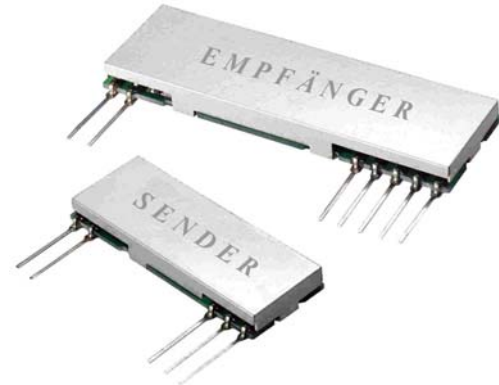


Features

- MINIATURE SIL PACKAGE
- FULLY SHIELDED
- DATA RATES UP TO 20KBITS/S
- NARROW BAND CRYSTAL TECHNOLOGIE
- PROVIDE OVER 500M RANGE AT LOW DATA
- AVAILABLE ON 434.075 MHz
- WILL OPERATE IN PRESENCE OF 433.92 MHZ SYSTEMS
- WIDE OPERATION VOLTAGE (2.2 –10 vdc)
- EN 300-220 compliant module



Applications

- REMOTE CONTROL FOR CRANES ETC
- WIRELESS MONITORING
- DISPERSED ALARM APPLICATIONS
- DOMESTIC AND COMMERCIAL SECURITY

Compatible Receiver Modules

- XR7 (se data sheet XR7)

General Description

The XT7 miniature transmitter UHF radio module enables the implementation of a simple telemetry link at data rates of up to 20Kbit/s when used with the compatible XR7 receiver modules.

The transmitter is based on a classical phase lock loop using a crystal reference oscillator. This results in an accurately controlled RF output in the frequency domain. A significant advantage of this is that narrow filtering can then be used in the receiver which results in high interference immunity.

In addition, the module is fitted with an on board voltage regulator which enhances the module performance due to better supply filtering as well as ensuring a constant RF output level. The XT7 module will suit one-to-one and multinode wireless links in applications including building and car security, remote industrial process monitoring and computer networking. Because of its small size and low power requirements, this modules is ideal for use in portable battery powered wireless applications.

Ordering Information

Standard Product;

Part No	Description
XT7-434-075	Medium Band FM Transmitter 434,075 MHz

Absolute Maximum Ratings: Transmitter

Operating temperature:	-20°C to +55°C
Storage temperature:	-40°C to +100°C
Supply Voltage (pin 3)	10V
Data input (pin 5)	10V

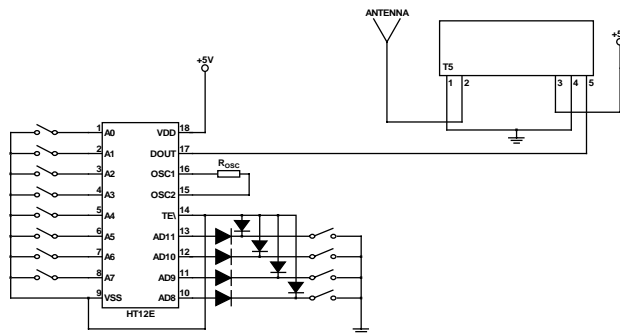
Electrical Characteristics: Transmitter

	pin	min.	Typ.	max.	units	notes
DC Levels						
Supply voltage	3	2.2	5.0	10.0	Volts	
Current & RF power						
434.075 MHz						
Supply current @ V _{CC} = 5V	3		7		mA	1
RF Power	2		3		mW	1
RF & Data						
2 nd harmonic			-60		dBm	2
Harmonics @ > 1GHz			-60		dBm	2
Initial frequency accuracy			+/-25		Hz	
Frequency accuracy over full temp range				+/-30	KHz	
FM deviation			20		KHz	3
Power up time to full RF						
			5		ms	
Data rate						
Data rate				20000	bits/s	3
Data pulse width		50			µs	

- Note 1:** measured into a 50Ω impedance
 A 10mW version will be available Q2 2002.
2: the limit for the European spec EN 300 220 is -36dBm
3: A ±2.5 KHz FM deviation of the RF carrier is also available. Please consult sales desk.

