



富相科技股份有限公司
SOLOMON GOLDENTEK DISPLAY CORP.


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PART NO : GG3224NWFRN1A(LM6635FWR)
FOR MESSRS : _____

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Accepted by : _____

Proposed by :  _____

Date : 03/04/2004

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GG3224NWFRN1A

REV : 1

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RECORD OF REVISION

DATE	PAGE	SUMMARY

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3. GENERAL SPECIFICATIONS AND MECHANICAL DATA**3.1 GENERAL SPECIFICATIONS**

PLEASE REFER TO:

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (SP-10-000)".

3.2 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS.**3.3 MECHANICAL DATA**

- (1) NUMBER OF DOTS-----320W*240H DOTS
- (2) MODULE SIZE -----91.6W*71.25H*5D (MAX.) mm
- (3) VIEWING AREA-----80.5W*61.5H mm
- (4) DOT SIZE-----0.225W*0.225H mm
- (5) DOT PITCH -----0.24W*0.24H mm
- (6) VIEWING DIRECTION -----6 O'CLOCK
- (7) LCD TYPE-----FSTN, BLACK/WHITE, POSITIVE,
REFLECTIVE
- (8) DRIVING METHOD-----1/240 DUTY MULTIPLEX DRIVE

4. ABSOLUTE MAXIMUM RATINGS**4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS**

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	-0.3	5.5	V	
POWER SUPPLY FOR LCD DRIVE	VEE-VSS	0	35.0	V	
INPUT VOLTAGE	VI	-0.3	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)

NOTE(1) : TEST METHOD AND CONDITIONS :

AFTER CHARGING UP 200PF CAPACITOR BY STATED VOLTAGE , THE CAPACITOR IS CONNECTED WITH INTERFACE PINS OF THE MODULE.

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20°C	50°C	-30°C	60°C	NOTE (2)
HUMIDITY	85%RH		85%RH		WITHOUT CONDENSATION
VIBRATION	—	4.9 m/s ² (0.5G)	—	19.6 m/s ² (5G)	10~300HZ XYZ DIRECTIONS 1 Hr.EACH
SHOCK	—	29.4 m/s ² (5G)	—	49.0 m/s ² (5G)	10 mSEC XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE(2) : Ta AT -30°C : 48HR MAX.
60°C : 168HR MAX.

