

## nanoLOC AVR Module

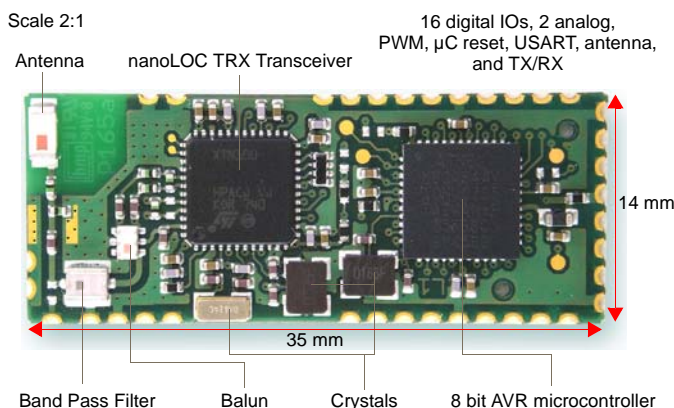
### Small Form Factor Smart RF Module Combining Location-Awareness and Robust Communication

#### Complete nanoLOC RF Module

Nanotron provides robust wireless technology for building Loss Protection Solutions and Real Time Location Systems (RTLS). The nanoLOC AVR Module with its small form and easy to integrate design enables easy and fast product development.

**Small form factor** – At only 35 mm x 14 mm x 3 mm, the nanoLOC AVR Module allows for the development of products such as tags or sensors that require minimal size and weight.

**Complete system** – This module is both small and smart. It integrates all the required components for a complete RF module, including Nanotron's innovative nanoLOC TRX Transceiver, an 8-bit ATmega644V microcontroller, a band pass filter, a balun, and a 2.4 GHz chip antenna.



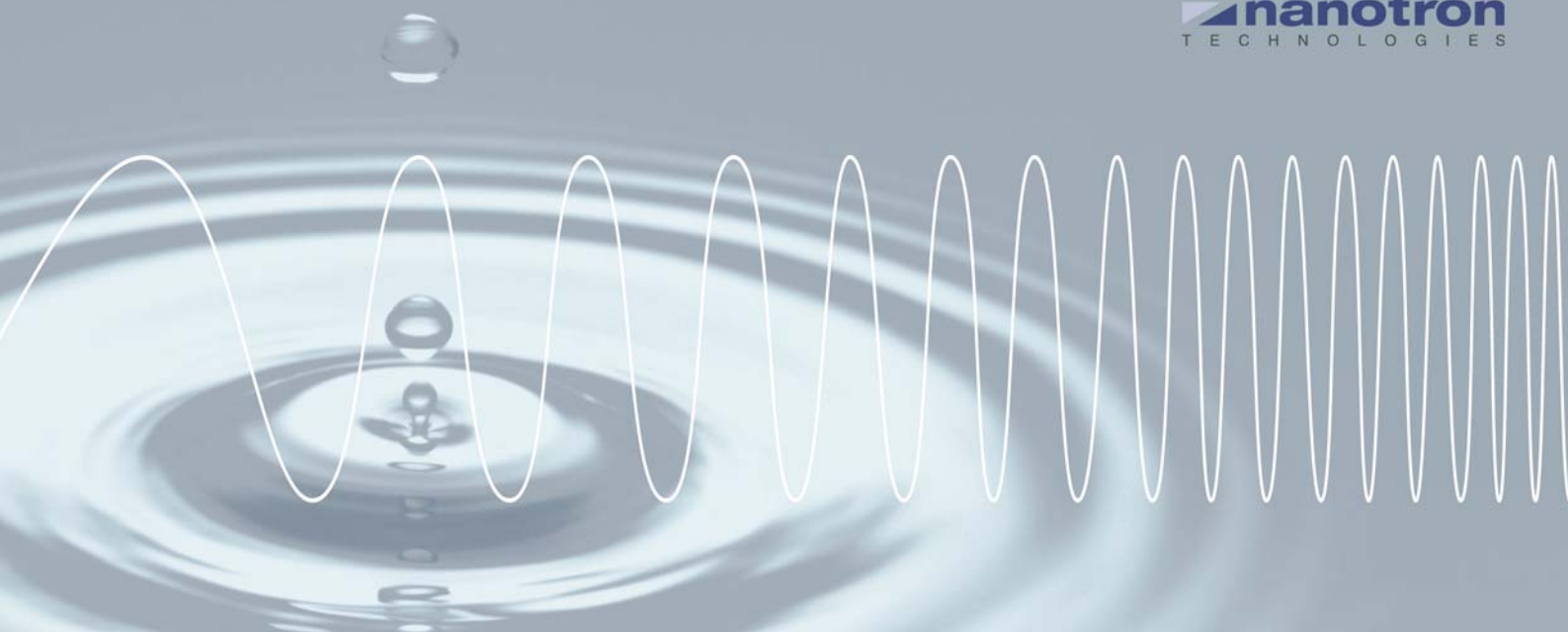
**Low power requirements** – The nanoLOC AVR Module can run from a single 2.5 V  $\pm$  0.2 V battery.

