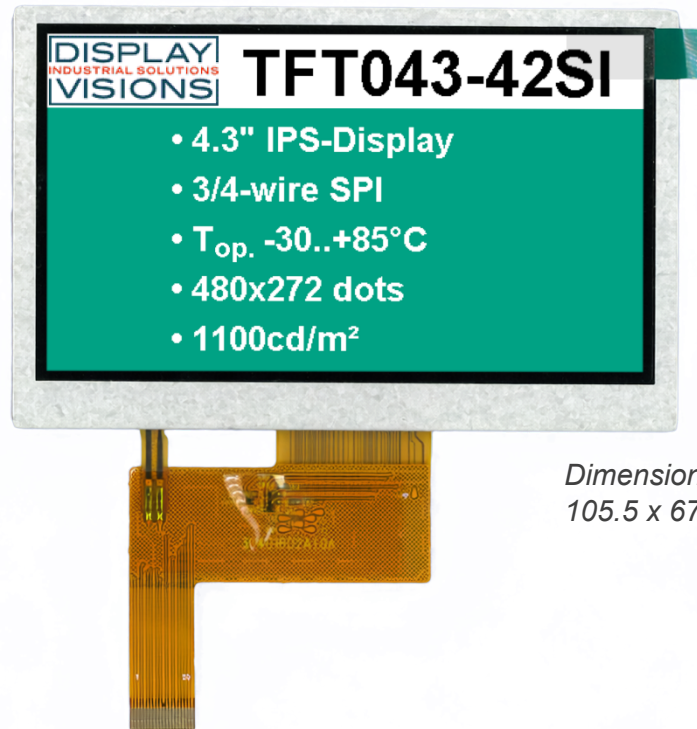


INCL CONTROLLER FOR 3-/4-WIRE SPI



Dimensions
105.5 x 67.2 x 2.92 mm

FEATURES

- 4.3" TFT WITH SPI INTERFACE
- HIGH RESOLUTION
- COLOR 480x272x3 DOTS
- IPS TECHNOLOGY WITH WIDE VIEWING ANGLE
- VERY BRIGHT 1100cd/m² - SUNLIGHT READABLE
- 3.3V POWER SUPPLY
- SPI-INTERFACE: 3-WIRE, 4-WIRE, SINGLE AND DUAL-SPI
- OPTIONALLY WITH PCA TOUCHPANEL
- WIDE TEMPERATURE RANGE (T_{OP} -30°C TO +85°C)

ORDERING CODE

4.3" IPS FULL GRAPHIC DISPLAY WITH SPI INTERFACE

EA TFT043-42SINN

4.3" IPS FULL GRAPHIC DISPLAY WITH SPI INTERFACE AND PCAP

EA TFT043-42SITS

ACCESSORY

ADAPTER BOARD INCL. LED DRIVER

EA 9980-TFT043SINN

CONTENT

FEATURES	1
OrdERING CODE	1
Accessory	1
1. Revision History	3
2. General Features	4
3. Block Diagram	5
4. Interface Definition	6
5. Operation Specifications	7
5.1. Absolute Maximum Ratings	7
5.2. Typical Operation Parameters	7
5.3. Backlight Driving Parameters	8
6. Optical Characteristics	9
7. Timing Characteristics	12
7.1. Display Serial Interface	12
7.2. Power ON/OFF Sequence	14
7.2.1. Power ON Sequence	14
7.2.2. Power OFF Sequence	14
8. Touch Panel	15
8.1 Pinout	15
9. Reliability Test	16
10. Precautions Relating Product Using	17
10.1. Safety	17
10.2. Handling	17
10.3. Static Electricity	17
10.4. Storage	17
10.5. Cleaning	17
11. Terms Of Warranty	18
11.1. Applicable Warrant Period	18
11.2. Unaccepted Responsibility And Limited Warranty	18
12. Dimensions w./o. touch (EA TFT043-42SINN)	19
13. Dimensions with Touch panel (EA TFT043-42SITS)	20

