

# xCORE-200 explorerKIT Hardware Manual

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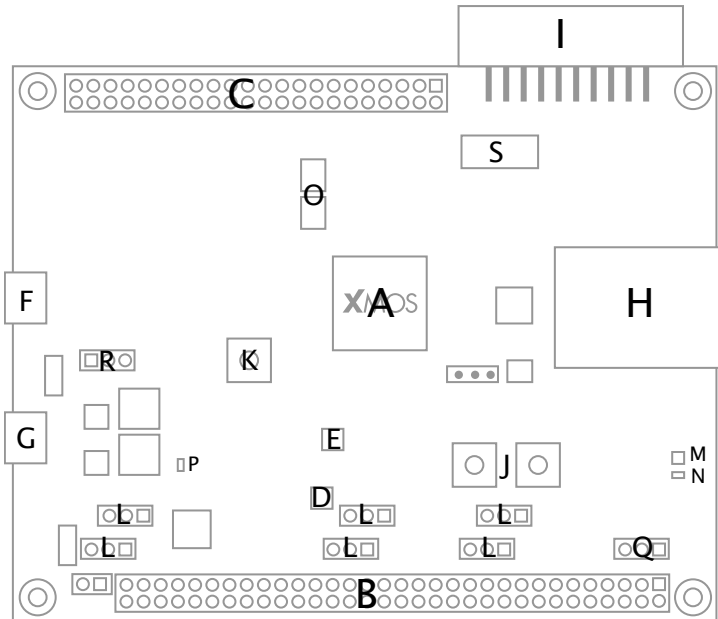
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xCORE-200 explorerKIT is an evaluation board for the configurable xCORE-200 multicore microcontroller products from XMOS. It's easy to use and provides lots of advanced features on a small, extremely low cost platform.

xCORE lets you software-configure the interfaces that you need for your system; so with xCORE-200 explorerKIT you can configure the board to match your exact requirements. The xCORE-200 multicore microcontroller has sixteen 32bit logical cores that deliver up to 2000MIPs completely deterministically, making xCORE-200 explorerKIT an ideal platform for functions ranging from robotics and motion control to networking and digital audio.

## 1 Features

A block diagram of the xCORE-200 explorerKIT is shown below:



**Figure 1:**  
xCORE-200  
explorerKIT  
block  
diagram

It includes the following features:

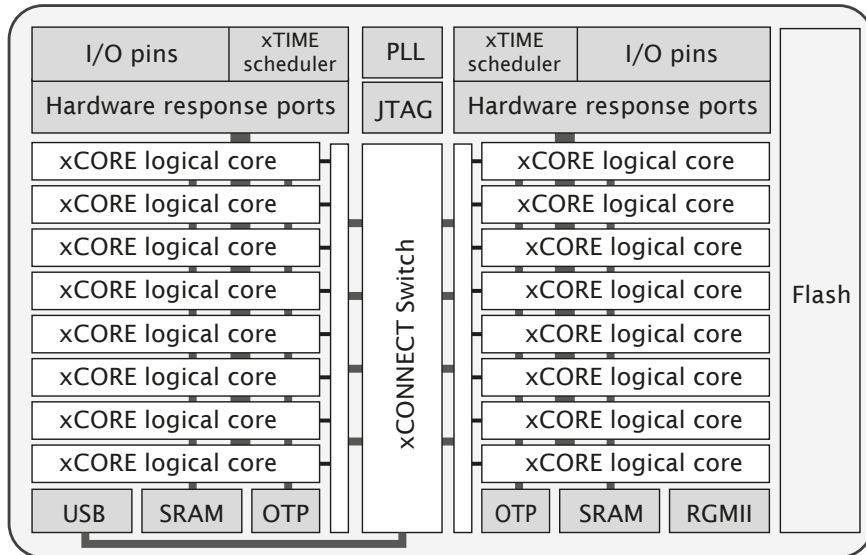
- ▶ A: xCORE-200 (XE216-512-TQ128) Multicore Microcontroller device
- ▶ B: 32 GPIO connections from tile 0, arranged on a 0.1" grid
- ▶ C: 21 GPIO connections from tile 1, arranged on a 0.1" grid
- ▶ D: A BMG160 3-axis gyroscope sensor
- ▶ E: An FXOS8700CQ Digital Sensor - 3D Accelerometer ( $\pm 2g/\pm 4g/\pm 8g$ ) + 3D Magnetometer
- ▶ F: A micro USB connector for connection to a USB device
- ▶ G: A micro USB connector for connection to a power supply
- ▶ H: An RGMII connector for connection to a 10/100/1000Mbps ethernet network
- ▶ I: An xSYS connector for connection to an xTAG debug adapter
- ▶ J: Two general purpose push-button switches
- ▶ K: A reset switch

- ▶ L: Six servo connections
- ▶ M: A general purpose green IED
- ▶ N: A general purpose RGB LED
- ▶ O: A QSPI flash
- ▶ P: A green 3.3v power-good LED
- ▶ Q, R: Two power supply headers
- ▶ S: 24MHz Oscillator

## 2 xCORE Multicore Microcontroller Device

xCORE-200 explorerKIT is based on a two-tile xCORE-200 device (XE216-512-TQ128). Each tile is user-programmable, providing eight logical cores with a total of up to 1000 MIPS compute. A total of 53 general-purpose digital I/O have been brought out to header pins, providing tremendous flexibility for connecting peripherals to the xCORE-200 explorerKIT board.

For information on xCORE-200 tiles and cores see the xCORE-200 Architecture Overview<sup>1</sup>.

