MITSUBISHI RF POWER TRANSISTOR

2SC1947

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC1947 is a silicon NPN epitaxial planar type transistor designed for industrial use RF power amplifiers on VHF band mobile radio applications.

FEATURES

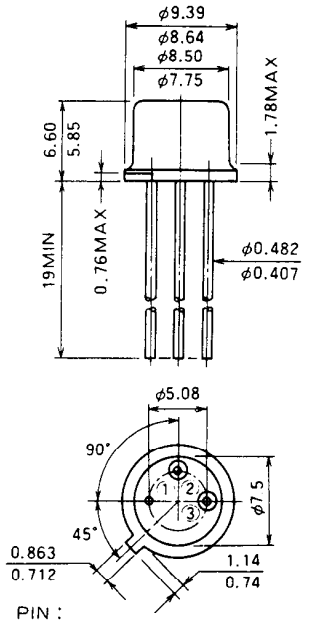
- High power gain: $G_{pe} \geqq 10.7$dB
  @V_{CC} = 13.5V, P_O = 3.5W, f = 175MHz
- TO-39 metal seeled package for high reliability.
- Emitter electrode is connected electrically to the case.

APPLICATION

1 to 3 watt power amplifiers in VHF band mobile 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		35	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	Collector to emitter voltage	$R_{BE}=\infty$	17	V
I_C	Collector current		1	A
P_C	Collector dissipation	T_a=25°C	1	W
		T_C=25°C	10	W
T_j	Junction temperature		175	°C
T_{stg}	Storage temperature		−65 to 175	°C
R_{th-a}	Thermal resistance	Junction to ambient	150	°C/W
R_{th-c}		Junction to case	15	°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=5mA, I_C=0	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C=10mA, I_E=0	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C=50mA, $R_{BE}=\infty$	17			V
I_{CBO}	Collector cutoff current	V_{CB}=25V, I_E=0			500	μA
I_{EBO}	Emitter cutoff current	V_{EB}=3V, I_C=0			500	μA
h_{FE}	DC forward current gain *	V_{CE}=10V, I_C=0.1A	10	50	180	—
P_O	Output power **	V_{CC}=13.5V, P_{in}=0.3W, f=175MHz	3.5	4		W
η_C	Collector efficiency		50	60		%

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

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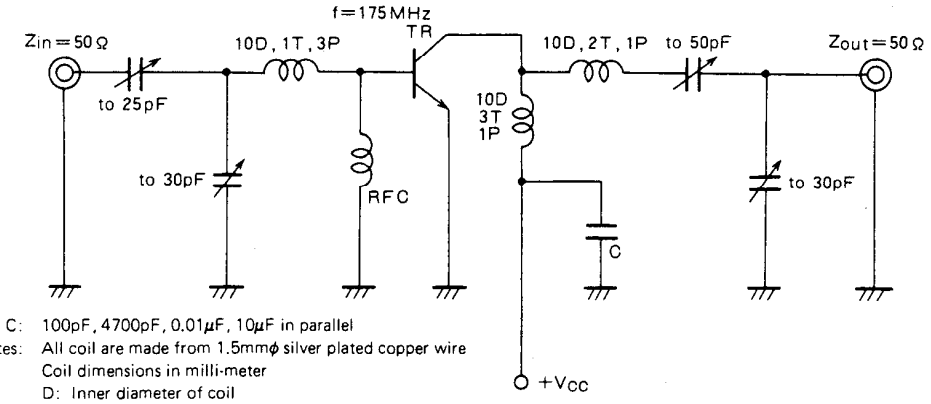
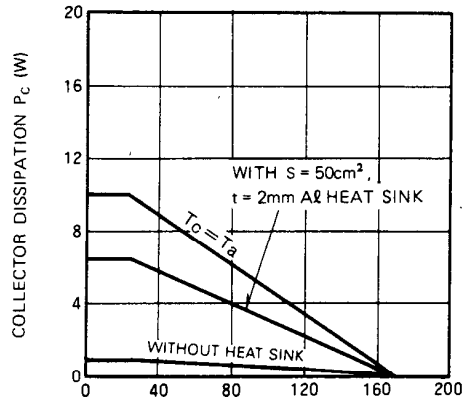
TEST CIRCUIT



