

TABLE 1: SIGNAL INTERFACE FOR DISPLAY CONNECTOR (CONTINUED)

Pin No.	Symbol	Level	Description
A28	SCK	I/O	Can be used for SPI Synchronous Serial Clock (SCK) or as general purpose I/O
B28	SDO (MOSI)	I/O	Can be used for SPI Master Out Slave In (MOSI) or as general purpose I/O
B29	SDI (MISO)	I/O	Can be used for SPI Master In Slave Out (MISO) or as general purpose I/O
A30-A31, B30-B31	NC	—	Not connected
A32, B32	GND	GND	Ground

TABLE 2: RBG INTERFACE MAPPING FOR TFT DISPLAYS

Color	Graphic Data Pins	18-bit RBG Display (6-6-6)	24-bit RGB Display (8-8-8)
Red	PMD<15:11>	Red<5:1>	Red<7:3>
	PMD<15>	Red<0>	Red<2:0>
Green	PMD<10:15>	Green<5:0>	Green<7:2>
	PMD<10>	Green<5>	Green<1:0>
Blue	PMD<4:0>	Blue<5:1>	Blue<7:3>
	PMD<4>	Blue<0>	Blue<2:0>

Americas

Atlanta - 678-957-9614
 Boston - 774-760-0087
 Chicago - 630-285-0071
 Cleveland - 216-447-0464
 Dallas - 972-818-7423
 Detroit - 248-538-2250
 Indianapolis - 317-773-8323
 Los Angeles - 949-462-9523
 Phoenix - 480-792-7200
 Santa Clara - 408-961-6444
 Toronto - 905-673-0699

Europe

Austria - Wels - 43-7242-2244-39
 Denmark - Copenhagen - 45-4450-2828
 France - Paris - 33-1-69-53-63-20
 Germany - Munich - 49-89-627-144-0
 Italy - Milan - 39-0331-742611
 Netherlands - Drunen - 31-416-690399
 Spain - Madrid - 34-91-708-08-90
 UK - Wokingham - 44-118-921-5869

Asia/Pacific

Australia - Sydney - 61-2-9868-6733
 China - Beijing - 86-10-8569-2100
 China - Chengdu - 86-28-8665-5511
 China - Chongqing - 86-23-8980-9588

Asia/Pacific (Continued)

China - Hangzhou - 86-571-2819-3187
 China - Hong Kong SAR - 852-2401-1200
 China - Nanjing - 86-25-8473-2460
 China - Qingdao - 86-532-8502-7355
 China - Shanghai - 86-21-5407-5533
 China - Shenyang - 86-24-2334-2829
 China - Shenzhen - 86-755-8203-2660
 China - Wuhan - 86-27-5980-5300
 China - Xiamen - 86-592-2388138
 China - Xian - 86-29-8833-7252
 China - Zhuhai - 86-756-3210040
 India - Bangalore - 91-80-3090-4444
 India - New Delhi - 91-11-4160-8631
 India - Pune - 91-20-2566-1512
 Japan - Osaka - 81-66-152-7160
 Japan - Yokohama - 81-45-471-6166
 Korea - Daegu - 82-53-744-4301
 Korea - Seoul - 82-2-554-7200
 Malaysia - Kuala Lumpur - 60-3-6201-9857
 Malaysia - Penang - 60-4-227-8870
 Philippines - Manila - 63-2-634-9065
 Singapore - 65-6334-8870
 Taiwan - Hsin Chu - 886-3-5778-366
 Taiwan - Kaohsiung - 886-7-536-4818
 Taiwan - Taipei - 886-2-2500-6610
 Thailand - Bangkok - 66-2-694-1351

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Microchip Technology Inc. • 2355 West Chandler Blvd. • Chandler, AZ 85224-6199

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DS51966C



Low Cost Controllerless (LCC) Graphics PICtail™ Plus Daughter Board Information Sheet

Features

- Controllerless graphics support for 4/8-bit STN, 4/8-bit CSTN, 18-bit HR-TFT and 9/12/18/24-bit TFT interfaces (additional samples can be obtained from www.microchipdirect.com)
- 16 Megabit (2 Mb x 8) serial Flash memory for additional data storage
- Display connector for interfacing with different display boards
- PICtail™ Plus interface for connecting to Explorer 16 Development Board
- Starter Kit connector

Getting Started

A Starter Kit, I/O Expansion Board, or an Explorer 16 Development Board (DM240001) is required, but only one should be used. An external 9V (AC162039) power supply can be connected through the Explorer 16 Development Board or directly to connector J5. When a Starter Kit is used, the setup can be powered via the USB debugger. If your USB device cannot supply enough power, the external power supply should be used. Finally, a display board, such as the Graphics Display Truly 3.2" 240x320 Board (AC164127-4), should be connected to the display connector.

