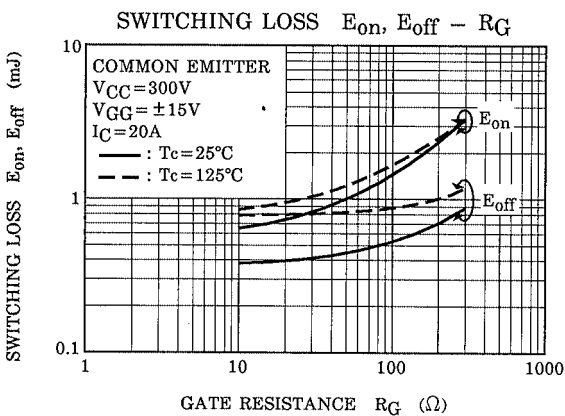
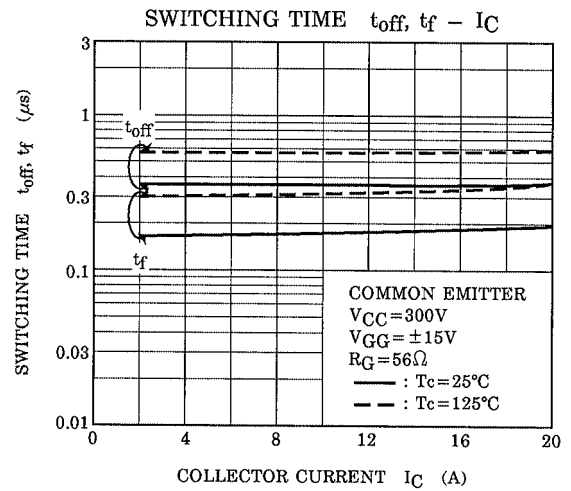
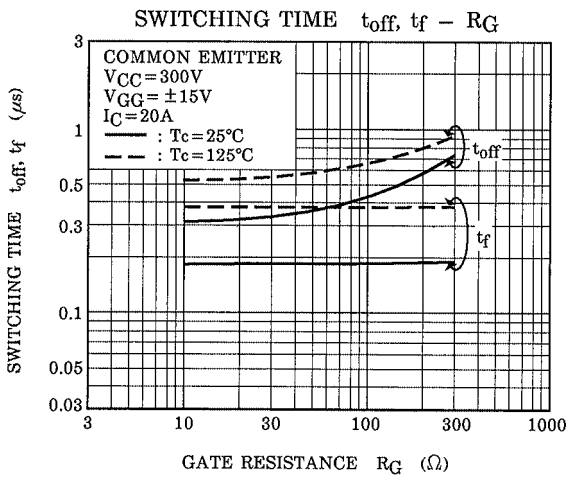
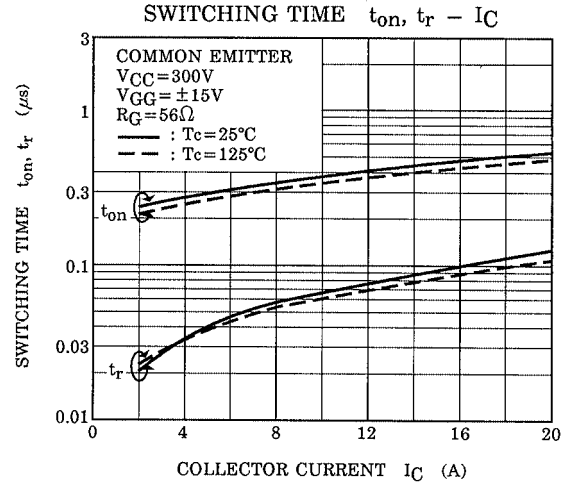
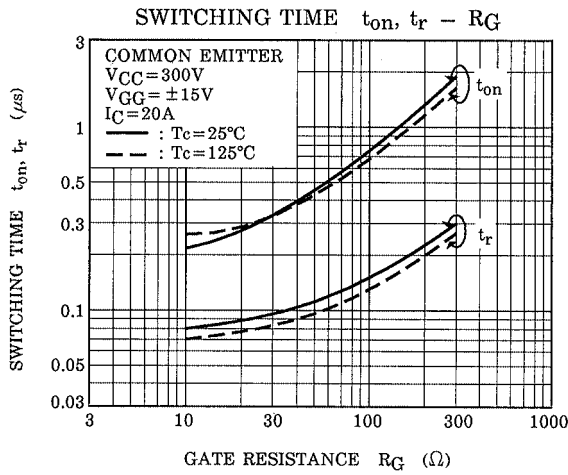
