RD-JT40/RD-JT41

SERVICE MANUAL

Caution

Be sure to read this manual before servicing. To assure safety from fire, electric shock, injury, harmful radiation and materials, various measures are provided in this Acer DLP projector. Be sure to read cautionary items described in the manual to maintain safety before servicing.

Service Warning

1. When replace the lamp, to avoid burns to yor fingers. The lamp becomes too hot.
2. Nevr touch the lamp bulbwith a finger or anything else. Never drop it or give it a shock. They may cause bursting of the bulb.
3. This projector is provided with a high voltage circuit for the lamp. Do not touch the electric parts of powrer unit (main), when turn on the pojector.
4. Do not touch the exhaust fan, during operation.

Contents

1. SPECIFICATIONS

Projector Specifications

Technical Specifications

Note: All specifications are subject to change without notice.

General	
Product name	Personal Projector
Model name	RD-JT40 1024*768XGA
	RD-JT41 800*600SVGA
Optical	
Display system	1-CHIP DMD
Lens F/Number	F/2.6
Lamp	210W NSH lamp
Electrical	
Power supply	AC100 ~ 240V, 3.5A, 50/60 Hz (Automatic)
Power consumption	330 W (Max)
Mechanical	
Dimensions	308mm/12in (W) x 95mm/3.7in (H) x 238mm/9.4in (D)
Operating temperature range	10°C ~ 40°C
Weight	6.9 lbs (3.1 Kg)
Input terminal	
Computer input	
RGB input	D-sub 15-pin (female)
Video signal input	
S-VIDEO	Mini DIN 4-pin port x1
VIDEO	RCA jack x1
HDTV signal input	YPBPR RCA jack x3
Audio signal input	
Audio 1	Mini jack stero port
Audio 2	RCA jack L, R x2
Output	
USB mouse connector	A/B series x1
Speaker	2 watt x 1
Control	
RS-232C	9-pin x1

Service Information

Accessories (included in the Standard Package)

Description of parts	Part No.
Power cord (EU)	27.82718.281
Power cord (US)	27.01818.000
Power cord (UK)	27.01018.000
VGA signal cable	50.J0508.502
Video cable	50.73213.501
S-Video cable	50.72920.011
PC audio cable	50.74405.501
Soft carrying case	98.J3402.001
HDTV cable	50.J2401.001
USB mouse cable	50.73213.501
Remote control	98.J3401.001
3-2 converter	22.91007.011

Optional Accessories (not included in the Standard Package)

Description of parts	Part No.
Mac adapter (switchable)	20.20118.A15
Spare lamp module	60.J3416.CB1

2. Spare Parts List

Item No:99.J3477.L11 Projector LG RD-JT40 spare parts list

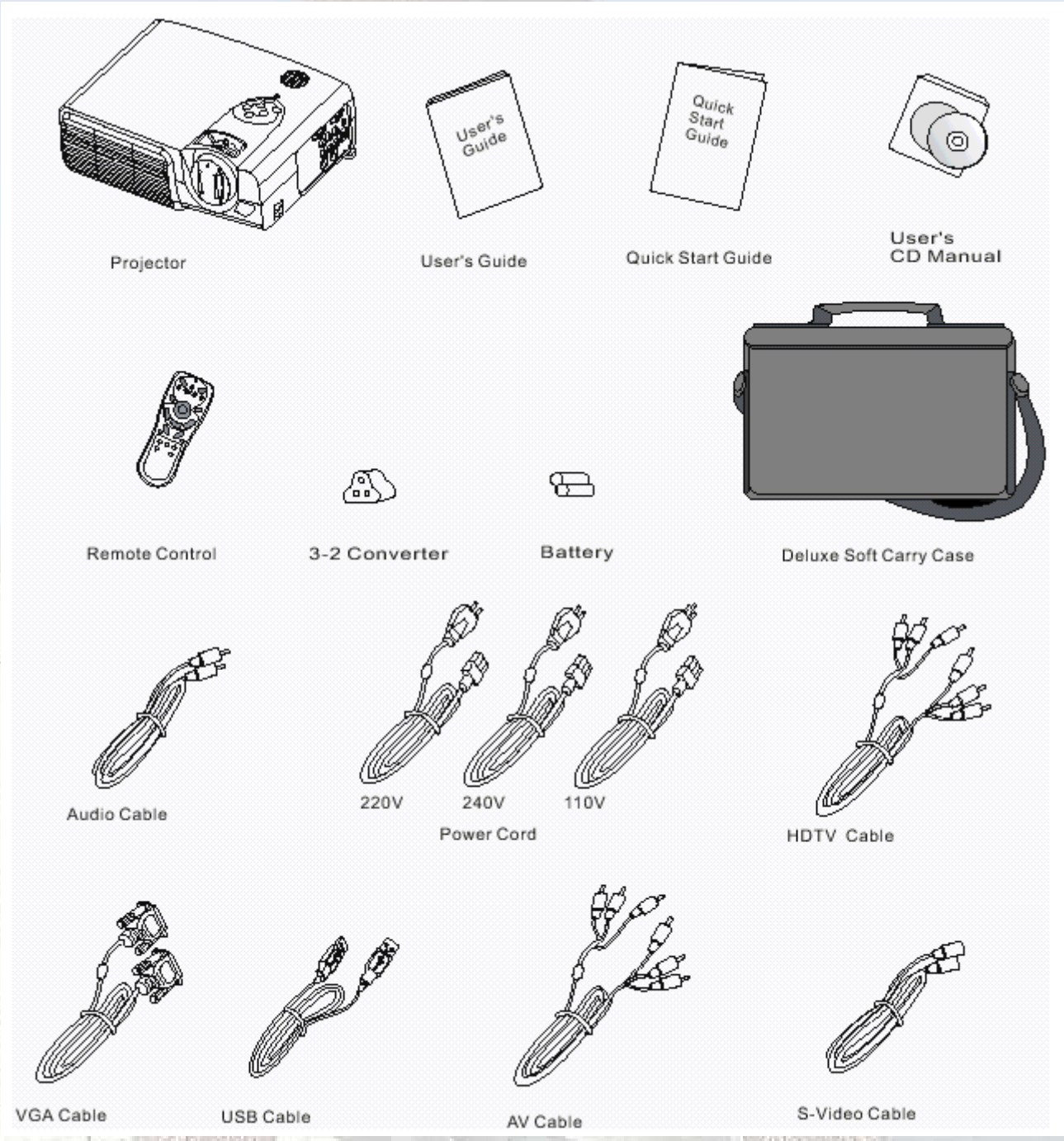
Parts No	Description
55.J3405.001	PCBA FAN CONTROL/B DX660
55.J3408.001	PCBA DC-DC/B DX660
60.J3419.001	ASSY PFC MODULE DX660
55.J3407.001	PCBA PFC CONTROL/B DX660
60.J3477.L11	ASSY ENGINE DX660-L11
55.J3419.001	PCBA THERMAL/B DX660
60.J3403.021	ASSY LOWER CASE P838 DX660/LG
42.J3415.001	FOOT REAR SILICON BLA. DX660
65.J3406.001	ADJUST FOOT FRONT MARS
55.J3401.001	PCBA DMD/B DX660
55.J3402.031	PCBA MAIN/BD LG DX660
60.J3414.031	ASSY OPTICAL ENG. DX660/LG
55.J3404.001	PCBA CHIP/B DX660
60.J3415.021	ASSY HSG DMD DX660/LG
71.01076.001	IC DIGITA IMAG DMD1076-7LGA11
60.J3404.001	ASSY BALLAST MODULE DX660
60.J3405.002	ASSY REAR FAN HLD MODULE DX66
60.J3407.021	ASSY REAR CVR MODULE DX660/LG
60.J3409.001	ASSY CAP LENS TRANS. DX660
60.J3412.061	ASSY UPPER CASE P896 DX660/LG
55.J3403.001	PCBA KEYPAD BD DX660
60.J3416.001	ASSY LAMP MODULE U DX660
60.J3482.001	ASSY REMOTE+CABLE LG DXS660
27.01018.000	CORD H05VV-F 13A250V 1830MM U
27.01818.000	CORD SVT#18*3C 10A125V 1830US
27.82718.281	CORD H05VV-F 10A250V EUR BLK
50.73213.501	CABLE 4P USB A-B 1800MM BLACK
50.J0508.502	SIGNAL/C 15/15P 2500MM/BLK
50.J7111.501	CABLE A/V (G.B.R)1800 BLK 784
50.72918.001	CABLE A/V RCA(R,W,Y)1500MM
50.72920.011	C.A MIN-DIN 4P S-VIDEO W/S 15
50.74405.501	CABLE AUD PC99PT284C/PT577C B
98.J3403.001	REMOTE CONTROLLER DXS660 LG
98.J3404.001	SOFT CASE DXS660 LG

Item No:99.J3877.L11 Projector LG RD-JT41 spare parts list

Parts No	Description
55.J3405.001	PCBA FAN CONTROL/B DX660
55.J3408.001	PCBA DC-DC/B DX660
60.J3419.001	ASSY PFC MODULE DX660
55.J3407.001	PCBA PFC CONTROL/B DX660
60.J3877.L11	ASSY ENGINE DS660-L11
55.J3419.001	PCBA THERMAL/B DX660
60.J3403.021	ASSY LOWER CASE P838 DX660/LG
42.J3415.001	FOOT REAR SILICON BLA. DX660
65.J3406.001	ADJUST FOOT FRONT MARS
60.J3406.061	ASSY INTERFACE MODULE DS660/L
55.J3801.001	PCBA DMD/BD FOR DS660
55.J3804.M21	PCBA MAIN/BD FOR LG DS660
60.J3410.001	ASSY BOX LAMP DX660
60.J3411.001	ASSY BKT BLOWER DX660
60.J3414.041	ASSY OPTICAL ENG. DS660/LG
55.J3802.001	PCBA DMD CHIP/BD FOR DS660
60.J3415.021	ASSY HSG DMD DX660/LG
71.08460.000	IC DIGITAL IMAG DMD8460 LGA11
60.J3404.001	ASSY BALLAST MODULE DX660
60.J3405.002	ASSY REAR FAN HLD MODULE DX660
60.J3407.021	ASSY REAR CVR MODULE DX660/LG
60.J3409.001	ASSY CAP LENS TRANS. DX660
60.J3412.071	ASSY UPPER CASE P896 DS660/LG
55.J3403.001	PCBA KEYPAD BD DX660
60.J3413.071	ASSY SUB U/C P896 DS660/LG
60.J3416.001	ASSY LAMP MODULE U DX660
60.J3417.021	ASSY DOOR LAMP P838 DX660/LG
60.J3481.001	ASSY MANU+WARRANTY LG
60.J3482.001	ASSY REMOTE+CABLE LG DXS660
98.J3403.001	REMOTE CONTROLLER DXS660 LG
98.J3404.001	SOFT CASE DXS660 LG

3. Shipping Contents

The Projector is shipped with the cables required for connection to standard PC or laptop computers. Carefully unpack and verify that you have all the items shown below. If any of these items are missing, please contact personnel at the place of purchase.

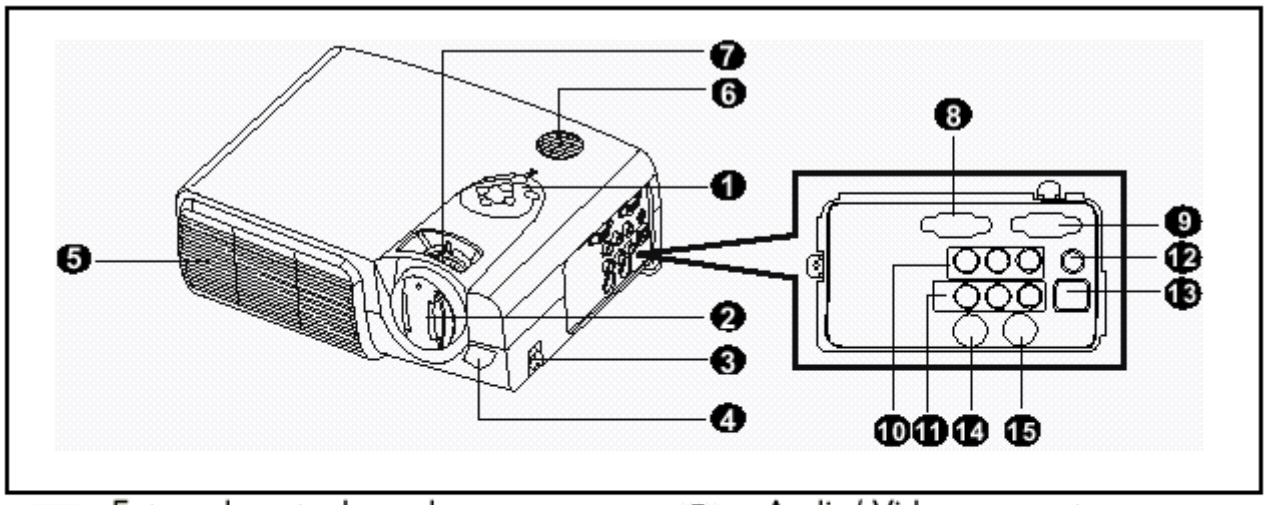


Optional Accessories

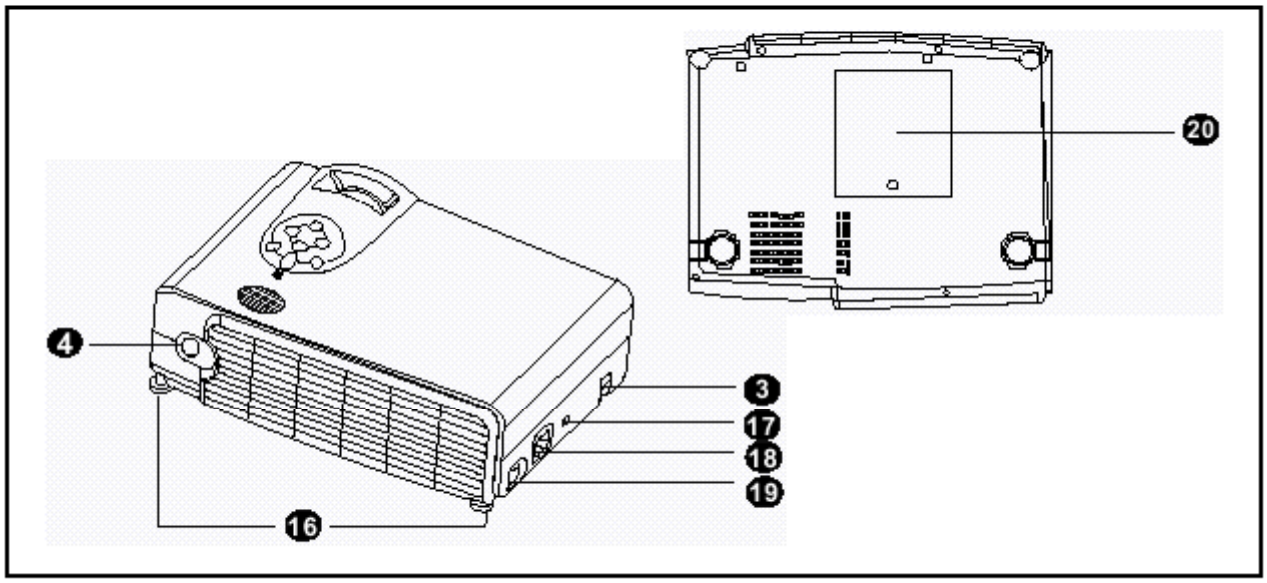
1. Macintosh adapter
2. 210W Lamp module

4. Projector Description

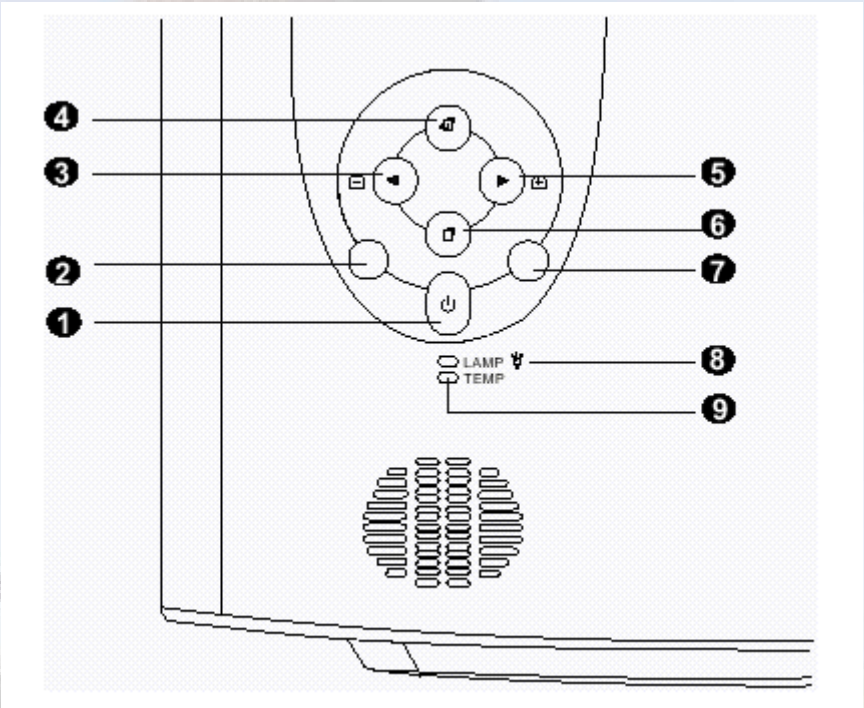
Projector



1	External control panel (see next page)	11	Audio/ Video connector
2	Projection lens	12	Audio jack
3	Front adjuster	13	USB mouse connector
4	IR remote sensor	14	S-Video jack
5	Ventilation grill	15	RS 232 control port
6	Speaker	16	Rear adjuster feet
7	Projection lens adjuster	17	Kensington lock
8	RGB signal input	18	AC power cord inlet
9	RGB signal output	19	Main power switch
10	YPBPR connector	20	Lamp door



External Control Panel



❶ Power

Presses the **Power** key to turn the projector on or off.

❷ Auto

Automatically determines the best picture settings for current received signals.

❸ Left/ Keystone - **❹ Exit**

❺ Right/ Keystone + **❻ Menu**

Menu will display the menu system on screen. Press **Menu** again to access the sub-menus. **Left** and **Right** help you navigate among choices and settings in the menus and sub-menus. However, when the on-screen menu is not activated, the **Left** and **Right** buttons will function as **Keystone +/-** hot keys.

Press the **Exit** button to go back to the main menu. Press **Exit** again to leave the menu system.

❼ Source

Selects signal sources from among PC, Video, S-Video and YPBPR.

❽ Lamp Indicator

The Lamp Indicator will light up when the lamp needs service, cooling or replacement. See "Lamp Information" on page 20 for more detailed information.

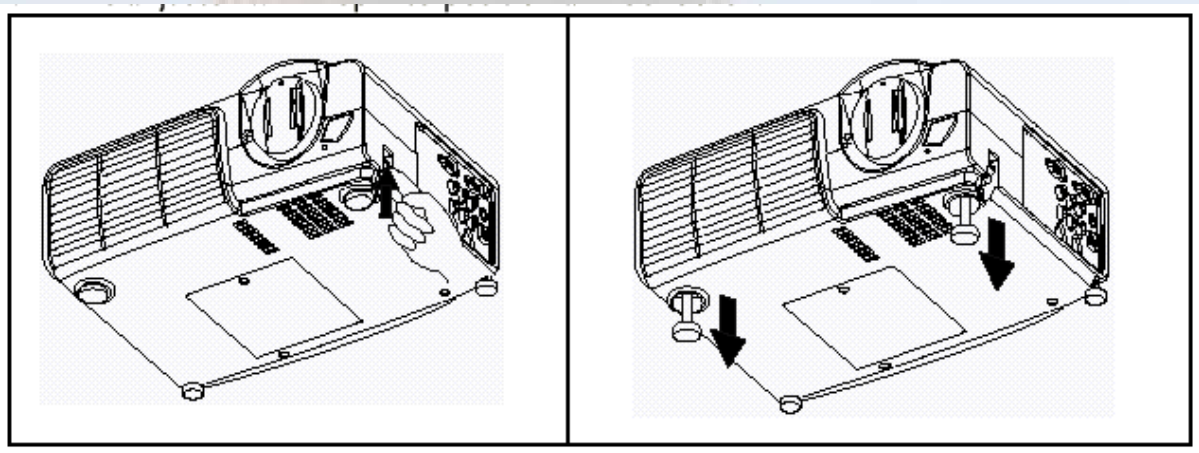
❾ Temp indicator

The Temp indicator will flash when the system temperature is too high, which may occur if the projector is operated improperly. See "Temp Information" on page 22 for more detailed information.

Adjuster

The projector is equipped with 2 quick-release adjuster feet. Push the buttons to adjust its tilt angle.

1. Lift the projector up and press the adjuster button to release the adjuster.
2. The adjuster will drop into position and be locked.



Projector Features

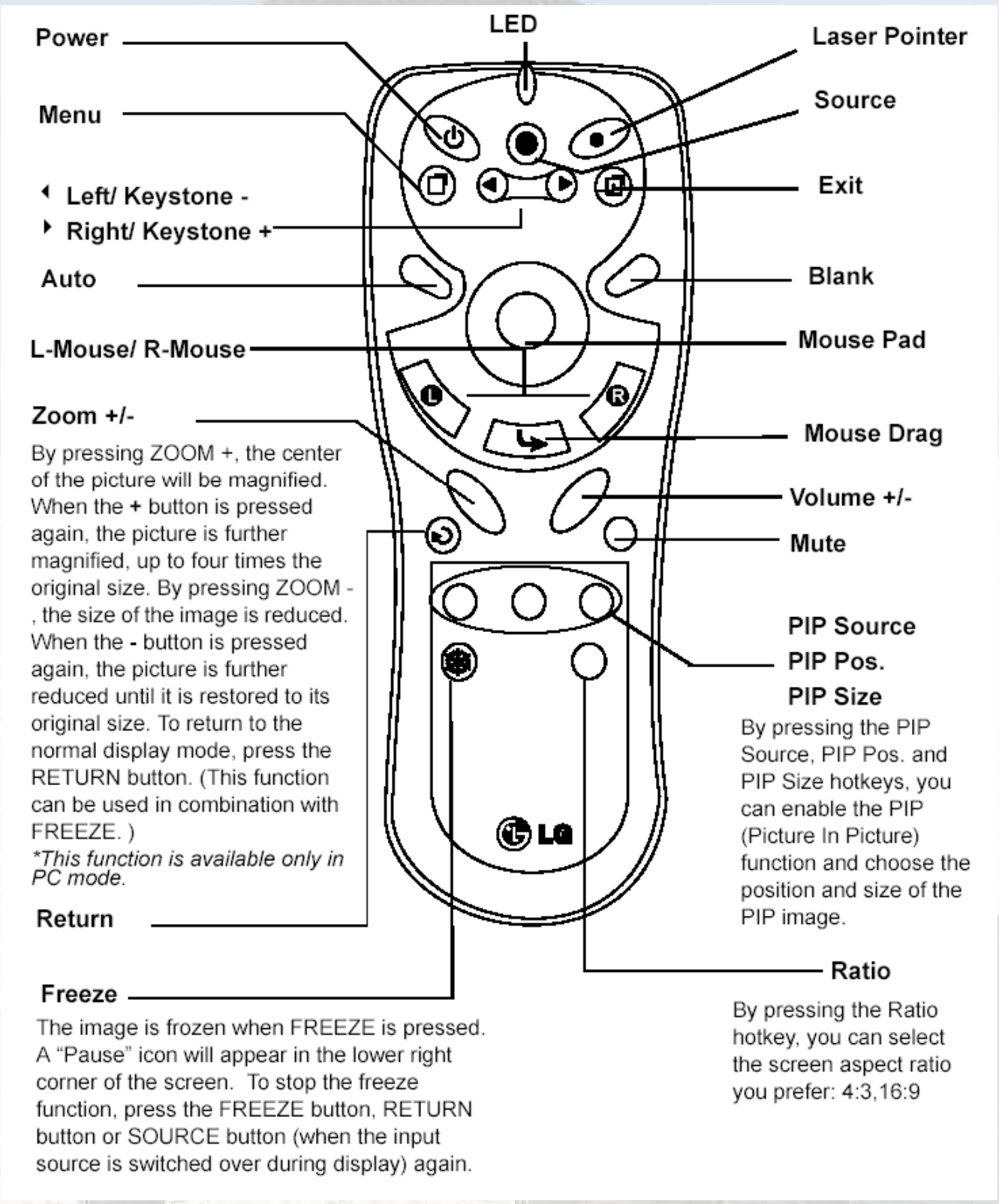
The projector integrates high-performance optical engine projection and a user-friendly design to deliver high reliability and ease of use. The projector offers the following features:

- Small and light for portability
- Full-function remote control with laser pointer/ remote mouse function
- Hight quality manual zoom lens
- One-key auto-adjustment to display the best picture quality
- Easy digital keystone correction through hot keys to correct distorted images
- Adjustable color balance control for data/video display
- Ultra-high brightness projection lamp
- Ability to display 16.7 million colors
- On-screen menus in 8 languages: English, French, German, Italian, Spanish, Korean, Simplified Chinese, and Traditional Chinese.
- Switchable Normal/ Video mode for data/ video display
- Powerful AV function to provide high quality AV picture
- HDTV compatibility (YPBPR)

Note: The brightness of the projected image will vary depending on the ambient lighting conditions and contrast/brightness settings.

5. Remote Control Description

The remote control sensors are located in the front/ back of the projector. The distance between the sensor and the remote control should not exceed 6 meters.

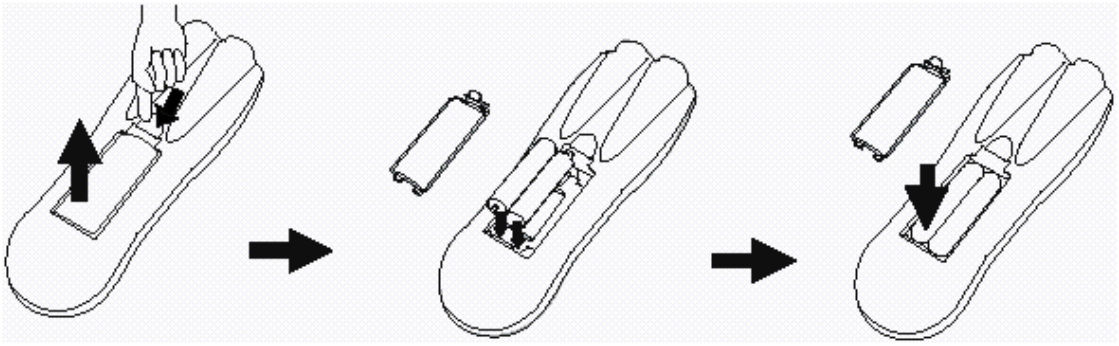


Installing or Replacing Batteries

❶ Push and slide the battery compartment lid in the direction shown.

❷ Install batteries as indicated by the diagram inside the compartment.

❸ Position the lid over the compartment and snap it back into place.



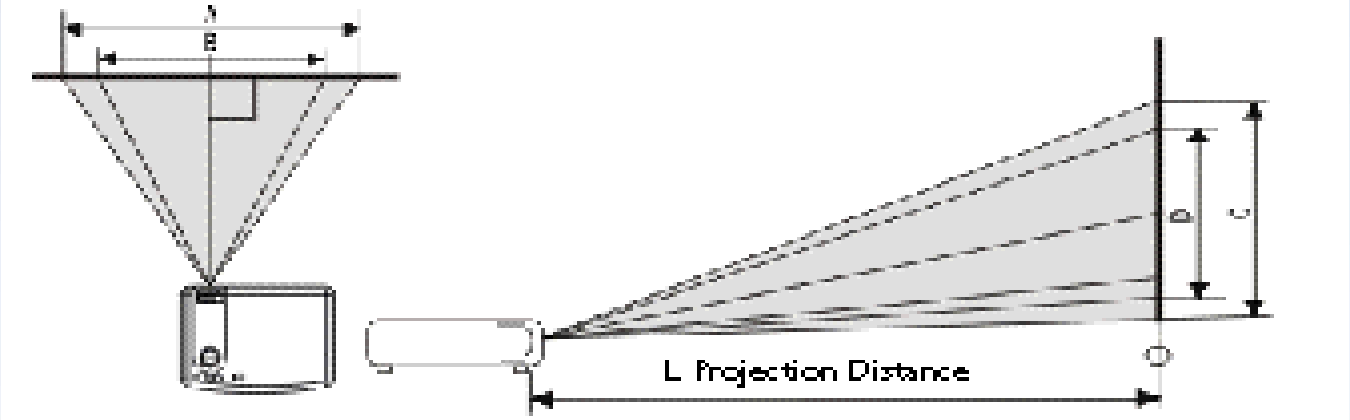
⚠ Caution

Avoid excessive heat and humidity. There may be danger of an explosion if batteries are incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

6. INSTALLATION

Screen Size

Place the projector at the required distance from the screen according to the desired picture size (see the table below).



Screen Size (Max.)			L. Projection distance (cm/in)	Screen Size (Min.)		
Diagonal (cm/in)	A. Width (cm/in)	C. Height (cm/in)		Diagonal (cm/in)	B. Width (cm/in)	D. Height (cm/in)
77/30.4	61.8/24	46.3/18	100/39	63/24.9	50.7/20	38.0/15
154/60.8	123.65/49	92.7/36	200/79	127/49.9	101.3/40	76.0/30
232/91.2	185.3/73	138.9/55	300/118	190/74.7	151.9/60	113.9/45
309/121.5	247.0/97	185.2/73	400/157	253/99.7	202.5/80	151.9/60
386/151.9	308.7/122	231.6/91	500/197	316/124.6	253.2/100	189.9/75
463/182.3	370.5/146	277.9/109	600/236	380/149.5	303.8/120	227.9/90
541/213.1	432.2/170	324.18/128	700/276	443/174.6	354.4/140	266.2/105
617/243.1	494.0/194	370.5/146	800/315	506/199.4	405.1/160	303.8/120
695/273.5	555.7/219	416.7/164	900/354	570/224.3	455.7/180	341.8/135
772/303.9	617.5/243	463.11/182	1000/394	633/249.2	506.3/200	379.8/150

Connecting to Various Equipment

HDTV description

The projector is capable of displaying various High Definition TV display modes. Some of these sources are:

- Digital-VHS (D-VHS) player
- DVD player
- Satellite Dish HDTV receiver
- DTV tuners

Most of these sources will provide an analog component video output, a standard VGA output, or a YPBPR (default) format.

The projector is capable of accepting HDTV data through a YPBPR connector. Use a HDTV cable that came with your projector to display HDTV images.

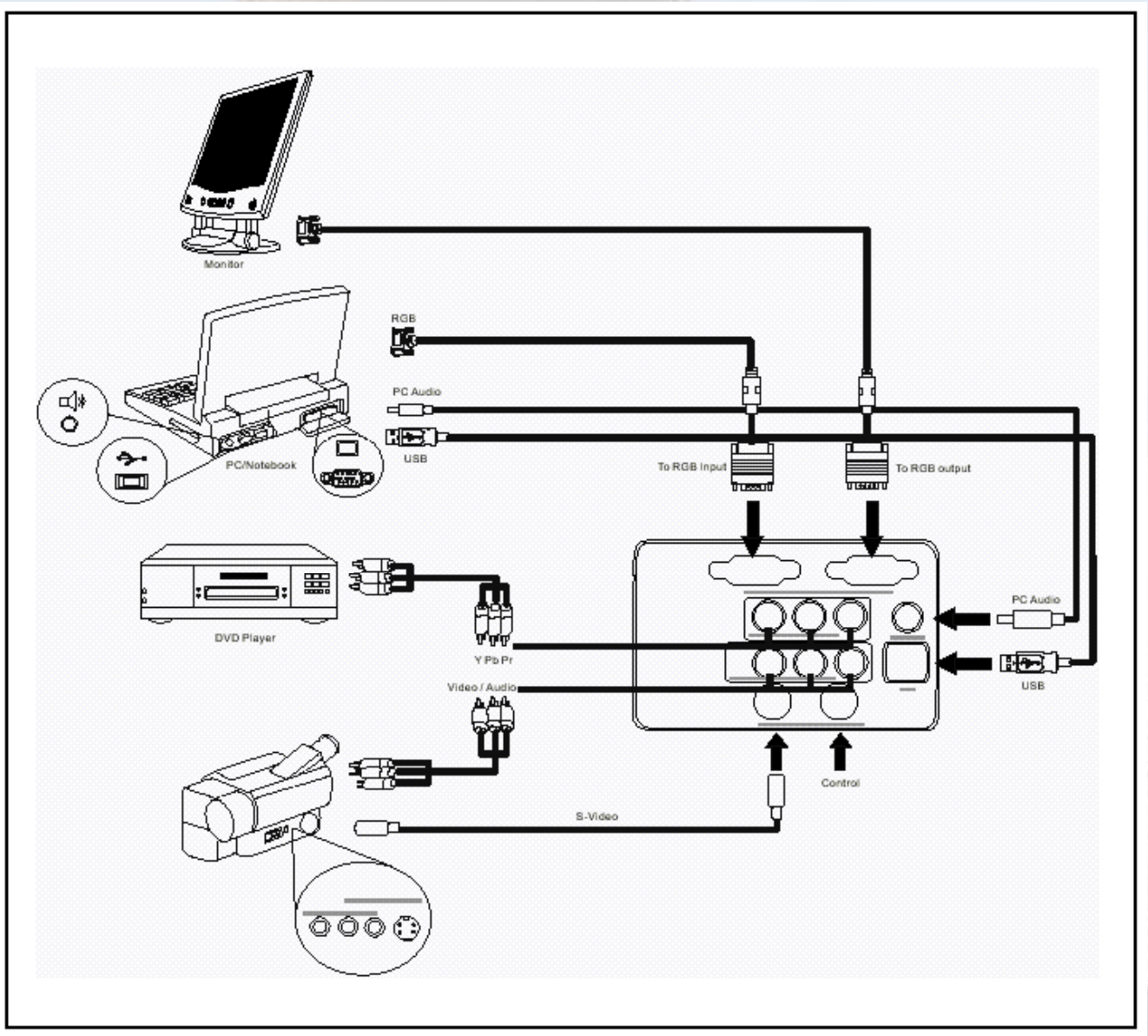
The following standards are supported in the HDTV function:

- 480i
- 480p
- 720p
- 1080i

Please refer to "Menu System" on page 13 for information on the HDTV OSD selections.

