

## 2SC4926

Silicon NPN Epitaxial

REJ03G0735-0300  
(Previous ADE-208-1128A)  
Rev.3.00  
Aug.10.2005

### Application

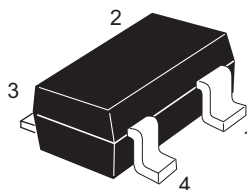
VHF / UHF wide band amplifier

### 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

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

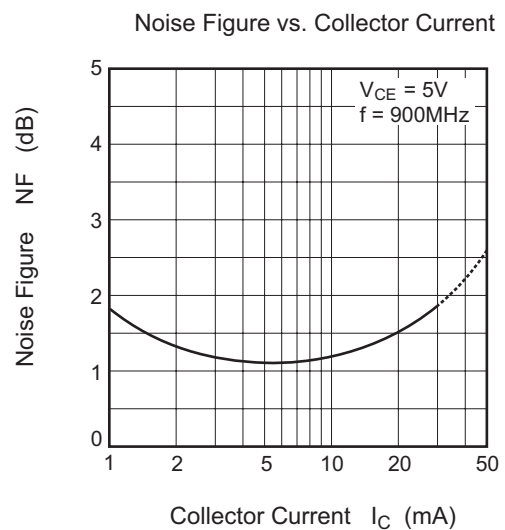
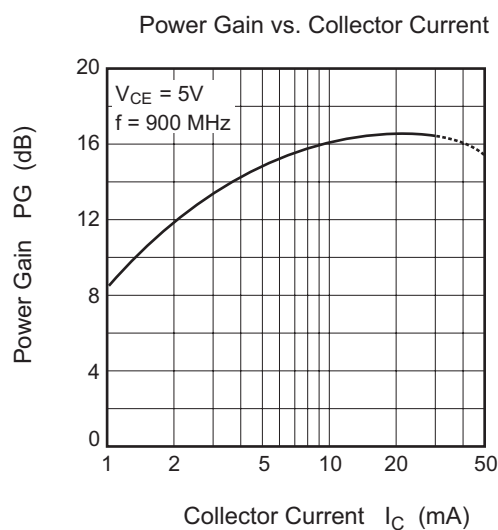
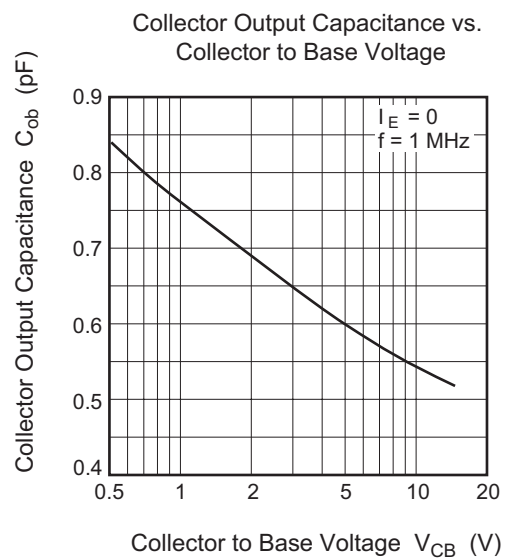
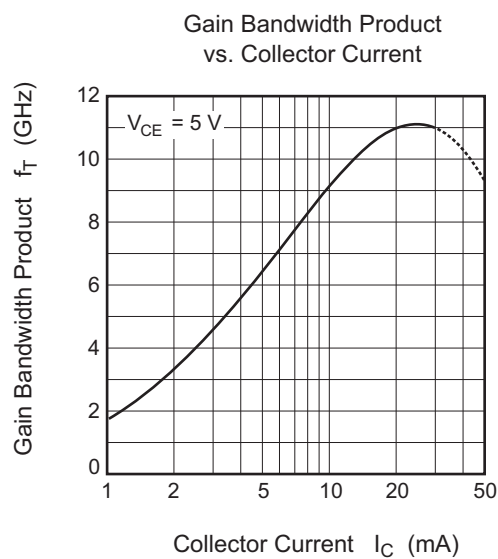
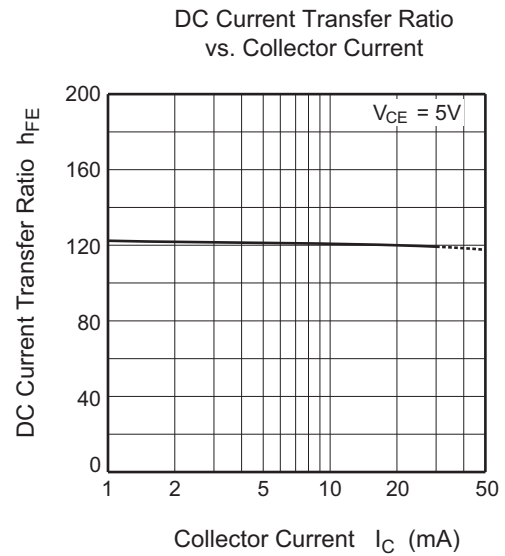
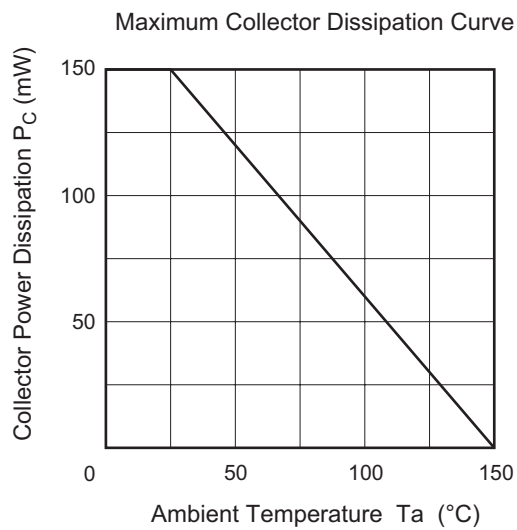
| Item                         | Symbol    | Ratings     | Unit             |
|------------------------------|-----------|-------------|------------------|
| Collector to base voltage    | $V_{CBO}$ | 15          | V                |
| Collector to emitter voltage | $V_{CEO}$ | 8           | V                |
| 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 | $^\circ\text{C}$ |

