

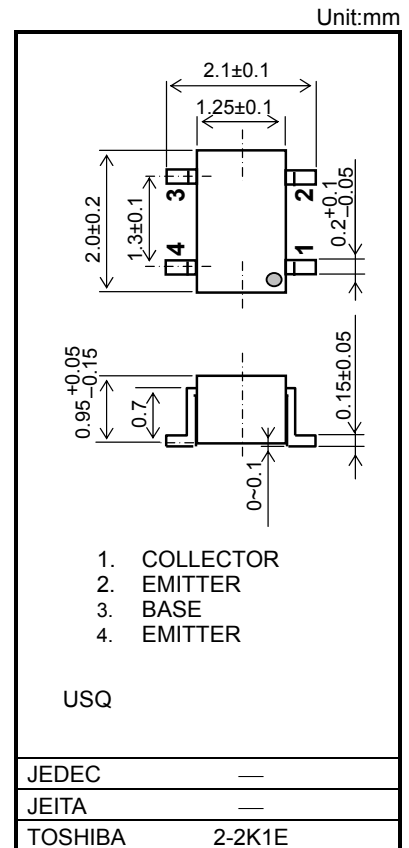
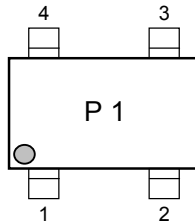
# MT4S104U

## UHF-SHF Low Noise Amplifier Application

### FEATURES

- Low Noise Figure :NF=1.25dB (@f=5.2GHz)
- High Gain:|S21e|^2=10.0dB (@f=5.2GHz)

### Marking



Weight: 0.006 g

### Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-Base voltage	V <sub>CBO</sub>	6	V
Collector-Emitter voltage	V <sub>CEO</sub>	3	V
Emitter-Base voltage	V <sub>EBO</sub>	1.2	V
Collector-Current	I <sub>C</sub>	10	mA
Base-Current	I <sub>B</sub>	5	mA
Collector Power dissipation	P <sub>C</sub>	30	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature Range	T <sub>stg</sub>	-55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

**Microwave Characteristics (Ta = 25°C)**

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition Frequency	$f_T$	$V_{CE}=2V, I_C=7mA, f=2GHz$	19	23	—	GHz
Insertion Gain	$ S_{21e} ^2(1)$	$V_{CE}=2V, I_C=7mA, f=2GHz$	14.0	16.5	—	dB
	$ S_{21e} ^2(2)$	$V_{CE}=2V, I_C=7mA, f=5.2GHz$	—	10.0	—	dB
Noise Figure	NF(1)	$V_{CE}=2V, I_C=5mA, f=2GHz$	—	0.67	0.95	dB
	NF(2)	$V_{CE}=2V, I_C=5mA, f=5.2GHz$	—	1.25	—	dB

