G057QAN01.1 Proposal & Specification comparison (Low power solution)

ADP GTM BU

2024/09/20

AUO Display+

G057QAN01.1 Proposal for G057QN01 V2 longevity supply

- Purpose : Considering product strategy, ADP would like to deliver EOL notice of G057QN01 V2
- ADP will launch a new model (G057QAN01.1) to replace G057QN01 V2 (ADP part no. : 97D05G01.210)

- Change items

1. Change Cell glass from TN to AHVA (IPS-like) and front-end fab from G3.5 to G5
2. Change Pol type from TN to AHVA (IPS-like)
3. Change PCBA components
4. Change Backlight LED light bar cable from 6 wire to 2 wire

- Desired customer reply date : Before 2024/9/30

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G057QN01 V2 vs. G057QAN01.1 Brief Summary

Model	G057QN01 V2	G057QAN01.1
LCD Surface	AG, 3H	AG, 3H
Mode	TN	**AHVA**
Resolution (pixel)	320 RGB(H) x 240(V)	320 RGB(H) x 240(V)
Active Area (mm)	115.2(H) x 86.4(V)	115.2(H) x 86.4(V)
Pixel Pitch (mm)	0.36(H)×0.36(V)	0.36(H)×0.36(V)
Outline Dimension (mm)	144.0(H) x 104.6(V) x 12.3(T) (Typ.)	144.0(H) x 104.6(V) x 12.3(T) (Typ.) **Keep same as G057QN01 V2**
View Angle (L/R/U/D)	80/80/70/70	**89/89/89/89**
Brightness (nit)	800 (typ.)	800 (typ.)
Contrast Ratio	800	**1000**
LED Life (hrs.)	50K (min)	50K (min)
NTSC Ratio (%)	50	50
Number of Colors	262K colors	262K colors
Response Time (ms)	25 (typ.)	25 (typ.)
Supply Voltage (V)	3.3	3.3
Power Consumption (W)	2.946	1.60 (Typ.)
Interface	Parallel RGB	Parallel RGB
Storage Temp. (℃)	-30~85	-30~85
Operation Temp. (℃)	-30~85	-30~85
PCBA & LED Driver	With	With

Feature

-Wide Viewing Angle
-Higher Contrast Ratio
-Lower power consumption

Low Energy consumption

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Detail Spec comparison

Before (Current model - G057QN01 V2)

2.1 Display Characteristics

The following items are G057QN01 V2 characteristics summary at 25 °C(Room Temperature).

Items	Unit	Specifications
Screen Diagonal	inch	5.7
Active Area	mm	115.2(H) x 86.4(V)
Pixels H x V		320 x 3(RGB) x 240
Pixel Pitch	mm	0.36 x 0.36
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN, Normally White
Nominal Input Voltage VDD	Volt	3.3 typ.
Typical Power Consumption	Watt	2.946 W (LCD: 0.066W / LED BLU: 2.88W) @ All black pattern, Full Load and V_{LED}=12V
Weight	Grams	150g (typ.), 165g (max.)
Physical Size	mm	144.0(H)x 104.6(V) x 12.3(D) (typ.)
Electrical Interface		CMOS 6-bit Parallel RGB
Surface Treatment		Anti-Glare, Hardness 3H
Support Color		262K colors
The most suitable view angle		12 o'clock
Temperature Range Operating Storage (Non-Operating)	 °C °C	 -30 to +85 -30 to +85
RoHS Compliance		RoHS Compliance

New model – G057QAN01.1

2.1 Display Characteristics

The following items are G057QAN01.1 characteristics summary at 25 °C(Room Temperature).

Items	Unit	Specifications
Screen Diagonal	inch	5.7
Active Area	mm	115.2(H) x 86.4(V)
Pixels H x V		320 x 3(RGB) x 240
Pixel Pitch	mm	0.36 x 0.36
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		AHVA mode,Normally Black
Nominal Input Voltage VDD	Volt	3.3 typ.
Typical Power Consumption	Watt	1.60W (LCD:0.09W / LED BLU: 1.51W) @ All white pattern, Full Load and VLED=12V
Weight	Grams	150g (typ.), 165g (max.)
Physical Size	mm	144.0(H)x 104.6(V) x 12.3(D) (typ.)
Electrical Interface		CMOS 6-bit Parallel RGB
Surface Treatment		Anti-Glare, Hardness 3H
Support Color		262K colors
The most suitable view angle		12 o'clock
Temperature Range Operating Storage (Non-Operating)	 °C °C	 -30 to +85 -30 to +85
RoHS Compliance		RoHS Compliance

Detail Spec comparison

Before (Current model - G057QN01 V2)

2.2 Optical Characteristics

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

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
White Luminance	cd/m2	V_{LED} =12V, D_{PWM} =100% (center point)	600	800	-	Note 1
Uniformity	%	5 Points		-	1.3	Note 1, 2, 3
Contrast Ratio			500	800	-	Note 4
Response Time	msec	Rising	-	15	20	Note 5
	msec	Falling	-	10	15	
	msec	Rising + Falling	-	25	35	
Viewing Angle	degree degree	Horizontal (Right) CR = 10 (Left)	70 70	80 80	- -	Note 6
	degree degree	Vertical (Upper) CR = 10 (Lower)	60 60	70 70	- -	
Color / Chromaticity Coordinates (CIE 1931)		White x	0.263	0.313	0.363	
		White y	0.279	0.329	0.379	
		Red x	0.506	0.556	0.606	
		Red y	0.265	0.315	0.365	
		Green x	0.281	0.331	0.381	
		Green y	0.546	0.596	0.646	
		Blue x	0.106	0.156	0.206	
		Blue y	0.070	0.120	0.170	
Color Gamut	%		-	50	-	

