

SPECIFICATION

Customer: _____
Model Name: SAT070AT50D21Y0-35100T048KN
SPEC NO.: _____
Date: _____
Version: _____

Preliminary Specification
 Final Specification

Approved by	Comment

Prepared by	Reviewed by	Approved by

Record of Revision

Version	Revise Date	Page	Content
Pre-spec.A	2015/07/24		Initial Release

視安通集團 SAT GROUP

Contents

1. General Specifications.....	4
2. Pin Assignment.....	5
3. Operation Specifications.....	8
3.1. Absolute Maximum Rating.....	8
3.1.1. Typical Operation Conditions.....	9
3.1.2. Current Consumption.....	9
3.1.3. Backlight Driving Conditions.....	10
3.2. Power Sequence.....	11
3.3. Timing Characteristics.....	12
3.3.1. AC Electrical Characteristics.....	12
3.3.2. Data Input Format.....	13
3.3.3. Timing.....	14
4. Optical Specifications.....	15
5. Mechanical Drawing.....	16

视安通集团 SAT GROUP

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	7.0 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	800 × 3(RGB) × 480	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.0642(W) × 0.1790(H) mm	
6	Active area	154.08(W) × 85.92(H) mm	
7	Module size	164.9(W) × 100.0(H) × 3.3(D) mm	
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	TTL RGB-24bit parallel interface	
11	Backlight power consumption	TBD	
12	Panel power consumption	TBD	
13	Weight	TBD	

2. Pin Assignment

FPC Connector is used for the module electronics interface. The recommended model is FH12A-50S-0.5SH manufactured by Hirose.

Pin No.	Symbol	I/O	Function	Remark
1	VLED+	P	Power for LED backlight(anode)	Note 8
2	VLED+	P	Power for LED backlight(anode)	Note 8
3	VLED-	P	Power for LED backlight(Cathode)	Note 8
4	VLED-	P	Power for LED backlight(Cathode)	Note 8
5	GND	P	Power ground	
6	V _{COM}	I	Common voltage	
7	DV _{DD}	P	Power for Digital Circuit	
8	MODE	I	DE/SYNC mode select	Note 1
9	DE	I	Data Input Enable	
10	VS	I	Vertical Sync Input	
11	HS	I	Horizontal Sync Input	
12	B7	I	Blue data(MSB)	
13	B6	I	Blue data	
14	B5	I	Blue data	
15	B4	I	Blue data	
16	B3	I	Blue data	
17	B2	I	Blue data	
18	B1	I	Blue data	Note 2
19	B0	I	Blue data(LSB)	Note 2
20	G7	I	Green data(MSB)	
21	G6	I	Green data	
22	G5	I	Green data	
23	G4	I	Green data	
24	G3	I	Green data	
25	G2	I	Green data	
26	G1	I	Green data	Note 2

27	G0	I	Green data(LSB)	Note 2
28	R7	I	Red data(MSB)	
29	R6	I	Red data	
30	R5	I	Red data	
31	R4	I	Red data	
32	R3	I	Red data	
33	R2	I	Red data	
34	R1	I	Red data	Note 2
35	R0	I	Red data(LSB)	Note 2
36	GND	P	Power Ground	
37	DCLK	I	Sample clock	Note 3
38	GND	P	Power Ground	
39	L/R	I	Left / right selection	Note 4,5
40	U/D	I	Up/down selection	Note 4,5
41	V _{GH}	P	Gate ON Voltage	
42	V _{GL}	P	Gate OFF Voltage	
43	AV _{DD}	P	Power for Analog Circuit	
44	RESET	I	Global reset pin.	Note 6
45	NC	-	No connection	
46	V _{COM}	I	Common Voltage	
47	DITHB	I	Dithering function	Note 7
48	GND	P	Power Ground	
49	NC	-	No connection	
50	NC	-	No connection	

I: input, O: output, P: Power

Note 1: DE/SYNC mode select. Normally pull high.

When select DE mode, MODE="1", VS and HS must pull high.

When select SYNC mode, MODE="0", DE must be grounded.

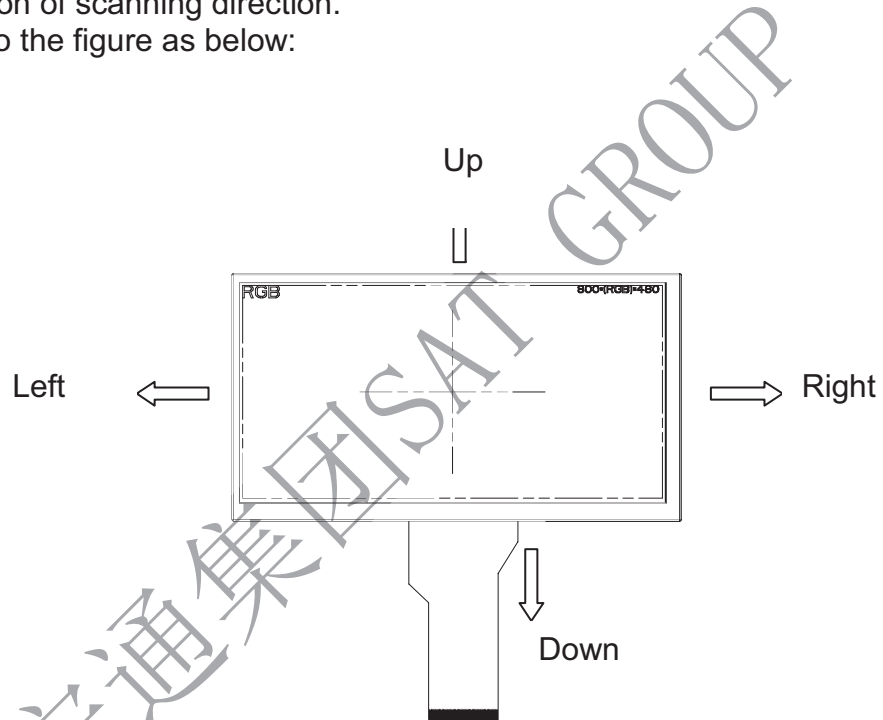
Note 2: When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.

Note 3: Data shall be latched at the falling edge of DCLK.

Note 4: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
GND	DV _{DD}	Up to down, left to right
DV _{DD}	GND	Down to up, right to left
GND	GND	Up to down, right to left
DV _{DD}	DV _{DD}	Down to up, left to right

Note 5: Definition of scanning direction.
Refer to the figure as below:



Note 6: Global reset pin. Active low to enter reset state. Suggest to connect with an RC reset circuit for stability. Normally pull high.

