ORDER NO. DSC0903022CE
B26

Service Manual

Digital Camera

LUMIX

Model No. **DMC-FS4P**
DMC-FS4PC
DMC-FS4PR
DMC-FS4PU
DMC-FS4EB
DMC-FS4EE
DMC-FS4EF
DMC-FS4EG
DMC-FS4EP
DMC-FS4GC
DMC-FS4GJ
DMC-FS4GK
DMC-FS4GN

Vol. 1
Colour
(S).....Silver Type (except PC/EF/GJ)
(K).....Black Type

⚠ 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.

Panasonic

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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 MΩ and 5.2 MΩ. 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 kΩ, 10 W resistor, in parallel with a 0.15 μF 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 kΩ/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 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

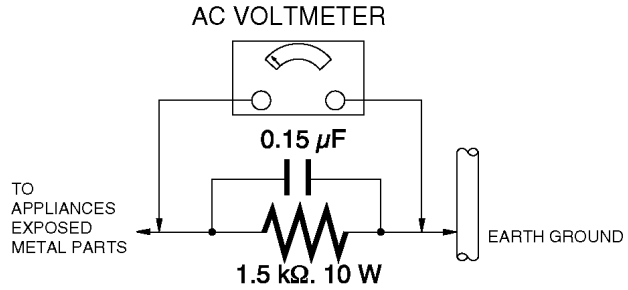


Figure. 1

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 (ERG5SJ102:1kΩ /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.

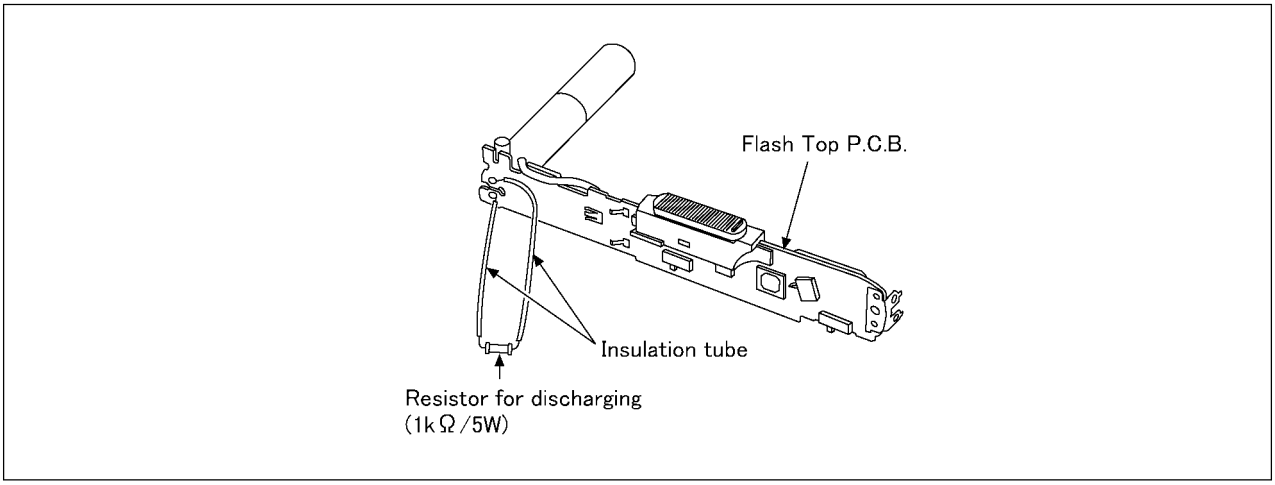


Fig. F1

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 ASTA mark or the BSI mark on the body of the fuse.

ASTA mark	BSI mark

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 safety.
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.

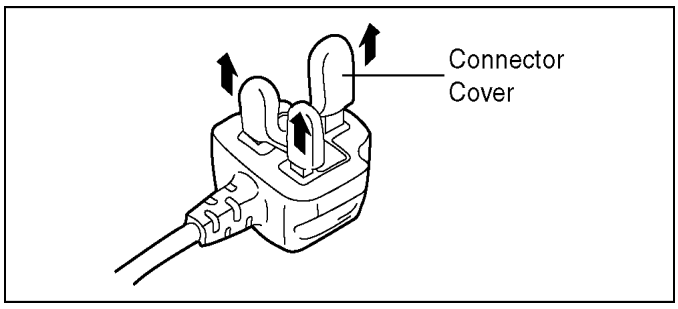
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

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.

Earth Symbol	⏚

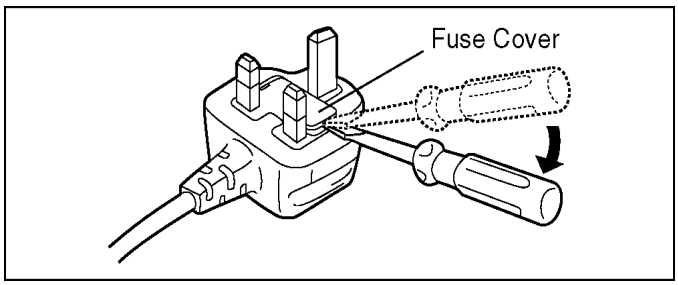
2.3.2.2. Before Use

Remove the Connector Cover as follows.

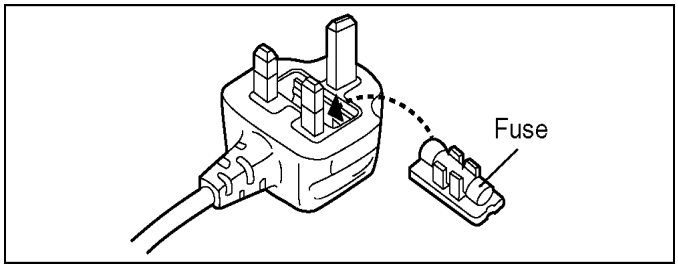


2.3.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse cover.



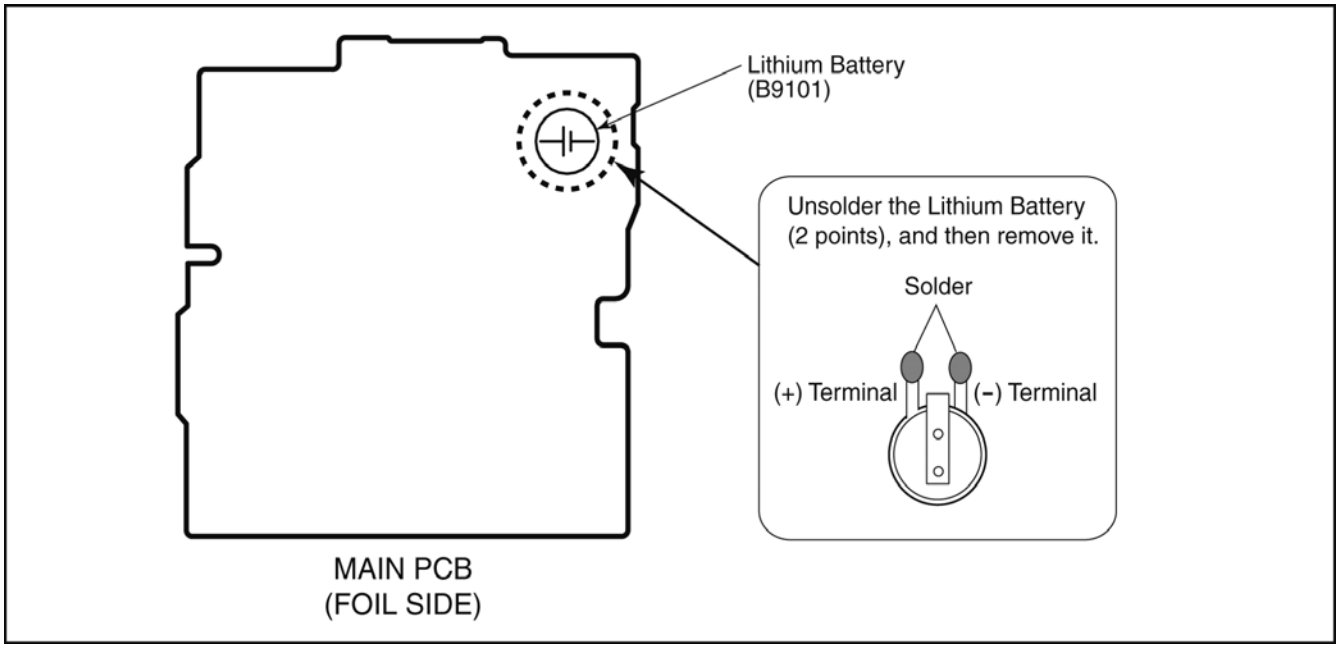
2.4. How to Replace the Lithium Battery

2.4.1. Replacement Procedure

1. Remove the MAIN PCB. (Refer to Disassembly Procedures.)
2. Unsolder the each soldering point of electric lead terminal for Lithium battery (Ref. No. “B9101” at foil side of MAIN PCB) and remove the Lithium battery together with electric lead terminal. Then replace it into new one.

NOTE:

The Type No. ML-421S/DN includes electric lead terminals.



NOTE:

This Lithium battery is a critical component.
(Type No.: ML-421S/DN **Manufactured by Energy Company, Panasonic Corporation.**)
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-FS4 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.
  RFKZ03D01KS----------(0.3mm 100g Reel)
  RFKZ06D01KS----------(0.6mm 100g Reel)
  RFKZ10D01KS----------(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/facilites.
   a. Schematic diagram, Block Diagram and PCB layout of MAIN PCB.
   b. Parts list for individual parts for MAIN PCB.
   When a part replacement is required for repairing MAIN PCB, replace as an assembled parts. (MAIN PCB)
2. The following category is/are recycle module part. please send it/them to Central Repair Center.
   - MAIN PCB (VEP56074C): Excluding replacement of Lithium Battery

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

There are five kinds of DMC-FS4, regardless of the colours.

- a) DMC-FS4P/PC
- b) DMC-FS4EB/EF/EG/EP/GN
- c) DMC-FS4EE
- d) DMC-FS4GK
- e) DMC-FS4PR/PU/GC/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.

a) DMC-FS4P/PC

The nameplate for these models show the following Safety registration mark.

b) DMC-FS4EB/EF/EG/EP/GN

The nameplate for these models show the following Safety registration mark.

c) DMC-FS4EE

The nameplate for this model show the following Safety registration mark.

d) DMC-FS4GK

The nameplate for this model show the following Safety registration mark.

e) DMC-FS4PR/PU/GC/GJ

The nameplate for these models do not show any above Safety registration mark.

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-AVC” web-site in “TSN system”, together with Maintenance software.

3.4.2. INITIAL SETTINGS:

After replacing 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 : "P/EG/EP/PU/GC/GK/EF/EB/EE/GN/PC/PR and GJ")

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

[NOTE:Only for "EG, EP, EF, EB and EE" models]

*.When one of the "EG, EP, EF, EB and EE" has been chosen, only "EG, EP, 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.

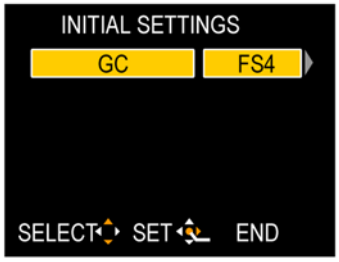
2. PROCEDURES:

- Precautions: Read the above "CAUTION 1" and "CAUTION 2", carefully.
- Preparation:
  1. Attach the Battery or AC Adaptor with a DC coupler to the unit.
  2. Set the recording mode to the [NORMAL PICTURE] mode.
     (Press the [MODE] button and select the [NORMAL PICTURE] by pressing the “[UP] and [DOWN] of Cursor buttons”, then press the [MENU/SET] button.)
     NOTE:
     If the unit is other than [NORMAL PICTURE] mode, it does not display the initial settings menu.
- **Step 1. The temporary cancellation of “INITIAL SETTINGS”:**
  Set the [REC]/[PLAYBACK] selector switch to “[REC] (Camera mark)”.
  While keep pressing “[UP] of Cursor button” and [DISPLAY] button simultaneously, turn the Power on.
- **Step 2. The cancellation of “INITIAL SETTINGS”:**
  Set the [REC]/[PLAYBACK] selector switch to “[PLAYBACK]”.
  Press “[UP] of Cursor button” and [DISPLAY] button simultaneously, then turn the Power off.
- **Step 3. Turn the Power on:**
  Set the [REC]/[PLAYBACK] selector switch to “[REC] (Camera mark)”, and then turn the Power on.
- **Step 4. Display the INITIAL SETTING:**
  NOTE:
  If the unit is other than [NORMAL PICTURE] mode, it does not display the initial settings menu.
  While keep pressing [MENU/SET] and “[RIGHT] of Cursor buttons” simultaneously, turn the Power off.
  The "INITIAL SETTINGS" menu is displayed.
  There are two kinds of “INITIAL SETTINGS” menu form as follows:

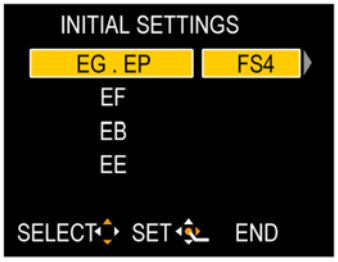
[CASE 1. After replacing MAIN P.C.B.]
When MAIN P.C.B. has just been replaced, all of the model suffix is displayed as follows. (Four pages in total)

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

<Other than “EG.EP/EF/EB/EE” models>

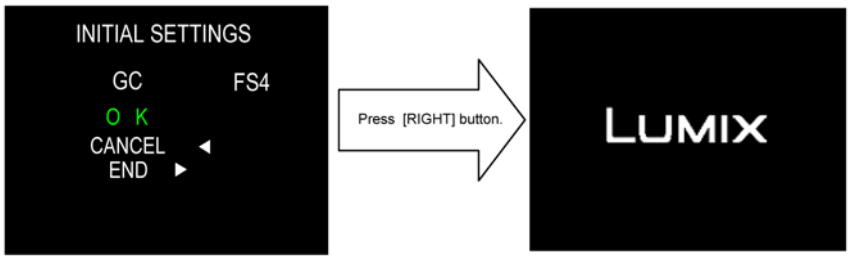


<Only “EG.EP/EF/EB/EE” models>



- **Step 5. Choose the model suffix in “INITIAL SETTINGS”: (Refer to “CAUTION 1”)**
  [Caution: After replacing MAIN P.C.B.]
  The model suffix can been 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.
  Therefore, select the area carefully.
  Select the area with pressing “[UP] / [DOWN] of Cursor buttons”.

- **Step 6. Set the model suffix in “INITIAL SETTINGS”:**
  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.)



• **Step 7. CONFIRMATION:**
Confirm the display of “PLEASE SET THE CLOCK” in concernd language when the unit is turned on again.
When the unit is connected to PC with USB cable, it is detected as removable media.

1) As for your reference, major default setting condition is as shown in the following table.

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

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DMC-FS4P	NTSC	English	Month/Date/Year	
b)	DMC-FS4EG	PAL	English	Date/Month/Year	
c)	DMC-FS4EP	PAL	English	Date/Month/Year	
d)	DMC-FS4PU	NTSC	English	Month/Date/Year	
e)	DMC-FS4GC	PAL	English	Date/Month/Year	
f)	DMC-FS4GK	PAL	Chinese (simplified)	Year/Month/Date	
g)	DMC-FS4EF	PAL	French	Date/Month/Year	
h)	DMC-FS4EB	PAL	English	Date/Month/Year	
i)	DMC-FS4EE	PAL	Russian	Date/Month/Year	
j)	DMC-FS4GN	PAL	English	Date/Month/Year	
k)	DMC-FS4PC	NTSC	English	Month/Date/Year	
l)	DMC-FS4PR	PAL	English	Date/Month/Year	
m)	DMC-FS4GJ	PAL	Thai	Date/Month/Year	

4 Specifications

Digital Camera:	Information for your safety
Power Source:	DC 5.1 V
Power Consumption:	1.0 W (When recording) 0.5 W (When playing back)
Camera Effective pixels:	8,100,000 pixels
Image sensor:	1/2.5″ CCD
Total pixels:	8,320,000 pixels Primary color filter
Lens:	Optical 4 × zoom, f=5.5 to 22 mm [35 mm film camera equivalent: 33 to 132 mm] / F2.8 to F5.9
Digital zoom:	Max. 4 ×
Extended optical zoom:	Max. 6.4 ×
Focus:	Normal / Macro Face detection / 9-area-focusing / 1-area-focusing
Focus range:	Normal : 50 cm (1.64 feet) to ∞ Macro / Auto scene : 5 cm (0.17 feet) (Wide) / 50 cm (1.64 feet) (Tele) to ∞ Scene mode: settings may be different to those shown above
Shutter system:	Electronic shutter+Mechanical shutter
Motion picture recording:	[WVGA] 848 × 480 pixels (30 frames/second) (When a card is used.) [VGA] 640 × 480 pixels (30 frames/second) (When a card is used.) [QVGA] 320 × 240 pixels (30 frames/second) With audio
Burst recording	
Burst speed:	Approx. 3 pictures/second (NORMAL), Approx. 2 pictures/second (Unlimited)
Number of recordable pictures:	Max. 7 pictures (Standard), max. 4 pictures (Fine), Depends on the remaining capacity of the built-in memory or the card (Unlimited).
Hi-speed burst	
Burst speed:	Approx. 5.5 pictures/second
Picture size:	[4:3 3M], [3:2 2.5M] or [16:9 2M] is selected as the picture size.
Number of recordable pictures:	When using the built-in memory: Approx. 10 pictures (immediately after formatting) When using a Card: Max. 100 pictures (differs depending on the type of Card and the recording conditions)
ISO sensitivity:	i.AUTO/ 80 / 100 / 200 / 400 / 800 / 1000 [HIGH SENS.] mode: 1600 to 6400
Shutter speed:	8 seconds to 1/2,000th of a second [STARRY SKY] mode:15 seconds, 30 seconds, 60 seconds
White balance:	Auto white balance / Daylight / Cloudy / Shade / Halogen / White set
Exposure (AE):	Program AE Exposure compensation (1/3 EV Step, -2 EV to +2 EV)
Metering mode:	Multiple
LCD monitor:	TFT LCD 2.5″ (Approx. 230,000 dots) (field of view ratio about 100%)

Flash:	Flash range: Approx. 30 cm (0.99 feet) to 6.3 m (20.7 feet) (Wide [i.AUTO]) AUTO, AUTO / Red-eye reduction, Forced ON (Forced ON / Red-eye reduction), (Slow sync. / Red-eye reduction), Forced 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:	[4:3 8M] 3264 × 2448 pixels, [16:9 5M] 2560 × 1920 pixels, [4:3 3M] 2048 × 1536 pixels [3:2 7M] 3264 × 2176 pixels, [3:2 2.5M] 2048 × 1360 pixels [16:9 6M] 3264 × 1840 pixels, [16:9 2M] 1920 × 1080 pixels
Motion pictures:	[WVGA] 848 × 480 pixels (When a card is used.), [VGA] 640 × 480 pixels (When a card is used.), [QVGA] 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
Motion pictures:	"QuickTime Motion JPEG" (motion pictures with audio)
Interface	
Digital:	USB 2.0 (Full Speed)
Analog video / audio:	NTSC / Audio line output (monaural)
Terminal	
AV OUT/DIGITAL:	Dedicated jack (8 pin)
Dimensions:	97.6 mm (W) × 55.4 mm (H) × 22.3 mm (D) (3.84″ (W) × 2.18″ (H) × 0.88″ (D)) (excluding the projection part)
Mass (Weight):	Approx. 112 g/0.25 lb (excluding Memory Card and battery) Approx. 134 g/0.30 lb (with Memory Card and battery)
Operating Temperature:	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity:	10% to 80%

Battery Charger (Panasonic DE-A59B):	Information for your safety
Input:	110 V to 240 V ~ 50/60 Hz, 0.2 A
Output:	CHARGE 4.2 V ⎓ 0.65 A
Equipment mobility:	Movable
Battery Pack (lithium-ion) (Panasonic DMW-BCF10PP):	Information for your safety
Voltage/capacity (Minimum):	3.6 V/940 mAh

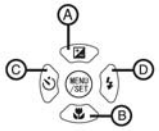
NOTE:(Only for "EB/EF/EG/EP/PR" models)

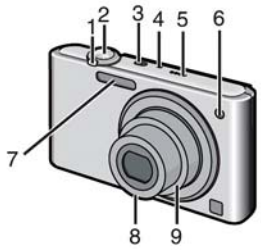
- Data from the PC can not be written to the camera using the USB connection cable.
- Motion pictures can be recorded continuously for up to 15 minutes.
  The maximum continuous recording time (up to 15 minutes) is displayed on the screen.