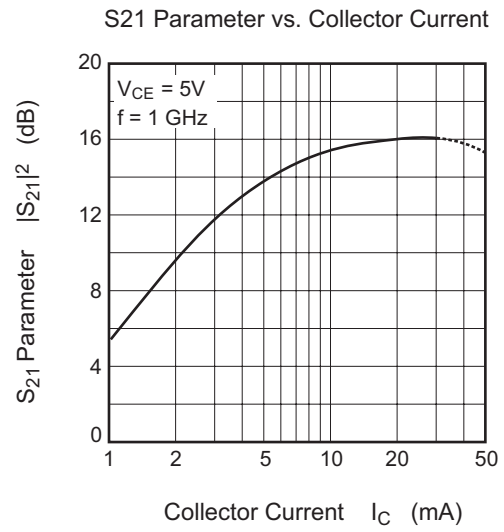
## Electrical Characteristics

(Ta = 25°C)

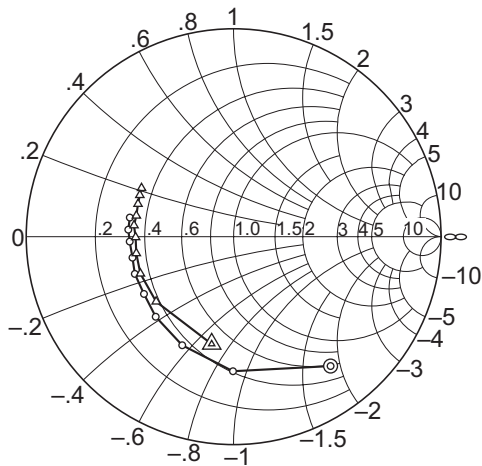
| Item                                | Symbol        | Min  | Typ  | Max | Unit    | Test conditions                                   |
|-------------------------------------|---------------|------|------|-----|---------|---------------------------------------------------|
| Collector to base breakdown voltage | $V_{(BR)CBO}$ | 15   | —    | —   | V       | $I_C = 10\ \mu A, I_E = 0$                        |
| Collector cutoff current            | $I_{CBO}$     | —    | —    | 10  | $\mu A$ | $V_{CB} = 12\ V, I_E = 0$                         |
|                                     | $I_{CEO}$     | —    | —    | 1   | mA      | $V_{CE} = 8\ V, R_{BE} = \infty$                  |
| Emitter cutoff current              | $I_{EBO}$     | —    | —    | 10  | $\mu A$ | $V_{EB} = 1.5\ V, I_C = 0$                        |
| 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      | $V_{CB} = 5\ V, I_E = 0,$<br>$f = 1\ MHz$         |
| 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      | $V_{CE} = 5\ V, I_C = 20\ mA,$<br>$f = 1000\ MHz$ |
| Power gain                          | PG            | 13.5 | 16.5 | —   | dB      | $V_{CE} = 5\ V, I_C = 20\ mA,$<br>$f = 900\ MHz$  |
| Noise figure                        | NF            | —    | 1.1  | 2.0 | dB      | $V_{CE} = 5\ V, I_C = 5\ mA,$<br>$f = 900\ MHz$   |

