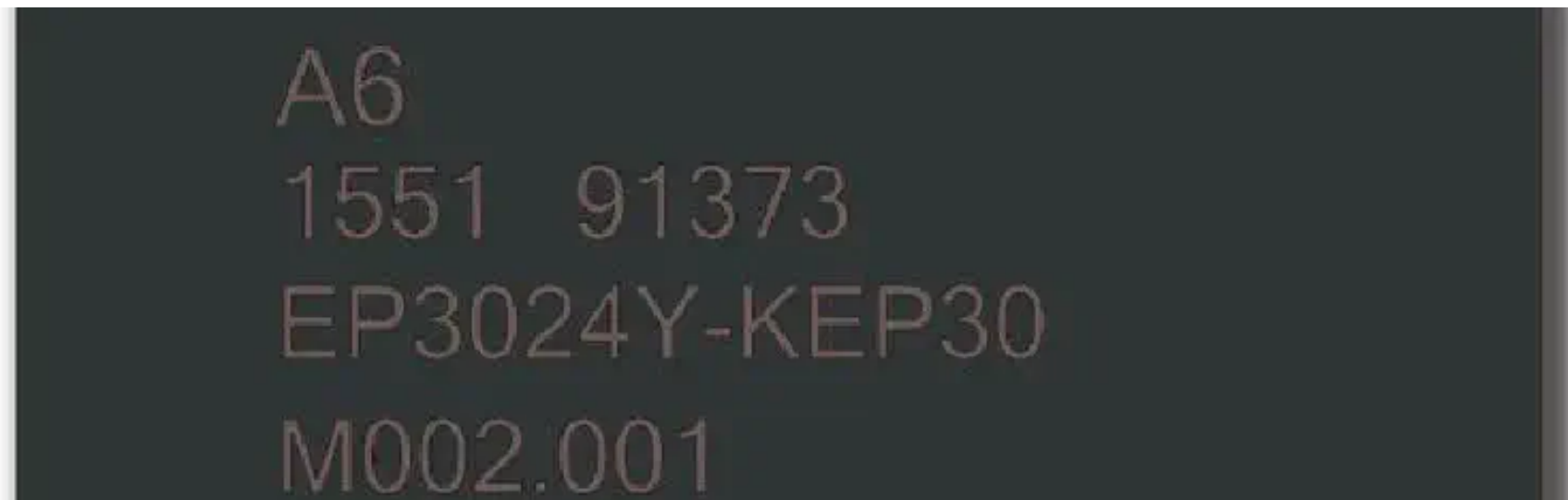


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## The AUCTUS A6: the chip enabling inexpensive DMR

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The **AUCTUS A6** is the chip behind the inexpensive COTRE CO01D DMR radio. There isn't much information available on the web. Here is what I was able to find.