New model – G057QAN01.1

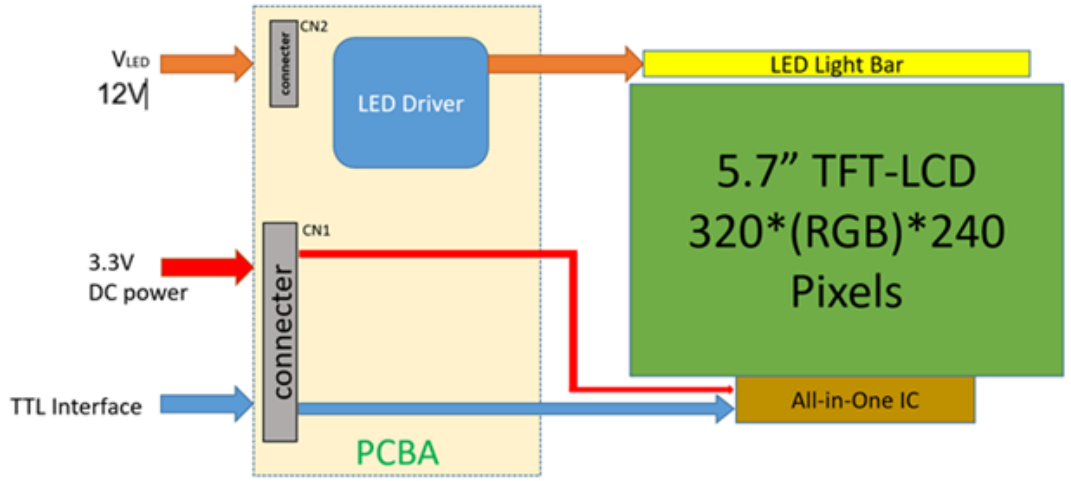
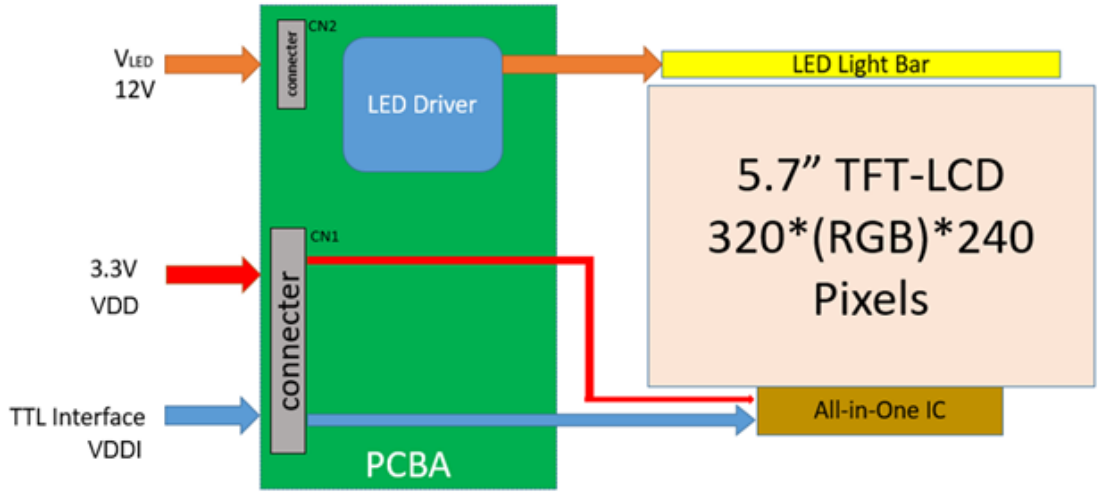
2.2 Optical Characteristics

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

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
White Luminance	cd/m2	V_{LED} =12V, D_{PWM} =100% (center point)	600	800	-	Note 1
Uniformity	%	5 Points		-	1.3	Note 1, 2, 3
Contrast Ratio			700	1000	-	Note 4
Response Time	msec	Rising	-	15	20	Note 5
	msec	Falling	-	10	15	
	msec	Rising + Falling	-	25	35	
Viewing Angle	degree degree	Horizontal (Right) CR = 10 (Left)	80 80	89 89	- -	Note 6
	degree degree	Vertical (Upper) CR = 10 (Lower)	80 80	89 89	- -	
Color / Chromaticity Coordinates (CIE 1931)		White x	0.263	0.313	0.363	
		White y	0.279	0.329	0.379	
		Red x		TBD		
		Red y		TBD		
		Green x		TBD		
		Green y		TBD		
		Blue x		TBD		
		Blue y		TBD		
Color Gamut	%		-	50	-	

Due to the new cell design, the chromaticity need to be changed.
The real chromaticity of R/G/B will be updated by first sample measured.

Detail Spec comparison

Before (Current model - G057QN01 V2)	New model – G057QAN01.1
3. Functional Block Diagram The following diagram shows the functional block of the G057QN01 V2 color TFT/LCD module. 	**3. Functional Block Diagram** The following diagram shows the functional block of the G057QAN01.1 color TFT/LCD module. 