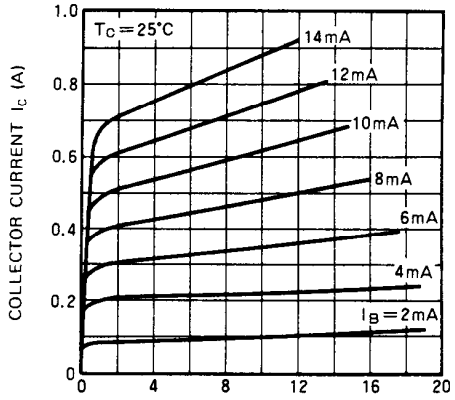
C: 100pF, 4700pF, 0.01μF, 10μF in parallel
Notes: All coil are made from 1.5mmϕ silver plated copper wire
Coil dimensions in milli-meter
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil

TYPICAL PERFORMANCE DATA

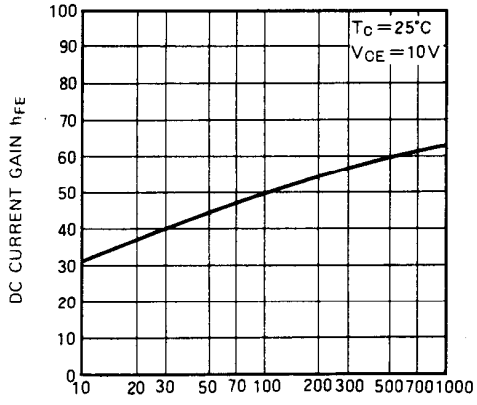
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



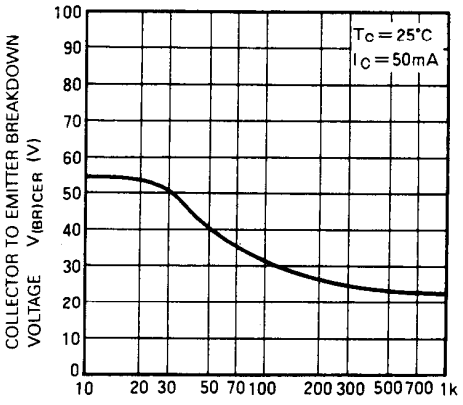
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN VS. COLLECTOR CURRENT



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



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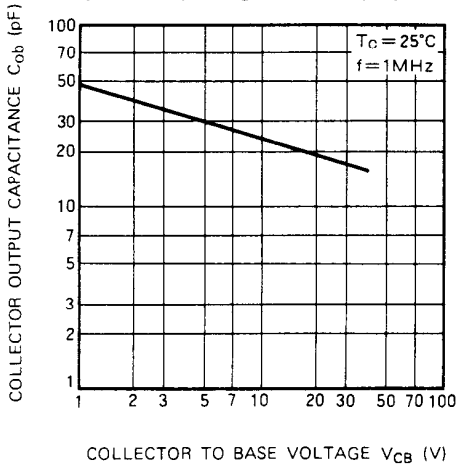
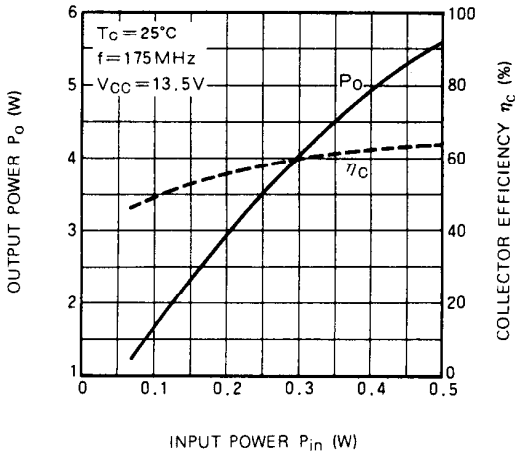
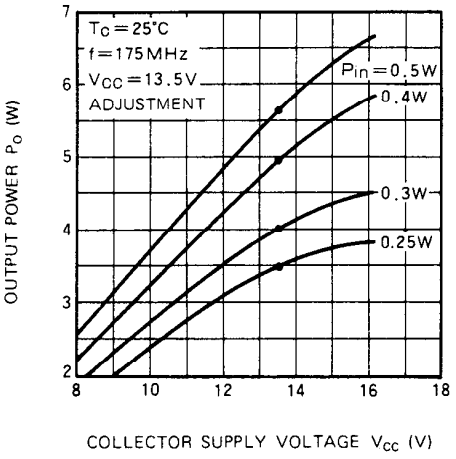
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE



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