



AVNET[®] SILICA



TD next Sigfox[™]
certified RF
Modules

MODULES, EVALUATION BOARDS
AND SOFTWARE DEVELOPMENT KITS

Getting started with TD next SIGFOX™ certified modules

TD next has the world's leading Sub Ghz transmitter and receiver radio modules designed uniquely for use on the SIGFOX™ network. The SIGFOX network is the first and only company providing global cellular connectivity for the Internet of Things. Its infrastructure is completely independent of existing networks, such as telecommunications networks. The SIGFOX network will power the IoT with the simplest communication solutions. The network offers lowest costs and ultra-low subscriptions, simple to integrate technology and a free-to-use protocol. Thereby extending battery life and optimizing communications tailored for the IoT radically lower energy consumption.

TD next modules have a combination of a powerful radio transceiver and a state-of-the-art ARM Cortex-M3 baseband processor achieves extremely high performance while maintaining ultra-low active and standby current consumption. The TD modules offer an outstanding RF sensitivity of – 126 dBm while providing an exceptional output power of up to +14 dBm with unmatched TX efficiency. The TD devices versatility provides the gateway function from a local Narrow Band ISM network to the long-distance Ultra Narrow Band SIGFOX network at no additional cost. Detailed here is the table of products and a breakdown of the specific features and benefits in the next pages.

Product Overview

Module	SIGFOX certified	Kit SDK	GPS + 3D accelerometer	Integrated antennas TD1207R
TD1207R 	•			
TD1208R 	•	•		
TD1508 (US) 	•	•		
TD1204 	•	•	•	
TD1205P 	•	•	•	•

TD1207R/08R

HIGH-PERFORMANCE, LOW-CURRENT SIGFOX GATEWAYS

TD1207R/08R devices are high performance, low current SIGFOX gateways. The combination of a powerful radio transceiver and a state-of-the-art ARM Cortex-M3 baseband processor achieves extremely high performance while maintaining ultra-low active and standby current consumption.

The TD1207R/08R device offers an outstanding RF sensitivity of -126 dBm while providing an exceptional output power of up to $+16$ dBm with unmatched TX efficiency. The TD1207R/08R device versatility provides the gateway function from a local Narrow Band ISM network to the long-distance Ultra Narrow Band SIGFOX network at no additional cost.

The broad range of analog and digital interfaces available in the TD1207R/08R module allows any application to interconnect easily to the SIGFOX network. The LVTTL low-energy UART, the I2C bus, the multiple timers with pulse count input/PWM output capabilities, the high-resolution/high-speed ADC and DAC, along with the numerous GPIOs can control any kind of external sensors or activators. Featuring an AES encryption engine and a DMA controller, the powerful 32-bit ARM Cortex-M3 baseband processor can implement highly complex and secure protocols in an efficient environmental and very low consumption way.

Key Features

- 145 dB maximum link budget
- (G)FSK, 4(G)FSK, OOK modulation
- Receive sensitivity: -126 dBm
- $+16$ dBm maximum output power
- Frequency range: ISM 868 MHz
- Low active radio power consumption (3.3 V)
- 5 mA Tx @ $+16$ dBm
- LGA25 (25.4 × 12.7 × 3.81mm) Land Grid Array package with castellated pads

Applications

- Sensor network
- Health monitors
- Remote control
- Home security and alarm
- Telemetry
- Industrial control



TD1508

HIGH-END FCC CERTIFIED MODULE FOR EMBEDDED APPLICATIONS

TD1508 devices are high performance, low current SIGFOX gateways. The combination of a powerful radio transceiver and a state-of-the-art ARM Cortex-M3 baseband processor achieves extremely high performance while maintaining ultra-low active and standby current consumption.

The TD1508 device offers an outstanding RF sensitivity of -127 dBm while providing an exceptional output power of up to +23 dBm with unmatched TX efficiency. The TD1508 device versatility provides the gateway function from a local Narrow Band ISM network to the long-distance Ultra Narrow Band SIGFOX network at no additional cost.

The broad range of analog and digital interfaces available in the TD1508 module allows any application to interconnect easily to the SIGFOX network. The LVTTTL low-energy UART, the I2C and SPI buses, the multiple timers with pulse count input/quadrature decoding/PWM output capabilities, the high-resolution/high-speed ADC and DAC, along with the numerous GPIOs can control any kind of external sensors or activators.

Key Features

- Frequency range: ITU region 2 ISM band (Americas, 902~928 MHz)
- Receive sensitivity: -127 dBm
- Modulation
 - (G)FSK, 4(G)FSK
 - OOK
- Max output power
 - +25 dBm
- Low active radio power consumption
 - 21 mA RX
 - 230 mA Tx @ +23 dBm
- Power supply: 2.3 to 3.6 V
- LGA25 (25.4×12.7×3.81 mm, 1"×0.5"×0.15") land grid array package

Applications

- Sensor network
- Health monitors
- Remote control
- Home security and alarm
- Telemetry
- Industrial control



TD1204

THE HIGH-END MODULE FOR GEOLOCATION

TD next's TD1204 devices are high performance, low current SIGFOX gateways, RF transceiver and GPS receiver. The combination of a powerful radio transceiver, a state-of-the-art receiver achieves extremely high performance while maintaining ultra-low active and standby current consumption.

