

# ALP262CGX

4.6cm (1.8/inch ) 557 X 234 dots

\* This specification is tentative and subject to change without notice. Please contact us when you use this module on your production.

## Overview

This low power consumption 1.8 inch low temperature poly-silicon TFT-LCD module is suitable for view finder of digital still camera.

## Features

- Diagonal 4.6cm (1.8inch) display size.
- 557x234=130,338dots.
- Transmissive type.
- RGB delta color arrangement.
- Proffered viewing angle ; 6 o'clock (FPC is bottom).
- Polarizer ; AR coat.
- Low power consumption (panel TYP. 23mW) by common inversion drive built-in negative power supply generator and gate level shifter.
- Up/down and right/left inverse function.
- Built-in level shifter circuit.
- Thinness ; 3mm (include BL).
- Recommended IC ; LV4141W, LV4149W (analog I/F), LC15007 (digital I/F)
- Operating temperature (panel surface) ; -10 to +60°C.
- Storage temperature ; -20 to +70°C.
- BL is Harnessless type (Option ; built-in harness).

## Specifications

Item	Specifications	Unit	Remarks
Dot count (H)x(V)	557 x 234	dot	
Active area dimensions (H)x(V)	36.516 x 27.378	mm	
Display size (diagonal)	4.6 (1.8inch)	cm	
Dot pitch (H)x(V)	0.0655 x 0.117	mm	
Color arrangement	RGB Delta	-	
Module external dimensions (W)x(H)x(D)	TYP.43.8 x 38.35 x 2.94	mm	Note1
FPC length	TYP.19.1	mm	
Weight	About 11.6	g	

\*Note1 : Excluding flexible cable and projections.

No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.

Anyone purchasing any products described or contained herein for an above-mentioned use shall:

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(2) Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.

Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

## Absolute Maximum Ratings at VSS = 0V

Item	Symbol	Ratings	Unit
H driver power supply voltage	HVDD	-1.0 to +10	V
V driver power supply voltage	VDD	-1.0 to +10	V
V driver negative power supply voltage	VBB	-6.0 to -1.0	V
Common electrode voltage	COM	-1.0 to +10	V
Strage capacity voltage	SC	-1.0 to +10	V
H/V scan control signal voltage	CSH,CSV	-1.0 to +10	V
H driver/Drain storage circuit input signal voltage	STH,XSTH,CKH1,CKH2, DSG,XDSG	-1.0 to +10	V
V driver input signal voltage	STV,XSTV,CKV1,CKV2, ENB,XENB	-1.0 to +10	V
Video signal/Drain storage data signal input voltage	G, R, B, DSD	-1.0 to +8	V

Item	Symbol	Ratings	Unit
Operating temperature (panel surface)	Topr	-10 to +60 <sup>*1</sup>	deg.
Storage temperature	Tstg	-20 to +70 <sup>*1</sup>	deg.
Backlight input current	If	25 <sup>*2</sup>	mA

\*1 Do not produce dew and make the wet bulb temperature in the condition of 39°C or below.

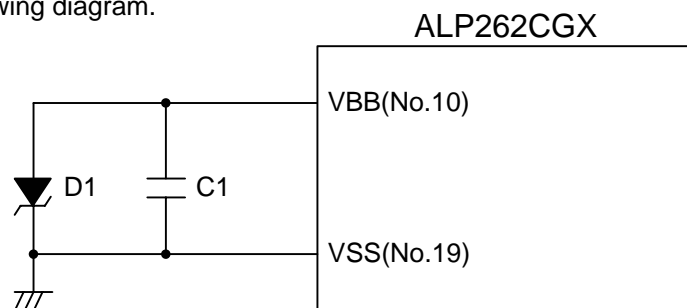
\*2 T=25°C

## Operating Conditions VSS=0V

Item	Symbol	MIN	TYP	MAX	Unit
Power supply voltage	HVDD	8.2	8.5	8.8	V
	VDD	8.2	8.5	8.8	V
VBB output voltage	VBB	-4.5	-4.0	-3.5	V

## Negative Power Supply Generater

To stabilize VBB output voltage, VBB should be tied VSS through a zener diode with smoothing capacitor as the following diagram.



