

EVERVISION	MODEL NO.		PAGE
	VGG107607-D	SPEC SAMPLE	5

4. Application

This specification is applied to the 15.0 inch XGA supported TFT-LCD module, and can display true 16.7M colors(8 bit/ color). This module is composed of a 15.0" TFT-LCD panel, a driver circuit and backlight unit.

5. Features

- XGA (1024×768 pixels) resolution.
- eDP Interface

6. General Specifications

Item	Specifications	Unit
Screen Size	15.0 (Diagonal)	inch
Display Format	1024RGB(H)×768(V)	dot
Active Area	304.1(H)×228.1(V)	mm
PIXEL Pitch	0.297(H)×0.297(V)	mm
Pixel Configuration	RGB Vertical Stripe	-
Display Mode	VA Type / Transmissive Mode / Normally Black	-
Surface Treatment	Hard Coating (3H), Anti-Glare	-
Viewing Direction	Full view angle	-
Outline Dimension	326.5(W)×253.5(H)×15.9(D)	mm
Weight	(982.2)	g
RoHS Compliance	RoHS Compliance	-

EVERVISION	MODEL NO.		PAGE
	VGG107607-D	SPEC SAMPLE	6

7. Absolute Maximum Ratings

7.1 Absolute Ratings of Environment

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-30	+80	°C	(1)(2)
Operating Temperature	T _{OP}	-30	+80	°C	(1)(2)

Note1: Background color changes slightly depending on ambient temperature.

This phenomenon is reversible.

Note2: Please refer to item of RELIABILITY.

7.2 Electrical Absolute Ratings

7.2.1 TFT-LCD Module

(Ta=25±2°C, GND=V_{SS}=0V)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Digital Power Supply Voltage	VCC	-0.5	5.0	V	-

7.2.2 BACKLIGHT UNIT

(Ta=25±2°C)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Converter Voltage	V _i	-0.3	18	V	(1), (2)
Enable Voltage	EN	---	5.5	V	
Backlight Adjust	Dimming	---	5.5	V	

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for LED (Refer to 8.2 for further information).

	MODEL NO.		PAGE
	VGG107607-D	SPEC SAMPLE	7

8. Electrical Characteristics

8.1 TFT-LCD Module

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	VCC	3.1	3.3	3.5	V	-
Power Supply Current	ICC	-	770	1078	mA	(1)
Power Consumption	P _L	-	2541	3557	mW	(1)
VSYNC Frequency	F _V	-	60	-	Hz	-

Note (1) The specified power consumption is under the conditions at VCC=3.3V,
F_V=60Hz, whereas a power dissipation check pattern below is displayed.

White Pattern / 255 Gray



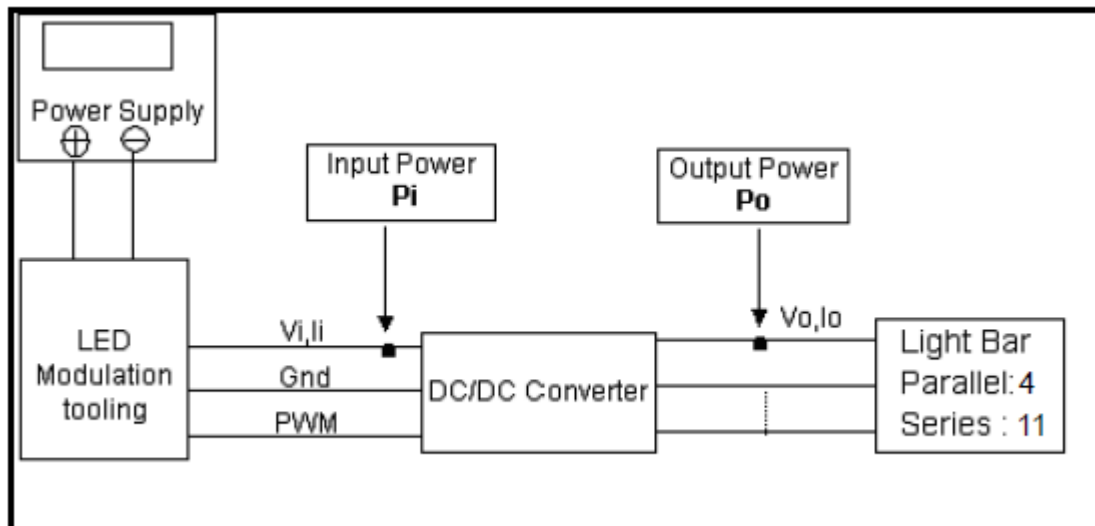
Active Area

8.2 Backlight Unit

(Ta=25±2°C)

