



ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

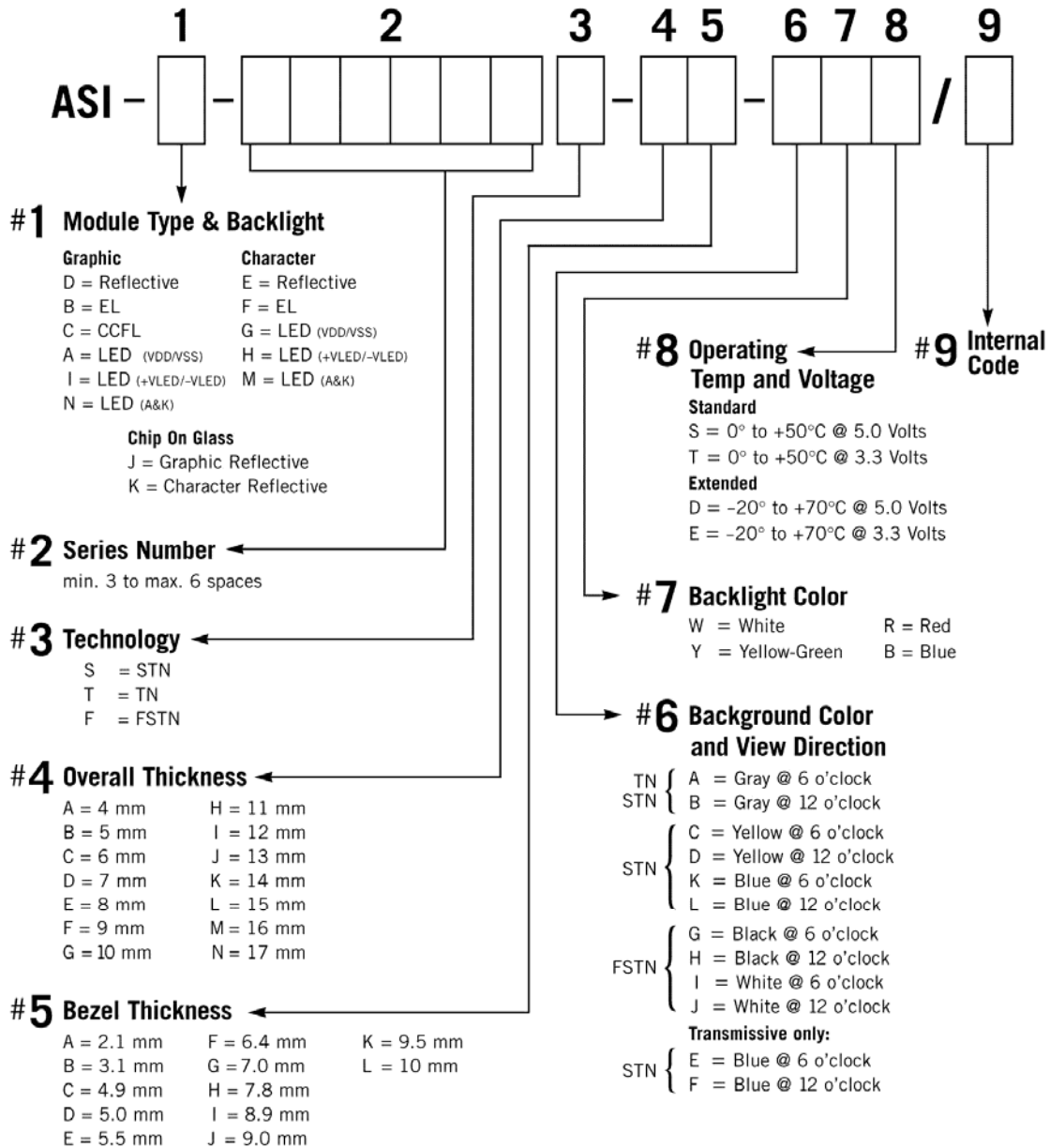
MODULE # : ASI-_-1603AS-GF-_YS/W

| | | |
|--------------------|-------|-----------------------------------|
| (1) NUMBER OF DOT | ----- | 160 W * 32 H DOTS |
| (2) MODULE SIZE | ----- | 80.0 W * 36.0 H * 10.0 T (Max) mm |
| (3) EFFECTIVE AREA | ----- | 64.6 W * 16.0 H mm |
| (4) ACTIVE AREA | ----- | 59.17 W * 11.81 H mm |
| (5) DOT SIZE | ----- | 0.34 W * 0.34 H mm |
| (6) DOT PITCH | ----- | 0.37 W * 0.37 H mm |



MODEL NO : ASI_-1603AS--GF-_YS W

LCD MODULE PART NUMBERING SYSTEM



NOTE: Some options may not be available in specific modules. Please contact your Sales Representative to check availability.



MODEL NO : ASI_-1603AS--GF-_YS W

1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

AS - 10-1000

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER : ST7920 or equivalent

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

ASI-10-10000

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF DOT -----160 W * 32 H DOTS
- (2) MODULE SIZE -----80.0 W * 36.0 H * 10.0 T (Max) mm
- (3) EFFECTIVE AREA -----64.6 W * 16.0 H mm
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3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS (AT Ta = 25°C)

| <i>ITEM</i> | <i>SYMBOL</i> | <i>MIN.</i> | <i>MAX.</i> | <i>UNIT</i> | <i>COMMENT</i> |
|------------------------|---------------|-------------|-------------|-------------|----------------|
| POWER SUPPLY FOR LOGIC | VDD-VSS | -0.3 | 5.5 | V | ----- |
| POWER SUPPLY FOR LCD | Vo | -0.3 | 3.5 | V | ----- |
| INPUT VOLTAGE | Vi | -0.3 | VDD+0.3 | V | ----- |
| STATIC ELECTRICITY | ----- | ----- | 100 | V | NOTE(1) |
| POWER SUPPLY FOR LED | NOTE(2) | ----- | NOTE(2) | V | ----- |

NOTE (1): ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200pF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

NOTE (2):

| <i>SYMBOL</i> | <i>V_{LED MAX}</i> | <i>LED TYPE</i> |
|------------------------|----------------------------|-------------------------------|
| <i>V_{LED}</i> | 5.5V | YELLOW-GREEN,AMBER,ORANGE,RED |
| | 5.0V | BLUE,PURE GREEN,WHITE |

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

| <i>ITEM</i> | <i>CONDITION</i> | <i>OPERATING</i> | | <i>STORAGE</i> | | <i>COMMENT</i> |
|-----------------------|------------------|------------------|-------------|----------------|-------------|---|
| | | <i>MIN.</i> | <i>MAX.</i> | <i>MIN.</i> | <i>MAX.</i> | |
| AMBIENT TEMPERATURE | NORMAL | 0°C | 50°C | -20°C | 70°C | ----- |
| | WIDE | -20°C | 70°C | | | |
| HUMIDITY | ----- | NOTE (3) | | NOTE (3) | | NO CONDENSATION |
| VIBRATION NOTE (4) | ----- | ----- | 0.5G | ----- | 2G | 10~300Hz XYZ DIRECTIONS 1 Hr EACH |
| SHOCK NOTE (4) | ----- | ----- | 3G | ----- | 50G | 10 msec XYZ DIRECTIONS 1 TIME EACH |
| CORROSIVE GAS | ----- | NOT ACCEPTABLE | | NOT ACCEPTABLE | | ----- |

NOTE (3):Ta ≤ 50°C: 90% RH MAX.

Ta > 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90% RH AT 50°C. (80% RH AT 60°C)

NOTE (4):1G = 9.8 m/s²



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4. ELECTRICAL CHARACTERISTICS

