Vibrant

LP-10T21

SERVICE MANUAL

TATUNG

CONTENTS

7.0 Circuit Diagram

7.1 Power Distribution

7.2 VGA Input

7.3 ADC

7.4 Damping Network

7.5 Frame Rate Conversion

7.6 ASI 321

7.7 ASI 321 Power & EXT. OSD

7.8 Micro controller

7.9 Panel Interface

8.0 Layout Diagram

(To be confirmed)

9.0 Parts List

About This Manual

Audience

This service manual is primarily for system engineers, service engineers, dealers and distributors. It carries the assumption that reader understands the basic operating concepts.

Purpose

This manual contains reference data for LP-10T21 LCD monitor. It gives information regarding the operating principles of monitors, as well as technical service and maintenance information.

1.0 Introduction

The LP-10T01 is a high performance 10.4” TFT LCD monitor. This micro-controlled monitor is designed for continuous operation from 31.5 to 48 KHz and is capable of displaying up to a resolution of 800 *600 in interface mode. The razor sharp flicker-free image, and the delicate ergonomic design of this monitor elevate not only productivity but also the user’s comfort.

1.1 Operation Specification

1.1.1 Operation Environment

Temperature
Operation 0 to 40
Storage -20 to 60
Humidity (Relative)
Operation 10 to 80% non-condensing
Storage 10 to 90% non-condensing
Altitude
Operation 0~8000ft
Storage 0~40000ft

1.1.2 Safety, Ergonomic, EMC Compliance

This monitor complies with the following safety, ergonomic, and EMC standard

UL UL1950, Third Edition

FCC FCC Rules and CISPR22 (Docket NO. 92-152, SEP. 1993) and FCC/ ANSIC63.K-1992

TUV-GS EN60950 1992+A1+A2+A3+A4+A11 and EK1-ITB2000

CUL CAN / CSA C22.2 NO.950

CE(EMC) EN55022/1998 and EN61000-3-2 / 1995 +A12/1996 +A13 / 1997 +A1/1998 +A2/1998 and EN61000-3-3/1995 and EN5502K / 1998

CE(LVD) EN60950 1992+A1+A2+A3+A4+A11

1.1.3 Signal Input Requirement

Connector:

15 pin D-Sub high-density connector for video and sync signals. See chapter 4 for pin assignment.

Video Signals:

Type: Red, Green, Blue channels analog input.

Level: 0.7Vp-p

Impedance:75 ohms.

Sync Signals:

Type: Separate Horizontal and Vertical Sync

Level: TTL Level

Polarity: Positive or negative

1.1.4 Power Input Requirement

Operating voltage range

100~240 V AC at 50/60 Hz

Power Consumption

Normal Operation: 19W

Stand by: 2.5W

Suspend mode: 2.5W

Off mode: 2.5W

1.2 Functional Specification

The standard conditions for verifying the following specification are:

Temperature: 25±5

Warm-Up Time: 15 minutes minimum

AC line input: 100~240 V AC±10%, 50 / 60±3Hz

View Distance: 30cm

1.2.1 Display Quality

Display Size (H*Z): 211.2mm*158.4mm

Brightness: more than 120 cd/ m^2

Contrast Ratio: 180:1

1.2.2 Color Quality

White Balance (Use full white pattern, set brightness to maximum)

At color temperature of white light CIE9300 K+27M..P.C.D

X=0.283±0.02, Y=0.298±0.02

At color temperature of white light CIE6500 K+27M..P.C.D

X=0.313±0.02, Y=0.329±0.02

1.3 Control And Adjustment

1.3.1 External User Controls

⏻	POWER	Power On / Off
▭	MENU	OSD Menu On / Off
△	UP	Increase the Value.
▽	DOWN	Decrease the Value.
↵	ENTER	Confirm the selection

1.3.2 Controlled Functions From OSD Menu

Brightness: Press (+) key to increase brightness, (-) key to decrease brightness.

Contrast: Press (+) key to increase contrast, (-) key to decrease contrast.

Auto Adjust: Press (+) or (-) to adjust H-phase & H-position & V-position clock automatically.

Phase: By varying this (+)(-) control the exact sampling time within the pixel can be adjusted.

Clock: Adjust sampling clock of analog to digital converter until clock is equal to pixel frequency of video input.

H-Position: Press (+) key to shift screen right, (-) key to shift screen left.

V-Position: Press (+) key to shift picture upward, (-) key to shift picture downward.

Sharpness: Press (+) key to increase sharpness, (-) key to decrease Sharpness.

Color Temp: Press (+) or (-) to choose three types of color temperature 9300, 6500 and user define.

Language: Press (+) or (-) to choose any one of the following languages: English, French, German, Italian and Spanish.

OSD: Adjust OSD frame location, timeout, transparency and preset OSD.

Dos-text / graphic: Select display quality (text / graphic) when this monitor is used in DOS.

Recall: Recall the default value.

1.3.3 Special Functions

Automatic storing: After adjusting the screen parameters, the microprocessor automatically stores the screen settings in user mode.

Entering factory mode: Press (+) and (-) at same moment before power on, the monitor will operate in factory mode. In this mode, the value of brightness, contrast, black-level, red, green, phase, OSD time, color save (color temperature) is stored as default value. During recall function, these values will be recalled again.

2.0 Theory Of Operation

2.1 Main Board

This module consists of microprocessor, Cheetah chip, AD converter, memory, clock generator, power conversion, 3.3-volt regulator and backlight controller.

2.1.1 A/D (AD9884A U8):

U8 is a triple 8-bit ADC with controllable amplifiers and clamps for the digitizing of large bandwidth RGB signals. The clamp level, the gain and all of the other settings are controlled via a serial interface, SDA (pin29), SCL (pin30).
Analog video inputs (Rin, Gin, Bin) are internal DC polarized. These inputs are AC coupled by C46, C52, and C54 - three capacitors. ADC outputs R0~R7, G0~G7, B0~B7 are connected to scaling IC (ASI-320) via resistor array.

