InnoSenT
Innovative Sensor Technology

User Manual IPS-354

Version 1.2—06.05.2019

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

PRODUCT FAMILY

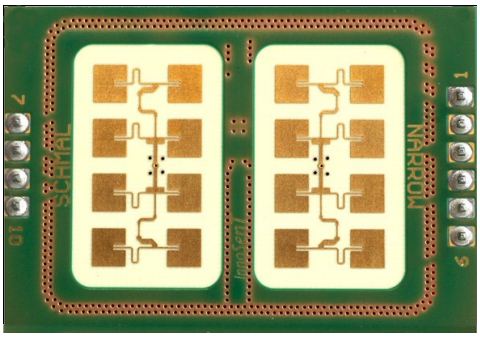
K-Band Transceiver

APPLICATIONS

- Door Opener
- Industrial Applications

FEATURES:

- radar-based motion detector working in the 24GHz - ISM - Band
- split transmit and receive path for maximum gain
- IF-pre-amplifier, bandwith limited for lowest noise performance
- stereo (dual channel) operation for direction of motion indentification
- compact outline dimensions



DESCRIPTION

The IPS-354 is a K-Band Transceiver with a split transmit and receive antenna.

Certificates available on request

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).

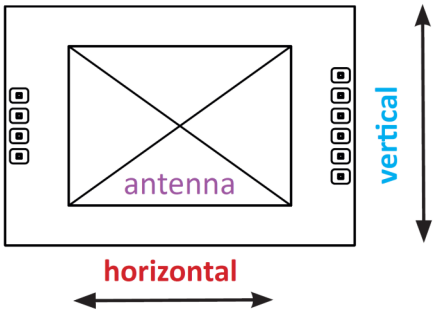
ELECTRICAL CHARACTERISTICS

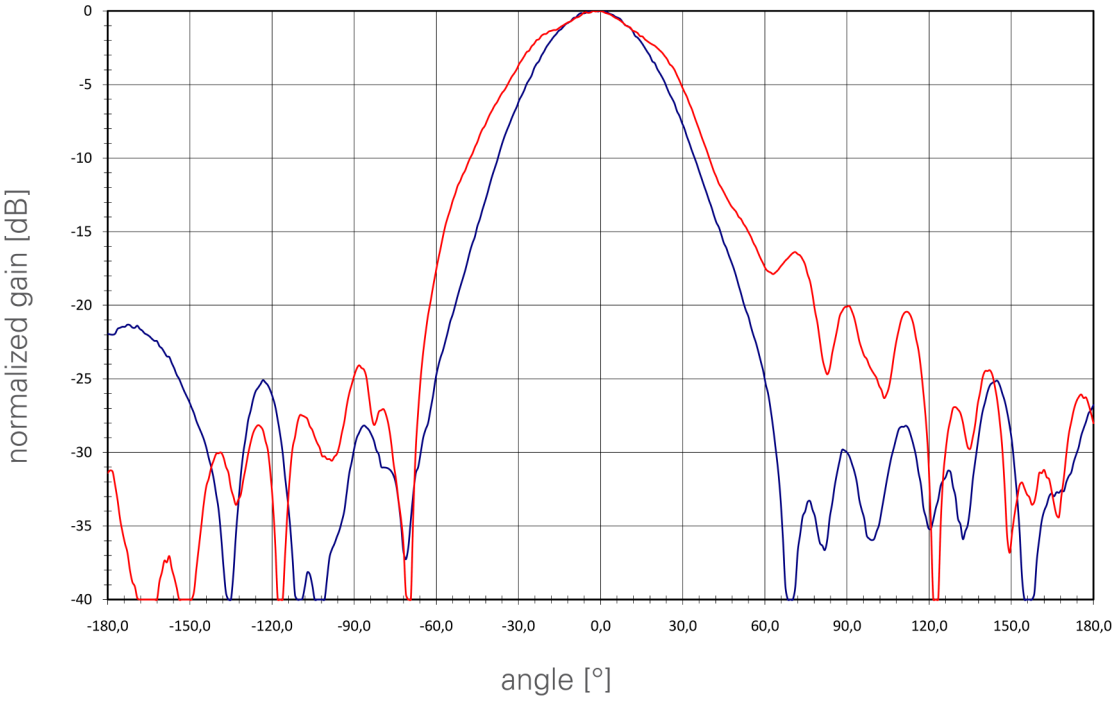
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
transmit frequencies	frequency band for US and EU	$f_{IPS-354}$	24.150		24.250	GHz
temperature drift (frequency)						
output power (EIRP)		P_{out}		11.7	12.7	dBm
transmitter turn on time				10		µs
IF-Bandwidth (-3dB)		B	DC		1	MHz
signal level (RCS = 8.4 * 10^{-4} m^2)		IF				mV
noise level	100 Hz … 1 kHz	$N_{1/2}$				
IF voltage offset		$IF_{DC-offset}$	1	2,5	4	V
[I/Q] balance amplitude			0		6	dB
phase			60	90	120	°
Power supply						
supply voltage		V_{cc}	4.25	5.0	5.75	V
suppy current		I_{cc}		48	60	mA
Environment						
operating temperature		T_{OP}	- 30		+ 60	°C
storage temperature		T_{STG}	- 30		+ 60	°C
Mechanical Outlines						
outline dimensions	compare drawing	Hight Length Width		8.3 (19) 44.0 30.0		mm

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.

