

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC5107

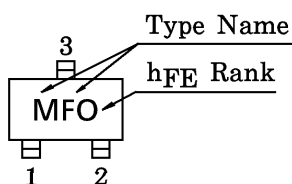
FOR VCO APPLICATION

Unit in mm

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

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	15	mA
Collector Current	I_C	30	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



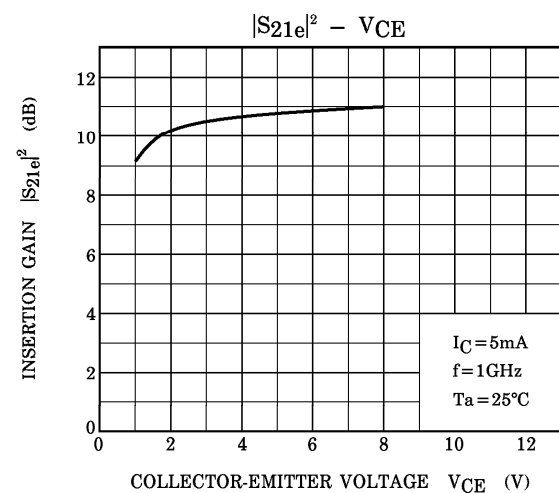
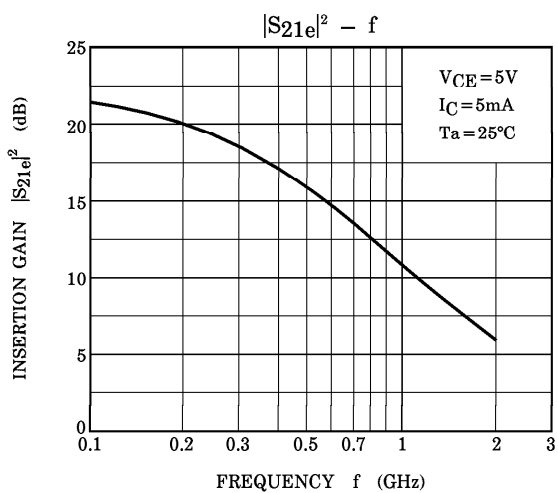
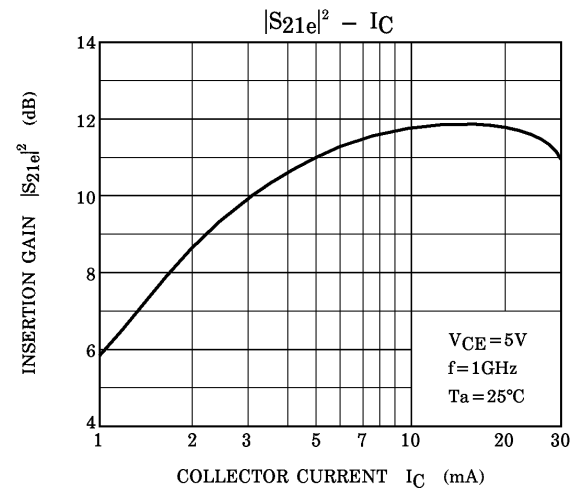
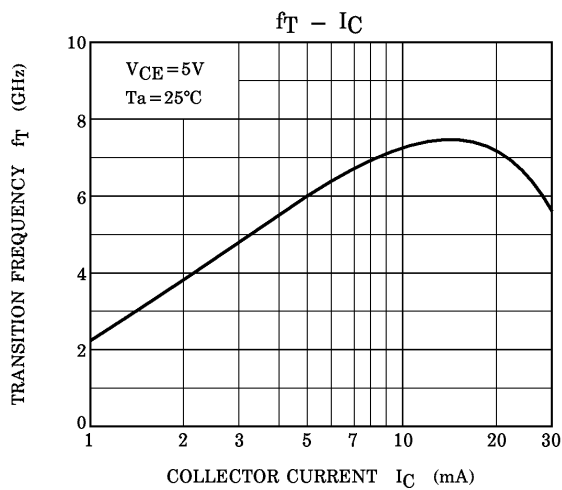
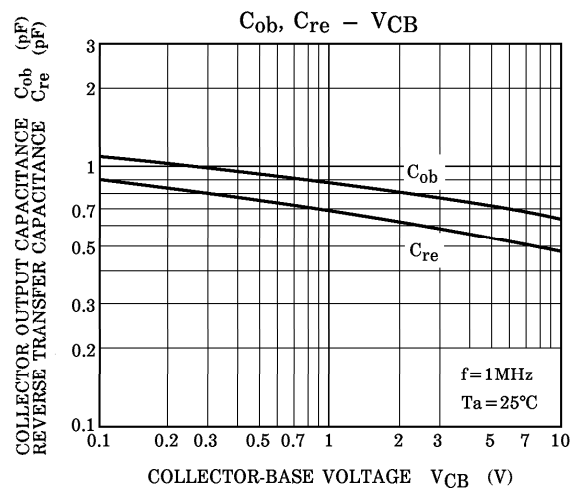
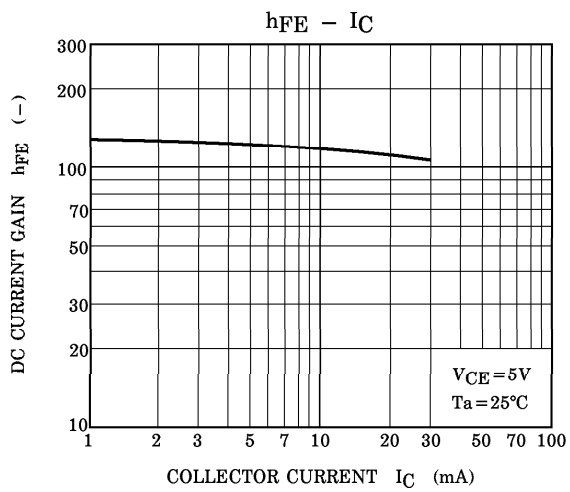
		1. BASE
		2. EMITTER
		3. COLLECTOR
USM		
JEDEC	—	
EIAJ	SC-70	
TOSHIBA	2-2E1A	

