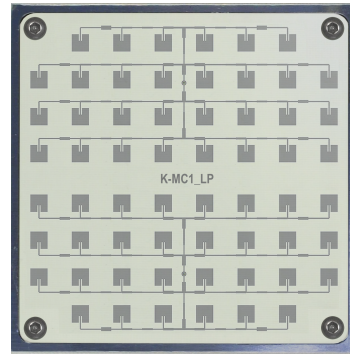


K-MC1_LP RADAR TRANSCEIVER

Product Information

Features

- LOW CURRENT 24 GHz short range transceiver
- 8mA @ 3.3V at same performance as K-MC1
- 3.3V ... 5V supply
- Less than 30mW power consumption
- High sensitivity, with integrated RF/IF amplifier
- Dual 30 patch antenna
- Buffered I/Q IF outputs
- Beam aperture 25°/12°
- Slim 6mm thickness construction



Applications

- Battery operated equipment
- Traffic supervision
- Object speed measurement systems
- Industrial sensors

Description

K-MC1_LP is a low current, doppler module with an asymmetrical narrow beam for long distance sensors. It is ideally suited for traffic applications.

This module includes a RF low noise amplifier and two 47dB IF pre-amplifiers for both I and Q channels. The need for external analogue electronics will be significantly reduced by this feature.

K-MC1_LP needs 10 times less current than our standard K-MC1 sensor and works from 3.3V or 5V power supplies.

An extremely slim construction with only 6mm depth gives you maximum flexibility in your equipment design.

Powerful starter kits with signal conditioning and visualization are available.

Blockdiagram

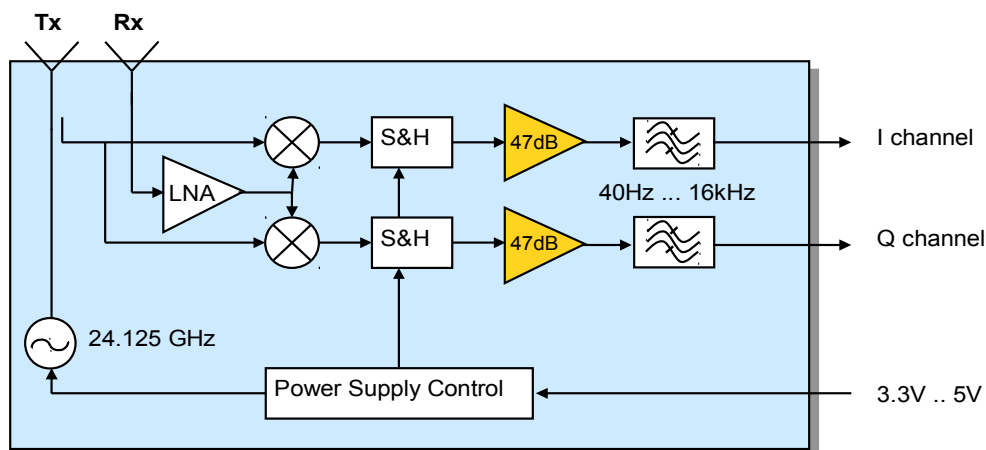


Fig. 1: K-MC1_LP Blockdiagram

K-MC1_LP RADAR TRANSCEIVER

Product Information

Characteristics

Parameter	Conditions / Notes	Symbol	Min	Typ	Max	Unit
Operating conditions						
Supply voltage		V_{cc}	3.15		6.0	V
Supply current	Module enabled (Pin 1 = V_{IL})	I_{cc}		7.5	9	mA
Operating temperature		T_{op}	-20		+80	°C
Storage temperature		T_{st}	-20		+80	°C
Transmitter						
Transmitter frequency	$U_{VCO}=5V$, $T_{amb}=-20^{\circ}C \dots +60^{\circ}C$	f_{TX}	24.050	24.150	24.250	GHz
Frequency drift vs temp.	$V_{cc}=5.0V$, $-20^{\circ}C \dots +60^{\circ}C$ Note 1	Δf_{TX}		-1.0		MHz/°C
Output power	EIRP peak power	P_{TX}	+16	+18	+20	dBm
Transmitter duty cycle	internally generated	d		1		%
Spurious emission	According to ETSI 300 440	P_{spur}			-30	dBm
Receiver						
Antenna gain	$F_{TX}=24.125GHz$ Note 2	G_{Ant}		18.5		dBi
LNA gain	$F_{RX}=24.125GHz$	G_{LNA}		10		dB
Mixer Conversion loss	$f_{IF}=500Hz$	D_{mixer}		-1		dB
Receiver sensitivity	$f_{IF}=500Hz$, $B=1kHz$, $S/N=6dB$	P_{RX}		-122		dBm
Overall sensitivity	$f_{IF}=500Hz$, $B=1kHz$, $S/N=6dB$	D_{system}		-140		dBc
IF output						
IF output impedance		R_{IF_AC}		100		Ω
IF Amplifier gain		G_{IF_AC}		47		dB
I/Q amplitude balance	$f_{IF}=500Hz$, $U_{IF}=100mV_{pp}$	ΔU_{IF}		3		dB
I/Q phase shift	$f_{IF}=500Hz$, $U_{IF}=100mV_{pp}$	φ	80	90	100	°
IF frequency range	-3dB Bandwidth	f_{IF_AC}	40		15k	Hz
Spurious signals	Internal regulator @ 100kHz	V_{sp}			0.3	mVrms
IF noise voltage	$f_{IF}=1kHz$	$U_{IFnoise}$		35		$\mu V/\sqrt{Hz}$
	$f_{IF}=1kHz$	$U_{IFnoise}$		-89		dBV/Hz
IF output offset voltage	$V_{cc}=5V$, $_{AC}$ outputs	U_{os_AC}	1.0	1.5	2.0	V
Supply rejection	Rejection supply pins to $_{AC}$ outputs, 500Hz	D_{supply}		-24		dB
Antenna						
Horizontal -3dB beamwidth	E-Plane	W_{φ}		12		°
Vertical -3dB beamwidth	H-Plane	W_{θ}		25		°
Horiz. sidelobe suppression		D_{φ}		-20		dB
Vert. sidelobe suppression		D_{θ}		-18		dB
Body						
Outline Dimensions	connector left unconnected			65*65*6		mm ³
Weight				50		g
Connector	Module side: AMP X-338069-8			8		pins

Note 1 Transmit frequency stays within 24.050 to 24.250GHz over the specified temperature range

Note 2 Theoretical value, given by Design

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