2.1.2 Scaling IC (ASI-320 U14):

U14 provides memory interface, ADC interface, microprocessor interface and flat panel interface. U14 can work either with or without the external frame buffer. The scaling IC is the data follow center between SDRAM (U12, U13), A/D converter (U8), MCU (U17) and LVDS transmitter (U20). Because the LVDS panel is 6 bits/color system, scaling IC also dither the 8 bits/color (from A/D) to 6bits/color system

2.1.3 Memory:

U12~U13 (A43L0616V-7) for 1M*16 SDRAM frame buffer. 2.1.4 Power conversion:
U1: Main 5 volts output are generated by DC to DC conversion, from adapter we get 12 volts DC input, convert 12 volts to 5 volts.

2.1.4 Regulator

3.3 volts regulator: U2, U4, U5, U6 are 3.3 volt regulators.
U2 output for LCD panel
U4 output for scaling IC (U14) and AD9884 (U8).
U5 output for SDRAM (U12, U13) and LVDS transmitter (U20)
U5 output for analog power of AD9884 (U8)

2.1.5 LVDS transmitter (U20)

U20 transmits the LVTTL color data via LVDS interface.

2.1.6 MCU (U17)

Dominate the OSD, preset mode, factory initial mode etc.

2.2 Keypad Board:

The key status input to Main Board for function adjustments ON OSD menu.

2.3 Inverter Board:

Inverts DC to high voltage AC for driving CCFL.

3.0 Troubleshooting Instruction

3.1 No Display, Power Indicator Is Off Or Blinking

3.1.1 Check AC/DC adaptor is proper installed with power code or DC jack.

3.1.2 Make sure having pressed power key.

3.2 No Display, Power Indicator Is Orange

3.2.1 Check the connector VGA1 for RGB signals input to Main board or not.

3.2.2 Change the Main Board

3.3 No Display, Power Indicator Is Green

3.3.1 Check the connector P7 for LVDS signals input to panel or not.

3.3.2 Check the LCD panel connector.

3.3.3 Check CON4 for power input of inverter.

3.3.4 Change the inverter board

3.3.5 Change the Main board

4.0 Video Connector Pin Assignment

Pin NO.	Signal	Pin NO.	Signal
1	R Signal	9	----------
2	G Signal	10	Sync Ground
3	B Signal	11	----------
4	----------	12	DDC Serial Data Line
5	Ground	13	Horizontal Sync
6	R Ground	14	Vertical Sync
7	G Ground	15	DDC Data Clock Line
8	B Ground		

5.0 Visual Inspection Criteria-LCD Panel

5.1 Criteria (acceptable)

Item		Accept Count
Bright Dot	Random R, G or B 1 dot	N 3
	Adjacent 2 dots	1 Pairs
	Adjacent 3 or more dots	0 Pairs
	Minimum distance between bright dots	15mm
Dark Dot	Random R, G or B 1 dot	N 4
	Adjacent 2 dots	1 Pairs
	Adjacent 3 or more dots	0 Pairs
	Minimum distance between bright dots	5mm
Total bright and dark dots		N 7

(1) Dot smaller than half dot is not counted as a defective dot.

(2) The adjacent dots defect is defined as align vertical, horizontal and diagonal direction.

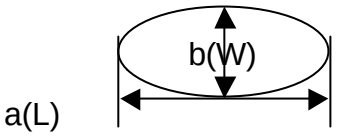
(3) The detailed dot defect diagrams are showed as below.

5.2 External inspection

Items To Be Inspected		Inspection Standards (Acceptable Level))
Extraneous Substances	Circular	0.1 D 0.5, N 3
	Liner	0.05 W 0.1, L 1.5, N 3
Polarizer Scratches		0.05 W 0.1, L 1.5, N 3
Polarizer Dent / Bubble		0.1 D 0.5, N 3

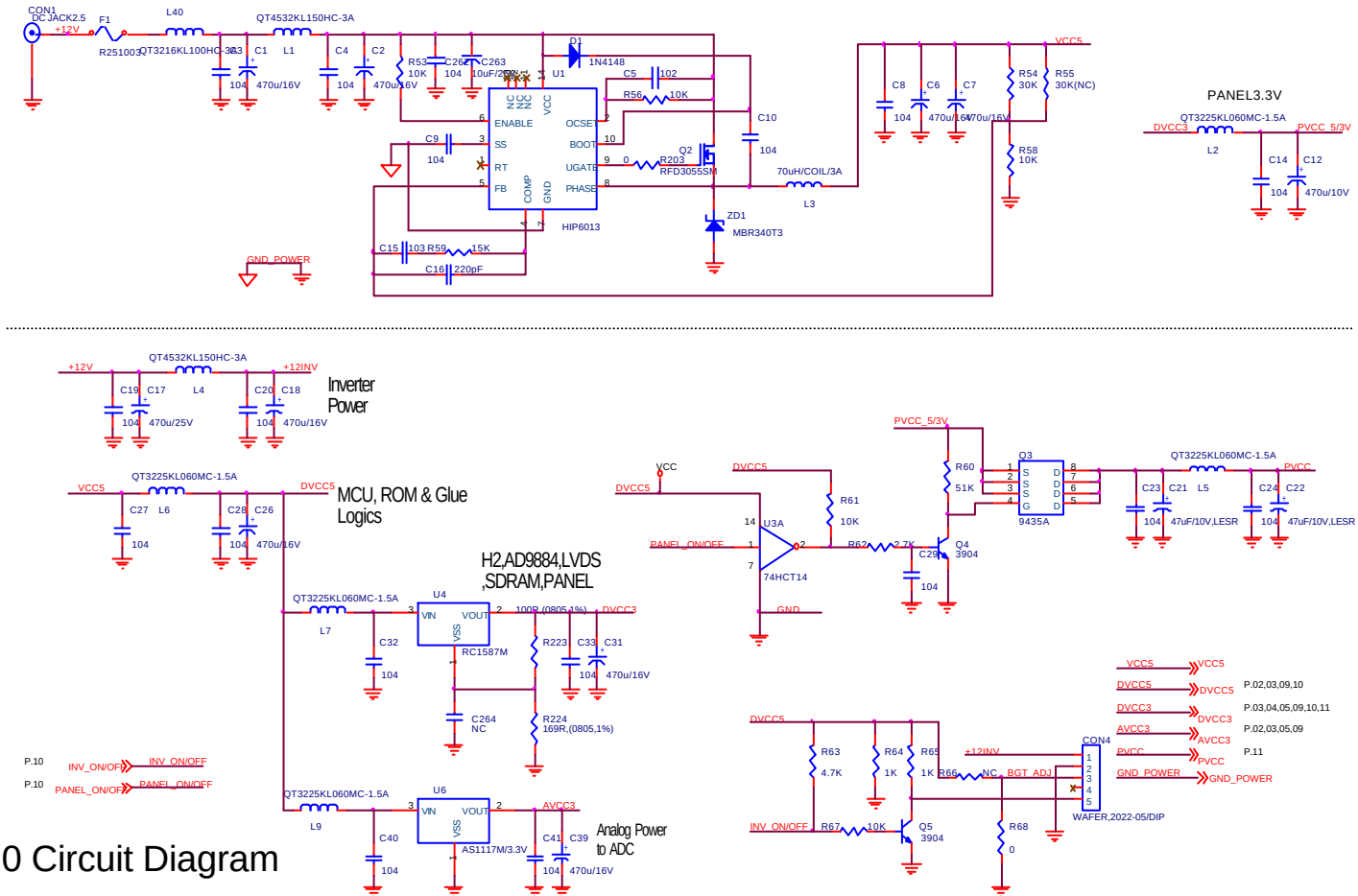
Width: W (mm), Length: L (mm), Average diameter: D (mm)

