DisplayModule

DM-TFT35-371

3.5" IPS 320x240 DISPLAY PANEL WITH CAPACITIVE TOUCH –RGB

Contents

1 Revision History

Date	Changes
2018-09-21	First release

2 Main Features

Item	Specification	Unit
Size	3.5	Inch
Resolution	320(RGB) x 240	pixel
Module Dimension	76.9 x 63.9 x 4.4	mm
Display area	70.08 x 52.56	mm
Pixel pitch	0.219 x 0.219	mm
TFT Controller IC	ST7272A	-
CTP Driver IC	FT6336G	-
Interface	24bit RGB	-
Display Color	65K/262K/16.7M	colors
View Direction	All	
Touch mode	Single points and Gestures	-
Display mode	Transmissive /LED Normally black	-
Weight	TBD	g

3 Pin Description

3.1 TFT

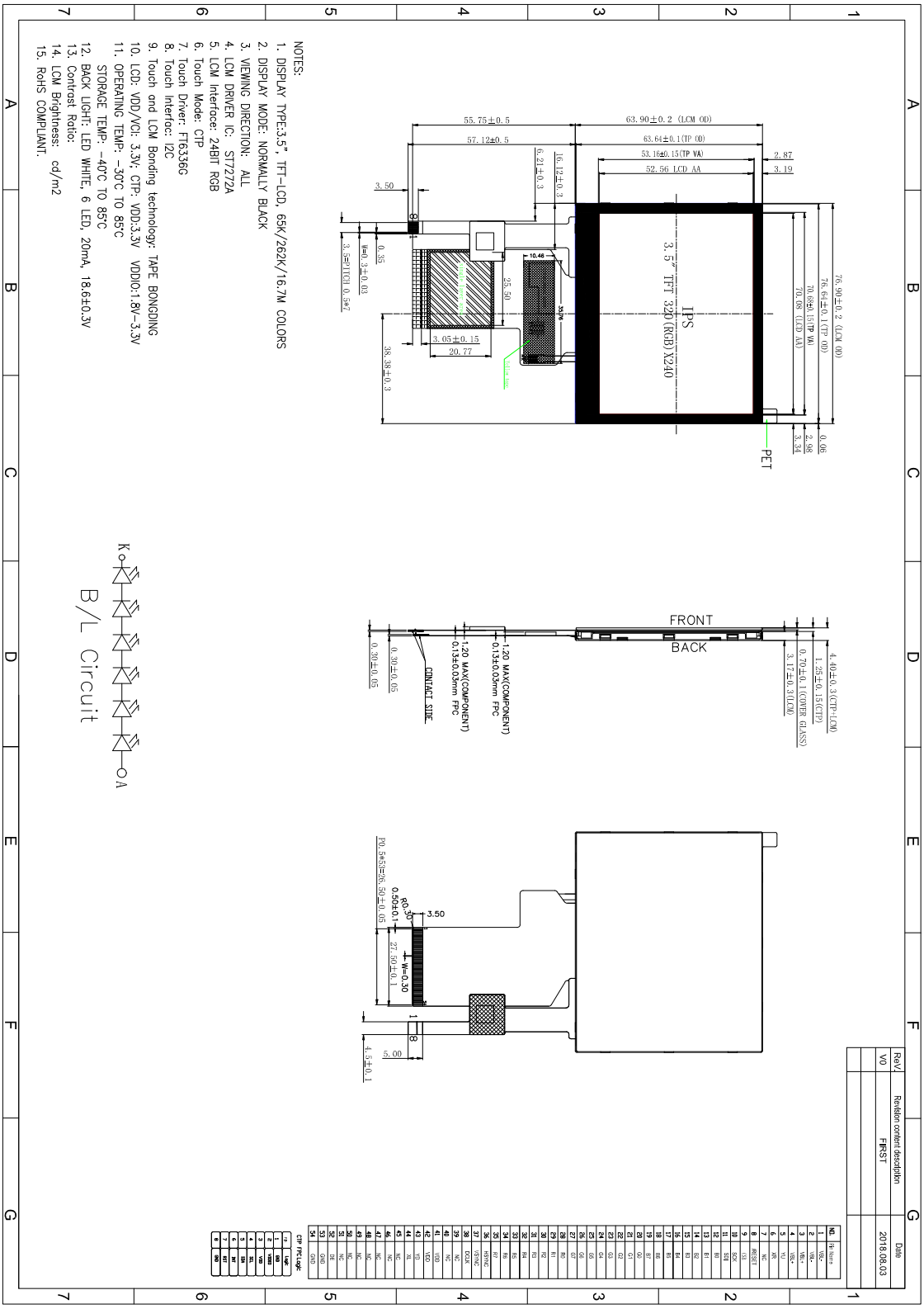
No.	Symbol	Description
1	VBL-	Cathode pin OF backlight
2	VBL-	Cathode pin OF backlight
3	VBL+	Anode pin of backlight
4	VBL+	Anode pin of backlight
5	YU(NC)	Touch panel Top Film Terminal
6	XR(NC)	Touch panel Right Glass Terminal
7	NC	No connection
8	/RESET	Global reset pin. When GRB is “L”, internal initialization procedure is executed
9	CSB	Chip select pin of serial interface. -Leave it open when not used.
10	SCK	Clock pin of serial interface. -Leave it open when not used.
11	SDI	Date input and output pin of serial interface. -Leave it open when not used.
12-19	B0-B7	8 bit data bus display blue data. B[7:0] are not used in 8-bit RGB interface and should be connected to “L”
20-27	G0-G7	8 bit data bus display green data. DG[7:0] are used in 8-bit RGB interface.
28-35	R0-R7	8 bit data bus display red data. DR[7:0] are not used in 8-bit RGB interface and should be connected to “L”
36	HSYNC	Horizontal Sync input. Default is negative polarity.
37	VSYNC	Vertical Sync input. Default is negative polarity
38	DCLK	Pixel clock input pin
39	NC	No connection
40	NC	No connection
41	VDD	Supply voltage(3.3V).
42	VDD	Supply voltage(3.3V).

