

2SC4926

R07DS0277EJ0400
 (Previous: REJ03G0735-0300)
 Rev.4.00
 Mar 28, 2011

Silicon NPN Epitaxial

Application

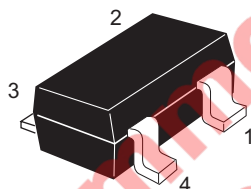
VHF / UHF wide band amplifier

Features

- High gain bandwidth product
 $f_T = 11 \text{ GHz Typ}$
- High gain, low noise figure
 $PG = 16.5 \text{ dB Typ, NF} = 1.1 \text{ dB Typ at } f = 900 \text{ MHz}$

Outline

RENESAS Package code: PLSP0004ZA-A
 (Package name: MPAK-4)



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

Note: Marking is "YD-".

Attention: This is electrostatic sensitive device.

Absolute Maximum Ratings

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

| Item | Symbol | Ratings | Unit |
|------------------------------|-----------|-------------|------------------|
| Collector to base voltage | V_{CBO} | 15 | V |
| Collector to emitter voltage | V_{CEO} | 8 | V |
| Emitter to base voltage | V_{EBO} | 1.5 | V |
| Collector current | I_C | 50 | mA |
| Collector power dissipation | P_C | 150 | mW |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

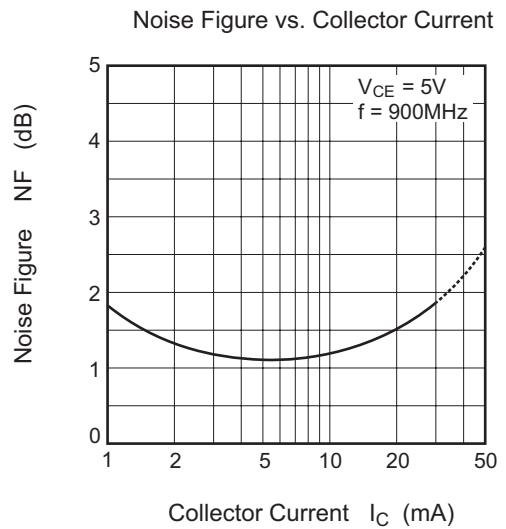
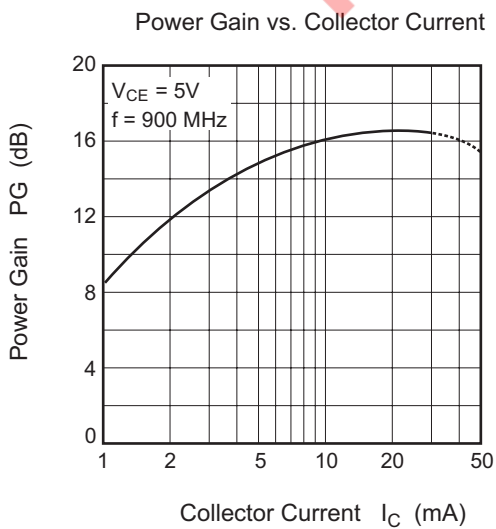
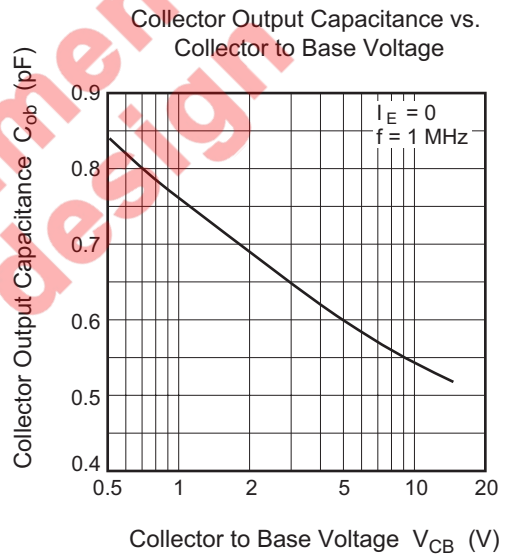
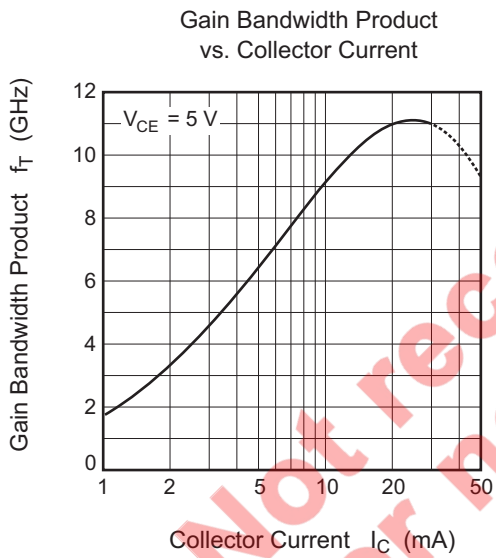
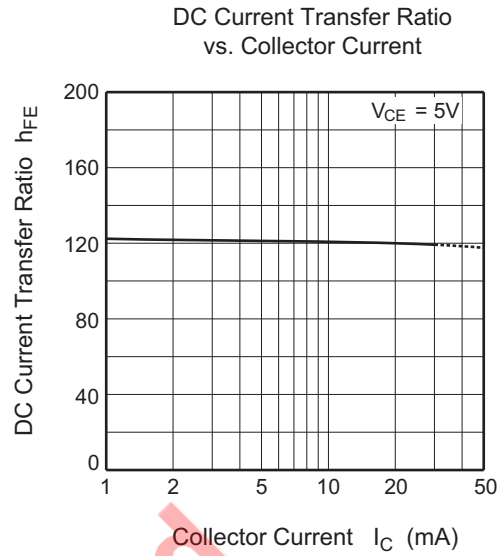
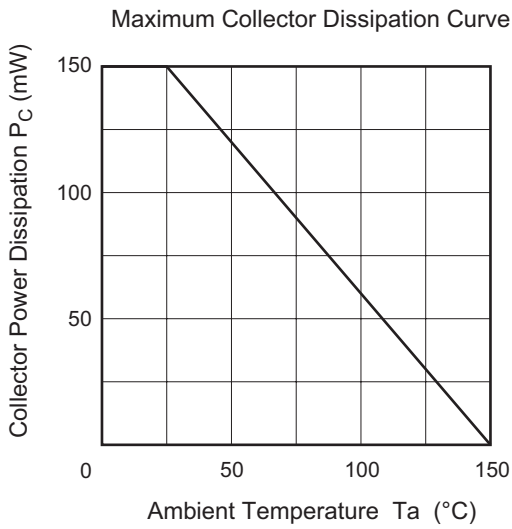
Electrical Characteristics