Several board settings can be selected:

- Jumper Pins 1-2: These pins set the board for internal memory mode. In this mode an 8 BPP color signal is sent to the LCD using internal SRAM memory from the PIC.
- Jumper Pins 2-3: These pins set the board for external memory mode. In this mode a 16 BPP color signal is sent to the LCD using external 8 Megabit SRAM (512 x 16) memory found on the board.

The LCC Graphics PICtail™ Plus Daughter Board can be used in conjunction with the Microchip Graphics Library. The Microchip Graphics Library and other firmware examples can be downloaded from the Low Cost Controllerless Graphics Web site found on www.microchip.com. Please refer to the "Getting Started" topic in the Microchip Graphics Library Help at this location to program and run demonstration projects.

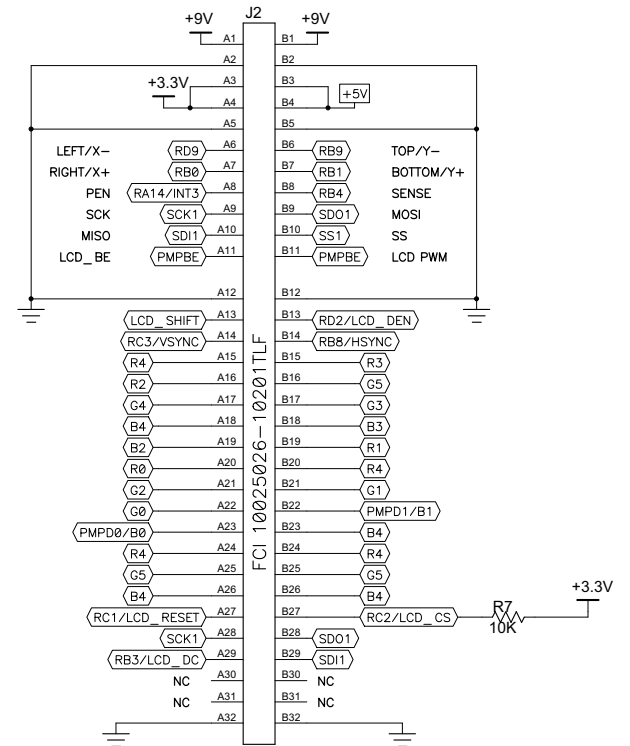
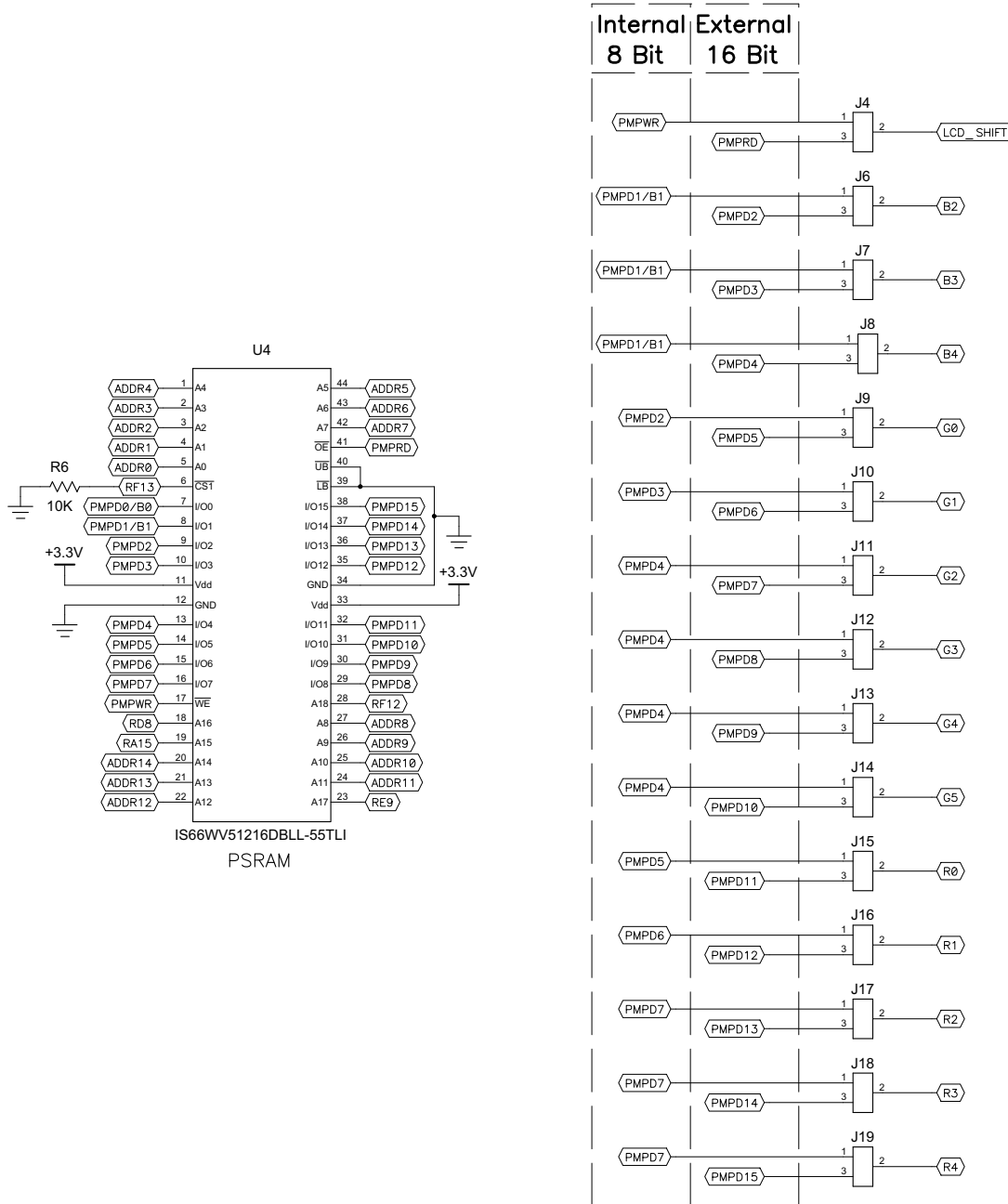
A different display board may also be available; please check www.microchip.com/graphics for available options. If an end designer chooses to develop a custom display board, the included schematic shows the details of signal connections. Please note that a different display may require modifications to the software provided with the Microchip Graphics Library to function properly.

