Instructions for programming XMOS xCORE-200 chips in mass production

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1 Scope

This document is intended for vendors or customers requiring high volume automated methods for programming the integrated flash in xCORE-200 chips.

2 Creating the flash binary image

The binary image file to be programmed into the flash should be generated from the XE executable using the XMOS tool xflash with the -o option. At the XMOS command line, use the following command:

```
xflash file.xe -o file.bin
```

In this example, file.bin is the binary image to be programmed into the flash. Please refer to the XMOS "Design and manufacture systems with flash memory" documentation [Ref 1] for more details. There is no need to further manipulate the flash image.

This command requires that the target system is attached so xflash can establish the boot partition size. To create the binary file without being attached, it is necessary to specify the –boot-partition-size and –noinq options, for example:

```
xflash file.xe -o file.bin --noinq --boot-partition-size <arg>
```

where *arg* is boot partition size in bytes.

Further technical details regarding the flash image can be found in Section 8 of the xCORE-200 datasheet.

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3 Programming method

The simplest way to programme the integrated flash is to access the flash die directly and use normal programming methods.

To do this, provide power to the chip as per the datasheet requirements and hold the XMOS die in reset. This is necessary to ensure the flash die is correctly powered and that the XMOS die does not interfere with the flash signals. No clock or other services are required by the XCORE.

The flash used is a 2MB Quad-SPI die from ISSI, part number IS25LQ016B [Ref 2]. The flash die pins can be accessed directly from the XMOS package pins given in figure 1. For details of the package pin, please refer to the appropriate XMOS datasheet.

Figure 1: Flash pin assignments for xCORE-200 products

Flash die pin	Package pin name
CS_N	X0D01
IO0	X0D04
IO1	X0D05
IO2	X0D06
IO3	X0D07
CLK	X0D10

It is necessary to set the Quad Enable bit (bit 6) in the status register, please refer to the flash datasheet.

4 XMOS part numbers

XMOS xCORE-200 parts affected by these instructions have part numbers prefixed in the following way:

- XLF- : general purpose with integrated flash
- XUF- : USB with integrated flash
- XEF- : USB and gigabit Ethernet with integrated flash

5 References

1. https://www.xmos.com/doc/XM-000949-PC
2. IS25LQ016B datasheet
   - http://www.issi.com/WW/pdf/25LQ080B-016B-032B.pdf