MODEL NO. : G1601FP104GG-001

ISSUED DATE: 2017-12-01

VERSION : A0

■Preliminary Specification
□Final Product Specification

Customer :

Approved by	Notes

GVO Confirmed :

Prepared by	Checked by	Approved by

This technical specification is subjected to change without notice.

Table of Contents

Record of Revision

Rev	Issue Date	Description	Editor
A0	2017-12-01	Draft	Yu Wei

1   General Specifications

Feature		Spec	Remark
Display Spec	Screen Size (inch)	6.01	
	Display Mode	AMOLED	
	Resolution(dot)	1080(W)×2160(H)	
	Active Area(mm)	68.256(W)×136.512 (H)	
	Pixel Pitch (um)	63.2 (W)×63.2(H)	
	Technology Type	LTPS	
	Color Depth	16.7M	
	Interface	MIPI 4LANE	
	Surface Treatment	Hard Coating	
Mechanical Characteristics	With TP/Without TP	With TP(on Cell)	
	Module Outline Dimension(W x H x D) (mm)	70.066(W)x140.917(H)x0.723(D)	
	Weight (g)	TBD	
Electronic	Driver IC(Type)	RM69299	
	Touch IC(Type)	GT1151	

Note 1: Requirements on Environmental Protection: RoHS.

2   Input/output Terminals

2.1   Main FPC Pin Assignment

FPC connector: BM24-50DS/2-0.35V(51) (Socket), B-TO-B Connector.

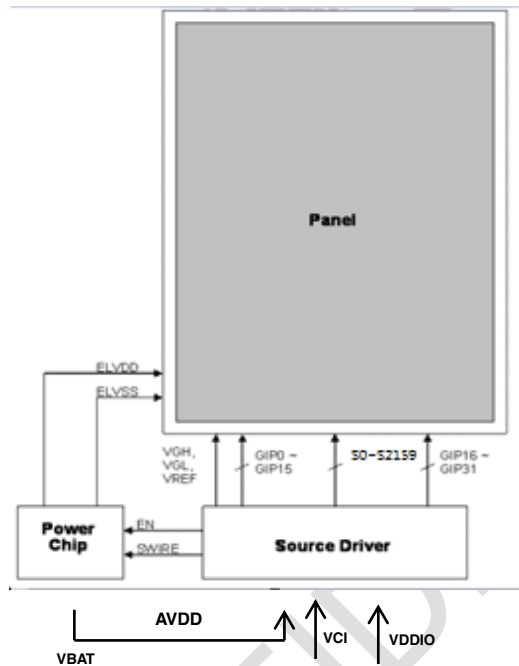Main board recommended connector: BM24-50DP/2-0.35V(51) (Header), B-TO-B Connector.

No	Symbol	I/O	Description
1	GND	GND	Ground
2	ELVSS	P	Negative power supply for EL
3	VPP	P	Power supply for MTP Programming or Erase. If it is not used, please let it open.
4	ELVSS	P	Negative power supply for EL
5	GND	GND	Ground
6	ELVSS	P	Negative power supply for EL
7	D3N	I	MIPI data lane
8	GND	GND	Ground
9	D3P	I	MIPI data lane
10	ELVDD	P	Positive power supply for EL
11	GND	GND	Ground
12	ELVDD	P	Positive power supply for EL
13	D0N	I	MIPI data lane
14	ELVDD	P	Positive power supply for EL
15	D0P	I	MIPI data lane
16	GND	GND	Ground
17	GND	GND	Ground
18	RESX	I	Display reset. Active low.
19	CLKN	I	MIPI clock lane
20	AVDD_EN	O	Power IC enable control pin
21	CLKP	I	MIPI clock lane
22	SWIRE	O	Control signal for power IC
23	GND	GND	Ground
24	ERR_FG	O	Error status of MIPI's HSDT
25	D1N	I	MIPI data lane

26	PCD	I	panel crack detection
27	D1P	I	MIPI data lane
28	TE	I	Sync Signal for preventing Tearing Effect
29	GND	GND	Ground
30	GND	GND	Ground
31	D2N	I	MIPI data lane
32	TSP_AVDD_3.3V	P	Analog Power for TP
33	D2P	I	MIPI data lane
34	AVDD	P	Power supply for Analog system
35	GND	GND	Ground
36	VCI	P	Power supply for display analog circuits
37	TSP_DVDD_1.8V	P	Power supply for TP logic circuits
38	VDDIO	P	Power supply for interface system except MIPI/MDDI interface
39	TSP_TA	NC	
40	GND	GND	Ground
41	TSP_INT	I	Interrupt signal for TP
42	F_SCLK	I	Flash signal
43	TSP_SCL	I	SCL pin for TP
44	F_CSN	I	Flash signal
45	TSP_SDA	I/O	SDA pin for TP
46	F_IO<0>	I/O	Flash signal
47	TSP_RESET	I	Reset Pin for TP, Active low.
48	F_IO<1>	I/O	Flash signal
49	GND	GND	Ground
50	GND	GND	Ground

Note: I=Input; O=Output; P=Power; I/O=Input / Output

2.2 Circuit block diagram (Display)

2.3 MCU and Display Module Interface Configuration

3   Absolute Maximum Ratings

3.1   Driving AMOLED Panel

Maximum Ratings (Voltage Referenced to VSS) Vss=0V, Ta=25℃

Item	Symbol	MIN	MAX	Unit
Analog Power supply	VCI	-0.3	+5.5	V
Logic Power supply	VDDIO	-0.3	+5.5	V
Positive Power Input	ELVDD	-	+5.0	V
Negative Power Input	ELVSS	-5.0	-	V
TP power supply Input	TSP_AVDD	-0.3	+4.2	V
TP power supply for logic circuits	TSP_DVDD	-0.3	+4.2	V

Note: Functional operation should satisfy the limits in the Electrical Characteristics tables or Pin Description section. If the module exceeds the absolute maximum ratings, permanent damage may occur. Besides, if the module is operated with the absolute maximum ratings for a long time, the reliability may also drop.

