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Custom Display

Production Custom designs Installation

Mechanical design



Project No. 项目编号	ET050FW02-T	
Customer 客户名称		
Module No. 客户型号		
Product type 产品内容	Standard LCD Module TFT: 480*RGBx854Dots 5.0" TFT LCD	
客户确认 Customer Approval		
项目负责人 Project Manager		
品质主管 Director of Quality		
采购工程师 Purchasing Engineer		



1. Introduction

1.1 Scope of application

This specification applies to the LCD module that is supplied by YOURITECH Technology CO., LTD.

LCD specification: Dots 480xRGBx854.

As to basic specification of the driver IC, refer to the IC (Sitronix:ST7701S) specification and data book.

All material & processing of the LCD module should be Lead Free.

1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL;

IPS Type LCD

480 dot-segment and 854 dot-common outputs;

16.7M Color can be selected by software;

White LED back light;

9bit_SPI -24BIT_RGB interface

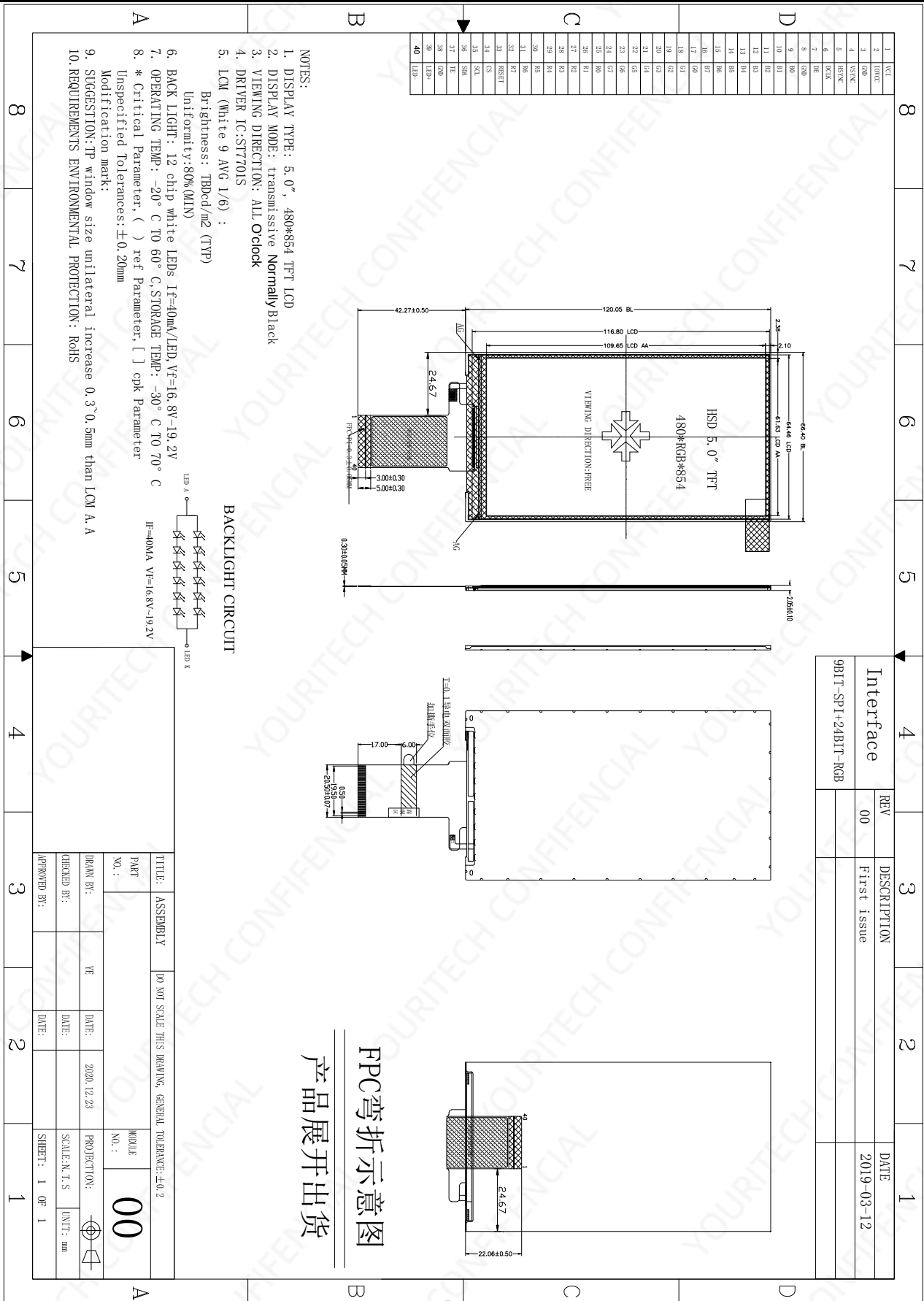
1.3 Applications:



2. LCM General specification

ITEM	Standard value	Unit
LCD Type	Normally black	--
Drive element	TFT active matrix	--
Number of pixels	480*3RGB(H)X854(V)	Dots
Pixel arrangement	RGB stripe	--
Pixel Pitch (W*H)	0.1284(H) x0.1284(V)	mm
Active area	61.632(H) x 109.6536(V)	mm
Module Size(W*H*T)	66.40(W) x120.05(H) X2.05(D)	-
Viewing direction	ALL O'CLOCK	
TFT Driver IC	ST7701S	-
TFT interface	9bit_SPI -24BIT_RGB Interface	-
Approx. Weight	TBD	g
Touch structure		
Touch Driver IC		-
Touch Interface		





3. Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T _{OPR}	-20	+60	°C
LCM Storage Temperature	T _{STG}	-30	+70	°C
Humidity	RH	-	90	%

4. Electrical Characteristics

4.1 TFT DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for I/O	VDDIO	1.65	1.8	3.3	V
Supply Voltage for(DC/DC)	VDD	2.7	2.8	3.6	V
Supply Voltage for(DC/DC)	AVDD				V
Supply Voltage for(DC/DC)	AVEE				V

4.2 Back-Light Unit Characteristics

The back-light system is an edge-lighting type with 12 white LEDs. The characteristics of the back-light are shown in the following tables.

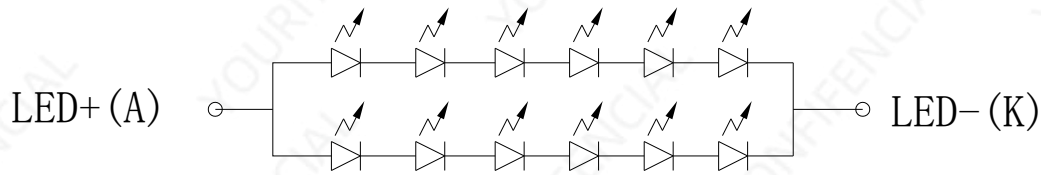
Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V _F	16.8	--	19.2	V	-
Forward current	I _F	--	40	-	mA	-
Luminance(With LCD)	L _v		TBD	--	cd/m ²	-
LED life time	N/A	----	30,000	--	Hr	Note 1

Note:

- (1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I_L=20mA/LED. The LED life time could be decreased if operating I_L is larger than 25mA/LED.

Backlight circuit diagram shown in below:





5. Module Function Description

Pin No.	Symbol	Functional	Notes
1	VCI	Power supply	
2	IOVCC	Power supply I/O Voltage	
3	GND	Power Ground	
4	VSYNC	Vertical (Frame) synchronizing input signal for RGB interface operation.	
5	HSYNC	Horizontal (Line) synchronizing input signal for RGB interface	
6	DCLK	Dot clock signal for RGB interface operation.	
7	DE	Data enable signal for RGB interface operation.	
8	GND	Power Ground	
9-16	B0-B7	RGB interface data bus.	
17-24	G0-G7	RGB interface data bus.	
25-32	R0-R7	RGB interface data bus.	
33	RESET	Reset signal input terminal. Active at 'L'.	
34	CS	Chip select signal input pin	
35	SCL	Serial interface clock	
36	SDA	Input/Output signal pin	
37	TE	Tearing effect output pin to synchronize MPU to frame writing	
38	GND	Power Ground	
39	LED+	Power supply for backlight anode input terminal.	
40	LED-	Power supply for backlight cathode input terminal.	



6. Timing Characteristics

6.1 RGB interface timing

The timing chart of RGB interface DE mode is shown as follows.