Note 7: Dithering function enable control, normally pull high.
When DITHB="1", Disable internal dithering function,
When DITHB="0", Enable internal dithering function,

Note 8: Reserve for LED power input.

3. Operation Specifications

3.1. Absolute Maximum Ratings

(Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	DV_{DD}	-0.3	5.0	V	
	AV_{DD}	6.5	13.5	V	
	V_{GH}	-0.3	40.0	V	
	V_{GL}	-20.0	0.3	V	
	$V_{GH}-V_{GL}$	-	40.0	V	
Operation Temperature	T_{OP}	-20	70	°C	
Storage Temperature	T_{ST}	-30	80	°C	

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

3.1.1. Typical Operation Conditions

(Note 1)

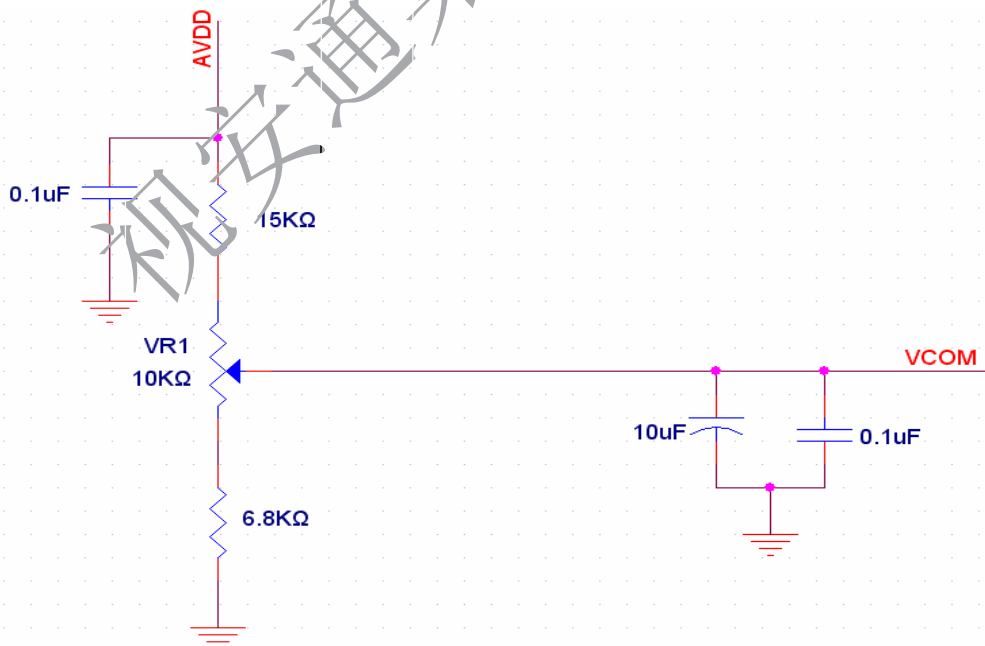
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	DV _{DD}	3.0	3.3	3.6	V	Note 2
	AV _{DD}	10.2	10.4	10.6	V	
	V _{GH}	15.3	16.0	16.7	V	
	V _{GL}	-7.7	-7.0	-6.3	V	
Input signal voltage	V _{COM}	3.9	(4.1)	4.3	V	Note 4
Input logic high voltage	V _{IH}	0.7 DV _{DD}	-	DV _{DD}	V	Note 3
Input logic low voltage	V _{IL}	0	-	0.3 DV _{DD}	V	

Note 1: Be sure to apply DV_{DD} and V_{GL} to the LCD first, and then apply V_{GH}.

Note 2: DV_{DD} setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note 3: DCLK,HS,VS,RESET,U/D, L/R, DE, R0~R7, G0~G7, B0~B7, MODE, DITHB.

Note 4: Typical V_{COM} is only a reference value. It must be optimized according to each LCM. Please use VR and base on below application circuit.

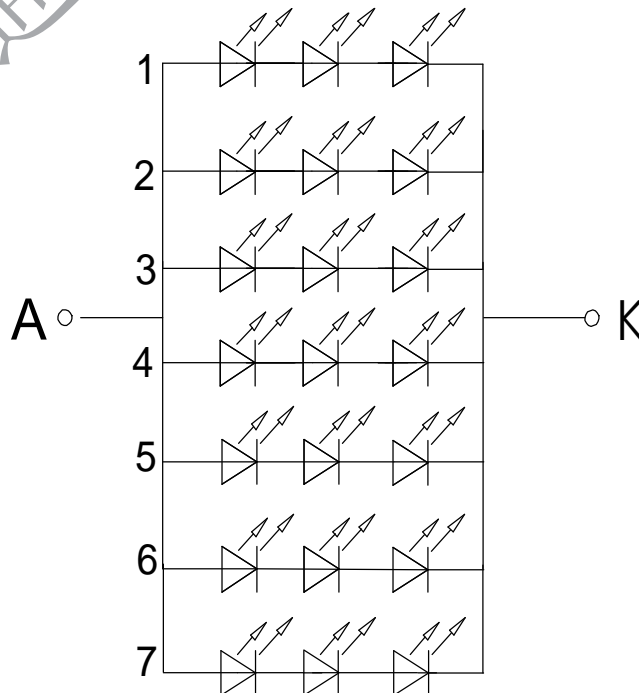


3.1.2. Current Consumption

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.2	1.0	mA	$V_{GH} = 16.0V$
	I_{GL}	-	0.2	1.0	mA	$V_{GL} = -7.0V$
	IDV_{DD}	-	4.0	10	mA	$DV_{DD} = 3.3V$
	$I_{AV_{DD}}$	-	20	50	mA	$AV_{DD} = 10.4V$