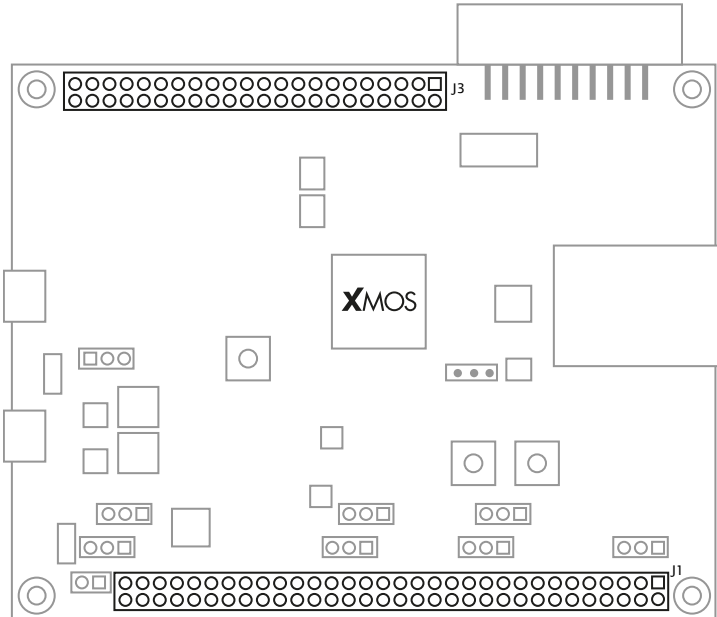


**Figure 2:**  
xCORE-200  
XE216-512-  
TQ128  
device

<sup>1</sup><http://www.xmos.com/published/xcore-architecture>

### 3 GPIO headers (J1 & J3)

J1 and J3 provide a rich set of IO that can be readily connected to off-board components.



**Figure 3:**  
GPIO  
connectors

The xCORE ports are mapped to the GPIO connector pins as shown in Figure 4 and Figure 5:

Notes:

- 1 - X0D31 is connected to the red terminal of the general purpose RGB LED (N). This GPIO may be used for other purposes.
- 2 - X0D30 is connected to the green terminal of the general purpose RGB LED (N). This GPIO may be used for other purposes.
- 3 - X0D29 is connected to the blue terminal of the general purpose RGB LED (N). This GPIO may be used for other purposes.
- 4 - X0D28 is connected to the general purpose green LED (M). This GPIO may be used for other purposes.
- 5 - X0D27 is connected to BUTTON B (SW2). This GPIO may be used for other purposes, but care must be taken.
- 6 - X0D26 is connected to BUTTON A (SW1). This GPIO may be used for other purposes, but care must be taken.

| Signal             | Port | GPIO J1 | Signal | GPIO J1 |
|--------------------|------|---------|--------|---------|
| X0D31 <sup>1</sup> | P4F3 | 1       | GND    | 2       |
| X0D30 <sup>2</sup> | P4F2 | 3       | GND    | 4       |
| X0D29 <sup>3</sup> | P4F1 | 5       | GND    | 6       |
| X0D28 <sup>4</sup> | P4F0 | 7       | GND    | 8       |
| X0D33              | P4E3 | 9       | GND    | 10      |
| X0D32              | P4E2 | 11      | GND    | 12      |
| X0D27 <sup>5</sup> | P4E1 | 13      | GND    | 14      |
| X0D26 <sup>6</sup> | P4E0 | 15      | GND    | 16      |
| X0D35              | P1L  | 17      | GND    | 18      |
| X0D34              | P1K  | 19      | GND    | 20      |
| X0D25              | P1J  | 21      | GND    | 22      |
| X0D24              | P1I  | 23      | GND    | 24      |
| X0D19              | P4D3 | 25      | GND    | 26      |
| X0D18              | P4D2 | 27      | GND    | 28      |
| X0D17              | P4D1 | 29      | GND    | 30      |
| X0D16              | P4D0 | 31      | GND    | 32      |
| X0D23              | P1H  | 33      | GND    | 34      |
| X0D22              | P1G  | 35      | GND    | 36      |
| X0D13 <sup>7</sup> | P1F  | 37      | GND    | 38      |
| X0D12 <sup>8</sup> | P1E  | 39      | GND    | 40      |
| X0D21              | P4C3 | 41      | GND    | 42      |
| X0D20              | P4C2 | 43      | GND    | 44      |
| X0D15              | P4C1 | 45      | GND    | 46      |
| X0D14              | P4C0 | 47      | GND    | 48      |
| X0D09              | P4A3 | 49      | GND    | 50      |
| X0D08              | P4A2 | 51      | GND    | 52      |
| X0D03              | P4A1 | 53      | GND    | 54      |
| X0D02              | P4A0 | 55      | GND    | 56      |
| X0D39              | P1P  | 57      | GND    | 58      |
| X0D38              | P1O  | 59      | GND    | 60      |
| X0D37              | P1N  | 61      | GND    | 62      |
| X0D36              | P1M  | 63      | GND    | 64      |

**Figure 4:**  
GPIO J1  
connector ..  
:class:  
horizontal-  
borders

7 - X0D13 is connected to clock (SDA) line of the I2C bus connected to the on-board sensors. A OR link is provided (R52), so that this connection can be isolated if necessary.

8 - X0D12 is connected to clock (SCL) line of the I2C bus connected to the on-board sensors. A OR link is provided (R49), so that this connection can be isolated if necessary.

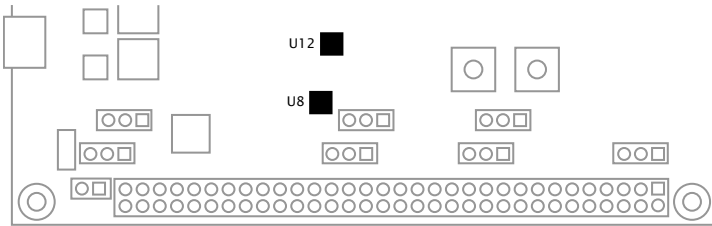
| Signal | GPIO J3 | Signal | Port | GPIO J3 |
|--------|---------|--------|------|---------|
| GND    | 1       | X1D35  | P1L  | 2       |
| GND    | 3       | X1D38  | P1O  | 4       |
| GND    | 5       | X1D39  | P1P  | 6       |
| GND    | 7       | X1D16  | P4D0 | 8       |
| GND    | 9       | X1D17  | P4D1 | 10      |
| GND    | 11      | X1D18  | P4D2 | 12      |
| GND    | 13      | X1D19  | P4D3 | 14      |
| GND    | 15      | X1D14  | P4C0 | 16      |
| GND    | 17      | X1D15  | P4C1 | 18      |
| GND    | 19      | X1D20  | P4C2 | 20      |
| GND    | 21      | X1D21  | P4C3 | 22      |
| GND    | 23      | X1D04  | P4B0 | 24      |
| GND    | 25      | X1D05  | P4B1 | 26      |
| GND    | 27      | X1D06  | P4B2 | 28      |
| GND    | 29      | X1D07  | P4B3 | 30      |
| GND    | 31      | X1D02  | P4A0 | 32      |
| GND    | 33      | X1D03  | P4A1 | 34      |
| GND    | 35      | X1D08  | P4A2 | 36      |
| GND    | 37      | X1D09  | P4A3 | 38      |
| GND    | 39      | X1D00  | P1A  | 40      |
| GND    | 41      | X1D01  | P1B  | 42      |
| GND    | 43      | GND    |      | 44      |

