



TENTATIVE

LED DOT MATRIX MODULE

MODEL : KLM-128 CFN
(*Chip LED type full color LDM*)

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1. OVERVIEW

AUK has successfully developed a 16*16 LED dot matrix module to display full color. It is integrated with chip LED lamps. This module is compact, slim and light. It is suitable for the wide applications of a graphic & video board beyond a simple message board.

2. SPECIFICATION

| ITEM | DESCRIPTION |
|-------------------------|--|
| Size(W×H×D) | 128×128×21(mm) |
| Display Color | Red, Green, Blue (full color) |
| Number of Dots | 256(16×16) |
| Drive mode | Dynamic Drive(1/8 Duty) |
| Brightness Control | Using VR |
| Viewing Angle | Horizontal : ±75° , Vertical ±60° |
| Over Voltage Protection | Works at over 6V(Red), 7.5V(Green, Blue) ※ LED off Only. |
| Weight | 225g |

3. ELECTRICAL CHARACTERISTICS

1) ABSOLUTE MAXIMUM RATINGS(Ta=25℃)

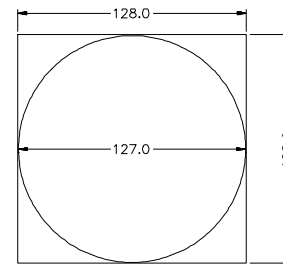
| ITEM | | SYMBOL | RATING | UNIT |
|-----------------------|---------|-------------------|--|------|
| DC Supply Voltage | Circuit | V _c | 6.0 | V |
| | LED | V _L | Red: 5.25 Green,Blue: 7.25 | V |
| Input Voltage | Circuit | V _{in-C} | -0.3 to V _c +0.3 | V |
| | LED | V _{in-L} | -0.3 to V _L | V |
| Current Consumption | Circuit | I _c | 0.3 (V _c =5V) | A |
| | LED | I _L | Red:2 Green,Blue:8 (V _L =7.0V) | A |
| Clock Frequency | | f | 50 | MHz |
| Operating Temperature | | T _{opr} | -25~60 | ℃ |
| Storage Temperature | | T _{stg} | -25~85 | ℃ |
| Isolation Temperature | | V _{iso} | AC500V(10mA), 1Minute(connector~supporter) | |

2) RECOMMENDABLE DRIVE CONDITIONS

| ITEM | | SYMBOL | RATING | UNIT |
|-----------------------|---------|------------------|------------------------------------|------|
| DC Supply Voltage | Circuit | V _c | 4.75~5.25 | V |
| | LED | V _L | R:4.75~5.25 G,B:6.7~7.0 | V |
| Operating Temperature | | T _{opr} | 0~40 | ℃ |

4. OPTICAL CHARACTERISTIC

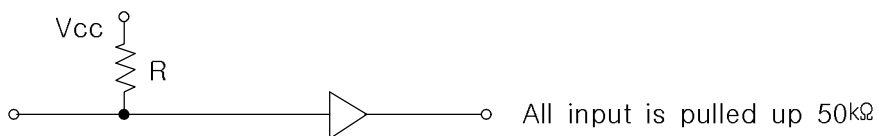
◆ MEASURE AREA : $\phi 127\text{mm}$
(Note 1)



| ITEM | SYMBOL | RATING | | | UNIT |
|--------------------------|-----------|--------------|-----|---------|---------------------------------|
| | | MIN | TYP | MAX | |
| Luminous intensity | Red(5V) | LvR | | (35) | cd/m ² (nit), Note 1 |
| | Green(7V) | LvG | | (190) | " |
| | Blue(7V) | LvB | | (20) | " |
| Peak Emission Wavelength | Red | λ pR | | 630 | nm |
| | Green | λ pG | | 572 | nm |
| | Blue | λ pB | | 428 | nm |

