Avago AFEM8030 - FBAR BAW Mid-Band Filter - Complete Tear-Down Analysis

Description: After a first introduction of Avago's power amplifier in the iPhone 4S and an integration in iPhone 5 series, Apple integrates again Avago's LTE Mid Band Front-End Module in the iPhone 6s series.

With the acquisition of Broadcom (Apple's Wifi FEM first suppliers), Avago becomes a top competitor in wireless communication thanks to its FBAR BAW filter knowledge.

Located on the main board of the smartphone, the Front-End Module of the Apple iPhone 6s Plus for mid-band LTE application is a complete Front-End Module. The component is made with several filter dies, assembled on a coreless PCB substrate.

The filters are hermetically wafer-level packaged with Avago's Microcap bonded-wafer CSP technology allowing the assembly of all components of the Front-End Module on the same chip with an area of less than 35 mm².

TSVs are etched in the cap two times in order to report electrical contacts. Also specific milling steps in FBAR fabrication give control of the AlN thickness.

Thanks to its design and manufacturing process, Avago device is very accurate and cost effective in respect to competitors.

The report includes comparisons with the BAW filter from Qorvo, also found in the Apple iPhone 6s Plus and the evolution of Avago's BAW filters since 2013.

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