

SAMSUNG

RF Front-End Module Comparison 2021 – Volume 3 - Focus on Samsung

Evolutionary technical and cost comparison between the radio frequency front-end module technologies integrated in Samsung's 2019-2021 smartphone series.

Last year, System Plus Consulting opened up hundreds of front-end modules (FEMs) and components in select flagship smartphones to provide an overview of the radio frequency (RF) FEM market. Gathering this information into four reports, ranging from player's evolution to a world area analysis, offered an opportunity for tracking the evolution of this technology market.

This year, System Plus Consulting again offers different volumes of technical and cost comparisons for smartphone RFFEMs. Each report focuses on a specific subject: it can be a player's evolution, a specific technology, or a comparison of flagship devices.

This third volume provides insights into technology and cost data for FEMs and several components found in the Samsung Galaxy S21 series in 2021. Included is a comprehensive overview of the RFFEM architectures on the market, comparing available smartphones from each company – with a focus on Samsung. Component dependency of Samsung to a specific manufacturer is revealed, along with the different choices in integration of communication technology – even millimeter wavelength (mmWave) signal support in Samsung's latest generation. This volume also reveals how Samsung maintains its leadership on several levels

in these markets.

With teardowns of the smartphones, the main RF modules and components have been extracted and physically analyzed – from the output of the transceiver to the antenna. Packaging, sizes, and technologies were also studied to provide a large panel of technical and economic choices as well as an overview of the market.

Lastly, this report includes a statistical analysis for most of RF front-end modules and explains the smartphone maker's choices and supplier tendencies. All RFFEM are integrated in this report, from baseband to antenna tuner, on 5G, 4G, Wifi, BT, GPS, and UWB.

COMPLETE TEARDOWN WITH:

- Detailed photos
- Precise measurements
- Module opening
- Die measurements
- Complete bills-of-materials for the modules
- Comparison between suppliers
- Comparison between oems
- Cost comparisons
- Detailed technical and cost analysis of 39 components

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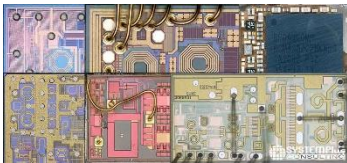
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AUTHOR



Stéphane Elisabeth, PhD is Senior Technology and Cost Analyst at System Plus Consulting, part of Yole Développement (Yole). He works on reverse engineering and costing reports while also managing custom projects in the RF electronics and advanced packaging fields. Stéphane holds an engineering degree in electronics and numerical technology (Université de Nantes, France) as well as a PhD. in Materials for Microelectronics (Université de Nantes, France).

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December 2021



Qorvo QM7810X 5G Sub-6 L-PAMiD with Rx Diversity

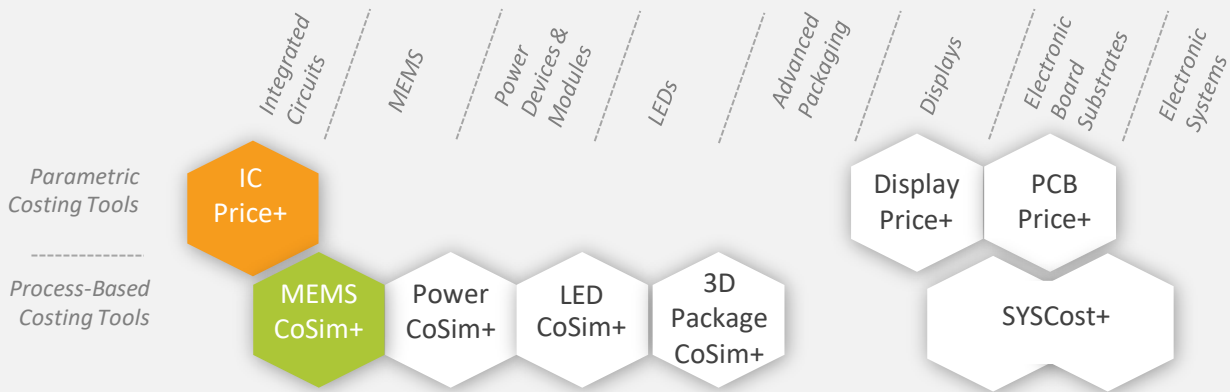
Complete technology and cost analysis of the front-end module using advanced DSMBGA, the latest GaAs PA, enhanced LNA-on-SOI, and novel micro-BAW technology.
October 2021



Cellular RF Front-End Technologies for Mobile Handset 2021

5G reaching the mass market is an opportunity and threat for RF front-end legacy players, and is unifying Chinese companies.
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Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



CONTACTS

Headquarters

22, bd Benoni Goullin
Nantes Biotech
44200 Nantes
France
+33 2 40 18 09 16
sales@systemplus.fr

Europe Sales Office

Lizzie LEVENEZ
Frankfurt am Main
Germany
+49 151 23 54 41 82
lizzie.levenez@yole.fr

America Sales Office

Hal LEVY
Western USA & Canada
+1 408 334 0554
hal.levy@yole.fr

Chris YOUUMAN
Eastern USA & Canada
+1 919-607-9839
chris.youuman@yole.fr

Asia Sales Office

Takashi ONOZAWA
Japan & Rest of Asia
+81 80 4371 4887
onozawa@yole.fr

Mavis WANG
Greater China
TW +886 979 336 809
CN +8613661566824
wang@yole.fr

Peter OK
Korea
+82 10 4089 0233
peter.ok@yole.fr

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www.systemplus.fr
sales@systemplus.fr

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