

RF Devices/Modules For Cellular Terminal Quarterly Market Report

1Q-CY2011

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Cellular Terminal Variation & Definition

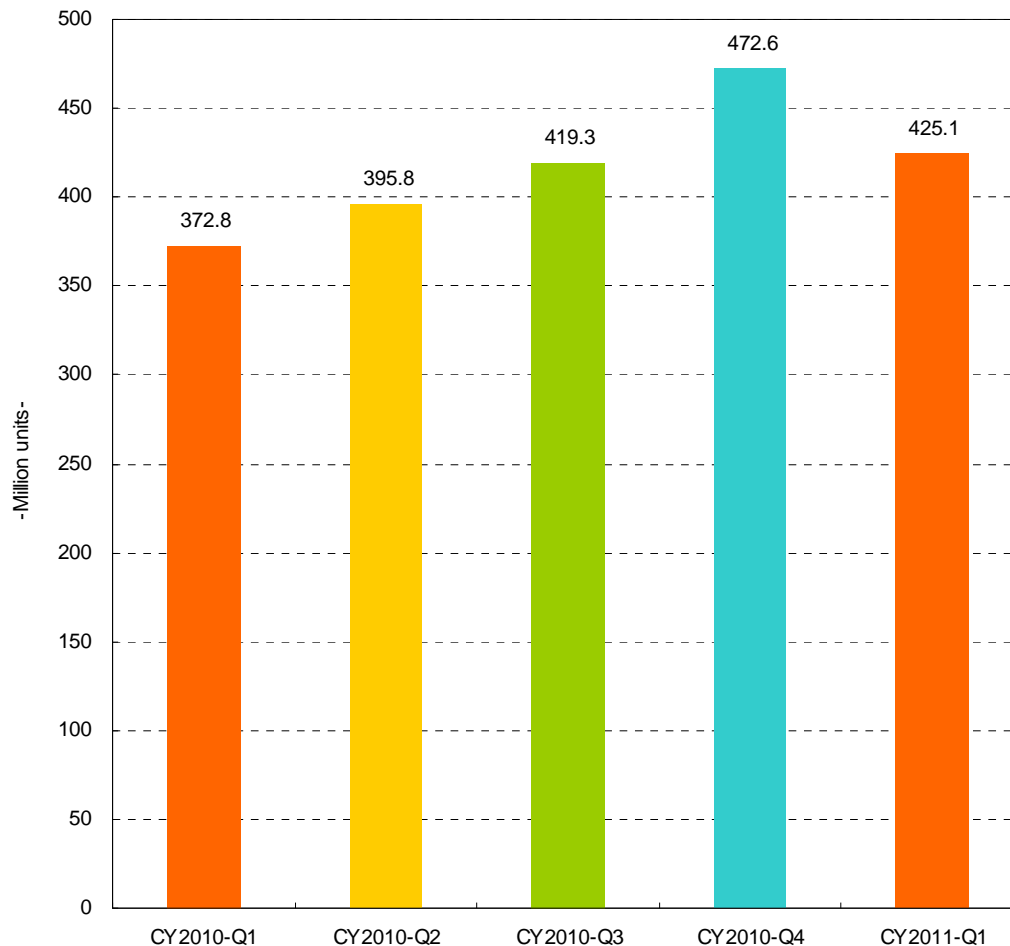


Non-Voice

Voice

Cellular Terminals		Notes
E-book Reader		Amazon KindleやSONY Reader Daily Edition等、Cellular 機能を備える製品が増加。
Tablet PC		Apple iPadが代表的な製品。今後はAndroid タブレットが複数メーカーから製品化の見込。
WWAN Terminal	Adapter/Dongle	Notebook PC向けのUSBやPCカード(PCMCIA)タイプのWWAN Terminal。アンテナまで内蔵、3G規格対応製品が大半。
	Embedded Module(Mini PCI)	Notebook PCなどに内蔵されるタイプのWWAN Terminal。標準搭載するNotebook PCが増加傾向に。(Mini PCI express)
Smart Phone		APIが公開されている汎用OSを採用。 ネイティブソフトがアドオンで利用可能。
Traditional Handset	Mobile Phone	音声通信を中心とした従来型の携帯電話。 データ通信も可能な製品が大半になっている。
	Fixed Wireless Terminal	固定電話をCDMAやGSMのセルラー網で実現。 新興国において、有線電話インフラより導入が容易とされる。

