2SC5624

Silicon NPN Epitaxial
High Frequency Low Noise Amplifier

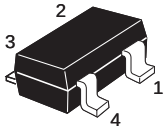
REJ03G0129-0300
Rev.3.00
Feb.21.2005

Features

- High gain bandwidth product
  f_T = 28 GHz typ.
- High power gain and low noise figure;
  PG = 18 dB typ., NF = 1.2 dB typ. at f = 1.8 GHz

Outline

RENESAS Package code: PTSP0004ZA-A
(Package name: CMPAK-4)



1. Emitter
2. Collector
3. Emitter
4. Base

Note: Marking is “VH-”.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	10	V
Collector to emitter voltage	V_{CEO}	3.5	V
Emitter to base voltage	V_{EBO}	0.8	V
Collector current	I_C	35	mA
Collector power dissipation	Pc	100	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	−55 to +150	°C

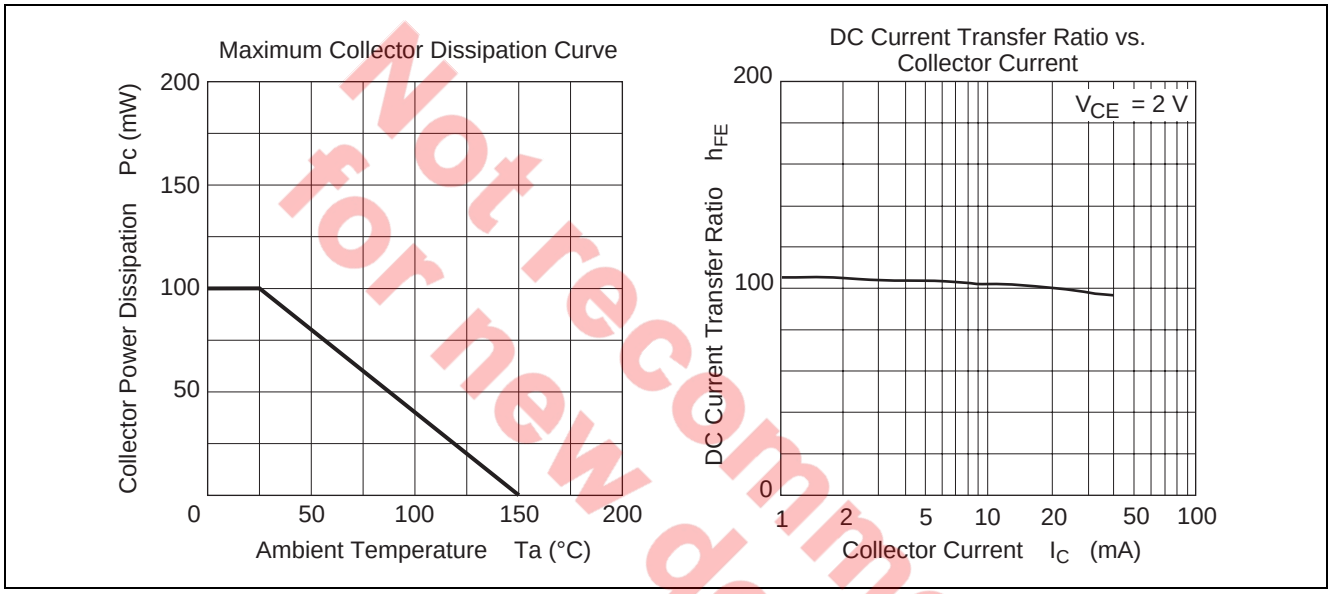
Note: Value on PCB (40 x 40 x 1.0mm)

