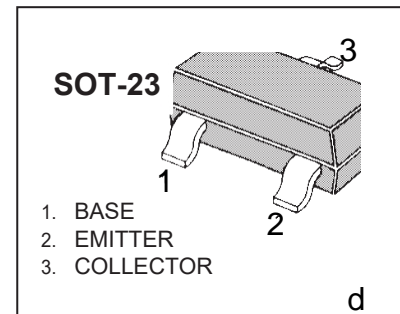


# SOT-23 Plastic-Encapsulate Transistors

## 2SA1977 PNP EPITAXIAL SILICON TRANSISTOR MICROWAVE AMPLIFIER

### FEATURES

- High  $f_T$   
 $f_T = 8.5 \text{ GHz TYP.}$
- High gain  
 $|S_{21e}|^2 = 12.0 \text{ dB TYP. @}f = 1.0 \text{ GHz, } V_{CE} = -8 \text{ V, } I_C = -20 \text{ mA}$
- High-speed switching characteristics



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25 \text{ }^\circ\text{C}$ )

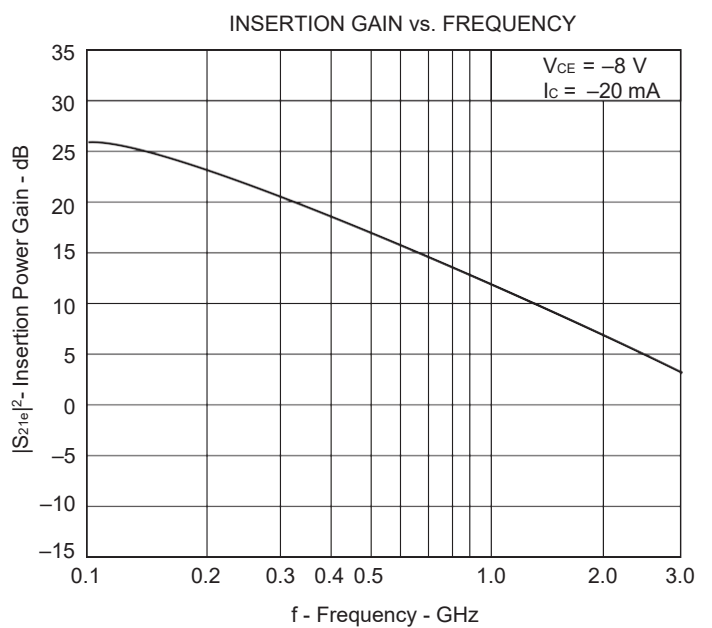
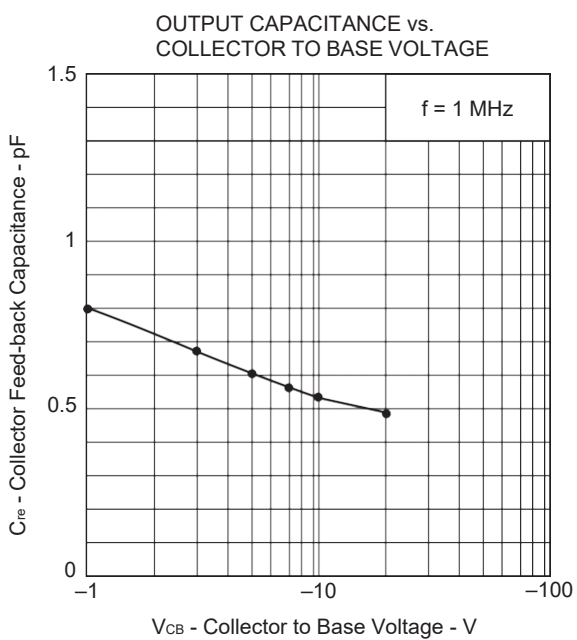
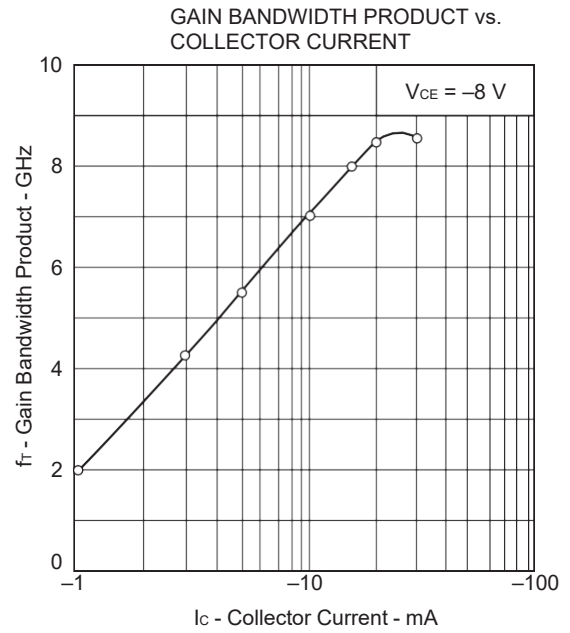
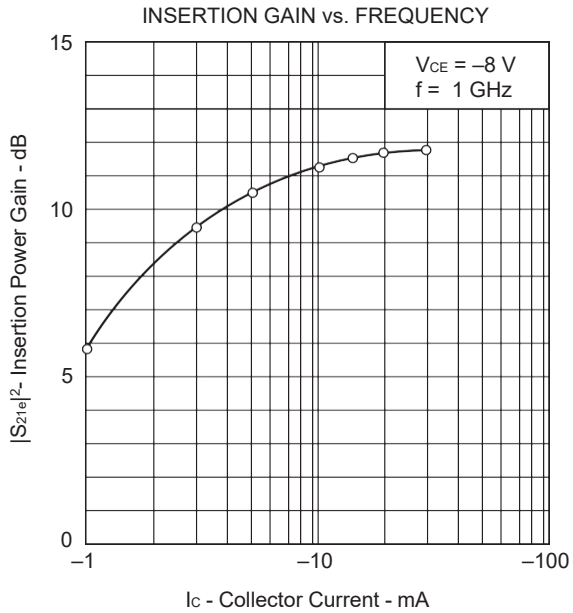
Parameter	Symbol	Rating	Unit
Collector to Base Voltage	$V_{CB0}$	-20	V
Collector to Emitter Voltage	$V_{CE0}$	-12	V
Emitter to Base Voltage	$V_{EB0}$	-3.0	V
Collector Current	$I_C$	-50	mA
Total Power Dissipation	$P_T$	200	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

