

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LSC050I18-MP-V1

Module Type: COG+FPC+B/L+CTP

APPROVED SIGNATURE

- ☒ Approved Product Specification only
- ☐ Approved Product Specification and Samples

<u>Prepared By</u>	<u>Checked By</u>	<u>Approved By</u>

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1. General Description

LSC050I18-MP-V1 is a transmissive type a-Si TFT-LCD (amorphous silicon thin film transistor liquid crystal display) module, which is composed of a TFT-LCD panel, a driver circuit and a backlight unit. The panel size is 4.97 inch and the resolution is 1080(RGB)*1920, the panel can display up to 16.7M colors.

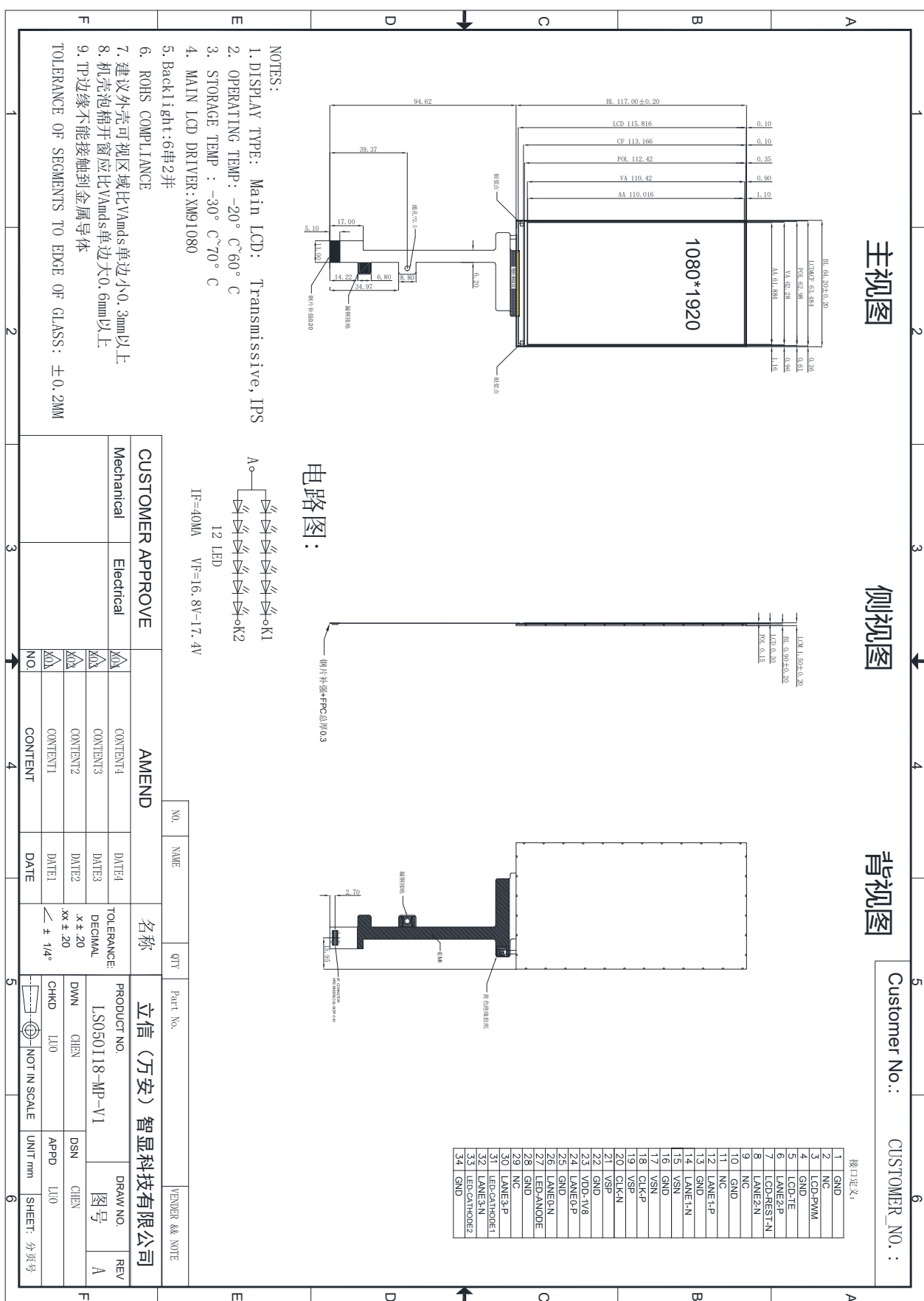
2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 1080(RGB)×1920 Dot-matrix
Input Data	MIPI
Viewing Direction (Grayscale Inversion)	Free (IPS)
Drive	XM91080