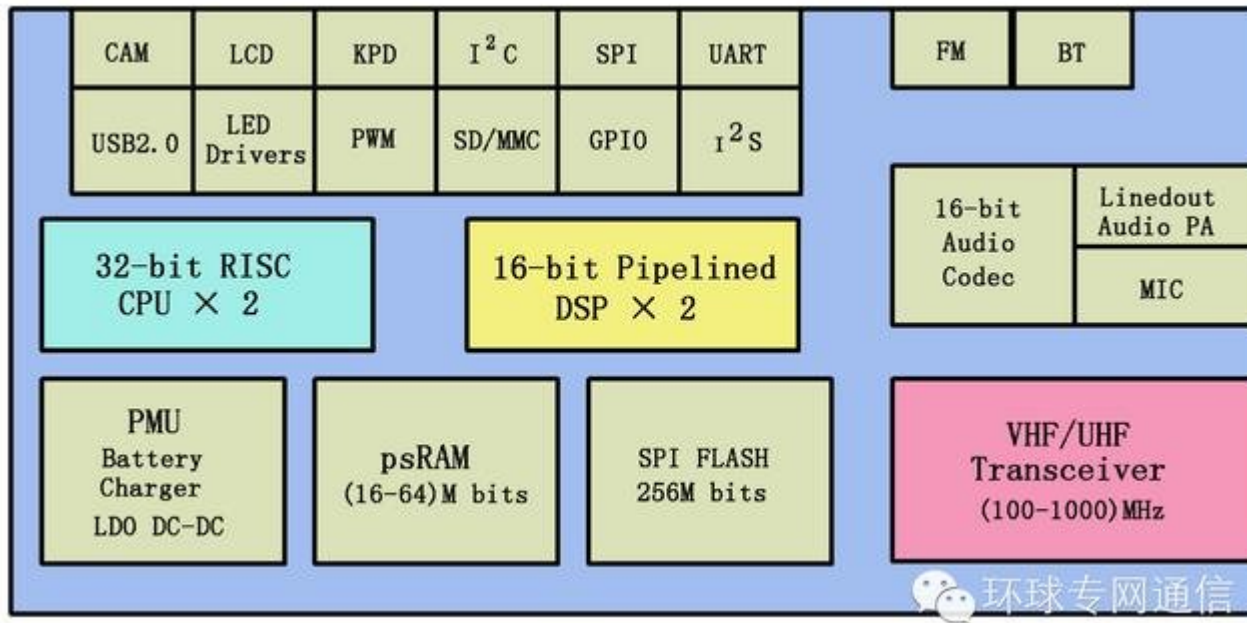
## # Introduction

While looking at the the [COTRE CO01D](#) radio, it is clear that this radio has a very low part count in comparison to other simple DMR radios. For example, the [RT53](#) DMR radio has separate microcontroller, DSP and RF ICs. I noticed that there is only a single IC that seems to be powering everything, the mystery Auctus A6.

## # Background

The company behind this chip is [Auctus Technology](#)(力同科技股份有限公司) out of Shenzhen. This company might be familiar to some radio enthusiasts as the company behind the AT1846S RF transceiver which powers the Baofeng UV-5r. They are company specializing in RF chips and while their current web page displays nothing but a landing page, the [Internet Archive](#) provides some information of their complete lineup of products. They manufacture devices under both their own mark as well as contracted devices for others such as RDA.

## # What is the Auctus A6



According to this [Chinese news site](#), the Auctus A6 is an integrated CPU, RF transceiver, DSP and vocoder. Their vision is to do what the AT1846S did for analog handheld radios for DMR radios.

## # CPU section

The CPU is a dual core 32-bit RISC processor of unknown design. It is coupled with 2-8 MB of psRAM(pseudostatic RAM) and 8 MB of flash. The CPU has sufficient I/O to handle everything a normal microcontroller would in a radio including GPIO for switches, I2C and SPI for communicating with other devices, UART and USB for communicating with a computer. Special

sections for driving LEDs, an LCD display and a keypad. Additionally, it has an camera I/O section, SD card slot and an I2S interface.

## # RF section

The RF section includes a VHF/UHF transceiver capable of operating between 100-1000 MHz. While additional details are not specified, we know it can operate using both analog and digital modes. They specify that the channels can be 6.25/12.5/25/200 kHz in width. The 200kHz is for some sort of data transmission, maybe packet radio.

## # DSP section

There is a separate DSP section which operates on the incoming RF data to demodulate the data transmissions, but also implements the CODEC. The CODEC section can be reprogrammed with different CODECs if desired.

## # Battery controller

This IC even integrates the battery controller IC.

## # Price

The Auctus A6 appears on [Taobao](#) for the price of ¥90, which is about \$13 in single quantities.

## # Integration

Because the A6 integrates so much functionality, very few external components are needed. These include the physical devices for I/O such as keys and displays and RF amplifiers (LNA/PA) and filters. As well as a crystal oscillator. This should further drive down the price of these radios.

Because the digital devices are integrated into a single package, fewer PCB layers are required as well.

## # Conclusions

The Auctus A6 might find itself integrated into a new wave of Baofeng-like DMR radios. The price is relatively low for the huge amount of functionality integrated into this IC. Because it reduces the part count and simplifies design, it will probably find its way into more amateur devices in the future.

While most of the radios I could find that use this chip operate in the 400-500 MHz range, the A6 actually is capable of operation between 100-1000 MHz which could mean it might be capable of making dualbanders or tribanders in the future.

The limiting factor in all of these might be the willingness of the mysterious company to provide specs and programming details.

The successor chip to the A6, the [A7](#), has recently been released and continues on with this same integrated design philosophy.