Advantech

AMT-1019N-D25B

Datasheet

Rev. 1.0

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CONTENTS

1. SCOPE

This document defines the performance requirements for a Flat Panel Display Monitor. This model is a 19 inch TFT LCD Display Monitor(WLED backlight). There will be a soft power switch button on the front of the monitor. One power supports the monitor energy on universal supply voltage range

2. Absolute Maximum Rating

		MIN	MAX
• *Storage Temperature*	TSTG	-20	60℃
• *Operating Temperature*	TOPR	0	40℃
• *Power Supply Voltage*	Vdd		5.0V
• Humidity		Operating: 10% ~ 90% (Non-condensation)	
		Non Operating: 10% ~ 90% (Non-condensation)	

3. General Spec.

- *Display Size:* 19" diagonal Panel : **M190ETN01.0**
- *Resolution:* 1280x1024 pixels
- *Pixel Pitch:* 0.294(H) × 0.294(W)mm
- Response Time: Tr+Tf: 5ms(typical)
- Number of color: 16.7M(6 Bit+FRC) colors
- Brightness: 250 cd/㎡(typical) 200 cd/㎡(min) (in Panel Spec)
- Contrast ratio: 1000:1(typical)/600:1(MIN)
- *Audio in:* 0.5Vrms(Type)/1KHz
- *Audio output:* 1W +1W

  Speaker: 8Ω /1.5W *2

- Scan Frequency

Horizontal	24kHz~83kHz
Vertical	55Hz~76Hz
Recommended Resolution	1280 dots ×1024 lines 60Hz 108MHz FOR DVI 1280 dots ×1024 lines 60Hz 135MHz FOR VGA

P.S : Horizontal & Vertical Frequency no include Video mode spec

- Signal registration

There are some resolution example listed in lookup timing table.

lookup timing table

(17Mode)	Resolution		H Freq (kHz)	H Total (pixels)	V Freq (Hz)	V Total (Line)	Pixel Clk (MHz)	Standard
	640x480	@60Hz	-31.469	800	-59.940	525	25.175	DMT
		@66.7Hz	-35.000	864	-66.667	525	30.24	Mac
		@72Hz	-37.861	832	-72.809	520	31.500	DMT
		@75Hz	-37.500	840	-75.000	500	31.500	DMT
	640x400	@56Hz	-24.830	848	-56.420	440	21.052	PC9800
	832x624	@75Hz	-49.720	1152	-74.550	667	57.280	Mac
	720x400	@70Hz	-31.470	900	+70.080	449	28.320	MS DOS
	800x600	@60Hz	+37.879	1056	+60.317	628	40.000	DMT
		@56Hz	+35.156	1024	+56.250	625	36.000	DMT
		@72Hz	+48.077	1040	+72.188	666	50.000	DMT
		@75Hz	+46.875	1056	+75.000	625	49.500	DMT
	1024x768	@60Hz	-48.363	1344	-60.004	806	65.000	DMT
		@70Hz	-56.476	1328	-70.069	806	75.000	DMT
		@75Hz	+60.023	1312	+75.029	800	78.750	DMT
		@75Hz	-60.240	1328	-74.930	804	80	Mac
	1280x1024	@60Hz	+63.981	1688	+60.020	1066	108.000	DMT
		@75Hz	+79.976	1688	+75.025	1066	135.000	DMT

It can display and not generate out of range when choosing below timings

- Video Mode Compatibility Table

	VGA	DVI
480i/480P	X	V
576i/576P	X	V
720p	X	V

4. User controls and indicators

4.1 Power on /off switch

The monitor shall have a power control switch visible and accessible on the front of the monitor.

