

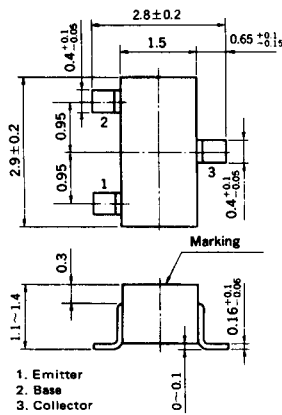
SILICON TRANSISTOR

2SA1411

AUDIO FREQUENCY AMPLIFIER, SWITCHING

PNP SILICON EPITAXIAL TRANSISTOR

PACKAGE DIMENSIONS in millimeters



FEATURES

- Very high DC current gain : $h_{FE} = 500$ to 1600
- High V_{EBO} Voltage : $V_{EBO} = -10$ V

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Current ($T_a = 25^\circ\text{C}$)

| | | | |
|------------------------------|-----------|------|----|
| Collector to Base Voltage | V_{CBO} | -25 | V |
| Collector to Emitter Voltage | V_{CEO} | -25 | V |
| Emitter to Base Voltage | V_{EBO} | -10 | V |
| Collector Current (DC) | I_C | -150 | mA |

Maximum Power Dissipation

| | | | |
|---|-------|-----|----|
| Total power Dissipation at 25°C Ambient Temperature | P_T | 200 | mW |
|---|-------|-----|----|

Maximum Temperatures

| | | | |
|---------------------------|-----------|-------------|------------------|
| Junction Temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|------------------------------|-----------------|------|-------|-------|------|--|
| Collector Cutoff Current | I_{CBO} | | | -100 | nA | $V_{CB} = -25$ V, $I_E = 0$ |
| Emitter Cutoff Current | I_{EBO} | | | -100 | nA | $V_{EB} = -7$ V, $I_C = 0$ |
| DC Current Gain | h_{FE1}^* | 500 | 1000 | 1600 | | $V_{CE} = -5.0$ V, $I_C = -1.0$ mA |
| DC Current Gain | h_{FE2}^* | 200 | 400 | | | $V_{CE} = -5.0$ V, $I_C = -100$ mA |
| Base to Emitter Voltage | V_{BE}^* | | -580 | | mV | $V_{CE} = -5.0$ V, $I_C = -1.0$ mA |
| Collector Saturation Voltage | $V_{CE(sat)}^*$ | | -0.15 | -0.30 | V | $I_C = -50$ mA, $I_B = -5.0$ mA |
| Base Saturation Voltage | $V_{BE(sat)}^*$ | | -0.8 | -1.2 | V | $I_C = -50$ mA, $I_B = -5.0$ mA |
| Gain Bandwidth Product | f_T | | 200 | | MHz | $V_{CE} = -5.0$ V, $I_E = 10$ mA |
| Output Capacitance | C_{ob} | | 4.6 | | pF | $V_{CB} = -5.0$ V, $I_E = 0$, $f = 1.0$ MHz |
| Turn-on Time | t_{on} | | 0.12 | | ns | $V_{CC} = -10$ V, $V_{BE(off)} = 2.7$ V |
| Storage Time | t_{stg} | | 0.58 | | ns | $I_C = -50$ mA |
| Turn-off Time | t_{off} | | 0.75 | | ns | $I_{B1} = -I_{B2} = -1.0$ mA |

* Pulsed: $PW \leq 350 \mu\text{s}$, Duty Cycle $\leq 2\%$

h_{FE} Classification

| Making | M15 | M16 |
|-----------|-------------|-------------|
| h_{FE1} | 500 to 1000 | 800 to 1600 |