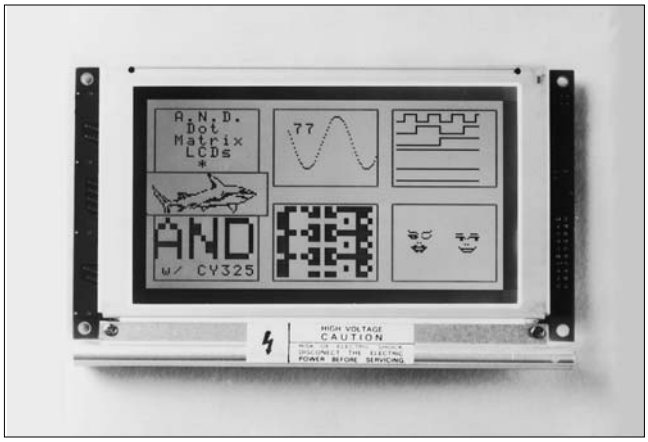
AND1741MST2

240 x 128 Dots
Intelligent Graphics Display



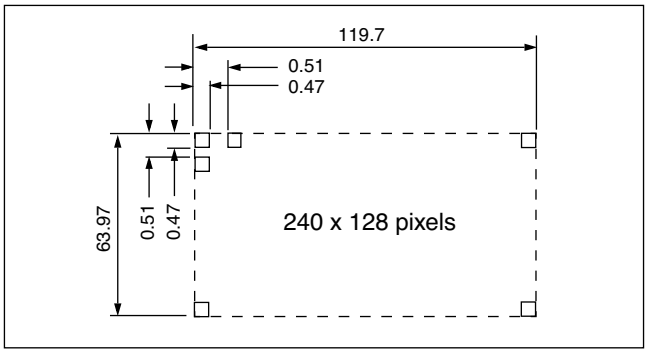
The AND1741MST2 devices are compact, full dot matrix, with "white page" appearance, LCD modules that have an on-board LCD controller (T6963C) and display memory (RAM). The AND1741MST2 can display TEXT information, numerals, letters and symbols, as well as GRAPHIC patterns. These devices are suitable for medical and measurement equipment, point-of-sale terminals, portable equipment, and marine instrumentation.

Features

• RoHS Compliant

- FSTN positive black & white LCD type
- Built-in CCFL backlight
- White backlight color, black frame
- 240 x 128 dot graphic display
- Excellent readability and high-contrast ratio
- Built-in LCD controller (RA8835/RAiO)
- Wide operating temperature range (0° to 50°C)
- 12 O'clock viewing direction
- ISO9001 certified

Dot Matrix Dimensions



Mechanical Characteristics

Item	Specification	Unit
Outline Dimensions	180.0 (W) x 110.0 (H) x 15.0 Max (D)	mm
Viewing Area	132.0 (W) x 76.0 (H)	mm
Dot Size	0.47 (W) x 0.47 (H)	mm
Dot Pitch	0.51 (W) x 0.51 (H)	mm
Resolution	240 (W) x 128 (H) Dots Matrix	–
Duty Ratio	1/128 Duty	–
Controller	RA8835 / RAiO	–
DC/DC Converter	Without	–

Absolute Maximum Ratings

Item	Absolute Maximum			Unit
	Symbol	Min	Max	
Power Supply for Logic	V_{DD} - V_{SS}	-0.3	7.0	V
Power Supply for LCD	V_{DD} - V_{EE}	0	24.0	V
Input Voltage	V1	-0.3	V_{DD}	V
CCFL Driving Voltage	V_{FL}	0	500	V_{rms}
CCFL Input Current	I_{FL}	–	7.0	mA

Electrical Characteristics (TA = 25°C)

Item	Symbol	Cond.	Min.	Typ.	Max.	Unit
Power Supply for Logic	V_{DD} - V_{SS}	–	4.5	5.0	5.5	V
Input Voltage	V_{IL}	L Level	0	–	0.6	V
	V_{IH}	H Level	2.2	–	V_{DD}	
	V_{DD} - V_O Bias = 1/12	Ta = 0°C	–	–	–	
		Ta = 25°C	16.7	17.8	18.5	
		Ta = 50°C	–	–	–	
Power Supply Current for LCM	I_{DD}	V_{DD}= 5.0V V_{DD} - V_{EE} = 17.8V	–	15.6	18	mA
	I_{EE}		–	2.4	–	
CCFL Starting Voltage	V_{FLS}	-	–	750	–	Vrms
CCFL Driving Voltage	V_{FLD}	–	–	360	–	Vrms

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.

