

HIGH FREQUENCY LOW NOISE AMPLIFIER

NPN SILICON EPITAXIAL TRANSISTOR

MINI MOLD

FEATURES

- Low Noise, High Gain
 - Low Voltage Operation
 - Low Feedback Capacitance
- $C_{re} = 0.3 \text{ pF TYP.}$

ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKING STYLE
2SC4954-T1	3 Kpcs/Reel.	Embossed tape 8 mm wide. Pin3 (Collector) face to perforation side of the tape.
2SC4954-T2	3 Kpcs/Reel.	Embossed tape 8 mm wide. Pin1 (Emitter), Pin2 (Base) face to perforation side of the tape.

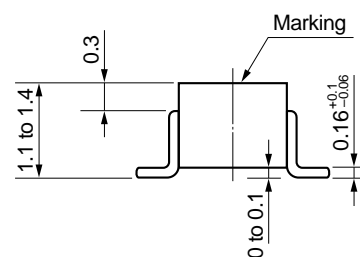
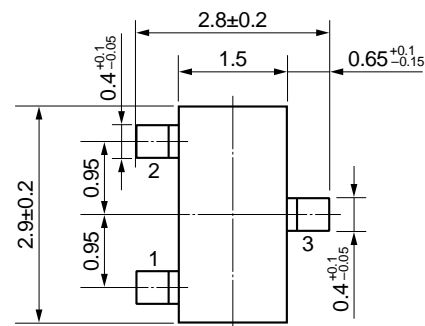
* Please contact with responsible NEC person, if you require evaluation sample. Unit sample quantity shall be 50 pcs. (Part No.: 2SC4954)

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

Collector to Base Voltage	V_{CB0}	9	V
Collector to Emitter Voltage	V_{CE0}	6	V
Emitter to Base Voltage	V_{EB0}	2	V
Collector Current	I_C	10	mA
Total Power Dissipation	P_T	60	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

PACKAGE DIMENSIONS

in millimeters



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

Caution; Electrostatic Sensitive Device.

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

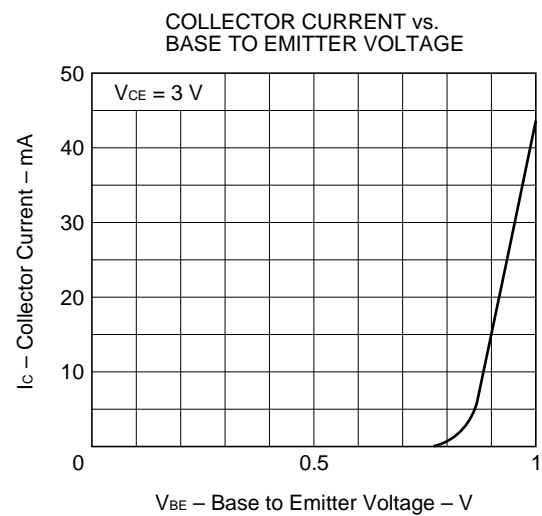
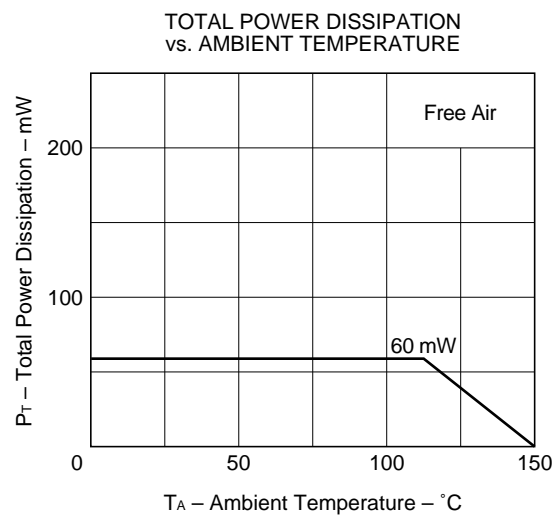
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Collector Cutoff Current	I_{CBO}			0.1	μA	$V_{CB} = 5\text{ V}$, $I_E = 0$
Emitter Cutoff Current	I_{EBO}			0.1	μA	$V_{EB} = 1\text{ V}$, $I_C = 0$
DC Current Gain	h_{FE}	75		150		$V_{CE} = 3\text{ V}$, $I_C = 5\text{ mA}^{*1}$
Gain Bandwidth Product	f_T		12		GHz	$V_{CE} = 3\text{ V}$, $I_C = 5\text{ mA}$, $f = 2.0\text{ GHz}$
Feed-back Capacitance	C_{re}		0.3	0.5	pF	$V_{CB} = 3\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}^{*2}$
Insertion Power Gain	$ S_{21e} ^2$	7	8.5		dB	$V_{CE} = 3\text{ V}$, $I_C = 5\text{ mA}$, $f = 2.0\text{ GHz}$
Noise Figure	NF		2.5	4.0	dB	$V_{CE} = 3\text{ V}$, $I_C = 3\text{ mA}$, $f = 2.0\text{ GHz}$