	Capacitance [ $\mu$ F]	Rating voltage	Capacitance tolerance
C1	0.022.	16VDC and more	+80% and less, -20% and more
D1	RD5.1S-B2 or RD5.1UM-B2 (NEC makes) or the corresponding products		

## Input Signal

Item		Symbol	MIN	TYP	MAX	Unit
H driver/Drain storage circuit input signal voltage	Low	VHIL	-0.3	0.0	0.3	V
	High	VHIH	2.5	3.0	4.0	V
V driver input signal voltage	Low	VVIL	-0.3	0.0	0.3	V
	High	VVIH	2.5	3.0	4.0	V
H scan control signal voltage	Low	VHSIL	VSS		VSS+0.2	V
	High	VHSIH	HVDD-0.2		HVDD	V
V scan control signal voltage	Low	VVSIL	VSS		VSS+0.2	V
	High	VVSIH	VVDD-0.2		VVDD	V
Video signal center level	analog I/F	VVC	3.30	3.50	3.70	V
	digital I/F	VVC	2.55	2.75	2.95	V
Video signal voltage (analog I/F)	Black(H)	Vblack(H)	5.05	5.25	5.45	V
	Black(L)	Vblack(L)	1.55	1.75	1.95	V
	White-Black	Vsig w-b			2.70	V
Video signal voltage (digital I/F)	Black(H)	Vblack(H)	4.30	4.50	4.70	V
	Black(L)	Vblack(L)	0.80	1.00	1.20	V
	White-Black	Vsig w-b			2.70	V
Common electrode signal center level	analog I/F	VCOM c	(VVC-0.3) -0.2	(VVC-0.3)	(VVC-0.3) +0.2	V
	digital I/F	VCOM c	(VVC-0.3) -0.2	(VVC-0.3)	(VVC-0.3) +0.2	V
Common electrode voltage amplitude	analog I/F	VCOM p-p		3.5	3.6	V
	digital I/F	VCOM p-p		3.5	3.6	V
Strage capacity center level		VSC c	5.7	6.1	6.5	V
Strage capacity voltage amplitude		VSC p-p		VCOM p-p		V
Drain storage data voltage		VDSD	VVC-0.2	VVC	VVC+0.2	V

## White LED backlight input current/voltage conditions

Item	MIN	TYP	MAX	Unit
Forward current	19.5	20	20.5	mA
D.C. voltage (constant current : 20mA)	9.5	10.5	12	V

## Power consumption

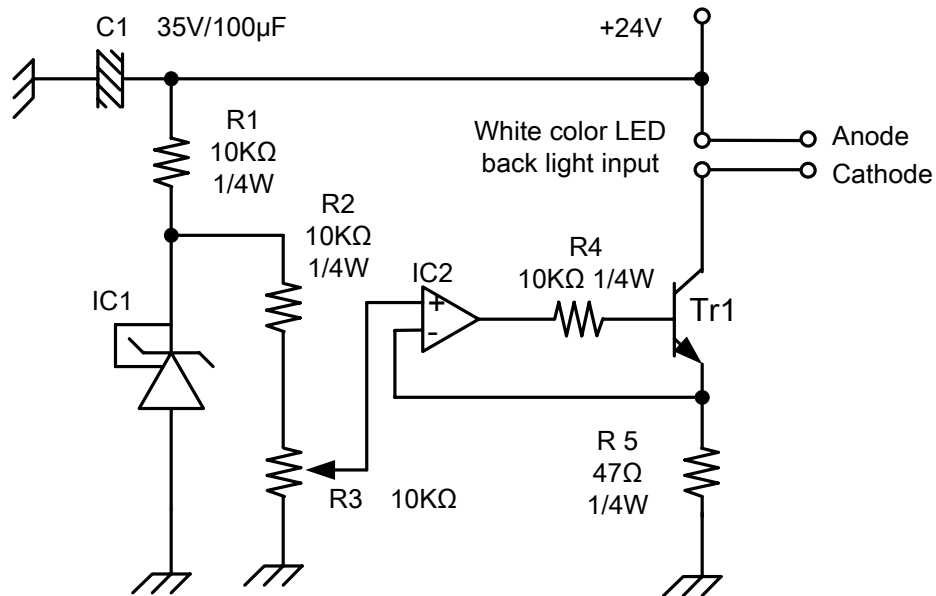
Item	Symbol	Condition	MIN	TYP	MAX	Unit
Panel power consumption	PWR		-	23	37.4	mW
Backlight power consumption		Constant current 20mA	-	210	-	mW