1. REVISION HISTORY

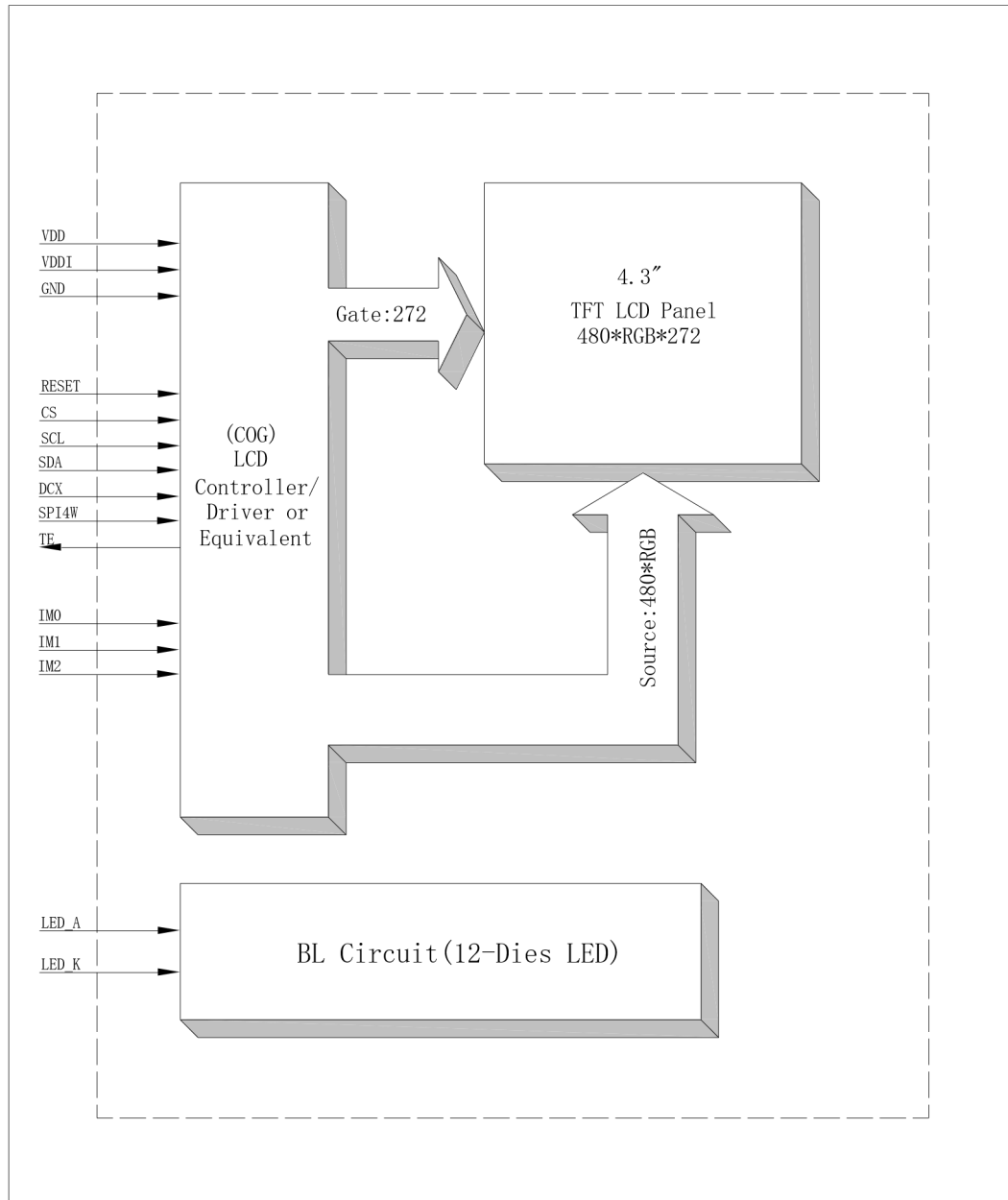
Version	Date	Contents	Note
A	2026-SEP-01	First Release	
	2026-OCT-02	Add Version with PCAP -42SITS	

2. GENERAL FEATURES

No.	Item	Specification	Remark
1	LCD Size	4.3 inch	
2	Driver element	a-Si TFT active matrix	
3	Resolution	480 x 3(RGB) x 272	
4	Display mode	IPS, normally black, transmissive	
5	View direction	All around	
6	Gray scale inversion	None	
7	LCM (W×H×D)	105.5 x 67.2 x 2.92 mm	Note 1
8	Active area(W×H)	95.04 x 53.86 mm	
9	Dot pitch(W×H)	0.198 x 0.198 mm	
10	Top Polarizer Surface	Anti-Glare	
11	Color arrangement	RGB vertical stripe	
12	Interface	3/4-wire SPI (single and dual)	
13	TFT driver	NV3041	
14	Colors	16.7M	
15	Backlight type	12 dies white LED	
16	Brightness	1100 cd/m ² (typ.)	
17	Brightness w. PCAP	950 cd/m ² (typ.)	
18	Touch panel type	PCAP	
19	Touchpanel Controller	FT5446	
20	Interface Touchpanel	I ² C	
21	Weight	45 g (w./o. touch)	

Note 1: Refer to Mechanical Drawing.

