

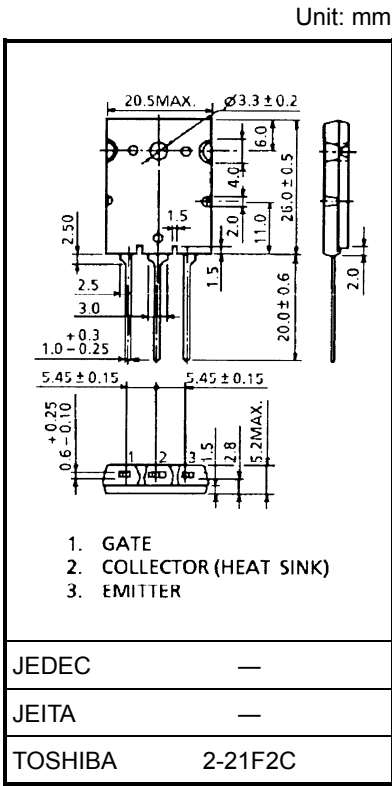
GT40T301

Parallel Resonance Inverter Switching Applications

- FRD included between emitter and collector
- Enhancement-mode
- High speed IGBT :  $t_f = 0.25 \mu s$  (typ.) ( $I_C = 40 A$ )  
FRD :  $t_{rr} = 0.7 \mu s$  (typ.) ( $di/dt = -20 A/\mu s$ )
- Low saturation voltage:  $V_{CE(sat)} = 3.7 V$  (typ.) ( $I_C = 40 A$ )

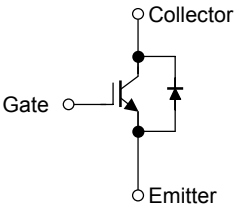
Maximum Ratings (Ta = 25°C)

| Characteristics                         |      | Symbol     | Rating   | Unit |
|-----------------------------------------|------|------------|----------|------|
| Collector-emitter voltage               |      | $V_{CES}$  | 1500     | V    |
| Gate-emitter voltage                    |      | $V_{GES}$  | $\pm 25$ | V    |
| Collector current                       | DC   | $I_C$      | 40       | A    |
|                                         | 1 ms | $I_{CP}$   | 80       |      |
| Emitter-collector forward current       | DC   | $I_{ECF}$  | 30       | A    |
|                                         | 1 ms | $I_{ECPF}$ | 80       |      |
| Collector power dissipation (Tc = 25°C) |      | $P_C$      | 200      | W    |
| Junction temperature                    |      | $T_j$      | 150      | °C   |
| Storage temperature range               |      | $T_{stg}$  | -55~150  | °C   |

