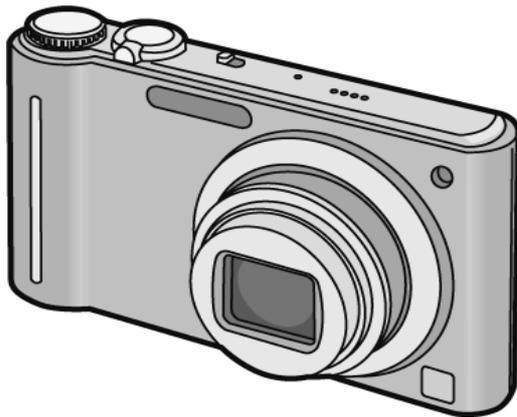


# Service Manual

Digital Camera

LUMIX



Model No. **DMC-ZX1EB**  
**DMC-ZX1EE**  
**DMC-ZX1EF**  
**DMC-ZX1EG**  
**DMC-ZX1EP**  
**DMC-ZX1SG**  
**DMC-ZR1P**  
**DMC-ZR1PC**  
**DMC-ZR1PR**  
**DMC-ZR1PU**  
**DMC-ZR1GC**  
**DMC-ZR1GD**  
**DMC-ZR1GH**  
**DMC-ZR1GK**  
**DMC-ZR1GN**  
**DMC-ZR1GT**

Vol. 1

Colour

- (S).....Silver Type (except PR/EF/GD/GT)
- (K).....Black Type
- (A).....Blue Type (only P/PC/EB/EF/EG/EP/GN)
- (R).....Red Type (except PR/EE/GD/GK)
- (W).....White Type  
(only PC/EB/EF/EG/EP/SG/GH/GK)

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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 Precautions

## 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  $1.5\text{ k}\Omega$ ,  $10\text{ W}$  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  $0.75\text{ V RMS}$ . 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

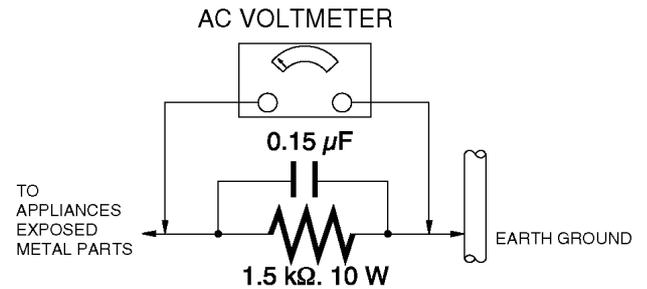


Figure. 1

## 1.4. How to Discharge the Capacitor on E.Capacitor P.C.B.

### CAUTION:

1. Be sure to discharge the capacitor on E.Capacitor P.C.B..
2. Be careful of the high voltage circuit on E.Capacitor P.C.B. 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 $\Omega$  /5W).  
(an equivalent type of resistor may be used.)
3. Put the resistor between both terminals of capacitor on E.Capacitor P.C.B. for approx. 5 seconds.
4. After discharging confirm that the capacitor voltage is lower than 10V using a voltmeter.

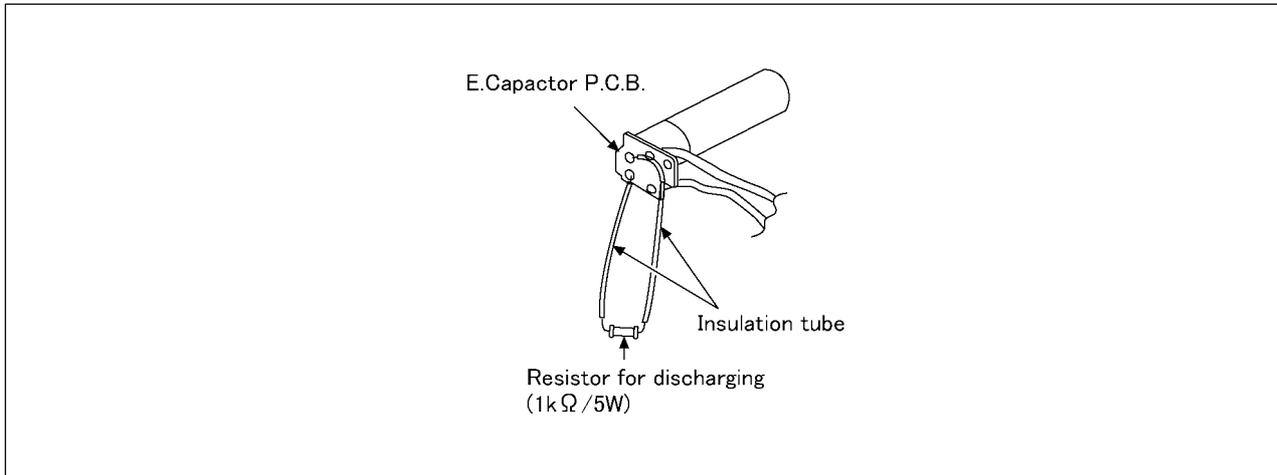


Fig. F1

## 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/GH)

### 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.



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.

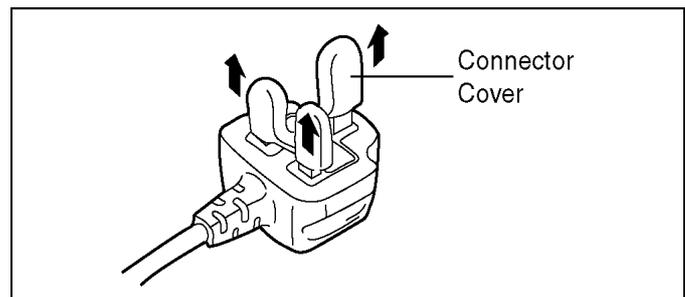
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

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.



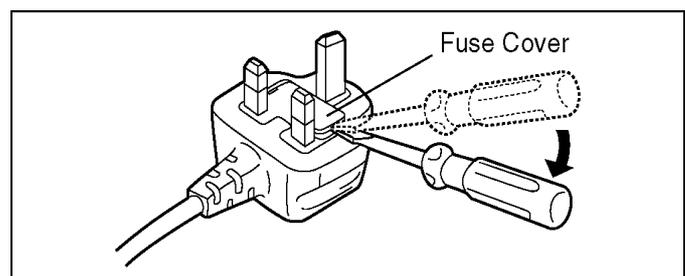
### 2.3.2.2. Before Use

Remove the Connector Cover as follows.

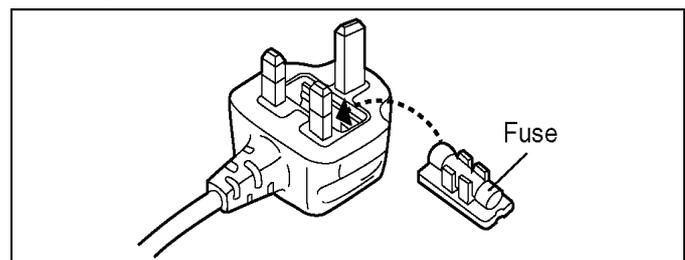


### 2.3.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



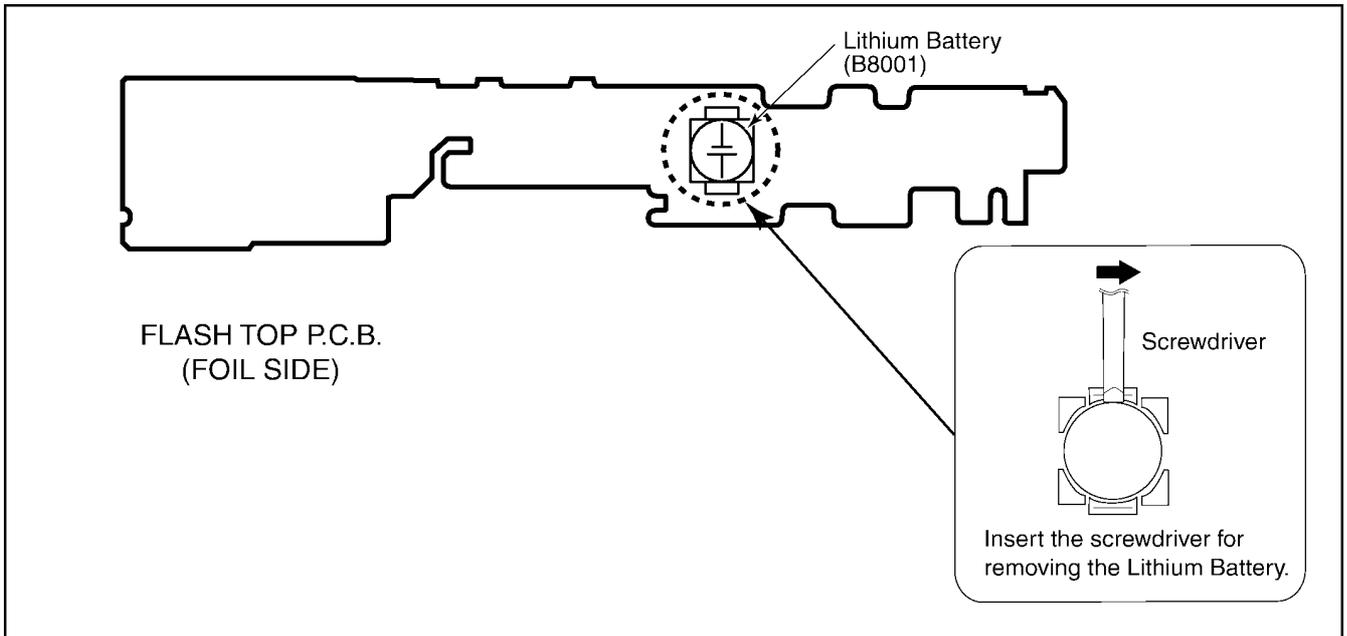
2. Replace the fuse and attach the Fuse cover.



## 2.4. How to Replace the Lithium Battery

### 2.4.1. Replacement Procedure

1. Remove the FLASH TOP P.C.B.. (Refer to Disassembly Procedures.)
2. Remove the Lithium battery (Ref. No. "B8001" at foil side of FLASH TOP P.C.B.) and then replace it into new one.



#### NOTE:

This Lithium battery is a critical component.

(Type No.: ML-421S/ZTN **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 fabricant.

#### NOTE:

Above caution is applicable for a battery pack which is for DMC-ZX1/ZR1 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 P.C.B. Lead Free Solder being used

The letter of "PbF" is printed either foil side or components side on the P.C.B. 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 P.C.B. 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 P.C.B. 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/facilities.
  - a. Schematic diagram, Block Diagram and P.C.B. layout of MAIN P.C.B..
  - b. Parts list for individual parts for MAIN P.C.B..

When a part replacement is required for repairing MAIN P.C.B., replace as an assembled parts. (MAIN P.C.B.)

2. The following category is/are recycle module part. please send it/them to Central Repair Center.
  - MAIN P.C.B.: VEP56090B----- (Only P/PC/PU/PR)
  - MAIN P.C.B.: VEP56090A----- (Except P/PC/PU/PR)

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

There are nine kinds of DMC-ZX1/ZR1, regardless of the colours.

- a) DMC-ZX1 (Japan domestic model), DMC-ZX1SG
- b) DMC-ZR1P/PC
- c) DMC-ZX1EB/EF/EG/EP
- d) DMC-ZX1EE
- e) DMC-ZR1GT
- f) DMC-ZR1GK
- g) DMC-ZR1GD
- h) DMC-ZR1GN
- i) DMC-ZR1PR/PU/GC/GH

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

#### 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><b>a) DMC-ZX1 (Japan domestic model), DMC-ZX1SG</b> The nameplate for these models show the following Safety registration mark.</p> 
<p><b>b) DMC-ZR1P/PC</b> The nameplate for these models show the following Safety registration mark.</p> 
<p><b>c) DMC-ZX1EB/EF/EG/EP</b> The nameplate for these models show the following Safety registration mark.</p> 
<p><b>d) DMC-ZX1EE</b> The nameplate for this model show the following Safety registration mark.</p> 
<p><b>e) DMC-ZR1GT</b> The nameplate for this model show the following Safety registration mark.</p> 
<p><b>f) DMC-ZR1GK</b> The nameplate for this model show the following Safety registration mark.</p> 
<p><b>g) DMC-ZR1GD</b> The nameplate for this model show the following Safety registration mark.</p> 
<p><b>h) DMC-ZR1GN</b> The nameplate for this model show the following Safety registration mark.</p> 
<p><b>i) DMC-ZR1PR/PU/GC/GH</b> The nameplate for these models do not show any above Safety registration mark.</p>

**NOTE:**

After replacing the MAIN P.C.B., be sure to achieve adjustment.

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

### 3.4.2. INITIAL SETTINGS:

After replacing the MAIN P.C.B., 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.**

(Effective model suffix : " EG/EP/GD/GC/GT/GK/EF/EB/EE/GN/SG/GH/P/PU/PC/PR/OLYMPIC and NONE(JAPAN)")

\*.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.40MB)  
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.  
(Rotate the Mode dial to adjust to the [ NORMAL PICTURE ] mode. (Camera mark))

#### 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:**

While keep pressing [ MENU/SET ] and “[ RIGHT ] of Cursor buttons” simultaneously, turn the Power off.

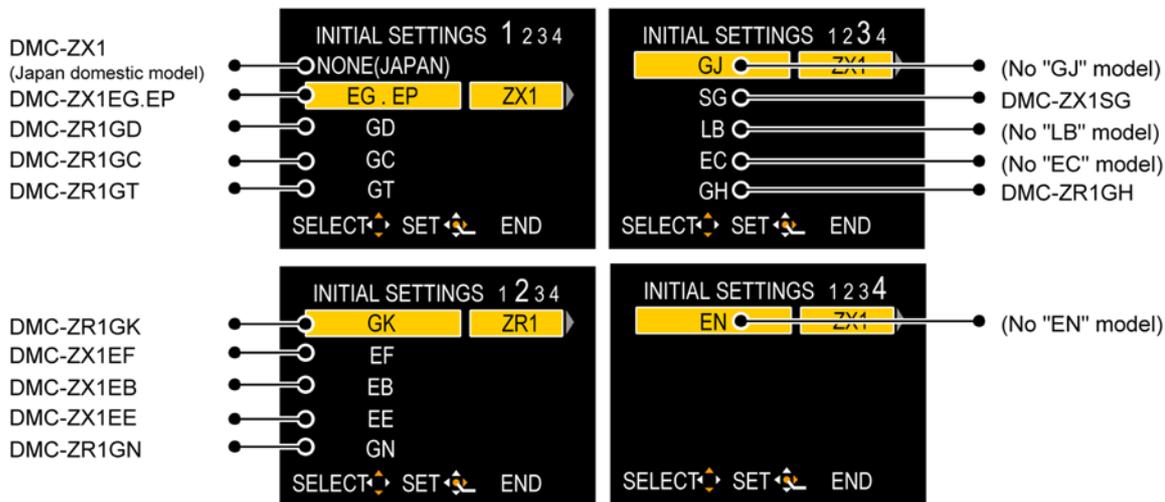
The "INITIAL SETTINGS" menu is displayed.

There are two kinds of “INITIAL SETTINGS” menu form as follows:

**■ [CASE 1. After replacing MAIN P.C.B.]**

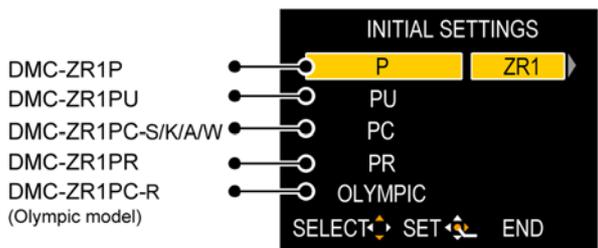
**[Except “P,PU,PC,PR and OLYMPIC” models: (VEP56090A is used as a Main P.C.B.)]**

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

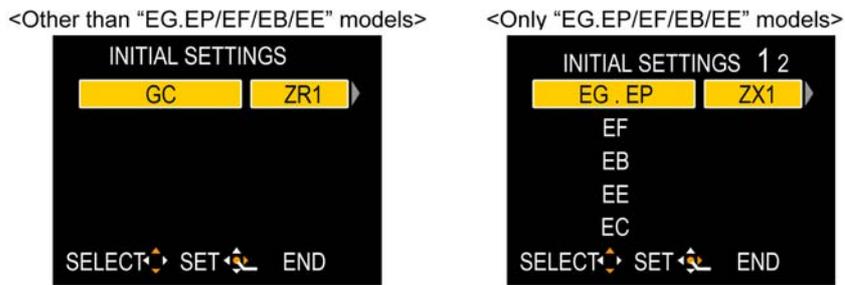


**[Only “P,PU,PC,PR and OLYMPIC” models: (VEP56090B is used as a Main P.C.B.)]**

When MAIN P.C.B. has just been replaced, only 5 model suffix are displayed as follows.



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



**• Step 5. Choose the model suffix in “INITIAL SETTINGS”: (Refer to “CAUTION 1”)**

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

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

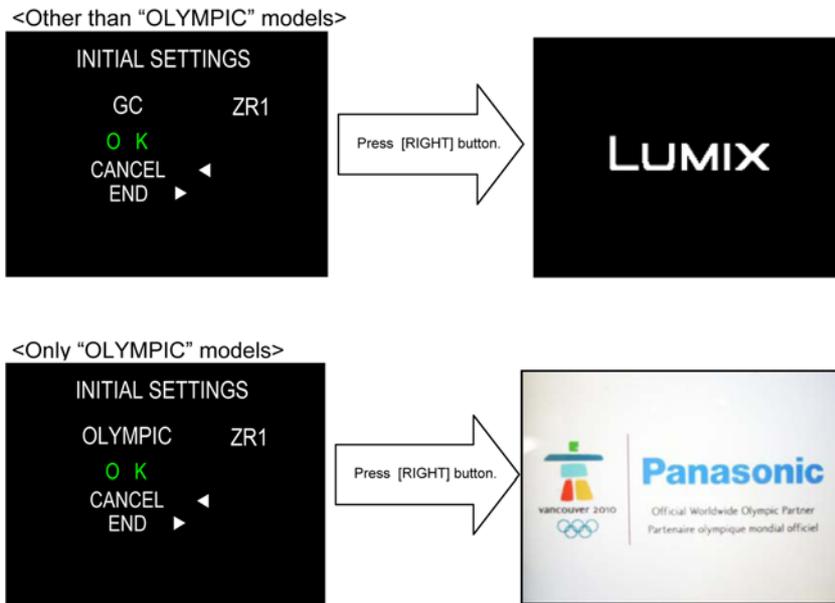
Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can be changed.

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 concerned 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-ZX1 (Japan domestic model)	NTSC	Japanese	Year/Month/Date	
b)	DMC-ZX1EG	PAL	English	Date/Month/Year	
c)	DMC-ZX1EP	PAL	English	Date/Month/Year	
d)	DMC-ZR1GD	NTSC	Korean	Year/Month/Date	
e)	DMC-ZR1GC	PAL	English	Date/Month/Year	
f)	DMC-ZR1GT	NTSC	Chinese (traditional)	Year/Month/Date	
g)	DMC-ZR1GK	PAL	Chinese (simplified)	Year/Month/Date	
h)	DMC-ZX1EF	PAL	French	Date/Month/Year	
i)	DMC-ZX1EB	PAL	English	Date/Month/Year	
j)	DMC-ZX1EE	PAL	Russian	Date/Month/Year	
k)	DMC-ZR1GN	PAL	English	Date/Month/Year	
l)	DMC-ZX1SG	PAL	English	Date/Month/Year	
m)	DMC-ZR1GH	PAL	English	Date/Month/Year	
n)	DMC-ZR1P	NTSC	English	Month/Date/Year	
o)	DMC-ZR1PU	NTSC	English	Month/Date/Year	
p)	DMC-ZR1PC-S/K/A/W	NTSC	English	Month/Date/Year	
q)	DMC-ZR1PR	PAL	English	Date/Month/Year	
r)	DMC-ZR1PC-R (Olympic model)	NTSC	English	Month/Date/Year	

# 4 Specifications

Digital Camera: Information for your safety

<b>Power Source:</b>	DC 5.1 V
<b>Power Consumption:</b>	1.2 W (When recording) 0.6 W (When playing back)

<b>Camera effective pixels:</b>	12,100,000 pixels
<b>Image sensor:</b>	1/2.33" CCD, total pixel number 12,700,000 pixels, Primary colour filter
<b>Lens:</b>	Optical 8× zoom, f=4.5 mm to 36 mm (35 mm film camera equivalent: 25 mm to 200 mm)/F3.3 to F5.9
<b>Digital zoom:</b>	Max. 4×
<b>Extra optical zoom:</b>	Max. 15.6×
<b>Focus:</b>	Normal/AF Macro/Macro zoom/Face detection/AF Tracking/11-area-focusing/1-area-focusing (High speed)/1-area-focusing/Spot-focusing
<b>Focus range:</b>	Normal: 50 cm (1.64 feet) (Wide)/2 m (6.56 feet) (Tele) to ∞ Macro/Intelligent auto/Clipboard mode: 3 cm (0.10 feet) (Wide)/1 m (3.28 feet) (Tele) to ∞ Scene mode: There may be differences in the above settings.
<b>Shutter system:</b>	Electronic shutter+Mechanical shutter
<b>Motion picture recording:</b>	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) With audio * Motion pictures can be recorded continuously for up to 15 minutes. Also, continuous recording exceeding 2 GB is not possible. Remaining time for continuous recording is displayed on the screen.
<b>Burst recording</b>	
<b>Burst speed:</b>	Approx. 2.3 pictures/second
<b>Number of recordable pictures:</b>	Max. 5 pictures (Standard), max. 3 pictures (Fine)
<b>Hi-speed burst</b>	
<b>Burst speed:</b>	Approx. 10 pictures/second (Speed priority) Approx. 6 pictures/second (Image priority)
<b>Number of recordable pictures:</b>	(3M (4:3), 2.5M (3:2) or 2M (16:9) is selected as the picture size.) Approx. 15 to 100
<b>ISO sensitivity (Standard Output Sensitivity):</b>	AUTO/80/100/200/400/800/1600 [HIGH SENS.] mode: 1600 to 6400 8 seconds to 1/2000th of a second
<b>Shutter speed:</b>	[STARRY SKY] mode: 15 seconds, 30 seconds, 60 seconds
<b>White balance:</b>	Auto white balance/Daylight/Cloudy/Shade/Incandescent lights/White set
<b>Exposure (AE):</b>	Programme AE Exposure compensation (1/3 EV Step, -2 EV to +2 EV)
<b>Metering mode:</b>	Multiple
<b>LCD monitor:</b>	2.7" TFT LCD (Approx. 230,000 dots) (field of view ratio about 100%)
<b>Flash:</b>	Flash range: [ISO AUTO] Approx. 60 cm (1.97 feet) to 5.3 m (17.4 feet) (Wide) AUTO, AUTO/Red-eye reduction, Forced flash ON (Forced ON/Red-eye reduction), Slow sync./Red-eye reduction, Forced flash OFF
<b>Microphone:</b>	Monaural
<b>Speaker:</b>	Monaural
<b>Recording media:</b>	Built-in Memory (Approx. 40 MB)/SD Memory Card/SDHC Memory Card

Picture size

**Still picture:** When the aspect ratio setting is [4:3]  
4000×3000 pixels, 3264×2448 pixels, 2560×1920 pixels, 2048×1536 pixels, 1600×1200 pixels, 640×480 pixels  
When the aspect ratio setting is [3:2]  
4000×2672 pixels, 3264×2176 pixels, 2560×1712 pixels, 2048×1360 pixels

When the aspect ratio setting is [16:9]  
4000×2248 pixels, 3264×1840 pixels, 2560×1440 pixels, 1920×1080 pixels

**Motion picture:** 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  
Fine/Standard

**Quality:**

**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)

**Motion picture:** "QuickTime Motion JPEG" (motion pictures with audio)

**Interface**

**Digital:** "USB 2.0" (High Speed)  
\* Data from the PC can not be written to the camera using the USB connection cable.