3. BLOCK DIAGRAM



4. INTERFACE DEFINITION

Pin No.	Symbol	I/O	Function
1	VDD	P	Power supply for analog circuit
2	VDDI	P	Power supply for digital interface I/O pins.
3	GND	P	Ground
4	RESET	I	Reset pin, active low
5	GND	P	Ground
6	CS	I	Chip select, internal pull high
7	SCL/CLK	I	Clock input, internal pull high.
8	GND	P	Ground
9	SDA/MOSI	I/O	Serial communication data input and output, internal pull low.
10	DCX	I	Data or Command flag DCX = "H" is data DCX = "L" is command Internal pull high.
11	NC	-	No connection
12	SPI4W	I	Std SPI 3/4 wire selection. SPI4W="H", 4 wire SPI; SPI4W="L", 3wire SPI.
13	GND	P	Ground
14	TE	O	Tearing effect output pin is used to synchronize MCU frame writing, activated by S/W command. When this pin is not activated (TE function OFF), this pin is GND level.
15	GND	P	Ground
16~18	IM0~IM2	I	IM = 3'b000, Disable; IM = 3'b001, Standard SPI interface enable; IM = 3'b010, Dual SPI interface enable; IM = 3'b011, Quard SPI interface enable; Internal pull low.
19	LED_A	P	Anode of LED backlight
20	LED_K	P	Cathode of LED backlight

I: input, O: output, P: Power

5. OPERATION SPECIFICATIONS

5.1. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Supply voltage for analog	VDD	-0.3	4.6	V	
Supply voltage for logic	VDI	-0.3	4.6	V	
Operation Temperature	T _{OP}	-30	85	°C	
Storage Temperature	T _{ST}	-40	85	°C	
Humidity (No condensation)	RH	-	90	%	T ≤ 40°C
		-	50	%	T > 40°C
LED Forward Current	I _F		30	mA	each LED

Note 1: The absolute maximum rating values are not allowed to be exceeded at any time. Otherwise, under some extreme conditions, the characteristics of the module might be destroyed permanently and cannot recover.

5.2. TYPICAL OPERATION PARAMETERS

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Supply Voltage for Analog	VDD	3.0	3.3	3.6	V	
Supply Voltage for Logic	VDDI	1.65	-	VDD	V	
Input logic high voltage	V _{IH}	0.7xV _{DDI}	-	VDDI	V	
Input logic low voltage	V _{IL}	0	-	0.3xVDDI	V	
Current	I _{OC}	-	15	-	mA	

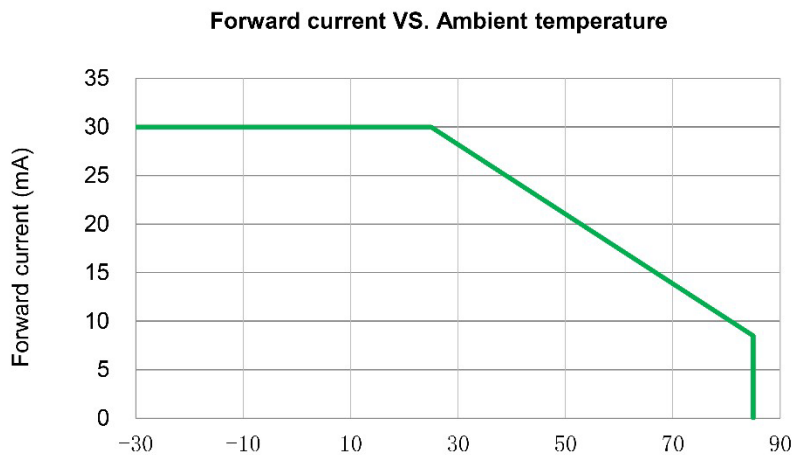
5.3. BACKLIGHT DRIVING PARAMETERS

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V_L	11.2	12.4	13.6	V	$I_L = 60\text{mA}$
Current for LED Backlight	I_L	-	60	-	mA	
Power consumption	P	-	0.744	-	W	
LED life time	-	30,000	50,000	-	Hr	Note 1

Note 1: The “LED life time ” is defined as the module brightness decrease to 50% original brightness at $T_a=25^\circ\text{C}$ and $I_L = 20\text{mA}$ for each LED. The life time of LED will reduce if LED is driven by high current, high ambient temperature and humidity conditions.

Note 2: We recommend a typical LED current of 15mA per LED for an optimum of life time over the full temperature range.