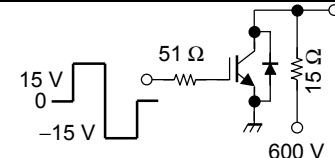


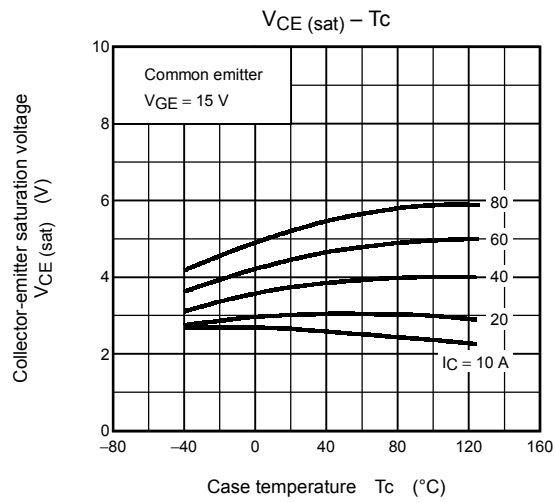
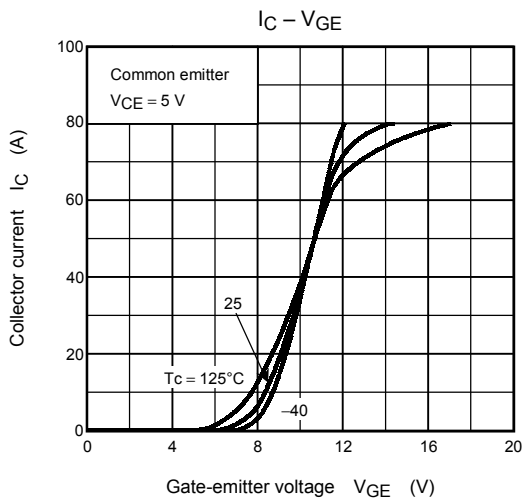
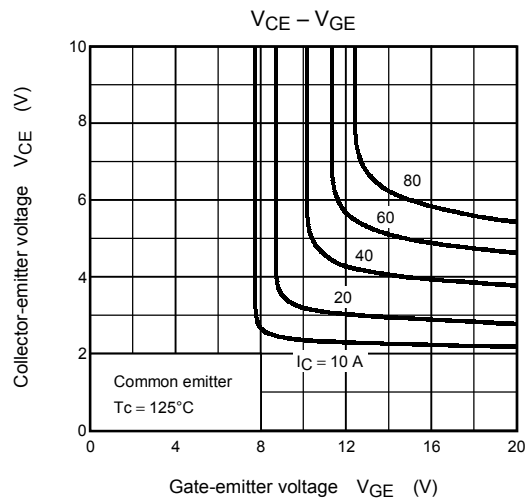
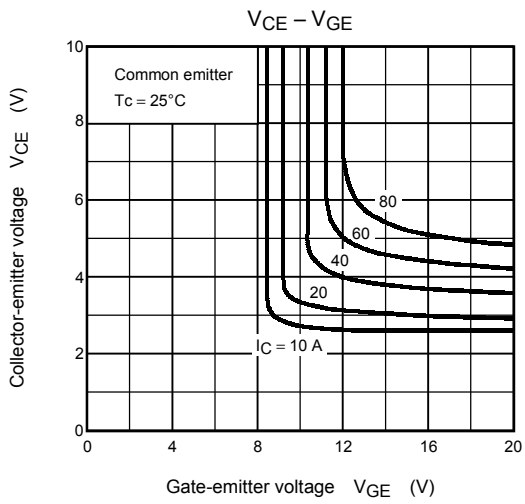
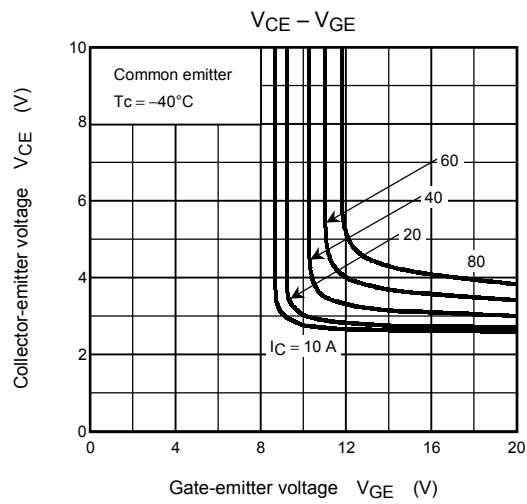
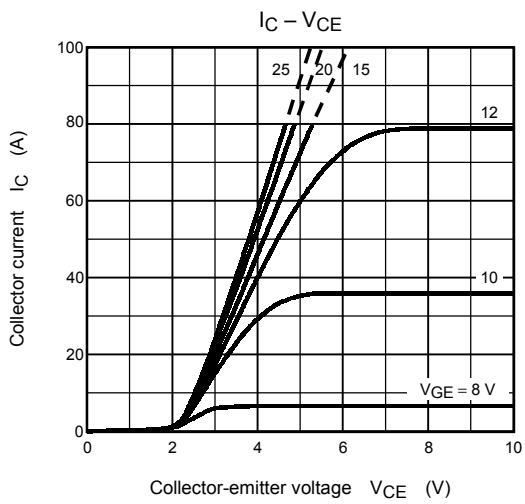
Weight: 9.75 g (typ.)

