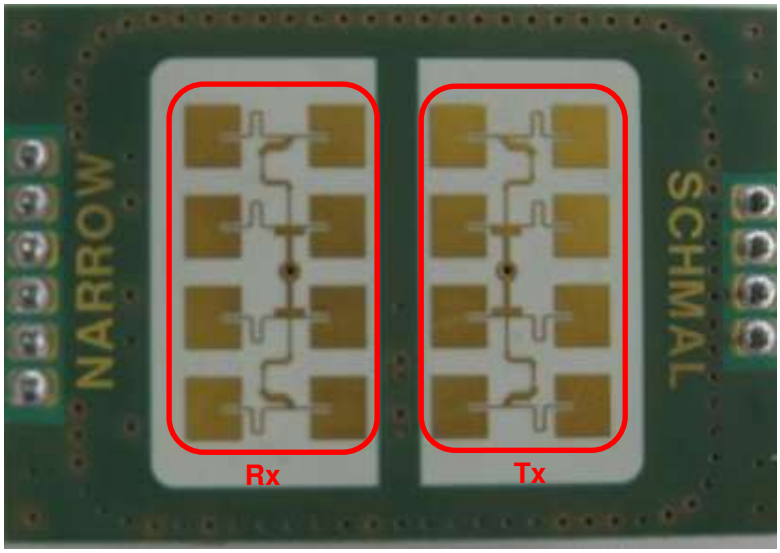
Antenna Specification

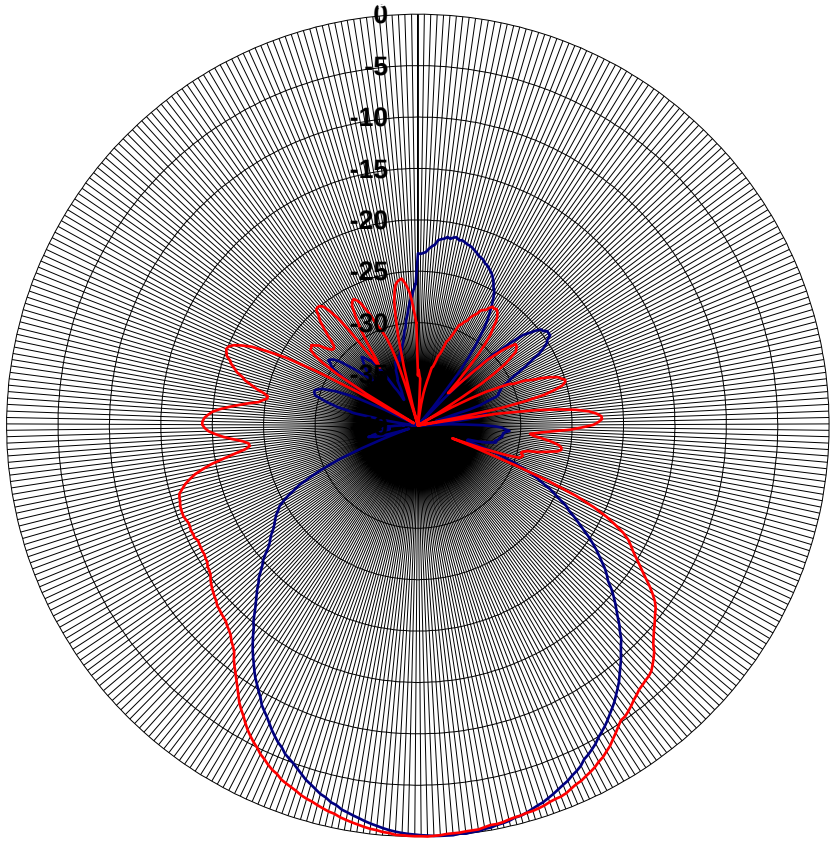


1) Antenna type: 24GHz patch antenna array

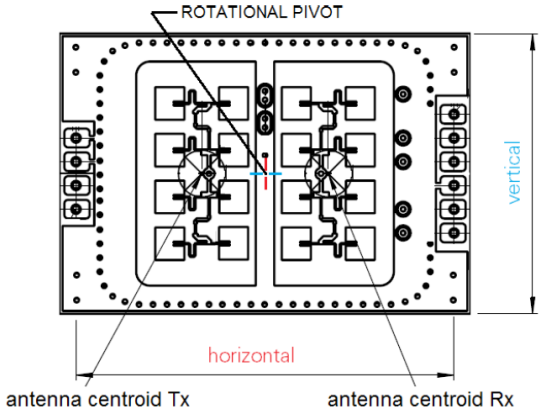
2) Antenna name: IVS-166

3) Antenna gain: 11dBi

- TX -Pattern -
IVS-166



Antenna diagram in [dB] (normalized)



Vertical
Horizontal

InnoSenT
Innovative Sensor Technology

Data Sheet IVS-166 (4100232)

Version 1.4 - 30.07.2014

designed and manufactured in Germany

PRODUCT FAMILY

K-Band VCO Transceiver

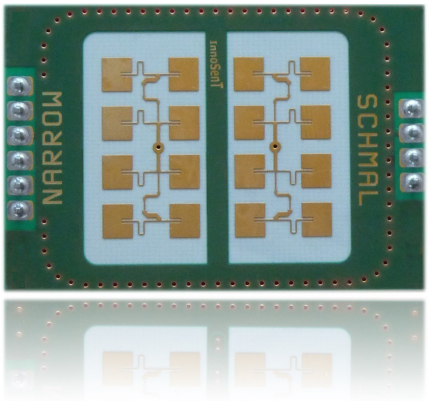
APPLICATIONS

- Industrial Applications
- Door Opener

- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

FEATURES:

» VCO-Transceiver centered @ 24GHz
» FMCW/FSK capable; therefore measurement of distance as well as recognition of stationary objects possible (depending on modulation)
» split transmit and receive path for maximum gain
» stereo (dual channel) operation for direction of motion identification
» IF-pre-amplifier, bandwith limited for lowest noise performance
» compact outline dimensions



DESCRIPTION

The IVS-166 is the FMCW/FSK-version of the IPS-154. The same outline dimensions as well as the identical antenna pattern make this product perfect for upgrading existing systems

CERTIFICATES

InnoSenT GmbH has established and applies a quality system for: development, production and sales of radar sensors for industrial and automotive sensors.

ADDITIONAL INFORMATION

InnoSenT Standard Product. Changes will not be notified as long as there is no influence on form, fit and within this datasheet specified function of the product.

RoHS-INFO

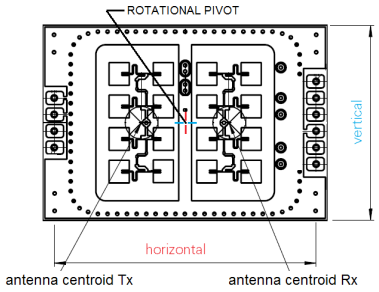
This product is compliant to the restriction of hazardous substances (RoHS - European Union directive 2011/65/EU).

