BenQ

Applicable Country & Regions:
All Regions

Product Service Manual – Level 2

Service Manual for BenQ:
Projector/MP512
<9H.Y1277.000>

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Content Index

Abbreviations & Acronyms

A	
A/D	Analog to Digital
B	
BenQ	BenQ Corporation
D	
DLP	Digital Light Processing / Texas Instruments®
DMD	Digital Micro mirror Device
DVI	Digital Video Interface
DVI-I	Digital Video Interface-Integrated
P	
POM	Pond of Mirrors
R	
RS232	Interface Between Data terminal Equipment and Data Communications Equipment Employing Serial Binary Data Interchange
S	
SVGA	Super Video Graphics Array, A screen resolution of 800 x 600 pixels.
SXGA	Super XGA. A screen resolution of 1280x1024 pixels.
V	
VGA	Video Graphics Array. A screen resolution of 640x480 pixels.
X	
XGA	A screen resolution of 1024x768 pixels.

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About This Manual

This manual contains information about maintenance and service of BenQ products. Use this manual to perform diagnostics tests, troubleshoot problems, and align the BenQ product.

Important
> *Only trained service personnel who are familiar with this BenQ Product shall perform service or maintenance to it. Before performing any maintenance or service, the engineer MUST read the "Important Safety Information"*

Trademark

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Introduction

This section contains general service information, please read through carefully. It should be stored for easy access place.

Important Service Information

RoHS (2002/95/EC) Requirements – Applied to all countries require RoHS.

The RoHS (Restriction of Hazardous Substance in Electrical and Electronic Equipment Directive) is a legal requirement by EU (European Union) for the global electronics industry which sold in EU and some counties also require this requirement.   Any electrical and electronics products launched in the market after June 2006 should meet this RoHS requirements.   Products launched in the market before June 2006 are not required to compliant with RoHS parts.   If the original parts are not RoHS complaints, the replacement parts can be non ROHS complaints, but if the original parts are RoHS compliant, the replacement parts MUST be RoHS complaints.

If the product service or maintenance require replacing any parts, please confirming the RoHS requirement before replace them.

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Safety Notice

1   Make sure your working environment is dry and clean, and meets all government safety requirements.
2   Ensure that other persons are safe while you are servicing the product.
3   DO NOT perform any action that may cause a hazard to the customer or make the product unsafe.
4   Use proper safety devices to ensure your personal safety.
5   Always use approved tools and test equipment for servicing.
6   Never assume the product's power is disconnected from the mains power supply. Check that it is disconnected before opening the product's cabinet.
7   Modules containing electrical components are sensitive to electrostatic discharge (ESD). Follow ESD safety procedures while handling these parts.
8   Some products contain more than one battery. Do not disassemble any battery, or expose it to high temperatures such as throwing into fire or it may explode.
9   Refer to government requirements for battery recycling or disposal.

Compliance Statement

Caution: This Optical Storage Product contains a Laser device. Refer to the product specifications and your local Laser Safety Compliance Requirements.

General Descriptions

This Service Manual contains general information. There are 2 levels of service:
Level 1: Cosmetic / Appearance / Alignment Service
Level 2: Circuit Board or Standard Parts Replacement

Related Service Information

Service Web Site

BenQ Global Service Website: http://support.benq.com/front/benqmain.asp
eSupport Website: http://esupport.benq.com/v2

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Product Overview

The Projector consists of the DLP projector controller, Lamp controller, Power supply system, and the system cooling controller. The DLP controller captures the digital PC data and video data and converts them into the DMD display device. The lamp controller controls the lamp's power and synchronizes its frequency with color display sequence. Power supply unit controls the AC line power factor and converts primary voltage to secondary low voltage for digital board. The system cooling controller drives the airflow to cool the lamp's heat and electrical component's heat.

Specifications:

1.0   Optical Performance

2.0   Image Quality

3.0   Mechanical Specification

4.0   Packaging

5.0   Thermal Specification

6.0   Environmental

7.0   Regulatory

8.0   Reliability

9.0   Power Requirements

10.0 Panel Specification

11.0 Compatibility

12.0 Image Interface

13.0 Control Interface

14.0 User Interface

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1.0 Optical Performance	Tested under 60" (diagonal) image size with Wide projection lens position unless other specified.
1.1 ANSI Brightness	Minimum 1760 Lumens
1.2 Brightness Uniformity	
1.2.1 ANSI Uniformity	Minimum 55%
1.2.2 JBMA Uniformity	Minimum 70%
1.2.3 Upper-Down unbalance	0.5~2
1.2.4 Left-Right unbalance	0.6~1.67
1.3 Contrast Ratio	
1.3.1 ANSI Contrast	Minimum 150:1
1.3.2 FOFO Contrast	Minimum 1200:1
1.3.3 Dynamic C/R	Minimum 1450:1
1.4 Light Leakage	
1.4.1 Light Leakage in Active Area	<0.5 lux compared to center point within 60" (Diagonal at 2.4m) image size. Note: This light leakage in Active area is only described as the spot light with obvious shape. It is not included the uniformity difference of the projector for black pattern.
1.4.2 Light Leakage out of Active Area (Except DMD Defect)	<0.65 lux with 50"~80"(Diagonal at 2m) image size
1.5 Color	Reference meter: BenQ YM5A/Measurement Center Integral sphere

	X	Y
1.5.1 White	0.313±0.04	0.350±0.04
1.5.2 Red	0.640±0.04	0.345±0.04
1.5.3 Green	0.345±0.04	0.533±0.04
1.5.4 Blue	0.144±0.04	0.075±0.04
1.6 Color Uniformity	X	Y
1.6.1 White	0.040	0.040
1.6.2 Red	0.040	0.040
1.6.3 Green	0.040	0.040
1.6.4 Blue	0.040	0.040

1.7 Color Gamut	typical 55% compare NTSC
2.0 Image Quality	
2.1 Throw Ratio	50"±5% Diagonal at 2m
2.2 Zoom Ratio (tolerance applied)	1(Fixed)
2.3 Distortion	
2.3.1 Keystone Distortion	<1.0%
2.3.2 Vertical TV Distortion	<1.0%
2.4 Projection Offset	120% ±5%
2.5 Focus Range	
2.5.1 Visible Range	1~8 m
2.5.2 Clearly Focus Range	1.5~6 m(Spec. defined as item 2.6)
2.6 Focus	
2.6.1 ⊠ Pattern	(1)If pattern can be uniformly focused, pass! (2)If not, check 2.6.2
2.6.2 Defocus and Flare	Defocus: R<=3.0; G<=3.0; B<=3.0 pixel Flare: R<=4.0; G<=4.0; B<=4.0 pixel

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	Slight flare is not counted as flare.		
2.6.3 Focus unbalance	Adjust focus from near to far until one corner clear, difference less than 50 cm		

2.7 Lateral Color		Center of 49"diagonal area	All other area
	R-G	<2/3	<1
	G-B	<2/3	<1
	R-B	<1	<1

2.8 Image Quality	
2.8.1 DMD Image Quality	
2.8.2 Image Imperfection	
2.8.3 Image Shadow or Blur	setups 1. 50" (Diagonal at 2m) image size. 2. Default preset mode " Dynamic" 3. Full white pattern to check the image. Let the projector on the desk (don't move it up/down or left/right) and just inspect the pattern. 4. Compare to the limit sample of OOB. (Right side blur sample → MP611 S/N: 245747-00013; Bottom side blur sample → MP611 S/N: PDM8601819SU0) If blur or shadow worse than OOB, than NG
3.0 Mechanical Specification	
3.1 Dimensions	255 x 214 x 90 mm (L x W x H)
3.2 Weight	<2500g
3.3 Security Slot	Kensington compatible slot 150N break away force
3.5 Lens Cover	Lens Cover (Refer to C109)
3.6 Feet	Fast adjustable foot in front, Adjustable foot and Fixed foot in rear. foot Tilt:0-6° ,right/left: +2.2° /-0.5°
4.0 Packaging	Detail refer to C309 (Packing Description)
4.1 Outside Dimensions	325 x 165 x 297mm (L x W x H)
4.2 Weight	<3700g
4.3 Transportation	40 feet container 3528 sets, 20 feet container 1708 sets By air(A pallet) 48 sets (C pallet) 56 sets (B pallet) 40 sets
5.0 Thermal Specification	Mechanical component temperature at ambience 0~40℃
5.1 Surface held or touched for short periods	Normal surface: Metal < 60°C; Plastic<85°C Bottom surface: @ 25° C Metal < 55°C; Plastic<70°C

5.2 Surface which may be touched	Metal	Plastic
	<70°C	<95°C

5.3 Exhaust Air	<95°C
6.0 Environmental	

6.1 Temperature	Operating	0~40°C, without condensation
	Storage	-20~60°C, without condensation
6.2 Humidity	Operating	10~90%RH, without condensation
	Storage	10~90%RH, without condensation
6.3 Audible Noise Level	Typical	Normal mode: 31dBA @ 25°C Eco mode: 26dBA @ 25°C

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	Maximum	Normal mode: 33dBA @ 25°C Eco mode: 28dBA @ 25°C
6.4 Altitude		Operating: Without high altitude mode 0°C~35°C @ 0~1499m above sea level With high altitude mode 0°C~30°C @ 1500~3000m above sea level Non-operating: 30℃@0~12,200m above sea level
7.0 Regulatory	Safety	cTUVus, TUV-GS, CCC, CB Report, PSE, GOST-R, PSB, SASO, eK, TUV-Argentina, CE, NOM
	EMC	FCC Class B requirements, C-Tick, VCCI, CE
	ESD	Qisda ESD Specification
8.0 Reliability		
8.1 MTBF		40000 hours except DMD chip, Color wheel, Lamp, Fan and Ballast
8.2 Lamp Lifetime		Normal : 3000 hours (50% brightness maintenance) Eco: 4000 hours
9.0 Power Requirements		Adhere to Appendix B
9.1 Power Supply (Normal)		VAC 100 – 240 (50/60Hz),
9.2 Power consumption	Typical	280W Max.
	Standby	5W Max.
9.3 Power Connector		IEC-06
10.0 Panel Specification		
10.1 Type		0.55" SVGA LVDS Type-X DMD
10.2 Pixels		H: 800 X V: 600
10.3 Color Depth		24 Bits (16770000 colors)
11.0 Compatibility		Appendix A
11.1 PC		PC Compatible 640X480 → 1024X768, compressed 1280X1024; Composite-Sync; Sync-on-Green; Interlace Mode (8514A);
11.2 Video		NTSC/ NTSC4.43/ PAL (Including PAL-M, PAL-N)/ SECAM/ PAL60/
11.3 YpbPr		NTSC (480i)/ 480p/ PAL (576i)/ 576p, HDTV (720p/ 1080i)
11.4 DDC		EDID 1.3
12.0 Image Interface		Adhere to Appendix A
12.1 Analog RGB Input		15 pin D-Sub (Female) x 1 G(Y): Video amplitude 0.7/1.0 Vp-p : Impedance 75 RB(CbCr): Video amplitude 0.7 Vp-p : Impedance 75 HD/VD/CS: TTL Level
12.2 Video Input		RCA jack (Yellow) Video amplitude 1.0 V_{p-p} : Impedance 75Ω
12.3 S-Video Input		4 pin Mini-Din (Female) Y: Luminance amplitude 1.0 V_{p-p} : Impedance 75Ω C: Chroma amplitude 0.286 V_{p-p} : Impedance 75Ω
12.4 YPbPr Input		15 pin D-Sub (Female) x 1 Y: Luminance amplitude 1.0 V_{p-p}: Impedance 75Ω PbPr/C_bC_r: Chroma amplitude 0.7 V_{p-p}: Impedance 75Ω

12.5 Analog RGB Output	15 pin D-Sub (Female) x 1 G(Y): Video amplitude 0.7/1.0 Vp-p : Impedance 75 RB(CbCr): Video amplitude 0.7 Vp-p : Impedance 75 HD/VD/CS: TTL Level
13.0 Control Interface	
13.1 IR Receiver	IR Receiver x1 (Front) Angle: ±30° Distance 0~8m
13.2 Serial Connector	RS232 9pin, command table adhere to Appendix A
14.0 User Interface	Adhere to Appendix A
14.1 Operator Keypad	10 Keys: Power ; Source ; Auto ; Blank ; Menu/Exit ; Left/Q?; Right/Panel Key lock ; Up(Keystone+) ; Down(Keystone-) ; Mode
14.2 Indicators	3 LEDs: Power On/Off Status; Lamp Status; Temperature Status
14.3 Electric Keystone	vertical keystone and adjustable range ±25°

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Appendix A - Electrical Specification

1. Timing Table
The PC timing is as following:

Resolution	Mode	Refresh rate (Hz)	H-frequency (kHz)	Clock (MHz)
720 x 400	720x400_70	70.087	31.469	28.3221
640 x 480	VGA_60	59.940	31.469	25.175
	VGA_72	72.809	37.861	31.500
	VGA_75	75.000	37.500	31.500
	VGA_85	85.008	43.269	36.000
800 x 600	SVGA_60	60.317	37.879	40.000
	SVGA_72	72.188	48.077	50.000
	SVGA_75	75.000	46.875	49.500
	SVGA_85	85.061	53.674	56.250
1024 x 768	XGA_60	60.004	48.363	65.000
	XGA_70	70.069	56.476	75.000
	XGA_75	75.029	60.023	78.750
	XGA_85	84.997	68.667	94.500
1280 x 1024	SXGA3_60	60.020	63.981	108.000
1280 x 800	SXGA_60	59.81	49.702	83.5
1280 x 960	1280 x 960_60	60.000	60.000	108
640x480@67Hz	MAC13	66.667	35.000	30.240
832x624@75	MAC16	74.546	49.722	57.280
1024x768@75Hz	MAC19	75.020	60.241	80.000
1152x870@75Hz	MAC21	75.06	68.68	100.00

YPbPr support timing is as following:

Signal format	fh(kHz)	fv(Hz)
480i(525i)@60Hz	15.73	59.94
480p(525p)@60Hz	31.47	59.94
576i(625i)@50Hz	15.63	50.00
576p(625p)@50Hz	31.25	50.00
720p(750p)@60Hz	45.00	60.00
720p(750p)@50Hz	37.50	50.00
1080i(1125i)@60Hz	33.75	60.00
1080i(1125i)@50Hz	28.13	50.00

Video, S-Video support timing is as following:

Video mode	fh(kHz)	fv(Hz)	fsc(MHz)
NTSC	15.73	60	3.58
PAL	15.63	50	4.43
SECAM	15.63	50	4.25 or 4.41
PAL-M	15.73	60	3.58
PAL-N	15.63	50	3.58
PAL-60	15.73	60	4.43
NTSC4.43	15.73	60	4.43

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2. Characteristics of inputs/outputs

Signal	Parameter	Min	Type	Max	
RDATA	Impedance		75		Ohm
GDATA	Amplitude		0.7		Volts peak-to-peak
BDATA	Black pedestal		0		Volts
	Pixel Clock		110		M Hz
GDATA_SOG	Impedance		75		Ohm
	Amplitude		1		Volts peak-to-peak
	Video amplitude		0.7		Volts peak-to-peak
	Sync amplitude		0.3		Volts peak-to-peak
	Black pedestal		0		Volts
	Pixel Clock		110		M Hz
HDATA	Impedance		1		K ohm
	Amplitude, low level	0		0.8	volt
	Amplitude, high level	2.5		5	Volt
	Frequency	31		82	K Hz
VDATA	Impedance		1		K ohm
	Amplitude, low level	0		0.8	volt
	Amplitude, high level	2.5		5	Volt
	Frequency	48		85	Hz
SDADATA	Amplitude, low level	0		0.8	volt
	Amplitude, high level	2.5		5	Volt
SCLDATA	Amplitude, low level	0		0.8	volt
	Amplitude, high level	2.5		5	Volt
RXD	Amplitude	-25		25	Volt
TXD	Amplitude	-25		25	Volt
CVBS	Amplitude, total (video+ sync)		1		Volts peak to peak
Luminance	Amplitude, video		0.7		Volts peak to peak
	Amplitude, sync		0.3		Volts peak to peak
	Impedance		75		ohm
CVBS Chroma	Amplitude		300		m Volts peak to peak
	Impedance		75		ohm

3. Electrical Interface Character

Interface Definition

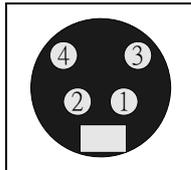● 15 pin definition of the mini D-sub male for DDC2B protocol
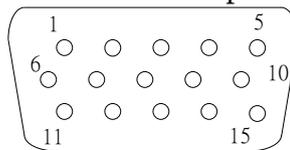
Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
1	Red video (Pr)	2	Green Video (Y)	3	Blue Video (Pb)	4	NC
5	NC	6	Red Video Return	7	Green Video Return	8	Blue Video Return
9	NC	10	Sync. Return	11	Monitor ID bit 0	12	Bi-directional data (SDA)
13	Horizontal Sync	14	Vertical Sync	15	Data clock (SCL)		

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● Video Input

1
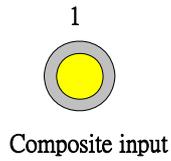
Composite input

Pin	Definition
1	Composite video input

● S-Video input

Pin	Description
1	GND
2	GND
3	Luminance
4	Chroma

● Control Port

1 ○ — Data carrier detect
6 ○ — Data set ready
2 ○ — Receive data
7 ○ — Request to send
3 ○ — Transmit data
8 ○ — Clear to send
4 ○ — Data terminal ready
9 ○ — Ring indicator
5 ○ — Signal ground

— Protective ground
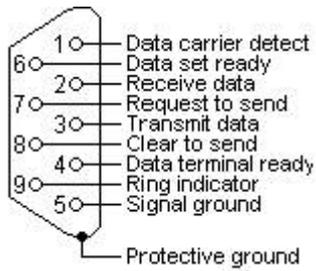
Pin	Description	Pin	Description
1	NC	2	RX
3	TX	4	NC
5	GND	6	NC
7	RTSZ	8	CTSZ
9	NC		

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Local Keyboard Description (Detailed description refer to SW Specification)

Key Name	Detailed Description
Power	Use this button to turn your Data Projector on and off (standby mode).
Source	To select input sources as Computer, Video, S-Video, YpbPr
Auto	Toggle auto-tracking image function
Blank	Press "Blank" key first to blank the screen
Mode/Enter	(1) When there is no OSD menu, this bottom is Mode hot key; user would press this bottom to choose one of preset modes (2) When there is confirm message, user could press this key to confirm
Menu/Exit	Press this key to open/exit the OSD menu
Right/Panel Key Lock	(1) When user press the bottom once, it will enter "Panel Key Lock" setting (2) When panel key is locked, user could press this key for 3 seconds to release Panel Key Lock (3) When there is OSD menu, user can press this key to move to right item
Left/Q?	(1) When user presses the bottom once, it would show main "Information" menu; and then user could press ▲ ▼ to choose questions group. (2) If there is OSD menu, user can press this key to move to the left item
Up	(1) Move item bar. (2) Move to page level. (3) Keystone+.
Down	(1) Move item bar. (2) Move to page level. (3) Keystone-.

Remote Control Keys Description (Detailed description refer to SW Specification)

IR-Key Name	Detailed Description
Power	Use this button to turn your Data Projector on and off (standby mode).
Source	To select input sources as Computer, YPbPr , Video, S-Video
Menu/Exit	(1) OSD pop-up. (2) Move next item
▸ / Panel Key Lock	(1) When user press the bottom once, it will enter "Panel Key Lock" setting (2) When panel key is locked, user could press this key for 3 seconds to release Panel Key Lock (3) When there is OSD menu, user can press this key to move to right item
◂ / Q?	(1) When user presses the bottom once, it would show main "Information" menu; and then user could press ▲ ▼ to choose questions group. (2) If there is OSD menu, user can press this key to move to the left item
▲ ▼	(1) Move item bar. (2) Move to page level. (3) Keystone+.
▼ ▲	(1) Move item bar. (2) Move to page level. (3) Keystone-.
Auto	Toggle auto-tracking image function
Mode/Enter	(1) When there is no OSD menu, this bottom is Mode hot key; user would press this bottom to choose one of preset modes (2) When there is confirm message, user could press this key to confirm
Freeze	This button will freeze a picture. Press again to resume motion.
Blank	Press "Blank" key first to blank the screen.
Timer	Call out the "Presentation Timer" setup OSD and user can set timer to remind presenter.
Digital Zoom in	By press this key, the center of picture can be magnified gradually.
Digital Zoom out	By press this key, the size of the magnified image will be reduced.

External Status indicator

LED Name	Detailed Description
Power LED	Display the power on/off sequence status
Lamp Status LED	Display the Lamp status (Lamp fail, Lamp spoil etc.)
Temperature Status LED	Display the Thermal status (Fan Fail, Over Temperature, etc.)

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4. Functionality
The Following functionality will be supported: (Detailed description refer to SW Specification)

Functionality	Data (Computer)	Video/S-Video	YPbPr/YCbCr
Volume	NO	NO	NO
Mute	NO	NO	NO
Preset Mode	YES	YES	YES
Brightness	YES	YES	YES
Contrast	YES	YES	YES
Color	NO	YES	YES
Tint	NO	YES	NO
Sharpness	NO	YES	YES
Color Temp	YES	YES	YES
H. Position	YES	NO	NO
V. Position	YES	NO	NO
H. Phase	YES	NO	NO
H. Size	YES	NO	NO
Keystone	YES	YES	YES
Language	YES	YES	YES
Auto	YES	NO	NO
Image Ratio	YES	YES	YES
Auto Off	YES	YES	YES
Mirror	YES	YES	YES
Source	YES	YES	YES
Freeze	YES	YES	YES
Blank	YES	YES	YES
Lamp Reset	YES	YES	YES
OSD Timer	YES	YES	YES
Source Scan	YES	YES	YES
Keystone Hold	YES	YES	YES
Mirror Hold	YES	YES	YES
Blank Time	YES	YES	YES
Information	YES	YES	YES
Reset	YES	YES	YES

External Message indicator (Detailed description refer to SW Specification)

Message	Occasion
PC/Composite Video /S-Video /Analog YPbPr Searching	The system does not detect the signal
Out of range	The signal is over the specification
Order replacement lamp Lamp > 3000 Hours	Lamp Hour $\geqq$ 3000 hours
Replace lamp soon Lamp > 3950 Hours	Lamp Hour $\geqq$ 3950 hours
Replace lamp Now Lamp > 4000 Hours Lamp usage time exceeded	Lamp Hour $\geqq$ 4000 hours. The warning message will be displayed when the projector is turned on (last for 30 Seconds)
Lamp-usage time exceeded Replace lamp (refer to user's manual) Then reset lamp timer.	Then the projector will show left message (last for 40 seconds)

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Appendix B - Power Supply Specification

1. Input Power Specification

Specification	Description
Input Voltage Range	The unit shall meet all the operating requirements with the range 90 ~ 264 VAC
Frequency Range	The unit shall meet all the operating requirements with an input frequency range 50 Hz ~ 60 Hz
Power Consumption	Normal operation: 280W (Max) standby mode: < 5W
Regulation Efficiency	80 % (typical) measuring at 115Vac and full load

2. Output Power Requirement

The power supply can provide DC output as below：

NO.	Voltage	Regulation	Load Current Range	Ripple & Noise
1	+12 V	±10 %	0.15 A ~ 2.5 A	300 mV

3. Lamp Power specifications

Specification	Description
Applicable Lamp	189W, AC operation
Starting pulse from Ignitor	

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Packing

POWER CODE
(Put 2nd power code
over here if necessary)

ACCESSARY
(MANUAL, CD, R/C, warranty card)

POWER CODE

CUSHION LEFT
P/N:4G.0GF03.00X

BAG
P/N:4B.01214.00X

CUSHION RIGHT
P/N:4G.0GF04.00X

CABLE SINGAL

CTN LBL
P/N:4E.L2701.XXX

CARTON
P/N:4D.0HI01.XXX

HANDLE HOLDER
P/N:4B.J1B24.00X

ORGANIC TRANSPARENT STICKER
P/N: 4E.A1202.03X

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CTN LBL PRINTING (For BQA):

4 mm

4 mm

39 mm

Minion Bold, H=38 point

BenQ MP512

H=36 point

Resolution / 解析度：

SVGA

Product Name / 商品名稱：Digital Projector / 數位投影機
AC Rating / 額定電壓及電流：～100-240V, 50-60Hz, 3.0A
Mfg. Date / 製造日期：May 2008 / 2008年05月
Quantity / 數量：1
Made in China / 製造產地：中國
Rev.：XX-XXX
P/N: 9H.Y1277.Q3A

BAR CODE 39

S/N: PDDMYXXXXXZZ0

BAR CODE 39

H=8 point

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電話：(02)2727-8899

JAN CODE
(4544438051099)

UPC CODE
(840046019464)

EAN CODE
(4718755320040)

Code 39
(S/N)

***除 **BenQ** 和特別標示外，其餘的打印英文字型爲Minion，
中文字型爲文鼎中黑, 字高 H=9 point
***Scale 1:1
*** Label Size:120x100mm

CTN LBL PRINTING (For BQE):

13.8 mm

48.5 mm

Minion Bold, H=38 point

15.0 mm

BenQ MP512

H=36 point

Resolution：

SVGA

Product Name：Digital Projector
AC Rating：～100-240V, 50-60Hz, 3.0A
Mfg. Date：May 2008
Quantity：1
Made in China
Rev.：XX-XXX
P/N: 9H.Y1277.Q3E

BAR CODE 39

S/N: PDDMYXXXXXZZ0

BAR CODE 39

H=10 point

BenQ Europe B.V.
Ekkersrijt 4130, 5692 DC Son, The Netherlands

EAN CODE
(4718755320040)

Code 39 (S/N)
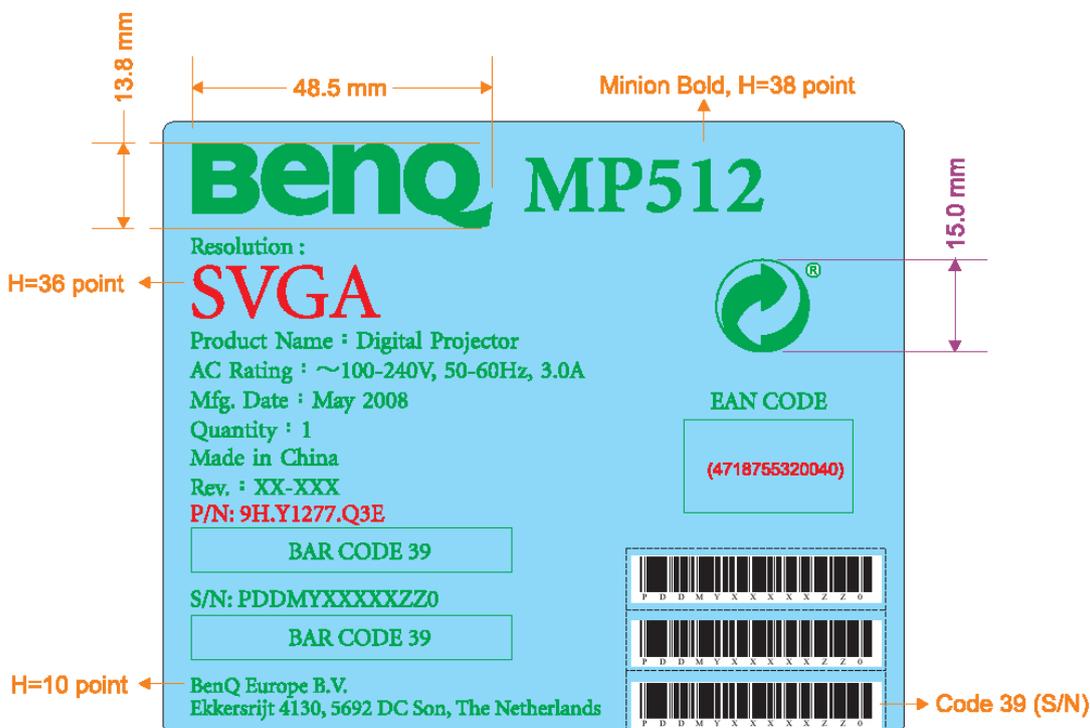
*** Besides Mark, English Font: Minion, H=11 point
*** Scale 1:1
*** Label size:120x100mm

明基電通 BenQ Corporation

CTN LBL PRINTING (For BQP):

BenQ MP512

Minion Bold, H=38 point

13.8 mm
48.5 mm
H=36 point

Resolution :
SVGA
Product Name：Digital Projector
AC Rating：～100-240V, 50-60Hz, 3.0A
Mfg. Date：May 2008
Quantity：1
Made in China
Rev.：XX-XXX
P/N: 9H.Y1277.Q3P
| BAR CODE 39 |

S/N: PDDMYXXXXXZZ0
| BAR CODE 39 |

EAN CODE

(4718755320040)

P D D M Y X X X X X Z Z 0
P D D M Y X X X X X Z Z 0
P D D M Y X X X X X Z Z 0

Code 39 (S/N)

*** Besides Mark, English Font: Minion, H=13 point

*** Scale 1:1

*** Label size:120x100mm

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CTN LBL PRINTING (For BQC)

5.0 mm

3.0 mm

型号:MP512	品名:数码投影机
企业标准号:Q/SIQB 25-2007	
额定电压及其频率:~100-240V,50-60Hz	
额定电流:3.0A	本纸箱材质:
包装重量:3.3Kg	
包装尺寸:32.5cm(长)*16.5cm(宽)*29.7cm(高)	
制造日期:2008年06月	Rev.:XX-XXX

中国营销总部:明基电通有限公司
地址:上海市长宁区广顺路33号B栋6层
服务热线: (0512)68073600
成品料号:9H.Y1277.Q3C

BARCODE 39

序列号:PDDMYXXXXXCU0

BARCODE 39

字高H=5 Point

BenQ Corporation
16 Jihu Road, Neihu, Taipei 114, Taiwan

BenQ MP512 数码投影机   成品料号:9H.Y1277.Q3C   字高H=6 Point
序列号:PDDMYXXXXXCU0

BARCODE 39

BARCODE 39

注: 除特别标识外,打印的中文印字型为文鼎CS中黑,
英文及数字的打印字型为Minion, 字高是7Point.

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SPEC LBL PRINTING
1. SPEC LBL PRINTING (For BQE, BQA, BQP)

Refer To Below Table(1)
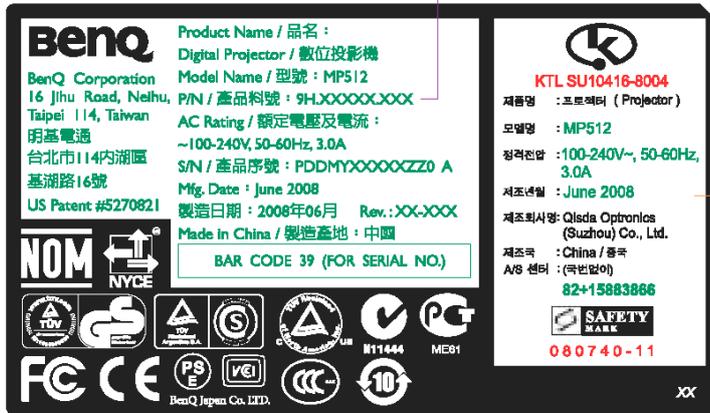
此區塊打印的英文字型為Arial，字高H=6 point

***除特別標示外，打印的英文字型皆為Gill Sans，
中文字型為文鼎中黑，字高H=6 point

***Scale 1:1

(1) P/N:

PART NUMBER	P/N ON SPEC LBL
9J.0GE77.B5A	9H.Y1277.Q3A
9J.0GE77.B5E	9H.Y1277.Q3E
9J.0GE77.B5P	9H.Y1277.Q3P

2. SPEC LBL PRINTING (For BQC)

此区域打印的英文字型为"Aril"，字高5

VENDOR CODE

*除了特殊规定外，中文打印字型为文鼎中黑6级，
英文数字打印字型为Gill Sans 6级；

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LAMP LBL PRINTING (For BQC)

⚠️ ⚡ 🔥 ♨️

Lamp Unit: 6K.0GF05.001

注意：高电压/高温/高压灯泡

灯泡要更换时,请将投影机关闭,
并将电源线拔掉.
灯泡冷却至少需要 45 分钟左右,
触摸高热灯泡可能会被烫到,
如果操作不当可能会使高压灯泡爆炸,
其更换方法请参照说明书.

