



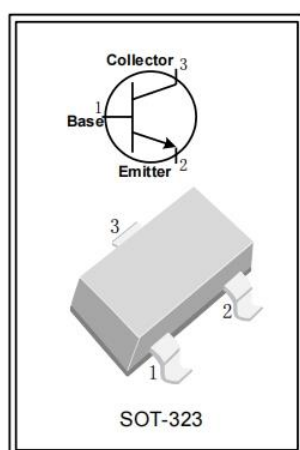
THE DATASHEET OF BFR380F



BFR380F — Microwave low noise silicon bipolar RF transistor

Description

- The transistor is suitable for operation with a collector current of 30 to 40mA and a voltage range of 3 to 5V; It can amplify signals for oscillator circuits operating at frequencies up to 3.8 GHz; At 1.8 GHz, the noise is approximately 1.1 dB;
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- Low leakage current, small junction capacitance, wide dynamic range, and ideal current linearity; Utilizing lead-free (Pb-free) surface-mount SOT323 packaging compliant with RoHS regulations;
- Mainly used in television tuners, satellite TV receivers, CATV video amplifiers, analog-digital cordless phones, radar motion sensors, wireless remote data transmission, wireless communications, RFID passive RFID systems, optical fiber amplifiers, etc.
- Ideal for signal amplification in VHF/UHF amplifiers, oscillators, mixers, detectors, and high-frequency microwave signal transmission and reception circuits;
- Package type: SOT323, Marking: FCs.



Maximum Ratings (T_{amb}=25°C)

Parameter	Symbol	Value	Unit
collector-base breakdown voltage	BV _{CBO}	15	V
collector-emitter breakdown voltage	BV _{CEO}	6	V
emitter-base breakdown voltage	BV _{EBO}	2	V
collector current	I _C	80	mA
power dissipation	P _T	380	mW
maximum junction temperature	T _J	150	°C
storage temperature	T _{STG}	-65~+150	°C

