User Manual

IDK-1107WR Series

TFT-LCD 7" WSVGA/WVGA (LED Backlight)

ADVANTECH

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A Message to the Customer

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Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

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Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Contents

Chapter 1

General Description and Features

This specification applies to the 7" inch color TFT LCD module IDK-1107WR-40WVA1E/IDK-1107WR-50WSA1E.

IDK-1107WR-40WVA1E/IDK-1107WR-50WSA1E is designed with wide viewing angle; wide operating temperature and long life LED backlights are well suited to display units for Industrial Applications.

LED driving board for backlight unit is included in this panel and the structure of the LED unit is replaceable.

IDK-1107WR-40WVA1E/IDK-1107WR-50WSA1E is built in timing controller and LVDS interface.

The screen format is intended to support the SVGA (800(H) x 480(V)) and WSVGA (1024(H) x 600(V)) screen and 16.2M (RGB8-bits) or 262k colors (RGB 6-bits). IDK-1107WR-40WVA1E/ IDK-1107WR-50WSA1E is a RoHS compliant product.

1.1 Display Characteristics

1.1.1 IDK-1107WR-40WVA1E

The following table items are display characteristics under 25°C conditions.

Items	Unit	Specifications
Screen Diagonal	[inch]	7.0 (177.8mm)
Active Area	[mm]	152.40(H) x 91.44(V)
Pixels H x V		800x3(RGB) x 480
Pixel Pitch	[mm]	0.1905 x 0.1905
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN, Normally White
Nominal Input Voltage VDD	[Volt]	3.3 typ
Typical Power Consumption	[Watt]	3.7 typ.
Weight	[Grams]	305 ± 10
Physical Size	[mm]	170.0(W) x 111.0(H) x 7.5(D) typ.
Electrical Interface		1 channel LVDS
Surface Treatment		Anti-glare, Hardness 3H
Support Color		262K(6-bit) / 16.2M(8-bit)

Temperature Range
    Operating
    Storage (Non-Operating)
	
	[°C]
	[°C]
		
		-5 to +60 (panel surface temperature)
		-30 to +70

RoHS Compliance		RoHS Compliance

1.1.2 IDK-1107WR-50WSA1E

Items	Unit	Specifications
Screen Diagonal	[inch]	7.0 (Diagonal)
Active Area	[mm]	153.60(H) x 90.0(V)
Pixels H x V		1024 x 3(RGB) x 600
Pixel Pitch	[mm]	0.05x 0.15
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN, Normally White
Nominal Input Voltage VDD	[Volt]	3.3 typ
Typical Power Consumption	[Watt]	3.567 typ.

Weight	[Grams]	190 ± 10
Physical Size	[mm]	165.5(W) x 104.44(H) x 8.97(D) typ.
Electrical Interface		1 channel LVDS
Surface Treatment		Anti-glare, Hardness 3H
Support Color		262K(6-bit) / 16.2M(8-bit)
Temperature Range Operating Storage (Non-Operating)	[°C] [°C]	-20 to +70 (panel surface temperature) -30 to +80
RoHS Compliance		RoHS Compliance

1.2 Optical Characteristics

Optical characteristics are measured under stable conditions at 25°C (Room Temperature):

1.2.1 IDK-1107WR-40WVA1E

Item	Unit	Conditions	Min.	Typ.	Max.	Note
White Luminance	[cd/m2]	IF= 80mA (center point)	300	400	-	1
Uniformity	%	5 Points		-	1.3	1,2,3
Contrast Ratio			750	1000	-	4
Response Time	[msec]	Rising	-	20	30	5
	[msec]	Falling	-	10	20	
	[msec]	Rising + Falling	-	30	50	
Viewing Angle	[degree]	Horizontal (Right)	70	80	-	6
	[degree]	CR = 10 (Left)	70	80	-	
	[degree]	Vertical (Upper)	70	80	-	
	[degree]	CR = 10 (Lower)	70	80	-	
Color/Chromaticity Coordinates (CIE 1931)		Red x	0.55	0.60	0.65	1
		Red y	0.30	0.35	0.40	
		Green x	0.27	0.32	0.37	
		Green y	0.55	0.60	0.65	
		Blue x	0.10	0.15	0.20	
		Blue y	0.03	0.08	0.13	
		White x	0.26	0.31	0.36	
		White y	0.28	0.33	0.38	
Contrast Gamut	%			60	-	1

1.2.2 IDK-1107WR-50WSA1E

Item	Unit	Conditions	Min.	Typ.	Max.	Note
White Luminance	[cd/m2]	IF= 120mA (center point)	320	400	-	1
Contrast Ratio			500	700	-	4

Response Time	[msec]	Rising	-	10	20	
	[msec]	Falling	-	15	30	5
	[msec]	Rising + Falling	-	25	50	
Viewing Angle	[degree]	Horizontal (Right)	65	75	-	
	[degree]	CR = 10 (Left)	65	75	-	6
	[degree]	Vertical (Upper)	65	70	-	
	[degree]	CR = 10 (Lower)	65	75	-	
Color/Chromaticity Coordinates (CIE 1931)		White x	0.249	0.299	0.349	1
		White y	0.273	0.323	0.373	
Contrast Gamut	%			60	-	1

Note1 *These items are measured by BM-5A(TOPCON) or CA-1000(MINOLTA) in the dark room (no ambient light) After 5 minutes operation, the optical properties are measured at the center point of the LCD screen.*

Note2 *Definition of Response Time (White-Black)*
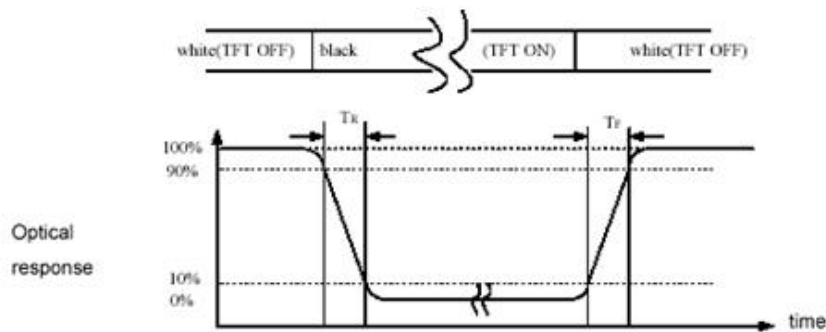
Note3 *Definition of Contrast Ratio*

Contrast ratio is calculated with the following formula :

Contrast Ratio (CR)=(White) Luminance of ON ÷ (Black) Luminance of OFF

Note4 *Definition of Luminance*

Measure the luminance of white state at center point.

Note5 *Definition of Luminance Uniformity*

Measured Maximum luminance [L(MAX)] and Minimum luminance [L(MIN)] on the 9 points

Luminance Uniformity is calculated with the following formula:

ΔL =[L(MIN) / L (MAX)] X 100%

Note6 *Definition of Viewing Angle*

Fig. 1 Definition of viewing angle
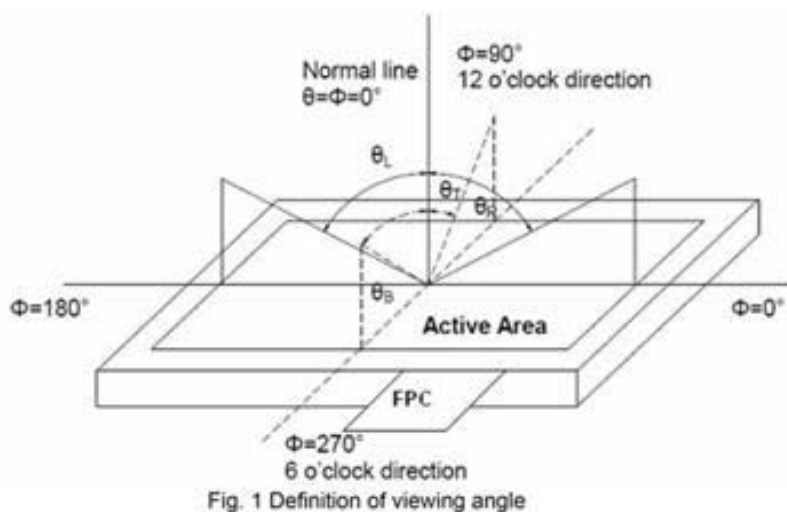
1.3 Functional Block Diagram

The following diagram shows the functional block of the 12.1 inches Color TFT-LCD Module:

