

2SB1603, 2SB1603A

Silicon PNP epitaxial planar type

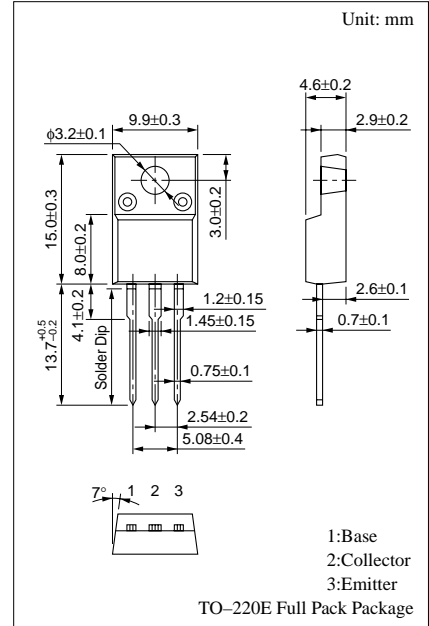
For low-voltage switching

Features

- Low collector to emitter saturation voltage $V_{CE(sat)}$
- High-speed switching
- Full-pack package with outstanding insulation, which can be installed to the heat sink with one screw

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

| Parameter | Symbol | Rated | Unit |
|--|-----------|-------------|------------------|
| Collector to base voltage | V_{CBO} | -40 | V |
| 2SB1603A | | -50 | |
| Collector to emitter voltage | V_{CEO} | -20 | V |
| 2SB1603A | | -40 | |
| Emitter to base voltage | V_{EBO} | -5 | V |
| Peak collector current | I_{CP} | -8 | A |
| Collector current | I_C | -4 | A |
| Collector power dissipation | P_C | 25 | W |
| $T_C=25^\circ\text{C}$ $T_a=25^\circ\text{C}$ | | 2 | |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |



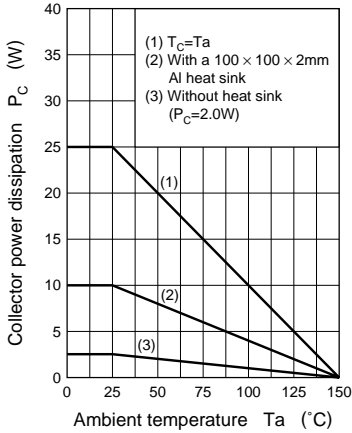
Electrical Characteristics ($T_C=25^\circ\text{C}$)

| Parameter | Symbol | Conditions | min | typ | max | Unit |
|---|---------------|---|-----|-----|------|---------------|
| Collector cutoff current | I_{CBO} | $V_{CB} = -40\text{V}, I_E = 0$ | | | -50 | μA |
| Emitter cutoff current | I_{EBO} | $V_{EB} = -5\text{V}, I_C = 0$ | | | -50 | μA |
| Collector to emitter voltage | V_{CEO} | $I_C = -10\text{mA}, I_B = 0$ | -20 | | | V |
| 2SB1603A | | | -40 | | | |
| Forward current transfer ratio | h_{FE1} | $V_{CE} = -2\text{V}, I_C = -0.1\text{A}$ | 45 | | | |
| | h_{FE2}^* | $V_{CE} = -2\text{V}, I_C = -1\text{A}$ | 90 | | 260 | |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -2\text{A}, I_B = -0.1\text{A}$ | | | -0.5 | V |
| Base to emitter saturation voltage | $V_{BE(sat)}$ | $I_C = -2\text{A}, I_B = -0.1\text{A}$ | | | -1.5 | V |
| Transition frequency | f_T | $V_{CE} = -5\text{V}, I_C = -0.5\text{A}, f = 10\text{MHz}$ | | 150 | | MHz |
| Turn-on time | t_{on} | $I_C = -2\text{A}, I_{B1} = -0.2\text{A}, I_{B2} = 0.2\text{A}$ | | 0.3 | | μs |
| Storage time | t_{stg} | | | 0.4 | | μs |
| Fall time | t_f | | | 0.1 | | μs |

