

HIGH FREQUENCY LOW NOISE AMPLIFIER  
NPN SILICON EPITAXIAL TRANSISTOR  
4 PINS MINI MOLD

DESCRIPTION

The 2SC4092 is an NPN silicon epitaxial transistor designed for low-noise amplifier at VHF, UHF band.

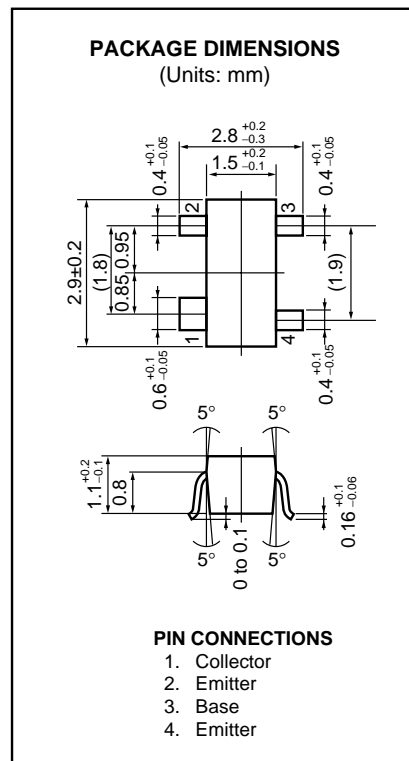
It is contained in 4 pins mini-mold package which enables high-isolation gain.

FEATURES

- NF = 1.5 dB TYP. @f = 1.0 GHz, V<sub>CE</sub> = 10 V, I<sub>c</sub> = 5 mA
- |S<sub>21e</sub>|<sup>2</sup> = 12 dB TYP. @f = 1.0 GHz, V<sub>CE</sub> = 10 V, I<sub>c</sub> = 20 mA

ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)

Collector to Base Voltage	V <sub>CBO</sub>	25	V
Collector to Emitter Voltage	V <sub>CEO</sub>	12	V
Emitter to Base Voltage	V <sub>EBO</sub>	3.0	V
Collector Current	I <sub>c</sub>	70	mA
Total Power Dissipation	P <sub>T</sub>	200	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-65 to +150	°C



