



ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

MODULE #: ASI-F-204AAT-GF-AWS/W

- (1) NUMBER OF CHARACTER-----20 CH * 4 LINE
- (2) MODULE SIZE-----98.0 W * 60.0 H * 10.0 T (max) mm
- (3) EFFECTIVE AREA-----76.0 W * 25.2 H mm
- (4) CHARACTER PATTERN -----5 * 7 DOTS + CURSOR
- (5) CHARACTER SIZE -----2.95 W * 4.15 H mm
- (6) CHARACTER PITCH-----3.55 mm
- (7) DOT SIZE -----0.55 W * 0.55 H mm
- (8) DOT PITCH -----0.60 W * 0.60 H mm
- (9) VIEWING DIRECTION-----6 O'CLOCK



MODEL NO : ASI_-204AAT-GF-AWS/W

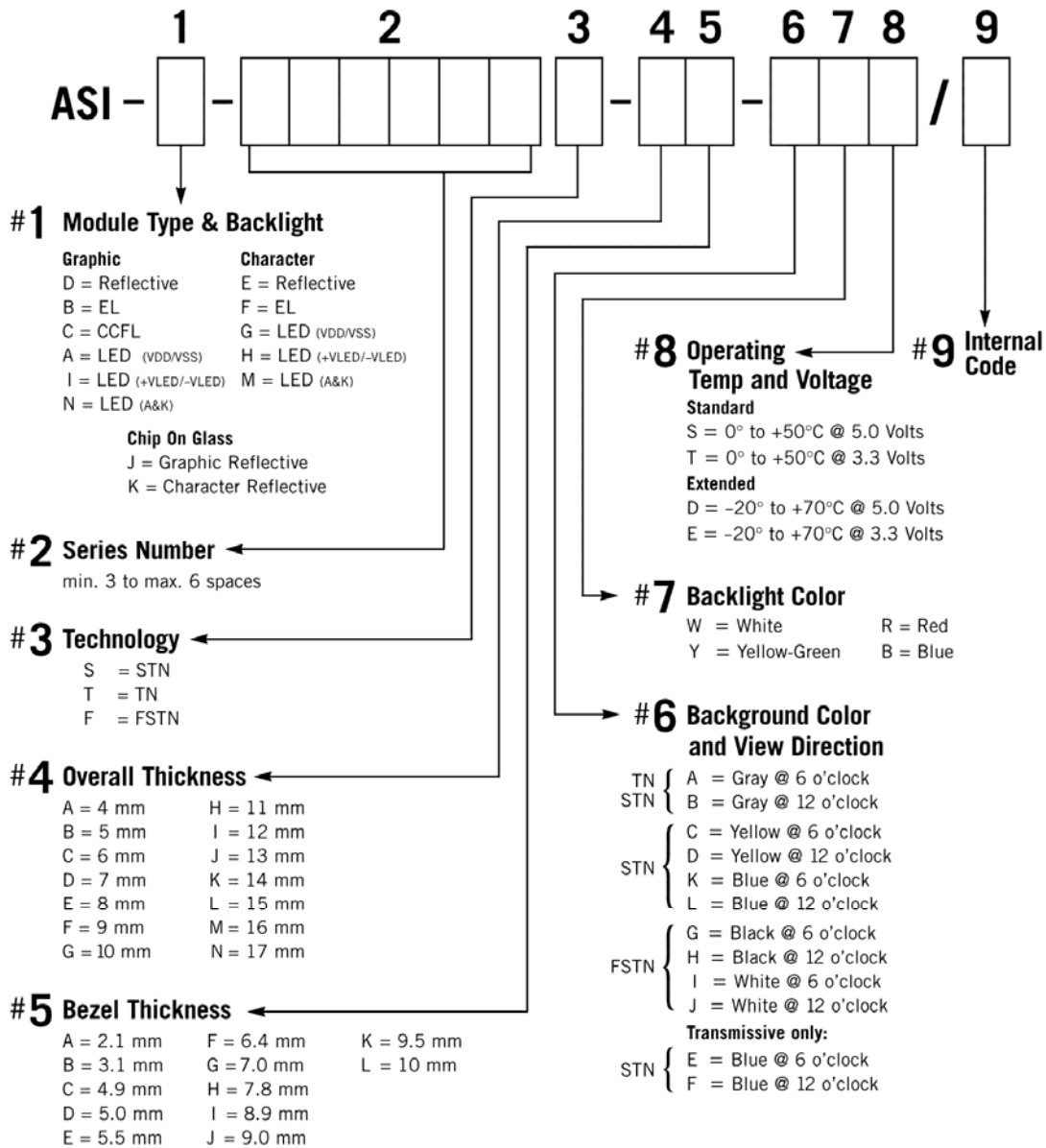
RECORD OF REVISION

DATE	PAGE	SUMMARY



MODEL NO : ASI_-204AAT-GF-AWS/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_-204AAT-GF-AWS/W

3. General specifications

3.1 General specifications

*PLEASE REFER TO:
"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-12780)".*

3.2 This individual specification is prior to general specifications

4. Mechanical data

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5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

<i>I T E M</i>	<i>SYMBOL</i>	<i>MIN.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>COMMENT</i>