Connecting to Various Equipment

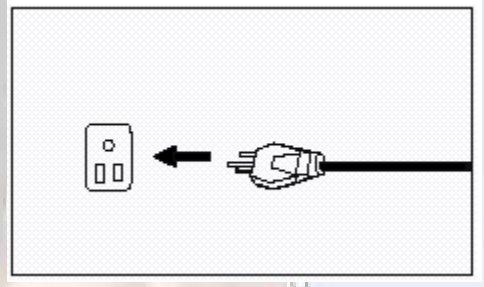
It only takes a few seconds to connect your projector to your desktop or notebook computer, VCR, or other systems. However, a Mac adapter (an optional accessory) is needed for connection to Macintosh computers.



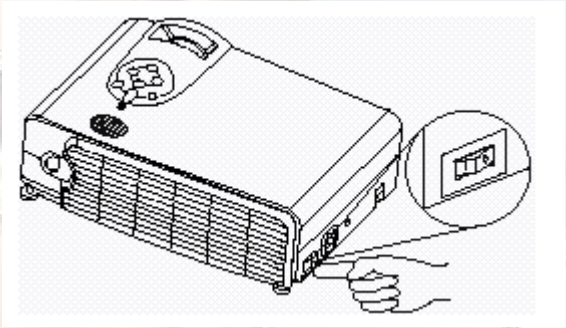
7. OPERATION

Start Up

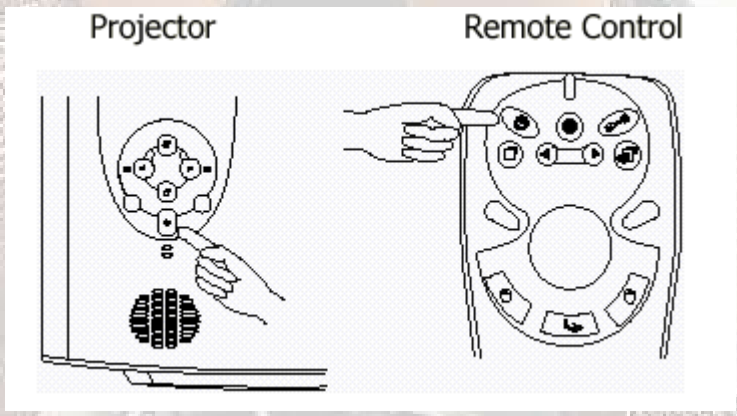
1. Plug the power cord into a wall socket.



2. Turn on the main power switch.



3. Press POWER to start the unit. The back-lit POWER key flashes green and stays green when the power is turned on

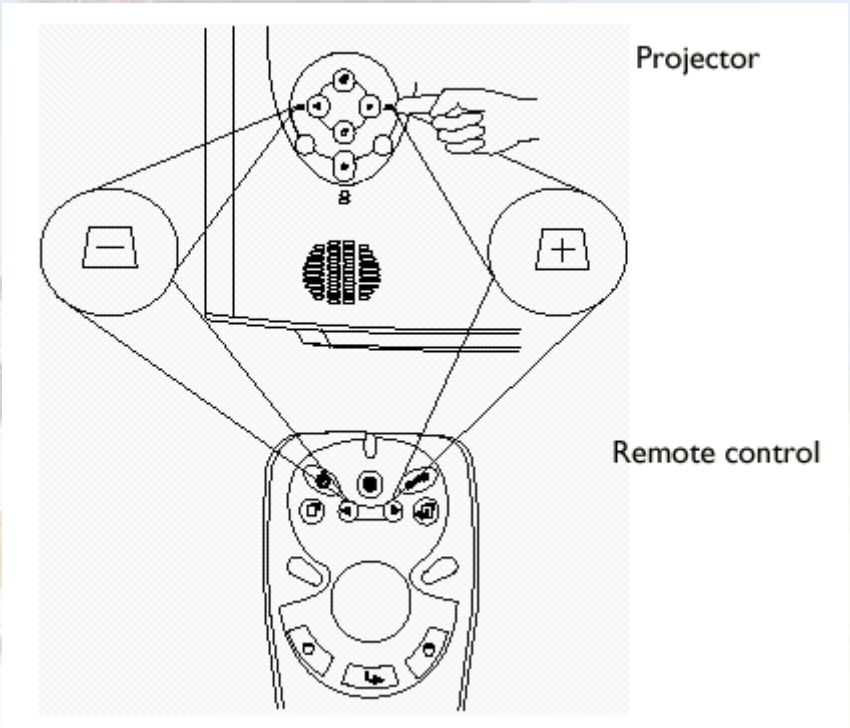


(When the power is turned off, there is a 60-second cooling period before the projector can be re-started.)

4. Switch on all connected equipment.

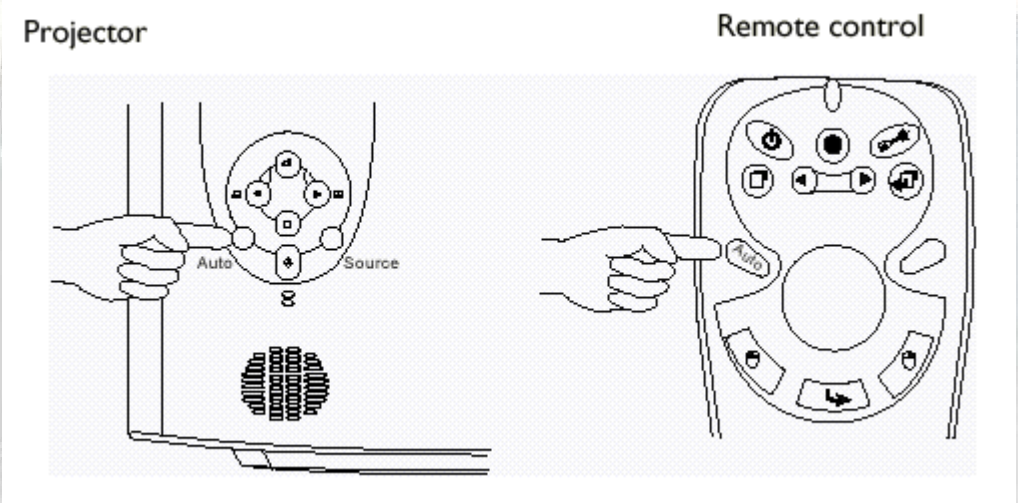
Digital Keystone Correction

Keystoning refers to the situation where the projected image is noticeably wider at either the top or bottom. To correct this, press KEYSTONE +/- (hot key) on the control panel of the projector or on the remote control, and then adjust the sliding bar labeled Keystone, as needed. Press **+** to correct keystoning at the top of the image. Press **-** to correct keystoning at the bottom of the image.



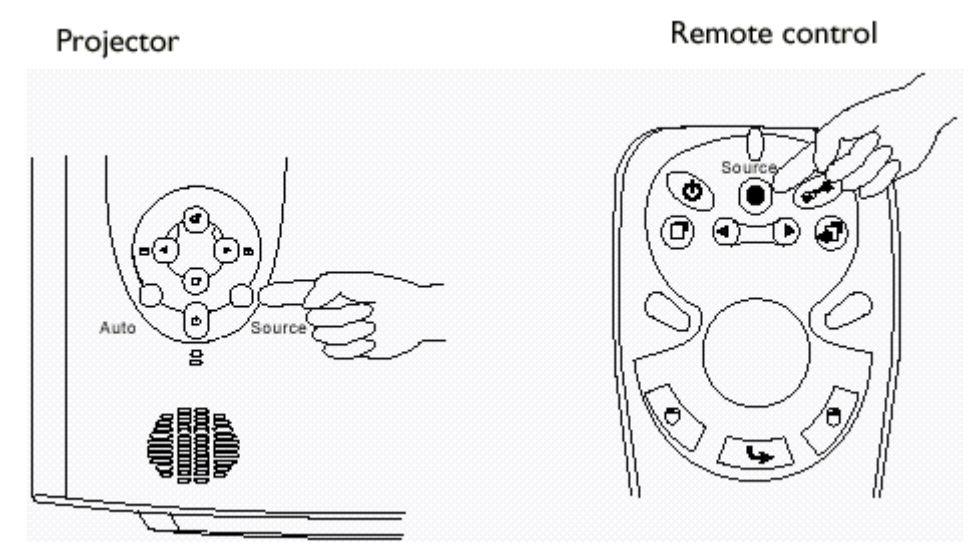
Auto Adjustment

In some cases, you may need to optimize the picture quality. To do this, press the AUTO key on the control panel of the projector or on the remote control. Within 3 seconds, the built-in Intelligent Auto Adjustment function will re-adjust settings to provide the best picture quality.



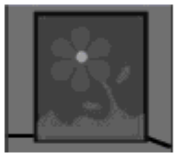
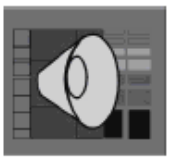
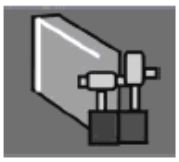
Source Selection

When several input sources are available, press the SOURCE key to make a selection from the control panel of the projector or the remote control.

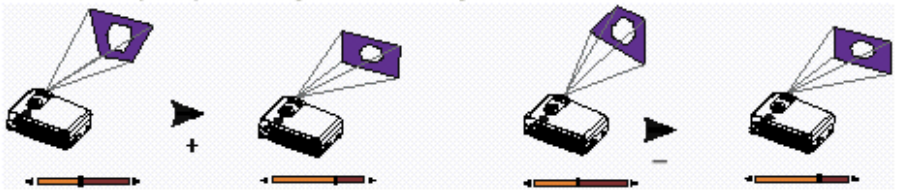
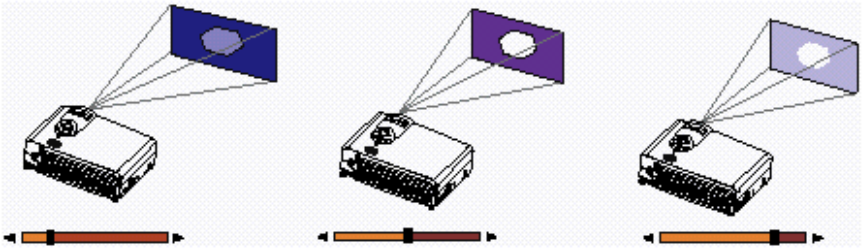
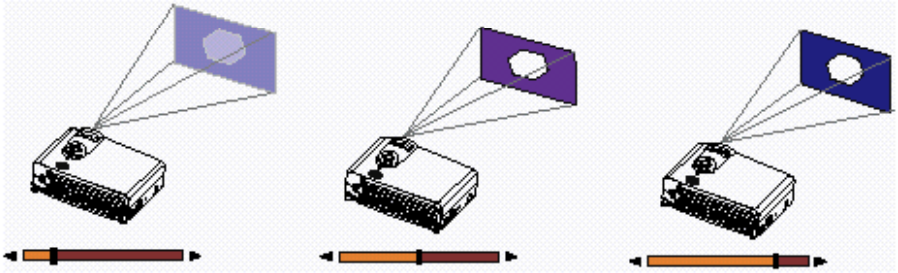
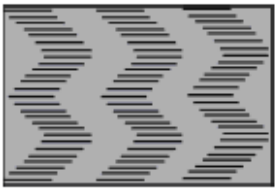


Menu System

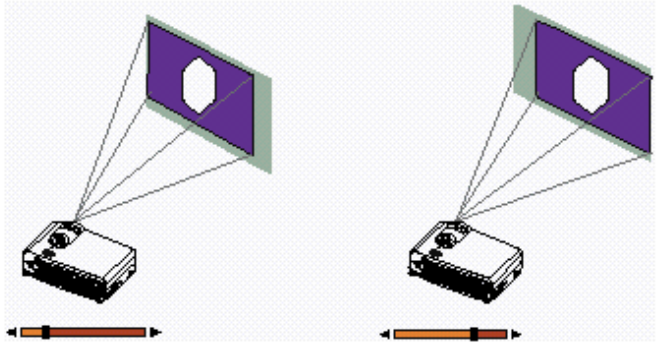
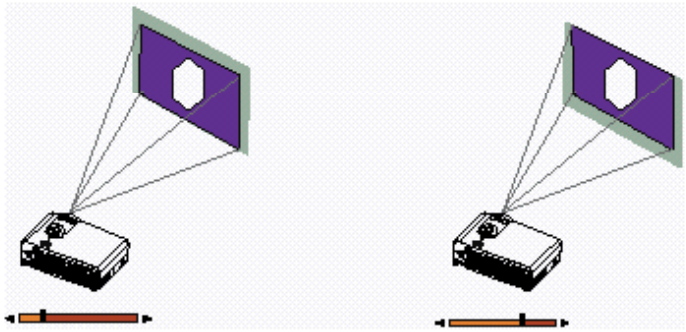
Press **Menu** for the main menu, and then press ◀ or ▶ to select a sub-menu. Press **Menu** again to select items in the sub-menu.

Menu Bar					
Sub-menu	**Display**	**Image**	**Source**	**Control**	**PIP**
PC	Keystone Brightness Contrast Phase H.Size	Ratio H-position V-position Color Temp Information	Mirror Source Volume Treble Bass Mute	Langauge OSD Setup Default Video Mode Lamp hour	Main page: PIP Source PIP Size PIP Pos. H. Position V.Position More Options Sub Page: Brightness Contrast Color Tint Sharpness System
Y/Pb/Pr		Ratio H-position V-position Color Tint Color Temp			
Video	Keystone Brightness Contrast Color Tint	Ratio System Sharpness Color Temp Information			

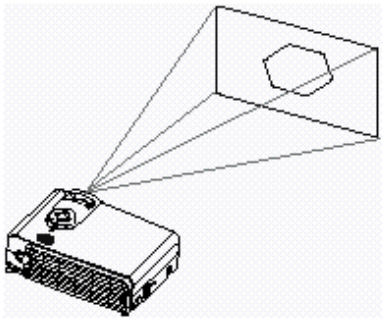
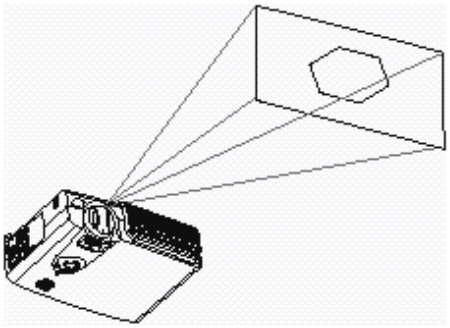
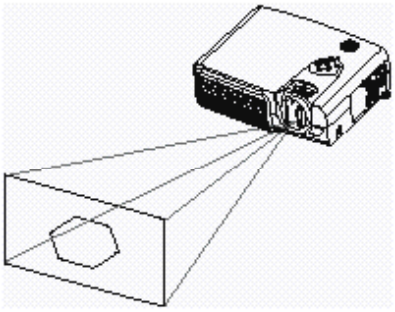
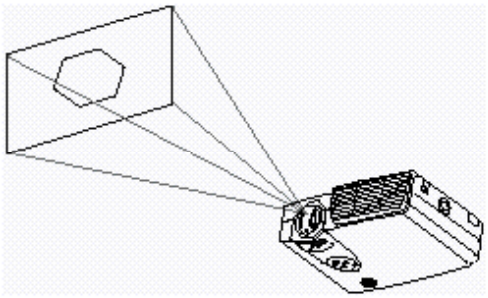
1. Display Menu

FUNCTION	DESCRIPTION
Keystone	Corrects any keystoning of the image. 
Brightness	Adjusts the brightness of the image. 
Contrast	Adjusts the degree of difference between dark and light in the image. 
Phase	Adjusts to avoid the occurrence of flicker.  ***This function is not available when the input mode is Video or S-Video.***
H.Size	Adjusts to fit in the desired image size. ***This function is not available when the input mode is Video or S-Video.***
Color	Increases or decreases the color range (R, G, B) of the image. ***This function is not available when the input mode is PC.***
Tint	Adjusts the image to make it appear more red or blue. ***This function is not available when the input mode is PC.***

2. Image Menu

FUNCTION	DESCRIPTION
Ratio	Users have 3 options for the image ratio. 1. 1:1 2. 4:3 3. 16:9
H-position	Adjusts the horizontal position of the projected image. 
V-position	Adjusts the vertical positon of the projected image. 
Color Temp.	Adjusts the color temperature to fit your preference.
Information	Shows the current resolution.
System	System information will be shown: 1. Auto 2.NTSC 3. PAL 4.SECAM ***The default setting for System is Auto.***
Sharpness	Adjusts the image to make it look sharper or softer. ***This function is not available when the input mode is PC or YPBPR.***
Color	Increases or decreases the color range (R, G, B) of the image. ***This function is not available when the input mode is PC.***
Tint	Adjusts the image to make it appear more red or blue. ***This function is not available when the input mode is PC.***

3. Source Menu

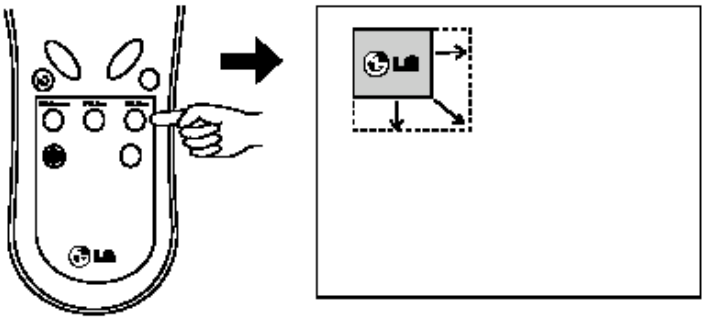
FUNCTION	DESCRIPTION
Mirror	**1.** Default  **2.** Ceiling mounted projection  **3.** Rear screen projection  **4.** Ceiling mounted and rear-screen projection 
Source	Selects the input source from among PC, Video, S-Video, and YPBPR.
Volume	Adjusts the volume level. 
Treble	Adjusts the treble level. 
Bass	Adjusts the bass level. 
Mute	**Off**  **On** 

4. Control Menu

FUNCTION	DESCRIPTION
Language	Language sets the language for the OSD control menus. Use the 3 / 4 key to select the desired language from among English, French, German, Italian, Spanish, Korean, Simplified Chinese and Traditional Chinese.
OSD	**OSD Pos.** Selects a desired OSD position.
	OSD Time Sets the length of time the OSD will remain active after the last time you pressed the button. The range is from 5 to 60 seconds in 5-second increments.
Setup	**Source scan** When selected, activates the Source scan function.
	Keystone hold When selected, preserves the last keystone correction value even when the projector is restarted.
	Mirror hold When selected, preserves the last mirror correction value even when the projector is restarted.
	Blank time Determines the length of time before the projector is shut off when Blank is activated.
	Auto off Sets the length of time before the system is shut off when no input is detected.
	User logo Enables the user to define the logo screen that will display during start-up. Three modes are available: Default (BOXLIGHT logo), black screen and blue screen.
Default	Returns all settings to their factory preset values.
Video Mode	Selects video mode.
Lamp hour	Shows lamp usage time.

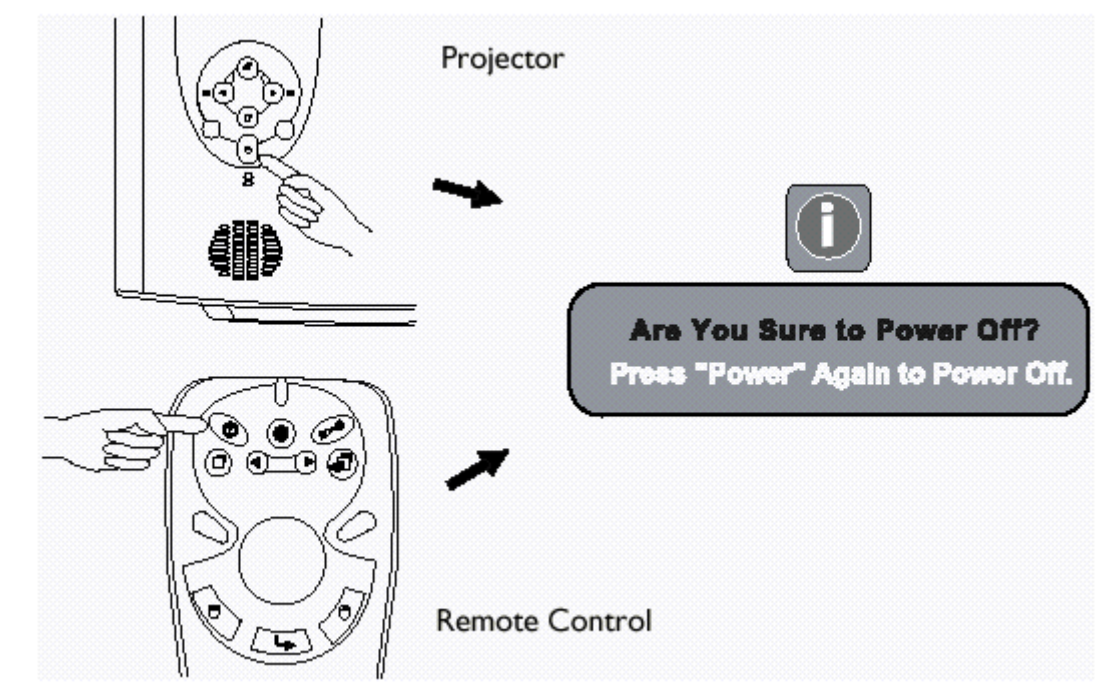
5. PIP Menu

These functions are available only when the input mode is PC and the PIP source is Video or S-Video

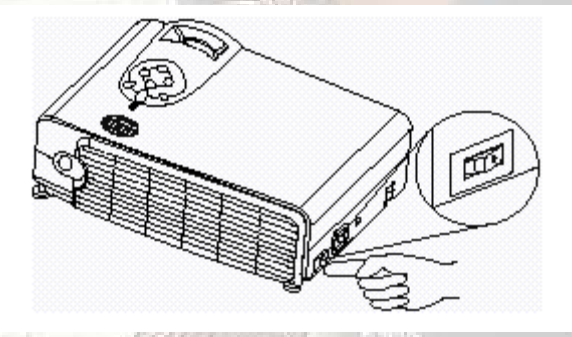
FUNCTION	DESCRIPTION
PIP Source	Selects the source for the PIP. 1. Off 2. Video 3. S-Video
PIP Size	Enables use of the ◂ or ▸ key to scroll through the three alternatives: Small, Medium, Large. 
H Position	Adjusts the horizontal position of the PIP image.
V Position	Adjusts the vertical position of the PIP image.
More Options	Enables use of the ◂ or ▸ key to select more PIP functions including Brightness, Contrast, Color, Tint, Sharpness and System.
Brightness	Adjusts the brightness of the PIP image.
Contrast	Adjusts the degree of difference between dark and light for the PIP image.
Color	Increases or decreases the color range (R, G, B) of the image.
Tint	Adjusts the image to make it appear more red or blue.
Sharpness	Adjusts the image to make it appear sharper or softer
System	Selects PIP image systems: NTSC, PAL, SECAM

8. Shutdown

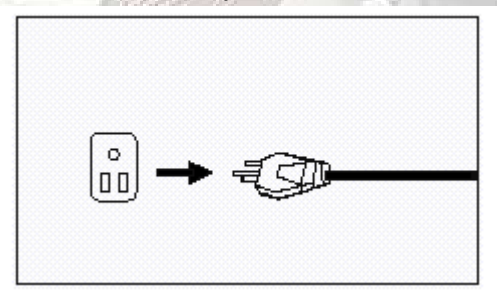
1. Press POWER and a warning message will appear. To turn off the projector, press POWER again.



2. The fan will continue to run for approximately two minutes.
3. Turn off the main power switch.



4. Disconnect the power cord from the wall socket.



⚠ Caution

Please do not unplug the power cord before POWER is shut down or during the two-minute cooling process. If the projector is not properly shut down, to protect the lamp, the system will detect this and cool the lamp for two minutes automatically before turning on again.

9. MAINTENANCE

Lamp Information

Use and Replacement of the Lamp

When the lamp Indicator lights up red or a message appears suggesting the time of lamp replacement, please install a new lamp or consult your dealer. An old lamp could cause a malfunction in the projector and in rare instances may even explode.

Lamp LED Indicators

Lamp Life Indicators	When the LED lights up red, it is warning you that lamp usage has exceeded 1500 hours. Replace the projection lamp with a new one immediately.
The Lamp is not properly attached	LED lights up red.
The temperature is too high	When the projector's internal temperature is too high for the projector to operate safely, the LED blinks orange and the lamp turns off automatically. The LED keeps blinking while the unit is off. If the LED light is off, the operation and temperature of the projector's lamp are normal.

⚠ Caution

The LAMP indicator will light up if the lamp becomes too hot. Turn off the power and let the projector cool for 45 minutes. If the LAMP indicator is still red when turning the power on, please contact your dealer.

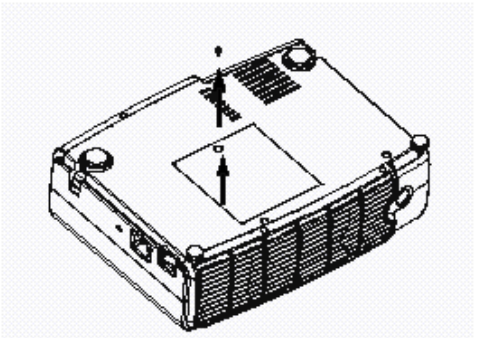
10. Lamp Replacement

Caution

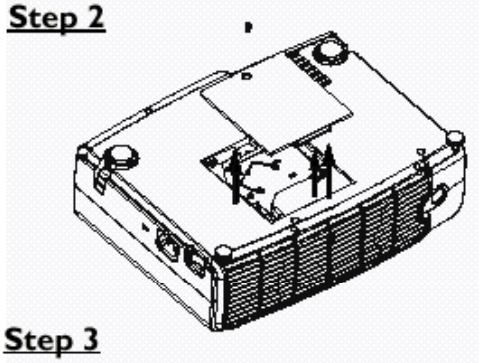
To reduce the risk of electrical shock, always turn off the projector and disconnect the power cord before changing the lamp

1. Press the **POWER** button to switch off the projector. Disconnect the power cord from the outlet and the projector.
2. Loosen the screw and remove the lamp cover. If the lamp is hot, avoid burns by waiting 45 minutes until the lamp has cooled.
3. Loosen the 3 screws. (It is strongly recommended that you use a magnetic-head screwdriver.) Pull the handle to remove the lamp housing. If the screws are not loosened completely, they could injure your fingers. Do not insert your hand into the box after the lamp is removed. If you touch the optical components inside, this could cause color unevenness in projected images.
4. Replace the lamp with a new one. Insert it into the projector, and tighten the screws firmly. Loose screws may cause a bad connection, which may result in malfunction.
5. Re-install the lamp cover and tighten the screw. **Do not turn on the power with the lamp cover removed.** Whenever the lamp is replaced, reset the total lamp operation time. **Do not reset if the lamp is not replaced as this could cause damage.**

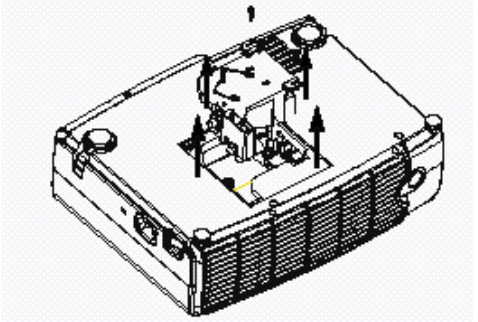
Step 1



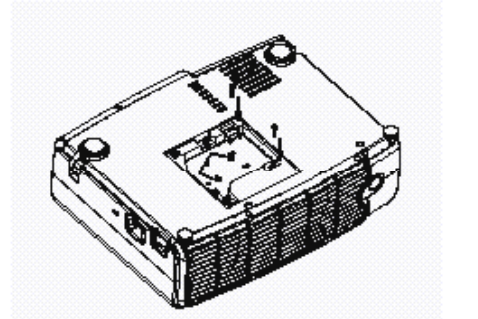
Step 2



Step 3



Step 4



Caution

To reduce the risk of severe burns, allow the projector to cool for at least 45 minutes before replacing the lamp.

The reduce the risk of injuries to fingers and damage to internal components, use caution when removing lamp glass that has shattered into sharp pieces.

To reduce the risk of injuries to fingers and/or compromising image quality by touching the lens, do not touch the empty lamp compartment when the lamp is removed.

This lamp contains mercury. Consult your local hazardous waste regulations to dispose of this lamp in a proper manner.

Resetting Lamp Hours

If you replace the lamp after 1500hours of operation, please follow the instructions below within 10 minutes of powering on.

OSD	FUNCTION
	Press the Exit button on the projector for 3 seconds to display the total used lamp time.
	• Press the MENU button on the projector during the lamp hour message. An adjustment message will appear. • Press ◀ or ▶ to reset lamp hours or press EXIT to leave.

Temp Information

When the LED lights up, it is warning you of the following possible problems:

1. The internal temperature is too high.
2. The fans are not working.

Turn off the projector and contact qualified service personnel for further help.

11. TROUBLE SHOOTING

Common Problems & Solutions

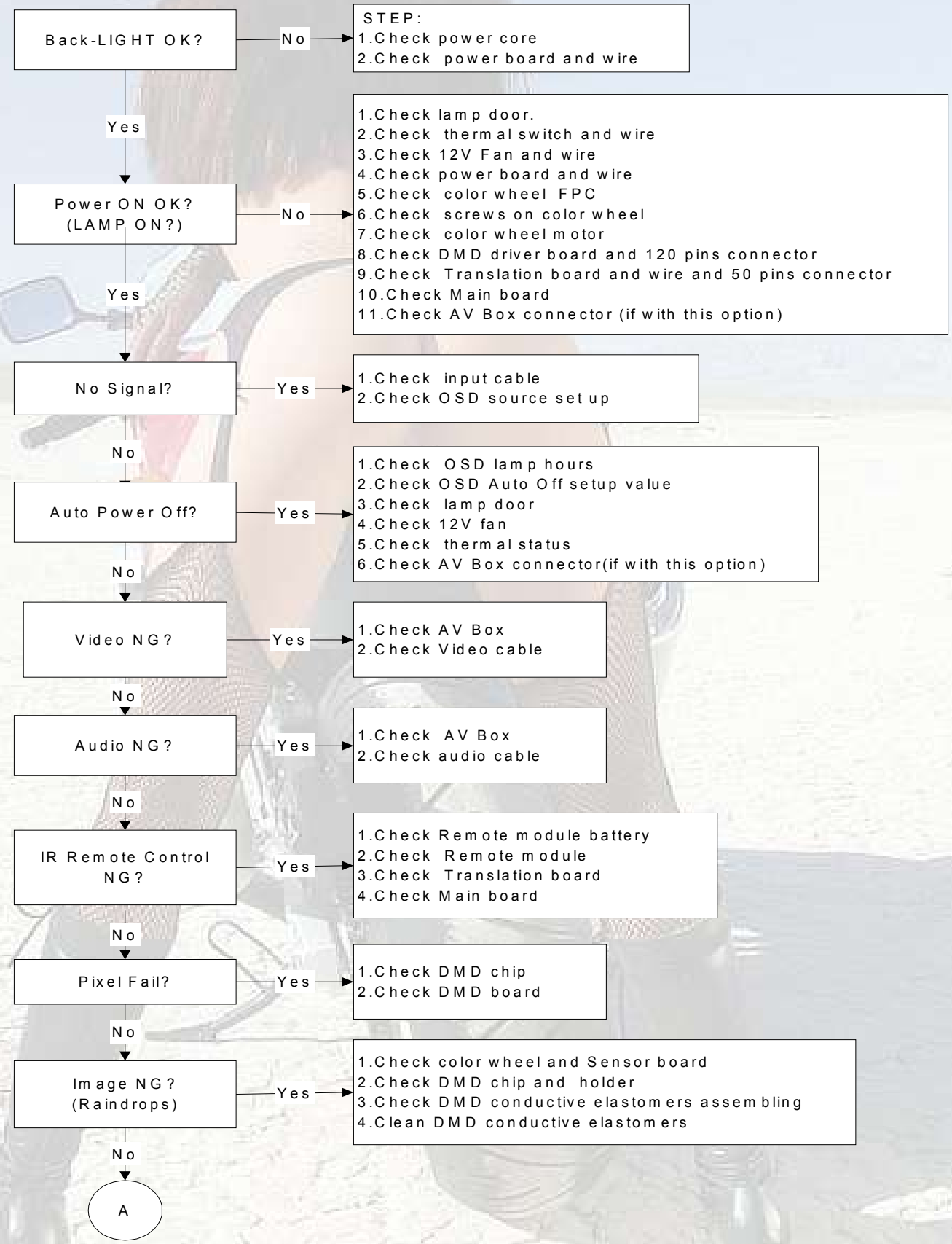
PROBLEMS	TRY THESE SOLUTIONS
NO POWER	◆ Make sure the power cord is inserted snuged into the AC adapter socket. ◆ Make sure the power cord is inserted snuged into the power outlet. ◆ Toggle the power switch to the position "I" ◆ Wait two minutes after the projector is turned off before turning the projector back on.
NO PICTURE	◆ Check for the proper input source. ◆ Ensure all cables are connected properly. ◆ Adjust the brightness and contrast. ◆ Remove the lens cap.
TRAPEZOID IMAGE ON THE SCREEN	◆ Reposition the unit to improve its angle on the screen. ◆ Use the **Keystone** correction key on the control panel of the projector or the remote control unit.
POOR COLOR	◆ Select the correct video system. ◆ Adjust brightness, contrast, or saturation.
BLURRED IMAGE	◆ Press **Auto** on the control panel of the projector or the remote control unit to get better picture quality. ◆ Adjust the focus. ◆ Reposition the unit to improve its projection angle. ◆ Ensure the distance between the unit and screen is within the adjustment range of the lens.
REMOTE CONTROL DOES NOT WORK	◆ Replace the batteries with new ones. ◆ Make sure there is no obstacle between the remote control and the projector. ◆ Stand within 4 meters (13 feet) of the projector. ◆ Make sure nothing is blocking the front and rear receivers.

