

Data Sheet IPS-280

Version 1.3 - 13.02.2017

designed and manufactured in Germany

PRODUCT FAMILY

K-Band Transceiver

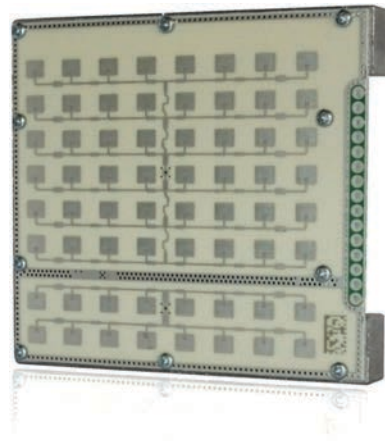
APPLICATIONS

- Traffic Monitoring
- Industrial Applications

■	Movement
■	Velocity
■	Direction
■	Presence
■	Distance
■	Angle

FEATURES:

- » Radar-based speed & motion sensor
- » Advanced MMIC Technology
- » Integrated Low Noise Amplifier
- » Extended temperature range from -40°C up to +85°C
- » Shutdown feature for low power operation



DESCRIPTION

High sensitivity K-Band CW Doppler Radar with adjustable frequency and I Q - outputs.

The shutdown option can be used for intermittent operation in battery powered applications.

ETSI / FCC

The IPS-280 module is compliant to ETSI 300 440 and FCC 15.245.

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.

CERTIFICATES

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



RoHS-INFO

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

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APPLICATION INFORMATION

The IPS-280 is typically centered in the US Band 24.075...24.175. By adding a resistor (20k...30kΩ) between 'R_tune' and GND the transmit frequency can be tuned to a higher value, e.g. 24.150...24.250GHz. The frequency can be monitored @ Pin 'DIV_OUT' (frequency divider ratio 1 : 8192).

ELECTRICAL CHARACTERISTICS

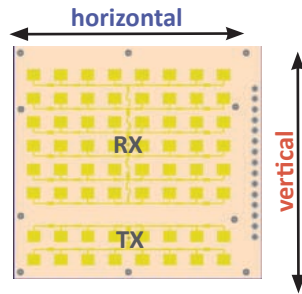
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Radar						
transmit frequency		f	24.075		24.175	GHz
output power (EIRP)		P _{out}			20	dBm
IF output DC-Offset		U _{DC-offset}	1.4	1.8	2.2	V
IF-Bandwidth (-3dB)		B	0		1M	Hz
signal level	(RCS = 10m ² @ 50m)	IF _{IQ}		250		μVrms
noise level	100Hz...1kHz	N _{1/2}		15		μVrms
quadrat. phase imbalance		ε _p	-25		25	°
overall gain	conversion gain + antenna gain	G _{OA}		52		dB
Divider						
divider ratio				8192		
divider output voltage	term with 50Ω			120		mV
Power supply						
supply voltage	transceiver	V _{CC}	3.2	3.3	3.4	V
	divider	V _{CC_DIV}	3.2	3.3	3.4	V
supply current	transceiver	I _{CC}		53	65	mA
	divider	I _{CC_DIV}		20	t.b.d.	mA
Environment						
operating temperature		T _{OP}	-40		+85	°C
storage temperature		T _{STG}	-40		+85	°C
Mechanical Outlines						
outline dimensions	compare to schematic on page 4	height length width		10.2 70 65.8		mm