**Figure 5:**  
GPIO J3  
connector

## 4 Gyroscope and accelerometer

The xCORE-200 explorerKIT provides a BMG160 3-axis gyroscope sensor and an FXOS8700CQ Digital Sensor (3D Accelerometer ( $\pm 2g/\pm 4g/\pm 8g$ ) + 3D Magnetometer). These are connected via an I2C interface as described in Figure 7.

**Figure 6:**  
Gyroscope  
and Ac-  
celerometer



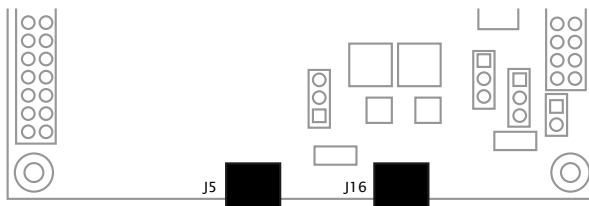
**Figure 7:**  
I2C sensor  
interface

| Pin   | Port | I2C signal |
|-------|------|------------|
| X0D12 | P1E  | SCL        |
| X0D13 | P1F  | SDA        |

## 5 USB connections

Two micro-USB (B-type) connections are provided:

**Figure 8:**  
USB  
connectors

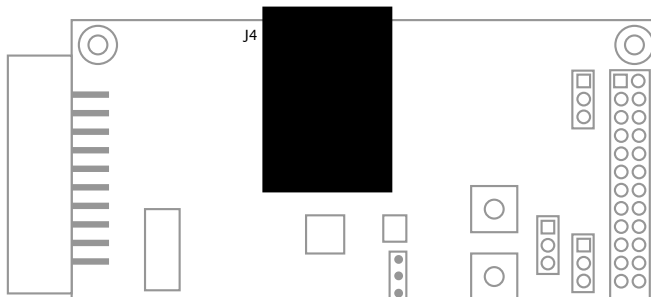


Note that J16 must be connected at all times, to provide power to the xCORE-200 explorerKIT. J5 should also be connected when developing USB applications.

## 6 RGMII connection

An RJ45 connector is available for the development of 10/100/1000 Mbps ethernet applications.

**Figure 9:**  
10/100/1000  
Ethernet  
connector

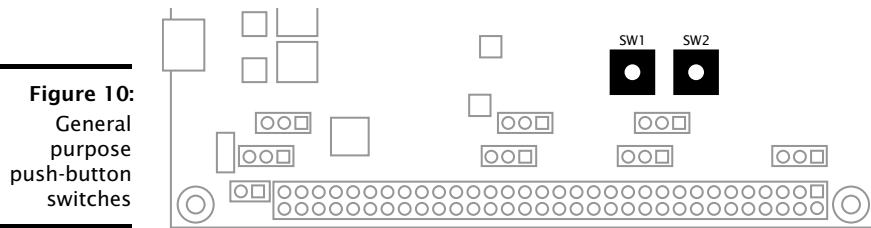


## 7 xSYS connector

The xSYS connector is provided to interface to an xTAG debug adapter. The xTAG debug adapter allows the xTIMEcomposer tools to interrogate the application running on the xCORE-200 device using the XMOS debugger and the xSCOPE library which provides non-intrusive program instrumentation.

## 8 General purpose push-button switches

Two general purpose push-button switches are provided as shown below. When depressed, the push-buttons create a connection from the IO to GND. Care must be taken to ensure that this does not cause undesirable behaviour on the xCORE-200 or other components connected through the GPIO headers:



**Figure 10:**  
General purpose push-button switches

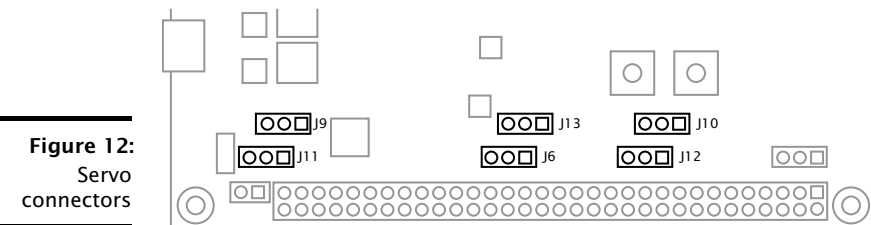
Each push-button switch is connected to a different IO on the xCORE-200 device as described in Figure 11:

**Figure 11:**  
General purpose push-button switches

| Pin   | Port | BUTTON |
|-------|------|--------|
| X0D26 | P4E0 | SW1    |
| X0D27 | P4E1 | SW2    |

## 9 Servo connectors

Up to six servos can be connected to the xCORE-200 explorerKIT using the header sockets provided. Note that it is up to the user to ensure that sufficient supply power is available to drive the servos.



**Figure 12:**  
Servo connectors

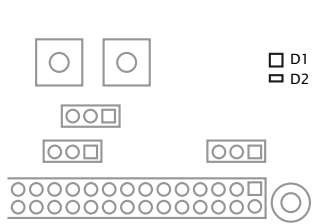


| Connector | Pin 1 | Port | Pin 2 | Pin 3 |
|-----------|-------|------|-------|-------|
| J8        | X0D22 | P1G  | +5V   | GND   |
| J9        | X0D37 | P1N  | +5V   | GND   |
| J10       | X0D35 | P1L  | +5V   | GND   |
| J11       | X0D36 | P1M  | +5V   | GND   |
| J12       | X0D34 | P1K  | +5V   | GND   |
| J13       | X0D23 | P1H  | +5V   | GND   |

**Figure 13:**  
GPIO servo  
connector

## 10 User LEDs

xCORE-200 explorerKIT provides two LEDs, a green LED and an RGD LED arranged as shown below:



**Figure 14:**  
User LEDs

The green LED and each colour terminal of the RGB LED are connected to a different pin as described in Figure 15:

| Pin   | Port | LED              |
|-------|------|------------------|
| X0D28 | P4F0 | Green            |
| X0D29 | P4F1 | RGB (blue term)  |
| X0D30 | P4F2 | RGB (green term) |
| X0D31 | P4F3 | RGB (red term)   |

**Figure 15:**  
User LEDs

## 11 QSPI Flash

xCORE-200 explorerKIT includes 1Mbytes of external Quad Serial Peripheral Interface (QSPI) FLASH memory, which is interfaced by the GPIO connections shown in Figure 16:

The xTIMEcomposer tools include the xFLASH utility for programming compiled programs into the flash memory. xCORE-200 explorerKIT designs may also access the FLASH memory at run-time by interfacing with the above pins.

| Pin   | Port | QSPI connection |
|-------|------|-----------------|
| X0D01 | P1A  | CE_n            |
| X0D04 | P4B0 | IO0             |
| X0D05 | P4B1 | IO1             |
| X0D06 | P4B2 | IO2             |
| X0D07 | P4B3 | IO3             |
| X0D10 | P1C  | SPI_CLK         |

**Figure 16:**  
External QSPI  
Flash

## 12 24MHz Crystal Oscillator

The xCORE-200 explorerKIT board is clocked at 24MHz by a crystal oscillator. Each tile is clocked at 500 MIPS, and all I/O ports are 100MHz.

## 13 Power connector

xCORE-200 explorerKIT requires a 5V power source input via the micro-USB cable.



**Figure 17:**  
Power  
connection  
via micro-USB

The voltage is converted by the on-board regulator to the 1V and 3V3 supplies used by the components. Additional or alternative power sources may use the power headers provided as shown in Figure 18:

| Connector | Pin 1 | Pin 2 | Pin 3 |
|-----------|-------|-------|-------|
| J14       | +5V   | +3.3V | GND   |
| J15       | +5V   | +3.3V | GND   |

**Figure 18:**  
Power  
connectors

See the *Operating requirements* section §14 for further information.

## 14 Operating requirements

A USB 2.0 high-speed compliant cable of less than 3m in length should be used when operating the xCORE-200 explorerKIT. XMOS cannot guarantee correct operation of the xCORE-200 explorerKIT should any other cable be used.

This product is, like most electronic equipment, sensitive to Electrostatic Discharge (ESD) events. Users should operate the xCORE-200 explorerKIT with appropriate ESD precautions in place.

## 15 Dimensions

The xCORE-200 explorerKIT dimensions are 105 x 80mm. The mounting holes are 2mm in diameter.

## 16 xCORE-200 explorerKIT Portmap

The table below provides a full description of the port-pin mappings described throughout this document.