**Electrical Characteristics (Ta = 25°C)**

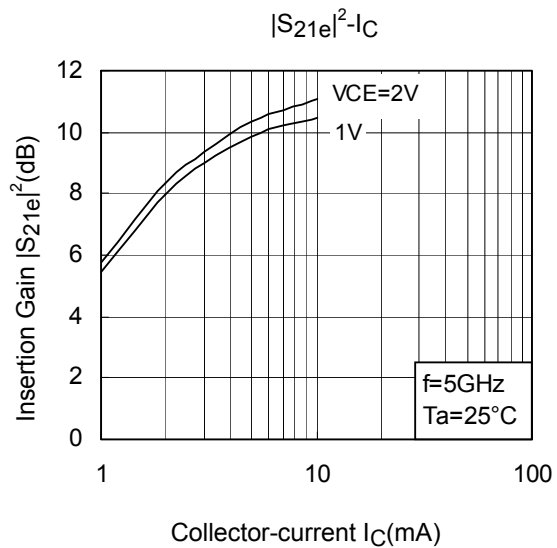
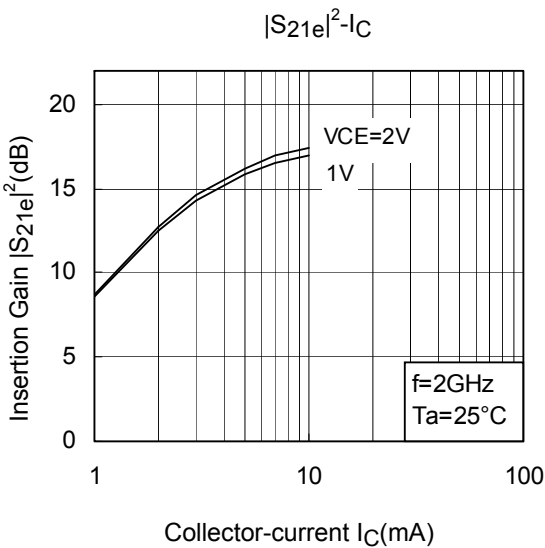
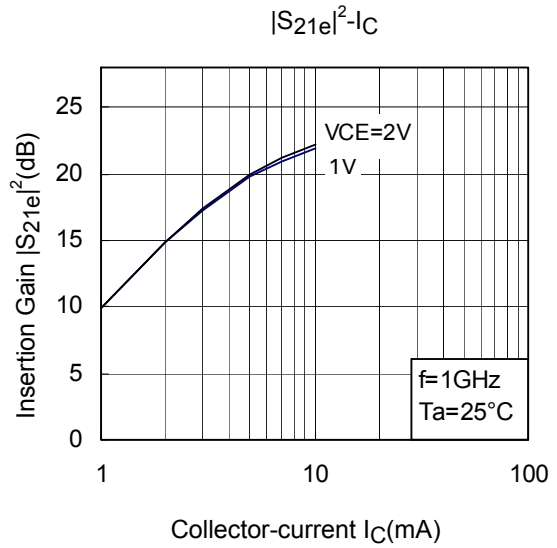
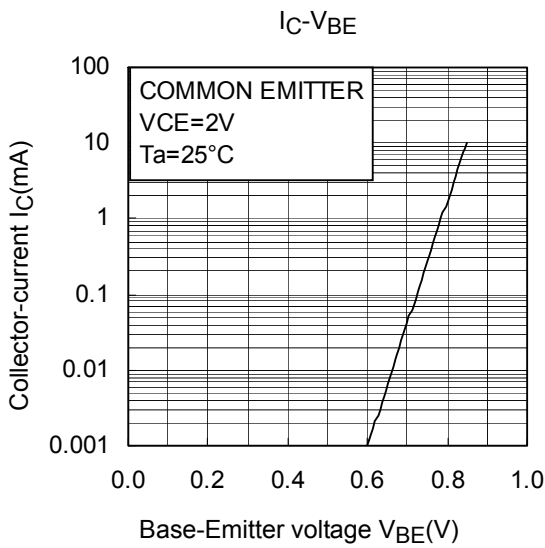
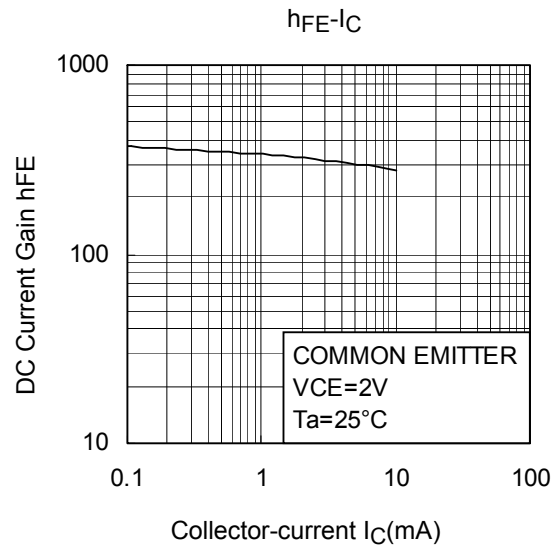
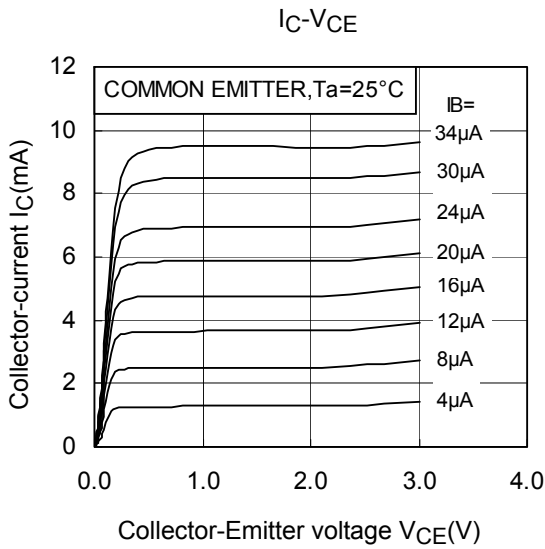
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector Cut-off Current	$I_{CBO}$	$V_{CB}=6V, I_E=0$	—	—	1	$\mu A$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=1V, I_C=0$	—	—	1	$\mu A$
DC Current Gain	hFE	$V_{CE}=2V, I_C=7mA$	200	—	400	-
Output Capacitance	$C_{ob}$	$V_{CB}=2V, I_E=0, f=1MHz$	—	0.26	0.5	pF
Reverse Transfer Capacitance	$C_{re}$	$V_{CB}=2V, I_E=0, f=1MHz$ (Note 1)	—	0.09	0.18	pF

