



富相科技股份有限公司

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PART NO : GC1602NDSGY1B(LM1120SBL)
 FOR MESSRS : _____

CONTENTS

NO.	ITEM	PAGE
1.	COVER	1
2.	RECORD OF REVISION	2
3.	GENERAL SPECIFICATION AND MECHANICAL DATA	3
4.	ABSOLUTE MAXIMUM RATINGS	4
5.	ELECTRICAL CHARACTERISTICS	5
6.	OPTICAL CHARACTERISTICS	6~7
7.	OUTLINE DIMENSION AND BLOCK DIAGRAM	8~9
8.	POWER SUPPLY	10

Accepted by : _____

Proposed by : *Mike Ma*

Date : 09,20,2002

RECORD OF REVISION

DATE	PAGE	SUMMARY
87,03,21	ALL	PAGES CHANGED
2002,09,20	ALL 4	CHANGE CORP. NAME & ADDRESS & FAX,TEL CHANGE PART NO.LM1120SBL → GC1602NDSGY1B 4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS. SHOCK STORAGE 490.0m/s ² (50G)→ 49.0m/s ² (5G)

3. GENERAL SPECIFICATIONS AND MECHANICAL DATA

3.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

”CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (SP-10-001)”.

3.2 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS.

3.3 MECHANICAL DATA

- (1) NUMBER OF CHARACTER----- 16CH*2LINES
- (2) MODULE SIZE ----- 122.0W*44.0H*14.0T (MAX) mm
- (3) VIEWING AREA ----- 99.0W*24.0H mm
- (4) CHARACTER PATTERN ----- 5 * 7dots + CURSOR
- (5) CHARACTER SIZE ----- 4.84W*9.66H mm
- (6) CHARACTER PITCH ----- 6.0 mm
- (7) DOT SIZE ----- 0.92W * 1.10H mm
- (8) DOT PITCH ----- 0.98W * 1.16H mm
- (9) LCD TYPE ----- STN ,BLUE , NEGATIVE ,
TRANSMISSIVE , 6 O’CLOCK
- (10) LED COLOR ----- YELLOW-GREEN

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	0	6.0	V	
POWER SUPPLY FOR LCD DRIVING VOLTAGE	VDD-VO	0	VDD	V	
INPUT VOLTAGE	VI	VSS	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	0°C	50°C	-20°C	60°C	NOTE (2)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	-----	4.9 m/s ² (0.5G)	-----	19.6 m/s ² (2G)	10~300Hz XYZ DIRECTIONS 1 Hr. EACH
SHOCK	-----	29.4 m/s ² (3G)	-----	49.0 m/s ² (5G)	10 mSEC. XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE(2) : Ta AT -20°C : 48HR MAX.
60°C : 168HR MAX.

NOTE(3) : Ta ≤ 40°C : 85% RH MAX.
Ta > 40°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 85%RH AT 40°C.

5. ELECTRICAL CHARACTERISTICS.

			Ta=25°C		VDD=5.0±0.25V	
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
INPUT VOLTAGE (H LEVEL)	VIH	-----	2.2	-----	-----	V
INPUT VOLTAGE (L LEVEL)	VIL	-----	-----	-----	0.6	V
OUTPUT VOLTAGE (H LEVEL)	VOH	-IOH=0.2mA	2.4	-----	-----	V
OUTPUT VOLTAGE (L LEVEL)	VOL	IOL=1.2mA	-----	-----	0.4	V
POWER SUPPLY CURRENT	IDD (INCULDING LED B.L.)	VDD=5.0V	-----	171	-----	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (1)	VDD-VO DUTY=1/16 Φ = 10°	Ta = 0°C	-----	4.8	-----	V
		Ta = 25 °C	-----	4.5	-----	V
		Ta = 50 °C	-----	4.2	-----	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25°C	-----	270	-----	KHz

NOTE(1) : RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTATE
ABOUT ± 0.5V BY EACH MODULE.

