InnoSenT
Innovative Sensor Technology

Data Sheet IPS-146_rev.2

Version 1.0 - 04.10.11

designed and manufactured in Germany

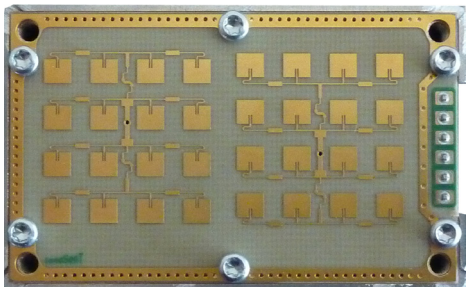
Product Family K-Band Transceiver

Applications Traffic Monitoring
Industrial Applications

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

Features:

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



Description

The IPS-146_rev.2 is a K-Band Transceiver with a split transmit and receive antenna.

This product is compliant to the restriction of hazardous substances (RoHS - European Union directive 2002/95/EG)

Additional Information

InnoSenT Standard Product. Changes will be not notified as long as there is no influence on form, fit and function of the product.

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

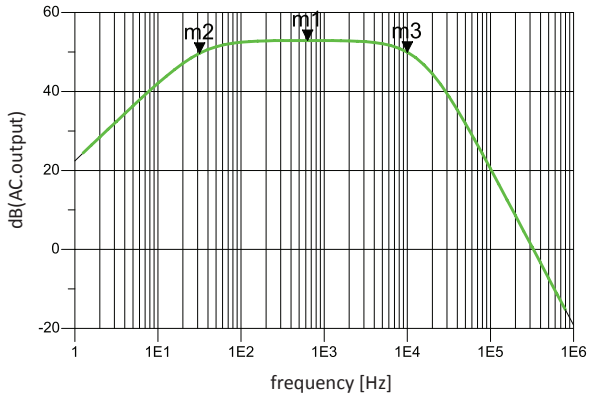
Qualitätsmanagement ISO 9001:2008 ▸ Regelmäßige freiwillige Überwachung DEKRA Certification DEKRA zertifiziert

Umweltmanagement ISO 14001 ▸ Regelmäßige freiwillige Überwachung DEKRA Certification DEKRA zertifiziert

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Comment
Oscillator						
transmit frequencies	$f_{IPS-146}$	24.050	24.125	24.250	GHz	delivery condition
	$f_{IPS-146\_UK}$	24.150	24.210	24.250	GHz	
	$f_{IPS-146\_F}$	24.075	24.135	24.175	GHz	
temperature drift (frequency)	$\Delta f_{-20°C...+60°C}$		0.420		MHz/°C	-20°C...+60°C
output power (EIRP)	P_{out}		19	20	dBm	@ 25°C
Receiver						
I/Q balance	amplitude			3	dB	
	phase	75	90	105	°	
IF-output	voltage offset		Vcc/2		V	
IF-amplifier	bandwidth		30 - 10k		Hz	details on page 3
	gain		53		dB	
Antenna pattern (compare with antenna plot on page 3)						
full beam width @ -3dB	horizontal		33		°	azimuth
	vertical		33		°	elevation
full beam width @ -10dB	horizontal		59		°	azimuth
	vertical		61		°	elevation
side-lobe suppression	horizontal	20	25		dB	azimuth
	vertical	20	25		dB	elevation
antenna gain	gain		15		dBi	
Power supply						
supply voltage	V_{CC}	4.75	5.0	5.25	V	
supply current	I_{CC}		75	80	mA	IF-amp included
turn-on-time (enable)	t_e		400		ms	details on page 3
turn-on-time (V_{CC})	t_{Vcc}		400		ms	details on page 3
Environment						
operating temperature	T_{OP}	-20		+60	°C	
storage temperature	T_{STG}	-40		+85	°C	
Mechanical Outlines						
outline dimensions	height length width		9.0 60.0 37.0		mm	

