

AND671WGST-LED Intelligent Character Display

The AND671WGST-LED is an STN Positive Graye liquid crystal display. It has a transfective rear polarizer, white LED backlight, 12 o'clock viewing angle and a wide temperature range with a 3.3V single supply voltage.

Features

- STN Positive Graye
- Transfective Rear Polarizer
- White LED Backlight
- 12 O'clock Viewing Direction
- Wide Temperature Range, 3.3V, Single Supply Voltage
- Silver Frame
- **ROHS Compliant**

Mechanical Characteristics

Item	Standard Value	Unit
Module Size	80.0 (W) x 36.0 (H) x 8.8.0 (12.7) (D) (max.)	mm
Viewing Area	65.0 (W) x 16.0 (H)	mm
Dot Size	0.56 (W) x 0.66 (H)	mm
Dot Pitch	0.60 (W) x 0.70 (H)	mm
Display Format	16 characters (W) x 2 lines (H)	–
Duty Ratio	1/16 Duty	–
Controller	ST7066U or equivalent	–

Electrical Absolute Maximum Ratings

Item	Symbol	Min.	Typ.	Max.	Unit
Power Supply for Logic	VDD - VSS	-0.3	–	7.0	V
Power Supply for LCD	VDD - VSS	-0.3	–	10.0	V
Input Voltage	VI	-0.3	–	VDD	V
LED Power Dissipation	PAD	–	–	90	mW
LED Forward Current	IAF	–	–	24	mA
LED Reverse Voltage	VR	–	–	5	V

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

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for Logic	VDD - VSS	—	2.7	3.3	4.5	V
Input Voltage	VIL	L Level	0	—	0.6	V
	VIH	H Level	2.2	—	VDD	V
LCM Recommend LCD Module Driving Voltage	VDD-VO	Ta = 0°C	—	—	—	V
		Ta=25°C	2.7	3.3	4.5	
		Ta=50°C	—	—	—	
Power Supply Current for LCM	IDD	VDD = 3.3V, VDD-VO=3.3V	—	2.0	3.0	mA
LED Forward Voltage	VF	iF = 20 mA	—	3.4	3.6	V
LED Forward Current	IF	—	—	20	—	mA
LED Reverse Voltage	IR	VR=5V	—	—	0.2	mA

Optical Specifications (Ta = 25 °C)

Item	Symbol	Remarks	Specifications			Units
			Min.	Typ.	Max.	
Viewing Angle	Φ f (12 o'clock)	When CR ≥ 1.4	—	20	—	deg
	Φ b (6 o'clock)		—	40	—	
	Φ l (9 o'clock)		—	30	—	
	Φ r (3 o'clock)		—	30	—	
Rise Time	Tr	VDD-VO = 3.3 V Ta = 25°C	—	200	—	mS
Fall Time	Tf		—	250	—	
Frame Frequency	Frm		—	64	—	Hz
Contrast	Cr		—	3.0	—	—
Brightness of Backlight	L	IF = 20 mA	120	180	—	cd/m ²
Peak Emission Wavelength	λ P		x = 0.29 y = 0.30	x = 0.31 y = 0.32	x = 0.33 y = 0.34	nm

Environmental Absolute Maximum Ratings

Item	Wide Temperature			
	Operating		Storage	
	Min.	Max.	Min.	Max.
Ambient Temperature	-20 °C	+70 °C	-30 °C	+80°C
Humidity (without condensation)	Note 4, 5		Note 4,6	

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

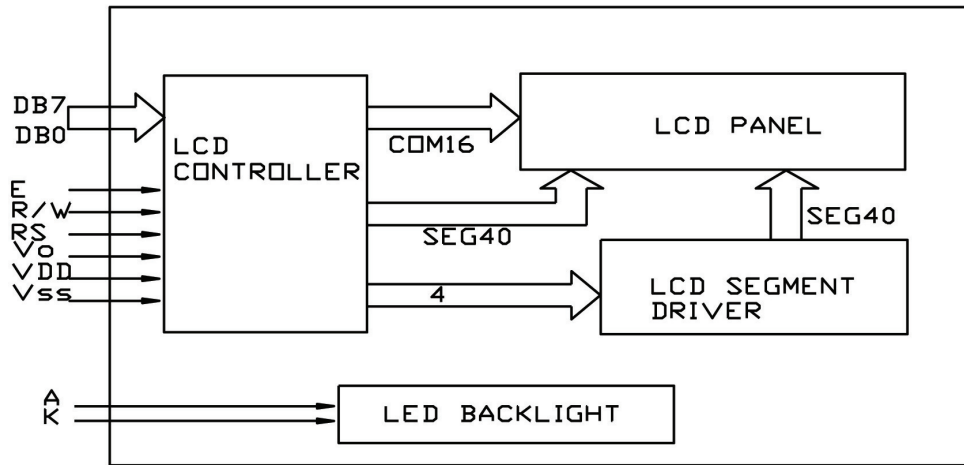
Note 5: Ta ≤ 70°C: 75 RH max; Ta > 70°C: absolute humidity must be lower than the humidity of 75% RH at 70°C.

