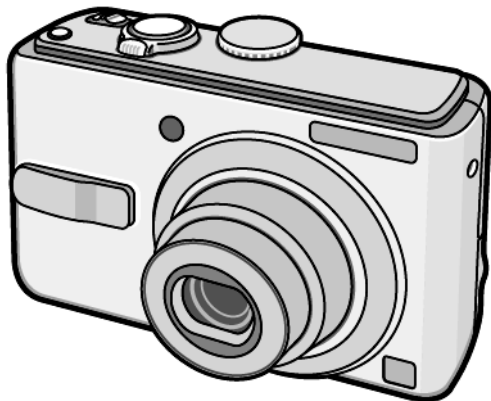


# Service Manual

Digital Camera

LUMIX



DMC-LS70P  
DMC-LS70PC  
DMC-LS70PL  
DMC-LS70EB  
DMC-LS70EE  
DMC-LS70EG  
DMC-LS70EGM  
DMC-LS70GC  
DMC-LS70GK  
DMC-LS70GN  
DMC-LS75P  
DMC-LS75PC  
DMC-LS75PL  
DMC-LS75EB  
DMC-LS75EE  
DMC-LS75EF  
DMC-LS75EG  
DMC-LS75EGM  
DMC-LS75GC  
DMC-LS75GK  
DMC-LS75GN  
DMC-LS60PC

**Panasonic**<sup>®</sup>

**DMC-LS60PL**  
**DMC-LS60EB**  
**DMC-LS60EE**  
**DMC-LS60EF**  
**DMC-LS60EG**  
**DMC-LS60EGM**

**DMC-LS60GC**  
**DMC-LS60GK**  
**DMC-LS60GN**

Vol. 1

Colour

(S).....Silver Type (except DMC-LS75PC)

(K).....Black Type (only DMC-LS75P/PC/EB/EE/  
 EF/EG/EGM)

**⚠ WARNING**

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

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# 1 Safety Precaution

## 1.1. General Guidelines

### 1. IMPORTANT SAFETY NOTICE

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

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

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

## 1.2. Leakage Current Cold Check

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

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

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a  $1.5\text{ k}\Omega$ ,  $10\text{ W}$  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

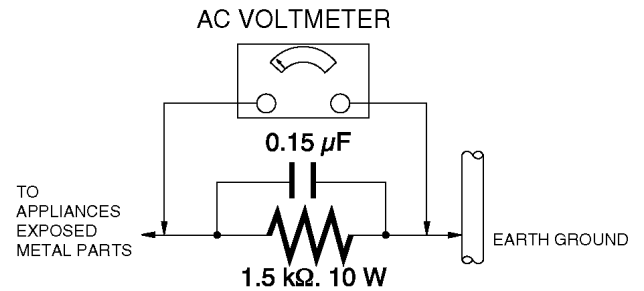


Figure. 1

## 1.4. How to Discharge the Capacitor on Flash Top PCB

### CAUTION:

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

### [Discharging Procedure]

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

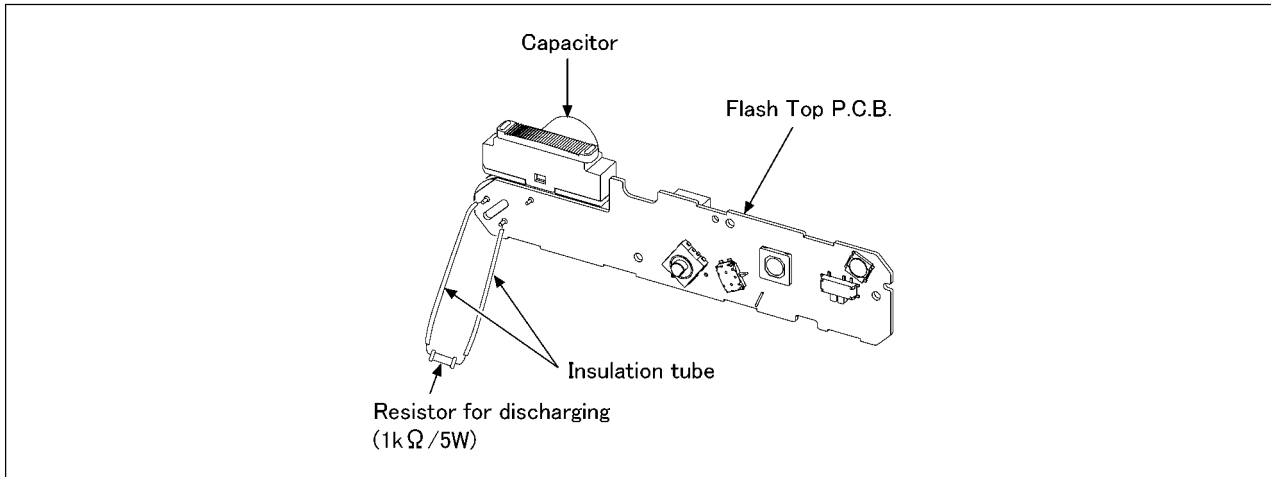


Fig. F1

## 2 Warning

### 2.1. Prevention of Electro Static 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 electro static 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).

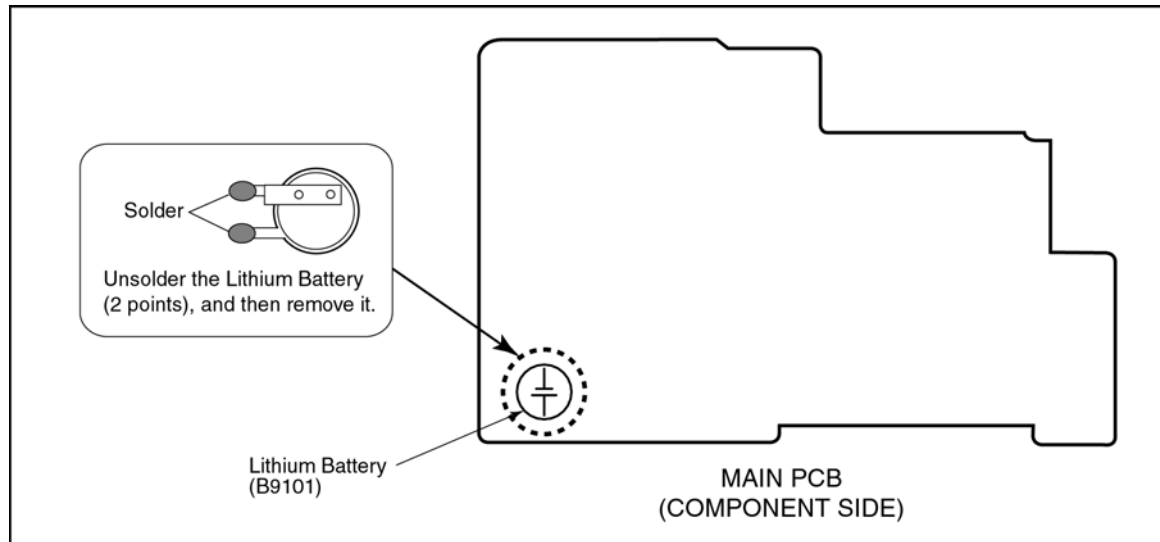
## 2.2. How to Replace the Lithium Battery

