

## CDMA phones: Cost, waning market restrict growth

Thursday, 10 September 2009

The segment persists despite limited demand and competing technologies. White-box phones are mainstays.

The manufacture of dual-mode GSM/CDMA mobile phones in China remains targeted at niche markets consisting primarily of business executives and international travelers even though demand from general consumers has improved.

This is because suppliers are still coming to terms with the cost issues that go with creating handsets that can work in two networks under different technologies.

Patent fees and the use of a combination of ICs make GSM/CDMA models more expensive to develop than the popular dual-SIM GSM phones, which rely on a single module.

As such, most companies cater to the low-end and midrange segments, leaving tier 1 enterprises to deal with patent, expense and other design concerns.

Suppliers likewise face limitations related to performance. RF interference between the two standards is one consideration, involving discussions on antenna positioning, components selection, and board and circuit design.

In addition, the potential for GSM/CDMA handsets remains limited. Driven by the rapid development of the 3G air interface, GSM/W-CDMA models continue to occupy nearly 90 percent of the worldwide mobile phone market.

Industry stakeholders are also pushing the LTE standard as the chief migration pathway for 4G, which could potentially hasten the decline of the dual-mode product line.

Currently, annual global shipments of dual-mode GSM/CDMA handsets are quite modest at 20 million units since such models can only be used in locations where both networks are supported. The figure is not likely to rise significantly in the near future as mobile phone exports are actually sagging.

In China alone, exports dropped 10 percent in 1Q09 while output fell nearly 4 percent, according to iSuppli and IDC.

Global industry driver

Regardless of the bleak outlook, China plays an important role in the dual-mode GSM/CDMA line. Aside from being the top production center for mobile phones, the country has the second-largest CDMA network in the world with about 30

million subscribers.

There are about 200 makers of dual-mode GSM/CDMA handsets in China, located mostly in Guangdong province. More than 95 percent are white-box companies that turn out approximately 10,000 low-end designs monthly. The key export market is the Middle East.

Suppliers generally approach R&D in one of three ways, the first of which is through an in-house design team.

Subcontracting the development of new models to design houses is the second option. The last method involves outsourcing the motherboard and conducting assembly, testing and packaging in-house, a practice often adopted by smaller makers.

Other operations, however, utilize all three. At KingTech Sci. & Tech. (Shenzhen) Co. Ltd, for example, 30 personnel are responsible for PCB and software design, while new models are developed together with an external partner. The last also provides KingTech with motherboards. The company exports 10,000 GSM/CDMA mobile phones a month.

The line was introduced in China by Samsung in response to strong demand for dual-mode handsets. Yulong followed suit, developing the world's first dual-mode, dualstandby mobile phone.

Initially, only top-tier companies such as ZTE, Yulong, Huawei and Hisense were engaged in the line. Together with Samsung, the first three continue to cater primarily to the domestic market. Each can turn out 100,000 to 1 million units annually.

Most small and midsize players, on the other hand, were hampered by US-based Qualcomm's billion-dollar patent fees and the added cost of platform, chipsets and fixedratio royalties.

Between 2007 and 2008, low-end models retailed for \$260 due to the high technical threshold necessary to manufacture dual-mode handsets.

Production costs have since gone down, a result partly of Via challenging the Qualcomm monopoly with its acquisition of LSI's CDMA chipset business in 2002. Chips from the Taiwan provider are mostly for low-end and midrange models.

Qualcomm responded by offering board-level licenses specifically to mainland China manufacturers. Since 2008, the company has been cooperating with local design houses to develop and produce finished motherboards for mobile phone makers, with patent and other fees included in the package.

As a result, prices of low-end GSM/CDMA phones have dropped to \$60 on average. The least-expensive Qualcomm-based CDMA handset is about \$45. Those fitted with a Via chip are quoted at roughly \$30 each.

## Low-cost units prevail

Dual-mode GSM/CDMA mobile phones come in two main types. The first is based on a solution where one independent application processor controls two sets of chips.

Each group contains a baseband processor, one GSM and the other CDMA, with either supported by its own RF power management IC. This design provides a more interactive operation that meets the requirements of a feature-rich, high-end unit.

The second type uses one baseband chip to control its counterpart. In this setup, a GSM baseband processor acts as host to control the CDMA IC, or vice versa.

This solution allows fewer applications and slows down multitasking but offers a less-expensive alternative for low-end and midsize markets.

This particular design is the mainstream in China. Most setups use a GSM baseband chip from MTK as host, paired with Qualcomm's CDMA chip.

As most companies adopt the same solution, the key specifications of China-made dual-mode phones are almost similar. Suppliers, however, do apply the latest design trends in new models. These include G-sensors, analog/digital TVs, multitouch technology and high-resolution cameras.

The application processor hosting solution is mostly adopted for the high-end market. Most of these products are already in the smartphones class with features and functions such as a QWERTY keyboard, software support, Wi-Fi and GPS.

Generally, a dual-mode GSM/CDMA phone is \$20 to \$30 more expensive than a GSM model with the same specifications.

Low-end units that support GSM 900/1,800/1,900+CDMA 800MHz have a 300,000-pixel camera, Bluetooth, FM radio and TF card extension. The chips used are usually MTK 6223 and QCS 6010. Models under this category have a 1.8 to 2.4in CSTN or TFT LCD with a 128x160 to 240x320 resolution, although some releases are fitted with a touchscreen display. Units are priced from \$55 to \$65.

Designs quoted between \$70 and \$90 feature a 2.4 to 3in TFT touchscreen display with a 240x320 resolution.

Models support GSM 850/900/1,800/1,900MHz and CDMA 800MHz. They have a 1.3MP camera, MP3/MP4 player support, Bluetooth 2.0, TF card extension and FM radio. Some units include an analog TV function. The chip solution is usually an MTK 6225+MTK 6302+QCS 6010 combination.

Dual-mode handsets that go for \$95 to \$120 have a similar set of chipsets and functions but boast a larger touchscreen

display and a higher-resolution camera. These units can have an analog or digital TV, and other features such as a G-sensor.

These prices and solutions are all for white-box suppliers. Tier 1 makers have other IC options, including Infineon, Spreadtrum, Via, TI and Samsung.

Smartphones under the high-end category could also include a GPS module, Wi-Fi connectivity, autofocus camera and software support. The OS is either Windows Mobile 6.0, 6.5 and 7.0 or the open-source Android platform. The price range is from \$150 to \$350.

Suppliers expect quotes to stay the same in the next six months, barring fluctuation in the cost of key materials and components.

This article "CDMA phones: Cost, waning market restrict growth" is originally posted in Global Sources.

Contact suppliers in this article

KingTech Sci.&Tech.(Shenzhen)Co.Ltd

Luckwell Co Ltd

Techtotop Microelectronics Co.,Ltd

Vanprasth Corporation

Wakwei Technologies (shenzhen) Co.,ltd

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function prodch(prod) {
var prodsrch = prod;
var newURL =
"http://www.globalsources.com/gsol/GeneralManager?point_search=on&page=search%2FProductSearchResults&product_search=on&supplier_search=off&article_search=off&type=new&select_category=2000000003844&search_what=1&query="
"+prodsrch+"&point_id=3000000149681&catalog_id=2000000003844&from=&loc=t&action=GetPoint&action=DoFreeTextSearch&AFF=ImportingStories";
var finalURL = newURL;
if (prodsrch == "" || prodsrch == "Find China suppliers and products here...")
{ alert("Please enter keyword"); document.singleSearchbox3.query.focus(); }
else
{ window.location = finalURL; }
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function write_blank() {document.singleSearchbox3.query.value="";}
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