警告

本投影机的灯泡中内含少量的水银,
如果灯泡破裂,应使发生灯泡破裂的
区域充分通风. 有关水银灯泡回收
事宜,请洽所在地环保局或相关机构.

警告

为避免遭电击,请勿任意打开外壳,
请向合格的维修人员咨询相关维修事宜.

Lamp: PHILIPS
Type No.:
UHP 185W-150W 1.0 E20.6
Max. Wattage:185W

***打印的英文字型皆为GILL SANS,
字高H＝5 Point

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Customer Acceptance

1.0 SCOPE

This document establishes the general workmanship standards and functional acceptance criteria for PROJECTOR produced by BENQ.

2.0 PURPOSE

The purpose of this publication is to define a procedure for inspection of the PROJECTOR by means of a customer acceptance test, the method of evaluation of defects and rules for specifying acceptance levels.

3.0 APPLICATION

The "Customer Acceptance Criteria" is applicable to the inspection of the PROJECTOR, completely packed and ready for dispatch to customers. Unless otherwise specified, the customer acceptance inspection should be conducted at manufacturer's site.

4.0 DEFINITION

The "Customer Acceptance Criteria" is the document defining the process of examining, testing or otherwise comparing the product with a given set of specified technical, esthetic and workmanship requirements leading to an evaluation of the "degree of fitness for use", including possible personal injury or property damage for the use of the product.

5.0 CLASSIFICATION OF DEFECTS

The defects are grouped into the following classes:

5.1 Critical defect

A critical defect is a defect which judgment and experience indicate that there is likely to result in hazardous or unsafe conditions for individuals using product.

5.2 Major defect

A major defect is a defect, other than critical one, is likely to result in failure, or to reduce materially the usability of the product for its intended purpose.

5.3 Minor defect

A minor defect is a defect that is not likely to reduce materially the usability of its intended purpose, or is a departure from established standards having little bearing on the effective use of operation of the product.

Note: If BenQ defect undefined failure, and it judged that is reduce the merchandisebility, BenQ CM Inform this defect. After that parties make communication and decide how to solve.

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6.0 EXPRESSION OF DEFECTIVES

$$\text{Percent of defects} = \frac{\text{Number of defects}}{\text{Number of products inspected}} \times 100\%$$

7.0 INSPECTION STANDARD

Unless otherwise specified, the inspection standard will be defined by MIL-STD-105E, NORMAL INSPECTION LEVEL Ⅱ, SINGLE SAMPLING PLAN. Level Ⅱ is in use all the time, inspection levels are normal, reduce and tighten.

7.1 Acceptance Quality Level

7.1.1 Critical Defect:

When a critical defect is found, this must be reported immediately upon detection, the lot or batch shall be rejected and further shipments shall be held up pending instructions from the responsible person in relevant department.

7.1.2 under normal sampling

Critical	Defective : 0% AQL
Major	Defective : 0.65% AQL
Minor	Defective : 2.5% AQL

7.1.3 under special sampling

Critical	Defective : 0% AQL
Major	Defective : 1.0% AQL
Minor	Defective : 4.0% AQL

8.0 GENERAL RULES

8.1 The inspection must be carried out by trained inspectors who have good knowledge about the product.

8.2 The inspection must be based upon the documents concerning the completely assembled and packed product.

8.3 When more defects appear with the same unit only the most serious defect has to be taken into account.

8.4 Defects found in accessory packed with the product such as Cable, Connector, Manual, CD

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and the like, and being inspected as a part of the complete product, must be included in the evaluation.

8.5 The evaluation must be within the limits of the product specification and, for not specified characteristics, refer to the sample machine or the judgment of BENQ QA Engineer. But any kind of proposals or judgments must be reasonable and acceptable by both sides.

8.6 Faults must be able to be repeatedly demonstrated.

9.0 TEST CONDITIONS

Unless other prescription, the test conditions are as followings:

Nominal voltage: refer to operation manual

Environmental illumination:

Variable from 500 to 800 Lux (For appearance inspection)

Variable from 0 to 7 Lux (For functional inspection)

Temperature: 25±5℃

Visual inspection shall be done with the distance from eyes to the sample 45 cm.

Display mode: refer to operation manual

10.0 TEST EQUIPMENTS

Dark room

PC

Pattern Generator: Chroma 2327 or equivalent

Minolta color analyzer (CL-100)

DVD player

Power supply (100~240 VAC) with consumption meter

Measuring tape

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Level 1 Cosmetic / Appearance / Alignment Service

OPERATIONAL INSPECTION CRITERIA

1. TEST PATTERN

PATTERN	PATTERN	TEST ITEM
Full white		ANSI Brightness、Bright Uniformity、FOFO Contrast Ratio、CIE white coordinate、Throw Ratio、Zoom Ratio、Distortion
Full Dark		FOFO Contrast Ratio
Full Red		Impurity、CIE coordinate
Full Green		Impurity、CIE coordinate
Full Blue		Impurity、CIE coordinate
Chromo 800x600		Focus Range
General-1 pattern		Performance/ Timing check/ function check
16 Gray		Gray Check
DDC check		Check the DDC information, Including S/N, model, manufacturer name, product code.
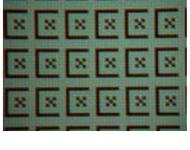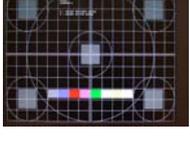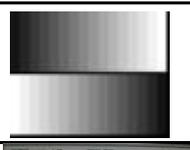
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2. TEST CONTENT:

	Test Condition	TEST ITEM	Input	Equipment
PC Mode	Chroma pattern 1024x768	Focus/ Focus range	D-SUB	Chroma
	FULL W , R , G , B	Impurity, CIE coordinate, pixel fail		
	At random	PC sound check	Audio	CD-ROM
HDTV	NTSC	Picture performance	YPbPr	Chroma / BS Tuner
DVD picture	NTSC disk/ PAL disk	Picture quality	Video S-video	DVD player

3. SPECIFICATION:

Item	Spec.	Condition	Pattern
ANSI Brightness	Minimum 1760Lumens	Contrast: Preset Brightness: Preset	Full white
ANSI Uniformity	Minimum 55%	Contrast: Preset Brightness: Preset	Full white
ANSI Contrast	Minimum 150:1	Contrast: Preset Brightness: Preset	Chessboard
FOFO Contrast Ratio	Minimum1200:1	Contrast: Preset Brightness: Preset	Full white and Full dark
Light Leakage (In Active Area)	<0.5 lux compared to center point within 60" (Diagonal at2.4m,wide) image size	Contrast: Preset Brightness: Preset	Full dark
Light Leakage (Out of Active Area)	<0.65 within 50"～80" (Diagonal at 2.4m, wide) image size	Contrast: Preset Brightness: Preset	Full dark
CIE white coordinate	x=0.313±0.04 y=0.350±0.04	Contrast: Preset Brightness: Preset	Full white
CIE red coordinate	x=0.640±0.04 y=0.345±0.04	Contrast: Preset Brightness: Preset	Full Red
CIE green coordinate	x=0.345±0.04 y=0.533±0.04	Contrast: Preset Brightness: Preset	Full Green
CIE blue coordinate	x=0.144±0.04 y=0.075±0.04	Contrast: Preset Brightness: Preset	Full Blue
Throw Ratio	50"±5% Diagonal @ 2M (Wide)	Contrast: Preset Brightness: Preset	Full white
Keystone Distortion	(W2-W1) / (W1+W2) <1.0%	Contrast: Preset Brightness: Preset	Full white
Vertical TV Distortion	(H1+H2-2×H3)/2H2 <1.0%	Contrast: Preset Brightness: Preset	Full white
Clearly Focus Range	1.5~6 m(Spec. defined as item 2.6)	Contrast: Preset Brightness: Preset	Chromo 84 X pattern
Gray Check	Should be clear and bright	Brightness: Preset Contrast: Preset	Chromo 16 gray pattern
DMD Image Quality	See Defect Classification	See Defect Classification	See Defect Classification
PC	PC Compatible 640X480 → 1024X768, compressed 1280X1024; Composite-Sync; Sync-on-Green; Interlace Mode (8514A);	Contrast: Preset Brightness: Preset	Chromo Test pattern

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Video	NTSC/NTSC4.43/PAL(Including PAL-M, PAL-n)/SECAM/PAL60	Contrast: Preset Brightness: Preset	VG828 Test pattern
YPbPr	NTSC (480i)/ 480p/ PAL (576i)/576p, HDTV (720P/1080i)	Contrast: Preset Brightness: Preset	VG828 Test pattern

3.1 Power Consumption:

Mode	Condition	Power Consumption	LED Color
Standby power	-	< 5 W	Red
Normal	-	<280 W	Green

4. OPERATIONAL INSPECTION CRITERIA:

No	Description	Class
1	Noise	
1.1	When power on or power off, fan or color wheel get abnormal noise.	Major
1.2	When normal operation, noise exceed noise level (refer to C201 document)	Major
2	Display Quality (include input: Video, S-video, YPbPr, and D-sub or RGB)	
2.1	Focus range out of specification	Major
2.2	Focus fail (focus not clear or flare/ defocus/ lateral color out of specification)	Major
2.3	Brightness & Uniformity --- out of specification.	Major
2.4	Contrast ratio --- out of specification	Major
2.5	Color coordinates --- out of specification.	Major
2.6	Light leakage out of specification (active area or out of active area)	Major
2.7	Throw ratio out of specification	Major
2.8	Room ratio out of specification	Major
2.9	Picture distortion out of specification	Major
2.10	DMD image out of specification	Major
2.11	Picture dust or other image quality out of specification	Major
2.12	Gray stage check --- Missing stage	Major
2.13	Video noise --- If video noise presented	Major
2.14	DDC data error / incorrect	Major
2.15	Mode detection error	Major
2.16	OSD Malfunction	Major
3	Audio Quality	
3.1	Audio malfunction	Major
3.2	Speaker no function	Major
3.4	Volume mute malfunction	Major
4	Remote control malfunction	Major

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5. IMAGE QUALITY SPECIFICATION:

SEQ #	TEST	SCREEN	ACCEPTANCE CRITERIA
1	Major Dark Blemish	Blue 60	1. ≦4 visible dark blemishes are allowed in the active area 2. No blemish will be >1.5" long / diameter
2	Major Light Blemish	Gray 10	1. ≦4 visible light blemishes are allowed in the active area 2. No blemish will be > 1.5" long / diameter
3	Reset Boundary Artifact	Gray 30	No rest boundary artifacts allowed
4	Eye catchers border Artifact	Any screen	Eye catchers border artifact are allowed
5	Projected Images	Any screen	1. No adjacent pixels 2. No bright pixels in Active Area 3. No unstable pixels in Active Area 4. ≦1 bright pixel in the POM 5. ≦4 dark pixels in the Active Area 6. No DMD window aperture shadowing on the Active Area 7. Minor blemishes are allowed

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Software/Firmware Upgrade Process

● How to download

Hardware required
1. Standard RS232 Download cable (P/N: 5K.Y1301.001)
2. Personal computer or laptop computer

Software required
1. DDP2230 Composer lite
2. New version FW

DDP2230 Composer lite install procedure

Installation Location

The default installation directory is:

C:\Program Files\DLP Composer Lite 7.0

If you want to install to a different directory (perhaps alongside a prior release of DLP Composer™ Lite), click the "Browse" button on the "Select Features" page.

RS232 Support - Installation (All Platforms)

This release includes support for a RS232 communications interface to DDP2230-based projectors. After DLP Composer™ Lite is installed,.
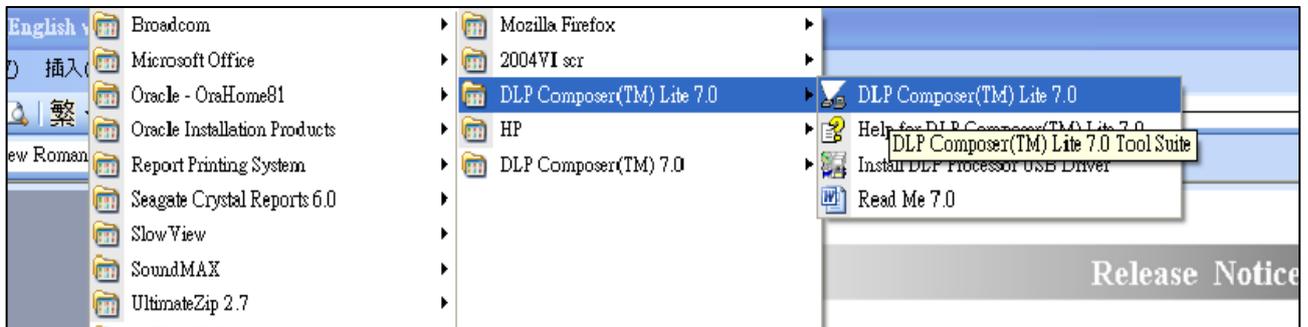
RS232 Support - Choosing the Serial Port interface

To select the RS232 communications interface, choose "Preferences" from the "Edit" menu, click the "Communications" page and choose "Serial Port (DDP2000/DDP3020 Only)".   You can now use DLP Composer™ Lite to communicate with a DDP2230-based projector via RS232 using the Flash Loader tool.

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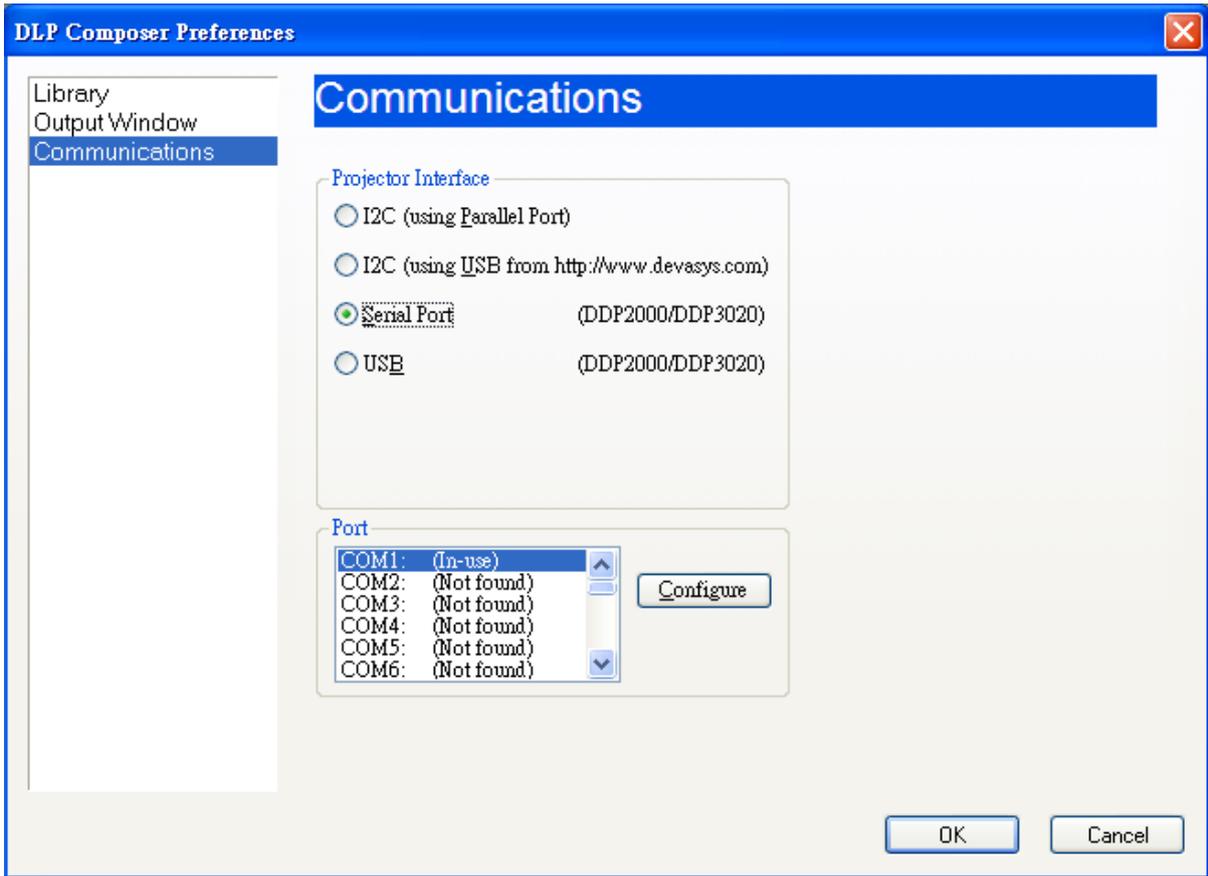
Download procedure

1. Click on Flash Loader and browse the image file (new version firmware)
2. Make sure to check "Skip Boot loader area (load all but the first 32KB)"
3. Plug power cord into projector
4. Plug in RS232 cable between computer and projector side
5. Press Reset Bus first
6. Press start download to begin update new firmware
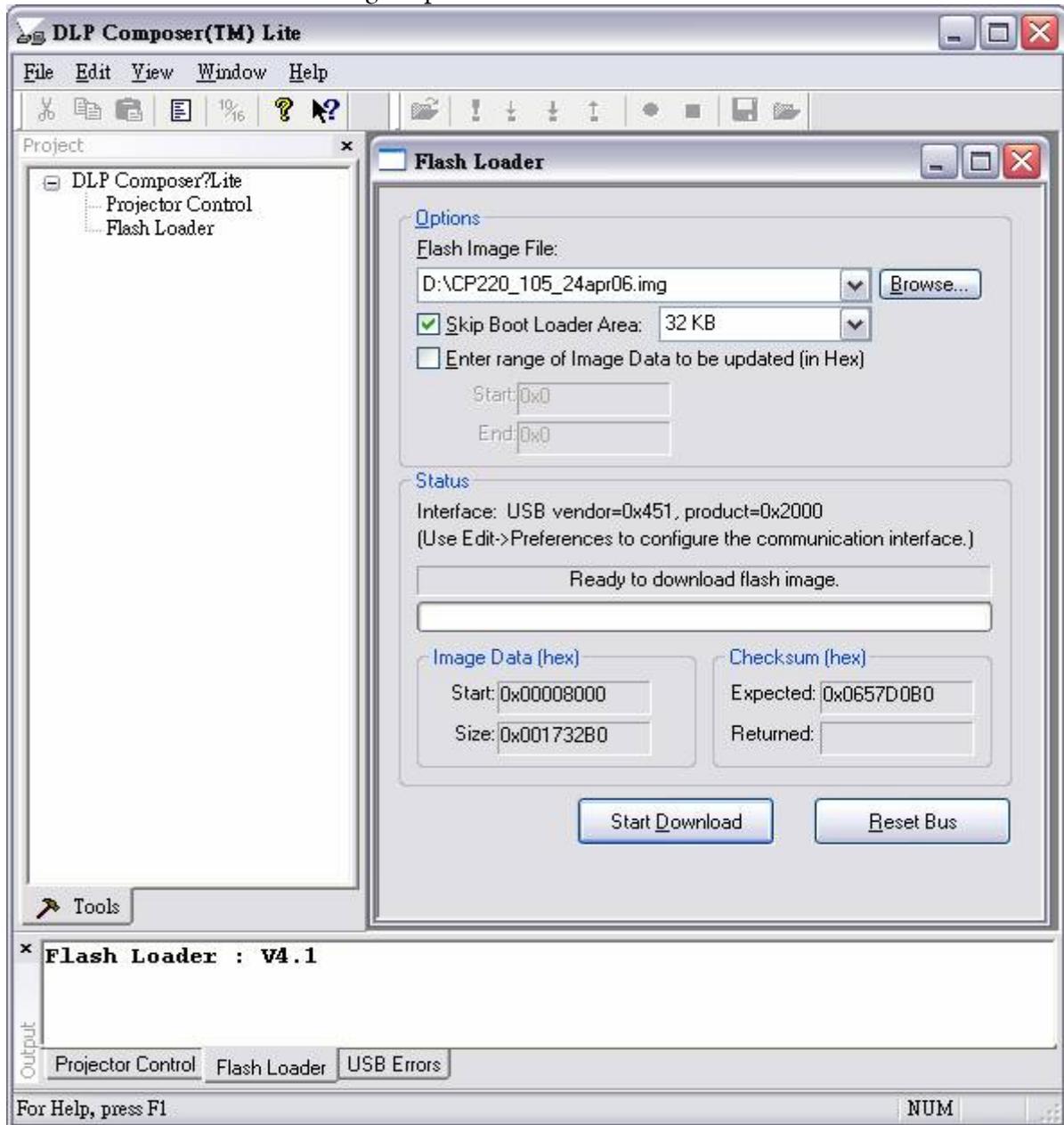
7. Wait till composer lite notice upgrade completed
8. Download is completed. The factory settings should be restored.

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Method to enter factory menu:

● Use Keypad to enter factory menu
    1.   Press **Menu** on keypad than the main menu popup

    2.   When showing main menu, press **Source + Mode** at the same time
    3.   Factory menu popup at the top-left of display

● Use Remote to enter factory menu
    1.   At the FAQ page, enter Image and Installation icon
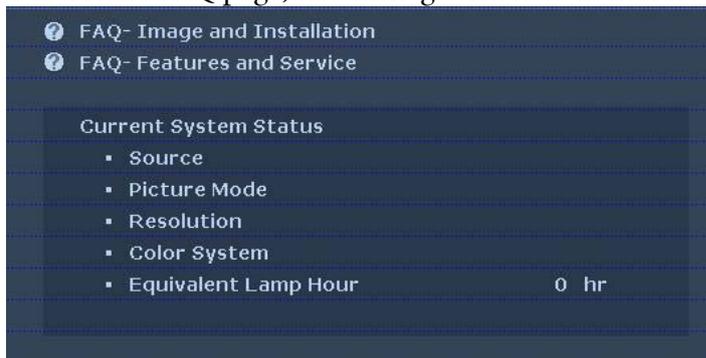
    2.   At the Image and Installation page, enter Installation problem icon

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3. At the Installation problem page, press Up, Down, Left, Right key to enter Factory menu
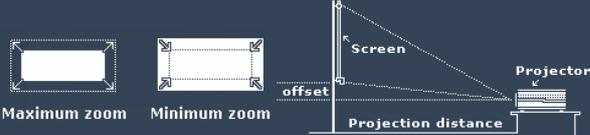
Screen Size			Projection Distance			Vertical Offset
Feet	Inches	mm	Min.(mm)	avg	Max.(mm)	mm
4	48	1219	1846	1938	2031	73
6	72	1829	2769	2908	3046	110
7	84	2134	3231	3392	3554	128
9	108	2743	4154	4362	4569	165
10	120	3048	4615	4846	5077	183

RS-232 connection:

1. Connection:

Below shows the illustration of connection between PC and Projector.

<CAUTION>
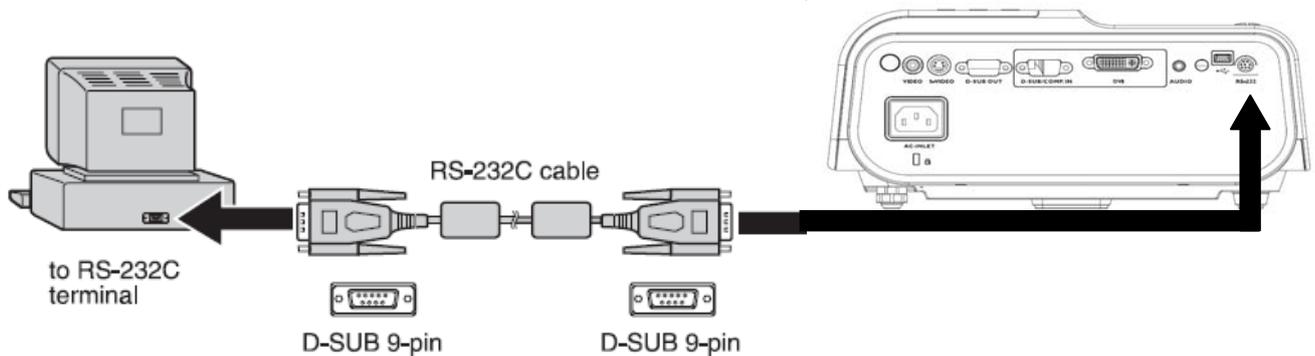
◆ Make sure that your computer and projector are turned off before connection.
◆ Power on the computer first, and then plug the power cord of the projector. (It may cause Com port incorrect function, if you do not follow this instruction)
◆ Adapters may be necessary depending on the PC connected to this projector. Please contact with your dealer for further details.

2. Hardware connection

<Download cable>

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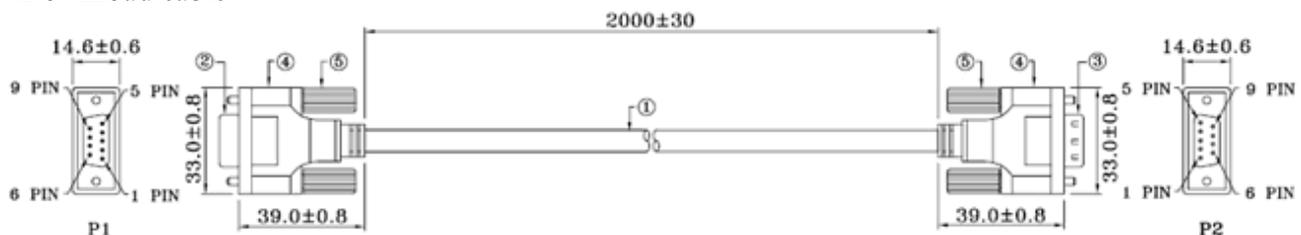
WIRE ARRANGEMENT		
P1	COLOR	P2
1	BLACK	1
2	BROWN	3
3	RED	2
4	ORANGE	4
5	YELLOW	5
6	GREEN	6
7	BLUE	7
8	PURPLE	8
9	GRAY	9
CASE	DRAIN WIRE	CASE

<pin assignment for this two end>

Pin	Description	Pin	Description
1	NC	2	RXD
3	TXD	4	NC
5	GND	6	NC
7	RTS	8	CTS
9	NC		
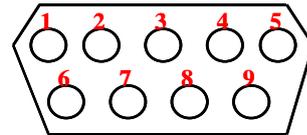
Interface Settings

RS-232 protocol	
Baud Rate	115200 bps (default) **Changeable settings in User OSD** **(9600/19200/38400/57600/115200)**
Data Length	8 bit
Parity Check	None
Stop Bit	1 bit
Flow Control	None

Software specification
1. Each input character will be echoed.
2. When give ASCII (13), it will echo 0x3E, 0x00. It means projector is ready to accept RS-232 command.
3. If no any command, it should echo 0x0D,0x0A,0x00 after 5 seconds.(5 sec time out)
4. If the command format is illegal, it will echo "Illegal format".

Command Category
Refer to Appendix 2

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Adjustment / Alignment Procedure

Content

1. Color Wheel Delay Alignment
2. Overfill adjustment
3. DMD Panel Alignment
4. PC Alignment Procedure
5. YUV Alignment Procedure

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1. Color Wheel Delay Alignment

(1)With Equipment:

Equipment:

- Battery Biased Silicon PIN Detector
- Oscilloscope (Vertical scale set to 10mV)
- Probe

Procedure:

1. Probe impedance matches 50 ohm

2. Open Factory OSD, and select color wheel delay item

3. Leave the image pure blue (DMD blue curtain)

4. Put the detector on the screen that blue image was projected.

5. Watch the oscilloscope and notice the square waveform

6. Use the "→" and "←" key to increment or decrement the color wheel delay value

7. No matter the waveform is square or not, let the waveform was lagged first.(see picture 1)

8. Then increment or decrement the value to let the waveform just to be square.(see picture 2)

9. Change to green curtain and check waveform again. If waveform is square (see picture 3), CW delay value is ok. If waveform is a little lag, then adjust CW value to let waveform square.

Picture 1

Picture 2

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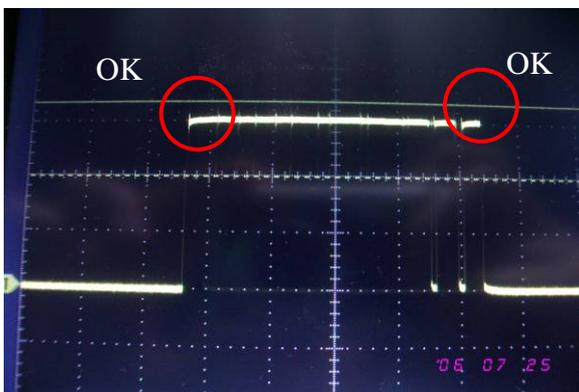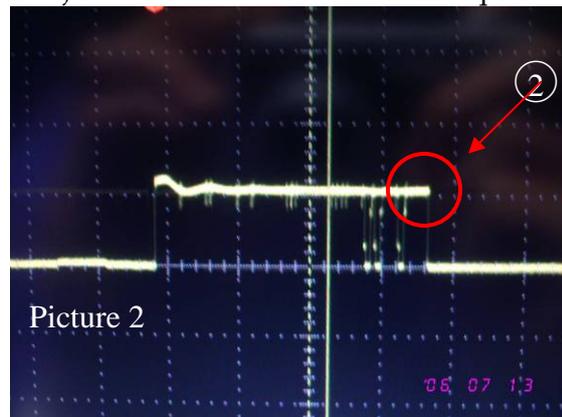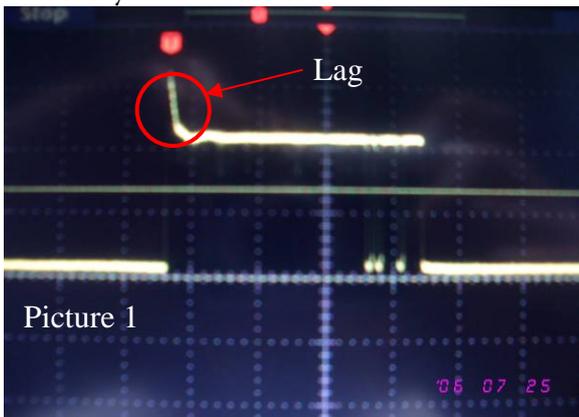
(2)Without Equipment:

Procedure:
1. Enter Factory Mode
2. Enter Block 1
3. Change CW Delay by adjusting the following gray pattern to smooth

32 Gray pattern
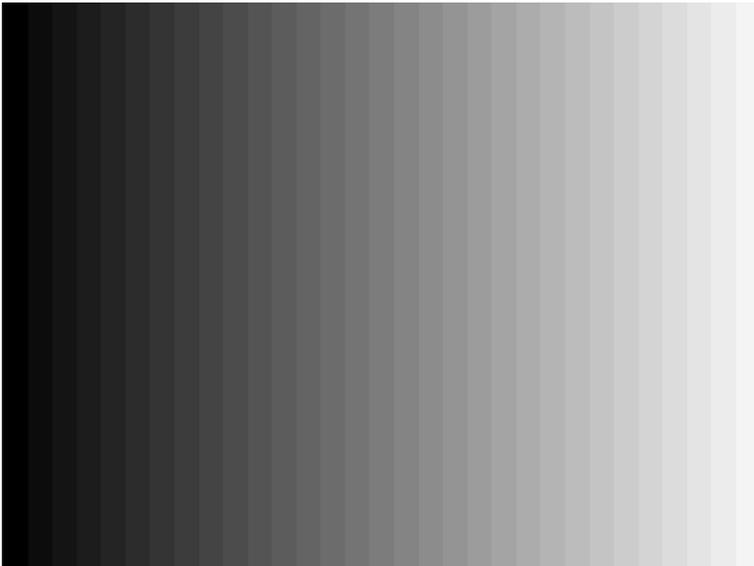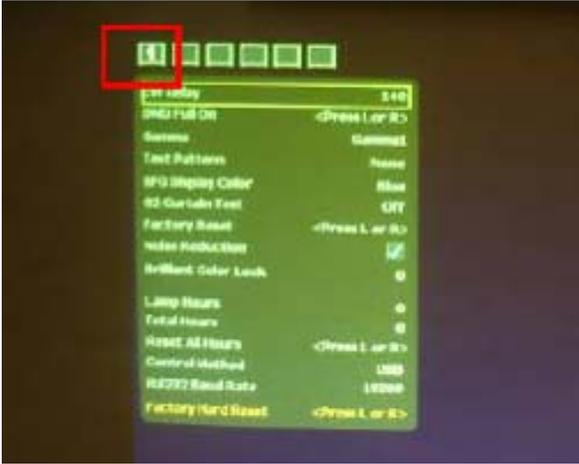
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2. Overfill adjustment

As the picture below, adjust light pipe to keep overfill image center.