5. ELECTRICAL CHARACTERISTICS.

Ta=25°C

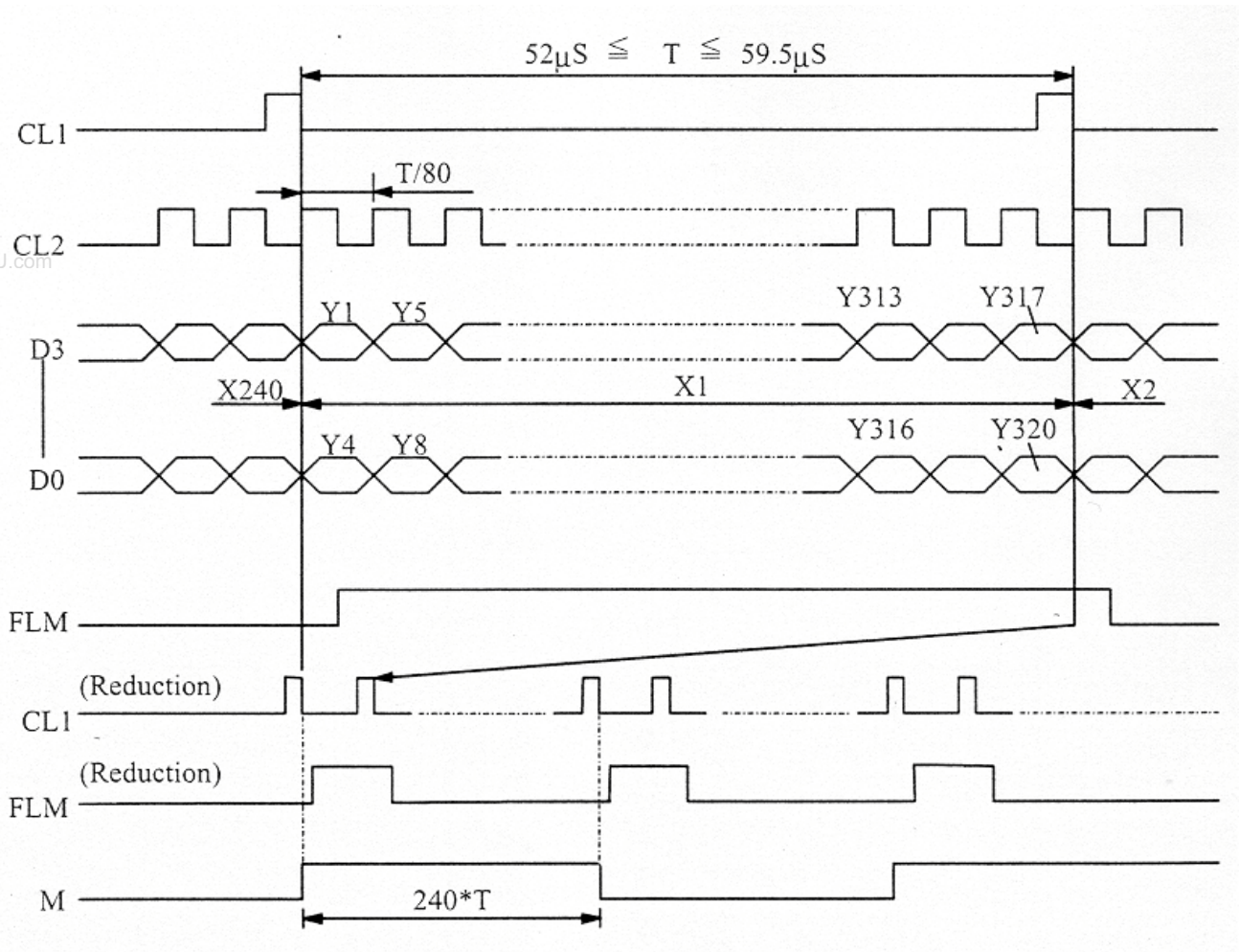
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
LOGIC CIRCUIT POWER SUPPLY VOLTAGE	V _{DD} -V _{SS}	————	2.5	3.0	5.5	V
LCD DRIVER CIRCUIT POWER SUPPLY VOLTAGE	V _{EE} -V _{SS}	————	15.0	——	30.0	V
INPUT VOLTAGE NOTE (1)	V _{IH}	H LEVEL	0.8V _{DD}	——	——	V
	V _{IL}	L LEVEL	——	——	0.2V _{DD}	V
OUTPUT VOLTAGE NOTE (1)	V _{OH}	I _{OH} =-0.4mA	V _{DD} -0.4	——	——	V
	V _{OL}	I _{OL} =+0.4mA	——	——	0.4	V
LOGIC CIRCUIT POWER SUPPLY CURRENT NOTE (2)	I _{DD}	V _{DD} -V _{SS} =3.0V V _{EE} -V _{SS} =21.0V	——	1.0	——	mA
LCD DRIVER CIRCUIT POWER SUPPLY CURRENT	I _{EE}	V _{DD} -V _{SS} =3.0V V _{EE} -V _{SS} =21.0V	——	2.5	——	mA
RECOMMENDED LCD DRIVING	V _{EE} - V _{SS} Φ=10° θ=0° DUTY = 1/240	Ta = -20°C	——	——	——	V
		Ta = 25°C	——	21.0	——	V
		Ta = 50°C	——	——	——	V
FLM FREQUENCY	f _{FLM}	————	70	75	80	Hz

NOTE(1) : APPEND TO TERMINALS D0~D3,FLM,CL1,CL2,M

NOTE(2) : I_{DD} : THE DISPLAY PATTERN IS ALL "Q".

