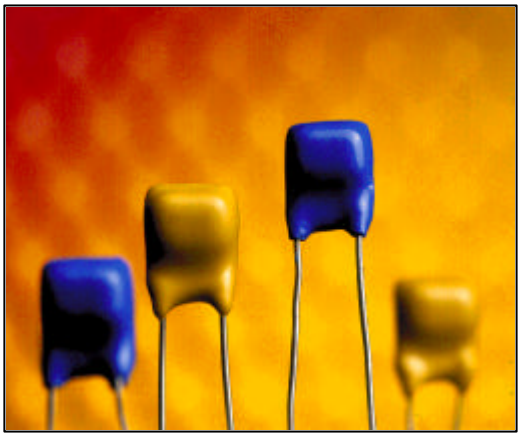
AM RF TRANSMITTER MODULE. AM-TX1-XXX

FEATURES

- MINIATURE MODULE (7.5 x 11.5 X 4.5mm)
- SAW CONTROLLED FREQUENCY STABILITY
- NO ADJUSTABLE COMPONENTS.
- TRANSMITTING RANGE UP TO 30 METRES.
- CMOS/TTL COMPATIBLE INPUT.
- CURRENT CONSUMPTION 2.5mA (typ).
- SINGLE SUPPLY VOLTAGE 2.5 -12V.
- COMPATIBLE WITH R.F. SOLUTIONS AM RECEIVER.
- MPT1340 LICENCE EXEMPT.
- AVAILABLE AS EITHER 418MHz OR 433MHz.



APPLICATIONS

- CAR ALARM KEYFOBS
- REMOTE TRANSMITTER ENCODERS
- GARAGE DOOR OPENERS
- REMOTE GATE SYSTEMS

DESCRIPTION

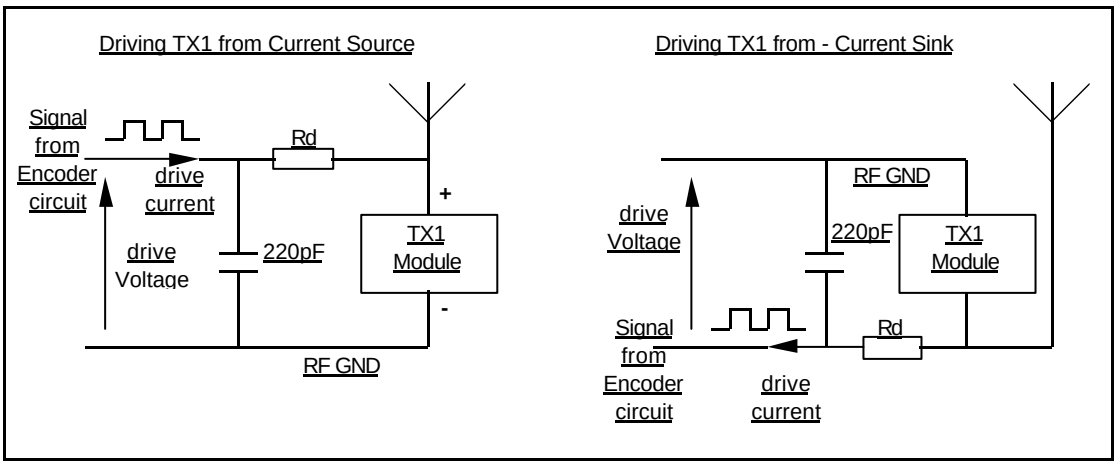
The R.F. Solutions AM Transmitter module offers a miniature hybrid modular RF transmitter providing on-off keyed modulation, which can be used to transmit data from any standard CMOS/TTL source up to 1200 baud.

The module is very simple to operate, requiring only two connections (see application circuit below). The module is also very efficient, using only 2.3mA (typ) which means that it may be driven directly from an encoder I/C or microcontroller. The output impedance has been designed to give optimum performance when coupled with a small antenna such as a tuned loop or short whip.

The modules are compatible with the AM Receiver modules (AM -HRRn-XXX or AM-RRS2-XXX).

The transmitter module is type approved to MPT1340 for use in general telemetry and telecommunications products, when used with the antenna as listed overleaf.

APPLICATION CIRCUIT



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Operation

The application circuit shows how to drive the module. The module may be driven from either a current source or current sink. In both cases the dropper resistor is required to set the drive current. The maximum and minimum drive voltage for various dropper resistor values is shown below. For other voltages between 2.5 - 13.1V the values may be calculated using the following formula

Min Rd = (Max drive Voltage - 3) / 0.0046

The minimum drive voltage for a given resistor value may then be calculated as;

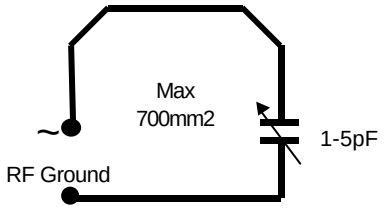
Min drive Voltage = 2.2 + .003 * Rd

Example: The max drive voltage is 5.5V. The min Rd is therefore 543 Ω. The nearest preferred value above this is 560 Ω. The min drive voltage with 560 Ω is 3.86V.

