

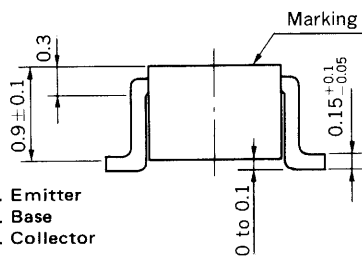
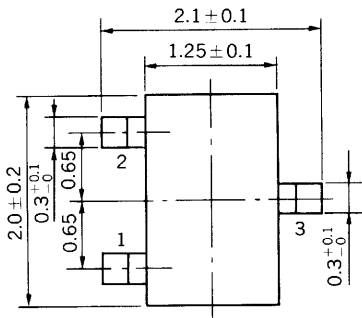
SILICON TRANSISTOR

2SA1608

HIGH FREQUENCY AMPLIFIER AND SWITCHING PNP SILICON EPITAXIAL TRANSISTOR

PACKAGE DIMENSIONS

in millimeters



- 1. Emitter
- 2. Base
- 3. Collector

FEATURES

- High f_T : $f_T = 400$ MHz
- Complementary to 2SC3739

ABSOLUTE MAXIMUM RATINGS

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

| | | | |
|------------------------------|-----------|------|----|
| Collector to Base Voltage | V_{CB0} | -60 | V |
| Collector to Emitter Voltage | V_{CEO} | -40 | V |
| Emitter to Base Voltage | V_{EBO} | -5.0 | V |
| Collector Current (DC) | I_C | -500 | mA |

Maximum Power Dissipation

| | | | |
|--|-------|-----|----|
| Total power Dissipation at 25°C Ambient Temperature | P_T | 150 | mW |
|--|-------|-----|----|

Maximum Temperatures

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

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

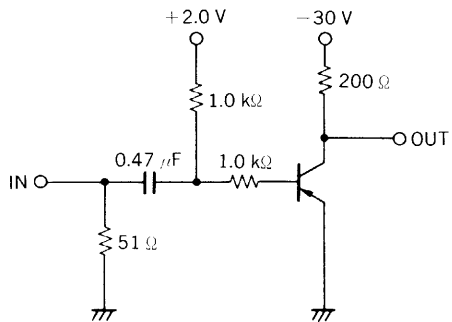
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|------------------------------|-----------------|------|-------|-------|------|--|
| Collector Cutoff Current | I_{CBO} | | | -100 | nA | $V_{CB} = -40\text{ V}, I_E = 0$ |
| Emitter Cutoff Current | I_{EBO} | | | -100 | nA | $V_{EB} = -4.0\text{ V}, I_C = 0$ |
| DC Current Gain | h_{FE1}^* | 75 | 140 | 300 | | $V_{CE} = -2.0\text{ V}, I_C = -150\text{ mA}$ |
| DC Current Gain | h_{FE2}^* | 20 | 50 | | | $V_{CE} = -2.0\text{ V}, I_C = -150\text{ mA}$ |
| Collector Saturation Voltage | $V_{CE(sat)}^*$ | | -0.45 | -0.75 | V | $I_C = -500\text{ mA}, I_B = -50\text{ mA}$ |
| Base Saturation Voltage | $V_{BE(sat)}^*$ | | -1.0 | -1.30 | V | $I_C = -500\text{ mA}, I_B = -50\text{ mA}$ |
| Gain Bandwidth Product | f_T | 150 | 400 | | MHz | $V_{CE} = -10\text{ V}, I_E = 20\text{ mA}$ |
| Output Capacitance | C_{ob} | | 5.0 | 8.0 | pF | $V_{CB} = -10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$ |
| Turn-on Time | t_{on} | | 25 | | ns | $V_{CC} = -30\text{ V}$ |
| Storage Time | t_{stg} | | 70 | | ns | $I_C = 150\text{ mA}$ |
| Turn-off Time | t_{off} | | 100 | | ns | $I_{B1} = -I_{B2} = 15\text{ mA}$ |