Application Circuit

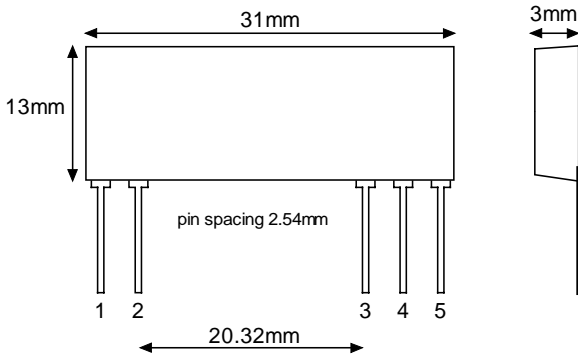
The application circuit shows how the XT7 transmitter can easily be integrated into a system to form a wireless link



Transmitter Application Circuit

Connection Details

Mechanical Dimensions



XT Transmitter

Pin Description:

RF GND (pin 1)

RF ground pin, internally connected to pin 4 (0V). This pin should ideally be connected to the nearest ground plane (e.g. coax braid, main PCB ground plane etc.)

RF OUT (pin2)

50Ω RF antenna output. To achieve best results the antenna impedance must match that of the module.

V_{CC} (pin 3)

+Ve supply pin. The module will generate RF when V_{CC} is present. It is strongly recommended that a 100nF capacitor decouples the supply rail as close as possible to this pin.

GND (pin 4)

Supply and data ground connection, connected to pin 1.

Data IN (pin 5)

This input has an impedance of 47KΩ and should ideally be driven by a CMOS logic drive or compatible. The drive circuitry should be supplied with the same supply voltage as the Tx module.

Application Information

Antenna Design

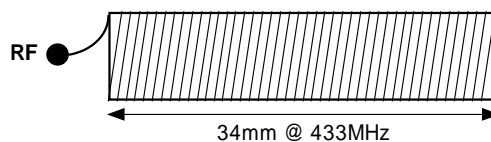
The design and positioning of the antenna is as crucial as the module performance itself in achieving a good wireless system range. The following will assist the designer in maximising system performance.

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.

Helical Antenna



17 turns equally spaced
 Ø = 5mm (inside)

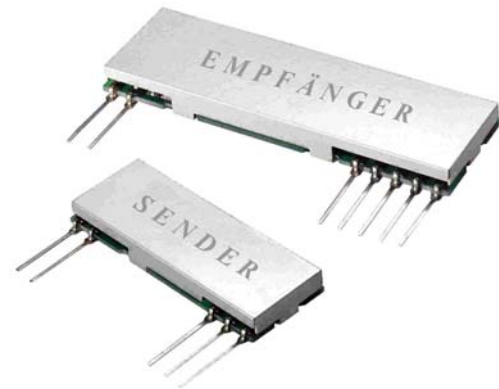
Whip Antenna



Antenna Configurations To Be Used With The Transmitter Modules

Features

- Miniature SIL package
- Single conversion FM Super-het using RF SAW and ceramic IF filtering at 10.7 MHz.
- Provides over 500m range at low data rates
- Dynamic range better than 120dB
- Fully shielded
- Analogue, Digital and true RSSI outputs
- DATA RATES UP TO 20KBITS/S
- Operation on 434.075 MHz
- HIGH SENSITIVITY (-113 dBm)
- OPTIMAL RANGE 350m
- Very low current consumption (6 mA)
- SINGLE 5V SUPPLY



Applications

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

Compatible Transmitter Modules

XT7-XXX (see data sheet XT7)

General Description

The XR7 miniature receiver UHF radio module enables the implementation of a reliable telemetry link at data rates of up to 20Kbit/s when used with one of the compatible XT transmitter modules

The receiver is based on the classical single conversion superhet principle utilising a crystal based phase lock loop for accurate generation of the local oscillator. This allows use of high Q bandpass filters resulting in good adjacent channel selectivity and high interference immunity.

