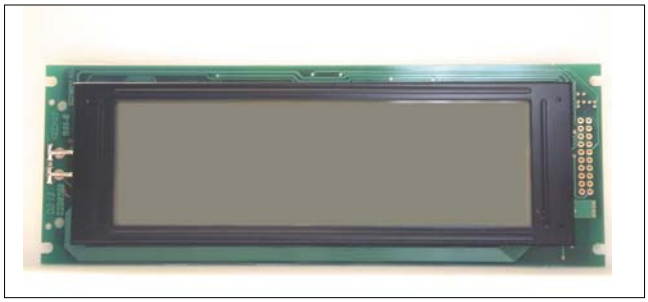


AND711AST-30/-EO

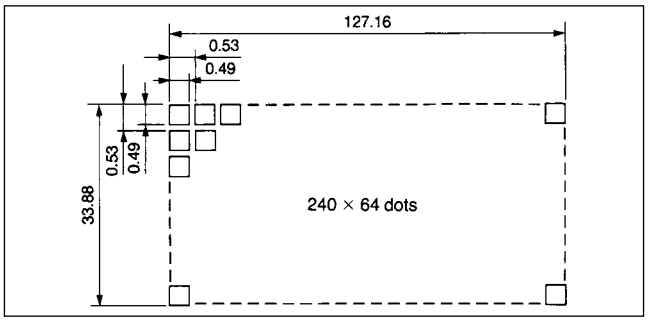
240 x 64 Dots
Intelligent Graphic Display

The AND711AST-30/-EO is a full dot matrix LCD module including an LCD controller and display RAM. This device can display graphic patterns and symbols and is suitable for a message display for various instruments such as business machine terminals.

Features

- Super twist
- 40 character x 8 line capability
- Excellent readability and high contrast ratio
- 8-bit parallel bus for read/write data by CPU interface
- Built-in LCD controller and display RAM (8k byte)
- Character mode, graphic mode, and character and graphic combination mode
- Various attribute functions
- Wide operating temperatures range (0°C to + 50°C)
- Compact and easily mounted on any equipment
- User-selectable font–6 x 8 or 8 x 8
- Available with EL backlighting attached (-EO option)

Dot Matrix Dimensions



Mechanical Characteristics

Item	Specification	Unit
Outline Dimensions	180 (W) x 65 (H) x 10 (D)	mm
Number of Dots	240 (W) x 64 (H)	
# of Characters	40 x 8 (320) Characters 6 x 8 dot format, alpha-numeric	
Viewing Area	132 (W) x 39 (H)	mm
Bezel Opening	132 (W) x 39 (H)	mm
Dot Size	0.49 (W) x 0.49 (H)	mm
Dot Pitch	0.53 (W) x 0.53 (H)	mm
Weight (approx.)	I20/150 (ST/EO)	gram

Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply Voltage	V_{DD}	5.5	V
	V_{EE}	-19	
EL Drive Voltage (f_{EL} = 1 kHz)	V_{EL}	130	V_{rms}
Input Voltage	V_{IN}	$-.3 \le V_{IN} \le +.3$	V
Operating Temperature	T_{op}	0 to +50	°C
Storage Temperature	T_{stg}	-20 to +70	°C
EL Driving Freq. (EO)	f_{EL}	1	kHz

Electrical Characteristics (TA = 25°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}	4.5	5.0	5.5	V
	V_{EE}	–5.75	–8.5	–11.5	
High Level In Voltage (V_{DD} = 5.0V)	V_{IN}	2.8	–	5	V
Low Level In Voltage (V_{DD} = 5.0V)	V_{IL}	–	–	0.8	
High Level Output Volt. (V_{DD} = 5.0V)	V_{OH}	V_{DD} –0.3	–	–	V
Low Level Output Volt. (V_{DD} = 5.0V)	V_{OL}	–	–	0.3	V
Power Consumption(1)	I_{DD}	–	16.0	25.0	mA
	I_{EE}	–	2.4	3.0	
	I_{EL}	–	4.0	10	(2)

1. All dots on. (V_{DD} = .5V, V_{EE} = –8.5V, V_{EL}=110, f_{EL} = 500 Hz or at Typ.)
2. mA 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.

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

Item	Symbol	Min.	Typ.	Max.	Unit
Viewing Angle	Right to Left	–	80	–	degree
	Up & Down	–	55	–	
Contrast	K	2.5	4.8	-	-
Turn On	T_{on}	-	200	350	ms
Turn Off	T_{off}	-	250	300	ms

Note: Refer to Applications Section for definitions of viewing angle, contrast ratio, response time (on and off) and luminance.

