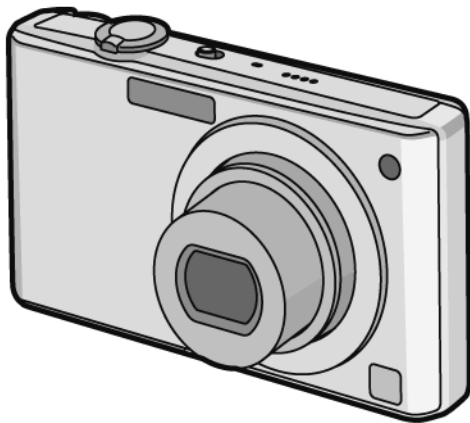


Service Manual

Digital Camera

LUMIX



Model No. **DMC-FX37P**
DMC-FX37PC
DMC-FX37PL
DMC-FX37E
DMC-FX37EB
DMC-FX37EE
DMC-FX37EF
DMC-FX37EG
DMC-FX37SG
DMC-FX38GC
DMC-FX38GD
DMC-FX38GK
DMC-FX38GN
DMC-FX38GT
DMC-FX38GJ

Vol. 1

Colour

- (S).....Silver Type (except PC/EF/GD)
- (K).....Black Type
- (P).....Pink Type (only PL/EE/SG/GC/GD/GN/GT/GJ)
- (A).....Blue Type (only P/PC/EE/EG)
- (W).....White Type (only P/E/EE/EF/EG/SG/GK)
- (T).....Brown Type
(only EB/EF/EG/SG/GC/GK/GT/GJ)

Panasonic®

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WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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1 Safety Precaution

1.1. General Guidelines

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by

 in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2. An Isolation Transformer should always be used during the servicing of AC Adaptor whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect AC Adaptor from being damaged by accidental shorting that may occur during servicing.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.2. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1\text{ M}\Omega$ and $5.2\text{ M}\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be infinity.

1.3. Leakage Current Hot Check (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a $1.5\text{ k}\Omega$, 10 W resistor, in parallel with a $0.15\text{ }\mu\text{F}$ capacitor, between each exposed metallic part on the set and a good earth ground, as shown in Figure 1.
3. Use an AC voltmeter, with $1\text{ k}\Omega/\text{V}$ or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS . A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed $1/2\text{ mA}$. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Hot-Check Circuit

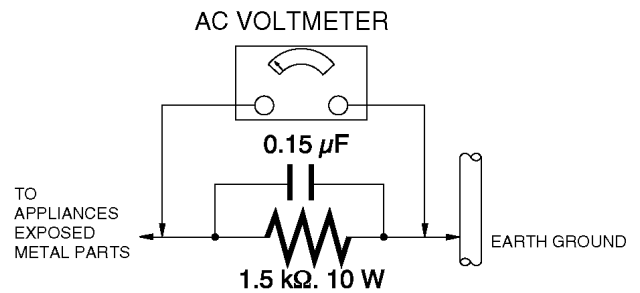


Figure. 1

1.4. How to Discharge the Capacitor on Flash Top PCB

CAUTION:

1. Be sure to discharge the capacitor on FLASH TOP PCB.
2. Be careful of the high voltage circuit on FLASH TOP PCB when servicing.

[Discharging Procedure]

1. Refer to the disassemble procedure and Remove the necessary parts/unit.
2. Put the insulation tube onto the lead part of Resistor (ERG5SJ102:1k Ω /5W).
(an equivalent type of resistor may be used.)
3. Put the resistor between both terminals of capacitor on FLASH TOP PCB for approx. 5 seconds.
4. After discharging confirm that the capacitor voltage is lower than 10V using a voltmeter.

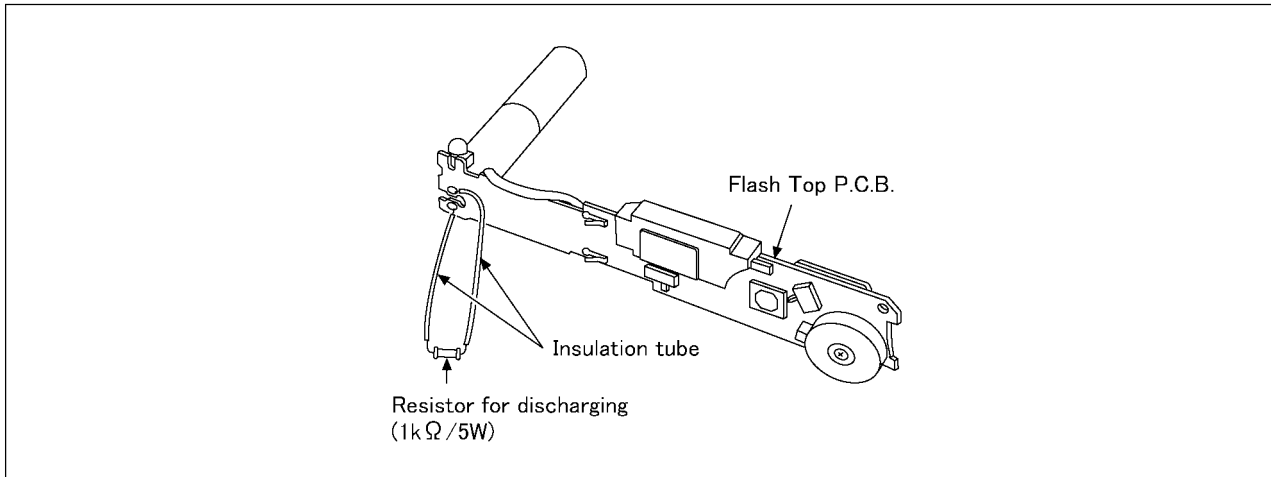


Fig. F1

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices.

Examples of typical ES devices are CCD image sensor, IC (integrated circuits) and some field-effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION :

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

2.2. How to Recycle the Lithium Ion Battery (U.S. Only)

ENGLISH



A lithium ion battery that is recyclable powers the product you have purchased. Please call 1-800-8-BATTERY for information on how to recycle this battery.

FRANÇAIS



L'appareil que vous vous êtes procuré est alimenté par une batterie au lithium-ion recyclable. Pour des renseignements sur le recyclage de la batterie, veuillez composer le 1-800-8-BATTERY.

2.3. Caution for AC Cord (For EB/GC)

2.3.1. Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

2.3.2. Caution for AC Mains Lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362

Check for the ASRA mark or the BSI mark on the body of the fuse.



If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safely.

There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt, please consult a qualified electrician.

2.3.2.1. Important

The wires in this mains lead are coloured in accordance with the following code:

Blue	Neutral
Brown	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

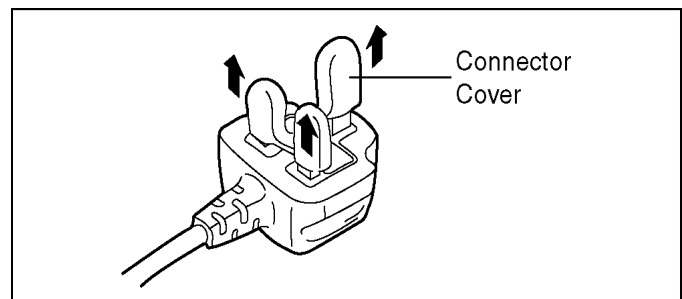
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol.



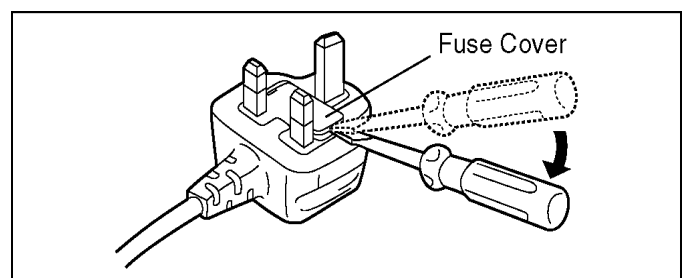
2.3.2.2. Before Use

Remove the Connector Cover as follows.

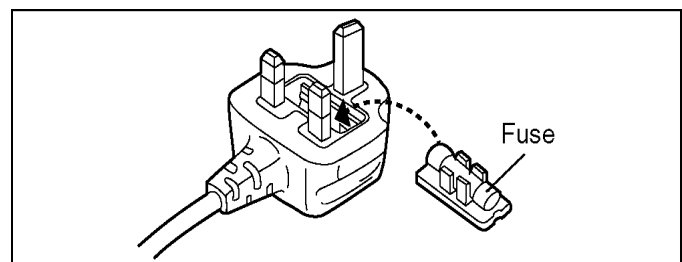


2.3.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



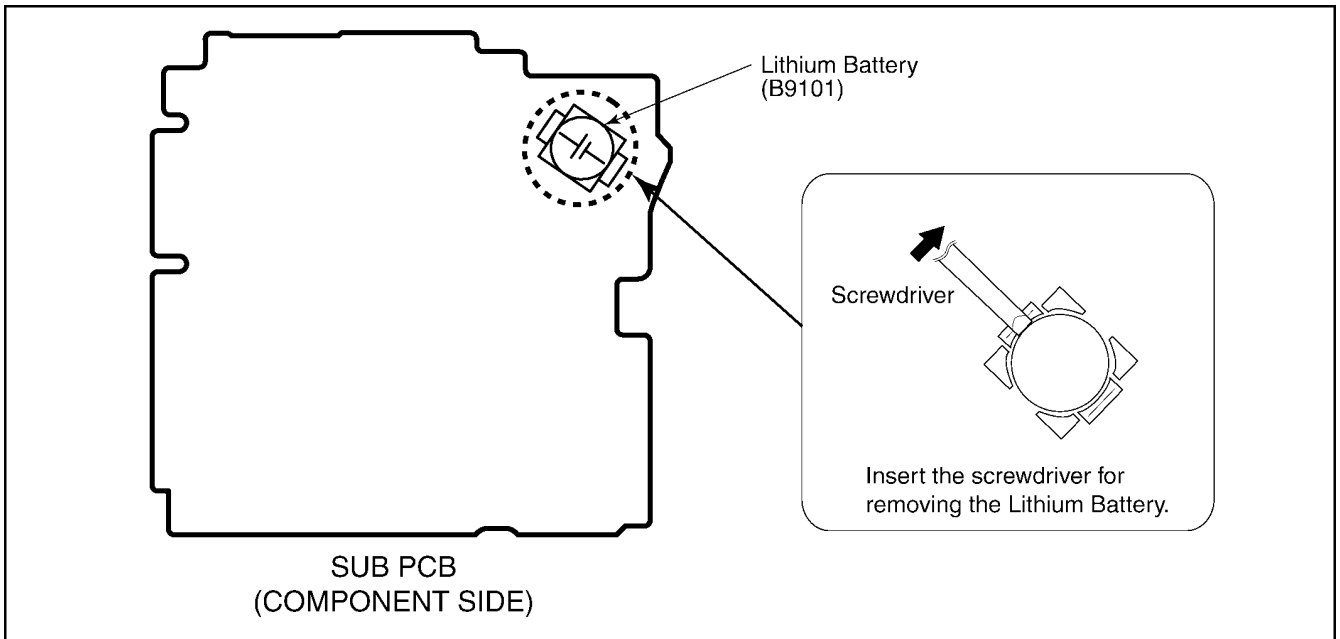
2. Replace the fuse and attach the Fuse cover.



2.4. How to Replace the Lithium Battery

2.4.1. Replacement Procedure

1. Remove the SUB PCB. (Refer to Disassembly Procedures.)
2. Remove the Lithium battery (Ref. No. "B9101" at component side of SUB PCB) and then replace it into new one.



NOTE:

This Lithium battery is a critical component.

(Type No.: ML421S/ZT **Manufactured by Matsushita Battery Industrial Co.,Ltd.**)

It must never be subjected to excessive heat or discharge.

It must therefore only be fitted in requirement designed specifically for its use.

Replacement batteries must be of same type and manufacture.

They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose.

It should be disposed of in waste products destined for burial rather than incineration.

(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

(For German)

ACHTUNG

Explosionsgefahr bei falschem Anbringen der Batterie. Ersetzen Sie nur mit einem äquivalentem vom Hersteller empfohlenem Typ.

Behandeln Sie gebrauchte Batterien nach den Anweisungen des Herstellers.

(For French)

MISE EN GARDE

Une batterie de remplacement inappropriée peut exploser. Ne remplacez qu'avec une batterie identique ou d'un type recommandé par le fabricant. L'élimination des batteries usées doit être faite conformément aux instructions du manufacturier.

NOTE:

Above caution is applicable for a battery pack which is for DMC-FX37/FX38 series, as well.

3 Service Navigation

3.1. Introduction

This service manual contains technical information, which allow service personnel's to understand and service this model.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

3.2. General Description About Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30°C (86°F) more than that of the normal solder.

Distinction of PCB Lead Free Solder being used

The letter of "PbF" is printed either foil side or components side on the PCB using the lead free solder.(See right figure)	PbF
-----------------------------------------------------------------------------------------------------------------------------	-----

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
(Definition: The letter of "PbF" is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30°C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
RFKZ03D01K----- (0.3mm 100g Reel)
RFKZ06D01K----- (0.6mm 100g Reel)
RFKZ10D01K----- (1.0mm 100g Reel)

Note

* Ingredient: tin (Sn) 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

3.3. Important Notice 1:(Other than U.S.A. and Canadian Market)

1. The service manual does not contain the following information, because of the impossibility of servicing at component level without concerned equipment/facilities.
 - a. Schematic diagram, Block Diagram and PCB layout of MAIN PCB and SUB PCB.
 - b. Parts list for individual parts for MAIN PCB and SUB PCB.When a part replacement is required for repairing MAIN PCB and/or SUB PCB, replace as an assembled parts. (MAIN PCB/ SUB PCB)
2. The following category is/are recycle module part. please send it/them to Central Repair Center.
 - MAIN PCB (VEP56065A)
 - SUB PCB (VEP51022A): Excluding replacement of Lithium Battery

3.4. How to Define the Model Suffix (NTSC or PAL model)









There are eight kinds of DMC-FX37/FX38, regardless of the colours.

- a) DMC-FX37 (Japan domestic model), DMC-FX37SG
- b) DMC-FX37P/PC
- c) DMC-FX37E/EB/EF/EG
- d) DMC-FX38GN
- e) DMC-FX37EE
- f) DMC-FX38GD
- g) DMC-FX38GT/GK
- h) DMC-FX37PL, FX38GC/GJ

What is the difference is that the "INITIAL SETTINGS" data which is stored in Flash ROM mounted on MAIN PCB.

3.4.1. Defining methods:

To define the model suffix to be serviced, refer to the nameplate which is putted on the bottom side of the Unit.

<p>a) DMC-FX37 (Japan domestic model), DMC-FX37SG The nameplate for these models show the following Safety registration mark.</p> 
<p>b) DMC-FX37P/PC The nameplate for these models show the following Safety registration mark.</p> 
<p>c) DMC-FX37E/EB/EF/EG The nameplate for these models show the following Safety registration mark.</p> 
<p>d) DMC-FX38GN The nameplate for this model show the following Safety registration mark.</p> 
<p>e) DMC-FX37EE The nameplate for this model show the following Safety registration mark.</p> 
<p>f) DMC-FX38GD The nameplate for this model show the following Safety registration mark.</p> 
<p>g) DMC-FX38GT The nameplate for this model show the following Safety registration mark.</p> 
<p>h) DMC-FX38GK The nameplate for this model show the following Safety registration mark.</p> 
<p>i) DMC-FX37PL, FX38GC/GJ The nameplate for these models do not show any above Safety registration mark.</p>

NOTE:

After replacing the MAIN PCB, be sure to achieve adjustment.

The adjustment instruction is available at "software download" on the "Support Information from NWBG/VDBG-PAVC" web-site in "TSN system", together with Maintenance software.

3.4.2. INITIAL SETTINGS:

When you replace the MAIN PCB, be sure to perform the initial settings after achieving the adjustment by ordering the following procedure in accordance with model suffix of the unit.

1. IMPORTANT NOTICE:

Before proceeding Initial settings, be sure to read the following CAUTIONS.

CAUTION 1 : (INITIAL SETTINGS)
 ---AFTER REPLACING THE MAIN P.C.B.---

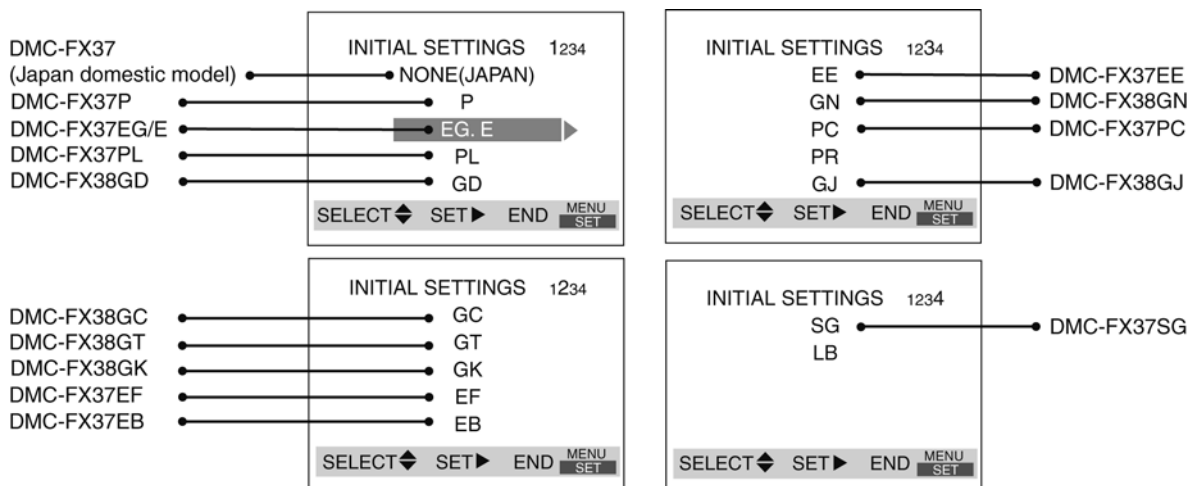
- *The model suffix can be chosen **JUST ONE TIME**.
 (Model suffix : "E/EB/EE/EF/EG/GC/GD/GJ/GK/GN/GT/P/PC/PL/SG and NONE(JAPAN)")
- *Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can not be changed.

[NOTE: Only for "EG.E/EF/EB/EE" models]
 *When one of the "EG.E, EF, EB, and EE" are chosen, "EG.E, EF, EB, and EE" are displayed from second times.

CAUTION 2 (Stored picture image data in the unit)
 This unit employs "Built-in Memory" for picture image data recording.(Approx. 50MB)
 After proceeding "INITIAL SETTINGS", the picture image data stored in the unit is erased.

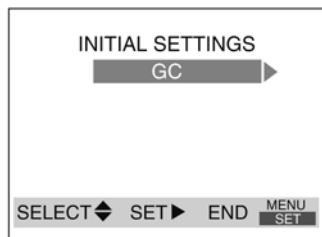
2. PROCEDURES:

- Precautions: Proceed the picture back up from the unit. (Refer to above "CAUTION 2")
- Preparation. Set the Mode dial to "Normal Picture Mode" (Red camera mark).
- **Step 1. The temporary cancellation of initial setting:**
 Set the [REC]/[PLAYBACK] selector switch to "[REC] (Red camera mark)".
 While keep pressing [DISPLAY] and "[UP] of Cursor buttons" simultaneously, turn the Power on.
- **Step 2. The cancellation of initial setting:**
 Set the [REC]/[PLAYBACK] selector switch to "[PLAYBACK]".
 Press [DISPLAY] and "[UP] of Cursor buttons" simultaneously, then turn the Power off.
- **Step 3. Turn the Power on:**
 Set the [REC]/[PLAYBACK] selector switch to "[REC] (Red camera mark)", and then turn the Power on.
- **Step 4. Display the INITIAL SETTING:**
 While keep pressing [MENU/SET] and "[RIGHT] of Cursor buttons" simultaneously, turn the Power off.
 When MAIN P.C.B. is replaced, all of the model suffix is displayed as follows.
 There are two kinds of "INITIAL SETTINGS" menu format.
 [1. After replacing MAIN P.C.B.]

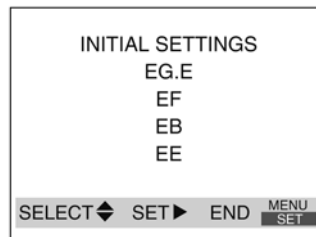


[2. Other than “After replacing MAIN P.C.B.”]

<Other than “EG.E/EF/EB/EE” models>



<Only “EG.E/EF/EB/EE” models>



• **Step 5. Set the INITIAL SETTING: (Refer to “CAUTION 1”)**

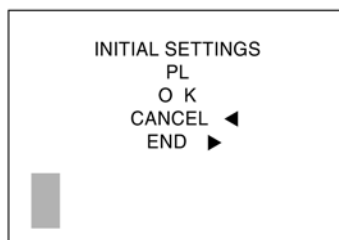
[Caution: After replacing MAIN P.C.B.]

