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Lumped parameter modeling and analysis of Vibration characteristics of Smart-phone

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ABSTRACT

Slimming of a smart phone is one of the key technologies in the current smart-phone industry. Because the vibration actuator is the thickest part of a smart-phone, a slim linear vibration actuator has been developed. For the analysis of the vibration characteristic of a smart phone, experiment has been used one of the most popular techniques, but it consumes a lot of cost and time especially in manufacturing prototype for experiment. Accordingly, as an alternative to experiments, mathematical modeling and analysis can be applied because it is simple and accurate. In addition, computation iteration can be carried out for optimal design. In this paper, a mathematical modeling is created for analysis of the vibration characteristics of a smart-phone applied with a horizontally vibrating linear actuator. In addition, the result of the mathematical analysis is compared with that of the experiment for verification.

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패턴된 은 나노입자 박막을 이용한 유연 압력 센서

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ABSTRACT

In this paper, we report the flexible pressure sensor fabricated by transfer patterning method and its performances to the pressure. This transfer patterning method is simple, low-cost, and the single-step process of silver nano-inks on the structured PDMS membrane by using the PDMS membrane as both stamp and target substrate. Uniform and clear micrometer-scale silver nano-ink patterns were achieved on the PDMS membrane with good electrical properties. The flexible pressure sensor based on silver nano-inks showed good detection performance to the deformation of the PDMS membrane by pressure change with very short response/recovery times. In strain analysis, the resistance of silver nano-ink film on the PDMS membrane increased under tensile loading and almost fully recovered after unloading. Also, we measured the resistance changes of silver nano-ink film on PDMS membrane by the temperature change. The resistance was almost stable regardless of change in temperature.