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RVT7.0A800480TNWR00

LCD TFT Datasheet

Rev.1.4

2015-05-26

ITEM	CONTENTS	UNIT
LCD Type	TFT/Transmissive/Normally white	/
Size	7.0	Inch
Viewing Direction	12:00 (without image inversion)	O' Clock
Gray Scale Inversion Direction	6:00	O' Clock
LCM (W × H × D)	164.80 × 99.80 × 7.00	mm ³
Active Area (W × H)	154.08 × 85.92	mm ²
Dot Pitch (W × H)	0.1926 × 0.179	mm ²
Number Of Dots	800 (RGB) × 480	/
Driver IC	HX8264+HX8664	/
Backlight Type	21 LEDs	/
Surface Luminance	320	cd/m ²
Interface Type	24bit RGB	/
Color Depth	16.7M	/
Pixel Arrangement	RGB Vertical Stripe	/
Surface Treatment	Anti-glare	
Input Voltage	3.3	V
With/Without TSP	Resistive Touch Panel	/
Weight	196	g

Note 1: RoHS compliant

Note 2: LCM weight tolerance: ± 5%.

REVISION RECORD

REVNO.	REVDATE	CONTENTS	REMARKS
1.0	2014-10-15	Initial Release	
1.1	2014-10-29	Add additional information on mechanical drawing	
1.2	2015-01-19	Update LED lifetime	
1.3	2015-02-11	Update dimensions information on mechanical drawing	
1.4	2015-05-25	Update mechanical drawing	

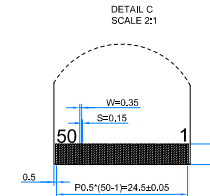
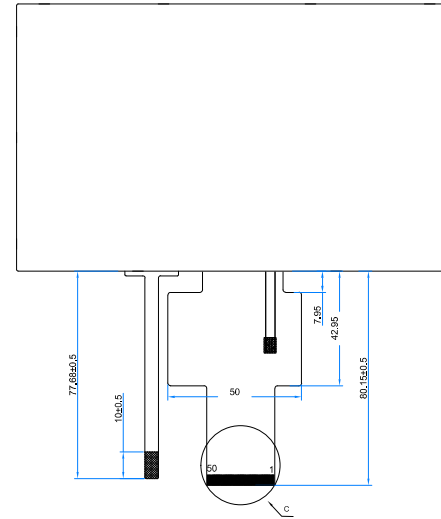
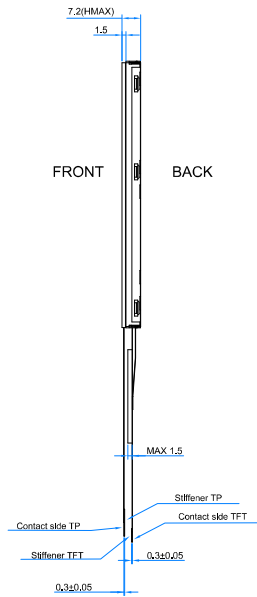
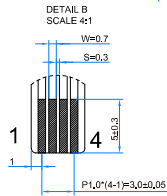
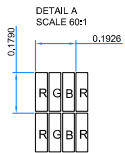
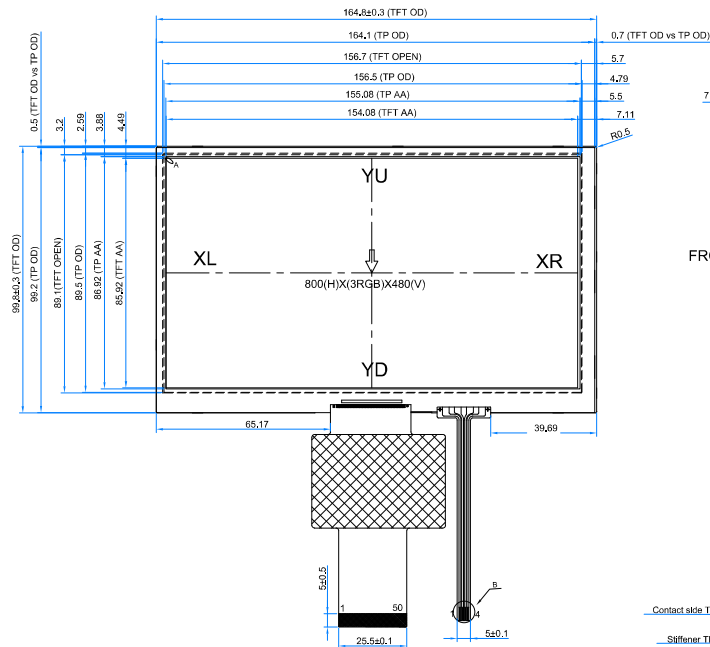
CONTENTS

