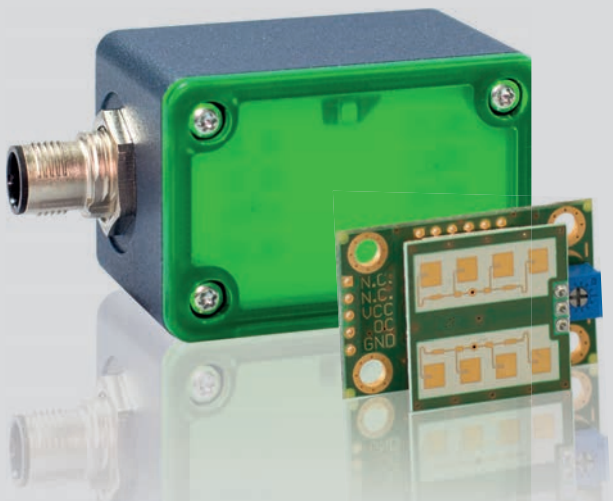
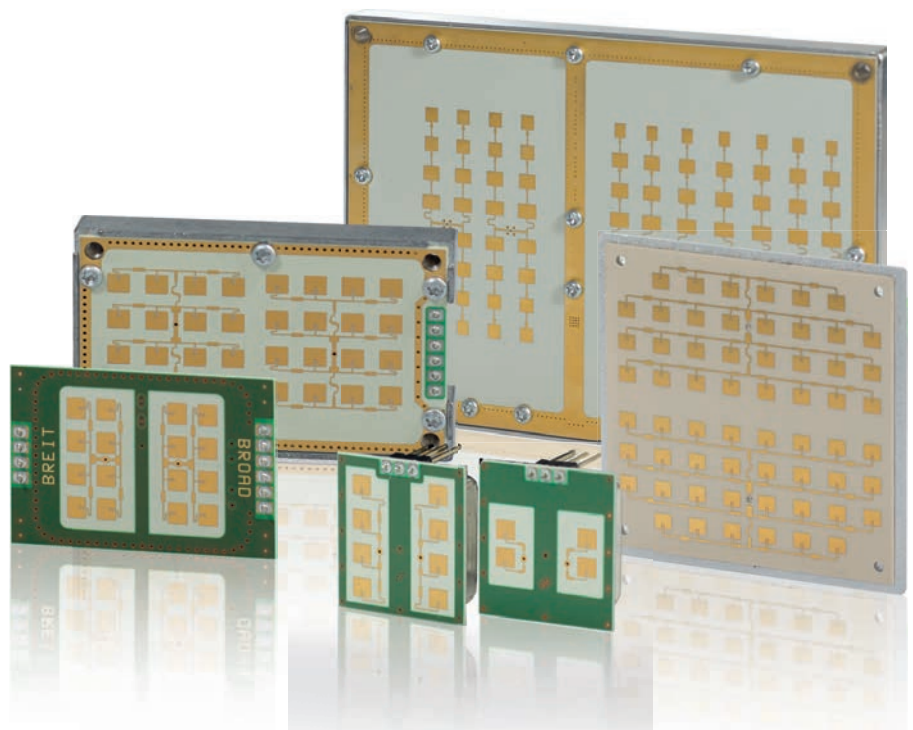
InnoSenT
Innovative Sensor Technology

Standard Products

Version: 2016_01

iSYS
www.InnoSenT.de





InnoSenT
Innovative Sensor Technology

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Content

The Corporation

InnoSenT is a mid-sized company headquartered in Donnersdorf, where all departments - from development to administration - are housed. We serve and deliver to clients in 37 countries on all 5 continents from this central location. With its numerous innovative products and ideas the company managed to position itself as a market leader in the civilian radar technology sector during its 15 year history.

We offer the most varied solutions, from a simple Doppler radar to FCMW/FSK-enabled devices and up to extensive complete systems.

In addition to our broad range of standard products, a team of more than 50 engineers and technicians - all of whom are daily looking for new challenges and innovations - is available to implement customer requirements.

Our product catalogue ranges from analogue radar front ends up to easily integrated all-digital systems. Our solutions are found in the 24GHz, 61GHz and 77GHz frequency ranges.

Production Know-How

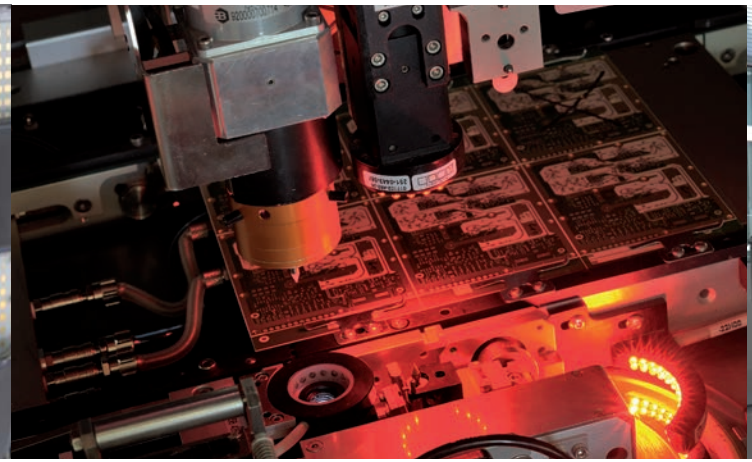
With over 2,2 million manufactured sensors InnoSenT is a worldwide active volume producer in radar sensor technology. Manufacturing takes place at 100% on our state-of-the-art production lines in Donnersdorf/Germany. By highest possible automation and more than 10 years of manufacturing Know-How this is not contradictory to market-driven prices.

Within the SMT-area InnoSenT uses optimized lines. The completely aligned lines generates high quantities in a 3-shift operational mode. Another line is setup for flexibility to produce quantities ranging from 100 pieces to 400.000 pieces per year of a certain product.

The completion as a perfect product takes place in a separate assembly area right next to the SMD placement area. At the end of the production process each device gets specifically tested. The storage of test data results in a SPC securing product stability.

To guarantee optimal process stability production is supported by a certain department, which exclusively pays attention to the proper process and testing techniques.

The teamwork of these two divisions guarantees the high quality level of our products.



Security Solutions

Radar-based movement detectors have been established for many years. The advantages radar sensors offer when monitoring rooms are, amongst others, the low power consumption levels, the fact that they can be concealed when installed and, primarily, their independence of light which is a huge advantage over optical systems.

Typical radar-based safety applications:

- Alarm systems (intrusion alarm systems)
- Access controls
- Securing hazard zones (e.g. power plants, prisons)
- Perimeter security

Intelligent Traffic Monitoring Solutions

There are a large number of applications for measuring vehicle velocities that are equipped with InnoSenT radar sensors. Everyone knows that radars are used to identify vehicles that exceed the maximum speed limit.

Typical radar-based traffic monitoring applications:

- Traffic light controls
- Wrong-way detection
- Speed enforcement & Speed displays
- Traffic monitoring & Traffic classification
- Speed measuring devices
- Safeguarding train tracks and crossings

Collision Avoidance

Autonomous vehicles are gaining ground in industrial applications and in the good logistics sector. They are usually used to transport parts or goods on predefined paths; the launch of self-driving lorries on public roads is also imminent.

In particular, the radar sensors offer advantages in the following extreme conditions:

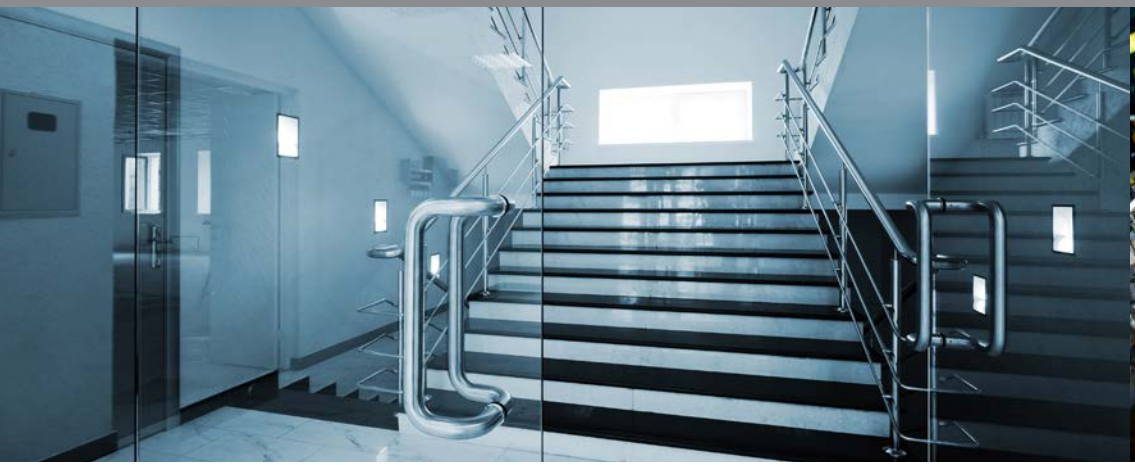
- Mobile outdoor applications: resistant to dirt and weather conditions
- Applications: off-road, e.g. construction machines, agricultural machines, trailers
- Extreme work environments in industrial production facilities: durable in the face of extreme temperatures, aggressive media, steam, vapours or swirling dust.
- Applications: assembly by industrial robots or production lines

Industrial Applications

Speed, distance and angle to an object can be measured using radar sensors. In addition to the touch-free and precise measuring functions, the radar sensor technology offers two decisive advantages in contrast to other processes like IR, laser or video:

