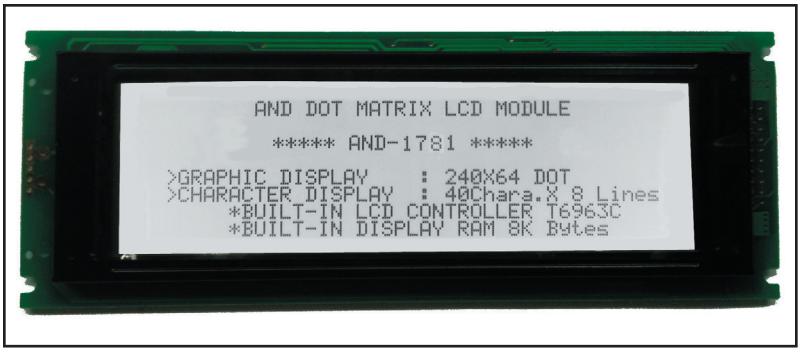


AND1781BST-LED
Intelligent Graphic Display

The AND1781BST-LED is an STN Blue Negative Black & White liquid crystal display. It has a transmissive rear polarizer, white LED backlight, 6 o-clock viewing angle and a normal temperature range.

Features
- STN Blue Negative Black & White
- Transmissive Rear Polarizer
- White LED Backlight
- 6 O'clock Viewing Direction
- Normal Temperature Range
- Black Frame
- **ROHS Compliant**

Mechanical Characteristics

Item	Standard Value	Unit
Module Size	180.0 (W) x 65.0 (H) x 9.7 (D) (max.)	mm
Viewing Area	134.0 (W) x 40.4 (H)	mm
Dot Size	0.49 (W) x 0.49 (H)	mm
Dot Pitch	0.53 (W) x 0.53 (H)	mm
Resolution	240 (W) x 64 (H)	dots
Duty Ratio	1/64 Duty	–
Controller	T6963C/Toshiba	–

Electrical Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Remark
Power Supply for Logic	VDD - VSS	-0.3	5.5	V	
Power Supply for LCD	VDD-VSS	0	24.0	V	
Input Voltage	V1	-0.3	VDD	V	
LED Power Dissipation	PAD	–	360	mW	
LED Frward Current	IAF	–	100	mA	
LED Reverse Voltage	VR		5	V	

Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for Logic	VDD-VSS	–	4.5	5.0	5.5	V
Input Voltage	VIL	L Level	0	–	0.6	V
	VH	H Level	2.2	–	VDD	V
	VDD-VO	Ta = -0ºC	–	–	–	V
		Ta = 25ºC	10.8	12.2	13.1	V
		Ta = 50ºC	–	–	–	V
Power Supply Current for LCM	IDD	VDD=5.0V VDD-VEE=12.2V	–	16.0	25.0	mA
	IEE		–	2.4	–	
LED Forward Voltage	VF	If=80 mA	–	3.4	3.6	V
LED Forward Current	IF	–	–	80	–	mA
LED Reverse Current	IR	VR=5V	–	–	0.3	mA

Optical Specifications (Ta = 25 ºC)

Item	Symbol	Remarks	Specifications Min.	Typ.	Max.	Units
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 = 12.2 V Ta = 25ºC	–	230	–	mS
Fall Time	Tf		–	250	–	
Frame Frequency	Frm		–	64	–	Hz
Congrast	Cr		–	5.0	–	–
Brightness of Backlight	L	IF = 80 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

