

# **K-Band Doppler Sensor Module**

RF Frequency: 24.05 to 24.25 GHz

Model No. NJR4262

Specifications

Rev.00-02 February 26, 2013

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New Japan Radio Co., Ltd.  
Microwave Components Division

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Category: K-Band Doppler Sensor Module  
 Type Name: NJR4262

Description:

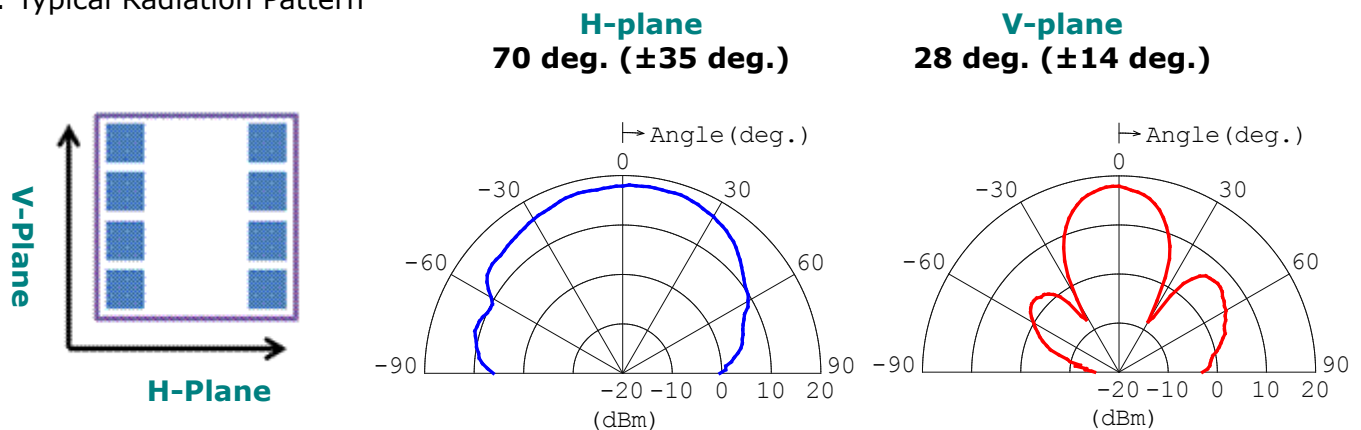
- Motion detector using microwave doppler effect
- Miniaturized RF circuit with MMIC technology
- High accurate I-Q mixer

Specification:

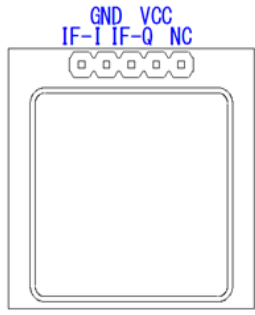
1. Electric Characteristics (Common measure condition Ta= +25 deg.C)

| Item                                  | Specification |             |              | Unit        | Condition / Note  |
|---------------------------------------|---------------|-------------|--------------|-------------|---|
|                                       | Min.          | Typ.        | Max.         |             |   |
| 1.1 Operation voltage                 | 3.3           | -           | 5.5          | V           |   |
| 1.2 Operation current                 | -             | 45          | 55           | mA          |   |
| 1.3 Operation frequency               | 24.05         | -           | 24.25        | GHz         |   |
| 1.4 E.I.R.P.                          | -             | +16<br>(40) | +20<br>(100) | dBm<br>(mW) |   |
| 1.5 Frequency Stability               | -1            | -           | 0            | MHz/deg.C   | Ta= -20 to +60 deg.C  |
| 1.6 Start-up time                     | -             | 4           | 6            | msec        |   |
| 1.7 2nd Harmonics (E.I.R.P.)          | -             | -           | -30          | dBm         |   |
| 1.8 Radiation pattern                 | -             | -           | -            | -           | See Fig.1: Typical Radiation Pattern.                         |
| 1.8.1 -3dB beam width (H-plane)       | -             | 70          | -            | deg.        |   |
| 1.8.2 -3dB beam width (V-plane)       | -             | 28          | -            | deg.        |   |
| 1.8.3 Side lobe suppression (H-plane) | -             | -           | -            | dB          | No side lobe  |
| 1.8.4 Side lobe suppression (V-plane) | -             | 13          | -            | dB          |   |
| 1.9 Noise Voltage                     | -             | -           | 400          | mV          | Upon amplified with 85dB Gain amp.<br>Band width: 10 to 300Hz |
| 1.10 Signal level                     | 0.5           | 0.8         | -            | Vp-p        | Refer to Fig.2 : Signal Test System                           |
| 1.11 Offset voltage                   | 1.1           | 1.35        | 1.6          | V           |   |
| 1.12 I-Q Amplitude Balance            | -3            | -           | +3           | dB          |   |
| 1.13 I-Q Phase Balance                | 85            | -           | 95           | deg.        |   |

