

**MT6L53E**

## VHF-UHF Band Low Noise Amplifier Application

## VHF-UHF Band Oscillator Application

- Tow devices are built in to the super-thin and ultra super mini (6 pin) package: ES6

	Q1: SSM (TESM)	Q2: TESM
Three pin (SSM/TESM) type part No.	MT3S06S (MT3S06T)	MT3S05T

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

Characteristics	Symbol	Q1	Q2	Unit
Collector-base voltage	$V_{CBO}$	10	10	V
Collector-emitter voltage	$V_{CEO}$	5	5	V
Emitter-base voltage	$V_{EBO}$	1.5	2	V
Collector current	$I_C$	15	40	mA
Base current	$I_B$	7	10	mA
Collector power dissipation	$P_C$ (Note 1)	100		mW
Junction temperature	$T_j$	125		°C
Storage temperature range	$T_{stg}$	-55 to 125		°C

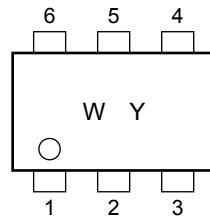
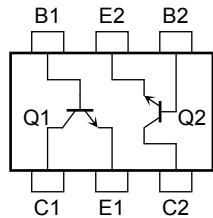
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Note 1: Total power dissipation of Q1 and Q2

## Pin Assignment

## Marking



## Electrical Characteristics Q1-Side (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 5 \text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 1 \text{ V}, I_C = 0$	—	—	1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}$	70	—	140	—
Transition frequency	$f_T$	$V_{CE} = 3 \text{ V}, I_C = 5 \text{ mA}$	7	10	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, f = 2 \text{ GHz}$	—	7.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3 \text{ V}, I_C = 7 \text{ mA}, f = 2 \text{ GHz}$	4.5	8	—	
Noise figure	NF (1)	$V_{CE} = 1 \text{ V}, I_C = 3 \text{ mA}, f = 2 \text{ GHz}$	—	1.7	3	dB
	NF (2)	$V_{CE} = 3 \text{ V}, I_C = 3 \text{ mA}, f = 2 \text{ GHz}$	—	1.6	3	
Reverse transfer capacitance	$C_{re}$	$V_{CB} = 1 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	0.35	0.75	pF

## Electrical Characteristics Q2-Side (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 5 \text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 1 \text{ V}, I_C = 0$	—	—	1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}$	80	—	140	—
Transition frequency	$f_T$	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}$	2	4.5	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, f = 1 \text{ GHz}$	—	7.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3 \text{ V}, I_C = 20 \text{ mA}, f = 1 \text{ GHz}$	7.5	10.5	—	
Noise figure	NF	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, f = 1 \text{ GHz}$	—	1.4	2.2	dB
Reverse transfer capacitance	$C_{re}$	$V_{CB} = 1 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	0.95	1.15	pF

## Caution

This device electrostatic sensitivity. Please handle with caution.

## RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

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