**Analogue video/ audio:**

NTSC/PAL Composite (Switched by menu), Component Audio line output (monaural)

**Terminal**

**[COMPONENT OUT]:** Dedicated jack (10 pin) (except P/PC/PU/PR)

**[AV OUT/DIGITAL]:** Dedicated jack (8 pin)

**Dimensions:** Approx. 97.8 mm (W)×54.6 mm (H)×26.0 mm (D)  
[3 3/4" (W)×2 1/4" (H)×1" (D)]  
(excluding the projecting parts)

**Mass:** Approx. 138 g/4.868 oz (excluding card and battery)

Approx. 160 g/5.644 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-A66A):** Information for your safety

<b>Input:</b>	110 V to 240 V~50/60 Hz, 0.2 A
<b>Output:</b>	CHARGE 4.2 V=0.65 A

**Equipment mobility:** Movable

**Battery Pack**

**(lithium-ion)**

**(Panasonic DMW-BCG10E):** Information for your safety

<b>Voltage/capacity:</b>	3.6 V/895 mAh
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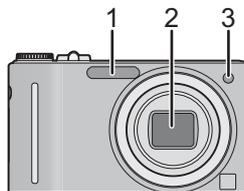
**NOTE:(Only for "EB/EF/EG/EP/PR" models)**

- 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.

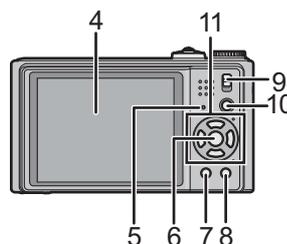
# 5 Location of Controls and Components

## Names of the Components

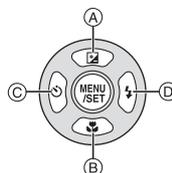
- 1 Flash
- 2 Lens
- 3 Self-timer indicator  
AF assist lamp



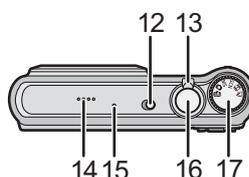
- 4 LCD monitor
- 5 Status indicator
- 6 [MENU/SET] button
- 7 [DISPLAY] button
- 8 [Q.MENU]/Delete button
- 9 [REC]/[PLAYBACK] selector switch
- 10 [E.ZOOM] button



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

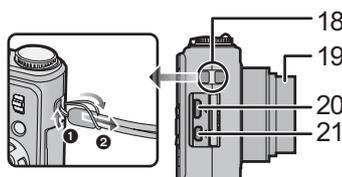


- 12 Camera ON/OFF switch
- 13 Zoom lever
- 14 Speaker
- 15 Microphone
- 16 Shutter button
- 17 Mode dial



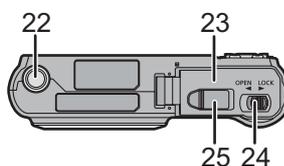
- 18 Hand strap eyelet
  - Be sure to attach the hand strap when using the camera to ensure that you will not drop it.

- 19 Lens barrel
- 20 [COMPONENT OUT] socket
  - except P/PC/PU/PR
- 21 [AV OUT/DIGITAL] socket



- 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

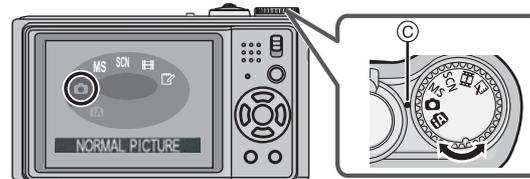


- 25 DC coupler cover
  - When using an AC adaptor, ensure that the Panasonic DC coupler (DMW-DCC5; optional) and AC adaptor (DMW-AC5E; optional) are used.
  - We recommend you use a battery with sufficient battery power or the AC adaptor when recording motion pictures.
  - If while recording motion pictures using the AC adaptor the power supply is cut off due to a power cut or if the AC adaptor is disconnected etc., the motion picture being recorded will not be recorded.

## 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.
  - A [REC]/[PLAYBACK] selector switch
  - B Mode dial
- 2 Slide the [REC]/[PLAYBACK] selector switch to [RECORDING].
- 3 Switching the mode by rotating the mode dial.



Align a desired mode with part C.

- Rotate the mode dial slowly and surely to adjust to each mode.

### 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.

#### **MS** My Scene Mode

Pictures are taken using previously registered recording scenes.

#### **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.

## About the Battery

- The camera has a function for distinguishing batteries which can be used safely. The dedicated battery supports this function. The only batteries suitable for use with this unit are genuine Panasonic products and batteries manufactured by other companies and certified by Panasonic. (Batteries which do not support this function cannot be used). Panasonic cannot in any way guarantee the quality, performance or safety of batteries which have been manufactured by other companies and are not genuine Panasonic products.

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.

\*Set the mode dial to "Normal picture mode" by all means, to display the error code.

\*The service mode is not executed in other than "Normal picture mode".

#### • Step 1. The temporary cancellation of "INITIAL SETTINGS":

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

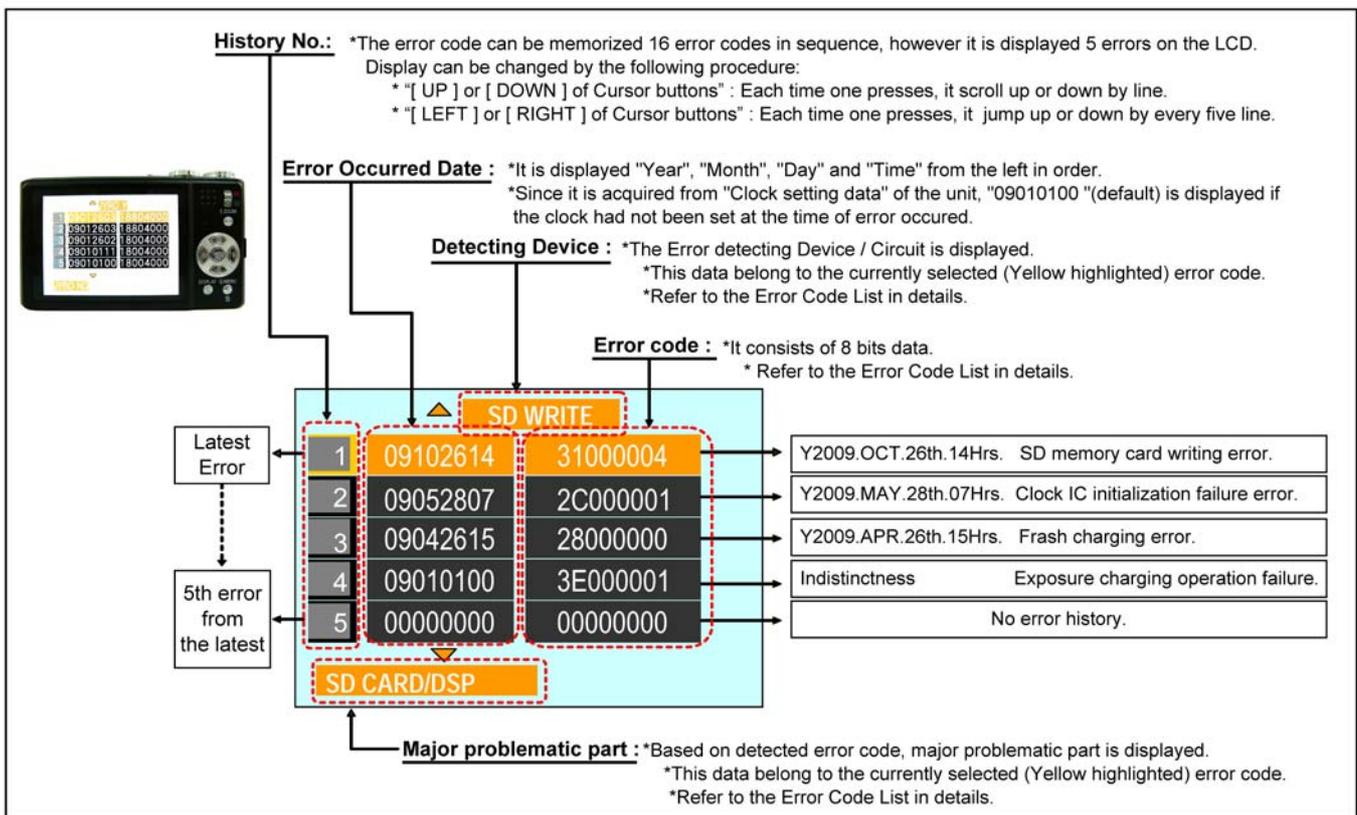
While keep pressing "[ UP ] of Cursor button" and [ DISPLAY ] button simultaneously, turn the Power on.

#### • 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	OIS	18*0	1000	PSD (X) error. Hall element (X axis) position detect error in OIS unit. OIS Unit	OIS X	LENSu NG		
				2000	PSD (Y) error. Hall element (Y axis) position detect error in OIS unit. OIS Unit	OIS Y			
				3000	GYRO (X) error. Gyro (IC7301: X axis) detect error on Flash Top P.C.B.. IC7301 (Gyro element) or IC6001 (VENUS 5)	JYRO X	JYRO NG		
				4000	GYRO (Y) error. Gyro (IC9501: Y axis) detect error on Rear Operation FPC Unit. IC9501 (Gyro element) or IC6001 (VENUS 5)	JYRO Y			
				5000	MREF error (Reference voltage error). IC9101 (SYSTEM) or IC6001 (VENUS 5)	OIS REF	LENSsD/DSP NG		
				6000	Drive voltage (X) error. LENS Unit, LENS flex breaks, IC6001 (VENUS 5) AD value error, etc.	OISX REF	LENSu/LENS FPC		
				7000	Drive voltage (Y) error. LENS Unit, LENS flex breaks, IC6001 (VENUS 5) AD value error, etc.	OISY REF			
		Zoom	0710	0710	Collapsible barrel Low detect error (Collapsible barrel encoder always detects Low.) Mechanical lock, FP9002-(2) signal line or IC6001 (VENUS 5)	ZOOM L	ZOOMm/LENSu		
				0720	Collapsible barrel High detect error (Collapsible barrel encoder always detects High.) Mechanical lock, FP9002-(2) signal line or IC6001 (VENUS 5)	ZOOM H			
				0730	Zoom motor sensor error. Mechanical lock, FP9002-(32), (34) signal line or IC6001 (VENUS 5)	ZOOM ENC			
				0740	Zoom motor sensor error. (During monitor mode.) Mechanical lock, FP9002-(32), (34) signal line or IC6001 (VENUS 5)				
				0750	Zoom motor sensor error. (During monitor mode with slow speed.) Mechanical lock, FP9002-(32), (34) signal line or IC6001 (VENUS 5)				
				0701	HP High detect error (Focus encoder always detects High, and not becomes Low) Mechanical lock, FP9002-(2) signal line or IC6001 (VENUS 5)			FOCUS L	LENS FPC/DSP
		0702	HP Low detect error (Focus encoder always detects Low, and not becomes High) Mechanical lock, FP9002-(2) signal line or IC6001 (VENUS 5)	FOCUS H					
	Lens	18*1	0000	Power ON time out error. Lens drive system	LENS DRV	LENSu			
			0000	Power OFF time out error. Lens drive system					
	Adj. History	OIS	19*0	2000	OIS adj. Yaw direction amplitude error (small)	OIS ADJ	OIS ADJ		
				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					
HARD				VENUS A/D	Flash			28*0	0000
	FLASH ROM (EEPROM Area)	FLASH ROM (EEPROM Area)	2B*0	0001	EEPROM read error	FROM RE	FROM		
				0003	IC6002 (FLASH ROM)	FROM WR	FROM		
				0004	EEPROM write error IC6002 (FLASH ROM)	(No indication)	(No indication)		
				0005	Firmware version up error Replace the firmware file in the SD memory card.	(No indication)	(No indication)		
				0008	SDRAM error	(No indication)	(No indication)		
	0009	SDRAM Mounting defective	(No indication)	(No indication)					
SYSTEM	RTC	2C*0	0001	SYSTEM IC initialize failure error Communication between IC6001 (VENUS 5) and IC9101 (SYSTEM)	SYS INIT	MAIN PCB			
SOFT	CPU	Reset	30*0	0001	NMI reset Non Mask-able Interrupt (30000001-30000007 are caused by factors)	NMI RST	MAIN PCB		
				0007	Card logic error SD memory card data line or IC6001 (VENUS 5)	SD CARD	SD CARD/DSP		
	Card	Card	31*0	0001	Card physical error SD memory card data line or IC6001 (VENUS 5)	SD WRITE			
				0002	Write error SD memory card data line or IC6001 (VENUS 5)	INMEMORY		FROM	
				0004	Format error	INMEMORY	FROM		
	CPU, ASIC hard	Stop	38*0	39*0	0005	Camera task finish process time out. Communication between Lens system and IC6001 (VENUS 5)	LENS COM	LENSu/DSP	
					0001	Camera task invalid code error. IC6001 (VENUS 5)	DSP	DSP	
					0002	File time out error in recording motion image IC6001 (VENUS 5)			
					0100	File data cue send error in recording motion image IC6001 (VENUS 5)			
					0200	Single or burst recording brake time out.			
					0300	USB work area partitioning failure USB dynamic memory securing failure when connecting	(No indication)	(No indication)	
	Operation Zoom	Power on Zoom	Zoom	3B*0	0000	FLASHROM processing early period of camera during movement.	INIT	(No indication)	
					3C*0	0000	Inperfect zoom lens processing Zoom lens	ZOOM	ZOOMm/LENSu
						0000	Software error (0-7bit : command, 8-15bit : status)	DSP	DSP
0000						Though record preprocessing is necessary, it is not called.			
0000						Though record preprocessing is necessary, it is not completed.	(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: 18001000)

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: 18801000)

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.

## 6.2. ICS (Indication of additional Camera Settings when picture was taken) function

### 1. General description

This unit is equipped with ICS (ICS: Indication of additional Camera Settings when picture was taken) function by playing back the concerned picture on the LCD display.

(This function is achieved by utilizing "maker note" data stored in Exif data area of recorded picture file.)

To proceed failure diagnosis, use this ICS function together with "displaying the recorded picture with picture information" function.

##### NOTE:

- The ICS function operates with a picture which is only taken with the same model. (It may not be displayed when the picture was taken with other model.)
- Since Exif data is not available after the picture is edited by PC, the ICS function may not be activated.

### 2. How to display

The ICS data is displayed by ordering the following procedure:

#### • Preparation:

1. Attach the Battery or AC Adaptor with a DC coupler to the unit.

##### NOTE:

Set the mode dial to "Normal picture mode" by all means, to display the ICS data.

The ICS data display is not executed in other than "Normal picture mode".

#### • 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 ICS display mode:

Set the [ REC ]/[ PLAYBACK ] selector switch to [ PLAYBACK ].

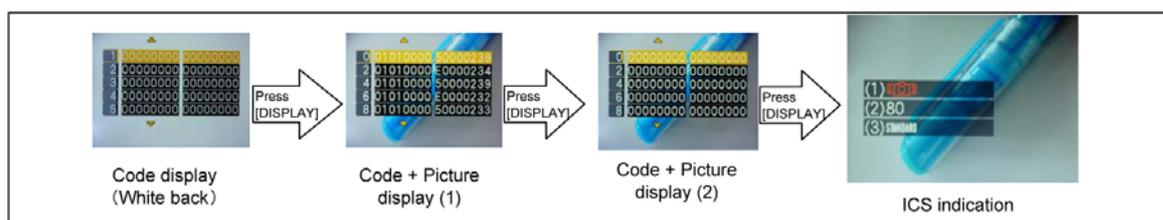
Select the concerned picture by pressing the "[ LEFT ] and [ RIGHT ] of Cursor button".

Press the "[ LEFT ] of Cursor button", [ MENU/SET ] button and [ DISPLAY ] button simultaneously.

Press the [ DISPLAY ] button, 3 times.

The display condition is changed as shown below when the [ DISPLAY ] button is pressed.

Code display → Code + Picture display (1) → Code + Picture display (2) → ICS display → Code display .....



### 3. How to read

**(1). Jitter alert was displayed or not:**  
 This part shows that the "Jitter alert" mark was displayed or not when the picture has just before been taken.  
 +.With "Jitter alert" mark : The "Jitter alert" mark was displayed.  
 +.Without "Jitter alert" mark: The "Jitter alert" mark was not displayed.  
 [About "Jitter alert" mark]  
 Due to lacking the enough light amount etc, shooting condition prone to make a "hand jitter", the "Jitter alert" mark is displayed.  
 [Reference Guide]  
 (Applicable settings : Normal picture mode, ISO100, WIDE edge, Flash OFF)  
 +.The "Jitter alert" mark is displayed when the shutter speed is 1/15th and below.

**(2). ISO Sensitivity Setting condition:**  
 This part shows that the "ISO Sensitivity" setting condition when the picture had been taken.  
 (Note: The [i ISO] is displayed when the "Intelligent ISO" was selected.)  
 For instance, when the recorded picture information shows [ISO80], it can be confirmed the ISO setting condition : [AUTO], [INTELLIGENT ISO] or [ISO 80](Fixed: set by user).  
 [Point for Confirmation]  
 \*The symptom is "Picture with "hand jitter". Subject is not clearly stopped." in darker scene, does the picture was taken with lower ISO setting mode?  
 \*The symptom is "Noisy picture. Rough picture image" in brighter scene, does the picture was taken with higher ISO setting mode?

**(3). Color mode Setting condition:**  
 This part shows that the "Color mode" setting condition when the picture had been taken.  
 [Point for Confirmation]  
 \*The symptom is "Color is strange. The picture is bluish (Yellowish) ", does the picture was taken with [SEPIA] / [COOL] / [WARM] settings?  
 NOTE: As for the symptom related with the color, confirm the picture information which is displayed in normal playback screen as well.  
 (In normal playback screen, the setting condition of "White balance" and "WB Adjustment "can be confirmed.)

[Reference Guide : Settings "When taking picture"]

**<ISO SENSITIVITY>**  
 \*This allows the sensitivity to light (ISO sensitivity) to be set. Setting to a higher figure enables pictures to be taken even in dark places without the resulting pictures coming out dark.  
 \*In this unit, it can be set one of the [AUTO], [80], [100], [200], [400], [800] and [1600] in "Normal shooting" mode.  
 (The ISO sensitivity setting is not available when the [INTELLIGENT ISO] is being used.)  
 \*When setting to [AUTO], the ISO sensitivity is automatically adjusted to a maximum of [ISO400] according to the brightness.  
 (It can be adjusted to a maximum of [ISO1600] when using the flash.)  
 \*To avoid picture noise, we recommend that you either reduce the ISO sensitivity level or set [COLOR MODE] to [NATURAL], and then take pictures.

ISO sensitivity	80	↔	1600
Recording location (recommended)	When it is light (outdoors)		When it is dark
Shutter speed	Slow		Fast
Noise	Less		Increased

**<COLOR MODE>**  
 \*Using these modes, the pictures can be made sharper or softer, the colors of the pictures can be turned into sepia colors or other color effects can be achieved.  
 \*In this unit, it can be set one of the following effects in "Normal shooting" mode.

[STANDARD] : This is the standard setting.	[B/W] : The picture becomes black and white.
[NATURAL] : The picture becomes softer.	[SEPIA] : The picture becomes sepia.
[VIVID] : The picture becomes sharper.	[COOL] : The picture becomes bluish.
	[WARM] : The picture becomes reddish.

NOTE: You cannot set [NATURAL], [VIVID], [COOL] or [WARM] in Intelligent auto mode.  
 \*When you take pictures in dark places, noise may become visible. To avoid noise, we recommend setting to [NATURAL].

Normal playback screen  
(Recorded picture with information)



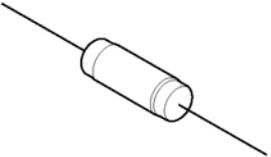
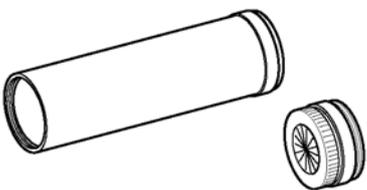
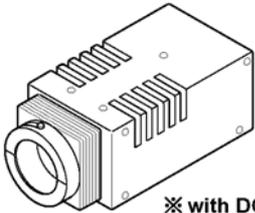
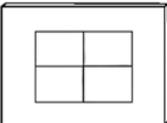
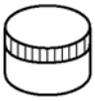
\*In playback mode, the picture information is displayed when pressing the [DISPLAY] button (It can be confirmed at user as well.)  
 \*Use this indication together with ICS function

**4. How to exit:**  
 Simply, turn the power off. (Since ICS function is executed under the condition of temporary cancellation of "INITIAL SETTINGS", it wake up with normal condition when turn off the power.)

# 7 Service Fixture & Tools

## 7.1. Service Fixture and Tools

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

<b>Resistor for Discharging</b> <b>ERG5SJ102</b>	<b>Infinity Lens (with Focus Chart)</b> <b>VFK1164TCM02</b>	<b>LIGHT BOX</b> <b>VFK1164TDVLB</b>
 An equivalent type of Resistor may be used.	 * RFKZ0422 can be used.	 ※ with DC Cable * RFKZ0523 can be used.
<b>TR Chart</b> <b>RFKZ0443</b>	<b>Lens Cleaning Kit (BK)</b> <b>VFK1900BK</b>	<b>Grease (for lens)</b> <b>RFKZ0472</b>
	 * Only supplied as 10 set/box.	

## 7.2. When Replacing the Main P.C.B.

After replacing the MAIN P.C.B., be sure to achieve adjustment.

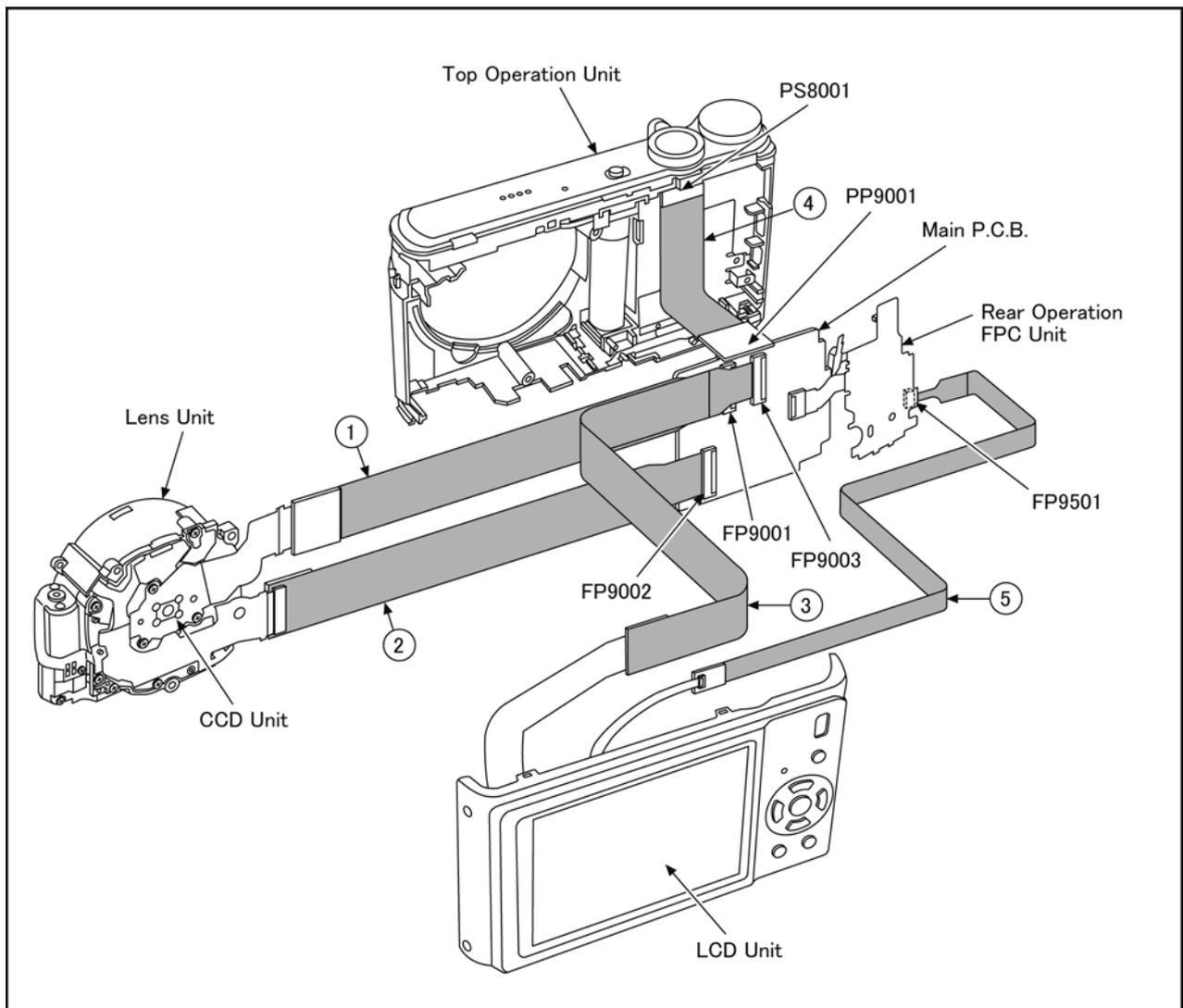
The adjustment instruction is available at "software download" on the "Support Information from NDBG/VDBG-AVC" web-site in "TSN system", together with Maintenance software.

