

# LCD Module User Manual

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## 1. General Specification

Signal Interface :	eDP
Display Mode :	Transmissive with Normally White
Screen Size :	13.3 inch
Outline Dimension :	$306.3 \times 195.2 \times 4.9$ (mm)(with mounting Bezel)
	(see outline drawing for details)
Active Area :	293.417x 164.966(mm)
Number of dots :	1366 x 3 (RGB) x 768
Pixel Pitch :	0.2148x 0.2148(mm)
Pixel Configuration :	R.G.B. Vertical Stripe
Backlight :	White LED
Viewing Direction :	6H ( Gray scale Inversion ) (*1)
viewing Direction .	12H (*2)
Operating Temperature :	0 ~ +50°C
Storage Temperature :	-20 ~ +60°C

Note:

\*1. For saturated color display content (eg. pure-red, pure-green, pure-blue or pure-colors -combinations).

\*2. For "color scales" display content.\*3. Color tone may slightly change by temperature and driving condition.

## 2. Block Diagram



## 3. Terminal Function

## 3.1 K1 Terminal

K1 Pin No.	Pin Name	I/O	Descriptions				
1	NC	-	No Connection				
2	H_GND	Power	High Speed Ground				
3	NC	-	No Connection				
4	NC	-					
5	H_GND	Power	High Speed Ground				
6	ML0-	Input	Complement Signal-Lane0				
7	ML0+	Input	True Signal-Main Lane0				
8	H_GND	Power	High Speed Ground				
9	AUX+	I/O	True Signal-Auxiliary Channel				
10	AUX-	I/O	Complement Signal-Auxiliary Channel				
11	H_GND	Power	High Speed Ground				
12	VCCS	Power	Positive Power Supply				
13	VCCS	Power					
14	NC	-	No Connection				
15	GND	Power	Ground				
16	GND	Power	Globin				
17	HPD	Input	Hot Plug Detect				
18	BL_GND						
•	:	Power	Backlight Ground				
21	BL_GND						
			Backlight Driver Control				
22	LED_EN	Input	LED_EN=High, Backlight Driver enable				
			LED_EN=Low, Backlight Driver disable				
23		Input	Backlight dimming Control				
20		mput	PWM may be used to adjust the output brightness				
24	NC	-	No Connection				
25	NC	-					
26	LED_VCCS						
:	:	Power	Backlight Positive Power Supply				
29	LED_VCCS						
30	NC	-	No Connection				

## 4. Absolute Maximum Ratings

Items	Symbol	Min.	Max.	Unit	Condition
Power Supply voltage	Vccs	-0.3	+4.0	V	
Logic Input Voltage	VIN	-0.3	Vccs+0.3	V	
Backlight Supply voltage	Vccs_led	-0.3	26.0	V	
Backlight Signal voltage	LED_EN	-0.3	5.0	V	
Backlight Signal voltage	LED_PWM	-0.3	5.0	V	
Operating Temperature	T <sub>OP</sub>	0	50	°C	No Condensation
Storage Temperature	T <sub>ST</sub>	-20	60	°C	No Condensation

Note:

\*1. This rating applies to all parts of the module. And it should not be exceeded.

\*2. The operating temperature only guarantees operation of the circuit. The contrast, response speed,

and the other specification related to electro-optical display quality is determined at the room temperature, T<sub>OP</sub>=25 C
\*3. Any Stresses exceeding the Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

## 5. Electrical Characteristics

## 5.1 Driving TFT LCD Panel Characteristics

							T <sub>a</sub> =25°C
Items		Symbol	Min.	Тур.	Max.	Unit	Remark
Power Supply V	oltage	Vccs	3.0	3.3	3.6	V	
HPD high voltage		VHPDIH	2.43	-	2.97	V	
HPD low voltage	9		0	-	0.4	V	
Inrush Current		RUSH	-	-	1.5	Α	*1
Power Supply	Mosaic	hunna	-	149	169	mA	
Current	Black	IVCCS	-	169	190	mA	

Note:

\*1. IRUSH: the maximum current when VCCS is rising.

\*2 IRUSH: the maximum current when VCCS is rising

IIS: the maximum current of the first 100ms after power-on

Measurement Conditions: Shown as the following figure. Test pattern: black.