6.OPTICAL CHARACTERISTICS

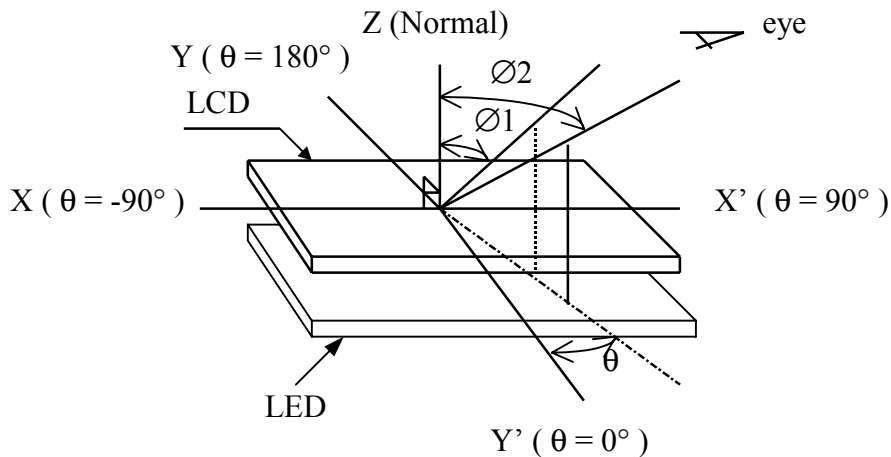
Ta = 25°C

VDD = 5.0V± 0.25V

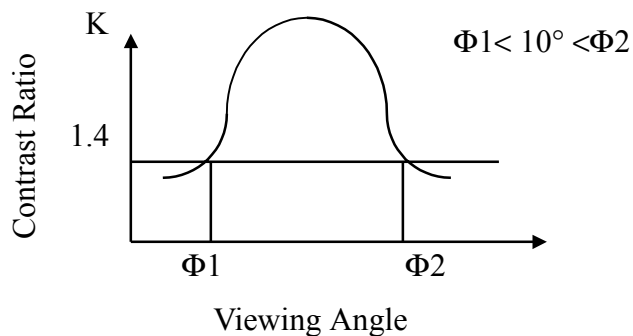
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	$\Phi 2-\Phi 1$	K= 1.4	40	-----	-----	deg.	1
CONTRAST RATION	K	$\Phi = 10^\circ$ $\theta = 0^\circ$	3	-----	-----	-----	2,3
RESPONSE TIME	tr(rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	250	400	ms	4
	tf(fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	350	450	ms	4
THE BRIGHTNESS OF BACKLIGHTING SOURCE	B	(*) $\Phi = 0^\circ$ $\theta = 0^\circ$	4.0	-----	-----	c/m ²	5

(* Under normal temperature and humidity in a dark room)

NOTE (1) : DEFINITION OF θ AND Φ



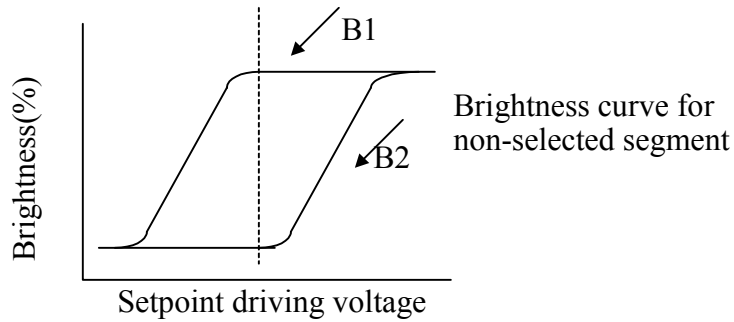
NOTE (2) : DEFINITION OF VIEWING ANGLE $\Phi 1$ AND $\Phi 2$



