MITSUBISHI RF POWER TRANSISTOR

2SC1945

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC1945 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers on HF band mobile radio applications.

FEATURES

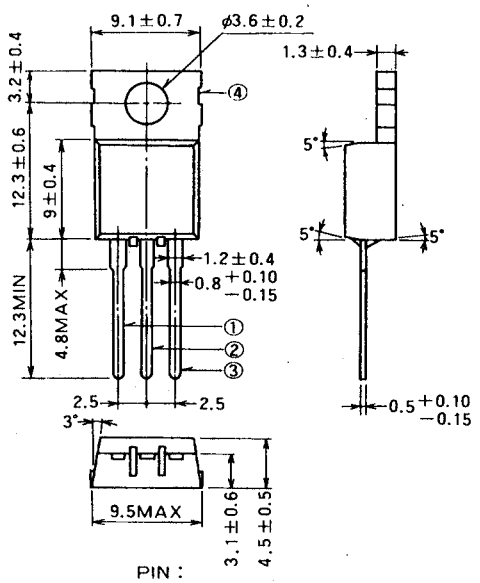
- High power gain: $G_{pe} \geqq 14.5$dB
  @V_{CC} = 12V, P_O = 18W, f = 27MHz
- Emitter ballasted construction for high reliability and good performances.
- TO-220 package similarly is combinient for mounting.
- Ability of withstanding infinite load VSWR when operated at V_{CC} = 16V, P_O = 18W, f = 27MHz.
- Equivalent input/output series impedance:
  Zin=1.7−j2.5Ω @Po=14W, Vcc=12V, f=27MHz
  Zout=7.3−j3.7Ω

APPLICATION

10 to 14 watts output power class AB amplifiers applications in HF band.

OUTLINE DRAWING

Dimensions in mm



PIN :
① BASE
② EMITTER (FIN)
③ COLLECTOR
④ FIN (EMITTER)

T-30E

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		80	V
V_{EBO}	Emitter to base voltage		5	V
V_{CEO}	Collector to emitter voltage	$R_{BE}=\infty$	40	V
I_C	Collector current		6	A
P_C	Collector dissipation	Ta=25°C	1.5	W
		Tc=25°C	20	W
T_j	Junction temperature		150	°C
Tstg	Storage temperature		−55 to 150	°C
Rth-a	Thermal resistance	Junction to ambient	83.3	°C/W
Rth-c		Junction to case	6.25	°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	5			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C=1mA, I_E=0	80			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C=10mA, $R_{BE}=\infty$	40			V
I_{CBO}	Collector cutoff current	V_{CB}=30V, I_E=0			100	μA
I_{EBO}	Emitter cutoff current	V_{EB}=4V, I_C=0			100	μA
h_{FE}	DC forward current gain *	V_{CE}=10V, I_C=0.1A	10	50	180	—
P_O	Output power	V_{CC}=12V, Pin=0.5W, f=27MHz	14	16		W
η_C	Collector efficiency		60	70		%

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

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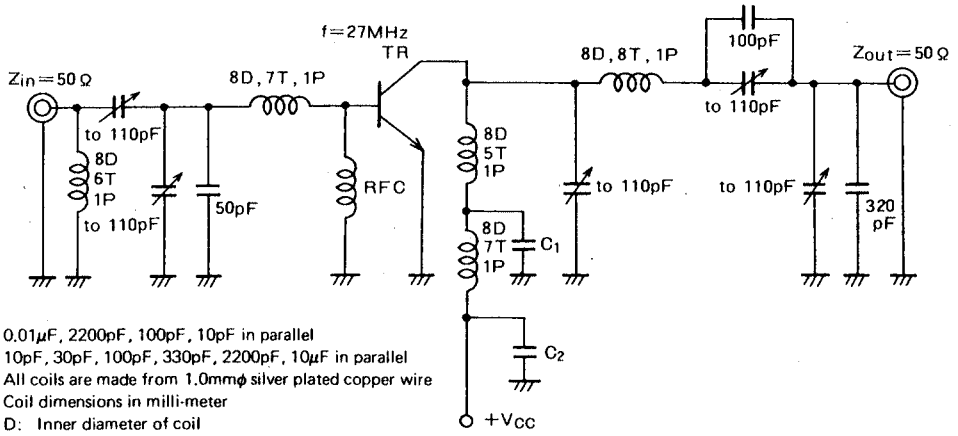
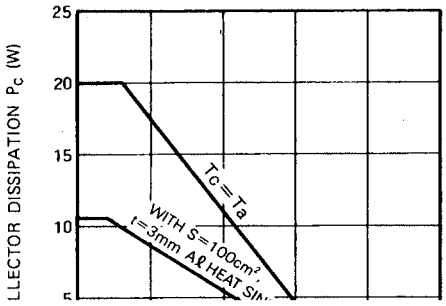
TEST CIRCUIT



C_1: 0.01μF, 2200pF, 100pF, 10pF in parallel
C_2: 10pF, 30pF, 100pF, 330pF, 2200pF, 10μF in parallel
Notes: All coils are made from 1.0mmφ 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