Cellular Terminal Quarterly Shipment History

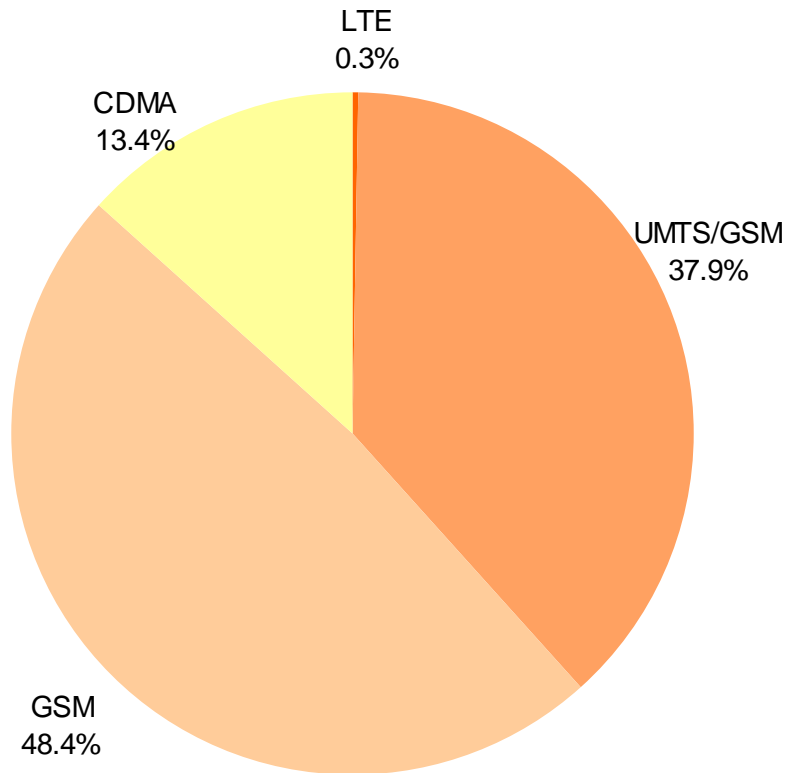


- ◆ Cellular terminal shipment for 2011/Q1 (2011/1-3) was 425.1 million, 89.9% QoQ, 114.0% YoY.
- ◆ -10.1% QoQ differential is generally due to annual season factor.
- ◆ +14.0% positive differential is driven by steady smartphone demand expansion.
- ◆ Cellular terminal shipment after Q2 may take impact of Major Japan Earthquake on March 11 which distracted supply chain.

Quarter	CY2010-Q1	CY2010-Q2	CY2010-Q3	CY2010-Q4	CY2011-Q1
Shipment	372.8	395.8	419.3	472.6	425.1
qoq	-	106.2%	105.9%	112.7%	89.9%
yoy	-	-	-	-	114.0%