## 5.2 LED Backlight Circuit Characteristics

					T <sub>a</sub> =25°C
Symbol	Min.	Тур.	Max.	Unit	Remark
	5.0	12.0	21.0	V	
<b>ILED</b> RUSH	-	-	1.5	Α	*1
VLED_EN <sub>IH</sub>	2.2	-	5.0	V	*2
VLED_EN <sub>IL</sub>	0	-	0.6	V	5
VLED_PWM <sub>IH</sub>	2.2	-	5.0	V	*2
VLED_PWM <sub>IL</sub>	0	-	0.6	V	5
f <sub>₽₩M</sub>	190	-	2k	Hz	
VCCS_LED	-	176	187	mA	*2
	Symbol V <sub>CCS_LED</sub> ILED <sub>RUSH</sub> VLED_EN <sub>IH</sub> VLED_EN <sub>IL</sub> VLED_PWM <sub>IH</sub> VLED_PWM <sub>IL</sub> f <sub>PWM</sub> Ivccs_LED	$\begin{array}{ c c c c } \hline Symbol & Min. \\ \hline V_{CCS\_LED} & 5.0 \\ \hline ILED_{RUSH} & - \\ \hline VLED\_EN_{IH} & 2.2 \\ \hline VLED\_EN_{IL} & 0 \\ \hline VLED\_PWM_{IH} & 2.2 \\ \hline VLED\_PWM_{IL} & 0 \\ \hline f_{PWM} & 190 \\ \hline I_{VCCS\_LED} & - \\ \hline \end{array}$	Symbol         Min.         Typ.           V <sub>CCS_LED</sub> 5.0         12.0           ILED <sub>RUSH</sub> -         -           VLED_EN <sub>IH</sub> 2.2         -           VLED_EN <sub>IL</sub> 0         -           VLED_PWM <sub>IH</sub> 2.2         -           VLED_PWM <sub>IH</sub> 0         -           f <sub>PWM</sub> 190         -           Ivccs_LED         -         176	$\begin{array}{ c c c c c c } \hline Symbol & Min. & Typ. & Max. \\ \hline V_{CCS\_LED} & 5.0 & 12.0 & 21.0 \\ \hline ILED_{RUSH} & - & - & 1.5 \\ \hline VLED\_EN_{IH} & 2.2 & - & 5.0 \\ \hline VLED\_EN_{IL} & 0 & - & 0.6 \\ \hline VLED\_PWM_{IH} & 2.2 & - & 5.0 \\ \hline VLED\_PWM_{IL} & 0 & - & 0.6 \\ \hline f_{PWM} & 190 & - & 2k \\ \hline I_{VCCS\_LED} & - & 176 & 187 \\ \hline \end{array}$	Symbol         Min.         Typ.         Max.         Unit           V <sub>CCS_LED</sub> 5.0         12.0         21.0         V           ILED <sub>RUSH</sub> -         -         1.5         A           VLED_EN <sub>IH</sub> 2.2         -         5.0         V           VLED_EN <sub>IL</sub> 0         -         0.6         V           VLED_PWM <sub>IH</sub> 2.2         -         5.0         V           VLED_PWM <sub>IH</sub> 0         -         0.6         V           VLED_PWM <sub>IL</sub> 0         -         0.6         V           VLED_PWM <sub>IL</sub> 0         -         2.0         V           VLED_PWM <sub>IL</sub> 0         -         2.4         Hz           Ivccs_LED         -         176         187         mA

Note:

\*1. ILEDRUSH: the maximum current when LED\_VCCS is rising

\*2. The specified LED power supply current is under the conditions at "LED\_VCCS = Typ.", Ta =  $25 \pm 2$  °C, fPWM = 200 Hz, Duty=100%

\*3. The specified signals have equivalent impedances pull down to ground in the LCD module.

## 5.3 Touch panel Characteristics

Items	MIN.	TYP.	MAX.	Unit	Applicable Pin
Operating Voltage	-	5.0	-	V	-
Terminal registence	450	-	1100	Ω	X- terminal
renninarresistance	100	-	500	Ω	Y- terminal
Response time	-	-	10	ms	-
Life Time	-	1.000.000	-	times	-

Cautions: Exceeding the recommended Condition could cause substantial damage to the touch panel and shorten its lifetime.



## TOPWAY

## 5.4 DISPLAY PORT SIGNAL TIMING SPECIFICATIOND

#### 5.4.1 DISPLAY PORT INTERFACE

						T <sub>a</sub> =25°C
Items	Symbol	MIN.	TYP.	MAX.	Unit	Note
Differential Signal Common Mode Voltage(MainLink and AUX)	VCM	0	-	2	V	
AUX AC Coupling Capacitor	Caux	75	-	200	nF	*1

Note:

\*1. The AUX AC Coupling Capacitor should be placed on Source Devices.



#### 5.4.2 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 6-bit gray scale data input for the color. The higher the binary input the brighter the color. The table below provides the assignment of color versus data input.

