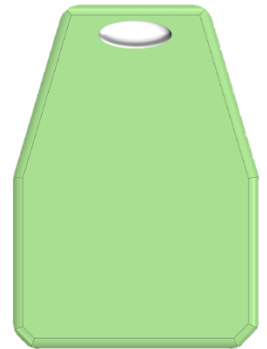


# ISP1580

## Miniature Bluetooth Low Energy Beacon

This miniature BLE Beacon, 24 x 35 x 8.0 mm, is based on the ultra-low power nRF52832 Chip. Insight SiP engineered the best in class Hardware and Software optimized solution to provide up to several years beacon advertising in a very inexpensive design.



### Key Features

- 2.4GHz Ultra Low Power RF Transceiver
- Bluetooth 5 Ready stack
- Fully integrated RF matching and Antenna
- Integrated 32 MHz & 32kHz Clock
- DC/DC converter with loading circuit
- Based on Nordic Semiconductor nRF52832
- 32-bit ARM Cortex M4 CPU
- Coin cell battery CR2032
- Very small size 24 x 35 x 8.0 mm
- Temperature -40 to +85 °C



### Applications

- Marketing or retail applications
- Location system
- Private network information
- Find me devices
- Healthcare
- Beacon technologies in Education



### Certifications

- Bluetooth SIG certified
- Fully CE certified module
- Fully FCC certified module
- Fully IC certified module
- Fully IMOC certified module
- Fully TELEC certified module

## Preliminary data sheet

### 1. Block Diagram

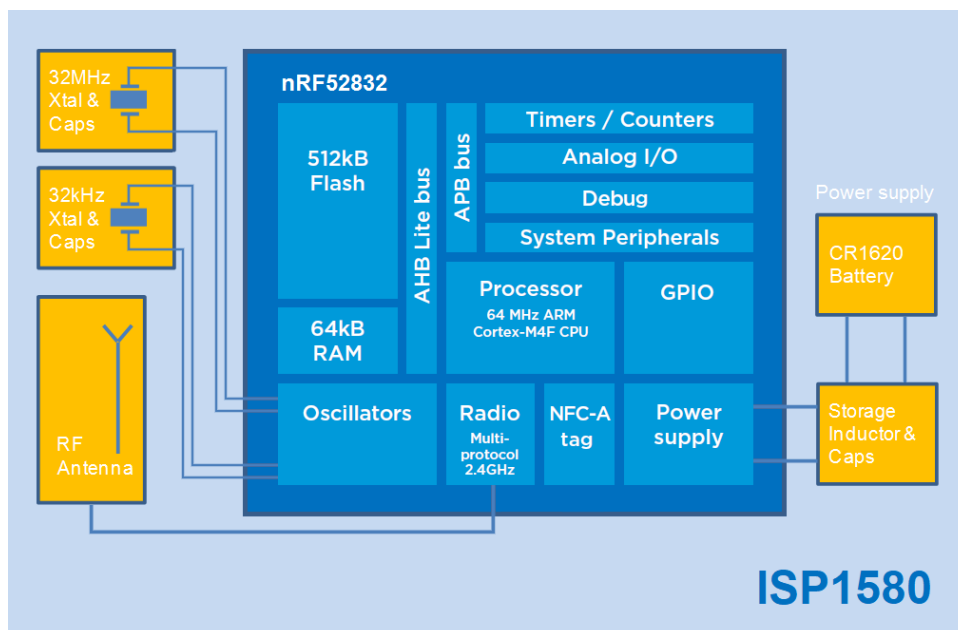
ISP1580 is an autonomous low-power device for beacon advertising. The complete device makes use of an Insight SiP ISP1507 BLE module integrating a low power host processor and a small primary button cell battery CR2032. Overall size of the device is 24 x 35 x 8.0 mm.

It has been developed to explore the full range of development possibilities for beacons using Bluetooth Smart technology. They allow indoor positioning, letting your phone know that you are in range of a beacon. As the “beacon” name suggests, they transmit packets of data in regular intervals, and this data can be then picked up by devices like smartphones

Ultra-low power consumption and advanced power management enables battery lifetimes up to several years on a coin cell battery.

For power consumption optimization, the ISP1580 beacon integrates decoupling capacitors, 16 MHz and 32 kHz crystals, load capacitors, DC-DC converter, RF matching circuit and antenna in addition to the wireless SoC. The host processor that handles the autonomous sensor application, the high-level portion of the BLE protocol stack is a low power 32-bit MCU (ARM Cortex-M4 based), integrating 512 kB flash memory and 64kB SRAM.

Insight SiP provides an application on App Store and Google Play in order to set the different parameters of the beacon, namely the UUID, the Major and the Minor, the output power and the connection interval.



