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Specification

MC21605E6W-SPTLYI



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4. As the difference in test standard and test conditions, also Midas insufficient familiarity with the actual LCD using environment, all the referred information in this DATASHEET (including the icons) only have two functions:
 - 4.1: providing quick reference when you are judging whether or not the product meets your requirements.
 - 4.2: listing out definitely the tolerance.

SAMPLE APPROVAL document rather than consider this DATASHEET as the standard for judging whether or not the LCD meets your requirements. Once you instruct Midas to a mass-production without definite demand for providing sample before, Midas will disclaim all responsibility if the mass-production is proved not meeting with your requirements.

5. The sequence of the icons is random and doesn't indicate the importance grade.
6. Icons explanation

Midas 2006 version logo. Midas is an integrated manufacturer of flat panel display (FPD). Midas supplies TN, HTN, STN, FSTN monochrome LCD panel; COB, COG, TAB LCD module; and all kinds of LED backlight.



FAST RESPONSE TIME

This icon on the cover indicates the product is with high response speed; Otherwise not.



PROTECTION CIRCUIT

This icon on the cover indicates the product is with protection circuit; Otherwise not.



HIGH CONTRAST

This icon on the cover indicates the product is with high contrast; Otherwise not.



LONG LIFE VERSION

This icon on the cover indicates the product is long life version (over 9K hours guaranteed); Otherwise not.



WIDE VIEWING SCOPE

This icon on the cover indicates the product is with wide viewing scope; Otherwise not.



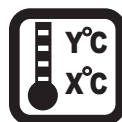
Anti UV VERSION

This icon on the cover indicates the product is against UV line. Otherwise not.



RoHS COMPLIANCE

This icon on the cover indicates the product meets ROHS requirements; Otherwise not.



OPERATION TEMPERATURE RANGE

This icon on the cover indicates the operating temperature range (X-Y).



3TIMES 100% QC EXAMINATION

This icon on the cover indicates the product has passed Midas thrice 100% QC. Otherwise not.



TWICE SELECTION OF LED MATERIALS

This icon on the cover indicates the LED had passed Midas twice strict selection which promises the product's identical color and brightness; Otherwise not.



V1cm = 3.0V

This icon on the cover indicates the product can work at 3.0V exactly; otherwise not.



N SERIES TECHNOLOGY (2008 developed)

New structure, new craft, new technology and new materials inside both LCD module and LCD panel to improve the "RainBow"

Midas LCD Part Number System

MC	COG	132033	A	*	6	W	*	*	-	S	N	T	L	W	*	*
1	2	3	4	5	6	7	8	9	-	10	11	12	13	14	15	16

1 = **MC:** Midas Components

2 = **Blank:** COB (chip on board) **COG:** chip on glass

3 = **No of dots** (e.g. 240064 = 240 x 64 dots) (e.g. 21605 = 2 x 16 5mm C.H.)

4 = **Series**

5 = **Series Variant:** A to Z – **see addendum**

6 = **3:** 3 o'clock **6:** 6 o'clock **9:** 9 o'clock **12:** 12 o'clock

7 = **S:** Normal (0 to + 50 deg C) **W:** Wide temp. (-20 to + 70 deg C) **X:** Extended temp (-30 + 80 Deg C)

8 = **Character Set**

Blank: Standard (English/Japanese)

C: Chinese Simplified (Graphic Displays only)

CB: Chinese Big 5 (Graphic Displays only)

H: Hebrew

K: European (std) (English/German/French/Greek)

L: English/Japanese (special)

M: European (English/Scandinavian)

R: Cyrillic

W: European (English/Greek)

U: European (English/Scandinavian/Icelandic)

9 = **Bezel Height** (where applicable / available)

	Top of Bezel to Top of PCB	Common (via pins 1 and 2)	Array or Edge Lit
Blank	9.5mm / not applicable	Common	Array
2	8.9 mm	Common	Array
3	7.8 mm	Separate	Array
4	7.8 mm	Common	Array
5	9.5 mm	Separate	Array
6	7 mm	Common	Array
7	7 mm	Separate	Array
8	6.4 mm	Common	Edge
9	6.4 mm	Separate	Edge
A	5.5 mm	Common	Edge
B	5.5 mm	Separate	Edge
D	6.0mm	Separate	Edge
E	5.0mm	Separate	Edge
F	4.7mm	Common	Edge
G	3.7mm	Separate	EL