5. INPUT LEVEL

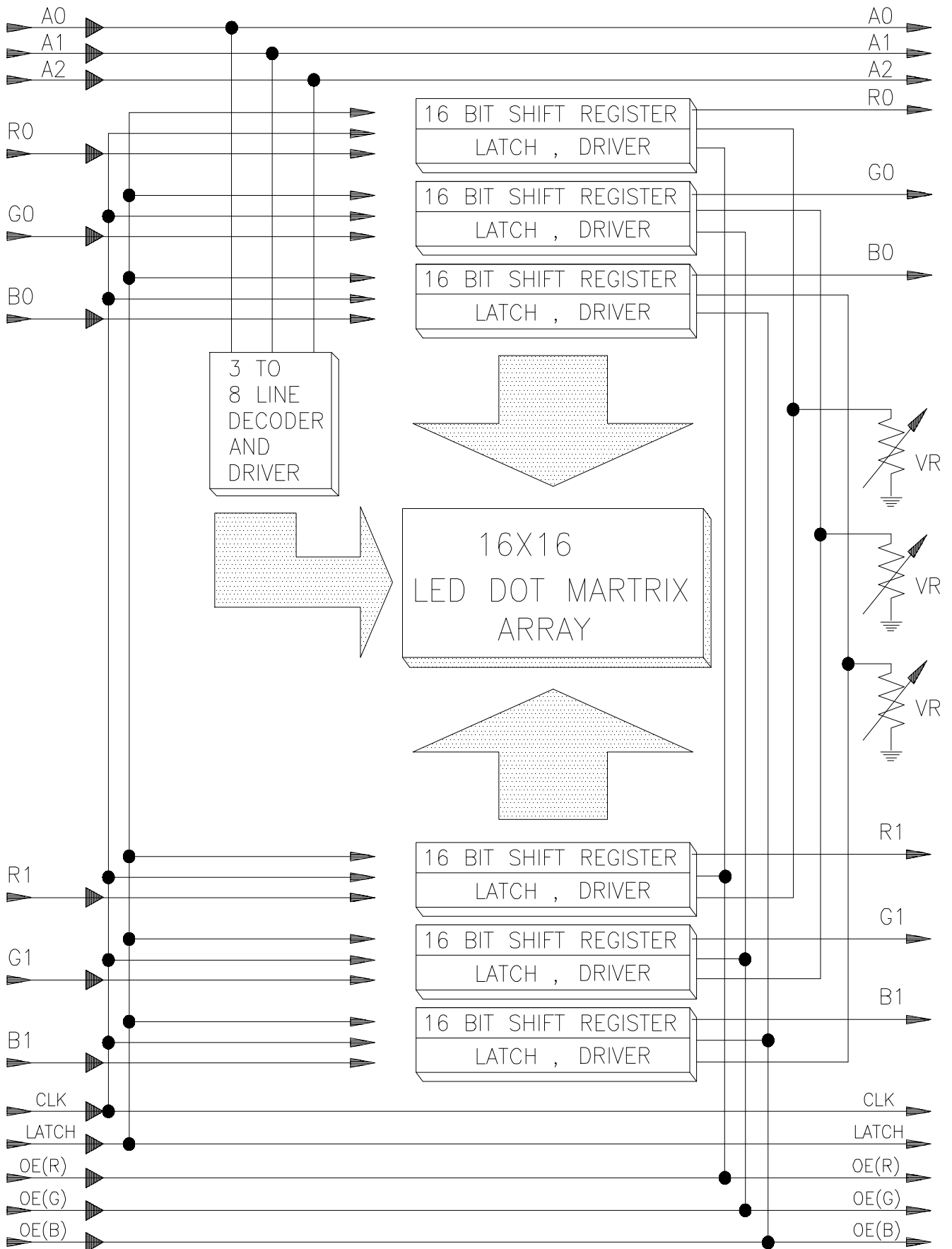
| ITEM | SYMBOL | MIN | TYP | MAX | UNIT |
|----------|--------|-----|-----|-----|------|
| Input"L" | ViL | — | — | 0.8 | V |
| Input"H" | ViH | 2.4 | — | — | |



