An Electronic Patch for Wearable Health Monitoring by Reflectance Pulse Oximetry

We report the development of an Electronic Patch for wearable health monitoring. The Electronic Patch is a new health monitoring system incorporating biomedical sensors, microelectronics, radio frequency (RF) communication, and a battery embedded in a 3-dimensional hydrocolloid polymer. In this paper the Electronic Patch is demonstrated with a new optical biomedical sensor for reflectance pulse oximetry so that the Electronic Patch in this case can measure the pulse and the oxygen saturation. The reflectance pulse oximetry solution is based on a recently developed annular backside silicon photodiode to enable low power consumption by the light emitting components. The Electronic Patch has a disposable part of soft adhesive hydrocolloid polymer and a reusable part of hard polylaurinlactam. The disposable part contains the battery. The reusable part contains the reflectance pulse oximetry sensor and microelectronics. The reusable part is 'clicked' into the disposable part when the patch is prepared for use. The patch has a size of 88 mm by 60 mm and a thickness of 5 mm.

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