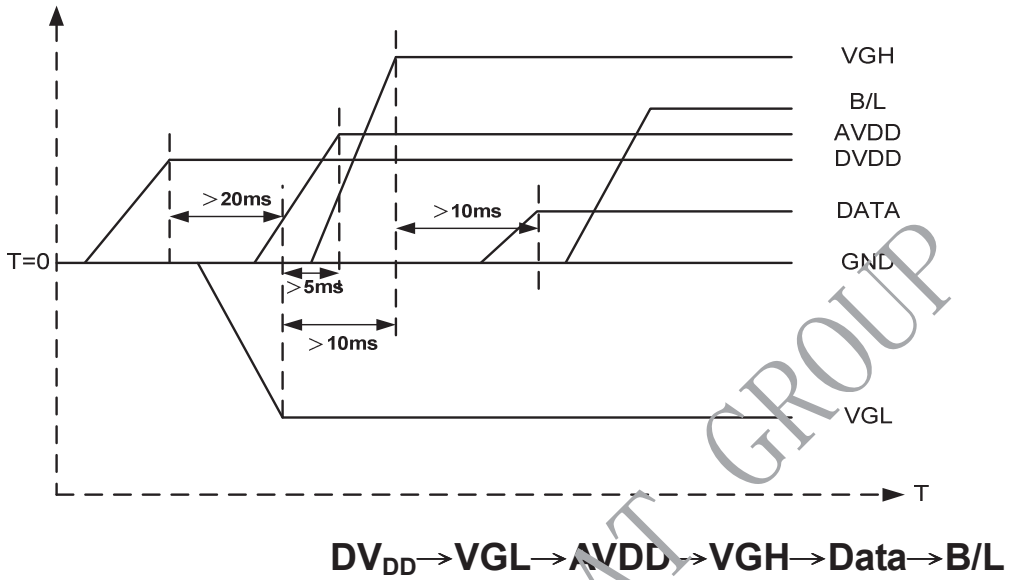
3.1.3. Backlight Driving Conditions (21 White Chips)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage of white LED backlight	V_L	8.7	9.6	10.5	V	Note 1
Curt for LED backlight	I_L	105	140	175	mA	
Luminance (on the module surface, BM-7)		200	250	-	cd/m ²	
LED life time		30,000	-	-	Hr	Note 2

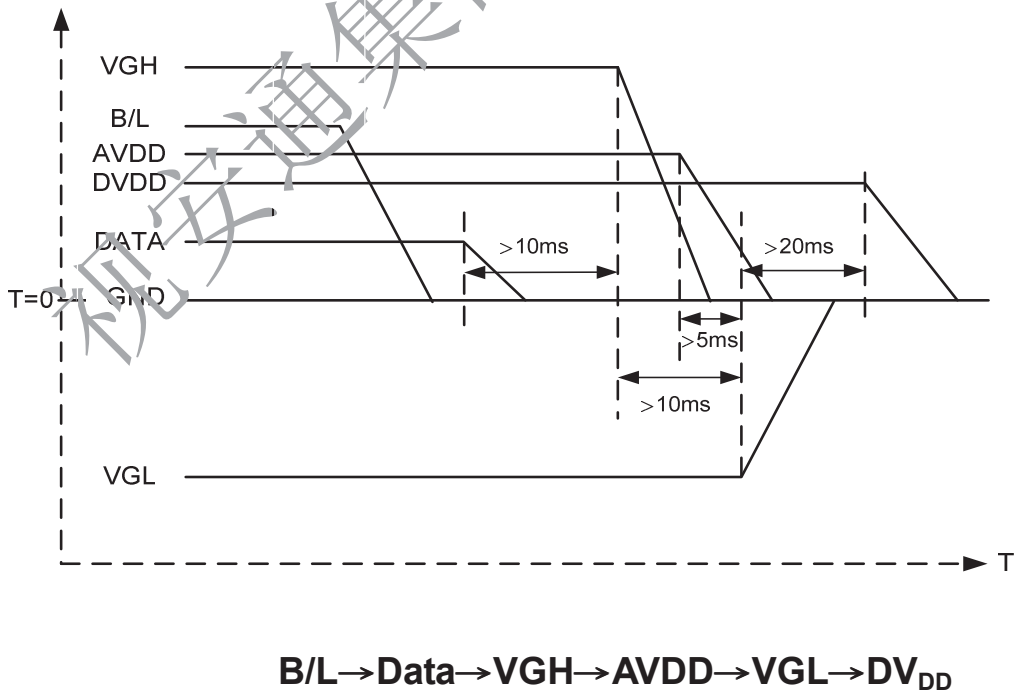


3.2. Power Sequence

Power on



Power off



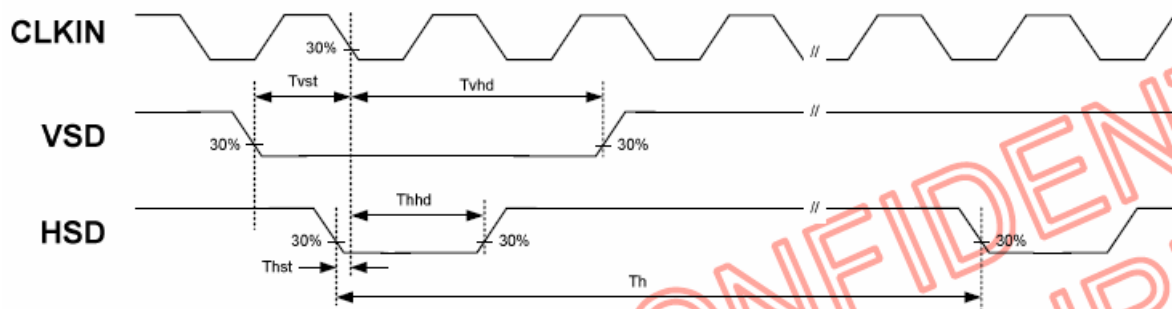
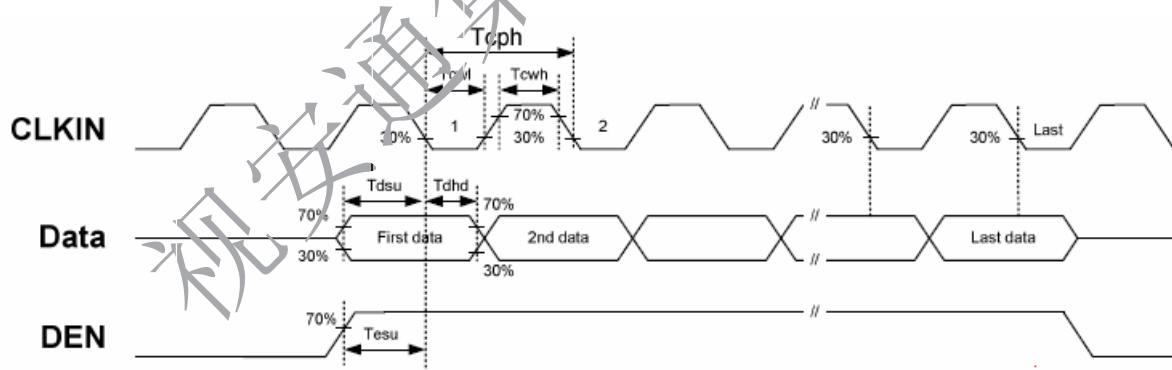
Note: Data include R0~R7, B0~B7, GO~G7, U/D, L/R, DCLK, HS,VS,DE.

