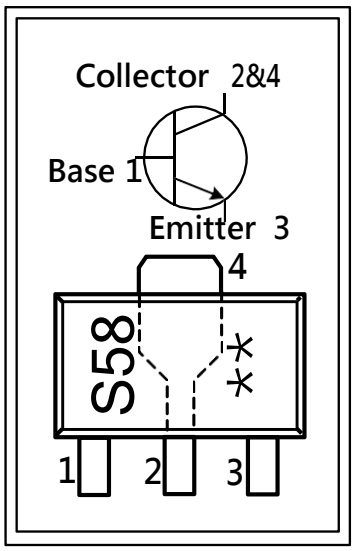
Microwave low noise amplifier NPN silicon epitaxial transistor

1.Description：



- This chip is manufactured using silicon epitaxial technology,featuring high power gain amplification, wide bandwidth, low noise, low leakage current, small junction capacitance characteristics, a large dynamic range, and ideal current linearity.
- It is mainly applied in ultra-high frequency microwave and high-frequency broadband low-noise amplifiers, such as CATV video amplifiers, wireless transceiver modules, various long-distance remote controllers, security alarms, analog-digital cordless telephones, and other related products.Suitable for medium power and high frequency signal amplification.
- Collector-Emitter Breakdown Voltage: BV_{CEO} = 12V Maximum Collector Current: I_{CM} = 100mA Collector Power Dissipation: P_C= 1000mW Transition Frequency: f_T = 8.5GHz
- Package Form: SOT89 Body Marking: S59

2.Limiting values（Tamb=25℃）：

Parameter	Symbol	Values	Unit
collector-base voltage	V_{CBO}	25	V
collector-emitter voltage	V_{CEO}	12	V
emitter-base voltage	V_{EBO}	3	V
collector current	I_{CM}	100	mA
power dissipation	P_T	1000	mW
maximum junction temperature	T_J	-40～150	℃
storage temperature	T_{stg}	-65～+150	℃

3.Electrical characteristics（Tamb=25℃）：

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
collector-base breakdown voltage	BV_{CBO}	open emitter	25			V
collector-emitter breakdown voltage	BV_{CEO}	open base	12			V
emitter-base breakdown voltage	BV_{EBO}	open collector	3			V
collector current	I_C			100		mA
collector cut-off current	I_{CBO}	V_{CB}=6V,I_E=0	-	-	0.05	μA
dc current amplification factor	h_{FE}	V_{CE}=8V,I_C=30mA,	60	95	130	
characteristic frequency	f_T	V_{CE}=8V,I_C=30mA,f=900MHz	10	10.5	-	GHz
feedback capacitor	Cre	I_C=i_C=0,V_{CB}=8V,f=1MHz	-	1.2	-	pF
collector capacitance	Cc	I_E=i_e=0,V_{CB}=8V,f=1MHz	-	1.8	-	pF
emitter capacitance	Ce	I_C=i_C=0,V_{EB}=0.5V,f=1MHz	-	3	-	pF
insertion power gain	$\|S_{21}\|^2$	I_C=30mA,V_{CE}=8V,f=433MHz	18	18.5	-	
		I_C=30mA,V_{CE}=8V,f=900MHz	13.5	14	-	dB
		I_C=30mA,V_{CE}=8V,f=1800MHz	8	8.5	-	
maximum unilateral power gain	G_{UM}	I_C=30mA,V_{CE}=8V,f=433MHz	19.	20	-	
		I_C=30mA,V_{CE}=8,f=900MHz	513.	14	-	dB
		I_C=30mA,V_{CE}=8V,f=1.8GHz	5	8.5	-	
			8			

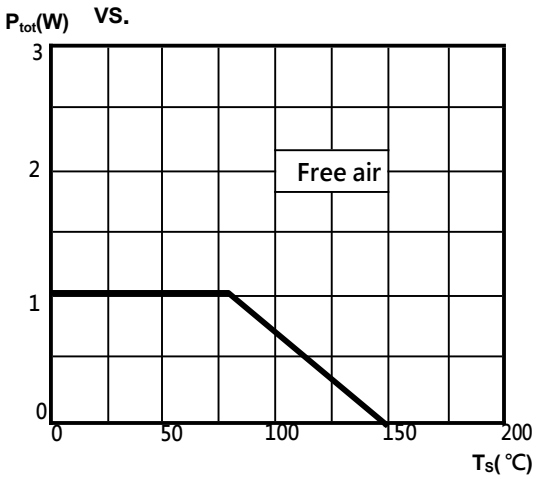
Among them : $$G_{UM} = 10\log\frac{|S_{21}|^2}{(1-S_{11})^2(1-S_{22})^2}dB$$

4.Typical characteristic:

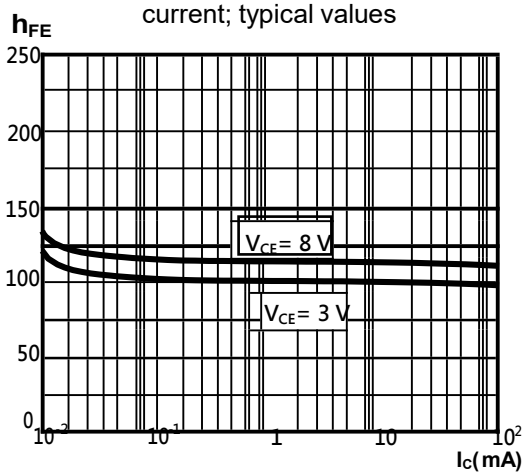
Typical characteristics

(T_A=25℃,unless otherwise specified)

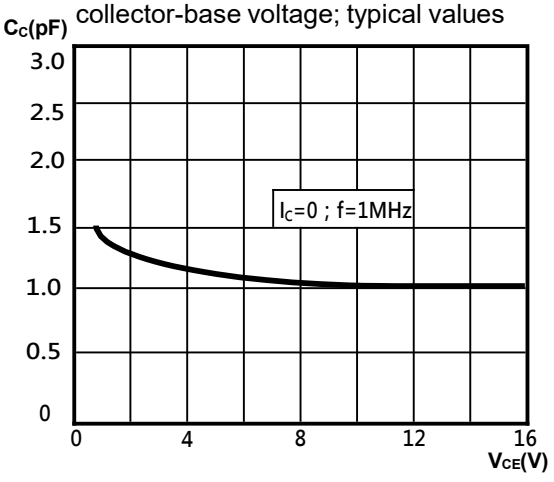
Power derating curve



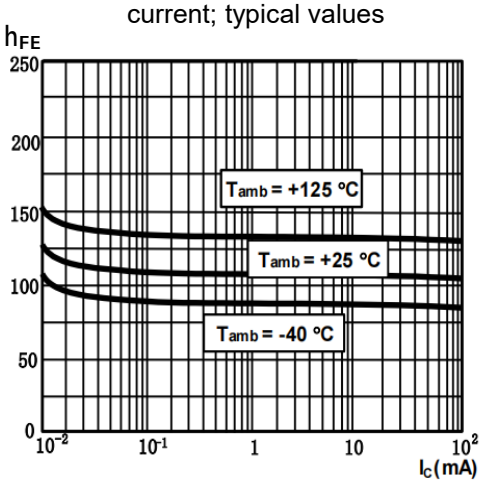
DC current gain as a function of collector current; typical values



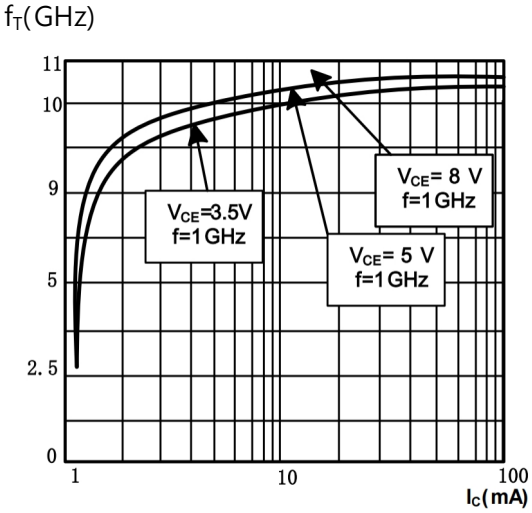
Collector capacitance as a function of collector-base voltage; typical values



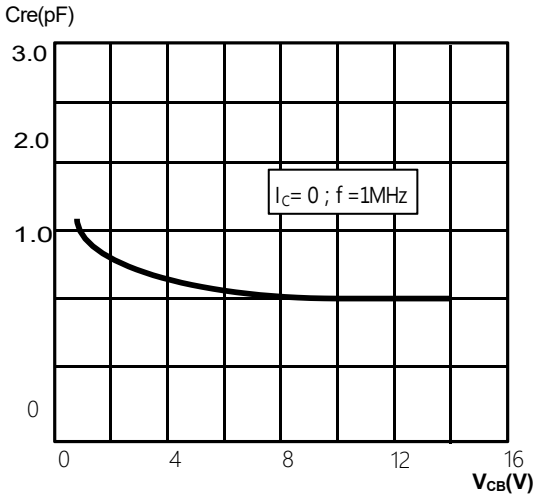
DC current gain as a function of collector current; typical values