Typical radar-based industrial applications:

- industrial applications e.g. level probing equipment, industrial automation
- environmental applications e.g. ice and rain measurement, flow speed measurement system
- building technology e.g. installation and safety technology, motion detection, automatic door openers, lighting technology, sanitary technology



Application Guide

Security

Product Number	Movement	Velocity	Direction	Presence	Distance	Angle	Page
IPS-946	X	X	X				- 13 -
IPS-154	X	X					- 14 -
IVS-163	X	X	X	X	X		- 18 -
IVQ-3004	X	X	X	X	X	X	- 20 -
IVS-162	X	X	X	X	X		- 21 -
IVS-979	X	X	X	X	X		- 23 -
IVS-465	X	X	X	X	X		- 26 -
IPM-165	X	X					- 27 -
IVS-565	X	X		X	X	X	- 28 -
IPS-265	X	X	X				- 29 -
IPM-365	X	X					- 30 -
IPB-914				X	X		- 32 -
iSYS-4001	X	X	X		X		- 38 -
iSYS-3106	X	X	X		X	X	- 37 -
iSYS-101	X	X					- 40 -

Traffic Monitoring

Product Number	Movement	Velocity	Direction	Presence	Distance	Angle	Page
IPS-144	X	X	X				- 11 -
IPS-946	X	X	X				- 13 -
IPS-182	X	X	X				- 15 -
IPS-168	X	X	X				- 16 -
IVS-148	X	X	X	X	X		- 19 -
IVQ-3004	X	X	X	X	X	X	- 20 -
IVS-167	X	X	X	X	X		- 22 -
IVS-979	X	X	X	X	X		- 23 -
IVS-4005	X	X	X	X	X		- 24 -
IVS-565	X	X		X	X	X	- 28 -
IMS-944	X	X	X				- 33 -
IVS-948	X	X	X	X	X		- 34 -
iSYS-3104	X	X	X		X		- 36 -
iSYS-4001	X	X	X		X		- 38 -
iSYS-4004				X	X		- 39 -

Collision Avoidance

Product Number	Movement	Velocity	Direction	Presence	Distance	Angle	Page
IVQ-3004	X	X	X	X	X	X	- 20 -
iSYS-4004				X	X		- 24 -
IVS-565	X	X		X	X	X	- 28 -
iSYS-6003				X	X		- 38 -

Industrial Applications

Product Number	Movement	Velocity	Direction	Presence	Distance	Angle	Page
iSYS-101	X	X					- 14 -
IVS-163	X	X	X	X	X		- 18 -
IVS-162	X	X	X	X	X		- 21 -
IVS-465	X	X	X	X	X		- 26 -
IMS-165	X	X					- 27 -
IVS-565	X	X		X	X	X	- 28 -
IPS-265	X	X	X				- 29 -
IPM-365	X	X					- 30 -
iSYS-6003				X	X		- 38 -
IPS-154	X	X	X				- 40 -

CW Standard Products

Most radar-modules today are utilizing the CW-Doppler principle. These allow speed measurements and the identification of the movement direction of an object. This measurement principle is important in application areas like:

- traffic monitoring
- automatic door openers
- alarm equipment
- security equipment
- sanitary equipment
- sport applications

InnoSenT GmbH offers a wide range of different radar modules for these application areas.

The standard products are listed on the following pages.

IPS-144

The IPS-144 is made for traffic monitoring. Especially the antenna pattern as well as the low power consumption fits perfect for this application.

Product Family: K-Band CW Transceiver

Applications:

- Traffic Monitoring
  (long range applications)
- Industrial Applications

Features:

» radar-based motion detector working in the 24GHz-ISM-Band
» available in different frequency ranges for worldwide use
» advanced DRO-oscillator with low current consumption
» RF-pre-amplifier for lowest noise operation
» split transmit and receive path for maximum gain
» stereo (dual channel) operation for direction of motion identification
» IF-pre-amplifier, bandwidth limited for lowest noise performance
» compact outline dimensions

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

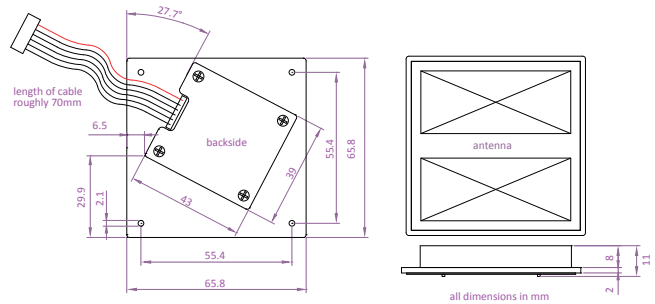
RoHs Info: This product is compliant to the restriction of hazardous substances (RoHS - European Union directive 2011/65/EU).

Approvals: Certified and approved according to:

- ETSI EN 300 440

certificate available on request.

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-500		kHz/°C
output power (EIRP)	P_{out}		20		dBm
IF-amplifier	gain		50		dB
	bandwidth		50 - 10k		Hz
IF-output	offset		$V_{cc}/2$		V
full beam width @ -3dB	horizontal		12		°
	vertical		25		°
side-lobe suppression	horizontal		20		dB
	vertical		15		dB
supply voltage	V_{cc}	4.75	5.0	5.25	V
supply current	I_{cc}		60	80	mA
operating temperature	T_{OP}	-20		+60	°C

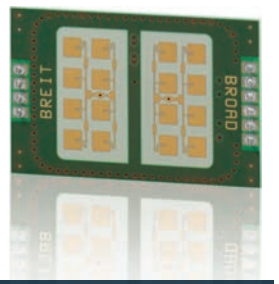
IPS-155

The IPS-155 is a K-Band Transceiver with a split transmit and receive antenna. It is certified and approved according to ETSI EN 300 440. Certificates available on request.

Product Family: K-Band Transceiver

Applications:

- Door Opener
- Industrial applications



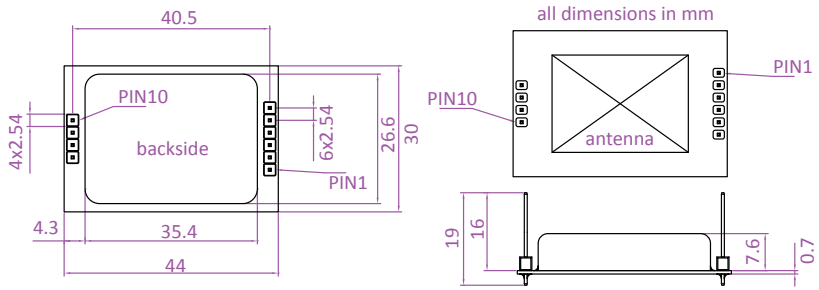
Features:

» radar-based motion detector operating in the 24GHz - ISM - Band
» available in different frequency ranges for worldwide use
» advanced LCO-oscillator with low current consumption
» split transmit and receive path for maximum gain
» IF-pre-amplifier, bandwidth limited for lowest noise performance
» stereo (dual channel) operation for direction of motion identification
» compact outline dimensions

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	$f_{IPS-155}$	24.000	24.125	24.250	GHz
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		15	20	dBm
IF-amplifier	bandwidth		DC - 50		Hz
	gain		20		dB
IF-output	volltage offset	1.0	2.2	4.0	V
full beam width @ -3dB	horizontal		70		°
	vertical		36		°
side-lobe suppression	horizontal		13		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		35	50	mA
operating temperature	T_{OP}	-20		+60	°C

IPS-946

The IPS-946 replaces the old fashioded GUNN-Transceivers with Standard-Gain-Horn. The low power consumption as well as the compact outline dimension matches perfectly to traffic monitoring requirements.

Product Family: K-Band CW Transceiver

Applications:

- Traffic Monitoring
  (medium range applications)
- Industrial applications

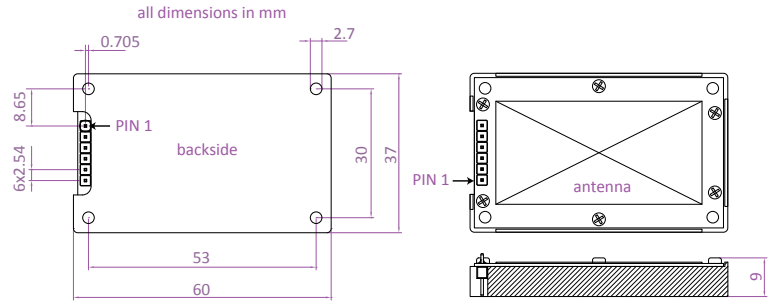
Features:

» radar-based motion detector working in the 24GHz - ISM - Band
» available in different frequency ranges for worldwide use
» advanced LCO-oscillator with low current consumption
» RF-pre-amplifier for lowest noise operation
» split transmit and receive path for maximum gain
» stereo (dual channel) operation for direction of motion identification
» IF-pre-amplifier, bandwidth limited for lowest noise performance
» compact outline dimensions

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-0.420		MHz/°C
output power (EIRP)	P_{out}		19	20	dBm
IF-amplifier	bandwidth		30 - 10k		Hz
	gain		54		dB
IF-output	offset		$V_{cc}/2$		V
full beam width @ -3dB	horizo-ntal		33		°
	vertical		33		°
side-lobe suppression	horizontal	20	25		dB
	vertical	20	25		dB
supply voltage	V_{cc}	4.75	5.0	5.25	V
supply current	I_{cc}		75	80	mA
operating temperature	T_{OP}	-20		+60	°C

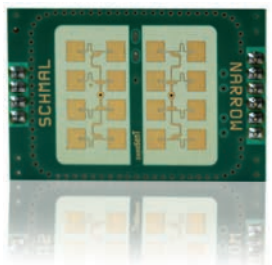
IPS-154

The IPS-154 was designed for automatic door openers. It is also available with a broader antenna pattern called IPS-155.

