AZ DISPLAYS, INC.

COMPLETE LCD SOLUTIONS

SPECIFICATIONS FOR
LIQUID CRYSTAL DISPLAY

PART NUMBER: AGM3224B Series

General Specifications

Item	☑Standard Value	Unit
Display Pattern	☑Graphic ☐Character ☐Segment ☐____ ☐with ICON	
Color	☑Mono. ☐Grayscale ☐____	
Module Dimension (W x H x T)	71.3*118.3*5.9	mm
Viewing Area (W x H)	60.6*79.8	mm
Active Area (W x H)	57.585*76.785	mm
Character Size (W x H)	/	mm
Character Pitch (W x H)	/	mm
DOT Size (W x H)	0.225*0.225	mm
DOT Pitch (W x H)	0.24*0.24	mm
LCD Type	☐TN, Positive ☐TN, Negative ☐HTN, Positive ☐HTN, Negative	
	☐STN, Yellow-Green ☐STN, Gray ☐STN, Blue ☑FSTN, Positive ☐FSTN, Negative	
	☐____ ☐FM LCD ☐Color STN	
Polarizer Type	☑Transflective ☐Transmissive ☐Reflective ☐Anti-Glare	
View Direction	☑6H ☐12H ☐____	
LCD Controller & Driver	SPLC563A SPLC564A	
LCD Driving Method	240duty, 1/12bias	
Interface Type	Serial ☐I^2C ☐4-line SPI ☐3-line SPI ☐____	
	Parallel ☐6800 ☐8080 ☑4-bit ☐	
Backlight Type	☐LED ☐Bottom ☐Single Side ☐Dual Side	
	☐____ ☑EL ☐CCFL	
Backlight Color	☐Yellow-Green ☐White ☐Amber ☐Blue ☐Red ☑Blue-green	
EL/CCFL Driver type	☐Build-in ☑External	
DC-DC Converter	☑Build-in ☐External	
Operation Temperature	T_{OPL} = 0 T_{OPH} = 50	°C
Storage Temperature	T_{STL} = -10 T_{STH} = 60	°C

Electrical-optical Specifications

Absolute Maximum Ratings

No	Item	Symbol	Min.	Max.	Unit
1	Supply Voltage For Logic	V_{DD} -V_{SS}	-0.5	7.0	V
2	Supply Voltage For LCD Driver	V_{LCD}	-0.5	25.0	V
3	Input Voltage	V_I	V_{SS}-0.5	V_{DD}+0.5	V

Note: Operating Temperature and Storage Temperature can be found in *1.General Specifications.*

Electrical-optical Characteristics

No	Item	Symbol	Condition	Min.	Typ.	Max.	Unit
1	Supply Voltage for Logic	V_{DD}-V_{SS}	-	2.8	3.0	3.3	V
2	Supply Voltage for LCD Driver	V_{LCD}	Ta=23±3 °C	19.8	20	20.2	V
3	Supply Current for Logic	I_{DD}	-….	-	-	10	mA
4	Frame Frequency	f_M	Ta=23±3 °C	-	-	-	Hz
5	Input High Voltage	V_{IH}	-	-	-	-	V
6	Input Low Voltage	V_{IL}	-	-	-	-	V
7	Output High Voltage	V_{OH}	-	-	-	-	V
8	Output Low Voltage	V_{OL}	-	-	-	-	V
9	Driver Frequency for EL Backlight	If	V_{EL} Typ. Ta=23±3 °C	-	400	-	HZ
10	Supply Voltage for EL Backlight	V_{EL}	I_{EL} Typ. Ta=23±3 °C	-	110	-	V
12	Emission Wavelength For EL Backlight		110VAC 400HZ	-	Blue-Green	-	nm

Optical Characteristics(1)

