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LED DOT MATRIX MODULE

VS096T110-0

ISSUED DATE		2012.11.14	ITEM	DESIGN	CHECK	APPROVAL
VER	SE1.00	2012.11.14	SIGNATURE			
			DATE			

1.MODEL NAME : VS096T110-0

2. FEATURES

ITEM		DESCRIPTION
Display Color		Red, Yellow Green, Amber
Structure	Size(W X H X D)	96 X 96 X10.1(mm)
	Dot Pitch	6(mm)
	Number Of Dots	256(16 × 16) Dots
	Leds Per Dot	R:1, YG:1 (2-IN-1 SMD)
Weight		Max. 90(g)
Drive Mode		1/16 Duty Drive
Application		Indoor

3. ABSOLUTE MAXIMUN RATINGS

ITEM	SYMBOL	VALUE	UNIT	REMARK
Supply Voltage	V_{CC}	0~+5.5	V	LED & LOGIC CIRCUIT
Signal Input Voltage Level	V_{IH}, V_{IL}	-0.3~ $V_{CC}+0.3$	V	
Operating Temperature	$T_{OP}^{[1]}$	-20 ~ +50	°C	On Dots=100%
		-20 ~ +60	°C	On Dots=30%
Storage Temperature	T_{stg}	-25 ~ +80	°C	


NOTES : [1] Temperature of led surface's should be remained below 70°C in case of necessity, led system requires cooling fan. Maintained at less than 80% relative humidity, and no dew condensation shall take place.

4. RECOMMENDABLE OPERATING CONDITIONS

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Supply Voltage	Led & Logic Circuit	V_{CC}	4.75	5	5.25	V	
Signal Input Voltage Level		V_{IH}	$0.8 \times V_{CC}$	-	V_{CC}		
		V_{IL}	0	-	$0.3 \times V_{CC}$		
Operating Temperature		T_{OP}	-15 ~ +45			°C	

5. ELECTRICAL CHARATERISTICS (AT $T_a = 25^\circ\text{C}$)

ITEM	SYMBOL	VALUE	UNIT	REMARK
Clock Frequency	F	MAX.16	Mhz	
Current Consumption For Module	I_{CC}	MAX. 2.5	A	ALL On

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6. OPTICAL CHARACTERISTICS(At T_a = 25°C)

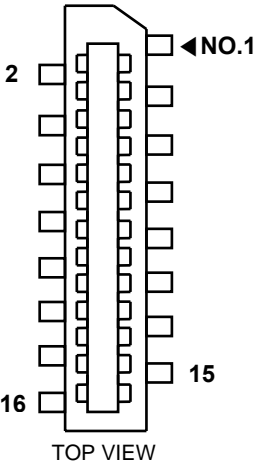
ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Brightness	RED	L _v	260	-	-	cd/m ²	
	GREEN		240	-	-		
	AMBER		450	-	-		
Wavelength	RED	λ _p	623	-	625	nm	
	GREEN		570	-	575		
Viewing Angle	HOR.	2θ _{1/2}	-	130	-	deg(°)	Half Value
	VER.		-	130	-		

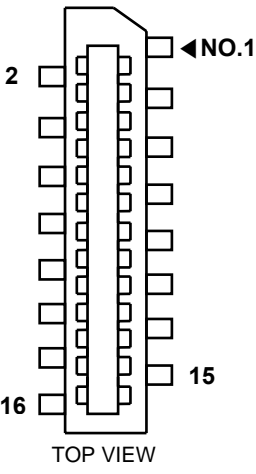
[REFERENCE] **Brightness of standard model are measured by Our company's the controller.**


If you have any questions about higher brightness, Please contact us.

