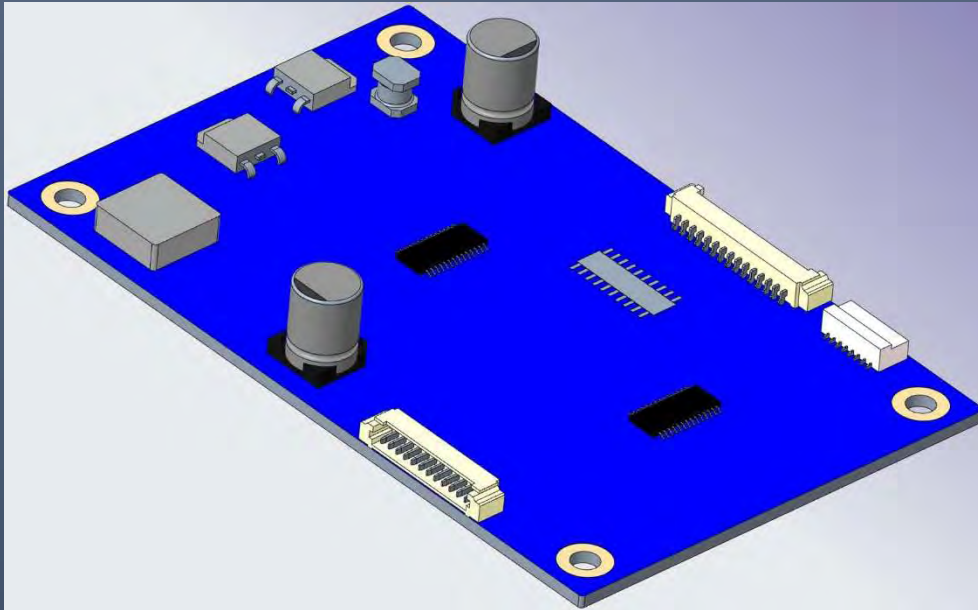


# Data Sheet



*Product Name : LED Driver  
(for Wide Range Dimming and  
Multi Panel Supportable Type)*

*Model No : CVT-WD2-xxx...xxx  
("xxx...xxx" : target LCD Part No.)*

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## Revision History

PCB Version	Rev. date	Revision Details
1.0	Jul 2020	Engineering Sample
	Aug 2020	Mass Production verion issued
		Driving I/C Model Changed from 70mA/CH with total 8 Channels supportable to 200mA/CH with total 6 channels supportable each
		Addition of supportable LCD Models : AUO 24", G240HW01.V1
	Sep 2020	Addition of supportable LCD Models : AUO 15", G150XTN06B
	Oct 2020	<u>Changing the Components Rating</u> for AUO 21.5", P215HAN02.0 -. Condenser : from 100V, 82 $\mu$ F to 200V, 22 $\mu$ F -. Capacitor : from 33 $\mu$ H to 47 $\mu$ H <u>Addition the Components</u> for AUO 21.5", P215HAN02.0 -. 1 pcs x Inductor at 47 $\mu$ H -. 6 pcs x Capacitor at 100V, 1 $\mu$ F
	Oct 2020	<u>Setting the Resister Rating</u> for Mitsubishi 15", AA150XT11 -. R206 at 110K 1% ( for OVP setting at 36V) -. R251, R551 at 47K 1% , R252, R552 :at 3.3K 1% (for current setting at 100mA/CH) -. R205, R505 at 150Kohm
	Nov 2020	<u>Setting the Resister Rating</u> for LG 31.5", LM315WR1-SSA1 : all details refer to the page 30
	Nov 2020	<u>Setting the Resister Rating</u> for LG 27", LM270QQ2-SPA3 : all details refer to the page 31

# 1. Design concept of Product

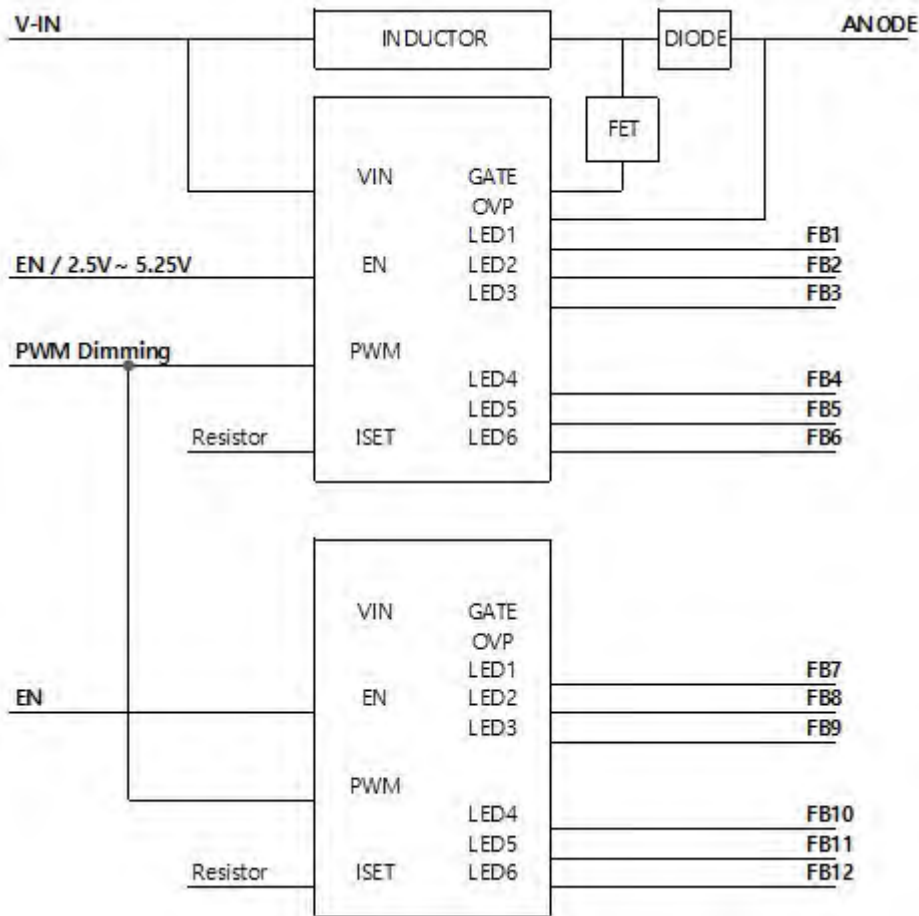
This product has been designed for providing a wide diming supportable LED Driver.

In order to overcome the difficulty from the limitation of diming range by ordinary LED Drivers in the market.

The basic parameters of diming range by this LED Driver are ;

- the supportable Contrast Ratio : 5000 : 1
- the supportable Backlight Channel : total 12 channels by 2 chip solution)
- the supportable Current per each Backlight Channel : 200mA / Channel

# 2. Block Diagram



### 3. Electrical Parameters

#### 3.1. Input Requirements

Parameter		Symbol	Values			Unit	Remark	
			Min	Typ	Max			
Power Supply Input Voltage		VBL	10.8		26.4	Vdc	** 1	
Power Supply Input Current		IBL	-	-	1.91	A	VBL = 12V Ext VBR-B =100%	
		IBL	-	-	1.66	A	VBL = 24V Ext VBR-B =100%	
Power Consumption		PBL	-	-	35 23	W	Input 24V Input 12V	
Input Voltage for Control System Signals	On/Off	On	V on	2.4	-	5.25	Vdc	HIGH : On duty LOW : Off duty ** 2
		Off	V off	-0.3	-	0.8	Vdc	
	Pulse Duty Level (PWM)	High Level	2.5	-	5.25	Vdc		
		Low Level	0.0	-	0.7	Vdc		
		Normal Freq.	90		220	Hz		
		Freq. Range	60		10K	Hz		
		Duty (5000:1)	0.02	-	100	%		

\*\* 1) The LED string voltage has to be higher than the input voltage (max) and the difference must be at least 3V deviation.

\*\* 2) If user needs to adopt the PWM Duty of under 10% level, the dimming frequency should be under 120Hz level.

### 3.2. Output Requirements

#### 3.2.1 Maximum Output Voltage and Current

Specified LCD Model	Output Connector	Numbers of Supportable Channel	Output Voltage Range (V)			Output Constant Current (mA)		
			Min.	Typ.	Max.	Min.	Typ.	Max.
None (Factory Default Condition)	depending on user's choice among CN300, CN400 & CN500	1CH ~ 12CH	15	-	75	-	-	2400

[Note] In case of specified LCD Model, please be informed of all the parameters in the above table on the Chapter 12. Appendix-A of this Data Sheet.