1.3.1 IDK-1107WR-40WVA1E
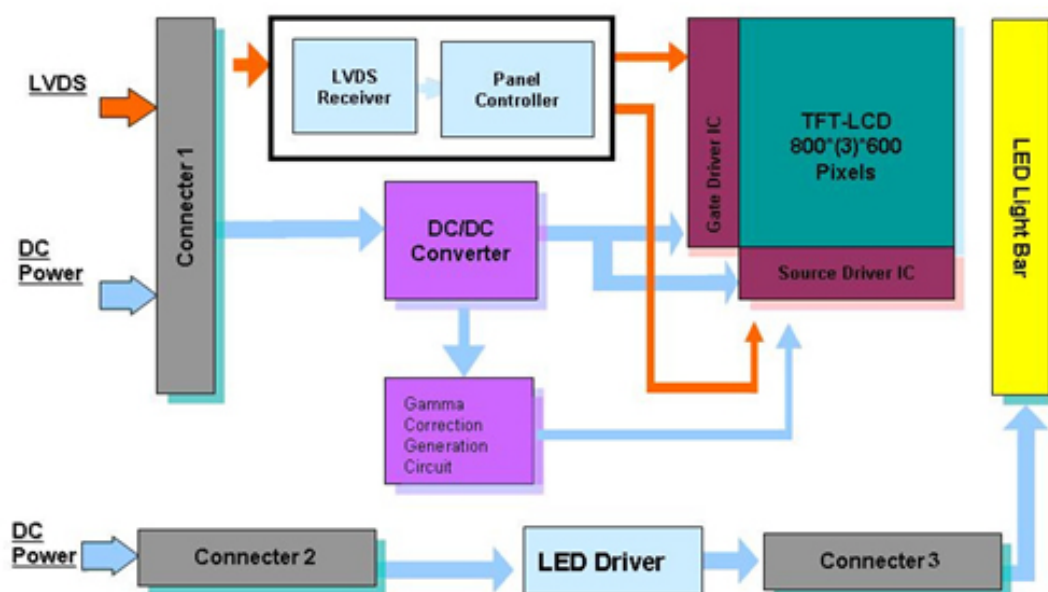
1.3.2 IDK-1107WR-50WSA1E
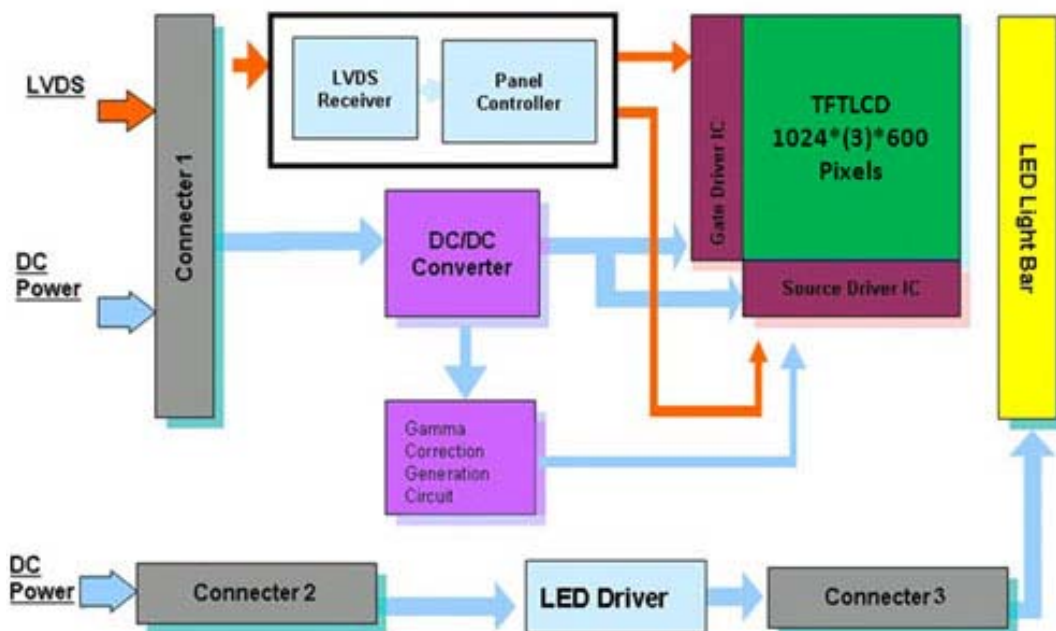
1.4 Absolute Maximum Ratings

1.4.1 Absolute Ratings of TFT LCD Module

1.4.1.1 IDK-1107WR-40WVA1E

Item	Symbol	Min.	Max.	Unit
Logic/LCD Drive	VDD	-0.3	+3.6	[Volt]

1.4.1.2 IDK-1107WR-50WSA1E

Item	Symbol	Min.	Max.	Unit
Logic/LCD Drive	VDD	-0.3	+4.2	[Volt]
LED B/L Drive	VCC	5	+12.0	[Volt]

1.4.2 Absolute Ratings of Environment

1.4.2.1 IDK-1107WR-40WVA1E

Item	Symbol	Min.	Max.	Unit
Operating Temperature	TOP	-10	+60	[oC]
Operation Humidity	HOP	5	90	[%RH]
Storage Temperature	TST	-30	+70	[oC]
Storage Humidity	HST	10	90	[%RH]

Note: *Maximum Wet-Bulb should be 38°C and no condensation.*

1.4.2.2 IDK-1107WR-50WSA1E

Item	Symbol	Min.	Max.	Unit
Operating Temperature	TOP	-20	+70	[oC]
Operation Humidity	HOP	5	90	[%RH]
Storage Temperature	TST	-30	+80	[oC]
Storage Humidity	HST	10	90	[%RH]

Note 1: *Maximum Wet-Bulb should be 25°C and no condensation.*

Note 2: *The module should be inspected after 1 hour storage in normal conditions (15~35°C, 45~65%RH).*

1.5 Outline Dimension

1.5.1 Front view: (For IDK-1107WR-40WVA1E only)

111.00±0.5(LCM Outline)
104.00±0.3(T/S Outline)
91.44±0.2(T/S AA)
(5.55)

170.00±0.5(LCM Outline)
165.00±0.3(T/S Outline)
152.40±0.2(T/S AA)

15.00±0.2
(1.82)
5.00±0.2
70.00±0.5
6.00±0.5
30
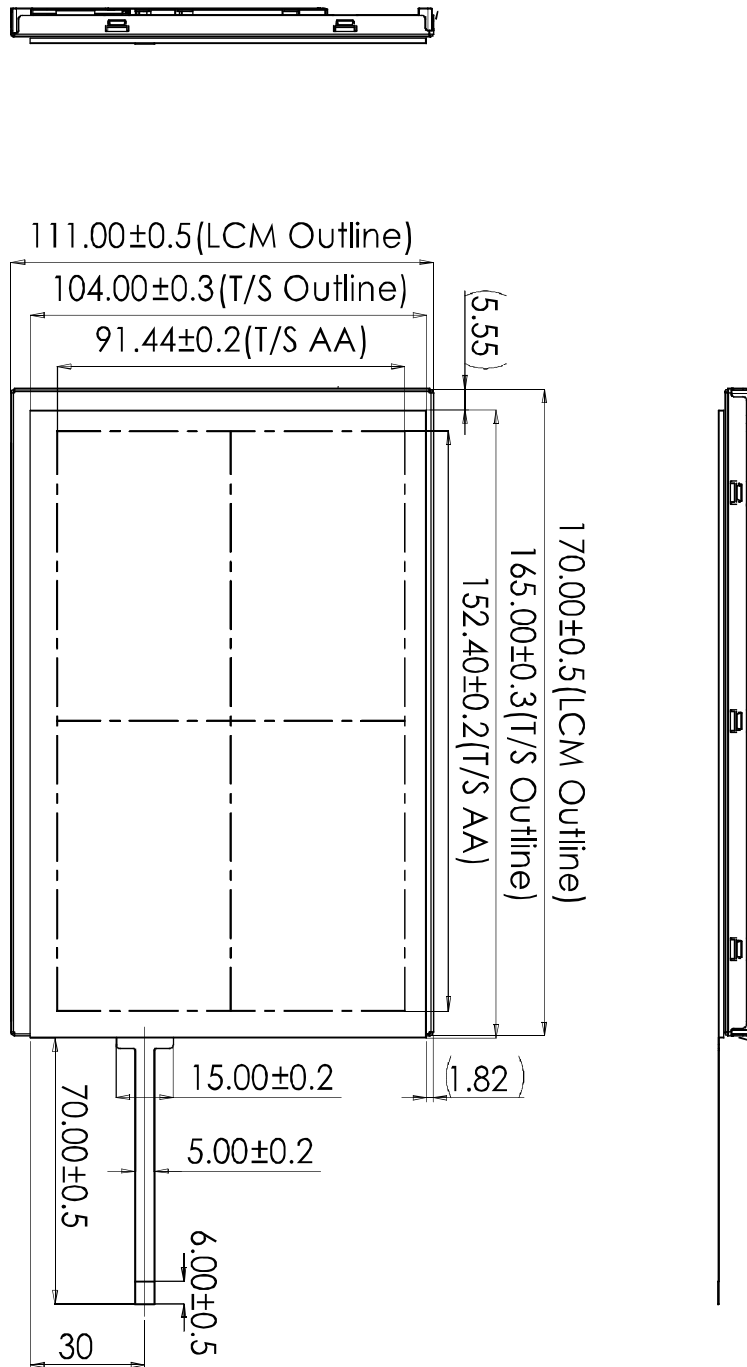
[Unit: mm]

