

MITSUBISHI RF POWER TRANSISTOR  
2SC2086  
NPN EPITAXIAL PLANAR TYPE

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## NPN EPITAXIAL PLANAR TYPE

### DESCRIPTION

2SC2086 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in HF band mobile radio applications.

### FEATURES

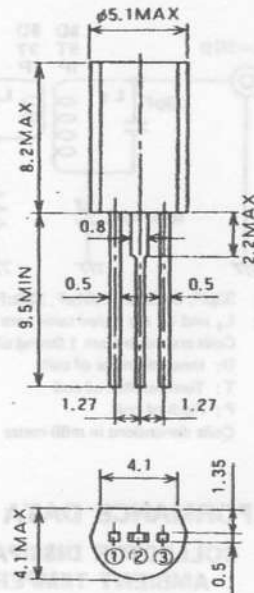
- High power gain:  $G_{pe} \geq 13\text{dB}$   
@  $V_{CC} = 12\text{V}$ ,  $P_O = 0.3\text{W}$ ,  $f = 27\text{MHz}$
- Emitter ballasted construction, gold metallization for good performances.
- TO-92 similar package with low thermal resistance.

### APPLICATION

Driver amplifiers in general in HF band mobile radio applications.

### OUTLINE DRAWING

Dimensions in mm



PIN :  
① BASE  
② COLLECTOR  
③ EMITTER

TO-92L

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

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CBO}$	Collector to base voltage		75	V
$V_{EBO}$	Emitter to base voltage		4	V
$V_{CEO}$	Collector to emitter voltage	$R_{BE} = \infty$	35	V
$I_C$	Collector current		1	A
$P_C$	Collector dissipation	$T_a = 25^\circ\text{C}$	0.8	W
$T_j$	Junction temperature		135	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 to 135	$^\circ\text{C}$
$R_{th-a}$	Thermal resistance	Junction to ambient	137.5	$^\circ\text{C/W}$

Note. Above parameters are guaranteed independently.

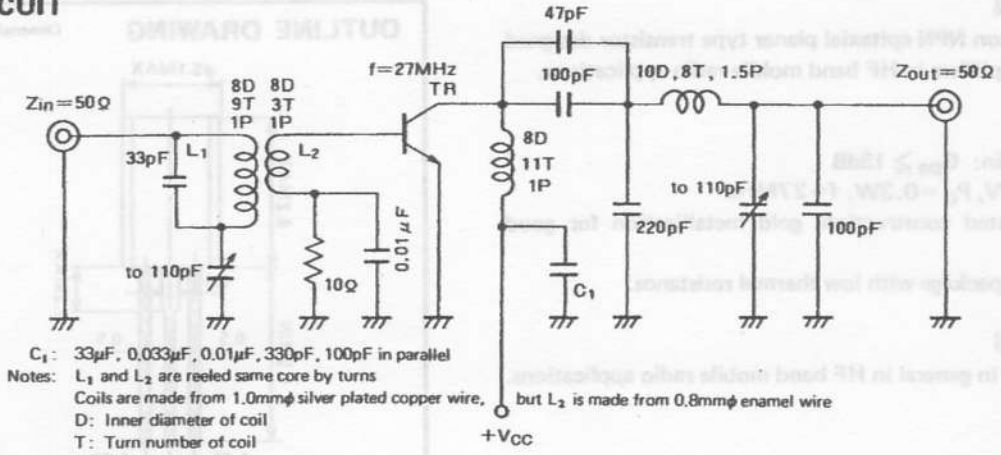
### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 1\text{mA}$ , $I_C = 0$	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 1\text{mA}$ , $I_E = 0$	75			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 10\text{mA}$ , $R_{BE} = \infty$	35			V
$I_{CBO}$	Collector cutoff current	$V_{CB} = 30\text{V}$ , $I_E = 0$			10	$\mu\text{A}$
$I_{EBO}$	Emitter cutoff current	$V_{EB} = 3\text{V}$ , $I_C = 0$			100	$\mu\text{A}$
$h_{FE}$	DC forward current gain*	$V_{CE} = 10\text{V}$ , $I_C = 0.1\text{A}$	35	70	300	—
$P_O$	Output power	$V_{CC} = 12\text{V}$ , $P_{in} = 15\text{mW}$ , $f = 27\text{MHz}$	0.3	0.45		W
$\eta_C$	Collector efficiency		50	60		%