TABLE 1: SIGNAL INTERFACE FOR DISPLAY CONNECTOR

Pin No.	Symbol	Level	Description
A1, B1	+9V	+9.0V	Power supply
A2, B2	GND	GND	Ground
A3, A4	+3.3V	+3.3V	Power supply
B3, B4	+5V	+5.0V	Power supply
A5, B5	GND	GND	Ground
A6	LEFT/X-	I/O	Touch panel left
B6	TOP/Y-	I/O	Touch panel top
A7	RIGHT/X+	I/O	Touch panel right
B7	BOTTOM/Y+	I/O	Touch panel bottom
A8	PEN	I	Pen interrupt (touch panel driver)
B8	SENSE	I	5-wire touch panel sense
A9	SCK	O	PIC® MCU SPI Synchronous Serial Clock (SCK)
B9	SDO	O	PIC MCU SPI Data Out (SDO)
A10	SDI	I	PIC MCU SPI Data In (SDI)
B10	SS	O	PIC MCU SPI Slave Synchronization (SS)
A11	LCD_BE	O	Enable for backlight driver
B11	LCD_PWM	O	PWM output for backlight driver
A12, B12	GND	GND	Ground
A13	SHIFT	O	Pixel shift signal
B13	DEN	O	Data enable for 24-bit digital RGB interface
A14	VSYNC	O	Frame pulse
B14	HSYNC	O	Line pulse
A15-A26, B15-B26	R0-R7, D0-D7, B0-B7	O	24-bit data
A27	LCD_RESET	O	Can be configured for display or as general purpose output
B27	CS	I/O	Can be used for SPI Chip Select (CS) or as general purpose I/O

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Schematics (Sheets 1 of 2)



Note: For optimal color with an 18/24-bit RGB display, follow the mapping provided in Table 2.