Note : Switching time measurement circuit and input / output waveforms

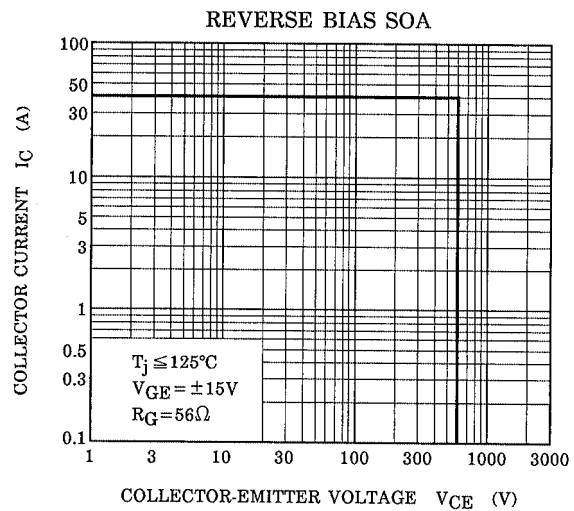
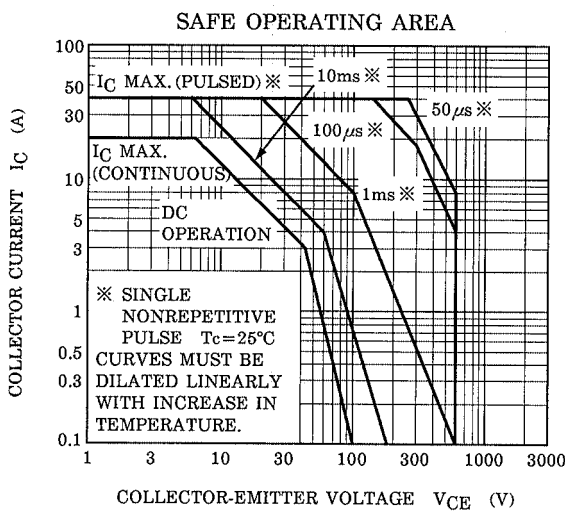
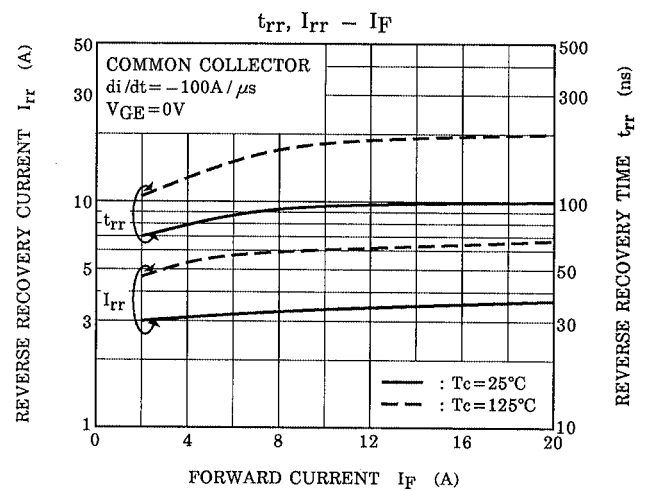
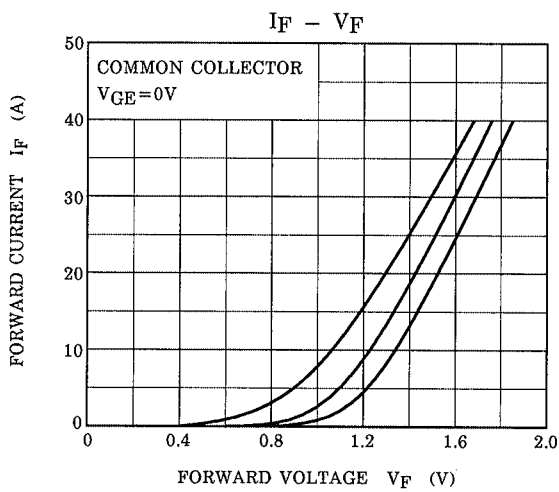
