



# AND065A041F-HB

## Custom 6.5" VGA ColorTFT-LCD Integrated Display Module

The AND065A041F-HB is a custom VGA (640 x 480) color a-Si TFT-LCD panel with a 6.5" diagonal viewing area.

### Features

- a-Si TFT-LCD
- 640 (W) x 3 (RGB) x 480 (H) vertical stripes, Highly minute
- "Transmitting type", low reflection treatment, high brightness, High contrast, Ultra wide viewing angle
- Digital 6 bit RGB input interface
- COG (Chip on Glass) composition
- LCD drive circuit is built in, but inverter for backlight is not built in.
- Applications include portable instruments and PDAs

### Mechanical Characteristics (H=Horizontal, V=Vertical, D=Depth)

Item	Specification	Unit
Outline Dimensions	151.0 (H) x 115.5 (V) x 10.0 (D)	mm
Number of Pixels	640 (H) x 3 (RGB) x 480 (V)	pixels
Color-Filter-Array	RGB vertical stripes	mm
Pixel Pitch	0.0685 (H) x 0.2055 (V)	mm
Effective Display Area	131.52 (H) x 98.63 (V)	mm
Gray Scales	64	-
Front Surface Treatment	Anti-Glare Coat (with WV film)	-
Backlight	CCFL with 3 wavelength spectrum	L-type
Consumption Power	4.00	W
Weight (TYP.)	205	grams

### Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit
Logic Voltage	$V_I$	-0.3	4.5	V
Supply Voltage	$V_{DD}$	-0.3	$V_{DD} + 0.3$	V
Backlight Input Voltage	-	-	3000	V <sub>rms</sub>
Operating Temperature (Panel Surface)	$T_{op}$	-20	70	°C
Storage Temperature (Panel Surface)	$T_{stg}$	-20	70	°C

### Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Power Voltage (input voltage)	$V_{DD}$	+3.15	+3.3	+3.45	V
Power Voltage (current consumption)	$I_{DD}$	-	240	350	mArms
Input Low Voltage	$V_{IL}$	0.0	-	0.3 * $V_{DD}$	V
Input High Voltage	$V_{IH}$	0.7 * $V_{DD}$	-	$V_{DD}$	V
Allowable Ripple Voltage	$V_{RP}$	-	-	100	mVp-p

