

2SC5700

Silicon NPN Epitaxial
VHF/UHF wide band amplifier

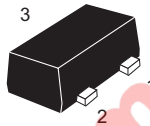
REJ03G0751-0100
(Previous ADE-208-1435)
Rev.1.00
Aug.10.2005

Features

- High power gain low noise figure at low power operation:
 $|S_{21}|^2 = 16 \text{ dB typ}$, $\text{NF} = 1.0 \text{ dB typ}$ ($V_{CE} = 1 \text{ V}$, $I_C = 5 \text{ mA}$, $f = 900 \text{ MHz}$)

Outline

RENESAS Package code: PUSF0003ZA-A
(Package name: MFPAK[®])



1. Emitter
2. Base
3. Collector

Note: Marking is "WB-".

*MFPAK is a trademark of Renesas Technology Corp.

Absolute Maximum Ratings

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

Parameter	Symbol	Value	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	4	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	50	mA
Collector power dissipation	P_c	80	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

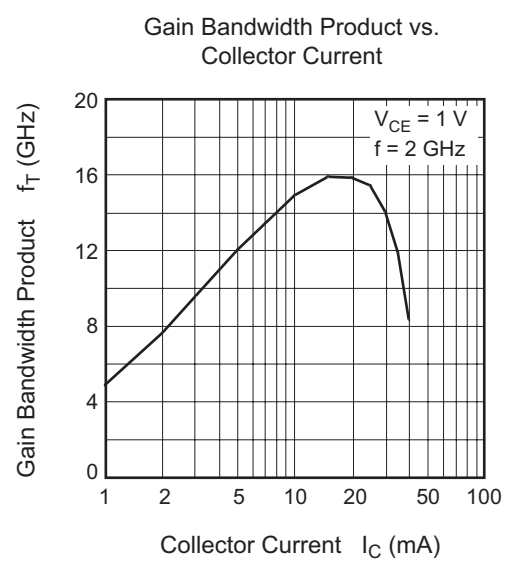
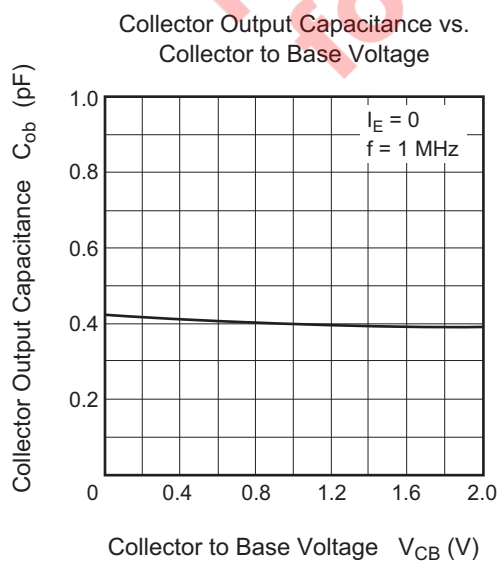
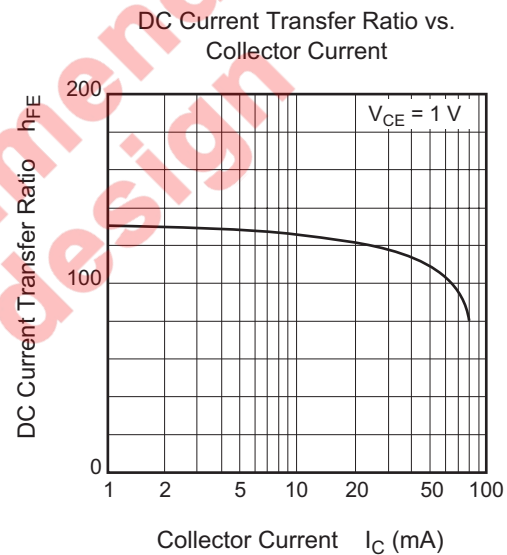
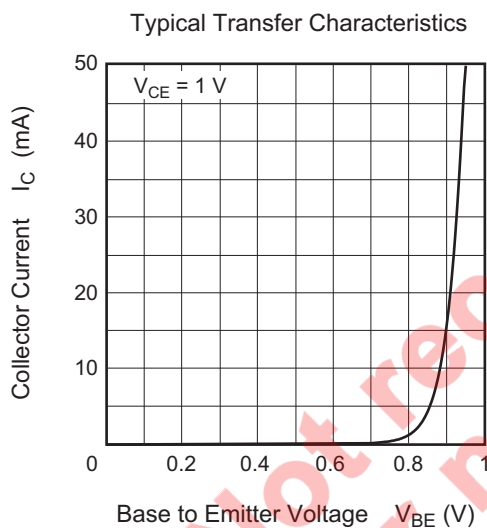
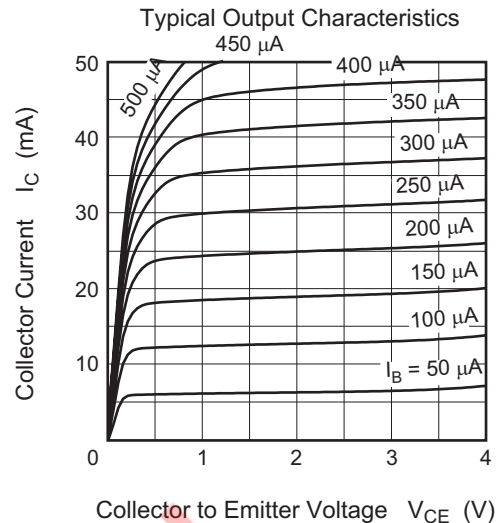
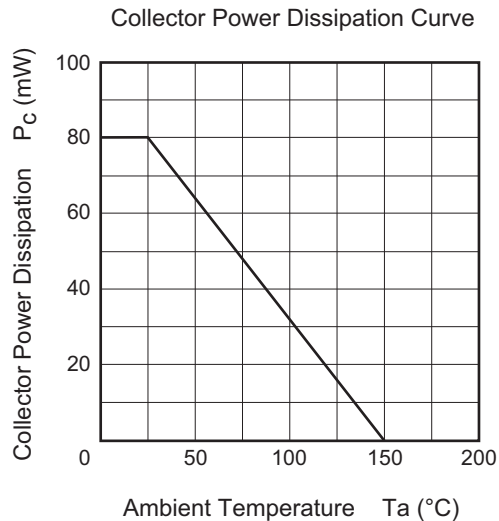
Electrical Characteristics