43	YD(NC)	Touch panel Bottom Film Terminal
44	XL(NC)	Touch panel LEFT Glass Terminal
45-51	NC	No connection
52	DE	Data input enable. Display access is enabled when DE is H
53	GND	Ground.
54	GND	Ground.

3.2 CTP TFT

No.	Symbol	Description
1	GND	Ground
2	VDDIO	I/O power supply voltage
3	VDD	Supply voltage
4	SCL	I2C clock input
5	SDA	I2C data input and output
6	INT	External interrupt to the host
7	RST	External Reset, Low is active
8	GND	Ground

4 Mechanical Drawing



5 Electrical Characteristics

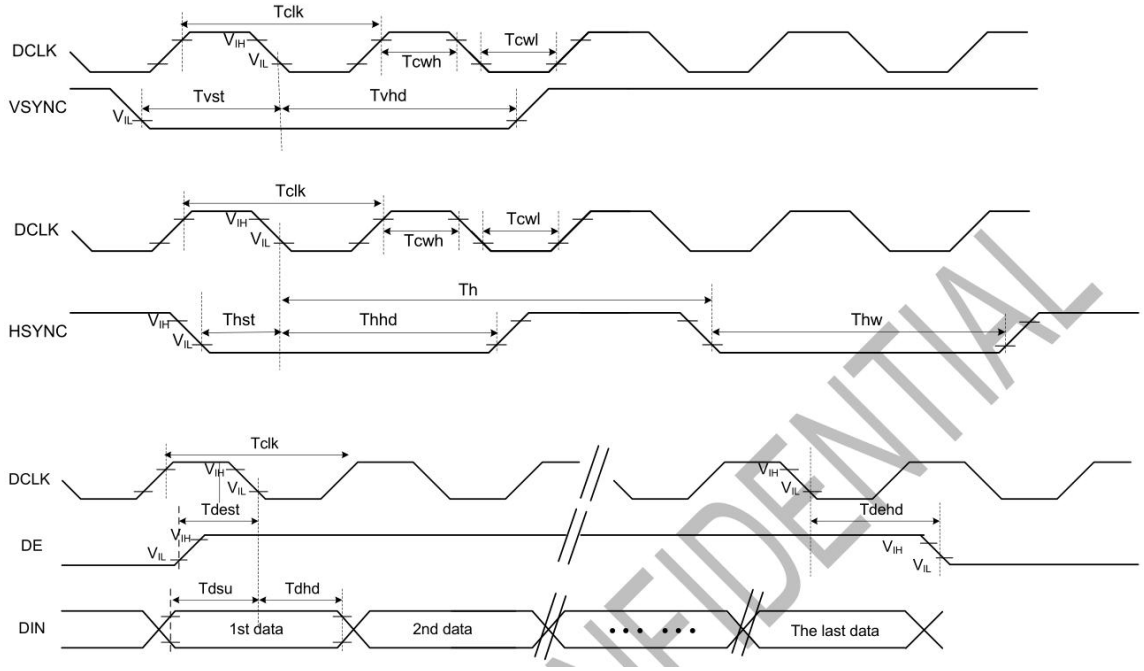
Item	Symbol	Condition	Min	Typ	Max	Unit
Digital Supply Voltage	VDD		3.0	3.3	3.6	V
Normal mode Current	IDD		-	20	-	mA
Operating Temperature	TOP	Absolute Max	-30	-	+85	℃
Storage Temperature	TST	Absolute Max	-40	-	+85	℃
LED Forward Current	If		15	20	-	mA
LED Forward Voltage	Vf		-	18.6	-	V

6 Optical Characteristics

Item	Symbol	Min	Typ	Max	Unit
View Angles TOP		70	80	-	deg
View Angles Bottom		70	80	-	deg
View Angles Right		70	80	-	deg
View Angles Left		70	80	-	deg
Response Time	Tr +Tf		30	40	ms
Contrast Ratio	CR	640	800	-	--
LCM Luminance	Lv	430	470	-	cd/m^2

