

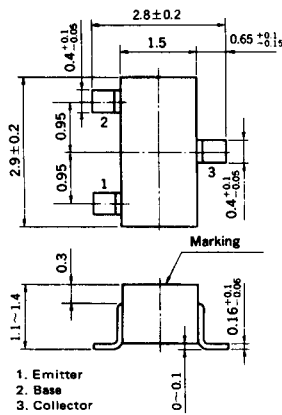
SILICON TRANSISTOR

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
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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