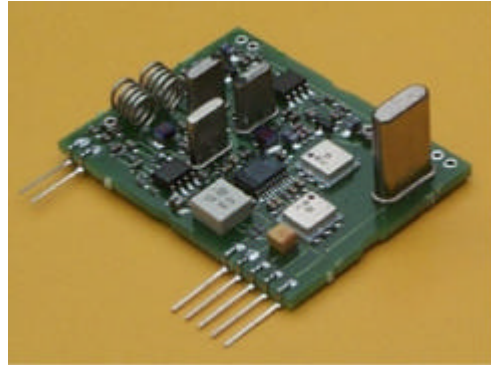


Features

- Miniature DIL / SIL package
- Double conversion FM Super-het.
- IF's at 45 MHz and 455 KHz
- Image rejection 80dB!
- Selectivity 80 dB!
- Fully shielded
- Analogue, Digital and true RSSI outputs
- Operation on any VHF band.
- HIGH SENSITIVITY (-117 dBm)
- SINGLE 5V SUPPLY



Applications

- Telemetry systems
- Remote switching applications
- Paging systems
- Domestic and commercial security

Compatible Transmitter Modules

- RS-MKT4-XXX
(see data sheet RS-MKT4-XXX)

General Description

The RS-MKR4 miniature receiver UHF radio module enables the implementation of a reliable telemetry link at data rates of up to 4800 bit/s when used with one of the compatible MK transmitter modules.

The receiver is based on the classical superhet double conversion architecture utilising IFs at 45 MHz and 455 KHz. In conjunction with the front end helical filter, high image rejection along with high selectivity is achieved. This results in an extremely reliable radio receiver owing to its high out of band rejection.

The RS-MKR4 will suit one-to-one and multi-node wireless links in applications including fixed and mobile security, remote industrial process monitoring etc.

Also due to its small size and low power requirements including a fast RSSI, the module is ideal for use in portable battery powered applications.

The module is highly suited for operation in harsh electrical environments where a reliable wireless link is essential.

Absolute Maximum Ratings: Receiver

Operating temperature:	-12°C to +55°C
Storage temperature:	-40°C to +100°C
Supply Voltage (pin 5)	6V
RF Input (pin 1)	+10 dBm (100mW)

Electrical Characteristics: Receiver (2,4 Kbits/sec version)

Performance data measured for 173,225 MHz version at 20 degC.

	pin	min.	typ.	max.	units	notes
DC LEVELS						
Supply voltage		4.5	5	5.5	V	
Supply current			10	12	mA	
Supply ripple		-	-	10	mV _{p-p}	
Data output high			=> 4,5		V	
Data output low			<= 0,5		V	
RF						
RF sensitivity			-117	-120	dBm	2
IF Bandwidth			25		KHz	
Initial frequency accuracy			± 100		Hz	
Max R.F. input			10		dBm	
Image Rejection			80		dB	
Adjacent channel rejection			80		dB	
E.M.C.						
Spurious responses upto 1GHz			<60		dB	
LO leakage, conducted			<60		dBm	
LO leakage, radiated			<60		dBm	
DYNAMIC TIMING						
Power up to stable data (With RF signal present)			10		mS	1
Signal to stable data (With power supply already on)			5		mS	1
Power up to valid RSSI (with RF signal present)				2	mS	1
Mark: space ratio			50		%	
Bit rate		100		4800	bps	

Notes

- 1) Timings are to be confirmed
- 2) For 12 dB SINAD from the AF output

Connection Details

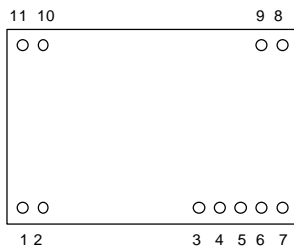


Figure 1: RS-MKR4 Receiver

Pin Description

RF IN (*pin 1*)

50Ω RF input from antenna, connect using shortest possible route. This input is isolated from the internal circuit using the air gap of the front end HELICAL filter.

RF GND (*pin 2*)

RF ground connection, preferably connected to a solid ground plane.

RSSI / Carrier Detect (*pin 3*)

The Received Signal Strength Indicator provides a DC output voltage proportional to the RF input signal. The amplitude of the RSSI voltage increases with increasing RF signal strength. A simple transistor interface can yield a carrier detect logic output.

Gnd (*pin 4*)

Connect to power supply ground

V_{CC} (*pin 5*)

+Ve supply pin. Operation from a 5V supply able to source 10mA at less than 10mV_{P,P} ripple.

AF (*pin 6*)

Audio frequency output.

DATA OUT (*pin 7*)

CMOS compatible output. This may be used to drive external decoders.

Gnd (*pins 8,9,10,11*)

Additional pins connected to the pcb ground plane providing additional mechanical stability for DIL version.

Application Information

Antenna Design

The design and positioning of the antenna is as crucial as the module performance itself in achieving a good wireless system range. The following will assist the designer in maximising system performance.

