InnoSenT
Innovative Sensor Technology

Data Sheet IPM-170

Version 4.3 - 01.07.2014

designed and manufactured in Germany

PRODUCT FAMILY

Low Cost CW K-Band Transceiver

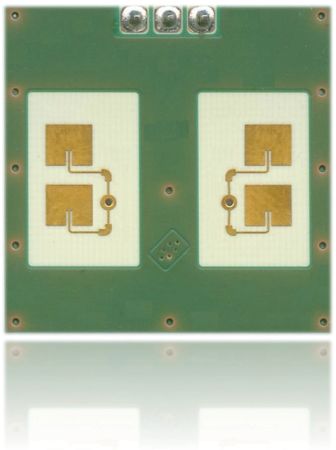
- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle

APPLICATIONS

- Security Applications
- Door Openers
- Industrial Applications

FEATURES:

» 24GHz short-range Transceiver
» CW (continouse wave) mode
» mono (single channel) operation
» available in different frequency ranges:
» standard; _F and _UK version
» advanced PHEMT oscillator with low current consumption
» very small outline dimensions
» split transmit and receive path for maximum sensitivity



DESCRIPTION

The IPM-170 is a 24GHz Doppler module with a symmetrical wide beam for detection of moving objects.
Low power consumption components are quickly enabled supporting duty cycles for battery or solar panel operation.
A continuous wave signal is generated by a 24GHz oscillator and partly transmitted via a planar microstrip antenna.
If the transmitted wave is reflected by an object, the received signal frequency gives information about the velocity of the detected object.

CERTIFICATES

InnoSenT GmbH 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.

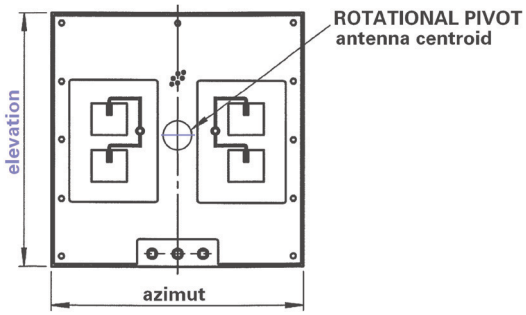
RoHS-INFO

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

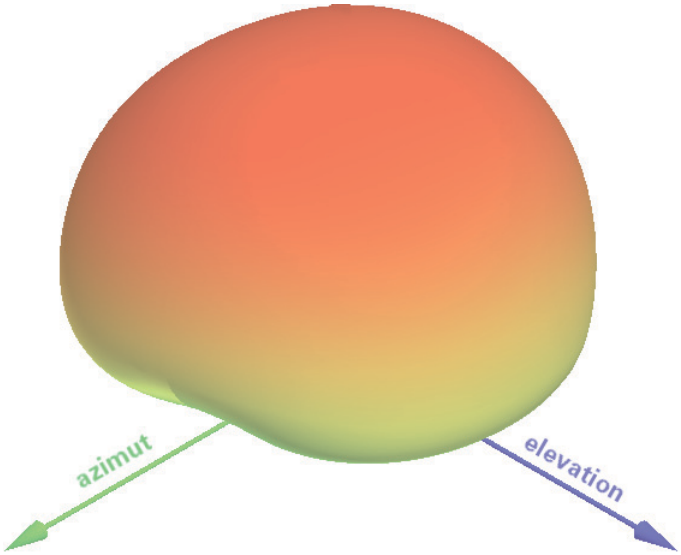
ELECTRICAL CHARACTERISTICS

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Transmitter						
transmit frequencies @23°±3°C		$f_{Standard}$	24.050	24.125	24.250	GHz
	US frequency band	$f_{IPM-170\_F}$	24.075	24.125	24.175	GHz
	UK frequency band	$f_{IPM-170\_UK}$	24.150	24.200	24.250	GHz
temperature drift frequency		Δf		-1		MHz/°C
output power		P_{out}		16		dBm
Receiver						
IF-output		voltage offset	-300		300	mV
Environment						
operating temperature		T_{OP}	-20		+60	°C
storage temperature		$T_{storage}$	-20		+60	°C
Antenna System Pattern						
antenna pattern (-3 dB)	azimuth	horizontal		70		°
	elevation	vertical		70		°
side lobe suppression	azimuth	horizontal		13		dB
	elevation	vertical		13		dB
antenna gain				8		dBi
Power supply						
supply voltage		V_{CC}	4.75	5.0	5.25	V
supply current		I_{CC}		30	40	mA
Mechanical Outlines						
outline dimensions	compare to drawing	height length width		25.0 25.0 7.0 (12.7)		mm

