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**LED DOT MATRIX MODULE**

**VS240F111-4**

ISSUED DATE		2013.04.08	ITEM	DESIG	CHECK	APPROVAL	REFERENCE
VER	BN1.00	2013.05.11	SIGNATURE				
			DATE				

# 1.MODEL NAME : VS240F111-4

## 2. FEATURES

ITEM		DESCRIPTION
Display Color		Full Color
Structure	Size(W X H X D)	240 X 240 X 14.2(mm)
	Dot Pitch	15(mm)
	Number Of Dots	256(16 × 16) Dots
	Leds Per Dot	R:1, PG:1,B:1 (3-In-1 3030 SMD LED)
Weight		Max. 500 (g)
Drive Mode		1/4 Duty Drive
Application		Indoor

## 3. ABSOLUTE MAXIMUN RATINGS

ITEM	SYMBOL	VALUE	UNIT	REMARK
Supply Voltage	$V_{LED}$	0~+5.5	V	
	$V_{CC}$	0~+6.0		
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	$V_{LED}$	4.75	5	5.25	V	
	Logic Circuit	$V_{CC}$	4.75	5	5.25		
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	$I_{LED}$	MAX. 4.5	A	ALL On
	$I_{IC}$	MAX. 0.5		

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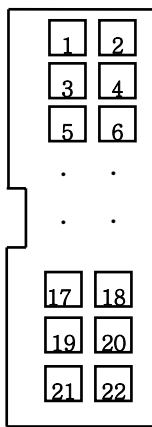
## 6. OPTICAL CHARACTERISTICS( AT T<sub>a</sub> = 25°C)

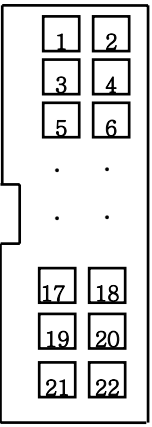
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Brightness	RED	750	-	-	cd/m <sup>2</sup>	
	GREEN	2200	-	-		
	BLUE	200	-	-		
	WHITE	3,000	-	-		
Wavelength	RED	614	-	630	nm	
	GREEN	522	-	538		
	BLUE	463	-	474		
Viewing Angle	HOR.	-	115	-	deg(°)	Half Value
	VER.	-	115	-		

[REFERENCE] **These are just brightness of standard model. If you have any questions about higher brightness, Please contact us.**

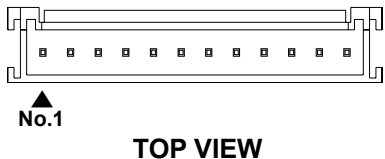
## 7. SIGNAL FUNTION

1) DATA SIGNAL CONNECTOR( **\*CAUTION : PIN PITCH OF DATA CONNECTOR IS 2.0mm**)

PIN MAP (IN)	PIN NUMBER	PIN NAME	FUNCTION DESCRIPTION
 <p>TOP VIEW</p>	1, 2, 3, 4	G0, G1, G2, G3	Data Input For Green Color
	5, 6, 7, 8	R0, R1, R2, R3	Data Input For Red Color
	9, 10, 11, 12	B0, B1, B2, B3	Data Input For Blue Color
	13[LSB], 14[MSB]	A[0:1]_IN	2BIT Line Address
	15	SCLK_IN	Shift Clock For Input Data
	16	LATCH_IN	Data Strobe
	17	NC	No Connection
	18	$\overline{GOE\_IN}$	Green Brightness Control
	20	$\overline{ROE\_IN}$	Red Brightness Control
	22	$\overline{BOE\_IN}$	Blue Brightness Control
	19, 21	GND	Ground Of The Module

PIN MAP (OUT)	PIN NUMBER	PIN NAME	FUNCTION DESCRIPTION
 <p>TOP VIEW</p>	1, 2, 3, 4	G0, G1, G2, G3	Data Output For Green Color
	5, 6, 7, 8	R0, R1, R2, R3	Data Output For Red Color
	9, 10, 11, 12	B0, B1, B2, B3	Data Output For Blue Color
	13[LSB], 14[MSB]	A[0:1]_OUT	2BIT Line Address
	15	SCLK_OUT	Shift Clock For Output Data
	16	LATCH_OUT	Data Strobe
	17	NC	No Connection
	18	$\overline{GOE\_OUT}$	Green Brightness Control
	20	$\overline{ROE\_OUT}$	Red Brightness Control
	22	$\overline{BOE\_OUT}$	Blue Brightness Control
	19, 21	GND	Ground Of The Module

