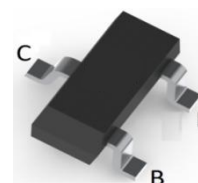


BIPOLAR TRANSISTOR (NPN)

FEATURES

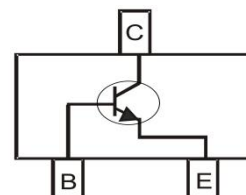
- High power gain
- Low Noise
- For Low Noise Amplifier at UHF/VHF/CATV Band
- Surface Mount device



SOT-23

MECHANICAL DATA

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.008 grams (approximate)



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	3	V
Collector Current	I_C	100	mA
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~+150	$^\circ\text{C}$

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

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	20			V	$I_C=10\mu\text{A}$, $I_E=0$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	12			V	$I_C=1\text{mA}$, $I_B=0$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	3			V	$I_E=10\mu\text{A}$, $I_C=0$
Collector cut-off current	I_{CBO}			1	μA	$V_{CB}=10\text{V}$, $I_E=0$
Emitter cut-off current	I_{EBO}			1	μA	$V_{EB}=1\text{V}$, $I_C=0$
DC current gain	h_{FE}	50	120	300		$V_{CE}=10\text{V}$, $I_C=20\text{mA}$
Insertion Power Gain	$ S_{21e} ^2$		11.5		dB	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$, $f=1\text{GHz}$
Transition frequency	f_T		7		GHz	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$
Collector output capacitance	C_{ob}		0.55	1.0	pF	$V_{CB}=10\text{V}$, $I_E=0$, $f=1\text{MHz}$
Noise figure	NF		1	2	dB	$V_{CE}=10\text{V}$, $I_C=7\text{mA}$, $f=1\text{GHz}$

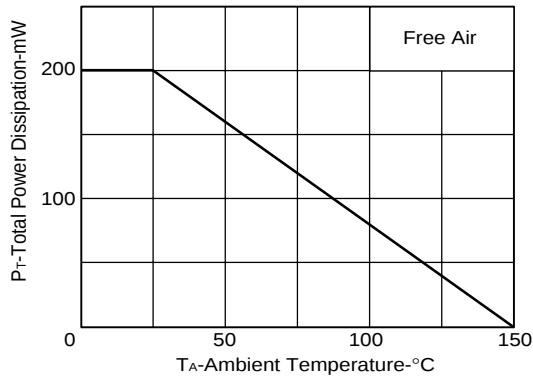
CLASSIFICATION OF h_{FE}

Rank	Q	R	S	T
Range	50-100	80-160	125-250	200-330
Marking	R23	R24	R25	R26

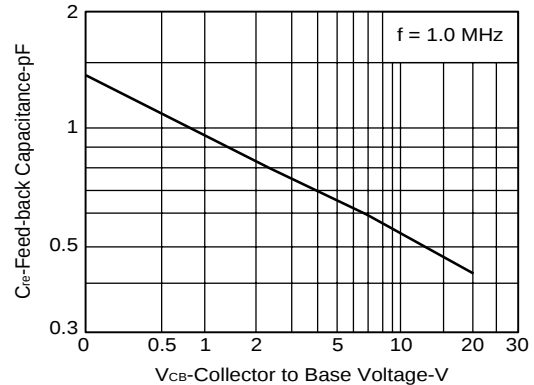
BIPOLAR TRANSISTOR (NPN)

Typical Characteristics

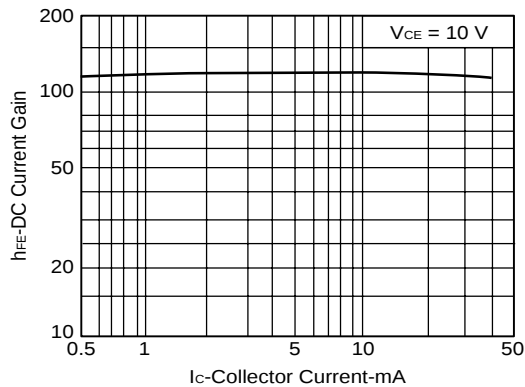
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



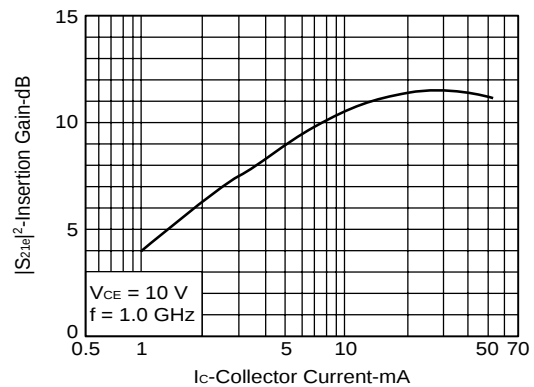
FEED-BACK CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