Product Family: K-Band CW Transceiver

Applications:

- Door Opener
- Industrial Applications



Features:

- » radar-based motion detector working in the 24GHz - ISM - Band
- » available in different frequency ranges for worldwide use
- » advanced LCO-oscillator with low current consumption
- » split transmit and receive path for maximum gain
- » IF-pre-amplifier, bandwidth limited for lowest noise performance
- » stereo (dual channel) operation for direction of motion identification
- » compact outline dimensions

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

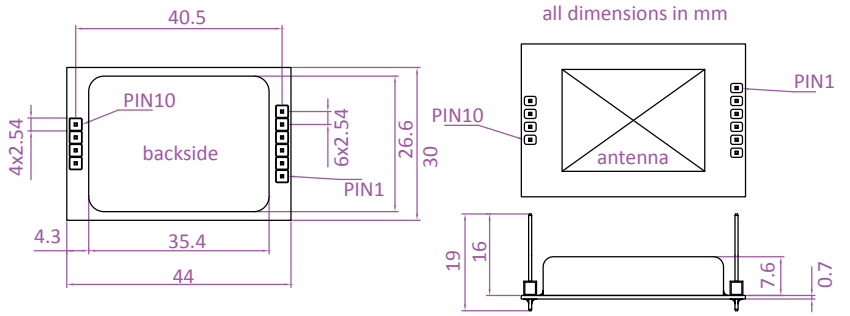
RoHs Info: This product is compliant to the restriction of hazardous substances (RoHS - European Union directive 2011/65/EU).

Approvals: Certified and approved according to

- ETSI EN 300 440
- FCC 15.245 (UXS-IPS154US)
  (modular approval request)

certificate available on request

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		16	20	dBm
IF-amplifier	bandwidth		DC - 50		kHz
	gain		20		dB
IF-output	offset	1.0	2.2	4.0	V
full beam width @ -3dB	horizontal		45		°
	vertical		38		°
side-lobe suppression	horizontal		13		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		35	50	mA
operating temperature	T_{OP}	-20		+60	°C

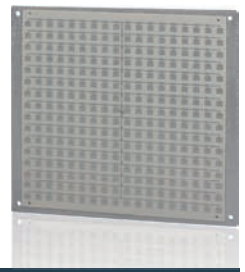
IPS-182

The IPS-182 has a narrow beam antenna as well as a very low power consumption that fits perfectly for traffic monitoring applications as well as security applications.

Product Family: K-Band CW Transceiver

Applications:

- Traffic Monitoring
- Industrial Applications



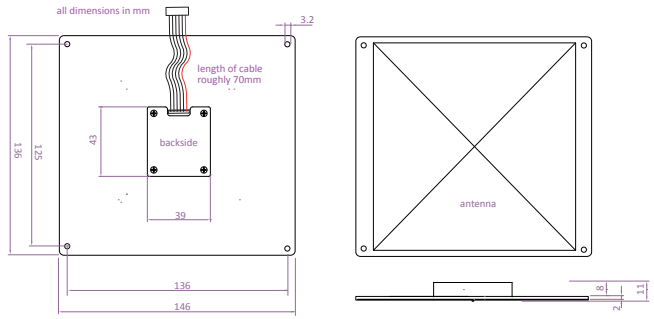
Features:

» radar-based motion detector working in the 24GHz-ISM-Band
» available in different frequency ranges for installations close to each other
» advanced DRO-oscillator with low current consumption
» narrow beam antenna
» stereo (dual channel) operation for direction of motion identification
» IF-pre-amplifier, bandwidth limited for lowest noise performance
» output power limited to 20dBm

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F_1	24.075	24.100	24.120	GHz
	F_2	24.130	24.150	24.175	GHz
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}			20	dBm
IF-amplifier	bandwidth		50 - 100k		kHz
	gain		58		dB
IF-output	offset		Vcc/2		V
full beam width @ -3dB	horizontal		6.5	8.5	°
	vertical		5.5	7.5	°
side-lobe suppression	horizontal	15			dB
	vertical	15			dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		40	50	mA
operating temperature	T_{OP}	-20		+60	°C

IPS-168

The IPS-168 is a high focussing K-Band Transceiver especially designed for speed enforcement systems.

Product Family: K-Band CW Transceiver

Applications:

- Speed Enforcement
- Traffic Monitoring
- Industrial Applications

Features:

» radar-based motion detector working in the 24GHz-ISM-Band
» available in different frequency ranges for worldwide use
» advanced DRO-oscillator with low current consumption
» high focussing antenna
» RF-pre-amplifier for lowest noise operation
» split transmit and receive path for maximum gain
» stereo (dual channel) operation for direction of motion identification
» IF-pre-amplifier, bandwidth limited for lowest noise performance

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

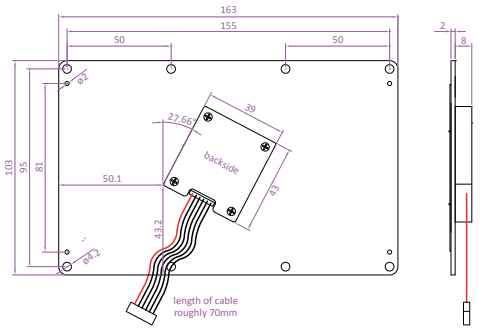
RoHs Info: This product is compliant to the restriction of hazardous substances (RoHS - European Union directive 2011/65/EU).

Approvals: Certified and approved according to

- ETSI EN 300 440

certificate available on request

Outline Dimensions:



Technical Data: *Please contact InnoSenT for a detailed Data-Sheet.*

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-500		kHz/°C
output power (EIRP)	P_{out}		26		dBm
IF-amplifier	bandwidth		50 - 10k		Hz
	gain		50		dB
IF-output	offset		$V_{CC}/2$		V
full beam width @ -3dB	horizontal		5		°
	vertical		22		°
side-lobe suppression	horizontal		15		dB
	vertical		15		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		60	80	mA
operating temperature	T_{OP}	-20		+60	°C

FMCW/FSK capable standard products

The FMCW approach is getting more and more common for industrial radar frontends. Many applications require to detect also stationary objects or if they are moving additional information like the distance.

The FMCW radar principle provides the following information:

- velocity and direction of motion (like the usual doppler radar)
- distance of the object from the sensor
- the angle offset with a certain receiver arrangement
- the distance from the sensor

InnoSenT GmbH offers a multitude of different radar devices for these applications.

The standard products are listed on the following pages.

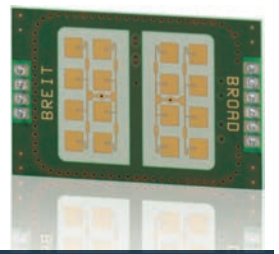
IVS-163

The IVS-163 is the FMCW/FSK-version of the IPS-155. The same outline dimensions as well as the identical antenna pattern make this product the perfect upgrade to your existing system.

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

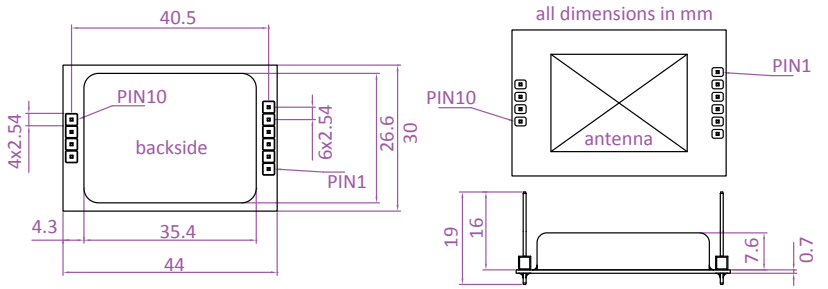
» stereo (dual channel) operation for direction of motion identification

» IF-pre-amplifier, bandwidth limited for lowest noise performance

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0.5		10	V
tuning slope			40		MHz/V
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		15		dBm
IF-output	volltage offset	1.0	2.2	4.0	V
IF-amplifier	bandwidth		DC - 50		kHz
	gain		20		dB
full beam width @ -3dB	horizontal		70		°
	vertical		36		°
side-lobe suppression	horizontal		13		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		35	50	mA
operating temperature	T_{OP}	-20		+60	°C

IVS-148

The IVS-148 is the FMCW/FSK-version of the IPS-144. It features the same outline dimensions as well as an identical antenna pattern, which makes it perfect for upgrading existing systems.