Electrical Characteristics (TA = 25°C) (Continued)

Item	Symbol	Cond.	Min.	Typ.	Max.	Unit
CCFL Driving Current	I_{FLD}	V_{FLD}= 450Vrms f_{FL} = 30kHz	–	5.0	–	mA
CCFL Driving Frequency	f_{FL}	V_{FLD}= 450Vrms f_{FL} = 30kHz	15	30	85	kHz
CCFL Saturation Time	t_{SAT}	Ta = 25ºC	–	1	–	minut

Optical Characteristics (TA = 25°C, ϕ = 0°, θ = 0)

Item	Symbol	Min.	Typ.	Max.	Unit
Viewing Angle Range (when Cr ≥ 2)	ϕ f(12 o'clock)	–	34	–	degree
	ϕ b(6 o'clock)	–	41	–	
	ϕ l(9 o'clock)	–	35	–	
	ϕ r(3 o'clock)	–	30	–	
Rise Time *	Tr	–	140	–	mS
Fall Time *	Tf	–	240	–	
Frame Frequency *	Frm	–	64	–	Hz
Contrast *	Cr	–	5.2	–	–

* Condition: V_{DD} - V_{EE} = 17.8V, Ta = 25ºC

Connector Pin Assignment

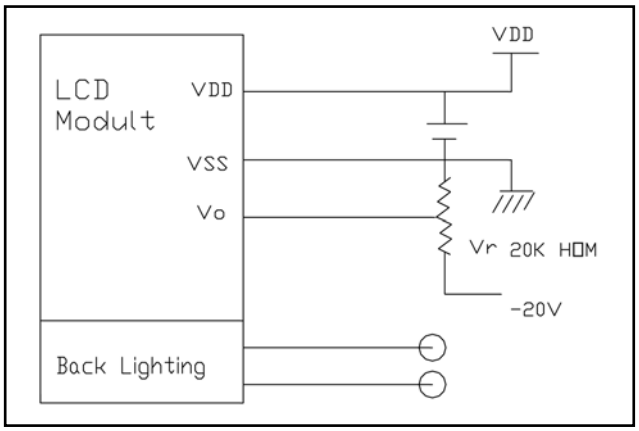
Pin No.	Signal	Level	Function
1	FGND	–	Frame Ground
2	V_{SS}	0V	Power Supply Ground
3	V_{DD}	5V	Power Supply Voltage
4	V_O	–	Contrast Adjustment Voltage
5	/WR	L	Write Signal
6	/RD	L	Read Signal
7	/CE	L	Enable Signal
8	C/D	H/L	WR = "L", C/D = "H": Command Write WR = "L", C/D = "L": Data Write RD = "L", C/D = "H": Status Read RD = "L", C/D = "L": Data Read
9	NC	–	No connection
10	/RST	L	Reset Signal
11	DB0	H/L	Data Bit 0
12	DB1	H/L	Data Bit 1
13	DB2	H/L	Data Bit 2
14	DB3	H/L	Data Bit 3
15	DB4	H/L	Data Bit 4
16	DB5	H/L	Data Bit 5
17	DB6	H/L	Data Bit 6
18	DB7	H/L	Data Bit 7
19	FS	H/L	H: 6 * 8 / L: 8 * 8 Select of Font
20	RV	–	Reverse Data IN