7. SIGNAL FUNTION

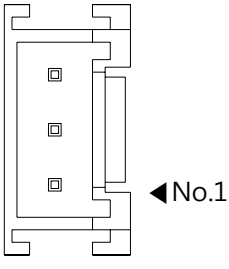
1) DATA SIGNAL CONNECTOR

PIN MAP (IN)	PIN NUMBER	PIN NAME	FUNCTION DESCRIPTION
 <p>TOP VIEW</p>	3	$\overline{\text{OE}}_{\text{IN}}$	Brightness Control
	4	LATCH_IN	Data Strobe
	6	RED_IN	Data Input For Red Color
	7	GREEN_IN	Data Input For Green Color
	9	SCLK_IN	Shift Clock For Input Data
	11[MSB],12,13,14[LSB]	A[3:0]	4BIT LINE ADDRESS
	1,2,5,8,10,15,16	GND	Ground Of The Module

PIN MAP (OUT)	PIN NUMBER	PIN NAME	FUNCTION DESCRIPTION
 <p>TOP VIEW</p>	3	$\overline{\text{OE}}_{\text{OUT}}$	Brightness Control
	4	LATCH_OUT	Data Strobe
	6	RED_OUT	Data Input For Red Color
	7	GREEN_OUT	Data Input For Green Color
	9	SCLK_OUT	Shift Clock For Input Data
	11[MSB],12,13,14[LSB]	A[3:0]_OUT	4BIT LINE ADDRESS
	1,2,5,8,10,15,16	GND	Ground Of The Module

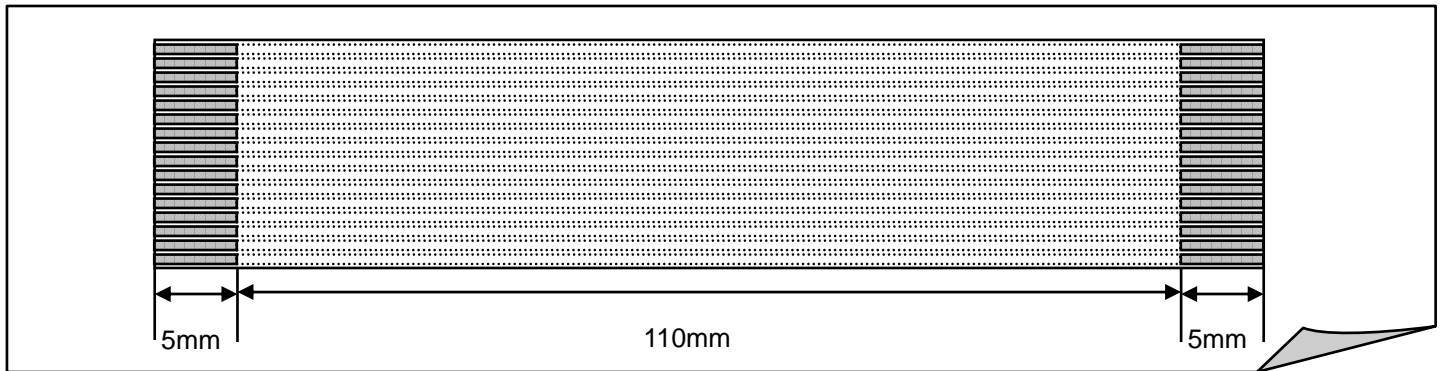
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2) POWER CONNECTOR

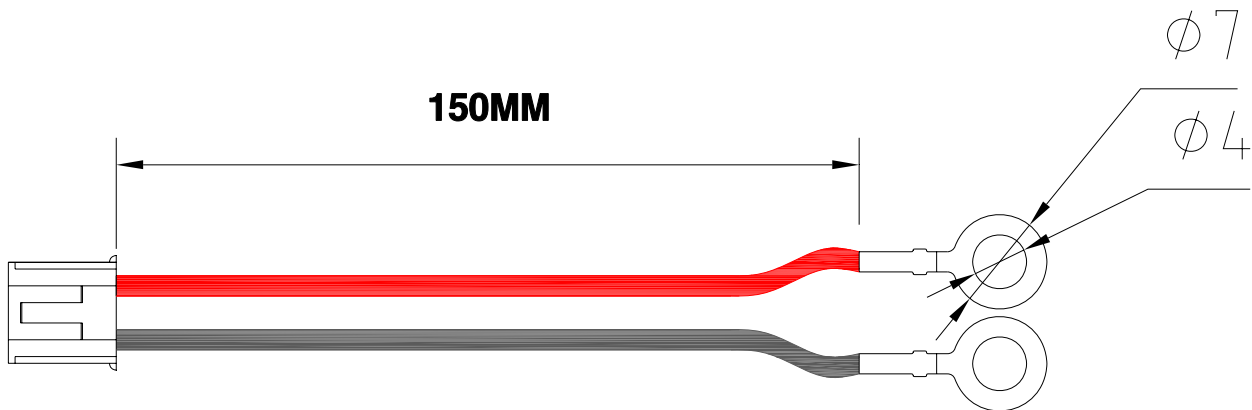
PIN MAP(POWER)	PIN NUMBER	PIN NAME	FUNCTION DESCRIPTION
 TOP VIEW	1	V _{CC}	Supply Voltage For LED & Logic Circuit
	2	NC	No Connection
	3	GND	Ground Of The Module

