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10/25/17



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DS50002707B

## Overview

The dsPIC33CH128MP508 General Purpose Explorer 16/32 PIM (MA330040) is designed to demonstrate the capabilities of the dsPIC33CH128MP508 family using the Explorer 16 or Explorer 16/32 Development Board. Refer to [Table 1](#) and [Table 2](#) for the mapping of the physical pins on the dsPIC33CH128MP508 to the 100 pins on the PIM connector.

Not all predefined PIM signals found on the Explorer 16/32 are connected due to the limited amount of I/O pins available.

The dsPIC33CH128MP508 is a dual core device. The Master core, as well the Slave, can be debugged and programmed using this PIM. Since there are two cores available in the dsPIC33CH128MP508 device, there are multiple ways to program and debug the Master and the Slave. The four scenarios are:

1. Master = Release, Slave = Release
2. Master = Debug, Slave = Release
3. Master = Release, Slave = Debug
4. Master = Debug, Slave = Debug (e.g., "Dual Debug" mode)

In scenarios 1, 2 and 3, only a single programmer/debugger tool is needed, and it should be connected to the PIM via the Explorer 16 (or Explorer 16/32) In-Circuit Serial Programming™ (ICSP™) interface.

In scenario 4 only ("Dual Debug" of both cores simultaneously), two debugger tools are required. In this scenario, the debugger connected via the Explorer 16 (or Explorer 16/32) ICSP interface is used to debug the Master core, while the second debugger is intended to be connected directly to the PIM via the 6-pin in-line ICSP interface J2 on the PIM. When using the Explorer 16/32, the PICkit™-On-Board (PKOB) circuit would typically be used to debug the Master core (thus requiring only one additional debugger tool in this scenario). The pins of J2 are slightly staggered to provide some retention friction, for temporary use, without requiring solder.

## Demo Overview

This demo project provides a basic demonstration of how to use both the Master and Slave cores within the dsPIC33CH128MP508, and how to use the Master/Slave core interface for sending data between the cores.

The `master.X` includes/uses the `slave.X` project. Therefore, attempting to build and program the `master.X` project should have the effect of simultaneously building and programming both the Master and Slave core program code into the device.

During execution, the demo performs the following operations:

1. Periodically takes ADC measurements on the potentiometer on the Explorer 16/32 and prints the results to the LCD screen.
2. Periodically computes the value of "pi" and prints the results to the LCD screen.
3. Blinks an LED (D10 on the Explorer 16/32).
4. Samples the S3 and S6 push buttons (used for "mode" switching).

The demo has two primary operating modes:

**Mode 1:** Uses only the Master core to perform all application tasks, or

**Mode 2:** Uses the Master core to perform user interface related tasks (ex: LCD printing, LED blinking, ADC measurements), while the Slave core is used to perform mathematical computations (computes "pi").

While operating in Mode 1, both the pi computations and other tasks are all performed on the Master core only, and since the pi computation is written as blocking code, it temporarily blocks the operation of the other application tasks (ex: ADC POT measurements, LED blinking and LCD screen updates are temporary halted while the pi computation is in progress).

While operating in Mode 2, the pi computations do not interrupt/interfere with the other application operations (such as ADC POT measurements and LCD printing), since the tasks are being performed on separate cores. In Mode 2, when a pi computation is complete, the value is sent to the Master core through the Master/Slave interface mailboxes, and the master core is responsible for printing the pi result to the LCD screen (along with the POT value data).

To operate the application in Mode 1 (Master only), press the "S3" push button on the Explorer 16/32 Development Board when prompted to do so on the LCD screen. Alternatively, to operate in Mode 2 (Master + Slave), press the "S6" push button.

To appreciate the difference between the two operating modes, it is suggested to continuously adjust the POT while the demo is running (and to compare the difference in LCD updating behavior between the modes).



