



DM-TFT35-335
3.5" 320x240 TFT LCD DISPLAY
PANEL WITH CAPACITIVE TOUCH -
SPI, RGB

Contents

[Revision History](#)

[Main Features](#)

[Pin Description](#)

[TFT](#)

[CTP](#)

[Mechanical Drawing](#)

[Electrical Characteristics](#)

[Optical Characteristics](#)

[Timing Characteristics](#)

[Input signal characteristics](#)

[Clock and Data Input Waveforms](#)

[CTP Specification](#)

[Elective Characteristics](#)

[Timing Characteristics](#)

[I2C Interface](#)

[Driver/Controller Information](#)

[Reliability](#)

[Warranty and Conditions](#)

1 Revision History

Date	Changes
2016-06-15	First release

2 Main Features

Item	Specification	Unit
LCD Type	TFT/TRANSMISSIVE	
Resolution	320(RGB) x 240	pixel
Module Dimension	86.84 x 74.84 x 5.05	mm
TFT Controller IC	HX8238D	-
CTP Controller IC	FT6336	
Interface	16/18/24 Bit RGB SYNC Mode	-
Dot Pitch	0.198 x 0.198	mm
Display Color	65K/262K/16.7M	
View Direction	12:00	
Touch Mode	Single point and Gestures	
Backlight Type	Normally White	-
Weight	TBD	g