ANTENNA PATTERN

Antenna Orientation:





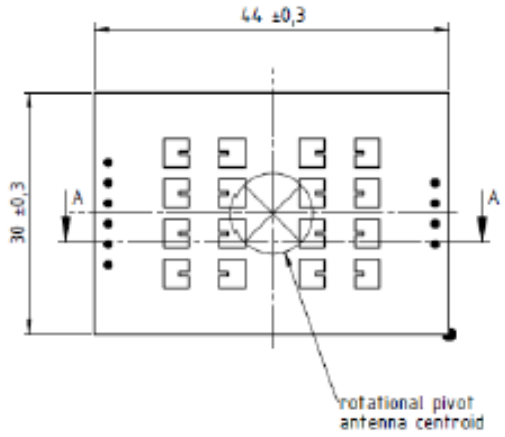
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
full beam width @ -3 dB		horizontal		45		°
		vertical		38		°
side-lobe suppression		horizontal		15		dB
		vertical		20		dB

INTERFACE

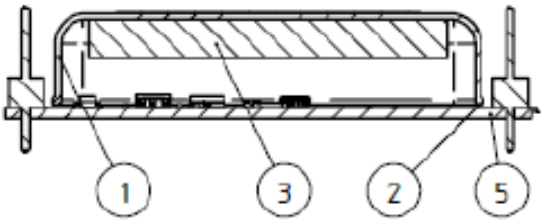
The sensor provides a 2.54 mm grid, single row pin header (square pin 0.635 mm).

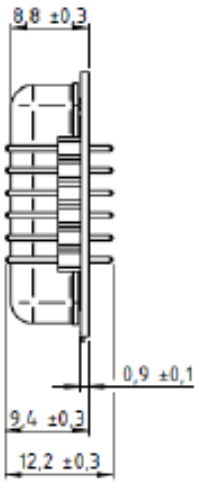
PIN #	DESCRIPTION	IN/OUT	COMMENT
1	d.n.c.		do not connect
2	enable	input	active low, the enable pin is used to switch off the power supply of the OSC enable on: 0 — 0.8 V enable off: 2.8 — 3.3 V
3	V_{cc}	input	supply voltage, 5 V +/- 15 %
4	GND	input	analog ground
5	IF1	output	signal I (nphase)
6	IF2	output	signal Q (uadrature)
7	d.n.c.		do not connect
8	d.n.c.		do not connect
9	GND	output	analog ground
10	d.n.c.		do not connect

MECHANICAL DRAWING

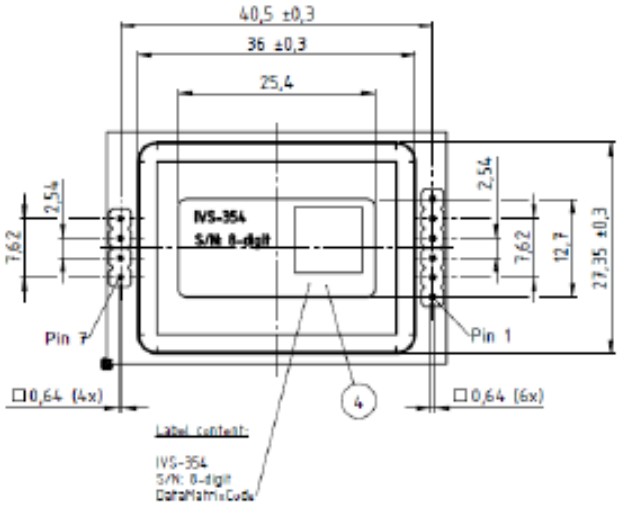


top view





side view



bottom view

Annex A

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.ero.dk

Frequency Bands in US FCC 15.249
For the US-market the IPS-354 can be used

24.250
24.000
US-frequency

FCC approval
This device complies with Part 15 of the FCC Rules and with RSS-310 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-354 Modules 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-IPS354".

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.

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	DAWN	RELEASED
1.0	05.12.2018	initial release	FZ	BL
1.1	19.02.2019	small changes in pin description	FZ	MW
1.2	06.05.2019	transfer to publisher	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