3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	75.4 ×129.4×3.68	mm
Number of dots	1080(RGB) ×1920	pixel
Active area (H×V)	61.884×110.016	mm

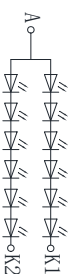
4. Outline Dimension LCM





接口定义:

电路



1	结构	G+0
2	填充	CGS18 轻质
3	隔热层	80 挤
4	表面找平层	60 灰泥板
5	材料厚度	T=1.0~0.9m
6	工作温度	-20℃~+60℃;20~90℃
7	相对湿度	-10℃~+70℃;20~90%
8	结霜速度	≤0.2%
9	未注公差	±0.20mm
10	隔热材料	
11	部分材料	1000/1500
12	部分材料	1000/1500

CUSTOMER APPROVE			AMEND		名称			立信（万安）智显科技有限公司								
		NO.	NAME		QTY		Part No.		VENDOR & NOTE							
Mechanical	Electrical															
		NO.1	CONTENT 4	DATE 4	TOLERANCE: DECIMAL X ± .20 .XX ± .20 ± 1/4"											
		NO.2	CONTENT 3	DATE 3												
		NO.3	CONTENT 2	DATE 2												
		NO.4	CONTENT 1	DATE 1												
		NO.	CONTENT	DATE												
					PRODUCT NO.						DRAW NO.		REV			
					LSC050118-MP-V1						图号		A			
					DWN CHEN						DSN CHEN					
					CHKD L10						APPD L10					
											NOT IN SCALE		UNIT mm		SHEET: 分项号	

NOTES:

1. DISPLAY TYPE: Main LCD: Transmissive, IPS
2. OPERATING TEMP: -20°C ~ 60°C
3. STORAGE TEMP: -30°C ~ 70°C
4. MAIN LCD DRIVER: XM91080
5. Backlight: 6串2并
6. ROHS COMPLIANCE
7. 建议外壳可视区域比Vands单边小0.3mm以上
8. 机壳泡棉开窗应比Vands单边大0.6mm以上
9. TP边缘不能接触到金属导体