Electrical Characteristics

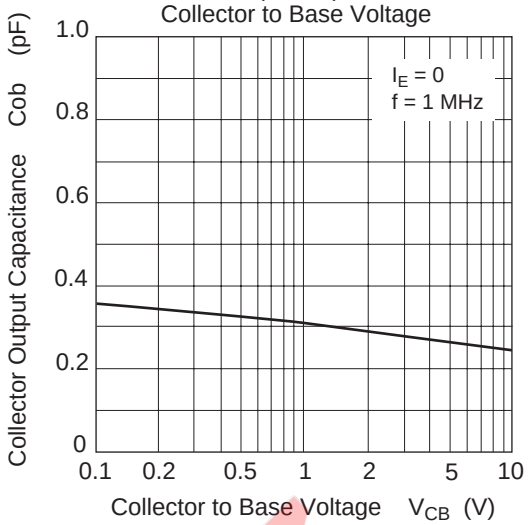
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector cutoff current	I_{CBO}	—	—	1	µA	V_{CB} = 8 V, I_E = 0
Collector cutoff current	I_{CEO}	—	—	1	µA	V_{CE} = 3 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 0.8 V, I_C = 0
DC current transfer ratio	h_{FE}	80	120	160		V_{CE} = 2 V, I_C = 20 mA
Collector output capacitance	Cob	—	0.3	0.6	pF	V_{CB} = 2 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	25	28	—	GHz	V_{CE} = 2 V, I_C = 30 mA, f = 2 GHz
Power gain	PG	14	18	—	dB	V_{CE} = 2 V, I_C = 30 mA, f = 1.8 GHz
Noise figure	NF	—	1.2	1.6	dB	V_{CE} = 2 V, I_C = 5 mA, f = 1.8 GHz

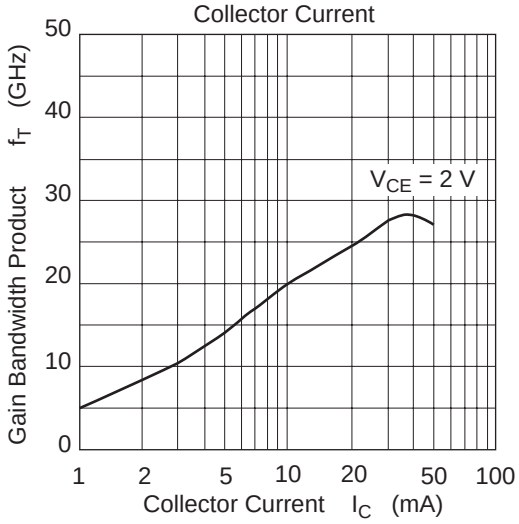
Main Characteristics



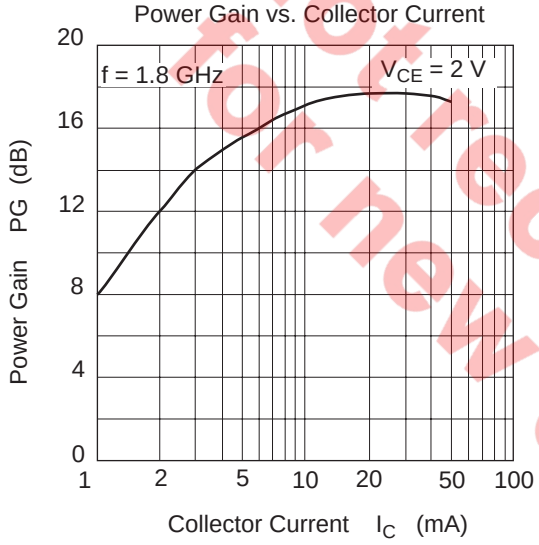
Collector Output Capacitance vs. Collector to Base Voltage



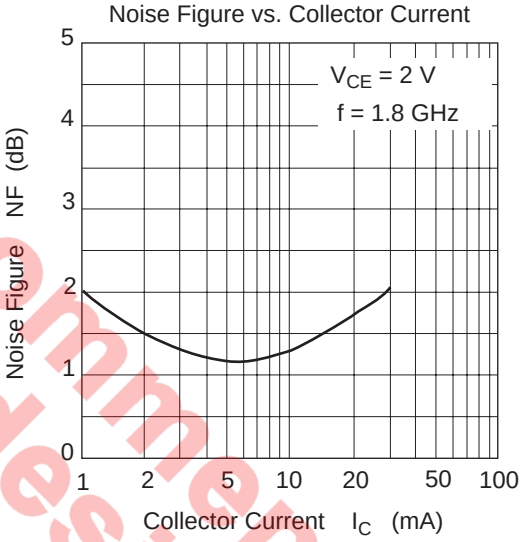
Gain Bandwidth Product vs. Collector Current



