

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

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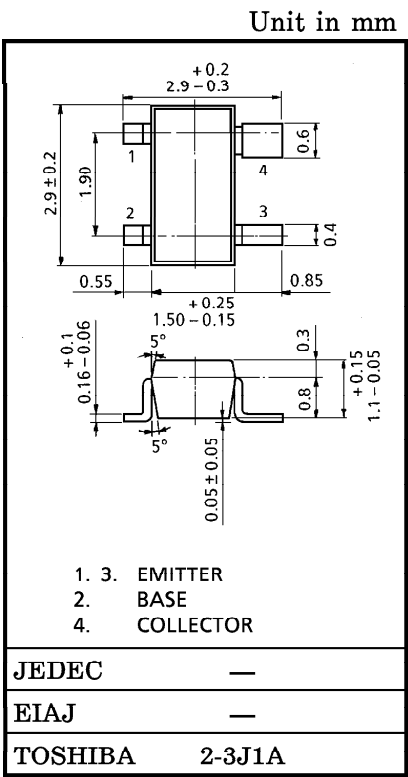
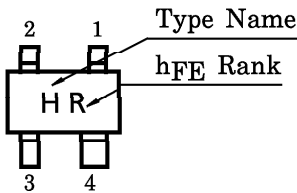
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

- Low Noise Figure : NF=1.5dB (f=2GHz)
- High Gain : Gain=10dB (f=2GHz)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	15	V
Collector-Emitter Voltage	V <sub>CEO</sub>	7	V
Emitter-Base Voltage	V <sub>EBO</sub>	1.5	V
Collector Current	I <sub>C</sub>	40	mA
Base Current	I <sub>B</sub>	20	mA
Collector Power Dissipation	P <sub>C</sub>	150	mW
Junction Temperature	T <sub>j</sub>	128	°C
Storage Temperature Range	T <sub>stg</sub>	−55~125	°C

MARKING



MICROWAVE CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =20mA	9	12	—	GHz
Insertion Gain	S <sub>21e</sub>   <sup>2</sup> (1)	V <sub>CE</sub> =5V, I <sub>C</sub> =20mA, f=1GHz	13	16	—	dB
	S <sub>21e</sub>   <sup>2</sup> (2)	V <sub>CE</sub> =5V, I <sub>C</sub> =20mA, f=2GHz	7	10	—	
Noise Figure	NF (1)	V <sub>CE</sub> =5V, I <sub>C</sub> =5mA, f=1GHz	—	1.1	—	dB
	NF (2)	V <sub>CE</sub> =5V, I <sub>C</sub> =5mA, f=2GHz	—	1.5	3	

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## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 10V, I_E = 0$	—	—	1	$\mu A$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 1V, I_C = 0$	—	—	1	$\mu A$
DC Current Gain	$h_{FE}$ (Note 1)	$V_{CE} = 5V, I_C = 20mA$	50	—	160	—
Output Capacitance	$C_{ob}$	$V_{CB} = 5V, I_E = 0, f = 1MHz$ (Note 2)	—	0.6	—	pF
Reverse Transfer Capacitance	$C_{re}$		—	0.45	0.85	pF

(Note 1) :  $h_{FE}$  Classification     R : 50~100,   O : 80~160

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