InnoSenT
Innovative Sensor Technology

Data Sheet IVS-187

Version 1.4 - 08.05.2015

designed and manufactured in Germany

PRODUCT FAMILY

K-Band VCO Transceiver

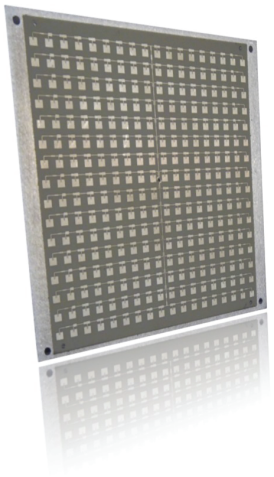
APPLICATIONS

- Industrial Applications
- Traffic Monitoring
- Level Measurement

- 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)
» stereo (dual channel) operation for direction of motion indection
» compact outline dimensions



DESCRIPTION

The IVS-187 is a FMCW/FSK capable K-Band Transceiver with a high focus antenna.

Antenna Manufacturer: Innosent (integral to the radio model)
Antenna P/N: IVS-187
Antenna Type: Internal, Planar
Antenna Gain: 22dBi

CERTIFICATES

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

Qualitätsmanagement ISO/TS 16949 ▸ Regelmäßige freiwillige Überwachung DEKRA Certification DEKRA zertifiziert

Qualitätsmanagement ISO 9001:2008 ▸ Regelmäßige freiwillige Überwachung DEKRA Certification DEKRA zertifiziert

Umweltmanagement ISO 14001 ▸ Regelmäßige freiwillige Überwachung DEKRA Certification DEKRA zertifiziert

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 i s compliant to the restriction of hazardous substances (RoHS - European Union directive 2011/65/EU).

ELECTRICAL CHARACTERISTICS

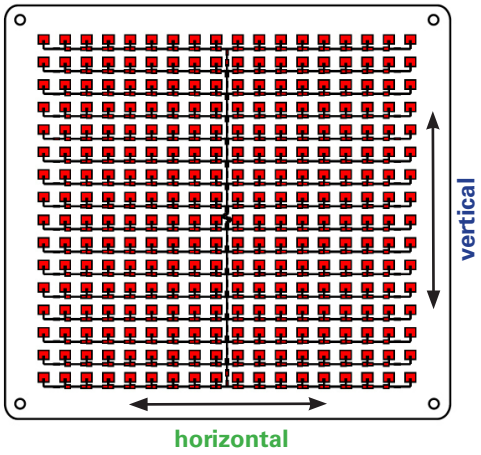
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
transmit frequencies	depending on V_{tune}	f_T		24.000 - 24.250		GHz
freqency@ V_{tune} 4V	@ 25°C	f_{4V}	24.100	24.125	24.150	GHz
varactor tuning voltage		V_{tune}	0.5		8	V
varactor tuning impedance				10		kΩ
modulation input					150	kHz
tuning slope				50		MHz/V
frequency drift over temp.		Δf_{temp}		-1		MHz/K
frequency drift over aging		Δf_{aging}		t.b.d.		
output power (EIRP)	@ 25°C	P_{out}	20	23	30	dBm
power drift over temp		ΔP_{temp}		t.b.d.		dB/K
Receiver						
|I/Q| balance		amplitude		0	6	dB
		phase	60	90	120	°
Voltage offset			2.35	2.5	2.65	V
IF - amplifier		bandwidth		33 - 110k		Hz
		gain		35		dB
self clutter[1]				t.b.d.		Vpp
Antenna System Pattern (compare with antenna plot on page 3)						
full beam width @ -3dB	azimuth	horizontal		5.5	7.5	°
	elevation	vertical		6.5	8.5	°
side-lobe suppression	azimuth	horizontal	15			dB
	elevation	vertical	15			dB
Power supply						
supply voltage		V_{CC}	4.75	5.00	5.25	V
permissible ripple voltage[2]					1	mVpp
supply current		I_{CC}	35	45	55	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		11.0 146.0 136.0		mm

