

User Manual IVS-362

Version 1.0 - 19.12.2018



PRODUCT FAMILY

K-Band VCO Transceiver

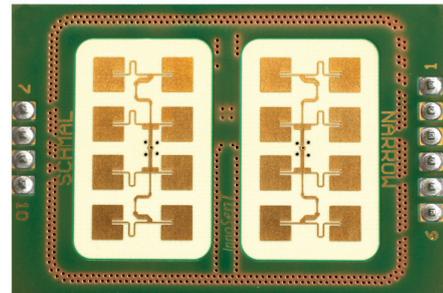
APPLICATIONS

- Industrial Applications
- Door Opener



FEATURES:

- » VCO-Transceiver centered @ 24GHz
- » FMCW/FSK capable; therefore enabling 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 detection
- » IF-pre-amplifier, bandwidth limited for lowest noise performance
- » compact outline dimensions



DESCRIPTION

The IVS-362 is the FMCW/FSK-version of the IPS-354. The same outline dimensions as well as the identical antenna pattern make this product perfect for upgrading existing systems.

Certification possible 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 user manual 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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ELECTRICAL CHARACTERISTICS

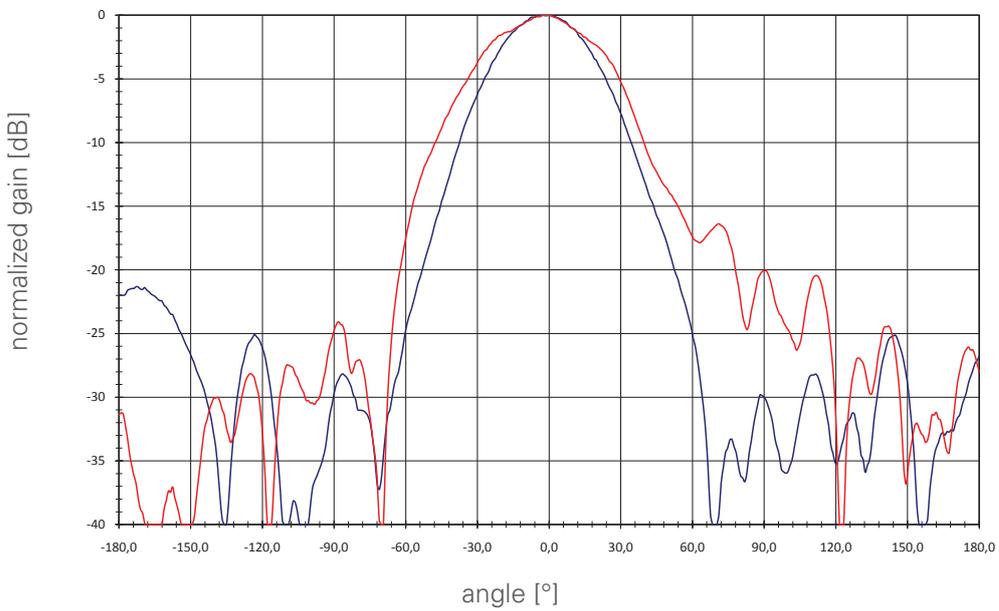
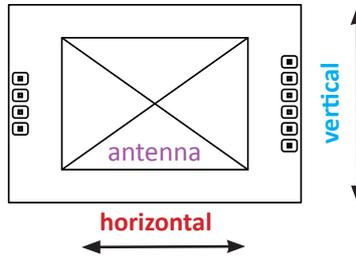
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
VCO frequency range	depending on V_{tune}	f_{VCO}	24		24.250	GHz
Tuning voltage	to cover VCO frequency range	V_{tune}	0.7		2.5	V
VCO tuning sensitivity	within VCO frequency range	K_{VCO}		720		MHz/V
Settling Time Pulsed Oscillator				10		μs
output power (EIRP)		P_{out}		14.8		dBm
Receiver						
IF output DC-Offset		$IF_{1/2_DC-offset}$		2.8		mV
I/Q balance amplitude			0		6	dB
phase			60	90	120	$^{\circ}$
signal level (RSC= $8.4 * 10^{-4} m^2$)		$IF_{1/2 - IVS-362}$		4.6		mV
noise level	100Hz... 1kHz	$N_{1/2}$		33		μV_{rms}
Frequency Divider						
Prescaler divider ratio		D_{DIV}		8192		
Prescaler output voltage	Peak to peakvoltage Terminated with 50Ω $D_{DIV}= 8192$	V_{DIV}		190		mV
Prescaler supply voltage		V_{CC_DIV}	3.2	3.3	3.4	V
Prescaler supply current		I_{CC_DIV}	13	19	25	mA
gain				t.b.d		
Antenna System Pattern (compare with antenna plot on page 3) full beam width @ -3dB azimuth horizontal 45 $^{\circ}$ elevation vertical 38 $^{\circ}$ side-lobe suppression azimuth horizontal 15 dB elevation vertical 20 dB						
Power supply						
supply voltage		V_{CC}	4.25	5.00	5.75	V
supply current	IFamp included	I_{CC}		48	60	mA
Environment						
operating temperature		T_{OP}	-30		+60	$^{\circ}C$
storage temperature		T_{STG}	-30		+60	$^{\circ}C$
Mechanical Outlines						
outline dimensions	compare drawing	height length width		8.3 (19) 44.0 30.0		mm