**Table 1: dsPIC33CH128MP508 PIM Mapping**

| PIM Pin #        | Device Pin # (80-Pin TQFP) | dsPIC33CH128MP508 I/Os   | Function               | Explorer 16/32 Net Name |
|------------------|----------------------------|--|------------------------|-------------------------|
| 1                | —                          | —  | —                      | P1_VBUS                 |
| 2                | 12, 25, 31, 51, 71         | VDD + AVDD   | VDD                    | VDD_PIM                 |
| 3                | 64                         | ASDA2/RE13/S1RE13  | LCD D5                 | P3_LCDD5                |
| 4                | 77                         | RE14/S1RE14  | LCD D6                 | P4_LCDD6                |
| 5                | 79                         | RE15/S1RE15  | LCD D7                 | P5_LCDD7                |
| 6                | 16                         | ANO/CMP1A/RA0/S1RA0  | General Purpose I/O    | P6                      |
| 7 <sup>(1)</sup> | —                          | —  | —                      | P7                      |
| 8 <sup>(1)</sup> | —                          | —  | —                      | P8                      |
| 9 <sup>(1)</sup> | —                          | —  | —                      | P9                      |
| 10               | 29                         | AN14/ISRC1/RP50/RC2/S1ANA0/S1RP50/S1RC2  | mikroBUS™ A SPI SCK    | P10_SCKA                |
| 11               | 53                         | RP70/RD6/S1RP70/S1PWM6H/S1RD6  | mikroBUS A SPI MISO    | P11_MISOA               |
| 12               | 33                         | CMP1B/RP51/RC3/S1AN8/S1CMP3B/S1RP51/S1RC3  | mikroBUS A SPI MOSI    | P12_MOSIA               |
| 13               | 9                          | MCLR   | MCLR Reset             | P13_MCLR                |
| 14               | 69                         | RP67/RD3/S1RP67/S1PWM3L/S1RD3  | mikroBUS A Chip Select | P14_CSA                 |
| 15               | 11, 26, 32, 50, 70         | VSS + AVSS   | VSS                    | VSS                     |
| 16               | 12, 25, 31, 51, 71         | VDD + AVDD   | VDD                    | VDD_PIM                 |
| 17               | 2                          | RE0/S1RE0  | LED D3                 | P17_LED3                |
| 18               | 80                         | RP45/PWM2L/RB13/S1RP45/S1RB13  | mikroBUS B Interrupt   | P18_INTB                |
| 19               | 30                         | RP54/RC6/S1AN11/S1CMP1B/S1RP54/S1RC6   | mikroBUS B Reset       | P19_RSTB                |
| 20               | 21                         | AN3/IBIAS0/RA3/S1AN0/S1CMP1A/S1PGA1P1/S1RA3  | 10k Potentiometer      | P20_POT                 |
| 21               | 18                         | AN1/RA1/S1AN15/S1RA1   | TC1047A Temp. Sensor   | P21_TEMP                |
| 22               | 28                         | AN13/ISRC0/RP49/RC1/S1ANA1/S1RP49/S1RC1  | General Purpose I/O    | P22                     |
| 23               | 58                         | TDO/AN9/RP39/RB7/S1MCLR1/S1AN6/S1RP39/S1PWM5H/S1RB7  | mikroBUS B Chip Select | P23_CSB                 |
| 24               | 41                         | DACOUT/AN7/CMP1D/RP34/INT0/RB2/S1MCLR2/S1AN3/S1ANCO/S1ANC1/S1CMP1D/S1CMP2D/S1CMP3D/S1RP34/S1INT0/S1RB2 | mikroBUS B Analog      | P24_ANB                 |