ANTENNA ORIENTATION:

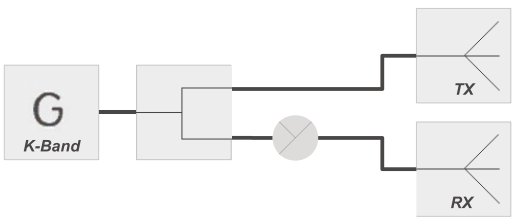


TX / RX-ANTENNA PATTERN:



PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
TX-antenna pattern / RX-antenna pattern						
Tx antenna pattern (3dB width)	horizontal	azimuth		70		°
	vertical	elevation		70		°
side-lobe suppression	horizontal	azimuth		13		dB
	vertical	elevation		13		dB

BLOCK DIAGRAM:



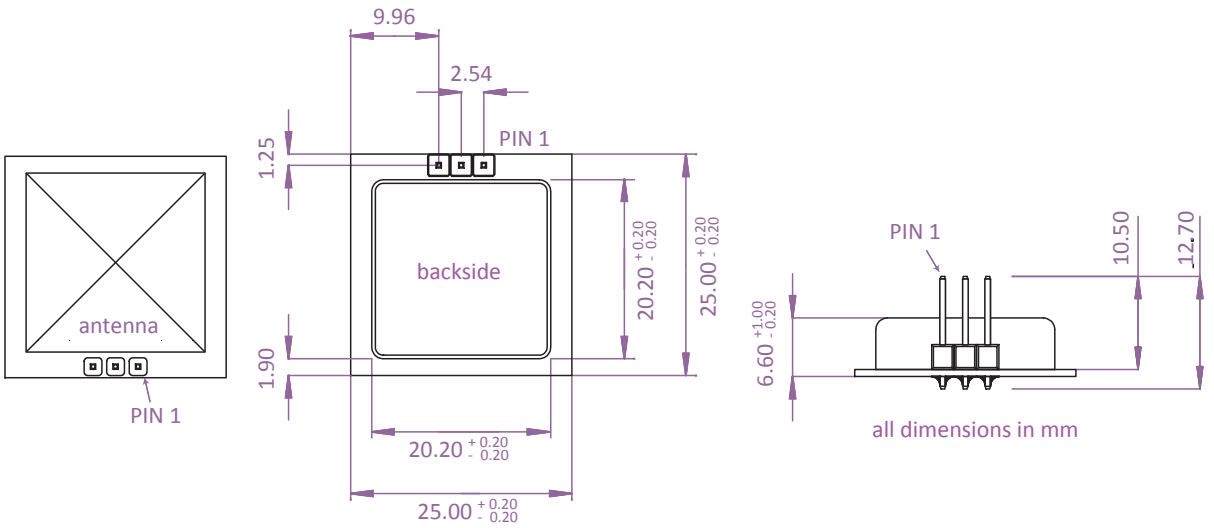
INTERFACE

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

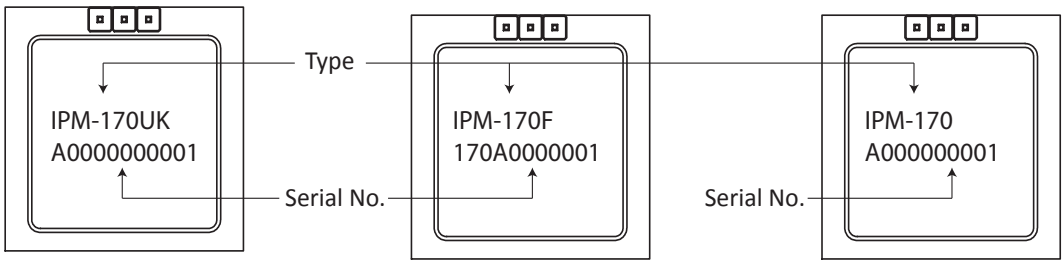
PIN #	DESCRIPTION	IN / OUT	COMMENT
1	V_{CC}	input	supply voltage 5V
2	IF1	output	signal I(nphase)
3	GND	input	analog ground

MECHANICAL OUTLINES

(all dimensions in mm)



LABELING



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.

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.

Annex A

The IPM-170 is available in different frequency ranges for worldwide use.
Depending on the country in which the product is intended to be used, different frequency ranges can be ordered at InnoSenT.
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 which is available under **www.ero erodocdb.dk**

VERSION	DATE	COMMENT
4.2	11.04.2013	new layout
4.3	01.07.2014	electrical characteristics, antenna pattern, block diagram

InnoSenT GmbH
Am Rödertor 30
97499 Donnersdorf
GERMANY

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