Last year, System Plus opened hundreds of front-end modules (FEMs) and components to provide an overview of the radio frequency (RF) FEM market in select flagship smartphones. The information was gathered in four reports, ranging from player’s evolution to World Area Analysis. This provided an excellent means of tracking this technology market’s evolution.

This year, System Plus Consulting will again offer different volumes of technical and cost comparisons of smartphone RFFEMs. Each comparison report will focus on a specific subject – for example, a player’s evolution, a specific technology, or a comparison of flagship devices.

In this first volume of 2021, we provide insights into technology and cost data for FEMs and several components found in 18 smartphones from the Apple iPhone series since 2016. This includes a comprehensive overview of the RFFEM architectures on the market that compare available smartphones from these companies. Apple’s dependency on specific component manufacturers is revealed, along with the different choices for integration of communication technology, even millimeter wavelength (mmWave) signal support in the latest generation. We also reveal how the company maintains its leadership on the premium market.

Through these smartphone teardowns, 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 are studied as well, providing a large panel of technical and economic choices and an overview of the market.

Every component has been analyzed to understand the manufacturing process cost.

This report also includes a technical and cost comparison of the modules and seeks to explain the smartphone makers’ 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
- Detailed technical and cost analysis of 45 components
- Complete bills-of-materials (boms) for the modules
- Comparison between suppliers
- Comparison between oems
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A study of the complete first generation of the 5G millimeter-wave chipset for Apple’s phones including custom antenna, FEM and antenna-on-package.
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5G’s Impact on RF Front-End and Connectivity for Cellphones 2020
An intensifying US-China competition for RF technology supremacy.
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COSTING TOOLS

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• Licensing, leasing, selling, offering for sale and assigning the Product;
• The Buyer would like to use data coming from the Products for presentations, press announcements and any other purposes not in accordance with the non-commercial purposes,
• Public Relations Director (info@yole.fr) to get an official authorization and verify data are up to date before the return the Seller will make sure to provide up-to-date data under a suitable public format.

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6.6 Please note that whether in Bundles or Annual Subscription, all unselected reports will be once used and lost after the 12 months delay or labour costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date any replacement is excluded for any event as set out in article 5 below.

6.7 The deadlines that the Seller is stated to states for the delivery of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to automatic cancellation of the orders, except for non-exceptable delays exceeding 3 months from the stated deadline. The only rights that the Buyer shall have in this case shall be entitled to ask for a reimbursement of its first down payment to the Seller.

6.8 The Seller does not make any warranties, express or implied, including, without limitation, those of saleability and fitness for a particular purpose, with respect to the Products. Although the Seller has used all due diligence, the Seller cannot be responsible for any virus, worms, Trojan horses or other codes containing contaminating or destructive elements.

6.9 Before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

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