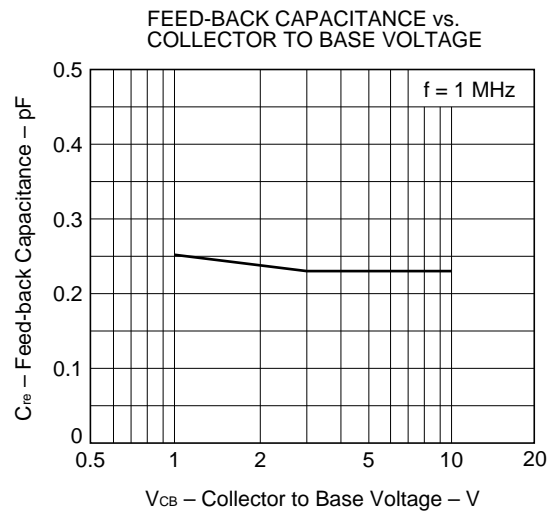
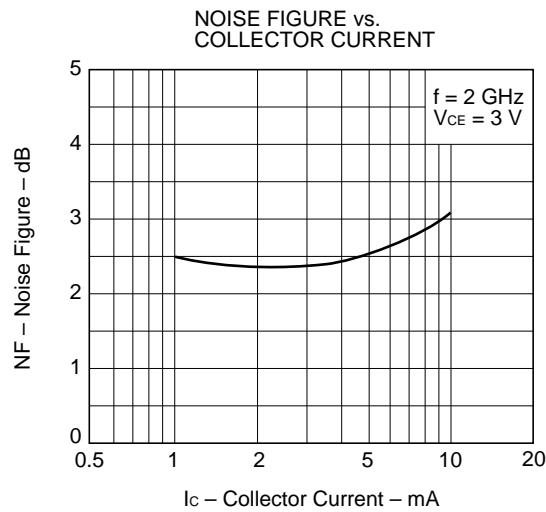
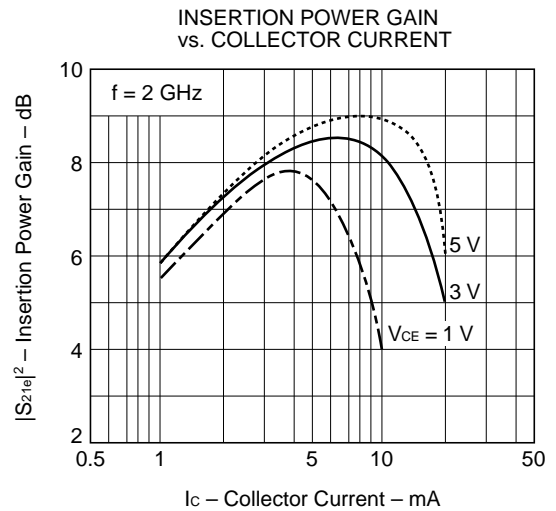
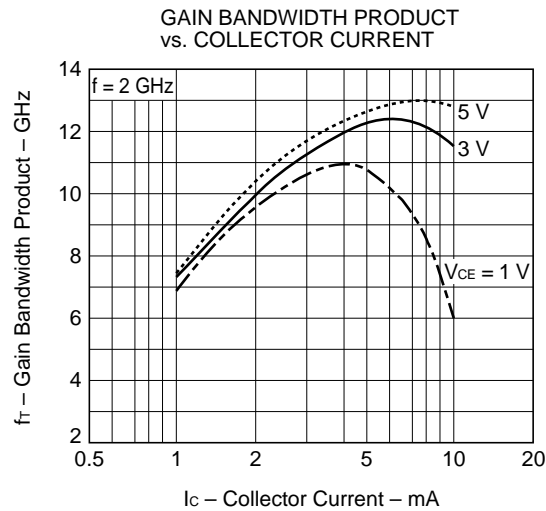