3 Pin Description

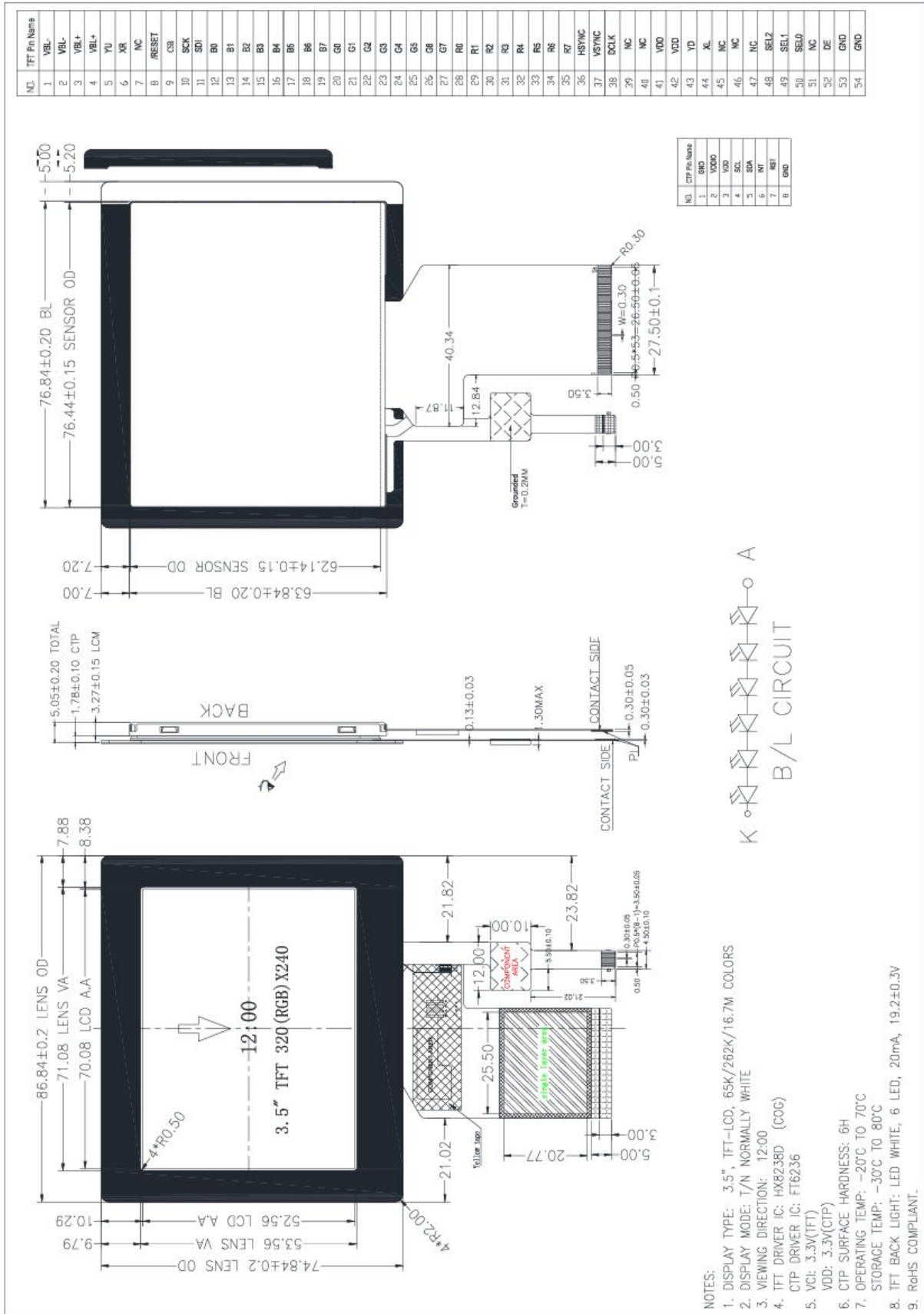
3.1 TFT

No.	Symbol	Description
1	BLK	Cathode pin OF backlight
2	BLK	Cathode pin OF backlight
3	BLA	Anode pin of backlight
4	BLA	Anode pin of backlight
5	YU(NC)	Touch panel Top Film Terminal
6	XR(NC)	Touch panel Right Glass Terminal
7	NC	System reset pin. Internal pull high.
8	RESET	-Connect to VDDIO when not used.
9	CSB	Chip select pin of serial interface. Internal pull high. -Leave it open when not used.
10	SCK	Clock pin of serial interface. Internal pull high. -Leave it open when not used.
11	SDI	Date input pin of serial interface. Internal pull high. -Leave it open when not used.
12-19	B0-B7	Blue data input.
20-27	G0-G7	Green data input.
28-35	R0-R7	Red data input.
36	HSYNC	Horizontal Sync input. Negative polarity.
37	VSYNC	Vertical Sync input. Negative polarity.
38	DCLK	Clock signal. Latching data at the rising edge
39	NC	
40	NC	
