DIGITIMES Research: China Smartphone AP Tracker – 4Q 2015

China smartphone AP shipments

Eric Lin, DIGITIMES Research, February 2016

Introduction

4Q15 review

China's smartphone AP shipments grew 16.1% sequentially in the fourth quarter of 2015 mainly thanks to demand for inventory preparation from some vendors and year-end holidays.

MediaTek's shipments only grew 3.2% sequentially in the fourth quarter as its mid-range and high-end solutions were being suppressed by those from Qualcomm, while its entry-level products had difficulties competing against those of Spreadtrum.

Spreadtrum had a simple product lineup for 2015 and mainly expanded its market share by offering inexpensive solutions. With aggressive promotions of its low-price 4G solutions, Spreadtrum managed to achieve 30.4% sequential growth in the fourth quarter of 2015.

Qualcomm began volume shipments its new AP products in the fourth quarter of 2015 and saw strong demand for the solutions from clients. These boosted its shipments 25% sequentially in the quarter.

1Q16 forecast

Smartphone AP shipments will drop 19.8% sequentially to reach 135.8 million units in the first quarter of 2016 and tablet AP shipments will see a decline of 21%, causing smartphone AP's shipment share to rise further.

MediaTek's shipments will drop 18.5% sequentially in the first quarter of 2016 and since its mid-range and high-end products are being suppressed by those of Qualcomm, the supplier's profitability is also expected to face decline.

Without new products to stimulate demand from clients, Spreadtrum's shipments will drop 22.2% sequentially in the first quarter of 2016.

Qualcomm has prepared a complete product lineup for the first quarter 2016 and demand from clients will remain stable in the quarter due to its products' strong competitiveness. However, the company will still see a sequential decline of 11.4% in the quarter mainly because of its entry-level APs.

Key factors affecting China smartphone AP shipments

Two major factors affected China smartphone AP shipments in the fourth quarter of 2015.

Market effects:

Demand from emerging markets remained stable. Year-end holiday shopping and vendors preparing component inventory both boosts China's smartphone AP shipments.

Chip vendor status:

MediaTek faced serious competitions from Qualcomm in the high-end and mid-range segments and Spreadtrum in the entry-level segment in the fourth quarter of 2015. Although MediaTek still had shipment growth in the quarter, its share of China's smartphone AP shipments dropped sharply.

Spreadtrum's shipments of low-price products continued to grow.

Qualcomm's new mid-range and high-end products started contributing shipments in the fourth quarter of 2015.

HiSilicon saw strong demand for its mid-range solutions and also started shipping new high-end solutions in the fourth quarter of 2015.

Xiaomi's aggressive promotions had a strong benefit to Leadcore shipments.

Table 1: Key factors affecting China smartphone AP shipments in 4Q15

Factor	Item	Analysis	Influence on shipments
Market forces	Environment	Demand from emerging markets enjoys stable growth	↑ ★
	End product firms	Year-end holiday demand and firms stock up component inventories to prepare for 1Q16	↑ ★
Chipmakers	Spreadtrum	Strengthening its mid-range and entry-level solution shipments	↑ ★★
	MediaTek	Having high shipments, but competition from Qualcomm and Spreadtrum affecting its performance	↓ ★★
	Qualcomm	Having a complete mid-range and high-end product lineup	↑ ★★
	HiSilicon	Demand for its mid-range solutions continuing to grow, while starting to ship new high-end solutions	↑ ★★
	Leadcore	Benefited by Xiaomi's aggressive promotions on its smartphone	↑ ★★

Note: The more stars, the higher the influence. ↓ indicates negative influence, ↑ indicates a positive influence.
Source: Digitimes Research, February 2016

1Q16 forecast

Two major factors affected China smartphone AP shipments in the first quarter of 2016.

Market effects:

Because of the Lunar New Year and seasonality, demand for most suppliers' solutions will drop.

Chip vendor status:

MediaTek is expected to see a sharp shipment decline in the first quarter of 2016 due to threats from Qualcomm and Spreadtrum as well as weakening market demand.

Spreadtrum's orders are mainly from local smartphone vendors and therefore its shipments will be impacted more seriously by the Lunar New Year holidays than its competitors.

Qualcomm will see increasing mid-range and high-end solution shipments in the first quarter of 2016 and will see its overall shipments drop to less than those of MediaTek and Spreadtrum as a major portion of its orders are from non-China vendors.

Demand for HiSilicon's mid-range solutions will start weakening in the first quarter of 2016 and despite the fact that its high-end solution will still enjoy good demand, the increased volume will not be sufficient to offset the decline.

Leadcore's shipments in the first quarter of 2016 will be seriously impacted by Xiaomi phasing out its Hongmi 2A and the Lunar New Year holidays.

Table 2: Key factors affecting China smartphone AP shipments in 1Q16

Factor	Item	Analysis	Influence on shipments
Market forces	Environment	China market will see reduced production demand due to the Lunar New Year	↓ ★★
	End product firms	Weakening market demand and vendors already prepared component inventory in 4Q15	↓ ★
Chipmakers	Spreadtrum	Weakening market demand will impact its shipments	↓ ★★
	MediaTek	Mid-range and high-end products will continue to be impacted by those of Qualcomm. Weakening market demand will hurt shipments too.	↓ ★★
	Qualcomm	Will see smaller drop thanks to a complete mid-range and high-end product lineup and stable orders from non-China vendors	↓ ★
	HiSilicon	Demand for mid-range solutions will drop, but high-end solution will continue to grow	↓ ★
	Leadcore	Xiaomi's Hongmi 2A to be phased out from the market. Demand to drop sharply	↓ ★★★

Note: The more stars, the higher the influence. ↓ indicates negative influence, ↑ indicates a positive influence.
Source: Digitimes Research, February 2016

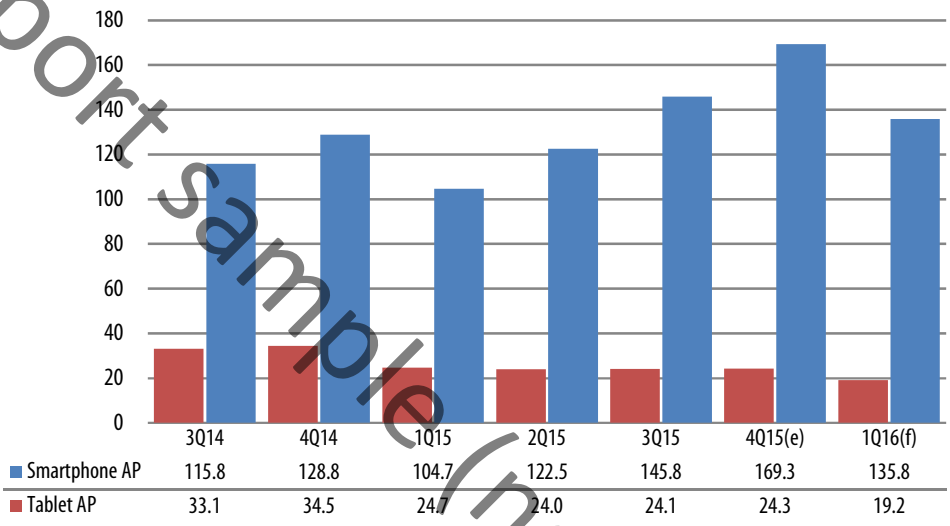
Shipment breakdown

Smartphone/Tablet share of AP market

China's smartphone AP shipments grew 16.1% sequentially in the fourth quarter of 2015, while tablet AP shipments almost had no growth. This helped the shipment share of smartphone APs to rise 1.6pp from a quarter ago to reach 87.4% and the tablet AP's share to drop to 12.6%.

China's smartphone AP shipments were down 29.6% on year in the fourth quarter of 2015 as demand for tablets continues weakening.

Chart 1: China AP shipments by application, 3Q14-1Q16 (m units)



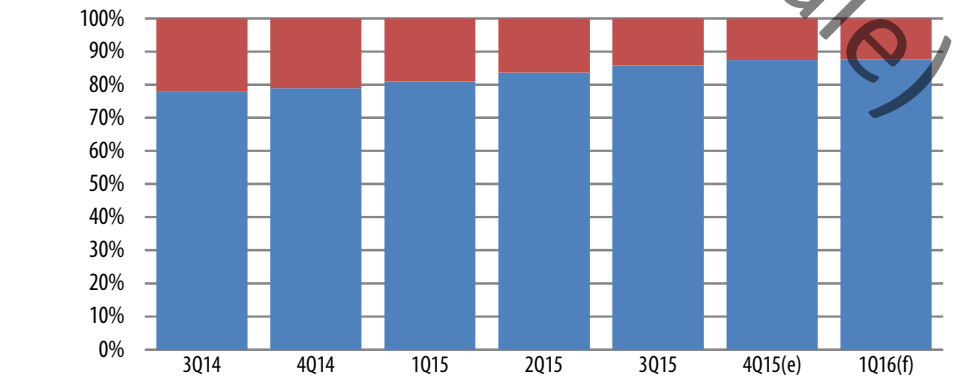
	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Smartphone AP	115.8	128.8	104.7	122.5	145.8	169.3	135.8
Tablet AP	33.1	34.5	24.7	24.0	24.1	24.3	19.2

Source: Digitimes Research, February 2016

1Q16 forecast

Smartphone AP shipments will drop 19.8% sequentially to reach 135.8 million units in the first quarter of 2016 and the tablet AP shipments will see a decline of 21%, causing smartphone AP's shipment share to rise further.