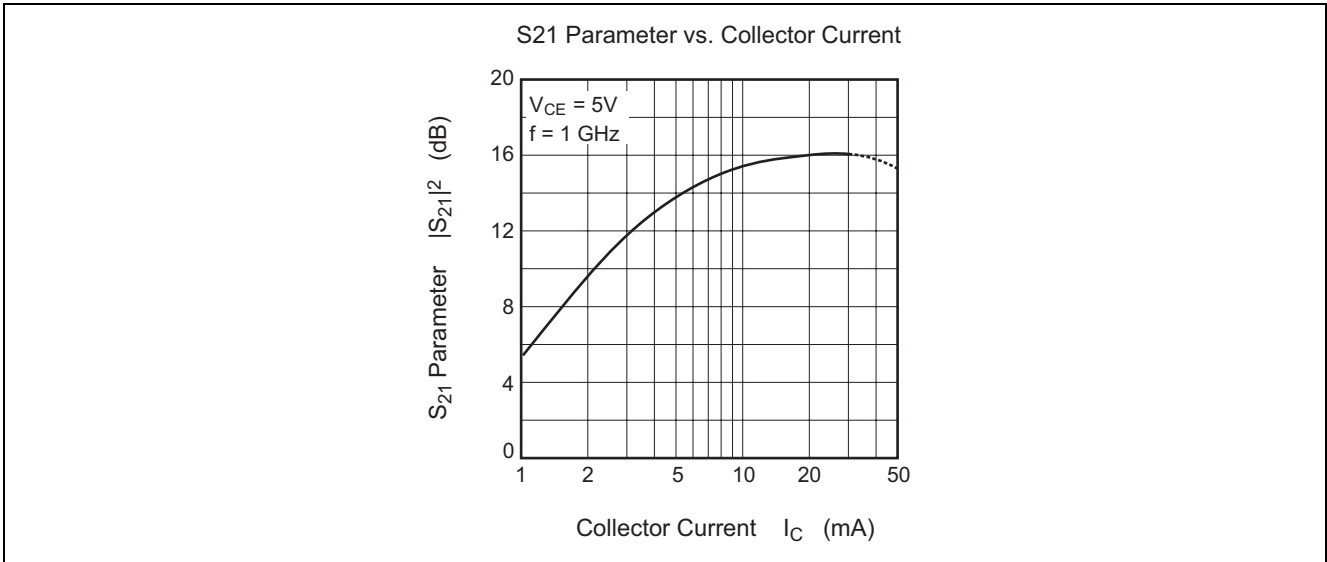
(Ta = 25°C)

