

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

2SC2714

HIGH FREQUENCY AMPLIFIER APPLICATIONS

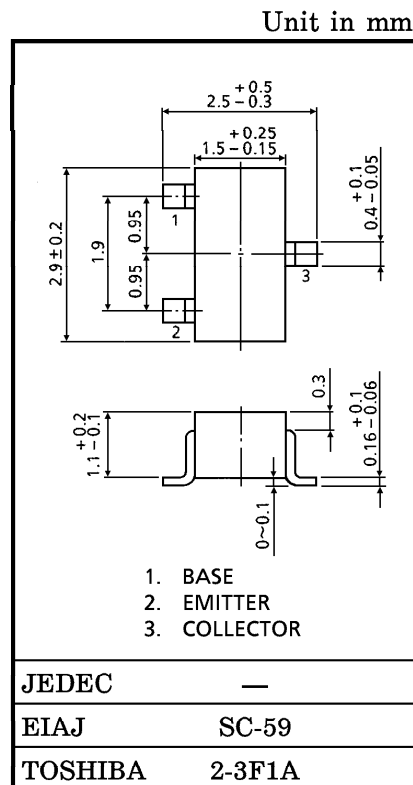
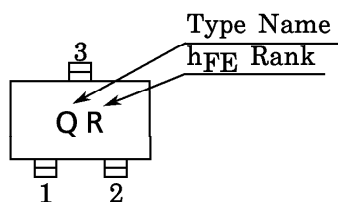
FM, RF, MIX, IF AMPLIFIER APPLICATIONS

- 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_{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}	$-55\sim 125$	$^\circ\text{C}$

Marking

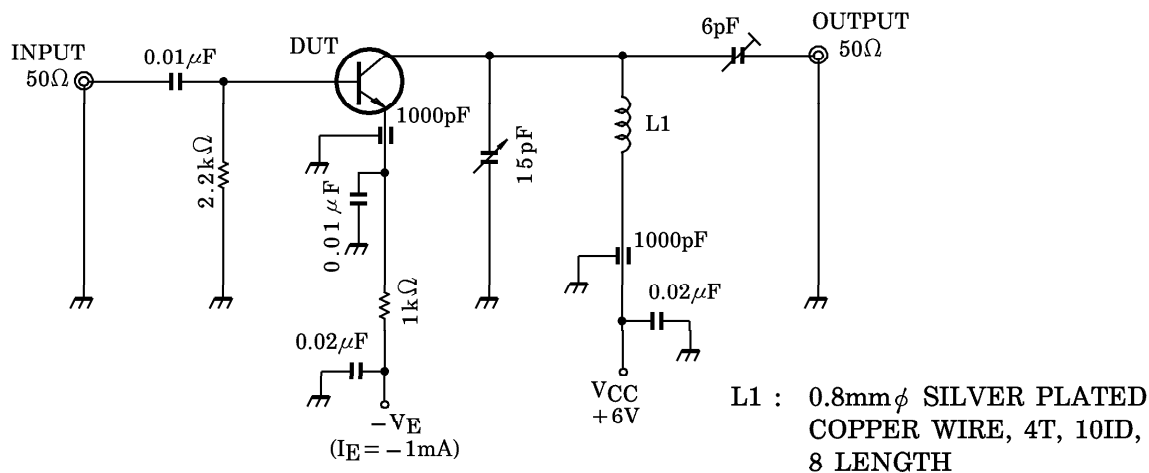


Weight : 0.012g

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}	$V_{CB}=6\text{V}, f=1\text{MHz}$	—	0.7	—	pF
Transition Frequency	f_T	$V_{CE}=6\text{V}, I_C=1\text{mA}$	—	550	—	MHz
Collector-Base Time Constant	$C_c \cdot r_{bb'}$		—	—	30	ps
Noise Figure	NF	$V_{CE}=6\text{V}, I_E=-1\text{mA}$	—	2.5	5.0	dB
Power Gain	G_{pe}	$f=100\text{MHz}, \text{Fig.}$	17	23	—	dB