4   Electrical Characteristics

4.1   Driving AMOLED Panel

Item		Symbol	MIN	TYP	MAX	Unit
Logic Power supply		VDDIO	1.65	1.80	3.3	V
Analog Power supply		VCI	2.5	2.80	3.60	V
ELVDD Supply Voltage		ELVDD	4.55	4.60	4.65	V
ELVSS Supply Voltage		ELVSS	-5	-3	-	V
TP power supply Input		TSP_AVDD	2.6	2.8	3.3	V
TP power supply for logic circuits		TSP_DVDD	1.53	1.8	3.3	V
Input Signal Voltage	High Level	VIH	0.80*VDDIO	-	VDDIO	V
	Low Level	VIL	0.00	-	0.20*VDDIO	V
Output Signal Voltage	High Level	VOH	0.80*VDDIO	-	VDDIO	V
	Low Level	VOL	0.00	-	0.20*VDDIO	V
Normal		I_{ELVDD} /I_{ELVSS}	-	TBD	TBD	mA
		I_{VCI}	-	TBD	TBD	mA
		I_{VDDIO}	-	TBD	TBD	mA
		I_{avdd}	-	TBD	TBD	mA
Stand-by		I_{VCI}	-	TBD	TBD	uA
		I_{VDDIO}	-	TBD	TBD	uA

Ta=25℃

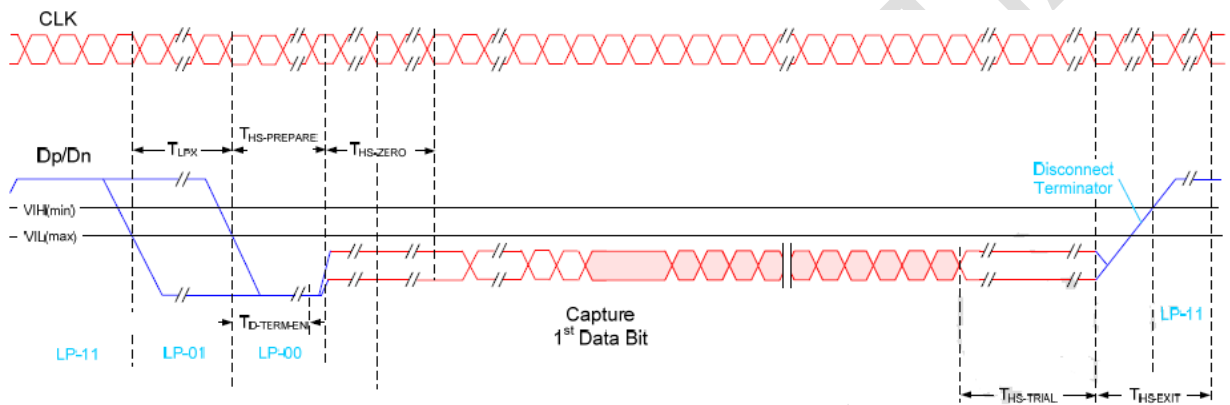Note1: The input digital voltage is the I/O reference voltage.

Note2: VDDIO usually ranges from 1.65V to 3.3 V. If VDDIO is changed, the remaining voltage needs to be changed to the same voltage as VDDIO.

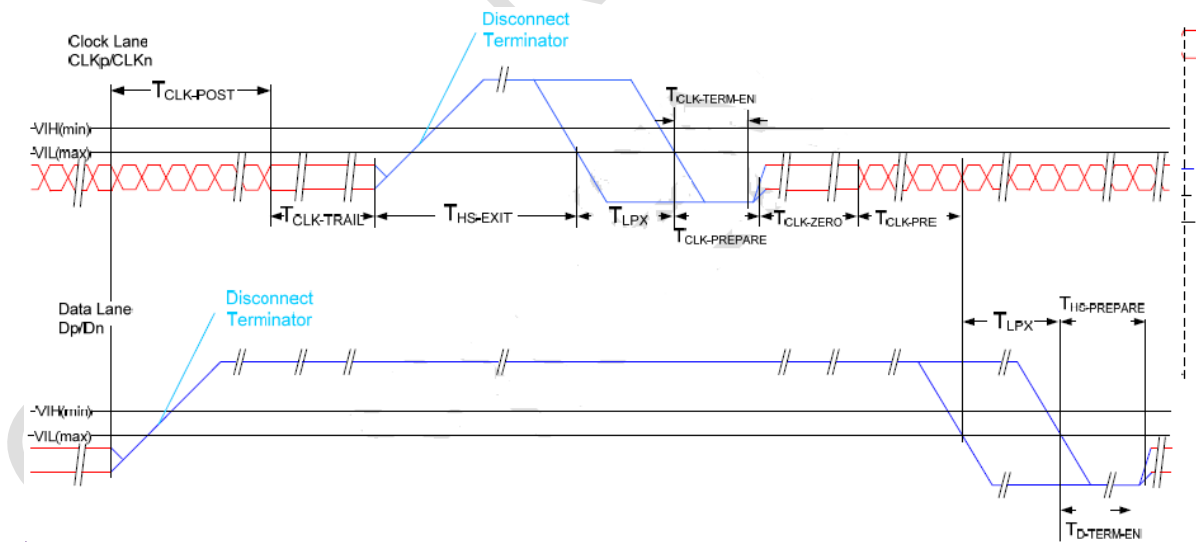Note3: Under full white pattern, Video Mode 60Hz.

