AND®Displays

AND3222MST-LEDW
6" FSTN LCD Module

The AND3222MST-LEDW display is a compact, full dot matrix, which is an STN gray positive LCD type, transflective rear polarizer with a yellow green backlight color. The AND3222MST-LEDW can display TEXT information, numerals, letters and symbols, as well as GRAPHIC patterns. These devices are suitable for medical and measurement equipment, point-of-sale terminals, protable equipment, and marine instrumentation.

Features
- STN Gray Positive LCD type
- Built-in LED yellow green backlight
- Excellent readability and high-contrast ratio
- 320 (W) x 240 (H) dot graphic display
- Wide operating temperature range (-20 to +70 ºC)
- Transflective rear polarizer
- 6 o'clock viewing angle
- **RoHS Compliant**

Mechanical Characteristics

Item	Specification	Unit
Outline Dimensions	148.0 (W) x 120.2 (H) x 20.5 max (D)	mm
Number of Pixels	320 (W) x 240 (H)	pixels
Active Area	120.14 (W) x 92.14 (H)	mm
Pixel Size	0.33 (W) x 0.33 (H)	mm
Pixel Pitch	0.36 (W) x 0.36 (H)	mm
Duty Ratio	1/240	duty
Controller	SID13305	–
DC/DC Converter	With	–

Absolute Maximum Ratings - Electrical

Item	Symbol	Min.	Max.	Unit
Power Supply for Logic	V_{DD} - V_{SS}	-0.3	7.0	V
Power Supply for LCD Driver	V_{DD} - V_{LCD}	0	30.0	V
Input Voltage	V_I	-0.3	V_{DD}	V
LED Power Dissipation	P_{AD}	–	1242	mW
LED Forward Current	I_{AF}	–	270	mA
LED Reverse Voltage	V_R		8	V

Electrical Characteristics (Ta = 25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for Logic	V_{DD} - V_{SS}	–	4.5	5.0	5.5	V
Power Supply for LCD Drive	V_{LCD} - V_{SS}	–	-21.6	-22.1	-22.7	V
Input Voltage	V_{IL}	L Level	0	–	0.6	V
	V_{IH}	H Level	2.2	–	V_{DD}	V
	V_{DD} - V_O	Ta = 0ºC	–	22.7	–	V
		Ta = 25ºC	–	24.3	–	V
		Ta = 50ºC	–	25.8	–	V
Logic Supply Current	I_{DD}	V_{DD} =5.0V	34.9	31.3	–	mA
	I_{EE}	V_{DD} - V_O = 24.3V	–	3.6	–	
LED Forward Voltage	V_F	If = 180 mA	–	4.2	4.6	V
LED Forward Current	I_F	–	–	180	–	mA
LED Reverse Current	I_R	VR = 8V	–	–	0.3	mA

Product specifications contained herein may be changed without prior notice. It is therefore advisable to contact Purdy Electronics before proceeding with the design of equipment incorporating this product.

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Purdy Electronics Corporation • 720 Palomar Avenue • Sunnyvale, CA 94085
Tel: 408.523.8200 • Fax: 408.733.1287 • email@purdyelectronics.com
www.purdyelectronics.com

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![AND Displays logo]