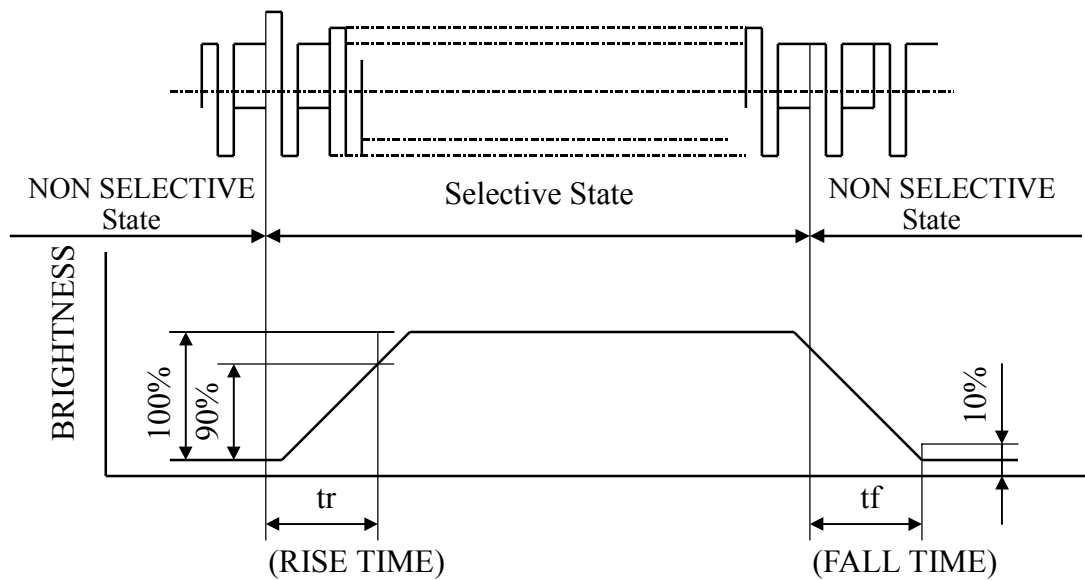
NOTE (3) : DEFINITION OF CONTRAST“K”

$$K = \frac{\text{Brightness of selected segment(B1)}}{\text{Brightness of non-selected segment (B2)}}$$