Chart 2: China AP shipment share by application, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Tablet AP	22.2%	21.1%	19.1%	16.4%	14.2%	12.6%	12.4%
Smartphone AP	77.8%	78.9%	80.9%	83.6%	85.8%	87.4%	87.6%

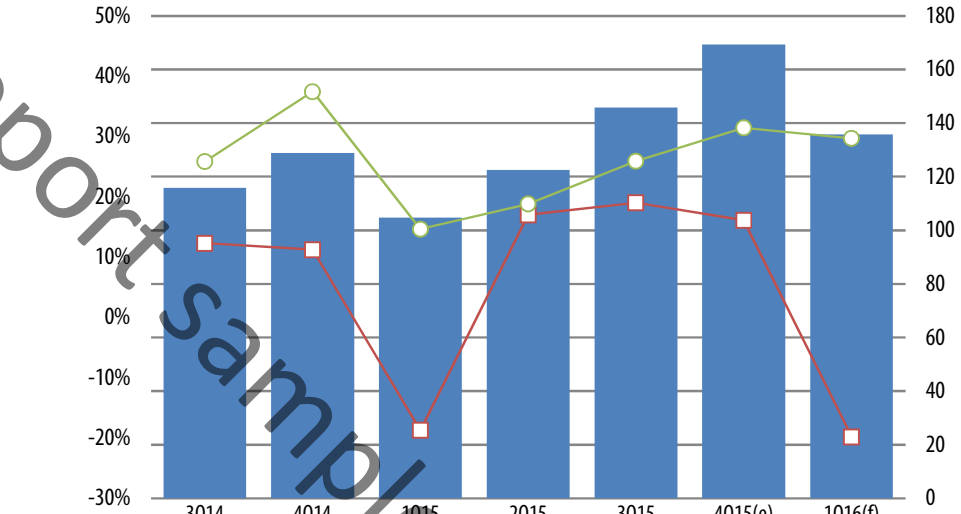
Source: Digitimes Research, February 2016

Smartphone AP shipments in China

China smartphone AP's shipment growth in the fourth quarter of 2015 was mainly thanks to demand for component preparation from some vendors and the year-end holidays.

Spreadtrum and Qualcomm were the main contributors of the shipment growth. HiSilicon also had a strong growth in the quarter. MediaTek achieved shipment growths in the quarter, but the scale was much smaller than those of Spreadtrum and Qualcomm.

Chart 3: China smartphone AP shipments, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Shipments	115.8	128.8	104.7	122.5	145.8	169.3	135.8
Q/Q	12.3%	11.2%	-18.7%	17.0%	19.0%	16.1%	-19.8%
Y/Y	25.9%	37.5%	14.7%	18.8%	25.9%	31.4%	29.7%

Source: Digitimes Research, February 2016

1Q16 forecast

Fewer working hours caused by the Lunar New Year holidays and falling demand for components are both expected to impact China's smartphone AP shipment performance in the first quarter of 2015.

Among the top-3 suppliers, only Qualcomm will manage to control its drop at around 10%, while both MediaTek and Spreadtrum will see sequential declines at around 20%. HiSilicon and Leadcore are also expected to see sharp drop in the quarter.

Shipments by supplier

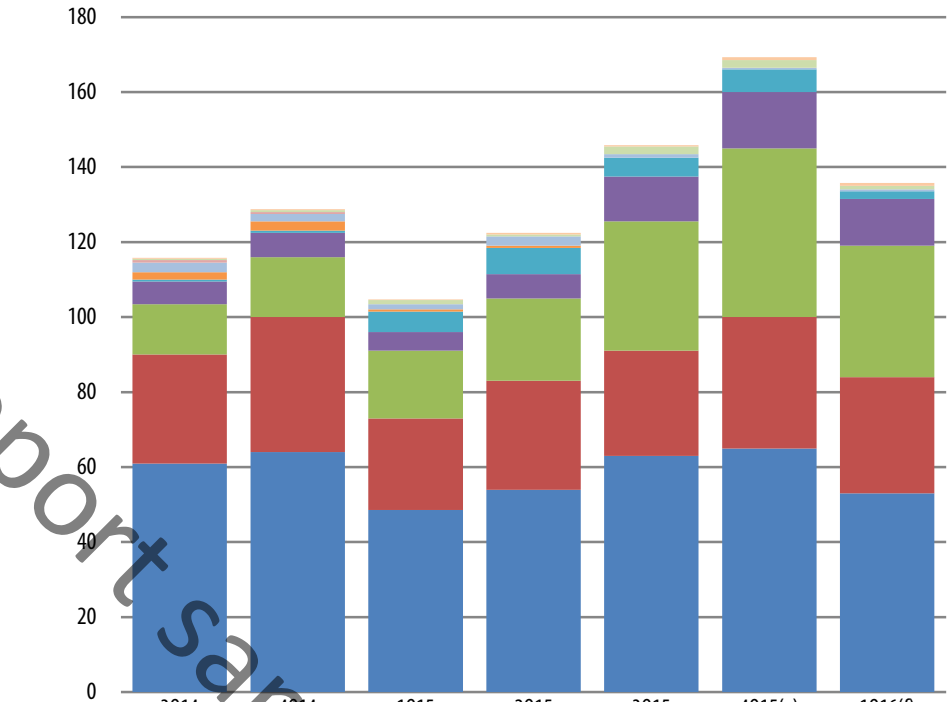
Compared to Qualcomm's 25% and Spreadtrum's 30.4% sequential shipment growths, MediaTek only had a sequential growth of 3.2% in the fourth quarter of 2015, reducing MediaTek's shipment share below 40%.

Qualcomm's aggressive promotions for its new mid-range and high-end APs successful boosted its shipments in the fourth quarter of 2015.

Spreadtrum continued to see strong demand for its inexpensive solutions. The company's new low-price 4G solution has also been largely adopted by clients.

HiSilicon's mid-range solutions had increased shipments in the fourth quarter of 2015. Its new high-end solution also had strong popularity in the industry.

Chart 4: Shipments by supplier, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Intel	0.2	0.3	0.2	0.5	0.3	0.8	0.8
ST-Ericsson	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TI	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Samsung	0.4	0.5	1.0	0.5	2.0	2.0	1.0
Broadcom	0.7	0.5	0.0	0.0	0.0	0.0	0.0
Marvell	2.5	2.0	1.5	2.5	1.0	0.5	0.5
NVIDIA	2.0	2.5	0.5	0.5	0.0	0.0	0.0
Leadcore	0.5	0.5	5.5	7.0	5.0	6.0	2.0
Hisilicon	6.0	6.5	5.0	6.5	12.0	15.0	12.5
Spreadtrum	13.5	16.0	18.0	22.0	34.5	45.0	35.0
Qualcomm	29.0	36.0	24.5	29.0	28.0	35.0	31.0
Mediatek	61.0	64.0	48.5	54.0	63.0	65.0	53.0

Source: Digitimes Research, February 2016

1Q16 forecast

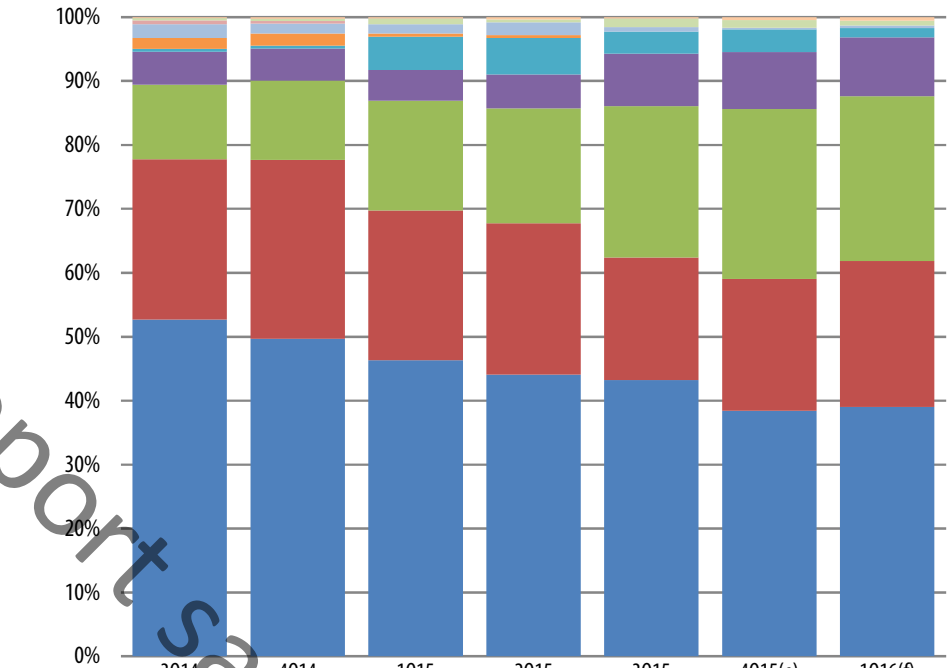
MediaTek's shipments will drop 18.5% sequentially in the first quarter of 2016, but its shipment share will grow slightly to 39% since its major competitor Spreadtrum will see an even larger decline.

Qualcomm will only see a 11.4% sequential decline in first-quarter-2016 shipments thanks to stable demand for its mid-range and high-end products.

Spreadtrum will see a 22.2% drop sequentially in the first quarter of 2016 as it is limited by its targeting markets.