### 2.2.1. Replacement Procedure

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

**NOTE:**

The Type No. ML614S/F9FE includes electric lead terminals.



**NOTE:**

This Lithium battery is a critical component.

(Type No.: ML614S/F9FE **Manufactured by Matsushita Battery Industrial Co.,Ltd.**)

It must never be subjected to excessive heat or discharge.

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

Replacement batteries must be of same type and manufacture.

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

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

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

**(For English)**

### CAUTION

Danger of explosion if battery is incorrectly replaced.

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

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

**(For German)**

### ACHTUNG

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

Behandeln Sie gebrauchte Batterien nach den Anweisungen des Herstellers.

**(For French)**

### MISE EN GARDE

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

**NOTE:**

Above caution are also applicable for below batteries which is for DMC-LS60, LS70 and LS75 all series, as well.

1. AA Oxiride batteries
2. AA Alkaline batteries
3. AA Rechargeable Ni-MH (nickel-metal hydride) batteries

# 3 Service Navigation

## 3.1. Introduction

This service manual contains technical information, which allow service personnel's to understand and service this model. Please place orders using the parts list and not the drawing reference numbers. If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

## 3.2. General Description About Lead Free Solder (PbF)

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

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

### Distinction of PCB Lead Free Solder being used

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

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

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

### Recommended Lead Free Solder (Service Parts Route.)

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

### Note

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

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

1. The service manual does not contain the following information, because of the impossibility of servicing at component level without concerned equipment/facilities.
  - a. Schematic diagram, Block Diagram and PCB layout of MAIN PCB.
  - b. Parts list for individual parts for MAIN PCB.When a part replacement is required for repairing MAIN PCB, replace as an assembled parts. (Main PCB)
2. The following category is/are recycle module part. please send it/them to Central Repair Center.
  - MAIN PCB (DMC-LS60/LS70: VEP56043B, DMC-LS75: VEP56043A)  
: Excluding replacement of Lithium Battery

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

There are five kinds of DMC-LS60/LS70/LS75, regardless of the colours.





- a) DMC-LS75S
- b) DMC-LS70, LS75P, DMC-LS60, LS70, LS75PC
- c) DMC-LS60, LS70, LS75EB/EG/EGM/GN, DMC-LS60, LS75EF
- d) DMC-LS60, LS70, LS75EE
- e) DMC-LS60, LS70, LS75PL/GC/GK

(DMC-LS75S is exclusively Japan domestic model.)

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

#### 3.4.1. Defining methods:

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

|   |  |
|---|--|
| <p><b>a) DMC-LS75S</b><br/>DMC-LS75S is exclusively Japan domestic model.</p> <p><b>b) DMC-LS70, LS75P, DMC-LS60, LS70, LS75PC</b><br/>The nameplate for these models show the following Safty registration mark.</p>  |  <p>Safty registration mark</p> |
| <p><b>c) DMC-LS60, LS70, LS75EB/EG/EGM/GN<br/>DMC-LS60, LS75EF</b><br/>The nameplate for these models show the following Safty registration mark.</p>    |  |
| <p><b>d) DMC-LS60, LS70, LS75EE</b><br/>The nameplate for these models show the following Safty registration mark.</p>   |  |
| <p><b>e) DMC-LS60, LS70, LS75PL/GC/GK</b><br/>The nameplate for these models do not show any above Safty registration mark.</p>   |  |

#### NOTE:

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

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



### 3.4.2. INITIAL SETTINGS:

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

#### 1. IMPORTANT NOTICE:

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

#### CAUTION 1 (Initial Settings)

**DO NOT** select "NONE(JAPAN)" or "P"(North America) if need to select "EG/EGM/PL/GC/GK/EF/EB/EE/GN and PC".

Otherwise, once "NONE(JAPAN)" or "P"(North America) are selected, "EG/EGM/PL/GC/GK/EF/EB/EE/GN and PC" will not displayed, thus, RE-Settings (changing area) can not be made.

#### CAUTION 2 (Picture back up from "Built-in Memory")

This unit employs "Built-in Memory" for picture image data recording.(Approx.27MB)  
Be sure to make picture data back up (i.e., Copying to SD memory card), before proceeding "INITIAL SETTINGS".

Once "INITIAL SETTINGS" has been carried out, all image data stored at "Built-in Memory" is erased.

#### 2. PROCEDURES:

- Preparation. Proceed the picture back up from the unit (Refer to above "CAUTION 2")

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

Set the mode dial to "[ Normal picture mode ] (Red camera mark)".

While keep pressing [ E.ZOOM ] and "[ UP ] of Cross key" simultaneously, turn the Power on.

- Step 2. The cancellation of initial setting:**

Set the mode dial to "[ Playback ]".

