

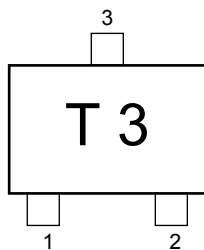
MT3S15TU

VHF-UHF Low-Noise, Low-Distortion Amplifier Application

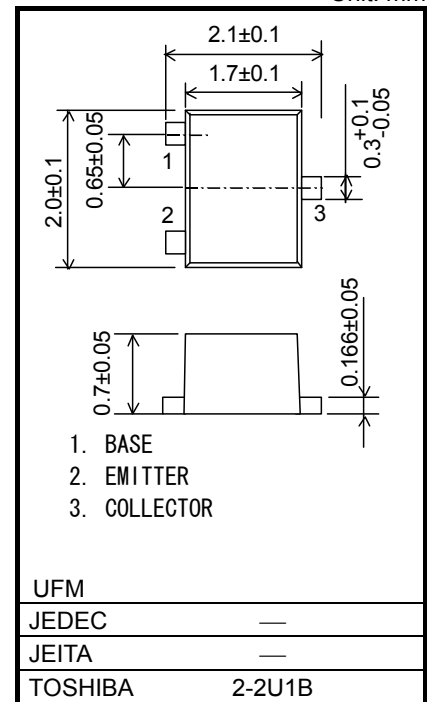
Features

- Low-Noise Figure: $NF=1.6$ dB (typ.) (@ $f=1$ GHz)
- High Gain: $|S_{21e}|^2=13.5$ dB (typ.) (@ $f=1$ GHz)

Marking



Unit: mm



Weight: 6.6 mg (typ.)

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

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	$P_{C(\text{Note 1})}$	900	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$

Note 1: The device is mounted on a ceramic board (25.4 mm x 25.4 mm x 0.8 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).

Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	$V_{CE}=5\text{ V}$, $I_C=50\text{ mA}$	9.5	11.5	—	GHz
Insertion gain	$ S_{21e} ^2(1)$	$V_{CE}=5\text{ V}$, $I_C=50\text{ mA}$, $f=500\text{ MHz}$	—	19.5	—	dB
	$ S_{21e} ^2(2)$	$V_{CE}=5\text{ V}$, $I_C=50\text{ mA}$, $f=1\text{ GHz}$	11.5	13.5	—	
Noise figure	NF	$V_{CE}=5\text{ V}$, $I_C=20\text{ mA}$, $f=1\text{ GHz}$	—	1.6	2	dB
3 rd order intermodulation distortion output intercept point	OIP ₃	$V_{CE}=5\text{ V}$, $I_C=50\text{ mA}$, $f=500\text{ MHz}$, $\Delta f=1\text{ MHz}$	28.5	32.5	—	dBmW

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB}=6\text{ V}$, $I_E=0\text{ A}$	—	—	100	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=1\text{ V}$, $I_C=0\text{ A}$	—	—	100	nA
DC current gain	h_{FE}	$V_{CE}=5\text{ V}$, $I_C=50\text{ mA}$	100	160	250	—
Reverse transfer capacitance	C_{re}	$V_{CB}=5\text{ V}$, $I_E=0\text{ A}$, $f=1\text{ MHz}$ (Note 3)	—	0.6	0.85	pF

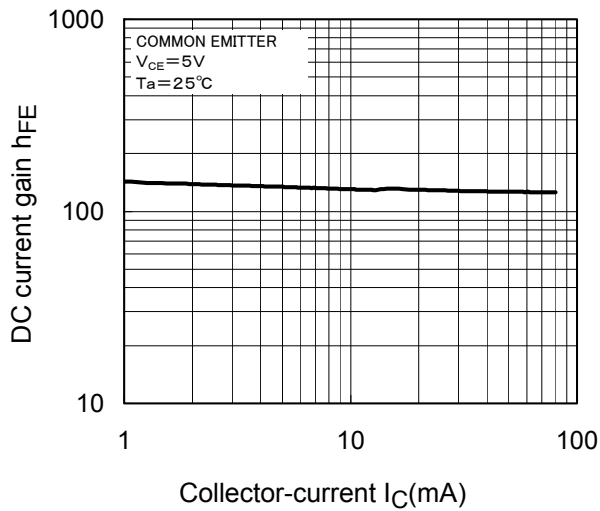
Note 3: C_{re} is measured using a 3-terminal method with capacitance bridge

Caution:

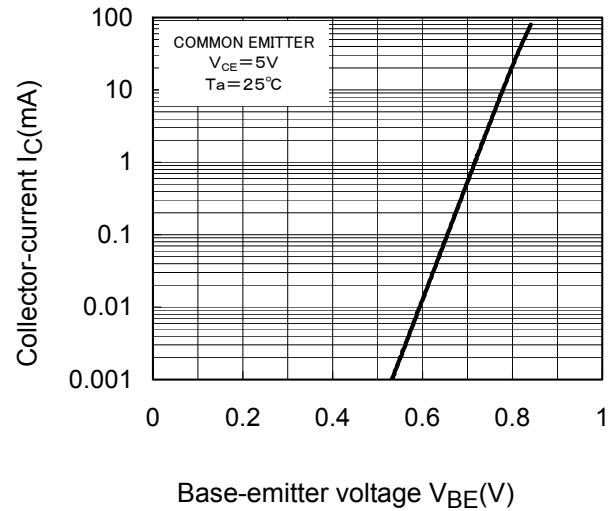
This device is sensitive to electrostatic discharge.

Please make tool and equipment earthed enough when you handle.

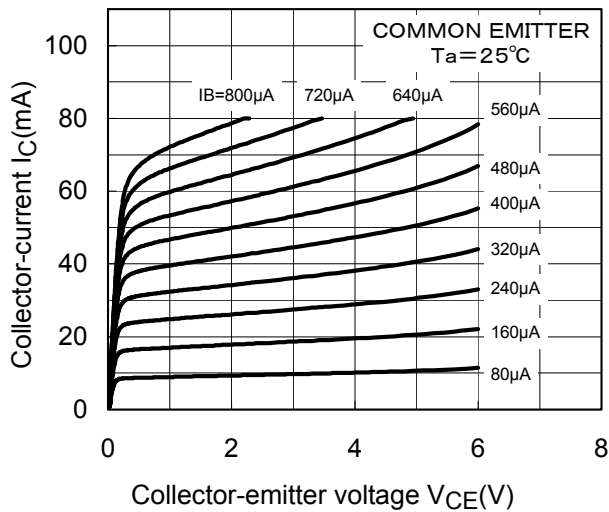
$h_{FE}-I_C$



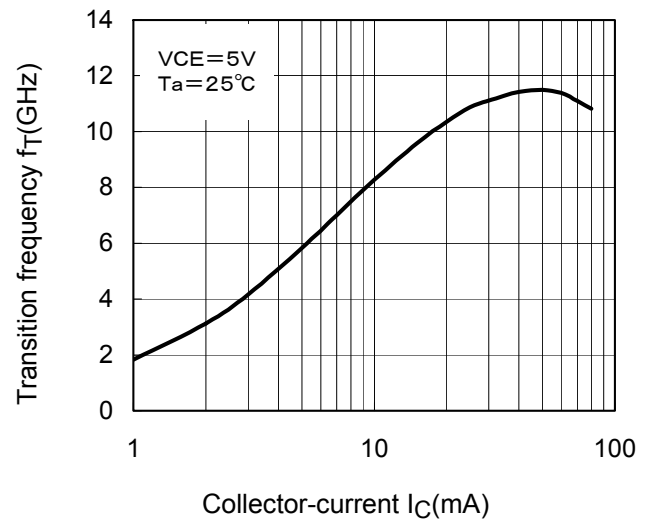
I_C-V_{BE}



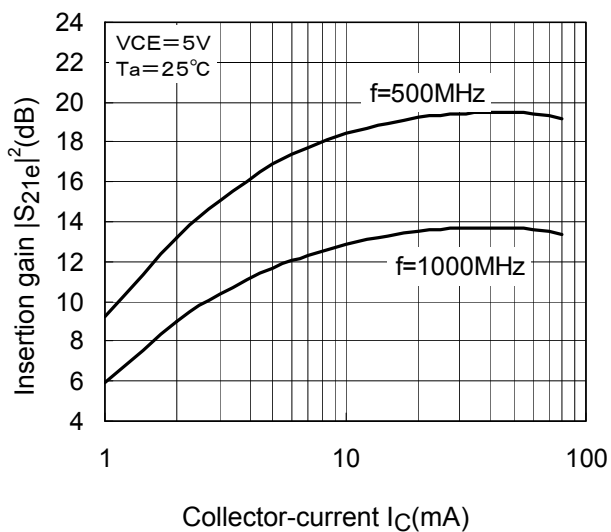