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 LIFT Glass Terminal
45-47	NC	
48	SEL2	Input pin to select input interface mode.
49	SEL1	Input pin to select input interface mode.
50	SEL0	Input pin to select input interface mode.
51	NC	
52	DE	Data input Enable. Active High to enable the data input Bus under "DE Mode". -if used SYNC mode Leave it open when not used.
53	GND	Ground.
54	GND	Ground.

3.2 CTP

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

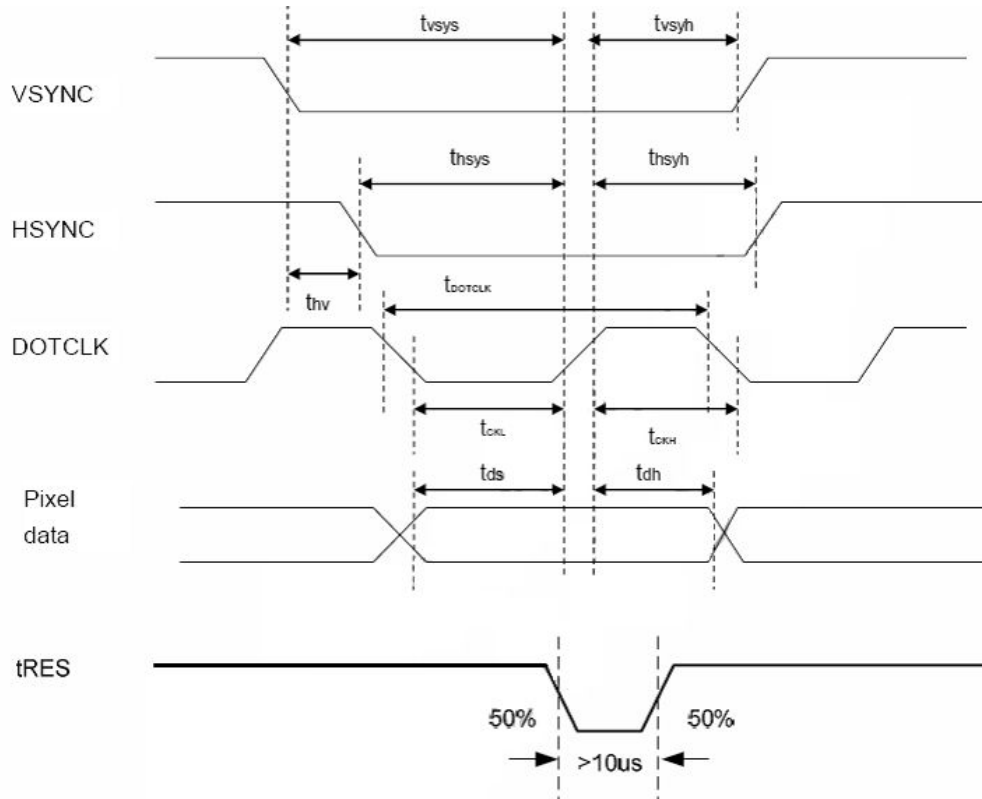
Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	VCI		3.0	3.3	3.6	V
I/O Digital Voltage	VDDIO		1.6	3.3	3.6	V
Input Current	IDD			10		mA
Low Level Input Voltage	V _{IL}		GND		0.3V _{DDIO}	V
High Level Input Voltage	V _{IH}		0.7V _{DDIO}		VDDIO	V
Low Level Output Voltage	V _{OL}		GND		GND+0.4	V
High Level Output Voltage	V _{OH}		VDDIO-0.4			V
Operating Temperature	TOP	Absolute Max	-20		+70	°C
Storage Temperature	TST	Absolute Max	-30		+80	°C