1.5.2 Rear view: (For IDK-1107WR-40WVA1E only)

9.30

40.00±0.5

60.00±0.5
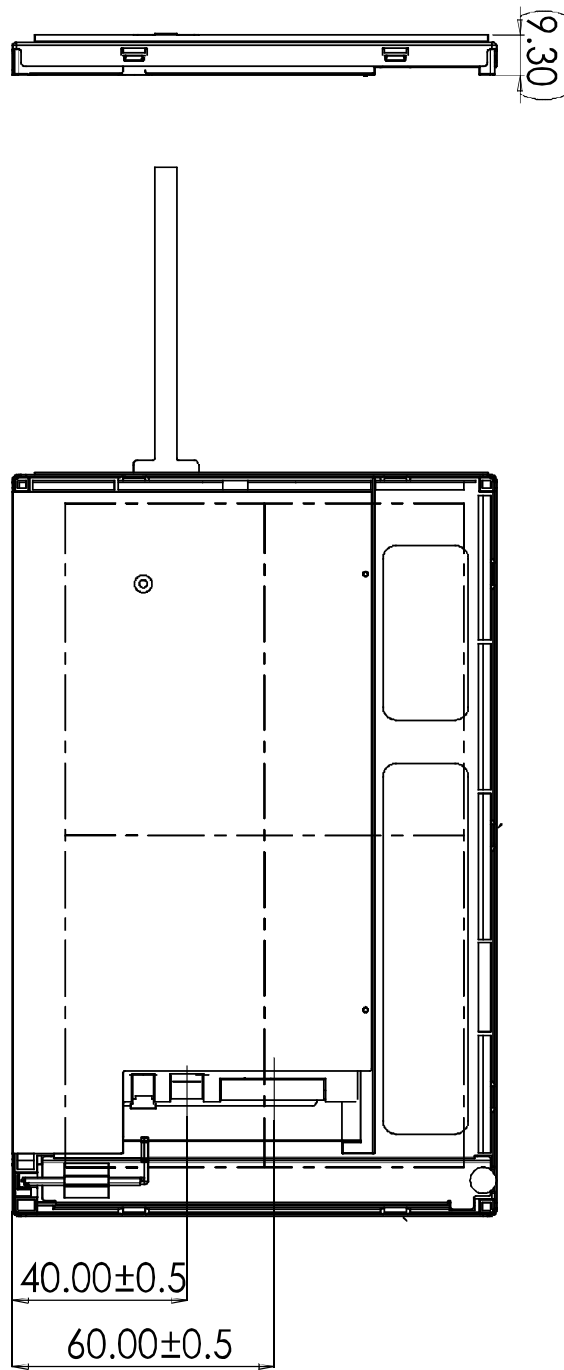
[Unit: mm]

1.5.3 Front view: (For IDK-1107WR-50WSA1E only)
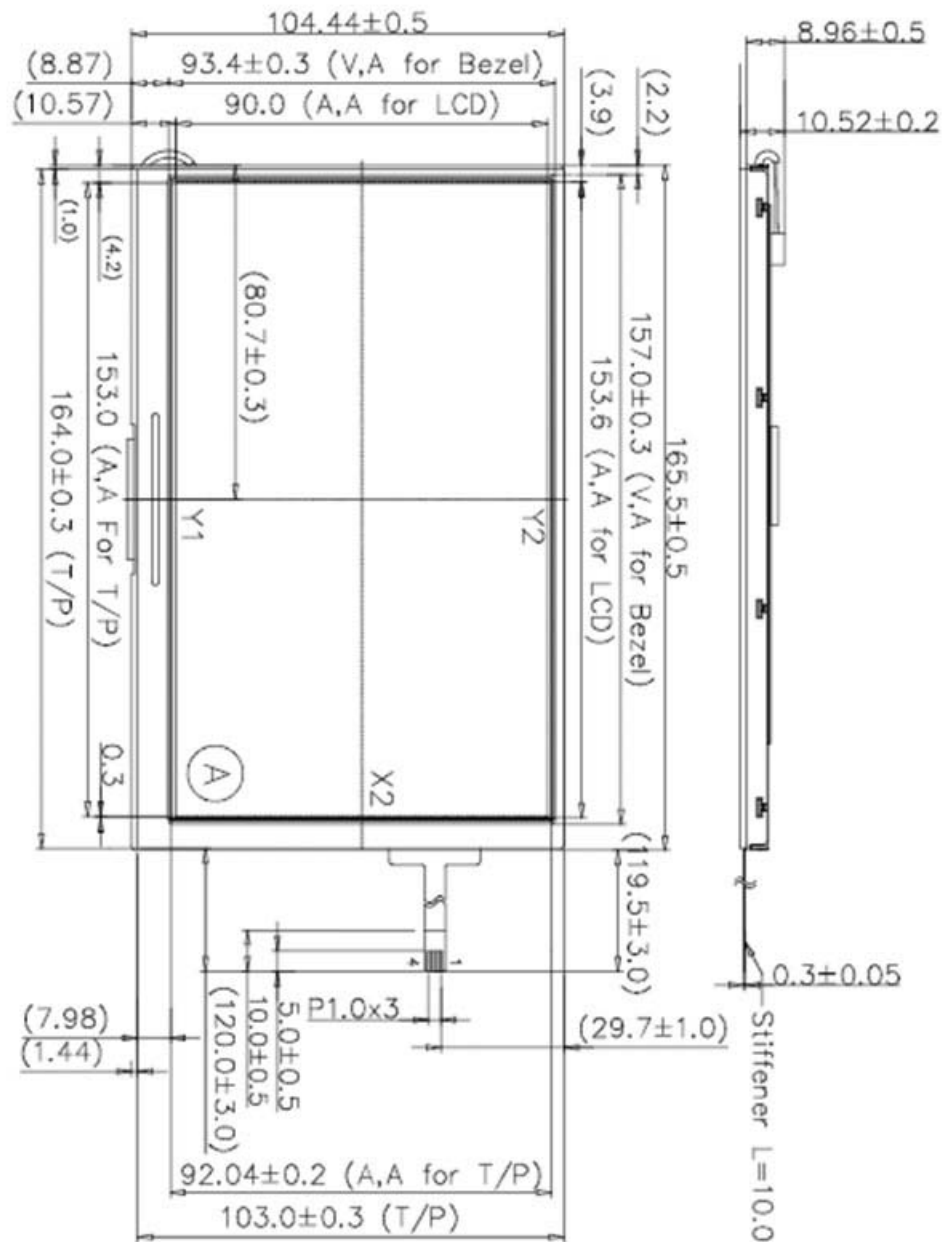
1.5.4 Rear view: (For IDK-1107WR-50WSA1E only)
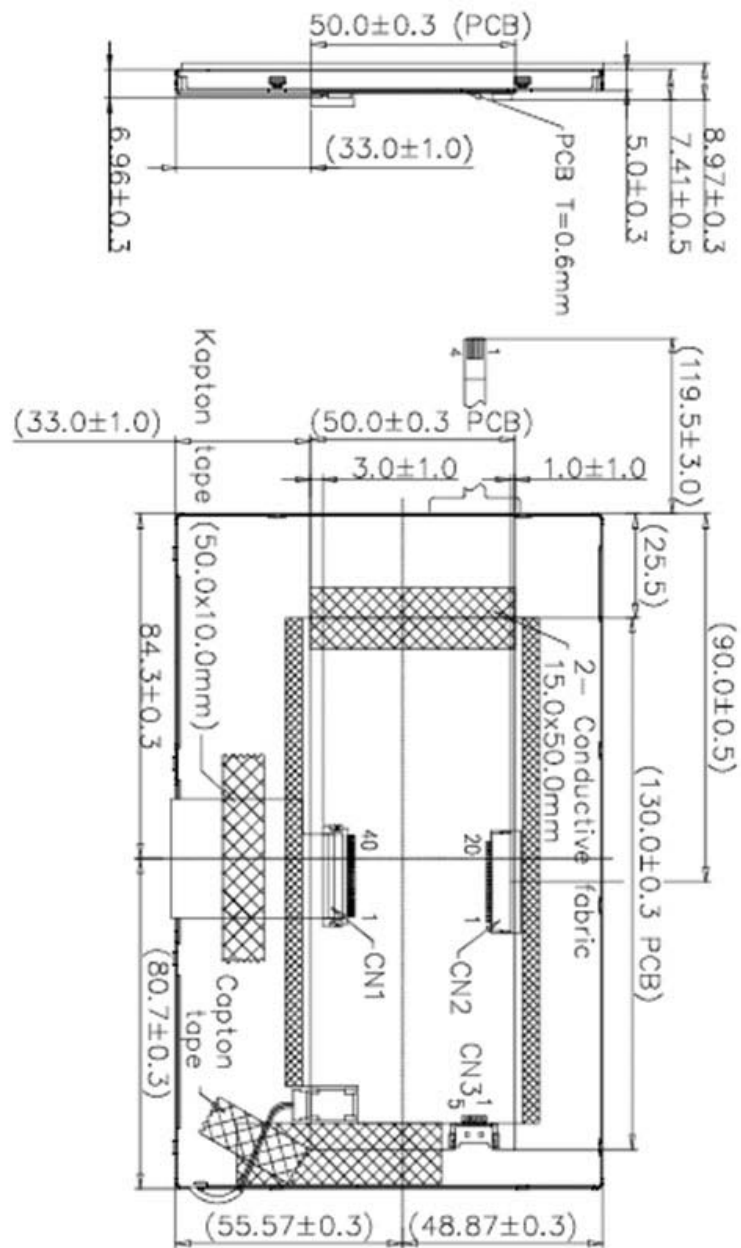
Chapter 2