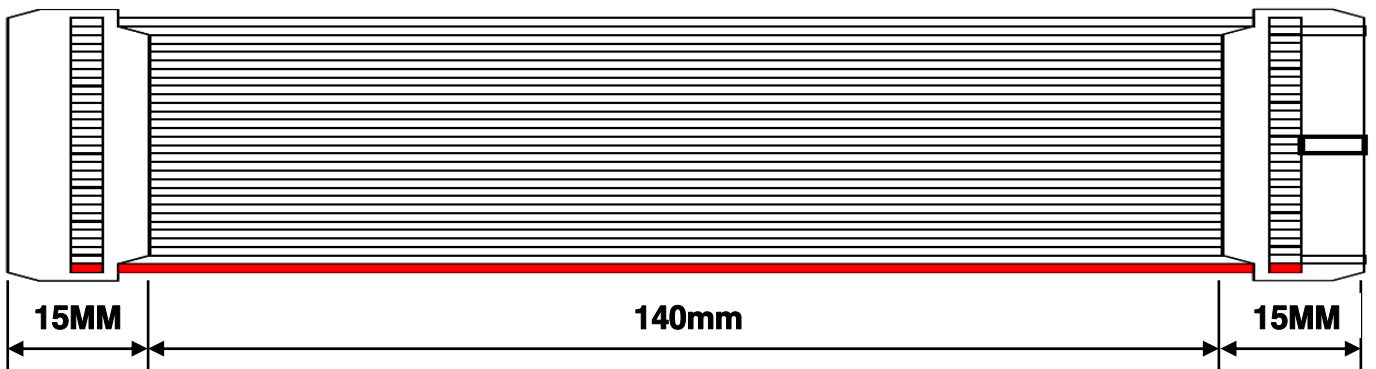
2) POWER CONNECTOR

PIN MAP(POWER)	PIN NUMBER	PIN NAME	FUNCTION DESCRIPTION
 <p><b>TOP VIEW</b></p>	1, 2, 3, 4, 5	GND	Ground Of The Module
	6, 7, 8, 9, 10, 11	V <sub>LED</sub>	Supply Voltage For LED
	12	V <sub>CC</sub>	Supply Voltage For IC