## 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	RFKZ0416	FP9002 (MAIN) - LENS UNIT	41PIN 0.3 FFC
3	RFKZ0416	FP9003 (MAIN) - LCD UNIT	41PIN 0.3 FFC
4	RFKZ0545	PP9001 (MAIN) - PS8001 (FLASH TOP)	34PIN B to B
5	VFK1974	FP9501 (REAR OPERATION FPC UNIT) - LCD UNIT	4PIN 0.5 FFC

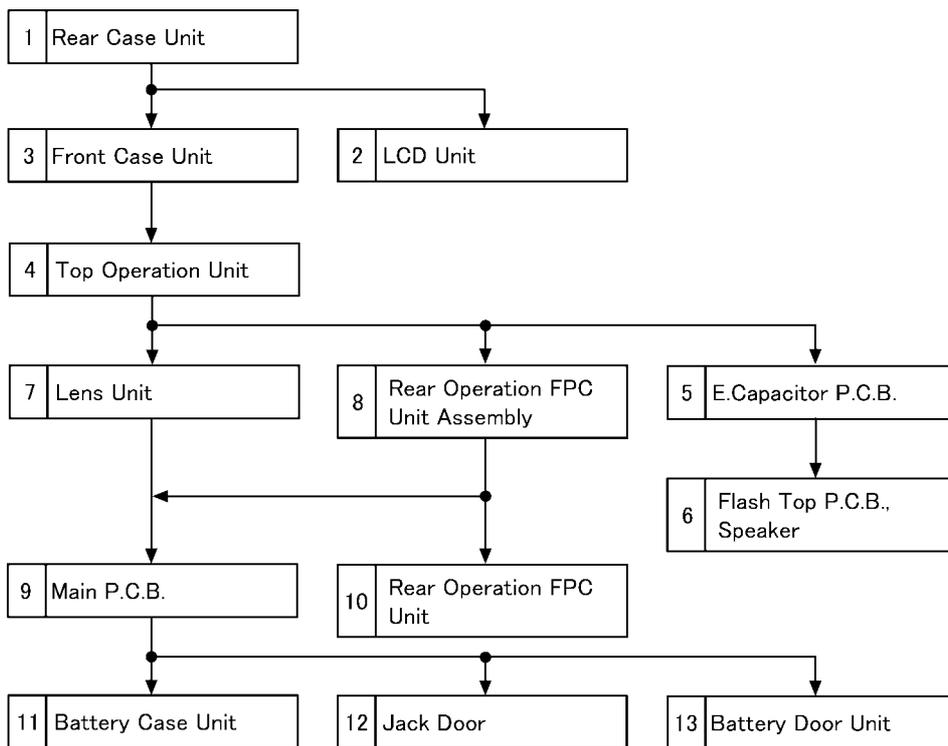


### CAUTION-1. (When servicing E.CAPACITOR P.C.B.)

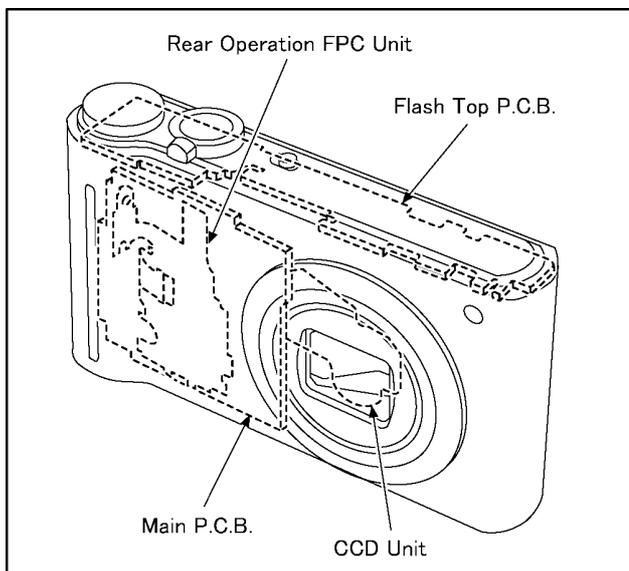
1. Be sure to discharge the capacitor on E.CAPACITOR P.C.B..  
Refer to "HOW TO DISCHARGE THE CAPACITOR ON E.CAPACITOR P.C.B.".  
The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on E.CAPACITOR P.C.B..
3. DO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

# 8 Disassembly and Assembly Instructions

## 8.1. Disassembly Flow Chart



## 8.2. P.C.B. Location



### 8.3. Disassembly Procedure

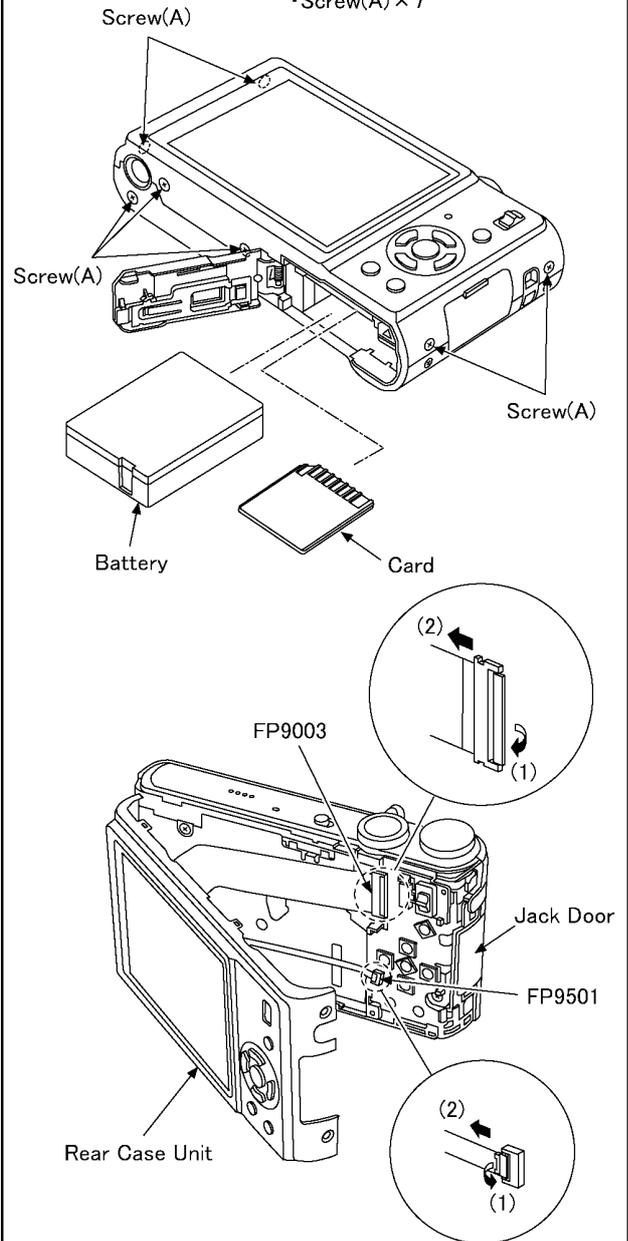
No.	Item	Fig	Removal						
1	Rear Case Unit	(Fig.D1)	Card						
			Battery						
			7 Screws (A)						
			FP9003(Flex)						
			FP9501(Flex)						
			Rear Case Unit						
2	LCD Unit	(Fig.D2)	4 Locking tabs						
			LCD Unit						
3	Front Case Unit	(Fig.D3)	4 Screws (B)						
			1 Locking tab						
			Front Case Unit						
4	Top Operation Unit	(Fig.D4)	PS8001(Connector)						
			Top Operation Unit						
5	E.Capacitor P.C.B.	(Fig.D5)	1 Screw (C)						
			1 Locking tab						
		(Fig.D6)	2 Ribs						
			1 Locking tab						
			E.Capacitor P.C.B. Holder E.Capacitor P.C.B.						
6	Flash Top P.C.B. Speaker	(Fig.D7)	2 Locking tabs						
			AF Panel Light						
			2 Screws (D)						
			Top Plate (R)						
			3 Locking tabs						
			Mic Damper						
			Power Knob Base						
			Power Knob						
			Flash Top P.C.B.						
			Speaker						
			(Fig.D8)	NOTE: (When Installing)					
			7	Lens Unit	(Fig.D9)	3 Screws (E)			
						1 Locking tab			
Frame Plate									
Tripod Fixing Plate									
FP9001(Flex)									
FP9002(Flex)									
Lens Unit									
8	Rear Operation FPC Unit Assembly	(Fig.D10)				1 Screw (F) 2 Ribs FP9004(Flex) Rear Operation FPC Unit Assembly			
9	Main P.C.B.	(Fig.D11)	1 Rib Main P.C.B.						
			10	Rear Operation FPC Unit	(Fig.D12)	1 Screw (G) 1 Locking tab 4 Locking tabs REC/PLAYBACK Selector Knob			
(Fig.D13)	2 Pins 5 Locking tabs 2 Pins 4 Locking tabs SW Plate P.C.B. Base Rear Operation FPC Unit								
	11	Battery Case Unit	(Fig.D14)			2 Locking tabs Battery Out Spring Battery Case Unit			
						12	Jack Door	(Fig.D15)	Jack Door Shaft Jack Door
									13

### 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) × 7
- FP9003(Flex)
- FP9501(Flex)

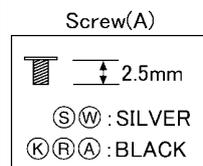


**NOTE: (When Replacing)**

- 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).

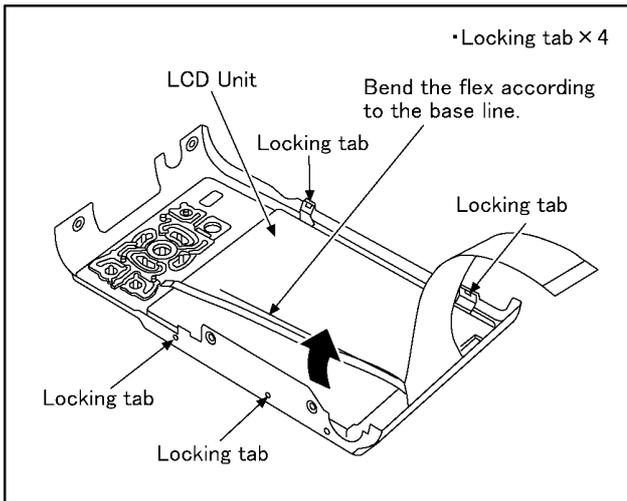
**NOTE: (When Installing)**

- Open the Jack door before installing the rear case unit. (to prevent damaged)



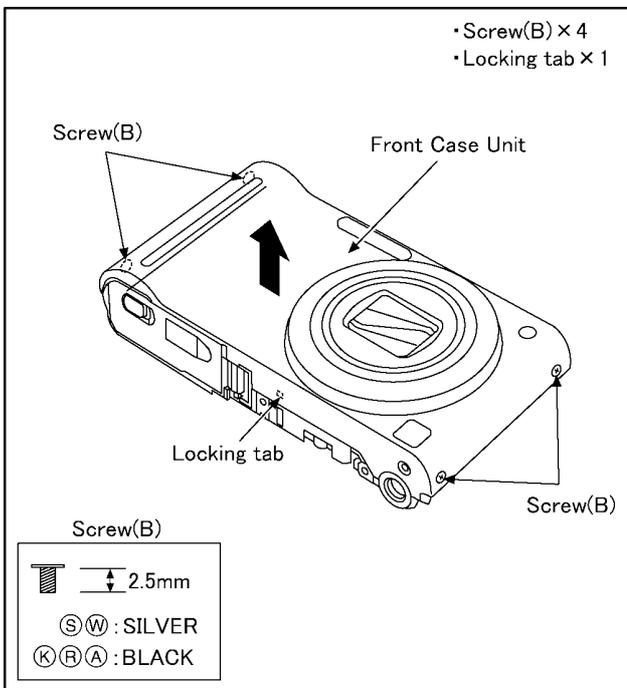
(Fig.D1)

### 8.3.2. Removal of the LCD Unit



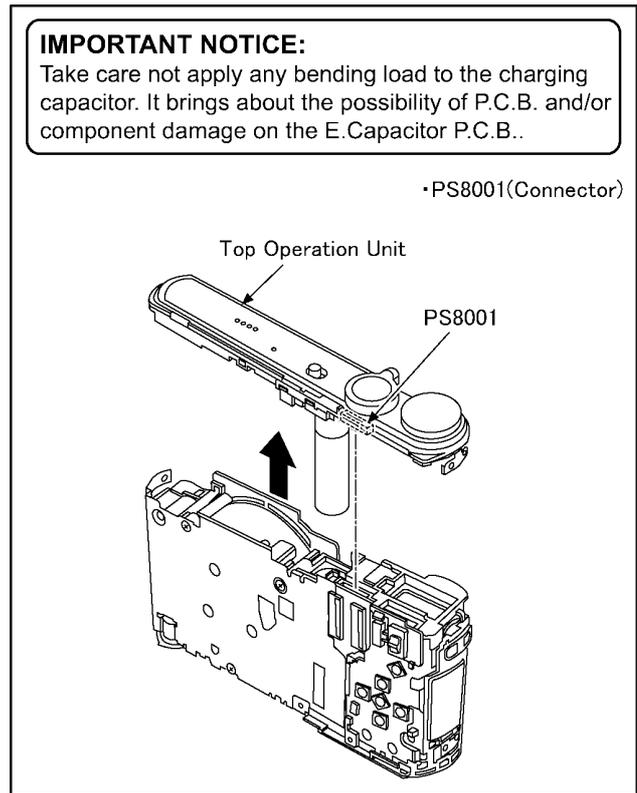
(Fig.D2)

### 8.3.3. Removal of the Front Case Unit



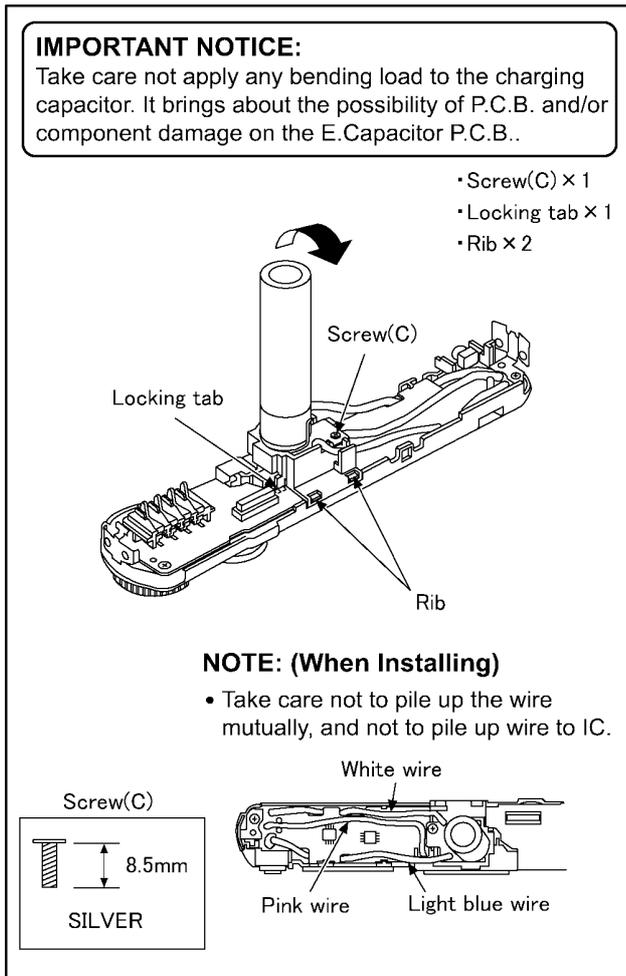
(Fig.D3)

### 8.3.4. Removal of the Top Operation Unit



(Fig.D4)

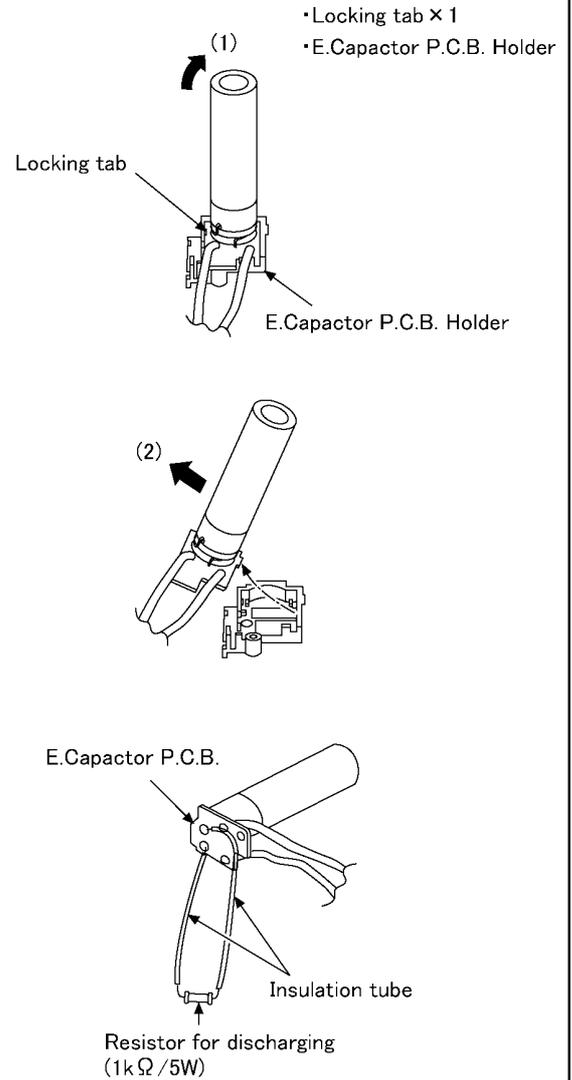
### 8.3.5. Removal of the E.Capacitor P.C.B.



(Fig.D5)

**IMPORTANT NOTICE:**

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



**NOTE: (When Replacing)**

- When remove the e.capacitor P.C.B., remove the 1 locking tab and pull up the e.capacitor P.C.B. in the direction of arrow (1), and then remove the e.capacitor P.C.B. in the direction of arrow (2).

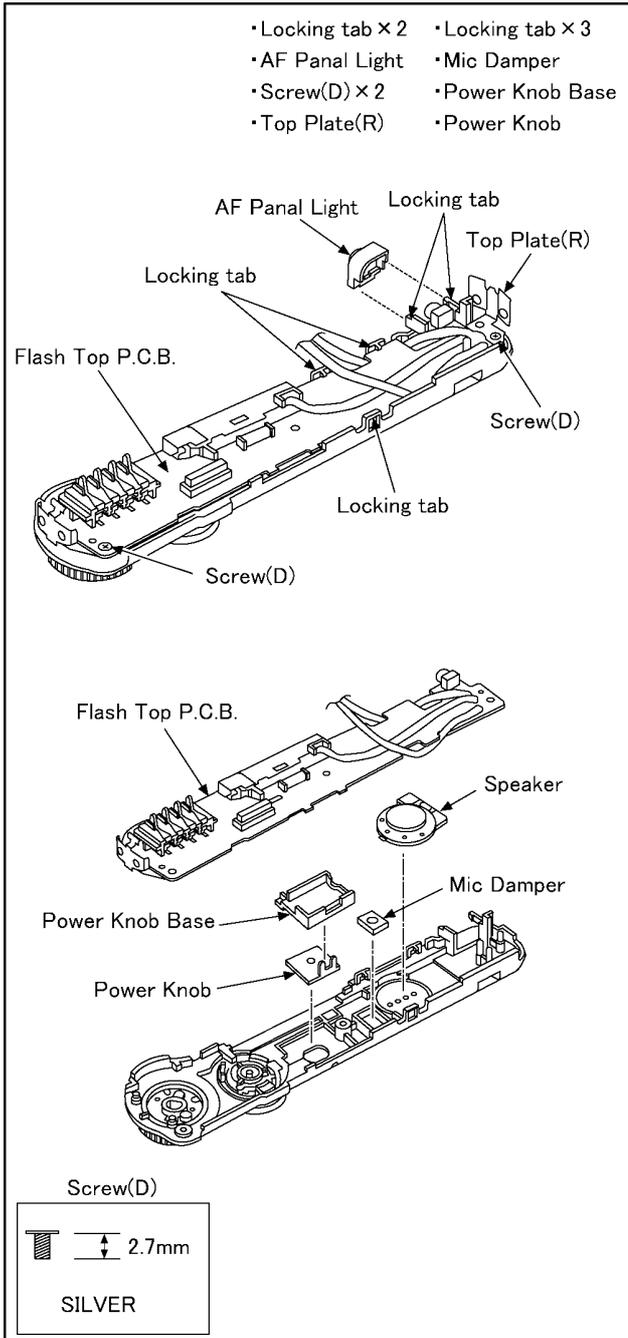
**CAUTION**

**Be sure to discharge the capacitor on E.Capacitor P.C.B. before disassembling.**

1. Remove the E.Capacitor 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.D6)

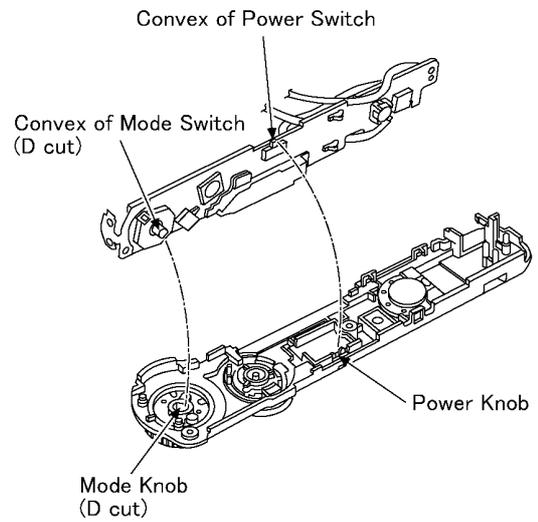
### 8.3.6. Removal of the Flash Top P.C.B. and Speaker



(Fig.D7)

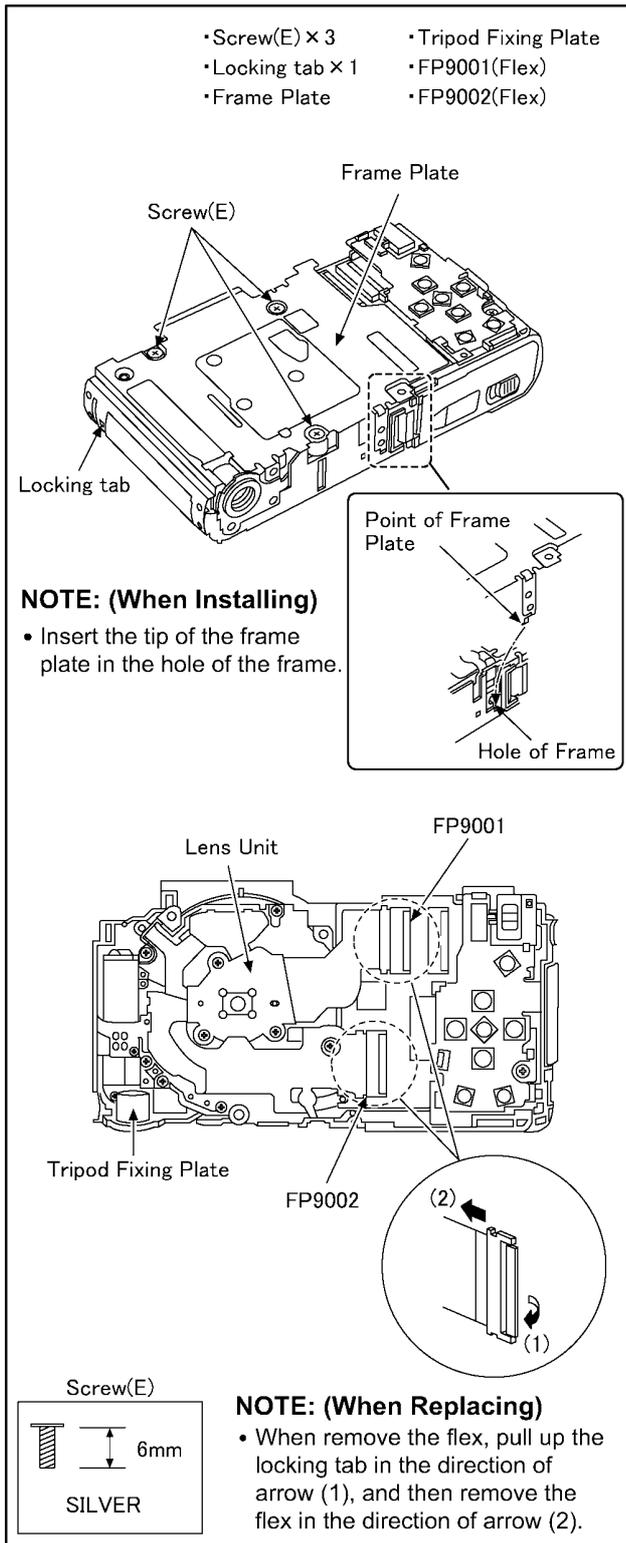
#### NOTE: (When Installing)

- Align the convex of power switch and power knob.
- Align the convex of mode switch (D cut) and mode knob (D cut).