Estimate by Navian

2011/Q1 Shipment Breakdown per Protocol



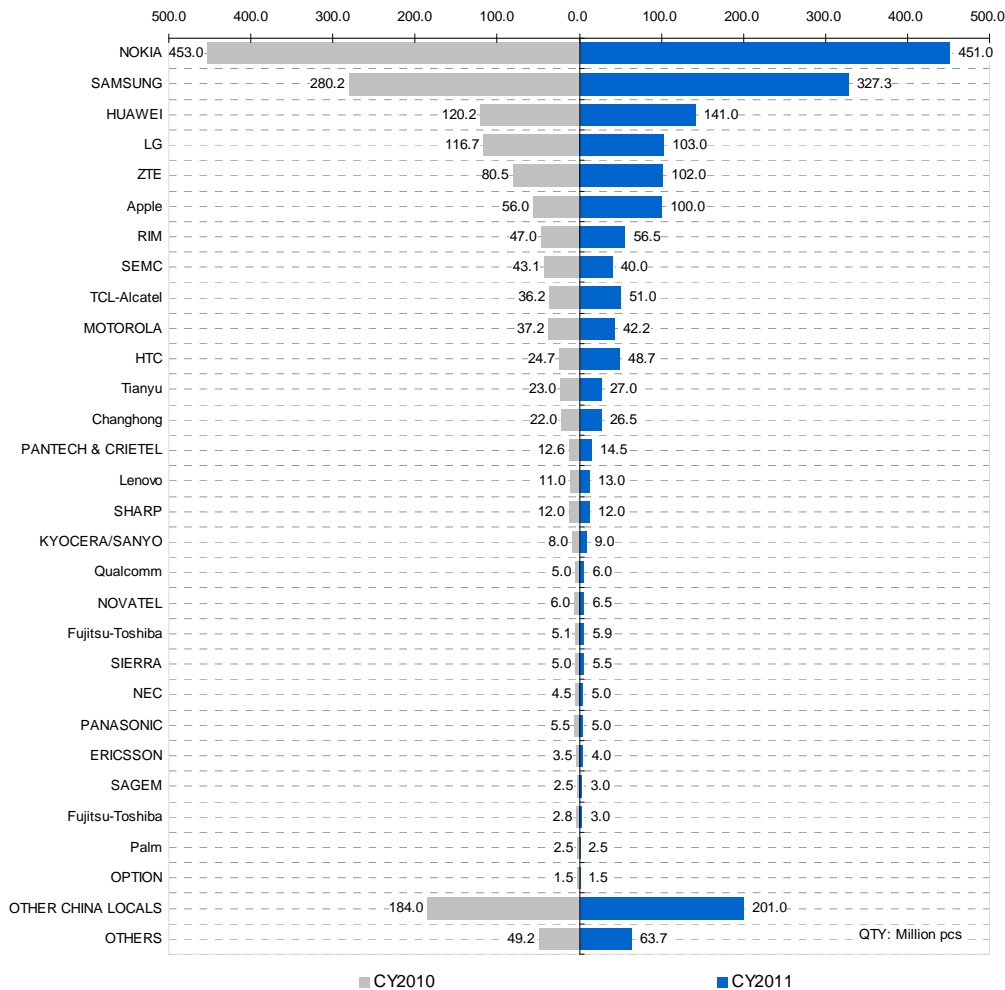
Estimate by Navian

LTE	UMTS/GSM	GSM	CDMA
1.2	156.0	199.2	55.1
WCDMA	TD-SCDMA	CDMA/GSM	iDEN
1.2	8.2	2.1	2.1
Million units			TOTAL
			425.1

- ◆ 2011/Q1 (Jan.–Mar.) Cellular terminal radio per protocol:
46.9% for GSM
36.7% for UMTS/GSM
13.0% for CDMA
- ◆ Smartphone market rapid expansion drives UMTS/GSM widespread, possibly take pole position in front of GSM in the next few years.
- ◆ LTE, the 3.9G shares only 0.3%.
- ◆ LTE with low share is due to low popularity in Europe where first service was launched in 2009.
- ◆ LTE forecasts widespread by Verizon and other US carriers, equipped with LTE/CDMA dual mode.

Forecast/CY2010 Cellular Terminal Manufacturer Share

- ◆ Top manufacturer such as NOKIA and LG expected to perform lower than previous year.
- ◆ SAMSUNG remains weak for having business reason to expand smartphone sales after Q2.
- ◆ Apple and HTC maintain winning in the market, but RIM's slowing down becomes apparent.