		į.							[	Data	Sign	al							
	Color	j	8	R	ed		0		Green					Blue					
		<b>R</b> 5	R4	R3	R2	<b>R</b> 1	R0	G5	G4	G3	G2	G1	GO	B5	B4	B3	B2	B1	<b>B0</b>
	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Basic	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Colors	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
0.50	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.532	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Scale	-	1	:	1	2	:	1	-	:	:	1	-	1	1	-	:	1		1
Of	<u></u>	1	1	1	:	:	:	1	:	:	2	2	:	:	1	:	1	3 I.	
Red	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.52	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Gray	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Scale	3	12	:	÷	-	-	:	-	1	:	3	3	:	:	1	:	÷	3	
Of		1	-	1	1	:	:	-	:	:		2	-		1	1	1		1
Green	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gray	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Scale	1		-	1	-				:	:	1	2	-	-	-	-	12		÷
Of	:	-	:	:	:	:				:	-		:	-	1	-	-	-	-
Blue	Blue(61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue(62) Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0

Note (1) 0: Low Level Voltage, 1: High Level Voltage

## 5.5 POWER ON/OFF SEQUENCE

The power sequence specifications are shown as the following table and diagram.



#### **Timing Specifications:**

Itomo	Description	Reqd.	V	Value		Notos		
items	Description	By	Min.	Max.	Unit	Notes		
t1	Power rail rise time, 10% to 90%	Source	0.5	100	ms	-		
t2	Delay from LCD,VCCS to black video generation	Sink	0	200	ms	Automatic Black Video generation prevents display noise until valid video data is received from the Source (see Notes:*2 and *3 below)		
t3	Delay from LCD,VCCS to HPD high	Sink	0	200	ms	Sink AUX Channel must be operational upon HPD high (see Note:*4 below )		
t4	Delay from HPD high to link training initialization	Source	-	-	ms	Allows for Source to read Link capability and initialize		
t5	Link training duration	Source	•	-	ms	Dependant on Source link training protocol		
t6	Link idle	Source	-	-	ms	Min Accounts for required BS- Idle pattern. Max allows for Source frame synchronization		
t 7	Delay from valid video data from Source to video on display	Sink	0	50	ms	Max value allows for Sink to validate video data and timing. At the end of T7, Sink will indicate the detection of valid video data by setting the SINK_STATUS bit to logic 1 (DPCD 00205h, bit 0), and Sink will no longer generate automatic Black Video		

		r				
t8	Delay from valid video data from Source to backlight on	Source	-	-	ms	Source must assure display video is stable
t9	Delay from backlight off to end of valid video data	Source	-	-	ms	Source must assure backlight is no longer illuminated. At the end of T9, Sink will indicate the detection of no valid video data by setting the SINK_STATUS bit to logic 0 (DPCD 00205h, bit 0), and Sink will automatically display Black Video.(See Notes: *2 and *3 below)
t10	Delay from end of valid video data from Source to power off	Source	0	500	ms	Black video will be displayed after receiving idle or off signals from Source
t11	VCCS power rail fall time, 90% to 10%	Source	0.5	10	ms	-
t12	VCCS Power off time	Source	500	-	ms	-
tA	LED power rail rise time, 10% to 90%	Source	0.5	10	ms	-
tв	LED power rail fall time, 90% to 10%	Source	0	10	ms	-
tc	Delay from LED power rising to LED dimming signal	Source	1	-	ms	-
t⊳	Delay from LED dimming signal to LED power falling	Source	1	-	ms	-
t⊧	Delay from LED dimming signal to LED enable signal	Source	1	-	ms	-
tr	Delay from LED enable signal to LED dimming signal	Source	1	-	ms	-

Note:

\*1. Please don't plug or unplug the interface cable when system is turned on.

\*2. The Sink must include the ability to automatically generate Black Video autonomously. The Sink must automatically enable Black Video under the following conditions:

- Upon LCDVCC power-on (within T2 max)

- When the "NoVideoStream\_Flag" (VB-ID Bit 3) is received from the Source (at the end of T9)

\*3. The Sink may implement the ability to disable the automatic Black Video function, as described in \*2, above, for system development and debugging purposes.

\*4. The Sink must support AUX Channel polling by the Source immediately following LCDVCC power-on without causing damage to the Sink device (the Source can re-try if the Sink is not ready). The Sink must be able to response to an AUX Channel transaction with the time specified within T3 max.

## 6. AC Characteristics

## 6.1 AC Characteristics

**Display Timing Specifications:** 

The input signal timing specifications are shown as the following table and timing diagram.

Signal	Items	Symbol	MIN.	TYP.	MAX.	Unit	Note
DCLK	Frequency	1/Tc	72.60	76.42	80.24	MHz	-
	Vertical Total Time	TV	780	800	900	TH	-
	Vertical Active Display Period	TVD	768	768	768	TH	-
DE	Vertical Active Blanking Period	TVB	TV-TVD	32	TV-TVD	TH	-
	Horizontal Total Time	TH	1520	1592	1800	Tc	-
	Horizontal Active Display Period	THD	1366	1366	1366	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	226	TH-THD	Тс	-

Note:

\*1. Because this module is operated by DE only mode, Hsync and Vsync are ignored.