10 = **T:** TN **S:** STN **B:** STN Blue **G:** STN Grey **F:** FSTN **F2:** FFSTN

11 = **P:** Positive **N:** Negative

12 = **R:** Reflective **M:** Transmissive **T:** Transflective

13 = **Backlight:** **Blank:** Reflective **L:** LED

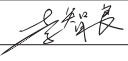
14 = **Backlight Colour:** **Y:** Yellow-Green **W:** White **B:** Blue **R:** Red **A:** Amber **O:** Orange **G:** Green **RGB:** R.G.B.

15 = **Driver Chip:** **Blank:** Standard **I:** I²C **T:** Toshiba T6963C **A:** Avant SAP1024B **R:** Raio RA8835

16 = **Voltage Variant:** e.g. 3 = 3v

BOOKBINDING AREA

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NO.	DATE	DESCRIPTION	ITEM	PAGE	APPROVED
1	2012.06	INITIAL ISSUED	ALL	ALL	



	STANDARD DOC.	NUMBER SYSTEM	PAGE	3/9
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1. GENERAL SPECIFICATIONS

ITEM	NOMINAL DIMENSIONS / AVAILABLE OPTIONS
DISPLAY FORMAT	16 Characters by 2 Lines
LCD PANEL OPTIONS	STN (Yellow-green color)
POLARIZER OPTIONS	Positive, Transflective
BACKLIGHT OPTIONS	Edge type LED backlight (Yellow-green color)
VIEWING ANGLE OPTIONS	12:00 (Top)
TEMPERATURE RANGE OPTIONS	Wide temp. range (-20°C ~ 70°C)
CONTROLLER IC	PCF2119
DISPLAY DUTY	1/18
DRIVING BIAS	1/4
OVERALL SIZE (mm)	84.0 44.0 10.0MAX
VIEWING AREA (mm)	61.0W 15.8H
DOT SIZE (mm)	0.578W 0.681H
DOT PITCH (mm)	0.593W 0.696H

2. ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITION	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	Vdd	25°C	-0.3	6.5	V
POWER SUPPLY (LCD)	V0	25°C	—	—	V
INPUT VOLTAGE	Vin	25°C	-0.3	Vdd +0.3	V
OPERATING TEMPERATURE	Vopr	—	-20	70	°C
STORAGE TEMPERATURE	Vstg	—	-30	80	°C

3. ELECTRONICAL CHARACTERISTIC*

ITEM	SYMBOL	CONDITION	STANDARD			UNIT
			MIN	TYP	MAX	
Input voltage	Vdd	+3V	2.7	3.0	5.5	V
Supply current	Idd	Vdd=3V	—	1.0	—	mA
Recommended LCD driving voltage for normal temp. Version module	Vdd - V0	-20°C	4.15	—	4.75	V
		0°C	4.10	—	4.65	
		25°C	4.00	4.30	4.60	
		50°C	3.95	—	4.50	
		70°C	3.80	—	4.35	
LED forward voltage	Vf	25°C	3.8	—	4.2	V
LED forward current	If	25°C	—	15	—	mA
LED reverse Current	Ir	25°C	—	—	10	μA
LED Peak wave length	λp	25°C If = 15mA	568	—	575	nm
LED illuminance (Without LCD)	Lv	25°C If = 15mA	160	—	—	cd/m ²
LED life time	—	25°C If = 15mA	9K**	—	—	Hours

* The above data are for reference only.

