

TOSHIBA TRANSISTOR SILICON, SILICON GERMANIUM NPN EPITAXIAL PLANAR TYPE

MT6L67FS

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Two devices are built in to the fine pitch small mold package (6pins):fs6

- It excels in the buffer and oscillation use.

Mounted Devices

	Q1	Q2
Three-pin fSM mold products are corresponded	MT3S36FS	MT3S106FS

Absolute Maximum Ratings (Ta = 25°C)

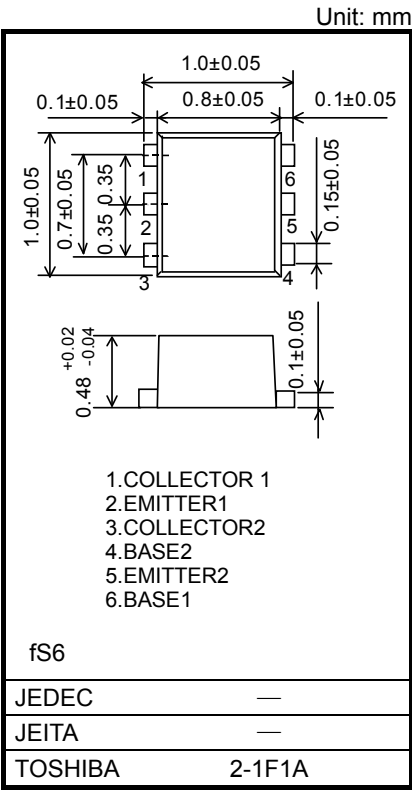
CHARACTERISTICS	SYMBOL	RATING		UNIT
		Q1	Q2	
Collector-Base Voltage	V <sub>CBO</sub>	8	13	V
Collector-Emitter Voltage	V <sub>CEO</sub>	4.5	6	V
Emitter-Base Voltage	V <sub>EBO</sub>	1.5	1	V
Collector Current	I <sub>C</sub>	36	80	mA
Base Current	I <sub>B</sub>	18	20	mA
Collector power dissipation	P <sub>C</sub> (Note 1)	100		mW
		110 (Note 2)		
Junction temperature	T <sub>j</sub>	125		°C
Storage temperature range	T <sub>stg</sub>	−55~125		°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).

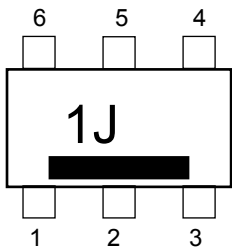
Note 1 : 10 mm<sup>2</sup> × 1.0 mm (t) at the time of glass epoxy printed circuit board mounting.

Note 2 : At the time of two-element operation

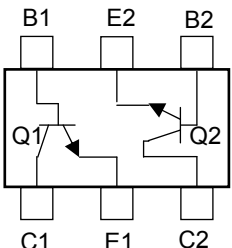


Weight: 0.001g (typ.)

Marking (top view)



Pin Assignment (top view)



## ELECTRICAL CHARACTERISTICS Q1 (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 8\text{ V}, I_E = 0$	—	—	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	$h_{FE}$	$V_{CE} = 3\text{ V}, I_C = 10\text{ mA}$	70	—	140	—
Reverse Transfer Capacitance	$C_{re}$ (Note)	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.21	0.4	pF
Transition Frequency	$f_T$	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}$	16	20	—	GHz
Insertion Gain	$ S_{21e} ^2$ (1)	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}, f = 1\text{ GHz}$	16.5	18.5	—	dB
	$ S_{21e} ^2$ (2)	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}, f = 2\text{ GHz}$	10.5	13	—	
Noise Figure	NF	$V_{CE} = 3\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$	—	1.3	1.8	dB

## ELECTRICAL CHARACTERISTICS Q2 (Ta = 25°C)

CHARACTERISTICS	SYMBOL	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	$I_{EBO}$	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	0.5	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	110	—	160	—
Reverse Transfer Capacitance	$C_{re}$ (Note)	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.5	0.7	pF
Transition Frequency	$f_T$	$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}$	6.5	8.5	—	GHz
Insertion Gain	$ S_{21e} ^2$ (1)	$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}, f = 2\text{ GHz}$	—	8	—	dB
	$ S_{21e} ^2$ (2)	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$	8.5	10	—	
Noise Figure	NF	$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}, f = 2\text{ GHz}$	—	1.2	2	dB

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

## Caution

This device is sensitive to electrostatic discharge due to applied the high frequency transistor process of

$f_T=60\text{GHz}$  class is used for this product.

Please make enough tool and equipment earthed when you handle.

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20070701-EN GENERAL

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