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# Embedded Development Board Product Datasheet

## EMB018TFTDEV

1.8" TFT Development Board for Microchip  
Development Tools

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## 1. Product Description

The Displaytech EMB018TFTDEV is a development board for the Displaytech DT018ATFT TFT display module. The EMB018TFTDEV interfaces with any Microchip PICtail Plus or Display Connector V1 capable development board, such as the Explorer16, Starter Kit I/O Expansion Board, PIC24FJ256DA210 Development Board, or Graphics PICtail Plus 3 Controller Board.

## 2. External Interfaces

The EMB018TFTDEV supports driving the DT018ATFT's COG Ilitek ILI9163 TFT controller via either a 16-bit parallel or 16-bit RGB interface. When connected to the PICtail Plus connector, the 16-bit parallel connection is automatically selected. When connected to the Display Connector V1, the 16-bit RGB connection is automatically selected. The ILI9163 is configured for each interface via the IM[2:0] and RCM[1:0] pins, which are connected to logic high or logic low depending on which interface is connected. Please see the [DT018ATFT Datasheet](#) and the [Pin Connection Table](#) for more information.

*Caution: Do not connect development boards to both the PICtail Plus and Display Connector V1 connectors at the same time.*

### 2.1. Display Connector V1 (16-bit RGB) Interface

When connected to the Display Connector V1 connection (RGB interface), the ILI9163 configuration registers are manipulated via a 3-wire SPI interface. The 3-wire SPI interface uses a 9-bit data length. Because of this requirement, the MCU must be programmed to bit-bang this SPI connection as the Microchip SPI peripheral does not support a 9-bit SPI interface.

The ILI9163 accepts an 18-bit RGB interface, but all Microchip graphics development tools output a 16-bit RGB signal. This 16-bit RGB interface is connected to the ILI9163 18-bit RGB interface by tying the MSBs of the red and blue channels to the LSBs of the red and blue channels in order to achieve maximum brightness of each channel. Please see the [PIC24FJ256DA210 Development Board Datasheet](#) for more information.

To configure the ILI9163 for RGB mode, please set registers 0xB0, 0xF6 and 0x3A appropriately. Please see the [ILI9163 Datasheet](#) Section 14 for more information.

### 2.2. PICtail Plus (16-bit Parallel) Interface

When using the parallel interface, all ILI9163 configuration registers are configured via the 8 least significant bits of the parallel interface. The ILI9163 must be configured to accept a 16-bit parallel input via register 0x3A (see the [ILI9163 Datasheet](#)).

## 3. Backlight Power

An on-board CAT4104V LED driver powers the backlight of the DT018ATFT and can be controlled via a PWM signal (CN1-93 [RD0] or CN2-B11 [RD0]). See the [DT018ATFT Datasheet](#) and the [Schematic](#) for more information.

*Note: The backlight power supply requires a 5V supply on the attached Microchip development board. Please power your Microchip development board from the 5V input.*