Note 3: Forward current derating curve VS ambient temperature



6. OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR ≥ 10)	θ_L	$\Phi=180^\circ$ (9 o'clock)	80	85	-	degree	Note 1
	θ_R	$\Phi=0^\circ$ (3 o'clock)	80	85	-		
	θ_T	$\Phi=90^\circ$ (12 o'clock)	80	85	-		
	θ_B	$\Phi=270^\circ$ (6 o'clock)	80	85	-		
Contrast ratio	CR	Normal $\theta = \Phi=0^\circ$	800	1000	-	-	Note 2,3
Response time	T _{ON}		-	13	15	ms	Note 2,4
	T _{OFF}		-	17	25	ms	
Color chromaticity	W _X		-0.05	0.335	+0.05	-	Note 2 Note 5
	W _Y			0.380		-	
	R _X			0.613		-	
	R _Y			0.322		-	
	G _X			0.363		-	
	G _Y			0.600		-	
	B _X			0.141		-	
	B _Y			0.154		-	
Luminance	L	-42SINN	880	1100	-	cd/m ²	Note 6
		-42SITS		950			
Luminance uniformity	Y _U		80	85	-	%	Note 7

Test Conditions:

$V_{DD} = 3.3V$, $I_L = 60mA$ (Backlight current), the ambient temperature is 25 °C.

The test systems refer to Note 2.

Note 1: Definition of viewing angle range

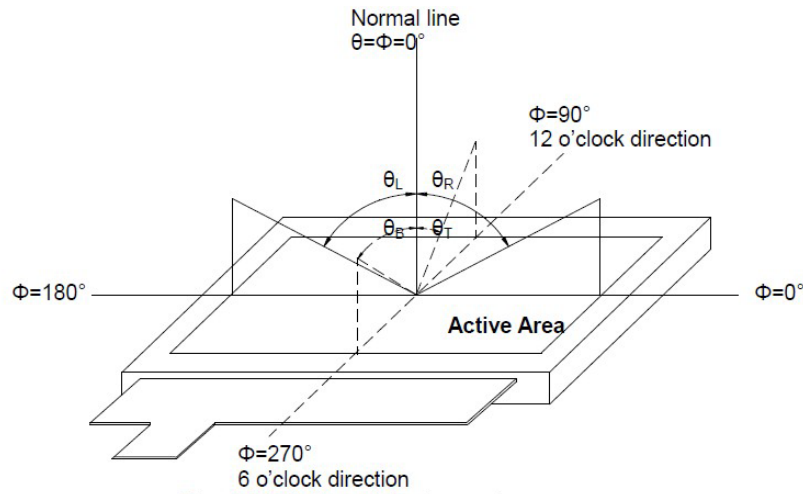


Fig. 4-1 Definition of viewing angle

Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen.

(Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)

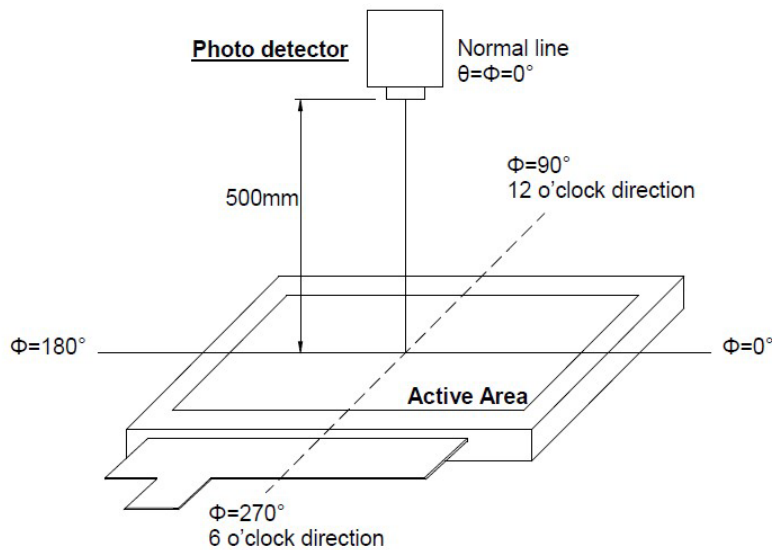


Fig. 4-2 Optical measurement system setup

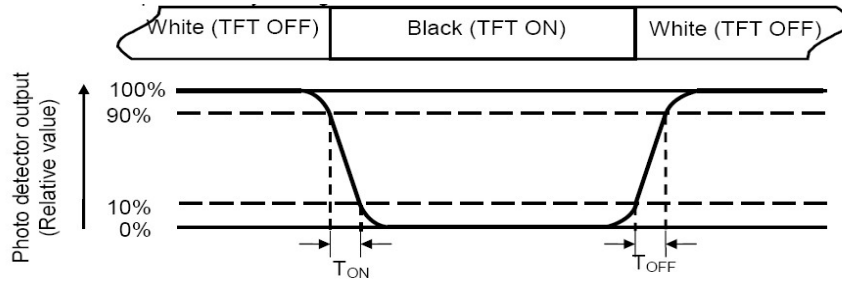
Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo

detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of luminance: Measured at the center area of the panel when LCD panel is driven at “white” state.(Refer to Fig. 4-4).