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

Fig. NF, G_{pe} TEST CIRCUIT

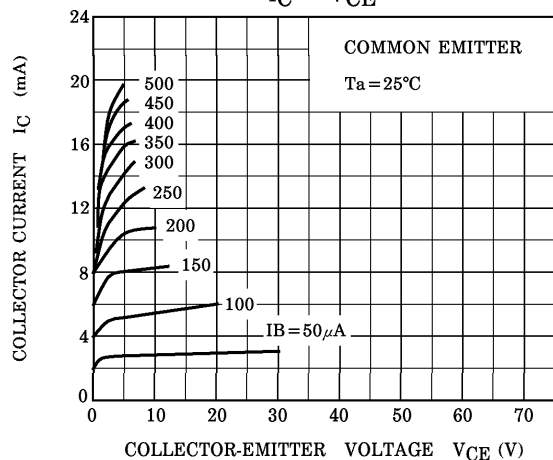
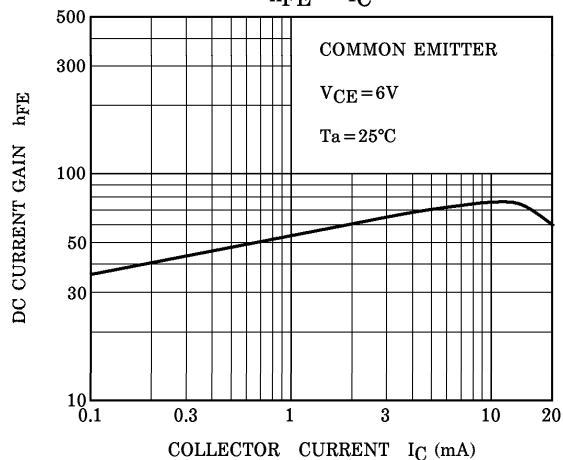
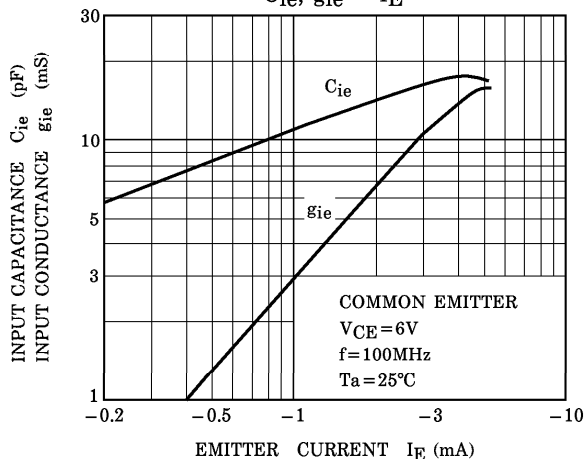
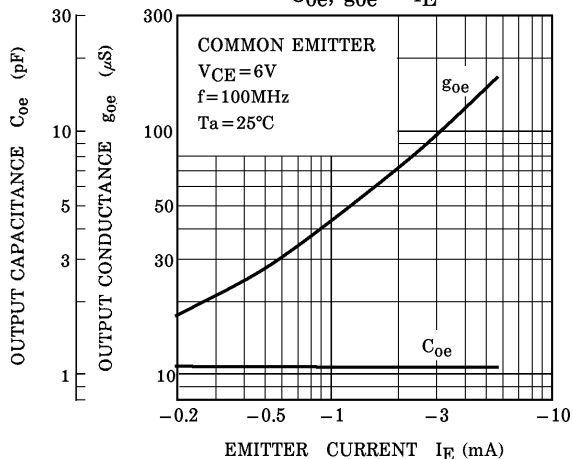
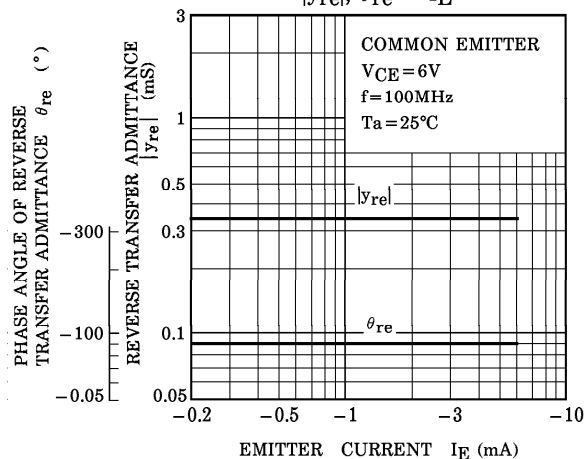
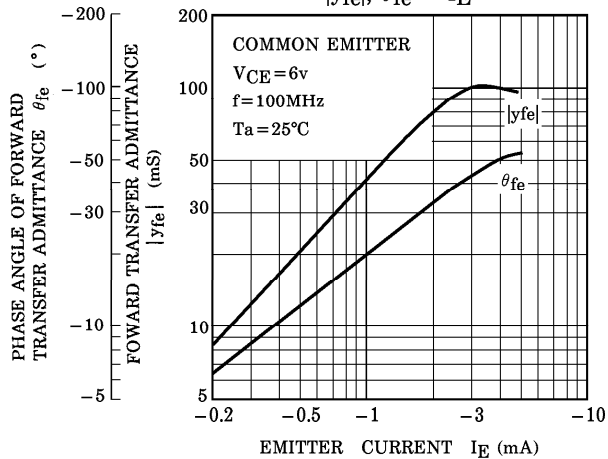
y PARAMETER (Typ.)

