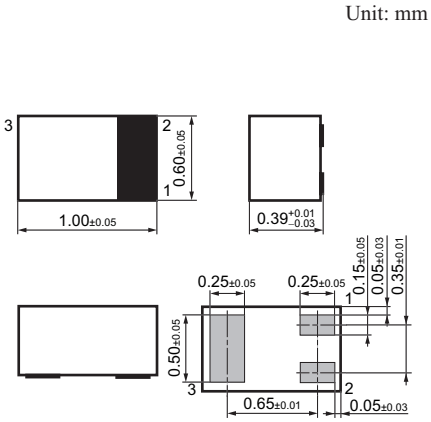
MSG43003

SiGe HBT type

For low-noise RF amplifier

■ Features

- Compatible between high breakdown voltage and high cutoff frequency
- Low-noise, high-gain amplification
- Suitable for high-density mounting and downsizing of the equipment for Ultraminiature package 0.6 mm × 1.0 mm (height 0.39mm)



1: Base
2: Emitter
3: Collector

ML3-N2 Package

Marking Symbol: 5X

■ Absolute Maximum Ratings $T_a = 25°C$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V_{CBO}	9	V
Collector-emitter voltage (Base open)	V_{CEO}	6	V
Emitter-base voltage (Collector open)	V_{EBO}	1	V
Collector current	I_C	100	mA
Collector power dissipation *	P_C	100	mW
Junction temperature	T_j	125	°C
Storage temperature	T_{stg}	–55 to +125	°C

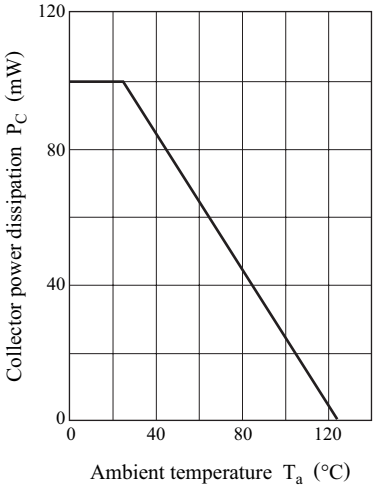
Note) Copper plate at the collector is 5.0 mm^2 on substrate at 10 mm × 12 mm × 0.8 mm.

■ Electrical Characteristics $T_a = 25°C \pm 3°C$

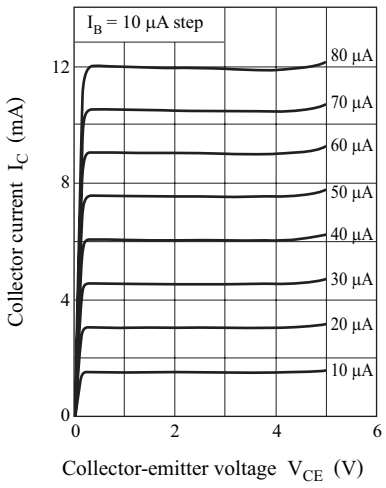
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 9$ V, $I_E = 0$			1	μA
Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 6$ V, $I_B = 0$			1	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = 1$ V, $I_C = 0$			1	μA
Forward current transfer ratio	h_{FE}	$V_{CE} = 3$ V, $I_C = 10$ mA		100	220	—
Transition frequency *	f_T	$V_{CE} = 3$ V, $I_C = 30$ mA, f = 2 GHz	19			GHz
Forward transfer gain *	$\lvert S_{21e} \rvert^2$	$V_{CE} = 3$ V, $I_C = 30$ mA, f = 2 GHz	10.0	7.0		dB
Noise figure *	NF	$V_{CE} = 3$ V, $I_C = 10$ mA, f = 2 GHz	1.4		2.0	dB
Collector output capacitance (Common base, input open circuited) *	C_{ob}	$V_{CB} = 3$ V, $I_E = 0$, f = 1 MHz	0.5		0.8	pF

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
2. Observe precautions for handling. Electrostatic sensitive devices.
3. *: Verified by random sampling