Electrical Characteristics

2.1 TFT LCD Module

2.1.1 Power Specification (IDK-1107WR-40WVA1E)

Table 2.1: Power Specification						
Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	±10%
IVD	VDD Current	-	240	260	[mA]	64 Gray Bar Pattern (VDD=3.3V, at 60Hz)
PVDD	VDD Power	-	-	3	[Watt]	64 Gray Bar Pattern (VDD=3.3V, at 60Hz)

Note1 *Measurement condition:*

2.1.2 Power Specification (IDK-1107WR-50WVA1E)

Table 2.2: Power Specification						
Item		Symbol	Values			Unit	Remark
			Min.	Typ.	Max.		
Power Voltage		V_{DD}	3.0	3.3	3.6	V	Note 1, 2
Power Consumption		I_{DD}	-	150	-	mA	Note 1,2 VDD=3.3V
Logic Input Voltage	Input Voltage	V_{IN}	0	-	V_{CC}	V	
	Logic input high voltage	V_{TH}	$0.7V_{CC}$	-	V_{CC}	V	Note 3
	Logic input low voltage	V_{TL}	GND	-	$0.3V_{CC}$	V	Note 3

Note 1: *Value for Power Board combined panel.*

Note 2: *VDD setting should match the signals output voltage (refer to Note 3) of customer's system board.*

Note 3: *LVDS.*

VDD rising time

64 Gray pattern
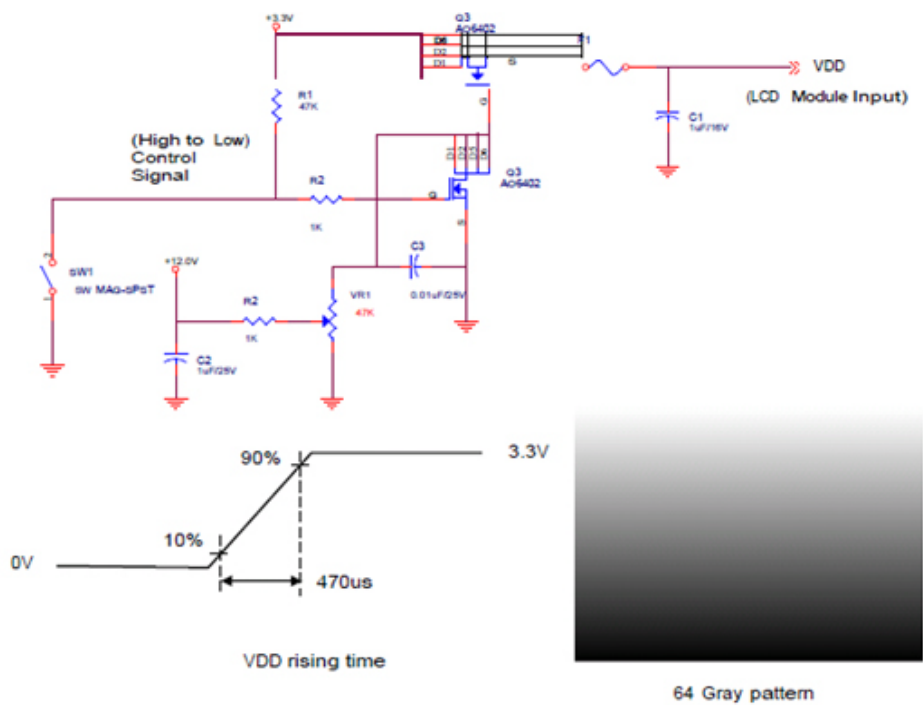
2.1.3 Signal Electrical Characteristics (IDK-1107WR-40WVA1E)

Input signals shall be low or Hi-Z state when VDD is off.

Table 2.3: Signal Electrical Characteristics (IDK-1107WR-40WVA1E)						
Symbol	Item	Min.	Typ.	Max.	Unit	Remark
VTH	Differential Input High Threshold	-	-	100	[mV]	VCM=1.2V
VTL	Differential Input Low Threshold	-100	-	-	[mV]	VCM=1.2V
VID	Input Differential Voltage	100	400	600	[mV]	
VICM	Differential Input Common Mode Voltage	-10	-	+10	[V]	VTH / VTL = ±100mV

Note LVDS Signal Waveform.
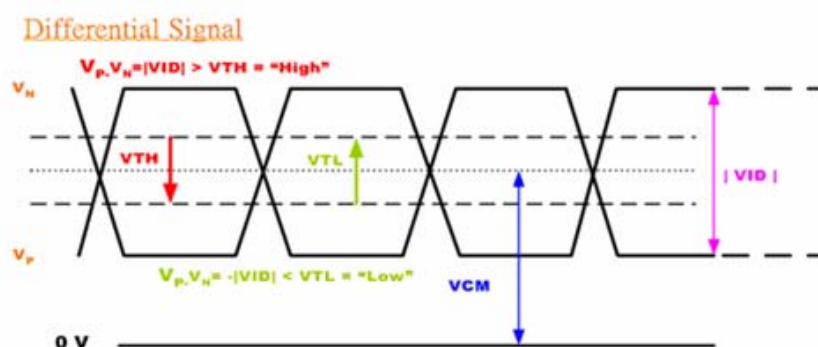
2.1.4 Signal Electrical Characteristics (IDK-1107WR-50WSA1E)

Table 2.4: Signal Electrical Characteristics (IDK-1107WR-50WSA1E)						
Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Differential input high Threshold voltage	RxVTH	-	-	+0.1	V	RXVCM=1.2V
Differential input low Threshold voltage	RxVTH	-0.1	-	-	V	
Input voltage range (singled-end)	RxVIN	0	-	2.4	V	
Differential input common mode voltage	RxVCM	|VID|/2	-	2.4-|VID|/2	V	
Differential voltage	|VID|	0.2	-	0.6	V	
Differential input leakage current	RVxliz	-10	-	+10	uA	

16
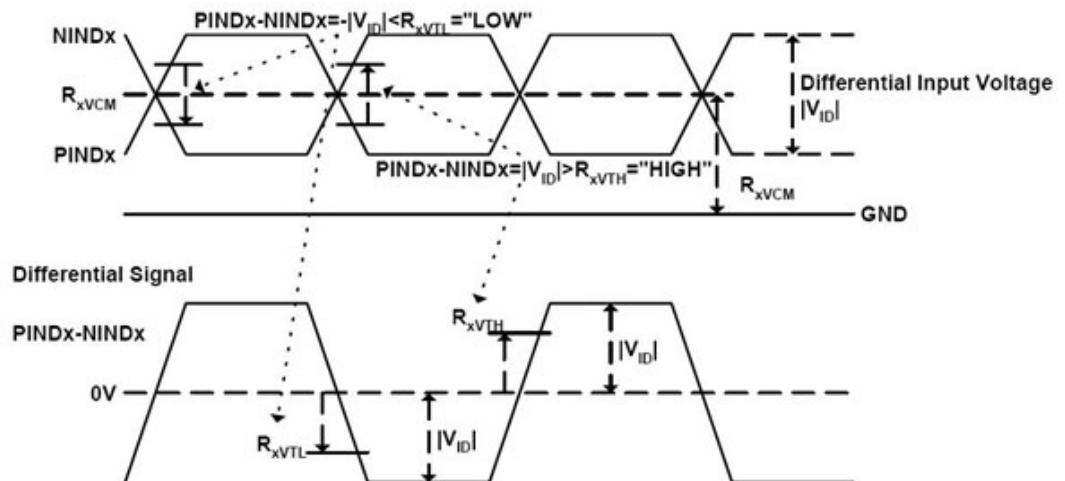
2.2   Backlight Unit

2.2.1   Parameter guideline for LED backlight

Following characteristics are measured under a stable condition using an inverter at 25°C (Room Temperature):

2.2.1.1   For IDK-1107WR-40WVA1E

Table 2.5: For IDK-1107WR-40WVA1E						
Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
VCC	Input Voltage	10.8	12	12.6	[Volt]	
I_{VCC}	Input Current	-	0.24	-	[A]	100% PWM Duty
P_{VCC}	Power Consumption	-	2.88	3.6	[Watt]	100% PWM Duty
F_{PWM}	Dimming Frequency	-	-	3.0	[Hz]	
	Swing Voltage	0.3		5.0	V	
	Dimming Duty Cycle	25		100	%	
I_F	LED Forward Current	-	80	84	mA	Ta = 25°C
V_F	LED Forward Voltage	-	35	-	Volt	I_F = 50mA, Ta = -30°C
			32	36.5	Volt	I_F = 50mA, Ta = 25°C
			30.5	-		I = 50mA, Ta = 85°C
P_{LED}	LED Power Consumption	-	2.56	-	Watt	I_F = 50mA, Ta = 25°C (total power)
	Operation Lifetime	50,000			Hrs	I_F = 50mA, Ta = 25°C

Note1 Ta means ambient temperature of TFT-LCD module.