Connector Pin Assignment

Pin No.	Signal	Function
1	FGND	Frame Ground (connected to metal bezel)
2	GND	Ground (signal)
3	V_{DD}	Power Supply for logic (5V)
4	V_{EE}	Power Supply for LCD Drive (–8.5 ±3V)
5	$\overline{WR}$	Data Write
6	$\overline{RD}$	Data Read
7	$\overline{CE}$	Chip Enable
8	C/$\overline{D}$	$\overline{WR}$ = "L", C/$\overline{D}$ = "H": Command Write $\overline{WR}$ = "L", C/$\overline{D}$ = "L": Data Write $\overline{RD}$ = "L", C/$\overline{D}$ = "H": Status Read $\overline{RD}$ = "L", C/$\overline{D}$ = "L": Data Read
9	NC	No connection
10	$\overline{RESET}$	Controller Reset (Active Pullup Required)
11	D0	Data Input/Output
12	D1	Data Input/Output
13	D2	Data Input/Output
14	D3	Data Input/Output
15	D4	Data Input/Output
16	D5	Data Input/Output
17	D6	Data Input/Output
18	D7	Data Input/Output
19	FS	Font select. Open or connect to V_{DD}: 6 x 8 dot Connect to ground: 8 x 8 dot
20	NC	No connection

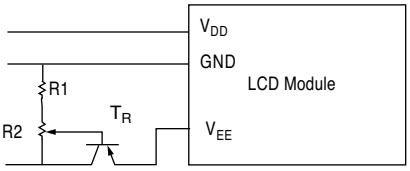
Power Supply

The LCD panel is driven by the voltage V_{DD}–V_{EE}, so an adjustable V_{EE} is required for contrast control and temperature compensation.

Temperature Variations

Temperature	V_{DD}–V_{EE}
0°C	13.9
+25°C	12.5
+50°C	10.8

Example of Variable Negative Voltage Supply



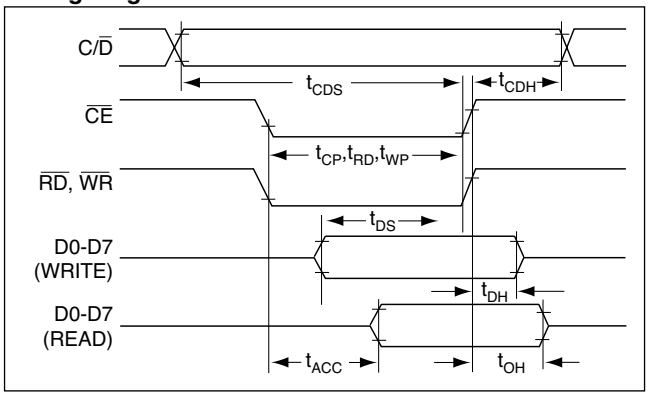
R1 = 10k, R2 = 10k, T_R 2SA1102 or equivalent

Timing Relationships and Diagram

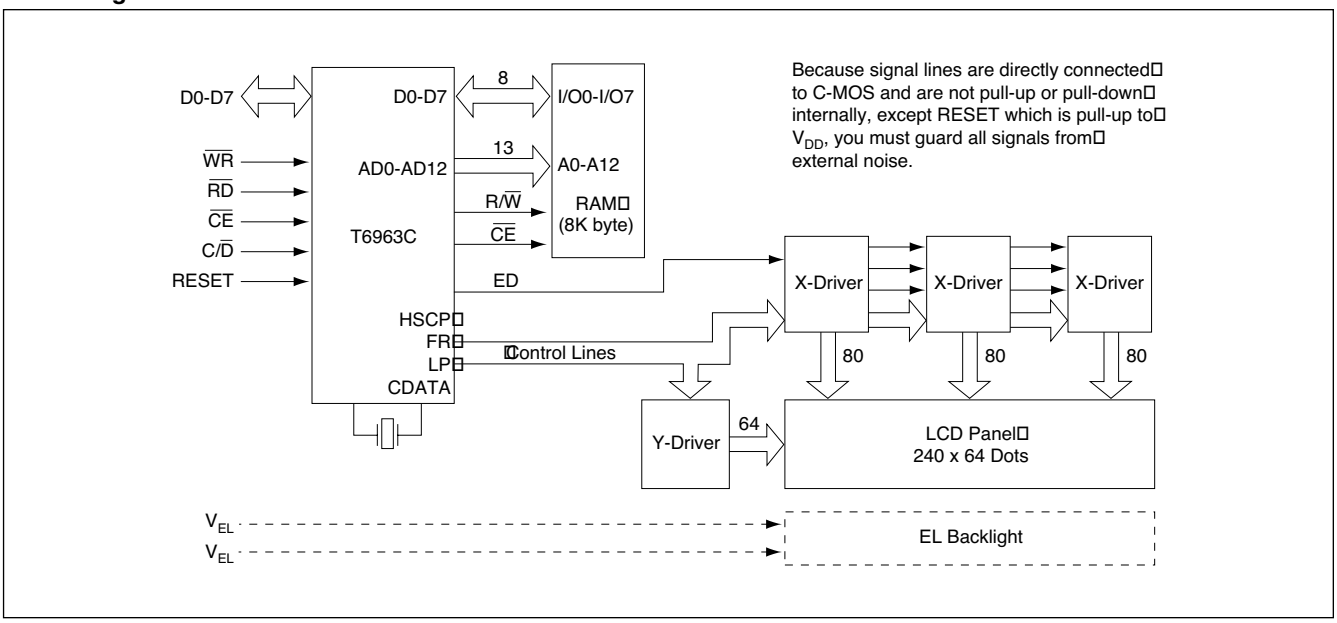
Signal Timing Relationships

Item	Symbol	Min.	Max.	Unit
C/D Set Up Time	t_{CDS}	100	–	ns
C/D Hold Time	t_{CDH}	10	–	
$\overline{CE}$, $\overline{RD}$, $\overline{WR}$ Pulse Width	t_{CE}, t_{RD}, t_{WR}	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