RADAR SIGNAL CONTROLLER RSP1

RSP1 is a member of RFbeam Radar signal processors. The RSPx family helps users concentrating on their application know-how instead of investing time and money in raw signal processing. RSP1 contains all signal processing for Doppler Radar. It covers slow movement detectors as well as speed estimators up 200 km/h. It can be used as stand alone processor or as a co-processor in higher complexity systems. User has only to add an input amplifier and digital output drivers and gets a high performance detection system.

RSP1 is applicable for movement detectors, lighting control systems, security applications, object speed detection, etc.

FEATURES

» Universal Doppler Radar signal processor
» Complete I/Q Radar sensor interface
» Double detection distance compared to traditional solutions
» Object speed and direction detection
» Complex FFT based signal processing
» Efficient adaptive interference suppression
» Inherent object speed detection up to 135 km/h
» Stand-alone or hosted operation

TECHNICAL KEY DATAS

» 12 Bit ADC
» Differential analog inputs for I and Q signals
» Internal programmable gain amplifier
» Sampling rates from 1280 Hz to 22.5 kHz
» Efficient 256 pt complex FFT
» Logarithmic detection algorithms
» Adaptive noise and interference analysis and canceling algorithms
» Serial command and debug/streaming interfaces
» Highly configurable by serial interface and/or digital and analog inputs
» Application settings can be down- and uploaded from chip
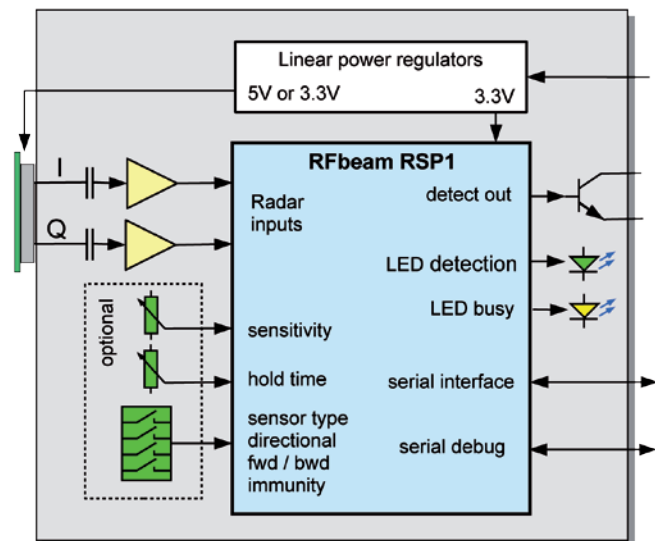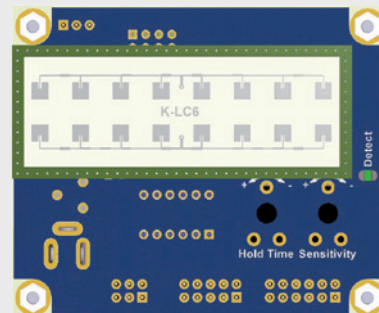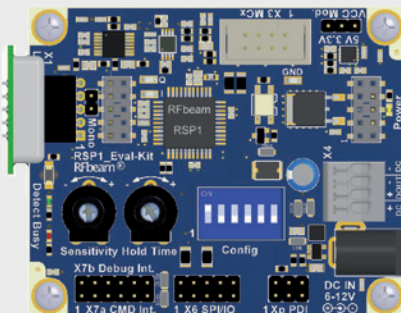» Sophisticated serial outputs like peak magnitude, frequency and sign, noise level and many more

TYPICAL STAND-ALONE APPLICATION CIRCUIT

Typical applications need minimal external components. Configuration can be made by switches and potentiometers or fully digital via serial interface.
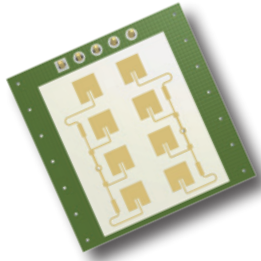