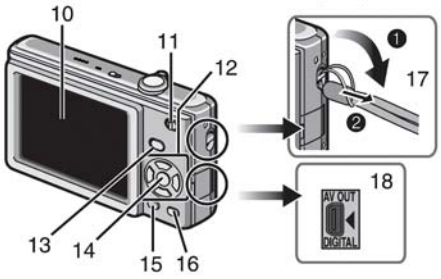
5 Location of Controls and Components

Names of the Components

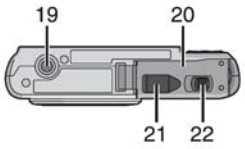
1 Zoom lever
2 Shutter button
3 Camera ON/OFF switch
4 Microphone
5 Speaker
6 Self-timer indicator
AF assist lamp
7 Flash
8 Lens part
9 Lens barrel
10 LCD monitor
11 Recording/playback switch
12 Cursor buttons
Ⓐ: ▲ /Exposure compensation
Ⓑ: ▼ /Macro button
Ⓒ: ◀ /Self-timer button
Ⓓ: ▶ /Flash mode button





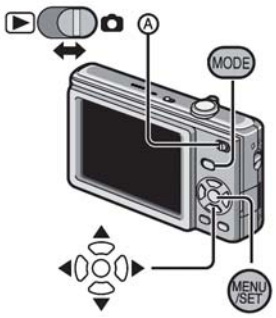


13 [MODE] button
14 [MENU/SET] button
15 [DISPLAY] button
16 [Q.MENU]/Delete button
17 Hand strap eyelet
• Attach the strap when using the camera to prevent it from dropping.
18 [AV OUT/DIGITAL] socket
19 Tripod receptacle
• When you use a tripod, make sure the tripod is stable with the camera attached to it.
20 Card/Battery door
21 DC coupler cover
• When using an AC adaptor, ensure that the Panasonic DC coupler (DMW-DCC4; optional) and AC adaptor (DMW-AC5PP; optional) are used.
22 Release lever

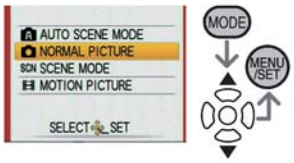


Mode switching

1 **Slide the recording/playback switch Ⓐ to (right) or (left).**
: Recording Mode
: Playback Mode



2 **Press [MODE] to display the mode selection screen.**
(Example: Normal Picture Mode)



3 **Press ▲/▼ to select a mode and press [MENU/SET] to close the menu.**

■ List of Recording Modes

Auto Scene Mode	Taking pictures easily.
Normal Picture Mode	Taking pictures in the desired setting.
SCN Scene Mode	Taking pictures according to the scene.
Motion Picture Mode	This mode allows you to record motion pictures with audio.

■ List of Playback Modes

Normal Play Mode	Playing back the pictures normally.
Slide Show Mode	Playing back the pictures continuously.
★ Favorite Play Mode	Playing back the pictures set as your favorite. • Pictures do not appear when the [FAVORITE] is set to [OFF].

About the Battery

• This unit has a function that can distinguish useable batteries. Exclusive batteries are supported by this function. (Conventional batteries not supported by this function cannot be used.)

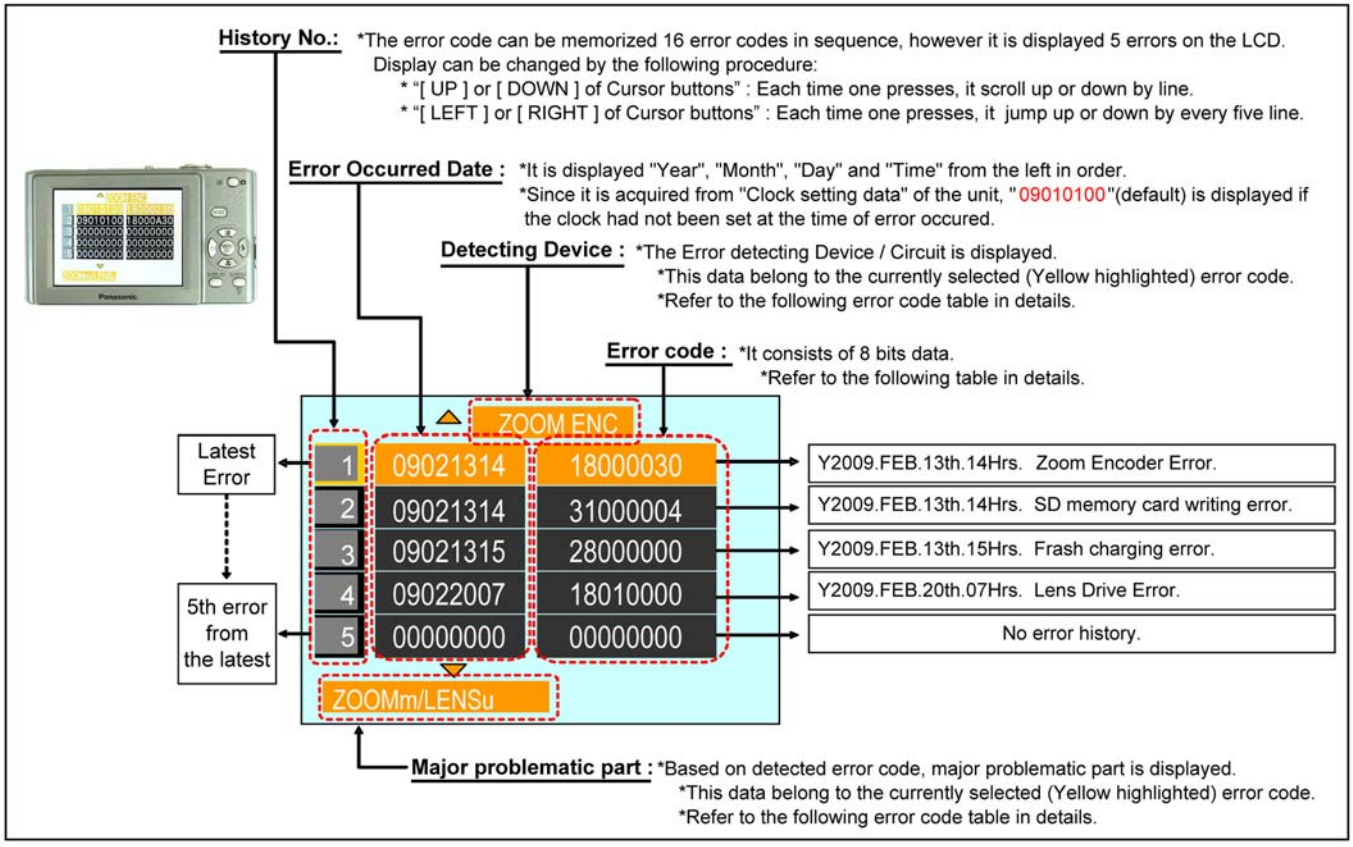
It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

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 (i.e.,when the unit is powered on by the battery, the battery is pulled out) The error code is memorized to FLASH ROM when the unit has just before powered off.
2. **How to display**
   The error code can be displayed by ordering the following procedure:

- **Preparation:**
  1. Attach the Battery or AC Adaptor with a DC coupler to the unit.
  NOTE:
  *Since this unit has built-in memory, it can be performed without inserting SD memory card.
  *It is not a matter of the setting condition of Recording mode (such as "normal picture/ Auto Scene / scene mode) to display the error code.
- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**
  Set the [REC]/[PLAYBACK] selector switch to "[REC] (Camera mark)".
  While keep pressing "[UP] of Cursor button" and [DISPLAY] button simultaneously, turn the Power on.
- **Step 2. Execute the error code display mode:**
  Press the "[LEFT] of Cursor button", [MENU/SET] button and [DISPLAY] button simultaneously.
  The display is changed as shown below when the above buttons are pressed simultaneously.
  Normal display → Error code display → Operation history display → Normal display → .....



Example of Error Code Display

• **3. Error Code List**

The error code consists of 8 bits data and it shows the following information.

Attribute	Main item	Sub item	Error code		Contents (Upper line)	Error Indication	
			High 4 bits	Low 4 bits	Problematic Part & Check point (Lower line)	Detecting device	Problematic Part/Circuit
LENS	Lens drive	Zoom (C.B.)	18*0	0?10	Collapsible barrel Low detect error (Collapsible barrel encoder always detects Low.) Mechanical lock, FP9002-(3) signal line or IC6001 (VENUS 4)	ZOOM L	ZOOMm/LENSu
				0?20	Collapsible barrel High detect error (Collapsible barrel encoder always detects High.) Mechanical lock, FP9002-(3) signal line or IC6001 (VENUS 4)	ZOOM H	
				0?30	Zoom motor sensor error. Mechanical lock, FP9002-(35), (38) signal line or IC6001 (VENUS 4)	ZOOM ENC	
				0?40	Zoom motor sensor error. (During monitor mode.) Mechanical lock, FP9002-(35), (38) signal line or IC6001 (VENUS 4)		
				0?50	Zoom motor sensor error. (During monitor mode with slow speed.) Mechanical lock, FP9002-(35), (38) signal line or IC6001 (VENUS 4)		
		Focus		0?01	HP High detect error (Focus encoder always detects High, and not becomes Low) Mechanical lock, FP9002-(3) signal line or IC6001 (VENUS 4)	FOCUS L	LENS FPC/DSP
				0?02	HP Low detect error (Focus encoder always detects Low, and not becomes High) Mechanical lock, FP9002-(3) signal line or IC6001 (VENUS 4)	FOCUS H	
		Lens	18*1	0000	Power ON time out error. Lens drive system	LENS DRV	LENSu
			18*2	0000	Power OFF time out error. Lens drive system		
HARD	VENUS A/D	Flash	28*0	0000	Flash charging error. IC6001-(AC17) signal line or Flash charging circuit	STRB CHG	STRB PCB/FPC
	FLASH ROM (EEPRO Area)	FLASH ROM (EEPRO Area)	2B*0	0001 0003 0004	EEPROM read error IC6002 (FLASH ROM)	FROM RE	FROM
				0002	EEPROM write error IC6002 (FLASH ROM)	FROM WR	FROM
				0005	Firmware viersion up error Replace the firmware file in the SD memory card.	(No indication)	(No indication)
				0008 0009	SDRAM error SDRAM Mounting defective		
	SYSTEM	RTC	2C*0	0001	SYSTEM IC initialize failure error Communication between IC6001 (VENUS 4) and IC9101 (SYSTEM)	SYS INIT	MAIN PCB
SOFT	CPU	Reset	30*0	0001 | 0007	NMI reset Non Mask-able Interrupt (30000001-30000007 are caused by factors)	NMI RST	MAIN PCB
	Card	Card	31*0	0001	Card logic error SD memory card data line or IC6001 (VENUS 4)	SD CARD	SD CARD/DSP
				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)	SD WRITE	
			39*0	0005	Format error	INMEMORY	FROM
	CPU, ASIC	Stop	38*0	0001	Camera task finish process time out. Communication between Lens system and IC6001 (VENUS 4)	LENS COM	LENSu/DSP
				0002	Camera task invalid code error. IC6001 (VENUS 4)	DSP	DSP
				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	(No indication)	(No indication)
	Operation	Power on	3B*0	0000	FLASHROM processing early period of camera during movement.	INIT	(No indication)
	Zoom	Zoom	3C*0	0000	Inperfect zoom lens processing Zoom lens	ZOOM	ZOOMm/LENSu
			35*0	0000 | FFFF	Software error (0-7bit : command, 8-15bit : status)	DSP	DSP
			35*1	0000	Though record preprocessing is necessary, it is not called.		
			35*2	0000	Though record preprocessing is necessary, it is not completed.	(No indication)	(No indication)

Important notice about "Error Code List"

1) About "*" indication:

The third digit from the left is different as follows.

- In case of 0 (example: 18**0**01000)
  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: 18**8**01000)
  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.

- **4. How to exit from Error Code display mode:**
  Simply, turn the power off. (Since Error code display mode is executed under the condition of temporary cancellation of "INITIAL SETTINGS", it wake up with normal condition when turn off the power.)

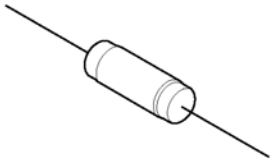
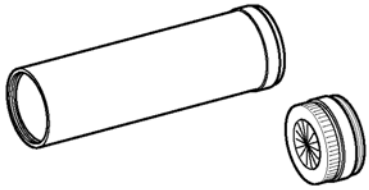
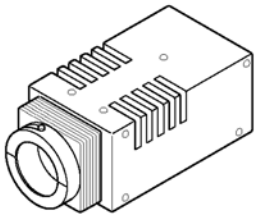
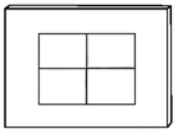
  NOTE:

  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.**	

7.2. When Replacing the Main PCB

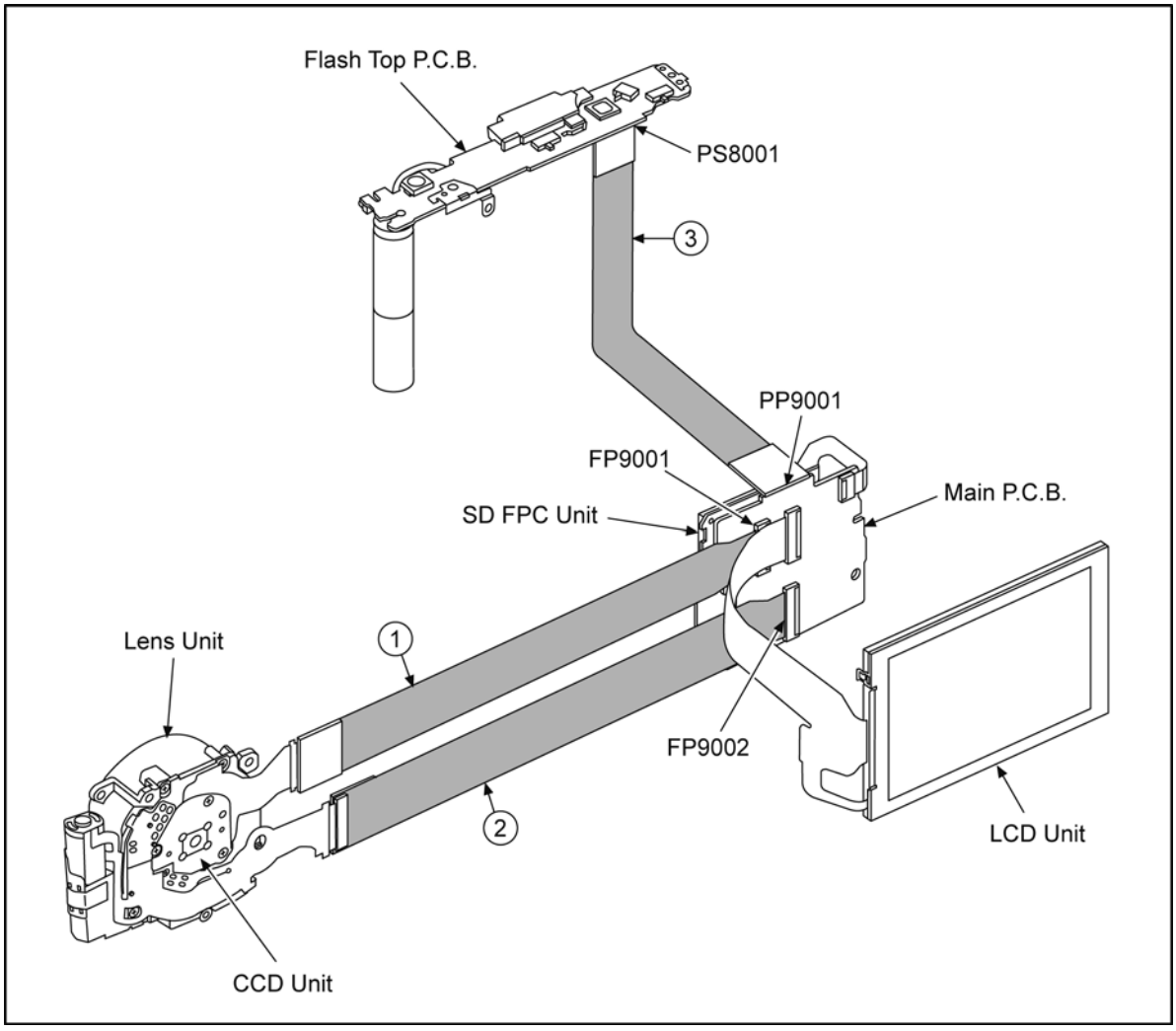
After replacing the MAIN PCB, be sure to achieve adjustment.
The adjustment instruction is available at “software download” on the “Support Information from NWBG/VDBG-AVC” web-site in “TSN system”, together with Maintenance software.