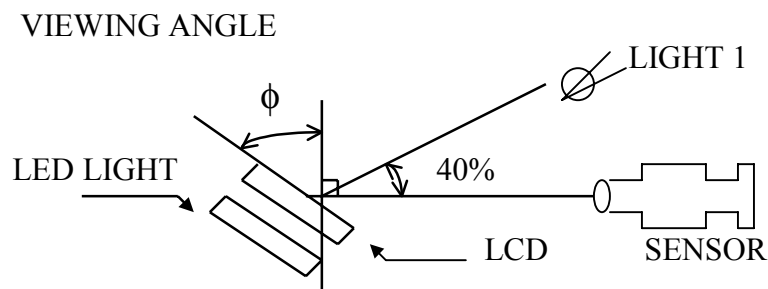
Brightness curve for selected segment



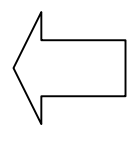
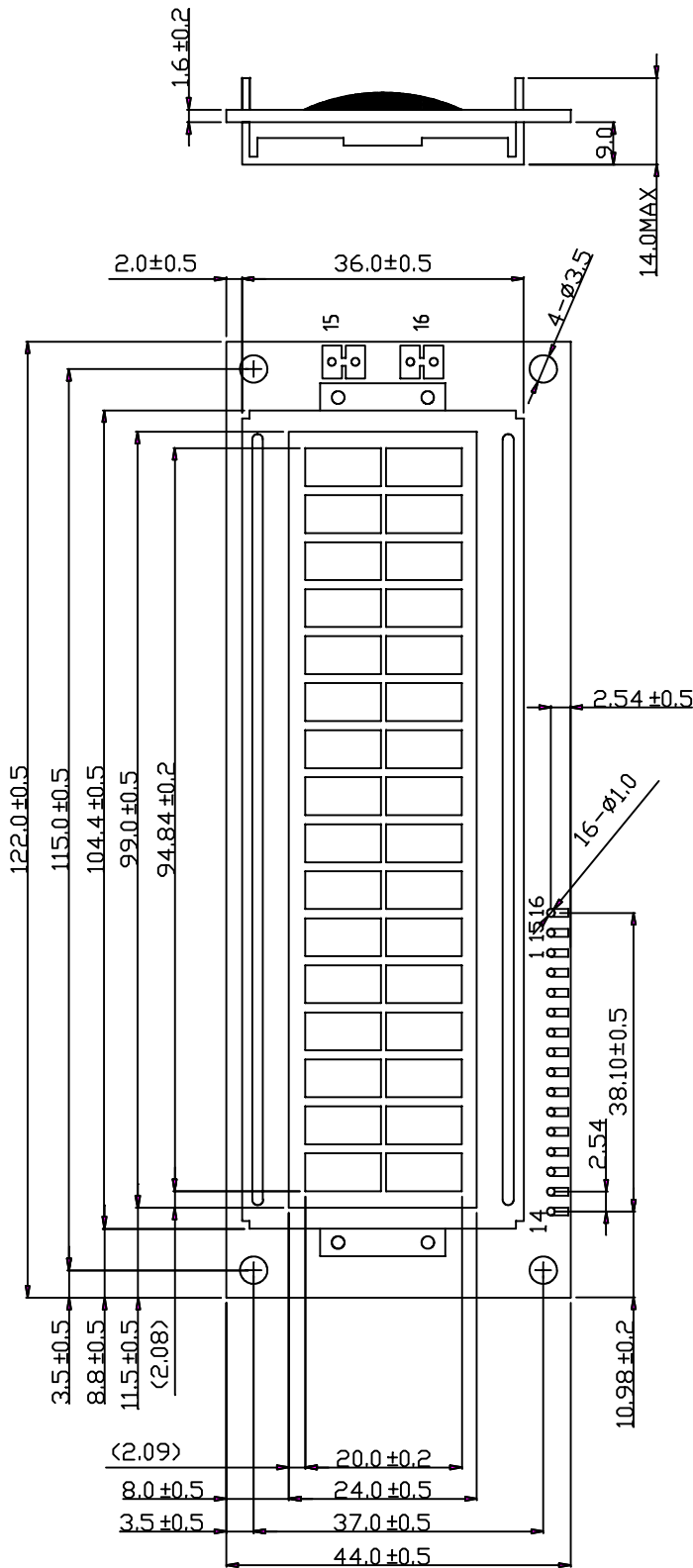
NOTE(4) : DEFINITION OF OPTICAL RESPONSE