Ta 25°C

| <i>I T E M</i> | <i>SYMBOL</i> | <i>CONDITION</i> | <i>MIN.</i> | <i>TYP.</i> | <i>MAX.</i> | <i>UNIT</i> | |
|--|-----------------------------------|---|---------------------|-------------|-----------------|-------------|---|
| POWER SUPPLY VOLTAGE FOR CIRCUIT | V _{DD} - V _{SS} | ----- | 2.7 | ----- | 5.5 | V | |
| INPUT VOLTAGE | V _{IH} | ----- | 0.7 V _{DD} | ----- | V _{DD} | V | |
| | V _{IL} | ----- | -0.3 | ----- | 0.6 | V | |
| OUTPUT VOLTAGE | V _{OH} | I _{OH} = -0.1 mA | 0.8V _{DD} | ----- | V _{DD} | V | |
| | V _{OL} | I _{OL} = 0.1 mA | ----- | ----- | 0.1 | V | |
| POWER SUPPLY CURRENT | I _{DD} | V _{DD} - V _{SS} | ----- | 0.5 | 1.0 | mA | |
| RECOMMENDED LCD DRIVING VOLTAGE, NOTE(1) | V _O -V _{SS} | STN/ FSTN DUTY =1/32 Φ=10° NOTE(2) | Ta=-20°C | ----- | ----- | ----- | V |
| | | | Ta= 0°C | ----- | ----- | ----- | V |
| | | | Ta= 25°C | ----- | 2.5 | ----- | V |
| | | | Ta= 50°C | ----- | ----- | ----- | V |
| | | | Ta= 70°C | ----- | ----- | ----- | V |
| POWER SUPPLY CURRENT FOR NOTE(3) | I _{LED} | V _{LED} NOTE(3) | ----- | NOTE(3) | NOTE(3) | mA | |

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ±0.5V BY EACH MODULE.

- (2): $\theta = 0^\circ$: VIEWING DIRECTION AT 6 O'CLOCK
 $\theta = 180^\circ$: VIEWING DIRECTION AT 12 O'CLOCK

(3): LED CURRENT OF DIFFERENT LED TYPE

| <i>LED B.L TYPE</i> | <i>V_{LED}</i> | <i>I_{LED}</i> | | | | <i>LED COLOR</i> |
|---------------------|------------------------|------------------------|-------------|-------------|--------------|-------------------------------|
| | | <i>MIN.</i> | <i>TYP.</i> | <i>MAX.</i> | <i>UNIT.</i> | |
| A | 4.8V | ----- | 30 | 40 | mA | YELLOW-GREEN、AMBER、ORANGE、RED |
| B | 4.0V | ----- | 30 | 40 | mA | BLUE、WHITE、PURE GREEN |



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5. OPTICAL CHARACTERISTICS

Ta = 25°C

STN TYPE LCD

Ta = 25°C

| <i>I T E M</i> | <i>SYMBOL</i> | <i>CONDITION</i> | <i>MIN.</i> | <i>TYP.</i> | <i>MAX.</i> | <i>UNIT</i> | <i>NOTE</i> |
|----------------|-----------------|------------------------------|-------------|-------------|-------------|-------------|-------------|
| VIEWING ANGLE | $\Phi 2-\Phi 1$ | K = 2.0 NOTE(1) | 30 | 40 | ---- | deg. | NOTE(2) |
| CONTRAST RATIO | K | $\Phi = 10^\circ$ NOTE(1) | 3.0 | 4.0 | ---- | ---- | NOTE(2) |
| RESPONSE TIME | tr (rise) | $\Phi = 10^\circ$ NOTE(1) | ---- | 200 | 350 | ms | NOTE(2) |
| | tf (fall) | $\Phi = 10^\circ$ NOTE(1) | ---- | 300 | 400 | ms | NOTE(2) |

FSTN /STN BLUE TYPE LCD

Ta = 25°C

| <i>I T E M</i> | <i>SYMBOL</i> | <i>CONDITION</i> | <i>MIN.</i> | <i>TYP.</i> | <i>MAX.</i> | <i>UNIT</i> | <i>NOTE</i> |
|----------------|-----------------|------------------------------|-------------|-------------|-------------|-------------|-------------|
| VIEWING ANGLE | $\Phi 2-\Phi 1$ | K = 2.0 NOTE(1) | 30 | 40 | ---- | deg. | NOTE(2) |
| CONTRAST RATIO | K | $\Phi = 10^\circ$ NOTE(1) | 4.0 | 5.0 | ---- | ---- | NOTE(2) |
| RESPONSE TIME | tr (rise) | $\Phi = 10^\circ$ NOTE(1) | ---- | 200 | 350 | ms | NOTE(2) |
| | tf (fall) | $\Phi = 10^\circ$ NOTE(1) | ---- | 300 | 400 | ms | NOTE(2) |

