

The Evolution of a Clinical Grade Wearable Vital Signs Monitor and the Role of Advanced Microelectronic Packaging Techniques to Increase Functionality

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Abstract

Wearable devices are being used monitor a number of vital signs, such as steps, Heart rate or Energy expenditure. While these consumer targeted devices have become popular, more advanced devices are being developed and introduced that add Sleep, Stress, Blood oxygenation, Respiratory rate, Heart rate variability, Blood pulse wave, Cutaneous water / sweat and Blood glucose dynamics to the suite of monitoring parameters.

Smaller more lightweight but robust devices are viewed as less intimidating and desirable to the patient. On the other hand, practitioners such as Doctors and care givers perceive smaller devices as being more advanced technically, especially when combined with more functionality. Thus smaller more diagnostically meaningful devices are expected to increase adoption amongst healthcare professionals and their patients.

This presentation will discuss a revolutionary clinical grade vital sign monitor used for tracking Steps and Motion, Skin temperature, Heart rate, Heart rate variability, Inter-beat intervals, Blood oxygenation, Skin blood perfusion and various Scores. The methods used in the design approach to determine the optimum way to achieve the size and increased functionality requirements will be discussed as will be the microelectronic manufacturing techniques that have been and will be employed to achieve the full functionality of the device as envisioned. Further, the medical device requirements that also dictated implementation of certain functionality and technical setups will also be discussed.