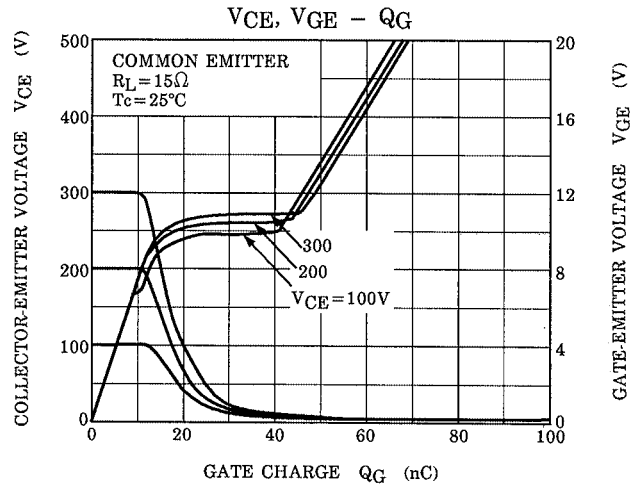
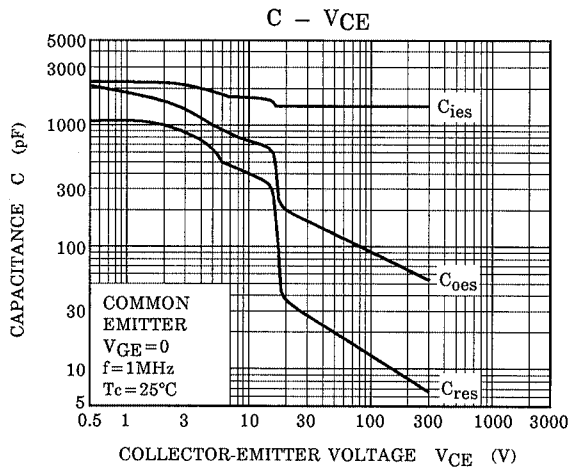


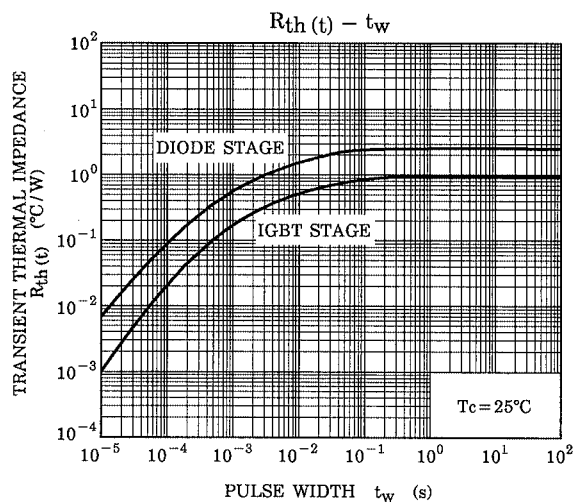
Switching loss measurement waveforms











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