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	RFKZ0416	FP9001 (MAIN) - CCD UNIT	41PIN 0.3 FFC
2	RFKZ0477	FP9002 (MAIN) - LENS UNIT	45PIN 0.3 FFC
3	RFKZ0418	PP9001 (MAIN) - PS8001 (FLASH TOP)	30PIN B to B

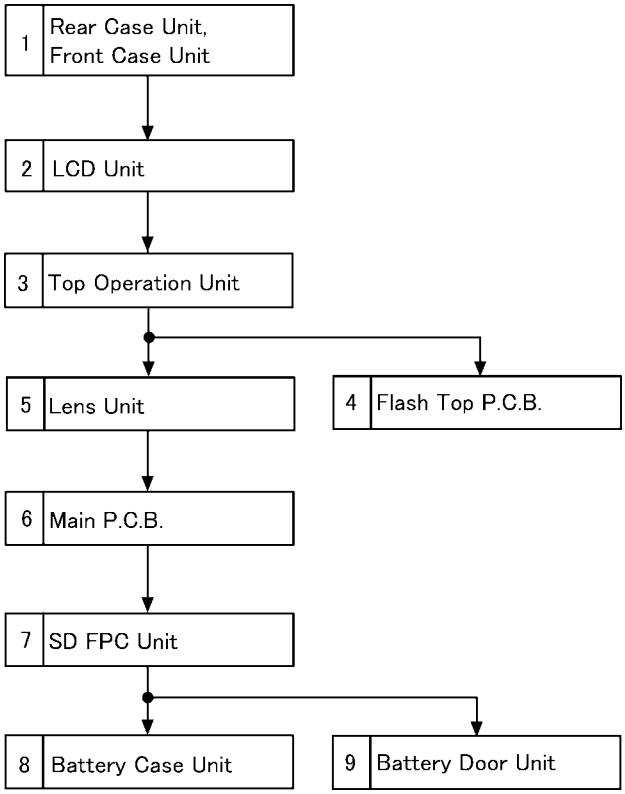


CAUTION-1. (When servicing FLASH TOP PCB)

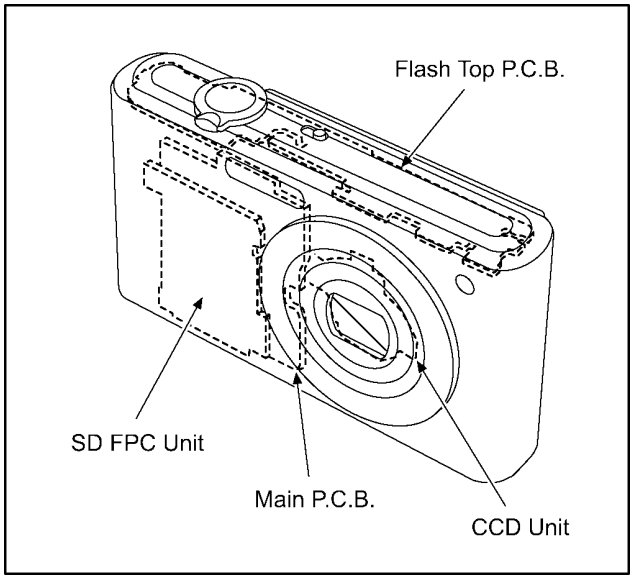
1. Be sure to discharge the capacitor on FLASH TOP PCB.
   Refer to “HOW TO DISCHARGE THE CAPACITOR ON FLASH TOP PCB”.
   The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on FLASH TOP PCB.
3. DO NOT allow other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

8 Disassembly and Assembly Instructions

8.1. Disassembly Flow Chart



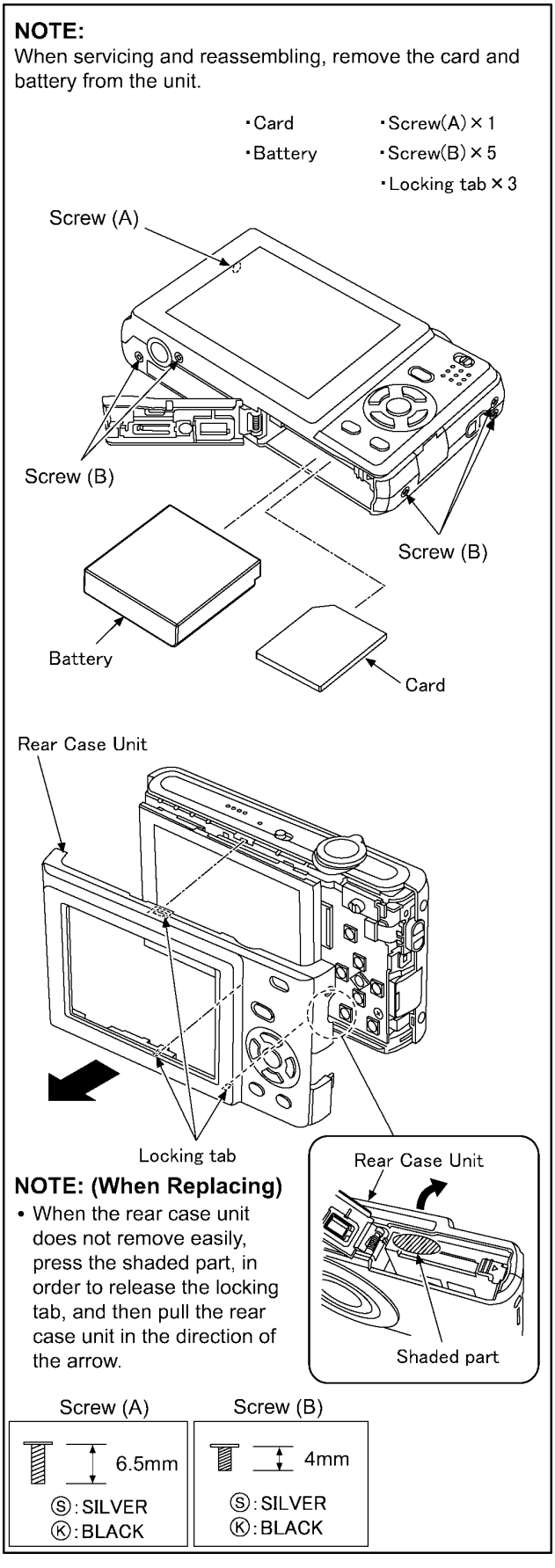
8.2. PCB Location



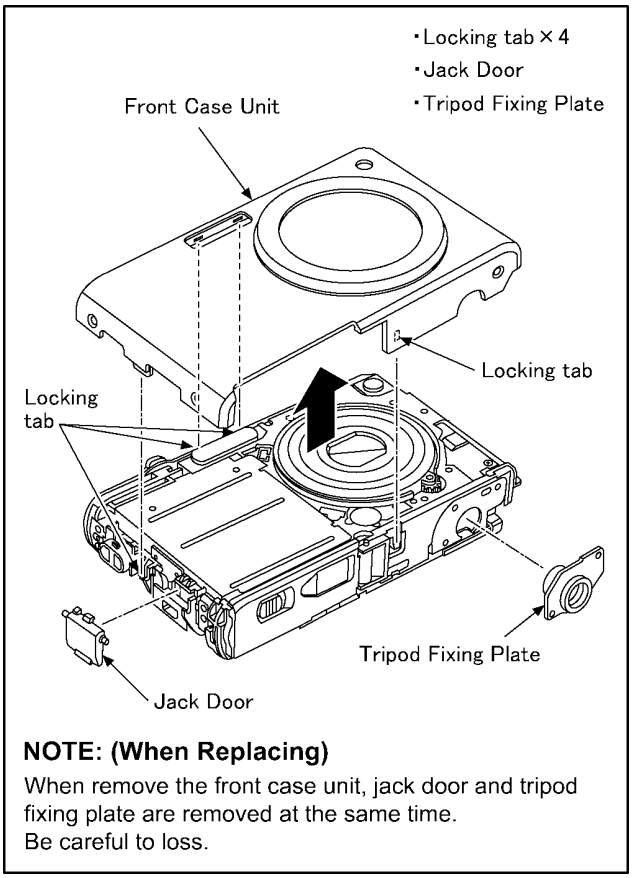
8.3. Disassembly Procedure

No.	Item	Fig	Removal
1	Rear Case Unit Front Case Unit	(Fig.D1)	Card
			Battery
			1 Screw (A)
			5 Screws (B)
			3 Locking tabs
			Rear Case Unit
		(Fig.D2)	4 Locking tabs
			Jack Door
			Tripod Fixing Plate
			Front Case Unit
2	LCD Unit	(Fig.D3)	1 Locking tab (A)
			2 Locking tabs (B)
		(Fig.D4)	3 Screws (C)
			1 Screw (D)
			3 Ribs
			Frame Plate
			FP9103(Flex)
			LCD Unit
3	Top Operation Unit	(Fig.D5)	PS8001(Connector)
			Top Operation Unit
4	Flash Top P.C.B.	(Fig.D6)	AF Panel Light
			2 Screws (E)
			5 Locking tabs
		(Fig.D7)	Top Ornament Unit
			Speaker Unit
			Mic Damper
			Power Knob Base
			Power Knob
			Flash Top P.C.B.
		(Fig.D8)	NOTE: (When installing)
5	Lens Unit	(Fig.D9)	FP9001(Flex)
			FP9002(Flex)
			Lens Unit
6	Main P.C.B.	(Fig.D10)	1 Screw (F)
			FP9005(Flex)
			1 Locking tab
			Main P.C.B.
7	SD FPC Unit	(Fig.D11)	1 Screw (G)
			SD FPC Unit
8	Battery Case Unit	(Fig.D12)	Earth Plate
			2 Locking tabs
			1 Rib
		(Fig.D13)	Battery Out Spring
			Battery Case Unit
9	Battery Door Unit	(Fig.D14)	Battery Door Shaft
			Battery Door Spring
			Battery Door Unit

8.3.1. Removal of the Rear Case Unit and Front Case Unit



(Fig.D1)

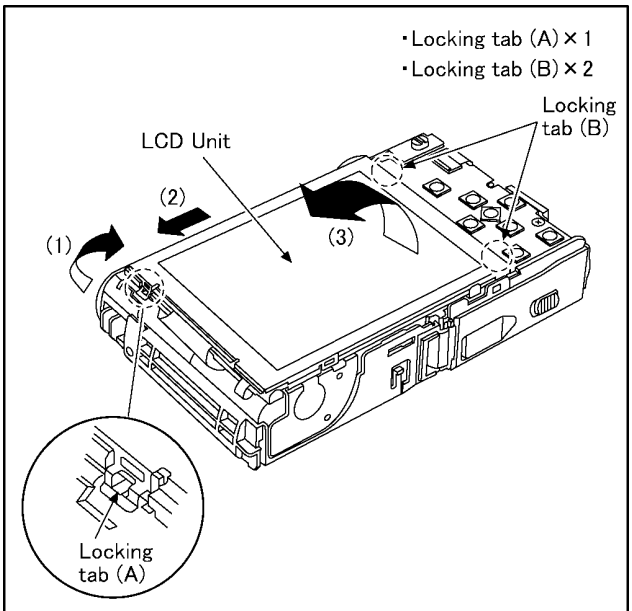


NOTE: (When Replacing)

When remove the front case unit, jack door and tripod fixing plate are removed at the same time.
Be careful to loss.

(Fig.D2)

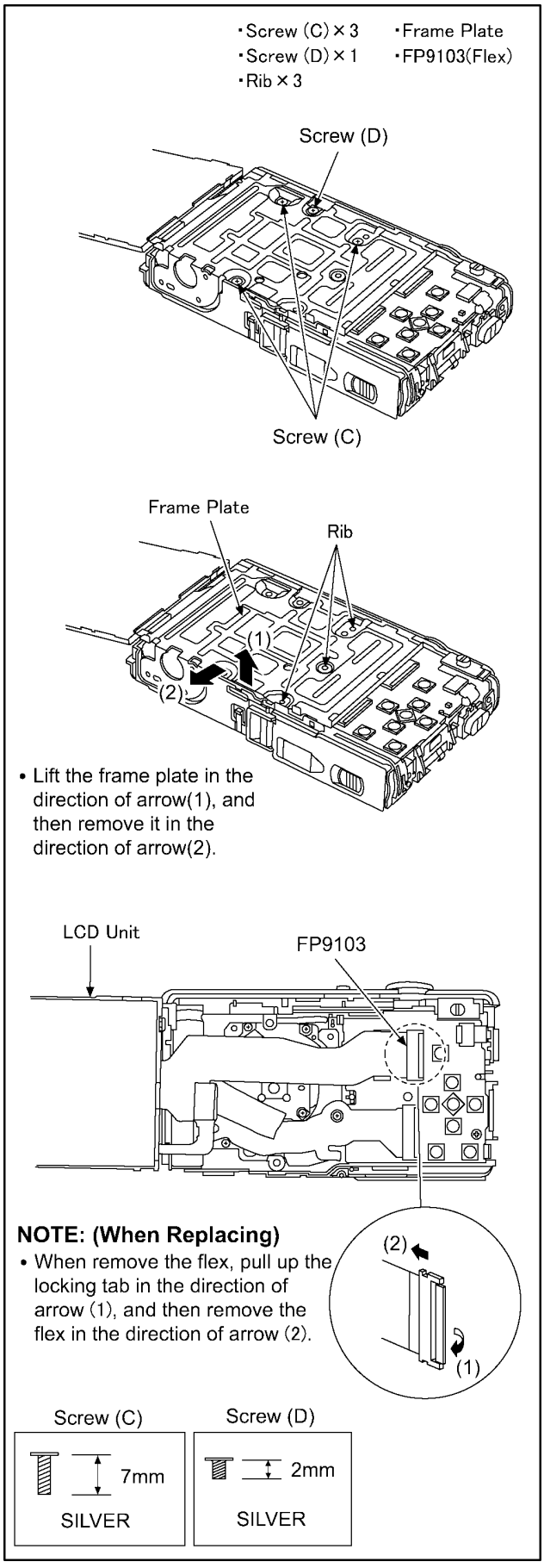
8.3.2. Removal of the LCD Unit



NOTE: (When Replacing)

- When remove the LCD unit, remove the locking tab(A) in the direction of arrow (1), slide the LCD unit in the direction of arrow (2), and then remove the locking tab(B).
- The LCD unit is half rotated in the direction of arrow (3) centering on the side with locking tab(A).
- Take care not to damage the flex.

(Fig.D3)



- Lift the frame plate in the direction of arrow(1), and then remove it in the direction of arrow(2).

NOTE: (When Replacing)

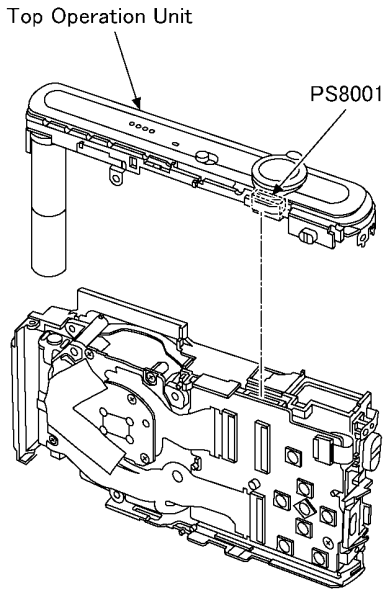
- When remove the flex, pull up the locking tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).

(Fig.D4)

8.3.3. 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.

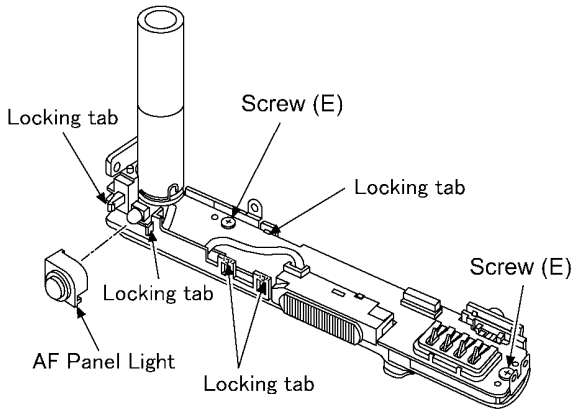
・PS8001(Connector)

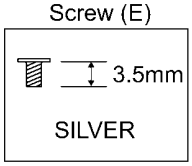


(Fig.D5)

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

・AF Panel Light ・Locking tab × 5
・Screw (E) × 2

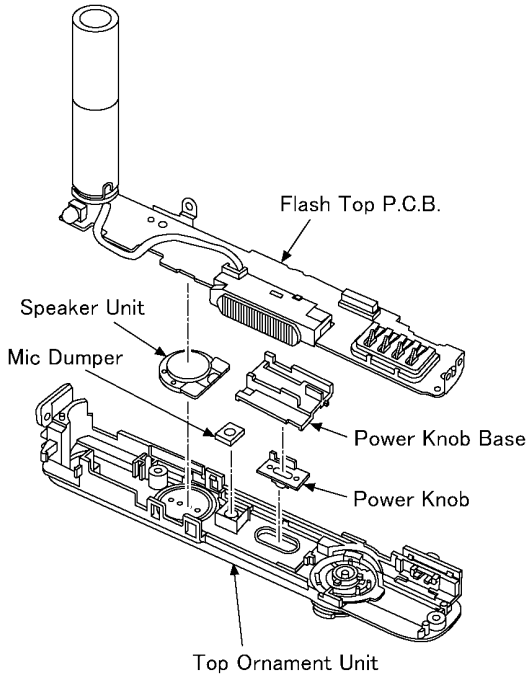


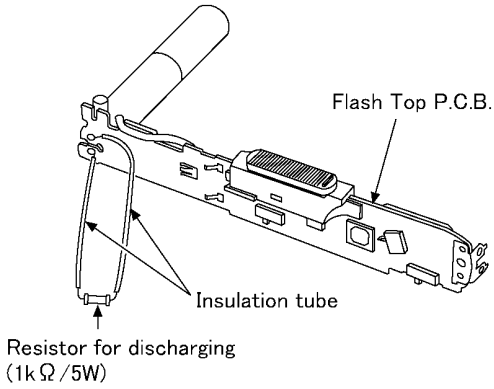


(Fig.D6)

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.