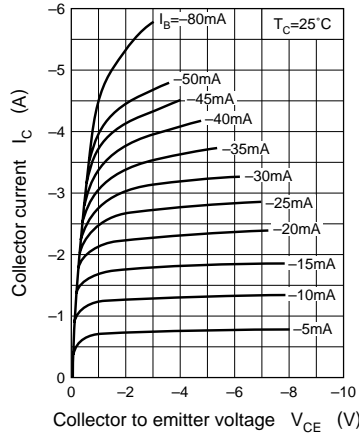
* h_{FE2} Rank classification

| Rank | Q | P |
|-----------|-----------|------------|
| h_{FE2} | 90 to 180 | 130 to 260 |

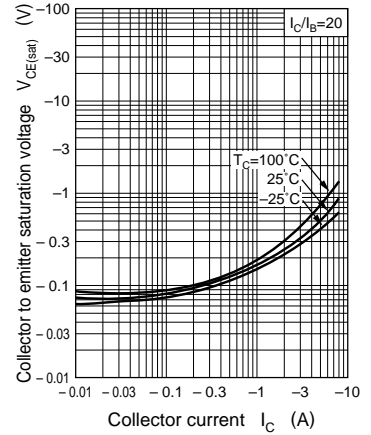
$P_C - T_a$



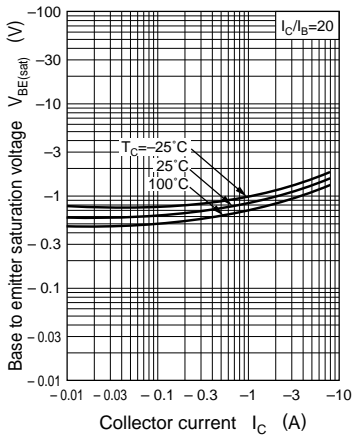
$I_C - V_{CE}$



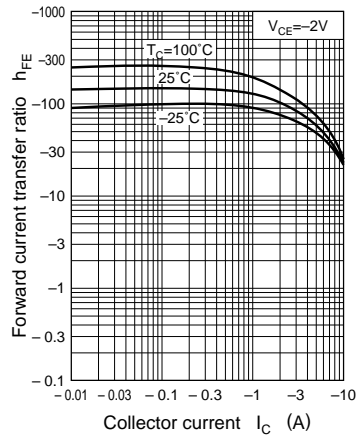
$V_{CE(sat)} - I_C$



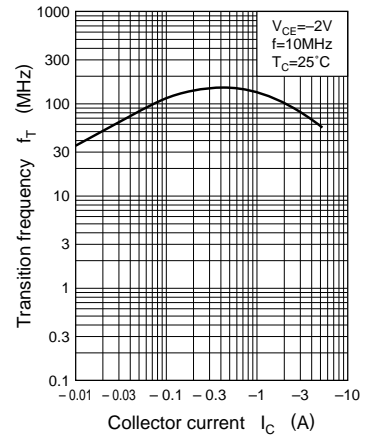
$V_{BE(sat)} - I_C$



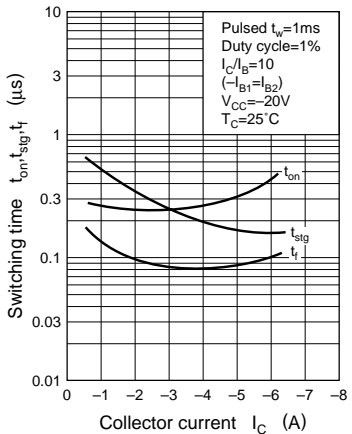
$h_{FE} - I_C$



$f_T - I_C$



$t_{on}, t_{stg}, t_f - I_C$



Area of safe operation (ASO)