Thanks to its high-end solutions, HiSilicon's shipments only dropped 16.7%, allowing it to see a slight growth in shipment share.

Chart 5: Shipment share by supplier, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Intel	0.2%	0.2%	0.2%	0.4%	0.2%	0.5%	0.6%
ST-Ericsson	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Samsung	0.3%	0.4%	1.0%	0.4%	1.4%	1.2%	0.7%
Broadcom	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Marvell	2.2%	1.6%	1.4%	2.0%	0.7%	0.3%	0.4%
NVIDIA	1.7%	1.9%	0.5%	0.4%	0.0%	0.0%	0.0%
Leadcore	0.4%	0.4%	5.3%	5.7%	3.4%	3.5%	1.5%
Hisilicon	5.2%	5.0%	4.8%	5.3%	8.2%	8.9%	9.2%
Spreadtrum	11.7%	12.4%	17.2%	18.0%	23.7%	26.6%	25.8%
Qualcomm	25.0%	28.0%	23.4%	23.7%	19.2%	20.7%	22.8%
Mediatek	52.7%	49.7%	46.3%	44.1%	43.2%	38.4%	39.0%

Source: Digitimes Research, February 2016

Shipments by architecture

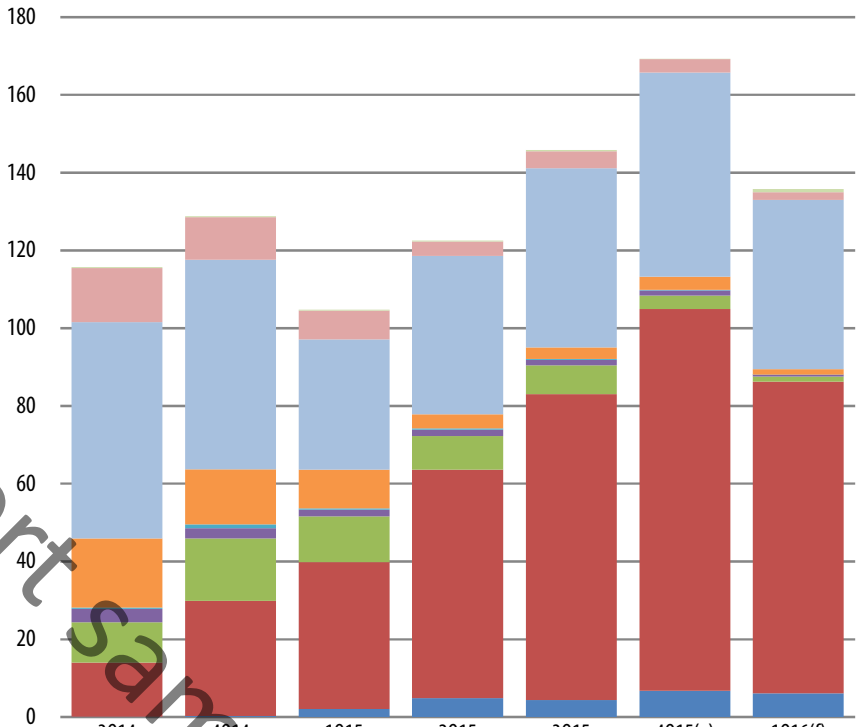
Shipments of Cortex-A53-based APs rose 24.7% sequentially in the fourth quarter of 2015 and accounted for 58% of the China's overall smartphone AP shipments.

Cortex-A7-based APs saw a sequential shipments growth of 13.9% in the fourth quarter of 2015 thanks to Spreadtrum's new 4G solution.

Cortex-A15/17-based AP shipments are shrinking rapidly as related demand has been taken over by 64-bit APs.

Samsung Electronics, HiSilicon and Qualcomm's Cortex-A72-based mid-range and high-end APs were launched in the fourth quarter of 2015 and relatively boosted the segment's shipments in the quarter.

Chart 6: Shipments by architecture, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
X86	0.20	0.26	0.21	0.25	0.29	0.17	0.82
Cortex-A5	13.90	10.95	7.33	3.68	4.37	3.39	2.04
Cortex-A7	55.60	53.84	33.50	40.67	46.07	52.48	43.46
Cortex-A9	17.80	14.17	9.95	3.68	2.92	3.39	1.36
Scorpion	0.30	1.03	0.31	0.25	0.29	0.17	0.14
Krait	3.50	2.58	1.78	1.72	1.46	1.35	0.41
Cortex-A15/A17	10.40	16.10	11.73	8.58	7.29	3.39	1.36
Cortex-A53	13.90	29.62	37.80	58.80	78.73	98.19	80.12
Cortex-A57/A72	0.10	0.26	2.09	4.90	4.37	6.77	6.11

Source: Digitimes Research, February 2016

1Q16 forecast

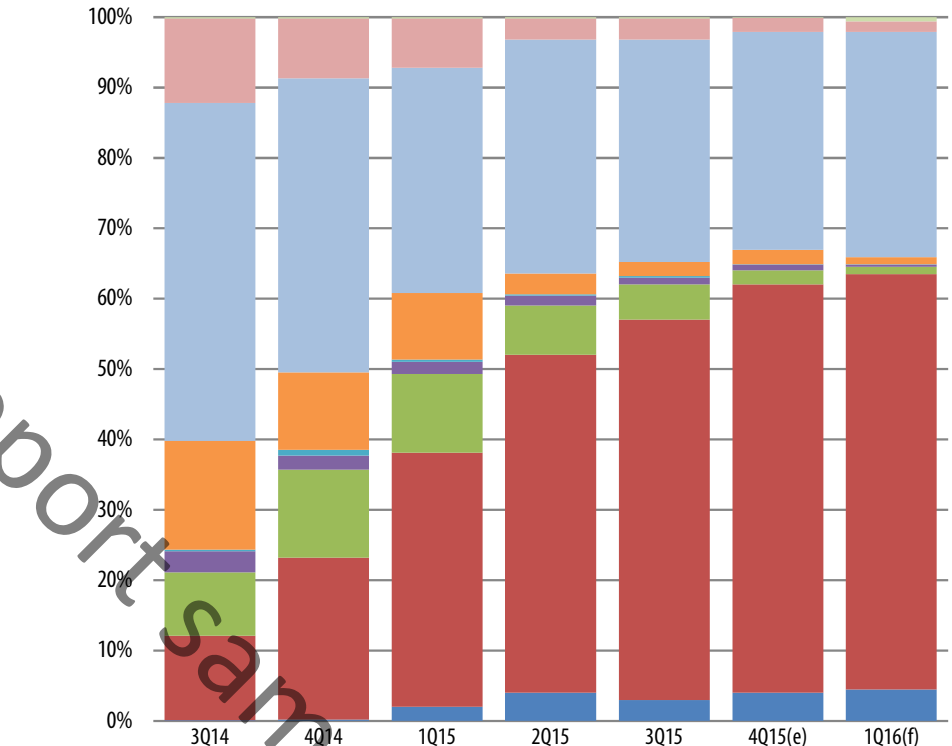
Cortex-A53-based AP shipments will drop 18.4% sequentially in the first quarter of 2016, but will remain the largest AP architecture.

The second-largest Cortex-A7-based APs will see its shipments decreasing 17.1%, slightly better than that of Cortex-A53 APs, and will see its shipment share rise to 32%.

Cortex-A15/A17-based APs will continue phasing out from the market and will see its shipments dropping to 1.36 million units, accounting for 1% of China's smartphone AP shipments.

The Cortex-A72-based APs will only have a 9.7% sequential decline in the first quarter of 2016 thanks to stable demand for related mid-range and high-end solutions.

Chart 7: Shipment share by architecture, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
X86	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.6%
Cortex-A5	12.0%	8.5%	7.0%	3.0%	3.0%	2.0%	1.5%
Cortex-A7	48.1%	41.8%	32.0%	33.2%	31.6%	31.0%	32.0%
Cortex-A9	15.4%	11.0%	9.5%	3.0%	2.0%	2.0%	1.0%
Scorpion	0.3%	0.8%	0.3%	0.2%	0.2%	0.1%	0.1%
Krait	3.0%	2.0%	1.7%	1.4%	1.0%	0.8%	0.3%
Cortex-A15/A17	9.0%	12.5%	11.2%	7.0%	5.0%	2.0%	1.0%
Cortex-A53	12.0%	23.0%	36.1%	48.0%	54.0%	58.0%	59.0%
Cortex-A57/A72	0.1%	0.2%	2.0%	4.0%	3.0%	4.0%	4.5%

