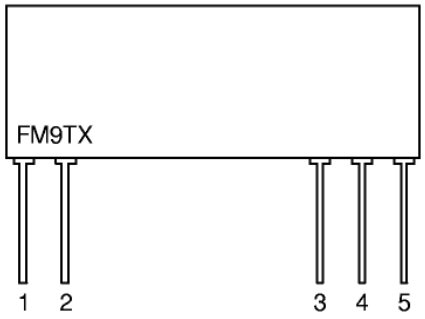
FM9TX 914.5MHz FM Transmitter Module

The FM9TX miniature UHF transmitter module enables the implementation of a wireless telemetry link at data rates of up to 64Kbit/s when used with the compatible FM9RX 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's performance due to better supply filtering as well as ensuring a constant RF output level.

The FM9TX 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 module is ideal for use in portable battery powered wireless applications.

Features

- Miniature SIL package
- Fully shielded
- Data rates up to 64kbps
- Bandwidth efficient PLL technology
- Wide operating voltage
- Operation on 914.5MHz
- Compatible with the ATRT100-914.5 trasceivers
- 50 Ω antenna impedance
- Compatible with the FM9RX receiver module



Typical Applications

- Telemetry systems
- Remote control
- Paging systems
- Domestic and commercial security
- Robotics
- SCADA

Pin Designation

1 — RF GND
2 — RF Out
3 — VCC
4 — GND
5 — Data In

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ABSOLUTE MAXIMUM RATINGS

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	2.3	5.0	10.0	Volts	
Current & RF POWER						
Supply current @ V_{CC} = 5V	3		7		mA	
RF power	2		1		mW	1
RF & Data						
Operating Frequency			914.5		MHz	
2nd harmonic			-50		dBm	
Harmonics @ > 1GHz			-50		dBm	
Initial frequency accuracy				30	KHz	
Modulation bandwidth @ -3dB			35		KHz	
Power up time to full RF			5		ms	
Data rate		0		64000	bits/s	
Data pulse width		15			µs	

Note 1: Measured into a 50 ohm impedance

Pin Descriptions

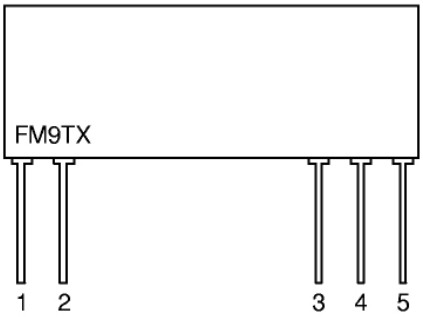
RF GND *(pin 1)*
RF ground pin, internally connected to pin 4 (0V). This pin should ideally be connected to the nearest ground plane (e.g. coax braid, main PCB ground plane etc.)

RF Out *(pin2)*
50 ohm RF antenna output. To achieve best results the antenna impedance must match that of the module.

VCC *(pin 3)*
+V supply pin. The module will generate RF when VCC is present.

GND *(pin 4)*
Supply and data ground connection, connected to pin 1.

Data In *(pin 5)*
This input has an impedance of 47K ohm 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.



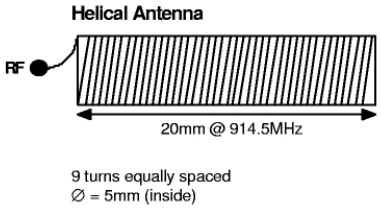
Antenna Design

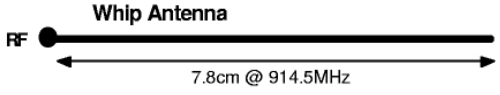
The design and positioning of the antenna is as crucial as the module performance itself in achieving a good wireless system range. The following will assist the designer in maximizing system performance.

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.

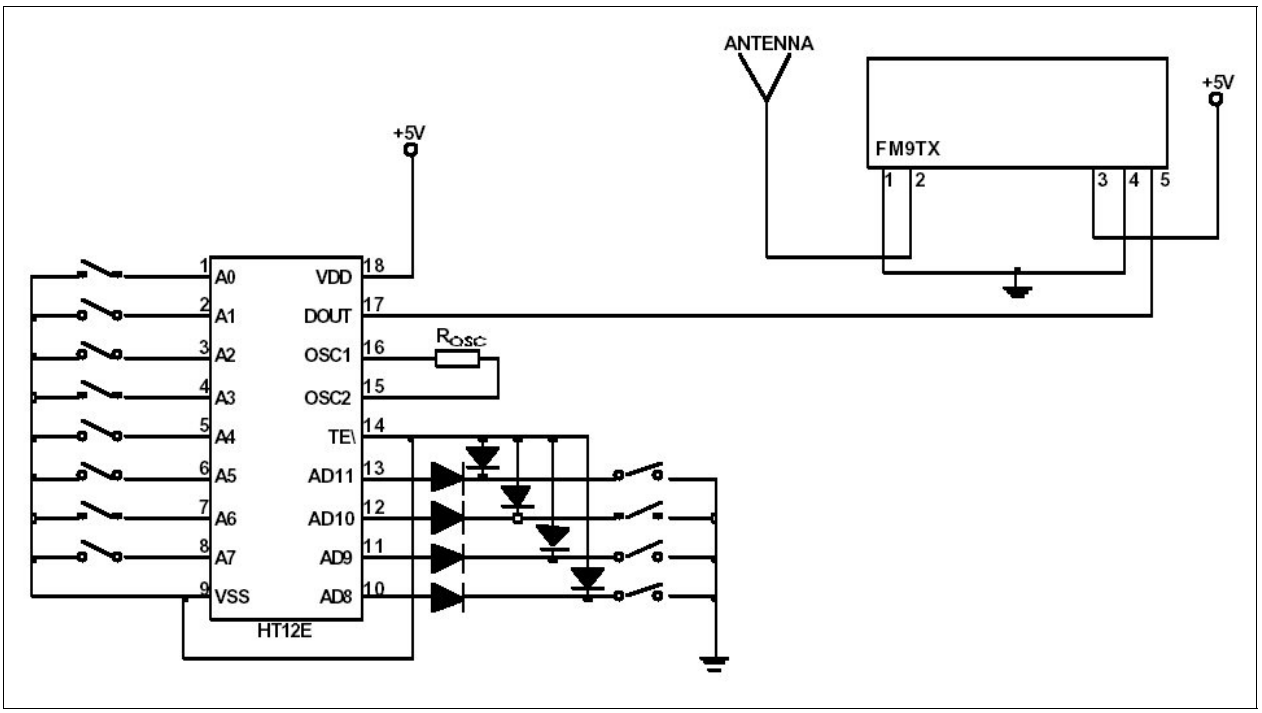
Best range is achieved with either a straight piece of wire, rod or PCB track @ ¼ wavelength (7.8cm @ 914.5MHz). Further range may be achieved if the ¼ wave antenna is placed perpendicular in the middle of a solid earth plane measuring at least 10cm radius. In this case, the antenna should be connected to the module via some 50 ohm characteristic impedance coax.





Application Circuit

The following simple application circuit shows how the FM9TX RF transmitter module can easily be integrated into a system to establish a wireless remote control link. Refer to the FM9RX data sheet for the receiver side of the remote control application circuit.
Please visit our website www.abacomdirect.com for other data encoders and decoders suitable for many different applications.



Mechanical Dimensions