THE DATASHEET OF

BFG540/X

MICROWAVE LOW NOISE AMPLIFIER NPN SILICON EPITAXIAL TRANSISTOR

1. Brief Description：

Made with the silicon epitaxy technology, the chip has characteristics such as high power gains, low noise factor, wide inversion frequency, low leakage current, gold material leading structure and high reliability;

- It is mainly applied to products of ultrahigh frequency microwave, VHF, UHF and CATV high frequency broad band low noise amplifiers, such as SATV tuners, CATV amplifiers, analog digital cordless telephone, radar detectors, radio frequency modules and relay amplifiers in optical fiber transmission;
- Collector-emitter breakdown voltage: BVCEO=12V, maximum collector current: IC=120mA, collector wasted power: PC=400mW, characteristic frequency: fT=9GHz;
- The 4-pin (the wide collector pins and the dual-emitter pins) SOT143B surface plastic package is adopted; BFG540 and BFG540/X have the same package forms but different definitions in pins.

2. Mode of Package and Definition of Pins:

Model	BFG540	BFG540/X
Package	SOT143B	SOT143B
Marking	WMG	WMM
Pin 1	collector	collector
Pin 2	base	emitter
Pin 3	emitter	base
Pin 4	emitter	emitter

3. Absolute parameters （Tamb=25℃）：

Name of parameter	Symbol	Rated value	Unit
Collector-base breakdown voltage	BV_{CBO}	20	V
Collector-emitter breakdown voltage	BV_{CEO}	15	V
Emitter-base breakdown voltage	BV_{EBO}	2.5	V
Collector current	I_C	120	mA
Power dissipation	P_T	400	mW
Maximum junction temperature	T_J	150	℃
Storage temperature	T_{stg}	-65～+150	℃

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

Paramet	Sym	Testing	Min	Typical	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB}=6V,I_E=0	-	-	0.05	μA
Direct current amplifying coefficient	h_{FE}	V_{CE}=8V,I_C=40mA	60	120	250	
Eigenfrequency	f_T	I_C=40mA V_{CE}=8V, f=1MHz, T_{amb}=25℃	-	9	-	GHz
feedback capacitor	Cre	I_C=i_c=0,V_{CB}=8V,f=1MHz	-	0.5	-	pF
Collector Capacitance	CC	IE=ie=0,VCB=8V,f=1MHz	-	0.9	-	pF
Emitter capacitance	Ce	I_C=i_c=0,V_{EB}=0.5V,f=1MHz	-	2.0	-	pF
Inserted power gain	$\|S_{21}\|$	Ic=40mA,V_{CE}=8V, f=900MHz T_{amb}=25℃	15	16	-	dB
Noise coefficient	NF	V_{CE}=8V,I_C=10mA,f=900MHz, T_{amb}=25℃	-	1.3	1.8	dB
		VCE=8V,IC=40mA f=900MHz Tamb=25℃	-	1.9	2.4	dB
		V_{CE}=8V,I_C=10mA,f=2GHz, Tamb=25℃	-	2.1	-	dB
Maximum unilateral power gain	G_{UM}*	I_C=40mA,V_{CE}=8V,f=900MHz, T_{amb}=25℃	-	18	-	dB
		I_C=40mA,V_{CE}=8V,f=2GHz，T_{amb}=25℃	-	11	-	dB
third-order intercept point	ITO	I_C=40mA,V_{CE}=8V,R_L=50Ω,f_p=900MHz,f_q=902MHz,T_{amb}=25℃	-	34	-	dBm
Output voltage		V_O=275mV,I_C=40mA,V_{CE}=8 f_q=803.25MHz,f_r=803.25MHz ,Tamb=25℃dim=-60dB		500	-	mV
Gain compression of the output power at 1dB	PL1	IC=40mA,VCE=8V,RL=50Ω, f= 900MHz, Tamb=25℃		21	-	dBm
Second-order intermodulation	d_2	VO=275mV,IC=40mA,VCE=8V,fp=250MHz,fq=560MHz, Tamb=25℃ -		50	-	dB

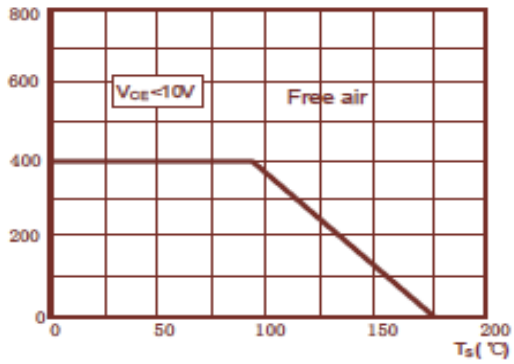
$$*G_{UM} = 10\log\frac{|S_{21}|^2}{(1-S_{11})^2(1-S_{22})^2}dB$$