・Top Ornament Unit ・Power Knob Base
・Speaker Unit ・Power Knob
・Mic Dumper





⚠ CAUTION

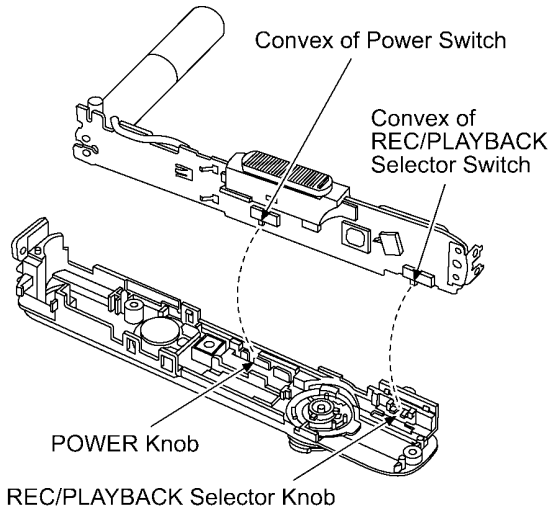
Be sure to discharge the capacitor on Flash Top P.C.B. before disassembling.

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)

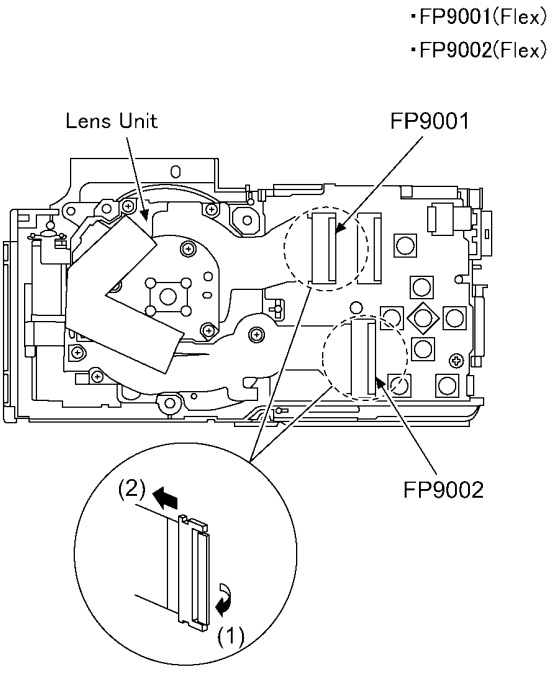
NOTE: (When Installing)

- Align the convex of power switch and power knob.
- Align the convex of REC/PLAYBACK selector switch and REC/PLAYBACK selector knob.



(Fig.D8)

8.3.5. Removal of the Lens Unit

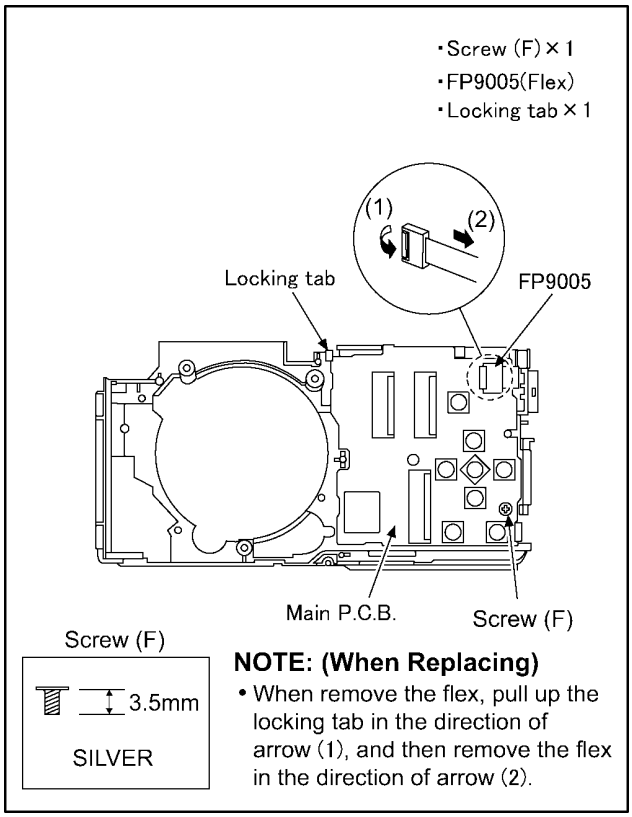


NOTE: (When Replacing)

- When remove the flex, pull up the locking tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).

(Fig.D9)

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

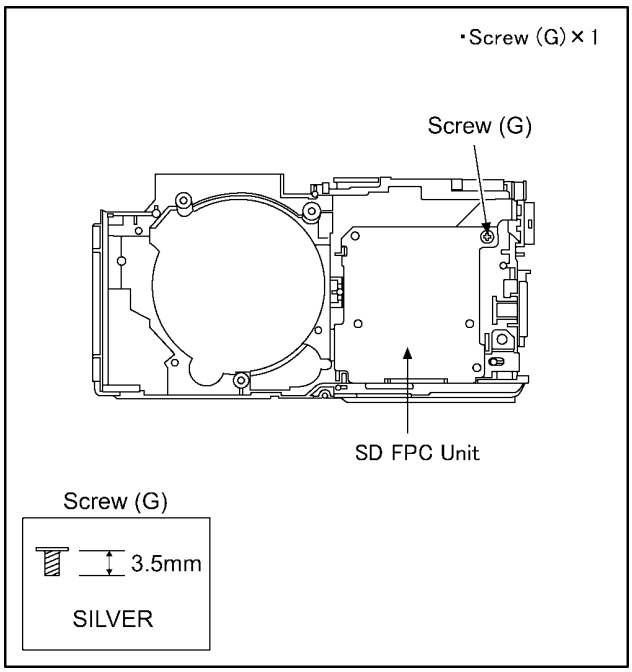


NOTE: (When Replacing)

- When remove the flex, pull up the locking tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).

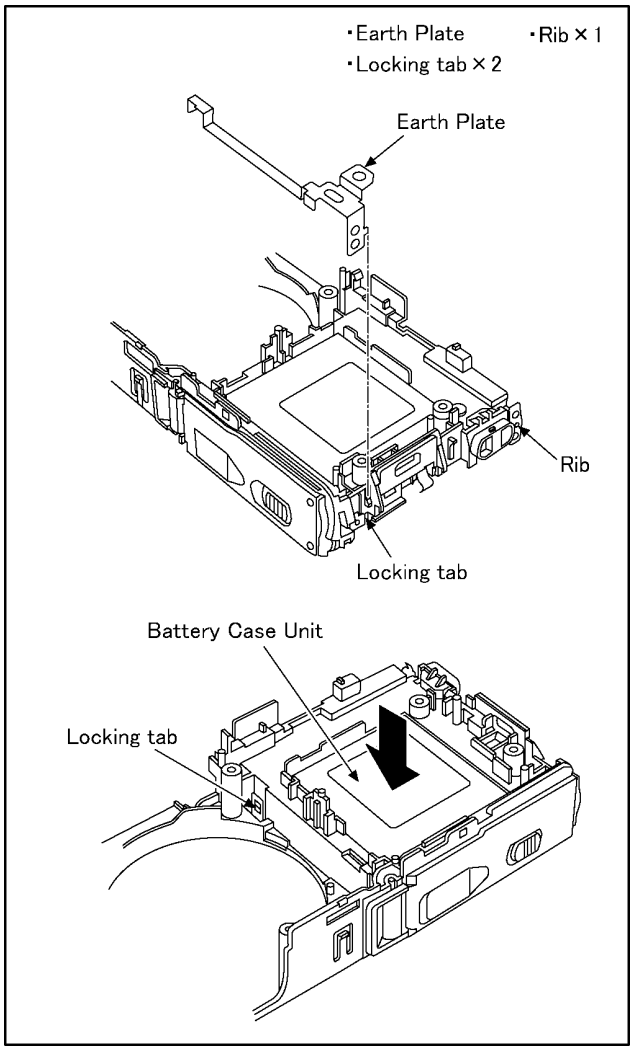
(Fig.D10)

8.3.7. Removal of the SD FPC Unit

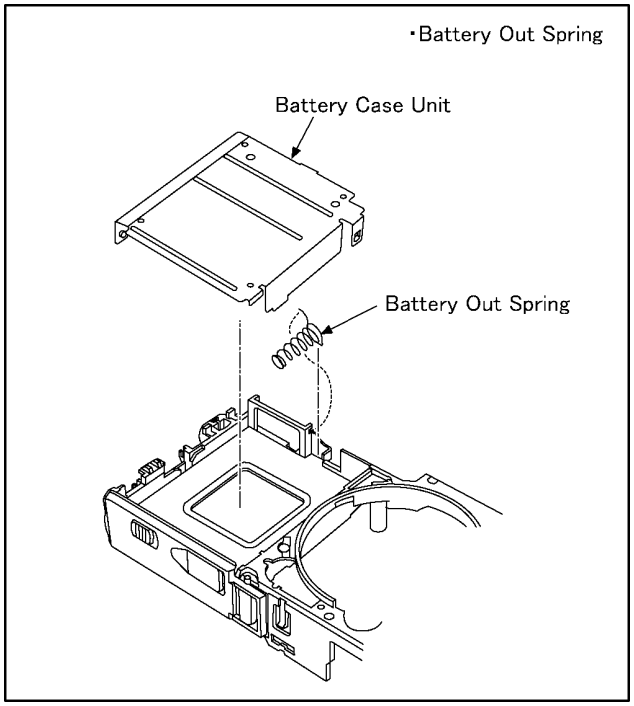


(Fig.D11)

8.3.8. Removal of the Battery Case Unit

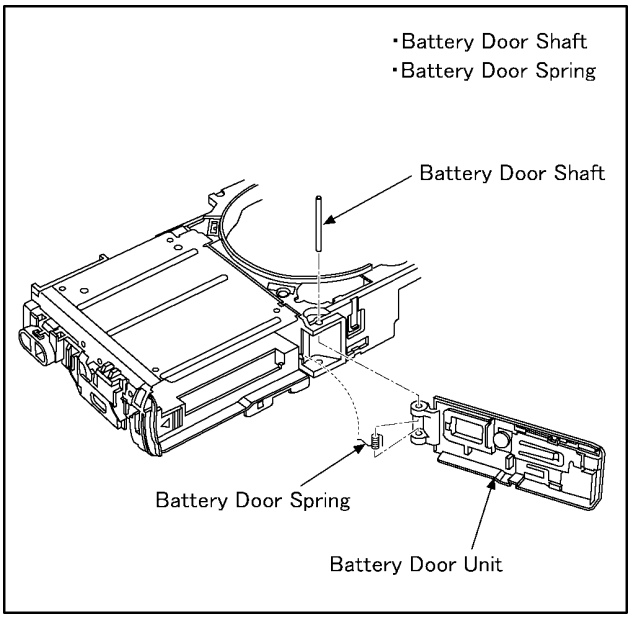


(Fig.D12)



(Fig.D13)

8.3.9. 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.)

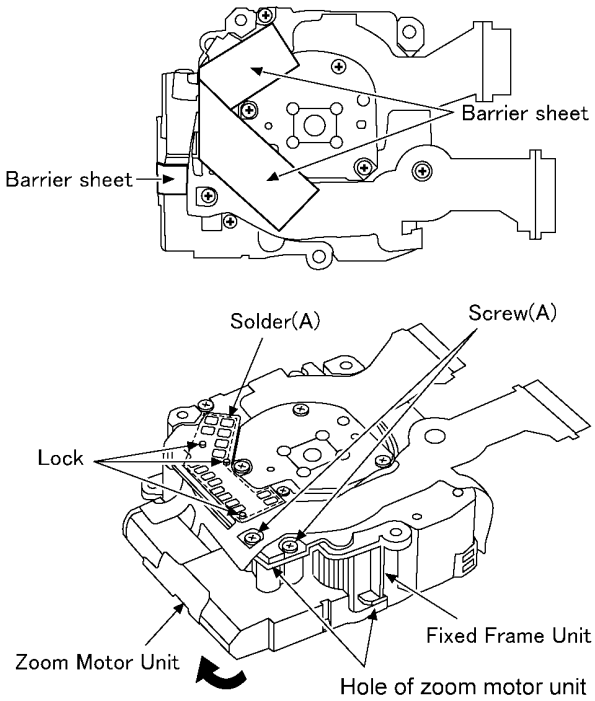
8.4. Disassembly Procedure for the Lens

NOTE: When Disassembling and Assembling for the Lens

1. 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.
2. 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.
3. Do not touch the surface of lens.
4. Use lens cleaning KIT (BK)(VFK1900BK).
5. 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.
6. When repair the drive frame, drive frame and direct frame, must be unit exchange.

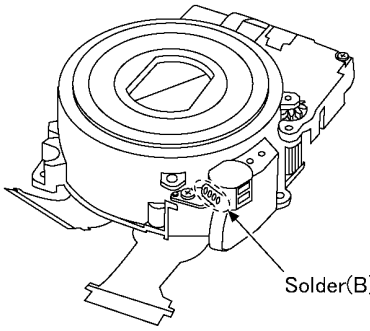
8.4.1. Removal of the Zoom Motor Unit and Lens FPC P.C.B. Unit

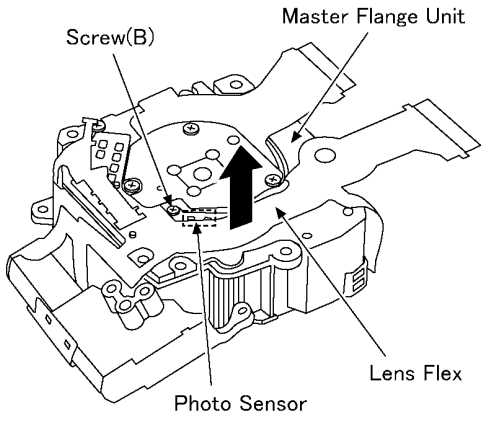
1. Peal the 3 barrier sheets.
2. Remove the 1 solder (A).
3. Remove the 3 locks.
4. Unscrew the 2 screws (A).
5. Remove the zoom motor unit to the indicated by arrow.
6. Remove the 1 solder (B).
7. Unscrew the 1 screw (B).
8. Remove the lens flex to the indicated by arrow.



NOTE: (When Assembling)

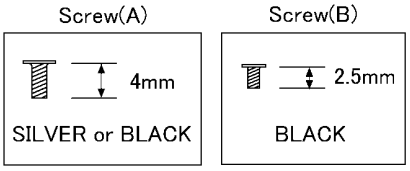
• Align the convex of fixed frame unit and hole of zoom motor unit, and then install them.



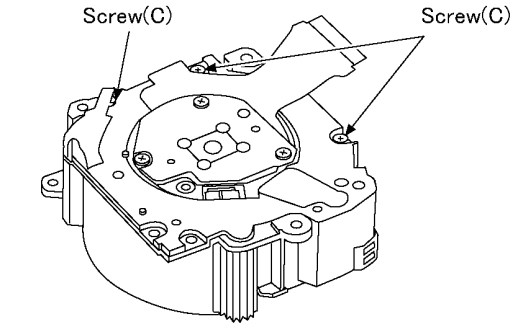


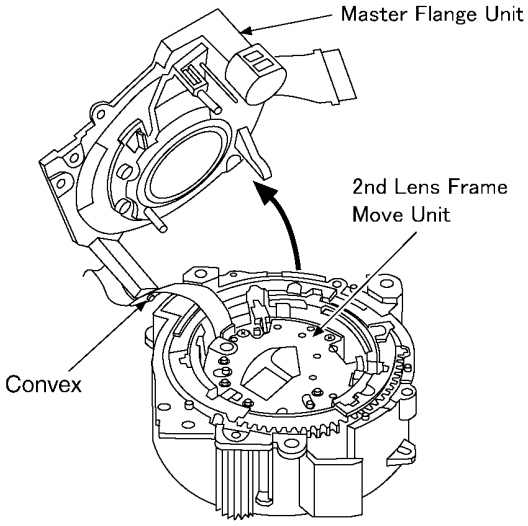
NOTE: (When Assembling)

・Take care not to damage the flex.



8.4.2. Removal of the Master Flange Unit





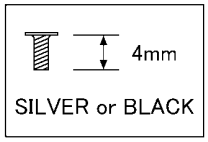
NOTE: (When Disassembling)

- Remove the flex of 2nd lens frame move unit from covex of the master flange unit.
- Take care not to damage the flex.

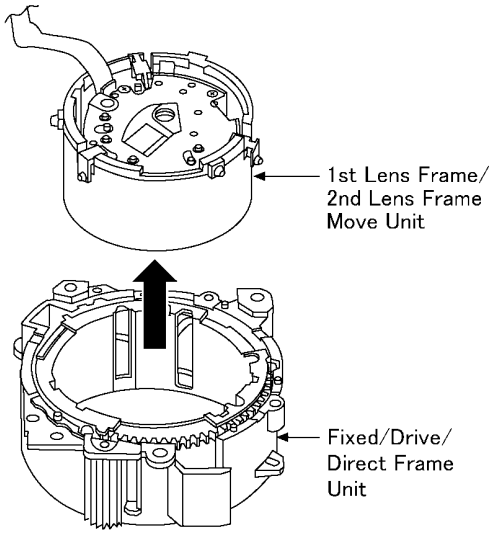
NOTE: (When Assembling)

- Refer to "THE APPLYMENT OF GREASE METHOD" when installing the master flange unit.

Screw(C)



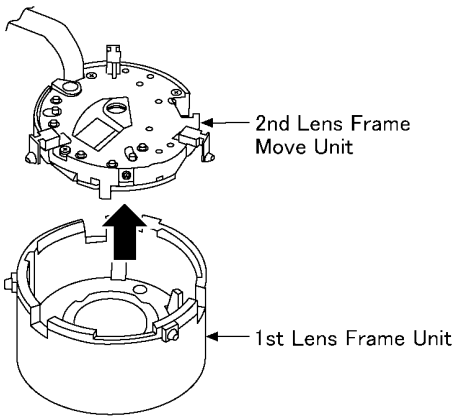
8.4.3. Removal of the 1st Lens Frame/2nd Lens Frame Move Unit



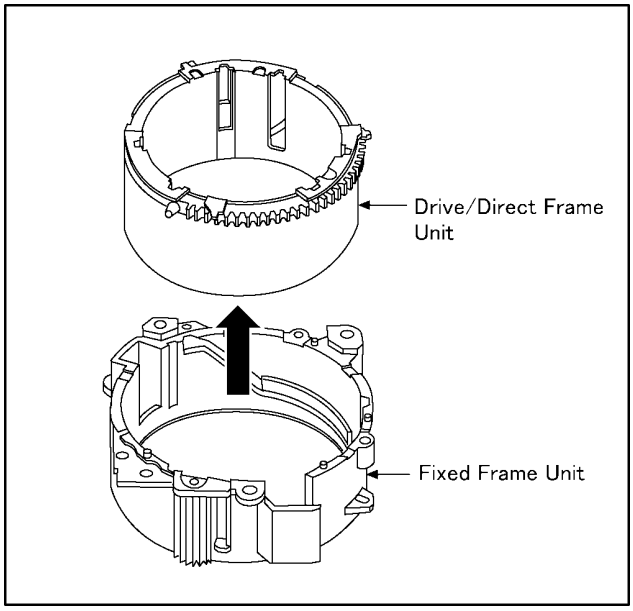
NOTE: (When Disassembling)

- When lift the1st lens frame/2nd lens frame move unit, take care not to put fingerprint of the lens.

