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PART NO : GC2004N4SAN1B(LM1100SYR)
FOR MESSRS : _____

CONTENTS

Accepted by :_____ Proposed by :_____
Date : 09,23,2002

RECORD OF REVISION

DATE	PAGE	SUMMARY
87.05.04	ALL	PAGES CHANGED (CHANGE TO COMMON BOARD)
2002,09,20	ALL	CHANGE CORP. NAME &ADDRESS & TEL,FAX CHANGE PART NO. LM1100SYR→GC2004N4SAN1B
	04	4.2 EVNIRONMENTAL ABSOLUTE MAXIMUM RATINGS. SHOCK STORAGE 490.0m/s^2(50G)→49.0m/s^2(5G)
	11	DELETE NOTE

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 DOTS ---------- 20CH*4 LINES
(2) MODULE SIZE ---------- 98.0W*60.0H*10.5T (MAX) mm
(3) VIEWING AREA ---------- 76.0W*25.2H mm
(4) CHARACTER PATTERN ---------- 5 * 7dots + CURSOR
(5) CHARACTER SIZE ---------- 2.95W *4.75H mm
(6) CHARACTER PITCH ---------- 3.55W * 5.35H mm
(7) DOT SIZE ---------- 0.55W * 0.55H mm
(8) DOT PITCH ---------- 0.60W * 0.60H mm
(9) LCD TYPE ----------STN , YELLOW-GREEN , Reflective ,6 O′clock

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	0	6.5	V	
POWER SUPPLY FOR LCD DRIVING VOLTAGE	VDD-VO	0	6.5	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℃	50℃	-20℃	60℃	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℃ : 48HR MAX.
60℃ : 168HR MAX.

NOTE(3) : Ta ≦ 40℃ : 90% RH MAX.
Ta ＞ 40℃ : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 40℃.

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 (LOGIC)	IDD	VDD = 5.0V	-----	1.0	3.0	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (1)	VDD-VO DUTY=1/16 Φ = 10°	Ta = 0℃	-----	(4.7)	-----	V
		Ta = 25 ℃	-----	4.4	-----	V
		Ta = 50 ℃	-----	(3.9)	-----	V

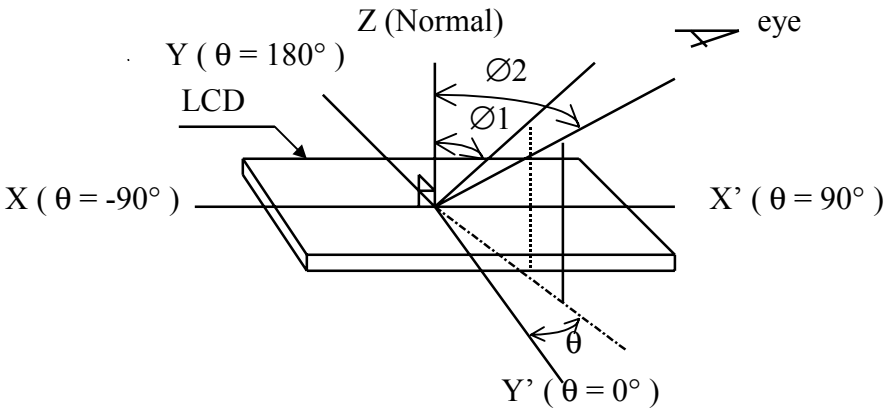
NOTE(1) : RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ± 0.5V BY EACH MODULE.

6. OPTICAL CHARACTERISTICS

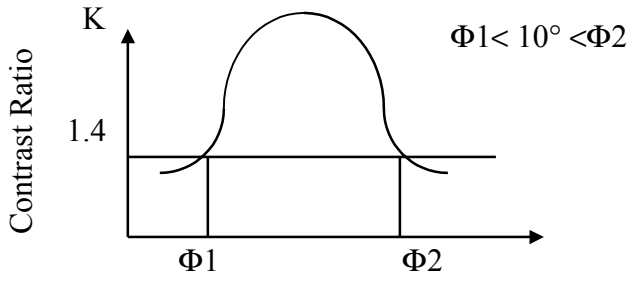
Ta = 25°C VDD = 5.0V±0.25V

I T E M	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
VIEWING AREA	Φ2-Φ1	K= 1.4	20	-----	-----	deg.
CONTRAST RATIO	K	Φ = 10° θ = 0°	-----	2	-----	-----
RESPONSE TIME	tr(rise)	Φ = 10° θ = 0°	-----	250	400	ms
	tf(fall)	Φ = 10° θ = 0°	-----	250	400	ms