** If you wanted to drive the LED BKL uninterruptedly exceed 12hours/day, you are not suggested this version

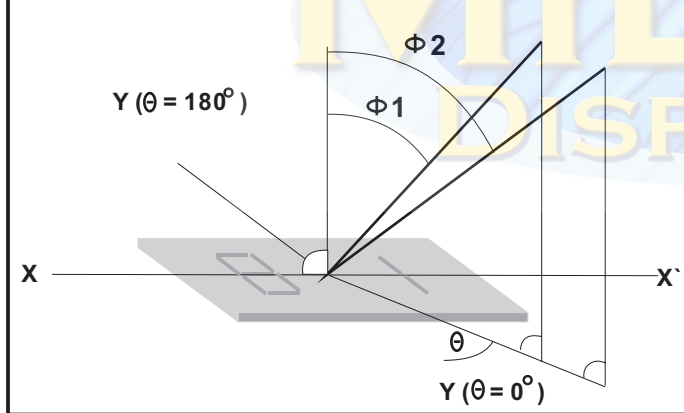
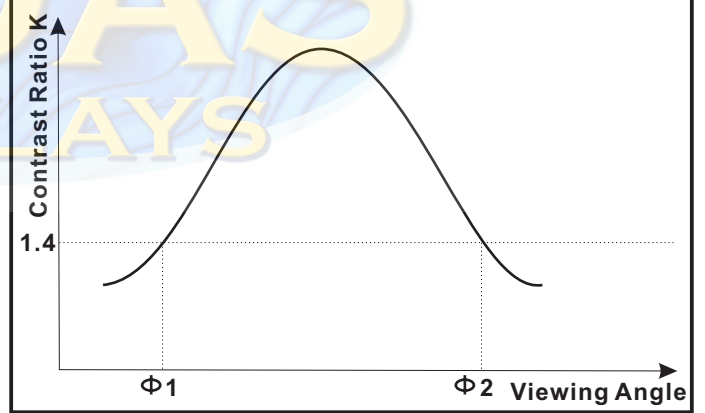
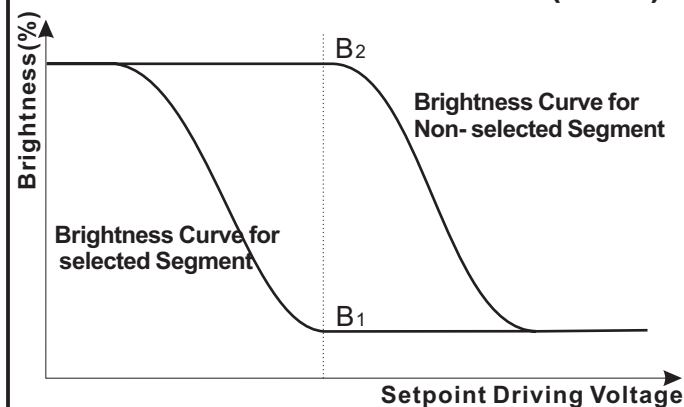
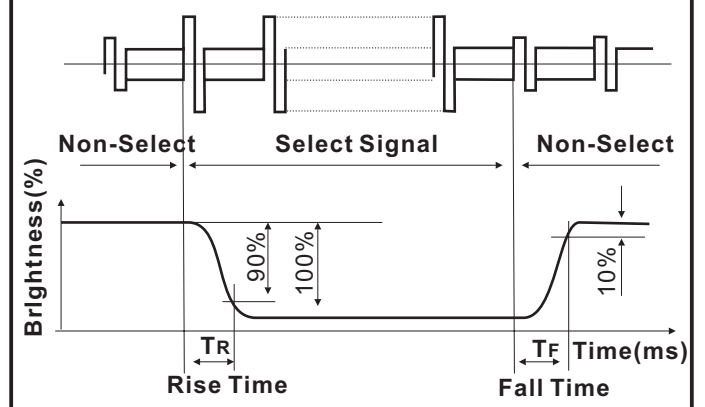
4. OPTICAL CHARACTERISTIC

FOR TN TYPE LCD MODULE ($T_A=25^\circ\text{C}$, $V_{dd}=3.0\text{V} \pm 0.25\text{V}$)

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
VIEWING ANGLE	$\Phi 2 - \Phi 1$	K=4	30	—	—	deg
	θ		25			
CONTRAST RATIO	K	—	—	2	—	—
RESPONSE TIME(RISE)	T_R	—	—	120	150	ms
RESPONSE TIME(FALL)	T_F	—	—	120	150	ms