Status Messages

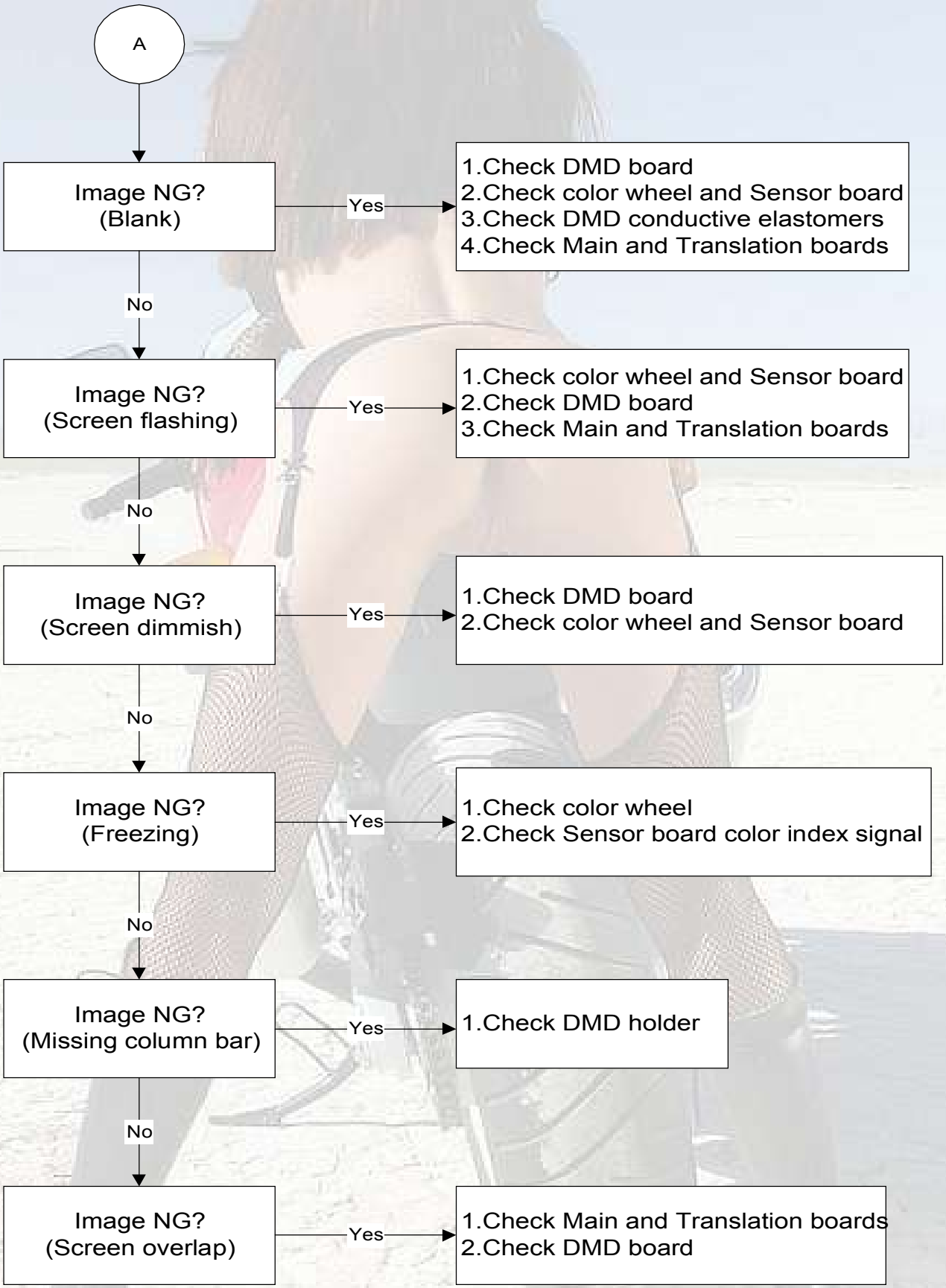
On-Screen Messages	Description
SEARCHING	Projector is searching for input.
ACQUIRING SIGNAL	Projector has identified the input signal and is running the auto image adjustment function.
OUT OF RANGE	Input signal frequency exceeds the projector's range.
LAMP WARNING – CHANGE LAMP AND RESET LAMP TIMER!	The lamp has been in operation for 1400 hours. Install a new lamp for optimal performance.
OUT OF LAMP USAGE TIME. CHANGE THE LAMP!	The lamp has been in operation for 1480 hours, and the power will turn off after 20 hours.
OUT OF LAMP USAGE TIME. YOU HAVE TO CHANGE THE LAMP!	The lamp has been in operation for over 1500 hours. The warning message will display for 30 seconds every 5 minutes after you turn on the projector and the power will turn off automatically after 10 minutes.

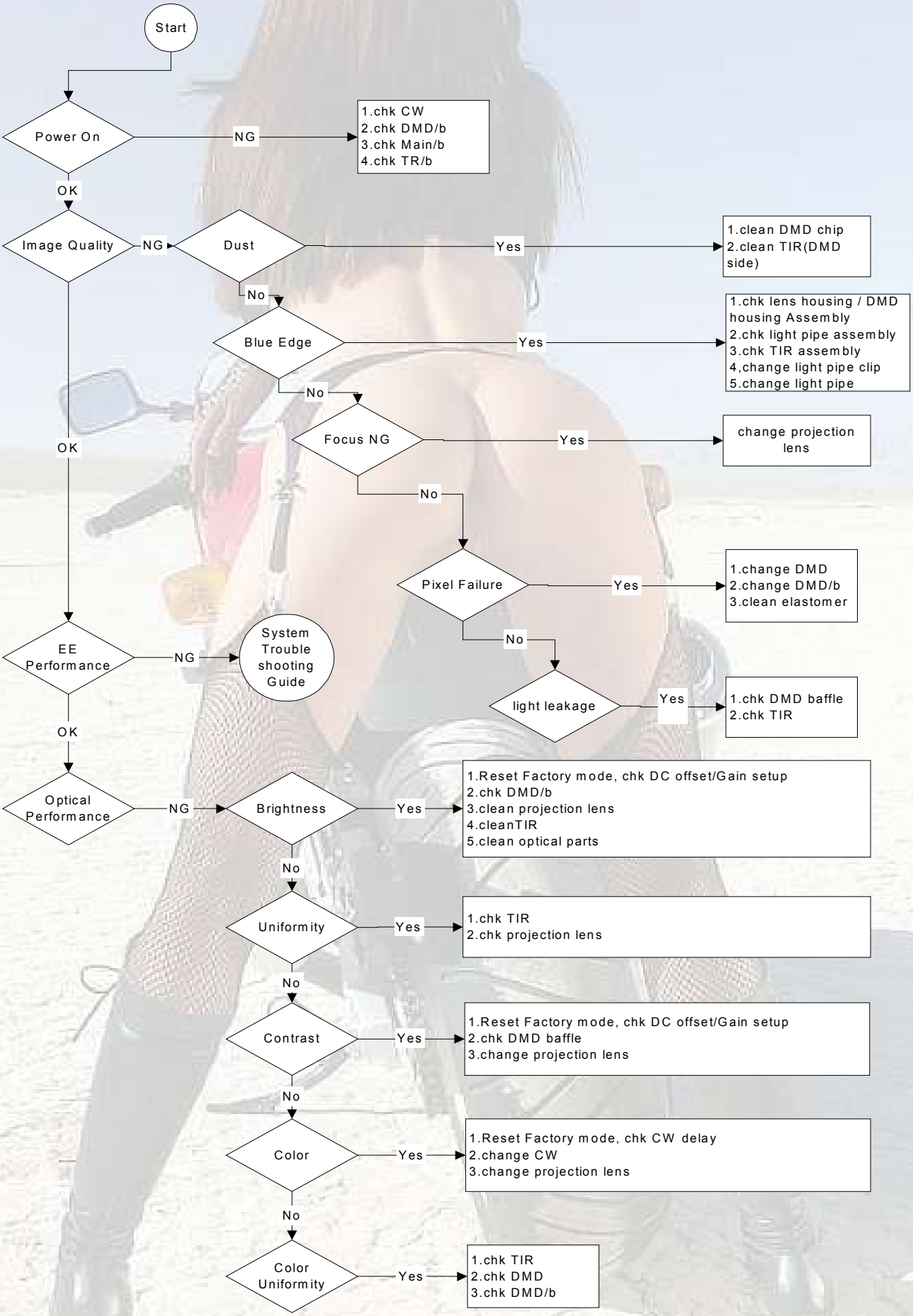
1. Final Assembly Trouble Shooting Guide

System Trouble Shooting Flow Char

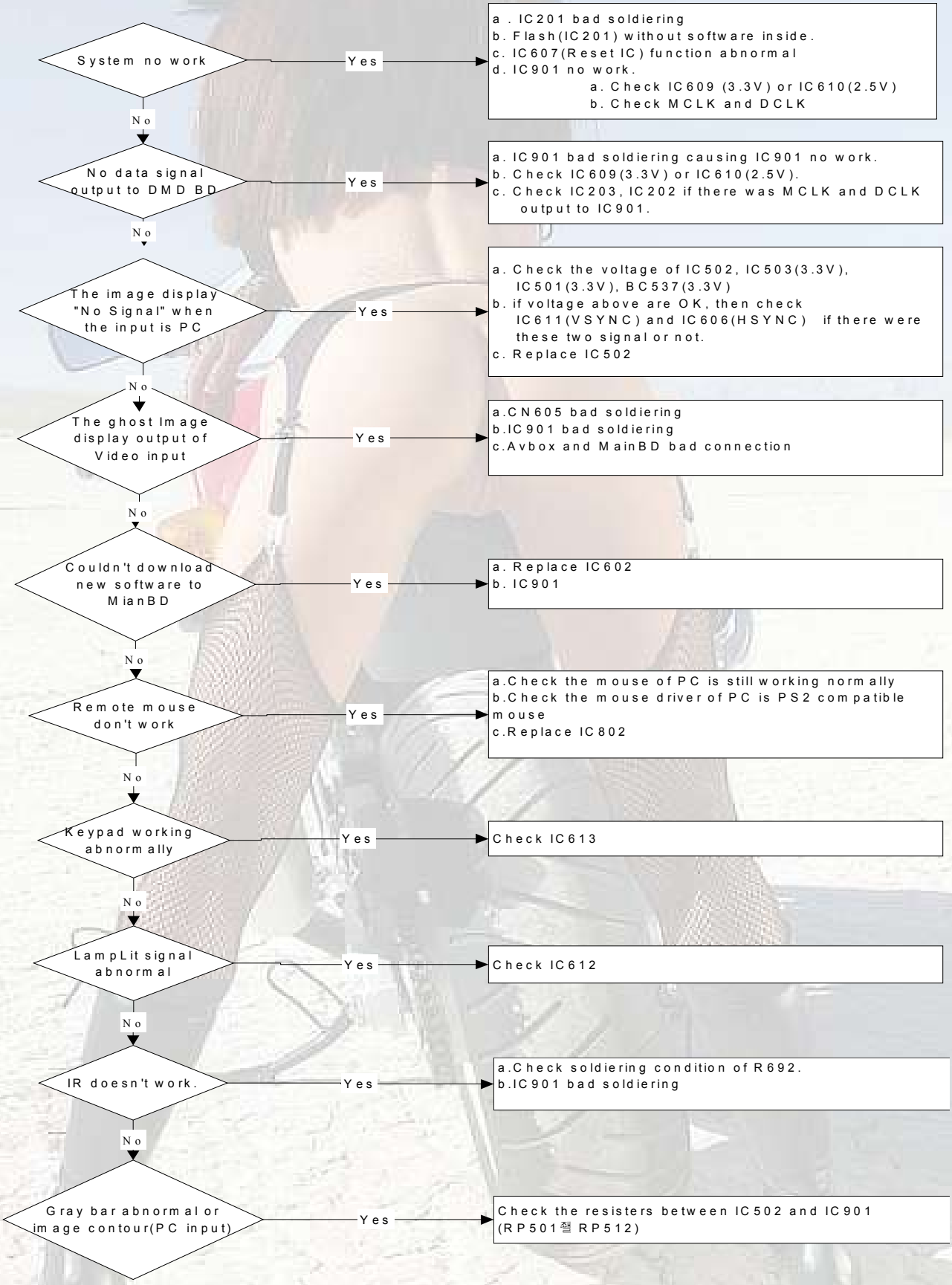


2. Engine Assembly Trouble Shooting Guide

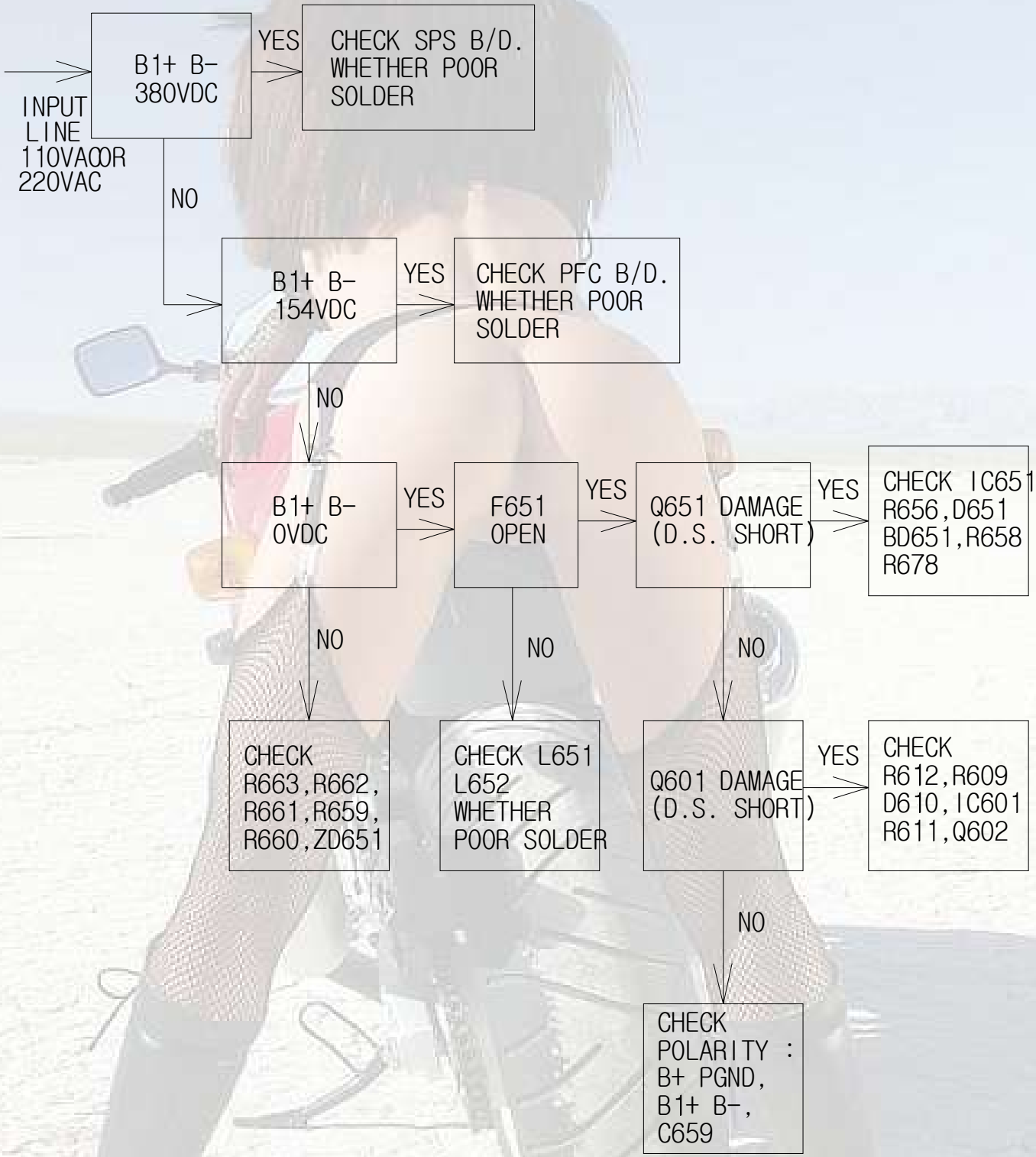



Start
Power On
NG
1.chk CW
2.chk DMD/b
3.chk Main/b
4.chk TR/b
OK
Image Quality
NG
Dust
Yes
1.clean DMD chip
2.clean TIR(DMD side)
No
Blue Edge
Yes
1.chk lens housing / DMD housing Assembly
2.chk light pipe assembly
3.chk TIR assembly
4,change light pipe clip
5.change light pipe
No
Focus NG
Yes
change projection lens
OK
No
Pixel Failure
Yes
1.change DMD
2.change DMD/b
3.clean elastomer
No
EE Performance
NG
System Trouble shooting Guide
light leakage
Yes
1.chk DMD baffle
2.chk TIR
OK
Optical Performance
NG
Brightness
Yes
1.Reset Factory mode, chk DC offset/Gain setup
2.chk DMD/b
3.clean projection lens
4.cleanTIR
5.clean optical parts
No
Uniformity
Yes
1.chk TIR
2.chk projection lens
No
Contrast
Yes
1.Reset Factory mode, chk DC offset/Gain setup
2.chk DMD baffle
3.change projection lens
No
Color
Yes
1.Reset Factory mode, chk CW delay
2.change CW
3.change projection lens
No
Color Uniformity
Yes
1.chk TIR
2.chk DMD
3.chk DMD/b

3. Main Board Trouble Shooting Guide

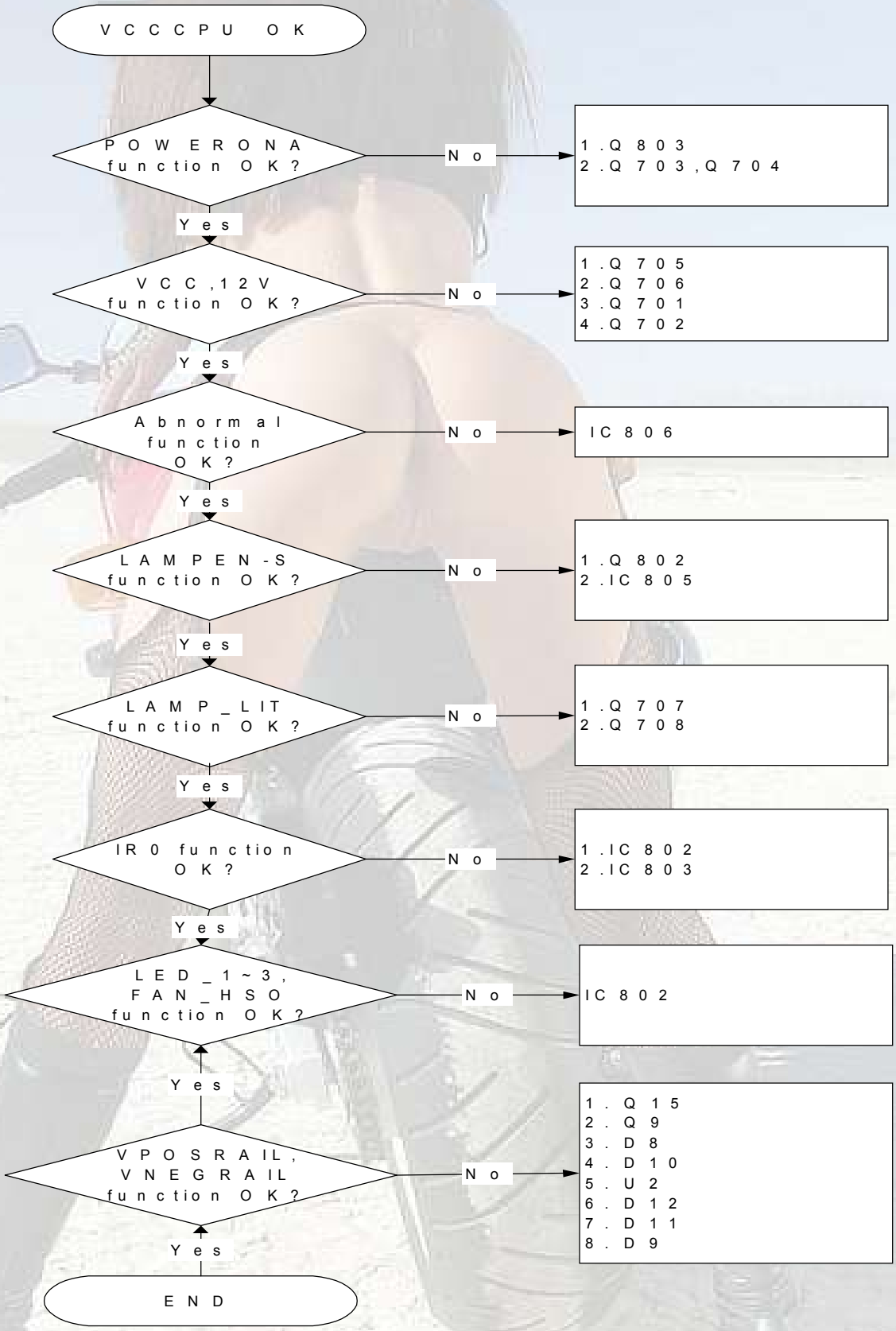


4. Power Supply Trouble Shooting Guide



5. Translation Board Trouble Shooting Guide

DS660 Translation Board Trouble Shooting Guide



6. DMD Board Trouble Shooting Guide

- Check power voltages.
- Check clocks from oscillator (58 MHz), from ASIC (58 MHz and 116 MHz), from FPGA (9.667 MHz and 2.4 MHz), to Hitachi (14 MHz), to motor controller (9.667 MHz)
- Verify HSYNC, VSYNC, ACTDATA, SYNCVALID, POWERGOOD, RESETZ from computer or source at 60 Hz. Verify these signals meet TI specified timing per Hardware ICD.
- Verify color wheel index running at 120 Hz
- If no color wheel spinning, check data transfer on the following lines: MTRDATA, MTRCLK, MTRSELZ.
- Verify phase lock of color wheel by checking rising edge of Index 275 us after Vsync
- If previous steps are verified, microcontroller is OK.
- Verify motor_spin line from microcontroller to FPGA is logic high.
- Verify hardware LAMPEN to ballast. Lamp type must be set to appropriate type if problems with getting LAMPLIT appear.
- 3.5 seconds after LAMPLIT, DMD should become active (unpark) and display an image.
- Verify reset (HRESETZ, pin 1) from FPGA to microcontroller only goes low once during the lamp strike period. LAMPLIT should be stable after microcontroller last reset.
- If everything else verified, but still no image, perform the following checks:
- Check DMD voltages at output of generation circuits, but also out of SR16 IC (be careful not to probe on pins or the device could be damaged): VBIAS (22-25v), VRESET (-26V), VCC2 (7.5V). Please attached file for reset waveform.
- Check voltage enables from FPGA are active as appropriate. If not, output drivers may be blown from previous probing.
- Be sure two reset lines are not tied together or the device WILL be damaged.
- Verify I2C communication by reading system status and microcontroller version. Verify READY bit in Status Byte.
- Set curtain mode to Full Green and verify green is displayed over entire screen. Repeat for Red and Blue. This checks for functionality of TI electronics between ASIC and DMD.
- If colors are wrong, check color wheel is spinning the correct direction. Put unit in red curtain mode and use a photosensor to verify that red is displayed 220 uS after color wheel Index.
- Use spoke light test register number 0x0E to verify sequence color transitions occur during wheel spoke interval. See Software ICD for register 0x0E.

Other suggestions:

- Be sure front end electronics are sending one pixel per clock.
- Elastomer and DMD are aligned properly to pads.
- Check data transfer on the following lines: PBCLKZ, PBDAT0, PBDAT1.
- If Color wheel has difficulty in starting or is unstable, the timing capacitors may need to be adjusted to match the motor parameter.

12. Timing Chart

Resolution	H Sync (kHz)	V Sync (Hz)	Remark
640x350	31.5	70.1	
640x400	37.9	85.1	VESA
720x400	31.5	70.0	
720x400	37.9	85.1	VESA
640x480	31.5	60.0	VESA
640x480	37.9	72.8	VESA
640x480	35	66.7	Macintosh
640x480	43.3	85.0	VESA
800x600	35.2	56.3	VESA
800x600	37.9	60.3	VESA
800x600	46.9	75.0	VESA
800x600	48.1	72.2	VESA
800x600	53.7	85.1	VESA
832x624	49.7	74.5	Macintosh
1024x768	48.4	60.0	VESA
1024x768	56.5	70.1	VESA
1024x768	60.0	75.0	VESA
1024x768	68.7	85.0	VESA
1280x1024	64.0	60.0	VESA

DMD Image Specification

1. SCOPE

This document specifies the image quality requirements applicable to the DLP™ XGA Component Set. The Component Set provides the DLP™ XGA Projector with digital imaging functionality based on Digital Micromirror Device (DMD) technology.

2. Definitions

2.1 Blemish

A blemish is an obstruction, reflection, or refraction of light that is visible, but out of focus in the projected image under specified conditions of inspection (see Table 1). It is caused by a particle, scratch, or other artifact located in the image illumination path.

2.2 Dark pixel

A single pixel or mirror that is stuck in the OFF position and is visibly darker than the surrounding pixels.

2.3 Bright pixel

A single pixel or mirror that is stuck in the ON position and is visibly brighter than the surrounding pixels.

2.4 Unstable pixel

A single pixel or mirror that does not operate in sequence with parameters loaded into memory. The unstable pixel appears to be flickering asynchronously with the image.

2.5 Adjacent pixel

Two or more stuck pixels sharing a common border or common point, also referred to as a cluster.

2.6 Streaks

Artifact resulting from locallized variation in mirror tilt angle relative to surrounding mirrors. They are similar in appearance to window scratches but appear at the mirror level. Streaks appear as faint diagonal or arcing patterns in the image.

2.7 Sea of Mirrors (SOM)

SOM is a rectangular array of off-state mirrors surrounding the active area.

2.8 Eyecatcher

A small localized light “spot” which has high spatial frequency and high differential brightness. These are due to various DMD window or window aperture “defects” including: digs, voids, particles and scratches.

2.9 Border Artifacts

All variations of these artifacts are acceptable under this image quality specification.

Border artifacts are a general category of image artifacts that may show up on screen in the area outside of the active array. Border artifacts include: Exposed Bond Wires, Exposed Metal 2, and Reflective Edge.

2.9.1 Bond Wires

Bond Wires attach the die to the superstructure. If visible, they will appear as short light

parallel lines outside of the Sea of Mirrors (SOM).

2.9.2 Exposed Metal 2

Exposed Metal 2 is due to a shift in positioning of either the die or the window aperture which may allow light to be reflected off of the layer of metal 2 that is below the super structure (mirrors). This defect is located at the outer edge of the SOM.

2.9.3 Reflective Edge

Reflective Edge is light that may reflect from the edge of the DMD's window aperture onto the projection screen. It will appear as a thin diffuse line outside of the SOM.

2.10 Two Zone Blue 60 Screen

The Two Zone Blue 60 screen is used to test for major dark blemishes. Refer to Figure 1 for configuration. All areas of the screen are colored a Microsoft Paintbrush blue 60 (green and red set at 0, blue set at 60).

NOTE: If linear degamma is not used then the Microsoft Paintbrush values must be adjusted to match the degamma table being used in order to generate an equivalent blue level on the test screen image.

2.11 Two Zone Gray 10 Screen

The Two Zone Gray 10 screen is used to test for major light blemishes. Refer to Figure 1 for configuration. All areas of the screen are colored a Microsoft Paintbrush gray 10 (green, red, and blue set at 10).

NOTE: If linear degamma is not used then the Microsoft Paintbrush values must be adjusted to match the degamma table being used in order to generate an equivalent gray level on the test screen image.

3. ACCEPTANCE REQUIREMENTS

3.1 Conditions of Acceptance

All DMD image quality defects must be determined under the following projected image test conditions:

a. Projector degamma shall be linear.
b. Projector error diffusion shall be "off"
c. Projector brightness and contrast settings shall be set to nominal.
d. The diagonal size of the projected image shall be a minimum of 60 inches.
e. The projection screen shall be 1X gain.
f. The projected image shall be inspected from an 8 feet minimum viewing distance.
g. The image shall be in focus during all Table 1 tests.

3.2 Test Sequence

Tests shall be run in the sequence listed in Table 1.

TABLE 1. Image Quality Specification

SEQ #	TEST	SCREEN	ACCEPTANCE CRITERIA
1	Major Dark Blemish	Two Zone Blue 60	1. No blemish will be darker than Microsoft Blue 60 in the Critical Zone 2. □ 2 blemishes in the Non-Critical Zone 3. No blemish will be > ½" long/diameter
2	Major Light Blemish	Two Zone Gray 10	1. No blemish will be lighter than Microsoft Gray 10 in the Critical Zone 2. □ 2 blemishes in the Non Critical Zone 3. No blemish will be > ½" long/diameter
3	Eyecatcher	Gray 10	1. No eyecatcher will be lighter than Microsoft Gray 10
	Streaks	Blue 60 Gray 10 White	1. No streaks
	Projected Images	Any screen	1. No adjacent pixels 2. No bright pixels (Active Area) 3. □ 1 bright pixel (SOM) 4. □ 4 dark pixels 5. □ 6 minor blemishes 6. No DMD window aperture shadowing on the Active Area 7. No unstable pixels in Active Area

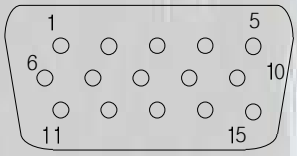
Notes:

1. Projected blemish numbers include the count for the shadow of the artifact in addition to the artifact itself, so that the count usually represents a single artifact on the window.
2. No blemish shall be more than 5 inches long or have a total area of more than 5 square inches on a 60 inch diagonal projected image. (□ ½ inch for Major Blemish tests)
3. During all Table 1 tests, projected images shall be inspected in accordance with the conditions of inspection specified in Section 3.
4. The rejection basis for all cosmetic DMD defects (scratches, nicks, particles) will be the projected image tests referenced in Table 1.
5. Any other image quality issue not specifically defined in this document shall be acceptable.
6. Black screens shall not be used as a basis for rejecting DMDs for image quality.

14. Electrical Interface Character

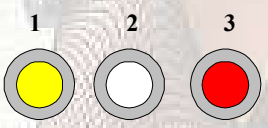
Interface Definition

- 15 pin definition of the mini D-sub male for DDC1/2B protocol

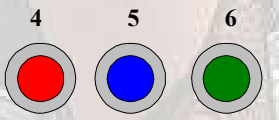


Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
1	Red video	2	Green Video	3	Blue Video	4	Monitor ID bit 2
5	Return	6	Red Video Return	7	Green Video Return	8	Blue Video Return
9	+5 Volt Supply (Mandatory Supply)	10	Sync. Return	11	Monitor ID bit 0	12	Bi-directional data (SDA)
13	Horizontal Sync	14	Vertical Sync	15	Data clock (SCL)		

- Video & Component Input



Composite input

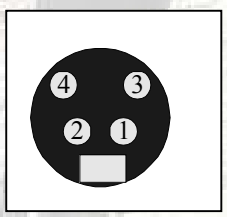


Component input

Pi	Definition	Pi	Definition	Pi	*Definition*
1	Composite video input	2	Audio input (left channel)	3	Audio input (right channel)
4	Luminance video input	5	B-Y Chroma input	6	R-Y Chroma input

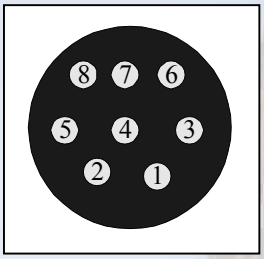
- 3.5 mm phone plug is used for stereo audio signal input.

- S-Video input



Pin	Description
1	GND
2	GND
3	Luminance
4	Chroma

- Control Port



Pin	Description	Pin	Description
1	Reserved	2	Reserved
3	TX	4	Reserved
5	Reserved	6	Reserved
7	RX	8	GND

15. Final Assembly Alignment Procedure

Unless other specified, all alignments should meet the following conditions:

1. All power on and power off condition should be last for more than 5 minute. i.e. no power on is permitted if UUT(Unit under test) had not been power off and last for more than 5 minute since last power on.
2. Brightness and contrast should be measured only 5 minute or more after lamp is on.
3. UUT should be placed at a distance ranges from 1.5 to 5 meter.
4. Applied timing should be 1024*768 @65Hz (XGA); 800*600@60Hz (SVGA)

Before test, be sure the following configurations are done properly:

1. Turn off light in test chamber.
2. Test chamber condition as per ANSI IT7.215-1992.
3. Connect DSUB cable to Graphics port of UUT.
4. Connect stereo input to stereo input of UUT.
5. Connect RCA terminal to Video input of UUT.
6. Connect S terminal to S-Video input of UUT.
7. Connect AC power cord to UUT.