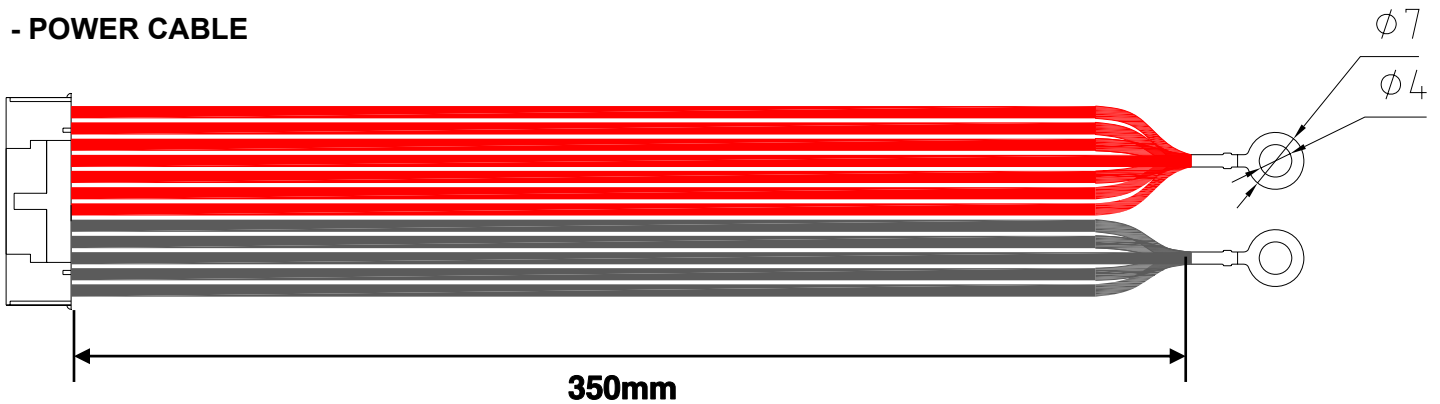
3) CONNECTOR CABLE SPECIFICATION

- DATA CABLE

22 PIN Cable (Pitch 2.00mm)




- POWER CABLE



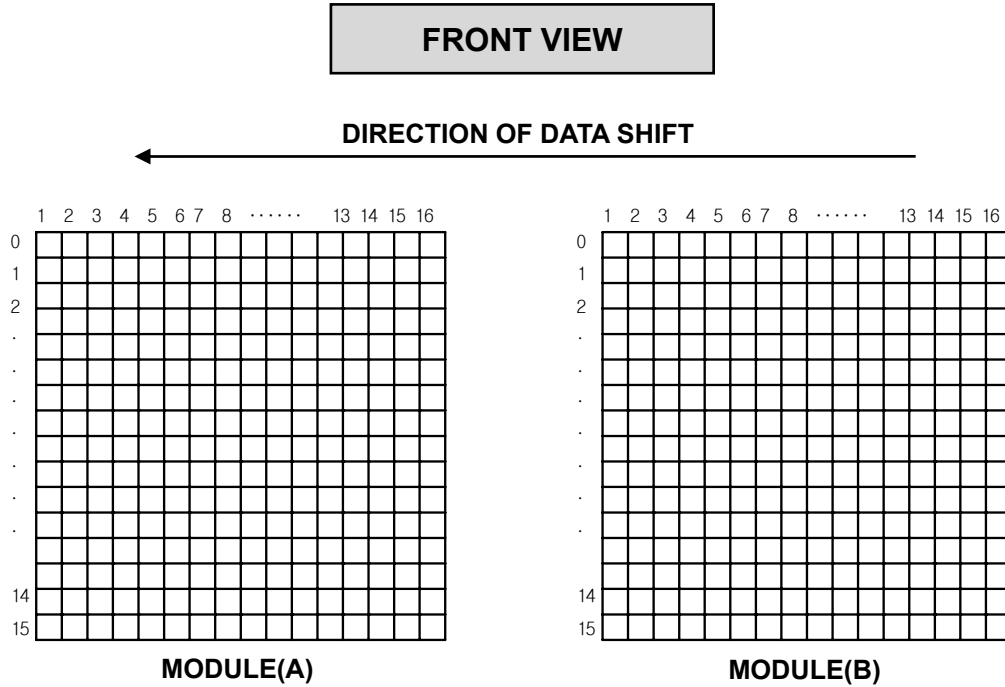
CONNECTOR	VENDOR	MODEL NO.	STANDARD	CABLE ASS`Y
IN,OUT DATA	DONCONNEX	C06S-34ASA1-G	22PIN, 2mm PITCH	A05G-22BSA1-G102
POWER	YEONHO	SMW200-12G	12PIN, 2mm PITCH	SMH200-12