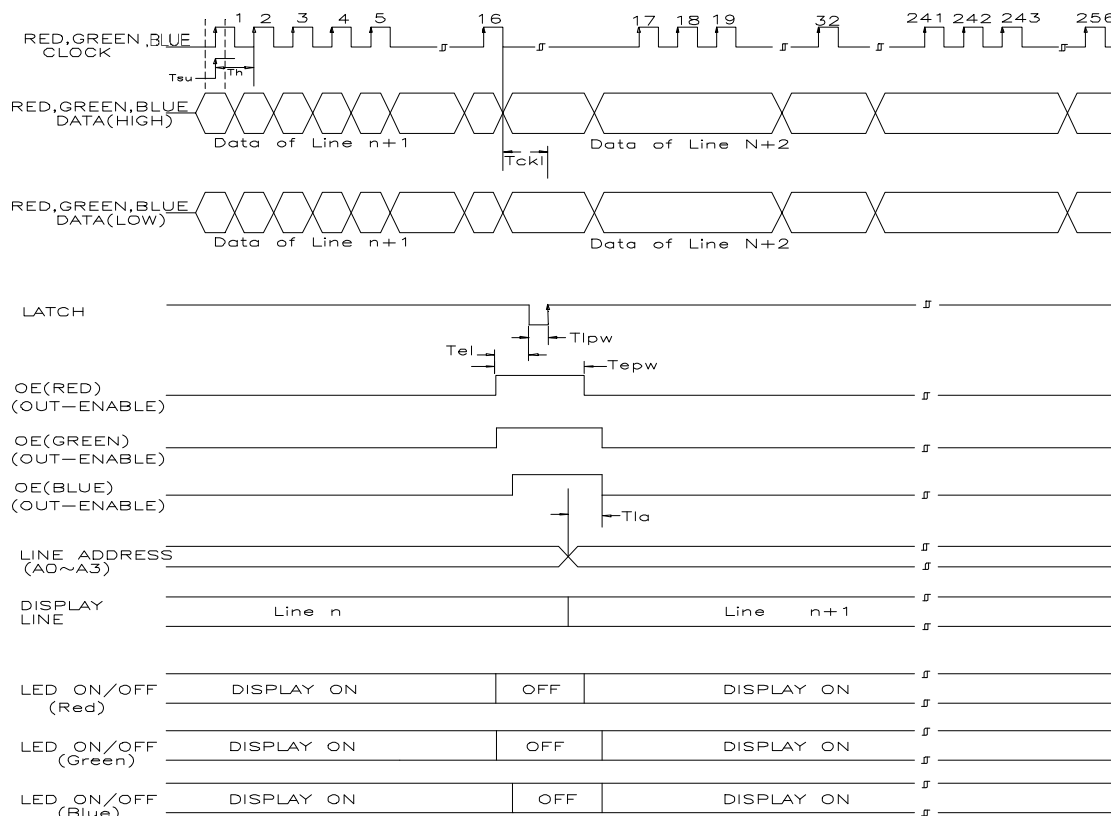
6.FUNCTION

| ITEM | PIN NAME | FUNCTION DESCRIPTION | PIN NO. | |
|-----------|---------------------|---|-----------------------------------|----|
| Power Pin | Vcc1 | Power supply for the circuit | 4 | |
| | Vcc2~4 | Power supply for the LED | 1,2,3 | |
| | GND | Ground of the module | 5,6,7 | |
| Data Pin | Red Data | R0 | Data input for Red color (High) | 7 |
| | | R1 | Data input for Red color (Low) | 10 |
| | Green Data | G0 | Data input for Green color (High) | 8 |
| | | G1 | Data input for Green color (Low) | 11 |
| | Blue Data | B0 | Data input for Blue color (High) | 9 |
| | | B1 | Data input for Blue color (Low) | 12 |
| | Line Address(A0~A2) | Signal input for line address | 13,14,15 | |
| | Clock (CLK) | Clock signal for Data input and display | 6 | |
| | Latch | Signal input for Data latch (New Data Latch at Rising Edge) | 4 | |
| | Out Enable (OE) | Display ON or OFF control ('H' Display OFF) ('L' Display ON) | 1(R),2(G),3(B) | |
| GND | Signal Ground | 5 | | |

7. BLOCK DIAGRAM



8. TIMING CHART



* To minimize the afterimage, you may equalize the width of latch to that of OE.