4.2 Power Indicator LED

Normal Operation➔LED Green

Power Saving Mode➔LED Orange

4.3 Function key

1. The monitor normally is in a normal operation after the power bottom is pressed. And the OSD main menu will be turned on when the " 1 " button is pressed.
2. The " ▼ " and "▲ "buttons are used to scroll down/up the menu. When moving around different levels within a menu system, the " 2 " bottom is always used to select an option, advancing to the next menu, and the " 1 "button is always used to exit a level, returning to a previous menu or exiting the menu system when in the main menu.
3. After selecting the function, "▲" or " ▼ "buttons are used to decrease / increase the values of the corresponding parameter.
4. OSD will be turned off if no any function key is pressed after displaying on screen for 15 sec (default value).And the time is changeable by selecting "OSD Timeout" item.
5. Power Button Lock
   The power button lock will be activated by pressing the front panel control buttons "1"+ "▼" for 10 seconds. Locking the power button means that the user won't be able to turn off the LCD while the power button is locked. If the user presses the power button while it is locked, a message will appear on the screen for 3 seconds showing "Power Button Locked". It also means that with the power button locked, the LCD would automatically turn back "On" when power is restored after a power failure. If the power button is not in the locked mode, then power should return to it's previous state when power is restored after a power failure. The power button lock will be deactivated by pressing the front panel control buttons "1"+ "▼" again for 10 seconds.
6. OSD Lock
   The OSD lock will be activated by pressing the front panel control buttons "1"+"▲" for 10 seconds. If the user then tries to access the OSD by pressing any of the buttons"1", "▼", "▲", or "2" ,a message will appear on the screen for 3 seconds showing "OSD Locked". The OSD lock will be deactivated by pressing the front panel control buttons "1"+"▲" again for 10seconds.

4.4. OSD Function

OSD Menu

Main Menu item	1st Sub Menu Item	Description	Adjust Range	Reset Value
Automatic adjustment	N/A	To automatically adjust H./V. Position, Phase adjust and Clock adjust. REMARK: There may need manual adjustment of 〞phase〞 for optimized performance for various VGA tolerance	Yes	N/A

Contrast /Brightness	**Contrast**	Contrast from Digital-register. Each step will increase / decrease value by 1.	0-100	Recall Contrast Value 50
	Brightness	Backlight Adjustment. Each step will increase / decrease value by 1	0-100	Recall Brightness Value 80
	ECO	T To select Dynamic Contrast Ratio (DCR) ON/OFF; If DCR ON, brightness should be constant at MAX and should not be adjustable.	ON/OFF	OFF
Input Source:	**VGA**	Select D-SUB signal source as input	ANALOG	Auto
	DVI	Select DVI signal source as input	Digital	
Audio Adjust	**Volume**	To adjust the output of speaker from Amplifier Each step will increase / decrease value by 5	0-100	50
	Mute	To set or reset the mute function	ON/OFF	OFF
Colour Settings	**Cool(9300K)**	Recall Cool (9300K)Color Temperature from EEPROM.	N/A	The Color Temperature will be set to Normal
	Normal(6500 K)	Recall Normal (6500K)Color Temperature from EEPROM	N/A	
	Warm(5400K)	Recall Warm(5400K) Color Temperature from EEPROM	N/A	
	User Colour	RED /GREEN /BLUE Gain from Digital-register. Each step will increase / decrease value by 1.	0-100	Recall 100 Value
Information		To display the data about Horizontal / Vertical frequency, Pixel clock, Resolution, Model number	N/A	N/A
Manual Image Adjustment	**Horizontal Size**	To adjust the horizontal pixel clock of the video	0-100	50
	H./V. Position:	To adjust the horizontal and vertical position of the video	0-100	50
	Fine Tune	To adjust the delay time of data and clock	0-100	auto
	Sharpness	To select the picture sharpness of display	3	2
	Color vision mode	To select Standard , Game, Cinema, scenery and Text mode. When it is not under Standard mode , contrast/Brightness /Color Adjust(9300K/6500K/5400K/usercolor)" option on "main menu" can't be selected and brightness is not adjustable	YES	Standard
Menu settings	**Language**	To select one of eight languages. (English, French, German, Italian, Spanish, Suomi,Japanese and S-chiness,T-chiness)		S-chiness
	OSD Position	Adjust the horizontal position of the OSD. each step will increase/decrease value by 1 Adjust the vertical position of the OSD. each step will increase/decrease value by 1	0-100	Recall 50 Value
	OSD Time Out	To set the displaying time of OSD	5,15,30,60	Recall 15 Value

	OSD Background On/OFF	Allows the user to turn the OSD background On/Off	ON/OFF	OFF
Memory Recall		Restore default settings of Clock, H./V. Position, Phase, Contrast, Brightness,ECO,Color temperature(except user color), OSD position, OSD timeout and Sharpness,Volume, Mute,Background	N/A	N/A

4.5. Factory settings

Performing the reset function, all setting return to below.

