

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANER TYPE

# MT3S38T

VCO OSCILLETOR STAGE

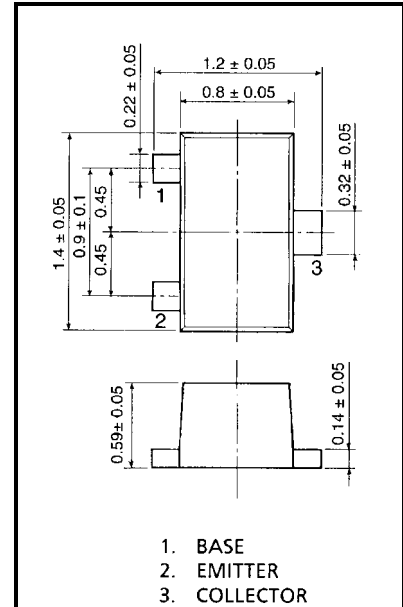
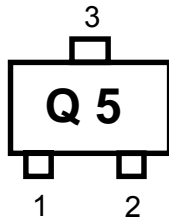
UHF LOW NOISE AMPLIFIER APPLICATION

Unit: mm

## FEATURES

- Low Noise Figure :NF=1.2dB (@f=2GHz)
- High Gain:|S21e|^2=11dB (@f=2GHz)

## Marking



TESM	
JEDEC	—
JEITA	—
TOSHIBA	2-1B1A

Weight:0.0022g (typ.)

## Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-Base voltage	V <sub>CBO</sub>	8	V
Collector-Emitter voltage	V <sub>CEO</sub>	4.5	V
Emitter-Base voltage	V <sub>EBO</sub>	1.5	V
Collector-Current	I <sub>C</sub>	50	mA
Base-Current	I <sub>B</sub>	25	mA
Collector Power dissipation	P <sub>C</sub>	100	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature Range	T <sub>stg</sub>	-55~150	°C

## Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition Frequency	fT	V <sub>CE</sub> =3V, I <sub>C</sub> =20mA, f=2GHz	13	17	-	GHz
Insertion Gain	S <sub>21e</sub>   <sup>2</sup> (1)	V <sub>CE</sub> =3V, I <sub>C</sub> =20mA, f=1GHz	14.5	16.5	-	dB
	S <sub>21e</sub>   <sup>2</sup> (2)	V <sub>CE</sub> =3V, I <sub>C</sub> =20mA, f=2GHz	9	11	-	dB
Noise Figure	NF(1)	V <sub>CE</sub> =3V, I <sub>C</sub> =5mA, f=1GHz	-	0.9	-	dB
	NF(2)	V <sub>CE</sub> =3V, I <sub>C</sub> =5mA, f=2GHz	-	1.2	1.8	dB