REVISION RECORD	2
CONTENTS	2
1. MODULE CLASSIFICATION INFORMATION	3
2. MODULE DRAWING.....	4
3. ABSOLUTE MAXIMUM RATINGS.....	5
4. ELECTRICAL CHARACTERISTICS.....	5
5. BACKLIGHT CHARACTERISTICS	5
6. ELECTRO-OPTICAL CHARACTERISTICS	5
7. INTERFACE DESCRIPTION	7
8. LCD TIMING CHARACTERISTICS	10
8.1 Clock and data input time diagram	10
8.2 Parallel RGB input timing table	10
9. TOUCH SCREEN PANEL SPECIFICATIONS	11
9.1. Electrical characteristics	11
9.2. Mechanical characteristics	11
10. RELIABILITY TEST.....	11
11. LEGAL INFORMATION.....	12

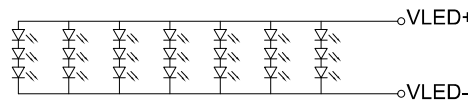
1. MODULE CLASSIFICATION INFORMATION

RV	T	7.0	A	800480	T	N	W	R	00
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.

1.	BRAND	RV – Riverdi
2.	PRODUCT TYPE	T – TFT Standard F – TFT Custom
3.	DISPLAY SIZE	3.5 – 3.5" 4.3 – 4.3" 5.7 – 5.7" 7.0 – 7.0"
4.	MODEL SERIAL NO.	A-Z
5.	RESOLUTION	320240 – 320x240 px 480272 – 480x272 px 800480 – 800x480 px
6.	INTERFACE	T – TFT LCD, RGB L – TFT LCD, LVDS C – TFT + Controller
7.	FRAME	N – No Frame F – Mounting Frame
8.	BACKLIGHT TYPE	W – LED White
9.	TOUCH PANEL	N – No Touch Panel R – Resistive Touch Panel C – Capacitive Touch Panel
10.	VERSION	00 (00-99)



Backlight LED Circuit



PIN DESCRIPTION			
PIN NO	SYMBOL	PIN NO	SYMBOL
1	VLED+	26	G1
2	VLED+	27	G0
3	VLED-	28	R7
4	VLED-	29	R6
5	GND	30	R5
6	VDD	31	R4
7	VDD	32	R3
8	MODE	33	R2
9	DE	34	R1
10	VSYNC	35	R0
11	HSYNC	36	GND
12	B7	37	DCLK
13	B6	38	GND
14	B5	39	LR
15	B4	40	UD
16	B3	41	VDD
17	B2	42	VDD
18	B1	43	NC
19	B0	44	RESET
20	G7	45	NC
21	G6	46	NC
22	G5	47	DITHB
23	G4	48	GND
24	G3	49	NC
25	G2	50	NC

CN1 DESCRIPTION	
1	YU
2	XL
3	YD
4	XR

NOTES:

1. DISPLAY TYPE: TFT, TRANSMISSIVE, POSITIVE
2. OPERATING VOLTAGE: VDD=3.3V
3. VIEWING DIRECTION: 12 O'CLOCK.
4. IC DRIVER: HX8264+HX8664
5. OPERATING TEMP: -20°C ~ 70°C.
6. STORAGE TEMP: -30°C ~ 80°C.
7. LED BACKLIGHT: 21-CHIP WHITE LED,
8. LCM SURFACE LUMINANCE: 320cd/m².
9. GENERAL TOLERANCE: ±0.2.
10. RoHS COMPLIANT.

Ver.	DESCRIPTION	DATE
1.2	Update PIN information	2015.05.26
1.1	Update dimensions	2015.02.11
1.0	Initial case	2014.10.10

CUSTOMER		DATE		2015-05-26	
DRAWN		SCALE	1:1	TITLE	
DFTG CHK				RVT7.0A800480TNWR00	
ENGR CHK		UNIT	mm	MODEL	
APPROVAL					
				DWG NO	PAGE
				Rev.1.2	1/1

3. ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage For Logic	VDD	-0.3	5.0	V
LED reverse voltage (each LED)	VR	-	1.2	V
LED forward voltage (each LED)	IF	-	30	mA
Operating Temperature	T _{OP}	-20	70	°C
Storage Temperature	T _{ST}	-30	80	°C
Humidity	RH	-	90% (Max 60°C)	RH

4. ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Power voltage	VDD	3.0	3.3	3.6	V
Input Current	IVDD	-	71.4	-	mA
Input Voltage ' H ' level	V _{IH}	0.8VDD	-	VDD	V
Input Voltage ' L ' level	V _{IL}	0	-	0.3VDD	V

5. BACKLIGHT CHARACTERISTICS

ITEM	SYMBOL	MIN	TYP	MAX	UNIT
Voltage for LED backlight	V _I	9.0	9.6	10.2	V
Current for LED backlight	I _i	170	180	200	mA
LED Life Time	-	30000	50000	-	Hrs

Note: The LED life time is defined as the module brightness decrease to 50% original brightness at Ta=25°C.

6. ELECTRO-OPTICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	REMARK	NOTE
Response Time	Tr+Tf	$\theta=0^\circ$	-	20	35	ms	FIG 1.	4
Contrast Ratio	Cr	$\phi=0^\circ$	400	500	-	---	FIG 2.	1
Luminance Uniformity	δ WHITE	Ta=25	70	75	-	%	FIG 2.	3
Surface Luminance	Lv		-	320	-	cd/m ²	FIG 2.	2
Viewing Angle Range	θ	$\phi = 90^\circ$	40	50	-	deg	FIG 3.	6
		$\phi = 270^\circ$	60	70	-	deg	FIG 3.	
		$\phi = 0^\circ$	60	70	-	deg	FIG 3.	
		$\phi = 180^\circ$	60	70	-	deg	FIG 3.	
CIE (x, y) Chromaticity	Red	x	-	-	-	FIG 2.	5	
		y	-	-	-			
	Green	x	-	-	-			
		y	-	-	-			
	Blue	x	-	-	-			
		y	-	-	-			
	White	x	-	0.280	-			
		y	-	0.310	-			

Note 1. Contrast Ratio(CR) is defined mathematically as below, for more information see Figure 1.

$$\text{Contrast Ratio} = \frac{\text{Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Average Surface Luminance with all black pixels (P1, P2, P3, P4, P5)}}$$

Note 2. Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information see Figure 2.

L_v = Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)

Note 3. The uniformity in surface luminance δ WHITE is determined by measuring luminance at each test position 1 through 5, and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance. For more information see Figure 2.

$$\delta \text{ WHITE} = \frac{\text{Minimum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Maximum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}$$

Note 4. Response time is the time required for the display to transition from white to black (Rise Time, T_r) and from black to white (Decay Time, T_f). For additional information see Figure 1. The test equipment is Autronic-Melchers's ConoScope series.

Note 5. CIE (x, y) chromaticity, the x, y value is determined by measuring luminance at each test position 1 through 5, and then make average value.

Note 6. Viewing angle is the angle at which the contrast ratio is greater than 2. For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see Figure 3.

Note 7. For viewing angle and response time testing, the testing data is based on Autronic-Melchers's ConoScope series. Instruments for Contrast Ratio, Surface Luminance, Luminance Uniformity, CIE the test data is based on TOPCON's BM-5 photo detector.