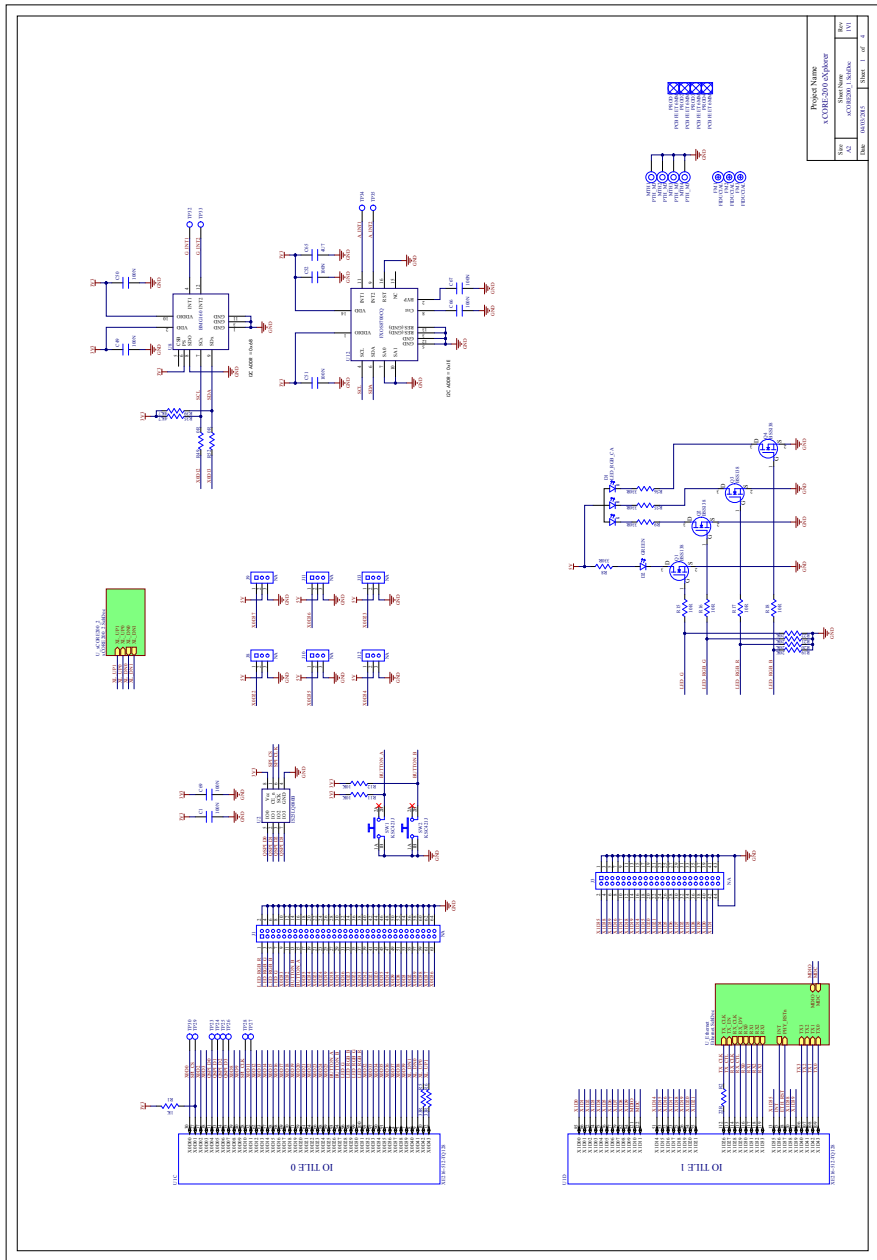
| Pin   | link               | 1-bit           | 4-bit           | 8-bit           | 16-bit            | 32-bit            | GPIO             | SPI  | BUTTON | LED | uplink | RGMI             |
|-------|--------------------|-----------------|-----------------|-----------------|-------------------|-------------------|------------------|------|--------|-----|--------|------------------|
| X0D00 |                    | 1A <sup>0</sup> |                 |                 |                   |                   |                  | MISO |        |     |        |                  |
| X0D01 | D <sup>2</sup> out | 1B <sup>0</sup> |                 |                 |                   |                   |                  | CS   |        |     |        |                  |
| X0D02 |                    |                 | 4A <sup>0</sup> | 8A <sup>0</sup> | 16A <sup>0</sup>  | 32A <sup>20</sup> | J1 <sup>55</sup> |      |        |     |        |                  |
| X0D03 |                    |                 | 4A <sup>1</sup> | 8A <sup>1</sup> | 16A <sup>1</sup>  | 32A <sup>21</sup> | J1 <sup>53</sup> |      |        |     |        |                  |
| X0D04 |                    |                 | 4B <sup>0</sup> | 8A <sup>2</sup> | 16A <sup>2</sup>  | 32A <sup>22</sup> |                  | D0   |        |     |        |                  |
| X0D05 |                    |                 | 4B <sup>1</sup> | 8A <sup>3</sup> | 16A <sup>3</sup>  | 32A <sup>23</sup> |                  | D1   |        |     |        |                  |
| X0D06 |                    |                 | 4B <sup>2</sup> | 8A <sup>4</sup> | 16A <sup>4</sup>  | 32A <sup>24</sup> |                  | D2   |        |     |        |                  |
| X0D07 |                    |                 | 4B <sup>3</sup> | 8A <sup>5</sup> | 16A <sup>5</sup>  | 32A <sup>25</sup> |                  | D3   |        |     |        |                  |
| X0D08 |                    |                 | 4A <sup>2</sup> | 8A <sup>6</sup> | 16A <sup>6</sup>  | 32A <sup>26</sup> | J1 <sup>51</sup> |      |        |     |        |                  |
| X0D09 |                    |                 | 4A <sup>3</sup> | 8A <sup>7</sup> | 16A <sup>7</sup>  | 32A <sup>27</sup> | J1 <sup>49</sup> |      |        |     |        |                  |
| X0D10 | D <sup>3</sup> out | 1C <sup>0</sup> |                 |                 |                   |                   |                  | CLK  |        |     |        |                  |
| X0D11 |                    | 1D <sup>0</sup> |                 |                 |                   |                   |                  | MOSI |        |     |        |                  |
| X0D12 |                    | 1E <sup>0</sup> |                 |                 |                   |                   | J1 <sup>39</sup> |      |        |     |        |                  |
| X0D13 |                    | 1F <sup>0</sup> |                 |                 |                   |                   | J1 <sup>37</sup> |      |        |     |        |                  |
| X0D14 |                    |                 | 4C <sup>0</sup> | 8B <sup>0</sup> | 16A <sup>8</sup>  | 32A <sup>28</sup> | J1 <sup>47</sup> |      |        |     |        |                  |
| X0D15 |                    |                 | 4C <sup>1</sup> | 8B <sup>1</sup> | 16A <sup>9</sup>  | 32A <sup>29</sup> | J1 <sup>45</sup> |      |        |     |        |                  |
| X0D16 | E <sup>4</sup> in  |                 | 4D <sup>0</sup> | 8B <sup>2</sup> | 16A <sup>10</sup> |                   | J1 <sup>31</sup> |      |        |     |        |                  |
| X0D17 | E <sup>3</sup> in  |                 | 4D <sup>1</sup> | 8B <sup>3</sup> | 16A <sup>11</sup> |                   | J1 <sup>29</sup> |      |        |     |        |                  |
| X0D18 | E <sup>2</sup> in  |                 | 4D <sup>2</sup> | 8B <sup>4</sup> | 16A <sup>12</sup> |                   | J1 <sup>27</sup> |      |        |     |        |                  |
| X0D19 | E <sup>1</sup> in  |                 | 4D <sup>3</sup> | 8B <sup>5</sup> | 16A <sup>13</sup> |                   | J1 <sup>25</sup> |      |        |     |        |                  |
| X0D20 |                    |                 | 4C <sup>2</sup> | 8B <sup>6</sup> | 16A <sup>14</sup> | 32A <sup>30</sup> | J1 <sup>43</sup> |      |        |     |        |                  |