Note2 VCC, Ivcc, PVCC , are defined for LED B/L.(100% duty of PWM dimming)

Note3 IF, VF are defined for each channel of LED Light Bar. There are two LED channels (AN1-CA1-CA2) in backlight unit.

Note4 If IDK-1107WR-40WVA1E module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note5 Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

2.2.1.2 For IDK-1107WR-50WSA1E

Table 2.6: For IDK-1107WR-50WSA1E

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LED Driver Power Voltage	VCC	5	-	12	V	
LED Driver Current Consumption	ICC	-	850	-	mA	VCC=5V ADJ=3.3V (duty 100%)
		-	350	-	mA	VCC=12V ADJ=3.3V (duty 100%
ADJ (Dimming) Input Voltage	VADJ	3.3	-	5	V	duty=100% Note(3)
LED voltage	VAK	-	25.6	-	V	Note(1)
LED Forward Current	IAK	-	120	-	mA	Ta = 25°C
LED life time	-	-	50.000	-	Hr	Note(2)

Note1 *The constant current source is needed for white LED back-light driving.*
When LCM is operated over 60 deg.C ambient temperature, the IAK of the LED back-light should be adjusted .

Note2 *Brightness to be decreased to 50% of the initial value. Note (3) VLEDADJ is PWM signal input. It is for brightness control.*
There are 3 Groups LED shown as below , VAK =25.6V , IAK =120mA.

Chapter   3

Signal Characteristics

3.1 Signal Description

LVDS is a differential signal technology for LCD interface and high speed data transfer device. The connector pin definition is as below.

Note : "Low" stands for 0V. "High" stands for 3.3V. "NC" stands for "No Connected."

3.1.1 Signal Description (IDK-1107WR-40WVA1E)

Pin No.	Symbol	Description
**Table 3.1: Symbol Description (IDK-1107WR-40WVA1E)**
1	VDD	Power Supply, 3.3V(typical)
2	VDD	Power Supply, 3.3V(typical)
3	UD	Vertical Reverse Scan Control, When UD=High or NC -> Normal Mode. When UD=Low -> Vertical Reverse Scan. Note
4	LR	Horizontal Reverse Scan Control, When LR=High or NC -> Normal Mode. When LR=Low -> Horizontal Reverse Scan. Note
5	RxIN1-	LVDS differential data input Pair 0
6	RxIN1+	
7	GND	Ground
8	RxIN2-	LVDS differential data input Pair 1
9	RxIN2+	
10	GND	Ground
11	RxIN3-	LVDS differential data input Pair 2
12	RxIN3+	
13	GND	Ground
14	RxCLKIN-	LVDS differential Clock input Pair
15	RxCLKIN+	
16	GND	Ground
17	SEL 68	LVDS 6/8 bit select function control, Low or NC -> 6 Bit Input Mode. High -> 8 Bit Input Mode. Note
18	NC	NC
19	RxIN4-	LVDS differential data input Pair 3. Must be set to NC in 6 bit input mode.
20	RxIN4+	

3.1.2 Signal Description (IDK-1107WR-50WSA1E)

CN2 LVDS connector: P1.0 20pin/CP100-S20G-H16

Pin No.	Symbol	I/O	Description	Note
Table 3.2: Symbol Description (IDK-1107WR-50WSA1E)				
1	VDD	P	Power Voltage for Logic: 3.3V	
2	VDD	P	Power Voltage for Logic: 3.3V	
3	GND	P	Ground	
4	GND	P	Ground	
5	IN0-	I	- LVDS differential data input	
6	IN0+	I	+ LVDS differential data input	
7	GND	P	Ground	
8	IN1-	I	- LVDS differential data input	
9	IN1+	I	+ LVDS differential data input	
10	GND	P	Ground	
11	IN2-	I	- LVDS differential data input	
12	IN2+	I	+ LVDS differential data input	
13	GND	P	Ground	
14	CLK-	I	- LVDS differential data input	
15	CLK+	I	+ LVDS differential data input	
16	GND	P	Ground	
17	IN3-	I	- LVDS differential data input	
18	IN3+	I	+ LVDS differential data input	
19	GND	P	Ground	
20	SELB	I	6bit/8bit mode select, "H":6bits, "L":8bits.	

CN3 LED connector: ENTERY 3808K-F05N-03L

Pin No.	Symbol	I/O	Description	Note
1	VCC	P	Power Voltage for Backlight: 12V	
2	GND	P	Power Ground	
3	ON/OFF	I	Backlight ON/OFF, "H" LED ON.	
4	Dimming	I	PWM Adjust the LED brightness	
5	NA	-	No Connection	

Note: Pin4: Dimming is PWM signal input. It is for brightness control.

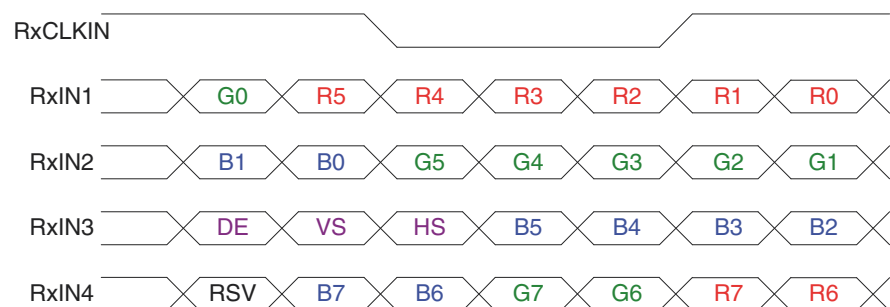| ITEM	SYMBOL	MIN	TYP	MAX	UNIT
ADJ (Dimming) signal frequency	fPWM	5	--	100	KHz
ADJ signal logic level High	VIH	2.4V	3.3	5.5	V
ADJ signal logic level Low	VIL	0	--	0.8	V
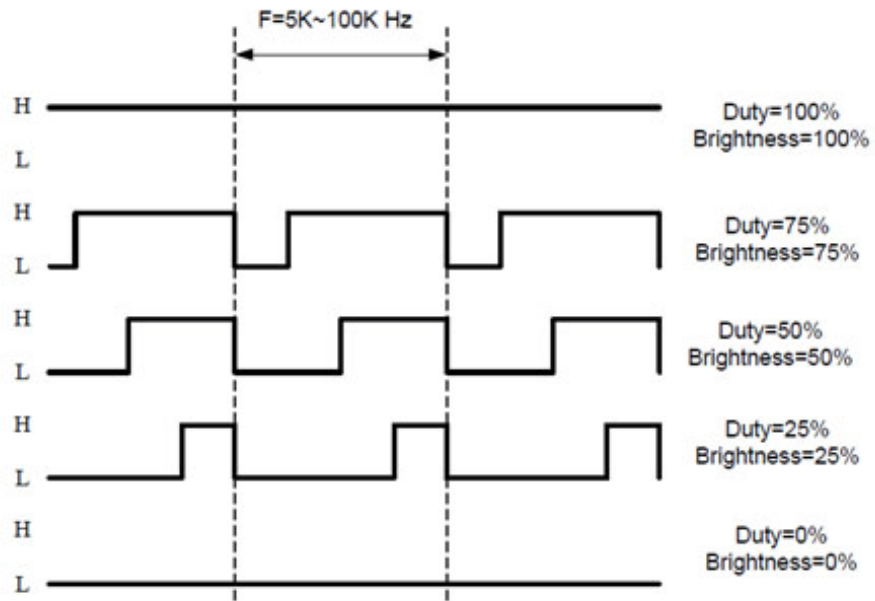
3.2 The Input Data Format

3.2.1 SEL68 (IDK-1107WR-40WVA1E)

SEL68 = "Low" or "NC" for 6 bits LVDS Input
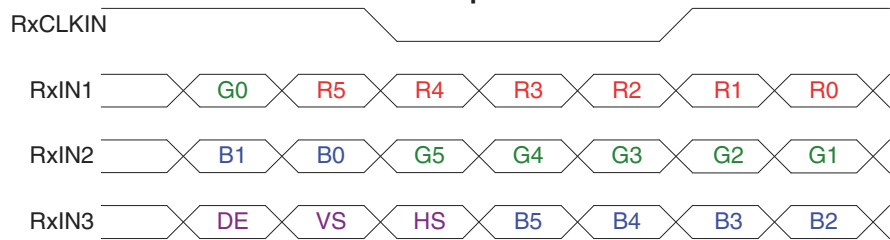
SEL68 = "High" for 8 bits LVDS Input

Note1: *Please follow PSWG.*
Note2: *R/G/B data 7:MSB, R/G/B data 0:LSB*

Signal Name	Description	Remark
R7	Red Data 7 (MSB)	Red-pixel Data Each red pixel's brightness data consists of these 8 bits pixel data.
R6	Red Data 6	
R5	Red Data 5	
R4	Red Data 4	
R3	Red Data 3	
R2	Red Data 2	
R1	Red Data 1	
R0	Red Data 0 (LSB)	
G7	Green Data 7 (MSB)	Green-pixel Data Each green pixel's brightness data consists of these 8 bits pixel data.
G6	Green Data 6	
G5	Green Data 5	
G4	Green Data 4	
G3	Green Data 3	
G2	Green Data 2	
G1	Green Data 1	
G0	Green Data 0 (LSB)	
B7	Blue Data 7 (MSB)	Blue-pixel Data Each blue pixel's brightness data consists of these 8 bits pixel data.
B6	Blue Data 6	
B5	Blue Data 5	
B4	Blue Data 4	
B3	Blue Data 3	
B2	Blue Data 2	
B1	Blue Data 1	
B0	Blue Data 0 (LSB)	
RxCLKIN+ RxCLKIN-	LVDS Clock Input	
DE	Display Enable	
VS	Vertical Sync	
HS	Horizontal Sync	

Note: Output signals from any system shall be low or Hi-Z state when VDD is off.

