

Contents

1. Scope	5
2. Warranty	5
3. Features	6
4. Mechanical specification	6
5. Maximum rating	6
6. Electrical characteristics	7
7. Electro-optical characteristics	8
8. Input/Output terminal	10
8-1. I/O Connection	10
8-2. Circuit Block Diagram (Module)	11
8-3. Circuit Block Diagram (IC)	12
8-4. RGB Interface	13
9. Recommended Operating Sequence	14
9-1. Normal mode(Power ON sequence).....	14
9-2. RGB Interface	14
9-3. Panel Conditions Set(LTPS).....	15
9-4. Display Condition Set.....	15
9-5. Analog Power Condition Set.....	16
9-6. Power OFF sequence(display off sequence).....	16
9-7 Exit Standby mode	17
9-8 Gamma Value	18
10. AC Characteristics	19
10-1. Clock synchronous serial interface timing characteristics..	19
10-2. Reset Timing Characteristics.....	20
10-3. RGB Interface Timing Characteristics.....	21
11. Quality Level	22
11-1. Environment Condition	22
11-2. Sampling Procedure	23
11-3. Inspection Item	24

SAMSUNG SMD CO., LTD.(All Rights Reserved).

Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

3/46

12. Reliability	26
12-1. Items of Reliability	26
13. Handling Precautions	28
13-1. Mounting Method	28
13-2. Caution of AMOLED Handling and Cleaning	28
13-3. Caution against Static Charge	28
13-4. Packing	28
13-5. Caution for Operation	29
13-6. Storage	29
13-7. Safety Precautions	29
13-8. Precautions before Use	30
14. Drawing	31
14-1. Product Drawing	31
14-2. FPCB Drawing	32
14-2-1. Schematic Diagram	33
14-2-2. Electronic Part List	34
14-3. Packing specification	35
14-3-1. Packing a cartoon box	35
14-3-2. Packing a pallet box	37
14-3-3. Packing tray drawing	38
15. Hazardous materials report	39

SAMSUNG SMD CO., LTD.(All Rights Reserved).

Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

4/46

1. Scope

This Specification defines general provisions as well as inspection standards for AMOLED module supplied by SAMSUNG SMD Co., LTD., If the event of unforeseen problems or unspecified items occurs, we naturally shall negotiate and agree to solution with customer.

2. Warranty

Basically, warranty term is **15 months** of reliability characteristics of quality level after the outgoing date in SAMSUNG SMD Co., LTD., and SAMSUNG SMD Co., LTD., could compensate for defectives which happens within warranty term under condition that the products should be stored or be used as specified under normal condition within the contents of specification. Otherwise, it is impossible to compensate for defectives when they happens by customer's mistake such as careless handling or circuit change, etc.
And after 15 months of warranty term, all replacements for defectives will be charged.

This Specification stipulates the final and comprehensive requirements for the respective products hereof. Beyond this Specification, it is responsibility of the customer to explicitly disclose any additional requirements, information or reservations regarding these requirements to Samsung SMD prior to implementation, where any and all disclosures of the customer shall be with an authorized representative of Samsung SMD in writing. Samsung SMD shall not be responsible for safety, performance, functionality, compatibility of the system with which the Samsung SMD-supplied components are integrated unless such features have been expressly communicated and described in the Specification.

SAMSUNG SMD MAKES NO GUARANTY OR WARRANTY, EXPRESS OR IMPLIED INCLUDING BUT NOT LIMITED TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TO ANY PARTY.

Moreover, any party should do their own due diligence regarding these requirements prior to implementation.

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Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

5/46

3. Features

- 1) Display Color : 16M_Color (RGB)
- 2) Display Format : 3.7" Visual WVGA 480 x 800 (240 RGBG x 800)
- 3) Interface : RGB-24bits, SPI-3 line
- 4) Driver IC : TL2796 By TOMATO LSI
- 5) Polarizer : Hard Coating Polarizer (2H)

4. Mechanical Specification

Item	Specifications	Unit
Outline dimension (Glass thickness)	53.94(W) x 90(H) x 1.5(T) (0.3t)	mm
Number of dots	240(W) x R(B)GB(R)G x 800(H)	Dots
Active area	48.24(W) x 80.4(H)	mm
Diagonal Inch	3.69	inch
Pixel pitch(RG or BG)	0.1005(W) x 0.1005(H)	mm