Source: Digitimes Research, February 2016

Supplier analysis

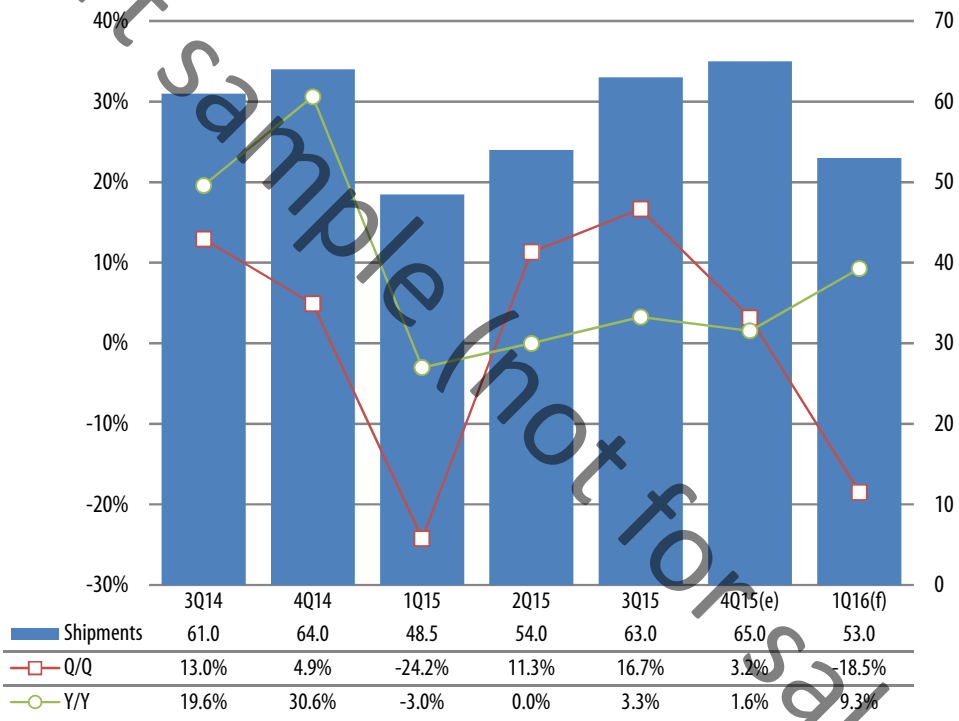
MediaTek

MediaTek's shipments only grew 3.2% sequentially in the fourth quarter as its mid-range and high-end solutions were being suppressed by those from Qualcomm, while its entry-level products had difficulty competing against those of Spreadtrum.

MediaTek's high-end solution Helio X20 will not become available until the middle of 2016; therefore, the entry-level and mid-range were still MediaTek's main targeting segments, but clients' orders continued weakening in the fourth quarter of 2015 as the AP supplier's Cat.6-based solution may not launch until the first quarter of 2016.

MediaTek's entry-level 3G and 4G AP solution shipments were impacted by Spreadtrum's products.

Chart 8: MediaTek smartphone AP shipments, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Shipments	61.0	64.0	48.5	54.0	63.0	65.0	53.0
Q/Q	13.0%	4.9%	-24.2%	11.3%	16.7%	3.2%	-18.5%
Y/Y	19.6%	30.6%	-3.0%	0.0%	3.3%	1.6%	9.3%

Source: Digitimes Research, February 2016

1Q16 forecast

MediaTek's shipments will drop 18.5% sequentially in the first quarter of 2016 and since its mid-range and high-end products are being suppressed by those of Qualcomm, the supplier's profitability is also expected to face a decline.

MediaTek's Cat.6-based mid-range and high-end solutions will not be launched in time to compete against Qualcomm's solutions and keep its clients' orders. This is the main driver causing the sequential decline in the first quarter of 2016.

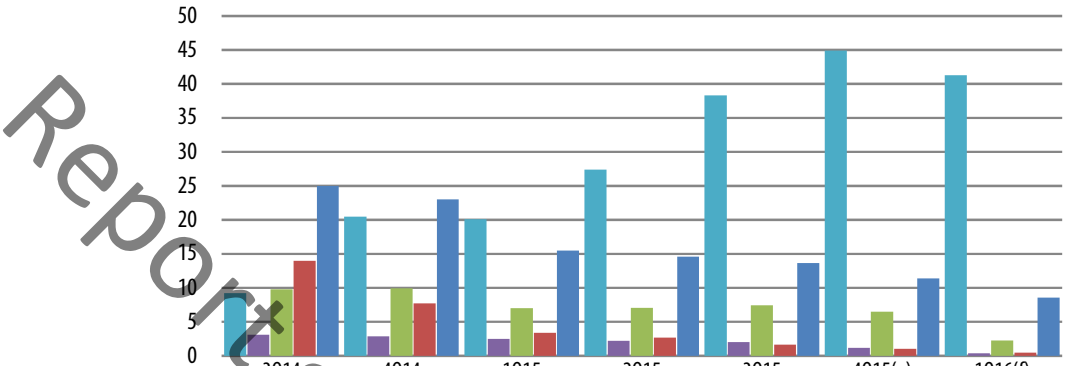
However, compared to the same quarter a year ago, MediaTek will continue to see growth in the first quarter of 2016.

By baseband type

MediaTek's LTE-based AP solution shipments grew 17.3% on quarter to close to 45 million units in the fourth quarter of 2015 as the supplier has been releasing new LTE solutions.

With MediaTek becoming more aggressive about LTE solutions, its WCDMA-based solution shipments dropped 16.4% sequentially in the quarter.

Chart 9: MediaTek shipments by baseband type, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
WCDMA	25.00	23.00	15.50	14.60	13.61	11.38	8.59
TDSCDMA	14.00	7.70	3.40	2.70	1.64	1.04	0.48
EDGE	9.80	9.90	7.00	7.10	7.43	6.50	2.28
CDMA	3.10	2.90	2.50	2.20	2.02	1.17	0.37
LTE	9.20	20.50	20.10	27.40	38.30	44.92	41.29

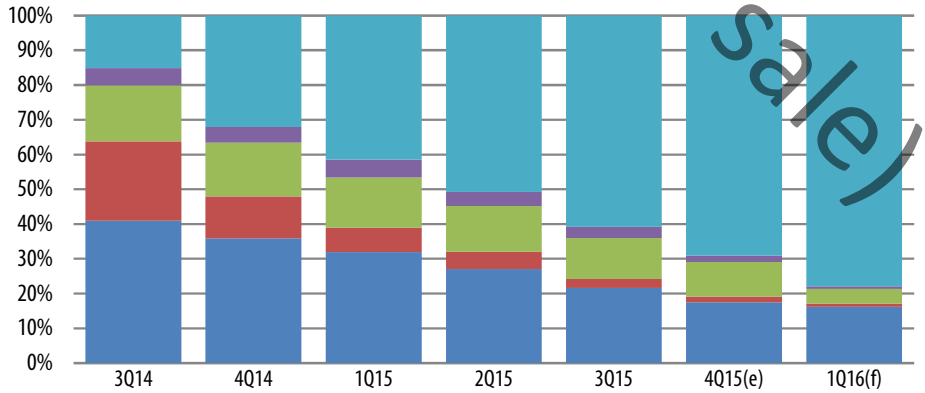
Source: Digitimes Research, February 2016

1Q16 forecast

MediaTek's LTE-based solution shipments will remain above 40 million units and drop only 8% sequentially in the first quarter of 2016 as the supplier is gradually shifting its focus to the LTE segment from the 3G.

The WCDMA-based solution shipments will continue dropping to fall below nine million units in the quarter.

Chart 10: MediaTek shipment share by baseband type, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
LTE	15.1%	32.0%	41.4%	50.7%	60.8%	69.1%	77.9%
CDMA	5.1%	4.5%	5.2%	4.1%	3.2%	1.8%	0.7%
EDGE	16.0%	15.5%	14.4%	13.1%	11.8%	10.0%	4.3%
TDSCDMA	22.9%	12.0%	7.0%	5.0%	2.6%	1.6%	0.9%
WCDMA	40.9%	35.9%	32.0%	27.0%	21.6%	17.5%	16.2%

Source: Digitimes Research, February 2016

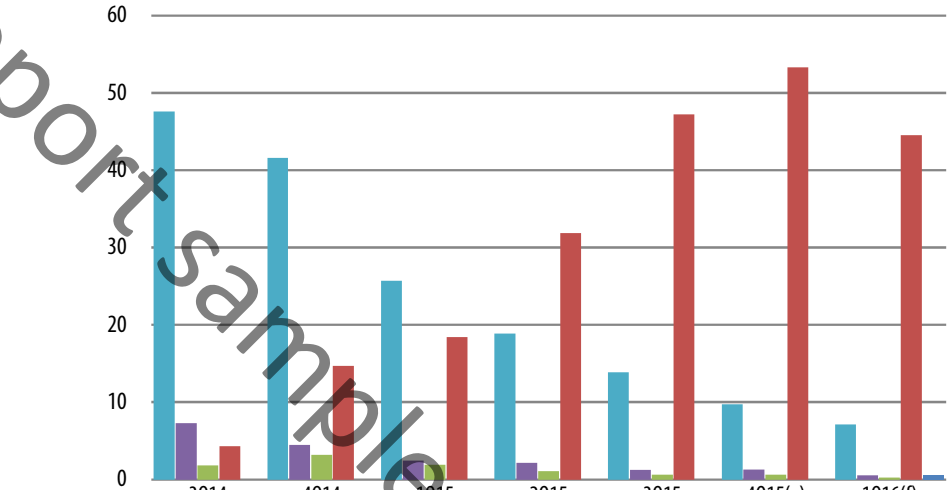
By architecture

The Cortex-A53 was the main architecture of MediaTek's AP shipments in the fourth quarter of 2015, accounting for over 80% of the volume. Cortex-A53-based AP shipments also grew 12.8% from a quarter ago in the fourth quarter of 2015.

MediaTek is mainly using Cortex-A7 APs for its 3G solutions and a few of its 4G solutions. With MediaTek gradually shifting its focus from the 3G to 4G area, Cortex-A7-based AP shipments dropped 29.7% on quarter in the fourth quarter of 2015.

MediaTek still has some orders for Cortex-A9- and Cortex-A15-based solutions, but their volumes are very small and are dropping every quarter.