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

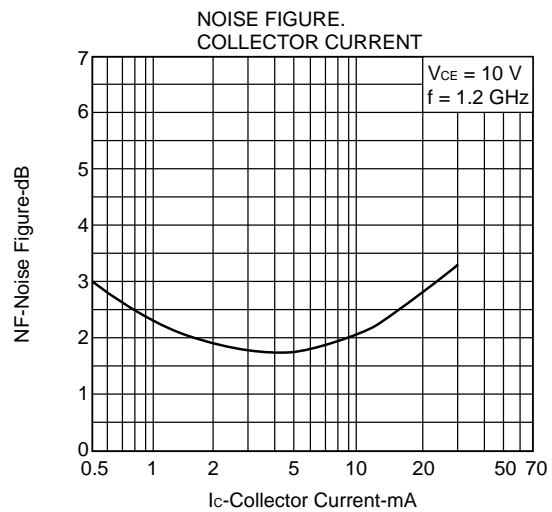
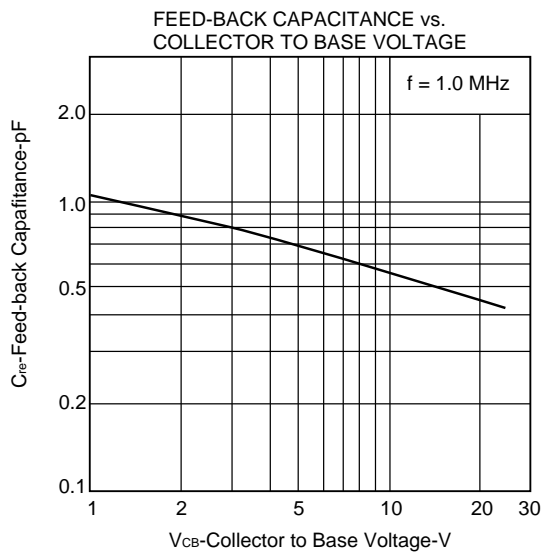
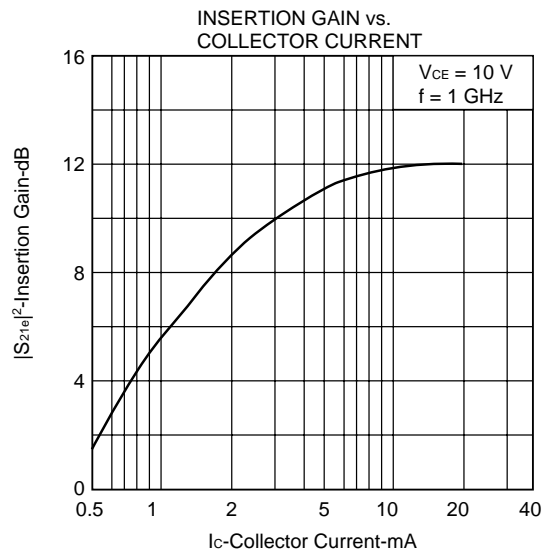
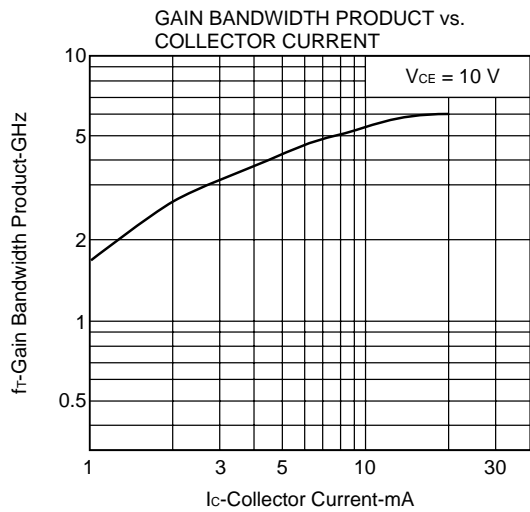
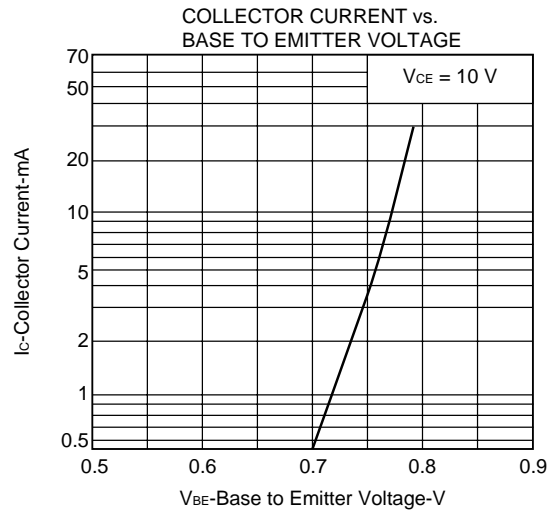
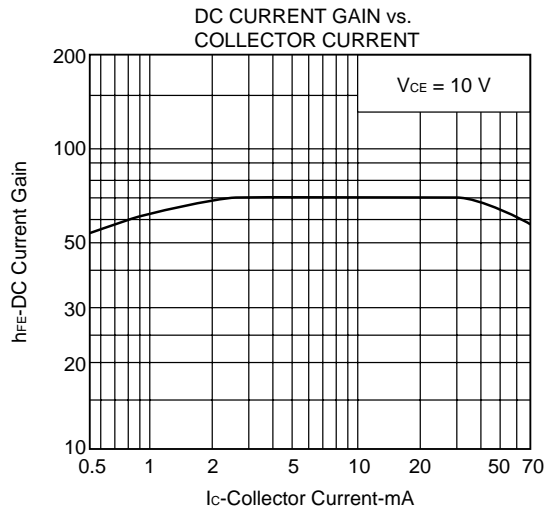
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I <sub>CBO</sub>			0.1	μA	V <sub>CB</sub> = 15 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>			0.1	μA	V <sub>EB</sub> = 2.0 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE</sub>	40		200		V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA
Gain Bandwidth Product	f <sub>T</sub>		6		GHz	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 1.0 GHz
Output Capacitance	C <sub>ob</sub>		0.55	0.9	pF	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	9.5	12		dB	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 1.0 GHz
Noise Figure	NF		1.5	3.0	dB	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 5 mA, f = 1.0 GHz
Maximum Available Gain	MAG		14.5		dB	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 1.0 GHz