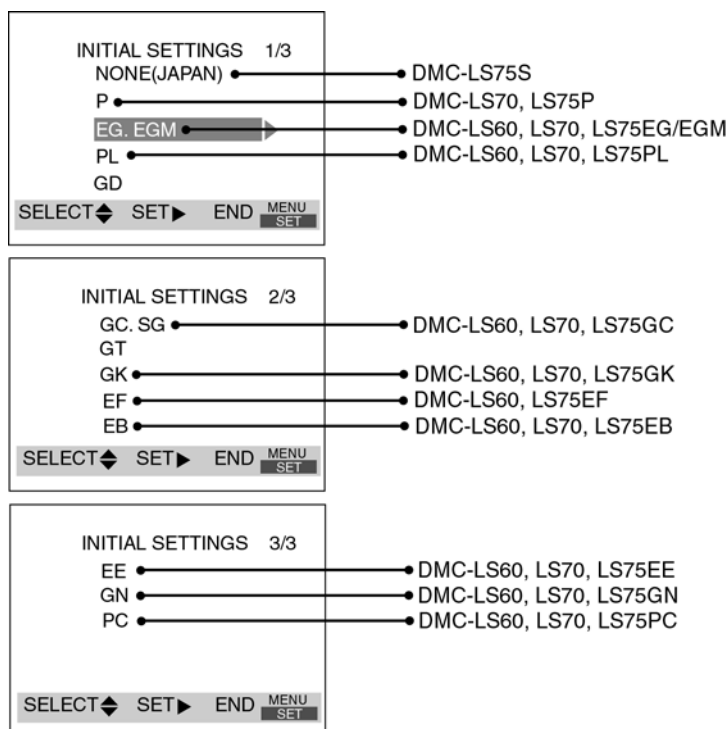
Press [ E.ZOOM ] and "[ UP ] of Cross key" simultaneously, then turn the Power off.

- Step 3. Turn the Power on:**

Set the mode dial to "[ Normal picture mode ] (Red camera mark)", and then turn the Power on.

- Step 4. Display the INITIAL SETTING:**

While keep pressing [ MENU ] and "[ RIGHT ] of Cross key" simultaneously, turn the Power off.



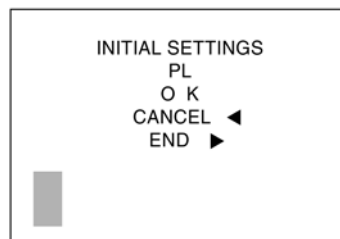
• **Step 5. Set the INITIAL SETTING: (Refer to “CAUTION 1”)**

**[Caution for before settings]**

Once "NONE(JAPAN)" (Area for Japan) or "P" (Area for North America) is selected with "INITIAL SETTINGS", other areas will not be displayed even if "INITIAL SETTINGS" menu is displayed again, thus, the area can not be changed.

Select the area carefully.

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



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

(The unit is powered off automatically.)

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

• **Step 6. CONFIRMATION:**

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

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

(When the “GK” model suffix is selected, the display shows “PLEASE SET THE CLOCK” in Chinese.)

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

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

|    | MODEL   | VIDEO OUTPUT | LANGUAGE             | DATE            | REMARKS |
|----|---|--------------|----------------------|-----------------|---------|
| a) | DMC-LS75S                                     | NTSC         | Japanese             | Year/Month/Date |         |
| b) | DMC-LS70, LS75P,<br>DMC-LS60, LS70, LS75PC/PL | NTSC         | English              | Month/Date/Year |         |
| c) | DMC-LS60, LS70, LS75EB/EG/EGM/GC/GN           | PAL          | English              | Date/Month/Year |         |
| d) | DMC-LS60, LS75EF                              | PAL          | French               | Date/Month/Year |         |
| e) | DMC-LS60, LS70, LS75EE                        | PAL          | Russian              | Date/Month/Year |         |
| f) | DMC-LS60, LS70, LS75GK                        | PAL          | Chinese (simplified) | Year/Month/Date |         |

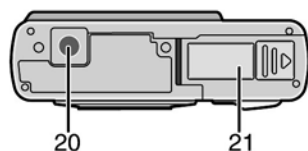
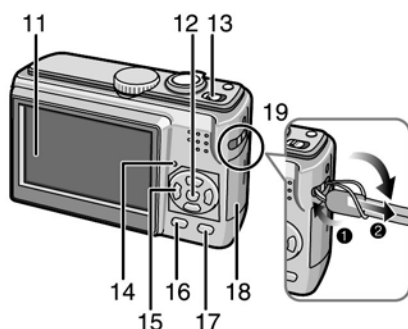
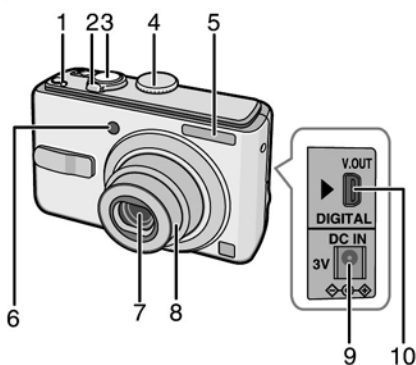
# 4 Specifications