3) CONNECTOR CABLE SPECIFICATION

- DATA CABLE




- POWER CABLE



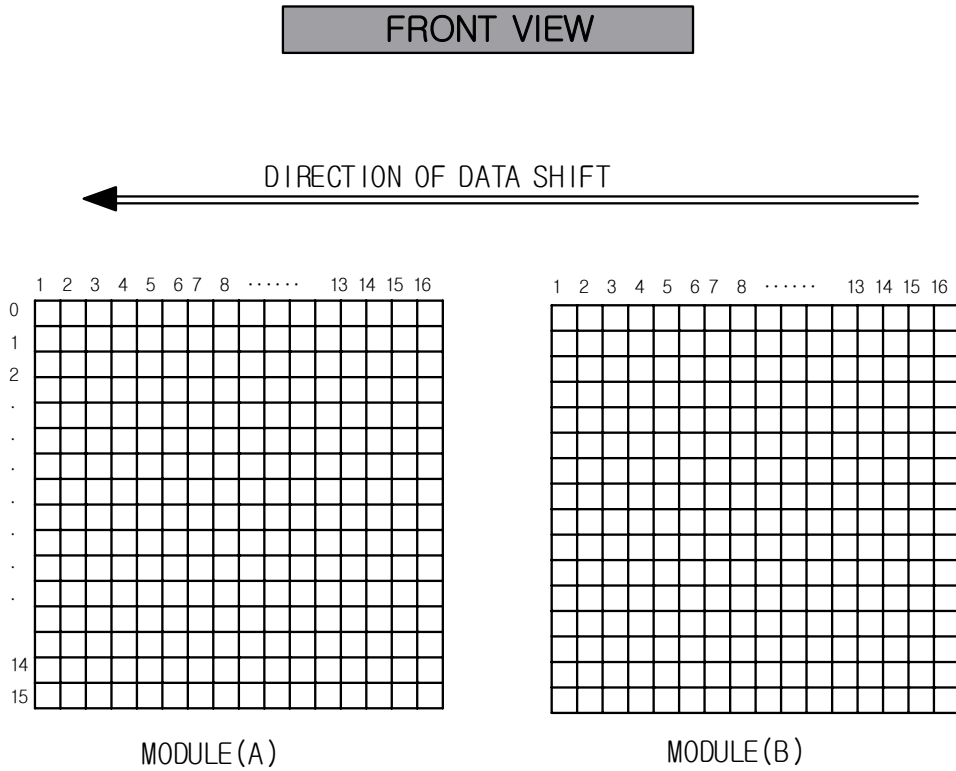
CONNECTOR	VENDOR	MODEL NO.	SPECIFICATION	HOUSING MODEL NO.
DATA	YENSEN Connector	YSF51643B2R	16PIN, 1mm Pitch	FPC-16-120
POWER	YEONHO	SMW200-H03G	3PIN, 2mm Pitch	SMH200-03

※ This connectors can be changed without a previous notice for quality improvement.