| 25               | 40                         | AN15/ISRC2/RP55/RC7/S1AN12/S1RP55/S1RC7  | mikroBUS A Analog      | P25_ANA_USBOC           |
| 26               | 45                         | PGC2/RP36/RB4/S1PGC2/S1AN9/S1RP36/S1PWM5L/S1RB4  | ICSP™ Prog/Debug PGC2  | P26_PGC                 |
| 27               | 43                         | PGD2/AN8/RP35/RB3/S1PGD2/S1AN18/S1CMP3A/S1PGA3P1/S1RP35/S1RB3  | ICSP Prog/Debug PGD2   | P27_PGD                 |
| 28               | 36                         | RD11/S1AN17/S1PGA1P2/S1RD11  | General Purpose I/O    | P28                     |
| 29               | 27                         | RD12/S1AN14/S1PGA2P2/S1RD12  | General Purpose I/O    | P29                     |
| 30               | 12, 25, 31, 51, 71         | VDD + AVDD   | VDD                    | VDD_PIM                 |
| 31               | 11, 26, 32, 50, 70         | VSS + AVSS   | VSS                    | VSS                     |
| 32               | 20                         | AN2/RA2/S1AN16/S1RA2   | General Purpose I/O    | P32_CC2                 |
| 33               | 15                         | AN12/IBIAS3/RP48/RC0/S1AN10/S1RP48/S1RC0   | General Purpose I/O    | P33_CC1                 |
| 34               | —                          | —  | —                      | P34                     |
| 35               | —                          | —  | —                      | P35                     |
| 36               | 11, 26, 32, 50, 70         | VSS + AVSS   | VSS                    | VSS                     |
| 37               | 12, 25, 31, 51, 71         | VDD + AVDD   | VDD                    | VDD_PIM                 |
| 38               | 4                          | RE1/S1RE1  | LED D4                 | P38_LED4                |
| 39               | 75                         | TMS/RP42/PWM3H/RB10/S1RP42/S1RB10  | General Purpose I/O    | P39                     |
| 40               | 76                         | TCK/RP43/PWM3L/RB11/S1RP43/S1RB11  | General Purpose I/O    | P40                     |
| 41               | —                          | —  | —                      | P41                     |
| 42               | —                          | —  | —                      | P42                     |
| 43               | —                          | —  | —                      | P43                     |
| 44               | 59                         | RE11/S1RE11  | LCD Register Select    | P44_LCDRS               |
| 45               | 11, 26, 32, 50, 70         | VSS + AVSS   | VSS                    | VSS                     |
| 46               | 12, 25, 31, 51, 71         | VDD + AVDD   | VDD                    | VDD_PIM                 |
| 47               | 7                          | RP62/RC14/S1RP62/S1PWM7H/S1RC14  | General Purpose I/O    | P47                     |
| 48               | 8                          | RP63/RC15/S1RP63/S1PWM7L/S1RC15  | General Purpose I/O    | P48                     |
| 49               | 66                         | RP58/RC10/S1RP58/S1PWM1H/S1RC10  | MCP2221A/mikroBUS B RX | P48                     |
| 50               | 67                         | RP59/RC11/S1RP59/S1PWM1L/S1RC11  | MCP2221A/mikroBUS B TX | P49_RXB                 |