The model suffix can be chosen, **JUST ONE TIME**.

Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can be changed.

Select the area carefully.

Select the area with pressing “[UP] / [DOWN] of Cursor buttons”, and then press the “[RIGHT] of Cursor buttons”.



The only set area is displayed, and then press the “[RIGHT] of Cursor buttons” after confirmation.

(The unit is powered off automatically.)

Confirm the display of “PLEASE SET THE CLOCK” in English when the unit is turned on again.

• **Step 6. CONFIRMATION:**

The display shows “PLEASE SET THE CLOCK” when turn the Power on again.

When the unit is connected to PC with USB cable, it is detected as removable media.

1) As for your reference Default setting condition is given in the following table.

• **Default setting (After “INITIAL SETTINGS”)**

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DMC-FX37 (Japan domestic model)	NTSC	Japanese	Year/Month/Date	
b)	DMC-FX37P/PC/PL	NTSC	English	Month/Date/Year	
c)	DMC-FX37E/EB/EG/SG, FX38GC/GN	PAL	English	Date/Month/Year	
d)	DMC-FX37EF	PAL	French	Date/Month/Year	
e)	DMC-FX37EE	PAL	Russian	Date/Month/Year	
f)	DMC-FX38GK	PAL	Chinese (simplified)	Year/Month/Date	
g)	DMC-FX38GT	NTSC	Chinese (traditional)	Year/Month/Date	
h)	DMC-FX38GD	NTSC	Korean	Year/Month/Date	
i)	DMC-FX38GJ	PAL	Thai	Date/Month/Year	

4 Specifications

Digital Camera: Information for your safety

Power Source:	DC 5.1 V
Power Consumption:	1.4 W (When recording) 0.6 W (When playing back)

Camera effective pixels: 10,100,000 pixels
Image sensor: 1/2.33" CCD, total pixel number 10,700,000 pixels, Primary color filter
Lens: Optical 5×zoom, f=4.4 mm to 22 mm (35 mm film camera equivalent: 25 mm to 125 mm)/F2.8 to F5.9
Digital zoom: Max. 4×
Extended optical zoom: Max. 8.9×
Focus: Normal/Macro/Face detection/AF Tracking/11-area-focusing/1-area-focusing (High speed)/1-area-focusing/Spot-focusing
Focus range: Normal: 50 cm (1.64 feet) (Wide)/1 m (3.28 feet) (Tele) to ∞
 Macro/Intelligent auto/Clipboard mode: 5 cm (0.17 feet) (Wide)/1 m (3.28 feet) (Tele) to ∞
 Scene mode: There may be differences in the above settings.
Shutter system: Electronic shutter+Mechanical shutter
Motion picture recording: 1280×720 pixels (30 frames/second, only when using a Card)/848×480 pixels (30 frames/second, only when using a Card)/640×480 pixels (30 frames/second, only when using a Card)/320×240 pixels (30 frames/second, 10 frame/second) With audio
Burst recording
Burst speed: 2.5 pictures/second (Normal), Approx. 2 pictures/second (Unlimited)
Number of recordable pictures: Max. 5 pictures (Standard), max. 3 pictures (Fine), Depends on the remaining capacity of the built-in memory or the card (Unlimited). (Performance in burst recording is only with SD Memory Card/SDHC Memory Card. MultiMediaCard performance will be less.)
Hi-speed burst
Burst speed: Approx. 6 pictures/second (3M (4:3), 2.5M (3:2) or 2M (16:9) is selected as the picture size.)
Number of recordable pictures: When using the built-in memory: Approx. 15 pictures (immediately after formatting)
 When using a Card: Max. 100 pictures (differs depending on the type of Card and the recording conditions)
ISO sensitivity: AUTO/100/200/400/800/1600 [HIGH SENS.] mode: 1600 to 6400
Shutter speed: 8 seconds to 1/2000th of a second [STARRY SKY] mode: 15 seconds, 30 seconds, 60 seconds
White balance: Auto white balance/Daylight/Cloudy/Shade/Incandescent lights/White set
Exposure (AE): Program AE Exposure compensation (1/3 EV Step, -2 EV to +2 EV)
Metering mode: Multiple
LCD monitor: 2.5" TFT LCD (Approx. 230,000 dots) (field of view ratio about 100%)
Flash: Flash range: [ISO AUTO] Approx. 60 cm (1.97 feet) to 6.0 m (19.7 feet) (Wide) AUTO, AUTO/Red-eye reduction, Forced flash ON (Forced ON/Red-eye reduction), Slow sync./Red-eye reduction, Forced flash OFF

Microphone: Monaural
Speaker: Monaural
Recording media: Built-in Memory (Approx. 50 MB)/SD Memory Card/SDHC Memory Card/MultiMediaCard (Still pictures only)

Picture size
Still picture: When the aspect ratio setting is [4:3] 3648×2736 pixels, 3072×2304 pixels, 2560×1920 pixels, 2048×1536 pixels, 1600×1200 pixels, 640×480 pixels
 When the aspect ratio setting is [16:9] 3648×2432 pixels, 3072×2048 pixels, 2560×1712 pixels, 2048×1360 pixels
 When the aspect ratio setting is [10:9] 3648×2056 pixels, 3072×1728 pixels, 2560×1440 pixels, 1920×1080 pixels
Motion pictures: 1280×720 pixels (Only when using a Card) 848×480 pixels (Only when using a Card) 640×480 pixels (Only when using a Card) 320×240 pixels

Quality: Fine/Standard
Recording file format
Still Picture: JPEG (based on "Design rule for Camera File system", based on "Exif 2.21" standard)/DPOF corresponding
Pictures with audio: JPEG (based on "Design rule for Camera File system", based on "Exif 2.21" standard)+ "QuickTime" (pictures with audio) "QuickTime Motion JPEG" (motion pictures with audio)
Motion pictures: "QuickTime Motion JPEG" (motion pictures with audio)
Interface
Digital: "USB 2.0" (High Speed)
Analog video/audio: NTSC Composite (P area) NTSC/PAL Composite (Switched by menu) (Other areas) Component Audio line output (monaural)

Terminal
[COMPONENT OUT]: Dedicated jack (10 pin)
[AV OUT/DIGITAL]: Dedicated jack (8 pin)
[DC IN]: Dedicated jack (2 pin)
Dimensions: Approx. 94.7 mm (W)×51.9 mm (H)×22.0 mm (D) [3 3/4" (W)×2 1/16" (H)×7/8" (D)] (excluding the projecting parts)
Mass (weight): Approx. 125 g/4.41 oz (excluding card and battery) Approx. 146 g/5.15 oz (with card and battery)
Operating temperature: 0 °C to 40 °C (32 °F to 104 °F)
Operating humidity: 10% to 80%

Battery Charger (Panasonic DE-A39B):

Information for your safety

Input:	110 V to 240 V ~ 50/60 Hz, 0.2 A
Output:	CHARGE 4.2 V --- 0.8 A

Equipment mobility: Movable

Battery Pack (lithium-ion) (Panasonic DMW-BCE10PP):

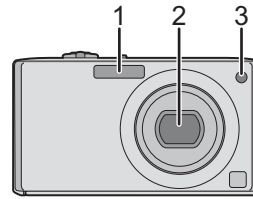
Information for your safety

Voltage:	3.6 V
-----------------	-------

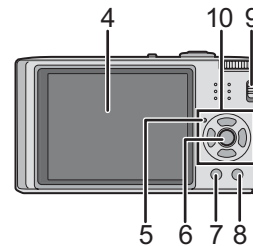
5 Location of Controls and Components

Names of the Components

- 1 Flash
- 2 Lens
- 3 Self-timer indicator
AF assist lamp

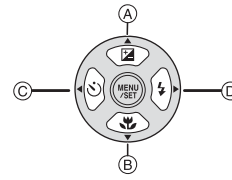


- 4 LCD monitor
- 5 Status indicator
- 6 [MENU/SET] button
- 7 [DISPLAY] button
- 8 [Q.MENU] /Delete button
- 9 [REC]/[PLAYBACK] selector switch

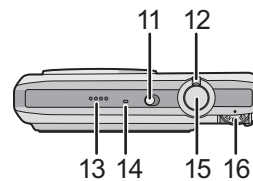


10 Cursor buttons

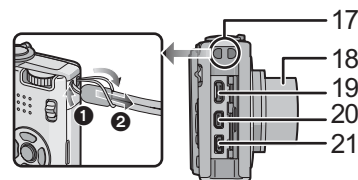
- (A): ▲/Exposure compensation / Auto bracket /White balance fine adjustment
- (B): ▼/Macro mode AF Tracking
- (C): ◀/Self-timer button
- (D): ▶/Flash setting button



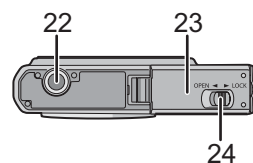
- 11 Camera ON/OFF switch
- 12 Zoom lever
- 13 Speaker
- 14 Microphone
- 15 Shutter button
- 16 Mode dial



- 17 Strap eyelet
- Be sure to attach the strap when using the camera to ensure that you will not drop it.
- 18 Lens barrel
- 19 [COMPONENT OUT] socket
- 20 [AV OUT/DIGITAL] socket
- 21 [DC IN] socket
- Always use a genuine Panasonic AC adaptor (DMW-AC5PP; optional).
- This camera cannot charge the battery even when the AC adaptor (DMW-AC5PP; optional) is connected to it.



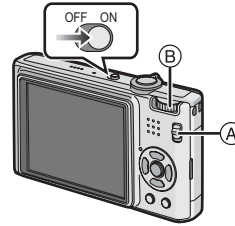
- 22 Tripod receptacle
- When you use a tripod, make sure the tripod is stable when the camera is attached to it.
- 23 Card/Battery door
- 24 Release lever



Selecting the [REC] Mode

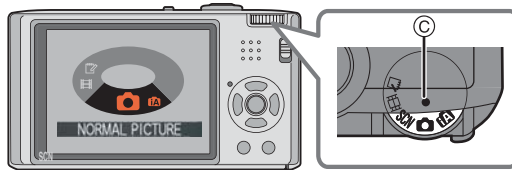
When the [REC] mode is selected, the camera can be set to the Intelligent auto mode in which the optimal settings are established in line with the subject to be recorded and the recording conditions, or to the scene mode which enables you to take pictures that match the scene being recorded.

- 1 Turn the camera on.**
 - Ⓐ [REC]/[PLAYBACK] selector switch
 - Ⓑ Mode dial
- 2 Slide the [REC]/[PLAYBACK] selector switch to [📷].**
- 3 Switching the mode by rotating the mode dial.**



Align a desired mode with part Ⓒ.

- Rotate the mode dial slowly and surely to adjust to each mode. (The part where there is no mode will not turn.)



List of [REC] modes

Intelligent auto mode

The subjects are recorded using settings automatically selected by the camera.

Normal picture mode

The subjects are recorded using your own settings.

SCN Scene mode

This allows you to take pictures that match the scene being recorded.

Motion picture mode

This mode allows you to record motion pictures with audio.

Clipboard mode

Record as a memo.

6 Service Mode

6.1. Error Code Memory Function

1. General description

This unit is equipped with history of error code memory function, and can be memorized 16 error codes in sequence from the latest. When the error is occurred more than 16, the oldest error is overwritten in sequence.

The error code is not memorized when the power supply is shut down forcibly (when the unit is powered on by the battery, the battery is pulled out) because the error code is memorized to FLASH ROM when the unit is powered off.

2. How to display

The error code can be displayed by the following procedure:

Before perform the error code memory function, connect the AC adaptor or insert the battery.

(Since this unit has built-in memory, this error code memory function can be performed without inserting SD memory card.)

- Preparation. Set the Mode dial to "Normal Picture Mode" (Red camera mark).

Set the [REC]/[PLAYBACK] selector switch to "[REC] (Red camera mark)".

- **1. The temporary cancellation of initial setting:**

Set the [REC]/[PLAYBACK] selector switch to "[REC] (Red camera mark)".

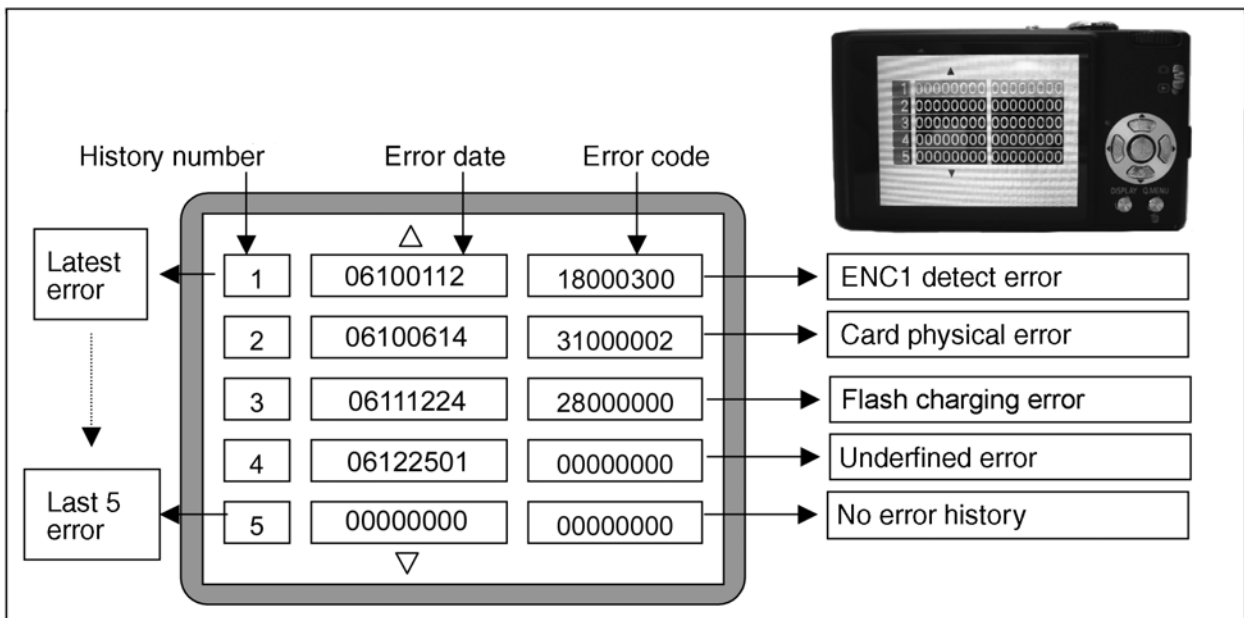
While keep pressing [DISPLAY] and "[UP] of Cursor buttons" simultaneously, turn the Power on.

- **2. The display of error code:**

Press [DISPLAY], [MENU/SET] and "[LEFT] of Cursor buttons" simultaneously with the step 1 condition.

The display is changed as shown below when the above buttons is pressed simultaneously.

Normal display → Error code display → Operation history display → Normal display →



Example of Error Code Display

- **3. The change of display:**

The error code can be memorized 16 error codes in sequence, however it is displayed 5 errors on the LCD.

Display can be changed by the following procedure:

"[UP] or [DOWN] of Cursor buttons" : It can be scroll up or down one.

"[LEFT] or [RIGHT] of Cursor buttons" : It can be display last 5 error or another 5 error.

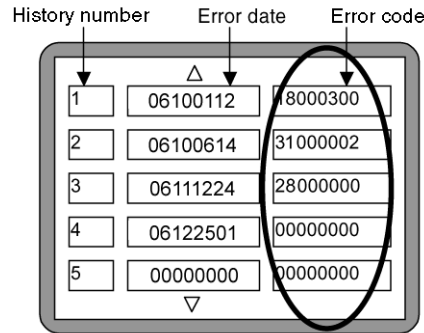
- **4. How to read the error date:**

The error date code is displayed from the left in order at the year, month, day, time.

Error date information is acquired from "Clock setting" information when the error occurs. When the clock is not setting, it is displayed as "00000000".

• 5. How to read the error code:

One error code is displayed for 8 bit, the contents of error codes is indicated the table as shown below.



Attribute	Main item	Sub item	Error code		Contents (Upper)	
			High 4 bits	Low 4 bits	Check point (Lower)	
LENS	Lens drive	OIS	18*0	1000	PSD (X) error. Hall element (X axis) position detect error in OIS unit. OIS Unit	
				2000	PSD (Y) error. Hall element (Y axis) position detect error in OIS unit. OIS Unit	
				3000	GYRO (X) error. Gyro (IC7101: X axis) detect error on Main P.C.B.. IC7101 (Gyro element) or IC6001 (VENUS 4)	
				4000	GYRO (Y) error. Gyro (IC7101: Y axis) detect error on Main P.C.B.. IC7101 (Gyro element) or IC6001 (VENUS 4)	
				5000	MREF error (Reference voltage error). IC9101 (LENS drive) or IC6001 (VENUS 4)	
				6000	Drive voltage (X) error. VENUS 4 AD value error, LENS Unit, LENS flex breaks etc.	
				7000	Drive voltage (Y) error. VENUS 4 AD value error, LENS Unit, LENS flex breaks etc.	
		Zoom (C.B.)	0?10	Collapsible barrel Low detect error (Collapsible barrel encoder always detects Low.) Mechanical lock, FP9802-(3) signal line or IC6001 (VENUS 4)		
			0?20	Collapsible barrel High detect error (Collapsible barrel encoder always detects High.) Mechanical lock, FP9802-(3) signal line or IC6001 (VENUS 4)		
			0?30	Zoom motor sensor error. Mechanical lock, FP9802-(35), (38) signal line or IC6001 (VENUS 4)		
			0?40	Zoom motor sensor error. (During monitor mode.) Mechanical lock, FP9802-(35), (38) signal line or IC6001 (VENUS 4)		
			0?50	Zoom motor sensor error. (During monitor mode with slow speed.) Mechanical lock, FP9802-(35), (38) signal line or IC6001 (VENUS 4)		
			Focus	0?01	HP High detect error (Focus encoder always detects High.). Mechanical lock, FP9802-(3) signal line or IC6001 (VENUS 4)	
		0?02		HP Low detect error (Focus encoder always detects Low.). Mechanical lock, FP9802-(3) signal line or IC6001 (VENUS 4)		
		Lens	18*1	0000	Power ON time out error. Lens drive system	
				0000	Power OFF time out error. Lens drive system	
		Adj.History	OIS	19*0	2000	OIS adj. Yaw direction amplitude error (small)
					3000	OIS adj. Pitch direction amplitude error (small)
	4000				OIS adj. Yaw direction amplitude error (large)	
	5000				OIS adj. Pitch direction amplitude error (large)	
	6000				OIS adj. MREF error	
	7000				OIS adj. time out error	
	8000				OIS adj. Yaw direction off set error	
9000	OIS adj. Pitch direction off set error					
A000	OIS adj. Yaw direction gain error					
B000	OIS adj. Pitch direction gain error					
C000	OIS adj. Yaw direction position sensor error					
D000	OIS adj. Pitch direction position sensor error					
E000	OIS adj. other error					

Attribute	Main item	Sub item	Error code		Contents (Upper)	
			High 4 bits	Low 4 bits	Check point (Lower)	
HARD	VENUS A/D	Flash	28*0	0000	Flash charging error. IC6001-(AC17) signal line or Flash charging circuit	
	FLASH ROM (EEPROM Area)	FLASH ROM (EEPROM Area)	2B*0	0001	EEPROM read error IC6002 (FLASH ROM)	
				0002	EEPROM write error IC6002 (FLASH ROM)	
				0008	SDRAM error SDRAM Mounting defective	
	SYSTEM	RTC	2C*0	0001	SYSTEM IC initialize failure error Communication between IC6001 (VENUS 4) and IC9101 (SYSTEM)	
SOFT	CPU	Reset	30*0	0001 0007	NMI reset Non Mask-able Interrupt (30000001-30000007 are caused by factors)	
	Card	Card	31*0	0001	Card logic error SD memory card data line or IC6001 (VENUS 4)	
				0002	Card physical error SD memory card data line or IC6001 (VENUS 4)	
				0004	Write error SD memory card data line or IC6001 (VENUS 4)	
					Format error	
				39*0	0005	Format error
	CPU, ASIC hard	Stop	38*0	0001	Camera task finish process time out. Communication between Lens system and IC6001 (VENUS 4)	
				0002	Camera task invalid code error. IC6001 (VENUS 4)	
				0100	File time out error in recording motion image IC6001 (VENUS 4)	
				0200	File data cue send error in recording motion image IC6001 (VENUS 4)	
				0300	Single or burst recording brake time out.	
		Memory area	3A*0	0008	USB work area partitioning failure USB dynamic memory securing failure when connecting	
		Operation	Power on	3B*0	0000	FLASHROM processing early period of camera during movement.
		Zoom	Zoom	3C*0	0000	Inperfect zoom lens processing Zoom lens
	0000 FFFF				Software error (0-7bit : command, 8-15bit : status)	
	35*1			0000	Though record preprocessing is necessary, it is not called.	
	35*2			0000	Though record preprocessing is necessary, it is not completed.	

