LCD MODULE SPECIFICATION

MODEL NO.

ST56AP02

FOR MESSRS:

_____

ON DATE OF :

_____

APPROVED BY:

_____ _____ _____

1. APPLICATION

NAVIGATION, SEAT VIDEO (airline, car, boat), INSTRUMENT, SECURITY, VIDEO PHONE, DOOR PHONE, TELEVISION

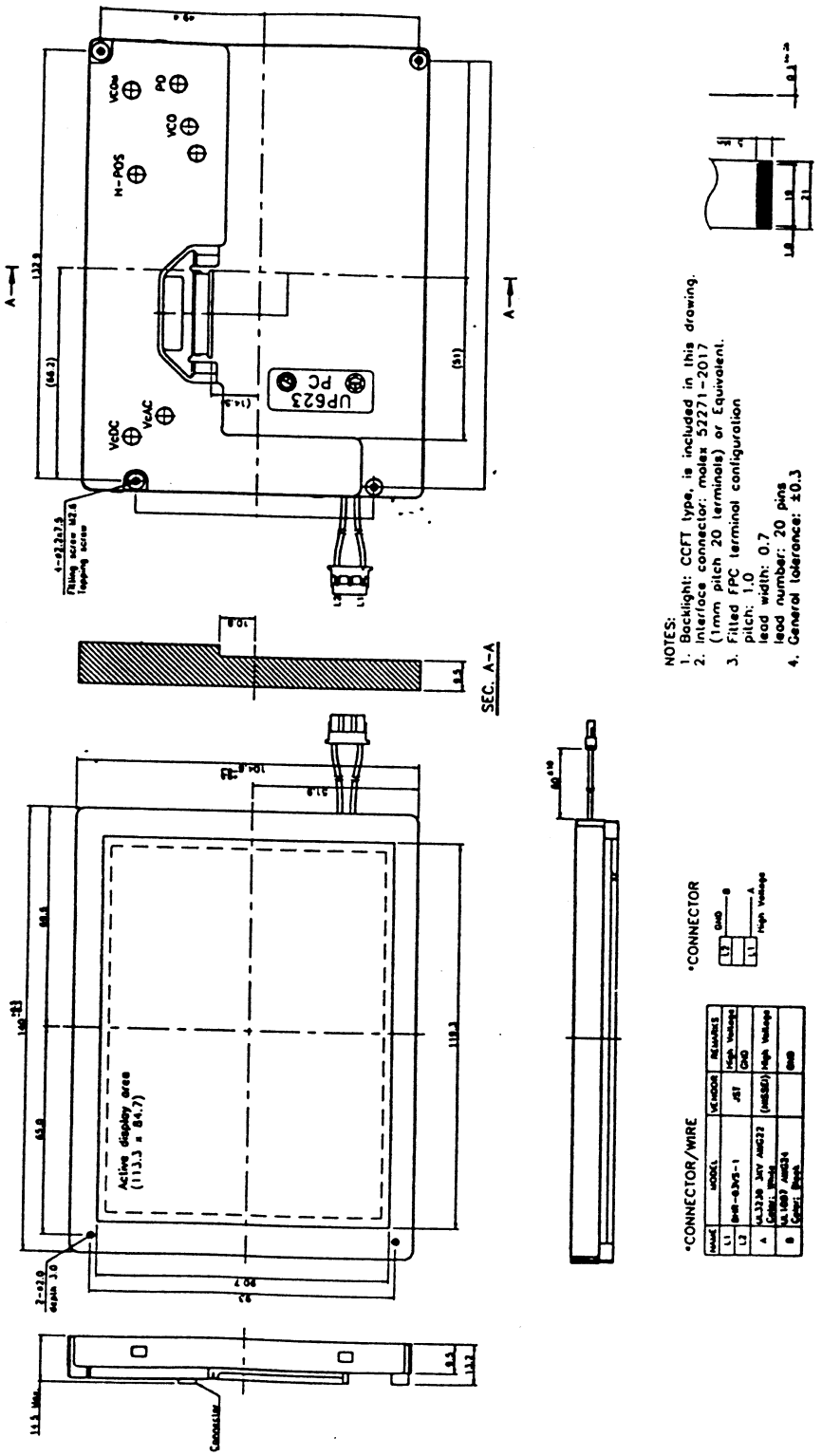
2. FEATURES

- HIGH RESOLUTION
- LOW POWER CONSUMPTION
- NO RADIATION
- SPEEDY RESPONSE TIME
- WIDE VIEW ANGLE

3. PHYSICAL SPECIFICATIONS

No.	Item	Specification	Remark
1	Display Resolution (dot)	960(H)×234(V)	
2	Active Area (mm)	113.3(W)×97.3(H)	
3	Screen Size (inch)	5.6" (Diagonal)	
4	Dot Pitch (mm)	0.118(W)×0.416(H)	
5	Outline Dimension(mm)	166.7(W)×119.8(H)×13(D)	Note 1
6	Color Configuration	R.G.B.Stripe	

