A Novel Remote Health Monitor with Replaceable Non-Fragile Bio-Probes on RFID Tag

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Abstract

Conventional bio-probes are produced on a silicon substrate, they are not only fragile but unable to dispose according to the profile of human body in a large area manner, and thus the contact resistance between probe and skin may be increased. Besides, the signal processing devices are required to improve both S/N ratio and impedance matching problems. This paper proposes a novel remote human health monitor and an active RFID tag with replaceable non-frangible probes and thin-film-transistor (TFT) amplifiers. The probes are made of bio-degradable polymer (photo resist) and covered with bio-compatible TiN. In addition, we use two pieces of double sides conducting tapes to connect both TFT amplifiers and probe modules. Thus the probe module can be replaced easily by peeling the used probe module away from the double sides conducting tapes to supply a new one. Since the tag is a flexible plastic substrate, e, g. PT, PET and PI, so the probes are easier to deploy and conform to the human body profile. In addition, the signal can be amplified by the TFT amplifier nearby to improve both S/N ratio and impedance matching. Thus the human health conditions can be remotely monitored by measuring various acupuncture impedances via the active RFID tag. The active RFID monitoring range is 15m by using 2.45 GHz ISM

band, the probe
resistance and parasitic capacitance are as 2735 Ω and 60.7 pf, respectively. Since the typical human
acupuncture point resistance is about 40-120KΩ, thus the proposed device and system can be applied.

Keyword：Active RFID Tag, Acupuncture Points, Impedance, Non-Fragile Bio-Probes