The above table

1) About "*" indication:

The third digit from the left is different as follows.

- In case of 0 (example: 1801000)

When the third digit from the left shows "0", this error occurred under the condition of INITIAL SETTINGS has been completed.

It means that this error is occurred basically at user side.

- In case of 8 (example: 1881000)

When the third digit from the left shows "8", this error occurred under the condition of INITIAL SETTINGS has been released.

(Example; Factory assembling-line before unit shipment, Service mode etc.)

It means that this error is occurred at service side.

2) About "?" indication: ("18*0 0?01" to "18*0 0?50"):

The third digit from the right shows one of the hexadecimal ("0" to "F") character.

• 6. How to returned to Normal Display:

Turn the power off and on, to exit from Error code display mode.

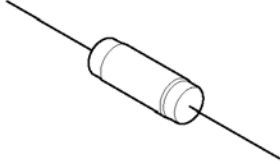
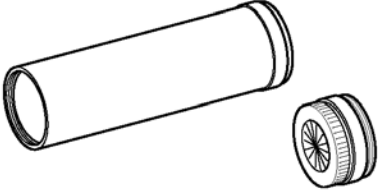
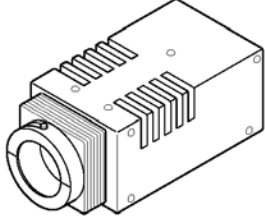
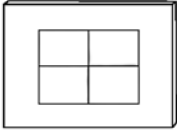




NOTE:

The error code can not be initialized.

7 Service Fixture & Tools

7.1. Service Fixture and Tools

The following Service Fixture and tools are used for checking and servicing this unit.

Resistor for Discharging ERG5SJ102	Infinity Lens (with Focus Chart) VFK1164TCM02	LIGHT BOX VFK1164TDVLB
 An equivalent type of Resistor may be used.	 * RFKZ0422 can be used.	 ※ with DC Cable
TR Chart RFKZ0443	Lens Cleaning Kit (BK) VFK1900BK	Grease (for lens) RFKZ0472
	 * Only supplied as 10 set/box.	
Dome type magnifying glass VFK1835	Driver (for mode dial installation screw) VFK1390	
		

7.2. When Replacing the Main PCB

After replacing the MAIN PCB, be sure to achieve adjustment.

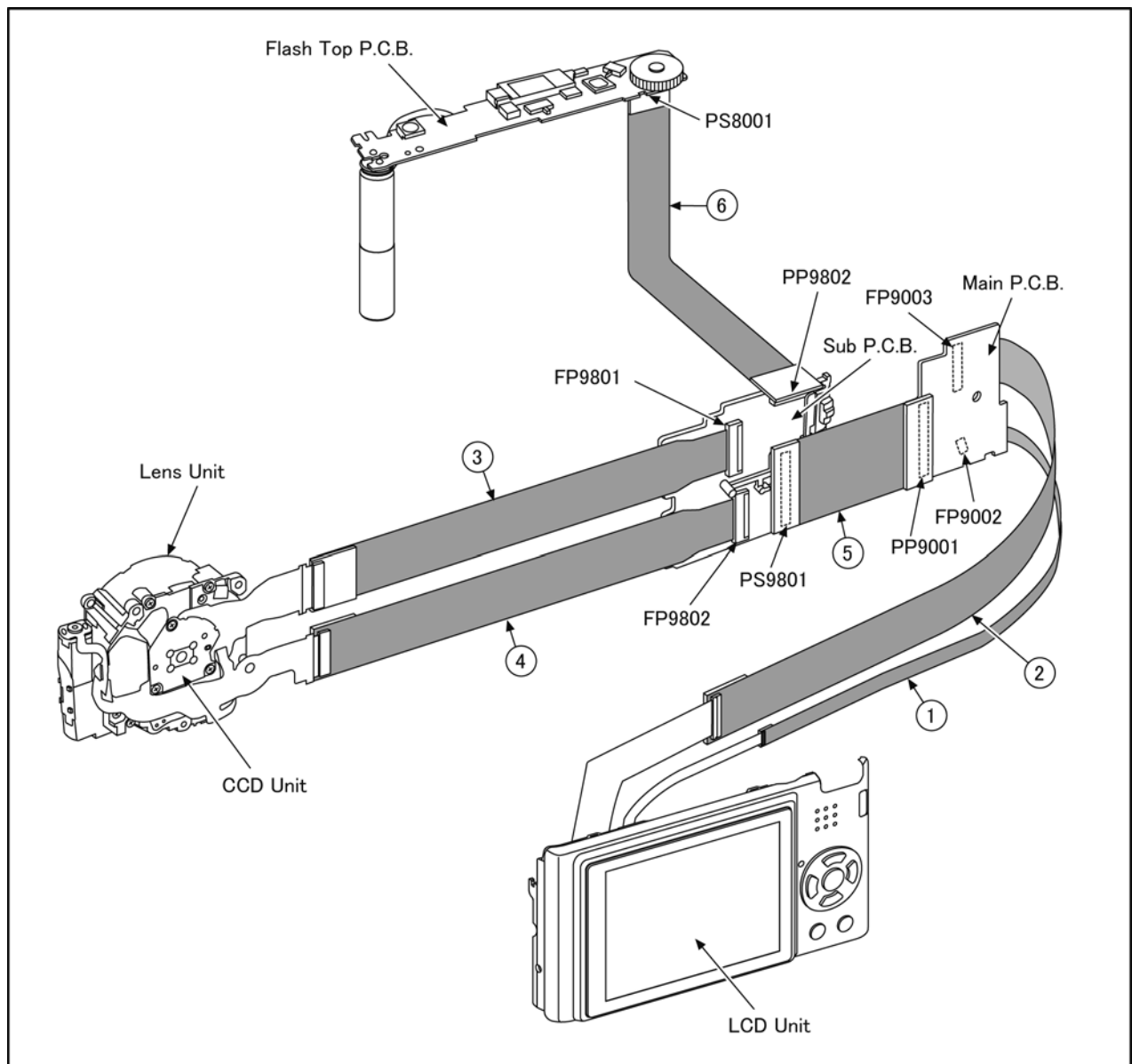
The adjustment instruction is available at “software download” on the “Support Information from NWBG/VDBG-PAVC” web-site in “TSN system”, together with Maintenance software.

7.3. Service Position

This Service Position is used for checking and replacing parts. Use the following Extension cables for servicing.

Table S1 Extension Cable List

No.	Parts No.	Connection	Form
1	VFK1974	FP9002 (MAIN) - LCD UNIT	4PIN 0.5 FFC
2	RFKZ0416	FP9003 (MAIN) - LCD UNIT	41PIN 0.3 FFC
3	RFKZ0416	FP9801 (SUB) - CCD UNIT	41PIN 0.3 FFC
4	RFKZ0477	FP9802 (SUB) - LENS UNIT	45PIN 0.3 FFC
5	RFKZ0445	PP9001 (MAIN) - PS9801 (SUB)	100PIN B to B
6	RFKZ0418	PP9802 (SUB) - PS8001 (FLASH TOP)	30PIN B to B

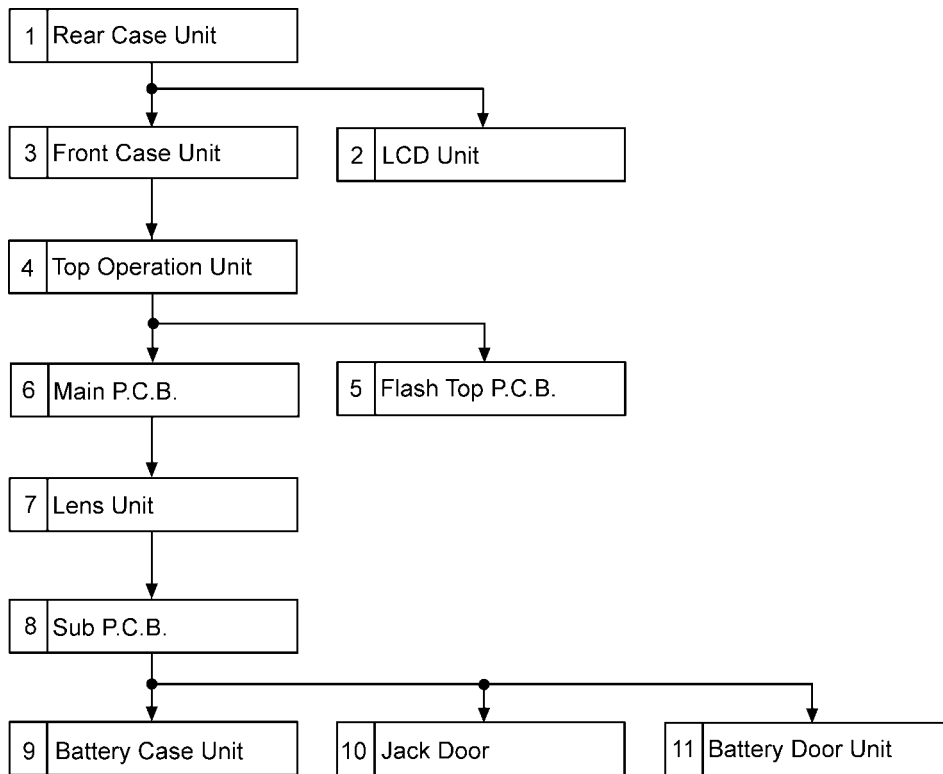


CAUTION-1. (When servicing FLASH TOP PCB)

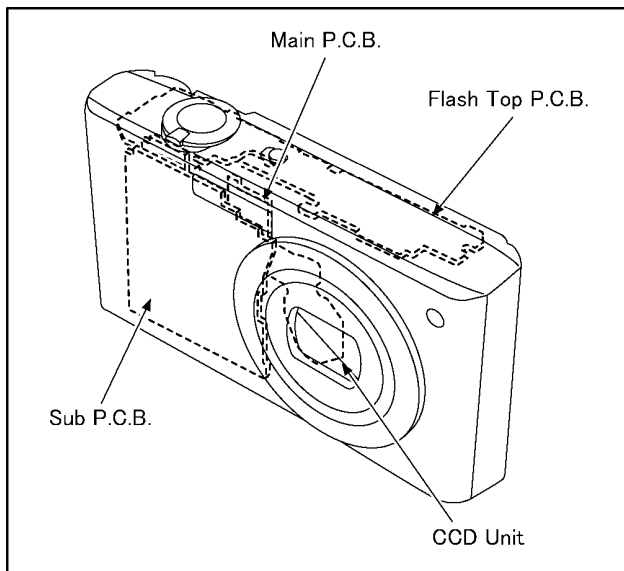
1. Be sure to discharge the capacitor on FLASH TOP PCB.
Refer to “HOW TO DISCHARGE THE CAPACITOR ON FLASH TOP PCB”.
The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on FLASH TOP PCB.
3. DO NOT allow other parts to touch the high voltage circuit on FLASH TOP PCB.

8 Disassembly and Assembly Instructions

8.1. Disassembly Flow Chart



8.2. PCB Location



8.3. Disassembly Procedure

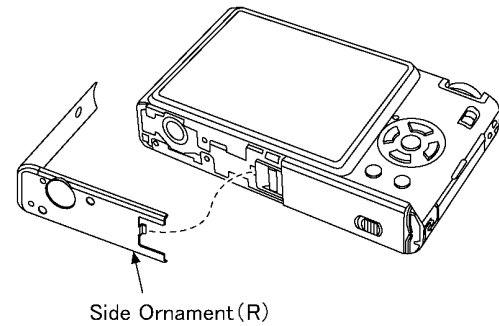
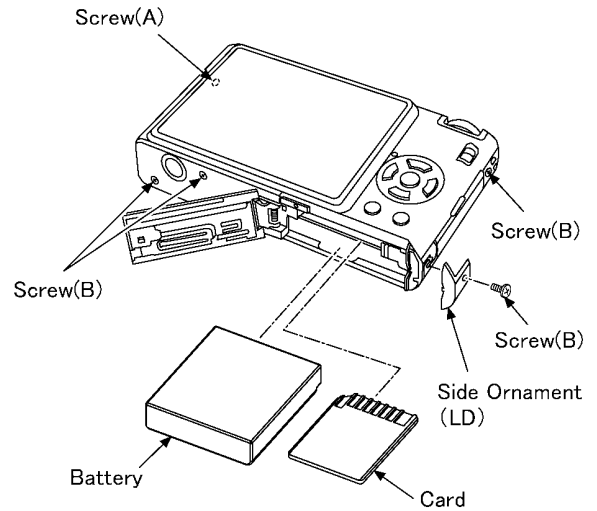
No.	Item	Fig	Removal
1	Rear Case Unit	Fig. D1	Card
			Battery
			1 Screw (A)
			4 Screws (B)
			Side Ornament (LD)
		Side Ornament (R)	
		Fig. D2	3 Locking tabs
			FP9002(Flex)
			FP9003(Flex)
			Rear Case Unit
2	LCD Unit	Fig. D3	4 Locking tabs LCD Unit
3	Front Case Unit	Fig. D4	2 Locking tabs Front Case Unit
4	Top Operation Unit	Fig. D5	PS8001(Connector) Top Operation Unit
5	Flash Top P.C.B.	Fig. D6	AF Panel Light
			2 Screws (C)
			5 Locking tabs
			Flash Top P.C.B.
		Fig. D7	NOTE: (When installing)
6	Main P.C.B.	Fig. D8	PP9001(Connector) Main P.C.B.
7	Lens Unit	Fig. D9	3 Screws (D)
			1 Screw (E)
			Frame Plate
		Fig. D10	Tripod Fixing Plate
			FP9801(Flex)
			FP9802(Flex)
8	Sub P.C.B.	Fig. D11	Lens Unit
			1 Screw (F)
			3 Locking tabs
			PCB Spacer
			Slide Knob
			Sub P.C.B.
9	Battery Case Unit	Fig. D12	2 Locking tabs Battery Out Spring Battery Case Unit
10	Jack Door	Fig. D13	Jack Door Shaft Jack Door
11	Battery Door Unit	Fig. D14	Battery Door Shaft
			Battery Door Spring
			Battery Door Unit

8.3.1. Removal of the Rear Case Unit

NOTE:

When servicing and reassembling, remove the card and battery from the unit.

- Card
- Battery
- Screw(A) × 1
- Screw(B) × 4
- Side Ornament (LD)
- Side Ornament (R)



Screw(A)		Screw(B)	
	2.5mm		3.3mm
			3mm
(S)(P)(W) : SILVER		(S)(P)(W) : SILVER	(K)(A)(T) : BLACK
(K)(A)(T) : BLACK			

Fig. D1

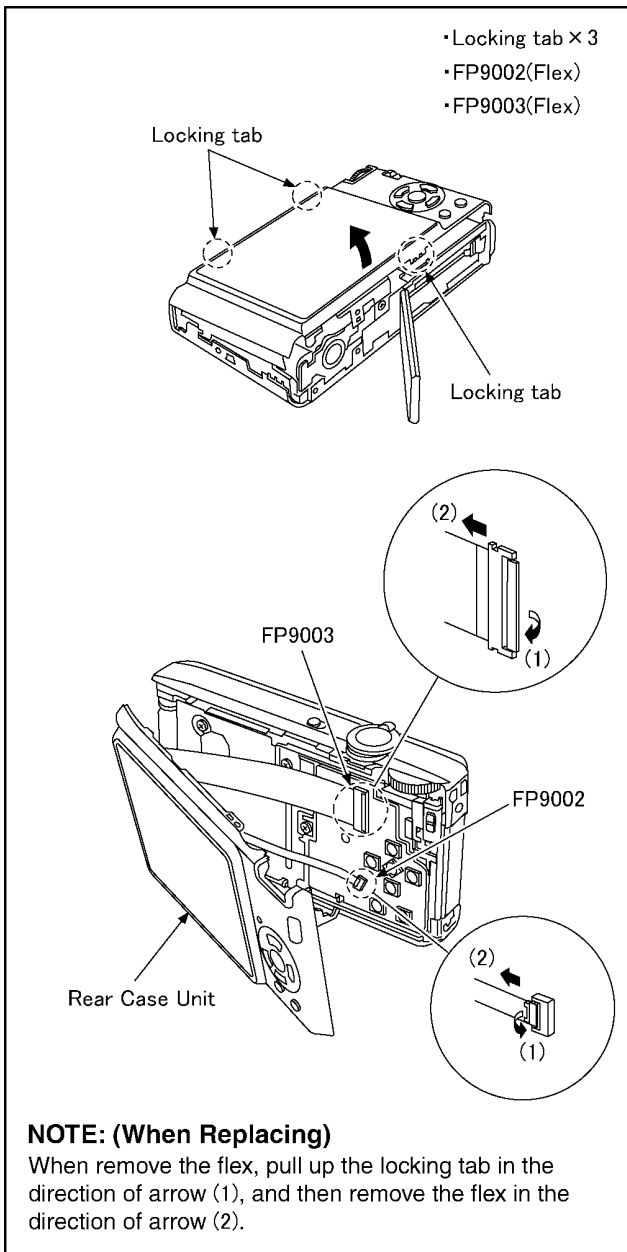


Fig. D2

8.3.2. Removal of the LCD Unit

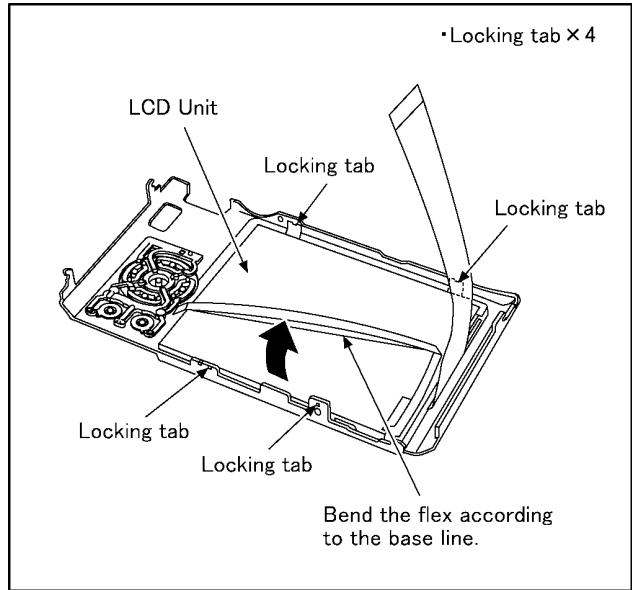


Fig. D3

8.3.3. Removal of the Front Case Unit

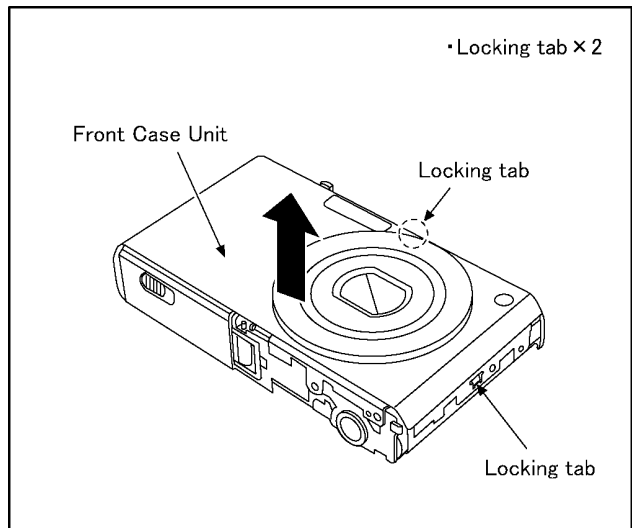


Fig. D4

8.3.4. Removal of the Top Operation Unit

IMPORTANT NOTICE:

Take care not apply any bending load to the charging capacitor. It brings about the possibility of PCB and/or component damage on the Flash Top P.C.B.

•PS8001(Connector)

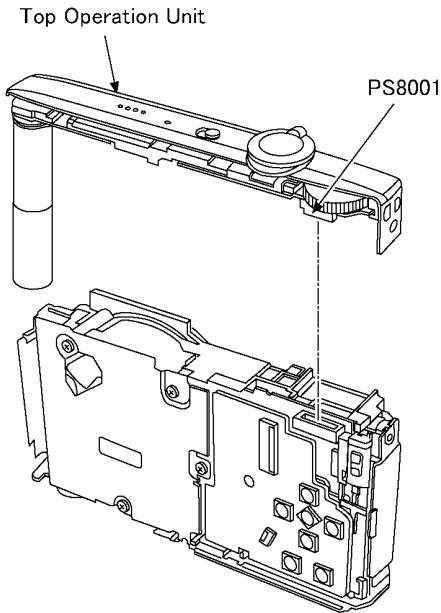


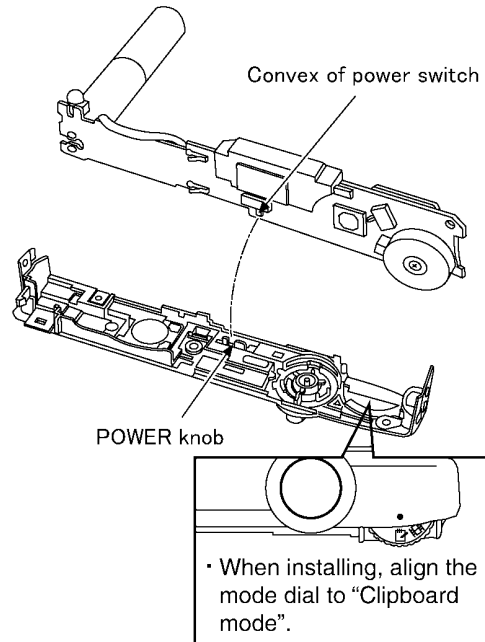
Fig. D5

IMPORTANT NOTICE:

Take care not apply any bending load to the charging capacitor. It brings about the possibility of PCB and/or component damage on the Flash Top P.C.B.