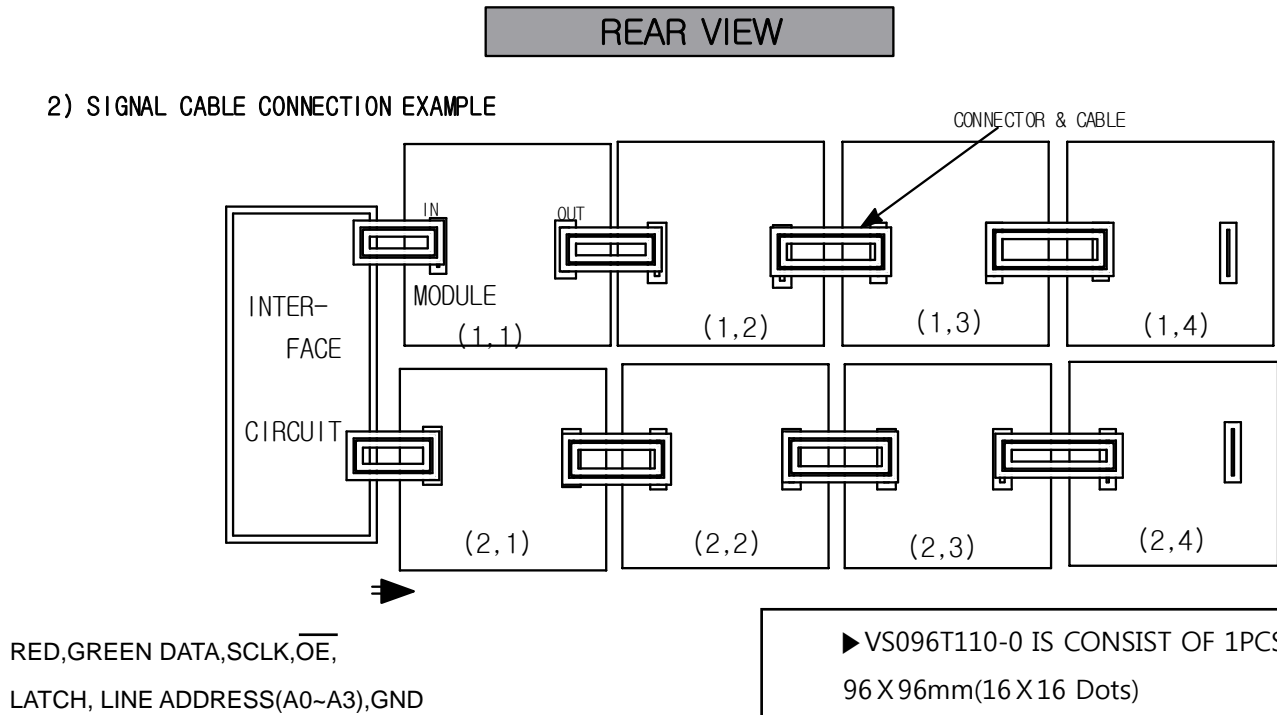
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8. SIGNAL & POWER CABLE CONNECTION

