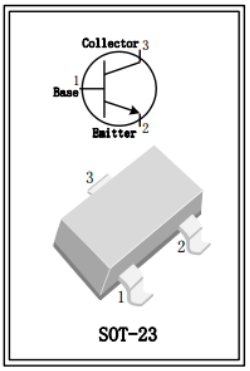
MICROWAVE LOW NOISE AMPLIFIER NPN SILICON EPITAXIAL TRANSISTOR

1.General Description



The chip is manufactured with the silicon epitaxy process, with characteristics such as high power gain, broadband, low noise, low leakage current and small junction capacity; in addition, it has relatively large dynamic ranges and ideal current linear features;

It is largely applied to UHF microwave, and VHF, UHF and CATV low-noise amplifiers with high-frequency broadband, including satellite TV tuners, CATV amplifiers, analog digital portable phones, radar sensor switches, RF modules and relay amplifiers built in the fiber optic transmission system, etc.

Collector-emitter breakdown voltage: BVCEO=12V, maximum collector current: IC=70mA, collector power dissipation: PC=300mW, characteristic frequency: fT=9GHz;

2.Maximum Ratings（Tamb=25℃）：

Name of parameter	Symbol	Rated value	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	2.5	V
Collector current	I_C	70	mA
Power dissipation	P_T	300	mW
Maximum junction temperature	T_J	150	℃
Storage temperature	T_{stg}	-65～+150	℃

3. Electrical Parameter and Specification（Tamb=25℃）：

Name of parameter	Symbol	Testing condition	Min	Typical	Max	Unit
Collector-base breakdown voltage	BV_{CBO}		20			V
Collector-emitter breakdown voltage	BV_{CEO}		12			V
Emitter-base breakdown voltage	BV_{EBO}		2.5			V
Collector cutoff current	I_{CBO}	V_{CB}=6V,I_E=0	-	-	0.05	μA
Direct current amplifying coefficient	h_{FE}	V_{CE}=6V,I_C=20mA	60	120	250	
Characteristic frequency	f_T	V_{CE}=6V,I_C=20mA	-	9	-	GHz
Feedback capacity	Cre	I_C=i_C=0,V_{CB}=6V,f=1MHz	-	0.4	-	pF
Collector capacity	CC	I_E=i_e=0,V_{CB}=6V,f=1MHz	-	0.5	-	pF
Emitter capacity	Ce	I_C=i_C=0,V_{EB}=0.5V,f=1MHz	-	1.0	-	pF
Inserted power gain	$\|S_{21}\|^2$	I_C=20mA,V_{CE}=6V,f=900MHz	14	15	-	dB
Noise coefficient	NF	V_{CE}=6V,I_C=5mA,f=900MHz	-	1.1	1.6	dB
		V_{CE}=6V,I_C=20mA,f=900MHz	-	1.6	2.1	dB
		V_{CE}=8V,I_C=5mA,f=2GHz	-	1.9	-	dB
Maximum unilateral power gain	G_{UM}	I_C=20mA,V_{CE}=6V,f=900MHz	15	16	-	dB
		I_C=20mA,V_{CE}=6V,f=2GHz	-	9	-	dB
Output voltage	V_O			270		mV
Gain compression of the output power at 1dB	PL1	I_C=20mA,V_{CE}=6V,R_L=50□;,f=900 MHz	-	17	-	dB
ITO Third Order Intercept Point			-	26	-	dBm

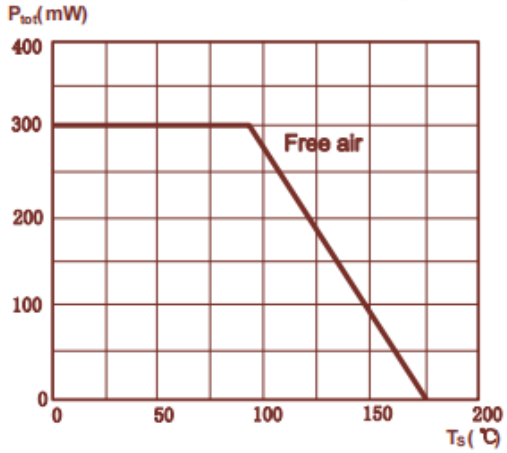
including:

$$G_{UM} = 10\log\frac{|S_{21}|^2}{(1-S_{11})^2(1-S_{22})^2}dB$$

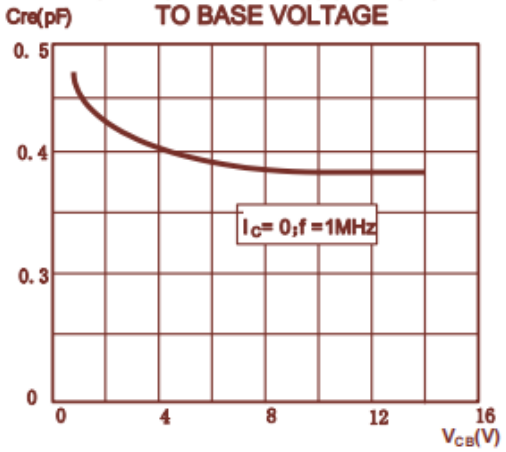
4. Typical Characteristic Curves：

TYPICAL CHARACTERISTICS
(T_A=25°C,unless otherwise specified)

