


| Specification | | | | | |
|---------------|---------|------------------|------|------|---|
| Part Number: | | MC42008A6W-SPTLY | | | |
| Version: | | 1 | | | |
| Date: | | 16/06/2016 | | | |
| Revision | | | | | |
| MARK | DATE | DESCRIPTION | ITEM | PAGE | APPROVED |
| 1 | 2016.04 | INITIAL ISSUED | ALL | ALL |  |

| | |
|-----------------------|---------------------------|
| Character Layout | 4 x 20 |
| Appearance | Dark Blue on Yellow/Green |
| Logic Voltage | 5V |
| Interface | Parallel i/f |
| Font Set | English / Japanese |
| Display Mode | Transflective |
| Character Height | 8mm |
| LC Type | Yellow/Green STN |
| Module Size W x H x D | 146.00 x 62.50 x 14.50 mm |
| Operating Temperature | -20°C ~ +70°C |
| Construction | COB |
| LED Backlight | Yellow/Green LED |



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MIDAS

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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)
J: Asian/Arabic
- 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 **Z:** Zero Power (Bi-Stable) **V:** VA
- 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.
If Z (Zero Power): **WB:** White on blue **GB:** Green on black **YB:** Yellow on black **YPB:** Yellow on pink and/or blue
- 15 = **Driver Chip: Blank:** Standard **T:** Raio RA6963 **A:** Avant SAPI024B **R:** Raio RA8835
- 16 = **Interface: I:** I2C **S:** SPI **Blank:** Parallel
- 17 = **Voltage Variant:** e.g. **3** = 3v



FEATURES

| AVAILABLE OPTIONS | CHARACTERISTICS | CODE | No. |
|----------------------------|--|----------|-----|
| DISPLAY FORMAT | 20 Characters by 4 Lines | MC42008A | 1~6 |
| POLARIZER OPTIONS | Positive Transflective | F | 7 |
| BACKLIGHT TYPE OPTIONS | Edge Type LED Backlight (Long life span version) | H | 8 |
| BACKLIGHT COLOR OPTIONS | Yellow-Green color | Y | 9 |
| LCD PANEL OPTIONS | Yellow-Green STN | Y | 10 |
| VIEWING ANGLE OPTIONS | 6:00 (Bottom) | B | 11 |
| TEMPERATURE RANGE OPTIONS | -20 °C ~ 70 °C, Single Supply Voltage | W | 12 |
| SUGGESTED DRIVING VOLTAGE | V _{lcm} = 5.0V V _{led} = 5.0V | 5 | 13 |
| SUGGESTED LED DRIVING MODE | PIN15: LED+, PIN16: LED- | 1 | 14 |
| CONTROLLER ▲1 | SPLC780D + SPLC063A | L | 15 |
| FONT MAP CODE | E Version | E | 16 |
| DRIVING DUTY | 1/16 | — | — |
| DRIVING BIAS | 1/5 | — | — |

▲1 Please ask for datasheet of the mentioned controller from 'AT & S' or 'AT & S' authorized distributors. You can find the related information including AC & DC characteristics, Write & Read Timing diagram, Instruction table and descriptions, DDRAM & CGRAM, Rest Function and so on from the datasheet of controller.

▲1 You can ask for the example of software program (C language) from 'AT & S' or 'AT & S' authorized distributors.


MECHANICAL SPECIFICATIONS

| | | | | | |
|-----------------------|----------------|----|------------------------|----------------|----|
| OVERALL SIZE | 146.0W x 62.5H | mm | THICKNESS | max 14.5 | mm |
| VIEWING AREA | 123.0W x 42.5H | mm | HOLE-HOLE | 139.0W x 55.5H | mm |
| CHARACTER SIZE | 4.84W x 9.22H | mm | CHARACTER PITCH | 1.16W x 0.53H | mm |
| DOT SIZE | 0.92W x 1.10H | mm | DOT PITCH | 0.06W x 0.06H | mm |

ABSOLUTE MAXIMUM RATINGS




| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|-----------------------|------------------|-----------|-----------------------|-----|----------------------|------|
| POWER SUPPLY (LOGIC) | V _{dd} | 25 °C | -0.3 | — | 7.0 | V |
| POWER SUPPLY (LCD) | V ₀ | 25 °C | V _{dd} -13.5 | — | V _{dd} +0.3 | V |
| INPUT VOLTAGE | V _{in} | 25 °C | -0.3 | — | V _{dd} +0.3 | V |
| OPERATING TEMPERATURE | V _{opr} | — | -20 | — | 70 | °C |
| STORAGE TEMPERATURE | V _{stg} | — | -30 | — | 80 | °C |

