To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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2SC4901

Silicon NPN Epitaxial

REJ03G0733-0300
(Previous ADE-208-1127A)
Rev.3.00
Aug.10.2005

Application

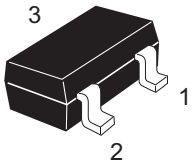
UHF / VHF wide band amplifier

Features

- High gain bandwidth product
  f_T = 9 GHz Typ
- High gain, low noise figure
  PG = 13.0 dB Typ, NF = 1.2 dB Typ at f = 900 MHz

Outline

RENESAS Package code: PTSP0003ZA-A
(Package name: CMPAK®)



1. Emitter
2. Base
3. Collector

Note: Marking is “YK–”.

*CMPAK is a trademark of Renesas Technology Corp.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	9	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	100	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

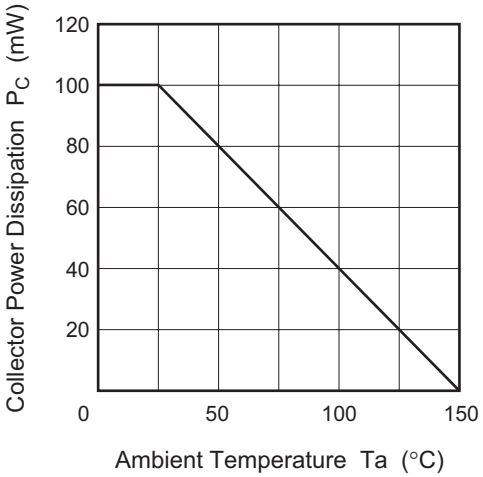
Electrical Characteristics

(Ta = 25°C)

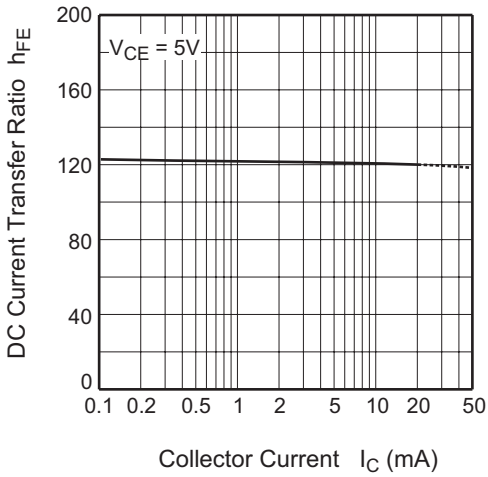
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	10	µA	V_{CB} = 12 V, I_E = 0
	I_{CEO}	—	—	1	mA	V_{CE} = 9 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 1.5 V, I_C = 0
DC current transfer ratio	h_{FE}	50	120	250		V_{CE} = 5 V, I_C = 20 mA
Collector output capacitance	Cob	—	0.9	1.4	pF	V_{CB} = 5 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	6.0	9.0	—	GHz	V_{CE} = 5 V, I_C = 20 mA
Power gain	PG	10.0	13.0	—	dB	V_{CE} = 5 V, I_C = 20 mA, f = 900 MHz
Noise figure	NF	—	1.2	2.5	dB	V_{CE} = 5 V, I_C = 5 mA, f = 900 MHz

