

2.8" ARDUINO TFT TOUCH SHIELD
2.8" TFT DISPLAY WITH SPI INTERFACE
DM-TFT28-105

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1 Revision history

Date	Changes
2014-05-04	First release

2 Main features

- 3.3V and 5.0V input voltage compatible, which means it should work with most hardware with an Arduino pin header
- With all features enabled, there are still 11 free pins on the Arduino header (D0, D1, D3, D5, D7 and A0->A5).
- Full speed hardware SPI on Arduino UNO and Arduino Mega compatible boards

Detail	Specification
Screen Size	2.8"
Module Dimension	70.10x55.14
Colors	262K
Resolution	240x320
Controller	Ilitek ILI9341
Touch Controller	XPT2046
Display Interface	SPI
microSD-card Interface	SPI
Background LED	4 LED
Flash	WinBond W25Q32BV
Flash Interface	SPI (single)
Flash size	32 Mega Bit (4 Mega Byte)

3 Pin layout

This display uses a SPI interface for TFT, Touch, SD-card and external flash memory.

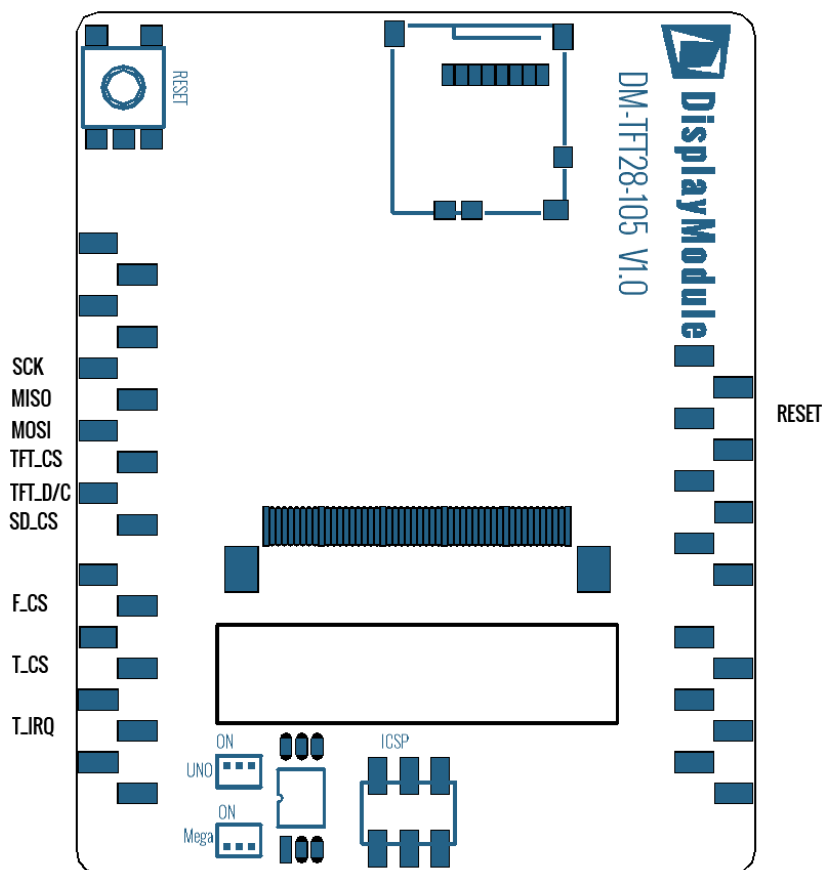


Figure 1: DM-TFT28-105 Pin Layout

3.1 Pin function

This TFT panel connects directly on top of an Arduino pin compatible device.