L_v = Average Surface Luminance with all white pixels ($P_1, P_2, P_3, \dots, P_n$)

Note 7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to Fig. 4-4).

Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{min}}{B_{max}}$$

L-----Active area length

W----- Active area width

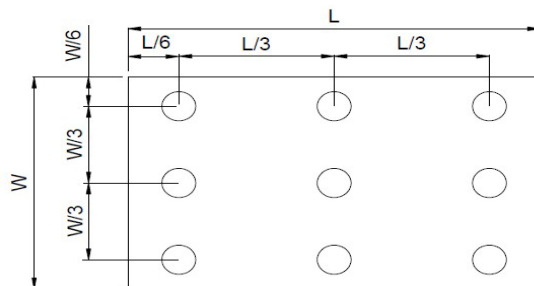


Fig. 4-4 Definition of measuring points

B_{max} : The measured maximum luminance of all measurement position.

B_{min} : The measured minimum luminance of all measurement position.

7. TIMING CHARACTERISTICS

7.1. DISPLAY SERIAL INTERFACE

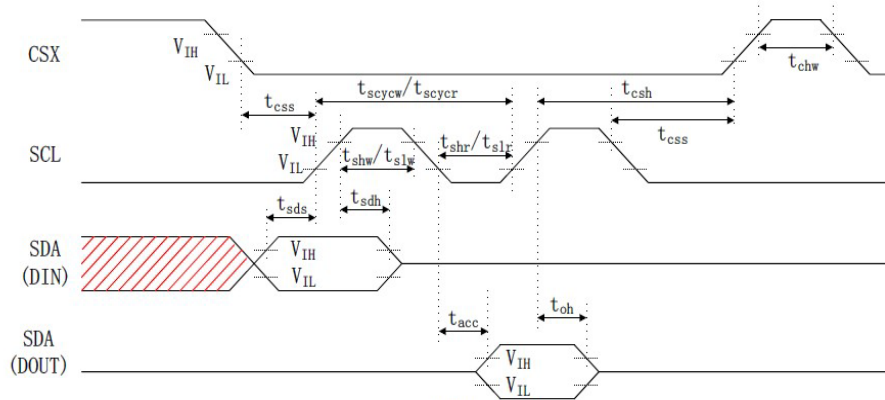


Figure 8-3-2

Signal	Symbol	Parameter	MIN	MAX	UNIT	Description
CSX	T_{CSS}	Chip Select Setup Time	10		ns	
	T_{CSH}	Chip Select Hold Time	30		ns	
	T_{CHW}	Chip Select "H" Pulse Width	30		ns	
SCL	T_{SCYCW}	Serial Clock Cycle(Write)	12.5		ns	QSPI 4 lane format (5-6-5): $T_{SCYCW} > 25\text{ns}$ (see "6.4.12.") QSPI 4 lane format (6-6-6): $T_{SCYCW} > 16\text{ns}$ (see "6.4.13") Other Format $T_{SCYCW} > 12.5\text{ns}$
	T_{SHW}	S"L" "H" Pulse Width(Write)	$T_{SCYCW}/2$		ns	
	T_{SLW}	S"L" "L" Pulse Width(Write)	$T_{SCYCW}/2$		ns	
	T_{SCYCR}	Serial Clock Cycle(Read)	150		ns	
	T_{SHR}	S"L" "H" Pulse Width(Read)	$T_{SCYCR}/2$		ns	
	T_{SLR}	S"L" "L" Pulse Width(Read)	$T_{SCYCR}/2$		ns	
SDA(DIN) (DOUT)	T_{SDS}	Data Setup Time	5		ns	
	T_{SDH}	Data Hold Time	5		ns	
	T_{ACC}	Access Time	5		ns	
	T_{OH}	Output Disable Time	10		ns	$CL_{max}=30\text{pF}$ $CL_{min}=8\text{pF}$

Table 8-3-2-1: Serial Interface Characteristics

Note 1: VDDI=1.65 to 3.3V, VDD=2.6 to 3.3V, AGND=GND=0V. Ta=-30 to 70°C (to +85°C no damage)

Note 2: The input signal rise time and fall time(T_r , T_f) is specified at 15 ns or less. Logic high and low levels are specified as 10% and 90% of VDDI for Input signals.