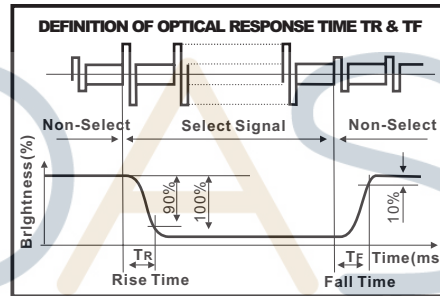
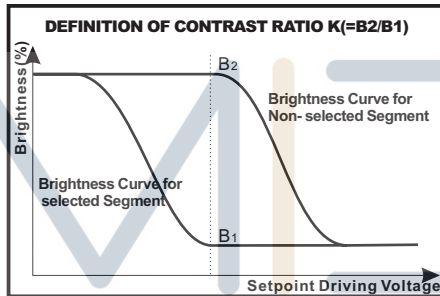
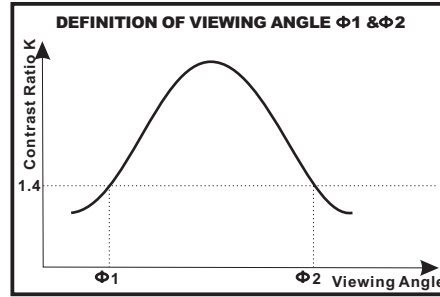
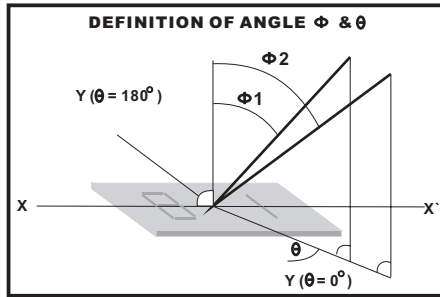
ELECTRONIC CHARACTERISTICS *

| ICONS | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|-------------------------------|--|---------------------|------|------|------|------|
| | INPUT VOLTAGE | V _{dd} | — | — | 5.0 | — | V |
| | SUPPLY CURRENT | I _{dd} | V _{dd} =5V | — | 1.5 | — | mA |
|  | DRIVING VOLTAGE FOR LCD PANEL | V _{lcd} = (V _{dd} - V ₀) | -20 °C | 4.55 | — | 4.80 | V |
| | | | 0 °C | 4.45 | — | 4.77 | |
| | | | 25 °C | 4.35 | 4.50 | 4.75 | |
| | | | 50 °C | 4.22 | — | 4.70 | |
| | | | 70 °C | 4.10 | — | 4.65 | |



* All data are recorded from TEST REPORT #FSYP027800185

LCD CHARACTERISTICS

| FOR STN/FSTN TYPE LCD Panel (TA=25 °C, Vdd=5.0V ± 0.5V) | | | | | | | |
|---|---------------------|-------------------|-----------|-----|-----|-----|------|
| ICONS | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|  | VIEWING ANGLE | $\Phi 2 - \Phi 1$ | K=4 | 40 | — | — | deg |
| | | θ | | 60 | | | |
|  | CONTRAST RATIO | K | — | — | 10 | — | — |
|  | RESPONSE TIME(RISE) | TR | — | — | 150 | 250 | ms |
| | RESPONSE TIME(FALL) | TF | — | — | 150 | 250 | ms |



LED CHARACTERISTICS

| ICONS | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|--|-------------------------------|-------------|-------------------|-----|-----|-----|-------------------|
|   | LED FORWARD VOLTAGE | Vf | 25 °C | — | 3.0 | — | V |
| | LED FORWARD CURRENT ▲2 | If | 25 °C | — | 20 | — | mA |
| | LED REVERSE CURRENT | Ir | 25 °C Vr=5.0V | — | — | 40 | μA |
| | LED PEAK WAVE LENGTH | λ_p | 25 °C If = 2*10mA | 569 | — | 579 | nm |
| | LED BRIGHTNESS (WITHOUT LCD) | Lv | 25 °C If = 2*10mA | — | 185 | — | cd/m ² |
| | LED BRIGHTNESS UNIFORMITY | Lvmin/Lvmax | 25 °C If = 2*10mA | 70 | — | — | Ratio |
| | LED LIFE TIME | — | 25 °C If = 2*10mA | 20K | — | — | Hours |

▲2 请注意, 驱动背光考虑的是恒流而不是恒压. 所以, 这个数值非常重要!