NOTE: (When Installing)

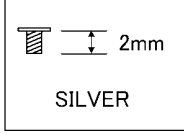
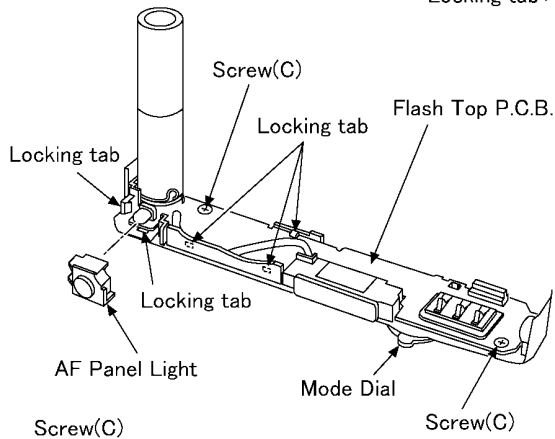
- Align the convex of power switch and power knob.



• When installing, align the mode dial to "Clipboard mode".

8.3.5. Removal of the Flash Top P.C.B.

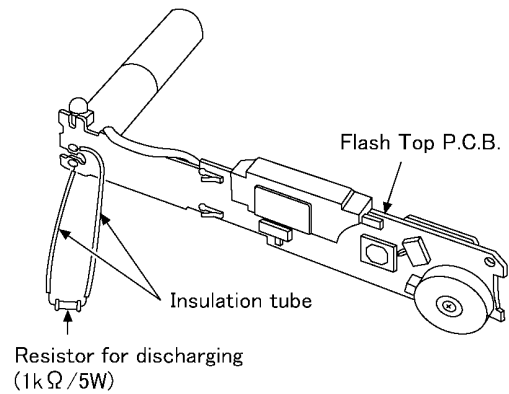
- AF Panel Light
- Screw(C) × 2
- Locking tab × 5



NOTE: (When Replacing)

When remove the Flash Top P.C.B., align the mode dial to "Clipboard mode".

Fig. D6



CAUTION

Be sure to discharge the capacitor on Flash Top P.C.B. before disassembling.

1. Remove the Flash Top P.C.B..
2. Put the insulation tube on the lead part of resistor (ERG5SJ102: 1kΩ/5W).
3. Put the resistor between both terminals of capacitor unit for approx. 5 seconds.

Fig. D7

8.3.6. Removal of the Main P.C.B.

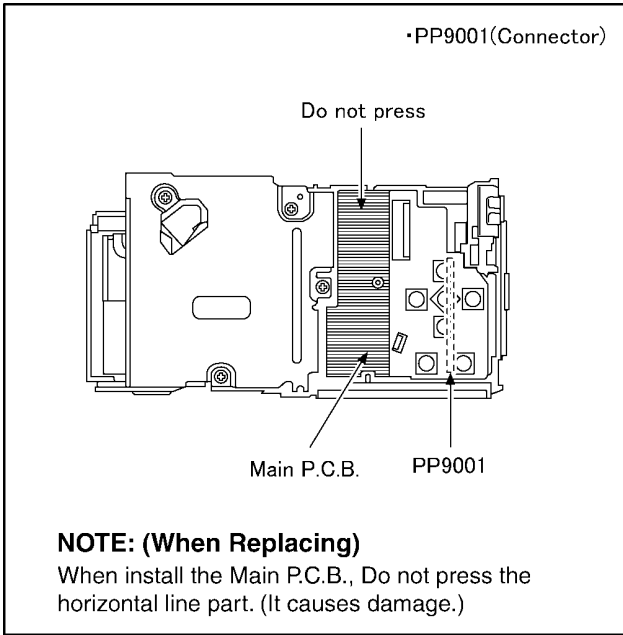


Fig. D8

8.3.7. Removal of the Lens Unit

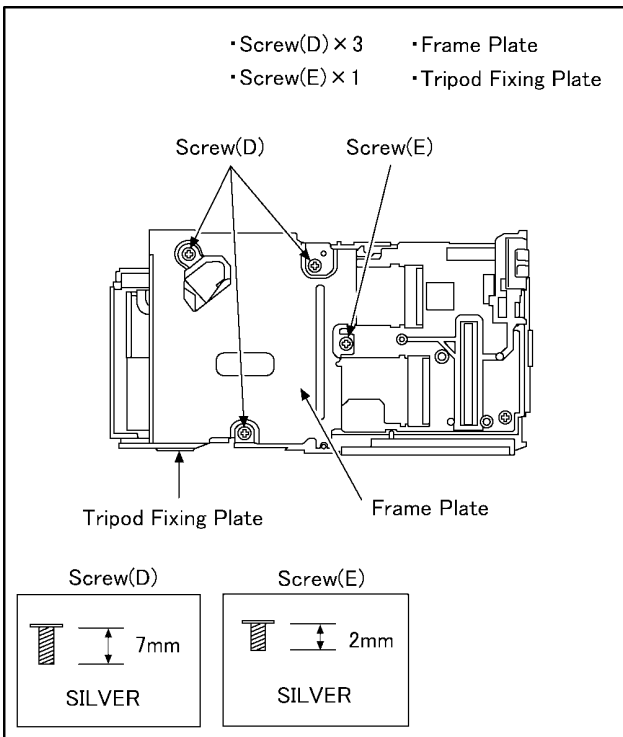


Fig. D9

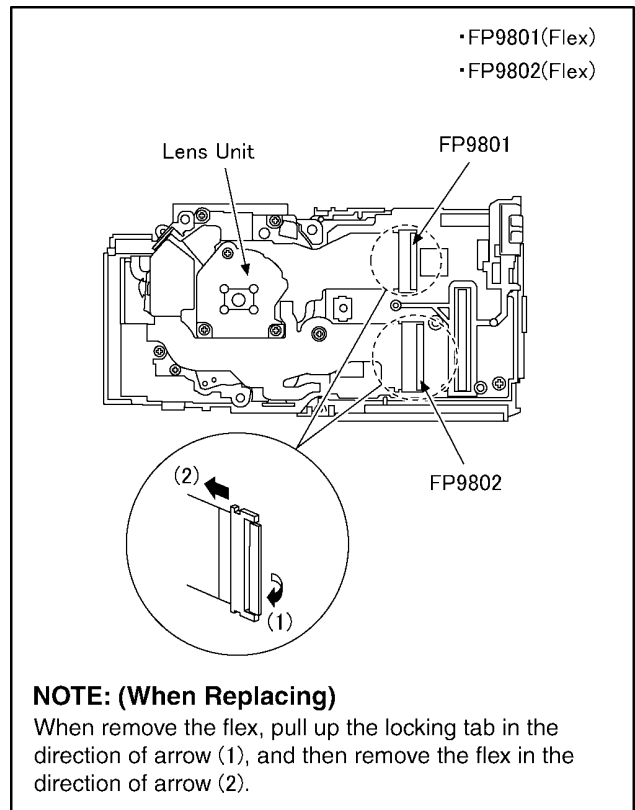


Fig. D10

8.3.8. Removal of the Sub P.C.B.

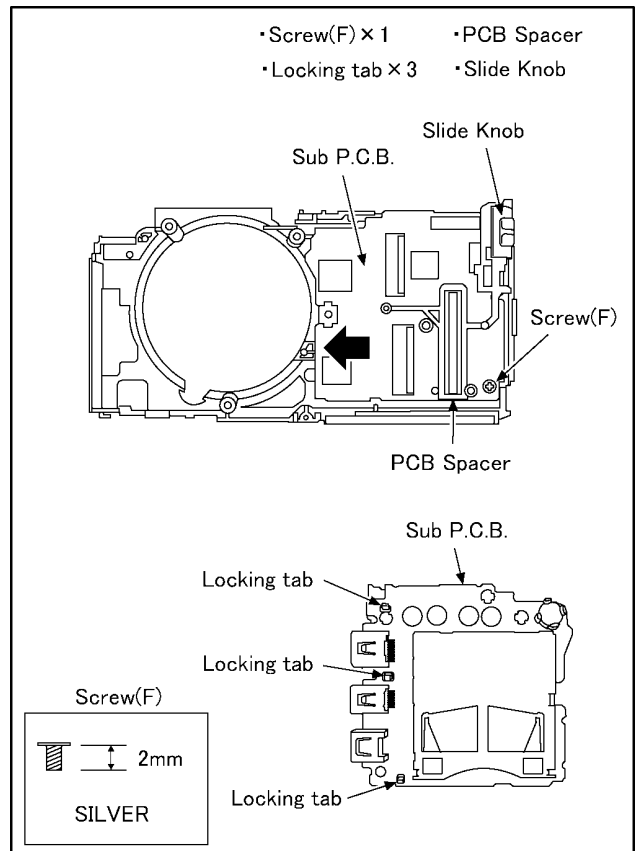


Fig. D11

8.3.9. Removal of the Battery Case Unit

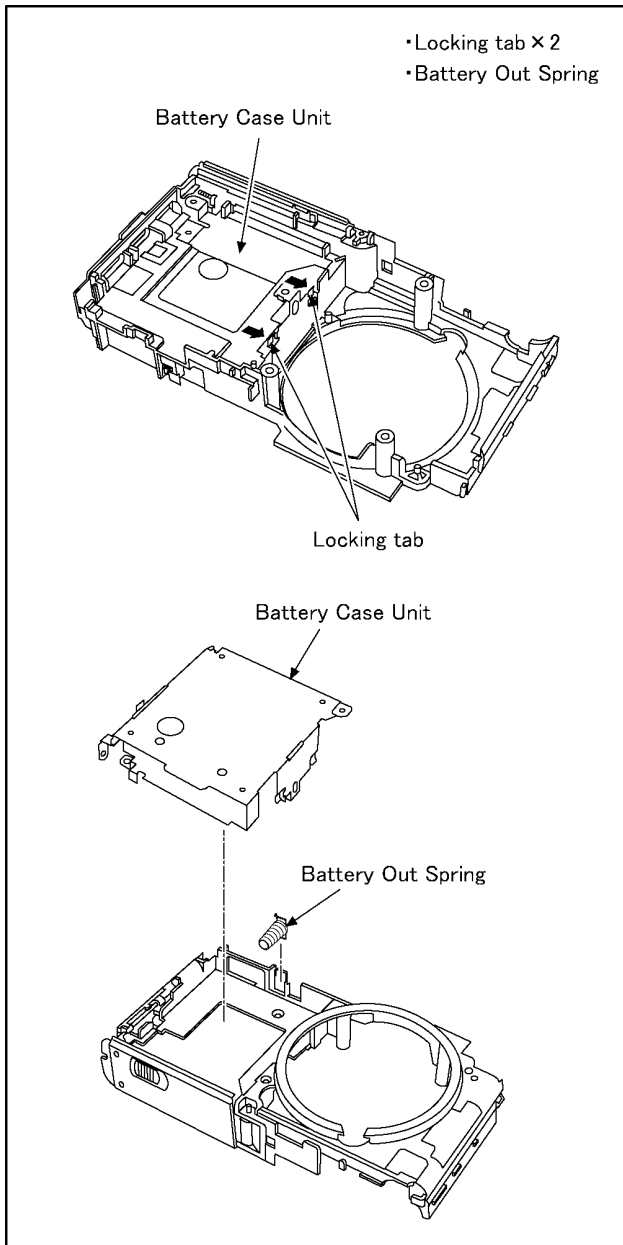


Fig. D12

8.3.10. Removal of the Jack Door

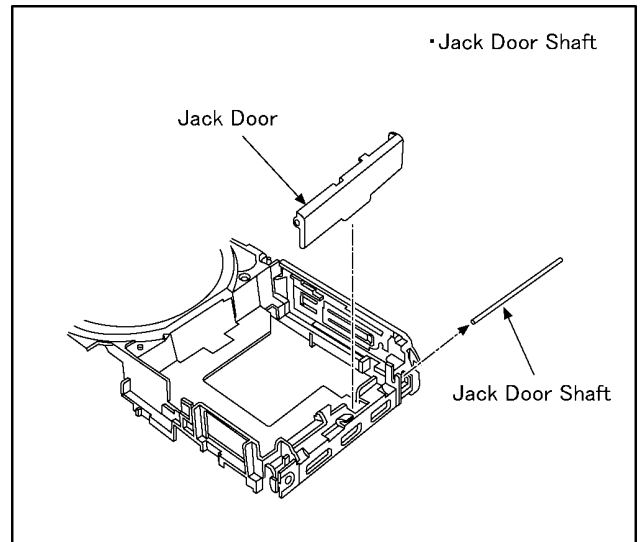


Fig. D13

8.3.11. Removal of the Battery Door Unit

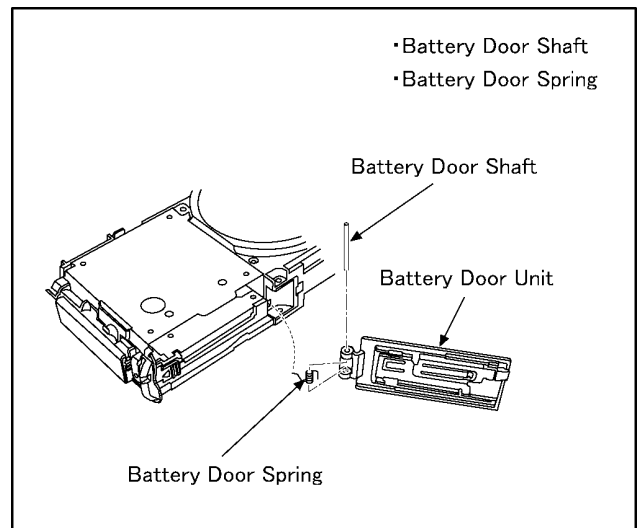


Fig. D14

NOTE: (When Assembling)

- Be sure to confirm the following points when assembling.
- The Screw is tightened enough.
 - Assembling conditions are fine. (No distortion, no illegal-space.)
 - No dust and/or dirt on every Lens surfaces.
 - LCD image is fine. (No dust and dirt on it, and no gradient images.)

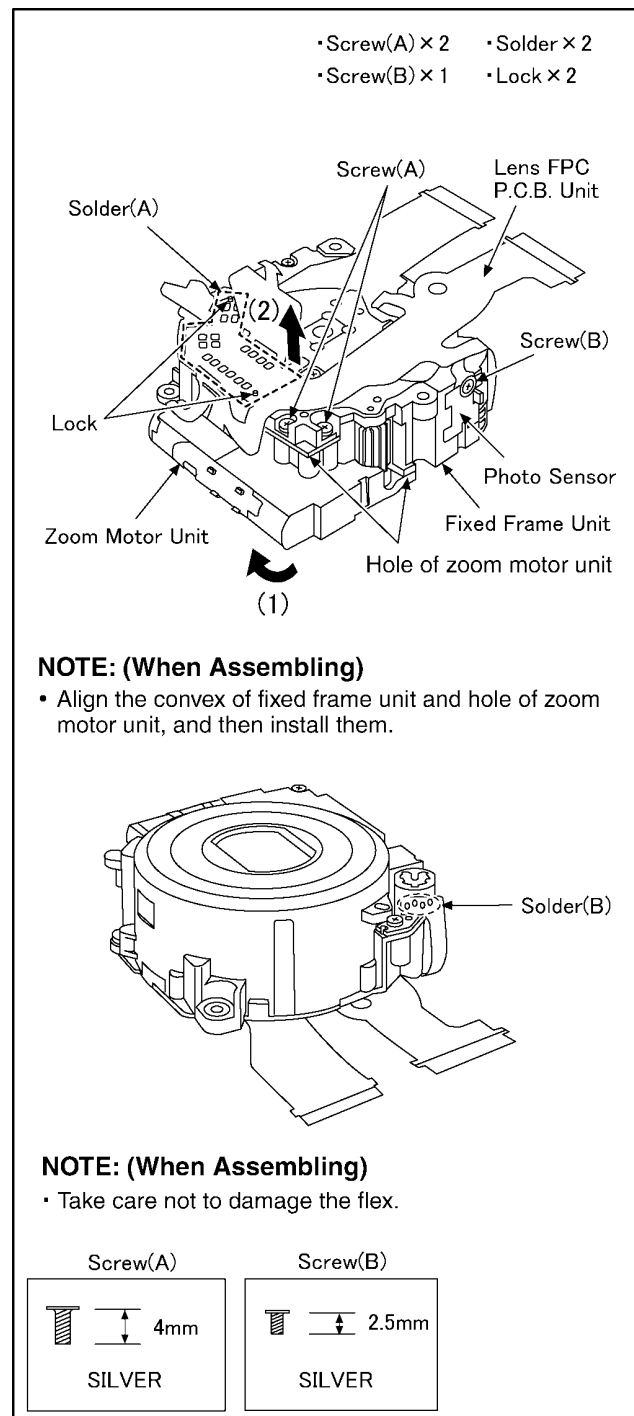
8.4. Disassembly Procedure for the Lens

NOTE: When Disassembling and Assembling for the Lens

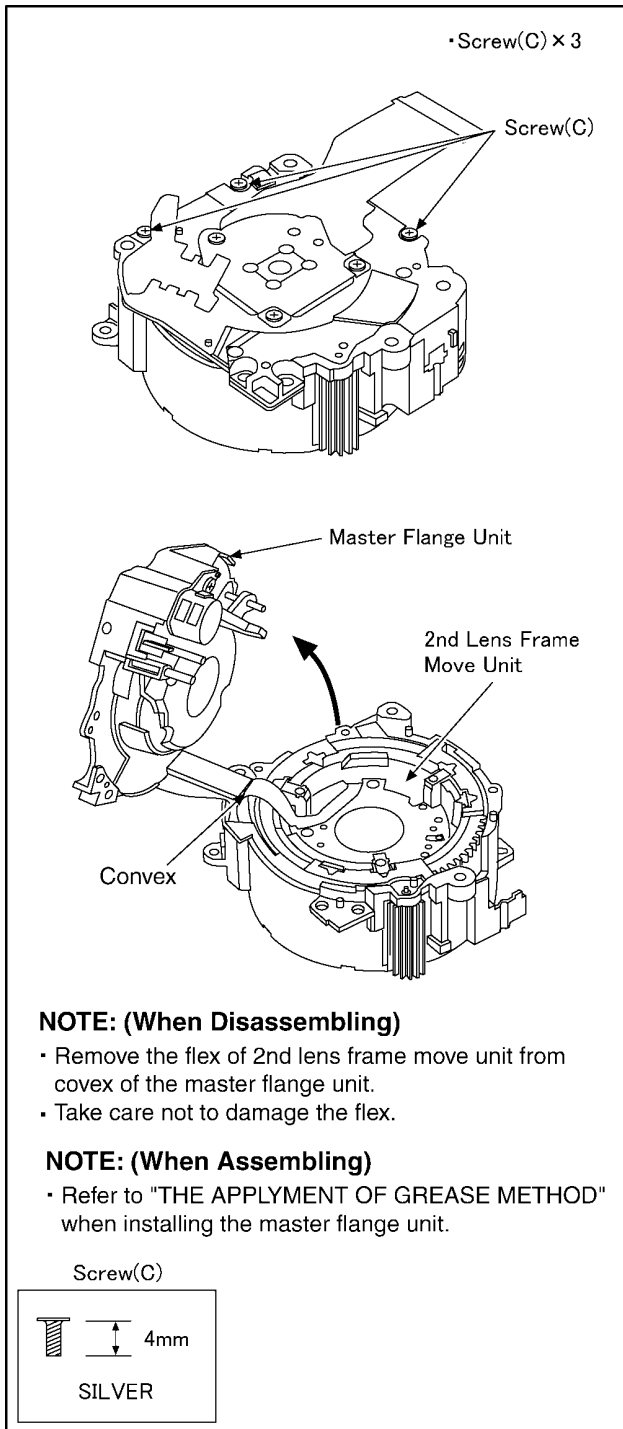
- To minimize the possibility of the CCD being dirt, perform disassemble and/or assemble under the condition of the CCD is being mounted.
Disassembling procedures for the CCD unit, refer to item 8.6.
- Take care that the dust and dirt are not entered into the lens.
In case of the dust is putted on the lens, blow off them by airbrush.
- Do not touch the surface of lens.
- Use lens cleaning KIT (BK)(VFK1900BK).
- Apply the grease (RFKZ0472) to the point where is shown to "Grease apply" in the figure.
When the grease is applied, use a toothpick and apply thinly.
- When repair the drive frame, direct frame and fixed frame, must be unit exchange.