1) DIRECTION OF DATA

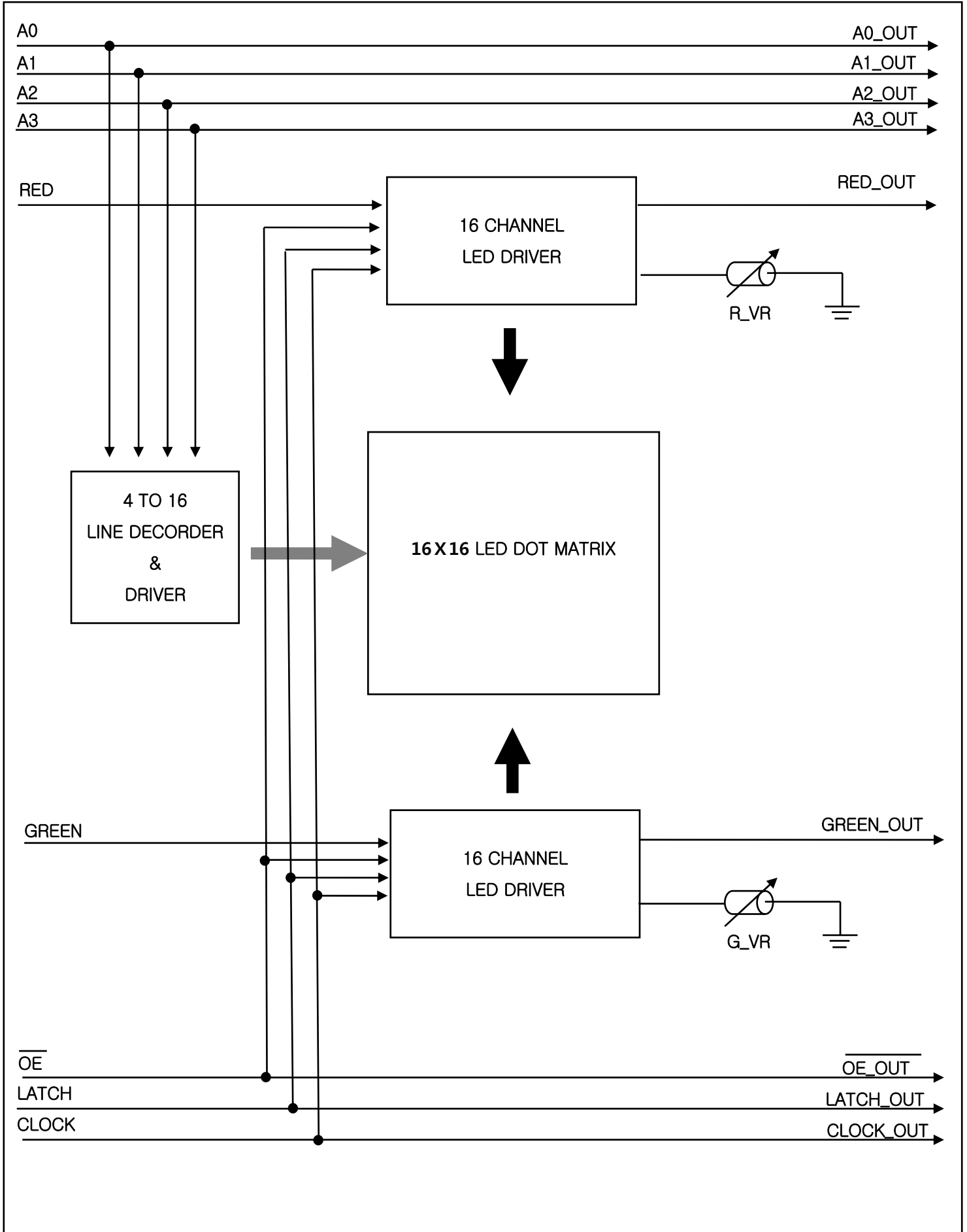



2) SIGNAL CABLE CONNECTION EXAMPLE



