

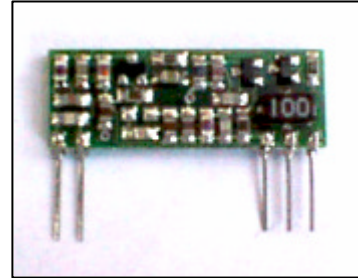


QM Transmitter Module

QFMT1-XXX

Features

- MINIATURE SIL PACKAGE
- UNIQUE QM (QUASI AM/FM) DESIGN
- DATA RATES UP TO 10KBITS/S
- OPTIMAL RANGE 500m (433.92 MHz Version)
- 433.92 / 868 / 916.5 MHz VERSIONS
- SAW STABILISED QUASI AM/FM TRANSMISSION
- 3 TO 9 VOLT SUPPLY VOLTAGE
- INDUSTRY PIN COMPATABLE
- 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 Quasar receiver modules.

Available for operation at 433.92, 868 and 916.5 MHz these modules are able to transmit at distances of up to 500m (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) $\pm 50V @ < 10\text{MHz}$, $+20\text{dBm} @ > 10\text{MHz}$

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						
2 nd harmonic			-50		dBc	1
Harmonics @ $> 1\text{GHz}$			-46		dBc	1
Initial frequency accuracy			± 75		KHz	
Overall frequency accuracy			± 100		KHz	
FM deviation (\pm)			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 50 Ω impedance

Connection Details

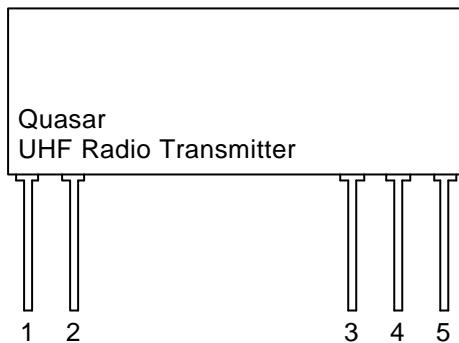


Figure 1: Quasar Transmitter

General Information

The Quasar 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 Quasar receivers will yield a highly efficient wireless link.

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*)

50 Ω 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 47K Ω 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.

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 @ $\frac{1}{4}$ wavelength (15.5cm @ 433.92MHz). Further range may be achieved if the $\frac{1}{4}$ 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

Application Circuit

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

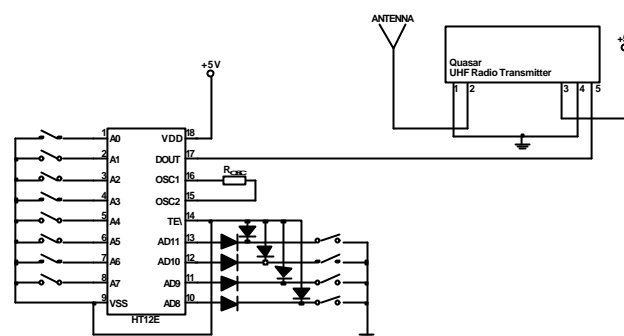


Figure 3: Quasar QM Transmitter Application Circuit

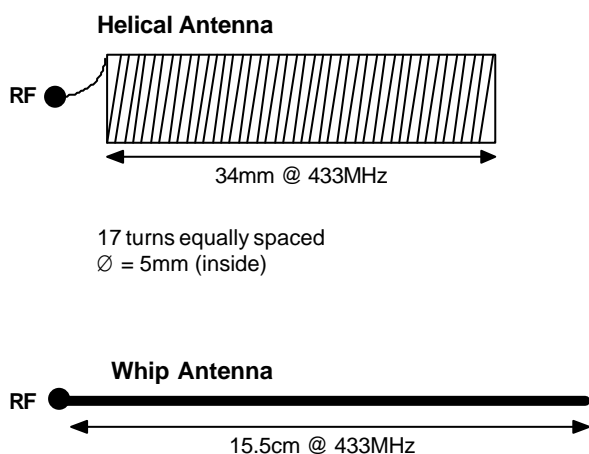


Figure 2: Antenna Configurations To Be Used With The Quasar QM Transmitter Module

Mechanical Dimensions

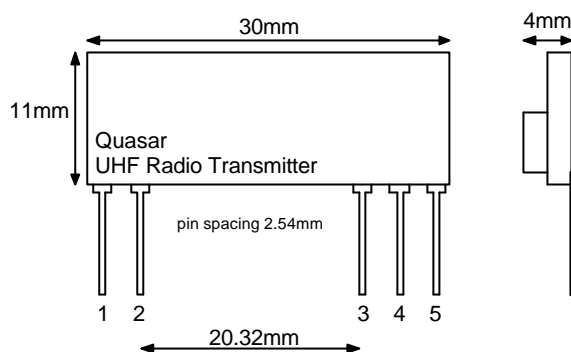


Figure 4: Quasar Transmitter

Ordering Information

Standard Product;

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

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