

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

2SC1923

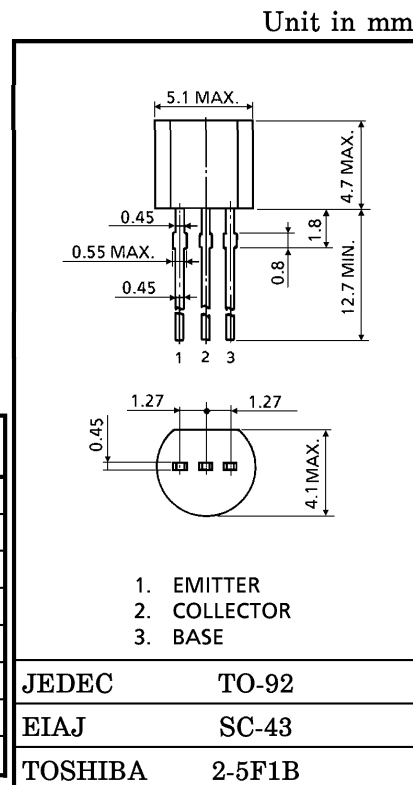
HIGH FREQUENCY AMPLIFIER APPLICATIONS

FM, RF, MIX, IF AMPLIFIER APPLICATIONS

- 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_{CB0}	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 : 0.21 g

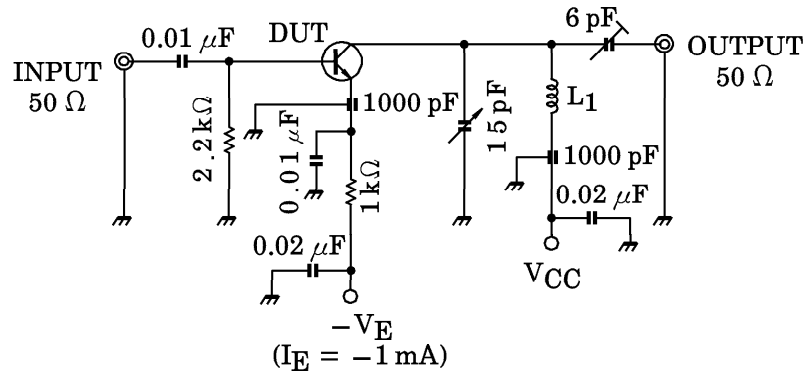
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 18 \text{ V}, I_E = 0$	—	—	0.5	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
Transition Frequency	f_T	$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}$	—	550	—	MHz
Collector-Base Time Constant	$C_{c.rbb'}$	$V_{CE} = 6 \text{ V}, I_E = -1 \text{ mA}, f = 30 \text{ MHz}$	—	—	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 = 5.0dB Max.)

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L₁ : 0.8 mmφ SILVER PLATED COPPER WIRE, 4T, 10ID, 8 LENGTH

Fig.1 NF, G_{pe} TEST CIRCUIT

y PARAMETER (Typ.)

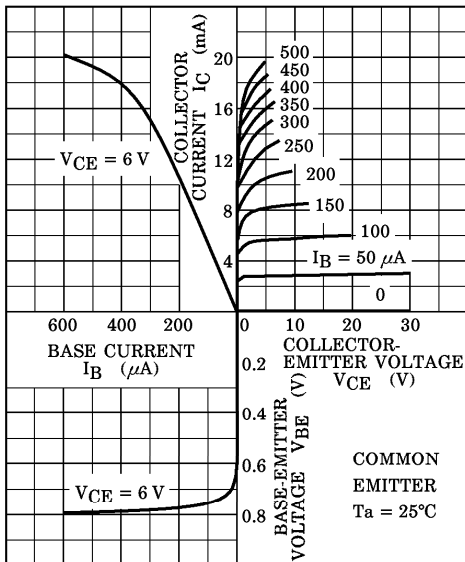
(1) COMMON EMITTER (V_{CE} = 6 V, I_E = -1 mA, f = 100 MHz)

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	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

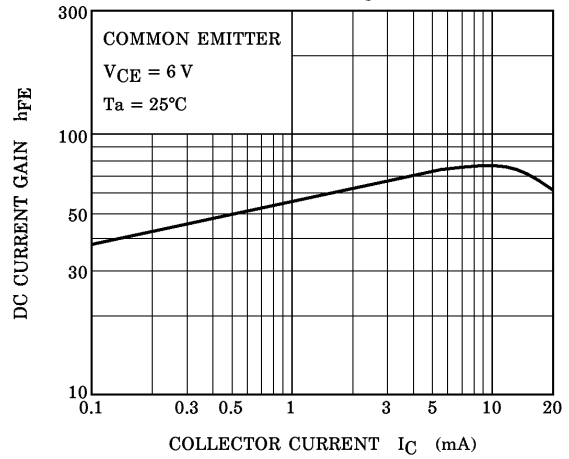
(2) COMMON BASE (V_{CE} = 6 V, I_E = -1 mA, f = 100 MHz)

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	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

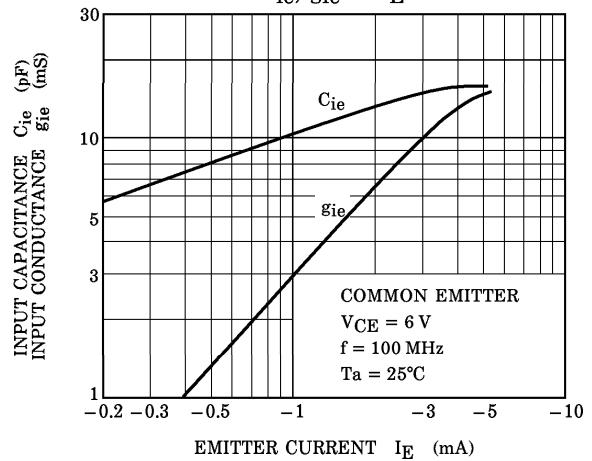
STATIC CHARACTERISTICS



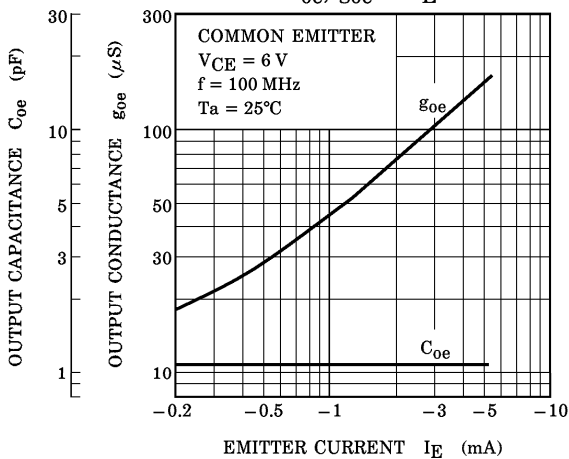
$h_{FE} - I_C$



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



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



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