5. Maximum Rating

Item		Symbol	Min.	Max.	Unit	Note
Supply voltage	Logic	VCI	-0.3	3.6	V	(1),(2)
		IOVCC	-0.3	3.6	V	(1),(2)
	Power	VBAT	0.3	6.0	V	(1),(2)
Input voltage		Vin	-0.5	IOVCC+0.5	V	(2)
Operating temperature		Top	-20	70	°C	-
Humidity		Hop	10	95	%(RH)	-
Storage temperature		Tstg	-30	85	°C	-
Humidity		Hstg	10	95	%(RH)	

Note 1) VCI, IOVCC, VBAT should satisfy the below condition of

$$VBAT > VCI, IOVCC > VSS (GND).$$

Note 2) If the supplied voltage exceeds the maximum limitation, LSI can be damaged permanently. Therefore, while operating, it is recommend to use LSI within the maximum electrical limitation. If not, LSI can cause decreased reliability or operational problems.

Note 3) Wet Bulb Temperature should not exceed 29 at most and not have any dew condensation.

SAMSUNG SMD CO., LTD.(All Rights Reserved).

Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

6/46

6. Electrical Characteristics

- Test Conditions : IOVCC=2.8V, VCI=2.8V, Vbat=3.8V, VSS=0V, Tamb=25℃
at Full white(250nit) unless otherwise specified.

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Logic	IOVCC	-	1.65	1.8	3.3	V
		VCI	-	2.5	2.9	3.3	
	Power	VBat	-	2.5	3.8	4.5	
Input Voltage	"H" level	VIH	-	0.8*IOVCC	-	IOVCC	V
	"L" level	VIL	-	-0.2	-	0.2*IOVCC	
Output Voltage	"H" level	VOH	IOH = -0.1mA IOL = 0.1mA	0.8*IOVCC	-	IOVCC	V
	"L" level	VOL		-0.2	-	0.2*IOVCC	
Leakage Current	Input	ILI	Vin=IOVCC or VSS	-1.0	-	1.0	uA
	Output	ILO		-3.0	-	3.0	uA
Supply Current	EL Power (250cd/m ² full white)	IBAT	VBAT=3.8V	-	320	380	mA
Driver IC Current Consumption		IOVCC	IOVCC =VCI=2.8V	-	-	1	mA
		IVCI		-	-	20	mA
		Istby (VBAT =3.8V)	IOVCC =VCI=2.8V	-	-	200	uA

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Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