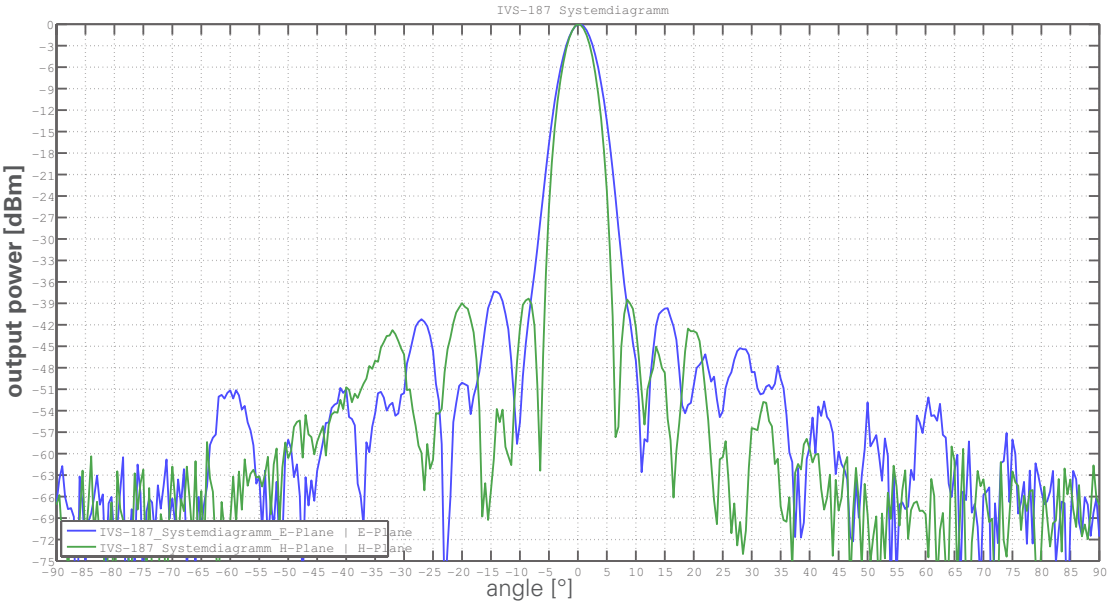
[1]Self Clutter is the signal measured at the IF output (without enclosure) due to modulation when no target is present. The Measurement setup is explained in detail in an external document.

[2]higher voltage ripple may degrades S/N and / or may generate ghost targets

SYSTEM- ANTENNA PATTERN

Antenna Orientation:

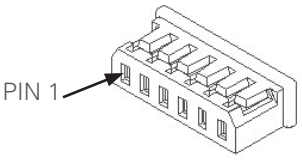




PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
full beam width @ -3dB		horizontal		5.5	7.5	°
		vertical		6.5	8.5	°
side-lobe suppression		horizontal	15			dB
		vertical	15			dB

INTERFACE

The sensor provides a 2mm pitch 6 pin Connector Molex P/N 51004-0600



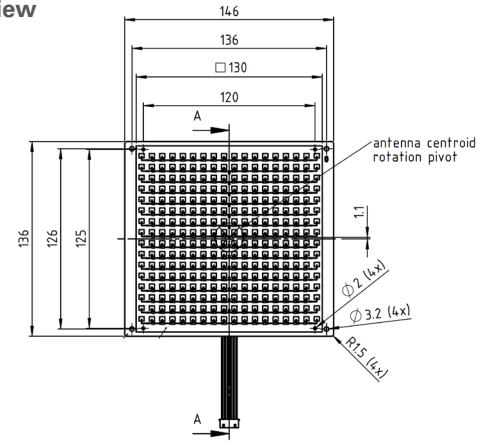
PIN #	DESCRIPTION	IN / OUT	COMMENT
1	n.c.		not connected; (red colored cable)
2	V_{CC}	input	supply voltage
3	GND	input	analog ground
4	IF2	output	signal Q(uadrature)
5	IF1	output	signal I(nphase)
6	V_{tune}	input	tuning voltage

(Connector mates with: Molex P/N 53014  and 53015 )