#### INPUT SIGNAL TIMING DIAGRAM



## 7. Optical Characteristics

Item	Symbol	Condition	MIN.	TYP.	MAX.	UNIT	Note.	
	θ∟	9 o'clock	60	70	-	dograa		
Viewing angle	$\theta_{R}$	3 o'clock	60	70	-		*2	
(CR≥10)	θτ	12 o'clock	40	50	-	uegree		
	θΒ	6 o'clock	60	70	-			
Pesponse Time	T <sub>f</sub>		-	10	20	msec msec	*3	
Response nine	Tr		-	15	30			
Contrast ratio	CR	Nerroral	400	500	-	-		
Color chromaticity	W <sub>x</sub>	Normai A=0°	0.26	0.31	0.26	-	*1	
	W <sub>Y</sub>	0 0	0.28	0.33	0.38	-		
Luminance	L		-	176	-	cd/m <sup>2</sup>	*4	
Luminance uniformity	Yu		70	75	-	%	*4	

Note:

\*1. Definition of Contrast Ratio

The contrast ratio could be calculate by the following expression:

Contrast Ratio (CR) = Luminanc with all pixels white / Luminance with all pixels black

\*2 Definition of Viewing Angle





\*4 Definition of Luminance Uniformity

Luminance uniformity (Lu)= Min. Luminance form pt1~pt9 / Max Luminance form Pt1~pt9



## 8. Appendix. EDID DATA STRUCTURE

The EDID (Extended Display Identification Data) data formats are to support displays as defined in the VESA Plug & Display and FPDI standards.