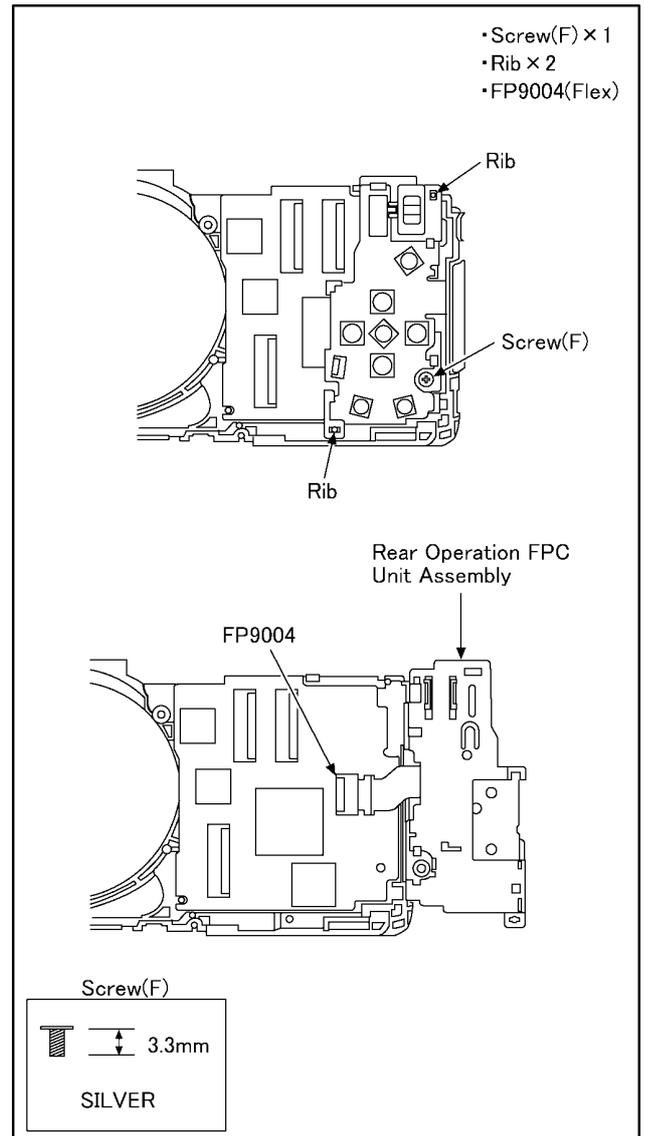


(Fig.D8)

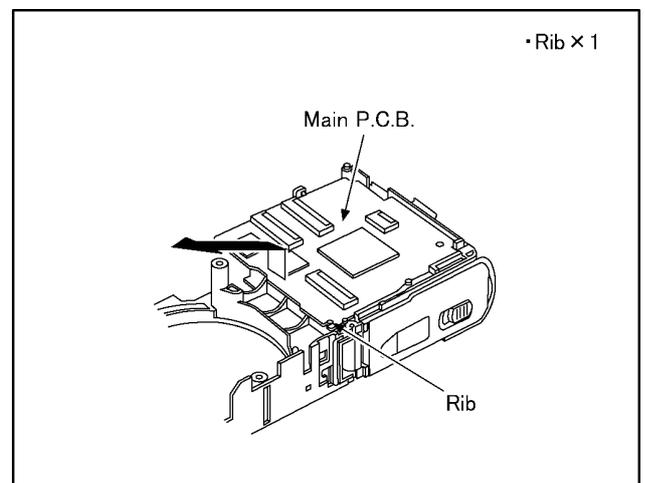
### 8.3.7. Removal of the Lens Unit



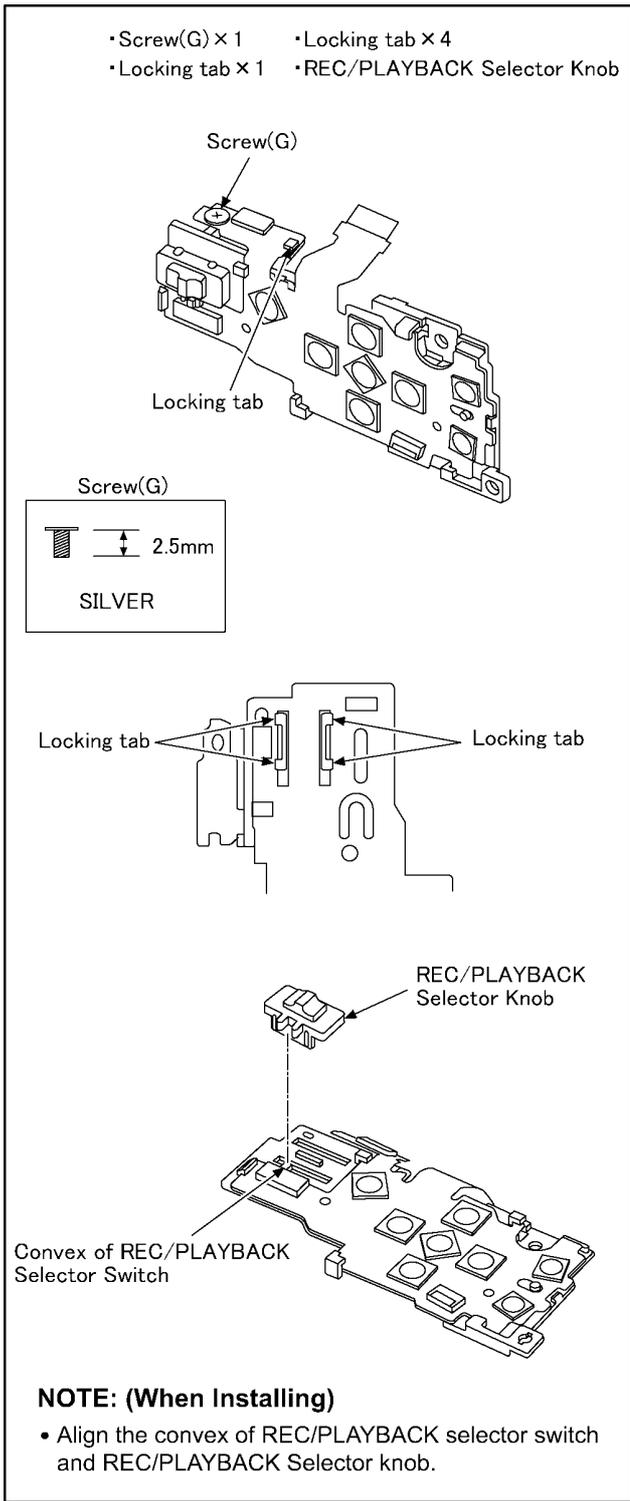
### 8.3.8. Removal of the Rear Operation FPC Unit Assembly



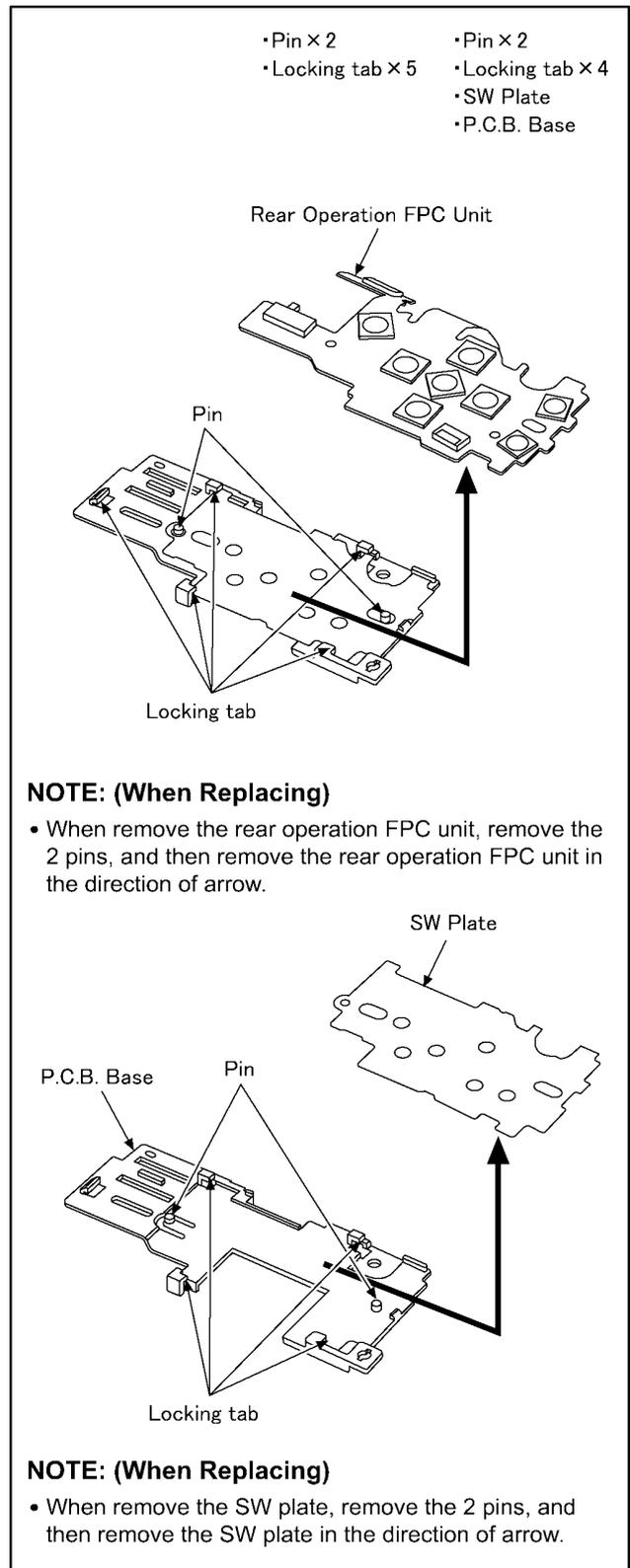
### 8.3.9. Removal of the Main P.C.B.



### 8.3.10. Removal of the Rear Operation FPC Unit

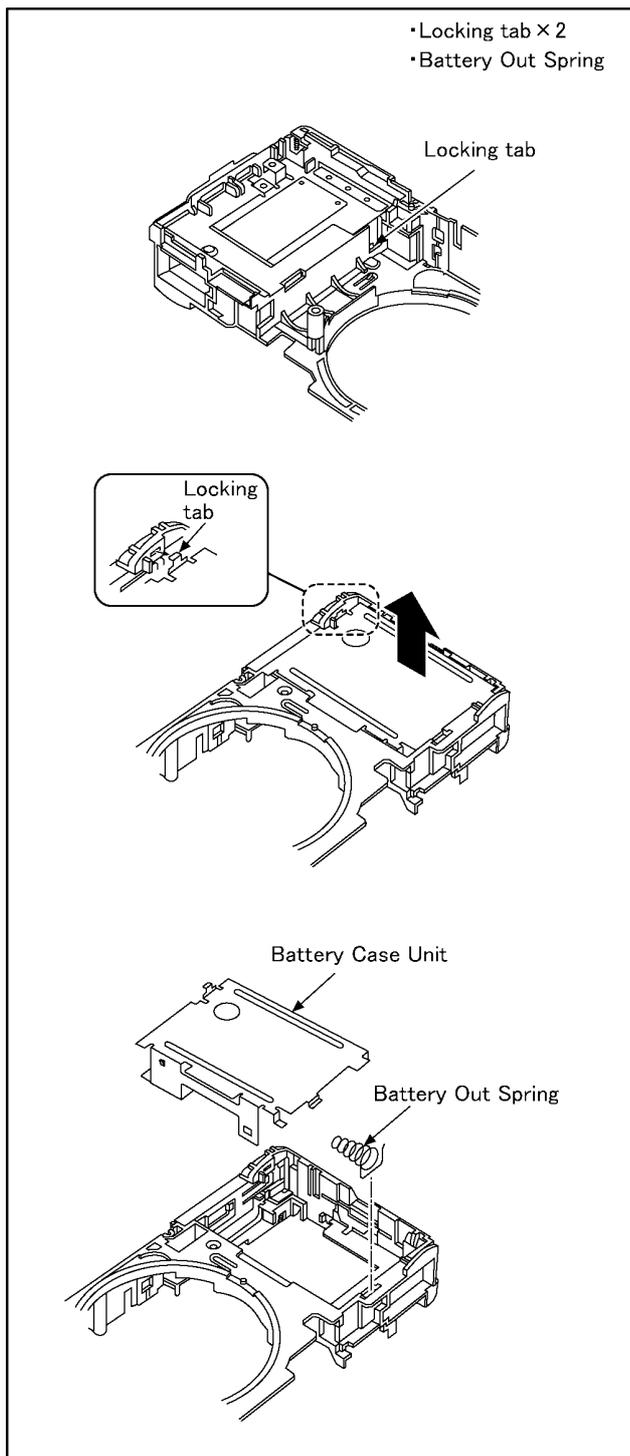


(Fig.D12)



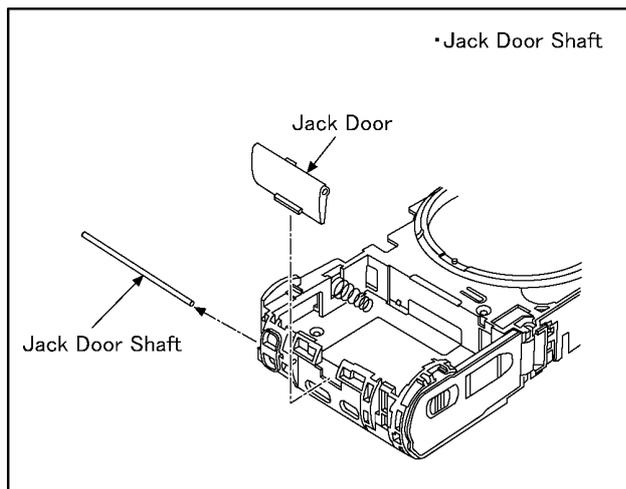
(Fig.D13)

### 8.3.11. Removal of the Battery Case Unit



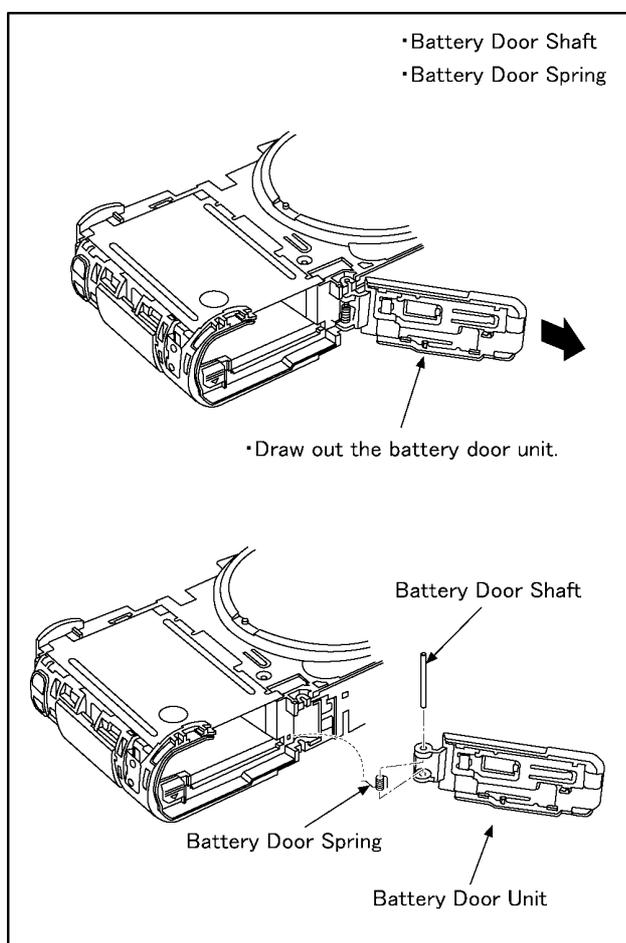
(Fig.D14)

### 8.3.12. Removal of the Jack Door



(Fig.D15)

### 8.3.13. Removal of the Battery Door Unit



(Fig.D16)

**NOTE: (When Installing)**

- Be sure to confirm the following points when installing.
- The Screw is tightened enough.
  - Installing 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).

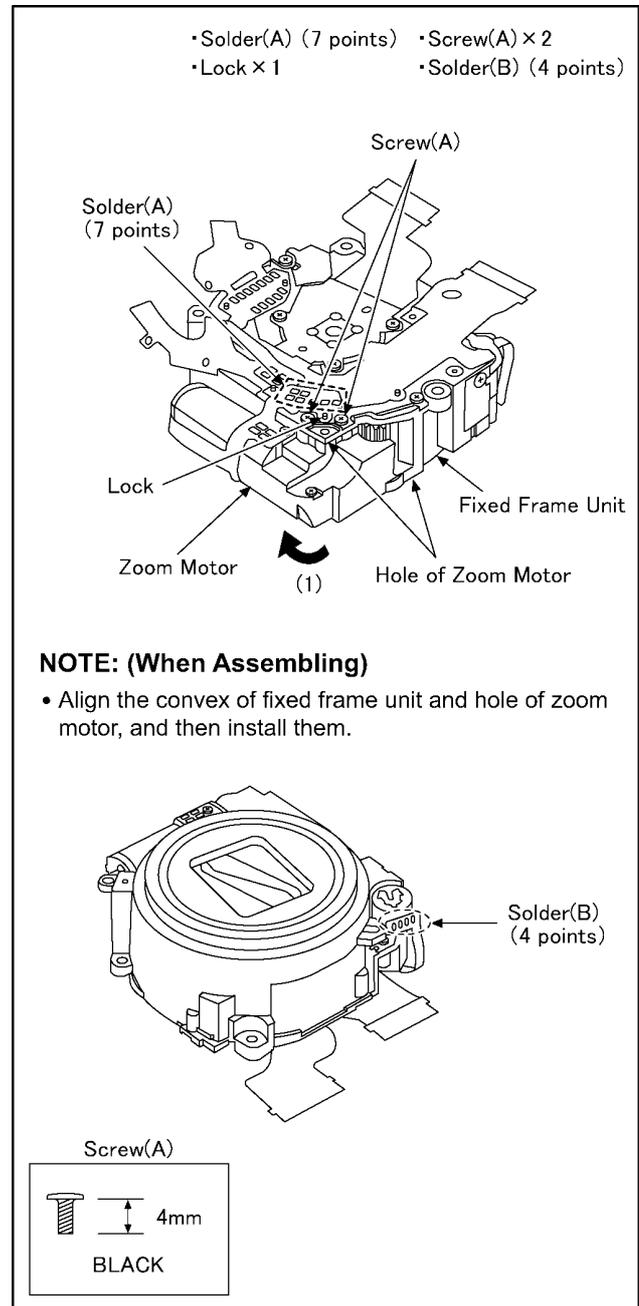
5. Apply the grease (RFKZ0472) to the point where is shown to "THE APPLICATION OF GREASE METHOD" in the figure.

When the grease is applied, use a toothpick and apply thinly.

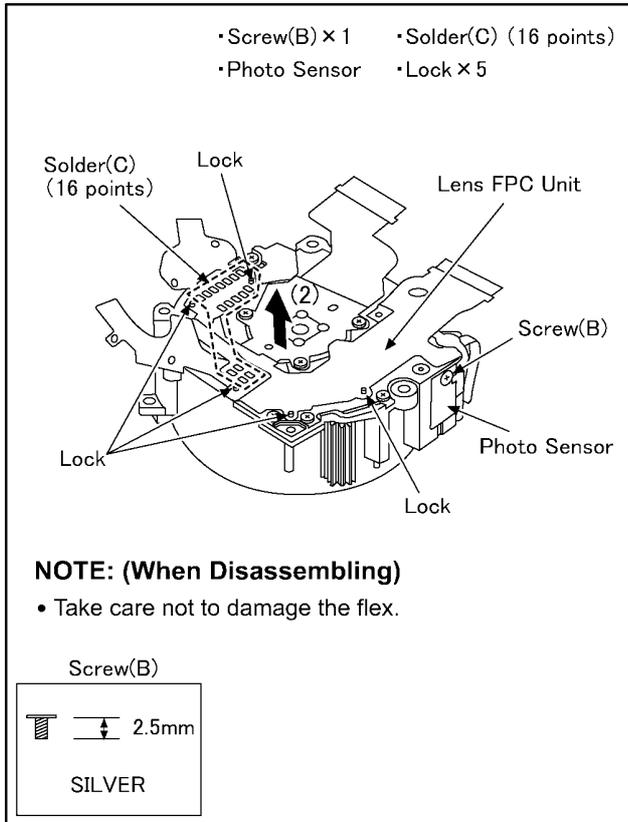
6. When repair the fixed frame unit, drive frame unit and penetration cam frame, must be unit exchange.

## 8.4.1. Removal of the Zoom Motor and Lens FPC Unit

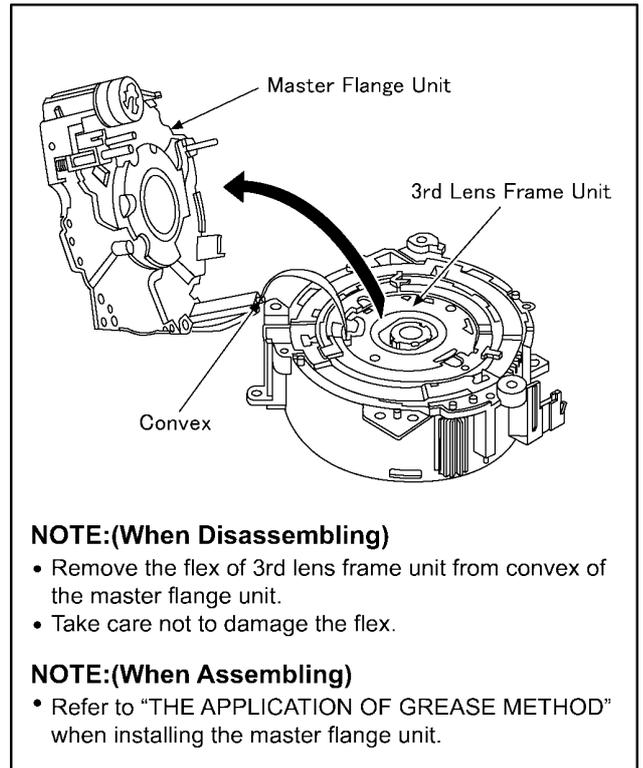
1. Remove the 7 solders (A).
2. Remove the 1 lock.
3. Unscrew the 2 screws (A).
4. Remove the zoom motor to the direction of arrow (1).
5. Remove the 4 solders (B).



6. Unscrew the 1 screw (B).
7. Remove the photo sensor.
8. Remove the 16 solders (C).
9. Remove the 5 locks.
10. Remove the lens FPC unit to the direction of arrow (2).

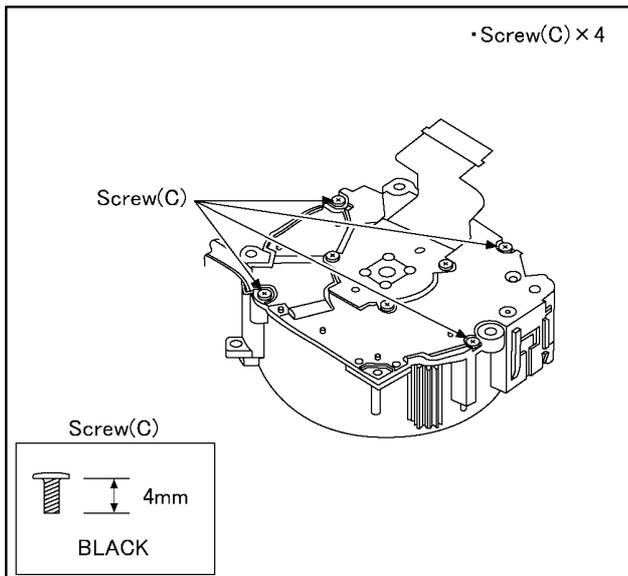


2. Remove the master flange unit.



### 8.4.2. Removal of the Master Flange Unit

1. Unscrew the 4 screws (C).



### 8.4.3. Removal of the 1st Lens Frame Unit/2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit

1. Push the both sides cam frame from the lens front side in the direction of arrow, and then remove the unit of 1st lens frame unit/2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit from the fixed frame unit/drive frame unit/penetration cam frame/1st direct frame unit.