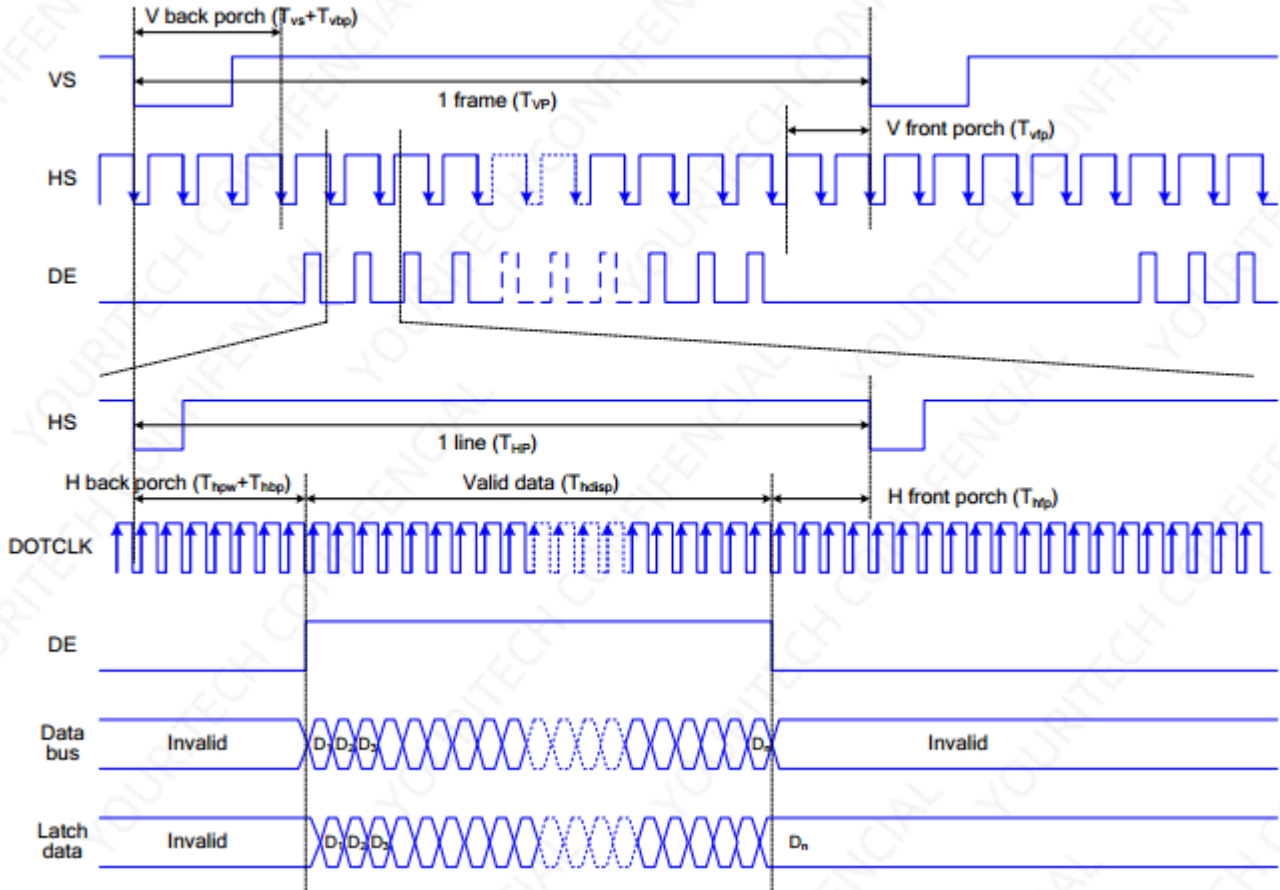
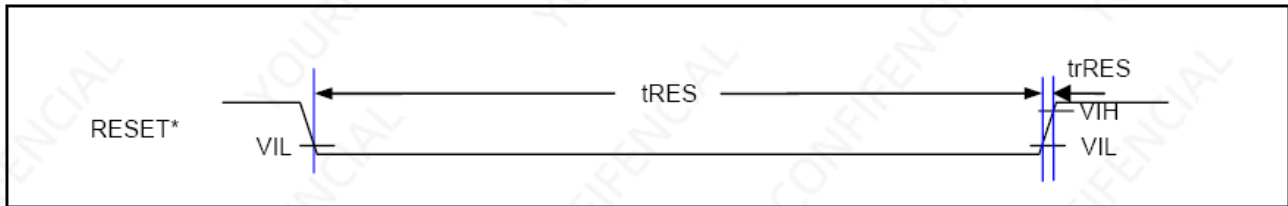