|                                       |   |
|---------------------------------------|---|
| <b>Digital Camera:</b>                | Information for your safety   |
| <b>Power Source:</b>                  | DC 3 V  |
| <b>Power Consumption:</b>             | DMC-LS75/DMC-LS70: 1.5 W (When recording)<br>DMC-LS60: 1.4 W (When recording)<br>0.6 W (When playing back)  |
| <b>Camera Effective pixels:</b>       | DMC-LS75/DMC-LS70: 7,200,000 pixels<br>DMC-LS60: 6,000,000 pixels   |
| <b>Image sensor:</b>                  | 1/2.5" CCD  |
| <b>Total pixels</b>                   | DMC-LS75/DMC-LS70: 7,380,000 pixels<br>DMC-LS60: 6,370,000 pixels<br>Primary color filter   |
| <b>Lens:</b>                          | Optical 3 × zoom, f=5.8 to 17.4 mm [35 mm film camera equivalent: 35 to 105 mm] /F2.8 to F5.0   |
| <b>Digital zoom:</b>                  | Max. 4 ×  |
| <b>Extended optical zoom:</b>         | DMC-LS75/DMC-LS70 : max 4.5 × (When recording resolution is <a href="#">3M</a> ) or less)<br>DMC-LS60 : max 4.1 × (When recording resolution is <a href="#">3M</a> ) or less)   |
| <b>Focus:</b>                         | Normal/Macro (Mode dial)<br>5-area-focusing/1-area-focusing (high speed)/1-area-focusing  |
| <b>Focus range:</b>                   | Normal :<br>50 cm (1.64 feet) to ∞<br>Macro/Simple/Intelligent ISO/Motion picture:<br>5 cm (0.16 feet) (Wide)/ 30 cm (0.98 feet) (Tele) to ∞<br>Scene mode: settings may be different to those shown above                    |
| <b>Shutter system:</b>                | Electronic shutter+Mechanical shutter   |
| <b>Motion picture recording:</b>      | Aspect ratio <a href="#">[4:3]</a> :<br>640 × 480 pixels (When a card is used.)/ 320 × 240 pixels<br>Aspect ratio <a href="#">[16:9]</a> :<br>848 × 480 pixels (When a card is used.)<br>30 or 10 frames/second without audio |
| <b>Burst recording</b>                |   |
| <b>Burst speed:</b>                   | Depends on the type of card, the recording resolution, and picture quality  |
| <b>Number of recordable pictures:</b> | Depends on the remaining capacity of the Built-in memory or the card. (unlimited)   |
| <b>ISO sensitivity:</b>               | AUTO/<br>100/200/400/800/1250<br>[HIGH SENS.] mode: 3200  |
| <b>Shutter speed:</b>                 | 8 seconds to 1/2,000th of a second<br>[STARRY SKY] mode:15 seconds, 30 seconds, 60 seconds<br>Motion picture mode:1/30th of a second to 1/6,400th of a second   |
| <b>White balance:</b>                 | Auto white balance/Daylight/Cloudy/Shade/Halogen/White set  |
| <b>Exposure (AE):</b>                 | Program AE<br>Exposure compensation (1/3 EV Step, -2 EV to +2 EV)   |
| <b>Metering mode:</b>                 | Multiple  |
| <b>LCD monitor:</b>                   | Amorphous silicon active TFT LCD<br>DMC-LS75: 2.5" (Approx. 115,200 pixels) (field of view ratio about 100%)<br>DMC-LS70/DMC-LS60: 2.0" (Approx. 86,400 pixels) (field of view ratio about 100%)                              |

|                               |  |
|-------------------------------|--|
| <b>Flash:</b>                 | Flash range: (ISO AUTO)<br>Approx. 30 cm (0.98 feet) to 4.7 m (15.42 feet) (Wide [ISO AUTO] mode)<br>AUTO, AUTO/Red-eye reduction, Forced ON (Forced ON/Red-eye reduction), Slow sync./Red-eye reduction, Forced OFF   |
| <b>Recording media:</b>       | Built-in Memory (Approx. 27 MB)/SD Memory Card/SDHC Memory Card/MultiMediaCard (Still pictures only)   |
| <b>Picture size:</b>          |  |
| <b>Still picture:</b>         | Aspect ratio <a href="#">[4:3]</a> :<br>3072 × 2304 pixels (DMC-LS75/DMC-LS70), 2816 × 2112 pixels (DMC-LS60 only), 2560 × 1920 pixels (DMC-LS75/DMC-LS70), 2048 × 1536 pixels, 1600 × 1200 pixels, 1280 × 960 pixels, 640 × 480 pixels<br>Aspect ratio <a href="#">[3:2]</a> :<br>3072 × 2048 pixels (DMC-LS75/DMC-LS70), 2816 × 1880 pixels (DMC-LS60 only), 2048 × 1360 pixels<br>Aspect ratio <a href="#">[16:9]</a> :<br>3072 × 1728 pixels (DMC-LS75/DMC-LS70), 2816 × 1584 pixels (DMC-LS60 only), 1920 × 1080 pixels |
| <b>Motion picture:</b>        | Aspect ratio <a href="#">[4:3]</a> :<br>640 × 480 pixels(Only when using an SD Memory card/SDHC Memory Card), 320 × 240 pixels<br>Aspect ratio <a href="#">[16:9]</a> :<br>848 × 480 pixels(Only when using an SD Memory card/SDHC Memory Card)<br>Fine/Standard   |
| <b>Quality:</b>               |  |
| <b>Recording file format</b>  |  |
| <b>Still Picture:</b>         | JPEG (Design rule for Camera File system, based on Exif 2.21 standard), DPOF corresponding   |
| <b>Motion pictures:</b>       | QuickTime Motion JPEG  |
| <b>Interface</b>              |  |
| <b>Digital:</b>               | USB 2.0 (Full Speed)   |
| <b>Analog video:</b>          | NTSC/PAL Composite (Switched by menu)  |
| <b>Terminal</b>               |  |
| <b>DIGITAL/V.OUT:</b>         | Dedicated jack (8 pin)   |
| <b>DC IN:</b>                 | Type1 jack   |
| <b>Dimensions:</b>            | 3.69"(W) × 2.44"(H) × 1.17"(D)<br>(93.7 mm (W) × 62.0 mm (H) × 29.7 mm (D))<br>(excluding the projection part)   |
| <b>Weight:</b>                | DMC-LS75:<br>Approx. 4.87 oz/138 g<br>(excluding Memory Card and battery)<br>Approx. 6.49 oz/184 g<br>(with Memory Card and battery)<br>DMC-LS70/DMC-LS60:<br>Approx. 4.76 oz/135 g<br>(excluding Memory Card and battery)<br>Approx. 6.38 oz/181 g<br>(with Memory Card and battery)  |
| <b>Operating Temperature:</b> | 0 °C to 40 °C (32 °F to 104 °F)  |
| <b>Operating Humidity:</b>    | 10 % to 80 %   |