Signal	Symbol	Parameter	MIN	MAX	UNIT	Description
CSX	T _{CSS}	Chip Select Setup Time	10		ns	
	T _{CSH}	Chip Select Hold Time	30		ns	
	T _{CHW}	Chip Select "H" Pulse Width	30		ns	
SCL	T _{SCYCW}	Serial Clock Cycle(Write)	12.5		ns	
	T _{SHW}	S "L" "H" Pulse Width(Write)	T _{SCYCW} /2		ns	
	T _{SLW}	S "L" "L" Pulse Width(Write)	T _{SCYCW} /2		ns	
	T _{SCYCR}	Serial Clock Cycle(Read)	150		ns	
	T _{SHR}	S "L" "H" Pulse Width(Read)	T _{SCYCR} /2		ns	
	T _{SLR}	S "L" "L" Pulse Width(Read)	T _{SCYCR} /2		ns	
D/CX	T _{DCS}	D/CX Setup Time	5		ns	
	T _{DCH}	D/CX Hold Time	5		ns	
SDA(DIN) (DOUT)	T _{SDS}	Data Setup Time	5		ns	
	T _{SDH}	Data Hold Time	5		ns	
	T _{ACC}	Access Time	5		ns	
	T _{OH}	Output Disable Time	10		ns	CLmax=30pF CLmin=8pF

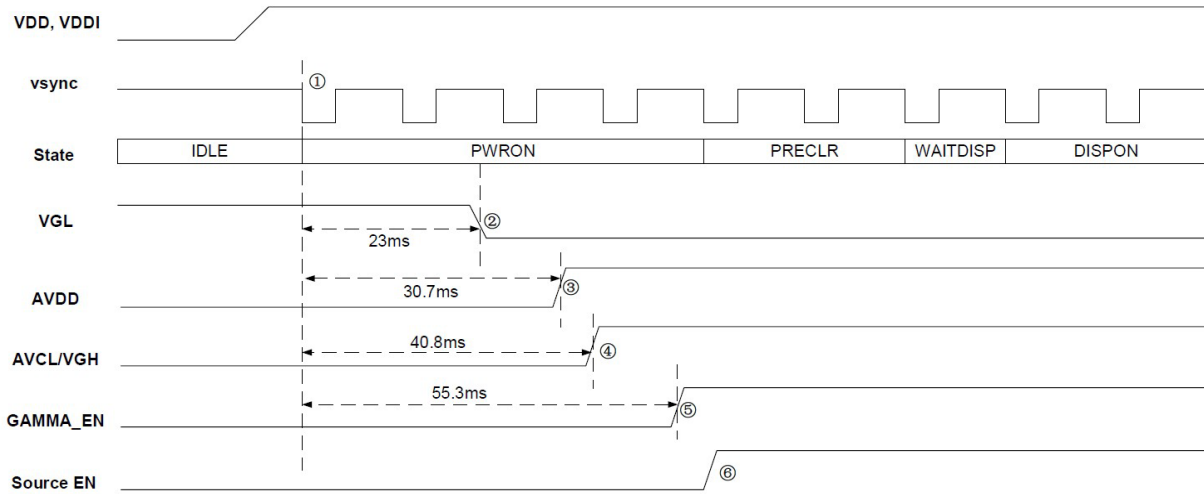
Table 8-3-2-2: 4 wire Serial Interface Characteristics

Note 1: VDDI=1.65 to 3.3V, VDD=2.6 to 3.3V, AGND=GND=0V. Ta=-30 to 70°C (to +85°C no damage)

Note 2: The input signal rise time and fall time (tr, tf) is specified at 15 ns or less. Logic high and low levels are specified as 10% and 90% of VDDI for Input signals.

