

Navian Marketing Report

RF Devices/Modules For Cellular Terminal

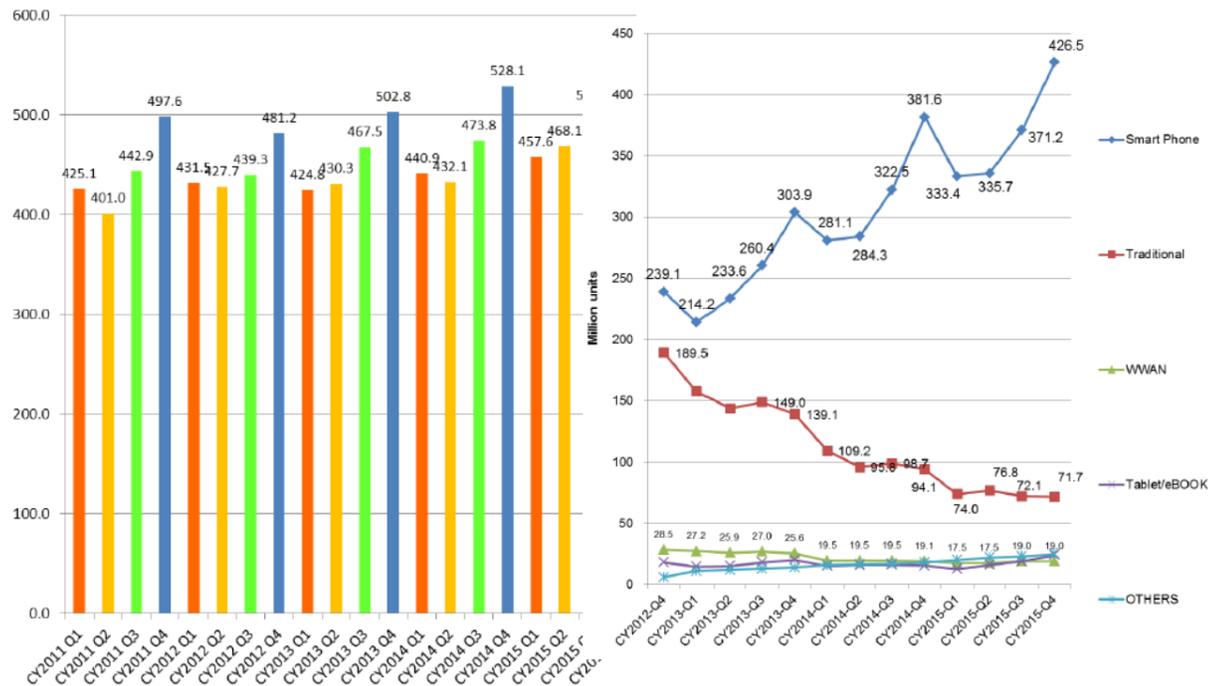
Quarterly Market Report Q3 2015

Released on March 20th 2016

RF Devices/Modules for Cellular Terminal in the report

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

Cellular Terminal Shipment History



e-Book Reader
Tablet PC

WWAN Terminal
Adapter

Embedded Module

Smart Phone

Traditional Handset
Mobile Phone

Fixed Wireless Terminal

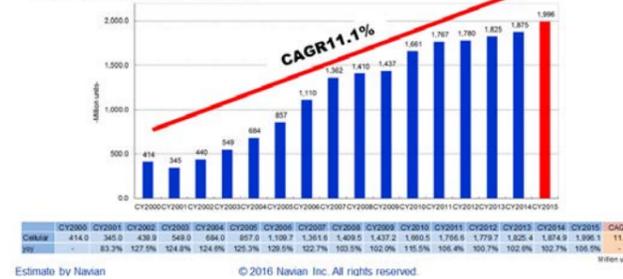
Non-Voice

Voice

Report Sample

Cellular Terminal Annual Shipment History CY2000-CY2015

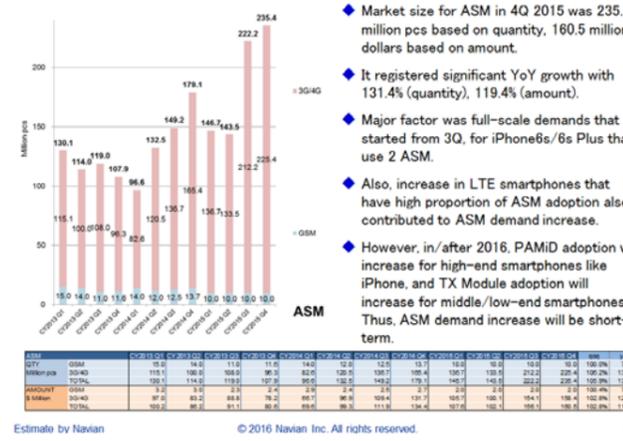
- ◆ Shipment size of Cellular Terminal in 2015 was 1,996.1 million units (YoY 106.5%) in 2015.
- ◆ Compound Annual Growth Rate from year 2000 will be 11.1%.
- ◆ Aside from rapidly growing demands for low-priced Smartphones in markets of emerging nations such as China, demand expansion of LTE Smartphones, triggered by TD-LTE services gaining momentum in China, was engine for this. However, Smartphone market growth is starting to show strong stalling trend.
- ◆ Full-scale popularization of non-voice type Cellular Terminal including the promising Tablet and Notebook PC will take place around 2016 to 2017.



Multiplexer: Quadplexer Example & Outline

- ◆ Quadplexer is earning increased demands as component that support Carrier Aggregation in middle-band group such as Band-1&3, and Band-2&4.
- ◆ The component is constituted by 2 Duplexers that work simultaneously.
- ◆ Both high isolation and attenuation characteristics are required for simultaneous processing, and thus product development is truly challenging.
- ◆ Currently, Quadplexer by AVAGO's FBAR that can be equipped with phase shifter natively, is leading the market.
- ◆ Aside from this, some of MURATA's SAW types are mass produced for Band-1 and 3.
- ◆ Skyworks is said to be developing a product which a Switch is used to replace phase shifter function, but since big loss can be expected, the competitiveness is unknown.
- ◆ Also, there is a "Quadplexer" to demultiplex frequency into 4, used in "Extractor" of iPhone6s, but this has different usage from the Quadplexer we are talking about.

3Q-4Q 2015: Antenna Switch Module Market Size



Oppo R7 Plus RF Circuit Estimation

- ◆ Oppo R7 Plus is a smartphone with 4 modes, TD-LTE/FDD-LTE/UMTS/GSM.
- ◆ FDD band support 6 bands, but TDD band is only 1 band, Band-40.
- ◆ It does not support Carrier Aggregation, and RF circuit composition is a standard TD-LTE/FDD-LTE style.
- ◆ Transceiver IC is Qualcomm's WTR4905, and it uses Skyworks' ASM for FEM.
- ◆ Of its 6 Duplexers, 4 are by Taiyo Yuden, showing the high share of the company in OPPO.
- ◆ For Power Amplifier Module, Multi-band/Multi-mode PA for Main Band and GSM are by Corvo, and one for High-band is by Skyworks.
- ◆ For Diversity side, 3 SAW Filters by MURATA and 4 by WISOL are used on-board.
- ◆ Filter for WiFi is BAW Filter by Taiyo Yuden.

Outline of the report
RF Devices/Modules For Cellular Terminal Quarterly Market Report Q3 2015
-CD-ROM (PDF file)-

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Quarterly Market Report English Version**

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