

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC941TM

High Frequency Amplifier Applications

AM High Frequency Amplifier Applications

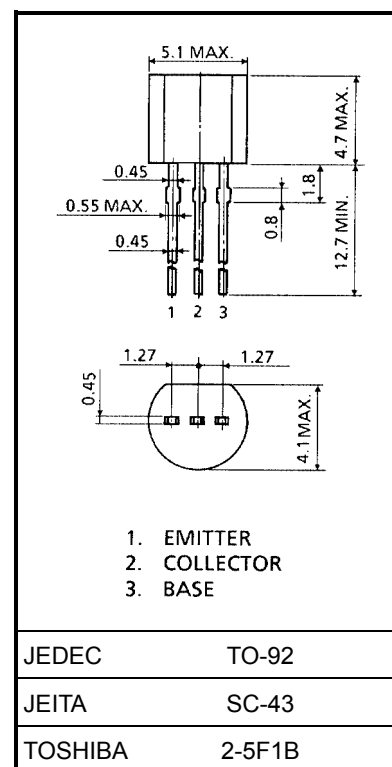
AM Frequency Converter Applications

Unit: mm

- Low noise figure: $NF = 3.5\text{dB (max)}$ ($f = 1\text{ MHz}$)

Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	35	V
Collector-emitter voltage	V_{CEO}	30	V
Emitter-base voltage	V_{EBO}	4	V
Collector current	I_C	100	mA
Base current	I_B	20	mA
Collector power dissipation	P_C	400	mW
Junction temperature	T_j	125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~125	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Weight: 0.21 g (typ.)

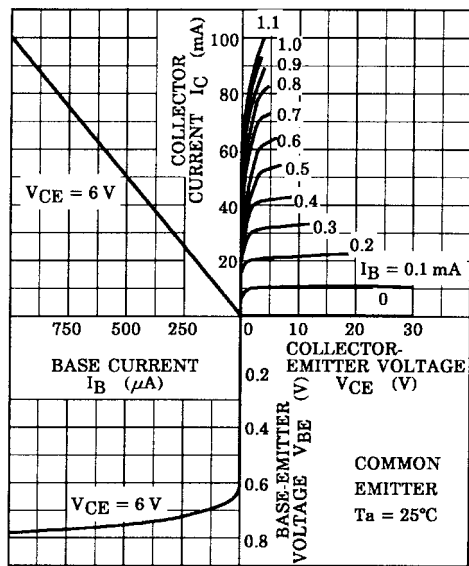
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 20\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 2\text{ V}, I_C = 0$	—	—	1.0	μA
DC current gain	h_{FE} (Note)	$V_{CE} = 12\text{ V}, I_C = 2\text{ mA}$	40	—	240	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\text{ mA}, I_B = 1\text{ mA}$	—	—	0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10\text{ mA}, I_B = 1\text{ mA}$	—	—	1.0	V
Transition frequency	f_T	$V_{CE} = 10\text{ V}, I_C = 2\text{ mA}$	80	120	—	MHz
Reverse transfer capacitance	C_{re}	$V_{CE} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	2.2	3.0	pF
Collector-base time constant	$C_c \cdot f_{bb'}$	$V_{CE} = 10\text{ V}, I_E = -1\text{ mA}, f = 30\text{ MHz}$	—	30	50	ps
Noise figure	NF	$V_{CE} = 10\text{ V}, I_E = -1\text{ mA}, f = 1\text{ MHz}, R_g = 50\ \Omega$	—	2.0	3.5	dB

Note: h_{FE} classification R: 40~80, O: 70~140, Y: 120~240

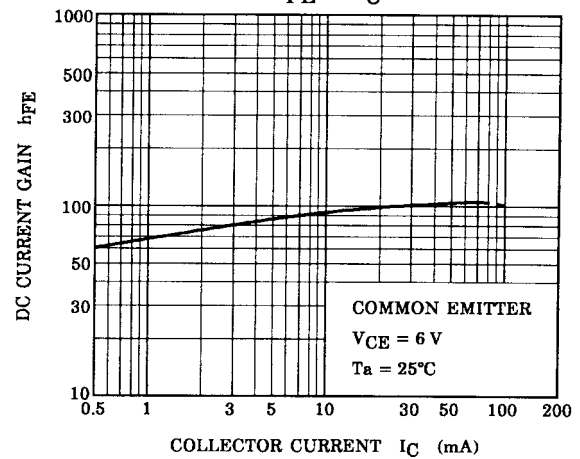
Y Parameters (typ.) (common emitter $V_{CE} = 6\text{ V}$, $I_E = -1\text{ mA}$, $f = 1\text{ MHz}$)