明基電通　BenQ Corporation
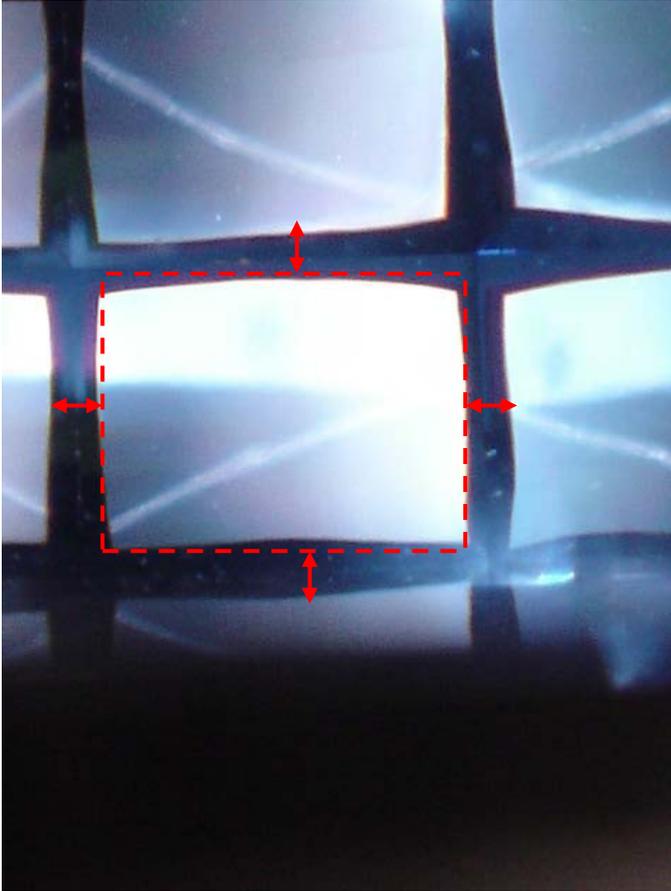
3. DMD Panel Alignment

Equipment:

-    Pattern Generator

Procedure:

1.   Connect power, Video signal into projector.

2.   Light on projector

3.   Change pattern generator to full white pattern.

4.   Watch the image if any pixel lost

5.   Change pattern to full black.

6.   Watch the image if any pixel lost

7.   Change pattern from full black to full white.

8.   Watch the image if any pixel can not return

9.   Change pattern from full black to full white.

10. Watch the image if any pixel can not return

11. If above 8 step has some pixel lost or can not return, it's DMD chip has pixel defect

12. Change to the Slid Line pattern

13. Watch the image if any pixel lost

14. If above step has some pixel lost, it's conductive socket has defect or assembly loosed.

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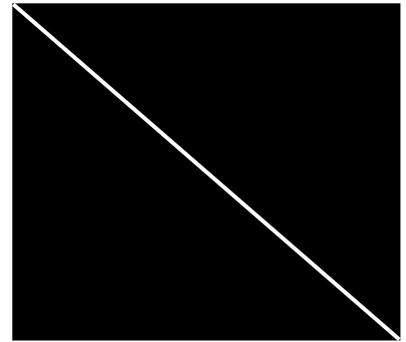
4. PC Alignment Procedure

Equipment:

- Pattern generator (Chroma-2250)

OSD Default value:

Item	Value
Cal R Offset	127
Cal G Offset	127
Cal B Offset	127
Cal R Gain	127
Cal G Gain	127
Cal B Gain	127
YPbPr R Offset	127
YPbPr B Offset	127

Procedure:

Gray Level:

1. Connect power, D-sub, into projector.

2. Change Timing and pattern of pattern generator:

3. Timing: 1024*768 @60Hz (XGA)

4. Pattern: As Figure1 {A near white color (240,240,240) and a near black color(16,16,16)}

5. Light on projector

6. Set user OSD values to default.

7. Enter factory mode.

8. Set Factory values to default.

9. Press "Calbration RGB" to let the black level to just distinguish, and the light output of white level to just max.

10. Check the 32 levels of gray. All steps must appear.

Figure1

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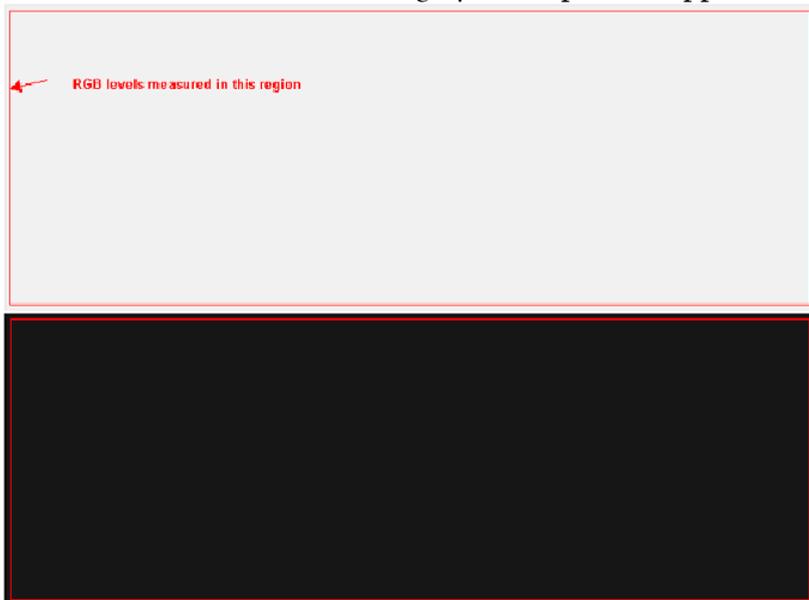
5. YUV Alignment Procedure

Equipment:

- Pattern generator (VG-828)

OSD Default value:

Item	Value
Cal R Offset	127
Cal G Offset	127
Cal B Offset	127
Cal R Gain	127
Cal G Gain	127
Cal B Gain	127
YPbPr R Offset	127
YPbPr B Offset	127

Procedure:

1. Connect power, YpbPr cable, into projector.

2. Change Timing and pattern of pattern generator:

   Timing: 480i
   Pattern: As Figure2

3. Light on projector

4. Adjust user OSD values to default.

5. Enter factory mode.

6. Adjust Factory values to default.

7. Press "Calibration YpbPr" to calibrate the mid level offset.

Figure2

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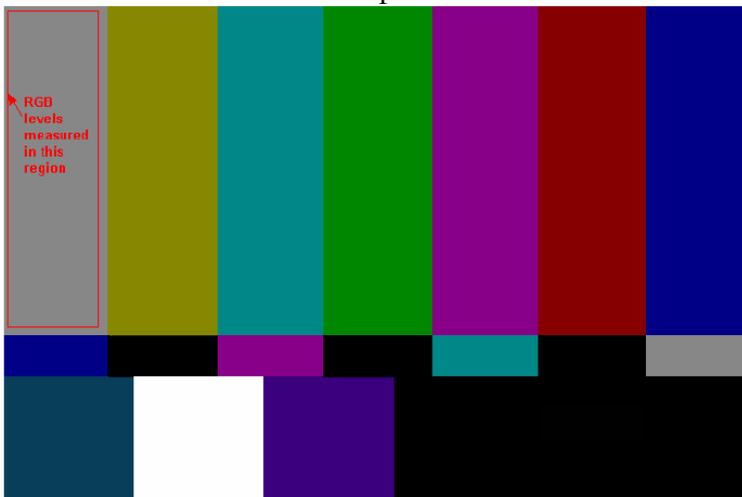
Level 2 Circuit Board and Standard Parts Replacement

Product Exploded View

Module 1 – Total Exploded View

18	ASSY OPT ENG	1
17	lamp box	1
16	mylar ballast	1
15	bkt blower	1
14	blower	1
13	POWER BD MP522	1
12	CASE INLET	1
11	CASE REAR	1
10	ASSY LAMP DOOR MP522	1
9	ASSSY LAMP MODULE	1
8	BALLAST	1
7	CASE OUTLET	1
6	FAN	1
5	ASSY FRONT CASE MP522	1
4	BKT MAIN BD SECC	1
3	MAIN BD MP522	1
2	SHIELD MAIN BD SPTE MP522	1
1	ASS UPPER CASE MP522	1
NO	Part Name	Quantity

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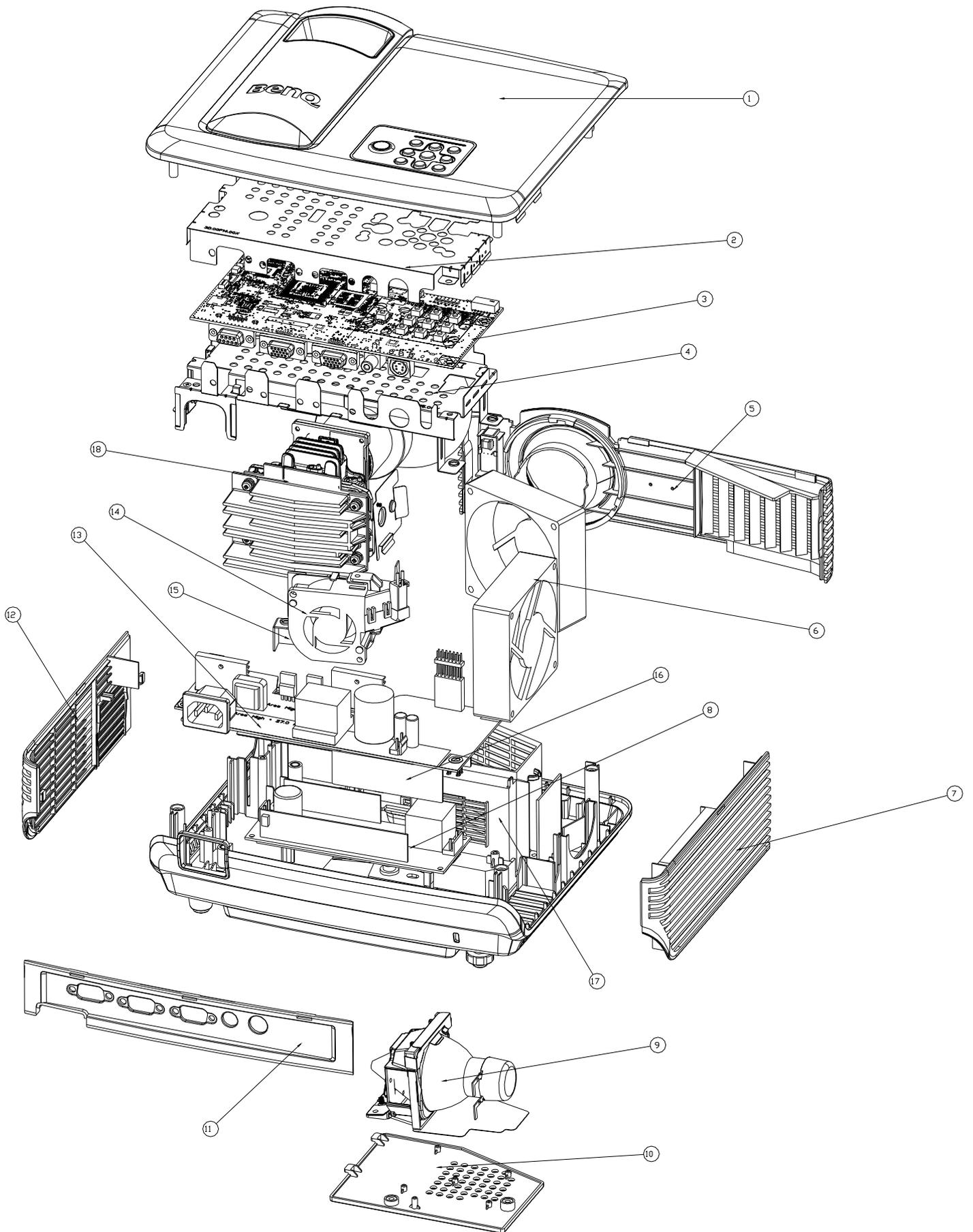
Module 2 – ASSY UPPER CASE

6	M3 SCRW 7L	1
5	KEY POWER ABS MP522	1
4	LED LENS	1
3	KEY PAD	1
2	Cover UC PC	1
1	UPPER CASE	1
NO	Part Name	Quantity

明基電通 BenQ Corporation
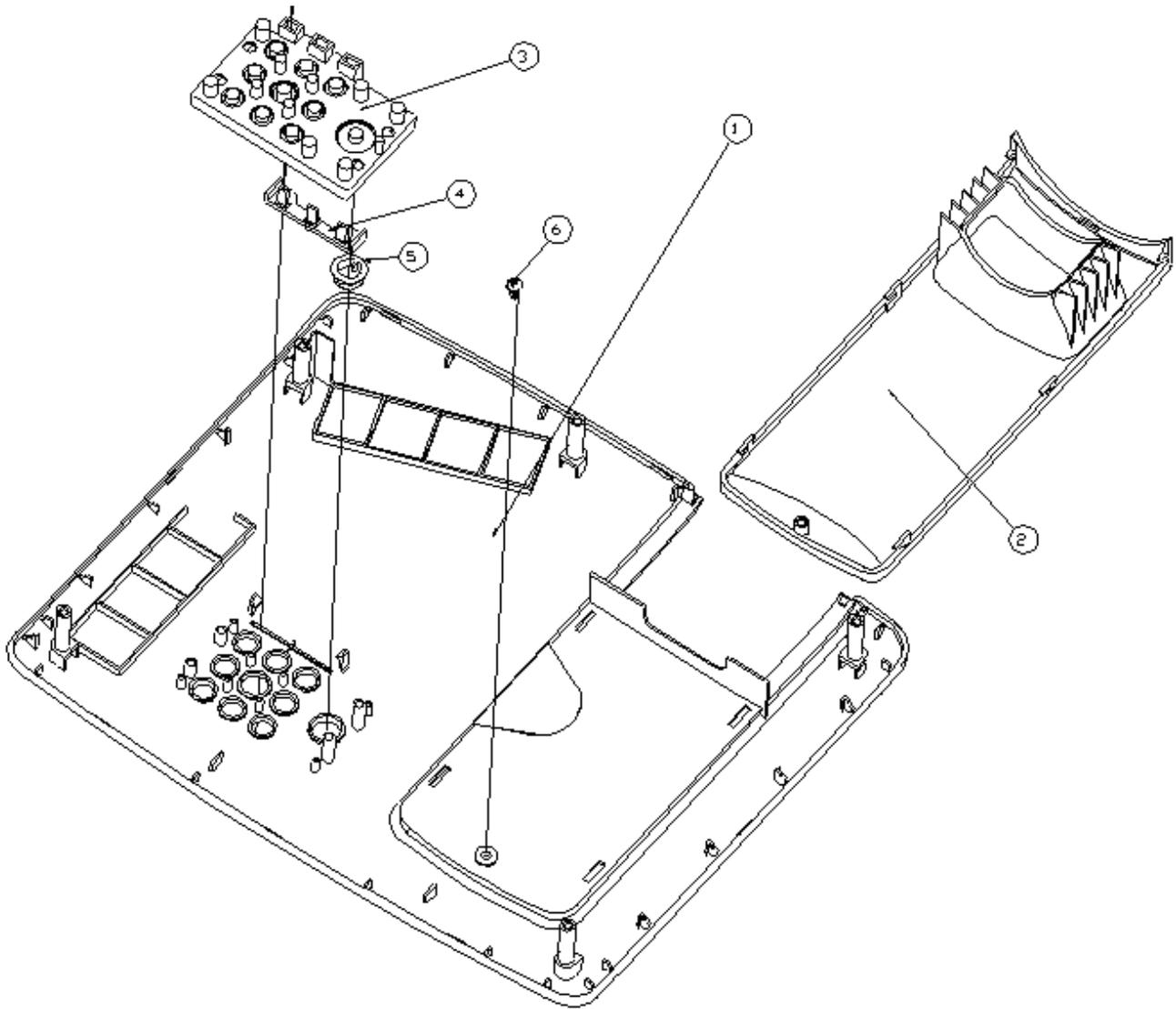
Module 3 – ASSY LOWER CASE

9	BTN PUSH	1
8	SPRING SLIDER SUS304 MP622	1
7	RUBBER	1
6	FOOT ADJFOOT PC MP622	1
5	FOOT REAR ADJUST RUBBER M610	1
4	RUBBER REAR	1
3	NUT HEX+WASHER M3▾2.3H NI	1
2	SECC 0.4 T	1
1	ASSY SUB LC	1
NO		Quantity

明基電通 BenQ Corporation
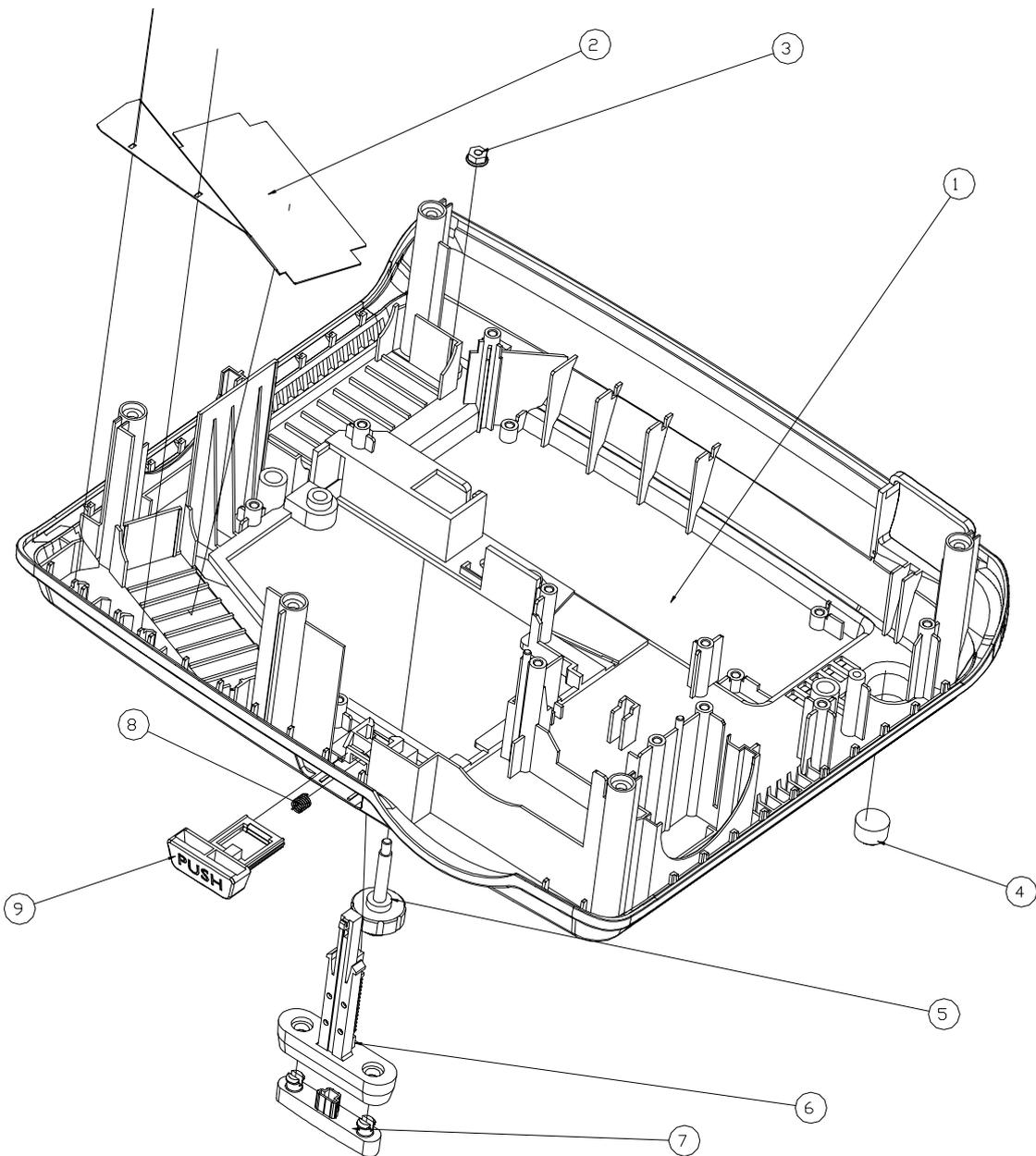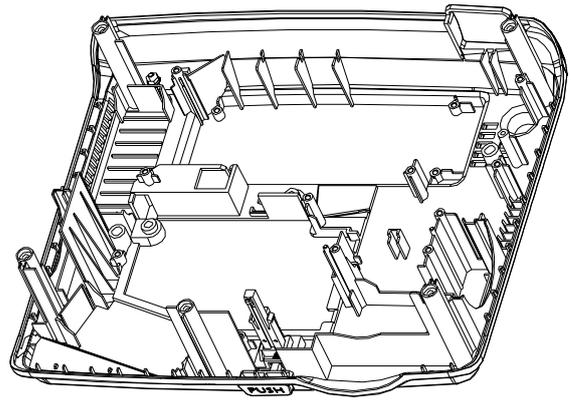
Module 4 – ASSY FRONT CASE

NO	Part Name	Quantity
4	IR BD	1
3	LENS IR FRONT PC	1
2	BENQ LOGO	1
1	CASE FRONT PC	1

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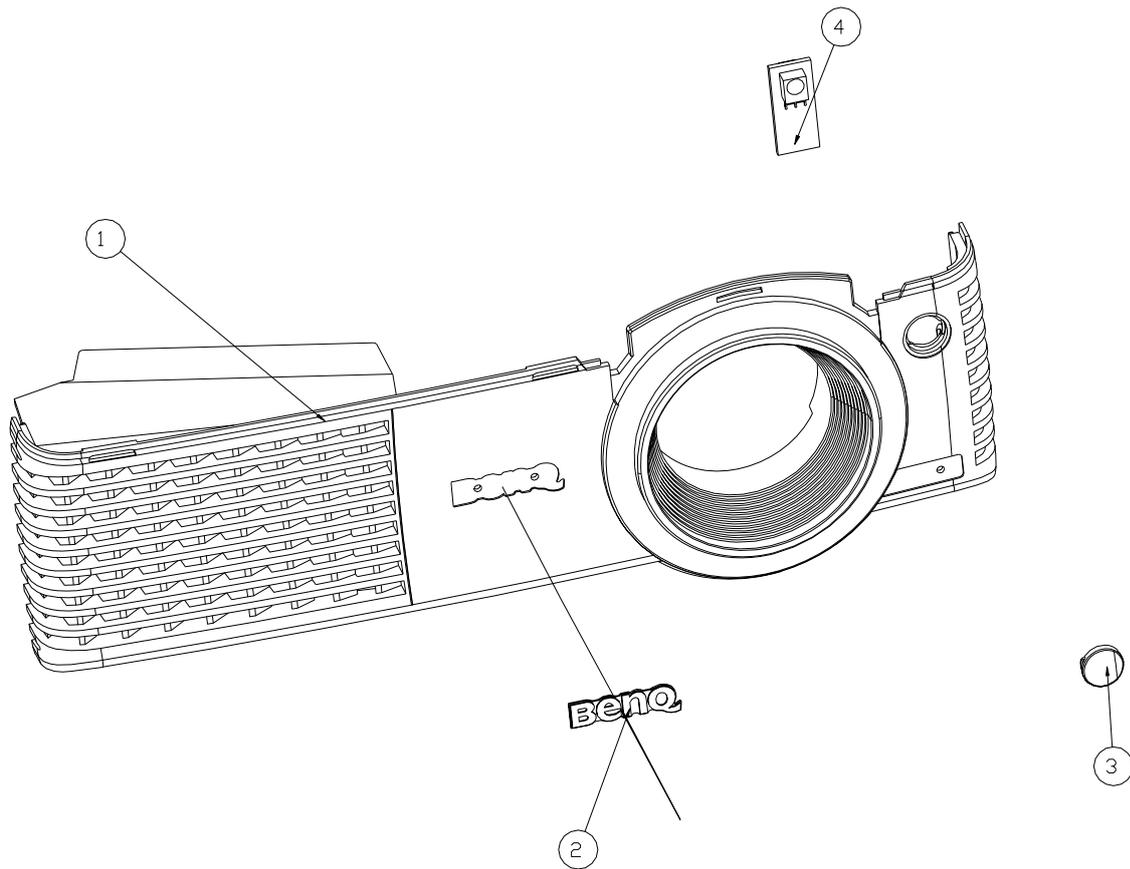
Product Disassembly / Assembly