Note 1: Refer to Fig. 1



NOTES:
1. Backlight: CCFT type, is included in this drawing.
2. Interface connector: molex 52271-2017
   (1mm pitch 20 terminals) or Equivalent.
3. Fitted FPC terminal configuration
   pitch: 1.0
   lead width: 0.7
   lead number: 20 pins
4. General tolerance: ±0.3

*CONNECTOR

*CONNECTOR/WIRE

NAME	MODEL	VENDOR	REMARKS
L1	BHR-03VS-1	JST	High Voltage
L2			GND
A	HU3230 24V AWG22 (AWG20)		High Voltage
B	HU1007 AWG24		GND

4. ELECTRICAL SPECIFICATIONS

4.1 INPUT/OUTPUT TERMINAL

PIN No.	Symbol	I/O	Description	Remark
1	DC IN	I	Power Supply for Board & Panel	Note 2
6	AV IN 1	I	Composite Video/Audio Signal Input	Note 2
8	AV IN 2	I	Composite Video/Audio Signal Input	Note 2
9	AV OUT	O	Composite Video/Audio Signal Output	Note 2
11	Ear Phone	O	Audio Signal for Earphone	Note 2
12	AU OUT	O	Audio Signal Output	Note 2

NOTE 2 : Refer to Fig 2

4.2 ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typical	Max.	Unit	Remark
Composite Signal Video	AV IN 1	0.8Vp-p	1.0Vp-p	1.2Vp-p	V	NOTE 2
	AV IN 2	0.8Vp-p	1.0Vp-p	1.2Vp-p	V	NOTE 2
Composite Signal Audio	AV IN 1	-	-	70	mVRMS	NOTE 2
	AV IN 2	-	-	70	mVRMS	NOTE 2
Supply Voltage	DC IN	10.8	12	13.2	V	NOTE 2
Audio Out	AU OUT			0.1	W	NOTE 2 8OHM
Audio Out for Earphone	Earphone	-	-	-	-	NOTE 2