### ELECTRICAL CHARACTERISTICS ( $T_A = 25 \text{ }^\circ\text{C}$ )

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cutoff Current	$I_{CB0}$	$V_{CB} = -10 \text{ V}$			-0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EB0}$	$V_{EB} = -1 \text{ V}$			-0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = -8 \text{ V, } I_C = -20 \text{ mA}$	20		100	
Gain Bandwidth Product	$f_T$	$V_{CE} = -8 \text{ V, } I_C = -20 \text{ mA, } f = 1 \text{ GHz}$	6.0	8.5		GHz
Collector Capacitance	$C_{re}^*$	$V_{CB} = -10 \text{ V, } I_E = 0, f = 1 \text{ MHz}$		0.5	1	pF
Insertion Power Gain	$ S_{21e} ^2$	$V_{CE} = -8 \text{ V, } I_C = -20 \text{ mA, } f = 1.0 \text{ GHz}$	8.0	12.0		dB
Noise Figure	NF	$V_{CE} = -8 \text{ V, } I_C = -3 \text{ mA, } f = 1 \text{ GHz}$		1.5	3	dB

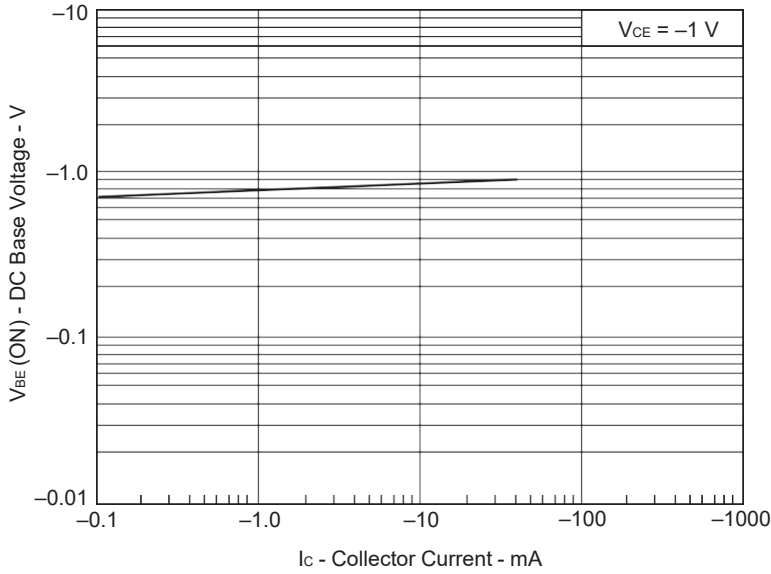
\* Measured by a 3-terminal bridge. Emitter and Case should be connected to the guard terminal.

