

### **“High temperature RFID system using passive SAWtransponders”**

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**Abstract** – The paper exemplifies the development of a RFID system using surface acoustic wave (SAW) technology. The suitability of the substrate materials lithium niobate, langasite and gallium orthophosphate has been investigated. The SAW design, the metallisation, the packaging and the assembly of a high temperature tag are discussed. Lifetime tests of the tags at 300°C and 350°C have been performed. The architecture of the developed frequency stepped continuous wave (FSCW) reader, operating in the 2.45 GHz ISM band, is described. The readout distance was measured for different antenna configurations and as a function of temperature. Gamma ray tests have been performed to demonstrate the usability of the tags in environments exposed to strong radiations like in sterilization chambers for surgery instruments or food.