Module Specification

Customer	-
Model Name	AMFN888
Description	3.1” Visual WVGA 480 × 800 16.7M
Document No.	-
Version	Version 0.1

Proposed by			Approved by
Designed	Checked	Approved	
JY SON	JH PARK		

CHANGE HISTORY

Issue	Date	Contents	Written	Approved
Draft 0.0	Mar. 2nd, 2009	Initial draft	JY SON	
v0.1	Mar. 3rd, 2009	**4.1.3 Electrical characteristics** Current consumption(IBAT) has been updated.	JY SON	
v0.2	Aug. 13th , 2009	**6.1 Mechanical drawing changed**	JY SON	

CONTENTS

1. SCOPE

This specification defines general provisions as well as inspection standards for AMOLED module supplied by Samsung Mobile Display 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 Mobile Display Co., LTD., and Samsung Mobile Display 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 handing 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 Mobile Display prior to implementation, where any and all disclosures of the customer shall be with an authorized representative of Samsung Mobile Display in writing. Samsung Mobile

Display shall not be responsible for safety, performance, functionality, compatibility of the system with which the Samsung Mobile Display-supplied components are integrated unless such features have been expressly communicated and described in the Specification. **SAMSUNG MOBILE DISPLAY 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.

3 GENERAL REQUIREMENTS

General	
Technology	AMOLED
Display format	240 columns R(B)GB(R)G× 800 rows
Active area size (width x height)	40.32 (W) X 67.20 (H)
Pixel pitch (width x height)	0.168 mm × 0.084 mm
Sub-pixel size (width x height)	0.042 mm × 0.084 mm
Weight	(g)
Dimensions	
Module size (width x height x thickness)	45.88 X 77.20 x 1.57 mm
Glass size (width x height x thickness)	44.58 X 75.90 x 0.80 mm
Driver IC	
Manufacture NO.	TL2796
Interface	24 bit RGB interface
Memory Size	RAMLESS
Optical	
Pixel arrangement	R(B)GB(R)B visual type
Coating	HC
Polarizer hardness	2H
Viewing direction	Free
Output luminance	300 nit(Default setting)
Illumination mode	Self-emissive
Refresh rate	60Hz
Numbers of colors	16.7 M 24-bit 8*R, 8*G, 8*B
Environmental	
Operational temperature	–20 ℃ to +60 ℃
Storage temperature	–30 ℃ to +70 ℃
Operational humanity	10 %RH to 90 %RH
Storage humanity	10 %RH to 90 %RH

4 ELECTRICAL SPECIFICATIONS

4.1 Electrical characteristics of display module

4.1.1 Interface pin description of display module

Pin No	Symbol	Type	Detail	Min	Nominal	Max	Unit	Signal Description
1	N/C	-						Not connected
2	VBAT	PWR		2.5	3.8	4.5	V	Power supply voltage
3	VBAT	PWR		2.5	3.8	4.5	V	Power supply voltage
4	VBAT	PWR		2.5	3.8	4.5	V	Power supply voltage
5	SDO	-						Logic output
6	VDD3	PWR		1.65	1.8	3.3	V	Power supply voltage
7	RESETB	IN						Logic input/output
8	GND	PWR						Ground
9	SCL	IN						Logic input
10	CSB	IN						Logic input
11	SDI	IN						Logic input
12	ENABLE	IN						Logic input
13	DOTCLK	IN						Logic input
14	HSYNC	IN						Logic input
15	VSYNC	IN						Logic input
16	GND	PWR						Ground
17	GND	PWR						Ground
18	D0	IN/OUT						Logic input/output
19	D1	IN/OUT						Logic input/output
20	D2	IN/OUT						Logic input/output
21	D3	IN/OUT						Logic input/output
22	D4	IN/OUT						Logic input/output
23	D5	IN/OUT						Logic input/output
24	D6	IN/OUT						Logic input/output
25	D7	IN/OUT						Logic input/output
26	D8	IN/OUT						Logic input/output
27	D9	IN/OUT						Logic input/output
28	D10	IN/OUT						Logic input/output

29	D11	IN/OUT						Logic input/output
30	D12	IN/OUT						Logic input/output
31	D13	IN/OUT						Logic input/output
32	D14	IN/OUT						Logic input/output
33	D15	IN/OUT						Logic input/output
34	D16	IN/OUT						Logic input/output
35	D17	IN/OUT						Logic input/output
36	D18	IN/OUT						Logic input/output
37	D19	IN/OUT						Logic input/output
38	D20	IN/OUT						Logic input/output
39	D21	IN/OUT						Logic input/output
40	D22	IN/OUT						Logic input/output
41	D23	IN/OUT						Logic input/output
42	N/C	-						Not connected
43	VCI	PWR			2.8	3.3	V	Power supply voltage
44	MTP2	IN						MTP voltage (Don't use it)
45	MTP1	IN						MTP voltage (Don't use it)

4.1.2 Maximum Ratings

[Vss=0.0VDC]

Items		Symbol	Min	Max	Unit	Remark
Supply Voltage	Logic	VDD3	-0.3	3.6	V	Note 1), 2)
	Analog	VCI	-0.3	3.6	V	Note 1), 2)
	Display	VBAT	-0.3	6.0	V	Note 1), 2)
Signal Input Voltage		VIN	-0.5	VDD + 0.5	V	Note 2)

Note

1) Power supply voltage VDD3, VCI and VBAT are always higher than Vss(=GND)

2) Driver IC and other electrical components could be eternally damaged if the Power Supply Voltages excess maximum rating mentioned above.

4.1.3 Electrical Characteristics

(Vss=0.0V, VDD3=1.8V, VCI=2.8V, VBAT=3.8V, Tamb=-20℃ to 60℃)

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
Logic power		VDD3	-	1.65	1.8	3.3	V	
Analog power		VCI	-	2.5	2.8	3.3	V	
Battery power		VBAT	-	2.5	3.8	4.5	V	
Input signal voltage	H-Level	VIH	--	0.8* VDD3	-	VDD3	V	
	L-Level	VIL	-	-0.2	-	0.2*VDD3	V	
Output signal voltage	H-Level	VOH	IOH = -0.1mA	0.8*VDD3	-	VDD3	V	
	L-Level	VOL	IOL = +0.1mA	-0.2	-	0.2*VDD3	V	
Leakage Current	Input	ILI	VI=I/O VCC or VSS	-1.0	-	1.0	uA	
	Output	ILO		-3.0	-	3.0	uA	
Current consumption of Logic power		IVDD3	Full White (Normal operation)	-	-	1	mA	Note 1)
		IVCI		-	-	20	mA	
		Istby (VBAT=3.8V)	Stand-by mode	-	10	200	uA	Note 2)
Current consumption of Battery power		IBAT(1)	100% on (Normal operation)	-	268	319	mA	Note 3)
			40% on (Normal operation)	-	107	128	mA	
Quiescent Current		IBAT(2)	EL_ON = “0” (Sleep Mode)	-	10	200	uA	Note 4)
Frame Frequency		f_{FRM}	-	-	60	-	Hz	Note 5)

Note

1) Logic current @ full white image which means whole RGB active area is emitting.

2) Logic current when stand-by mode is ON(STB = ‘1’)

3) Battery current consumption @ VBAT = 3.8V and full white image.

4) Battery current consumption @ Stand-by ON and DC/DC OFF.

5) Frame frequency would be corresponding to software setting.
(also differ with resistance variation of OSC so that the value referred here is just a reference.)

5 OPTICAL CHARACTERISTICS

(VSS=0.0V, I/O VCC=1.8V, VCI=2.8V, VBAT=3.8V, Tamb=-25℃, Measuring angle=Orthogonal)

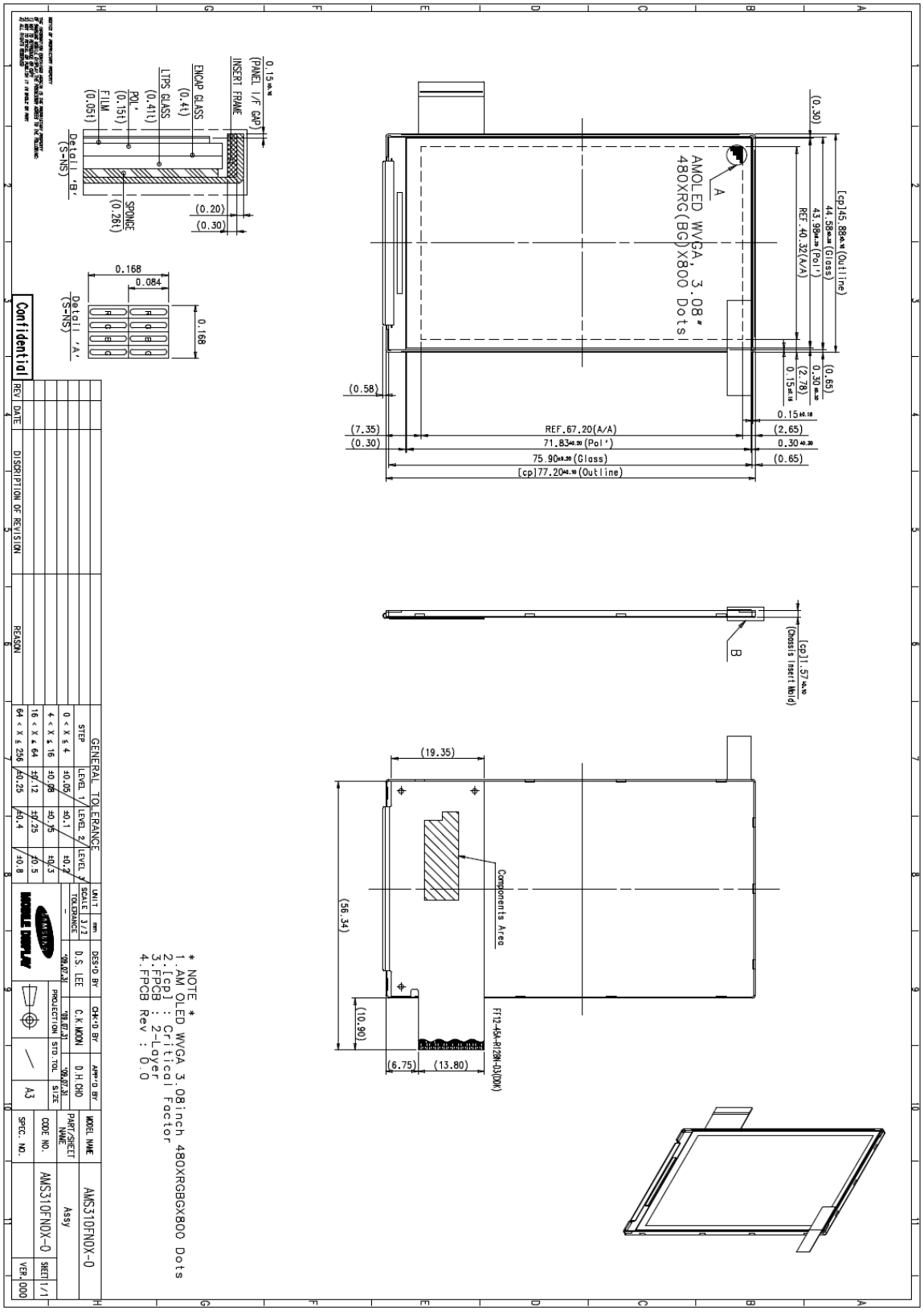
Item		Symbol	Condition		Min	Typ	Max	Unit
Luminance (CTF)		L	FULL WHITE		255	300	360	cd/m^2
Uniformity		-	FULL WHITE		80	90	-	%
Viewing Angle		Φ	C/R≥10 (Black & White)	Θ= 0°	80	-	-	degree
				Θ= 90°	80	-	-	degree
				Θ=180°	80	-	-	degree
				Θ=270°	80	-	-	degree
Contrast		C/R	WHITE/BLACK		5,000	-	-	-
Color coordinate (xy-coordinate) (CIE-1931)	White	W_x	Θ=Φ=0° (R255*G255*B255)		0.280	0.300	0.320	-
		W_y			0.290	0.310	0.330	-
	Red	R_x	Θ=Φ=0° (R255*G0*B0)		0.625	0.675	0.725	-
		R_y			0.295	0.325	0.355	-
	Green	G_x	Θ=Φ=0° (R0*G255*B0)		0.190	0.220	0.250	-
		G_y			0.695	0.725	0.755	-
	Blue	B_x	Θ=Φ=0° (R0*G0*B255)		0.115	0.145	0.175	-
		B_y			0.025	0.055	0.085	-
Life time		-	FULL WHITE @typical condition		20K	-	-	hrs

6 MECHANICS SPECIFICATION

6.1 Part list of display module

No	Part name	Description	Vendors
1	AMOLED Panel	0.8t	Samsung Mobile Display
2	POLARIZER	HC 0.15t	KORENO
3	Adhesive-SIL(Tuffy)	TF-4200EB-451	Hitachi Chemical
4	DRIVER IC	TL2796(Polishing)	Crover Hi-tech
5	Schottky Diode	RB520G-30GT2R	Rohm
6	FPCB	LJ41-06249A	BH FLEX
7	Capacitor	1000nF, 6.3V, 1005	TAIYO,SEM,MURATA,Samhwa
8	Capacitor	1000nF, 10V, 1005	TAIYO,SEM,MURATA,Samhwa
9	Capacitor	1000nF, 16V, 1005	TAIYO,SEM,MURATA,Samhwa
10	Capacitor	0.1nF, 50V, 1005	TAIYO,SEM,MURATA,Samhwa
11	Capacitor	0.027nF, 50V, 1005	TAIYO,SEM,MURATA,Samhwa
12	Capacitor	4700nF, 10V, 1608	TAIYO,SEM,MURATA,Samhwa
13	Resistor	100Kohm, 1005	SEM, Rohm, AVX, Kyocera
14	Resistor	300ohm, 1005	SEM, Rohm, AVX, Kyocera
15	DC/DC Converter	STOD02-D 0.6t	STMicroelectronics
16	Inductor	2520, 4.7uH	ABCO

6.2 Mechanical outline dimensions



DISPLAY MODULE BLOCK DIAGRAM