3.3. Timing Characteristics

3.3.1. AC Electrical Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
HS setup time	T_{hst}	8	-	-	ns	
HS hold time	T_{hhd}	8	-	-	ns	
VS setup time	T_{vst}	8	-	-	ns	
VS hold time	T_{vhd}	8	-	-	ns	
Data setup time	T_{dsu}	8	-	-	ns	
Data hole time	T_{dhd}	8	-	-	ns	
DE setup time	T_{esu}	8	-	-	ns	
DE hole time	T_{ehd}	8	-	-	ns	
DV _{DD} Power On Slew rate	T_{POR}	-	-	20	ms	From 0 to 90% DV _{DD}
RESET pulse width	T_{Rst}	1	-	-	ms	
DCLK cycle time	T_{coh}	20	-	-	ns	
DCLK pulse duty	T_{cwh}	40	50	60	%	

3.3.2. Input Clock and Data Timing Diagram



3.3.3. Timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tvd	-	480	-	TH	
VS period time	tv	510	525	650	TH	
VS pulse width	ivpw	1	-	20	TH	
VS Blanking	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

3.3.4. Data Input Format

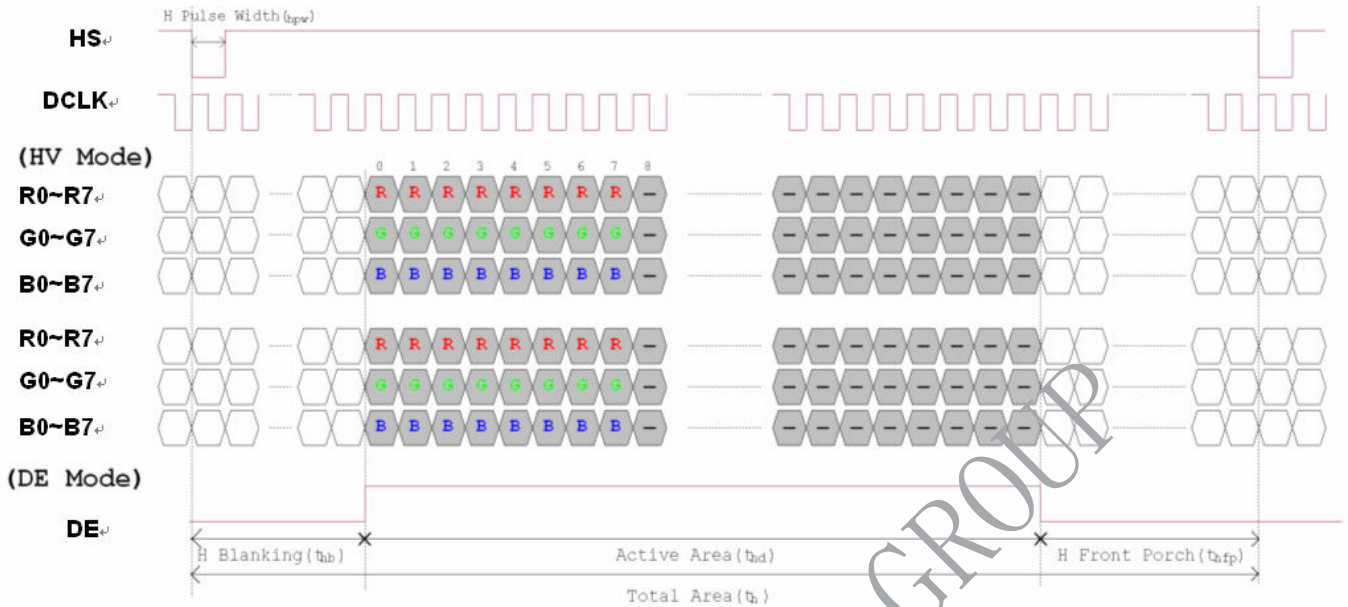


Figure 3. 1 Horizontal input timing diagram.

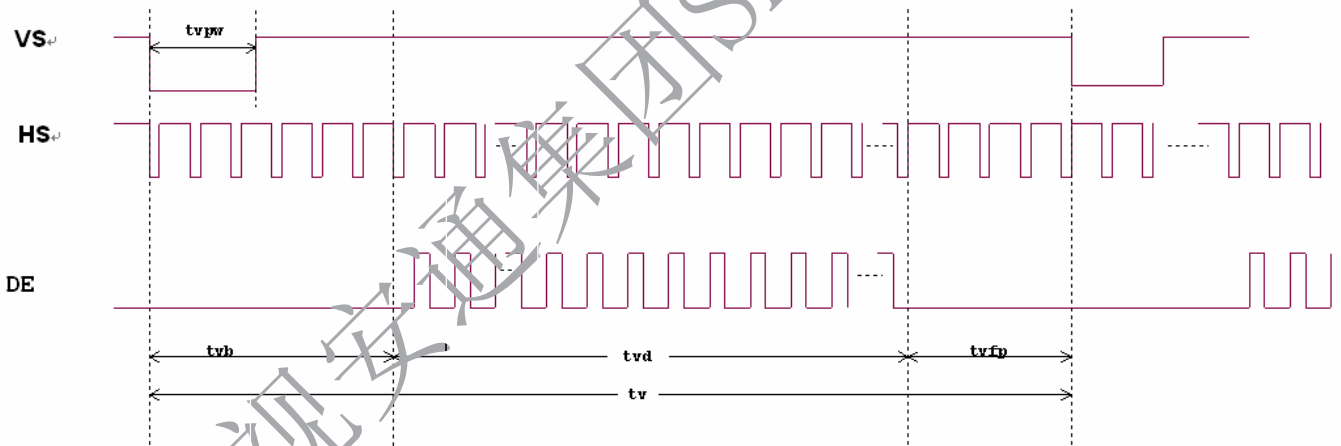


Figure 3. 2 Vertical input timing diagram.