Main Characteristics

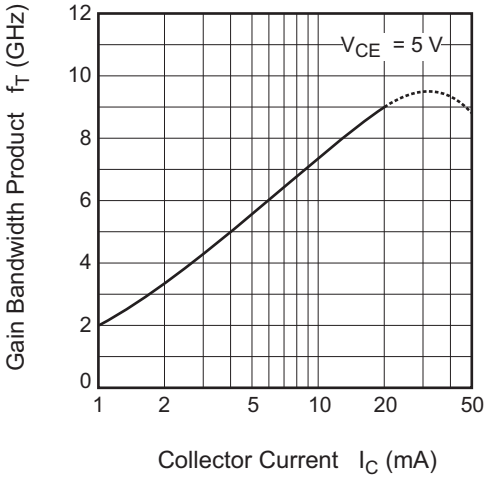
Maximum Collector Dissipation Curve



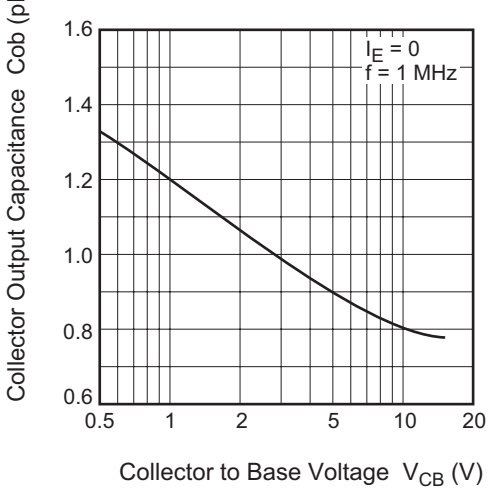
DC Current Transfer Ratio vs. Collector Current



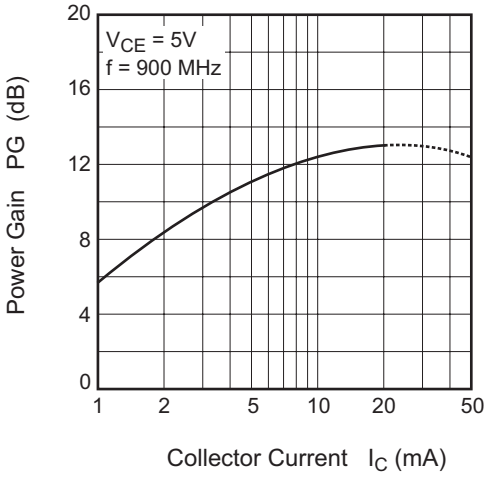
Gain Bandwidth Product vs. Collector Current



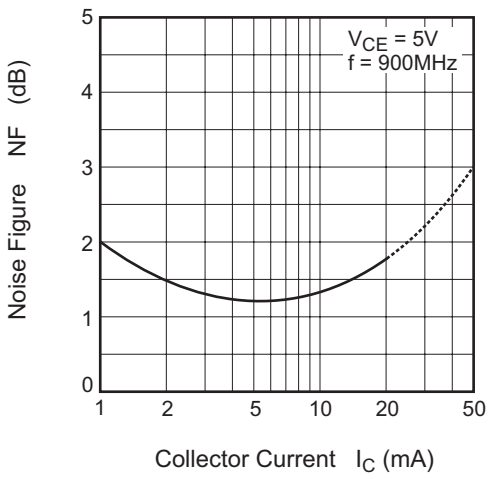
Collector Output Capacitance vs. Collector to Base Voltage



