MITSUBISHI RF POWER TRANSISTOR

2SC2056

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC2056 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in VHF band portable or hand-held radio applications.

FEATURES

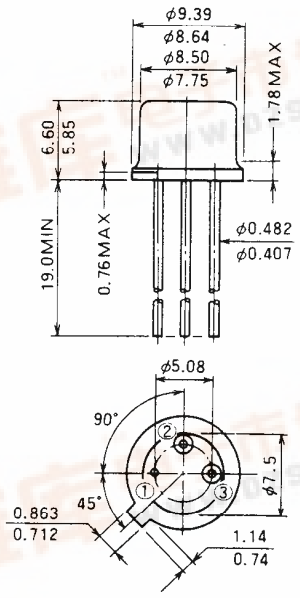
- High power gain: $G_{pe} \geqq 9dB$
  @V_{CC} = 7.2V, P_O = 1.6W, f = 175MHz
- TO-39 metal seeled package for high reliability.
- Emitter ballasted construction, gold metallization for good performances.
- Emitter electrode is connected electrically to the case.

APPLICATION

1 to 1.5 watt power amplifiers in VHF band portable or hand-held radio applications.

OUTLINE DRAWING

Dimensions in mm



PIN :
① EMITTER (CASE)
② BASE
③ COLLECTOR

T-8E

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		18	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	Collector to emitter voltage	R_{BE} = ∞	9	V
I_C	Collector current		0.6	A
P_C	Collector dissipation	T_a = 25°C	0.8	W
		T_C = 25°C	4	W
T_j	Junction temperature		175	°C
T_{stg}	Storage temperature		−55 to 175	°C
Rth-a	Thermal resistance	Junction to ambient	187.5	°C/W
Rth-c		Junction to case	37.5	°C/W

Note. Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_E = 1mA, I_C = 0	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C = 10mA, I_E = 0	18			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C = 10mA, R_{BE} = ∞	9			V
I_{CBO}	Collector cutoff current	V_{CB} = 10V, I_E = 0			100	μA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0			100	μA
h_{FE}	DC forward current gain *	V_{CE} = 7V, I_C = 0.1A	10	50	180	—
P_O	Output power	V_{CC} = 7.2V, P_{in} = 0.2W, f = 175MHz	1.6	2		W
η_C	Collector efficiency		55	60		%

Note. *Pulse test, P_W = 150μs, duty = 5%.
Above parameters, ratings, limits and conditions are subject to change.

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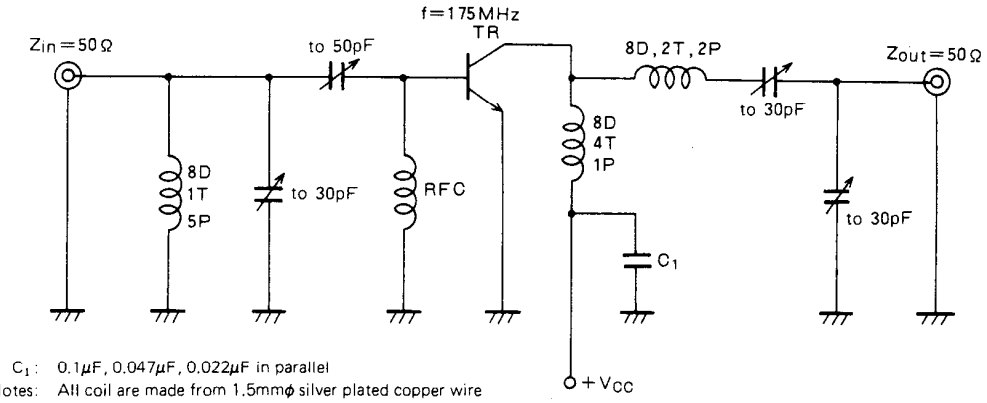
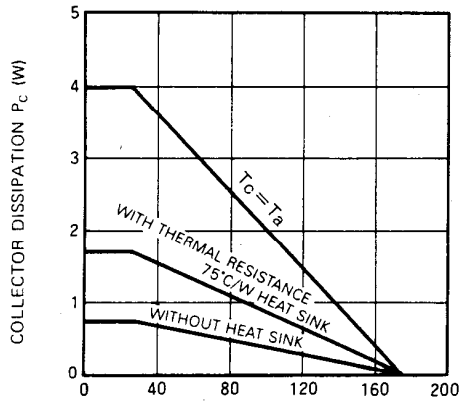
TEST CIRCUIT