TOLERANCE OF SEGMENTS TO EDGE OF GLASS: $\pm 0.2\text{MM}$

5. Absolute Maximum Ratings

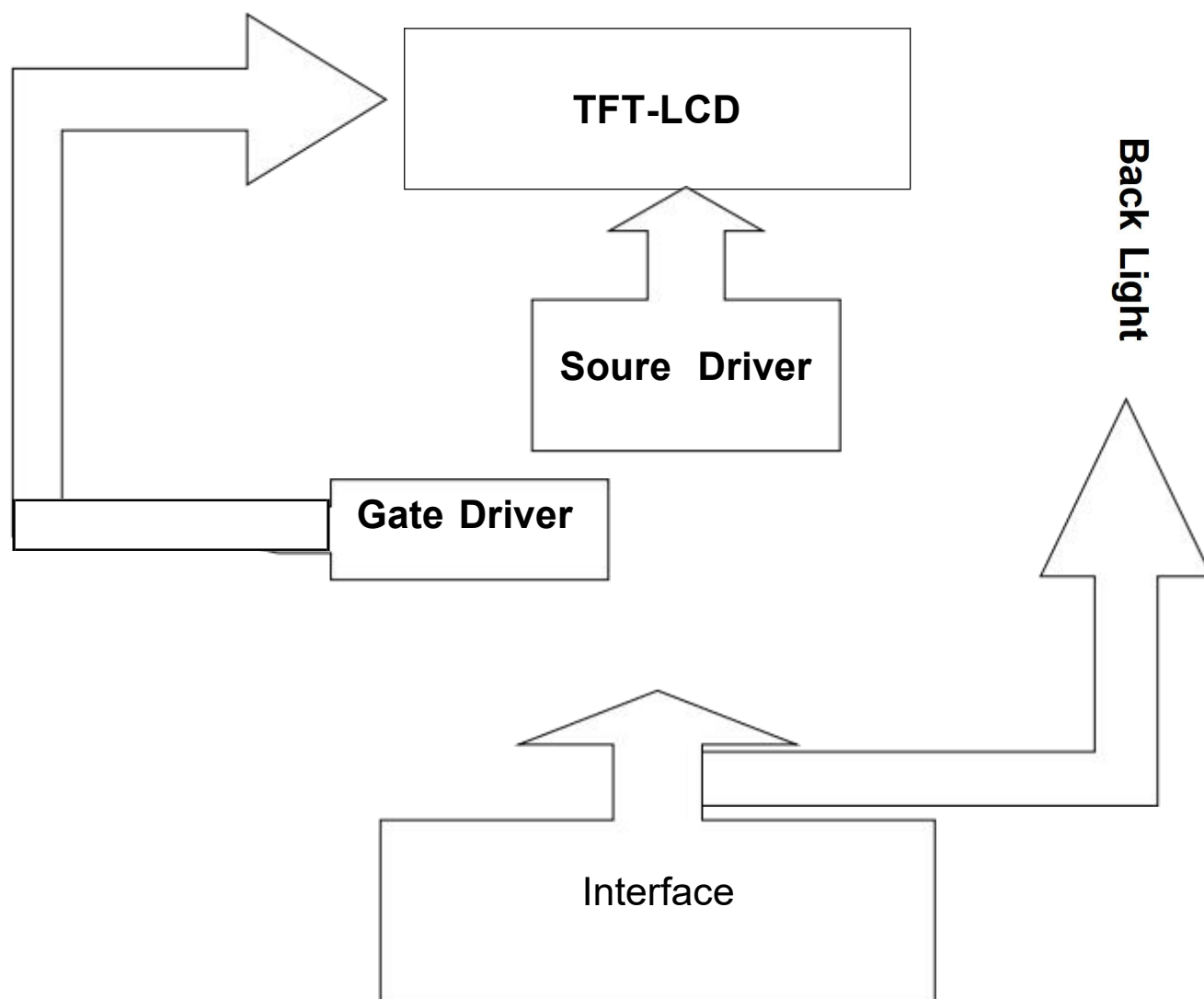
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	IOVCC	-0.3	1.95	V	
Operating temperature	TOPR	-20	60	°C	
Storage temperature	TSTR	-30	70	°C	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		IOVCC	1.65	1.8	3.6	V	Note1
Supply voltage		VSP	4.5	5	6		
Supply voltage		VSN	-4.5	-5	-6		
Input Voltage	L level	VIL	0	---	0.3*IOVCC	V	
	H level	VIH	0.7*IOVCC	---	IOVCC	V	