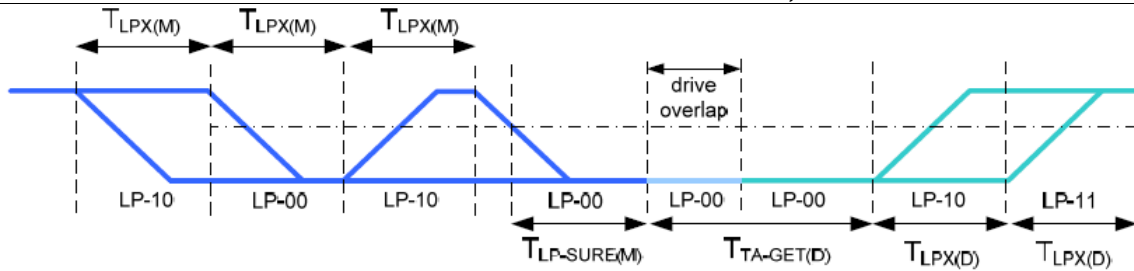Note4: 60Hz command mode at 800 Mbps.

5 AC Characteristics

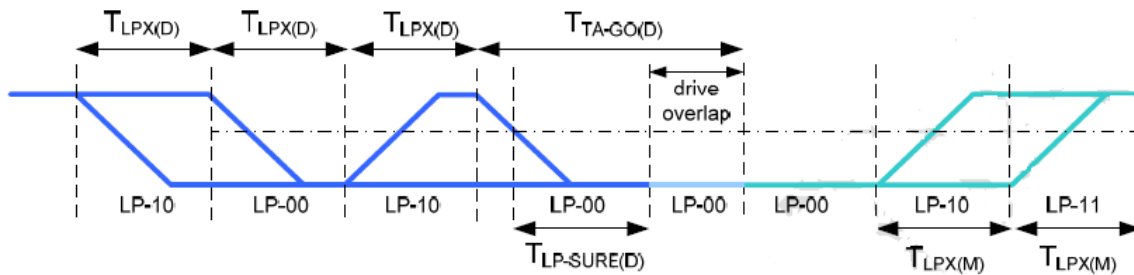## 5.1 MIPI Interface Characteristics
HS Data Transmission Burst

HS clock transmission

Turnaround Procedure

Bus turnaround (BAT) from MPU to display module timing

Timing Parameters：

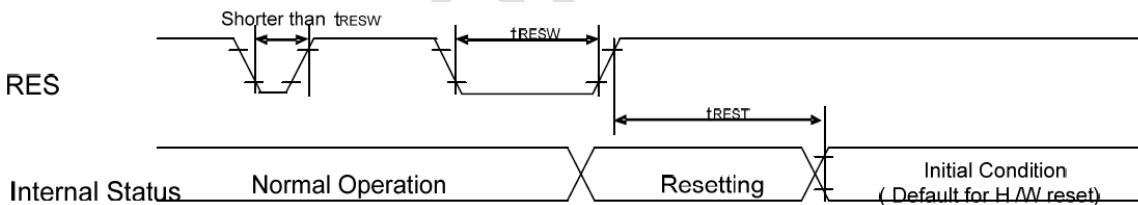| Parameter	Description	Min	Typ	Max	Unit
$T_{CLK-POST}$	Time that the transmitter continues to send HS clock after the last associated Data Lane has transitioned to LP Mode. Interval is defined as the period from the end of $T_{HS-TRAIL}$ to the beginning of $T_{CLK-TRAIL}$.	60ns + 52*UI			ns
$T_{CLK-TRAIL}$	Time that the transmitter drives the HS-0 state after the last payload clock bit of a HS transmission burst.	60			ns
$T_{HS-EXIT}$	Time that the transmitter drives LP-11 following a HS burst.	**300**			ns
$T_{CLK-TERM-EN}$	Time for the Clock Lane receiver to enable the HS line termination, starting from the time point when Dn crosses $V_{IL,MAX}$.	Time for Dn to reach $V_{TERM-EN}$		38	ns
$T_{CLK-PREPARE}$	Time that the transmitter drives the Clock Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission.	38		95	ns
$T_{CLK-PRE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	8			UI
$T_{CLK-PREPARE}$ + $T_{CLK-ZERO}$	$T_{CLK-PREPARE}$ + time that the transmitter drives the HS-0 state prior to starting the Clock.	300			ns
$T_{D-TERM-EN}$	Time for the Data Lane receiver to enable the HS line termination, starting from the time point when Dn crosses $V_{IL,MAX}$.	Time for Dn to reach $V_{TERM-EN}$		35 ns +4*UI	

$T_{HS\text{-}PREPARE}$	Time that the transmitter drives the Data Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission	40ns + 4*UI		85 ns + 6*UI		ns
$T_{HS\text{-}PREPARE}$ + $T_{HS\text{-}ZERO}$	**$T_{HS\text{-}PREPARE}$ + time that the transmitter drives the HS-0 state prior to transmitting the Sync sequence.**	**145ns + 10*UI**				**ns**
$T_{HS\text{-}TRAIL}$	Time that the transmitter drives the flipped differential state after last payload data bit of a HS transmission burst	60ns + 4*UI				ns