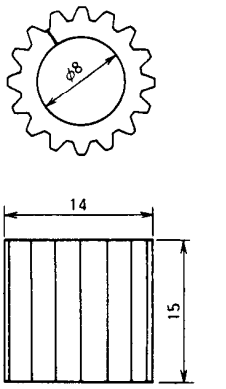
C_1: 0.1μF, 0.047μF, 0.022μF in parallel
Notes: All coil are made from 1.5mmφ silver plated copper wire
Coil dimensions in milli-meter
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil

TYPICAL PERFORMANCE DATA

COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE

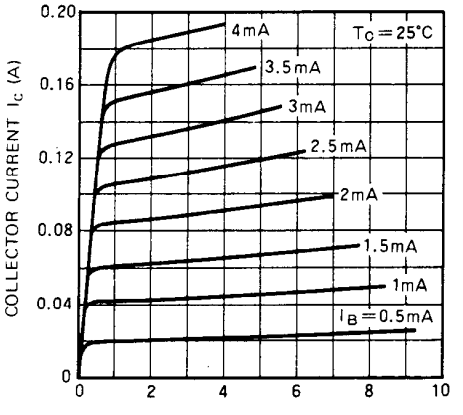


THERMAL RESISTANCE 75°C/W HEAT SINK OUTLINE DRAWING

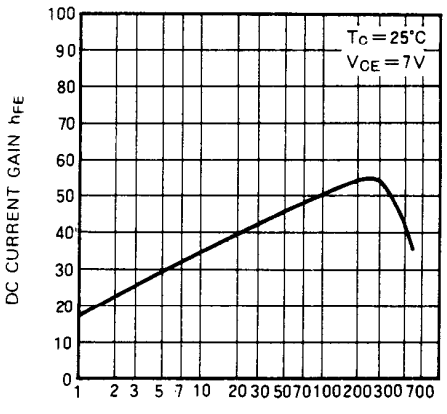


MATERIAL: Aℓ
DIMENSIONS: mm

COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN VS. COLLECTOR CURRENT



MITSUBISHI ELECTRIC

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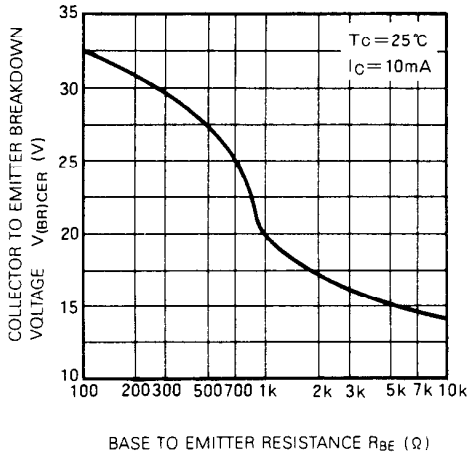
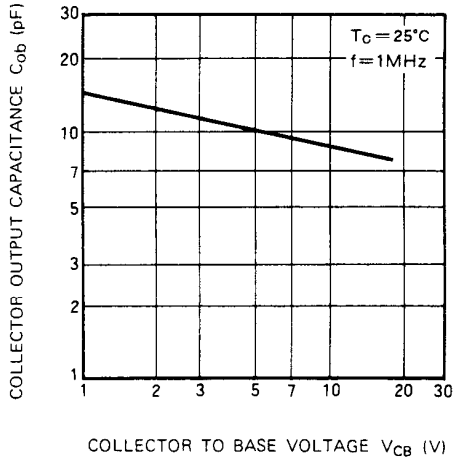
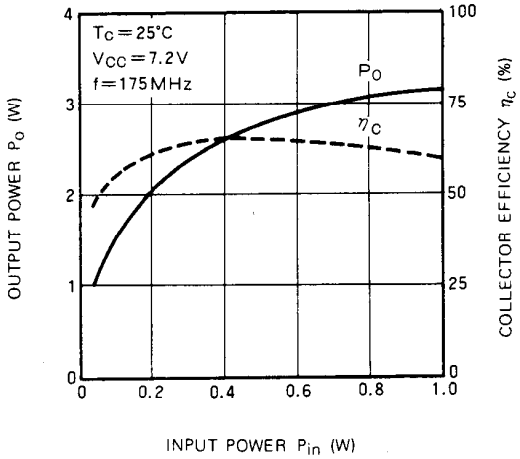
COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE