

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

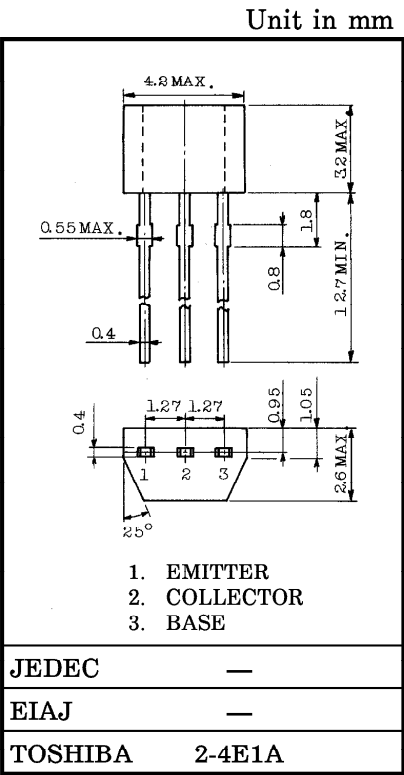
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HIGH FREQUENCY AMPLIFIER APPLICATIONS.
FM, RF, IF AMPLIFIER APLIFIER APPLICATIONS.

- Small Reverse Transfer Capacitance : $C_{re}=0.70\text{pF}$ (Typ.)
- Low Noise Figure : $NF=2.5\text{dB}$ (Typ.)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	4	V
Collector Current	I_C	20	mA
Emitter Current	I_B	4	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature Range	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55\sim 125$	$^\circ\text{C}$



Weight : 0.13g

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

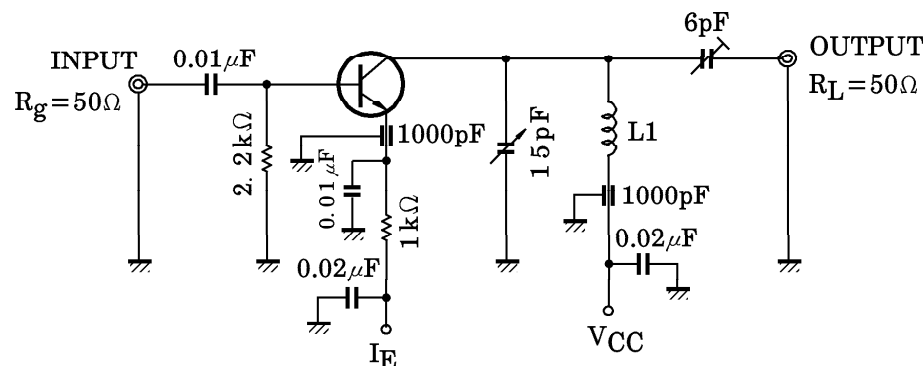
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB}=40\text{V}$, $I_E=0$	—	—	0.5	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB}=4\text{V}$, $I_C=0$	—	—	0.5	μA
DC Current Gain	h_{FE} (Note)	$V_{CE}=6\text{V}$, $I_C=1\text{mA}$	40	—	200	—
Reverse Transfer Capacitance	C_{re}	$V_{CE}=6\text{V}$, $f=1\text{MHz}$	—	0.70	—	pF
Transistion Frequency	f_T	$V_{CE}=6\text{V}$, $I_C=1\text{mA}$	—	550	—	MHz
Collector-Base Time Constant	$C_c \cdot r_{bb'}$	$V_{CE}=6\text{V}$, $I_E = -1\text{mA}$, $f=30\text{MHz}$	—	—	30	ps
Noise Figure	NF	$V_{CC}=6\text{V}$, $I_E = -1\text{mA}$, $f=100\text{MHz}$ (Fig.1)	—	2.5	5.0	dB
Power Gain	G_{pe}		—	18	—	dB

Note : h_{FE} Classification R : 40~80, O : 70~140, Y : 100~200

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Fig.1. NF, G_{pe} TEST CIRCUIT



L1 : 0.8mm ϕ SILVER PLATED COPPER WIRE, 4Turns. 10mm ID, 8mm Lengh.

Y PARAMETER (Typ.)

(1) COMMON EMITTER ($V_{CE} = 6V$, $I_E = -1mA$, $f = 100MHz$)

CHARACTERISTIC	SYMBOL	TYP.	UNIT
Input Conductance	g_{ie}	2.9	ms
Input Capacitance	C_{ie}	10.2	pF
Reverse Transfer Admittance	$ Y_{re} $	0.33	ms
Phase Angle of Reverse Transfer Admittance	θ_{re}	-90	°
Forward transfer Admittance	$ Y_{fe} $	40	ms
Phase Angle of Forward Transfer Admittance	θ_{fe}	-20	°
Output Conductance	g_{oe}	45	μS
Output Capacitance	C_{oe}	1.1	pF

(2) COMMON BASE ($V_{CB} = 6V$, $I_E = -1mA$, $f = 100MHz$)

CHARACTERISTIC	SYMBOL	TYP.	UNIT
Input Conductance	g_{ib}	34	ms
Input Capacitance	C_{ib}	-10	pF
Reverse Transfer Admittance	$ Y_{rb} $	0.27	ms
Phase Angle of Reverse Transfer Admittance	θ_{rb}	-105	°
Forward Transfer Admittance	$ Y_{fb} $	34	ms
Phase Angle of Forward Transfer Admittance	θ_{fb}	165	°
Output Conductance	g_{ob}	45	μS
Output Capacitance	C_{ob}	1.1	pF