Parameter	Description	Min	Typ	Max	Unit	Notes
$T_{LPX(M)}$	Transmitted length of any Low-Power state period of MCU to display module	50		**150**	ns	1,2
$T_{TA\text{-}SURE(M)}$	Time that the display module waits after the LP-10 state before transmitting the Bridge state (LP-00) during a Link Turnaround.	$T_{LPX(M)}$		$2*T_{LPX(M)}$	ns	2
$T_{LPX(D)}$	Transmitted length of any Low-Power state period of display module to MCU	50		**150**	ns	1,2
$T_{TA\text{-}GET(D)}$	Time that the display module drives the Bridge state (LP-00) after accepting control during a Link Turnaround.		$5*T_{LPX(D)}$		ns	2
$T_{TA\text{-}GO(D)}$	Time that the display module drives the Bridge state (LP-00) before releasing control during a Link Turnaround.		$4*T_{LPX(D)}$		ns	2
$T_{TA\text{-}SURE(D)}$	Time that the MPU waits after the LP-10 state before transmitting the Bridge state (LP-00) during a Link Turnaround.	$T_{LPX(D)}$		$2*T_{LPX(D)}$	ns	2

5.2 Display RESET Timing Characteristics
Reset input timing:

VDDIO=1.65 to 3.3V, VDD=2.7 to 3.6V, AGND=DGND=0V, Ta=-40 to 85℃

Timing Parameters

Symbol	Parameter	Related Pins	MIN	TYP	MAX	Note	Unit
t_{RESW}	*1) Reset low pulse width	RESX	10	-	-	-	µs
t_{REST}	*2) Reset complete time	-	-	-	5	When reset applied during Sleep in mode	ms
		-	-	-	120	When reset applied during Sleep out mode	ms

Note1.Spike caused by an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.
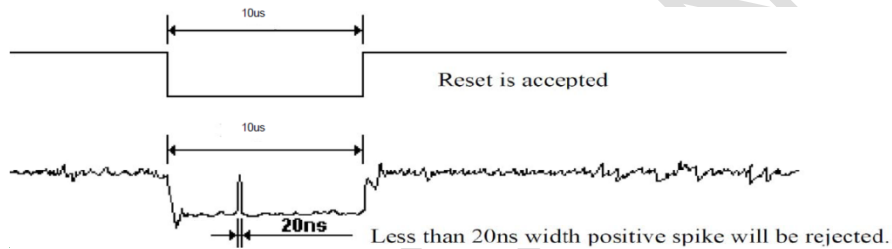
RESX Pulse	Action
Shorter than 5μs	Reset Rejected
Longer than 10μs	Reset
Between 5μs and 10μs	Reset starts (It depends on voltage and temperature condition.)

Note 2. *During the resetting period, the display will be blank (The display is entering blanking sequence, whose maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains blank in Sleep In –mode) and then return to Default condition for H/W reset.*

Note 3. *During Reset Complete Time, data in OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (tREST) within 5ms after a rising edge of RESX.*

Note 4. *Spike Rejection also applies during a valid reset pulse as shown below:*

Note 5. *It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.*

5.3 TE Timing Characteristics

Mode1, The Tearing Effect Output line consists of V-Blanking information only.

Tvdh = The display is not updated from the frame memory.
Tvdl = The display is updated from the frame memory.

6 Recommended Operating Sequence

6.1 Display Power on / off Sequence

6.1.1 Power On Sequence

6.1.2 Power Off Sequence

6.2   Brightness control

Use "command 5100h, data xxh" to adjust the Manual Brightness value of the display:
In principle relationship is that 00h value means the lowest brightness and FFh value means the highest brightness.

Inst/Para	R/W	Address		Date Type	Description
		MIPI	Other		
BRTCTRL	W	51h	5100h	Hex	Value form 0~255(FF)

7 Optical Characteristics Optical Specification

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angle		θT	CR≥10	80	-		Degree	Note 2 Test Equipment： CS2000A
		θB		80	-			
		θL		80	-			
		θR		80	-			
Contrast Ratio		CR	θ=0°	100000				Note1,Note3 Test Equipment： CS2000A
Response Time		T_{ON}	25℃			1	ms	Note1,Note4 Test Equipment： Admesy MSE
		T_{OFF}						
Chromaticity	White	x		(0.280)	(0.300)	(0.320)		Test Equipment： CS2000A Note: Chromaticity can be modified according to customer demand
		y		(0.295)	(0.315)	(0.335)		
	Red	x		(0.625)	(0.655)	(0.685)		
		y		(0.315)	(0.345)	(0.375)		
	Green	x		(0.210)	(0.250)	(0.290)		
		y		(0.670)	(0.710)	(0.750)		
	Blue	x		(0.105)	(0.135)	(0.165)		
		y		(0.030)	(0.060)	(0.090)		
Uniformity		U		75			%	Note1,Note6 Test Equipment： CS2000A
NTSC				90	100		%	Note5
Luminance		L	Normal	365	430	495	Cd/m^2	Note1,Note7 Test Equipment： CS2000A
Cross-talk						1.5	%	Note8 Test Equipment： CS2000A
Gamma				2.0	2.2	2.4		Gamma=2.2±0.2 Test Equipment： CS2000A

Test Conditions:

the ambient temperature is 25℃.

1.   The test systems refer to Note1 and Note2.

Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. The optical properties are measured at the center point of the AMOLED screen. All input terminals AMOLED panel must be ground when measuring the center area of the panel.

Fig. 6 Measurement illustration

Note 2: Definition of viewing angle range and measurement system.

Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

$$\text{Contrast ratio(CR)} = \frac{\text{Luminance measured when LCD is on the "white" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

"White state ": A state where the AMOLED should be driven by Vwhite.

"Black state": A state where the AMOLED should be driven by Vblack.

Note 4: Definition of response time

The response time is defined as the AMOLED optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changing from 10% to 90%. And fall time (T_{OFF}) is the time between photo detector output intensity changing from 90% to 10%.

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates are measured at the center point of AMOLED.

Note 6: Definition of luminance uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity(U) = Lmin/ Lmax

L-------Active area length W----- Active area width

Fig. 2 Definition of uniformity

Lmax: The measured maximum luminance of all measurement position.

Lmin: The measured minimum luminance of all measurement position.