8.4.1. Removal of the Zoom Motor Unit and Lens FPC P.C.B. Unit

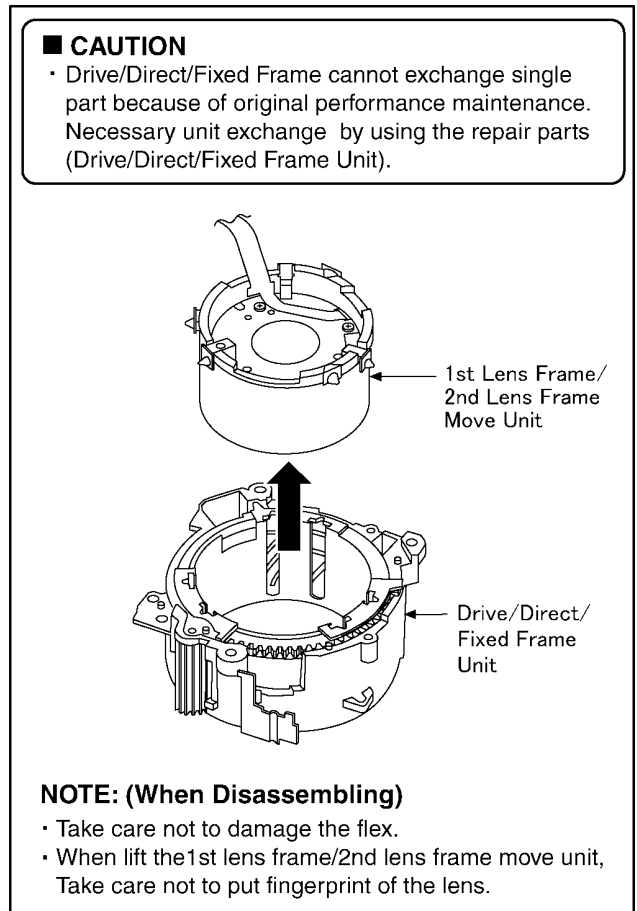
- Remove the 1 solder (A).
- Remove the 1 solder (B).
- Unscrew the 2 screws (A).
- Unscrew the 1 screw (B).
- Remove the 2 locks.
- Remove the zoom motor unit to the indicated by arrow (1).
- Remove the lens FPC P.C.B. unit to the indicated by arrow (2).



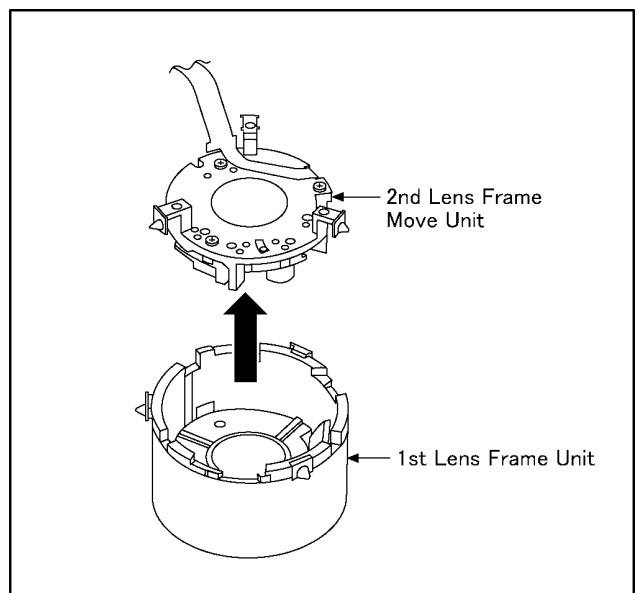
8.4.2. Removal of the Master Flange Unit



8.4.3. Removal of the 1st Lens Frame/2nd Lens Frame Move Unit



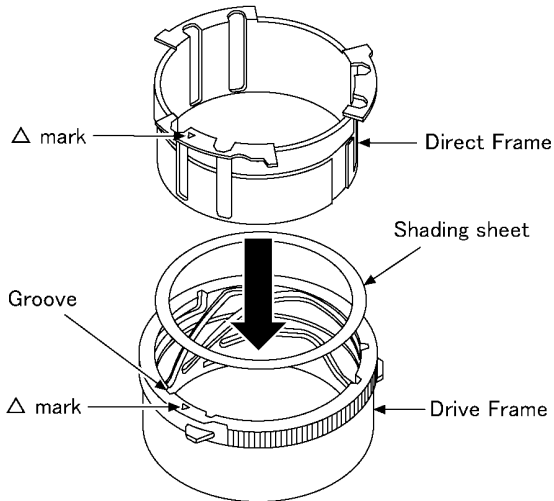
8.4.4. Removal of the 2nd Lens Frame Move Unit



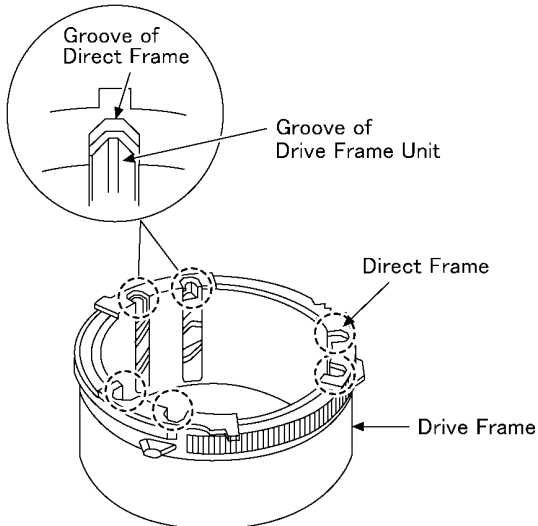
8.5. Assembly Procedure for the Lens

8.5.1. Phase alignment of the Direct Frame and Drive Frame Unit

- Insert the shading sheet to drive frame.
(When insert the shading sheet, so that the luster side facing to subject side)
- Align the Δ mark of direct frame and groove in the interior of Δ mark of drive frame, and then install the direct frame to drive frame.

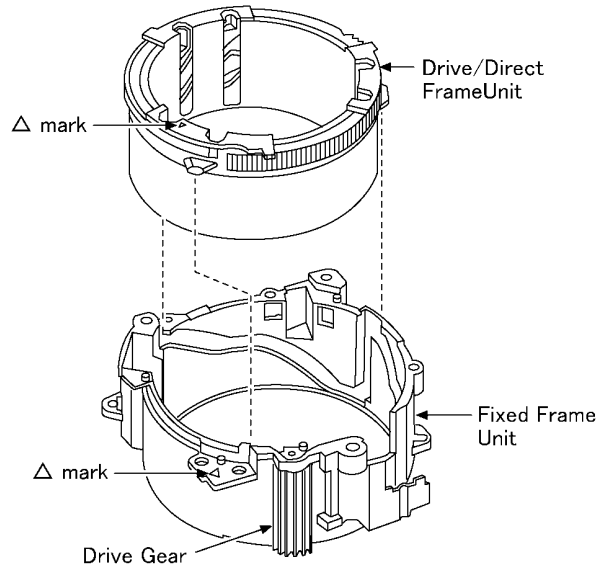


- Move the external U cut of direct frame to gear edge, and then align the phase of the groove (6 points).



8.5.2. Phase alignment of the Drive/Direct Unit and Fixed Frame Unit

- Align the Δ mark, and then install the drive/direct frame unit to fixed frame unit.

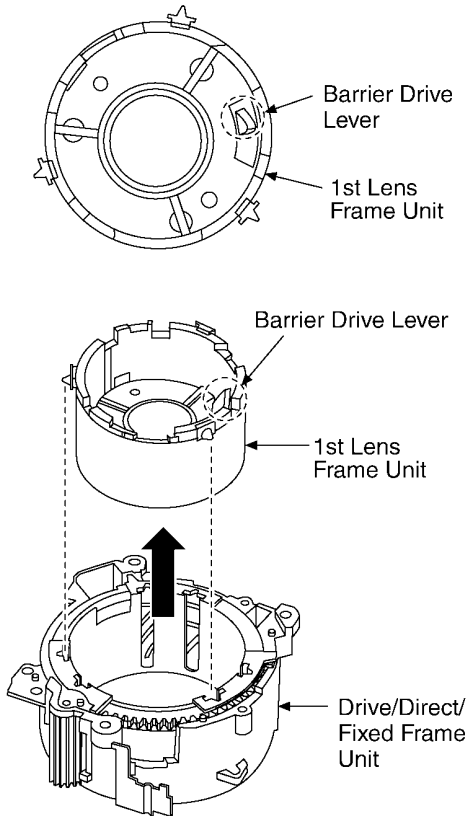


NOTE: (When Assembling)

- With aligning the phase of the drive/direct frame unit, confirm the gear of drive unit is engaged with the fixed frame unit firmly.

8.5.3. Assembly for the 1st Lens Frame Unit and Drive/Direct/Fixed Frame Unit

- Inserts the 1st lens frame unit to the drive/direct/fixed frame unit so that the barrier drive lever may become the position of the figure below.

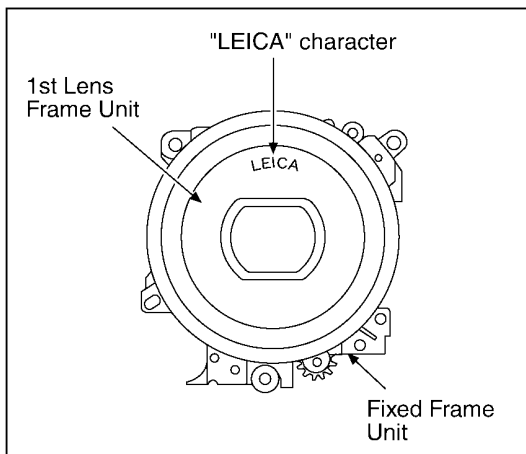


NOTE: (When Assembling)

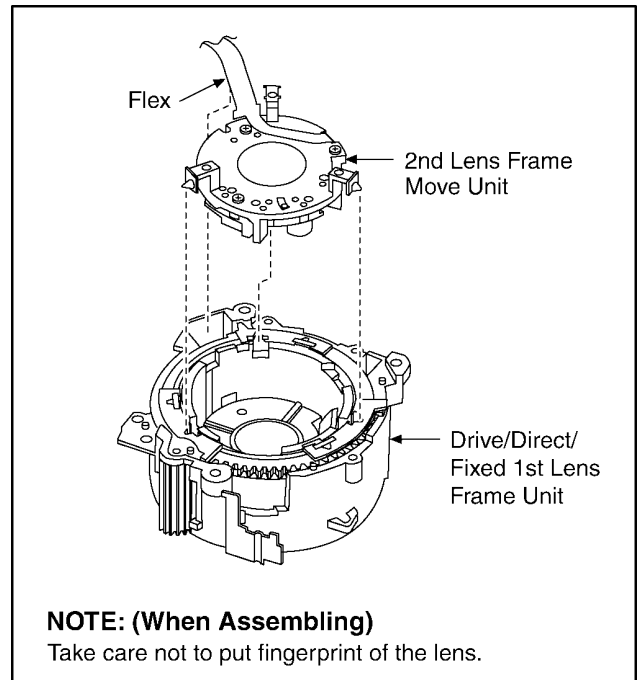
Take care not to put fingerprint of the lens.

FRONT VIEW

- Install the 1st lens frame unit so that the "LEICA" character may become the position of the figure below.



8.5.4. Assembly for the 2nd Lens Frame Move Unit and Drive/Direct/Fixed Frame/1st Lens Frame Unit



8.5.5. Assembly for the Master Flange Unit and Drive/Direct/Fixed Frame/1st Lens Frame/2nd Lens Frame Move Unit

• Screw(C) × 3

- Align the flex insert part of fixed frame unit and convex of the master flange unit, and then insert the master flange unit.

Flex
Flex insert part
Convex
Master Flange Unit
Drive/Direct/Fixed 1st Lens Frame/2nd Lens Frame Move Unit

Insert the convex to positioning hole of FPC

NOTE: (When Assembling)

- Take care not to damage the flex.
- Refer to "THE APPLYMENT OF GREASE METHOD" when installing the master flange unit.

Shutter

- Turn the Drive Gear in the direction of an arrow, and then confirm the lens shutter is closed.

Screw(C)
Drive Gear

Screw(C)
4mm
SILVER

8.6. Removal of the CCD Unit

• Screw(D) × 3
• CCD Cushion × 1
• Optical Filter × 1

CCD Unit
Screw(D)
Screw(D)
3mm
BLACK

CCD side (red is pale)
Lens side (red is deep)
CCD Cushion
Optical Filter

NOTE: (When Assembling)

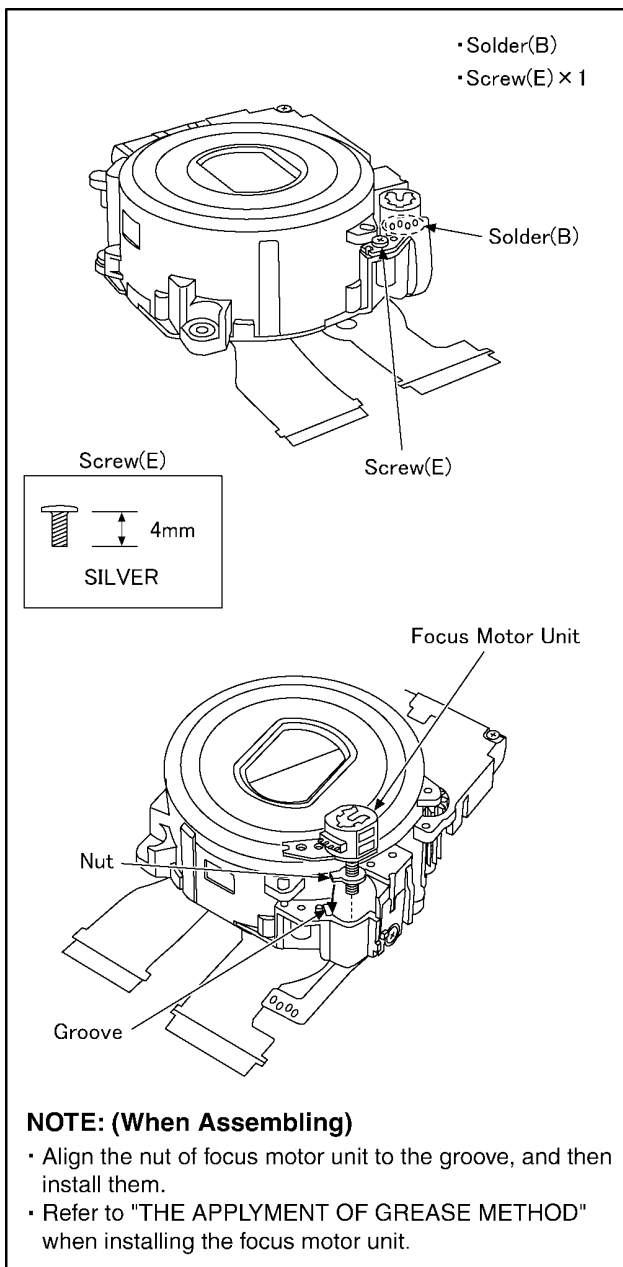
Definitions of mount side of Optical filter.

- *Set the optical filter under the condition of reflecting the fluorescent lamp can be seen by your eyes.
- *Although depth of the red color may be changed in accordance with seeing angle, compare the deepest red color in both sides to define each side.
 - Lens side: red color is deeper than the other side.
 - CCD side: red color is paler than the other side.

It can be easy to confirm the red color density on the blue paper.

- *The optical filter might stuck to CCD unit.
- When replace the CCD unit, remove the optical filter, and then install it with CCD unit.

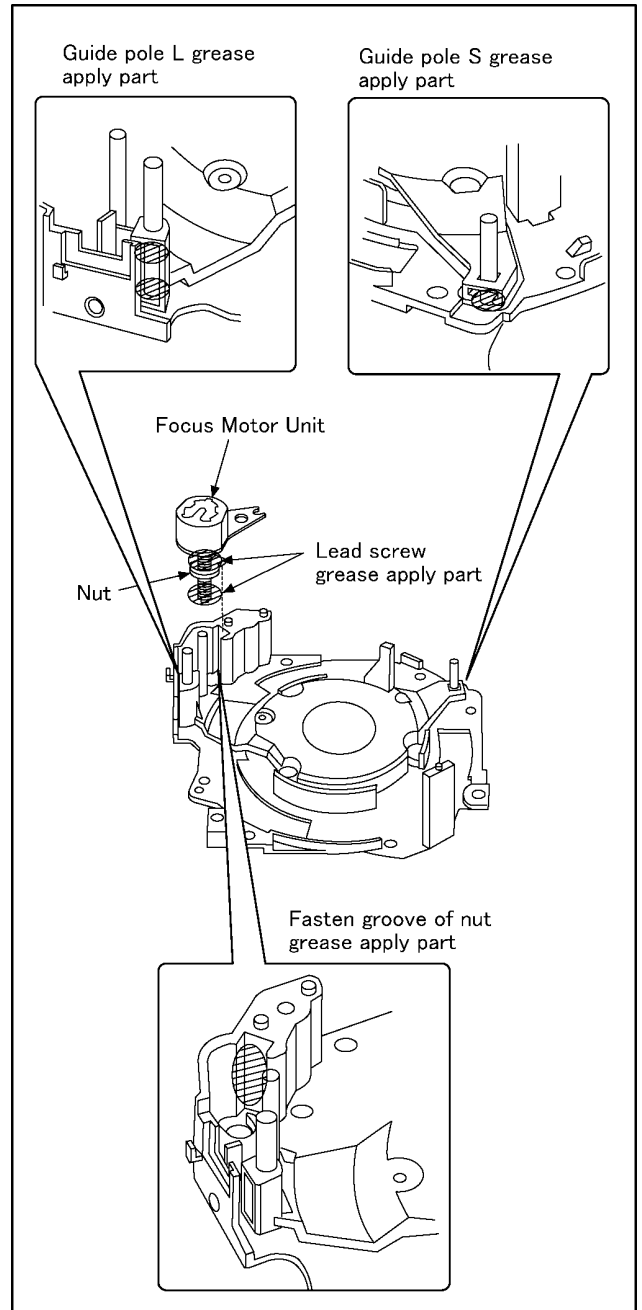
8.7. Removal of the Focus Motor Unit



8.8. The Applyment of Grease Method

The grease apply point of lens unit are as follows.
Apply grease additionally in the specified position if necessary.
When the grease is applied, use a toothpick and apply thinly.

- Lead screw/Guide pole L,S/Fasten groove of nut
 - Grease: RFKZ0472
 - Amount of apply: 2 - 4 mg



9 Measurements and Adjustments

9.1. Matrix Chart for Replaced Part and Necessary Adjustment

The relation between Replaced part and Necessary Adjustment is shown in the following table.

When concerned part is replaced, be sure to achieve the necessary adjustment(s).

As for Adjustment condition/procedure, consult the "Adjustment Manual" which is available in Adjustment software.

The Adjustment software is available at "TSN Website", therefore, access to "TSN Website" at "Support Information from NWBG/VDBG-PAVC".

NOTE:

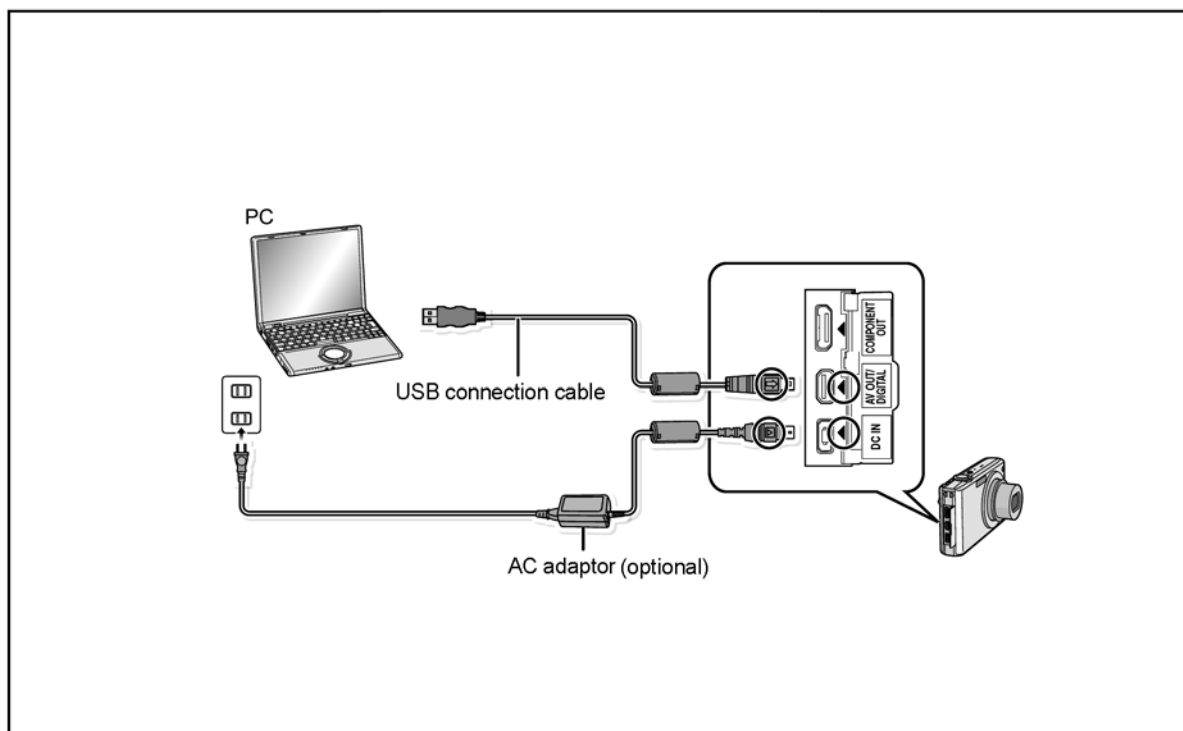
After adjustments have been terminated, make sure to achieve "INITIAL SETTINGS".