**■ CAUTION**

- Fixed Frame Unit/Drive Frame Unit/Penetration Cam Frame cannot exchange single part because of original performance maintenance. Necessary unit exchange by using the repair parts (Fix/Drive/Cam Frame Unit).

1st Lens Frame Unit/2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit

Drive Frame Unit/Fixed Frame Unit/Penetration Cam Frame/1st Direct Frame Unit

**NOTE: (When Disassembling)**

- Take care not to damage the flex.
- When lift the 1st lens frame unit/2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit, take care not to put fingerprint of the lens.

### 8.4.4. Removal of the 2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit

1. Turn the 2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit in the direction of the arrow (1) fully, and then remove them in the direction of the arrow (2).

(2)

(1) 2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit

2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit

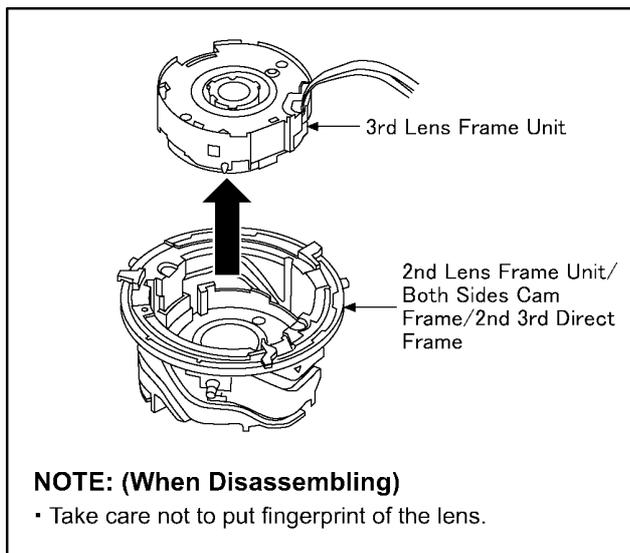
1st Lens Frame Unit

**NOTE: (When Disassembling)**

- Take care not to damage the flex.

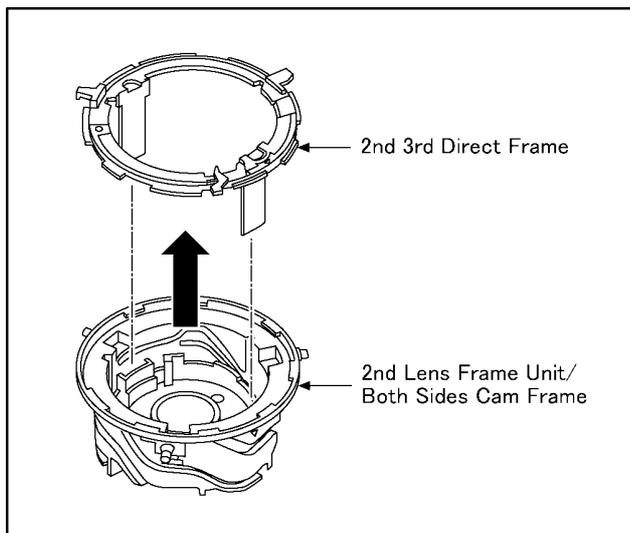
### 8.4.5. Removal of the 3rd Lens Frame Unit

1. Remove the 3rd lens frame unit in the direction of the arrow.



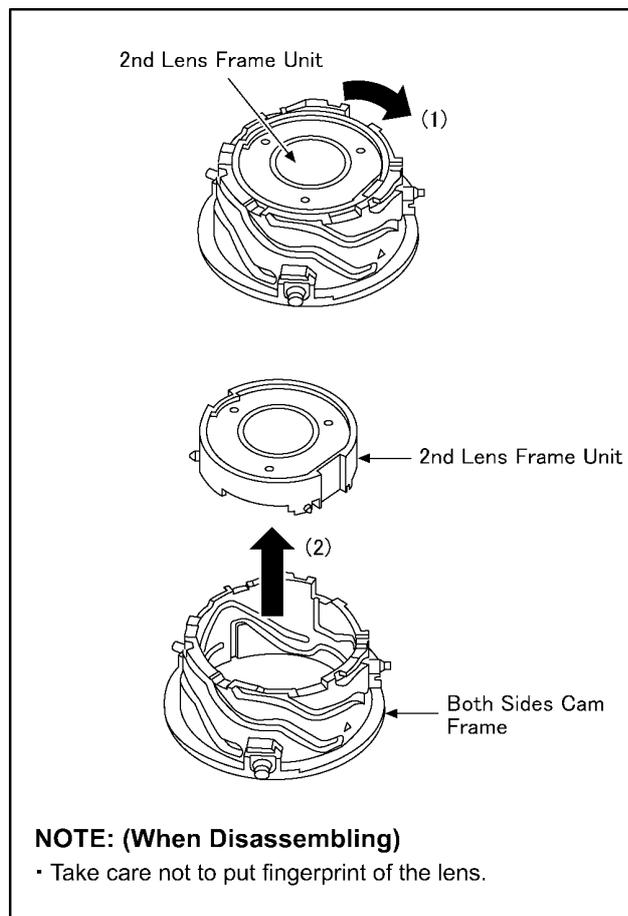
### 8.4.6. Removal of the 2nd 3rd Direct Frame

1. Remove the 2nd 3rd direct frame in the direction of the arrow.



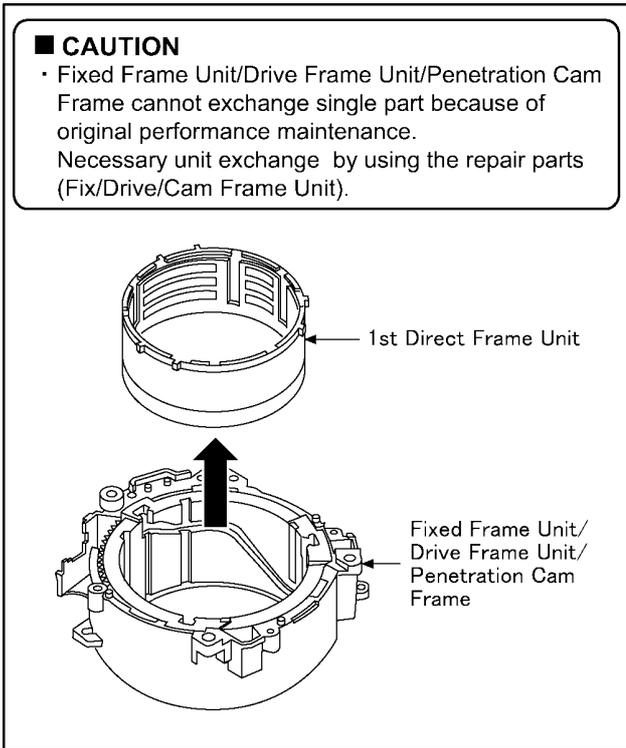
### 8.4.7. Removal of the 2nd Lens Frame Unit

1. Turn the 2nd lens frame unit in the direction of the arrow (1) a little, and then remove it in the direction of the arrow (2).



### 8.4.8. Removal of the 1st Direct Frame Unit

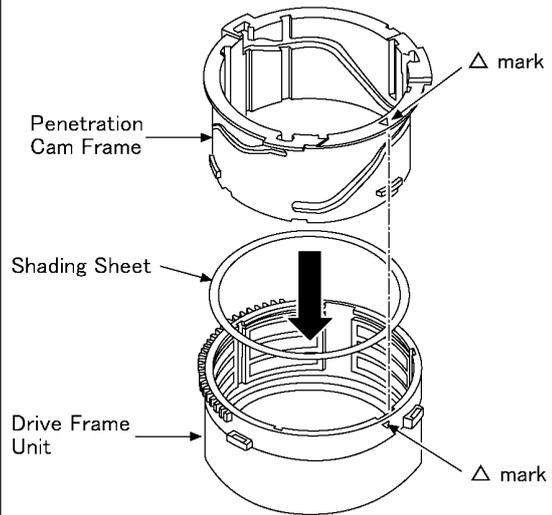
1. Remove the 1st direct frame unit in the direction of the arrow.



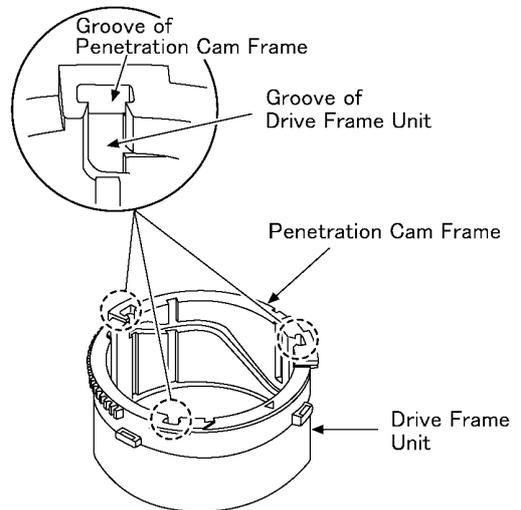
### 8.5. Assembly Procedure for the Lens

#### 8.5.1. Phase alignment of the Penetration Cam Frame and Drive Frame Unit

- Insert the shading sheet to drive frame unit. (When insert the shading sheet, so that the luster side facing to subject side.)
- Align the  $\Delta$  mark of penetration cam frame and the  $\Delta$  mark of drive frame unit, and then install the penetration cam frame to drive frame unit.

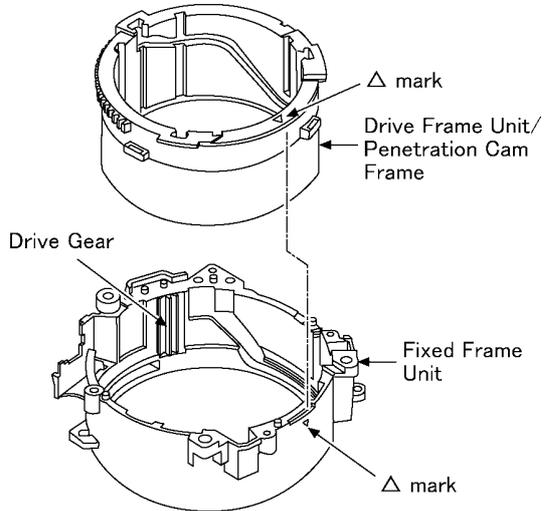


- Align the phase of the groove of penetration cam frame and the groove of drive frame unit (3 points).



### 8.5.2. Phase alignment of the Drive Frame Unit/Penetration Cam Frame and Fixed Frame Unit

- Align the  $\Delta$  mark of drive frame unit/penetration cam frame and the  $\Delta$  mark of fixed frame unit, and then install the drive frame unit/penetration cam frame to fixed frame unit.

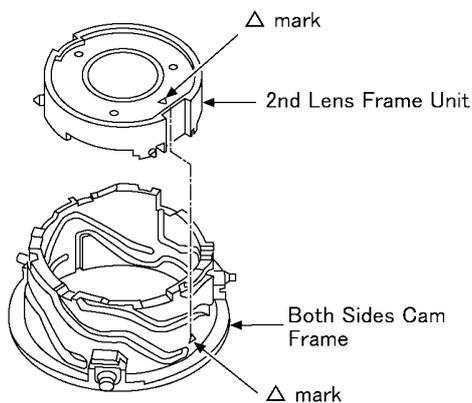


**NOTE: (When Assembling)**

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

### 8.5.3. Phase alignment of the 2nd Lens Frame Unit and Both Sides Cam Frame

- Align the  $\Delta$  mark of 2nd lens frame unit and the  $\Delta$  mark of both sides cam frame, and then install the 2nd lens frame unit to both sides cam frame.

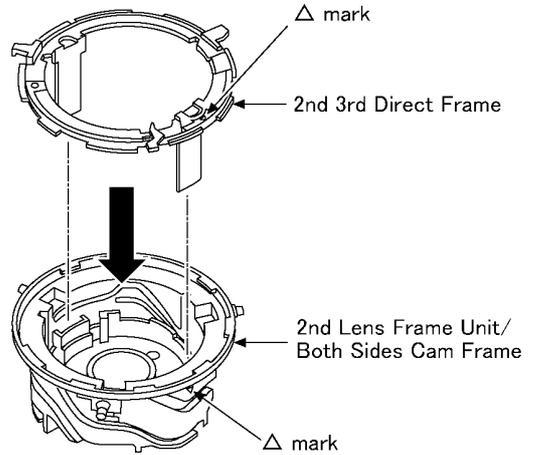


**NOTE: (When Assembling)**

- Take care not to put fingerprint of the lens.

### 8.5.4. Phase alignment of the 2nd 3rd Direct Frame and 2nd Lens Frame Unit/Both Sides Cam Frame

- Align the  $\Delta$  mark of 2nd 3rd direct frame and the  $\Delta$  mark of 2nd lens frame unit/both sides cam frame, and then install the 2nd 3rd direct frame to 2nd lens frame unit/both sides cam frame.

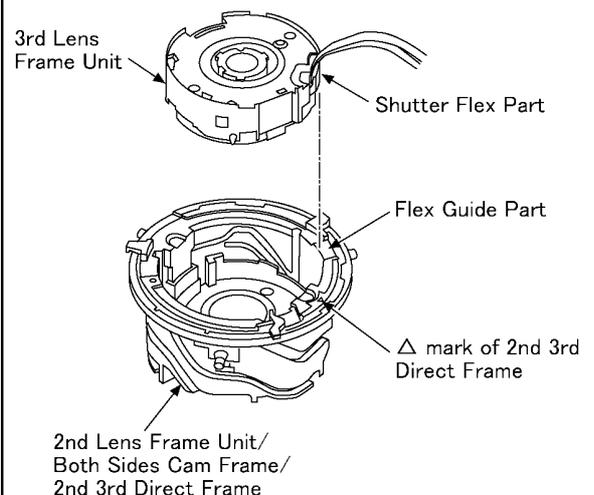


**NOTE: (When Assembling)**

- Take care not to put fingerprint of the lens.

### 8.5.5. Phase alignment of the 3rd Lens Frame Unit and 2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame

- Align the flex guide part on left side of  $\Delta$  mark of 2nd 3rd direct frame and the shutter flex part of 3rd lens frame unit, and then install the 3rd lens frame unit to 2nd 3rd direct frame.

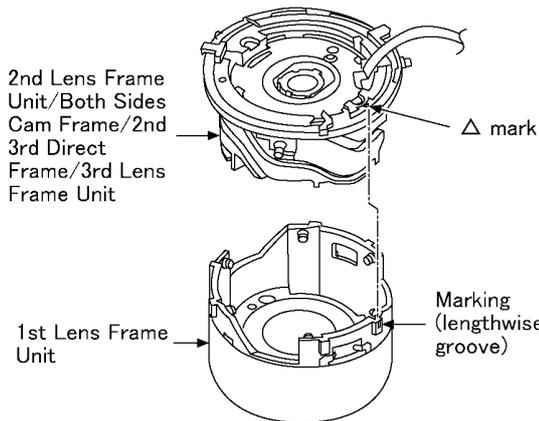


**NOTE: (When Assembling)**

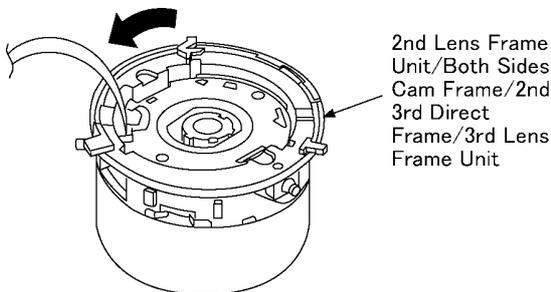
- Take care not to put fingerprint of the lens.
- Take care not to damage the flex.

**8.5.6. Phase alignment of the 2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit and 1st Lens Frame Unit**

1. Align the  $\Delta$  mark of 2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit and the marking (lengthwise groove) of 1st lens frame unit, and then install the 2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit to 1st lens frame unit.



2. Install the 2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit to 1st lens frame unit and then turn in the direction of the arrow fully.

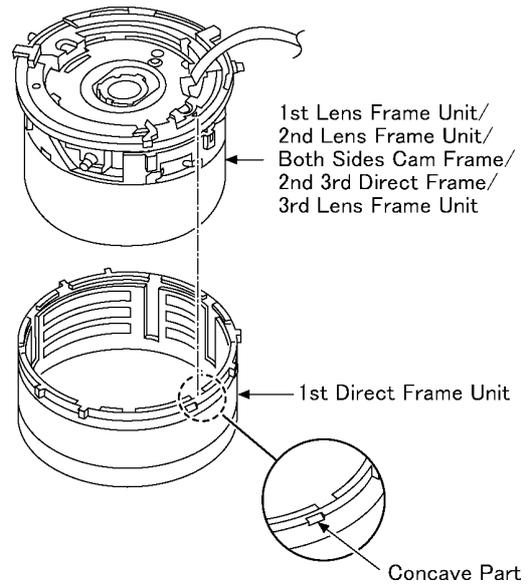


**NOTE: (When Assembling)**

- Take care not to put fingerprint of the lens.
- Take care not to damage the flex.

**8.5.7. Phase alignment of the 1st Lens Frame Unit/2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit and 1st Direct Frame Unit**

- Align the  $\Delta$  mark of 1st lens frame unit/2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit and the concave part of 1st direct frame unit, and then install the 1st lens frame unit/2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit to 1st direct frame unit.

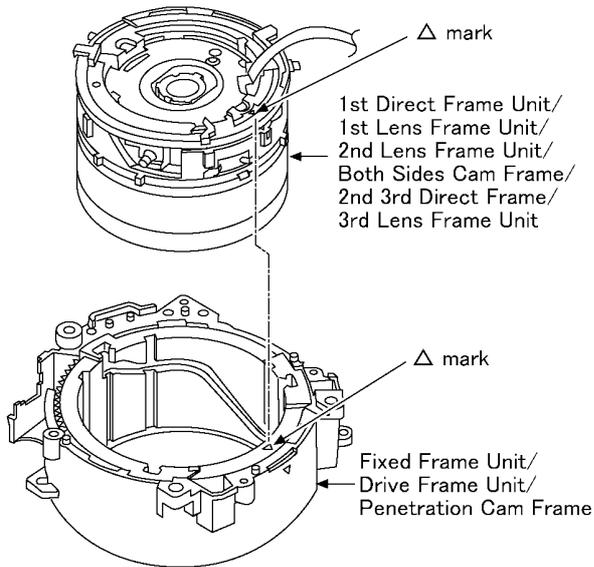


**NOTE: (When Assembling)**

- Take care not to put fingerprint of the lens.
- Take care not to damage the flex.

### 8.5.8. Phase alignment of the 1st Direct Frame Unit/1st Lens Frame Unit/2nd Lens Frame Unit/Both Sides Cam Frame/2nd 3rd Direct Frame/3rd Lens Frame Unit and Fixed Frame Unit/Drive Frame Unit/Penetration Cam Frame

- Align the  $\Delta$  mark of 1st direct frame unit/1st lens frame unit/2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit and the  $\Delta$  mark of fixed frame unit/drive frame unit/penetration cam frame, and then install the 1st direct frame unit/1st lens frame unit/2nd lens frame unit/both sides cam frame/2nd 3rd direct frame/3rd lens frame unit to fixed frame unit/drive frame unit/penetration cam frame.

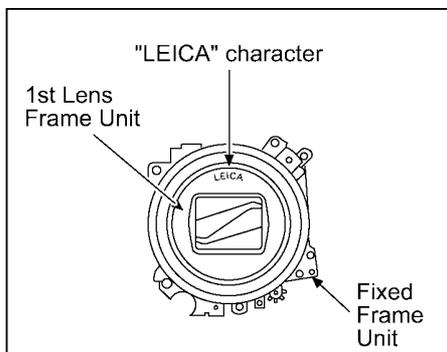


#### NOTE: (When Assembling)

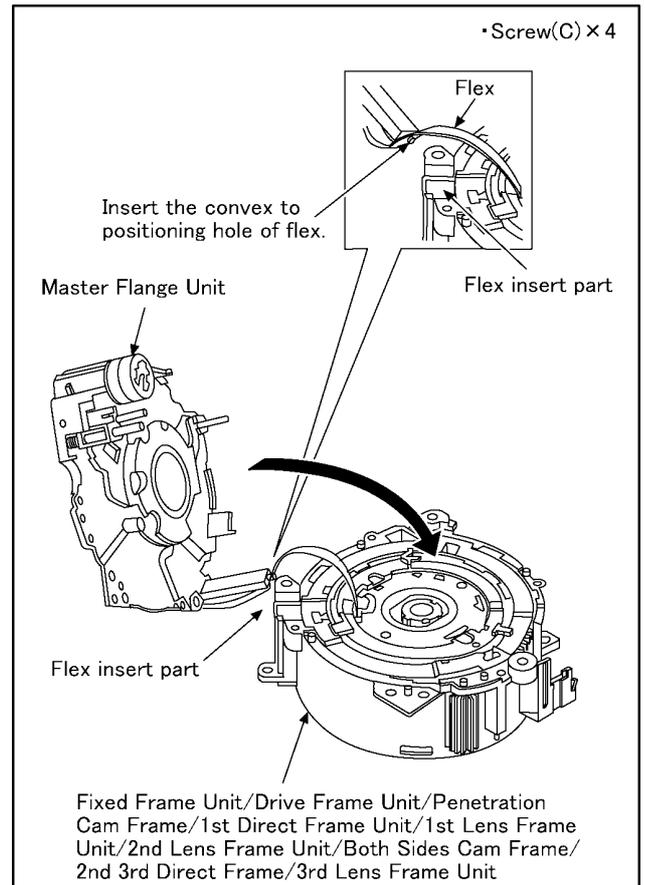
- Take care not to put fingerprint of the lens.
- Take care not to damage the flex.

#### FRONT VIEW

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

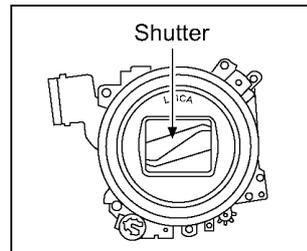


### 8.5.9. Install of the Master Flange Unit

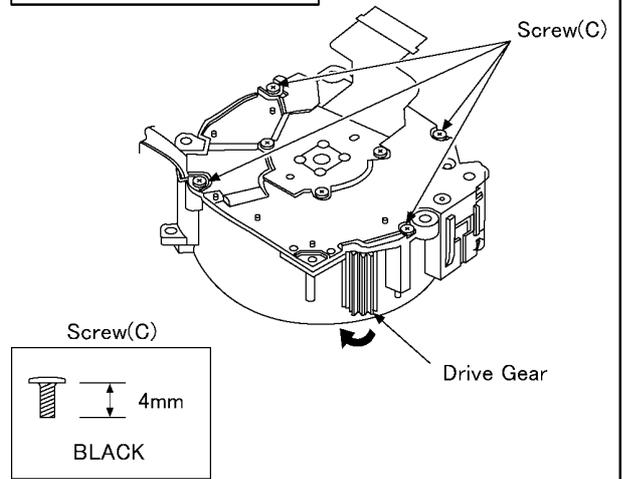


#### NOTE: (When Assembling)

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



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



### 8.5.10. Install of the Lens FPC Unit and Zoom Motor

### 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.

- Lock × 5
- Solder(C) (16 points)
- Photo Sensor
- Screw(B) × 1
- Solder(B) (4 points)
- Screw(A) × 2
- Lock × 1
- Solder(A) (7 points)

**NOTE: (When Assembling)**

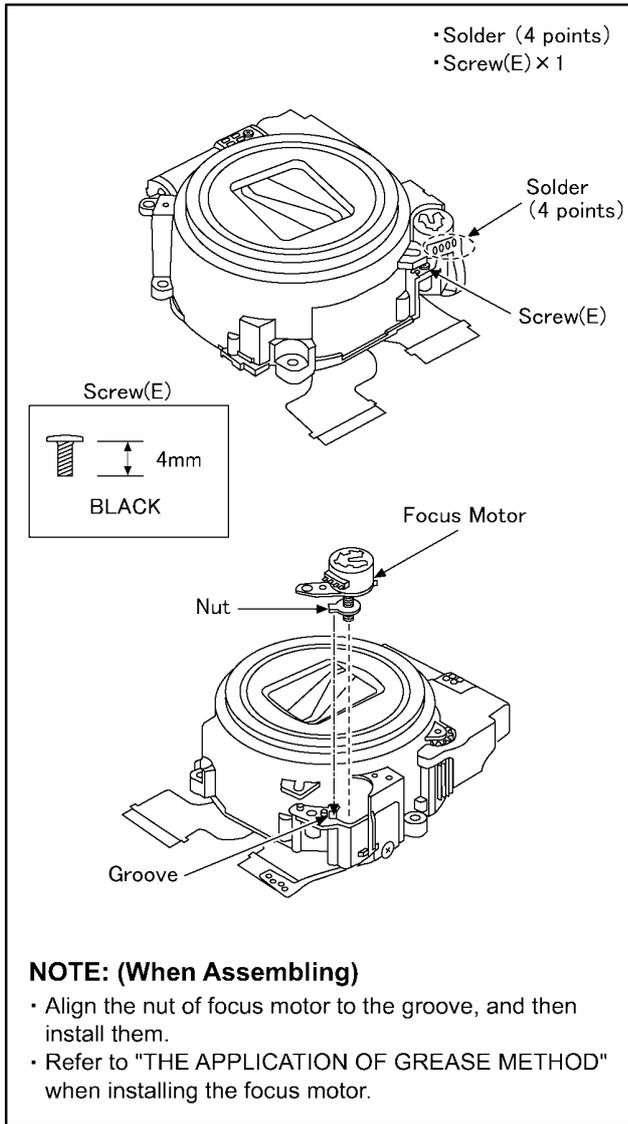
- Align the convex of fixed frame unit and hole of zoom motor, and then install them.