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

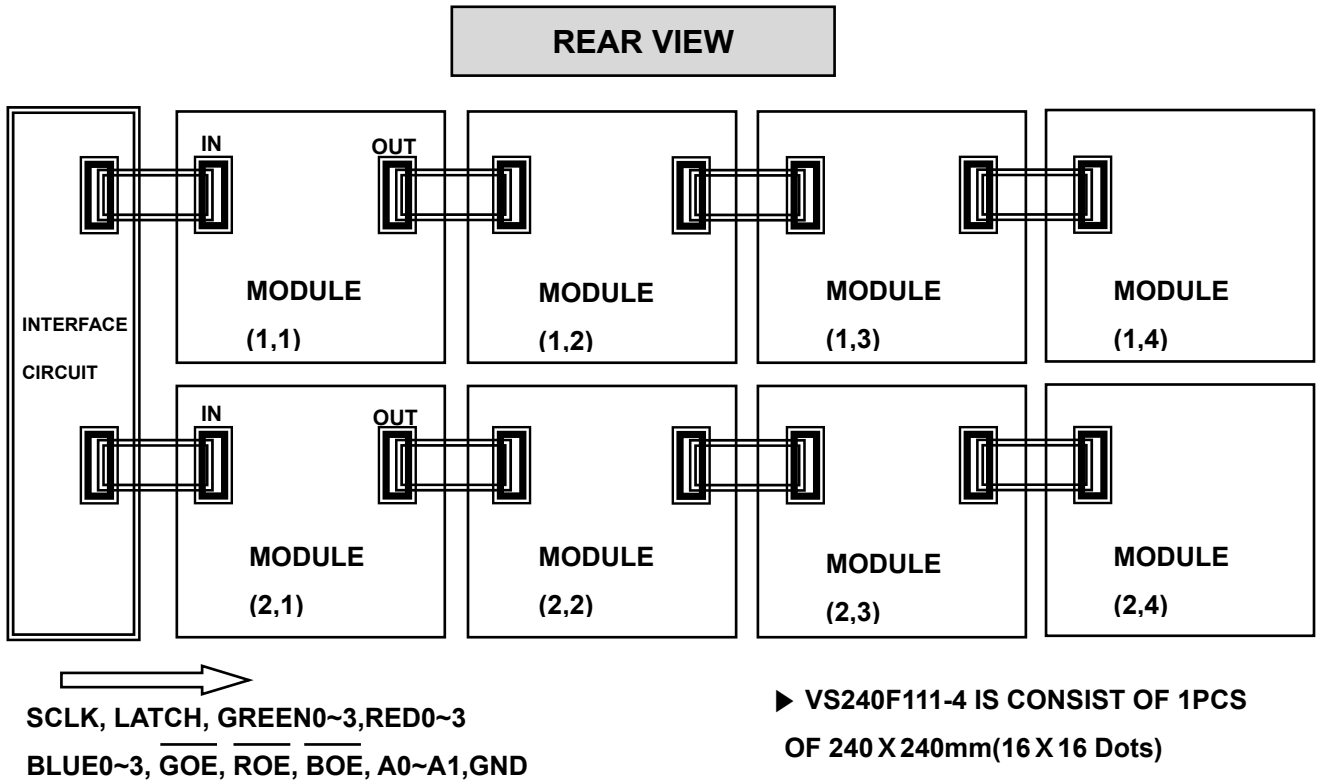
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# 8. SIGNAL & POWER CABLE CONNECTION