** when the Latch "L" or OE "H" => LED turn Off

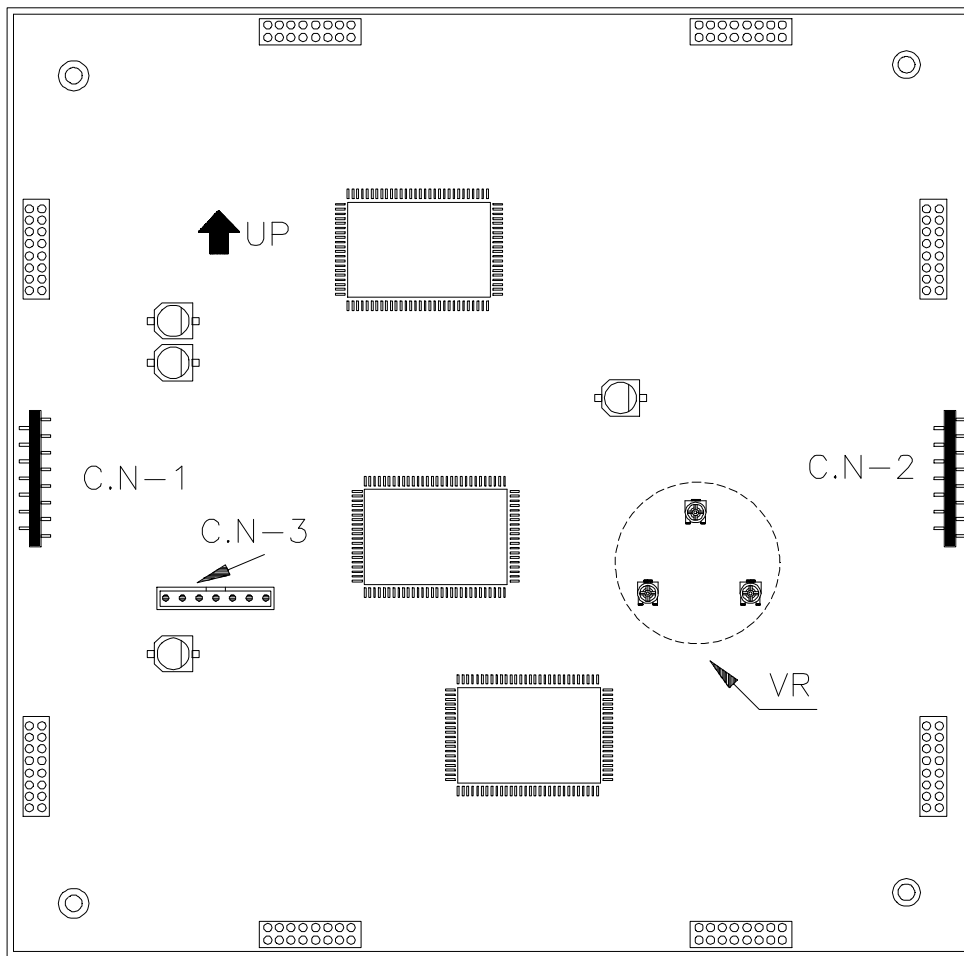
LEDs will be turned on when "DATA" is "LOW".

■ OPERATING TIMING

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

| NO | ITEM | SYMBOL | MIN | MAX | UNIT |
|----|---------------------|--------|-----|-----|---------|
| 1 | Clock Cycle | T | — | 50 | MHz |
| 2 | Data Set up Time | Tsu | 5 | — | ns |
| 3 | Data Hold Time | Th | 5 | — | ns |
| 4 | Latch Pulse Width | Tpw | 5 | — | ns |
| 5 | Clock-Latch Time | Tckl | 20 | — | ns |
| 6 | Enable-Latch Time | Tel | 3 | — | μS |
| 7 | Enable Pulse Width | Tepw | 3 | — | μS |
| 8 | Address-Enable Time | Tae | 1.5 | — | μS |
| 9 | Latch-Address Time | Tla | 1.5 | — | μS |