MP522ST Dismantle SOP

Step	Discription		Tool
1	Disassemble the screw*5		screw driver
2	Take off the the IR sensor wire from mainboar, then take off upper case module, Notice : When taking off upper case module, don't draw the IR sensor wire in case of breaking.	 sponge*3 screw*1 keypad	
3	Take off the case left module and the front case module	 small sponge*2 big sponge*3 BENQ LOGO LENS IR FRONT FRONT IR BD SPONGE*2 RING FRONT upper case cover	
4	Disassemble the screw*6, and take off the rear case.	 rear case	screw driver
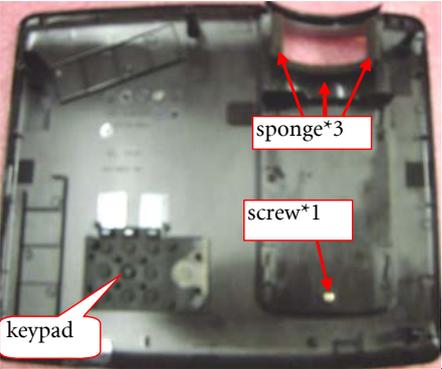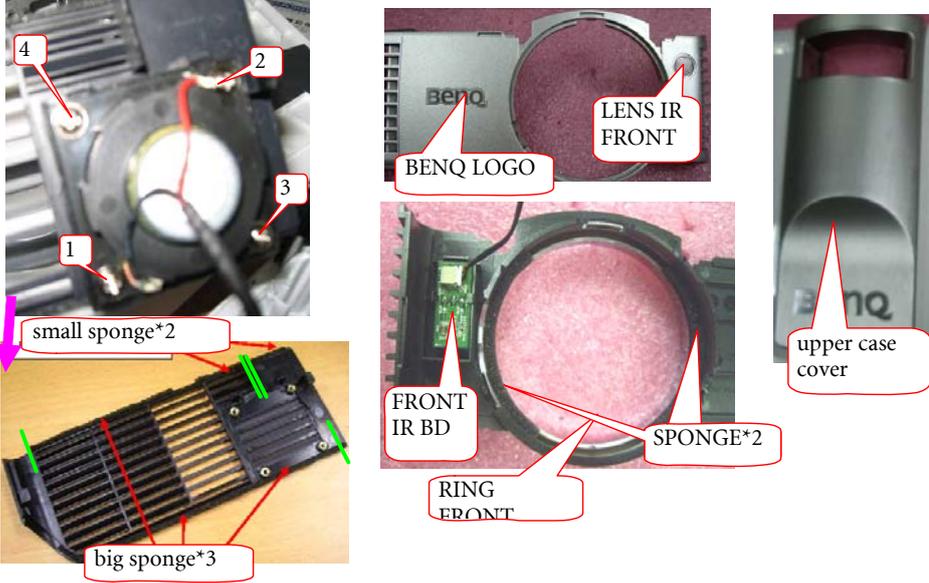
明基電通 BenQ Corporation
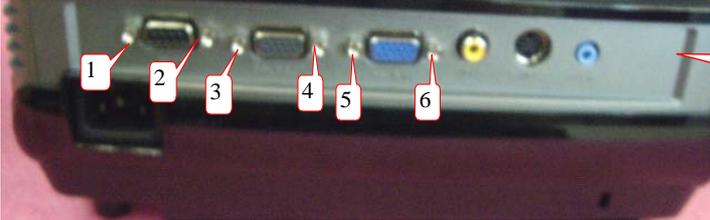
5	Disassemble the screw*5, and take off the M/B shielding.	screw*5	screw driver
6	(1)Take off the long wire (one of twin fan wire), then disassemble the twin fan. (2)Take off the twin fan wire from M/B.	take off this long wire first	twin fan	
7	Take off the C/W FPC wire、 blower fan wire、 C/W sensor wire、 Ballast 5-Pin wire 、 speaker wire form M/B ， take off right cass module	C/W sensor wire C/W FPC wire blower fan wire speaker wire Ballast 5Pin wire	screw driver
8	Take off the M/B and MB SPG-RCA PBR		screw driver
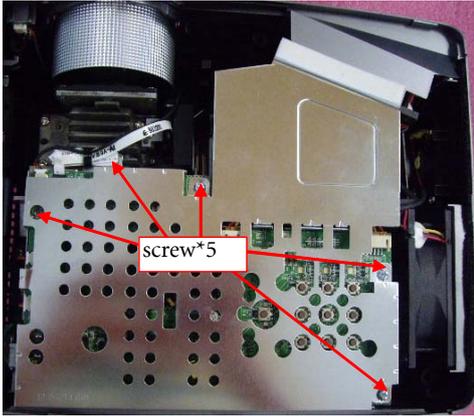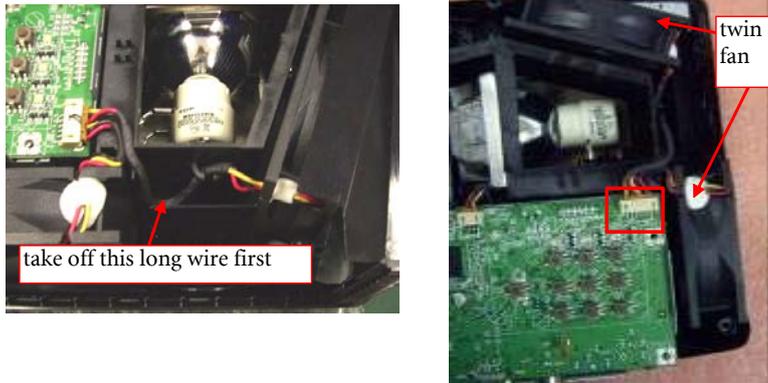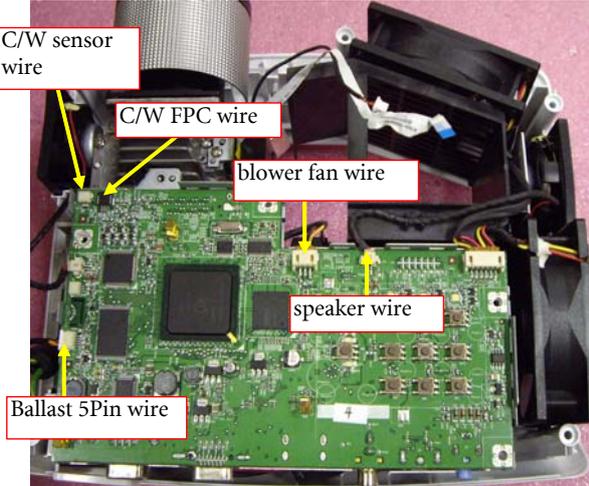
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9	(1)Disassemble the screw*2, and take off the lamp door. (2)Disassemble the screw*1 and lamp wire, and take off the lamp module.	screw*1	screw driver
10	(1)Disassemble the screw*3. (2)Disassemble the grounding screw*1, and take off the Power B/D SHD.	grounding screw *1	screw driver
11	Disassemble the wire*2 and screw*1, and take off the power BD and ballast Mylar.	screw*1 / blower fan's thermal wire / ballast wire	screw driver
12	(1)Disassemble the screw*2, and take off the lamp box. (2)Disassembly the screw*2, and take off the blower fan	screw*1	screw driver
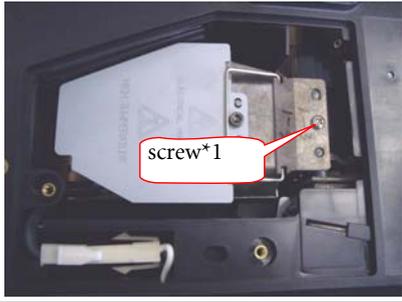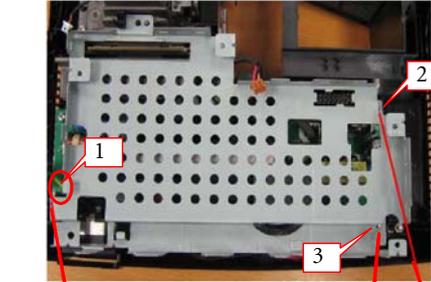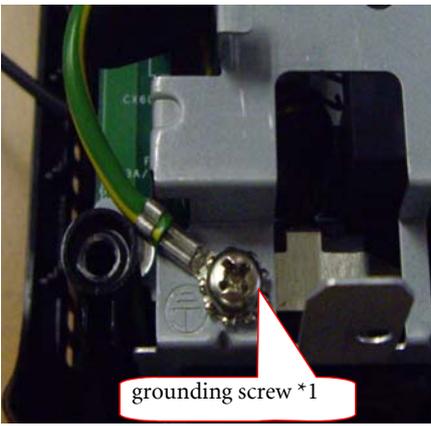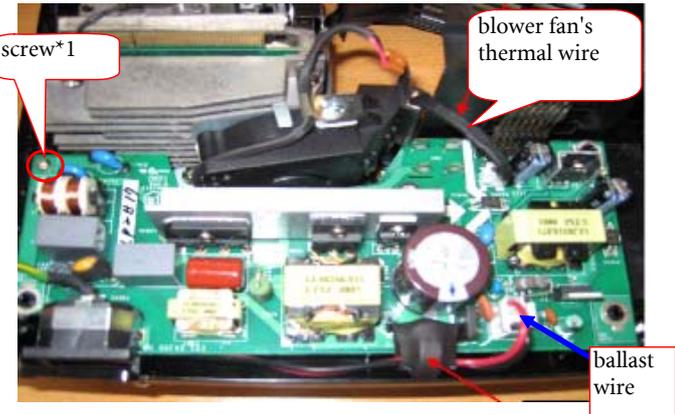
明基電通　BenQ Corporation
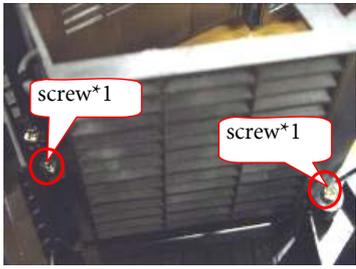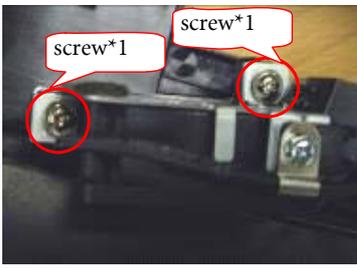
13	Disassemble the screw*3, and take off the OPT eng .		screw driver
14	Disassemble the screw*2, the ballast BD, and wire*3.		screw driver
15	(1)Take off the push button . (2)Disassemble the screw*3 .		screw driver
16	(1)Take off the gasket*2. (2)Disassemble the ring focus		screw driver
17	Take off th LENS screw*4 and FRAME LENS screw*3		screw driver
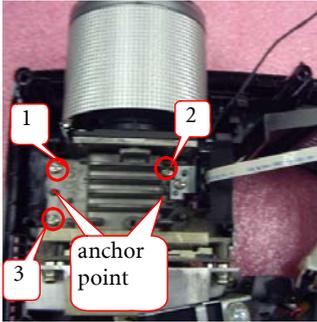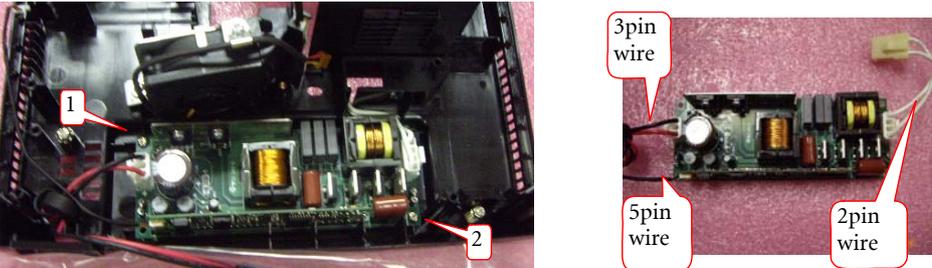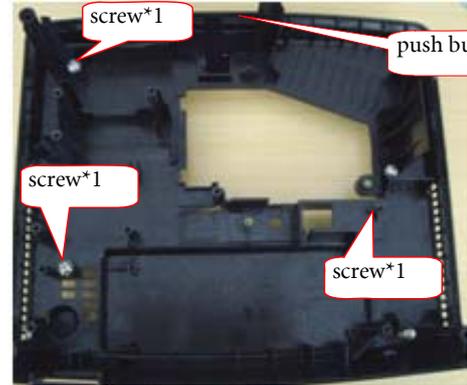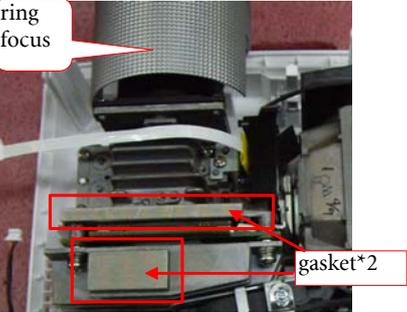
明基電通 BenQ Corporation
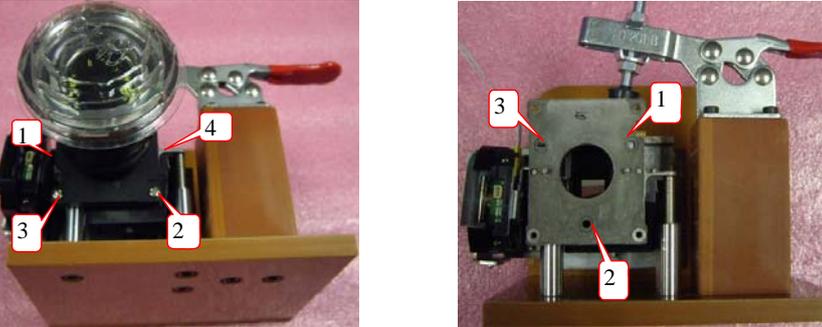
18	Disassemble the screw*4, and take off the HSINK and DMD chip with Chip BD.		screw driver
19	(1)Disassemble the baffle DMD. (2)Disassemble the screw*3 and take off the CW module.		screw driver
20	Rotate to open the switch on socket, and take off the DMD chip.		screw driver
21	(1)Disassemble ILL module(screw*2). (2)Take off screw*1, FM holder, fold mirror, FM clip*2, clip CM front, clip CM side and sponge.		screw driver
22	(1)Disassembly the screw*2. (2)Take off the LP module and LP screw*2.		screw driver
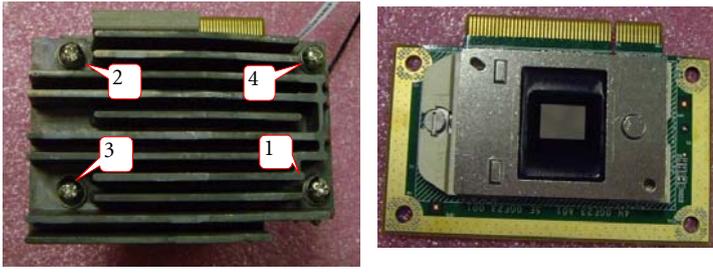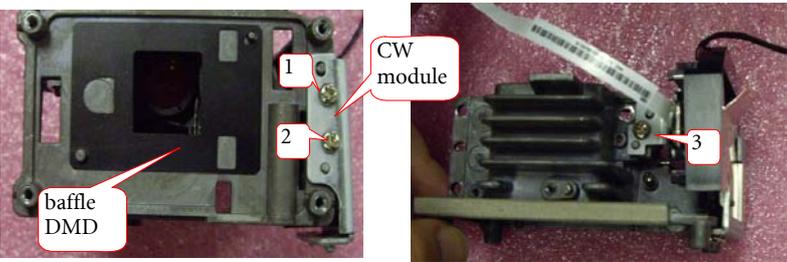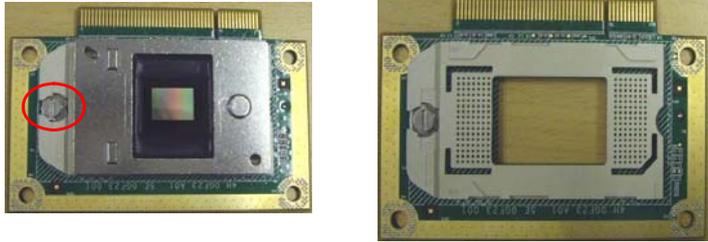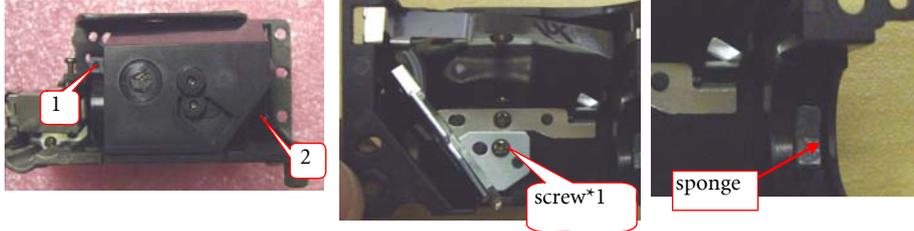
52　明基電通　BenQ Corporation
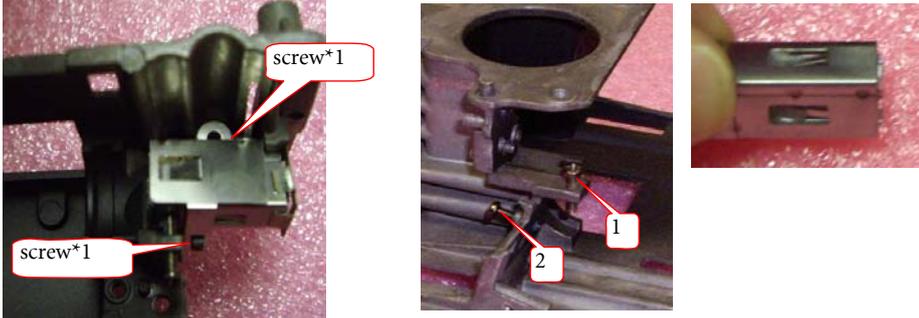
Module Assembly Key Point - Optical Engine

1. Assembly Lamp module:

1.1 Washer, Screw, Mesh and Fin Assembly

   I.   Assemble Washer and Screw to the HLD Lamp (Figure1-1).

   II. Assemble "MESH" with Lamp holder .Mesh hooks HLD Lamp first (Figure1-2) and press it assemble to the right position (Figure1-3).

   III. Assemble "FIN" with Lamp holder and lock screw well (Figure 1-4).

8F.1A554.4R0
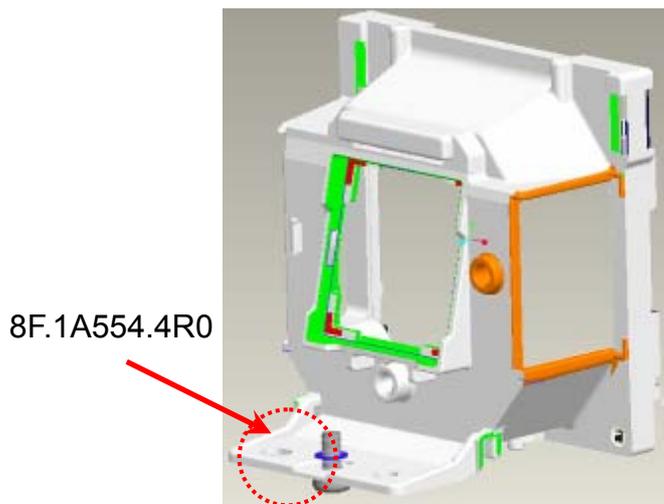
Fig. 1-1

Fig. 1-2

Fig. 1-3

Fig. 1-4

8F.1A554.4R0
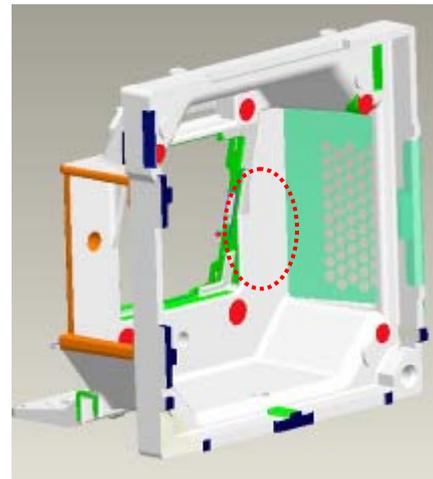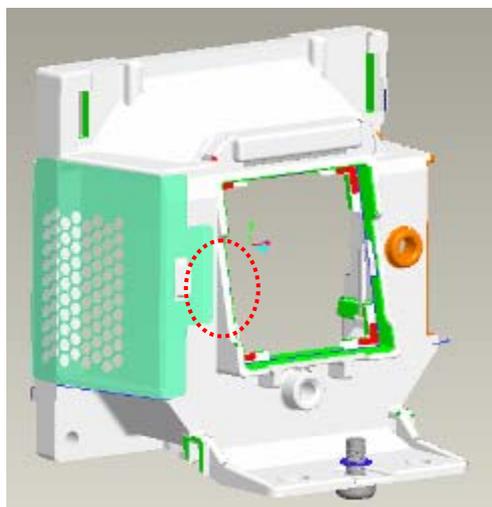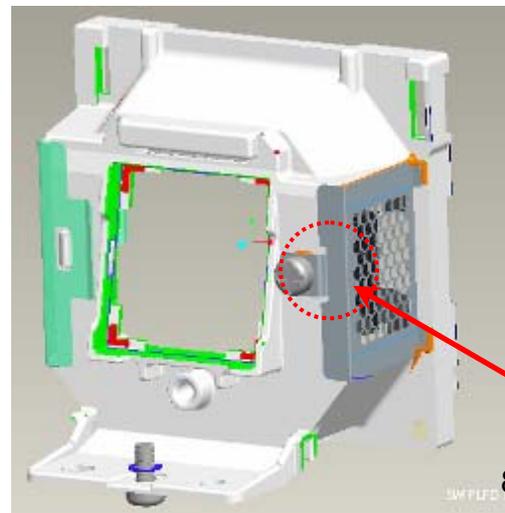
1.2 Front Glass Assembly.

   i.   Front Glass UV coated surface (marked) must face to Lamp. (Figure 1-6)

   ii. F/G must be placed on datum surfaces well. (Figure 1-7)

   iii. To make sure F/G Clip inserts with HLD lamp and lock screw well. (Figure 1-8,1-9)

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Fig. 1-6

F/G datum

Fig. 1-7

Insert to HLD Lamp
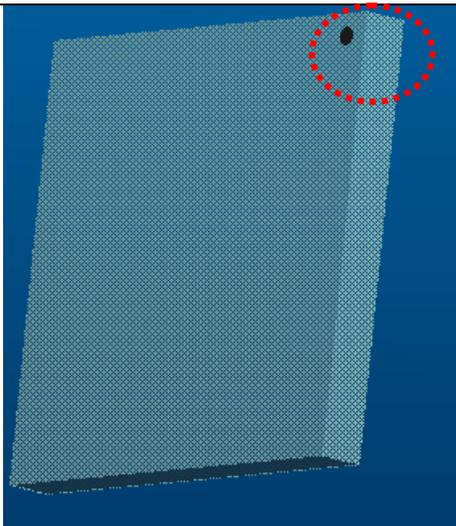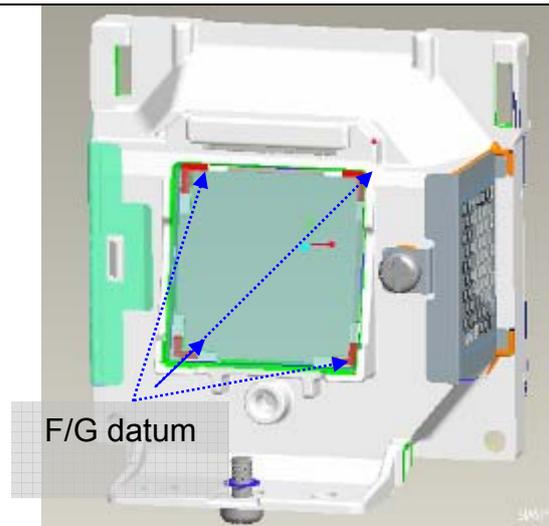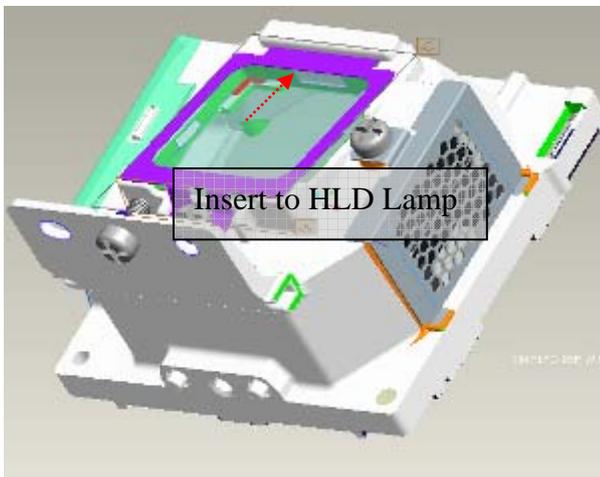
Fig. 1-8
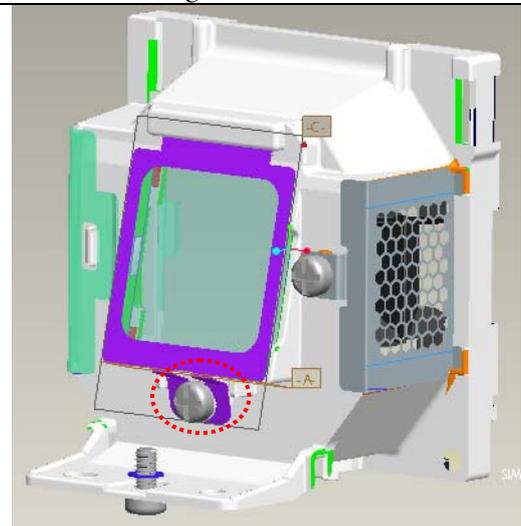
Fig. 1-9

1.3 Lamp Wire Arrangement

I. Lamp Wire arrangement have to look likes as below(Figure 1-11)

II. Bending Angle have to face to backside of Lamp(Figure 1-12)

Short Wire
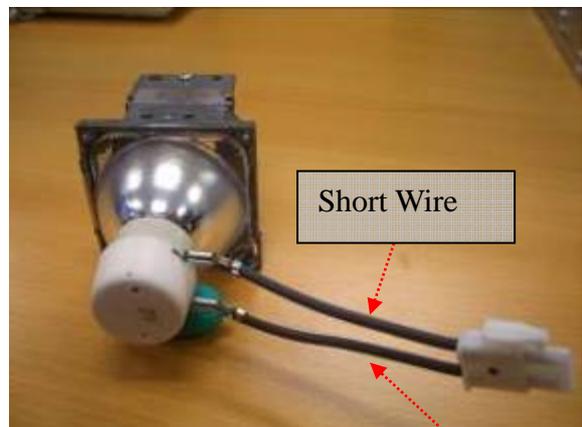
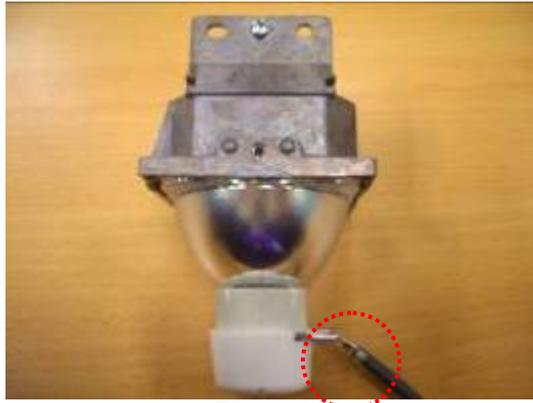Long Wire

Fig. 1-10

Short Wire

Long Wire

Fig. 1-11

54
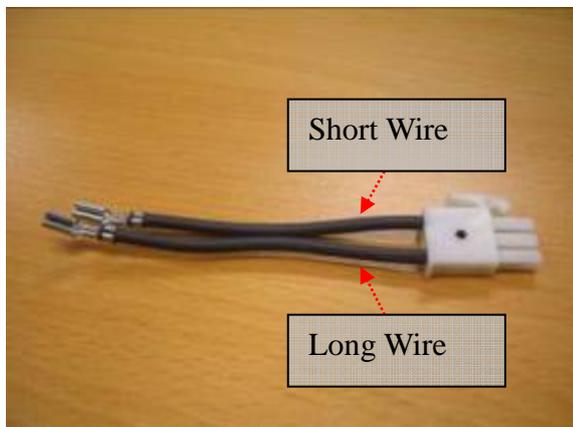
Fig. 1-12

1.4 Lamp Assembly.

    i.   Lamp Assembly sequence look likes below:

        (A) Insert lamp into HLD Lamp Lamp and touch to the Mesh Lamp (Fig. 1-13).

        (B) Push lamp slightly to the right side (Fig. 1-13).

        (C) Then push Lamp forward to touch DTM Lamp of HLD Lamp (Fig. 1-13).

    ii.   Insert Lamp into HLD Lamp Lamp and push Lamp forward to touch DTM Lamp of HLD Lamp (Fig. 1-13).

    iii.   To make sure that three datum contact with the lamp well (Fig. 1-14).

    iv.   Assemble Clips Lamp to HLD Lamp and lock screws (Fig. 1-15).

    v.   Hook "Clip Up Lamp" on the HLD Lamp to fix Lamp last (Fig. 1-16).

    vi.   Check assembly again and make sure the three datum contact with the lamp.

    vii.   Assemble Clip Plate to HLD Lamp and breach is located on top of terminal then lock screw (Fig. 1-17).

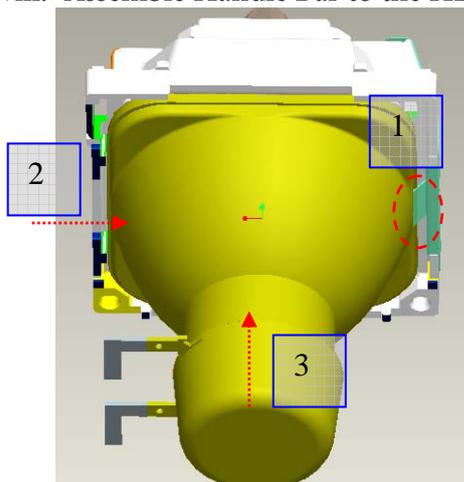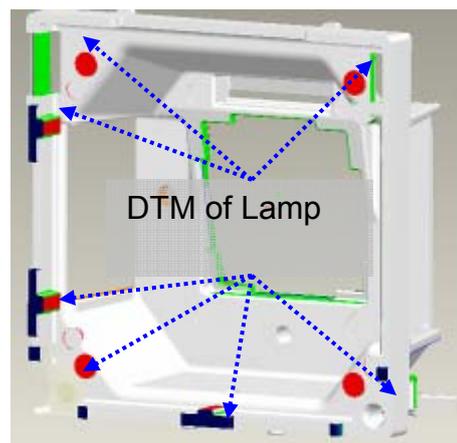   viii.   Assemble Handle Bar to the HLD Lamp and fixed on the screw (Fig. 1-18).

Fig. 1-13

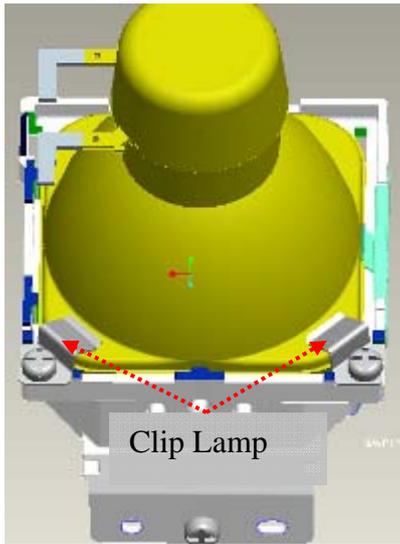

Fig. 1-14

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Clip Up Lamp

Clip Lamp

Fig. 1-15

Fig.1-16
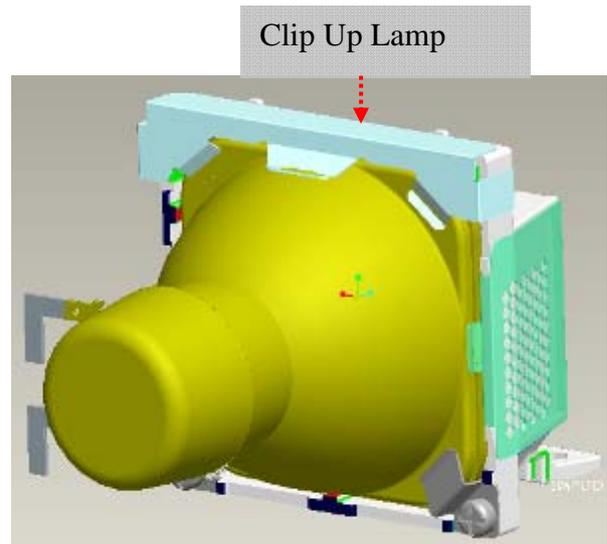
ELECTRICAL HAZARD
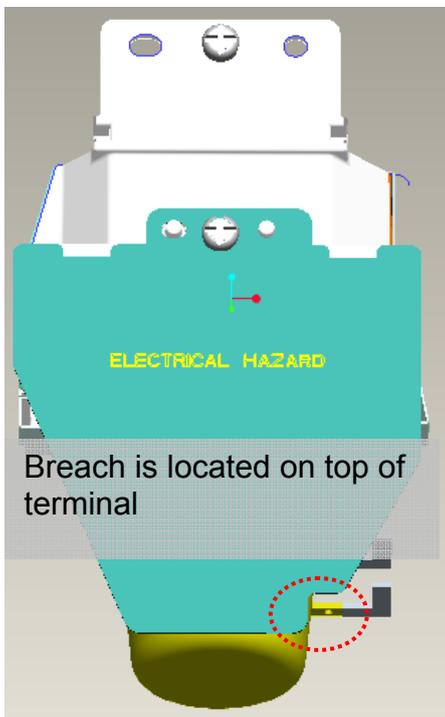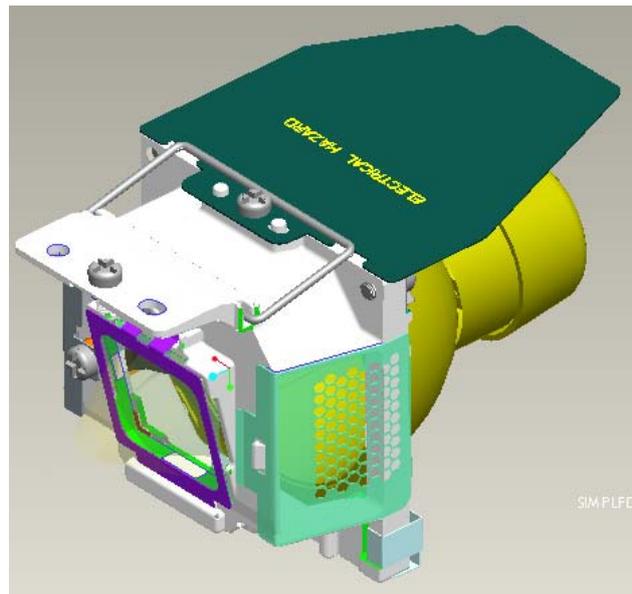
Breach is located on top of terminal

Fig.1-17

Fig.1-18

2. BKT Link Lamp and CW Shield Assembly:

2.1 Insert "CW Shield" and hook "BKT Link Lamp"(Fig. 2-1).
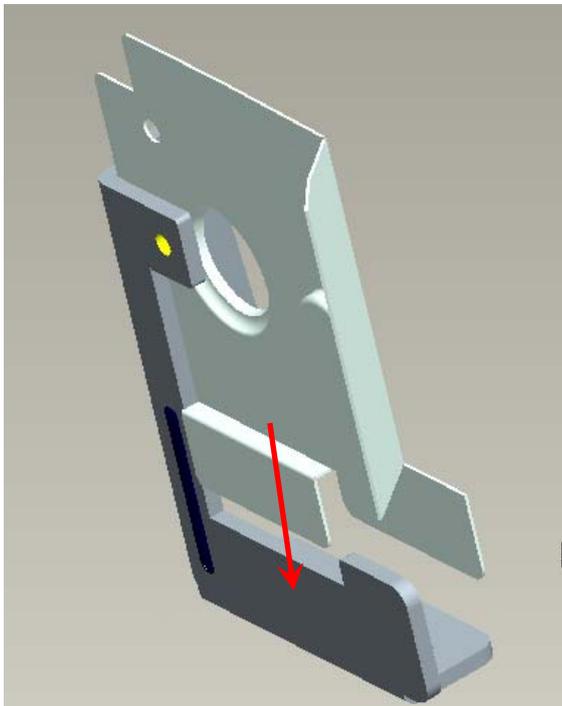
2.2 Lock Screw well (Fig. 2-2).

