

TOSHIBA Transistor Silicon-Germanium NPN Epitaxial Planer Type

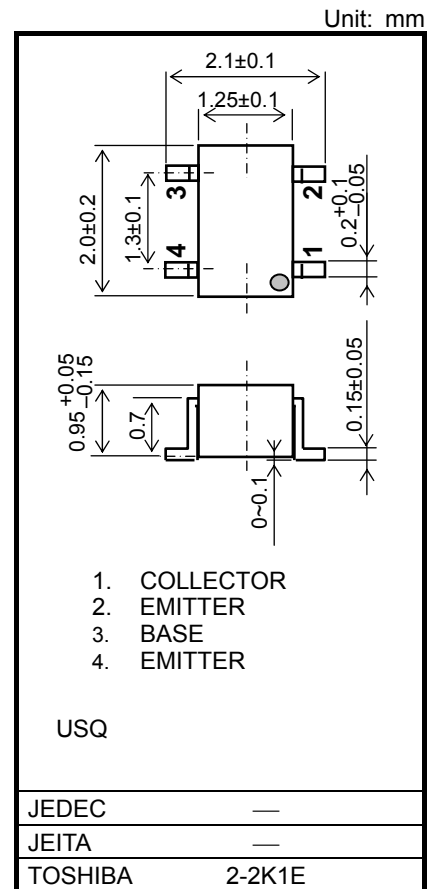
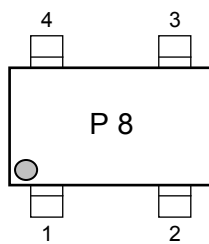
MT4S102U

UHF-SHF Low Noise Amplifier Application

FEATURES

- Low Noise Figure :NF=0.58dB (@f=2GHz)
- High Gain:|S_{21e}|²=15.0dB (@f=2GHz)

Marking



Weight: 0.006 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-Base voltage	V _{CBO}	6	V
Collector-Emitter voltage	V _{CEO}	3	V
Emitter-Base voltage	V _{EBO}	1.2	V
Collector-Current	I _C	20	mA
Base-Current	I _B	10	mA
Collector Power dissipation	P _C	60	mW
Junction temperature	T _j	150	°C
Storage temperature Range	T _{stg}	-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	$V_{CE}=2V, I_C=15mA, f=2GHz$	20	24	—	GHz
Insertion Gain	$ S_{21e} ^2(1)$	$V_{CE}=2V, I_C=15mA, f=2GHz$	12.5	15.0	—	dB
	$ S_{21e} ^2(2)$	$V_{CE}=2V, I_C=15mA, f=5.2GHz$	—	8.0	—	dB
Noise Figure	NF(1)	$V_{CE}=2V, I_C=10mA, f=2GHz$	—	0.58	0.85	dB
	NF(2)	$V_{CE}=2V, I_C=10mA, f=5.2GHz$	—	1.4	—	dB

Electrical Characteristics (Ta = 25°C)

