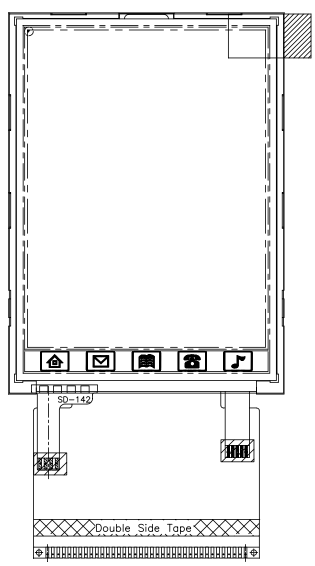
PRODUCT SPECIFICATION

HDA280T

(TOUCH SCREEN)

240X320 , TFT COLOR GRAPHICS LCD DISPLAY MODULE



HANTRONIX, INC. 10080 BUBB RD. CUPERTINO, CA 95014	Q.A.: ZW	REV.: 1.0	HDA280T	SHEET 1 OF 14 DATE: 3/26/08

GENERAL SPECIFICATION

ITEM	CONTENTS
Module Size	50.0 (W)mm * 98.95 (H)mm * 4.2(D) mm
Display Size	2.8 inch
Display Format	240(RGB)* 320 Pixels
Active Area	43.2 (W) * 57.6 (H) mm
Pixel Pitch	0.18 * 0.18 mm
LCD Type	TFT (262K)/ Transmissive / Positive
View Angle	12 O'clock
Controller IC	ILI9320
Backlight Driver type	External Power
DC to DC circuit	Build-In
Approx. Weight	24g

ABSOLUTE MAXIMUM RATING(Ta=25℃ VSS=0V)

Item	Symbol	Min.	Type	Max.	Unit	Humidity
Supply Voltage for Logic	VCC-GND	-0.3	-	+4.6	Volt	-
Supply Voltage for Analog	VCI-GND	-0.3	-	+4.6	Volt	-
Operating Temperature	Top	-20	-	+70	℃	Note1
Storage Temperature	Tst	-30	-	+80	℃	Note2

Note1 : Background color changes slightly depending on ambient temperature. This phenomenon is reversible.

Ta≦70℃ : 75%RH max

Ta>70℃ : absolute humidity must be lower than the humidity of 75%RH at 70℃

Note2: Ta at -30℃ will be <48hrs, at 80 ℃ will be <120hrs

ELECTRO-OPTICAL CHARACTERISTICS (Ta=25℃)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for Logic	VCC-GND	-	2.4	2.8	3.3	Volt
Power Supply for Analog	VCI-GND	-	2.4	2.8	3.3	Volt
Power Supply for interface	IOVCC-GND	-	1.65	2.8	3.3	Volt
Power Supply Current for LCM	IDD	VCC=VCI=2.8V	-	10	14	mA

OPTICAL CHARACTERISTICS

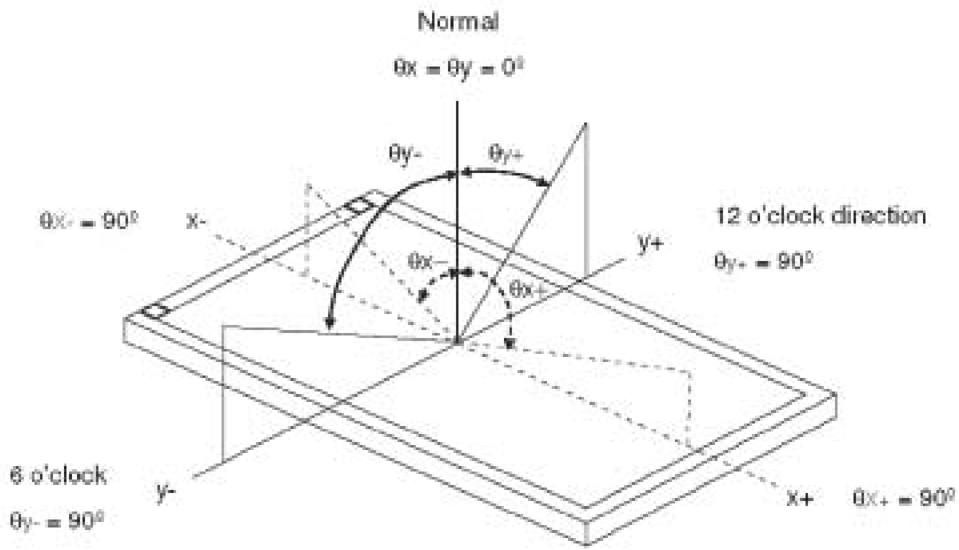
The optical characteristics should be measured in a dark environment (≤ 1 lux) or equivalent state with the methods shown in Note (4).