**Location-awareness and robust communication** – The nanoLOC TRX Transceiver is a sophisticated mixed signal IC utilizing Nanotron's robust wireless Chirp Spread Spectrum (CSS) communication technology.

nanoLOC allows simultaneous transmission of both ranging values and data from applications, sensors, or other sources: location-awareness and robust wireless communication in one chip.

#### Key Features

- Modulation technique.....Chirp Spread Spectrum
- Operates worldwide ..... 2.4 GHz ISM band
- Ranging accuracy ..... 2 m indoors / 1 m outdoors
- Supply voltage ..... 2.5 V  $\pm$  0.2 V
- Output power (programmable)..... -33 dBm to 0 dBm
- Data rates (programmable).....125 kbps to 2 Mbps
- Receiver sensitivity (FEC on)..... up to -97 dBm
- Current consumption TX .....30 mA @ 0 dBm
- Current consumption RX..... starts at 33 mA
- Standby current with active RTC..... 1.2  $\mu$ A
- Flashing and debugging..... SPI and JTAG pads
- 36 module pins.....16 digital Inputs and Outputs, 2 analog
- SPI and JTAG pads..... for flashing and debugging
- Antenna and /TX\_RX signal.....to enable external PA



## Applications

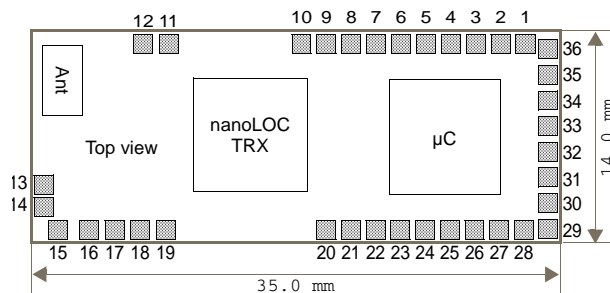
Use the nanoLOC AVR Module for Loss Protection Solutions and Real Time Location Systems (RTL5):

- *Child Loss Protection Solutions (CLOPS)* – Stand alone devices or integrated with other mobile terminals.
- *Pet Safety* – Circular and free form fencing solutions.
- *Farming, Manufacturing and Logistics* – Asset visibility and Status Monitoring through Real Time Location Systems with built-in Server to Asset communication link.

## Certification

The nanoLOC AVR Module is certified for use in Europe (R&TTE), Japan (ARIB-T66), and the US (FCC).

## Pin Description



Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	DIGIO1	9	DIGIO8	23	DIGIO12	32	PWMOUT
2	DIGIO2	15	ANT	25	DIGIO13	33	VCC
3	DIGIO3	18	TX_RX	26	DIGIO14	34	RXD
4	DIGIO4	19	/RESET	27	DIGIO15	35	TXD
6	DIGIO5	20	DIGIO9	28	DIGIO16	5,10-14	GND
7	DIGIO6	21	DIGIO10	30	AIN1	16,17,24	
8	DIGIO7	22	DIGIO11	31	AIN2	29,30	

Note: SPI and JTAG pins for flashing and debugging are on the bottom side of module.

*nanoLOC AVR Module – pin description*

## nanoLOC nTRX Driver

The nanoLOC nTRX Driver's API enables the development of a wide range of applications for the nanoLOC AVR Module. Written in C code, it can be easily adapted to a wide range of microcontrollers. Sample applications are also provided with the driver.

## nanoLOC Development Kit

Quickly develop location-aware applications with this easy-to-use Development Kit based on the nanoLOC TRX Transceiver. Afterwards, go into full production using the nanoLOC AVR Module on your own custom hardware.



*nanoLOC Development Kit*

## Ordering Information

Number	Description
MN0501AVR	nanoLOC AVR Module
MN0501AVR	nanoLOC nTRX Driver Suite
KN100L	nanoLOC Development Kit

For our complete product line and to locate an authorized distributor in your area, visit [www.nanotron.com](http://www.nanotron.com).

Nanotron Technologies GmbH  
 Alt-Moabit 60 | 10555 Berlin | Germany  
 Phone +49 30 399 954 - 0 | Fax +49 30 399 954 - 188  
 E-mail [sales@nanotron.com](mailto:sales@nanotron.com) | Web [www.nanotron.com](http://www.nanotron.com)