FOR STN TYPE LCD MODULE ($T_A=25^\circ\text{C}$, $V_{dd}=3.0\text{V} \pm 0.25\text{V}$)

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
VIEWING ANGLE	$\Phi 2 - \Phi 1$	K=4	40	—	—	deg
	θ		60			
CONTRAST RATIO	K	—	—	6	—	—
RESPONSE TIME(RISE)	T_R	—	—	150	250	ms
RESPONSE TIME(FALL)	T_F	—	—	150	250	ms

DEFINITION OF ANGLE Φ & θ DEFINITION OF VIEWING ANGLE $\Phi 1$ & $\Phi 2$ DEFINITION OF CONTRAST RATIO $K(=B_2/B_1)$ DEFINITION OF OPTICAL RESPONSE TIME T_R & T_F 

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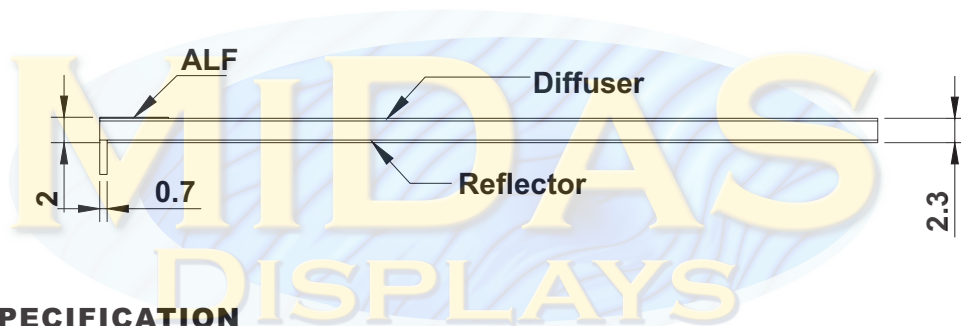
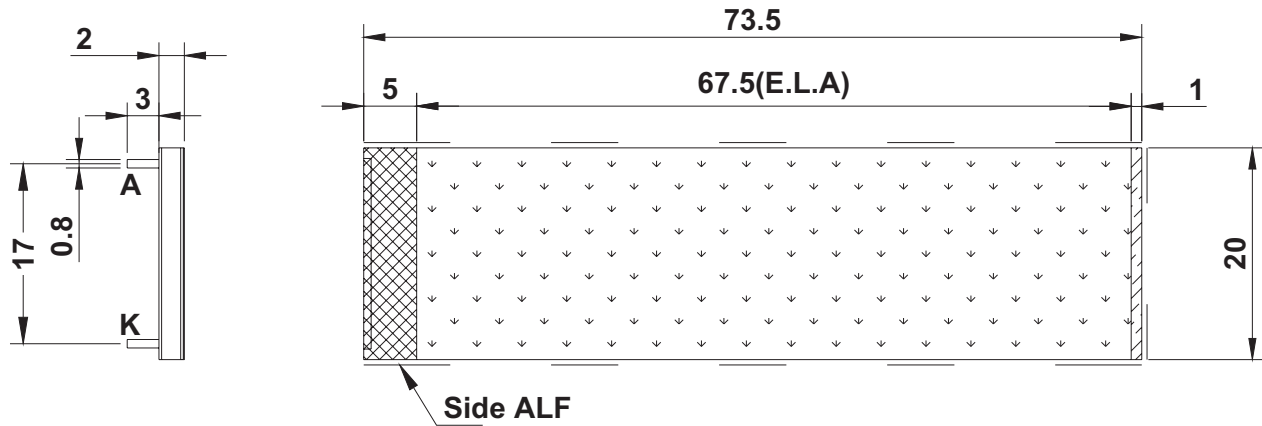
5. MECHANICAL OUTLINE

结构尺寸MECHANICAL OUTLINE

(未注尺寸公差Unspecified Tolerances is ± 0.3)

COLOR: YELLOW-GREEN

颜色: 黄绿色



6. BACKLIGHT SPECIFICATION

6.1 CIRCUIT DIAGRAM (LED 1 X 2 = 2 dies)



6.2 保存和焊接条件 STORAGE & SOLDERING CONDITIONS:

- Store with care. Storing the units in bad condition will cause the reflector sheet and decrease its adhesive power. Storage The products under the condition: temperature ($25^{\circ}\text{C} \pm 10^{\circ}\text{C}$) and humidity ($65\%\text{RH} \pm 20\%\text{RH}$) our recommendation.
- The Soldering Temperature is $260 \pm 5^{\circ}\text{C}$ and Soldering Time should be less than 3sec, and soldering iron power should be less than 30W.
- The soldering point should be farther than 1.6mm (1/10") from body.
- 注意保存, 保存条件不好时, 会降低反光膜(扩散膜)导光片(反射壳)的粘附力.
推荐保存条件: 温度 $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$
湿度 $65\%\text{RH} \pm 20\%$
- 焊接温度 $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 焊接时间小于3秒, 烙铁功率小于30W
- 焊接点应离焊接实体大于1.6mm.

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6.3 极限参数 **ABSOLUTE MAXIMUM RATINGS**

(除非特别说明, 环境温度 $T_a = 25^\circ\text{C}$. Unless specified, the Ambient temperature $T_a = 25^\circ\text{C}$)

项 目 Item	符号 Symbol	条件 Conditions	值 Rating	单位 Unit
*极限直流正向电流 Absolute maximum forward current	Ifm		15	mA
*脉冲驱动时极限正向电流 Peak forward current	Ifp	1 msec脉冲, 1/10占空比 1 msec Plus 10% Duty Cycle	—	mA
反向电压 Reverse Voltage	Vr		10	V
*极限功耗 Power dissipation	Pd		200	mW
工作温度 Operating Temperature Range	Topr		-20~+70	$^\circ\text{C}$
贮存温度 Storage Temperature Range	Tstg		-30~+80	$^\circ\text{C}$

* 当工作温度高于 25°C 时, Ifm, Ifp和Pd必须降低; 电流降低率是 $-1.08\text{mA}/^\circ\text{C}$ (直流驱动), 或 $-2.58\text{mA}/^\circ\text{C}$ (脉冲驱动), 功率降低率是 $-27.0\text{mW}/^\circ\text{C}$. 产品工作电流不能大于对应的工作条件温度Ifm或Ifpr的60%.
For operation above 25°C , The Ifm Ifp & Pd must be derated, the Current derating is $-1.08\text{mA}/^\circ\text{C}$ for DC drive and $-2.58\text{mA}/^\circ\text{C}$ for Pulse drive, the Power dissipation is $-27.0\text{mW}/^\circ\text{C}$. The product working current must not be more than 60% of the Ifm or Ifp according to the working temperature.

6.4 光电特性 **ELECTRICAL-OPTICAL CHARACTERISTICS**

(除非特别说明, 环境温度 $T_a = 25^\circ\text{C}$. Unless specified, the Ambient temperature $T_a = 25^\circ\text{C}$)

项目 Item	符号 Symbol	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit	测定条件 Condition
正向电压 Forward Voltage	Vf	3.8	4.0	4.2	V	If= 60 mA
反向电流 Reverse Current	Ir	—	15	—	μA	Vr= 4 V
峰值波长 Peak wave length	λ_p	565	—	575	nm	If= 60 mA
频谱半宽度 Spectral Line Half Width	$\Delta\lambda$	—	—	—	nm	If= 60 mA
**亮度 Luminance	Lv	160	—	—	cd/m^2	If= 60 mA

*亮度值是5个测量点的平均值, 亮度最大值比最小值一般小于1.5(最大1.7)

∅使用BM-7亮度色仪测量, 测量光圈 10mm.