Chart 11: MediaTek shipments by architecture, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Cortex-A57/A72	0.00	0.00	0.00	0.00	0.00	0.00	0.53
Cortex-A53	4.30	14.70	18.43	31.86	47.25	53.30	44.52
Cortex-A15/A17	1.80	3.20	1.94	1.08	0.63	0.65	0.27
Cortex-A9	7.30	4.50	2.43	2.16	1.26	1.30	0.53
Cortex-A7	47.60	41.60	25.71	18.90	13.86	9.75	7.16

Source: Digitimes Research, February 2016

1Q16 forecast

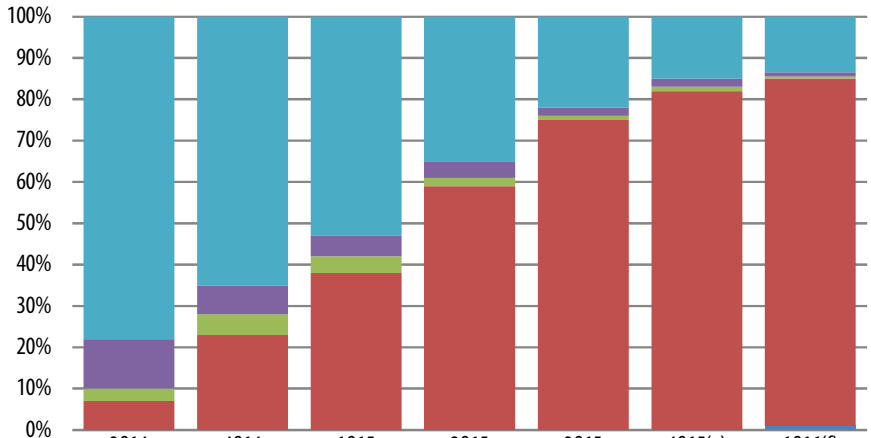
MediaTek's new AP solutions for the first quarter of 2016 were mainly based on the Cortex-A53 architecture, further boosting its shipment share to 84% despite an expectation of seeing a sequential shipment drop of 16.5%.

MediaTek will also have some shipments for Cortex-A57/A72-based AP solutions, though the volume is not much.

Shipments in the Cortex-A7 segment will drop 26.6% sequentially.

MediaTek still has some orders for Cortex-A9- and Cortex-A15-based solutions, but their volumes are very small and are dropping every quarter.

Chart 12: MediaTek shipment share by architecture, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Cortex-A7	78.0%	65.0%	53.0%	35.0%	22.0%	15.0%	13.5%
Cortex-A9	12.0%	7.0%	5.0%	4.0%	2.0%	2.0%	1.0%
Cortex-A15/A17	3.0%	5.0%	4.0%	2.0%	1.0%	1.0%	0.5%
Cortex-A53	7.0%	23.0%	38.0%	59.0%	75.0%	82.0%	84.0%
Cortex-A57/A72	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%

Source: Digitimes Research, February 2016

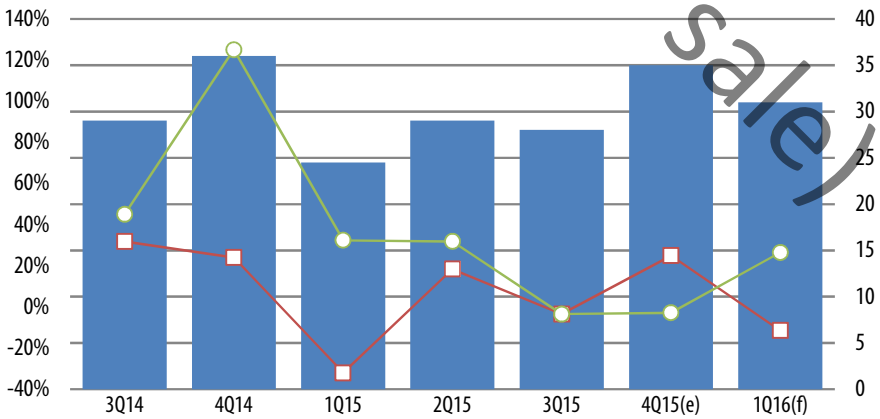
Qualcomm

Qualcomm mass shipped its new AP products in the fourth quarter of 2015 and saw strong demand for the solutions from clients. These boosted its shipments by 25% sequentially in the quarter.

Qualcomm's new products were mainly for the mid-range and high-end segments, which should relatively boost the chip supplier's profitability in the quarter.

As for the entry-level segment, compared to solutions from its competitors, Qualcomm's entry-level 4G solutions were still too expensive and placed the supplier at a disadvantage competing against Spreadtrum and MediaTek.

Chart 13: Qualcomm smartphone AP shipments, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Shipments	29.0	36.0	24.5	29.0	28.0	35.0	31.0
Q/Q	31.8%	24.1%	-31.9%	18.4%	-3.4%	25.0%	-11.4%
Y/Y	45.0%	125.0%	32.4%	31.8%	-3.4%	-2.8%	26.5%

Source: Digitimes Research, February 2016

1Q16 forecast

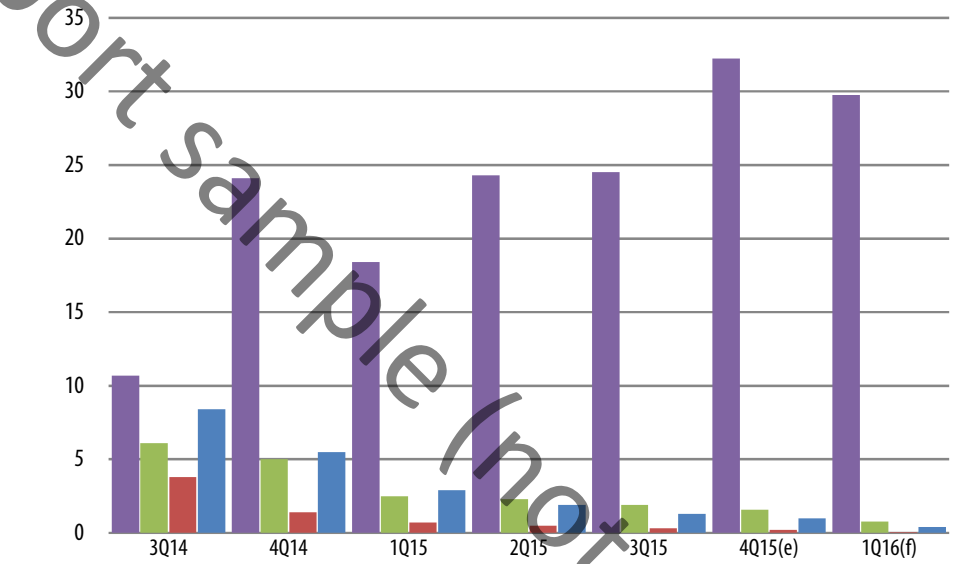
Qualcomm has prepared a complete product lineup for the first quarter 2016 and demand from clients will remain stable in the quarter due to its products' strong competitiveness. However, the company will still see a sequential decline of 11.4% in the quarter mainly because of its entry-level APs.

Compared to the same quarter a year ago, Qualcomm's smartphone AP shipments will still grow 26.5%.

By baseband type

Qualcomm's LTE-based AP solution shipments accounted for over 90% of the company's overall shipments in the fourth quarter of 2015. With LTE becoming the mainstream baseband type for Qualcomm, the supplier's 3G-based solution shipments continued decreasing in the quarter.

Chart 14: Qualcomm shipments by baseband type, 3Q14-1Q16 (m units)



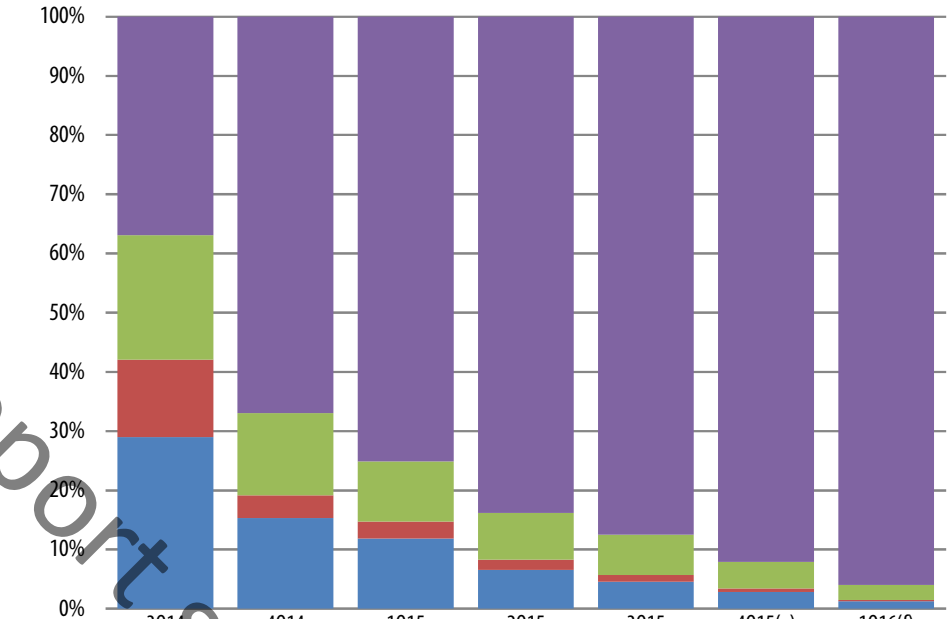
	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
WCDMA	8.40	5.50	2.90	1.91	1.29	0.98	0.40
TDSCDMA	3.80	1.40	0.70	0.49	0.31	0.21	0.06
CDMA	6.10	5.00	2.50	2.29	1.90	1.58	0.78
LTE	10.70	24.10	18.40	24.30	24.50	32.24	29.76

Source: Digitimes Research, February 2016

1Q16 forecast

The shipment share of Qualcomm's LTE-based AP solutions will rise further to 96% in the first quarter of 2016 with 3G solutions' combined share to drop to 4%.