9. PIN CONNECTION & SWITCH



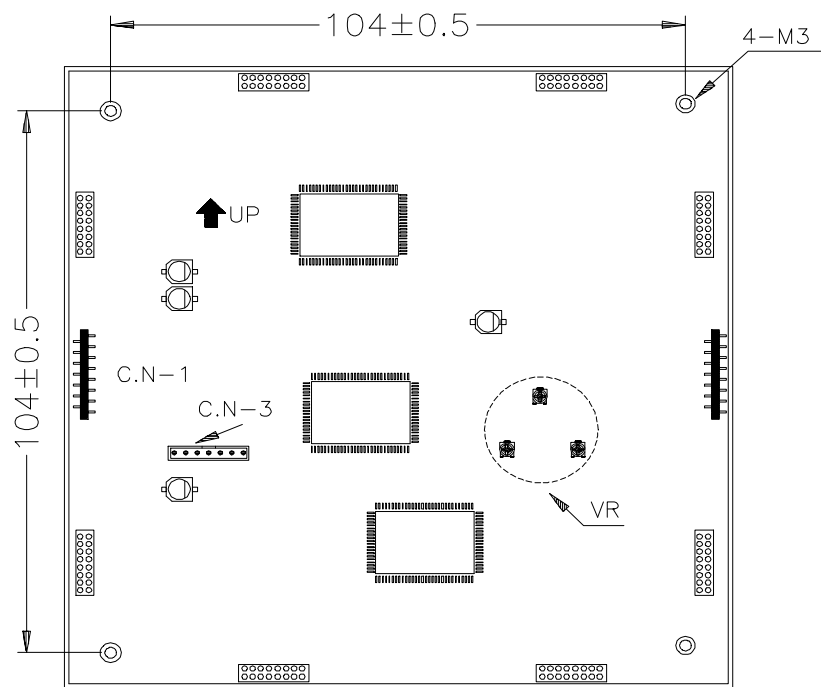
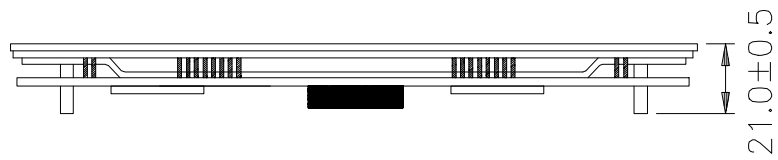
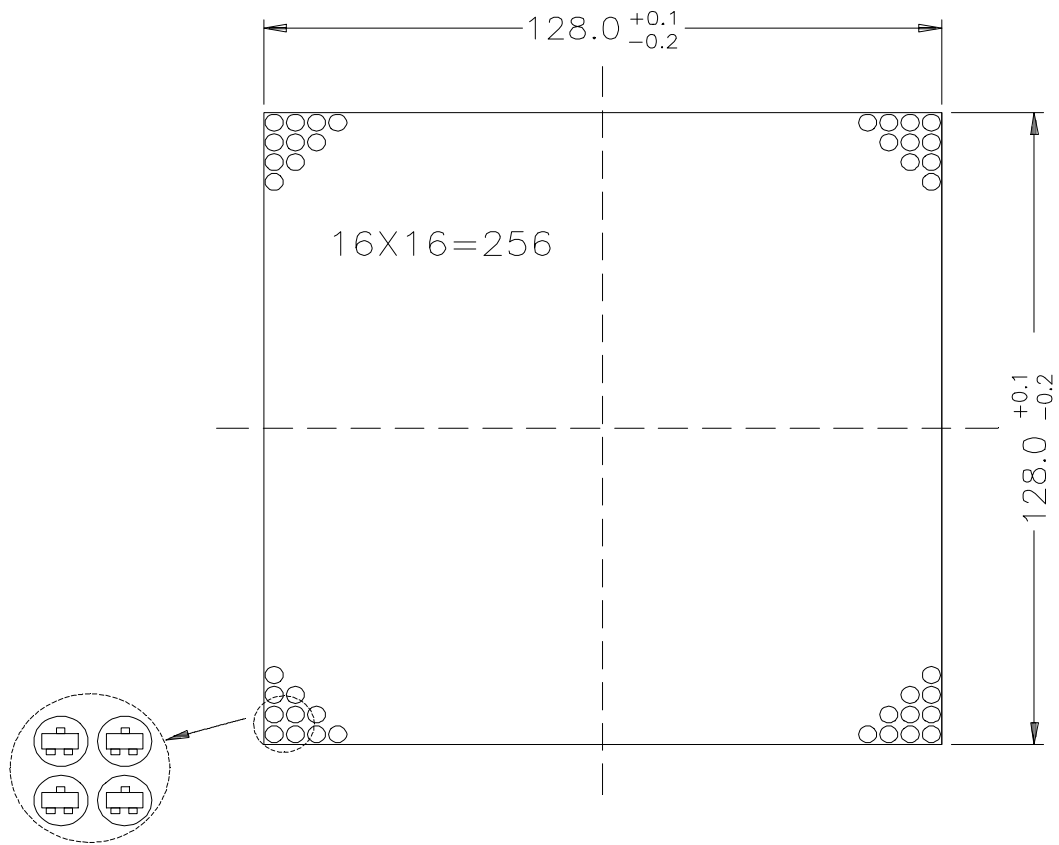
1) C.N-1 (DATA INPUT)

