

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

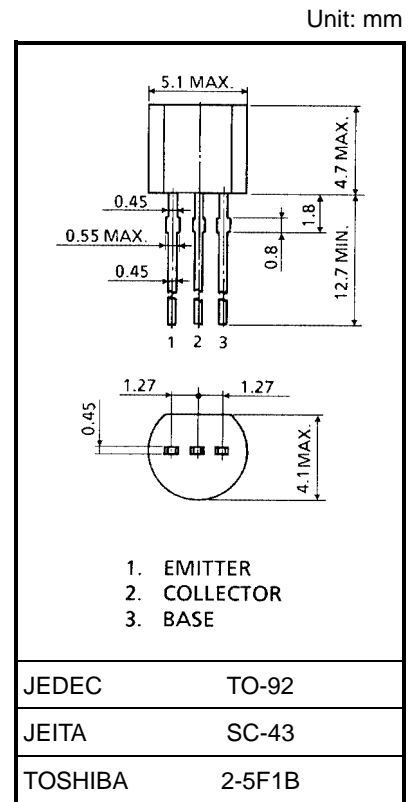
# 2SC941TM

High Frequency Amplifier Applications  
 AM High Frequency Amplifier Applications  
 AM Frequency Converter Applications

- Low noise figure: NF = 3.5dB (max) (f = 1 MHz)

### Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V <sub>CBO</sub>	35	V
Collector-emitter voltage	V <sub>CEO</sub>	30	V
Emitter-base voltage	V <sub>EBO</sub>	4	V
Collector current	I <sub>C</sub>	100	mA
Base current	I <sub>B</sub>	20	mA
Collector power dissipation	P <sub>C</sub>	400	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature range	T <sub>stg</sub>	-55~125	°C



Weight: 0.21 g (typ.)

### Electrical Characteristics (Ta = 25°C)

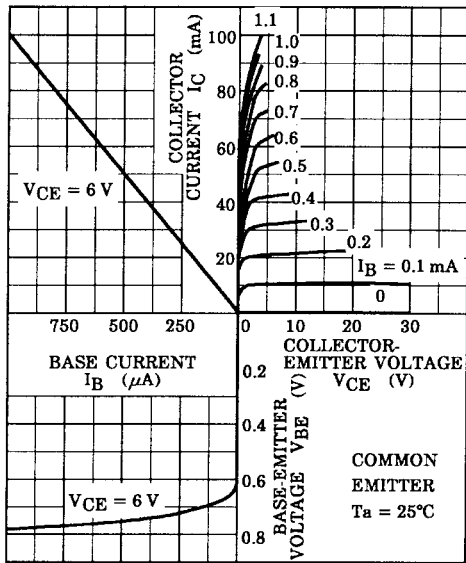
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0	—	—	0.1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 2 V, I <sub>C</sub> = 0	—	—	1.0	μA
DC current gain	h <sub>FE</sub> (Note)	V <sub>CE</sub> = 12 V, I <sub>C</sub> = 2 mA	40	—	240	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 1 mA	—	—	0.4	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 1 mA	—	—	1.0	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 2 mA	80	120	—	MHz
Reverse transfer capacitance	C <sub>re</sub>	V <sub>CE</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz	—	2.2	3.0	pF
Collector-base time constant	C <sub>c-fbb'</sub>	V <sub>CE</sub> = 10 V, I <sub>E</sub> = -1 mA, f = 30 MHz	—	30	50	ps
Noise figure	NF	V <sub>CE</sub> = 10 V, I <sub>E</sub> = -1 mA, f = 1 MHz, R <sub>g</sub> = 50 Ω	—	2.0	3.5	dB

Note: h<sub>FE</sub> classification R: 40~80, O: 70~140, Y: 120~240

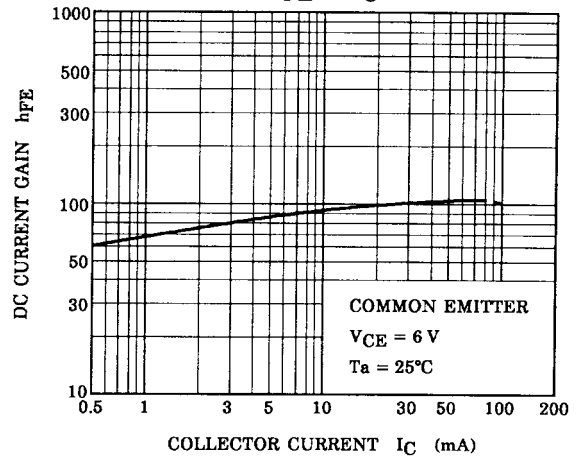
Y Parameters (typ.) (common emitter  $V_{CE} = 6\text{ V}$ ,  $I_E = -1\text{ mA}$ ,  $f = 1\text{ MHz}$ )