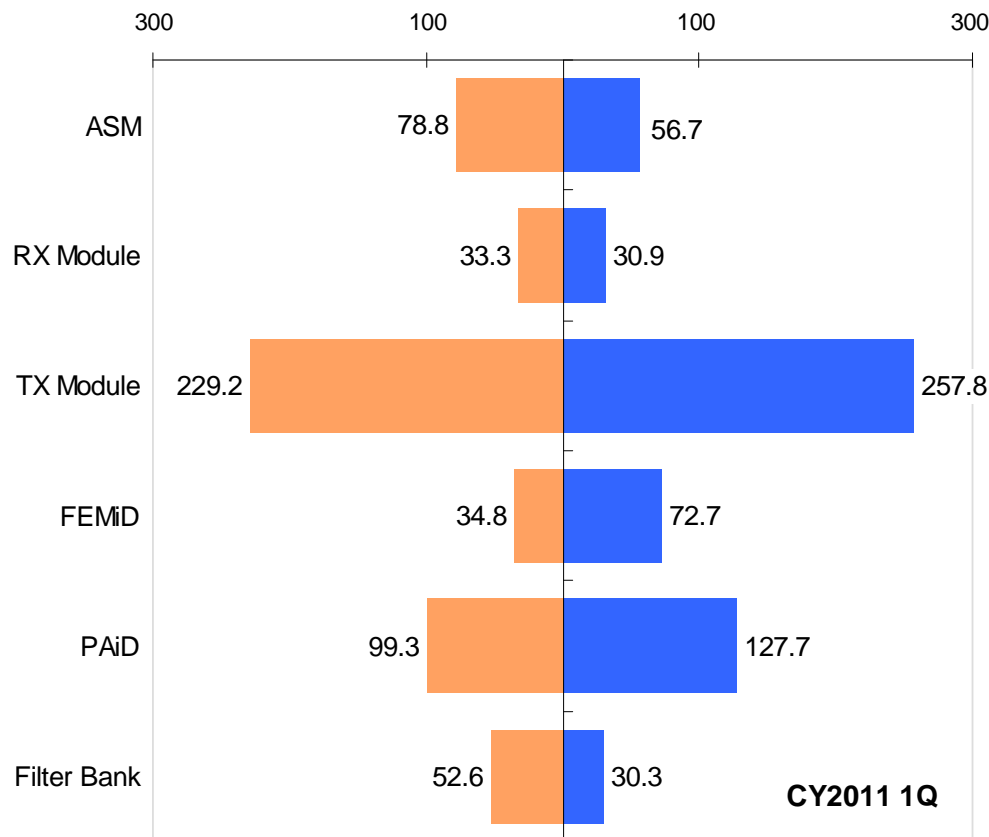


MFR	CY2010	share	CY2011	share	yoy
NOKIA	453.0	27.3%	451.0	24.0%	99.6%
SAMSUNG	280.2	16.9%	327.3	17.4%	116.8%
HUAWEI	120.2	7.2%	141.0	7.5%	117.3%
LG	116.7	7.0%	103.0	5.5%	88.3%
ZTE	80.5	4.8%	102.0	5.4%	126.7%
Apple	56.0	3.4%	100.0	5.3%	178.6%
RIM	47.0	2.8%	56.5	3.0%	120.2%
SEMC	43.1	2.6%	40.0	2.1%	92.8%
TCL-Alcatel	36.2	2.2%	51.0	2.7%	140.9%
MOTOROLA	37.2	2.2%	42.2	2.2%	113.4%
HTC	24.7	1.5%	48.7	2.6%	197.2%
Tianyu	23.0	1.4%	27.0	1.4%	117.4%
Changhong	22.0	1.3%	26.5	1.4%	120.5%
PANTECH & CRIETEL	12.6	0.8%	14.5	0.8%	115.1%
Lenovo	11.0	0.7%	13.0	0.7%	118.2%
SHARP	12.0	0.7%	12.0	0.6%	100.0%
KYOCERA/SANYO	8.0	0.5%	9.0	0.5%	112.5%
Qualcomm	5.0	0.3%	6.0	0.3%	120.0%
NOVATEL	6.0	0.4%	6.5	0.3%	108.3%
Fujitsu-Toshiba	5.1	0.3%	5.9	0.3%	115.7%
SIERRA	5.0	0.3%	5.5	0.3%	110.0%
NEC	4.5	0.3%	5.0	0.3%	111.1%
PANASONIC	5.5	0.3%	5.0	0.3%	90.9%
ERICSSON	3.5	0.2%	4.0	0.2%	114.3%
SAGEM	2.5	0.2%	3.0	0.2%	120.0%
Fujitsu-Toshiba	2.8	0.2%	3.0	0.2%	107.1%
Palm	2.5	0.2%	2.5	0.1%	100.0%
OPTION	1.5	0.1%	1.5	0.1%	100.0%
OTHER CHINA LOCALS	184.0	11.1%	201.0	10.7%	109.2%
OTHERS	49.2	3.0%	63.7	3.4%	129.5%
TOTAL	1,660.5	100.0%	1,877.3	100.0%	113.1%