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	μS
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	θ_{fe}	-1.6	-1.6	-1.6	°
Reverse transfer admittance	$ y_{re} $	14	14	14	μS
Phase angle of reverse transfer admittance	θ_{re}	-90	-90	-90	°

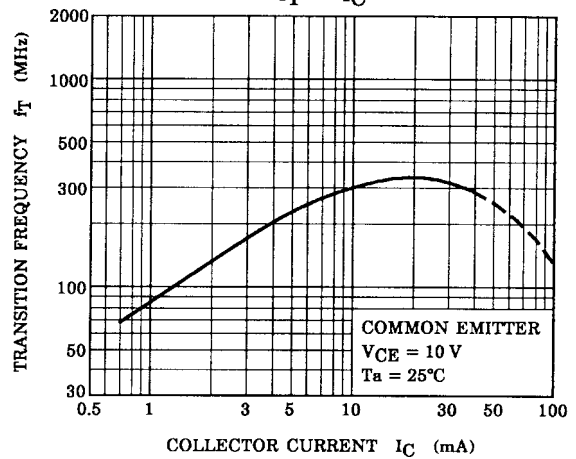
STATIC CHARACTERISTICS



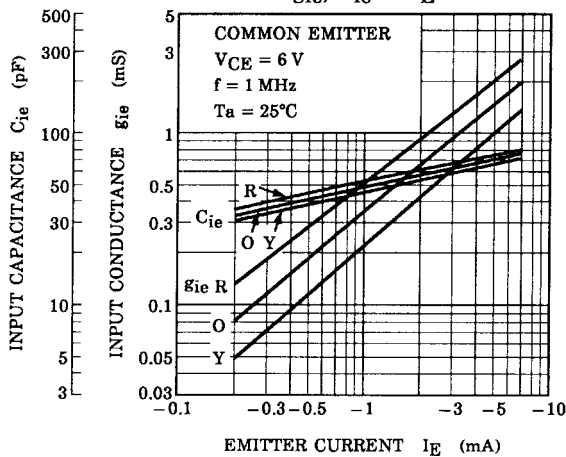
$h_{FE} - I_C$