Chart 15: Qualcomm shipment share by baseband type, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
LTE	36.9%	66.9%	75.1%	83.8%	87.5%	92.1%	96.0%
CDMA	21.0%	13.9%	10.2%	7.9%	6.8%	4.5%	2.5%
TDSCDMA	13.1%	3.9%	2.9%	1.7%	1.1%	0.6%	0.2%
WCDMA	29.0%	15.3%	11.8%	6.6%	4.6%	2.8%	1.3%

Source: Digitimes Research, February 2016

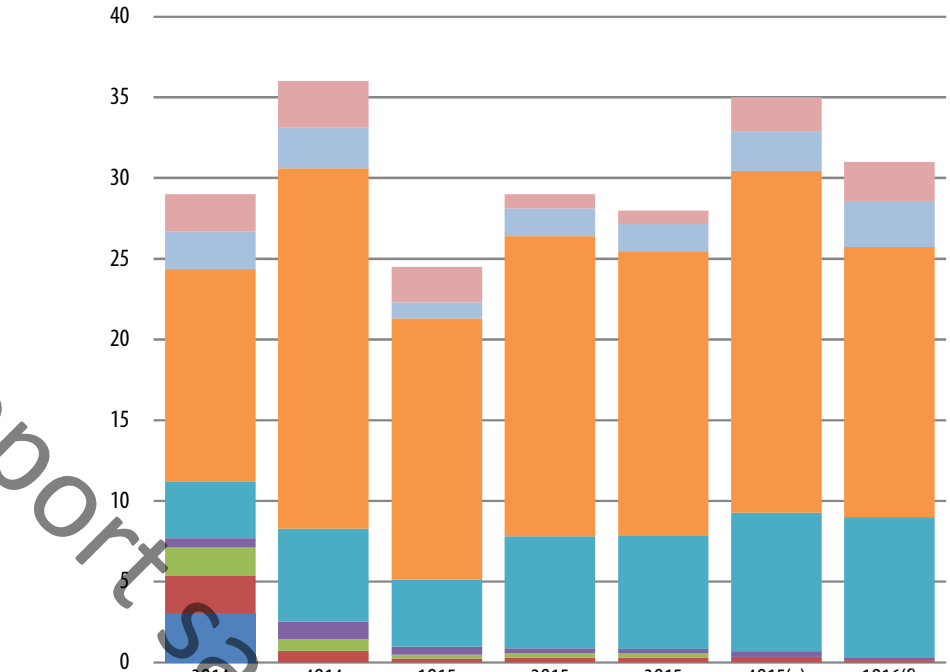
By architecture

Qualcomm released new AP solutions based on Snapdragon 400, 600 and 800 architectures in the fourth quarter of 2016. Among the three architectures, the Snapdragon 400 had the smallest sequential growth at only 20% in the quarter, while the Snapdragon 600 had 45.8% and the Snapdragon 800 150%.

The Snapdragon 400 was the largest architecture segment for Qualcomm's smartphone AP shipments, but its shipment share decreased from 63% to 60.5% in the fourth quarter of 2015.

Although Qualcomm did not release a new Snapdragon 200-based solution, shipments in the segment still grew 22.6% sequentially in the fourth quarter of 2015.

Chart 16: Qualcomm shipments by architecture, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Snapdragon 800	2.32	2.88	2.21	0.87	0.84	2.10	2.48
Snapdragon 600	2.32	2.52	0.98	1.74	1.68	2.45	2.79
Snapdragon 400	13.20	22.32	16.17	18.56	17.64	21.18	16.74
Snapdragon 200	3.48	5.76	4.16	6.96	7.00	8.58	8.68
S4	0.58	1.08	0.49	0.29	0.28	0.35	0.16
S3	1.74	0.72	0.25	0.29	0.28	0.00	0.00
S2	2.32	0.72	0.25	0.29	0.28	0.35	0.16
S1	3.05	0.00	0.00	0.00	0.00	0.00	0.00

Source: Digitimes Research, February 2016

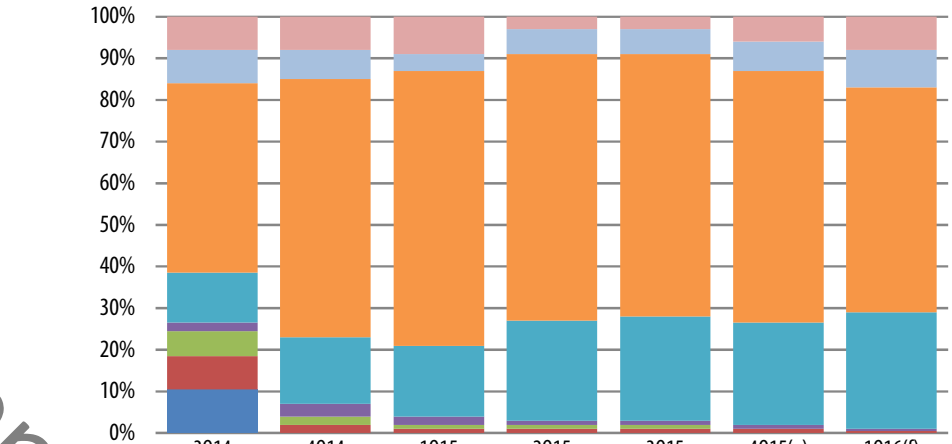
1Q16 forecast

Qualcomm's shipments of high-end Snapdragon 600- and 800-based AP solutions will both enjoy sequential growth in the first quarter of 2016, up 13.9% and 18.1%, respectively.

Among the Snapdragon series, the Snapdragon 400 will be the only sector to suffer shipment declines in the first quarter of 2016, dropping 21% sequentially.

Shipments in the Snapdragon 200 segment will grow 1.2% sequentially in the first quarter of 2016 as related solutions still have demand from several markets and Qualcomm will release new solutions based on the architecture in the quarter.

Chart 17: Qualcomm shipment share by architecture, 3Q14-1Q16



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Snapdragon 800	8.0%	8.0%	9.0%	3.0%	3.0%	6.0%	8.0%
Snapdragon 600	8.0%	7.0%	4.0%	6.0%	6.0%	7.0%	9.0%
Snapdragon 400	45.5%	62.0%	66.0%	64.0%	63.0%	60.5%	54.0%
Snapdragon 200	12.0%	16.0%	17.0%	24.0%	25.0%	24.5%	28.0%
S4	2.0%	3.0%	2.0%	1.0%	1.0%	1.0%	0.5%
S3	6.0%	2.0%	1.0%	1.0%	1.0%	0.0%	0.0%
S2	8.0%	2.0%	1.0%	1.0%	1.0%	1.0%	0.5%
S1	10.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

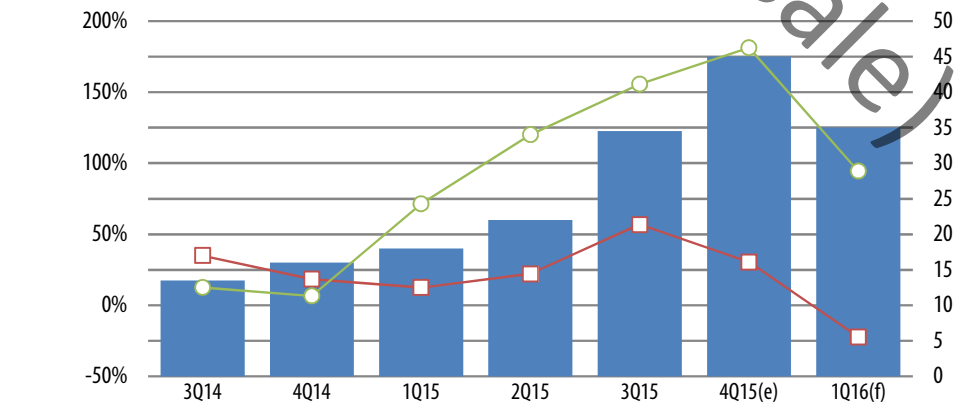
Source: Digitimes Research, February 2016

Spreadtrum

Spreadtrum had a simple product lineup for 2015 and mainly expanded its market share by offering inexpensive solutions. With aggressive promotions of its low-price 4G solutions, Spreadtrum managed to achieve 30.4% sequential growth in the fourth quarter of 2015.

Spreadtrum's inexpensive WCDMA-based solutions were also a driver to pump up the company's shipments in the fourth quarter of 2015. Since Qualcomm and MediaTek are no longer releasing new 3G solutions, Spreadtrum was able to snatch related demand from them and is seeing good business opportunity from emerging markets.

