



SPECIFICATION OF LIQUID CRYSTAL DISPLAY MODULE

Product No. : GWMS5509

Customer : _____

Version : A01

Date : Sep.15,2006

Engineering Dept.				QA Dept.	Customer
LCD Prepared	LCM Prepared	Checked	Approved	Approved	Approved
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Note: If you agree on the specification, *please approve and fax it to the Goworld Market Department.*

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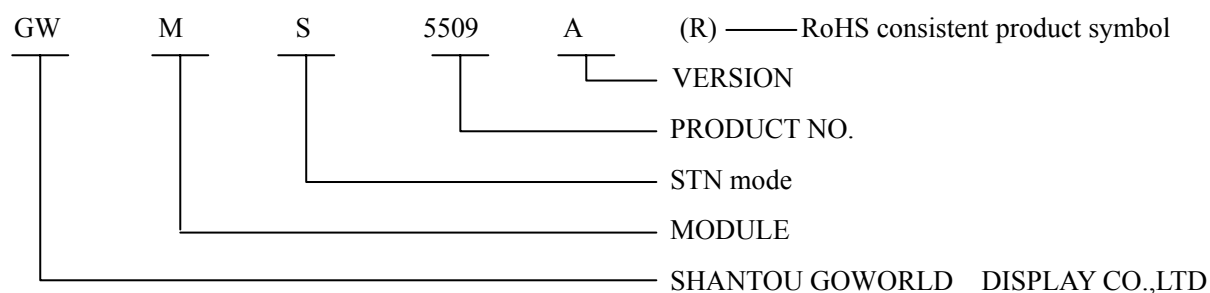
1.0 INTRODUCTION

This USER'S MANUAL is introduced the outside dimensions, optical characteristics, electrical characteristics, interface defines, controller commands, etc. of the custom design LCD module.

1.1 FEATURE

- 1). Compact, integral display module.
- 2). LCD: FSTN /Positive/ Transflective,6:00
- 3). Driving Method: 1/65duty .1/9bias.
- 4). Built-in Control LSI: ST7665V-G

2.0 CLASSIFICATION OF MODULE



3.0 DIMENSIONAL DIAGRAM

PIN CONNECTION

NO	SYMBOL	NO	SYMBOL
1	IRS	18	C5-
2	/HPM	19	VOUT
3	P/S	20	VSS
4	C86	21	VDD
5	VR	22	D7
6	V5	23	D6
7	V4	24	D5
8	V3	25	D4
9	V2	26	D3
10	V1	27	D2
11	VRS	28	D1
12	C4-	29	D0
13	C2+	30	/RD
14	C2-	31	/WR
15	C1-	32	A0
16	C1+	33	/RES
17	C3-	34	/CS1

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Display Type : FSTN/POSITIVE
Display Mode : TRANSFLECTIVE
Viewing Direction : 6:00
Driver IC: ST17565V-G
Logical Voltage (VDD) : type 3.0V MAX 3.3V
LCD Driver Voltage (Vlcd) : 9.0V
LCM Driver Current: Im(MAX)
Driving Method : 1/65 DUTY 1/9 BIAS
LED Driver Voltage (Vled) : <BLUE>TYPE 3.5V MAX 3.8V
LED Driver Current (IF) : 80mA
Operating Temperature : -20~ +70°C
Storage Temperature : -30~ +80°C
Interface Connector : FPC
All unmarked tolerances: ±0.2mm

CUSTOMER APPROVAL:

LCM NO: 31WMS5509-LCM/A00 UNITS: mm
DWG NO: ED-5509-LCM/A00 SHEET 1 OF 1

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2006-03-31

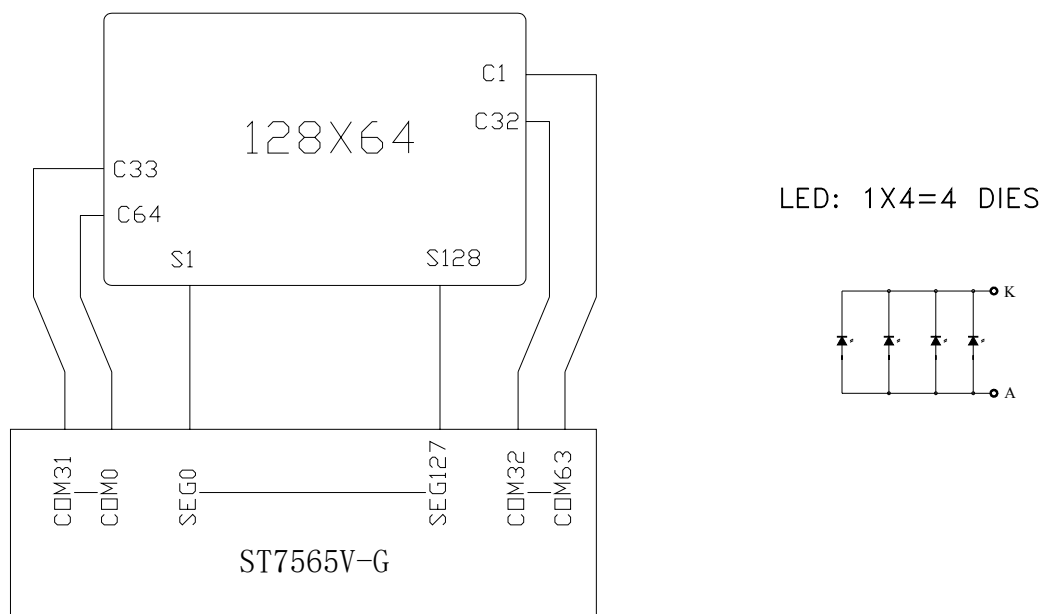
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2006-03-31

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4.0 BLOCK DIAGRAM



5.0 MECHANICAL SPECIFICATIONS

ITEM	STANDARD VALUE	UNIT
MODULE DIMENSION	55.2(W)×79.8(H)×6.4MAX(D)	mm
VIEW AREA	45.2(W)×27.0(H)	mm
DUTY	1/65	-
LCD TYPE	FSTN, Transflective, Positive	-
VIEWING DIRECTION	6 O'CLOCK	-

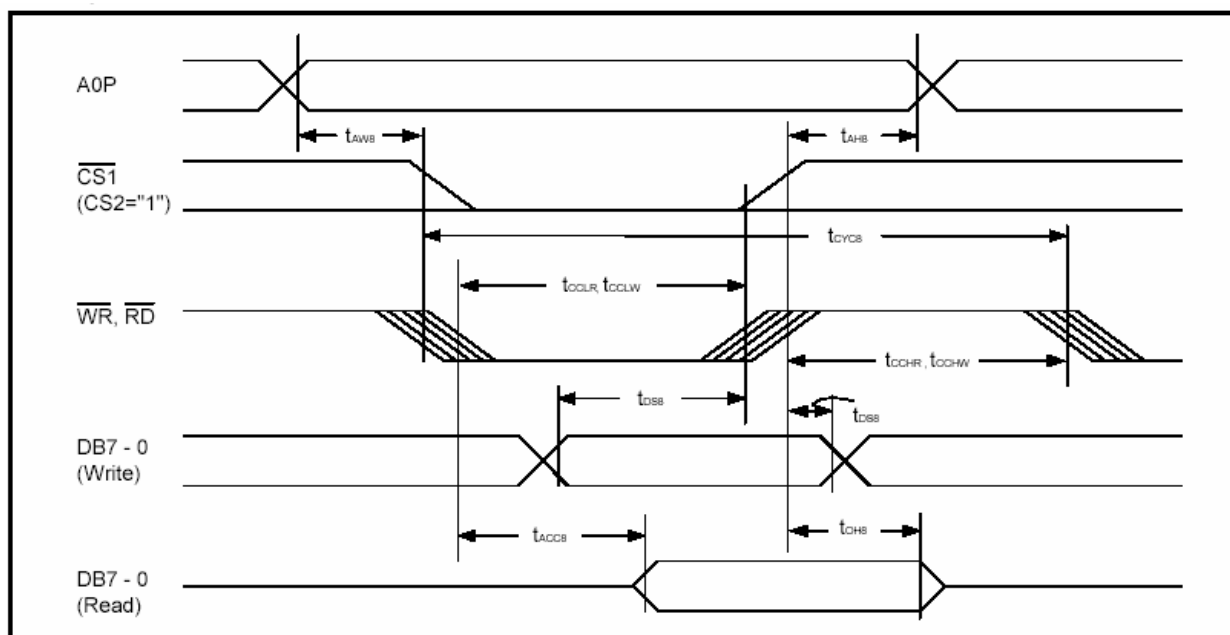
6.0 MAX STANDARD VALUE

ITEM	SYMBOL	MIN.	MAX.	UNIT
OPERATING TEMPERATURE	Top	-20	70	°C
STORAGE TEMPERATURE	Tst	-30	80	°C
SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	2.4	5.5	V
SUPPLY VOLTAGE FOR LCD	VLCD	8.3	8.7	V

7.0 ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	TEST CONDITION	MIN.	TYPE	MAX.	UNIT
SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	Ta=25°C	2.4	3.0	3.3	V
SUPPLY VOLTAGE FOR LCD DRIVER	VLCD	Ta=25°C	8.3	8.5	8.7	V
POWER SUPPLY FOR LOGIC CURRENT	IDD	VDD=3.0V	/	1.0	1.5	mA
FORWARD VOLTAGE OF BACKLIGHT	VLED	If=40mA	1.8	2.1	2.5	V
PEAK WAVE LENGTH OF BACKLIGHT	λ_p	If=40mA	569	572	575	nm

8.0 TIMING CHARACTERISTICS

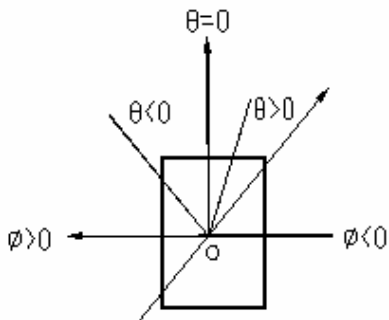
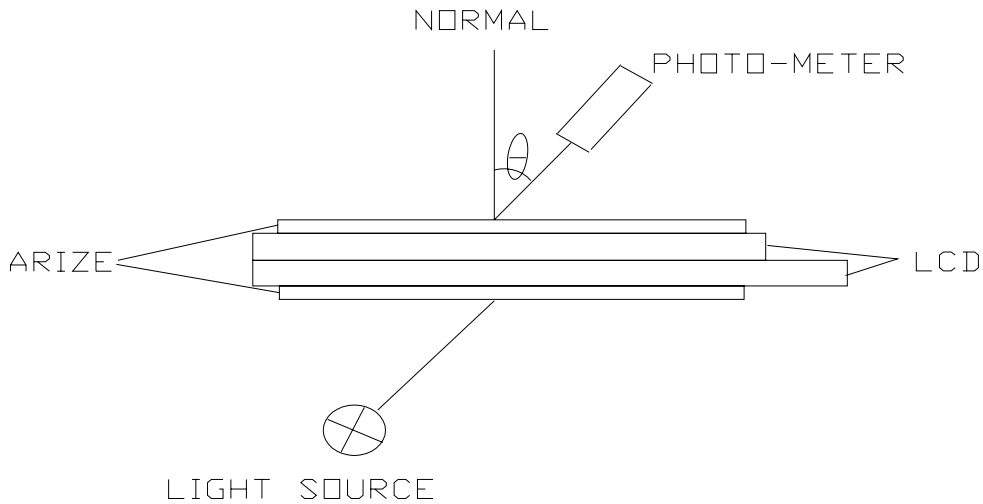


9.0 OPTICAL CHARACTERISTICS

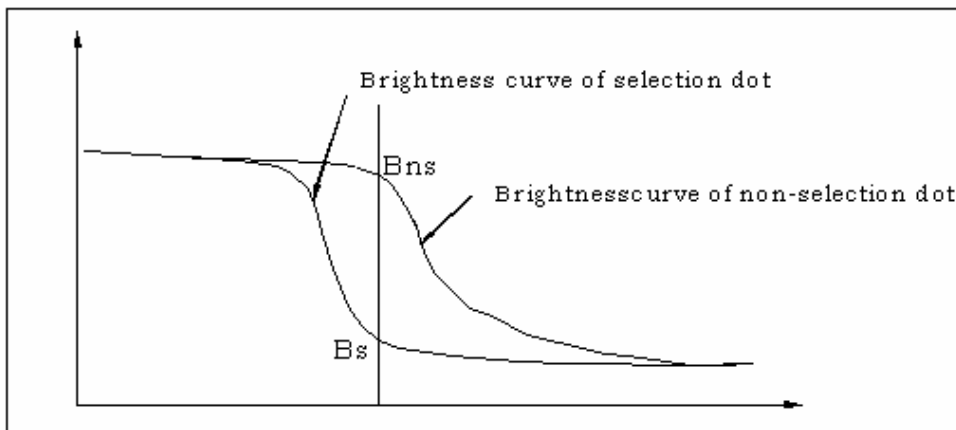
ITEM	SYMBOL	CONDITION	MIN.	TYPE	MAX.	UNIT
Viewing Angle	θ (BK-FT)	$Cr > 2.0$	-25	-	48	DEG
	ϕ (R-L)	Ta=25°C	-50	-	50	
Contrast Ratio	Cr	$\theta = 0, \phi = 0$	3	6.1	9	
Response Time(Rise)	Ton	Ta=25°C VLCD=8.5V	-	408	600	Ms
Response Time(Fall)	Toff		-	227	400	Ms

9.1 OPTICAL MEASUREMENT SYSTEM

9.2 DEFINITION OF θ and Φ



$$Cr = \frac{\text{Brightness of non-selection dot (BNS)}}{\text{Brightness of selection dot (BS)}}$$