Menu	Items	Factory
Screen Adjustment	Contrast/Brightness	50%/80%
Color Adjustment	Temperature	Normal
Others settings	Menu position	Center
Sharpness		2
OSD Time Out		15sec

4.6. OSD Factory Mode

Adjustment of white balance:

Presetting:

1. Warm up time must be over 30 minutes.
2. Set 800X600@60Hz at 5 WHITE BLOCK pattern.
3. Set up CA210 color analyzer at the center of screen and along a perpendicular to the screen at 20cm from the display.
4. Press "▲"and" 2 " key then Press POWER key at the same time inter factory mode then press "▼" or "▲" key move cursor to "WHITE BALANCE" then press " 2 " Monitor will execute auto white balance and showing the " WHITE BALANCE" Text. When the Text disappeared, the auto white balance is OK.

5. Power

- The Power supply shall start and function properly when under full load, with worst case conditions of input voltage/frequency at 0℃ ~ 40℃ ambient temperature.
- The inrush current must be limited to 40A at 90Vac and 80A at 264Vac.
- The operating range shall be from 90 to 264Vac and frequency range from 47 to 63Hz.
- Power consumption for the monitor shall be less than 20W over the specified voltage and frequency ranges.
- AC power cord is 1.8m in length

6. LCD monitor

6.1.

6.1.1. LCD monitor power consumption

		Power LED color
Normal:	<20W	Green
Power saving	<0.5W	Orange

6.1.2. Connector pin assignments

The signal cable connector shall be a molded-over, shield twisted pair cable. The cable shall be 1.5 meters long. The pin assignments shall be listed as below:

D-sub connector

PIN	D-SUB Connector
1	Red Video
2	Green Video
3	Blue Video
4	NC
5	GND
6	GND
7	GND
8	GND
9	+5V for DDC
10	GND
11	NC
12	SDA
13	H-sync
14	V-sync
15	SCL

6.1.3. Brightness Adjustment range:

Adjusting brightness control from min. to max. position at full white screen and maximum contrast. The typical light output of white pattern shall be increased more than 70 cd/m².

6.1.4 Contrast Adjustment range:

Adjusting contrast control from min. to max. position at full white screen and maximum brightness, The typical light output of white pattern shall be increased more than 100 cd/m².(based on Normal)

6.1.5. Light output

The light output should be greater than 200 cd/m² , when the contrast and brightness are set to max position. (based on Normal)

*

6.1.6. White Color Coordinate:

CIE chromatic diagram (x y) coordinates for the screen center.

White color temperature	Cool	Normal	Warm
x°	0.283	0.313	0.332
y°	0.297	0.329	0.348

Test conditions: Full white pattern
Brightness and Contrast are set to default

The color tolerance range is x°= ±0.03, y°= ±0.03

6.2. Flat Panel

LCD Panel Model No: **M190ETN01.0**

- The panel used as the display device shall be HD mode resolution 19" diagonal TFT-LCD.
- The brightness uniformity of the panel shall be measured by measuring brightness at nine pre-defined locations and taking the ratio shall be more than 75 %. (Fig.1)
-

Definition

Brightness: Average value of 9 points shown in **Fig. 1**

Minimum Luminance in 9 Points (1-9)

$$\text{Brightness Uniformity} = \frac{\text{Minimum Luminance in 9 Points (1-9)}}{\text{Maximum Luminance in 9 Points (1-9)}} \times 100\ \%$$