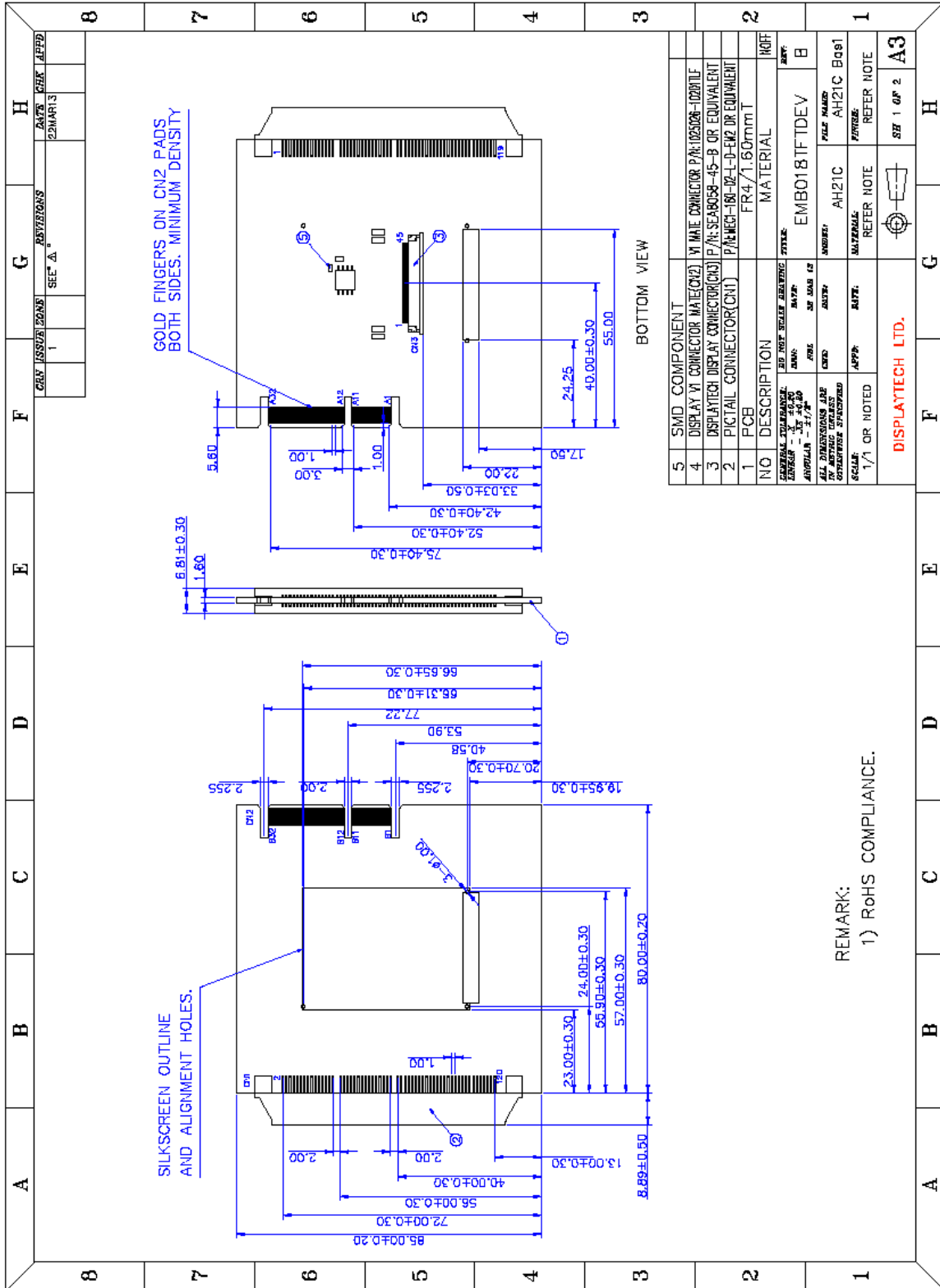
## 4. Example Software

Example software is available from Displaytech upon request. Please contact Displaytech at [sales@displaytech-us.com](mailto:sales@displaytech-us.com).

## 5. Pin Connection Table

DT018ATFT	PICtail Plus	Display Connector V1
9 (SDA)	-	B28
12 (RD)	98 (PMRD)	-
13 (RS)	73 (RA6)	A28 (RD8)
14 (DB17)	-	A15 (GD15)
15 (DB16)	-	B15 (GD14)
16 (DB15)	100 (PMD15)	A16 (GD13)
17 (DB14)	99 (PMD14)	B19 (GD12)
18 (DB13)	106 (PMD13)	A20 (GD11)
19 (DB12)	105 (PMD12)	B20 (GD15)
20 (DB11)	28 (PMD11)	B16 (GD10)
21 (DB10)	30 (PMD10)	A17 (GD9)
22 (DB9)	29 (PMD9)	B17 (GD8)
23 (DB8)	27 (PMD8)	A21 (GD7)
24 (DB7)	116 (PMD7)	B21 (GD6)
25 (DB6)	115 (PMD6)	A22 (GD5)
26 (DB5)	114 (PMD5)	A18 (GD4)
27 (DB4)	113 (PMD4)	B18 (GD3)
28 (DB3)	112 (PMD3)	A19 (GD2)
29 (DB2)	111 (PMD2)	B22 (GD1)
30 (DB1)	110 (PMD1)	A23 (GD0)
31 (DB0)	109 (PMD0)	B23 (GD4)
32 (TE)	-	-
33 (RES)	74 (RA7)	A27 (RA5)
34 (CS)	104 (PMDCS1)	B27 (RA0)
35 (WR)	97 (PMWR)	-
36 (PCLK)	-	A13 (GCLK)
37 (DE)	-	B13 (GEN)
38 (HS)	-	B14 (HSYNC)
39 (VS)	-	A14 (VSYNC)

### 6. Mechanical Drawing





**8. BOM**

Manufacturer	Part Number	Package	Qty	Value	Designator	Description
TDK	C1608X6S1C225M	0603	1	2.2uF	C1	Capacitor
TDK	C1608X7R1V105M	0603	1	1uF	C2	Capacitor
Samtec	MEC-160-02-L-D-EM2	-	1	-	CN1	120 PIN CARD-EDGE
FCI	10025026-10201TLF	-	1	-	CN2	FCI 64 PAD PWB CARD-EDGE
Displaytech	SEA8058-45	-	1	-	CN3	Displaytech FFC/FPC ZIF 45 Pin
Vishay	CRCW0603100KFKEAHP	0603	18	100K	R1, R3, R6- R21	Resistor
Yageo	RC0603JR-070RL	0603	1	0 Ohm	R4	Resistor
Vishay	CRCW060312K7FKEA	0603	1	12.7K	R5	Resistor
OnSemi	CAT4104V-GT3	SOIJ-SM8	1	-	U1	LED Driver LDO, 700mA, SOIC8

## 9. Component Datasheets

Displaytech DT018ATFT	<a href="#">Link</a>
Ilitek ILI9163 COG TFT Controller/Driver	<a href="#">Link</a>
ON Semiconductor CAT4104 LED Driver	<a href="#">Link</a>
Microchip Explorer 16 Development Board	<a href="#">Link</a>
Microchip Starter Kit I/O Expansion Board	<a href="#">Link</a>
Microchip PIC24FJ256DA210 Development Board	<a href="#">Link</a>
On Semiconductor CAT4104	<a href="#">Link</a>