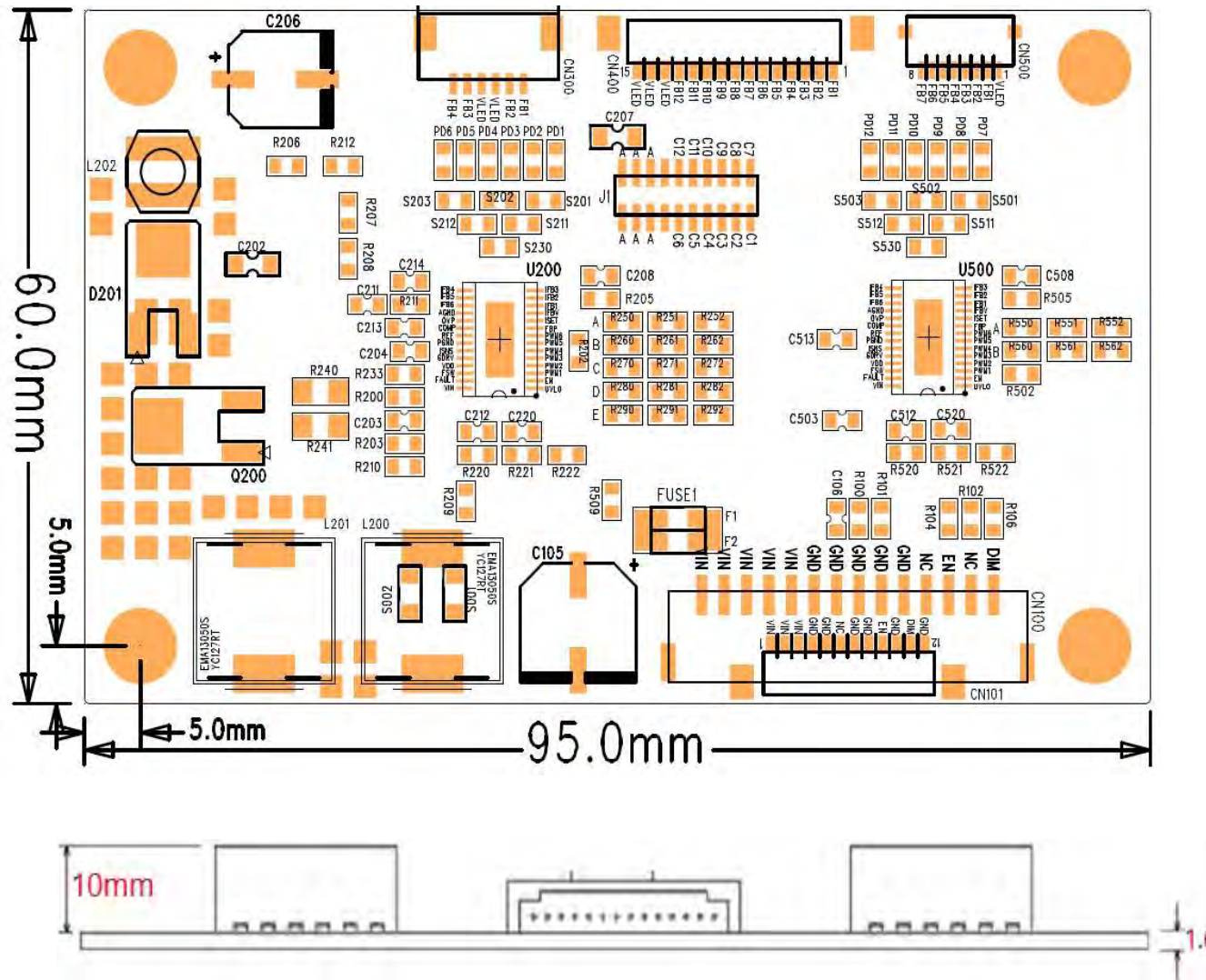
#### 3.2.2 Over Voltage Protection (OVP)

The voltage will not exceed the upper trip limit.

The noise spikes that exceed the lower trip limit of less than 10  $\mu$ s will not clamp the output voltage to zero.

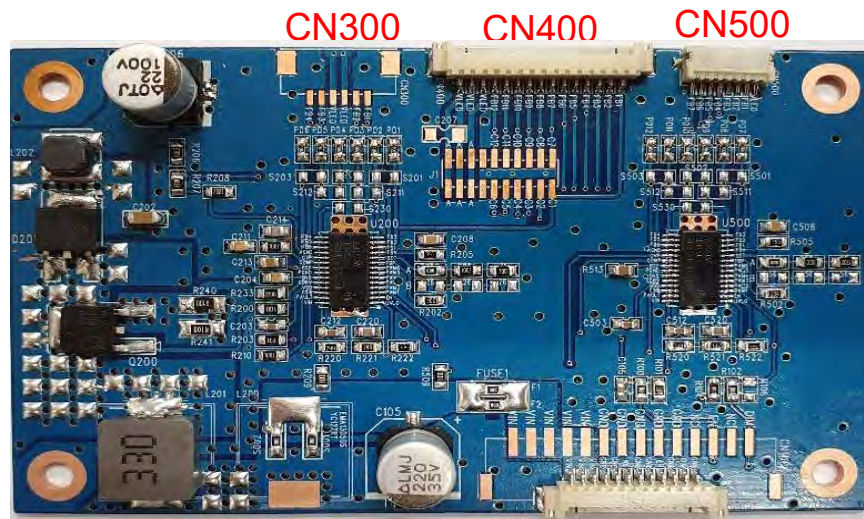
Voltage	Over Voltage Protection	
	Range[V]	Protection
Output	This LED Driver was designed based on the OVP setting at 20% ~ 30% higher level than the forwarding(string) voltage of panels in use.	Shut Down

4. Dimension (60mm x 95mm x 10mm, 30g Weight)

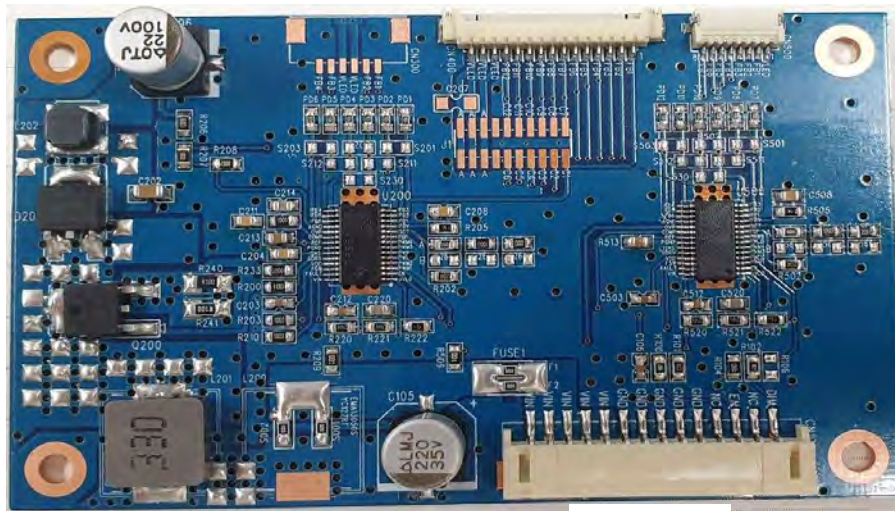




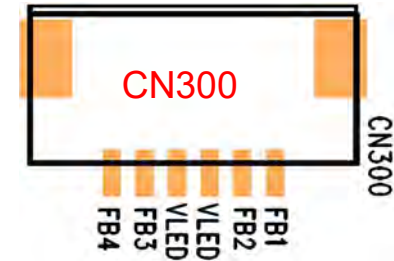
## 5. Connectors and Pin Map Table



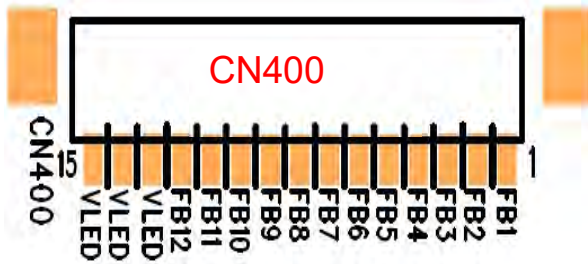
CN101



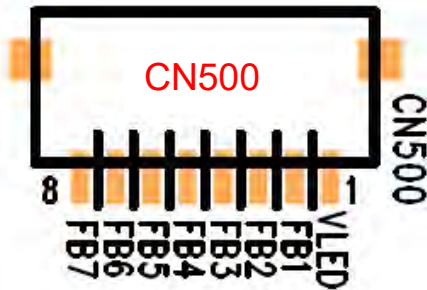
CN100



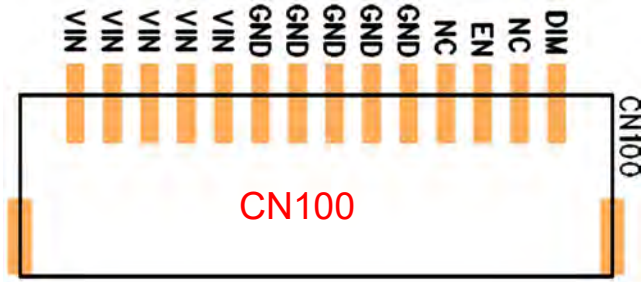
CN300 : 12505WR-06P (Yeon-Ho / 1.25mm Pitch, 6Pin)		
Pin No	Symbol	Description
1	FB1	Feedback 1 (Cathode)
2	FB2	Feedback 2 (Cathode)
3	VLED	LED Input (Anode)
4	VLED	LED Input (Anode)
5	FB3	Feedback 3 (Cathode)
6	FB4	Feedback 4 (Cathode)



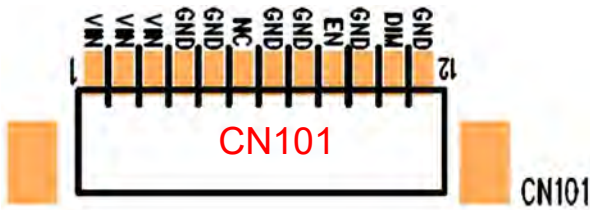
CN400 : 12505WR-15P (Yeon-Ho / 1.25 Pitch, 15 Pin)					
Pin No	Symbol	Description	Pin No	Symbol	Description
1	FB1	Feedback 1 (Cathode)	9	FB9	Feedback 9 (Cathode)
2	FB2	Feedback 2 (Cathode)	10	FB10	Feedback 10 (Cathode)
3	FB3	Feedback 3 (Cathode)	11	FB11	Feedback 11 (Cathode)
4	FB4	Feedback 4 (Cathode)	12	FB12	Feedback 12 (Cathode)
5	FB5	Feedback 5 (Cathode)	13	VLED	LED Input (Anode)
6	FB6	Feedback 6 (Cathode)	14	VLED	LED Input (Anode)
7	FB7	Feedback 7 (Cathode)	15	VLED	LED Input (Anode)
8	FB8	Feedback 8 (Cathode)			



CN500 : CI1408M1HRL-NH (Cvilux / 1.0mm Pitch, 8 Pin)					
Pin No	Symbol	Description	Pin No	Symbol	Description
1	VLED	Input (Anode)	5	FB4	Feedback 4
2	FB1	Feedback 1	6	FB5	Feedback 5
3	FB2	Feedback 2	7	FB6	Feedback 6
4	FB3	Feedback 3	8	FB7	Feedback 7



<b>CN100 : 20022WR(YEON-HO)</b> (Yeon-Ho / 2.0mm Pitch, 14 Pin)					
Pin No	Symbol	Description	Pin No	Symbol	Description
1	V <sub>in</sub>	Voltage Input	8	GND	Ground
2	V <sub>in</sub>	Voltage Input	9	GND	Ground
3	V <sub>in</sub>	Voltage Input	10	EN	On / Off (Active High)
4	V <sub>in</sub>	Voltage Input	11	NC	No Connection
5	GND	Ground	12	EN	On / Off (Active High)
6	GND	Ground	13	NC	No Connection
7	GND	Ground	14	DIM	PWM Dimming