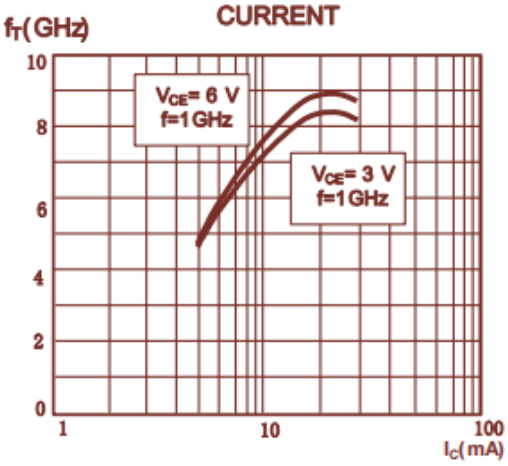
TOTAL POWER DISSIPATION VS AMBIENT TEMPERATTURE



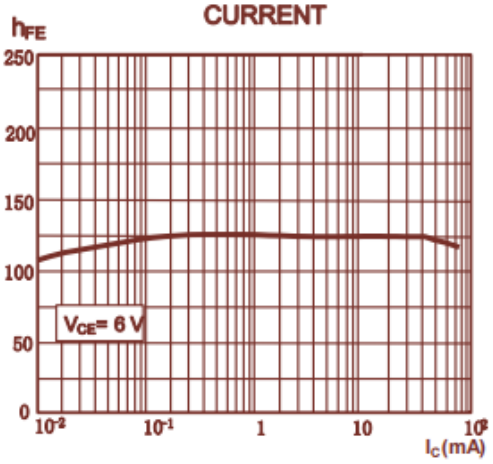
REVERSE TRANSFER CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