## Typical Characteristics

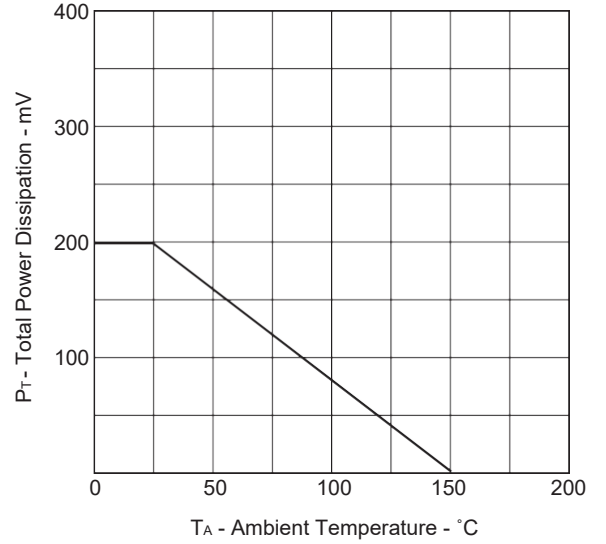


Typical Characteristics

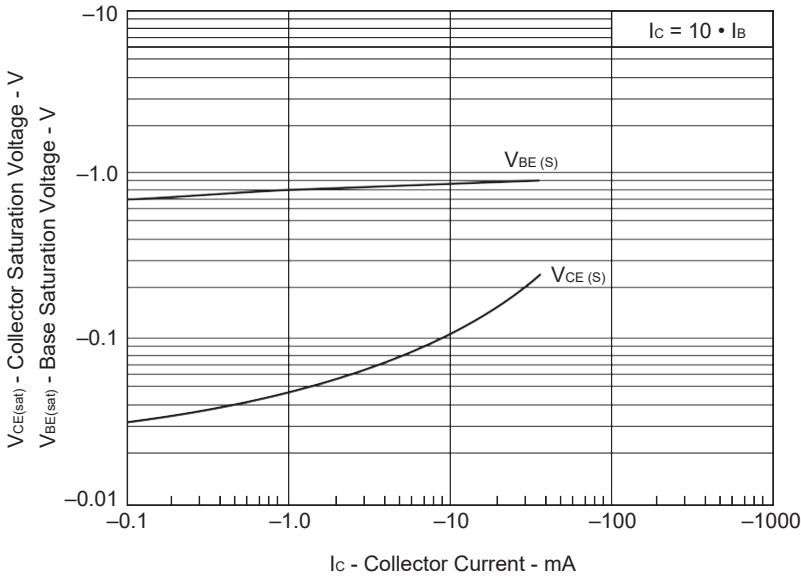
BASE TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



