The Applications of Surface Acoustic Wave on Torque Sensors

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ABSTRACT

The component of Surface acoustic wave (SAW) developed in the period of integrated circuit. Following with the progress of Interdigital Transducer (IDT), it effectively reduced to plug Insertion Loss (IL). This makes the SAW not only for telecommunication kit using, also common used in detecting of the research the physics because of the piezoelectric characteristic. Firstly, the research has to understand the physical characteristic of SAW, the basic material quality of the piezoelectric materic and the relation between the distance changes of IDT and the center frequency, then design a double SAW which could be used in measure the strain of double SAW kit when the shaft body has torque by the simulate of the software. Also testing the SAW model by stain and the frequency changes, then to design the SAW torque sensor place on the twin shaft of opposite axis measured in plus or minus 45 degrees. Proceeding the ratio between the torques sensor of double SAW and strain gage. Finally, according to the exterior control sweep the part of pin control to replace the sign of SAW sensor measure from the network analysis instrument, and testing the difference of signal deliver by wired and wireless. It would become the beginning of design development for the SAW torque sensor module in the wireless future.

Keywords : Surface Acoustic Wave, Torque sensor

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