Condition

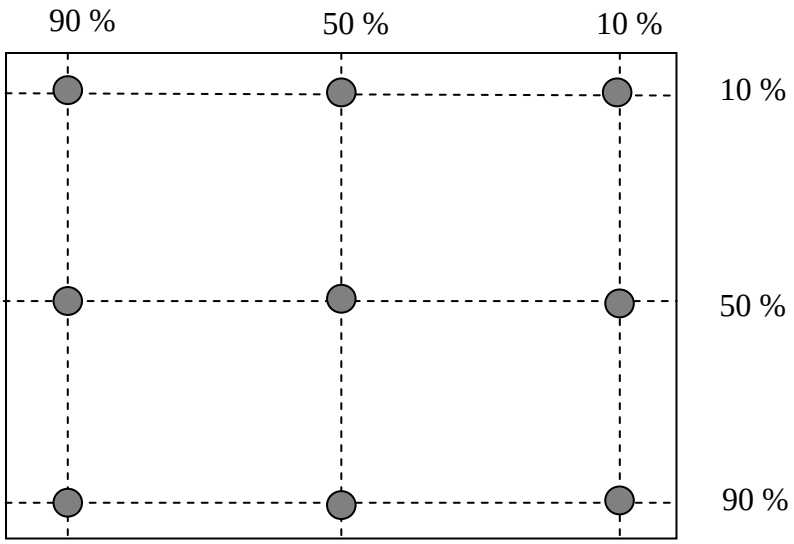


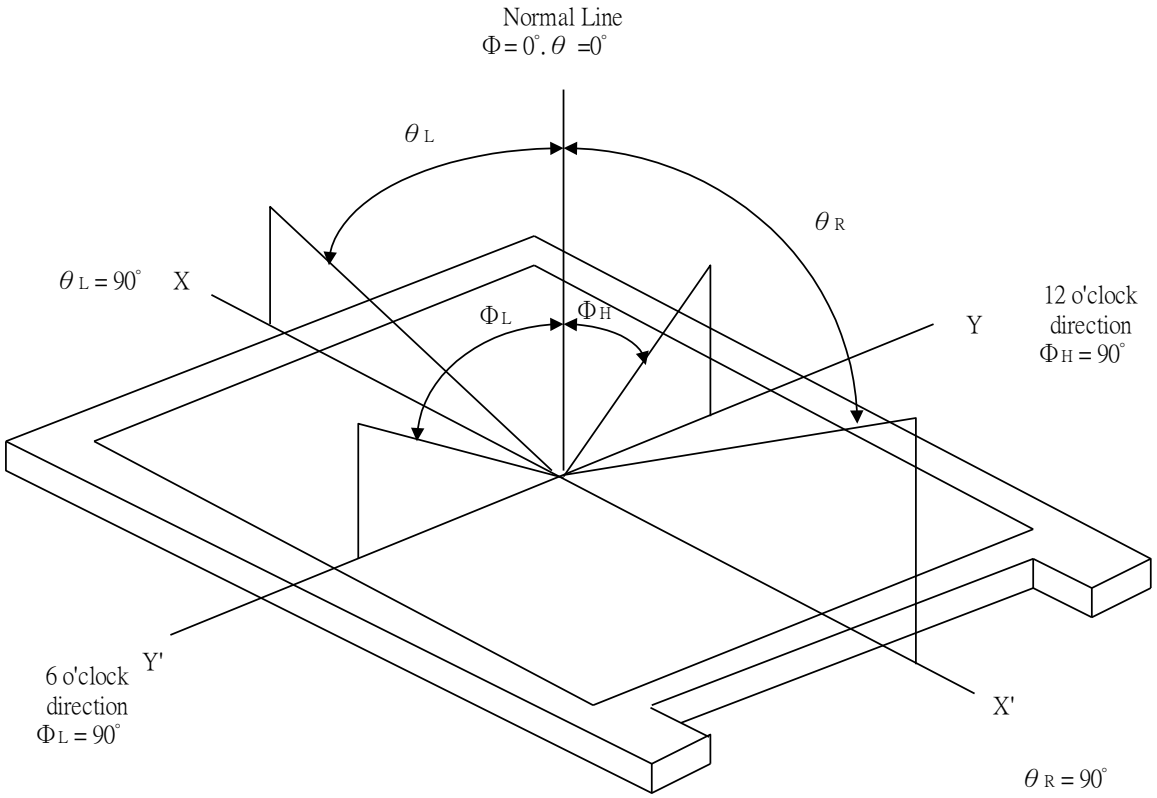
Fig. 1

- The response time : Tr+Tf typical is5ms, Tr+Tf max is 8 ms
- The typical viewing angle in the horizontal direction is170degrees，
  The typical viewing angle in the vertical direction is 160degrees. (Fig.2)
- The contrast ratio of the panel is measured by measuring the brightness of full white screen and the brightness of full dark screen and taking the ratio of the white to dark measurements.
- The contrast ratio TYP:1000:1,MIN:600:1

Ratio of gray max (G max), gray min (G max) at the center point of panel.

$$CR = \frac{\text{Luminance with all pixels white (Y Bmax Cmax)}}{\text{Luminance with all pixels black (Y Bmax Cmax)}}$$