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

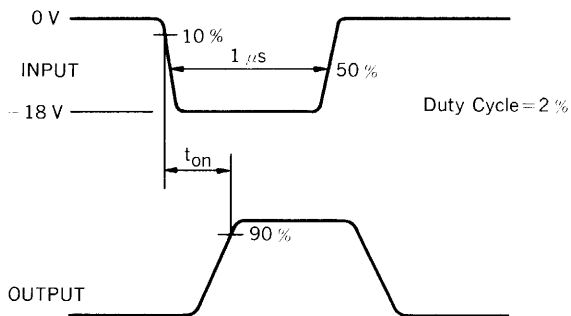
h_{FE} Classification

| Making | Y12 | Y13 | Y14 |
|-----------|-----------|------------|------------|
| h_{FE1} | 75 to 150 | 100 to 200 | 150 to 300 |

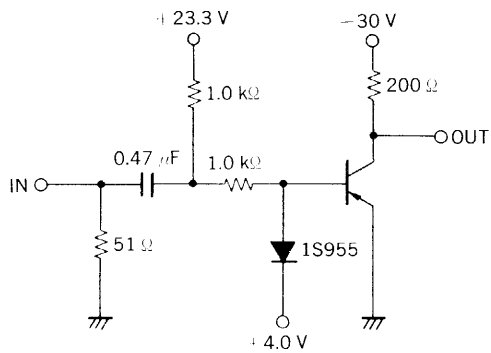
SWITCHING TIME TEST CIRCUIT



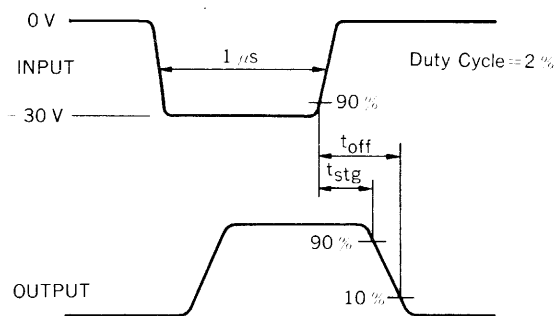
t_{on} SWITCHING



VOLTAGE WAVEFORMS

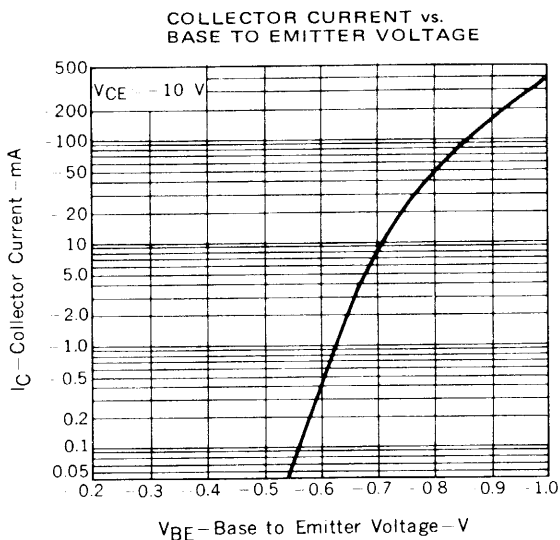
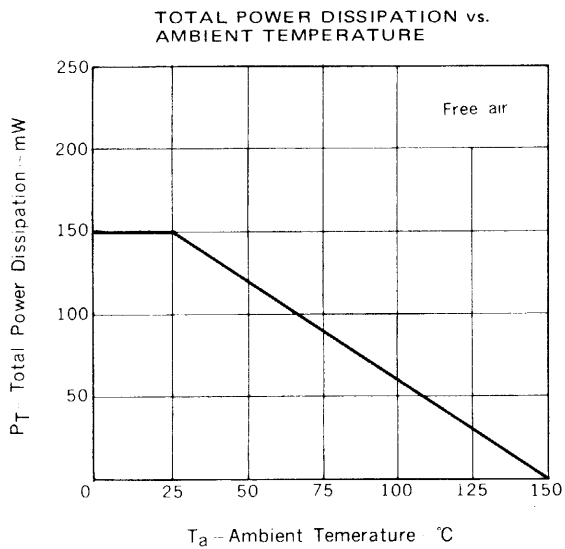