Million units

Estimate by Navian

2011/Q1: Front End Module Market



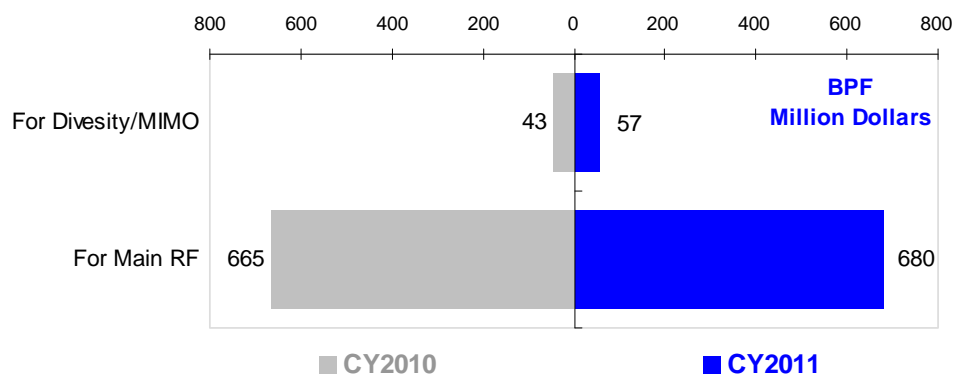
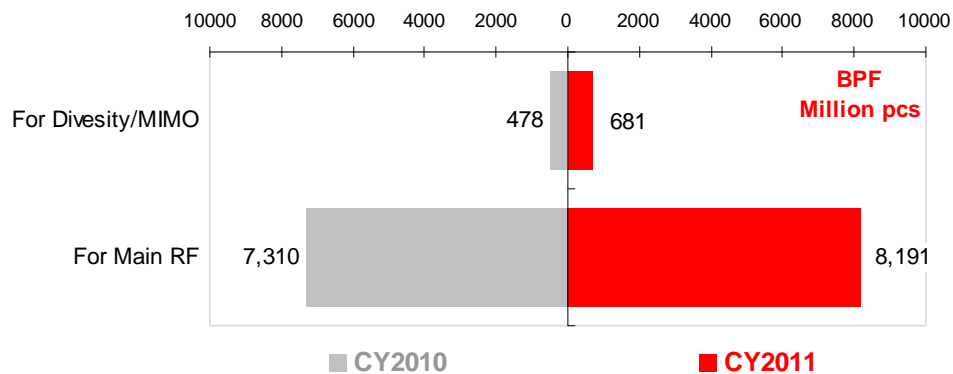
■ Million pcs

■ Million dollars

FEMs	Million pcs	Million dollars	Unit price:\$
ASM	78.8	56.7	0.720
RXM	33.3	30.9	0.927
TXM	229.2	257.8	1.125
FEMiD	34.8	72.7	2.089
PAiD	99.3	127.7	1.286
Filter Bank	52.6	30.3	0.576
TOTAL(Ave)	528.0	576.0	1.091