**Note 1:** These pins can optionally be connected to the microcontroller if jumper resistors R1, R2 and R3 are populated.

**Table 1: dsPIC33CH128MP508 PIM Mapping (Continued)**

| PIM Pin # | Device Pin # (80-Pin TQFP) | dsPIC33CH128MP508 I/Os                                   | Function                    | Explorer 16/32 Net Name |
|-----------|----------------------------|--|-----------------------------|-------------------------|
| 51        | 73                         | RP65/RD1/S1RP65/S1PWM4H/S1RD1                            | mikroBUS™ A TX              | P51_TXA                 |
| 52        | 74                         | RP64/RD0/S1RP64/S1PWM4L/S1RD0                            | mikroBUS A RX               | P52_RXA                 |
| 53        | 49                         | SDO2/PCI19/RD8/S1SDO1/S1PCI19/S1RD8                      | mikroBUS B MOSI             | P53_MOSIB               |
| 54        | 47                         | RP57/ASCL1/SDI2/RC9/S1RP57/S1ASCL1/S1SDI1/S1RC9          | mikroBUS B MISO             | P54_MISOB               |
| 55        | 46                         | RP56/ASDA1/SCK2/RC8/S1RP56/S1ASDA1/S1SCK1/S1RC8          | mikroBUS B SPI SCK          | P55_SCKB                |
| 56        | 61                         | PGC1/AN11/RP41/SDA1/RB9/S1PGC1/S1RP41/S1SDA1/S1RB9       | Shared I <sup>2</sup> C SDA | P56_SDA                 |
| 57        | 60                         | PGD1/AN10/RP40/SCL1/RB8/S1PGD1/S1AN7/S1RP40/S1SCL1/S1RB8 | Shared I <sup>2</sup> C SCL | P57_SCL                 |
| 58        | 17                         | RE2/S1RE2  | LED D5                      | P58_LED5                |
| 59        | 19                         | RE3/S1RE3  | LED D6                      | P59_LED6                |
| 60        | 22                         | RE4/S1RE4  | LED D7                      | P60_LED7                |
| 61        | 24                         | RE5/S1RE5  | LED D8                      | P61_LED8                |
| 62        | 12, 25, 31, 51, 71         | VDD + AVDD   | VDD                         | VDD_PIM                 |
| 63        | 34                         | OSCI/CLKI/AN5/RP32/RB0/S1AN5/S1RP32/S1RB0                | Primary Oscillator In       | P63_OSCI                |
| 64        | 35                         | OSCO/CLKO/AN6/IBIAS2/RP33/RB1/S1AN4/S1RP33/S1RB1         | Primary Oscillator Out      | P64_OSOCO               |
| 65        | 11, 26, 32, 50, 70         | VSS + AVSS   | VSS                         | VSS                     |
| 66        | 78                         | TDI/RP44/PWM2H/RB12/S1RP44/S1RB12                        | General Purpose I/O         | P66                     |
| 67        | 72                         | RP66/RD2/S1RP66/S1PWM8L/S1RD2                            | mikroBUS A Interrupt        | P67_INTA                |
| 68        | 14                         | RD13/S1ANNO/S1PGA1N2/S1RD13                              | General Purpose I/O         | P68                     |
| 69        | 65                         | RP53/RC5/S1RP53/S1PWM2L/S1RC5                            | General Purpose I/O         | P69                     |
| 70        | 13                         | PCI21/RD14/S1ANN1/S1PGA2N2/S1PCI21/S1RD14                | General Purpose I/O         | P70                     |
| 71        | —                          | —  | —                           | P71                     |
| 72        | 3                          | RP47/PWM1L/RB15/S1RP47/S1RB15                            | mikroBUS A PWM              | P72_PWMMA               |
| 73        | —                          | —  | —                           | P73_SOSCI               |
| 74        | —                          | —  | —                           | P74_SOSCO               |
| 75        | 11, 26, 32, 50, 70         | VSS + AVSS   | VSS                         | VSS                     |
| 76        | 38                         | ISRC3/RD10/S1AN13/S1CMP2B/S1RD10                         | General Purpose I/O         | P76                     |
| 77        | —                          | —  | —                           | P77                     |
| 78        | 63                         | RP52/RC4/S1RP52/S1PWM2H/S1RC4                            | mikroBUS B PWM              | P78_PWMMA               |
| 79        | 10                         | PCI22/RD15/S1PCI22/S1RD15                                | EEPROM Chip Select          | P79_EECS                |
| 80        | 44                         | RE9/S1RE9  | Button S4                   | P80_S4                  |
| 81        | 57                         | RE10/S1RE10  | LCD E                       | P81_LCDE                |
| 82        | —                          | —  | LCD R/nW (pulled low by R4) | P82_LCDRW               |
| 83        | 1                          | RP46/PWM1H/RB14/S1RP46/S1RB14                            | Button S3                   | P83_S3                  |
| 84        | 42                         | RE8/S1RE8  | Button S6                   | P84_S6                  |
| 85        | —                          | —  | —                           | P85_VDDCORE             |
| 86        | —                          | —  | —                           | P86_ENVREG              |
| 87        | 5                          | RP60/PWM4H/RC12/S1RP60/S1RC12                            | General Purpose I/O         | P87                     |
| 88        | 6                          | RP61/PWM4L/RC13/S1RP61/S1RC13                            | General Purpose I/O         | P88                     |
| 89        | 52                         | RP71/RD7/S1RP71/S1PWM8H/S1RD7                            | General Purpose I/O         | P89_USBDN               |
| 90        | 54                         | RP69/RD5/S1RP69/S1PWM6L/S1RD5                            | General Purpose I/O         | P90_USBDP               |
| 91        | 37                         | RE6/S1PGA3N2/S1RE6                                       | LED D9                      | P91_LED9                |
| 92        | 39                         | RE7/S1RE7  | Button S5, LED D10          | P92_S5_LED10            |
| 93        | —                          | —  | —                           | P93_LCDD0               |
| 94        | —                          | —  | —                           | P94_LCDD1               |
| 95        | 68                         | RP68/RD4/S1RP68/S1PWM3H/S1RD4                            | mikroBUS A Reset Pin        | P95_RSTA                |
| 96        | 48                         | PCI20/RD9/S1PCI20/S1RD9                                  | General Purpose I/O         | P96_VBUSON              |
| 97        | —                          | —  | —                           | P97                     |
| 98        | —                          | —  | —                           | P98_LCDD2               |
| 99        | —                          | —  | —                           | P99_LCDD3               |
| 100       | 62                         | ASCL2/RE12/S1RE12  | LCD D4                      | P100_LCDD4              |

**Note 1:** These pins can optionally be connected to the microcontroller if jumper resistors R1, R2 and R3 are populated.

