

MT3S19R

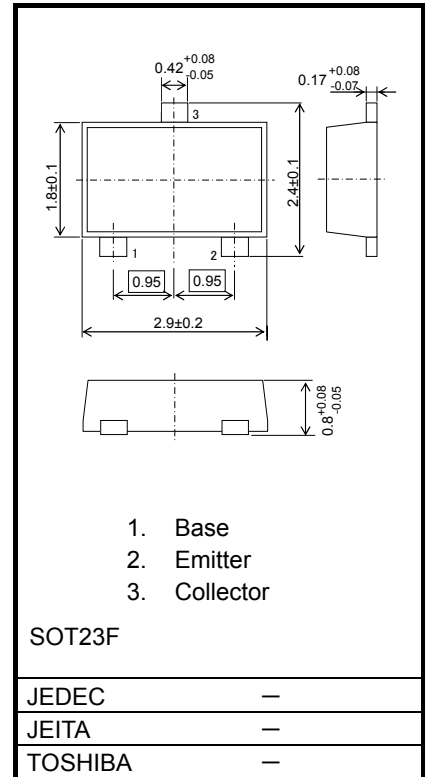
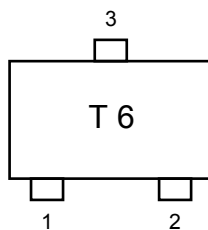
VHF-UHF Band Low-Noise, Low-Distortion Amplifier Applications

Unit: mm

FEATURES

- Low Noise Figure: NF=1.5dB (typ.) (@ f=1GHz)
- High Gain: $|S_{21e}|^2=13\text{dB}$ (typ.) (@ f=1GHz)

Marking



1. Base
2. Emitter
3. Collector

SOT23F

JEDEC	—
JEITA	—
TOSHIBA	—

Weight: 11 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	12	V
Collector-emitter voltage	V_{CEO}	6	V
Emitter-base voltage	V_{EBO}	2	V
Collector-current	I_C	80	mA
Base-current	I_B	10	mA
Collector power dissipation	P_C (Note1)	320	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55 to 150	°C

Note 1: The device is mounted on a FR4 board (20 mm x 25 mm x 1.55 mm (t))

Note 2: 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).

Start of commercial production
2011-03

Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Transition frequency	f_T	$V_{CE} = 5V, I_C = 50mA$	11.5	13.5	—	GHz
Insertion gain	$ S_{21e} ^2(1)$	$V_{CE} = 5V, I_C = 50mA, f = 500MHz$	—	18.5	—	dB
	$ S_{21e} ^2(2)$	$V_{CE} = 5V, I_C = 50mA, f = 1GHz$	11	13	—	
Noise figure	NF	$V_{CE} = 5V, I_C = 20mA, f = 1GHz$	—	1.5	1.9	dB
3 rd order intermodulation distortion output intercept point	OIP3	$V_{CE} = 5V, I_C = 50mA, f = 500MHz, \Delta f = 1MHz$	29.5	33.5	—	dBmW

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 6V, I_E = 0$	—	—	100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1V, I_C = 0$	—	—	100	nA
DC current gain	h_{FE}	$V_{CE} = 5V, I_C = 50mA$	100	—	250	—
Reverse transfer capacitance	C_{re}	$V_{CB} = 5V, I_E = 0, f = 1MHz$ (Note3)	—	0.75	1	pF

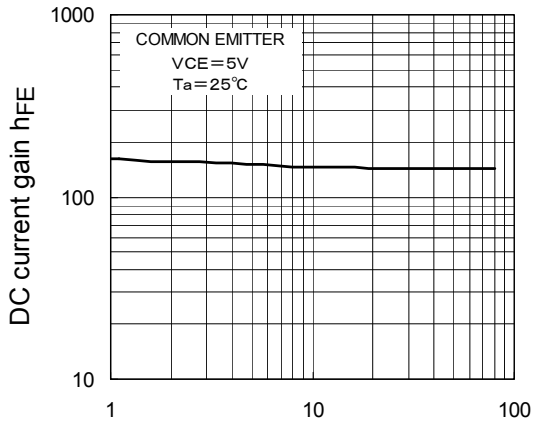
Note 3: C_{re} is measured using a 3-terminal method with capacitance bridge

Caution:

This device is sensitive to electrostatic discharge.