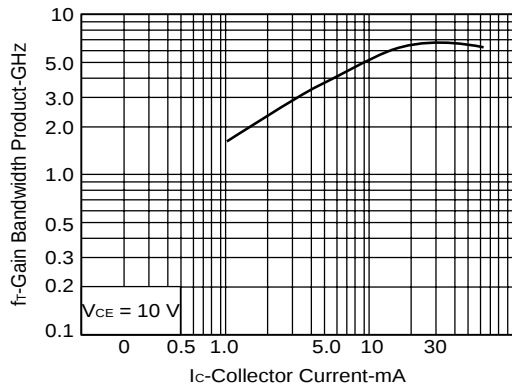
DC CURRENT GAIN vs. COLLECTOR CURRENT



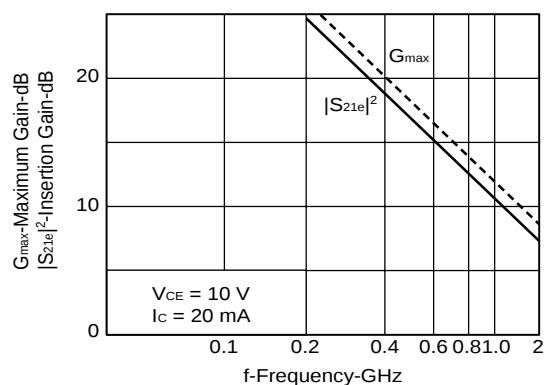
INSERTION GAIN vs. COLLECTOR CURRENT



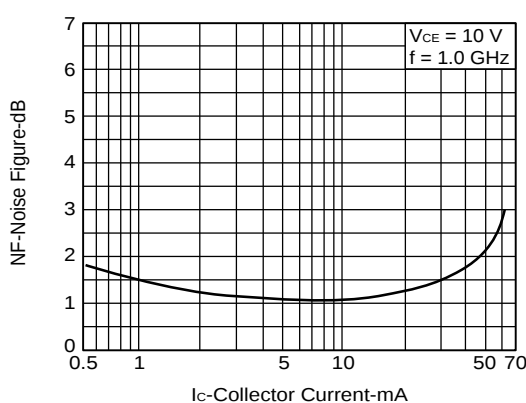
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



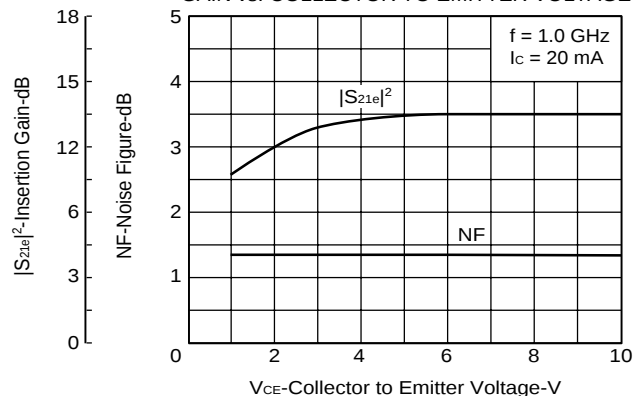
INSERTION GAIN, MAXIMUM GAIN vs. FREQUENCY



