

MITSUBISHI RF POWER TRANSISTOR 2SC3105

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC3105 is a silicon NPN epitaxial planar type transistor specifically designed for power amplifiers in the 800 – 900MHz band range.

FEATURES

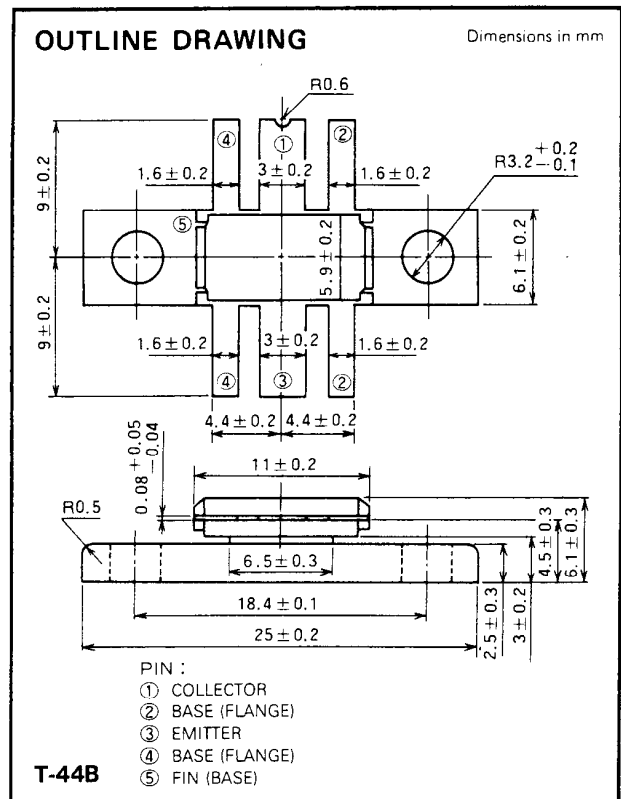
- High gain, high efficiency
 $P_o \geq 30W$, $G_{pb} \geq 3.0dB$, $\eta_c = 50\%$ (MIN)
 $@f = 850MHz$, $V_{CC} = 12.5V$, $P_{in} = 15W$
- Emitter ballasted by diffusion resistance.
- Gold metalization of transistor die for good reliability.
- The ability withstand infinite VSWR when operated at $P_o = 30W$, $V_{CC} = 15.2V$.
- High Input-Impedance Transistor (HI^2T); internal input matching network.
- Common-base type.

APPLICATION

For RF power amplifiers in the 800 – 900MHz band range, especially suitable for mobile radio applications.

SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE

$Z_{in} = 2.75 - j0.65(\Omega)$, $Z_{out} = 3.45 + j0.15(\Omega)$, $@f = 850MHz$,
 $V_{CC} = 12.5V$, $P_o = 30W$.



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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CEO}	Collector to base voltage		35	V
V_{EBO}	Emitter to base voltage		3	V
V_{CEO}	Collector to emitter voltage	$R_{BE} = \infty$	17	V
I_C	Collector current		10	A
P_C	Collector dissipation	$T_C = 25^\circ C$	80	W
T_J	Junction temperature		175	$^\circ C$
T_{stg}	Storage temperature		-55 to 175	$^\circ C$

Note. Above parameters are guaranteed independently.