Arduino Pin	Arduino Function	DM Function
Reset	Reset	Reset
5V	5V	5V
GND	GND	GND
GND	GND	GND
A0	A0	
A1	A1	
A2	A2	
A3	A3	
A4	A4	
A5	A5	

~ Support PWM

Arduino Pin	Arduino Function	DM Function
D13	SCK	CLK
D12	MISO	MISO
D11	MOSI ~	MOSI
D10	SS~	TFT_CS
D9		TFT_D/C
D8		SD_CS
D7		
D6	~	F_CS
D5	~	
D4		T_CS
D3	IRQ ~	
D2	IRQ	T_IRQ
D1	TX	
D0	RX	

Table 1: DM-TFT28-105 Pin Function

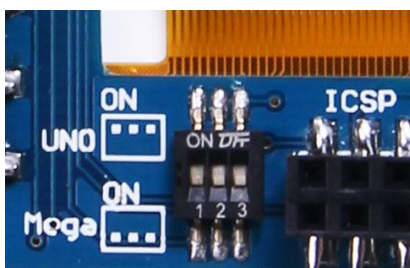
3.2 Switch

The backside of the screen has a switch which let you turn off access to SPI on pin D11, D12 and D13. This is useful for Mega and all Mega compatible boards which does not have hardware SPI to these pins.

Put pin 1, 2 and 3 on the switches to ON to use D11, D12 and D13 for SPI connection. Typically all Arduino UNO compatible boards should have this setting.

Put pin 1, 2 and 3 on the switches to OFF to disable use of D11, D12 and D13 for SPI connection. Now we rely on the ICSP header for the SPI communication. Typically all Arduino Mega compatible boards should have this setting.

Worth noting that the Arduino UNO R3 will work with all these settings because the ICSP is directly connected to D11, D12 and D13 while many Arduino UNO compatible boards does not have the ICSP header.



4 Flash

The module has an onboard flash memory which can be used to store any data; images, fonts, calibration data, log files etc. suitable for the same type of files that are usually stored on the SD-card. It is not suitable to store program code on the flash.

The flash is connected through a single SPI connection using the same CLK, MOSI and MISO as the SD-card, Touch driver and the TFT. When initializing the hardware set all chip select (CS) pins to high, F_CS, SD_CS, T_CS and TFT_CS.

Flash	Specification
Manufacturer	WinBond
Chipset	W25Q32BV
Size	32 MegaBit (4 MegaByte)
Interface	Single SPI

5 Display specifications

Display	Specification
Screen size	2.8" (5.59 cm)
Colors	262K
Resolution	240x320
Module dimension	70.10x55.14
Module dimension (with SD-card)	71.10x55.14
Viewing area	57.6x43.2
Dot pitch (Pixel pitch)	0.18x0.18
Background LED	4 LEDs
Weight	39.8g

