TENTATIVE

CONTENTS

2. OVERVIEW

T-55465D065J-LW-A-AAN is 6.5" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs, control circuit, and backlight unit.

By applying 6 bit digital data 640 480, 262k-color images are displayed on the 6.5" diagonal screen. Input power voltage is 3.3 V for LCD driving.
The type of data and control signals are digital and transmitted via CMOS interface per Typ. 25 MHz clock cycle.

Driver circuit for LED backlight is not included in this module. General specifications are summarized in the following table:

ITEM	SPECIFICATION
Display Area (mm)	132.48(H) 99.36(V) (6.5-inch diagonal)
Number of Dots	640 3 (H) 480 (V)
Pixel Pitch (mm)	0.207 (H) 0.207 (V)
Color Pixel Arrangement	RGB vertical stripe
Display Mode	Normally white TN
Number of Color	262k
Luminance (cd/m^2)	700
Wide Viewing Angle Technology	Optical compensation film
Viewing Angle (CR 10)	80 80° (H) 60~80° (V)
Surface Treatment	Anti-glare and hard-coating 3H
Electrical Interface	CMOS
Optimum Viewing Angle (Contrast ratio)	6 o'clock
Module Size (mm)	154.0 (W) 121.0 (H) 11.0 (D)
Module Mass (g)	185
Backlight Unit	LED, edge-light, replaceable

Characteristic value without any note is typical value.

3. ABSOLUTE MAXIMUM RATINGS

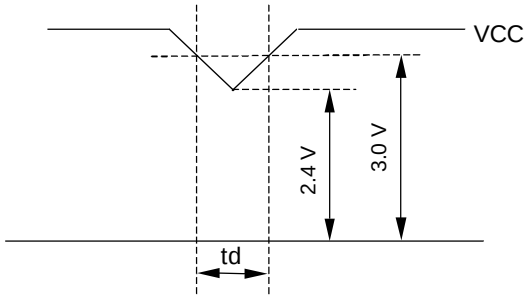
ITEM	SYMBOL	MIN.	MAX	UNIT
Power Supply Voltage for LCD	VCC	0.3	4.0	V

VCC-dip conditions:

1) When 2.4 V VCC < 3.0 V, td 10 ms

2) When VCC < 2.4 V

VCC-dip conditions should also follow the power and signals sequence.



*2) VCC = + 3.3 V, f

5. INTERFACE PIN CONNECTION

(1) CN 1(Interface Signal)

Used connector: DF9B-31P-1V(32) (HIROSE)

Corresponding connector: DF9-31S-1V(32) (HIROSE)

Pin No.	Symbol	Function
1	GND	
2	DCLK	Clock signal for sampling catch data signal
3	HD	Horizontal sync signal *1)
4	VD	Vertical sync signal *1)
5	GND	
6	R0	Red data signal(LSB)
7	R1	Red data signal
8	R2	Red data signal
9	R3	Red data signal
10	R4	Red data signal
11	R5	Red data signal(MSB)
12	GND	
13	G0	Green data signal(LSB)
14	G1	Green data signal
15	G2	Green data signal
16	G3	Green data signal
17	G4	Green data signal
18	G5	Green data signal(MSB)

(2) CN 2(Backlight)

Backlight-side connector: SM06B-SHLS-TF (JST)

Corresponding connector: SHLP-06V-S-B (JST)

Pin No.	Symbol	Function
1	NC	This pin should be open.
2	NC	This pin should be open.
3	LED C 1	LED cathode 1
4	LED A 1	LED anode 1
5	LED A 2	LED anode 2
6	LED C 2	LED cathode 2

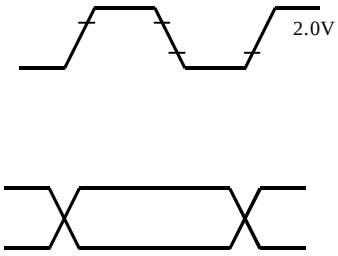
6. INTERFACE TIMING

(1) Timing Specifications

ITEM			SYMBOL	MIN.	TYP.	MAX.	UNIT
DCLK	Frequency		f_{CLK}	20	25	30	MHz
	Period		t_{CLK}	33.3	40	50	ns
	Low Width		t_{WCL}	10	--	--	ns
	High Width		t_{WCH}	10	--	--	ns
DATA(R,G,B), DENA	Set up time		t_{DS}	4	--	--	ns
	Hold time		t_{DH}	4	--	--	ns
		Active Time	t_{HA}	640	640	640	t_{CLK}
		Blanking Time	t_{HB}	20	160	--	t_{CLK}
		Frequency	f_H	27	31.5	38	kHzf