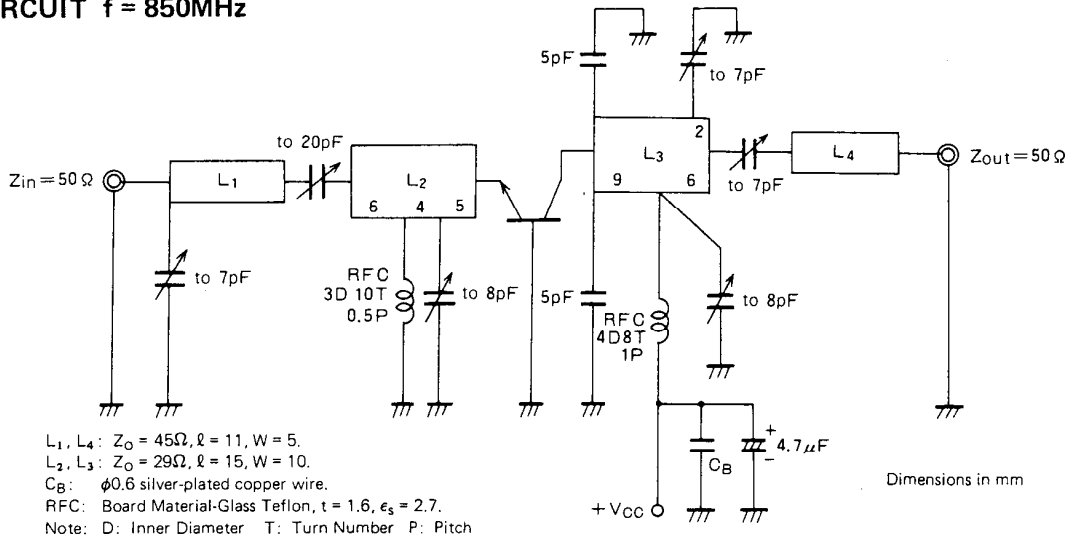
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 10mA$, $I_C = 0$	3			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	$I_C = 0.1A$, $R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	$V_{CB} = 15V$, $I_E = 0$			5	mA
I_{EBO}	Emitter cutoff current	$V_{EB} = 2V$, $I_C = 0$			5	mA
h_{FE}	DC forward current gain *	$V_{CE} = 10V$, $I_C = 1A$	10	40	120	—
* P_O	Output power	$V_{CC} = 12.5V$, $P_{in} = 15W$, $f = 850MHz$	30	34		W
η_C	Collector efficiency		50	55		%

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

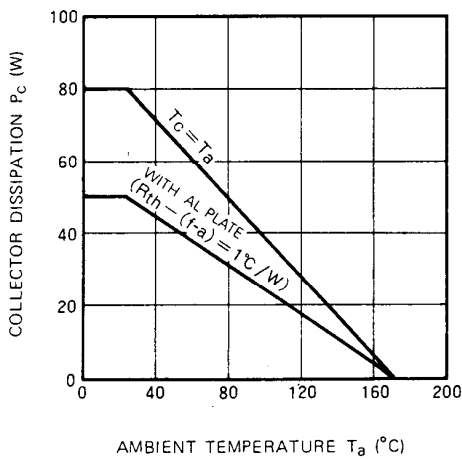
Above parameters, ratings, limits and conditions are subject to change.

TEST CIRCUIT $f = 850\text{MHz}$

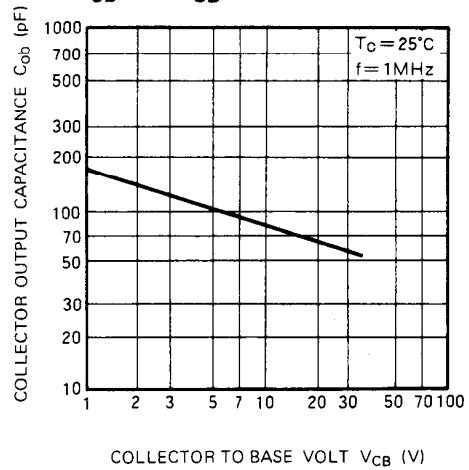


TYPICAL CHARACTERISTICS

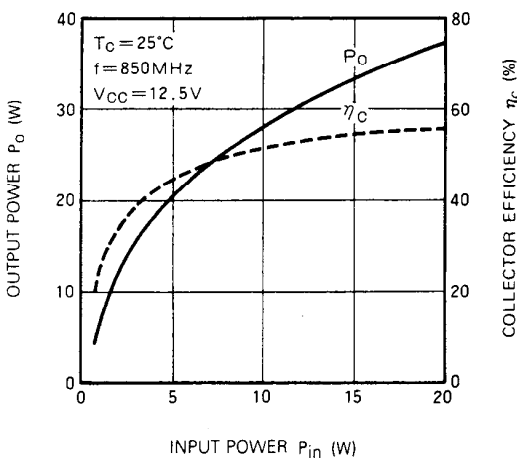
P_c VS. T_a CHARACTERISTICS



C_{ob} VS. V_{CB} CHARACTERISTICS



P_o, η_c VS. P_{in} CHARACTERISTICS



P_o VS. V_{CC} CHARACTERISTICS