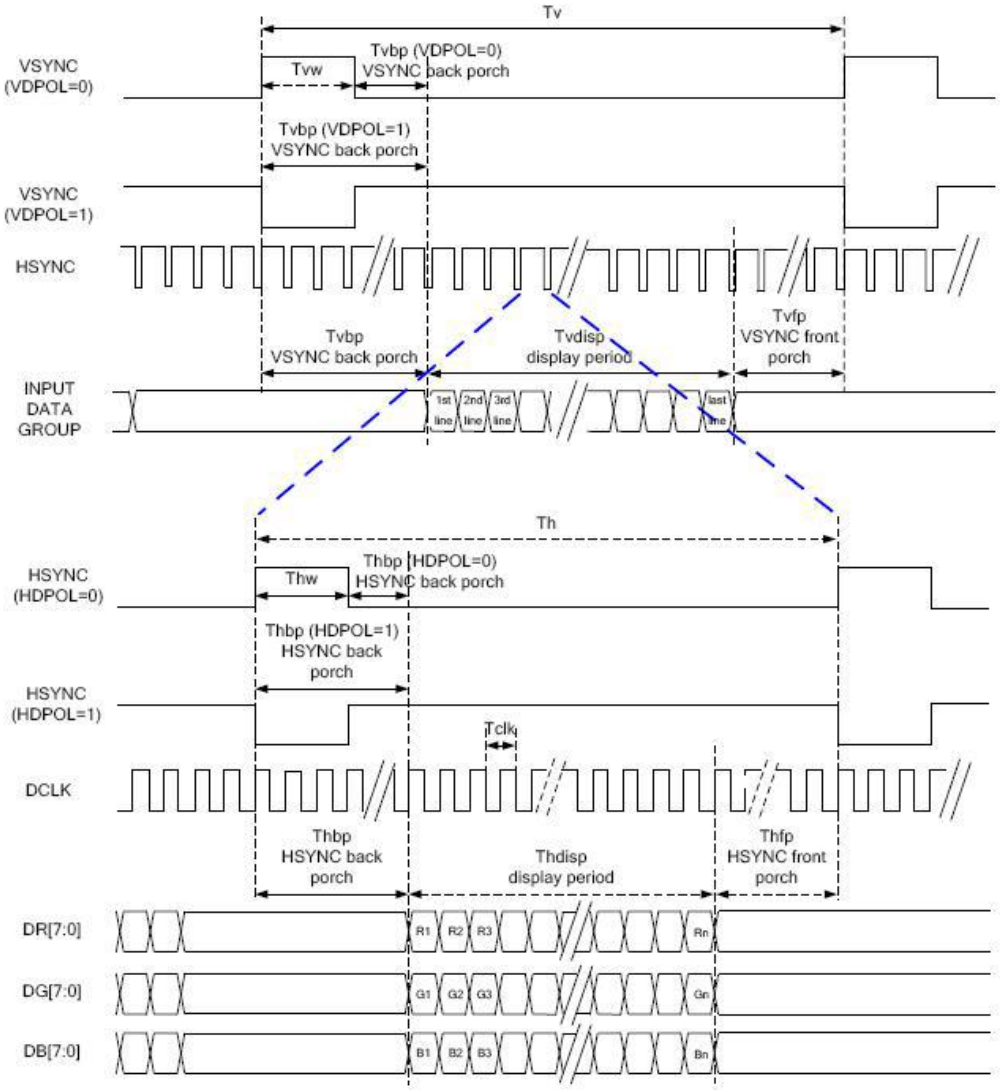
7 AC Characteristics

7.1 System bus timing for RGB interface

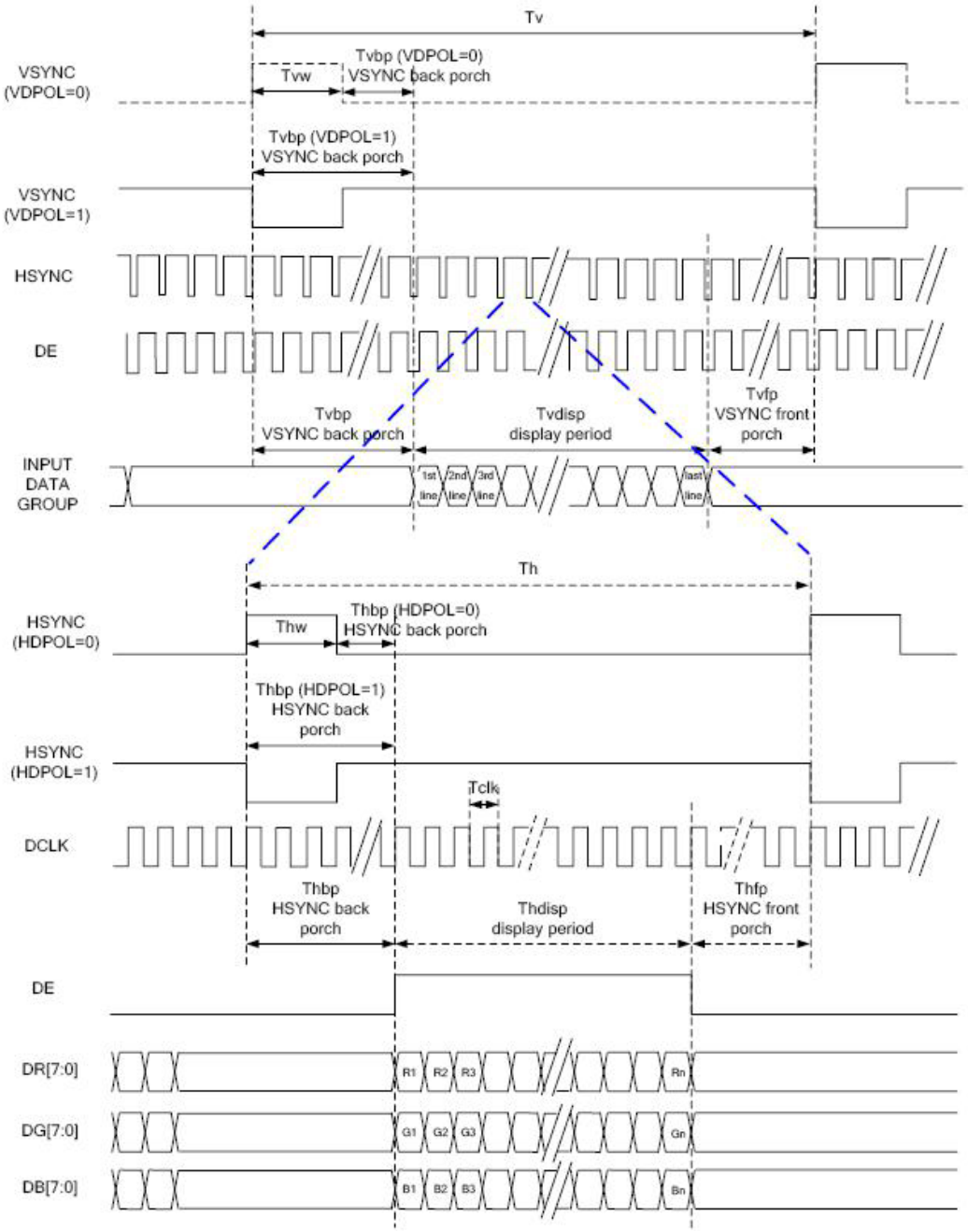


Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tclk	40	50	60	%	
HSYNC Width	Thw	2	-	-	DCLK	
HSYNC Period	Th	55	60	65	us	
VSYNC Setup Time	Tvst	12	-	-	ns	
VSYNC Hold Time	Tvhd	12	-	-	ns	
HSYNC Setup Time	Thst	12	-	-	ns	
HSYNC Hold Time	Thhd	12	-	-	ns	
Data Setup Time	Tdsu	12	-	-	ns	
Data Hold Time	Tdhd	12	-	-	ns	
DE Setup Time	Tdest	12	-	-	ns	
DE Hold Time	Tdehd	12	-	-	ns	