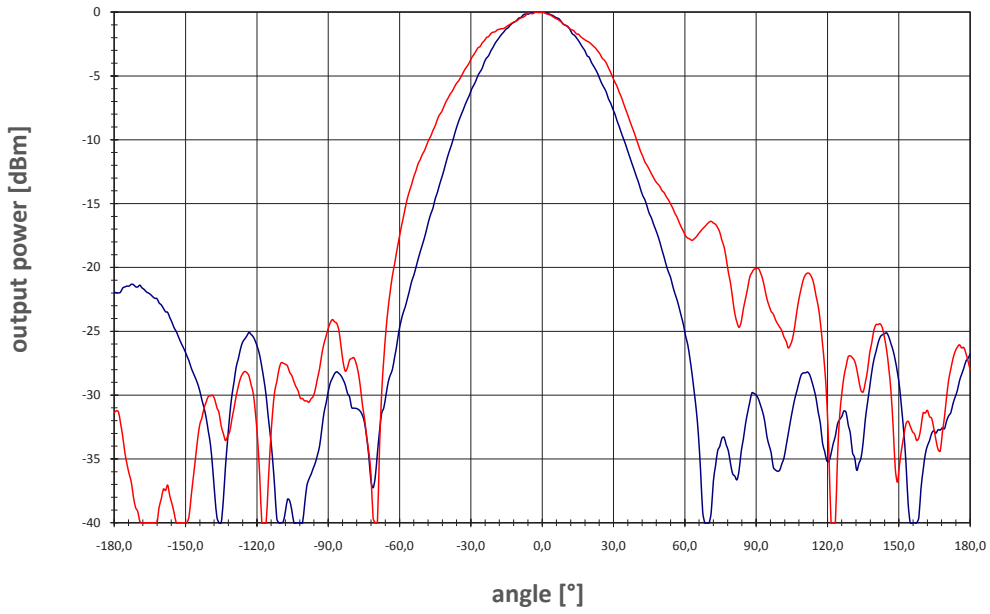
ELECTRICAL CHARACTERISTICS

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
transmit frequency	depending on V_{tune}	f		24.000 - 24.250		GHz
freq @ V_{tune} 0.5V, @ VCC=5.0V	triming-temperature 23°C±3°C	$f_{0.5}$		23.950	24.050	GHz
freq @ V_{tune} 4.5V, @ VCC=5.0V	triming-temperature 23°C±3°C	$f_{4.5}$	24.195	24.215		GHz
bandwidth	V_{tune} =[0.5 ... 4.5V]		190			MHz
varactor tuning voltage		V_{tune}	0.5		10	V
varactor tuning impedance				10		kΩ
modulation input					150	kHz
tuning slope				65		MHz/V
temperature drift (frequency)		Δf		-1		MHz/°C
output power (EIRP)	temperature 23°C±3°C	P_{out}		15		dBm
Receiver						
I/Q balance		amplitude			6	dB
		phase	60	90	120	°
IF-output		voltage offset	1.0	2.2	4.0	V
IF - amplifier		bandwidth		DC - 50		kHz
		gain		20		dB
Antenna System Pattern (compare with antenna plot on page 3)						
full beam width @ -3dB	azimuth	horizontal		45		°
	elevation	vertical		38		°
side-lobe suppression	azimuth	horizontal		15		dB
	elevation	vertical		20		dB
Power supply						
supply voltage		V_{CC}	4.75	5.00	5.25	V
supply current	IF-amp included	I_{CC}		35	50	mA
Environment						
operating temperature		T_{OP}	-20		+60	°C
storage temperature		T_{STG}	-40		+85	°C
Mechanical Outlines						
outline dimensions	compare drawing	height length width		8.5 (18.3) 44.0 30.0		mm

TX- ANTENNA PATTERN

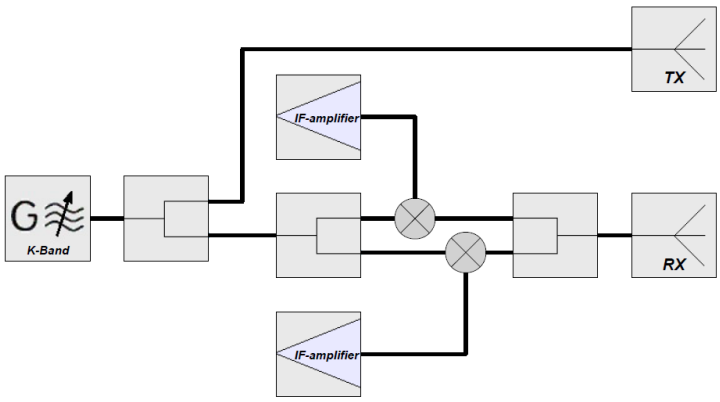
Antenna Orientation:





PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
full beam width @ -3dB		horizontal		45		°
		vertical		38		°
side-lobe suppression		horizontal		15		dB
		vertical		20		dB