# 5 Location of Controls and Components

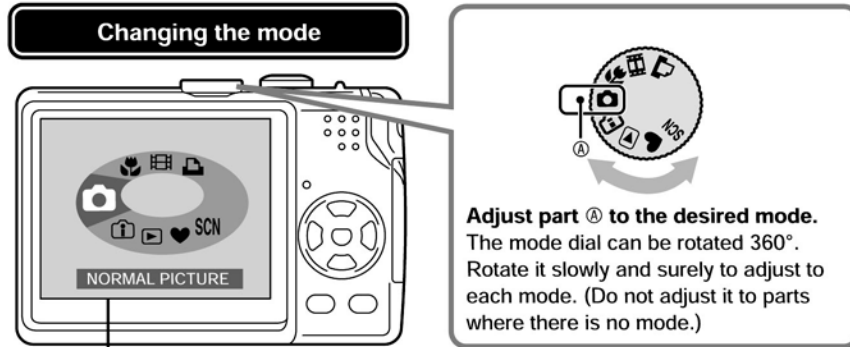
## Names of the Components










- 1 [E. ZOOM] (Easy Zoom) Button
- 2 Zoom Lever
- 3 Shutter Button
- 4 Mode Dial
- 5 Flash
- 6 Self-timer Indicator  
AF Assist Lamp
- 7 Lens part
- 8 Lens barrel
- 9 [DC IN] Socket  
Always use a genuine Panasonic AC  
adaptor (DMW-AC6: optional).
- 10 [V.OUT/DIGITAL] Socket
- 11 LCD Monitor
- 12 [MENU/SET] Button
- 13 Camera Switch
- 14 Status Indicator
- 15 Cursor buttons
  - ◀/Self-timer Button
  - ▼/[REV] Button
  - ▶/Flash Mode Button
  - ▲/Backlight Compensation in Simple  
Mode/Exposure Compensation  
Button
- 16 [DISPLAY] / [HIGH ANGLE]  
Button
- 17 [FUNC] (function)/Delete  
Button
- 18 Card Door
- 19 Strap Eyelet  
To remove the strap, use a pointed  
object to undo the knot.
- 20 Tripod Receptacle  
When you use a tripod, make sure  
the tripod is stable with the camera  
attached to it.
- 21 Battery Door

## About the Mode Dial

When the power is on and you turn the mode dial, you can switch between shooting and playback modes, and also select modes suited to the subject such as the macro mode and scene modes.



This screen appears when you turn the mode dial to show which mode is selected. The current mode appears on the LCD when you turn the camera on.

| Basic  | Advanced   |
|--|--|
| <p> <b>Normal picture mode</b><br/>Use this mode for normal recording.</p> <p> <b>Simple mode</b><br/>This mode is recommended for beginners.</p> <p> <b>Playback mode</b><br/>This mode allows you to play back recorded pictures.</p> | <p> <b>Intelligent ISO mode</b><br/>This feature detects the subject's movement and brightness, choosing the optimal ISO sensitivity and shutter speed for shooting.</p> <p> <b>Macro mode</b><br/>This mode allows you to take a close-up picture of a subject.</p> <p><b>SCN Scene mode</b><br/>This mode allows you to take pictures depending on the recording scenes.</p> <p> <b>Motion picture mode</b><br/>This mode allows you to record motion pictures.</p> <p> <b>Print mode</b><br/>This mode allows you to print pictures from a PictBridge-compliant printer connected directly to the camera.</p> |

# 6 Service Mode

## 6.1. Error Code Memory Function

### 1. General description

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

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

### 2. How to display

The error code can be displayed by the following procedure:

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

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

#### • 1. The temporary cancellation of initial setting:

Set the mode dial to "[ Normal picture mode ] (Red camera mark)".

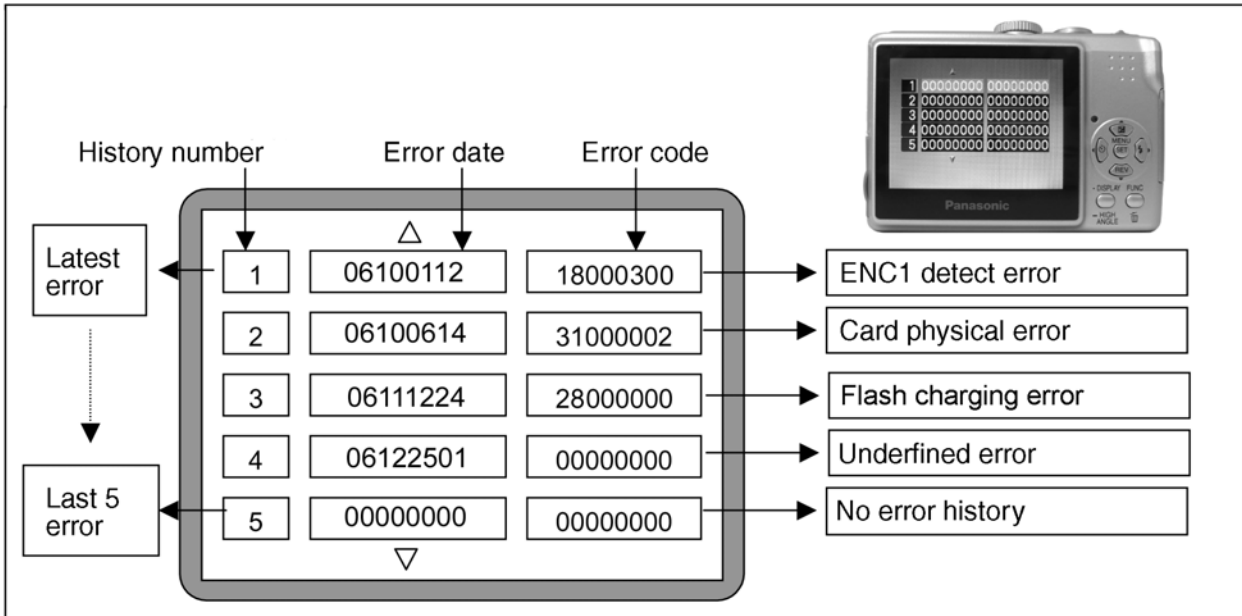
While keep pressing [ E.ZOOM ] and "[ UP ] of Cross key" simultaneously, turn the Power on.

#### • 2. The display of error code:

Press [ E.ZOOM ], [ MENU ] and "[ LEFT ] of Cross key" simultaneously with the step 1 condition.