Product Family: K-Band VCO Transceiver

Applications:

- Traffic Monitoring
  (long range applications)
- Industrial Applications

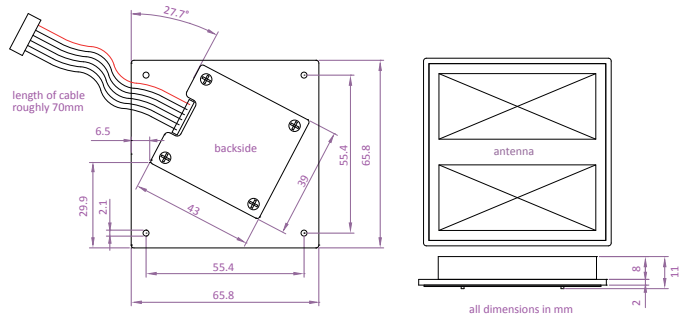
Features:

» VCO-Transceiver centered @ 24GHz
» FMCW/FSK capable; therefore measurement of distance as well as recognition of stationary objects possible
» RF-pre-amplifier for lowest noise operation
» split transmit and receive path for maximum gain
» stereo (dual channel) operation for direction of motion identification
» IF-pre-amplifier, bandwidth limited for lowest noise performance
» compact outline dimensions

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0.5		10	V
tuning slope			50		MHz/V
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		20		dBm
IF-output	offset		$V_{CC}/2$		V
IF-amplifier	bandwidth		50 - 100k		Hz
	gain		30		dB
full beam width @ -3dB	horizontal		12		°
	vertical		25		°
side-lobe suppression	horizontal		15		dB
	vertical		15		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		60	80	mA
operating temperature	T_{OP}	-20		+60	°C

IVQ-3004

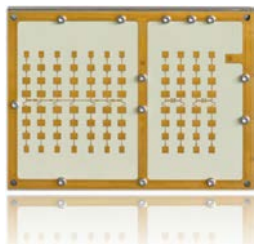
The RFE-3004 provides an advanced 24GHz MMIC Design. The module can be used in CW / FSK / FMCW-mode. The two receiving antenna enables the user to measure the angle of arrival in a defined area.

Product Family:

K-Band VCO Transceiver with advanced MMIC technology & angle of arrival measurement capability

Applications:

- Traffic Monitoring
- Industrial Applications



Features:

» K-Band VCO Transceiver with advanced SiGe MMIC technology
» supports CW / FSK / FMCW modes
» two receiving antenna for phase comperision operation
» integrated RF - pre-amplifier for long range applications
» I/Q channels for direction of motion discrimination
» integrated IF - amplifier

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

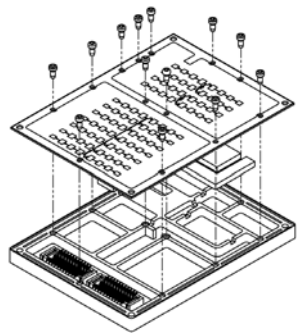
RoHs Info:

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

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.

Outline Dimensions:
isometry view



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter		Symbol	Min.	Typ.	Max.	Units
transmit frequency		f		24.000 - 24.250		GHz
output power (EIRP)		V_{tune}	8		30	dBm
IF lower cutoff frequency			59	96	133	Hz
IF upper cutoff frequency			55		61	kHz
side-lobe suppression			35	40		dB
supply voltage		V_{CC}	5.5	5.8	6.1	V
supply current Vcc	RFE on	I_{CC}		560	690	mA
	RFE off	I_{CC}		410	450	mA
operating temperature		T_{OP}	-25		+60	°C

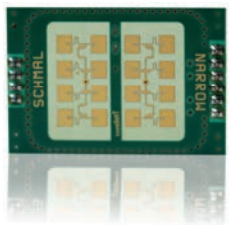
IVS-162

The IVS-162 is the FMCW/FSK-version of the IPS-154. The same outlines as well as the identical antenna pattern give the opportunity of a simple upgrade of your existing system.

Product Family: K-Band VCO Transceiver

Applications:

- Door Opener
- Industrial Applications



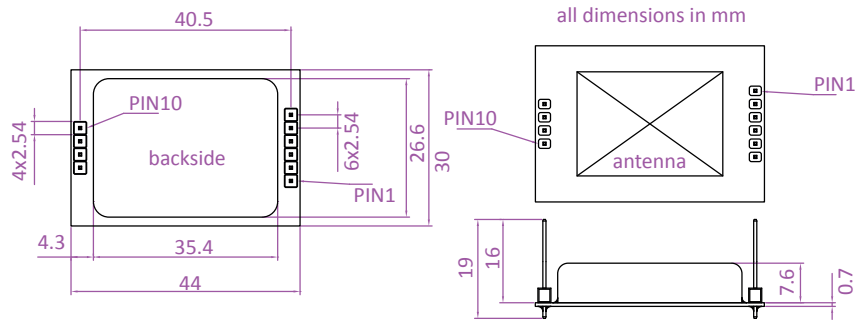
Features:

- » 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 identification
- » IF-pre-amplifier, bandwidth limited for lowest noise performance
- » compact outline dimensions

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0.5		10	V
tuning slope			40		MHz/V
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		15		dBm
IF-output	offset	1.0	2.2	4.0	V
IF-amplifier	bandwidth		DC - 50k		Hz
	gain		20		dB
full beam width @ -3dB	horizontal		45		°
	vertical		38		°
side-lobe suppression	horizontal		13		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		35	50	mA
operating temperature	T_{OP}	-20		+60	°C

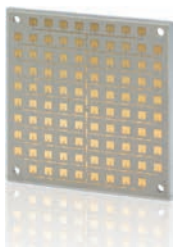
IVS-167

The IVS-167 is a FMCW/FSK capable K-Band Traceiver with a symetrical antenna pattern.

Product Family: K-Band VCO Transceiver

Applications:

- Traffic Monitoring
- Industrial Applications
- Level Measurement



Features:

» VCO-Transceiver centered @ 24GHz

» FMCW/FSK capable; therefore measurement of distance as well as recognition of stationary objects possible (depending on modulation)

» narrow beam pattern

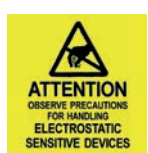
» stereo (dual channel) operation for direction of motion identification

» compact outline dimensions

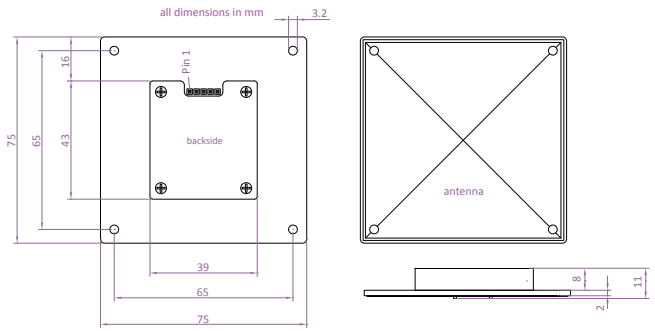
- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

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

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.



Outline Dimensions:



Technical Data: *Please contact InnoSenT for a detailed Data-Sheet.*

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0.5		8	V
tuning slope			50		MHz/V
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		18		dBm
IF-amplifier			no IF-amplifier included		
full beam width @ -3dB	horizontal		11		°
	vertical		11		°
side-lobe suppression	horizontal		15		dB
	vertical		15		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		33	40	mA
operating temperature	T_{OP}	-20		+60	°C

IVS-979

The IVS-979 is the narrow beam version of the IVS-148. The IVS-979 is a perfect option for applications where the IVS-148 antenna pattern is to broad.

Product Family: K-Band VCO Transceiver

Applications:

- Traffic Monitoring
  (long range applications)
- Industrial Applications

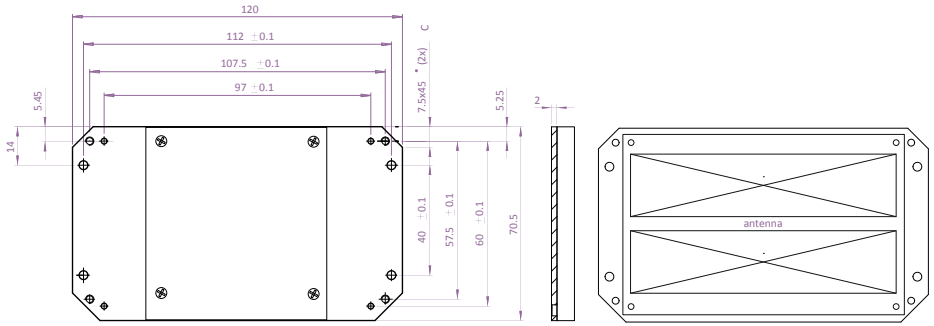
Features:

- » K-Band VCO Transceiver with advanced SiGe MMIC technology
- » FMCW/FSK capable; therefore measurement of distance as well as recognition of stationary objects is possible
- » 1/x divider for reference frequency output
- » RF-pre-amplifier for lowest noise operation
- » split transmit and receive path for maximum gain
- » stereo (dual channel) operation for direction of motion identification
- » IF-pre-amplifier, bandwidth limited for lowest noise performance

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0		30	V
tuning slope (fine)		59	96	133	MHz/V
tuning slope (coarse)		340	552	766	
temperature drift (frequency)	Δf		-4	-5	MHz/°C
output power (EIRP)	P_{out}		20		dBm
IF-output	offset		1.65		V
IF-amplifier	bandwidth		100 - 2.5M		Hz
	gain		40		dB
full beam width @ -3dB	horizontal		7		°
	vertical		28		°
side-lobe suppression	horizontal		15		dB
	vertical		15		dB
supply voltage	V_{CC}	5.3	5.5	6	V
supply current	I_{CC}			170	mA
operating temperature	T_{OP}	-30		+60	°C

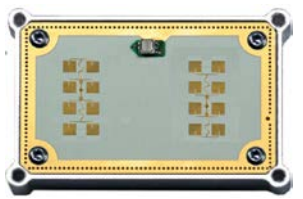
IVS-4005

The RFE-4005 is InnoSenT's first full digital radar-front-end. The integrated PLL-Syntesizer enables a digital modulation generation by programming the modulation schemes directly. This guarentees a high stable performance over the complete lifetime of the product.