NOISE FIGURE vs. COLLECTOR CURRENT

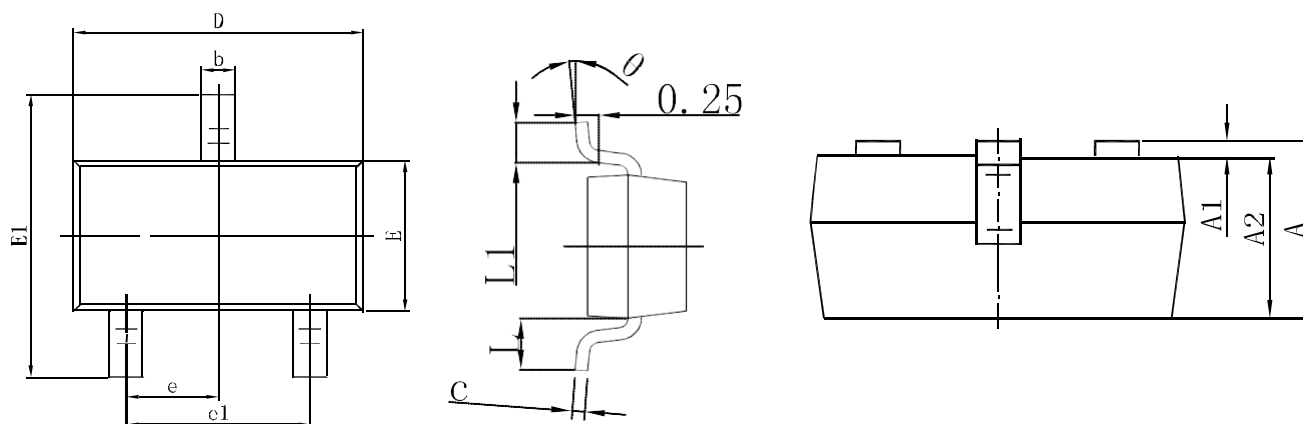


NOISE FIGURE, FORWARD INSERTION GAIN vs. COLLECTOR TO EMITTER VOLTAGE



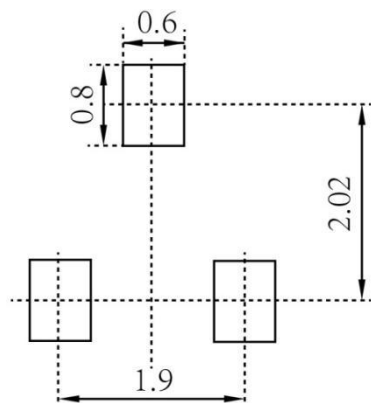
BIPOLAR TRANSISTOR (NPN)

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



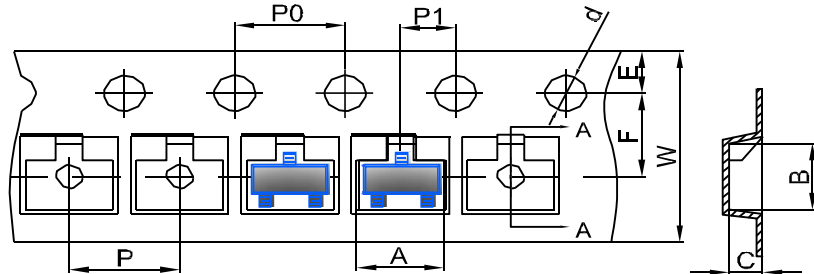
Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

BIPOLAR TRANSISTOR (NPN)

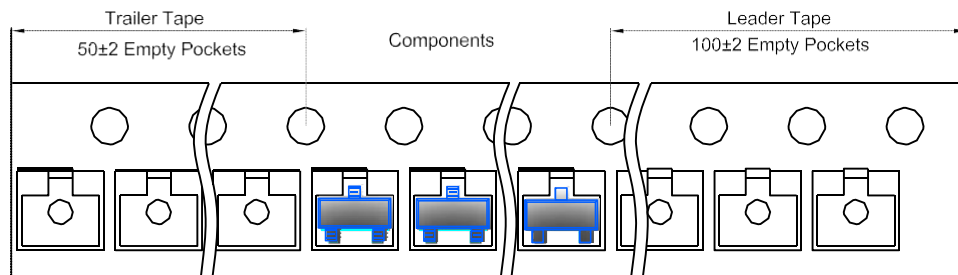
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

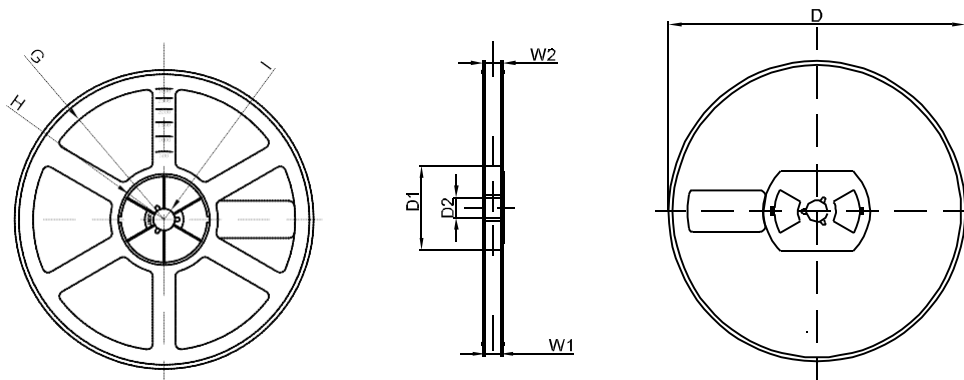


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOT-23 Tape Leader and Trailer



SOT-23 Reel



	DIMENSIONS ARE IN MILLIMETER							
REEL OPTION	D	D1	D2	G	H	I	W1	W2
7" DIA	Ø178	54.40	13.00	R78	R25.60	R6.50	9.50	12.30
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1