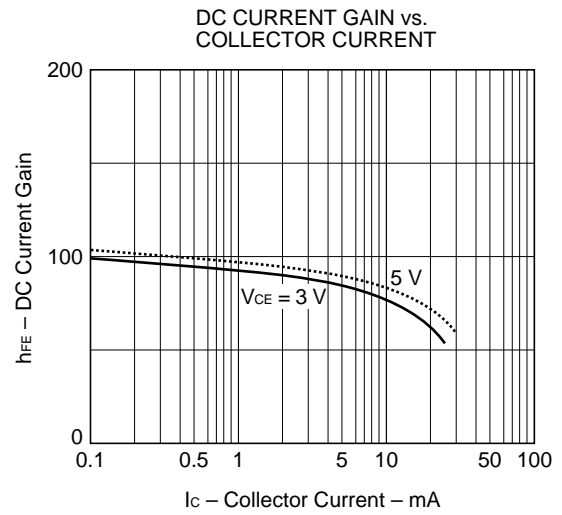
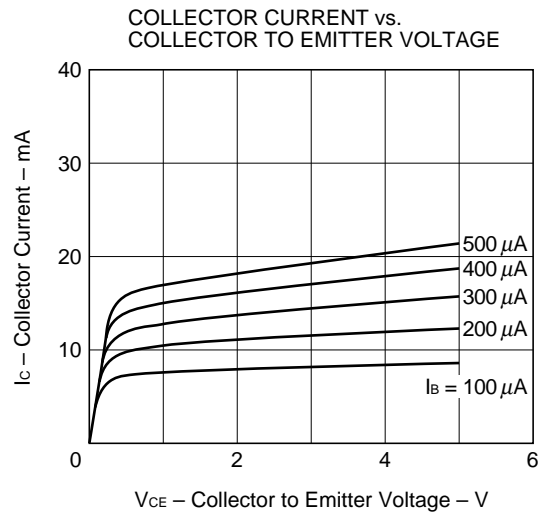
*1 Pulse Measurement; $PW \leq 350\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$ Pulsed.