Detail Spec comparison

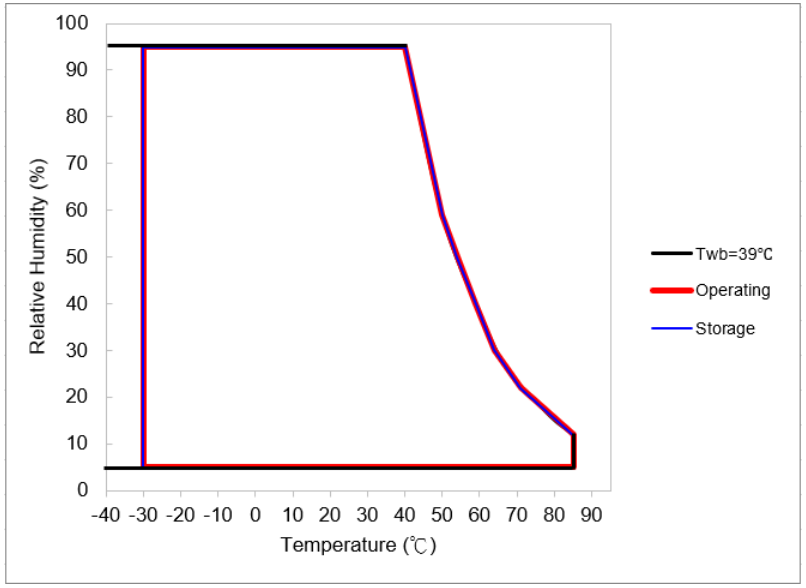
Before (Current model - G057QN01 V2)	New model – G057QAN01.1

4.1 Absolute Ratings

Item	Symbo	Min	Max	Unit	Remark
Logic/LCD Drive Voltage	VDD	-0.3	+4.0	Volt	Ta= 25°C
LCD Input Signal Voltage	VIN	-0.3	+4.0	Volt	Ta= 25°C
LED BLU Drive Voltage	V_{LED}	0	23	Volt	Ta= 25°C
LED Dimming Input Voltage	V_{PWM}	0	8	Volt	Ta= 25°C

4.1 Absolute Ratings of TFT LCD Module

Item	Symbol	Min	Max	Unit	Remark
Logic/LCD Drive Voltage	VDD	-0.3	+4.0	Volt	Ta= 25°C
LCD Input Signal Voltage	VIN	-0.3	+4.0	Volt	Ta= 25°C
LED BLU Drive Voltage	V_{LED}	-0.3	+26.5	Volt	Ta= 25°C
LED Dimming Input Voltage	V_{PWM}	-0.3	+26.5	Volt	Ta= 25°C
LED On/Off Input Voltage	$V_{LED\ On/Off}$	-0.3	+26.5	Volt	Ta= 25°C



Detail Spec comparison

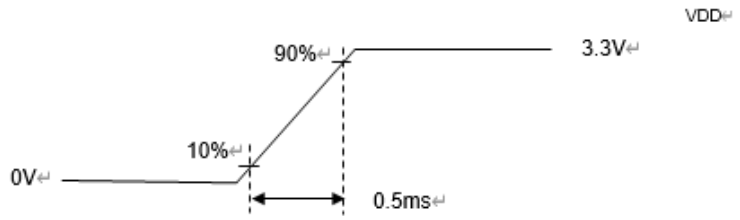
Before (Current model - G057QN01 V2)

5.1 TFT-LCD Driving

5.1.1 Power Specification

Symbol	Parameter	Min	Typ	Max	Units	Remark
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	Volt	
IDD	VDD Current	-	20	24	mA	All Black Pattern (VDD=3.3V, at 60Hz)
Irush	LCD Inrush Current	-	-	280	mA	Note 1
PDD	VDD Power	-	0.066	0.079	Watt	All Black Pattern (VDD=3.3V, at 60Hz)
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	mVp-p	All Black Pattern (VDD=3.3V, at 60Hz)

Note 1: Measurement condition:



VDD rising time

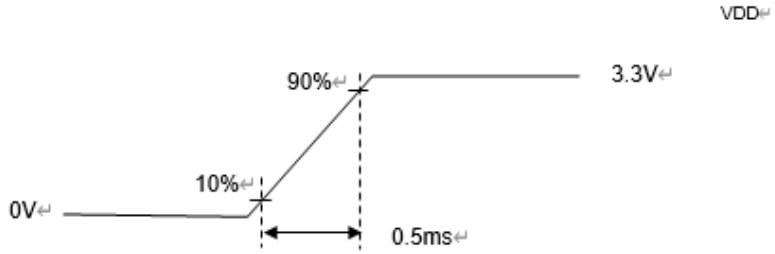
New model – G057QAN01.1

5.1 TFT-LCD Driving

5.1.1 Power Specification

Symbol	Parameter	Min	Typ	Max	Units	Remark
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	
VDDI	LCD Input Signal Voltage	3.0	3.3	3.6	[Volt]	
IDD	VDD Current	-	27	30	[mA]	All White Pattern (VDD=3.3V, at 60Hz)
Irush	LCD Inrush Current	-	-	280	[A]	Note 1
PDD	VDD Power		0.09	0.1	[Watt]	All White Pattern (VDD=3.3V, at 60Hz)
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	mVp-p	All White Pattern (VDD=3.3V, at 60Hz)

Note 1: Measurement condition:



VDD rising time

Due to the AHVA new cell characteristics, IDD current, PDD (VDD power) will be changed.

