# Silicon PNP Power Transistors 2SA1646

## DESCRIPTION

·With TO-220 package
·Fast switching speed
·Low collector saturation voltage

## APPLICATIONS

·For use in switching power supplies,DC-DC converters,motor drivers,solenoid drivers, and other low-voltage power supply devices, as well as for high current switching

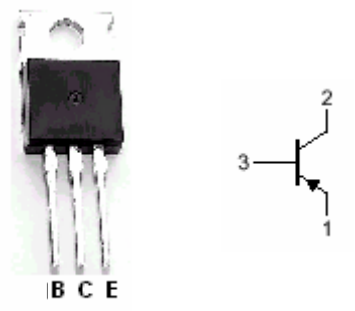


**Fig.1 simplified outline (TO-220) and symbol**

**PINNING**

| PIN | DESCRIPTION |
|---|---|
| 1 | Emitter |
| 2 | Collector;connected to mounting base |
| 3 | Base |

**Absolute maximum ratings(Ta=25□)**

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $V_{CBO}$ | Collector-base voltage | Open emitter | -150 | V |
| $V_{CEO}$ | Collector-emitter voltage | Open base | -100 | V |
| $V_{EBO}$ | Emitter-base voltage | Open collector | -7 | V |
| $I_C$ | Collector current | | -10 | A |
| $I_{CM}$ | Collector current-peak | PW≤300μs, duty cycle≤10% | -20 | A |
| $I_B$ | Base current | | -6 | A |
| $P_T$ | Total power dissipation | $T_a$=25□ | 1.5 | W |
| | | $T_C$=25□ | 40 | |
| $T_j$ | Junction temperature | | 150 | □ |
| $T_{stg}$ | Storage temperature | | -55~150 | □ |

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## CHARACTERISTICS

**Tj=25□ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{CEsat-1}$ | Collector-emitter saturation voltage | $I_C$=-6A; $I_B$=-0.3A | | | -0.3 | V |
| $V_{CEsat-2}$ | Collector-emitter saturation voltage | $I_C$=-8A; $I_B$=-0.4A | | | -0.5 | V |
| $V_{BE\ sat-1}$ | Base-emitter saturation voltage | $I_C$=-6A; $I_B$=-0.3A | | | -1.2 | V |
| $V_{BE\ sat-2}$ | Base-emitter saturation voltage | $I_C$=-8A; $I_B$=-0.4A | | | -1.5 | V |
| $I_{CBO}$ | Collector cut-off current | $V_{CB}$=-100V; $I_E$=0 | | | -10 | μA |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$=-5V; $I_C$=0 | | | -10 | μA |
| $h_{FE-1}$ | DC current gain | $I_C$=-0.5A ; $V_{CE}$=-2V | 100 | | | |
| $h_{FE-2}$ | DC current gain | $I_C$=-2A ; $V_{CE}$=-2V | 100 | | 400 | |
| $h_{FE-3}$ | DC current gain | $I_C$=-6A ; $V_{CE}$=-2V | 60 | | | |
| $C_{OB}$ | Output capacitance | $I_E$=0 ; $V_{CB}$=-10V;f=1MHz | | 250 | | pF |
| $f_T$ | Transition frequency | $I_C$=-0.5A ; $V_{CE}$=-10V | | 150 | | MHz |
| Switching times | | | | | | |
| $t_{on}$ | Turn-on time | $_C$=-6A ; $V_{CC}$=-50V<br>$I_{B1}$=-$I_{B2}$=-0.3A;$R_L$=8.3Ω | | 0.3 | | μs |
| $t_{stg}$ | Storage time | | | 1.5 | | μs |
| $t_f$ | Fall time | | | 0.4 | | μs |

### ◆ $h_{FE-2}$ Classifications

| M | L | K |
|---|---|---|
| 100-200 | 150-300 | 200-400 |

**PACKAGE OUTLINE**

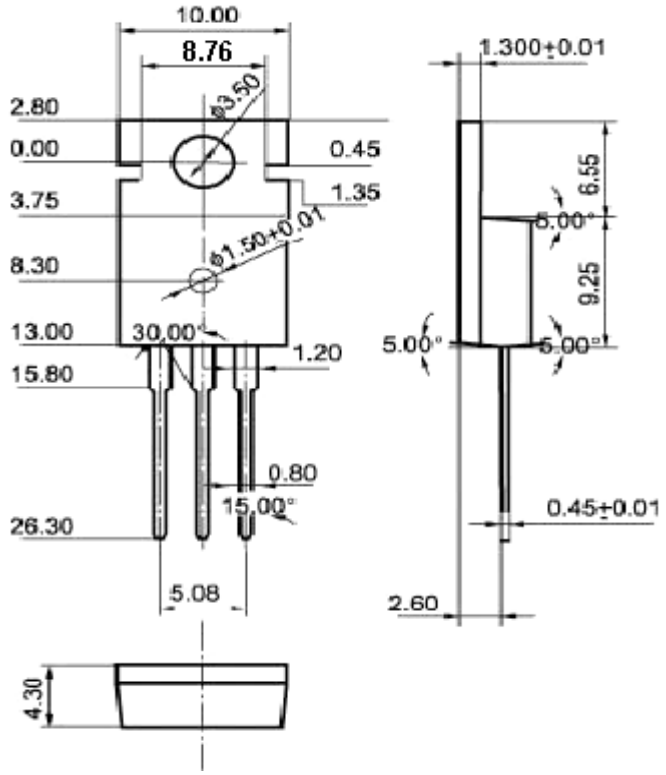


**Fig.2 Outline dimensions(unindicated tolerance:±0.10 mm)**