Average Diameter: D



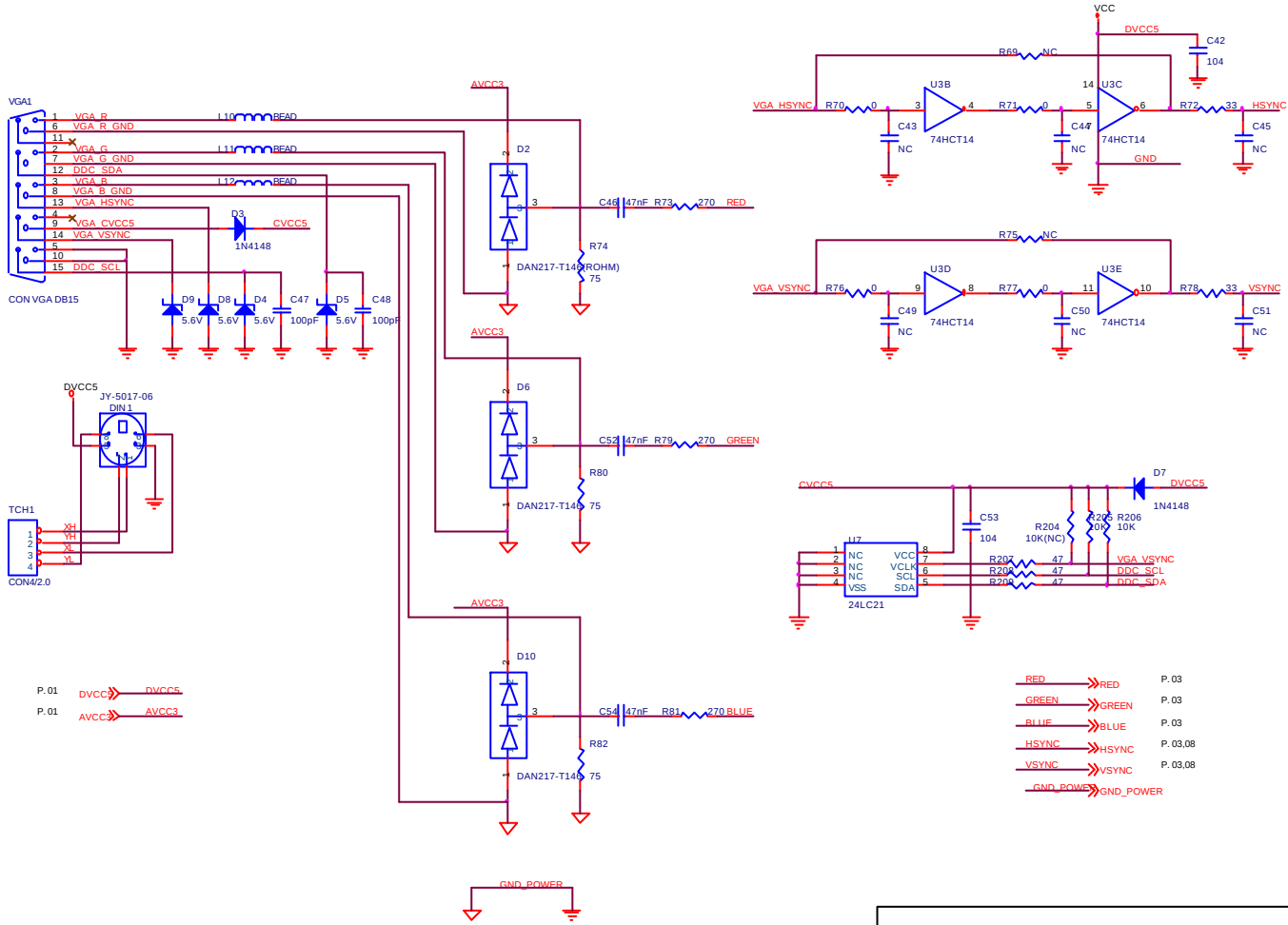
6.0 Spare Parts List

Parts No.	Description	Notes
1	Main Board	891-0100-068
2	Transfer Board	891-0310-002
3	Inverter	891-0250-003
4	Keypad	891-0010-010
5	Driving Board	891-0280-001
6	Power Adaptor	560-1000-002
7	LCD Panel	501-1044-321