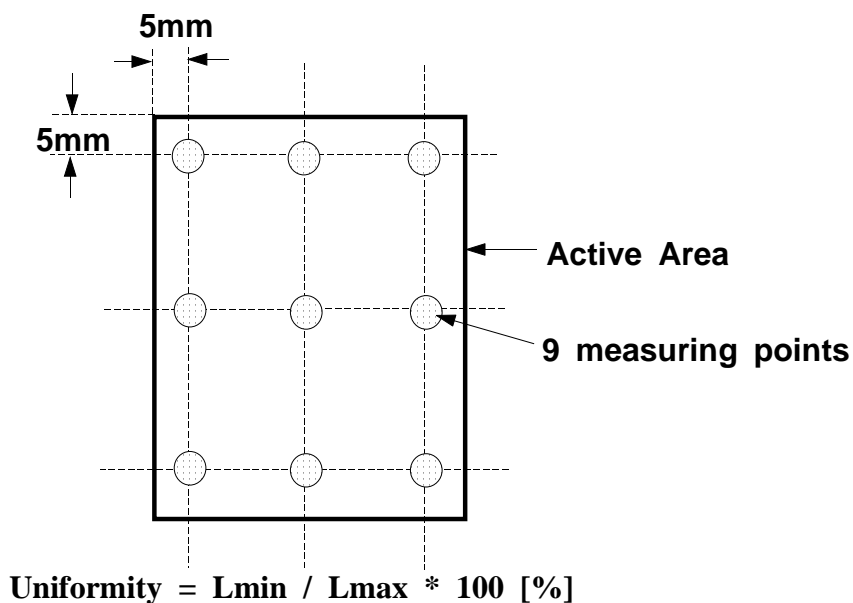
Rev. : 5.0

7/46

7. Electro-optical characteristics

Item	Symbol	Temp	Condition	Min.	Typ.	Max.	Unit	Note
Brightness		25℃	Normal (White Mode)	200	250	300	cd/m ²	Center brightness
Uniformity		25℃	Normal (White Mode)	82	90	-	%	(1)
Contrast ratio	K	25℃	Φ=0°,θ=0°	2,000		-	-	(1),(2)
Color of CIE coordinate	White	x	25℃ Φ=0° θ=0°	0.280	0.300	0.320	-	(1),(2),(3)
		y		0.290	0.310	0.330	-	
	Red	x		0.625	0.675	0.725	-	
		y		0.275	0.325	0.375	-	
	Green	x		0.170	0.220	0.270	-	
		y		0.675	0.725	0.775	-	
	Blue	x		0.095	0.145	0.195	-	
		y		0.005	0.055	0.105	-	
Color Gamut		25℃	vs. NTSC	-	105	-	%	
Life Time(5)		25℃	50% Brightness drop @250cd/m ² , Full White	-	30,000	-	Hr	(4)

Note1) Uniformity Measuring Point



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Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

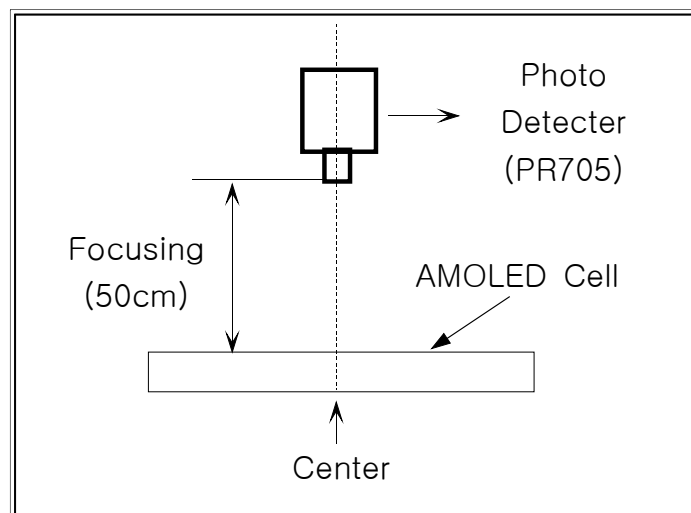
Rev. : 5.0

8/46

Note 2) Definition of contrast ratio (K)

$$\text{Contrast Ratio(K)} = \frac{\text{Brightness of selected dot (White patterned area) at } 250\text{cd/m}^2}{\text{Brightness of non-selected dot (Black patterned area) at } 250\text{cd/m}^2}$$

Note 3) Optical measuring system : temperature regulated chamber



Note 4) Life Time

The elapsed time that the full white brightness decreases to the half of initial value.

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Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

9/46

8. Input/Output Terminal Assignment

8-1. I/O Connection

No.	I/O	Symbol	Function
1	Power	GND	Ground Terminal
2	Power	GND	Ground Terminal
3	Power	ELVSS	Power for LTPS
4	Power	ELVSS	Power for LTPS
5	-	NC	-
6	Power	ELVDD	Power for LTPS
7	Power	ELVDD	Power for LTPS
8	-	NC	-
9	Logic I/O Power	VDDI(IOVCC)	Data I/O power supply
10	Analog Power	VCI	Internal power for RAM
11	O	ELON	DC DC IC Enable
12	I	CSB	Chip select signal input (Low Active)
13	-	SCL	Serial data transfer clock input pin
14	I	SDI	Serial data input pin
15	I	SDO	Serial data output pin
16	I	ENABLE	Data enable signal pin for RGB I/F
17	I	VSYNC	Vertical sync signal of the RGB I/F
18	I	HSYNC	Horizontal sync signal of the RGB I/F
19	Power	GND	Ground Terminal
20	I	DOTCLK	Dot clock signal of the RGB I/F
21	Power	GND	Ground Terminal
22	I/O	D23	Unidirectional Data Bus
23	I/O	D22	Unidirectional Data Bus
24	I/O	D21	Unidirectional Data Bus
25	I/O	D20	Unidirectional Data Bus
26	I/O	D19	Unidirectional Data Bus
27	I/O	D18	Unidirectional Data Bus
28	I/O	D17	Unidirectional Data Bus
29	I/O	D16	Unidirectional Data Bus
30	I/O	D15	Unidirectional Data Bus
31	I/O	D14	Unidirectional Data Bus
32	I/O	D13	Unidirectional Data Bus
33	I/O	D12	Unidirectional Data Bus
34	I/O	D11	Unidirectional Data Bus
35	I/O	D10	Unidirectional Data Bus
36	I/O	D9	Unidirectional Data Bus
37	I/O	D8	Unidirectional Data Bus
38	I/O	D7	Unidirectional Data Bus
39	I/O	D6	Unidirectional Data Bus
40	I/O	D5	Unidirectional Data Bus
41	I/O	D4	Unidirectional Data Bus
42	I/O	D3	Unidirectional Data Bus
43	I/O	D2	Unidirectional Data Bus
44	I/O	D1	Unidirectional Data Bus
45	I/O	D0	Unidirectional Data Bus
46	I/O	GND	Ground Terminal
47	I	RESETB	Reset Signal (0: reset, 1: normal operation)
48	-	MTP_VPP2	Connection to VCI when it is not EEPROM write program mode.
49	-	MTP_VPP1	Connection to GND when it is not EEPROM write program mode.
50	-	GND	Ground Terminal
51	-	GND	Ground Terminal