Detail Spec comparison

Before (Current model - G057QN01 V2)

5.2 Backlight Unit Driving

5.2.1 Parameter guideline for LED

Following characteristics are measured under stable condition at 25°C (Room Temperature).

Symbol	Parameter	Min	Typ	Max	Units	Remark
V_{LED}	Input Voltage	9	12	20	Volt	
I_{LED}	Input Current	-	0.24	0.29	A	V_{LED} =12V, D_{PWM} =100%
P_{LED}	Power Consumption	-	2.88	3.48	W	V_{LED} =12V, D_{PWM} =100%
$Irush_{LED}$	Inrush Current	-		1.5	A	V_{LED} =12V, D_{PWM} =100%
$V_{PWM\ DIM}$	Dimming control Voltage High	2.0	3.3	5.5	Volt	Note 1,2
	Dimming control Voltage Low	-	-	0.2	Volt	
F_{PWM}	Dimming Frequency	200		30K	Hz	
D_{PWM}	Dimming duty cycle	1		100	%	
$V_{LED\ On/Off}$	On Control Voltage	2	3.3	5.5	Volt	Note 3, 4
	Off Control Voltage	-	-	0.8	Volt	
I_F	LED Forward Current		100		mA	Ta = 25oC
V_F	LED Forward Voltage		25.6	29.2		IF = 100mA, Ta = 25oC
P_{LED}	LED Power		2.56	2.92		
Operating Life		50000	-	-	Hrs	Note 5, 6

New model – G057QAN01.1

5.2 Backlight Unit Driving

5.2.1 Parameter guideline for LED

Following characteristics are measured under stable condition at 25°C (Room Temperature).

Symbol	Parameter	Min	Typ	Max	Units	Remark
V_{LED}	Input Voltage	9	12	20	Volt	
I_{LED}	Input Current	-	0.126	0.132	A	V_{LED} =12V, D_{PWM} =100%
P_{LED}	Power Consumption	-	1.51	1.59	W	V_{LED} =12V, D_{PWM} =100%
$Irush_{LED}$	Inrush Current	-		1.5	A	V_{LED} =12V, D_{PWM} =100%
$V_{PWM\ DIM}$	Dimming control Voltage High	2.0	3.3	5	Volt	Note 1,2
	Dimming control Voltage Low	-	-	0.15	Volt	
F_{PWM}	Dimming Frequency	200		25K	Hz	
D_{PWM}	Dimming duty cycle	1		100	%	
$V_{LED\ On/Off}$	On Control Voltage	2	3.3	5	Volt	Note 3, 4
	Off Control Voltage	-	-	0.6	Volt	
I_F	LED Forward Current		57		mA	Ta = 25oC
V_F	LED Forward Voltage	22.4	23.6	24.8	Volt	IF = 57 mA, Ta = 25°C
Operating Life		50,000	-	-	Hrs	Note 5, 6, 7

Note 7: The test condition is 57mA in 25℃room temperature.

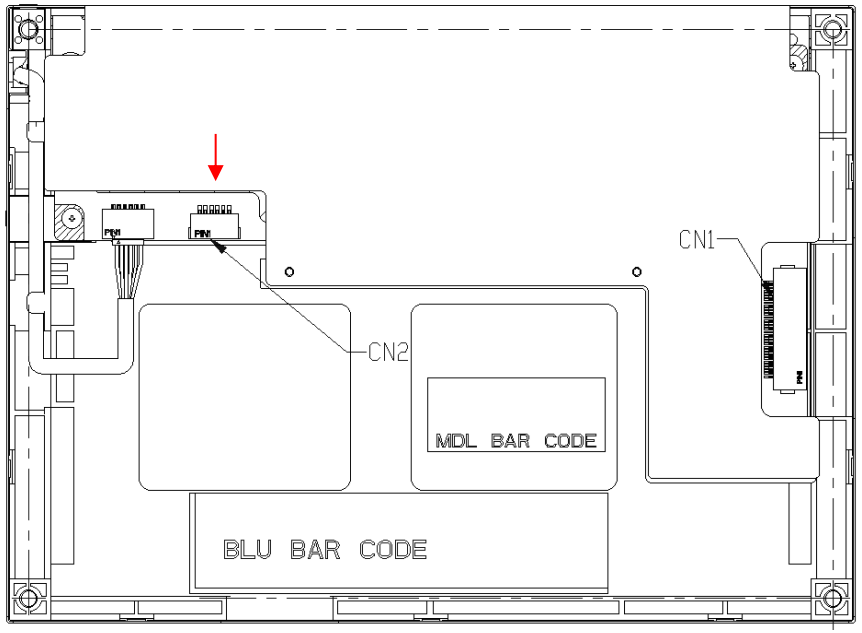
Due to the new backlight unit & LED type, some backlight parameter will be changed.