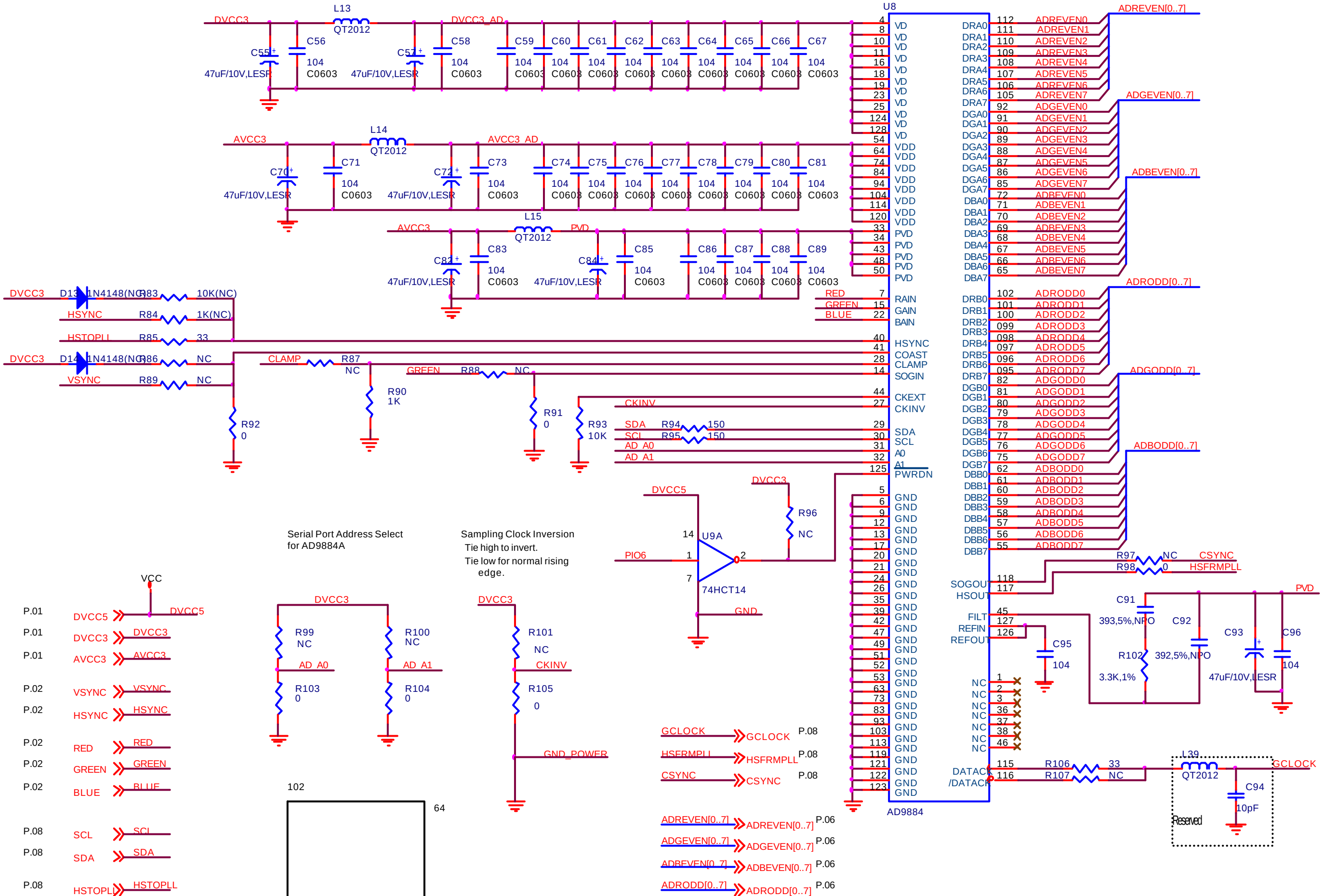


7.0 Circuit Diagram

7.1 Power Distribution

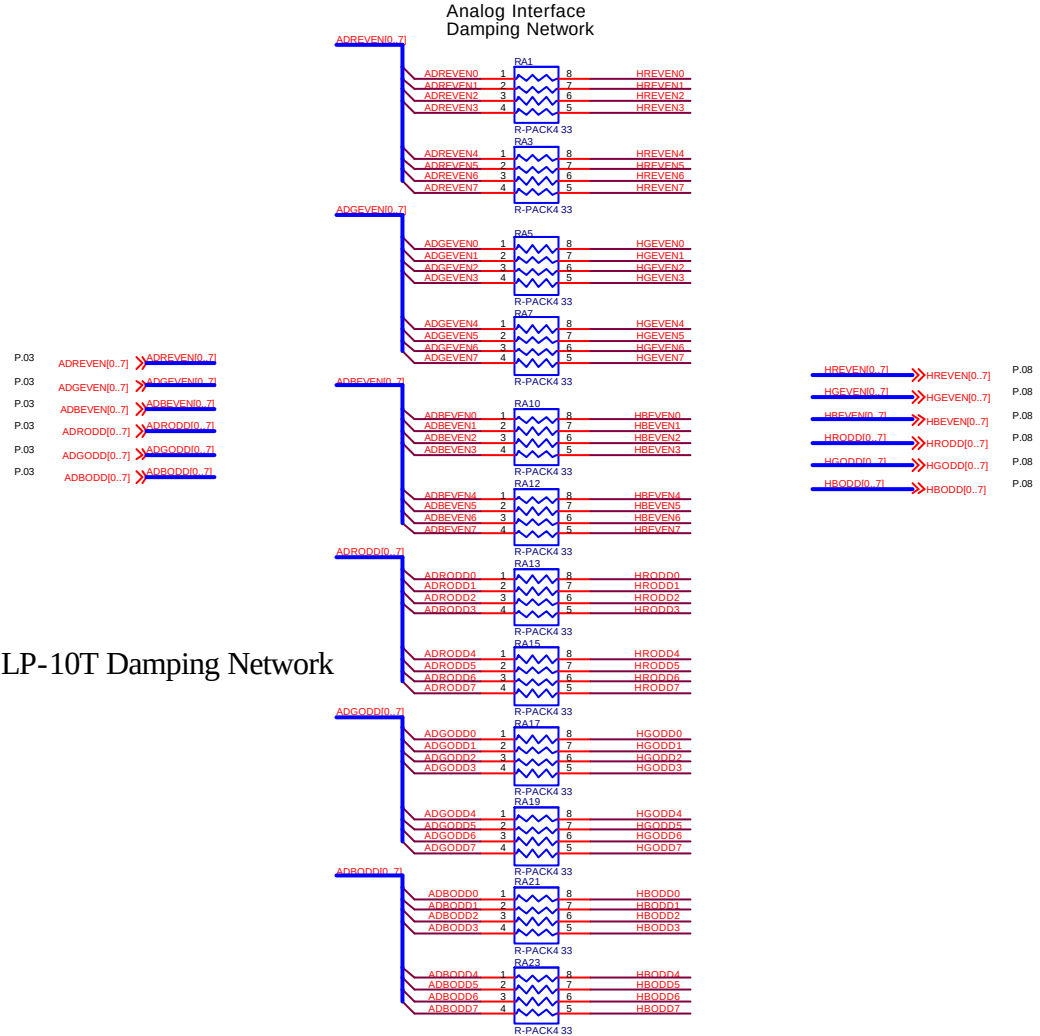


LP-10T VGA Input

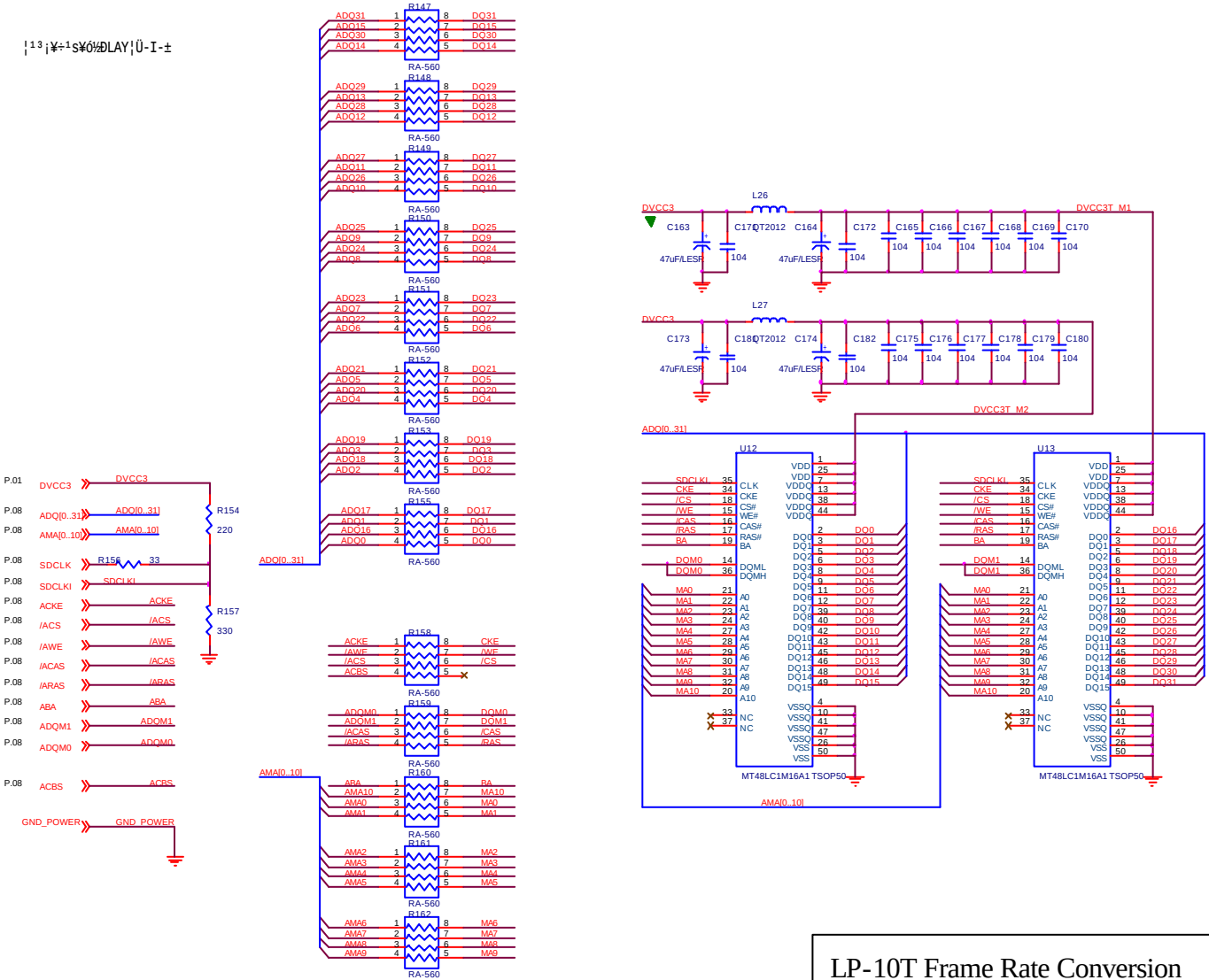

U8
AD9884
U9A
74HCT14
L13 QT2012
L14 QT2012
L15 QT2012
L39 QT2012
DVCC3
DVCC3_AD
AVCC3
AVCC3_AD
PVD
DVCC5
VCC
Serial Port Address Select
for AD9884A
Sampling Clock Inversion
Tie high to invert.
Tie low for normal rising
edge.
Reserved
ADREVEN[0..7]
ADGEVEN[0..7]
ADBEVEN[0..7]
ADRODD[0..7]
ADGODD[0..7]
ADBODD[0..7]
GCLOCK
HSFRMPLL
CSYNC
GND_POWER

