RF Front-End Module Technical Comparison 2019

Extensive overview of 100 RF Front-End modules and components found in eight leading flagship smartphones from Apple, Samsung, Huawei, Xiaomi, and Oppo.

In 2019 RF Front-End Module suppliers have brought through new communication technology. This follows the disruptive choices made in 2018 by the high-end smartphone original equipment manufacturers (OEMs). Some chose the Diversity Switch (RxDM), others picked mixed Mid-Band/High Band Power Amplifier integrated Duplexers (MB/HB PAMiDs). Today, the choices are becoming even more diverse, due to the upcoming fifth generation (5G) wireless technology. High-end smartphone OEMs are seeking new ways to integrate more into one device, along with better isolation techniques for all the front-end communication devices, in a market with high-quality competitors. To keep track of the industry’s evolution and see what’s coming, this is the perfect time to look the players by comparing the integration technologies between the smartphone brands, the module suppliers and last year’s technologies.

This comparative technology study has been conducted to provide insight into technology data for Radio-Frequency (RF) Front-End Modules and components in smartphones. The report includes the study of Front-End Modules and components found in eight flagship smartphones: the Apple iPhone Xs/Xs Max, Apple iPhone Xr, Samsung Galaxy S9 Plus X US and European version, Samsung Galaxy S10 Plus European Version, Huawei Mate 20 Pro, Huawei P30 Pro, Xiaomi Mi8 Explorer Edition, and the Oppo Find X.

With teardowns of a large variety of smartphones, the main RF Modules and components, from the output of the transceiver to the antenna, have been extracted and physically analyzed. We have studied packaging, sizes and technologies to provide a large panel of the smartphone producers’ technical and economical choices and an overview of the market. In terms of design wins in these smartphones, Qorvo is now a major player, along with Skyworks and Broadcom/Avago. Several other players like Murata and Qualcomm are also involved and have been analyzed.

The report includes a description of each component and statistical analyses for most front-end modules. It also tries to explain the smartphone-making OEMs choices and supplier preferences. Wi-Fi and Bluetooth Module analyses are not covered in this report.

COMPLETE TEARDOWN WITH
• Detailed photos
• Precise measurements
• Complete bills-of-materials of the modules
• Comparison between suppliers
• Comparison between OEMs
• Comparison with 2017 and 2018 smartphones
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