ANTENNAS

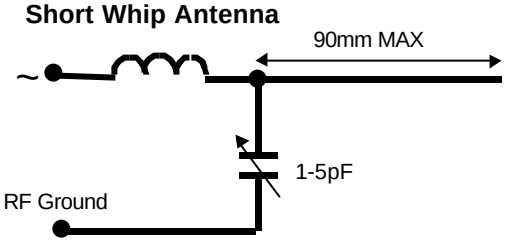
Two types of antenna may be used, a tuned loop, or a short whip. The tuned loop should be driven directly from the module. The whip should be driven via the specified tuning network. The module is not type approved for use with a $^1/_4$ wave or helical type antenna.

Tuned Loop Antenna



The tuned loop Ant is constructed from wire of 1-1.5mm DIA, or PCB track of 1.5-2.5mm width.
The enclosed area of the loop shall not exceed 700mm2. The trimming capacitor should be used to tune the ant for max output. A 1.5 - 5pF cap is generally

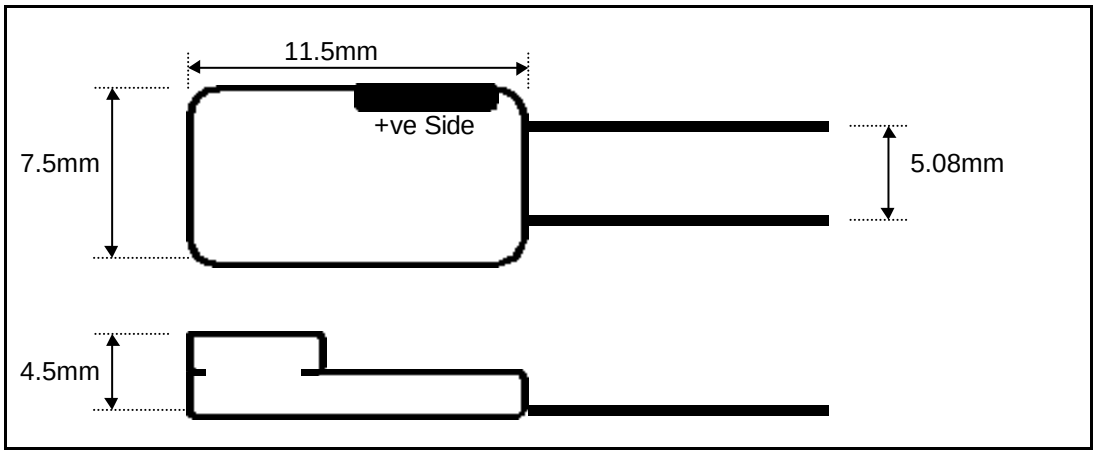
Short Whip Antenna



The short whip ant is constructed from a wire rod or PCB track of 90mm length.
The 15nH inductor may be an SOIC component on the PCB, or an air cored solenoid of 0.8mm inside DIA, close wound with 9 turns of 0.56mm. The trimming capacitor should be used to tune the ant for max output. A 1.5 - 5pF cap is generally adequate

MECHANICAL DETAILS

Width = 7mm, Height = 11.5mm, thickness: 4.5mm. Lead Pitch 5.08mm.
+ve connection is shown by marking on body side



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TECHNICAL SPECIFICATION

Absolute Maximums

Voltage + ve to - ve -2.5 to 8.5V Storage Temp -40 to +85° C

Ambient temperature 20deg C

ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION
Module Voltage (@ max drive)		3.0		V
Module Voltage (@ min drive)		2.2		V
Drive Current (@ max drive)		4.6		mA
Drive Current (@ min drive)		3.0		mA
Working Frequency	417.925	418.000	418.075	MHz
Working Frequency		433.92		MHz
Data Throughput			1200	baud
Tuning Tolerance		+/-75		KHz
Radiated Power (ERP) (@ max drive V)		-6.0		dBm
Modulation		ON-OFF		
Modulation Pulse width	0.8			mSecs
Operating Temperature	-10		+40	°C

DRIVE VOLTAGE			RESISTOR VALUE (R_D)
MIN	MAX	UNIT	W
8.8	13.1	V	2K2
6.7	9.9	V	1K5
5.2	7.6	V	1K
4.2	6.1	V	680
3.6	5.2	V	470
3.2	4.5	V	330
2.8	4.0	V	220
2.5	3.5	V	100
-1	0.5	V	'off voltage'

LICENCE EXEMPTION

This range of Radio transmitters is approved by the Department of Trade & Industry (D.T.I. Specification MPT1340) in the U.K., and therefore the user requires no radio operating licence in the U.K. Please note however the following requirements to comply with MPT1340;

1. All transmitters shall use integral antennas only. Receivers may use an external or integral antenna. An integral antenna is defined as one which is designed to be connected permanently to the transmitter or receiver without the use of an external feeder. The antenna shall be a tuned loop not exceeding 700mm^2 enclosed area, or a whip not exceeding 90mm in length.
2. The equipment in which the module is used must carry an inspection mark located on the outside of the equipment which is clearly visible. It shall state "MPT1340 W.T. Licence Exempt". The minimum dimensions of the mark shall be 10 x 15mm and the figure height shall be not less than 2mm.

PART No	DESCRIPTION
AM-TX1-418	Transmitter Module 418MHz
AM-TX1-433	Transmitter Module 433MHz

Should you require further assistance, please call;

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RF Solutions is a member of the Low Power Radio Association.

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