10.0 INTERFACE

PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	IRS	2	/HPM
3	P/S	4	C86
5	VR	6	V5
7	V4	8	V3
9	V2	10	V1
11	VRS	12	C4-
13	C2+	14	C2-
15	C1-	16	C1+
17	C3-	18	C5-
19	VOUT	20	VSS
21	VDD	22	D7
23	D6	24	D5
25	D4	26	D3
27	D2	28	D1
29	D0	30	/RD
31	/WR	32	A0
33	/RES	34	/CS1

11.0 RELIABILITY

ITEM OF RELIABILITY TEST

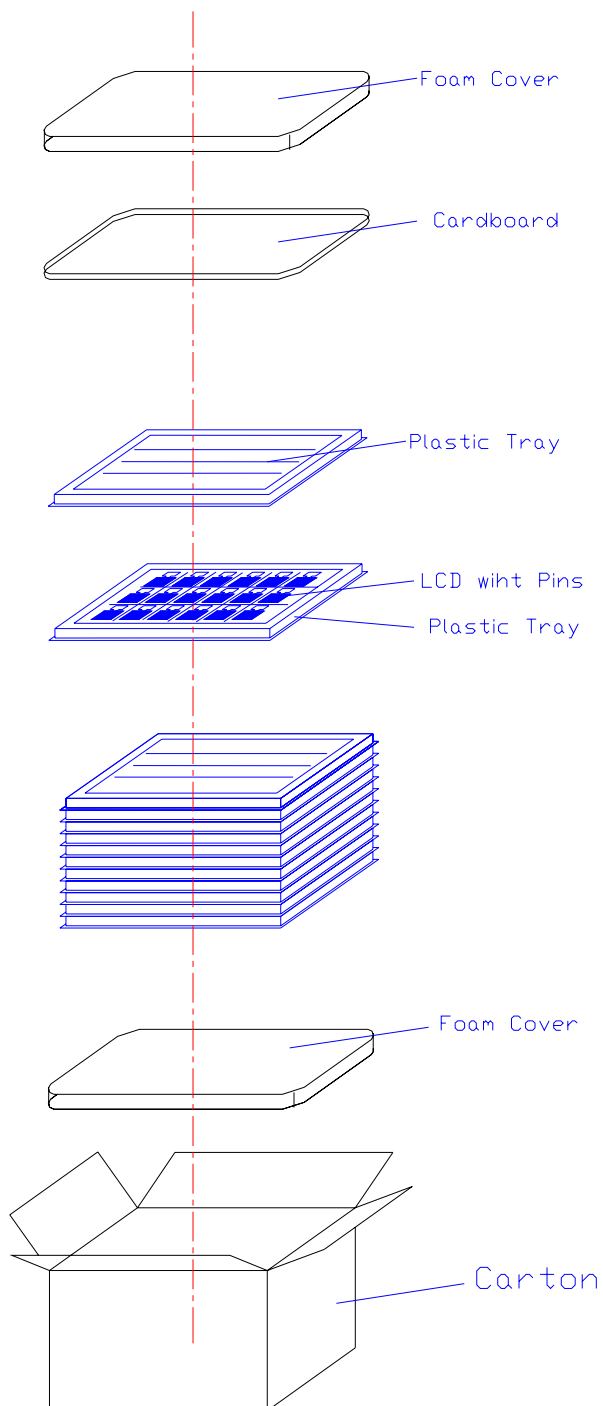
NO.	ITEM	CONDITION	NOTE
1	HIGH TEMPERATURE OPERATING	70+/-2°C OPERATING FOR 96Hrs	THE ENVIRONMENTAL TESTING SHOULD BE DONE BY ED.
2	LOW TEMPERATURE OPERATING	-20+/- 2°C OPERATING FOR 96Hrs	
3	HIGH TEMPERATURE STORAGE	80+/-2°C STORAGE FOR 96Hrs	
4	LOW TEMPERATURE STORAGE	-30+/-2°C STORAGE FOR 96Hrs	
5	HIGH TEMP. HUMIDITY OPERATION	40°C/90% REL.HUMIDITY,96H	

Testing Conditions and Inspection Criteria

For the final test, the testing sample must be stored at room temperature for 2 hours, after the tests listed in Table; Standard specifications for Reliability have been executed in order to ensure stability.

NO	Item	Test Model	Inspection Criteria
1	Current Consumption	Refer to Specification	The current consumption should under double of initial test
2	Contrast	Refer to Specification	The contrast must be larger than half of initial test
3	Appearance	Visual Inspection	Defect free

12.0 PACKING



APPENDIX

Specification Revision History:

Version	Content	Date
A00	ORIGINAL EDITION	JUN. 14, 2006
A01	Increase the RoHS	Sep. 15, 2006