- ◆ 2011/Q1 Front End Module market estimation: 528 million units for 576 million USD.
- ◆ Unit/Sales – TX Module, standard of GSM Front End Module, occupies large share in the market. FEMiD demands for multi-band 3G/4G is also increasing.
- ◆ 2011/Q1 FEMiD market: 34.8 million units for 72.7 million USD.
- ◆ Demand by NOKIA, started adopting in second half of 2010, occupies 13 million.
- ◆ Since 2011: 4 million+ monthly production.
After 2011/Q2: 6 million/month

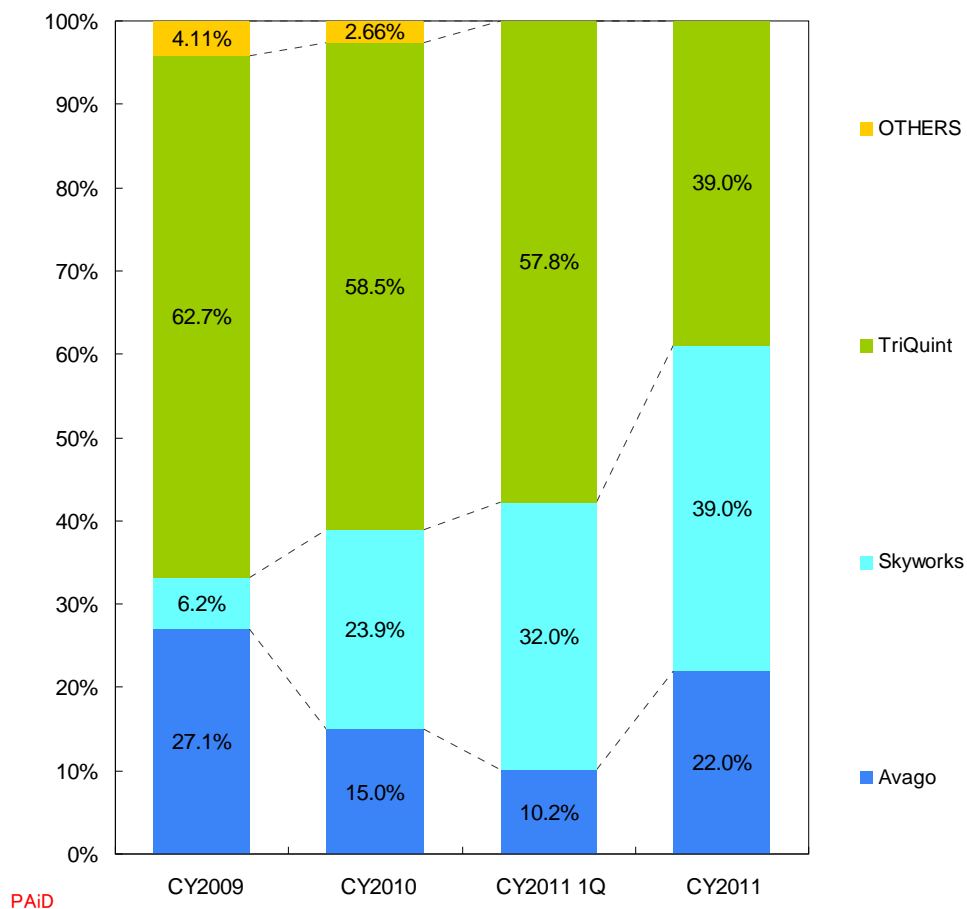
2011: Band Pass Filter Market Forecast



BPF		CY2009	CY2010	yoy	CY2011	yoy
QTY Million pcs	For Diversity/MIMO	305.0	477.6	156.6%	681.0	142.6%
	For Main RF	5,835.4	7,309.8	125.3%	8,190.5	112.0%
	TOTAL	6,140.4	7,787.4	126.8%	8,871.5	113.9%
AMOUNT Million dollars	For Diversity/MIMO	31.4	43.5	138.3%	56.5	130.1%
	For Main RF	601.0	665.2	110.7%	679.8	102.2%
	TOTAL	632.5	708.7	112.0%	736.3	103.9%
Unit price:\$	For Diversity/MIMO	0.103	0.091	88.3%	0.083	91.2%
	For Main RF	0.103	0.091	88.3%	0.083	91.2%
	AVERAGE	0.103	0.091	88.3%	0.083	91.2%

- ◆ 2011 Band Pass Filter market estimation:
8.8715 billion units (113.9% YoY) for 736.3 million USD (103.9% YoY).
- ◆ Band Pass Filter has maintained high level increase due to steady cellular phone market expansion and progress of multi-band migration on UMTS terminals. Component count reduction factors such as omitting interstage filter and sharing filters among GSM impacts to slow down growth.
- ◆ RX Diversity and MIMO/MIMO adoption will start contributing to increase demand for Band Pass Filter after 2012.

2011/Q1: PAiD Market Share & Forecast



- ◆ PAiD market manufacturer share depends on Apple's adoption status, which consumes most of the emerging demands.
