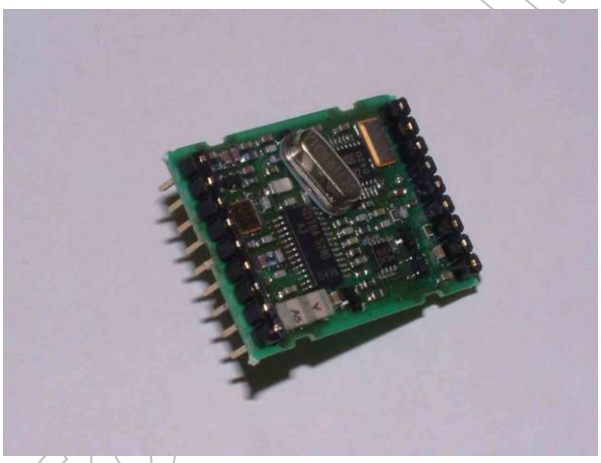
Features

- Operation on 433.92 MHz
  (Other channels to follow)
- Double RF filtering = High Reliability RF Link
- Data rates to 14.4 kbps (Wide-band high data rate version available soon)
- -116 dBm receiver sensitivity
- 10mW & 25 mW transmit power versions
- Crystal stabilised accurate RF
- Hence narrower BW filter utilised
- Results in 1000m+ range
- EN 300 220-1, 300 683 compliant

1Km Range



Applications

- EPOS TERMINALS
- REMOTE TELEMETRY & TELECOMMAND
- REMOTE METER READING
- DOMESTIC AND COMERCIAL SECURITY

General Description

The GTR1 radio transceiver module was designed to provide reliable wireless operation at moderate data rates for use throughout the world. Its unique features of narrower RF channel bandwidths and hence high interference rejection capability at SAW module prices make the GTR1 the ideal choice for next generation applications.

Available for operation at the major frequency allocations world-wide in the same package, these modules have been designed to provide a reliable wire free link for the next century, accounting for the increased traffic from other legal users of the radio spectrum.

The transmitter section uses a PLL design that utilises a highly stable and accurate reference crystal oscillator. This results in a RF transmission tightly controlled in its frequency spread and over its operating temperature range. This is exploited in the receiver design.

The receiver section uses a single conversion super-het design, again using PLL technology. Hence narrower bandwidth RF filters are utilised which result in superior rejection of interference as well as providing good receiver sensitivity and hence range.

Absolute Maximum Ratings: Receiver

Operating temperature:	-10°C to +55°C
Storage temperature:	-40°C to +100°C
Supply Voltage	6V
Data input	Vcc + 0.3v
RF Input	0dBm

Electrical Characteristics:

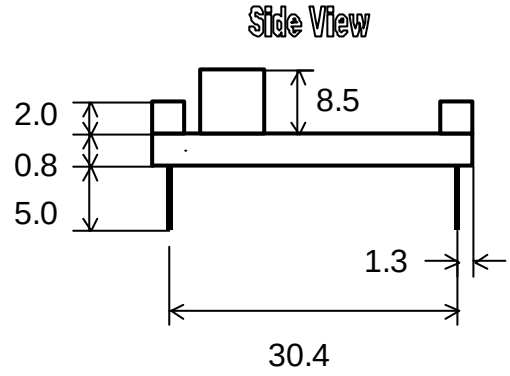
Performance data measured at 20°C and +5 volt supply and RF = 433.92 MHz.

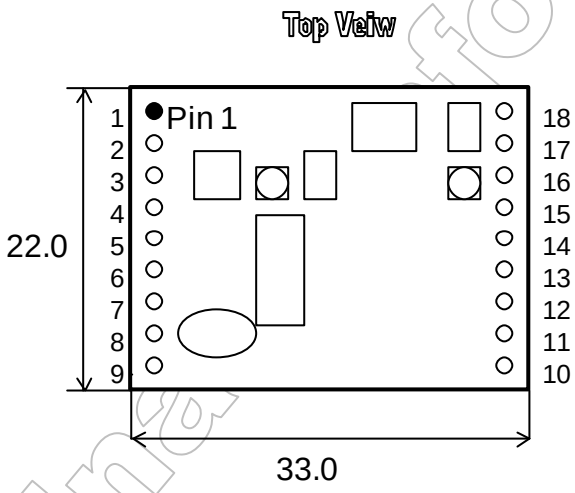
	pin	min.	typ.	max.	units	notes
DC LEVELS						
Supply voltage	17	4.75	5	5.25	V	
Supply current (receiver enabled)	17		12		mA	
Supply current (transmitter enabled)	17		17		mA	1
Leakege current with Vcc connected				1	uA	2
Data input/output high	12,14	0.7xVcc		Vcc	V	
Data input/output low	12,14	0		0.0xVcc	V	
RF						
Receiver sensitivity (12 dB SINAD on AF output)	13		-116 -110		dBm	Med band Wide band
Image rejection			50		dB	
RF power out (transmitter)			10		mW	1
FM Deviation			+/-15		KHz	
Initial frequency accuracy			±100		Hz	
Overall frequency accuracy			+/-10		KHz	
Max R.F. input to receiver			0		dBm	
E.M.C.						
Spurious responses upto 1GHz			<-36		dB	
LO leakage, conducted			<60		dBm	
LO leakage, radiated			<60		dBm	
DYNAMIC TIMING						
RX enable to valid RSSI		2.5		3.5	mS	
RX enable to stable receiver data out		25		35	mS	3
TX enable to full RF out			5		mS	
Data rate		300		7500	Hz	4

