

EVENT-DRIVEN COULTER COUNTER IC FOR HIGH THROUGHPUT PARTICLE COUNTING

ABSTRACT

A particle occurrence sensing circuit for microfluidic particle sensing includes a set of particle event indicators, each of which includes: a Coulter counter having a sensing electrode exposable to a fluid within a microfluidic channel and configured for providing a particle sensing signal; an input stage configured for providing an extracted particle sensing signal; and a particle event detector configured for providing a set of particle event occurrence signals. Each of the set of particle event occurrence signals indicates a sensed occurrence of a particle greater than or equal to a given reference particle size during fluid flow through the microfluidic channel to which the sensing electrode is exposed. The particle event detector includes a successive approximation (SA) analog-to-digital converter (ADC) configured for generating a plurality of reference particle size threshold values and successively comparing the extracted particle sensing signal amplitude with reference particle size threshold values.