\*1: 8 color bars pattern

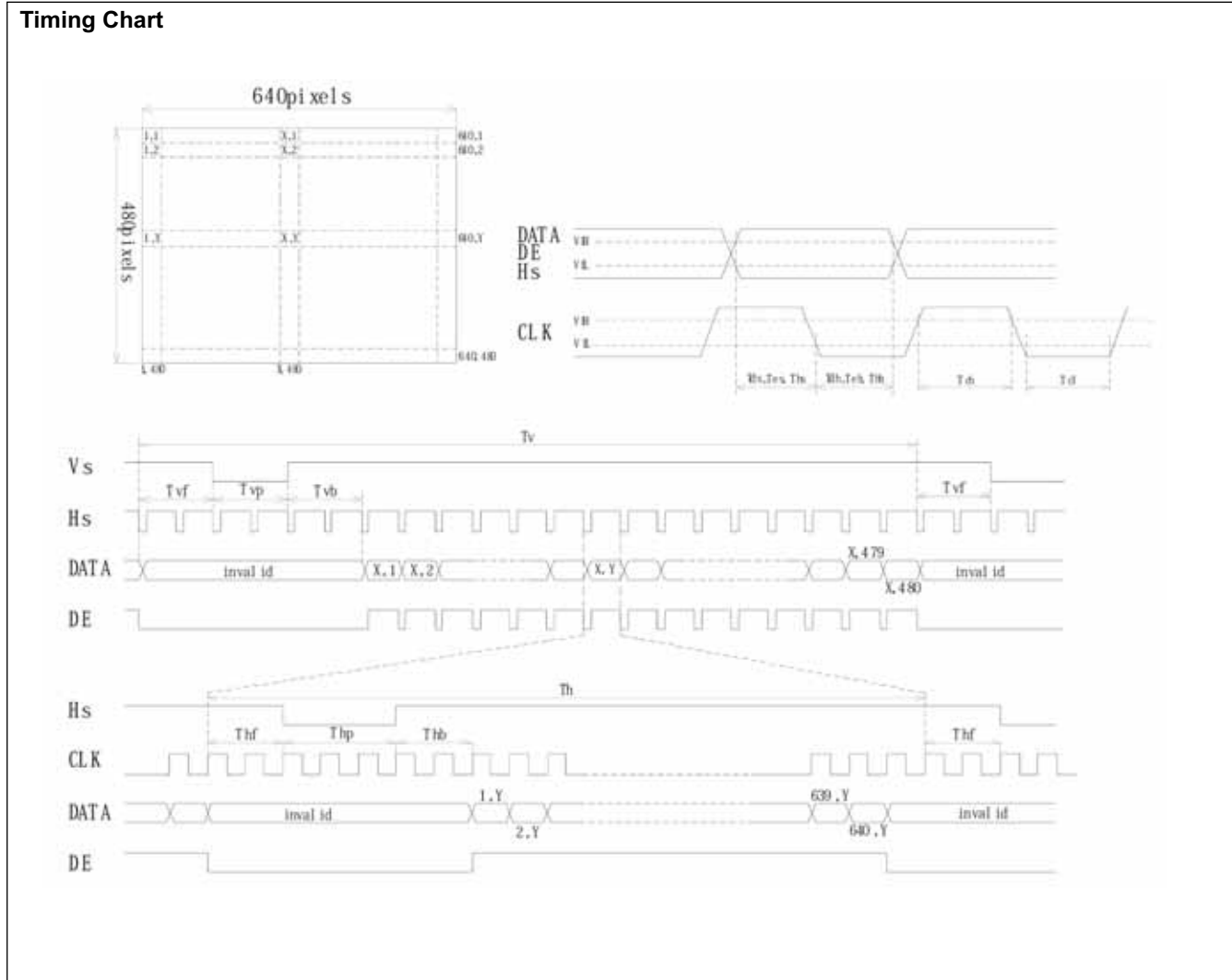
### Optical Characteristics (Ta = 25°C)

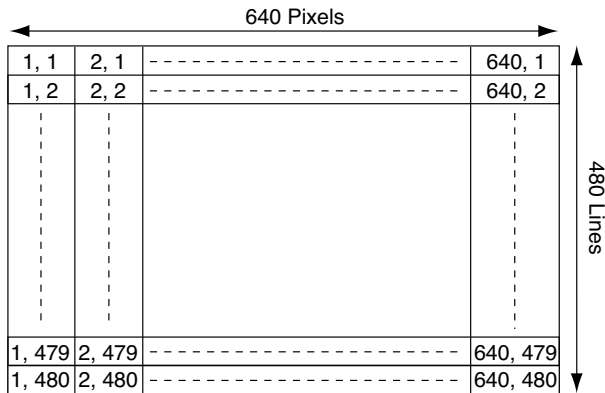
Item	Sym.	Condition			Standard Value			Unit
		$\theta$	$\phi$	C	Min	Typ	Max	
Brightness	B	0°	0°	-	300	400	-	cd/m <sup>2</sup>
Contrast ratio	C <sub>max</sub>	Best Angle			100	250	-	-
White color chromaticity	X	0°	0°	-	0.27	0.31	0.35	-
	Y	0°	0°	-	0.28	0.32	0.36	-
Bright./uniformity	-	0°	0°	-	0.7	-	-	-
Vert. viewing angle	$\theta U$	-	0°	≥10	40	60	-	°
	$\theta D$	-	0°	≥10	20	30	-	°
Horz. viewing angle	$\phi L$	0°	-	≥10	45	60	-	°
	$\phi R$	0°	-	≥10	45	60	-	°
Response time	$\tau r$	0°	0°	-	-	10	20	ms
	$\tau d$	0°	0°	-	-	15	30	ms

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.

