DisplayModule

DM-TFT24-316

2.4” TOUCH TFT DISPLAY WITH 8/16 BIT MCU INTERFACE

Contents

1 Revision History 3
2 Main Features 3
3 Pin Description 4
4 Mechanical Drawing 5
5 Electrical Characteristics 6
6 Optical Characteristics 6
7 Timing Characteristics 7
7.1 Parallel MCU Interface Timing Characteristics (8080-system) 7
7.2 Reset Timing Characteristics 8
8 Application Reference 9
9 Reliability 10
10 Warranty and Conditions 11

1 Revision History

Date	Changes
2015-01-21	First release
2015-07-20	Application Reference update

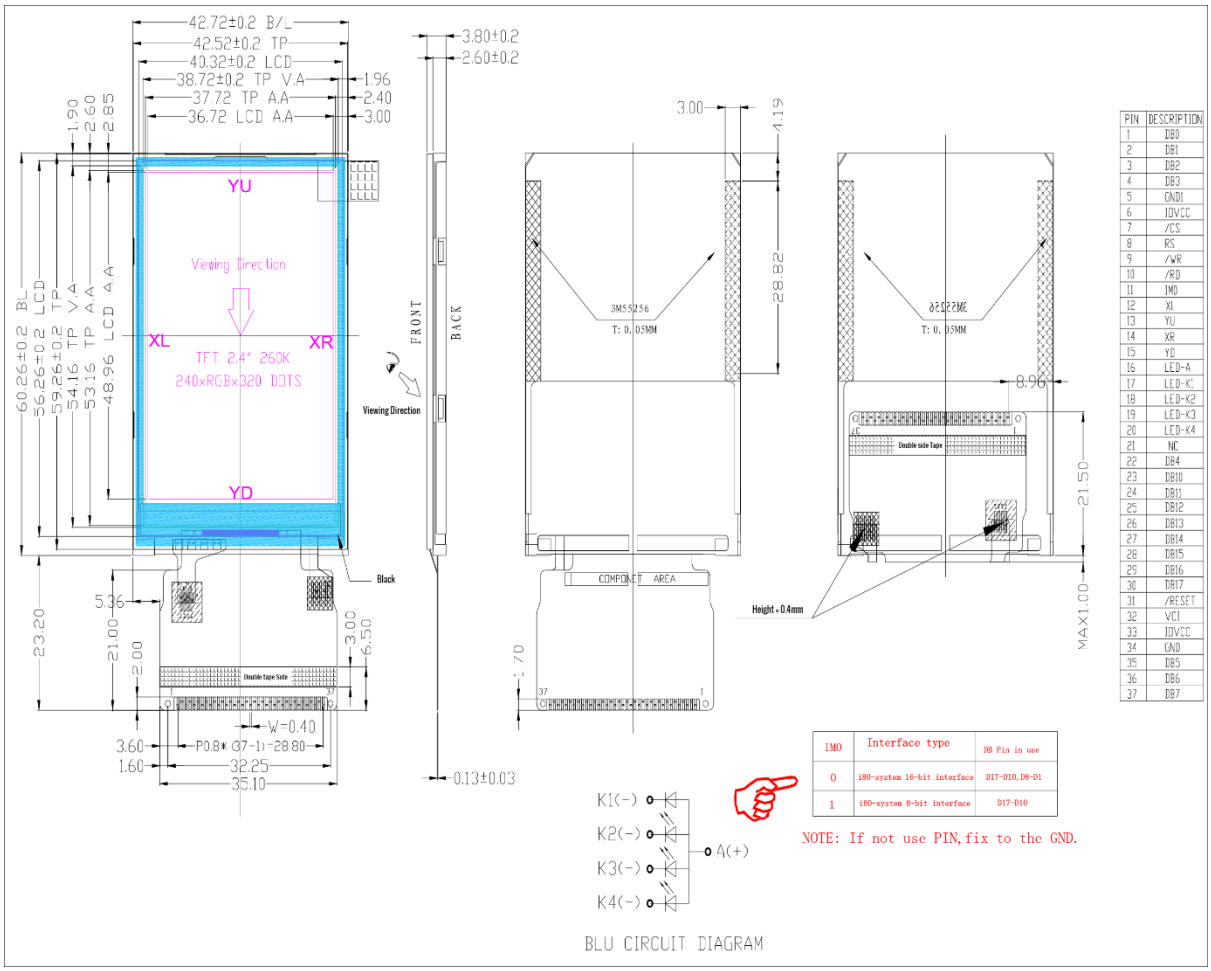
2 Main Features

Item	Specification	Unit
Screen Size	2.4	inch
Driver Mode	Transmissive	-
Display Colors	65K/262K	colors
Resolution	240 x 320	dots
Controller IC	RM68090	-
Interface	8/16bit MCU,	-
Power Supply	3.3	V
View Direction	12 o'clock	-
Background LED	4 LED Normally White	-
Weight	16.0	g