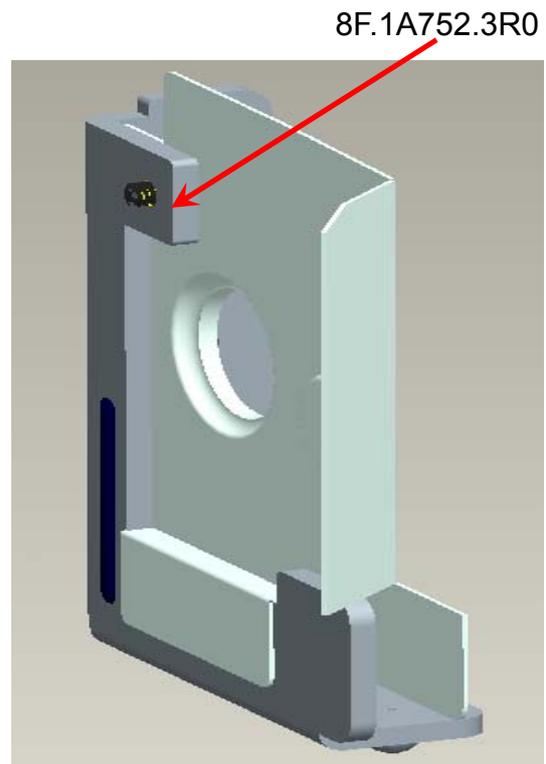8F.1A752.3R0

Fig. 2-1

Fig. 2-2

3. Assembly CW Module:

3.1 CW Module Assembly Sequence as blow (Fig. 3-1, Fig. 3-2):

    (1) BKT CW (2) Damper CW (3) CW (4) Screw (8F.00345.5R6) (5) Sensor Board

    (6) Screw (8F.1A752.3R0)   (7) CW CVR   (8) Screw (8F.1A752.3R0).
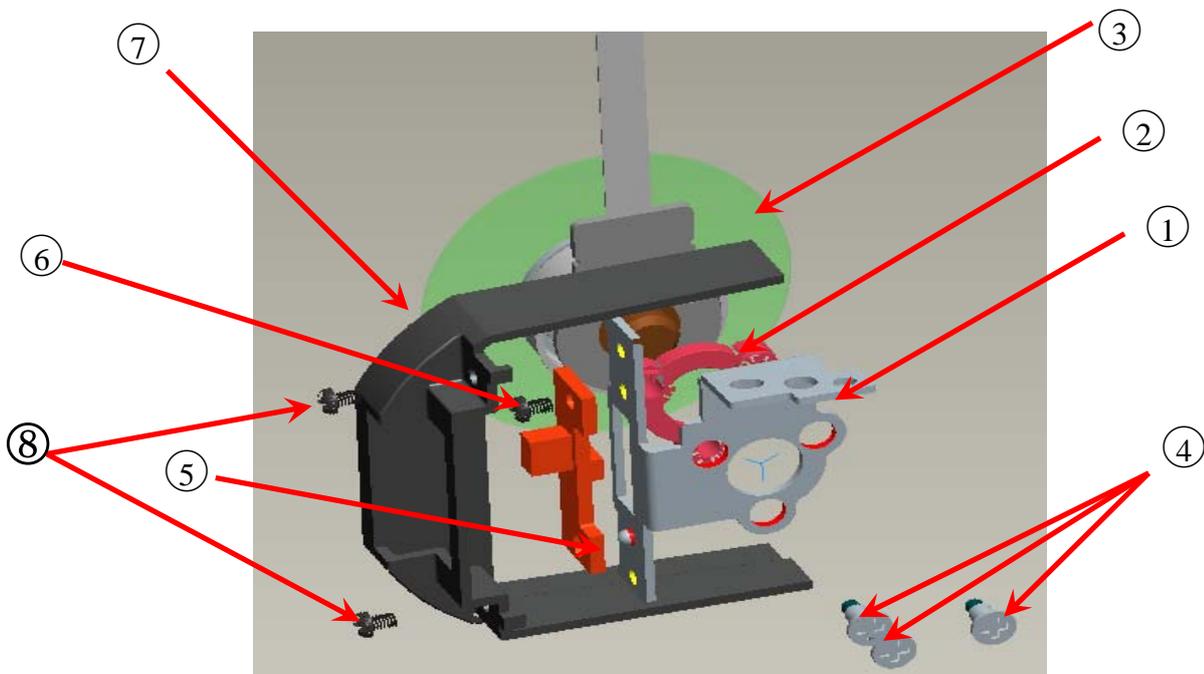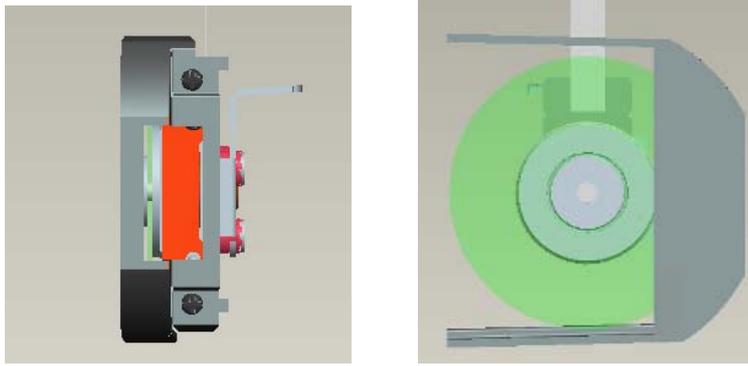

Fig. 3-1

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Fig. 3-2

4. Assembly LP module:

4.1 LP must datum well with "BKT_LP" show as Fig. 4-1.

4.2 Referring to Fig. 4-2, it must be visible clearance between "BKT_LP" and "LP Opening" after assembling.
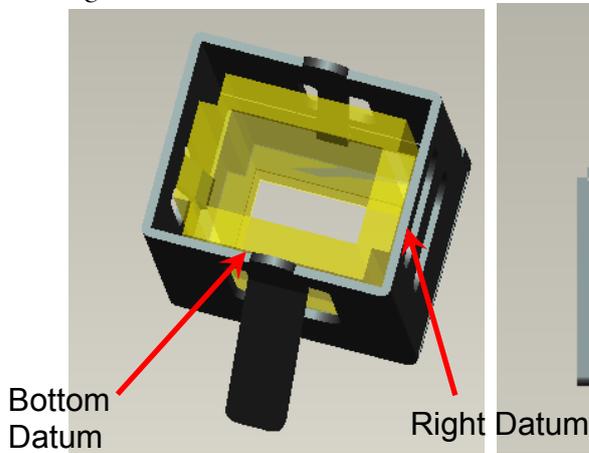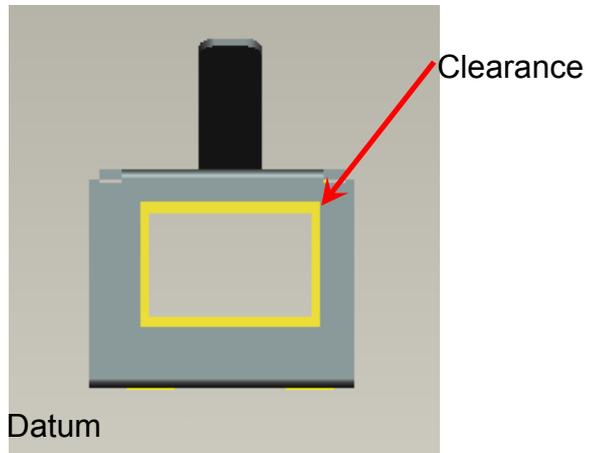
Fig. 4-1   Fig. 4-2

4.3 Glue "LP" and "BKT_LP" with "UV5503 Glue" at two opening of "BKT_LP" show in Fig. 4-3.

4.4 UV-5503 Glue curing process and concerns:

    i.   The UV-glue must fill up the whole opening area (shown in Fig. 4-3) to contact well with LP surfaces and "BKT_LP".

    ii.   Exposed to visible light at 350 ~ 420nm(at least 100mW/cm2) wavelength for 1 minute.

    iii.   After curing, the height of UV-glue should not exceed BKT_LP for more than 0.6mm.

Fig. 4-3

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4.5 Assembly LP Module to HSG DMD

    i. Assembly two Overfill adjustment screws (8F.1A752.8R0) to HSG DMD (Fig. 4-4).
      ** Adjustment criteria refer to below item 4.6.

    ii. Assembly "Clip LP" and lock with screw well (Fig. 4-5).

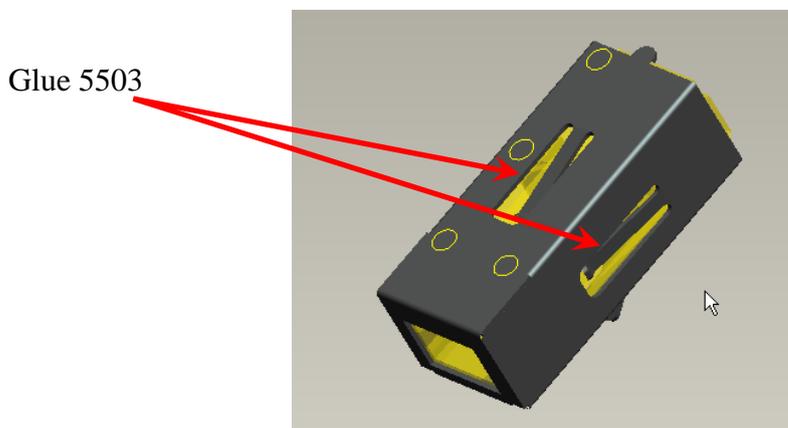   iii. Press CLIP of BKT_LP first, and then push it into the hole (Fig. 4-6).

    iv. Placed LP Module on LP datum of "DMD HSG" and adjustment screw well, shown (Fig.4-7).

    v. Assembly "Baffle LP" first (Fig. 4-8-1) & push "Baffle LP" to hook DMD HSG, and then lock with screw well (Fig. 4-8-2).

4.6 Overfill Adjustment @ LP Module

Overfill Adjustment Criteria:

    i. Pre-assembly 2 adjusting screws. Criteria shown as Fig.4-9.

    ii. Alignment Sequence:

    a. To adjust "Horizontal Adjustment Screw" firstly, and then "Vertical Adjustment Screw".

    b. Refer to Fig. 4-9.

For Overfill Re-adjustment:

    a. Those 2 Adjustment Screws must be released closely to the "Pre-assembly" positions first (defined in 4.6).

    b. Follow adjustment steps shown in Item 4.6-ii.

Fig. 4-4

Fig. 4-5

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1. Press down the Clip

2. Insert the LP Module

Fig. 4-6

LP Datum of DMD HSG

Overfill adjustment screws

Fig. 4-7

1. Place Clips on BKT surface

3. Lock screw 8F.1A752.3R0

2. Push Baffle LP to hook DMD HSG

Fig. 4-8-1

Fig. 4-8-2

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Pre assemble this screw not over the side surface.

Pre assemble this screw not over the bottom surface.
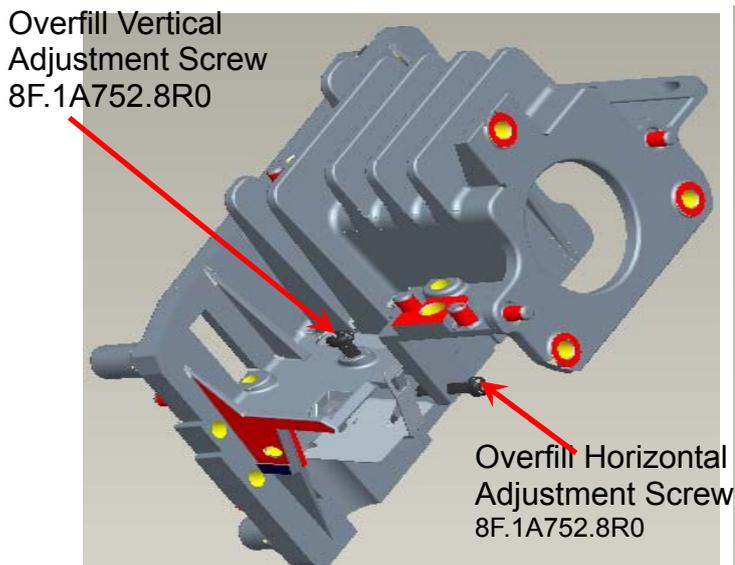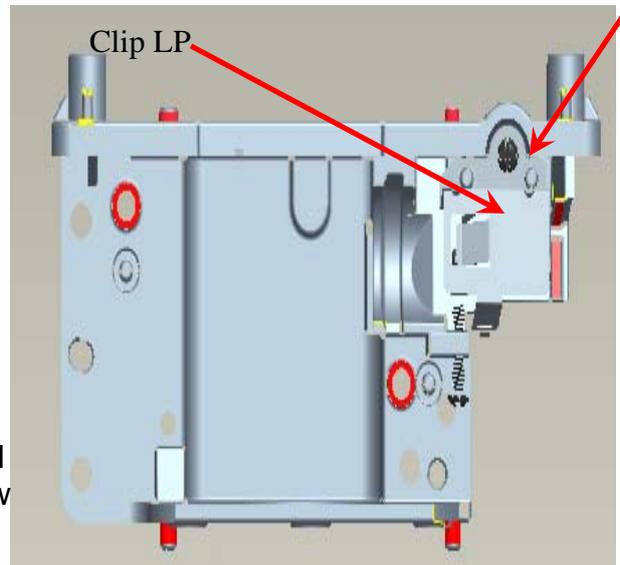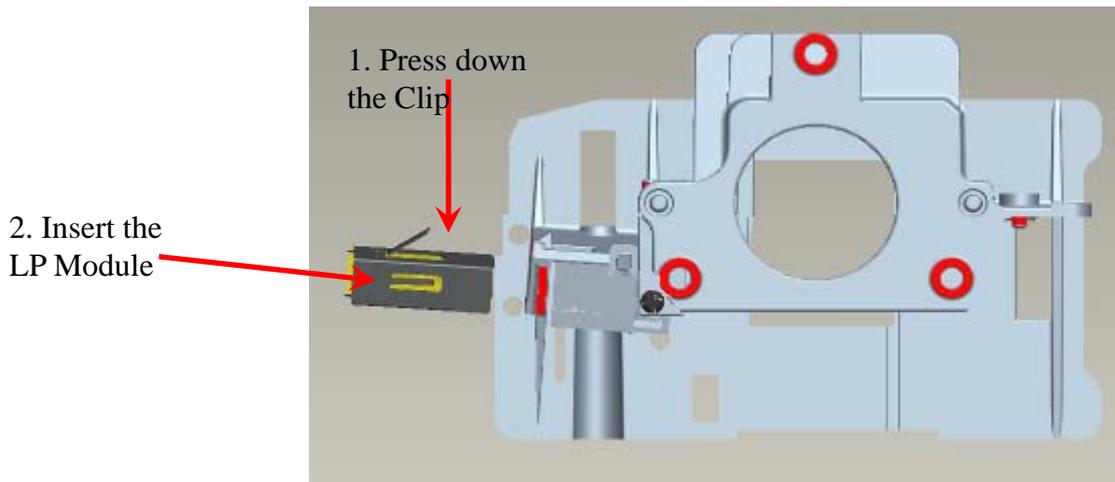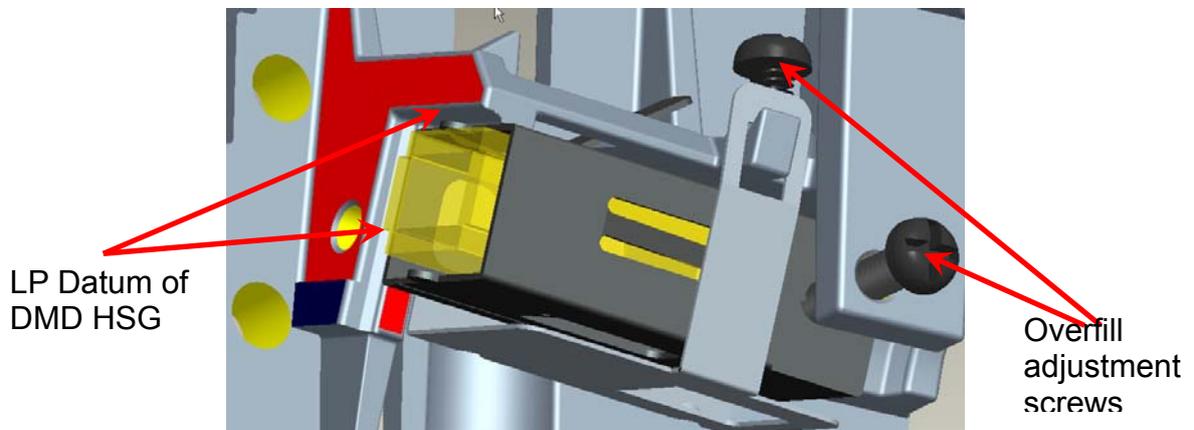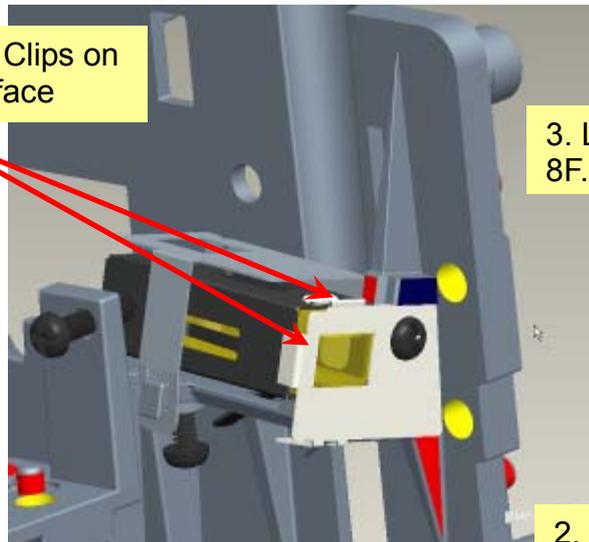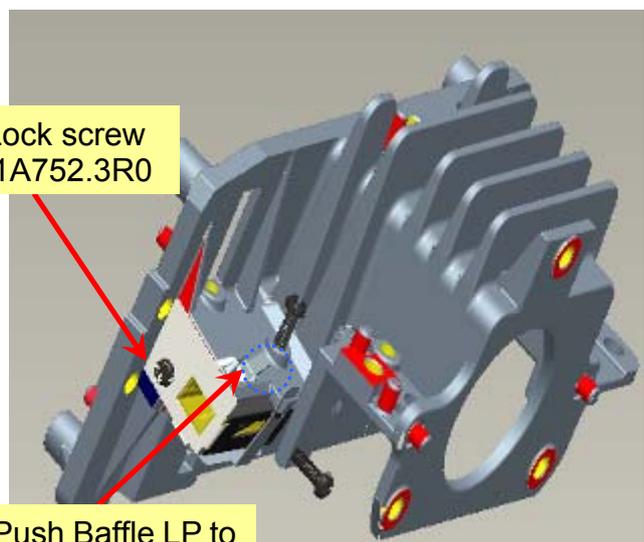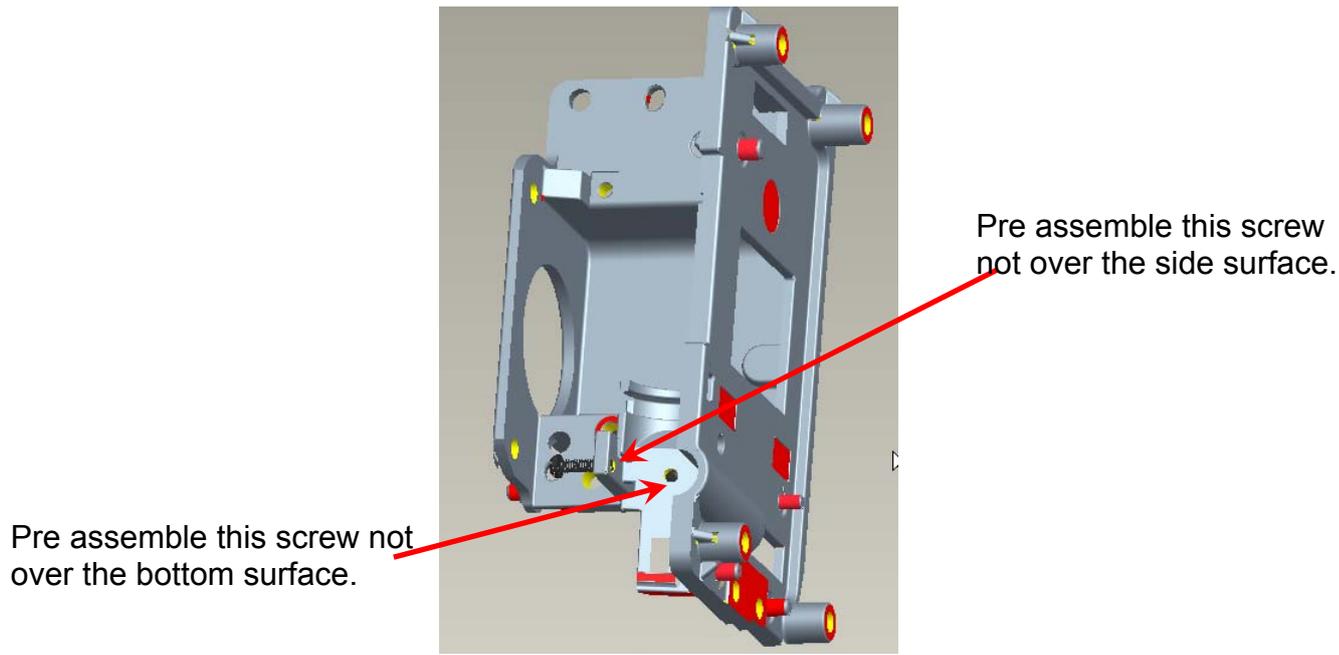
Fig. 4-9

5. Assembly FM Module:
5.1 Place FM on "HLD FM" surface(Fig. 5-1) and use "Clip FM" to fix FM(Fig. 5-2).

Touch the side surface

Clip FM hook the punch points

Fig. 5-1   Fig. 5-2

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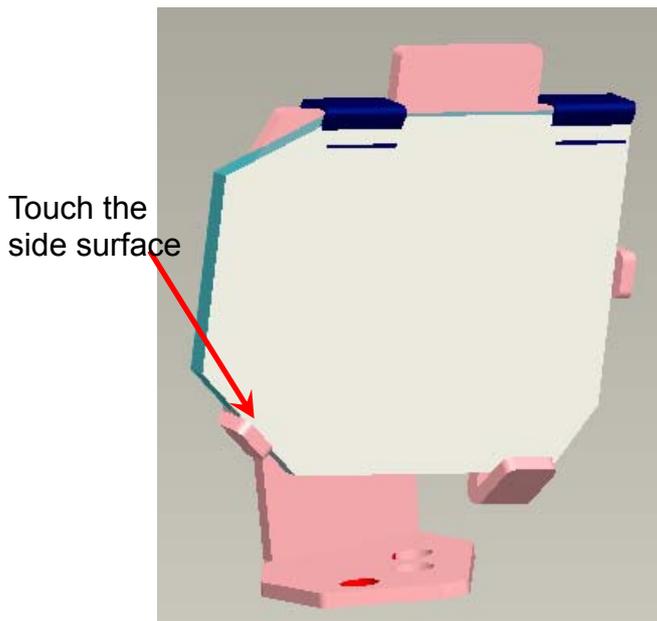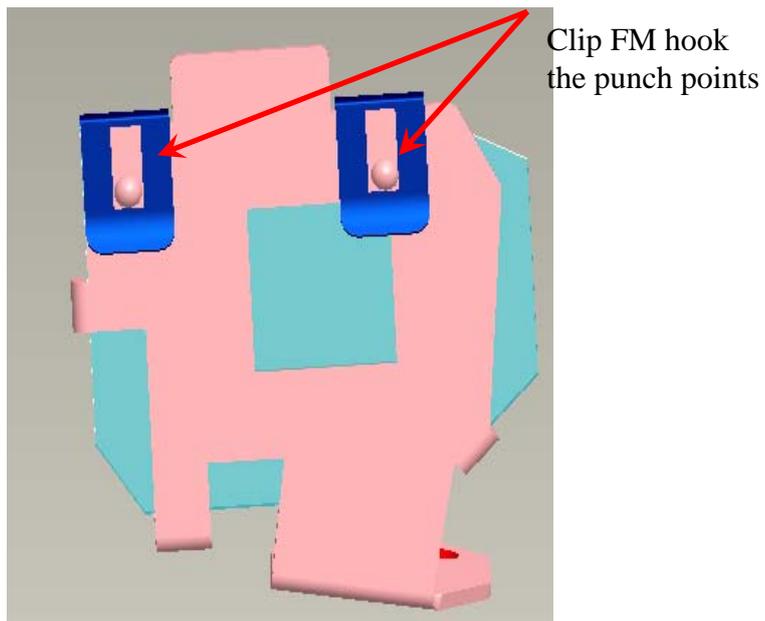
6. Assembly HSG ILL Module:

6.1 CM Assembly

    I.   Insert "Clip CM Side" first, and then place "Clip Front CM" to fixed-shaft of ILL SUB before locking screw (Fig. 6-1, Fig. 6-2).

    II.   Assemble CM to HSG ILL and to make CM contact three datum on the HSG ILL Well (Fig. 6-3).

    III. Assemble "CLIP TOP CM" (with forceps) to the "HSG IL" (Fig. 6-4,).

    IV. To check and make sure "CLIP of CM" hooks the HSG ILL very Well (Fig. 6-5).

    V.   Paste "Sponge tube AL" on cannelure of" HSG ILL" (Fig. 6-6).

6.2 FM Module Assembly

    I.   FM Module must be placed to fixed shaft and on the datum surface of "ILL SUB" and then lock with screw well (Fig. 6-7).

Fig. 6-1

Fig. 6-2

Fig. 6-3

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Clip UP CM

Fig. 6-4

Fig. 6-5

Sponge

Fig. 6-6

Fig. 6-7

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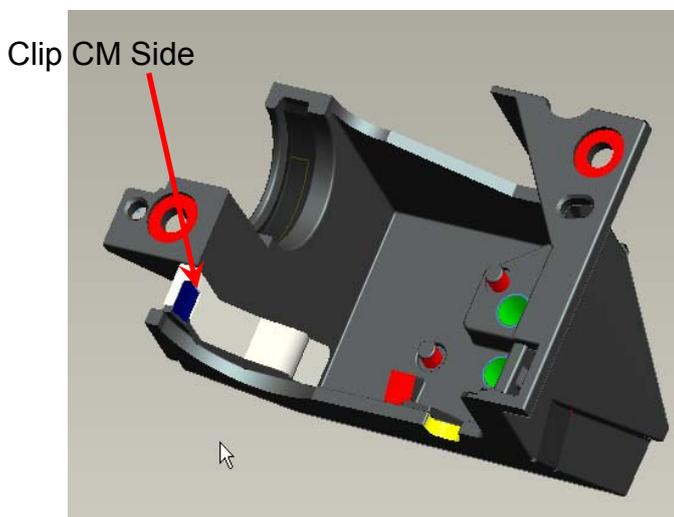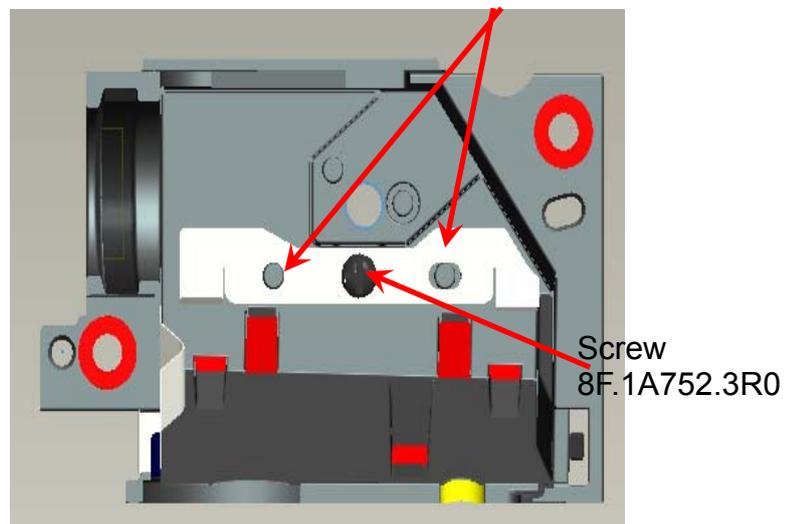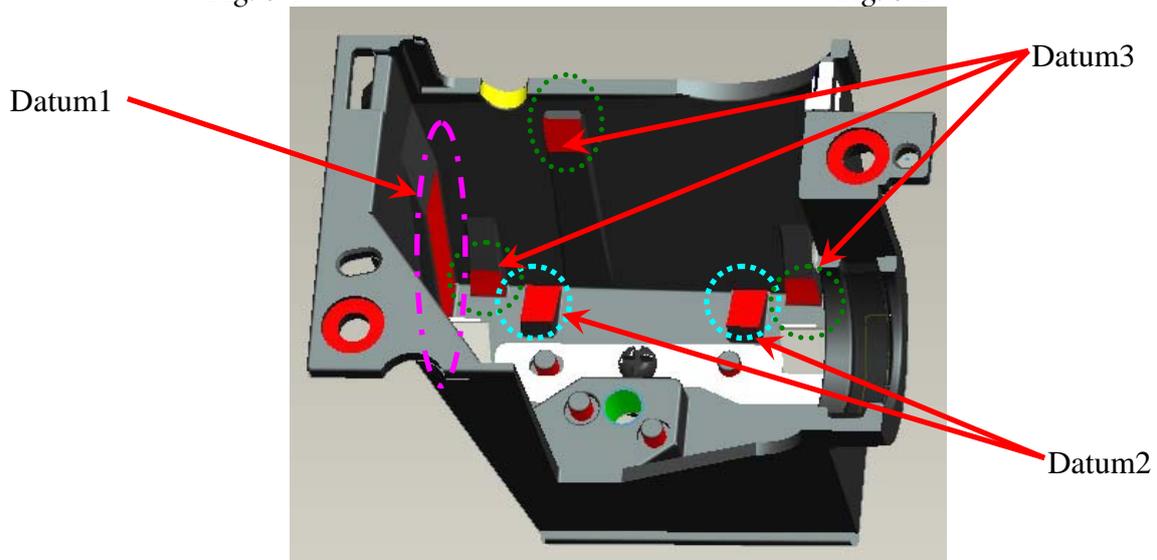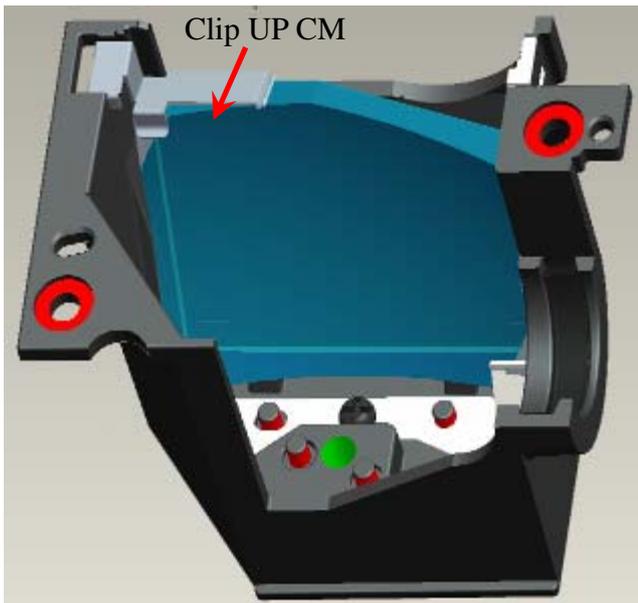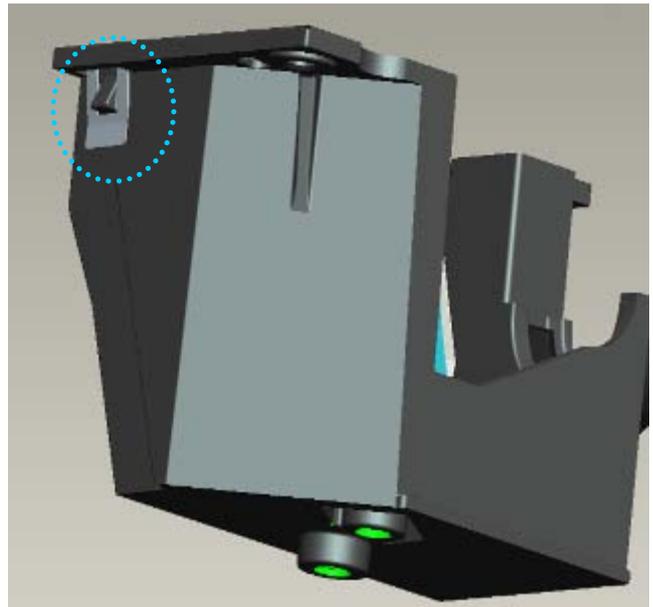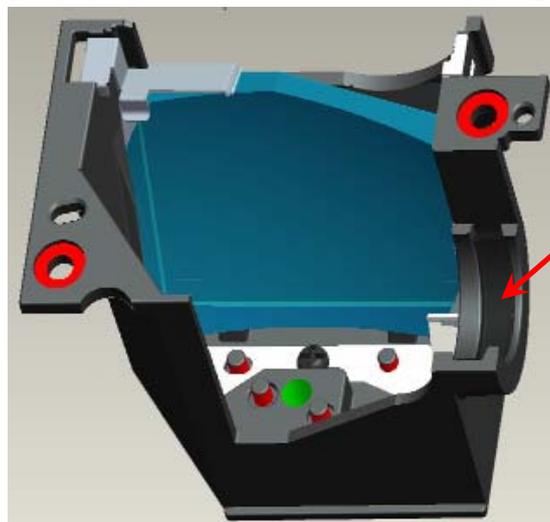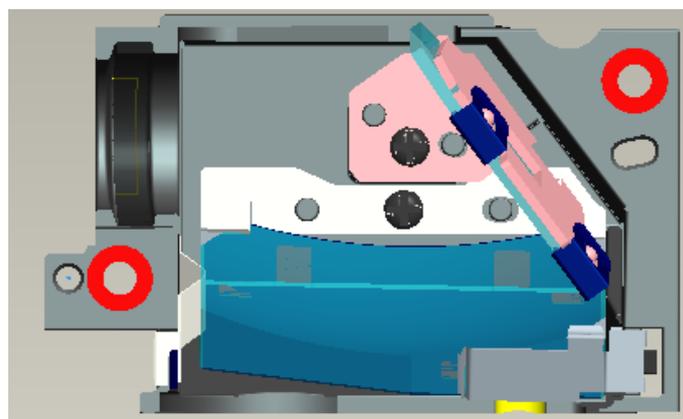
7. AL, HSG ILL and HSG DMD Assembly:

7.1 Placed "AL" on the "HSG DMD". The "raised surface" of "AL" shall toward "DMD direction" (Fig. 7-1).

7.2 To assemble "HSG ILL SUB Module" with "HSG DMD" and cover over on "AL" and the then lock with screws(Fig. 7-2).
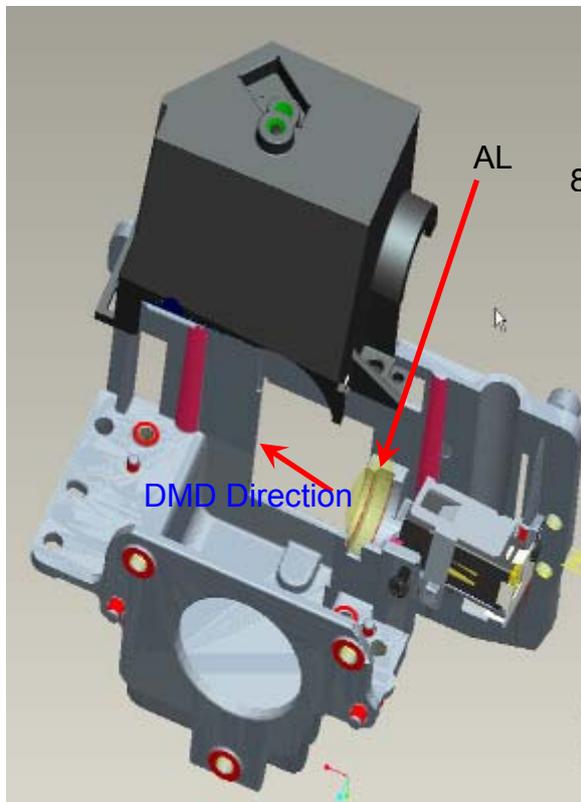
Fig. 7-1
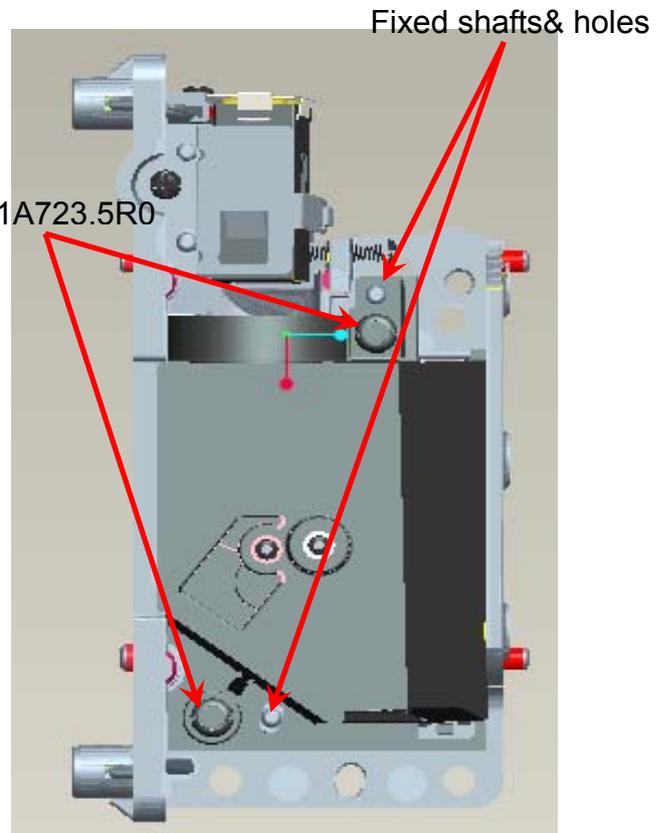
Fig. 7-2

8. DMD and Chip B/D Module:

8.1. Judge Chip B/D and DMD alignment keying first (Fig. 8-1, 8-2).

8.2. Alight keying and Assemble DMD to Chip B/D (Fig. 8-3).

8.3. Push DMD slightly and use screwdriver rotate clockwise button to lock (close notation) DMD on Chip B/D (Fig. 8-4).

Fig. 8-1

Alignment keying

Fig. 8-2

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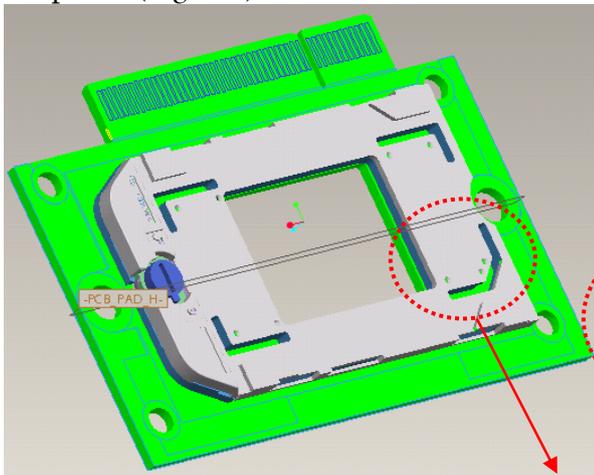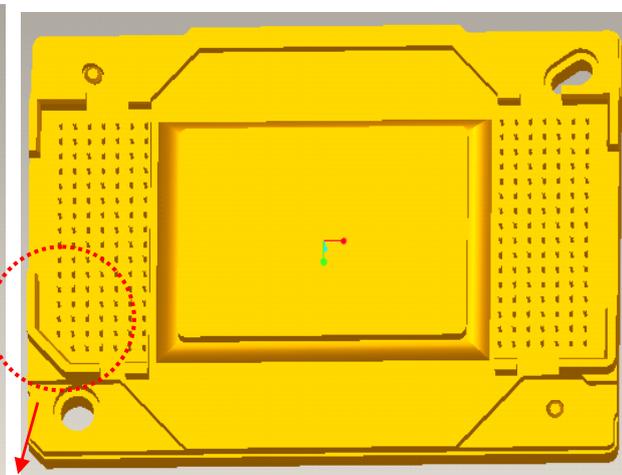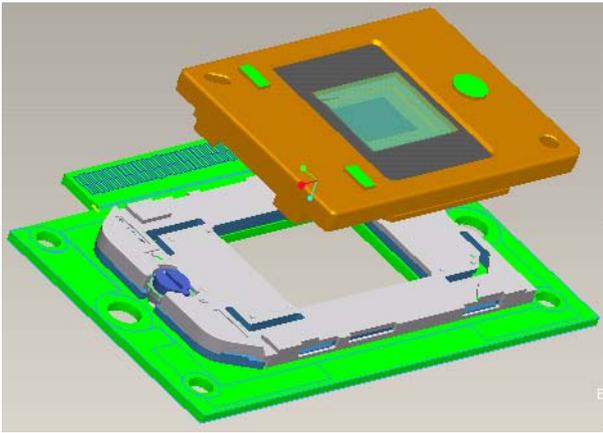
Fig. 8-3
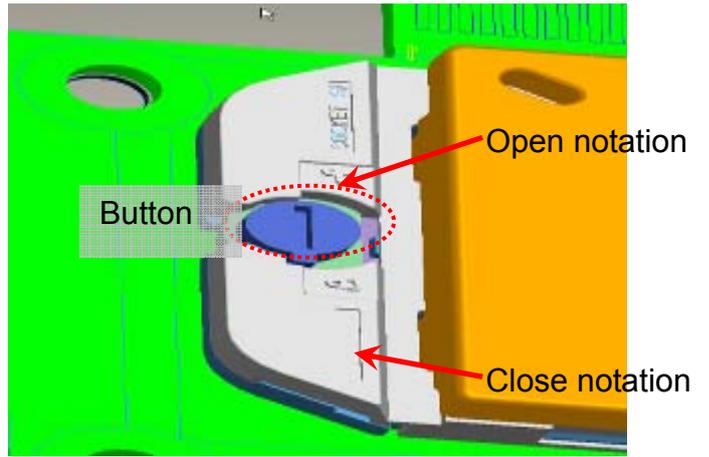
Fig. 8-4

8.4 Place Damper on the surface of Chip-BD Fig. 8-5.
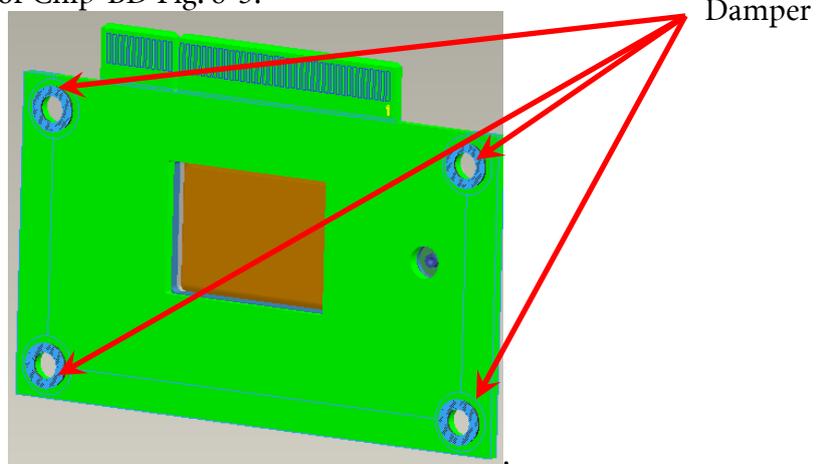
Fig. 8-5.

9. Assembly Optical Engine:

9.1 Assemble "BKT Link Lamp & CW shield" on "DMD HSG" and then lock with screws well (Fig. 9-1).

Fig. 9-1

明基電通 BenQ Corporation
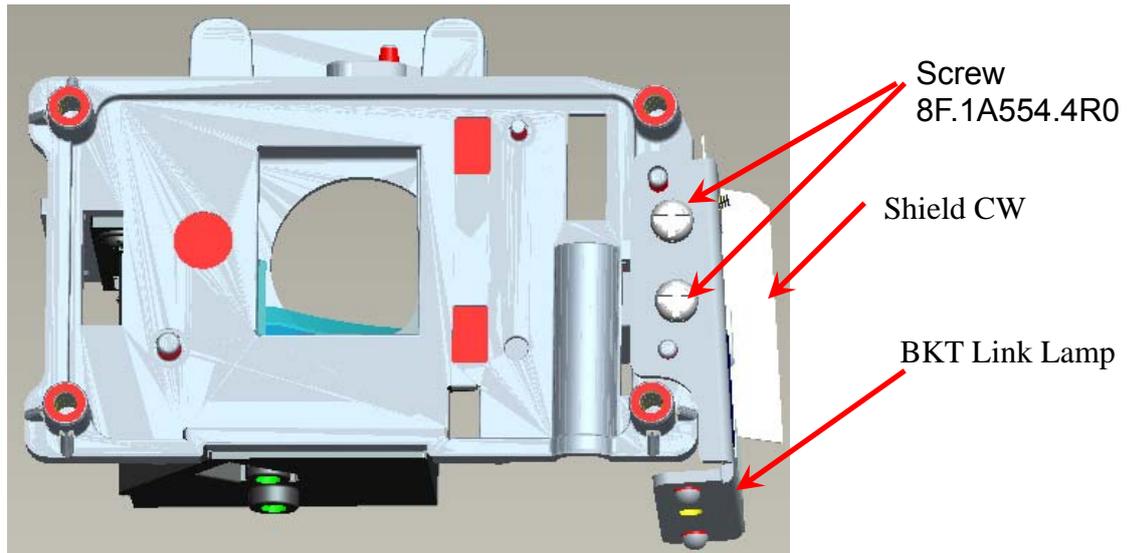
10. Assembly OP ENG

10.1 Assemble "Baffle DMD" to "HSG DMD" (Fig.10-1).

10.2 Assemble Chip B/D Module to "HSG DMD" (Fig. 10-2).

Fixed shafts of DMD HSG
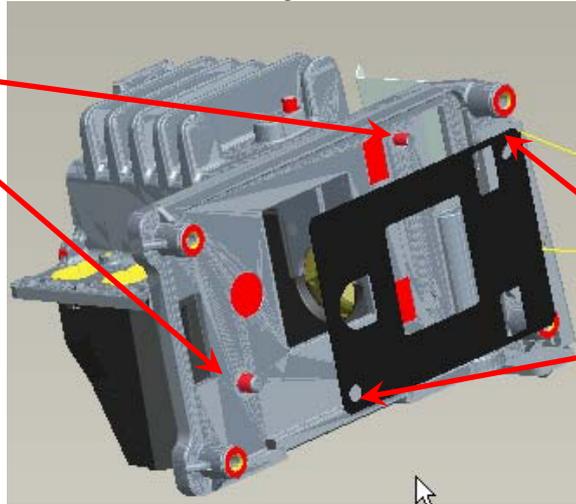
Fixed holes of ILL SUB HSG

Fig.10-1

Fixed shafts of DMD HSG

Fixed holes of DMD
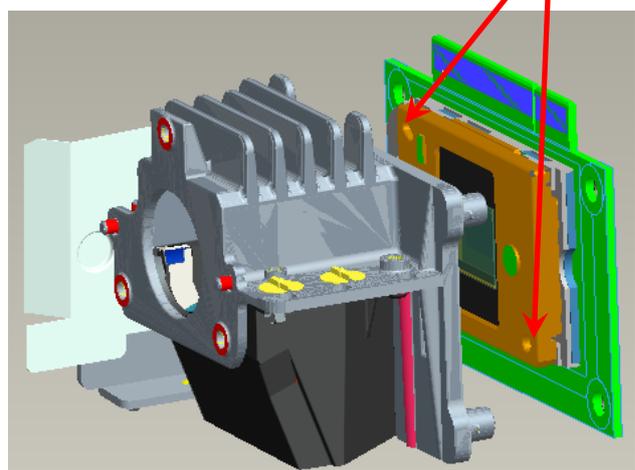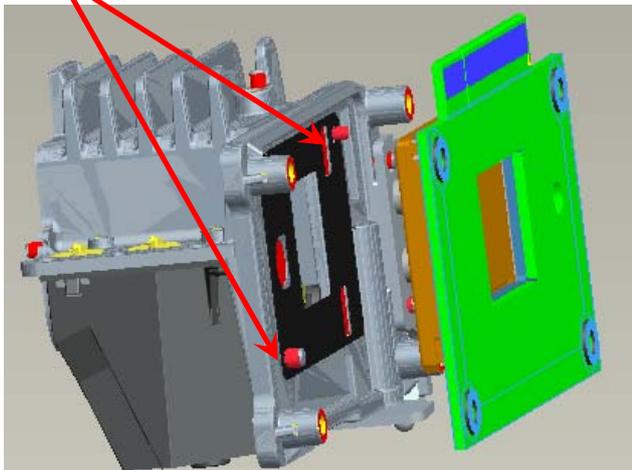
Fig.10-2

10.3 Assemble Thermal Pad & Gasket Hest-sink then place contact DMD (Fig. 10-3).

1. Pre-fastening Sequence: [1] - [2] - [3] - [4].

2. Fastening Sequence: [4] - [3] - [2] - [1].

3. Screw Torque must be confirmed to be 6 kg-cm.

6E.0GF01.001

③

②

④

①

4G.J2G04.002 Gasket

Fig. 10-3

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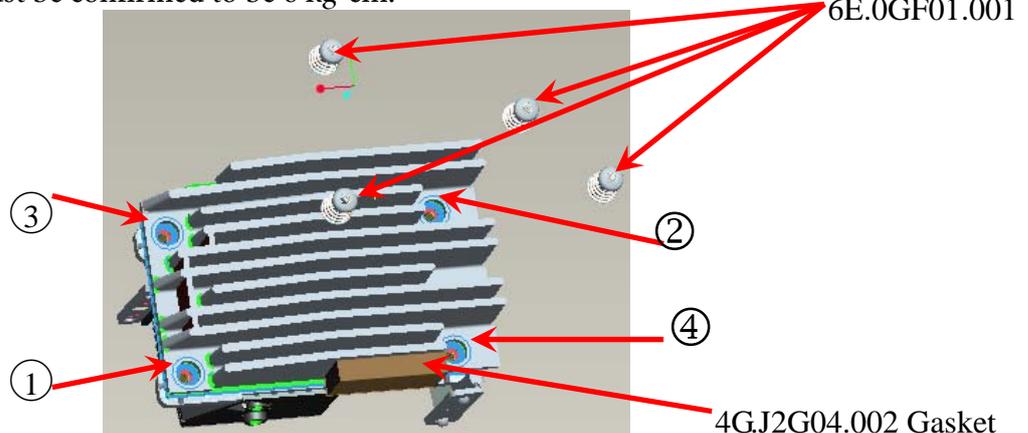
10.4 Assemble "CW Module" to "DMD HSG" and lock with screws well (Fig.10-4).

8F.1A554.4R0

Fixed shafts
of DMD HSG
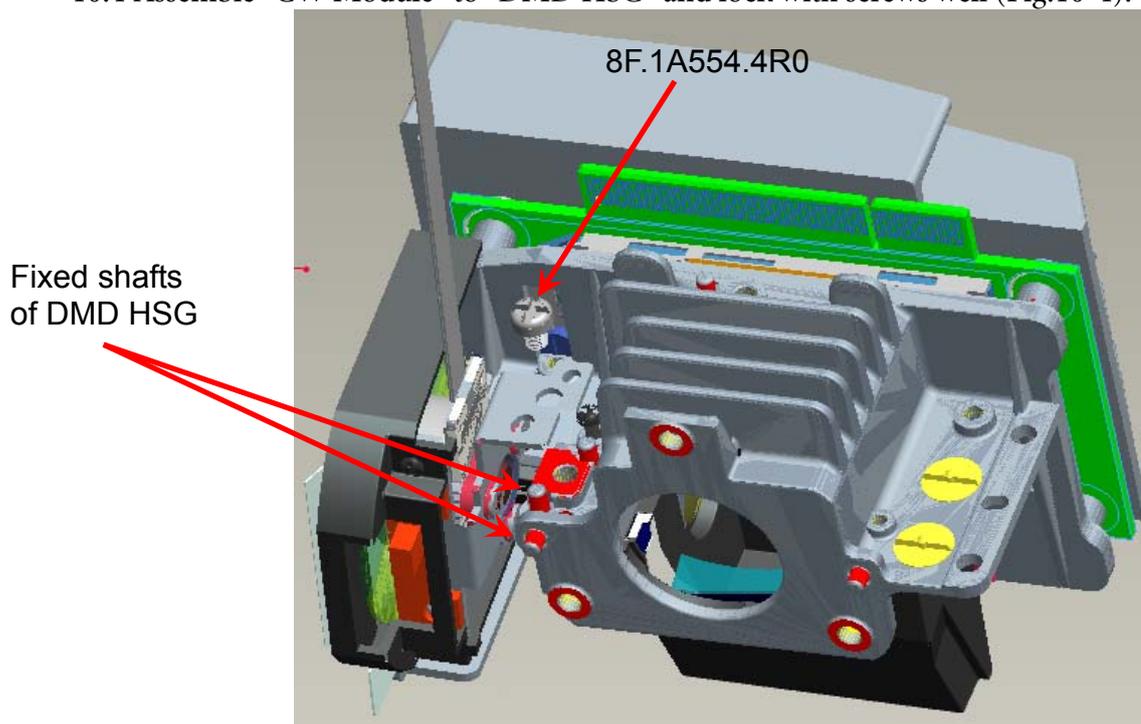
Fig.10-4

10.5 Assemble "PL Lens" and lock with screws well (Fig. 10-5).

8F.JA754.4R0

Fig. 10-5

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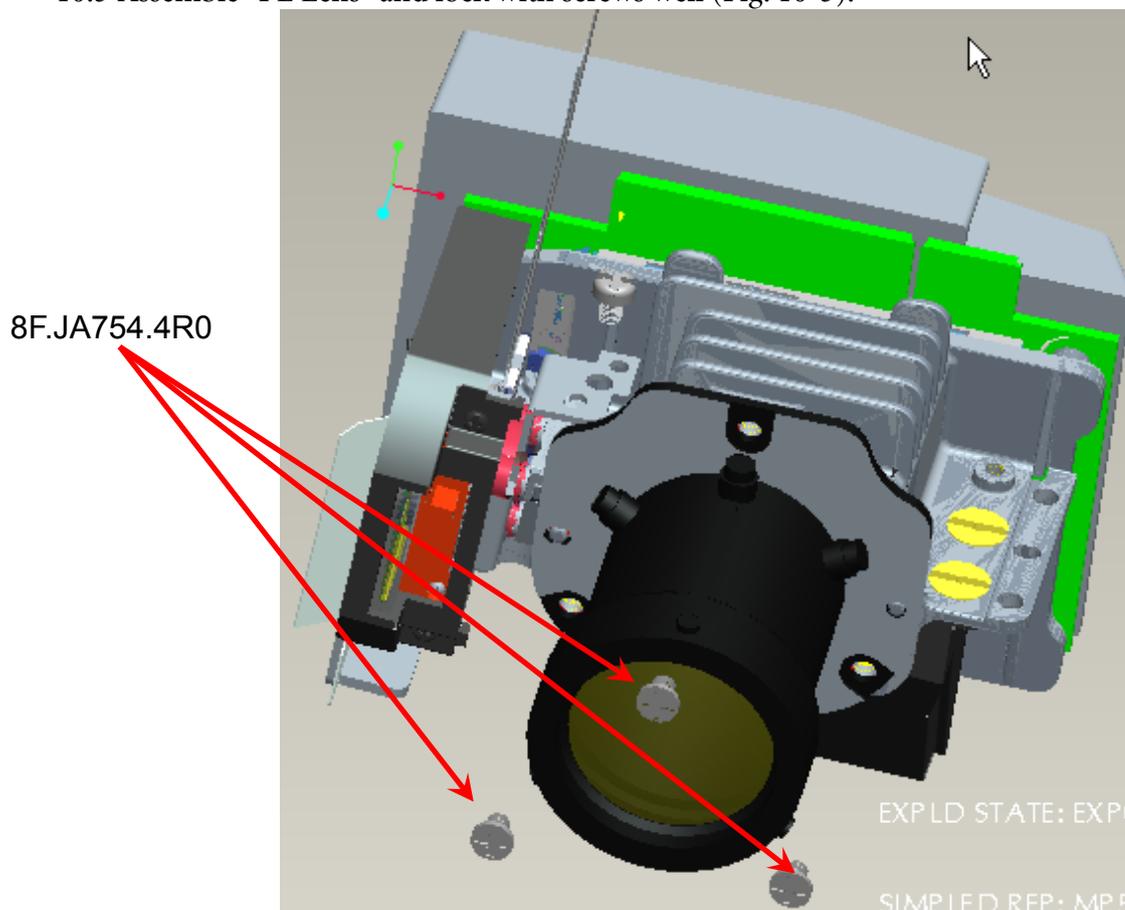
10.6 Assemble "Ring Zoom" before locking screws first, and then assemble "Ring Focus" (Fig. 10-6, Fig. 10-7).

Ring Zoom
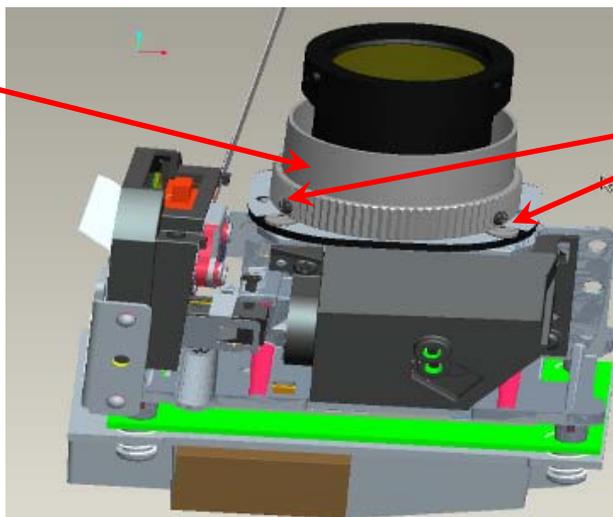
8F.1A752.3R0

Fig. 10-6

Ring Focus
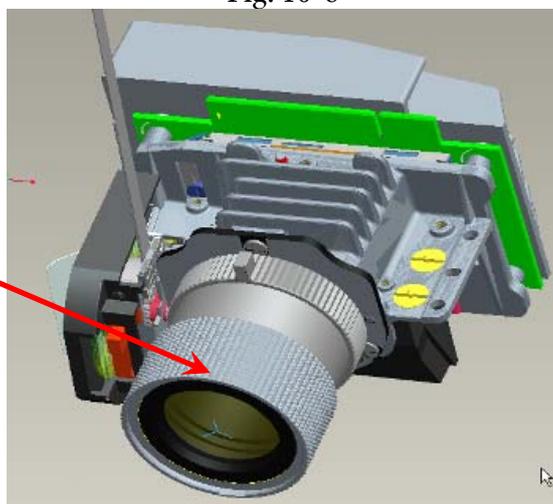
Fig. 10-7

10.7 Assemble Lamp Module to "BKT Link Lamp" and then lock with screw well (Fig. 10-8, Fig. 10-9).
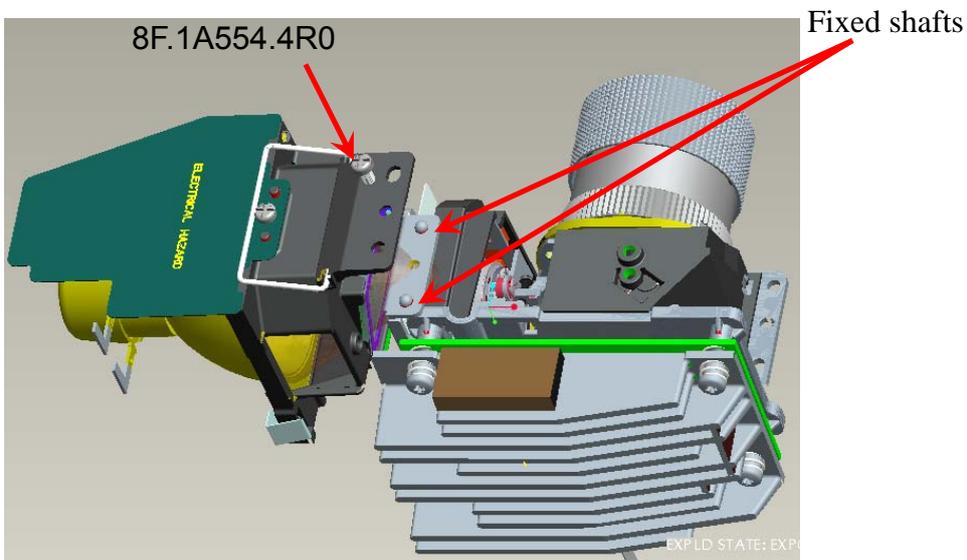
8F.1A554.4R0

Fixed shafts

Fig. 10-8

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Fig. 10-9

EMI Solution

1.	Solution： Gasket (4G.J2G04.002-LP2). Use gasket to connect optic engine H-Sink and BKT down.	4G.J2G04.002 W15*H6*L30 mm

　明基電通　BenQ Corporation
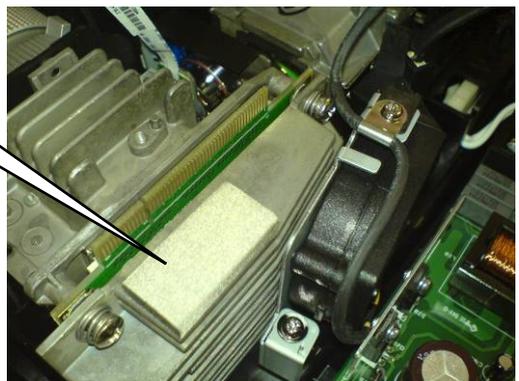
Module Assembly Key Point - Mechanical

Contents:

1. Blower module assembly contents
2. Lower case assemble contents.
3. Twin Fan adhesive mylar sheet
4. Upper Case assemble contents
5. Front Case assemble content
6. Ballast assemble & wire alignment concern
7. Assy Mylar Ballast concern
8. Assy Power BD and Wire alignment concern
9. Bracket Power BD assemble concern
10. Main BD Assemble and Wire alignment
11. Main BD Shielding Assemble and Wire alignment
12. Engine and Lower case constrain concern
13. Rear Cover Screw fix sequence
14. Lamp Wire assemble concern
15. Lamp door screw assemble sequence
16. Twin Fan Wire Arrange Contents.

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1. Blower module assembly contents

This blower Module assemble method same with MP612 Model.

But add New EMI part (1-1), fixed screw between BKT blowers

And nozzle is (1-2) part.

1-2 Screw
8F.1D224.5R0

1-1 Clip 3D.05E04.001

Wire Clip is above the Nozzle
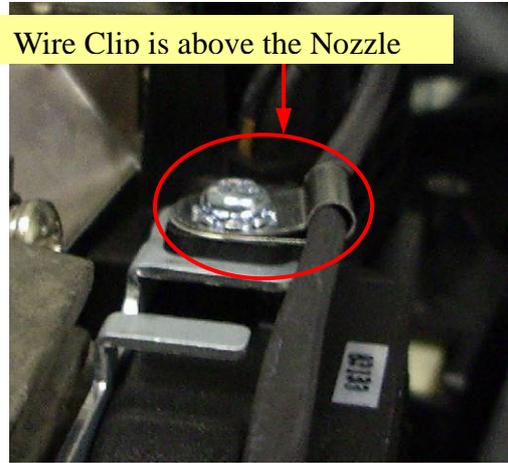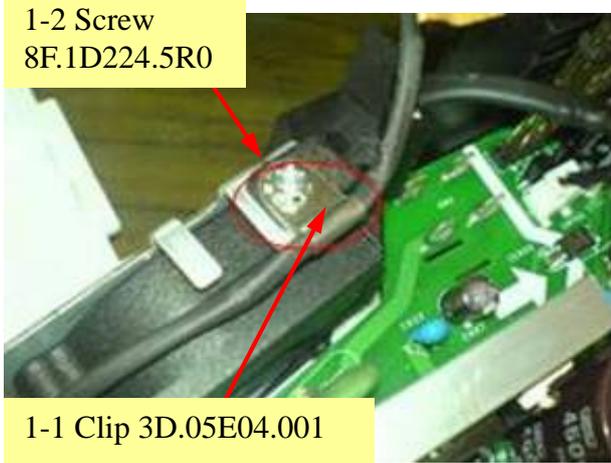
2. Lower case assemble contents.

2-1 8F.1D526.6R0 *3 Ceiling Mount Boss Screw

2-2 Shd Plate LC 3D.0GF22.001

2-3 Glue 3H.01076.001 -- Dripping of glue between foot and screw nut.

2-2

2-1

2-3
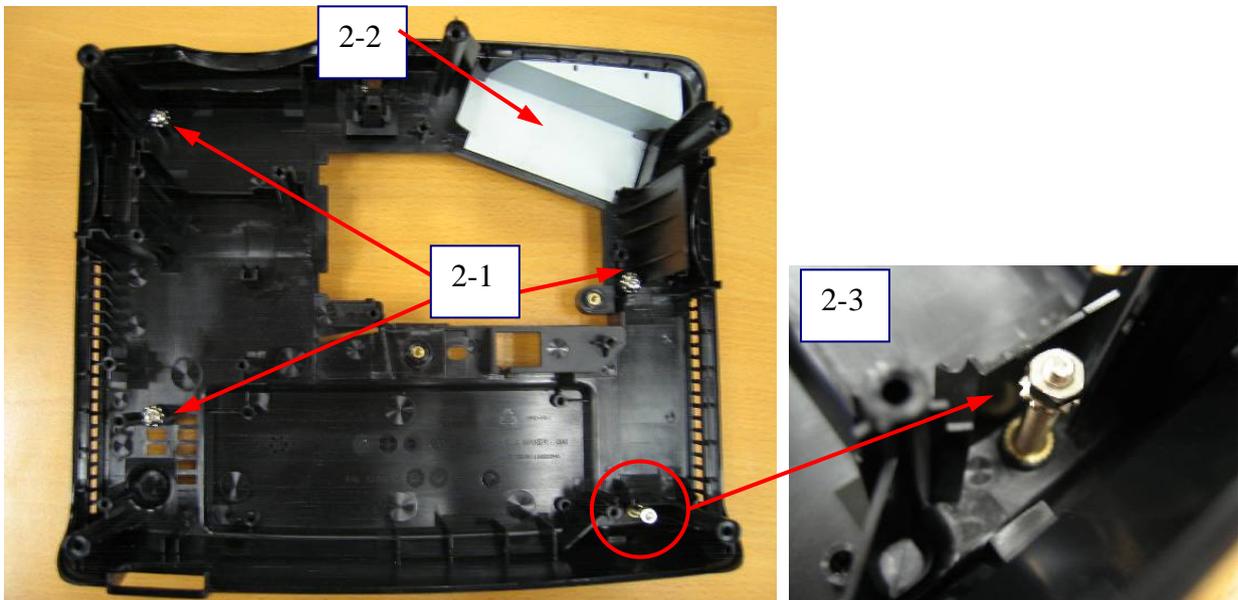
3. Twin Fan adhesive mylar sheet
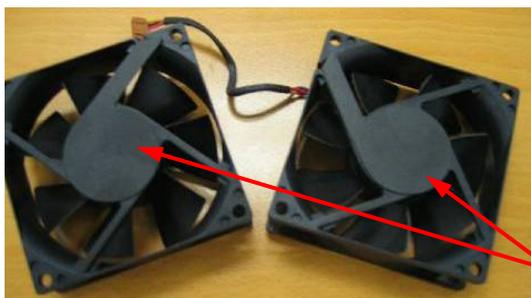
3-1 Mylar Fan 4K.06206.001
   Use Mylar Fan to paste fan spec label
   For appearance issue

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4 Upper Case assemble contents

4-1 Power Button assemble method must make sure direction for assemble.