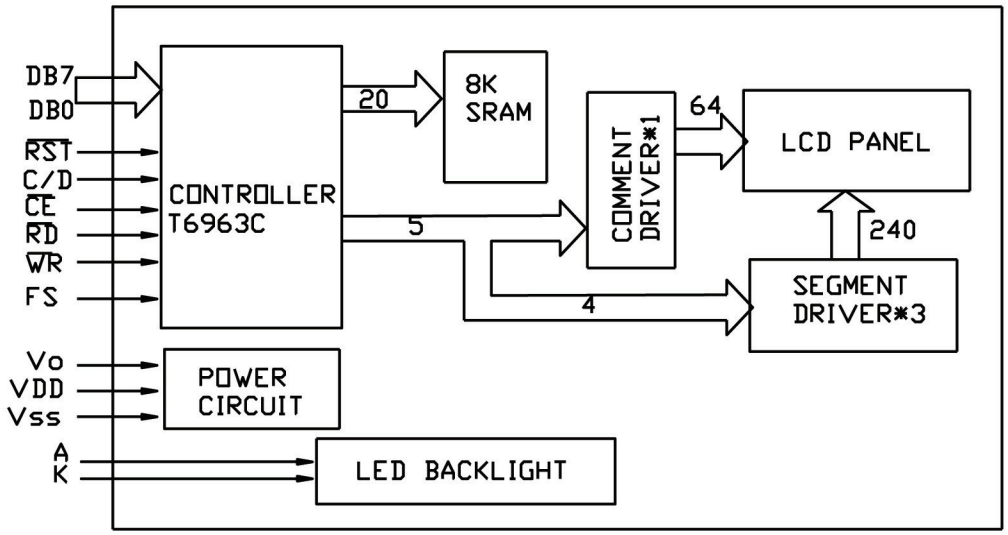
Item	Normal Temperature			
	Operating		Storage	
	Min.	Max.	Min.	Max.
Ambient Temperature	0 ºC	+50 ºC	-20 ºC	+70ºC
Humidity (without condensation)	Note 2, 4		Note 3,5	

Note 2: Ta ≤ 50ºC: 80% RH max; Ta > 50ºC: Absolute humidity must be lower than the humidity of 85% RH at 50ºC.
Note 3: Ta at -20ºC will be < 48 hrs at 70ºC will be <120 hrs when humidity is higher than 75%.

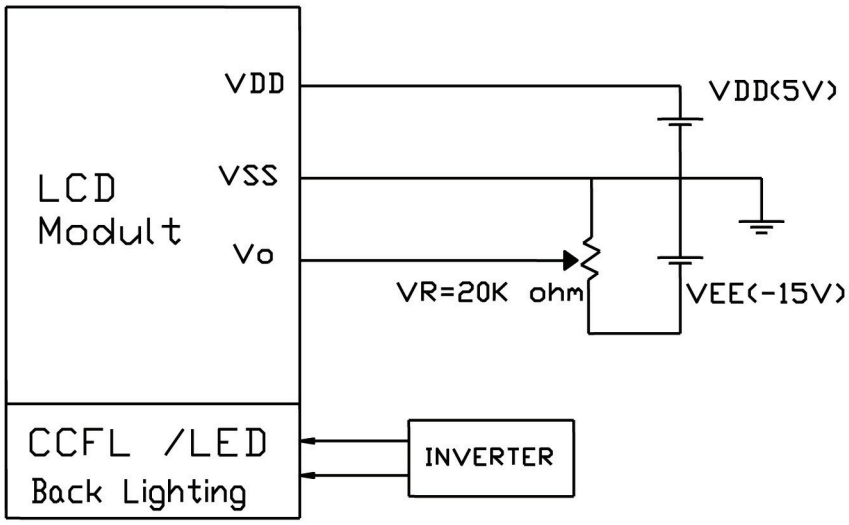
Interface Pin Assignment

Pin No.	Pin Out	Function Description		Pin No	Pin Out	Function Description
1	FGND	For Ground		11	DB0	Data Bit 0
2	VSS	Power Supply Ground		12	DB1	Data Bit 1
3	VDD	Power Supply Voltage		13	DB2	Data Bit 2
4	VO	Contrast Adjustment Voltage		14	DB3	Data Bit 3
5	/WR	Data Write		15	DB4	Data Bit 4
6	/RD	Data Read		16	DB5	Data Bit 5
7	/CE	Enable Signal		17	DB6	Data Bit 6
8	C/D	Wr = "I", 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		18	DB7	Data Bit 7
9	NC	No Connection		19	FS	H: 6*8/L: 8*8 Select of font
10	/RST	Reset Signal		20	NC	No Connection