4. Optical Specifications

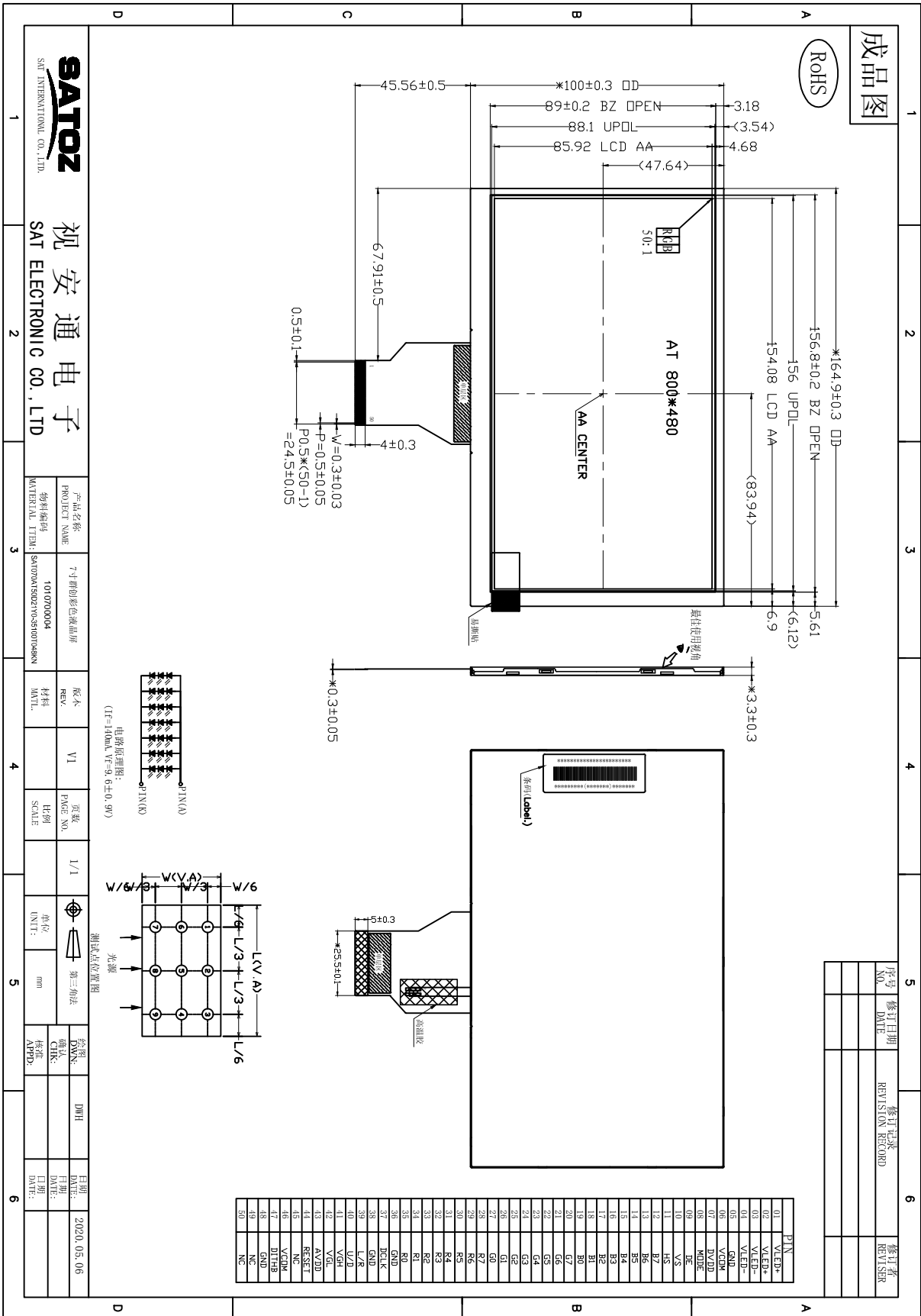
Ta=25 °C

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark	
View Angles	θT	CR ≥ 10	40	50	--	Degree	Note1	
	θB		50	60	--			
	θL		60	70	--			
	θR		60	70	--			
Contrast Ratio	CR	θ=0°	300	500	--		Note4	
Response Time	T _{ON}	25°C	--	10	20	ms	Note3	
	T _{OFF}		--	15	30			
Chromaticity	White	Backlight is on	x	0.255	0.285	0.315		Note2 Note5 Note6
			y	0.275	0.305	0.335		
Luminance	L		200	250	--	cd/m ²	Note6	

Test Conditions:

1. DV_{DD}=3.3V, I_L=140mA(Backlight current),the ambient temperature is 25°C.
2. The test systems refer to Note 2.

5. Mechanical Drawing



杭州凡诺电子有限公司
FANNAL ELECTRONICS CO., LTD

Specifications for Module
 Model NO: FN070A133-V1.0

Approved For Specifications Only
 Approved For Specifications And Sample

FANNAL			CUSTOMER
PREPARED	CHECKED	APPROVED	APPROVED
<i>Yan Zhang</i> 2020.2.20	<i>Adam</i> 2020.2.20	<i>Dolphe</i> 2020.2.20	

