

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

## 2SC941TM

HIGH FREQUENCY AMPLIFIER APPLICATIONS

AM HIGH FREQUENCY AMPLIFIER APPLICATIONS

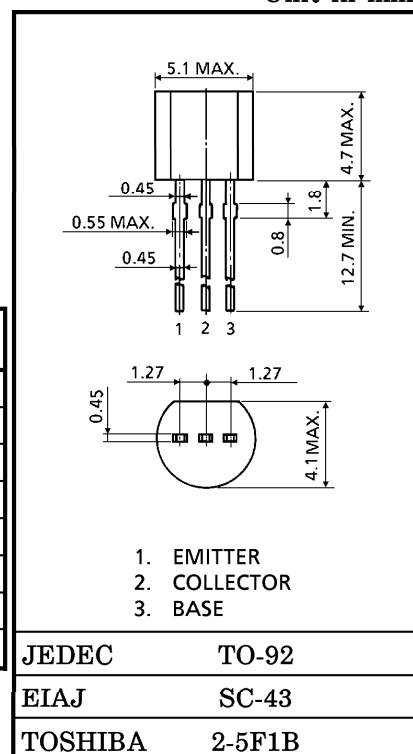
AM FREQUENCY CONVERTER APPLICATIONS

- Low Noise Figure :  $NF = 3.5\text{dB (Max.)}$  ( $f = 1\text{ MHz}$ )

MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CB0}$	35	V
Collector-Emitter Voltage	$V_{CE0}$	30	V
Emitter-Base Voltage	$V_{EB0}$	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	$T_{stg}$	$-55\sim 125$	$^\circ\text{C}$

Unit in mm

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

Weight : 0.21 g

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 20\text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 2\text{ V}, I_C = 0$	—	—	1.0	$\mu\text{A}$
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	$C_{re}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	2.2	3.0	pF
Collector-Base Time Constant	$C_c \cdot r_{bb'}$	$V_{CE} = 10\text{ V}, I_E = -1\text{ mA}, f = 30\text{ MHz}$	—	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

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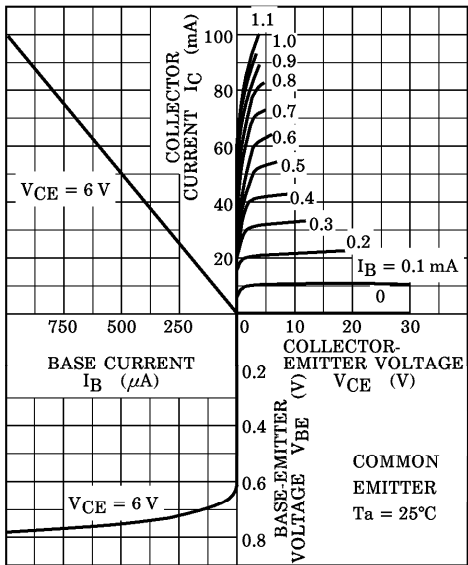
y PARAMETERS (Typ.) (COMMON EMITTER  $V_{CE} = 6\text{ V}$ ,  $I_E = -1\text{ mA}$ ,  $f = 1\text{ MHz}$ )

CHARACTERISTIC	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	°
Reverse Transfer Admittance	$ y_{re} $	14	14	14	$\mu\text{S}$
Phase Angle of Reverse Transfer Admittance	$\theta_{re}$	-90	-90	-90	°

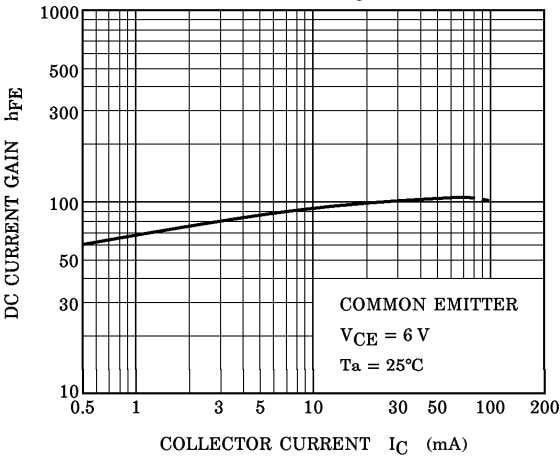
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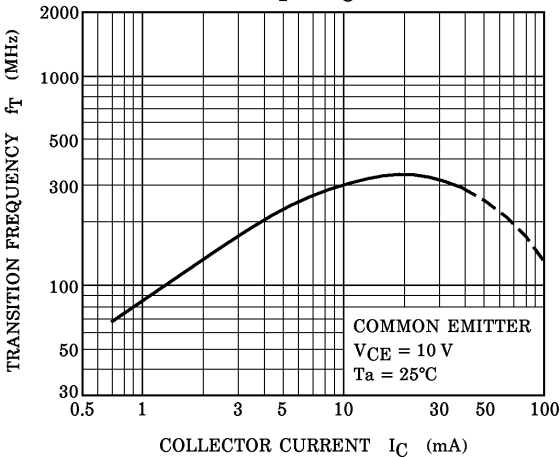
STATIC CHARACTERISTICS



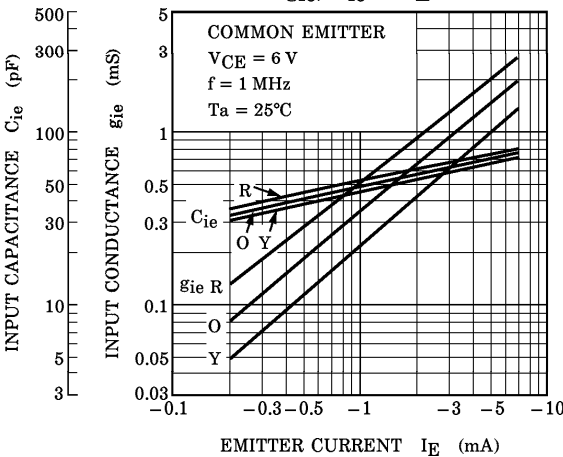
$h_{FE} - I_C$



$f_T - I_C$



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



$|Y_{re}| - I_E$