7. Module Function Description

7- 1. Block Diagram Of LCM



7-2. Pin Description

PIN NO.	Symbol	I/O	Description
1	GND	P	Ground
2	NC		
3	LCD_PWM	O	LCD backlight PWM control.
4	GND	P	Ground
5	TE	O	Tearing effect output pin to synchronies MCU to frame writing, activated by S/W command.
6	D2P	I	MIPI-DSI Data differential signal input pins.
7	RESET	I	Global Reset Signal. Active Low
8	D2N	I	MIPI-DSI Data differential signal input pins.
9	NC		
10	GND	P	Ground
11	NC		
12	D1P	I	MIPI-DSI Data differential signal input pins.
13	GND	P	Ground
14	D1N	I	MIPI-DSI Data differential signal input pins.
15	VSN	P	-4.5V~-6.0V. Connect a capacitor for stabilization
16	GND	P	Ground
17	VSN	P	-4.5V~-6.0V. Connect a capacitor for stabilization
18	CLKP	I	MIPI-DSI CLOCK differential signal input pins.
19	VSP	P	4.5V~6.0V. Connect a capacitor for stabilization
20	CLKN	I	MIPI-DSI CLOCK differential signal input pins.
21	VSP	P	4.5V~6.0V. Connect a capacitor for stabilization
22	GND	P	Ground
23	IOVCC1.8V	P	power Supply for IO, 1.65V~1.95V.
24	D0P	I/O	MIPI-DSI Data differential signal input pins.
25	GND	P	Ground
26	D0N	I/O	MIPI-DSI Data differential signal input pins.
27	LEDA	P	Power for LED backlight anode
28	GND	P	Ground
29	NC		
30	D3P	I	MIPI-DSI Data differential signal input pins
31	LEDK	P	Power for LED backlight cathode
32	D3N	I	MIPI-DSI Data differential signal input pins
33	LEDK	P	Power for LED backlight cathode
34	GND	P	Ground

TP PIN

CTPpin1	GND
CTPpin2	INT
CTPpin3	SCL
CTPpin4	SDA
CTPpin5	RST
CTPpin6	3.3V

7-3 Timing Characteristics

11.3.1 MIPI Interface Characteristics

High Speed Data Transmission: Data-Clock Timing

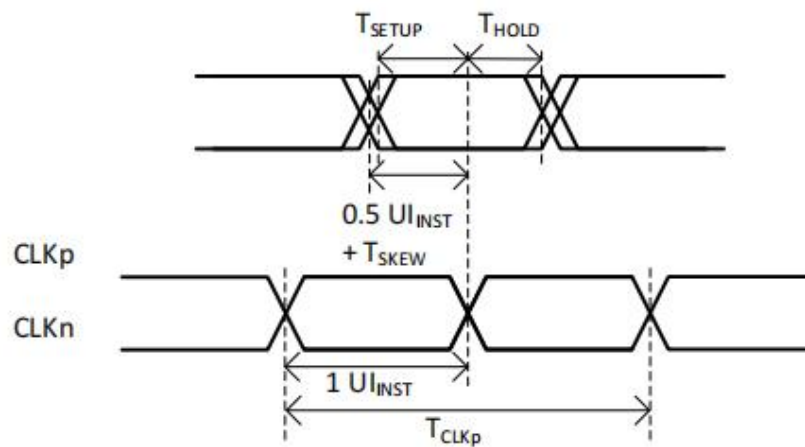


Figure 4. High Speed Data Transmission: Data-Clock Timing

Parameter	Symbol	Specification			Unit	Notes
		Min	Typ	Max		
UI instantaneous	UI_{INST}	1		12.5	ns	Note1,2
Data to Clock Skew [measured at transmitter]	$T_{\text{SKEW}}[\text{TX}]$	-0.15		0.15	UI_{INST}	
Data to Clock Setup Time [measured at receiver]	$T_{\text{SETUP}}[\text{RX}]$	-0.15		0.15	UI_{INST}	
Data to Clock Hold Time [measured at receiver]	$T_{\text{HOLD}}[\text{RX}]$	-0.15		0.15	UI_{INST}	
20% - 80% rise time and fall time	t_R/t_F	100			ps	Note3
				0.3	UI_{INST}	

Note:

1. This value corresponds to a minimum 300 MHz data rate
2. MIPI speed limitation: Per lane bandwidth is 1.2Gbps
3. Applicable for all HS bit rates. However, to avoid excessive radiation, bit rates ≤ 1.2 Gbps ($UI \geq 0.8334\text{ns}$), should not use values below 100 ps.

