Development of High Power-durable Electrodes with Multi-layered structure by aging treatment and Passivation layer for The power durability of Al-0.5wt% electrodes in 800MHz-band interdigital transducer surface acoustic wave (IDT SAW) antenna duplexer was investigated with Al-Cu thin film electrodes by Cu atom segregation and passivation layer deposited by atomic layer deposition (ALD) through accelerated time-to-failure(TF) tests in relation to grain sizes and mechanical strength, resistivity then the multi-4layer (Al-0.5wt%Cu/Ti/Al-0.5wt%Cu/Ti) electrode structure was applicated. The power durability of an Al-Cu thin film electrode by Cu atom segregation showed more longer lifetime than that of non aging electrode at an input power level of 31dbm. The passivation layer effect on the power durability were examined by using Al_2O_3, thin film layers which have good step coverage. The 300Å thin Al_2O_3 layer suppressed the migration of aluminum and prevented form shorting out IDT electrodes effectively. From the Arrhenius plot, the lifetime of Al_2O_3 passivated electrode could be predicted more than 50,000 hours at an input power level of 31 dBm and at room temperature.

SAW antenna duplexer Applications