3.3 Interface Timing

3.3.1 Timing Characteristics

DE mode only (IDK-1107WR-40WVA1E)

Table 3.3: Timing Characteristics (IDK-1107WR-40WVA1E)							
Parameter		**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Condition**
Clock frequency		$1/T_{Clock}$	27	33.3	39.4	MHz	
Vertical Section	Period	T_V	490	508	530	T_H	
	Active	T_{VD}	480	480	600		
	Blanking	T_{VB}	8	28	50		
Horizontal Section	Period	T_H	920	1056	1240	T_{Clock}	
	Active	T_{HD}	800	800	800		
	Blanking	T_{HB}	120	256	440		

Note1: Frame rate is 60 Hz.
Note2: DE mode.

DE mode only (IDK-1107WR-50WSA1E)
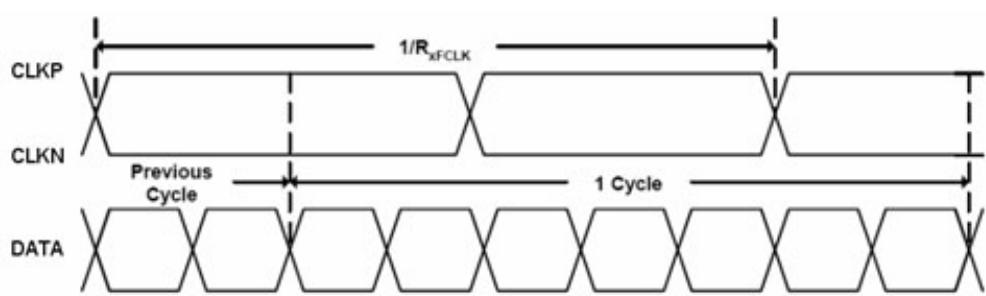
Table 3.4: Timing Characteristics (IDK-1107WR-50WSA1E)						
Parameter	**Symbol**	**Values**			**Unit**	**Remark**
		Min.	**Typ.**	**Max.**		
Clock frequency	T_{xFCLK}	40.8	51	71		
Input data skew margin	T_{RSKM}	500	-	-		
Clock high time	T_{LVCH}	-	$4/(7* R_{xFCLK})$	-		
Clock low time	T_{LVCL}	-	$3/(7* RxT_{xFCLK})$	-		

Parameter	**Symbol**	**Values**			**Unit**	**Remark**
		Min.	**Typ.**	**Max.**		
Clock frequency	fclk	40.8	51.2	67.2	MHz	Frame rate=60Hz
Horizontal display area	thd	1024	1024	1024	DCLK	
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb	90	320	376	DCLK	
Vertical display area	tvd	600	600	600	H	
VS period time	tv	610	635	800	H	
VS Blanking	thb	10	35	200	H	

3.3.2 Input Timing Diagram (IDK-1107WR-40WVA1E)
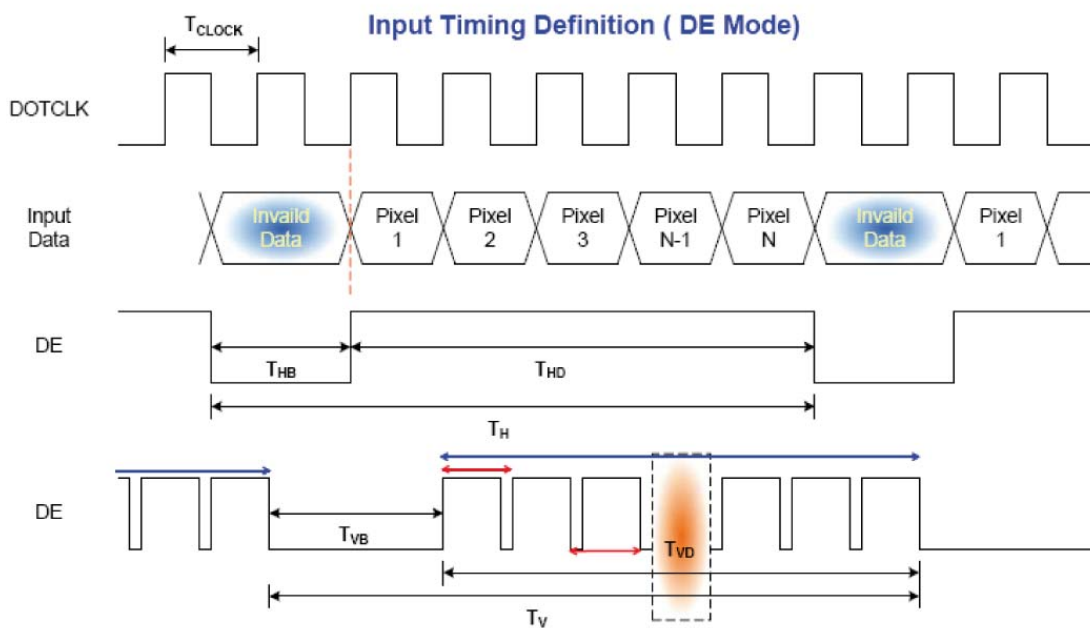
3.3.3 Input Timing Diagram (IDK-1107WR-50WSA1E)

T_{RSKM}: Receiver strobe margin
R_{SPOS}: Receiver strobe position
T_{SW} : Strobe width (Internal data sampling window)
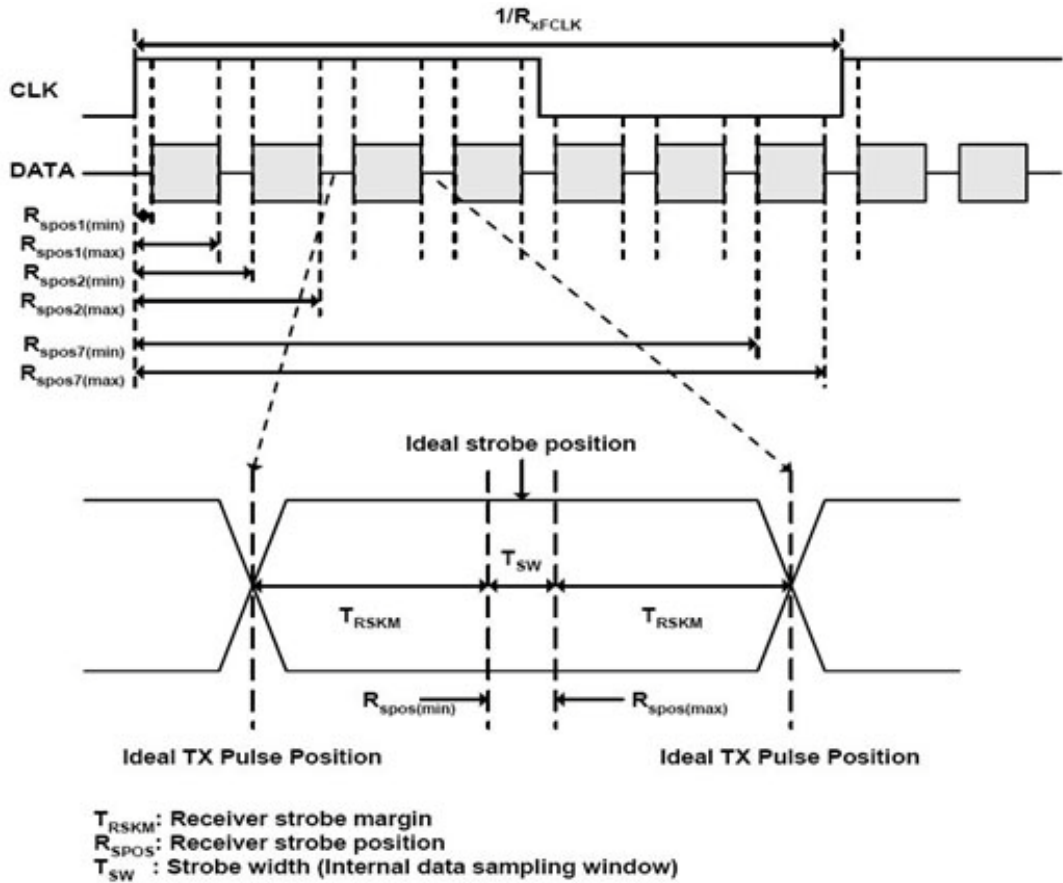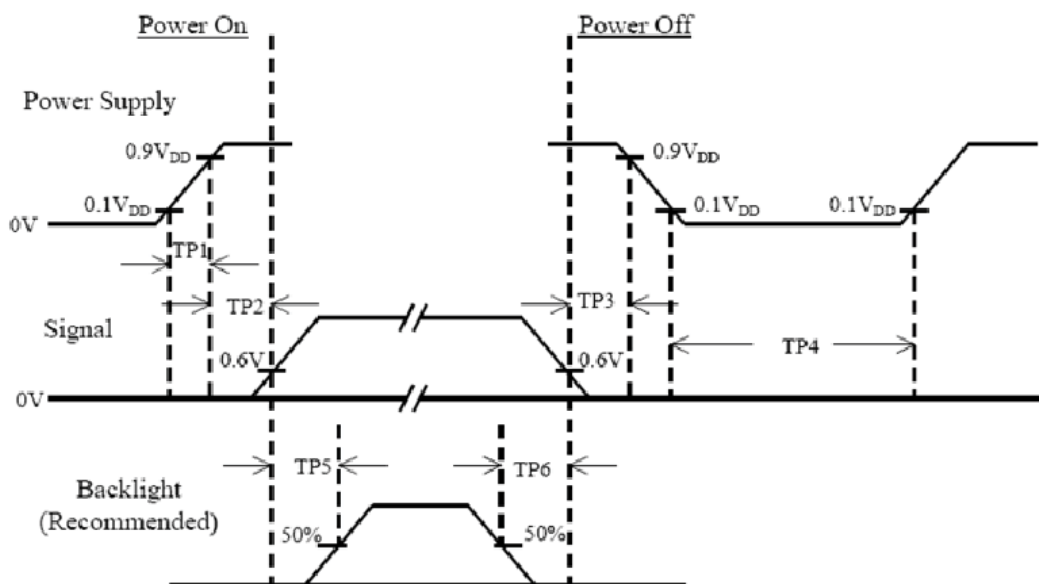
3.4 Power ON/OFF Sequence

