

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

# 2SC1923

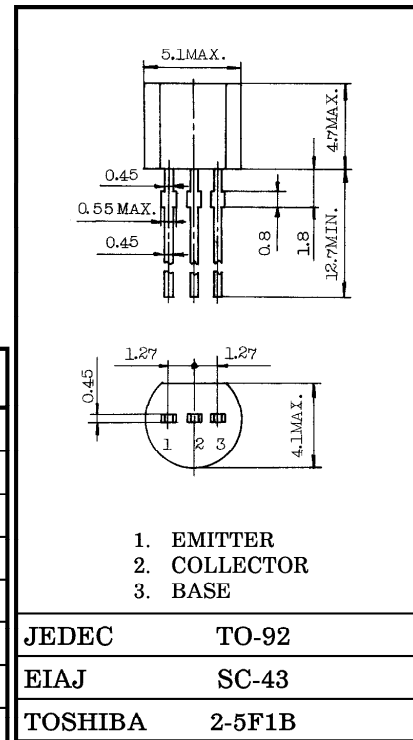
HIGH FREQUENCY AMPLIFIER APPLICATIONS.  
FM, RF, MIX, IF AMPLIFIER APPLICATIONS.

Unit in mm

- Small Reverse Transfer Capacitance  
:  $C_{re} = 0.7\text{pF}$  (Typ.)
- Low Noise Figure  
:  $NF = 2.5\text{dB}$  (Typ.) ( $f = 100\text{MHz}$ )

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
Base Current	$I_B$	4	mA
Collector Power Dissipation	$P_C$	100	mW
Junction Temperature	$T_j$	125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~125	$^\circ\text{C}$



Weight : 0.21g

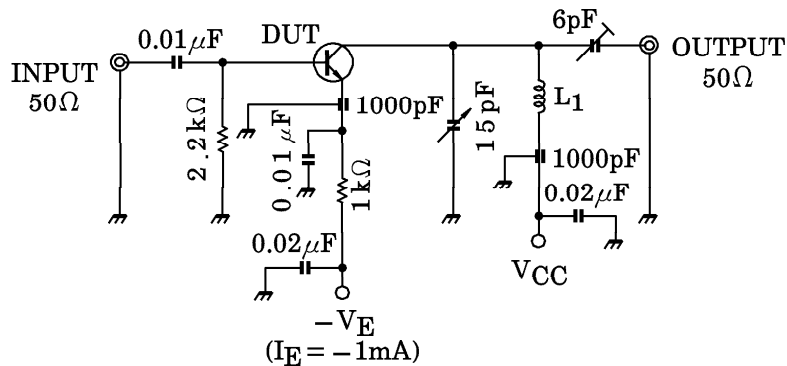
ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 18\text{V}, I_E = 0$	—	—	0.5	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 4\text{V}, I_C = 0$	—	—	0.5	$\mu\text{A}$
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
Transition 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	$V_{CE} = 6\text{V}, I_E = -1\text{mA}, f = 100\text{MHz}, \text{Fig.}$	—	2.5	4.0*	dB
Power Gain	$G_{pe}$		15	18	—	

Note :  $h_{FE}$  Classification R : 40~80, O : 70~140, Y : 100~200 (\*  $NF = 5.0\text{dB Max.}$ )

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L<sub>1</sub> : 0.8mmφ SILVER PLATED COPPER WIRE, 4T, 10ID, 8 LENGTH

Fig.1 NF, G<sub>pe</sub> TEST CIRCUIT

y PARAMETER (Typ.)