| X0D21 |                    |                 | 4C <sup>3</sup> | 8B <sup>7</sup> | 16A <sup>15</sup> | 32A <sup>31</sup> | J1 <sup>41</sup> |      |        |     |        |                  |
| X0D22 |                    | 1G <sup>0</sup> |                 |                 |                   |                   | J1 <sup>35</sup> |      |        |     |        |                  |
| X0D23 |                    | 1H <sup>0</sup> |                 |                 |                   |                   | J1 <sup>33</sup> |      |        |     |        |                  |
| X0D24 | H <sup>0</sup> in  | 1I <sup>0</sup> |                 |                 |                   |                   | J1 <sup>23</sup> |      |        |     |        |                  |
| X0D25 | H <sup>0</sup> out | 1J <sup>0</sup> |                 |                 |                   |                   | J1 <sup>21</sup> |      |        |     |        |                  |
| X0D26 | H <sup>3</sup> out |                 | 4E <sup>0</sup> | 8C <sup>0</sup> | 16B <sup>0</sup>  |                   | J1 <sup>15</sup> |      | A      |     |        |                  |
| X0D27 | H <sup>4</sup> out |                 | 4E <sup>1</sup> | 8C <sup>1</sup> | 16B <sup>1</sup>  |                   | J1 <sup>13</sup> |      | B      |     |        |                  |
| X0D28 |                    |                 | 4F <sup>0</sup> | 8C <sup>2</sup> | 16B <sup>2</sup>  |                   | J1 <sup>7</sup>  |      |        |     |        | Green            |
| X0D29 |                    |                 | 4F <sup>1</sup> | 8C <sup>3</sup> | 16B <sup>3</sup>  |                   | J1 <sup>5</sup>  |      |        |     |        | RGB <sup>B</sup> |
| X0D30 |                    |                 | 4F <sup>2</sup> | 8C <sup>4</sup> | 16B <sup>4</sup>  |                   | J1 <sup>3</sup>  |      |        |     |        | RGB <sup>G</sup> |
| X0D31 |                    |                 | 4F <sup>3</sup> | 8C <sup>5</sup> | 16B <sup>5</sup>  |                   | J1 <sup>1</sup>  |      |        |     |        | RGB <sup>R</sup> |
| X0D32 |                    |                 | 4E <sup>2</sup> | 8C <sup>6</sup> | 16B <sup>6</sup>  |                   | J1 <sup>11</sup> |      |        |     |        |                  |
| X0D33 |                    |                 | 4E <sup>3</sup> | 8C <sup>7</sup> | 16B <sup>7</sup>  |                   | J1 <sup>9</sup>  |      |        |     |        |                  |
| X0D34 | H <sup>1</sup> out | 1K <sup>0</sup> |                 |                 |                   |                   | J1 <sup>19</sup> |      |        |     |        |                  |
| X0D35 | H <sup>2</sup> out | 1L <sup>0</sup> |                 |                 |                   |                   | J1 <sup>17</sup> |      |        |     |        |                  |
| X0D36 |                    | 1M <sup>0</sup> |                 | 8D <sup>0</sup> | 16B <sup>8</sup>  |                   | J1 <sup>63</sup> |      |        |     |        |                  |
| X0D37 | A <sup>4</sup> in  | 1N <sup>0</sup> |                 | 8D <sup>1</sup> | 16B <sup>9</sup>  |                   | J1 <sup>61</sup> |      |        |     |        |                  |
| X0D38 | A <sup>3</sup> in  | 1O <sup>0</sup> |                 | 8D <sup>2</sup> | 16B <sup>10</sup> |                   | J1 <sup>59</sup> |      |        |     |        |                  |
| X0D39 | A <sup>2</sup> in  | 1P <sup>0</sup> |                 | 8D <sup>3</sup> | 16B <sup>11</sup> |                   | J1 <sup>57</sup> |      |        |     |        |                  |
| X0D40 | A <sup>1</sup> in  |                 |                 | 8D <sup>4</sup> | 16B <sup>12</sup> |                   |                  |      |        |     |        | DN1              |
| X0D41 | A <sup>0</sup> in  |                 |                 | 8D <sup>5</sup> | 16B <sup>13</sup> |                   |                  |      |        |     |        | DN0              |
| X0D42 | A <sup>0</sup> out |                 |                 | 8D <sup>6</sup> | 16B <sup>14</sup> |                   |                  |      |        |     |        | UPO              |
| X0D43 | A <sup>1</sup> out |                 |                 | 8D <sup>7</sup> | 16B <sup>15</sup> |                   |                  |      |        |     |        | UPI              |

