Overview
Fujitsu’s 24GHz Doppler Radar Sensor FWM7RAZ01 is a sophisticated product which includes a 24GHz transceiver, TX and RX array antennas, IF amplifier, MCU, DAC, E2PROM and an LDO voltage regulator all integrated in to a single, compact module.

The compact package, 30mm x 40mm x 9.5mm, includes a pin header on the back for hassle-free, easy integration, even for customers who aren’t familiar with high-frequency circuits.

This sensor is suitable for a wide variety of applications including vital sensing, machine monitoring, and any other moving objects.

While supporting Japan, China and North America (planned) with our standard product, we’ll also support other regions to help you penetrate your target market.

The 24GHz Doppler Radar Sensor is manufactured by Fujitsu Component Ltd., and made in Japan.

Features
- 24GHz radio wave provides stable sensing environment.
- 3 channels selectable operation prevents interference between adjacent sensors.
- Very low noise outputs of IFs (I, Q) support the detection of objects varied in size and distance.
- Stable transmission frequency supports accurate target object detection.
- Wide frequency range IFs (I, Q) output supports the detection of objects from very slow speeds to super-fast speeds.

Fig. 1 Functional block diagram
Specifications

- Operating frequency band: 24.075 to 24.175 GHz (North America) / 24.050 to 24.250 GHz (Japan and China)
- Output power: +9 to +13dBm EIRP typical
- Detection method: Doppler method
- Number of channels: 3 channels
- Interface: Intermediate frequency (I/Q) analog signal, PIO
- Connector: 2.54mm pitch pin header
- Operating voltage range: +3.4 to 5.5VDC
- Current consumption: 63mA @ operating, 0.5mA @ disable
- Antenna: 2 x 4 array for TX and RX
- Dimensions: 30 x 44 x 9.5mm
- Certification: FCC, IC (planned), Radio Act (Japan)
- Schedule: ES now (without FCC), MP ready (Japan/China)

Pin descriptions

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin name</th>
<th>I/O</th>
<th>/CE=L</th>
<th>/CE=H</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rev1</td>
<td>In</td>
<td>Hi-Z</td>
<td>Hi-Z</td>
<td>Reserved pin (not connected)</td>
</tr>
<tr>
<td>2</td>
<td>/CE</td>
<td>IH</td>
<td>Pull-up to Vcc</td>
<td>Pull-up to Vcc</td>
<td>Enable (low active), this pin is pulled up to Vcc by 10KΩ internally</td>
</tr>
<tr>
<td>3</td>
<td>Vcc</td>
<td>Po</td>
<td>-</td>
<td>-</td>
<td>Power supply DC +3.4 to +5.5V</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>IF1</td>
<td>Aout</td>
<td>Vcc/2</td>
<td>Hi-Z</td>
<td>I output</td>
</tr>
<tr>
<td>6</td>
<td>IF2</td>
<td>Aout</td>
<td>Vcc/2</td>
<td>Hi-Z</td>
<td>Q output</td>
</tr>
<tr>
<td>7</td>
<td>Rev2</td>
<td>Dout</td>
<td>Hi-Z</td>
<td></td>
<td>Reserved pin (not connected)</td>
</tr>
<tr>
<td>8</td>
<td>L-SFT</td>
<td>IL</td>
<td>Pull-down</td>
<td>Pull-down</td>
<td>Channel selection, this pin is pulled down to GND by 100KΩ internally</td>
</tr>
<tr>
<td>9</td>
<td>GND</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>GND</td>
</tr>
<tr>
<td>10</td>
<td>Rev3</td>
<td>In</td>
<td>Hi-Z</td>
<td>Hi-Z</td>
<td>Reserved pin (not connected)</td>
</tr>
<tr>
<td>11</td>
<td>H-SFT</td>
<td>IL</td>
<td>Pull-down</td>
<td>Pull-down</td>
<td>Channel selection, this pin is pulled down to GND by 100KΩ internally</td>
</tr>
<tr>
<td>12</td>
<td>Rev4</td>
<td>-</td>
<td>Hi-Z</td>
<td>Hi-Z</td>
<td>Reserved pin (not connected)</td>
</tr>
</tbody>
</table>

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