

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

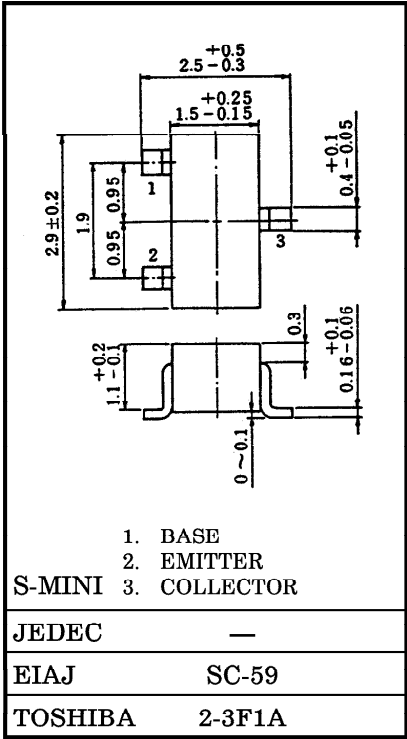
2SC5109

FOR VCO APPLICATION

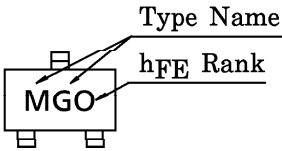
Unit in mm

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V _{CBO}	20	V
Collector-Emitter Voltage	V _{CEO}	10	V
Emitter-Base Voltage	V _{EBO}	3	V
Base Current	I _B	30	mA
Collector Current	I _C	60	mA
Collector Power Dissipation	P _C	150	mW
Junction Temperature	T _j	125	°C
Storage Temperature Range	T _{stg}	-55~125	°C



