

GTR5i Embedded Radio Transceiver Technical Manual



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General Description

Fast, nimble and frequency agile - an accurate description of the new narrow band radio transceiver incorporating embedded s/w.

The GTR5i utilises proven narrow band technology combined with the advantages of an integrated digital processor in this software flexible radio terminal. The miniature terminal contains an agile and fast 15mW transmitter, agile receiver and a powerful signal processor.

The intelligent radio terminal provides a high performance but yet simple to use embedded wireless solution where data has to be communicated reliably.

Available in a small package measuring just 15 x 43 mm and operating down to 2.8v dc, the GTR5i is especially suited to portable and low power consumption applications.

The single GTR5i can cover the majority of the world's license exempt frequency bands due to it's capability to operate down to VHF frequencies in addition to operating on the usual 433/868 and 915 MHz bands as used in Europe and the USA.

This series of radio modules makes it very easy to incorporate wireless functionality into products for the global market.

Features

- Small module size
- Software selectable digital and RF parameters
- Superior performing radio engine
- Narrow Band FM yields secure and reliable data transfer
- Best in class blocking immunity to interference
- Bit Error Rate (BER) function included
- UART interface with built in comms protocols
- Available for operation on VHF & UHF bands
- Stand alone operation – just add a battery and interface to your sensors
- Low voltage portable operation
- EN 300-220 & EN301 489-3 compliant module

Development Aids

The GTR5i evaluation platform enables rapid assessment of the following;

- Target environment range testing
- Evaluation of propagation at different RF frequencies to determine optimum frequency of operation
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Applications

- Wireless telemetry, modems & AMR
- Home & Building Automation
- Domestic and commercial security
- Wireless environment data logging
- Wireless networking, EPOS etc, etc

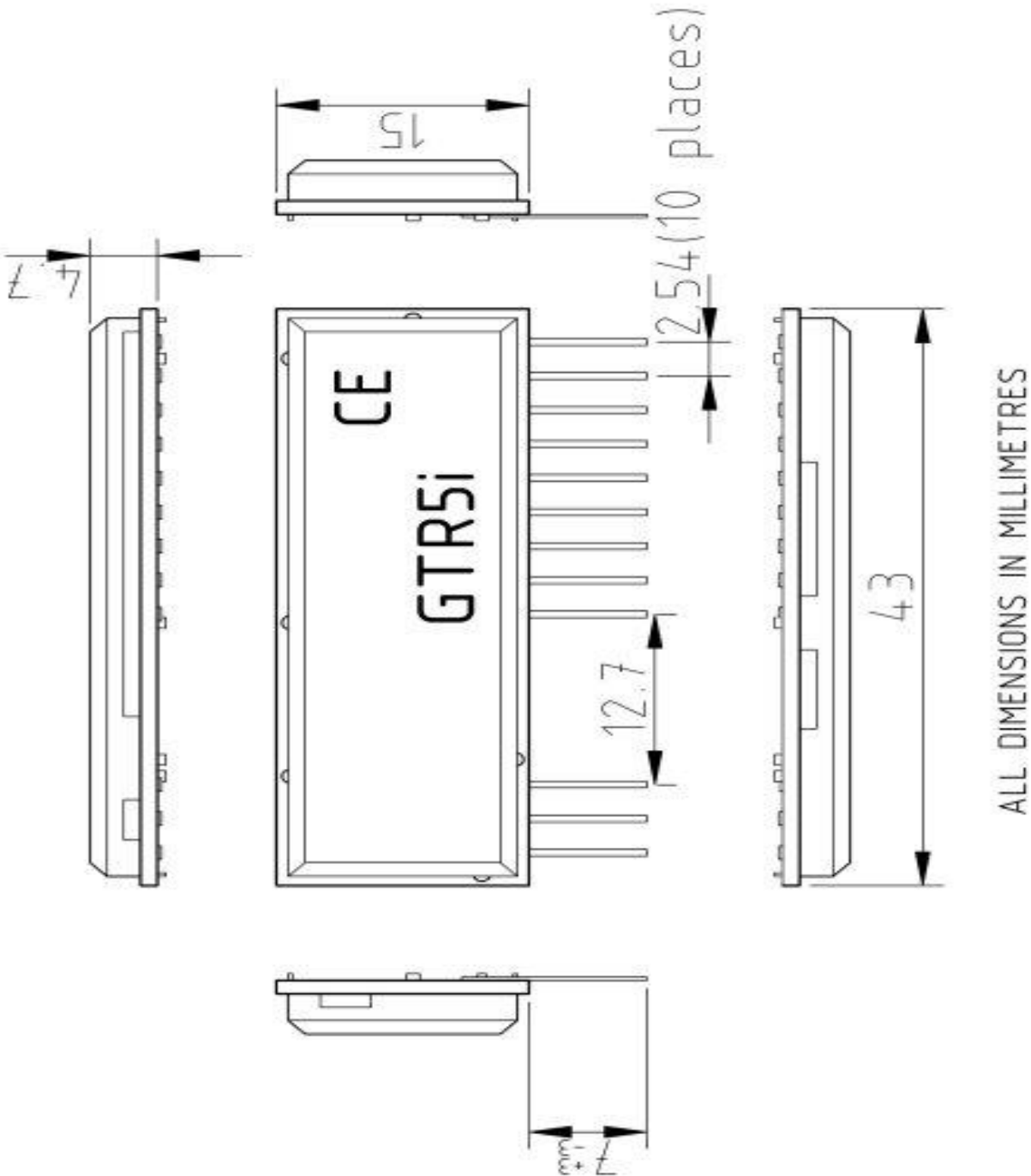
Embedded Software Features

The GTR5i incorporates a range of data formatting options.