3 Pin Description

Pin No.	Symbol	Function Description
1	DB0	DATA BUS. If not used pins must be fixed to GND level.
2	DB1	DATA BUS. If not used pins must be fixed to GND level.
3	DB2	DATA BUS. If not used pins must be fixed to GND level.
4	DB3	DATA BUS. If not used pins must be fixed to GND level.
5	GND	Ground
6	IOVCC	Supply voltage (3.3V).
7	CS	Chip select input pin
8	RS	A register select signal
9	WR	Write enable clock input pin
10	RD	Read enable clock input pin, if not use connect to IOVCC
11	IM0	Interface select. H: 8BIT, DB17-DB10. L: 16BIT，DB17-DB10，DB8-DB1.
12	XL	Touch panel LIFT Glass Terminal
13	YU	Touch panel Top Film Terminal
14	XR	Touch panel Right Glass Terminal
15	YD	Touch panel Bottom Film Terminal
16	LEDA	Anode pin of backlight
17	LEDK1	Cathode pin OF backlight
18	LEDK2	Cathode pin OF backlight
19	LEDK3	Cathode pin OF backlight
20	LEDK4	Cathode pin OF backlight
21	NC	
22	DB4	DATA BUS. If not used pins must be fixed to GND level.
23	EB10	DATA BUS. If not used pins must be fixed to GND level.
24	DB11	DATA BUS. If not used pins must be fixed to GND level.
25	DB12	DATA BUS. If not used pins must be fixed to GND level.
26	DB13	DATA BUS. If not used pins must be fixed to GND level.
27	DB14	DATA BUS. If not used pins must be fixed to GND level.
28	DB15	DATA BUS. If not used pins must be fixed to GND level.
29	DB16	DATA BUS. If not used pins must be fixed to GND level.
30	DB17	DATA BUS. If not used pins must be fixed to GND level.
31	RESET	Active LOW Reset signal
32	VCI	Supply voltage (3.3V).
33	IOVCC	Supply voltage (3.3V).
34	GND	Ground
35	DB5	DATA BUS. If not used pins must be fixed to GND level.
36	DB6	DATA BUS. If not used pins must be fixed to GND level.
37	DB7	DATA BUS. If not used pins must be fixed to GND level.

4 Mechanical Drawing



IMO	Interface type	DB Pin in use
0	i80-system 16-bit interface	D17-D10, D8-D1
1	i80-system 8-bit interface	D17-D10

PIN	DESCRIPTION
1	DB0
2	DB1
3	DB2
4	DB3
5	GND
6	IOVCC
7	/CS
8	RS
9	/WR
10	/RD
11	IM0
12	XL
13	YU
14	XR
15	YD
16	LED-A
17	LED-K1
18	LED-K2
19	LED-K3
20	LED-K4
21	NC
22	DB4
23	DB10
24	DB11
25	DB12
26	DB13
27	DB14
28	DB15
29	DB16
30	DB17
31	/RESET
32	VCI
33	IOVCC
34	GND
35	DB5
36	DB6
37	DB7