NOTE (1) : DEFINITION OF θ AND Φ



NOTE (2) : DEFINITION OF VIEWING ANGLE Φ1 AND Φ2

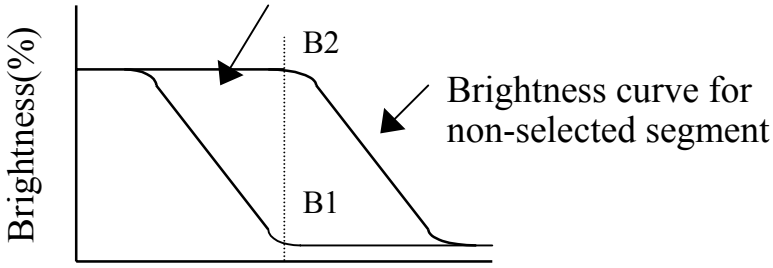


Viewing Angle

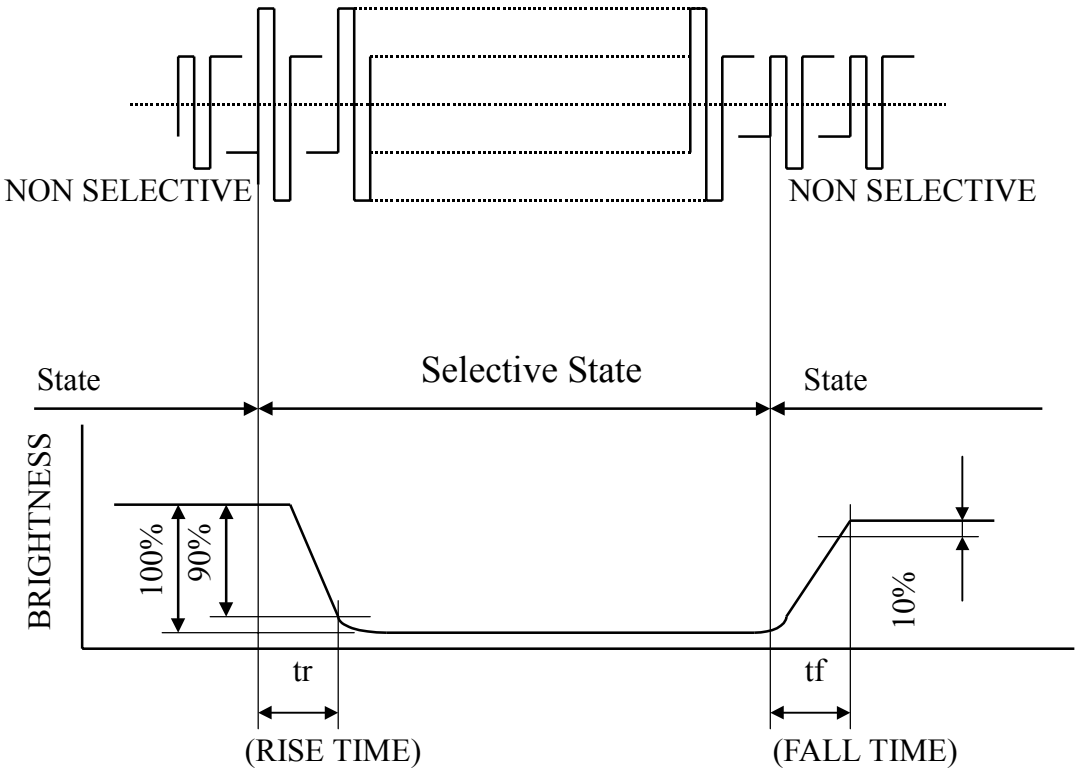
NOTE (3) : DEFINITION OF CONTRAST"K"