Adjustment Item		Replaced Part				
		Main P.C.B.	VENUS (IC6001)	Flash-ROM (IC6002)	Lens Part (Excluding CCD)	CCD Unit
Camera Section	OIS hall element adjustment (OIS)	○	○	○	○	—
	Back focus adjustment (BF)	○	○	○	○	○*1
	Shutter adjustment (SHT)	○	○	○	○	○
	ISO sensitivity adjustment (ISO)	○	○	○	○	○
	AWB adjustment High brightness coloration inspection (WBL)	○	○	○	○	○
	CCD white scratch compensation (WKI)	○	○	○	—	○*1
	CCD black scratch compensation (BKI)	○	○	○	—	○*1
	IRIS adjustment (IRS)	○	○	○	○	○
	Venus zoom inspection (PZM)	○	○	○	—	—
	Monitor linearity inspection (MLN)	○	○	○	○	○

*1: This adjustment is necessary, not only replacing CCD unit but also removing it from the lens unit.

NOTE:

*There is no LCD adjustment in this model.



10 Maintenance

10.1. Cleaning Lens and LCD Panel

Do not touch the surface of lens and LCD Panel with your hand.

When cleaning the lens, use air-Blower to blow off the dust.

When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the their surface.

Note:

The Lens Cleaning KIT ; VFK1900BK (Only supplied as 10 set/Box) is available as Service Aid.

Service Manual

Diagrams and Replacement Parts List

Digital Camera

Model No.

DMC-FX37P	DMC-FX37EG	DMC-FX38GJ
DMC-FX37PC	DMC-FX37SG	
DMC-FX37PL	DMC-FX38GC	
DMC-FX37E	DMC-FX38GD	
DMC-FX37EB	DMC-FX38GK	
DMC-FX37EE	DMC-FX38GN	
DMC-FX37EF	DMC-FX38GT	

Vol. 1

Colour

(S).....Silver Type (except PC/EF/GD)

(K).....Black Type

(P).....Pink Type (only PL/EE/SG/GC/GD/GN/GT/GJ)

(A).....Blue Type (only P/PC/EE/EG)

(W).....White Type (only P/E/EE/EF/EG/SG/GK)

(T).....Brown Type (only EB/EF/EG/SG/GC/GK/GT/GJ)

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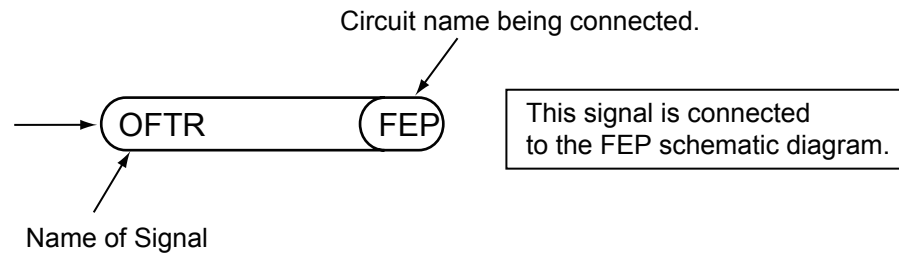
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S1. About Indication of The Schematic Diagram

S1.1. Important Safety Notice

COMPONENTS IDENTIFIED WITH THE MARK \triangle HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY THE SAME TYPE.

1. Although reference number of the parts is indicated on the P.C.B. drawing and/or schematic diagrams, it is NOT mounted on the P.C.B. when it is displayed with "\$" mark.
2. It is only the "Test Round" and no terminal (Pin) is available on the P.C.B. when the TP (Test Point) indicated as "●" mark.
3. The voltage being indicated on the schematic diagram is measured in "Standard-Playback" mode when there is no specify mode is mentioned.
4. Although the voltage and waveform available on here is measured with standard frame, it may be differ from actual measurement due to modification of circuit and so on.
5. The voltage being indicated here may be include observational-error (deviation) due to internal-resistance and/or reactance of equipment. Therefore, handle the value indicated on here as reference.
6. Use the parts number indicated on the Replacement Parts List .
7. Indication on Schematic diagrams:



S2. Voltage Chart

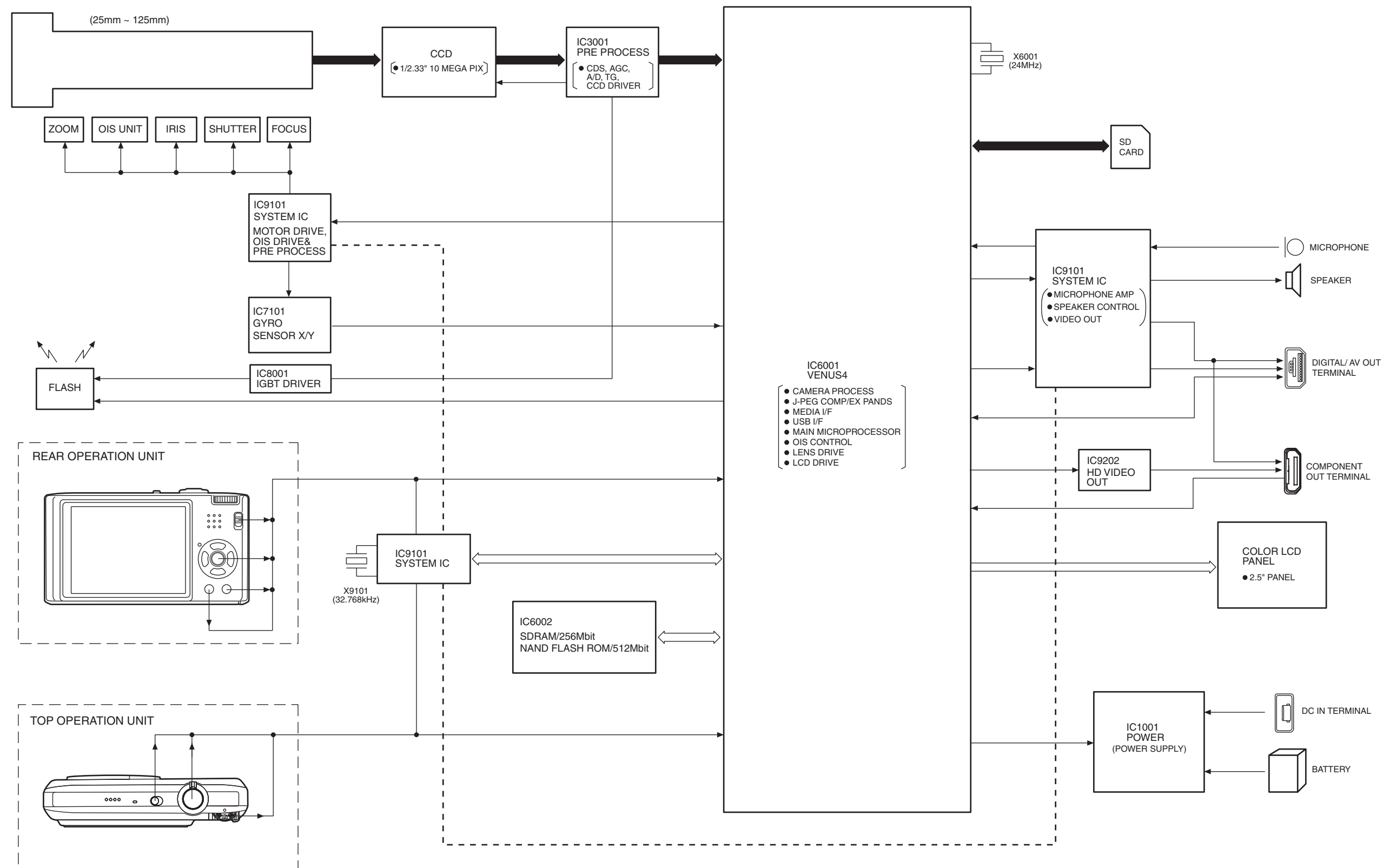
Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

S2.1. Flash Top P.C.B.

REF No.	PIN No.	POWER ON
IC8001	1	3.4
IC8001	2	0
IC8001	3	0
IC8001	4	0
IC8001	5	4
Q8009	1	4.6
Q8009	2	4.6
Q8009	3	0
Q8009	4	0
Q8009	5	4.6
Q8009	6	4.6

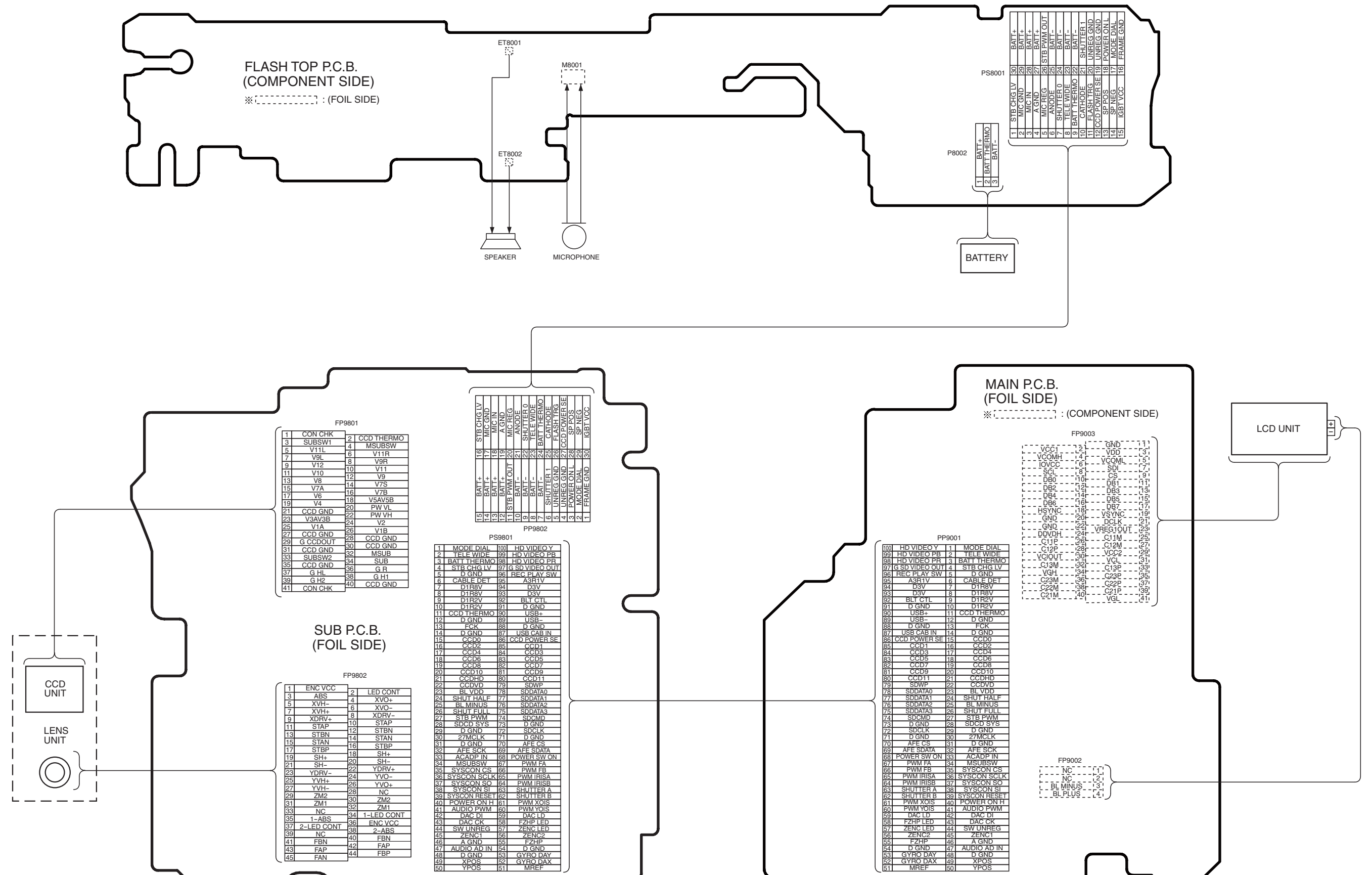
S3. Block Diagram

S3.1. Overall Block Diagram

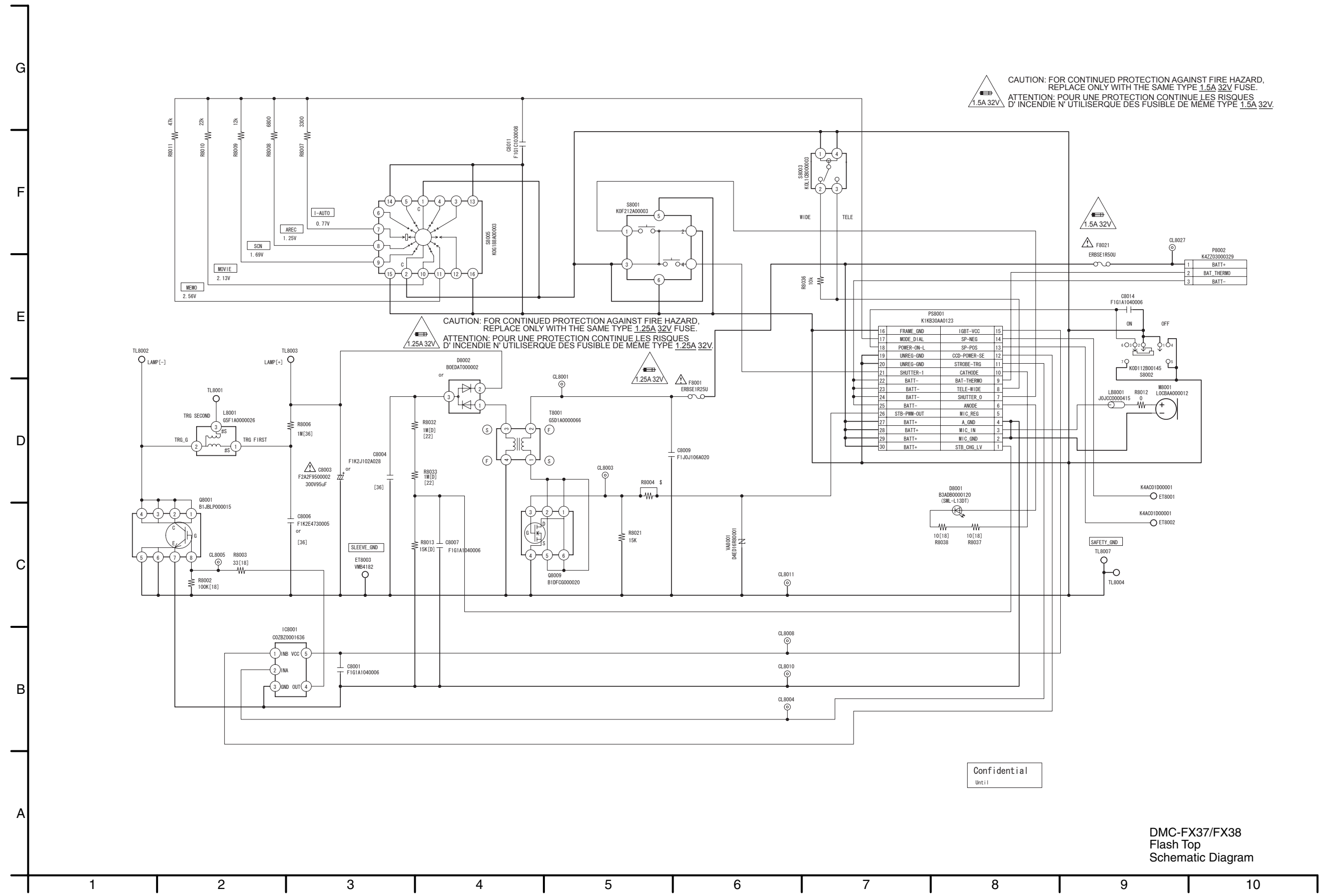


S4. Schematic Diagram

S4.1. Interconnection Diagram



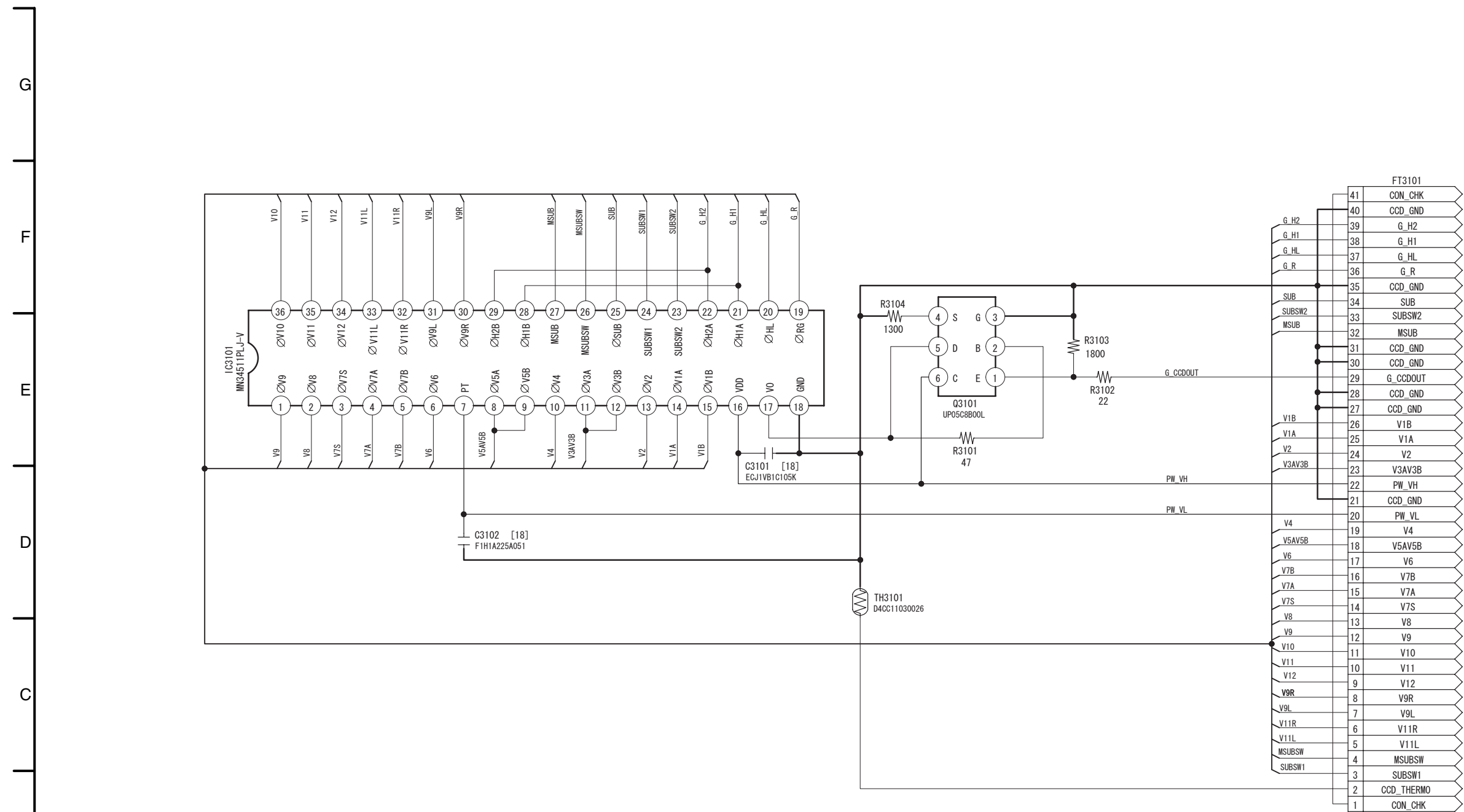
S4.2. Flash Top Schematic Diagram



Confidential
Until

DMC-FX37/FX38
Flash Top
Schematic Diagram

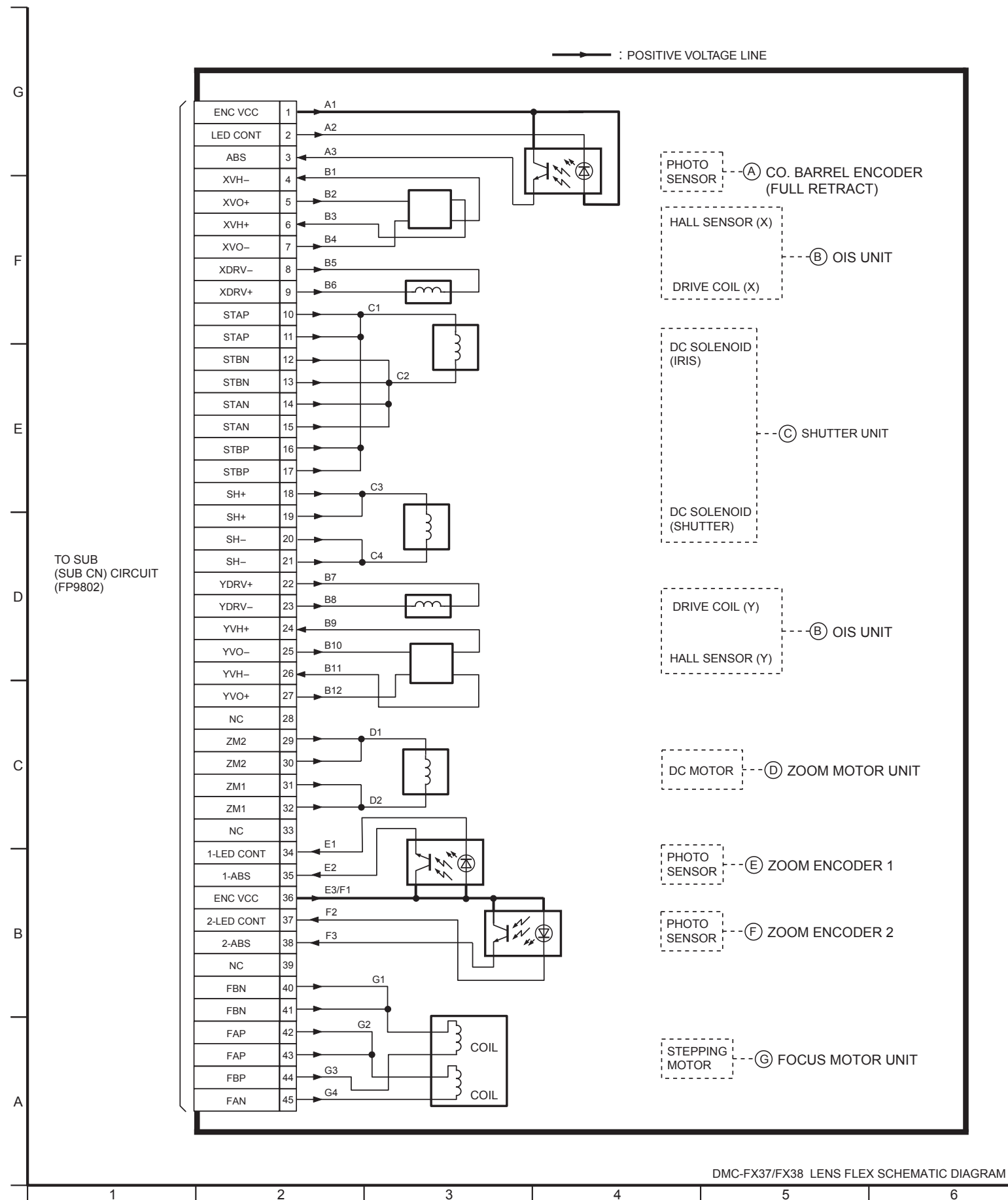
S4.3. CCD Flex Schematic Diagram



Confidential
Until

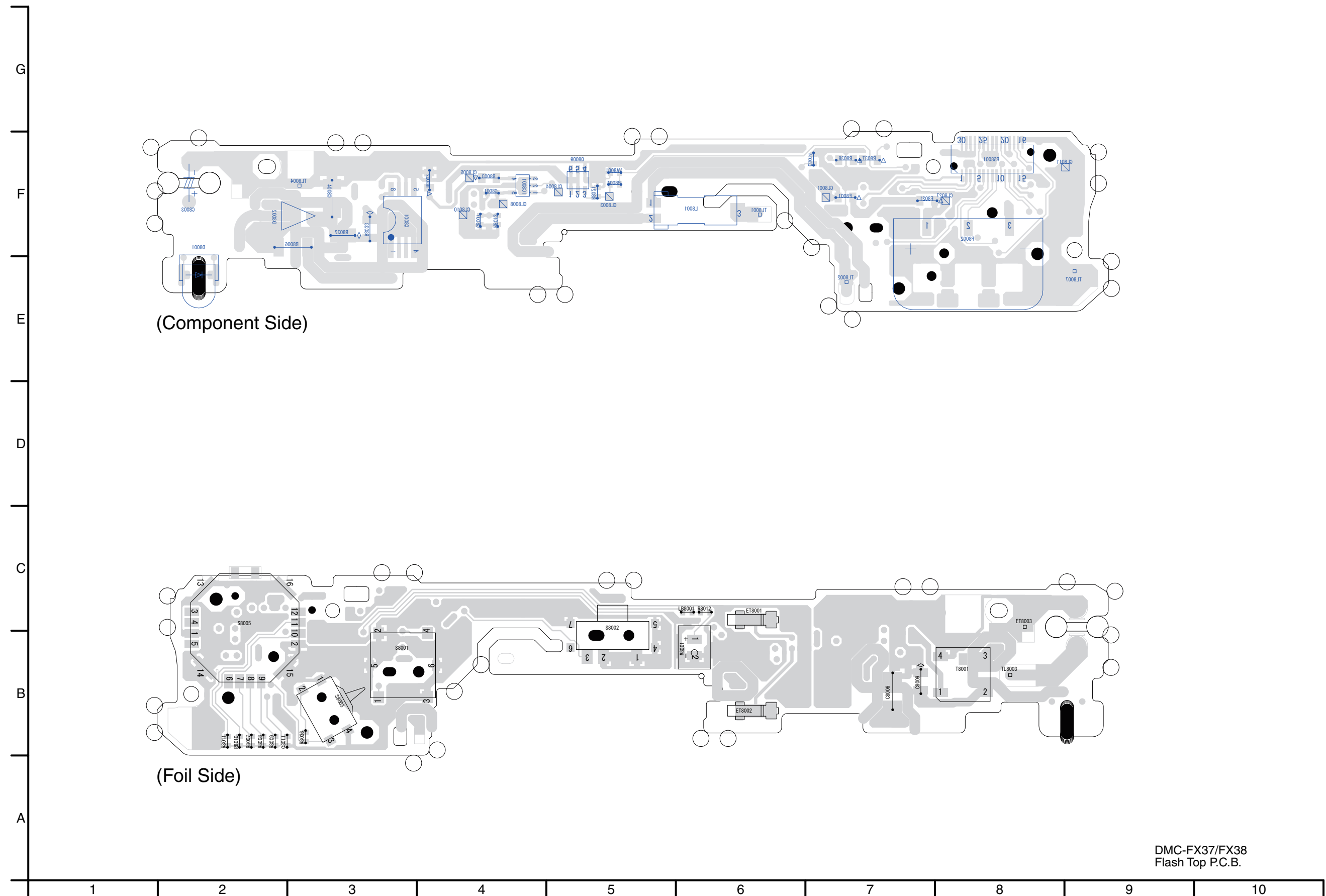
DMC-FX37/FX38
CCD Flex
Schematic Diagram

S4.4. Lens Flex Schematic Diagram

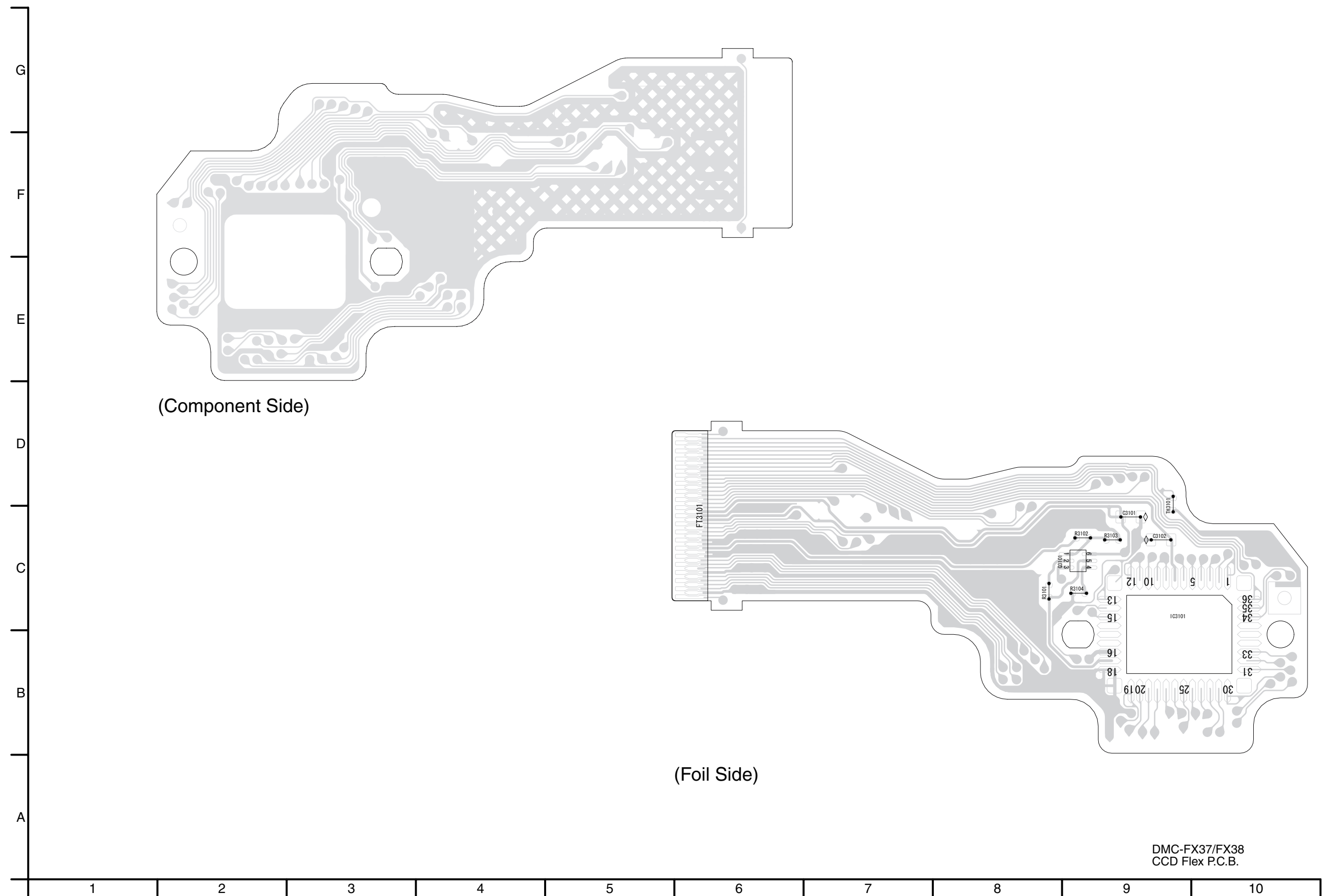


S5. Print Circuit Board

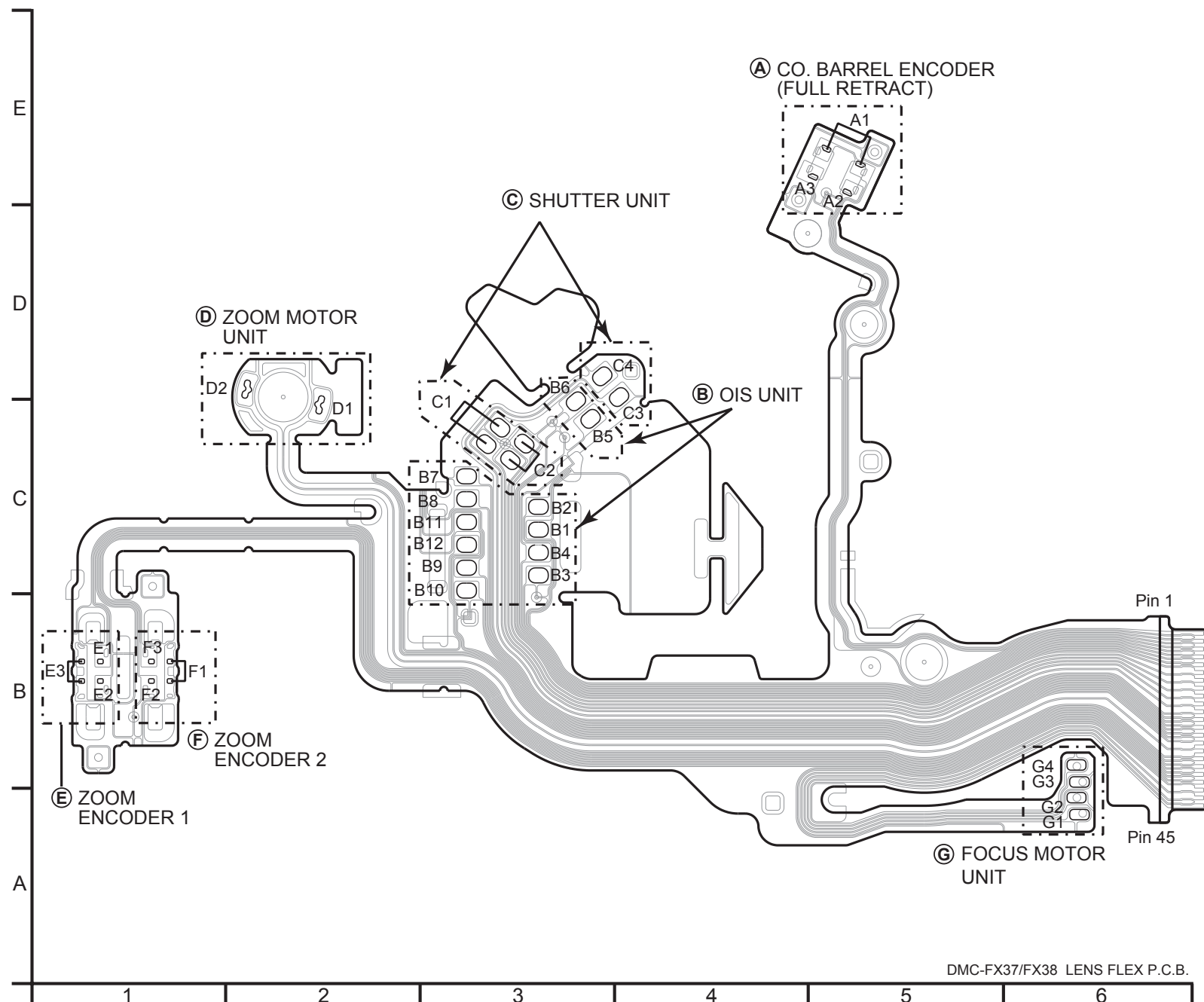
S5.1. Flash Top P.C.B.



S5.2. CCD Flex P.C.B.



S5.3. Lens Flex P.C.B.



S6. Replacement Parts List

- Note: 1.* Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark \triangle have the special characteristics for safety.
When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
4. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.
5. Supply of CD-ROM, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.

E.S.D. standards for Electrostatically Sensitive Devices, refer to PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES section.

Definition of Parts supplier:

1. Parts marked with [MBI] in the remarks column are supplied from **Matsushita Battery Industrial Co., Ltd.**

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		----- P.C.B. LIST -----							
	VEP58059A	FLASH TOP P.C.B.	1	(RTL) E.S.D.	Q3101	UP05C8B00L	TRANSISTOR	1	E.S.D.
	VEK0L79	CCD UNIT	1	E.S.D.	R3101	ERJ2GEJ470	M.RESISTOR CH 1/16W 47	1	
					R3102	ERJ2GEJ220	M.RESISTOR CH 1/16W 22	1	
					R3103	ERJ2GEJ182	M.RESISTOR CH 1/16W 1.8K	1	
					R3104	ERJ2GEJ132	M.RESISTOR CH 1/16W 1.3K	1	
		--- INDIVIDUAL PARTS ---			TH3101	D4CC11030026	NTC THERMISTORS	1	
△ C8003	F2A2F9500002	E.CAPACITOR	1						
ET8003	VMB4182	EARTH SPRING	1						
		--- ELEC. COMPONENTS ---							
##	VEP58059A	FLASH TOP P.C.B.		(RTL) E.S.D.					
C8001	F1G1A104A012	C.CAPACITOR CH 10V 0.1U	1						
C8004	F1K2J102A028	C.CAPACITOR 630V 1000P	1						
C8006	F1K2E4730005	C.CAPACITOR 250V 0.047U	1						
C8007	F1G1A104A012	C.CAPACITOR CH 10V 0.1U	1						
C8009	F1J0J106A020	C.CAPACITOR CH 6.3V 10U	1						
C8011	F1G1C1030008	C.CAPACITOR CH 16V 0.01U	1						
C8014	F1G1A104A012	C.CAPACITOR CH 10V 0.1U	1						
D8001	B3ADB0000120	DIODE	1	E.S.D.					
D8002	B0EDAT000002	DIODE	1	E.S.D.					
ET8001	K4AC01D00001	EARTH SPRING	1						
ET8002	K4AC01D00001	EARTH SPRING	1						
△ F8001	ERBSE1R25U	FUSE 32V 1.25A	1						
△ F8021	ERBSE1R50U	FUSE 32V 1.5A	1						
IC8001	C0ZBZ0001636	IC	1	E.S.D.					
L8001	G5F1A0000026	CHIP INDUCTOR	1						
LB8001	J0JCC0000415	FILTER	1						
M8001	L0CBAA000012	MICROPHONE UNITS	1						
P8002	K4ZZ03000329	CONNECTOR 3P	1						
PS8001	K1KB30AA0123	CONNECTOR 30P	1						
Q8001	B1JBLP000015	TRANSISTOR	1	E.S.D.					
Q8009	B1DFCCG000020	TRANSISTOR	1	E.S.D.					
R8002	ERJ3GEYJ104	M.RESISTOR CH 1/10W 100K	1						
R8003	ERJ3GEYJ330	M.RESISTOR CH 1/10W 33	1						
R8006	ERJ8GEYJ105V	M.RESISTOR CH 1/8W 1M	1						
R8007	ERJ2GEJ332	M.RESISTOR CH 1/16W 3.3K	1						
R8008	ERJ2RHD682X	M.RESISTOR CH 1/16W 6.8K	1						
R8009	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1						
R8010	ERJ2GEJ223	M.RESISTOR CH 1/16W 22K	1						
R8011	ERJ2GEJ473	M.RESISTOR CH 1/16W 47K	1						
R8012	D0YAR0000007	M.RESISTOR CH 1/16W 0	1						
R8013	ERJ2RHD153X	M.RESISTOR CH 1/16W 15K	1						
R8021	ERJ2GEJ153	M.RESISTOR CH 1/16W 15K	1						
R8032	ERJ6RED105	M.RESISTOR CH 1/16W 1M	1						
R8033	ERJ6RED105	M.RESISTOR CH 1/16W 1M	1						
R8036	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1						
R8037	ERJ3GEYJ100	M.RESISTOR CH 1/10W 10	1						
R8038	ERJ3GEYJ100	M.RESISTOR CH 1/10W 10	1						
S8001	K0F212A00003	SWITCH	1						
S8002	K0D112B00145	SWITCH	1						
S8003	K0L1CB000003	SWITCH	1						
S8005	K0G188A00003	SWITCH	1						
T8001	G5D1A0000066	TRANSFORMER	1						
VA8001	D4ED16R80001	VARISTORS	1						
##	VEK0L79	CCD UNIT		E.S.D.					
C3101	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1						
C3102	F1H1A225A051	C.CAPACITOR CH 10V 2.2U	1						

