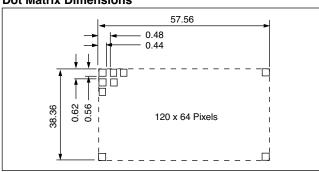


Features

· RoHS Compliant

- Super twist
- 15 characters x 8 line capability
- 120 x 64 dot graphic display
- · Excellent readability and high-contrast ratio
- Built-in LCD controller (T6963C)
- Wide operating temperature range (0° to 50°C)
- Available with EL backlighting (-EO option)

Dot Matrix Dimensions



Mechanical Characteristics

Item	Specification	Unit
Outline Dimensions	85.0 (W) x 70.0 (H) x 20.0 MAX (D)	mm
Number of Dots	120 x 64 Dots (15)	
# of Characters	15 x 8 (120) Characters, 8 x 8 font	
Viewing Area	62.5 (W) x 43.5 (H)	mm
Bezel Opening	62.5 (W) x 43.5 (H)	mm
Dot Size	0.44 (W) x 0.56 (H)	mm
Dot Pitch	0.56 (W) x 0.60 (H)	mm
Weight (approx.)	70/85 (ST/EO)	gram

AND1021ST/-EO

120 x 64 Dots Intelligent Graphics Display

The AND1021ST/-EO devices are compact, full dot matrix, LCD modules that have an on-board LCD controller (T6963C) and display memory (RAM). The AND1021ST/-EO 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.

Absolute Maximum Ratings

- 1000 1010 1010 1010 1010 1010 1010 10					
Item	Symbol Rating		Unit		
	V _{DD}	7.0	V		
Supply Voltage	V _{EE}	-22	V		
	V _{EL}	110 (EO)	V_{rms}		
Input Voltage	V _{IN}	$GND \leq V_{IN} \leq V_{DD}$	V		
Operating Temperature	T _{op}	0 to +50	°C		
Storage Temperature	T _{stg}	-20 to +60	°C		
EL Driving Freq. (EO)	f _{EL}	1	kHz		

Electrical Characteristics (TA = 25°C)

Item	Symbol	Min.	Тур.	Max.	Unit
Supply Voltage	V_{DD}	4.75	5.0	5.25	V
Supply Voltage	V _{EE}	-7.75	-8.5	-9.25	
EL Drive voltage (f _{EL} = 500 Hz)	V _{EL}	100	110	120	V _{rms}
High Level In Voltage (V _{DD} = 5.0V)	V _{IN}	-0.5	-	V _{DD}	V
Low Level In Voltage (V _{DD} = 5.0V)	V _{IH}	0	-	0.5	V
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
(4)	I _{DD}	-		10.0	mA
Power Consumption ⁽¹⁾	I _{EE}	_		2.0	IIIA
	I _{EL}			15	(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 $^{\circ}$ C, ϕ = 0 $^{\circ}$, θ = 0)

Item	Symbol	Min.	Тур.	Max.	Unit	
Viewing Angle	Right to Left	_	80	-	dograo	
	Up & Down	_	55	-	degree	
Contrast	K	2.5	4.8	-	-	
Turn On	T _{on}	-	200	350	ms	
Turn Off	T _{off}	_	250	350	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	
5	WR	Data Write	
6	RD	Data Read	
7	CE	Chip Enable	
8	C/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	RESET	Controller Reset	
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	NC	No connection	
20	NC	No connection	

Power Supply

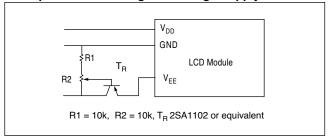
The LCD panel is driven by the voltage $V_{\mbox{\scriptsize DD}}\!\!-\!\!V_{\mbox{\tiny EE}},$ so adjustable

 $\ensuremath{V_{\text{EE}}}$ 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

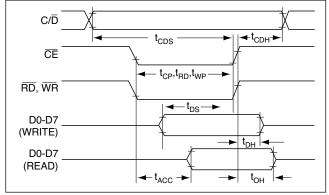


Timing Relationships and Diagram

Signal Timing Relationships

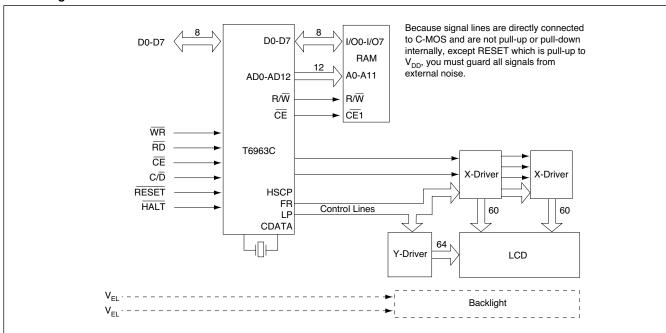
Item	Symbol	Min.	Max.	Unit
C/D Set Up Time	t _{CDS}	100	-	
C/D Hold Time	t _{CDH}	10	-	
CE, RD, WR Pulse Width	t _{CE,} t _{RD,} t _{WR}	80	ı	
Data Set Up Time	t _{DS}	80	-	ns
Data Hold Time	t _{DH}	40	-	
Access Time	t _{ACC}	-	150	
Output Hold Time	t _{OH}	10	50	

Timing Diagram





Block Diagram



Dimensional Outline