8.4.4. Removal of the 2nd Lens Frame Move Unit



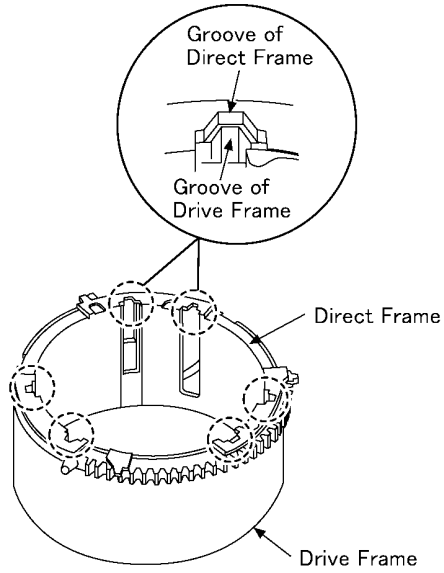
8.4.5. Removal of the Drive/Direct Frame Unit



8.5. Assembly Procedure for the Lens

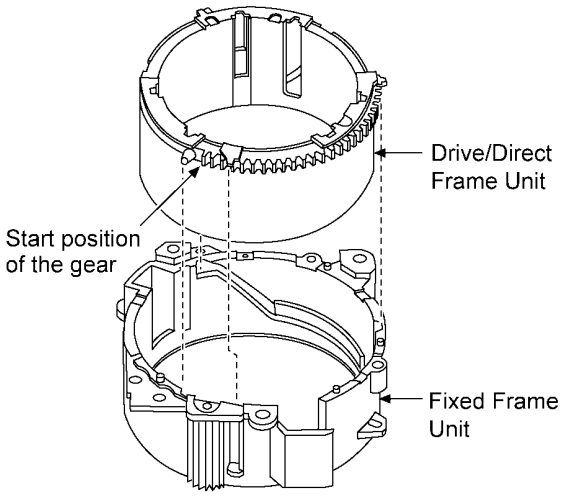
8.5.1. Phase alignment of the Direct Frame and Drive Frame Unit

・Align the drive frame and direct frame.
(six groove places)



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

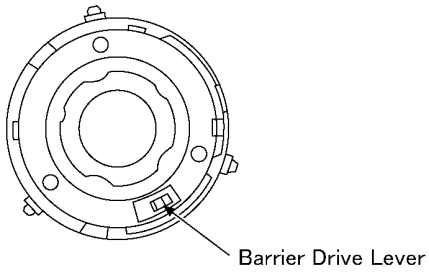
• Insert the drive/direct frame unit to the fixed frame unit.



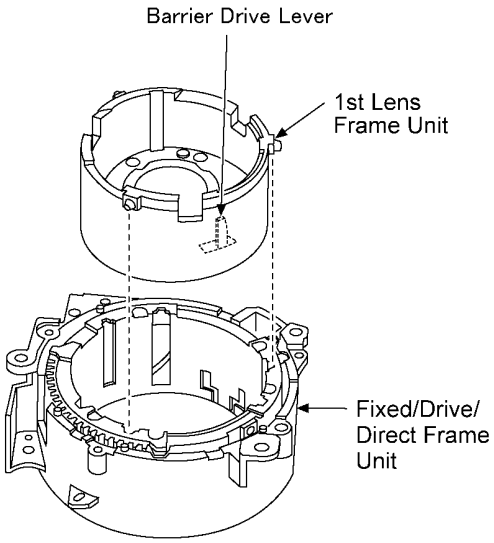
NOTE: (When Assembling)

・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 Fixed/Drive/Direct Frame Unit



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

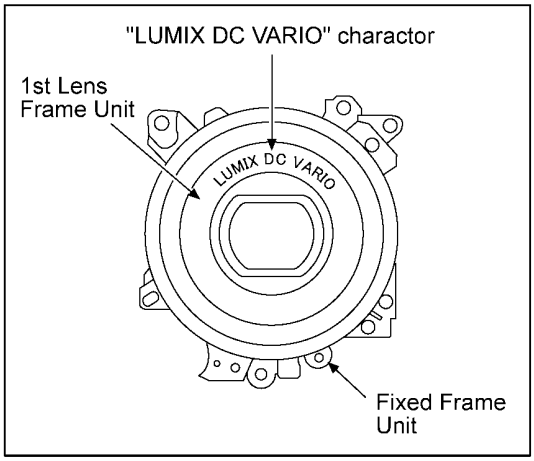


NOTE: (When Assembling)

Take care not to put fingerprint of the lens.

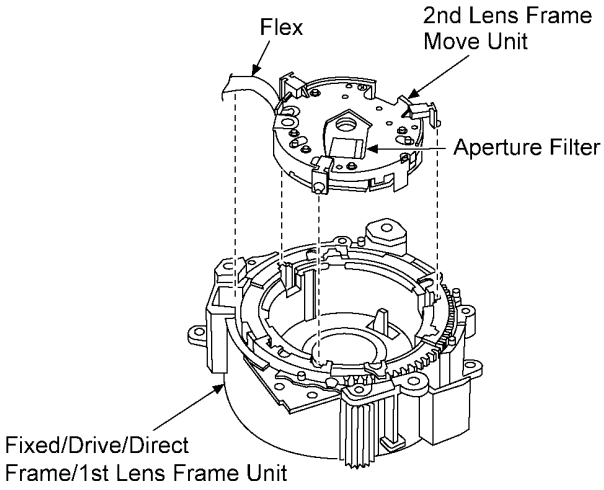
FRONT VIEW

- Install the 1st lens frame unit so that the "LUMIX DC VARIO" charactor may become the position of the figure below.



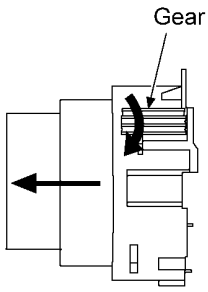
8.5.4. Assembly for the 2nd Lens Frame Move Unit and Fixed/Drive/Direct Frame/1st Lens Frame Unit

- Inset the 2nd lens frame move unit to the fixed/drive/ direct frame/1st lens frame unit.



NOTE: (When Assembling)

Take care not to put fingerprint of the aperture filter and lens.



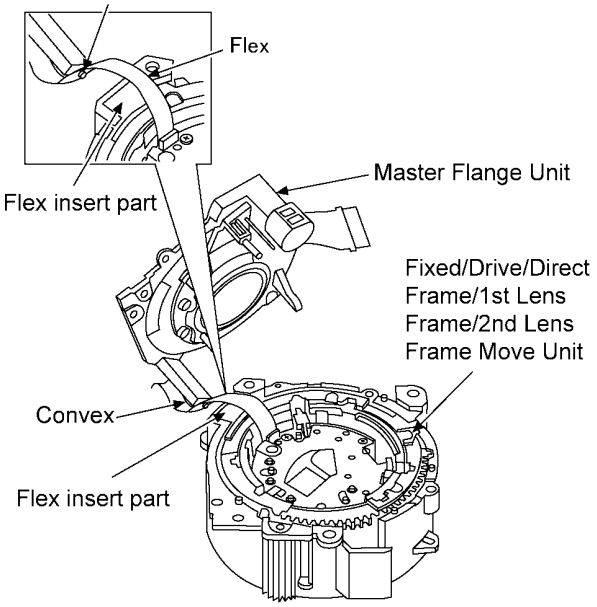
NOTE: (When Assembling)

- Turn the gear of the fixed frame unit in the direction of the arrow, and then confirm to operate smoothly.

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

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

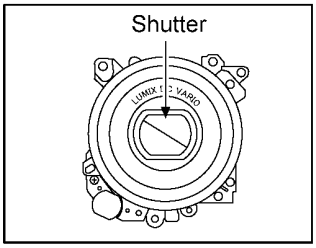
  Insert the convex to positioning hole of FPC

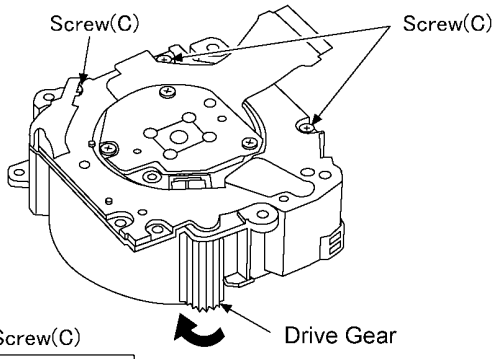


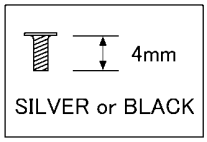
NOTE: (When Assembling)

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

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



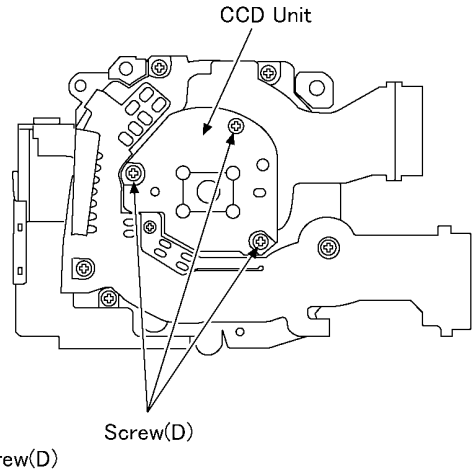


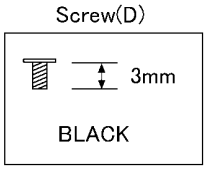


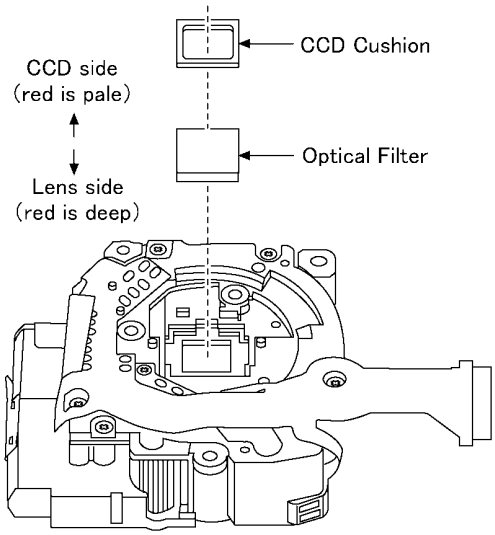
8.6. Removal of the CCD Unit

To prevent the CCD unit from catching the dust and dirt, do not remove the CCD unit except for replacing.

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







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.

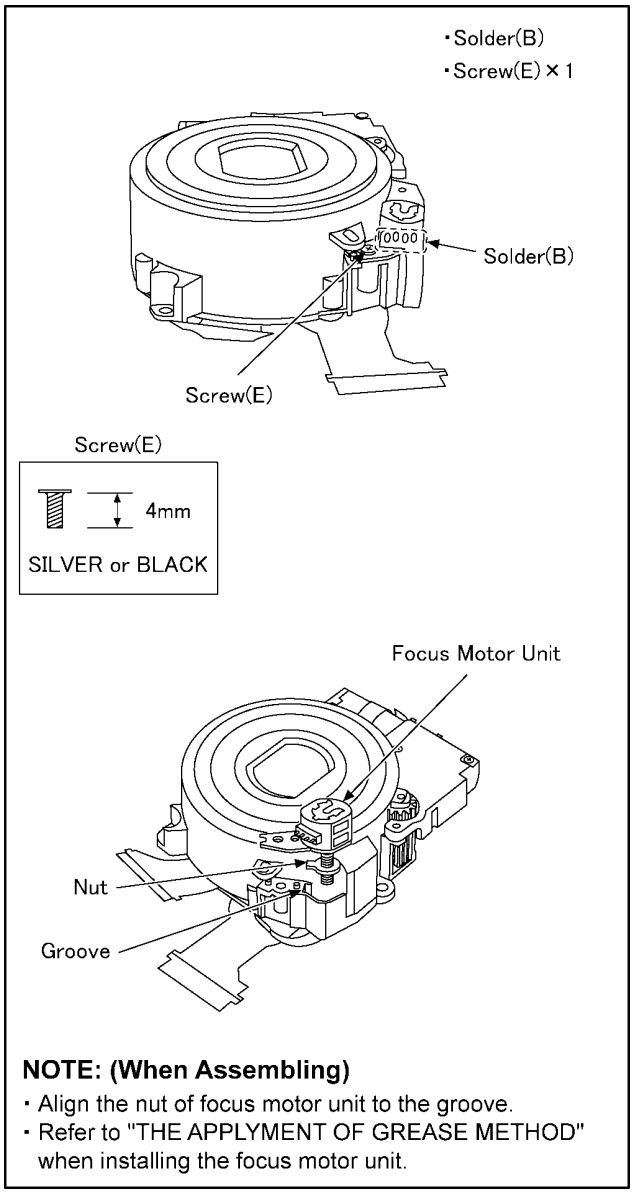
CCD side: red color is paler than the other side.

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



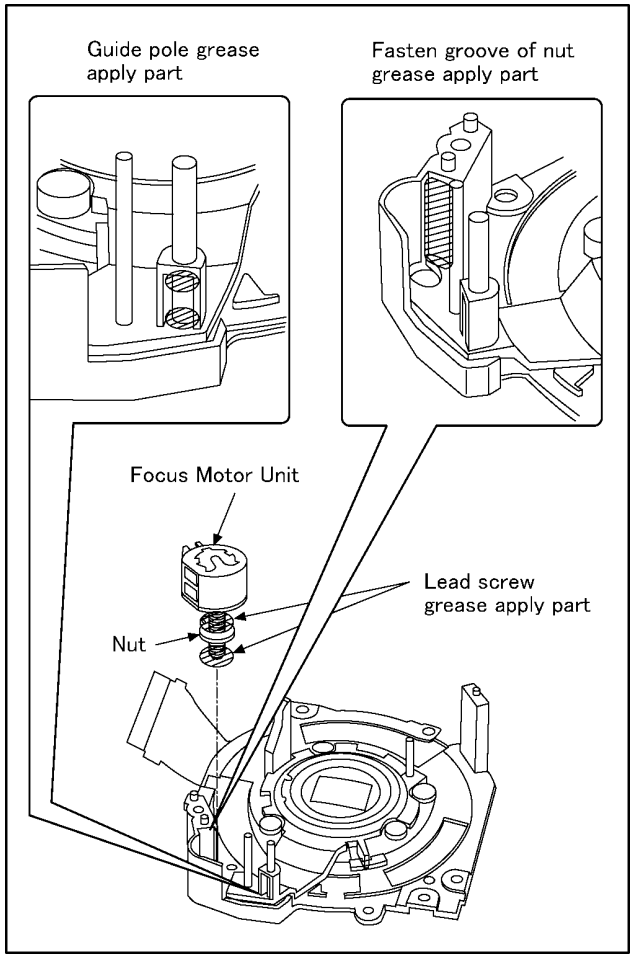
NOTE: (When Assembling)

・Align the nut of focus motor unit to the groove.
・Refer to "THE APPLYMENT OF GREASE METHOD" when installing 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.

- Guide pole/Fasten groove of nut/Focus motor unit (Lead screw)
  - 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-AVC”.

NOTE:

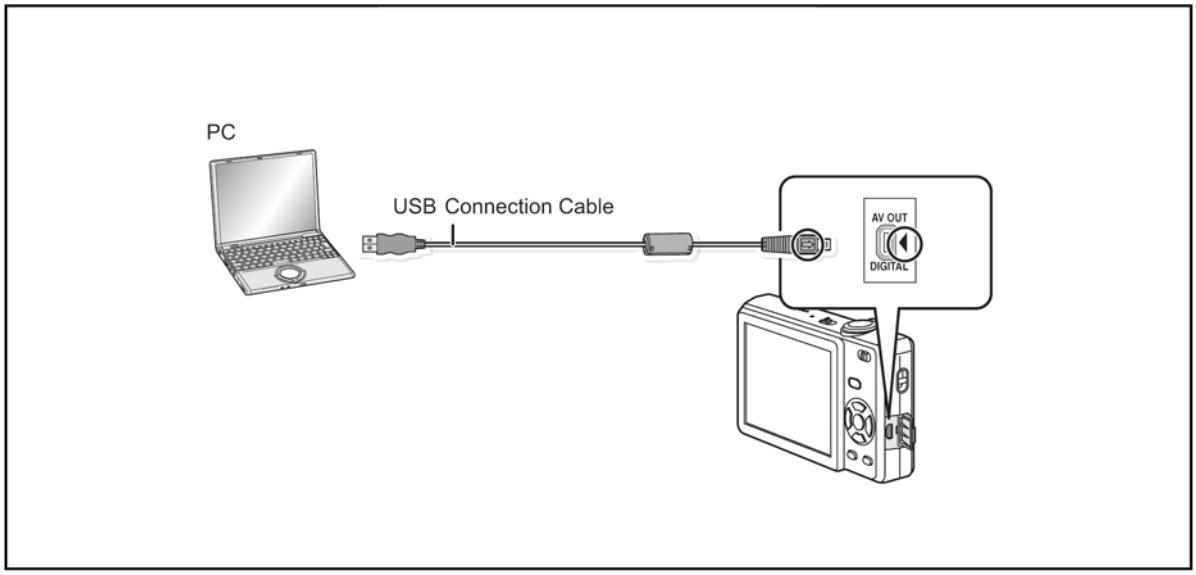
After adjustments have been terminated, make sure to achieve “INITIAL SETTINGS”.

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)	O	O	O	O	–
	Back focus adjustment (BF)	O	O	O	O	O*1
	Shutter adjustment (SHT)	O	O	O	O	O
	ISO sensitivity adjustment (ISO)	O	O	O	O	O
	AWB adjustment High brightness coloration inspection (WBL)	O	O	O	O	O
	CCD white scratch compensation (WKI)	O	O	O	–	O*1
	CCD black scratch compensation (BKI)	O	O	O	–	O*1
	Venus zoom inspection (PZM)	O	O	O	–	–
	Monitor linearity inspection (MLN)	O	O	O	O	O
	Colour reproduction inspection MIC inspection (COL)	O	O	O	O	O

*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 Maintenace

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.

DSC0903022CE

Service Manual

Diagrams and Replacement Parts List

Digital Camera

Model No.