Detail Spec comparison

Before (Current model - G057QN01 V2)	New model – G057QAN01.1

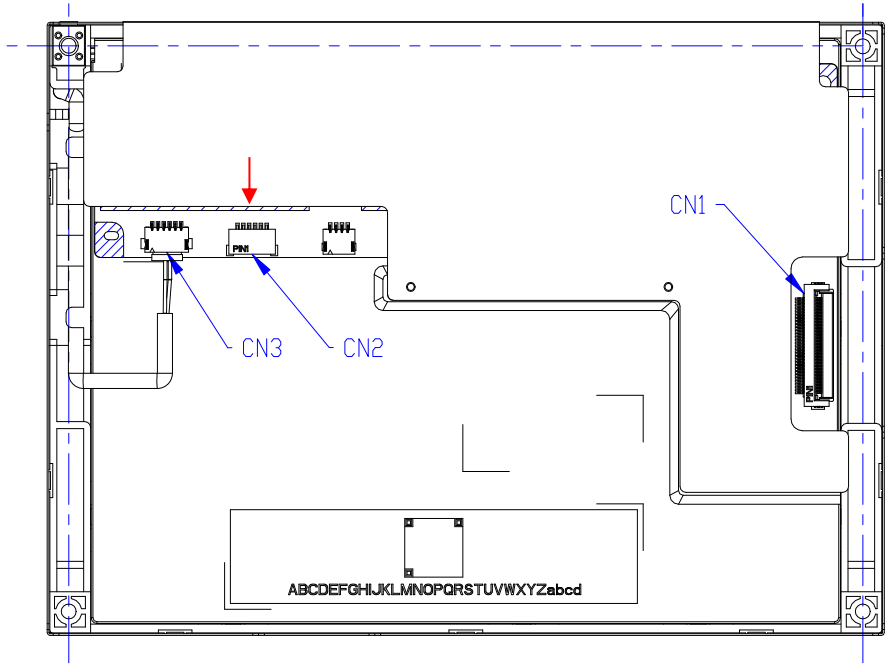
7.2 LED Backlight Unit (CN2): Backlight Connector

Manufacturer	JST
Connector Model Number	SM06B-SRKS-G-TB compatible with JST SM06B-SRSS-TB (LS) (SN)
Mating Connecter Model Number	JST SHR-06V-BKHF-B or compatible



7.2 LED Backlight Unit (CN2): Backlight Connector

Manufacturer	CviLux
Connector Model Number (female)	CI1106M1HR0-NH or compatible with SM06B-SRKS-G-TB
Mating Connecter Model Number (male)	JST SHR-06V-BKHF-B or compatible



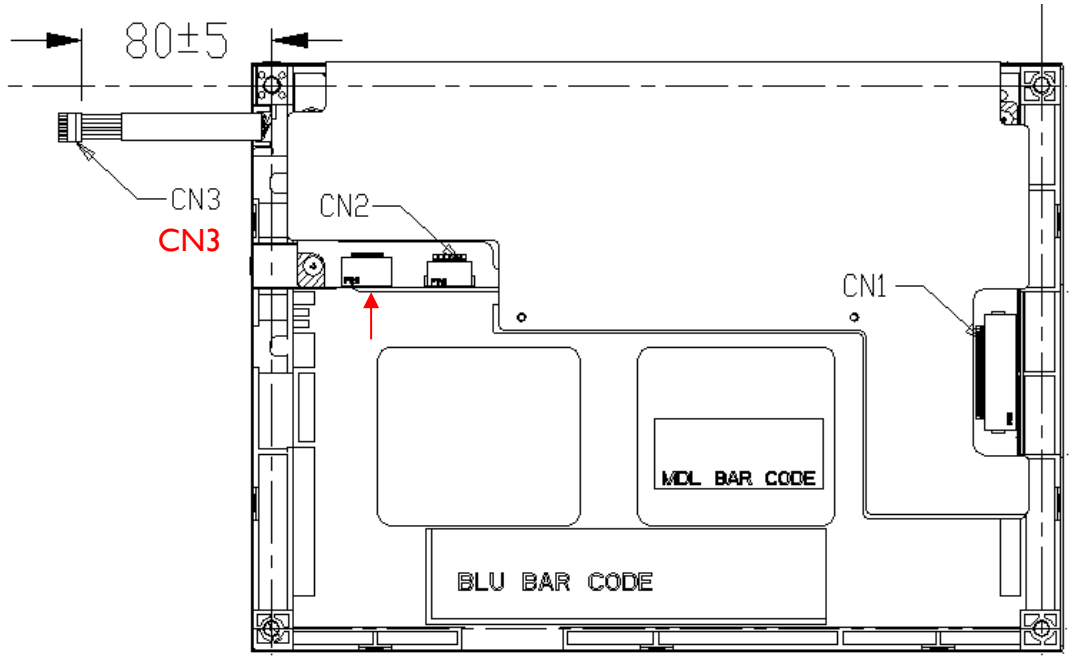
Change CN2 (backlight connector) from JST to CviLux for longevity supply.
CviLux connector is pin compatible with JST.

