

MSG43004

SiGe HBT type

For low-noise RF amplifier

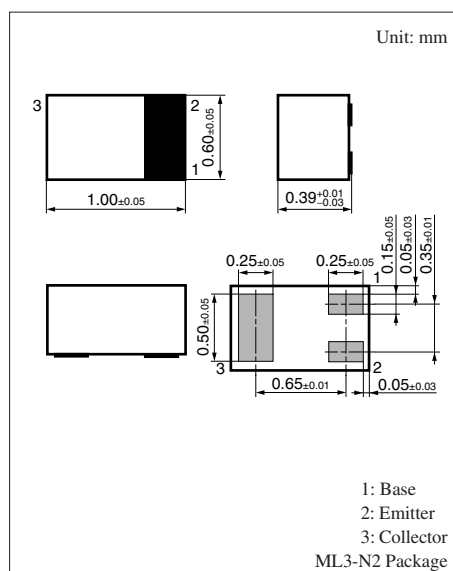
■ Features

- Compatible between high breakdown voltage and high cut-off frequency
- Low noise, high-gain amplification
- Optimal size reduction and high level integration for ultra-small packages

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +125	$^\circ\text{C}$

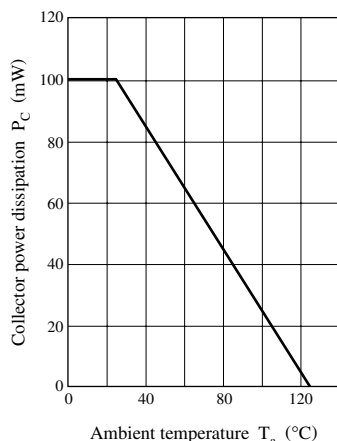
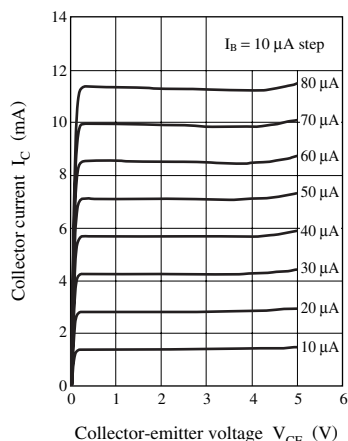
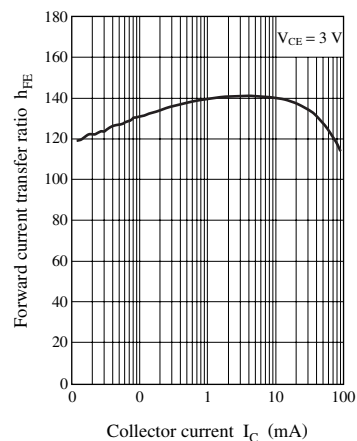
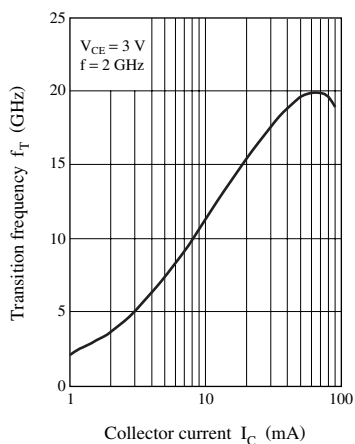
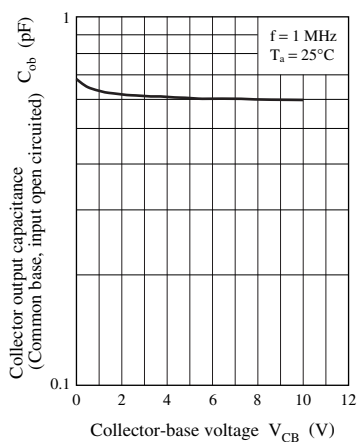
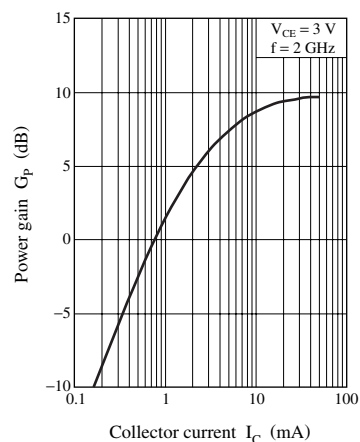
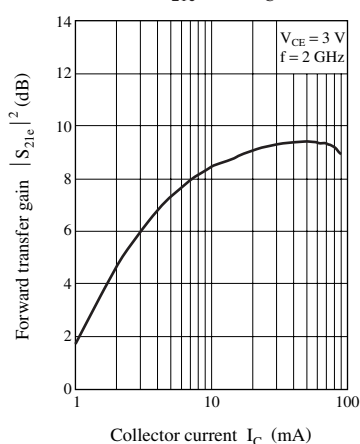
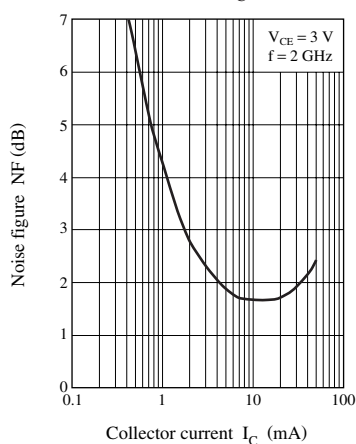
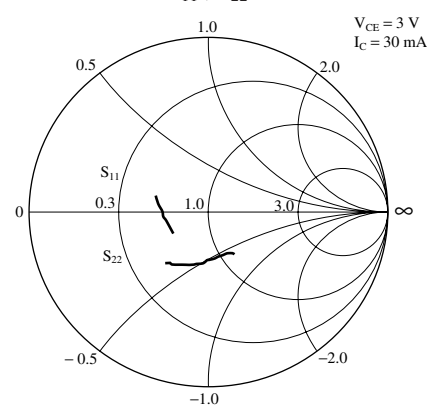
Note) *: Copper plate at the collector is 5.0 mm² on substrate at 10 mm × 12 mm × 0.8 mm.

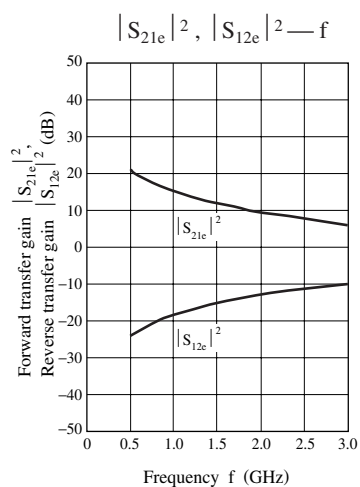


■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 9\text{ V}, I_E = 0$			1	μA
Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 6\text{ V}, I_B = 0$			1	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$			1	μA
Forward current transfer ratio	h_{FE}	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}$	100		220	—
Transition frequency *	f_T	$V_{CE} = 3\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$		17		GHz
Forward transfer gain *	$ S_{21e} ^2$	$V_{CE} = 3\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$	6.0	9.0		dB
Noise figure *	NF	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}, f = 2\text{ GHz}$		1.4	2.0	dB
Collector output capacitance (Common base, input open circuited) *	C_{ob}	$V_{CB} = 3\text{ V}, I_E = 0, f = 1\text{ MHz}$		0.6	0.9	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} 



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