IF-amplifier

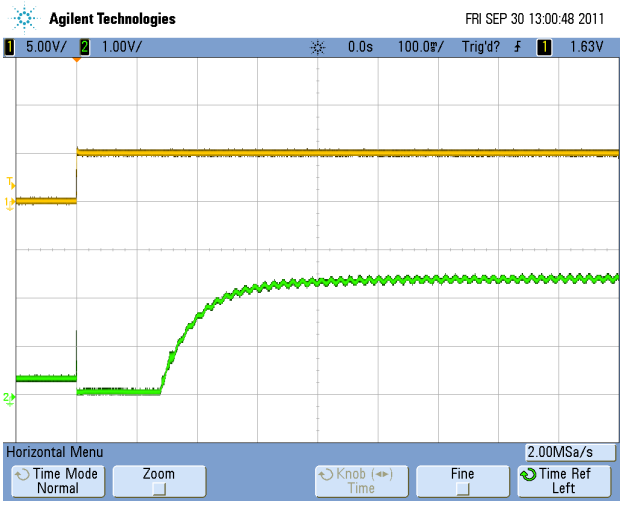


m2
freq = 31.62Hz
dB(AC.output)=49.661

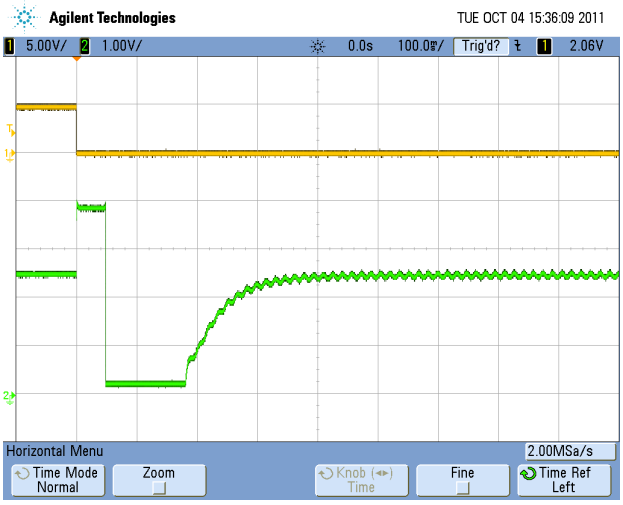
m1
freq = 631.0Hz
dB(AC.output)=52.902

m3
freq = 10.00kHz
dB(AC.output)=49.924

Turn-on-time



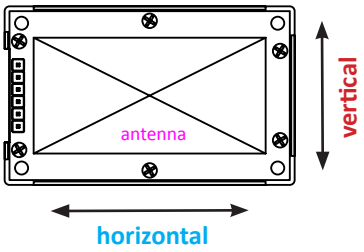
turn-on by Vcc

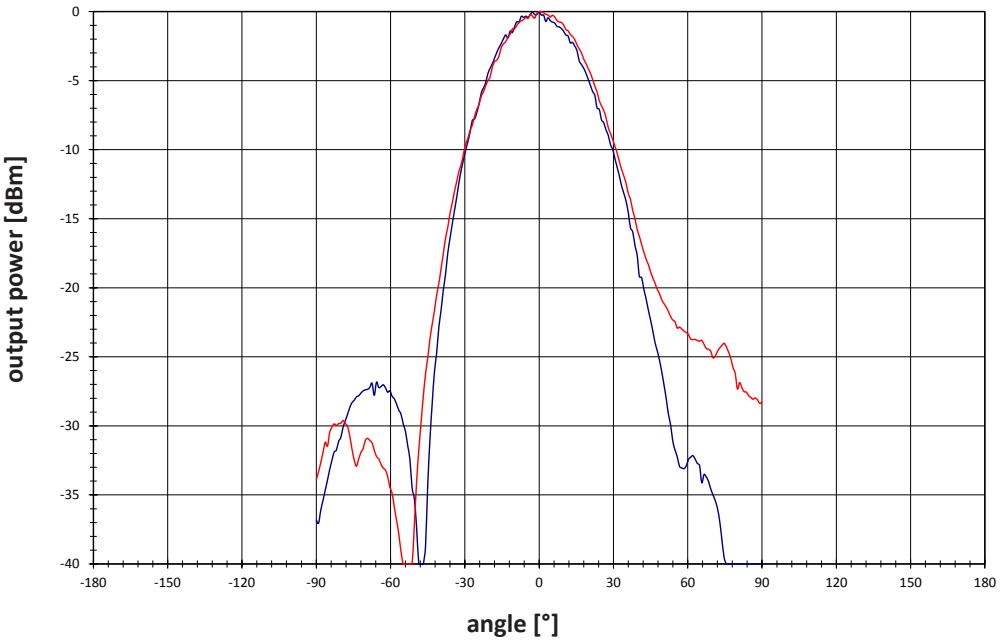


turn-on by enable

Tx - antenna pattern

Antenna Orientation:





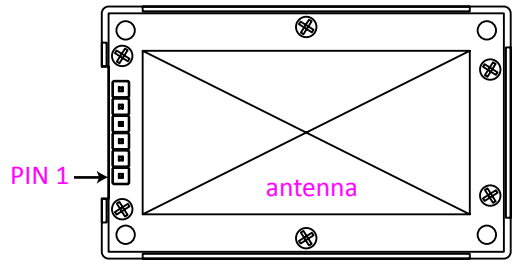
Parameter	Symbol	Min.	Typ.	Max.	Units	Comment
full beam width @ -3dB	horizontal		33		°	
	vertical		33		°	
full beam width @ -10dB	horizontal		59		°	
	vertical		61		°	
side-lobe suppression	horizontal	20	25		dB	
	vertical	20	25		dB	

Interface

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

Pin #	Description	In / Out	Comment
1	NC		not connected
2	enable	input	active low / enables OSC + LNA / internally pulled up to VCC with 10kOhm / pull down to GND to enable
3	V_{cc}	input	supply voltage +5V
4	GND	input	analog ground
5	IF2	output	signal Q(uadrature)
6	IF1	output	signal I(nphase)

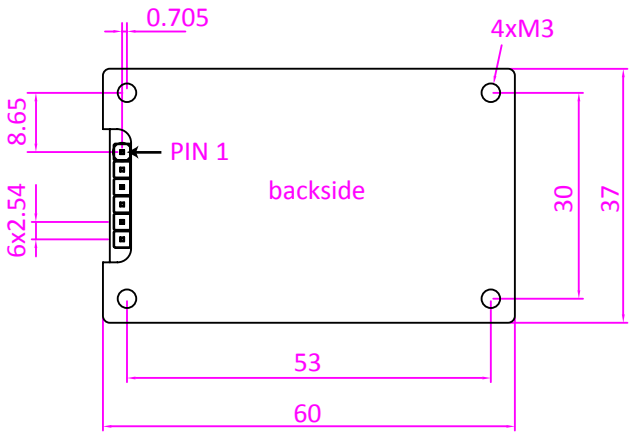
Mechanical Outlines



top view

side view

all dimensions in mm



bottom view

Approval

This Data Sheet contains the technical specifications of the described product. Changes of the specification must be in written form. All previous versions of this Data Sheet are no longer valid.

The technical specifications of this Data Sheet are approved by:

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