

IronIC Patch: A Wearable Device for the Remote Powering and Connectivity of Implantable Systems

Jacopo Olivo, Sandro Carrara, and Giovanni De Micheli

Integrated Systems Laboratory - EPFL

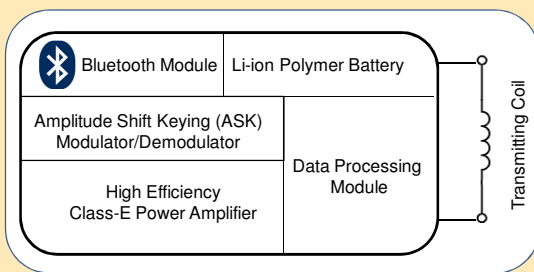


Target



- Remote powering through inductive link
- Short-range communication with the sensor
- Long-range communication with smartphone
- Possibility to place it directly over the sensors
- Completely stand-alone, no wires are needed
- Battery powered

IronIC Patch ^[1]

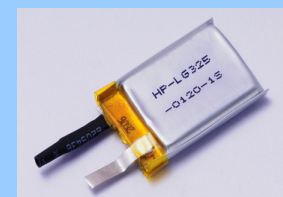


Performance ^[1]



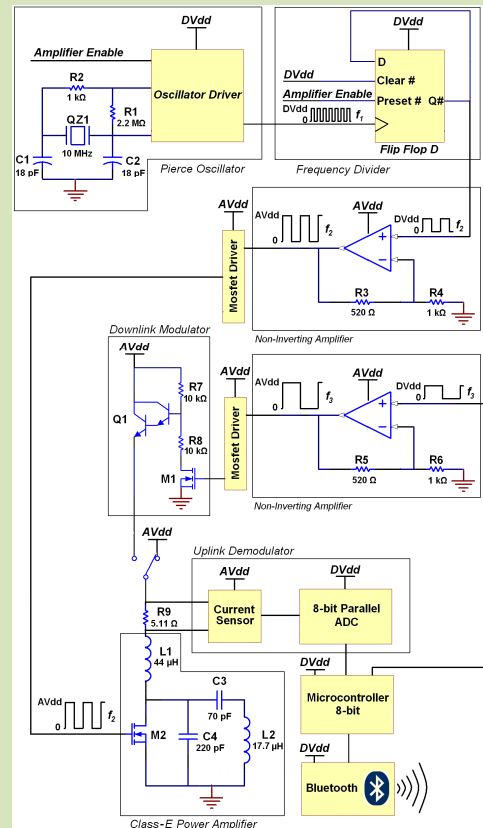
- 15 mW transmitted within 6 mm in air
- Downlink up to 100 kbps with ASK
- Uplink up to 66.6 kbps with LSK
- Bluetooth communication (Class-2)
- 1.17mW transmitted over 17mm of bovine tissue

Autonomy ^[1]

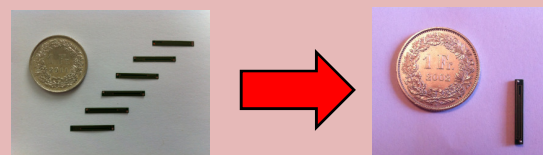
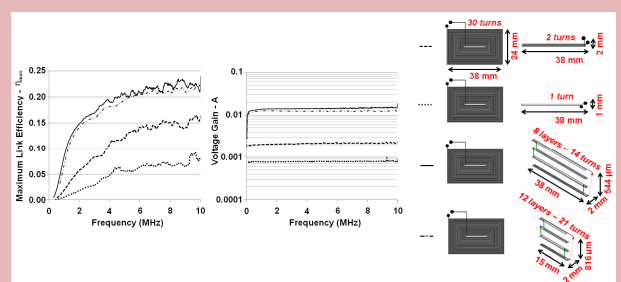


- Stand-by mode: 10 hours
- Power mode: 1.5 hours
- Voltage: 3.7V
- Weight: 3.7g
- Size: 30.6 x 20.2 x 3.6 mm³
- Capacity: 120 mAh
- Max. discharge: 3A
- Max. charge: 0.6A

Schematic ^[1]



Multilayer Inductors ^[2]



References

- [1] J.Olivo, S.Carrara, and G. De Micheli, "IronIC Patch: A Wearable Device for the Remote Powering and Connectivity of Implantable Systems," IEEE I2MTC 2012, (In press).
- [2] J.Olivo, S.Carrara, and G. De Micheli, "Multi-Layer Implantable Inductors for Remote Powering of Subcutaneous Biosensors," submitted to the IEEE Transaction on Biomedical Circuits and Systems.