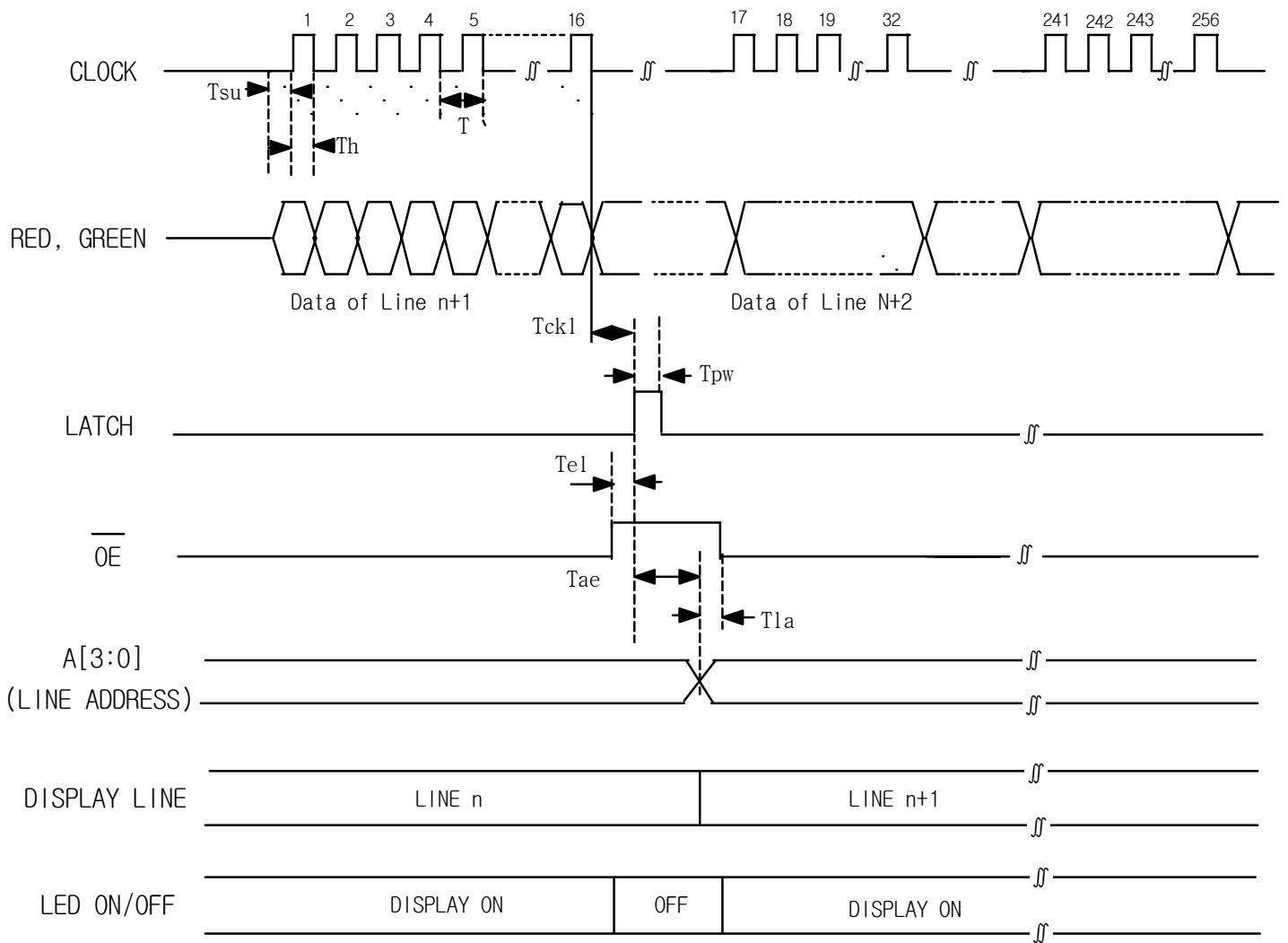
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9. BLOCK DIAGRAM