NOTE(5) : OPTICAL OF LIGHT



7. OUTLINE DIMENSION



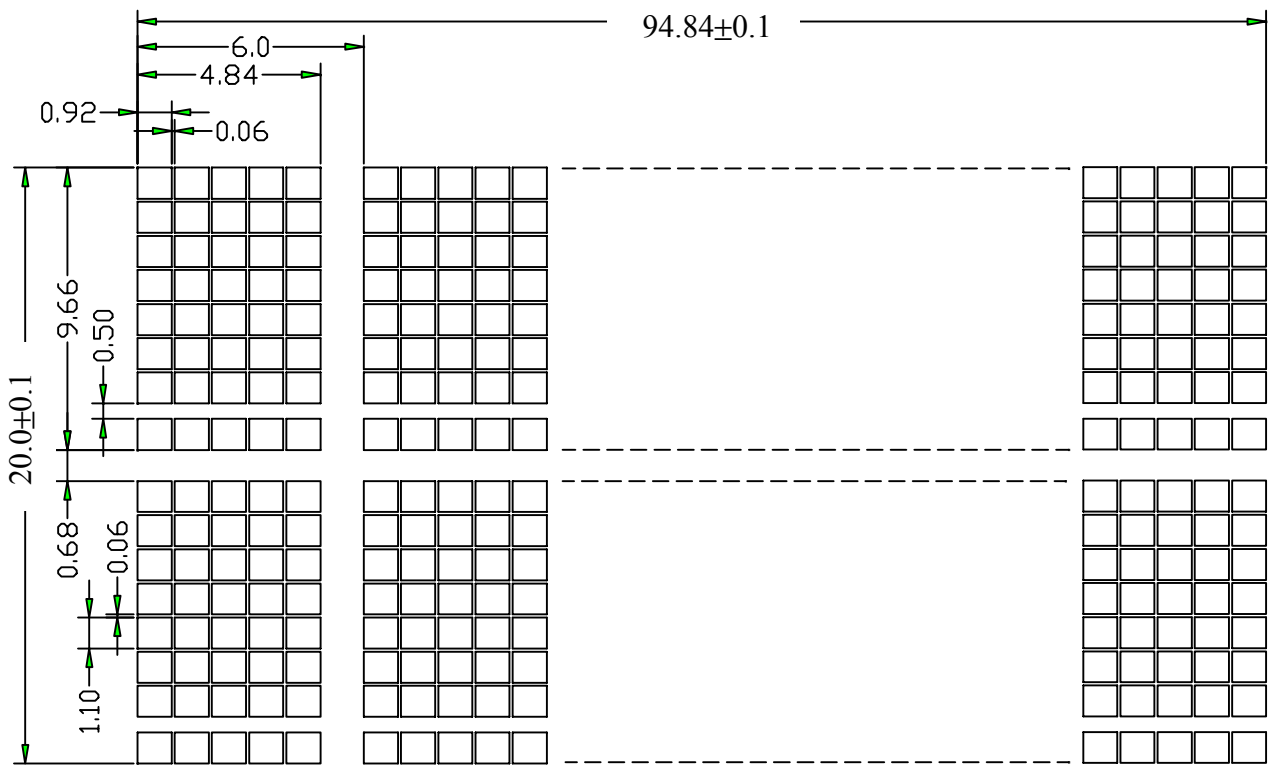
UNIT : mm
 SCALE : NTS
 NO SPECIFIED TOLERANCE : ±0.5

6 O'CLOCK

INTEFACE PIN CONNECTION

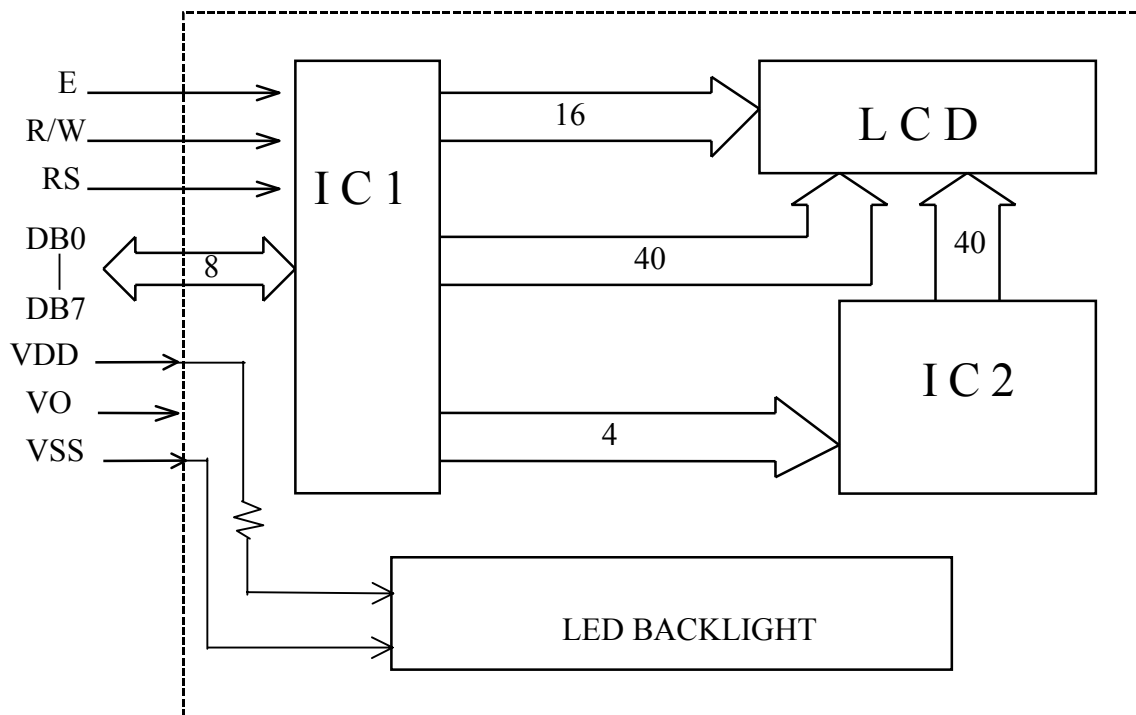
PIN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SYMBOL	VSS	VDD	VO	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	NC	NC