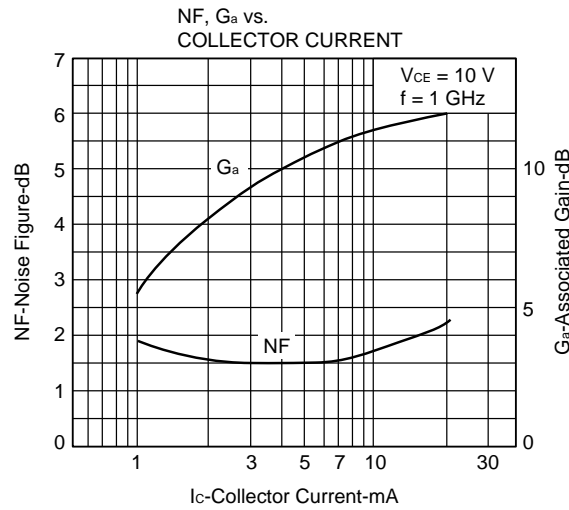
h<sub>FE</sub> Classification

Class	R4/RD *	R5/RE *
Marking	R4	R5
h <sub>FE</sub>	40 to 120	100 to 200

\* Old Specification / New Specification

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





**S-PARAMETER**

$V_{CE} = 10\text{ V}$ ,  $I_c = 5\text{ mA}$ ,  $Z_o = 50\ \Omega$

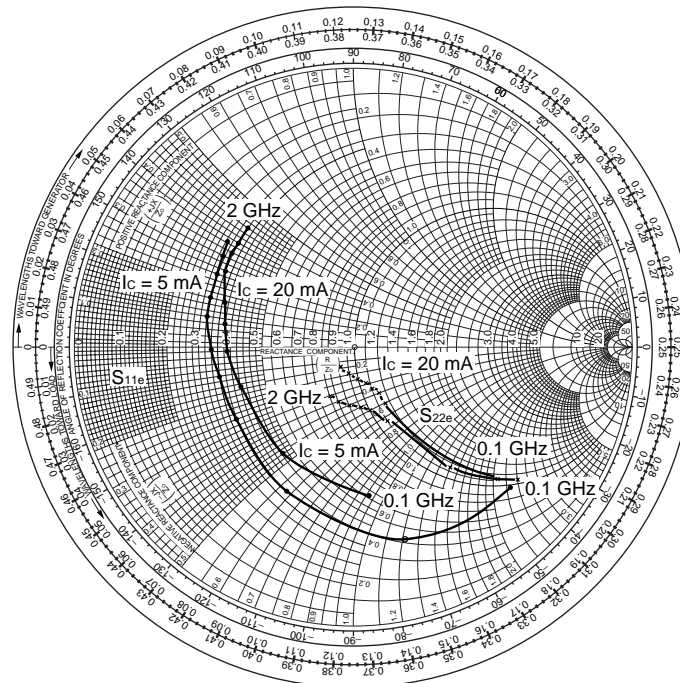
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.780	-39.4	13.956	155.8	0.027	62.9	0.905	-21.2
200	0.709	-73.6	11.808	130.8	0.058	62.3	0.767	-36.3
400	0.567	-114.4	7.509	106.5	0.081	42.1	0.542	-50.3
600	0.503	-143.3	5.678	93.2	0.093	39.0	0.424	-56.2
800	0.486	-164.3	4.155	80.6	0.104	36.8	0.353	-59.3
1000	0.488	-179.5	3.499	72.3	0.117	37.2	0.301	-63.1
1200	0.506	167.5	2.830	63.0	0.129	36.6	0.265	-66.1
1400	0.520	159.9	2.588	55.3	0.144	35.9	0.246	-73.4
1600	0.528	149.8	2.188	48.5	0.155	37.5	0.217	-79.1
1800	0.533	141.8	2.092	41.7	0.173	35.7	0.209	-88.0
2000	0.556	134.9	1.794	36.0	0.181	36.1	0.192	-97.8

