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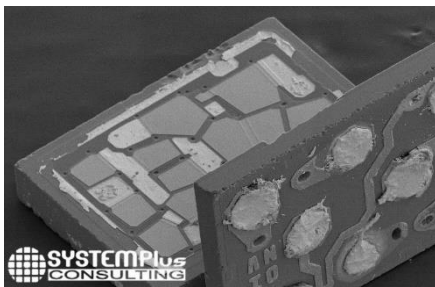
SYSTEM

POWER

## Avago AFEM-9040

# Avago's New Generation Front-End Module

*Avago has introduced a new generation of film bulk acoustic resonator (FBAR-BAW) technology in the Samsung Galaxy S7*



In the front-end filter market Broadcom, which was formerly Avago Technologies, shares the leadership with Qorvo. The company has forged its empire on selling its technology to smartphone industry giants like Apple or Samsung. Samsung has integrated the latest AFEM-9040 front-end module from Avago in its new

flagship, the Galaxy S7. The module features Avago's new generation of film bulk acoustic resonator (FBAR) technology.

The front-end module is located on the main board of the smartphone, in which Samsung has proposed a different configuration of its LTE front-end part. The AFEM-9040 from Avago was found in all versions of the Galaxy S7. However, depending on the region, it shared the front-end with Qorvo, Skyworks or Murata.

The AFEM-9040 is dedicated to the LTE mid-band. It is made with several die filters, assembled on a coreless PCB substrate. The filters are still hermetically wafer-level packaged with Avago's Microcap bonded-wafer chip scale packaging (CSP) technology. Through-silicon vias (TSVs) enable electrical contacts. Compared to the previous generation, the FBAR technology features some advances in the piezoelectric material. This allows a better coupling coefficient and better performance.

The front-end module also features an active part comprising a GaAs E-pHEMT and coupling system manufactured with Avago's intellectual property, described in more detail in this report.

The report also includes complete chip and module fabrication processes overviews and cost estimation. It also compares AFEM-9040 technology with the previous generation of FBAR-BAW filter (AFEM-8030) that can be found in the Apple iPhone 6S. All the differences are highlighted and measured.

**Title:** Avago AFEM 9040 – FBAR New Generation

**Pages:** 112

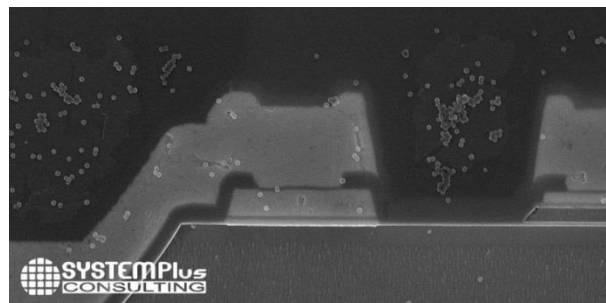
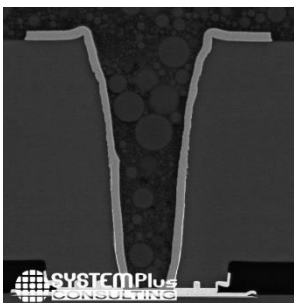
**Date:** June 2016

**Format:** PDF & Excel file

**Price:** Full report: EUR 3,290

### COMPLETE TEARDOWN WITH:

- Detailed photos
- Precise measurements
- Material analysis
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis
- Selling price estimation
- Comparison with Avago's previous generation module