- ◆ 2010, iPhone 4 was released. TriQuint and Skyworks were adopted. Skyworks' share is rapidly rising.
- ◆ TriQuint markets new client such as SAMSUNG, but share is dropping.
- ◆ New iPhone scheduled to be launched in Autumn 2011 may cause further chaos in PAiD supply market. Share may change.

MAKER	CY2009	share	CY2010	share	yoy	CY2011 1Q	share	CY2011 TOTAL	share	yoy '11/'10
Skyworks	9.0	6.2%	72.0	23.9%	800.0%	31.8	32.0%	147.0	39.0%	204.2%
TriQuint	91.5	62.7%	176.0	58.5%	192.3%	57.4	57.8%	147.0	39.0%	83.5%
Avago	39.5	27.1%	45.0	15.0%	113.9%	10.1	10.2%	83.0	22.0%	184.4%
OTHERS	6.0	4.1%	8.0	2.7%	133.3%	0.0	0.0%	0.0	0.0%	0.0%
TOTAL	146.0	100.0%	301.0	100.0%	206.2%	99.3	100.0%	377.0	100.0%	125.2%

Million pcs

Teardown Summary 1/4 -FEM/RF IC/Base band IC-

Brand		NOKIA	RIM	Huawei	SEMC	LG	HTC	
Category		Smartphone	Smartphone	Smartphone	Smartphone	WWAN USB dongle	Smartphone	
PRODUCT ID		X3-02	BlackBerry 9630 Tour	IDEOS U8150-B	SO-01C Xperia ARC	docomo L-02C	Thunderbolt	
Shop price		March-April	329 USD	571 USD	195 USD	559 USD	-	425 USD
Release date		2010 September	2010 July	2010 September	2011 April	2010 December	2011 March	
FEM-1	TYPE	FEMiD	ASM	RX Module	ASM	RX Module	-	
	MAKER	TDK-EPC	SONY	MURATA	SONY	TDK-EPC	-	
	SIZE	8.7x6.0x1.15	3.8x3.0x0.8	4.55x4.49x1.1	3.8x3.0x0.8	4.5x3.2x1.1	-	
FEM-2	TYPE	-	Band-2 PAiD	-	-	-	-	
	MAKER	-	Avago	-	-	-	-	
	SIZE	-	7.0x4.0x1.1	-	-	-	-	
FEM-3	TYPE	-	Band-5 PAiD	-	-	-	-	
	MAKER	-	TriQuint	-	-	-	-	
	SIZE	-	7.0x4.0x1.1	-	-	-	-	
FEM-4	TYPE	-	-	-	-	-	-	
	MAKER	-	-	-	-	-	-	
	SIZE	-	-	-	-	-	-	
RF IC	RF IC	ST-Ericsson	Qualcomm RTR6285/RTR6500	Qualcomm RTR6285	Qualcomm QTR8200	Qualcomm RTR8600	Qualcomm QTR8600/RTR8605	
Baseband	Baseband	ST-Ericsson	Qualcomm MSM7600	Qualcomm MSM7225	Qualcomm MSM8255	Qualcomm MDM9200	Qualcomm MDM9600	