**Figure 19:**  
xCORE-200  
explorerKIT  
Portmap

| Pin   | link               | 1-bit           | 4-bit           | 8-bit            | 16-bit            | 32-bit            | GPIO             | SPI | BUTTON | LED | uplink | RGMI     |
|-------|--------------------|-----------------|-----------------|------------------|-------------------|-------------------|------------------|-----|--------|-----|--------|----------|
| X1D00 | H <sup>2</sup> in  | 1A <sup>0</sup> |                 |                  |                   |                   | J3 <sup>40</sup> |     |        |     |        |          |
| X1D01 | H <sup>1</sup> in  | 1B <sup>0</sup> |                 |                  |                   |                   | J3 <sup>42</sup> |     |        |     |        |          |
| X1D02 | E <sup>0</sup> in  |                 | 4A <sup>0</sup> | 8A <sup>0</sup>  | 16A <sup>0</sup>  | 32A <sup>20</sup> | J3 <sup>32</sup> |     |        |     |        |          |
| X1D03 | E <sup>0</sup> out |                 | 4A <sup>1</sup> | 8A <sup>1</sup>  | 16A <sup>1</sup>  | 32A <sup>21</sup> | J3 <sup>34</sup> |     |        |     |        |          |
| X1D04 | E <sup>1</sup> out |                 | 4B <sup>0</sup> | 8A <sup>2</sup>  | 16A <sup>2</sup>  | 32A <sup>22</sup> | J3 <sup>24</sup> |     |        |     |        |          |
| X1D05 | E <sup>2</sup> out |                 | 4B <sup>1</sup> | 8A <sup>3</sup>  | 16A <sup>3</sup>  | 32A <sup>23</sup> | J3 <sup>26</sup> |     |        |     |        |          |
| X1D06 | E <sup>3</sup> out |                 | 4B <sup>2</sup> | 8A <sup>4</sup>  | 16A <sup>4</sup>  | 32A <sup>24</sup> | J3 <sup>28</sup> |     |        |     |        |          |
| X1D07 | E <sup>4</sup> out |                 | 4B <sup>3</sup> | 8A <sup>5</sup>  | 16A <sup>5</sup>  | 32A <sup>25</sup> | J3 <sup>30</sup> |     |        |     |        |          |
| X1D08 | H <sup>4</sup> in  |                 | 4A <sup>2</sup> | 8A <sup>6</sup>  | 16A <sup>6</sup>  | 32A <sup>26</sup> | J3 <sup>36</sup> |     |        |     |        |          |
| X1D09 | H <sup>3</sup> in  |                 | 4A <sup>3</sup> | 8A <sup>7</sup>  | 16A <sup>7</sup>  | 32A <sup>27</sup> | J3 <sup>38</sup> |     |        |     |        |          |
| X1D10 |                    | 1C <sup>0</sup> |                 |                  |                   |                   |                  |     |        |     |        | MDIO     |
| X1D11 |                    | 1D <sup>0</sup> |                 |                  |                   |                   |                  |     |        |     |        | MDC      |
| X1D14 |                    |                 | 4C <sup>0</sup> | 8B <sup>0</sup>  | 16A <sup>8</sup>  | 32A <sup>28</sup> | J3 <sup>16</sup> |     |        |     |        |          |
| X1D15 |                    |                 | 4C <sup>1</sup> | 8B <sup>1</sup>  | 16A <sup>9</sup>  | 32A <sup>29</sup> | J3 <sup>18</sup> |     |        |     |        |          |
| X1D16 | D <sup>1</sup> in  |                 | 4D <sup>0</sup> | 8B <sup>2</sup>  | 16A <sup>10</sup> |                   | J3 <sup>8</sup>  |     |        |     |        |          |
| X1D17 | D <sup>0</sup> in  |                 | 4D <sup>1</sup> | 8B <sup>3</sup>  | 16A <sup>11</sup> |                   | J3 <sup>10</sup> |     |        |     |        |          |
| X1D18 | D <sup>0</sup> out |                 | 4D <sup>2</sup> | 8B <sup>4</sup>  | 16A <sup>12</sup> |                   | J3 <sup>12</sup> |     |        |     |        |          |
| X1D19 | D <sup>1</sup> out |                 | 4D <sup>3</sup> | 8B <sup>5</sup>  | 16A <sup>13</sup> |                   | J3 <sup>14</sup> |     |        |     |        |          |
| X1D20 |                    |                 | 4C <sup>2</sup> | 8B <sup>6</sup>  | 16A <sup>14</sup> | 32A <sup>30</sup> | J3 <sup>20</sup> |     |        |     |        |          |
| X1D21 |                    |                 | 4C <sup>3</sup> | 8B <sup>7</sup>  | 16A <sup>15</sup> | 32A <sup>31</sup> | J3 <sup>22</sup> |     |        |     |        |          |
| X1D26 |                    | 4E <sup>0</sup> | 8C <sup>0</sup> | 16B <sup>0</sup> |                   |                   |                  |     |        |     |        | TX_CLK   |
| X1D27 |                    | 4E <sup>1</sup> | 8C <sup>1</sup> | 16B <sup>1</sup> |                   |                   |                  |     |        |     |        | TX_EN    |
| X1D28 |                    | 4F <sup>0</sup> | 8C <sup>2</sup> | 16B <sup>2</sup> |                   |                   |                  |     |        |     |        | RX_CLK   |
| X1D29 |                    | 4F <sup>1</sup> | 8C <sup>3</sup> | 16B <sup>3</sup> |                   |                   |                  |     |        |     |        | RX_DV    |
| X1D30 |                    |                 | 4F <sup>2</sup> | 8C <sup>4</sup>  | 16B <sup>4</sup>  |                   |                  |     |        |     |        | RX0      |
| X1D31 |                    |                 | 4F <sup>3</sup> | 8C <sup>5</sup>  | 16B <sup>5</sup>  |                   |                  |     |        |     |        | RX1      |
| X1D32 |                    |                 | 4E <sup>2</sup> | 8C <sup>6</sup>  | 16B <sup>6</sup>  |                   |                  |     |        |     |        | RX2      |
| X1D33 |                    |                 | 4E <sup>3</sup> | 8C <sup>7</sup>  | 16B <sup>7</sup>  |                   |                  |     |        |     |        | RX3      |
| X1D35 | A <sup>3</sup> out | 1L <sup>0</sup> |                 |                  |                   |                   | J3 <sup>2</sup>  |     |        |     |        |          |
| X1D36 | A <sup>4</sup> out | 1M <sup>0</sup> |                 | 8D <sup>0</sup>  | 16B <sup>8</sup>  |                   |                  |     |        |     |        | INT      |
| X1D37 | D <sup>4</sup> in  | 1N <sup>0</sup> |                 | 8D <sup>1</sup>  | 16B <sup>9</sup>  |                   |                  |     |        |     |        | PHY_RSTn |
| X1D38 | D <sup>3</sup> in  | 1O <sup>0</sup> |                 | 8D <sup>2</sup>  | 16B <sup>10</sup> |                   | J3 <sup>4</sup>  |     |        |     |        |          |
| X1D39 | D <sup>2</sup> in  | 1P <sup>0</sup> |                 | 8D <sup>3</sup>  | 16B <sup>11</sup> |                   | J3 <sup>6</sup>  |     |        |     |        |          |
| X1D40 |                    |                 |                 | 8D <sup>4</sup>  | 16B <sup>12</sup> |                   |                  |     |        |     |        | TX3      |
| X1D41 |                    |                 |                 | 8D <sup>5</sup>  | 16B <sup>13</sup> |                   |                  |     |        |     |        | TX4      |
| X1D42 |                    |                 |                 | 8D <sup>6</sup>  | 16B <sup>14</sup> |                   |                  |     |        |     |        | TX5      |
| X1D43 |                    |                 |                 | 8D <sup>7</sup>  | 16B <sup>15</sup> |                   |                  |     |        |     |        | TX6      |