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

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



Example of Error Code Display

#### • 3. The change of display:

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

Display can be changed by the following procedure:

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

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

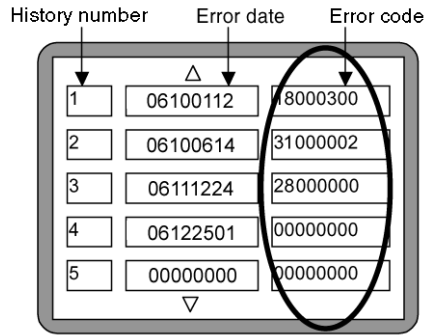
#### • 4. How to read the error date:

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

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

• 5. How to read the error code:

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



| Attribute | Main item            | Sub item  | Error code  |  | Contents (Upper)  |
|-----------|----------------------|-----------|-------------|--|---|
|           |                      |           | High 4 bits | Low 4 bits   | Check point (Lower)   |
| LENS      | Lens drive           | OIS       | 18*0        | 1000   | PSD (X) error. Hall element (X axis) position detect error in OIS unit.<br>OIS Unit                             |
|           |                      |           |             | 2000   | PSD (Y) error. Hall element (Y axis) position detect error in OIS unit.<br>OIS Unit                             |
|           |                      |           |             | 3000   | GYRO (X) error. Gyro (IC7102: X axis) detect error on Main P.C.B..<br>IC7102 (Gyro element) or IC6001 (VENUS 3) |
|           |                      |           |             | 4000   | GYRO (Y) error. Gyro (IC7101: Y axis) detect error on Main P.C.B..<br>IC7101 (Gyro element) or IC6001 (VENUS 3) |
|           |                      |           |             | 5000   | MREF error (Reference voltage error).<br>IC7001 (LENS drive) or IC6001 (VENUS 3)                                |
|           |                      |           |             | 6000   | Drive voltage (X) error.<br>VENUS 3 AD value error, LENS Unit, LENS flex breaks etc.                            |
|           |                      |           |             | 7000   | Drive voltage (Y) error.<br>VENUS 3 AD value error, LENS Unit, LENS flex breaks etc.                            |
|           |                      | C.B./Zoom | 0100        | HP Low detect error (C.B. encoder (full retract) always Low detect).<br>FP9001-(3,5) signal line or IC6001 (VENUS 3)   |   |
|           |                      |           | 0200        | HP High detect error (C.B. encoder (full retract) always High detect).<br>FP9001-(2,4) signal line or IC6001 (VENUS 3) |   |
|           |                      |           | 0300        | ENC1 detect error (C.B. motor encoder detect error).<br>FP9001-(3) signal line or IC6001 (VENUS 3)                     |   |
|           |                      |           | 0400        | ENC2 detect error (C.B. motor encoder detect error).<br>FP9001-(5) signal line or IC6001 (VENUS 3)                     |   |
|           |                      |           | Focus       | 0001   | HP Low detect error (Focus encoder always Low detect error).<br>FP9001-(23) signal line or IC6001 (VENUS 3)     |
|           |                      |           |             | 0002   | HP High detect error (Focus encoder always High detect error).<br>FP9001-(21) signal line or IC6001 (VENUS 3)   |
|           |                      | Lens      | 18*1        | 0000   | Power ON time out error.<br>Lens drive system   |
|           | 18*2                 |           |             | 0000   | Power OFF time out error.<br>Lens drive system  |
|           | Adj.History          | OIS       | 19*0        | 2000   | OIS adj. Yaw direction amplitude error (small)  |
|           |                      |           |             | 3000   | OIS adj. Pitch direction amplitude error (small)  |
|           |                      |           |             | 4000   | OIS adj. Yaw direction amplitude error (large)  |
|           |                      |           |             | 5000   | OIS adj. Pitch direction amplitude error (large)  |
|           |                      |           |             | 6000   | OIS adj. MREF error   |
|           |                      |           |             | 7000   | OIS adj. time out error   |
|           |                      |           |             | 8000   | OIS adj. Yaw direction off set error  |
|           |                      |           |             | 9000   | OIS adj. Pitch direction off set error  |
| A000      |                      |           |             | OIS adj. Yaw direction gain error  |   |
| B000      |                      |           |             | OIS adj. Pitch direction gain error  |   |
| C000      |                      |           |             | OIS adj. Yaw direction position sensor error   |   |
| D000      |                      |           |             | OIS adj. Pitch direction position sensor error   |   |
| E000      | OIS adj. other error |           |             |  |   |

| Attribute | Main item | Sub item   | Error code                      |                            | Contents (Upper)  |   |  |  |
|-----------|-----------|--|---------------------------------|----------------------------|---|---|--|--|
|           |           |  | High 4 bits                     | Low 4 bits                 | Check point (Lower)   |   |  |  |
| HARD      | VENUS A/D | Flash  | 20*0                            | 0000                       | Flash charging error.<br>IC6001-(247) signal line or Flash charging circuit |   |  |  |
|           |           |  |                                 | FLASH ROM<br>(EEPROM Area) | FLASH ROM<br>(EEPROM Area)  | 2B*0  | 0001   | EEPROM read error<br>IC6002 (FLASH ROM)  |
|           | 0002      | EEPROM write error<br>IC6002 (FLASH ROM)                           |                                 |                            |   |   |  |  |
|           | SYSTEM    | RTC  | 2C*0                            |                            |   |   | 0001   | SYSTEM IC initialize failure error<br>Communication between IC6001 (VENUS 3) and IC9101 (SYSTEM) |
|           | SOFT      | CPU  | Reset                           | 30*0                       | 0001  | NMI reset   |  |  |
| 0007      |           |  |                                 |                            | Non Mask-able Interrupt<br>(30000001-30000007 are caused by factors)        |   |  |  |
| Card      |           | Card   | 31*0                            | 0001                       | 0001  | Card logic error<br>SD memory card data line or IC6001 (VENUS 3)    |  |  |
|           |           |  |                                 |                            | 0002  | Card physical error<br>SD memory card data line or IC6001 (VENUS 3) |  |  |
|           |           |  |                                 |                            | 0004  | Write error<br>SD memory card data line or IC6001 (VENUS 3)         |  |  |
|           |           |  |                                 |                            |   | 0005  | Format error   |  |
|           |           |  |                                 |                            | CPU,<br>ASIC hard   | Stop  | 38*0   | 0001   |
| 0002      |           | Camera task invalid code error.<br>IC6001 (VENUS 3)                |                                 |                            |   |   |  |  |
| 0100      |           | File time out error in recording motion image<br>IC6001 (VENUS 3)  |                                 |                            |   |   |  |  |
| 0200      |           | File data send error in recording motion image<br>IC6001 (VENUS 3) |                                 |                            |   |   |  |  |
| 0300      |           | Single or burst recording brake time out.                          |                                 |                            |   |   |  |  |
| Operation |           | Power on   | 3B*0                            | 0000                       |   |   |  |  |
| Zoom      |           | Zoom   | 3C*0                            | 0000                       | 0000  | Inperfect zoom lens processing.<br>Zoom lens                        |  |  |
|           |           |  |                                 |                            | 35*0  | 0001  | 0001   | Software error.<br>(0-7bit : command, 8-15bit : status)  |
|           |           |  |                                 |                            |   |   | 0007   |  |
|           |           |  |                                 |                            | 35*1  | 0000  | Though record preprocessing is necessary, it is not called.    |  |
|           |           |  |                                 |                            | 35*2  | 0000  | Though record preprocessing is necessary, it is not completed. |  |
| 3C*0      |           | 0000   | Inperfect zoom lens processing. |                            |   |   |  |  |

