

DESCRIPTION

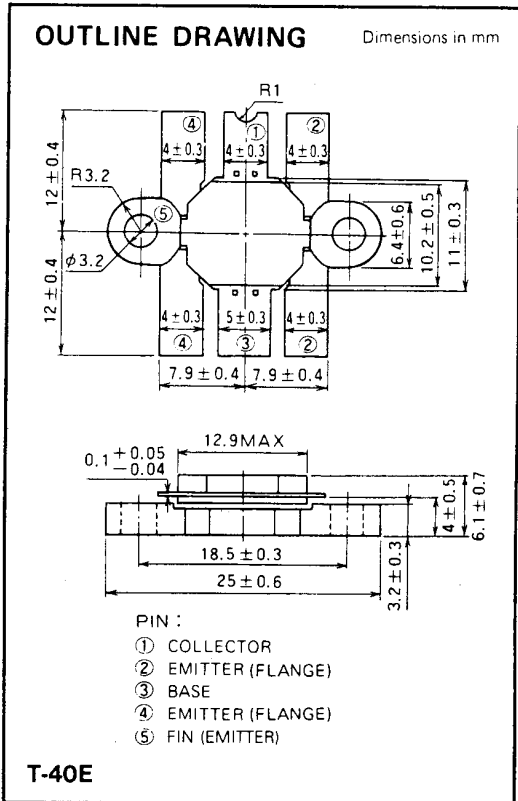
2SC3102 is a silicon NPN epitaxial planar type transistor specifically designed for high power amplifiers applications in UHF band.

FEATURES

- High power output and high gain: $P_O \geq 60W$, $G_{pe} \geq 4.8dB$
@ $V_{CC} = 12.5V$, $f = 520MHz$, $P_{in} = 20W$.
- Emitter ballasted construction.
- High ruggedness: Ability to withstand more than 20:1 load VSWR when operated at $V_{CC} = 15.2V$, $P_O = 60W$, $f = 520MHz$.
- High reliability due to gold metalization die
- Flange type ceramic package
- $Z_{in} = 1.0 + j1.0\Omega$, $Z_{out} = 1.1 + j1.0\Omega$
@ $V_{CC} = 12.5V$, $f = 520MHz$, $P_O = 60W$.

APPLICATION

For output stage of 50W power amplifiers in UHF band.



ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ C$)

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		18	A
P_C	Collector dissipation	$T_C = 25^\circ C$	170	W
T_j	Junction temperature		175	$^\circ C$
T_{stg}	Storage temperature		-55 to 175	$^\circ C$

Note. Above parameters are guaranteed independently.

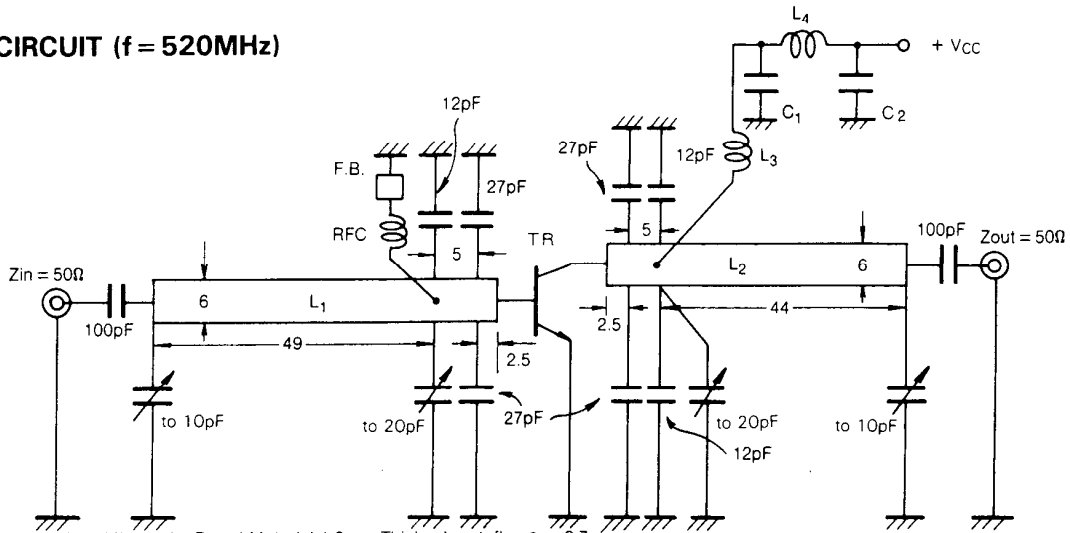
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 20mA, I_C = 0$	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 20mA, I_E = 0$	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 0.2A, R_{BE} = \infty$	17			V
I_{CBO}	Collector cut off current	$V_{CB} = 15V, I_E = 0$			5	mA
I_{EBO}	Emitter cut off current	$V_{EB} = 3V, I_C = 0$			5	mA
h_{FE}	DC forward current gain *	$V_{CE} = 10V, I_C = 2A$	10	50	180	-
P_O	Power Output	$V_{CC} = 12.5V, P_{in} = 20W, f = 520MHz$	60	65		W
η_C	Collector efficiency		60	65		%

