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# **Closed-Form Admittance Calculation for Periodic SAW Transducers**

## **Outline**

### **1. Nodal Admittance Matrix of Periodic SAW Transducer**

- 1.1. Definition of the transducer admittance matrix
- 1.2. Modeling assumptions (quasi-static approximation)
- 1.3. Elemental nodal admittance
- 1.4. Self- and mutual nodal admittance
- 1.5. Properties of the admittance matrix

### **2. Admittance of Unapodized SAW Transducers**

- 2.1. Admittance calculation in terms of finger potentials
  - 2.1.1. Nodal admittance matrix
  - 2.1.2. Total admittance
- 2.2. Admittance calculation in terms of gap voltages
  - 2.2.1. Nodal admittance matrix
  - 2.2.2. Total admittance
- 2.3. Contribution of guard fingers
- 2.4. Particular cases
- 2.5. Example of the admittance calculation and experimental results

### **3. Admittance of Apodized SAW Transducers**

- 3.1. Admittance calculation in terms of finger taps
- 3.2. Admittance calculation in terms of gap (overlap) taps
- 3.3. Weighting of the Elemental Admittances

### **4. Computational Implementation of the Algorithm**

### **5. Calculation Example and Experimental Results**

### **6. Conclusions**