Figure 1. The definition of response time

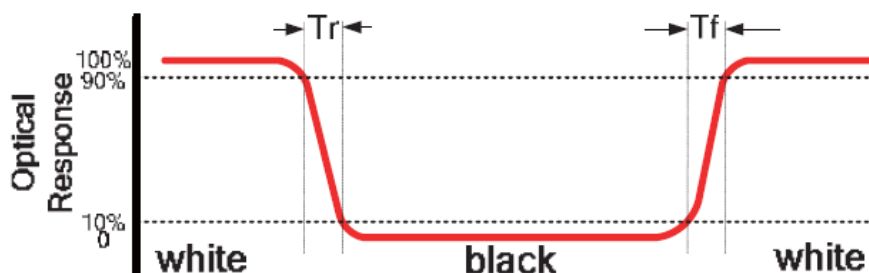


Figure 2.Measuring method for Contrast ratio, surface luminance, luminance uniformity, CIE (x, y) chromaticity

A : 5 mm
B : 5 mm
H, V : Active Area
Light spot size $\varnothing=5\text{mm}$, 500mm distance from the LCD surface to detector lens
measurement instrument is TOPCON's luminance meter BM-5

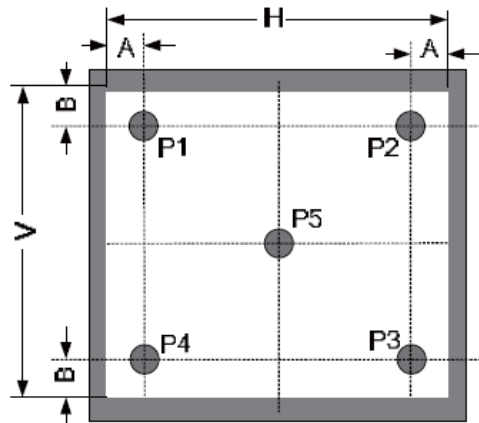
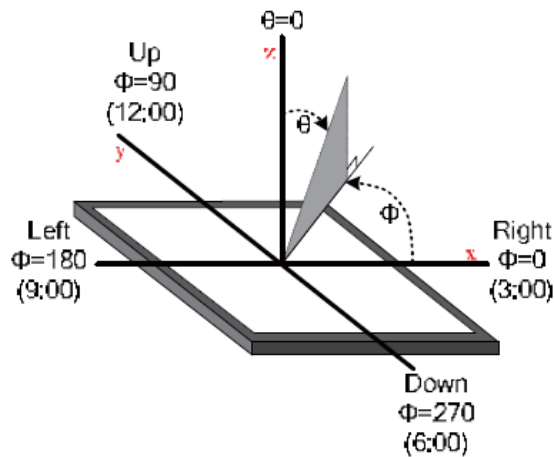


Figure 3.The definition of viewing angle



7. INTERFACE DESCRIPTION

PIN NO.	SYMBOL	DESCRIPTION	REMARK
1	VLED+	Anode Of LED Backlight	
2	VLED+	Anode Of LED Backlight	
3	VLED-	Cathode Of LED Backlight	
4	VLED-	Cathode Of LED Backlight	
5	GND	Power Ground	
6	VDD	Power For Circuit	
7	VDD	Power For Circuit	
8	MODE	DE/SYNC Mode Select	Note 1
9	DE	Data Input Enable	
10	VSYNC	Vertical Sync Signal	
11	HSYNC	Horizontal Sync Signal	
12	B7	Blue Data (MSB)	
13	B6	Blue Data	
14	B5	Blue Data	
15	B4	Blue Data	

16	B3	Blue Data	
17	B2	Blue Data	
18	B1	Blue Data	Note 2
19	B0	Blue Data (LSB)	Note 2
20	G7	Green Data (MSB)	
21	G6	Green Data	
22	G5	Green Data	
23	G4	Green Data	
24	G3	Green Data	
25	G2	Green Data	
26	G1	Green Data	Note 2
27	G0	Green Data (LSB)	Note 2
28	R7	Red Data (MSB)	
29	R6	Red Data	
30	R5	Red Data	
31	R4	Red Data	
32	R3	Red Data	
33	R2	Red Data	
34	R1	Red Data	Note 2
35	R0	Red Data (LSB)	Note 2
36	GND	Power Ground	
37	DCLK	Clock For Input Data	Note 3
38	GND	Power Ground	
39	LR	Left / Right Selection	Note 4,5,8
40	UD	Up / Down Selection	Note 4,5,9
41	VDD	Power For Circuit	
42	VDD	Power For Circuit	
43	NC	No Connection	
44	RESET	Global Reset Pin	Note 6
45	NC	No Connection	
46	NC	No Connection	
47	DITHB	Dithering Function	Note 7
48	GND	Power Ground	
49	NC	No Connection	
50	NC	No Connection	

Note 1: DE/SYNC mode select. Normally (internally) pulled 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 18bit 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.

