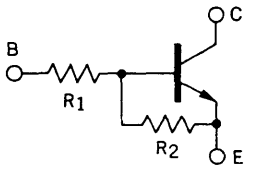
NEC

NPN SILICON TRANSISTOR
BA1F4M

DESCRIPTION The BA1F4M is designed for use in medium speed switching circuit.

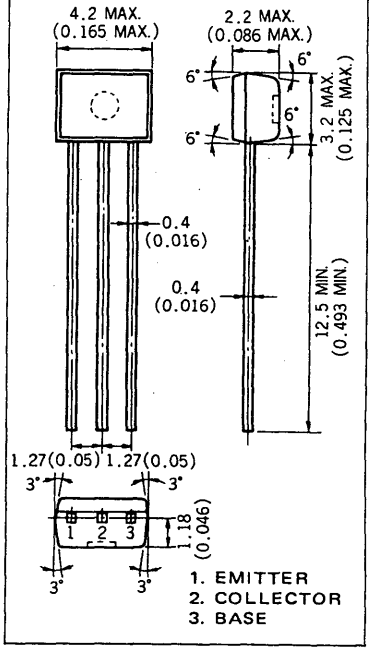
FEATURE

- Bias resistors built-in type NPN transistor equivalent circuit.



R_1 = 22 kΩ
R_2 = 22 kΩ

PACKAGE DIMENSIONS
in millimeters (inches)



ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

- Storage Temperature . . . . . −55 to +150 °C
- Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipation (T_a = 25 °C)

- Total Power Dissipation . . . . . 250 mW

Maximum Voltages and Currents (T_a = 25 °C)

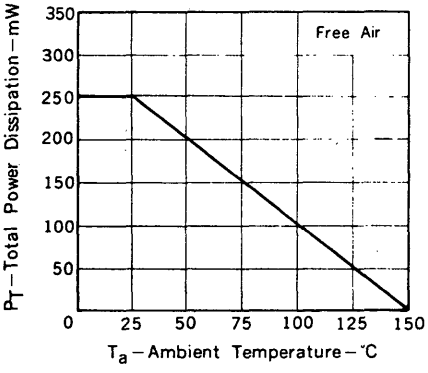
- V_{CBO} Collector to Base Voltage . . . . . 60 V
- V_{CEO} Collector to Emitter Voltage . . . . . 50 V
- V_{EBO} Emitter to Base Voltage . . . . . 10 V
- $I_{C(DC)}$ Collector Current (DC) . . . . . 100 mA
- $I_{C(pulse)}$ Collector Current (pulse) . . . . . 200 mA

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

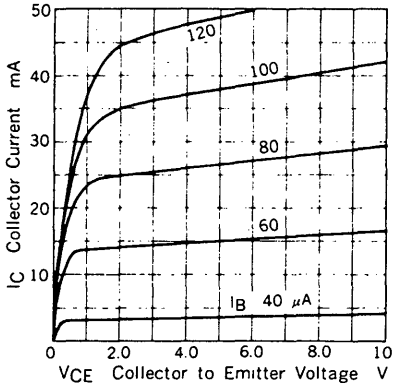
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
R_1	Input Resistance	15.4	22.0	28.6	kΩ	
R_1/R_2	Resistors Ratio	0.9	1.0	1.1	—	
V_{IL}	Low Level Input Voltage		1.1	0.8	V	V_{CE} = 5.0 V, I_C = 100 μA
V_{IH}	Hi Level Input Voltage	4.0	1.6		V	V_{CE} = 0.2 V, I_C = 5.0 mA
t_{on}	Turn on Time		0.11	0.4	μs	V_{CC} = 5.0 V, R_L = 1.0 kΩ
t_{stg}	Storage Time		2.3	5.0	μs	V_{in} = 5.0 V,
t_{off}	Turn off Time		2.6	6.0	μs	PW = 2 μs, Duty Cycle ≦ 2 %
h_{FE1}	DC Current Gain	60	120	195	—	V_{CE} = 5.0 V, I_C = 5.0 mA
h_{FE2}	DC Current Gain	90	400		—	V_{CE} = 5.0 V, I_C = 50 mA
$V_{CE(sat)}$	Collector Saturation Voltage		0.04	0.2	V	I_C = 5.0 mA, I_B = 0.25 mA
I_{CBO}	Collector Cutoff Current			0.1	μA	V_{CB} = 50 V, I_E = 0