Detail Spec comparison

Before (Current model - G057QN01 V2)	New model – G057QAN01.1

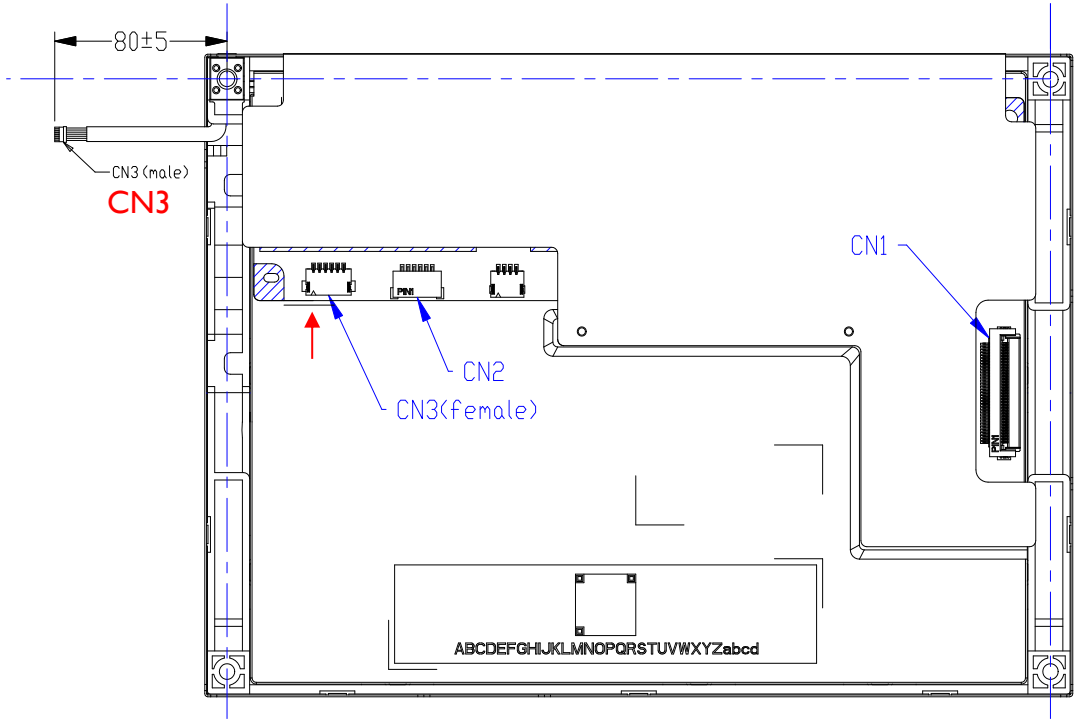
7.3 LED Light Bar Input (CN3): Light Bar Connector

Manufacturer	STM or compatible
Connector Model Number	P24021P6 or compatible
Mating Connecter Model Number	JST SM06B-SHLK-G-TF or compatible



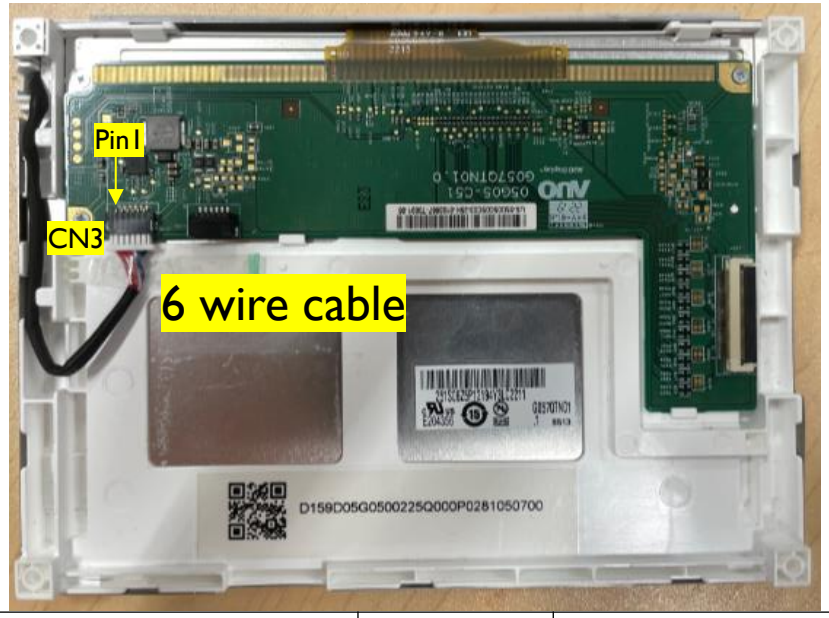
7.3 LED Light Bar Input (CN3): Light Bar Connector

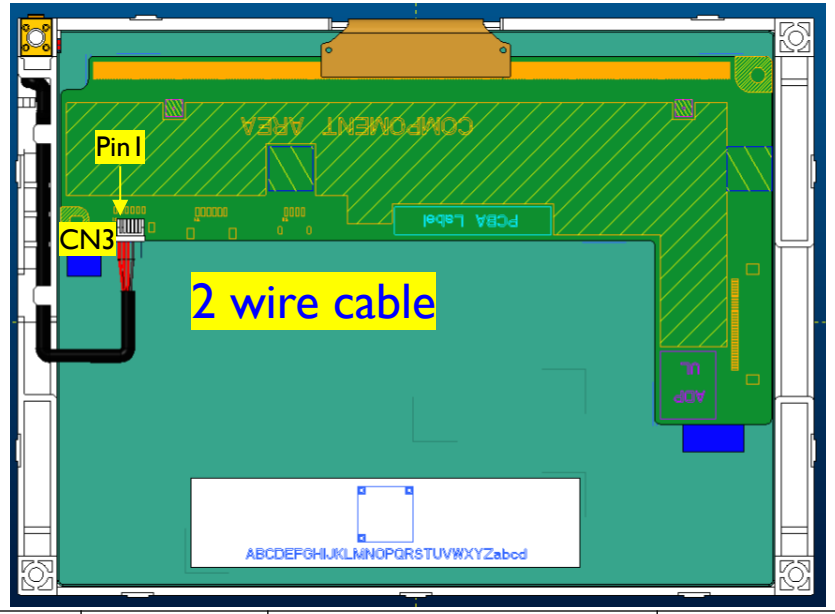
Manufacturer	STM or compatible
Connector Model Number (male)	P24021P6 or compatible
Mating Connecter Model Number (female)	JST / SM06B-SHLK-GTF(HF) or compatible