POWER SUPPLY FOR LOGIC	V _{DD} -V _{SS}	0	6.0	V	
INPUT VOLTAGE	V _I	V _{SS}	V _{DD}	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR E L	V _{EL}	—	AC115V	V	f _{EL} : 1.0KHz 60SEC.MAX
	f _{EL}	—	2.0	KHz	AC115V _{rms} 60SEC.MAX

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

5.2 Environmental absolute maximum ratings

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

NOTE (2): T_a ≤ 50°C: 90% RH MAX.

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

NOTE (3): 1G = 9.8 m/s²


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6. Electrical characteristics
Ta = 25° VDD = 5.0±0.25 V

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>
INPUT VOLTAGE	V _{IH}	—————	2.0	———	V _{DD}	V
	V _{IL}		V _{SS}	———	0.8	V
OUTPUT VOLTAGE	V _{OH}	I _{OH} = -0.2 mA	2.4	———	———	V
	V _{OL}	I _{OL} = 1.6 mA	———	———	0.4	V
POWER SUPPLY CURRENT	I _{DD}	V _{DD} = 5.0V	———	2.0	3.5	mA
RECOMMENDED LCD DRIVING VOLTAGE	V _{DD} -V _O DUTY= 1/16	Ta = 0°C	———	5.0	———	V
		Ta = 25°C	———	4.6	———	V
		Ta = 50°C	———	4.3	———	V
POWER SUPPLY CURRENT FOR EL	V _{EL}	f _{EL} = 400Hz	———	115	———	V _{rms}
	I _{EL}	V _{EL} = 11.5V f _{EL} = 400Hz	———	2.0	———	mA V _{rms}

