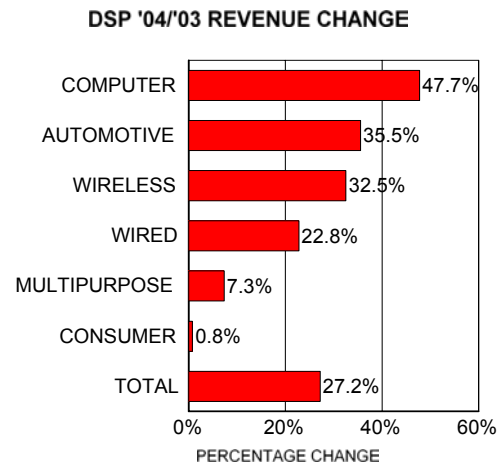
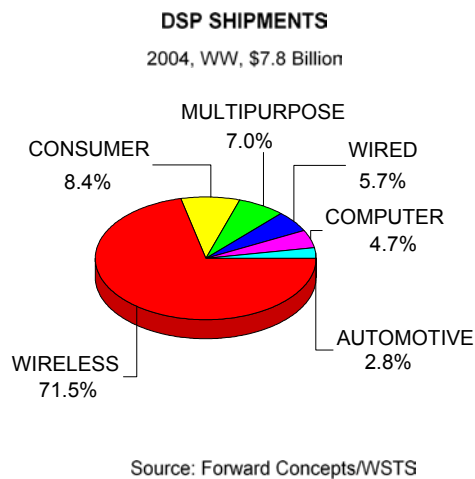




**FORWARD CONCEPTS'
DSP/WIRELESS MARKET BULLETIN**
2/9/05

2004: A Good Year

The DSP chip market was up just under the 30% that we had predicted, actually 27.2%. As one might expect, the principal driver has been the wireless market, which now constitutes almost three fourths of the DSP market, at 71.5% (up from 68% in 2003), as illustrated below. Unfortunately, most of the gains occurred in the first half, with the second half of the year being relatively flat as (mostly) Chinese cellphone makers found themselves with a glut of inventory that had to be bled off, slowing new baseband chip orders.



Note the year-on-year revenue changes in the accompanying bar chart. Although relatively small in size, the computer market segment (mostly disk drive controllers) grew the most, by close to 50%, but it still didn't reach 2003 levels. Note that we don't expect much future growth in this segment in the future, as most disk drive controllers are becoming SoC (system-on-chip) solutions that include read channels, and are increasingly reported (to WSTS) as "ASICs." The automotive segment consists mostly of dashboard entertainment and navigation electronics and a small amount of drive-train DSP silicon, where MCUs are "good enough," for now. The automotive segment is also small, but growth is monotonically upwards, and will continue to grow, in my opinion.

Wireless, of course is the biggest market segment and its 33% growth is very respectable. The telecom "Nuclear Winter" has finally turned to Spring, thanks to DSP growth (much for Wi-Fi "hotspots") and VoIP growth. We forecast continuing growth from this point onwards. The consumer segment had an outstanding 108% market growth in 2003 and stayed at a relatively high level (\$654 million). It should be noted that most DSP silicon in the consumer market is "embedded" and is not classified as DSP. The multipurpose segment consists mostly of relatively low-volume (but high ASP) sales through catalogs and distributors. It has continued to grow since 2003, but could fluctuate, since introduction of new off-the-shelf chip designs are often reflected in this category.

Geography Shift Continues

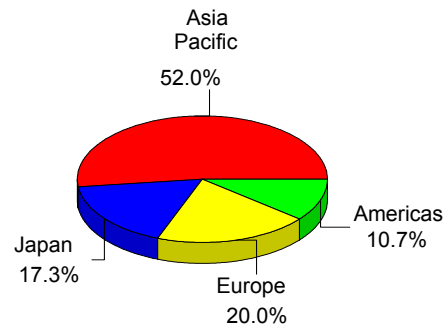
DSP chips for cellular handsets constitute the largest market and are the real market movers and the biggest cellular market is now China, the accompanying chart indicates that Asia Pacific (mostly China, but including Taiwan, Korea and Singapore, too) is now over half the world market for DSP silicon.

Vendor Ranking Surprise

After interviews with the major DSP chip vendors, Forward Concepts has estimated 2002 market shares as illustrated in the pie chart below. As you might expect, TI continues to lead the pack, with shipment growth that increased their market share to 50%.