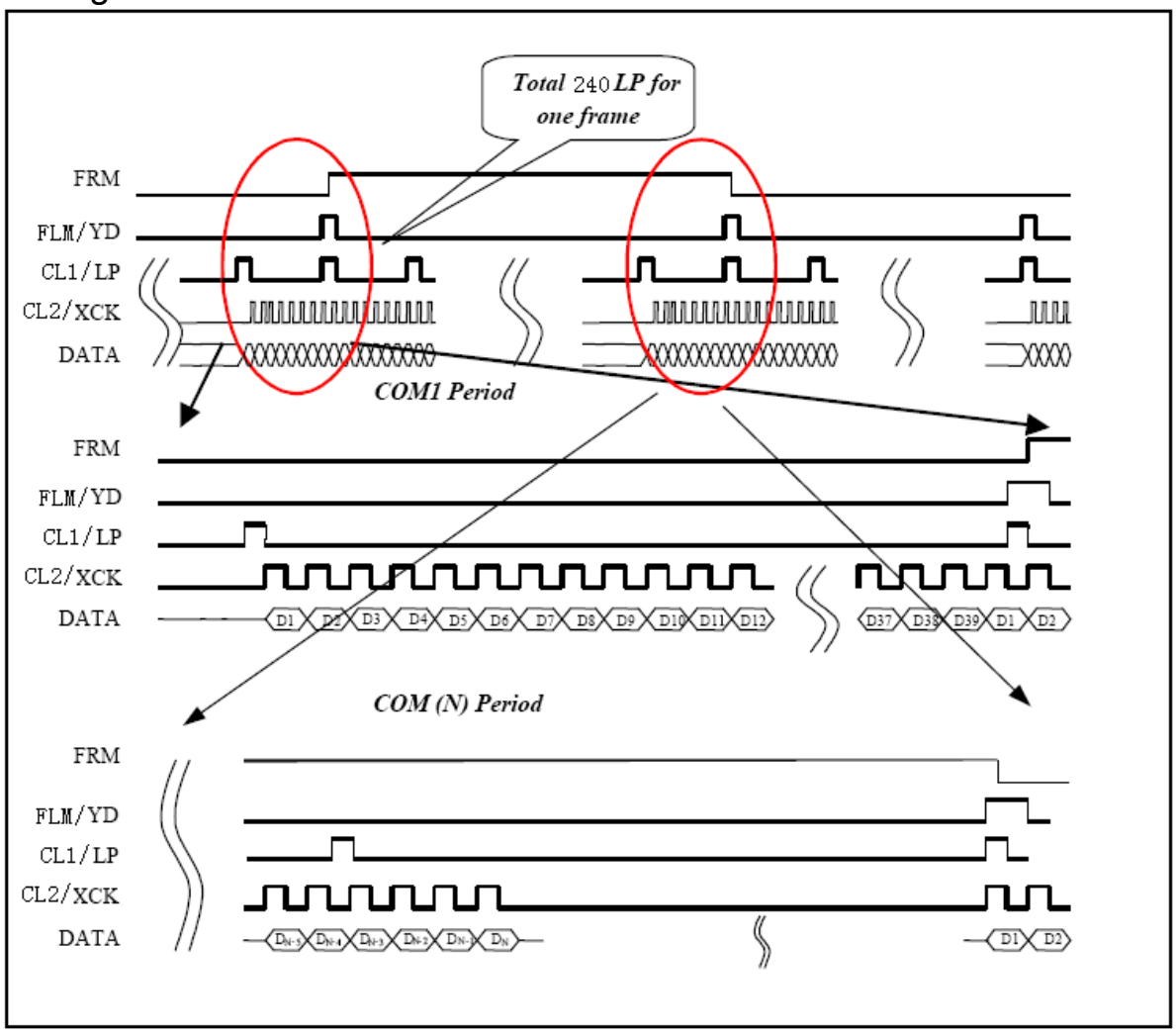
No	Item		Symbol	Condition	Min.	Typ.	Max.	Unit
1	Contrast Ratio		Cr	Ta=23±3°C V_{LCD} = Typ. (2)		4.2	3.5	-
2	Response time		T_{ON}	Ta=23±3°C	-	310	380	ms
3	Response time		T_{OFF}	Ta=23±3 °C	-	139	250	ms
4	Viewing Angle	3H	Θ1	Cr = 2 Ta=23±3 °C		50		Deg.
5		9H	Θ2			52		Deg.
6		6H	Θ3			25		Deg.
7		12H	Θ4			50		Deg.

Note:

(1) See Appendix 1 Definition of Optical Characteristics for detail.