VDD power and lamp on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.
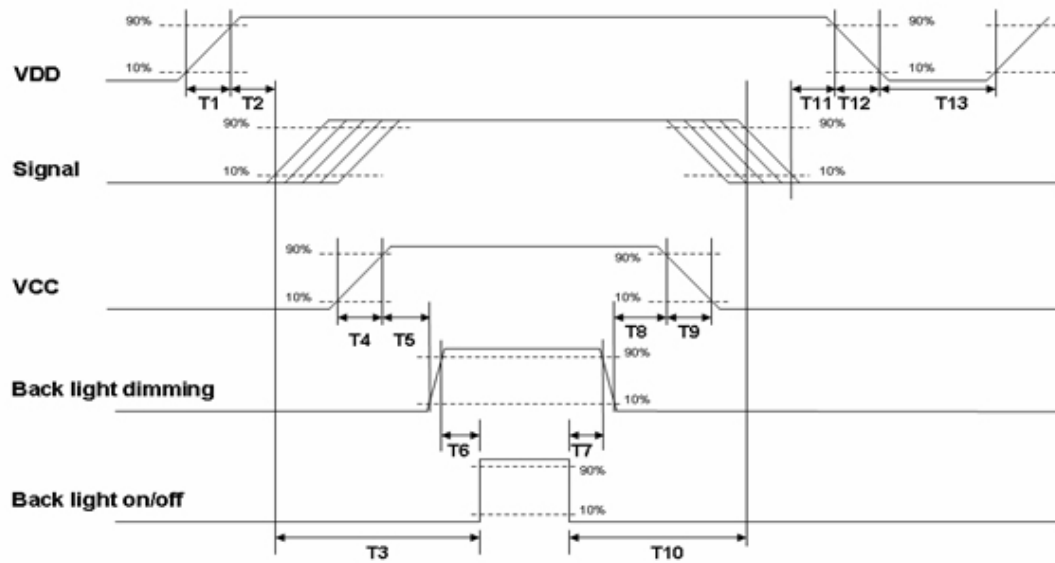
Power ON/OFF Sequence Timing (For IDK-1107WR-40WVA1E only)

Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	0.5	-	10	[ms]
T2	0	40	50	[ms]
T3	200	-	-	[ms]
T4	200	-	-	[ms]
T5	0	16	50	[ms]
T6	0	-	10	[ms]
T7	1000	-	-	[ms]
T8	10	-	-	[ms]
T9	10	-	-	[ms]

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

Power ON/OFF sequence timing (For IDK-1107WR-50WSA1E only)

Item	Min.	Typ.	Max.	Unit
T1	0.5	-	10	[ms]
T2	0	-	50	[ms]
T3	0	-	50	[ms]
T4	500	-	-	[ms]
T5	200	-	-	[ms]
T6	200	-	-	[ms]

Note 1: *The supply voltage of the external system for the module input should be the same as the definition of VDD*

Note 2: *Apply the lamp voltage within the LCD operation range. When the back-light turns on before the LCD operation or the LCD turns off before the back-light turns off, the display may momentarily become white.*

Note 3: *In case of VDD = off level, please keep the level of input signal on the low or keep a high impedance.*

Note4: *TP4 should be measured after the module has been fully discharged between power off and on period.*

Note 5: *Interface signal shall not be kept at high impedance when the power is on.*

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

Chapter 4

Display Connector Definition (For IDK-1107WR-40WVA1E Only)

4.1 TFT LCD Signal (CN1): LVDS Connector

Table 4.1: TFT LCD Signal (CN1): LVDS Connector	
Connector Name / Description	Signal Connector
Manufacturer	STM, Hirose or compatible
Connector Model Number	STM -MSB24013P20HA, Hirose- DF19LA-20P-1H or compatible
Mating Model Number	STM-P24013P20, Hirose-DF19-20S-1C or compatible

Table 4.2: Pin Assignment			
Pin No.	Signal Name	Pin No.	Signal Name
1	VDD	2	VDD
3	UD	4	LR
5	RxIN1	6	RxIN1
7	GND	8	RxIN2
9	RxIN2	10	GND
11	RxIN3	12	RxIN3
13	GND	14	RxCKIN
15	RxCKIN+	16	GND
17	SEL	18	NC
19	RxIN4	20	RxIN4

4.2 LED Backlight Unit (CN2): LED Driver Connector

Connector Name / Designation	LED Connector
Manufacturer	ENTERY
Connector Model Number	ENTERY 3808K-F04N-02R or compatible
Mating Model Number	ENTERY H208K-P04N-02B or compatible.

Pin #	Symbol	Pin Description
1	GND	GND
2	Display ON/OFF	+3.3V:ON, 0V:OFF
3	Dimming	Analog Dimming
4	VCC12V	12V Power Input

4.3 LED Light Bar Input Connector (CN4)

Table 4.3: LED Light Bar Input Connector (CN4)	
Connector Name / Description	**Signal Connector**
Manufacturer	H208K-P02N-02B or compatible
Mating Connector Model Number	3808K-F02N-02R or compatible

Pin #	Symbol	Pin Description
1	AN1	LED anode
2	CA1	LED cathode

Pin #	Symbol	Cable Color
1	AN1	Red
2	CA1	Black

Chapter 5

Touch Screen

5.1 Touch Characteristics

This touch panel is a resistance type that customers use with flat displays like LCDs. Once an operator touches it, the circuit sends coordinate points to the PC from the voltage at contact points.