## Optical Specifications (Ta=25°C, θ= 0°, SANYO standard measurement system)

Item	Symbol	MIN	TYP	MAX	Unit	
Contrast ratio	CR	70	100	-	-	
V-T characteristic	V90	VT90	1.1	1.4	1.7	V
	V10	VT10	2.0	2.3	2.6	
Luminance* <sup>3</sup>	L	200	250	-	cd/m <sup>2</sup>	

\*3

## Constant Current Circuit for Luminance Measurement



IC1 : Diode 1431T

IC2 : OP amplifier M358

Tr1 : Transistor 2SC1213

## Pin Function

No.	Symbol	Function
1	COM	Common electrode voltage
2	CKV1	V driver clock1
3	CKV2	V driver clock2
4	STV	V driver start signal
5	XSTV	Inverted signal of STV
6	VVDD	VDD for V driver
7	ENB	Enable signal
8	XENB	Inverted signal of ENB
9	CSV	Up/down scan control signal (H:Normal scan, L:Reverse scan)
10	VBB	V driver setting negative power supply
11	DSG	Drain storage gate signal
12	XDSG	Inverted signal of DSG
13	DSD	Drain storage data signal
14	B	Video signal (B)
15	R	Video signal (R)
16	G	Video signal (G)
17	CSH	Right/left scan controll signal (H:Normal scan, L:Reverse scan)
18	SC	Strage capacity voltage
19	VSS	VSS for V and H driver
20	STH	H driver start signal
21	XSTH	Inverted signal of STH
22	HVDD	VDD for H driver
23	CKH1	H driver clock1
24	CKH2	H driver clock2

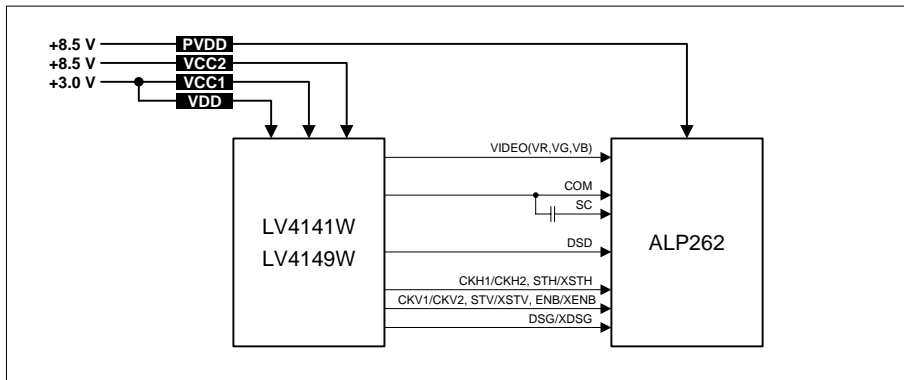
No.	Symbol	Function
1	Anode	INPUT (+)
2	Cathode	GND (-)