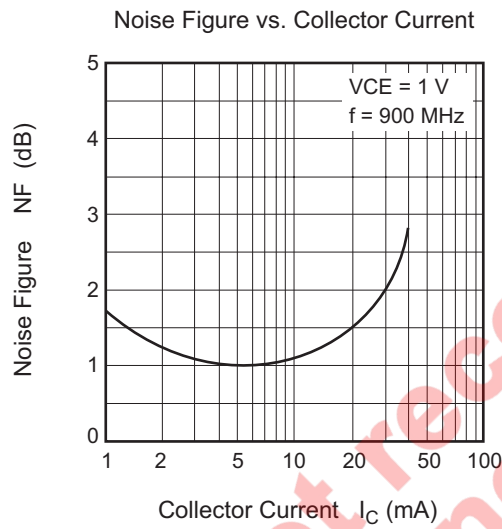
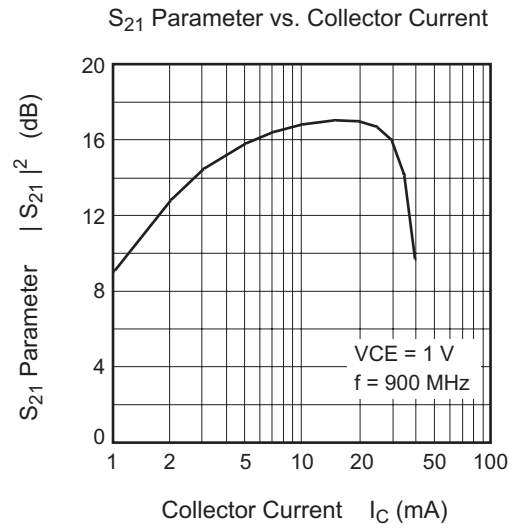
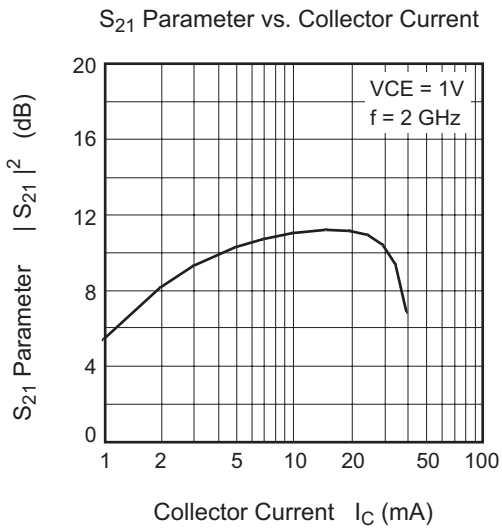
(Ta = 25°C)