LP-10T ADC

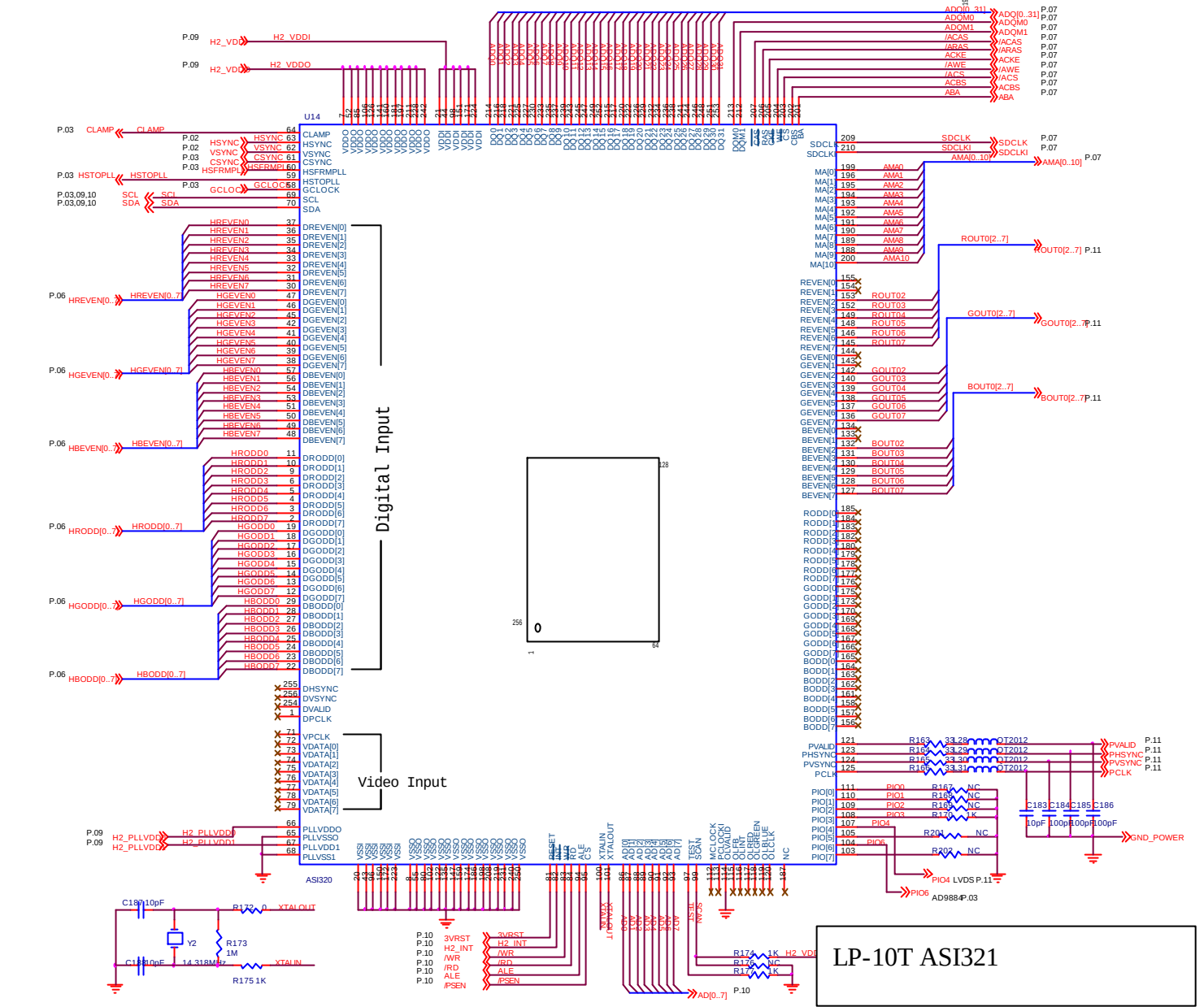
7.4 Damping Network

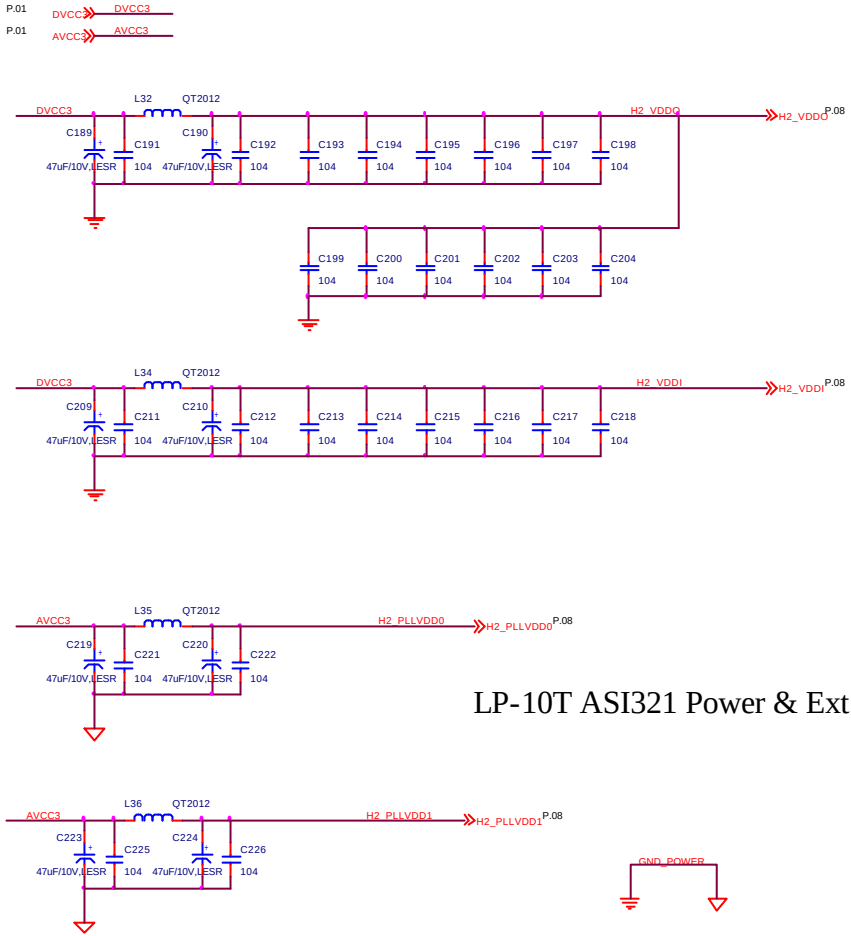


LP-10T Damping Network

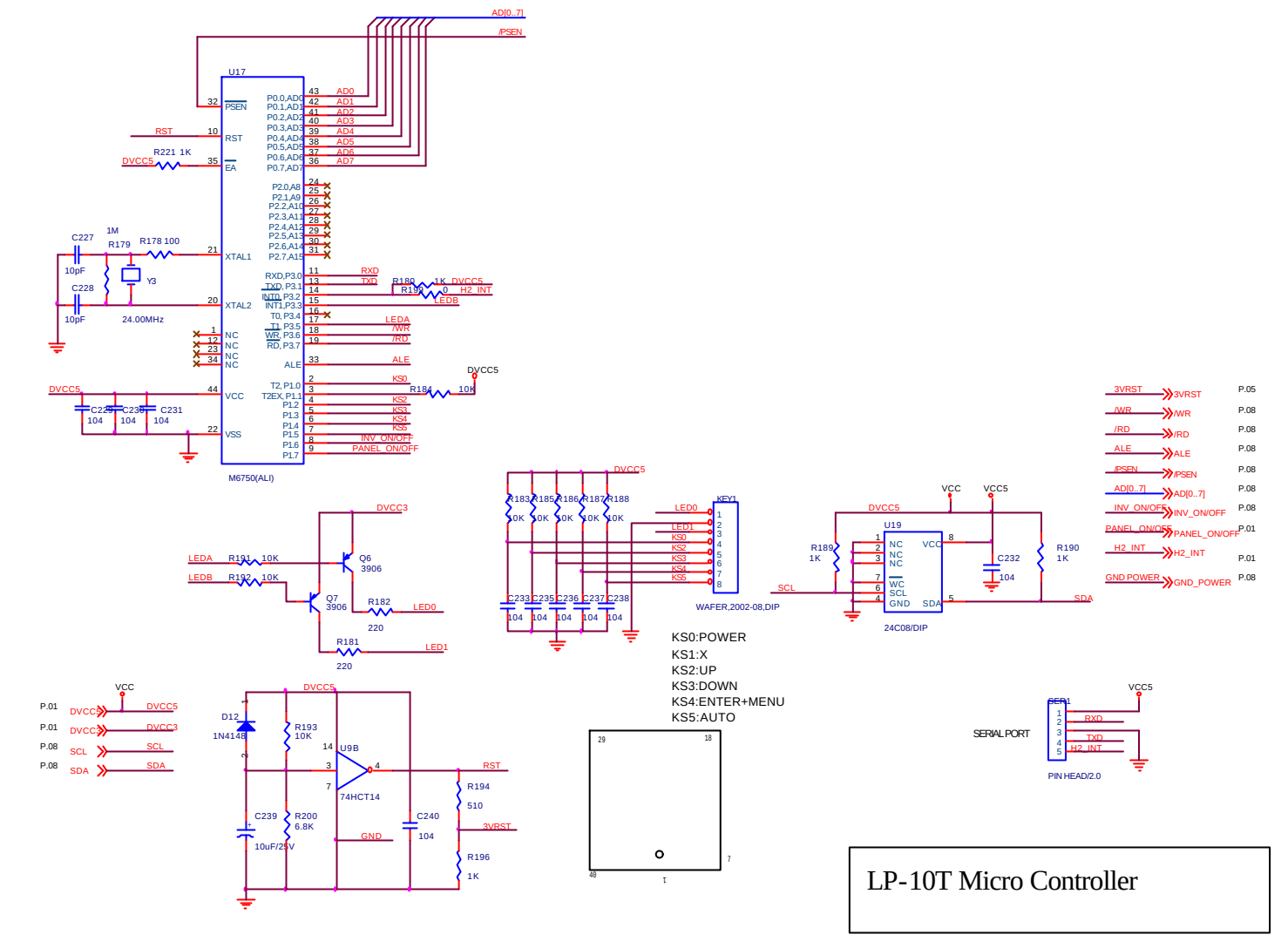


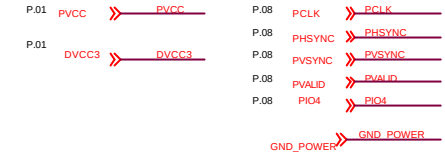
LP-10T Frame Rate Conversion

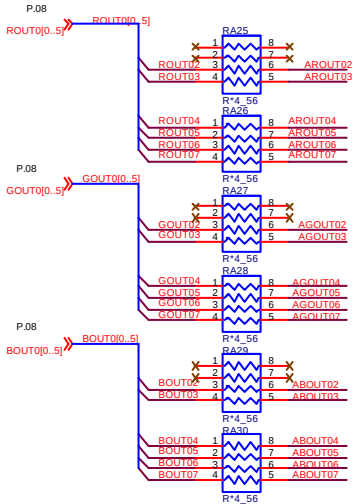

U14
ASI320
Digital Input
Video Input
LP-10T ASI321



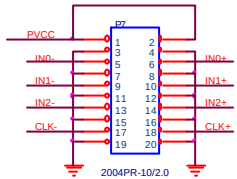
LP-10T ASI321 Power & Ext. OSD


U17
M6750(ALI)
AD[0..7]
/PSEN
RST
DVCC5
R221 1K
C227
10pF
C228
10pF
1M
R179
R178 100
Y3
24.00MHz
P0.0,AD0
P0.1,AD1
P0.2,AD2
P0.3,AD3
P0.4,AD4
P0.5,AD5
P0.6,AD6
P0.7,AD7
P2.0,A8
P2.1,A9
P2.2,A10
P2.3,A11
P2.4,A12
P2.5,A13
P2.6,A14
P2.7,A15
RXD,P3.0
TXD,P3.1
INT0,P3.2
INT1,P3.3
T0,P3.4
T1,P3.5
WR,P3.6
RD,P3.7
ALE
T2,P1.0
T2EX,P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
NC
VCC
VSS
C229 104
C230 104
C231 104
R180 1K
R181 0
H2_INT
LEDB
LEDA
R184 10K
KS0
KS2
KS3
KS4
KS5
INV_ON/OFF
PANEL_ON/OFF
DVCC3
LEDA
R191 10K
LEDB
R192 10K
Q6 3906
Q7 3906
R182 220
R181 220
LED0
LED1
R183 10K
R185 10K
R186 10K
R187 10K
R188 10K
C233 104
C235 104
C236 104
C237 104