| | PIN NO. | NAME |
|--|---------|-------|
| | 1 | OE(R) |
| | 2 | OE(G) |
| | 3 | OE(B) |
| | 4 | ST |
| | 5 | GND |
| | 6 | CLK |
| | 7 | R0 |
| | 8 | G0 |
| | 9 | B0 |
| | 10 | R1 |
| | 11 | G1 |
| | 12 | B1 |
| | 13 | A |
| | 14 | B |
| | 15 | C |

2) C.N-2 (DATA OUTPUT)

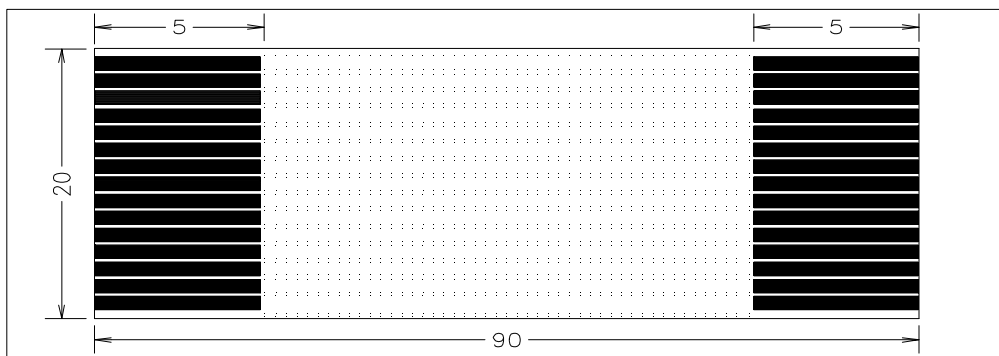
| | PIN NO. | NAME |
|--|---------|-------|
| | 1 | OE(R) |
| | 2 | OE(G) |
| | 3 | OE(B) |
| | 4 | ST |
| | 5 | GND |
| | 6 | CLK |
| | 7 | R0 |
| | 8 | G0 |
| | 9 | B0 |
| | 10 | R1 |
| | 11 | G1 |
| | 12 | B1 |
| | 13 | A |
| | 14 | B |
| | 15 | C |

10. DIMENSION

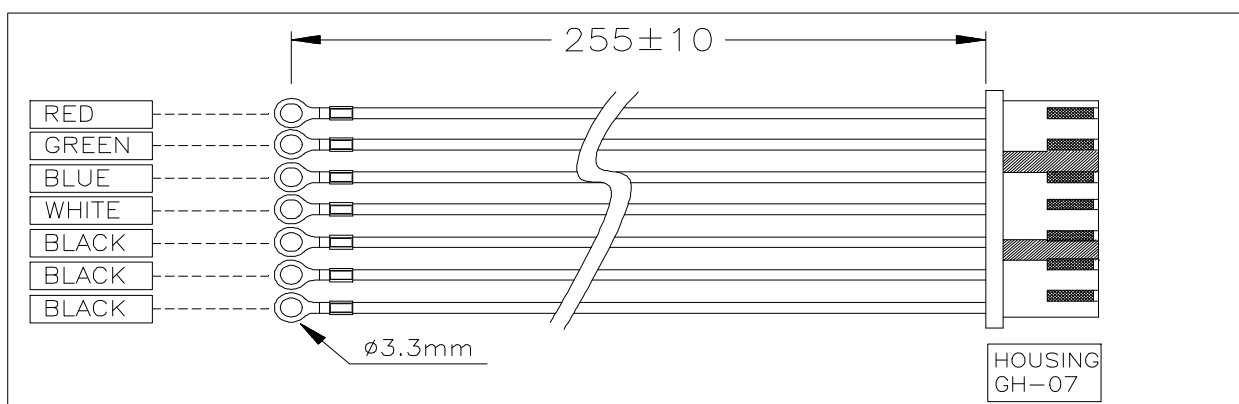


11. CONNECTION & CABLE (STANDARD)

1) C.N-1, C.N-2 (FFC CABLE)