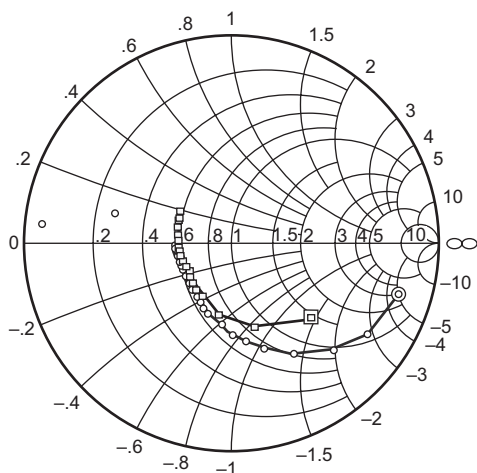
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	$I_C = 10\ \mu A, I_E = 0$
Collector cutoff current	I_{CBO}	—	—	0.1	μA	$V_{CB} = 15\ V, I_E = 0$
Collector cutoff current	I_{CEO}	—	—	1	μA	$V_{CE} = 4\ V, R_{BE} = \infty$
Emitter cutoff current	I_{EBO}	—	—	200	nA	$V_{EB} = 0.8\ V, I_C = 0$
DC current transfer ratio	h_{FE}	100	130	170		$V_{CE} = 1\ V, I_C = 5\ mA$
Collector output capacitance	C_{ob}	—	0.4	0.7	pF	$V_{CB} = 1\ V, I_E = 0,$ $f = 1\ MHz$
Gain bandwidth product	f_T	10	12	—	GHz	$V_{CE} = 1\ V, I_C = 5\ mA$
Forward transmission coefficient	$ S_{21} ^2$	13	16	—	dB	$V_{CE} = 1\ V, I_C = 5\ mA,$ $f = 900\ MHz$
Noise figure	NF	—	1.0	1.7	dB	$V_{CE} = 1\ V, I_C = 5\ mA,$ $f = 900\ MHz,$ $Z_S = Z_L = 50\ \Omega$

Not recommend
for new design

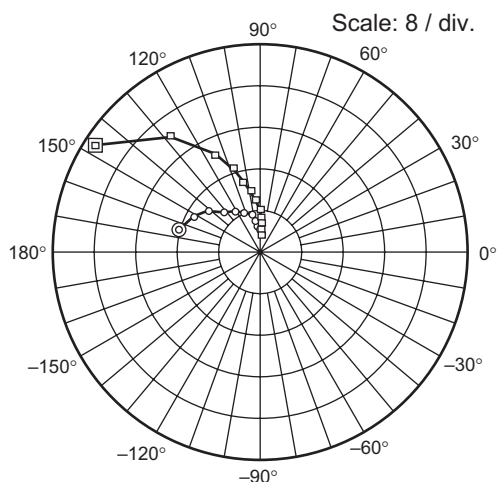
Main Characteristics





S_{11} Parameter vs. Frequency

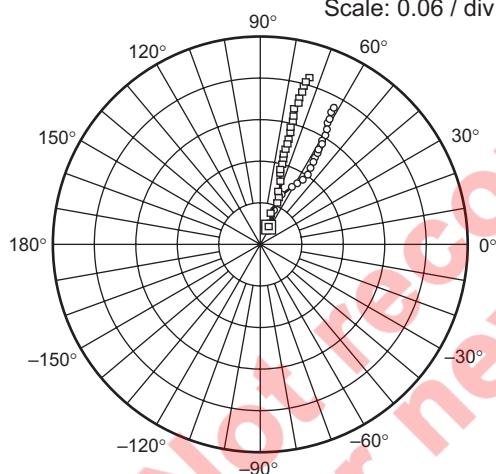
Condition: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
 100 to 2000 MHz (100 MHz Step)
 ○ ($I_C = 5$ mA)
 □ ($I_C = 20$ mA)