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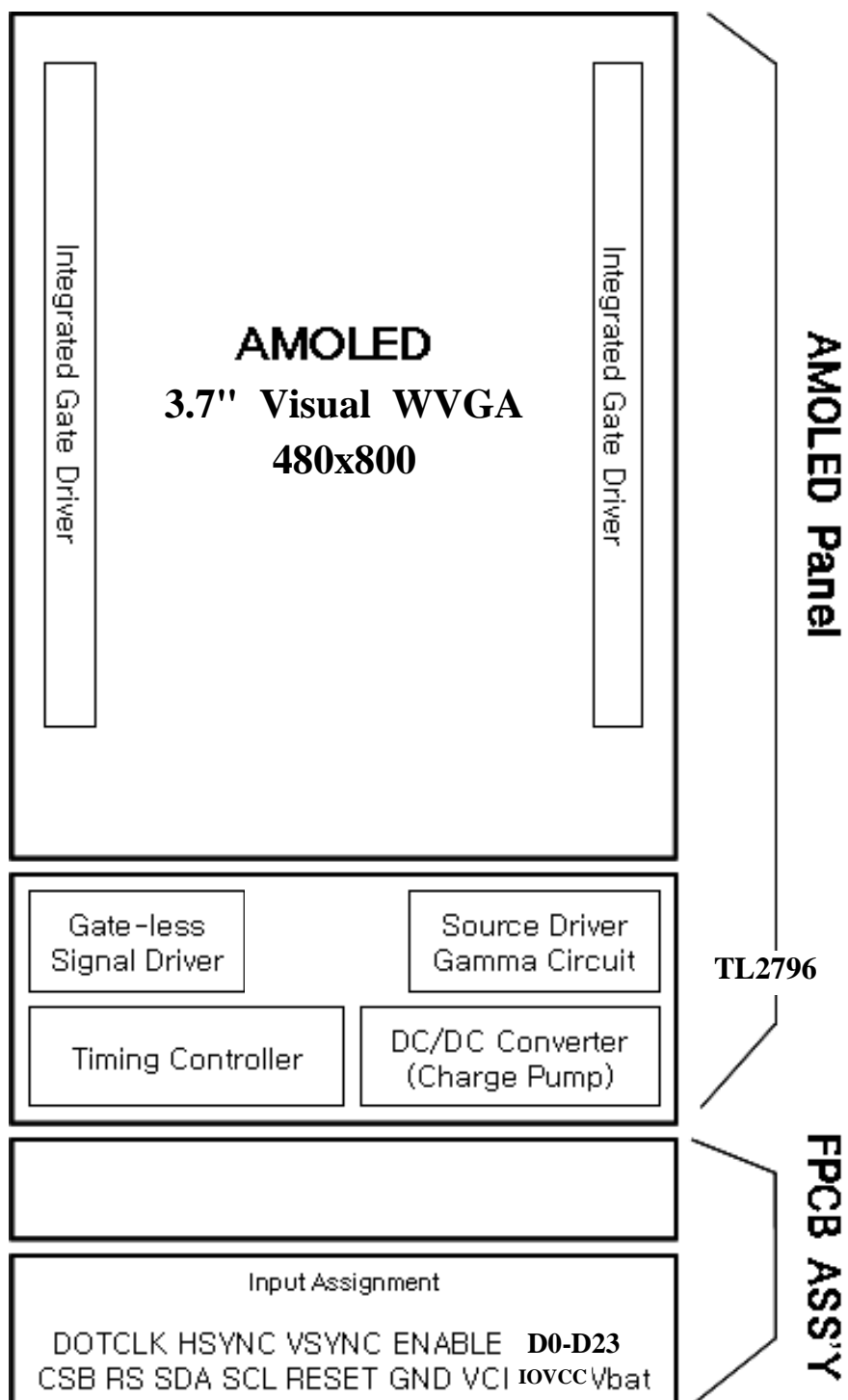
Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

10/46

8-2. Circuit block diagram (Module)



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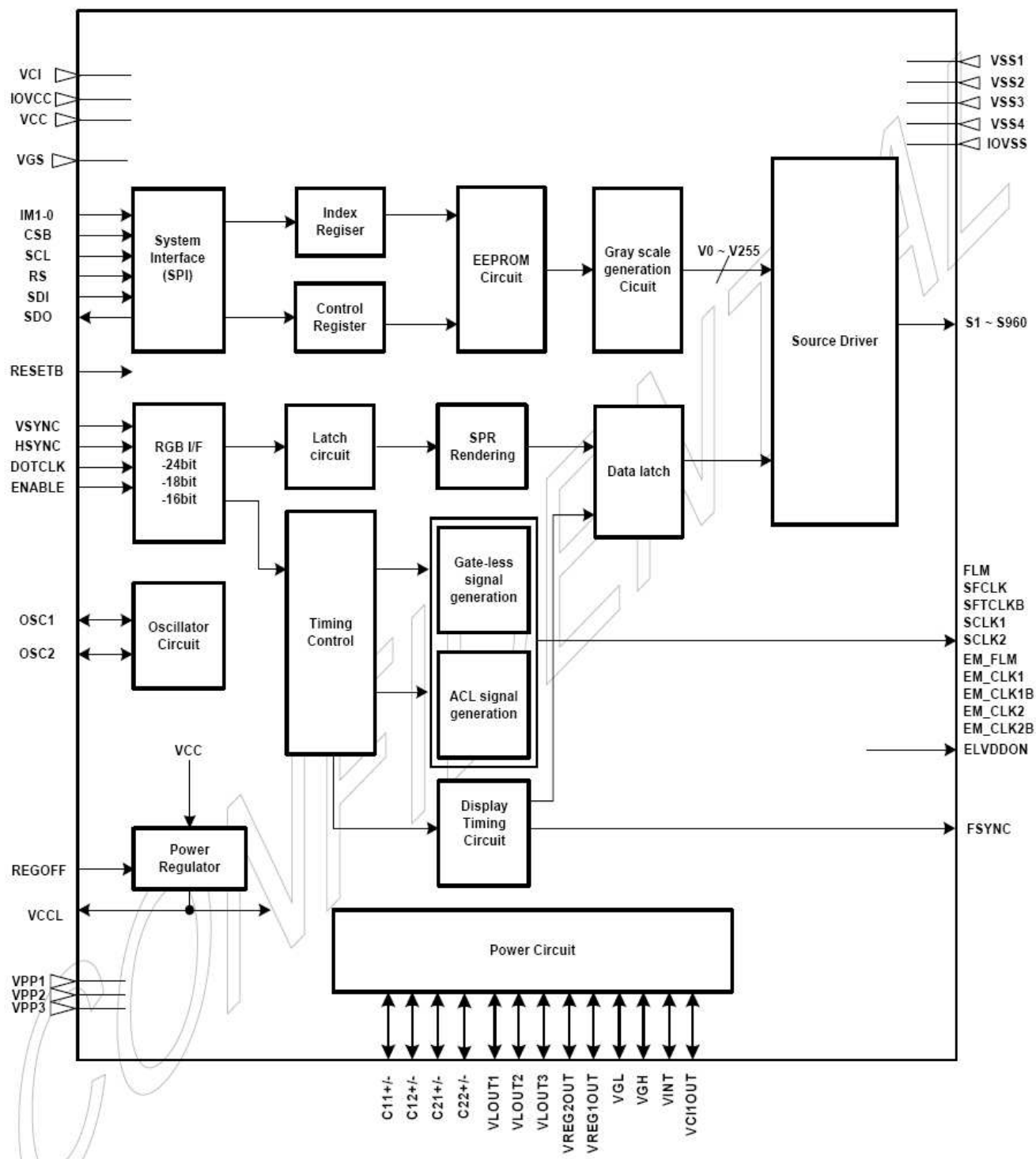
Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

11/46

8-3. Circuit block diagram (IC)



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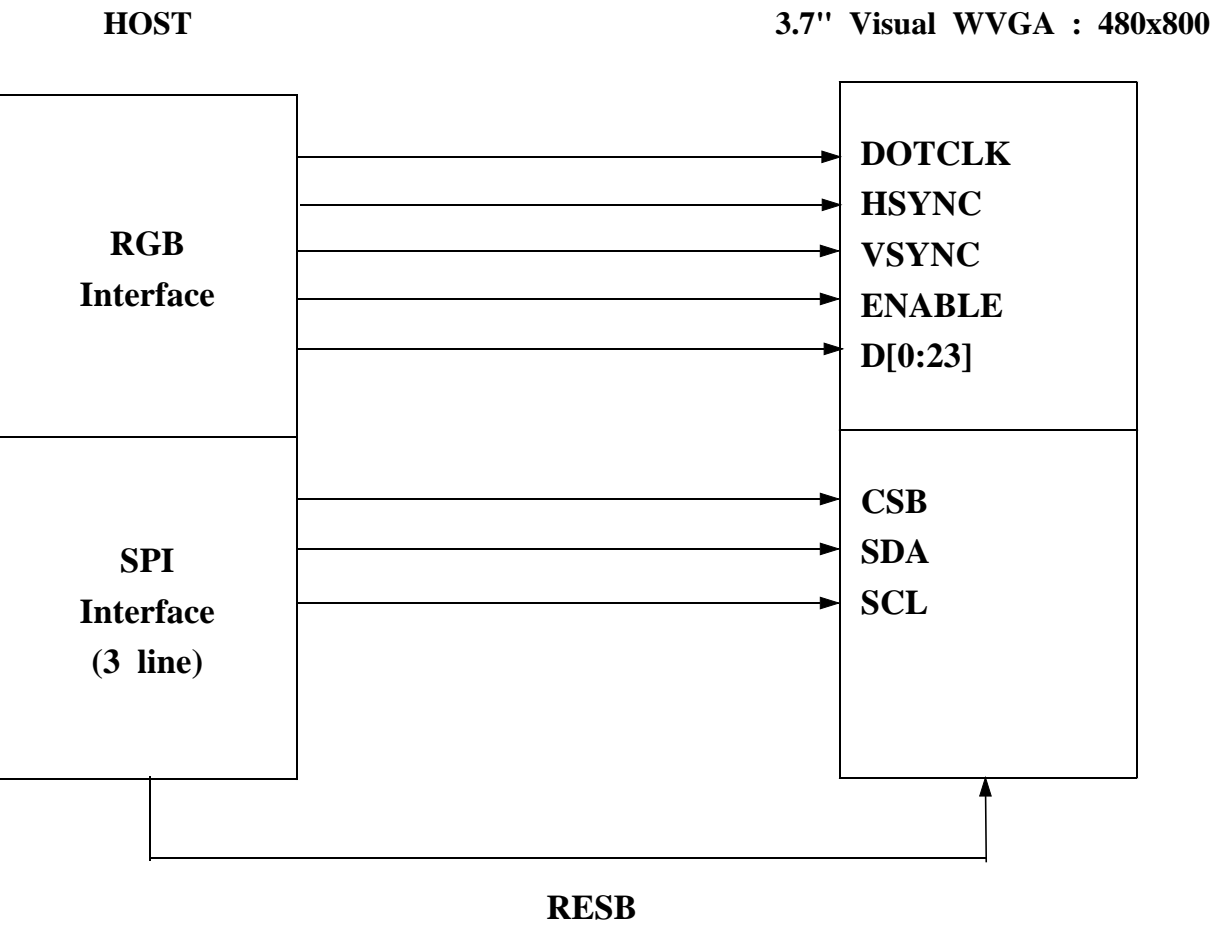
Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

12/46

8-4. RGB Interface

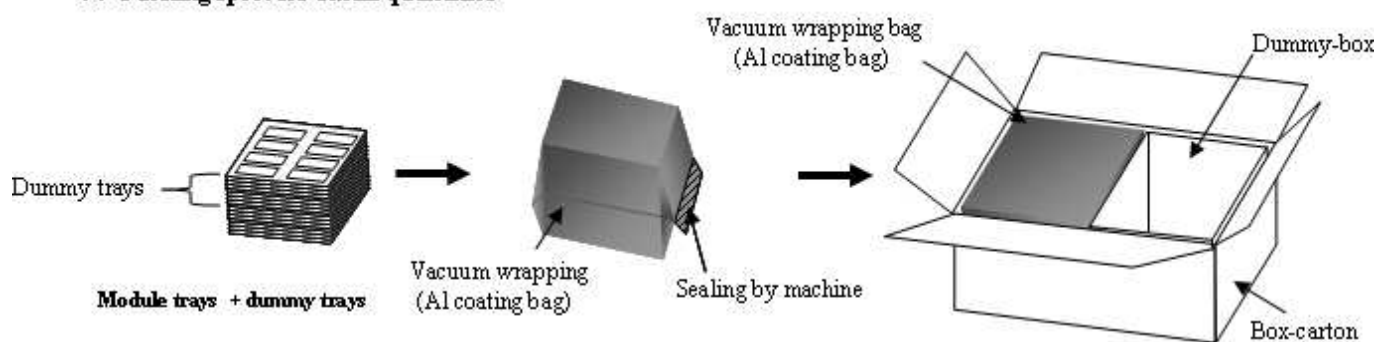




Note

- (1) Total : Box-carton approx. : (00)kg
- (2) Size :583(W) x 388(D) x 210(H)
- (3) Place the panels in the tray facing up direction.
- (4) Stack the trays and cover (dummy) tray.
- (5) Wrap the Al coating bag by vacuum sealing machine.
- (6) Put the bags in the box-carton with divider.
- (7) Seal the box-carton and affix the label-safety.

※ Packing spec. for small quantities



Note

- (1) When package quantity is small, panels containing trays are stacked the bottom, and dummy trays are stacked at the top of package, then wrap the Al coating bag by vacuum sealing machine
- (2) When only one tray bag (Vacuum wrapping bag) is available, dummy box is inserted into the vacant space

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Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

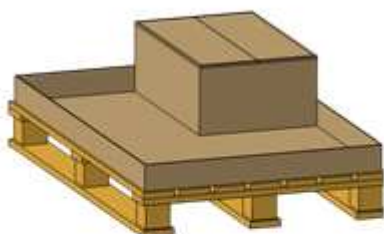
Rev. : 5.0

36/46

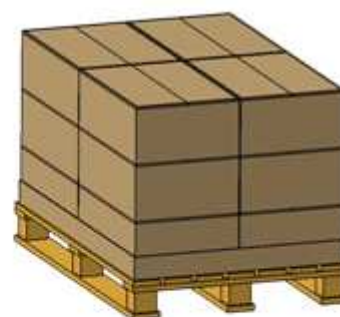
14-3-2. Packing a Pallet Box

Part	Quantity
Pallet	1 EA
Sleeve Bottom	1 EA
Sleeve Box	1 EA
Sleeve Cap	1 EA

①

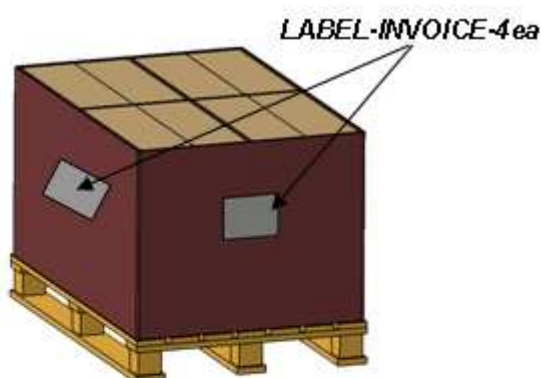


- Load sleeve bottom on a pallet



- Load **12EA** carton boxes

③



- Cover a packing box

④



- Cover a sleeve cap
- Taping and Warping
- Label-Invoice 4EA
- Label-safety 24EA