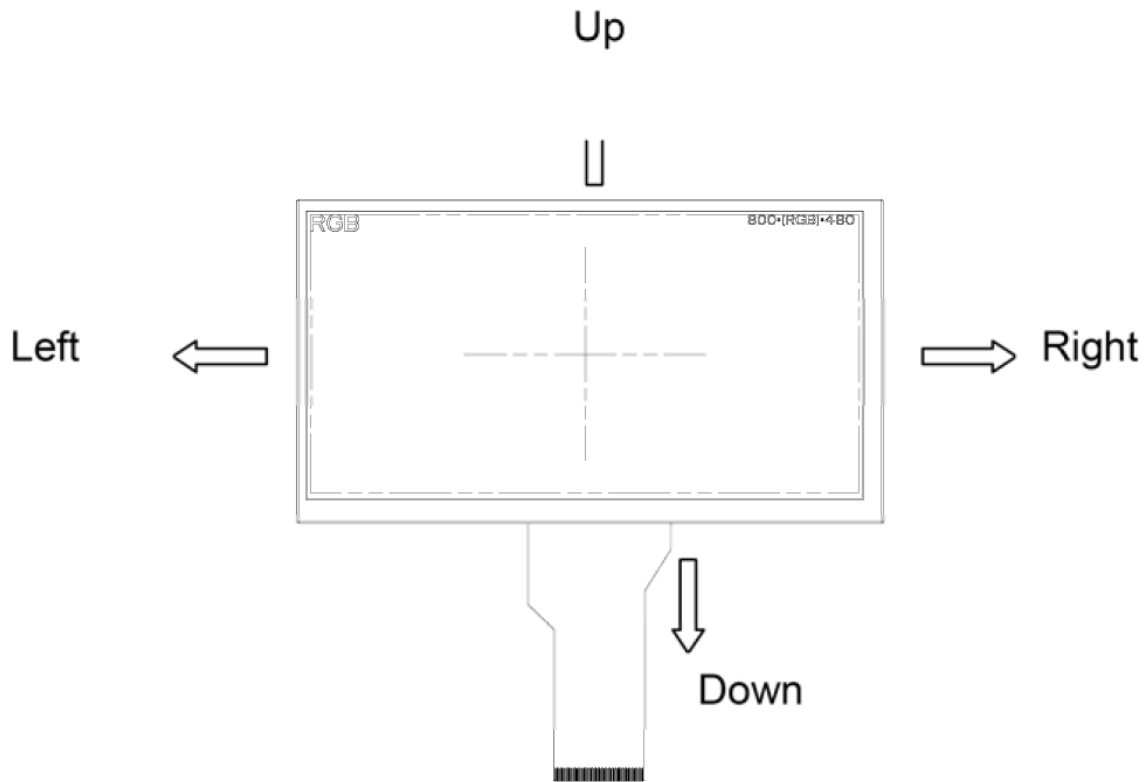
Note 4: Selection of scanning mode.

SET OF SCAN CONTROL INPUT		SCANNING DIRECTION
UD	LR	
GND	VDD	Up To Down, Left To Right
VDD	GND	Down To Up, Right To Left
GND	GND	Up To Down, Right To Left
VDD	VDD	Down To Up, Left To Right

Note 5: Definition of scanning direction.

Refer to the figure Figure 4.

Figure 4. Definition of scanning direction



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

Note 7: Dithering function enable control, normally (internally) pull high.

When DITHB="1", Disable internal dithering function,

When DITHB="0", Enable internal dithering function,

Note 8: Normally (internally) pull high.

Note 9: Normally (internally) pull low.