Fig.2 Definition of Viewing Angle: Viewing Angle Range (10 < CR)



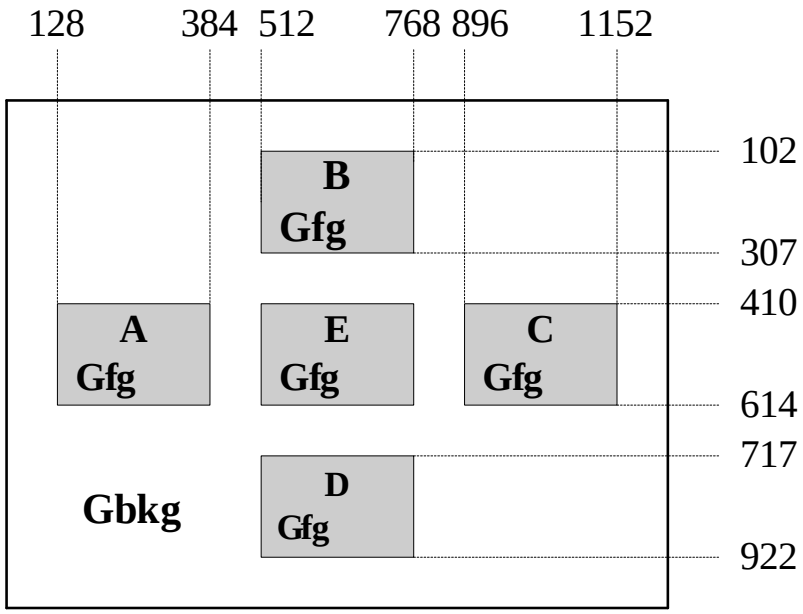
The typical luminance of white (center of screen) is 250 cd/㎡

x = 0.313 +/- 0.02

y = 0.329 +/- 0.02

Brightness and Contrast are set to maximum.

Definition of Crosstalk



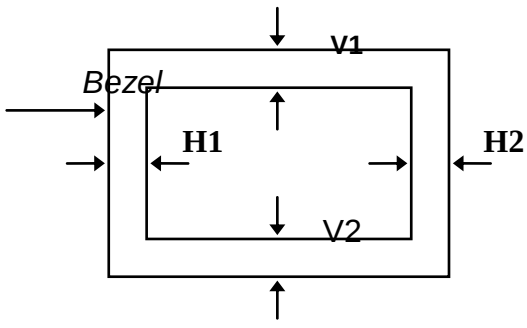
The calculation for shadowing is made from the 2 Luminance measurements Gbkg and Lsh, as followings:

$$\text{Crosstalk} = \frac{\text{Lmax - Lmin}}{\text{Lmin}} \times 100\%$$

Where Lmax is the larger value of Gbkg or Lsh, and Lmin is the smaller of the two.

6.2.1. Display image

The displayed image should be within following spec.

Horizontal :0≦ | H1-H2 | ≦ 1.5mm **Vertical : 0≦ | V1-V2 | ≦1.5mm**	

7. *Audio Test Function*

7.1 Audio amplifier Specification.

Load: 8 Ω speaker

Max rating power of speaker: 1.5W x 2

Sound Pressure at 0.3M with 1 Watt 78dB+/- 3dB

Audio output: Volume Max (Input= 0.5Vrms, 1KHz) 1W (+/-10%)

Audio input jack: CES3.5ψstereo jack and light green color

Amplifier: Input Reference=0.5Vrms, 1KHz

Description	Reference Condition	Specification
Usable Output Power	THD=10%	1.0W +/-10% (per-channel)
Signal to noise ratio	at 50mW output. A-weighted ON	>65dB
Distortion	200mW output ,1KHz	<1.5% THD
Hum Level	Input shorted by 600ohm, Volume at max.	<10mV
Frequency Response	200mW output	100Hz~8KHz within 6dB
Input handling voltage	50mW output and 3% THD	~1.5Vrms

7.2 Sound Vibration

7.2.1. Purpose:

To make sure no vibration, rattle noise and mechanical resonance occurred during TV/monitor operation.

