SiGeC microwave NPN transistor BFU725F

A perfect match up to 20 GHz

Meet the trend towards higher frequencies. With NXP Semiconductors' latest SiGeC microwave NPN transistor BFU725F, you get high switching frequencies plus extremely high gain and low noise. All this in an easy-to-use SOT343F package. It's the ideal solution for applications up to 20 GHz.

Key features

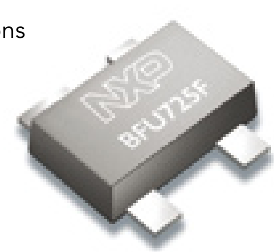
- Very low noise (0.4 dB at 1.8 GHz / 0.67 dB at 5.8 GHz)
- High maximum stable gain (27.8 dB at 1.8 GHz / 10 dB at 18 GHz)
- High switching frequency (f_T >100 GHz / f_{MAX} >150 GHz)
- Plastic surface-mount SOT343F package

Key benefits

- SiGeC process delivers high switching frequency from a silicon-based device
- 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 blocks (LNBs)
- Satellite radio
- WLAN and CDMA applications
- Low-noise microwave applications



The NPN microwave transistor BFU725F delivers an unbeatable blend of high switching frequency, high gain and very low noise. Thanks to its ultra-low noise figure, it's perfect for your sensitive RF receivers particularly those for high-performance cell phones. Alternatively, with its high cut-off frequency, it's your ideal solution for microwave applications in the 10 GHz to 30 GHz range, such as satellite TV receivers and automotive collision avoidance radar.

The BFU725F get its outstanding performance from our innovative silicon-germanium-carbon (SiGeC) BiCMOS process. QUBiC4X was designed specifically to meet the needs of real-life, high-frequency applications and delivers an unrivalled fusion of high power gain and excellent dynamic range. It combines the performance of gallium-arsenide (GaAs) technologies with the reliability of a silicon-based process.

In addition, with the BFU725F, you don't need a biasing IC or negative biasing voltage. So it's a much more cost-effective solution than GaAs pHEMT devices.

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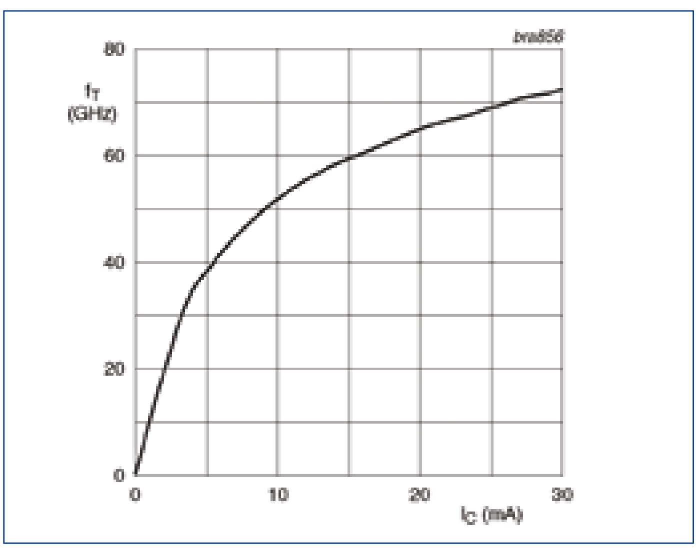
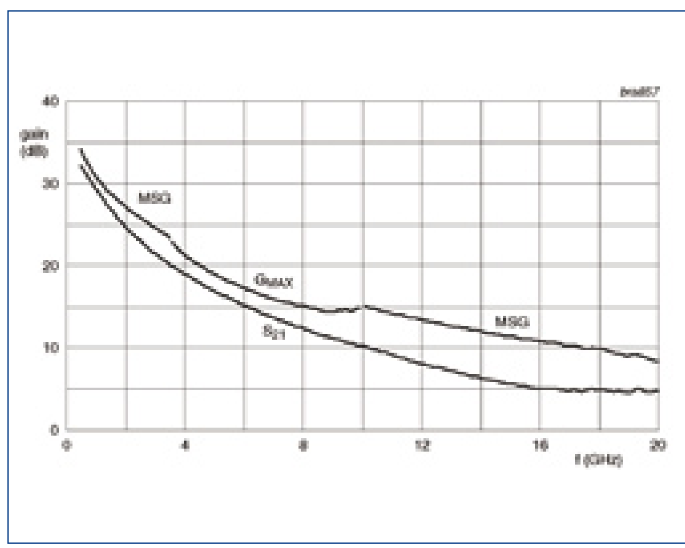
Parameter	Symbol	Conditions	Value
Collector-emitter breakdown voltage	BV_{CEO}	I_C = 1 mA; I_B = 0	3.2 V
Maximum collector current	$I_{C(max)}$		40 mA
Transition frequency	f_T	V_{CE} = 2 V; I_C = 25 mA; f = 2 GHz	68 GHz
Noise figure	NF	V_{CE} = 2 V; I_C = 5 mA; f = 1.8 GHz; $\Gamma_s = \Gamma_{opt}$	0.4 dB
		V_{CE} = 2 V; I_C = 5 mA; f = 2.4 GHz; $\Gamma_s = \Gamma_{opt}$	0.45 dB
		V_{CE} = 2 V; I_C = 5 mA; f = 5.8 GHz; $\Gamma_s = \Gamma_{opt}$	0.7 dB
		V_{CE} = 2 V; I_C = 5 mA; f = 12 GHz; $\Gamma_s = \Gamma_{opt}$	1.0 dB
Maximum stable power gain	MSG / $G_{P(max)}$	V_{CE} = 2 V; I_C = 25 mA; f = 1.8 GHz	26.6 dB
		V_{CE} = 2 V; I_C = 25 mA; f = 2.4 GHz	25.5 dB
		V_{CE} = 2 V; I_C = 25 mA; f = 12 GHz	13 dB
		V_{CE} = 2 V; I_C = 25 mA; f = 5.8 GHz	17 dB

Quick reference data



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



Gain as a function of frequency (typical values)

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