# TABLE OF CONTENTS

## Overview / Introduction

## Company Profile and Supply Chain

## Samsung Galaxy S7 Teardown

## Physical Analysis

- Physical Analysis Methodology
- Front-End Module Package
  - ✓ Module Views & Dimensions
  - ✓ Module Cross-Section
  - ✓ Module Dies
- Power Amplifier
  - ✓ Die Views & Dimensions
  - ✓ Power Amplifier Die Details
  - ✓ Power Amplifier Die Cross-Section
- SPDT Switch
  - ✓ SPDT Switch Die Views & Dimensions
  - ✓ SPDT Switch Die Details
  - ✓ SPDT Switch Die Cross-Section
- Coupler Die
  - ✓ Coupler Die Views & Dimensions
  - ✓ Coupler Die Details
  - ✓ Coupler Die Cross-Section
- FBAR BAW Filter Die
  - ✓ BAW Filter Die View & Dimensions
  - ✓ BAW Filter Die Opening
  - ✓ BAW Filter Die Cap Details
  - ✓ BAW Filter Die Resonators
  - ✓ BAW Filter Die Cross-section
  - ✓ BAW Filter Die TSVs
  - ✓ BAW Filter Die Au/Au Bonding
  - ✓ BAW Filter Die Membrane

## Manufacturing Process Flow

- Component Packaging
- MEMS FBAR Process
  - ✓ FBAR Wafer Process Flow
  - ✓ Cap Wafer Process Flow
  - ✓ Bonding and TSV Process Flow
- MEMS FBAR Fabrication Unit
- Active Chips Process
- Active Chips Fabrication Units
- FE Module Packaging Process
- FE Module Packaging Unit

## Cost Analysis

- FBAR BAW Filter Wafer Front-End Cost
- FBAR BAW Filter Wafer Front-End Cost per Process Steps
- FBAR BAW Filter Probe Test and Dicing Cost
- FBAR BAW Filter Die Cost
- Active Devices Wafer Front-End Cost
- Actives Dies Cost
- FE Module Package Cost
- FE Module Cost
- Estimated Manufacturer Price

## Technology and Cost Comparison with Previous Generation of Mid Band Front-End Module



**Author:**  
Stéphane Elisabeth

Stéphane has a deep knowledge of materials characterizations and electronics systems. He holds an Engineering Degree in Electronics and Numerical Technology, and a PhD in Materials for Microelectronics.



**Author (Lab):**  
Yvon Le Goff

Yvon Le Goff has joined System Plus Consulting in 2011, in order to set up the laboratory of System Plus Consulting. He previously worked during 25 years in Atmel Nantes Technological Analysis Laboratory as fab support in physical analysis, and 3 years at Hirex Engineering in Toulouse, in a DPA lab.

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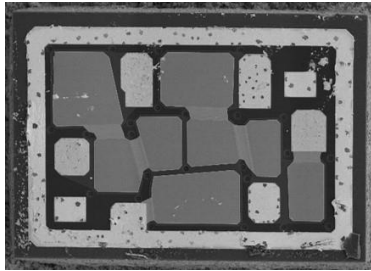
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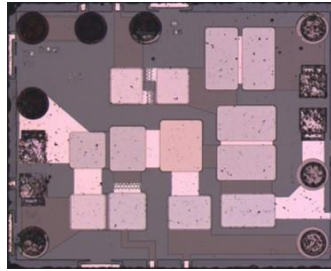
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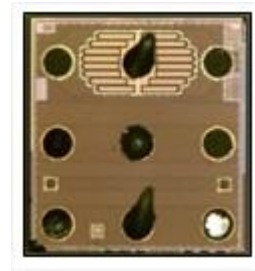
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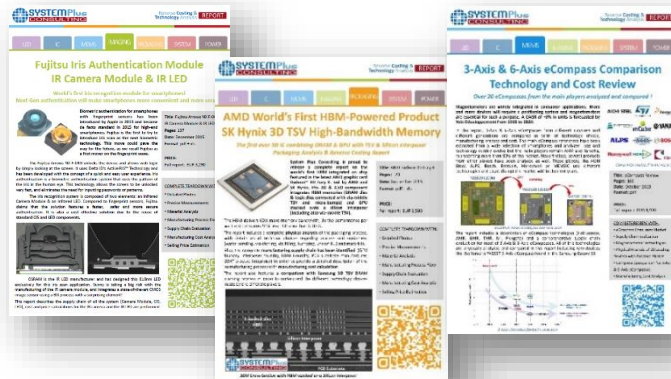
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