Characteristics	Symbol	2SC941-R	2SC941-O	2SC941-Y	Unit
Input conductance	$g_{ie}$	0.5	0.35	0.22	mS
Input capacitance	$C_{ie}$	50	48	46	pF
Output conductance	$g_{oe}$	4	5	6.5	$\mu\text{S}$
Output capacitance	$C_{oe}$	3.7	3.4	3.2	pF
Forward transfer admittance	$ y_{fe} $	36	36	36	mS
Phase angle of forward transfer admittance	$\theta_{fe}$	-1.6	-1.6	-1.6	$^\circ$
Reverse transfer admittance	$ y_{re} $	14	14	14	$\mu\text{S}$
Phase angle of reverse transfer admittance	$\theta_{re}$	-90	-90	-90	$^\circ$

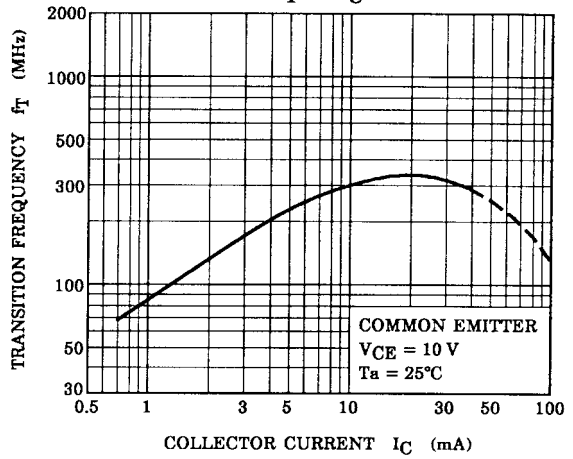
