

HIGH FREQUENCY LOW NOISE AMPLIFIER  
NPN SILICON EPITAXIAL TRANSISTOR  
MINI MOLD

FEATURES

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

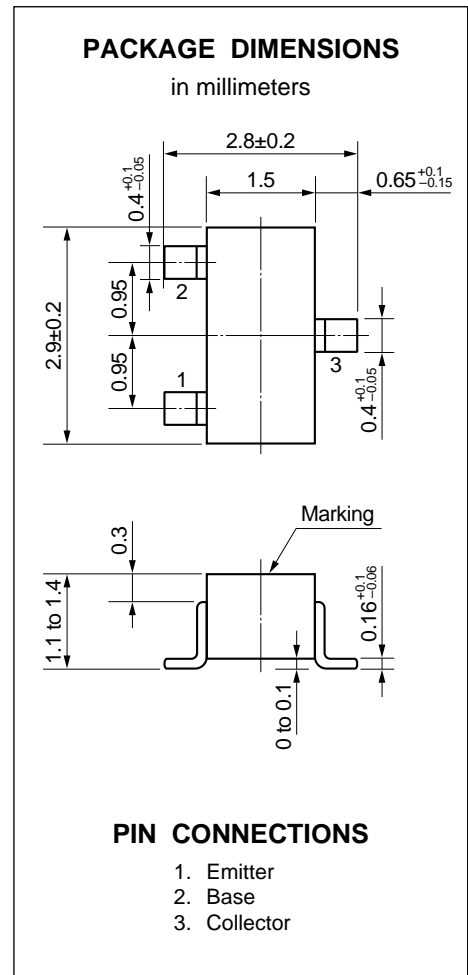
ORDERING INFORMATION

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

Collector to Base Voltage	$V_{CBO}$	9	V
Collector to Emitter Voltage	$V_{CEO}$	6	V
Emitter to Base Voltage	$V_{EBO}$	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	$^\circ\text{C}$



Caution; Electrostatic Sensitive Device.

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Collector Cutoff Current	I <sub>CB0</sub>			0.1	μA	V <sub>CB</sub> = 5 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EB0</sub>			0.1	μA	V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE</sub>	75		150		V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA* <sup>1</sup>
Gain Bandwidth Product	f <sub>T</sub>		12		GHz	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA, f = 2.0 GHz
Feed-back Capacitance	C <sub>re</sub>		0.3	0.5	pF	V <sub>CB</sub> = 3 V, I <sub>E</sub> = 0, f = 1 MHz* <sup>2</sup>
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	7	8.5		dB	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA, f = 2.0 GHz
Noise Figure	NF		2.5	4.0	dB	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 3 mA, f = 2.0 GHz

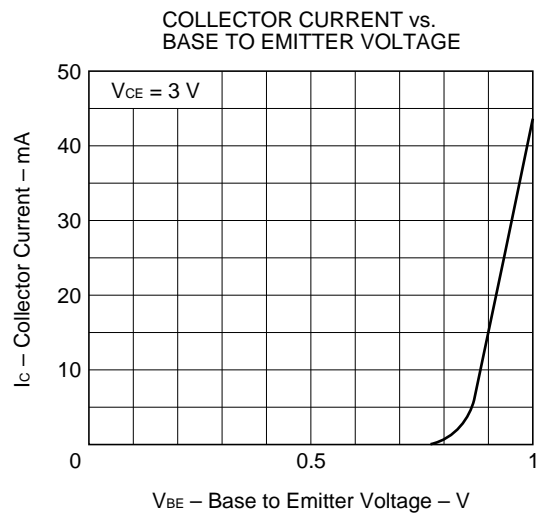
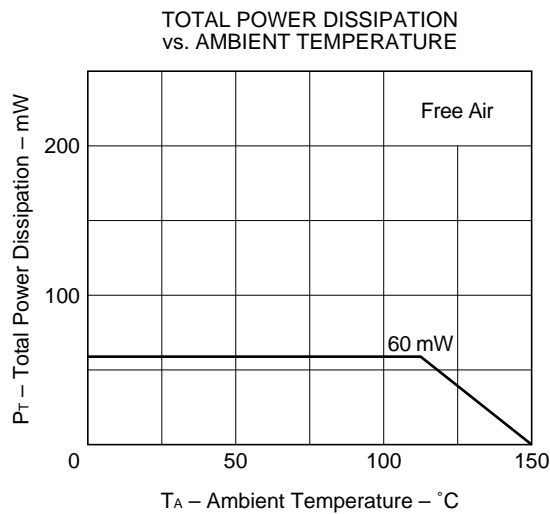
\*1 Pulse Measurement; PW ≤ 350 μs, Duty Cycle ≤ 2 % Pulsed.