| 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} | — | — | 10 | μA | $V_{CB} = 12 V, I_E = 0$ |
| | I_{CEO} | — | — | 1 | mA | $V_{CE} = 8 V, R_{BE} = \infty$ |
| 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 | C_{ob} | — | 0.6 | 1.1 | pF | $V_{CB} = 5 V, I_E = 0,$ $f = 1 MHz$ |
| Gain bandwidth product | f_T | 8.0 | 11.0 | — | GHz | $V_{CE} = 5 V, I_C = 20 mA$ |
| S_{21} Parameter | $ S_{21} ^2$ | — | 16 | — | dB | $V_{CE} = 5 V, I_C = 20 mA,$ $f = 1000 MHz$ |
| Power gain | PG | 13.5 | 16.5 | — | dB | $V_{CE} = 5 V, I_C = 20 mA,$ $f = 900 MHz$ |
| Noise figure | NF | — | 1.1 | 2.0 | dB | $V_{CE} = 5 V, I_C = 5 mA,$ $f = 900 MHz$ |

Not recommend
for new design

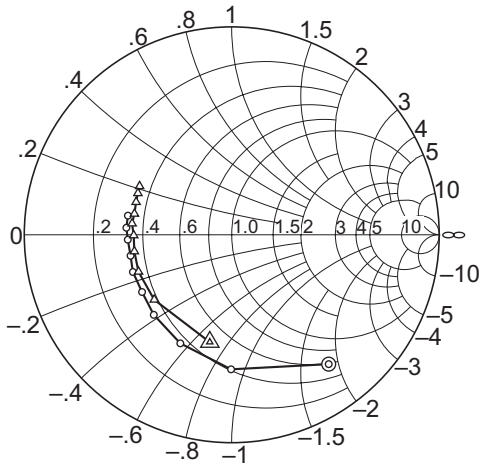
Main Characteristics





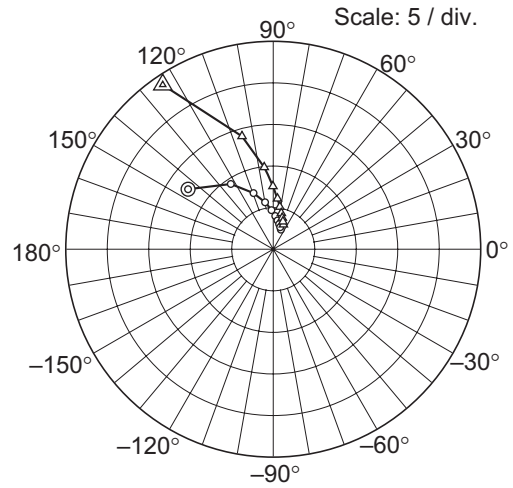
Not recommend
for new design

S11 Parameter vs. Frequency



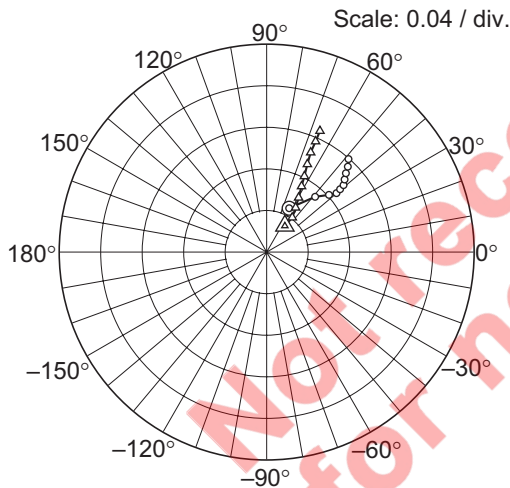
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ ($I_C = 5\text{ mA}$)
 △ ($I_C = 20\text{ mA}$)