7.2. POWER ON/OFF SEQUENCE

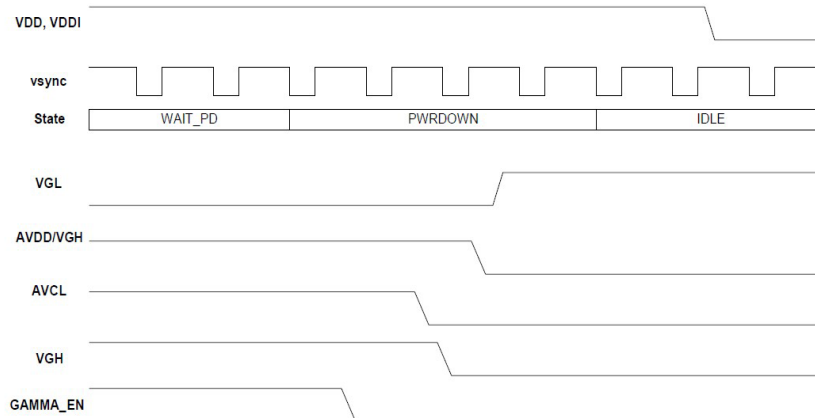
7.2.1. POWER ON SEQUENCE



No.	Description	Min. Time
1	After VDD/VDDI become stable , reset finished and host send command “11H”	Decide by host 11H command
2	VGL from 0V to -11.5V	23ms
3	AVDD from VCI to 6.6V	30.7ms
4	AVCL from 0 to -5V and VGH from AVDD to 15.4	40.8ms
5	Gamma output enable	55.3ms
6	Source output enable	Decide by host “29H” command

7.2.2. POWER OFF SEQUENCE

When host sends “10H” command, State from WAIT_PD to PWRDOWN, in which power disabled sequentially.



8. TOUCH PANEL

The EA TFT043-42SITS comes with a PCAP that provides touch input directly on the display. Interface is I²C with controller FT5446.

Data sheet:

<https://www.lcd-module.de/fileadmin/html-seiten/eng/pdf/zubehoer/FT5446-P03.pdf>

8.1 PINOUT

Pin No.	Symbol	I/O	Function
1	NC	-	No connection
2	NC	-	No connection
3	RST	I	Reset pin, active low
4	GND	P	Ground
5	INT	O	A low level informs the host processor that data is ready for read
6	SDA	I/O	Data I ² C bus
7	SCL	I/O	Clock I ² C bus
8	GND	P	Ground
9	GND	P	Ground
10	VDD	P	Power supply for circuit

Application note:

<https://lcd-module.de/fileadmin/html-seiten/eng/pdf/zubehoer/FT5x46%20Application%20Note.zip>

9. RELIABILITY TEST

No.	Test Items	Test condition	Remark
1	High temp. Operating test	85°C ± 2°C / 240Hrs.	Note 1,2
2	Low temp. Operating test	-30°C ± 2°C / 240Hrs.	Note 1,2
3	High temp. Storage test	85°C ± 2°C / 240Hrs.	Note 1,2
4	Low temp. Storage test	-40°C ± 2°C / 240Hrs.	Note 1,2
5	High temp. & high humidity operating test	60 ± 5°C, 90%RH 240Hrs.	Note 1,2
6	Thermal Shock Test (Non-operating)	-20±2°C(30Min.)~25±2°C(5Min.)~70±2°C(30Min.) 100Cycles	
7	Vibration Test (Non-operating)	Frequency: 10~55Hz Amplitude: 1.5mm Sweep Time: 11Mins Test Period: 6 Cycles For Each Direction of X, Y, Z (Packing Condition)	
8	Shock Test (Non-operating)	100G, 6Ms Direction: ±X, ±Y, ±Z Cycle: 3 Times	
9	Electro-Static Discharge Test	R: 330 Ω, C:150pF, 5points/panel Air: ±8KV, 5times; Contact: ±4KV, 5times; (Environment: 15°C~35°C, 30%~60%, 86Kpa~106Kpa)	

Note 1: No water condensation.

Note 2: The function test shall be conducted after 2 hours storage at the room temperature and the humidity of chamber should be removed.

10. PRECAUTIONS RELATING PRODUCT USING

10.1. SAFETY

Liquid crystal is poisonous. If the LCD panel breaks, be careful not to get the liquid crystal to touch your skin. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

10.2. HANDLING

The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.

To avoid contamination on the display surface, do not touch the module surface with bare hands.

Keep a space so that the LCD panels do not touch other components.

Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.

Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.

Do not leave module in direct sunlight to avoid malfunction of the ICs.

10.3. STATIC ELECTRICITY

Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

Be sure to ground module before turning on power or operating module.

Do not apply voltage which exceeds the absolute maximum rating value.

10.4. STORAGE

Store the module in a dark room where must keep at $25 \pm 10^{\circ}\text{C}$ and 65%RH or less.

and do not expose to sunlight or fluorescent light. Do not store the module in surroundings containing organic solvent or corrosive gas.

Store the module in an anti-electrostatic container or bag.

10.5. CLEANING

Do not wipe the polarizer with dry cloth. It might cause scratch.

Only use a soft cloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

11. TERMS OF WARRANTY

11.1. APPLICABLE WARRANTY PERIOD

The period is within thirteen months after shipping date under normal using and storage conditions.