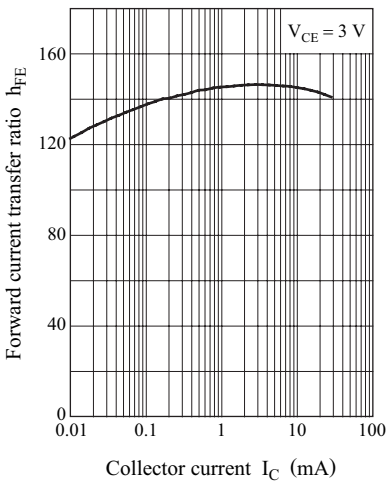
P_C — T_a



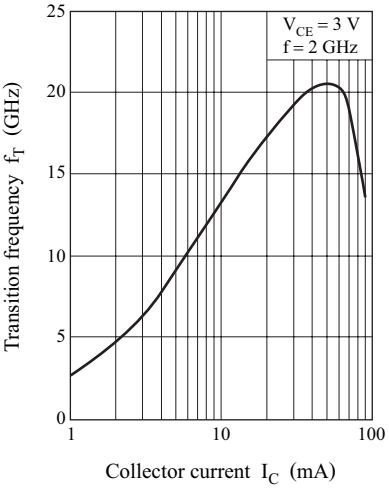
I_C — V_{CE}



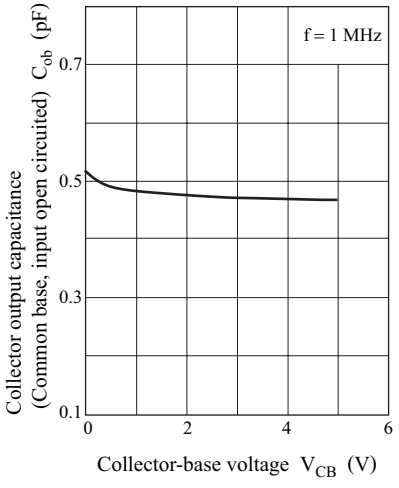
h_{FE} — I_C



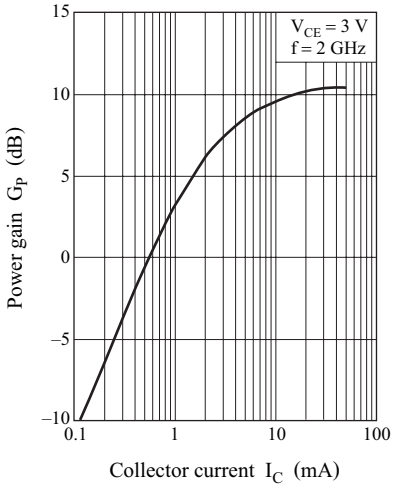
f_T — I_C



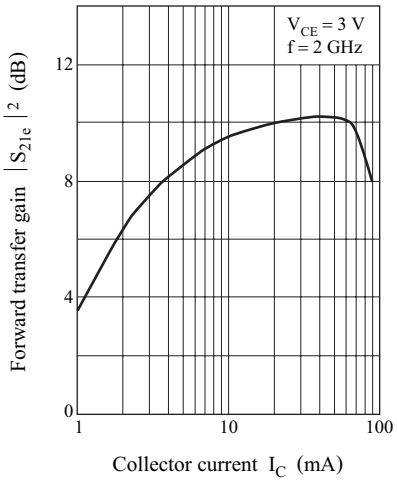
C_{ob} — V_{CB}



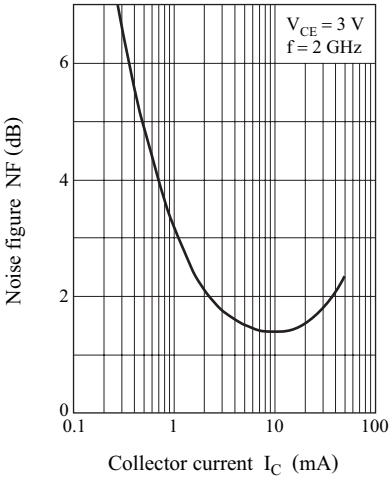
G_P — I_C



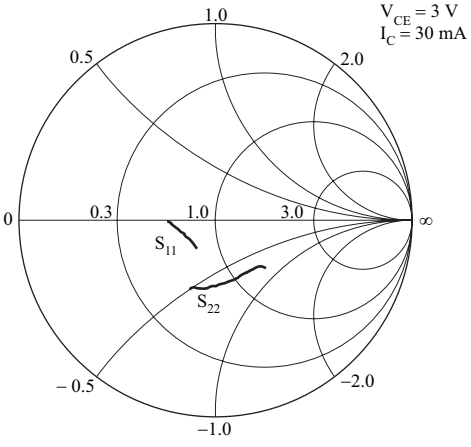
$|S_{21e}|^2$ — I_C



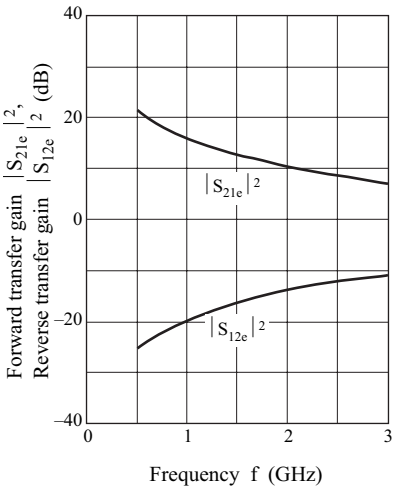
NF — I_C



S_{11} , S_{22}



$|S_{21e}|^2$, $|S_{12e}|^2$ — f



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