Brightness for LCM backlight

| <i>SYMBOL</i> | <i>CONDITION</i> | <i>MIN.</i> | <i>TYP.</i> | <i>MAX.</i> | <i>UNIT</i> | <i>LED TYPE</i> | <i>NOTE</i> |
|---------------|--------------------|-------------|-------------|-------------|-------------------|-----------------------------------|-------------|
| B | $\Phi = 0^\circ$ | 4.0 | ---- | ---- | cd/m ² | YELLOW-GREEN、RED、 AMBER、ORANGE | NOTE(2) |
| | $\theta = 0^\circ$ | 6.0 | ---- | ---- | | BLUE、PURE GREEN、 WHITE | NOTE(3) |

NOTE (1): $\theta = 0^\circ$ WHEN VIEWING DIRECTION AT 6 O'CLOCK

$\theta = 180^\circ$ WHEN VIEWING DIRECTION AT 12 O'CLOCK

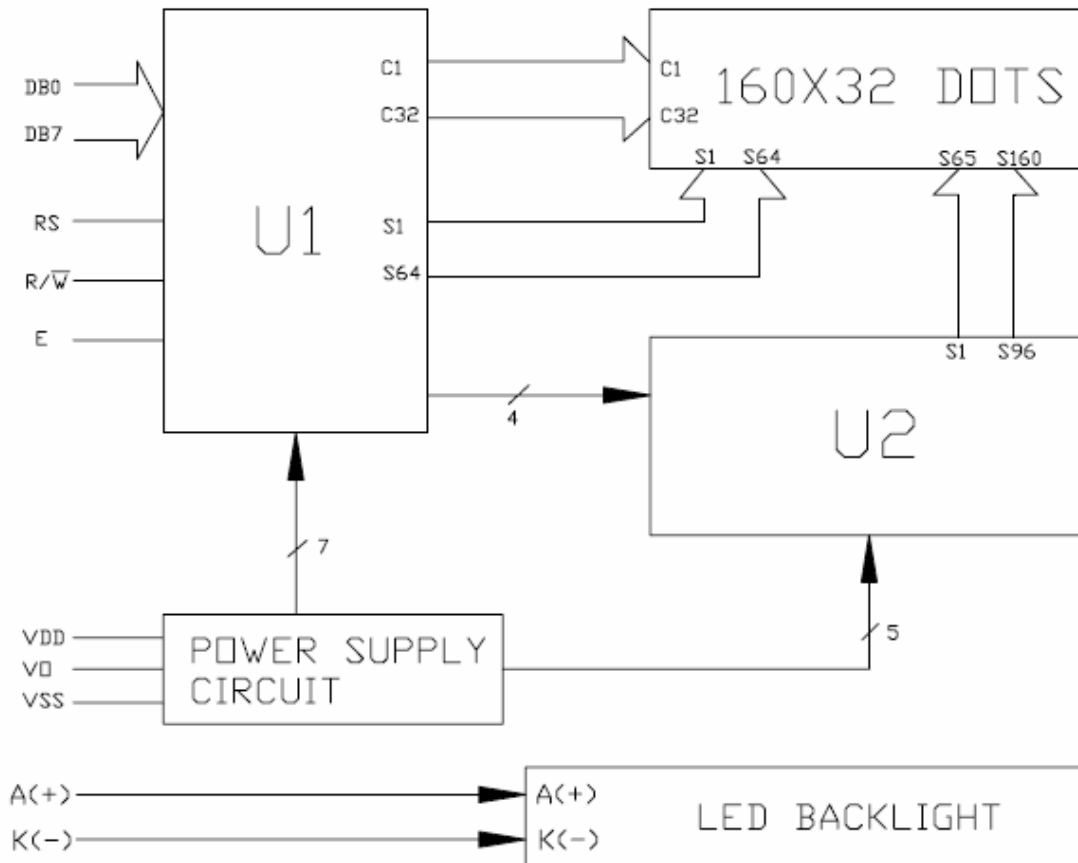
(2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

(3): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.



