

Navian Marketing Report

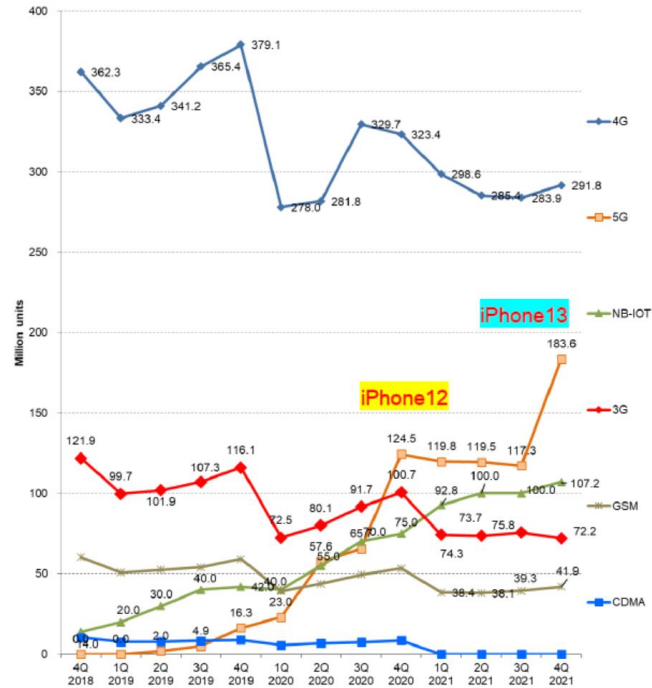
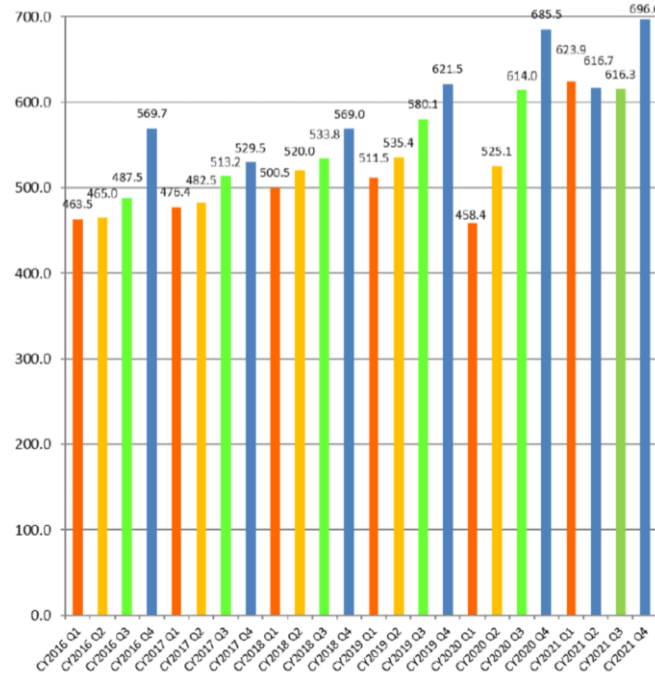
RF Devices/Modules For Cellular Terminal Quarterly Market Report Q3 2021

Released on March 25th ,2022

RF Components & Modules in this report

- ① Front end Module (ASM·TX Module·PAiD·FEMiD·All-in-One FEM·PAMiD·**5G TX Module/PAMiF-NEW**· Multiplexer·A-Multiplexer·**5G RX Module-NEW**)
- ② Antenna Switch (Main RF/Diversity) Power Amplifier Module
- ④ Duplexer
- ⑤ Band Pass Filter
- ⑥ TCXO

RF Components & Modules in this report

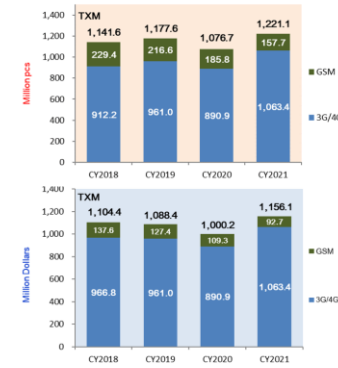


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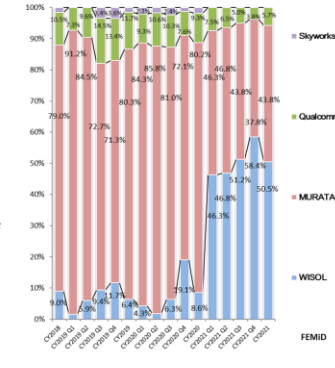
Report Sample