(A) Video EE Check

Equipment: VG828, DVD Player

Aspect Ratio: 4:3

Channel	Prime Mode	Timing	Pattern	Item	Criteria
Composite Video	*	NTSC (H: 15.73KHz, 29.96Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct Color Noise Acceptable
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Only Color Noise Acceptable
			PT976 64Gray & Color	Gray & Color Check	64 Step
			PT863 Text	EM Character	EM distinguish Color Noise Acceptable
			Movie	Video Essential	
		PAL (H: 15.63KHz, 25Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct Color Noise Acceptable
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Only Color Noise Acceptable

Channel	Prime Mode	Timing	Pattern	Item	Criteria
S-Video	*	NTSC (H: 15.73KHz, 29.96Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
			PT976 64Gray & Color	Gray & Color Check	64 Step
			PT863 Text	EM Character	EM distinguish
			Movie	Video Essential	
		PAL (H: 15.63KHz, 25Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
YcbCr	*	NTSC (H: 15.73KHz, 29.96Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
			PT976 64Gray & Color	Gray & Color Check	64 Step
			PT863 Text	EM Character	EM distinguish
			Movie	Video Essential	
		PAL (H: 15.63KHz, 25Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
YPbPr	*	480p (H: 31.54KHz, 60.08Hz, p)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
			PT976 64Gray & Color	Gray & Color Check	64 Step

			PT863 Text	EM Character	EM Clear
			Movie	Video Essential	
		720p (H: 45.00KHz, 60Hz, p)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	2 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		1080I (H: 33.75Khz, 30Hz, I)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	4 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Only interlace jitter acceptable

(B) PC EE Check:

Equipment: Chroma 2250, CL-100

Aspect Ratio: 4:3

Channel	Prime Mode	Timing	Pattern	Item	Criteria
DSB	*	1024*768@85Hz (68.677KHz, 84.997Hz)	PT5 SMPTE 3	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
			PT48 32 Gray	Gray Check	32 Step
			PT85 Text	Character	Clear
			PT46 10 Gray	ColorTemp@80 %Gray	
				Cool (1)	(0.272,0.283) ±0.02
				Standard (2)	(0.281,0.311) ±0.02
				Warm (3)	(0.313,0.329) ±0.02
			Picture Phone Lady	Picture check	
		640*400@70Hz (31.47KHz, 70.08Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		640*480@60Hz	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line

		(31.469KHz, 59.94Hz)		Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		640*400@85 Hz (43.269KHz, 85.008Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		800*600@60 Hz (37.879KHz, 60.317Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		800*600@75 Hz (46.875KHz, 75Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	1 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		800*600 @85Hz (53.67KHz, 85.06Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	2 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		1024*768@60Hz (48.4KHz, 60Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	2 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable
		1024*768@75Hz (60.023KHz, 75.029Hz)	PT2 Master Pattern	Gray	0-100%
				H&V Res.	2 Line
				Color	Hue, Sat need correct
				Smear	Not acceptable
				Linearity	As optical spec
				Jitter, Swing, Snack, Ring, Cross-talk	Not Acceptable

(C) Optical Check

Equipment: Chroma 2250, CL-100

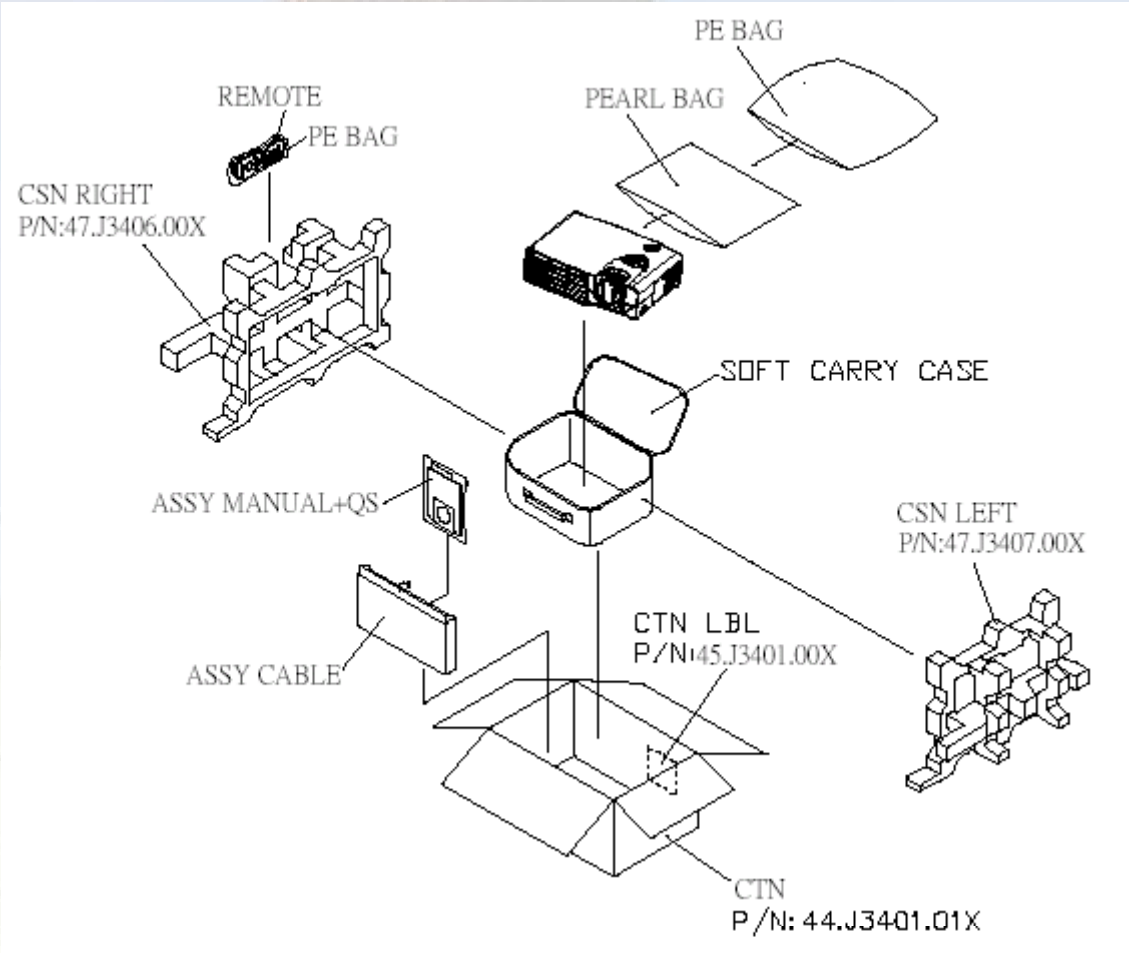
Aspect Ratio: 4:3

User OSD setting: (PC), 30 gray

Final Check				
Step	**Screen**	**Check Items**	**Acceptance Criteria**	**Equipment**
1.Brightness	100% W Pattern	ANSI Lumens	>=450@PC mode	
		Uniformity	>=70%	
2.Contrast Ratio	Checker Board	ANSI C/R	>=130:1	
3.Color	R Pattern	Chromaticity Coordinate x, y	□<=0.04	
	G Pattern	Chromaticity Coordinate x, y	□<=0.04	
	B Pattern	Chromaticity Coordinate x, y	□<=0.04	
	100% W Pattern	Chromaticity Coordinate x, y	□<=0.04	
		Uniformity	□<=0.04	
	50% W Pattern	Chromaticity Coordinate x, y	□<=0.04	
		Uniformity	□<=0.04	
4.DMD	Blue 180 Pattern	Dark Blemish	<=6	
		Dark pixel	<=4	
	Gray 30 Pattern	Bright Blemish	<=6	
		Bright pixel	=0	

Inspection			
Step	**Check Items**	**Acceptance Criteria**	**Equipment**
1.Apperance	CHK Appearance	C315	
2.Buttom	CHK Functionality	Shinning and No Stuck	
3.Front / Rear Foot	CHK Functionality	Adjustable	
4.Zoom / Focus Ring	CHK Functionality	Adjustable	
5.CFM	Measure Air Flow	>= TBD CFM	
6.PC	SMPTE133 Pattern	Jitter	PC
		Geometry	
		Focus/Ring	
	Color Ramp Pattern	Stuck Bit	
		Flashing	
	Phone Lady picture	Tint	
		General Picture Quality	
7.Video (RCA, S-Video)	Static pattern (SMPTE133 Pattern)	Flicker	DVD Player
		Stuck Bit	
	Dynamic movie (Toy Story/ Video Essential)	Tint	
		Noise	
		General Picture Quality	
8.Audio		Input / Output	DVD Player
9.OSD/Remote			PC input
10.Hi-Pot			High Power Generator

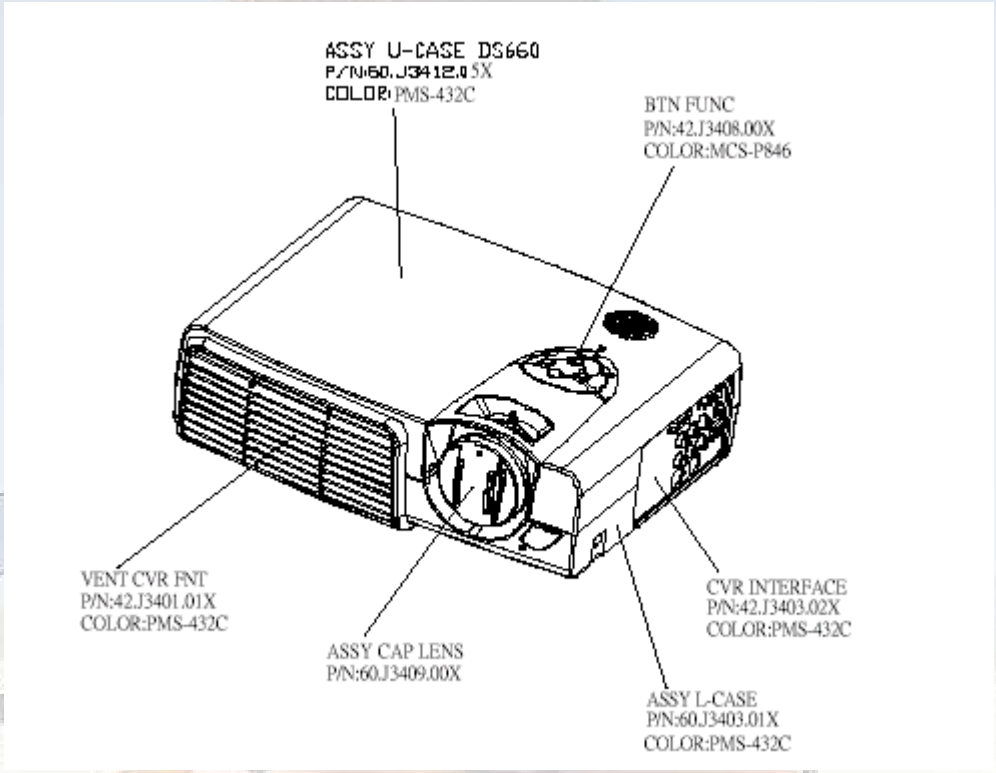
16. PACKING DESCRIPTION

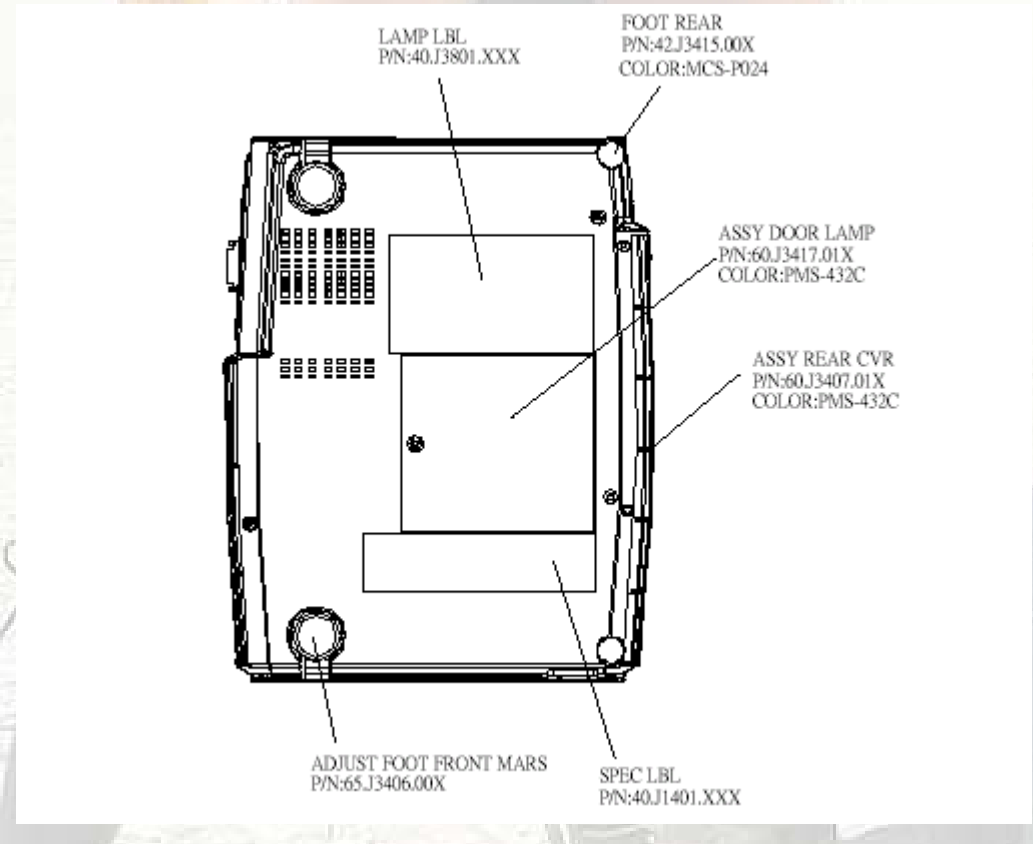


CTN LBL PRINTING:


Model Name: RD-JT41
Resolution : SVGA
Made in Taiwan
S/N: YMMACXXXXX
BAR CODE 39 FOR S/N
OTHER
P/N:45.L2701.001

17. APPEARANCE DESCRIPTION





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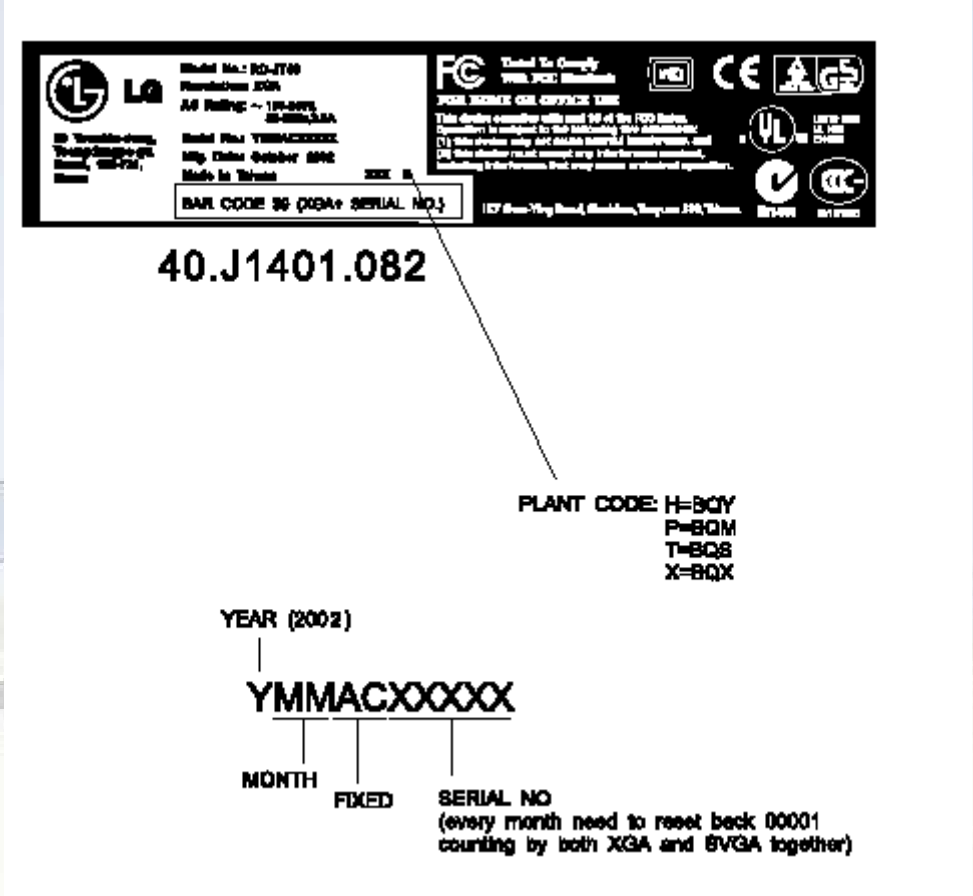

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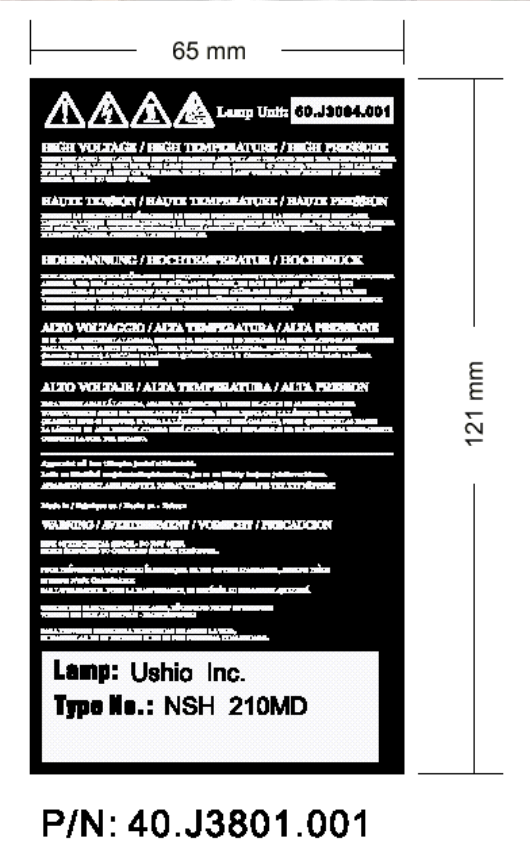
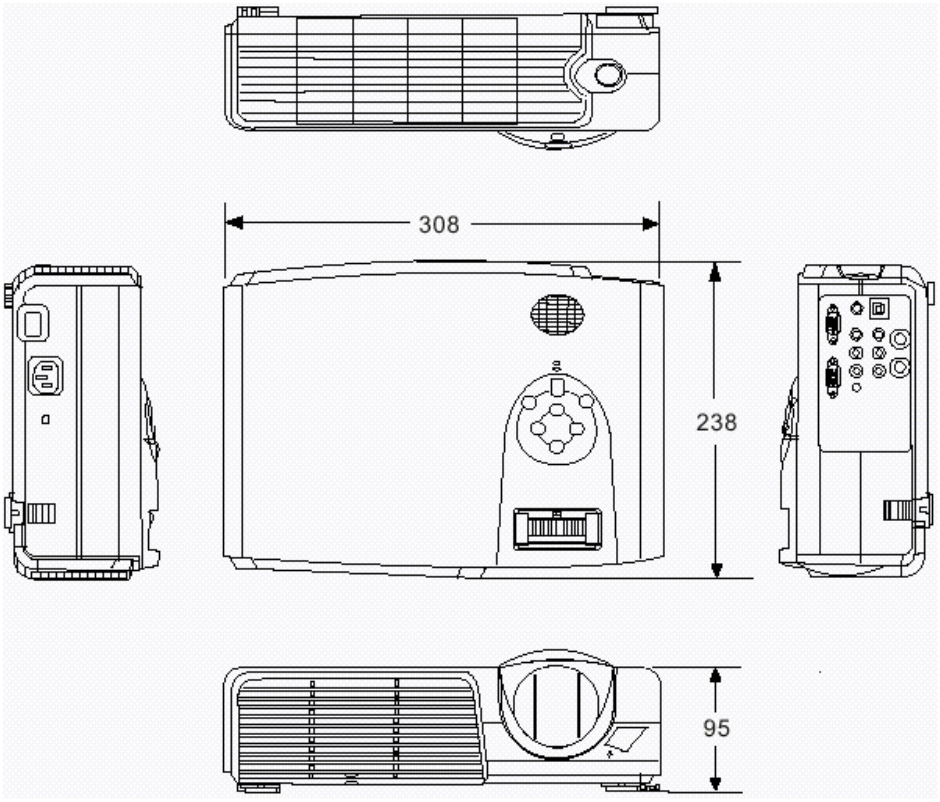
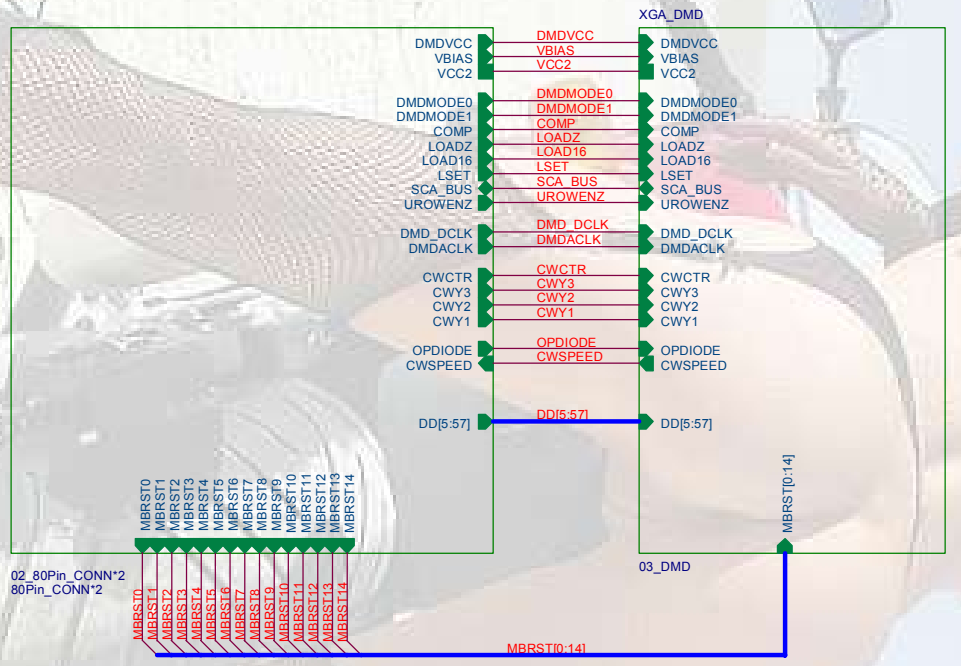


18. Dimensions



Unit: mm



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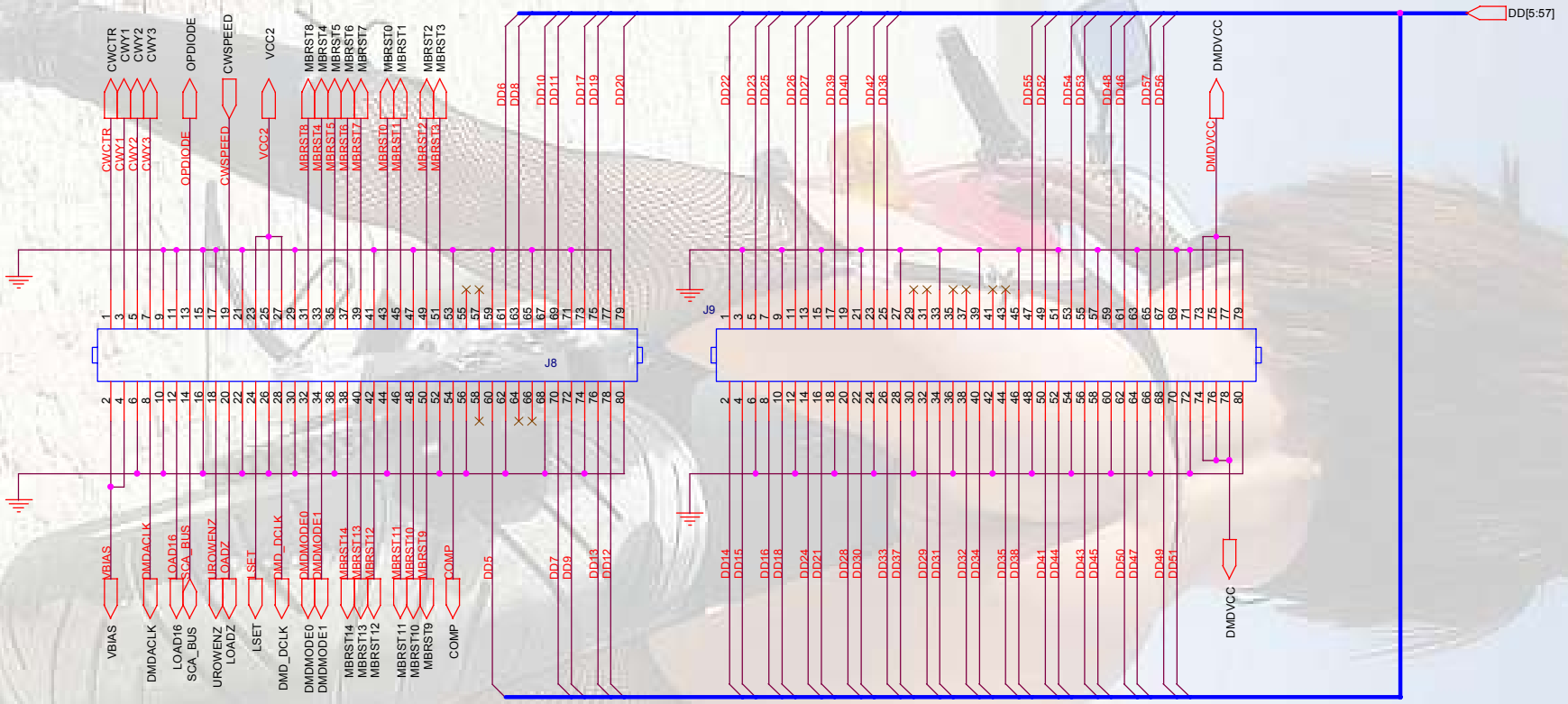
Title	DS660 DMD CHIP BD		
Size A3	Document Number 304-C01 48.J3802.S01 FAB:S01		Rev 0
Date: Monday, March 25, 2002	Sheet 1 of 4		
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	



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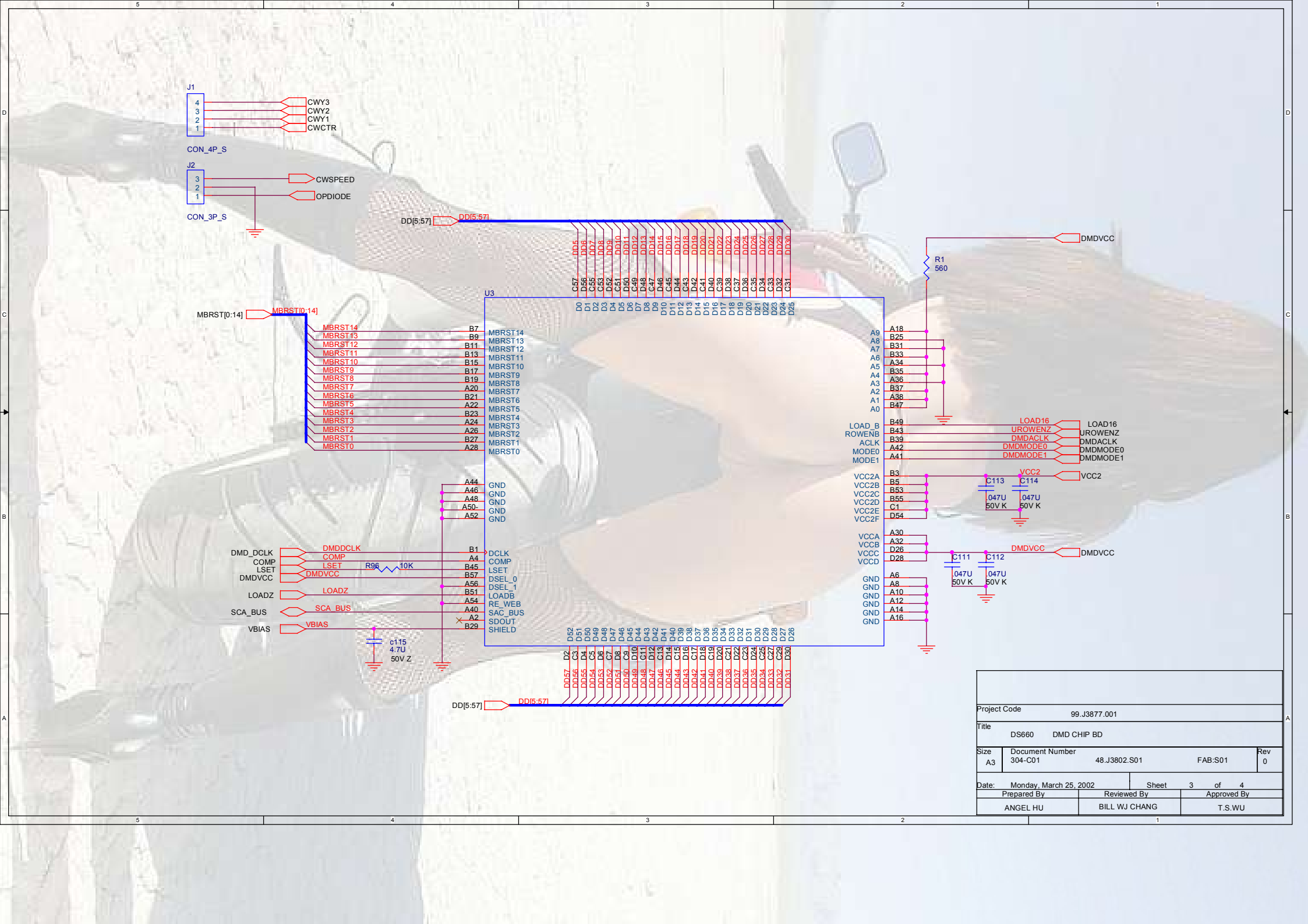
Title	DS660 DMD CHIP BD		
Size A3	Document Number 304-C01 48.J3802.S01 FAB:S01		Rev 0
Date: Monday, March 25, 2002		Sheet 2 of 4	
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	



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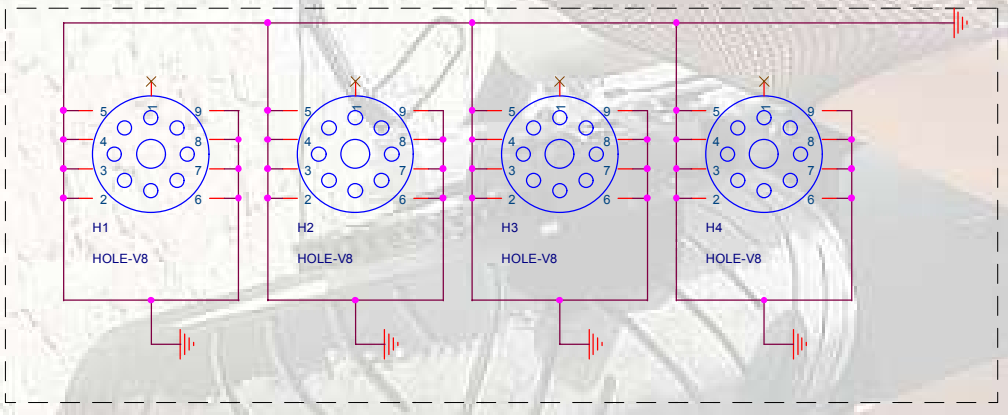
Title	DS660 DMD CHIP BD		
Size A3	Document Number 304-C01	48.J3802.S01	FAB:S01 Rev 0
Date: Monday, March 25, 2002		Sheet 3 of 4	
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	

Screw Holes



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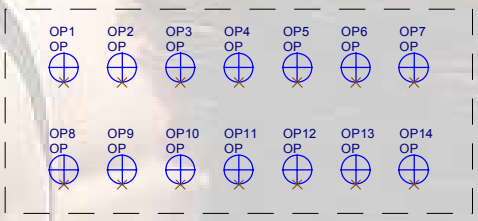

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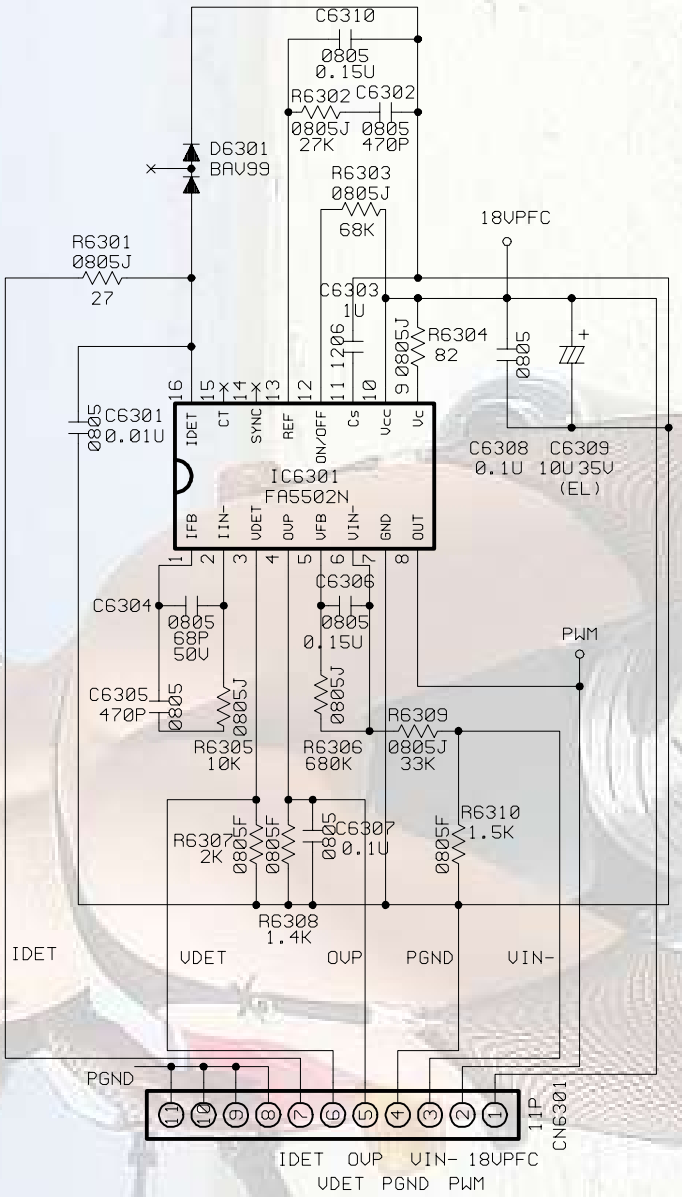
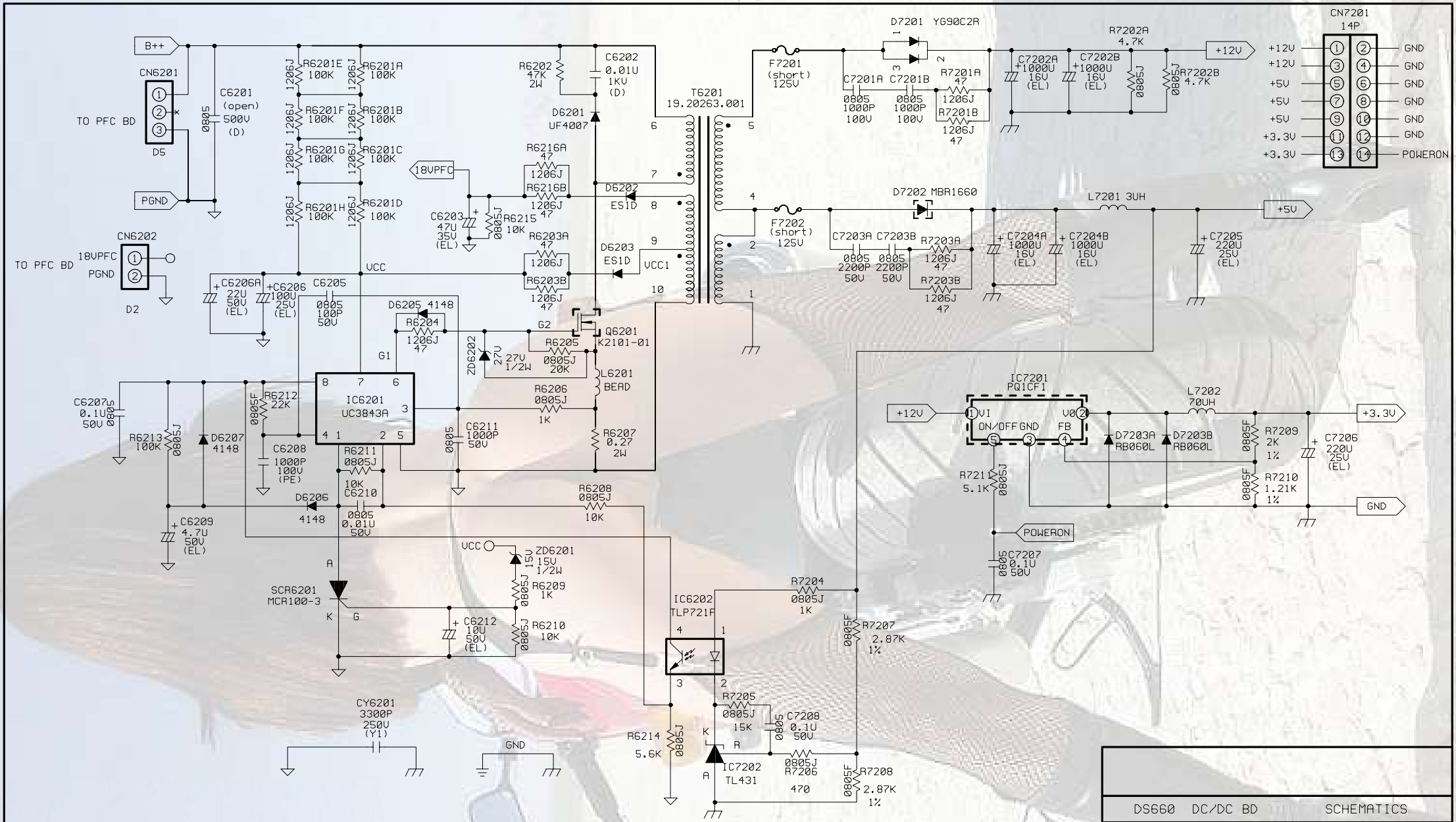
Title	DS660 DMD CHIP BD		
Size: A3	Document Number: 304-C01 48.J3802.S01 FAB:S01		Rev: 0
Date: Monday, March 25, 2002		Sheet 4 of 4	
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	



NOTES:
1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are 1/8 watt, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

DS660 PFC CONTROL BD SCHEMATICS				
SIZE A4	J3407A00.SCH	FAB A00	Doc.No. 304-C07	REV. 0
DATE : 10/3/2002		Sheet 1 OF 1		
Project Code. 99.J3877.001				
Prepared By	Reviewed By	Approved By		
ANGEL HU 10/3/2002	KEN JA CHEN 10/3/2002	JACK CHEN 10/3/2002		



NOTES: 1.Resistor values are in ohm,K=1,000 ohm,M=1,000,000 ohm
2.All resistors are 0805,5% except where otherwise indicated
3. Represents PCB common ground.