6 Optical Characteristics

Item	Symbol	Min	Typ	Max	Unit
View Angles TOP	AV		35	-	deg
View Angles Bottom	AV		15	-	deg
View Angles Right	AH		45	-	deg
View Angles Left	AH		45	-	deg
Response Time	Tr +Tf		50	80	ms
Contrast Ratio	CR	200	300	-	-
LED Forward Current	If	15	20		mA
LED Forward Voltage	Vf		19.2		V
LCM Luminance	Lv	350		-	cd/m ²

7 Timing Characteristics

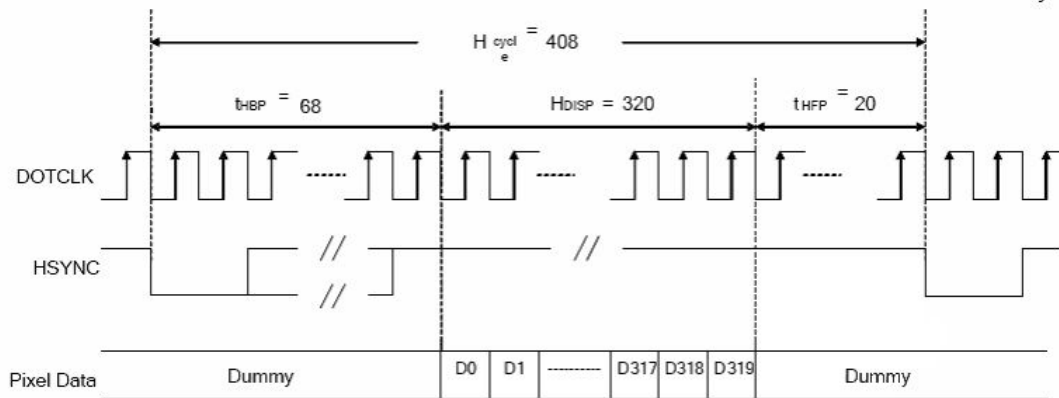
7.1 Input signal characteristics



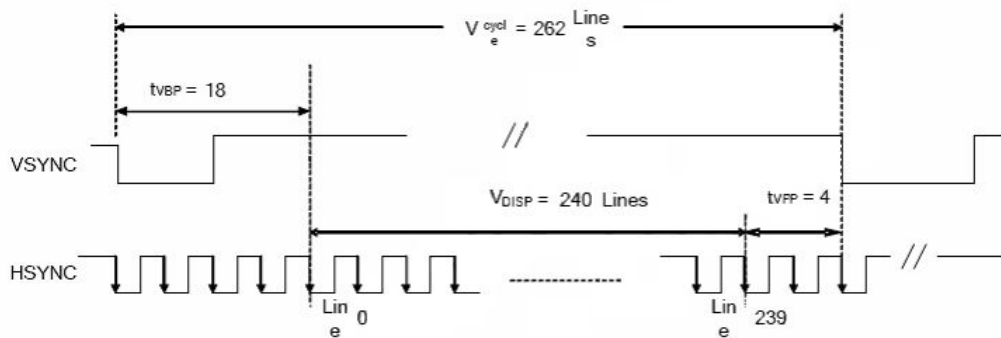
Characteristics	Symbol	Min.		Typ.		Max.		Unit
		24 bit	8 bit	24 bit	8 bit	24 bit	8 bit	
DOTCLK Frequency	fDOTCLK	-	-	6.5	19.5	10	30	MHz
DOTCLK Period	tDOTCLK	100	33.3	154	51.3	-	-	ns
Vertical Sync Setup Time	tvsys	20	10	-	-	-	-	ns
Vertical Sync Hold Time	tvsyh	20	10	-	-	-	-	ns
Horizontal Sync Setup Time	thsys	20	10	-	-	-	-	ns
Horizontal Sync Hold Time	thsyh	20	10	-	-	-	-	ns
Phase difference of Sync Signal Falling Edge	thv	1		-		240		tDOTCLK
DOTCLK Low Period	tCKL	50	15	-	-	-	-	ns
DOTCLK High Period	tCKH	50	15	-	-	-	-	ns
Data Setup Time	tds	12	10	-	-	-	-	ns
Data hold Time	tdh	12	10	-	-	-	-	ns
Reset pulse width	tRES	10		-		-		μs

Note: External clock source must be provided to DOTCLK pin of HX8238-D. The driver will not operate if absent of the clocking signal.

7.2 Clock and Data Input Waveforms



(a) Horizontal Data Transaction Timing



(b) Vertical Data Transaction Timing

Characteristics	Symbol	Min.		Typ.		Max.		Unit
		24 bit	8 bit	24 bit	8 bit	24 bit	8 bit	
DOTCLK Frequency	fDOTCLK	-	-	6.5	19.5	10	30	MHz
DOTCLK Period	tDOTCLK	100	33.3	154	51.3	-	-	ns
Horizontal Frequency (Line)	fH	-	-	14.9	-	22.35	-	KHz
Vertical Frequency (Refresh)	fV	-	-	60	-	90	-	Hz
Horizontal Back Porch	tHBP	-	-	68	204	-	-	tDOTCLK
Horizontal Front Porch	tHFP	-	-	20	60	-	-	tDOTCLK
Horizontal Data Start Point	tHBP	-	-	68	204	-	-	tDOTCLK
Horizontal Blanking Period	tHBP + tHFP	-	-	88	264	-	-	tDOTCLK
Horizontal Display Area	HDISP	-	-	320	960	-	-	tDOTCLK
Horizontal Cycle	Hcycle	-	-	408	1224	450	1350	tDOTCLK
Vertical Back Porch	tVBP	-	-	18	-	-	-	Lines
Vertical Front Porch	tVFP	-	-	4	-	-	-	Lines
Vertical Data Start Point	tVBP	-	-	18	-	-	-	Lines
Vertical Blanking Period	tVBP + tVFP	-	-	22	-	-	-	Lines
Vertical Display Area	NTSC	VDISP	-	240		-	-	Lines
	PAL			280(PALM=0)				
	PAL			288(PALM=1)				
Vertical Cycle	NTSC	Vcycle	-	262		350	-	Lines
	PAL			313				

8 CTP Specification

8.1 Elective Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	VCI		2.8	3.3	3.6	V
I/O Digital Voltage	VDDIO		1.8	3.3	3.6	V
Input Current	IDD			4		mA
Low Level Input Voltage	V_{IL}		-0.3		0.3IOVCC	V
High Level Input Voltage	V_{IH}		0.7IOVCC		IOVCC	V
Low Level Output Voltage	V_{OL}		-		0.3IOVCC	V
High Level Output Voltage	V_{OH}		0.7IOVCC		-	V
Operating Temperature	TOP	Absolute Max	-20		+70	°C
Storage Temperature	TST	Absolute Max	-30		+80	°C