 S_{21} Parameter vs. Frequency

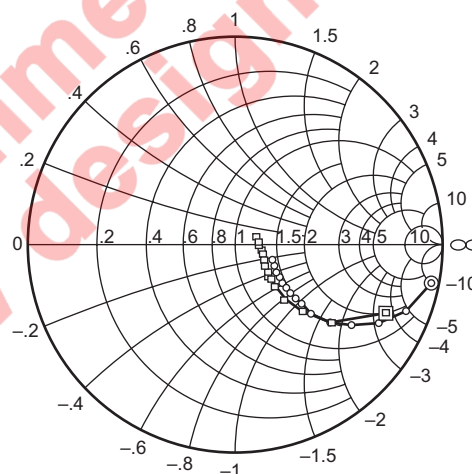
Condition: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
 100 to 2000 MHz (100 MHz Step)
 ○ ($I_C = 5$ mA)
 □ ($I_C = 20$ mA)

 S_{12} Parameter vs. Frequency

Scale: 0.06 / div.



Condition: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
 100 to 2000 MHz (100 MHz Step)
 ○ ($I_C = 5$ mA)
 □ ($I_C = 20$ mA)

 S_{22} Parameter vs. Frequency

Condition: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
 100 to 2000 MHz (100 MHz Step)
 ○ ($I_C = 5$ mA)
 □ ($I_C = 20$ mA)

Sparameter

(V_{CE} = 1V, I_C = 5mA, Z_o = 50Ω)

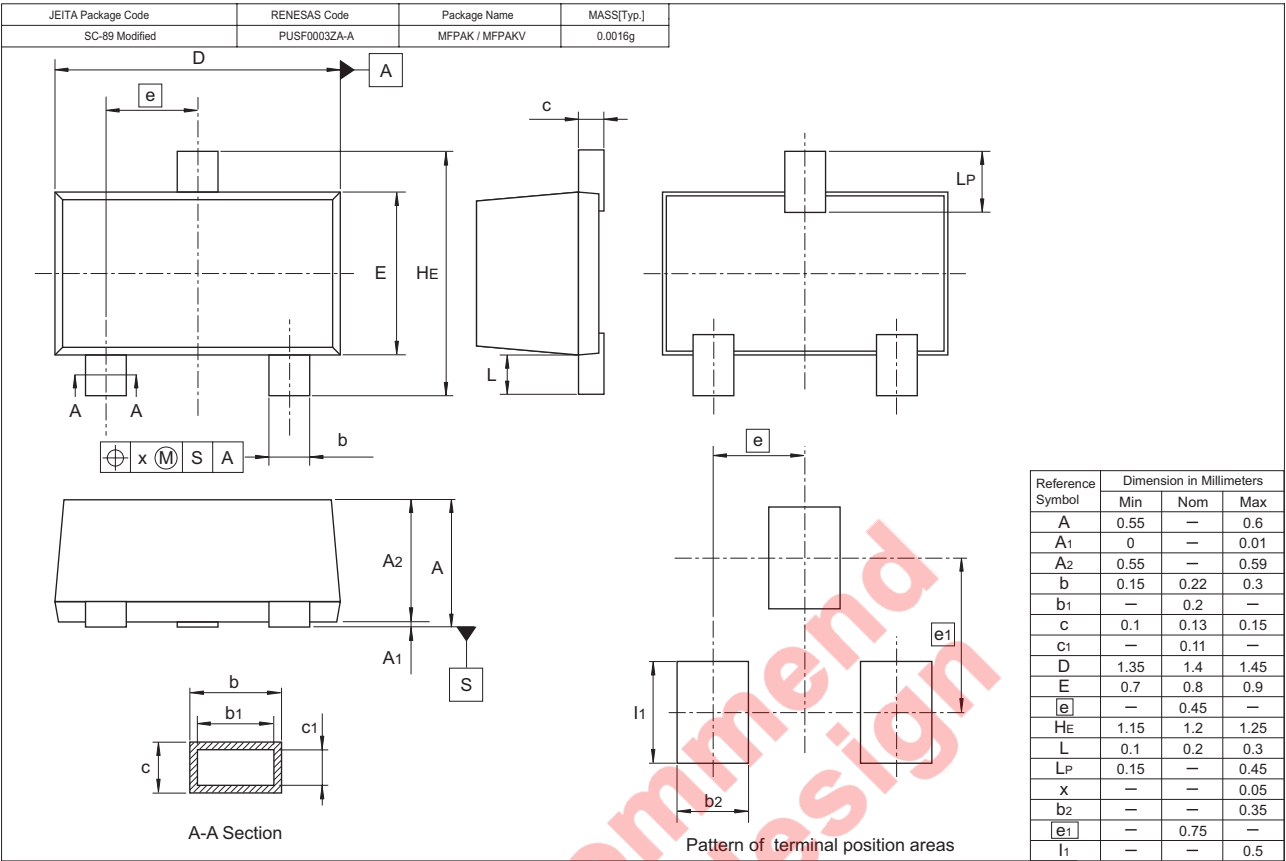
f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.855	-16.3	15.67	165.4	0.018	81.2	0.962	-10.7
200	0.784	-32.7	14.42	152.1	0.035	72.2	0.889	-20.9
300	0.703	-48.4	12.92	140.6	0.048	65.3	0.791	-28.9
400	0.616	-60.4	11.41	131.2	0.059	61.2	0.698	-34.6
500	0.540	-72.1	10.09	123.5	0.067	58.6	0.618	-38.2
600	0.475	-81.4	8.94	117.2	0.074	57.3	0.549	-40.7
700	0.428	-90.3	8.00	112.3	0.080	56.6	0.492	-42.1
800	0.385	-99.1	7.23	108.2	0.085	56.1	0.445	-42.5
900	0.348	-106.5	6.54	104.2	0.091	56.3	0.404	-42.7
1000	0.320	-113.6	6.00	100.9	0.096	57.3	0.373	-42.0
1100	0.297	-121.6	5.51	98.2	0.101	57.4	0.344	-41.6
1200	0.283	-128.8	5.14	95.4	0.106	57.8	0.321	-40.7
1300	0.271	-134.6	4.80	93.1	0.111	58.7	0.298	-39.1
1400	0.262	-142.4	4.47	90.8	0.117	59.2	0.283	-37.5
1500	0.254	-149.0	4.23	89.0	0.122	60.0	0.263	-36.3
1600	0.246	-155.3	3.99	87.0	0.128	60.5	0.252	-34.6
1700	0.248	-160.8	3.79	85.3	0.134	61.1	0.238	-33.0
1800	0.249	-167.3	3.59	83.7	0.140	61.5	0.226	-31.3
1900	0.253	-172.0	3.44	81.9	0.145	62.1	0.215	-29.6
2000	0.253	-177.5	3.29	80.5	0.151	62.7	0.204	-27.2