TYPICAL CHARACTERISTICS (T_a = 25 °C)

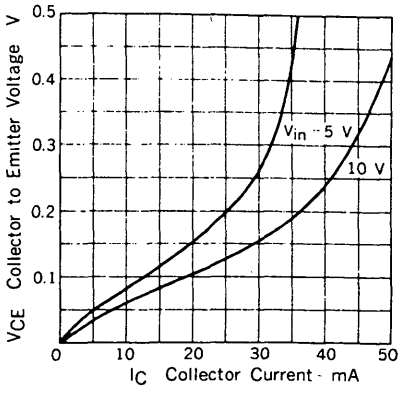
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



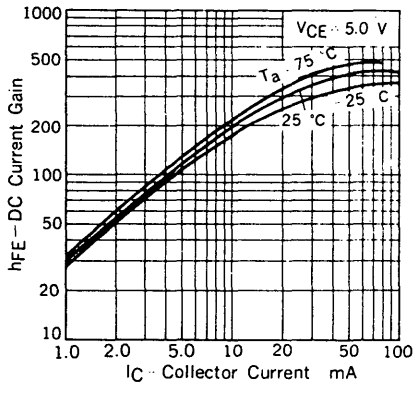
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



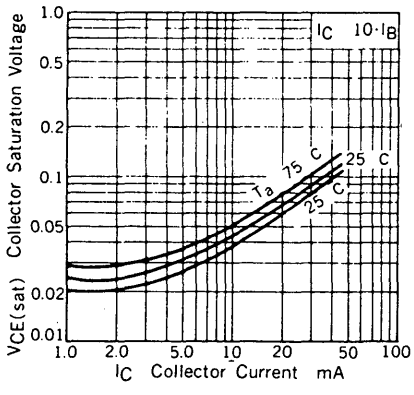
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



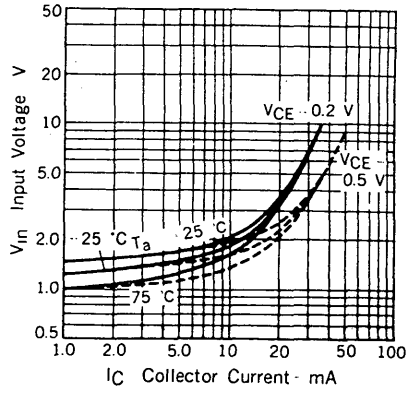
DC CURRENT GAIN vs. COLLECTOR CURRENT



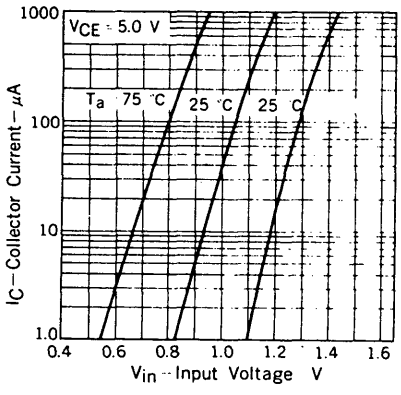
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



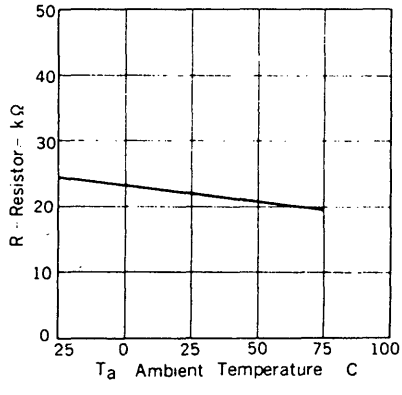
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE



SWITCHING TIME vs. COLLECTOR CURRENT