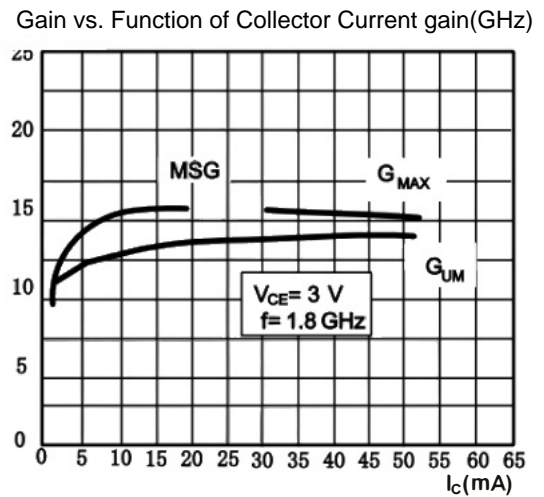
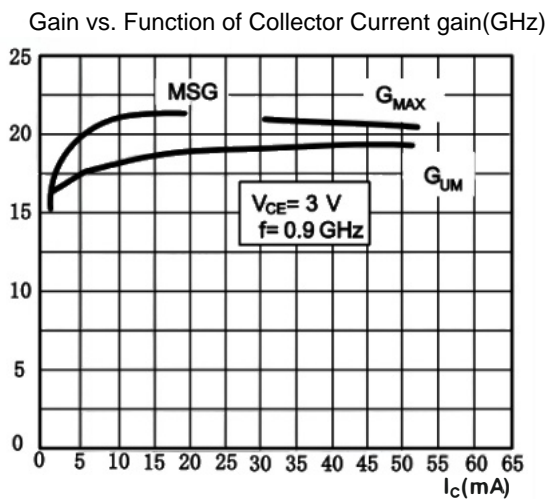
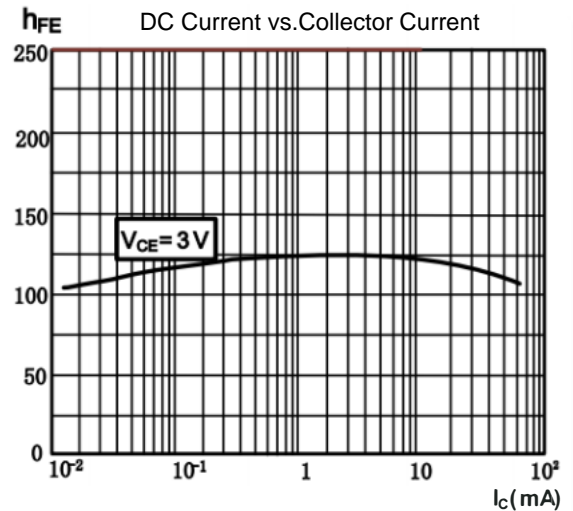
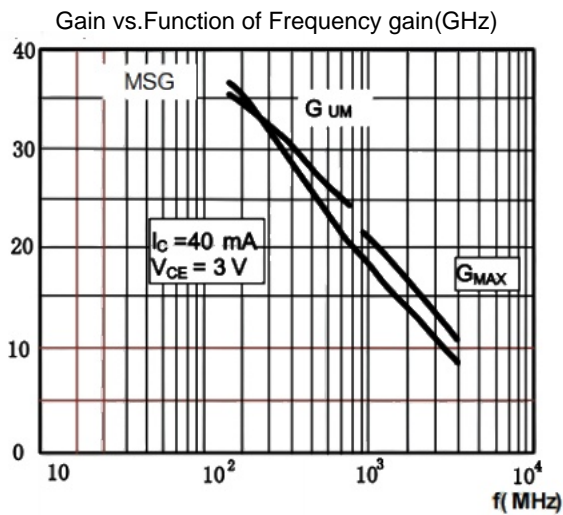
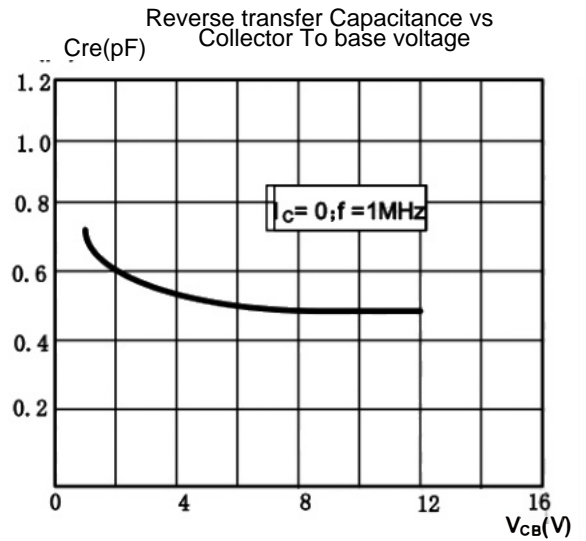
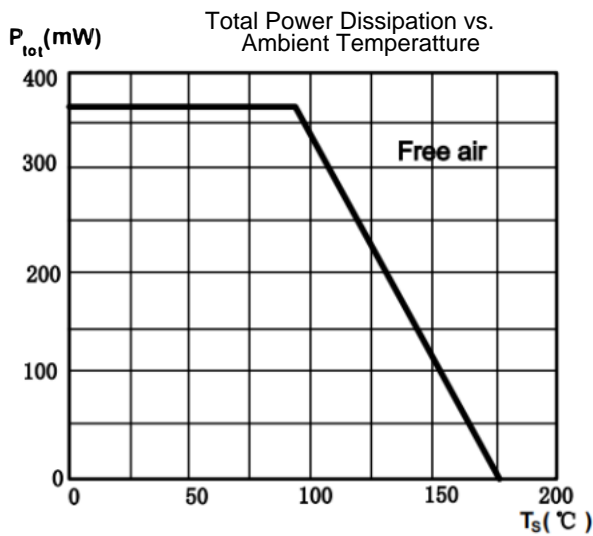
Electrical characteristics ($T_{amb}=25^{\circ}C$) :