**Table 2: dsPIC33CH128MP508 PIC® MCU Mapping**

| Device Pin # (80-Pin TQFP) | PIM Pin # | dsPIC33CH128MP508 I/Os  | Function                   | Explorer 16/32 Net Name |
|----------------------------|-----------|---|----------------------------|-------------------------|
| 1                          | 83        | RP46/PWM1H/RB14/S1RP46/S1RB14                                 | Button S3                  | P83_S3                  |
| 2                          | 17        | RE0/S1RE0   | LED D3                     | P17_LED3                |
| 3                          | 72        | RP47/PWM1L/RB15/S1RP47/S1RB15                                 | mikroBUS™ A PWM            | P72_PWMA                |
| 4                          | 38        | RE1/S1RE1   | LED D4                     | P38_LED4                |
| 5                          | 87        | RP60/PWM4H/RC12/S1RP60/S1RC12                                 | General Purpose I/O        | P87                     |
| 6                          | 88        | RP61/PWM4L/RC13/S1RP61/S1RC13                                 | General Purpose I/O        | P88                     |
| 7                          | 47        | RP62/RC14/S1RP62/S1PWM7H/S1RC14                               | General Purpose I/O        | P47                     |
| 8                          | 48        | RP63/RC15/S1RP63/S1PWM7L/S1RC15                               | General Purpose I/O        | P48                     |
| 9                          | 13        | MCLR  | MCLR Reset                 | P13_MCLR                |
| 10                         | 79        | PCI22/RD15/S1PCI22/S1RD15                                     | EEPROM Chip Select         | P79_EECS                |
| 11, 26, 32, 50, 70         | 15        | Vss + AVss  | Vss                        | VSS                     |
| 12, 25, 31, 51, 71         | 16        | Vdd + AVdd  | Vdd                        | VDD_PIM                 |
| 13                         | 70        | PCI21/RD14/S1ANN1/S1PGA2N2/S1PCI21/S1RD14                     | General Purpose I/O        | P70                     |
| 14                         | 68        | RD13/S1ANNO/S1PGA1N2/S1RD13                                   | General Purpose I/O        | P68                     |
| 15                         | 33        | AN12/BIAS3/FP48/RC0/S1AN10/S1RP48/S1RC0                       | General Purpose I/O        | P33_CC1                 |
| 16                         | 6         | AN0/CMP1A/RA0/S1RA0   | General Purpose I/O        | P6                      |
| 17                         | 58        | RE2/S1RE2   | LED D5                     | P58_LED5                |
| 18                         | 21        | AN1/RA1/S1AN15/S1RA1  | TC1047A Temp. Sensor       | P21_TEMP                |
| 19                         | 59        | RE3/S1RE3   | LED D6                     | P59_LED6                |
| 20                         | 32        | AN2/RA2/S1AN16/S1RA2  | General Purpose I/O        | P32_CC2                 |
| 21                         | 20        | AN3/BIAS0/RA3/S1AN0/S1CMP1A/S1PGA1P1/S1RA3                    | 10K Potentiometer          | P20_POT                 |
| 22                         | 60        | RE4/S1RE4   | LED D7                     | P60_LED7                |
| 23 <sup>(1)</sup>          | NC        | SMCLR3/AN4/S1AN1/ S1CMP2A/S1PGA2P1/ S1PGA3P2/BIAS1/ RA4/S1RA4 | —                          | —                       |
| 24                         | 61        | RE5/S1RE5   | LED D8                     | P61_LED8                |
| 12, 25, 31, 51, 71         | 62        | Vdd + AVdd  | Vdd                        | VDD_PIM                 |
| 11, 26, 32, 50, 70         | 65        | Vss + AVss  | Vss                        | VSS                     |
| 27                         | 29        | RD12/S1AN14/S1PGA2P2/S1RD12                                   | General Purpose I/O        | P29                     |
| 28                         | 22        | AN13/ISRC0/FP49/RC1/S1ANA1/S1RP49/S1RC1                       | General Purpose I/O        | P22                     |
| 29                         | 10        | AN14/ISRC1/FP50/RC2/S1ANA0/S1RP50/S1RC2                       | mikroBUS A SPI SCK         | P10_SCKA                |
| 30                         | 19        | RP54/RC6/S1AN11/S1CMP1B/S1RP54/S1RC6                          | mikroBUS B Reset           | P19_RSTB                |
| 12, 25, 31, 51, 71         | 16        | Vdd + AVdd  | Vdd                        | VDD_PIM                 |
| 11, 26, 32, 50, 70         | 15        | Vss + AVss  | Vss                        | VSS                     |
| 33                         | 12        | CMP1B/FP51/RC3/S1AN8/S1CMP3B/S1RP51/S1RC3                     | mikroBUS A SPI MOSI        | P12_MOSIA               |
| 34                         | 63        | OSCI/CLKI/AN5/FP32/RB0/S1AN5/S1RP32/S1RB0                     | Primary Oscillator In      | P63_OSCI                |
| 35                         | 64        | OSCO/CLKO/AN6/BIAS2/FP33/RB1/S1AN4/S1RP33/ S1RB1              | Primary Oscillator Out     | P64_OSICO               |
| 36                         | 28        | RD11/S1AN17/S1PGA1P2/S1RD11                                   | General Purpose I/O        | P28                     |
| 37                         | 91        | RE6/S1PGA3N2/S1RE6  | LED D9                     | P91_LED9                |
| 38                         | 76        | ISRC3/RD10/S1AN13/S1CMP2B/S1RD10                              | General Purpose I/O        | P76                     |
| 39                         | 92        | RE7/S1RE7   | Button S5/LED D10          | P92_S5_LED10            |
| 40                         | 25        | AN15/ISRC2/FP55/RC7/S1AN12/S1RP55/S1RC7                       | mikroBUS A Analog          | P25_ANA_USBOC           |
| 40                         | 50        | RC12/U1TX   | MCP2221A and mikroBUS B TX | P50_TXB                 |