**Timing Specifications**

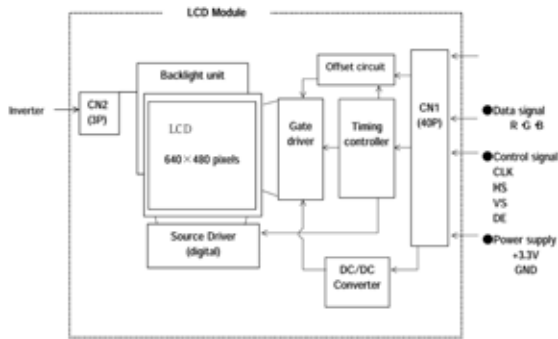
Characteristics		SYMBOL	MIN	TYP.	MAX	UNIT	REMARKS
CLK Clock	Frequency	Fck	-	25.175	-	MHz	
	Period	Clk	-	39.72	-	ns	
	High/Low Time	Tch/Tcl	12/12	-	-	ns	
DATA Data	Setup/Hold Time	Tds/Tdh	5/10	-	-	ns	
DE Data Enable	Setup/Hold Time	Tes/Teh	5/10	-	-	ns	
Hs Horiz. Sync.	Setup/Hold Time	Ths/Thh	5/10	-	-	ns	
	Period	Th	700	800	832	clk	
	Pulse Width	Thp	4	96	-	clk	
	Front/Back Porch	Thf/Thb	-/7	13/51	-/-	clk	
Vs Vert. Sync.	Period	Tv	516/16.2	525/16.7	534/17.6	th/ms	
	Pulse Width	Tvp	1	2	-	th	
	Front/Back Porch	Thf/Thb	-/4	11/32	-/-	th	

**Timing Chart**




Recommended Inverter: TBD

### Block Diagram



- 1) Drivers are fabricated on the LCD glass
- 2) Connectors  
 CN1  
 1L-FHR-B40S-HF / JAE  
 Mating connector: FFC (0.5mm pitch)

### Photo of back of display



### Connector Pin Assignments for Interface CN1; Signal Interface

Terminal No.	Symbol	Function
1	VDD	+3.3V Power Supply
2	VDD	+3.3V Power Supply
3	VDD	+3.3V Power Supply
4	VDD	+3.3V Power Supply
5	GND	Signal Ground
6	GSX1	Display period compensation signal
7	GND	Signal Ground
8	DOFF1	Non-display pd. compensation signal
9	GND	Signal Ground
10	DE	Data Enable Signal
11	GND	Signal Ground
12	VS	Vertical Sync.
13	GND	Signal Ground
14	HS	Horizontal Sync.
15	GND	Signal Ground
16	B5	Blue Data
17	B4	
18	B3	
19	B2	
20	B1	
21	B0	Green Data
22	GND	
23	G5	
24	G4	
25	G3	
26	G2	
27	G1	
28	G0	
29	GND	Red Data
30	R5	
31	R4	
32	R3	
33	R2	
34	R1	
35	R0	
36	GND	Signal Ground
37	GND	Signal Ground
38	CLK	Dot Clock
39	GND	Signal Ground
40	GND	Signal Ground

Note (2): 256K colors are displayed by the combinations of 18 data bits.

	Display	R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0	Gray Scale Level
Basic Color	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	-
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	-
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	-
	Lt. Blue	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	-
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	-
	Purple	H	H	H	H	H	H	L	L	L	L	L	L	H	H	H	H	H	H	-
	Yellow	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	L	L	-
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-
Gray Scale of Red	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark ↑ ↓	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L1
		L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~L60
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Light	H	H	H	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L61
		H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L62
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	Green L63
Gray Scale of Green	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark ↑ ↓	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L1
		L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~L60
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Light	L	L	L	L	L	L	H	H	H	H	L	H	L	L	L	L	L	L	L61
		L	L	L	L	L	L	H	H	H	H	H	L	L	L	L	L	L	L	L62
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	Green L63
Gray Scale of Blue	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark ↑ ↓	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L1
		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~L60
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Light	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	L	H	L61
		L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	L	L62
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	Blue L63
Gray Scale of White & Black	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark ↑ ↓	L	L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L1
		L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~L60
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Light	H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	H	L61
		H	H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	L62
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	White L63

## Mechanical Drawing