Product Family: 24 GHz MMIC Transceiver

Applications:

- Industrial Applications
- Motion Detection
- Security Applications



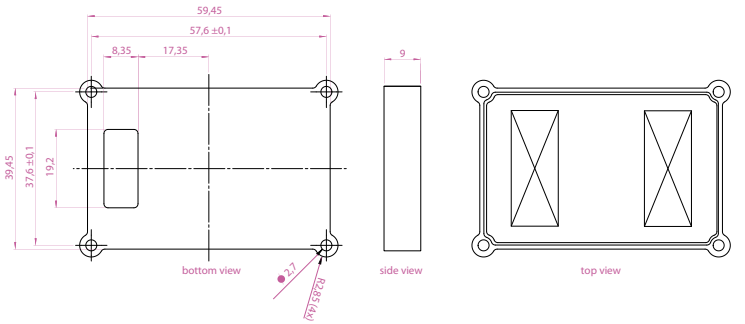
Features:

- » radar-based motion detector working in the 24GHz - ISM - Band
- » integrated PLL -Syntesizer for digital modulation generation
- » modulation programmable by costumer
- » integrated adjustable IF - pre - amplifier
- » integrated IF - filters
- » integrated power detector
- » programmable output power
- » three colour LED for control by user

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

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
output power (EIRP)	P_{out}	16		25	dBm
IF-output	voltage offset	1.49	1.65	1.82	V
IF-amplifier	bandwith	30		100k	Hz
	adjustable gain	20.8		47.6	dB
side-lobe suppression	horizontal		30		dB
	vertical		20		dB
supply voltage	V_{CC}	3.5	4	5.25	V
supply current	I_{CC}	150	180	220	mA
operating temperature	T_{OP}	-20		+60	°C

Low-Cost Transceivers

The low-cost transceivers are entry level devices with small outline dimensions and are easy to integrate.

The typical application are:

- Intrusion alarm and security systems
- Home automation (e.g. motion detector for automatic light switch)
- Automatic door openers

The standard products are listed on the following pages.

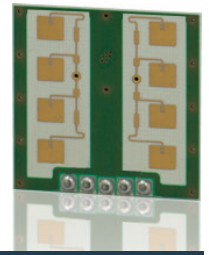
IVS-465

The IVS-465 is the VCO version of the IPS-265 and therfore the perfect choice for low cost applications which require to detect stationary objects as well as the distance to an object.

Product Family: Low Cost K-Band VCO Transceiver

Applications:

- Door Openers
- Security Applications
- Industrial Applications



Features:

» radar-based motion detector working in the 24GHz - ISM - Band

» FMCW/FSK capable; therefore measurement of distance as well as recognition of stationary objects is possible

» advanced VCO-oscillator with low current consumption

» split transmit and receive path for maximum gain

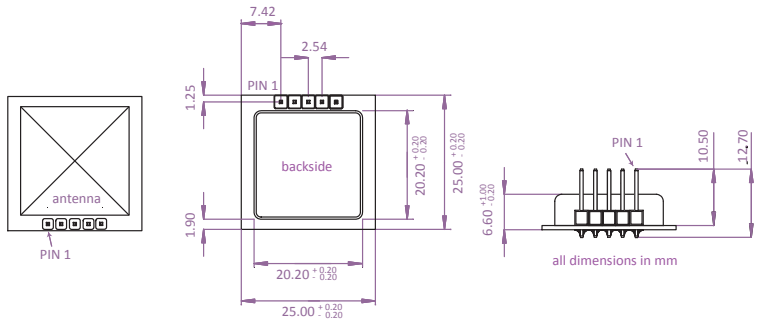
» dual channel operation for direction of motion identification

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

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

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.

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies	f		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0.5		10	V
tuning slope			50		MHz/V
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		16		dBm
IF-output	offset	-300		300	mV
IF-amplifier	bandwidth		no IF-amplifier included		
full beam width @ -3dB	horizontal		80		°
	vertical		32		°
side-lobe suppression	horizontal		13		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		30	40	mA
operating temperature	T_{OP}	-20		+60	°C

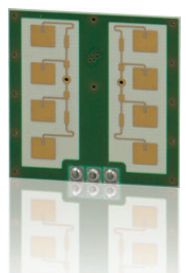
IPM-165

The IPM-165 is already a standard in the field of intrusion alarm and intrusion.

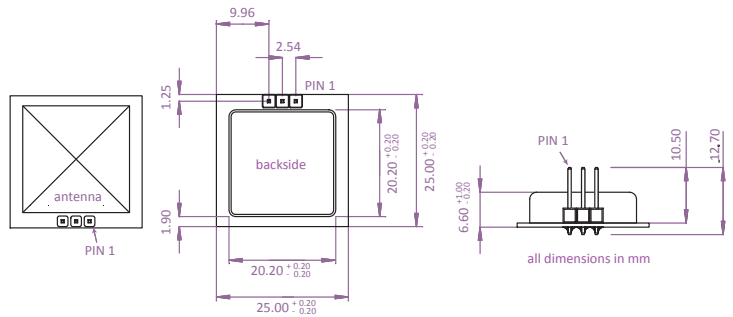
Product Family: Low Cost K-Band Transceiver

Applications:

- Door Openers
- Security Applications
- Industrial Applications



Outline Dimensions:



Features:

» radar-based motion detector working in the 24GHz - ISM - Band
» available in different frequency ranges for worldwide use
» advanced LCO-oscillator with low current consumption
» split transmit and receive path for maximum gain
» very compact outline dimensions

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

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

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.

Approvals: Certified and approved according to

- ETSI EN 300 440
- FCC 15.245 (UXS1) *(modular approval request)*

certificate available on request

Technical Data: *Please contact InnoSenT for a detailed Data-Sheet.*

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		16		dBm
IF-output	offset	-300		300	mV
IF-amplifier		no IF-amplifier included			
full beam width @ -3dB	horizontal		80		°
	vertical		35		°
side-lobe suppression	horizontal		12		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		30	40	mA
operating temperature	T_{OP}	-20		+60	°C

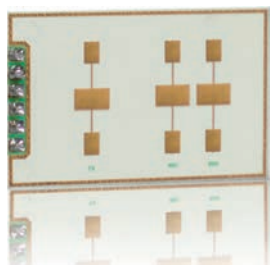
IVS-565

The IVS-565 is a K-Band VCO radar transceiver for FMCW/FSK modulation. One of its features is the second receive antenna which allows angle measuring capability. It is the perfect device for highend security applications and door openers.

Product Family: Low Cost K-Band Transceiver

Applications:

- Motion Detection
- Security Applications
- Industrial Applications



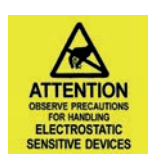
Features:

» radar-based motion detector working in the 24GHz - ISM - Band
» available in different frequency ranges for worldwide use
» RF-pre-amplifier for lowest noise operation
» advanced LCO-oscillator with low current consumption
» very compact outline dimensions

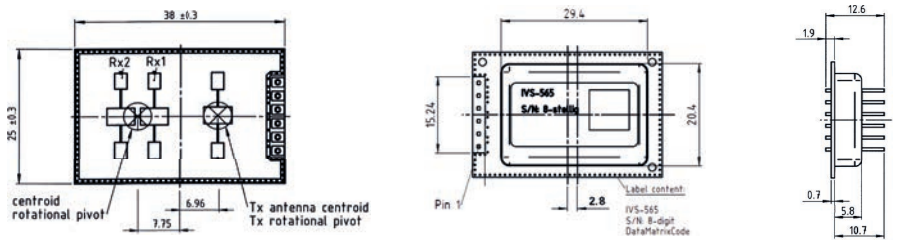
- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

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

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.



Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	f_t	24.000		24.250	GHz
varactor tuning voltage	V_t	0.5		10	V
varactor input impedance			10		kΩ
output power (EIRP)	P_{out}		12		dBm
rise time of device				100	µSec
IF-output	voltage offset	-300		300	mV
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	V_{CC}		35	50	mA
operating temperature	T_{OP}	-20		+60	°C

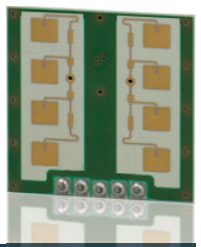
IPS-265

The IPS-265 is the stereo version of the IPM-165 and therfore the perfect choice for low cost applications where the detection of movement direction is necessary.

Product Family: Low Cost K-Band Transceiver

Applications:

- Door Openers
- Security Applications
- Industrial Applications



Features:

» radar-based motion detector working in the 24GHz - ISM - Band
» available in different frequency ranges for worldwide use
» advanced LCO-oscillator with low current consumption
» split transmit and receive path for maximum gain
» dual channel operation for direction of motion identification

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

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

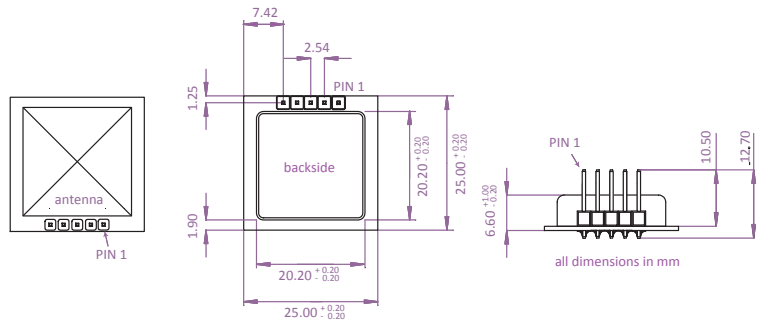
ESD Info: This InnoSenT sensor is sensitive to damage from ESD. Normal precautions as usually applied to CMOS devices are sufficient when handling the device. Touching the signal output pins has to be avoided at any time before soldering or plugging the device into a motherboard.