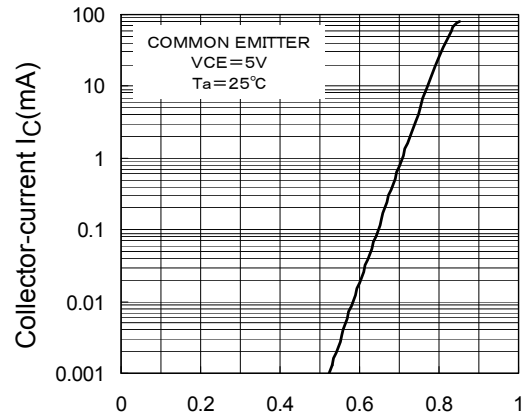
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$h_{FE}-I_C$



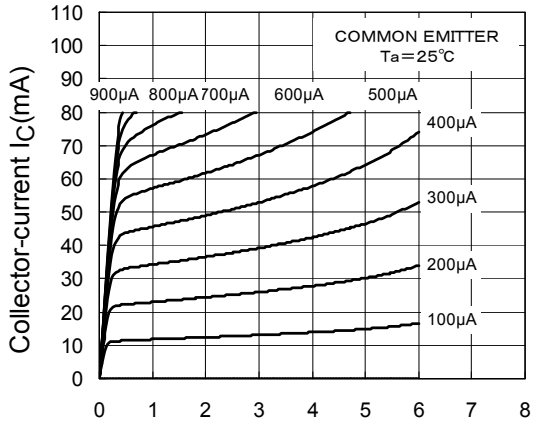
Collector-current I_C (mA)

I_C-V_{BE}



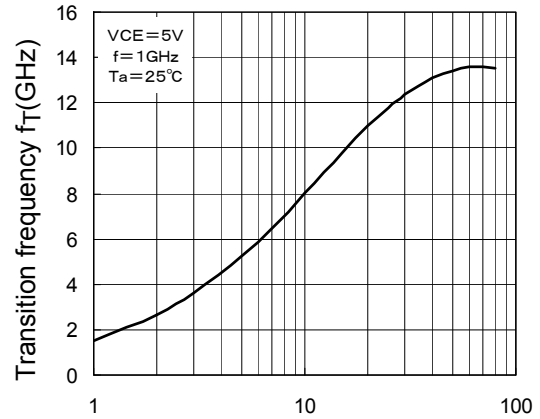
Base-emitter voltage V_{BE} (V)

I_C-V_{CE}



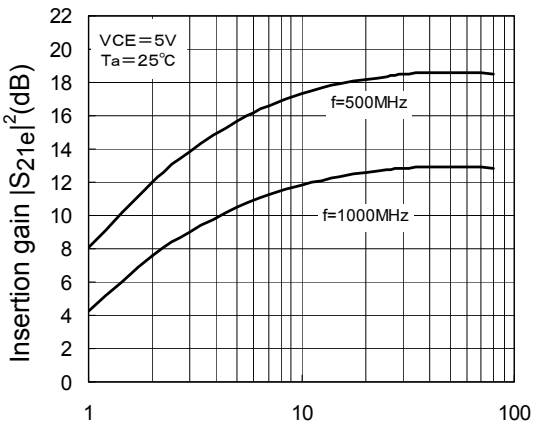
Collector-emitter voltage V_{CE} (V)

f_T-I_C



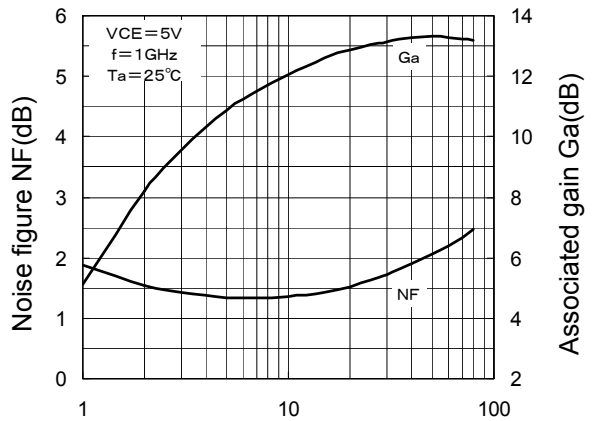
Collector-current I_C (mA)

