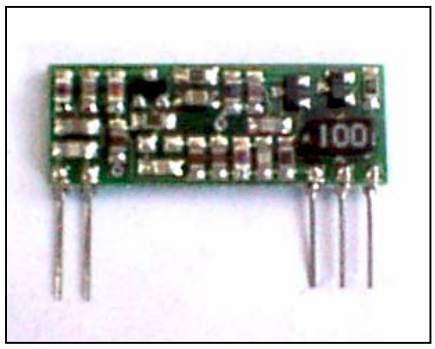
## Features

- Miniature SIL Package
- Unique QM (Quasi AM/FM) Design
- Data Rates Up To 10kbits/S
- Optimal Range 200m
- 433.92 / 868 / 916.5 MHz Versions
- Saw Stabilised Quasi AM/FM Transmission
- 3 To 9 Volt Supply Voltage
- Industry Pin Compatible
- Unique Modulation Scheme (High Interference Rejection)
- Approved To En 300-220-1



## Applications

- Vehicle Alarm Systems
- Remote Gate Controls
- Garage Door Openers
- Domestic And Commercial Security

## Compatible Receiver Modules

- QMR1-XXX (see data sheet QMR1)
- QFMR2-XXX (see data sheet QFMRX)
- QFMR3-XXX (see data sheet QFMRX)
- QTRC1-XXX Transceiver (see data sheet QTRC1)

## General Description

The QFMT1-XXX miniature transmitter UHF radio module enables the implementation of a simple telemetry link at data rates of up to 10Kbit/s when used with one of the compatible receiver modules.

Available for operation at 433.92, 868 and 916.5 MHz these modules are able to transmit at distances of up to 200m (433.92 MHz version).

The QFMT1-XXX module will suit one-to-one and multi-node 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

## 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 |
| RF Out (pin 2) | ±50V @ < 10MHz , +20dBm @ > 10MHz |

## Electrical Characteristics: Transmitter

| | pin | min. | Typ. | max. | units | notes |
|---|---|---|---|---|---|---|
| ***DC LEVELS*** | | | | | | |
| Supply voltage | 3 | 3.0 | 7.0 | 9.0 | Volts | |
| | | | | | | |
| ***Current & RF POWER*** | | | | | | |
| | | | | | | |
| 433.92 | | | | | | |
| Supply current @ $V_{CC}$ = 5V (data low/high) | 3 | | | 3/12 | mA | 1 |
| RF power @ $V_{CC}$ = 5V | 2 | | 0 | +8 | dBm | 1 |
| | | | | | | |
| 868 | | | | | | |
| Supply current @ $V_{CC}$ = 5V (data low/high) | 3 | | | 5/16 | mA | 1 |
| RF power @ $V_{CC}$ = 5V | 2 | | 0 | +3 | dBm | 1 |
| | | | | | | |
| 916.5 | | | | | | |
| Supply current @ $V_{CC}$ = 5V (data low/high) | 3 | | | 5/16 | mA | 1 |
| RF power @ $V_{CC}$ = 5V | 2 | | 0 | +3 | dBm | 1 |
| | | | | | | |
| ***RF & Data*** | | | | | | |
| 2nd harmonic | | | -50 | | dBc | 1 |
| Harmonics @ > 1GHz | | | -46 | | dBc | 1 |
| Initial frequency accuracy | | | ±75 | | KHz | |
| Overall frequency accuracy | | | ±100 | | KHz | |
| | | | | | | |
| FM deviation (±) | | | 10 | | KHz | |
| Modulation bandwidth @ -3dB | | | 20 | | KHz | |
| Modulation distortion (THD) | | | | | % | |
| Power up time to full RF | | | 10 | | µs | |
| | | | | | | |
| Data rate | | 100 | | 20000 | bits/s | |
| Data pulse width | | 100 | | | µs | |

**Note 1:** measured into a 50Ω impedance

## Connection Details

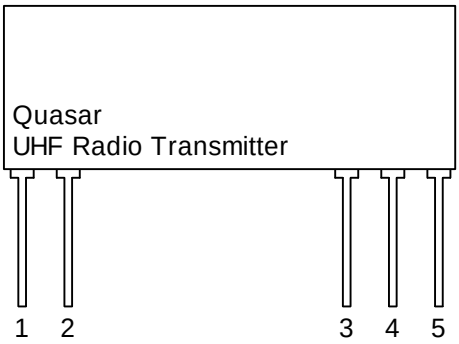



**Figure 1: Transmitter**

## 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 (3.0 to 9.0 volts). 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.

## General Information

The transmitter module implements a unique quasi AM/FM modulation scheme that puts the baseband data signal onto the RF carrier in two different ways. Firstly the carrier is shifted in frequency (typically 20 KHz) which generates the normal FSK spectrum, but simultaneously the RF carrier is also amplified thus yielding the ASK spectrum.

Utilising the quasi AM/FM modulation technique with one of the compatible receivers will yield a highly efficient wireless link.

**Note:** Because of the way Quasi Modulation operates the QMR1 and the QFMT1 will not work reliably in close proximity to each other.

## 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

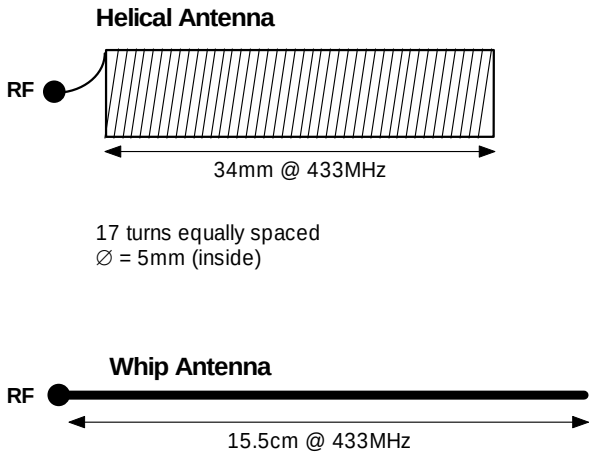



**Figure 2: Antenna Configurations To Be Used With The QM Transmitter Module**

## Application Circuit

For detail application information please see datasheet DS600

## Mechanical Dimensions

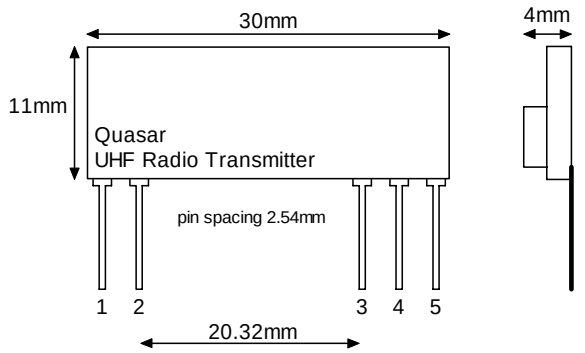



**Figure 4: Transmitter**

## Ordering Information

**Standard Product;**

| Part No | Description |
|---|---|
| QFMT1-434 | SIL Transmitter 434MHz |
| QFMT1-868 | SIL Transmitter 868MHz |
| QFMT1-916 | SIL Transmitter 916MHz |

Should you require further assistance please contact :
**R F Solutions Ltd.,**
**Unit 21, Cliffe Industrial Estate,**
**South Street, Lewes,**
**E. Sussex. BN8 6JL, England**

**Tel: +44 (0)1273 898 000** **Fax: +44 (0)1273 480 661**

**Email : sales@rfsolutions.co.uk** **http://www.rfsolutions.co.uk**