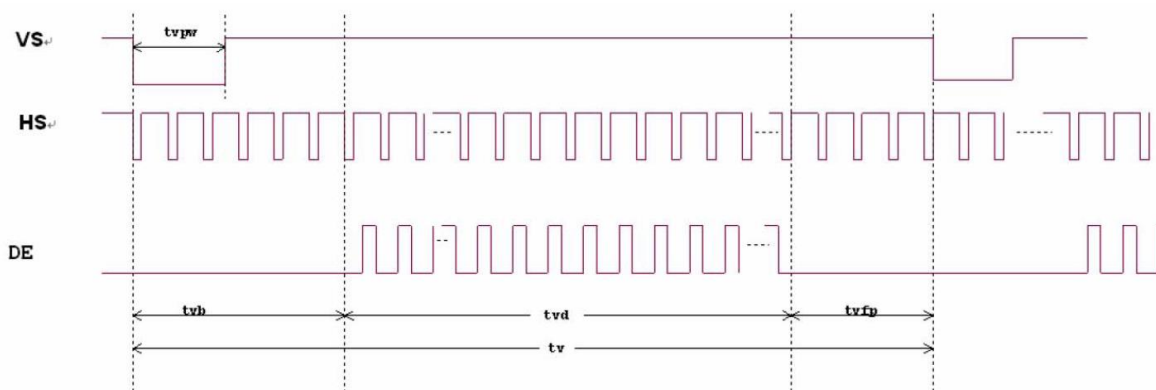
8. LCD TIMING CHARACTERISTICS

8.1 Clock and data input time diagram

Figure 5. Horizontal input timing diagram



Figure 6. Vertical input timing diagram



8.2 Parallel RGB input timing table

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
DCLK Frequency	Fclk	26.4	33.3	46.8	MHz
VSD Period Time	Tv	510	525	650	TH
VSD Display Area	Tvd		480		TH
VSD Blanking	Tvb		23		TH
VSD Front Porch	Tvfp	7	22	147	TH
VSD Pulse Width	Tvpw	1	-	20	TH
HSD Pulse Width	Thpw	1	-	40	DCLK
HSD Period Time	Th	862	1056	1200	DCLK
HSD Display Area	Thd		800		DCLK
HSD Blanking	Thb		46		DCLK
HSD Front Porch	Thfp	16	210	354	DCLK

9. TOUCH SCREEN PANEL SPECIFICATIONS

9.1. Electrical characteristics

ITEM	VALUE			UNIT	REMARK
	Min.	Typ.	Max.		
Linearity	-3.0	-	3.0	%	Analog X and Y directions
Terminal Resistance	440	-	1100	Ω	X
	100	-	420	Ω	Y
Insulation Resistance	25	-	-	M Ω	DC 25V
Voltage	-	-	10	V	DC
Chattering	-	-	10	ms	100k Ω pull-up
Transparency	78	-	-	%	JIS K7105

Note: Avoid operating with hard or sharp material such as a ball point pen or a mechanical pencil except a polyacetal pen (tip R0.8mm or less) or a finger

9.2. Mechanical characteristics

ITEM	VALUE			UNIT	REMARK
	Min.	Typ.	Max.		
Activation Force	20	-	100	gf	
Durability-Surface Scratching	Write 100,000	-	-	characters	
Durability-Surface Pitting	1,000,000	-	-	touches	
Surface Hardness	3	-	-	H	JIS K5400

10. RELIABILITY TEST

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Storage	80 \pm 2 $^{\circ}$ C/240hours
2	Low Temperature Storage	-30 \pm 2 $^{\circ}$ C/240hours
3	High Temperature Operating	70 \pm 2 $^{\circ}$ C/240hours
4	Low Temperature Operating	-20 \pm 2 $^{\circ}$ C/240hours
5	Temperature Cycle	-30 \pm 2 $^{\circ}$ C \sim 25 \sim 80 \pm 2 $^{\circ}$ C \times 20 cycles (30min.) (5min.) (30min.)
6	Damp Proof Test	60 $^{\circ}$ C \pm 5 $^{\circ}$ C \times 90%RH/240hours
7	Vibration Test	Frequency 10Hz \sim 55Hz Amplitude of vibration : 1.5mm Sweep: 10Hz \sim 55Hz \sim 10Hz X, Y, Z 2 hours for each direction.
8	Package Vibration Test	Random vibration :0.15G*G/HZ from 5-200HZ,-6dB/Octave from 200-500HZ of each direction of X.Y. Z (6 hours for total)
9	Package Drop Test	Height:60 cm 1 corner,3 edges,6 surfaces
10	ESD Test	\pm 2KV, Human body mode,100pF/1500 Ω
11	Mechanical Shock	100G 6ms, X, Y, Z 3 times for each direction

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