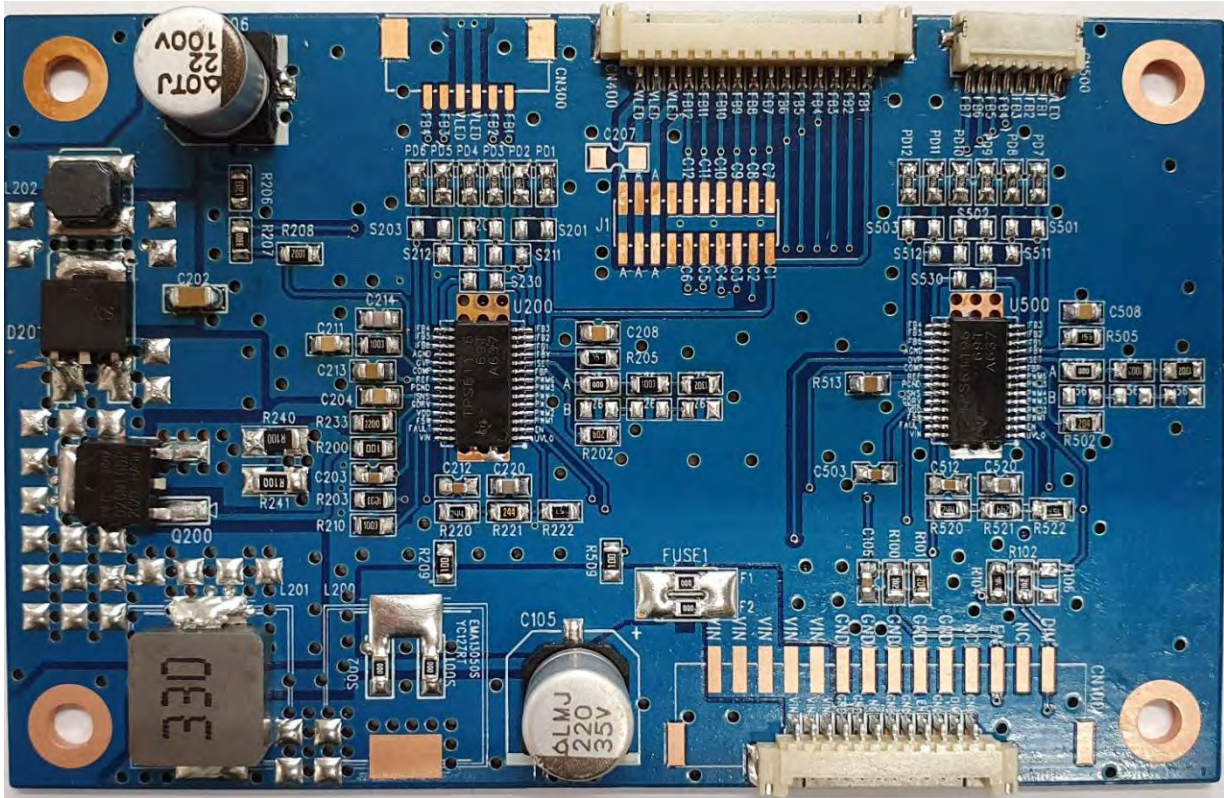
<b>CN101 : 12505WR-12P</b> (Yeon-Ho / 1.25mm Pitch, 12 Pin)					
Pin No	Symbol	Description	Pin No	Symbol	Description
1	V <sub>in</sub>	Voltage Input	7	GND	Ground
2	V <sub>in</sub>	Voltage Input	8	GND	Ground
3	V <sub>in</sub>	Voltage Input	9	EN	On / Off (Active High)
4	GND	Ground	10	GND	Ground
5	GND	Ground	11	DIM	PWM Dimming
6	NC	No Connection	12	GND	Ground



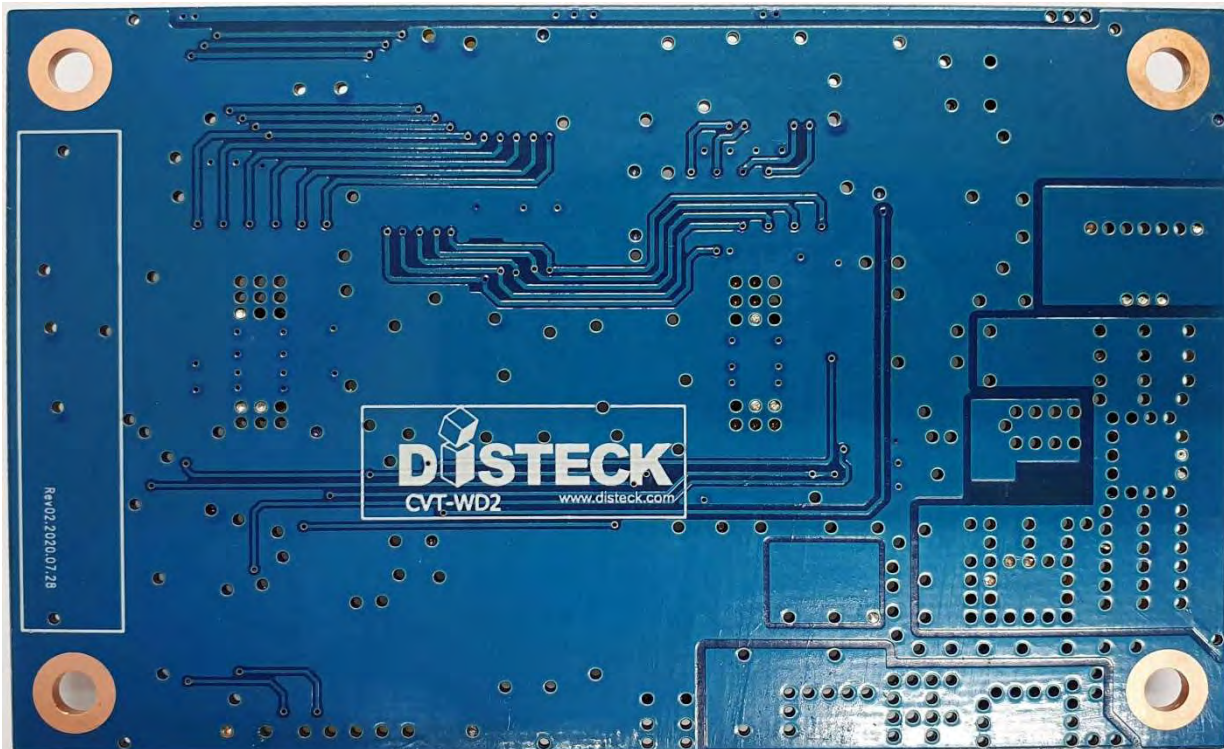
## 6. Product Pictures

### 6.1 Standard Model

Top View



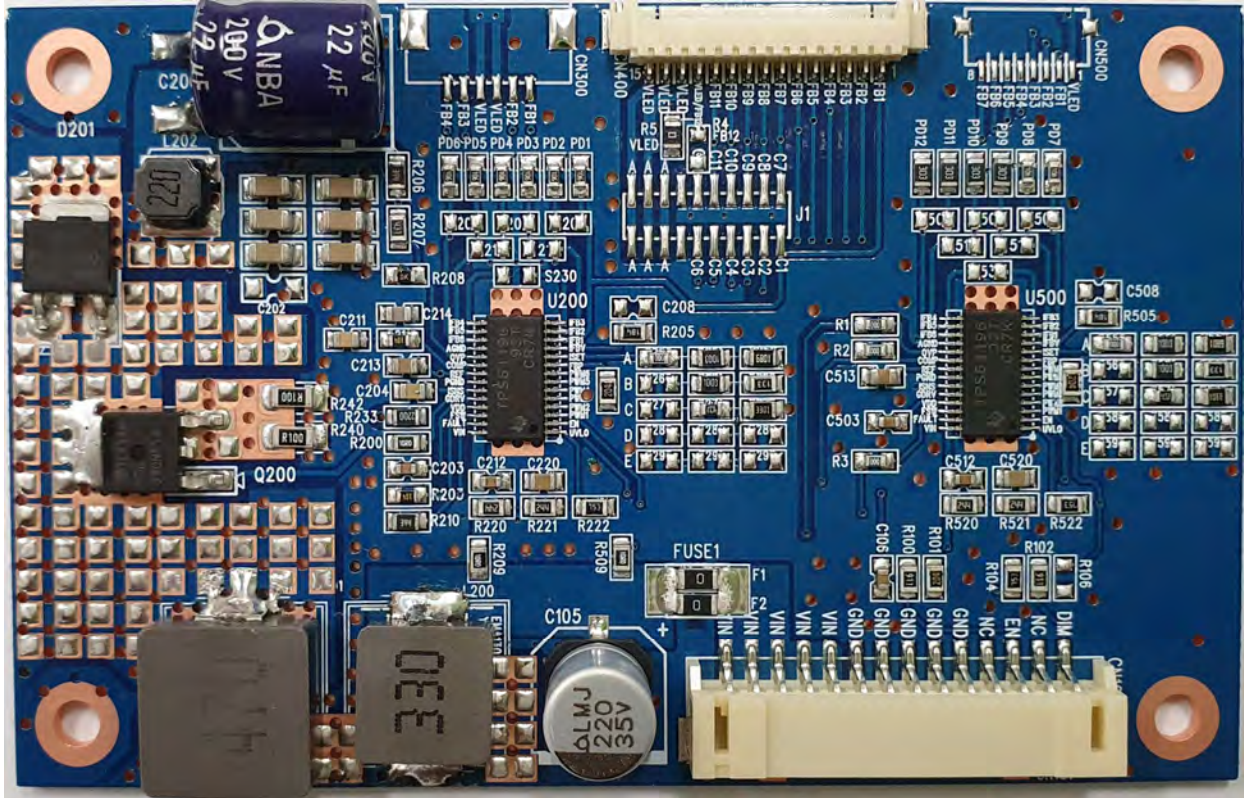
Rear View





## 6.2 Optional Model for AUO 21.5", P215HAN02.0

Top View



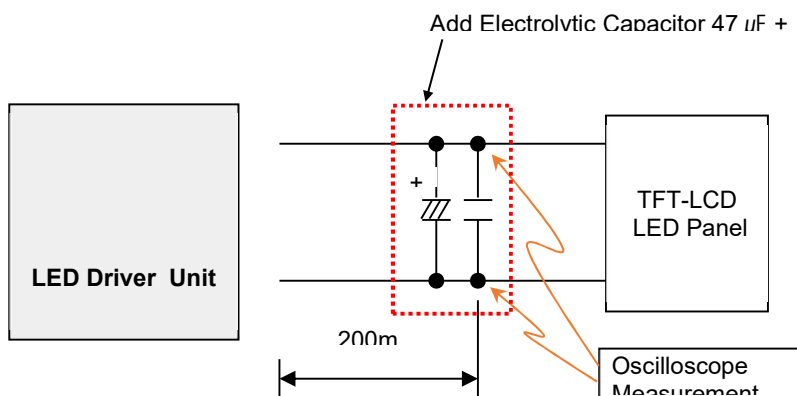
Rear View



## 7. Power Characteristics

### 7.1 Ripple and Noise

The ripple and noise are defined as a periodic or random signal over frequency band at the 10Hz ~ 20MHz, measuring by an oscilloscope capable 20MHz bandwidth.