S21 Parameter vs. Frequency



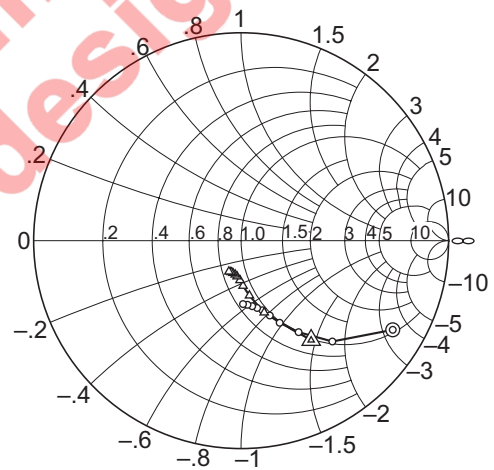
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ ($I_C = 5\text{ mA}$)
 △ ($I_C = 20\text{ mA}$)

S12 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ ($I_C = 5\text{ mA}$)
 △ ($I_C = 20\text{ mA}$)

S22 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ ($I_C = 5\text{ mA}$)
 △ ($I_C = 20\text{ mA}$)

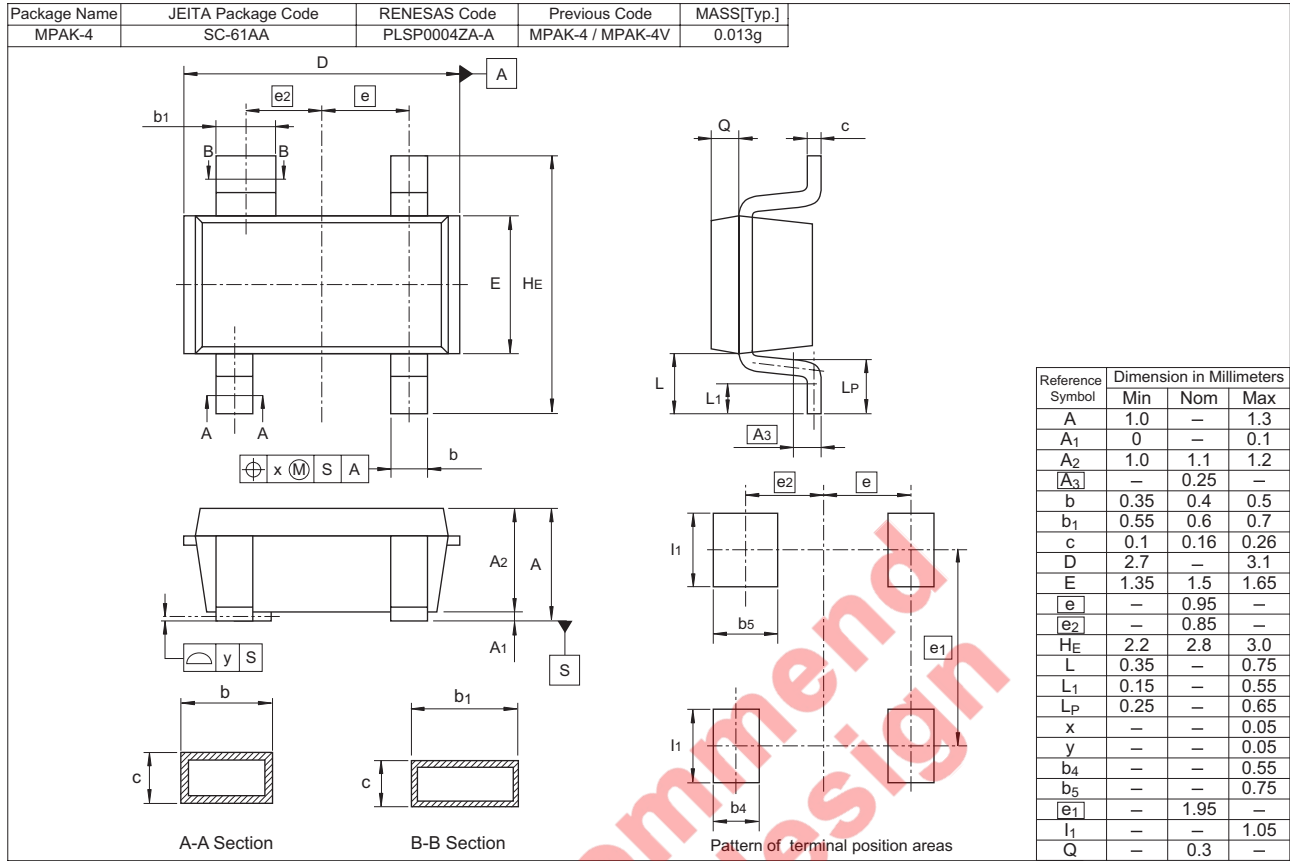
S Parameter $(V_{CE} = 5\text{ V}, I_C = 5\text{ mA}, Z_O = 50\ \Omega, \text{Emitter common})$