C238 104
KEY1
WAFER,2002-08,DIP
KS0:POWER
KS1:X
KS2:UP
KS3:DOWN
KS4:ENTER+MENU
KS5:AUTO
U19
24C08/DIP
R189 1K
R190 1K
C232 104
SCL
SDA
3VRST
/WR
/RD
ALE
/PSEN
AD[0..7]
INV_ON/OFF
PANEL_ON/OFF
H2_INT
GND POWER
P.05
P.08
P.01
VCC
P.01 DVCC5
P.01 DVCC3
P.08 SCL
P.08 SDA
D12 1N4148
R193 10K
U9B
74HCT14
R194 510
R196 1K
R200 6.8K
C239 10uF/25V
C240 104
GND
3VRST
RST
SERIAL PORT
SER1
RXD
TXD
H2_INT
PIN HEAD/2.0
LP-10T Micro Controller

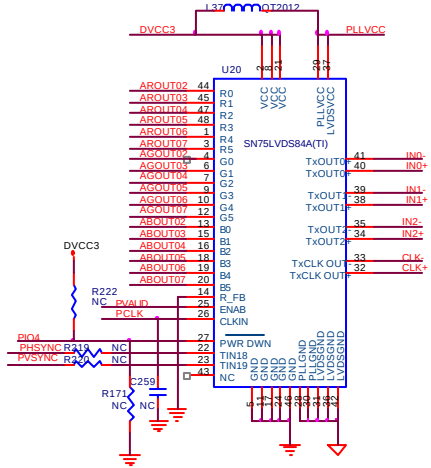




LP-10T Panel Interface



PVI 10.4" PANEL USED



NOTE:

IN0_ »P IN0+ ¦ÜP7¥²¶·¨â¨â¨Ã¦æ,³Ì¦nµ¥ªø

IN1_ »P IN1+¦ÜP7¥²¶·¨â¨â¨Ã¦æ,³Ì¦nµ¥ªø

IN2_ »P IN2+¦ÜP7¥²¶·¨â¨â¨Ã¦æ,³Ì¦nµ¥ªø

CLK- »P CLK+¦ÜP7¥²¶·¨â¨â¨Ã¦æ,³Ì¦nµ¥ªø

9.0 Parts List

P/N	LOCATION	P/N	LOCATION
356-5613-000	FRONT PANEL	216-0840-031	BH SCREW
356-6813-111	REAR COVER	213-0630-033	FH SCREW
356-5613-102	CONTROL PANEL	213-0630-043	FH SCREW
356-5613-889	CONTROL KEYS	211-0830-032	PH SCREW
356-5695-910	LED LENS	451-7004-033	MYAR FILM
356-5613-444	SWIVEL BASE	451-9303-034	
356-6813-444	BASE	451-9303-035	
356-5613-112	ARM COVER	302-0054-000	ID LABEL