## Sequence (When the power supply is blocked.)

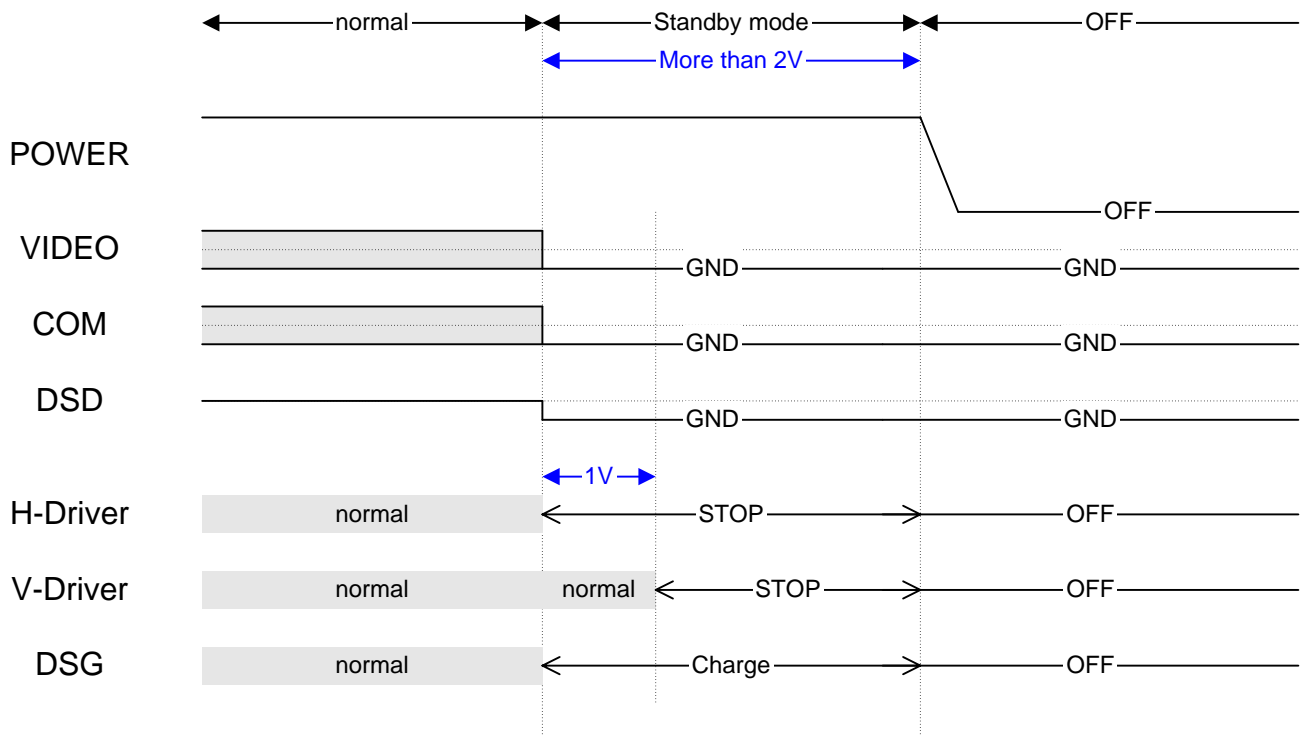
When the power supply is blocked, the afterimage (crossbars) may appear on ALP262. (It is not a image stick.)

This afterimage does not affect the quality of the LCD product. The power supply sequence as below is executed to avoid to appear the afterimage.

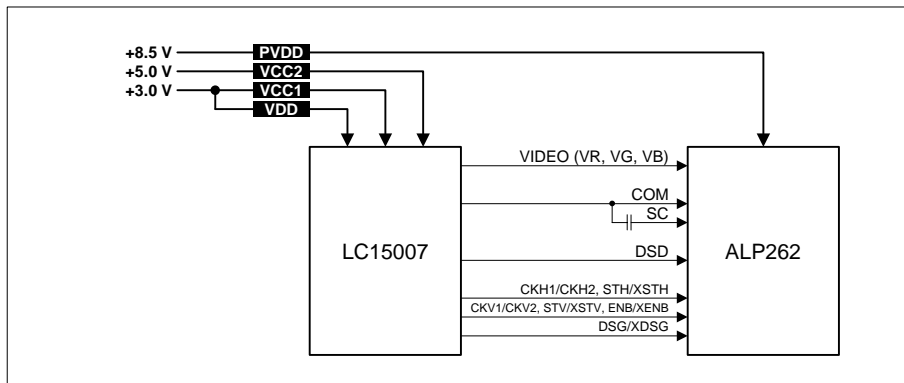
### Recommended Sequence (1) [Driving LSI : LV4141W, LV4149W ]