Approvals: Certified and approved according to

- ETSI EN 300 440
- FCC 15.245 (UXS2) *(modular approval request)*

certificate available on request

Outline Dimensions:



Technical Data: *Please contact InnoSenT for a detailed Data-Sheet.*

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-1		MHz/°C
output power (EIRP)	P_{out}		16		dBm
IF-output	offset	-300		300	mV
IF-amplifier	bandwidth	no IF-amplifier included			
full beam width @ -3dB	horizontal		80		°
	vertical		32		°
side-lobe suppression	horizontal		13		dB
	vertical		13		dB
supply voltage	V_{CC}	4.75	5.0	5.25	V
supply current	I_{CC}		30	40	mA
operating temperature	T_{OP}	-20		+60	°C

IPM-170 / IPM-365

The IPM-170 has a broad antenna pattern in both azimuth and elevation. Therefore it is a perfect choice for ceiling mounting. The IPM-w365 is the 3V version of the IPM-165 that sets a standard in the field of intrusion alarm and low-cost door openers.

Product Family: Low Cost K-Band Transceiver

Applications:

- Door Openers
- Security Applications
- Industrial Applications

Features:

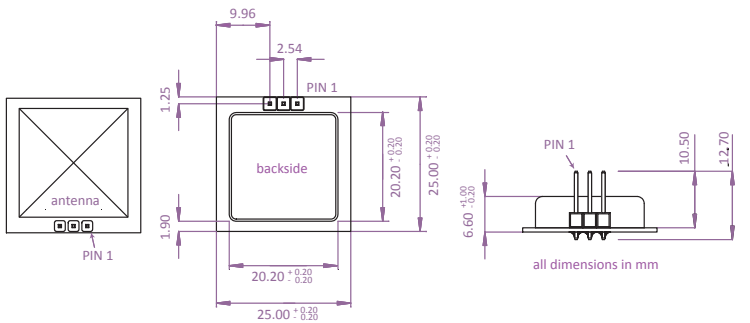
» radar-based motion detector working in the 24GHz - ISM - Band
» available in different frequency ranges for worldwide use
» advanced LCO-oscillator with low current consumption
» split transmit and receive path for maximum gain
» very compact outline dimensions

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

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

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.

Outline Dimensions:



Technical Data: *Please contact InnoSenT for a detailed Data-Sheet.*

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequency	F	24.000		24.250	GHz
temperature drift (frequency)	Δf		-1		MHz/°C
IF-output	offset	-300		300	mV
IF-amplifier		no IF-amplifier included			kHz
supply current	I_{CC}		30	40	mA
operating temperature	T_{OP}	-20		+60	°C

Specific Parameter	Symbol	IPM-170			IPM-365		
output power (EIRP)	P_{out}	typ. 16 dBm			typ. 13 dBm		
full beam width @ -3dB	horizontal	typ. 70°			typ. 80°		
	vertical	typ. 70°			typ. 32°		
side-lobe suppression	horizontal	typ. 13°			typ. 13°		
	vertical	typ. 13°			typ. 13°		
supply voltage	V_{CC}	min. 4.75	typ. 5.0	max. 5.25	min. 2.85	typ. 3.0	max. 3.3

InnoSenT K-Band Series 9xx

This series is based on advanced MMIC technology and offers smart features to the customer.

The typical application areas of these modules are:

- Traffic Monitoring (Speed - Distance)
- Intrusion alarm and security (Perimeter Security)
- Industrial Applications

The standard products are listed on the following pages.

IPT-914 / IPR-915

The IPT-914 is a K-Band Transmitter with ASK-modulation capability. Together with the IPR-915 K-Band Receiver it can be used as K-Band barrier for security application / perimeter protection up to a range of 180m.

Product Family: Monopuls K-Band VCO Transceiver

Applications:

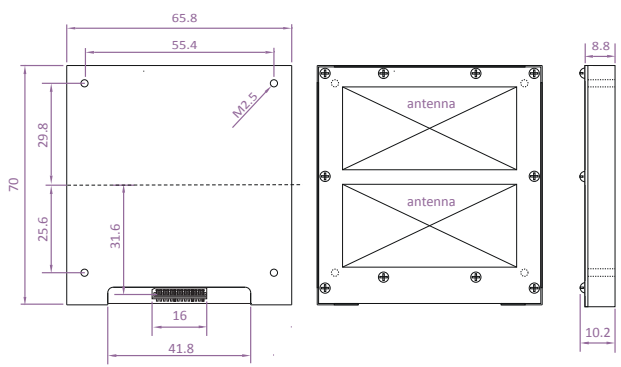
- Security Applications
- Industrial Applications

Features:

» radar-based barrier consisting of one Tx- and one Rx-Module.
» integrated RF-pre-amplifier within the Rx-Module.
» integrated PLL-circuit for high frequency stability and low phase noise for the Tx- and Rx-Part.
» Tx- and Rx-frequencies are customer programmable.
» 2 selectable output power levels (ETSI / FCC) for the Tx-Module.
» the Tx-signal can be ASK-modulated up to 26kHz.

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
Transmitter IPT-914					
transmit frequencies*	F	24.000		24.250	GHz
channel spacing			5		MHz
temperature drift frequency	Δf		< 10		kHz/°C
output power (EIRP)**	P_{out}		20	24	dBm
modulation frequency	f_{mod}			26	kHz
positive supply voltage	V_{cc}		5		V
positive supply current	I_{cc}			140	mA
Receiver IPB-914					
transmit frequencies	F	24.000		24.250	GHz
channel spacing			5		MHz
IF-amplifier	gain		10		dB
	bandwidth		5		MHz
positive supply voltage	V_{cc}		5		V
positive supply current	I_{cc}			140	mA
Antenna					
full beam width @ -3dB	horizontal	13		°	azimuth
	vertical	13		°	elevation
side-lobe suppression	horizontal	10		dB	azimuth
	vertical	10		dB	elevation
Enviroment					
operating temperature	T_{OP}	-20		+60	°C

IMS-944

The IMS-944 is the advanced version of the K-Band Transceiver IPS-144. New and smart features like programmable Tx-frequency and 2 power options give the user the freedom to have one stock item for different markets / countries.

Product Family: Multifunctional K-Band Transceiver

Applications:

- Traffic Monitoring
  (long range applications)
- Industrial Applications

Features:

» radar-based motion detector operating in the 24GHz - ISM - Band
» dual channel operation for direction of motion identification
» integrated RF-pre-amplifier
» programmable IF-amplifier (factory setting: 53dB)
» 2 selectable output power levels (ETSI / FCC)
» integrated PLL-circuit for high frequency stability
» frequencies are programmable by customer (factory setting 24.160GHz)

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

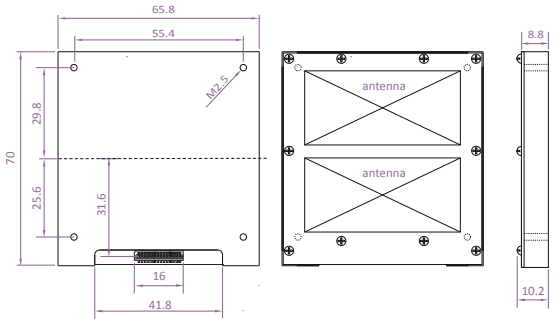
RoHs Info: This product is compliant to the restriction of hazardous substances (RoHS - European Union directive 2011/65/EU).

Approvals: Certified and approved according to

- ETSI EN 300 440
- FCC 15.245 (UXSIMS944)
  (modular approval request)

certificate available on request

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies*	F	24.000		24.250	GHz
channel spacing		4			MHz
temperature drift (frequency)	Δf		< 10		kHz/°C
output power (EIRP)*	P_{out}		20	26	dBm
IF-amplifier*	gain	20		53	dB
	upper corner	150k			Hz
	lower corner			40	Hz
IF-output	offset		1.65		V
full beam width @ -3dB	horizontal		32		°
	vertical		14		°
side-lobe suppression	horizontal		25		dB
	vertical		25		dB
supply voltage	V_{CC}		5.0		V
supply current	I_{CC}			170	mA
operating temperature	T_{OP}	-20		+60	°C

* programmable

IVS-948

The IVS-948 is the advanced version of the K-Band Transceiver IVS-148. New smart features like the 1/x divider output for VCO tuning slope linearization, progammable IF-amplifier and two output power options offer the user a wide range of possibilities.