Notes

1) For 10mW transmit power version. 25mW version consumes 25mA
2) Sleep mode, that is with tx and rx not enabled
3) At 1KHz data rate
4) 1 Hz = 2 bps

GTR1 – Mechanical Description





Notes

- Recommended PCB hole diameter to accommodate the connecting pins = 1.2mm
- All dimensions are in mm
- Distance between each connecting pin = 2.54mm
- Pins 4,5,6 and 7 are internally floating not connected to anything

GTR1 – Pin Functional description

Pin No.	Description	Details
1 & 3	RF Ground	For best results, these pins should be connected to the ground plane against which the antenna radiates.
2	Antenna	Nominal 50 ohm input/output impedance capacitively isolated from internal circuit. See application notes for antenna examples.
9,10,18	Ground	Supply ground points.
4,5,6,7 & 8	NC	Not connected internally.
11	RSSI	Receiver signal strength indicator. DC voltage proportional to RF signal strength being received.
12	RxD	Receiver digital data output (CMOS logic out) representing true data as supplied to the transmitter.
13	AF	Audio Frequency Output'
14	TxD	Data input to the transmitter can be directly interfaced to CMOS logic drive operating on the same supply voltage as the transceiver.
15	Tx Enable	Active Low. Applying Vcc disables the transmitter.
16	Rx En	Active Low. Applying Vcc places the receiver in sleep mode.
17	Vcc	Supply voltage range from 4.5 to 5.5volts. Note that module is not reverse polarity protected.

State Table

Tx (Pin 15)	Rx (Pin 16)	Mode
1	1	Power down mode. Supply current < 1uA
1	0	Receiver only enabled. Data, AF, CD and RSSI outputs valid.
0	1	Transmitter only enabled. Tx data input valid.
0	0	Tx and Rx on. Avoid this mode as it will eventually destroy the module.

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 (15.5cm @ 433.92MHz). Further range may be achieved if the ¼ wave antenna is placed perpendicular in the middle of a solid earth plane measuring at least 16cm radius. In this case, the antenna should be connected to the module via some 50 ohm characteristic impedance coax

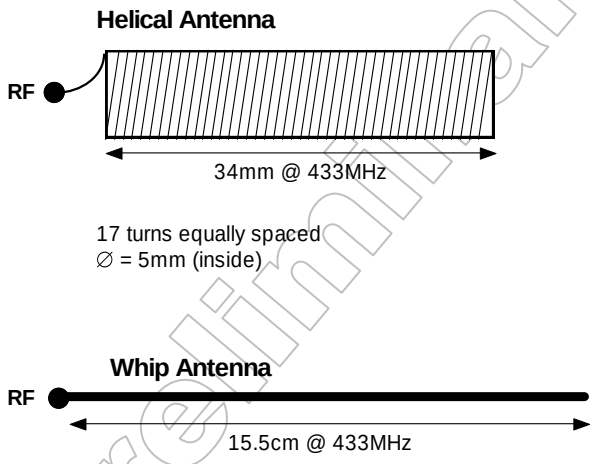


Figure 2: Antenna Configurations To Be Used With The GTR1

RSSI Values

The RSSI output provides a dc voltage that is proportional to the RF signal strength picked up on the antenna (pin 2) port of the module.

The table below gives typical values of RSSI for varying degrees of RF signal strength applied.

RF Input (dBm)	RSSI (V)
-116	1.35
-110	1.4
-100	1.66
-90	1.9
-80	2.2
-70	2.5
-60	2.64
-50	2.64

Applications Support Hotline

Your questions may be forwarded to us at the following email address;

appsupport@mkconultants.eu

Ordering Information

Standard Product;

Part No	Description
GTR1-433.92-XX	medium band transceiver
GTR1-433.92-WB-XX	wide band transceiver

XX – specify 10 or 25mW version

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