Environmental Absolute Maximum Ratings

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

Power Supply



Reliability Test

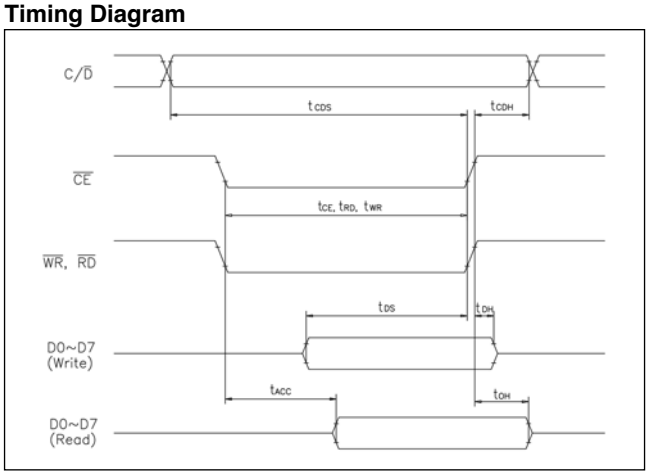
No.	Item	Conditions	
1	High Temp. Operation	70ºC	120 HR
2	High Temp. Storage	80ºC	120 HR
3	Low Temp. Operation	-20ºC	120 HR
4	Low Temp. Storage	-30ºC	120 HR
5	High Temp./Humid Storage	60ºC 90%RH	120 HR
6	Thermal Shock	-20ºC, 30 min. +60ºC, 30 min.	10 cycle