## Main Characteristics





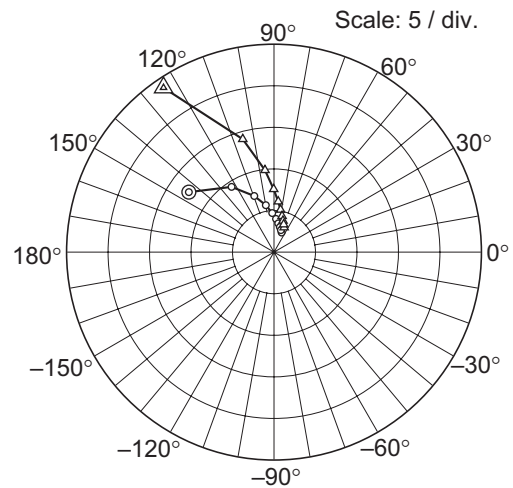
S11 Parameter vs. Frequency



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

○ — ○ ( $I_C = 5 \text{ mA}$ )  
 △ — △ ( $I_C = 20 \text{ mA}$ )

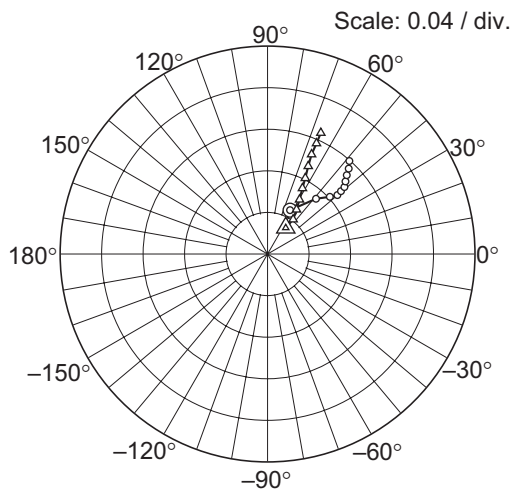
S21 Parameter vs. Frequency



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

○ — ○ ( $I_C = 5 \text{ mA}$ )  
 △ — △ ( $I_C = 20 \text{ mA}$ )

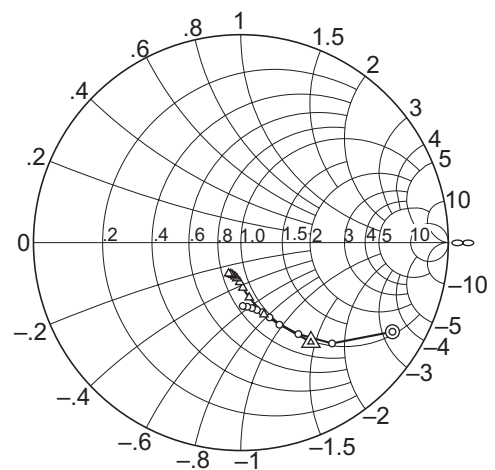
S12 Parameter vs. Frequency



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)

○ — ○ ( $I_C = 5 \text{ mA}$ )  
 △ — △ ( $I_C = 20 \text{ mA}$ )