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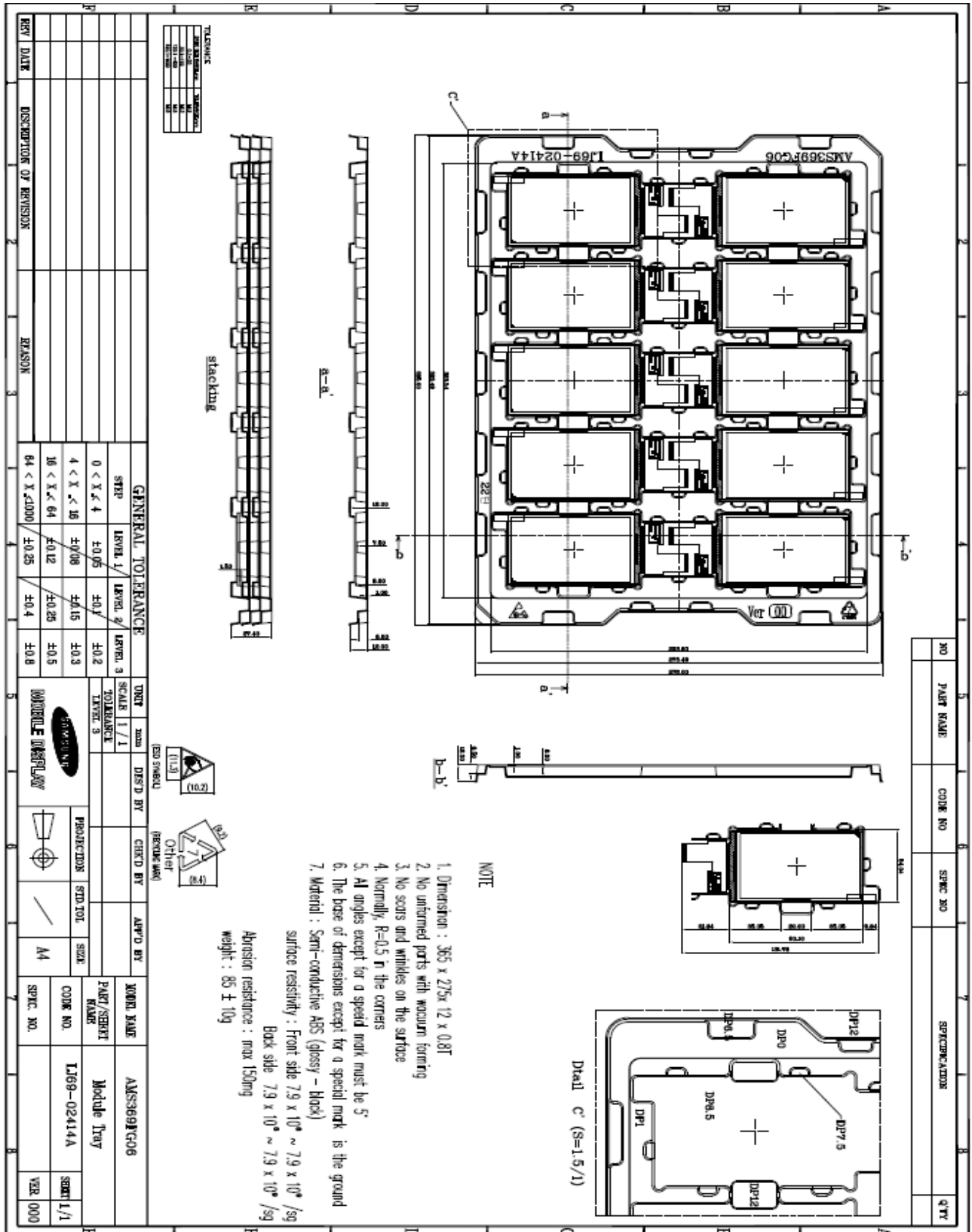
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AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

37/46

14-3-3. Packing tray drawing



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Doc. No.:
AMS369FG06-0

TITLE : 3.7" Visual WVGA 480*800
AMOLED

Rev. : 5.0

38/46