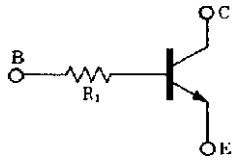
NEC

COMPOUND TRANSISTOR
AA1F4Z

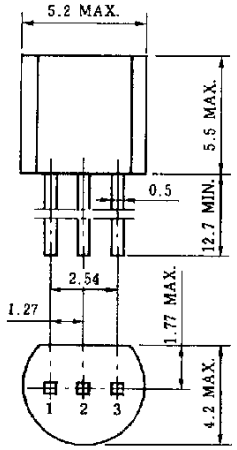
on-chip resistor NPN silicon epitaxial transistor
For mid-speed switching

FEATURES

- On-chip bias resistor
  (R_1 = 22 kΩ)
- Complementary transistor with AN1F4Z



PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Emitter EIAJ : SC-43B
2. Collector JEDEC : TO-92
3. Base IEC : PA33

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	60	V
Collector to emitter voltage	V_{CEO}	50	V
Emitter to base voltage	V_{EBO}	5	V
Collector current (DC)	$I_{C(DC)}$	100	mA
Collector current (Pulse)	$I_{C(pulse)}$ *	200	mA
Total power dissipation	P_T	250	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

* PW ≤ 10 ms, duty cycle ≤ 50 %

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 50 V, I_E = 0			100	nA
DC current gain	h_{FE1} **	V_{CE} = 5.0 V, I_C = 5.0 mA	135	330	600	–
DC current gain	h_{FE2} **	V_{CE} = 5.0 V, I_C = 50 mA	100	290		–
Collector saturation voltage	$V_{CE(sat)}$ **	I_C = 5.0 mA, I_B = 0.25 mA		0.04	0.2	V
Low level input voltage	V_{IL} **	V_{CE} = 5.0 V, I_C = 100 μA		0.55	0.5	V
High level input voltage	V_{IH} **	V_{CE} = 0.2 V, I_C = 5.0 mA	3.0	1.05		V
Input resistance	R_1		15.4	22	28.6	kΩ
Turn-on time	t_{on}	V_{CC} = 5.0 V, R_L = 1.0 kΩ			0.2	μs
Storage time	t_{stg}	V_I = 5.0 V, PW = 2.0 μs			5.0	μs
Turn-off time	t_{off}	duty cycle≤2 %			6.0	μs

** Pulse test PW ≤ 350 μs, duty cycle ≤ 2 %

h_{FE} CLASSIFICATION

Marking	Q	P	K
h_{FE1}	135 to 270	200 to 400	300 to 600

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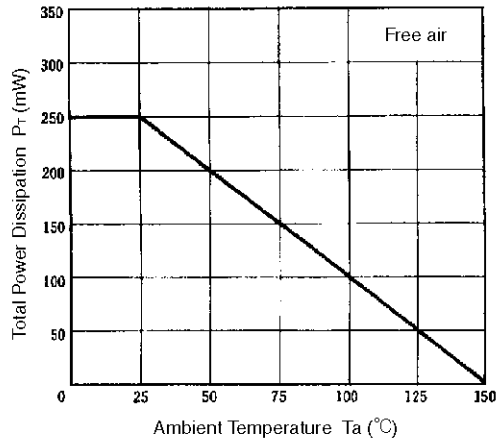
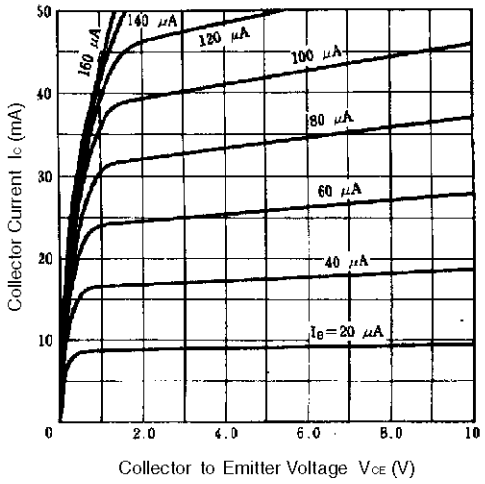
TYPICAL CHARACTERISTICS (T_a = 25°C)

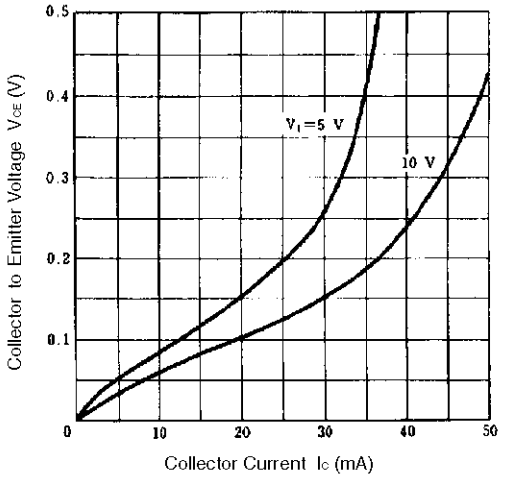
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



