

## A Contactless Capacitive Biosensor for Muscle Activity Measurement

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**Abstract :** As elderly population grows globally, the percentage of people diagnosed with musculoskeletal disorder (MSD) increase proportionally. Electromyography (EMG) is an important biosignal that contributes to MSD's clinical diagnose and recovery process. Conventional conductive electrode has many disadvantages in the continuous EMG measurement application. This research has design a new surface EMG biosensor based on the parallel-plate capacitive coupling principle. The biosensor is developed by using a double-sided PCB with having one side of the PCB use to construct high input impedance circuitry while the other side of the copper (CU) plate function as biosignal sensing metal plate. The metal plate is insulated using kapton tape for contactless application. The result implicates that capacitive biosensor is capable to constantly capture EMG signal without having galvanic contact to human skin surface. However, there are noticeable noise couple into the measured signal. Post signal processing is needed in order to present a clean and significant EMG signal. A complete design of single ended, non-contact, high input impedance, front end EMG biosensor is presented in this paper.

**Keywords :** contactless, capacitive, biosensor, electromyography

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