Market Result of TX Module in CY2021



- ◆ On top of the decrease in shipment of Cellular Terminal in 2020 affected by COVID pandemic, the increase in 5G smartphones adopting PAMiD and FEMiD resulted in demand shrinkage for TX Module.
- ◆ Market size of TX Module in 2020 was 1,076.7 million pcs (YoY 91.4%, quantity) and 1,000.2 million dollars (YoY 91.9%, amount).
- ◆ Meanwhile, growth was seen in adoption of Low-end Platform from companies like Media Tek which adopt TX Module in middle/low-end 5G smartphones, and also for IOT Module market. The increase is contributing to growth in TX Module demands.
- ◆ Market size of TX Module in 2021 resulted with 1,221.1 million pcs (YoY 113.4%, quantity) and 1,156.1 million dollars (YoY 115.6%, amount).

FEMiD Market Share for Q3-Q4 CY2021 & CY2021



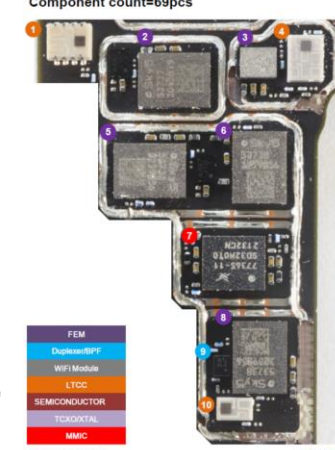
- ◆ 4 companies have entered the FEMiD market: MURATA, RF360 (former TDK), WISOL, and Skyworks.
- ◆ MURATA has an overwhelming share of the FEMiD market, and the competitiveness of other companies is weak.
- ◆ Most of FEMiD's demand is for SAMSUNG.
- ◆ SAMSUNG has an attitude to correct MURATA's share which is too high, and tried to raise the share of other companies. However, it did not work as well as expected and WISOL and Skyworks' shares are still very little.
- ◆ From 2019, Huawei has been adopting FEMiD, which is also supplied monopolistically by MURATA.
- ◆ But unfortunately, Huawei's adoption of FEMiD cannot be expected after 2021 because of the tighter U.S. sanctions.
- ◆ WISOL started supplying FEMiD for High-band (Band-7/40/41) to SAMSUNG in Q3 2020, expanding its share.
- ◆ WISOL's supply of high-band FEMiD is expanding in contrast to MURATA's demand decrease for main band FEMiD. WISOL exceeded MURATA with 50.5% share in 2021.

5G Shipment CY2019-CY2022 by Brand ~ Apple dominates the 5G market ~



- ◆ Graph on left shows the shipment volume of 5G-compatible products, by manufacturer.
- ◆ Shipment volume of Apple, with their new model iPhones all supporting 5G, is expected to grow to an overwhelming 244.0 million units in 2022.
- ◆ Since the virtual withdrawal of Huawei, that used to be their biggest rival in the premium high-end smartphone market, iPhone's share is further increasing.
- ◆ Runner up is SAMSUNG, the top shareholder of smartphones. However, their shipment size is expected to stay at 100.0 million units, not even half of Apple's.
- ◆ 3rd ranking and below are major Chinese manufacturers such as Xiaomi, OPPO, and VIVO.

Google Pixel 6 Mother board SIDE-A



- LTCC Filter TDK 2.5x2.1x7mm
- Low band Diversity FEM SKY53737 Skyworks Skyworks For Low-band? 4.0x3.0x7mm
- n77 5G RX Module MURATA 2.0x1.6x7mm
- LTCC Filter TDK 2.5x2.0x7mm
- Middle-High-band Diversity FEM SKY53738 Skyworks 4.0x3.0x7mm
- Middle-High-band Diversity FEM SKY53738 Skyworks 4.0x3.0x7mm
- GSM PAM SKY77365-11 Skyworks 3.5x3.0x7mm
- Middle-High-band Diversity FEM SKY53738 Skyworks 4.10x3.0x7mm
- Band-32 SAW Filter MURATA 1.1x7x7mm
- LTCC Filter TDK 2.0x1.3x7mm

Outline of the report
RF Devices/Modules For Cellular Terminal Quarterly Market Report Q3 2021
-CD-ROM (PDF file)-

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**PHASE 1. CELLULAR TERMINAL SHIPMENT
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- 5G M2M WWAN Module -
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 - ② Teardown pictures & RF Modules/Components

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Report Title	Price	Initial
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