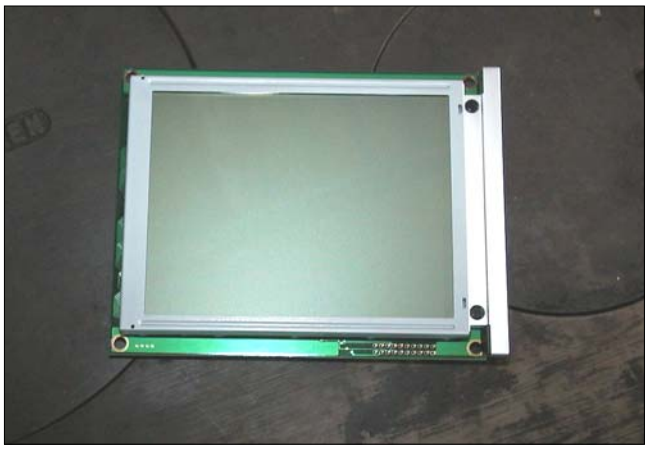
AND Displays



AND3222MST2
6” FSTN LCD Module

The AND3222MST2 display is a compact, full dot matrix, with “white page” appearance, LCD modules that have an on-board LCD controller (SED1330) and display memory (RAM). The AND3222MST2 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 **• RoHS Compliant**

- Black and white ST (MST) transflective positive mode
- Built-in CCFL backlight
- Excellent readability and high-contrast ratio
- 320 (W) x 240 (H) dot graphic display
- Built-in LCD controller (SED1330)
- Wide operating temperature range (-20 to +70 ºC)
- Available without controller (AND322MST-C)
- 6 o’clock viewing angle

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	1/240	–
Controller	SED1335	–
DC/DC Converter	With	–

Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit
Power Supply for Logic	V_{DD} - V_{SS}	-0.3	7.0	V
Power Supply for LCD	V_{DD} - V_{LCD}	0	30	V
Input Voltage	V_I	-0.3	V_{DD}	V
CCFL Driving Voltage	V_{FL}	0	500	Vrms
CCFL Input Current	I_{FL}	–	7.0	mA
Storage Temperature	Tstg	-30	+80	ºC
Operating Temperature	Top	-20	+70	ºC
Humidity	–	–	80	% RH

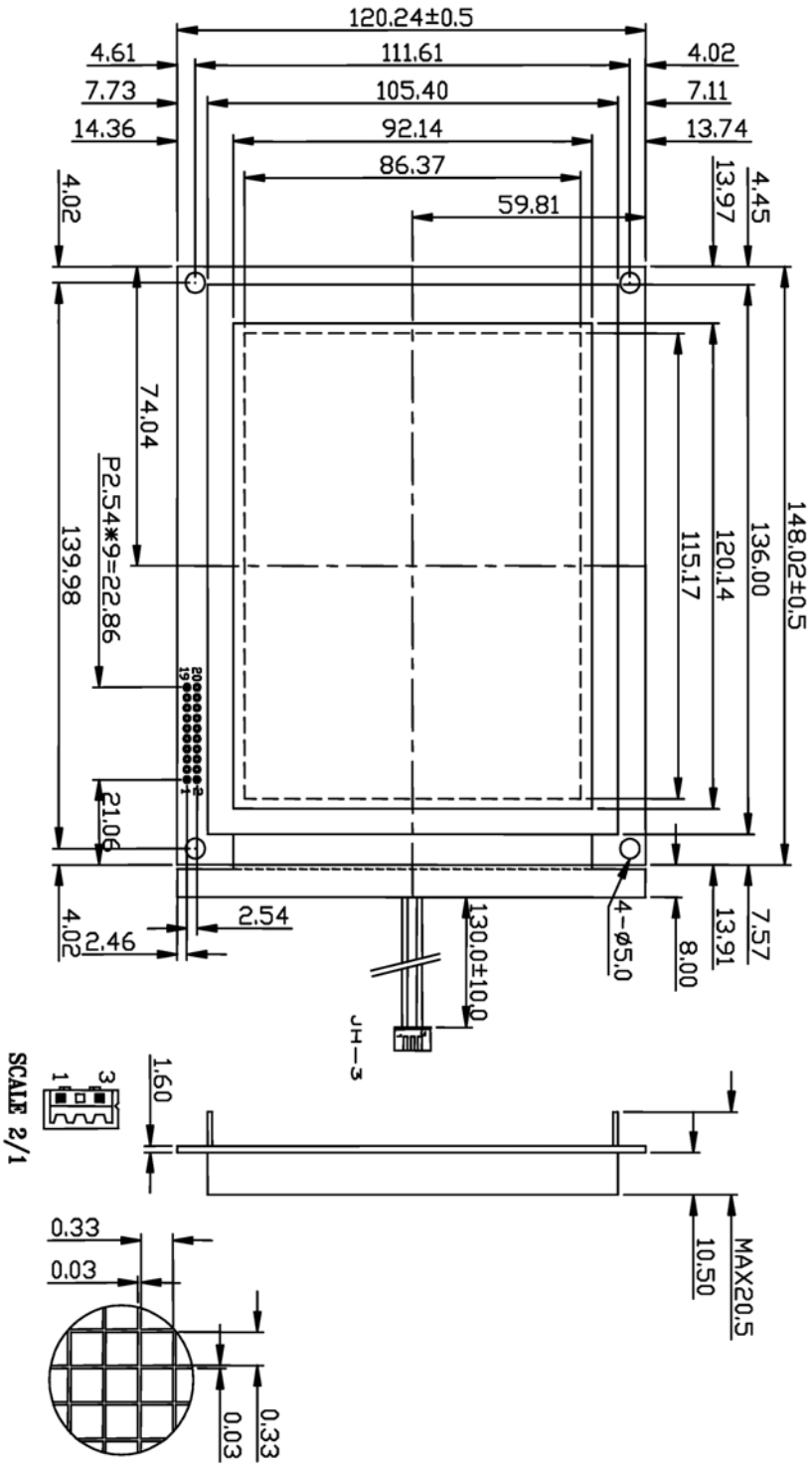
Electrical/Optical Characteristics (Ta = 25°C)