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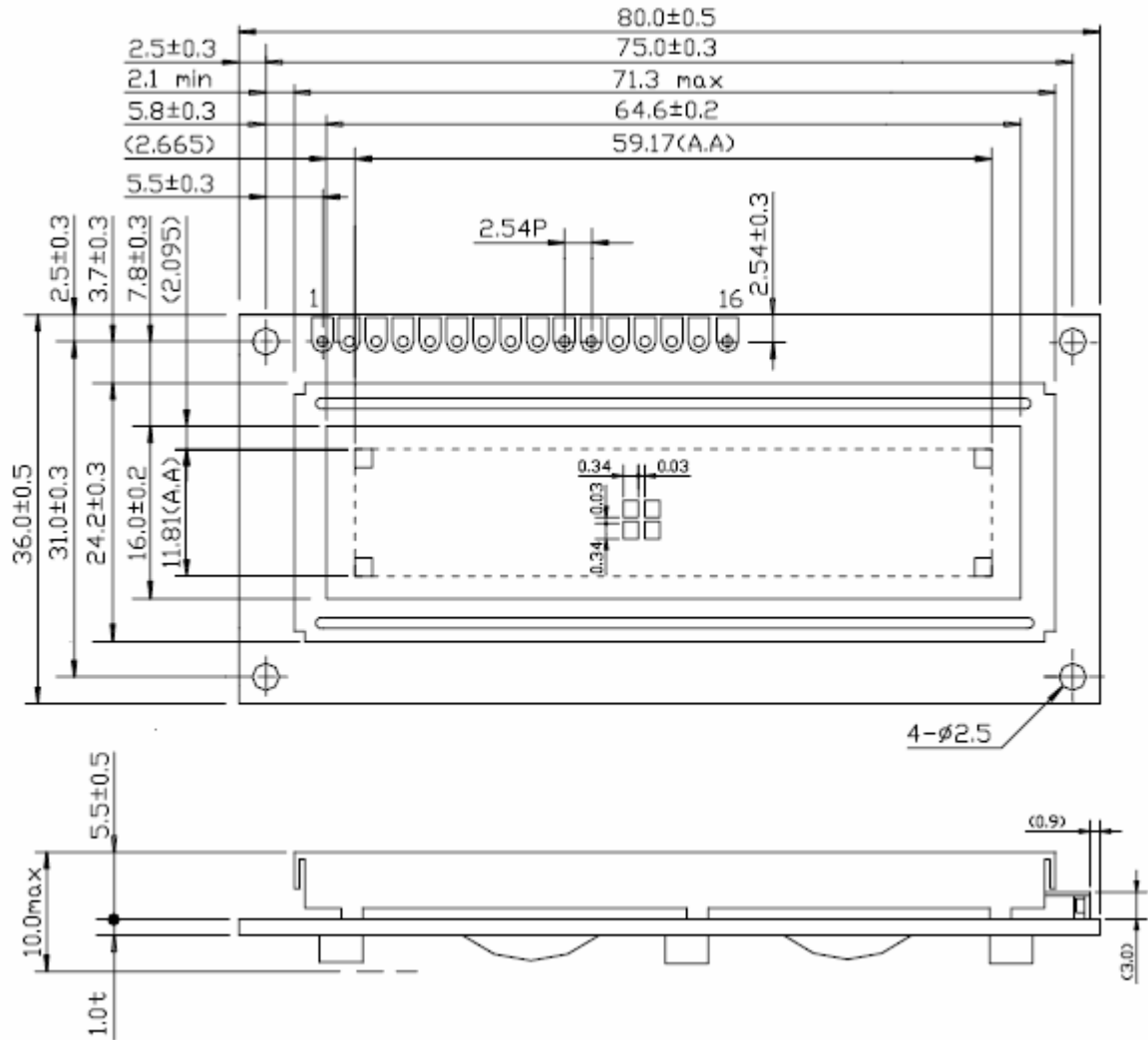
6. BLOCK DIAGRAM





