

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

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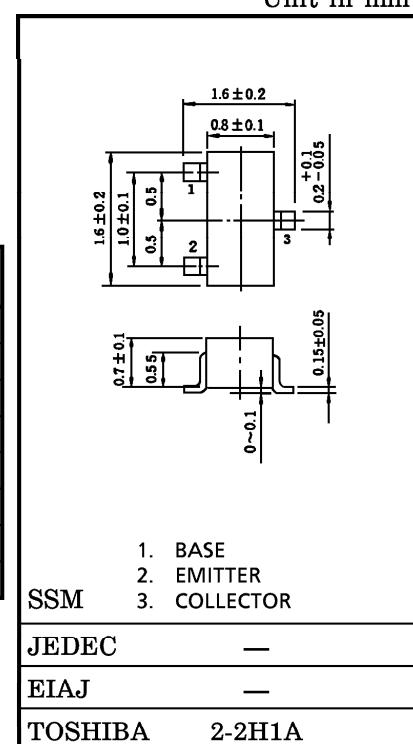
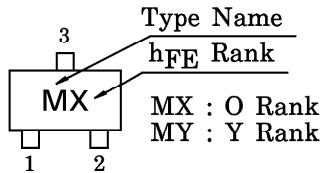
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

- Low Noise Figure, High Gain.
- $NF = 1.1\text{dB}$, $|S_{21e}|^2 = 12\text{dB}$ ($f = 1\text{GHz}$)

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	3	V
Collector Current	I_C	60	mA
Base Current	I_B	30	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55\text{--}125$	$^\circ\text{C}$

MARKING

MICROWAVE CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	$V_{CE} = 8\text{V}$, $I_C = 15\text{mA}$	5	7	—	GHz
Insertion Gain	$ S_{21e} ^2 (1)$	$V_{CE} = 8\text{V}$, $I_C = 15\text{mA}$, $f = 500\text{MHz}$	—	17.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 8\text{V}$, $I_C = 15\text{mA}$, $f = 1\text{GHz}$	8	12	—	
Noise Figure	NF (1)	$V_{CE} = 8\text{V}$, $I_C = 5\text{mA}$, $f = 500\text{MHz}$	—	1	—	dB
	NF (2)	$V_{CE} = 8\text{V}$, $I_C = 5\text{mA}$, $f = 1\text{GHz}$	—	1.1	2	

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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	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} =1V, I _C =0	—	—	1	μA
DC Current Gain	^{h_{FE}} (Note 1)	V _{CE} =8V, I _C =15mA	80	—	240	—
Output Capacitance	C _{ob}	V _{CB} =8V, I _E =0, f=1MHz (Note 2)	—	0.8	—	pF
Reverse Transfer Capacitance	C _{re}		—	0.55	—	pF

(Note 1) : h_{FE} Classification O : 80~160, Y : 160~240(Note 2) : C_{re} is measured by 3 terminal method with capacitance bridge.