HARDWARE DIFFERENCES BETWEEN THE CS800D AND THE CS800D PLUS

We have been getting many requests to upgrade an existing CS800D to the CS800D PLUS. This application note explains the differences and the problems in achieving the conversion. The table below shows the differences between the two products.

CS800D PLUS	CS800D
CKS32F407VGT6	STM32F407VGT6
W25Q256	W25Q64
SKY72310-11	SKY72310-362

Hardware Differences

The CKS32F407VGT6 and the STM32F407VGT6 microprocessor are 99% identical both functionally and mechanically and therefore it should be possible to replace the STM32F407VGT6 with the CKS32F407VGT6. The only real issue is replacing a 100-pin fine pitch IC is extremely difficult and should not be attempted without the proper equipment and experience. The differences between the two parts could easily be compensated by firmware. However, without the manufacturer making the firmware to be compatible between the two, it would not be possible for us to make the changes.

The W25Q256 used in the CS800D PLUS is a 256-megabit flash memory. The W25Q64 used in the CS800D is a 64-megabit flash memory. Normally it is easy to replace a memory of one size with an identical memory of the other size. The CS800D uses an eight pin SOIC package. The CS800D uses a much larger package size so it would be difficult to replace the smaller package. There does exist 256-megabit flash memory in an eight pin SOIC package from other manufacturers but the existing firmware with the CS800D PLUS might not be compatible.

The PLL specifications and pin outs are slightly different between the two parts. I would expect that the manufacturer could compensate for the differences between the two parts in the firmware. However, without the manufacturer making the firmware to be compatible between the two, I

would not expect the CS800D and the CS800D PLUS to work optimally. Because the packages are slightly different between the two parts, it might not be possible to easily replace the SKY72310-362 with the SKY72310-11 thereby making the PLL identical in the two products.

Summary

It is possible to upgrade the CS800D to the CS800D PLUS. However, it would be very difficult with a good chance of ruining the radio before the conversion is complete. Once you get the hardware changed, you would have to retune the radio because the tuning parameters reside in the flash memory you just replaced. The test equipment to retune the radio costs about $40,000.

The manufacturer could make it relatively easy to do the conversion if they desired. But there is no reason to expect them to do it, because by doing it, they would be spending a lot of resources on making the radio compatible and they would then sell less radios.