The antenna should be kept as far away from sources of electrical interference as physically possible. If necessary, additional power line decoupling capacitors should be placed close to the module.

The antenna ‘hot end’ should be kept clear of any objects, especially any metal as this can severely restrict the efficiency of the antenna to receive power. Any earth planes restricting the radiation path to the antenna will also have the same effect.

Best range is achieved with either a straight piece of wire, rod or PCB track @ ¼ wavelength (43cm @ 173 MHz). Further range may be achieved if the ¼ wave antenna is placed perpendicular in the middle of a solid earth plane. In this case, the antenna should be connected to the module via some 50 ohm characteristic impedance coax.

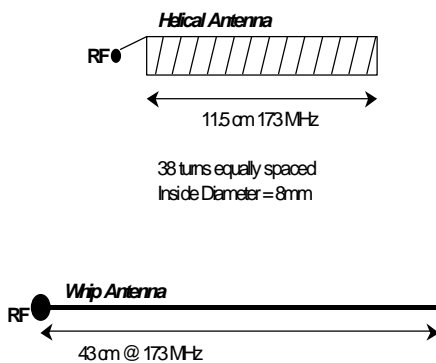


Figure 2: Antenna Configurations To Be Used With The MK receiver Module

Application Circuit

The application circuit shows how the MKR4 Receiver can easily be integrated into a system to form a wireless link.

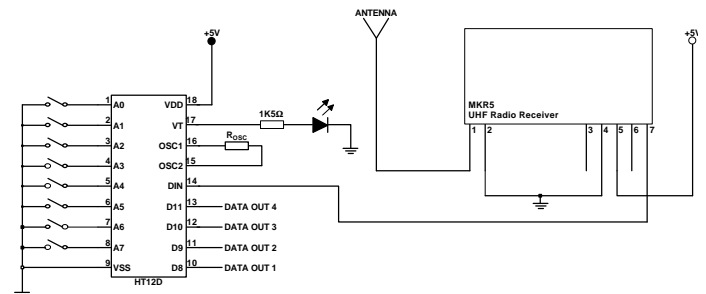


Figure 3: MK Receiver Application Circuit

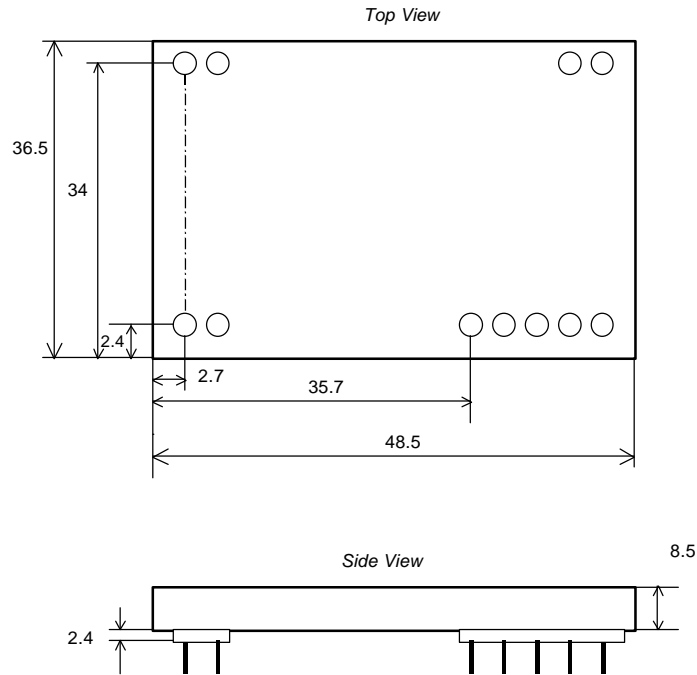
RSSI Values

The RS-MKR4 RSSI output provides a DC output proportional to the RF input signal. The table below shows the typical RSSI value depending on the RF signal strength.

RF Signal Strength / dBm	RSSI / V
-130	0,7
-120	0,95
-110	1,38
-100	1,97
-90	2,38
-80	2,85
-70	3,23
-60	3,75
-50	4,09
-40	4,15
-30	4,15

Please note that the underlying trend may be slightly shifted. This is due to the background noise floor of the application circuit.

Mechanical Description



Notes

- All dimensions in mm
- Spacings between connector pins = 2,54 mm
- Recommended pcb hole diameter to accommodate connector pins = 1,2 mm

Ordering Information

Standard Product;

Part No	Description
RS-MKR4-173-225-S or D	173,225 MHz receiver
Note: The suffix S or D denotes SIL or DIL package	

Please consult our sales department for further information.

Round Solutions Ltd.
 Niederlassung Deutschland
 Zaunweg 4
 D-63303 Dreieich
 Tel. 06103 960510
 Fax. 06103 960509

www.roundsolutions.com
info@roundsolutions.com