4-1

To make sure Power Mark direction
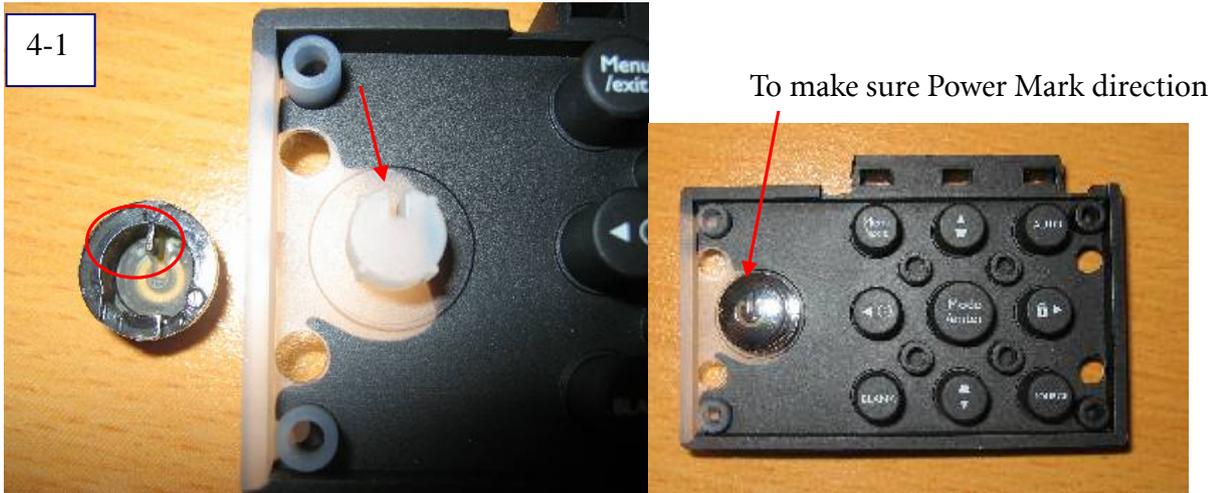
Led lens assemble with Upper Case

4-2

4-3

Rubber Key and Led Lens and Power assemble in Upper Case
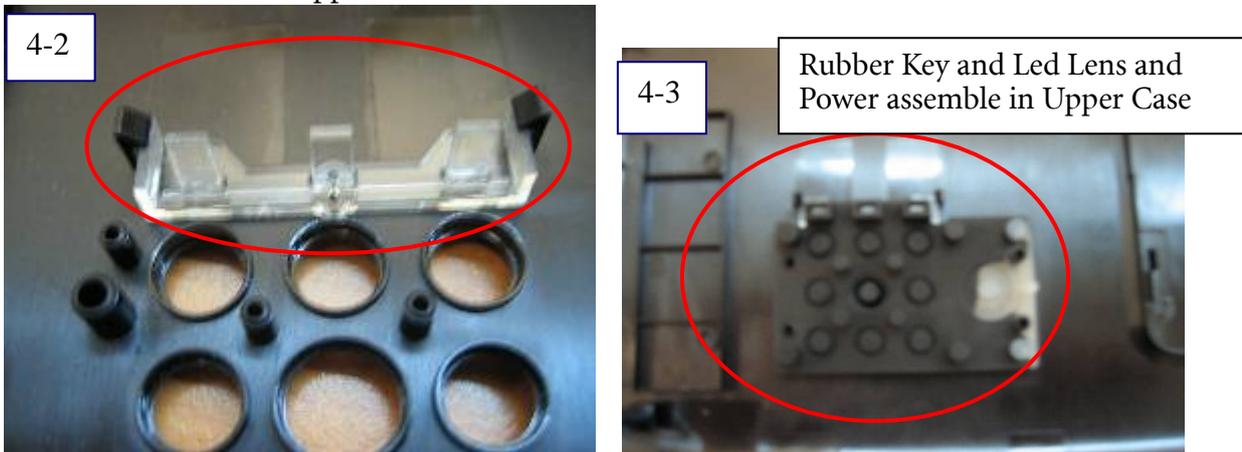
5 Front Case assemble content

Assy Front case assemble

1) BenQ logo assemble
2) Name Plate
3) IR Lens assemble

BenQ logo

IR Lens

Name Plate

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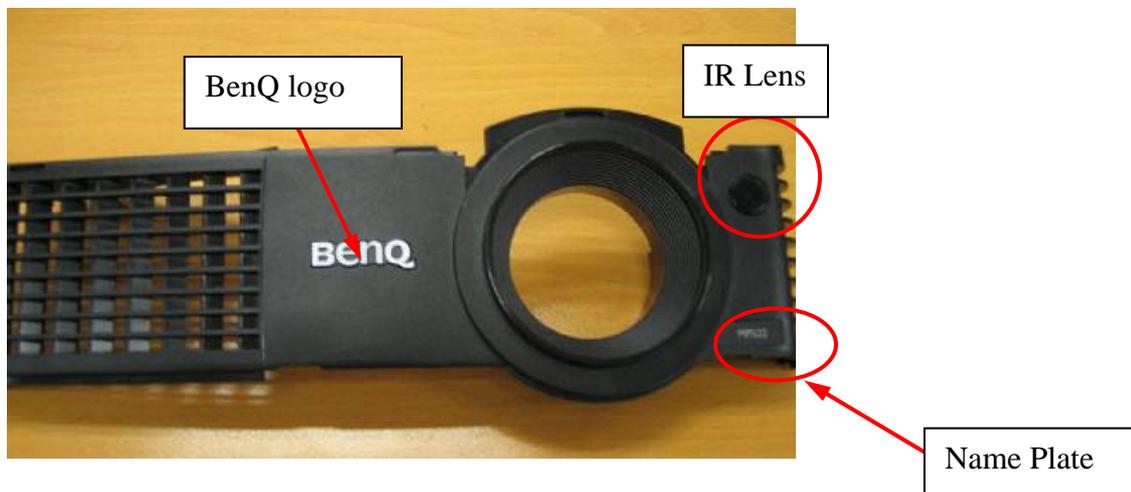
IR Lens assemble direction
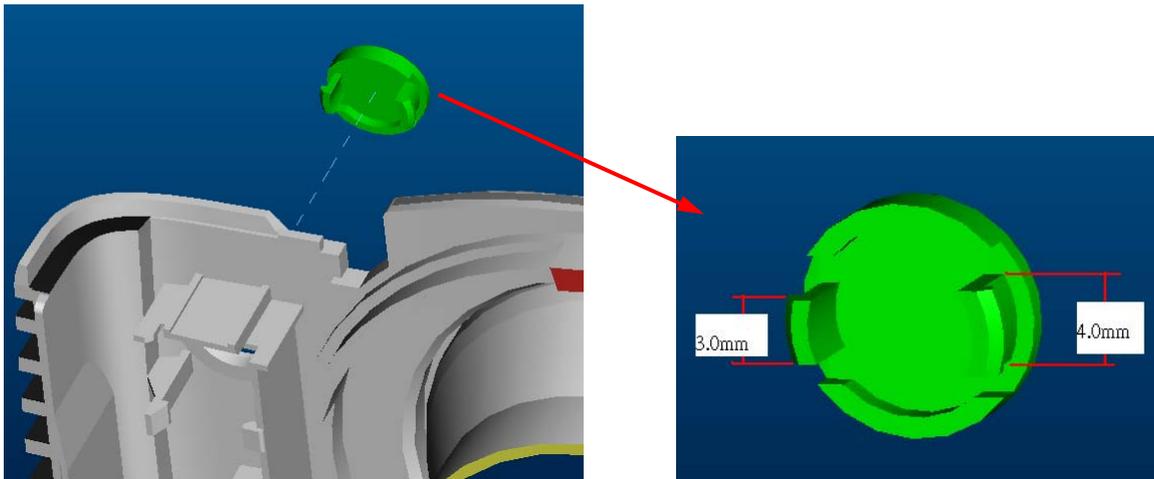
6 Ballast assemble & wire alignment concern

1) Ballast screw quantity *2➔ step1 : top-left;   step2: bottom-right

2) Wire ballast to M/B alignment , (note 2)

3) Wire ballast to PWR/B alignment , (note 3)

4) Wire ballast to Lamp alignment , (note 4)
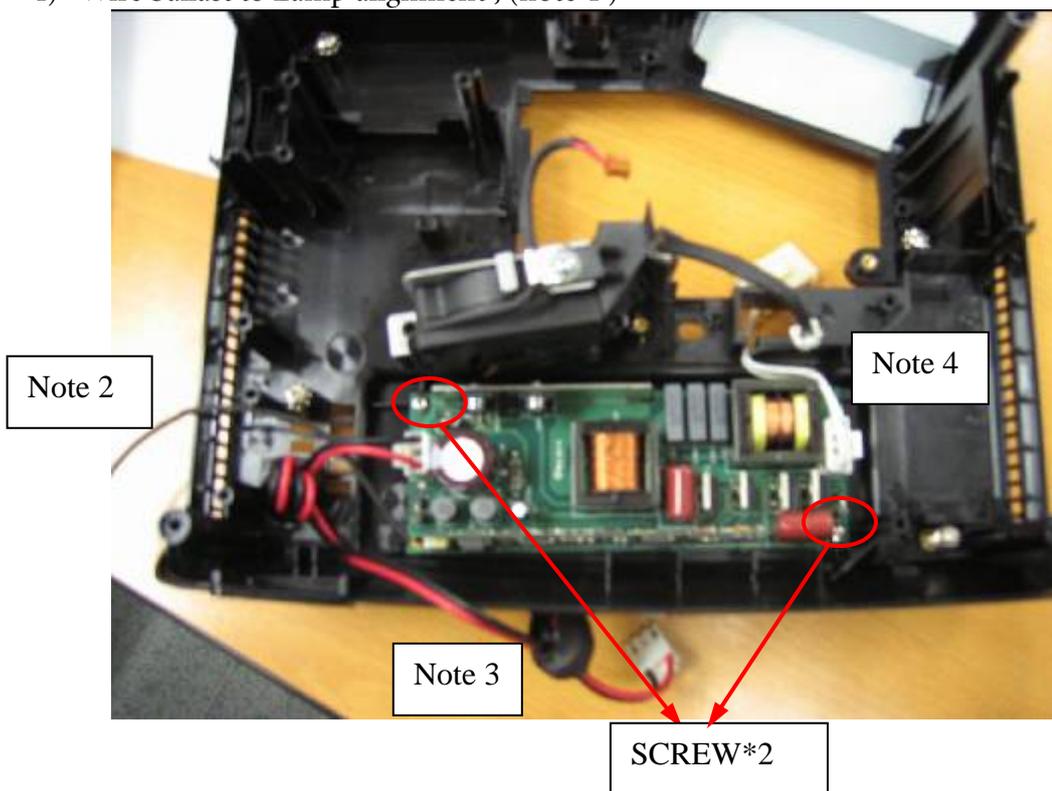
7 Assy Mylar Ballast concern

7-1 Mylar Assemble alignment.
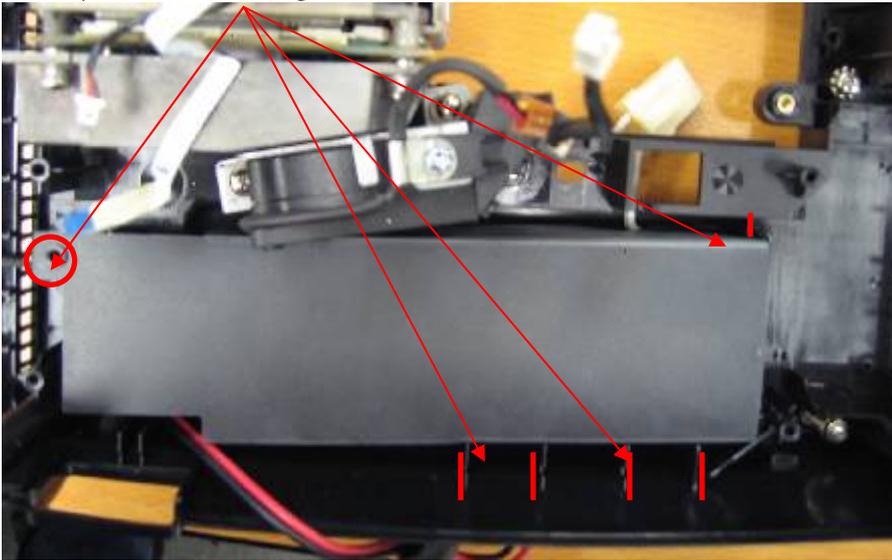
7-2 Mylar Assemble alignment.

Ballast wire alignment through
To hole on Mylar ballast

8 Assy Power BD and Wire alignment concern

8-1 Thermal Break wire alignment

8-2 Ballast wire alignment

8-3 Power BD alignment with lower case

8-1

8-2

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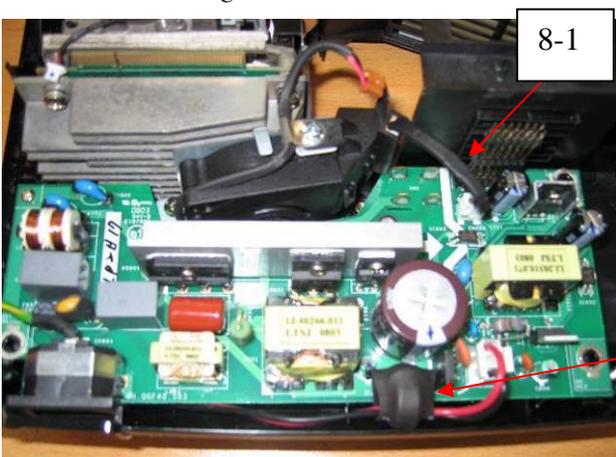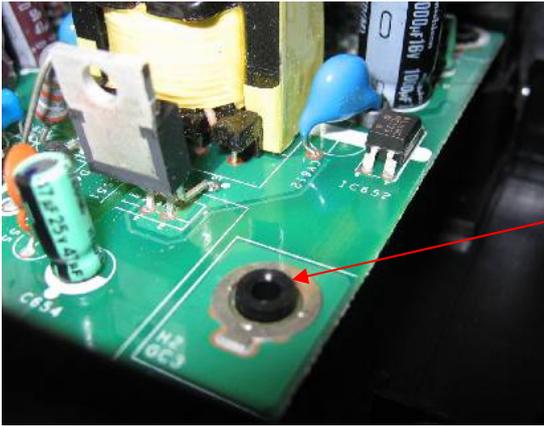
8-3

9 Bracket Power BD assemble concern

9-1 8F.VG564.8R0 *3 for BKT Power BD and Lower Case

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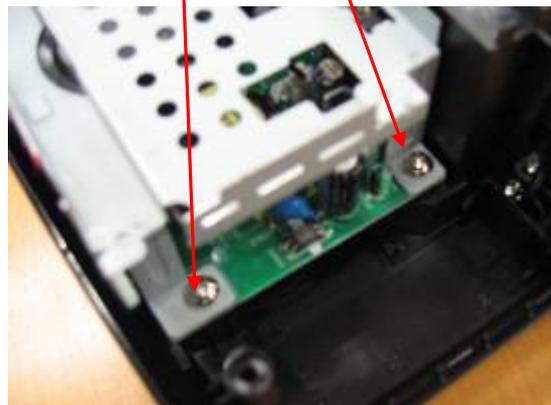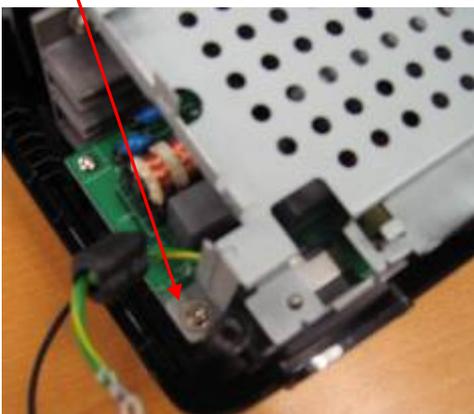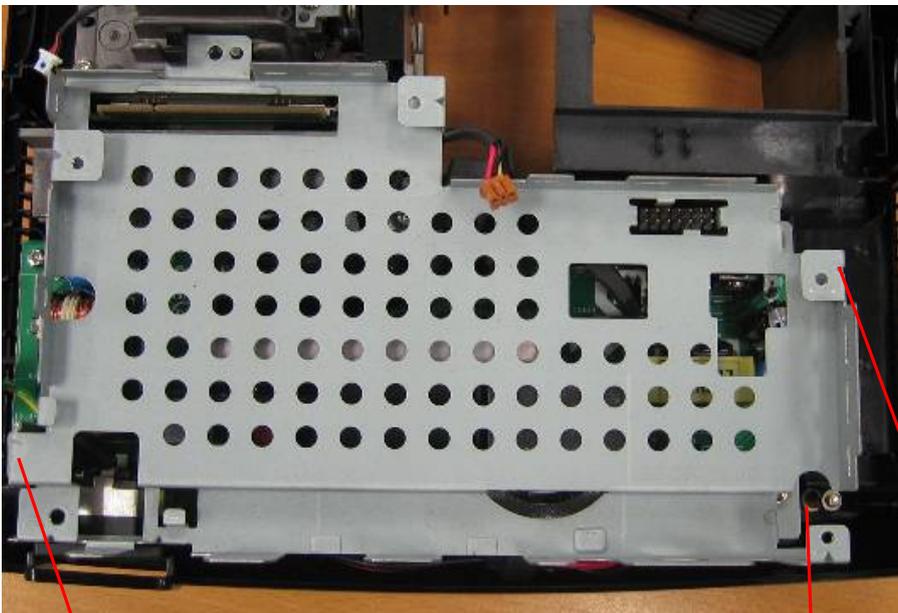
10 Main BD Assemble and Wire alignment

10-1 Wire Assemble for MB

Sensor Wire

CW Wire

Blower Wire

Fan Wire

5 pin Blst to MB

Ground Wire
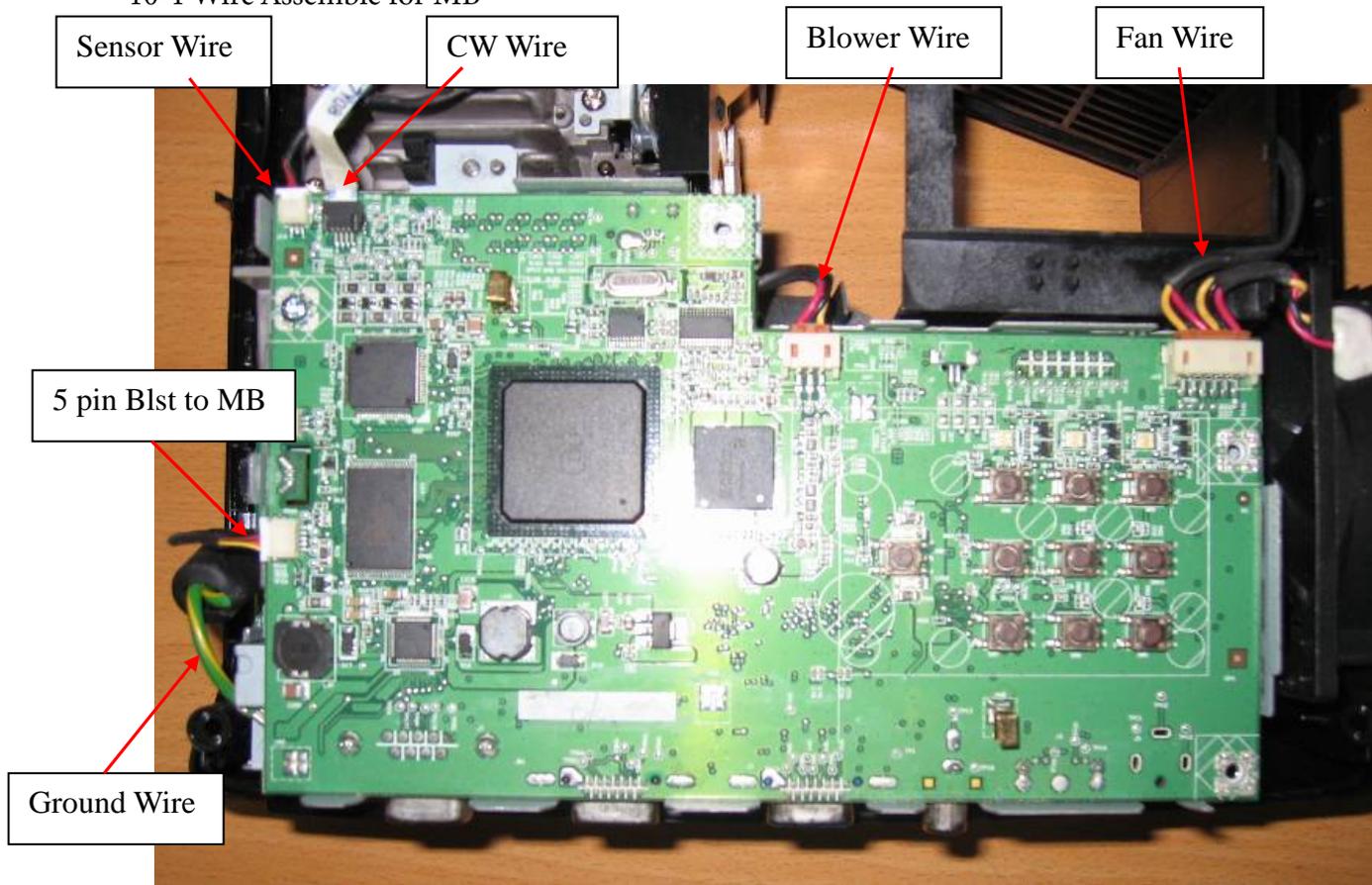
10-2 Main BD assemble for Screw Fix

8F.1D224.5R0

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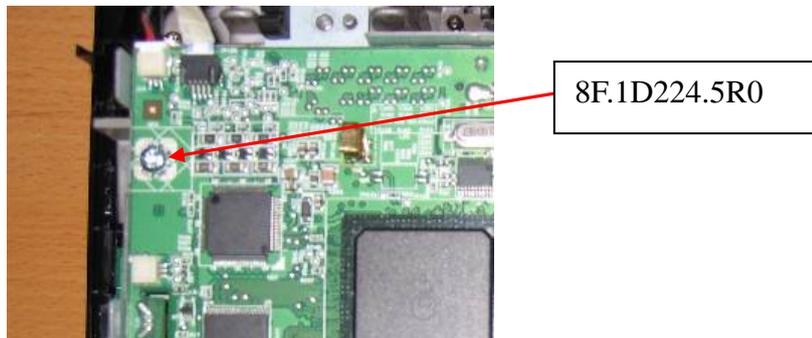
11. Main BD Shielding Assemble and Wire alignment

11-1 Screw Assemble for MB shielding
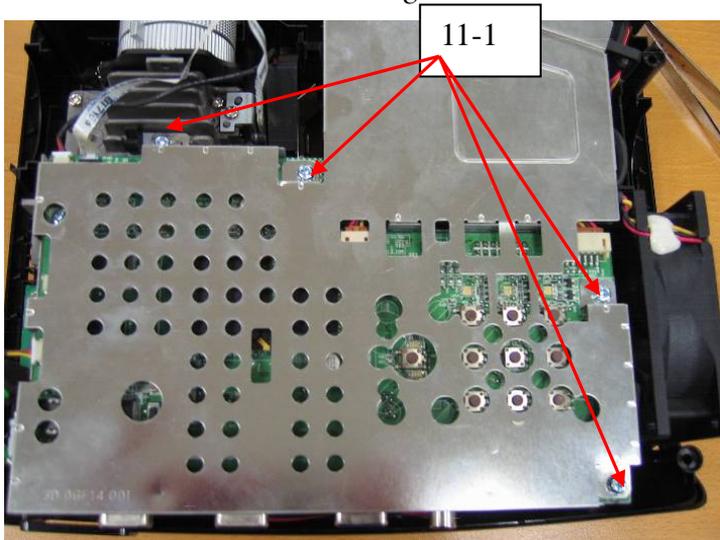
11-2 Screw Assemble for MB shielding
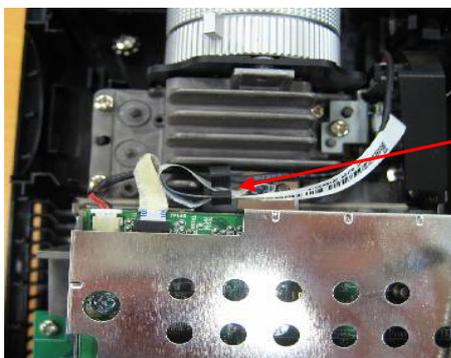
CW wire alignment

12 Engine and Lower case constrain concern

Screw Type: 8F.VA564.7R0

First Fixed location

Second Fixed location

3rd Fixed location

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13 Rear Cover Screw fix sequence

Second Fixed location

First Fixed location
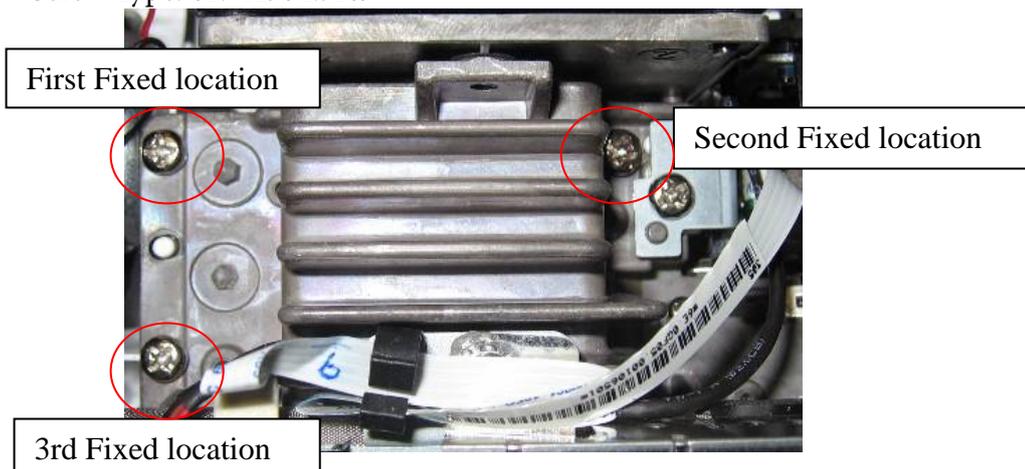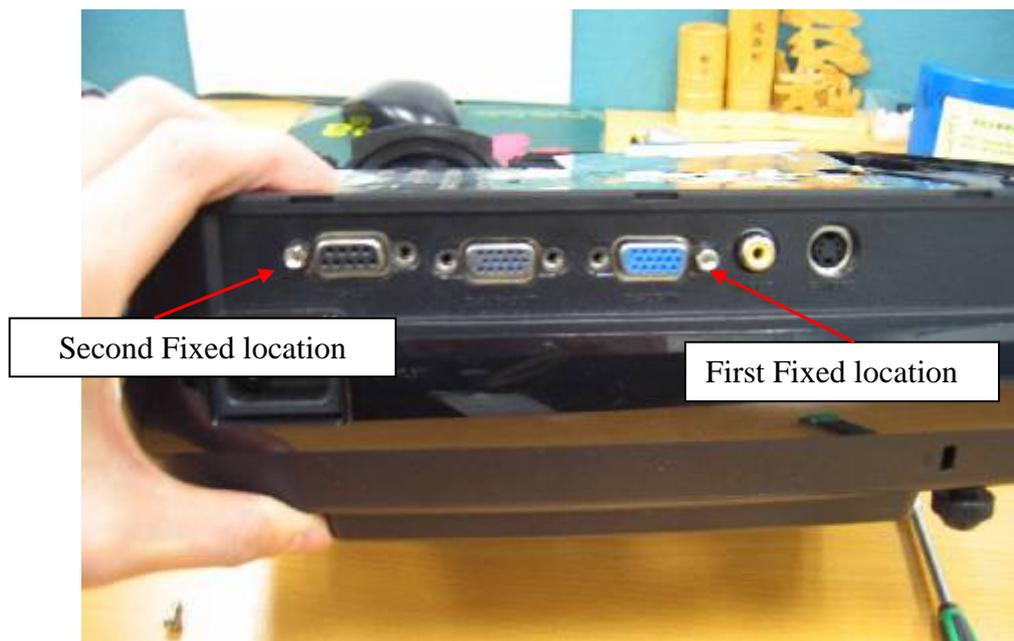
14 Lamp Wire assemble concern

Lamp wire connector insert to lower case tunnel, please check the high for connector lamp
And rib of lower case be alignment. Please refer to Note 14-1.

14-1

15 Lamp door screw assemble sequence

First Fixed
location

Second Fixed location

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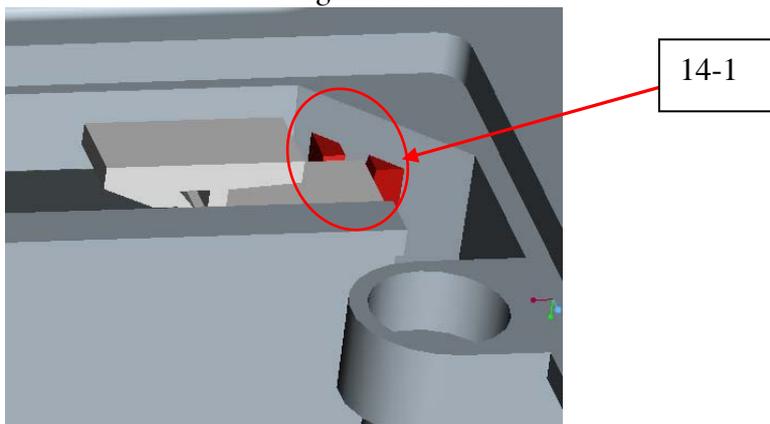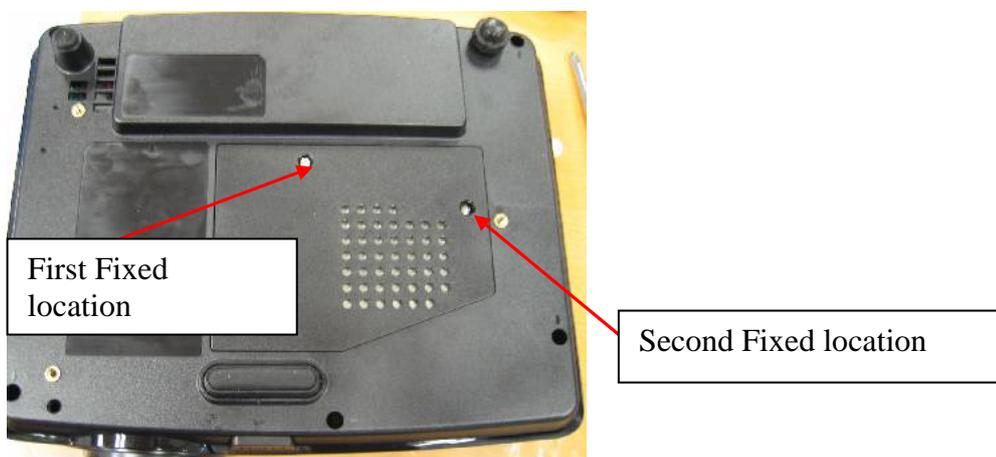
16 Twin Fan Wire arrange
Please following the Fan Wire arrange such as below photo.