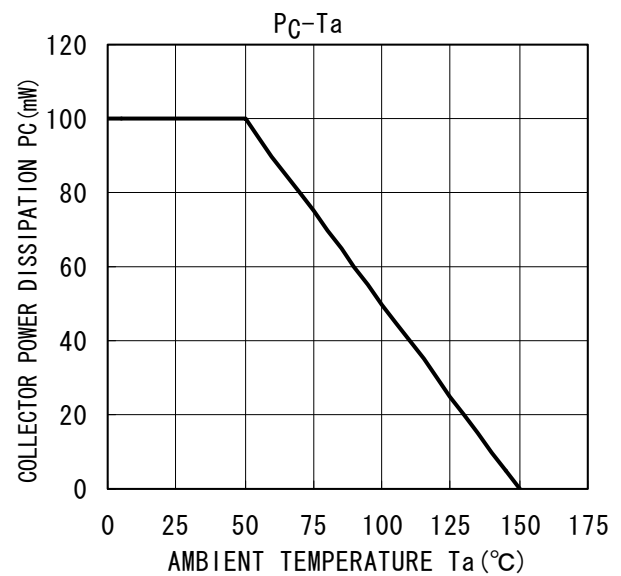
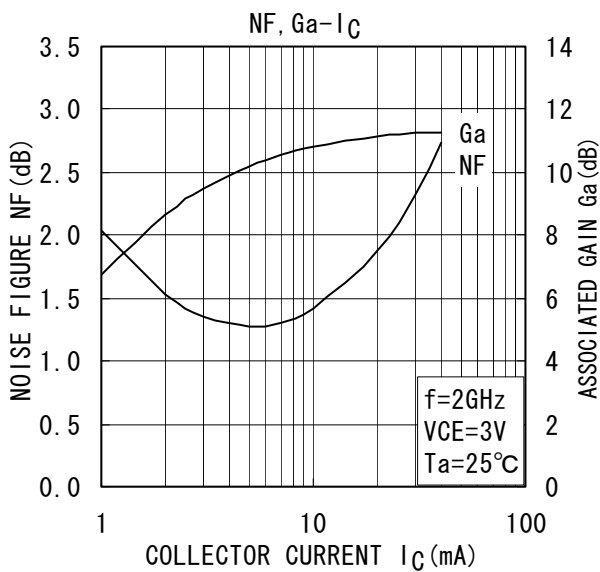
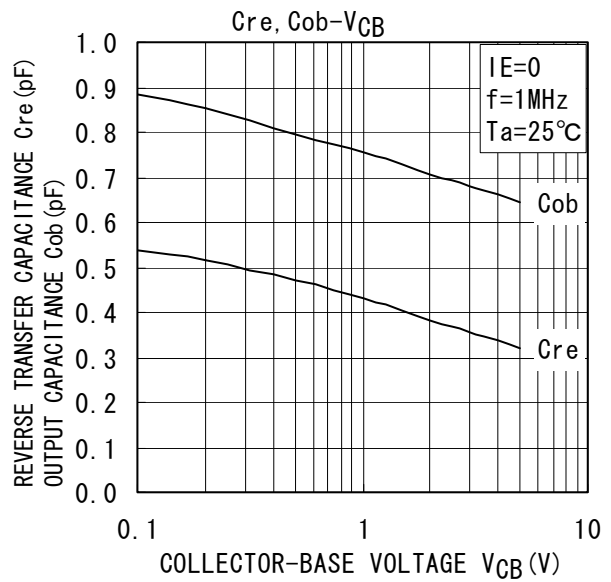
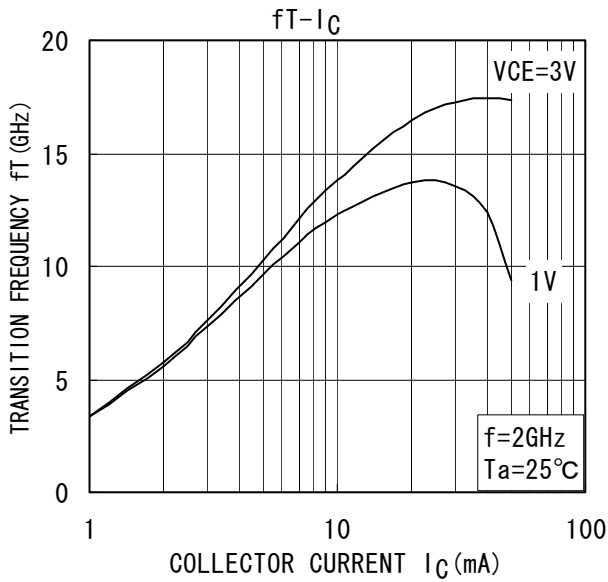
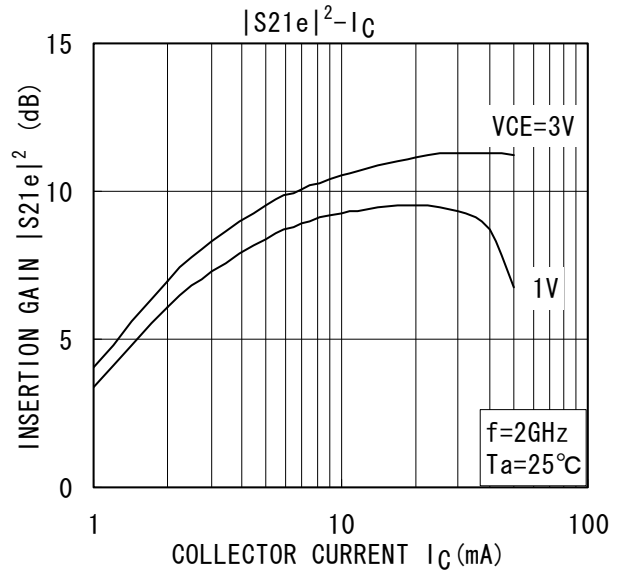
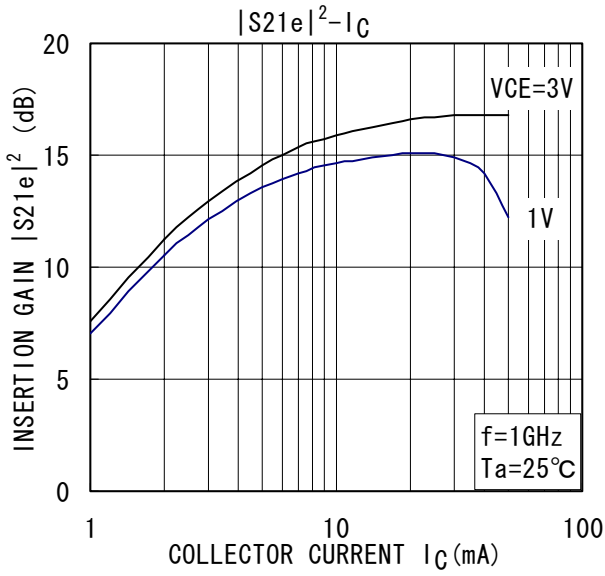
## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> =8V, I <sub>E</sub> =0	-	-	1	μA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> =1V, I <sub>C</sub> =0	-	-	1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =3V, I <sub>C</sub> =20mA	70	-	140	-
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =1V, I <sub>E</sub> =0, f=1MHz	-	0.76	1.2	pF
Reverse Transistor Capacitance	C <sub>re</sub>	V <sub>CB</sub> =1V, I <sub>E</sub> =0, f=1MHz (Note 1)	-	0.44	0.8	pF

**Note 1:** C<sub>re</sub> is measured by 3 terminal method with capacitance bridge.

**Caution:** This device is sensitive to electrostatic discharge.

Please make enough tool and equipment earthed when you handle.



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