5.1 Dimensions - front

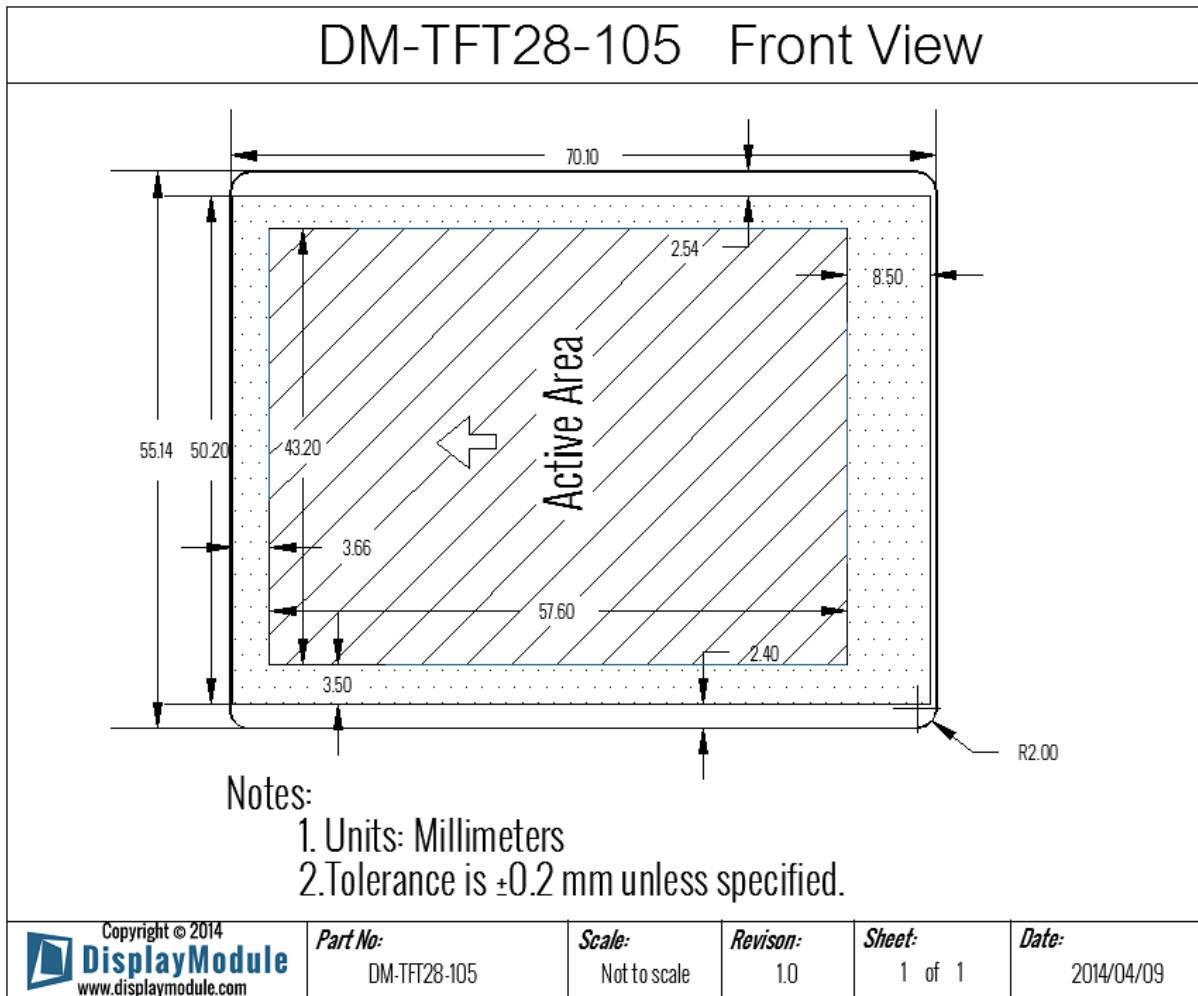


Figure 2: DM-TFT28-105 Front View

5.2 Dimensions - back

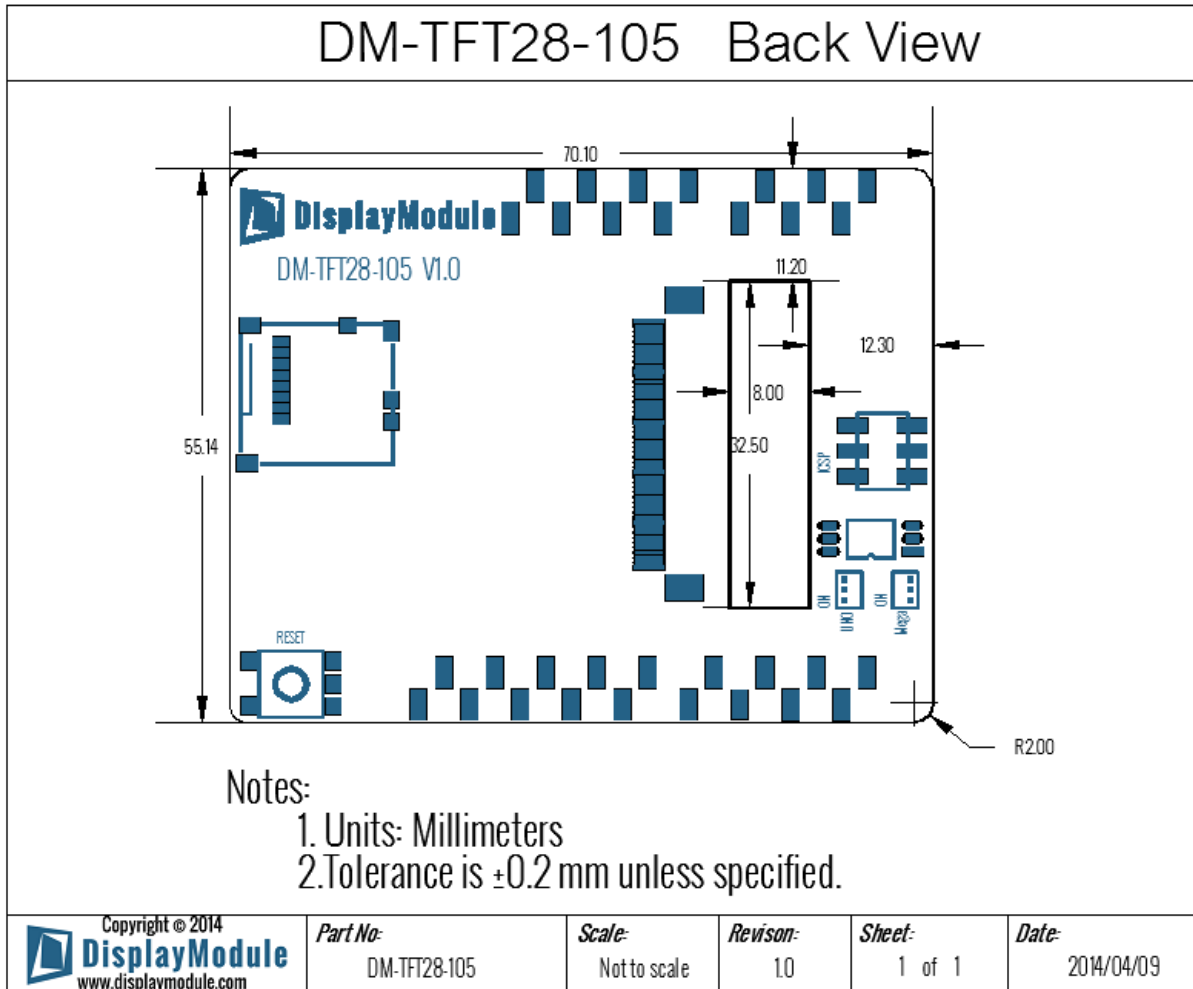


Figure 3: DM-TFT28-105 Back View

5.3 Absolute Maximum Ratings

Item	Min	Max	Unit
Operating Temperature	-20	+70	°C
Storage Temperature	-30	+80	°C

6 Electrical specifications

6.1 Absolute Maximum Ratings

Item	Min	Max	Unit
Logic Supply Voltage	-0.3	5.5	V
Analog Supply Voltage	-0.3	5.5	V
Input Voltage	-0.3	5.2	V
Back Light Forward Current	-	80	mA

6.2 Electrical Characteristics

Item	Min	Typ.	Max	Unit
Logic Supply Voltage	4.8	5.0	5.2	V
Analog Supply Voltage	4.8	5.0	5.2	V
Input Voltage, Low*	0	-	1.5	V
Input Signal Voltage, High*	3.0	-	5.0	V

*MOSI, MISO, CLK, TFT_CS, TFT_D/C, SD_CS, F_CS, T_CS and T_IRQ

6.3 Driving backlight

Item	Max	Unit
Forward Current	20	mA each LED
Forward Voltage	3.4	V (4 LEDs in parallel)
Power Consumption	272	mW (4 LEDs in parallel)

7 Optical Specifications

Item	Typ	Unit
View Angles Top	70	°
View Angles Bottom	57	°
View Angles Left	70	°
View Angles Right	70	°
Contrast Ratio	500	
Response Time (25°C)	25	ms
Uniformity		%
NTSC		%
Luminance	240	cd/m ²