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>

MICROCHIP

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

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

Schematics (Sheets 1 of 2)
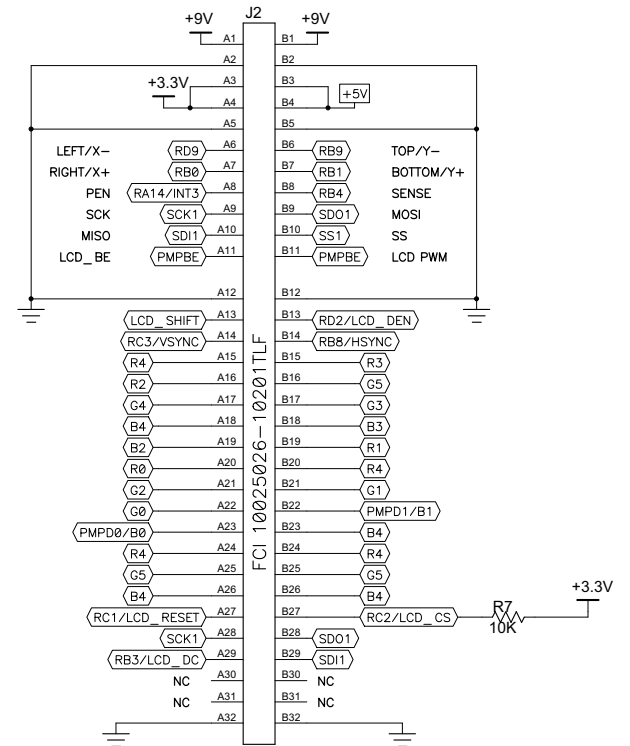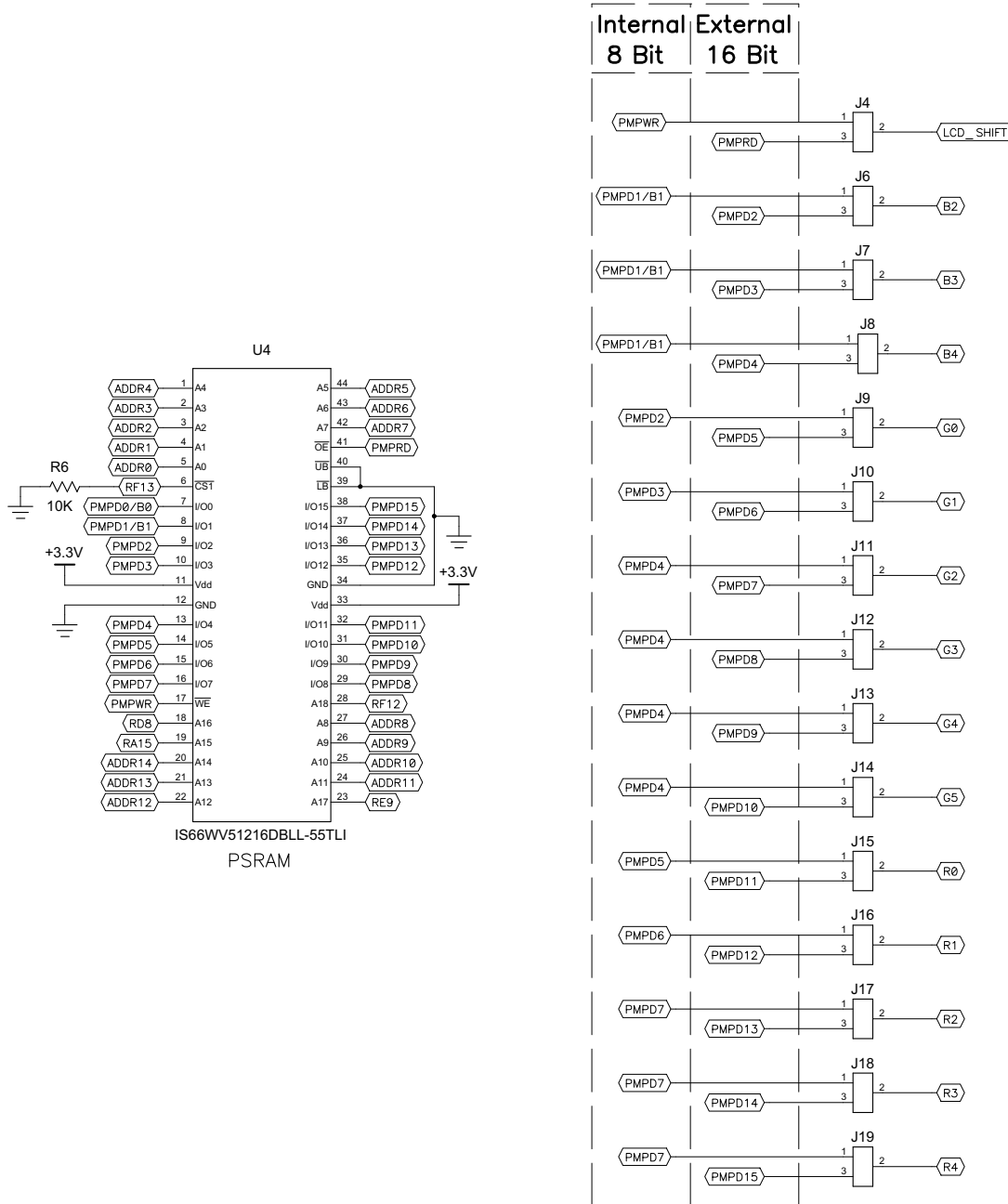
Note: For optimal color with an 18/24-bit RGB display, follow the mapping provided in Table 2.

Schematics (Sheets 2 of 2)