Note 7: Definition of luminance:

Measure the luminance of white state at the center point.

Note 8: Cross Talk

A. Measure luminance at the position, P0.

B. Calculate cross talk as below equation.

$$L_{W\_OFF} = \frac{L_{W1} + L_{W2} + L_{W3} + L_{W4}}{4}$$

$$L_{B\_OFF} = \frac{L_{B1} + L_{B2} + L_{B3} + L_{B4}}{4}$$

$$crosstalk = \frac{|L_{Wi\_ON} - L_{W\_OFF}|}{L_{W\_OFF}} \times 100\% \qquad (i = 5\ to\ 8)$$

$$crosstalk = \frac{|L_{Bi\_ON} - L_{B\_OFF}|}{L_{B\_OFF}} \times 100\% \qquad (i = 5\ to\ 8)$$

(a) L_{W_OFF}, L_{B_OFF} measuring pattern

(b) L_{W_ON}, L_{B_ON} measuring pattern

8 Environmental / Reliability Test

No	Test Item	Condition	Remark
1	High Temperature Operation	+70℃, 120hrs	According to the customer request
2	Low Temperature Operation	-20℃, 120hrs	According to the customer request
3	High Temperature Storage	+80℃, 120hrs	According to the customer request
4	Low Temperature Storage	-30℃, 120hrs	According to the customer request
5	High Temperature & High Humidity Operation	60℃, 90% RH,120hrs	According to the customer request
6	High Temperature & High Humidity Storage	60℃, 90% RH,120hrs	According to the customer request
7	Thermal Shock (Non-operation)	-30℃(30 min)~+70℃(30 min), Change time:10min, 30Cycles	According to the customer request
8	Electro Static Discharge (Operation)	C=150pF, R=330Ω，5points/panel Air:±8KV, 5times; Contact:±4KV, 5 times; (Environment: 15℃~35℃, 30%~60%, 86Kpa~106Kpa). 	IEC61000-4-2 GB/T17626.2

9 Quality Level

9.1 AMOLED Module of Characteristic Inspection

The environmental condition and visual inspection shall be conducted as below:

(1) Ambient temperature: 23± 3℃

(2) Humidity: 55 ± 10%RH

(3) Ambient light intensity of visual inspection: 800 ~ 1200 lux

(4) Ambient light intensity of function inspection: ≤200lux

(5) Viewing Distance: 30 ± 5cm

(6) Viewing angle (tolerance): the front side 45° (Z) ±15°

(7) Inspection time: 10 ±5 sec

9.2 Sampling Procedures for each item acceptance table

Defect type	Sampling Procedures	AQL
Major defect	GB/T2828.1-2003 Inspection levelⅡ normal inspection single sample inspection	0.65
Minor defect	GB/T2828.1-2003 Inspection levelⅡ normal inspection single sample inspection	1.0

Major defect:
Any defect may result in functional failure, or reduce the usability of product for its purpose.
For example, electrical failure, deformation and etc.

Minor defect
A defect does not reduce the usability of product for its intended purpose and un-uniformity, such as dot defect and etc.

The criteria on major and/or minor judgment will be according with the classification of defects.

9.3 Inspection Item

No.	Item	Area	Criterion of Defect			Defect type
			Type	DS	Acceptable number	
1	Dot Defect	AA	Bright Dot	≥10mm	0	Minor
			Dark Dot	≥10mm	4	
			Dark Dot （≥two	≥10mm	2	

				connections）				
2	No Display	AA	/				Not allowed	Fatal
3	Abnormal Display	AA	/				Not allowed	Fatal
4	Normally white	AA	/				Not allowed	Fatal
5	Line Defect	AA	single line		Bright line		Not allowed	Fatal
					Dark line		Not allowed	
			Multiple lines		Bright line		Not allowed	
					Dark line		Not allowed	
			Half-Line		Bright line		Not allowed	
					Dark line		Not allowed	
6	Image sticking	AA	Switch to the next screen and display the image of the previous picture					Major
7	Color & Edge Mura	AA	See limit sample(under full white screen)					Major
8	Color crast	AA	See limit sample(under full white screen)					Major
9	Water Ripple	AA	Not allowed					Major
10	Other mura(Low gray-scale white spot、S-Line Mura)	AA	Not allowed(under full white screen) or See limit sample(under low gray-scale white screen)					Major
11	TP	AA	TP function NG				Not allowed	Fatal
12	Glass crack	AA、OA	/				Not allowed	Fatal
13	Screen bump	AA、OA	Encap surface is not allowed and LTPS does not affect assembly					Major
14	Line sefects (light visible)	AA	W（mm）	L（mm）		DS（mm）	Acceptable number	Minor
			W≤0.03	-		-	Ignore	
			0.03＜W≤0.05	L≤5.0		≥10	2	
			0.05＜W	-		-	0	
			-	L>5.0		-	0	
15	Point sefects (light visible)	AA	D（mm）	DS（mm）			Acceptable number	Minor
			D≤0.1	/			Ignore	