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

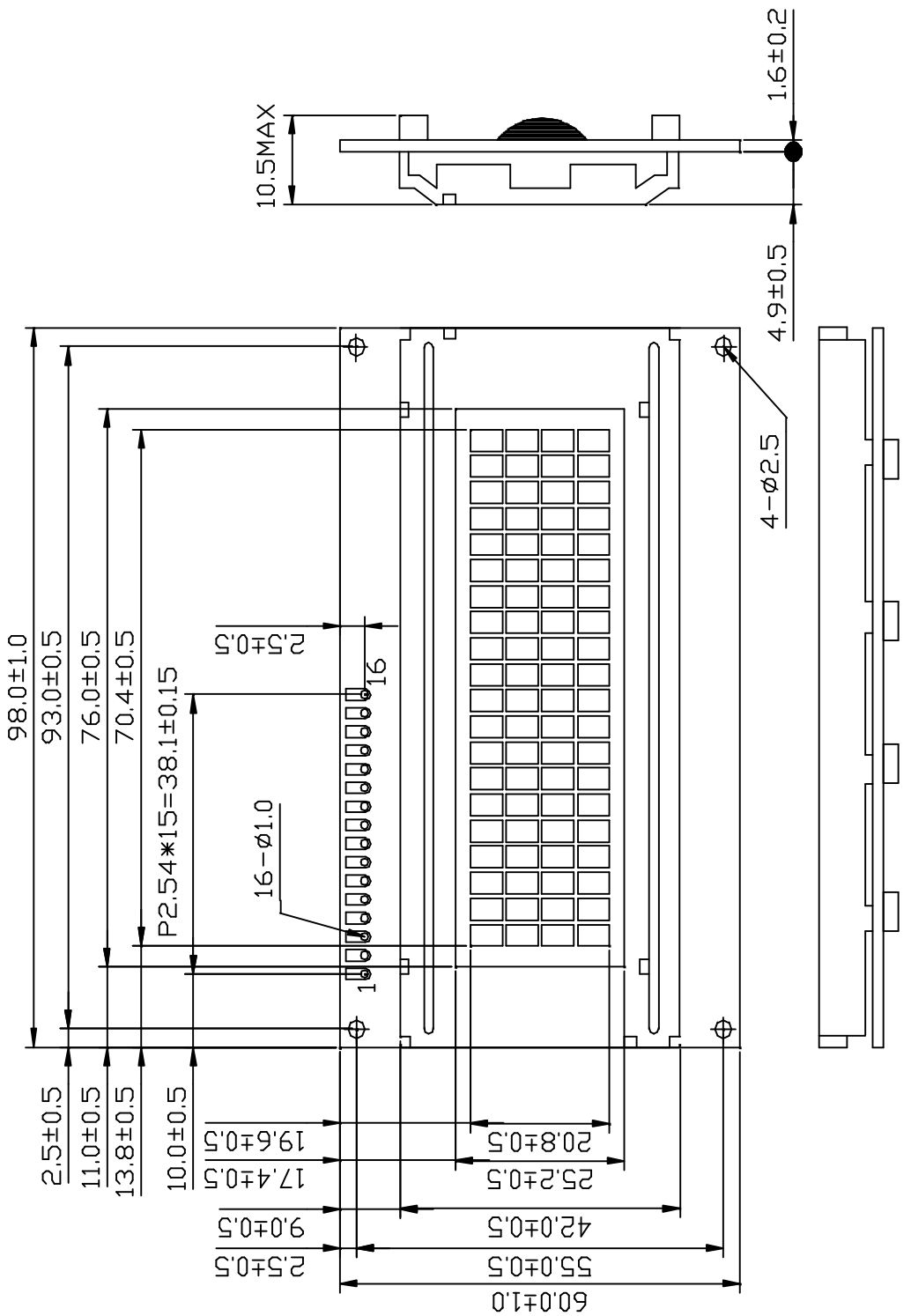
Brightness curve for selected segment