Wire Arrange Method

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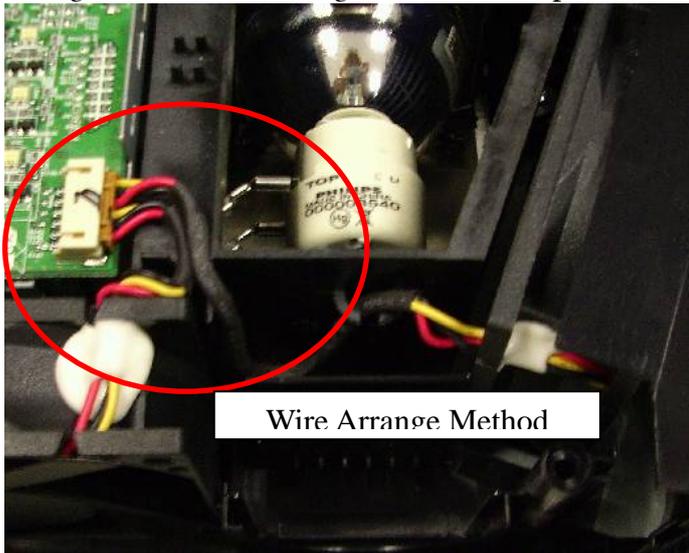
Block Diagram

Hardware Architecture

Keypad Circuit		Main Operation Circuit	Thermal break sensor Circuit
Input Source Circuit	CW Index sensor board	Lamp Door switch	Fan Driver Circuit
			Ballast Module

From AC socket → EMI Filter → PFC Circuit

To Lamp
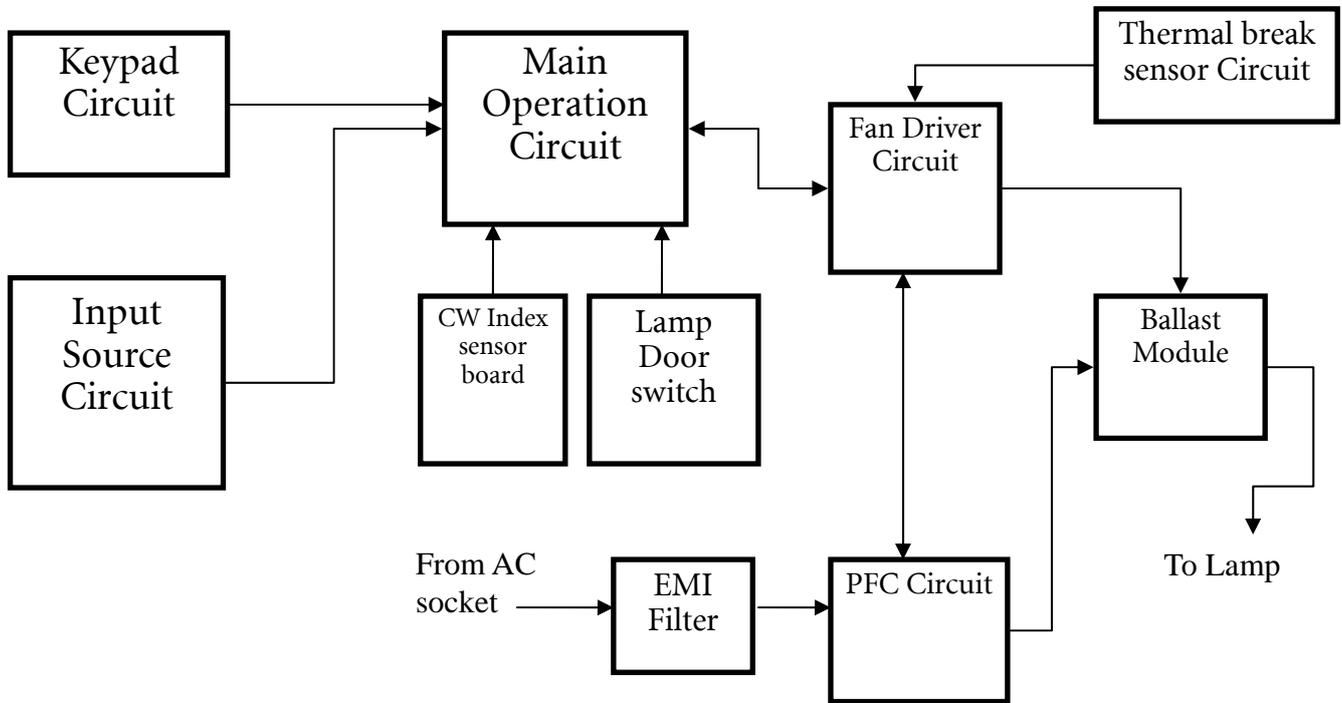
Figure 1 Hardware Architecture

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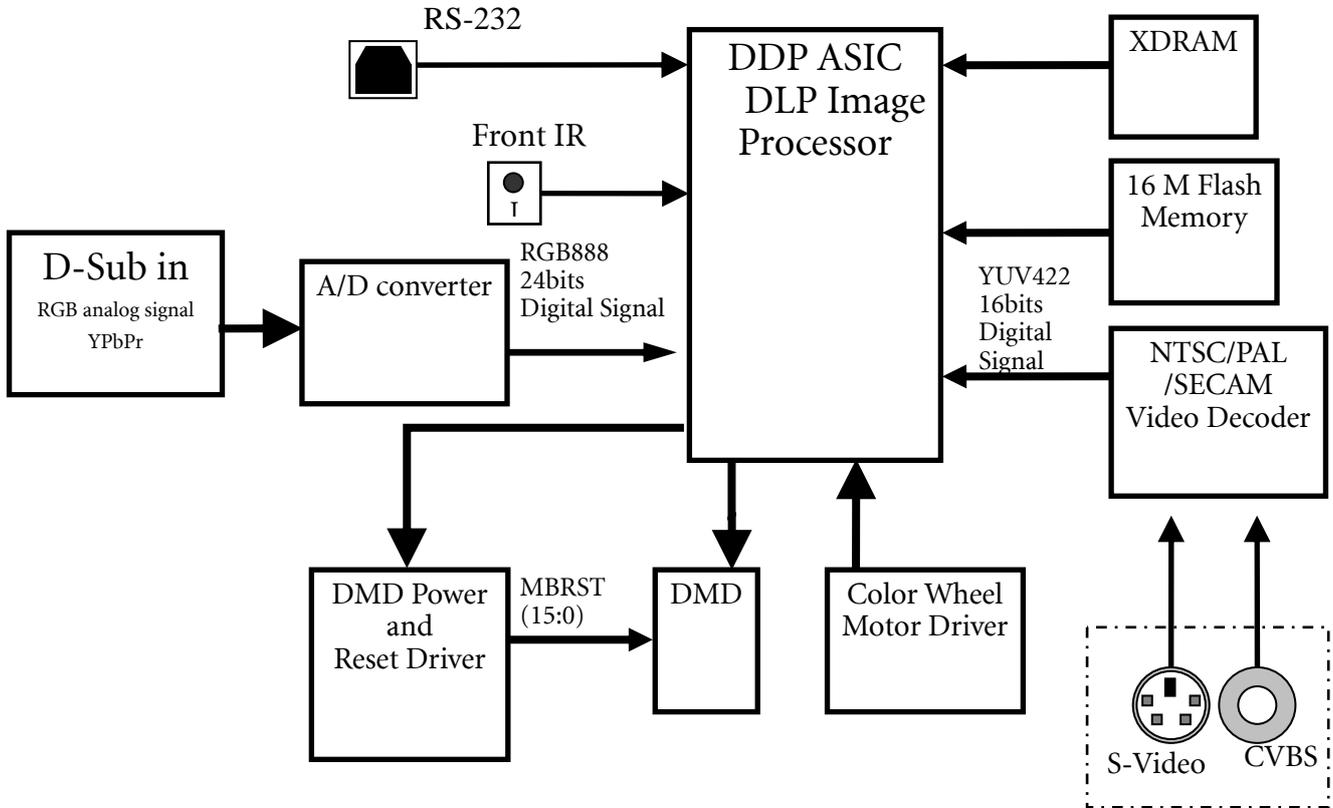
Main Board

Figure 2 Main board & Input board BLOCK DIAGRAM

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Troubleshooting

Chapter 1 System Analysis
Chapter 2 Optical Trouble Shooting Guide
Chapter 3 Power Supply Trouble Shooting Guide
Chapter 4 LED Messages Definition
Chapter 5 Error Count Messages Definition

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Chapter 1 - System Analysis

```
Keypad LED OK ──No──▶ Step:
                       1.  Check Lamp Door
                       2.  Check Power Board and Interlock
                       3.  Check Connection between PWR BD
                           and Main BD
                       4.  Check Main Board
```

Yes

```
If Power On, Lamp On? ──No──▶ 1.  Check Lampen wire , Lamp wire and
                                  Ballast wire
                              2.  Check C/W and wire connection
                              3.  Check Main board
                              4.  Check Lamp
                              5.  Check Ballast
```

Yes

```
No Signal? ──Yes──▶ 1.  Check Input Cable
                    2.  Check OSD Source set up
                    3.  Check Main board
```

No

```
Power Auto Turn Off ──Yes──▶ 1.  Check OSD Lamp Hours
                             2.  Check Lamp Door
                             3.  Check Lamp still light or not?
                             4.  Check Fan still spin or not?
                             5.  Check Thermal status
```

No

```
IR Remote Control NG? ──Yes──▶ 1.  Check Remote module battery
                               2.  Check Remote module
                               3.  Check IR Receiver on Main board
                               4.  Check IR Receiver on IR board
```

No

```
Pixel Fail? ──Yes──▶ 1.  Check the connection between Main
                         BD and Chip BD
                     2.  Check the connection between OP
                         engine and DMD Chip
                     3.  Check Chip board
                     4.  Check Main board
```

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Chapter 2 - Optical Trouble Shooting Guide

No.	Item	Trouble Shooting Guide
1	Brightness	1. Change lamp
2	Uniformity	1. Change lamp
3	FOFO Contrast	1. Check ADC calibration 2. Check user's menu brightness & contrast are default 3. Clean DMD 4. Clean PL 5. Check ILL stop assy
4	ANSI Contrast	1. Clean PL 2. Clean DMD 3. Change PL
5	Color	1. Check color wheel delay 2. Check CW 50% point. Replace CW if necessary
6	Color Uniformity	1. Change lamp
7	Blue Edge	1. Refer to Item#2-1 (attached below) 2. Change CM 3. Change SUB HSG
8	Blue/Purple Border	1. Refer to Item#2-1(attached below) 2. Change CM 3. Change SUB HSG
9	Focus	1. Change Projection Lens 2. Check PL datum and DMD parallel
10	Dust	Clean DMD
11	Horizontal/Vertical Strips	1. Check connector between chip BD and Main BD 2. Re-install DMD with chip BD 3. Check if any pin of C-Spring is missing, damaged or dirty 4. Change new Chip BD/C-Spring 5. Change new DMD
12	Pixel Fail	Change new DMD

2-1. "Blue Edge" Trouble Shooting:

I.   Re-adjust "Overfill" first.
     For Overfill Re-adjustment:

     i.   Those 2 Adjustment Screws must be released for around 2 mm first.

     ii. Alignment Sequence:

          c.   To adjust "Horizontal Adjustment Screw" firstly, then "Vertical Adjustment Screw".

          d.   Refer to Figure 2-1..

(2) Overfill Vertical Adjustment Screw

(1) Overfill Horizontal Adjustment Screw
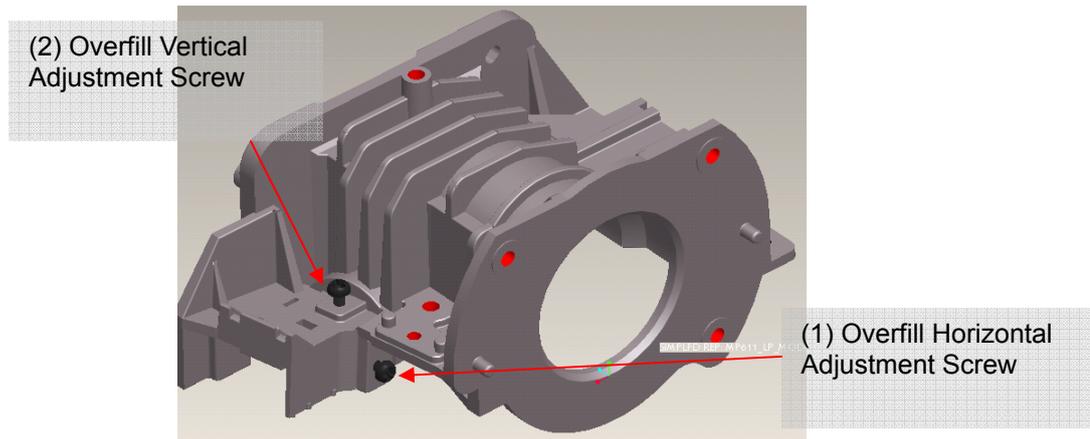
Fig. 2-1

II. Re-assemble LP module—include LP, LP Baffle, LP clip.

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Chapter 3 - Power Trouble Shooting Guide

Power BD Check.

Fuse Broken ? —No→ Proceed to "check DC-DC OUTPUT"

Yes

Proceed to "Primary Circuit Check".

No DC-DC Output.

B+=385VDC ? —No→ Proceed to " Primary Circuit Check"

Yes

TOPSwitch Broken ? —No→ Lacks of some componets around TOPSitch ? —No→ Check Trace.

Yes

Replace new TOPSwitch

Yes

solder them.

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```
┌─────────────────┐
│ ┌─────────────┐ │
│ │Check primary│ │
│ │   circuit.  │ │
│ └─────────────┘ │
└─────────────────┘
         │
         ▼
      ╱─────╲                              ╭──────────────╮
     ╱ Fuse  ╲────── No ──────────────────▶│ Proceed to   │
     ╲Broken ?╱                            │ "Check       │
      ╲─────╱                              │ IC601".      │
         │                                 ╰──────────────╯
        Yes
         │
         ▼
      ╱───────────╲              ╱───────────╲                      ╭──────────────╮
     ╱ Check Q601  ╲─── No ─────▶ Check BD601  ╲──── No ───────────▶│ Proceed to   │
     ╲  damages ?  ╱             ╲  damages ?  ╱                    │ "Check       │
      ╲───────────╱               ╲───────────╱                     │ IC601".      │
         │                             │                            ╰──────────────╯
        Yes                           Yes
         │                             │
         ▼                             ▼
┌──────────────────┐          ┌──────────────────┐
│ PinD & PinS of   │          │ Inside diodes of │
│ Q601 are shorted.│          │ BD601 are        │
│ Replace new      │          │ shorted. Replace │
│ MOSFET.          │          │ new bridge diode.│
└──────────────────┘          └──────────────────┘


┌─────────────────┐
│ ┌─────────────┐ │
│ │ Check IC601.│ │
│ └─────────────┘ │
└─────────────────┘
         │
         ▼
┌──────────────────┐
│ Check Pin8 if    │
│ shorted to GND.  │
└──────────────────┘
         │
         ▼
      ╱───────────────╲                    ┌──────────────────┐
     ╱ Output Pin      ╲                    │ Check 15VPFC     │
     ╱ shorted to       ╲──── No ──────────▶│ Votage.          │
     ╲ GND ? (Pin8)     ╱                    └──────────────────┘
      ╲───────────────╱
         │
        Yes
         │
         ▼
┌──────────────────┐
│ Replace with new │
│ IC L6561D and    │
│ D611, D612, and  │
│ D613             │
└──────────────────┘
```

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Chapter 4 - LED Messages Definition

Power	Temp	Lamp	Status	Note
O			Stand-by	
G			Powering up	
G			Normal operation	
O			Normal power-down cooling	
Lamp Error Messages				
		R	Lamp error in normal operation(single lamp)	
R		R	Scaler reset fail	
G		R	CW start fail	
Thermal Error Messages				
	R		Fan 1 error (the actual fan speed is ±20% outside the desired speed.)	Lamp Fan
	R	R	Fan 2 error (the actual fan speed is ±20% outside the desired speed.)	Ballast Fan
	R	G	Fan 3 error (the actual fan speed is ±20% outside the desired speed.)	Blower Fan
R	R	R	Thermal Sensor 1 open error (the remote diode has an open-circuit condition.)	DMD sensor
R	R	G	Thermal Sensor 2 open error (the remote diode has an open-circuit condition.)	
G	R	R	Thermal Sensor 1 short error (the remote diode has an short-circuit condition.)	
G	R	G	Thermal Sensor 2 short error (the remote diode has an short-circuit condition.)	
O	R	R	Temperature 1 error (over limited temperature)	
O	R	G	Temperature 2 error (over limited temperature)	
	G	R	Fan IC #1 I2C Connection error	

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Chapter 5 - Error Count Messages Definition

Error Count	Definition	Specification
LAMP Fail error	LAMP OFF	DETECT LAMPLIT
FAN 1 Speed Error	LAMP FAN SPEED ERROR	SPEED OVER ± 20%
FAN 2 Speed Error	BALLAST FAN SPEED ERROR	SPEED OVER ± 20%
FAN 3 Speed Error	BLOWER FAN SPEED ERROR	SPEED OVER ± 20%
Sensor 1 Open Error	Main Board SENSOR ERROR	DETECT Sensor 1
Sensor 2 Open Error	Power board SENSOR ERROR	DETECT Sensor 2
Sensor 1 Short Error	Main Board SENSOR ERROR	DETECT Sensor 1
Sensor 2 Short Error	Power board SENSOR ERROR	DETECT Sensor 2
Temperature 1 Error	over limited temperature	N/A
Temperature 2 Error	over limited temperature	N/A
FAN IC I2C ERROR	I2C communication error	N/A

Appendix 1 – Screw List / Torque

Model name :MP522/512 (MD)

	No.	Screw P/N	Description				Torque	Where use	Q'ty	Q'ty
		Part name	Type	Head	Length	Surface	(kgf-cm)		Unit	
M3	1	8F.VG564.8R0 SCRW TAP PH W/F M3*8L NI D-PT	TAP (DELTA)	PHW	8	NI	7.5+/-0. 5	BKT MB == LC	3	5
								BKT BLOWER==LC	2	
	2	8F.VA564.7R0 SCRW TAP PAN M3*7L NI D-PT	TAP (DELTA)	PH	7	NI	6.5+/-0. 5	POWER==LC	1	14
								LAMP BOX==LC	2	
								BALLAST==LC	2	
								ENGINE==LC	3	
								UC==UC COVER	1	
								UC==LC	5	
	4	8F.1D224.5R0 SCRW MACH PAN EXT-TOO M3*5L ZN	MACH	PH	6	ZINC	4.5+/-0. 5	MB BKT==ENGINE HSG	1	6
								BKT BLOWER==NOZZLE	1	
								MB==MB SHIELDING	4	
	5	8F.1A524.6R0 SCRW MACH M3*6L NI	MACH	PH	6	NI	4.5+/-0. 5	DOOR==LC	2	2
M4	6	8F.1D526.6R0 SCRW MACH PAN EXT-TOO M4*6L NI	MACH	PAN	8	NI	6.5+/-0. 5	GROUNDING==MB BKT	1	4
								CEILING MOUNT LC	3	
								SUM=		31

	No.	Screw P/N	Description				Torque	Where use	Q'ty	Q'ty
STAND OFF
		Part name	Type	Head	Length	Surface	(kgf-cm)		Unit	
#4-4 0	7	8F.00461.120 STAND OFF XH4#-40X4+8. 1 NI	MACH	HEX	6	NI	5.5+/-0. 5	MB=REAR COVER	6	6

	No.	Screw P/N	Description				Torque	Where use	Q'ty	Q'ty
Nut
		Part name	Type	Head	Length	Surface	(kgf-cm)		Unit	
	8	8G.00020.423	NUT	HEX	2.3	NI	3.5+/-0. 5	Nut & Foot Rear	1	1

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| | No. | P/N | Description | | | | Torque | Where use | Q'ty | Q'ty |
			Type	Head	Length	Surface	(kgf-cm)		Unit	
M2	1	8F.1A752.3R0	MACH	PH	3.0	B-NI	2.5+/-0.5	Clip LP VS. HSG DMD	1	10
								Baffle LP VS. HSG DMD	1	
								CW Sensor BD VS. BKT CW	1	
								CW CVR VS. BKT CW	2	
								CW Shield VS. BKT Link Lamp	1	
								FM Module VS. ILL SUB HSG	1	
								Clip Front CM VS. ILL SUB HSG	1	
							1.5+/-0.5	Ring Zoom VS. PL	2	
	2	8F.1A752.8R0.	MACH	PH	8.0	B-NI	2.5+/-0.5	LP Adjustment	2	2
M2.5	1	8F.00345.5R06.	MACH	FPH	5.6	NI	2.5+/-0.5	CW VS. BKT CW	3	3
	2	8F.1A723.5R0	MACH	PAN	5.0	B-NI	3.0+/-0.5	ILL SUB HSG VS. DMD HSG	2	2
M3	1	8F.JA754.4R0	MACH	FPH	4.0	B-NI	4.0+/-0.5	PL Flange VS. HSG DMD	3	3
	2	8F.1A554.4R0	MACH	PAN	4.0	NI	4.0+/-0.5	Clip FG VS. HLD Lamp	1	9
								CW Module VS. HSG DMD	1	
								Clip Lamp VS. HLD Lamp	2	
								Lamp Module VS. HSG DMD	1	
								FIN VS. HLD Lamp	1	
								BKT Link Lamp VS. HSG DMD	2	
	3	8F.2R754.6R0	MACH	HEX	6.0	B-NI	4.0+/-0.5	Clip Plate VS. HLD Lamp	1	
	4	6E.0GF01.001	ASSY SPRING SCREW	PH	15.15	NI	6.0+/-0.5	H-Sink VS. DMD HSG	4	4
									SUM=	33

Model Name :MP522 (OM)

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Appendix 2 - Code List: IR / RS232 / DDC Data

Remote Control Code:

1. IR Code
(A) IR setting value
      Frequency: 38.5kHz
      Protocal: NEC format
(B) IR command code

CUSTOMER CODE	DATA CODE	FUNCTION
0030	02	POWER
0030	03	❙❙/▶
0030	04	SOURCE
0030	05	TIMER (ON)
0030	06	TIMER (SETUP)
0030	07	BLANK
0030	08	AUTO
0030	0B	▲
0030	0C	▼
0030	0D	◀
0030	0E	▶
0030	0F	MENU
0030	10	MODE
0030	18	DIGITAL ZOOM +
0030	19	DIGITAL ZOOM –
0030	4F	Power On
0030	4E	Power Off
0030	82	Vol +
0030	83	Vol -

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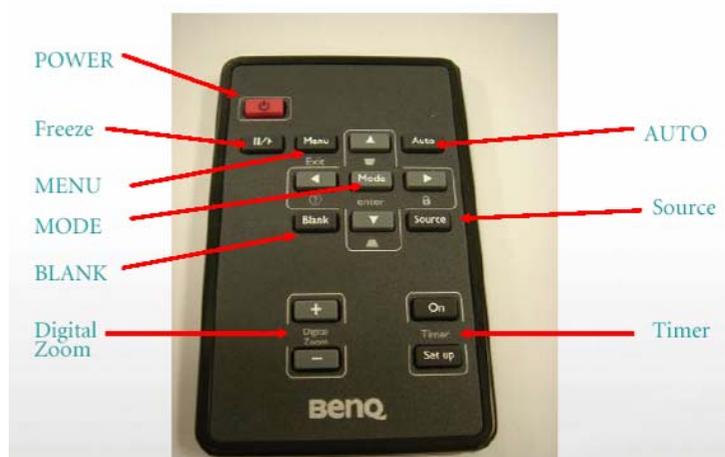
2. RS-232 Command Code

CMD	ACTION	ASCII (DDP2000)	condition
Power	Power On	<CR>*pow=on#<CR>	Execute under Standby
	Power off	<CR>*pow=off#<CR>	Execute under power on
	Power Status	<CR>*pow=?#<CR>	
Source Selection (depend on models)	VGA/YPbPr	<CR>*sour=RGB#<CR>	Execute under power on
	VGA/YPbPr-2	<CR>*sour=RGB2#<CR>	
	YPbPr	<CR>*sour=YPbr#<CR>	
	DVI-A	<CR>*sour=dviA#<CR>	
	DVI-D	<CR>*sour=dvid#<CR>	
	HDMI	<CR>*sour=hdmi#<CR>	
	HDMI-2	<CR>*sour=hdmi2#<CR>	
	Network	<CR>*sour=net#<CR>	
	Composite	<CR>*sour=vid#<CR>	
	SVIDEO	<CR>*sour=svid#<CR>	
	Current source	<CR>*sour=?#<CR>	
Audio	Mute On	<CR>*mute=on#<CR>	1.power on 2. System will execute after Audio commanding, but audio related OSD will refresh until turn-off and reopen OSD
	Mute Off	<CR>*mute=off#<CR>	
	Mute Status	<CR>*mute=?#<CR>	
	Volume +	<CR>*vol=+#<CR>	
	Volume -	<CR>*vol=-#<CR>	
	Volume	<CR>*vol=?#<CR>	
Picture Setting (depend on models)	Contrast +	<CR>*con=+#<CR>	1. Execute under power on and connecting to source 2. System will execute after commanding, but bright ,contrast,& aspect related OSD will refresh until turn-off and reopen OSD 3.Unable to execute under freeze on or blank on status
	Contrast -	<CR>*con=-#<CR>	
	Contrast value	<CR>*con=?#<CR>	
	Brightness +	<CR>*bri=+#<CR>	
	Brightness -	<CR>*bri=-#<CR>	
	Brightness value	<CR>*bri=?#<CR>	
	Aspect 4:3	<CR>*asp=4:3#<CR>	
	Aspect 16:9	<CR>*asp=16:9#<CR>	
	Aspect Auto	<CR>*asp=AUTO#<CR>	
	Aspect Real	<CR>*asp=REAL#<CR>	
	Aspect Letterbox	<CR>*asp=LBOX#<CR>	
	Aspect Wide	<CR>*asp=WIDE#<CR>	
	Aspect Anamorphic	<CR>*asp=ANAM#<CR>	

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Lamp Control	Lamp 1 Hour	<CR>*ltim=?#<CR>	
	Lamp 2 Hour	<CR>*ltim2=?#<CR>	
	Normal mode	<CR>*lampm=lnor#<CR>	1. Execute under power on 2. System will execute after commanding, but Lamp related OSD will refresh until turn-off and reopen OSD
	Economic mode	<CR>* lampm =eco#<CR>	
	Dual Brightest	<CR>*lampm =dualbr#<CR>	
	Dual Reliable	<CR>* lampm =dualre#<CR>	
	Single Alternative	<CR>* lampm =single#<CR>	
	LampMode Status	<CR>*lampm=?#<CR>	
Miscellaneous	Blank On	<CR>*blank=on#<CR>	1. Execute under power on and connecting to source 2. Same as operating Remote, but cmd divides to ON and OFF
	Blank Off	<CR>*blank=off#<CR>	
	Blank Status	<CR>*blank=?#<CR>	
	Freeze On	<CR>*freeze=on#<CR>	
	Freeze Off	<CR>*freeze=off#<CR>	
	Freeze Status	<CR>*freeze=?#<CR>	
	Menu On	<CR>*menu#<CR>	1. Execute under power on 2. Same as operating Remote
	Up	<CR>*up#<CR>	
	Down	<CR>*down#<CR>	
	Right	<CR>*right#<CR>	
	Left	<CR>*left#<CR>	
	enter	<CR>*enter#<CR>	
	Auto	<CR>*auto#<CR>	
	Zoom In	<CR>*zoomI#<CR>	
	Zoom out	<CR>*zoomO#<CR>	

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DDC Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	09	D1	01	AC	01	01	01	01
10	01	12	01	03	0E	00	00	78	0A	54	AC	A1	5A	5A	89	23
20	18	50	58	BD	EE	80	31	59	45	59	61	59	81	80	81	00
30	81	40	01	01	01	01	A0	0F	20	00	31	58	1C	20	28	80
40	14	00	00	00	00	00	00	18	00	00	00	FE	00	42	45	4E
50	51	0A	20	20	20	20	20	20	20	20	00	00	00	FC	00	4D
60	50	35	31	32	0A	20	20	20	20	20	20	20	00	00	00	FD
70	00	30	55	1F	52	0B	00	0A	20	20	20	20	20	20	00	46

(08H-09H)   ID Manufacturer Name _____   = BNQ
(0AH-0BH)   Product ID Code _____   = AC01
(0CH-0FH)   Last 5 Digits of Serial Number _____   = UNUSE
(10H)   Week of Manufacture _____   = 01
(11H)   Year of Manufacture _____   = 2008
(12H)   EDID Version Number _____   = 1
(13H)   EDID Revision Number _____   = 3

(14H)   VIDEO INPUT DEFINITION:
            Analog Signal
            0.700, 0.300 (1.000 Vp-p)
            Sync on Green, Composite Sync, Separate Syncs
Error: (0-5) Incorrect Video Information Byte
(15H)   Maximum Horizontal Image Size _____   =   mm
(16H)   Maximum Vertical Image Size _____   =   mm
(17H)   Display Gamma _____   =   2.20

(18H)   DPMS and Supported Feature(s):
            Preferred Timing Mode
            Display Type = R/G/B Color

(19H-22H)   CHROMA INFO:
            Red x - 0.630 Green x - 0.353 Blue x - 0.139 White x - 0.315
            Red y - 0.353 Green y - 0.535 Blue y - 0.096 White y - 0.344

(23H)   ESTABLISHED TIMING I:
            720 x 400 @ 70Hz (IBM,VGA)
            640 x 480 @ 60Hz (IBM,VGA)
            640 x 480 @ 67Hz (Apple,Mac II)
            640 x 480 @ 72Hz (VESA)
            640 x 480 @ 75Hz (VESA)
            800 x 600 @ 60Hz (VESA)

(24H)   ESTABLISHED TIMING II:
            800 x 600 @ 72Hz (VESA)
            800 x 600 @ 75Hz (VESA)
            832 x 624 @ 75Hz (Apple,Mac II)
            1024 x 768 @ 60Hz (VESA)
            1024 x 768 @ 70Hz (VESA)
            1024 x 768 @ 75Hz (VESA)

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(25H)   Manufacturer's Reserved Timing:
               1152 x 870 @ 75Hz (Apple,Mac II)

(38-53)   Standard Timing Identification:
          Standard Timing ID 1: 640 x 480 @85Hz
          Standard Timing ID 2: 800 x 600 @85Hz
          Standard Timing ID 3: 1024 x 768 @85Hz
          Standard Timing ID 4: 1280 x 1024 @60Hz
          Standard Timing ID 5: 1280 x 800 @60Hz
          Standard Timing ID 6: 1280 x 960 @60Hz
          Standard Timing ID 7 - Not Used
          Standard Timing ID 8 - Not Used

(36H-47H) Detailed Timing / Descriptor Block 1:
          800x600   Pixel Clock: 40.00 MHz

          Horizontal Image Size: 0 mm   Vertical Image Size: 0 mm
          Refreshed Mode: Non-Interlaced   Normal Display - No Stereo

Horizontal:
          Active Count: 800 pixels   Blanking Count: 256 pixels
          Sync Offset: 40 pixels   Sync Pulse Width: 128 pixels
          Border: 0 pixels   Frequency: 37.88 kHz

Vertical:
          Active Count: 600 lines   Blanking Count: 28 lines
          Sync Offset: 1 lines   Sync Pulse Width: 4 lines
          Border: 0 lines   Frequency: 60.32 Hz

Digital Separate, Horizontal Polarity (-) Vertical Polarity (-)

(48H-59H) Detailed Timing / Descriptor Block 2:

          ASCII Data:
          BENQ

(5AH-6BH) Detailed Timing / Descriptor Block 3:

          Monitor Name:
          MP512

(6CH-7DH) Detailed Timing / Descriptor Block 4:
          Monitor Range Limits:
          Min Vertical Freq - 48 Hz
          Max Vertical Freq - 85 Hz
          Min Horiz. Freq - 31 kHz
          Max Horiz. Freq - 82 kHz
          Pixel Clock   - 110 MHz
          GTF - Not Used
(7EH) Block No: No Extension EDID Block(s)
Error: (0-3) Incorrect Extension Flag(7FH)   CheckSum OK