



# SMA540B

## Active Biased RF Transistor

PRELIMINARY DATA

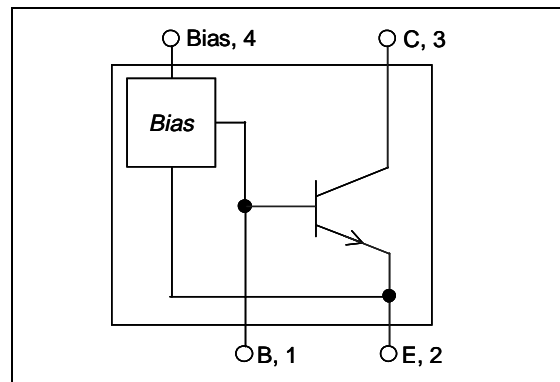
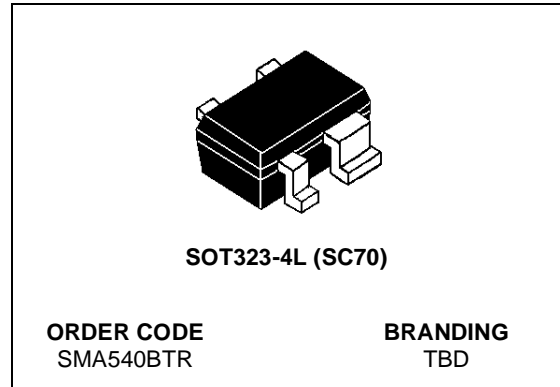
- HIGH GAIN LOW NOISE AMPLIFIERS  
 $G_{ms} = 19 \text{ dB}$  at 1.8 GHz
- CURRENT EASY ADJUSTABLE BY AN EXTERNAL RESISTOR
- OPEN COLLECTOR OUTPUT
- TYPICAL SUPPLY VOLTAGE: 1.4-3.3 V
- TRANSITION FREQUENCY 42 GHz
- ULTRA MINIATURE SOT323-4L PACKAGE (LEAD FREE)

### APPLICATIONS

- WIDEBAND APPLICATIONS
- CELLULAR AND CORDLESS TELEPHONES
- HIGH FREQUENCY OSCILLATORS

### DESCRIPTION

The SMA540B is a NPN Transistor integrating a current mirror as biasing. In this way the IC (collector current) can be controlled setting the current at Bias pin according to  $I_C = 10 * I_{BIAS}$ . The  $I_{BIAS}$  current is easy adjustable using an external resistor. SMA540B is housed in ultra miniature SOT323-4L package(LEAD FREE), the relative dimensions are 1.15mmx1.8mm with 0.8mm thickness.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{ceo}$	Collector emitter voltage	4.5	V
$V_{ebo}$	Emitter base voltage	1.5	V
$I_c$	Collector current	40	mA
$I_b$	Base current	4	mA
$I_{BIAS}$	BIAS Current	4	mA
$P_{tot}$	Total dissipation, $T_s = 107 \text{ }^\circ\text{C}$	120	mW
$T_{op}$	Operating temperature	-40 to +85	$^\circ\text{C}$
$T_{stg}$	Storage temperature	-65 to +150	$^\circ\text{C}$
$T_j$	Max. operating junction temperature	150	$^\circ\text{C}$

### THERMAL RESISTANCE

$R_{thjs}$	Thermal Resistance Junction soldering point	< 270	$^\circ\text{C}/\text{W}$
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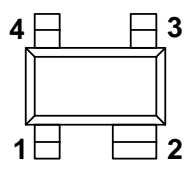
## ELECTRICAL CHARACTERISTICS

( $T_A=25\text{ }^\circ\text{C}$ ,  $Z_{L/S} = 50\Omega$ , tested in circuit shown in fig.1, unless otherwise specified )

