Electronic Supplementary Material (ESI) for Lab on a Chip

Supplementary Material: Miniature Magnetic Resonance System for Point-of-Care Diagnostics

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Figure Captions

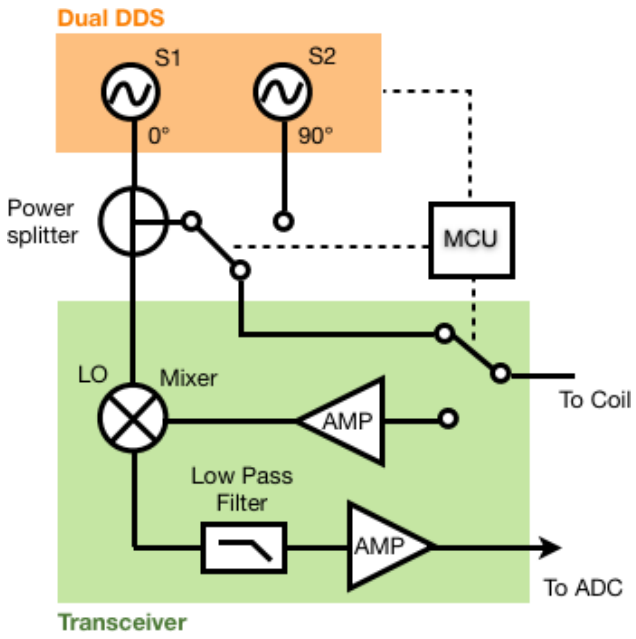

Figure S1. Schematic for the radio frequency (RF) transceiver. The transceiver board receives RF signals from the dual direct digital synthesis (DDS) chips. These RF signals (S1 and S2) have a phase offset of 0° and 90°, respectively. In CPMG measurements, S1 is used for $\pi/2$ pulses and S2 for πpulses. S1 is also divided by a power splitter (XFMR_ADT1.5-1; Mini Circuits) to provide a local oscillator (LO) input to a mixer (ADE-6; Mini Circuits). RF carriers are pulsed to the NMR coil through switches (ADG1419BRMZ; Analog Devices) that are gated by the microcontroller unit (MCU). The RF frequencies and the pulse durations are controlled by the MCU as well. The NMR signal induced in the coil is amplified by a low noise amplifier (AD604AR; Analog Devices), and is sent to the mixer for frequency down-conversion (from 20 MHz to 3 kHz). The down-converted signal is further conditioned by a low pass filter and a low noise amplifier (AD604AR). The signal is finally sent via a coaxial cable to the analog to digital conversion (ADC) board.