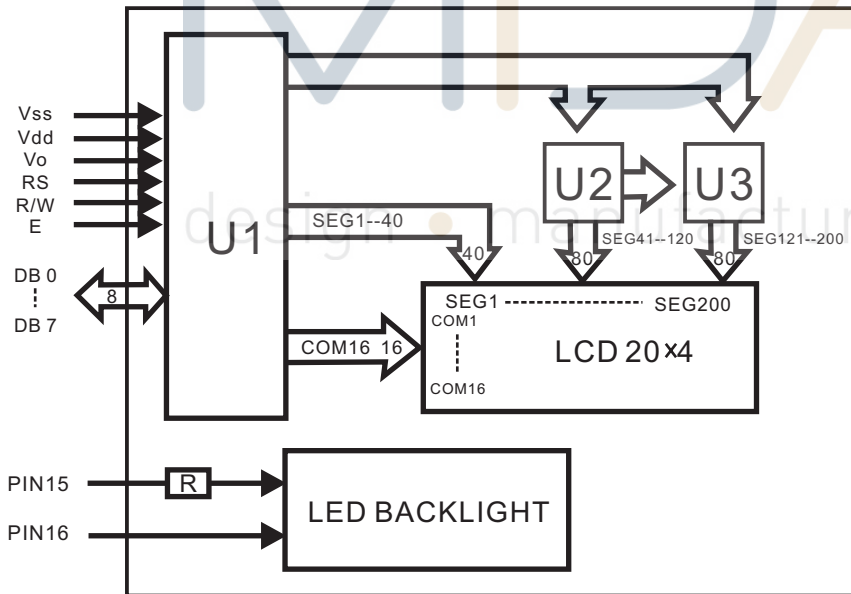
YOUR ATTENTION: It is constant current (not constant voltage) that should be applied when driving LED backlight. Therefore, this data is very important!

* 当工作温度高于25 °C时, Ifm, Ifp和Pd必须降低; 电流降低率是 -0.36*4mA/°C (直流驱动), 或-0.86*4A/°C (脉冲驱动), 功率降低率是-75*4mW/°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 -0.36*4mA/°C for DC drive and -0.86*4 mA/°C for Pulse drive, the power dissipation is -75*4 mW/°C The product working current must not be more than 60% of the Ifm or Ifp according to the working temperature.

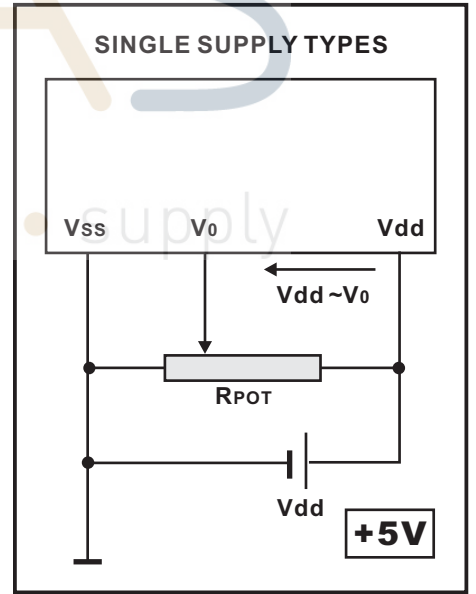
PIN ASSIGNMENT

| PIN | SYMBOL | DESCRIPTION | REMARKS |
|-----|--------|------------------------|---------|
| 1 | Vss | GND | |
| 2 | Vdd | Power supply for LCM | 5.0V |
| 3 | V0 | Contrast Adjust | |
| 4 | RS | Register Select Signal | |
| 5 | R/W | Data Read / Write | |
| 6 | E | Enable Signal | |
| 7 | DB0 | Data bus line | |
| 8 | DB1 | Data bus line | |
| 9 | DB2 | Data bus line | |
| 10 | DB3 | Data bus line | |
| 11 | DB4 | Data bus line | |
| 12 | DB5 | Data bus line | |
| 13 | DB6 | Data bus line | |
| 14 | DB7 | Data bus line | |
| 15 | LED+ | Power supply for BKL | 5.0V |
| 16 | LED- | Power supply for BKL | |