7.2.2.Equipment:

Audio Signal Generator

- Output: 320 mV
- Sweep range: 200 Hz ~ 3K Hz
- Sweep time: 10 sec

7.2.3.Test condition

(1) Monitor settings:
Standard position except volume =70%
(2) Listening position:
- Angle: -60° ~ +60°
- Distance: 60 cm

7.2.4. Result:

Sound trembling must not arise.

8.Monitor dimensions and weight

8.1. Dimensions (Width × Height × Depth)

- *Monitor dimensions (unpacked)*
  W × H × D: 407.1mm × 406.9mm ×177.8mm

- *Packing Size:*
  W × H × D: 460mm× 472mm×118mm

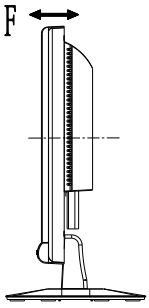
  View Size:
  W × H: 376.32mm × 301.06mm

8.2. Weight

- *Net (unpacked)*: 2.97±0.2 Kgs
- *Gross (packed)*: 4.1±0.3 Kgs

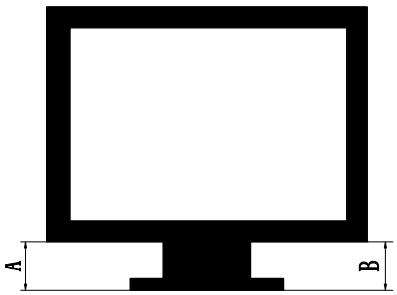
8.3. Case Work

- *Test Condition*
  Ambient temperature: 25℃±5℃.
- *Material*
  The plastic material used shall be meet safety requirement
- *Bucket/Bezel Alignment*
  The maximum acceptable bucket to bezel mismatch is 0.03 inch (0.8mm) all around the jointed surfaces.
- *Bucket/Bezel Gap*
  The maximum acceptable bucket to bezel gap shall be 0.8mm or less(Not contain fine-artists seam).
- *LCD/Bezel GAP*
  The maximum acceptable LCD to bezel gap shall be 1.5mm or less before drop test(Not contain fine-artists seam).
- *Tilt*
  The monitor shall be equipped with a tilt device allowing for 0±2degree to 20 ±2degree with respect to the horizontal .the push force shall be F<= 2.5 kgf



- Head tilt tolerance

  The maximum acceptable tolerance shall be /A-B/<=5mm before drop test .Size A is stand bottom plane to bezel bottom plane left distance , size B is stand bottom plane to bezel bottom plane right distance . .



8.4. Container Loading

- *20 feet container*:

840 (W/Pallet)

- *40 feet container*:

1848 (W/Pallet)

8.5. VIBRATION

- *Vibration frequency:* 5-250 Hz
- *Acceleration:* 1.0g
- *Sweep Time* 1 Oct./Min
- *Test Time:* 60Min Per Axis

8.6. Drop

- *1Coner* 76cm
- *3Coner* 76cm
- *6Coner* *76*cm

8.7. Accessories

- *Power cable /VGA cable /DVI cable/Audio cable*
- *User’s manual*
- *Warranty registration card*
- *Warranty card bag (Japan only)*

9.Timing Table

ITEM	1	2	3	4
TIMING	720 ×400 70HZ	640 ×480 60HZ	640 ×480 67HZ	640 ×480 72HZ
Pixel Rate	28.322MHZ	25.175MHZ	30.240MHZ	31.5MHZ
H TOTAL	31.778us	31.778us	28.571us	26.413 us
H DISPLAY	25.422us	25.422us	21.164us	20.317 us
H B-Porch	1.907us	1.907us	3.175us	3.81 us
H Width	3.813us	3.813us	2.116us	1.27us
H Border	0.318us	0.318us	0.000us	0.000us
V TOTAL	14.268ms	16.683ms	15.000ms	13.735ms
V DISPLAY	12.711ms	15.253ms	13.714ms	12.678ms
V B-Porch	1.112ms	1.049ms	1.114ms	0.528ms
Vs Width	0.064ms	0.064ms	0.086ms	0.079ms
V Border	0.222ms	0.254ms	0.000ms	0.000ms
H/V Sync	-/+	-/-	-/-	-/-
Interlace	No.	No.	No.	No.