NOTE(4) : DEFINITION OF OPTICAL RESPONSE



7. OUTLINE DIMENSION



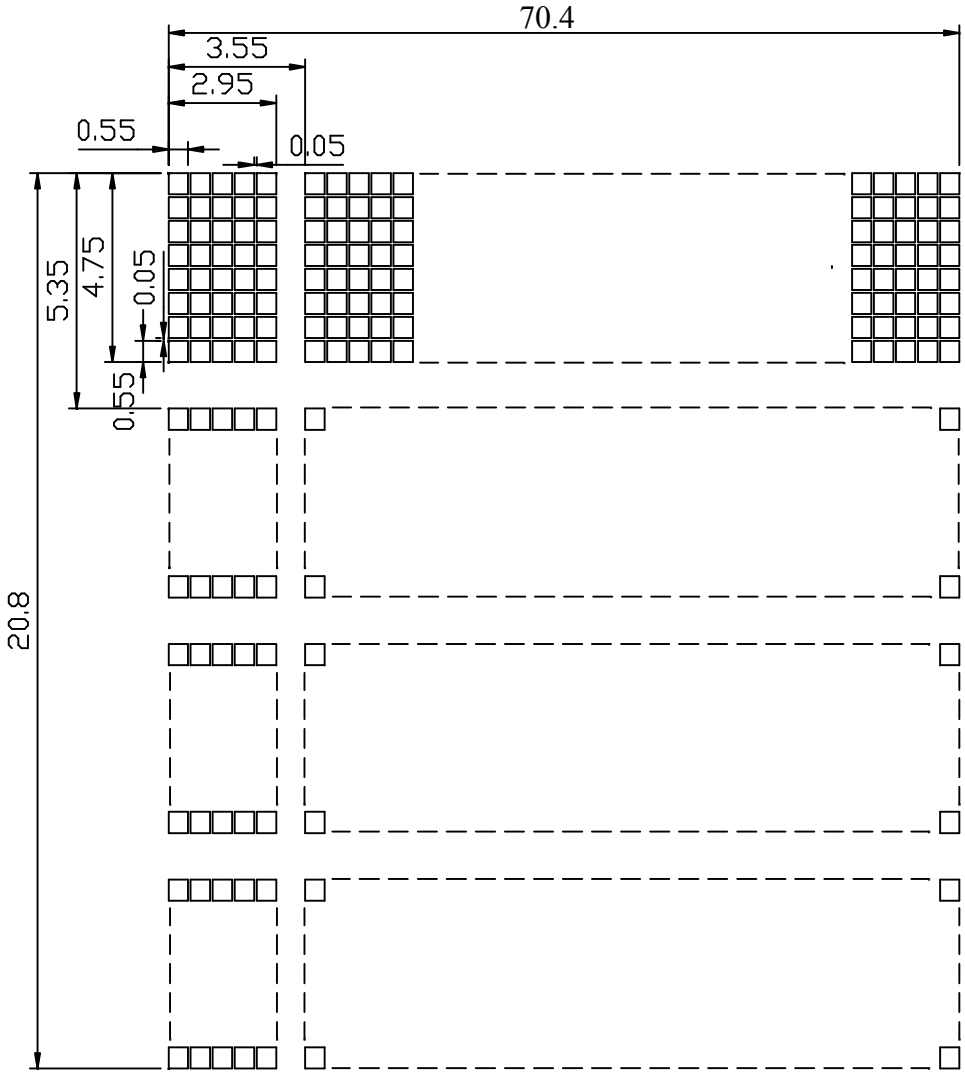
UNIT : mm
SCALE : NTS
NO SPECIFIED TOLERANCE : ±0.5