8.2 Timing Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
OSC clock 1	Fosc 1	VDDA=2.8V; Ta=25°C	34.65	35	35.35	MHz

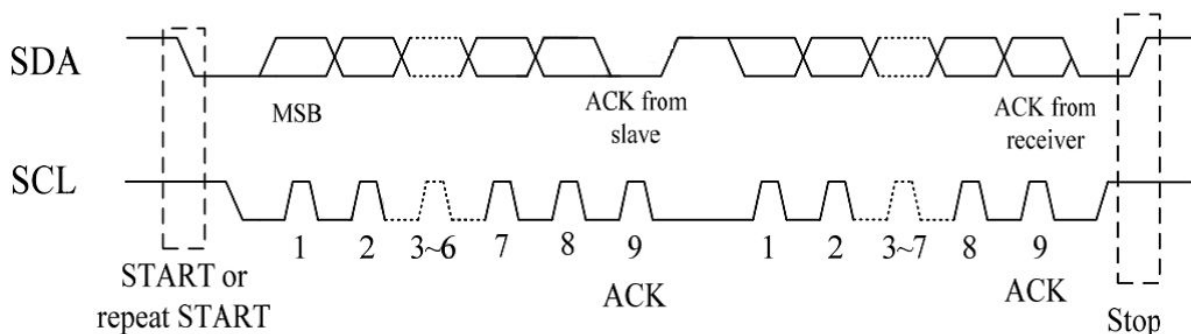
AC characteristics of Oscillators

Item	Symbol	Condition	Min	Typ	Max	Unit
Sensor acceptable clock	ftx	VDDA=2.8V; Ta=25°C	0	100	300	KHz
Sensor output rise time	Ttxr	VDDA=2.8V; Ta=25°C	-	100	-	nS
Sensor output fall time	Ttxf	VDDA=2.8V; Ta=25°C	-	80	-	nS
Sensor input voltage	Trxi	VDDA=2.8V; Ta=25°C	-	5	-	V

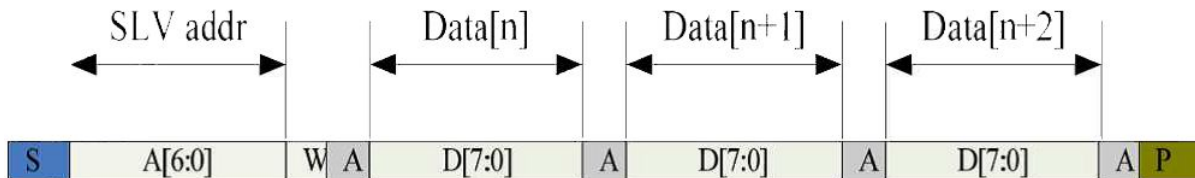
AC Characteristics of sensor

I2C Interface

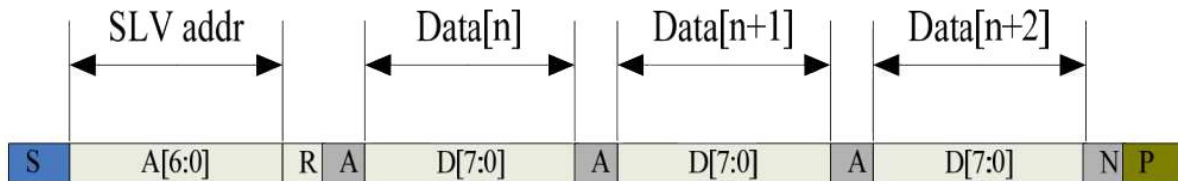
The I2C is always configured in the Slave mode.



I2C Serial Data Transfer Format



I2C master write, slave read



I2C master read, slave write

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)

Slave Address is 0x38;

I2C Interface 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 Driver/Controller Information

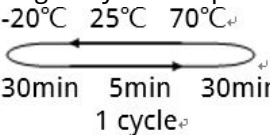
Built-in HX8238D IC:

<https://drive.google.com/file/d/0B5IkVYnewKTGanB1MEjtVUJYY0U/view?usp=sharing>

CTP FT6236 Driver IC:

<https://drive.google.com/file/d/0B5IkVYnewKTGVljZkHXzZKeWc/view?usp=sharing>

10 Reliability

Test Item	Content of Test	Test Condition	Note
High Temperature Storage	Endurance test applying the high storage temperature for a long time.	80°C 200hrs	2
Low Temperature Storage	Endurance test applying the high storage temperature for a long time.	-30°C 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°C 200hrs	-
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60°C,90%RH max, for 96hrs under no-load condition excluding the polarizer. Then taking it out and drying it at normal temperature.	60°C,90%RH 96hrs	1,2
Thermal Shock Resistance	The sample should be allowed stand the following 10 cycles of operation. 	-20°C/70°C 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

11 Warranty and Conditions

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