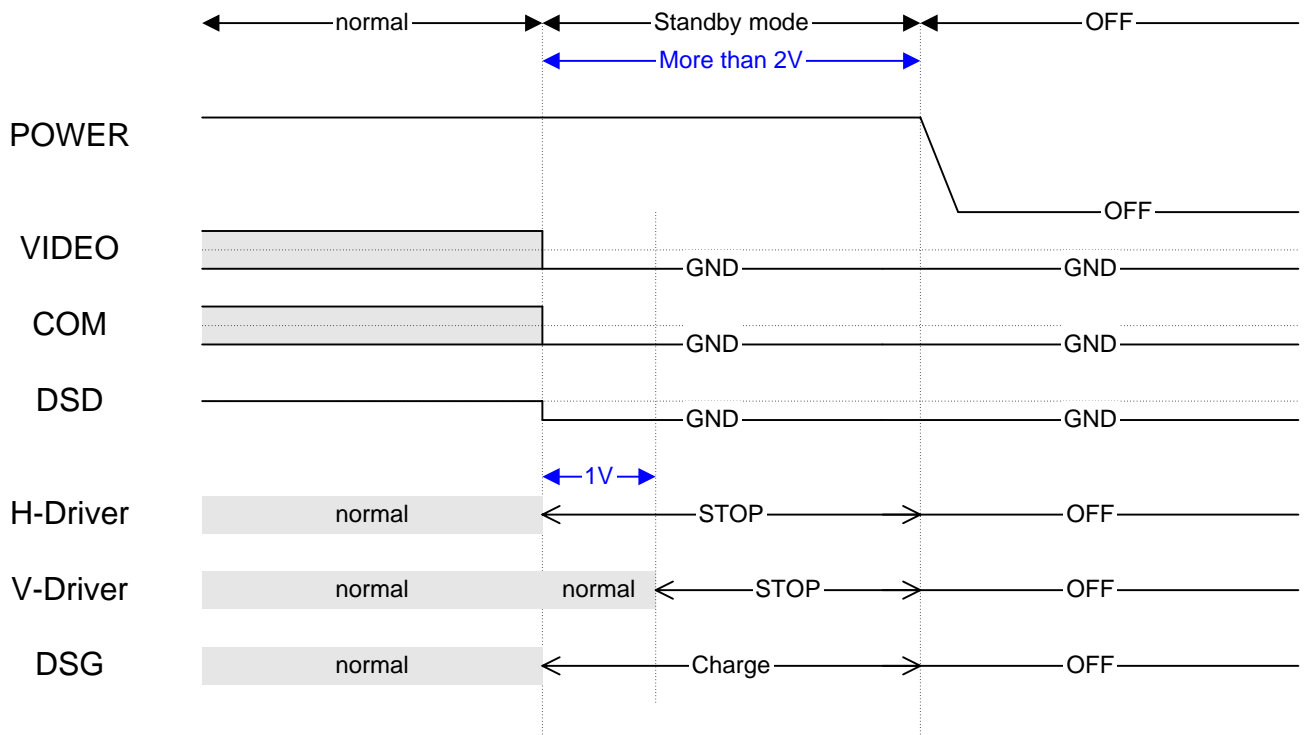
NORMAL  
 ↓  
 Set to STANDBY  
 ↓  
 Power Source OFF