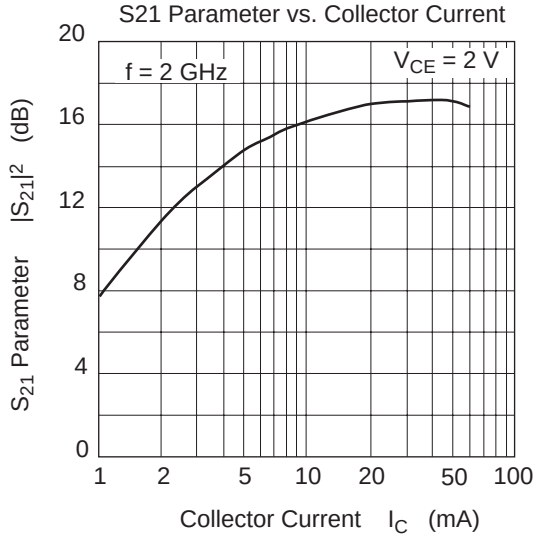
Power Gain vs. Collector Current



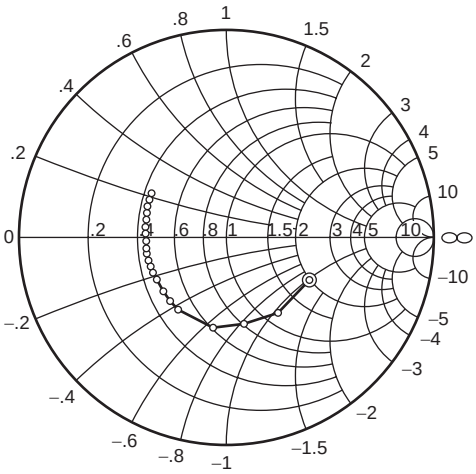
Noise Figure vs. Collector Current



S21 Parameter vs. Collector Current



S11 Parameter vs. Frequency

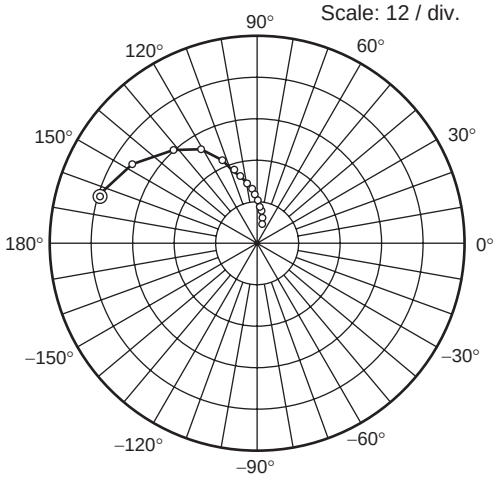


Condition ; V_{CE} = 2 V, I_C = 30 mA

100 to 3000 MHz (100 MHz step)

S21 Parameter vs. Frequency

Scale: 12 / div.

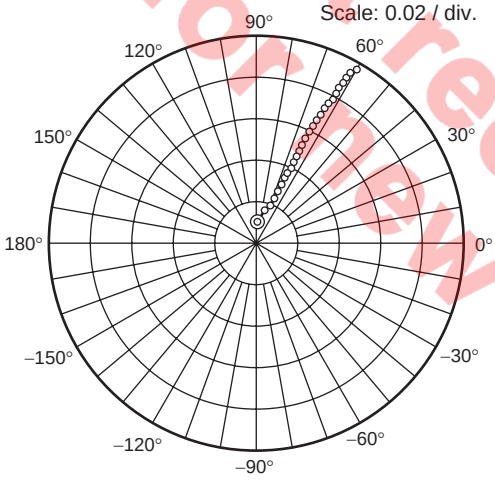


Condition ; V_{CE} = 2 V, I_C = 30 mA

100 to 3000 MHz (100 MHz step)