RSP1-EVALUATION KIT

RSP1_Eval-Kit; Left: K-LC2 sensor on front connector; Right: Backside equipped with K-LC6 sensor

With RSP1 Evaluation Kit, you may explore most features of RSP1 working with different RFbeam sensors. Using a RSP_Terminal you have access to more than 30 parameters. Explore FFT, noise and other signals with the RFbeam SerialScope PC Software, that.also makes part of the kit. All schematics, PCB layout and BOM are included as a reference.

new

K-LC2 RADAR-TRANSCEIVER

K-LC2 is a 2×4 patch Doppler module with an asymmetrical beam for low-cost short distance applications. Its typical applications are movement sensors in the security and presence detection domain. In building automation this module may be an alternative for infrared PIR or AIR systems thanks to its outstanding performance/cost ratio.

The module is extremely small and lightweight. With its IF bandwidth from DC to 50 MHz it opens many new applications. FSK is possible thanks to the unique RFbeam oscillator design. This allows to use this lowcost module even in ranging applications. Powerful starterkits (ST100 and ST200) with signal conditioning and visualization on the PC's are available.

FEATURES

- » 24 GHz K-band miniature I/Q transceiver
- » 140 MHz sweep FM input
- » 2 × 4 patch antenna
- » 2 balanced mixer with 50 MHz bandwidth
- » Excellent noise cancelling ability though I/Q technology
- » Beam aperture 80°/34°
- » 15 dBm EIRP output power
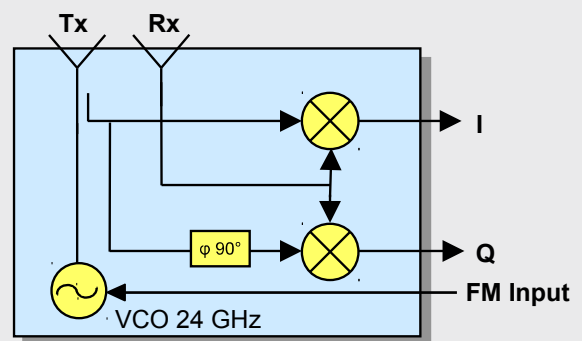- » 25×25 mm^2 surface, <6.5 mm thickness
- » Low-cost design

APPLICATIONS

- » Direction sensitive movement detectors
- » Security systems
- » Object speed measurement systems
- » Simple ranging detection using FSK
- » Industrial sensors

K-LC2 BLOCK DIAGRAM

Tx Rx

I

φ 90°
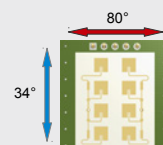
Q

FM Input

VCO 24 GHz

ANTENNA SYSTEM DIAGRAM (LOGARITHMIC SCALE)

This diagram shows module sensitivity (output voltage) in both azimuth and elevation directions.
It incorporates the transmitter and receiver antenna characteristics.

Systemdiagram K-LC2
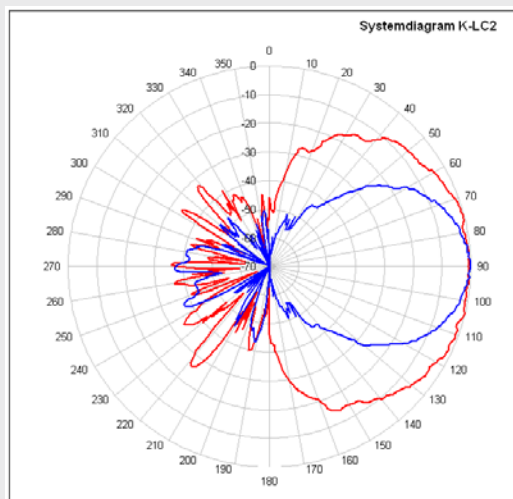
Horizontal 80° , vertical 34°
at IF output voltage -6dB
(corresponds to -3dB Tx power)

80°

34°

Remarks:
The broader the antenna, the narrower the beam.

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