## 1) DIRECTION OF DATA

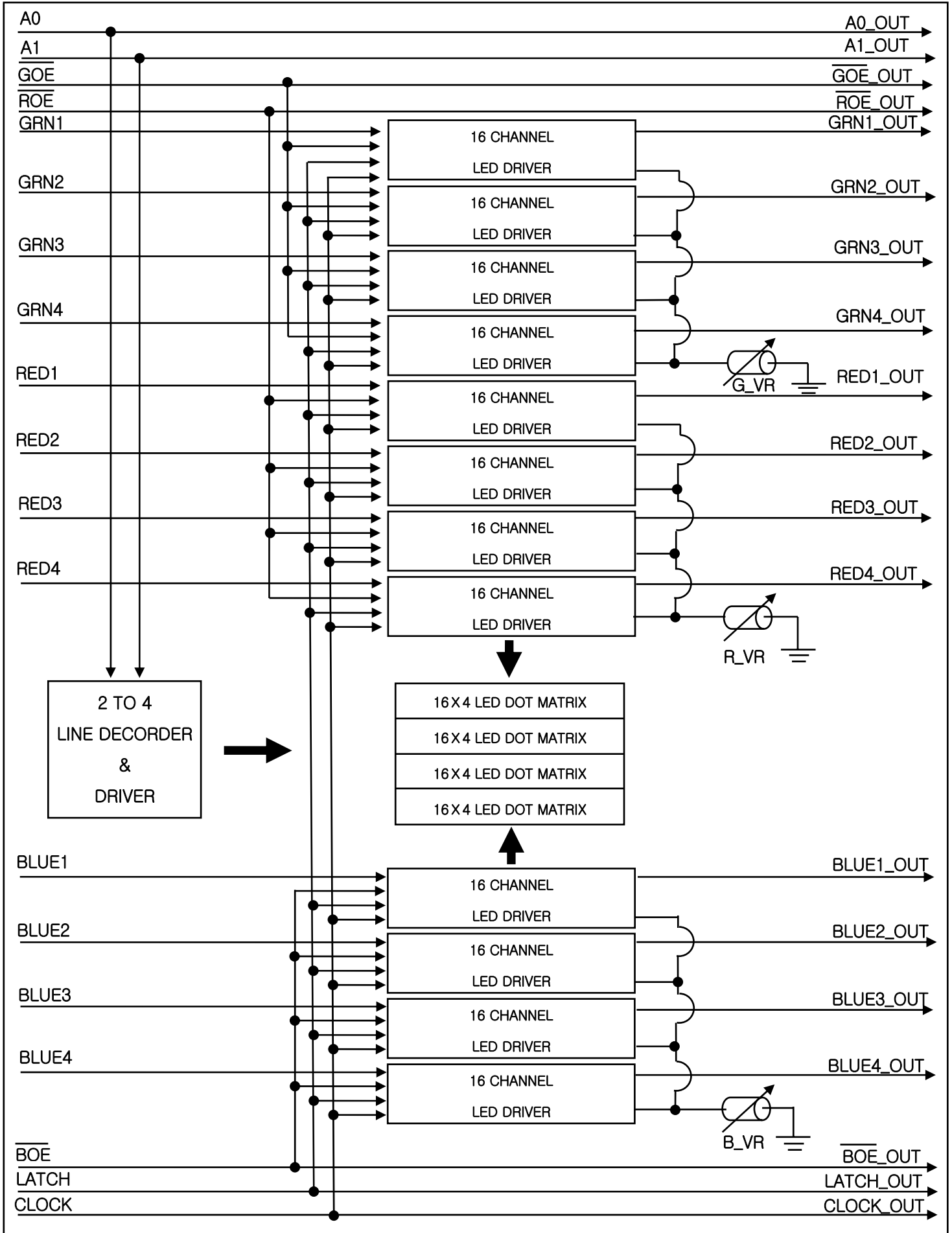



## 2) SIGNAL CABLE CONNECTION EXAMPLE



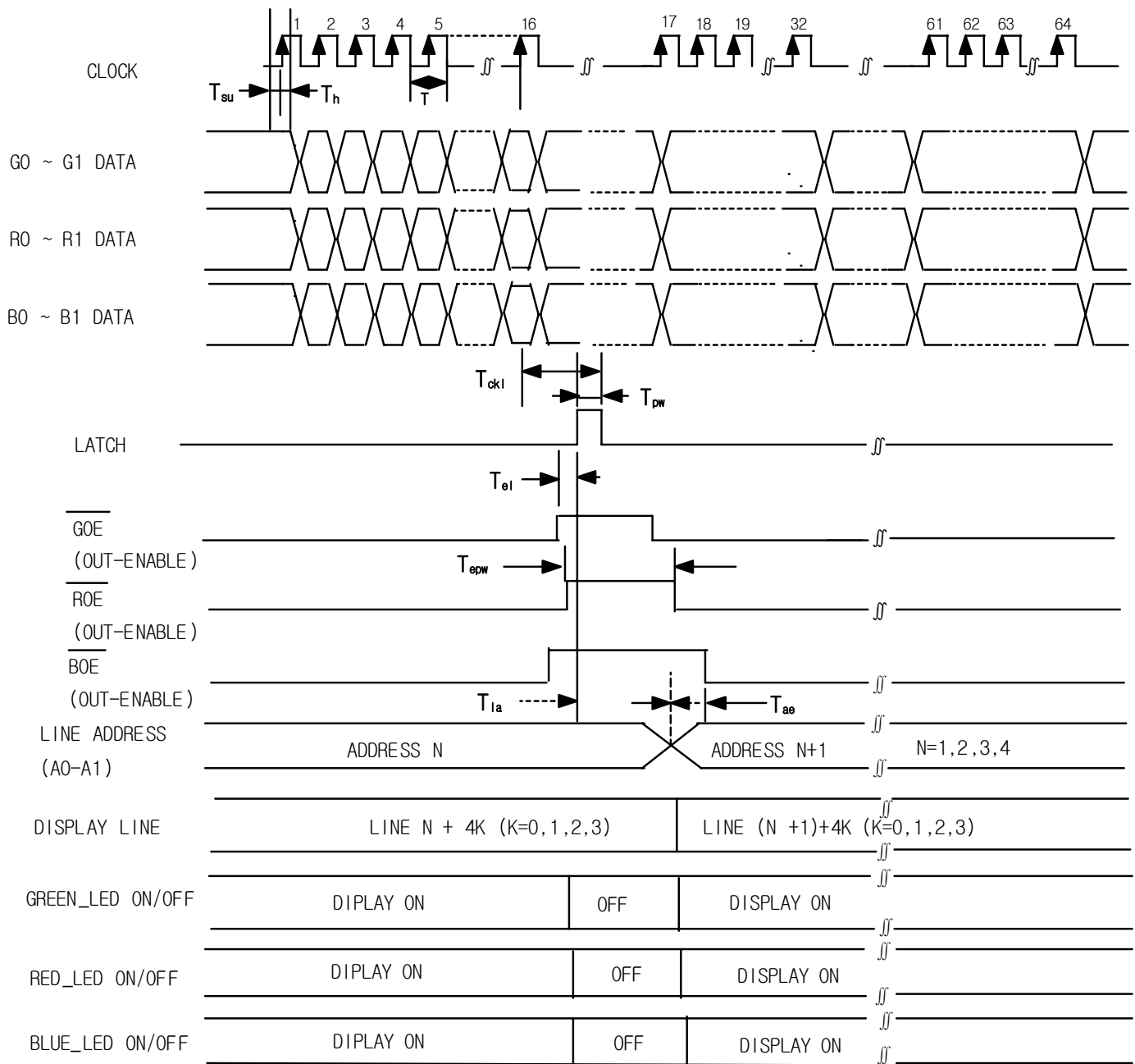
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# 9. BLOCK DIAGRAM