**About "\*" indication in the above table:**

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.

**• 6. How to returned to Normal Display:**

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

**NOTE:**

The error code can not be initialized.



## 6.2. Confirmation of Firmware Version

The Firmware version can be confirmed by ordering the following steps:

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

Set the mode dial to “[ Normal picture mode ] (Red camera mark)”.

Insert the SD memory card which has a few photo data.

While keep pressing [ E.ZOOM ] and “[ UP ] of Cross key” simultaneously, then turn the power on.

- **Step 2. Confirm the version:**

Set the mode dial to “[ Playback ]” and then press [ DISPLAY ] to switch to LCD with indication. (Fig. A)

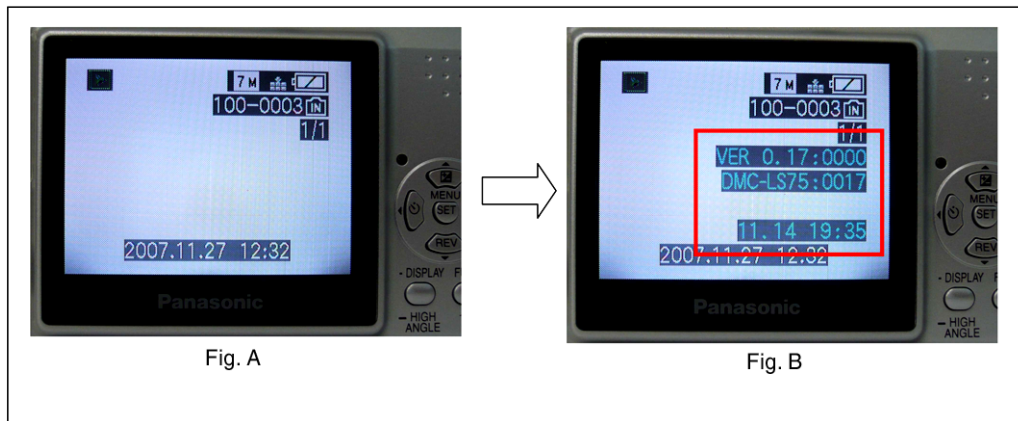
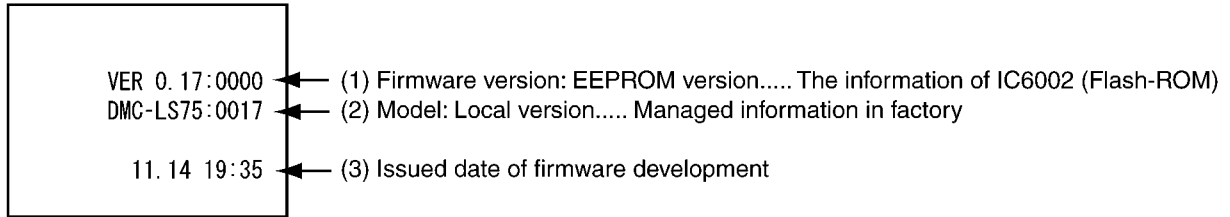
Press [ E.ZOOM ] and “[ DOWN ] of Cross key” simultaneously. (No need to keep pressing.)

(The version information is displayed on the LCD with light blue colour letters.) (Fig. B)

**CAUTION:**

The version information does not display if the LCD has switched to LCD with indication already.

In this case, press [ DISPLAY ] to switch to LCD with indication.



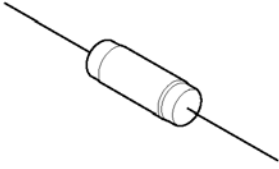
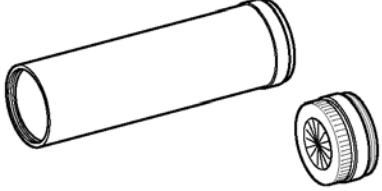
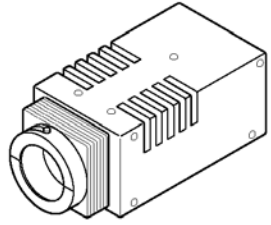
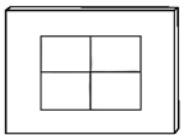

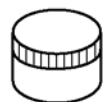
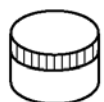

**<Point>**

- The firmware version and EEPROM version can be confirmed with the information (1).
- The information (2), (3) are just reference.

# 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><br><b>ERG5SJ102</b>  | <b>Infinity Lens (with Focus Chart)</b><br><b>VFK1164TCM02</b>  | <b>LIGHT BOX</b><br><b>VFK1164TDVLB</b>  |
|  <p>An equivalent type of Resistor may be used.</p> |                                        |  <p>※ with DC Cable</p> |
| <b>TR Chart</b><br><b>RFKZ0434</b>   | <b>Lens Cleaning Kit (BK)</b><br><b>VFK1900BK</b>   | <b>Grease (for lens)</b><br><b>VFK1829</b>   |
|   |  <p>* Only supplied as 10 set/box.</p> |                         |
| <b>Furoyl grease (for focus motor)</b><br><b>VFK1850</b>   | <b>T3 Torx Driver</b><br><b>RFKZ0334</b>  |  |
|   |                                      |  |