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_X=0°$, $\theta_Y=0°$ Viewing Normal Angle	-	(300)	-	-	(2)
Response Time		$T_{R+}T_F$		-	(40)	-	ms	(3)
Viewing angle	Horizontal	θ_X+	CR≥10	-	45	-	Degree	(1),(4)
		θ_X-		-	45	-		
	Vertical	θ_Y+		-	40	-		
		θ_Y-		-	20	-		

Color of CIE coordinate:

Item		Symbol	Condition	Min.	Typ.	Max.	Brightness
Chromaticity Coordinates (Transmissive)	Red	x	$\theta = \phi = 0°$ LED Backlight Color Degree X=0.30 Y=0.30 Brightness =2300cd/m²	0.59	0.64	0.69	20 cd/m²
		y		0.30	0.35	0.40	
	Green	x		0.29	0.34	0.39	100cd/m²
		y		0.55	0.60	0.65	
	Blue	x		0.09	0.14	0.19	15 cd/m²
		y		0.04	0.09	0.14	
	White	x		0.26	0.31	0.36	150 cd/m²
		y		0.30	0.35	0.40	

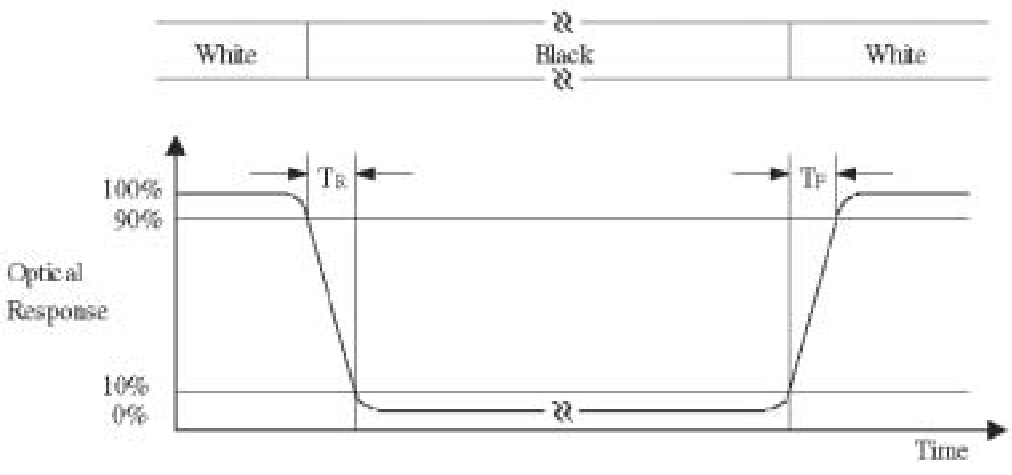
Note (1). Definition of Viewing Angle (θx, θy):



Note (2). Definition of Contrast Ratio (CR):

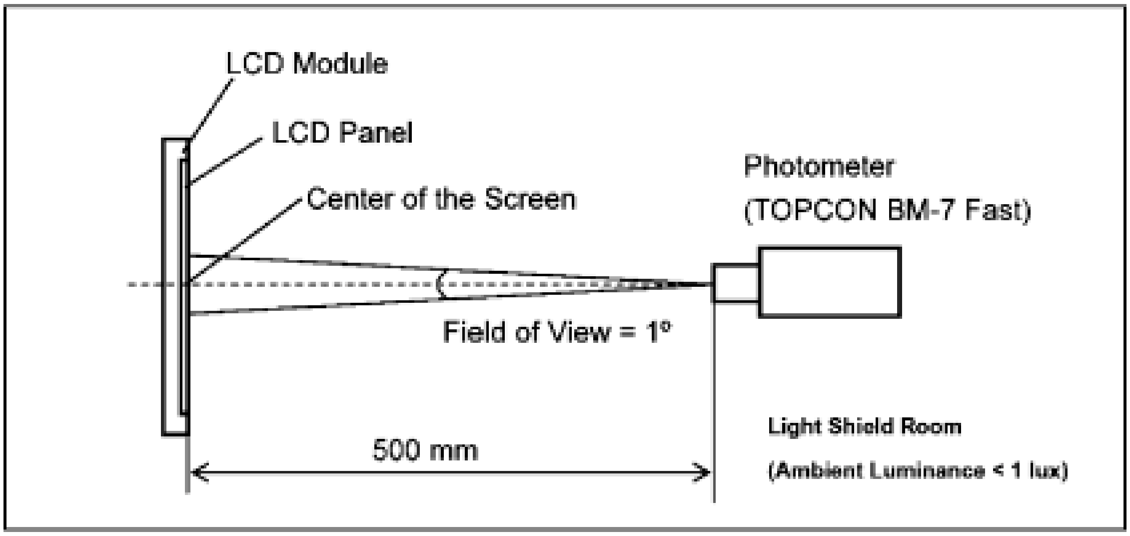
$$CR = \frac{\text{Luminance (brightness) all pixels "White"}}{\text{Luminance (brightness) all pixels "dark"}}$$

Note (3). Definition of Response Time (T_R, T_F):



Note (4). Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room.

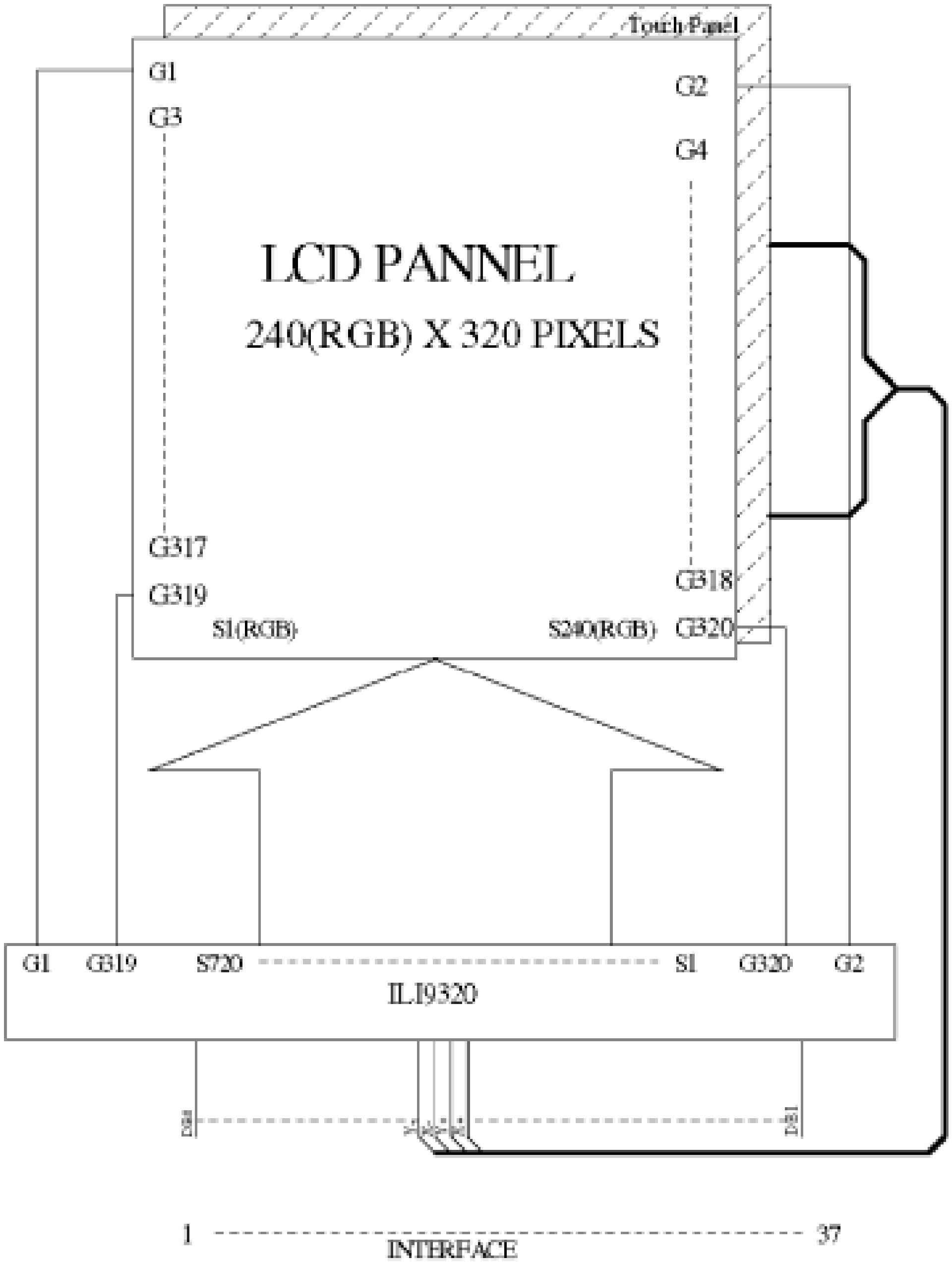


INTERFACE PIN ASSIGNMENT

No.	Symbol	Function
1	DB1	A data bus pin.
2	DB2	A data bus pin.
3	DB3	A data bus pin.
4	DB4	A data bus pin.
5	GND	System Ground
6	VCC	A supply voltage to the internal logic.
7	nCS	A chip select signal. Low: the ILI9320 is selected and accessible High: the Ill9320 is not selected and not accessible
8	RS	A register select signal. Low: select an index or status register High: select a control register Fix either IOVCC or GND level when not in use.
9	nWR	A write strobe signal and enables an operation to write data when the signal is low. Fix to either IOVCC or GND
10	nRD	A read strobe signal and enables an operation to read out data when the signal is low. Fix to either IOVCC or GND level when not in use. SPI Mode: Synchronizing clock signal in SPI mode.
11	IM0	Select the MPU system interface mode. IM3 / IM0 / MPU-Interface / DB Pin in use 0 / 0 / I80-system 16-bit interface / DB[17:10],DB[8:1] 0 / 1 / I80-system 8-bit interface / DB[17:10] When the serial peripheral interface is selected,IM0 pin is used for the device code ID setting.
12	X+	Touch panel coordinate in the left side of envisage drawing.
13	Y+	Touch panel coordinate in the up side of envisage drawing.
14	X-	Touch panel coordinate in the right side of envisage drawing.
15	Y-	Touch panel coordinate in the down side of envisage drawing.
16	LED_A	LED Anode
17	LED_K1	LED Cathode

No.	Symbol	Function
18	LED_K2	LED Cathode
19	LED_K3	LED Cathode
20	LED_K4	LED Cathode
21	IM3	Select the MPU system interface mode. IM3 / IM0 / MPU-Interface / DB Pin in use 0 / 0 / I80-system 16-bit interface / DB[17:10],DB[8:1] 0 / 1 / I80-system 8-bit interface / DB[17:10]
22	DB5	A data bus pin.
23	DB10	A data bus pin.
24	DB11	A data bus pin.
25	DB12	A data bus pin.
26	DB13	A data bus pin.
27	DB14	A data bus pin.
28	DB15	A data bus pin.
29	DB16	A data bus pin.
30	DB17	A data bus pin.
31	nRESET	A reset pin. initializes the ILI9320 with a low input. Be sure to execute a power-on reset after supplying power.
32	VCI	A supply voltage to the analog circuit.
33	IOVCC	A voltage to the interface pins.
34	GND	System Ground
35	DB6	A data bus pin.
36	DB7	A data bus pin.
37	DB8	A data bus pin.

BLOCK DIAGRAM



Software select: SM=0 GS=0

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BACKLIGHT

1. Standard Lamp Styles (Edge Lighting Type):
   The LED chips are distributed over the edge light area of the illumination unit, which gives the less power consumption:

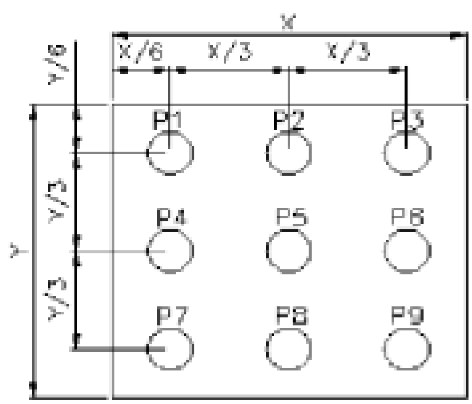
2. The Main Advantages of the LED Backlight are as Following:
   2.1 The brightness of the backlight can simply be adjusted.
   By a resistor or a potentiometer.

