DataSeal-125 circuit description

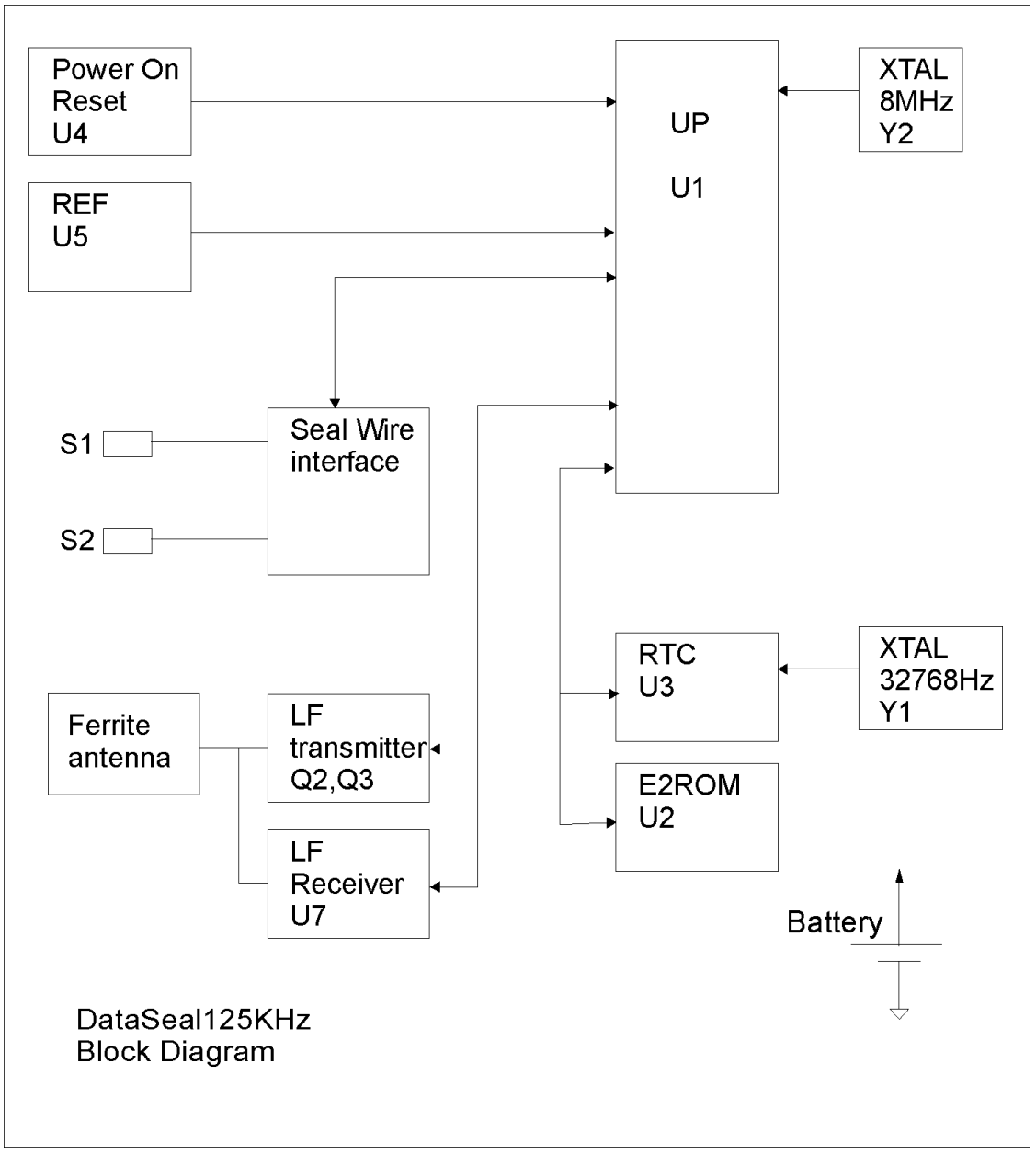
1. Reference documents
   1.1. Board circuit diagram, document number 47A10050

2. General description
   2.1. The DataSeal is used to seal assets during storage or shipment. If the seal wire is opened or tampered, the seal records an event and reports to the interrogator (Hand Held Terminal).
   2.2. The DataSeal is a stand-alone unit. It is battery operated, it has LF receiver, transmitter and ìP which controlled the DataSeal125 operation.
   2.3. The Low Frequency (LF) channel is 125KHz carrier with OOK modulated data.

3. Functional description
   3.1. The DataSeal125 performs seal wire test and integrity test of its stored data. The LF receiver is always opened for data.

4. Circuit description.

4.1. Block Diagram



4.2. **ìP** (U1 Pg.2) : PIC18LC252 ìP timed by a 8MHz ceramic resonator (Y2 Pg.2).

4.3. **POR** (U4 Pg.2) : Power on and low voltage reset.

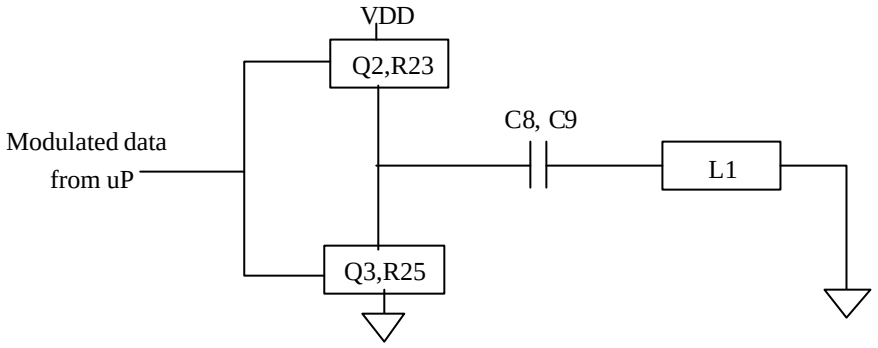
4.4. **REF** (U5 Pg. 2) : ìP A/D reference.

4.5. **Seal wire Interface** (Q1 Pg.2) : A small current flows to the seal wire via R14. If the seal wire opens, an interrupt is generated in U1(26). The µP measures seal wire resistance by opening Q1 and measuring voltage in U1(5). D1 is surge protector.

4.6. **RTC** (U3 Pg.2): Real time clock IC with 32768Hz crystal used as calendar IC. It is serially connected to the µP.

4.7. **E²ROM:** (U2 Pg.2): Serial E²ROM stores unit parameters and data.

4.8. **LF Transmitter** (Q2,Q3 Pg.3): OOK modulated data comes from the µP to the driver transistors Q2,Q3 which drives a ferrite antenna (L1 Pg.2). Q4,Q5 are optional and not populated.



4.9. **LF Receiver** (R26 to U6 Pg.3) : Data received in the ferrite antenna, is chopped by D5, then clamped by D2,D4 and Q4. Data then rectified by D3 and demodulated by U6.

4.10. **Battery** (BT1 Pg.2) : 3.6V Lithium battery, TL4986 by TADIRAN.