

## Mobile Audio IC Industry Report, 2007-2008



Mobile audio IC is mainly applied to mobile phone and MP3 players and now it is extended to game console, hand-held navigation, digital camera and other fields. However, application in these fields is still small, Compared to that in mobile phone and MP3 players. Mobile phone audio IC is divided into three categories, namely melody IC, CODEC, and audio amplifier IC. The audio IC of MP3 players mainly adopts MP3 decoder IC and CODEC.

Melody IC market prospects are bleak. Key global mobile phone manufacturers, like Nokia, Motorola, Sony-Ericsson and Siemens, seldom adopt melody IC. Especially since 2005, the four big producers have generally used application processor and customized analog baseband to replace melody IC. In early stage, mainly Japanese mobile phone producers, Samsung, LG and Chinese handset producers adopted melody IC chips. Nowadays, only Japanese manufacturers still insist on adopting melody IC, and the rest all have given it up.

There are only a small number of audio CODEC manufacturers, mainly TI, AKM and Wolfson Microelectronics. Audio CODEC market entry threshold is very high, and only the manufacturers mastering DELTA-SIGMA conversion can win themselves a place in the field. What's more, audio CODEC is mostly applied to compressed music players, and especially a huge amount is used in MP3 and digital camera. To CODEC producers, mobile phone is only their sideline business, about which they don't care much, if they lose it. As for MP3 player, Wolfson is absolutely the market dominator, monopolizing the market. As for non-portable music players like CD player and professional acoustics equipment, ADI, AKM and Cirrus share the market. Wolfson is seldom involved in the high-quality audio market. These manufacturers are comparatively conservative, and they don't pay much attention to portable music players. However, Cirrus has aggressively entered the field recently, claiming that it has beat Wolfson and would have its audio CODEC applied in the next generation of Apple iPods.

With a large amount of high-quality audio mobile phones put into the market, more and more mobile phones have started adopting CODEC. Nokia has cooperated with TI all the time, so all of its audio CODEC is provided by TI. AKM, a small subsidiary of Asahi Kasei Corp., a Japanese chemical giant, has behaved conservatively, so its market is only restricted in Japan and South Korea. Normally, Wolfson is the only choice to producers.

Nowadays, independent audio amplifier IC is more and more used in mobile phones, while it used to be entirely integrated into analog baseband in the past.

About 85% of Nokia's mobile phones use independent audio amplifier IC in 2008, while about 70% of Samsung handsets also do so. Motorola and Sony Ericsson seldom adopt independent audio amplifier IC. At present, audio amplifier applied in mobile phone has two development trends: headphone driver amplifier and loudspeaker driver amplifier, which are common configurations to Nokia handsets.

Class-D audio amplifier applied in handsets accounts for more than 50% of the market share, and it mainly has the following types, TPA2010D1, TPA2012D2, TPA2005D1, YDA144, YDA1454, TPA4411, TPA6310A2, and SAPA1D2. New mobile phones, especially Nokia's new handsets, apply a large amount of Class-D audio amplifiers, and use a pair of amplifiers, one is headphone driver and the other is loudspeaker driver.



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