(ueuna)         (inex)         (inex)         (inex)           0         0         Header         00         00000000           1         01         Header         FF         11111111           2         02         Header         FF         11111111           3         03         Header         FF         11111111           4         04         Header         FF         11111111           5         05         Header         FF         11111111           6         06         Header         FF         11111111           7         07         Header         FF         11111111           7         07         Header         FF         11111111           7         07         Header         FF         11111111           10         0A         ID product code (ISB)         62         00000000           11         0B         ID product code (IMSB)         13         00010011           12         0C         ID S/N (fixed '0'')         00         000000000           13         0D Product code (IMSB)         13         00010000           14         0E         ID S/N (fixed '0'')	Byte #	Byte #	Field Name and Comments	Value	Value
0         00         000         0000000           1         00         00000000         FF         1111111           2         02         Header         FF         1111111           3         03         Header         FF         1111111           4         04         Header         FF         1111111           5         05         Header         FF         1111111           6         06         Header         FF         1111111           7         07         Header         FF         1111111           6         06         Header         FF         1111111           7         07         Header         FF         1111111           6         08         EISA ID manufacture name         AE         1010110           9         09         EISA ID manufacture name         AE         1010101           10         ID product code (MSB)         13         00010000         13         0001000000           11         08         ID S/N (fixed '0')         00         000000000         00         00000000           11         12         DC         ID S/N (fixed '0')         00         00000000	(uecimai)	(nex)	Header	(nex)	(binary)
1         01         Preader         FF         1111111           2         02         Header         FF         1111111           3         03         Header         FF         1111111           4         04         Header         FF         1111111           5         05         Header         FF         1111111           6         06         Header         FF         1111111           7         07         Header         A         D         00         00000000           8         08         EISA ID manufacturer name         AE         D101111         00         00         00000000           10         0A         ID product code (MSB)         13         00010011         13         000         000000000           14         0E         ID S/N (fixed '0')         00         000000000         14         0E         ID S/N (fixed '0')         00         000000000         14         0E         100	1	00	Header		11111111
2         02         Header         FF         1111111           3         03         Header         FF         1111111           4         04         Header         FF         1111111           5         05         Header         FF         1111111           6         06         Header         FF         1111111           7         07         Header         00         00000000           8         08         EISA ID manufacturer name ("CMN")         0D         00001101           9         09         EISA ID manufacturer name ("CMN")         0D         00000000           10         0A         ID product code (MSB)         13         00010011           11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E<	2	01	Header		1111111
3         0.5         Header         Fr         1111111           4         0.4         Header         FF         1111111           5         0.5         Header         FF         1111111           6         0.6         Header         FF         1111111           7         0.7         Header         AE         1010110           9         0.9         EISA ID manufacture name ("CMN")         0.0         00000000           11         0.8         ID product code (MSB)         1.3         0001001           12         0.0         DS/N (fixed "0")         0.0         0.00000000           13         0.0         ID S/N (fixed "0")         0.0         0.0000000           14         0.5         N (fixed "0")         0.0         0.0000000           15	2	02	Header		1111111
4         04         FP         1111111           5         05         Header         FF         1111111           6         06         Header         FF         1111111           7         07         Header         00         0000000           8         08         EISA ID manufacturer name         AE         1010110           9         09         EISA ID manufacturer name         AE         1010110           10         0A         ID product code (LSB)         62         0110010           11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0001110           17         11         Year of manufacture (fixed year code)         18         0011000           18         12         EDID structure version ("1")         01	3	03	Header		1111111
5         05         Header         FP         1111111           6         06         Header         FF         1111111           7         07         Header         00         00000000           8         08         EISA ID manufacturer name ("CMN")         0D         00001101           9         09         EISA ID manufacturer name ("CMN")         0D         00000000           10         0.A         ID product code (LSB)         62         01100010           11         0B         ID product code (MSB)         13         00010011           12         0.C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0.E         ID S/N (fixed "0")         00         00000000           15         0.F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0000111           17         11         Year of manufacture (fixed year code)         18         0001100           18         12         EDID Envision ("4")         04         00000010           19	4	04	Header	FF	1111111
0         06         Header         00         0000000           8         08         EISA ID manufacturer name ("CMN")         0D         00001101           9         09         EISA ID manufacturer name         AE         10101110           10         0A         ID product code (LSB)         62         01100010           11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0000110           17         11         Year of manufacture (fixed year code)         18         00011000           18         12         EDID structure version ("1")         01         00000000           20         14         Video I/P definition ("Digital")         95         1001010           21         16         Active area vertical ("16.497cm")         10         0001000	0	05	Header	FF	1111111
1         07         Preader         00         00000000           8         08         EISA ID manufacturer name ("CMN")         0D         00001101           10         0A         ID product code (LSB)         62         0110010           11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         00001101           17         11         Year of manufacture (fixed year code)         18         00011000           18         12         EDID structure version ("1")         01         00000001           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         1D         00011000           23         17         Display Gamma (Gamma = "2.2")         78         01111000	0	00	Header	FF	00000000
8         08         EISA ID manufacturer name         AE         10101110           9         09         EISA ID manufacturer name         AE         1010110           10         0A         ID product code (LSB)         62         01100010           11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0000110           17         11         Year of manufacture (fixed year code)         18         00011000           18         12         EDID structure version ("1")         01         0000000           19         13         EDID revision ("4")         04         0000100           20         14         Video I/P definition ("Digital")         95         10011010           21         15         Active area vertical ("16 A97cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78	1	07	Float ID men factore serve (ICNNIII)	00	00000000
9         09         EISA ID manufacturer name         AE         1010110           10         0A         ID product code (LSB)         62         01100010           11         0B         ID product code (MSB)         13         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         00         00000000           17         11         Year of manufacture (fixed year code)         18         00011000           18         12         EDID structure version ("1")         01         00000000           19         13         EDID revision ("4")         04         00000100           20         14         Video I/P definition ("Digital")         95         10010101           121         15         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")	8	08	EISAID manufacturer name ("CMN")	0D	00001101
10         0A         ID product code (LSB)         6.2         0110010           11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0001110           17         11         Year of manufacture (fixed year code)         18         00010000           18         12         EDID structure version ("1")         01         00000000           20         14         Video I/P definition ("Digital")         95         1001010           21         15         Active area horizontal ("29.342cm")         1D         00011000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, W	9	09	EISA ID manufacturer name	AE	10101110
11         0B         ID product code (MSB)         13         00010011           12         0C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0000110           17         11         Year of manufacture (fixed year code)         18         00000000           18         12         EDID structure version ("1")         01         00000000           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01110000           24         18         Feature support ("RGB, Non-continous")         02         00000101           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         0101000           25         19         Rx1, Bx0, By1, By0, W	10	UA	ID product code (LSB)	62	01100010
12         0C         ID S/N (fixed "0")         00         00000000           13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         00001100           17         11         Year of manufacture (fixed year code)         18         00010000           18         12         EDID structure version ("1")         01         00000000           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         10         00011000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10001010           27         1B         Rx=0.579	11	0B	ID product code (MSB)	13	00010011
13         0D         ID S/N (fixed "0")         00         00000000           14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         0000110           17         11         Year of manufacture (fixed year code)         18         0001000           18         12         EDID structure version ("4")         04         0000010           20         14         Video I/P definition ("Digital")         95         1001010           21         15         Active area horizontal ("29.342cm")         1D         00011000           23         17         Display Gamma (Gamma ="2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         0000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000110           27         18         Rx=0.579         94         10010100           28         1C         Ry=0.337	12	0C	ID S/N (fixed "0")	00	00000000
14         0E         ID S/N (fixed "0")         00         00000000           15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed year code)         0E         00001110           17         11         Year of manufacture (fixed year code)         18         0001000           18         12         EDID structure version ("1")         01         0000000           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         1D         00011000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         0000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           25         19         Rx1, Rx0, Ry1, By0, Wx1, Wx0, Wy1, Wy0         85         1000011           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10010110           28         1C         Ry=0.337         56         01010100           29         1D	13	0D	ID S/N (fixed "0")	00	00000000
15         0F         ID S/N (fixed "0")         00         00000000           16         10         Week of manufacture (fixed week code)         0E         00001110           17         11         Year of manufacture (fixed year code)         18         00010000           18         12         EDID structure version ("1")         01         0000001           19         13         EDID revision ("4")         04         00000100           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         10         00011000           22         16         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         0000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000111           29         1D         Gx=0.324         53         0101010           29         1D         <	14	0E	ID S/N (fixed "0")	00	00000000
16         10         Week of manufacture (fixed week code)         0E         00001110           17         11         Year of manufacture (fixed year code)         18         00011000           18         12         EDID structure version ("1")         01         0000001           19         13         EDID revision ("4")         04         0000010           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         10         00001000           23         17         Display Gamma (Gamma = "2.2")         78         011110000           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         0101001           30         1E         Gy=0.586         96 <td>15</td> <td>OF</td> <td>ID S/N (fixed "0")</td> <td>00</td> <td>00000000</td>	15	OF	ID S/N (fixed "0")	00	00000000
17         11         Year of manufacture (fixed year code)         18         00011000           18         12         EDID structure version ("1")         01         0000001           19         13         EDID revision ("4")         04         0000010           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         1D         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010101           29         1D         Gx=0.324         53         01010101           30         1E         Gy=0.586         96         10010100           32         20         By=0.137         23         01100000	16	10	Week of manufacture (fixed week code)	0E	00001110
18         12         EDID structure version ("1")         01         00000001           19         13         EDID revision ("4")         04         00000100           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         1D         00011000           22         16         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         0101000           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         01101000	17	11	Year of manufacture (fixed year code)	18	00011000
19         13         EDID revision ("4")         04         00000100           20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         1D         00011001           22         16         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         1000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         0101001           30         1E         Gy=0.586         96         10010100           32         20         By=0.137         23         00100001           33         21         Wx=0.313         50         01010000	18	12	EDID structure version ("1")	01	00000001
20         14         Video I/P definition ("Digital")         95         10010101           21         15         Active area horizontal ("29.342cm")         1D         00011010           22         16         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         0101010           29         1D         Gx=0.324         53         0101001           30         1E         Gy=0.586         96         10010100           32         20         By=0.137         23         00100001           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35 <td>19</td> <td>13</td> <td>EDID revision ("4")</td> <td>04</td> <td>00000100</td>	19	13	EDID revision ("4")	04	00000100
21         15         Active area horizontal ("29.342cm")         1D         00011101           22         16         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         0111100           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010101           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010100           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100001           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35         23	20	14	Video I/P definition ("Digital")	95	10010101
22         16         Active area vertical ("16.497cm")         10         00010000           23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010100           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100001           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         00         00000000           36         2	21	15	Active area horizontal ("29.342cm")	1D	00011101
23         17         Display Gamma (Gamma = "2.2")         78         01111000           24         18         Feature support ("RGB, Non-continous")         02         0000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010101           29         1D         Gx=0.324         53         01010101           30         1E         Gy=0.586         96         1001010           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         0010001           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         0101000           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's re	22	16	Active area vertical ("16.497cm")	10	00010000
24         18         Feature support ("RGB, Non-continous")         02         00000010           25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010101           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010100           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100001           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         0101000           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard tim	23	17	Display Gamma (Gamma = "2.2")	78	01111000
25         19         Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0         50         01010000           26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010100           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         0010000           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         0101000           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           38         26         Standard timing ID # 1         01         00000001	24	18	Feature support ("RGB, Non-continous")	02	00000010
26         1A         Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0         85         10000101           27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010100           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         0010001           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         0101000           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	25	19	Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0	50	01010000
27         1B         Rx=0.579         94         10010100           28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010100           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100011           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         0101000           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	26	1A	Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0	85	10000101
28         1C         Ry=0.337         56         01010110           29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010110           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100011           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	27	1B	Rx=0.579	94	10010100
29         1D         Gx=0.324         53         01010011           30         1E         Gy=0.586         96         10010110           31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100011           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         0101000           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         0000001           39         27         Standard timing ID # 1         01         0000001	28	1C	Ry=0.337	56	01010110
30         1E         Gy=0.586         96         10010110           31         1F         Bx=0.158         28         0010100           32         20         By=0.137         23         00100011           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	29	1D	Gx=0.324	53	01010011
31         1F         Bx=0.158         28         00101000           32         20         By=0.137         23         00100011           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	30	1E	Gv=0.586	96	10010110
32         20         By=0.137         23         00100011           33         21         Wx=0.313         50         0101000           34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         0000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         0000001           39         27         Standard timing ID # 1         01         00000001	31	1F	Bx=0.158	28	00101000
33         21         Wx=0.313         50         01010000           34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         0000001           39         27         Standard timing ID # 1         01         00000001	32	20	By=0.137	23	00100011
34         22         Wy=0.329         54         01010100           35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         0000001           39         27         Standard timing ID # 1         01         00000001	33	21	Wx=0.313	50	01010000
35         23         Established timings 1         00         00000000           36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	34	22	Wv=0.329	54	01010100
36         24         Established timings 2         00         00000000           37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	35	23	Established timings 1	00	00000000
37         25         Manufacturer's reserved timings         00         00000000           38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	36	24	Established timings 2	00	00000000
38         26         Standard timing ID # 1         01         00000001           39         27         Standard timing ID # 1         01         00000001	37	25	Manufacturer's reserved timings	00	00000000
39         27         Standard timing ID # 1         01         00000001	38	26	Standard timing ID # 1	01	00000001
	30	27	Standard timing ID # 1	01	00000001
40 28 Standard timing ID # 2 01 0000001	40	28	Standard timing ID # 2	01	00000001
41 29 Standard timing ID # 2 01 0000001	41	29	Standard timing ID # 2	01	00000001