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 = 0°C	–	22.7	–	V
		Ta = 25°C	–	24.3	–	
		Ta = 50°C	–	25.8	–	
Power Supply Current for LCM	I_{DD}	V_{DD} =5.0V V_{DD} - V_O =24.3V	34.9	31.3	–	mA
	I_{EE}		–	3.6	–	
CCFL Starting Voltage	V_{FLS}	–	–	750	–	Vrms
CCFL Driving Voltage	V_{FLD}	–	–	360	–	Vrms
CCFL Driving Current	I_{FLD}	V_{FLD} =450Vrms f_{FL} =30kHzV	–	5.0	–	mA
CCFL Driving Frequency	f_{FL}		15	30	85	KHz
CCFL Saturation Time	t_{SAT}	Ta = 25°C	–	3	–	minut
Viewing Angle Range	Φ f (12 o’clock)	When Cr ≥ 1.4	–	20	–	°
	Φ b (6 o’clock)		–	40	–	
	Φ l (9 o’clock)		–	30	–	
	Φ (3 o’clock)		–	30	–	
Rise Time	Tr	V_{DD} - V_O =24.3V Ta = 25°C	–	175	–	ms
Fall Time	Tf		–	170	–	
Frame Frequency	Frm		–	64	–	Hz
Contrast	Cr		–	4.5	–	–
Brightness of Backlight	L	–	600	650	–	cd/m^2

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.