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Converter Input Voltage		V_i	10.8	12.0	13.2	V _{DC}	(Duty 100%)
Converter Input Ripple Voltage		V_{iRP}	-	-	500	mV	
Converter Input Current		I_i	0.5	0.65	0.8	A _{DC}	@ $V_i = 12V$ (Duty 100%)
Converter Inrush Current		I_{iRUSH}	-	-	5.0	A	@ V_i rising time=10ms ($V_i=12V$)
Input Power Consumption		P_i	-	7.8	9.6	W	(1)
EN Control Level	Backlight on	ENLED (BLON)	2.0	3.3	5.0	V	
	Backlight off		0	-	0.15	V	
PWM Control Level	PWM High Level	Dimming (E_PWM)	2.0	-	5.0	V	
	PWM Low Level		0	-	0.15	V	
PWN Noise Range		V_{Noise}	-	-	0.1	V	
PWM Control Frequency		f_{PWM}	190	200	20k	Hz	(2)
PWM Dimming Control Duty Ratio		-	5	-	100	%	(2), @ 190Hz< f_{PWM} <1kHz
			20	-	100	%	(2), @ 1kHz≤ f_{PWM} <20kHz
LED Life Time		L_{LED}	50,000	70,000	-	Hrs	(3)

Note (1) LED current is measured by utilizing a high frequency current meter as shown below:



Note (2) At 190 ~1kHz PWM control frequency, duty ratio range is restricted from 5% to 100%.

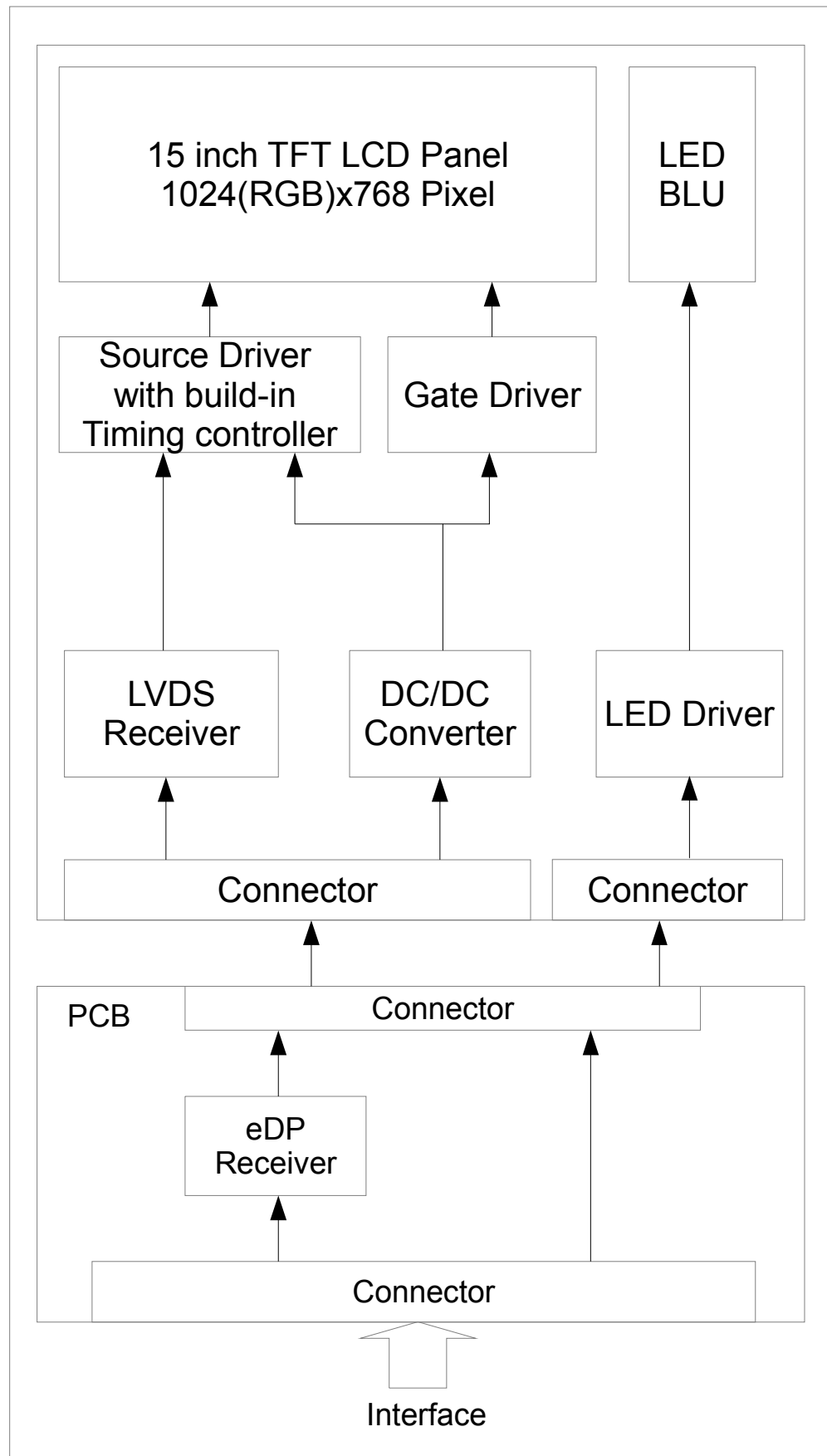
1K ~20kHz PWM control frequency, duty ratio range is restricted from 20% to 100%.