42	2A	Standard timing ID # 3	01	00000001
43	2B	Standard timing ID # 3	01	00000001
44	2C	Standard timing ID # 4	01	00000001
45	2D	Standard timing ID # 4	01	00000001
46	2E	Standard timing ID # 5	01	00000001
47	2F	Standard timing ID # 5	01	00000001
48	30	Standard timing ID # 6	01	00000001
49	31	Standard timing ID # 6	01	00000001
50	32	Standard timing ID # 7	01	00000001
51	33	Standard timing ID # 7	01	00000001
52	34	Standard timing ID # 8	01	00000001
53	35	Standard timing ID # 8	01	00000001
54	36	Detailed timing description # 1 Pixel clock ("76.42MHz")	DA	11011010
55	37	# 1 Pixel clock (hex LSB first)	1D	00011101
56	38	# 1 H active ("1366")	56	01010110
57	39	# 1 H blank ("226")	E2	11100010
58	3A	# 1 H active : H blank	50	01010000
59	3B	# 1 V active ("768")	00	00000000
60	3C	# 1 V blank ("32")	20	00100000
61	3D	# 1 V active : V blank	30	00110000
62	3E	# 1 H sync offset ("68")	44	01000100
63	3F	# 1 H sync pulse width ("45")	2D	00101101
64	40	# 1 V sync offset : V sync pulse width ("4 : 7")	47	01000111
65	41	# 1 H sync offset : H sync pulse width : V sync offset : V sync width	00	00000000
66	42	# 1 H image size ("293 mm")	25	00100101
67	43	# 1 V image size (*164 mm*)	A4	10100100
68	44	#1 H image size : V image size	10	00010000
69	45	# 1 H boarder ("0")	00	00000000
70	46	# 1 V boarder ("0")	00	00000000
71	47	# 1 Non-interlaced, Normal, no stereo, Separate sync, H/V pol Negatives	18	00011000
72	48	Detailed timing description # 2	00	00000000
73	49	# 2 Flag	00	00000000
74	4A	# 2 Reserved	00	00000000
75	4B	# 2 ASCII string Model name	FE	11111110
76	4C	# 2 Flag	00	00000000
77	4D	# 2 Character of Model name ("N")	4E	01001110
78	4E	# 2 Character of Model name ("1")	31	00110001
79	4F	# 2 Character of Model name ("3")	33	00110011
80	50	# 2 Character of Model name ("3")	33	00110011
81	51	# 2 Character of Model name ("B")	42	01000010
82	52	# 2 Character of Model name ("G")	47	01000111
83	53	# 2 Character of Model name ("E")	45	01000101
84	54	# 2 Character of Model name ("-")	2D	00101101
85	55	# 2 Character of Model name ("E")	45	01000101
86	56	# 2 Character of Model name ("A")	41	01000001
87	57	# 2 Character of Model name ("B")	42	01000010
88	58	# 2 New line character indicates end of ASCII string	0A	00001010
				The second s

