

# INNCOM TXR RF Module Datasheet

## Overview

The INNCOM TXR series of embedded RF radio modules provides INNCOM products with a common radio platform. The TXR RF radios are used in the point to point Layer-1 in-room network and in Layer-2 802.15.4 Zigbee 2006 mesh network topologies at 2.4 GHz.



## Features

- Common footprint designed for use with a variety of host products
- Multiple antenna options
- 2.4Ghz IEEE 802.15.4 compliant RF transceiver (CC2430 radio core)
- Low power and long range variants available
- Industrial temperature ratings 0-65 C°
- FCC Part 15C

**Table 1 INNCOM TXR Radio Specifications**

Performance	02-9994	02-9894	02-9927
<b>RF Data Rate</b>	250kbps	250kbps	250kbps
<b>Antenna Type</b>	SMT	u.FL male connector	SMT
<b>Indoor Range</b>	70ft	98ft	100ft
<b>Outdoor/ RF line-of-sight range</b>	540ft	980ft+	1000ft+
<b>Transmit Power</b>	1mW (+0dBm)	2mW (+2dBm)	10mW (+18dBm)
<b>Receive Sensitivity</b>	-94.6dBm	-94dBi	-94.6dBm
<b>Frequency Band</b>	2.4Ghz	2.4Ghz	2.4Ghz
<b>Encryption</b>	AES-128	AES-128	AES-128
<b>Protocol</b>	802.15.4	802.15.4	802.15.4
<b>Frequency Channels</b>	11-26	11-26	11-26
<b>Dimensions</b>	28mm x 38mm	28mm x 38mm	28mm x 38mm

Ranges are determined by performing an RF link quality test using two identical e528.3G thermostats containing radios as defined in tables 2 and 3. The maximum distance threshold is based on a 95% overall link quality. Outdoor ranges were conducted in a low noise, free air environment. Indoor ranges are for reference. Indoor ranges are impacted by the ambient environmental noise floor, and building construction materials.

## Secondary Range Performance Data

The following table describes the indoor and outdoor range when using un-like antenna combinations.

**Table 2 INNCOM TXR Radio Indoor Range**

Transmitter	Receiver	Receiver	Receiver
	<b>02-9994</b>	<b>02-9894</b>	<b>02-9927</b>
<b>02-9994</b>	70ft (21m)	73ft (22m)	98ft (30m)
<b>02-9894</b>	100ft (31m)	100ft (31m)	100ft (31m)
<b>02-9927</b>	90ft (27m)	100ft (31m)	98ft (30m)

**Table 3 INNCOM TXR Radio Outdoor Range**

Transmitter	Receiver	Receiver	Receiver
	<b>02-9994</b>	<b>02-9894</b>	<b>02-9927</b>
<b>02-9994</b>	540ft (165m)	570ft (174m)	654ft (199m)
<b>02-9894</b>	640ft (195m)	980ft+ (299m+)	768ft (234m)
<b>02-9927</b>	550ft (168m)	620ft (189m)	980ft+ (299m+)

**Table 4 INNCOM TXR Operating Conditions**

Parameter	Min	Max	Unit
<b>Operating ambient temperature range</b>	-40	85	°C
<b>Operating supply voltage</b>	2.0	3.6	V

The supply pins to the radio must be driven by the 1.8VDC on-chip voltage regulator.

**Table 5 INNCOM TXR Safety / Regulatory**

Agency Approval	Specification	Status
<b>FCC</b>	<b>15.247</b>	<b>02-9994 Certified under FCC ID: GTC029994TXR</b>

Only approved antennas can be used with this module. Additional antennas would require an application filing with the FCC in order to have them approved. Antennas which have either a higher gain or are of a different type may not be used, with this module, unless additional certification is obtained.

All Final Products containing the INNCOM TXR 02-9994 must contain the following statements on their label:

This device contains FCC ID: GTC029994TXR.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

All Final Products containing the INNCOM TXR 02-9894 should keep a safe distance of at least 20cm from all persons. The final product cannot be co located with any other antenna or transmitter.

Modifications not expressly approved by INNCOM International Inc. could void the user's authority to operate the equipment.

## Ordering Information

Part Number	Model Number	Assembly
02-9994	TXR-154.1	0dB radio with SMT antenna
02-9927	TXR-154.x	0dB radio with 5"u.fl to rpsma harness / ½ wave dipole antenna
02-9894	TXR-154.2	20dB radio with SMT antenna

## Document Revision History

Revision	Date Issued	Reason
0.1	20-Mar-2009	FCC Reports for 02-9894, 02-9927
0.2	24-Mar-2009	Revised for formatting and style
0.3	27-Mar-2009	Revised to update range performance data
1.0	07-Apr-2009	Released
1.1	23-Dec-2009	Updated to add FCC statements
1.2	07-Jan-2010	Added modifications warning
1.3	14-Jan-2010	Updated FCC statements