

## DESCRIPTION

2SC3001 is a silicon NPN epitaxial planar type transistor specifically designed for VHF power amplifier applications.

## FEATURES

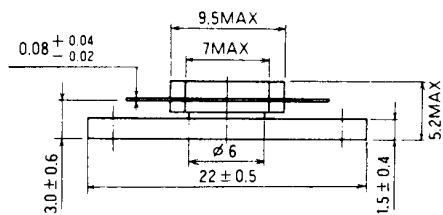
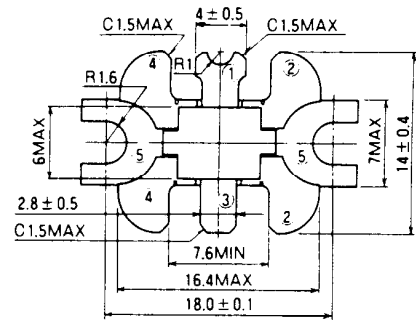
- High power gain:  $G_{pe} \geq 13\text{dB}$ .  
@  $V_{CC} = 7.2\text{V}$ ,  $f = 175\text{MHz}$ ,  $P_{in} = 0.3\text{W}$ .
- Emitter ballasted construction.
- High ruggedness: Ability to withstand more than 20:1 load VSWR when operated at  $V_{CC} = 9\text{V}$ ,  $f = 175\text{MHz}$ ,  $P_O = 6.0\text{W}$ .
- Flange type ceramic package.
- $Z_{in} = 1.5 - j1.3\Omega$ ,  $Z_{out} = 5.0 - j1.2\Omega$   
@  $V_{CC} = 7.2\text{V}$ ,  $f = 175\text{MHz}$ ,  $P_O = 6.0\text{W}$ .

## APPLICATION

For output stage of 5W power amplifiers in VHF band portable type radio sets.

## OUTLINE DRAWING

Dimensions in mm



PIN :

- ① COLLECTOR
- ② EMITTER (FLANGE)
- ③ BASE
- ④ EMITTER (FLANGE)
- ⑤ FIN (EMITTER)

T-31E

## ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ )

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CB0}$	Collector to base voltage		20	V
$V_{EB0}$	Emitter to base voltage		3.5	V
$V_{CEO}$	Collector to emitter voltage	$R_{BE} = \infty$	9	V
$I_C$	Collector current		3	A
$P_C$	Collector dissipation	$T_C = 25^\circ\text{C}$	20	W
$T_J$	Junction temperature		175	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 to 175	$^\circ\text{C}$

Note. Above parameters are guaranteed independently.

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ )

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 5\text{mA}$ , $I_C = 0$	3.5			V
$V_{(BR)CB0}$	Collector to base breakdown voltage	$I_C = 10\text{mA}$ , $I_E = 0$	20			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 50\text{mA}$ , $R_{BE} = \infty$	9			V
$I_{CB0}$	Collector cut-off current	$V_{CB} = 10\text{V}$ , $I_E = 0$			500	$\mu\text{A}$
$I_{EB0}$	Emitter cut-off current	$V_{EB} = 2\text{V}$ , $I_C = 0$			500	$\mu\text{A}$
$h_{FE}$	DC forward current gain *	$V_{CE} = 5\text{V}$ , $I_C = 0.1\text{A}$	20	50	180	--
$P_O$	Power Output	$V_{CC} = 7.2\text{V}$ , $P_{in} = 0.3\text{W}$ , $f = 175\text{MHz}$	6	7		W
$\eta_C$	Collector efficiency		60	65		%

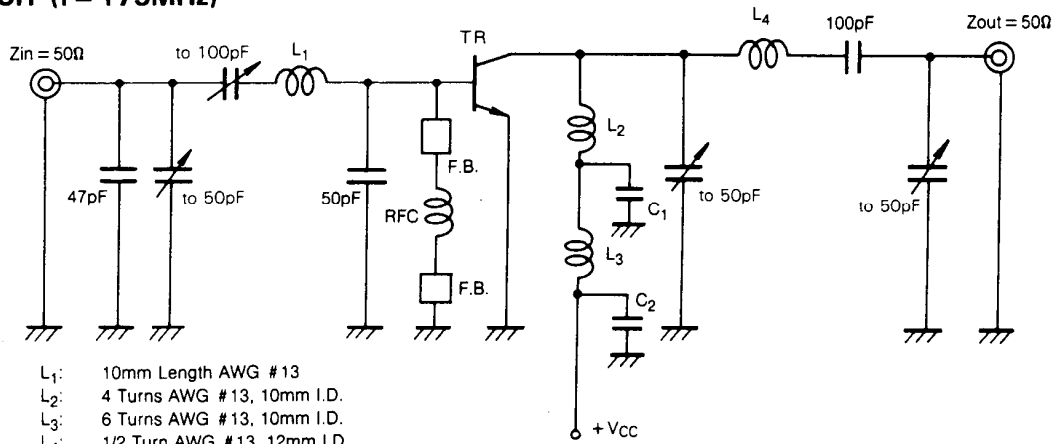
Note. \* Pulse test,  $P_w = 150\mu\text{s}$ , duty=5%.

Above parameters, ratings, limits and conditions are subject to change.