If PWM control frequency is applied in the range from 1KHz to 20KHz, The “non-linear” phenomenon on the Backlight Unit may be found. So It’s a suggestion that PWM control frequency should be less than 1KHz.

Note (3) The lifetime of LED is estimated data and defined as the time when it continues to operate under the conditions at Ta = 25 ±2 °C and Duty 100% until the brightness becomes ≤ 50% of its original value. Operating LED at high temperature condition will reduce life time and lead to color shift.

9. Block Diagram

9.1 TFT-LCD Module with Backlight Unit



10. Input / Output Terminals Pin Assignment

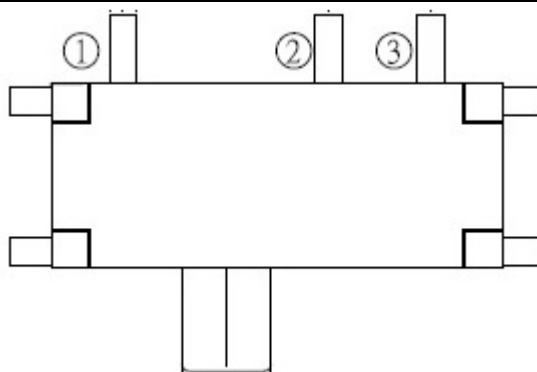
10.1 TFT-LCD Module

Connector: J2, IPEX 20455-030E-99 or equivalent

No.	Symbol	I/O	Description
1	N.C.	-	Not Connection
2	GND	I	Ground
3	DP1-	I	Main Link Lane 1- Input
4	DP1+	I	Main Link Lane 1+ Input
5	GND	I	Ground
6	DP0-	I	Main Link Lane 0- Input
7	DP0+	I	Main Link Lane 0+ Input
8	GND	I	Ground
9	AUX+	I/O	AUX Channel Differential Input/Output
10	AUX-	I/O	AUX Channel Differential Input/Output
11	GND	I	Ground
12	VCC	I	Power supply
13	VCC	I	Power supply
14	N.C.	-	Not Connection
15	GND	I	Ground
16	GND	I	Ground
17	HPD	O	Hot Plug Detect
18	GND	I	Ground
19	GND	I	Ground
20	GND	I	Ground
21	GND	I	Ground
22	ENLED	I	Backlight enable pin
23	Dimming	I	Backlight adjust
24	N.C.	-	Not Connection
25	N.C.	-	Not Connection
26	Vi	I	LED driver power supply
27	Vi	I	LED driver power supply
28	Vi	I	LED driver power supply
29	Vi	I	LED driver power supply
30	N.C.	-	Not Connection