The luminance is the average value of 5 points, and

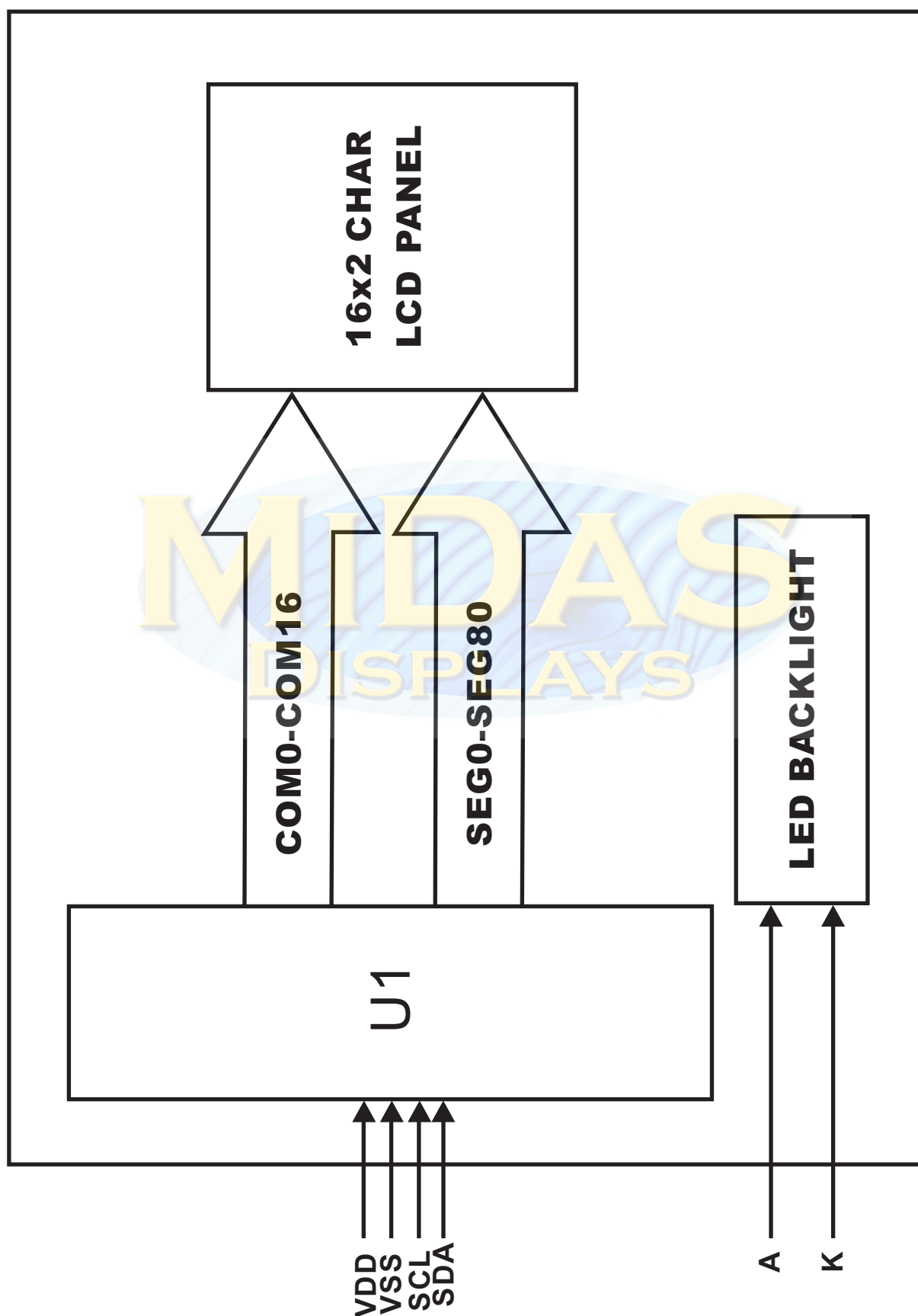
The $L_{v\max.}/L_{v\min.}$ is less than 1.5 Typical (max 1.7).

The measurement instrument is BM-7 luminance

∅Colorimeter. The caperture is 10 mm.

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7. BLOCK DIAGRAM



8. INSTRUCTION

Detailed Information please refer to the other two file, the datasheet for PCF2119.

PIN ASSIGNMENT		
PIN	SYMBOL	FUNCTION
1	GND	GND
2	Vdd	Power Supply
3	SCL	Serial clock input
4	SDA	Serial data input
5	LED+	Power supply for BKL (-)
6	LED-	Power supply for BKL (+)