DS660 DC/DC BD			SCHEMATICS	
SIZE A4	J3408A00.SCH	FAB A00	Doc.No. 304-C08	REV. 0
DATE : 10/3/2002		Sheet 1 OF 1		
Project Code. 99.J3877.001				
Prepared By	Reviewed By	Approved By		
ANGEL HU 10/3/2002	KEN JA CHEN 10/3/2002	JACK CHEN 10/3/2002		

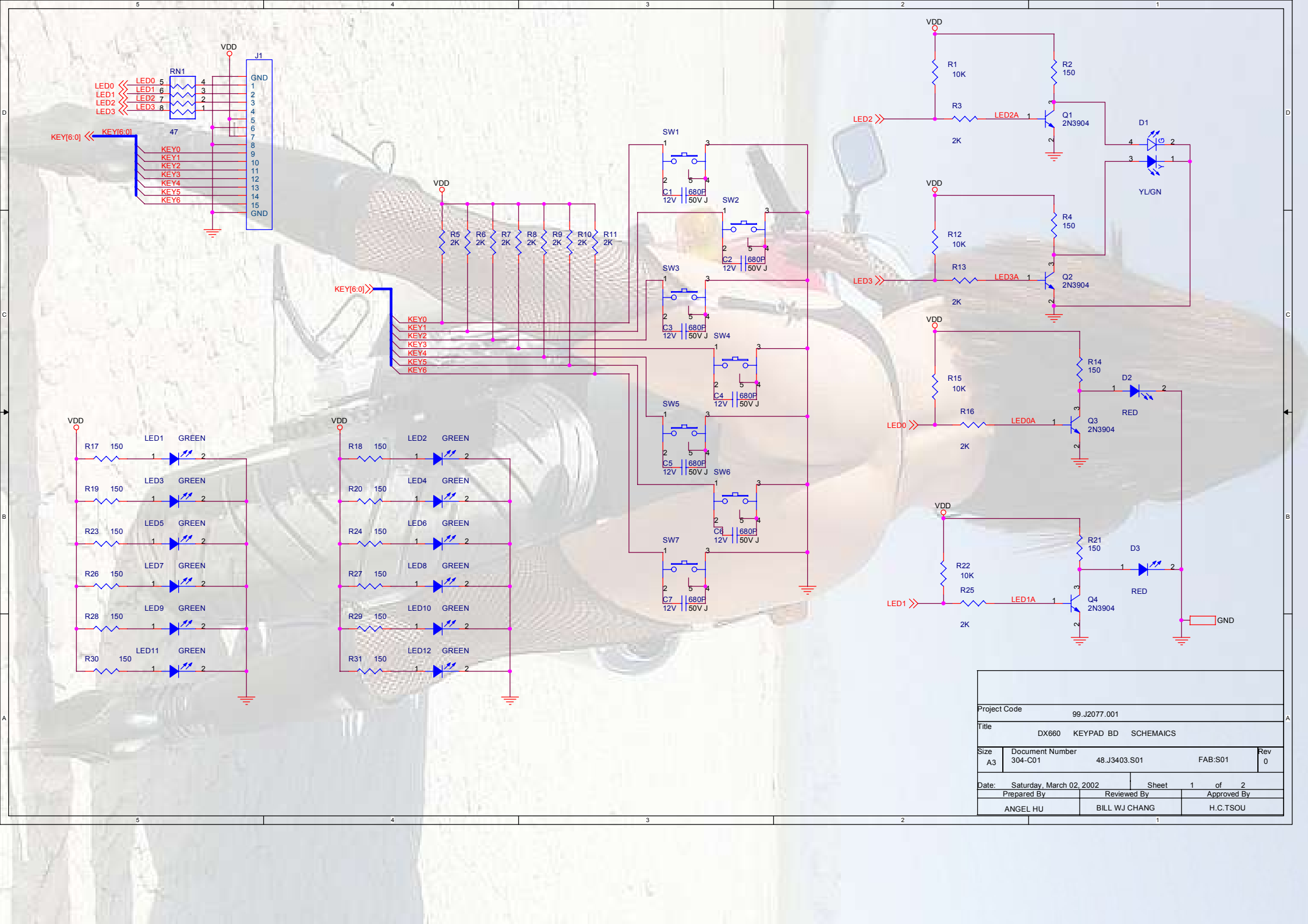
DS660 THERMAL BD SCHEMATICS

SIZE		FAB	Doc.No.	REV.
A3	J3419A01.SCH	A01	304-C09	0

DATE : 10/3/2002 | Sheet 1 OF 1

Project Code. 99.J3877.001

Prepared By	Reviewed By	Approved By
ANGEL HU 10/3/2002	JOHN LIN 10/3/2002	T.S WU 10/3/2002



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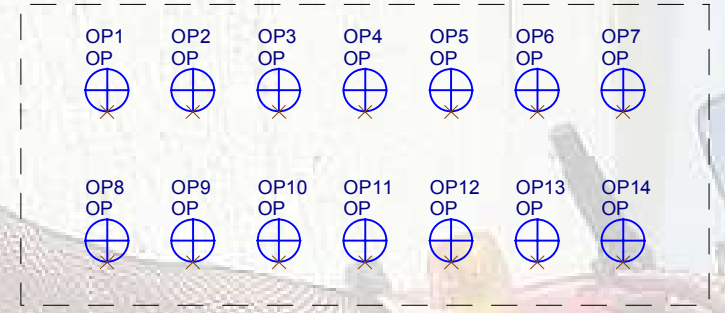
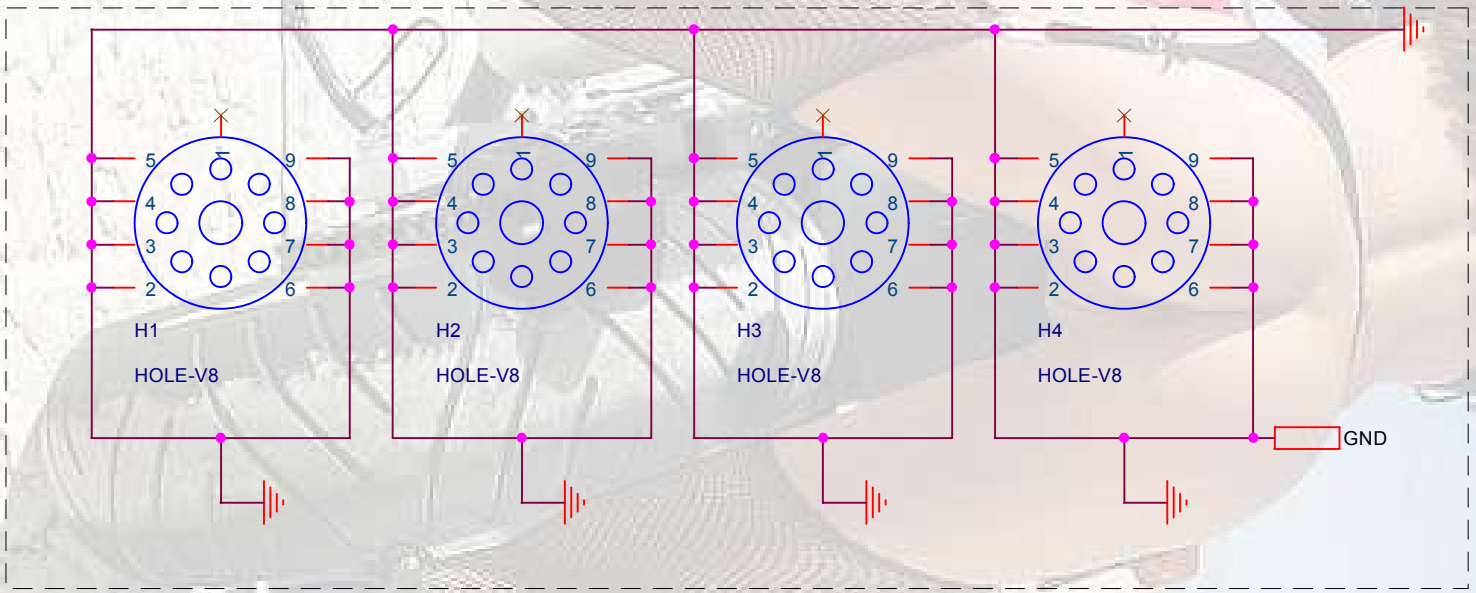
Size A3	Document Number 304-C01 48.J3403.S01 FAB:S01		Rev 0
Date: Saturday, March 02, 2002		Sheet 1 of 2	
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	H.C.TSOU	

Optical P oints



Screw Holes



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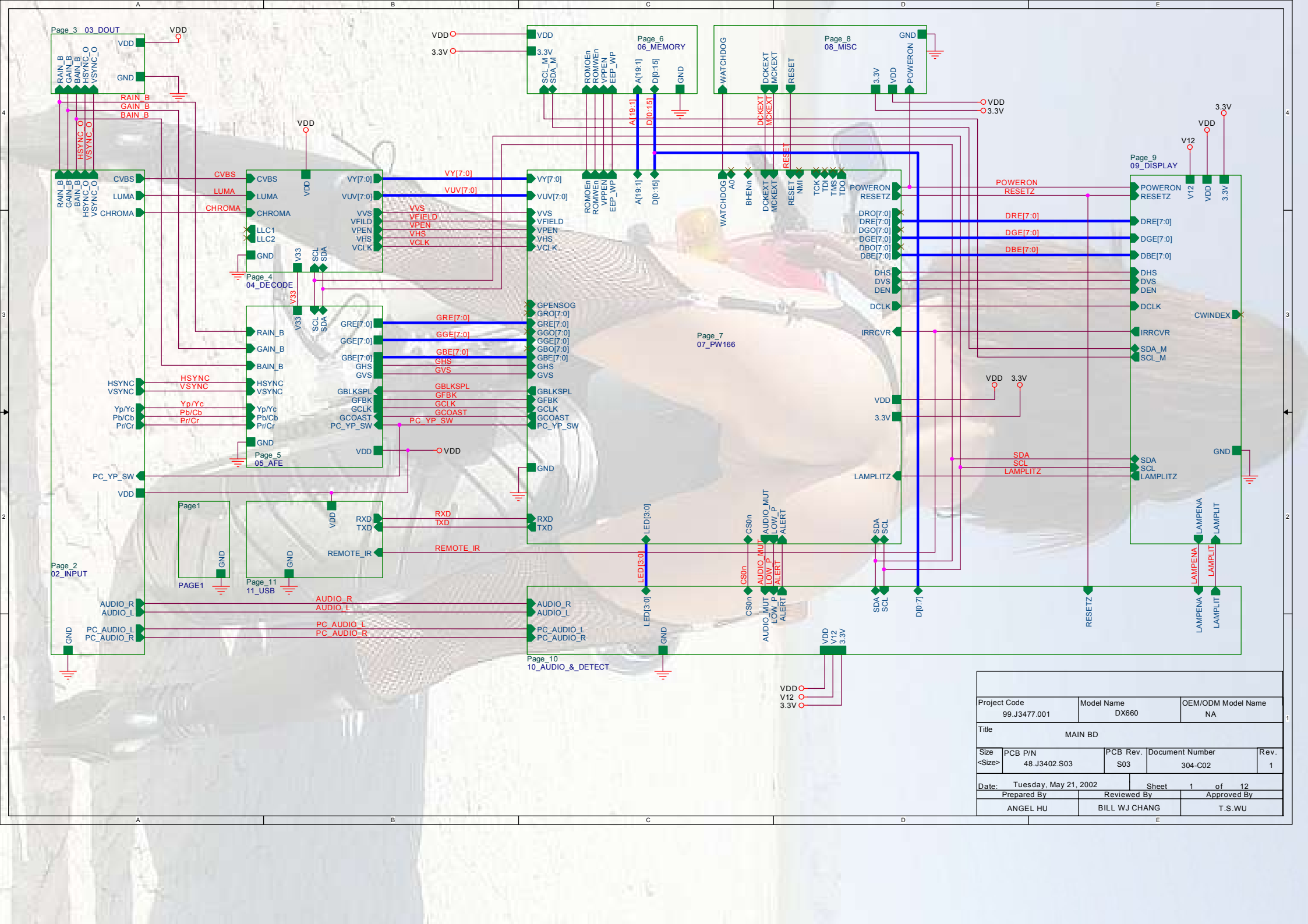
Title	DX660 KEYPAD BD SCHEMAICS		
Size A3	Document Number 304-C01 48.J3403.S01 FAB:S01		Rev 0
Date: Saturday, March 02, 2002		Sheet 2 of 2	
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	H.C.TSOU	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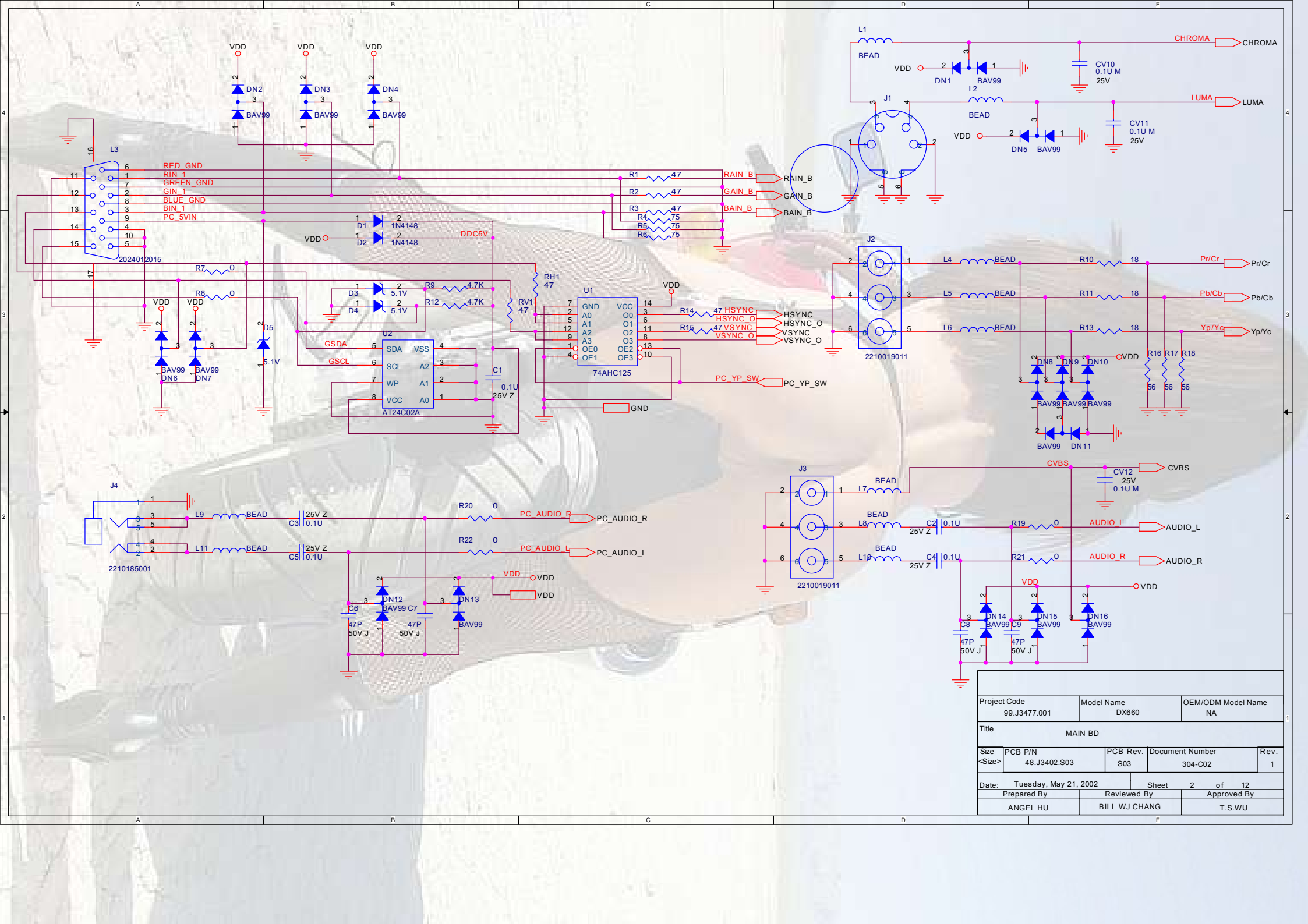
Page_4 04_DECODE
Page_5 05_AFE
Page_7 07_PW166
Page_2 02_INPUT
Page_10 10_AUDIO_&_DETECT
Page_11 11_USB
PAGE1
Project Code 99.J3477.001
Model Name DX660
OEM/ODM Model Name NA
Title MAIN BD
PCB P/N 48.J3402.S03
PCB Rev. S03
Document Number 304-C02
Rev. 1
Date: Tuesday, May 21, 2002
Sheet 1 of 12
Prepared By ANGEL HU
Reviewed By BILL WJ CHANG
Approved By T.S.WU



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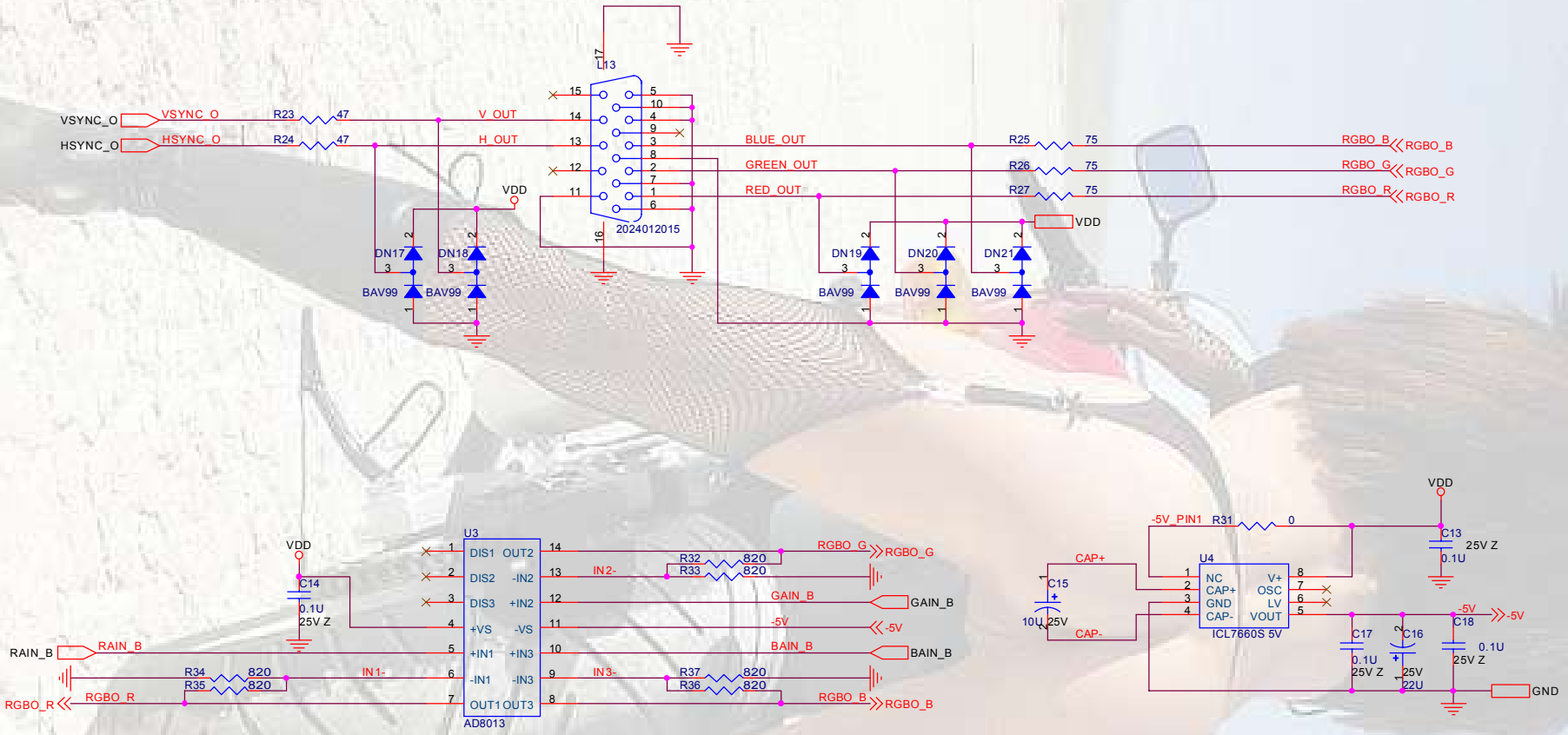
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 2 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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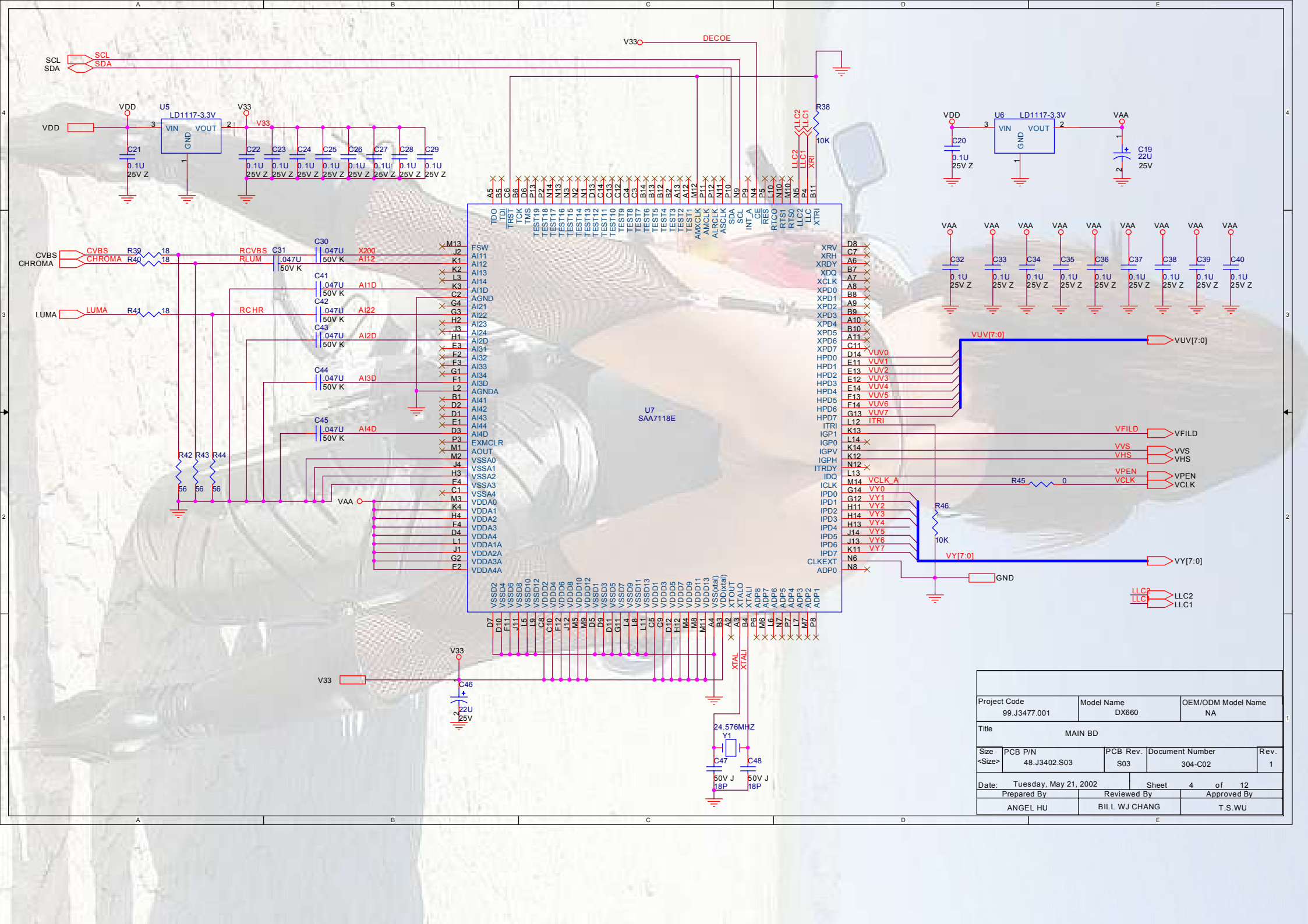
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 3 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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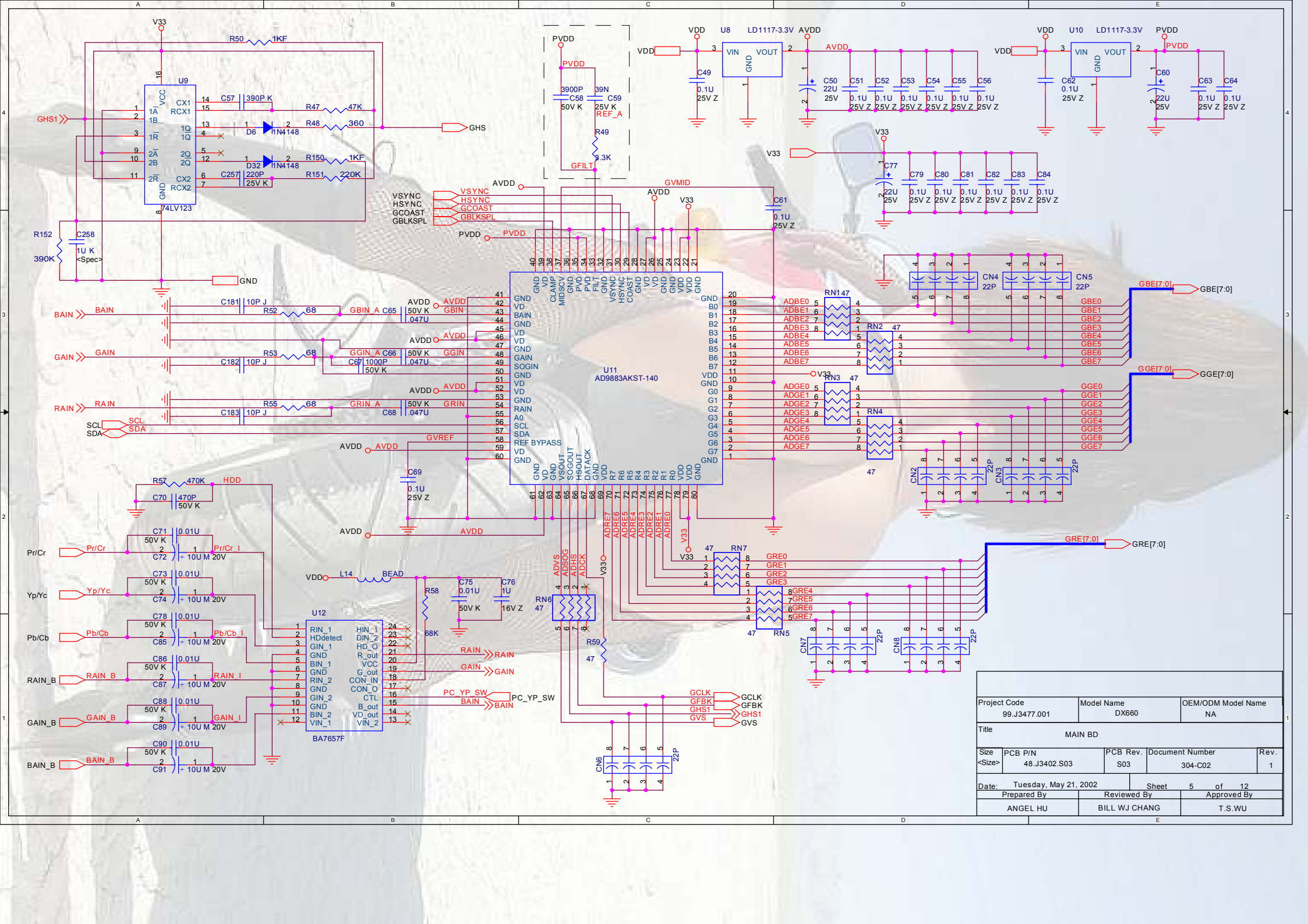
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 4 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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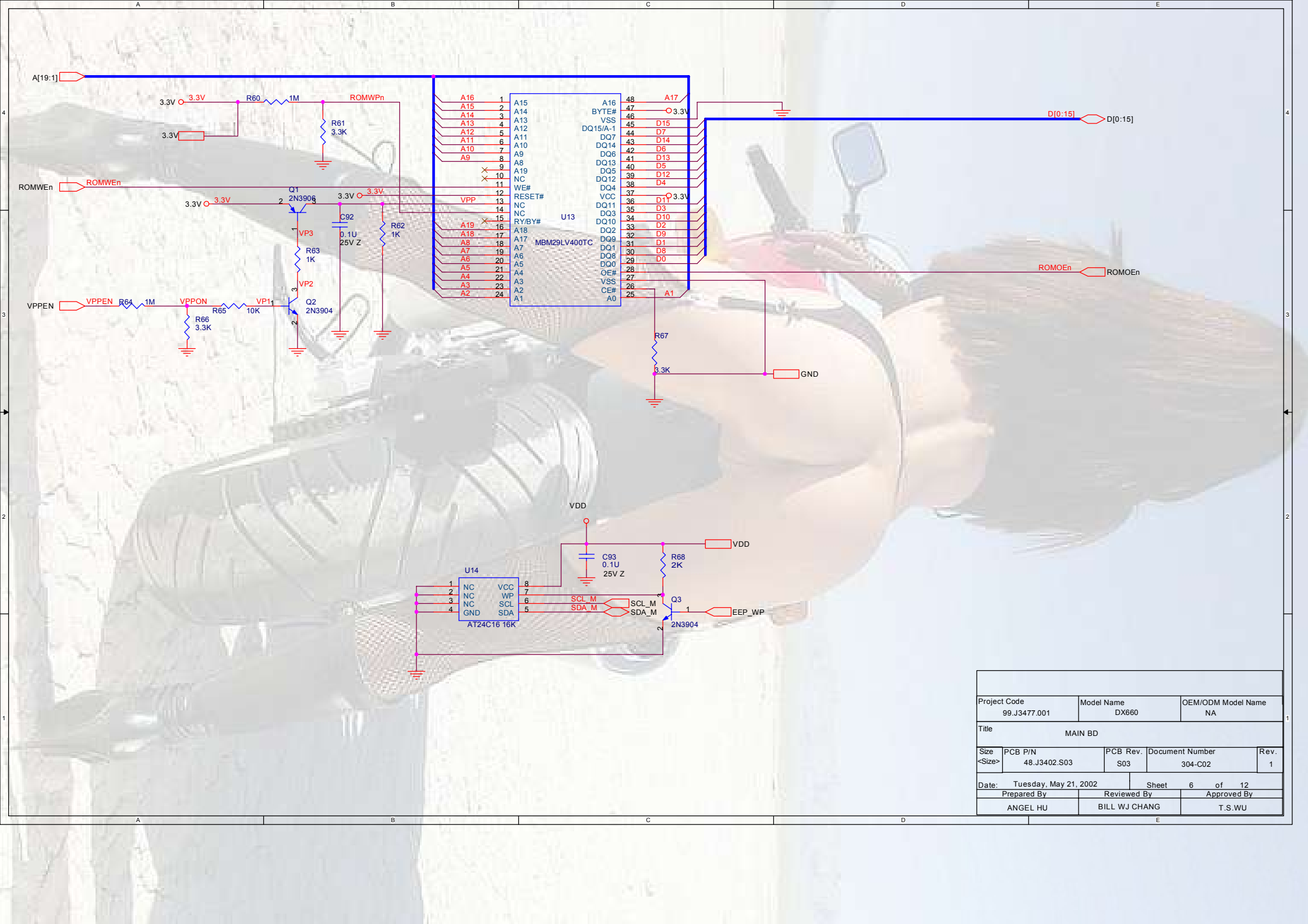
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 5 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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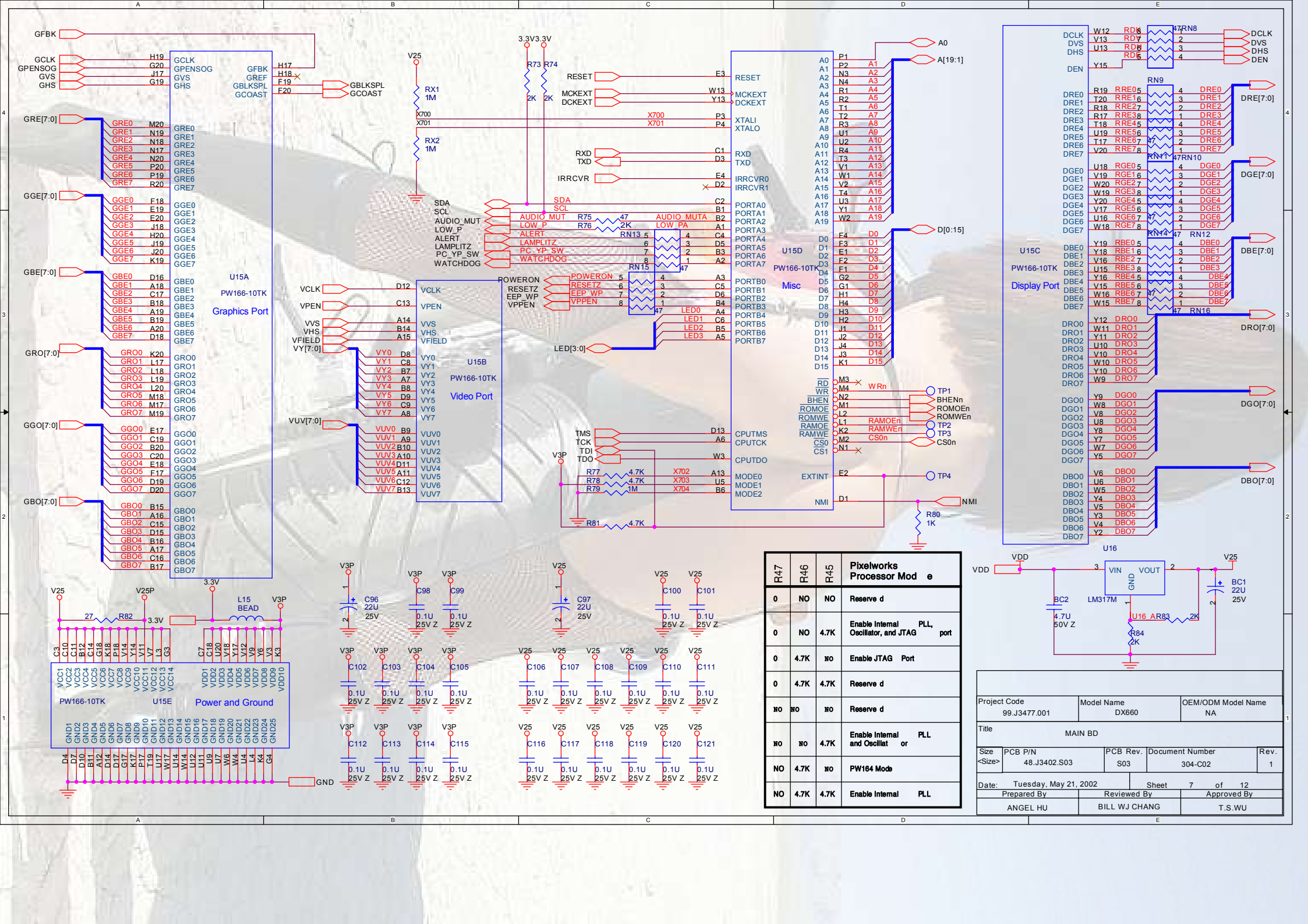
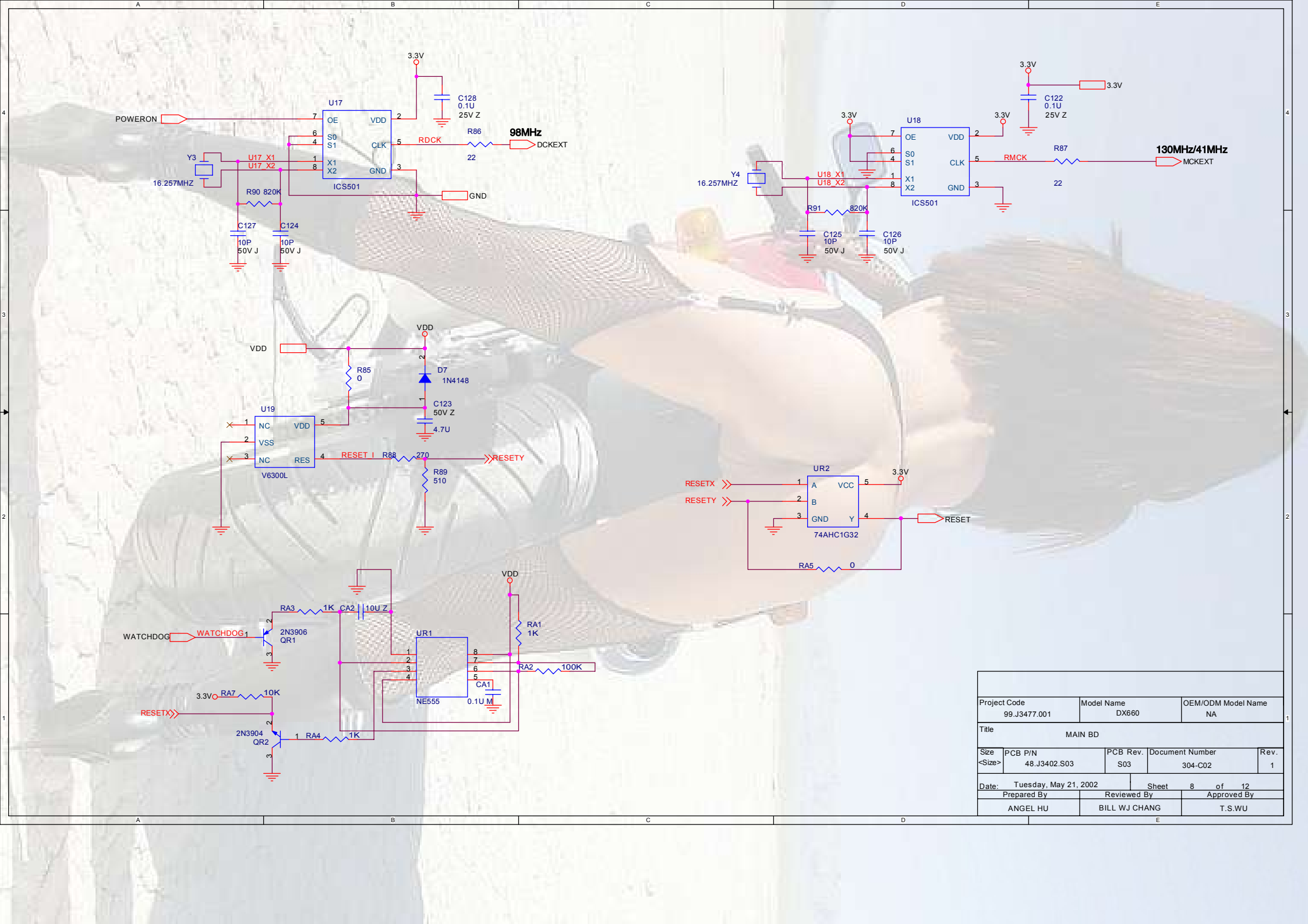
Title: MAIN BD		
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 6 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU


U15A
PW166-10TK
Graphics Port
U15B
PW166-10TK
Video Port
U15C
PW166-10TK
Display Port
U15D
PW166-10TK
Misc
U15E
PW166-10TK
Power and Ground
U16
LM317M
Pixelworks Processor Mod e
R47 R46 R45
0 NO NO Reserve d
0 NO 4.7K Enable Internal PLL, Oscillator, and JTAG port
0 4.7K NO Enable JTAG Port
0 4.7K 4.7K Reserve d
NO NO NO Reserve d
NO NO 4.7K Enable Internal PLL and Oscillat or
NO 4.7K NO PW164 Mode
NO 4.7K 4.7K Enable Internal PLL
Project Code 99.J3477.001
Model Name DX660
OEM/ODM Model Name NA
Title MAIN BD
Size <Size>
PCB P/N 48.J3402.S03
PCB Rev. S03
Document Number 304-C02
Rev. 1
Date: Tuesday, May 21, 2002
Sheet 7 of 12
Prepared By ANGEL HU
Reviewed By BILL WJ CHANG
Approved By T.S.WU



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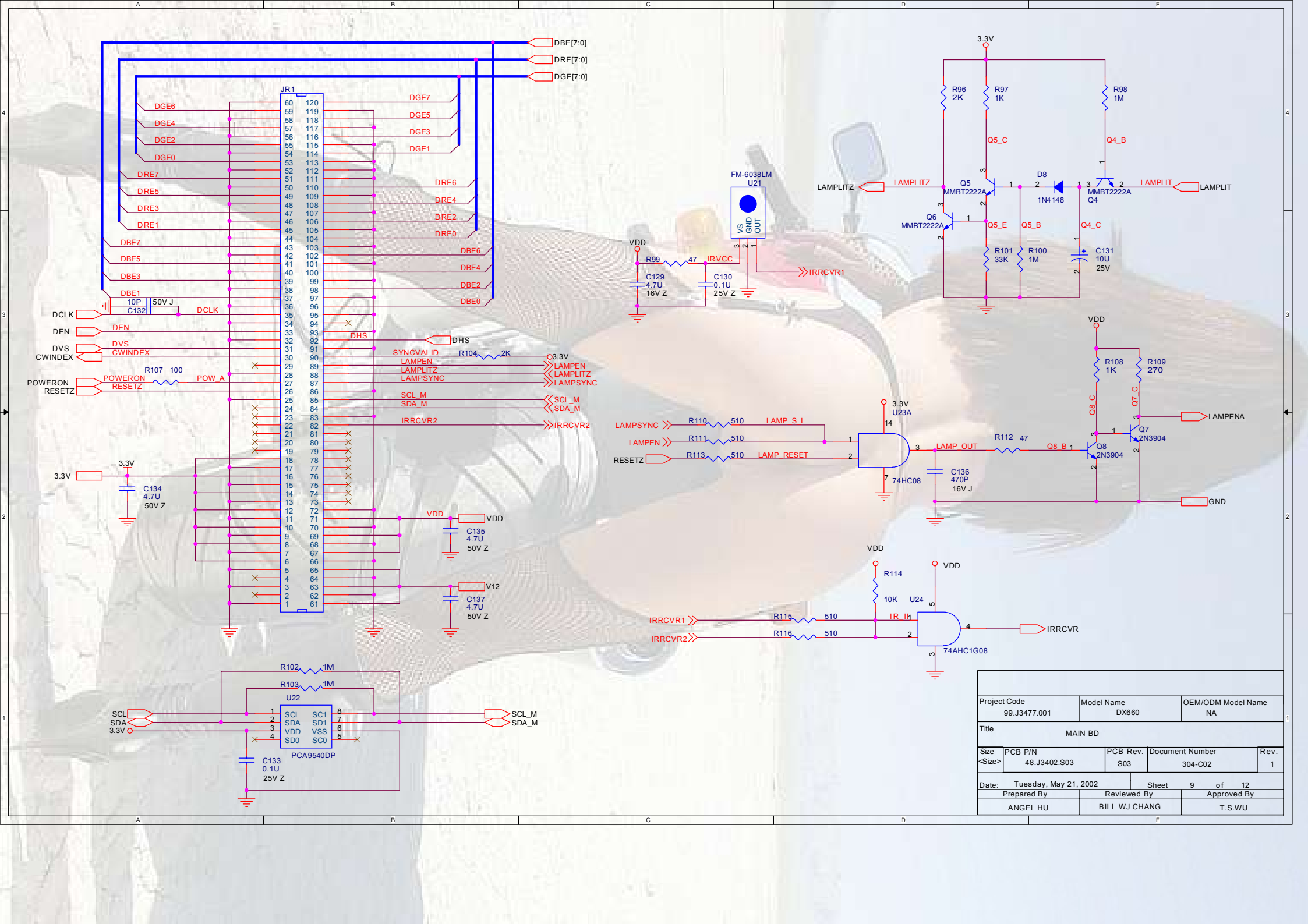
Title: MAIN BD		
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 8 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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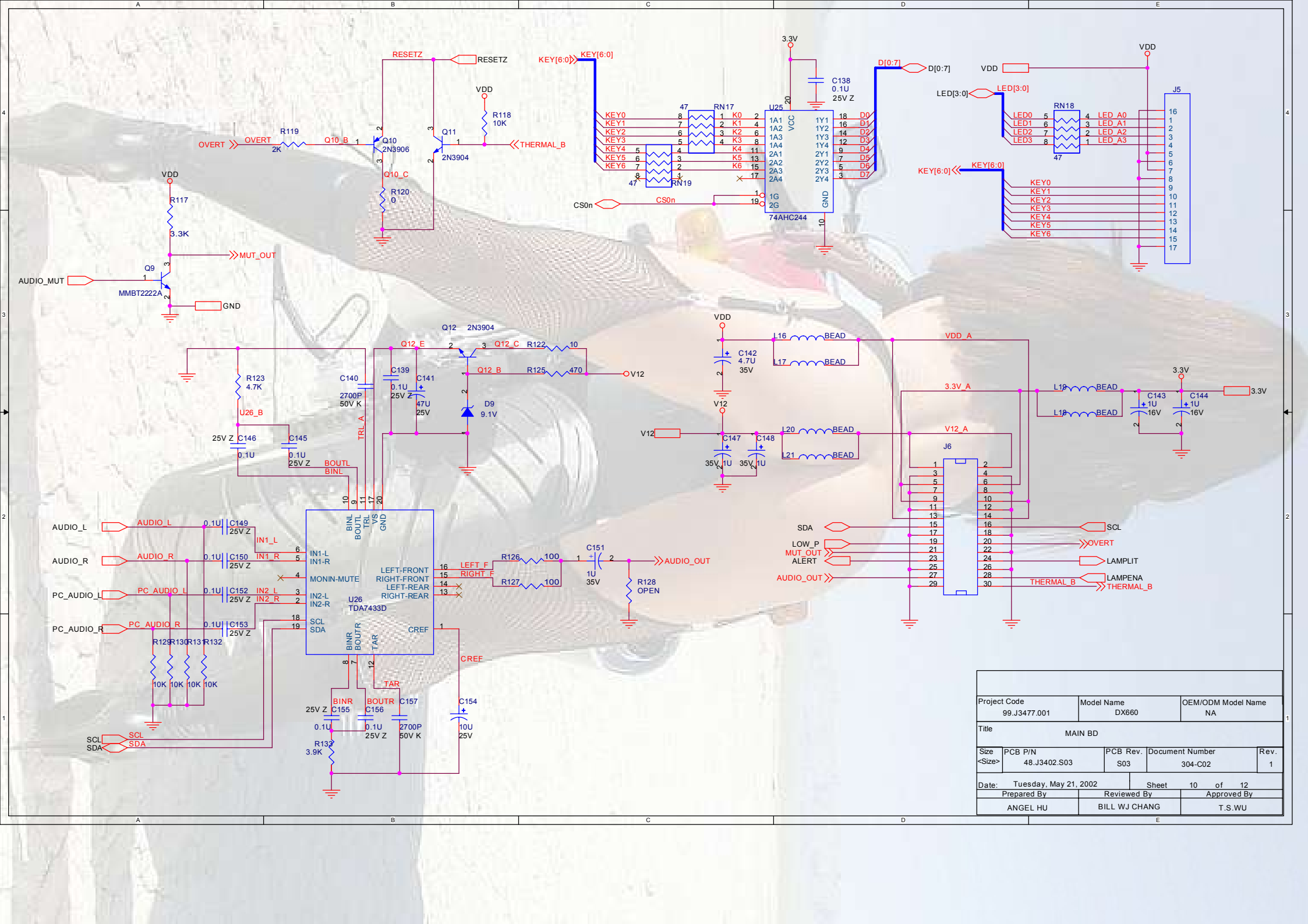
Title: MAIN BD		
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02	Rev.: 1	
Date: Tuesday, May 21, 2002	Sheet 9 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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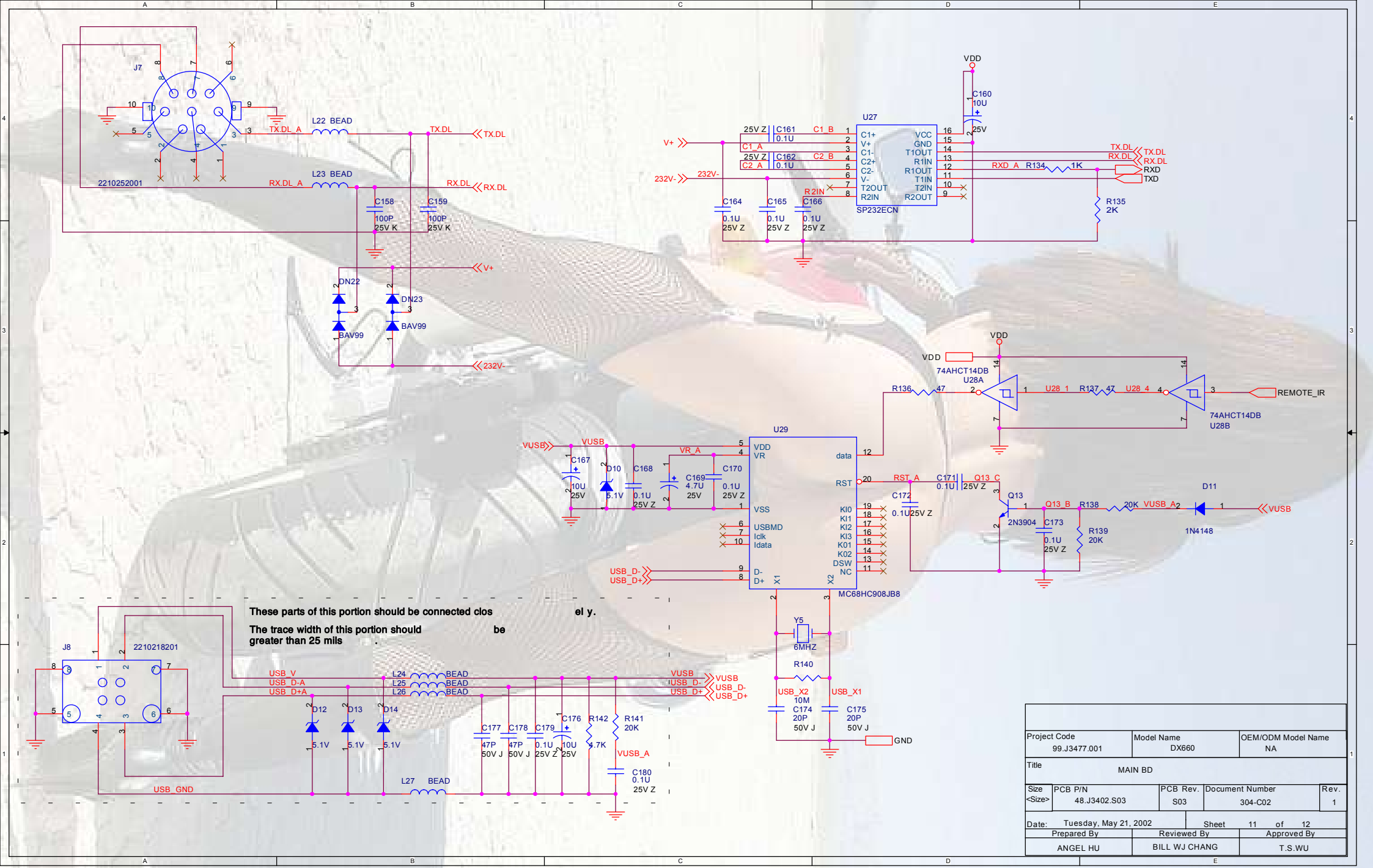
Title: MAIN BD		
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02	Rev.: 1	
Date: Tuesday, May 21, 2002	Sheet 10 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



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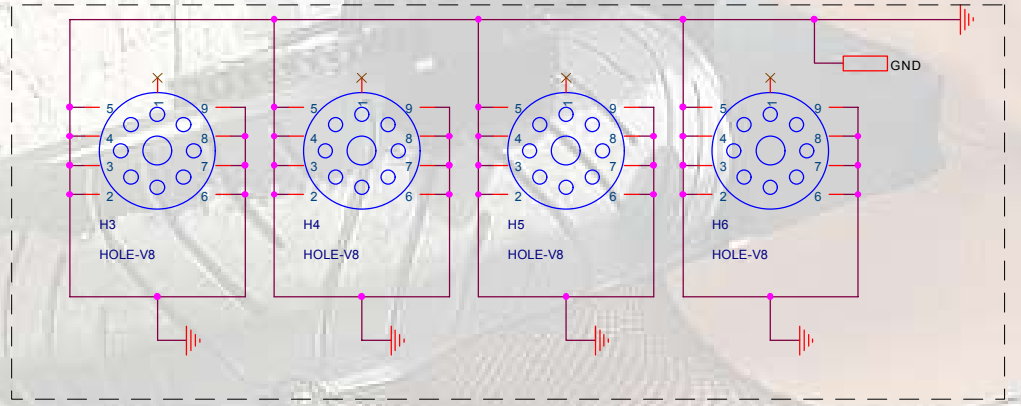
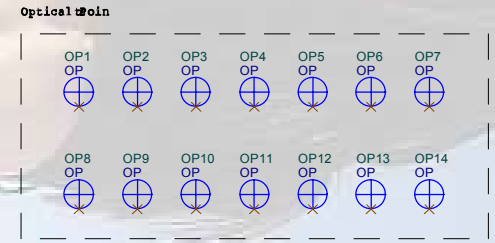
Title: MAIN BD		
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 11 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU

Screw Holes





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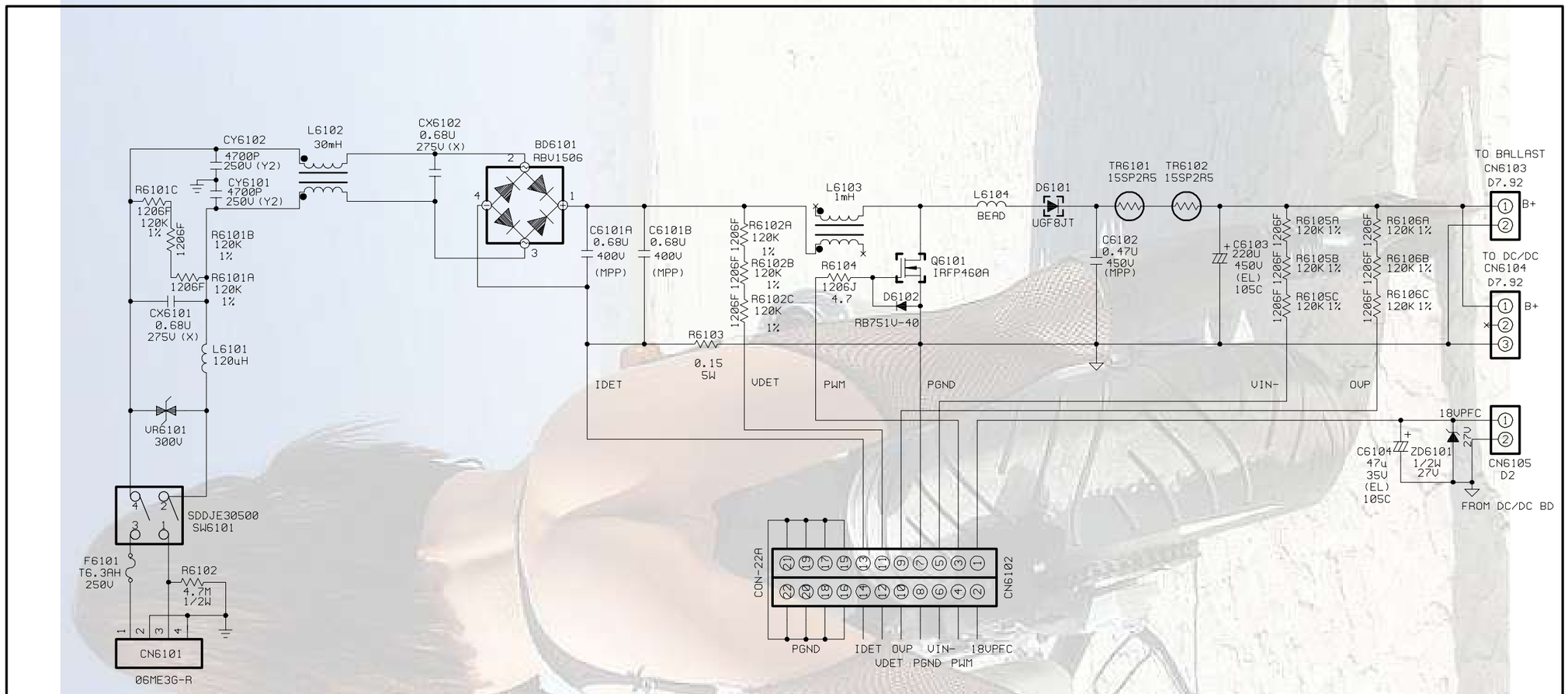
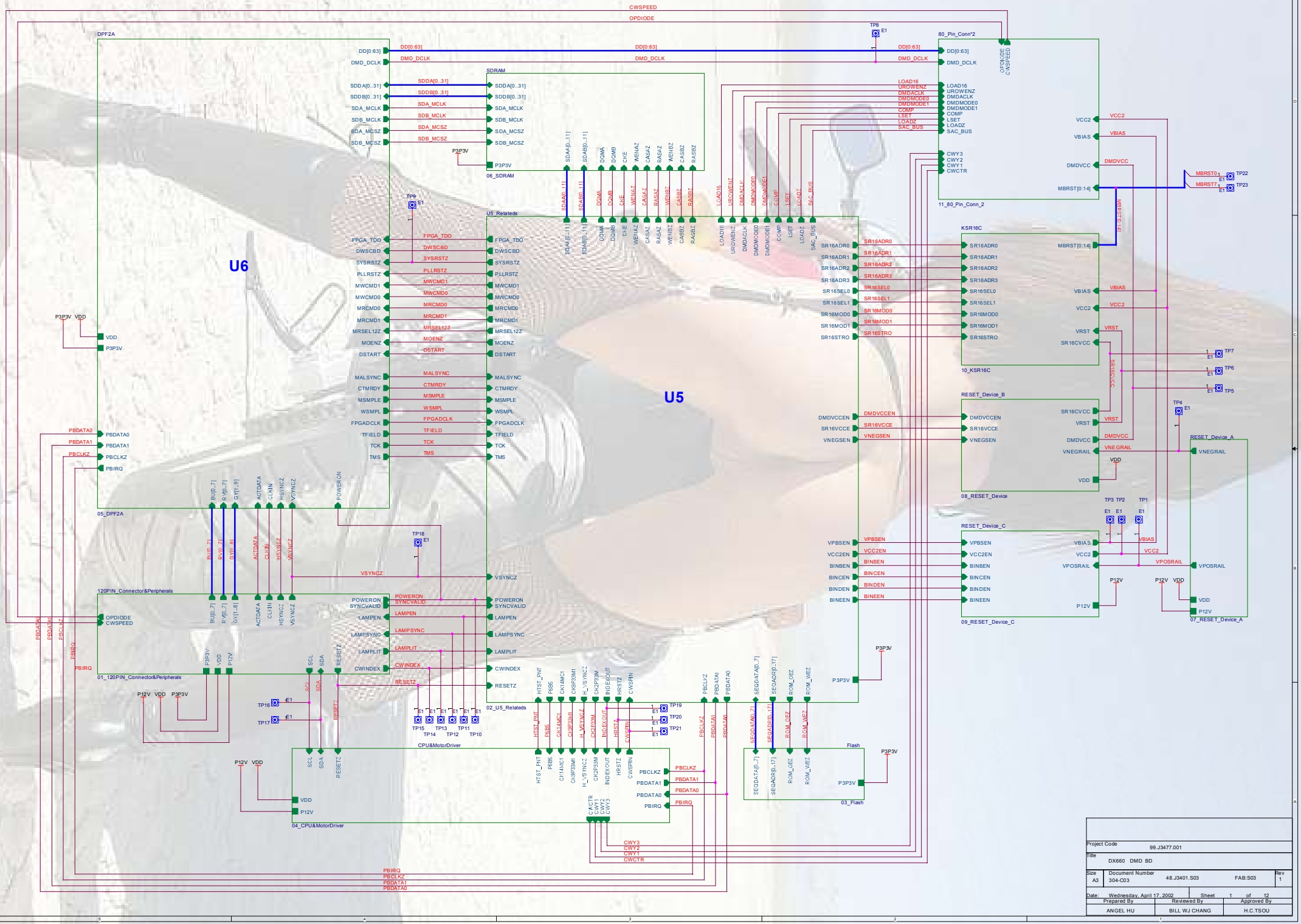
Title: MAIN BD		
Size: <Size>	PCB P/N: 48.J3402.S03	PCB Rev.: S03
Document Number: 304-C02		Rev.: 1
Date: Tuesday, May 21, 2002	Sheet 12 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: T.S.WU



NOTES:
1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are 1/8 watt, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

DX660 PFC BD SCHEMATICS				
SIZE A4	48.J3406.S02	FAB S02	Doc.No. 304-C04	REV. 0
DATE : 3/27/2002		Sheet 1 OF 1		
Project Code. 99.J3477.001				
Prepared By	Reviewed By	Approved By		
ANGEL HU 3/27/2002	KEN JA CHEN 3/27/2002	ANDREW TAN 3/27/2002		


U6
U5
DPF2A
SDRAM
06_SDRAM
U5_Relateds
80_Pin_Conn*2
11_80_Pin_Conn_2
KSR16C
10_KSR16C
RESET_Device_B
08_RESET_Device
RESET_Device_C
09_RESET_Device_C
RESET_Device_A
07_RESET_Device_A
05_DPF2A
120PIN_Connector&Peripherals
01_120PIN_Connector&Peripherals
02_U5_Relateds
CPU&MotorDriver
04_CPU&MotorDriver
Flash
03_Flash
CWSPEED
OPDIODE
Project Code 99.J3477.001
Title DX660 DMD BD
Size A3
Document Number 304-C03
48.J3401.S03
FAB:S03
Rev 1
Date: Wednesday, April 17, 2002
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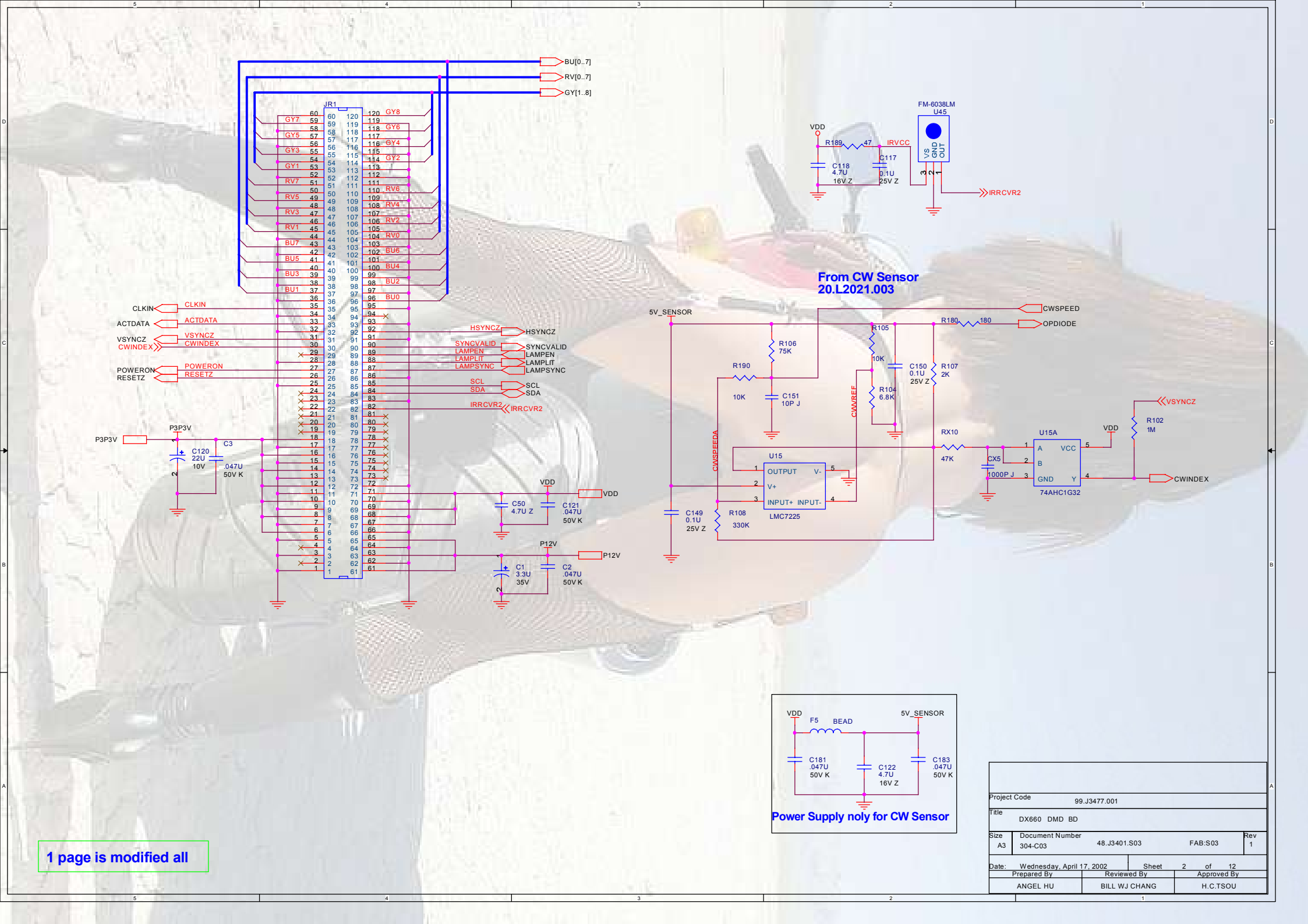
Prepared By ANGEL HU
Reviewed By BILL WJ CHANG
Approved By H.C.TSOU