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

NPN EPITAXIAL PLANAR TYPE

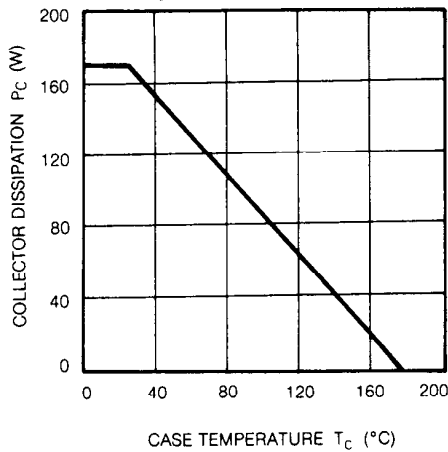
TEST CIRCUIT (f = 520MHz)



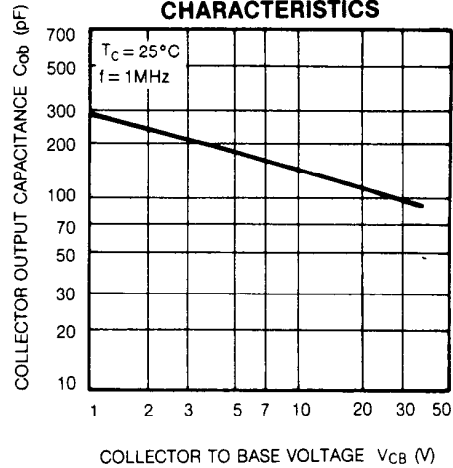
L_1, L_2 : Microstrip; Board Material 1.6mm Thick, glass-teflon $\epsilon_r = 2.7$
 L_3 : 1 Turn, AWG #13, 8mm I.D.
 L_4 : 4 Turns, AWG #13, 8mm I.D.
 RFC: 8 Turns, AWG #20, 4mm I.D.
 F.B.: Ferrite Bead
 C_1 : 82pF, 220pF, 2200pF, 4700pF, 33 μ F in Parallel
 C_2 : 82pF, 220pF, 2200pF, 4700pF, 22 μ F in Parallel
 Dimensions: mm