3. Data About LED Backlight:

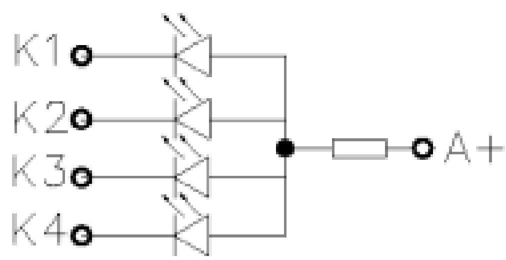
PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
Supply Current	I	-	80	-	mA	V=3.4V	-
Supply Voltage	V	-	3.4	-	V	If=80mA	-
Reverse Voltage	V_R	-	-	5	V	If=80mA	-
Luminous Intensity for LCM	Iv	-	150	-	Cd/m^2	If=80mA	2
Uniformity for LCM	-	80	-	-	%	If=80mA	3
Life Time	-	50000	-	-	Hr.	V≤3.4V	4
Color	White						

NOTE:
1. Backlight Only
2. Average Luminous Intensity of P1-P9
3. Uniformity = Min/Max * 100%
4.LED life time defined as follows: The final brightness is at 50% of original brightness

Measured Method: (X*Y: Light Area)



Internal Circuit Diagram



(Effective spatial Distribution)

Hole Diameterø3mm ; 1 to 9 per Position Measured Luminous

RELIABILITY

Environmental Test

NO.	Test Item	Test Condition	Test Time	Note
1	Low temperature storage	-30±2℃	240H	
2	High temperature storage	80±2℃	240H	
3	Low temperature operation	-20±2℃	240H	
4	High temperature operation	70±2℃	240H	
5	High temperature/ Humidity storage	60±2℃ 90%±5%RH	240H	Without dewing
6	Thermal shock storage	-30℃(30mim)→25℃(5min)→ +80℃(30min)	10 cycles	

Mechanical Test

NO.	Test Item	Test Condition	Note
1	Vibration test	Sweep for 1 min at 10Hz，55Hz，10Hz，amplitude 1.5mm 15 minutes each in the X，Y and Z directions(Total 45 minutes)	Non operation state
2	Drop test	One angle, three edges and six sides. 75cm above the ground(no weight difference)	Non operation state

LIFE TIME

Item	Description
1.	Functions, Performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature (25±10°C) , normal humidity(45±20%RH),and in area not exposed to direct sun light. (Except backlight)

SPECIFICATION OF QUALITY ASSURANCE

Purpose

This standard for quality assurance should affirm the quality of LCD module products to supply to ________ （Purchaser） by HANTRONIX

Standard for Quality Test

1.2.1Test method: According to MIL-STD-105E, General Inspection Level II take a single time.

1.2.2Electronic Assemblies Standard is according to IPC-AA610 REV. C . CLASS 2

1.2.3The defects classify of AQL as following list.

Classify	Inspect item	Nonconforming status	AQL	Remark
Critical defect	1.Display damage	（1） Non-Display	AQL=0.65	Product no function
		（2） Occur high current		
		（3） Segment missing		
		（4） LCD with wrong viewing direction		
		（5） Back light unlighted		
	2.Dimension not correct	（1） PCB and bezel out of specification	AQL=0.65	Can not assembly
Major defect	1.Display	（1） Display scanned Disorder	AQL=1.0	
		（2） display defect		
	2.Back-light	（1） Flash，duct		
		（2） Wong color		
Minor defect	1.LCD	（1）Dust(Black spot，white spot)	AQL=2.50	Appearance defect
		（2） Polarizer scratch		
		（3） Reflective polarizer with bubble		
		（4） Display segment transfigure		
		（5） Color out of the range of sample color		
Total			AQL=2.50	

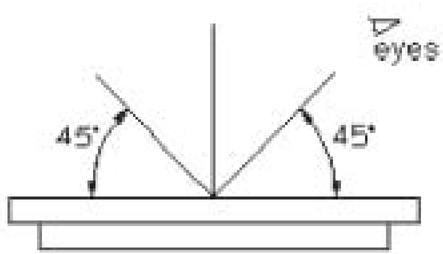
Standard of the product appearance test

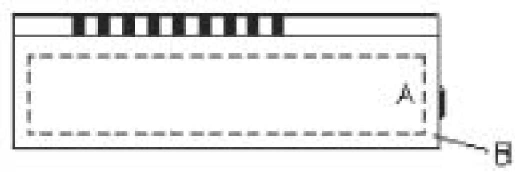
Manner of appearance test

The test must be under 20W×2 or 40W fluorescent light，and the distance of view must be at 30cm.

When test the model of transmissive product must add the reflective plate.

The test direction is base on about 45° of vertical line.

