

# Operational Description

## PowerTouch 1500-TP Transponder

The nominal operating frequency of the transponder is 433.92 MHz. The frequency determining element is quartz crystal Y1 which operates at 13.56 MHz. The crystal frequency is multiplied by a factor of 32 using a phase-locked loop to produce the output frequency.

Whenever a button is pressed, or a wake-up pattern is detected on the low-frequency (125 kHz) transponder coil input, MCU U1 produces Manchester encoded data pulses. Data packets consist of a preamble, a header, a start bit, 69 data bits, and a stop bit. The minimum time between pulse transitions is nominally 200  $\mu$ s.

The transmitter section consists of IC U2. Input pulses on the DATA pin (U2-6) activate the transmitter and amplitude modulate its output using On-Off Keying (OOK). The transmitter IC powers down approximately 5 ms after the last pulse transition.

Transmitter output PAOUT (U2-4) is biased through inductor L1 and resistor R1 which are bypassed by C6. R1 limits the available drive current to the transmitter output stage, thereby providing a means to control the output power.

The RF output is lowpass filtered by a pi-filter consisting of C8, L2, and C9. The circuit board printed wire antenna is connected to the output of the pi-filter.

The transmitter is powered by one 3V lithium coin cell.

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2009-03-17

