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Optimized RC timing technique for accurate measurement of minute capacitance changes (Conference Paper)

Zaharudin, Z.^a [✉](#), Adam, I.^a [✉](#), Kadir, K.A.^a [✉](#), Khan, S.^b [✉](#), Nurashikin, A.^b [✉](#), Shaikh, F.A.^b, Abdalla, A.H.^b [✉](#), Malik, N.A.^b [✉](#), Morshidi, W.H.W.^b [✉](#)^aMedical, Electronics and Electrical Section, University Kuala Lumpur, Gombak, Selangor, 53100, Malaysia^bDepartment of Computer Engineering, International Islamic University of Malaysia, Gombak, Selangor, 53100, Malaysia

Abstract

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This paper presents a technique for accurate measurement of small capacitive changes. This is based on selecting the most linear part of the curve obtained by charging the capacitor undergoing changes through a known resistor value. This measurement is part of the design of a system for measuring blood glucose content non-invasively. The technique is based on measuring ultra-low low glucose levels in the blood as capacitive changes converted into RC timing constant optimized using a circuit set to trigger at an appropriate time activating a counter. The measured data is captured instant later, selecting the most linear part of the charging curve. The results so obtained are compared with the ones obtained through RC - timing standard procedure. The technique reported is with a remarkable low error of about 2.25% as against 11.78% by the standard RC - timing technique. © 2017 IEEE.

SciVal Topic Prominence [i](#)

Topic: Biosensors | Dielectric spectroscopy | Glucose

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Author keywords

[Capacitance](#) [Comparator](#) [RC timing](#)

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