

TOSHIBA Transistor Silicon PNP Epitaxial Type

# TPC6601

High-Speed Switching Applications

DC-DC Converter Applications

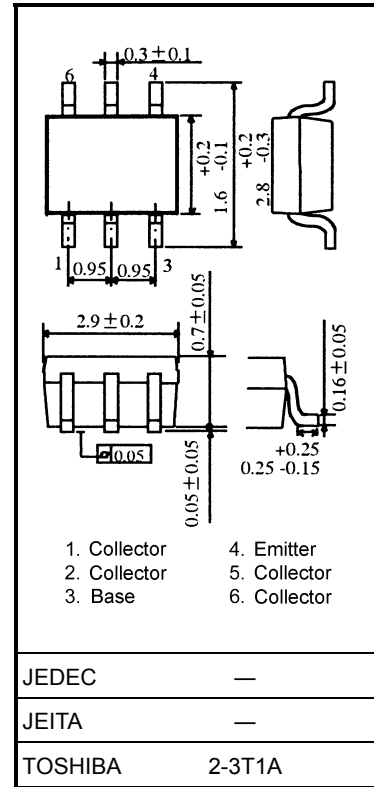
Unit: mm

- High DC current gain:  $h_{FE} = 200$  to  $500$  ( $I_C = -0.3$  A)
- Low collector-emitter saturation voltage:  $V_{CE(sat)} = -0.2$  V (max)
- High-speed switching:  $t_f = 90$  ns (typ.)

## Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Characteristics             |            | Symbol          | Rating     | Unit             |
|-----------------------------|------------|-----------------|------------|------------------|
| Collector-base voltage      |            | $V_{CBO}$       | -50        | V                |
| Collector-emitter voltage   |            | $V_{CEO}$       | -50        | V                |
| Emitter-base voltage        |            | $V_{EBO}$       | -7         | V                |
| Collector current           | DC         | $I_C$           | -2.0       | A                |
|                             | Pulse      | $I_{CP}$        | -3.5       |                  |
| Base current                |            | $I_B$           | -0.2       | A                |
| Collector power dissipation | DC         | $P_C$<br>(Note) | 0.8        | W                |
|                             | $t = 10$ s |                 | 1.6        |                  |
| Junction temperature        |            | $T_j$           | 150        | $^\circ\text{C}$ |
| Storage temperature range   |            | $T_{stg}$       | -55 to 150 | $^\circ\text{C}$ |

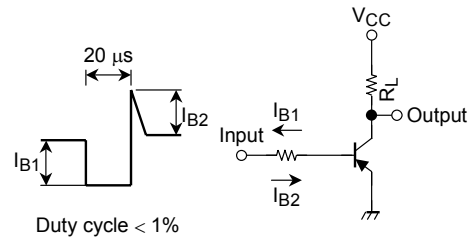
Note: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm<sup>2</sup>)



Weight: 0.011 g (typ.)

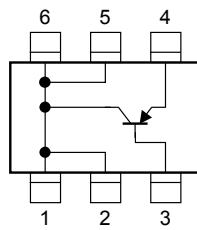
## Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