I_C-V_{CE}



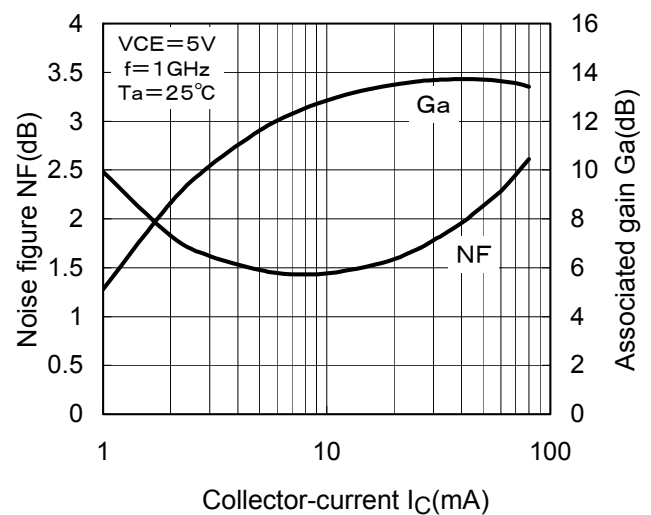
f_T-I_C

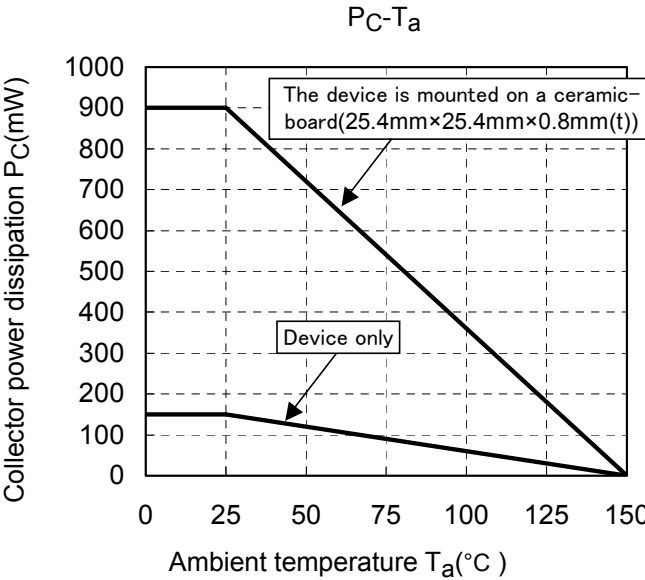
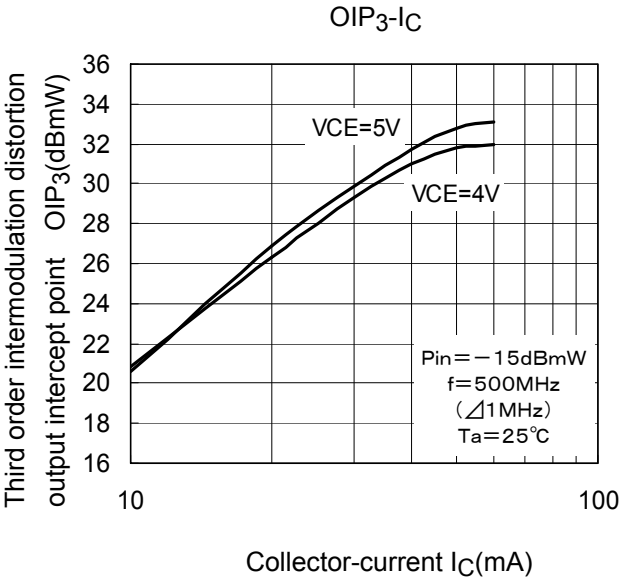
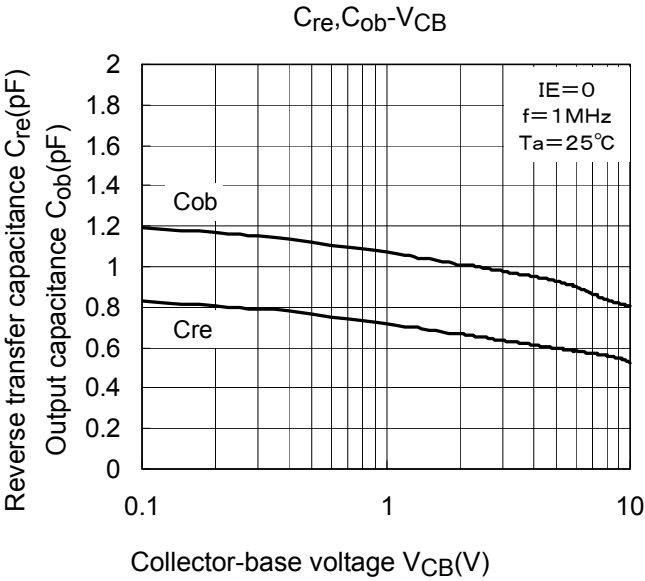


$|S_{21e}|^2-I_C$



NF, Ga - I_C





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