Figure 24 Access area by RGB interface

Please refer to the following table for the setting limitation of RGB interface signals.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Horizontal Sync. Width	hpw	1	-	255	Clock
Horizontal Sync. Back Porch	hbp	1	--	255	Clock
Horizontal Sync. Front Porch	hfp	1	--	-	Clock
Vertical Sync. Width	vs	1	--	254	Line
Vertical Sync. Back Porch	vbp	1	--	254	Line
Vertical Sync. Front Porch	vfp	2	--	--	Line





Item	Symbol	Unit	Min.	Typ.	Max.
Reset low-level width	tRES	ms	1	-	-
Reset rise time	trRES	μs	-	-	10

7.Optical Characteristics

Items		Symbol	Condition	Specifications			Unit
				Min.	Typ.	Max.	
Contrast Ratio		CR		-	800	-	-
Response Time		T _R		-	16	21	ms
		T _F		-	19	24	ms
Chromaticity	Red	X _R			/		-
		Y _R			/		-
	Green	X _G			/		-
		Y _G			/		-
	Blue	X _B			/		-
		Y _B			/		-
	White	X _W	0.28	0.31	0.34	-	
		Y _W	0.29	0.32	0.35	-	
Viewing angle	Hor.	φ1(3 o'clock)	Center CR≥10	-	80	-	deg.
		φ2(9 o'clock)		-	80	-	
	Ver.	θ2(12 o'clock)		-	80	-	
		θ1(6 o'clock)		-	80	-	
Uniformity					---		%

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Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63

L0: Luminance of gray level 0

CR = CR (10)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note 5.

Note 2: Definition of Response Time (TR, TF):