MITSUBISHI RF POWER TRANSISTOR  
**2SC3001**

**NPN EPITAXIAL PLANAR TYPE**

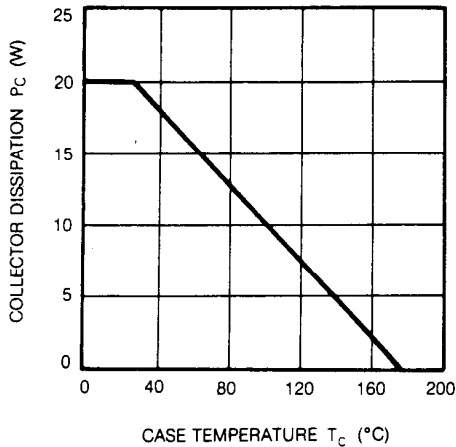
**TEST CIRCUIT (f = 175MHz)**



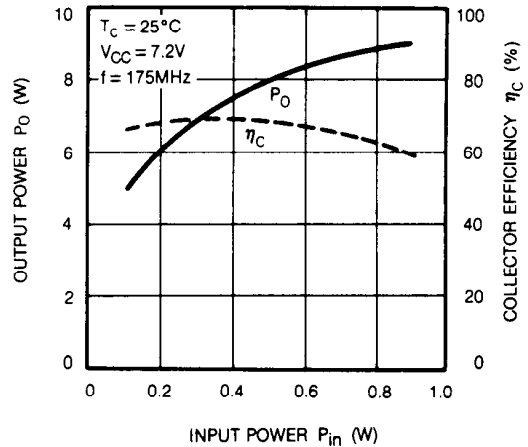
- L<sub>1</sub>: 10mm Length AWG #13
- L<sub>2</sub>: 4 Turns AWG #13, 10mm I.D.
- L<sub>3</sub>: 6 Turns AWG #13, 10mm I.D.
- L<sub>4</sub>: 1/2 Turn AWG #13, 12mm I.D.
- RFC: 40 Turns AWG #32 Enameled wire Close Wound on 4mm O.D. 14mm Length Bakelite.
- C<sub>1</sub>: 220pF, 1000pF, 4700pF, 10μF in parallel.
- C<sub>2</sub>: 220pF, 1000pF, 4700pF, 10μF in parallel.

**TYPICAL PERFORMANCE DATA**

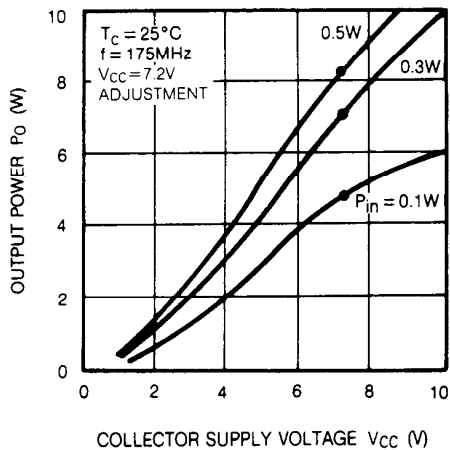
**COLLECTOR DISSIPATION VS. CASE TEMPERATURE CHARACTERISTICS**



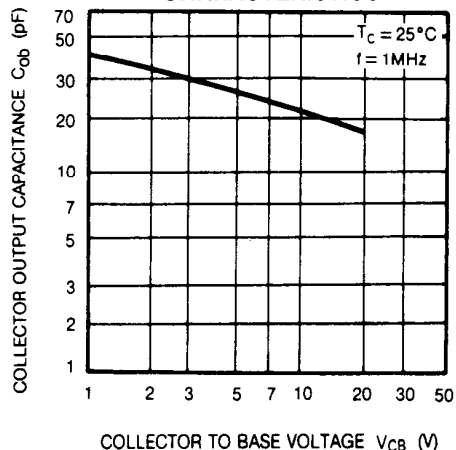
**OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS.**



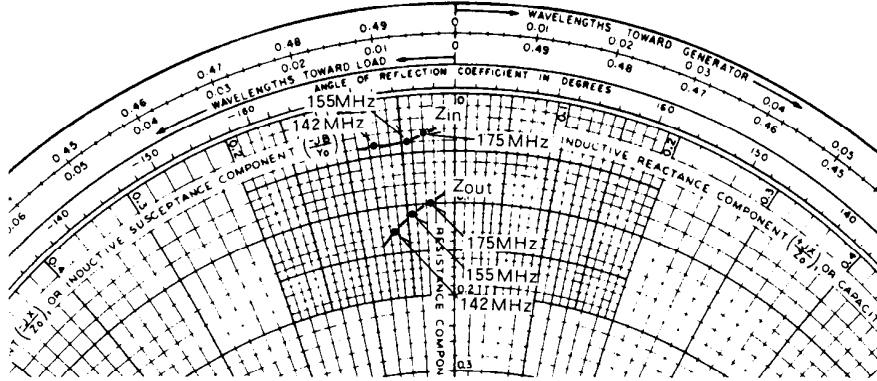
**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS**



**COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS**



**INPUT/OUTPUT IMPEDANCE VS. FREQUENCY CHARACTERISTICS**



f (MHz)	Z <sub>in</sub> (Ω)	Z <sub>out</sub> (Ω)
142	2.0 - j3.6	6.0 - j3.2
155	1.8 - j2.0	5.4 - j2.3
175	1.5 - j1.3	5.0 - j1.2
V <sub>CC</sub> = 7.2V, P <sub>o</sub> = 6W		