S12 Parameter vs. Frequency

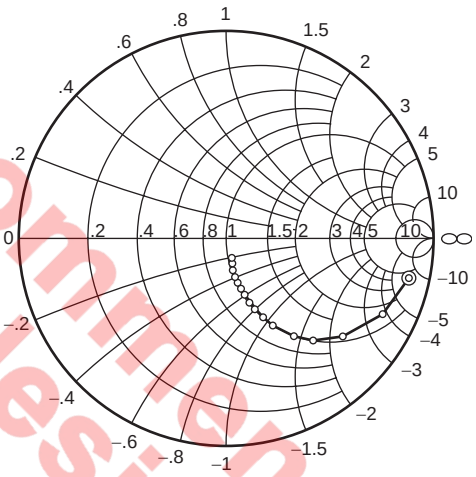
Scale: 0.02 / div.



Condition ; V_{CE} = 2 V, I_C = 30 mA

100 to 3000 MHz (100 MHz step)

S22 Parameter vs. Frequency



Condition ; V_{CE} = 2 V, I_C = 30 mA

100 to 3000 MHz (100 MHz step)

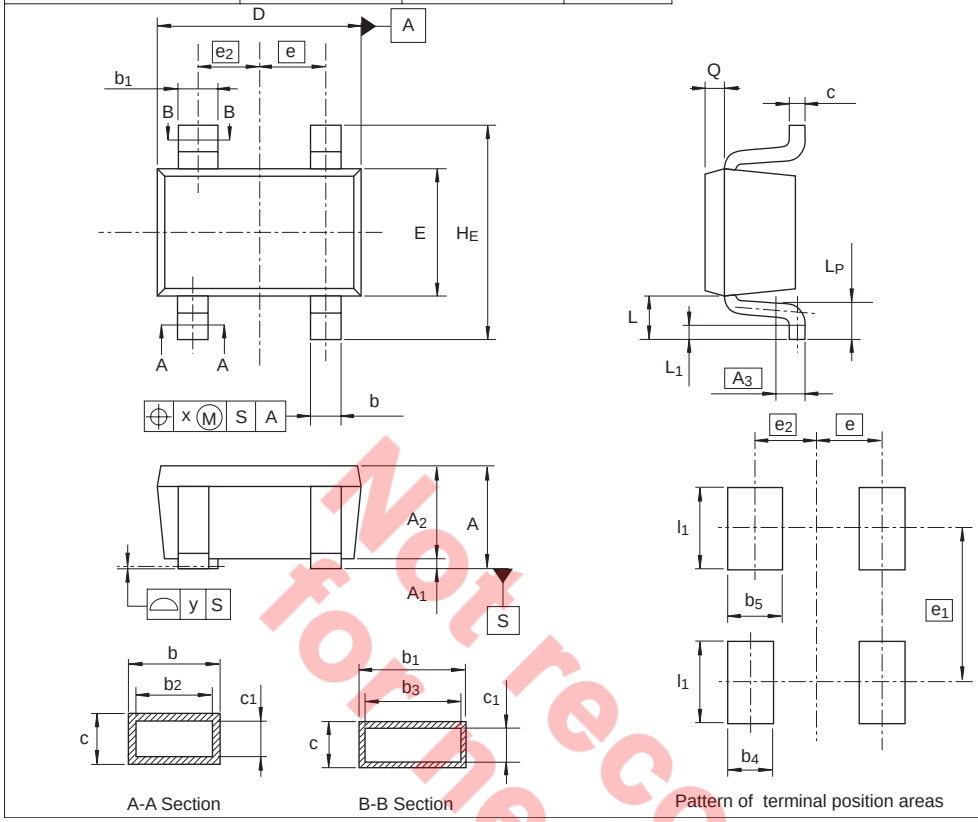
S Parameter

(V_{CE} = 2 V, I_C = 30 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.445	–27.3	46.66	163.5	0.0055	83.8	0.904	–12.9
200	0.447	–54.4	42.27	147.1	0.0115	78.6	0.846	–26.8
300	0.439	–78.7	36.16	133.0	0.0165	73.6	0.750	–39.3
400	0.432	–98.8	30.59	122.2	0.0207	68.8	0.650	–48.8
500	0.424	–112.8	25.84	114.5	0.0246	67.1	0.561	–55.9
600	0.414	–124.3	22.15	108.9	0.0277	66.1	0.487	–61.4
700	0.407	–133.4	19.22	104.4	0.0307	65.0	0.426	–65.3
800	0.398	–141.5	16.94	100.8	0.0335	65.3	0.376	–68.6
900	0.390	–147.9	15.05	97.7	0.0372	64.4	0.335	–70.7
1000	0.386	–154.1	13.63	95.3	0.0398	65.1	0.301	–72.5
1100	0.381	–159.0	12.45	93.3	0.0420	65.2	0.273	–73.7
1200	0.377	–164.0	11.48	91.3	0.0452	65.0	0.250	–74.5
1300	0.371	–167.8	10.60	89.6	0.0480	64.5	0.229	–74.9
1400	0.370	–171.8	9.84	87.7	0.0509	64.7	0.213	–75.1
1500	0.367	–175.7	9.23	86.1	0.0535	64.3	0.197	–75.2
1600	0.368	–178.8	8.66	84.7	0.0567	64.1	0.186	–74.7
1700	0.370	178.0	8.16	83.4	0.0595	64.4	0.173	–74.7
1800	0.360	174.7	7.72	82.2	0.0623	64.3	0.164	–74.0
1900	0.365	172.0	7.33	80.8	0.0651	64.0	0.156	–73.6
2000	0.365	168.9	6.95	79.4	0.0682	63.8	0.148	–72.7
2100	0.362	166.8	6.66	78.2	0.0709	63.1	0.142	–72.0
2200	0.372	164.1	6.35	77.0	0.0737	63.0	0.135	–71.3
2300	0.370	160.9	6.08	75.6	0.0764	62.3	0.130	–70.8
