OSRAM
Opto Semiconductors

Precise heart rate measurements

Osram adds new generation of sensors to BioFy family

Type: Spotlight - 17.10.2016

Osram Opto Semiconductors presents two new sensors for monitoring fitness levels. Their main benefit is the excellent signal quality for heart rate measurements, which allows the derivation of secondary measurement parameters such as blood pressure. The SFH 7072 has also been further optimized for determining the oxygen saturation of blood (SpO2). Samples for the SFH 7070 are expected end of November – for the SFH 7072 end of this year.

The SFH 7070 is a sensor specifically designed for pulse rate measurements at the wrist. It consists of two green emitters and one photodiode, the sensitivity of which is very high in the green spectrum and is greatly suppressed for infrared light. This minimizes the noise signal on the detector, which is created when ambient light penetrates the part of the body being measured and is dispersed. This effect is particularly strong for infrared wavelengths. Compared to the previous version, the SFH 7051, the arrangement of the individual components has also been optimized with regard to signal quality. The green emitters sit on both sides of the photodiode – separated by optical barriers. That way more light hits the detector and there are fewer measurement artifacts caused by the user's movements. The photodiode is almost twice the size of the one in the SFH 7051, which significantly increases the signal strength. What's more, the emitters in the new sensor produce almost four times more brightness per chip – an optical output of 11.7 milliwatts at a current of 20 milliampere for each chip. This has been achieved by larger chips and a white housing which absorbs less light.

Thanks to this, a sensor could be created which ensures excellent signal quality even at a low operating current. This makes it possible to use the measured data also for further evaluations to determine blood pressure or heart rate variability, for instance.

The new features described have also been implemented in the SFH 7072. This sensor has the same dimensions as the SFH 7070. Apart from two green emitters and one photodiode with an infrared filter, it also contains one red and one infrared emitter as well as a broadband photodiode. The distance between the three latter components was increased so that more light is reflected onto the detector. The improved signal quality of the measurements with infrared and red light simplifies the calculation of the oxygen saturation of blood (SpO_2).

Chris Goeltner is responsible for the BioFy family at Osram Opto Semiconductors. He sums up the improvements: “At Osram we have all process steps under one roof. This allows us to focus on all levels, both working on the individual components and optimizing their interaction in the integrated sensor. That way we keep our finger on the pulse for our customers – in every sense of the word.”

Technical data

	SFH 7070	**SFH 7072**
Dimensions	7.5 mm x 3.9 mm x 0.9 mm	7.5 mm x 3.9 mm x 0.9 mm
Wavelengths	530 nm	950 nm / 660nm / 530 nm
Optical output (for each green LED) at 20mA	11.7 mW	11.7 mW
Photo-sensitive area Broadband detector	n/a	0.801 mm^2
Photo-sensitive area IR-cut detector	3.46 mm^2	3.46 mm^2