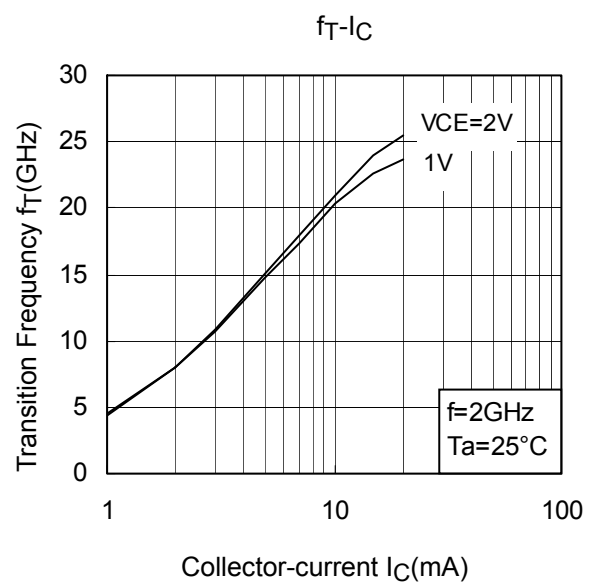
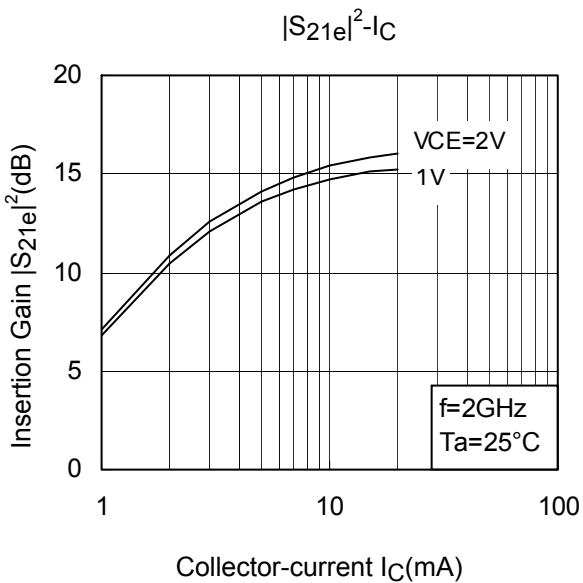
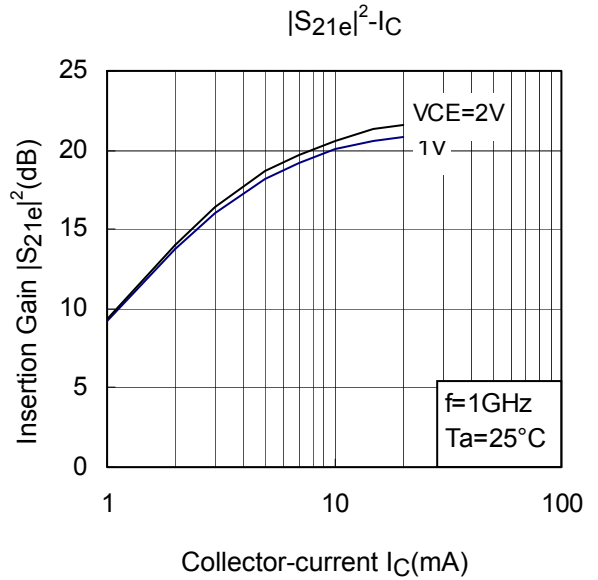
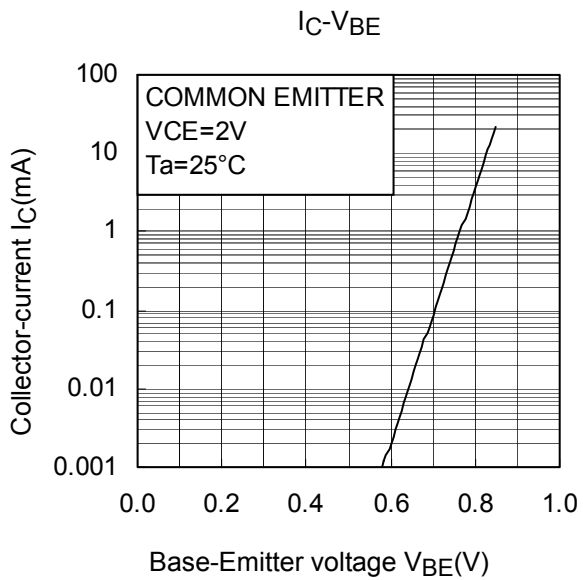
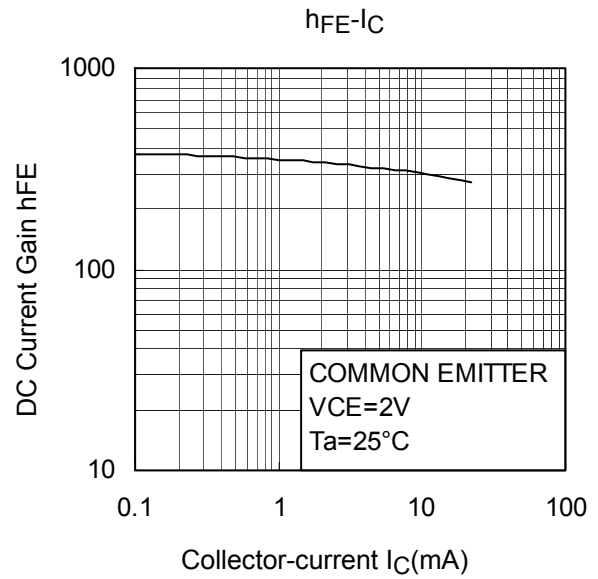
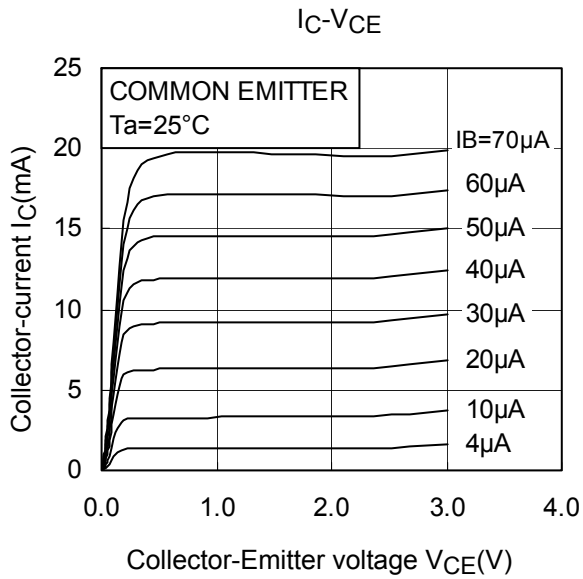
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector Cut-off Current	I_{CBO}	$V_{CB}=6V, I_E=0$	—	—	1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB}=1V, I_C=0$	—	—	1	μA
DC Current Gain	h_{FE}	$V_{CE}=2V, I_C=15mA$	200	—	400	-
Output Capacitance	C_{ob}	$V_{CB}=2V, I_E=0, f=1MHz$	—	0.43	0.6	pF
Reverse Transfer Capacitance	C_{re}	$V_{CB}=2V, I_E=0, f=1MHz$ (Note 1)	—	0.17	0.25	pF