**Note 1:** These pins are connected to "Dual Debug" header J2. They can optionally be connected to the Explorer 16/32 if R1, R2 and R3 are populated with jumper resistors.

**Table 2: dsPIC33CH128MP508 PIC® MCU Mapping (Continued)**

| Device Pin # (80-Pin TQFP) | PIM Pin # | dsPIC33CH128MP508 I/Os   | Function                    | Explorer 16/32 Net Name |
|----------------------------|-----------|--|-----------------------------|-------------------------|
| 41                         | 24        | DACOUT/AN7/CMP1D/FP34/INT0/RB2/S1MCLR2/S1AN3/ S1ANCO/S1ANCI/S1CMP1D/S1CMP2D/S1CMP3D/S1RP34/ S1INT0/S1RB2 | mikroBUS B Analog           | P24_ANB                 |
| 42                         | 84        | RE8/S1RE8  | Button S6                   | P84_S6                  |
| 43                         | 27        | PGD2/AN8/FP35/RB3/S1PGD2/S1AN18/S1CMP3A/ S1PGA3P1/S1RP35/S1RB3   | ICSP™ Prog/Debug PGD2       | P27_PGD                 |
| 44                         | 80        | RE9/S1RE9  | Button S4                   | P80_S4                  |
| 45                         | 26        | PGC2/FP36/RB4/S1PGC2/S1AN9/S1RP36/S1PWM5L/S1RB4  | ICSP™ Prog/Debug PGC2       | P26_PGC                 |
| 46                         | 55        | RP56/ASDA1/SCK2/RC8/S1RP56/S1ASDA1/S1SCK1/S1RC8  | mikroBUS™ B SPI SCK         | P55_SCKB                |
| 47                         | 54        | RP57/ASCL1/S1SDI2/RC9/S1RP57/S1ASCL1/S1SDI1/S1RC9  | mikroBUS B SPI MISO         | P54_MISOB               |
| 48                         | 96        | PCI20/RD9/S1PCI20/S1RD9  | General Purpose I/O         | P96_VBUSON              |
| 49                         | 53        | SDO2/PC19/RD8/S1SDO1/S1PC19/S1RD8  | mikroBUS B SPI MOSI         | P53_MOSIB               |
| 11, 26, 32, 50, 70         | 65        | Vss + AVss   | Vss                         | VSS                     |
| 12, 25, 31, 51, 71         | 62        | Vdd + AVdd   | Vdd                         | VDD_PIM                 |
| 52                         | 89        | RP71/RD7/S1RP71/S1PWM8H/S1RD7  | General Purpose I/O         | P89_USBDN               |
| 53                         | 11        | RP70/RD6/S1RP70/S1PWM6H/S1RD6  | mikroBUS A SPI MISO         | P11_MISOA               |
| 54                         | 90        | RP69/RD5/S1RP69/S1PWM6L/S1RD5  | General Purpose I/O         | P90_USBDP               |
| 55 <sup>(1)</sup>          | NC        | S1PGC3/FPIN38/RPO6/S1RPIN38/S1RPO6/SCL2/RB6/ S1RB6   | —                           | —                       |
| 56 <sup>(1)</sup>          | NC        | S1PGD3/FPIN37/RPO5/S1RPIN37/S1RPO5/SDA2/RB5/ S1RB5   | —                           | —                       |
| 57                         | 81        | RE10/S1RE10  | LCD E                       | P81_LCDE                |
| 58                         | 23        | TDO/AN9/FP39/RB7/S1MCLR1/S1AN6/S1RP39/S1PWM5H/ S1RB7   | mikroBUS B Chip Select      | P23_CSB                 |
| 59                         | 44        | RE11/S1RE11  | LCD Register Select         | P44_LCDRS               |
