

## AT-MT1-xxx Miniature AM Transmitter Module

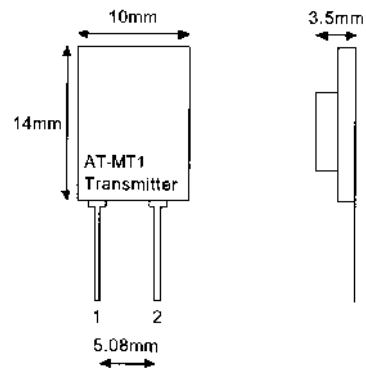
The AT-MT1 miniature UHF RF transmitter modules are well suited to applications where size constraints are dominant. Employing OOK modulation, the AT-MT1 transmits the carrier only when the data input signal is at a high level.

Low current consumption and OOK modulation yield excellent power conservation characteristics making the AT-MT1 an ideal RF transmitter module for portable battery powered wireless applications.

The AT-MT1 will suite one-to-one and multinode wireless links in applications including security, RKE, robotics, wireless data acquisition, remote control etc. and may be driven directly by micro-controllers and data encoders such as the DPC-2400, HT12E, and the MC145026.



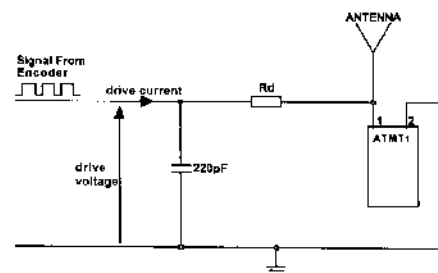
### Mechanical Outline



### Features

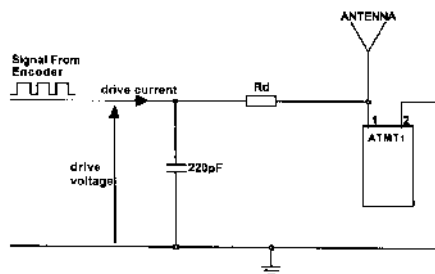
- Miniature two pin package
- SAW resonator stability
- Data rates up to 2400bps
- Optimal range 300ft
- 418MHz , 433.92MHz and 916.5MHz versions
- CMOS / TTL compatible input
- Low current (typ. 5mA)
- Wide power supply range 1.5-13V
- Compatible with our AM receiver modules

### Schematic



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## Application Information

### Antenna Design

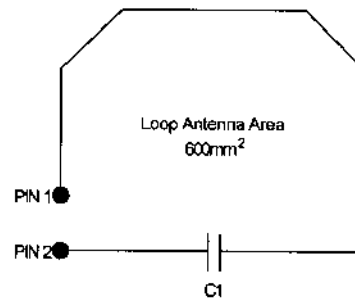
The design and positioning of the antenna is as crucial as the module performance itself in achieving a good wireless system range. The following will assist the designer in maximizing system performance.

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 transmit power. Any ground 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. (. Further range may be achieved if the 1/4 wave antenna (15.5cm @ 433.92MHz) is placed perpendicular in the middle of a solid ground plane measuring at least 16cm radius. In this case, the antenna should be connected to the module via some 50Ω characteristic impedance coaxial cable such as RG174U or RG58U.

### Loop Antenna



C1 = 2.2pF @ 418MHz  
C1 = 1pF @ 433MHz

### Whip Antenna



When designing a PCB loop antenna, the inside area of the loop must be kept clear of any other components, as well as the area surrounding the loop. In other words the loop antenna must occupy an area of the PCB which is allocated to the antenna only. In some cases where PCB real estate is at a premium, the loop may be designed as a discrete component which solders onto the board. The tuning capacitor is usually a variable capacitor which may be replaced with a fixed value capacitor once the tuned value has been determined. Provision can be made in the PCB layout to accommodate for this.

For the 916.5MHz AT-MT1 transmitter modules, the variable capacitor value is typically very low, in the region of 0.5uF and the loop area will also be smaller than for the lower UHF devices. The value of the capacitor will be a function of the loop size and electrical dimensions as applies to any tuned circuit.

### Data Encoding

Data encoding and decoding is invariably required for successful RF data communications.