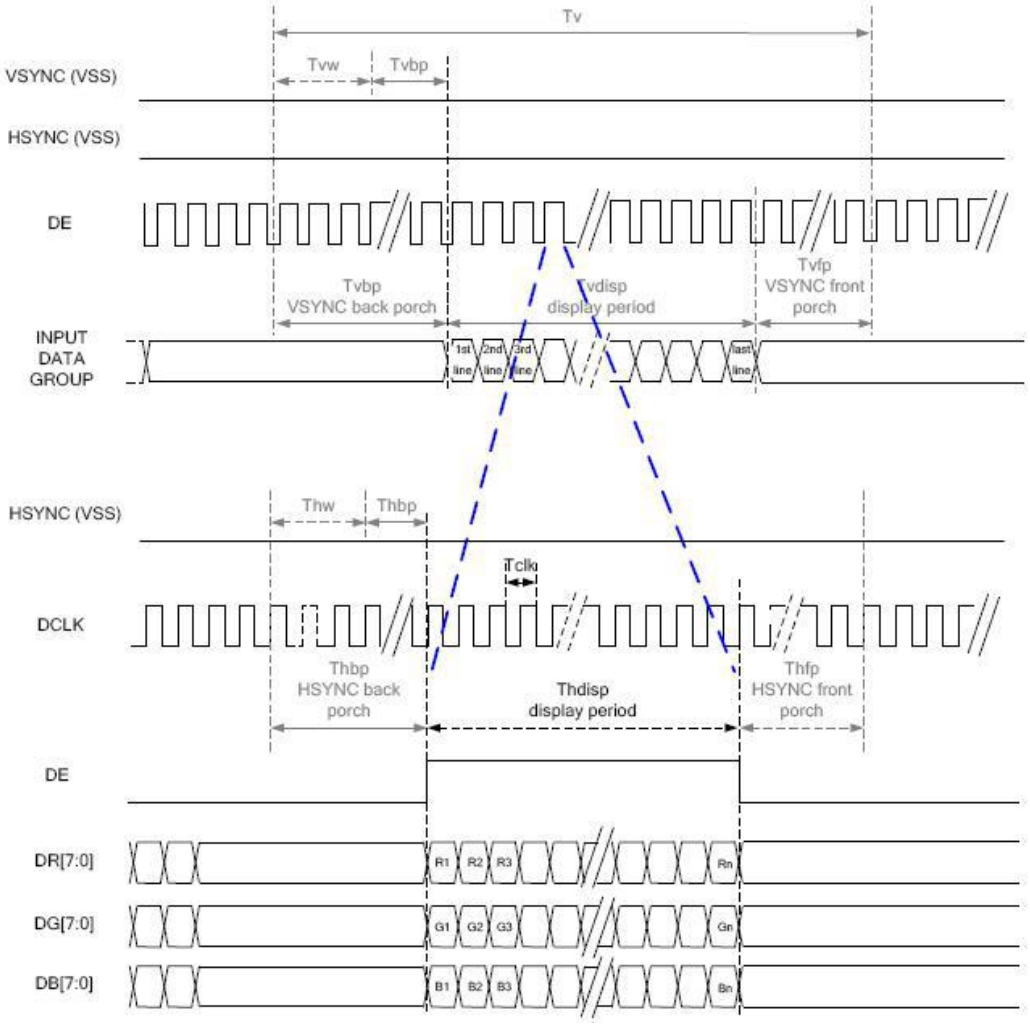
7.2 RGB Interface- SYNC Mode



7.3 RGB Interface- SYNC-DE Mode



7.4 RGB Interface- DE Mode



RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

Note: "Input" means these signals are driven by host side.

7.5 Parallel 24-bit RGB Input Timing Table

Parallel 24-bit RGB Input Timing (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

Parallel 24-bit RGB Input Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	5	6	8	MHz	
DCLK Period		Tclk	125	167	200	ns	
HSYNC	Period Time	Th	325	371	438	DCLK	
	Display Period	Thdisp		320		DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_BLANKING setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	43	DCLK	
VSYNC	Period Time	Tv	244	260	289	HSYNC	
	Display Period	Tvdisp		240		HSYNC	
	Back Porch	Tvbp	2	12	12	HSYNC	By V_BLANKING setting
	Front Porch	Tvfp	2	8	37	HSYNC	
	Pulse Width	Tvw	2	4	12	HSYNC	

Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

8 CTP Specification

8.1 Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage	VDD		2.8	3.3	3.6	V
Normal mode Current			-	4	-	mA
Operating Temperature	TOP	Absolute Max	-20	-	+70	℃
Storage Temperature	TST	Absolute Max	-30	-	+80	℃

NOTES:

If used beyond the absolute maximum ratings, FT6336G may be permanently damaged. It is strongly recommanded that the device be used within the electrical characteristics in normal operations. If exposed to thecondition not within the electrical characteristics, it may affect the reliability of the device

8.2 AC Characteristics

Item	Condition	Min	Typ	Max	Unit
OSC clock	AVDD=2.8V;Ta=25° C	34.65	35	35.35	MHz

AC characteristics of Oscillators

I2C interface:

The I2C is always configured in the Slave mode, The data transfer format is shown in Figure4-1:

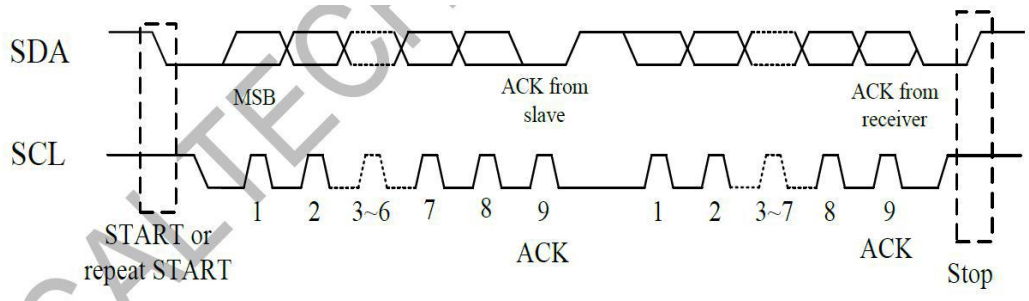


Figure 4-1 I2C Serial Data Transfer Format

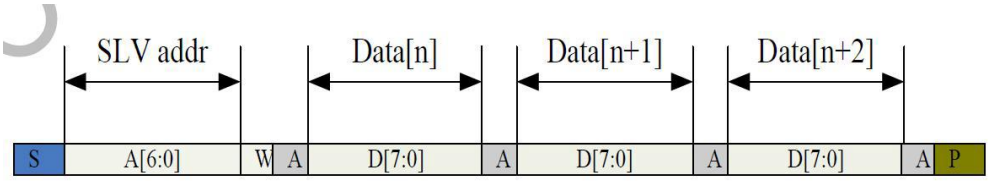


Figure 4-2 I2C master write, slave read

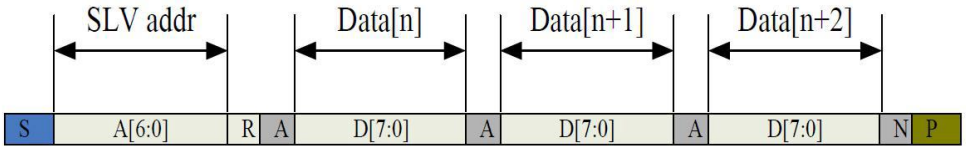


Figure 4-3 I2C master read, slave write

Table4-3 lists the meanings of the mnemonics used in the above figures.

Table 4-3 Mnemonics Description

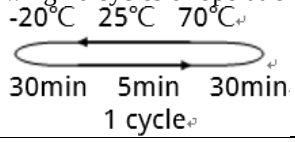
Mnemonics	Description
S	I2C Start or I2C Restart
A[6:0]	Slave address
R/W	READ/WRITE bit, '1' for read, '0'for write
A(N)	ACK(NACK)
P	STOP: the indication of the end of a packet (if this bit is missing, S will indicate the end of the current packet and the beginning of the next packet)

I2C Interface Timing Characteristics is shown in Table4-4.

Table 4-4 I2C Timing Characteristics

Parameter	Min	Max	Unit
SCL frequency	10	400	KHz
Bus free time between a STOP and START condition	4.7	\	us
Hold time (repeated) START condition	4.0	\	us
Data setup time	250	\	ns
Setup time for a repeated START condition	4.7	\	us
Setup Time for STOP condition	4.0	\	us

9 Reliability

Test Item	Content of Test	Test Condition	Note
High Temperature Storage	Endurance test applying the high storage temperature for a long time.	85℃ 200hrs	2
Low Temperature Storage	Endurance test applying the high storage temperature for a long time.	-40℃ 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.	85℃ 200hrs	-
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30℃ 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℃/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: Test performed on product itself, not inside a container

10 Warranty and Conditions

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