## Preliminary data sheet

### 2. Specifications

#### 2.1. Temperature Range

Parameter	Min	Typ	Max	Unit
Storage Temperature	-40		+125	°C
Extended Industrial Operating Temperature Range	-40	+25	+85	°C

#### 2.2. Power Consumption

Parameter	Min	Typ	Max	Unit
Peak current, Receiver 1 Mbps, 3V + DCDC		6.5		mA
Peak current, Transmitter -40 dBm, 3V + DCDC		4.1		mA
Peak current, Transmitter 0 dBm, 3V + DCDC		7.1		mA

#### 2.3. Battery Lifetime

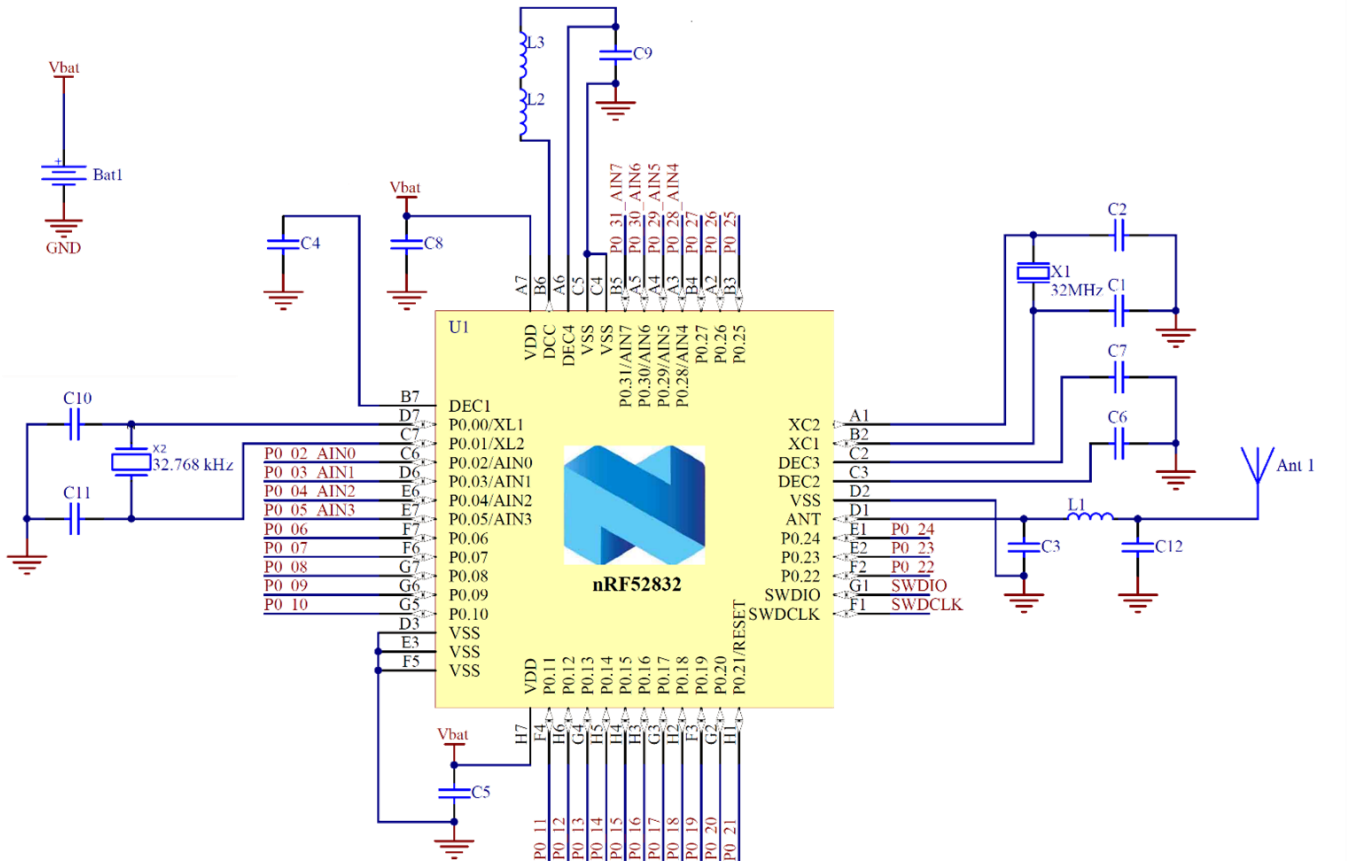
The measured total average current consumption and autonomy of the ISP1580 is shown hereunder for several connection intervals. The beacon is supplied by a CR2032 which is given for 225 mAh.

Parameter	Typical Average Current ( $\mu$ A)	Typical Autonomy on CR2032 (year)
100 ms Connection Interval, 0 dBm Output Power	132	0.2
400 ms Connection Interval, 0 dBm Output Power	34.1	0.8
1000 ms Connection Interval, 0 dBm Output Power	14.6	1.8
3300 ms Connection Interval, 0 dBm Output Power	5.5	4.5

#### 2.4. Radio Specifications

Parameter	Min	Typ	Max	Unit
Frequency Range	2402		2480	Mhz
Channel 0 to 39 Spacing		2		Mhz
Output Power Channels 0 to 39	-20		+4	dBm
Rx sensitivity Level for BER <0,1% ideal Tx	-96			dBm
Antenna Gain		0.6		dBi

### 2.5. Electrical Schematic



## Preliminary data sheet

### 3. Mechanical Outlines