**STATIC CHARACTERISTICS**



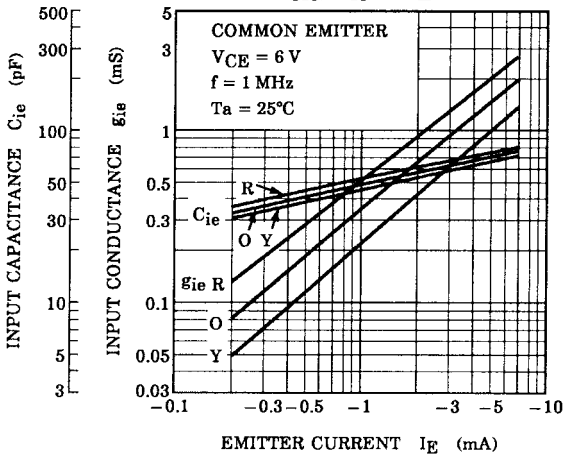
**$h_{FE} - I_C$**



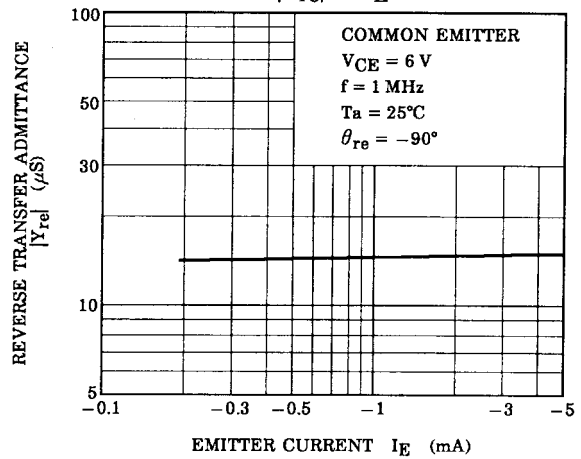
**$f_T - I_C$**

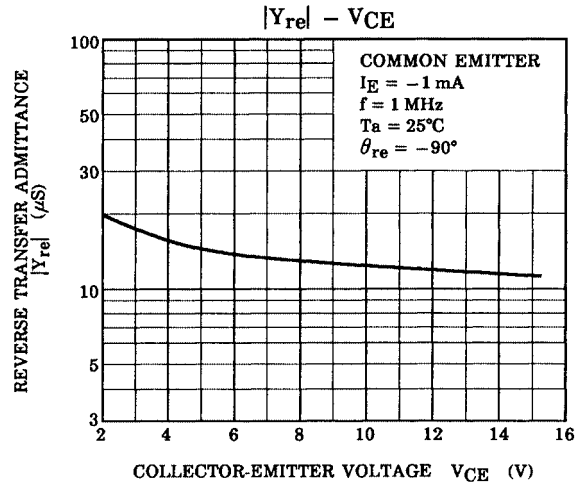
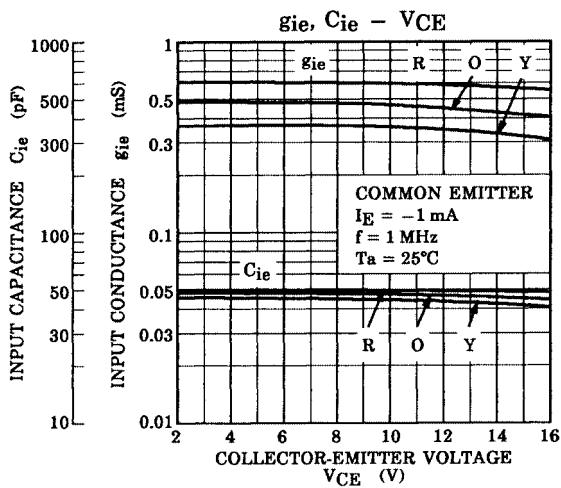
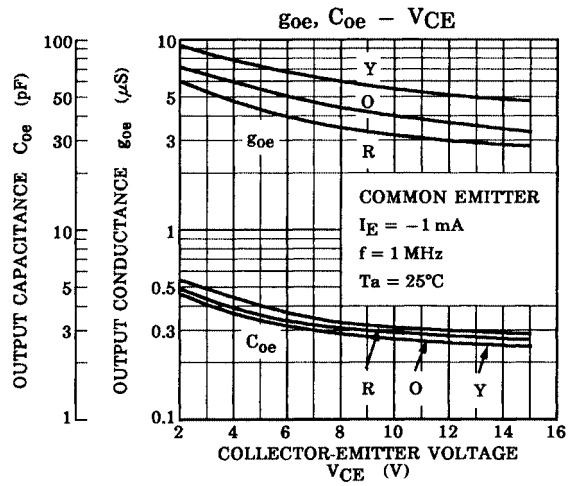
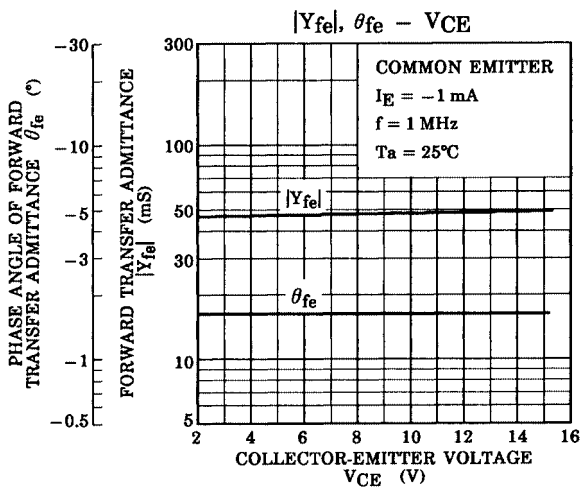
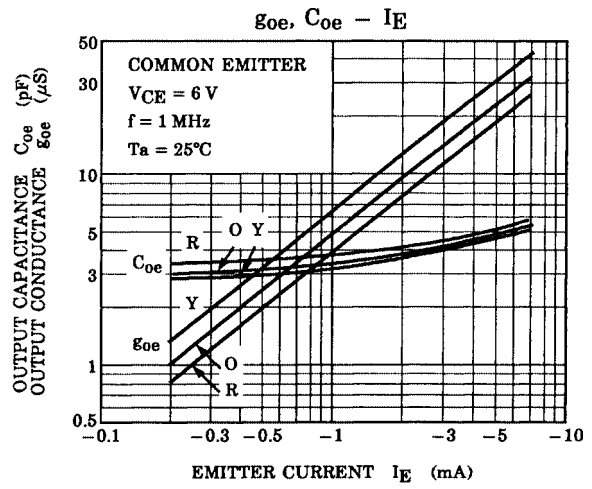
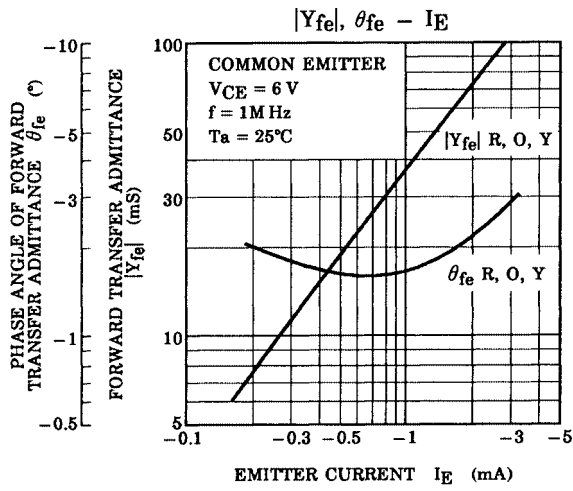


**$g_{ie}, C_{ie} - I_E$**



**$|Y_{re}| - I_E$**





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