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10. TIMMING CHART

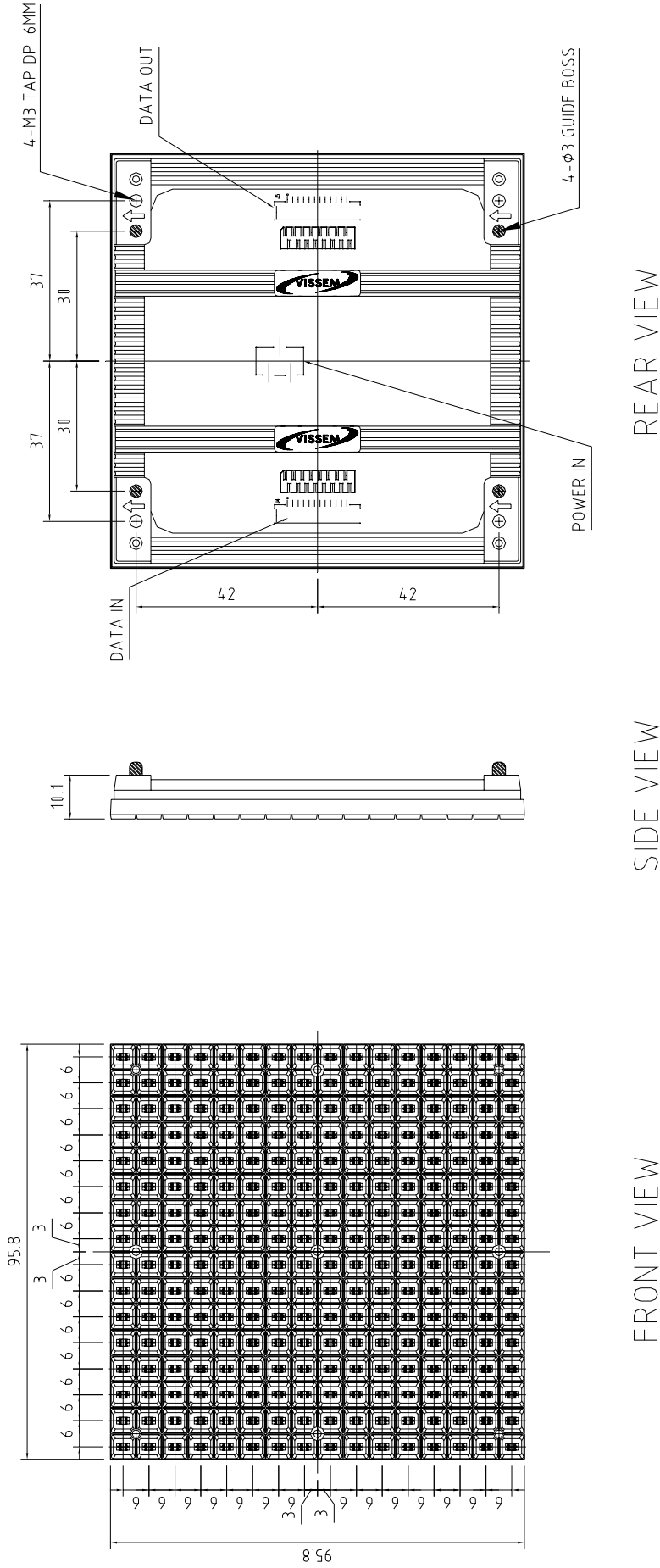


$V_{cc}=5V, T_a=25^{\circ}C$

CHARACTERISTICS	SYMBOL	MIN	MAX	UNIT
CLOCK CYCLE	T	-	16	MHz
DATA SETUP TIME	T_{su}	10	-	ns
DATA HOLD TIME	T_h	15	-	ns
LATCH PULSE WIDTH	T_{pw}	50	-	ns
LATCH HOLD TIME	T_{ckl}	15	-	ns
ENABLE-LATCH TIME	T_{el}	1	-	μs
ENABLE PULSE WIDTH	T_{epw}	3	-	μs
ADDRESS-ENABLE TIME	T_{ae}	1	-	μs
LATCH-ADDRESS TIME	T_{la}	20	-	ns

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11. DIMENSION



주의

1. M3*8(샘스볼트:스프링, 평와사 붙이 볼트)
2. M3*6(일반볼트)

볼트 기장이 위에 정해놓은 수치보다 긴 볼트는 사용하지 않것.
(타공판 철판 두께 1.2~1.6T 기준)