DMC-FS4P	DMC-FS4EG
DMC-FS4PC	DMC-FS4EP
DMC-FS4PR	DMC-FS4GC
DMC-FS4PU	DMC-FS4GJ
DMC-FS4EB	DMC-FS4GK
DMC-FS4EE	DMC-FS4GN
DMC-FS4EF	

Vol. 1
Colour
(S).....Silver Type (except PC/EF/GJ)
(K).....Black Type

Table of contents

S1. About Indication of The Schematic Diagram

S1.1. Important Safety Notice

COMPONENTS IDENTIFIED WITH THE MARK ⚠ 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.

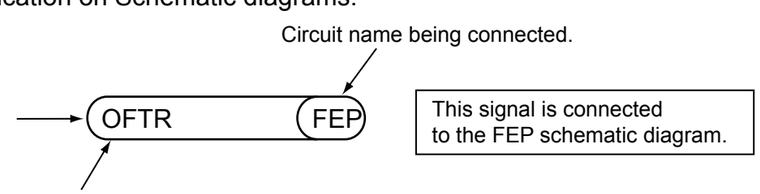
3.The voltage being indicated on the schematic diagram is measured in "Standard-Playback" mode when there is no specify mode is mentioned.

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

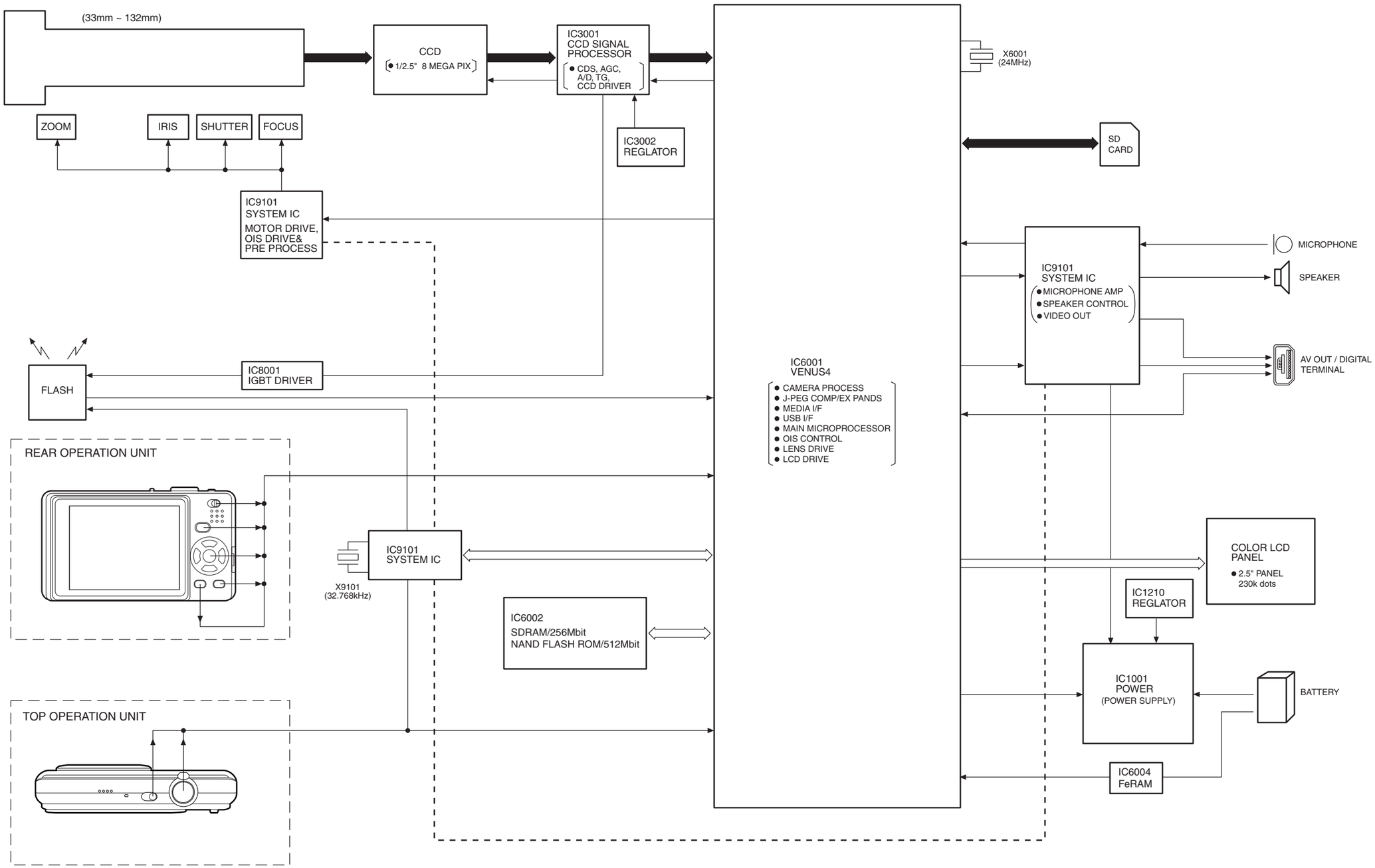
Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

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

REF No.	PIN No.	POWER ON
IC8001	1	5.8
IC8001	2	0
IC8001	3	0
IC8001	4	0
IC8001	5	5.8
Q8009	1	6.9
Q8009	2	6.9
Q8009	3	0
Q8009	4	0
Q8009	5	6.9
Q8009	6	6.9