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

7. Optical characteristics
Ta = 25° VDD = 5.0V

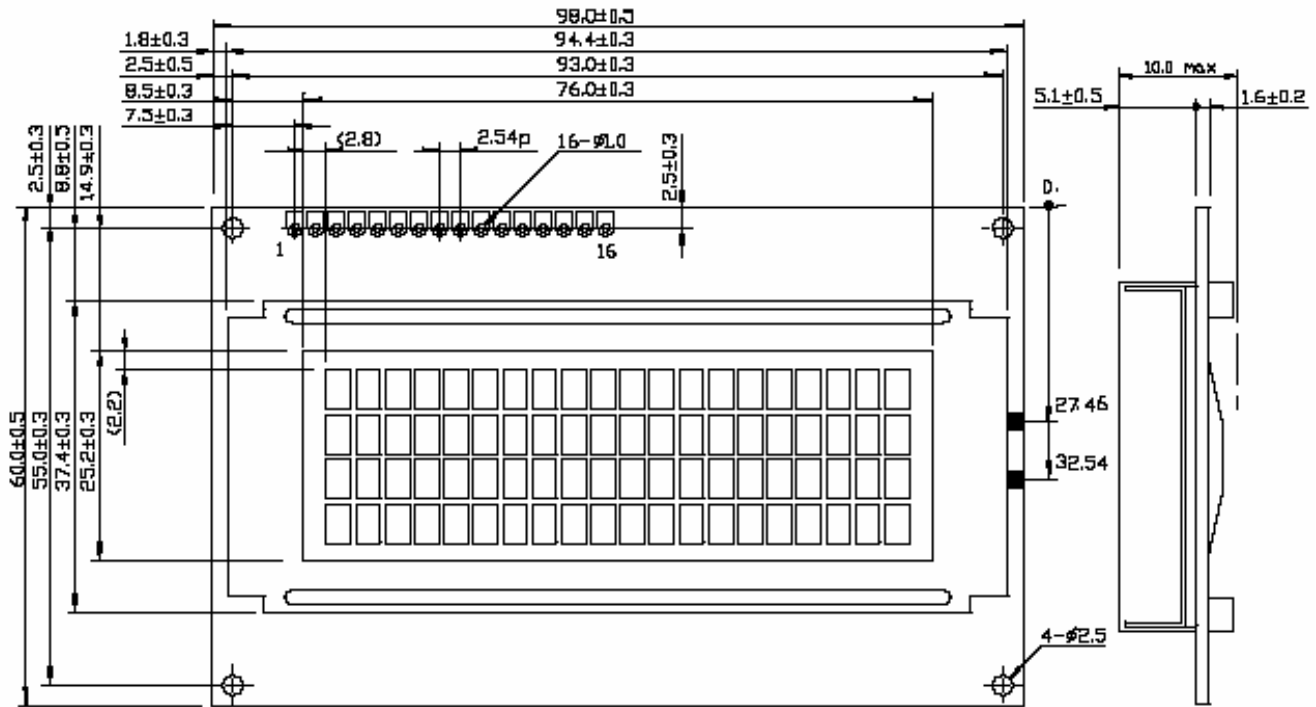
<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>NOTE</i>
VIEWING ANGLE	Φ2-Φ1	K = 2.0	30	40	———	deg.	2
CONTRAST RATIO	K	Φ = 10° θ = 0°	———	4.0	———	———	2
RESPONSE TIME	tr (rise)	Φ = 10° θ = 0°	———	200	350	ms	2
	tf (fall)	Φ = 10° θ = 0°	———	300	400	ms	2
BRIGHTNESS FOR EL BACKLIGHT	B	Φ = 0° θ = 0°	4.0	———	———	cd/m ²	2,3

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

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

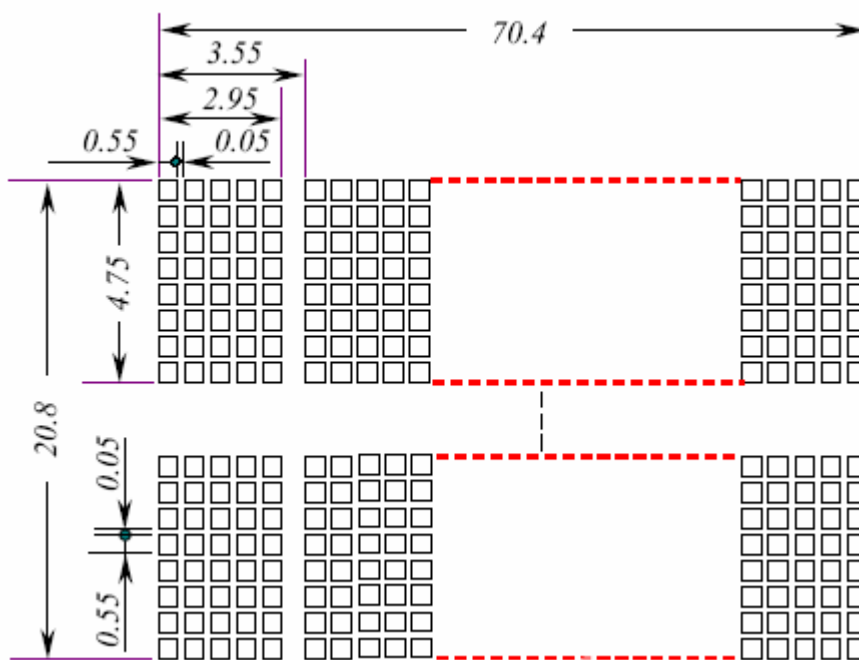
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8. Outline dimension

