

# ***RADIO MODULE***

## **MTX-705/15/35**

### **FSK/ASK TRANSMITTER MODULE**

**Supports the follow parts:**

MTX-705

MTX-715

MTX-735

PRELIMINARY

# **DATA SHEET**

***Radios, Inc.***

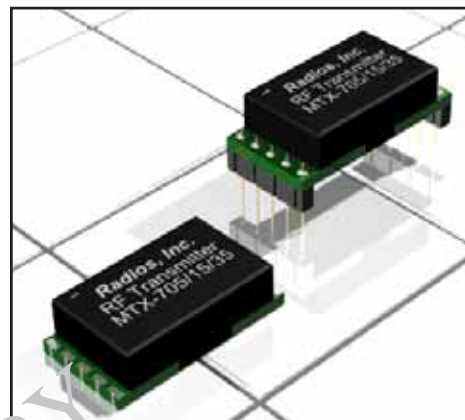
April 14, 2006 Preliminary Data Sheet

# MTX-705/15/35

## FSK/ASK TRANSMITTER MODULE

The MTX-705/15/35 FSK/ASK transmitter is designed for applications in the 315 MHz, 433 MHz, or 868 MHz industrial-scientific-medical (ISM) band, according to the EN 300 220 telecommunications standard; but it can also be used in any other country with similar frequency bands.

The MTX-705/15/35 transmitter consists of a fully integrated voltage-controlled oscillator, a divide-by-32 divider, a phase-frequency detector and a charge pump. An internal loop filter determines the dynamic behavior of the PLL and suppresses reference spurious signals. A Colpitts crystal oscillator is used as the reference oscillator of a phase-locked loop synthesizer. The VCO's output signal feeds the power amplifier.



### Key Features

- Fully integrated PLL-stabilized VCO
- Frequency range from 250-350MHz, 380-450MHz, or 850-930MHz
- Single-ended RF output
- FSK through crystal pulling allows modulation from DC to 40 kbit/s
- High FSK deviation possible for wideband data transmission
- ASK achieved by on/off keying of internal power amplifier up to 40 kbit/s
- Very low standby current
- On-chip low voltage detector
- High over-all frequency accuracy
- FSK deviation and center frequency independently adjustable
- Adjustable output power range: -11 to +10 dBm
- Adjustable current consumption: 3.4 to 10.6 mA

### Typical Applications

- General digital data transmission
- Tire Pressure Monitoring System (TPMS)
- Remote Keyless Entry (RKE)
- Low-power telemetry
- Alarm and security systems
- Garage door openers
- Home automation

### PRODUCT ORDER INFORMATION

Part Number	Description
MTX-705(D)(S)	TH72005 FSK/ASK Module Transmitter
MTX-715(D)(S)	TH72015 FSK/ASK Module Transmitter
MTX-735(D)(S)	TH72035 FSK/ASK Module Transmitter

