MITSUBISHI RF POWER TRANSISTOR

2SC2053

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC2053 is a silicon NPN epitaxial planar type transistor designed for RF amplifiers on VHF band mobile radio applications.

FEATURES

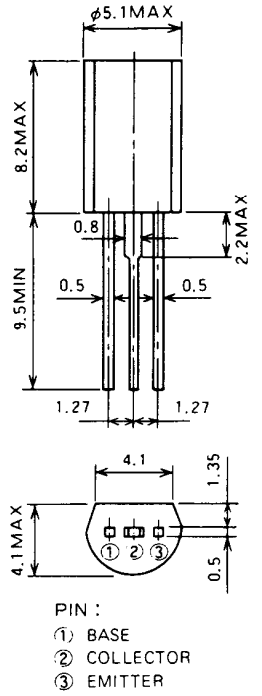
- High power gain: $G_{pe} \geqq 15.7$dB
  @V_{CC} = 13.5V, P_O = 0.15W, f = 175MHz
- Emitter ballasted construction, gold metallization for high reliability and good performances.
- TO-92 similar package is combinient for mounting.

APPLICATION

Driver amplifiers in general in VHF band mobile radio applications.

OUTLINE DRAWING

Dimensions in mm



PIN :
① BASE
② COLLECTOR
③ EMITTER

TO-92L

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		40	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	Collector to emitter voltage	$R_{BE} = \infty$	17	V
I_C	Collector current		0.3	A
P_C	Collector dissipation	T_a = 25°C	0.6	W
T_j	Junction temperature		135	°C
T_{stg}	Storage temperature		−55 to 135	°C
Rth-a	Thermal resistance	Junction to ambient	183	°C/W

Note. Above parameters are guaranteed independently.

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

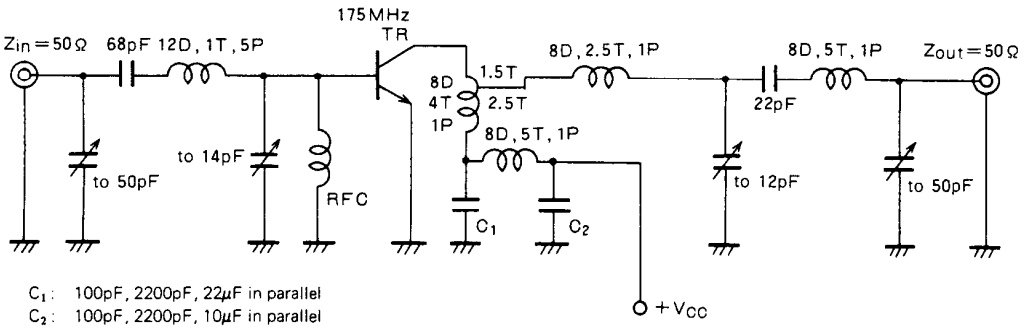
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_E = 1mA, I_C = 0	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C = 1mA, I_E = 0	40			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C = 10mA, $R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	V_{CB} = 15V, I_E = 0			20	μA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0			20	μA
h_{FE}	DC forward current gain *	V_{CE} = 10V, I_C = 10mA	10	50	180	—
P_O	Output power	V_{CC} = 13.5V, P_{in} = 4mW, f = 175MHz	150	200		mW
η_C	Collector efficiency		40	50		%