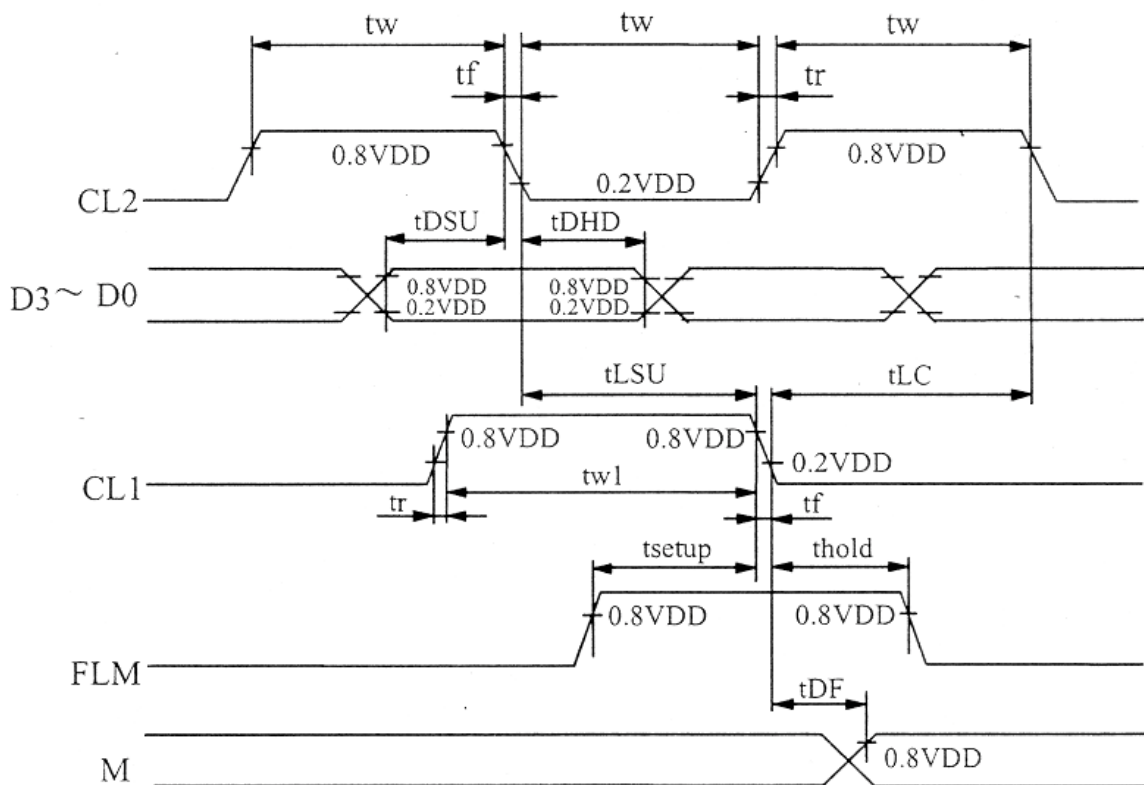
6. TIMING CHARACTERISTICS.

6.1 Interface Timing



6.2 SWITCHING CHARACTERISTICS.

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
CL1 PULSE WIDTH	tw1	51	—	—	ns
CL2 PULSE	tw	51	—	—	ns
RISE,FALL TIME	tr,tf	—	—	50	ns
DATA SETUP TIME	tDSU	30	—	—	ns
DATA HOLD TIME	tDHD	40	—	—	ns
CL1 SETUP TIME	tLSU	51	—	—	ns
CL1 TO CL2 TIME	tLC	51	—	—	ns
FLM SETUP TIME	tsetup	30	—	—	ns
FLM HOLD TIME	thold	50	—	—	ns
OUTPUT DELAY TIME	tDF	—	—	200	ns



7. OPTICAL CHARACTERISTICS.

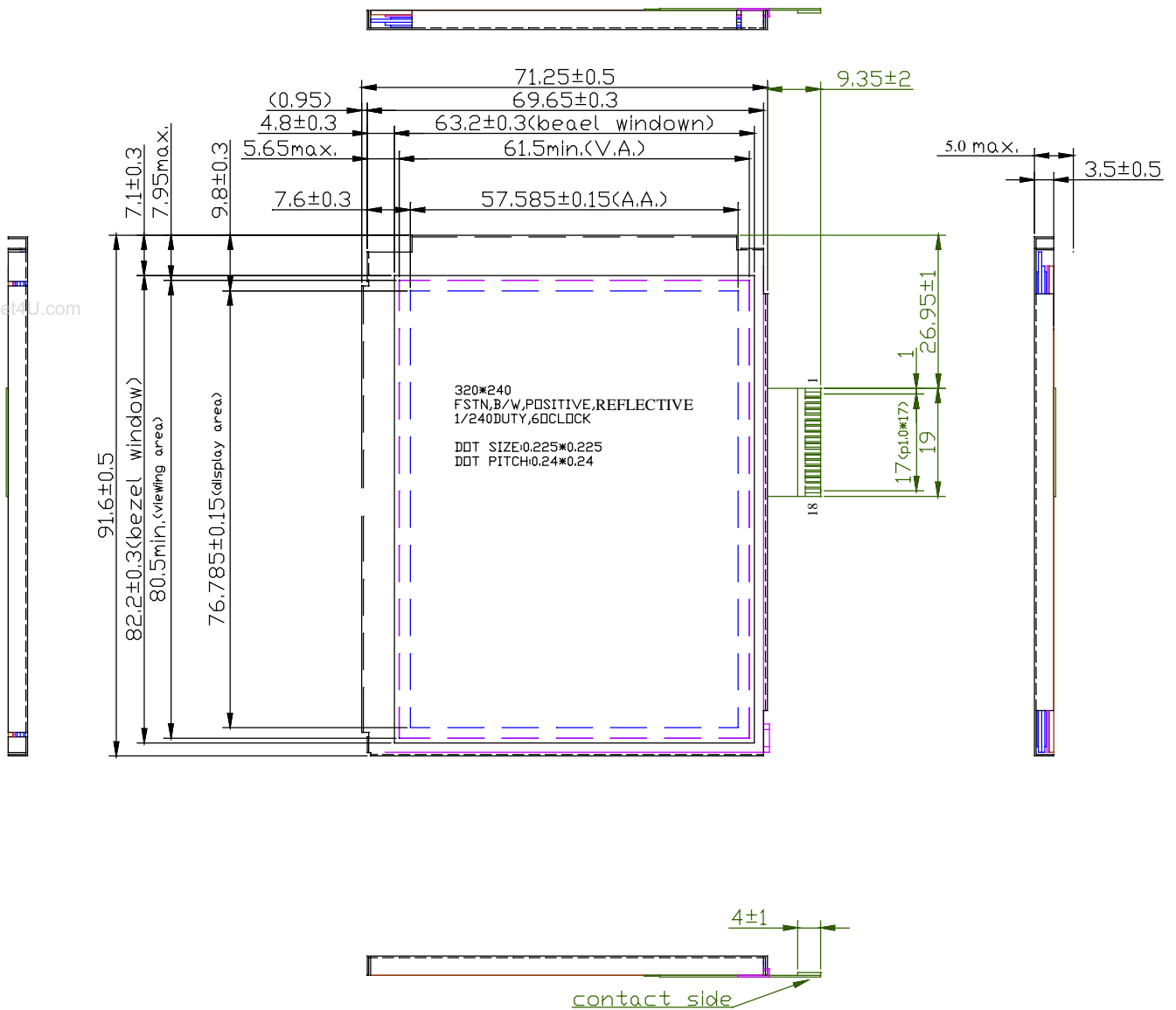
Ta = 25°C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	$\Phi 2 - \Phi 1$	$K \geq 1.4$	—	40	—	deg.	1
CONTRAST RATIO	K	$\Phi = 10^\circ$ $\theta = 0^\circ$	—	3	—	—	1
RESPONSE TIME	tr(rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	—	310	—	ms	1
	tf(fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	—	150	—	ms	1

NOTE (1) PLEASE REFER TO:

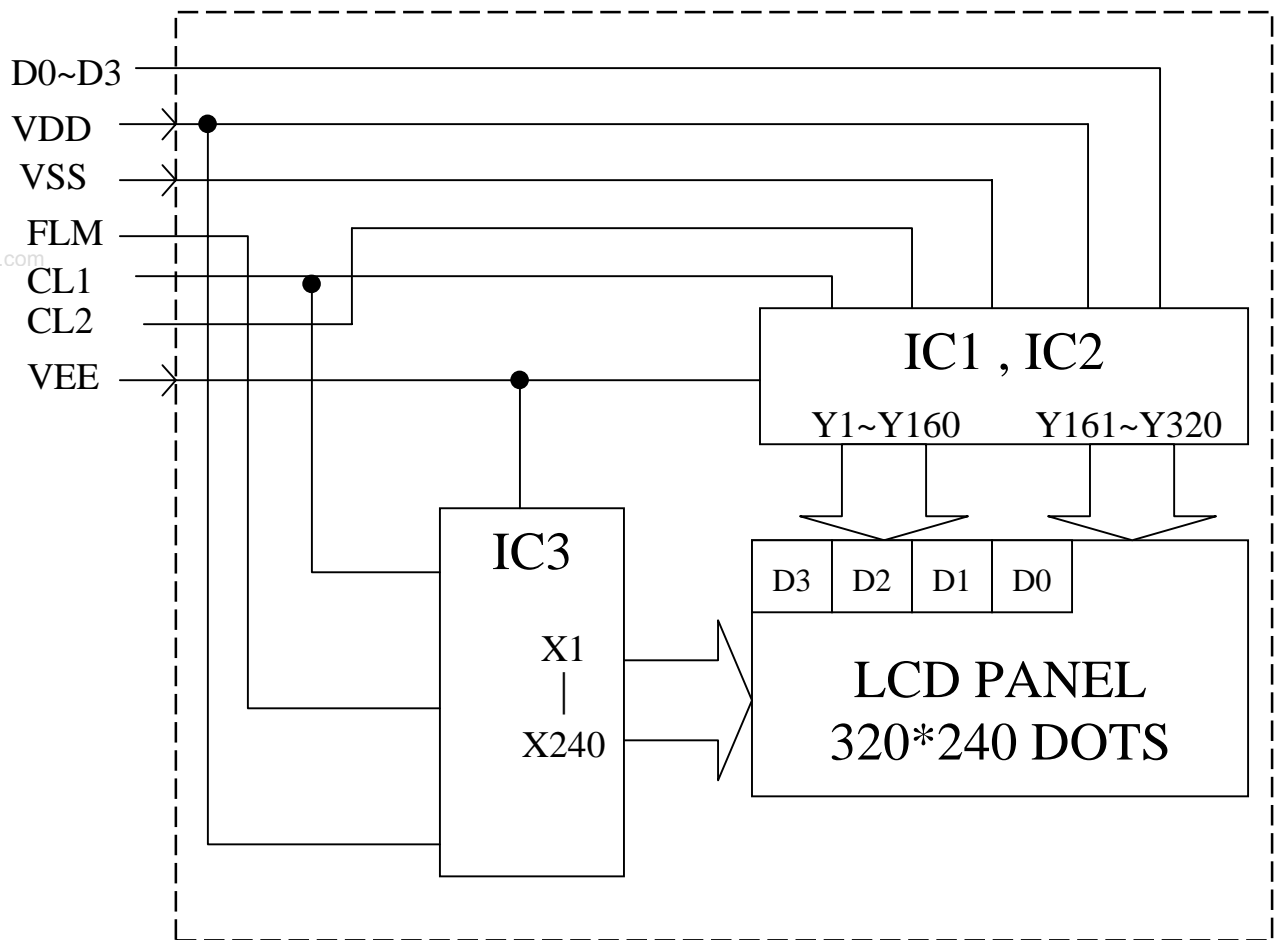
"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (SP-10-000)"

8. OUTLINE DIMENSION



UNIT: mm
 SCALE: NTS
 NOT SPECIFIED TOLERANCE IS ± 0.5 mm

9. BLOCK DIAGRAM

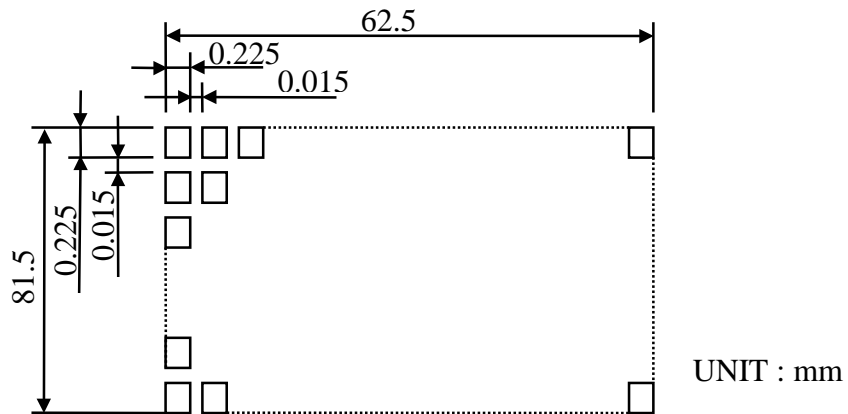


10. INTERFACE PIN CONNECTION

INTERFACE PIN CONNECTION:

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	CL2	H/L	Data Shift Clock Signal.
2	CL1	H/L	Data Latch Clock Signal.
3	FLM	H/L	Frame Signal.
4	M	—	Alternate Signal For LCD Driver
5	D0	H/L	Display Data.
6	D1	H/L	Display Data.
7	D2	H/L	Display Data.
8	D3	H/L	Display Data.
9	VEE	—	Power Supply for LCD (+V).
10	VDD	—	Power Supply for Logic.
11	VSS	—	Power Supply (0V).
12	N.C	—	N.C
13	N.C	—	N.C
14	N.C	—	N.C
15	N.C	—	N.C
16	N.C	—	N.C
17	N.C	—	N.C
18	N.C	—	N.C

11. DISPLAY PATTERN.



12. POWER SUPPLY.

12.1 POWER SUPPLY FOR LCM