BLOCK DIAGRAM



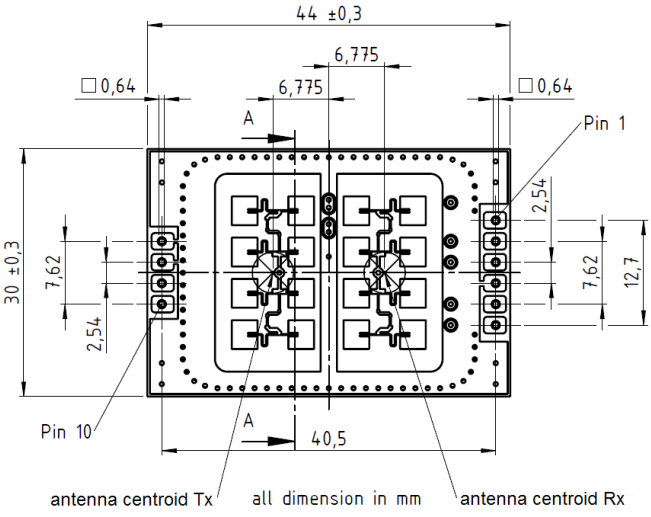
INTERFACE

The sensor provides a 2.54mm grid, single row pin header (square pin □ 0.635mm).

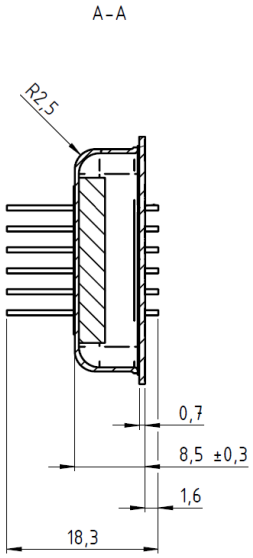
PIN #	DESCRIPTION	IN / OUT	COMMENT
1	V_{tune}	input	varactor tuning voltage
2	enable	input	active low
3	V_{cc}	input	supply voltage (+5 V)
4	GND	input	analog ground
5	IF1	output	signal I(nphase)
6	IF2	output	signal Q(uadrature)
7	GND	input	analog ground
8	GND	input	analog ground
9	NC		not connected
10	NC		not connected

MECHANICAL OUTLINES

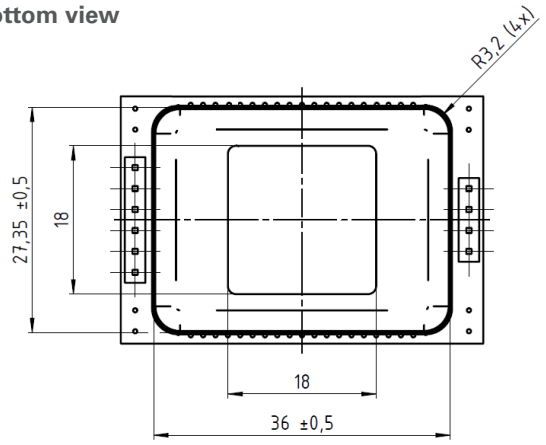
top view



side view



bottom view



ESD-INFORMATION

This InnoSenT sensor is sensitive to damage from ESD. Normal precautions as usually applied to CMOS devices are sufficient when handling the device. Touching the signal output pins has to be avoided at any time before soldering or plugging the device into a motherboard.

APPROVAL

This Data Sheet contains the technical specifications of the described product. All previous versions of this Data Sheet are no longer valid.

The sensor uses Hydrocarbon based material which may change its dielectric properties when used in an oxidative environment. This may vary based on temperature. Therefore InnoSenT recommends evaluating this influence within the specific environment.

VERSION	DATE	COMMENT
1.0	06.08.2013	new layout
1.1	29.04.2014	mechanical outlines, block diagram, labeling, packing tray, ESD-information, FCC ID updated
1.2	09.05.2014	produkt picture, antenna orientation
1.3	26.06.2014	mark on packing box, changes on electrical characteristics
1.4	30.07.2014	bandwidth

InnoSenT GmbH
Am Rödertor 30
97499 Donnersdorf
GERMANY

Tel.: +49 (0) 9528 - 9518 - 0
E-Mail: info@innosent.de
URL: www.innosent.de