Output Voltage	LED Output
Ripple Voltage Range (mV)	5000

※ The ripple & noise are measured at the 20MHz bandwidth by a 12" twisted pair-wire which is cut off through the 0.1µF & 47µF parallel capacitor.

☞ Test condition

- Temperature: 25°C room temperature
- Test equipment: PWM Dimming 100%

### 7.2 Overshoot

The output overshoot at the boot up must not exceed 25% than ordinary operating voltage value with or without under the working load condition.

### 7.3 In-rush

At the moment of turning on, the rise time of output voltage has to be shorter than 200msec, which is measured from the 10% point to the 90% point at the normal state

☞ Test condition

- Temperature : 25°C room temperature
- Test equipment : Resistance load

## 8. Absolute Rating

### 8.1 Temperature

- Operating Temp. : -35 ~ 85°C (optional guarantee – up to -40°C)
- Storage Temp. : -35 ~ 85°C (optional guarantee – up to -40°C)

### 8.2 Humidity

- Operation humidity : 20 ~ 85% non-condensate
- Storage humidity : 5 ~ 95% non-condensate

## 9. Reliability Test

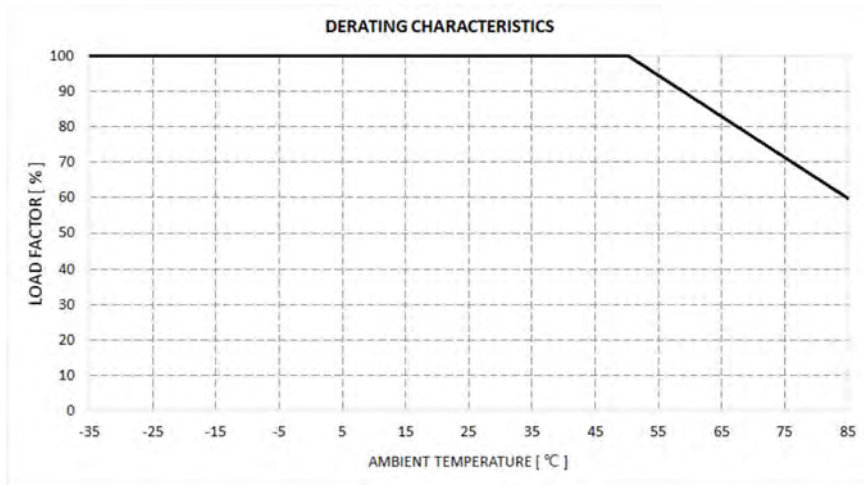
### 9.1 Environment Test

Adopted Test	Test method																		
Intermittent Operating Stability Test	The power supply unit should be On&Off for 25,000 hours at an interval of 10 seconds at maximum load, after its electrical characteristics are satisfied.																		
Low Temp. Operating Test	The power supply unit is left in operation at a minimum temperature (-30°C) for 200 hours. This should be satisfied without applying the electrical characteristics.																		
High Temp. & High Humidity Operating Test	The power supply unit is left at an operating temperature (85°C) in 85% humidity for 200 hours. This should be satisfied without applying the electrical characteristics.																		
Low Temp. Storage Test	The power supply unit should be left at minimum temperature (-35°C) for 96 hours or more. Then the switching regulator is left at room temperature and humidity for an hour or more and then the electrical characteristics should be satisfied																		
Heat cycle Operating Test	The power supply unit is left at at room temperature and humidity for an hour or more after 10 consecutive temperature cycles are performed while heated. Afterwards, the electrical characteristics should be satisfied.																		
	<table border="1"> <thead> <tr> <th>Consecutive Cycle</th> <th>Temperature</th> </tr> </thead> <tbody> <tr> <td>10 minutes</td> <td>25°C</td> </tr> <tr> <td>30 minutes</td> <td>25°C → -35°C</td> </tr> <tr> <td>240 minutes</td> <td>Minimum temperature(-35°C)</td> </tr> <tr> <td>30 minutes</td> <td>-35°C → 25°C</td> </tr> <tr> <td>10 minutes</td> <td>25°C</td> </tr> <tr> <td>30 minutes</td> <td>25°C → 85°C</td> </tr> <tr> <td>240 minutes</td> <td>Maximum temperature (85°C)</td> </tr> <tr> <td>30 minutes</td> <td>85°C → 25°C</td> </tr> </tbody> </table>	Consecutive Cycle	Temperature	10 minutes	25°C	30 minutes	25°C → -35°C	240 minutes	Minimum temperature(-35°C)	30 minutes	-35°C → 25°C	10 minutes	25°C	30 minutes	25°C → 85°C	240 minutes	Maximum temperature (85°C)	30 minutes	85°C → 25°C
	Consecutive Cycle	Temperature																	
	10 minutes	25°C																	
	30 minutes	25°C → -35°C																	
	240 minutes	Minimum temperature(-35°C)																	
	30 minutes	-35°C → 25°C																	
	10 minutes	25°C																	
	30 minutes	25°C → 85°C																	
240 minutes	Maximum temperature (85°C)																		
30 minutes	85°C → 25°C																		
Vibration Test	The power supply unit is left at below environment condition for 2 hours or more ; -. Vibration amplitude: 1.5mm, Frequency: 10-5-10Hz, -. Sweep Time: 1Min, each of each X, Y, and Z for 2 hours or more. There should be no damage to its appearance and structure.																		
Appearance Test	There should be no contaminant or dirt on the switching regulator that may cause damage (adverse effect) on the electrical characteristics. There should be no excessive unevenness or scratches on the plated or painted surface.																		

## 9.2 Mean Time Between Failure (MTBF)

The product has been designed by 60,000 MTBF with 90% reliability index under below conditions.

- Input voltage : 12V DC
- Duty cycle : 6hours ON, 2hours OFF
- Ambient Temp :  $25 \pm 2^{\circ}\text{C}$
- Humidity : prevailing condition



It measured by Lambda Predict Program, "Reliasoft" made. And it calculates by the Telcordia SR-332 Issue 3

The MTBF : **278,576** hours

(refer to the calculation data can be provided by users' request additionally)





Name: LED DRIVER [CVT-WD2]  
 Failure Rate(t=INF) (FITs): 1376.7586  
 Category: Telcordia SR-332 Issue 3  
 User Name: SeongHwan, Ma

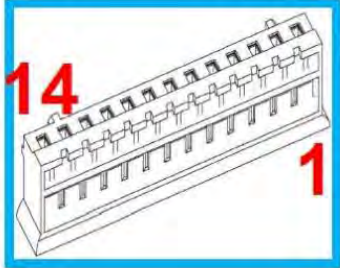
Category	Location No.	Failure Rate(t=INF) (FITs)	MTBF (hrs)	Contribution	Quantity
Capacitor	C105	130.2571	278,576	0.2526	1
Capacitor	C106	0.1402	6,802,400,000	1.00E-04	1
Capacitor	C202	1.579	420,020,000	1.00E-03	1
Capacitor	C203	1.201	709,891,000	5.00E-04	1
Capacitor	C204	1.201	709,891,000	5.00E-04	1
Capacitor	C206	118.2423	301,540	0.2388	1
Capacitor	C208	0.3327	2,101,941,000	1.20E-04	1
Capacitor	C211	0.1402	6,802,400,000	1.00E-04	1
Capacitor	C212	1.201	709,891,000	5.00E-04	1
Capacitor	C213	0.9812	1,001,412,000	3.00E-05	1
Capacitor	C214	0.1402	6,802,400,000	1.00E-04	1
Capacitor	C220	0.3802	2,820,700,000	1.70E-04	1
Capacitor	C503	1.201	709,891,000	5.00E-04	1
Capacitor	C508	0.3327	2,101,941,000	1.20E-04	1
Capacitor	C512	1.201	709,891,000	5.00E-04	1
Capacitor	C513	0.9812	1,001,412,000	3.00E-05	1
Capacitor	C520	0.3802	2,820,700,000	1.70E-04	1
Connector	CN100	5.312	201,894,000	0.0072	1
Connector	CN101	5.312	201,894,000	0.0072	1
Connector	CN300	5.312	201,894,000	0.0072	1
Connector	CN400	5.312	201,894,000	0.0072	1
Connector	CN500	30.128	9,114,310	0.0701	1
Diode	D201	491.288	3,284,610	0.0904	1
Inductor	L201	24.711	110,753,240	0.042	1
Inductor	L202	27.098	64,218,000	0.053	1
External	PCB	-	-	0	1
Resistor, Fixed	PD1	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD2	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD3	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD4	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD5	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD6	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD7	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD8	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD9	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD10	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD11	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	PD12	1.6321	681,300,000	1.20E-04	1
Transistor	Q200	108.8112	7,804,200	0.0584	1
Resistor, Fixed	R100	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R101	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R102	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R104	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R200	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R202	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R203	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R205	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R206	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R207	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R208	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R209	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R210	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R211	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R220	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R221	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R222	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R233	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R240	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R241	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R502	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R505	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R509	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R520	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R521	1.6321	681,300,000	1.20E-04	1
Resistor, Fixed	R522	1.6321	681,300,000	1.20E-04	1
IC, TI	U200	175.7812	6,102,700	0.0781	1
IC, TI	U500	175.7812	6,102,700	0.0781	1
		Minimum	278,576		