Add more description of CN3 Light bar connector

CN3 : New LED Lightbar Cable Proposal





Pin #	Symbol	Pin Description on Connector side	Cable` color	Corresponds to the pin assignment on the PCBA
1	AN1	Channel 1 LED anode	Red	VLED+
2	AN2	Channel 2 LED anode	Red	VLED+
3	AN3	Channel 3 LED anode	Red	VLED+
4	CA1	Channel 1 LED cathode	White	VLED-
5	CA2	Channel 2 LED cathode	Blue	NC
6	CA3	Channel 3 LED cathode	Black	NC

It is composed of 8 LEDs connected in series; total LED current is 100mA per string.

Pin #	Symbol	Pin Description on Connector side	Cable color	Corresponds to the pin assignment on the PCBA
1	NC	-	-	-
2	NC	-	-	-
3	AN1	Channel 1 LED anode	Red	VLED+
4	CA1	Channel 1 LED cathode	White	VLED-
5	NC	-	No cable	NC
6	NC	-	No cable	NC

It is composed of 8 LEDs connected in series; total LED current is 57mA per string.

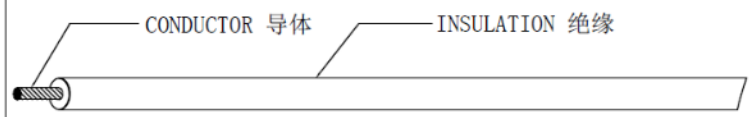
We are proposal to keep only 1 cathode cable & 1 anode cable is enough. Please confirm if it OK?

If customers does not use an additional LED driver board to drive the LEDs, this design change is not necessary.

CN3 : New LED Lightbar Cable Proposal

Cable Spec.

规 格 承 认 书
SPECIFICATION FOR APPROVAL

规格型号 SPEC NO.	UL10368系列		
额定温度 RATED TEMPERATURE	-40~105℃	额定电压 RATED VOLTAGE	300V
环保标准 ENVIRONMENTAL STANDARDS	ROHS	参照标准 REFERENCE STANDARD	UL758-2022
CONSTRUCTION FIGURE 结构简图			

TECHNICAL PARAMETERS 技术参数

AWG 线号数	NO./mm (±0.008) 线数/线径	Dia. (mm) 导体外径	Nom. Thick. (mm) 平均厚度	Dia. (mm) 成品外径	COND. RESISTANCE 导体电阻(Ω/KM20℃)	INSU. RESISTANCE 绝缘电阻(MΩ/KM20℃)	DIELECTRIC TEST 耐压测试(AC V/min)
32	7/0.08TS	0.24(Ref)	0.23	0.6±0.1	588	≥100	2000
30	7/0.10TS	0.30(Ref)	0.23	0.7±0.1	381	≥100	2000
28	7/0.127TS	0.38(Ref)	0.23	0.8±0.1	239	≥100	2000
26	7/0.16TS	0.48(Ref)	0.23	1.0±0.1	150	≥100	2000
24	11/0.16TS	0.61(Ref)	0.23	1.1±0.1	94.2	≥100	2000

Wire cable rating Amp Spec. table

線號/線徑/耐電流對照表
Wire Guage VS Rating Amp Cross Reference

2018-01-26

Guage	Diameter	Amp	Guage	Diameter	Amp	Guage	Diameter	Amp
AWG #2/0	9.2660	532	AWG #15	1.4480	13.00	AWG #31	0.2261	0.3200
AWG #0	8.2510	424	AWG #16	1.2950	10.00	AWG #32	0.2007	0.2500
AWG #1	7.3480	336	AWG #17	1.1430	8.40	AWG #33	0.1803	0.2000
AWG #2	6.5440	266	AWG #18	1.0160	6.40	AWG #34	0.1600	0.1600
AWG #3	5.8270	208	AWG #19	0.9140	5.20	AWG #35	0.1422	0.1250
AWG #4	5.1890	166	AWG #20	0.8130	4.00	AWG #36	0.1270	0.1000
AWG #5	4.6210	132	AWG #21	0.7240	3.20	AWG #37	0.1180	0.0811
AWG #6	4.1150	104	AWG #22	0.6430	2.50	AWG #38	0.1016	0.0644
AWG #7	3.6580	83	AWG #23	0.5740	2.00	AWG #39	0.0889	0.0499
AWG #8	3.2510	65	AWG #24	0.5106	1.60	AWG #40	0.0787	0.0388
AWG #9	2.8960	52	AWG #25	0.4547	1.30	AWG #41	0.0711	0.0311
AWG #10	2.5910	41	AWG #26	0.4039	1.00	AWG #42	0.0633	0.0255
AWG #11	2.3100	33	AWG #27	0.3606	0.80	AWG #43	0.0564	0.0199
AWG #12	2.0570	26	AWG #28	0.3200	0.65	AWG #44	0.0502	0.0166
AWG #13	1.8290	21	AWG #29	0.2870	0.50	AWG #45	0.0417	
AWG #14	1.6260	16	AWG #30	0.2540	0.40			

Unit : A

- G057QAN01.1 total LED current is 57mA per string.
- The current capacity of this LED cable (AWG #28) is ≤650mA.