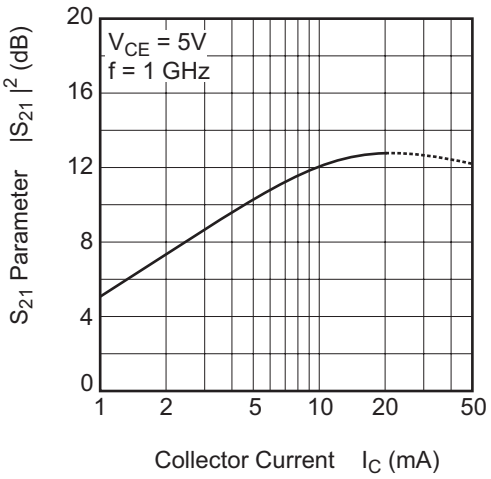
Power Gain vs. Collector Current



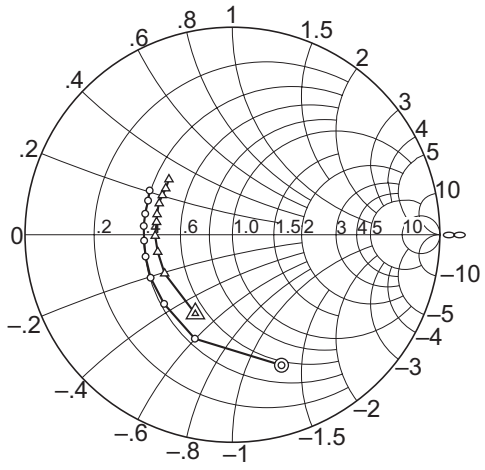
Noise Figure vs. Collector Current



S21 Parameter vs. Collector Current

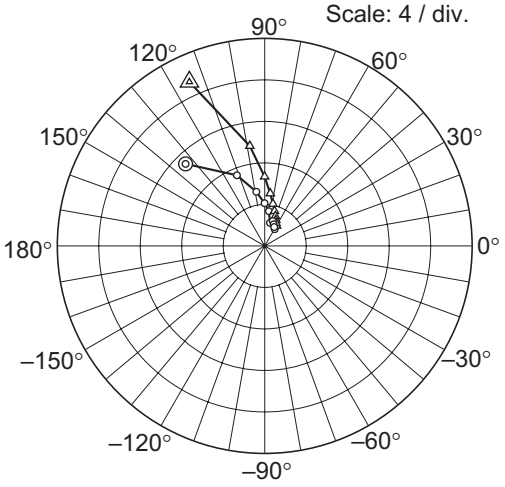


S11 Parameter vs. Frequency



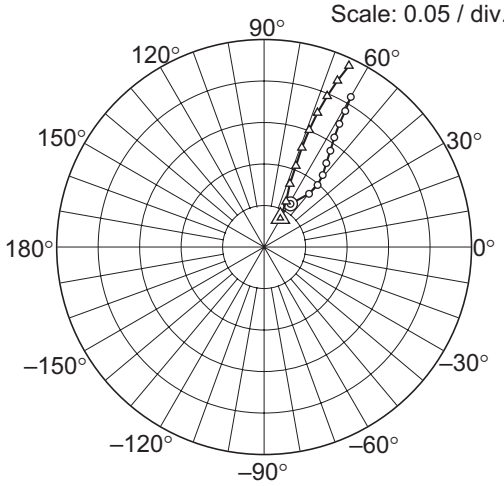
Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S21 Parameter vs. Frequency
Scale: 4 / div.



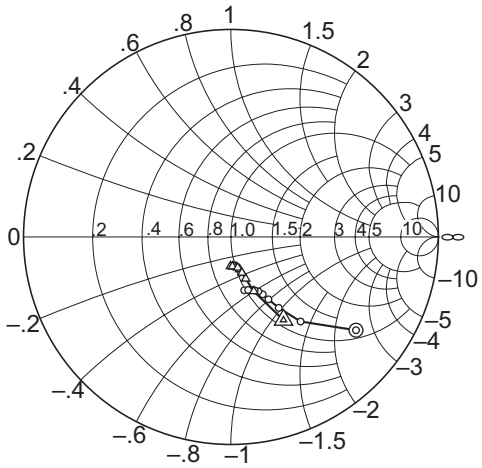
Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S12 Parameter vs. Frequency
Scale: 0.05 / div.



Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S22 Parameter vs. Frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S Parameter

(V_{CE} = 5 V, I_C = 5 mA, Z_O = 50 Ω, Emitter common)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.672	–69.4	10.99	134.0	0.0610	58.8	0.752	–26.7
400	0.533	–109.9	7.32	111.5	0.0841	49.9	0.528	–50.5
600	0.469	–134.7	5.28	98.8	0.0989	49.3	0.412	–56.0
800	0.446	–152.3	4.12	90.2	0.112	50.9	0.351	–59.0
1000	0.432	–165.9	3.37	83.2	0.126	53.5	0.316	–61.0
1200	0.427	–176.2	2.88	77.2	0.141	55.5	0.294	–63.3
1400	0.430	174.1	2.52	72.1	0.157	57.4	0.282	–66.0
1600	0.433	166.5	2.26	67.5	0.174	58.6	0.274	–69.1
1800	0.439	158.0	2.04	63.3	0.191	59.2	0.269	–72.0
2000	0.453	151.9	1.88	59.2	0.209	60.0	0.265	–76.0