S3. Block Diagram

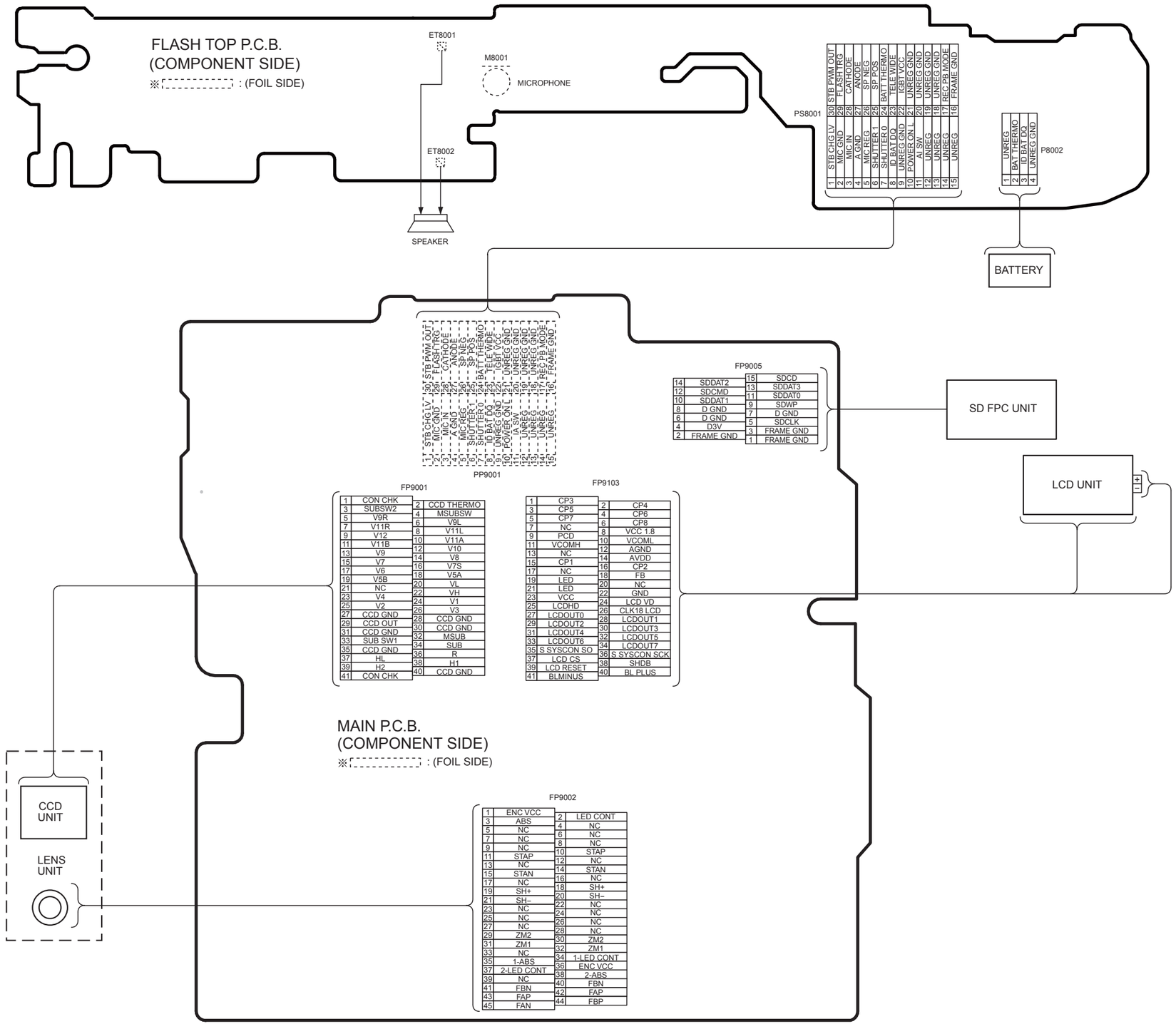
S3.1. Overall Block Diagram



DMC-FS4 OVERALL BLOCK DIAGRAM

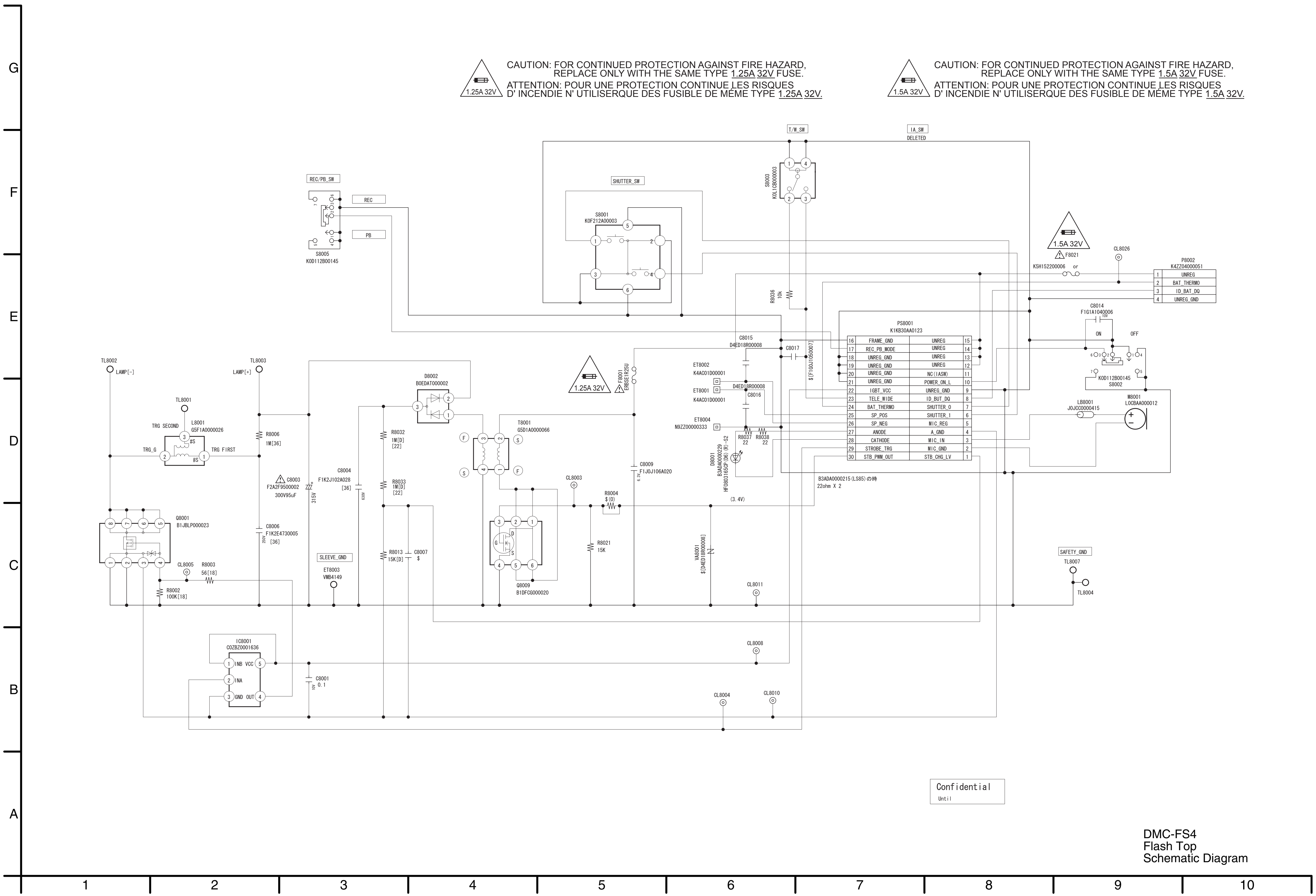
S4. Schematic Diagram

S4.1. Interconnection Diagram



DMC-FS4 INTERCONNECTION DIAGRAM

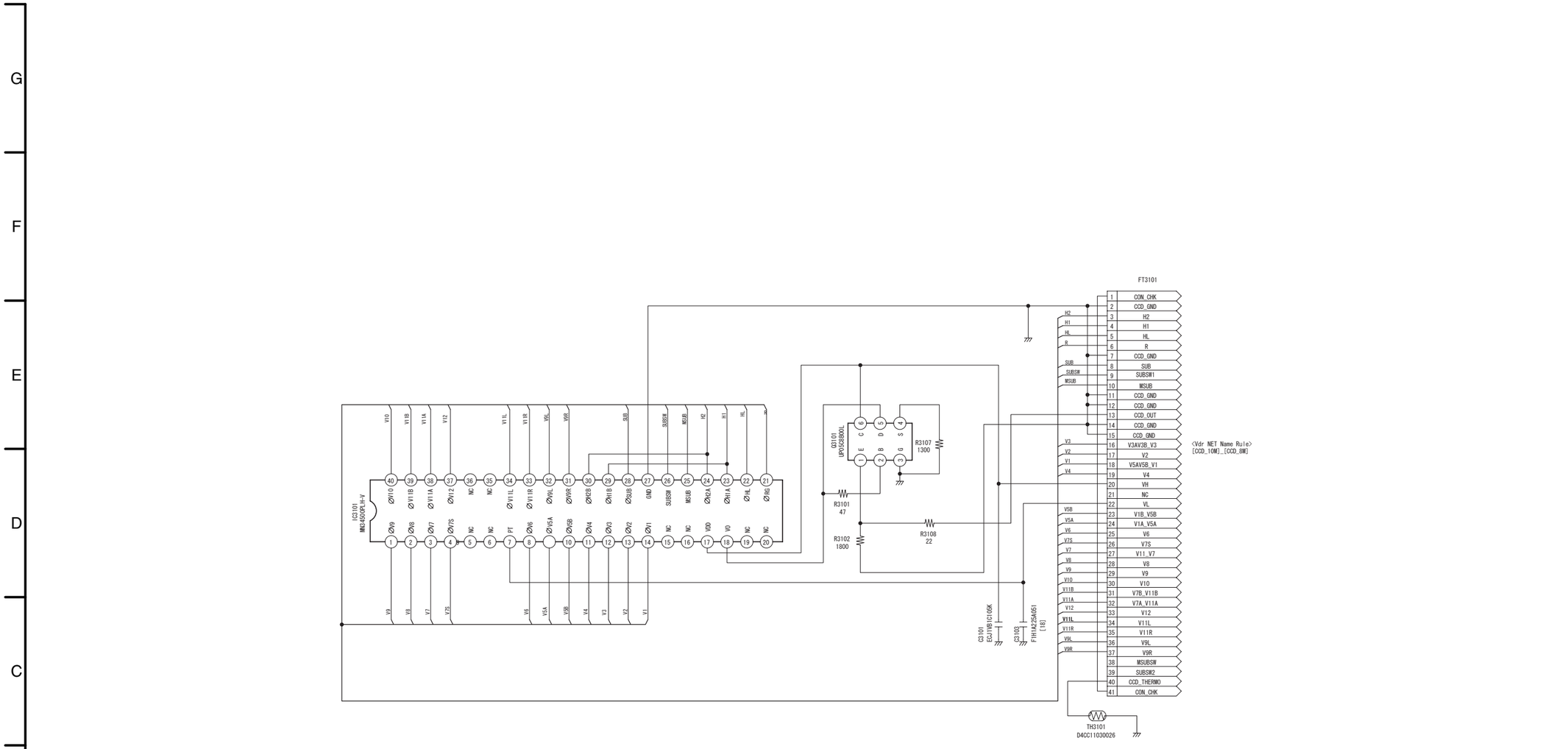
S4.2. Flash Top Schematic Diagram



Confidential
Until

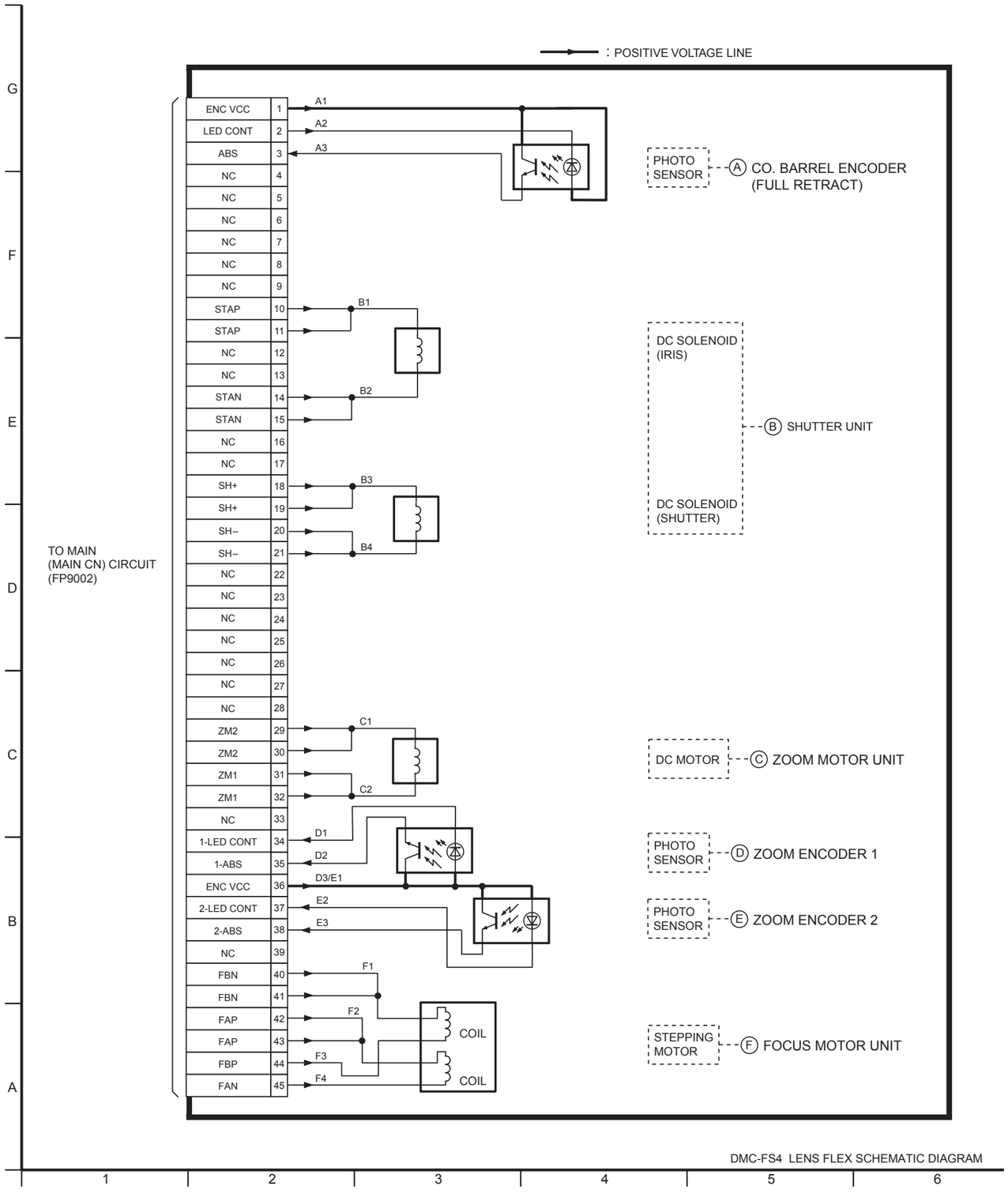
DMC-FS4
Flash Top
Schematic Diagram

S4.3. CCD Flex Schematic Diagram



DMC-FS4
CCD Flex
Schematic Diagram

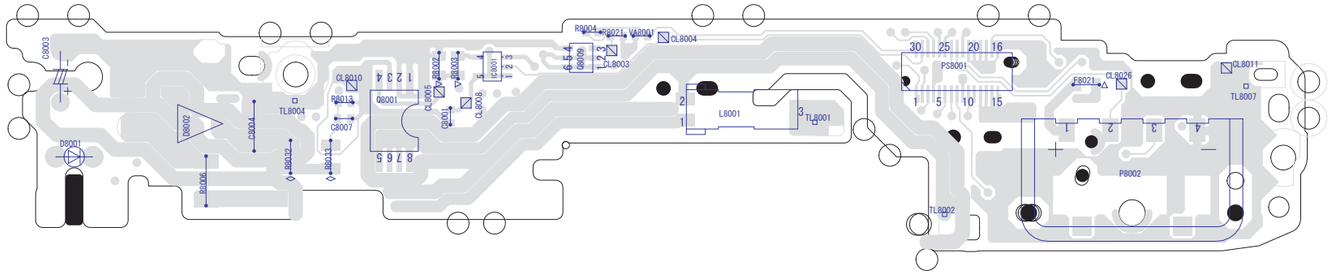
S4.4. Lens Flex Schematic Diagram



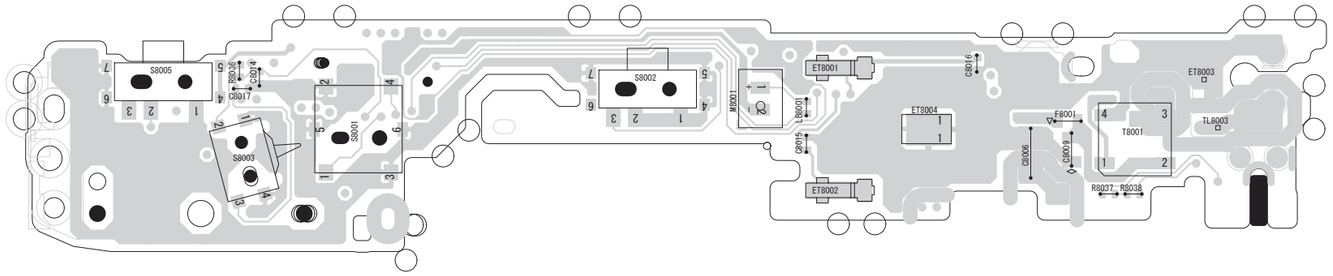
DMC-FS4 LENS FLEX SCHEMATIC DIAGRAM

S5. Print Circuit Board

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



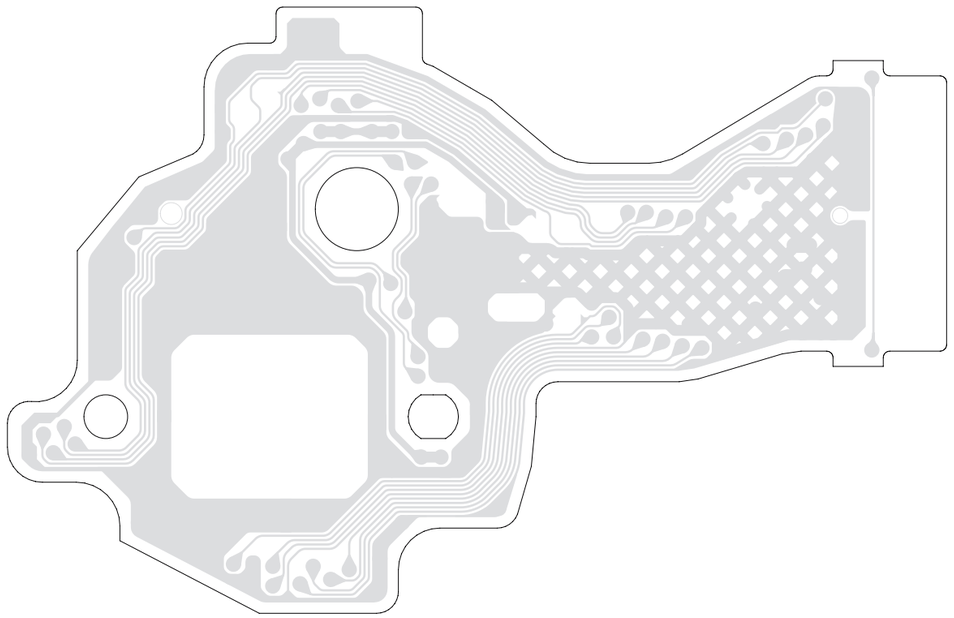
(Component Side)



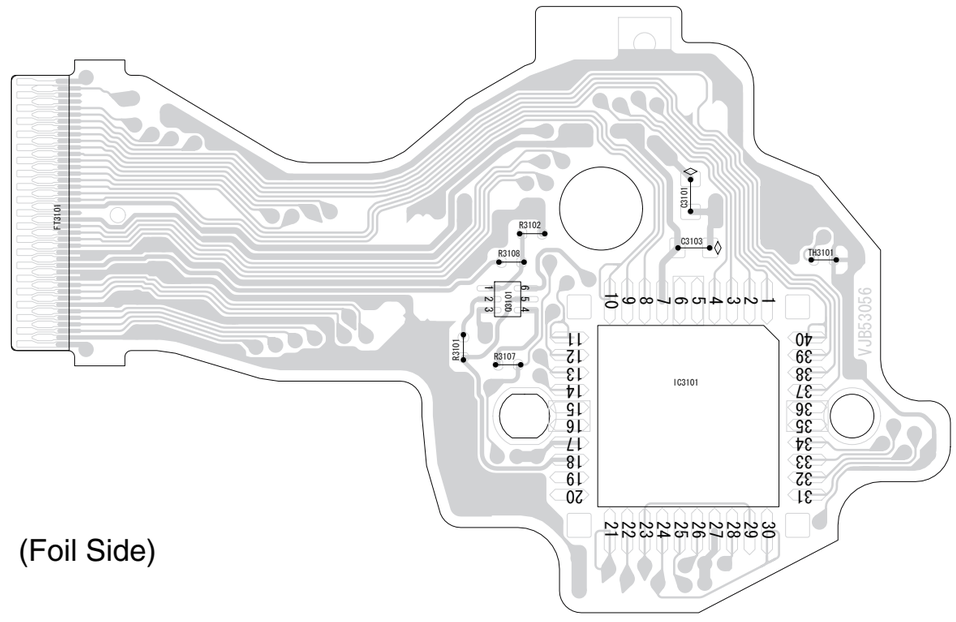
(Foil Side)

DMC-FS4
Flash Top P.C.B.

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



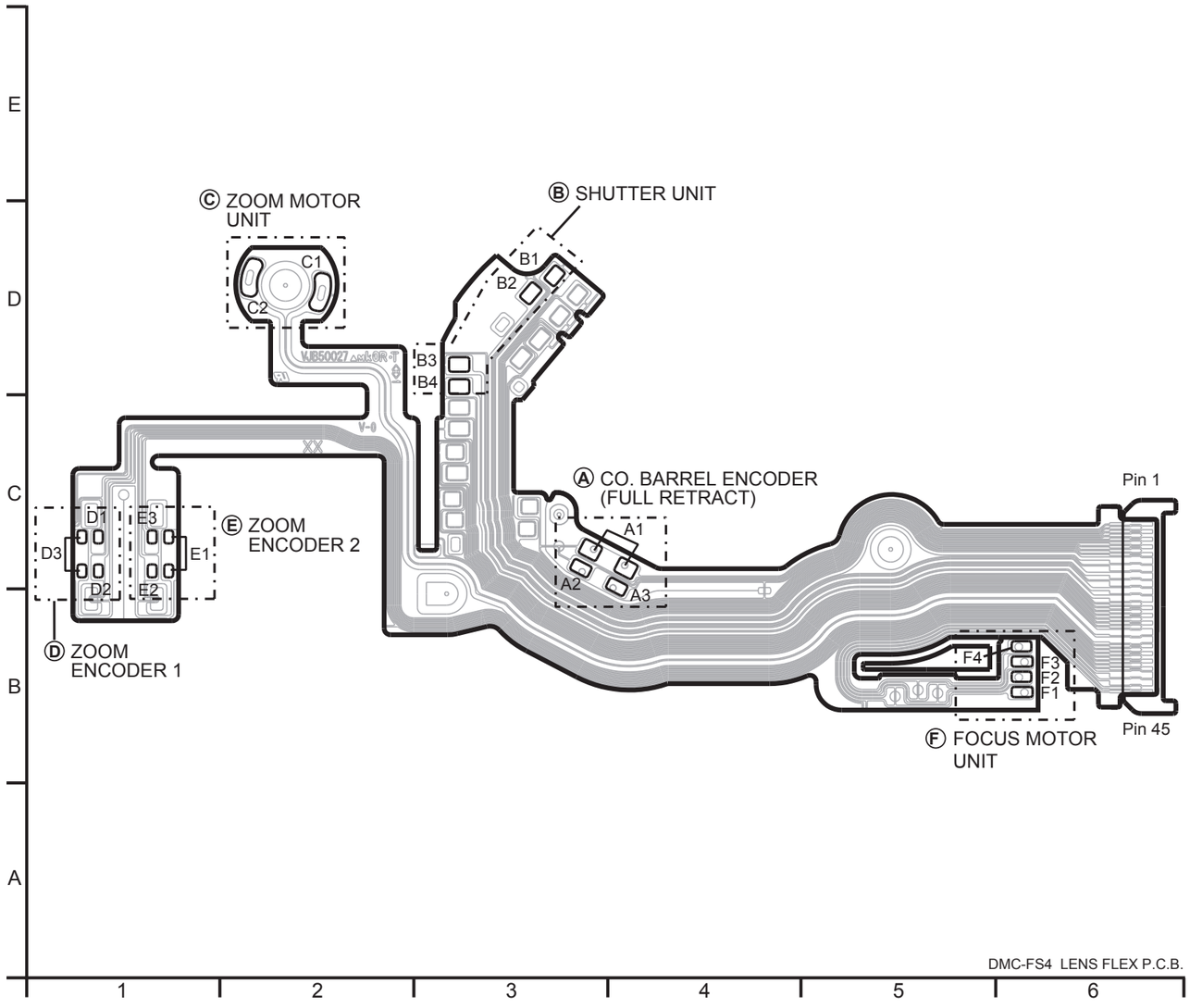
(Component Side)



(Foil Side)

DMC-FS4
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 ⚠ 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 [ENERGY] in the remarks column are supplied from Panasonic Corporation Energy Company.**

2. **Parts marked with [SPC] in the remarks column are supplied from AVC-CSC-SPC. Others are supplied from PAVCSG.**

DMC-FS4P-S
VEP58092A / VEK0P06

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		------ P.C.B. LIST ------		
	VEP56074C	MAIN P.C.B.	1	(RTL) E.S.D.
	VEP58092A	FLASH TOP P.C.B.	1	(RTL) E.S.D.
	VEK0P06	CCD UNIT	1	[SPC]E.S.D.
		--- INDIVIDUAL PARTS ---		
⚠ C8003	F2A2F9500002	E.CAPACITOR	1	
ET8003	VMB4149	EARTH SPRING	1	
D8001	B3ADA0000230	AF LED	1	E.S.D.
		--- ELEC. COMPONENTS ---		
##	VEP58092A	FLASH TOP P.C.B.	1	(RTL) E.S.D.
C8001	F1G1A1040006	C.CAPACITOR CH 10V 0.1U	1	
C8004	F1K2J102A028	C.CAPACITOR 630V 1000P	1	
C8006	F1K2E4730005	C.CAPACITOR 250V 0.047U	1	
C8009	F1J0J106A020	C.CAPACITOR CH 6.3V 10U	1	
C8014	F1G1A1040006	C.CAPACITOR CH 10V 0.1U	1	
C8015	D4ED18R00008	C.CAPACITOR	1	
C8016	D4ED18R00008	C.CAPACITOR	1	
C8017	EZJP0V080MA	VARISTOR	1	
D8002	B0EDAT000002	DIODE	1	E.S.D.
ET8001	K4AC01D00001	EARTH SPRING	1	
ET8002	K4AC01D00001	EARTH SPRING	1	
ET8004	N9ZZ00000333	EARTH SPRING	1	
⚠ F8001	ERBSE1R25U	FUSE 32V 1.25A	1	
⚠ F8021	K5H152200006	FUSE 32V 1.5A	1	
IC8001	C0ZBZ0001636	IC	1	E.S.D.
L8001	G5F1A0000026	CHIP INDUCTOR	1	
LB8001	J0JCC0000415	FILTER	1	
M8001	L0CBAA000012	MICROPHONE	1	
P8002	K4ZZ04000051	CONNECTOR 4P	1	
PS8001	K1KB30AA0123	CONNECTOR 30P	1	
Q8001	B1JBLP000023	TRANSISTOR	1	E.S.D.
Q8009	B1DFCG000020	TRANSISTOR	1	E.S.D.
R8002	ERJ3GEYJ104V	M.RESISTOR CH 1/10W 100K	1	
R8003	ERJ3GEYJ560V	M.RESISTOR CH 1/10W 56	1	
R8006	ERJ8GEYJ105V	M.RESISTOR CH 1/8W 1M	1	
R8013	ERJ2RHD153X	M.RESISTOR CH 1/16W 15K	1	
R8021	ERJ2GEJ153X	M.RESISTOR CH 1/16W 15K	1	
R8032	ERJ6RED105V	M.RESISTOR CH 1/16W 1M	1	
R8033	ERJ6RED105V	M.RESISTOR CH 1/16W 1M	1	
R8036	ERJ2GEJ103X	M.RESISTOR CH 1/16W 10K	1	
R8037	ERJ2GEJ220X	M.RESISTOR CH 1/16W 22	1	
R8038	ERJ2GEJ220X	M.RESISTOR CH 1/16W 22	1	
S8001	K0F212A00003	SWITCH	1	
S8002	K0D112B00145	SWITCH	1	
S8003	K0L1CB000003	SWITCH	1	
S8005	K0D112B00145	SWITCH	1	
T8001	G5D1A0000066	TRANSFORMER	1	
##	VEK0P06	CCD UNIT	1	[SPC]E.S.D.
C3101	F1H1A225A051	C.CAPACITOR CH 10V 2.2U	1	[SPC]
C3102	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	[SPC]
Q3101	UP05C8B00L	TRANSISTOR	1	[SPC]E.S.D.
R3101	ERJ2GEJ470	M.RESISTOR CH 1/16W 47	1	[SPC]
R3102	ERJ2RHD272	M.RESISTOR CH 1/16W 2.7K	1	[SPC]
R3103	ERJ2GEJ220	M.RESISTOR CH 1/16W 22	1	[SPC]
R3104	ERJ2GEJ132	M.RESISTOR CH 1/16W 1.3K	1	[SPC]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	VEP56074C	MAIN P.C.B.	1	(RTL) E.S.D.
⚠ 2	ML-421S/DN	BUTTON BATTERY	1	(B9101)[ENERGY]
3	VEK0N16	SD FPC UNIT	1	
4	VGQ0B59	DPR SHEET	1	
5	VGQ0B87	PCB SPACER	1	
6	VHD2111	TRIPOD	1	
7	VKF4540	JACK DOOR	1	(-S)
7	VKF4541	JACK DOOR	1	(-K)
8	VMP9364	FRAME PLATE	1	
9	VMP9366	EARTH PLATE	1	
10	VGQ0G28	FRAME SHEET	1	
11	VGQ9717	BATTERY LOCK KNOB	1	
12	VMB4152	BATTERY LOCK SPRING	1	
13	VMB4283	BATTERY OUT SPRING	1	
14	VMP9362	FRAME	1	
15	VYK3F07	BATTERY CASE UNIT	1	
17	VYK3F86	BATTERY DOOR UNIT	1	(-S)
17	VYK3F87	BATTERY DOOR UNIT	1	(-K)
17-1	VMB4143	BATTERY DOOR SPRING	1	
17-2	VMS7863	BATTERY DOOR SHAFT	1	
18	VYK3F88	FRONT CASE UNIT	1	(-S)
18	VYK3F89	FRONT CASE UNIT	1	(-K)
19	VYK3F90	REAR CASE UNIT	1	(-S)
19	VYK3F91	REAR CASE UNIT	1	(-K)
19-1	VGU0E49	CURSOR BUTTON	1	(-S)
19-1	VGU0E57	CURSOR BUTTON	1	(-K)
19-2	VMA0W59	CURSOR EARTH PLATE	1	
⚠ 20	F2A2F9500002	E.CAPACITOR	1	(C8003)
21	L0AA01A00032	SPEAKER UNIT	1	
23	VEK0N43	FLASH UNIT	1	
24	VEP58092A	FLASH TOP P.C.B.	1	(RTL) E.S.D.
25	VGL1290	AF PANEL LIGHT	1	
26	VMB4149	EARTH SPRING	1	(ET8003)
27	VMP9363	TOP PLATE(R)	1	
28	VMP9367	TOP PLATE(L)	1	
29	VMT1968	MIC DAMPER	1	
30	VYK3F94	TOP ORNAMENT UNIT	1	(-S)
30	VYK3F95	TOP ORNAMENT UNIT	1	(-K)
30-1	VGQ0B86	POWER KNOB BASE	1	
30-2	VGU0E53	REC/PLAYBACK SELECTOR KNOB	1	(-S)
30-2	VGU0E54	REC/PLAYBACK SELECTOR KNOB	1	(-K)
30-3	VGU0E60	POWER KNOB	1	
36	VYK3H41	LCD UNIT	1	
37	B3ADA0000230	AF LED	1	(D8001)
B1	VHD1684	SCREW	1	(-K)
B1	VHD2138	SCREW	1	(-S)
B2	VHD1684	SCREW	1	(-K)
B2	VHD2138	SCREW	1	(-S)
B3	VHD1684	SCREW	1	(-K)
B3	VHD2138	SCREW	1	(-S)
B4	VHD1684	SCREW	1	(-K)
B4	VHD2138	SCREW	1	(-S)
B5	VHD1684	SCREW	1	(-K)
B5	VHD2138	SCREW	1	(-S)
B6	VHD1876	SCREW	1	
B7	VHD1998	SCREW	1	
B8	VHD1998	SCREW	1	
B9	VHD1998	SCREW	1	
B10	VHD1998	SCREW	1	
B11	XQN16+BJ65FC	SCREW	1	(-S)
B11	XQN16+BJ65FJK	SCREW	1	(-K)
B12	XQN16+BJ7FN	SCREW	1	
B13	XQN16+BJ7FN	SCREW	1	
B14	XQN16+BJ7FN	SCREW	1	