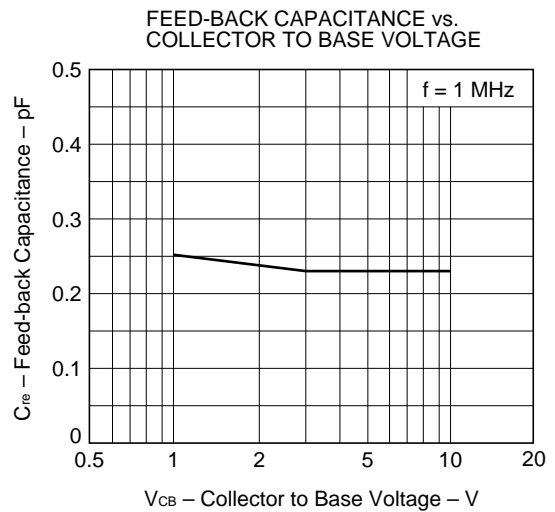
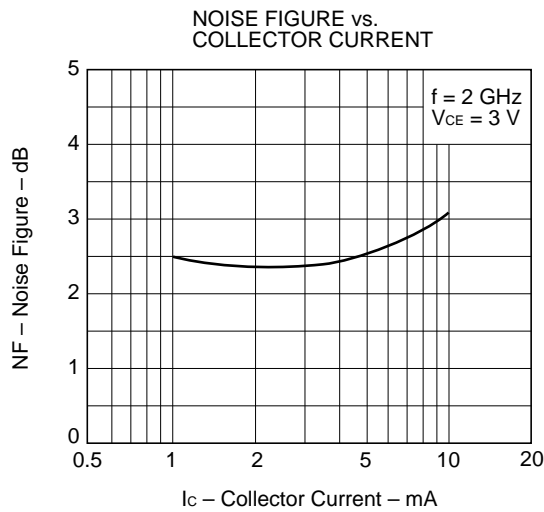
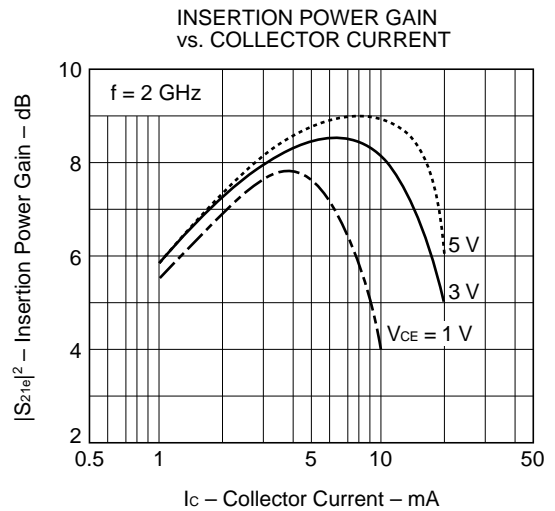
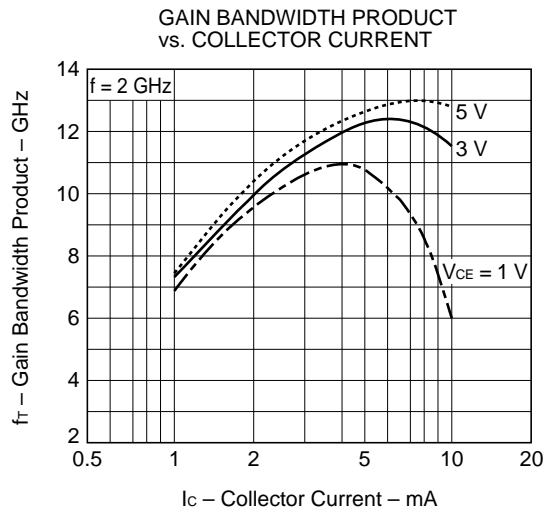
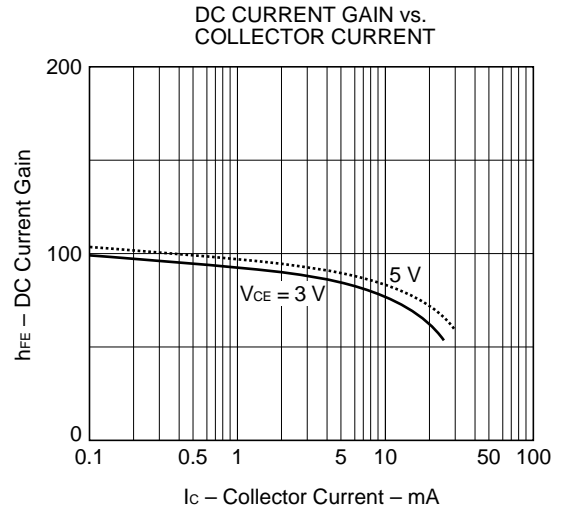
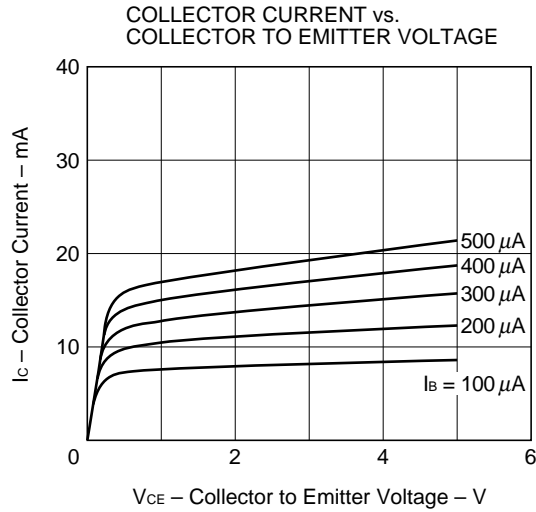
\*2 Measured with 3 terminals bridge, Emitter and Case should be grounded.

**h<sub>FE</sub> Classification**

Rank	T82
Marking	T82
h <sub>FE</sub>	75 to 150

**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**





**S-PARAMETER**

(V<sub>CE</sub> = 3 V, I<sub>c</sub> = 1 mA, Z<sub>o</sub> = 50 Ω)

f (GHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	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<sub>CE</sub> = 3 V, I<sub>c</sub> = 3 mA, Z<sub>o</sub> = 50 Ω)

f (GHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	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<sub>CE</sub> = 3 V, I<sub>c</sub> = 5 mA, Z<sub>o</sub> = 50 Ω)

f (GHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	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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