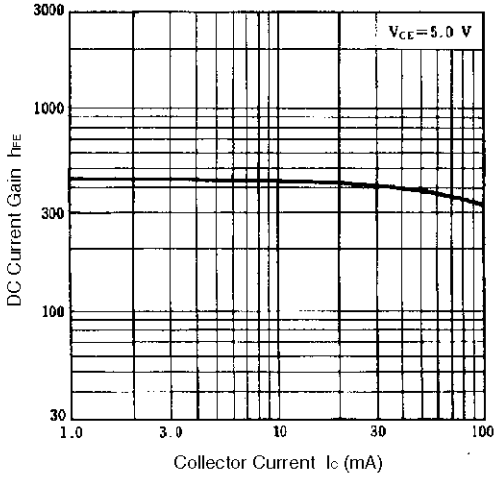
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



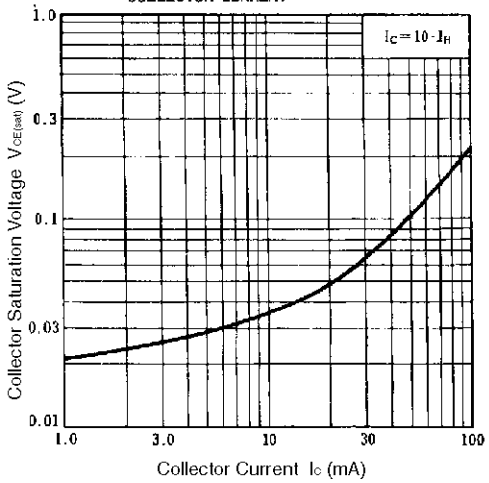
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



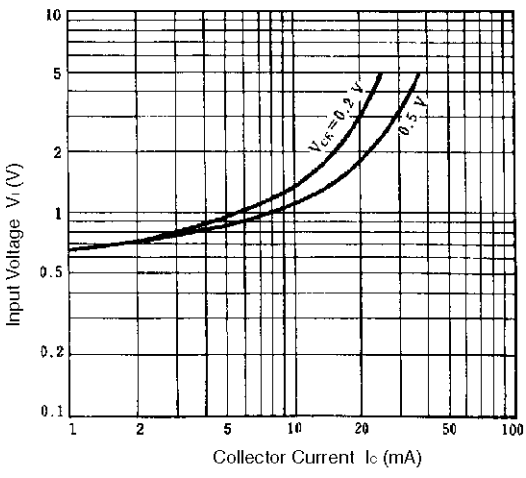
DC CURRENT GAIN vs. COLLECTOR CURRENT

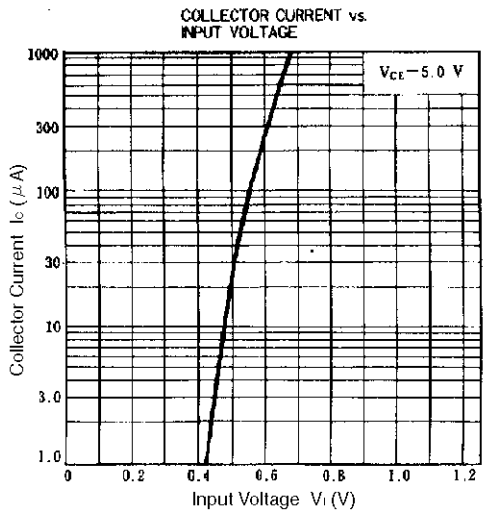


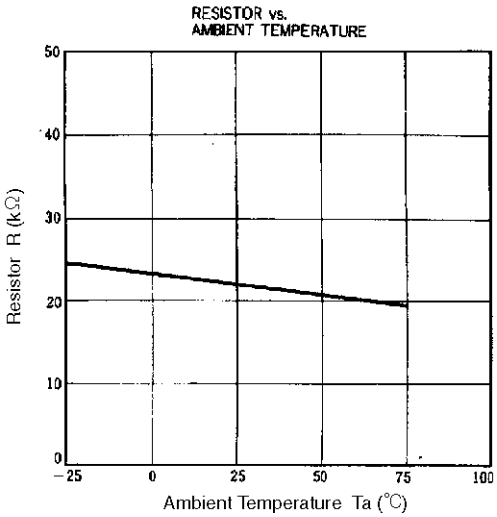
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



INPUT VOLTAGE vs. COLLECTOR CURRENT




COLLECTOR CURRENT vs.
INPUT VOLTAGE
V_{CE} = 5.0 V
Collector Current I_C (μA)
1000
300
100
30
10
3.0
1.0
0
0.2
0.4
0.6
0.8
1.0
1.2
Input Voltage V_I (V)


RESISTOR vs.
AMBIENT TEMPERATURE
Resistor R (kΩ)
50
40
30
20
10
0
−25
0
25
50
75
100
Ambient Temperature Ta (°C)

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