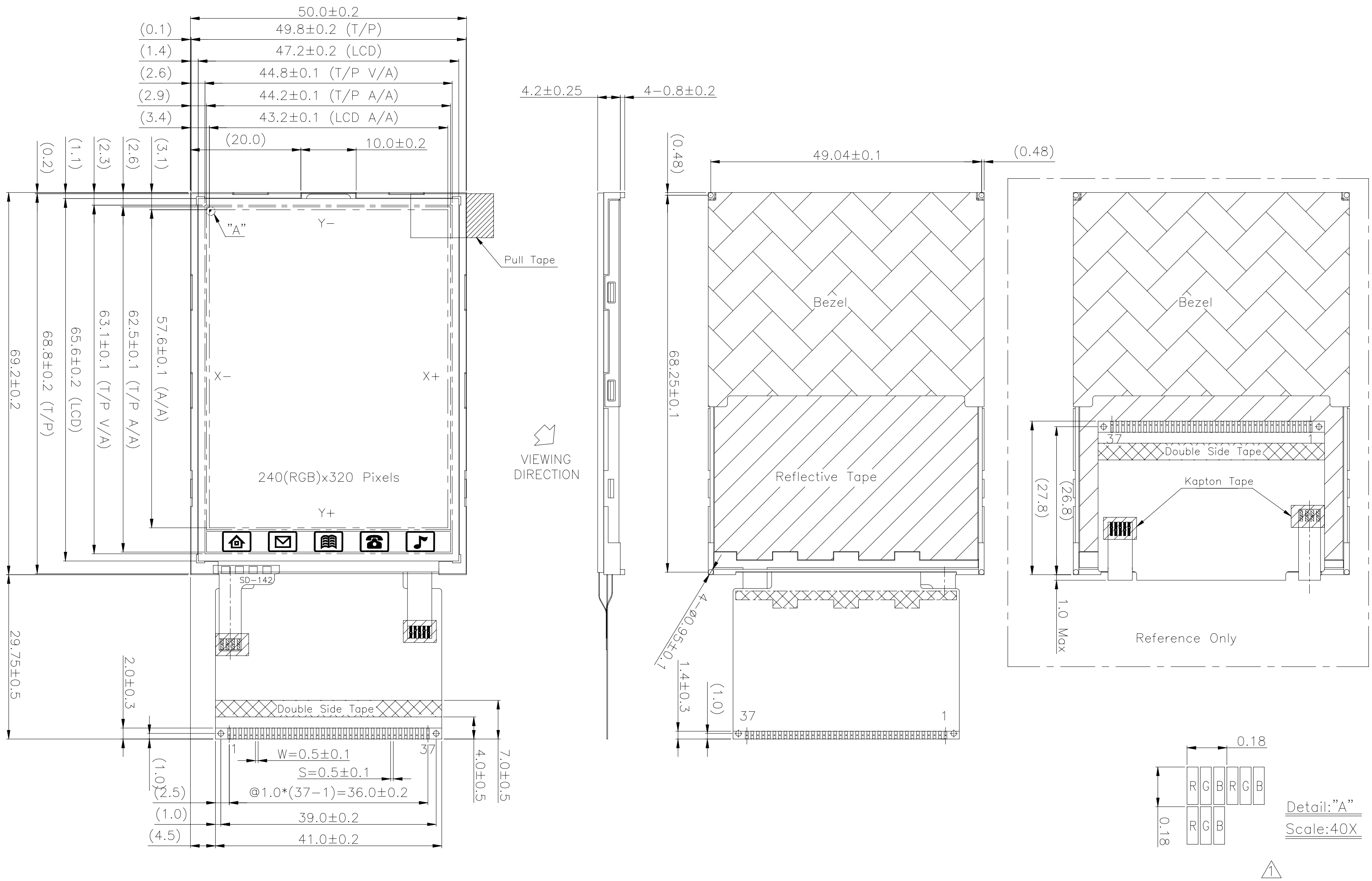




Definition of area :

A area: viewing area

B area: out of viewing area(outside viewing area)



4				DRAWING	! ! "	DATE	08/24'07	MODEL	HDA280T	HANTRONIX			
3				CHECK		DATE		TYPE	Assembly				
2	Modify Drawing : Company's Title ⚠	! ! "	08/24'07	APPROVE		DATE		PAGE	1 OF 1				
1	INITIAL DRAWING	! ! "	03/29'07	TOLERANCE: .X	±0.5	.XX	±0.3	.X°	±	REV.	2	UNIT	mm
REVISION	DESCRIPTION	REVISER	DATE	MATERIAL		Part Number				SCALE		SIZE	A4

(3)