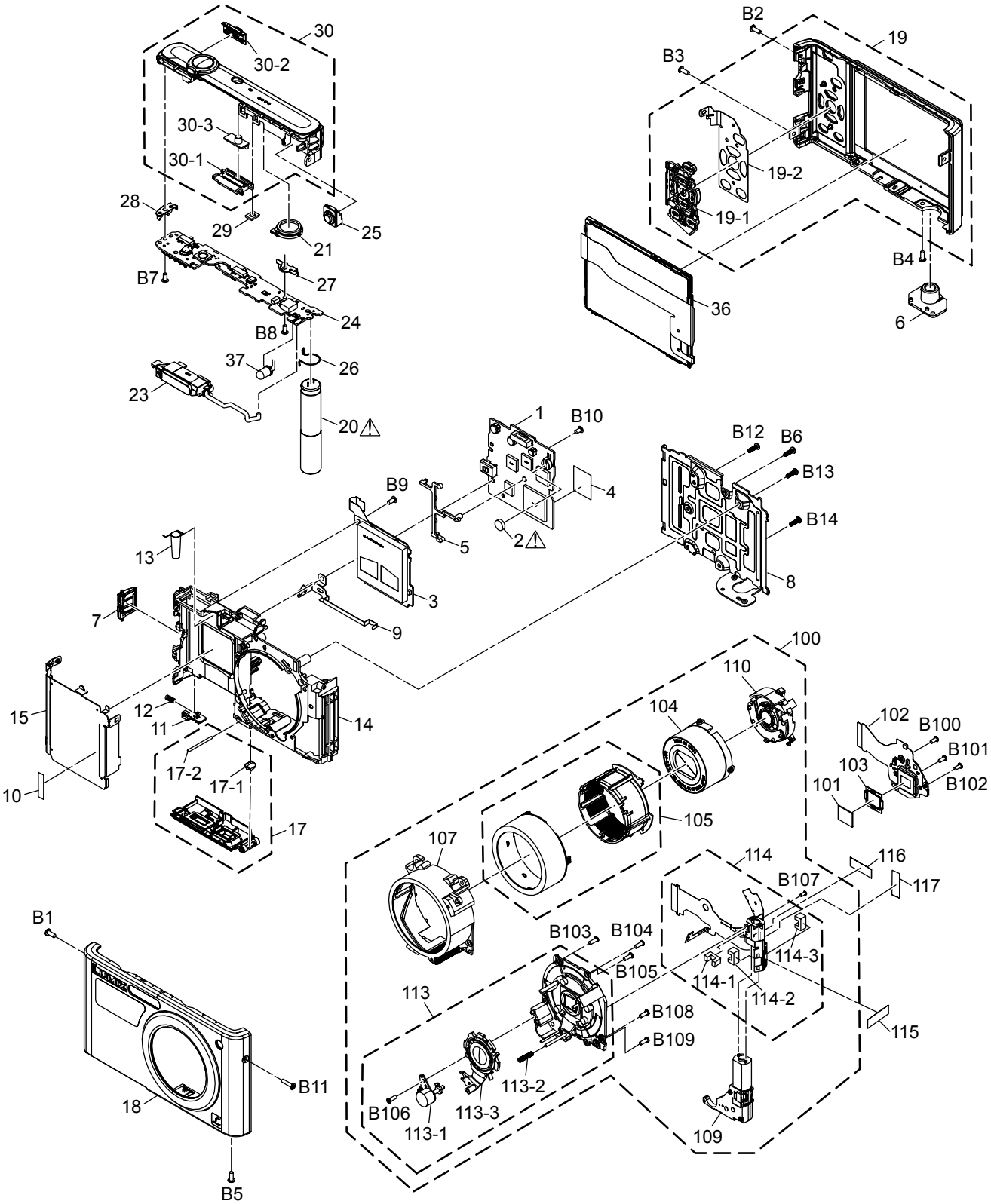
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100	VXW1050	LENS UNIT(W/O CCD)	1	[SPC]
101	VDL1950	OPTICAL FILTER	1	[SPC]
102	VEK0P06	CCD UNIT	1	[SPC]E.S.D.
103	VMX3658	CCD CUSHION	1	[SPC]
104	VXP3216	1ST LENS FRAME UNIT	1	[SPC]
105	VXP3117	DRIVE/DIRECT FRAME UNIT	1	[SPC]
107	VXP3119	FIXED FRAME UNIT	1	[SPC]
109	L6DA8BEC0003	ZOOM MOTOR	1	[SPC]
110	VXP3219	2ND LENS FRAME UNIT	1	[SPC]
113	VXP3120	MASTER FLANGE UNIT	1	[SPC]
113-1	L6HA66NC0013	FOCUS MOTOR UNIT	1	[SPC]
113-2	VMB4173	FOCUS SPRING	1	[SPC]
113-3	VXP3121	3RD LENS FRAME UNIT	1	[SPC]
114	VEK0L88	LENS FPC UNIT	1	[SPC]
114-1	B3NAA0000132	PHOTO SENSOR	1	[SPC]
114-2	B3NBA0000011	PHOTO SENSOR	1	[SPC]
114-3	B3NBA0000011	PHOTO SENSOR	1	[SPC]
115	VZT0815	BARRIER	1	[SPC]
116	VZT0814	BARRIER	1	[SPC]
117	VZT0814	BARRIER	1	[SPC]
B100	VHD1871	SCREW	1	[SPC]
B101	VHD1871	SCREW	1	[SPC]
B102	VHD1871	SCREW	1	[SPC]
B103	XQN14+CJ4FN	SCREW	1	[SPC]
B104	XQN14+CJ4FN	SCREW	1	[SPC]
B105	XQN14+CJ4FN	SCREW	1	[SPC]
B106	XQN14+CJ4FN	SCREW	1	[SPC]
B107	VHD2020	SCREW	1	[SPC]
B108	XQN14+CJ4FN	SCREW	1	[SPC]
B109	XQN14+CJ4FN	SCREW	1	[SPC]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
200	VPFW0023	CAMERA BAG	1	P,PC,PU
⚠ 201	DE-A59BA/SX	BATTERY CHARGER	1	P,PC,PU
⚠ 202	-----	BATTERY	1	P,PC,PU
204	K1HA08AD0001	USB CABLE W/PLUG	1	P,PC,PU
205	K1HA08CD0027	AV CABLE W/PLUG	1	PU
206	VFC4297-A	HAND STRAP	1	P,PC,PU
207	VFF0484-S	CD-ROM	1	[SPC]P,PC,PU See"Notes"
208	VGQ0D56	BATTERY PROTECTION CASE	1	P,PC,PU
210	VPF1100	BAG,POLYETHYLENE	1	P,PC,PU
214	VPK3852	PACKING CASE	1	PS
214	VPK3855	PACKING CASE	1	PK,PCK
214	VPK3853	PACKING CASE	1	PUS
214	VPK3856	PACKING CASE	1	PUK
215	VPN6796	CUSHION	1	P,PC,PU
⚠ 224	VFF0487-C	CD-ROM(INSTRUCTION BOOK)	1	P,PC
⚠ 224	VFF0488-C	CD-ROM(INSTRUCTION BOOK)	1	PU
⚠ 225	VQT2B45	SIMPLIFIED O/I	1	P
		(ENGLISH/SPANISH)		
⚠ 225	VQT2B46	SIMPLIFIED O/I	1	PC
		(ENGLISH/CANADIAN FRENCH)		
⚠ 225	VQT2B47	SIMPLIFIED O/I	1	PU
		(SPANISH/PORTUGUESE)		
226	VQT2B61	O/I SOFTWARE	1	P,PC
		(ENGLISH/CANADIAN FRENCH)		
226	VQT2B62	O/I SOFTWARE	1	PU
		(SPANISH/PORTUGUESE)		
229	VQL1L48-6A	ORERATING LABEL	1	PC

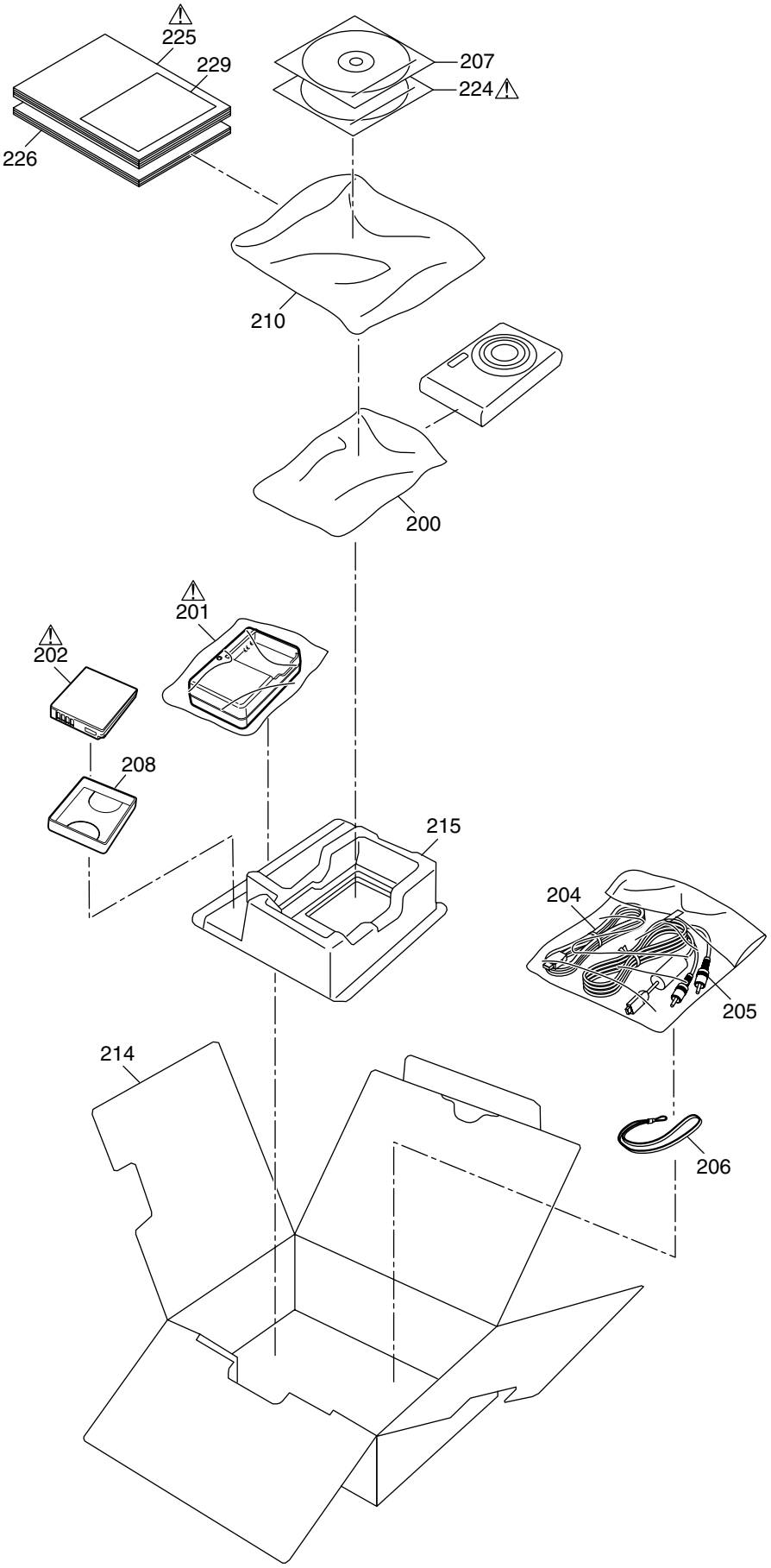
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
300	VPFW0023	CAMERA BAG	1	EXCEPT P,PC,PU
⚠ 301	DE-A60DA/SX	BATTERY CHARGER	1	PR
⚠ 301	DE-A60AA/SX	BATTERY CHARGER	1	EB,EF,EG,EP,GN
⚠ 301	DE-A60BA/SX	BATTERY CHARGER	1	EE,GC,GJ,GK
⚠ 302	-----	BATTERY	1	EXCEPT P,PC,PU
304	K1HA08AD0001	USB CABLE W/PLUG	1	EXCEPT P,PC,PU
305	K1HA08CD0027	AV CABLE W/PLUG	1	PR,GC,GJ,GK
306	VFC4297-A	HAND STRAP	1	EXCEPT P,PC,PU
307	VFF0484-S	CD-ROM	1	[SPC]PR,EB,EE,EF,EG,EP,
				GC,GJ,GN See"Notes"
307	VFF0485-S	CD-ROM	1	[SPC]GK See"Notes"
308	VGQ0D56	BATTERY PROTECTION CASE	1	EXCEPT P,PC,PU
310	VPF1100	BAG,POLYETHYLENE	1	EXCEPT P,PC,PU
314	VPK3854	PACKING CASE	1	PRS,EBS,EES,EGS,EPS,GCS,GNS
314	VPK3857	PACKING CASE	1	PRK,EBK,EEK,EFK,EGK,EPK,
				GCK,GJK,GNK
314	VPK3872	PACKING CASE	1	GKS
314	VPK3873	PACKING CASE	1	GKK
315	VPN6797	CUSHION	1	EXCEPT P,PC,PU
⚠ 319	K2CT3CA00004	AC CORD W/PLUG	1	EB,GC
⚠ 320	K2CQ2CA00006	AC CORD W/PLUG	1	EE,EF,EG,EP,GC
⚠ 320	K2CP2YY00001	AC CORD W/PLUG	1	GJ
⚠ 321	K2CJ2DA00008	AC CORD W/PLUG	1	GN
⚠ 322	K2CA2CA00020	AC CORD W/PLUG	1	GK
⚠ 323	K2CJ2DA00006	AC CORD W/PLUG	1	PR
⚠ 324	VFF0488-C	CD-ROM(INSTRUCTION BOOK)	1	PR,EB,EF,EG,EP
⚠ 324	VFF0489-C	CD-ROM(INSTRUCTION BOOK)	1	EE
⚠ 324	VFF0490-C	CD-ROM(INSTRUCTION BOOK)	1	GC,GJ,GN
⚠ 325	VQT2B50	SIMPLIFIED O/I	1	PR,EG
		(SPANISH/PORTUGUESE)		
⚠ 325	VQT2B55	SIMPLIFIED O/I	1	EB
		(ENGLISH)		
⚠ 325	VQT2B56	SIMPLIFIED O/I	1	EE
		(RUSSIAN/UKRAINIAN)		
⚠ 325	VQT2B54	SIMPLIFIED O/I	1	EF
		(FRENCH)		
⚠ 325	VQT2B48	SIMPLIFIED O/I	1	EG
		(GERMAN/FRENCH)		
⚠ 325	VQT2B49	SIMPLIFIED O/I	1	EG
		(ITALIAN/DUTCH)		
⚠ 325	VQT2B51	SIMPLIFIED O/I	1	EP
		(SWEDISH/DANISH)		
⚠ 325	VQT2B52	SIMPLIFIED O/I	1	EP
		(POLISH/CZECH)		
⚠ 325	VQT2B53	SIMPLIFIED O/I	1	EP
		(HUNGARIAN/FINNISH)		
⚠ 325	VQT2B57	SIMPLIFIED O/I	1	GC,GJ
		(ENGLISH/CHINESE(TRADITIONAL))		
⚠ 325	VQT2B58	SIMPLIFIED O/I	1	GC
		(ARABIC/PERSIAN)		
⚠ 325	VQT2B59	INSTRUCTION BOOK	1	GK
		(CHINESE(SIMPLIFIED))		
⚠ 325	VQT2B60	SIMPLIFIED O/I	1	GN
		(ENGLISH)		
326	VQT2B63	O/I SOFTWARE	1	PR,EG
		(GERMAN/FRENCH/ITALIAN/		
		DUTCH/SPANISH/PORTUGUESE)		
326	VQT2B66	O/I SOFTWARE	1	EB,GN
		(ENGLISH)		
326	VQT2B67	O/I SOFTWARE	1	EE
		(RUSSIAN/UKRAINIAN)		
326	VQT2B65	O/I SOFTWARE	1	EF
		(FRENCH)		
326	VQT2B64	O/I SOFTWARE	1	EP
		(FINNISH/SWEDISH/DANISH/		
		POLISH/CZECH/HUNGARIAN)		
326	VQT2B68	O/I SOFTWARE	1	GC,GJ
		(ENGLISH/CHINESE(TRADITIONAL)/		
		ARABIC/PERSIAN)		
326	VQT2B69	O/I SOFTWARE	1	GK
		(CHINESE(SIMPLIFIED))		

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)