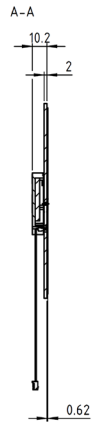
MECHANICAL OUTLINES

all dimensions in mm

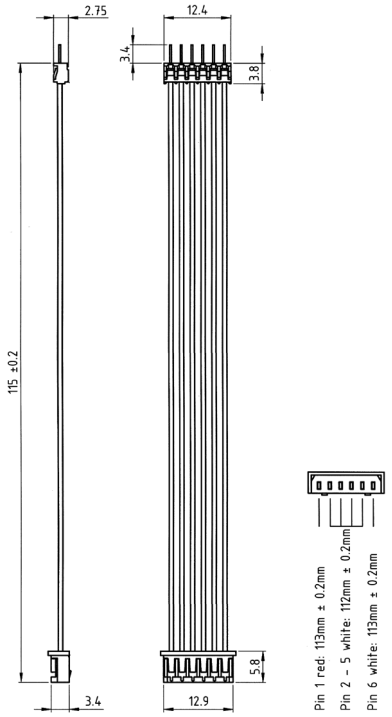
top view



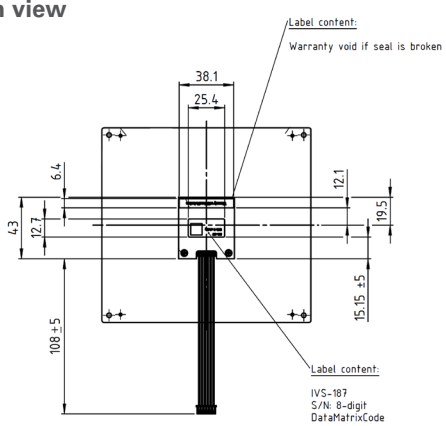
side view



cabel harness

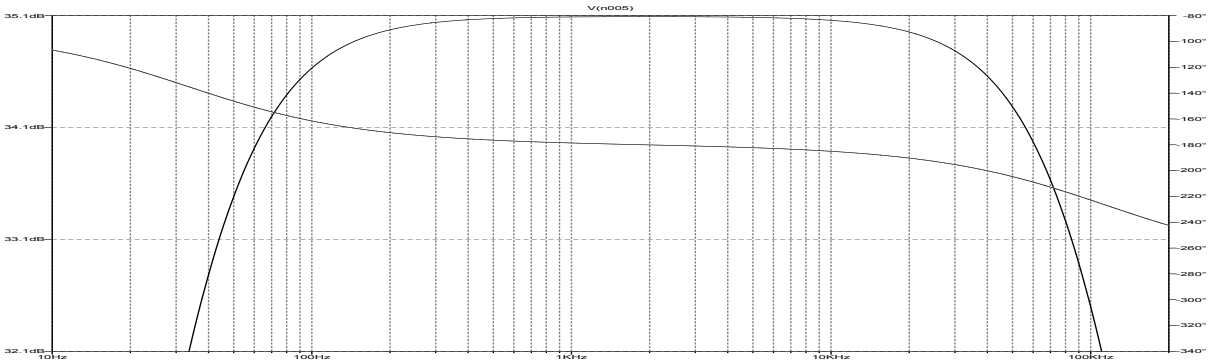


bottom view

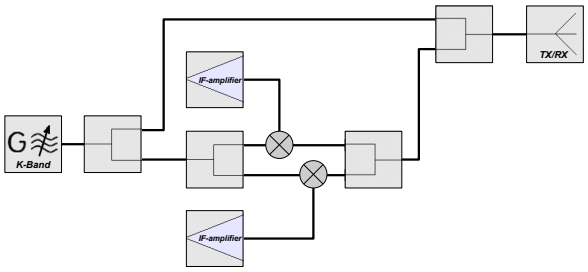


according to InnoSenT factory standart WN 7-1_2

RECEIVER SIMULATION



BLOCK DIAGRAM



ESD-INFO

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	23.07.2014	inital release
1.1	01.09.2014	freqency$_{4V}$; varactor tuning impedance; output power;premissible ripple voltage; supply current
1.2	30.09.2014	IF - amplifier bandwidth
1.3	31.10.2014	changes in the antenna information
1.4	08.05.2015	changes in the system pattern

InnoSenT GmbH
Am Rödertor 30
97499 Donnersdorf
GERMANY

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