2400	0.372	159.0	5.86	74.6	0.0795	62.3	0.125	–69.9
2500	0.378	156.6	5.64	73.5	0.0824	62.0	0.121	–68.7
2600	0.370	154.5	5.42	72.3	0.0848	61.6	0.117	–68.5
2700	0.382	152.2	5.24	71.3	0.0874	61.7	0.113	–67.1
2800	0.388	150.7	5.03	70.3	0.0906	60.7	0.109	–66.8
2900	0.387	147.6	4.86	69.0	0.0928	61.0	0.105	–65.7
3000	0.388	146.9	4.72	67.9	0.0964	59.7	0.102	–65.5

Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-82A	PTSP0004ZA-A	CMPAK-4(T) / CMPAK-4(T)V	0.006g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.8	—	1.1
A_1	0	—	0.1
A_2	0.8	0.9	1.0
$\boxed{A_3}$	—	0.25	—
b	0.25	0.32	0.4
b_1	0.35	0.42	0.5
b_2	—	0.3	—
b_3	—	0.4	—
c	0.1	0.13	0.15
c_1	—	0.11	—
D	1.8	2.0	2.2
E	1.15	1.25	1.35
$\boxed{e}$	—	0.65	—
$\boxed{e_2}$	—	0.6	—
H_E	1.8	2.1	2.4
L	0.3	—	0.7
L_1	0.1	—	0.5
L_P	0.2	—	0.6
x	—	—	0.05
y	—	—	0.05
b_4	—	—	0.45
b_5	—	—	0.55
$\boxed{e_1}$	—	1.5	—
l_1	—	—	0.9
Q	—	0.2	—

Ordering Information

Part Name	Quantity	Shipping Container
2SC5624VH-TL-E	3000 pcs.	ϕ178 Reel, 8 mm Taping

Note: Therefore especially small contact area of terminal, miss contact may occur if inadequate soldering condition is applied.
Contact Renesas sales office for any question regarding recommended soldering condition of Renesas.

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

RENESAS SALES OFFICES

http://www.renesas.com

Refer to "**http://www.renesas.com/en/network**" for the latest and detailed information.

Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.
Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

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