					DS（mm）	Acceptable number	
			0.1＜D≤0.25		≥10	2	
			0.25＜D		–	0	
16	Glass scratch	AA	W（mm）	L（mm）	DS（mm）	Acceptable number	Minor
			W≤0.03	L＜5.0	≥10	Ignore	
			0.03＜W≤0.05	L≤2.0	≥10	Ignore	
				2.0＜L≤5.0	≥10	2	
			0.05＜W	-	0	0	
				L>5.0	0	0	
17	Frit Encapsulation	FA	Frit width uniformity. It should not have bubble or breakage.				Major
18	Polarizer crease / indentation	AA	See limit sample				Minor
19	Protective film starved/overflow glue/burr	Except AA	No control under W≤0.3mm				Minor
20	Polarizer bump point	Whole area	Bump:D≤0.25mm，dent ≤1mm or See limit sample		Allow 3		Minor
21	Polarizer bubble line	Out of AA，≤0.25mm	Encap surface		Not allowed		Minor
22	Scratches on the surface of polarizer	Whole area	No harm subject regardless of control				Minor
23	Concave dot、Black and white dot、Polarizer Dent/Bubble	AA		D（mm）	DS（mm）	Acceptable number	Minor
			Front（Encap surface）	D≤0.1	≥10	Ignore	
				0.1＜D≤0.2	≥10	3	
				0.2＜D	≥10	0	
			Metal material foreign material	/	≥10	Not allowed	
24	Polarizer Scratch/Fiber(Linear)	AA	W（mm）	L（mm）	DS（mm）	Acceptable number	Minor
			W≤0.03	L≤5.0	≥10	Ignore	
			0.03＜W≤0.05	L≤2.0	≥10	Ignore	
				2.0＜	≥10	3	

| | | | 0.05＜W | - | ≥10 | 0 | |
| | | | | L>5.0 | ≥10 | 0 | |

25	Edge/Side breakage	OA	The following Criterion is applicable to any side（unit：mm）				Minor
			Z	X	Y	Acceptable number	
			≤ T	≤2.0	not extended to circuit Area or Frit	＜5	

26	UV glue	Not IC side	Over coating			Not allowed	Minor
		IC side	The coating of IC side is not higher than POL.			Not allowed	
		IC side	The coating of IC side is not higher than POL.			Not allowed	

27	Tuffy glue	IC and FPC bonding area	The coating should not have breakage or Bubble.				Minor
			The coating is not higher than POL.				
		Other area	Tuffy glue is not allowed to interrupt and the diameter of Bubble is not more than 0.5mm.				
			The coating is not higher than POL.				
		IC	Not allowed				
		FPC	Ribbon glue: the width is not more than 1mm. Dot glue: the diameter is not more than 2mm.				

| 28 | Rear reinforcement glue of FPC | FPC | The width is not more than 1mm . The height is lower than LTPS. | | | | Minor |

| 29 | ACF | Bonding Area | The length of attachment is more than both ends of FPC, which should be range from 0.2 to 1mm. Don't go beyond the edge of panel. Effective lap width of wiring ACF is more than 2/3, which is compared with the width of the gold finger of FPC. Don't have bubble or wrinkle. | | | | Minor |

30	FPCA	FPC	The component can not reverse polarity				Minor
			No wrong insertion				
			FPC should not have serious crease which destroy the line, prick and spots damage. Scratch is not allowed if Cu layer is exposed.				
			The gold fingers should not be oxidized, scraped, folded, impressed, broken, spotted or dissymmetry.				
			Make sure FPC is not scalded, with its location holes not having deficiency or obviously shift.				
			The component of FPC should be the same as BOM				

No	Item	Area	Criterion of Defect				Defect type
			list.				
			No remaining soldering Sn				
			No visual particle on the pad line				
31	FPC bonding	Bonding area	Bubble: Visible bubble is not allowed				Minor
			Overhang ：The size above 1/2 of soldering electrode of the parts overhang to the LAND is prohibited. The tilt height less than 0.5mm between FPC and foam.				
	FPC Skew		Not allowed				
32	Package	Other	Products should put into the anti-static trays, with non-overlapping, and the trays should be staggered placed.				Minor
			Different products cannot be mixed into the same inner package.				
			The package should not have obvious deformation or breakage .The printing labels type and quantity are correct.				
			The package should have QC signature. ROHS label is needed if the product is under ROHS control.				

Inspection standard for cover

No.	Item	Area	Criterion of Defect				Defect type
33	Cover dot、Black and white dot、Polarizer Dent/Bubble	Whole area	D（mm）	DS（mm）		Acceptable number	Minor
			D≤0.15mm	/		Ignore (specks is not allowed)	
			0.15mm＜D＜0.25mm	DS≥10mm		2	
			D＞0.25mm	/		Not allowed	
			Specks: D＜0.15mm，N＞5 in 10mm*10mm area				
34	Cover Scratch/ Fiber(Linear)	AA	W(mm)	L(mm)	DS(mm)	Acceptable number	Minor
			W≤0.03mm	L≤10mm	≥10	Ignore	
			0.03mm＜W ≤0.05mm	L≤5.0mm	≥10	2	
			W＞0.05	/	/	Not allowed	
			/	L＞5.0mm	/	Not allowed	
			Not allowed to scratch				
35	Edge pinhole	Edge of cover	D （mm）	DS（mm）	Acceptable number		Minor
			D＜ 0.1mm	DS≥ 10mm	one is allowed on each side		

No	Defect	Area	Criteria			Level
36	Uneven edge of the ink	Edge of cover	W（B or D）	L(A or C)	Acceptable number	Minor
			W≤0.15mm	L≤3mm	≤2	
37	ink silk screen serrated	OA area	D（mm）	DS（mm）	Acceptable number	Minor
			D≤0.2	DS≥10mm	2	
38	Camera Hole	OA area	breakage or crack: D≤0.1mm			Minor
			Hole is not round: Refer to the limit sample			
			Dot Defect：D≤0.1mm, and N≤1, heterochrosis and line defect are not allowed；			
			Camera hole smudge:not allowed			
39	Printing defect	OA area	Wrongly、Missing、Ghosting and incomplete printing : not allowed			Minor
			Fonts consistent with the standard characters, no significant difference in visualization			
			Penetrating scratch is not allowed			
40	IR Hole/ Black spots/ Line scratch foreign matter/ Residue	OA area	DS(mm)	Acceptable number		Minor
			DS＜0.1	Ignore		
			0.1≤DS≤0.15	1		
			Note: Not visible on black background, don't affect the transmission rate			
			Foreign body, dirty in IR hole: not allowed			
			Scratched\Line defects in IR hole: W≤0.03mm，L≤1mm，N≤1, Not visible on black background, don't affect the transmission rate.			
			Residual glue in IR hole: not allowed			
41	Cover lens deformation	OA area	Raised height<0.15mm, and the area is less than 25% of the entire non-display area in the cover lens			Minor
		AA area	Deformation is not allowed in AA area			