Encoders which interface suitably with the ATMT1 RF transmitter modules such as Holtek's HT12E, Motorola and National Semiconductor's MC145026 and Microchip's Keeloq devices, are typically used for data encoding in remote control

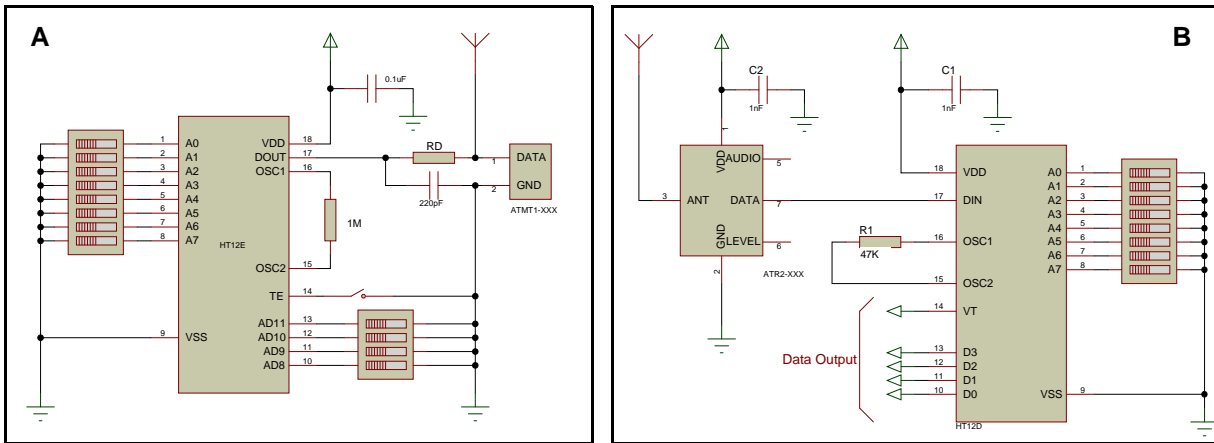
and security applications.

ABACOM's DPC-2400 and DPC-64 encoder/decoders are designed as a serial data interface between host processors such as microcontrollers or PC's, and the ATMT1 RF transmitter module and companion receiver modules.

The DPC encoders/decoders perform the required data formatting of serial data for RF wireless communications, greatly simplifying the design process

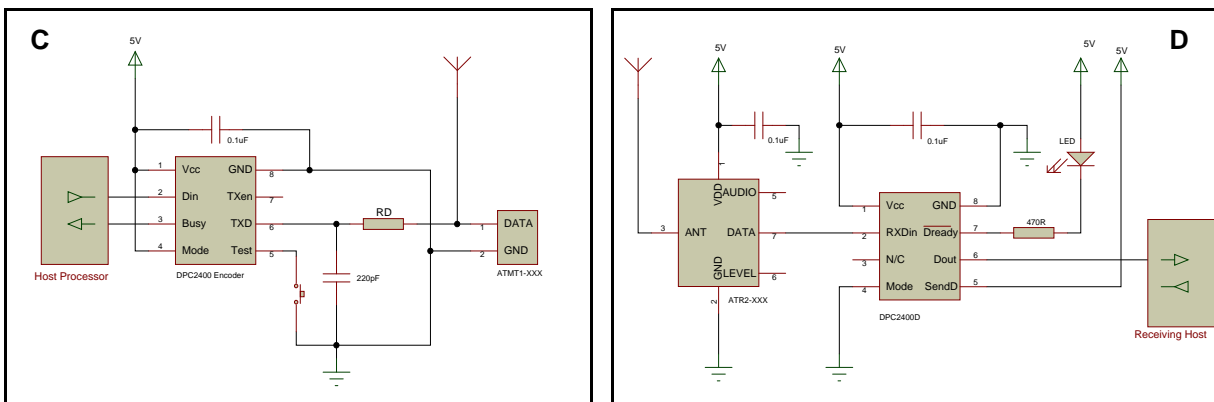
### Example Application: Remote Control

ATMT1 interfaced to HT12E data encoder (A) and companion receiver and data decoder (B)



### Example Application: Serial Data

ATMT1 interfaced to the DPC 2400 serial data encoder (C) and companion receiver and DPC 2400 data decoder (D)



## Absolute Maximum Ratings

Operating Temperature: -20°C to +55°C

Storage Temperature: -40°C to +85°C

Supply Voltage (pin 1): 15V

Data input (pin 1): 15V

## Electrical Characteristics

Parameter	Min.	Typ.	Max.	Units
<b>DC Levels</b>				
Supply Voltage	1.5	5.0	13	
<b>Current &amp; RF Power</b>				
For supply 7 to 13volts:				
Supply current @ Rd=1.0KΩ	6	8.2	9	mA
RF power into 50Ω @ Rd=1.0KΩ	2	4	6	dBm
For supply 1.5 to 3.7 volts:				
Supply current @ Rd=51Ω (data high)	4		7	mA
RF power into 50Ω @ Rd=51Ω	-4		0	dBm
<b>RF &amp; Data</b>				
Data rate @ rf<500MHz	100		2400	bps
Data rate @ rf>500MHz	100		4800	bps

**Applications Support:** [abacom@abacom-tech.com](mailto:abacom@abacom-tech.com)

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