Screw(B)	Screw(A)
SILVER	BLACK

- Screw(D) × 3

Screw(D)
BLACK

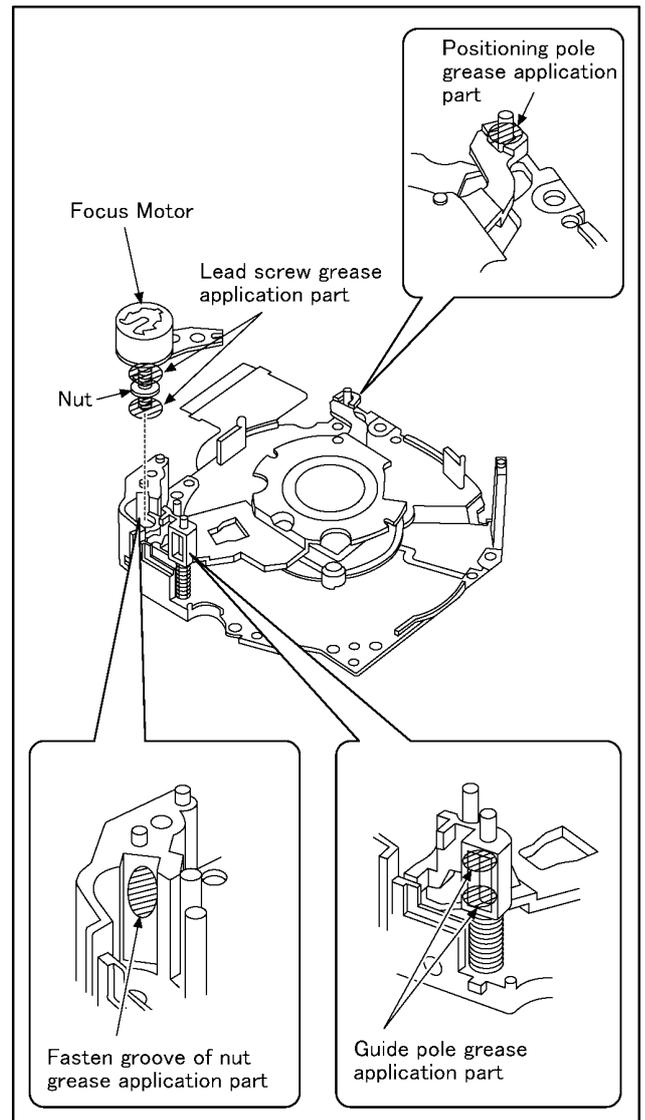
## 8.7. Removal of the Focus Motor



## 8.8. The Application of Grease Method

The grease application parts 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.

- Focus motor (lead screw)/Fasten groove of nut/Guide pole
  - Grease: RFKZ0472
  - Amount of application: 2 - 4 mg
- Positioning pole
  - Grease: RFKZ0472
  - Amount of application: 1 - 2 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:**

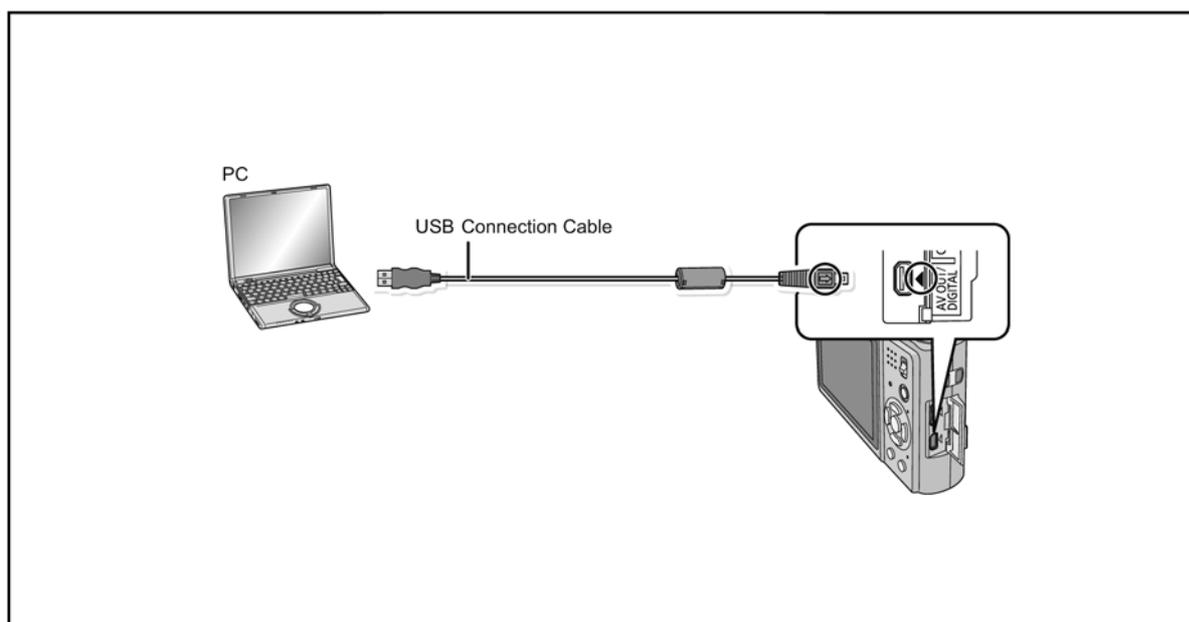
After adjustments have been terminated, make sure to achieve "INITIAL SETTINGS".

Adjustment Item		Replaced Part							
		Main P.C.B.	Rear OPE FPC Unit	Flash Top P.C.B.	VENUS (IC6001)	Flash-ROM (IC6002)	Lens Part (Excluding CCD)	CCD Unit	GYRO (IC7301/IC9501)
Camera Section	OIS hall element adjustment (OIS)	○	-	-	○	○	○	-	-
	Back focus adjustment, Gyro adjustment (BF)	○	○	○	○	○	○	○ <sup>*1</sup>	○
	Shutter adjustment (SHT)	○	-	-	○	○	○	○	-
	ISO sensitivity adjustment (ISO)	○	-	-	○	○	○	○	-
	AWB adjustment, High brightness coloration inspection (WBL)	○	-	-	○	○	○	○	-
	CCD white scratch compensation (WKI)	○	-	-	○	○	-	○ <sup>*1</sup>	-
	CCD black scratch compensation (BKI)	○	-	-	○	○	-	○ <sup>*1</sup>	-
	Venus zoom inspection (PZM)	○	-	-	○	○	-	-	-
	Monitor linearity inspection (MLN)	○	-	-	○	○	○	○	-
	Colour reproduction inspection, MIC inspection (COL)	○	-	-	○	○	○	○	-

\*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 its surface.

**Note:**

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

# Service Manual

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## Diagrams and Replacement Parts List

### Digital Camera

Model No.

DMC-ZX1EB	DMC-ZR1PR
DMC-ZX1EE	DMC-ZR1PU
DMC-ZX1EF	DMC-ZR1GC
DMC-ZX1EG	DMC-ZR1GD
DMC-ZX1EP	DMC-ZR1GH
DMC-ZX1SG	DMC-ZR1GK
DMC-ZR1P	DMC-ZR1GN
DMC-ZR1PC	DMC-ZR1GT

Vol. 1

Colour

(S).....Silver Type (except PR/EF/GD/GT)

(K).....Black Type

(A).....Blue Type (only P/PC/EB/EF/EG/EP/GN)

(R).....Red Type (except PR/EE/GD/GK)

(W).....White Type (only PC/EB/EF/EG/EP/SG/GH/GK)

### Table of contents

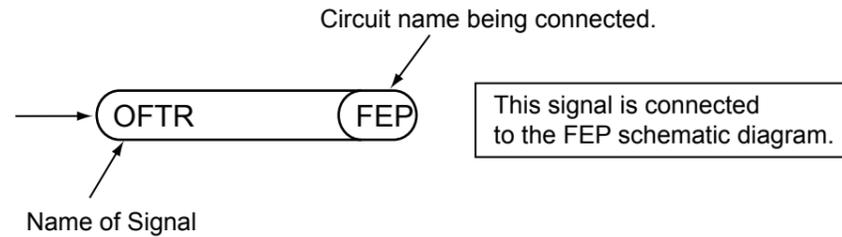
S1. About Indication of The Schematic Diagram.....	S-1
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## S1. About Indication of The Schematic Diagram

### 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

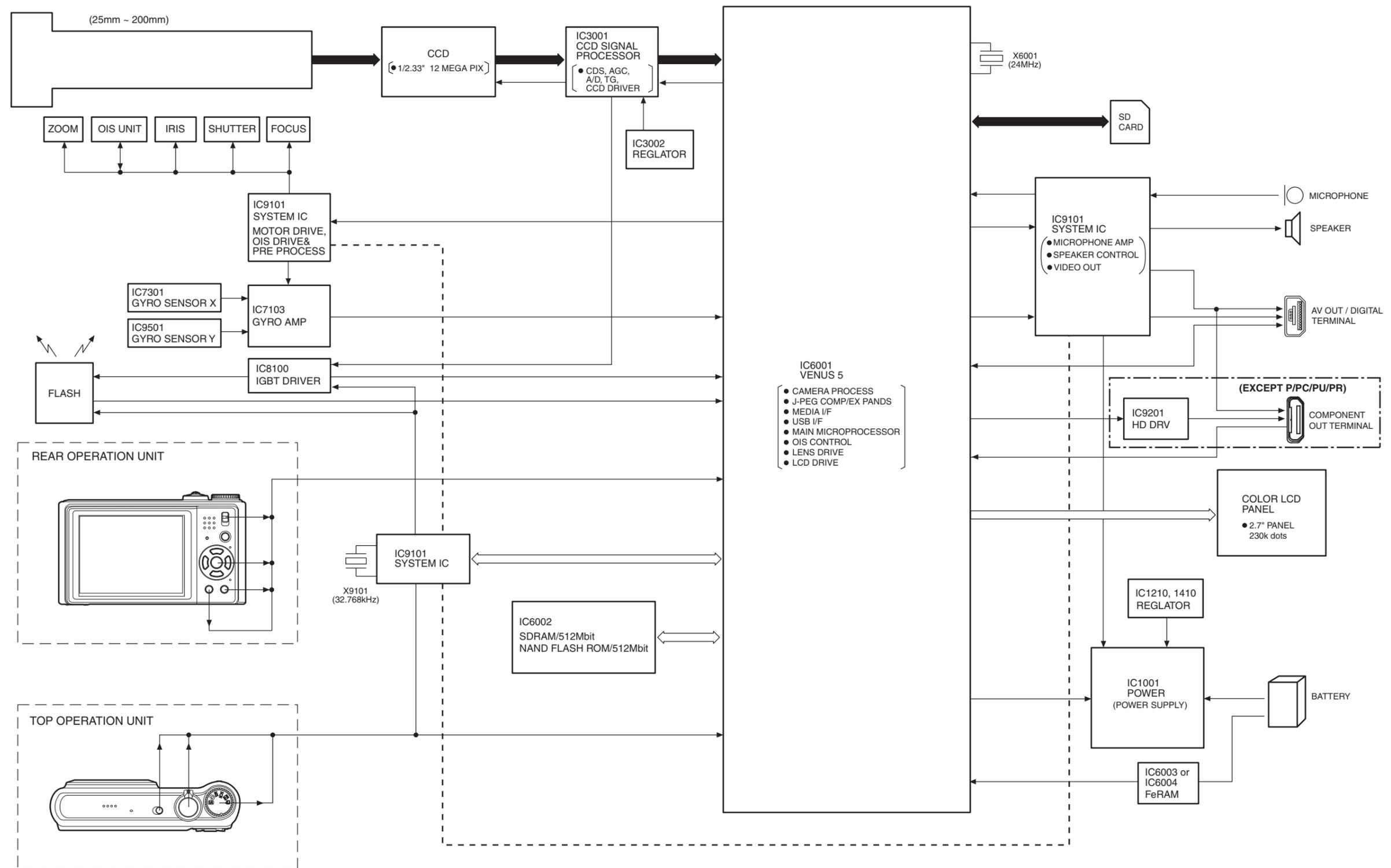
Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.  
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

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

REF No.	PIN No.	POWER ON
IC8100	1	0
IC8100	2	0
IC8100	3	0
IC8100	4	0
IC8100	5	6.1
IC8100	6	0
IC8100	7	0
IC8100	8	0
IC8100	9	5.5
IC8100	10	6.9