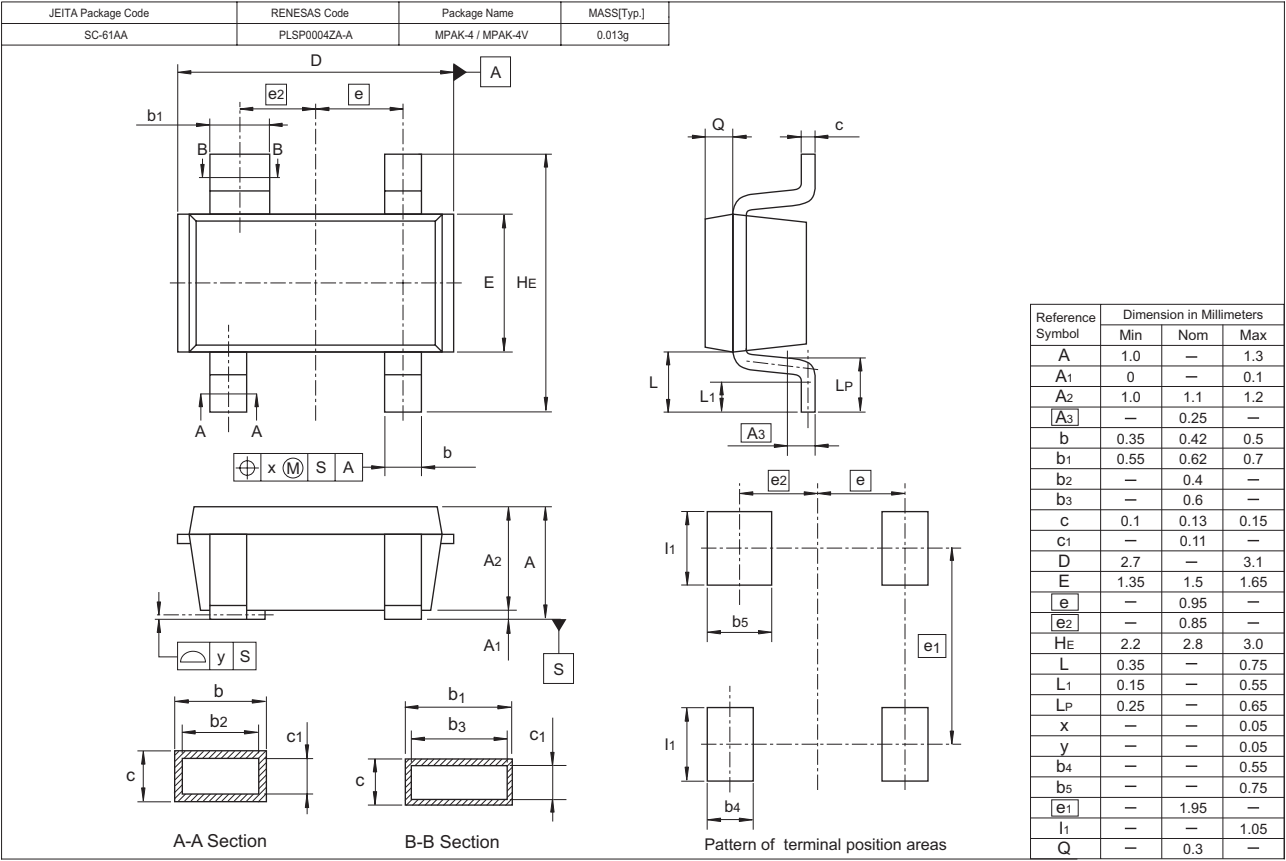
**S Parameter**(V<sub>CE</sub> = 5 V, I<sub>C</sub> = 5 mA, Z<sub>O</sub> = 50 Ω, Emitter common)

| Freq.<br>(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<sub>CE</sub> = 5 V, I<sub>C</sub> = 20 mA, Z<sub>O</sub> = 50 Ω, Emitter common)

| Freq.<br>(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

| Part Name      | Quantity | Shipping Container                |
|----------------|----------|-----------------------------------|
| 2SC4926YD-TL-E | 3000     | 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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