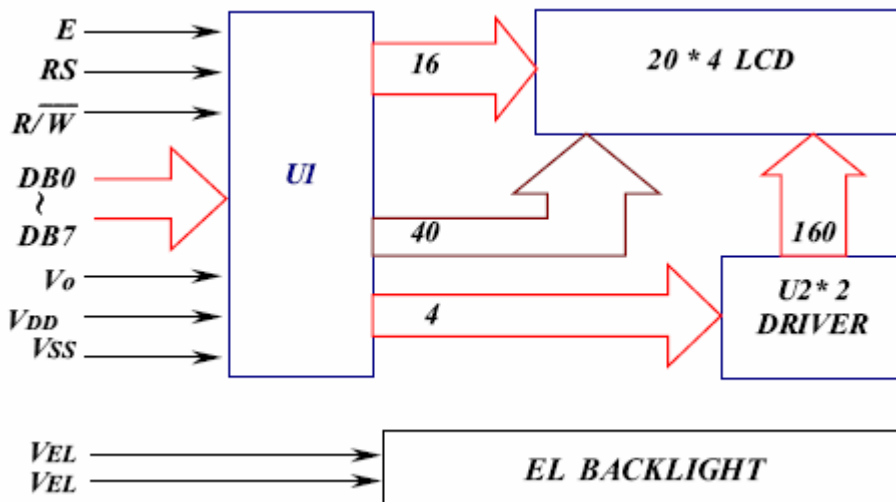
*Interface pin connection*

<i>PIN NO.</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
SYMBOL	V _{SS}	V _{DD}	V _O	RS	R/ \bar{W}	E	DB0	DB1
<i>PIN NO.</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	VEL	VEL

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9. Block diagram



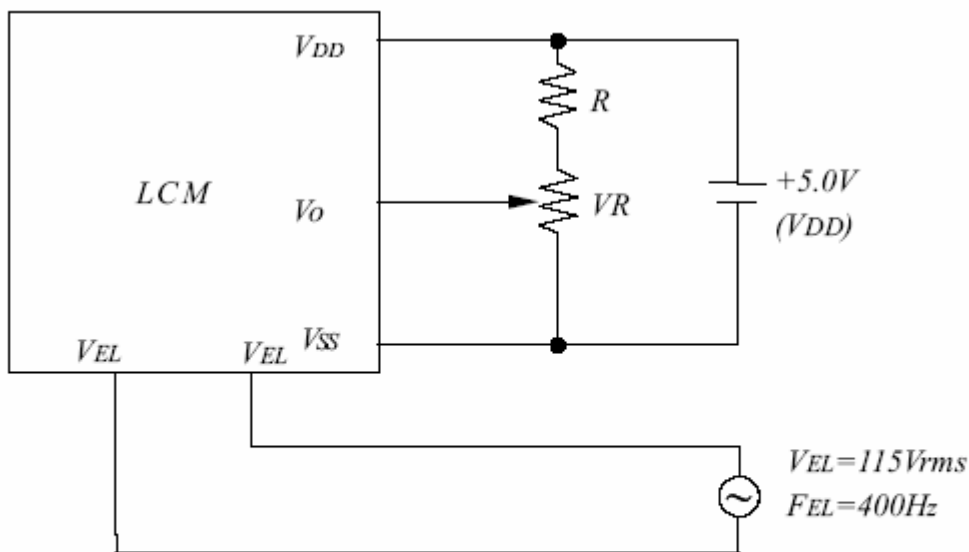


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Display data address charts

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90	91	92	93
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3
LINE 3	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0	A1	A2	A3	A4	A5	A6	A7
LINE 4	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7

10. Power supply for LCM



RECOMMENDED RESISTOR R: $V_{DD} - V_o \geq 1.5V$
 $V_{DD} - V_o$: LCD DRIVING VOLTAGE
 VR: $10K\Omega \sim 20K\Omega$