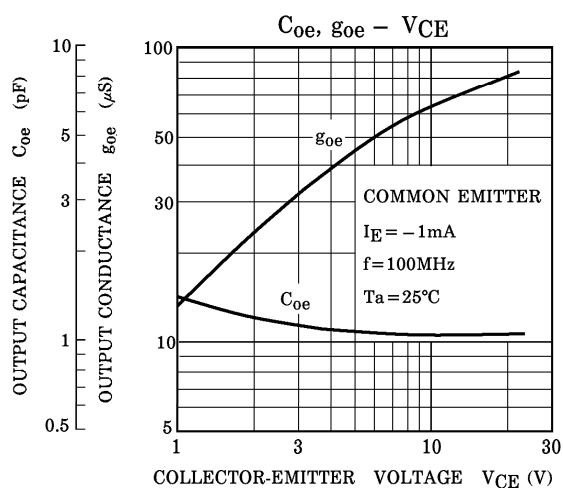
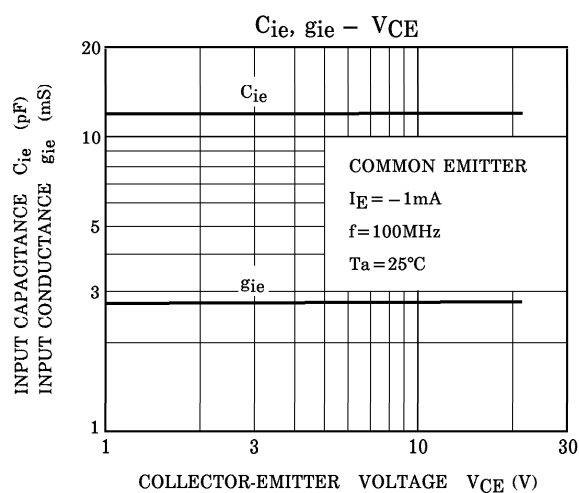
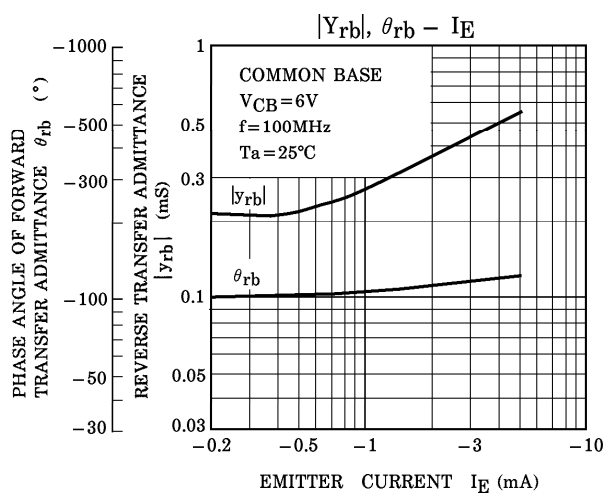
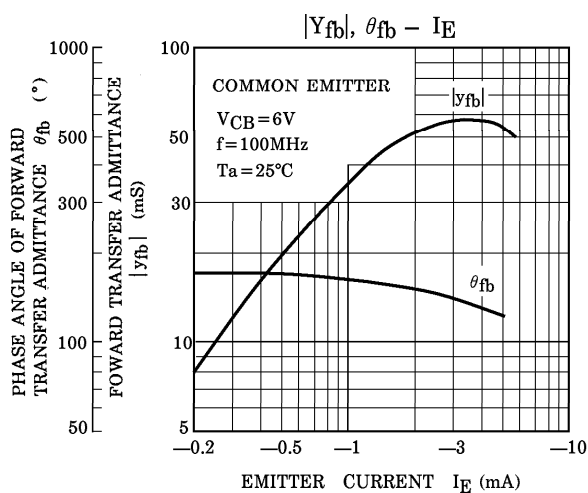
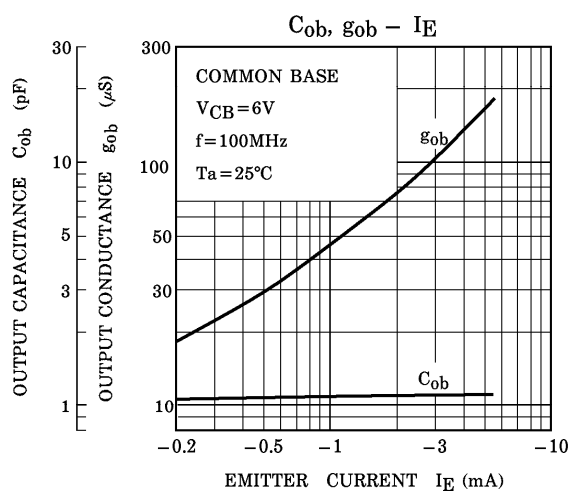
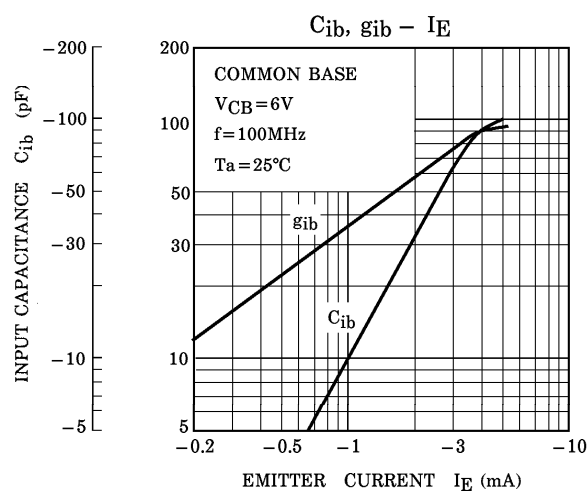
(1) COMMON EMITTER ($V_{CE} = 6V$, $I_E = -1mA$, $f = 100MHz$)