Sparameter

(V_{CE} = 1V, I_C = 20mA, Z_o = 50Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.526	-43.0	37.91	148.3	0.015	75.0	0.817	-25.2
200	0.406	-76.6	27.98	127.5	0.025	67.3	0.605	-40.0
300	0.334	-100.0	20.76	115.3	0.033	66.9	0.453	-45.9
400	0.284	-116.6	16.30	108.1	0.040	68.0	0.360	-47.1
500	0.263	-131.4	13.33	103.0	0.047	69.8	0.300	-46.2
600	0.243	-143.4	11.24	99.2	0.055	71.1	0.257	-44.4
700	0.242	-152.6	9.74	96.3	0.063	72.0	0.226	-41.4
800	0.236	-159.6	8.57	93.6	0.071	72.7	0.203	-38.2
900	0.230	-167.8	7.62	91.4	0.078	73.5	0.184	-34.3
1000	0.239	-173.4	6.91	89.4	0.086	74.1	0.170	-30.5
1100	0.240	-179.4	6.31	87.7	0.094	73.9	0.160	-26.8
1200	0.247	175.6	5.82	85.9	0.102	74.1	0.150	-22.6
1300	0.246	172.4	5.38	84.4	0.110	74.4	0.143	-18.1
1400	0.255	167.4	5.02	82.9	0.117	74.3	0.138	-14.0
1500	0.257	163.8	4.71	81.3	0.126	74.2	0.133	-9.6
1600	0.265	160.2	4.45	80.1	0.134	74.4	0.130	-5.3
1700	0.268	158.7	4.19	78.9	0.142	74.2	0.128	-1.2
1800	0.282	154.1	3.97	77.6	0.149	73.9	0.125	2.5
1900	0.283	152.7	3.80	76.4	0.157	74.1	0.123	7.1
2000	0.300	150.3	3.63	75.4	0.165	73.7	0.123	11.8

Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SC5700WB-TR-E	9000	φ 178 mm Reel, 8 mm Emboss Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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