



# AND1742MST2

## 240 x 128 Dots

### Intelligent Graphics Display

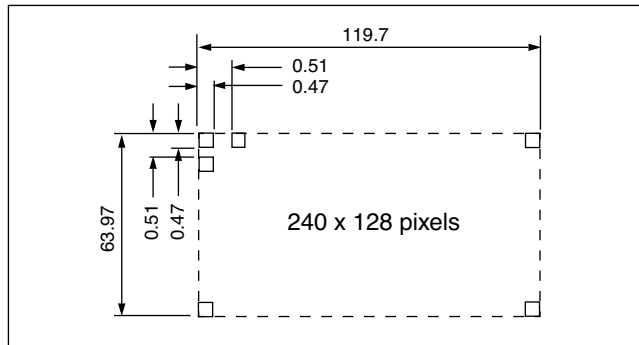
The AND1742MST2 devices are compact, full dot matrix, with “white page” appearance, LCD modules that have an on-board LCD controller (RA8835) and display memory (RAM). The AND1742MST2 can display TEXT information, numerals, letters and symbols, as well as GRAPHIC patterns. These devices are suitable 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	$I_{DD}$	$V_{DD} = 5.0V$	-	15.6	18	mA
	$I_{EE}$	$V_{DD} - V_{EE} = 17.8V$	-	2.4	-	
CCFL Starting Voltage	$V_{FLS}$	-	-	750	-	$V_{rms}$
CCFL Driving Voltage	$V_{FLD}$	-	-	360	-	$V_{rms}$

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	$I_{FLD}$	$V_{FLD}=450V_{rms}$ $f_{FL}=30kHz$	-	5.0	-	mA
CCFL Driving Frequency	$f_{FL}$	$V_{FLD}=450V_{rms}$ $f_{FL}=30kHz$	15	30	85	kHz
CCFL Saturation Time	$t_{SAT}$	$T_a = 25^{\circ}C$	-	1	-	minut

### Optical Characteristics (TA = 25°C, $\phi = 0^{\circ}$ , $\theta = 0$ )

Item	Symbol	Min.	Typ.	Max.	Unit
Viewing Angle Range (when $Cr \geq 2$ )	$\phi f(12\text{ o'clock})$	-	34	-	degree
	$\phi b(6\text{ o'clock})$	-	41	-	
	$\phi l(9\text{ o'clock})$	-	35	-	
	$\phi r(3\text{ o'clock})$	-	30	-	
Rise Time *	$T_r$	-	140	-	mS
Fall Time *	$T_f$	-	240	-	
Frame Frequency *	$F_{rm}$	-	64	-	Hz
Contrast *	$Cr$	-	5.2	-	-

\* Condition:  $V_{DD} - V_{EE} = 17.8V$ ,  $T_a = 25^{\circ}C$

### 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	0°C	+50°C	-20°C	+70°C	-20°C	+70°C	-30°C	+80°C
Humidity (without condensation)	Note 2,4		Note 3, 5		Note 4,5		Note 4,6	

Note 2:  $T_a \leq 50^{\circ}C$ : 80% RH max.  $T_a > 50^{\circ}C$ : Absolute humidity must be lower than the humidity of 85% RH at  $50^{\circ}C$ .

Note 3:  $T_a$  at  $-20^{\circ}C$  will be < 48 hrs at  $70^{\circ}C$  will be < 120 hrs when humidity is higher than 75%.

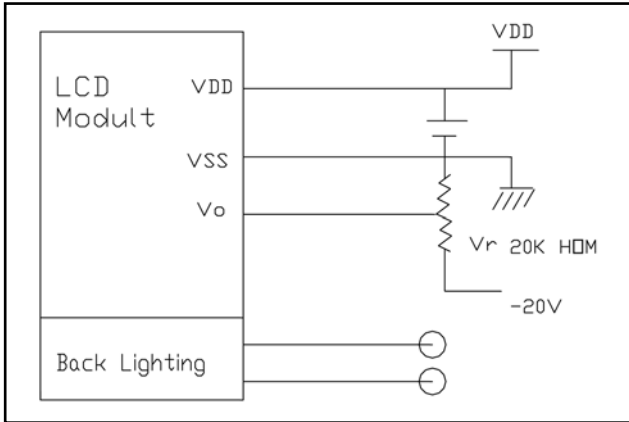
Note 4: Background color changes slightly depending on ambient temperature. This phenomenon is reversible.

Note 5:  $T_a \leq 70^{\circ}C$ : 75% RH max.  $T_a > 70^{\circ}C$ : absolute humidity must be lower than the humidity of 75% RH at  $70^{\circ}C$ .