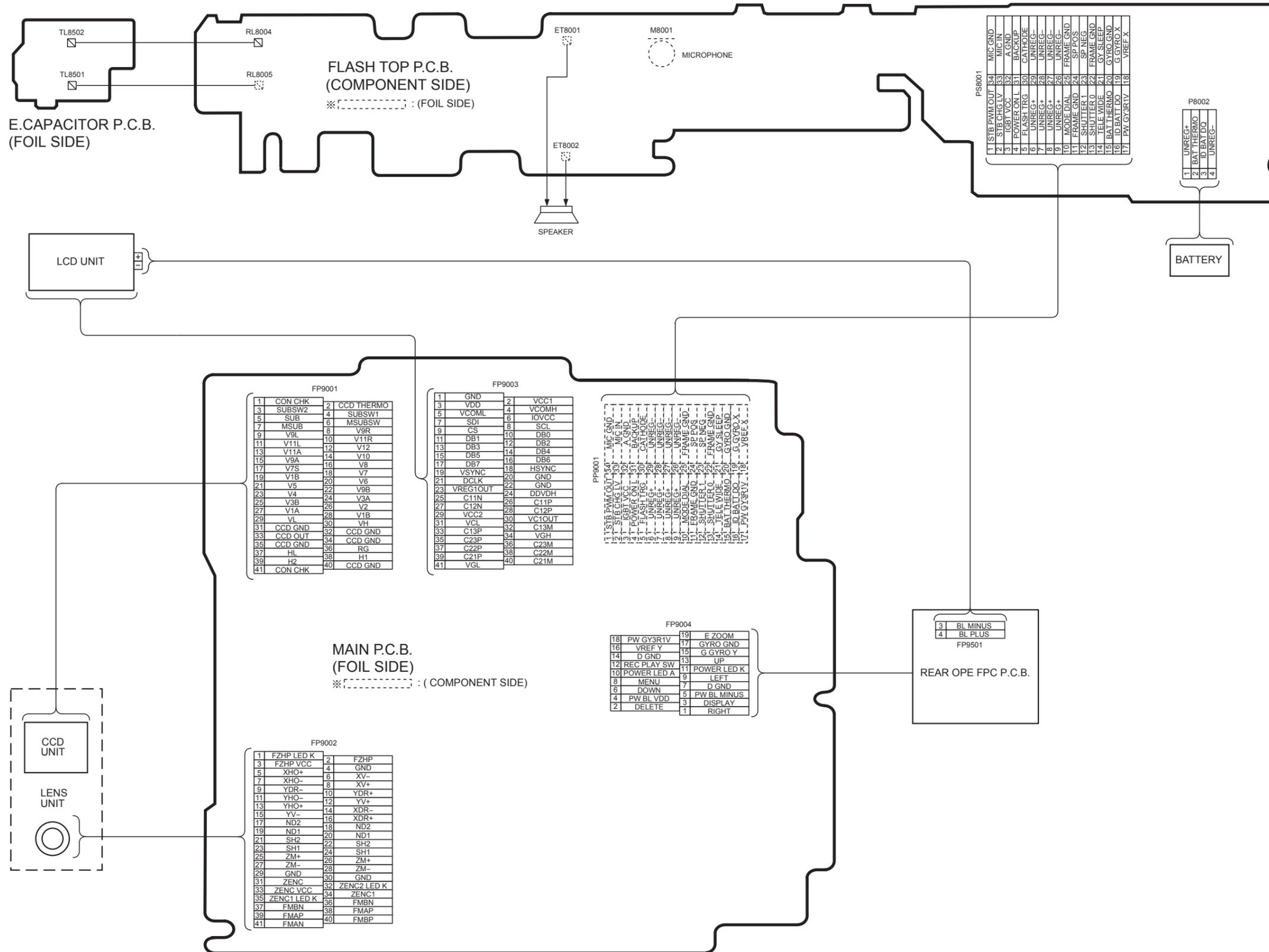
# S3. Block Diagram

## S3.1. Overall Block Diagram

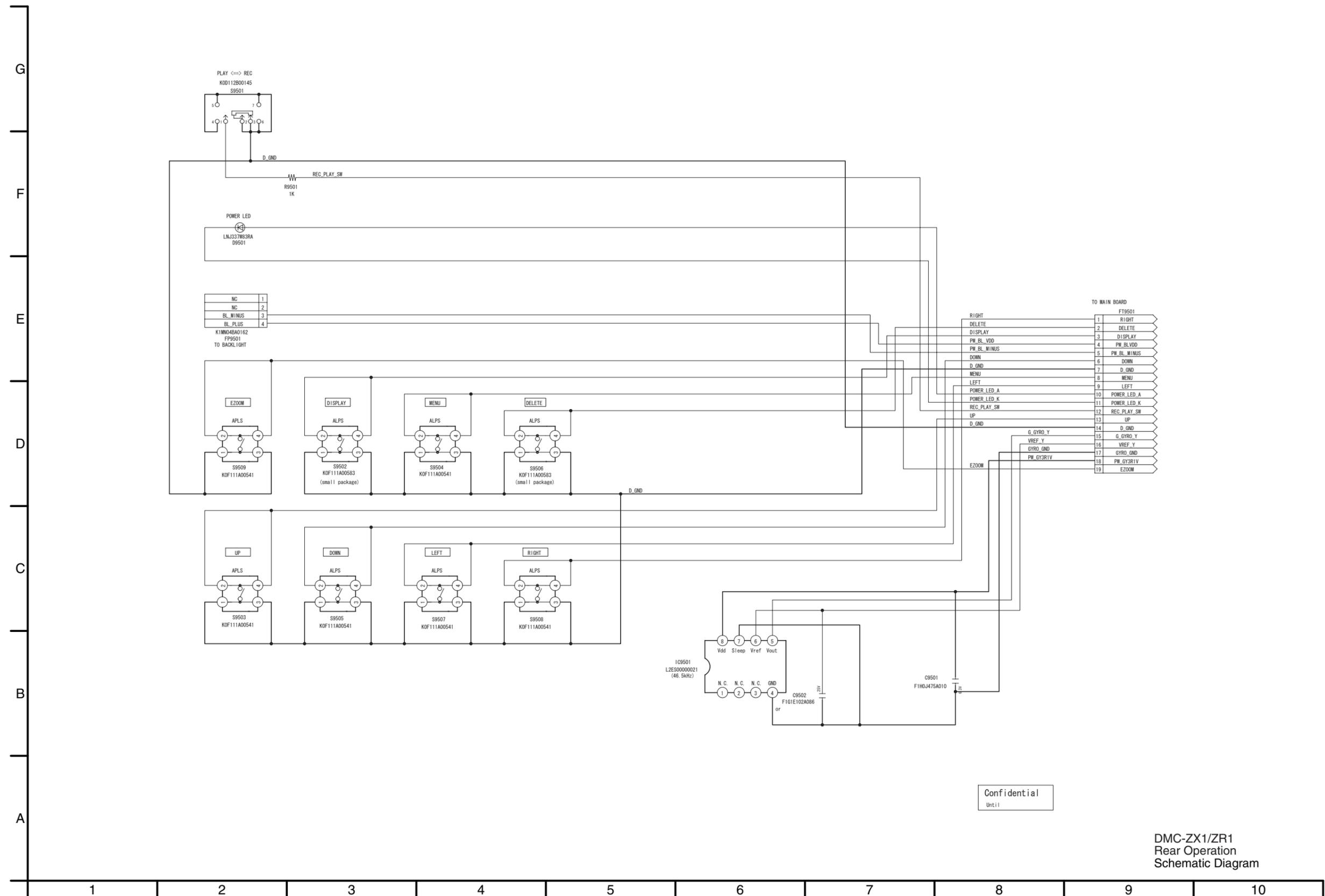


# S4. Schematic Diagram

## S4.1. Interconnection Diagram

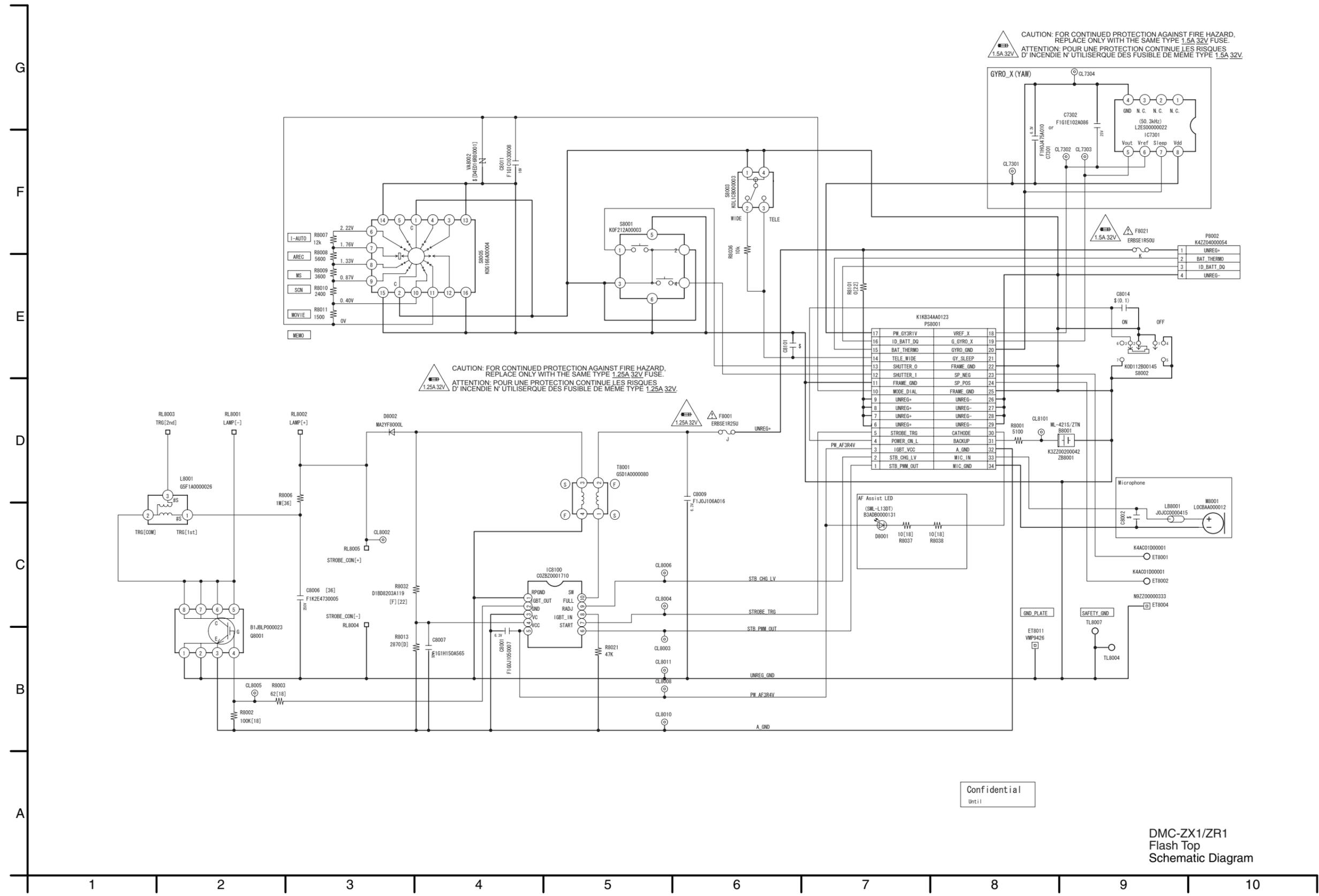


## S4.2. Rear Operation Schematic Diagram



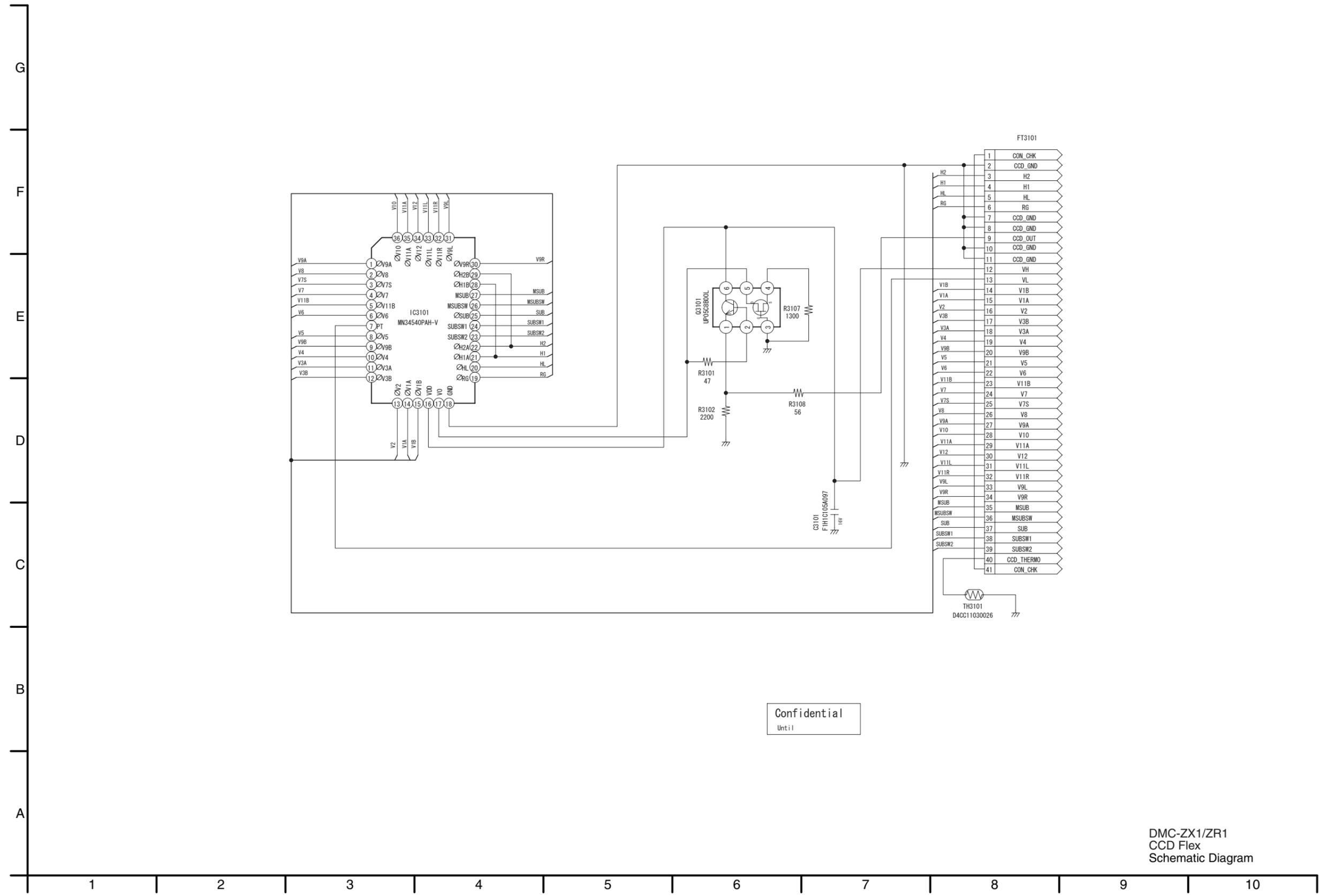
Confidential  
Unit 1

# S4.3. Flash Top Schematic Diagram



Confidential  
Until

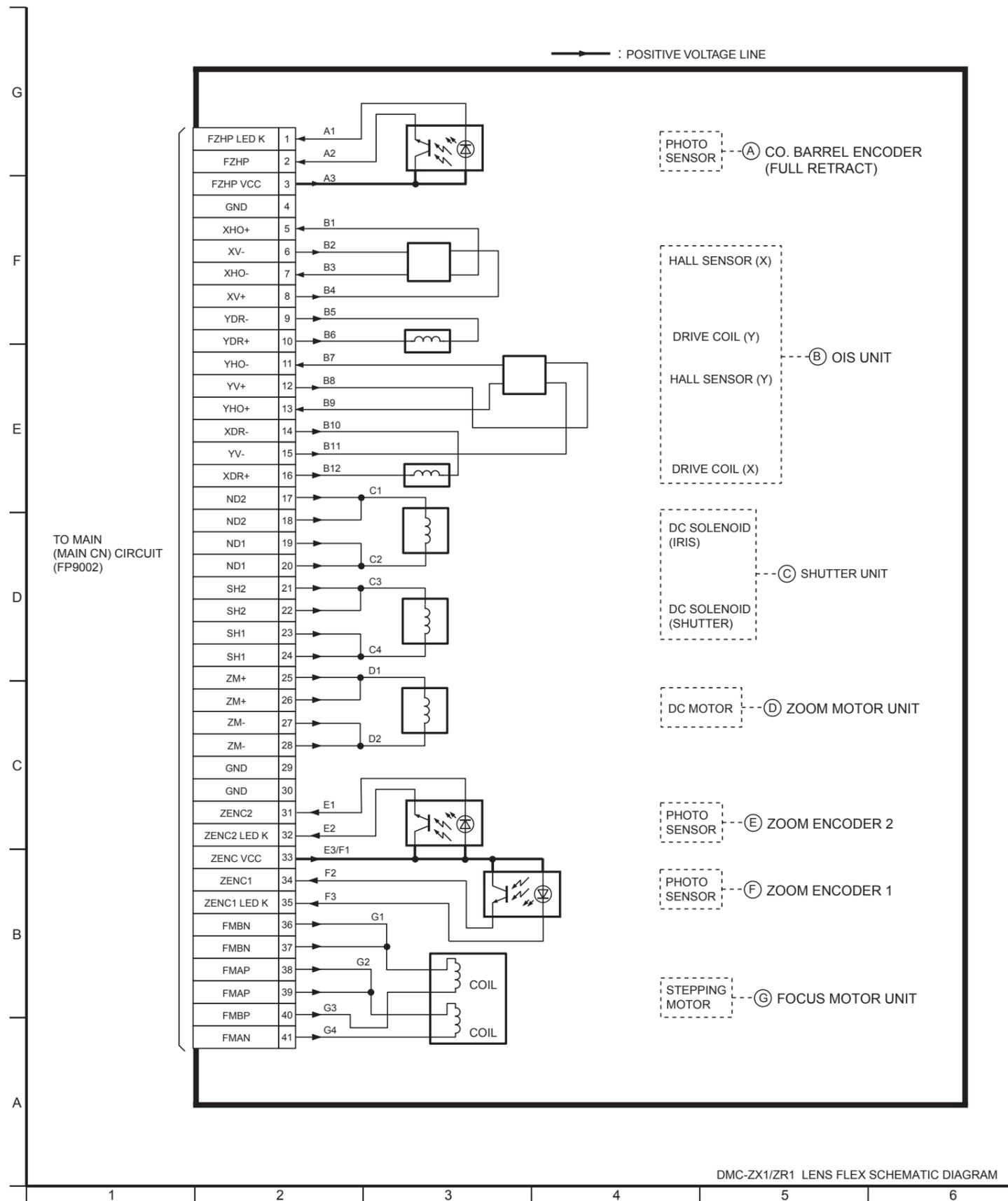
# S4.4. CCD Flex Schematic Diagram



Confidential  
Until

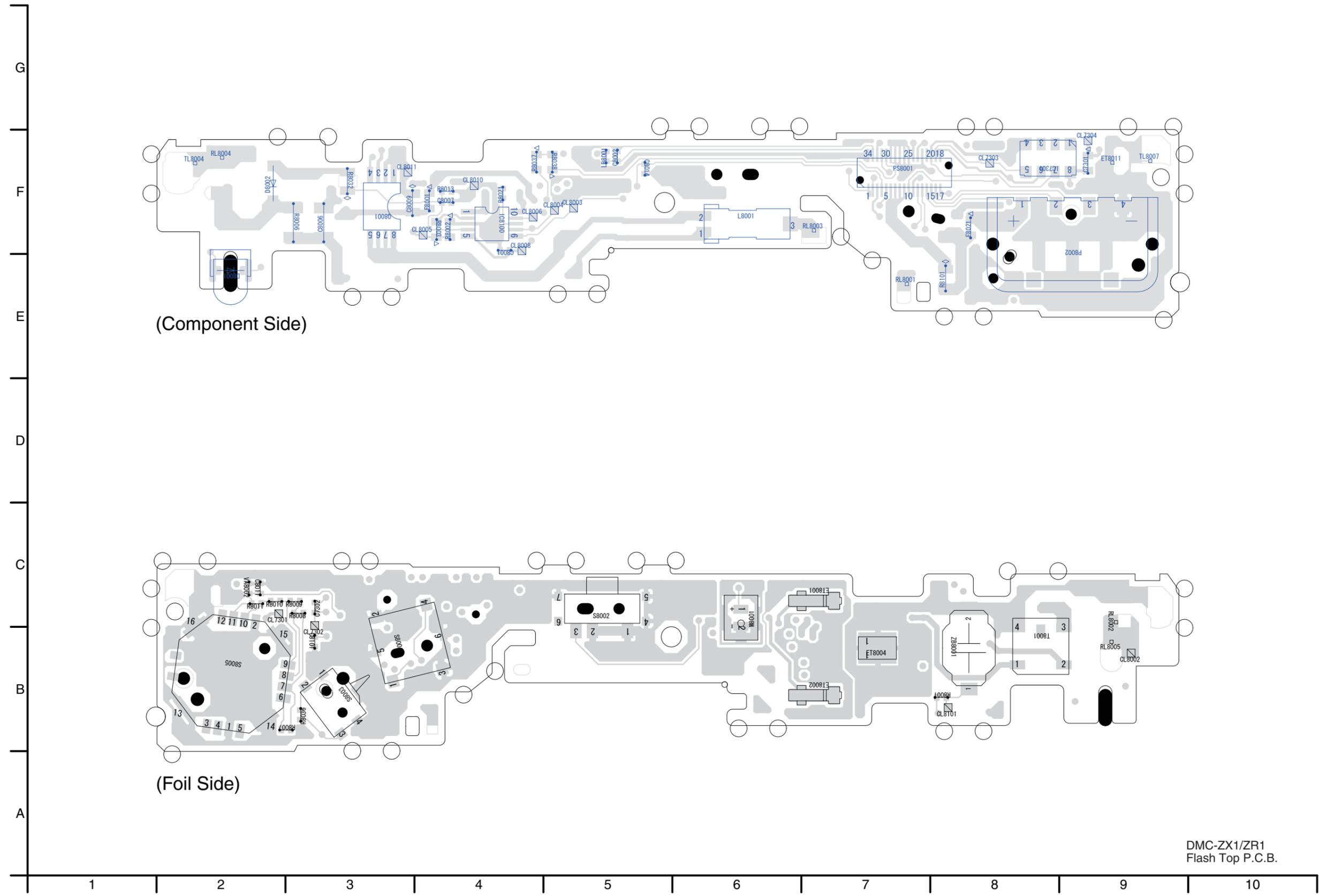
DMC-ZX1/ZR1  
CCD Flex  
Schematic Diagram

### S4.5. Lens Flex Schematic Diagram

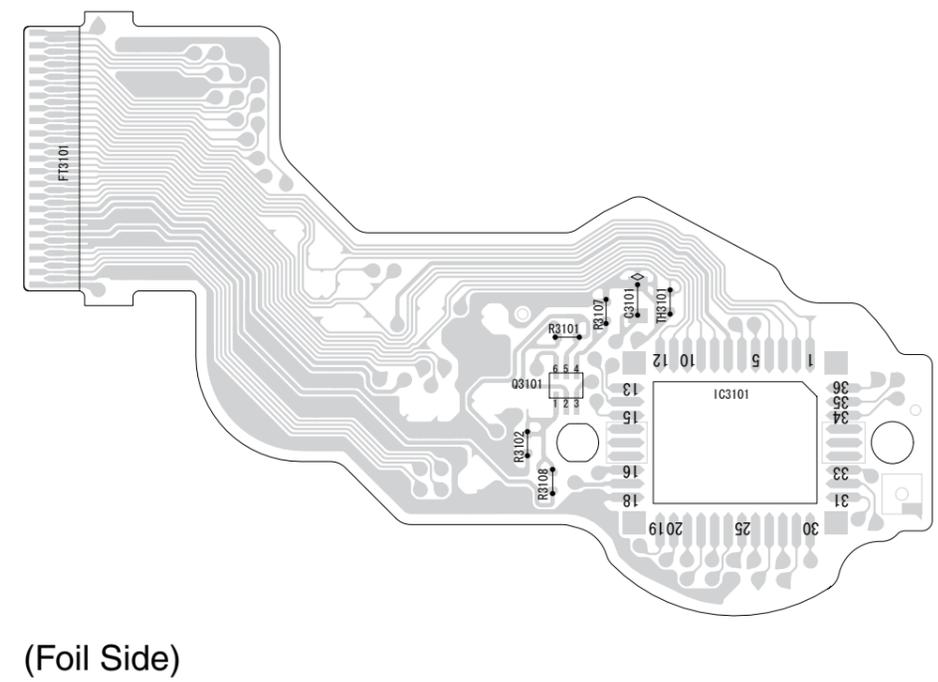
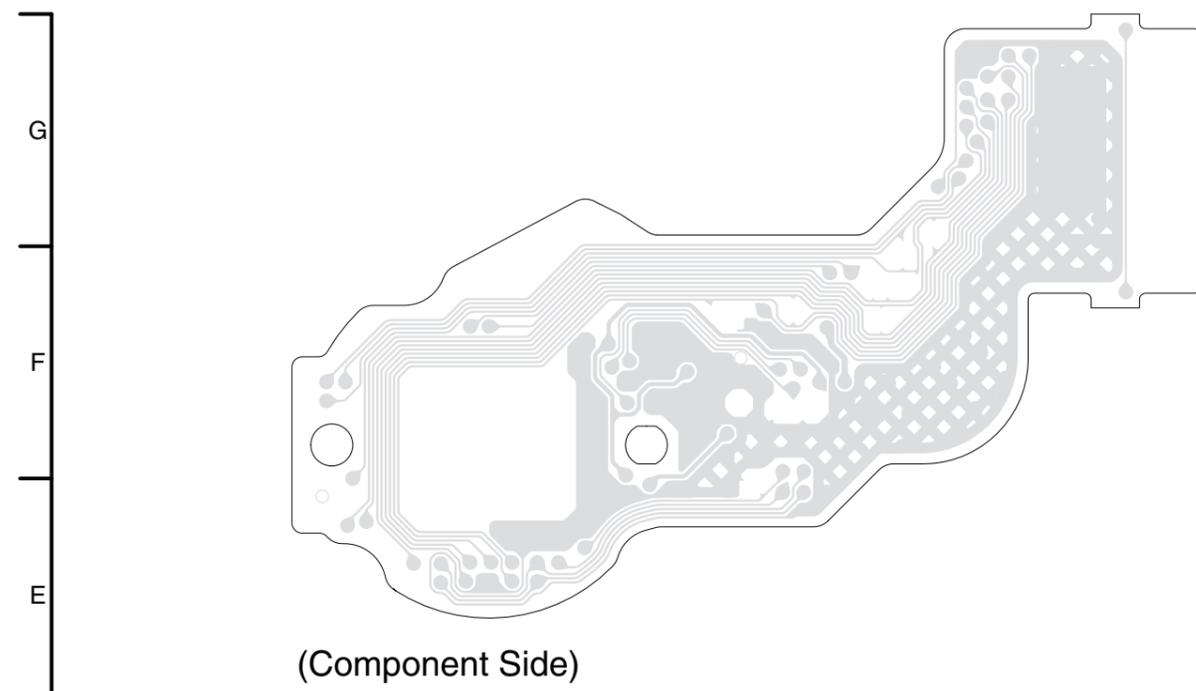




S5.2. Flash Top P.C.B.

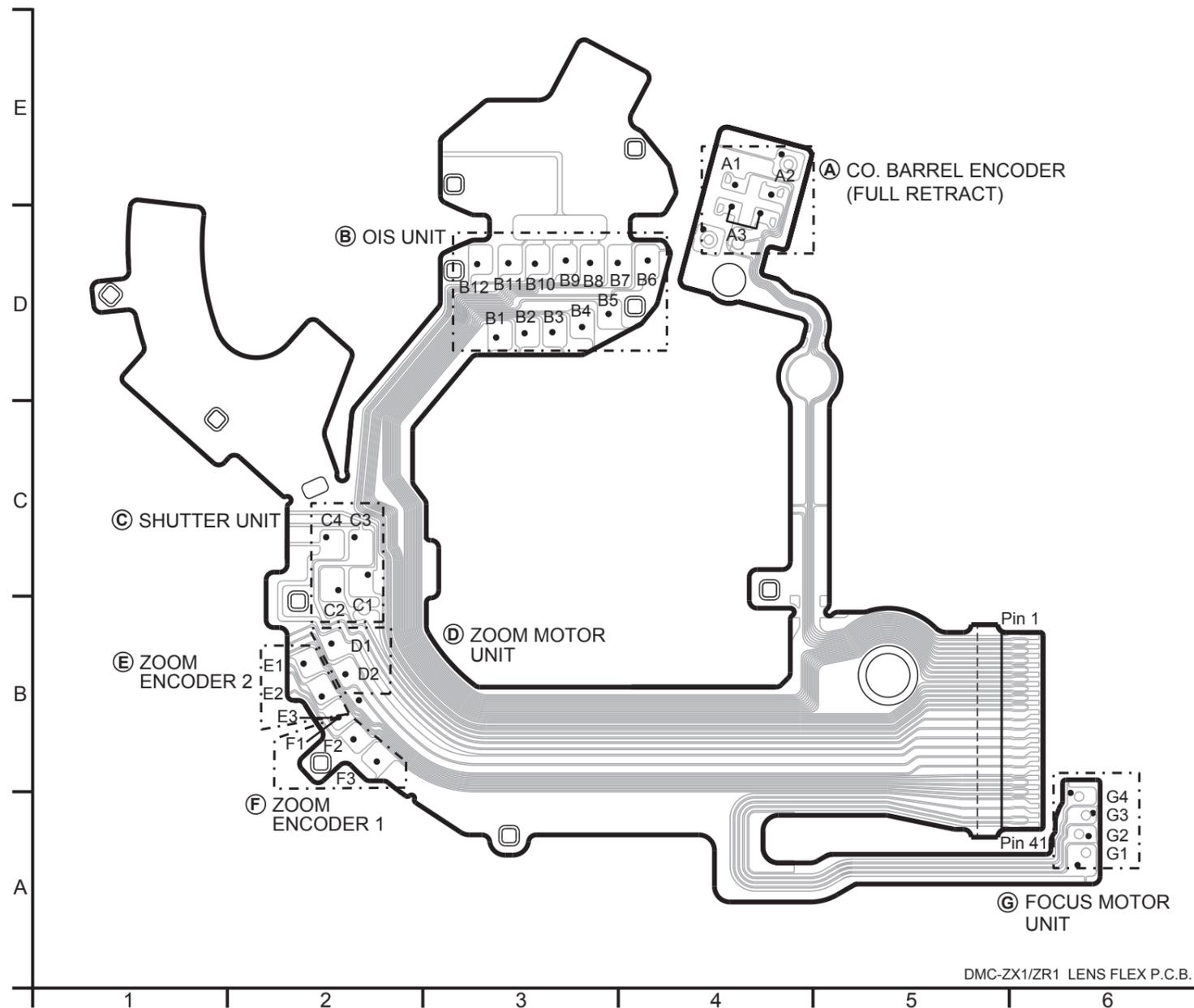


S5.3. CCD Flex P.C.B.



DMC-ZX1/ZR1  
CCD Flex P.C.B.

S5.4. 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.
  6. This IC is mounted on either of drawing No. IC6003 or IC6004.