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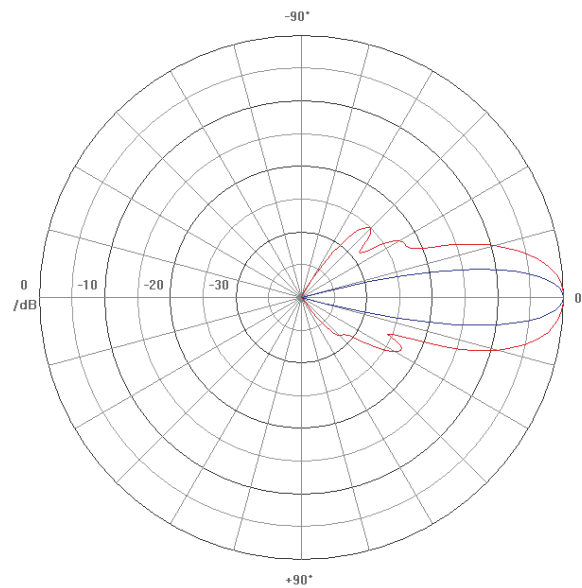
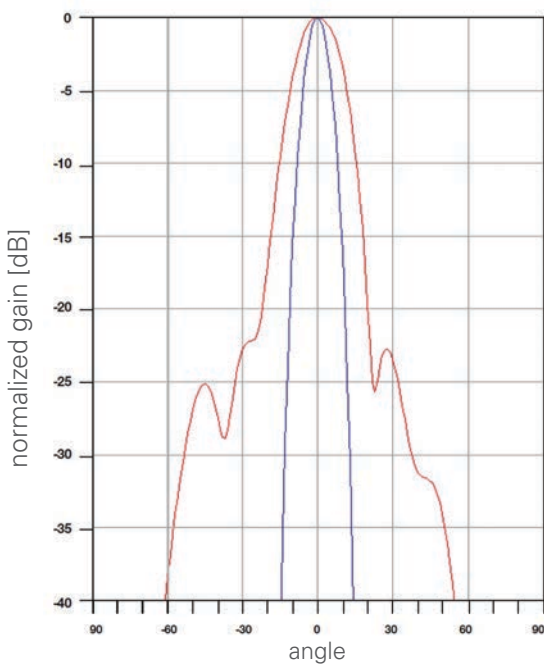
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SIMULATED ANTENNA PATTERN

Antenna Orientation:



System Pattern (without radome)



PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
System beam width @ -3dB		horizontal		9		°
		vertical		18		°

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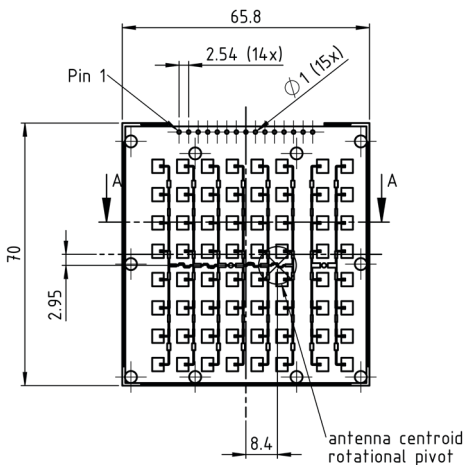
INTERFACE

The sensor provides a 2.54mm hole grid

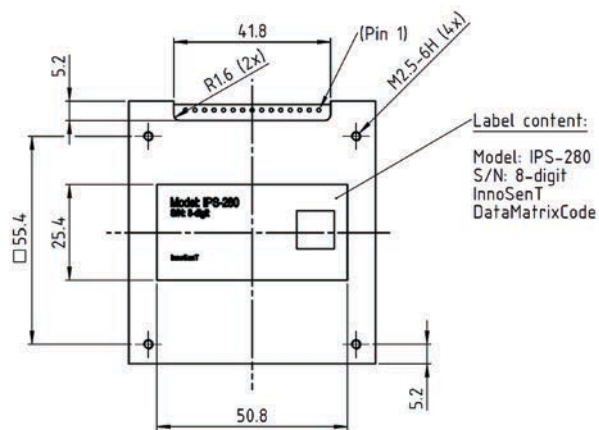
PIN #	DESCRIPTION	IN / OUT	COMMENT
1	GND	input	analog ground
2	R_TUNE		frequency tuning by adding a resistor to GND
3	d.n.c.		do not connect
4	VP	d.n.c.	test output, do not connect
5	enable	input	active low, enables power supply
6	V _{CC}	input	supply voltage 3.3V
7	VCCP	d.n.c.	test output, do not connect
8	VCC_DIV	input	divider supply voltage (optional) 3.3V
9	TX_ON	input	active high, enables transmit power
10	GND	input	analog ground
11	Q	output	Analog Output Quad Phase
12	I	output	Analog Output In Phase
13	GND	input	analog ground
14	DIV_OUT	output	divider signal / 1:8192
15	GND	input	analog ground

MECHANICAL OUTLINES

top view



bottom view



side view



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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.

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	03.05.2016	initial issue
1.1	06.06.2016	changing antenna position / interface
1.2	16.09.2016	changing in signal level, overall gain, interface and product picture
1.3	13.02.2017	changing in mechanical

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