Address: 6th Floor No.77 Xingwang West Road, Hangzhou, Zhejiang, China

Phone: +86 (0)571 85161516

<http://www.fannal.cn>

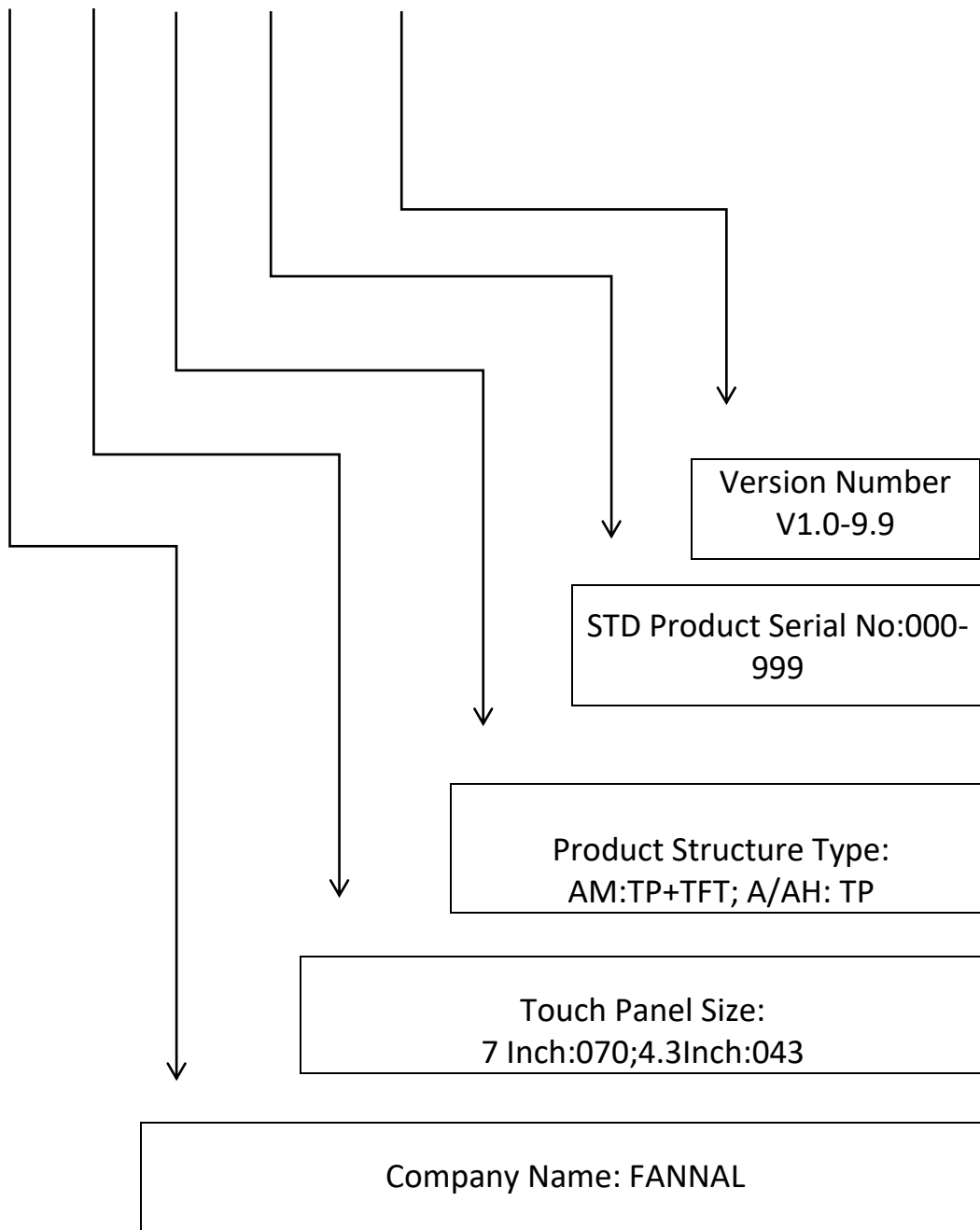
<http://www.fannal.com>

2. Table of Content

NO.	Content	Page
1	Record of Revision	2
2	Table of Content	3
3	Module Numbering System	4
4	Application	5
5	General Specifications	5
6	Pin Assignment	6
7	Mechanical Characteristic	6
8	Reliability Test	7
9	Function Test	8
10	Appearance Inspection	8
11	Appearance Specification	8
12	Mechanical Drawing	9
13	Packaging	10

3. Module Numbering System

FN 070 A 133 - V1.0



4. Application

This improved projected capacitive touch panel module is applied to industrial applications which required touch input.

Industrial control, medical devices and automation industries (transportation, military, smart home, and others)

5. General Specifications

NO.	Item		Specifications	Unit
1	Touch Panel Size		7.0(Diagonal)	inch
2	Structure		G+G	
3	View Area		155.08(H)x86.92(V)	mm
4	Outline Dimension		164.9(H)x100(V)x1.58(D)	mm
5	Transparency		85%Min	
6	Surface Hardness		6H	
7	Driver IC		GT911	
8	Detect Points		5	
9	Interface		I2C	
10	Power supply		3.3	V
11	Operating Temperature		-20~70	°C
12	Storage Temperature		-30~80	°C
13	ESD	Air	±8	KV
		Contact	±4	KV
14	RoHS Compliance		OK	

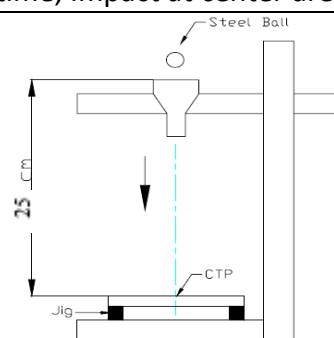
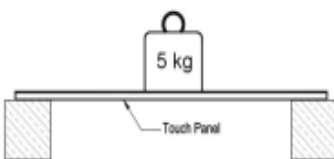
6. Pin Assignment

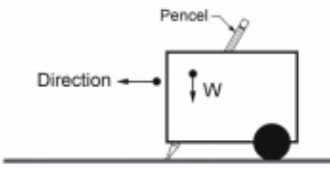
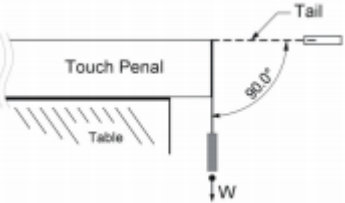
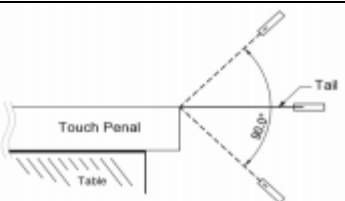
Pin No.	Symbol	I/O	Description	Note
1	VDD (3.3V)	--	Power supply	
2	GND	--	System ground	
3	INT (3.3V)	O	Interrupt signal, active low, asserted to request Host start a new transaction	
4	SDA (3.3V)	I/O	I ² C data signal	
5	SCL (3.3V)	I/O	I ² C clock signal	
6	RST (3.3V)	I	External reset signal, active low	

CTP Test Program

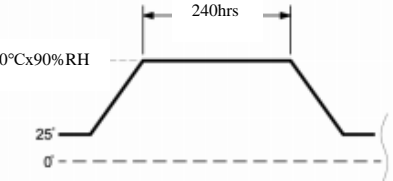
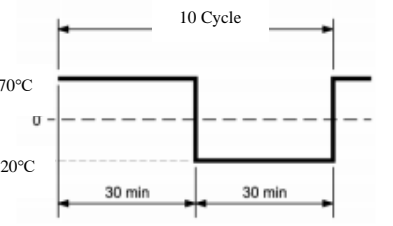
FW Name:	FN070A133_GT911_VER95_20200116.cfg
FW Version:	0X95
Test Config:	FN070A133_CTP_MP.ini

