

Global and China GaAs-based Device Industry Report, 2011-2012

May 2012

STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include National Bureau of Statistics of China, the Ministry of Industry and Information Technology of China etc.

Abstract

Distinct from traditional silicon semiconductor, gallium arsenide (GaAs) is a compound of the elements gallium and arsenic. It is an III-V semiconductor and is mainly used in handset RF front end like power amplifier (PA). In the 4G era, handset RF front end becomes more sophisticated. The RF front end of 4G devices costs around USD9-11, twice of that of 3G system and 6 times of that of 2G system. The handset RF system mainly consists of transceiver, PA, filter and antenna switch. The market size of handset RF approximated USD3.8 billion and is expected to hit USD5 billion in 2016.

Taking 4G iPad for example, it applies as many as 19 RF front-end components, including 7 PAs, 1 transceiver and 2 antenna switch modules (ASM). Of those devices, 3 PAs are provided by AVAGO and correspond to three LTE frequency bands; 2 PAs are supplied by Skyworks and correspond to two 3G frequency bands; 1 PA is offered by TriQuint, which contains three separate PA dies and corresponds to four 2G frequency bands; the rest 1 PA is in the ASM supplied by Japan-based Murata; the two ASMs are provided by Murata. Additionally, 4G iPad is integrated with 802.11/Bluetooth/FM supported by Broadcom BCM4330, and its SIP IC contains GaAs pHEMT PA provided by Skyworks.

Revenue of Global GaAs Manufacturers, 2011-2012 (Unit: US\$M)

Company	Region	2011	2012 E	Category	Remark
Murata	Japan	1,678	1,960	Fully Integrated	Including revenue from SAW filter and communication module. The revenue in 2012 also includes the sales contributed by the acquired Renesas PA.
Kopin	U.S.	125	138	Epilayer	
IQE	U.K.	120	142	Epilayer	
VPEC	Taiwan	73	101	Epilayer	
AXT	U.S.	104	126	Substrate	Controlled by a Chinese company
Win Semiconductor	Taiwan	294	365	Foundry	
AWSC	Taiwan	56	65	Foundry	
TriQuint	U.S.	896	908	IDM	
Avago	U.S.	888	1126	IDM	Including revenue from BAW filter
Anadigics	U.S.	153	146	IDM	
RFMD	U.S.	902	810	IDM	
Skyworks	U.S.	1477	1819	IDM	Including revenue from analog devices
SEDI	Japan	308	560	IDM	Including revenue from optics modules
M/A-COM	U.S.	310	350	IDM	
RDA	Chinese Mainland	289	360	IC Design House	
Hittite Microwave	U.S.	264	280	IC Design House	

Source: *Global and China GaAs-based Device Industry Report, 2011-2012*

Murata is the largest MLCC manufacturer, the largest communication module (including Bluetooth module and WLAN module) producer, the second largest SAW filter manufacturer and the largest antenna switch producer in the world. On March 1, 2012, Murata completed the acquisition on PA Division of Renesas and marched into PA market, which empowers the company to possess the most complete product line in the handset RF market.

Kopin, VPEC and IQE are the world's top three GaAs Epilayer manufacturers, together accounting for over 60% market share. Kopin and VPEC adopt MOCVD process and IQE applies MBE method. Headquartered in the U.S., AXT, the only publicly traded GaAs substrate company, was acquired by a Chinese company in Dalian as early as in 2003, with manufacturing base located in Beijing.

Win Semiconductor is the largest GaAs foundry with AVAGO as its main customer. AWSC's major client is Skyworks that has its own GaAs fab and outsources its production in the case of insufficient capacity. Anadigics is the smallest GaAs IDM and its revenue fell by 29% in 2011.

RFMD, once the world's largest PA manufacturer, relies heavily on big customers. In FY2008, Nokia contributed to 59% of RFMD's revenue, and Motorola 14%. In the era of 3G and smart phone, Nokia's business drops sharply, so RFMD shows slow transition and sees declining performance, with revenue slipping 17% or so in 2011.

Skyworks is in its heyday. It is supported by its main customers, the global top 10 mobile phone vendors, and boasts the most reasonable customer distribution and first-class technology.

AVAGO is a rising star and provides services for 3G and 4G devices. Its acquisition of Infineon's BAW Division in 2008 makes AVAGO market share in BAW filter area register as high as 65%, and BAW filter enjoys the highest price among the handset RF front end components. AVAGO and Skyworks may rival each other in the coming years.

SEDI is a subsidiary of Sumitomo Electric Industries which acts as a manufacturer possessing the complete industry chain ranging from the upstream substrate to the downstream IC. The products of SEDI target at the PA of base station.

RDA, a Chinese mainland manufacturer, booms by virtue of unbranded phone fabrication, with revenue growing 51.3% in 2011. The company ranks No. 1 in the market of unbranded cell phone PA, Bluetooth, FM tuner and DVB-S tuner, and occupies more than 50% of FM tuner and DVB-S tuner market share.

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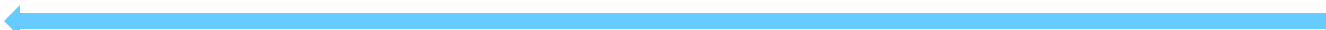
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