11.4 Reset Timing Characteristics

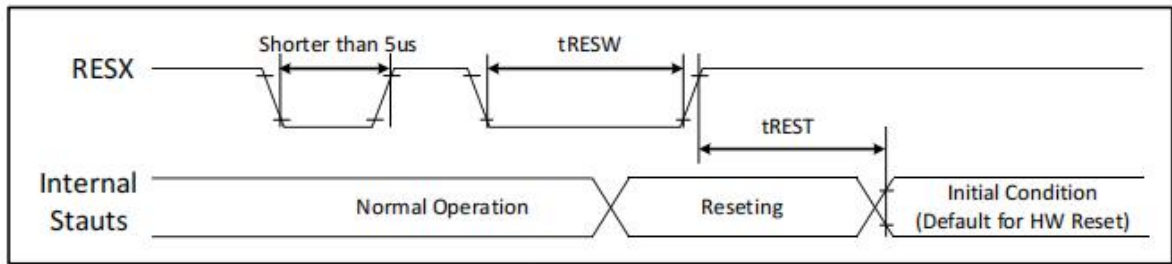


Figure 5. Reset Input Timing

Symbol	Parameter	Related Pins	Spec.			Unit	Note
			Min.	Typ.	Max.		
tRESW	Reset low pulse width	RESX	10	-	-	μs	-
tREST	Reset complete time	-	-	-	5	ms	During Sleep in mode
tREST	Reset complete time	-	-	-	120	ms	During Sleep out mode

Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5μs	Reset low pulse width
Longer than 10μs	Reset complete time
Between 5μs and 10μs	Reset start (by voltage and temperature condition)

During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120ms, when Reset Starts in Sleep Out mode. The display remains the blank state in Sleep In mode) and then return to Default condition for H/W reset. During Reset Complete Time, ID1/ID2/ID3/ID4 and VCOM value in OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (tREST) within 5ms after a rising edge of RESX. Spike Rejection also applies during a valid reset pulse as shown below:

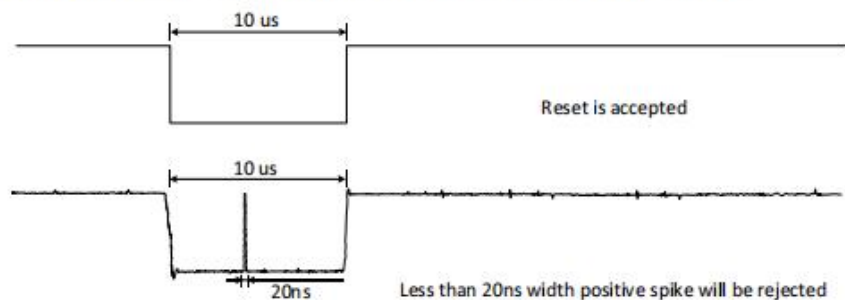


Figure 6. Reset Timing

It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120 msec.

8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time		Tr +Tf	$\theta_x = \theta_y = 0$	---	---	35	ms	Note 1
Contrast Ratio		CR		1000	1500	---	---	Note 2
Transmittance		T%		3.6	4.3	---	%	
Color Chromaticity (CIE1931)	White	W x	$\theta_x = \theta_y = 0$	---	0.300	---	---	
		W y		---	0.338	---	---	
Viewing angle	θ_T		CR > 10	---	80	---	Deg.	Note 3
	θ_B			---	80	---		
	θ_L			---	80	---		
	θ_R			---	80	---		
Luminance ($I_F = 40mA$)		L		--	300	---	cd/m2	Note4

Note:

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o' clock direction and the vertical or 6, 12 o' clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).
2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGUR 1)
Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Transmittance is the Value without CG, APF and Haze. ESR Reflector and Composite Prism backlight unit shall be used for Transmittance measurements. Transmittance value shall be tested by PR730.
4. The color chromaticity coordinates specified in the above table shall be calculated from the spectral data measured with bare CF Glass at C standard light source. Measurements shall be made at the center of the CF Glass.
5. The electro-optical response time measurements shall be made as FIGURE 2 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Tf.

Note(4) Backlight circuit



9.Records Of Version

Version	Revise Date	Page	Content
00	2025-6-18	ALL	New released