(2) V_{LCD} can be found in 4.3 Electrical Characteristics *Supply Voltage for LCD Driver*

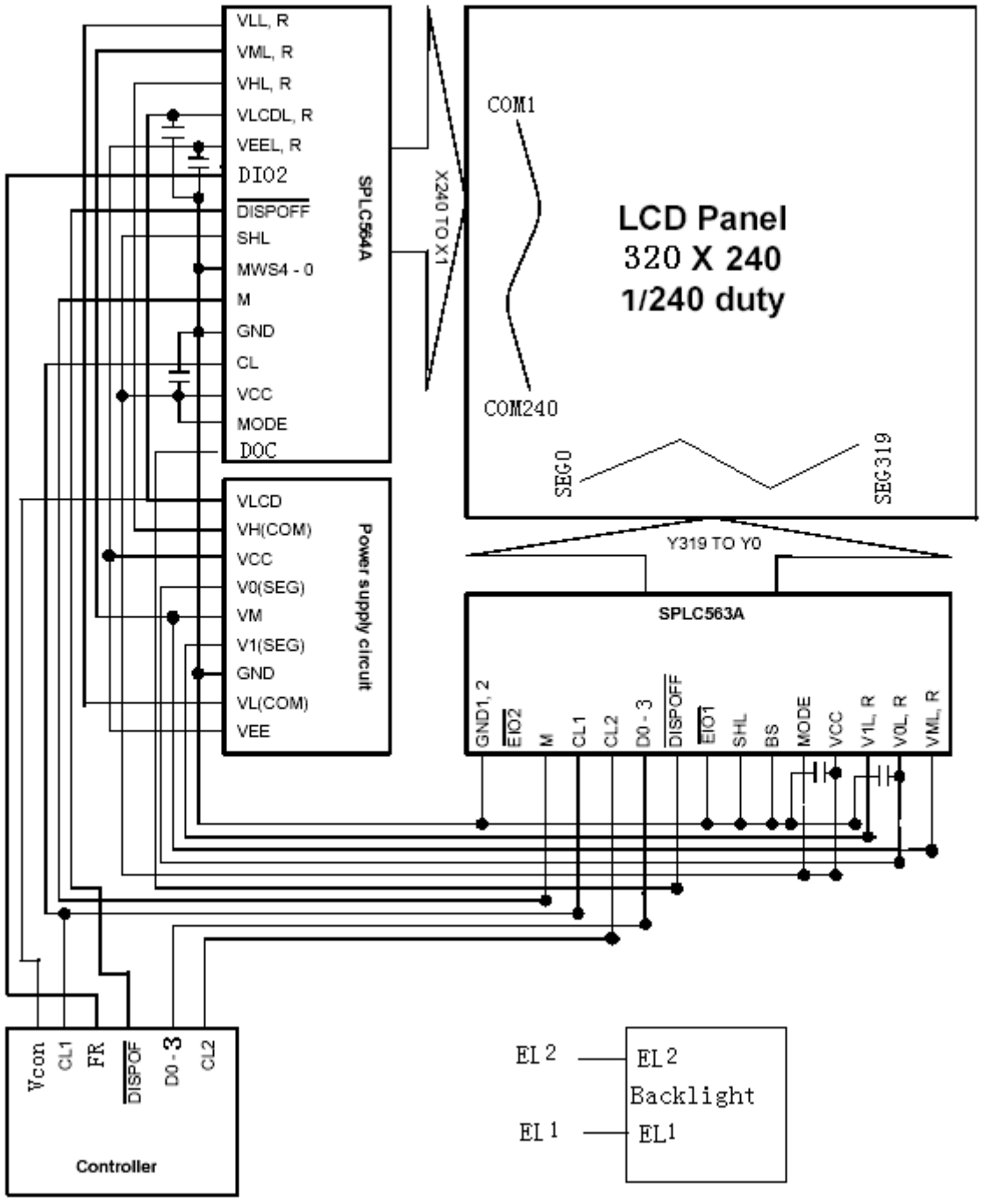
Timing Characteristics

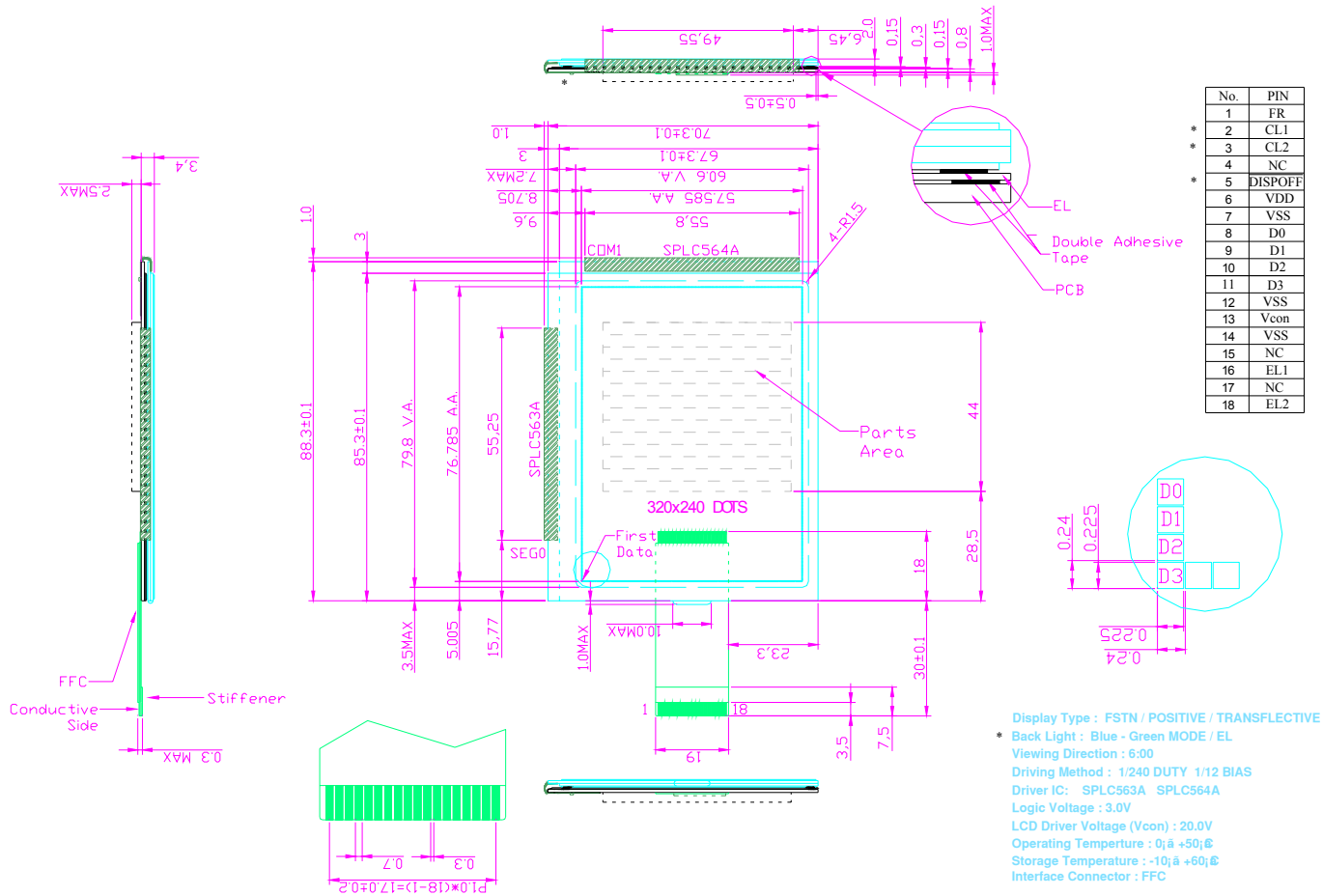


Interface Description

Pin NO.	Symbol	Function Description
1	FR	The signal indicate the beginning of each frame
2	CL2	Data shift clock pulse
3	CL1	Data latch pulse
4	NC	NC
5	DISPOFF	Grounding DISPOFF sets liquid crystal drive output to the VM level
6	VDD	VDD
7	VSS	VSS
8	D0	Display data
9	D1	Display data
10	D2	Display data
11	D3	Display data
12	VSS	VSS
13	Vcon	Connect a rheostat(50KΩ) to VSS
14	VSS	VSS
15	NC	NC
16	EL1	CONNECT TO EL BLACKLIGHT
17	NC	NC
18	EL2	CONNECT TO EL BLACKLIGHT

Block Diagram





No.	PIN
1	FR
* 2	CL1
* 3	CL2
4	NC
* 5	DISPOFF
6	VDD
7	VSS
8	D0
9	D1
10	D2
11	D3
12	VSS
13	Vcon
14	VSS
15	NC
16	EL1
17	NC
18	EL2

Display Type : FSTN / POSITIVE / TRANSFLECTIVE
* Back Light : Blue - Green MODE / EL
Viewing Direction : 6:00
Driving Method : 1/240 DUTY 1/12 BIAS
Driver IC: SPLC563A SPLC564A
Logic Voltage : 3.0V
LCD Driver Voltage (Vcon) : 20.0V
Operating Temperture : 0¡ã +50¡ã
Storage Temperature : -10¡ã +60¡ã
Interface Connector : FFC

AZ DISPLAYS, INC.		
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DWG NO: ED-4495-LCM/A	UNIT: MM	