The TD1204 device offers an outstanding RF sensitivity of -126 dBm while providing an exceptional output power of up to $+14$ dBm. The TD1204 device versatility provides the gateway function from a local Narrow Band ISM network to the long-distance Ultra Narrow Band SIGFOX network at no additional cost.

Moreover the fully integrated on-board GPS receiver combines outstanding sensitivity with ultra-low power which allows you to achieve excellent accuracy and Time-To-First-Fix performance.

Key Features

- Frequency range: ISM 868 MHz
- Receive sensitivity: -126 dBm
- Modulation
 - (G)FSK, 4(G)FSK, OOK
- Max output power
 - $+14$ dBm
- Low active radio power consumption
 - $22 \mu\text{A}$ RX (windowed mode)
 - 37 mA Tx @ $+10$ dBm

Applications

- SIGFOX transceiver (fully certified)
- Geolocation and tracking
- Universal timing and synchronization
- Sensor network
- Health monitors
- Home security and alarm
- Industrial control
- Remote control
- Vehicles and objects tracking
- People and pets geolocation



TD1205P

HIGH-END MODULE FOR A FASTER AND EASIER GEOLOCATION

TD next's TD1205P devices are high performance, low current SIGFOX gateways, RF transceiver and GPS receiver with integrated antennas. The combination of a powerful radio transceiver, a state-of-the-art receiver achieves extremely high performance while maintaining ultra-low active and standby current consumption.

The TD1205P device offers an outstanding RF sensitivity of -126 dBm while providing an exceptional power radiated from integrated antenna of up to $+14$ dBm. The TD1205P device versatility provides the gateway function from a local Narrow Band ISM network to the long-distance Ultra Narrow Band SIGFOX network at no additional cost.

Moreover the fully integrated on-board GPS receiver combines outstanding sensitivity with ultra-low power which allows you to achieve excellent accuracy and Time-To-First-Fix performance. The TD1205P also embeds an ultra-low power 3D accelerometer with motion and free fall detection to further extend application range.

Key Features

- Frequency range: ISM 868 MHz
- Receive sensitivity: -126 dBm
- Modulation
 - (G)FSK, 4(G)FSK, OOK
- Max output power
- $+16$ dBm
- Low active radio power consumption
 - 20 μ A RX (windowed mode)
 - 50 mA Tx @ $+16$ dBm
- Hall effect sensor

Applications

- SIGFOX transceiver (fully certified)
- Geolocation and tracking
- Universal timing and synchronization
- People and pets geolocation
- Sensor network



Evaluation Boards

TD next Evaluation Boards (EVB's) are the easiest and fastest way to test the SIGFOX network and to become familiar with their modules.

The **LGA25 EVB** is available for the following modules: TD1207R, TD1208R and TD1508. It provides access to the different TD next LGA25 module interfaces, USB connectivity using a standard FTDI LVTTTL RS232 USB cable, and development flashing/debugging facility using the standard ARM SWD debug interface, as well as an integrated regulated power supply. The LGA25 EVB can be powered from USB or from the dedicated power pins on the available headers, with the capability to measure the current consumption of the target TD next LGA25 module.

The LGA25 EVB is delivered in a box containing:

- A TTL-232R-3V3 FTDI USB to TTL serial cable (3.3 V) - 1.8 m
- The LGA25 EVB Evaluation Board itself
- Antenna

The **TD1204 EVB** provides a rich development platform for the TD next TD1204 SIGFOX gateway module. It provides access to the different TD1204 SIGFOX gateway module interfaces, USB connectivity using a standard FTDI LVTTTL RS232 USB cable, and development flashing/debugging facility using the standard ARM SWD debug interface, as well as an integrated regulated power supply.

The TD1204 EVB can be powered from USB or from the dedicated power pins on the available headers, with the capability to measure the current consumption of the target TD1204 module. It is delivered in a box containing:

- A TTL-232R-3V3 FTDI USB to TTL serial cable (3.3 V) - 1.8 m
- The TD1204 EVB Evaluation Board itself
- An active GPS antenna
- A 20 cm 868 MHz-Band Swivel antenna

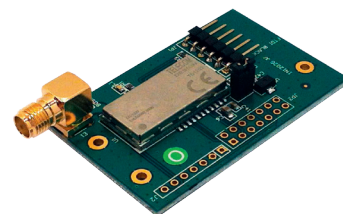
SOFTWARE DEVELOPMENT KIT

Embed your own application into the TD12XX thanks to the ARM Cortex-M3 processor: Have one single MCU unit in your IoT device, strongly reduce power consumption and reduce your bill of material cost.

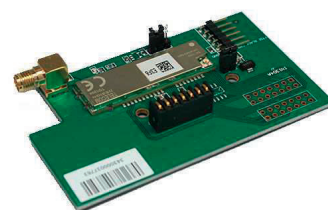
The TD12xx modules are powered by an ARM Cortex-M3 MCU with roughly 80 kB of free flash, more than enough to embed many M2M and IoT applications. The SDK runs on TD12xx EVB's through a Silabs STK3300 card used as a JTAG adapter.

A complete toolchain and IDE (Integrated Development Environment) based on Eclipse is provided free of charge. Software resources and documentations required to program your own application into the TD next module are provided in order to enable access to all embedded ARM Cortex-M3 microcontroller, GPIOs, I2C bus, timers with full access to the TD next libraries.

Learn more at avnet-silica.com/tdnext, <http://rfmodules.td-next.com/sdk>



TD1207R, TD1208R and TD1508



TD1204

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