7. Mechanical Characteristic

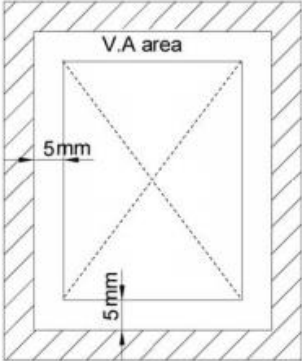
NO.	Item	Condition	Specifications
1	Operating Force	Finger \leq 10g	
2	Impact	Steel Ball/132g/Height=25cm/1 time, Impact at center area 	Satisfy- 1. Optical Characteristics 2. Electrical Characteristics Appearance- 1. Ignore test area 2. No mechanical damage
3	Static Load	5000g within 10cm Φ area for 30sec 	Satisfy- 1. Optical Characteristics 2. Electrical Characteristics Appearance- 1. Ignore test area 2. No mechanical damage

NO.	Item	Condition	Specifications
4	Hardness	6H pencil, pressure 500g/45°	Satisfy- 1. Optical Characteristics 2. Electrical Characteristics Appearance- 1. Ignore test area 2. No mechanical damage
			
5	Tail Peeling	500g/cm by vertical 90° for 30sec	
			
6	Tail Bending	90° 10times left & right	
			

8. Reliability Test

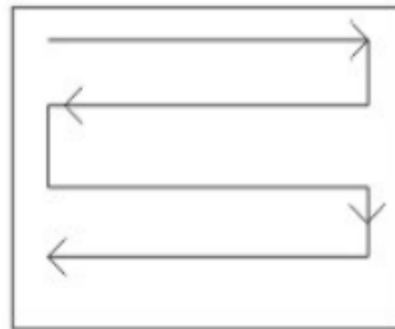
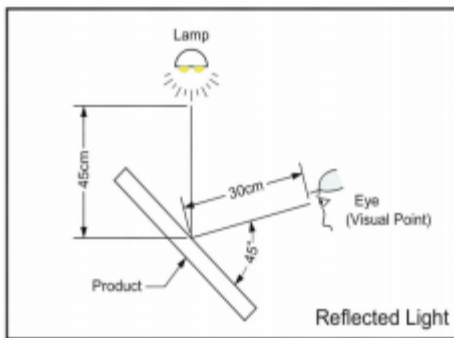
NO.	Item	Condition	Specifications
1	Constant Temperature/Humidity	60°C X 90%RH, 240hrs and normalized for 24hrs	Satisfy- 1、 Electrical Characteristics
			
2	Heat Cycle	80°C/240hrs and normalized for 24hrs	
3	Cold Cycle	-30°C/240hrs and normalized for 24hrs	
4	Thermal Cycle	-20°C~70°C [30min/cycle]*10cycles and normalized for 24hrs	
			

9. Function test

Function Test	<p>Test Method: Use $\Phi 8$ copper stick to draw the square diagonal line.</p> <p>Test Area: 5mm inward view area.</p> <p>Disapproval Criteria: It is NG when we see the off-liner or jumping out spec shift.</p>	
---------------	---	---

10. Appearance Inspection

The inspection is to be performed with 800-1000 LUX fluorescent lamp lighting from the back or side. The panel is to be placed 30cm away from eyes. Viewing Time: 15 ± 3 seconds/per face (Figure 13-1)



11. Appearance Specification

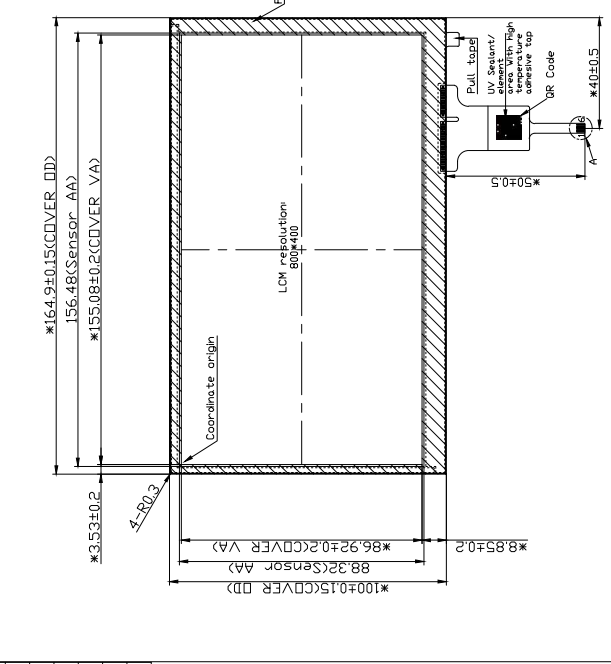
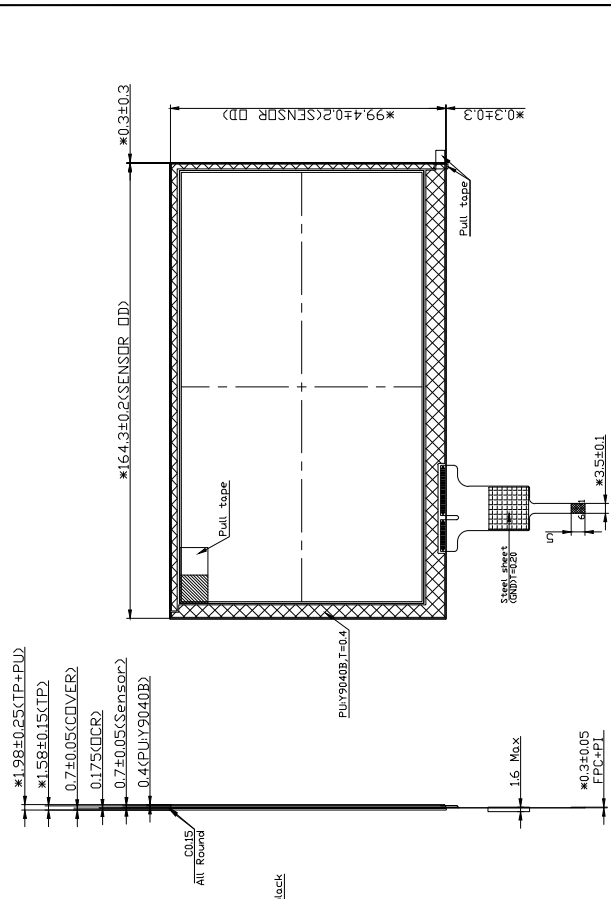
NO.	Item	Specifications	Judgment
1	Dot Contamination	1) $D \leq 0.2\text{mm}$ 2) $0.2\text{mm} < D \leq 0.50\text{mm}, DS \geq 10\text{mm}$ 3) $D > 0.5\text{mm}$	1) Ignore 2) OK with 5 3) NG
2	Linear Contamination	1) $W \leq 0.05\text{mm}, DS \geq 10\text{mm}$ 2) $0.05\text{mm} < W \leq 0.1\text{mm}, L \leq 5\text{mm}, DS \geq 10\text{mm}$ 3) $W > 0.1\text{mm}$ or $L \geq 5\text{mm}$	1) Ignore 2) OK with 5 3) NG
3	Cracks and Chips (Surface)	$X < 0.2\text{mm}, Y < 0.2\text{mm}, Z < \frac{1}{2}T$	Ignore

<Endorse>
 1. D=Diameter / W=Width / L=Length
 2. Tail: Slight bend mark is allowed on the tail; crack or tear is not allowed.
 3. Particle Spots: Flaws found coating if transparent, please follow Particle Spots specification.
 4. The dirty of surface can be clean that can be acceptable.