Timing Relationships and Diagram

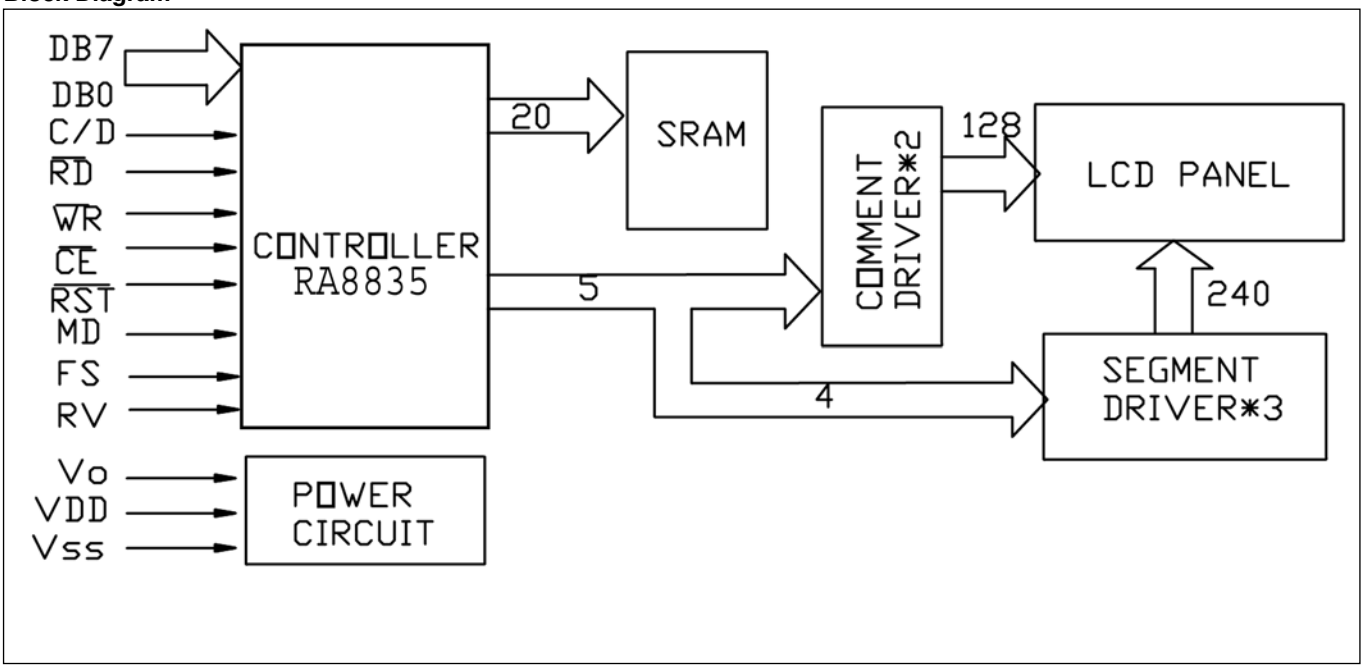
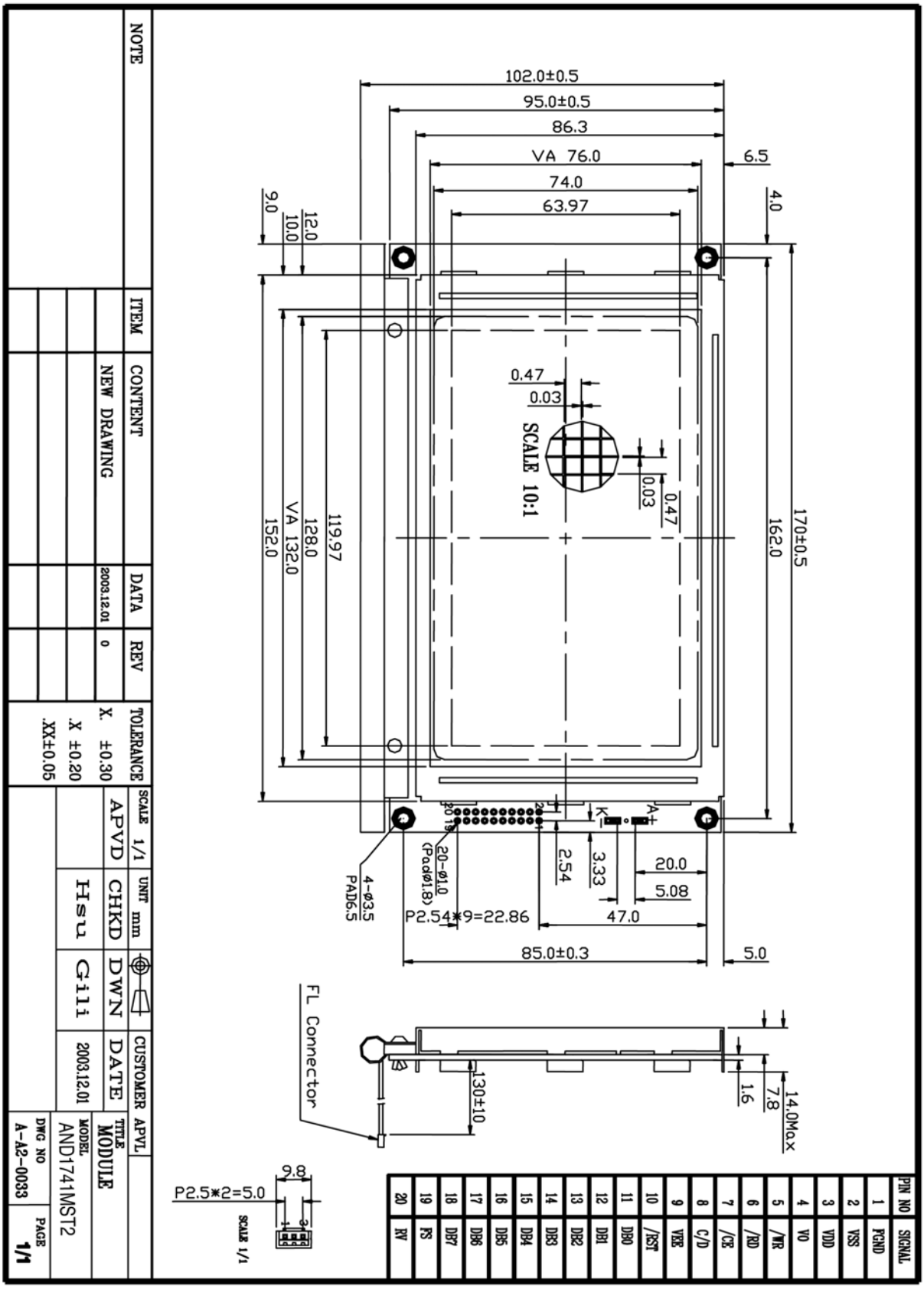
Signal Timing Relationships

Item	Symbol	Min.	Max.	Unit
C/D Set Up Time	t_{CDS}	100	–	ns
C/D Hold Time	t_{CDH}	10	–	
CE, RD, WR Pulse Width	t_{CDS}, t_{CDS}, t_{CDS}	80	–	
Data Set Up Time	t_{DS}	80	–	
Data Hold Time	t_{DH}	40	–	
Access Time	t_{ACC}	–	150	
Output Hold Time	t_{OH}	10	50	

Timing Diagram



Block Diagram



Dimensional Outline