5. Typical Characteristic Curves

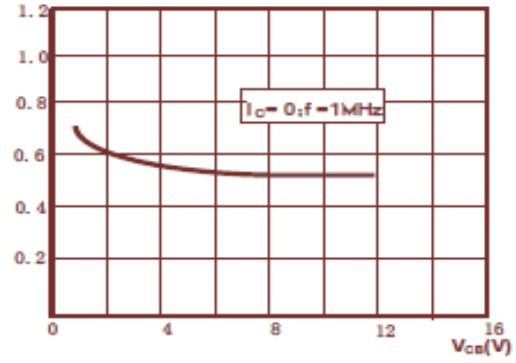
TYPICAL CHARACTERISTICS

(T_A=25℃,unless otherwise specified)

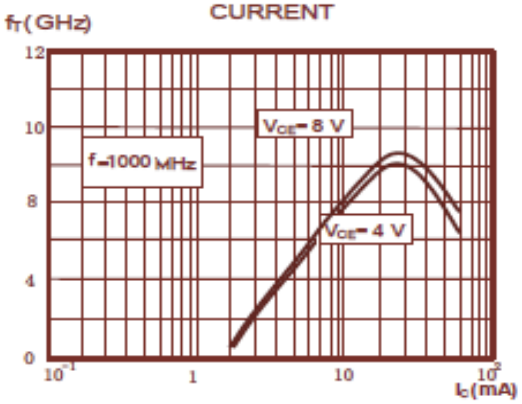
TOTAL POWER DISSIPATION VS AMBIENT TEMPERATTURE



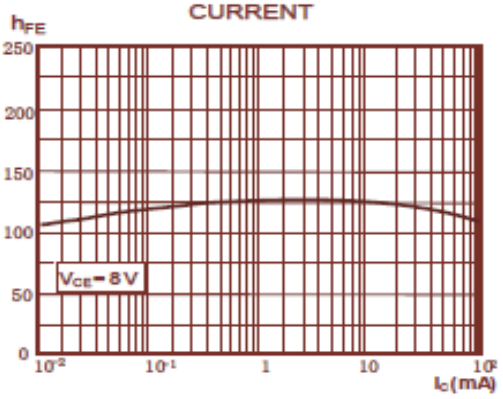
REVERSE TRANSFER CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



