

A perfect match up to 20 GHz

Philips NPN SiGe:C microwave transistor BFU725F for high-speed, low-noise applications

To match the trend towards higher frequencies and answer your needs, Philips' latest NPN SiGe:C transistor delivers extremely low noise and high gain in the easy-to-use SOT343F package. That makes the microwave transistor BFU725F an ideal solution for all your applications operating up to 20 GHz.

Key features

- Very low noise of 0.69 dB at 6 GHz
- High maximum stable gain (G_{ms}) 27.8 dB at 1.8 GHz
- High switching frequency – $f_T > 100$ GHz, $f_{max} > 150$ GHz
- Plastic surface mounted package, SOT343F

Key benefits

- Very low noise of 0.4 at 1.8 GHz
- High gain of 10 dB at 18 GHz
- SiGe:C process ensures high switching frequency
- Cost-effective alternative to GaAs devices
- RoHS compliant

Key applications

- GPS systems
- DECT phones
- Low noise amplifier (LNA) for microwave communications systems
- 2nd stage LNA and mixer in direct broadcast satellite (DBS) low-noise boxes (LNBS)
- Satellite radio
- WLAN and CDMA applications
- Low-noise microwave applications

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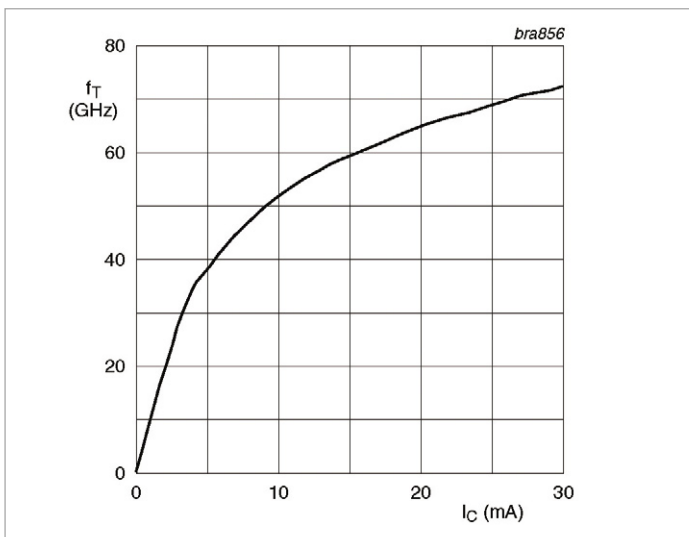
Helping you meet the trend towards high frequency systems, our NPN microwave transistor BFU725F offers an unbeatable blend of high switching frequency, high gain and very low noise. Its ultra-low noise figure makes it a perfect solution for sensitive RF receivers such as those required in high-performance mobile phones. Alternatively its high cut-off frequency gives you an ideal solution for microwave applications in the 10 GHz to 30 GHz range, such as satellite TV receivers and automotive collision avoidance radars.

The outstanding performance of the BFU725F is due to our innovative silicon-germanium-carbon (SiGe:C) BiCMOS process - QUBiC4X. Designed specifically with real high-frequency applications in mind, QUBiC4X enables a unique combination of high power gain and excellent dynamic range. It delivers all the performance of gallium-arsenide (GaAs) with the reliability of a silicon-based process.

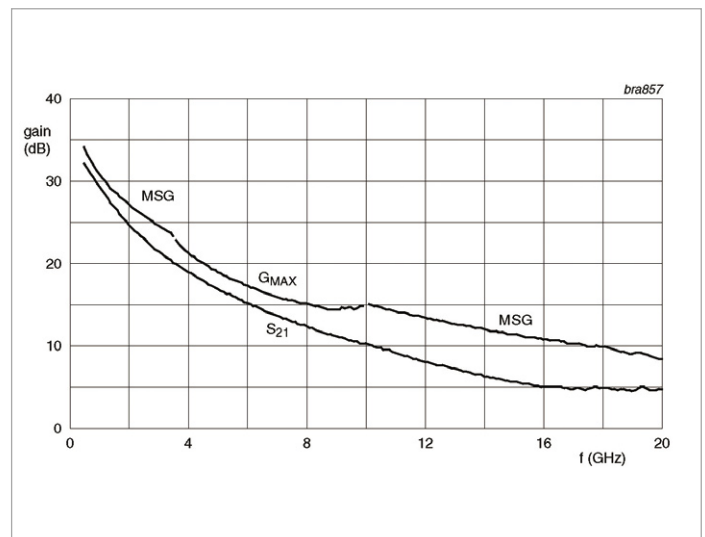
In addition, compared to GaAs devices, with the BFU725F no negative biasing voltages are needed, making it a more cost-effective alternative.

Quick reference data for the BFU725F (SOT343F)

Symbol	Parameter	Conditions			Typ	Unit	
BV_{CEO}	Collector emitter breakdown voltage	$I_C = 1\text{ mA}$,	$I_B = 0$		3.5	(V)	
$I_C \text{ max}$	Collector current $I_C \text{ max}$					40	(mA)
f_T	Transition frequency	$I_C = 25\text{ mA}$	$V_{CE} = 3\text{ V}$	$f = 2\text{ GHz}$	68	(GHz)	
Noise F	Noise figure; target spec.	$V_{CE} = 3\text{ V}$	$f = 1.8\text{ GHz}$	$Z_S = Z_{opt}$	0.4	(dB)	
Noise F	Noise figure; target spec.	$V_{CE} = 3\text{ V}$	$f = 6\text{ GHz}$	$Z_S = Z_{opt}$	0.69	(dB)	
Gain G_{ms}	Power gain, maximum stable	$I_C = 25\text{ mA}$	$V_{CE} = 3\text{ V}$	$f = 1.8\text{ GHz}$	$Z_S = Z_{opt}$ $Z_L = Z_{opt}$	27.8	(dB)
Gain G_{max}	Power gain, maximum available	$I_C = 25\text{ mA}$	$V_{CE} = 3\text{ V}$	$f = 6\text{ GHz}$	$Z_S = Z_{opt}$ $Z_L = Z_{opt}$	17.3	(dB)



Transition frequency as a function of collector current (typical values)



Gain as a function of frequency (typical values)

Philips Semiconductors

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