Note 6:  $T_a$  at  $-30^{\circ}C$  will be < 48 hrs, at  $80^{\circ}C$  will be <120 hrs when humidity is higher than 75%.



**Power Supply**



**Timing Relationships and Diagram**

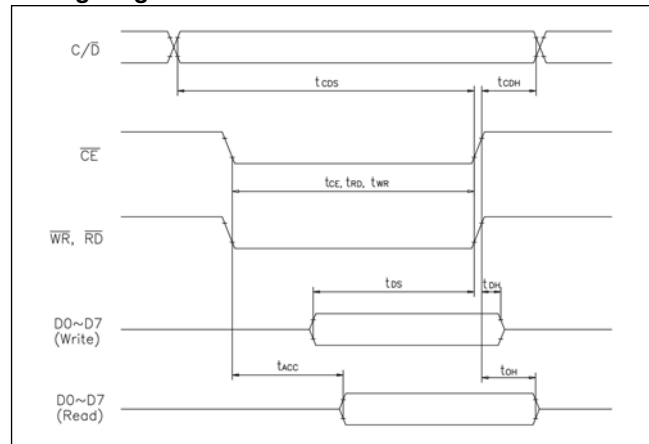
**Signal Timing Relationships**

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	

**Reliability Test**

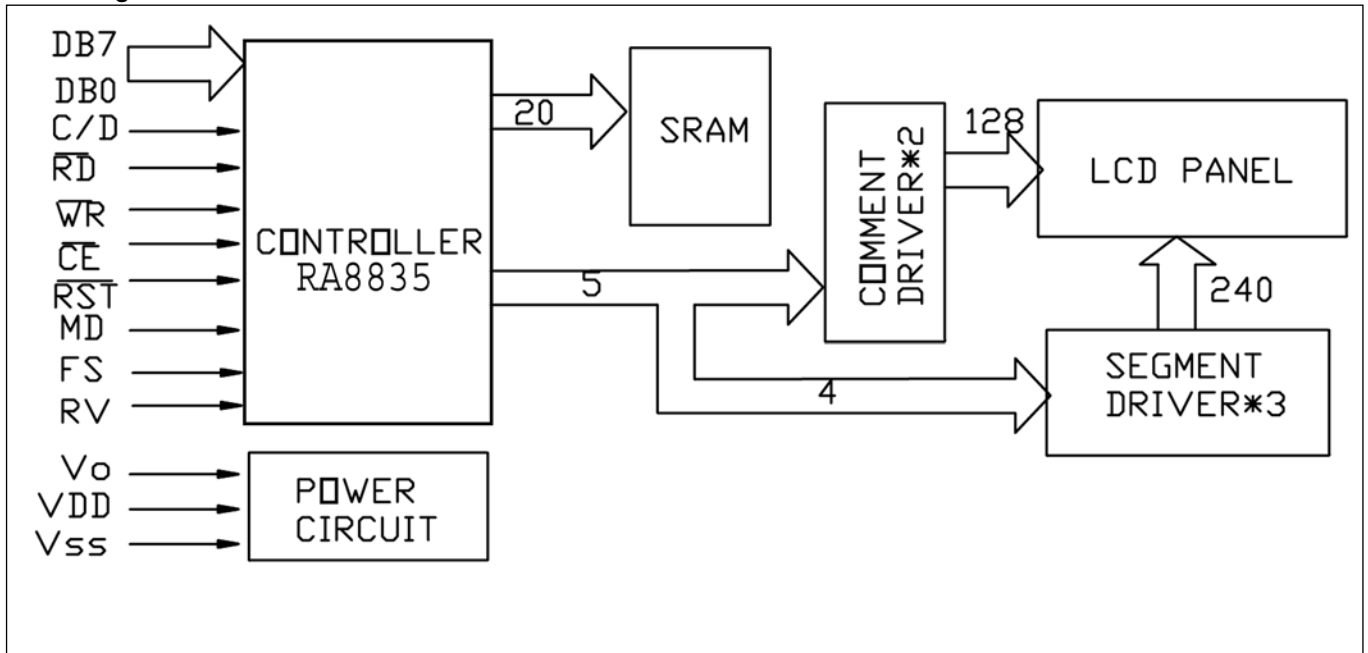
No.	Item	Conditions
1	High Temp. Operation	70°C 120 HR
2	High Temp. Storage	80°C 120 HR
3	Low Temp. Operation	-20°C 120 HR
4	Low Temp. Storage	-30°C 120 HR
5	High Temp./Humid Storage	60°C 90%RH 120 HR
6	Thermal Shock	-20°C, 30 min. +60°C, 30 min. 10 cycle