| Characteristics                      |              | Symbol        | Test Condition                            | Min | Typ. | Max  | Unit |
|--------------------------------------|--------------|---------------|---|-----|------|------|------|
| Collector cut-off current            |              | $I_{CBO}$     | $V_{CB} = -50$ V, $I_E = 0$               | —   | —    | -100 | nA   |
| Emitter cut-off current              |              | $I_{EBO}$     | $V_{EB} = -7$ V, $I_C = 0$                | —   | —    | -100 | nA   |
| Collector-emitter breakdown voltage  |              | $V_{(BR)CEO}$ | $I_C = -10$ mA, $I_B = 0$                 | -50 | —    | —    | V    |
| DC current gain                      |              | $h_{FE}(1)$   | $V_{CE} = -2$ V, $I_C = -0.3$ A           | 200 | —    | 500  |      |
|                                      |              | $h_{FE}(2)$   | $V_{CE} = -2$ V, $I_C = -1.0$ A           | 100 | —    | —    |      |
| Collector-emitter saturation voltage |              | $V_{CE(sat)}$ | $I_C = -1.0$ A, $I_B = -33$ mA            | —   | —    | -0.2 | V    |
| Base-emitter saturation voltage      |              | $V_{BE(sat)}$ | $I_C = -1.0$ A, $I_B = -33$ mA            | —   | —    | -1.1 | V    |
| Switching time                       | Rise time    | $t_r$         | See Figure 1 circuit diagram.             | —   | 60   | —    | ns   |
|                                      | Storage time | $t_{stg}$     | $V_{CC} \approx -30$ V, $R_L = 30 \Omega$ | —   | 250  | —    |      |
|                                      | Fall time    | $t_f$         | $I_{B1} = -I_{B2} = -33$ mA               | —   | 90   | —    |      |

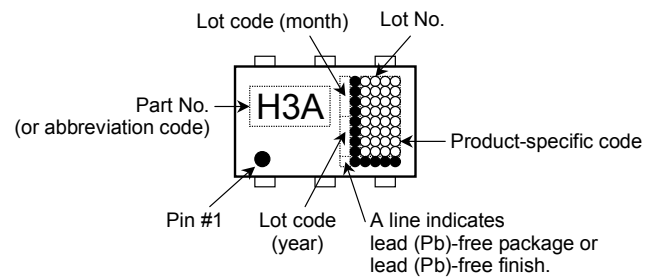


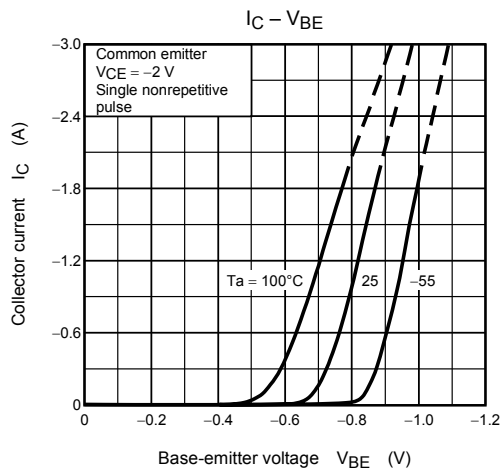
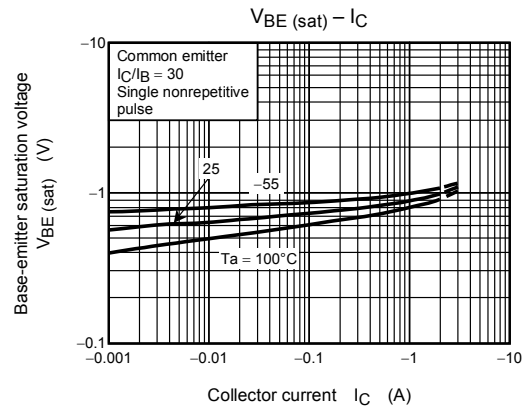
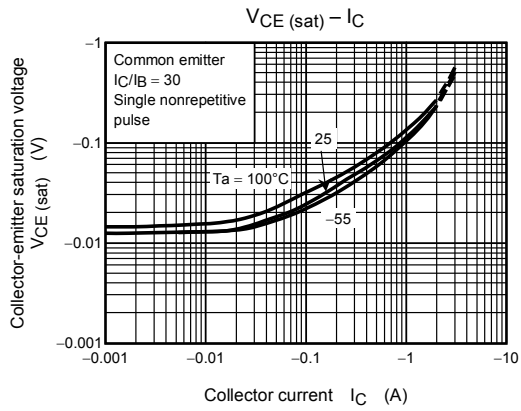
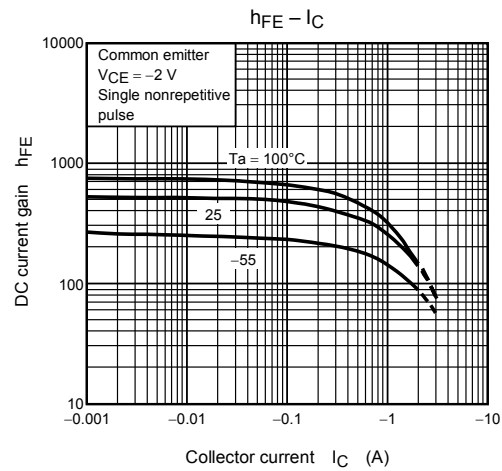
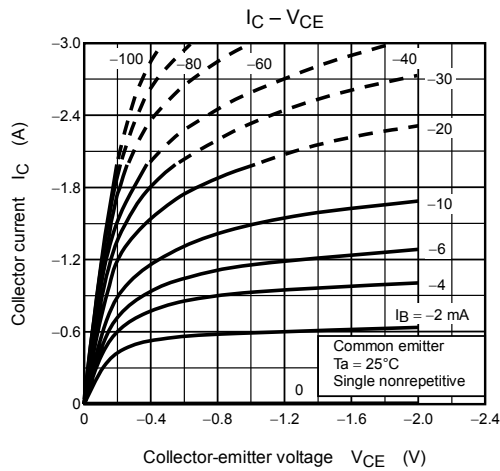
**Figure 1 Switching Time Test Circuit & Timing Chart**