12. Mechanical Drawing

THE DRAWING ON THIS PRINT AND INFORMATION THEREWITH ARE PART WITHOUT WRITTEN PERMISSION OF FANNAL

TECHNOLOGY CHARACTERISTICS CTP	
PROPERTY	Requirement
STRUCTURE	G+G
Bonding Type	/
TOUCH IC	GT911
NO. OF TOUCH	5
Cover glass Thickness	0.7mm(Soda Lime)
ITO Glass Thickness	0.7mm
Surface Hardness	≥6H
Light Transmittance	85% Min
Operating Temperature	-20~70° C
Storage Temperature	-30~80° C

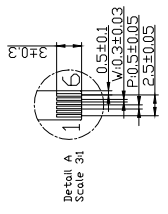


Side view

Front view

Back view

IIC PIN DEFINITION	
Pin No	Definition
1	VDD(3.3V)
2	GND
3	INT(3.3V)
4	SDA(3.3V)
5	SCL(3.3V)
6	RST(3.3V)



NOTES:
 *: Important dimensions
 TOLERANCE UNLESS: x: ±0.3
 OTHERWISE SPECIFIED: xx: ±0.2
 DIMENSIONS IN MM: ANGULAR: ±1°

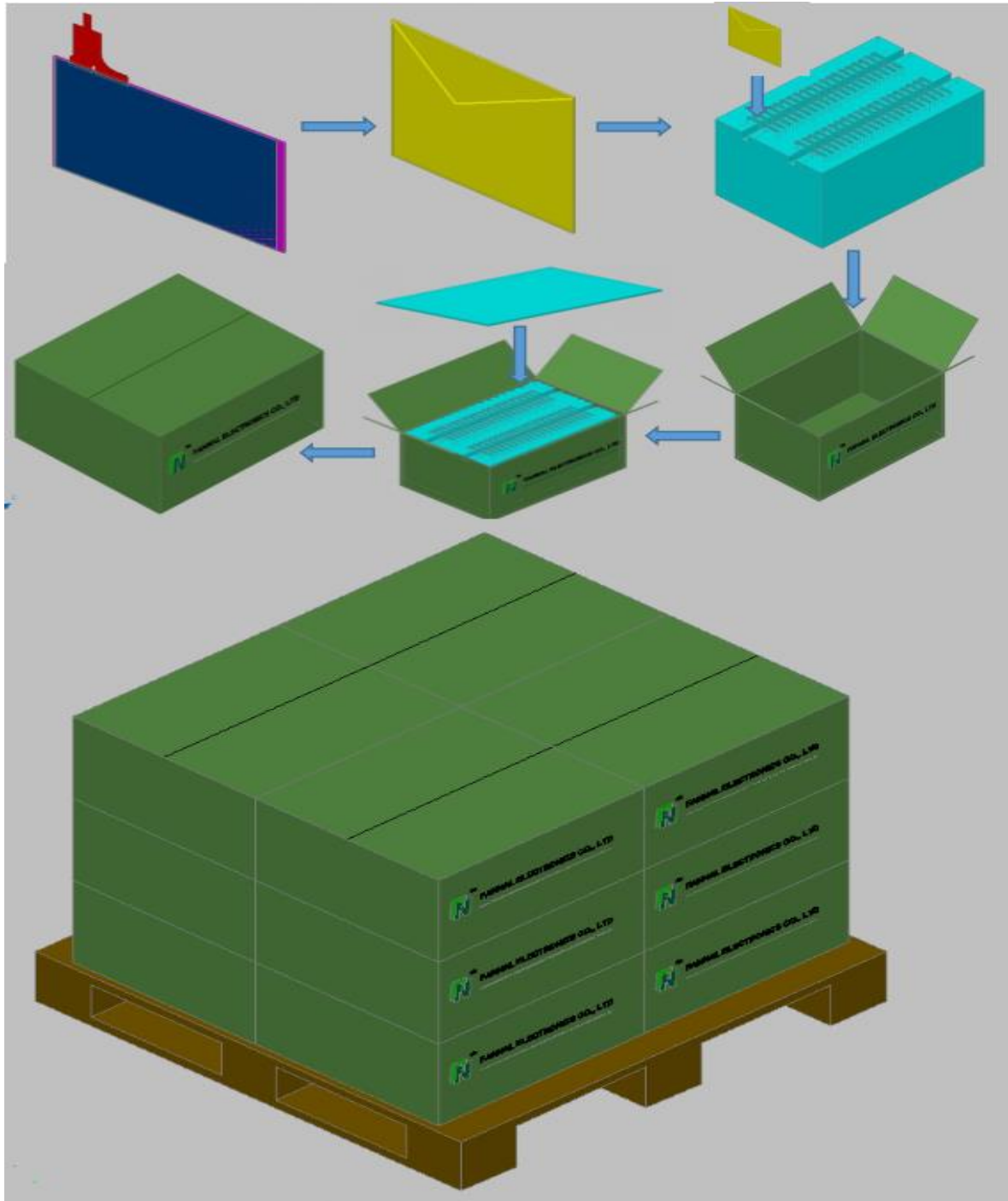
DRAWN		Yan
CHECKED	Lee	
APPROVED	Dolphe	
CSR APPROVED		
Customer No:	2019.12.10	Yan
3rd Angle	2019.12.05	Yan
SHEET 1 OF 1	DATE	SIGN
	AMENDMENT	

TITLE	
MODULE SPEC.	
Drawing NO:CT0476-V2.0	
Product NO:FN070A133-V1.0	
Project No: TPM8469	

ROHS

FANNAL ELECTRONICS CO., LTD

13. Packaging(NEUTRAL PACKING)



SIZE(Carton): 53X36X27.5cm