10. Power Input Cable (Optional Accessory)

10.1 Interconnection Cable

(between this LED Driver and user's SMPS & user's Driving Board)

PN : CBL501-CVTWD2-2002WR-OPEN



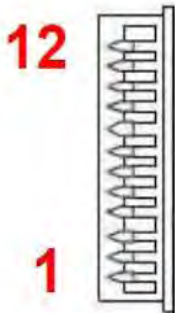
In case of CN100 Wafer adoption

500mm

LED Driver / CVT-WD2 / CN100		
WAFER : 2002WR-14AML(YEONHO)		
HOUSING : 2002HS-14(YEONHO)		
RED	24V	1
RED	24V	2
RED	24V	3
RED	24V	4
RED	24V	5
BLK	GND	6
BLK	GND	7
BLK	GND	8
BLK	GND	9
BLK	GND	10
-	NC	11 NC
YEL	EN	12
-	NC	13 NC
BLU	EXT_DIM	14



PN : CBL501-CVTWD2-12505WR-OPEN



In case of CN101 Wafer adoption

500mm

LED Driver / CVT-WD2 / CN101		
WAFER : 12505WR-12(YEONHO)		
HOUSING : 12505HS-12(YEONHO)		
RED	24V	1
RED	24V	2
RED	24V	3
BLK	GND	4
BLK	GND	5
-	NC	6 NC
BLK	GND	7
BLK	GND	8
YEL	EN	9
BLK	GND	10
BLU	EXT_DIM	11
BLK	GND	12



## 11. Ordering Information

Order Code	Description	Status
<b>CVT - WD2 - xxx...xxx</b>	The "xxx...xxx" means the target LCD Model No.	
<b>CVT - WD2 - G240HW01V1</b>	Wide Range Dimming type LED Driver for AUO 24", G240HW01 v1 panel	
<b>CVT - WD2 - G150XTN06B</b>	Wide Range Dimming type LED Driver for AUO 15", G150XTN06.B panel	Gender Daughter Board included
<b>CVT-WD2-P215HAN02.0</b>	Wide Range Dimming type Driver for AUO 21.5" high brightness model, P215HAN02.0 panel	Adoption of High Rating Components : Inductor, Capacitor
<b>CVT - WD2 – AA150XT11</b>	Wide Range Dimming type LED Driver for Mitsubishi 15", AA150XT11	
<b>CVT - WD2 – LM315WR1-SSA1</b>	Wide Range Dimming type LED Driver for LG 31.5", LM315WR1-SSA1	
<b>CVT - WD2 – LM270QQ2-SPA3</b>	Wide Range Dimming type LED Driver for LG 27", LM270QQ2-SPA3	

CNI

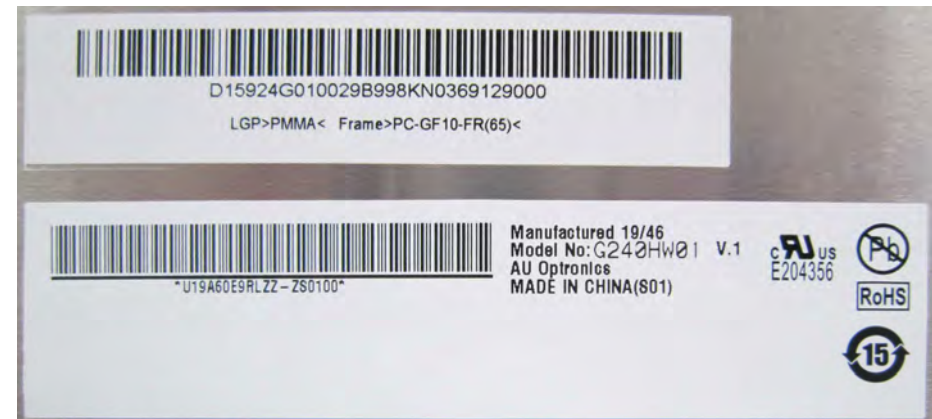
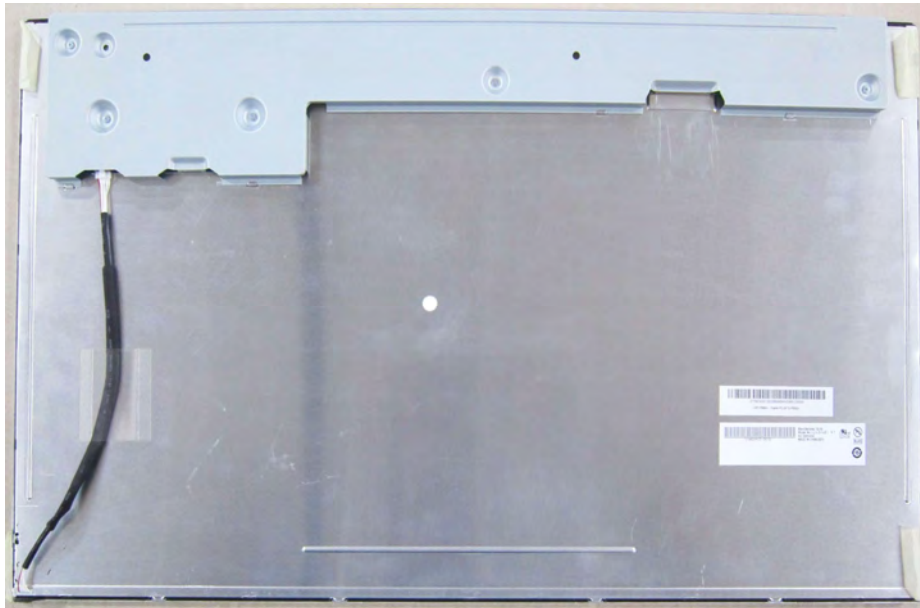
## 12. Appendix – A

### Tested LCD Record of Output Voltage & Current

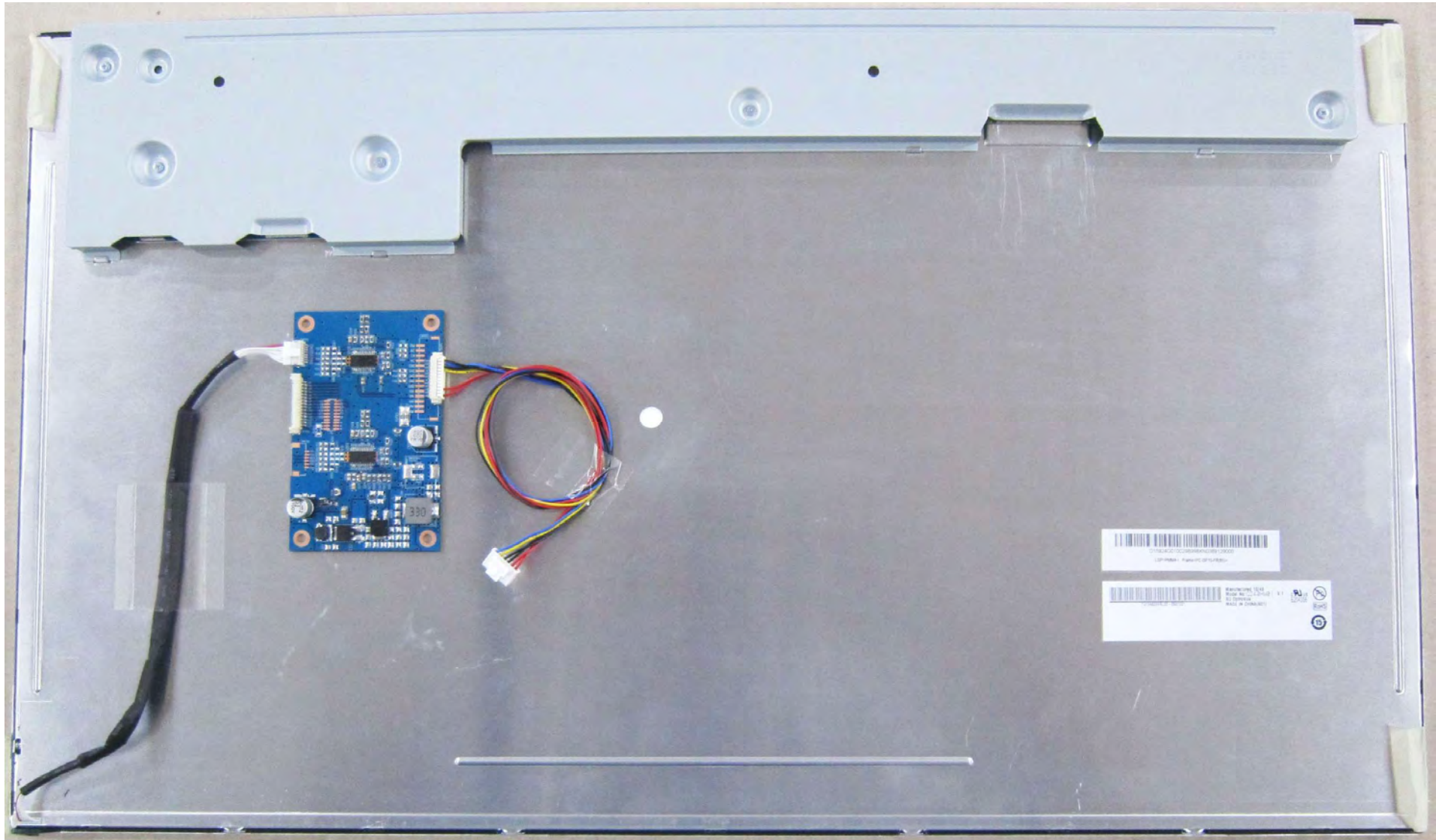
#### 12.1 AUO 24", G240HW01 V1 Panel

This is one of built-in LED Driver, but the built-in LED Driver cannot perform the wide range dimming function. Therefore adopt the CVT-WD2 external type wide range dimming supportable LED Driver instead of built-in one.