Product Family: K-Band VCO Transceiver

Applications:

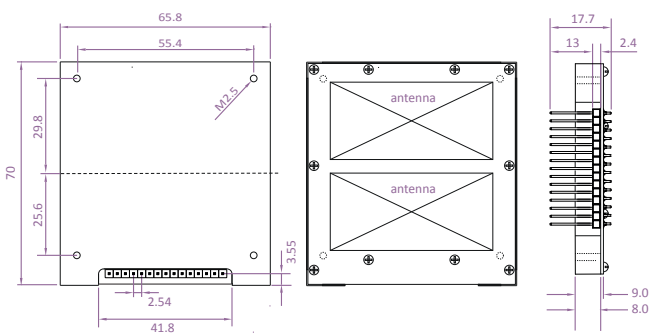
- Traffic Monitoring
  (with distance measurement)
- Industrial Applications

Features:

» K-Band VCO Transceiver with advanced SiGe MMIC technology
» CW / FSK / FMCW modes
» 1/x divider for reference frequency output
» stereo (dual channel) operation to detect direction of motion
» integrated RF-pre-amplifier
» programmable IF-amplifier
» two selectable output power levels (ETSI / FCC)

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

Outline Dimensions:



Technical Data: *Please contact InnoSenT for a detailed Data-Sheet.*

Parameter	Symbol	Min.	Typ.	Max.	Units
transmit frequencies*	F		24.000 - 24.250		GHz
varactor tuning voltage	V_{tune}	0		3	V
tuning slope coarse		340	550	770	MHz/V
tuning slope fine		59	95	135	MHz/V
temperature drift (frequency)	Δf		- 4		MHz/°C
channel spacing			4		MHz
divider ratio factory setting			65,536		
output power (EIRP)*	P_{out}		20	26	dBm
IF-amplifier**	gain	20		53	dB
	band-width***	20		500k	Hz
IF-output	offset		1.65		V
full beam width @ -3dB	horizontal		32		°
	vertical		14		°
side-lobe suppression	horizontal		25		dB
	vertical		25		dB
supply voltage	V_{CC}		5.0		V
supply current	I_{CC}			170	mA
operating temperature	T_{OP}	-20		+60	°C

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.

iSYS Series

The iSYS- series are intelligent sensor systems with great funcitionaly especially for industrial applications.

In our iSYS systems, we realise all available radar principles (CW, FMCW, FSK). The signal processing is integrated into the system. The output of the information is done via industrial normed interfaces such as RS232, RS485 or CAN.

The iSYS-Series can be used in applications where movement, speed or distance is of interest, like

- door applications
- lighting applications
- level measurement
- people detection
- industrial applications
- traffic monitoring

The standard products are listed on the following pages.

iSYS-3104

K-Band radar system for multi lane traffic monitoring applications with ethernet and RS485 interface, GUI (Graphical user interface), 12-24V supply or PoE (Power over Ethernet).

Product Family: K-Band Traffic Monitoring Radar System

Applications:

- Vehicle Counting and Classification
- Speed Measurement
- Red Light Observation

Features:

The system delivers an application message for each vehicle and an object list over an Ethernet and RS485/422 Interface.

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

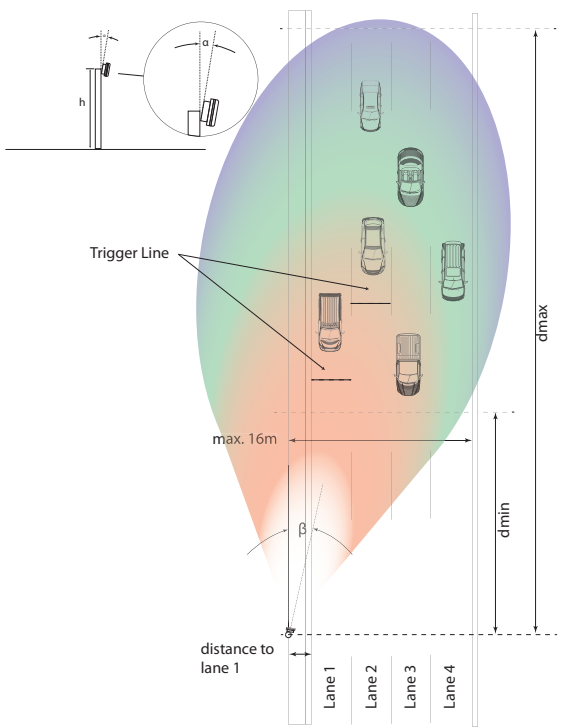
» Detection Range*: 5..300m
» Trigger area*: 20...80m (optimal area for counting and classification)
» Detection angle: 40° (±20°)
» Velocity measurement: 3..300km/h
» Velocity accuracy: <1km/h (for velocity <=100km/h)
<1% (for velocity >100 km/h)
» Direction: receding and approaching traffic
» Counting precision: >90% precision
» Classification precision: >80% precision
» Classes: 2+1 (passenger car, truck, others)
» Update time: 60 ms
» Protection class: IP67
» Mechanical Outlines: H: 132.1mm, L: 162.1mm, B:72.4mm

* depends on lane, installation and traffic direction

Typical Left Side Installation (Right Side, Gantry Installation possible)

Installation	Comment	Symbol	Min.	Typ.	Max.	Units
height		h	6	7	8	m
elevation angle		a	9	10	11	°
azimuth angle		ß	-8	-9	-10	°
distance to lane 1		d_{offert}		0		m
*trigger area lane 1	approaching	$d_{trigger\_lane1}$	20		60	m
*trigger area lane 2	approaching	$d_{trigger\_lane2}$	20		60	m
*trigger area lane 3	approaching	$d_{trigger\_lane3}$	30		60	m
*trigger area lane 4	approaching	$d_{trigger\_lane4}$	30		60	m

*valid for all weather conditions (rain etc.)



iSYS-3106

K- Band motion detection radar system for security applications. Detects moving objects in a speed range of 1km/h up to 140km/h. Detection range is up to 300m for objects with 0.75m² RCS. Radar signal processing generates a Targetlist with range, velocity, angle & signal strength for each detection & puts it into a multi-target tracker to calculate the Object-List.

Product Family: K-Band radar system for security applications

Applications:

- Perimeter Security

Features:

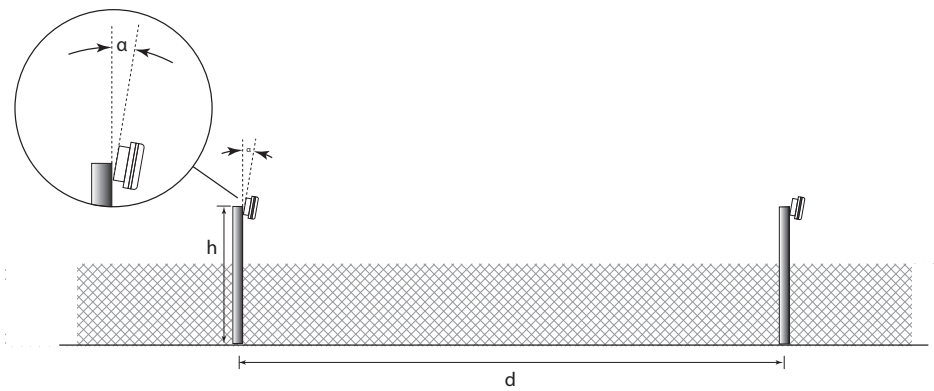
- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

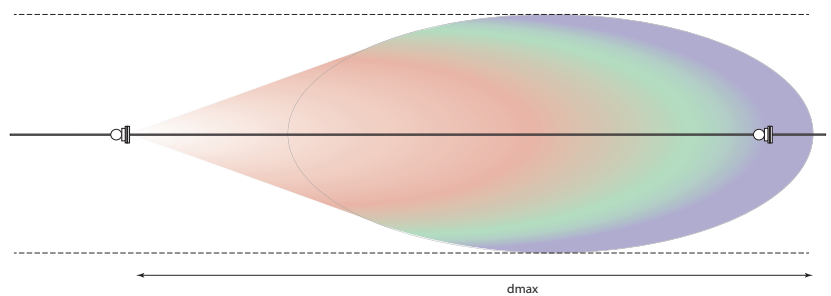
» Detection of Objects with 0.75m² RCS up to 300 m distance
» Detection range configurable
» Detectable radial speed: 0.25 km/h up to 140 km/h
» Object detection and tracking
» Configuration and Object-Lists over Ethernet interface
» Protection class IP67 for outdoor use
» 16 different frequency channels for simultaneous use of more RADAR Systems
» Addition Slave Sensor iSYS-3006 available to enlarge detection area
» Mechanical Outlines H: 132.1mm, L: 162.1mm, B:72.4mm

Typical Installation:

Installation	Comment	Symbol	Min.	Typ.	Max.	Units
height		h	3	6	6.5	m
pole distance		d		200		m
maximum distance*		dmax		300		m

* depends on correct installation, target size ,radial velocity, detection angle etc





iSYS-4001

K-Band based motion detector with intelligent decision unit. It can detect moving objects in a speed range of 0.2 km/h (0.12 mph) up to 250 km/h (155.32 mph). The detection range is from 0.3m (1ft) up to 150m (492.5ft) (depending on RCS of moving object).