89	59	# 2 Padding with "Blank" character	20	00100000
90	5A	Detailed timing description # 3	00	00000000
91	5B	# 3 Flag	00	00000000
92	5C	# 3 Reserved	00	00000000
93	5D	# 3 ASCII string Vendor	FE	11111110
94	5E	# 3 Flag	00	00000000
95	5F	# 3 Character of string ("C")	43	01000011
96	60	# 3 Character of string ("M")	4D	01001101
97	61	# 3 Character of string ("N")	4E	01001110
98	62	# 3 New line character indicates end of ASCII string	0A	00001010
99	63	# 3 Padding with "Blank" character	20	00100000
100	64	# 3 Padding with "Blank" character	20	00100000
101	65	# 3 Padding with "Blank" character	20	00100000
102	66	# 3 Padding with "Blank" character	20	00100000
103	67	# 3 Padding with "Blank" character	20	00100000
104	68	# 3 Padding with "Blank" character	20	00100000
105	69	# 3 Padding with "Blank" character	20	00100000
106	6A	# 3 Padding with "Blank" character	20	00100000
107	6B	# 3 Padding with "Blank" character	20	00100000
108	6C	Detailed timing description # 4	00	00000000
109	6D	# 4 Flag	00	00000000
110	6E	# 4 Reserved	00	00000000
111	6F	# 4 ASCII string Model Name	FE	11111110
112	70	# 4 Flag	00	00000000
113	71	# 4 Character of Model name ("N")	4E	01001110
114	72	# 4 Character of Model name ("1")	31	00110001
115	73	# 4 Character of Model name ("3")	33	00110011
116	74	# 4 Character of Model name ("3")	33	00110011
117	75	# 4 Character of Model name ("B")	42	01000010
118	76	# 4 Character of Model name ("G")	47	01000111
119	77	# 4 Character of Model name ("E")	45	01000101
120	78	# 4 Character of Model name ("-")	2D	00101101
121	79	# 4 Character of Model name ("E")	45	01000101
122	7A	# 4 Character of Model name ("A")	41	01000001
123	7B	# 4 Character of Model name ("B")	42	01000010
124	7C	# 4 New line character indicates end of ASCII string	0A	00001010
125	7D	# 4 Padding with "Blank" character	20	00100000
126	7E	Extension flag	00	00000000
127	7F	Checksum	AA	10101010