(2) Timing Chart

a. Pixel Timing Chart



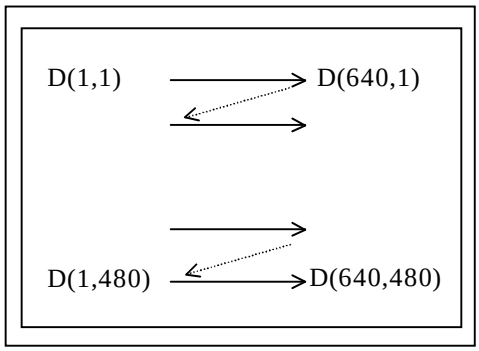
(3) Color Data Assignment

	INPUT DATA		
	R DATA	G DATA	B DATA
	R5 R4 R3 R2 R1 R0 G5		

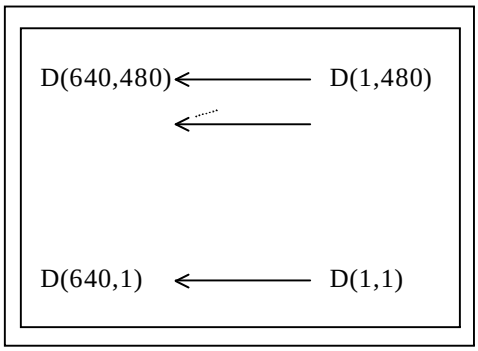
(4) Display Position and Scan Direction

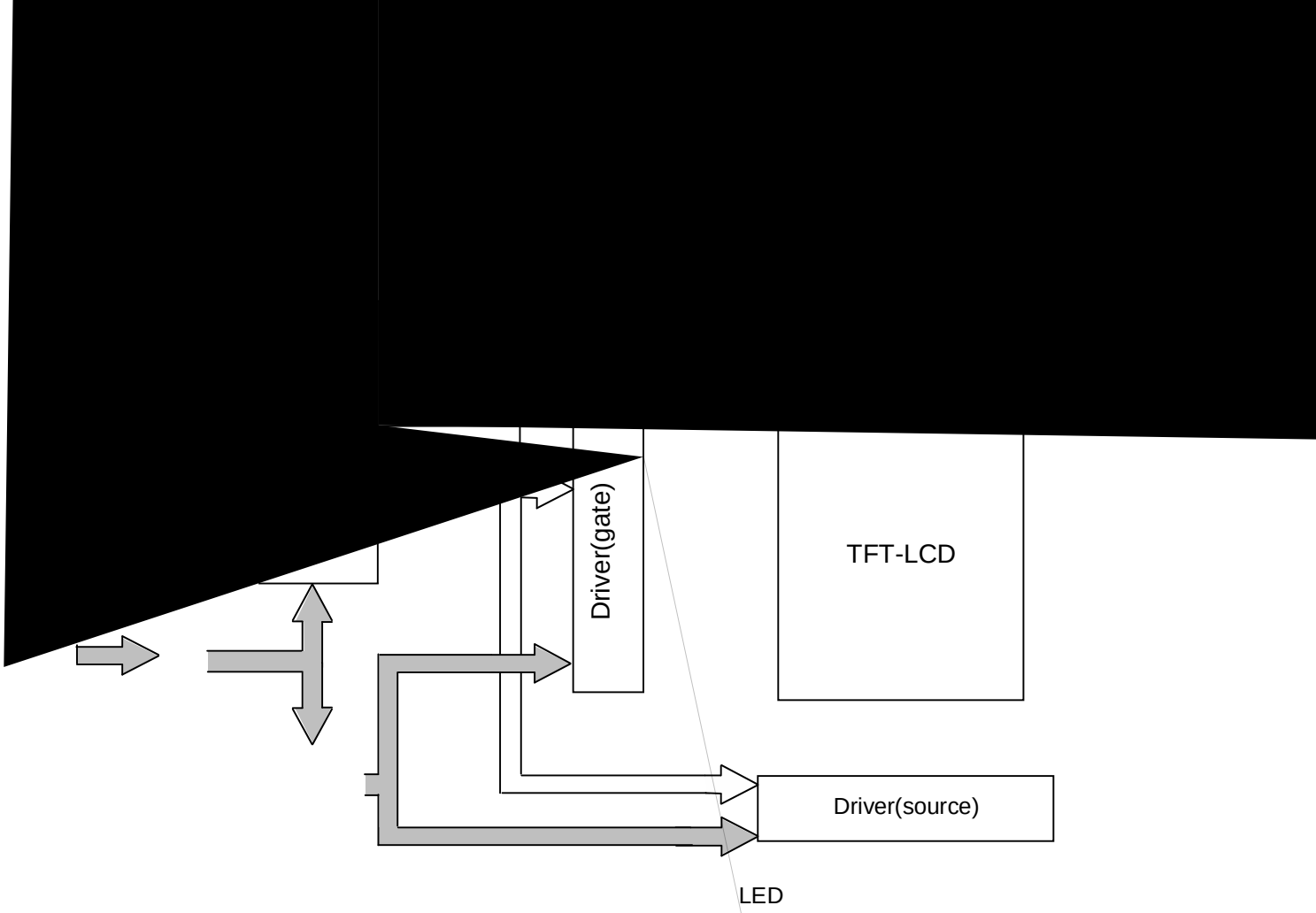
D(X,Y) shows the data number of input signal for LCD panel signal processing PCB.