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

DMC-ZX1EG-S

VEP59068A / VEK0P75 / VEK0P76

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		----- P.C.B. LIST -----		
	VEP56090A	MAIN P.C.B.	1	EXCEPT(P)(PC)(PR)(PU) (RTL) E.S.D.
	VEP56090B	MAIN P.C.B.	1	(P)(PC)(PU)(PR) (RTL) E.S.D.
	VEP59068A	REAR OPERATION FPC UNIT	1	(RTL) E.S.D.
	VEK0P75	FLASH TOP P.C.B.	1	(RTL) E.S.D.[PAVCSG]
	VEK0P76	CCD UNIT	1	E.S.D.
		--- INDIVIDUAL PARTS ---		
△	C8503	F2A2F8500004	1	[PAVCSG]03
△	ET8503	VMB4149	1	[PAVCSG]03
		--- ELEC. COMPONENTS ---		
##	VEP59068A	REAR OPERATION FPC UNIT	1	(RTL) E.S.D.
C9501	F1H0J475A010	C.CAPACITOR CH 6.3V 4.7U	1	
C9502	F1G1E102A086	C.CAPACITOR CH 25V 1000P	1	
D9501	LNJ337W83RA	DIODE	1	E.S.D.
FP9501	K1MN04BA0162	CONNECTOR 4P	1	
IC9501	L2ES00000021	IC	1	E.S.D.
R9501	ERJ2GEJ102X	M.RESISTOR CH 1/16W 1K	1	
S9501	K0D112B00145	SWITCH	1	
S9502	K0F111A00583	SWITCH	1	
S9503	K0F111A00541	SWITCH	1	
S9504	K0F111A00541	SWITCH	1	
S9505	K0F111A00541	SWITCH	1	
S9506	K0F111A00583	SWITCH	1	
S9507	K0F111A00541	SWITCH	1	
S9508	K0F111A00541	SWITCH	1	
S9509	K0F111A00541	SWITCH	1	
##	VEK0P75	FLASH TOP P.C.B.	1	(RTL) E.S.D.[PAVCSG]
C7301	F1H0J475A010	C.CAPACITOR CH 6.3V 4.7U	1	[PAVCSG]
C7302	F1G1E102A086	C.CAPACITOR CH 25V 1000P	1	[PAVCSG]
C8001	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	[PAVCSG]
C8006	F1K2E4730005	CAPACITOR	1	[PAVCSG]
C8007	F1G1H150A565	CAPACITOR	1	[PAVCSG]
C8009	F1J0J106A016	CAPACITOR	1	[PAVCSG]
C8011	F1G1C1030008	C.CAPACITOR CH 16V 0.01U	1	[PAVCSG]
D8001	B3ADB0000131	LED	1	[PAVCSG]E.S.D.
D8002	MA2YF8000L	DIODE	1	[PAVCSG]E.S.D.
ET8001	K4AC01D00001	EARTH SPRING	1	[PAVCSG]
ET8002	K4AC01D00001	EARTH SPRING	1	[PAVCSG]
ET8004	N9ZZ00000333	EARTH SPRING	1	[PAVCSG]
△	F8001	ERBSE1R25U	1	[PAVCSG]
△	F8021	ERBSE1R50U	1	[PAVCSG]
IC7301	L2ES00000022	IC	1	[PAVCSG]E.S.D.
IC8100	C0ZBZ0001710	IC	1	[PAVCSG]E.S.D.
L8001	G5F1A0000026	COIL	1	[PAVCSG]
LB8001	J0JCC0000415	FILTER	1	[PAVCSG]
M8001	L0CBAA000012	MICROPHONE	1	[PAVCSG]
P8002	K4ZZ04000054	CONNECTOR 4P	1	[PAVCSG]
PS8001	K1KB34AA0123	CONNECTOR 34P	1	[PAVCSG]
Q8001	B1JBLP000023	TRANSISTOR	1	[PAVCSG]E.S.D.
R8001	ERJ2GEJ512X	RESISTOR	1	[PAVCSG]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R8002	ERJ3GEYJ104V	RESISTOR	1	[PAVCSG]
R8003	ERJ3GEYJ470V	RESISTOR	1	[PAVCSG]
R8006	ERJ8GEYJ105V	RESISTOR	1	[PAVCSG]
R8007	ERJ2GEJ123X	RESISTOR	1	[PAVCSG]
R8008	ERJ2GEJ562X	RESISTOR	1	[PAVCSG]
R8009	ERJ2GEJ362X	RESISTOR	1	[PAVCSG]
R8010	ERJ2GEJ242X	RESISTOR	1	[PAVCSG]
R8011	ERJ2GEJ152X	RESISTOR	1	[PAVCSG]
R8013	ERJ2RHD2871X	RESISTOR	1	[PAVCSG]
R8021	ERJ2GEJ473X	M.RESISTOR CH 1/10W 47K	1	[PAVCSG]
R8032	D1BD8203A119	RESISTOR	1	[PAVCSG]
R8036	ERJ2GEJ103X	M.RESISTOR CH 1/10W 10K	1	[PAVCSG]
R8037	ERJ3GEYJ100V	RESISTOR	1	[PAVCSG]
R8038	ERJ3GEYJ100V	RESISTOR	1	[PAVCSG]
R8101	ERJ6GEY0R00V	RESISTOR	1	[PAVCSG]
S8001	K0F212A00003	SWITCH	1	[PAVCSG]
S8002	K0D112B00145	SWITCH	1	[PAVCSG]
S8003	K0L1CB000003	SWITCH	1	[PAVCSG]
S8005	K0G166A00004	SWITCH	1	[PAVCSG]
T8001	G5D1A0000080	TRANSFORMER	1	[PAVCSG]
ZB8001	K3ZZ00200042	BATTERY SOCKET	1	[PAVCSG]
##	VEK0P76	CCD UNIT	1	E.S.D.
C3101	F1H1C105A097	C.CAPACITOR CH 16V 1U	1	
Q3101	UP05C8B00L	TRANSISTOR	1	E.S.D.
R3101	ERJ2GEJ470	M.RESISTOR CH 1/16W 47	1	
R3102	ERJ2GEJ222	M.RESISTOR CH 1/10W 2.2K	1	
R3107	ERJ2GEJ132	M.RESISTOR CH 1/10W 1.3K	1	
R3108	ERJ2GEJ560X	M.RESISTOR CH 1/10W 56	1	
TH3101	D4CC11030013	THERMISTOR	1	

DMC-ZX1EG-S

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	VEP56090B	MAIN P.C.B.	1	(P)(PC)(PU)(PR) (RTL) E.S.D.	B3	XQN14+BJ85FN	SCREW	1	[PAVCSG]
1	VEP56090A	MAIN P.C.B.	1	EXCEPT(P)(PC)(PR)(PU) (RTL) E.S.D.	B4	VHD1886	SCREW	1	
2	VYK3K67	FRONT CASE UNIT	1	(-S) [PAVCSG]	B5	VHD2036-1	SCREW	1	
2	VYK3K91	FRONT CASE UNIT	1	(-K) [PAVCSG]	B6	VHD2084	SCREW	1	
2	VYK3Q08	FRONT CASE UNIT	1	PC-R [PAVCSG]	B7	VHD2084	SCREW	1	
2	VYK3K98	FRONT CASE UNIT	1	P-R,PU-R,EG-R,EP-R,EF-R, EB-R,SG-R,GC-R,GH-R,GT-R, GN-R [PAVCSG]	B8	VHD2084	SCREW	1	
2	VYK3L05	FRONT CASE UNIT	1	(-A) [PAVCSG]	B9	VHD2102	SCREW	1	(-S)(-W)
2	VYK3L13	FRONT CASE UNIT	1	(-W) [PAVCSG]	B9	VHD2103	SCREW	1	(-K)(-R)(-A)
2-1	VGK3554	FRONT GRIP	1	[PAVCSG]	B10	VHD2102	SCREW	1	(-S)(-W)
3	VYK3K70	LCD UNIT	1		B10	VHD2103	SCREW	1	(-K)(-R)(-A)
4	VYK3K72	REAR CASE UNIT	1	(-S) [PAVCSG]	B11	VHD2102	SCREW	1	(-S)(-W)
4	VYK3K93	REAR CASE UNIT	1	(-K) [PAVCSG]	B11	VHD2103	SCREW	1	(-K)(-R)(-A)
4	VYK3L00	REAR CASE UNIT	1	(-R) [PAVCSG]	B12	VHD2102	SCREW	1	(-S)(-W)
4	VYK3L07	REAR CASE UNIT	1	(-A) [PAVCSG]	B12	VHD2103	SCREW	1	(-K)(-R)(-A)
4	VYK3L15	REAR CASE UNIT	1	(-W) [PAVCSG]	B13	VHD2102	SCREW	1	(-S)(-W)
4-1	VGL1317	REAR PANEL LIGHT	1	[PAVCSG]	B13	VHD2103	SCREW	1	(-K)(-R)(-A)
4-2	VGU0E79	CURSOR BUTTON	1	[PAVCSG]	B14	VHD2102	SCREW	1	(-S)(-W)
6	VYK3K74	BATTERY DOOR UNIT	1	(-S) [PAVCSG]	B14	VHD2103	SCREW	1	(-K)(-R)(-A)
6	VYK3K95	BATTERY DOOR UNIT	1	(-K) [PAVCSG]	B15	VHD2102	SCREW	1	(-S)(-W)
6	VYK3L02	BATTERY DOOR UNIT	1	(-R) [PAVCSG]	B15	VHD2103	SCREW	1	(-K)(-R)(-A)
6	VYK3L12	BATTERY DOOR UNIT	1	(-A) [PAVCSG]	B16	VHD2102	SCREW	1	(-S)(-W)
6	VYK3L17	BATTERY DOOR UNIT	1	(-W) [PAVCSG]	B16	VHD2103	SCREW	1	(-K)(-R)(-A)
6-1	VMB4143	BATTERY DOOR SPRING	1	[PAVCSG]	B17	VHD2102	SCREW	1	(-S)(-W)
6-2	VMS7863	BATTERY DOOR SHAFT	1	[PAVCSG]	B17	VHD2103	SCREW	1	(-K)(-R)(-A)
7	VGQ0G11	BATTERY LOCK KNOB	1	[PAVCSG]	B18	VHD2102	SCREW	1	(-S)(-W)
8	VKF4570	JACK DOOR	1	EG-S,EP-S,EB-S,EE-S,SG-S, GC-S,GH-S,GK-S,GN-S [PAVCSG]	B18	VHD2103	SCREW	1	(-K)(-R)(-A)
8	VKF4571	JACK DOOR	1	EG-K,EP-K,EF-K,EE-K,EB-K,SG-K, GC-K,GH-K,GT-K,GK-K,GN-K,GD-K [PAVCSG]	B19	VHD2102	SCREW	1	(-S)(-W)
8	VKF4573	JACK DOOR	1	EG-R,EP-R,EF-R,EB-R,SG-R, GC-R,GH-R,GT-R,GN-R [PAVCSG]					
8	VKF4572	JACK DOOR	1	EG-A,EP-A,EF-A,EB-A,GN-A [PAVCSG]					
8	VKF4574	JACK DOOR	1	EG-W,EP-W,EF-W,EB-W,SG-W, GH-W,GK-W [PAVCSG]					
8	VKF4613	JACK DOOR	1	P-S,PC-S,PU-S [PAVCSG]					
8	VKF4614	JACK DOOR	1	P-K,PC-K,PU-K,PR-K [PAVCSG]					
8	VKF4616	JACK DOOR	1	P-R,PC-R,PU-R [PAVCSG]					
8	VKF4615	JACK DOOR	1	P-A,PC-A [PAVCSG]					
8	VKF4617	JACK DOOR	1	PC-W [PAVCSG]					
9	VMB4152	BATTERY LOCK SPRING	1	[PAVCSG]					
10	VMB4305	BATTERY OUT SPRING	1	[PAVCSG]					
11	VMP9423	FRAME	1	EXCEPT(P)(PC)(PU)(PR) [PAVCSG]					
11	VMP9515	FRAME	1	(P)(PC)(PR)(PU) [PAVCSG]					
12	VMP9424	BATTERY CASE UNIT	1	[PAVCSG]					
13	VMS7892-A	JACK DOOR SHAFT	1	[PAVCSG]					
14	L0AA01A00032	SPEAKER	1	[PAVCSG]					
△ 15	ML-421S/ZTN	BUTTON BATTERY	1	(B8001)[ENERGY]					
16	VEP58096A	E.CAPACITOR P.C.B.	1	[PAVCSG]					
17	VGL1290	AF PANEL LIGHT	1	[PAVCSG]					
18	VGQ0G09-1	E.CAPACITOR P.C.B. HOLDER	1	[PAVCSG]					
19	VMP9426	TOP PLATE(L)	1	[PAVCSG]					
20	VMP9427	TOP PLATE(R)	1	[PAVCSG]					
21	VMT1968	MIC DAMPER	1	[PAVCSG]					
22	VYK3K86	TOP CASE UNIT	1	ZX1 [PAVCSG]					
22	VYK3K88	TOP CASE UNIT	1	ZR1 [PAVCSG]					
22-1	VGQ0G07-1	POWER KNOB BASE	1	[PAVCSG]					
22-2	VGU0F42	POWER KNOB	1	[PAVCSG]					
23	EFN-AMAM2AZD	FLASH UNIT	1	[PAVCSG]					
26	VEK0P75	FLASH TOP P.C.B.	1	(RTL) E.S.D.[PAVCSG]					
27	VEP59068A	REAR OPERATION FPC UNIT	1	(RTL) E.S.D.					
28	VGQ0G80	P.C.B. BASE	1						
29	VGU0E82	REC/PLAYBACK SELECTOR KNOB	1						
30	VMP9497	SW PLATE	1						
31	VGQ0G06	TORIPOD	1						
32	VMP9425	FRAME PLATE	1						
△ 34	F2A2F8500004	E.CAPACITOR	1	(C8503)[PAVCSG]					
35	VMB4149	EARTH SPRING	1	[PAVCSG]					
36	VYK3K71	LCD PANEL UNIT	1						
37	VMT2006	MIC CUSHION	1	[PAVCSG]					
B1	VHD2182	SCREW	2	[PAVCSG]					
B2	VHD2182	SCREW	2	[PAVCSG]					

DMC-ZX1EG-S

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100	VXW1080	LENS UNIT(W/O CCD)	1	
102	VEK0P76	CCD UNIT	1	E.S.D.
103	L6DAACGC0002	ZOOM MOTOR	1	
104	VEK0P53	LENS FPC UNIT	1	
104-1	B3NBA0000010	PHOTO SENSOR	1	
105	VDW1892	BOTH SIDES CAM FRAME	1	
106	VDW1893	2ND 3RD DIRECT FRAME	1	
107	VXP3271	1ST LENS FRAME UNIT	1	
108	VXP3274	1ST DIRECT FRAME UNIT	1	
109	VXP3275	2ND LENS FRAME UNIT	1	
110	VXP3276	3RD LENS FRAME UNIT	1	
111	VXQ1843	FIX/DRIVE/CAM FRAME UNIT	1	
112	VXQ1788	MASTER FLANGE UNIT	1	
112-1	L6HA64NC0017	FOCUS MOTOR UNIT	1	
112-2	VMB4299	FOCUS SPRING	1	
112-3	VXP3284	4TH LENS FRAME UNIT	1	
B101	VHD1871	SCREW	1	
B102	VHD1871	SCREW	1	
B103	VHD1871	SCREW	1	
B104	VHD2011	SCREW	1	
B105	XQN14+BJ4FNK	SCREW	1	
B106	XQN14+BJ4FNK	SCREW	1	
B107	XQN14+BJ4FNK	SCREW	1	
B108	XQN14+BJ4FNK	SCREW	1	
B109	XQN14+BJ4FNK	SCREW	1	
B110	XQN14+BJ4FNK	SCREW	1	
B111	XQN14+BJ4FNK	SCREW	1	

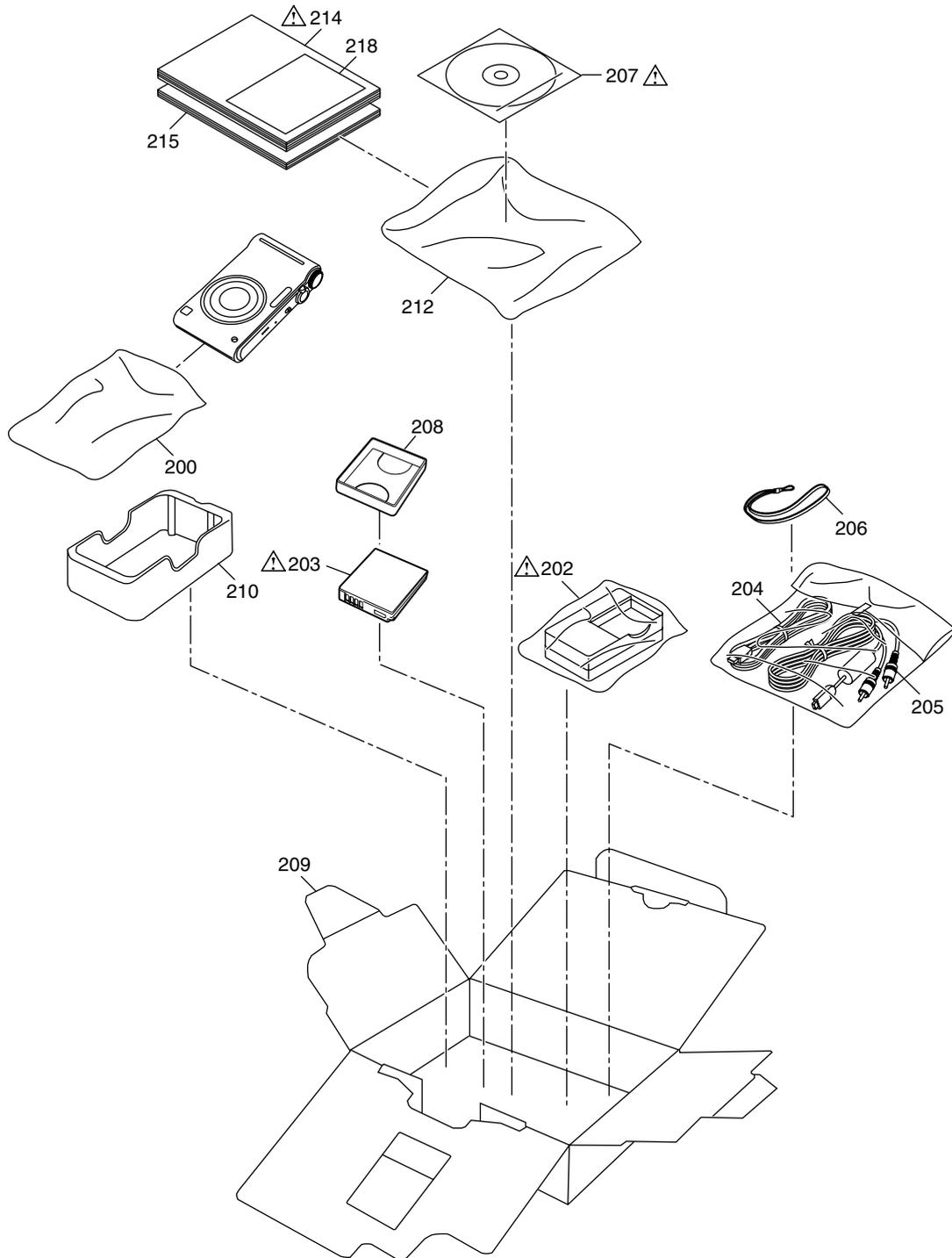
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
200	VPF1301	CAMERA BAG	1	(P)(PC) [PAVCSG]
△ 202	DE-A65BA	BATTERY CHARGER	1	(P)(PC)
△ 203	----	BATTERY	1	(P)(PC)
204	K1HA08AD0003	USB CABLE W/PLUG	1	(P)(PC)
205	K1HA08CD0020	AV CABLE W/PLUG	1	(PC)
206	VFC4297	HAND STRAP	1	(P)(PC)
△ 207	VFF0523-S	CD-ROM	1	(P)(PC) See*Notes*
		(SOFTWARE/INSTRUCTION BOOK)		
208	VGQ0E45	BATTERY PROTECTION CASE	1	(P)(PC)
209	VPK3979	PACKING CASE	1	P-S,PC-S
209	VPK3984	PACKING CASE	1	P-K,PC-K
209	VPK3989	PACKING CASE	1	P-R,PC-R
209	VPK3992	PACKING CASE	1	P-A,PC-A
209	VPK3996	PACKING CASE	1	PC-W
210	VPN6928	CUSHION	1	(P)(PC)
212	VPF1294	BAG, POLYETHYLENE	1	(P)(PC)
△ 214	VQT2G33	INSTRUCTION BOOK	1	(P)
		(ENGLISH/SPANISH)		
△ 214	VQT2G34	SIMPLIFIED O/I	1	(PC)
		(ENGLISH/CANADIAN FRENCH)		
215	VQT2G81	O/I SOFTWARE	1	(P)(PC)
		(ENGLISH/CANADIAN FRENCH)		
218	VQL1L48-7	OPERATING LABEL	1	(PC)

DMC-ZX1EG-S

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
300	VPF1301	CAMERA BAG	1	EXCEPT(P)(PC) [PAVCSG]	315	VQT2E49	O/I SOFTWARE (ENGLISH)	1	(EB)(GN)
△ 302	DE-A66AA	BATTERY CHARGER	1	(EG)(EP)(EF)(EB)(GN)	315	VQT2E50	O/I SOFTWARE (RUSSIAN/UKRAINIAN)	1	(EE)
△ 302	DE-A66BB	BATTERY CHARGER	1	(EE)(GC)(GH)(GK)(GD)	315	VQT2E51	O/I SOFTWARE (ENGLISH/CHINESE(TRADITIONAL)/ ARABIC/PERSIAN)	1	(SG)(GC)(GH)
△ 302	DE-A66EA	BATTERY CHARGER	1	(SG)	315	VQT2G82	O/I SOFTWARE (SPANISH/PORTUGUESE)	1	(PU)(PR)
△ 302	DE-A65BA	BATTERY CHARGER	1	(PU)	315	VQT2E52	O/I SOFTWARE (CHINESE(TRADITIONAL))	1	(GT)
△ 302	DE-A66DA	BATTERY CHARGER	1	(PR)	315	VQT2E53	O/I SOFTWARE (CHINESE(SIMPLIFIED))	1	(GK)
△ 302	DE-A66CA	BATTERY CHARGER	1	(GT)	315	VQT2E54	O/I SOFTWARE (KOREAN)	1	(GD)
△ 303	-----	BATTERY	1	EXCEPT(P)(PC)	318	VQL1G34-6	OPERATING LABEL	1	(GT)
304	K1HA08AD0003	USB CABLE W/PLUG	1	EXCEPT(P)(PC)	△ 319	K2CT39A00002	AC CORD W/PLUG	1	(EB)(GC)(GH)
305	K1HA08CD0020	AV CABLE W/PLUG	1	EXCEPT(P)(PC)(PR)(PU)	△ 320	K2CQ29A00002	AC CORD W/PLUG	1	(EG)(EP)(EF)(EE)(GC)
306	VFC4297	HAND STRAP	1	EXCEPT(P)(PC)	△ 320	K2CR29A00001	AC CORD W/PLUG	1	(GD)
△ 307	VFF0523-S	CD-ROM (SOFTWARE/INSTRUCTION BOOK)	1	(PU)(PR) See"Notes"	△ 321	K2CJ29A00002	AC CORD W/PLUG	1	(GN)
307	VFF0502-S	CD-ROM(SOFTWARE)	1	ZX1(GC)(GH)(GN)(GD) See"Notes"	△ 322	K2CA29A00023	AC CORD W/PLUG	1	(SG)
307	VFF0503-S	CD-ROM(SOFTWARE)	1	(GT)(GK) See"Notes"	△ 322	K2CA29A00021	AC CORD W/PLUG	1	(GT)
308	VGQ0E45	BATTERY PROTECTION CASE	1	EXCEPT(P)(PC)	△ 322	K2CA2YY00070	AC CORD W/PLUG	1	(GK)
309	VPK3980	PACKING CASE	1	EG-S,EP-S,EB-S,EE-S,SG-S	△ 324	K2CJ29A00003	AC CORD W/PLUG	1	(PR)
309	VPK3985	PACKING CASE	1	EG-K,EP-K,EF-K,EB-K,EE-K,SG-K					
309	VPK3990	PACKING CASE	1	EG-R,EP-R,EF-R, See"Notes"					
309	VPK3993	PACKING CASE	1	EG-A,EP-A,EF-A,EB-A					
309	VPK3997	PACKING CASE	1	EG-W,EP-W,EF-W,EB-W,SG-W					
309	VPK3981	PACKING CASE	1	PU-S,GC-S,GH-S,GN-S					
309	VPK3986	PACKING CASE	1	PU-K,PR-K,GK-K,GH-K,GT-K, GN-K,GD-K					
309	VPK3991	PACKING CASE	1	PU-R,GC-R,GH-R,GT-R,GN-R					
309	VPK3998	PACKING CASE	1	GH-W					
309	VPK3982	PACKING CASE	1	GK-S					
309	VPK3987	PACKING CASE	1	GK-K					
309	VPK3999	PACKING CASE	1	GK-W					
309	VPK3994	PACKING CASE	1	GN-A					
310	VPN6928	CUSHION	1	EXCEPT(P)(PC)					
312	VPF1294	BAG, POLYETHYLENE	1	EXCEPT(P)(PC)					
△ 313	VFF0524-J	CD-ROM(INSTRUCTION BOOK)	1	(EG)(EP)(EF)(EB)					
△ 313	VFF0533-J	CD-ROM(INSTRUCTION BOOK)	1	(EE)(SG)					
△ 313	VFF0525-J	CD-ROM(INSTRUCTION BOOK)	1	(GC)(GH)(GN)					
△ 314	VQT2F35	SIMPLIFIED O/I (GERMAN/FRENCH)	1	(EG)					
△ 314	VQT2F36	SIMPLIFIED O/I (ITALIAN/DUTCH)	1	(EG)					
△ 314	VQT2F37	SIMPLIFIED O/I (SPANISH/PORTUGUESE)	1	(EG)					
△ 314	VQT2F38	SIMPLIFIED O/I (SWEDISH/DANISH)	1	(EP)					
△ 314	VQT2F39	SIMPLIFIED O/I (POLISH/CZECH)	1	(EP)					
△ 314	VQT2F40	SIMPLIFIED O/I (HUNGARIAN/FINNISH)	1	(EP)					
△ 314	VQT2F41	SIMPLIFIED O/I (FRENCH)	1	(EF)					
△ 314	VQT2F42	SIMPLIFIED O/I (ENGLISH)	1	(EB)					
△ 314	VQT2G36	SIMPLIFIED O/I (RUSSIAN/UKRAINIAN)	1	(EE)					
△ 314	VQT2F45	SIMPLIFIED O/I (ENGLISH/CHINESE(TRADITIONAL))	1	(SG)(GC)(GH)					
△ 314	VQT2F34	SIMPLIFIED O/I (SPANISH/PORTUGUESE)	1	(PU)					
△ 314	VQT2G35	SIMPLIFIED O/I (SPANISH)	1	(PR)					
△ 314	VQT2F46	SIMPLIFIED O/I (ARABIC/PERSIAN)	1	(GC)					
△ 314	VQT2F47	INSTRUCTION BOOK (CHINESE(TRADITIONAL))	1	(GT)					
△ 314	VQT2F48	INSTRUCTION BOOK (CHINESE(SIMPLIFIED))	1	(GK)					
△ 314	VQT2F49	SIMPLIFIED O/I (ENGLISH)	1	(GN)					
△ 314	VQT2F50	INSTRUCTION BOOK (KOREAN)	1	(GD)					
315	VQT2E46	O/I SOFTWARE (GERMAN/FRENCH/ITALIAN/ DUTCH/SPANISH/PORTUGUESE)	1	(EG)					
315	VQT2E47	O/I SOFTWARE (FINNISH/SWEDISH/DANISH/ POLISH/CZECH/HUNGARIAN)	1	(EP)					
315	VQT2E48	O/I SOFTWARE (FRENCH)	1	(EF)					



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



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