**Timing Diagram**



**Controller: RA8835**

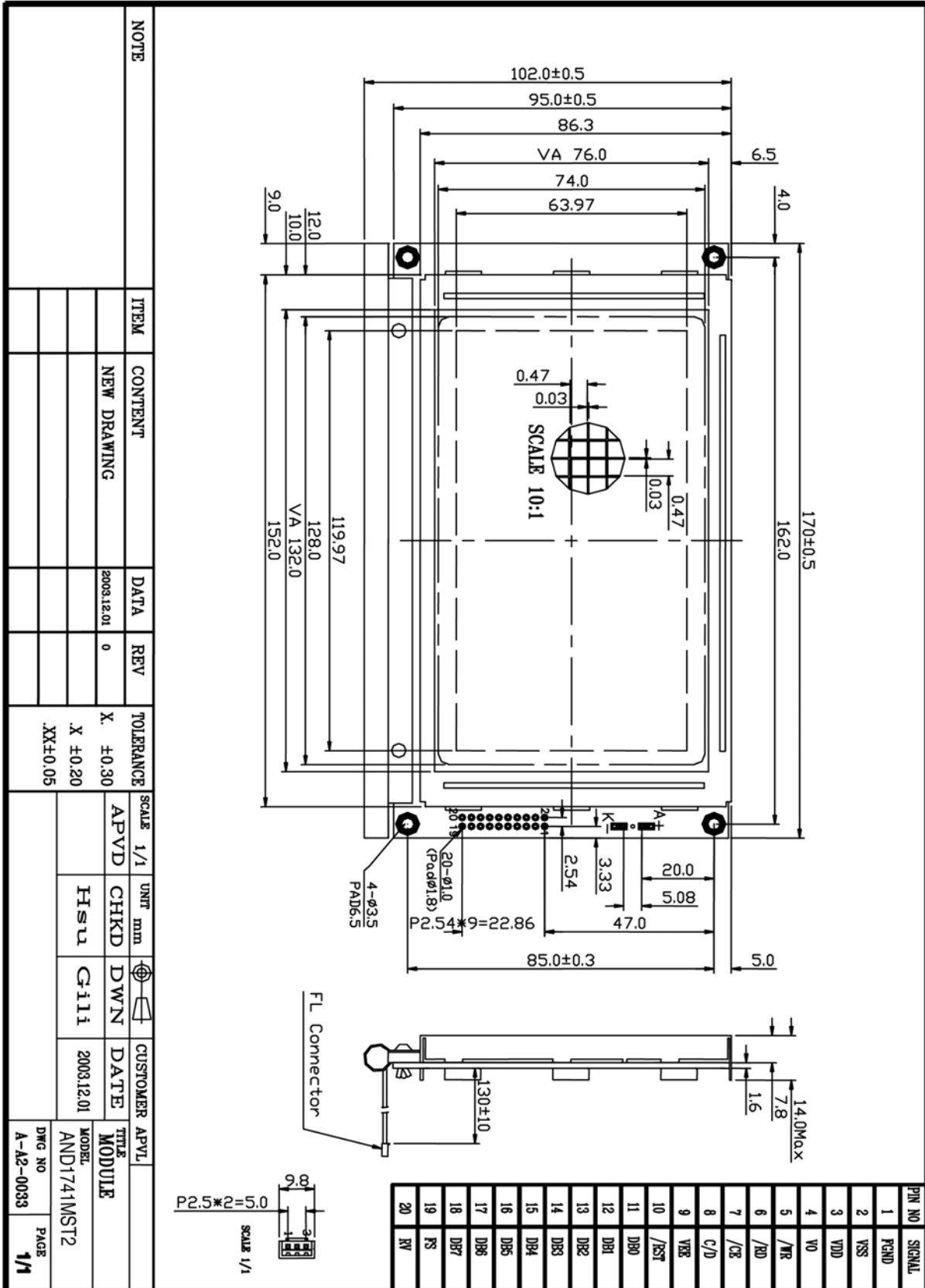
**Block Diagram**





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## Dimensional Outline



NOTE	ITEM	CONTENT	DATA	REV	TOLERANCE	SCALE	APVD	CHKD	DWN	DATE	CUSTOMER	APVL	TITLE	MODEL	DWG NO	PAGE
		NEW DRAWING	2003.12.01	0	X ±0.30 XX ±0.05	1/1	Hsu	G111		2003.12.01			MODULE	AND1741MST2	A-A2-0033	1/1