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$G_{ms}^{(1)}$	Maximum stable gain	$V_d = 2V, I_c = 20mA$	$f = 1.8GHz$		19		dB
$ S_{21} ^2$	Insertion power gain	$V_d = 2V, I_c = 20mA$	$f = 1.8GHz$		17.5		dB
$F_{50\Omega}$	Noise Figure	$V_d = 2V, I_c = 5mA, Z_s = 50\Omega$	$f = 1.8GHz$		1.3		dB
$P_{-1dB}$	Output Power at 1dB Compression Point	$V_d = 2V, I_c = 20mA,$	$f = 1.8GHz$		9		dBm
OIP3	Output third order intercept point	$V_d = 2V, I_c = 20mA$	$f = 1.8GHz$		19		dBm
$C_{CB}$	Collector-base capacitance	$V_{cb} = 2V, f = 1MHz$			0.13		pF
CR	Current Ratio ( $I_c/I_{Bias}$ )	$I_{Bias} = 0.5mA, V_d = 2V$			10		

Note(1):  $G_{ms} = |S_{21} / S_{12}|$

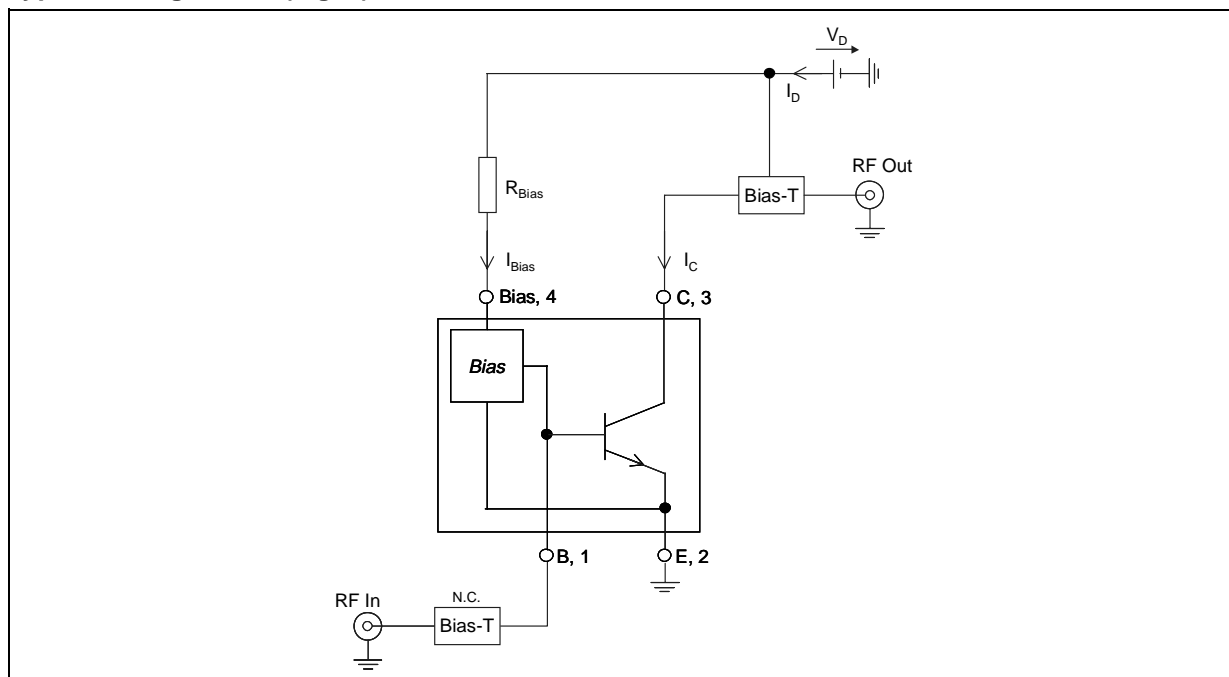
## PIN CONNECTION



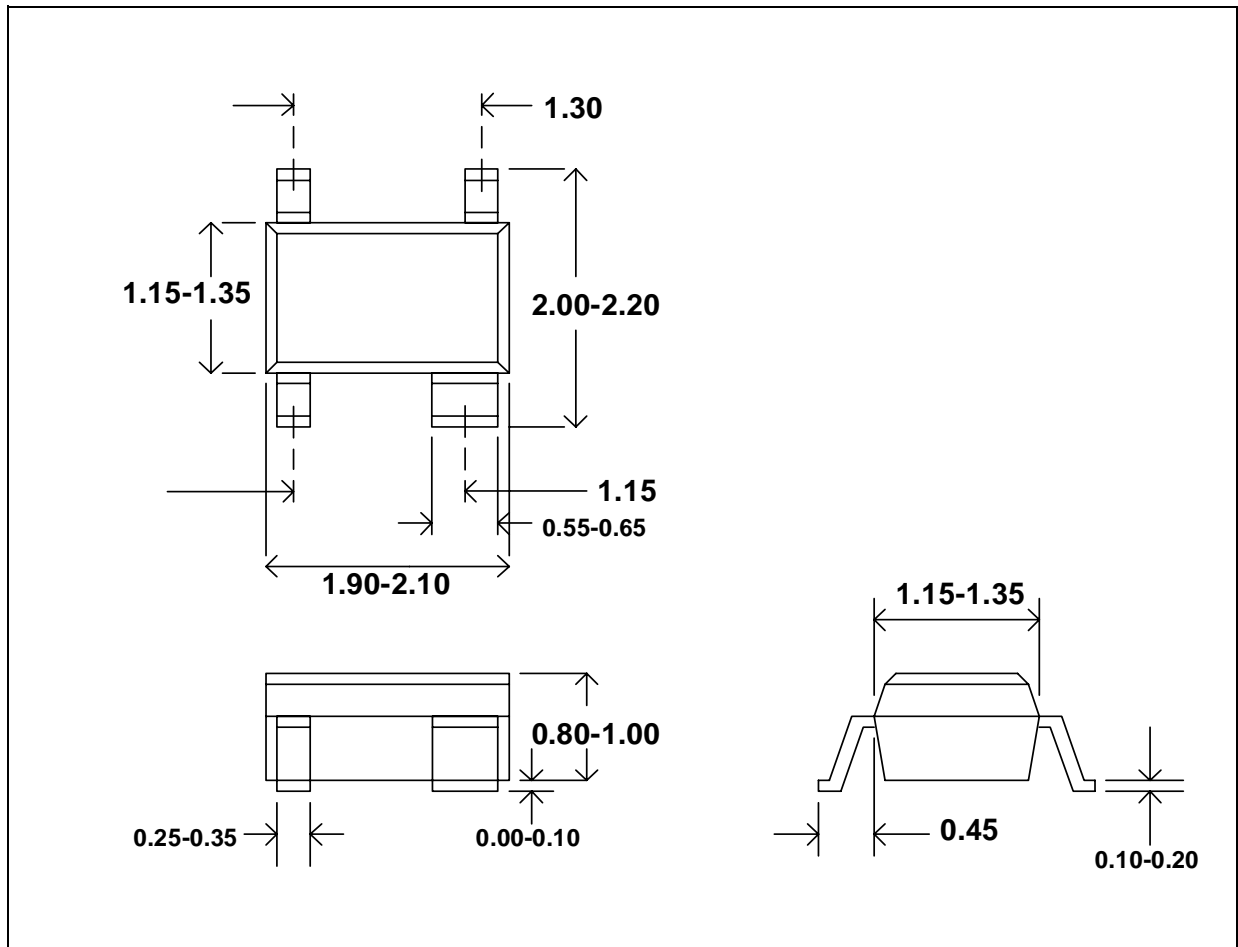
Pin No.	Description
1	BASE
2	EMITTER
3	COLLECTOR
4	BIAS

**SOT343**

## Typical configuration (Fig. 1)



## PACKAGE DIMENSIONS SOT323-4L (SC-70 4 leads)



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