

## USER MANUAL

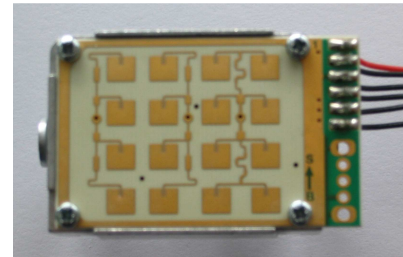
Product Family: K-Band Transceiver  
 Range of use: advanced door applications

Module Number: **IPQ-05\_Rev.05**

### Description:

#### Basic Features IPQ-05\_Rev.05

- radar-based motion detector centered @ 24.125 GHz
- advanced PHEMT-oscillator with low current consumption
- split transmit and receive path for maximum gain
- stereo (dual channel) operation for direction of motion identification
- integrated IF-pre-amplifier
- enable input for oscillator shut down
- small outline dimensions
- two electronically selectable antenna patterns
- EN 61508:2001 certification requires that the transceiver is built into a housing rated
  0. min. IP20 for indoor use
  1. min. IP54 for outdoor use



#### Electrical Characteristics

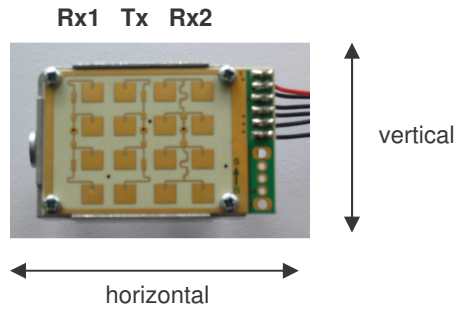
Parameter	Symbol	min.	typ.	max.	units	comment
transmit frequency	$f_{\text{transmit}}$	24.075	24.125	24.175	GHz	
output power (EIRP)	$P_{\text{out}}$		15	20	dBm	
temperature drift	$\Delta f$		- 1		MHz/°C	
I/Q balance	amplitude			6	dB	
	phase	60	90	120	°	
IF-output	voltage offset	1.0		4.0	V	
IF-amplifier <sup>1</sup>	gain		23		dB	
	bandwidth	DC		220 *	kHz	* <b>typical</b> upper frequency limit
switching voltage <sup>2</sup>	high level	2		5.5	V	narrow antenna pattern
	low level	GND		0.5	V	broad antenna pattern
supply voltage	$V_{\text{CC}}$	4.75	5.0	5.25	V	
supply current	$I_{\text{CC}}$		35	50	mA	
threshold for enable input <sup>3</sup>	min off	$V_{\text{CC}}-0.2$			V	
	max on			0.5	V	
turn-on time oscillator	$t_{\text{on}}$	0.5		5	$\mu\text{s}$	
turn-off time oscillator	$t_{\text{off}}$	1		5	$\mu\text{s}$	
step response		40			mV	absolute value (Delta S1)+ absolute value (DeltaS2)
operating temperature	$T_{\text{OP}}$	- 20		+ 60	°C	
outline dimensions		~ 40 x 25 x 24			mm	

<sup>1</sup>Output-Impedance  $R_{\text{out}}(\text{IF1}, \text{IF2}) = 100 \Omega$

<sup>2</sup>no Pullup or Pulldown-Resistor

<sup>3</sup>Internal Pullup-Resistor with 10k $\Omega$

Antenna Characteristics (radiation pattern)

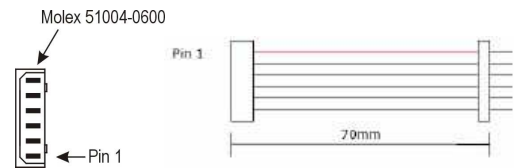


Parameter	Symbol	min.	typ.	max.	units	comment
antenna pattern Tx (3dB)	horizontal		76		°	azimuth
	vertical		35		°	elevation
antenna pattern Tx (10dB)	horizontal		135		°	azimuth
	vertical		62		°	elevation
side lobe suppression Tx	horizontal			13	dB	azimuth
	vertical			13	dB	elevation
antenna pattern Rx1 (3dB)	horizontal		76		°	azimuth
	vertical		35		°	elevation
antenna pattern Rx1 (10dB)	horizontal		135		°	azimuth
	vertical		62		°	elevation
side lobe suppression Rx1	horizontal			13	dB	azimuth
	vertical			13	dB	elevation
antenna pattern Rx2 (3dB)	horizontal		49		°	azimuth
	vertical		40		°	elevation
antenna pattern Rx2 (10dB)	horizontal		89		°	azimuth
	vertical		69		°	elevation
side lobe suppression Rx	horizontal			13	dB	azimuth
	vertical			13	dB	elevation

Interface

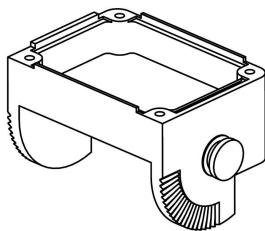
The sensor provides a 2 mm pitch 6 pin connector Molex 51004-0600.

Pin #	Description	In/Out	Comment
1	enable	input	active low
2	V <sub>CC</sub>	input	supply voltage (+5 V)
3	GND	input	analog ground
4	IF1	output	Signal I(nphase)
5	IF2	output	Signal Q(uadrature)
6	switch	input	



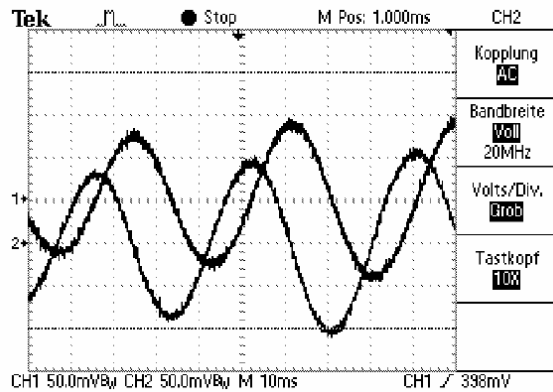
mates with: Molex P/N 53014, 53015 and 53025

Mechanical Outlines



all dimensions in mm  
for details compare with  
drawing 41-1190.42

I/Q-Definition



Signal Q is leading if an object moves towards the radar transceiver.

**Certification and Environment Protection**

InnoSenT GmbH has established and applies a quality system for: Development, production and sales of radar sensors for commercial and industrial sensors



An audit was performed, Report No. 010350 Proof has been furnished that the requirements according to DIN EN ISO 9001:2000 are fulfilled.

This InnoSenT product is compliant to the restriction of hazardous substances (RoHs – European Union directive 2002/95/EG).



**FCC-Approval**

- This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada.  
 Operation is subject to the following two conditions:
  - (1) this device may not cause harmful interference, and
  - (2) this device must accept any interference received, including interference that may cause undesired operation.
- Warning: Changes or modifications made to this equipment not expressly approved by InnoSenT GmbH may void the FCC authorization to operate this equipment.
- Manufacturers of mobile or fixed devices incorporating IPQ-05 modules are authorized to use the FCC Grants and IC Certificates of the IPQ-05 modules for their own final products according to the conditions referenced in these documents. In this case, the FCC label of the module shall be visible from the outside, or the host device shall bear a second label stating "Contains FCC ID: UXS-IPQ05R05" and "Contains IC: 6902A-IPQ05R05".

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