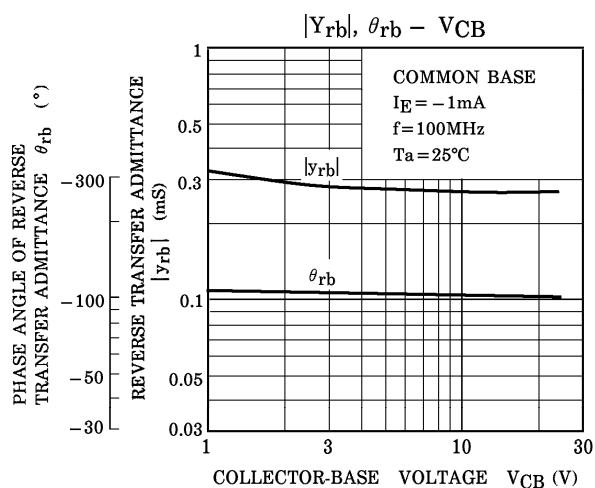
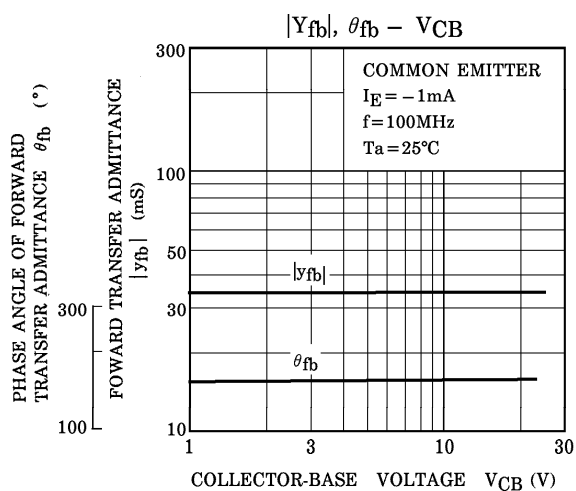
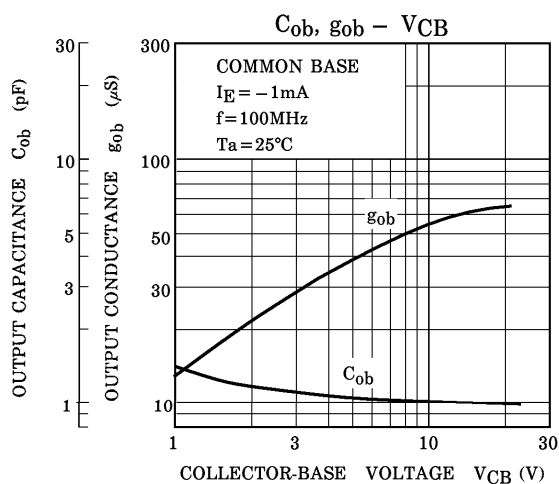
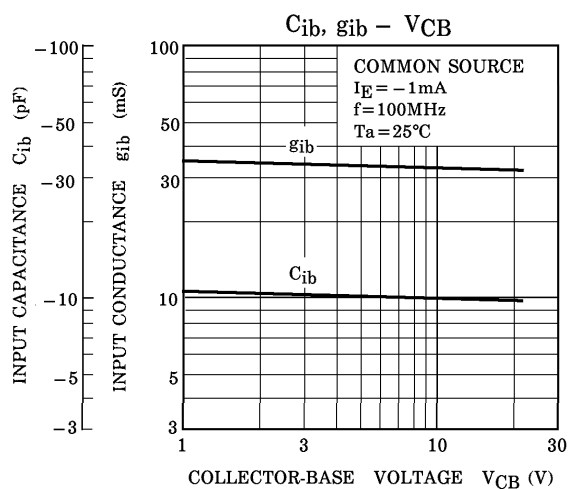
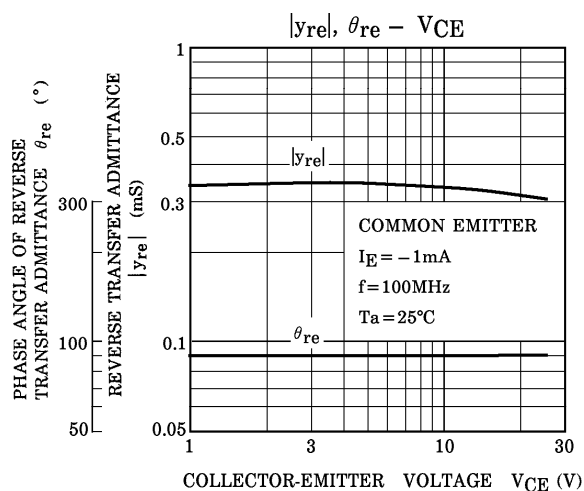
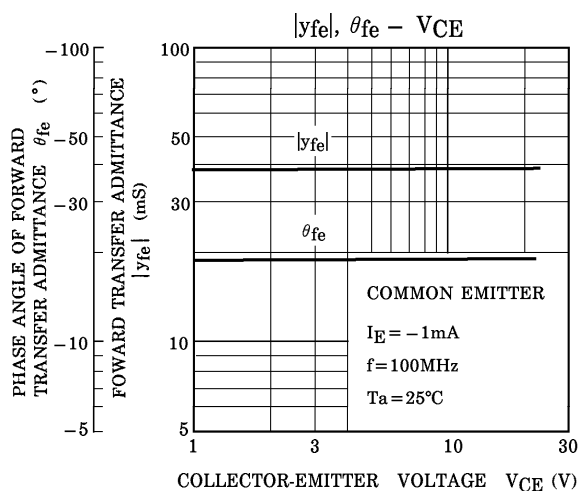
CHARACTERISTIC	SYMBOL	TYP.	UNIT
Input Conductance	g_{ie}	2.9	mS
Input Capacitance	C_{ie}	10.2	pF
Reverse Transfer Admittance	$ y_{re} $	0.33	mS
Phase Angle of Reverse Transfer Admittance	θ_{re}	-90	°
Forward Transfer Admittance	$ y_{fe} $	40	mS
Phase Angle of Forward Transfer Admittance	θ_{fe}	-20	°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