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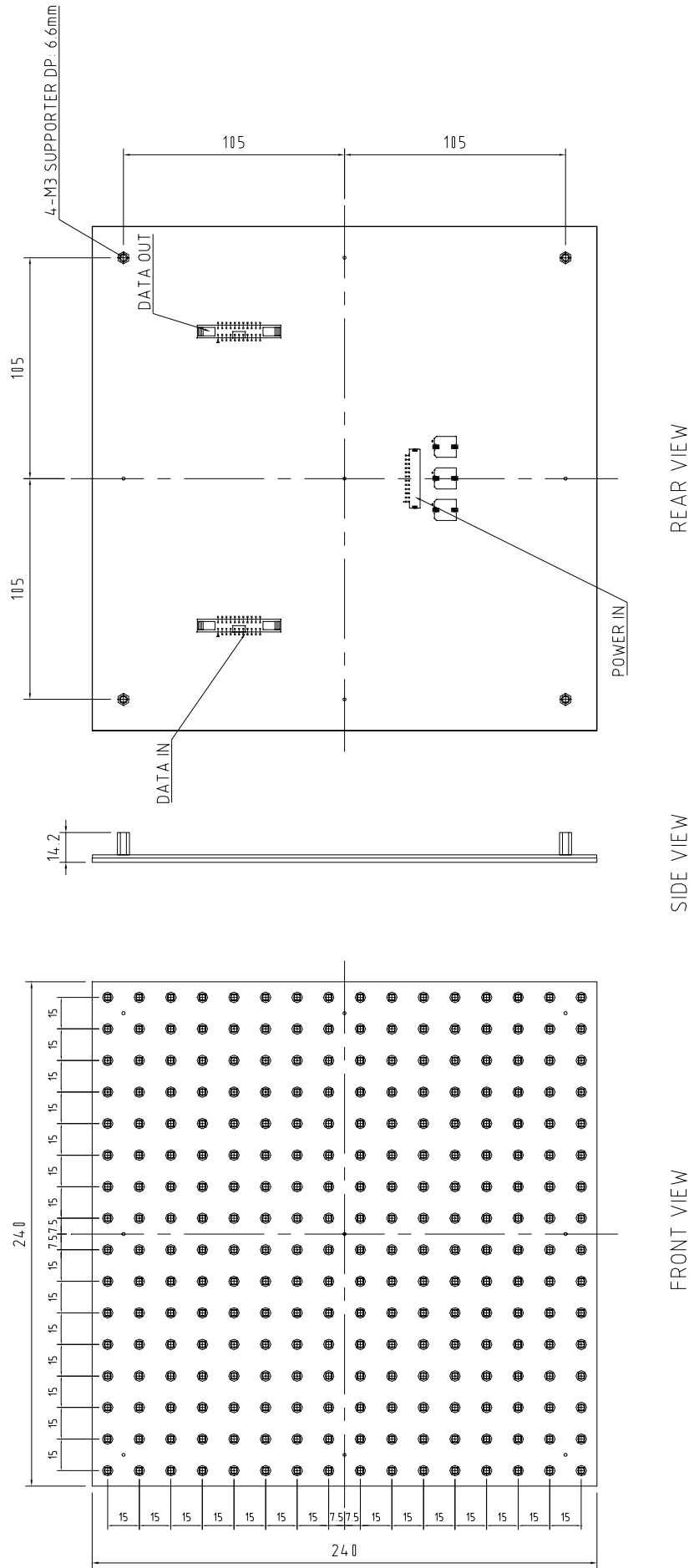
# 10. TIMMING CHART