| Freq. (MHz) | S11 | | S21 | | S12 | | S22 | |
|----------------|-------|--------|-------|-------|--------|------|-------|-------|
| | MAG. | ANG. | MAG. | ANG. | MAG. | ANG. | MAG. | ANG. |
| 200 | 0.777 | -53.1 | 12.52 | 144.9 | 0.0475 | 62.8 | 0.849 | -30.4 |
| 400 | 0.647 | -90.3 | 9.36 | 123.1 | 0.0708 | 48.7 | 0.655 | -47.8 |
| 600 | 0.579 | -115.4 | 7.16 | 109.4 | 0.0817 | 42.5 | 0.522 | -57.8 |
| 800 | 0.538 | -134.3 | 5.73 | 99.9 | 0.0880 | 40.1 | 0.438 | -64.8 |
| 1000 | 0.513 | -147.5 | 4.70 | 92.6 | 0.0933 | 40.5 | 0.386 | -69.0 |
| 1200 | 0.508 | -159.4 | 4.00 | 86.5 | 0.0980 | 41.0 | 0.350 | -72.9 |
| 1400 | 0.500 | -168.3 | 3.49 | 81.6 | 0.102 | 42.9 | 0.333 | -76.6 |
| 1600 | 0.501 | -177.3 | 3.09 | 76.8 | 0.108 | 44.8 | 0.319 | -80.4 |
| 1800 | 0.508 | 176.2 | 2.78 | 72.5 | 0.113 | 46.4 | 0.310 | -84.3 |
| 2000 | 0.510 | 169.6 | 2.53 | 68.7 | 0.119 | 48.6 | 0.305 | -88.3 |

S Parameter $(V_{CE} = 5\text{ V}, I_C = 20\text{ mA}, Z_O = 50\ \Omega, \text{Emitter common})$

| Freq. (MHz) | S11 | | S21 | | S12 | | S22 | |
|----------------|-------|--------|-------|-------|--------|------|-------|--------|
| | MAG. | ANG. | MAG. | ANG. | MAG. | ANG. | MAG. | ANG. |
| 200 | 0.527 | -101.6 | 23.79 | 124.0 | 0.0307 | 55.1 | 0.587 | -54.9 |
| 400 | 0.488 | -140.1 | 14.12 | 105.5 | 0.0413 | 53.4 | 0.363 | -72.2 |
| 600 | 0.482 | -158.4 | 9.89 | 96.3 | 0.0510 | 56.8 | 0.267 | -81.4 |
| 800 | 0.478 | -170.3 | 7.56 | 90.3 | 0.0606 | 59.5 | 0.218 | -87.6 |
| 1000 | 0.474 | -179.6 | 6.10 | 85.2 | 0.0716 | 62.0 | 0.191 | -91.7 |
| 1200 | 0.484 | 173.6 | 5.14 | 81.2 | 0.0817 | 63.5 | 0.174 | -96.5 |
| 1400 | 0.481 | 167.9 | 4.44 | 77.4 | 0.0931 | 65.1 | 0.166 | -100.0 |
| 1600 | 0.486 | 161.2 | 3.92 | 74.0 | 0.105 | 66.1 | 0.161 | -104.4 |
| 1800 | 0.496 | 156.2 | 3.52 | 70.7 | 0.117 | 66.1 | 0.159 | -107.9 |
| 2000 | 0.502 | 152.3 | 3.20 | 67.7 | 0.127 | 66.2 | 0.161 | -111.9 |

Package Dimensions



Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|-----------------------|----------|-----------------------------------|
| 2SC4926YD-TL-E | 3000 | φ 178 mm Reel, 8 mm Emboss Taping |
| 2SC4926YD-TL-H | | |

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