Chart 18: Spreadtrum smartphone AP shipments, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Shipments	13.5	16.0	18.0	22.0	34.5	45.0	35.0
Q/Q	35.0%	18.5%	12.5%	22.2%	56.8%	30.4%	-22.2%
Y/Y	12.5%	6.7%	71.4%	120.0%	155.6%	181.3%	94.4%

Source: Digitimes Research, February 2016

1Q16 forecast

Spreadtrum's new AP products including an in-house-designed eight-core LTE AP and Intel's LTE solution, which Spreadtrum will act as a distributor, will not be released until the second half of 2016 and therefore, Spreadtrum will still need to rely on its existing products to prop up its performance.

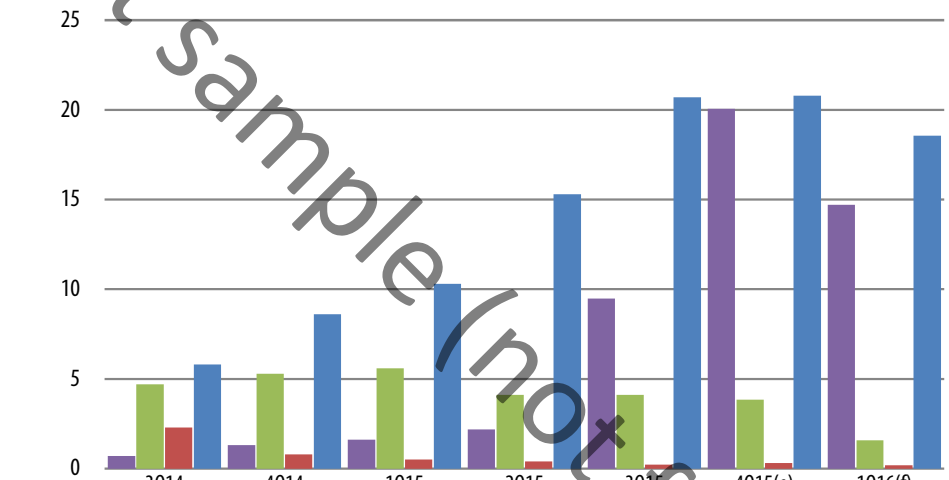
Without new products to stimulate demand from clients, Spreadtrum's shipments will drop 22.2% sequentially in the first quarter of 2016.

By baseband type

Spreadtrum shipped a similar amount of LTE- and WCDMA-based solutions in the fourth quarter of 2016, but its LTE-based AP solution shipments grew dramatically by 111% sequentially in the fourth quarter of 2015, while its WCDMA-based AP solution shipments almost had no growth.

Shipments in the TD-SCDMA segment rose slightly from a quarter ago in the fourth quarter of 2015 as demand from China's tier-3 to -4 cities increased. However, the company had decreased shipments for its Edge-based solutions.

Chart 19: Spreadtrum shipments by baseband type, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
WCDMA	5.80	8.60	10.30	15.30	20.70	20.79	18.55
TDSCDMA	2.30	0.80	0.50	0.40	0.21	0.32	0.18
EDGE	4.70	5.30	5.60	4.10	4.11	3.83	1.58
LTE	0.70	1.30	1.60	2.20	9.49	20.07	14.70

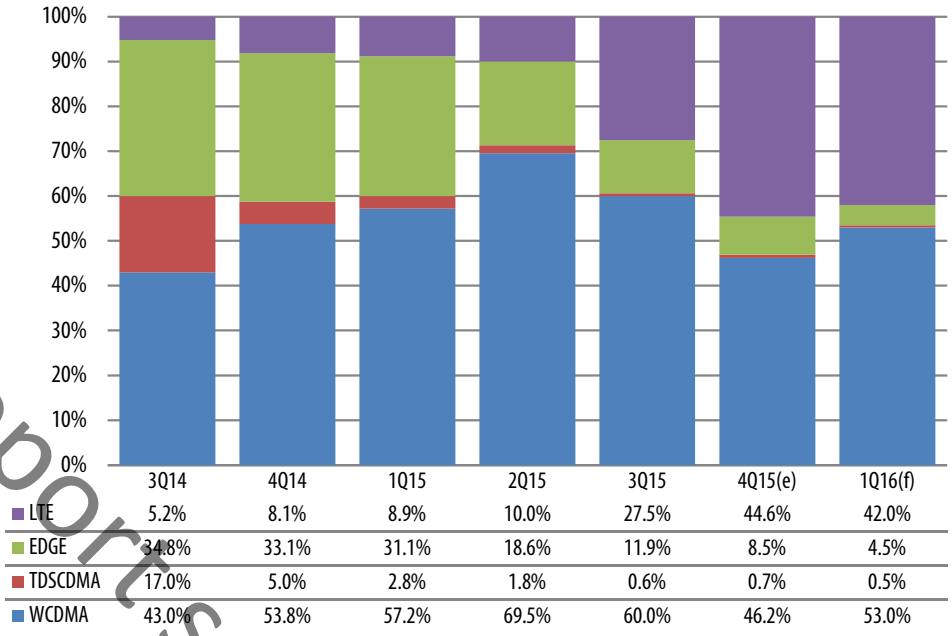
Source: Digitimes Research, February 2016

1Q16 forecast

Spreadtrum's LTE-based solutions will suffer a 26.8% shipment decline sequentially in the first quarter of 2016 because of weakening demand from China's smartphone vendors and Spreadtrum's clients have turned to seek solutions featuring Cat.6 technology, which Spreadtrum's LTE solutions currently still lack.

Spreadtrum will only see small orders for TD-SCDMA-based solutions, while EDGE-based solutions will see shipments drop to 1.58 million units.

Chart 20: Spreadtrum shipment share by baseband type, 3Q14-1Q16



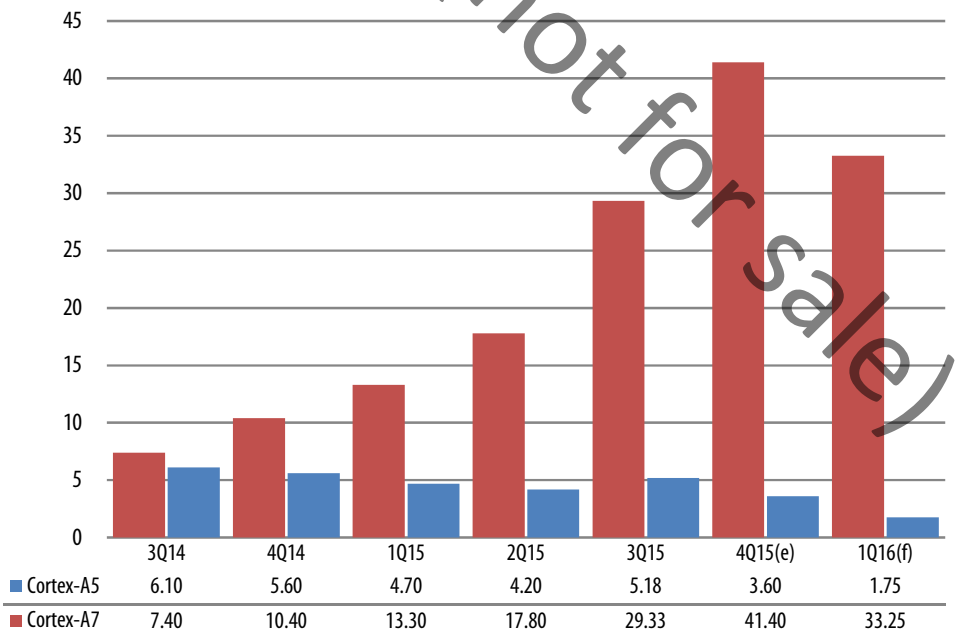
	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
LTE	5.2%	8.1%	8.9%	10.0%	27.5%	44.6%	42.0%
EDGE	34.8%	33.1%	31.1%	18.6%	11.9%	8.5%	4.5%
TDSCDMA	17.0%	5.0%	2.8%	1.8%	0.6%	0.7%	0.5%
WCDMA	43.0%	53.8%	57.2%	69.5%	60.0%	46.2%	53.0%

Source: Digitimes Research, February 2016

By architecture

With Spreadtrum continuing to increase its adoption of a Cortex-A7-based AP for its 3G and 4G solutions, the architecture achieved shipment share of 92% in the fourth quarter, leaving only about 8% to Cortex-A5-based solutions.

Chart 21: Spreadtrum shipments by architecture, 3Q14-1Q16 (m units)



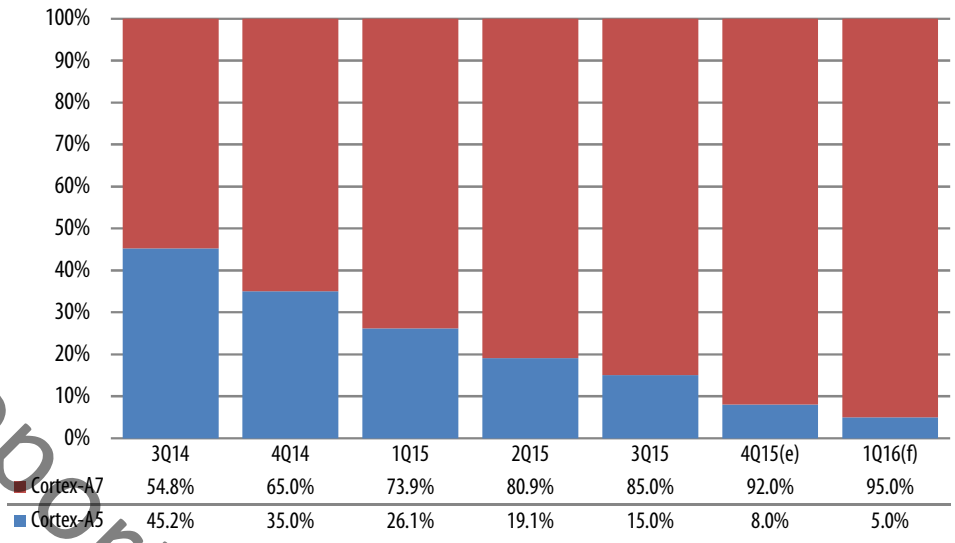
	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Cortex-A5	6.10	5.60	4.70	4.20	5.18	3.60	1.75
Cortex-A7	7.40	10.40	13.30	17.80	29.33	41.40	33.25

Source: Digitimes Research, February 2016

1Q16 forecast

The trend will continue in the first quarter of 2016 with Cortex-A7-based solutions to account for 95% of Spreadtrum's smartphone AP shipments.