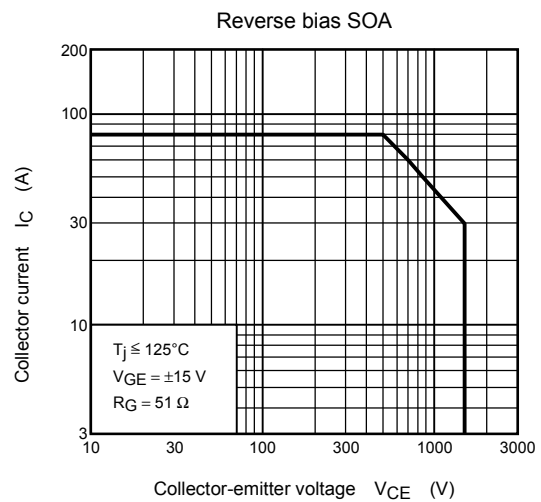
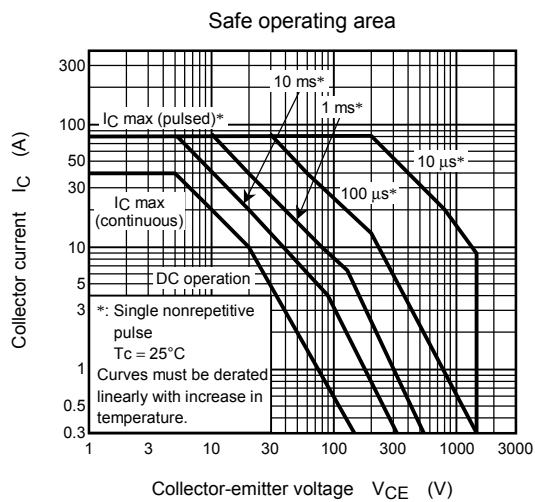
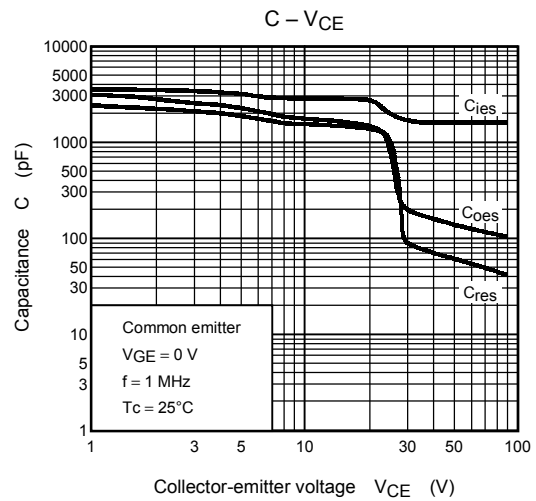
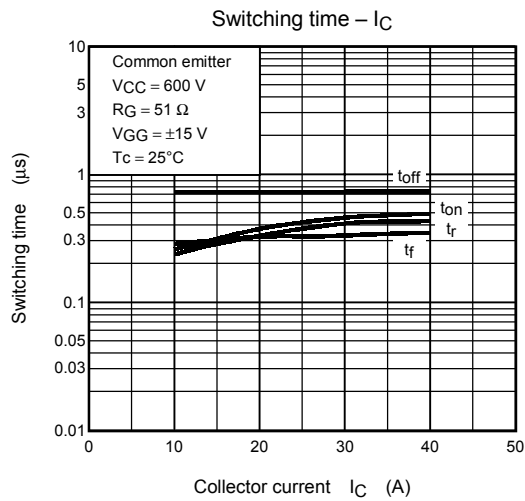
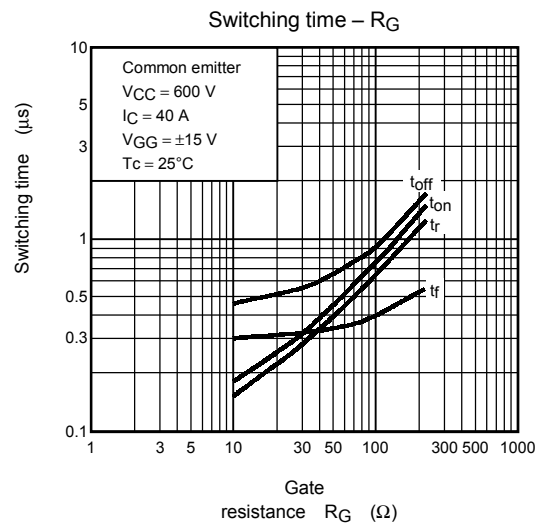
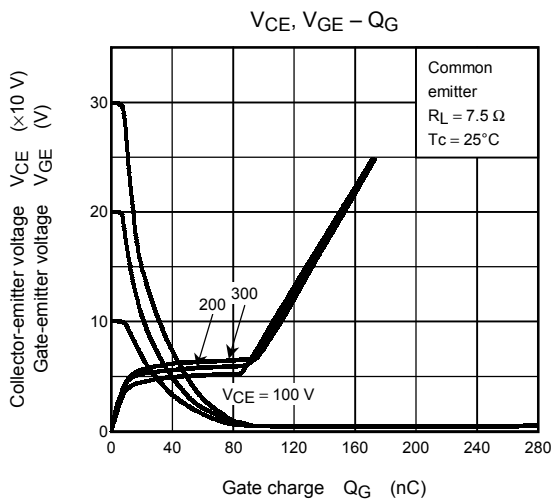
Equivalent Circuit

