InnoSenT
Innovative Sensor Technology

User Manual IPS-937 (UXS-IPS937)

Version 1.4—12.06.2019

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

PRODUCT FAMILY

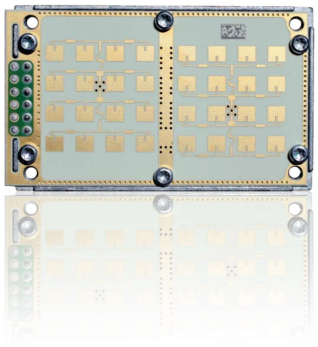
K-Band Transceiver

APPLICATIONS

- Traffic Monitoring
- Industrial Applications

FEATURES:

- K-Band Transceiver with advanced SiGe MMIC technology
- I/Q channels for direction of motion discrimination
- RF LNA for high SNR
- Available in different frequency ranges for worldwide use



DESCRIPTION

The IPS-937 provides an advanced 24GHz MMIC Design.

CERTIFICATES

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

https://www.innosent.de/en/company/certifications/

ADDITIONAL INFORMATION

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

RoHS-INFO

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

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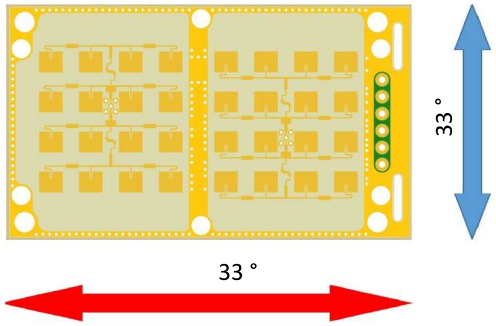
PARAMETERS

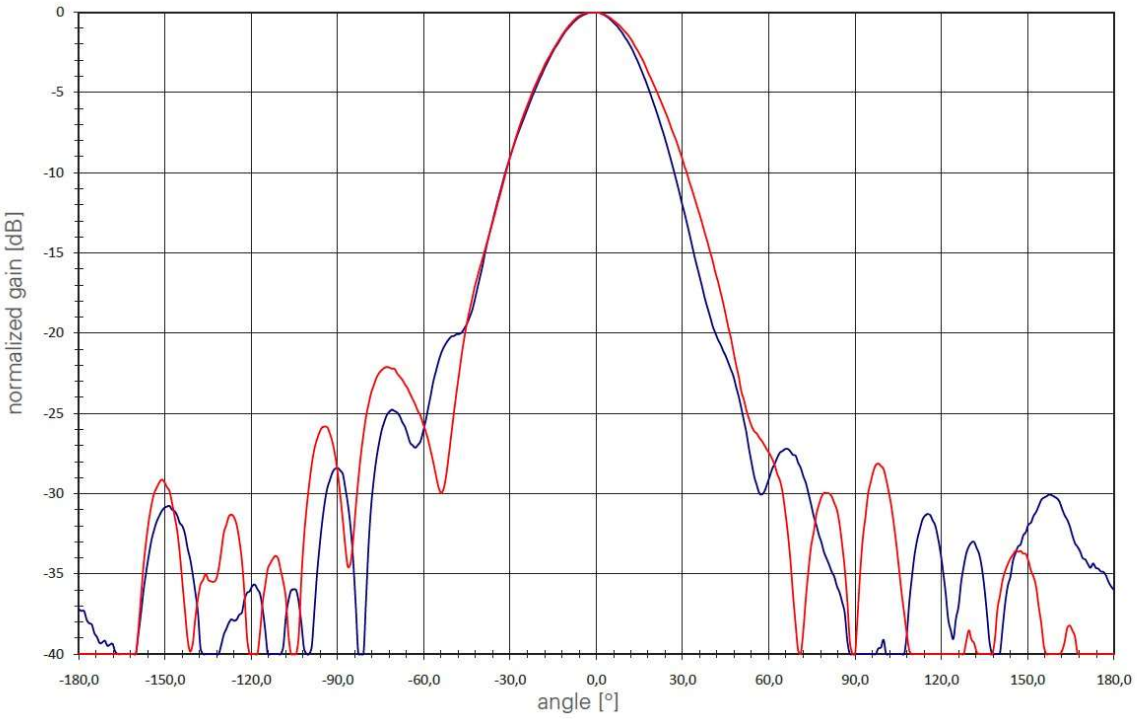
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
transmit frequencies	delivery conditions	$f_{IPS-937}$	24.050	24.125	24.250	GHz
	US-frequency band	$f_{IPS-937_F}$	24.075	24.125	24.175	GHz
	UK-frequency band	$f_{IPS-937_UK}$	24.150	24.200	24.250	GHz
output power (EIRP)	@ 25 °C	P_{out}		19	20	dBm
power drift over temp.		ΔP_{temp}		-0.01		dB/°C
Receiver						
|I/Q| balance		amplitude	-1.5	0	1.5	dB
		phase	70	90	110	°
IF-output		voltage offset		1.65		V
IF-amplifier	gain			40		dB
	bandwidth			30-10k		Hz
Power supply						
supply voltage		V_{cc}	4.75	5.0	5.25	V
supply current		I_{cc}		55	65	mA
Environment						
operating temperature		T_{OP}	-40		+85	°C
storage temperature		$T_{storage}$	-40		+85	°C
Mechanical Outlines						
outline dimensions		height length width		9.0 61.6 37.0		mm