t_{stg} , t_{off} SWITCHING

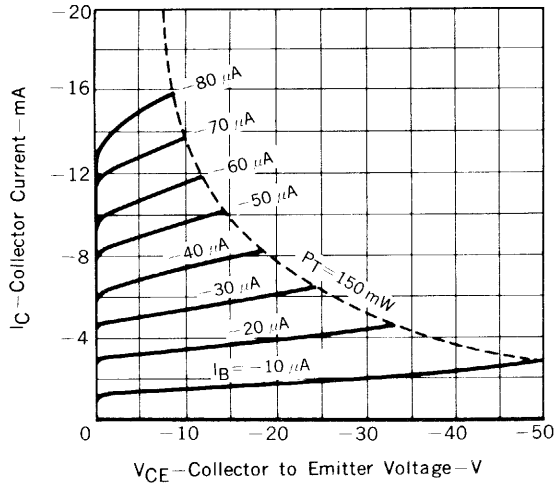


VOLTAGE WAVEFORMS

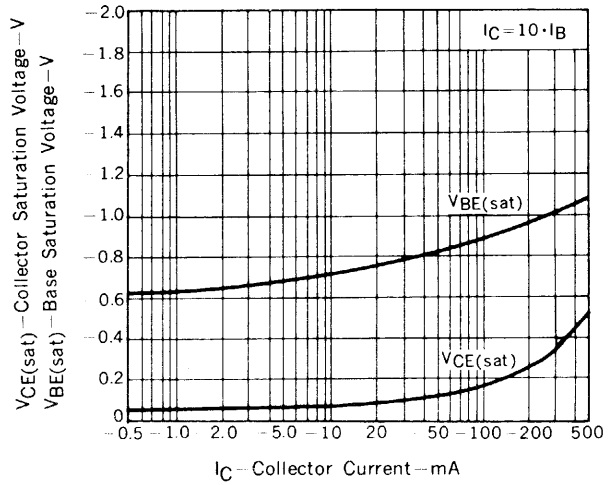
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



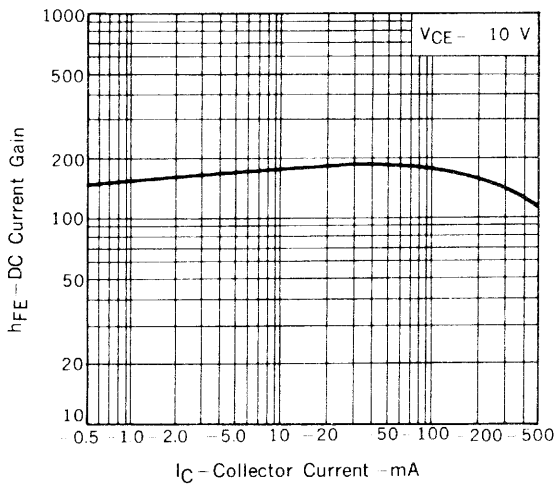
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



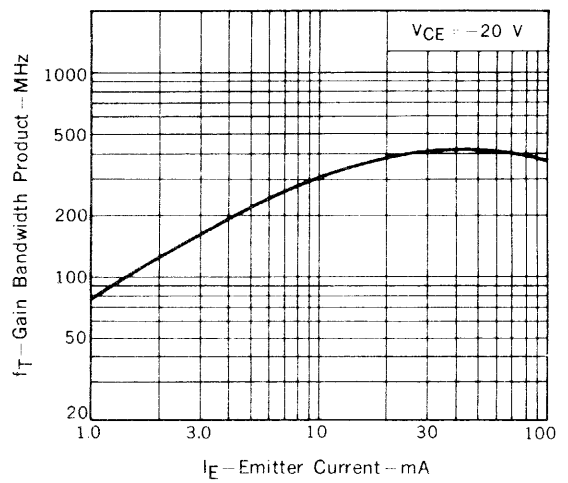
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



