

**NPN EPITAXIAL PLANAR TYPE**

**DESCRIPTION**

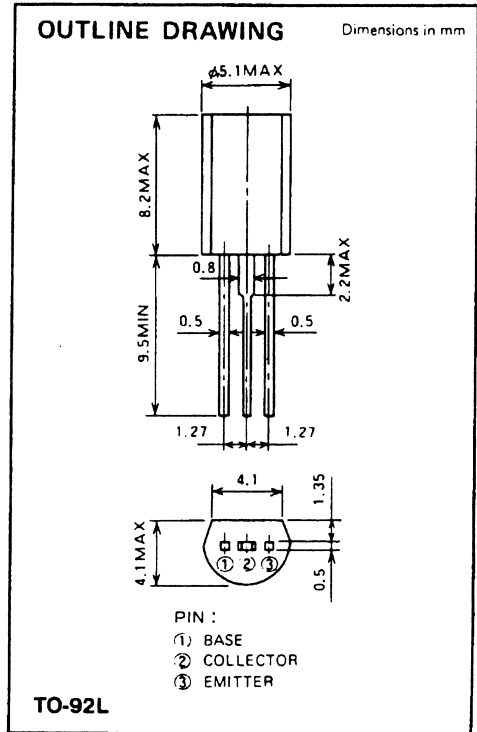
2SC2053 is a silicon NPN epitaxial planar type transistor designed for RF amplifiers on VHF band mobile radio applications.

**FEATURES**

- High power gain:  $G_{p0} \geq 15.7\text{dB}$   
@  $V_{CC} = 13.5\text{V}$ ,  $P_O = 0.15\text{W}$ ,  $f = 175\text{MHz}$
- Emitter ballasted construction, gold metallization for high reliability and good performances.
- TO-92 similar package is combinient for mounting.

**APPLICATION**

Driver amplifiers in general in VHF band mobile radio applications.



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

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CBO}$	Collector to base voltage		40	V
$V_{EBO}$	Emitter to base voltage		4	V
$V_{CEO}$	Collector to emitter voltage	$R_{BE} = \infty$	17	V
$I_C$	Collector current		0.3	A
$P_C$	Collector dissipation	$T_a = 25^\circ\text{C}$	0.6	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	183	$^\circ\text{C}/\text{W}$

Note. Above parameters are guaranteed independently.

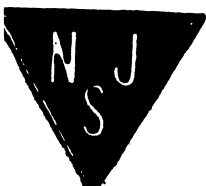
**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise specified)

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	$I_C = 1\text{mA}$ , $I_E = 0$	40			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 10\text{mA}$ , $R_{BE} = \infty$	17			V
$I_{CBO}$	Collector cutoff current	$V_{CB} = 15\text{V}$ , $I_E = 0$			20	$\mu\text{A}$
$I_{EBO}$	Emitter cutoff current	$V_{EB} = 3\text{V}$ , $I_C = 0$			20	$\mu\text{A}$
$h_{FE}$	DC forward current gain *	$V_{CE} = 10\text{V}$ , $I_C = 10\text{mA}$	10	50	180	—
$P_O$	Output power	$V_{CC} = 13.5\text{V}$ , $P_{in} = 4\text{mW}$ , $f = 175\text{MHz}$	150	200		mW
$\eta_C$	Collector efficiency		40	50		%

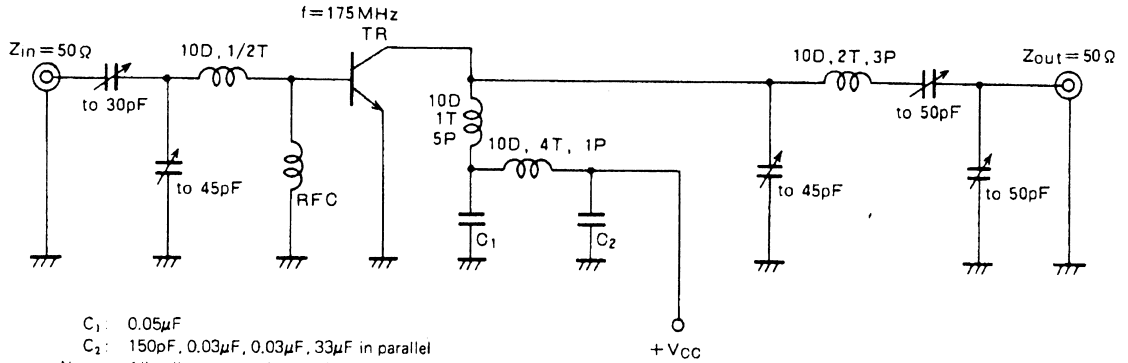
Note. \* Pulse test,  $P_w = 150\mu\text{s}$ , duty = 5%.

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

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.



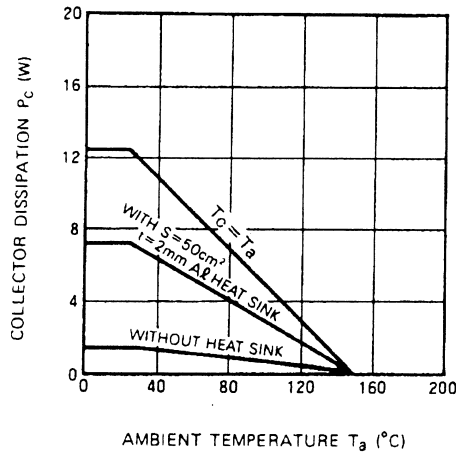
## TEST CIRCUIT



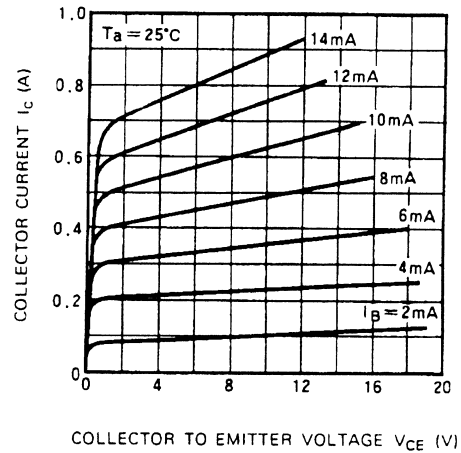
- $C_1$ :  $0.05\mu\text{F}$   
 $C_2$ :  $150\text{pF}$ ,  $0.03\mu\text{F}$ ,  $0.03\mu\text{F}$ ,  $33\mu\text{F}$  in parallel  
 Notes: All coils are made from 1.5mm $\phi$  silver plated copper wire  
 Coil dimensions in milli-meter  
 D: Inner diameter of coil  
 T: Turn number of coil  
 P: Pitch of coil

## TYPICAL PERFORMANCE DATA

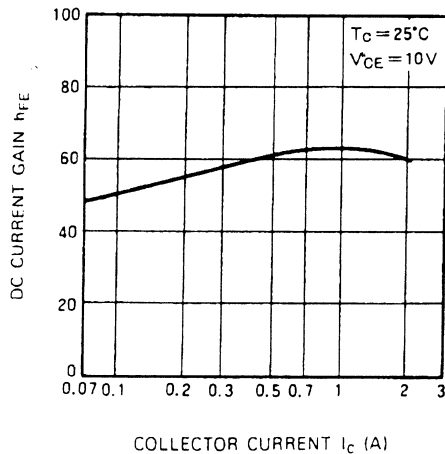
### COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



### COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



### DC CURRENT GAIN VS. COLLECTOR CURRENT



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

