



# **TOSHIBA**

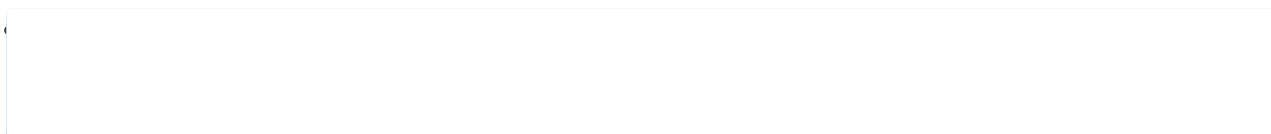
Toshiba TLP710E Technical Training Manual

3 lcd data projector



1
Table Of Contents
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31



•

## Table of Contents

- 

## Bookmarks

--

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TECHNICAL TRAINING MANUAL  
**TOSHIBA**  
3 LCD DATA PROJECTOR

FILE NO. 336-9806

*TLP710E*

*TLP711E*

*TLP710H* **TOSHIBA**

*TLP711H*

*TLP710U*

*TLP711U*

PRINTED IN JAPAN, Oct., 1998

[Table of Contents](#)

[Next Page](#)

1  
2  
3  
4  
5

## Related Manuals for Toshiba TLP710E

### [Projector Toshiba TLP710U Service Manual](#)

3lcd data projector (30 pages)

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### [Projector Toshiba TLP-781U Service Manual](#)

3lcd data projector (64 pages)

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3lcd data projector (82 pages)

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3lcd data projector (29 pages)

### [Projector Toshiba TLP-X150 Owner's Manual](#)

User manual (35 pages)

### [Projector Toshiba TLP411E Technical Training Manual](#)

3 lcd data projector (84 pages)

## Summary of Contents for Toshiba TLP710E

[Page 1](#) FILE NO. 336-9806 TECHNICAL TRAINING MANUAL 3 LCD DATA PROJECTOR TLP710E TLP711E TLP710H TLP711H TLP710U TLP711U PRINTED IN JAPAN, Oct., 1998...

### [Page 2: Table Of Contents](#)

C O N T E N T S 1 . MAIN POWER SUPPLY 5 . VIDEO/RGB CIRCUIT ..5-1 5-1. Video Signal Process Circuit ..5-1 C I R C U I T ....1-1 5-2. RGB Signal Process Section ..5-3 1-1.

### [Page 3: Main Power Supply Circuit](#)

1 . MAIN POWER SUPPLY CIRCUIT 1-2. Output Control The power supply circuit has a function to

turn on/off the 1-1. Description secondary output lines other than 56V by the external Power supply circuit employs APS-115. This power control. The control by pin 21 of connector CN201 turns supply boosts up at boost-up-converter just after bridge- on/off each output of +6V, +3.3V, +10V, +13V, +16.8V rectifying AC input voltage, supplies the voltage...

## [Page 4: Over-Current Protection](#)

1-4. Over-current Protection 1-5. Overheat Protection Over-current protection circuit for 350V line supplying As an overheat protection of the power supply, the the power to lamp output detects the voltage drop of the temperature of switching FET Q101 of the boost-up- current detection resistor R107 applied to pin 5 of IC302.

## [Page 5: OPTICAL SYSTEM](#)

2 . OPTICAL SYSTEM 2-1. Configuration N a m e Description Light source of the optical system. AC lighting system 120W, arc length 1.3 mm. As the arc length is shorter than the conventional metal halide lamp, the light source UHP lamp operates as an ideal light point source and this improves the light convergence factor.

[Page 6](#) Fig. 2-1-1 Optical configuration diagram Fig. 2-1-2 Double polarizing optical system...

[Page 7](#) Fig. 2-1-3 Microlens array...

## [Page 8: Drive Circuit](#)

timing generator (Q903), pulse signal buffer ICs (Q901 and 3 . DRIVE CIRCUIT Q902), 8 bit D/A for electronic variable resistor (Q900 and 3-1. Outline Q905) and power supply IC (Q950, Q951, Q952 and Q954). The drive circuit is composed of 18 ICs in total as shown in The gamma process IC (Q701) and 8 bit D/As (Q900 and Fig.

## [Page 9: General Operation Of](#)

This IC functions to clamp, process gamma and amplify 3-2. General Operation of Each IC and each of RGB signals. The main features are as follows; Signal Flow • Gamma circuit: Adjusts gain and position in three 3-2-1. Input Amplifiers (Q408, Q508 and Q608) points (white side: 1, black side: 2) These circuits amplify the video signal to the input level for RGB each separate adjustment.

[Page 10](#) These ICs amplify the signals with gamma controlled and 3-2-3. Alternation/Sample & Hold ICs supply the signals alternately. These signals are divided in (Q401, Q402, Q501, Q502, Q601 and Q602) x 2 = 12 phase) and supplied to the LCD 6 phase signals (6 The block diagram is shown in Fig.

[Page 11](#) 3-2-4. Timing Generator (Q903) 3-2-5. Electronic Variable Resistor 8 bit D/A (Q900, Q905) This IC generates the timing to operate LCD panel, gamma process ICs and alternation/sample & hold ICs. The timing This circuit develops a DC voltage controlled by I C bus and mode are controlled by three line bus.

## [Page 12: MICROPROCESSOR](#)

4. 4. MICROPROCESSOR MICROPROCESSOR 4-1-3. Adjustment Control Adjustment Control • Video 1 adjustments (contrast, brightness, color den- 4-1. 4-1. System Outline System Outline sity, tint, sharpness) The system microprocessor has features as shown below. • Video 2 adjustments (R level, G level, B level) In considering easy maintenance for specification •...