TYPICAL PERFORMANCE DATA

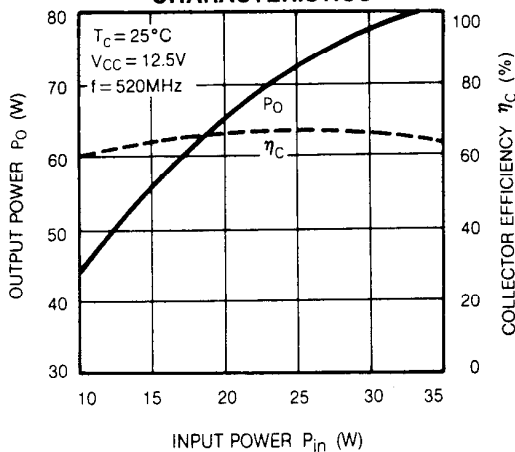
COLLECTOR DISSIPATION VS. CASE TEMPERATURE CHARACTERISTICS



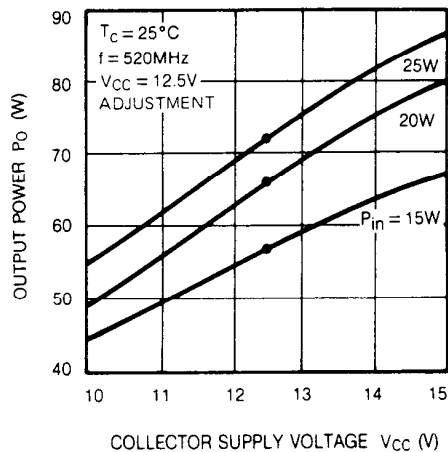
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS



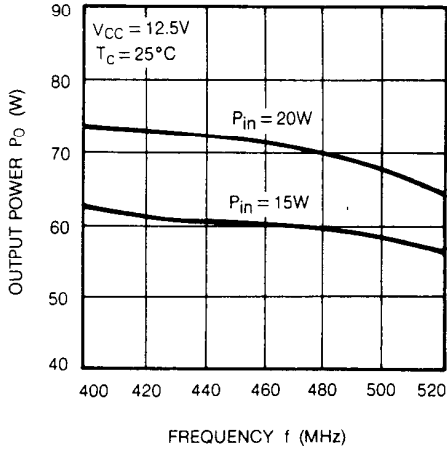
OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS



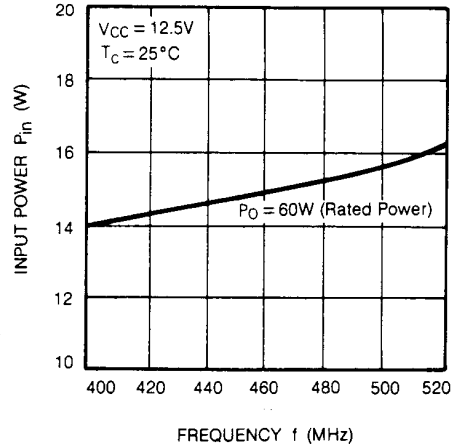
OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS



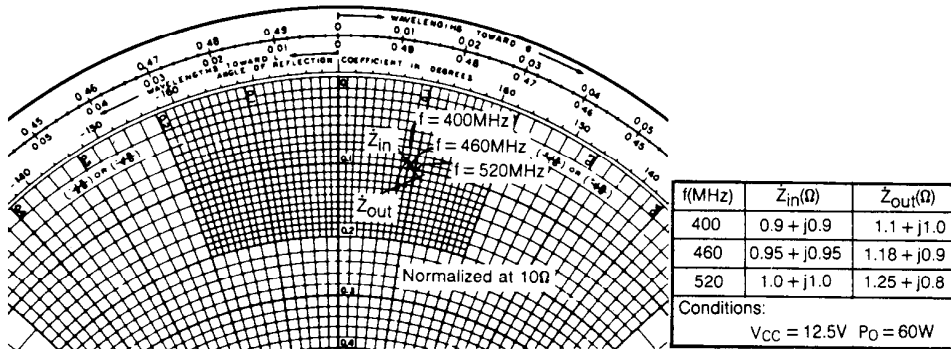
OUTPUT POWER VS. FREQUENCY CHARACTERISTICS



INPUT POWER VS. FREQUENCY CHARACTERISTICS @ RATED POWER



SERIES INPUT AND OUTPUT IMPEDANCE VS. FREQUENCY CHARACTERISTICS, 2SC3102



TEST CIRCUIT BOARD LAYOUT (f = 520MHz)