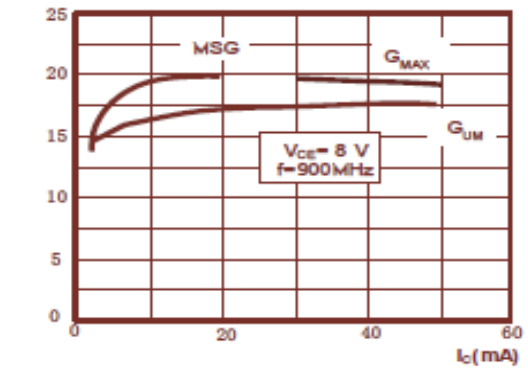
FREQUENCY VS. COLLECTOR CURRENT



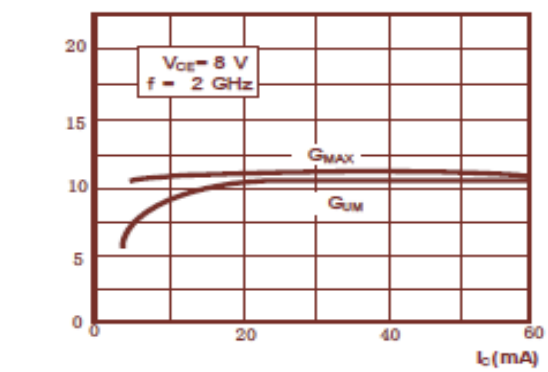
DC CURRENTVS. COLLECTOR CURRENT



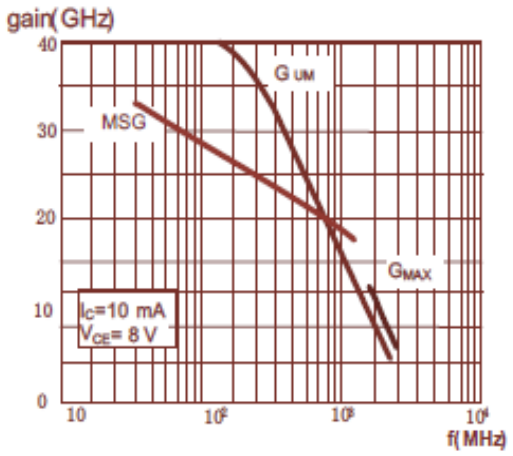
GAINVS. FUNCTION of COLLECTOR CURRENT



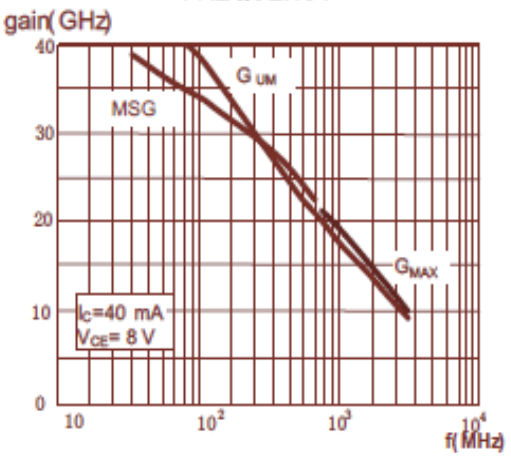
GAINVS. FUNCTION of COLLECTOR CURRENT



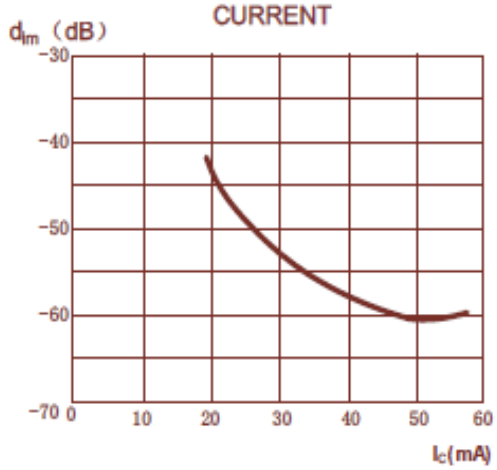
GAINvs. FUNCTION of FREQUENCY



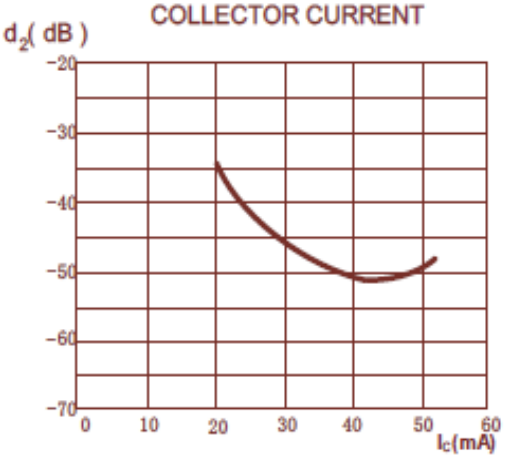
GAINvs. FUNCTION of FREQUENCY



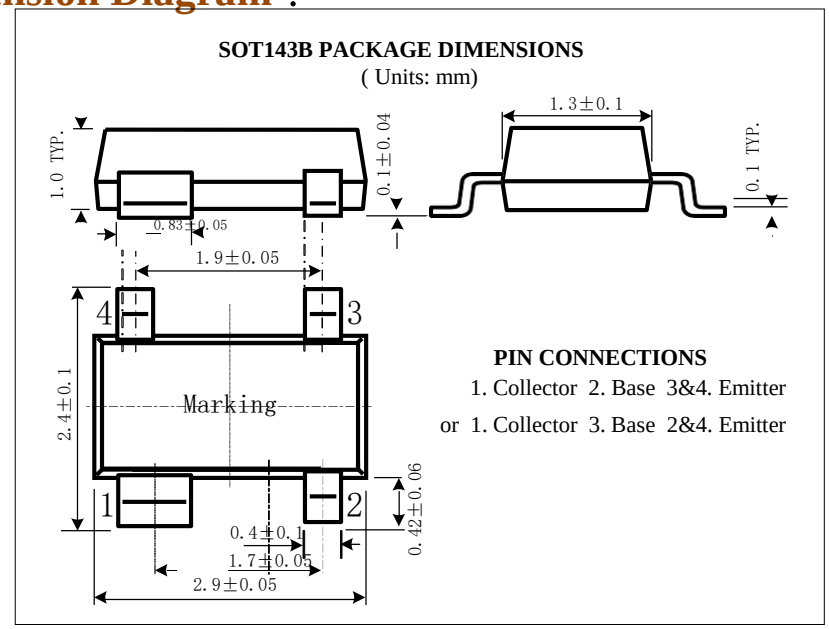
INTERMODULATION DISTORTION vs. FUNCTION of COLLECTOR CURRENT



SECOND ORDER INTERMODULATION DISTORTION vs. FUNCTION of COLLECTOR CURRENT



6. Package Dimension Diagram：



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