42	Poor penetration of icons	OA area	DS≤0.15 and N≤1		Minor
43	Cover dirt	Whole area	Not allowed		Minor
44	Cover crack				Fatal flaw
45	Cover paint chips				
46	Burr	Edge of cover	L≤0.05mm，W＜0.2mm accept (The premise does not affect the assembly and function and user operation)		Minor
47	colour difference	OA area	No significant difference in visualization (refer to the limit sample if necessary)		
48	Overfill	Whole area	Not allowed in AA area The visible part of the periphery can not be seen after assembly, and can not affect the assembly		Minor
49	Protective film	Whole area	Film position deviation≤0.15mm Scratch: no control when don't damage the body Overfill/ lack of plastic/ Burr: no control Not control the bubble inside the cover protection film		
50	Easy to tear	Cover surface	Function failure\ damaged\ Missing label: not allowed Wrinkle\ Convex-concave point\dirty\ punching\burr\ squeeze out: not control		
51	Composite tape	LTPS	Don't go beyond the edge of panel. Folds\ Light leakage\ Impact assembly or thickness: not allowed Damaged: not allowed Bump does not affect the assembly: not control Punching the bad size meet the drawings requirements: not control Non-wipe dirty\foreign body: not allowed Foreign objects in accordance with the standard line/point Burr does not exceed the screen edge: not control Do not have obvious bubbles Gumflower\Overfill: no control		Minor
52	Film warpage	Whole area	Warpage ≤0.2mm		Minor
53	ICON hole	OA area	chromatic aberration、double image、dot defect 、line defect：not allowed（or refer to limited sample）		
54	Earpiece hole	OA area	left-right asymmetry，Hole Rather large/small or off normal(Out of specification)No chamfer, Uneven polishing: not allowed		Minor
55	Ink bumps	OA area	Positive side reference point defects; The back side does not affect the assembly; Ink overflow or		

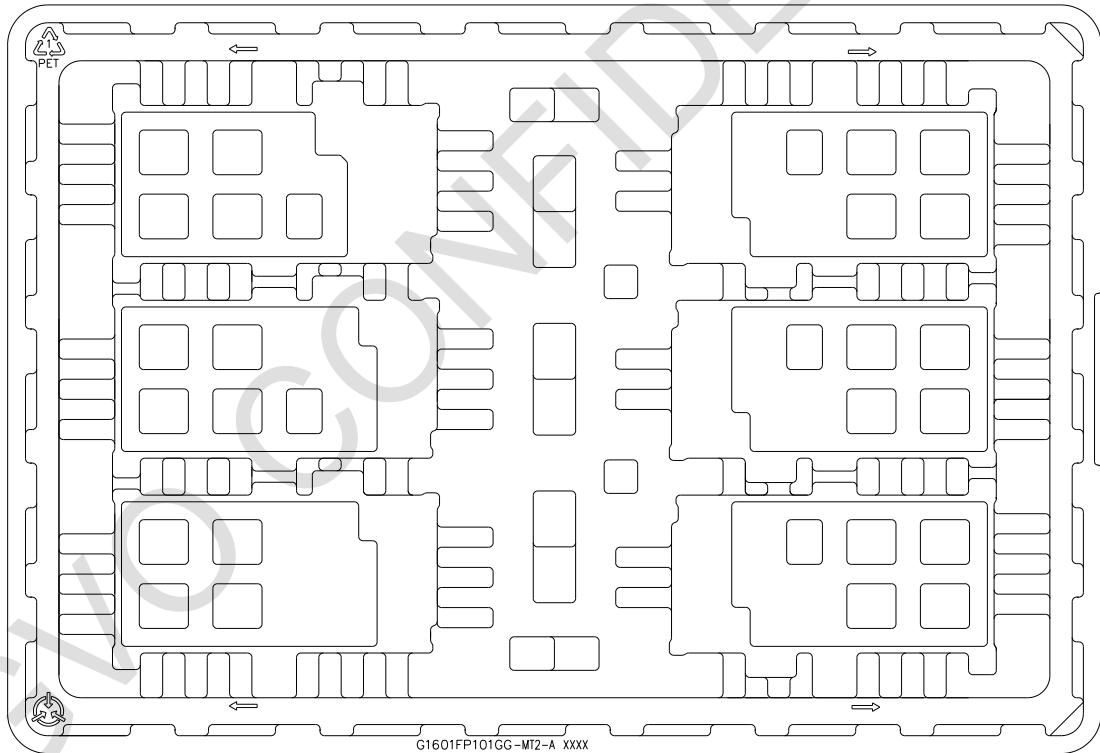| No	Item	Area	Standard					Level
			accumulation: not allowed					
56	Cover concave convex point	Whole area	Front : Height & depth ≤ 0.15mm, size ≤ 0.4mm, if necessary reference limit sample					
			Back：Don't affect the fit process is not controlled					
57	Insulation Tape	Bonding area	Obvious wrinkles and bubbles: not allowed					Minor
		Component area	Scratch/ Gumflower: not control					
			Non-wipe dirty: not allowed					
			Offset can not exceed the edge of the product, Others are required to the drawings					
			Burr\ Overfill: not control					
			Damaged/incomplete/missing paste: not allowed					
58	Cover edge/side breakage	Edge of cover	X	Y	Z	DS	Acceptable number	Minor
			X<0.2mm	Y<0.2mm	Z≤1/2t	DS>5mm	Unilateral ≤2	
			X>0.2mm	/	/		not allowed	
			/	Y>0.2mm	/		not allowed	
			/	/	Z>1/2T		not allowed	
			Cracks are not allowed					
59	Blunt	Whole area	Not allowed					Fatal flaw
60	Fit bubble	AA	According to the punctate specifications					Minor
61	Vision area edge defect	OA	D≤0.2mm，DS＞10,N≤2（hole saw tusk less than 2），if necessary reference limit sample.					Minor
62	Cover heterochrosis	OA	Heterochrosis side execute according to point defect size, bulk/stick refer to Limited sample					Minor