ITEM	5	6	7	8
TIMING	640 ×480 75HZ	800 ×600 56HZ	800 ×600 60HZ	800 ×600 72HZ
Pixel Rate	31.500MHZ	36.000MHZ	40.000MHZ	50.000MHZ
H TOTAL	26.667us	28.444us	26.400us	20.800us
H DISPLAY	20.317us	22.222us	20.000us	16.000us
H B-Porch	3.810us	3.556us	2.200us	1.280us
H Width	2.032us	2.000us	3.200us	2.400us
H Border	0.000us	0.000us	0.000us	0.000us
V TOTAL	13.334ms	17.778ms	16.579ms	13.853ms
V DISPLAY	12.800ms	17.066ms	15.840ms	12.480ms
V B-Porch	0.427ms	0.626ms	0.607ms	0.478ms
Vs Width	0.080ms	0.057ms	0.106ms	0.125ms
V Border	0.000ms	0.000ms	0.000ms	0.000ms
H/V Sync	-/-	+/+	+/+	+/+
Interlace	No.	No.	No.	No.

ITEM	9	10	11	12
TIMING	800 ×600 75HZ	832 ×624 74.5HZ	1024 ×768 60HZ	1024 ×768 70HZ
Pixel Rate	49.500MHZ	57.280MHZ	65.000MHZ	75.000MHZ
H TOTAL	21.333us	20.111us	20.677us	17.707us
H DISPLAY	16.162us	14.525us	15.754us	13.653us
H B-Porch	3.232us	3.910us	2.462us	1.920us
H Width	1.616us	1.117us	2.092us	1.813us
H Border	0.000us	0.000us	0.000us	0.000us
V TOTAL	13.333ms	13.417ms	16.666ms	14.272ms
V DISPLAY	12.800ms	12.549ms	15.880ms	13.599ms
V B-Porch	0.448ms	0.784ms	0.600ms	0.513ms
Vs Width	0.064ms	0.060ms	0.124ms	0.106ms
V Border	0.000ms	0.00ms	0.000ms	0.000ms
H/V Sync	+/+	-/-	-/-	-/-
Interlace	No.	No.	No.	No.

ITEM	13	14	15	16
TIMING	1024 ×768 75HZ	1152 x 864 75HZ	1152 x 870 75HZ	1280×960 60HZ
Pixel Rate	78.750MHZ	108MHZ	100MHZ	108MHZ
H TOTAL	16.660us	14.815us	14.560us	16.667us
H DISPLAY	13.003us	10.667us	11.520us	11.852us
H B-Porch	2.235us	2.370us	1.440us	2.889us
H Width	1.219us	1.185us	1.280us	1.037us
H Border	0.000us	0.000us	0.000us	0.000us
V TOTAL	13.328ms	13.333ms	13.322ms	16.667ms
V DISPLAY	12.795ms	12.800ms	12.667ms	16.000ms
V B-Porch	0.466ms	0.474ms	0.568ms	0.600ms
Vs Width	0.050ms	0.044ms	0.044ms	0.050ms
V Border	0.000ms	0.000ms	0.000ms	0.000ms
H/V Sync	+/+	+/+	-/-	+/+
Interlace	No.	No.	No.	No.

ITEM	17	18
TIMING	1280 ×1024 60HZ	1280 ×1024 75HZ
Pixel Rate	108MHZ	135.000MHZ
H TOTAL	15.630us	12.504us
H DISPLAY	11.852us	9.481us
H B-Porch	2.296us	1.837us
H Width	1.037us	1.067us
H Border	0.000us	0.000us
V TOTAL	16.661ms	13.329ms
V DISPLAY	16.005ms	12.804ms
V B-Porch	0.594ms	0.475ms
Vs Width	0.047ms	0.038ms
V Border	0.00ms	0.000ms
H/V Sync	+/+	+/+
Interlace	No.	No.

10.REGULATORY

The following documents form a part of this specification to the extent specified herein.
The product has been tested and approved to use the relevant marks on statements:
The following documents form a part of this specification to the extent specified herein.
The product has been tested and approved to use the relevant marks on statements:
CCC

11.RELIABILITY

11.1. Reliability of the monitor

The MTBF of the monitor has to be 50,000 hours (except LCD module). The MTBF shall be calculated according to the MIL standard 217E/F. The calculation shall be performed for a primary test /preset mode under ambient temperature of 25℃.

11.2. Lifetime of backlight

The brightness is still more than 50% of the original brightness after:
Min : 30,000 hours