Parameter	Symb ol	Conditions	Min.	Typ.	Max.	Unit
collector emitter breakdown voltage	BV_{CEO}	$I_C=1mA, I_B=0$	6	9	-	V
collector emitter cutoff current	I_{CES}	$V_{CE}=4V, V_{BE}=0$	-	1	30	nA
collector base cut-off current	I_{CBO}	$V_{CB}=6V, I_E=0$	-	-	100	nA
emitter base cutoff current	I_{EBO}	$V_{EB}=6V, I_C=0$	-	-	-	μA
DC current amplification factor	h_{FE}	$V_{CE}=3V, I_C=40mA$	80	100	200	-
characteristic frequency	f_T	$V_{CE}=3V, I_C=15mA, f=1GHz$	11	14	-	GHz
feedback capacitor	C_{re}	$I_C=i_C=0, V_{CB}=5V, f=1MHz$	-	0.2	-	pF
collector capacitance	C_C	$I_E=i_e=0, V_{CB}=5V, f=1MHz$	-	0.47	0.7	pF
emitter capacitance	C_e	$I_C=i_C=0, V_{EB}=0.5V, f=1MHz$	-	1	-	pF
insertion power gain	$ S_{21} ^2$	$V_{CE}=3V, I_C=40mA, f=1.8GHz$	-	11	-	dB
		$V_{CE}=3V, I_C=40mA, f=3.0GHz$	-	6.5	-	dB
noise figure	NF	$V_{CE}=3V, I_C=8mA, f=1.8GHz$	-	1.1	-	dB
maximum unilateral power gain	G_{UM}	$V_{CE}=3V, I_C=40mA, f=1.8GHz$	-	13.5	-	dB
		$V_{CE}=3V, I_C=40mA, f=3.0GHz$	-	9	-	dB
output third-order intercept point gain	IP3	$V_{CE}=3V, I_C=40mA, Z_S=Z_L=50\Omega, f=1.8GHz$	-	29	-	dBm

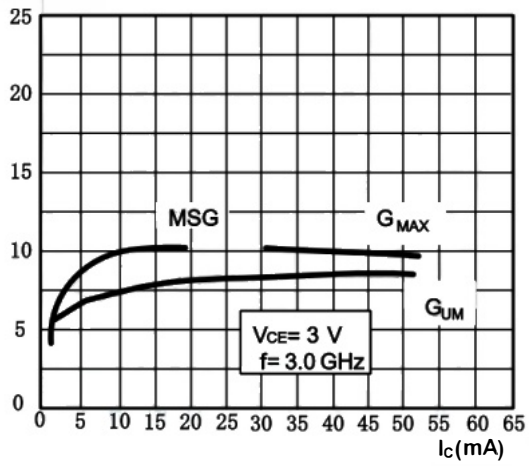
$$G_{UM} = 10 \log \frac{|S_{21}|^2}{(1 - S_{11})^2 (1 - S_{22})^2} dB$$

Typical characteristic curve

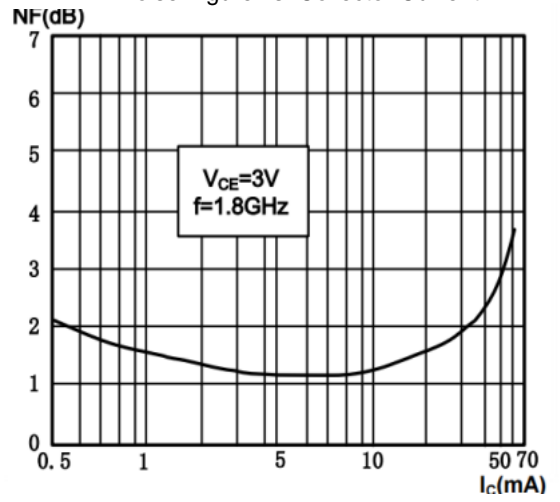
$T_A=25^\circ\text{C}$, unless otherwise specified



Gain vs. Function of Collector Current gain(GHz)



Noise Figure vs. Collector Current



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