6'O CLOCK

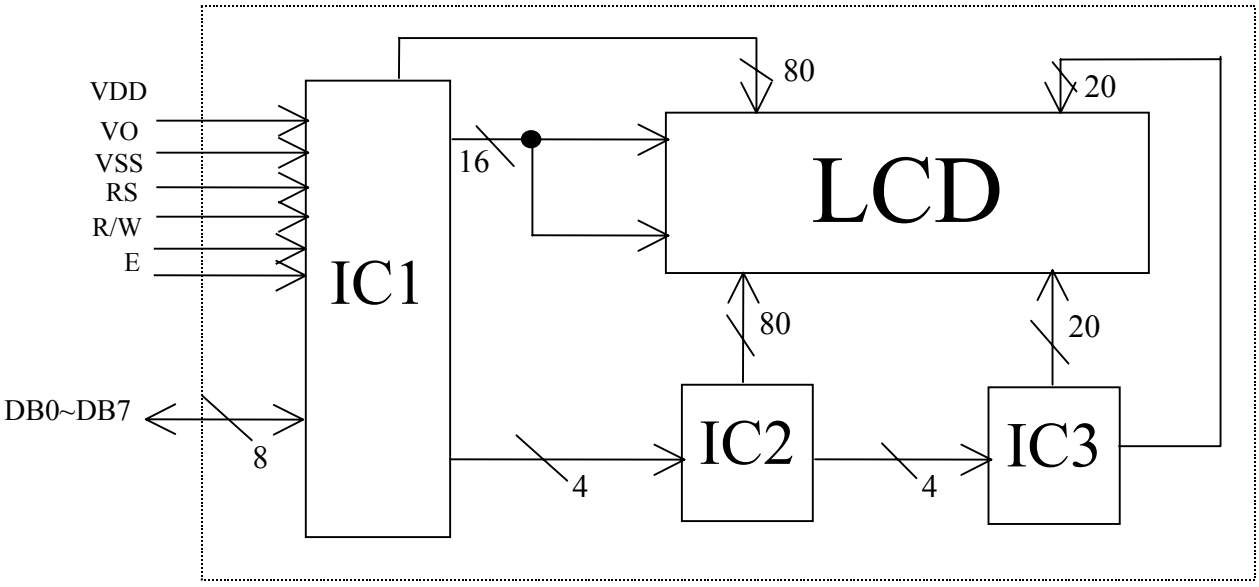
INTERFACE PIN CONNECTION

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	

7.1 DETAIL DRAWING OF MATERIX PATTERN

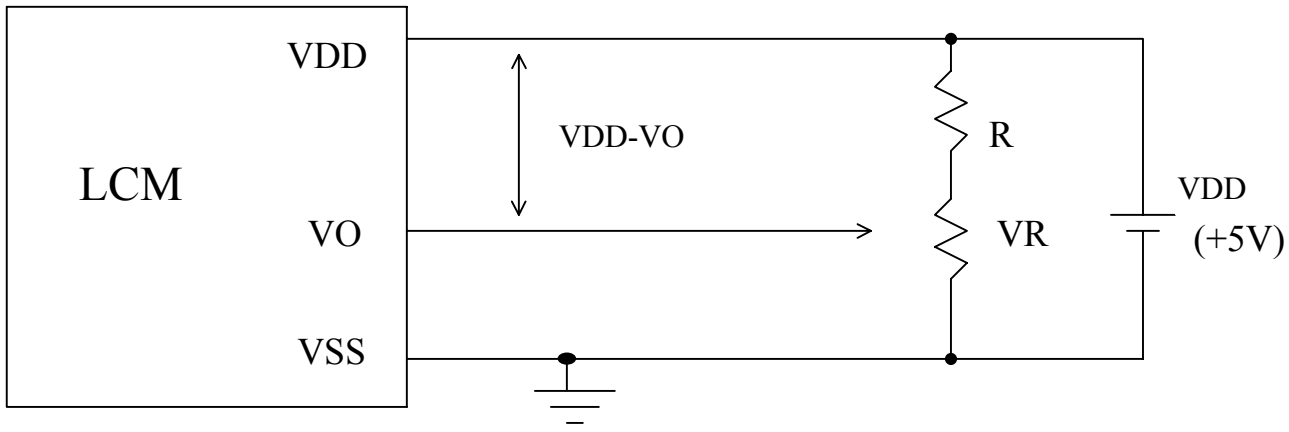


7.2 BLOCK DIAGRAM



8. POWER SUPPLY

8.1 POWER SUPPLY FOR LCM



VDD-VO : LCD DRIVING VOLTAGE
VR : 10KΩ～20KΩ
RECOMMEND RESISTOR R : VDD-VO ≧1.5V

8.2 DISPLAY DATA ADDRESS CHARTS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90	91	92	93
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3
LINE 3	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0	A1	A2	A3	A4	A5	A6	A7
LINE 4	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7