Chart 22: Spreadtrum shipment share by architecture, 3Q14-1Q16

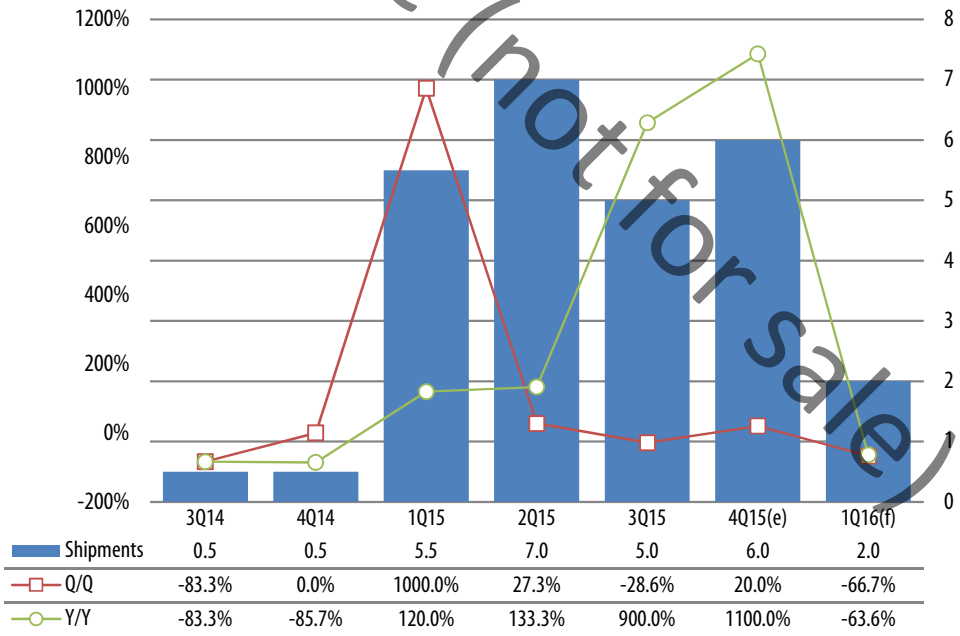


Source: Digitimes Research, February 2016

Leadcore

Leadcore's shipments increased 20% sequentially in the fourth quarter of 2015 mainly thanks to Xiaomi's aggressive promotions on its Hongmi 2A in the quarter.

Chart 23: Leadcore smartphone AP shipments, 3Q14-1Q16 (m units)



Source: Digitimes Research, February 2016

1Q16 forecast

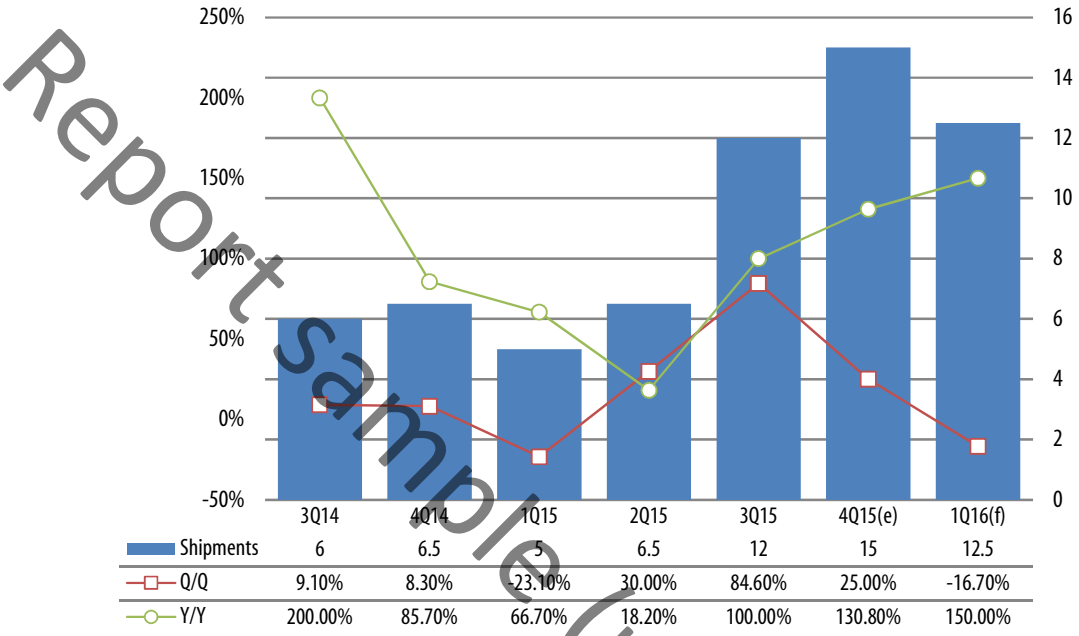
With the Hongmi 2A ready to be phased out from the market, Leadcore's shipments will drop sharply by 66.7% on quarter in the first quarter of 2016.

HiSilicon

HiSilicon's 25% sequential shipment growth in the fourth quarter of 2015 was partly contributed by the supplier's new high-end solution released in the quarter.

However, HiSilicon's mid-range Kirin930/935 solutions were the main growth driver for the fourth quarter of 2015.

Chart 24: HiSilicon smartphone AP shipments, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Shipments	6	6.5	5	6.5	12	15	12.5
Q/Q	9.10%	8.30%	-23.10%	30.00%	84.60%	25.00%	-16.70%
Y/Y	200.00%	85.70%	66.70%	18.20%	100.00%	130.80%	150.00%

Source: Digitimes Research, February 2016

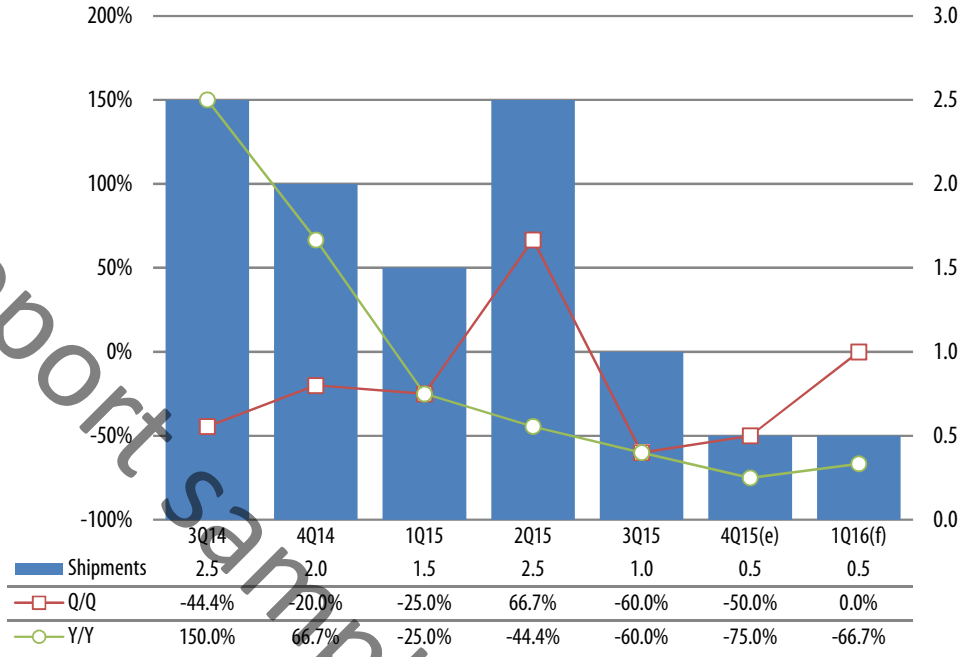
1Q16 forecast

Although HiSilicon's high-end solution will have dramatic shipment growth in the first quarter of 2016, the increased volume will still not be sufficient to offset the shipment declines from other AP products.

HiSilicon is mainly relying on its Kirin930/935 solutions to compete in the mid-range segment, but facing Qualcomm's competition, the supplier is unlikely to regain shipment growth until the second quarter, when the company will release its new solutions.

Marvell

Chart 25: Marvell smartphone AP shipments, 3Q14-1Q16 (m units)



	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15(e)	1Q16(f)
Shipments	2.5	2.0	1.5	2.5	1.0	0.5	0.5
Q/Q	-44.4%	-20.0%	-25.0%	66.7%	-60.0%	-50.0%	0.0%
Y/Y	150.0%	66.7%	-25.0%	-44.4%	-60.0%	-75.0%	-66.7%

Source: Digitimes Research, February 2016