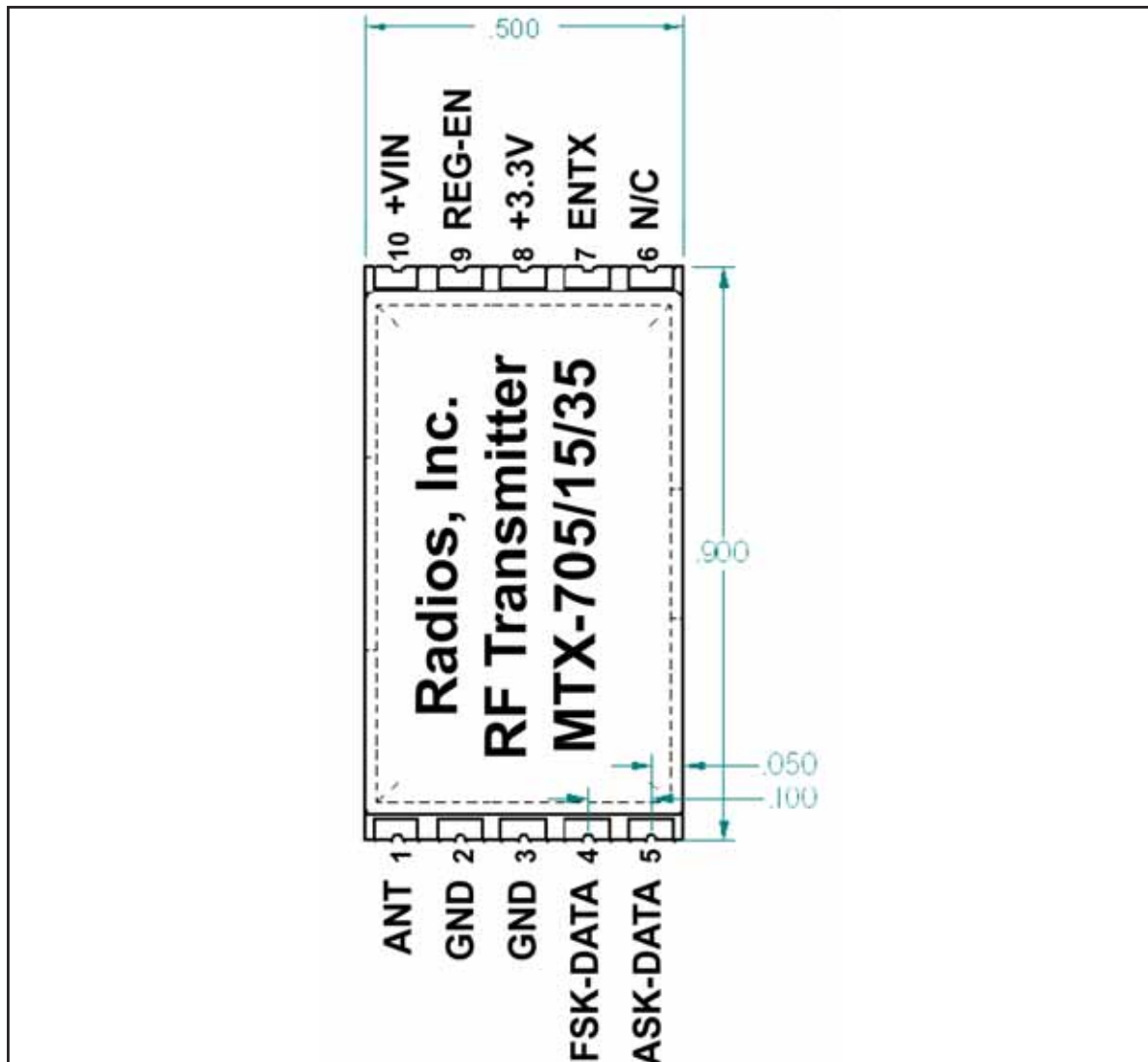
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## MTX-705/15/35

### FSK/ASK TRANSMITTER MODULE

## Mechanical and Pin Diagram



### Pin Description

Pin Num	Pin Name	Description	Pin Num	Pin Name	Description
Pin 1	Ant	RF Output	Pin 6	+VIN	Supply Voltage
Pin 2	Gnd	Ground	Pin 7	REG-EN	Regulator Enable
Pin 3	Gnd	Ground	Pin 8	+3.3V	Regulated Output
Pin 4	FSK-DATA	FSK Data Input	Pin 9	ENTX	Bandwidth Selection Bit 0
Pin 5	ASK-DATA	ASK Data Input	Pin 10	N/C	No Connect

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## FSK/ASK TRANSMITTER MODULE

### Electrical Limits

Sym	Parameters	Min	Typ	Max	Unit	Notes
<b>Absolute Maximum Ratings</b>						
VDD	Supply Voltage	-20		20	V	
	Storage Temperature Range	-65		150	°C	
	Lead Temperature		260		°C	
V <sub>EN</sub>	Enable Input Voltage	-20		+20	V	
<b>Operating Ratings</b>						
	Supply Voltage	2.5		16	V	
V <sub>EN</sub>	Enable Input Voltage	0		TBD	V	
TA	Ambient operating temperature	-40		125	°C	

### Electrical Characteristics

This device is ESD sensitive. Do not operate or store near strong electrostatic fields. Use appropriate ESD precautions. All voltages are with respect to Ground.