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

NOV. '97

MITSUBISHI ELECTRIC

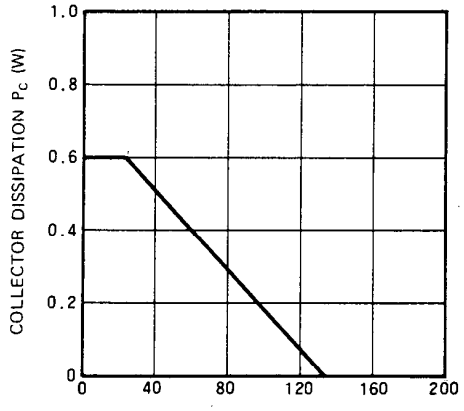
TEST CIRCUIT



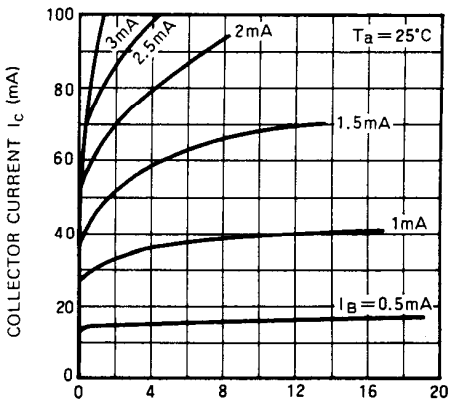
C_1: 100pF, 2200pF, 22μF in parallel
C_2: 100pF, 2200pF, 10μF in parallel
Notes: All coil are made from 1.5mmφ silver plated copper wire
Coil dimensions in milli-meter
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil

TYPICAL PERFORMANCE DATA

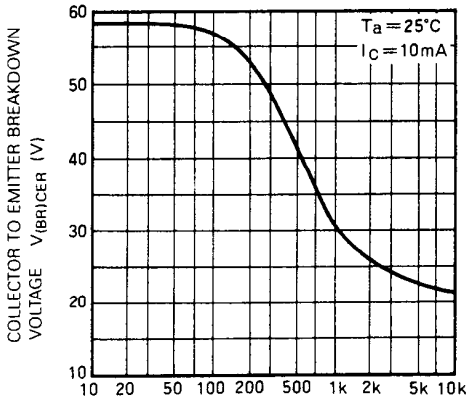
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



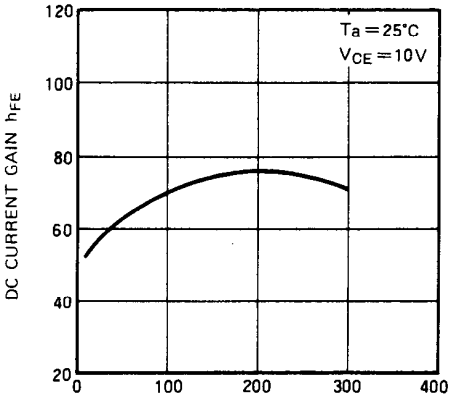
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



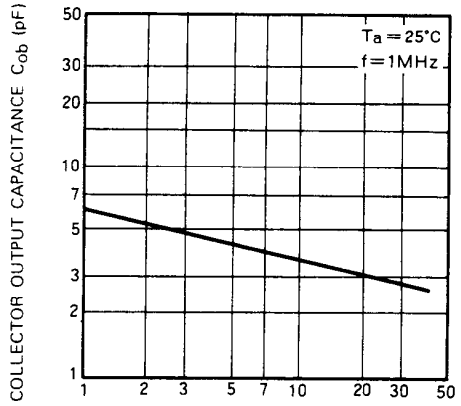
DC CURRENT GAIN VS. COLLECTOR CURRENT



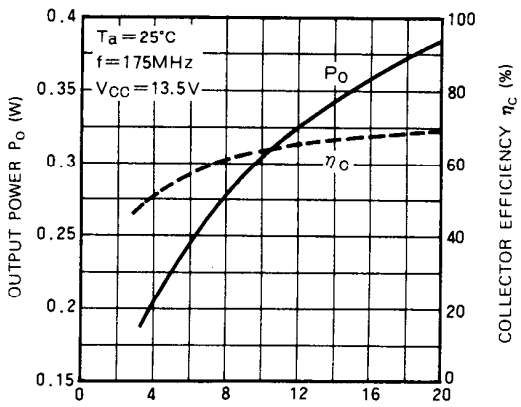
MITSUBISHI ELECTRIC

NPN EPITAXIAL PLANAR TYPE

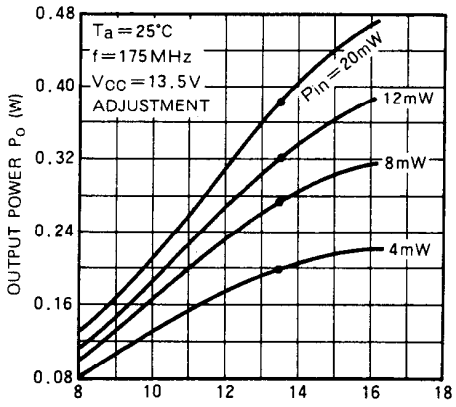
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE



MITSUBISHI ELECTRIC