11.2. UNACCEPTED RESPONSIBILITY AND LIMITED WARRANTY

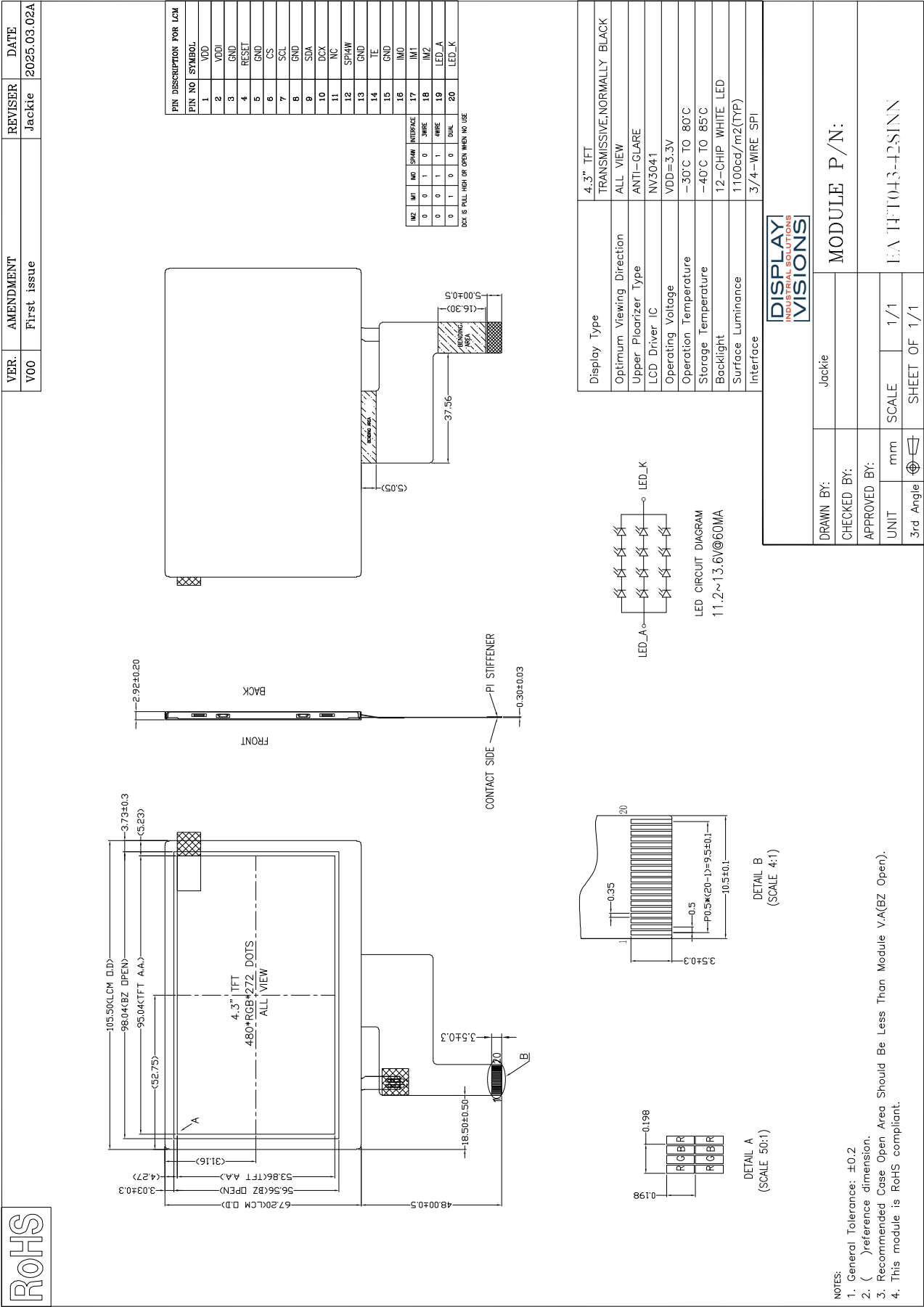
This product has been manufactured to our specification as a part for use in your general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we would not take responsibility if the product is used in nuclear power control equipment, aerospace equipment, fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

Unless mutual agreed, DISPLAY VISIONS will replace or repair any of its LCD modules which are found to be functionally defective in accordance with DISPLY VISIONS LCD acceptance standards (copies available upon request) under warranty period. Cosmetic/visual defects must be advised within 90 days after shipment. Confirmation of such date shall be based on data code on product.

The warranty liability is limited to repair and/or replacement on the terms set forth above.

DISPLAY VISIONS will not be responsible for any subsequent or consequential events.

12.DIMENSIONS W./O. TOUCH (EA TFT043-42SINN)



13. DIMENSIONS WITH TOUCH PANEL (EA TFT043-42SITS)

[illegible]