$V_{CE} = 10\text{ V}$ ,  $I_c = 5\text{ mA}$ ,  $Z_o = 50\ \Omega$

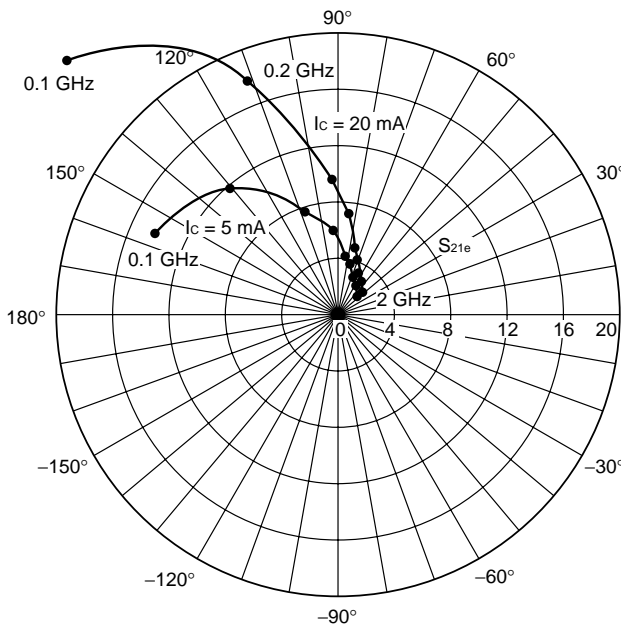
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.534	-82.1	25.861	136.3	0.021	34.8	0.717	-41.1
200	0.468	-121.0	17.231	110.2	0.033	60.5	0.481	-50.5
400	0.428	-157.0	9.440	92.4	0.051	50.1	0.297	-57.8
600	0.435	-176.6	6.738	83.4	0.069	57.2	0.230	-59.5
800	0.448	170.0	4.823	73.7	0.090	54.6	0.197	-60.9
1000	0.464	161.0	4.013	67.2	0.107	54.1	0.164	-66.3
1200	0.480	152.1	3.232	59.4	0.127	53.5	0.140	-70.7
1400	0.495	146.5	2.945	52.7	0.149	49.6	0.131	-80.5
1600	0.511	138.9	2.480	46.9	0.164	49.5	0.104	-91.4
1800	0.517	132.7	2.364	40.9	0.187	45.2	0.104	-103.7
2000	0.546	127.0	2.024	35.9	0.197	44.3	0.094	-120.7

S-PARAMETER

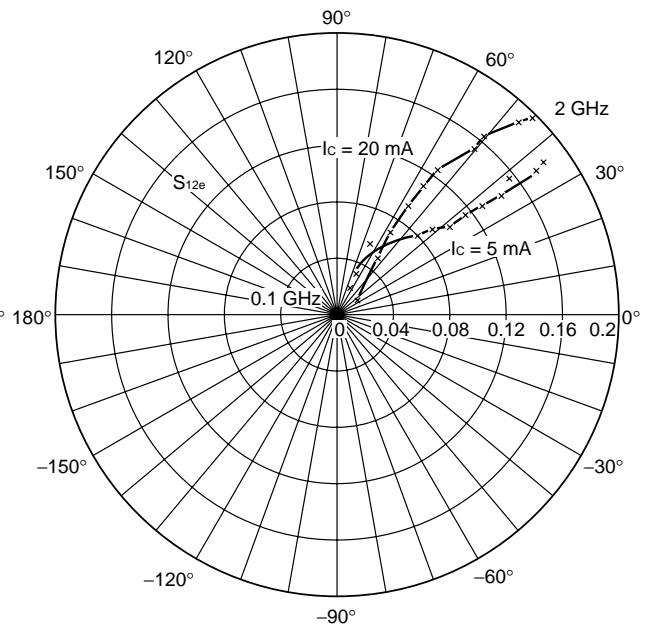
$S_{11e}$ ,  $S_{22e}$ -FREQUENCY CONDITION  $V_{CE} = 10\text{ V}$ ,  $f = 0.1, 0.2$  to  $2.0\text{ GHz}$  (Step 200 MHz)



$S_{21e}$ -FREQUENCY CONDITION  $V_{CE} = 10\text{ V}$



$S_{12e}$ -FREQUENCY CONDITION  $V_{CE} = 10\text{ V}$



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Anti-radioactive design is not implemented in this product.