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	VEP56065A	MAIN P.C.B.	1	(RTL) E.S.D.
△ 2	ML421S/ZT	BUTTON BATTERY	1	(B9101) [MBI]
3	VEP51022A	SUB P.C.B.	1	(RTL) E.S.D.
4	VGO9934	PCB SPACER	1	
5	VGUOC80	SLIDE KNOB	1	
6	VGOQB41	BATTERY CASE SHEET	1	(-K,-A,-T)
7	VGO9720	BATTERY LOCK KNOB	1	
8	VKF4333	JACK DOOR	1	(-S,-P,-W)
8	VKF4350	JACK DOOR	1	(-K,-A,-T)
9	VMB3962	BATTERY LOCK SPRING	1	
10	VMB4094	BATTERY OUT SPRING	1	
11	VMB4150	BATTERY DOOR SPRING	1	
12	VMP8990	FRAME	1	
13	VMS7867	BATTERY DOOR SHAFT	1	
14	VMS7892	JACK DOOR SHAFT	1	
15	VYF3177	BATTERY DOOR UNIT	1	(-S,-P,-W)
15	VYF3206	BATTERY DOOR UNIT	1	(-K,-A,-T)
16	VYK2K26	BATTERY CASE UNIT	1	
17	VGL1268	AF PANEL LIGHT	1	
18	VYK2S20	TOP ORNAMENT UNIT	1	FX37 SERIES (-S,-P,-W)
18	VYK2S21	TOP ORNAMENT UNIT	1	FX37 SERIES (-K,-A,-T)
18	VYK2S22	TOP ORNAMENT UNIT	1	FX38 SERIES (-S,-P,-W)
18	VYK2S23	TOP ORNAMENT UNIT	1	FX38 SERIES (-K,-T)
19	EFN-FSY56ZC	FLASH UNIT	1	
△ 20	F2A2F9500002	E.CAPACITOR	1	(C8003)
21	VEP58059A	FLASH TOP P.C.B.	1	(RTL) E.S.D.
22	VMB4182	EARTH SPRING	1	(ET8003)
23	VYQ4113	MIC DAMPER	1	
24	VYQ4268	MODE DIAL UNIT	1	(-S,-P,-W)
24	VYQ4410	MODE DIAL UNIT	1	(-K,-A,-T)
25	VMP8995	SIDE ORNAMENT R	1	(-S,-P,-W)
25	VMP9113	SIDE ORNAMENT R	1	(-K,-A,-T)
26	VMP8996	SIDE ORNAMENT LD	1	(-S,-P,-W)
26	VMP9112	SIDE ORNAMENT LD	1	(-K,-A,-T)
27	VMP8997	TRIPOD	1	
28	VMP9124	FRAME PLATE	1	
29	VYK2S05	REAR CASE UNIT	1	(-S)
29	VYK2S08	REAR CASE UNIT	1	(-K)
29	VYK2S06	REAR CASE UNIT	1	(-P)
29	VYK2S09	REAR CASE UNIT	1	(-A)
29	VYK2S07	REAR CASE UNIT	1	(-W)
29	VYK2S10	REAR CASE UNIT	1	(-T)
29-1	VGL1230	REAR PANEL LIGHT	1	
29-2	VGUOC11	CURSOR BUTTON	1	
30	VYK2S11	LCD UNIT	1	
31	VYK2W53	FRONT CASE UNIT	1	(-S)
31	VYK2R96	FRONT CASE UNIT	1	(-K)
31	VYK2L15	FRONT CASE UNIT	1	(-P)
31	VYK2R97	FRONT CASE UNIT	1	(-A)
31	VYK2L16	FRONT CASE UNIT	1	(-W)
31	VYK2R98	FRONT CASE UNIT	1	(-T)
32	VMX3687	CONDENSER CUSHION	1	
B1	VHD1694	SCREW	1	
B2	VHD1876	SCREW	1	
B3	VHD1876	SCREW	1	
B4	VHD2018	SCREW	1	(-S,-P,-W)
B4	VHD2041	SCREW	1	(-K,-A,-T)
B5	VHD2036	SCREW	1	(-S,-P,-W)
B5	VHD2022	SCREW	1	(-K,-A,-T)
B6	VHD2036	SCREW	1	(-S,-P,-W)
B6	VHD2022	SCREW	1	(-K,-A,-T)
B7	VHD2036	SCREW	1	(-S,-P,-W)
B7	VHD2022	SCREW	1	(-K,-A,-T)
B8	VHD2036	SCREW	1	(-S,-P,-W)
B8	VHD2022	SCREW	1	(-K,-A,-T)
B9	XQN16+BJ7FJK	SCREW	1	
B10	XQN16+BJ7FJK	SCREW	1	
B11	XQN16+BJ7FJK	SCREW	1	
B12	VHD1876	SCREW	1	
B13	VHD1876	SCREW	1	

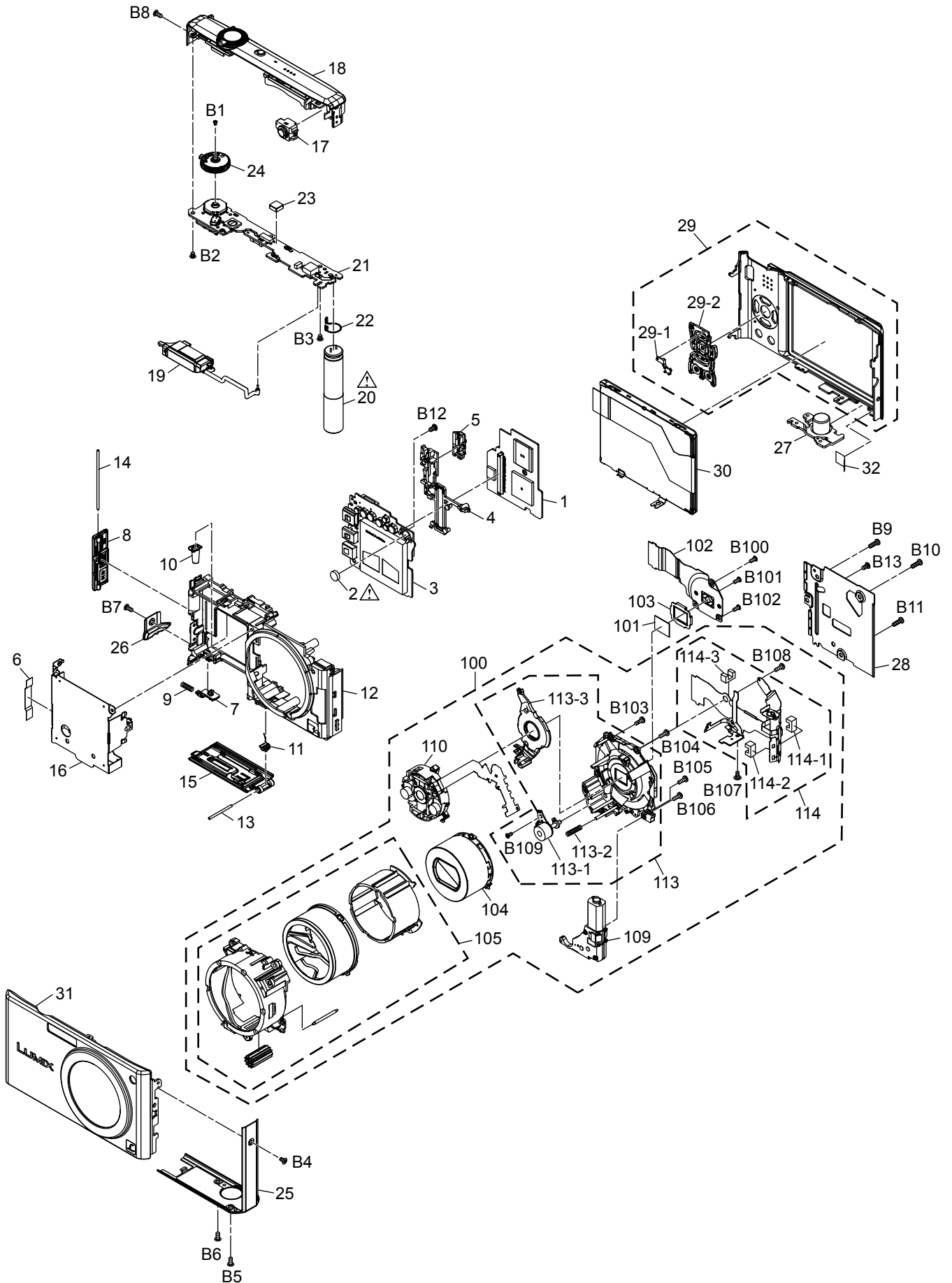
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100	VXW0982	LENS UNIT(W/O CCD)	1	
101	VDL2046	OPTICAL FILTER	1	
102	VEK0L79	CCD UNIT	1	E.S.D.
103	VMX3650	CCD CUSHION	1	
104	VXP3021	1ST LENS FRAME UNIT	1	
105	VXP3088	FIX/DRIVE/DIRECT FRAME UNIT	1	
109	L6DA8BEC0003	ZOOM MOTOR	1	
110	VXP2970	2ND LENS FRAME UNIT	1	
113	VXQ1599	MASTER FLANGE UNIT	1	
113-1	L6HA64NC0014	FOCUS MOTOR UNIT	1	
113-2	VMB4158	FOCUS SPRING	1	
113-3	VXP2969	3RD LENS FRAME UNIT	1	
114	VEK0L76	LENS FPC UNIT	1	
114-1	B3NBA0000011	PHOTO SENSOR	1	
114-2	B3NBA0000011	PHOTO SENSOR	1	
114-3	B3NBA0000011	PHOTO SENSOR	1	
B100	VHD1871	SCREW	1	
B101	VHD1871	SCREW	1	
B102	VHD1871	SCREW	1	
B103	XQN14+CJ4FN	SCREW	1	
B104	XQN14+CJ4FN	SCREW	1	
B105	XQN14+CJ4FN	SCREW	1	
B106	XQN14+CJ4FN	SCREW	1	
B107	VHD2011	SCREW	1	
B108	XQN14+CJ4FN	SCREW	1	
B109	XQN14+CJ4FN	SCREW	1	
200	VPF1317	CAMERA BAG	1	P,PC
△ 202	DE-A39BA	BATTERY CHARGER	1	P,PC
△ 203	-----	BATTERY	1	P,PC
204	K1HA08CD0019	USB CABLE W/PLUG	1	P,PC
205	K1HA08CD0020	AV CABLE W/PLUG	1	P,PC
206	VFC4297	HAND STRAP	1	P,PC
207	VFF0428-S	CD-ROM(OVERSEAS)	1	P,PC See "Notes"
208	VPK3575	PACKING CASE	1	PS
208	VPK3580	PACKING CASE	1	PK,PCK
208	VPK3584	PACKING CASE	1	PA,PCA
208	VPK3615	PACKING CASE	1	PW
209	VPN6657	CUSHION	1	P,PC
211	VPF1294	BAG, POLYETHYLENE	1	P,PC
△ 213	VOT1R88	INSTRUCTION BOOK	1	P
		(SPANISH)		
△ 213	VOT1R87	INSTRUCTION BOOK	1	P,PC
		(ENGLISH)		
△ 213	VOT1R89	INSTRUCTION BOOK	1	PC
		(CANADIAN FRENCH)		
214	VOT1U68	O/I SOFTWARE	1	P,PC
		(ENGLISH/CANADIAN FRENCH)		
215	VYQ3914	BATTERY CARRYING CASE U	1	P,PC

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
300	VPF1317	CAMERA BAG	1	(EXCEPT P,PC)
△ 302	DE-A40AA	BATTERY CHARGER	1	E,EB,EF,EG,GN
△ 302	DE-A40BA	BATTERY CHARGER	1	EE,GC,GD,GK,GJ
△ 302	DE-A39BA	BATTERY CHARGER	1	PL
△ 302	DE-A40AB	BATTERY CHARGER	1	SG
△ 302	DE-A40CA	BATTERY CHARGER	1	GT
△ 303	-----	BATTERY	1	(EXCEPT P,PC)
304	K1HA08CD0019	USB CABLE W/PLUG	1	(EXCEPT P,PC)
305	K1HA08CD0020	AV CABLE W/PLUG	1	(EXCEPT P,PC)
306	VFC4297	HAND STRAP	1	(EXCEPT P,PC)
307	VFF0428-S	CD-ROM (OVERSEAS)	1	PL,E,EB,EE,EF,EG,SG,GC,GD, GN,GT,GJ
				See "Notes"
307	VFF0429-S	CD-ROM (OVERSEAS)	1	GK See "Notes"
308	VPK3576	PACKING CASE	1	PLS,ES,EBS,EES, EGS,SGS
308	VPK3581	PACKING CASE	1	PLK,EK,EBK,EEK, EFK,EGK,SGK
308	VPK3591	PACKING CASE	1	PLP,EEP,SGP
308	VPK3587	PACKING CASE	1	EW,EEW,EFW,EGW,SGW
308	VPK3595	PACKING CASE	1	EBT,EFT,EGT,SGT
308	VPK3585	PACKING CASE	1	EEA,EGA
308	VPK3577	PACKING CASE	1	GCS,GNS,GTS,GJS
308	VPK3582	PACKING CASE	1	GCK,GDK,GNK,GTK,GJK
308	VPK3592	PACKING CASE	1	GCP,GDP,GNP,GTP,GJP
308	VPK3616	PACKING CASE	1	GCT,GTT,GJT
308	VPK3578	PACKING CASE	1	GKS
308	VPK3583	PACKING CASE	1	GKK
308	VPK3589	PACKING CASE	1	GKW
308	VPK3593	PACKING CASE	1	GKT
309	VPN6657	CUSHION	1	(EXCEPT P,PC)
310	VPN6666	PAD	1	EB,GC
310	VPN6664	PAD	1	PL,E,EE,EF,EG,SG,GD,GK,GN, GT,GJ
311	VPF1294	BAG, POLYETHYLENE	1	(EXCEPT P,PC)
△ 312	VFF0430	CD-ROM (INSTRUCTION BOOK)	1	PL,E,EG,SG,GC
△ 313	VQT1R90	SIMPLIFIED O/I (ENGLISH/SPANISH)	1	PL
△ 313	VQT1R91	SIMPLIFIED O/I (PORTUGUESE)	1	PL
△ 313	VQT1R95	SIMPLIFIED O/I (SWEDISH/DANISH)	1	E
△ 313	VQT1R96	SIMPLIFIED O/I (POLISH/CZECH)	1	E
△ 313	VQT1R97	SIMPLIFIED O/I (HUNGARIAN/FI)	1	E
△ 313	VQT1R99	INSTRUCTION BOOK (ENGLISH)	1	EB
△ 313	VQT1S00	INSTRUCTION BOOK (RUSSIAN)	1	EE
△ 313	VQT1S01	INSTRUCTION BOOK (UKRAINIAN)	1	EE
△ 313	VQT1R98	INSTRUCTION BOOK (FRENCH)	1	EF
△ 313	VQT1R92	SIMPLIFIED O/I (GERMAN/FRENCH)	1	EG
△ 313	VQT1R93	SIMPLIFIED O/I (ITALIAN/DUTCH)	1	EG
△ 313	VQT1R94	SIMPLIFIED O/I (SPANISH/PORTUGUESE)	1	EG
△ 313	VQT1S02	SIMPLIFIED O/I (ENGLISH/CHINESE(TRADITIONAL))	1	SG,GC
△ 313	VQT1S03	SIMPLIFIED O/I (ARABIC/PERSIAN)	1	GC
△ 313	VQT1S08	INSTRUCTION BOOK (KOREAN)	1	GD
△ 313	VQT1S06	INSTRUCTION BOOK (CHINESE(SIMPLIFIED))	1	GK
△ 313	VQT1S07	INSTRUCTION BOOK (ENGLISH)	1	GN
△ 313	VQT1S05	INSTRUCTION BOOK (CHINESE(TRADITIONAL))	1	GT
△ 313	VQT1S04	INSTRUCTION BOOK (THAI)	1	GJ
314	VQT1U69	O/I SOFTWARE (ENGLISH/SPANISH/PORTUGUESE)	1	PL

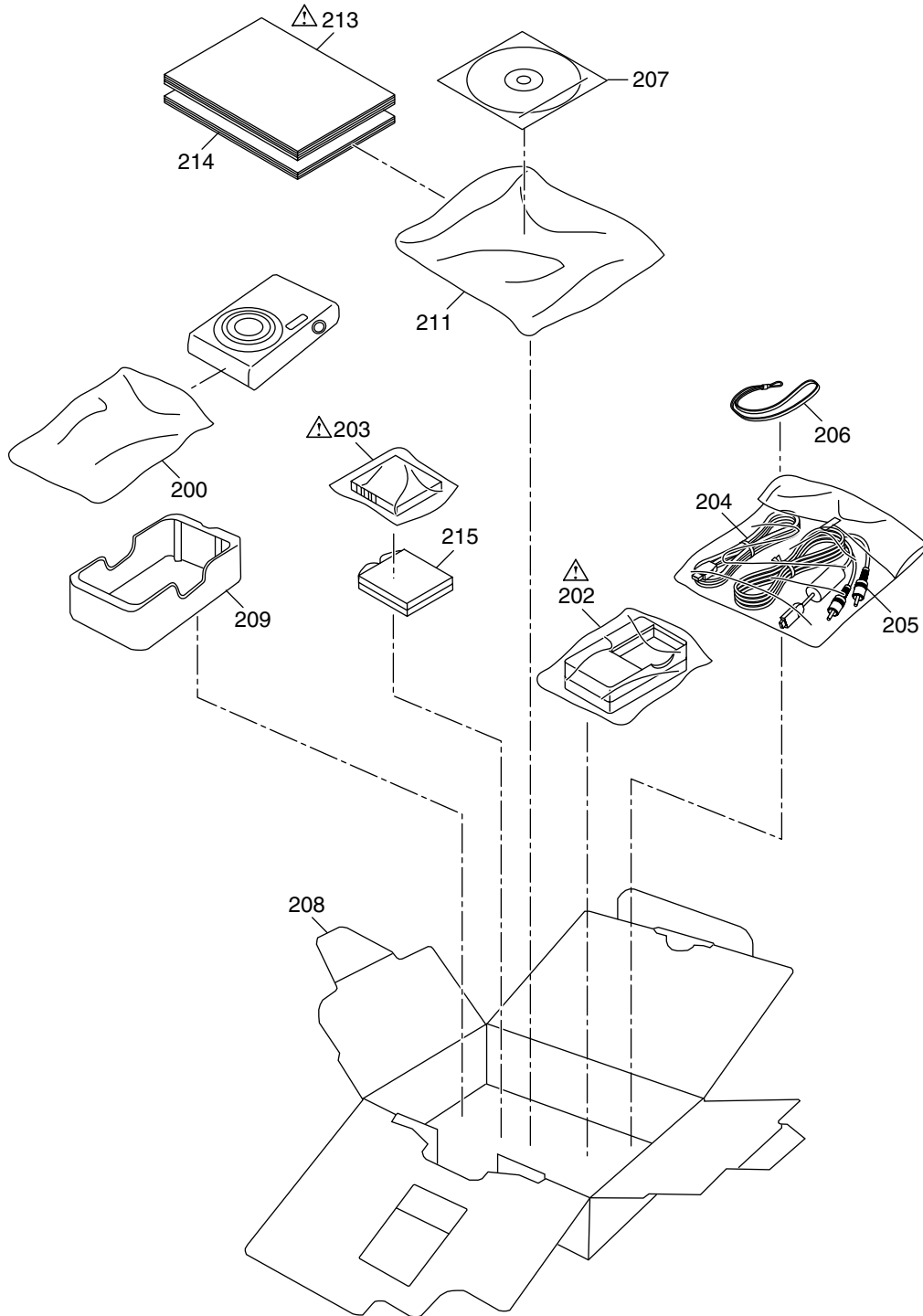
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
314	VOT1U71	O/I SOFTWARE (FI/SWEDISH/DANISH/POLISH/ CZECH/HUNGARIAN)	1	E
314	VOT1U73	O/I SOFTWARE (ENGLISH)	1	EB,GN
314	VOT1U74	O/I SOFTWARE (RUSSIAN/UKRAINIAN)	1	EE
314	VOT1U72	O/I SOFTWARE (FRENCH)	1	EF
314	VOT1U70	O/I SOFTWARE (GERMAN/FRENCH/ITALIAN/DUTCH/ SPANISH/PORTUGUESE)	1	EG
314	VOT1U75	O/I SOFTWARE (ENGLISH/CHINESE(TRADITIONAL)/ ARABIC/PERSIAN)	1	SG,GC
314	VOT1U79	O/I SOFTWARE (KOREAN)	1	GD
314	VOT1U78	O/I SOFTWARE (CHINESE(SIMPLIFIED))	1	GK
314	VOT1U77	O/I SOFTWARE (CHINESE(TRADITIONAL))	1	GT
314	VOT1U76	O/I SOFTWARE (THAI)	1	GJ
315	VYQ3914	BATTERY CARRYING CASE U	1	(EXCEPT P,PC)
316	VQL1G34	OPERATING LABEL	1	GT
△ 319	K2CT3CA00004	AC CORD W/PLUG	1	EB,GC
△ 320	K2CQ2CA00006	AC CORD W/PLUG	1	E,EE,EF,EG,GC
△ 320	K2CP2Y00001	AC CORD W/PLUG	1	GJ
△ 321	K2CR2CA00003	AC CORD W/PLUG	1	GD
△ 322	K2CA2CA00020	AC CORD W/PLUG	1	GK
△ 322	K2CA2CA00019	AC CORD W/PLUG	1	SG
△ 322	K2CA2CA00027	AC CORD W/PLUG	1	GT
△ 323	K2CJ2DA00008	AC CORD W/PLUG	1	GN

S7. Exploded View

S7.1. Frame and Casing Section



S7.2. Packing Parts and Accessories Section (1)



S7.3. Packing Parts and Accessories Section (2)