Parameters	Test Conditions	Min	Typ	Max	Unit
<b>Operating Conditions</b>					
Input Low Voltage	ENTX, DATA pins			0.3VCC	V
Input High Voltage	ENTX, DATA pins	0.7VCC			V
XOSC Frequency	MTX-705	9		10.9	MHz
	MTX-715	11.9		14	MHz
	MTX-735	26.6		29	MHz
VCO Frequency	MTX-705	290		350	MHz
	MTX-715	380		450	MHz
	MTX-735	850		930	MHz
FSK Deviation	MTX-705	±2.5		±30	kHz
	MTX-715	±2.5		±40	kHz
	MTX-735	±2.5		±60	kHz
FSK Data Rate	NRZ			40	kbit/s
ASK Data Rate	NRZ			40	kbit/s
<b>Operating Currents</b>					
Standby Current	ENTX=0, 85°C		0.2	200	nA
	ENTX=0, 125°C			4	µA
Supply Current - MTX-705/15		7.3	10.6	13.3	mA
Supply Current - MTX-735		9.4	13.4	17.3	mA
<b>Digital Pin Characteristics</b>					
Input Low Voltage CMOS	ENTX, DATA pins	-0.3		0.3VCC	V
Input High Voltage CMOS	ENTX, DATA pins	0.7VCC		VCC+0.3	V
Pull Down Current ENTX pin	ENTX=1	0.2	2	20	µA
Low Level Input Current ENTX pin	ENTX=0			0.02	µA
High Level Input Current DATA pins	FSK/ASK-DATA=1			0.02	µA
Pull Up Current DATA pins active	FSK/ASK-DATA=0, ENTX=1	0.1	1.5	12	µA
Pull Up Current DATA pins standby	FSK/ASK-DATA=0, ENTX=0			0.02	µA
<b>FSK Switch Resistance</b>					
MOS Switch On Resistance	FSK-DATA=0, ENTX=1		20	60	Ohm
MOS Switch Off Resistance	FSK-DATA=1, ENTX=1	1			MOhm

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## FSK/ASK TRANSMITTER MODULE

### Electrical Characteristics - CONT.

<b>Power Select Characteristics</b>					
Power Select Current	ENTX=1	7	8.6	9.9	μA
Power Select Voltage	ENTX=1	1.47			V
<b>Low Voltage Detection Characteristic</b>					
Low Voltage Detect Threshold	ENTX=1	1.75	1.85	1.95	V
<b>CW Spectrum Characteristics</b>					
Output Power MTX-705	ENTX=1		7.6		dBm
Output Power MTX-715	ENTX=1		7.1		dBm
Output Power MTX-735	ENTX=1		6.7		dBm
Phase Noise	@ 200kHz offset		-88	-83	dBc/Hz
Spurious Emissions According to EN 300 220-1 (2000.09) table 13	47MHz < f < 74MHz			-54	dBm
	87.5MHz < f < 118MHz				
	174MHz < f < 230MHz				
	470MHz < f < 862MHz, B=100kHz				
	f < 1GHz, B=100kHz			-36	dBm
	f > 1GHz, B=1MHz			-30	dBm
<b>Start-up Parameters</b>					
Start-up Time	from standby to transmit mode		0.8	1.2	ms
<b>Frequency Stability</b>					
Frequency Stability vs. Supply Voltage				±3	ppm
Frequency Stability vs. Temperature	crystal at constant temperature			±10	ppm
<b>ENABLE Input</b>					
Enable Input Logic-Low Voltage(V <sub>IL</sub> )	regulator shutdown			0.4	V
				0.18	V
Enable Input Logic-High Voltage(V <sub>IH</sub> )	regulator enabled	2.0			V
Enable Input Current	V <sub>IL</sub> <= 0.4V	2	0.01	-1	μA
	V <sub>IL</sub> <= 0.18V			-2	μA
	V <sub>IH</sub> = 2.0V			20	μA
	V <sub>IH</sub> = 2.0V			25	μA

Note 1. Exceeding the absolute maximum rating may damage the device.

Note 2. The device is not guaranteed to function outside its operating rating.

Note 3. Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

**FSK/ASK TRANSMITTER MODULE**

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## **FSK/ASK TRANSMITTER MODULE**

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Radios Inc. is committed to providing its customers with excellent technical support and the resources necessary to assist its customers with their product development. Customers have several options to obtain assistance. First, any questions or concerns can be e-mailed to Radios Inc. at [information@radiosinc.com](mailto:information@radiosinc.com). We monitor our e-mail daily, and will respond to all questions promptly. Additionally, to speak directly to a technical support representative, customers may call Radios Inc. at 215-362-1899.

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	(Date)
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