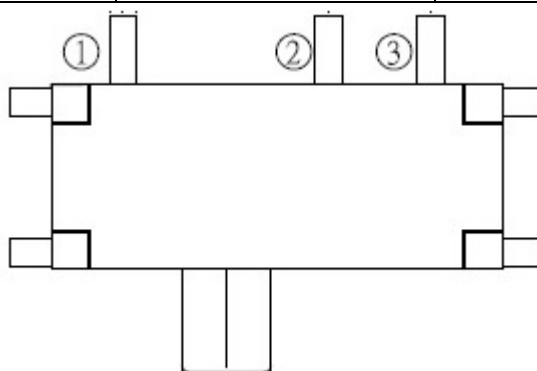
10.2 Slider Switch for Backlight Enable (S1)

Pin	Description	Note
1-2	ENLED	Default
2-3	eDP-EN	-



10.3 Slider Switch for Backlight PWM (S2)

Pin	Description	Note
1-2	Dimming	Default
2-3	eDP-PWM	-



10.4 Tact Switch for Backlight Brightness Adjustment

Symbol	Description
BL+	Increment Backlight Brightness
BL-	Decrement Backlight Brightness

Note:

1. The internal control of brightness will need to switch S1&S2 to Pin2-3.
2. 100% brightness is preset and the adjustable range will be 0~100%(16 steps)
3. After adjusting the brightness, the brightness will be automatically memorized after 10 seconds.

10.5 Color Data Input Assignment

The brightness of each primary color (red, green and blue) is based on the 8 bit gray scale data input for the color. The higher the binary input, the brighter the color. The table provides the assignment of color versus data input.

[illegible]

11. Interface Timing

11.1 Input Signal Characteristics

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

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	F _c	53.35	65	80	MHz	-
	Period	T _c	12.5	15.38	18.75	ns	
	Input cycle to cycle jitter	T _{rd}	---	---	200	ns	(a)
	Input Clock to data skew	TLVCCS	-0.02*T _c	-	0.02*T _c	ps	(b)
	Spread spectrum modulation range	F _{clkin_mod}	-	-	1.02*F _c	MHz	(c)
	Spread spectrum modulation frequency	F _{SSM}	-	-	200	KHz	
Vertical Display Term	Frame Rate	Fr	55	60	70	Hz	T _v =T _{vd} +T _{vb}
	Total	T _v	780	806	840	Th	-
	Active Display	T _{vd}	768	768	768	Th	-
	Blank	T _{vb}	T _v -T _{vd}	38	T _v -T _{vd}	Th	-
Horizontal Display Term	Total	T _h	1240	1344	1360	Tc	T _h =T _{hd} +T _{hb}
	Active Display	T _{hd}	1024	1024	1024	Tc	-
	Blank	T _{hb}	T _h -T _{hd}	320	T _h -T _{hd}	Tc	-

Note (1) Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormally.

12. Optical Characteristics

The optical characteristics should be measured in a dark environment (≤ 1 lux) or equivalent state with the methods shown in Note (4).

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Normal Angle	1800	(2500)	-	-	(2)
Response Time		$T_R + T_F$		-	23	35	ms	(3)
Luminance (Center)		Y		400	(500)	-	cd/m ²	(4)
White Variation		δW		75	80	-	%	(5)
Color Chromaticity	Red	Rx		0.597	0.647	0.697	-	(1),(4)
		Ry		0.288	0.338	0.388	-	
	Green	Gx		0.271	0.321	0.371	-	
		Gy		0.556	0.606	0.656	-	
	Blue	Bx		0.107	0.157	0.207	-	
		By		0.000	0.039	0.089	-	
	White	Wx		0.263	0.313	0.363	-	
		Wy		0.279	0.329	0.379	-	
Viewing Angle	Horizontal	θ_{x+}	$CR \geq 10$	80	(88)	-	deg.	
		θ_{x-}		80	(88)	-		
	Vertical	θ_{y+}		80	(88)	-		
		θ_{y-}		80	(88)	-		

16.Outline Drawing