10 Mechanical Drawing

PIN ASSIGNMENT

1	GND	2	ELVSS
3	VPP	4	ELVSS
5	GND	6	ELVSS
7	D3N	8	GND
9	D3P	10	ELVDD
11	GND	12	ELVDD
13	D0N	14	ELVDD
15	D0P	16	GND
17	GND	18	RESX
19	CLKN	20	AVDD_EN
21	CLKP	22	SWIRE
23	GND	24	ERR_FG
25	DIN	26	PCD
27	DIP	28	TE
29	GND	30	GND
31	D2N	32	TP_AVDD
33	D2P	34	AVDD
35	GND	36	VCI
37	TP_DVDD	38	VDDIO
39	TP_TA	40	GND
41	TP_INT	42	I_SPCK
43	TP_SCL	44	I_SPCS
45	TP_SDA	46	I_SPDI
47	TP_RESET	48	I_SPDD
49	GND	50	GND

Detail A
Scale 10:1

−0.143(POL)
−0.25(Encap)
−0.20(TFT)
−0.13(Poron)

Release Film

Component Area
Max:H=1.25mm(含锡)
(Insulating tape
+Components+Tin
+FPC+Adhesive Tape)

COF area:
0.4mm Max
(含COF+泡棉胶)

Component Area
Max:H=1.45mm(含锡)
(Insulating tape
+Components+Tin+FPC
+SUS+Adhesive Tape)

*Max 1.50

*35.70±0.50

*7.95±0.50

*Total 0.723±0.15
(Excluding Tear Tape
&Protective Film)

Detail A

*Max 3.20
POL 切 FPC 剪断最高点

UV

Tear Tape

*70.07±0.15(OLED Outline)
(68.26 A,A,)

1080(W)*2160(H)

Tuffy

(0.905)
(0.905)

*2-1.09 +0.22/−0.20

*2-2.50 +0.50/−0.20

(136.51 A,A,)
139.42±0.15(Encap)
*140.92±0.15(OLED Outline)

NOTES:
1.Unspecified tolerance is ±0.2mm;
2.Module FPC Connector Type:BM24-50DS-0_35V;
3.Driver IC: RM69299;
4.TP IC: GT1151;
5."*"Critical Dimension;
6.( )Reference Dimension;
7.RoHS Compliance;

Rev.	Date	Notes
⚠	2017.12.11	Primary

Part Name | Module | G1601FP104GG
Project Code | G1601FP104GG-MA1-A
Part No.

Date 2017.12.11 | DES'D BY Xu Tao | CHK'D BY | CHK'D BY | APPROVED
Rev. 01 | Unit mm | 1/1

3rd Angle Projection

Packing Drawing

Packing Condition	Contents
Packing Type	TRAY + Carton packing type
TRAY material model	tray (10^5~$10^9\Omega$)
Tray packing type	See the picture 1
Number of panels per tray	6 pieces
Number of Tray per carton	28units ((26 units + 2empty)PET tray)
Number of panels per carton	156pieces

G1601FP1O1GG-MT2-A XXXX

Picture 1

11 Precautions for Use of AMOLED Modules

11.1 Handling Precautions:
11.1.1   The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from height.
11.1.2   Do not press down the screen on the adjoining areas too hard because the color tone may be shifted.
11.1.3   The polarizer covering the display surface of the AMOLED module is soft and easily scratched. Handle this polarizer carefully.
11.1.4   If the display surface is contaminated, blow on the surface and gently wipe it with a soft dry cloth. If it is still not completely clear, moisten the cloth with ethyl alcohol.
11.1.5   Solvents may damage the polarizer. Do not use water, ketone or aromatic solvents except ethyl alcohol.
   Do not attempt to disassemble the AMOLED Module.
11.1.6   If the logic circuit power is off, do not apply the input signals.
11.1.7   To prevent destruction from static electricity, be careful to maintain an optimum working environment.
11.1.8   Be sure to make yourself in contact with the ground when handling with the AMOLED Modules.
11.1.9   Tools required for assembly, such as soldering irons, must be properly ground.
11.1.10 To reduce the generation of static electricity, do not conduct assembly or other work under dry conditions.
11.1.11 To protect the display surface, the AMOLED Module is coated with a film. Be careful when peeling off this protective film, because static electricity may generate.

11.2 Storage Precautions:
11.2.1   When storing the AMOLED modules, be sure that they are not directly exposed to the sunlight or the light of fluorescent lamps.
11.2.2   The AMOLED modules should be stored under the storage temperature range. If the AMOLED modules will be stored for a long time, the recommended condition is:
   Temperature: 0℃~40℃ Relatively humidity: ≤80%
11.2.3   The AMOLED modules should be stored in the room without acid, alkali or harmful gas.

11.3 Transportation Precautions:
11.3.1   The AMOLED modules should not be suffered from falling and violent shocking during transportation. Besides, excessive press, water, damp and sunshine, should be avoided.