Specified LCD Model	Output Connector	No. of BLU CH	Output Voltage Range (V)			Output Constant Current (mA)		
			Min.	Typ.	Max.	Min.	Typ.	Max.
AUO 24", G240HW01 V1	CN500, CI1408M1HRL-NH / CVILUX	7 CH	-	28	-	42.7	45	47.3





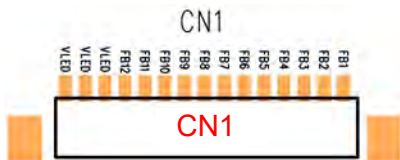
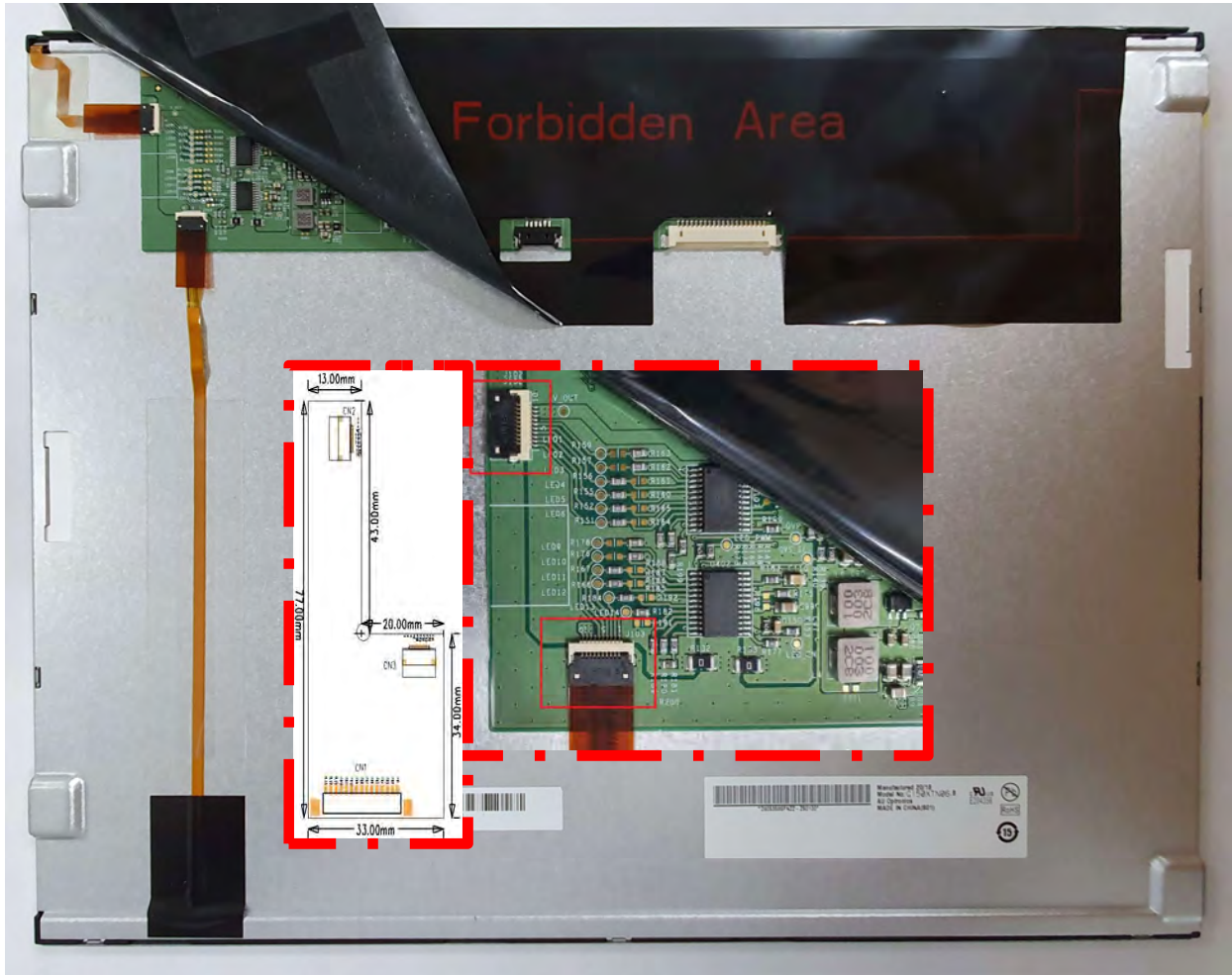


## 12.2 AUO 15", G150XTN06.B Panel

This is one of built-in LED Driver, but the built-in LED Driver cannot perform the wide range dimming function. Therefore adopt the CVT-WD2 external type wide range dimming supportable LED Driver instead of built-in one.

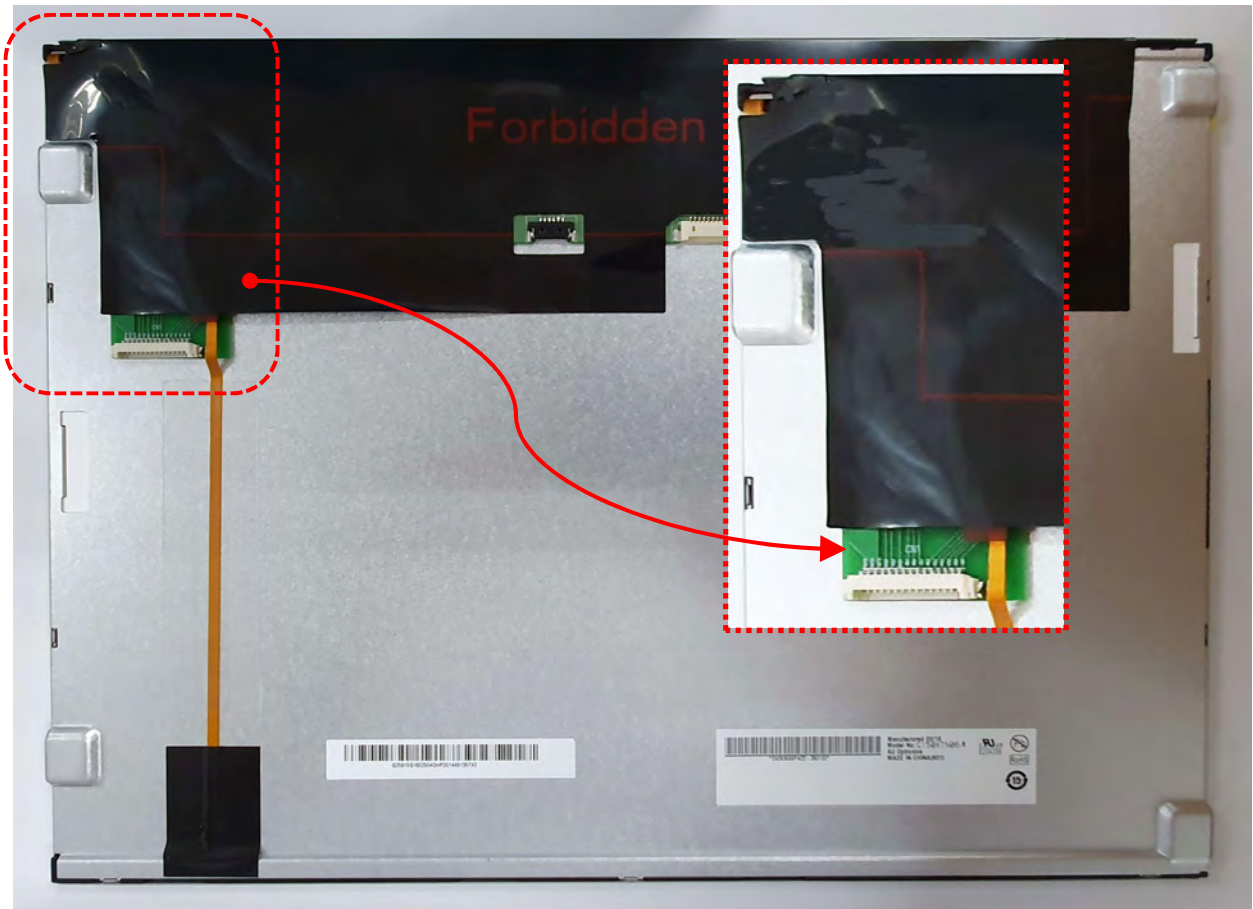
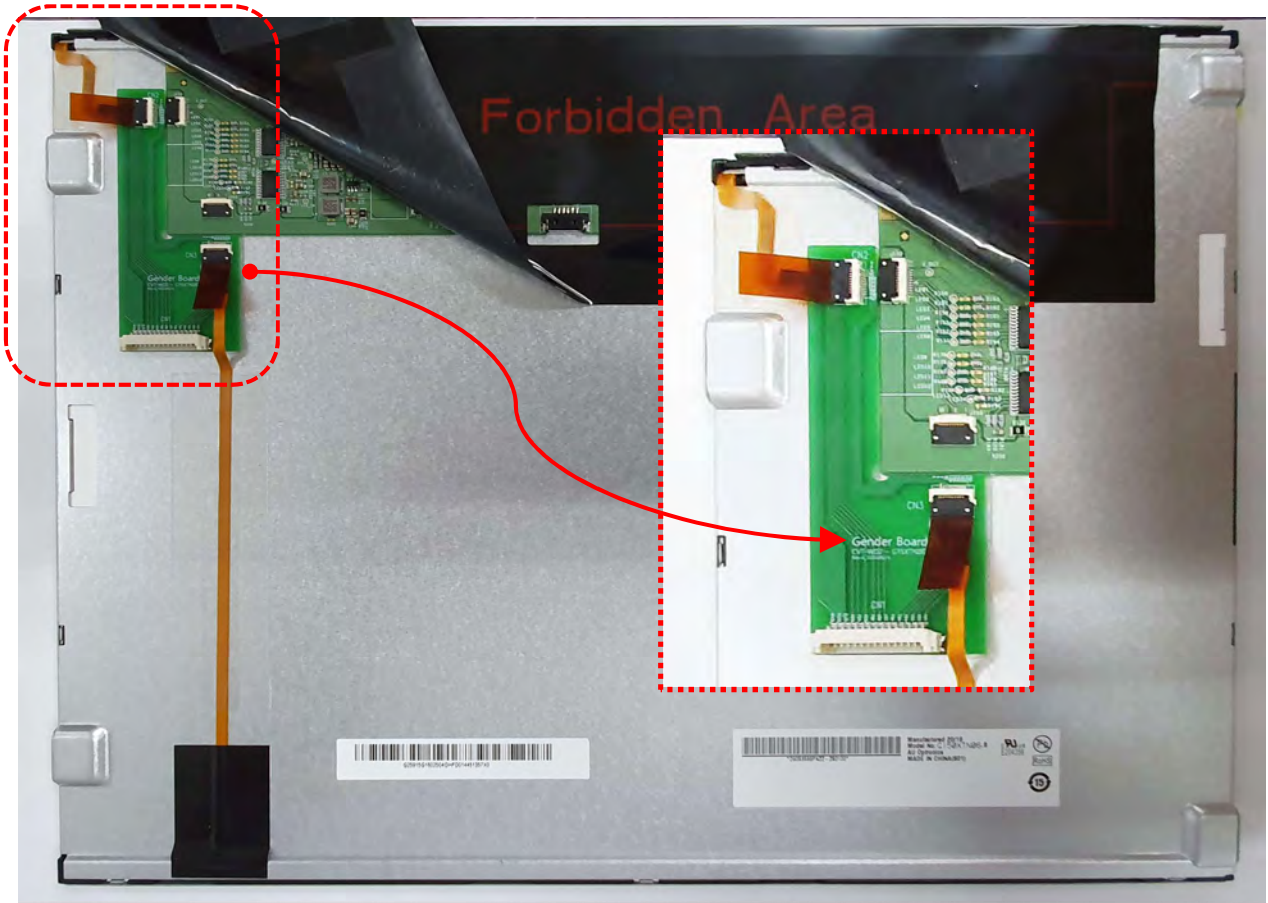
Specified LCD Model	Output Connector	No. of BLU CH	Output Voltage Range (V)			Output Constant Current (mA)		
			Min.	Typ.	Max.	Min.	Typ.	Max.
AUO 15", G150XTN06.B	Daughter Board 24022-MSK / CVILUX	8 CH	-	23.7	-	34.0	<b>35.8</b>	37.6