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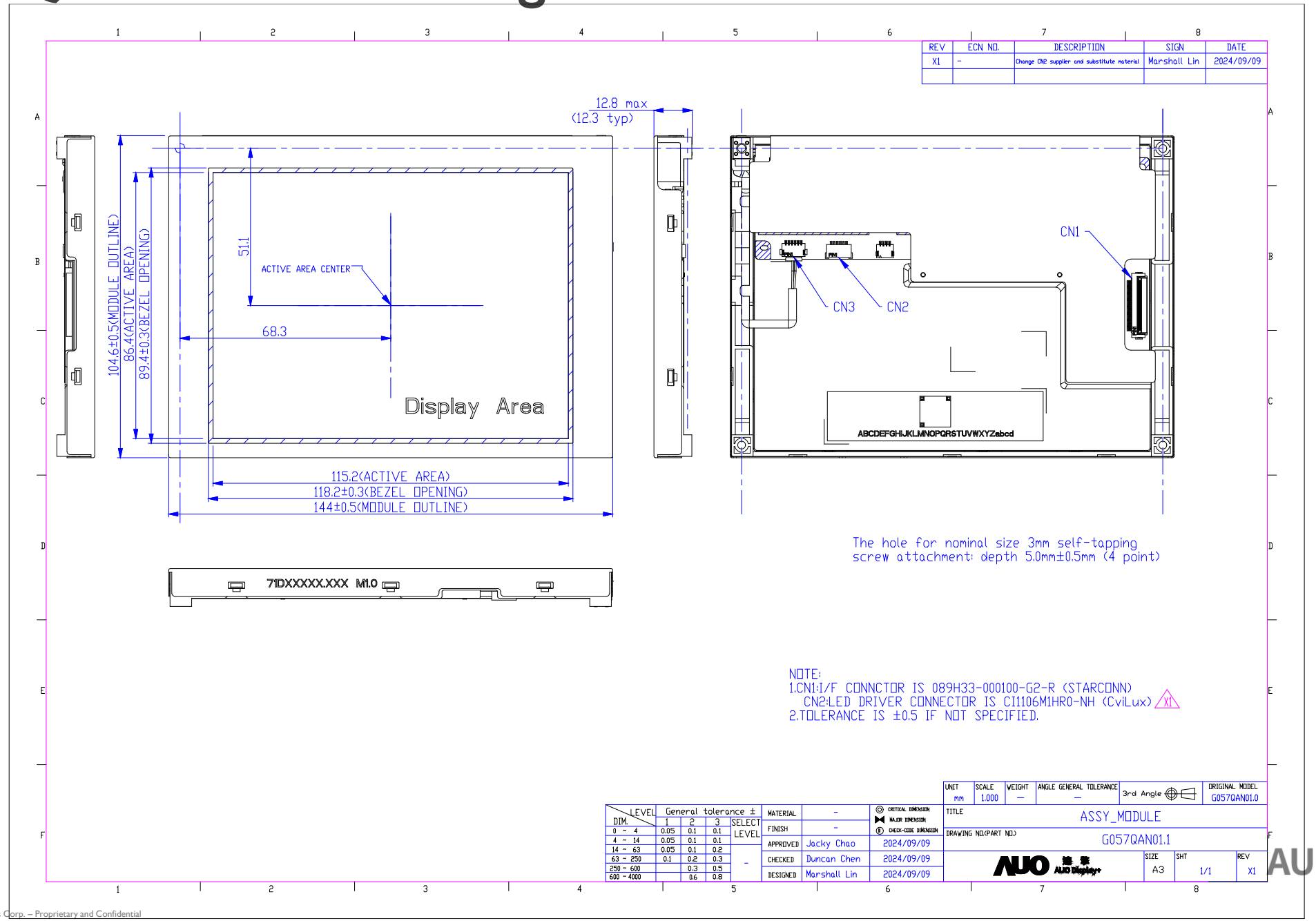
G057QAN01.1 2D drawing



Others Spec

The following relevant specifications of G057QAN01.1 are the same as old models (G057QN01 V2)

5.1.2 TFT LCD Module Signal Electrical Characteristics

6.1 Pixel Format Image
6.2 Scanning Direction
6.3 TFT- LCD Interface Signal Description
6.4 The Input Data Format
6.5 Interface Timing
6.6 LED Backlight Unit Interface Signal Description
6.7 Power ON/OFF Sequence

8. Reliability Test Criteria

Need customer feedback

Q1 : For lower power consumption performance, G057QAN01.1 total LED current is 57mA per string, please confirm if it OK?

Q2 : We are proposal to keep only 1 cathode cable & 1 anode cable is enough. Please confirm if it OK?
If customers does not use an additional LED driver board to drive the LEDs, this design change is not necessary.

Bright Innovation Amazing Life