[Page 13](#) Fig. 4-1-1 System block diagram Fig. 4-1-1 System block diagram...

[Page 14](#) 4-2. 4-2. System Microprocessor System Microprocessor Using an exclusive data-writer allows easy maintenance of the system microprocessor when specification modifi- The system microprocessor QL001 employs an 8 bit cation, bug correction, etc. will occur. micro-controller (H8F3337YF16). Table 4-2-1 shows the terminal functions of the system In this system microprocessor, a program area is pro- microprocessor.

## [Page 15: RS-232C Transmission](#)

4-3. 4-3. Power Supply Reset Process Power Supply Reset Process 4-6. RS-232C Transmission/Reception 4-6. RS-232C Transmission/Reception Process In the power supply reset process, power supply reset IC (RN5VD27A), QL005 is employed. In the RS-232C

reception process, an RS-232C signal entered through the RS-232C connector (D-SUB 9P) is The reset IC, QL005, develops the reset signal when the decoded in the RS-232C interface ( $\mu$ PD4721) of QL013,...

[Page 16](#) Table 4-7-1 The contents and logic of the status read signals Table 4-7-1 The contents and logic of the status read signals Signal name Pin No. Power Volume + Volume - Exit Enter Select-Up Select-Dw QF202 Pushed Pushed Pushed Pushed Pushed Pushed Pushed...

## [Page 17: Various Display Modes](#)

4-10. 4-10. Various Display Modes Various Display Modes When the power is turned off by pressing the ON/ STANDBY key, the unit enters the standby status in In this system, various LED display patterns are provided passing through following processes. in relation to the display modes shown in Table 4-8-1.

## [Page 18: Applicable Signal](#)

Table 4-11-1 Applicable signal Table 4-11-1 Applicable signal Signal Resolution Frequency Operation Clock Corre- Mode Content H (kHz) V (Hz) Sync Remarks (MHz) spondence NTSC NTSC 15.730 59.940 12.590 Video 15.630 50.000 12.500 Video HDTV HD-TV 1920 1125 -/-  $\Delta$  Y/Pb/Pr NEC24K PC98-STD...

[Page 19](#) 4-12. 4-12. RS-232C Control Method RS-232C Control Method Table 4-12-1 RS-232C connection signals Table 4-12-1 RS-232C connection signals Signals are connected to the RS-232C connector in a Pin No. Signal name Signal content straight format as shown in Table 4-12-1 RS-232C Reception data connection signals.

## [Page 20: Video/Rgb Circuit](#)

QA006 (M52347FP, sync separation IC) separates the 5 . VIDEO/RGB CIRCUIT sync signal superimposed on the Y signal at Y, Pb and Pr signal input and determines the display mode using the 5-1. Video Signal Process Circuit frequency of the sync signal separated by QA006. 5-1-1.

## [Page 22: Rgb Signal Process Section](#)

The HD and VD signals sync-separated are sent to the 5-2. RGB Signal Process Section digital PC board (PB8430) and the polarity information The RGB signal process section mainly performs the of the sync signal is converted into I C data by QB011 following processes.

## [Page 23: U P - C O N V E R T E R C I R C U I T](#)

6 . U P - C O N V E R T E R C I R C U I T 6-2 . Circuit Description Fig. 6-2-1 shows the block diagram of this circuit. 6-1. Outline 6-2-1. Input Process Section This up-converter circuit performs the double speed This section performs the gain adjustment and frequency conversion which converts an interlace scanning signal of...

[Page 24](#) 6-2-2. Motion Adaptable Sequential Scanning Signal 6-2-3. Output Process Section Conversion Section The output process section converts the 8-bit digital This section consists of the exclusive IC, QX300, and signal to an analog signal and smoothes the video signal three external field memory ICs of QX310, QX320 and waveform by using a low pass filter.

## [Page 25: Digital Circuit](#)

7 . DIGITAL CIRCUIT 7-3. AD Converter Circuit The CXA3026AQ (QD201, QD301, QD401) is an 8 bit The digital circuit performs various operations such as a A/D converter which can operate up to max. 140 MHz. format conversion (enlargement, reduction) which The A/D converter converts voltages across VRB (pin 2) converts an input signal into a XGA signal, automatic and VRT (pin 11) into a digital signal.

## [Page 26: Automatic Adjustment](#)

7-7. Automatic Adjustment, 7-8. Main Microprocessor Circuit Timing Generation Circuits QL001 is the main microprocessor which controls the The automatic adjustment circuit consists of an unit entirely. For more details, refer to the chapter on the EPF6024AQC208 (QD014) and the sub-microprocessor microprocessor.

## [Page 29: Camera Out Circuit](#)

8 . CAMERA CIRCUIT 8-3. P L D (For TLP711) The PLD controls all of the digital signal processes such as timings for the A/D converter, NTSC/PAL encoder, PLL The camera out circuit converts luminance color differ- control, memory control, picture format conversion, etc. ence signals (Y/Pb/Pr) sent from a CCD camera into a The signal systems and their effective areas for the standard video signal in a format of the NTSC or PAL...

[Page 31](#) T O S H I B A C O R P O R A T I O N 1 - 1 , S H I B A U R A 1 - C H O M E , M I N A T O - K U , T O K Y O 1 0 5 - 8 0 0 1 , J A P A N ..

This manual is also suitable for:

[Tlp711eTlp711hTlp711uTlp710uTlp710h](#)