<b>CN1 : 12505WR-15P</b> (Yeon-Ho / 1.25 Pitch, 15 Pin)					
Pin No	Symbol	Description	Pin No	Symbol	Description
1	VLED	LED Input (Anode)	9	FB6	Feedback 6 / NC
2	VLED	LED Input (Anode)	10	FB7	Feedback 7 (Cathode)
3	VLED	LED Input (Anode)	11	FB8	Feedback 8 (Cathode)
4	FB1	Feedback 1 (Cathode)	12	FB9	Feedback 9 (Cathode)
5	FB2	Feedback 2 (Cathode)	13	FB10	Feedback 10 (Cathode)
6	FB3	Feedback 3 (Cathode)	14	FB11	Feedback 11 / NC
7	FB4	Feedback 4 (Cathode)	15	FB12	Feedback 12 / NC
8	FB5	Feedback 5 / NC			







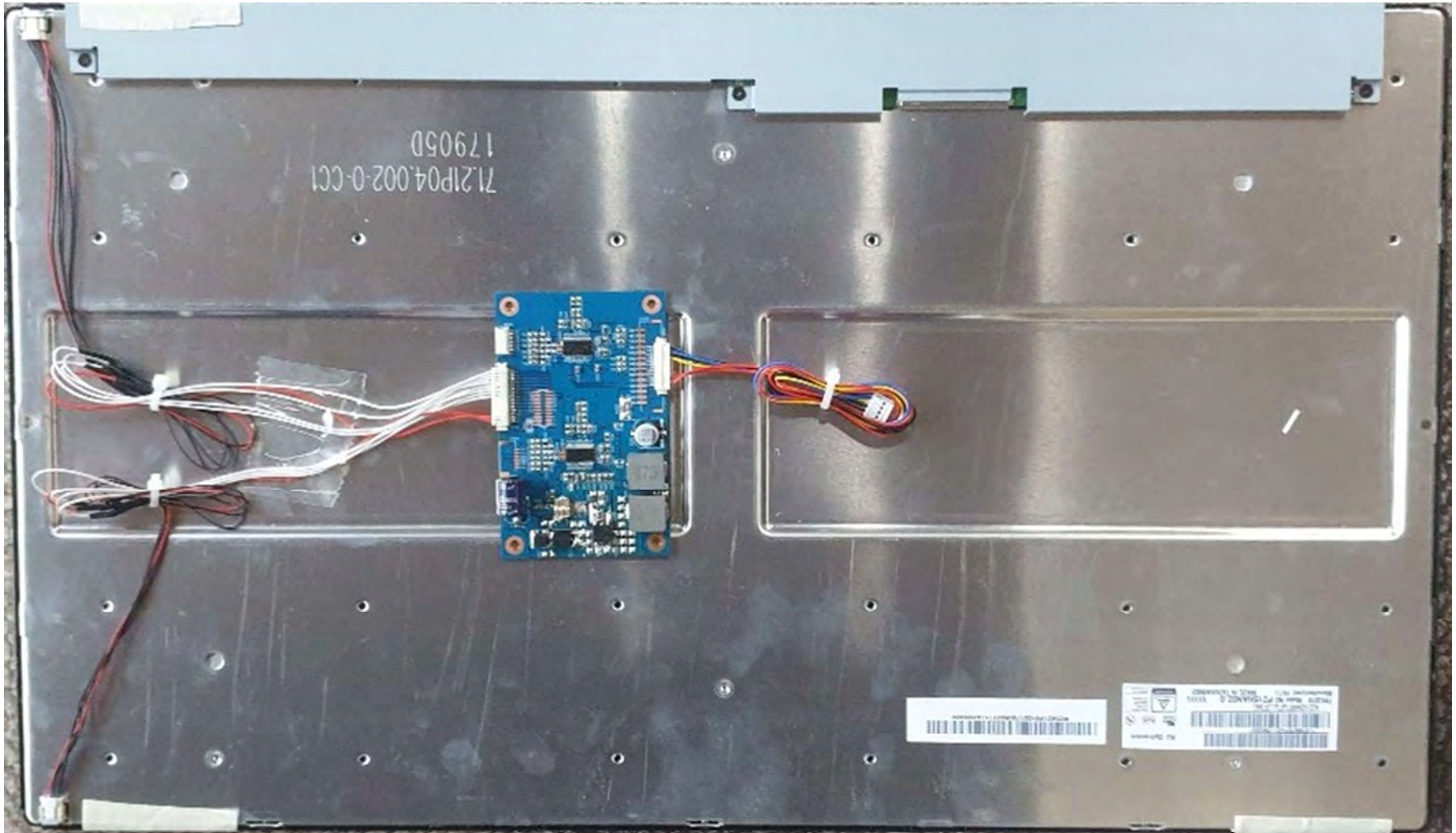


### 12.3 AUO 21.5", P215HAN02.0 Panel

This is a high brightness version LCD Module which has 8 channels, 47mA/Channel, 95.2Vf LED Backlight Rail. Therefore need to adopt this CVT-WD2 at 24V input DC Power and so below spec table including relevant parameters.

Specified LCD Model	Output Connector	No. of BLU CH	Output Voltage Range (V) / LCD Panel Spec			Output Constant Current (mA) / LED Driver Spec		
			Min.	Typ.	Max.	Min.	Typ.	Max.
AUO 21.5", P215HAN02.0	CN2 & CN3 Cvilux, CI16M1VRA-NH	4CH x 2	91.8	95.2	109.3	44.7	<b>47</b>	49.3





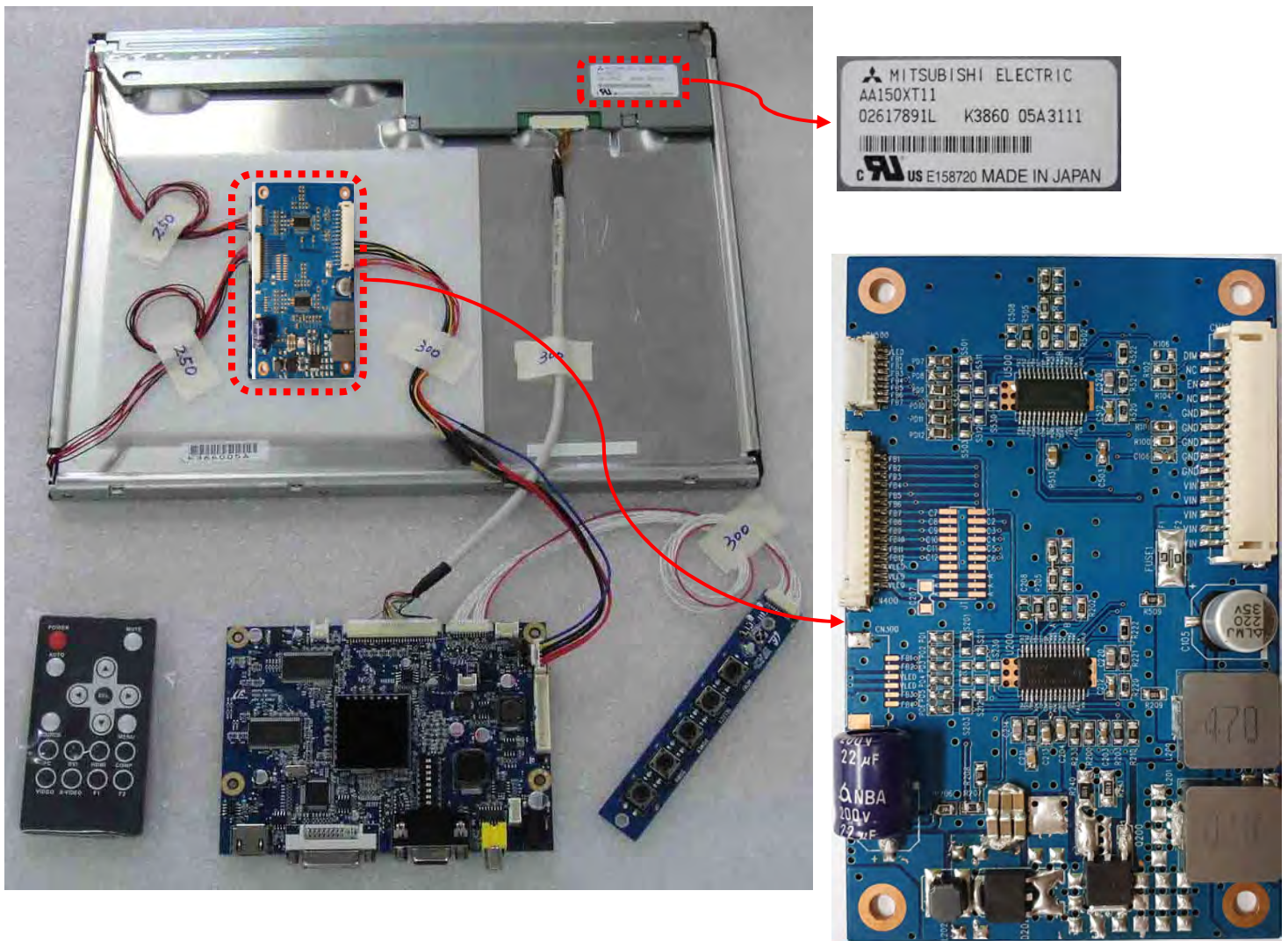


### 12.4 Mitsubishi 15", AA150XT11 Panel

This is a high brightness (1500 cd/m<sup>2</sup>) version LCD Module which has 8 channels, 100mA/Channel, 24Vf LED Backlight Rail.