5 Electrical Characteristics

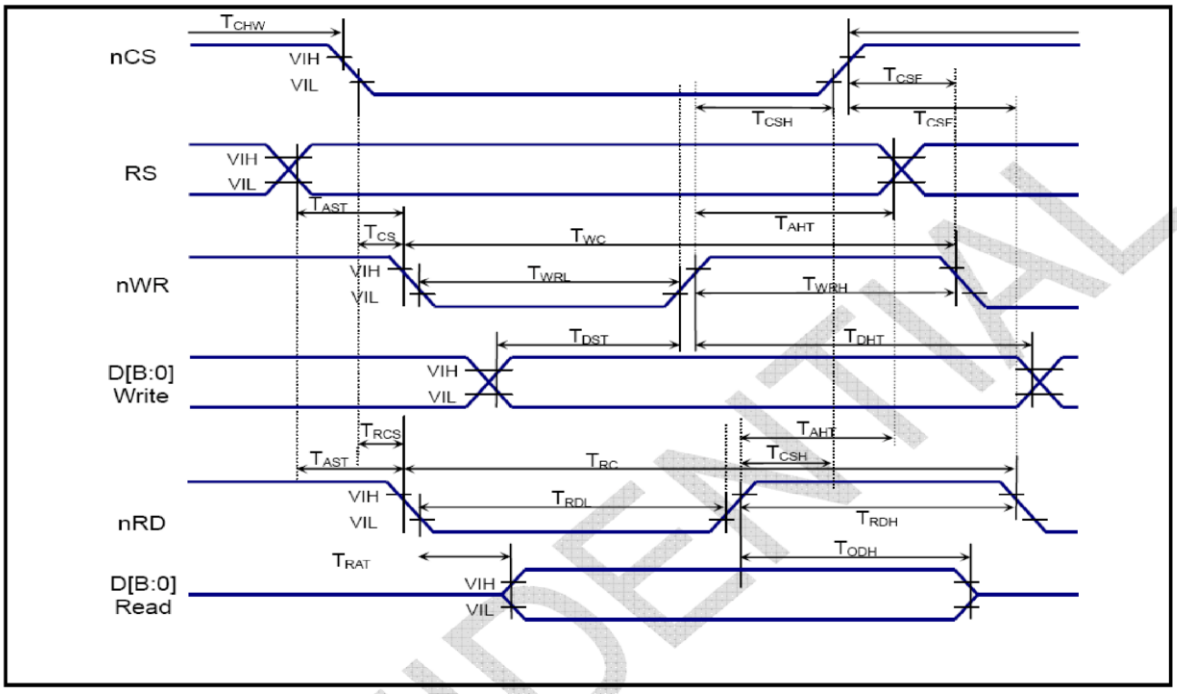
Item	Symbol	Condition	Min	Typ.	Max	Unit
Supply Voltage For Logic	VDD		2.4	3.3	4.2	V
Digital Operation Current	IDD	VDD=3.3V	-	8	-	mA
Low Level Input Voltage	V_{IL}		GND	-	0.3VDD	V
High Level Input Voltage	V_{IH}		0.7VDD	-	VDD	V
Low Level Output Voltage	V_{OL}		GND		0.2VDD	V
High Level Output Voltage	V_{OH}		0.8VDD		VDD	V
Backlight Forward Voltage	V_{LED}		-	3.2	-	V
Backlight Forward Current	I_{LED}	V_{LED}=3.2V	60	80	-	mA
Operating Temperature	TOP	Absolute Max	-20	-	+70	℃
Storage Temperature	TST	Absolute Max	-30	-	+80	℃

6 Optical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Note
View Angles Top		-	45		°	
View Angles Bottom		-	20		°	
View Angles Left		-	45		°	
View Angles Right		-	45		°	
Response Time (25°C)	Tr + Tf		30	-	ms	
Uniformity		80			%	
Contrast Ratio	CR	-	500			
Luminance	L_V	200	-		cd/m²	

7 Timing Characteristics

7.1 Parallel MCU Interface Timing Characteristics (8080-system)



Normal Write Mode (VDDI = 1.65~3.3V, VCI=2.5~3.3V)

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
RS	T_{AST}	Address setup time	10		ns	-
	T_{AHT}	Address hold time (Write/Read)	5		ns	
nCS	T_{CHW}	Chip select "H" pulse width	0		ns	-
	T_{CS}	Chip select setup time (Write)	10		ns	
	T_{RCS}	Chip select setup time (Read)	10		ns	
nWR	T_{CSH}	Chip select hold time	10		ns	
	T_{WC}	Write cycle	75		ns	
	T_{WRH}	Control pulse "H" duration	30		ns	-
	T_{WRL}	Control pulse "L" duration	40		ns	
nRD (ID)	T_{CSH}	Chip select hold time	10		ns	
	T_{RC}	Read cycle	300		ns	-
	T_{RDH}	Control pulse "H" duration	150		ns	
	T_{RDL}	Control pulse "L" duration	150		ns	
D[17:0]	T_{DST}	Data setup time	10		ns	-
	T_{DHT}	Data hold time	15		ns	
	T_{RAT}	Read access time		100	ns	
	T_{ODH}	Output disable time	5		ns	