5.2 Optical Characteristics (For IDK-1107WR-40WVA1E only)

	Item	Specification	Remarks
1	TRANSPARENCY	82.5% Typ. (Active area) (Inside of guaranteed active area)	JIS K-7105
2	HAZE	5.0% Typ. (Anti-glare)	JIS K-7105

5.3 Environmental Characteristics (For IDK-1107WR-40WVA1E only)

	Item	Specification	Remarks
1	Operation temperature	-5°C ~ 60°C	
2	Storage temperature	-30°C ~ 70°C	Max. wet Temp is 38°C(No dew)
3	Operation Humidity	20% ~ 90%RH	
4	Storage temperature	10% ~ 90%RH	

5.4 Mechanical Characteristics (For IDK-1107WR-40WVA1E only)

	Item	Specification		Remarks
1	Hardness of surface	Pencil hardness 3H.		JIS K-5600-5-4 150gf, 45 degree
2	FPC peeling strength	1) 5N (5N Min.)		1) Peeling upward by 90°
3	Operation force	Pen	Max: 80gf	Dot-Spacer Within "guaranteed active area", but not on the age and Dot-Spacer.
		Finger		

5.5 Electronic Characteristics

5.5.1 For IDK-1107WR-40WVA1E

	Item	Specification	Remarks
1	Rated Voltage	DC 7V max.	
2	Resistance	X axis: 200Ω ~ 600Ω(Glass side)	FPC connector
		Y axis: 400Ω ~ 1100Ω(Film side)	
3	Linearity	±1.5%max initial value ±2.0%max "after environmental & life test"	Reference: 250gf
4	Chattering	10ms Max At connector pin	
5	Insulation Resistance	20MΩ min(DC 25V) 10MΩ min(DC 25V)	

5.5.2 For IDK-1107WR-50WSA1E

	Item	Specification	Remarks
1	Rated Voltage	DC 7V max.	
2	Resistance	X axis: 250Ω ~ 1200Ω(Glass side)	FPC At connector
		Y axis: 100Ω ~ 600Ω(Film side)	
3	Chattering	10ms Max At connector pin	
4	Insulation Resistance	25MΩ min(DC 25V)	

Chapter   6

Touch Controller

6.1 Touch Controller Characteristics

Advantech ETM-RES05C touch control board is the ultimate combo board. This touch panel controller provides optimum performance of your analog resistive touch panels for 4-wire models. It communicates with PC system directly through USB and RS-232 connector. You can see how superior the design is in sensitivity accuracy and friendly operation. The touch panel driver emulates mouse left and right button functions.

6.2 Specifications

Electrical Features

- +5 Vdc/ 100 mA typical, 50mV peak to peak maximum ripple and noise.
- Bi-directional RS-232 serial communication and USB 1.1 full speed
- Report rate of RS-232 is 180 points/sec (max.). And, USB is 200 points/sec (max.)
- Unaffected by environmental EMI
- Panel resistance of 4-wire resistive model is from 50 to 200 ohm (Pin to pin on same layer)
- Touch resistance under 3K ohm

Serial Interface

- EIA 232E (Serial RS-232)
- No parity, 8 data bits, 1 stop bit, 9600 baud (N, 8, 1, 9600)
- Support Windows 2000/ Vista/ XP/ 7, Windows CE 5.0/ 6.0/ 7.0, Windows NT4, Linux, DOS, QNX

USB Interface

- Conforms to USB Revision 1.1 full speed.
- If the USB is connected to the controller, the controller will communicate over the USB, and will not communicate over the serial port.
- Supports Windows 2000/ Vista/ XP/ 7, Windows CE 5.0/ 6.0/ 7.0, Linux, QNX

Touch Resolution

- 2,048 x 2,048 resolution

Response Time

- Max. 20 ms

6.3 Environmental Features

Reliability

- MTBF is 200,000 hours

Temperature Ranges

- Operating : -25°C ~ 85°C
- Storage: -25°C ~ 85°C

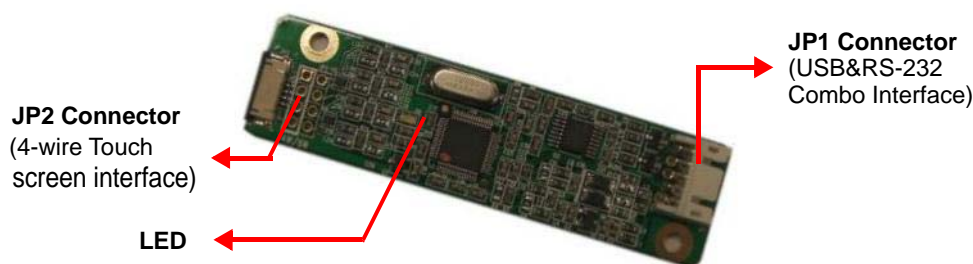**Relative Humidity**

■   95% at 60°C, RH Non-condensing

Acquired RoHS certificate
Requlatory FCC-B, CE approvals
Dimension: 75 mm x 20 mm x 10 mm

6.4   Pin Assignment and Description

6.4.1 Connector and LED Location

6.4.2 Combo Interface Connector, JP1, Pins and Signal Descriptions

The combo interface connector: USB and RS-232, is a 2.0mm 10-pin 90° degree male type with lock connector, intended to be used with single wired pins in a 5+5 pin header. The pins are numbered as shown in the table below.

USB Pin#	Signal Name	Signal Function	RS-232 Pin#	Signal Name	Signal Function
1	G	Ground	1	G	Ground
2	V	USB Power	2	V	Power
3	G	Ground	3	G	Ground
4	D+	USB D+	4	TxD	Serial Port
5	D-	USB D-	5	RxD	Serial Port

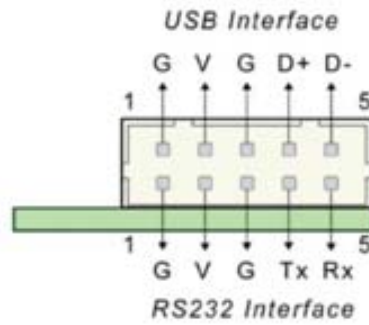| Signal Name	DB-9 pin #	RS-232 pin #	Sourced by	Signal Description
RxD	2	5	ctlr	serial data from controller to host
TxD	3	4	host	serial data from host to controller

Figure 6.1 Board mounted header

6.4.3 Touch Screen Connector, JP2, Pins and Signal Descriptions

The Touch Screen connector, JP2, is a FFC/FPC SMD 1.0mm 4-pin 90° degree, female type connector. The pins are numbered as shown in the table below.

TS4 Pin #	Signal Name	Signal Description
1	YB	Bottom
2	XL	Left
3	YT	Top
4	XR	Right
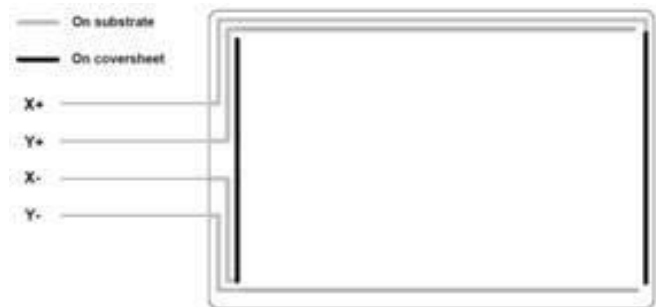
4-Wire Touch Screen ZIF connector   4-Wire Screen viewed from cover sheet side
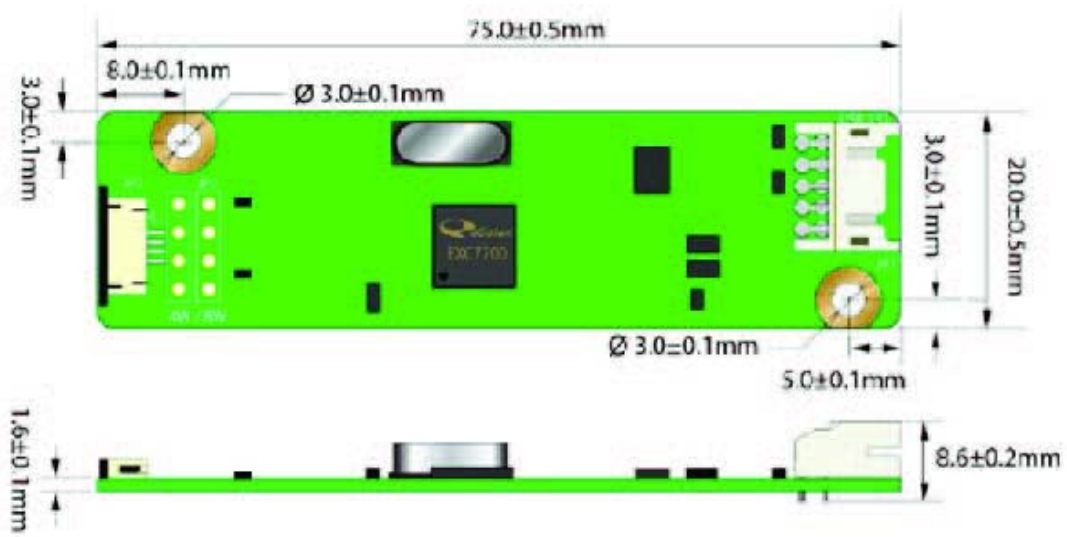
6.4.4 Physical Dimension

Figure 6.2 Physical Dimension

Appendix A

Handling Precautions

A.1 Handling Precautions

The optical characteristics are measured under stable conditions at 25°C (Room Temperature)

1. Since front polarizer is easily damaged, pay attention not to scratch it.
2. Be sure to turn off power supply when inserting or disconnecting from input connector.
3. Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
4. When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
5. Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
6. Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
7. Do not open or modify the Module Assembly.
8. Do not press the reflector sheet at the back of the module to any directions.
9. In case if a Module has to be put back into the packing container slot after once it was taken out from the container, please press at the far ends of the LED light bar reflector edge softly. Otherwise the TFT Module may be damaged.
10. At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
11. After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
12. Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.

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