SC: Low



SC: High

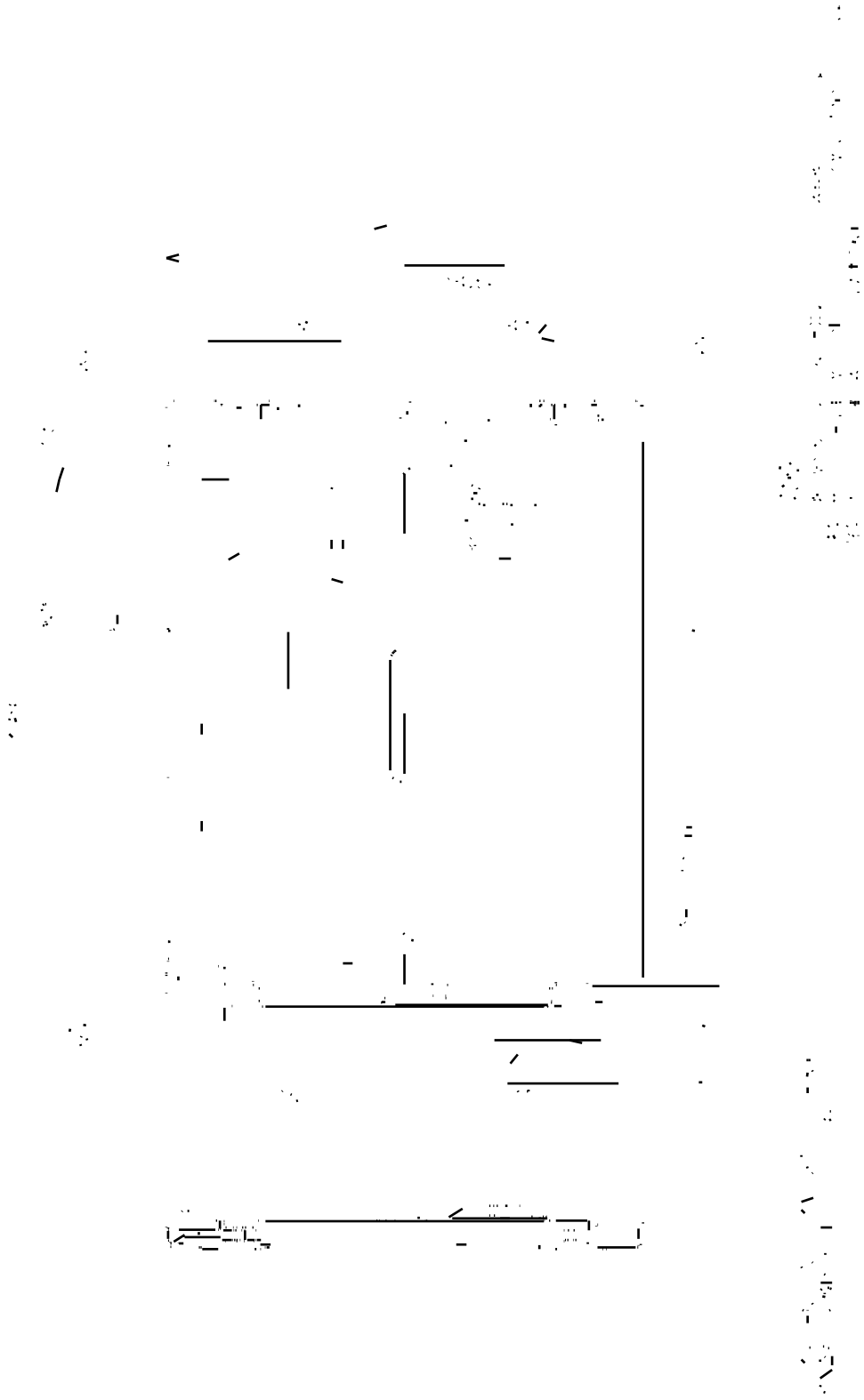



Driver(gate)
TFT-LCD
Driver(source)
LED

8. MECHANICAL SPECIFICATIONS

(1) Front Side

(2) Rear Side



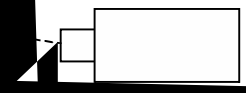
°C, VCC=3.3 V, Input Signals: Typ. Values shown in Section 6