Fig.1: Typical Radiation Pattern

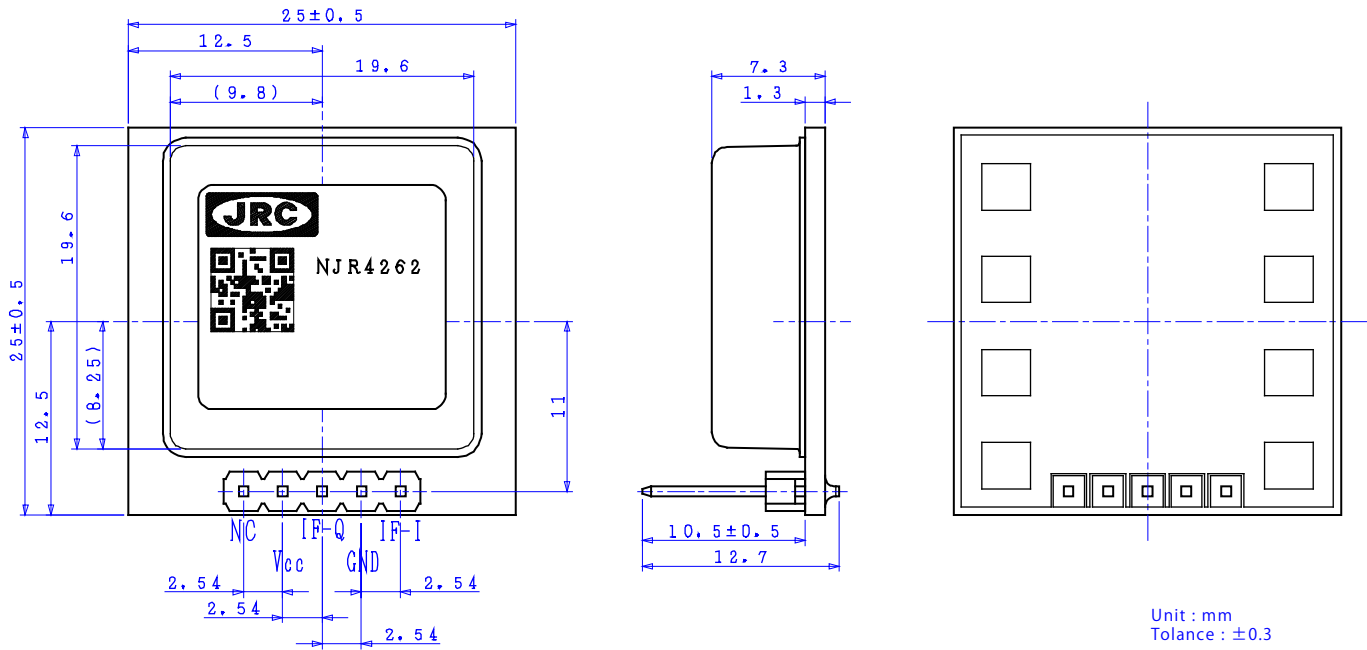


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| 2. Mechanical characteristics    |  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
|----------------------------------|--|------|------|-------|------------------|-----|-------------|------|---|-----|-----|------|---|-----|-----------------|----|----------------|
| Item                             | Specification  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 2.1 Size                         | 25(W) x 25(D) x 7.3(H) mm<br>Tolerance: ±0.5 mm  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 2.2 Weight                       | 7 g max.   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 2.3 Interface / Pin assignment   | Pin Size: 0.64 mm square<br>Pin Pitch: 2.54 mm<br><div style="display: flex; align-items: center; justify-content: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Pin</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>IF-I</td> <td>Doppler signal output(I).<br/>Output impedance:1.5kohm</td> </tr> <tr> <td>GND</td> <td>GND</td> </tr> <tr> <td>IF-Q</td> <td>Doppler signal output(Q).<br/>Output impedance:1.5kohm</td> </tr> <tr> <td>VCC</td> <td>Voltage supply.</td> </tr> <tr> <td>NC</td> <td>No connection.</td> </tr> </tbody> </table> </div> |      |      |       |                  | Pin | Description | IF-I | Doppler signal output(I).<br>Output impedance:1.5kohm | GND | GND | IF-Q | Doppler signal output(Q).<br>Output impedance:1.5kohm | VCC | Voltage supply. | NC | No connection. |
| Pin                              | Description  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| IF-I                             | Doppler signal output(I).<br>Output impedance:1.5kohm  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| GND                              | GND  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| IF-Q                             | Doppler signal output(Q).<br>Output impedance:1.5kohm  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| VCC                              | Voltage supply.  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| NC                               | No connection.   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
|                                  | Recommended via hole diameter: 1.2 ± 0.05 mm   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 3. Environmental characteristics |  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| Item                             | Specification  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 3.1 Operation Temperature        | -20 to +60 deg.C   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 3.2 Storage Temperature          | -40 to +80 deg.C   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 3.3 Humidity                     | 0 to 95 % @ +30 deg.C  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 3.4 Vibration                    | 49.03 m/s <sup>2</sup> (5 G)<br>30 to 50 Hz, 10 minutes, XYZ direction   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 3.5 Shock                        | 196.13 m/s <sup>2</sup> (20 G)<br>Half sine, 11 msec, XYZ direction, 3 times   |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 4. Absolute Maximum Rating       |  |      |      |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| Item                             | Specification  |      |      | Unit  | Condition / Note |     |             |      |   |     |     |      |   |     |                 |    |                |
|                                  | Min.   | Typ. | Max. |       |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 4.1 Supply voltage               | 0  | -    | 7    | V     |                  |     |             |      |   |     |     |      |   |     |                 |    |                |
| 4.2 Operation Temperature        | -40  | -    | +85  | deg.C | No damage        |     |             |      |   |     |     |      |   |     |                 |    |                |
| 4.3 Storage Temperature          | -40  | -    | +85  | deg.C |                  |     |             |      |   |     |     |      |   |     |                 |    |                |

