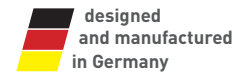


User Manual IVS-166

Version 1.0 - 03.12.2013



PRODUCT FAMILY

K-Band VCO Transceiver

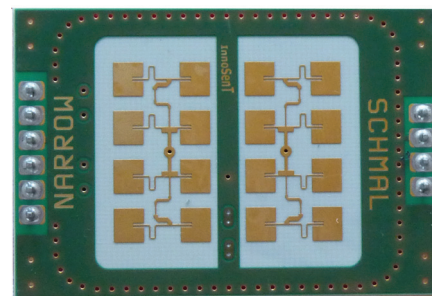
APPLICATIONS

- Industrial Applications
- Door Opener



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 induction
- » IF-pre-amplifier, bandwidth 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).

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ELECTRICAL CHARACTERISTICS

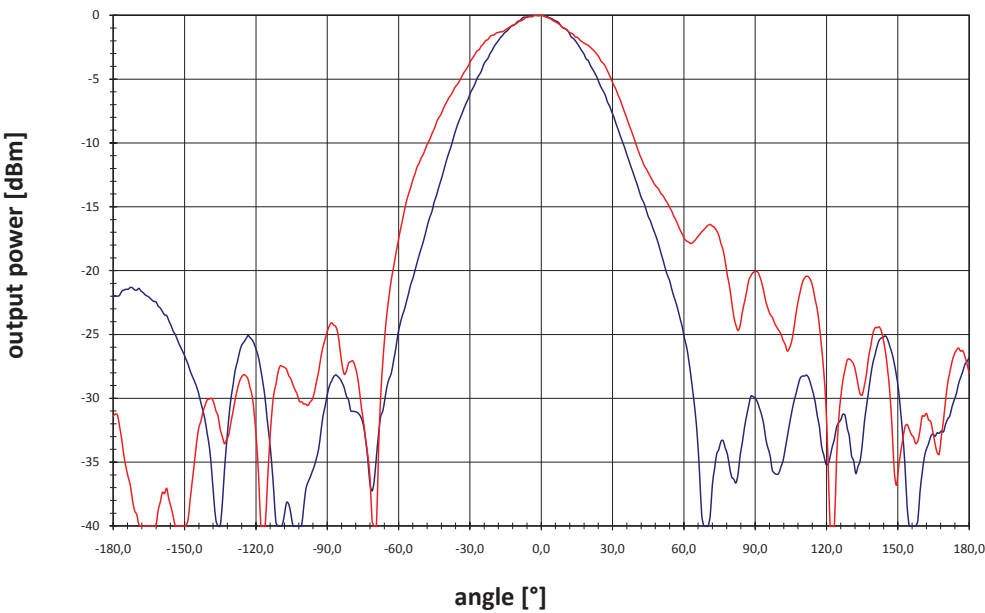
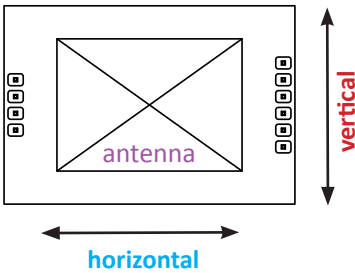
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
transmit frequencies	depending on V_{tune}	f	24.000 - 24.250			GHz
freq @ $V_{\text{tune}} = 5,0\text{V}$	@ 25°C	$f_{5,0\text{V}}$	24.100	24.125	24.150	GHz
varactor tuning voltage		V_{tune}	0.5		10	V
varactor tuning impedance				10k		kΩ
modulation input					150	kHz
tuning slope				40		MHz/V
temperature drift (frequency)		Δf		-1		MHz/°C
output power (EIRP)	@ 25°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	IFamp 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	8.3 (19) 44.0 30.0			mm

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TX- ANTENNA PATTERN

Antenna Orientation:



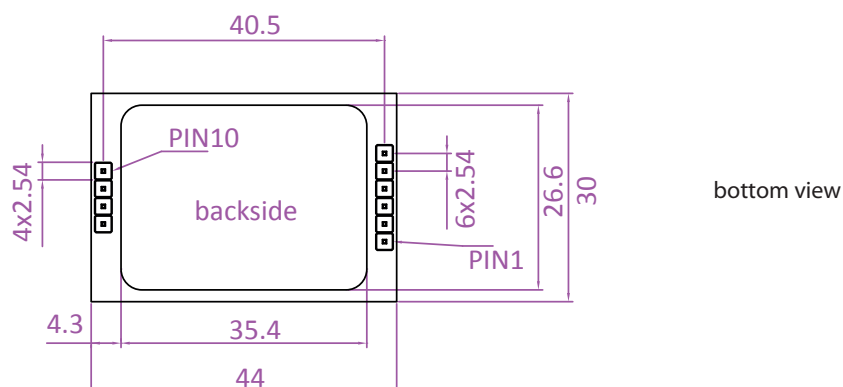
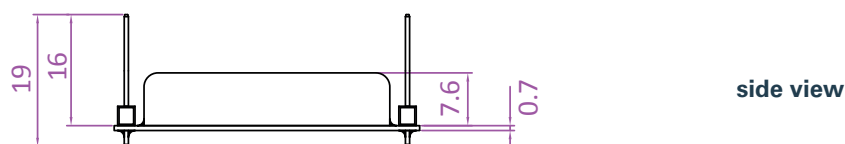
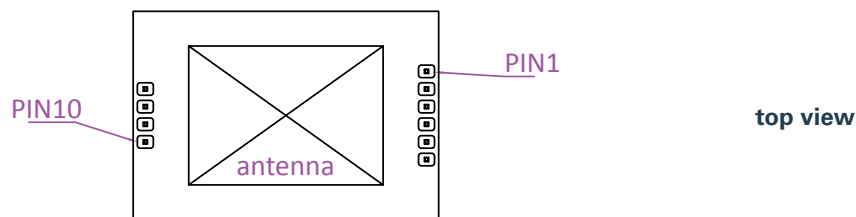
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
full beam width @ -3dB		horizontal		45		°
		vertical		38		°
side-lobe suppression		horizontal		15		dB
		vertical		20		dB

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
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



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NOTICE:

This device complies with Part 15 of the FCC Rules [and with Industry Canada licence-exempt RSS standard(s)].

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.

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.

Text for User Manual (blue cursive text)

For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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FCC approval

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

The use of the transceiver module is authorized in mobile or fixed host devices taking into account the conditions listed below:

- OEM Integrator must ensure that the end user manual may not contain any information about the way to install or remove the module from the final product.
- Depending on the final host device additional authorization requirements for the non-transmitter functions of the transmitter module may be required (i.e., Verification, or Declaration of Conformity) The OEM integrator is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements.
- The information on the label and in the user manual is required to be incorporated in the user manual of the final host. see 47 CFR15 requirements for more details (e.g. 15.19 / 15.21 / 15.101 / 15.105 / RSS-GEN / ICES)
- Additional label with the words 'Contains FCC ID: DC9-IVS166' and 'Contains IC: 4012A-IVS166' shall be applied and visible from the outside of the host product.
- The module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the module.
- The end user manual for the final host product operating with this transmitter must include operating instructions to satisfy RF exposure compliance requirements.
e.g

Radiofrequency radiation exposure Information:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- The antenna of the module may not be removed, replaced nor modified. The antenna must not be co-located or operating in conjunction with any other antenna or transmitter. No additional antenna must be used.
- When the final host product operating with this transmitter deviate from above, installation of this module into specific final hosts may require the submission of a Class II permissive change application containing data pertinent to RF Exposure, spurious emissions, ERP/EIRP, and host/module authentication, or new application if appropriate.

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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	03.12.2013	Creating user manual IVS-166

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