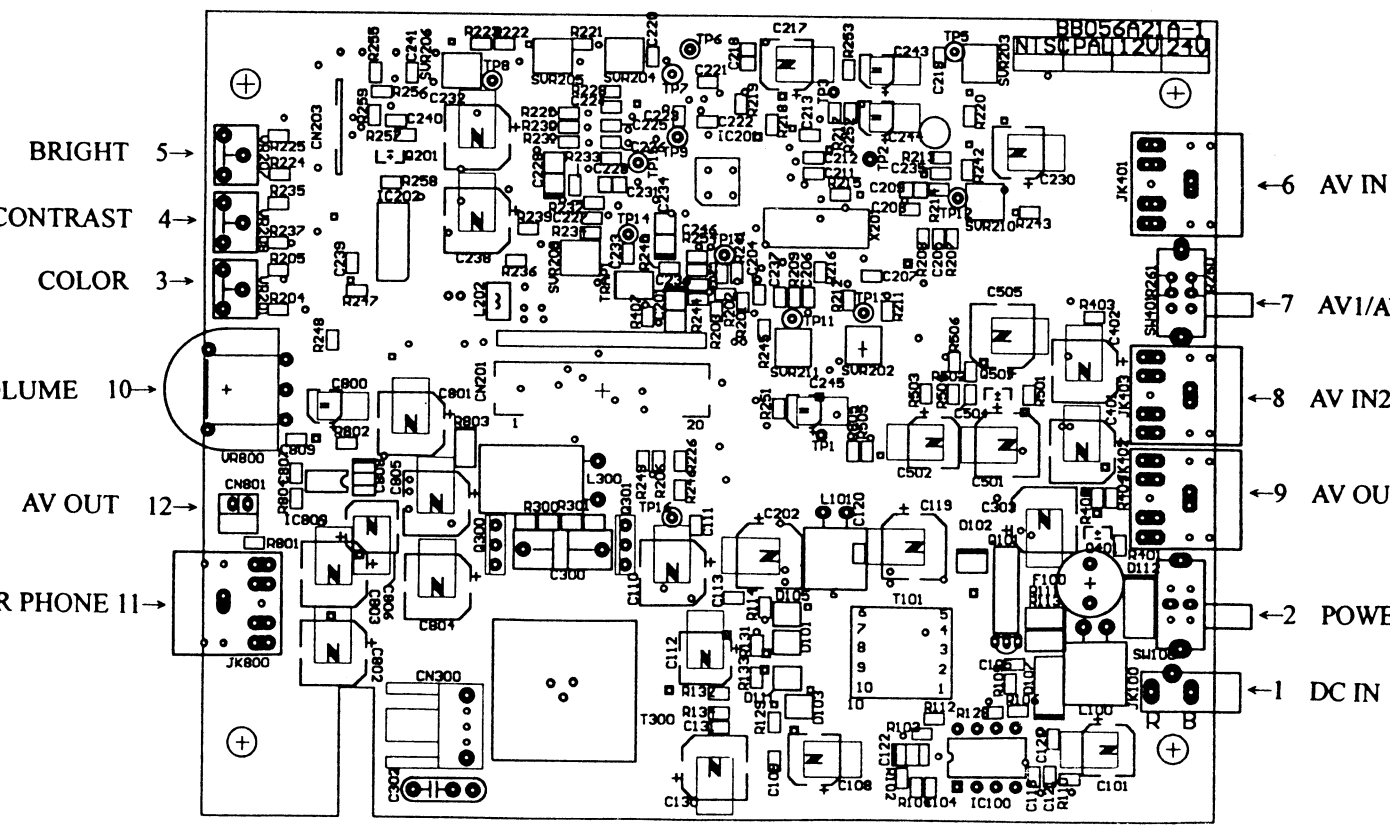
4.3 ALIGNMENT

Symbol	Description	Remark
COLOR VR	for Color Alignment	NOTE 2
CONTRAST VR	for Tint Alignment	NOTE 2
BRIGHT VR	for Brightness Alignment	NOTE 2
VOLUME VR	for Audio Volume Alignment	NOTE 2

4.4 CURRENT CONSUMPTION

Parameter	Condition	Min.	Typ.	Max.	Units	Remark
Current for Unit	Vcc = 12V	-	-	600	mA	

Fig. 2



(a) Horizontally

209~1168 clock from the falling dege of $\overline{HSY}$. (SAM="H")

83~402 clock from the falling edge of $\overline{HSY}$. (SAM="L")

(b) Vertically

20~253H from the falling edge of $\overline{VSY}$.

5. Optical specifications (Note 1, Note 2, Note 3)

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Response time Rising time Falling time	 T_r T_f	$\theta = 0°$	 - -	 25 30	 50 60	ms	Note 4
Contrast ratio	CR	At optimized viewing angle	60				Note 5,6
Viewing angle Top Bottom Left Right		 CR≧10	 30 10 45 45	 - - - -	 - - - -	deg.	Note 9
Brightness	Y_L	$\theta = 0°$	200	170	-	nit	Note 7,8
White Chromaticity	x	$\theta = 0°$	0.26	0.31	0.36		
	y		0.28	0.33	0.38		
Color Temperature	K_L	$\theta = 0°$	-	6600	-	K	

Note 1 : Ambient temperature=25℃.

Note 2 : To be measured in dark room.

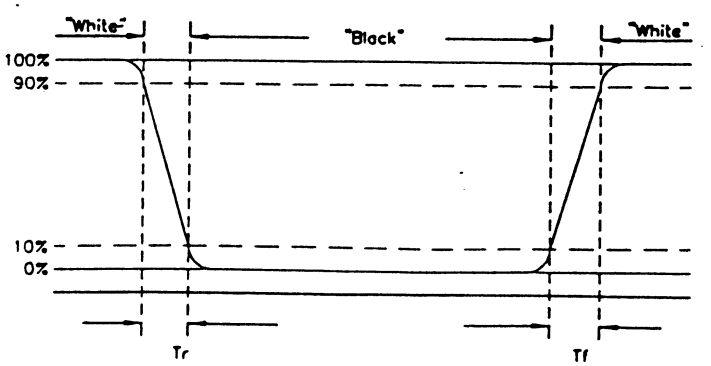
Note 3 : To be measured with a viewing cone of 1° by Topcon luminance meter BM-7.

Note 4 : Definition of response time :

The output signals of photodetector are measured when the input signals are changed from "Black" to "White" (falling-time) and from "White" to"Black" (rising time), respectively.

The response time is defined as the time interval between the 10% and 90% of amplitudes.

Refer to Figure as below.



Note 5 : Definition of contrast ratio :

Contrast ratio is calculated with the following formula.

$$\text{Contrast Ratio (CR)} = \frac{\text{Photodetector output when LCD is at "White" state}}{\text{Photodetector output when LCD is at "Black" state}}$$

Note 6 : White $Vi = V_{150} \pm 1.5V$

Black $Vi = V_{150} \pm 2.0V$

V_{150} : The analog input voltage when transmission is 50%.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 7 : Measured on the center area of the panel.

Note 8 : Driving conditions for CCFT : Lrms = 6.5mA, Vrms = 700V.

Note 9 : Definition of viewing angle.

Refer to figure as below.

