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(54) **MICRO-ELECTRO-MECHANICAL SYSTEM  
DEVICE AND PIEZOELECTRIC  
COMPOSITE STACK THEREOF**

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(57) **ABSTRACT**

A micro-electro-mechanical system (MEMS) device includes a substrate having a cavity and a MEMS structure disposed over the cavity and attached to the substrate. The MEMS structure includes at least one first piezoelectric layer having a first piezoelectric coefficient and two second piezoelectric layers respectively disposed under and above the first piezoelectric layer, where each second piezoelectric layer has a second piezoelectric coefficient higher than the first piezoelectric coefficient. The MEMS structure further includes a first electrode layer and a second electrode layer sandwiching the two second piezoelectric layers.