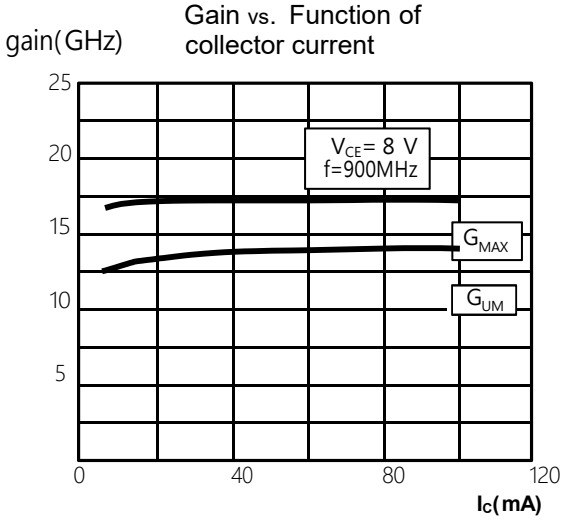
Frequency collector vs.current



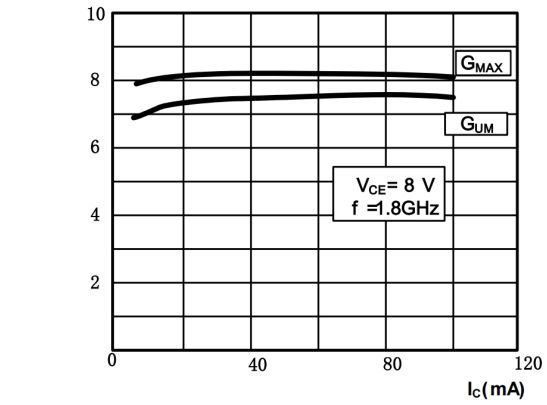
Reverse transfer capacitance vs.
Collector to base voltage



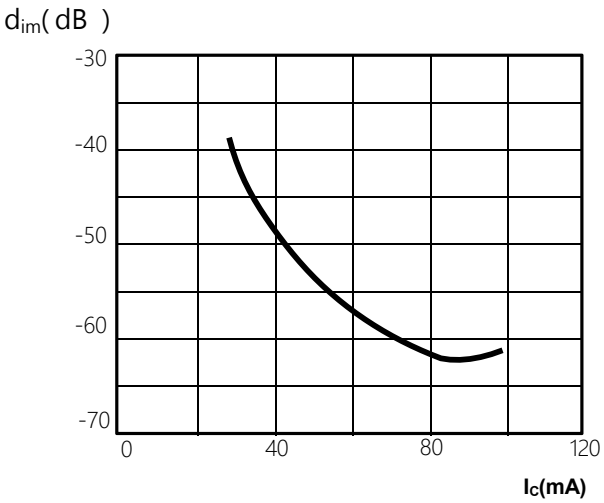
Gain vs. Function of
collector current



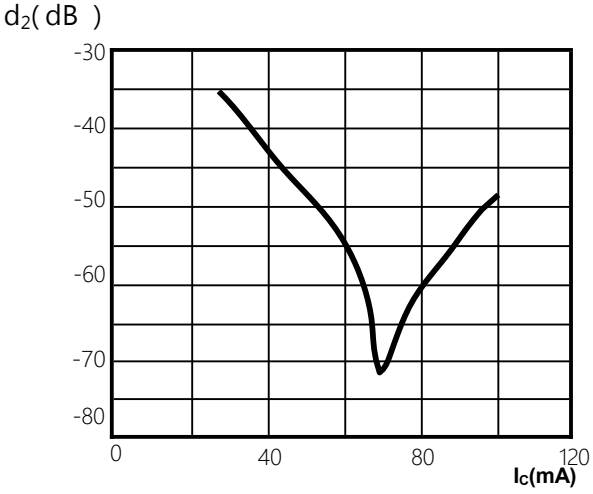
Gain vs. Function of
collector current



Intermodulation distortion
Vs.function of collector current

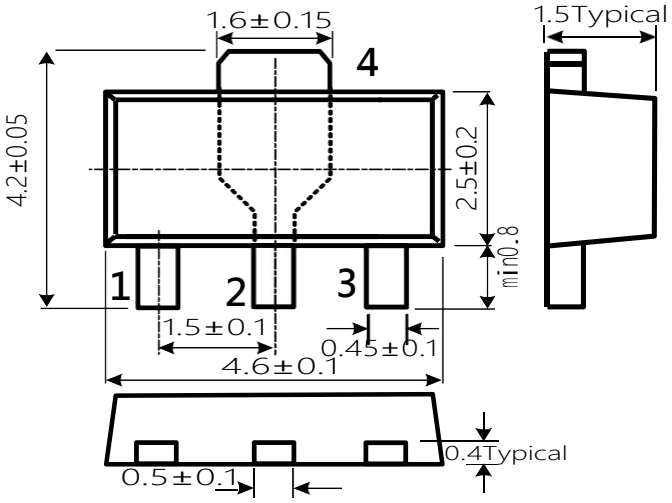


Second order intermodulation distortion
vs. function of collector current



5.Package dimensions diagram :

SOT-89 package dimensions
(Units:mm)



PIN Connections
1.Base 2&4. Collector 3.Emitter