7.2 Reset Timing Characteristics

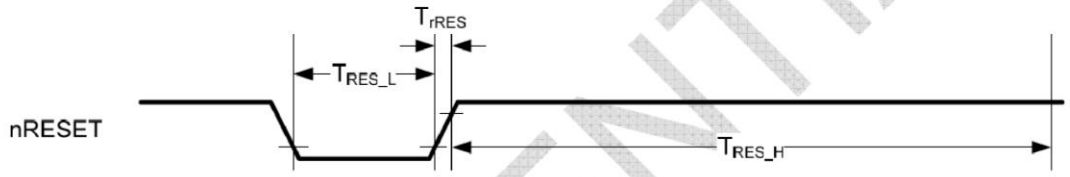


Figure 49 Reset Operation

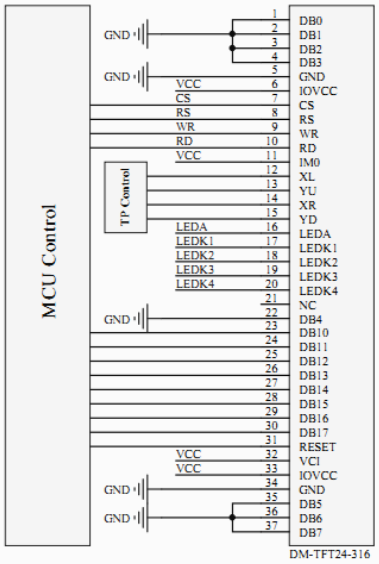
Reset Timing Characteristics (VCI = 2.5 ~ 3.3 V, VDDI = 1.65 ~ 3.3 V)

Item	Symbol	MIN	MAX	Unit	Description
Reset low-level width	T_{RES_L}	1		ms	-
Reset rise time	T_{rRES}		10	us	-
Reset high-level witdth	T_{RES_H}	50		ms	-

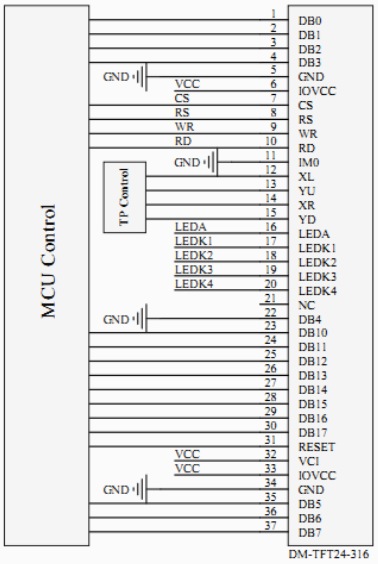
Note: After nRESET releasing, the host processor have to wait 10 milliseconds before sending any command.

8 Application Reference

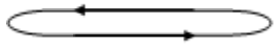
8-bit MCU INTERFACE



16-bit MCU INTERFACE



9 Reliability

Test Item	Content of Test	Test Condition	Note
High Temperature Storage	Endurance test applying the high storage temperature for a long time.	80℃ 200hrs	2
Low Temperature Storage	Endurance test applying the high storage temperature for a long time.	-30℃ 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70℃ 200hrs	-
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20 ℃ 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60℃,90%RH max, for 96hrs under no-load condition excluding the polarizer. Then taking it out and drying it at normal temperature.	60℃,90%RH 96hrs	1,2
Thermal Shock Resistance	The sample should be allowed stand the following 10 cycles of operation -20℃ 25℃ 70℃  30min 5min 30min 1 cycle	-20℃/70℃ 10 cycles	-
Vibration Test	Endurance test applying the vibration during transportation and using	Total fixed amplitude: 15mm; Vibration: 10~55Hz; One cycle 60 seconds to 3 directions of X, Y, Z, for each 16 minutes.	3
Static Electricity Test	Endurance test apply the electric stress to the terminal.	VS=800V, RS=1.5kΩ, CS=100pF, 1 time.	-

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal. Temperature and humidity after remove from the rest chamber.

Note3: The packing have to including into the vibration testing.

10 Warranty and Conditions

http://www.displaymodule.com/pages/faq