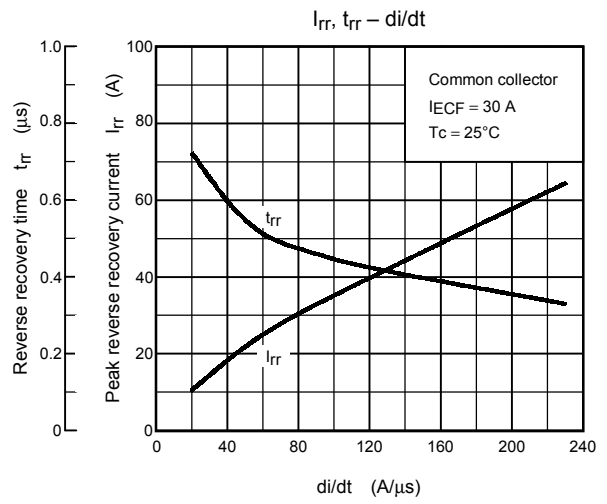
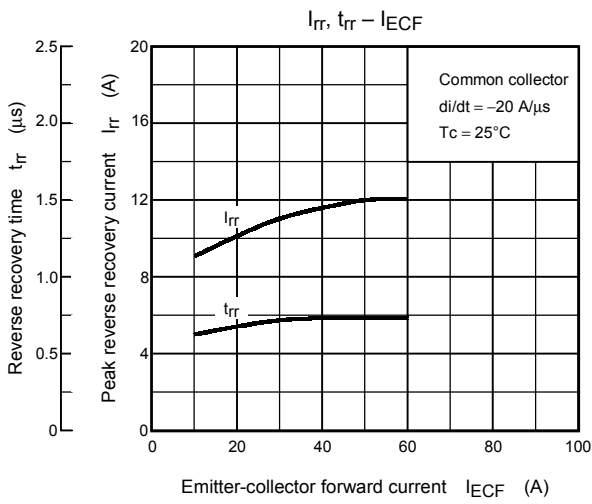
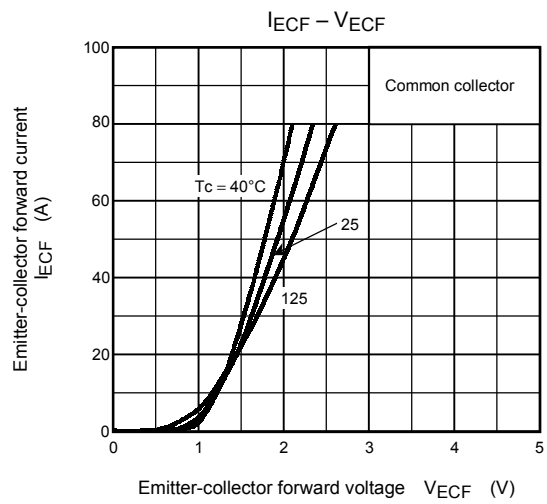
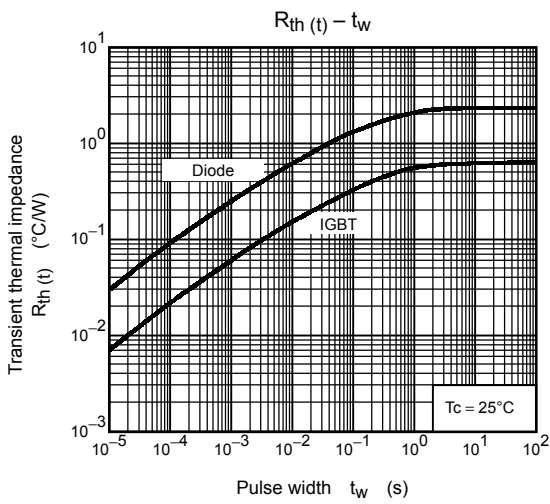