## Recommended Sequence (2) [Driving LSI : LC15007]

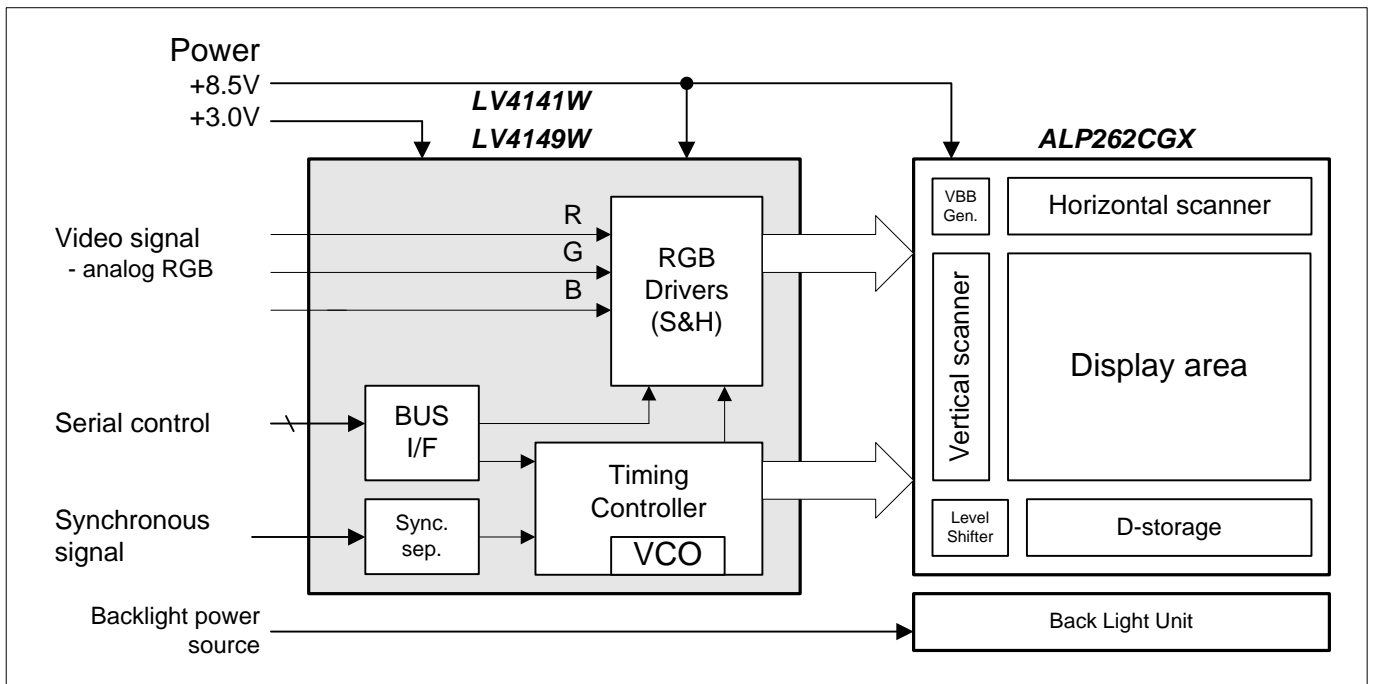


NORMAL  
 ↓  
 Set to STANDBY  
 ↓  
 Power Source OFF

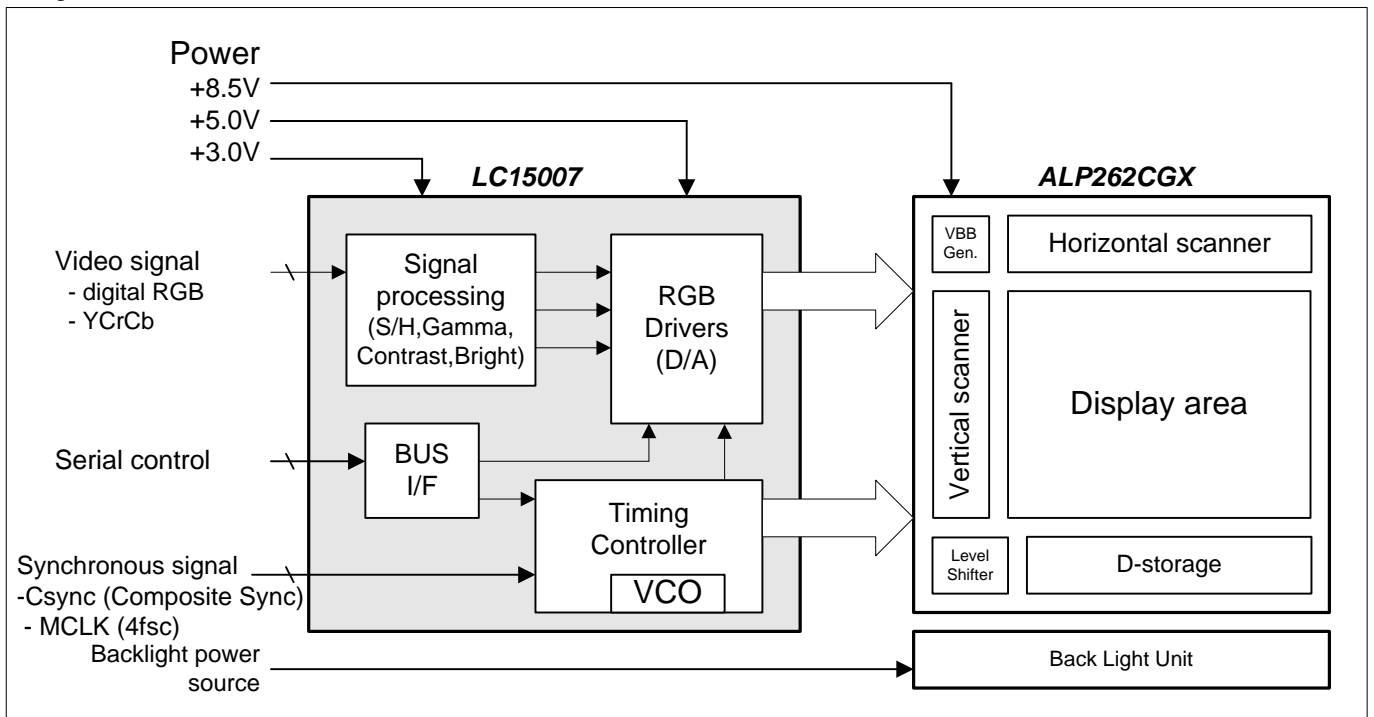


## System configuration

- analog RGB

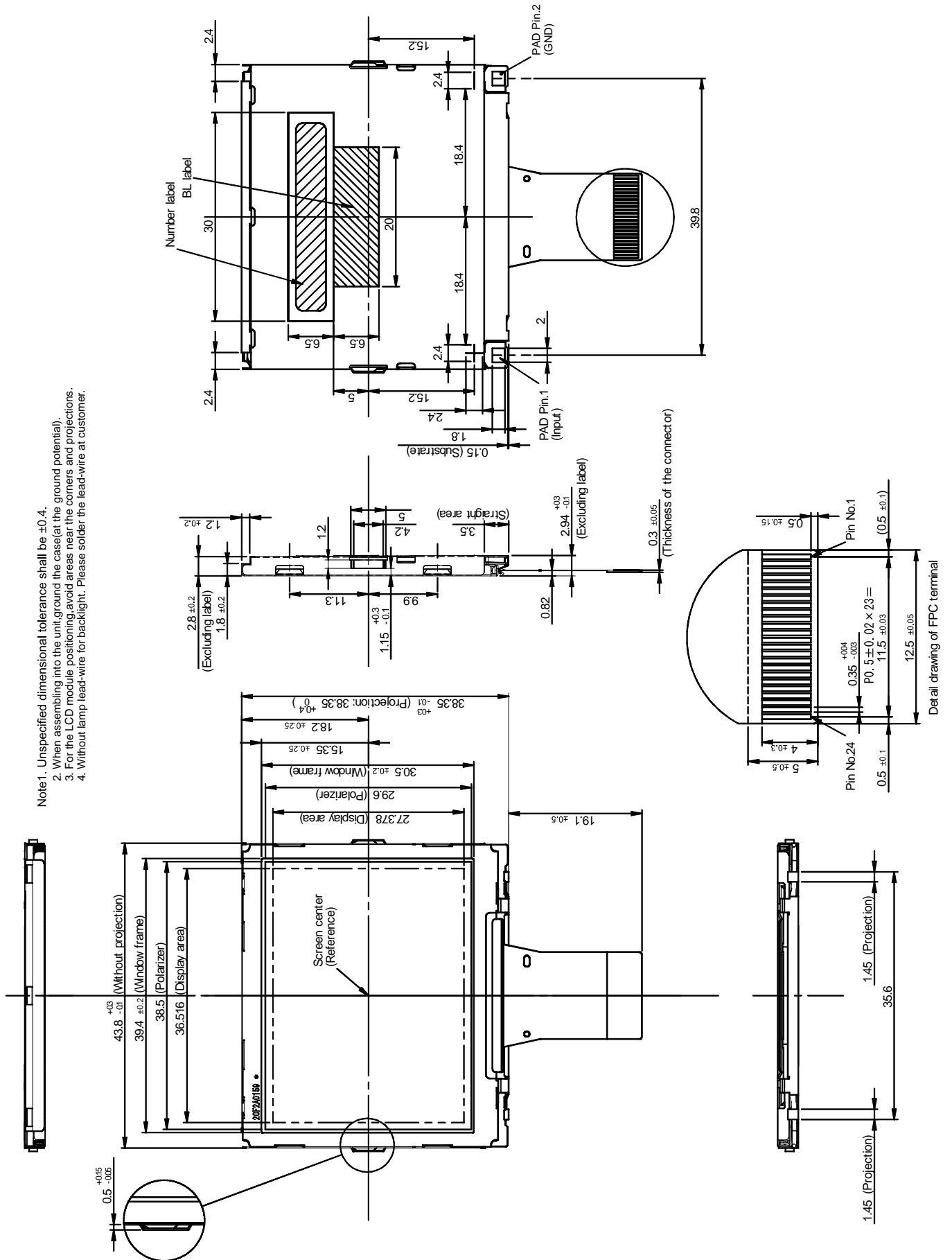


- digital RGB





# Package Dimension



- Note 1. Unspecified dimensional tolerance shall be  $\pm 0.4$ .
2. When assembling into the unit, ground the case (at the ground potential).
3. For the LCD module positioning, avoid areas near the corners and projections.
4. Without lamp lead-wire for backlight. Please solder the lead-wire at customer.