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ANTENNA PATTERN

Antenna Orientation





PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
full beam width @ -3 dB	azimuth	horizontal		33		°
	elevation	vertical		33		°
full beam width @ -10 dB	azimuth	horizontal		59		°
	elevation	vertical		61		°
side-lobe suppression	azimuth	horizontal	20	25		dB
	elevation	vertical	20	25		dB
antenna gain		gain		15		dBi

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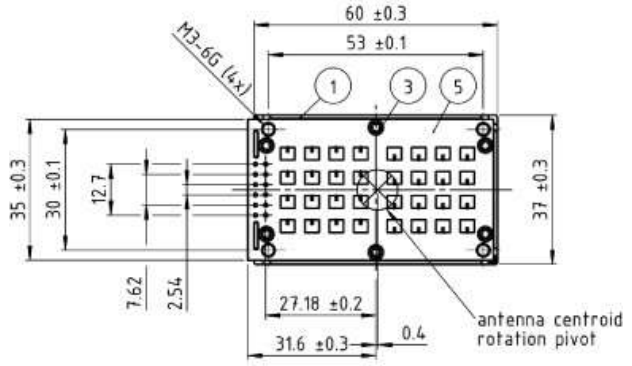
INTERFACE

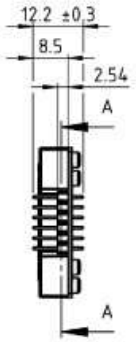
The sensor provides a 2.5mm grid, single row pin header (square pin □ 0.635 mm).

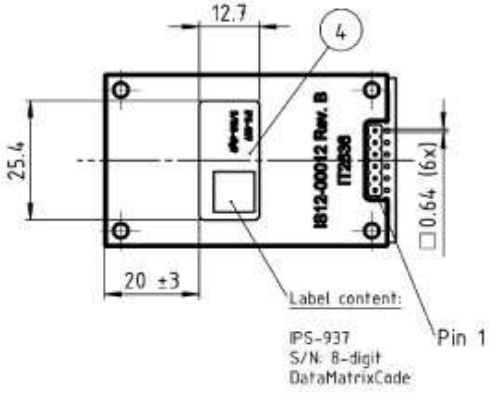
PIN #	DESCRIPTION	IN/OUT	COMMENT
1	TX on		active high / enable TX-power / internally pulled up to +3.3V with 10kOhm / pull down to GND to disable
2	enable	input	active low / enable OSC + LNA / internally pulled up to VCC with 10kOhm / pull down to GND to enable
3	V_{cc}	input	supply voltage
4	GND	input	analog ground
5	IF2	output	signal Q(uadrature)
6	IF1	output	signal I(nphase)

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MECHANICAL DRAWING







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Annex

The information that will be given below is only a rough overview; for details please contact the local approval agencies. An overview over the frequency bands in Europe can also be found in the REC 70-03 (Annex 6) which is available under www.efis.dk

Frequency Bands in US FCC 15.245
For the US-market the IPS-937 can be used

24.075 … 24.175 GHz US-frequency bandwidth.

FCC approval
This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications made to this equipment not expressly approved by InnoSenT GmbH may void the FCC authorization to operate this equipment.

Manufacturers of mobile or fixed devices incorporating IPS-937Modules are authorized to use the FCC Grants for their own final products according to the conditions referenced in these documents. In this case, the FCC label of the module shall be visible from the outside, or the host device shall bear a second label stating „Contains FCC ID: UXS-IPS937".

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio RSS-210.
L'exploitation est autorisée aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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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. Changes of the specification must be in written form. All previous versions of this Data Sheet are no longer valid.

VERSION	DATE	COMMENT	DAWN	APPROVED
1.0	15.05.2018	initial release		
1.1	25.06.2018	small changes in interface comment		
1.2	25.10.2018	Update drawings and product picture		
1.3	23.11.2018	Update electrical characteristics		
1.4	12.06.2019	add FCC & IC Regulatories	NF	WH

InnoSenT GmbH

Am Roedertor 30
97499 Donnersdorf
GERMANY

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

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