## Electrical Characteristics (Ta = 25°C)

| Characteristics                      |               | Symbol               | Test Condition                                                                     | Min | Typ. | Max       | Unit                        |
|--------------------------------------|---------------|----------------------|------------------------------------------------------------------------------------|-----|------|-----------|-----------------------------|
| Gate leakage current                 |               | $I_{GES}$            | $V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$                                            | —   | —    | $\pm 500$ | nA                          |
| Collector cut-off current            |               | $I_{CES}$            | $V_{CE} = 1500 \text{ V}, V_{GE} = 0$                                              | —   | —    | 1.0       | mA                          |
| Gate-emitter cut-off voltage         |               | $V_{GE}(\text{OFF})$ | $I_C = 40 \text{ mA}, V_{CE} = 5 \text{ V}$                                        | 4.0 | —    | 7.0       | V                           |
| Collector-emitter saturation voltage |               | $V_{CE}(\text{sat})$ | $I_C = 40 \text{ A}, V_{GE} = 15 \text{ V}$                                        | —   | 3.7  | 5.0       | V                           |
| Input capacitance                    |               | $C_{ies}$            | $V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$                             | —   | 2900 | —         | pF                          |
| Switching time                       | Rise time     | $t_r$                |  | —   | 0.40 | —         | $\mu\text{s}$               |
|                                      | Turn-on time  | $t_{on}$             |                                                                                    | —   | 0.45 | —         |                             |
|                                      | Fall time     | $t_f$                |                                                                                    | —   | 0.23 | 0.40      |                             |
|                                      | Turn-off time | $t_{off}$            |                                                                                    | —   | 0.6  | —         |                             |
| Emitter-collector forward voltage    |               | $V_{ECF}$            | $I_{ECF} = 30 \text{ A}, V_{GE} = 0$                                               | —   | 1.9  | 2.5       | V                           |
| Reverse recovery time                |               | $t_{rr}$             | $I_{ECF} = 30 \text{ A}, V_{GE} = 0, di/dt = -20 \text{ A}/\mu\text{s}$            | —   | 0.7  | 3.0       | $\mu\text{s}$               |
| Thermal resistance                   |               | $R_{th(j-c)}$        | IGBT                                                                               | —   | —    | 0.625     | $^{\circ}\text{C}/\text{W}$ |
|                                      |               |                      | Diode                                                                              | —   | —    | 1.25      |                             |







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