MARKING



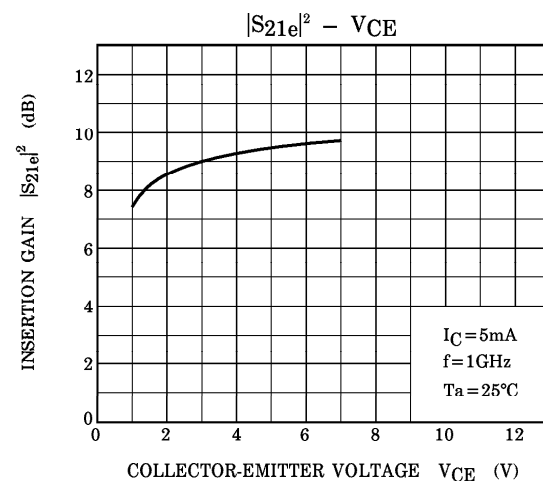
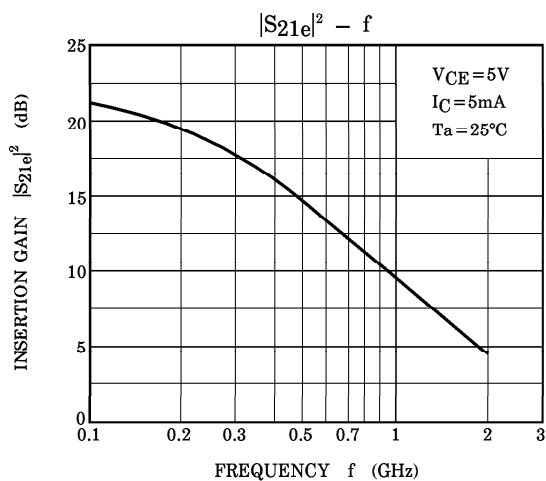
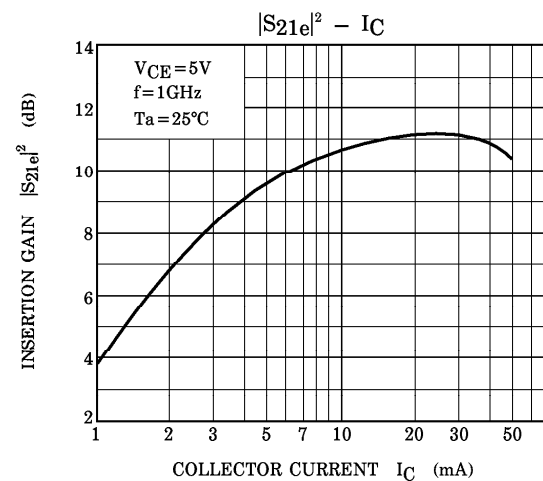
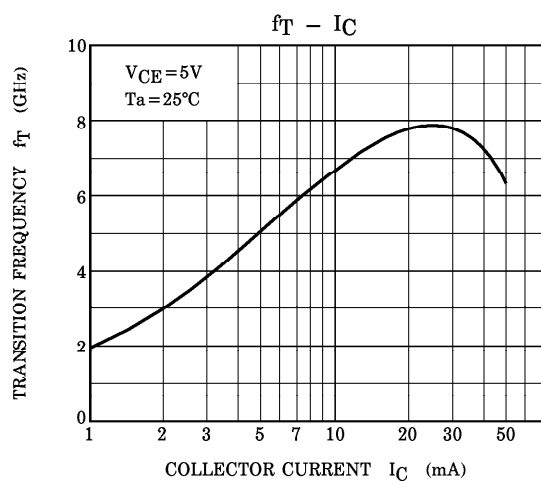
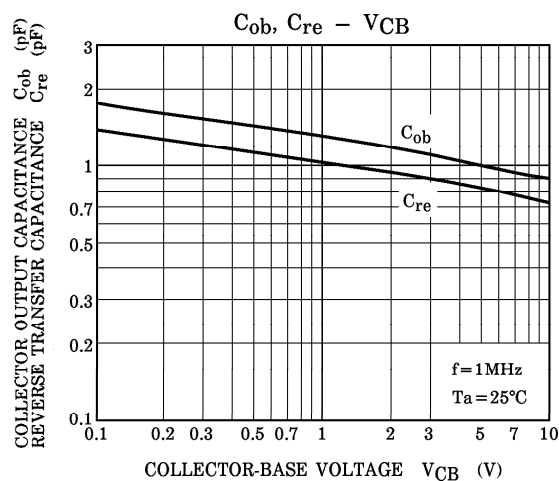
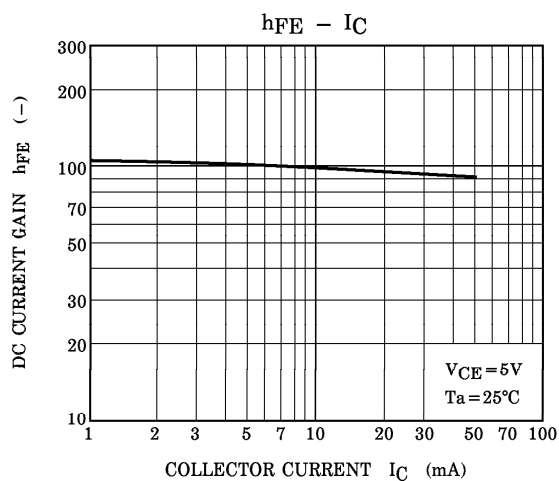
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I _{CBO}	V _{CB} =10V, I _E =0	—	—	0.1	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} =1V, I _C =0	—	—	0.1	μA
DC Current Gain	h _{FE} (Note 1)	V _{CE} =5V, I _C =5mA	80	—	240	—
Transition Frequency	f _T	V _{CE} =5V, I _C =5mA	4	6	—	GHz
Insertion Gain	S _{21e} ²	V _{CE} =5V, I _C =5mA, f=1GHz	7	11	—	dB
Output Capacitance	C _{ob}	V _{CB} =5V, I _E =0, f=1MHz (Note 2)	—	0.7	—	pF
Reverse Transfer Capacitance	C _{re}		—	0.5	0.9	pF
Collector-Base Time Constant	C _c ·r _{bb} '	V _{CB} =5V, I _C =3mA, f=30MHz	—	5.5	10	ps

(Note 1) : h_{FE} Classification O : 80~160, Y : 120~240

(Note 2) : C_{re} is measured by 3 terminal method with capacitance bridge.