DSP GLOBAL SHIPMENTS

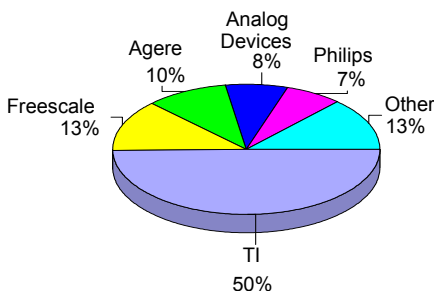
2004, \$7.8 Billion



Source: Forward Concepts/WSTS

DSP VENDOR MARKET SHARES

CY 2004: \$7.8 Billion



Note our inclusion of **Philips Semiconductor** for the first time. The company's 2004 DSP revenue growth of 407% moved them out of the "other" category (as we have reported them in the past) and into respectability. Philips' rapid growth is attributable to its cellphone baseband chips, which passed the 30-million-unit mark in shipments. Freescale (formerly Motorola Semiconductor) also had remarkable growth in the cellphone market, with 59% growth in overall DSP shipments.

Details on DSP chip company shares and their revenue growth for 2003 and 2004 are presented in the table below.

Note that Agere's DSP shipments are understated. As the #1 supplier of DSP-based hard disk controllers, Agere no longer reports those shipments as DSPs. Since both the read channel and controller have been integrated on the same die as an SoC, often custom to a particular customer, Agere now reports virtually all of them as "ASICs."

PROGRAMMABLE DSP CHIP MARKET SHARES

(Revenues in \$Millions)

Company	2003 Revenue	Market Share	Y-Y Change	2004 Revenue	Market Share	Y-Y Change
Texas Instruments	\$2,926	47.7%	39.7%	\$3,875	49.7%	32.4%
Freescale Semiconductor	\$631	10.3%	-7.7%	\$1,004	12.9%	59.1%
Agere Systems	\$806	13.1%	19.4%	\$768	9.8%	-4.7%
Analog Devices	\$464	7.6%	7.2%	\$600	7.7%	29.3%
Philips Semiconductor	\$105	1.7%		\$533	6.8%	407.6%
Other	\$1,198	19.5%	23.8%	\$1,018	13.1%	-15.0%
Total	\$6,130	100.0%	26.3%	\$7,798	100.0%	27.2%

2005: Looking OK, but not Exciting

Other analysts have forecast overall 2005 semiconductor shipments to grow, variously, from -5% to +5% (with one outlier in Europe at +15%). In short, it looks like a flat-growth year, but at a reasonably high level of shipments. The DSP market is now largely driven by wireless growth that appears to be in the 10%-12% cellphone growth range. Consequently, we are lowering our earlier DSP shipment forecast for 2005 from 20% to 10%. We forecast that UMTS/WCDMA will finally catch on this year and next year (2006) will see healthier 25% growth as many subscribers upgrade to the newer technology.

PROGRAMMABLE DSP CHIP MARKET (WORLDWIDE, \$MILLIONS)

'04	'05E	'06E	'07E	'08E	'09E	CAGR
\$7,798	\$8,578	\$10,722	\$12,867	\$15,440	\$18,528	18.9%

Source: Forward Concepts

On a long-term basis, wireless will still be the market to bet on, since cellphones are sucking in all the functionality (and market shares) of PDAs, MP3 players, digital cameras, GPS navigation, Wi-Fi & Bluetooth connectivity and more. But VoIP has finally re-emerged as a growth market, thanks to Vonage, AT&T, Skype and their cousins. Consumer markets are driven by multimedia capabilities, and you can't have multimedia without DSP. The same is true for automotive multimedia and telematics. And a lot of DSP is being morphed into SoC implementations, losing its separate identity, but constituting some two-thirds of the universe of DSP-centric chips.

For our next Act:

Forward Concepts has been studying the cellular handset market for the past six months. Shortly after we return from our visit to the **3GSM World Congress** in Cannes, France next week, we will formally announce our latest (550-page) study that is now in final edit:

GLOBAL CELLULAR HANDSET & CHIP MARKETS:

An In-Depth Analysis of Cellphone ODMs, OEMs, Chips,
Cellular Operators & Subscribers

As always, we welcome your comments.

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