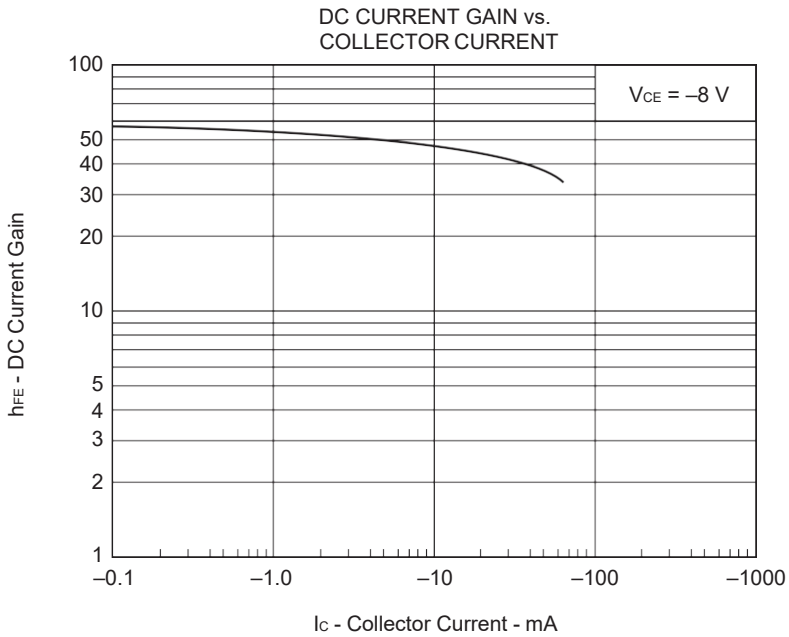
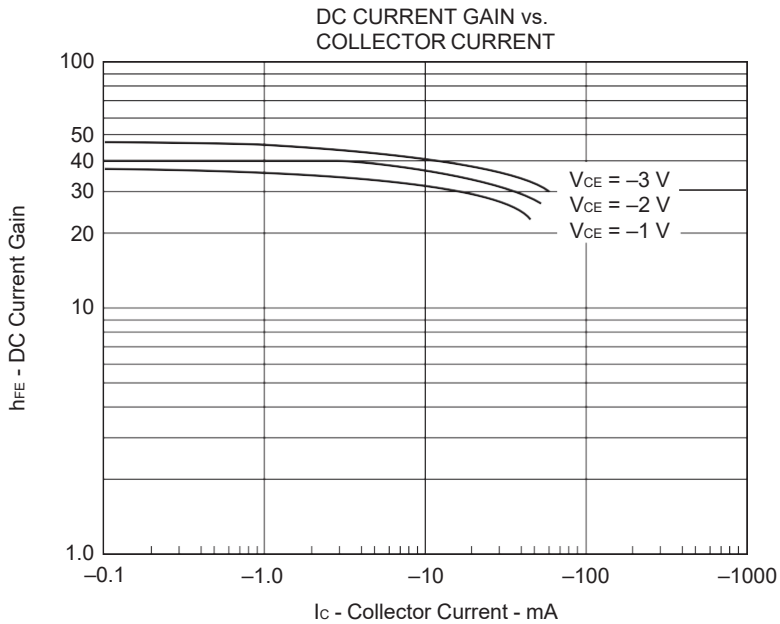
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



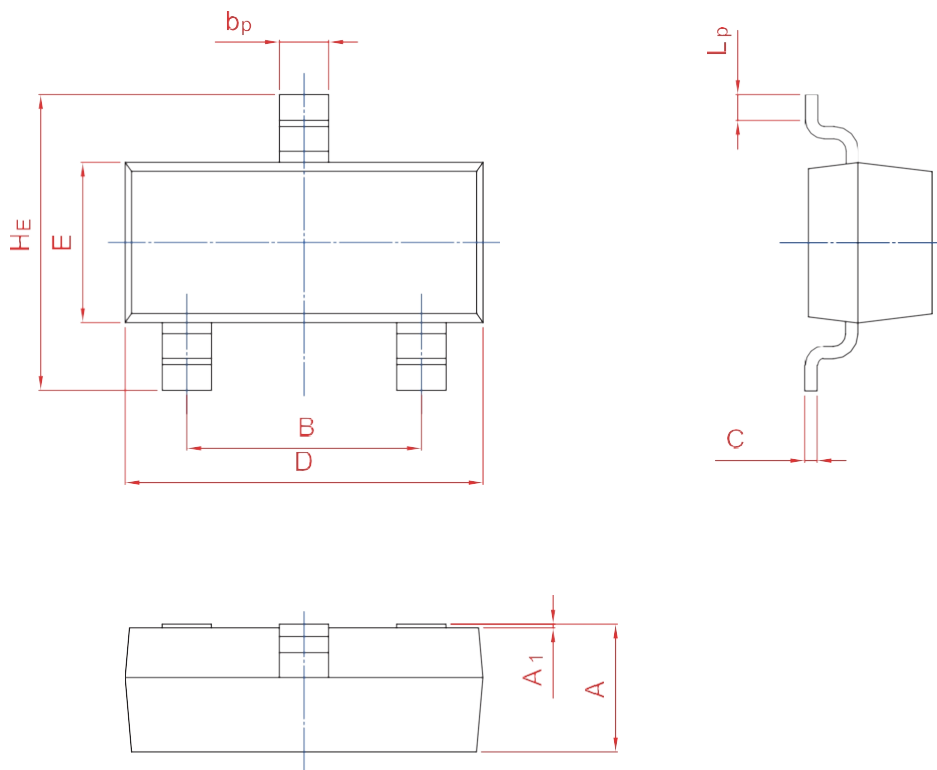
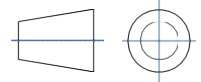
### Typical Characteristics



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b <sub>p</sub>	C	D	E	H <sub>E</sub>	A <sub>1</sub>	L <sub>p</sub>
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20