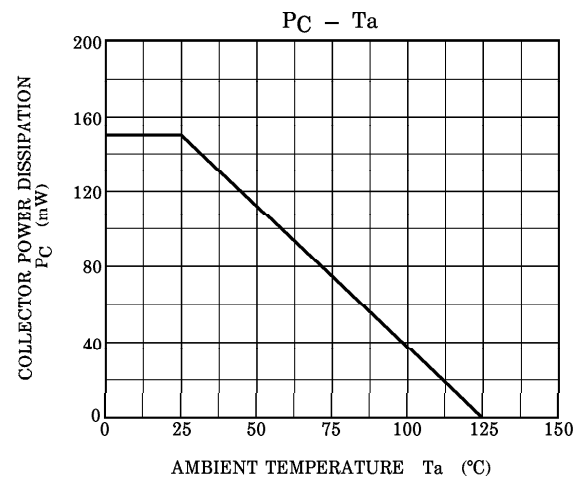
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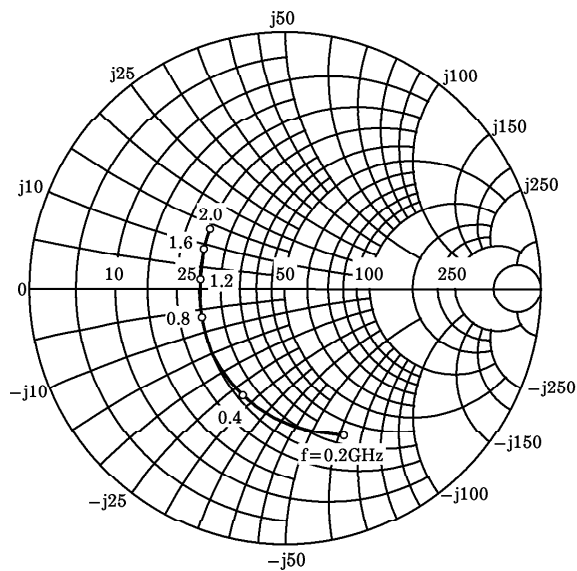
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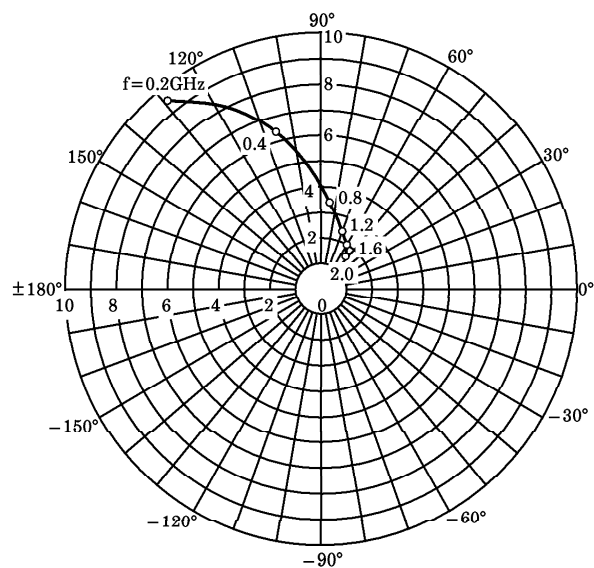
S-Parameter $Z_O = 50\Omega$, $T_a = 25^\circ\text{C}$
 $V_{CE} = 5\text{V}$, $I_C = 5\text{mA}$

frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.631	-67.7	9.526	129.8	0.062	55.9	0.687	-38.7
400	0.441	-111.7	6.393	106.3	0.084	49.5	0.459	-48.5
600	0.363	-139.8	4.611	93.6	0.100	50.6	0.360	-50.6
800	0.338	-159.8	3.599	84.6	0.117	52.9	0.312	-51.1
1000	0.331	-175.0	2.990	77.5	0.134	55.1	0.286	-51.6
1200	0.337	171.9	2.556	71.2	0.152	57.2	0.271	-53.0
1400	0.344	161.7	2.252	65.3	0.174	58.6	0.265	-55.7
1600	0.359	152.1	2.011	60.3	0.196	58.5	0.259	-59.5
1800	0.373	144.6	1.845	55.4	0.217	57.9	0.254	-63.6
2000	0.391	138.5	1.691	50.8	0.238	58.3	0.249	-68.8

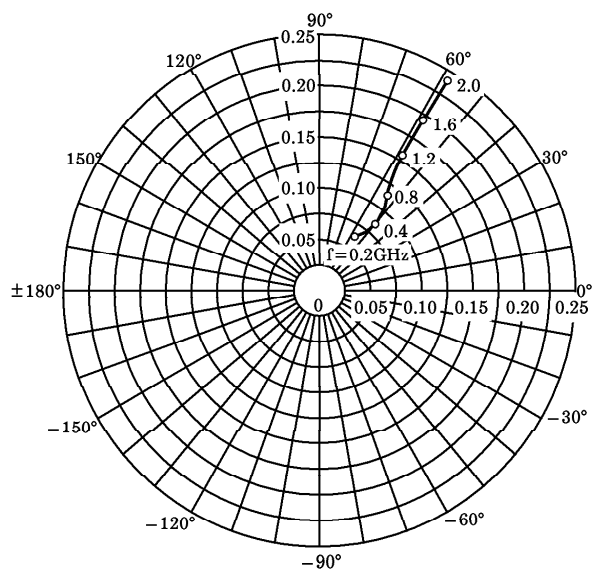
S_{11e}
 $V_{CE}=5V$
 $I_C=5mA$
 $T_a=25^\circ C$
 (UNIT : Ω)



S_{21e}
 $V_{CE}=5V$
 $I_C=5mA$
 $T_a=25^\circ C$



S_{12e}
 $V_{CE}=5V$
 $I_C=5mA$
 $T_a=25^\circ C$



S_{22e}
 $V_{CE}=5V$
 $I_C=5mA$
 $T_a=25^\circ C$
 (UNIT : Ω)

