TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC5108

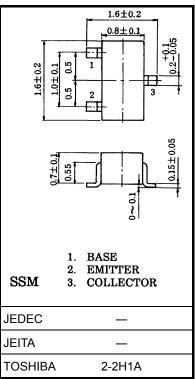
For VCO Application

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	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	Ι _Β	15	mA
Collector current	Ι _C	30	mA
Collector power dissipation	P _C	100	mW
Junction temperature	Тј	125	°C
Storage temperature range	T _{stg}	-55 to 125	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Weight: 2.4 mg (typ.)

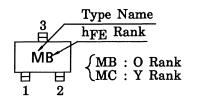
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	$V_{CB} = 10 V, I_E = 0$	_	_	1	μA
Emitter cut-off current	I _{EBO}	$V_{EB} = 1 V, I_{C} = 0$	_	_	1	μA
DC current gain	h _{FE} (Note 1)	$V_{CE} = 5 \text{ V}, \text{ I}_{C} = 5 \text{ mA}$	80	_	240	
Transition frequency	fT	$V_{CE} = 5 \text{ V}, I_{C} = 5 \text{ mA}$	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 V, I _F = 0, f = 1 MHz (Note 2)	_	0.7	_	pF
Reverse transfer capacitance	C _{re}	$v_{CB} = 5 v$, $i_E = 0$, $i = 1 \text{ MHZ}$ (Note 2)	_	0.5	0.9	pF
Collector-base time constant	C _c .rbb'	$V_{CB} = 5 \text{ V}, \text{ I}_{C} = 3 \text{ mA}, \text{ f} = 30 \text{ MHz}$		5.5	15	ps

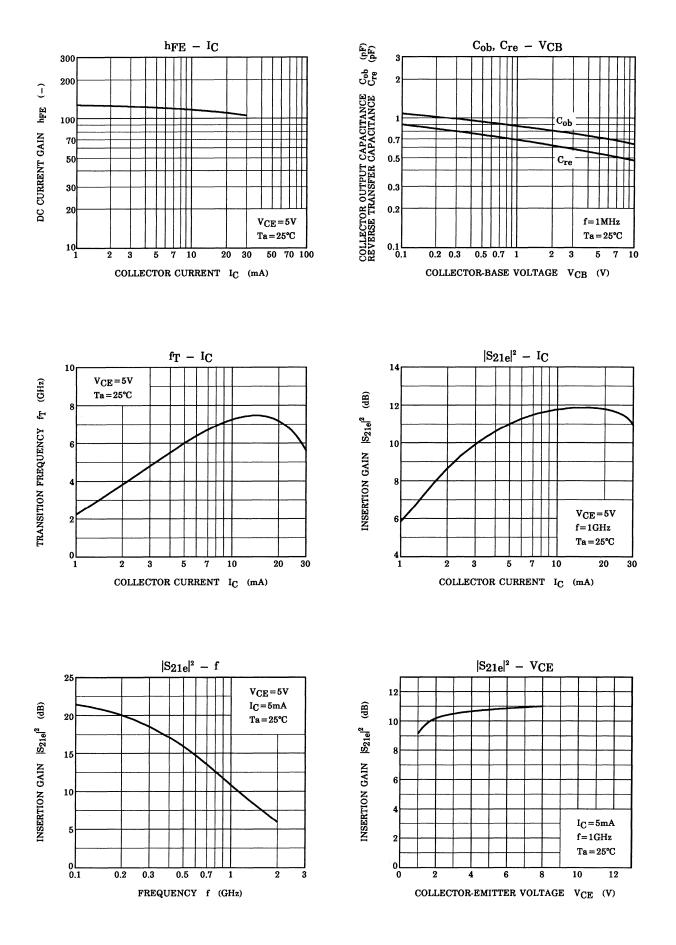
Note 1: hFE classification O: 80 to 160, Y: 120 to 240

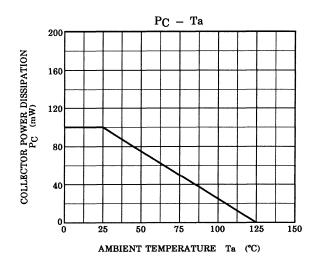
Note 2: C_{re} is measured by 3 terminal method with capacitance bridge.

Marking



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S-Parameter $Z_O = 50 \ \Omega$, Ta = 25°C

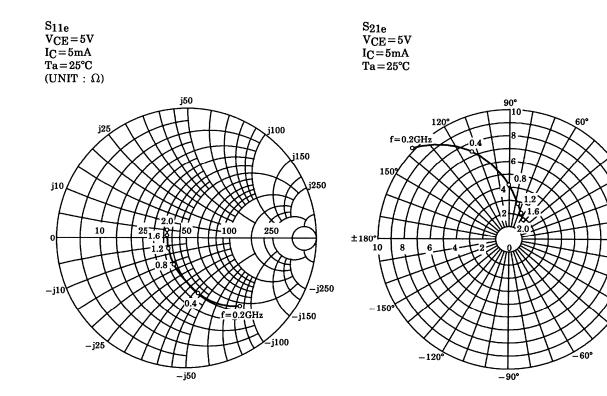
$V_{CE} = 5 V$, $I_C = 5 mA$

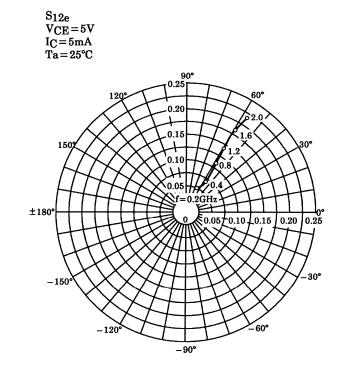
Frequency	S11		S21		S1	S12		S22	
(MHz)	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	
200	0.684	-47.0	10.116	136.8	0.049	63.1	0.765	-29.5	
400	0.438	-79.2	7.260	112.9	0.072	56.5	0.553	-37.8	
600	0.301	-101.2	5.388	99.1	0.090	56.5	0.452	-39.1	
800	0.226	-119.2	4.227	90.0	0.107	57.6	0.402	-39.0	
1000	0.182	-136.2	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	

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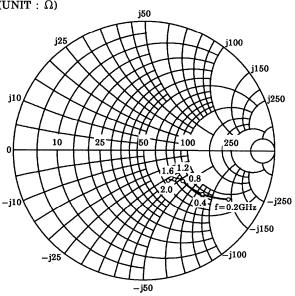
30°

30°









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