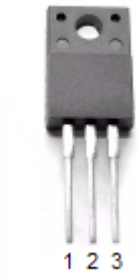
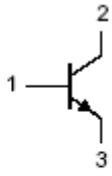
# NPN 2SC4550

## SILCON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SC4550 is a power transistor developed for high-speed switching and features low $V_{CE(sat)}$ and high $h_{FE}$.
This transistor is ideal for use in drivers such as DC/DC converters and actuators.
In addition, a small resin-molded insulation type package contributes to high-density mounting and reduction of cost.
Compliance to RoHS.




PIN 1. BASE
2. COLLECTOR
3. EMITTER
TO-220F package

### ABSOLUTE MAXIMUM RATINGS

| Symbol | Ratings | | Value | Unit |
|---|---|---|---|---|
| $V_{CEO}$ | Collector-Emitter Voltage | | 60 | V |
| $V_{CBO}$ | Collector-Base Voltage | | 100 | V |
| $V_{EBO}$ | Emitter-Base Voltage | | 7 | V |
| $I_C$ | Collector Current | | 7 | A |
| $I_{C(pulse)}$ | Collector Current (pulse) | | 14 | A |
| $I_B$ | Base Current | | 3.5 | A |
| $P_D$ | Total Power Dissipation | @ $T_C$ = 25°C | 30 | W |
| $P_D$ | Total Power Dissipation | @ $T_a$ = 25°C | 2 | W |
| $T_J$ | Junction Temperature | | 150 | °C |
| $T_{Stg}$ | Storage Temperature | | -65 to +200 | °C |

# NPN 2SC4550

## $h_{FE}$ CLASSIFICATION

| Marking | Test Condition(s) | M | L | K |
|---|---|---|---|---|
| $h_{FE2}$ | $I_C$ = 1.5 A, $V_{CE}$ = 2 V | 100 to 200 | 150 to 300 | 200 to 400 |

## ELECTRICAL CHARACTERISTICS

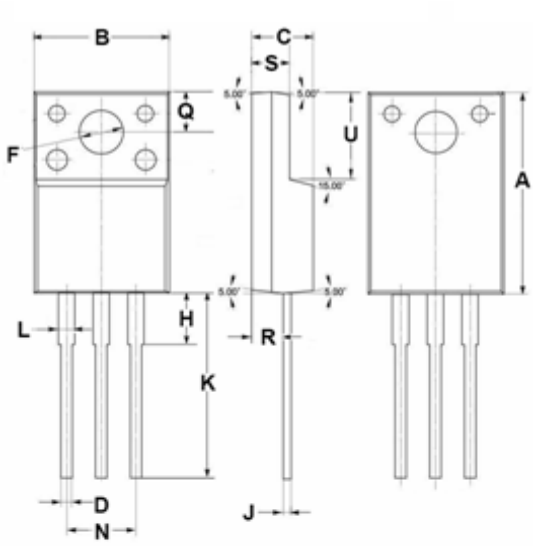
TC=25°C unless otherwise noted

| Symbol | Ratings | | Test Condition(s) | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $V_{CEO}$ | Collector to Emitter Voltage | | $I_C$ = 4 A, $I_B$ = 0.4 A, L = 1 mH | 60 | - | - | V |
| $V_{CEX}$ | Collector to Emitter Voltage | | $I_C$ = 4 A, $I_{B1}$ = -$I_{B2}$ = 0.4 A<br>$V_{BE(OFF)}$ = -1.5V, L = 180 µH clamped | 60 | - | - | |
| $I_{CBO}$ | Collector Cutoff Current | | $V_{CB}$ = 60 V, $I_E$ = 0 | - | - | 10 | µA |
| $I_{CER}$ | Collector Cutoff Current | | $V_{CE}$ = 60 V, $R_{BE}$ = 50 Ω<br>$T_a$ = 125°C | - | - | 1 | mA |
| $I_{CEX}$ | Collector Cutoff Current | | $V_{CE}$ = 60 V, $V_{BE(OFF)}$ = -1.5 V | - | - | 10 | µA |
| | | | $V_{CE}$ = 60 V, $V_{BE(OFF)}$ = -1.5 V<br>$T_a$ = 125°C | - | - | 1 | mA |
| $I_{EBO}$ | Emitter Cutoff Current | | $V_{EB}$ = 5.0 V, $I_C$ = 0 | - | - | 10 | µA |
| $h_{FE}$ | DC Current Gain (*) | $h_{FE1}$ | $I_C$ = 0.7 A, $V_{CE}$ = 2 V | 100 | - | - | - |
| | | $h_{FE2}$ | $I_C$ = 1.5 A, $V_{CE}$ = 2 V | 100 | 200 | 400 | |
| | | $h_{FE3}$ | $I_C$ = 4 A, $V_{CE}$ = 2 V | 60 | - | - | |
| $V_{CE(SAT)}$ | Collector-Emitter saturation Voltage (*) | | $I_C$ = 4 A, $I_B$ = 0.2 A | - | - | 0.3 | V |
| | | | $I_C$ = 6 A, $I_B$ = 0.3 A | - | - | 0.5 | |
| $V_{BE(SAT)}$ | Base-Emitter saturation Voltage (*) | | $I_C$ = 4 A, $I_B$ = 0.2 A | - | - | 1.2 | |
| | | | $I_C$ = 6 A, $I_B$ = 0.3 A | - | - | 1.5 | |
| $C_{ob}$ | Collector capacitance | | $V_{CB}$ = 10 V, $I_E$ = 0<br>f = 1.0MHz | - | 100 | - | pF |
| $f_T$ | Gain bandwidth product | | $I_C$ = 1 A, $V_{CE}$ = 10 V | - | 150 | - | MHz |
| $t_{on}$ | Turn-on time | | $I_C$ = 4 A, $R_L$ = 12.5 Ω | - | 0.1 | 0.3 | µs |
| $t_{stg}$ | Storage time | | $I_{B1}$ = -$I_{B2}$ = 0.2 A, $V_{CC}$ = 50 V | - | 1 | 1.5 | |
| $t_f$ | Fall time | | Refer to the test circuit. | - | 0.1 | 0.3 | |

(*) Pulse conditions : tp < 300 µs, δ =2%

# NPN 2SC4550

## MECHANICAL DATA CASE TO-220




| DIM | mm MIN | MAX |
|---|---|---|
| A | 14.95 | 15.05 |
| B | 10.00 | 10.10 |
| C | 4.40 | 4.60 |
| D | 0.75 | 0.80 |
| F | 3.10 | 3.30 |
| H | 3.70 | 3.90 |
| J | 0.50 | 0.70 |
| K | 13.4 | 13.6 |
| L | 1.10 | 1.30 |
| N | 5.00 | 5.20 |
| Q | 2.70 | 2.90 |
| R | 2.20 | 2.40 |
| S | 2.65 | 2.85 |
| U | 6.40 | 6.60 |

Revised August 2012