BLOCK DIAGRAM

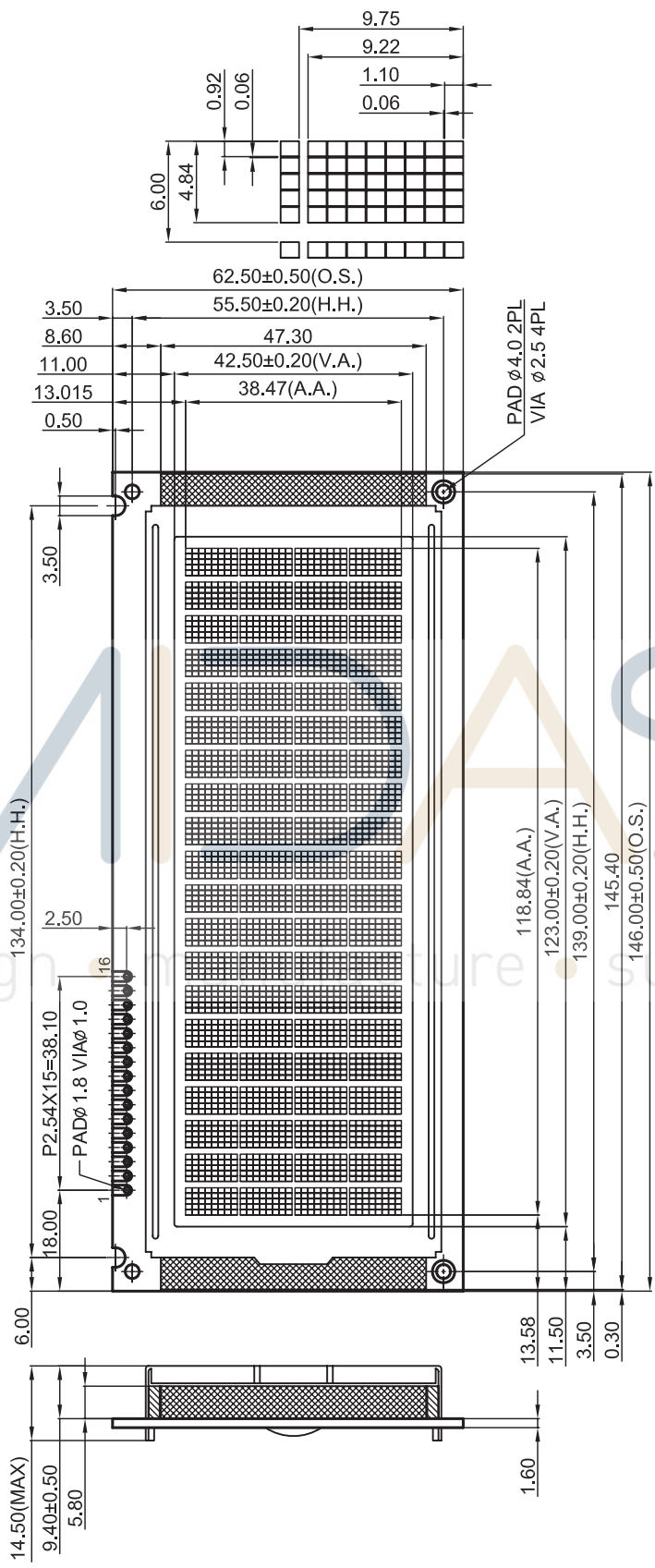


POWER SUPPLY DIAGRAM



| Upper 4bit Lower 4bit | LLLL | LLLH | LLHL | LLHH | LHLL | LHLH | LHHL | LHHH | HLLL | HLLH | HLHL | HLHH | HHLL | HHLH | HHHL | HHHH |
|--------------------------------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LLLL | CG RAM (1) | | | | | | | | | | | | | | | |
| LLLH | (2) | | | | | | | | | | | | | | | |
| LLHL | (3) | | | | | | | | | | | | | | | |
| LLHH | (4) | | | | | | | | | | | | | | | |
| LHLL | (5) | | | | | | | | | | | | | | | |
| LHLH | (6) | | | | | | | | | | | | | | | |
| LHHL | (7) | | | | | | | | | | | | | | | |
| LHHH | (8) | | | | | | | | | | | | | | | |
| HLLL | (1) | | | | | | | | | | | | | | | |
| HLLH | (2) | | | | | | | | | | | | | | | |
| HLHL | (3) | | | | | | | | | | | | | | | |
| HLHH | (4) | | | | | | | | | | | | | | | |
| HHLL | (5) | | | | | | | | | | | | | | | |
| HHLH | (6) | | | | | | | | | | | | | | | |
| HHHL | (7) | | | | | | | | | | | | | | | |
| HHHH | (8) | | | | | | | | | | | | | | | |





design future supply



| FULL-SIZED PACKAGE |
|------------------------------|
| 15 PCS/BOX |
| 8 BOXES/CARTON |
| 120 PCS/CARTON |
| 18.00 KGS/CTN(G.W.) |
| 0.054 M ³ /CARTON |

| HALF-SIZED PACKAGE |
|------------------------------|
| 15 PCS/BOX |
| 4 BOXES/CARTON |
| 60 PCS/CARTON |
| 9.00 KGS/CTN(G.W.) |
| 0.027 M ³ /CARTON |

| PACKING DECLARATION |
|--|
| 1. This packaging information is for reference only. The actual information is subject to the actual packaging. Especially for packaging of LCL, tolerances may exist. |
| 2. T&A will not be responsible for quality problems caused by unnormal transportation conditions (including but not limited to climate factors or human factors, such as improper handling). |