**Figure 20:**  
xCORE-200  
explorerKIT  
Portmap

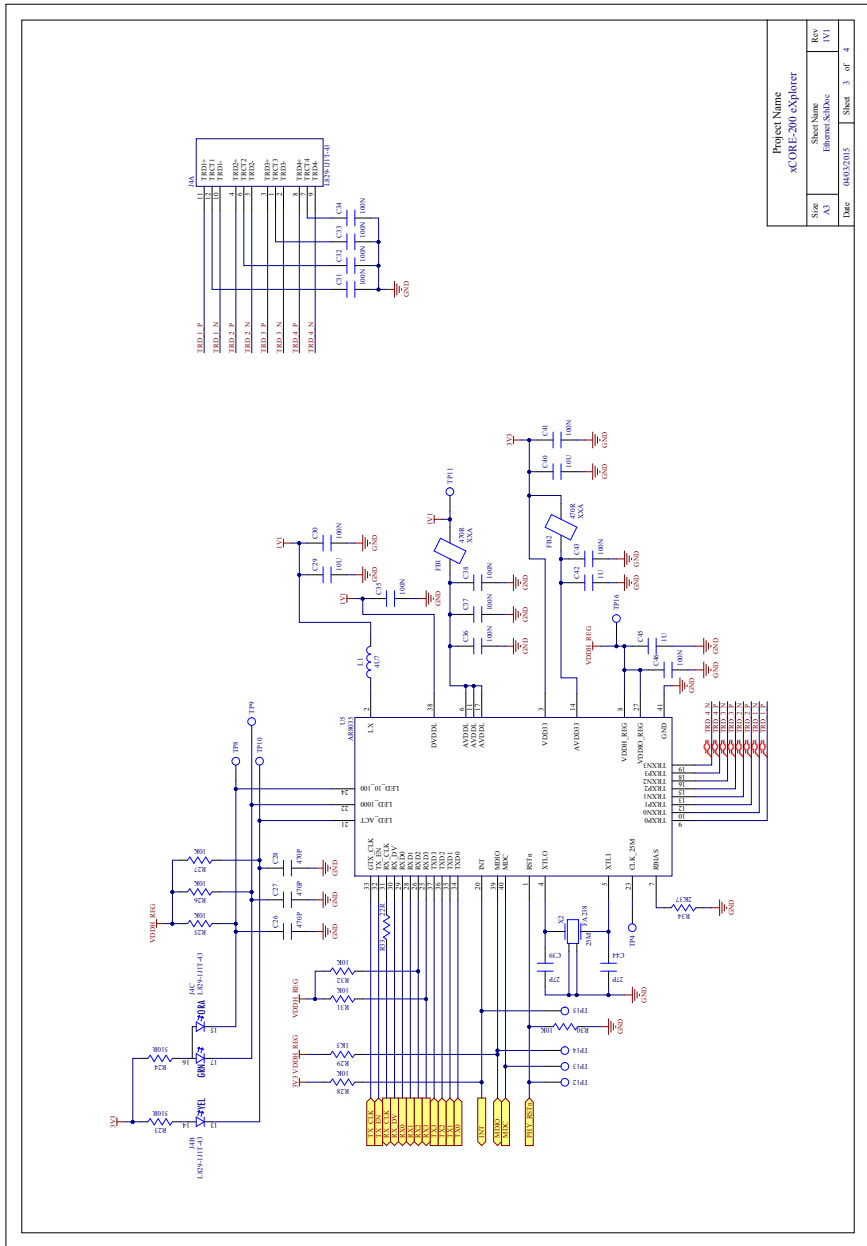
# 17 xCORE-200 explorerKIT schematics



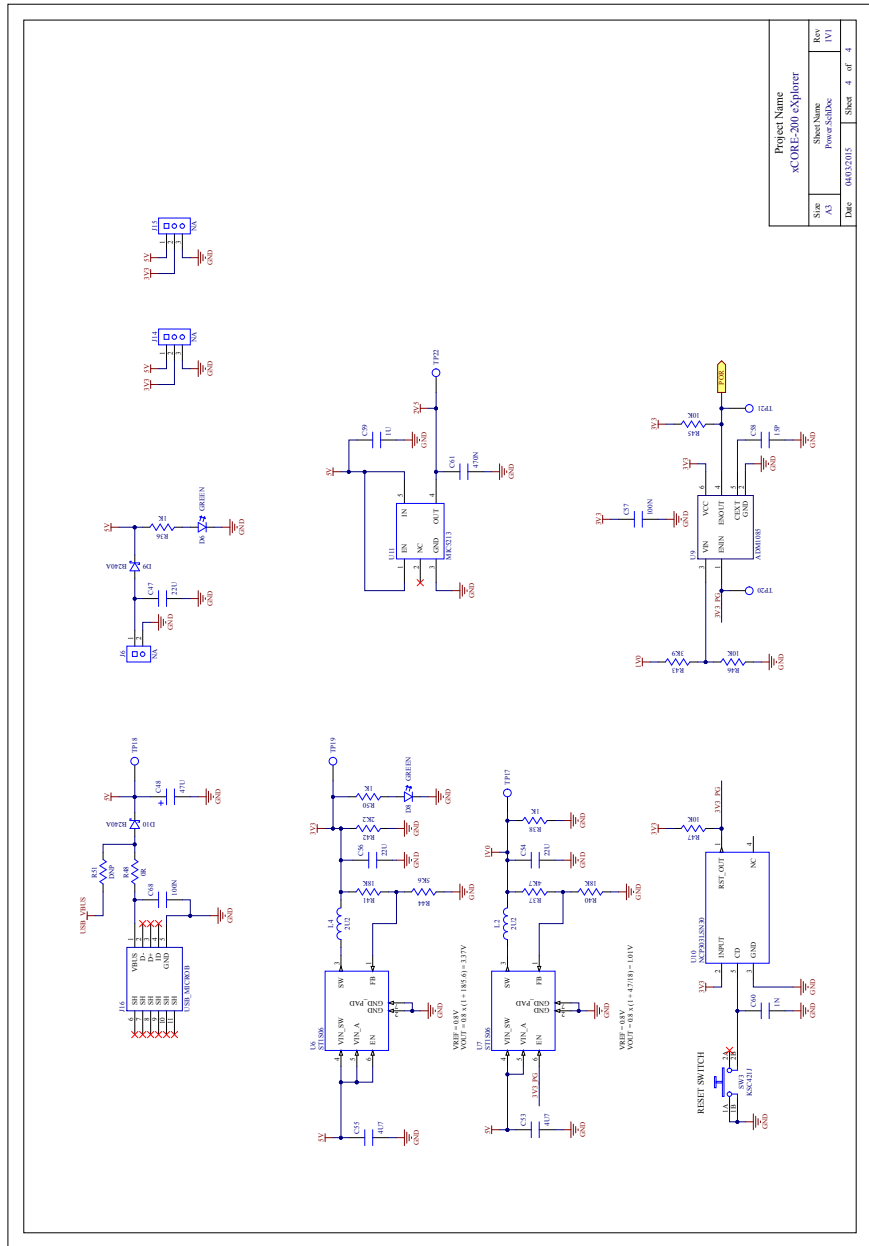
**Figure 21:**  
xCORE-200  
explorerKIT  
schematic



**Figure 23:**  
xCORE-200  
explorerKIT  
Ethernet  
schematic







**Figure 24:**  
xCORE-200  
explorerKIT  
power  
schematic

## 18 RoHS and REACH

The xCORE-200 explorerKIT complies with appropriate RoHS2 and REACH regulations and is a Pb-free product.

The xCORE-200 explorerKIT is subject to the European Union WEEE directive and should not be disposed of in household waste. Alternative requirements may apply outside of the EU.



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