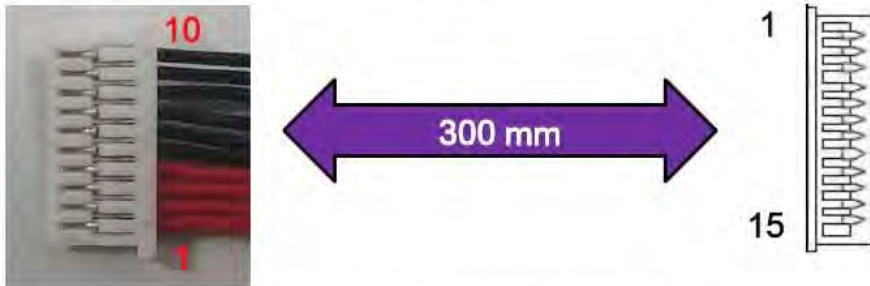
The out voltage is 24Vf, therefore need to adopt this CVT-WD2 at 12V input DC Power & min 3.75 A AC/DC Adaptor and so below spec table including relevant parameters.

Specified LCD Model	Output Connector	No. of BLU CH	Output Voltage Range (V) / LCD Panel Spec			Output Constant Current (mA) / LED Driver Spec		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Mitsubishi 15", AA150XT11	CN2 & CN3, JST, SM10B-SHLS-TF(LF)	4CH x 2	-	24	32.5	-	100	110



- Mating connection cable between the Mitsubishi 15" and CVT-WD2 LED Driver

PN : CBL301-CVTWD2-AA150XT11



WIRE : UL1061 AWG #28

Panel : AA150XT11

Terminal : SSSL-003T-P0.2

W A F E R SM10B-SHLS-TF / JST  
H O U S I N G SHLP-10V-S-B / JST

NC	1
NC	2
LED C1	3
LED A1	4
LED A2	5
LED C2	6
LED C3	7
LED A3	8
LED A4	9
LED C4	10

Terminal : SSSL-003T-P0.2

W A F E R SM10B-SHLS-TF / JST  
H O U S I N G SHLP-10V-S-B / JST

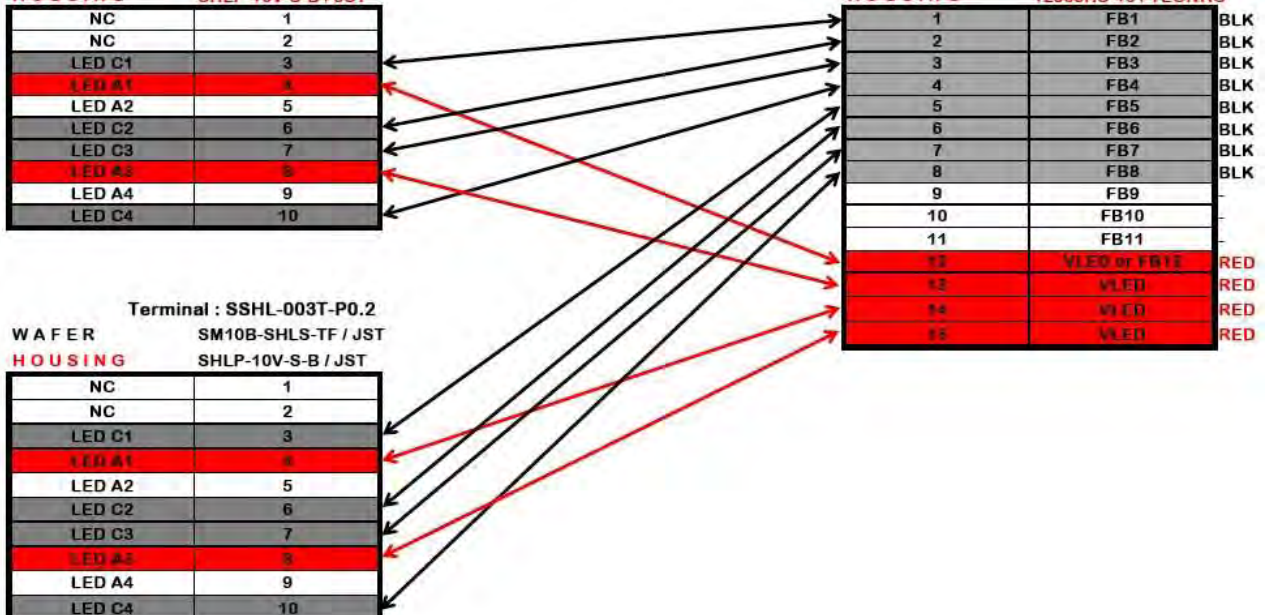
NC	1
NC	2
LED C1	3
LED A1	4
LED A2	5
LED C2	6
LED A3	8
LED A4	9
LED C4	10

LED Driver : CVT-WD2

Terminal : 12505TS

W A F E R 12505WR-15 / YEONHO  
H O U S I N G 12505HS-15 / YEONHO

1	FB1	BLK
2	FB2	BLK
3	FB3	BLK
4	FB4	BLK
5	FB5	BLK
6	FB6	BLK
7	FB7	BLK
8	FB8	BLK
9	FB9	BLK
10	FB10	-
11	FB11	-
12	VLED or FB12	RED
13	VLED	RED
14	VLED	RED
15	VLED	RED





### 12.5 LG 31.5", LM315WR1-SSA1 Panel

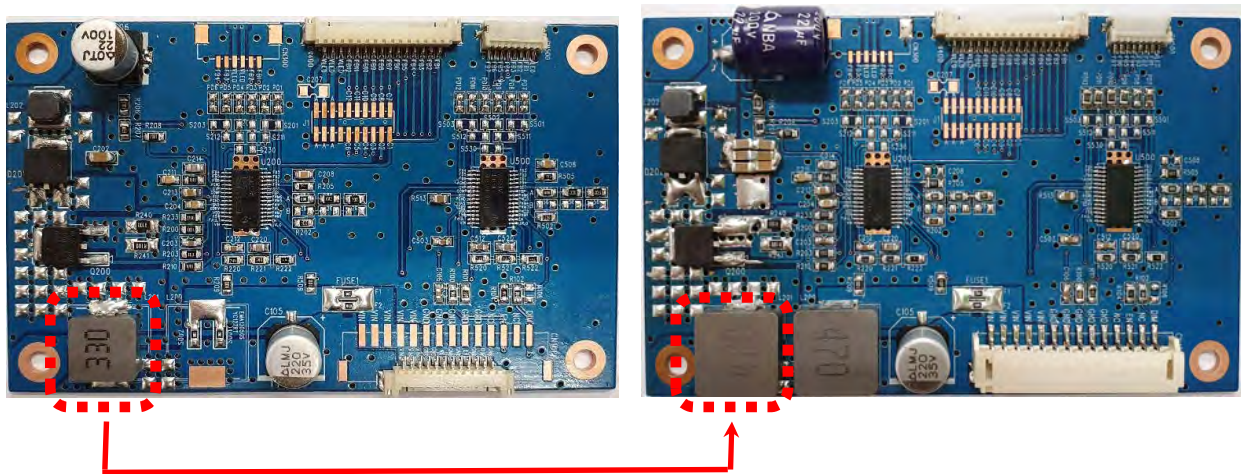
This is 4CH LED Backlight type panel which has been connected by 2 separated connection port, 2 CH each x 2 ports (left and right bottom).

Specified LCD Model	Output Connector	No. of BLU CH	Output Voltage Range (V) / LCD Panel Spec			Output Constant Current (mA) / LED Driver Spec		
			Min.	Typ.	Max.	Min.	Typ.	Max.
LG 31.5", LM315WR1-SSA1	CN2 & CN3, JST, SHJP-06V-S(HF), SHJP-06V-A-K(HF)	4CH	52.5-	56.3	60.1	-	110	

The details of setting guide from standard hardware changing points are ;

- for OVP (over Voltage Protection) setting : R206 at 220k Ohm :
- for current / string setting : R281 at 43K Ohm, 1% type and R282 at 2.2K Ohm, 1% type
- for others setting : R205 at 75k Ohm, PD1 & PD2 at 30K Ohm, and Remove the R1, R2, R3, R509
- Based on input voltage by 24V DC

In case of 12V DC input condition due to the users' environment, the L201 Inductor has to be changed from 33μH to 47μH



The real connection pictures will be enclosed.

## 12.6 LG 27", LM270QQ2-SPA3 Panel

This is 4CH LED Backlight type panel.

Specified LCD Model	Output Connector	No. of BLU CH	Output Voltage Range (V) / LCD Panel Spec			Output Constant Current (mA) / LED Driver Spec		
			Min.	Typ.	Max.	Min.	Typ.	Max.
LG 27", LM270QQ2-SPA3	10035WR-H06D(HF) / Yeon-Ho	4CH	53.8-	54.5	62.1	-	<b>145</b>	150

The details of setting guide from standard hardware changing points are ;

- for OVP (over Voltage Protection) setting : R206 at 220k Ohm :
- for current / string setting : R291 at 33K Ohm, 1% type and R292 at 1.5K Ohm, 1% type
- for FBV (Feed Back Voltage) setting : R205 at 56K Ohm
- for others setting : PD6 & PD5 at 30K Ohm,  
and Change the R1, R2, R3 from 0 Ohm to NC, R509 from 10 Ohm to NC NC
- Based on input voltage by 24V DC

## 13. Appendix – B : Drawings for adopted connectors

The relevant drawing of Applied Connectors can be provided by customers' request additionally.