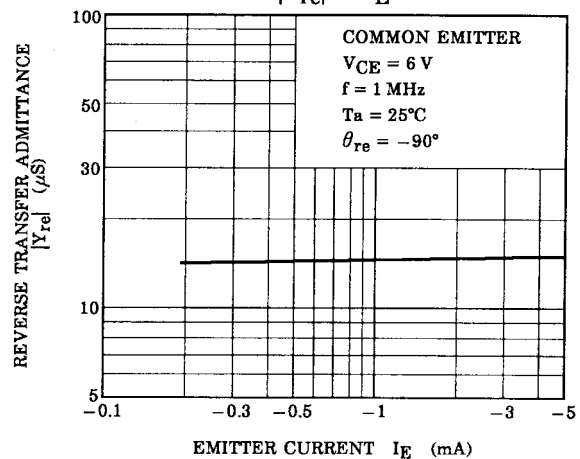
$f_T - I_C$

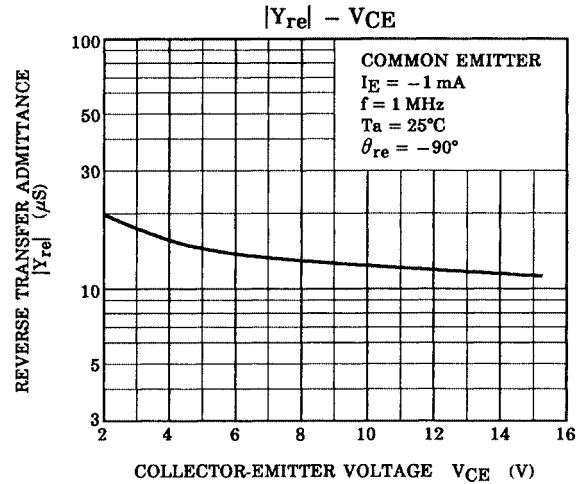
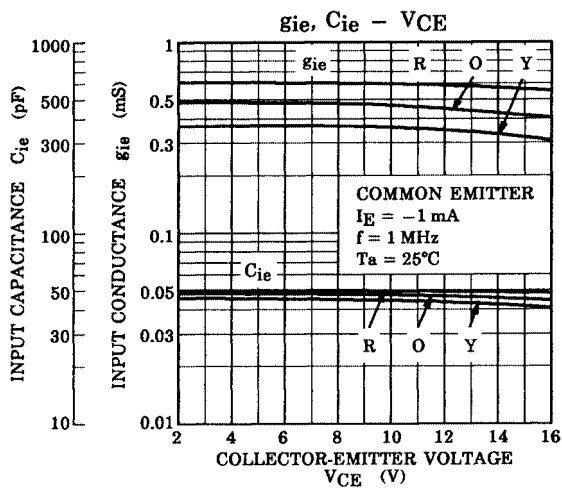
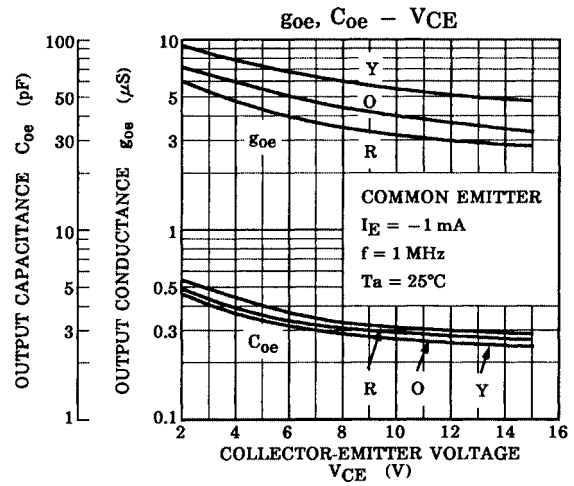
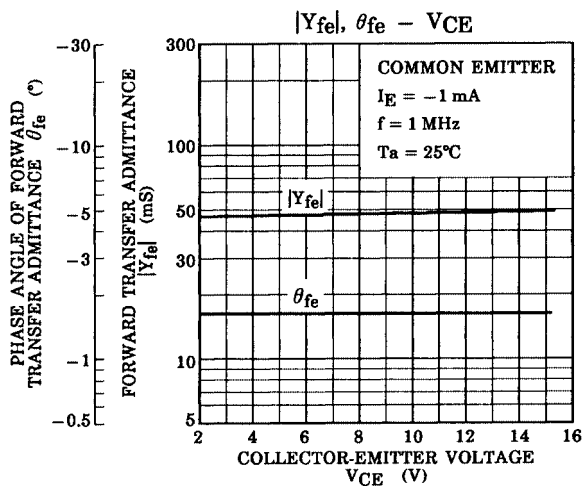
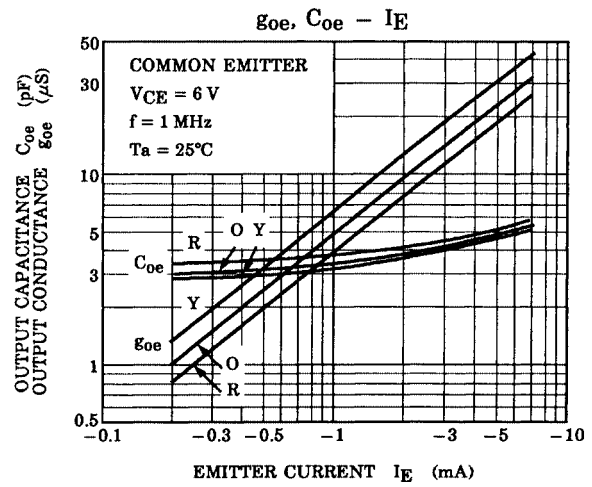
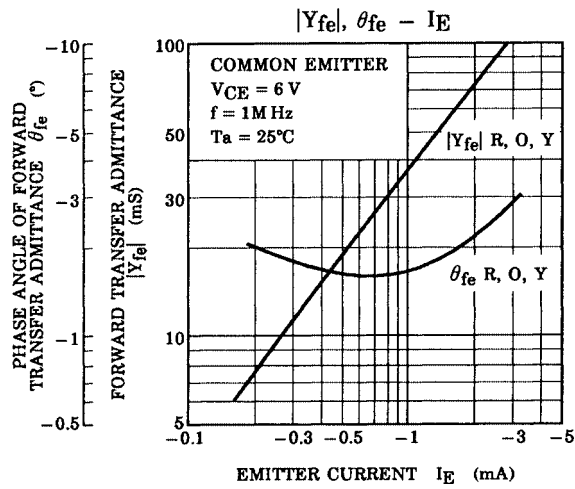


$g_{ie}, C_{ie} - I_E$



$|Y_{re}| - I_E$





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