

# 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

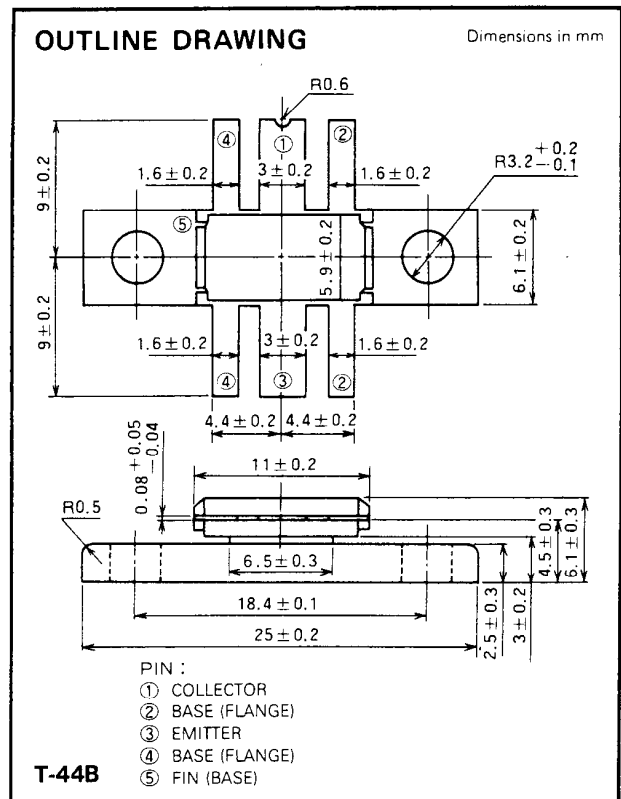
- High gain, high efficiency  
 $P_o \geq 30W$ ,  $G_{pb} \geq 3.0dB$ ,  $\eta_c = 50\%$  (MIN)  
 $@f = 850MHz$ ,  $V_{CC} = 12.5V$ ,  $P_{in} = 15W$
- Emitter ballasted by diffusion resistance.
- Gold metalization of transistor die for good reliability.
- The ability withstand infinite VSWR when operated 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
$\eta_C$	Collector efficiency		50	55		%

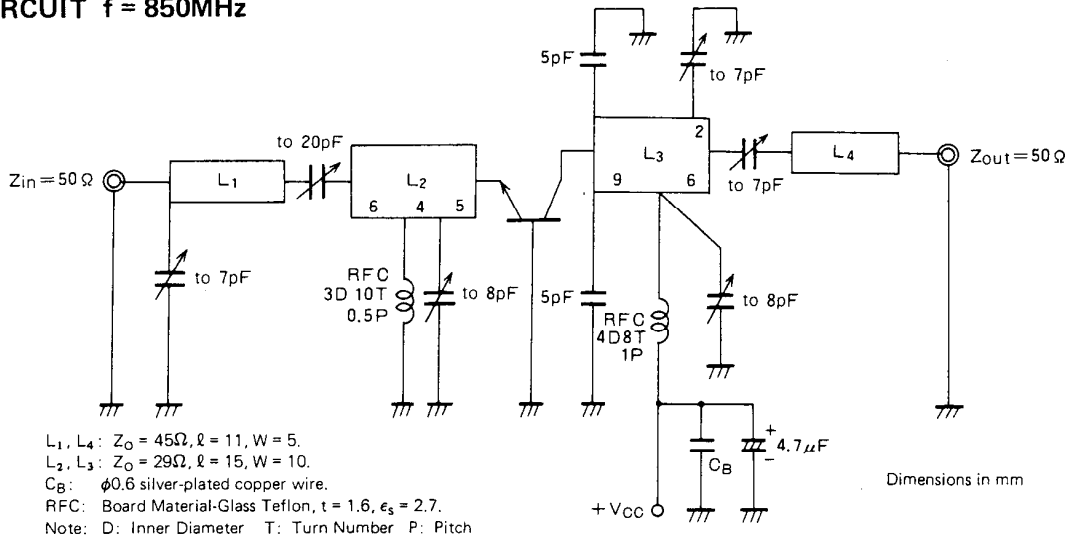
Note. \* Pulse test,  $P_w = 150\mu s$ , duty = 5%.

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

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**2SC3105**

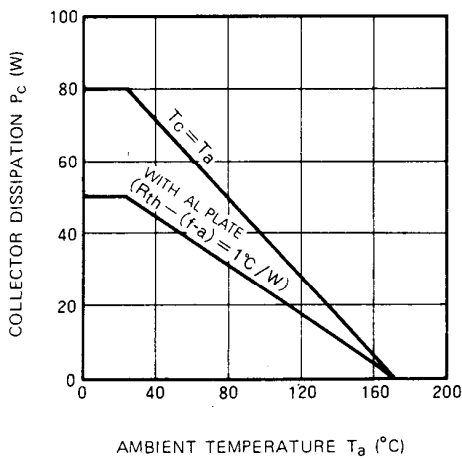
**NPN EPITAXIAL PLANAR TYPE**

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

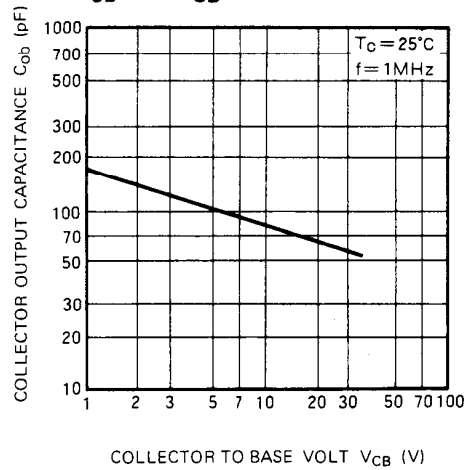


**TYPICAL CHARACTERISTICS**

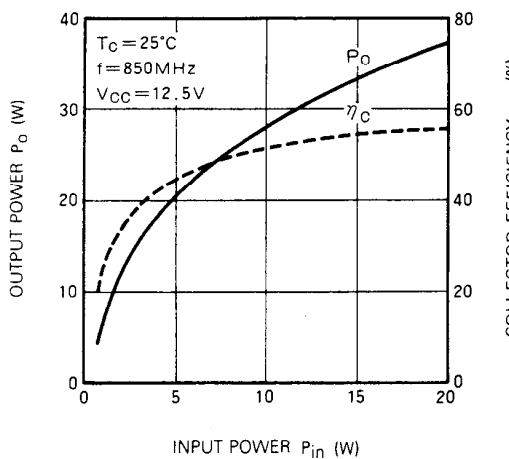
**$P_c$  VS.  $T_a$  CHARACTERISTICS**



**$C_{ob}$  VS.  $V_{CB}$  CHARACTERISTICS**



**$P_o, \eta_c$  VS.  $P_{in}$  CHARACTERISTICS**



**$P_o$  VS.  $V_{CC}$  CHARACTERISTICS**