7.1 DETAIL DRAWING OF MATERIX PATTERN



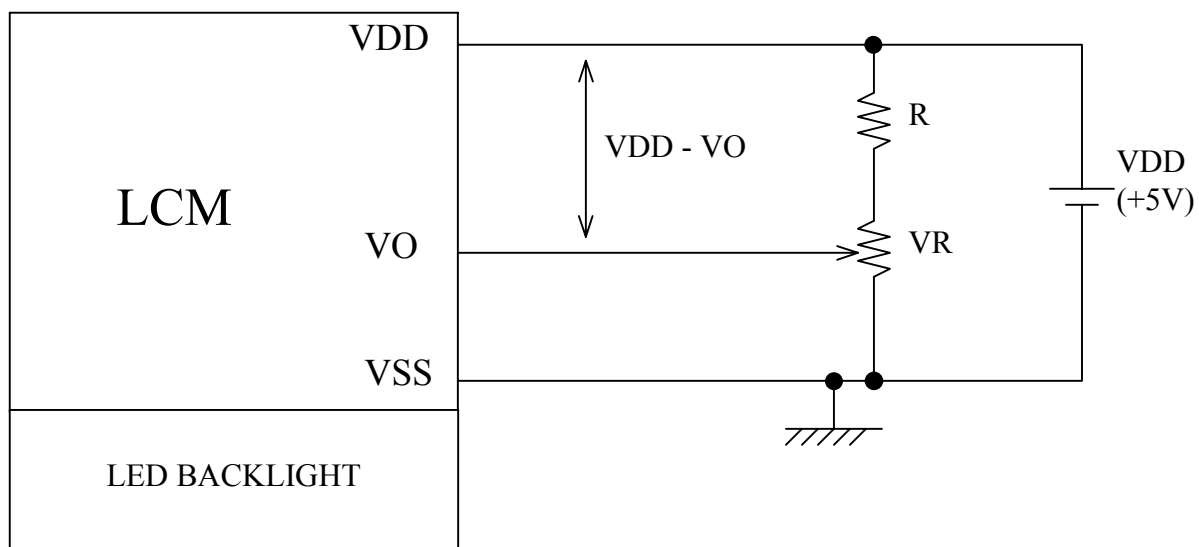
NO SPECIFIED TOLERANCE:±0.01

7.2 BLOCK DIAGRAM.



8. POWER SUPPLY

8.1 POWER SUPPLY FOR LCM



VDD - VO : LCD DRIVING VOLTAGE

VR : 10K Ω ~ 20K Ω

RECOMMEND RESISTOR R : VDD - VO \geq 1.5V