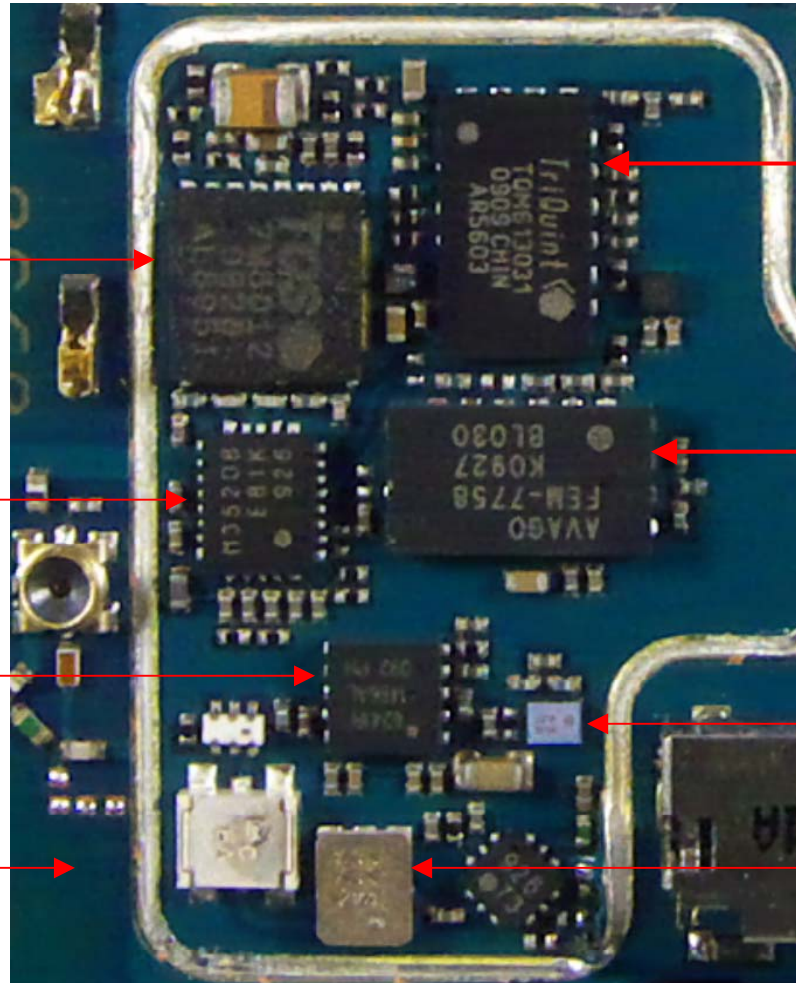
BlackBerry Tour 9630 3/6 Main RF Section

GSM PAM
TQM7M5012
5.11x5.06x1.16mm
TriQuint

Antenna Switch Module
SP10T M3520
3.0mmx3.8mmx0.8mm
SONY

UMTS Band-1 PAM
AMMC-6241
3.2mmx2.5mmx1.2mm
Avago

UMTS Band-1 Isolator
3.2mmx2.5mmx1.2mm
MURATA



PAiD Band-5
TQM613031
7.0x4.0x1.1mm
TriQuint

PAiD Band-2
AFEM-7758
7.0x4.0x1.1mm
Avago

UMTS Band-1 TX SAW Filter
1.4mmx1.1mmx0.4mm
TDK-EPC

UMTS Band-1 Duplexer
3.05mmx2.54mmx0.84mm
MURATA