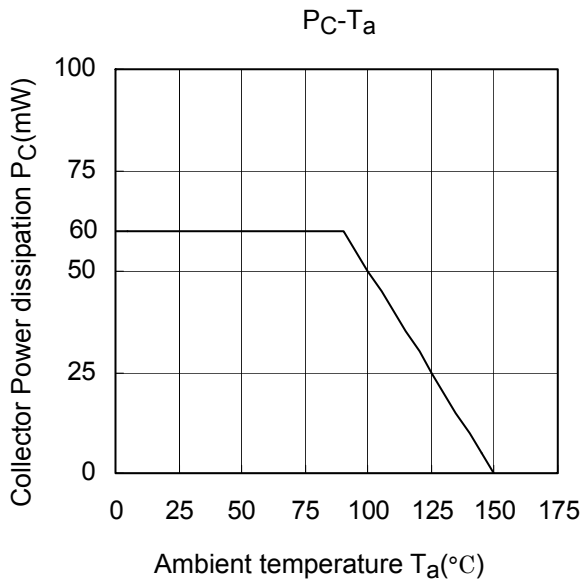
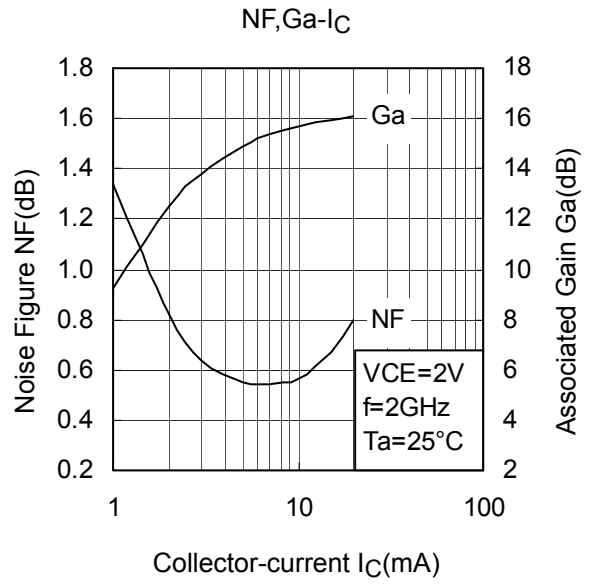
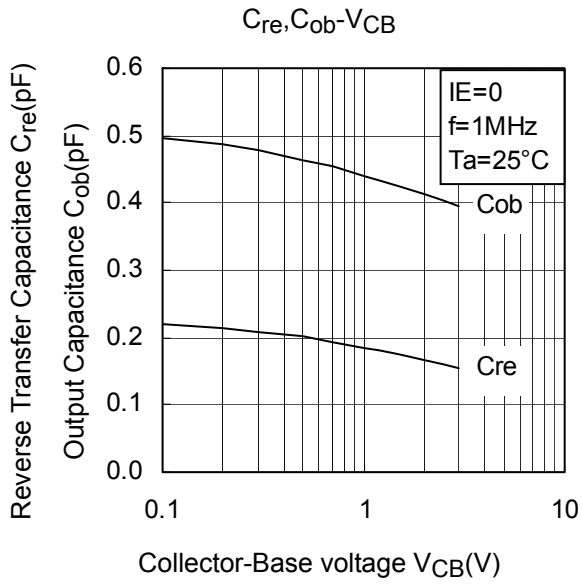
Note 1: C_{re} is measured by 3 terminal method with capacitance bridge.

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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