Preliminary TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6L55E

VHF-UHF Band Low Noise Amplifier Application
VHF-UHF Band Oscillator Application

- Two devices are built into the super-thin and ultra-super-mini (6-pin) ES6 package.

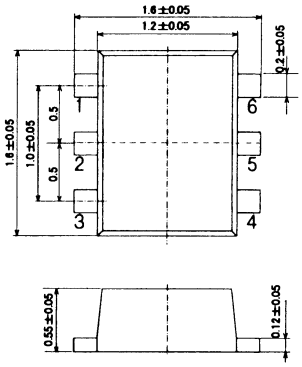
Mounted Devices

	Q1: SSM (TESM)	Q2: TESM
Three-pin (SSM/TESM) product No.	MT3S07S (MT3S07T)	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	25	40	mA
Base current	I_B	10	10	mA
Collector power dissipation	P_C (Note 1)	150		mW
Junction temperature	T_j	125		°C
Storage temperature range	T_{stg}	−55~125		°C

Unit: mm



1.COLLECTOR1 4.BASE2
2.EMITTER1 5.EMITTER2
3.COLLECTOR2 6.BASE1

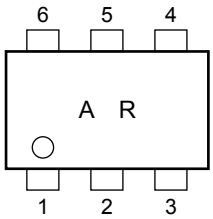
JEDEC	—
JEITA	—
TOSHIBA	2-2N1C

Weight: 3 mg (typ.)

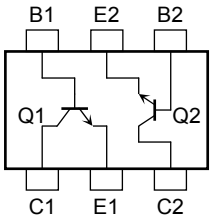
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Marking



Pin Connections



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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 5 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1	μA
DC current gain	h_{FE}	V_{CE} = 1 V, I_C = 5 mA	70	—	140	—
Transition frequency	f_T	V_{CE} = 3 V, I_C = 10 mA	10	12	—	GHz
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	—	6.5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 3 V, I_C = 15 mA, f = 2 GHz	4	7	—	
Noise figure	NF (1)	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	—	1.6	3	dB
	NF (2)	V_{CE} = 3 V, I_C = 5 mA, f = 2 GHz	—	1.5	3	
Reverse transfer capacitance	C_{re}	V_{CB} = 1 V, I_E = 0, f = 1 MHz (Note 2)	—	0.45	0.85	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 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1	μA
DC current gain	h_{FE}	V_{CE} = 1 V, I_C = 5 mA	80	—	140	—
Transition frequency	f_T	V_{CE} = 1 V, I_C = 5 mA	2	4.5	—	GHz
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz	—	7.5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 3 V, I_C = 20 mA, f = 1 GHz	7.5	10.5	—	
Noise figure	NF	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz	—	1.4	2.2	dB
Reverse transfer capacitance	C_{re}	V_{CB} = 1 V, I_E = 0, f = 1 MHz (Note 2)	—	0.95	1.15	pF

Note 2: C_{re} is measured by 3 terminal method with capacitance bridge.

Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

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20070701-EN GENERAL

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