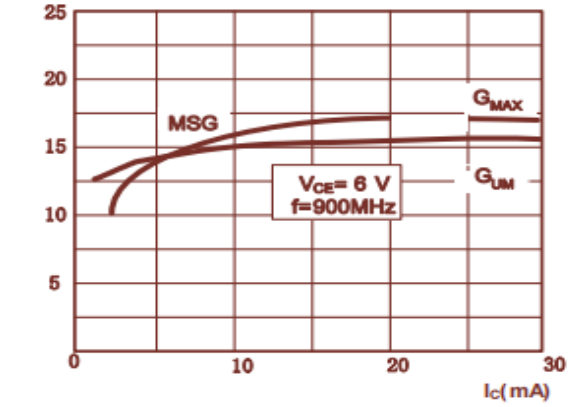
FREQUENCY VS. COLLECTOR CURRENT



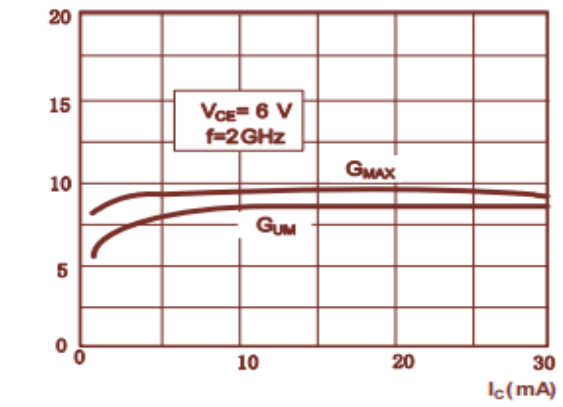
DC CURRENT VS. COLLECTOR CURRENT



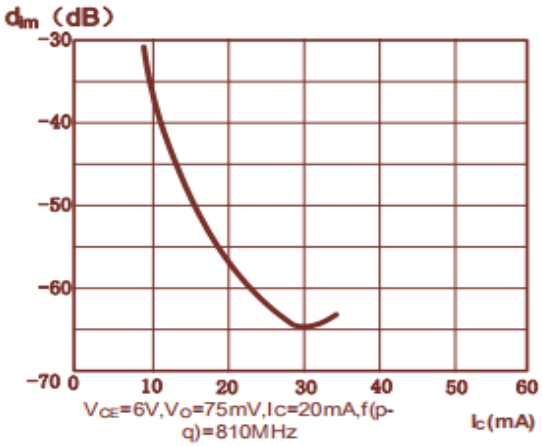
GAINvs. FUNCTION of COLLECTOR CURRENT



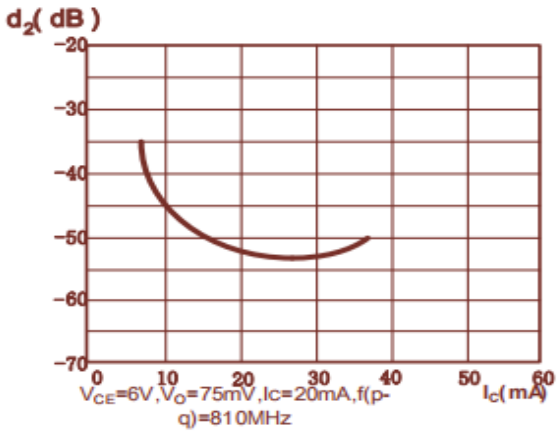
GAINvs. FUNCTION of COLLECTOR CURRENT



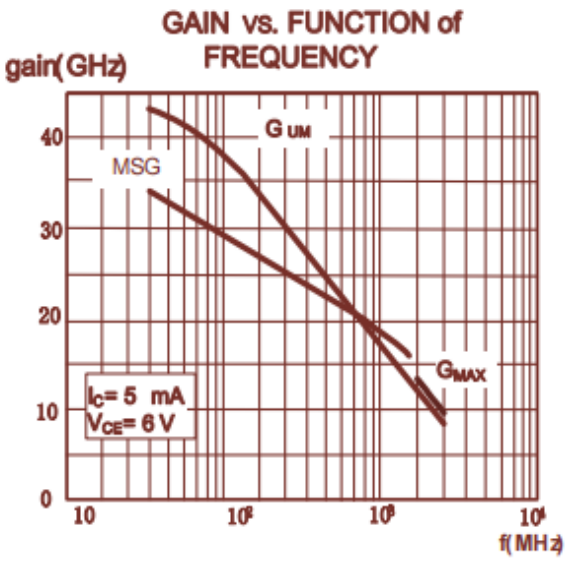
vs. FUNCTION of COLLECTOR CURRENT



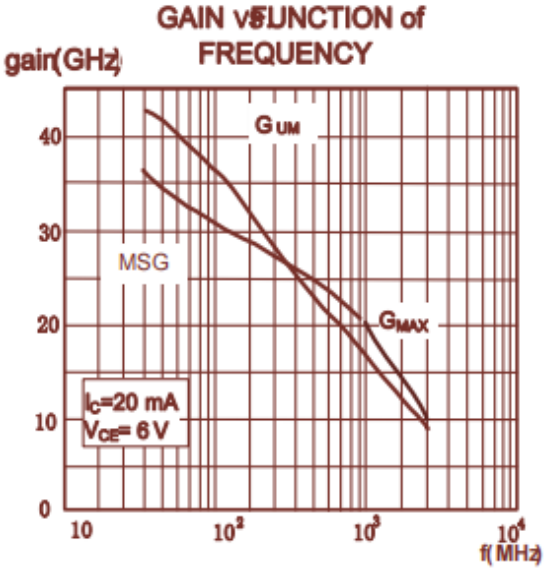
DISTORTIONvs. FUNCTION of COLLECTOR CURRENT



GAIN vs. FUNCTION of FREQUENCY



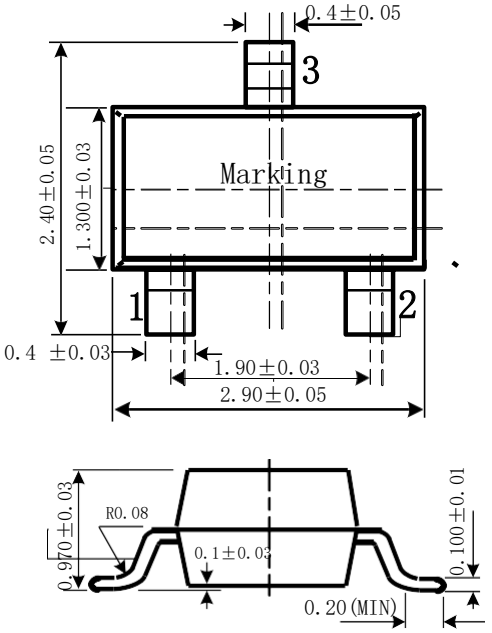
GAIN vs. FUNCTION of FREQUENCY



5. Package Dimension Diagram：

SOT-23 PACKAGE DIMENSIONS

(Units: mm)



PIN CONNECTIONS

1.Base 2. Emitter 3.Collector