2) C.N-3 (POWER CABLE)



| CONNECTION NO. | MODEL NO. | SPEC |
|----------------|--------------------------------|------------------------|
| C.N-1 , C.N-2 | KF2B 15/50P7 S9 B9 :VS3 VB3 | 15P*90*1.25*7(0.1*0.8) |
| C.N-3 | GH-0722-250mm | HARNESS 250mm |

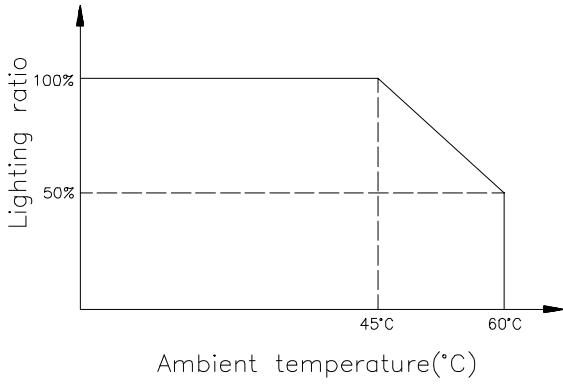
3) VR (BRIGHTNESS CONTROL Variable Resistor)

| | | |
|--|-------|--------------------------|
| | UP | Red brightness control |
| | LEFT | Green brightness control |
| | RIGHT | Blue brightness control |

4) C.N-3 (POWER)

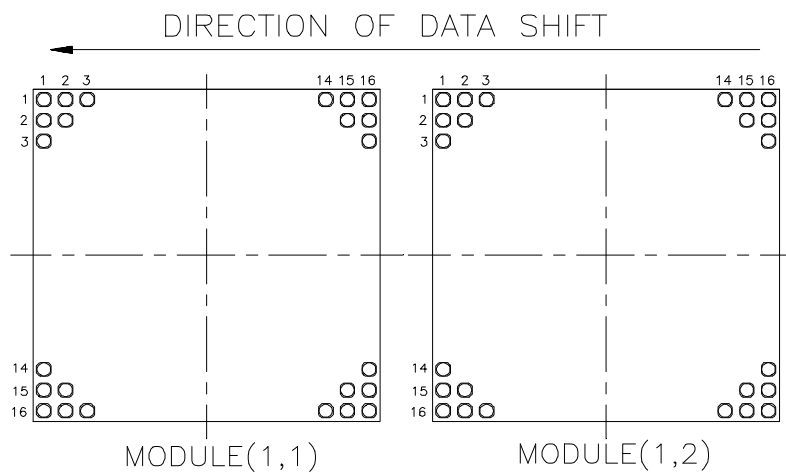
| PIN NO | NAME | LEVEL | FUNCTION |
|--------|-------|-------|---------------|
| | | | |
| 1 | Red | 5.0 | Red LED VCC |
| 2 | Green | 7.0 | Green LED VCC |
| 3 | Blue | 7.0 | Blue LED VCC |
| 4 | Logic | 5.0 | ASIC |
| 5 | GND | 0 | GND |
| 6 | GND | 0 | GND |
| 7 | GND | 0 | GND |