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

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

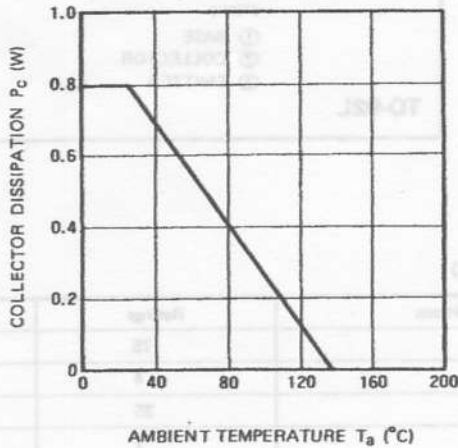
**TEST CIRCUIT**



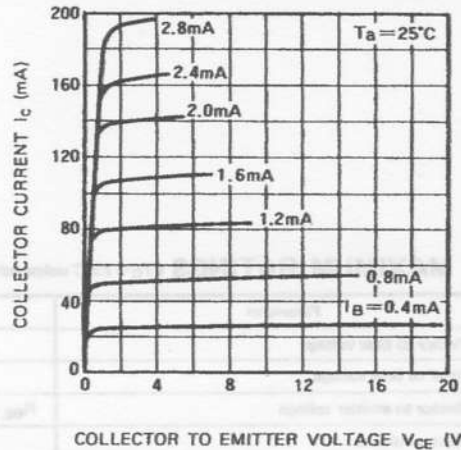
$C_1$ : 33 $\mu$ F, 0.033 $\mu$ F, 0.01 $\mu$ F, 330pF, 100pF in parallel  
 Notes:  $L_1$  and  $L_2$  are reeled same core by turns  
 Coils are made from 1.0mm $\phi$  silver plated copper wire, but  $L_2$  is made from 0.8mm $\phi$  enamel wire  
 D: Inner diameter of coil  
 T: Turn number of coil  
 P: Pitch of coil  
 Coils dimensions in milli-meter

**TYPICAL PERFORMANCE DATA**

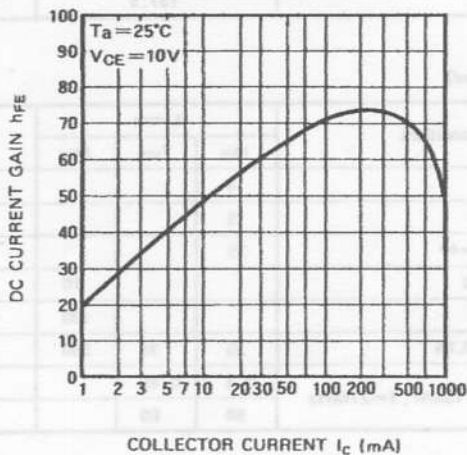
**COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE**



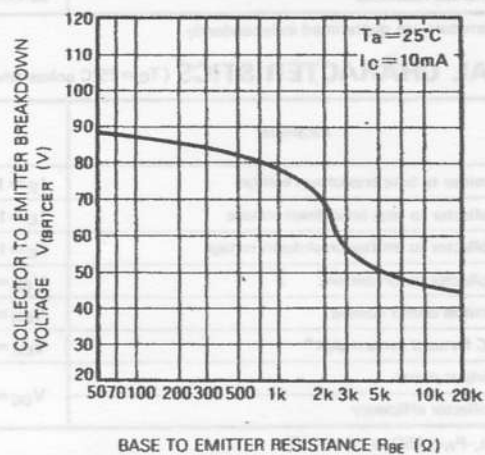
**COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE**



**DC CURRENT GAIN VS. COLLECTOR CURRENT**

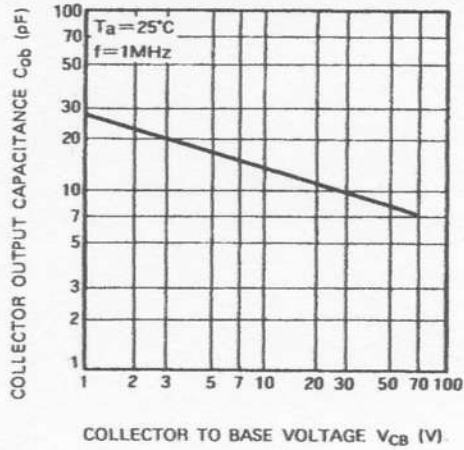


**COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE**

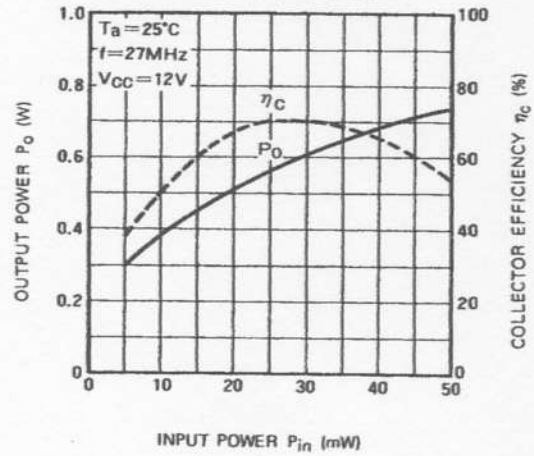


**NPN EPITAXIAL PLANAR TYPE**

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



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



**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE**

