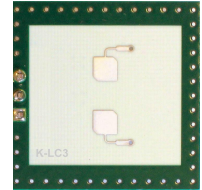


Features

- 24 GHz K-band miniature transceiver
- Dual 1 patch circular polarized antenna
- Single balanced mixer with 50MHz bandwidth
- Wide beam aperture 138°/132°
- 10dBm EIRP output power
- 25x25mm² surface, <6mm thickness
- Low cost design



K-LC3 Actual Size

Applications

- Lowcost general purpose movement detectors
- Security systems
- Ceiling and wall mount surveillance system
- Industrial sensors

Description

K-LC3 is a 2 patch Doppler module with a nearly symmetrical wide beam for low cost short distance applications.

Its typical applications are movement sensors for security, lighting and building automation applications. This module may be an alternative or a complementary sensor for infrared PIR or AIR systems thanks to its outstanding performance/cost ratio.

The module is extremely small and lightweight. With an IF bandwidth from DC to 50MHz it opens many new applications.

The unique RFbeam circular polarized antenna forms much wider acquisition fields than the traditional linear polarized patch antenna. A powerful starterkit with signal conditioning and visualization is available from RFbeam. Find more informations on www.rfbeam.ch.

Blockdiagram

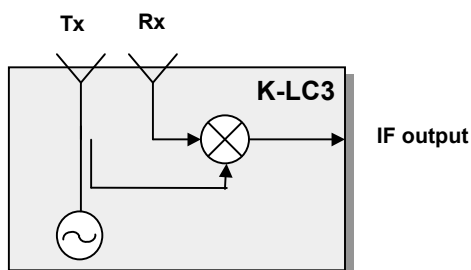


Fig. 1: Block diagram

K-LC3 RADAR TRANSCEIVER

Product Information

Characteristics

Parameter	Conditions / Notes	Symbol	Min	Typ	Max	Unit
Operating conditions						
Supply voltage		V_{cc}	4.75	5.0	5.25	V
Supply current		I_{cc}		35	45	mA
Operating temperature		T_{op}	-20		+60	°C
Storage temperature		T_{st}	-20		+80	°C
Transmitter						
Transmitter frequency	$T_{amb} = -20^{\circ}\text{C} \dots +60^{\circ}\text{C}$	f_{TX}	24.150	24.200	24.250	GHz
Frequency drift vs temperature	$V_{cc} = 5.0\text{V}$, $-20^{\circ}\text{C} \dots +60^{\circ}\text{C}$ ^{Note 1}	Δf_{TX}		-0.9		MHz/°C
Output power	EIRP	P_{TX}	+7	+10	+13	dBm
Spurious emission	According to ETSI 300 440	P_{spur}			-30	dBm
Turn-on time	Until oscillator stable, $\Delta f_{TX} < 5\text{MHz}$	t_{on}		1		µs
Receiver						
Mixer Conversion loss	$f_{IF} = 1\text{kHz}$, IF load = 1kΩ	D_{mixer1}		-6		dB
	$f_{IF} = 20\text{MHz}$, IF load = 50Ω	D_{mixer2}		-11		dB
Antenna Gain	$F_{TX} = 24.125\text{GHz}$ ^{Note 2}	G_{Ant}		4.8		dB
Receiver sensitivity	$f_{IF} = 500\text{Hz}$, B=1kHz, $R_{IF} = 1\text{k}\Omega$, S/N=6dB	P_{RX1}		-95		dBm
	$f_{IF} = 1\text{MHz}$, B=20MHz, $R_{IF} = 50\Omega$, S/N=6dB	P_{RX1}		-83		dBm
Overall sensitivity	$f_{IF} = 500\text{Hz}$, B=1kHz, $R_{IF} = 1\text{k}\Omega$, S/N=6dB	D_{system}		-105		dBc
IF output						
IF resistance		R_{IF}		50		Ω
IF frequency range	-3dB Bandwidth, IF load = 50Ω	f_{IF}	0		50	MHz
IF noise power	$f_{IF} = 500\text{Hz}$, IF load = 50Ω	$P_{IFnoise1}$		-137		dBm/Hz
	$f_{IF} = 1\text{MHz}$, IF load = 50Ω	$P_{IFnoise2}$		-164		dBm/Hz
IF noise voltage	$f_{IF} = 500\text{Hz}$, IF load = 1kΩ	$U_{IFnoise1}$		-150		dBV/Hz
	$f_{IF} = 500\text{Hz}$, IF load = 1kΩ	$U_{IFnoise1}$		31		nV/√Hz
IF output offset voltage	no object in range	U_{IF}	10		200	mV
Supply rejection	Rejection supply pins to IF output	D_{supply}		26		dB
Antenna						
Antenna type	Right hand circular polarized	RHCP				
Horizontal -3dB beamwidth	E-Plane	W_{ϕ}		138		°
Vertical -3dB beamwidth	H-Plane	W_{θ}		132		°
Horiz. sidelobe suppression		D_{ϕ}		-12		dB
Vertical sidelobe suppression		D_{θ}		-12		dB
Body						
Outline Dimensions				25*25*6		mm ³
Weight				4.5		g
Connector	3pin single row jumper					

Note 1 Transmit frequency stays within 24.150 to 24.250GHz over the specified temperature range

Note 2 Theoretical value, given by Design