BU[0..7]
RV[0..7]
GY[1..8]
JR1
CLKIN
ACTDATA
VSYNCZ
CWINDEX
POWERON
RESETZ
HSYNCZ
SYNCVALID
LAMPEN
LAMPLIT
LAMPSYNC
SCL
SDA
IRRCVR2
P3P3V
C120 22U 10V
C3 .047U 50V K
VDD
C50 4.7U Z
C121 .047U 50V K
P12V
C1 3.3U 35V
C2 .047U 50V K
FM-6038LM U45
R189 47
IRVCC
C118 4.7U 16V Z
C117 0.1U 25V Z
IRRCVR2
From CW Sensor 20.L2021.003
5V_SENSOR
CWSPEED
OPDIODE
R180 180
R106 75K
R105 10K
R190 10K
C151 10P J
R104 6.8K
C150 0.1U 25V Z
R107 2K
CWVREF
CWSPEEDA
U15
OUTPUT
V-
V+
INPUT+
INPUT-
LMC7225
C149 0.1U 25V Z
R108 330K
RX10 47K
CX5 1000P J
U15A
74AHC1G32
R102 1M
VSYNCZ
CWINDEX
F5 BEAD
C181 .047U 50V K
C122 4.7U 16V Z
C183 .047U 50V K
Power Supply noly for CW Sensor
1 page is modified all
Project Code 99.J3477.001
Title DX660 DMD BD
Size A3
Document Number 304-C03
48.J3401.S03
FAB:S03
Rev 1
Date: Wednesday, April 17, 2002
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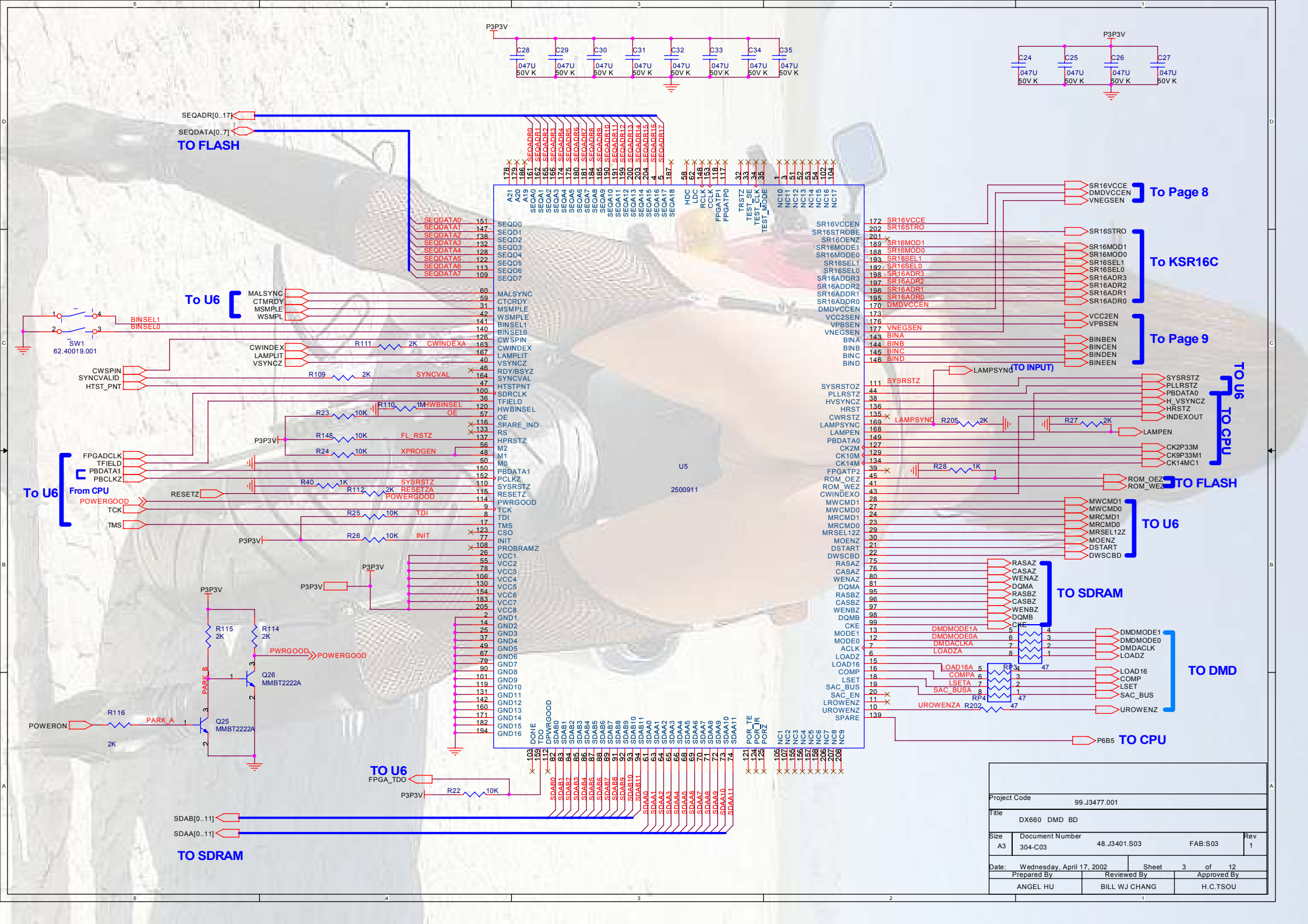
Prepared By ANGEL HU
Reviewed By BILL WJ CHANG
Approved By H.C.TSOU


P3P3V
C28 C29 C30 C31 C32 C33 C34 C35
.047U 50V K
C24 C25 C26 C27
SEQADR[0..17]
SEQDATA[0..7]
TO FLASH
U5
2500911
SEQDATA0 SEQDATA1 SEQDATA2 SEQDATA3 SEQDATA4 SEQDATA5 SEQDATA6 SEQDATA7
SEQD0 SEQD1 SEQD2 SEQD3 SEQD4 SEQD5 SEQD6 SEQD7
To U6
MALSYNC CTMRDY MSMPLE WSMPL
BINSEL1 BINSEL0
SW1
62.40019.001
CWINDEX LAMPLIT VSYNCZ
CWINDEXA
R111 2K
CWSPIN SYNCVALID HTST_PNT
SYNCVAL
R109 2K
R110 1M
HWBINSEL
OE
R23 10K
R148 10K
FL_RSTZ
R24 10K
XPROGEN
FPGADCLK TFIELD PBDATA1 PBCLKZ
From CPU
RESETZ
POWERGOOD TCK TMS
R40 1K
R112 2K
SYSRSTZ
RESETZA
POWERGOOD
R25 10K
TDI
R26 10K
INIT
P3P3V
R115 2K
R114 2K
PWRGOOD
POWERGOOD
PARK_B
Q26
MMBT2222A
POWERON
R116
PARK_A
Q25
MMBT2222A
2K
TO U6
FPGA_TDO
R22 10K
SDAB[0..11]
SDAA[0..11]
TO SDRAM
To Page 8
SR16VCCE DMDVCCEN VNEGSEN
To KSR16C
SR16STRO SR16MOD1 SR16MOD0 SR16SEL1 SR16SEL0 SR16ADR3 SR16ADR2 SR16ADR1 SR16ADR0
To Page 9
VCC2SEN VPBSEN
BINBEN BINCEN BINDEN BINEEN
LAMPSYNC (TO INPUT)
R205 2K
R27 2K
LAMPEN
R28 1K
TO U6
TO CPU
SYSRSTZ PLLRSTZ PBDATA0 H_VSYNCZ HRSTZ INDEXOUT
CK2P33M CK9P33M1 CK14MC1
TO FLASH
ROM_OEZ ROM_WEZ
TO U6
MWCMD1 MWCMD0 MRCMD1 MRCMD0 MRSEL12Z MOENZ DSTART DWSCBD
TO SDRAM
RASAZ CASAZ WENAZ DQMA RASBZ CASBZ WENBZ DQMB CKE
TO DMD
DMDMODE1A DMDMODE0A DMDACLKA LOADZA
RP3 47
LOAD16A COMPA LSETA SAC_BUSA
RP4 47
R202 47
UROWENZA
DMDMODE1 DMDMODE0 DMDACLK LOADZ
LOAD16 COMP LSET SAC_BUS
UROWENZ
P6B5
TO CPU
Project Code 99.J3477.001
Title DX660 DMD BD
Size A3
Document Number 304-C03 48.J3401.S03
FAB:S03
Rev 1
Date: Wednesday, April 17, 2002
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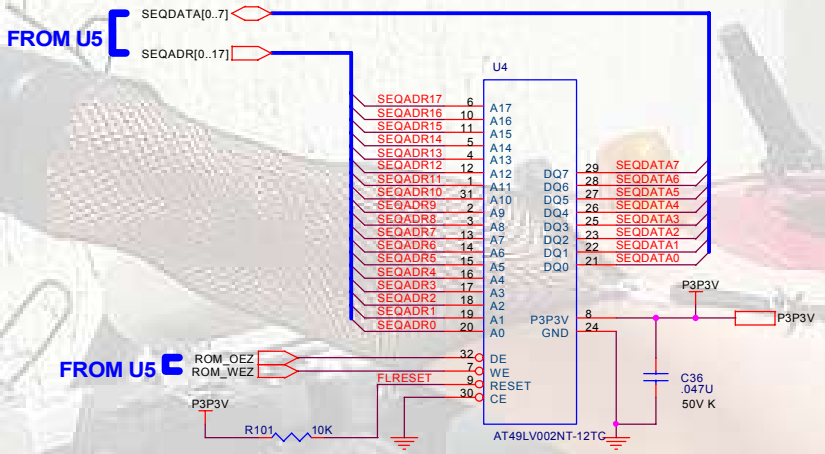
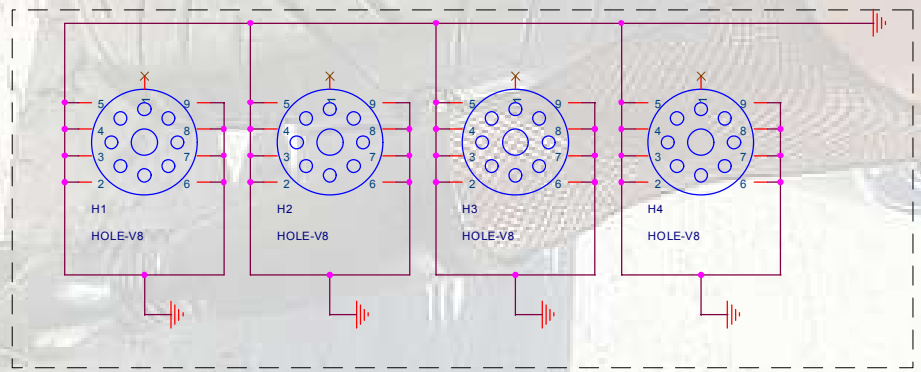
Prepared By ANGEL HU
Reviewed By BILL WJ CHANG
Approved By H.C.TSOU



Screw Holes



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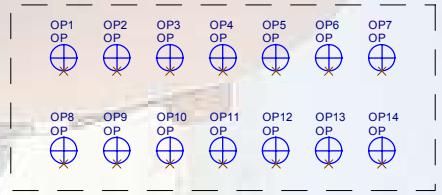
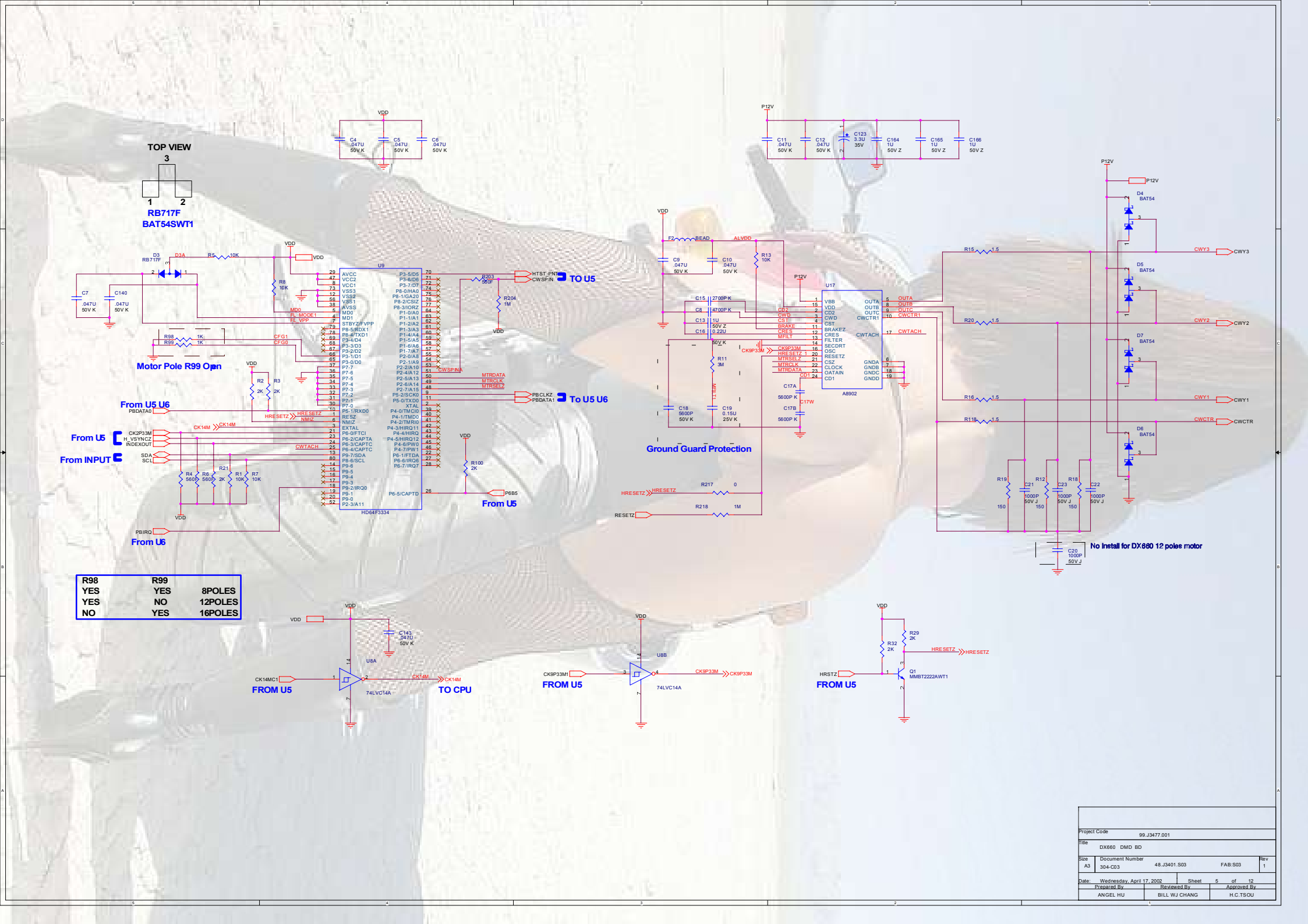
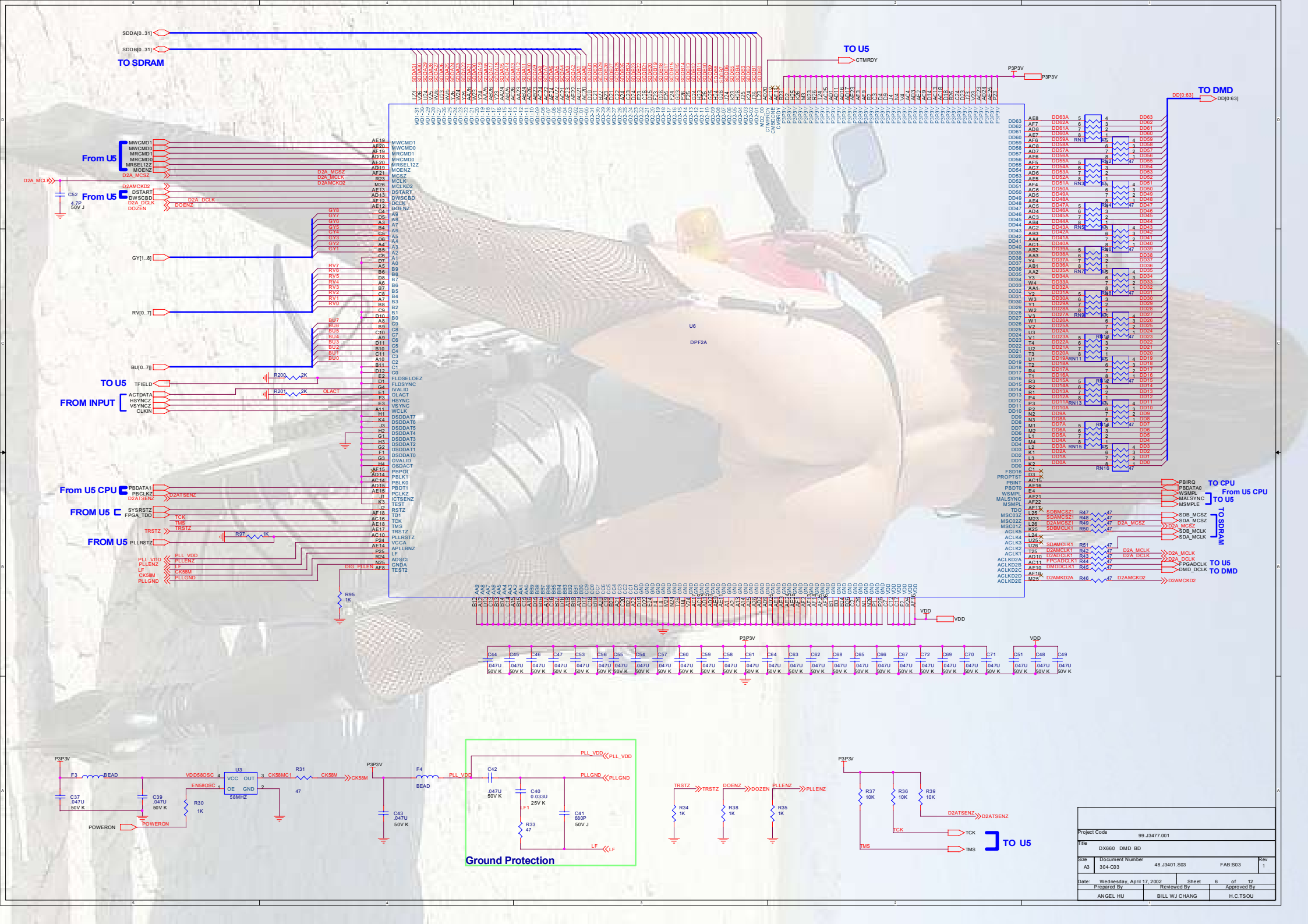


Project Code	99.J3477.001		
Title	DX660 DMD BD		
Size A3	Document Number 304-C03	48.J3401.S03	FAB:S03 Rev 1
Date: Wednesday, April 17, 2002	Sheet 4 of 12		
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	H.C.TSOU	



R98	R99	
YES	YES	8POLES
YES	NO	12POLES
NO	YES	16POLES

Project Code	99.J3477.001	
Title	DX660 DMD BD	
Size: A3	Document Number: 304-C03 48.J3401.S03	FAB:S03 Rev: 1
Date: Wednesday, April 17, 2002	Sheet 5 of 12	
Prepared By: ANGEL HU	Reviewed By: BILL WJ CHANG	Approved By: H.C.TSOU


SDDA[0..31]
SDDB[0..31]
TO SDRAM
TO U5
CTMRDY
P3P3V
TO DMD
DD[0:63]
From U5
MWCMD1
MWCMD0
MRCMD1
MRCMD0
MRSEL12Z
MOENZ
D2A_MCSZ
D2A_MCLK
D2AMCKD2
DSTART
DWSCBD
D2A_DCLK
DOENZ
C52
4.7P
50V J
GY[1..8]
RV[0..7]
BU[0..7]
U6
DPF2A
TO U5
TFIELD
FROM INPUT
ACTDATA
HSYNCZ
VSYNCZ
CLKIN
R200
2K
R201
2K
OLACT
From U5 CPU
PBDATA1
PBCLKZ
D2ATSENZ
FROM U5
SYSRSTZ
FPGA_TDO
TCK
TMS
TRSTZ
PLLRSTZ
R97
1K
PLL_VDD
PLLENZ
LF
CK58M
PLLGND
DIG_PLLEN
R95
1K
TO CPU
From U5 CPU
TO U5
TO SDRAM
TO U5
TO DMD
VDD
P3P3V
C44
C45
C46
C47
C53
C56
C55
C54
C57
C60
C59
C58
C61
C64
C63
C62
C68
C65
C66
C67
C72
C69
C70
C71
C51
C48
C49
.047U
50V K
P3P3V
F3
BEAD
U3
VCC
OUT
OE
GND
58MHZ
VDD58OSC
EN58OSC
CK58MC1
R31
47
CK58M
C37
.047U
50V K
C39
.047U
50V K
R30
1K
POWERON
C43
.047U
50V K
F4
BEAD
PLL_VDD
C42
.047U
50V K
C40
0.033U
25V K
LF1
R33
47
C41
680P
50V J
PLLGND
LF
Ground Protection
TRSTZ
DOENZ
PLLENZ
R34
1K
R38
1K
R35
1K
P3P3V
R37
10K
R36
10K
R39
10K
D2ATSENZ
TCK
TMS
TO U5
Project Code
99.J3477.001
Title
DX660 DMD BD
Size
A3
Document Number
304-C03
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Rev
1
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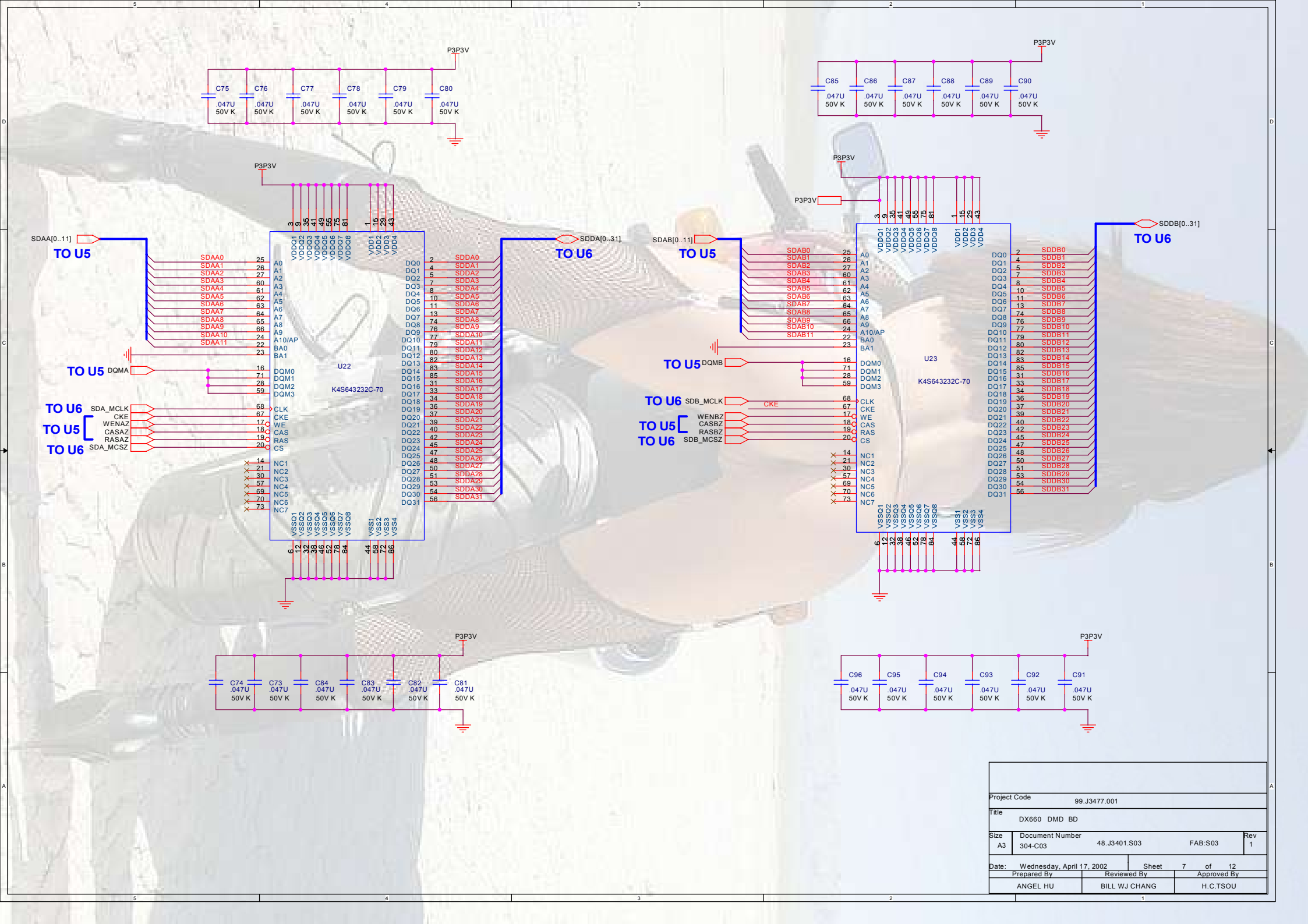
Reviewed By
BILL WJ CHANG
Approved By
H.C.TSOU



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Title	DX660 DMD BD		
Size A3	Document Number 304-C03	48.J3401.S03	FAB:S03 Rev 1
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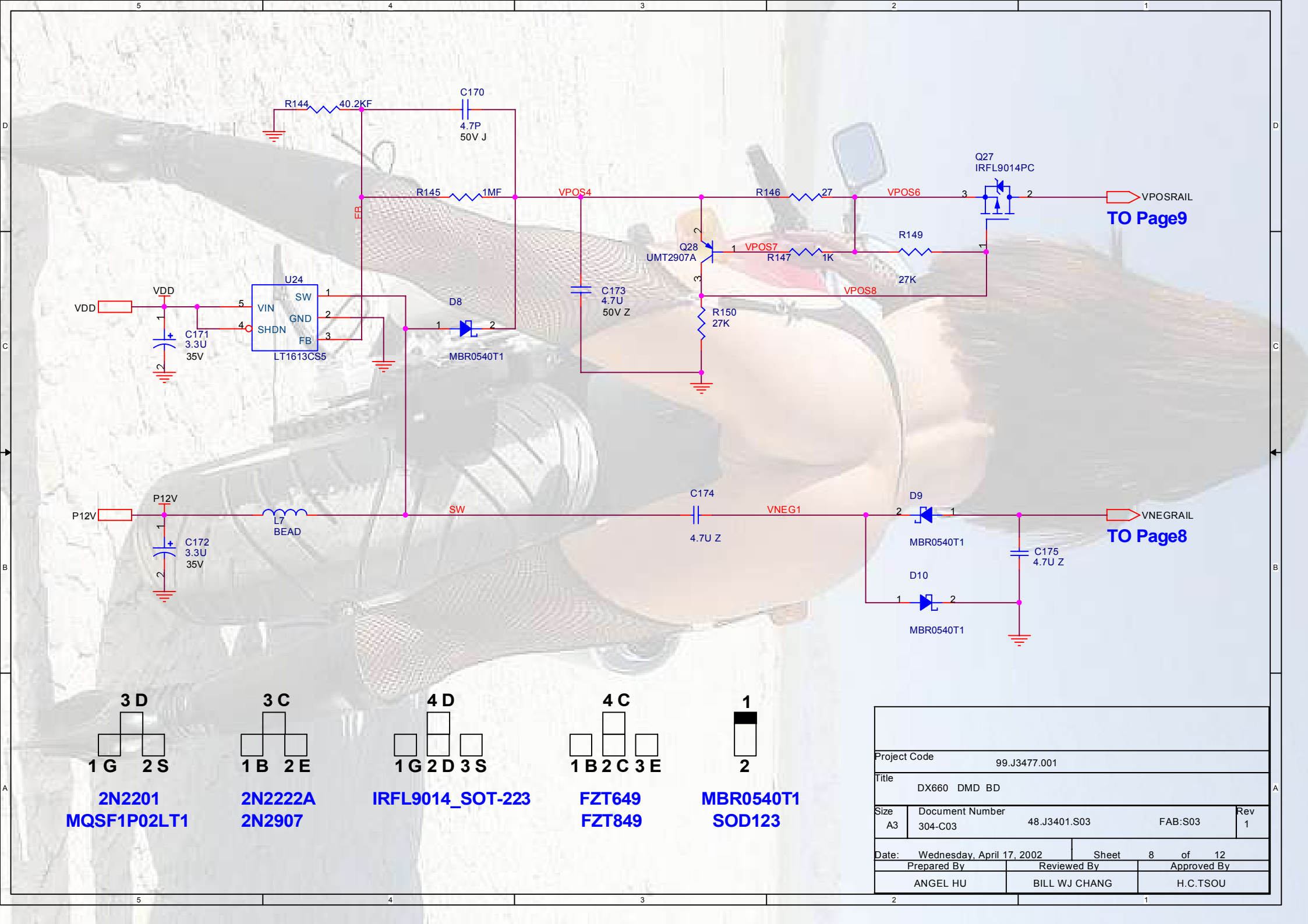
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	H.C.TSOU	



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Size A3	Document Number 304-C03	48.J3401.S03	FAB:S03 / Rev 1
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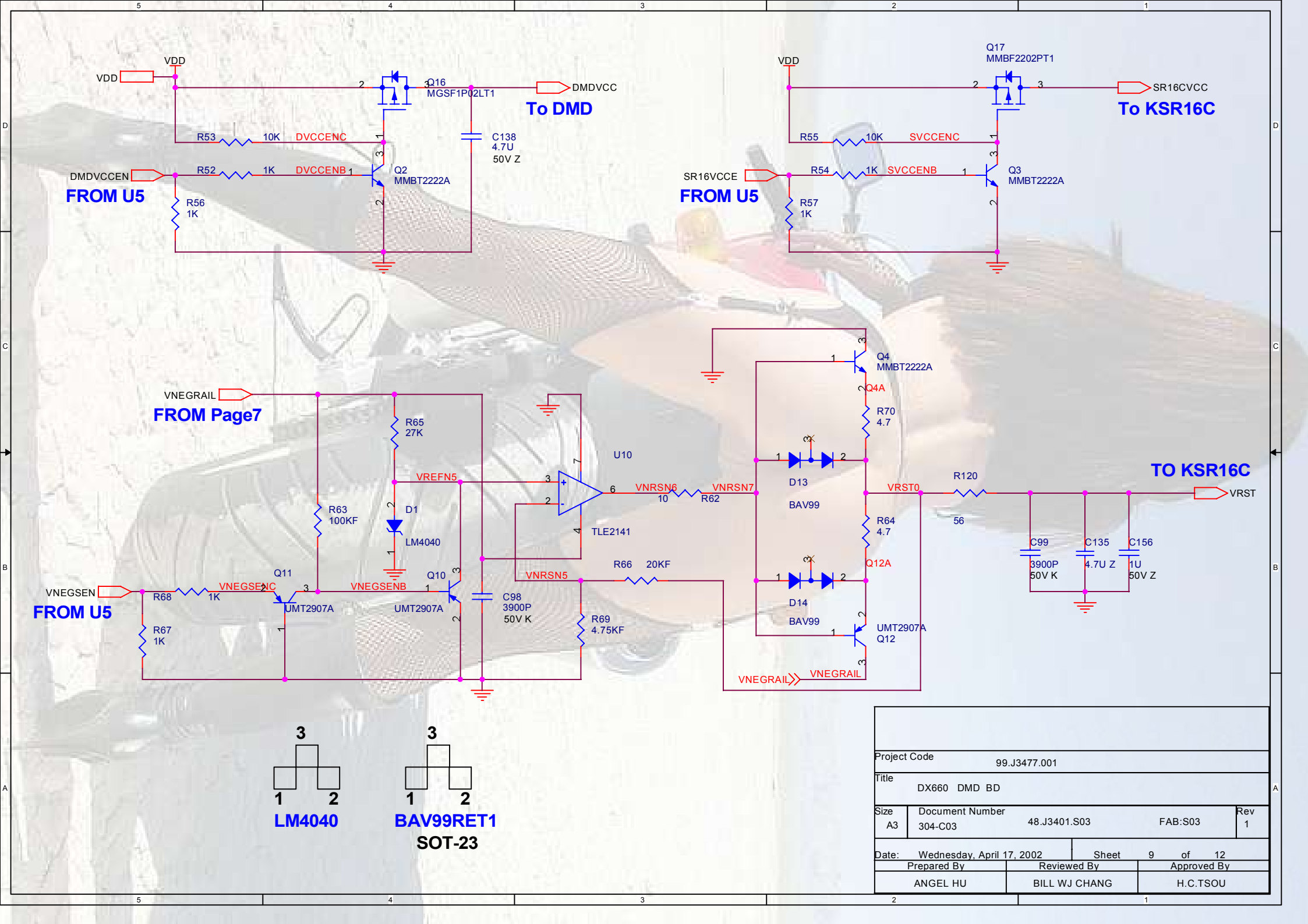
ANGEL HU	BILL WJ CHANG	H.C.TSOU	


VDD
VDD
Q16
MGSF1P02LT1
DMDVCC
To DMD
R53
10K
DVCCENC
C138
4.7U
50V Z
DMDVCCEN
FROM U5
R52
1K
DVCCENB
Q2
MMBT2222A
R56
1K
VDD
Q17
MMBF2202PT1
SR16CVCC
To KSR16C
R55
10K
SVCCENC
SR16VCCE
FROM U5
R54
1K
SVCCENB
Q3
MMBT2222A
R57
1K
VNEGRAIL
FROM Page7
R65
27K
VREFN5
R63
100KF
D1
LM4040
U10
TLE2141
VNRSN6
10
R62
VNRSN7
Q4
MMBT2222A
Q4A
R70
4.7
D13
BAV99
VRST0
R120
56
TO KSR16C
VRST
R64
4.7
Q12A
D14
BAV99
UMT2907A
Q12
C99
3900P
50V K
C135
4.7U Z
C156
1U
50V Z
VNEGSEN
FROM U5
R68
1K
Q11
VNEGSENC
UMT2907A
VNEGSENB
Q10
UMT2907A
C98
3900P
50V K
VNRSN5
R66
20KF
R69
4.75KF
R67
1K
VNEGRAIL
VNEGRAIL
3
1
2
LM4040
3
1
2
BAV99RET1
SOT-23
Project Code
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Title
DX660 DMD BD
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12
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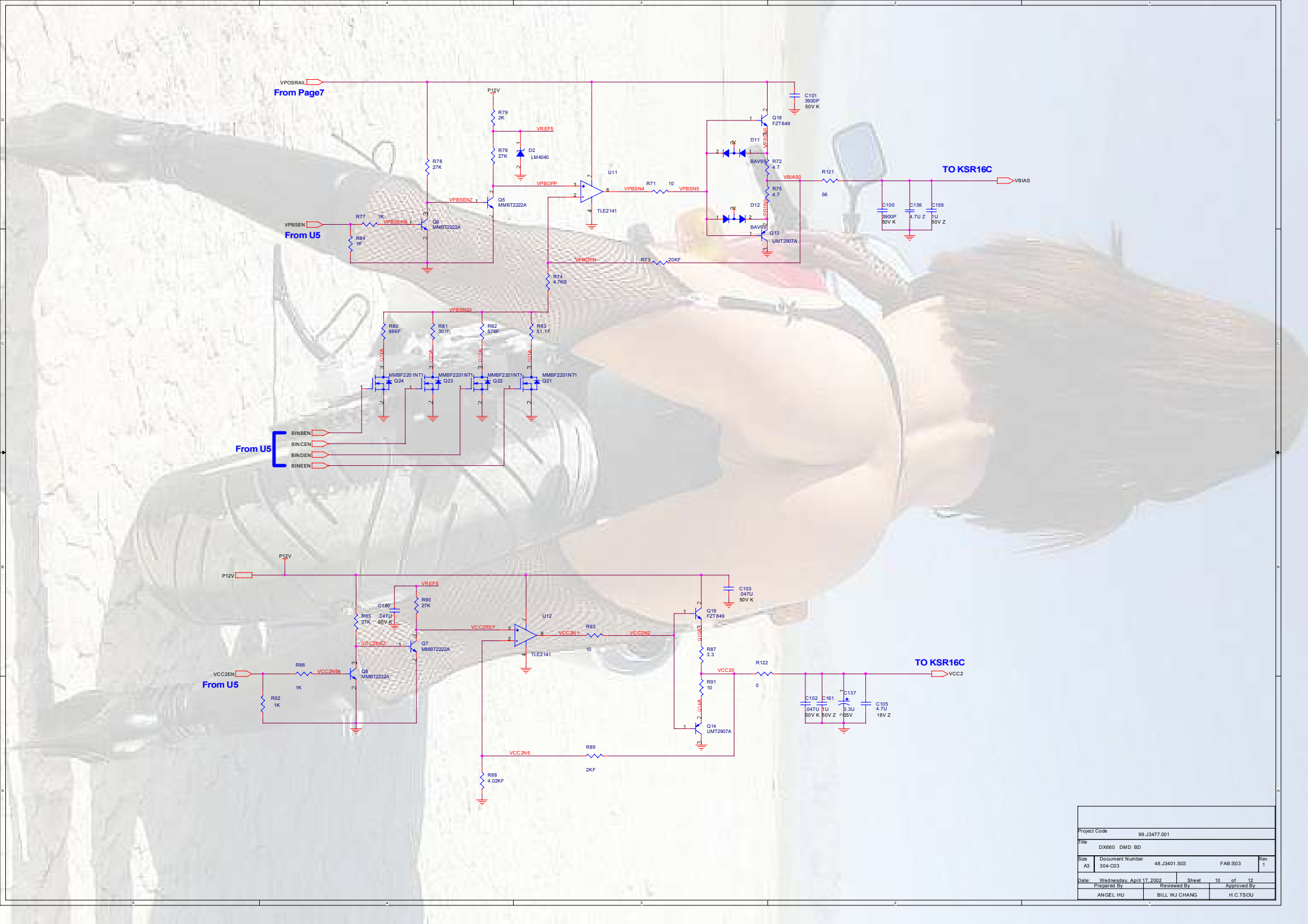
H.C.TSOU