Dimensional Outline

Unit: mm
Standard Tolerance: 0.5mm
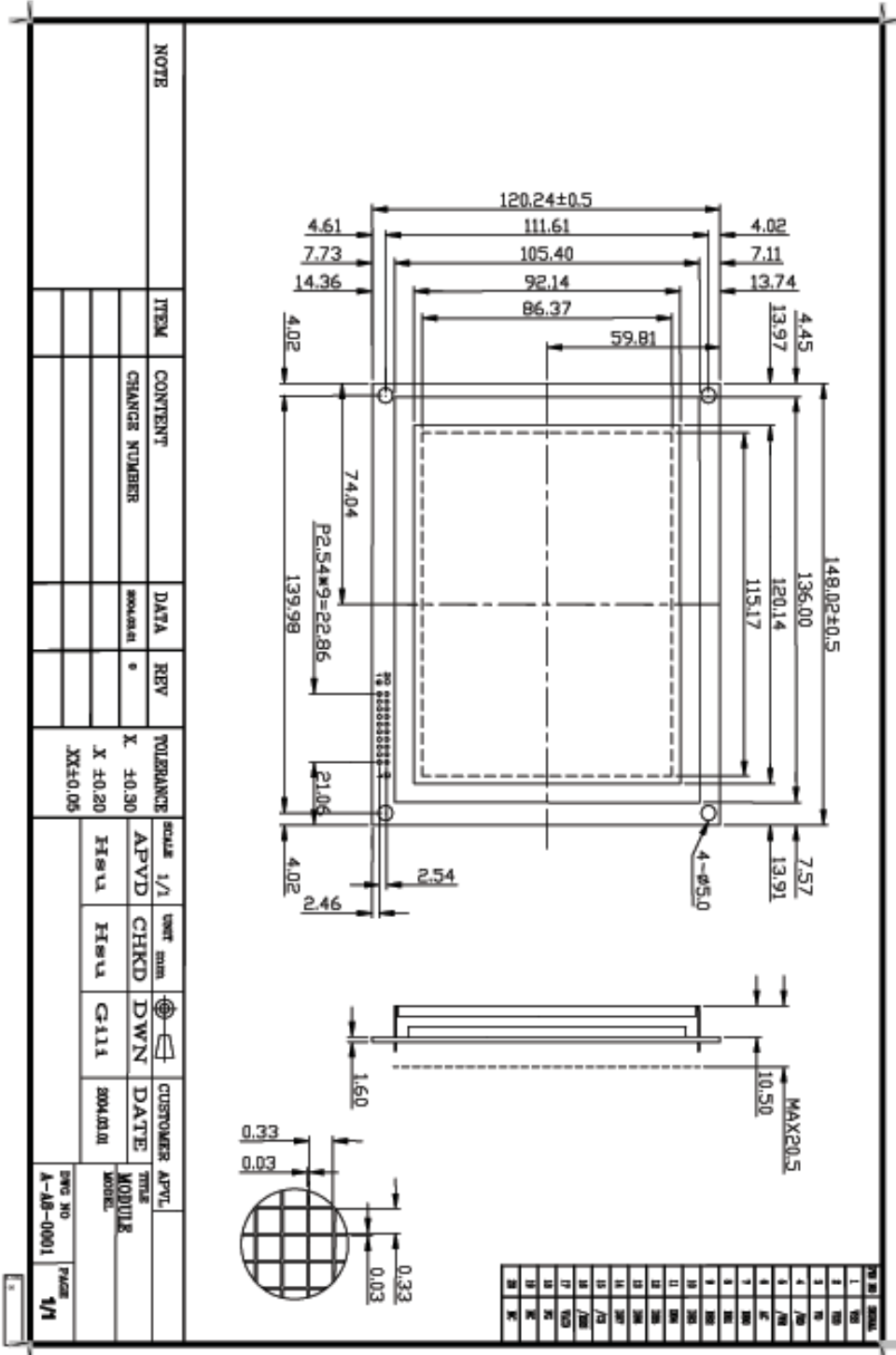
Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing angle range	φ f (12 o'clock)	When Cr ≥ 1.4	–	20	–	degree
	φ b (6 o'clock)		–	40	–	
	φ l (9 o'clock)		–	30	–	
	φ r (3 o'clock)		–	30	–	
Rise time	Tr	V_{DD}-V_O=24.3V Ta=25ºC		175		ms
Fall time	Tf			170		ms
Frame frequency	Frm		–	64	–	Hz
Contrast	Cr		–	4.5	–	
Brightness of Backlight	L	IF = 180 mA	10	20	–	cd/m^2
Peak Emission Wavelength	λ P		567	570	576	nm

Environmental Absolute Maximum Ratings

Item	Normal Temperature				Wide Temperature			
	Operating		Storage		Operating		Storage	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Ambient Temperature	0 ºC	+50 ºC	-20 ºC	+70 ºC	-20 ºC	+70 ºC	-30 ºC	+80 ºC
Humidity (without condensation)	See Note 2, 4		See note 3, 5		See Note 4, 5		See Note 4.6	

