

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6L68FS

VHF~UHF Band Low-Noise Amplifier Applications

Two devices are incorporated in a fine-pitch, small-mold package (6 pins): fS6.

- Superior noise characteristics
- Superior performance in buffer and oscillator applications
- Lead (Pb)-free.

Mounted Devices

	Q1	Q2
Corresponding three-pin products: TESM(fSM) mold products	MT3S06T (MT3S06FS)	MT3S11T (MT3S11FS)

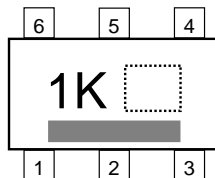
Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating		Unit
		Q1	Q2	
Collector-base voltage	V _{CBO}	10	13	V
Collector-emitter voltage	V _{CEO}	5	6	V
Emitter-base voltage	V _{EBO}	1.5	1	V
Collector current	I _C	15	40	mA
Base current	I _B	7	10	mA
Collector power dissipation	P _C (Note 1)	100		mW
		110 (Note 2)		
Junction temperature	T _j	125		°C
Storage temperature range	T _{stg}	−55~125		°C

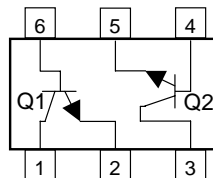
Note 1: $10\text{ mm}^2 \times 1.0\text{ mm}$ (t), mounted on a glass-epoxy printed circuit board.

Note 2: During two-element operation.

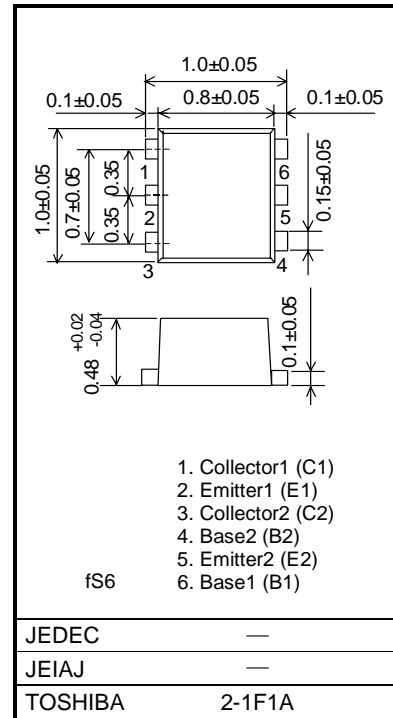
Marking (top view)



Pin Assignment (top view)



Unit: mm



Weight: 0.001 g (typ.)

Electrical Characteristics Q1 (Ta = 25°C)

Characteristic	Symbol	Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	μA
DC current gain	h_{FE}	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	70	—	140	—
Reverse transfer capacitance	$C_{re}(\text{Note})$	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.25	0.5	pF
Transition frequency	f_T	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}$	7	10	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	8.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 7\text{ mA}, f = 2\text{ GHz}$	7	9.5	—	
Noise figure	NF	$V_{CE} = 1\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$	—	1.7	3	dB

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Electrical Characteristics Q2 (Ta = 25°C)

Characteristic	Symbol	Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	μA
DC current gain	h_{FE}	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	100	—	160	—
Reverse transfer capacitance	$C_{re}(\text{Note})$	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.65	0.9	pF
Transition frequency	f_T	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	4	6	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	3.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$	4	6.5	—	
Noise figure	NF	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	2.4	3.2	dB

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

Caution

This device is sensitive to electrostatic discharge. Ensure that tools and equipment are sufficiently grounded before handling. When handling individual devices (which are not yet mounted on a circuit board), ensure that the environment is protected against electrostatic discharge. Operators should wear antistatic clothing, and containers and other objects that come into direct contact with devices should be made of antistatic materials.

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