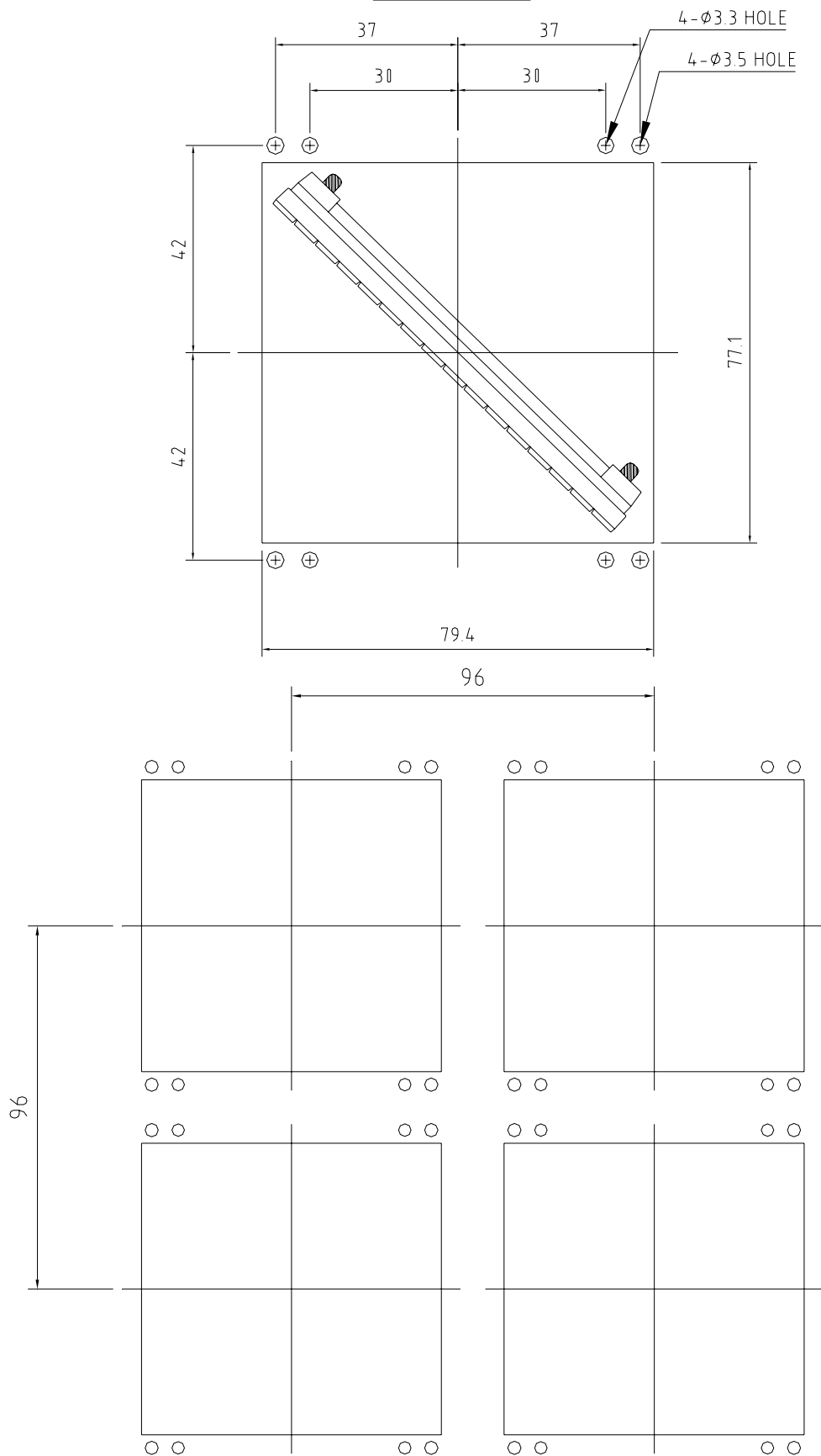

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Plate Work



2BY2 ARRAY


**** Hole for assemble between unit case and module.**

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12. SAFETY

● Precautions in installing LED Module

1. Please escape the place where electromagnetic wave and noise is, which might cause malfunction to LED module, when install LED Display Board.
2. Since over voltage and reverse voltage might cause the problem in internal circuit and LED, please make sure and check the input voltage range, before operation.
3. Please escape the high humidity and leakage place which cause the LED module to be broken.
4. The temperature of the surface of LED module shall be under 70°C during operation.
5. Heating from LED might cause damage in LED module or/and malfunction in LED display board, user shall prepare suitable ventilation and cooling facility.
6. Even though the brightness become lower and lower, after long time use, it's prohibited to input over voltage in order to increase the brightness, which might cause severe damage to LED Module.
For the best operation, user shall operate LED module according to data sheet.
7. Please turn off the power supply, when display data are not charged.
8. Please be careful not to exposure LED Module to the dust, dirt, base, gas and other noxious gas, when install LED Display.
9. User shall consider the weight of LED module enough, when prepare steel structure and install LED Display Board.

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● Precautions in installing LED Module

1. Any jumper and switch is set up properly before delivery, please do not modify or/and change setting without consulting with manufacturer.
2. The circuit part of LED Module include CMOS components, please treat carefully with consideration of static electricity
3. Impact and vibration to LED Module might be the reason of disconnection and dot off, please escape those factors.
4. It's highly recommended to escape the high temperature & humidity and be careful not to exposure LED module to dust, dirt, base and SO2 Gas and other noxious Gas in order to escape the potential problem.
5. Please be careful not to be scratched and hurt on the surface of LED module.
6. It's prohibited to clean up LED module with solvent.
In order to clean up LED module, it's highly recommended to use a piece of dried cloth and smooth brush.
7. Stacking LED modules without anti-impact material and wearing out the surface or/and edge of LED modules might cause fatal problem.
8. It's highly recommended to use twisted cable or shielded wire in order to remove the noise from high frequency.
9. When user use and store LED module, please pack LED module with anti-static material.

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