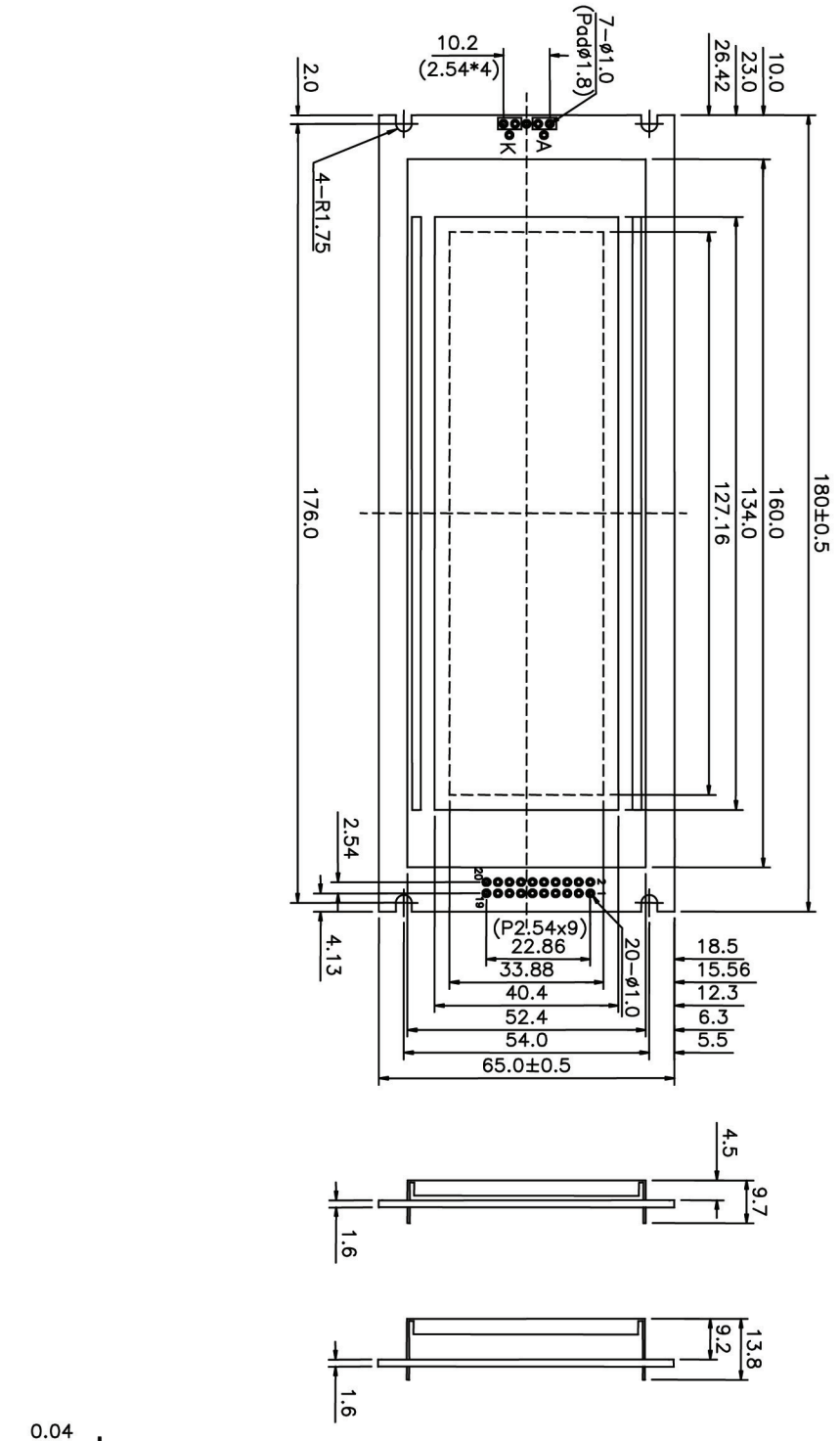
Block Diagram



Power Supply



Mechanical Dimensions



PIN NO	SIGNAL
1	FGND
2	VSS
3	VDD
4	VO
5	WR
6	RD
7	CE
8	CD
9	NC
10	RST
11	DB0
12	DB1
13	DB2
14	DB3
15	DB4
16	DB5
17	DB6
18	DB7
19	FS
20	NC