Product Family: K-Band Movement Detection System

Applications:

- Industrial Applications
- Energy Saving
- Lighting Control
- Security Applications

Features:

» radar-based motion detector working in the 24GHz - ISM - Band
» detection of moving objects in a distance from 0.3 to 80m (depending on RCS of detected object)
» detection range configurable
» detectable speed: ±0.2km/h up to ±250 km/h
» direction of motion discrimination
» protection class IP67 for outdoor use
» robust metal housing

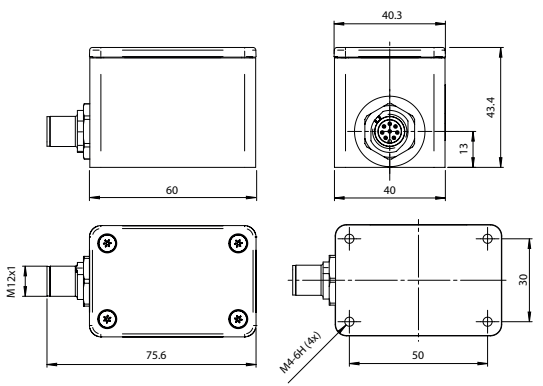
- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

Technical Data:

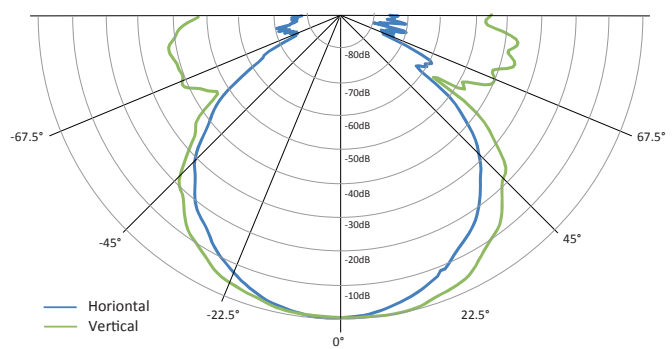
Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
Radar					
transmit frequencies	f_1		24.190		GHz
channel spacing	f_2		24.210		MHz
output power (EIRP)	P_{out}			20	dBm
Sensor					
detectoin distance	d_r			150	m
speed range	v_r			250	km/h
standar detection field	horizontal		34		°
	vertical		49		°
Power Supply					
positive supply voltage	V_{cc}	10		30	V
positive supply current	I_{cc}		250	550	mA
Enviroment					
operating temperature	T_{OP}	-25		+60	°C
storage temperature	T_{STH}	-25		+60	°C

Outline Dimensions:



Detection Field:



iSYS-4004

K-Band distance measurement system with intelligent µC decision unit. The system is based on modern MMIC technology. Depending on the available bandwidth the system can detect stationary objects in a distance between 1.1m (3.6ft) / 2.7m (8.9ft) to 35m (115ft) (depending on the RCS of the object).

Product Family: K-Band Distance Measurement System

Applications:

- Industrial Applications
- Level Measurement

Features:

» radar-based distance measurement system working in the 24GHz - ISM - Band

» distance measurement of stationary objects

» measuring distance from 1.1 to 35m with an accuracy of ±3cm for EU (available Bandwidth 250MHz)

» measuring distance from 2.7 to 35m with an accuracy of ±7.5cm for US, UK, F (available Bandwidth 100MHz)

» detection range configurable

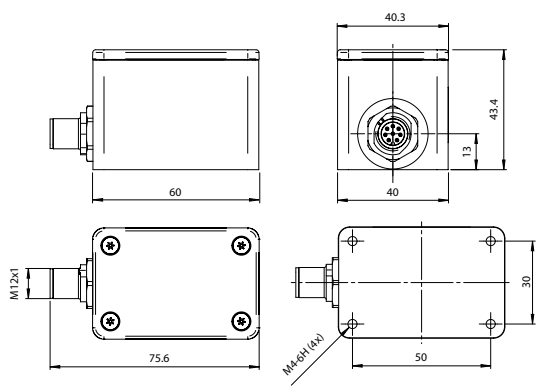
- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

Technical Data:

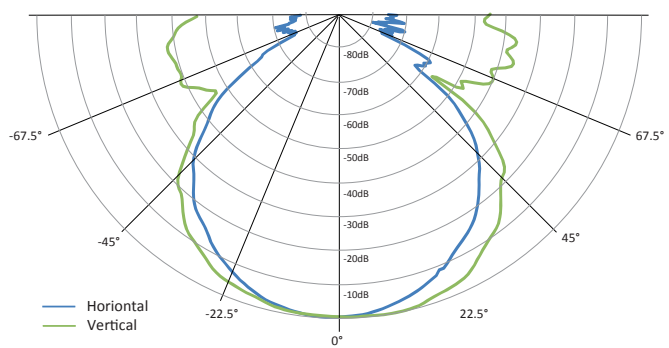
Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
Radar					
transmit frequencies	f	24.000		24.250	GHz
occupied bandwith	B_{EU}		24.210	250	MHz
	B_{US}			100	MHz
output power (EIRP)	P_{out}			20	dBm
Sensor					
detectoin distance	d_{rEU}	1.1		35	m
standar detection field	horizontal		34		°
	vertical		49		°
Power Supply					
supply voltage	V_{cc}	10		30	V
supply current	I_{cc}		350	550	mA
Enviroment					
operating temperature	T_{OP}	-25		+60	°C
storage temperature	T_{STG}	-25		+60	°C

Outline Dimensions:



Detection Field:



iSYS-101

K-Band Transceiver based motion detector with intelligent µC decision unit. It can detect a speed from 0.2 km/h (0.12 mph) up to 25 km/h (15.5 mph). The detection range is up to 15m (50 ft) (in case of a moving person).

Product Family: K-Band Movement Detection System

Applications:

- Energy Saving
- Motion Detection
- Lighting Control
- Security Applications

Features:

» radar-based motion detector working in the 24GHz - ISM - Band

» available in different frequency ranges for worldwide use

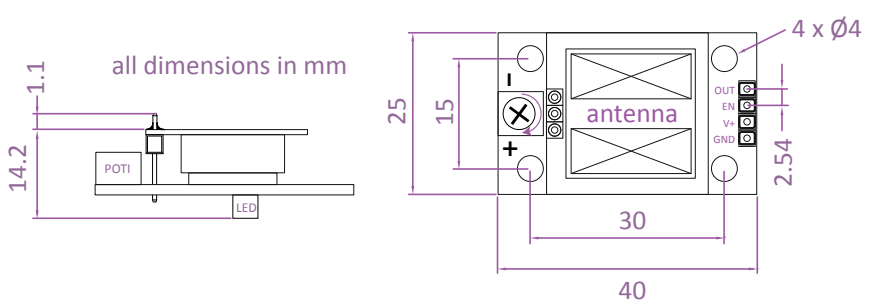
» small outline dimensions (25 x 40mm)

» adjustable gain from 36 up to 83dB resulting in an adjustable detection from 0.5m to 15m for people

» µC driven decision unit with interference suppression for fluorescent lamps

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
Radar					
transmit frequencies	f	24.000		24.250	GHz
output power (EIRP)	P_{out}		16		dBm
Sensor					
detectoin distance	d_r		10	15	m
speed range	v_r	0		25	km/h
standar detection field	horizontal		80		°
	vertical		32		°
wake up time from power-on	t		8		s
OPEN collectror output					
collector-emitter-voltage	V_{C-E}			36	V
collector-current	I_C			100	mA
amplification		36		83	dB
Power Supply					
positive supply voltage	V_{cc}	5		12	V
positive supply current	I_{cc}			20	mA
Enviroment					
operating temperature	T_{OP}	-25		+60	°C
storage temperature	T_{STH}	-25		+60	°C

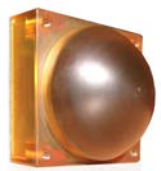
iSYS-6003

61 GHz radar module with signal-processing for precise distance measurement for stationary or slow moving targets.

Product Family: V-Band Distance Measurement System

Applications:

- Industrial Applications
- Level Measurement



Features:

» distance measurement with milimeter accuracy

» small size (50mm x 50mm) for easy integration into customer housing

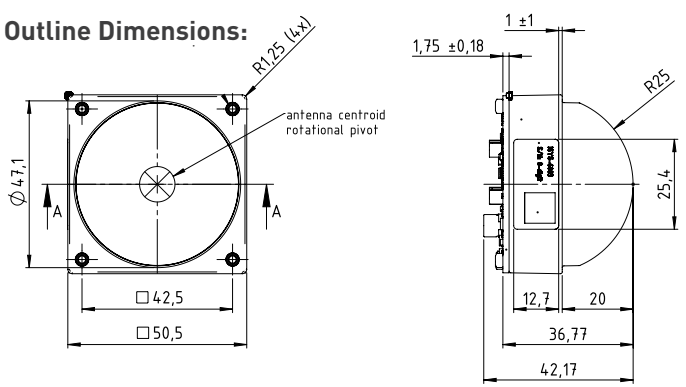
» narrow beam width

» client board with USB and RS-485 interface available for fast initial operation

» customer can reuse InnoSenT´s client board layout and/or schematic to build their own specialized sensor solution

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

Outline Dimensions:



Technical Data:

Please contact InnoSenT for a detailed Data-Sheet.

Parameter	Symbol	Min.	Typ.	Max.	Units
Radar					
transmit frequencies	f	58		62	GHz
occupied bandwith	B		3.8		GHz
output power (EIRP)	P_{out}			10	dBm
Sensor					
detection distance	d	5		2000	cm
distance accuracy *			+/- 2		mm
standar detection field	horizontal		8		°
	vertical		8		°
side lobe supression			- 25		dB
Power Supply					
supply voltage	V_{cc}	4.9		5.2	V
supply current	I_{cc}		530		mA
Enviroment					
operating temperature	T_{OP}	-25		+60	°C
storage temperature	T_{STG}	-25		+60	°C

*measured with reference target metal sheet 20x20 cm

Contact Information

If you have further questions regarding our products or looking for a customized solution please contact us or one of our representatives.

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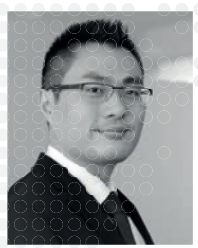

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