(1) COMMON EMITTER (V<sub>CE</sub> = 6V, I<sub>E</sub> = -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	μS
Phase Angle of Reverse Transfer Admittance	$\theta_{re}$	-90	°
Forward Transfer Admittance	$ y_{fe} $	40	mS
Phase Angle of Forward Transfer Admittance	$\theta_{fe}$	-20	°
Output Conductance	$g_{oe}$	45	μS
Output Capacitance	$C_{oe}$	1.1	pF

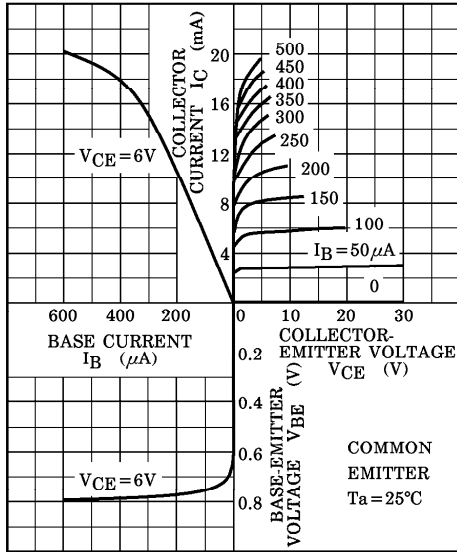
(2) COMMON BASE (V<sub>CE</sub> = 6V, I<sub>E</sub> = -1mA, f = 100MHz)

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

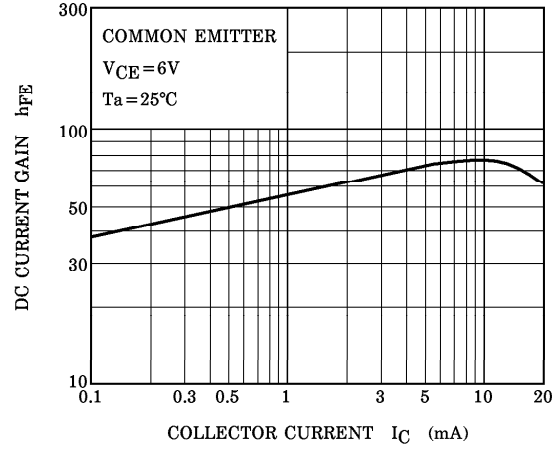
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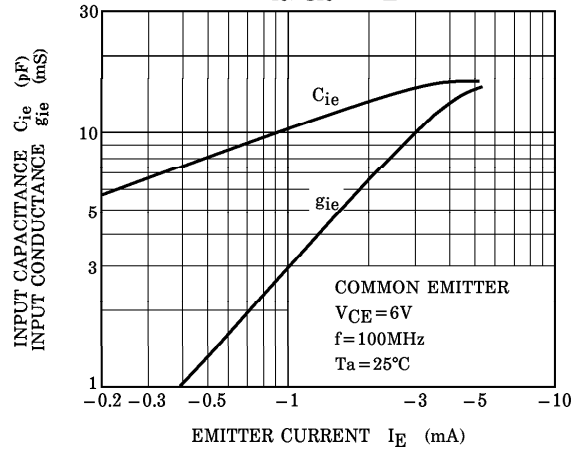
STATIC CHARACTERISTICS



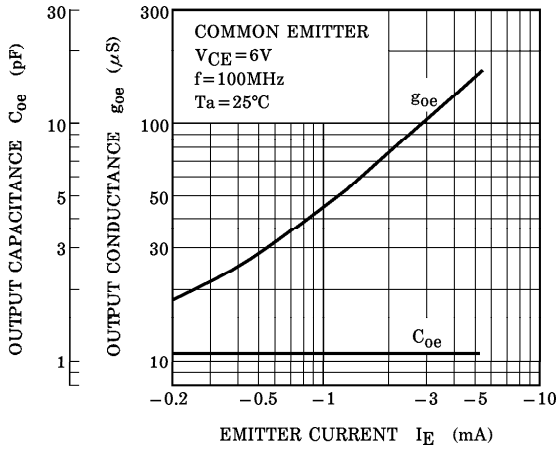
$h_{FE} - I_C$



$C_{ie}, g_{ie} - I_E$



$C_{oe}, g_{oe} - I_E$



$|Y_{re}|, \theta_{re} - I_E$