Vcc=5V, Ta=25°C

CHARACTERISTICS	SYMBOL	MIN	MAX	UNIT
CLOCK CYCLE	<b>T</b>	-	16	MHz
DATA SETUP TIME	<b>T<sub>su</sub></b>	10	-	ns
DATA HOLD TIME	<b>T<sub>h</sub></b>	15	-	ns
LATCH PULSE WIDTH	<b>T<sub>pw</sub></b>	50	-	ns
LATCH HOLD TIME	<b>T<sub>ckl</sub></b>	15	-	ns
ENABLE-LATCH TIME	<b>T<sub>el</sub></b>	1	-	μs
ENABLE PULSE WIDTH	<b>T<sub>epw</sub></b>	3	-	μs
ADDRESS-ENABLE TIME	<b>T<sub>ae</sub></b>	1	-	μs
LATCH-ADDRESS TIME	<b>T<sub>ia</sub></b>	20	-	ns

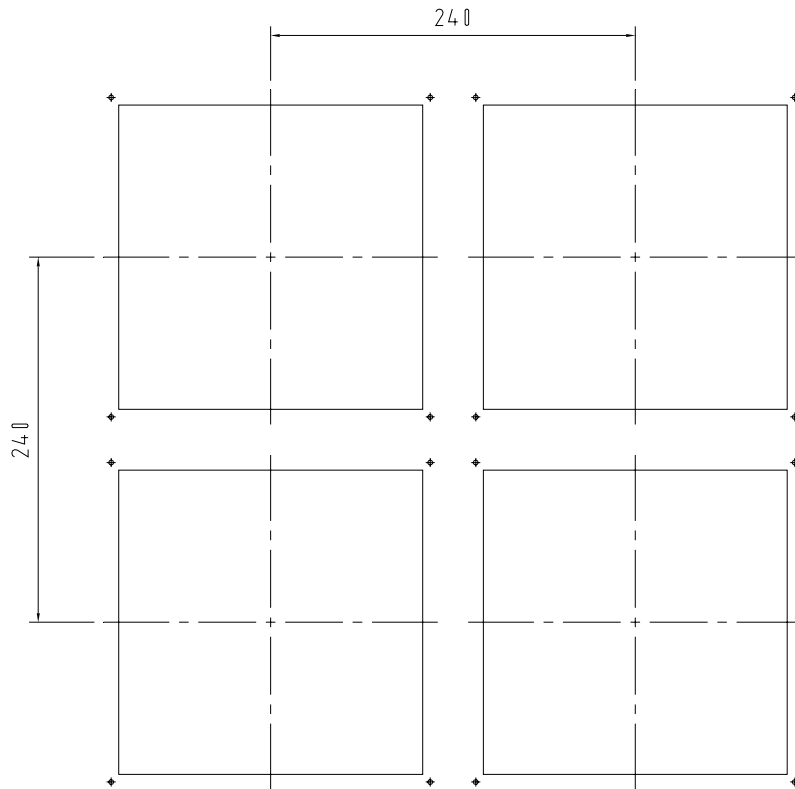
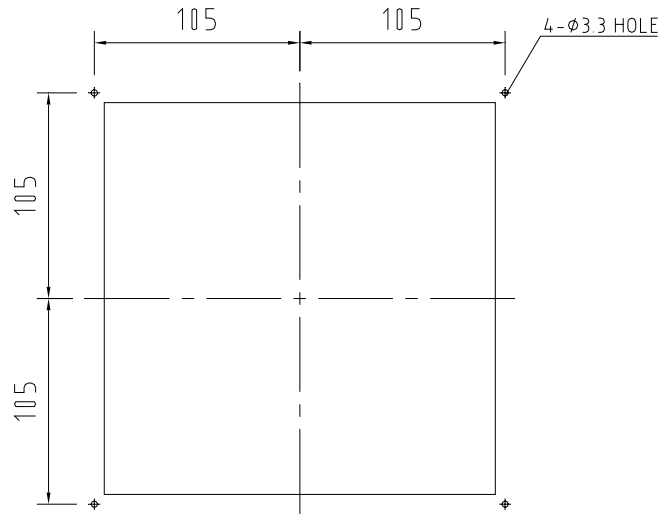
# 11. DIMENSION



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**Plate Work**



2\*2 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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