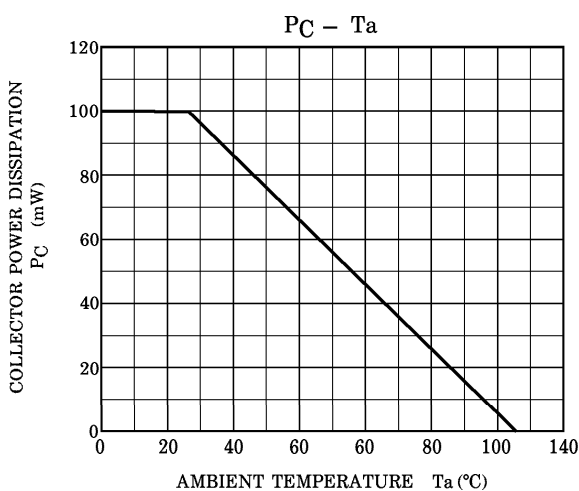
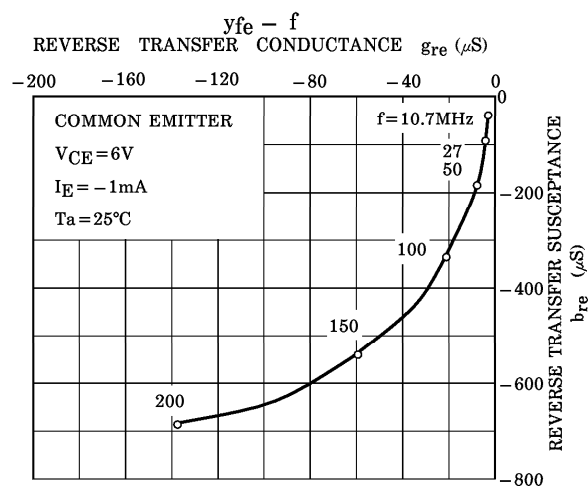
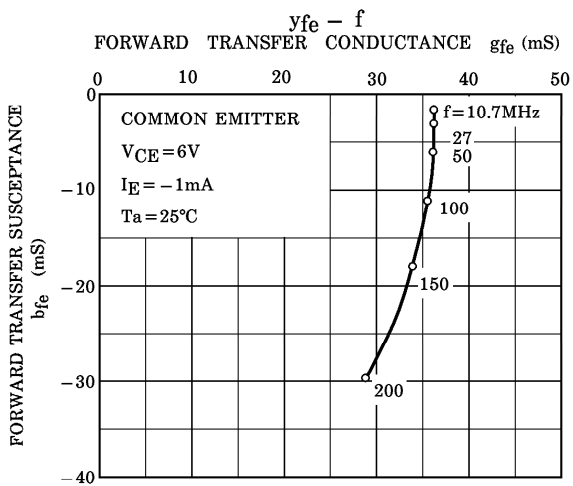
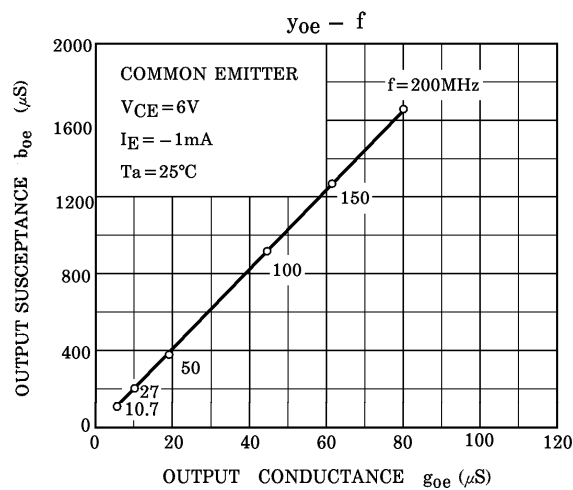
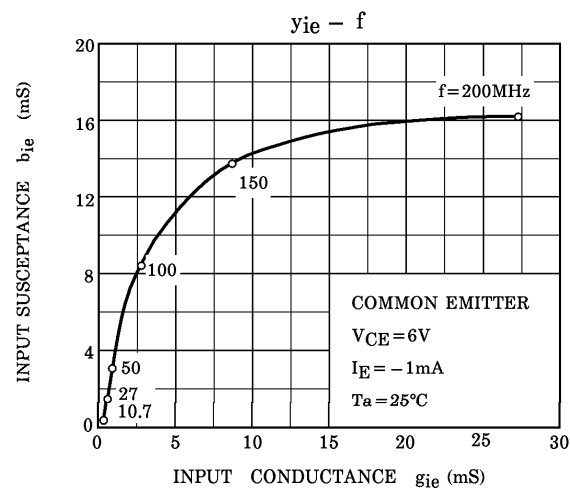
(2) COMMON BASE ($V_{CE} = 6V$, $I_E = -1mA$, $f = 100MHz$)

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

$I_C - V_{CE}$  $h_{FE} - I_C$  $C_{ie}, g_{ie} - I_E$  $C_{oe}, g_{oe} - I_E$  $|y_{re}|, \theta_{re} - I_E$  $|y_{fe}|, \theta_{fe} - I_E$ 







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