Note 6: Ta at -30°C will be <48 hrs, at 80°C will be < 120 hrs when humidity is higher than 75%.

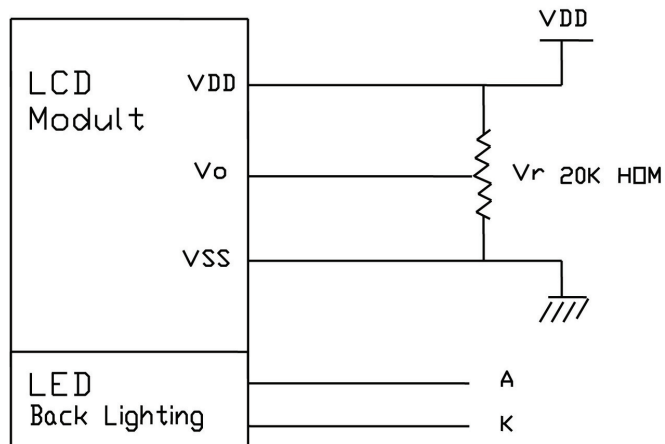
Interface Pin Assignment

Pin No.	Pin Out	Level	Function Description	Pin No.	Pin Out	Level	Function Description
1	VSS	0V	Power Supply Ground	9	DB2	H/L	Data Bit 2
2	VDD	3.3V	Power Supply Voltage	10	DB3	H/L	Data Bit 3
3	V0	—	Contrast Adjustment	11	DB4	H/L	Data Bit 4
4	RS	H/L	Register Select	12	DB5	H/L	Data Bit 5
5	R/W	H/L	Read/ Write	13	DB6	H/L	Data Bit 6
6	E	H, H → L	Enable Signal	14	DB7	H/L	Data Bit 7
7	DB0	H/L	Data Bit 0	15	A	3.5V	LED Power Supply (+)
8	DB1	H/L	Data Bit 1	16	K	0V	LED Power Supply (-)