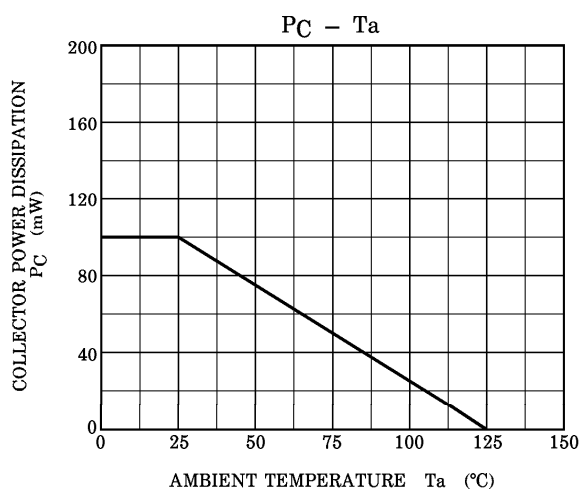
Weight : 0.006g

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 10\text{V}, I_E = 0$	—	—	0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1\text{V}, I_C = 0$	—	—	0.1	μA
DC Current Gain	h_{FE} (Note 1)	$V_{CE} = 5\text{V}, I_C = 5\text{mA}$	80	—	240	—
Transition Frequency	f_T	$V_{CE} = 5\text{V}, I_C = 5\text{mA}$	4	6	—	GHz
Insertion Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{V}, I_C = 5\text{mA}, f = 1\text{GHz}$	7	11	—	dB
Output Capacitance	C_{ob}	$V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$ (Note 2)	—	0.7	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.5	0.9	pF
Collector-Base Time Constant	$C_{c-rbb'}$	$V_{CB} = 5\text{V}, I_C = 3\text{mA}, f = 30\text{MHz}$	—	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.