$|S_{21e}|^2-I_C$



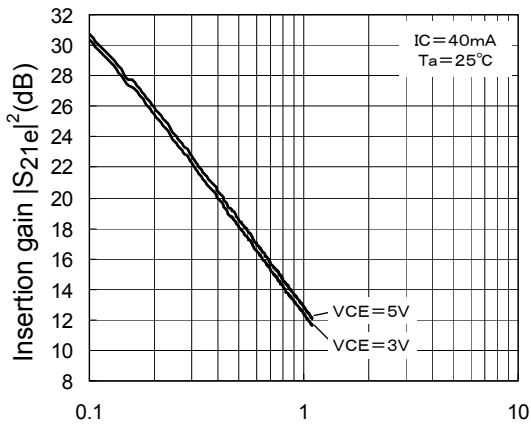
Collector-current I_C (mA)

NF, $G_a - I_C$



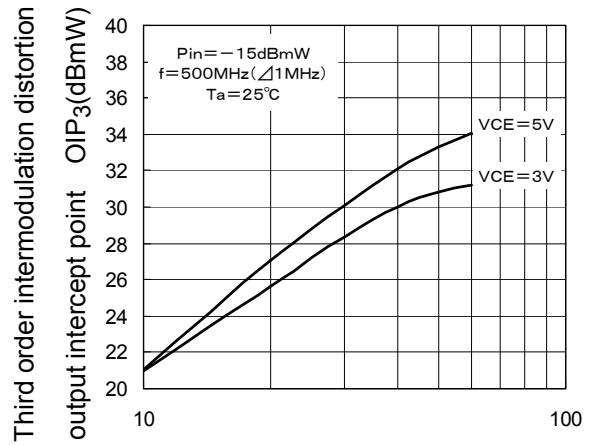
Collector-current I_C (mA)

$|S_{21e}|^2$ -Freq.



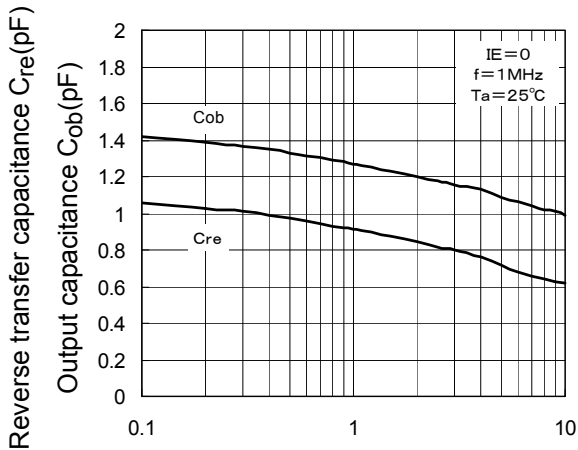
Frequency (GHz)

OIP₃-I_C



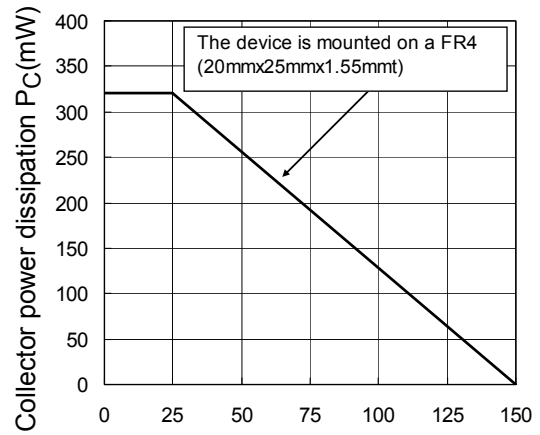
Collector-current I_C (mA)

C_{re}, C_{ob} -V_{CB}



Collector-base voltage V_{CB} (V)

P_C -T_a



Ambient temperature T_a (°C)

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