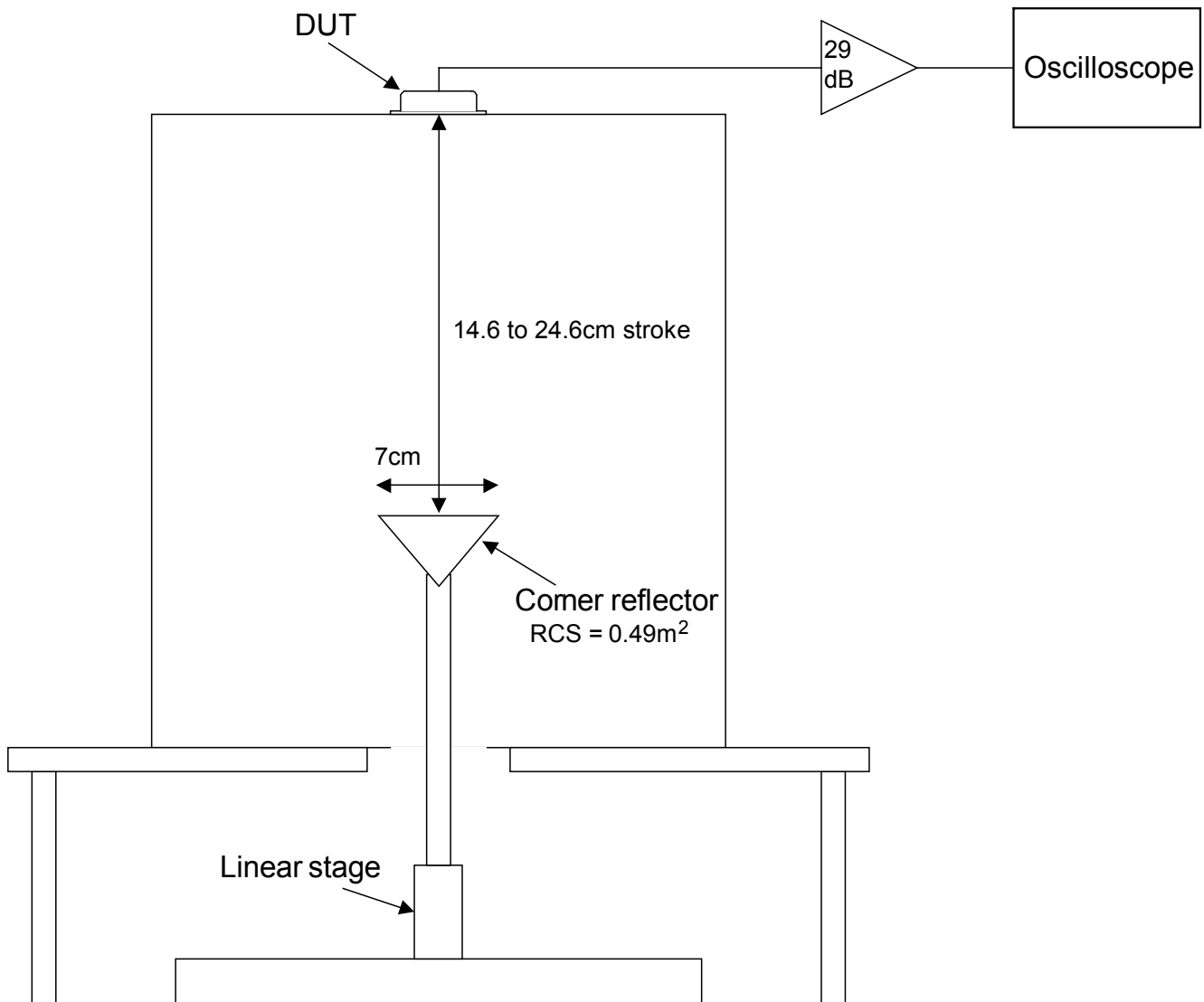
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## 5. Outline



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Fig2. Signal Test System



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