Dimensional Outline

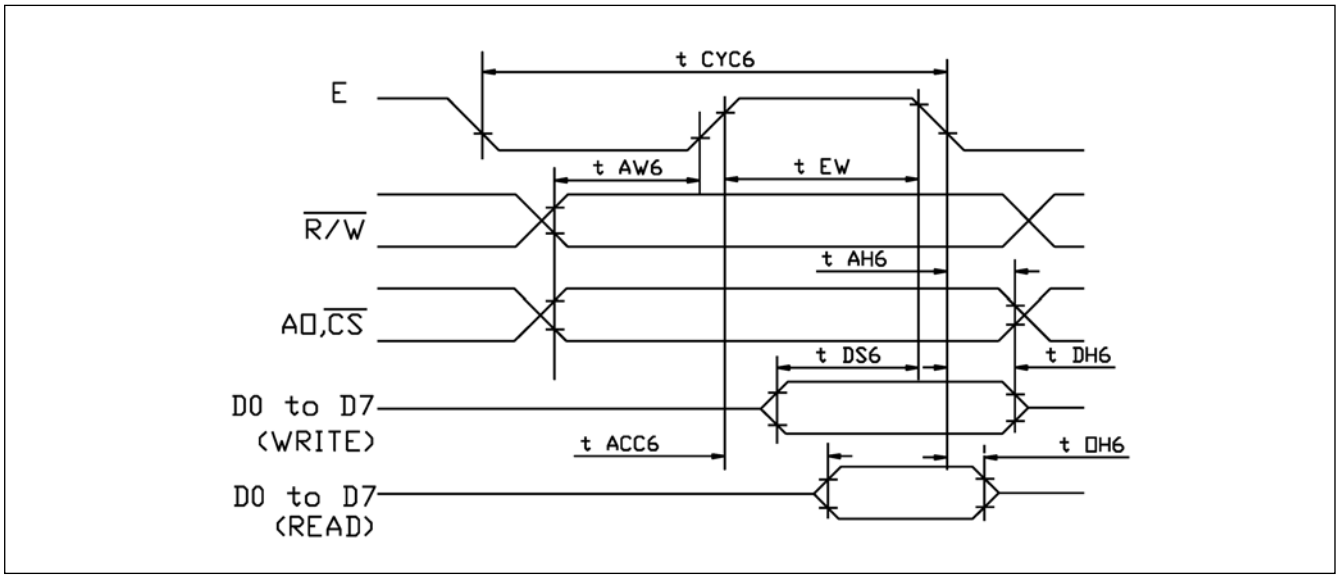
Unit: mm
Standard Tolerance: 0.5mm



Timing Specifications

Item		Symbol	Min	Typ	Max	Unit
System Cycle Time		t_{CVC}	425	–	–	ns
Address Set-up Time		t_{AW}	30	–	–	ns
Address Hold Time		t_{AH}	10	–	–	ns
Data Set-up Time		t_{DS}	120	–	–	ns
Data Hold Time		t_{DH}	10	–	–	ns
Output Disable Time		t_{OH}	10	–	50	ns
AccessTime		t_{ACC}	–	–	120	ns
Enable Pulse Width	Read	t_{EW}	220	–	–	ns
	Write		220	–	–	ns

Timing Chart

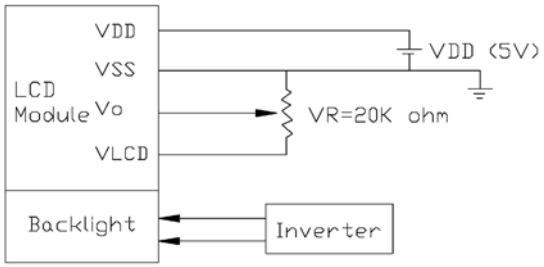


Environmental Absolute Maximum Ratings

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 Notes 1, 3		See Notes 2, 4		See Notes 3, 4		See Notes 3, 5	

NOTES:
1. Ta≤ 50 ºC: 80% RH max
   Ta> 50 ºC: Absolute humidity must be lower than the humidity of 85%RH at 50 ºC
2. Ta at -20 ºC will be < 48 hrs at 0 ºC will be <120 hrs when humidity is higher than 75%.
3. Background color changes slightly depending on ambient temperature. This phenomenon is reversable.
4. Ta ≤ 70 ºC: 75RH max
   Ta > 70 ºC: abosolute humidity must be lower than the humidity of 75%RH at 70 ºC.
5. Ta at -30 ºC will be <48hrs, at 80 ºC will be <120hrs when humidity is higher than 75%.

Power Supply



Connector Pin Assignment for Interface

Interface Pin Assignment

Terminal No.	Symbol	Level	Function
1	V_{SS}	0V	Power Supply Ground
2	V_{DD}	5V	Logic Supply Voltage
3	V_O	–	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	
9	DB2	H/L	
10	DB3	H/L	
11	DB4	H/L	
12	DB5	H/L	
13	DB6	H/L	
14	DB7	H/L	
15	/CS	L	Chip Signal
16	/RST	L	Reset Signal
17	V_{LCD}	–	Power Supply for LCD
18	FG	–	For GND
19	NC	–	No Connection
20	NC		No Connection

Block Diagram