Transparent mode allows users to design their own traffic structure with limitation as the full data rate is maintained indefinitely.

Packet mode provides 16 bit addressing and encryption with acknowledgments that are optionally included. The status of the acknowledgement is optionally reported to the user along with data passed in the acknowledgement message. This flexible structure allows the full range of scenarios from simple packet based messages to complex telemetry applications where remote readings are retrieved. The use of repeaters to extend range is possible too.

Mechanical Dimensions



ALL DIMENSIONS IN MILLIMETRES

Electrical Characteristics

Absolute Maximum Ratings:

Operating temperature:	-20°C to +60°C to be confirmed
Storage temperature:	-40°C to +100°C
Supply Voltage	3V

	pin	min.	typ.	max.	units	notes
DC LEVELS						
Supply voltage		2.8		6	V	
Supply current Rx mode (Icc)			33		mA	
Supply current Tx mode (Icc)			46		mA	1
Current in standby mode			6		mA	
current in sleep mode			1uA		uA	
Receiver Section						
RF sensitivity (for 12 dB SINAD) GTR5i-169 GTR5i-433 GTR5i-900			-117(-112) -117(-112) -117(-112)		dBm for BER of 1E-2	2
Selectable IF Bandwidth		12.5		25	KHz	
Max R.F. input			10		dBm	
LO Leakage, conducted			-70		dBm	
Blocking -2MHz			70		dB	
Blocking +2MHz			65		dB	
Blocking -10MHz			75		dB	
Blocking +10MHz			76		dB	
Adjacent channel rejection (upper)			45(39)		dB	3
Adjacent channel rejection (lower)			39(32)			3
Transmitter Section						
Power Output GTR5i-169 GTR5i-433 GTR5i-900				15 15 15	mW	
Harmonics (All bands)						4
Dynamic Timings – Receiver						
Standby to stable data output			30		mS	5
Dynamic Timings – Transmitter						
receive mode to full RF output			3		mS	
Standby mode to full RF output				13	mS	
Dynamic RF latency						
turn around time tx to rx			20		mS	

Notes

- 1) At maximum output power.
- 2) Measurements for 2400 baud serial data. Measurements in brackets are for 9600 baud data.
- 3) Measurements for 2400 baud. Upper refers to +25KHz and lower is -25KHz. Figures in brackets refer to serial data at 9600 baud.
- 4) All harmonics are within the levels specified within EN300-220
- 5) Actually data is received in 10mS but internal processing of the data requires an additional 20mS.

Module Pin Description



Pin descriptions are for a connected PC RS232 serial port.
GPIO means general purpose digital input/ output.
For very low current in Sleep mode all signal pins should be inactive high.
Signal pins operate with 3V logic levels.

Pin No	Description	Primary Functionality Modem with serial port	Optional Functionality
1	RF Gnd	Antenna ground connection	
2	RF / Antenna	Antenna feed connection	
3	RF Gnd	Antenna ground connection	
4	CTS output (PC input)	Clear to send (UART flow control, active low). Signals to PC that data can be sent.	Secondary UART Tx GPIO Trigger from Sleep
5	RTS input (PC output)	Request to send (UART flow control, active low. Serial output is inhibited if inactive high.	Secondary UART Rx GPIO Trigger from Sleep
6	MODE input to GTR5I	Active low gives configuration mode when DTR inactive. Inactive high gives sleep mode with 1uA current.	Input
7	DTR input (PC output)	Active low gives transceiver on In active high (standby) gives configuration mode if MODE is active low	Analogue input GPIO
8	RD (GTR5i Tx output) (PC input)	Data received from the radio terminal	Analogue input GPIO
9	TD (GTR5I Rx input) (PC output)	Data to be transmitted by the radio terminal	Analogue input GPIO
10	DSR output (PC input)	Active low signals a valid incoming message. Active low indicates a BER better than 10E2 for an incoming standard PN9 sequence.	Analogue input GPIO
11	Vcc 3.0V to 6.0V	Power supply positive input	
12	0v	Power supply negative input	

Ordering Information

Standard Product;

Part No	Description
GTR5i – 169	151 to 173 MHz Transceiver Module
GTR5i – 433	433 to 434 MHz Transceiver Module
GTR5i - 900	868 to 915 MHz Transceiver Module

Please consult our sales department for further information.

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Data sheet history

Version	Date	Change details
1.0	1/6/2010	Version 1.0 released

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