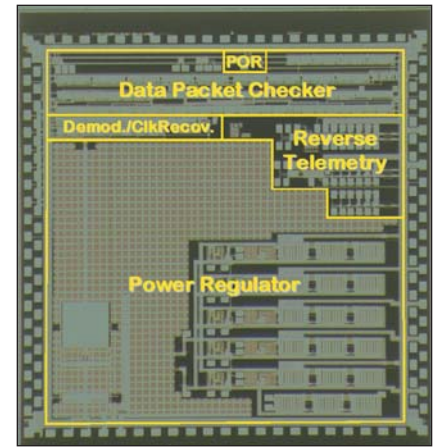


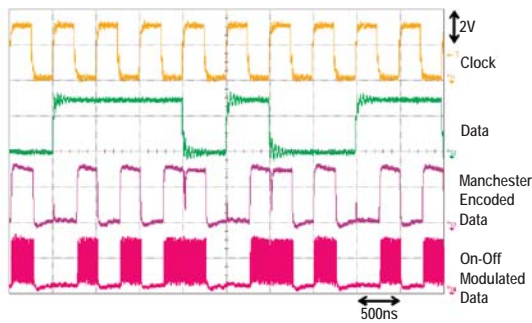
# An Interface Chip for Power and Bidirectional Data Telemetry in an Implantable Cochlear Microsystem

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A wireless interface chip has been designed and fabricated for a cochlear implant that receives power, data, and clock through an inductive link and in turn transmits neural-response and position information prepared by the system to the external setup. The forward telemetry front-end of the chip is composed of a multi-output power regulator, wideband frequency shift keying (FSK) data demodulator, and clock recovery circuit. The reverse telemetry back-end consists of a Manchester encoder, an on-off keying modulator, and an antenna driver. A data packet checker is also employed to check the format and contents (parity) of the received data. A power-on reset block is also considered on the chip, which generates a short reset pulse upon the establishment of the power supplies. Carrier frequency for the forward telemetry link is 8MHz, and the data can be transferred at a rate of up to 2Mbps. The reverse telemetry link has a programmable carrier frequency adjustable within the range of 80MHz–190MHz. Bit rate for the outgoing data is 2Mbps also. The chip has been fabricated in 1.5 $\mu$ m CMOS technology and measures 4.6mm x 4.6mm. ■



Six components of the chip.



Samples of experimental results.