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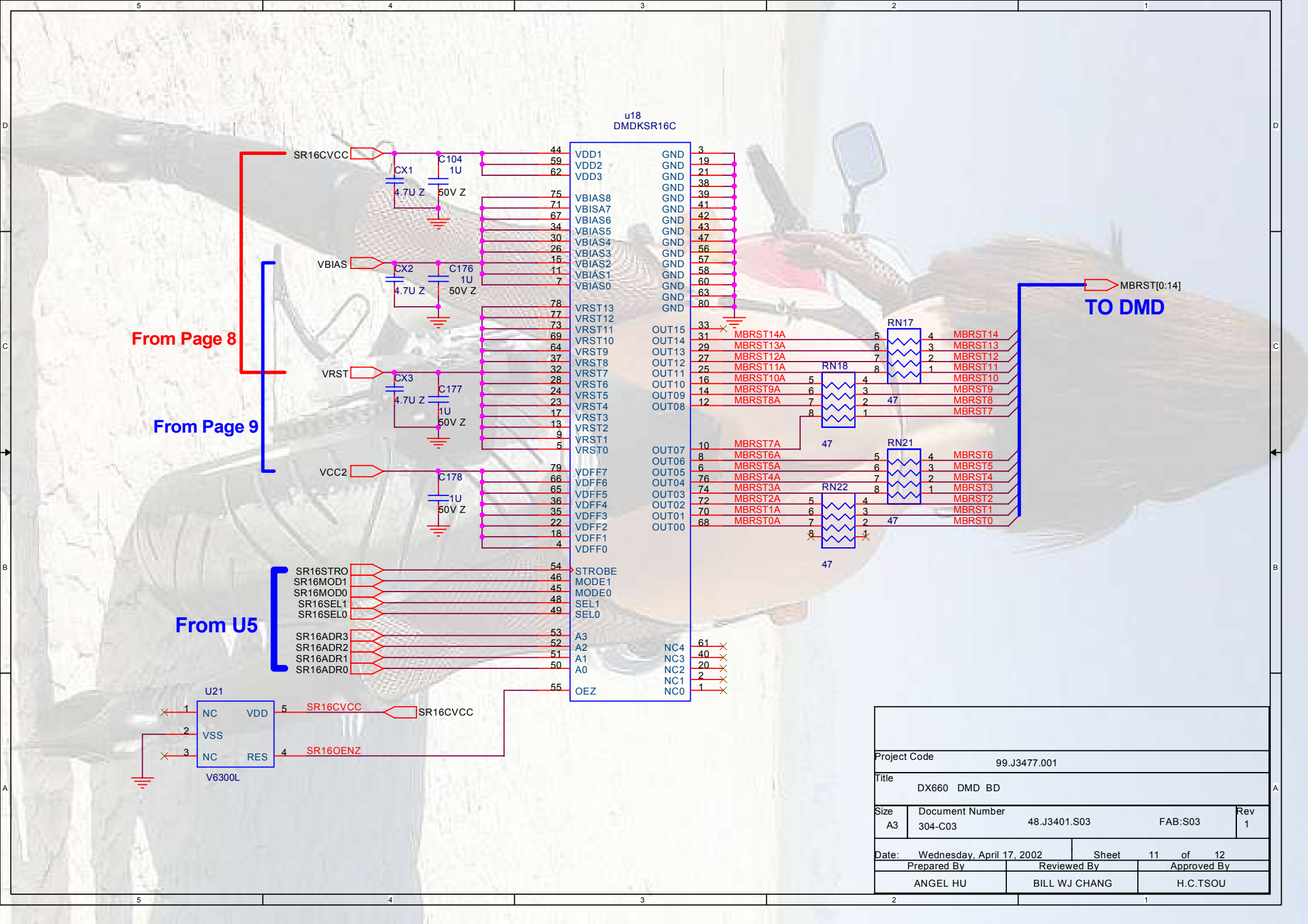

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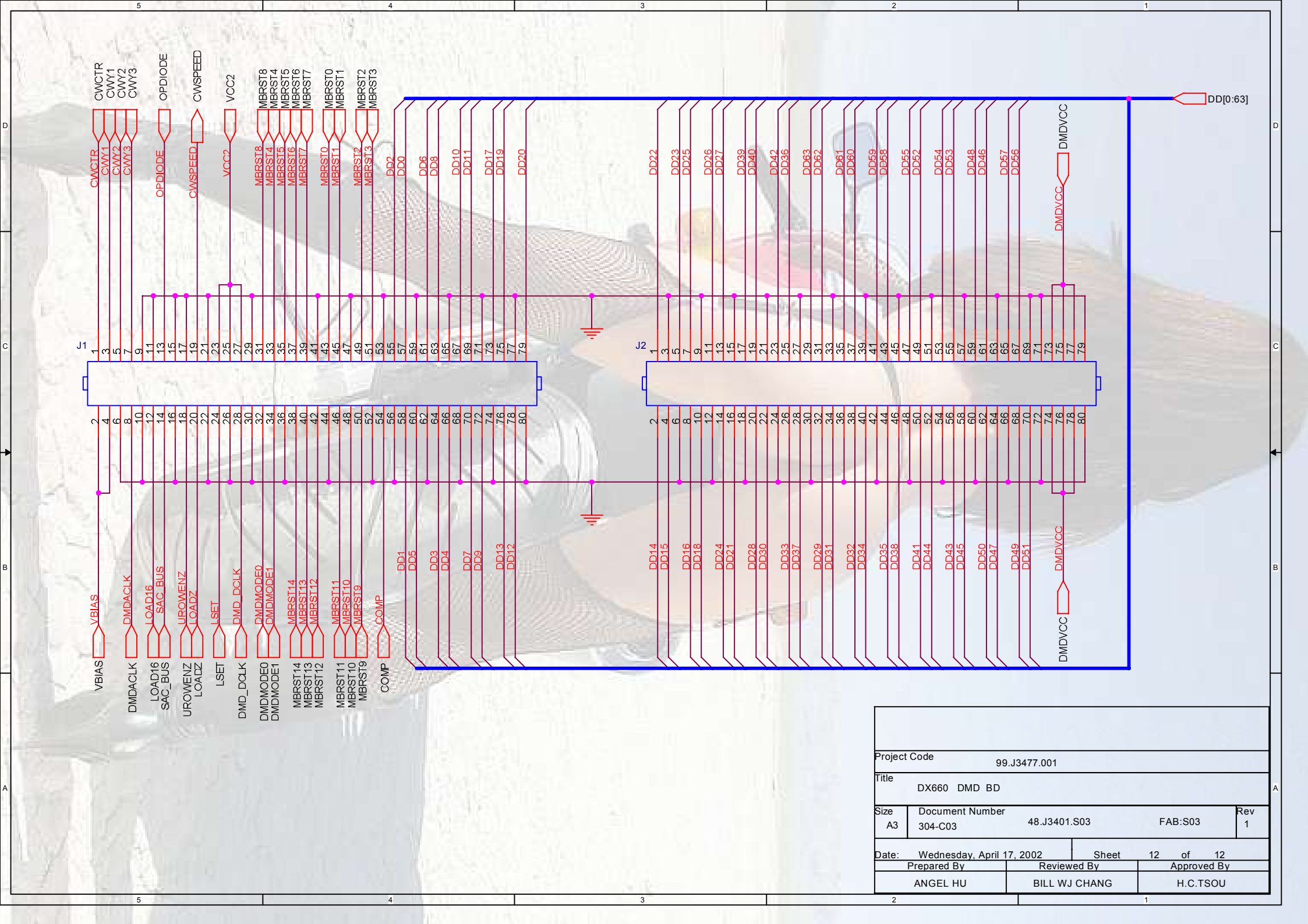
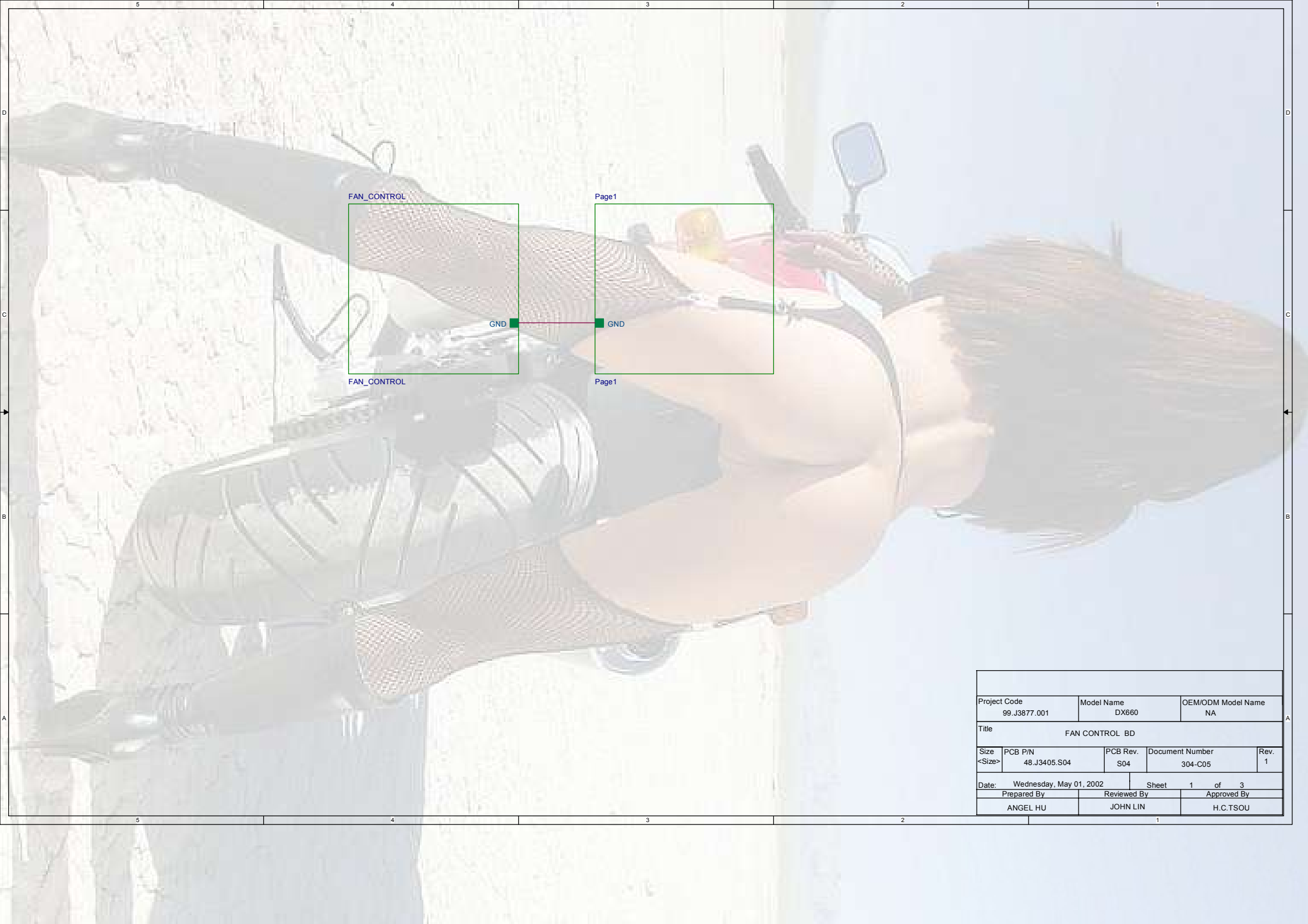
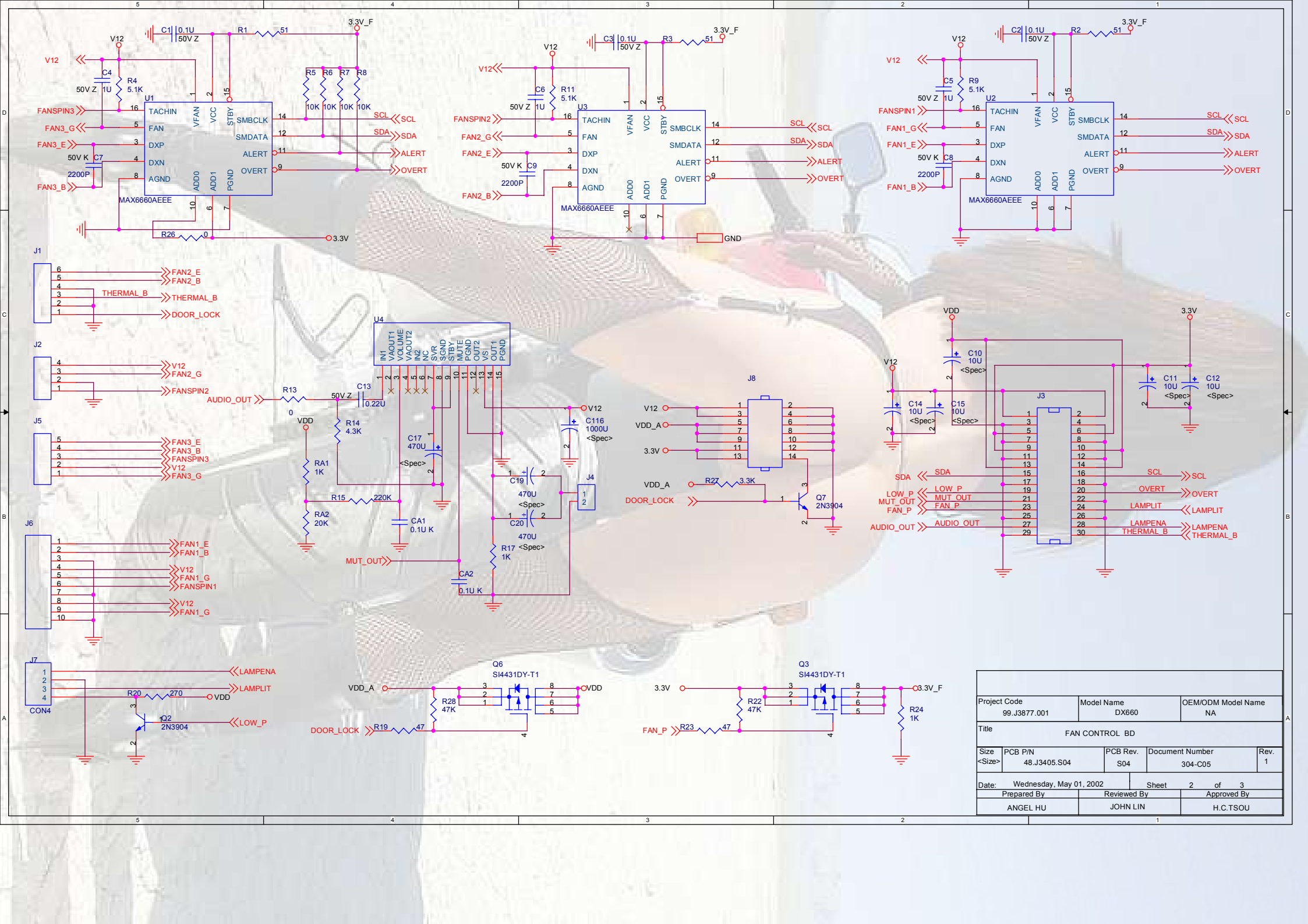
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	H.C.TSOU	



Project Code	99.J3477.001		
Title	DX660 DMD BD		
Size A3	Document Number 304-C03 48.J3401.S03 FAB:S03		Rev 1
Date: Wednesday, April 17, 2002		Sheet 12 of 12	
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	H.C.TSOU	



Project Code: 99.J3877.001	Model Name: DX660	OEM/ODM Model Name: NA
Title: FAN CONTROL BD		
Size: <Size> / PCB P/N: 48.J3405.S04	PCB Rev.: S04	Document Number: 304-C05 / Rev.: 1
Date: Wednesday, May 01, 2002	Sheet 1 of 3	
Prepared By: ANGEL HU	Reviewed By: JOHN LIN	Approved By: H.C.TSOU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TACHIN
FAN
DXP
DXN
AGND
VFAN
VCC
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SMBCLK
SMDATA
ALERT
OVERT
ADD0
ADD1
PGND
U3
MAX6660AEEE
U2
MAX6660AEEE
U4
IN1
VAOUT1
VOLUME
VAOUT2
IN2
NC
SVR
SGND
STBY
MUTE
PGND
OUT2
VS
OUT1
PGND
J1
J2
J3
J4
J5
J6
J7
J8
CON4
Q1
2N3904
Q2
2N3904
Q3
SI4431DY-T1
Q6
SI4431DY-T1
Q7
2N3904
V12
3.3V_F
3.3V
VDD
VDD_A
GND
FANSPIN3
FAN3_G
FAN3_E
FAN3_B
FANSPIN2
FAN2_G
FAN2_E
FAN2_B
FANSPIN1
FAN1_G
FAN1_E
FAN1_B
SCL
SDA
ALERT
OVERT
THERMAL_B
DOOR_LOCK
AUDIO_OUT
MUT_OUT
LOW_P
FAN_P
LAMPENA
LAMPLIT
C1 0.1U 50V Z
C2 0.1U 50V Z
C3 0.1U 50V Z
C4 1U 50V Z
C5 1U 50V Z
C6 1U 50V Z
C7 2200P 50V K
C8 2200P 50V K
C9 2200P 50V K
C10 10U <Spec>
C11 10U <Spec>
C12 10U <Spec>
C13 0.22U 50V Z
C14 10U <Spec>
C15 10U <Spec>
C16 1000U <Spec>
C17 470U <Spec>
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CA2 0.1U K
R1 51
R2 51
R3 51
R4 5.1K
R5 10K
R6 10K
R7 10K
R8 10K
R9 5.1K
R11 5.1K
R13 0
R14 4.3K
R15 220K
R17 1K
R19 47
R20 270
R22 47K
R23 47
R24 1K
R26 0
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Model Name DX660
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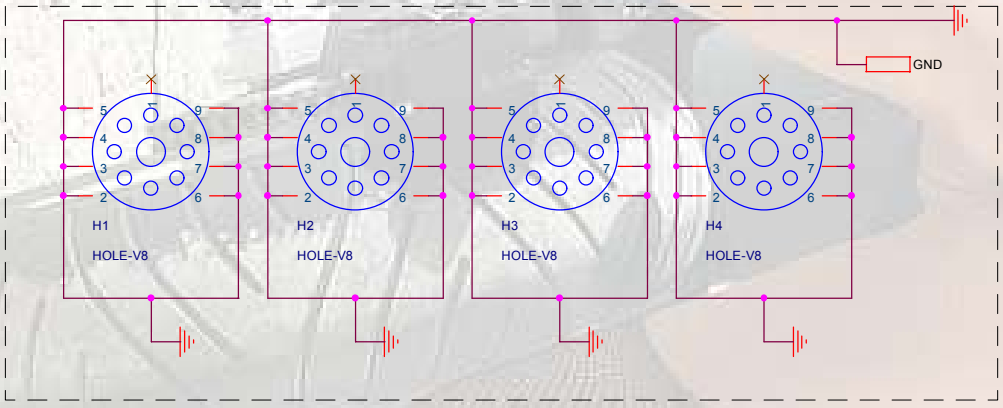
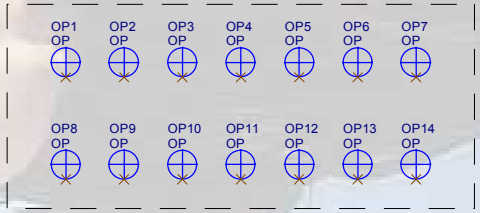
Title FAN CONTROL BD
Size <Size>
PCB P/N 48.J3405.S04
PCB Rev. S04
Document Number 304-C05
Rev. 1
Date: Wednesday, May 01, 2002
Sheet 2 of 3
Prepared By ANGEL HU
Reviewed By JOHN LIN
Approved By H.C.TSOU

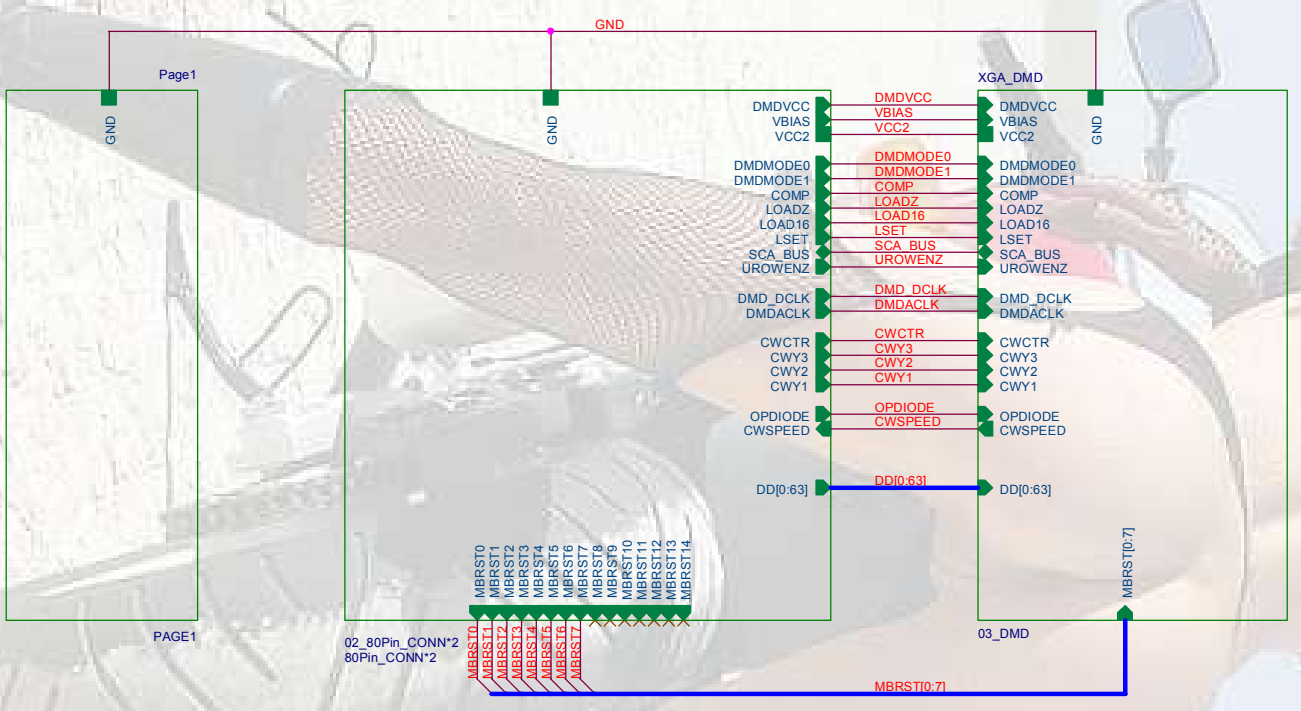
Screw Holes



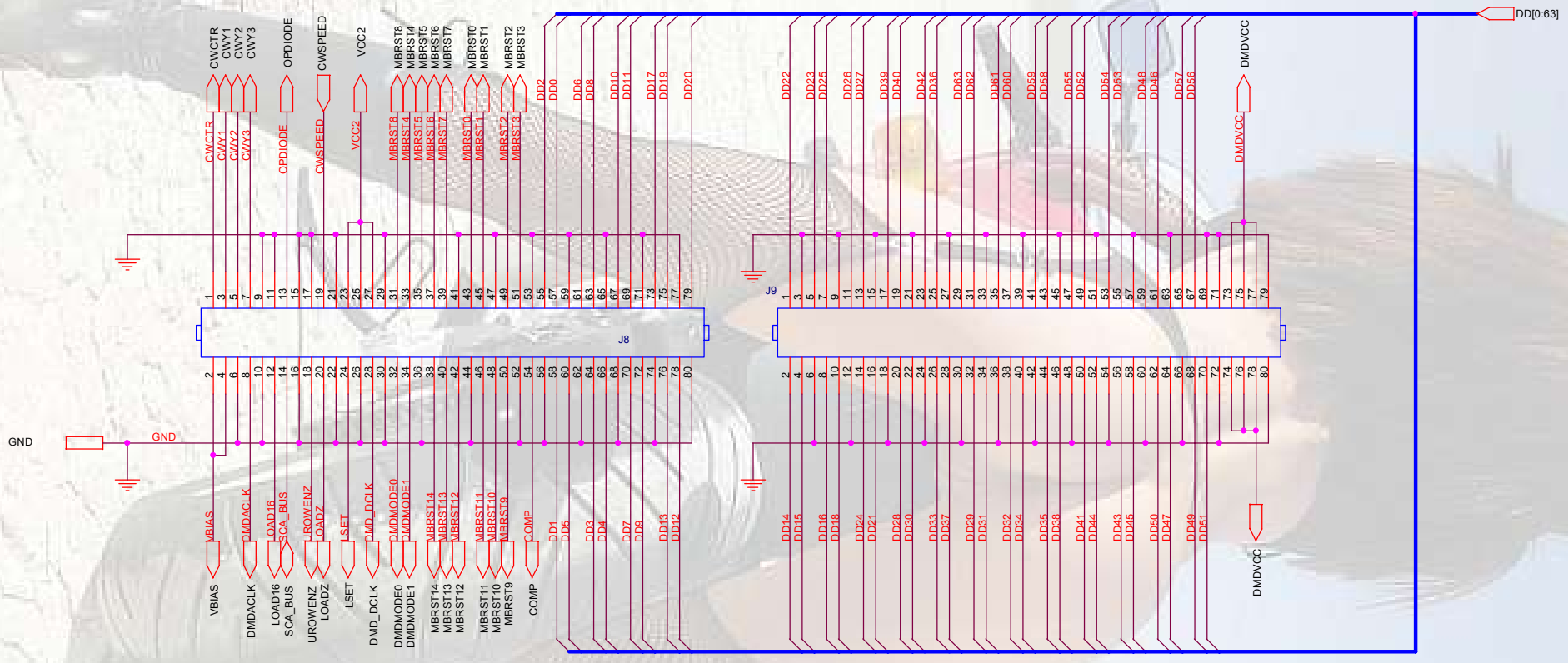
Optical Points



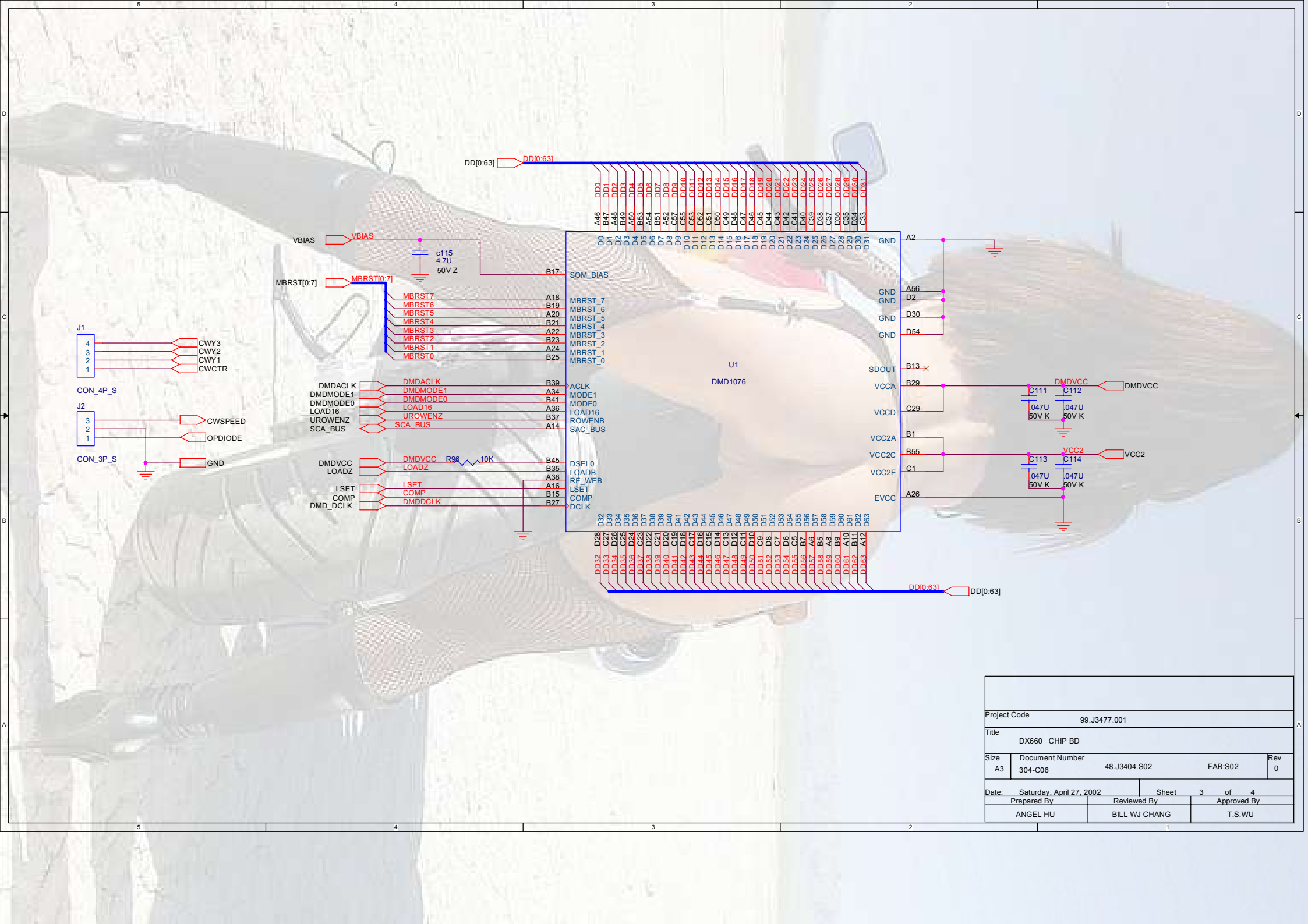
Project Code: 99.J3877.001	Model Name: DX660	OEM/ODM Model Name: NA
Title: FAN CONTROL BD		
Size: <Size> / PCB P/N: 48.J3405.S04	PCB Rev.: S04	Document Number: 304-C05 / Rev.: 1
Date: Wednesday, May 01, 2002	Sheet 3 of 3	
Prepared By: ANGEL HU	Reviewed By: JOHN LIN	Approved By: H.C.TSOU



Project Code	99.J3477.001		
Title	DX660 CHIP BD		
Size A3	Document Number 304-C06 48.J3404.S02	FAB:S02	Rev 0
Date: Saturday, April 27, 2002	Sheet 1 of 4		
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	

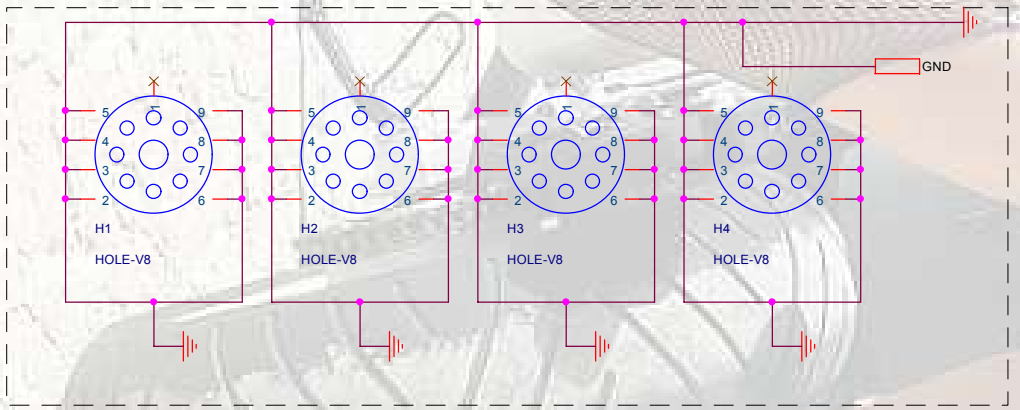


Project Code	99.J3477.001		
Title	DX660 CHIP BD		
Size A3	Document Number 304-C06 48.J3404.S02	FAB:S02	Rev 0
Date: Saturday, April 27, 2002	Sheet 2 of 4		
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	

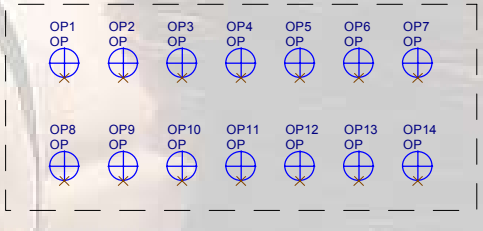


Project Code	99.J3477.001		
Title	DX660 CHIP BD		
Size A3	Document Number 304-C06 48.J3404.S02	FAB:S02	Rev 0
Date: Saturday, April 27, 2002	Sheet 3 of 4		
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	

Screw Holes



Optical Points



Project Code	99.J3477.001		
Title	DX660 CHIP BD		
Size A3	Document Number 304-C06 48.J3404.S02	FAB:S02	Rev 0
Date: Saturday, April 27, 2002	Sheet 4 of 4		
Prepared By	Reviewed By	Approved By	
ANGEL HU	BILL WJ CHANG	T.S.WU	