

AND711AST-30/-EO

240 x 64 Dots

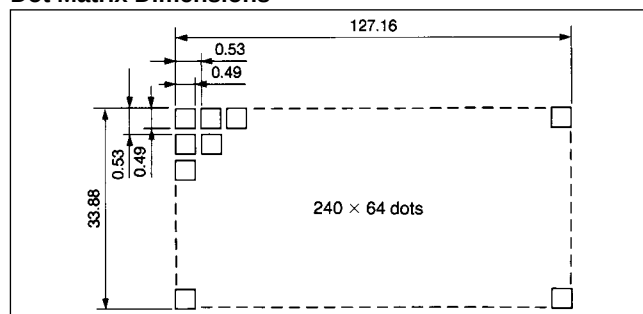
Intelligent Graphic Display

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 12 (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.)	120/150 (ST/EO)	gram

Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply Voltage	V_{DD}	7.0	V
	V_{EE}	-15	
EL Drive Voltage ($f_{EL} = 500$ Hz)	V_{EL}	130	V_{rms}
Input Voltage	V_{IN}	$-0.3 \leq V_{IN} \leq +0.3$	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}	4.75	5.0	5.25	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}	—	—	13.0	mA
	I_{EE}	—	—	2.0	
	I_{EL}	—	—	21	

1. All dots on. ($V_{DD} = 5.0V$, $V_{EE} = -8.5V$, $V_{EL} = 110V$, $f_{EL} = 500$ Hz or at Typ.)

2. mA rms



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

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/D	$\overline{WR} = "L", C/D = "H"$: Command Write $\overline{WR} = "L", C/D = "L"$: Data Write $\overline{RD} = "L", C/D = "H"$: Status Read $\overline{RD} = "L", C/D = "L"$: 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

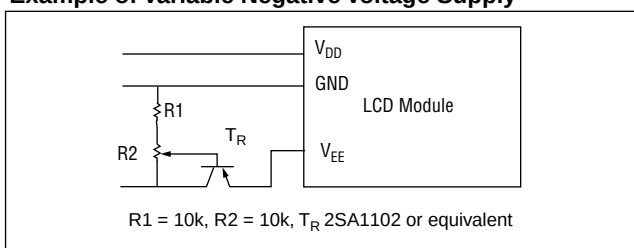
Power Supply

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}	V _{DD} –V _{EE} (EO option)
0°C	14.6	14.1
+25°C	13.5	13.0
+50°C	11.6	11.1

Example of Variable Negative Voltage Supply

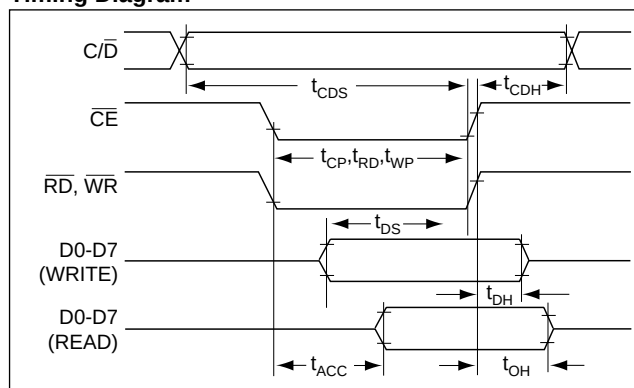


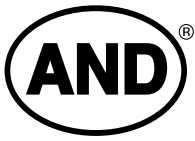
Timing Relationships and Diagram

Signal Timing Relationships

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

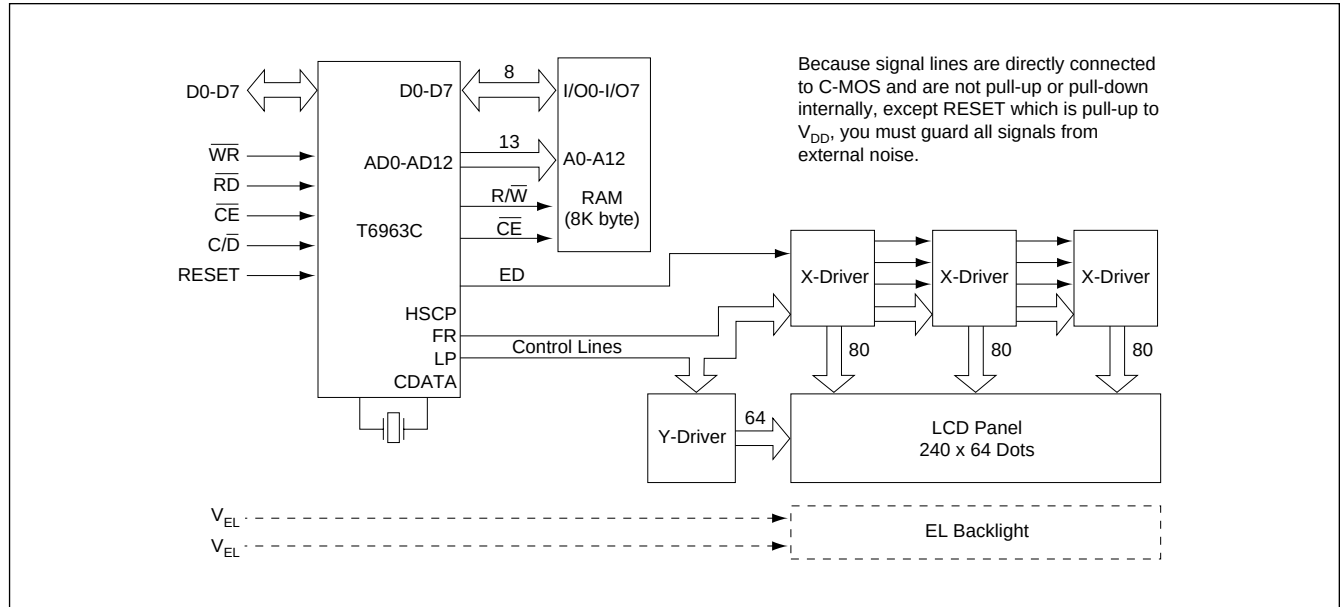
Timing Diagram





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Block Diagram



Dimensional Outline