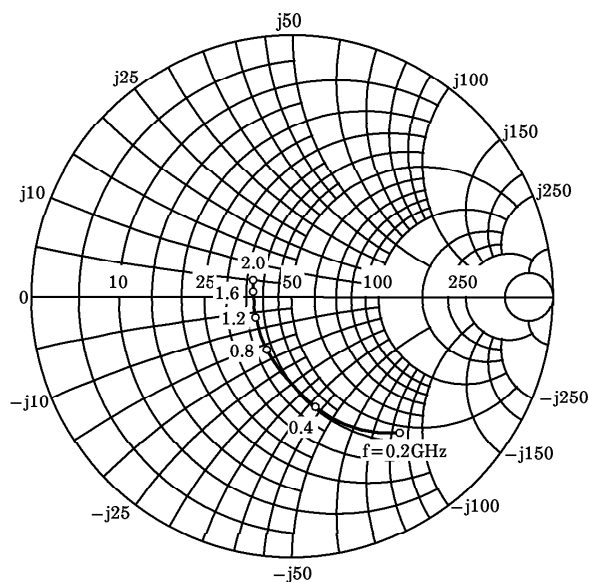




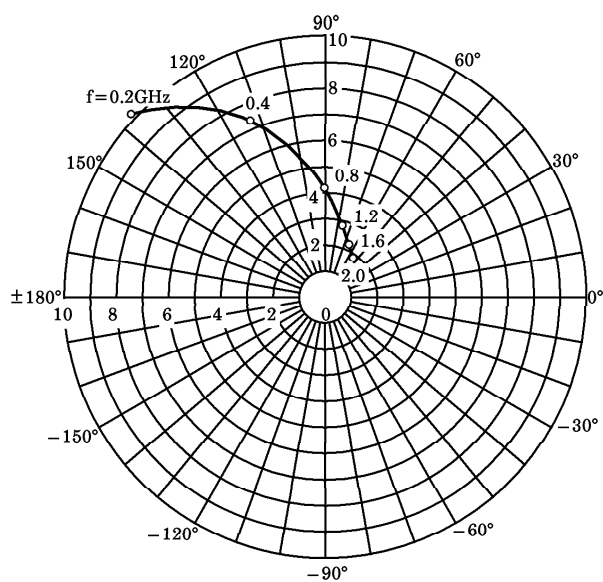
S-Parameter $Z_O = 50\Omega$, $T_a = 25^\circ\text{C}$
 $V_{CE} = 5\text{V}$, $I_C = 5\text{mA}$

周波数 (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.684	-47.0	10.116	136.8	0.049	63.1	0.765	-29.5
400	0.438	-79.2	7.260	112.9	0.072	56.5	0.553	-37.8
600	0.301	-101.2	5.388	99.1	0.090	56.5	0.452	-39.1
800	0.226	-119.2	4.227	90.0	0.107	57.6	0.402	-39.0
1000	0.182	-136.2	3.494	82.7	0.124	58.8	0.374	-38.9
1200	0.159	-153.3	2.988	76.9	0.142	59.6	0.359	-39.4
1400	0.147	-170.3	2.632	71.2	0.163	59.9	0.348	-40.7
1600	0.145	174.4	2.345	66.0	0.182	59.2	0.339	-43.2
1800	0.149	162.6	2.128	61.4	0.200	58.4	0.329	-46.3
2000	0.161	150.9	1.967	57.1	0.219	58.1	0.318	-49.5

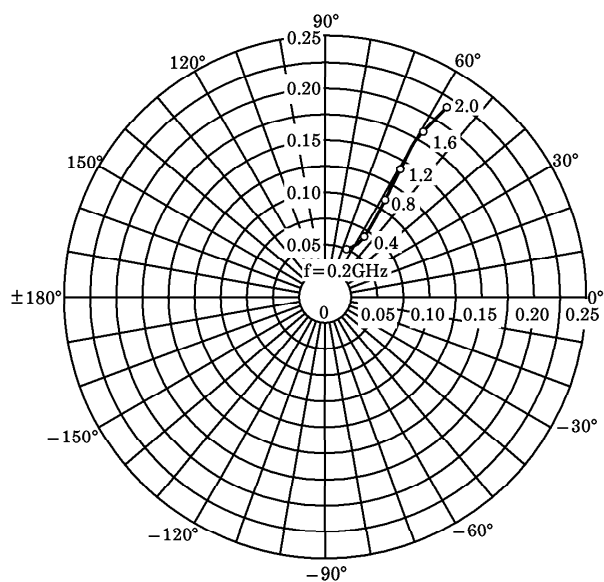
S_{11e}
 $V_{CE}=5V$
 $I_C=5mA$
 $T_a=25^\circ C$
 (UNIT : Ω)



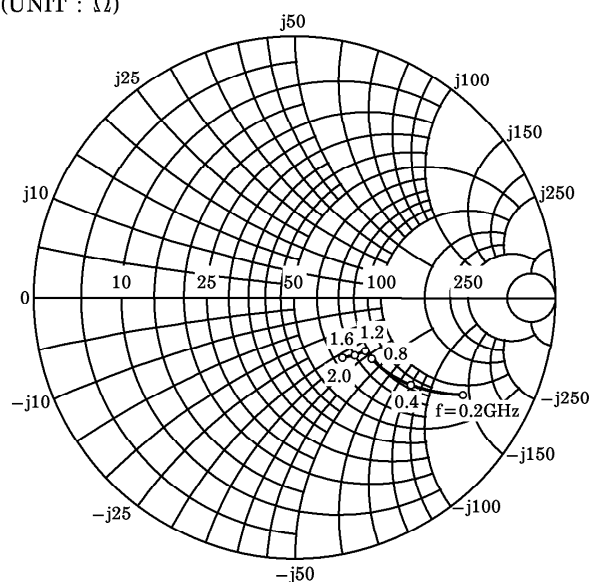
S_{21e}
 $V_{CE}=5V$
 $I_C=5mA$
 $T_a=25^\circ C$



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)



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