*2 Measured with 3 terminals bridge, Emitter and Case should be grounded.

 h_{FE} Classification

Rank	T82
Marking	T82
h_{FE}	75 to 150

TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$)



S-PARAMETER(V_{CE} = 3 V, I_C = 1 mA, Z_o = 50 Ω)

f (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.200	0.9550	-9.0	3.2340	168.1	0.0340	77.3	0.9870	-6.8
0.400	0.9140	-17.3	3.0460	154.7	0.0650	76.7	0.9640	-13.4
0.600	0.8630	-25.8	2.9630	144.2	0.0930	71.6	0.9250	-19.5
0.800	0.7880	-33.1	2.7870	133.1	0.1180	66.7	0.8850	-24.3
1.000	0.7320	-39.1	2.6480	123.5	0.1360	63.7	0.8330	-28.9
1.200	0.6720	-45.2	2.5390	114.4	0.1570	57.2	0.7820	-33.2
1.400	0.5910	-50.5	2.3460	106.8	0.1780	56.3	0.7570	-37.1
1.600	0.5430	-55.0	2.2000	99.0	0.1870	51.7	0.7250	-40.1
1.800	0.4830	-57.4	2.0710	91.6	0.2030	51.3	0.6720	-43.2
2.000	0.4240	-60.7	1.9590	85.7	0.2090	50.4	0.6490	-46.1
2.200	0.3710	-66.9	1.8970	79.8	0.2240	50.9	0.6230	-49.1
2.400	0.3390	-68.0	1.8100	74.8	0.2440	47.8	0.5970	-49.4
2.600	0.3030	-71.3	1.6980	70.2	0.2530	47.7	0.5740	-54.1
2.800	0.2460	-72.2	1.6530	64.7	0.2550	44.5	0.5610	-56.8
3.000	0.1990	-68.9	1.5750	59.9	0.2830	43.0	0.5130	-61.6

(V_{CE} = 3 V, I_C = 3 mA, Z_o = 50 Ω)

f (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.200	0.8730	-15.0	7.3980	159.5	0.0340	74.6	0.9590	-11.1
0.400	0.7600	-26.2	6.3600	140.6	0.0580	71.3	0.8830	-18.9
0.600	0.6530	-35.6	5.5680	127.0	0.0840	69.6	0.7970	-25.7
0.800	0.6530	-35.6	5.5680	127.0	0.0840	69.6	0.7970	-25.7
1.000	0.4750	-45.3	4.1940	105.8	0.1160	64.0	0.6690	-32.7
1.200	0.4110	-48.3	3.7680	98.0	0.1330	64.0	0.6690	-32.7
1.400	0.3470	-49.3	3.3170	91.8	0.1510	61.9	0.6060	-36.3
1.600	0.3190	-50.4	3.0080	85.7	0.1600	62.5	0.5720	-37.6
1.800	0.2830	-46.5	2.7180	79.4	0.1820	58.0	0.5510	-39.9
2.000	0.2510	-45.6	2.5040	74.9	0.1980	57.5	0.5290	-41.8
2.200	0.2020	-48.2	2.3810	70.4	0.2150	56.6	0.5170	-44.1
2.400	0.1940	-47.4	2.2280	66.0	0.2290	53.2	0.5070	-45.2
2.600	0.1850	-47.8	2.0580	62.7	0.2310	56.3	0.4920	-49.6
2.800	0.1710	-39.0	1.9740	57.8	0.2620	54.7	0.4670	-51.7
3.000	0.1430	-31.7	1.8480	54.4	0.2940	53.6	0.4160	-54.9

S-PARAMETER

($V_{CE} = 3\text{ V}$, $I_C = 5\text{ mA}$, $Z_0 = 50\ \Omega$)

f (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.200	.775	−19.9	10.233	153.0	.029	78.0	.931	−14.1
0.400	.653	−32.4	8.408	133.2	.056	66.1	.815	−23.3
0.600	.527	−39.8	6.761	119.0	.073	70.0	.717	−27.3
0.800	.447	−45.7	5.598	108.5	.088	67.6	.639	−30.3
1.000	.359	−49.6	4.670	100.0	.111	66.9	.595	−31.2
1.200	.314	−50.3	4.118	92.7	.123	67.5	.565	−32.4
1.400	.279	−48.1	3.630	87.1	.140	66.8	.545	−34.4
1.600	.246	−46.9	3.246	82.1	.154	64.1	.519	−35.9
1.800	.219	−46.8	2.885	78.1	.178	62.0	.521	−37.0
2.000	.178	−43.6	2.747	73.7	.194	62.9	.500	−38.9
2.200	.165	−44.7	2.581	68.8	.201	62.0	.478	−43.1
2.400	.149	−37.6	2.382	64.8	.224	60.1	.455	−43.1
2.600	.137	−50.0	2.244	61.4	.241	60.9	.471	−43.9
2.800	.132	−47.6	2.138	59.0	.253	57.7	.449	−47.9
3.000	.103	−33.7	2.044	55.3	.265	55.3	.438	−47.0

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