MODEL NO : ASI_-1603AS--GF-_YS W

7. OUTLINE DIMENSION



NOTE :
 1.UNIT : mm
 2.SCALE : NTS

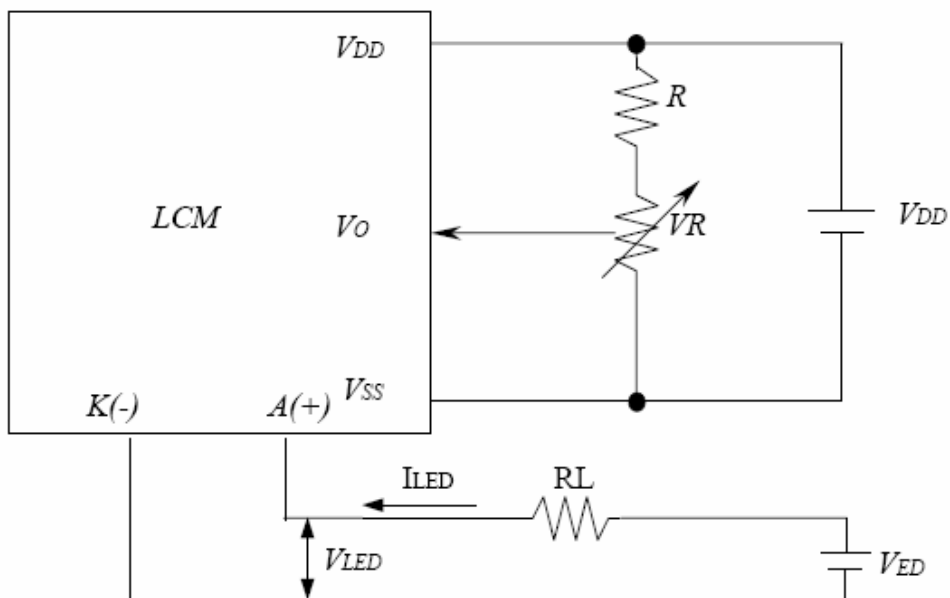


MODEL NO : ASI-_-1603AS--GF-_YS W

| <i>PIN NO.</i> | <i>SYMBOL</i> | <i>FUNCTION</i> |
|----------------|-----------------|---|
| 1 | V _{SS} | POWER SUPPLY (GND) |
| 2 | V _{DD} | POWER SUPPLY (+5V) |
| 3 | V _o | POWER SUPPLY FOR LCD |
| 4 | RS | RS = "H" DB0~DB7 FOR DISPLAY DATA RS = "L" DB0~DB7 FOR CONTROL DATA |
| 5 | R/ \bar{W} | H: DATA READ (LCD MODULE → MPU) L: DATA WRITE (LCD MODULE ← MPU) |
| 6 | E | ENABLE SIGNAL |
| 7 | DB0 | DATA INPUT/OUTPUT (LSB) |
| 8 | DB1 | DATA INPUT/OUTPUT |
| 9 | DB2 | DATA INPUT/OUTPUT |
| 10 | DB3 | DATA INPUT/OUTPUT |
| 11 | DB4 | DATA INPUT/OUTPUT |
| 12 | DB5 | DATA INPUT/OUTPUT |
| 13 | DB6 | DATA INPUT/OUTPUT |
| 14 | DB7 | DATA INPUT/OUTPUT (MSB) |
| 15 | A(+) | POWER SUPPLY FOR LED (+) |
| 16 | K(-) | POWER SUPPLY FOR LED (-) |



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$V_{DD}-V_0$: LCD DRIVING VOLTAGE
 VR : 10K Ω ~20K Ω

| ITEM | LED B.L TYPE | CONDITION |
|----------------------------|--------------|---|
| Limit resister of LED (RL) | A | $RL \geq ((V_{ED}-4.8V) / I_{LED})$, $I_{LED} \leq 40mA$ |
| | B | $RL \geq ((V_{ED}-4.0V) / I_{LED})$, $I_{LED} \leq 40mA$ |

The information presented in this datasheet has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Information contained herein is for selection purposes only, and is subject to change without notice. Please contact ASI for current datasheets prior to designing.