| 60                         | 57        | PGD1/AN10/FP40/SCL1/RB8/S1PGD1/S1AN7/S1RP40/ S1SCL1/S1RB8  | Shared I <sup>2</sup> C SCL | P57_SCL                 |
| 61                         | 56        | PGC1/AN11/FP41/SDA1/RB9/S1PGC1/S1RP41/S1SDA1/ S1RB9  | Shared I <sup>2</sup> C SDA | P56_SDA                 |
| 62                         | 100       | ASCL2/RE12/ S1RE12   | LCD D4                      | P100_LCDD4              |
| 63                         | 78        | RP52/RC4/S1RP52/S1PWM2H/S1RC4  | mikroBUS B PWM              | P78_PWMB                |
| 64                         | 3         | ASDA2/RE13/S1RE13  | LCD D5                      | P3_LCDD5                |
| 65                         | 69        | RP53/RC5/S1RP53/S1PWM2L/S1RC5  | General Purpose I/O         | P69                     |
| 66                         | 49        | RP58/RC10/S1RP58/S1PWM1H/S1RC10  | MCP2221A and mikroBUS B RX  | P49_RXB                 |
| 67                         | 50        | RP59/RC11/S1RP59/S1PWM1L/S1RC11  | MCP2221A and mikroBUS B TX  | P50_TXB                 |
| 68                         | 95        | RP68/RD4/S1RP68/S1PWM3H/S1RD4  | mikroBUS A Reset Pin        | P95_RSTA                |
| 69                         | 14        | RP67/RD3/S1RP67/S1PWM3L/S1RD3  | mikroBUS A Reset Pin        | P14_CSA                 |
| 11, 26, 32, 50, 70         | 65        | Vss + AVss   | Vss                         | VSS                     |
| 12, 25, 31, 51, 71         | 62        | Vdd + AVdd   | Vdd                         | VDD_PIM                 |
| 72                         | 67        | RP66/RD2/S1RP66/S1PWM8L/S1RD2  | mikroBUS A Interrupt        | P67_INTA                |
| 73                         | 51        | RP65/RD1/S1RP65/S1PWM4H/S1RD1  | mikroBUS A TX               | P51_TXA                 |
| 74                         | 52        | RP64/RD0/S1RP64/S1PWM4L/S1RD0  | mikroBUS A RX               | P52_RXA                 |
| 75                         | 39        | TMS/FP42/PWM3H/RB10/S1RP42/S1RB10  | General Purpose I/O         | P39                     |
| 76                         | 40        | TCK/FP43/PWM3L/RB11/S1RP43/S1RB11  | General Purpose I/O         | P40                     |
| 77                         | 4         | RE14/S1RE14  | LCD D6                      | P4_LCDD6                |
| 78                         | 66        | TDI/FP44/PWM2H/RB12/S1RP44/S1RB12  | General Purpose I/O         | P66                     |
| 79                         | 5         | RE15/S1RE15  | LCD D7                      | P5_LCDD7                |
| 80                         | 18        | RP45/PWM2L/RB13/S1RP45/S1RB13  | mikroBUS B Interrupt        | P18_INTB                |

**Note 1:** These pins are connected to "Dual Debug" header J2. They can optionally be connected to the Explorer 16/32 if R1, R2 and R3 are populated with jumper resistors.

# dsPIC33CH128MP508 Plug-In Module (PIM) Information Sheet

## Schematic Revision 1.0