# TOPWAY

## 9. Touch panel Design Precautions

1. It should prevent front case touching the touch panel Active Area (A.A.) to prevent abnormal touch.

It should left gab (e.g. 0.2~0.3mm) in between.



2. Outer case design should take care about the area outside the A.A. Those areas contain circuit wires which is having different thickness. Touching those areas could deform the ITO film. As a result case the ITO cold be damaged and shorten its lifetime. It is suggested to protect those areas with gasket (between the front case and the touch panel). The suggested figures are B≥0.50mm; C≥0.50mm.



3. The front case side wall should keep space (e.g.  $0.2 \sim 0.3$ mm) from the touch panel.

	Front	Front case		
		Fouch Panel		
$\sim$				
	· · · · · · · · · · · · · · · · · · ·			
	0.20mm~0.30mm			

- 4. I In general design,
  - touch panel V.A. should be bigger than the LCD V.A. and touch panel A.A. should be bigger than the LCD A.A.



## **10. Precautions for Use of LCD Modules**

## Mounting

- Mounting must use holes arranged in four corners or four sides.
- The mounting structure so provide even force on to LCD module. Uneven force (ex. Twisted stress) should not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- It is suggested to attach a transparent protective plate to the surface in order to protect the polarizer. It should have sufficient strength in order to the resist external force.
- The housing should adopt radiation structure to satisfy the temperature specification.
- Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
- Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. Never rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth.(Some cosmetics deteriorate the polarizer.)
- When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzine. Normal-hexane is recommended for cleaning the adhesives used to attach front / rear polarizers. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer.
- Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer

#### Operating

- The spike noise causes the mis-operation of circuits. It should be within the ±200mV level (Over and under shoot voltage)
- Response time depends on the temperature.(In lower temperature, it becomes longer.)
- Brightness depends on the temperature. (In lower temperature, it becomes lower.) And in lower temperature, response time(required time that brightness is stable after turned on) becomes longer.
- Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- When fixed patterns are displayed for a long time, remnant image is likely to occur.
- Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimized the interference

#### **Electrostatic Discharge Control**

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.

#### Strong Light Exposure

Strong light exposure causes degradation of polarizer and color filter.

## Storage

When storing modules as spares for a long time, the following precautions are necessary.

- Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
- The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

#### **Protection Film**

- When the protection film is peeled off, static electricity is generated between the film and polarizer. This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
- The protection film is attached to the polarizer with a small amount of glue. If some stress is applied to rub the protection film against the polarizer during the time you peel off the film, the glue is apt tore main on the polarizer. Please carefully peel off the protection film without rubbing it against the polarizer.
- When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of glue still on the polarizer after the protection film is peeled off.
- You can remove the glue easily. When the glue remains on the polarizer surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.

#### Transportation

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.