The XR7 module will suit one-to-one and multinode wireless links in applications including building and car security, remote industrial process monitoring and computer networking. Because of its small size and low power requirements, the module is ideal for use in portable battery powered wireless applications

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

Ordering Information

Standard Product:

Part No	Description
XR7-434-075	Medium Band FM Receiver Module 434,075 MHz

Absolute Maximum Ratings: Receiver

Operating temperature:	-10°C to +55°C -40 to +80 deg C option available
Storage temperature:	-40°C to +100°C
Supply Voltage (pin 5)	7V
RF Input (pin 1)	+20 dBm (100mW)

Electrical Characteristics: Receiver (20 Kbits/sec version)

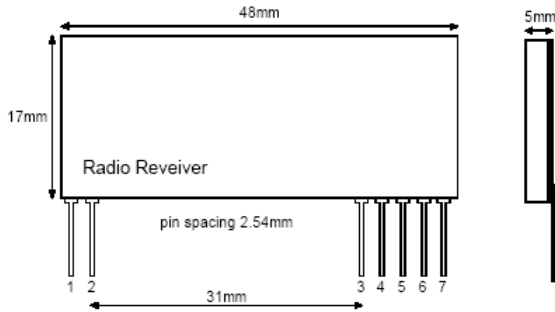
	pin	min.	typ.	max.	units	notes
DC LEVELS						
Supply voltage		4.5	5	5.5	V	
Supply current			6	7	mA	
Supply ripple		-	-	10	mV _{P-P}	
Data output high			=>4.5		V	
Data output low			<= 0.5		V	
RF						
RF sensitivity			-113		dBm	
IF Bandwidth			±270		KHz	
Initial frequency accuracy			±100		Hz	
Frequency Accuracy Overall			20		dBm	1
E.M.C.						
Spurious responses upto 1GHz			<60		dB	
LO leakage, conducted			<60		dBm	
LO leakage, radiated			<60		dBm	
Image rejection			63		dB	
DYNAMIC TIMING						
Power up to stable data <i>(With RF signal present)</i>			18	23	mS	
Signal to stable data <i>(With power supply already on)</i>			2,5	5	mS	
Power up to valid RSSI <i>(with RF signal present)</i>			3	5	mS	
Mark:space ratio				50	%	
Bit rate		100		20000	bps	2

Notes

- 1) For 12 dB SINAD from the AF output
- 2) Note 1Hz = 2 bps

Connection Details

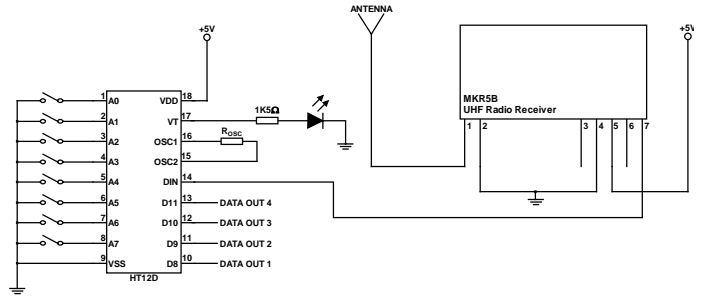
Mechanical Dimensions



XR7 Receiver

Application Circuit

The application circuit shows how the XR7 Receiver can easily be integrated into a system to form a wireless link.



Receiver Application Circuit

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 SAW RF 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 14mA 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.

Vertrieb:

AGT electronic Handelsges. mbH
Spannstücken 22
22159 Hamburg

RSSI Values

The XR7 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
-120	1,06
-110	1.16
-100	1.34
-90	1,59
-80	1,78
-70	1,81
-60	1,81
-50	2.17
-40	2.45