TION	MIN.	TYP.	MAX.	UNIT	Remarks
H	350	600	--	--	*1)*2)*5)
H	560	700	--	cd/m²	*1)*5)
H	--	--	30	%	*1)*3)*5)
H	--	6	--	ms	*1)*4)*5)
H	--	19	--	ms	*1)*4)*5)
10	70~70	80~80	--	°	*1)*5)
	50~70	60~80	--	°	*1)*5)
	--	--	2	s	*6)
	0.516	0.556	0.596	--	*1)*5)
	0.301	0.341	0.381		
	0.321	0.361	0.401		
	0.522	0.562	0.602		
	0.126	0.166	0.206		
	0.100	0.140	0.180		
	0.273	0.313	0.353		
	0.289	0.329	0.369		

NOLTA) for color coordinates, EZContrast(ELDIM) for CON) for others under the dark room condition (no m turning on the backlight unless noted.

coordinates is as follows.

Photodetector
Luminance : =2 (BM-5A)
Color coordinates : =1 (CS1000)



*1) Measurement Point

Contrast Ratio, Luminance, Response Time, Viewing Angle, Color Coordinates: Display Center
Luminance Uniformity: point 1 5 shown in a figure below

*6) Image Sticking

10. RELIABILITY TEST CONDITION

(1) Temperature and Humidity

ITEM	CONDITIONS
HIGH TEMPERATURE HIGH HUMIDITY OPERATION	40°C, 90%RH, 240 h (No condensation)
HIGH TEMPERATURE OPERATION	80°C, 240 h
LOW TEMPERATURE OPERATION	30°C, 240 h
HIGH TEMPERATURE STORAGE	80°C, 240 h
LOW TEMPERATURE STORAGE	30°C, 240 h
THERMAL SHOCK (NON-OPERATION)	BETWEEN 30°C (1h) and 80°C(1h), 100 CYCLES

(2) Shock & Vibration

ITEM	CONDITIONS
SHOCK (NON-OPERATION)	Shock level: 1470m/s^2 (150G) Waveform: half sinusoidal wave, 2ms Number of shocks: one shock input in each direction of three mutually perpendicular axis for a total of six shock inputs
VIBRATION (NON-OPERATION)	Vibration level: 9.8m/s^2 (1.0G) Waveform: sinusoidal Frequency range: 5 to 500Hz Frequency sweep rate: 0.5 octave /min Duration: one sweep from 5 to 500 Hz in each of three mutually perpendicular axis(total 3 hours)

(3) Judgment standard

The judgment of the above tests should be made as follow:

Pass: Normal display image, no damage of the display function. (ex. no line defect)
Partial transformation of the module parts should be ignored.

Fail: No display image, damage of the display function. (ex. line defect)

11. OTHER FEATURE

This LCD module complies with RoHS*) directive.

*) RoHS: Restriction of the use of certain hazardous substances in electrical and electronic equipment

frames can happen during a long preservation of soiled LCD modules.

i. Please handle metal frame carefully because edge of metal frame is very sharp.

j. Please pay attention to handling LED backlight cable so that it is not tugged in connecting with LED driver.

k. Please connect the metal frame of LCD module to GND in order to minimize the effect of external noise and EMI.

l. Be sure to connect the cables and the connecters correctly.

(2) OPERATING PRECAUTIONS

a. Please be sure to turn off the power supply before connecting and disconnecting signal input cable.

b. Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification.

c. The interface signal speed is very high. Please pay attention to transmission line design and other high speed signal precautions to satisfy signal specification.

d. A condensation might happen on the surface and inside of LCD module in case of sudden change of ambient temperature.

e. Please pay attention not to display the same pattern for very long time. Image might stick on LCD. Even if image sticking happens, it may disappear as the operation time proceeds.

f. Please obey the same safe instructions as ones being prepared for ordinary electronic products.

(3) PRECAUTIONS WITH ELECTROSTATICS

a. This LCD module use CMOS-IC on circuit board and TFT-LCD panel, and so it is easy to be affected by electrostatics. Please be careful with electrostatics by the way of your body connecting to the ground and so on.

b. Please remove protection film very slowly from the surface of LCD module to prevent from electrostatics occurrence.

(4) STORAGE PRECAUTIONS

a. Please do not leave the LCDs in the environment of high humidity and high temperature such as 60°C90%RH.

b. Please do not leave the LCDs in the environment of low temperature; below –30°C.

(5) SAFETY PRECAUTIONS

a. When you waste damaged or unnecessary LCDs, it is recommended to crush LCDs into pieces

and wash them off with solvents such as acetone and ethanol, which should later be burned.