EM MICROELECTRONIC

SWATCH GROUP ELECTRONIC SYSTEMS

CZECH TECHNICAL UNIVERSITY IN PRAGUE

EM9201 and EM6819 Based Reference Design for 2.45 ISM Band Low Power Wireless Network

This reference design utilizes the fully integrated, low power 2.45GHz transceiver **EM9201** and the low power microcontroller **EM6819** to create a low cost wireless network optimized for prolonged battery lifetime of the peripheral nodes. The network has a star topology, with the central node represented by a PC with a USB dongle, and up to 6 peripheral nodes powered by a CR2032 battery. The design comes with a purpose developed communication stack that was optimized to minimize the current consumption on the peripheral nodes. The communication protocol features frequency hopping, and connection oriented and connectionless data transfer. The parameters of individual connections can be optimized with great variability to achieve the optimal tradeoff between the data rate and current consumption. The reference design also comes with a demonstration application that illustrates basic network operations, and provides tools for visualization of measured data.

Parameters:

Parameter	*Value*	*Note*
Range	>100m	free space
Battery lifetime	up to 5 years	minimal data rate
Number of peripheral nodes	6	may be increased in near future
Maximal data rate	60kbps	

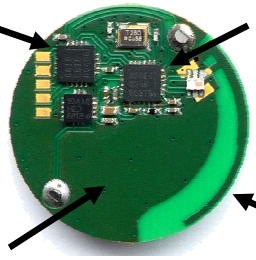
Typical applications:

- Remote sensing in general
- Wireless mouse, keyboard etc.
- Wireless sensors in watches
- Wireless sports equipment
- Alarm and security systems

Peripheral Node

EM6819 - an MCU designed to be battery operated for extended lifetime applications

EM9201 - fully integrated, low power 2.45GHz transceiver



PCB area available for **user hardware**

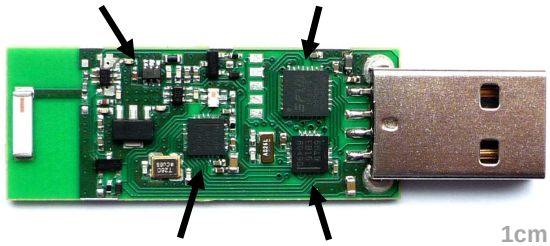
Printed antenna designed for 2.45GHz ISM band

1cm

USB Dongle

LNA and PA Block

USB Interface



EM9201

EM6819

1cm

Demonstration Application

Illustrates basic network operations and provides data visualization tools.