356-5613-446	ADRON COVER	460-0001-370	POLYFORM
357-0210-003		305-1181-000	DOUBLE CARTON
604-0003-313	SHIELDING PLATE	305-1276-000	CARTON BOX
604-0003-314	SHIELDING PLATE	305-1282-000	
602-LCD0-006	FIXED BRACKET	306-0061-000	CARTON LABEL
602-LCD0-017	ARM U PLATE	306-0071-000	CARTON LABEL
602-LCD0-019	BASE PLATE	312-0138-101	USER MANUAL
602-LCD0-020	RIGHT HINGE BRACKET	357-0631-001	
602-LCD0-021	LEFT HINGE BRACKET	470-0010-020	PE BAG
602-LCD2-019	BASE PLATE	470-0011-022	
602-LCD2-025	SWIL BALL	451-7104-032	PVC
604-0005-570	JACK PLATE	621-0811-004	3M TAPE
605-0100-001	EMI	501-1044-321	LCD PANEL
222-0000-002	CONNECTOR	891-0250-003	LCD INVERTER
219-0410-153	WASHER	891-0280-001	DRIVING BOARD
219-0510-181	WASHER	891-0100-068	MAIN BOARD
219-0510-458	WASHER	891-0310-002	TRANSFER BOARD
219-0510-A54		891-0150-010	FUNCTION BOARD
219-0620-006	BUBBER WASHER	421-6602-168	L/W HOUSING
219-0408-A74		421-8116-188	L/W HOUSING
218-0408-036		421-6305-170	L/W HOUSING
218-0508-033	M5	412-0020-004	VGA CABLE
216-0826-042	BH SCREW	410-5820-044	SIGNAL CABLE
216-0830-042	BH SCREW	560-1000-002	AC ADAPTER