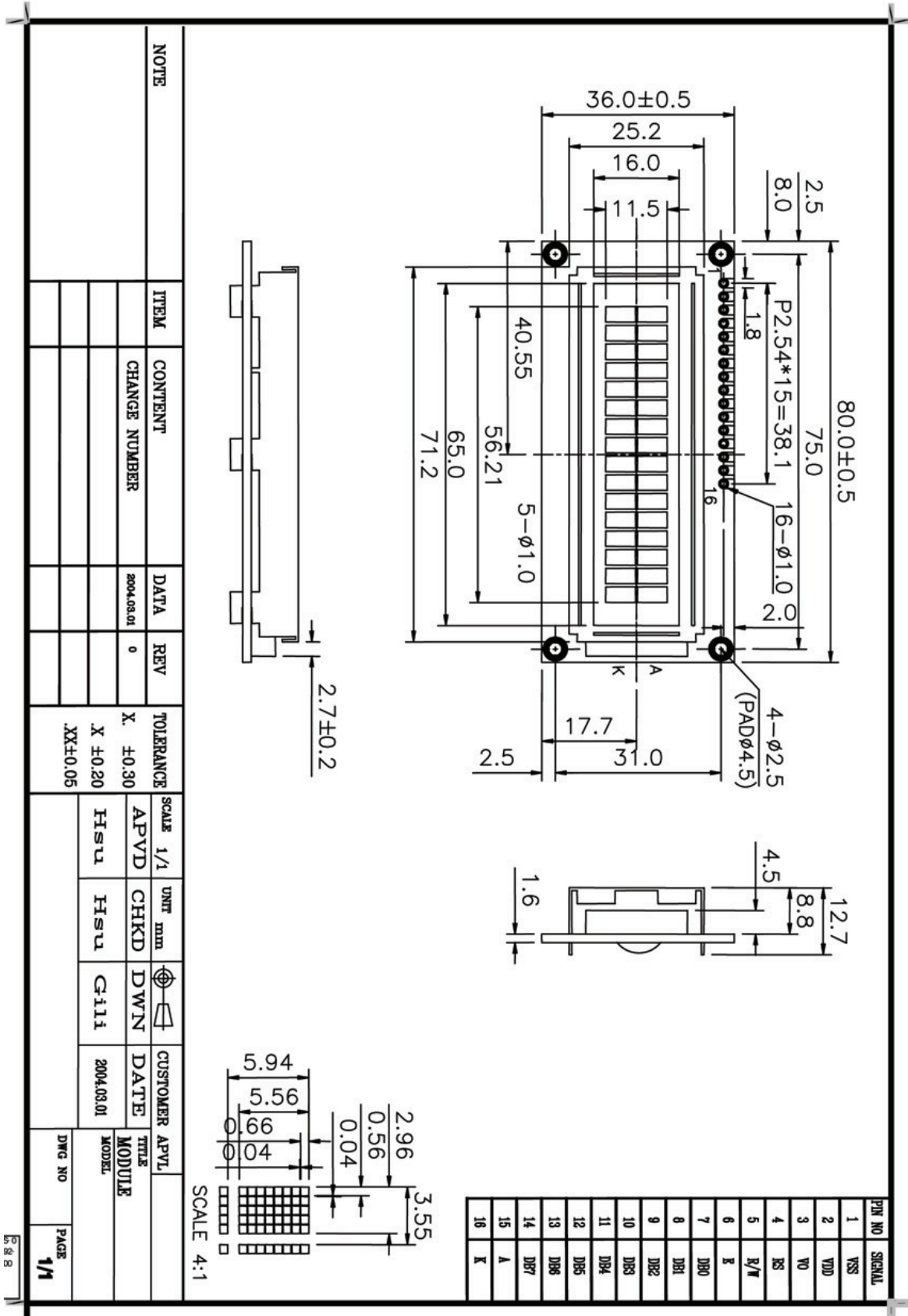
Block Diagram



Power Supply



Mechanical Dimensions

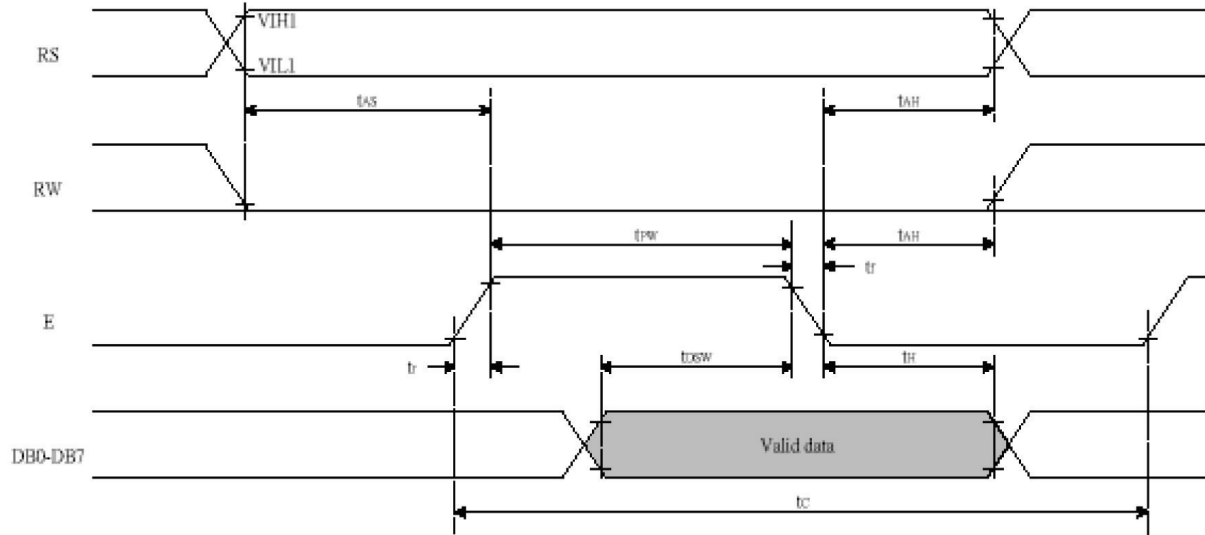


Timing Characteristics ($T_a = 25\text{ }^\circ\text{C}$, $V_{CC} = 2.7\text{V}$)

Symbol	Characteristics	Test Condition	Specifications			Units
			Min.	Typ.	Max.	
Internal Clock Operation						
f_{OSC}	OSC Frequency	$R = 75\text{K}\Omega$	190	270	350	KHz
External Clock Operation						
f_{EX}	External Frequency	–	125	270	410	KHz
	Duty Cycle	–	45	50	55	%
$T_{R'} T_F$	Rise/Fall Time	–	–	–	0.2	μs
Write Mode (Writing data from MPU to ST7066U)						
T_C	Enable Cycle Time	Pin E	1200	–	–	ns
T_{PW}	Enable Plus Time	Pin E	460	–	–	ns
$T_{R'} T_F$	Enable Rise/Fall Time	Pin E	–	–	25	ns
T_{AS}	Address Setup Time	Pins RS, RW, E	0	–	–	ns
T_{AH}	Address Hold Time	Pins RS, RW, E	10	–	–	ns
T_{DSW}	Data Setup Time	Pins: DB0 - DB7	80	–	–	ns
T_H	Data Hold Time	Pins: DB0 - DB7	10	–	–	ns
Read Mode (Reading Data from ST7066U to MPU)						
T_C	Enable Cycle Time	Pin E	1200	–	–	ns
T_{PW}	Enable Pulse Width	Pin E	480	–	–	ns
$T_{R'} T_F$	Enable Rise/Fall Time	Pin E	–	–	25	ns
T_{AS}	Address Setup Time	Pins: RS, RW, E	0	–	–	ns
T_{AH}	Address Hold Time	Pins: RS, RW, E	10	–	–	ns
T_{DOR}	Data Setup Time	Pins: DB0 - DB&	–	–	320	ns
T_H	Data Hold Time	Pins: DB0 - DB7	10	–	–	ns

Read/Write Timing Chart

- **Writing data from MPU to ST7066U**



- **Reading data from ST7066U to MPU**