12. The rate of Lits derating curve

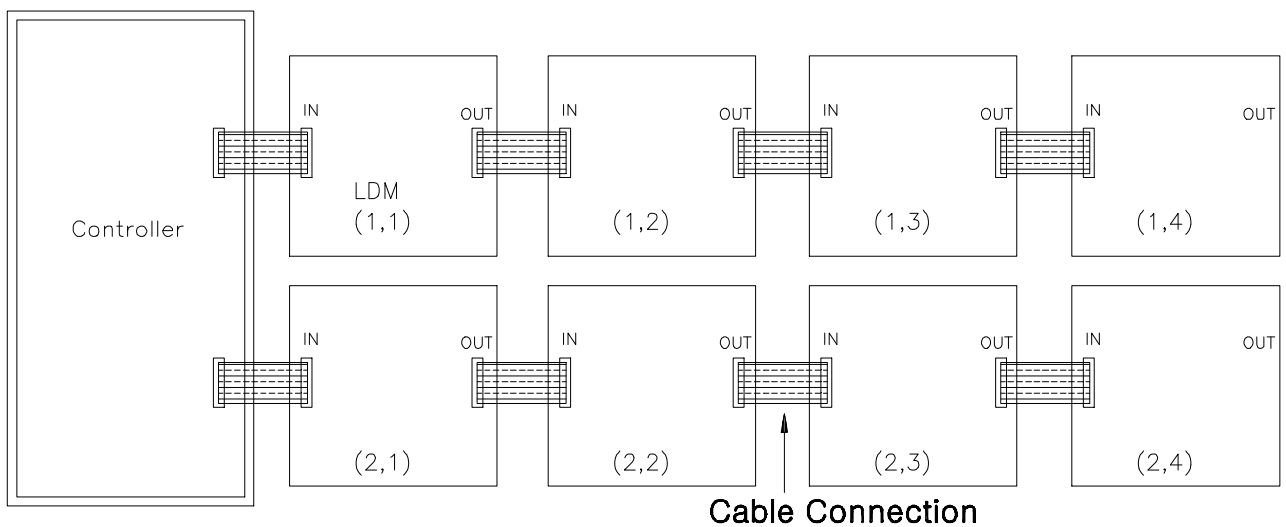


When you drive the module, refer to left graph.

13. Data Shift Direction



14. Example connection



**** The above drawing shows the back side of LDM***

15. Matter on caution when installed (assembly)

- 1) It should be installed deeply considered in noisy place because wrong operation might be occurred.
- 2) Make sure of power source before operating after being assembled module. Damage may be occurred by low voltage or short circuit.
- 3) The module is not waterproofed. so, do waterproof treatment to instrument if you need.
- 4) Please install module within guaranteed scope and specially escape installation from circumstance of smoke, dust, and SO₂-GAS.
- 5) Please turn off power source if there is no data transmission when you testing its operation after installation.
- 6) Please establish policy of heat release and use it under circumstance within guarantee scope in case a lot of module is assembled and used.
- 7) In case it is used under below zero circumstance, it is favorable to use it with high voltage within maximum extent of value of input power source.
- 8) Please make instrument after examining weight fully as module weight is 225g.

16. Matter of reference when handling.

- 1) Over voltage prevention circuit is built in "LED POWER SUPPLY (Vcc2)" of module and LED will be turned off in case high voltage is supplied beyond maximum extent of regular power.
- 2) Switch of brightness adjustment use is adjusted in fixed rank by LOT and supplied therefore don't operate it as you please.
- 3) Operating circuit is composed of CMOS, so, please take caution for static electricity.
- 4) If you have any question for using this, please contact us.

Product warranty

Warranty contents

Exchange without compensation will be made for the period of 12 month after having been delivered in case troubles in ordinary treatment in occurred.

Warranty is for delivered products. Expense of exchange work, damage compensation for advertisement suspension is not paid. Also compensative treatment will be made in case of following even for warranty period.

- 1) Troubles by handling carelessness and wrong using.
- 2) Troubles by inapplicable repair or remarking.
- 3) Troubles by natural disaster.

◎ Matters that demand attention and notice in compliance with contents of this document and use of the product.

- (1) In case that the products mentioned in this document is applicable to foreign exchange and foreign control law, admission of korea government is required when exporting or taking out.
 - (2) Technical information mentioned in this document is record of production characteristics and practical circuit and it does not mean guarantee of possessive right of industry or permission of performance right.
 - (3) Standard use of this production – It is used for general electronic parts (indicators, Display, office machine measuring equipment and home consumer products). When it is used for specific use (Aviation space, Traffic equipment, Burning equipment and safety equipment, ETC) which special quality and reliability is required and when trouble or miss operation of these threaten human's life or do harm to person, you should discuss it with us in advance considering using except standard use of our intention.
 - (4) You should use it within the warranty scope for special maximum rating operation power source electronic voltage scope and heat release ability.
We are not responsible for the defect that occur to instrument when it is used beyond our warranty measures.
- ◎ If you have any question or change required about the specification, please solve it after agreement with us.