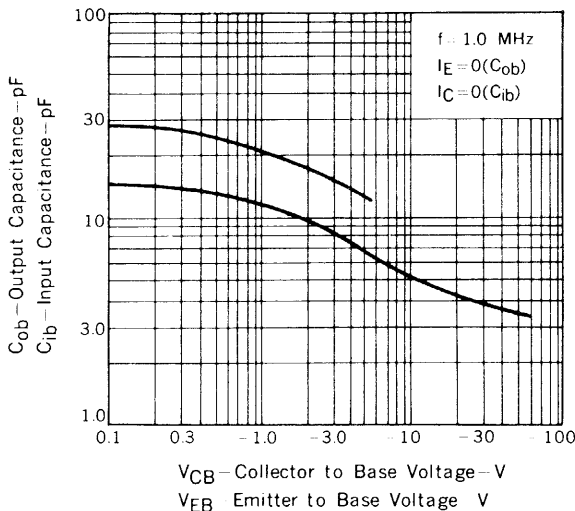
DC CURRENT GAIN vs. COLLECTOR CURRENT



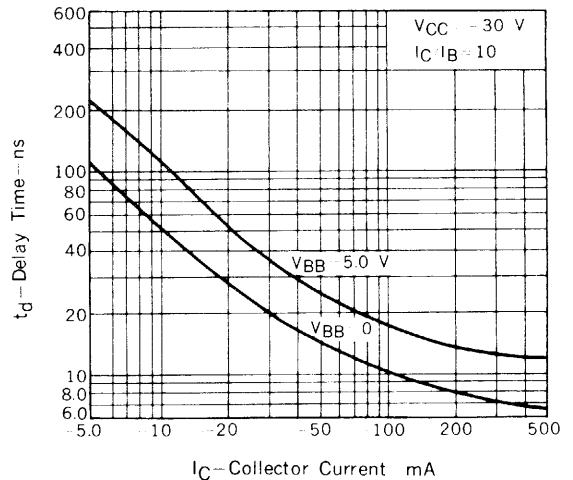
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



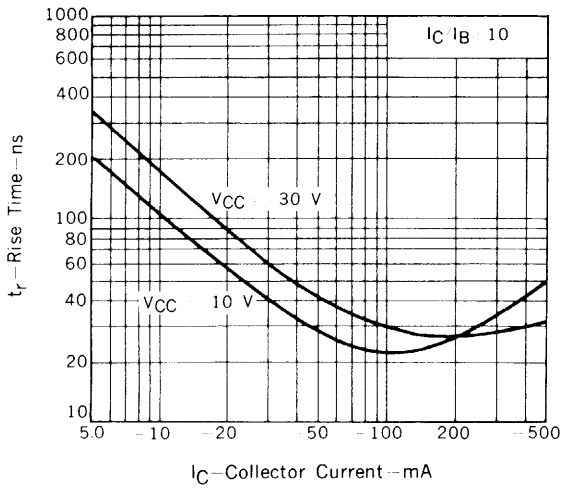
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



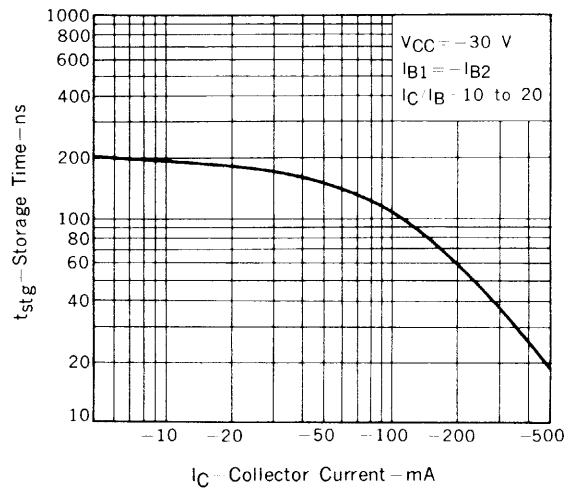
DELAY TIME vs. COLLECTOR CURRENT



RISE TIME vs. COLLECTOR CURRENT



STORAGE TIME vs. COLLECTOR CURRENT



FALL TIME vs. COLLECTOR CURRENT