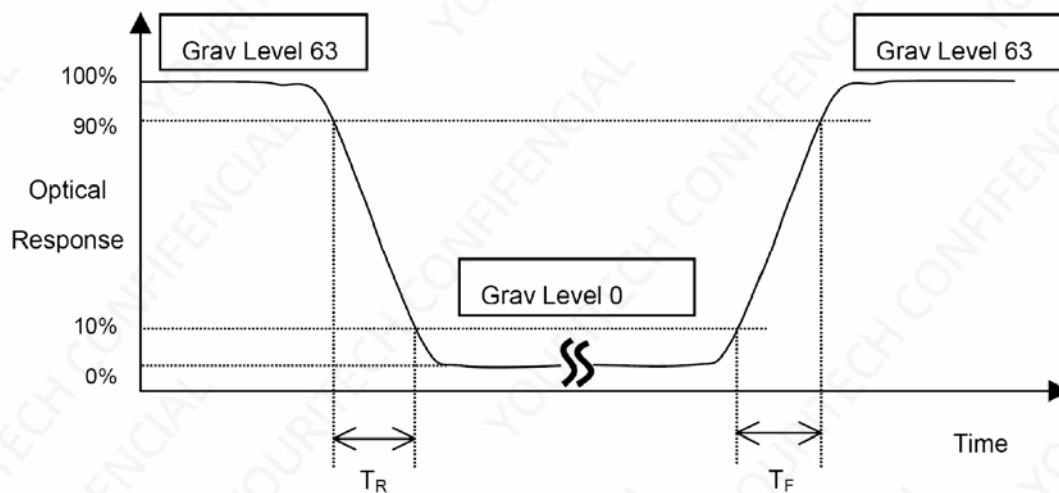


Figure 3

Note 3: Viewing Angle

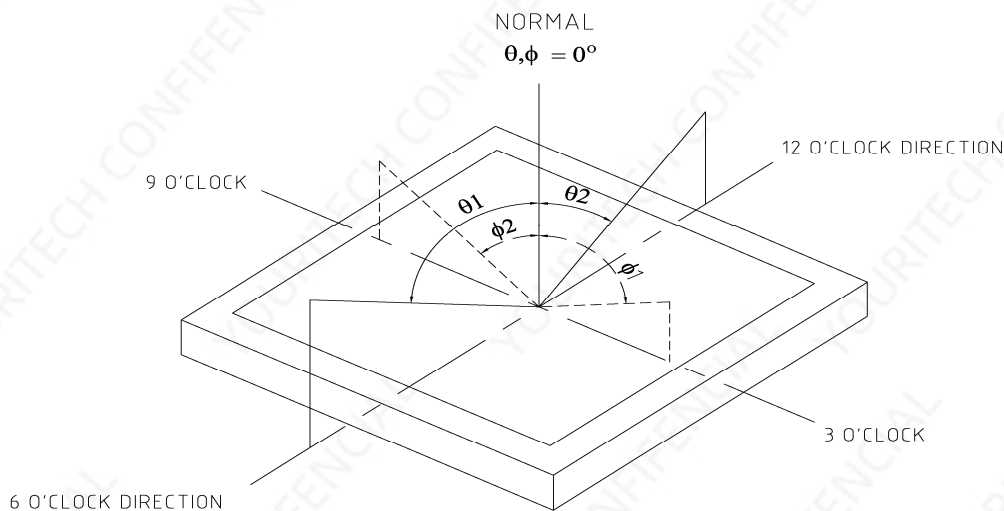


Figure 4

The above “Viewing Angle” is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 6 O'clock. Module maker can increase the “Viewing Angle” by applying Wide View Film.

Note 4: Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



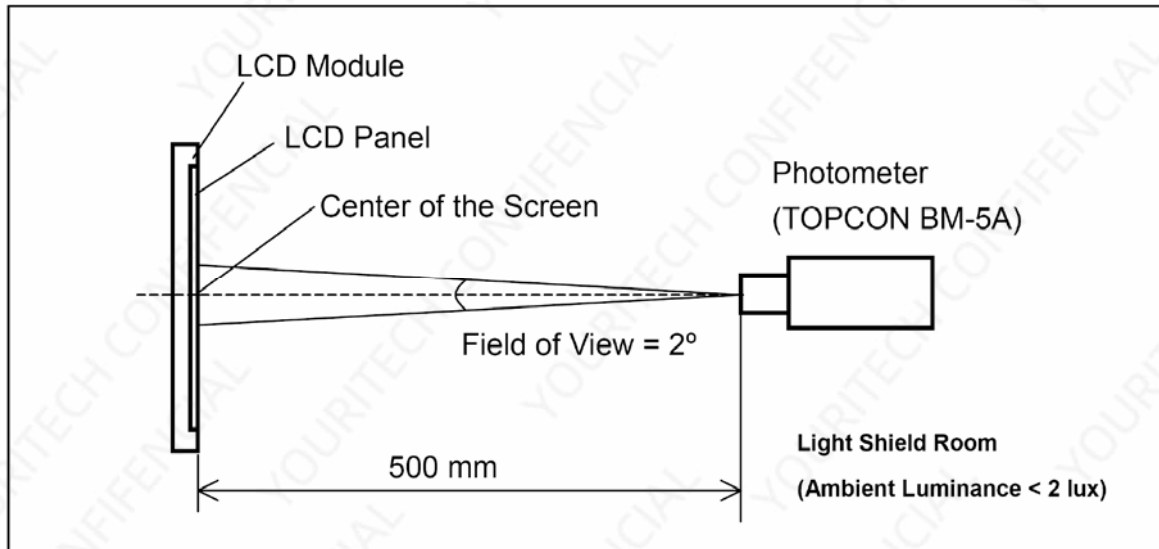


Figure 5

8. Reliability Test Item

No.	Test Item	Test Condition	Notes
1	High Temp. Storage	+70°C / 96H	1. Functional test is OK. Missing Segment, short, unclear segment non-display, display abnormally and liquid crystal leakage un-allowed. 2. No low temperature bubbles, end seal loose and fall, frame rainbow.
2	Low Temp. Storage	-30°C / 96H	
3	High Temp. Operating	+60°C / 96H	
4	Low Temp. Operating	-20°C / 96H	
5	High Temperature / Humidity storage	50°C x 90%RH / 96H	
6	Thermal and cold shock	Static state, -20°C (30min) ~60°C (30min), 50 cycles	

9. Packing Method----TBD

- END -