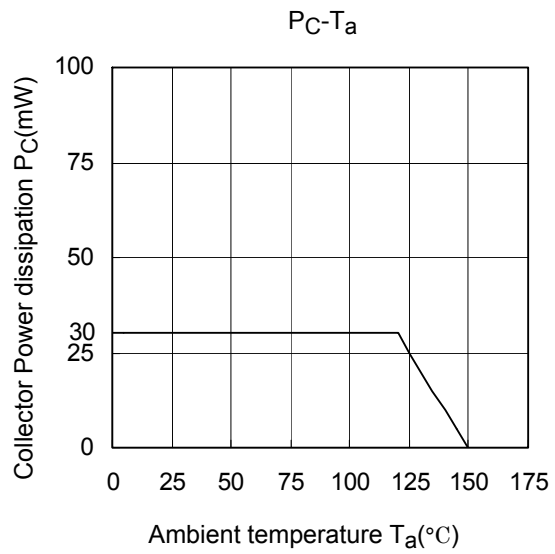
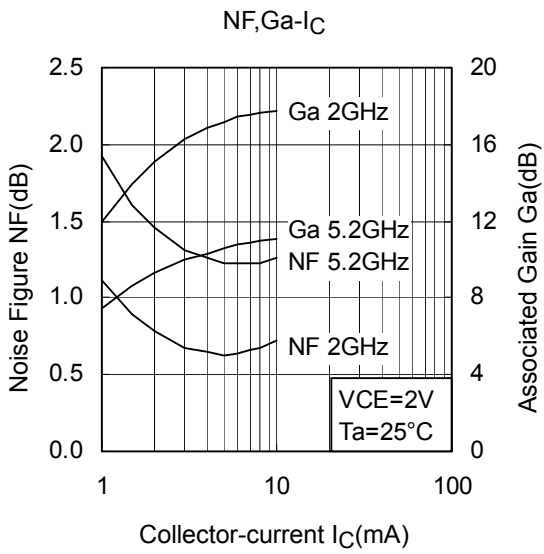
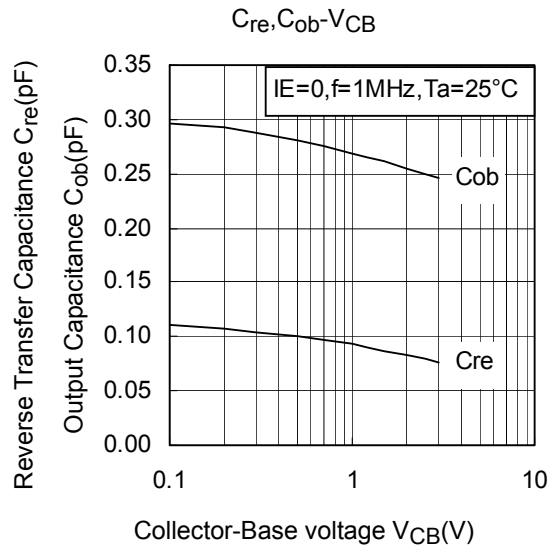
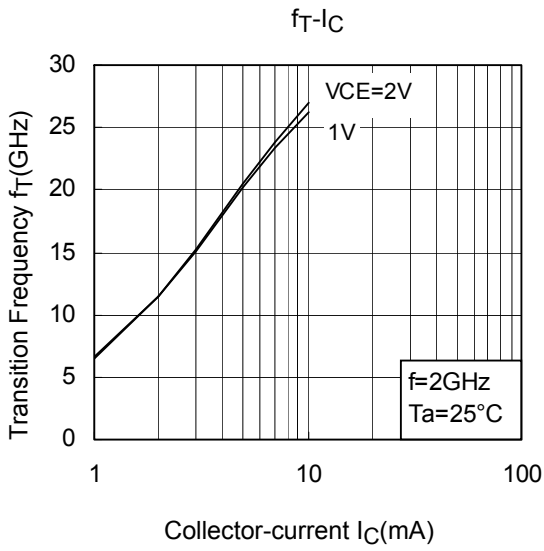
**Note 1:** Cre is measured by 3 terminal method with capacitance bridge.

**Caution:**

This device is sensitive to electrostatic discharge due to applied the high frequency transistor process of  $f_T=60GHz$  class is used for this product.

Please make enough tool and equipment earthed when you handle.





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20070701-EN GENERAL

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