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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

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INTERFACE

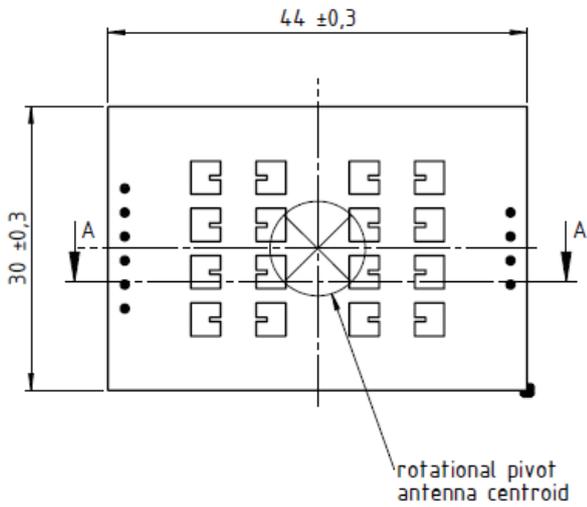
The sensor provides a 2.54mm grid, single row pin header (square pin \square 0.635mm).

PIN #	DESCRIPTION	IN / OUT	COMMENT
1	V_{tune}	input	varactor tuning voltage
2	enable	input	active low, the enable pin is used to switch off the power supply of the VCO. enable on: 0 - 0.8V enable off: 2.8 - 3.3V
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	div_out	output	frequency divider output, divide by 8192
8	$V_{\text{cc_DIV}}$	input	supply voltage of prescaler (3.3V - 3.4V)
9	d.n.c		do not connect
10	$V_{\text{cc_PTAT}}$	input	must be connected to $V_{\text{cc_DIV}}$ if the counter is used.

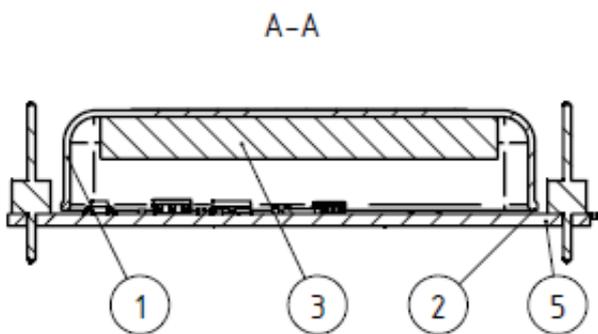
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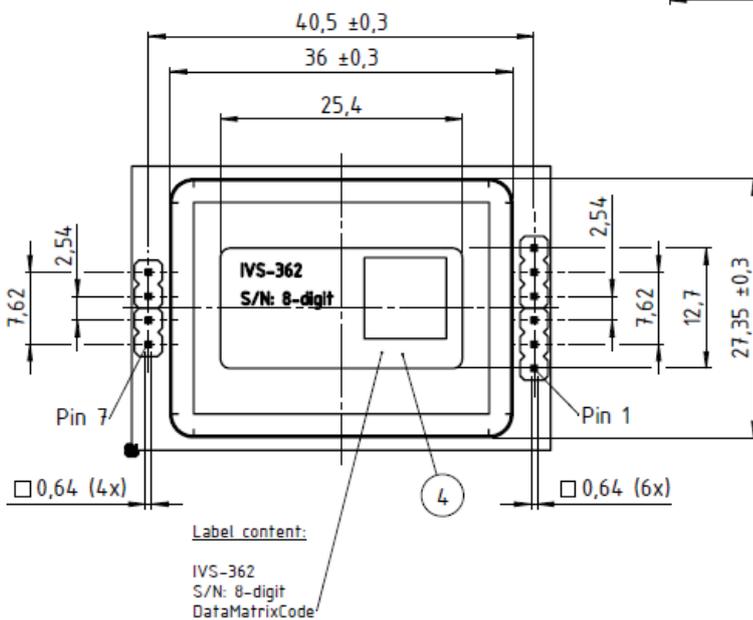
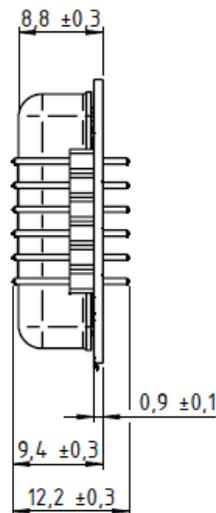
MECHANICAL OUTLINES



top view



side view



bottom view

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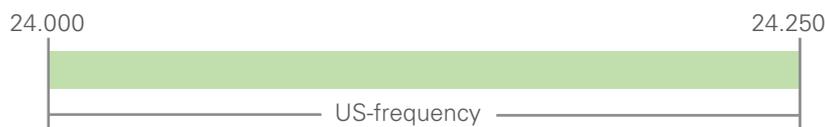
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Annex A

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-362 can be used



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-362 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-IPS-362“

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. 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.

NOTICE:

Changes or modifications made to this equipment not expressly approved by (manufacturer name) may void the FCC authorization to operate this equipment.

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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. 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	19.12.2018	initial release

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