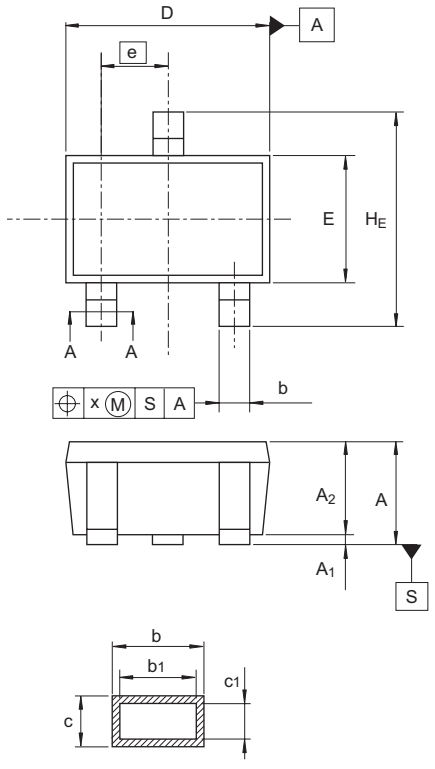
S Parameter

(V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω, Emitter common)

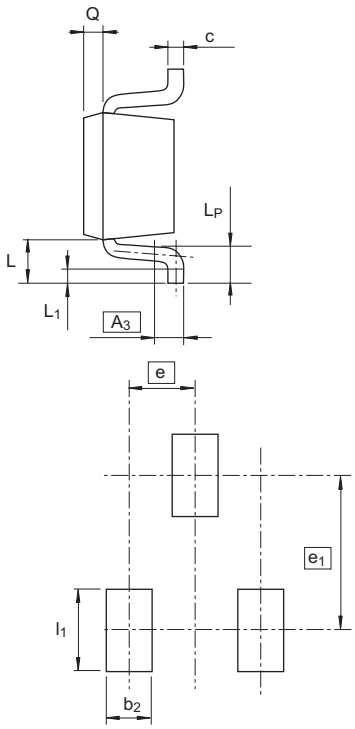
Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.421	–115.2	17.40	114.7	0.0399	50.6	0.474	–57.7
400	0.377	–150.2	9.74	98.5	0.0609	64.2	0.284	–67.2
600	0.370	–167.0	6.68	90.1	0.0822	67.8	0.213	–70.5
800	0.373	–179.1	5.09	84.0	0.105	68.6	0.180	–72.9
1000	0.371	170.6	4.13	79.0	0.128	69.2	0.161	–74.9
1200	0.377	164.9	3.49	74.3	0.151	68.9	0.151	–77.6
1400	0.384	156.9	3.04	70.3	0.174	68.3	0.146	–80.7
1600	0.388	150.7	2.71	66.8	0.197	67.3	0.143	–83.5
1800	0.392	145.3	2.45	63.3	0.219	66.2	0.142	–87.2
2000	0.406	139.0	2.25	59.5	0.241	64.9	0.141	–91.0

Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-70	PTSP0003ZA-A	CMPAK / CMPAKV	0.006g



A-A Section



Pattern of terminal position areas

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
A_3	—	0.25	—
b	0.25	0.32	0.4
b_1	—	0.3	—
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
e	—	0.65	—
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
b_2	—	—	0.45
e_1	—	1.5	—
l_1	—	—	0.9
Q	—	0.2	—

Ordering Information

Part Name	Quantity	Shipping Container
2SC4901YK-TL-E	3000	ϕ 178 mm Reel, 8 mm Emboss Taping

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http://www.renesas.com

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Colophon .3.0