Note 2: Ta ≤ 50ºC: 80% RH max; Ta > 50ºC: Absolute humidity must be lower than the humidity of 85% RH at 50ºC
Note 3: Ta at -20ºC will be < 48 hrs at 70ºC will be <120 hrs when humidity is higher than 75%.
Note 4: Background color changes slightly depending on ambient temperature. This phenomenon is reversible.
Note 5: Ta ≤ 70ºC: 75% RH max; Ta > 70ºC: absolutely humidity must be lower than the humidity of 75% RH at 70ºC.
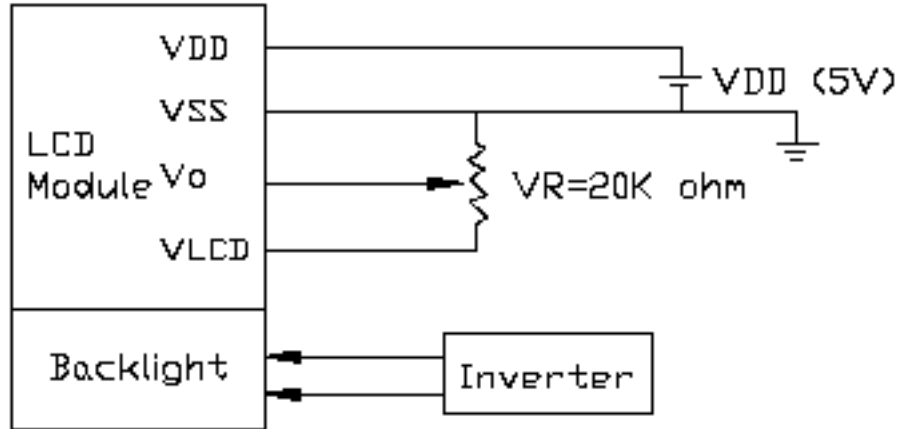Note 6: Ta at -30ºC will be < 48 hrs, at 80ºC will be < 120 hrs when humidity is higher than 75%.
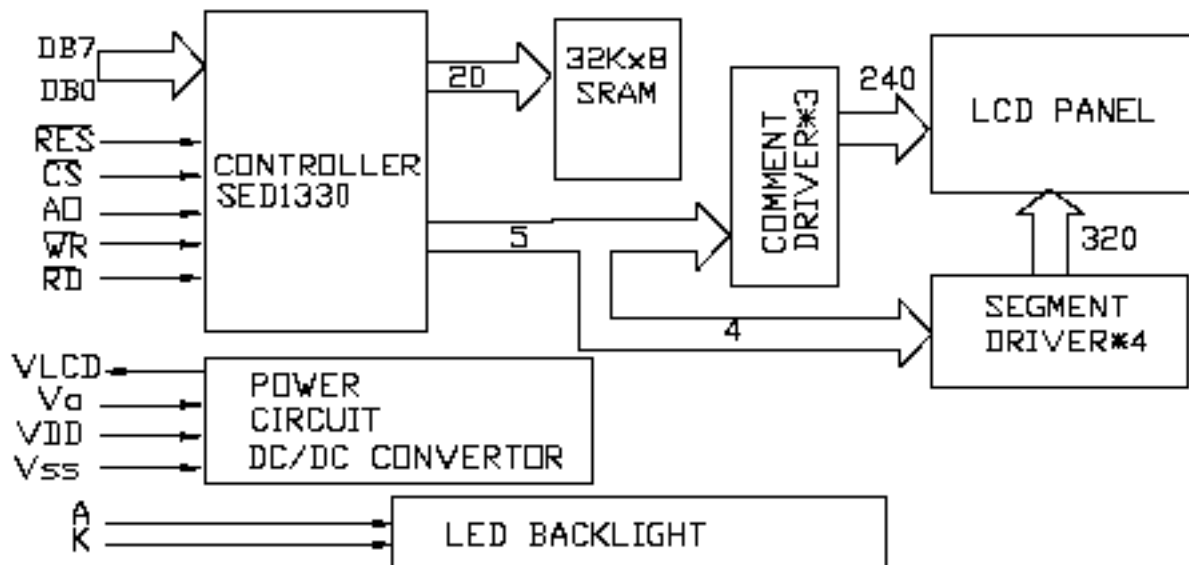
Interface Pin Assignment

Pin No.	Pin Out	Level	Description
1	VSS	0V	Power Supply Ground
2	VDD	5V	Logic Supply Voltage
3	VO	–	Contrast Adjustment Voltage
4	/RD	L	Read Signal
5	/WR	L	Write Signal
6	AO	H/L	Data Type Select
7	DB0	H/L	Data Bus Line
8	DB1	H/L	Data Bus Line
9	DB2	H/L	Data Bus Line
10	DB3	H/L	Data Bus Line

Pin No.	Pin Out	Level	Description
11	DB4	H/L	Data Bus Line
12	DB5	H/L	Data Bus Line
13	DB6	H/L	Data Bus Line
14	DB7	H/L	Data Bus Line
15	/CS	L	Chip Signal
16	/RST	L	Reset Signal
17	V_{LCD}	–	Power Supply Voltage for LCD
18	FG	–	For GND
19	A	4.2V	LED Power External (Red)
20	K	GND	LED Ground External (White)

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Power Supply

Block Diagram

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Timing Characteristics

Item		Symbol	Min.	Typ.	Max.	Unit
System Cycle Time		tCYC	425	–	–	ns
Address Set-up Time		tAW	30	–	–	ns
Address Hold Time		tAH	10	–	–	ns
Data Set-up Time		tDS	120	–	–	ns
Data Hold Time		tDH	10	–	–	ns
Output Disable Time		tOH	10	–	50	ns
Access Time		tACC	–	–	120	ns
Enable Pulse Width	Read	tEW	220	–	–	ns
	Write		220	–	–	ns

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