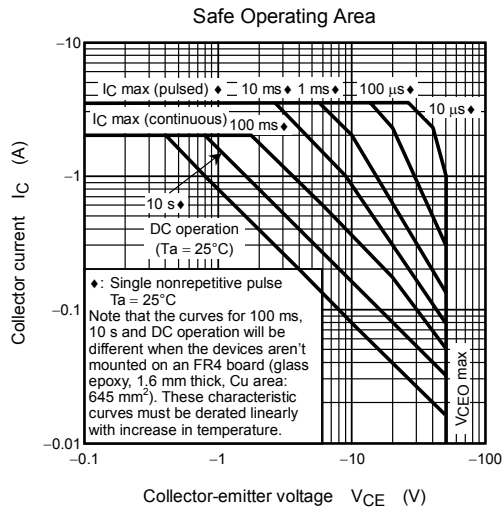
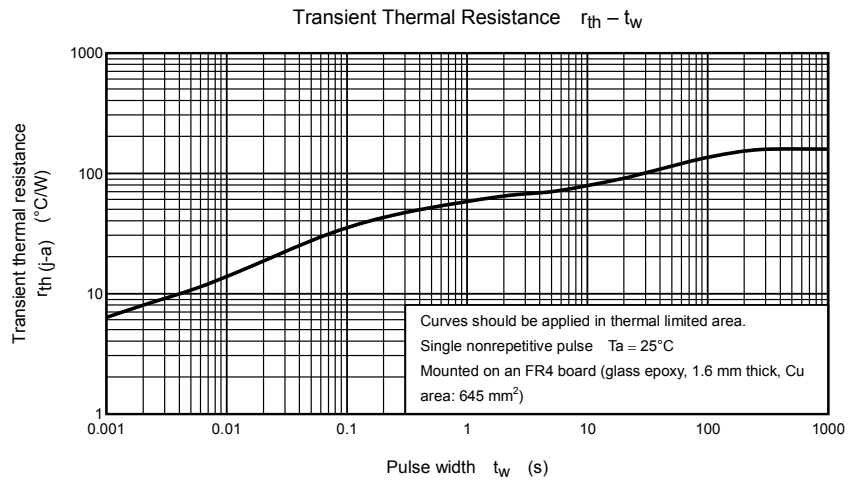
### Circuit Configuration



### Marking







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