## 7.2. When Replacing the Main PCB

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

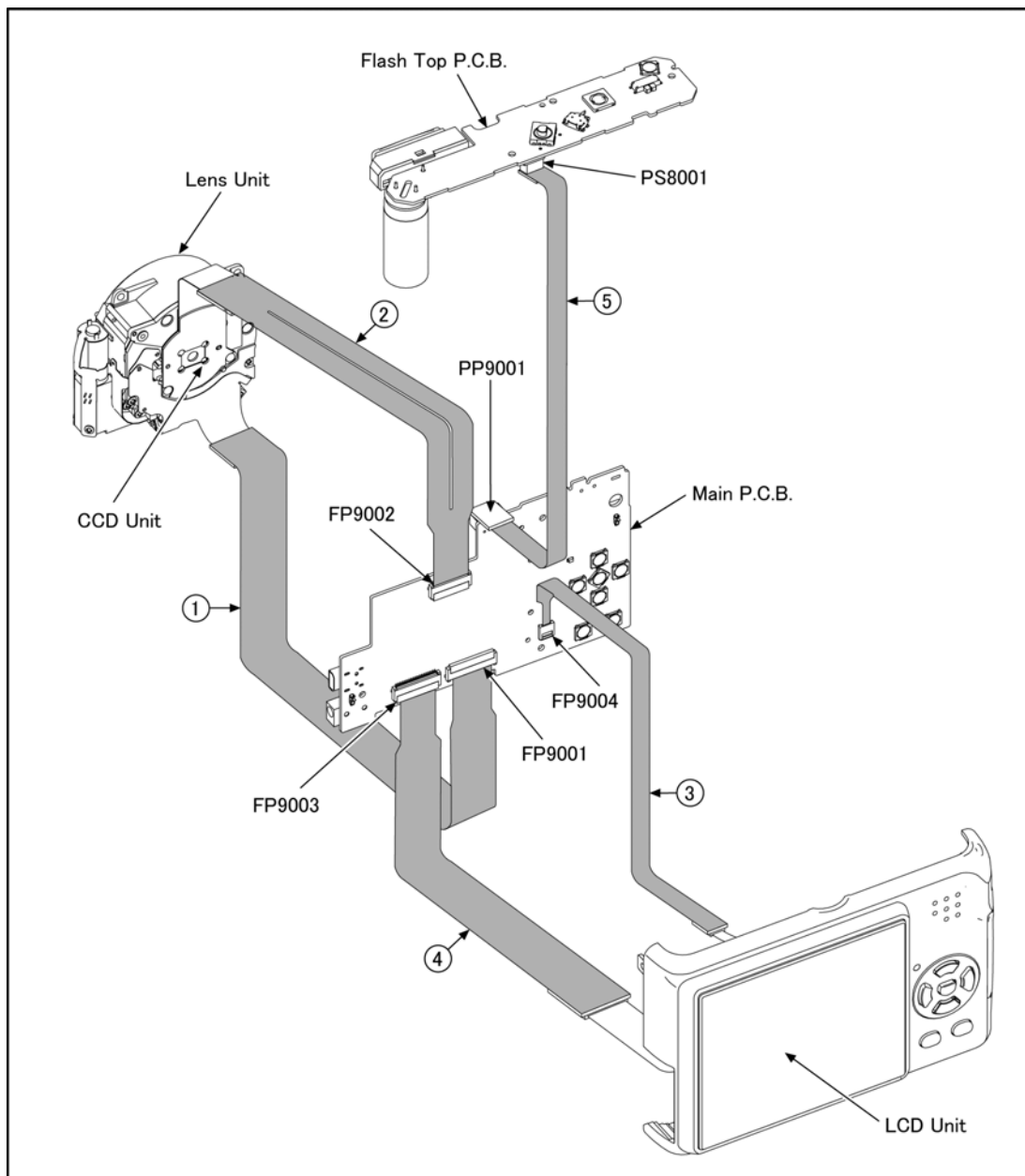
The adjustment instruction is available at “software download” on the “Support Information from NWBG/VDBG-PAVC” web-site in “TSN system”, together with Maintenance software.

## 7.3. Service Position

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

Table S1 Extension Cable List

| No. | Parts No. | Connection                         | Form          |
|-----|-----------|------------------------------------|---------------|
| 1   | VFK1951   | FP9001 (MAIN) - LENS UNIT          | 39PIN 0.3 FFC |
| 2   | VFK1978   | FP9002 (MAIN) - CCD UNIT           | 31PIN 0.3 FFC |
| 3   | VFK1974   | FP9004 (MAIN) - LCD UNIT           | 4PIN 0.3 FFC  |
| 4   | RFKZ0354  | FP9003 (MAIN) - LCD UNIT           | 37PIN 0.5 FFC |
| 5   | VFK1906   | PP9001 (MAIN) - PS8001 (FLASH TOP) | 20PIN B to B  |

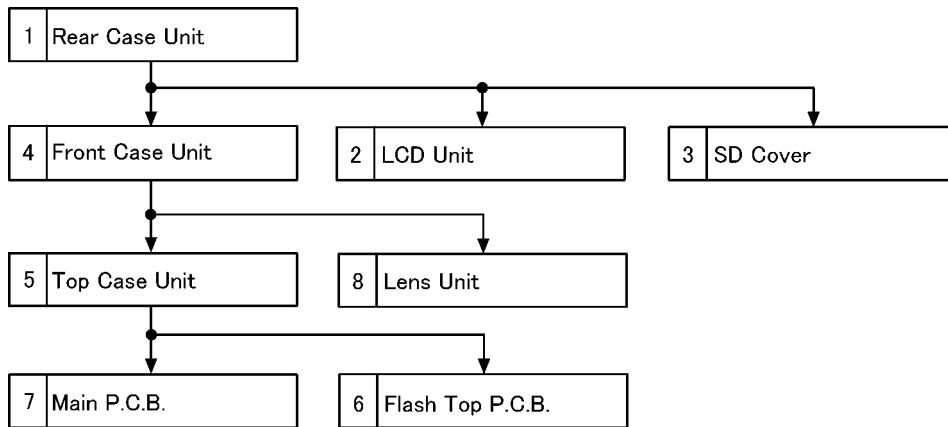


### CAUTION-1. (When servicing FLASH TOP PCB)

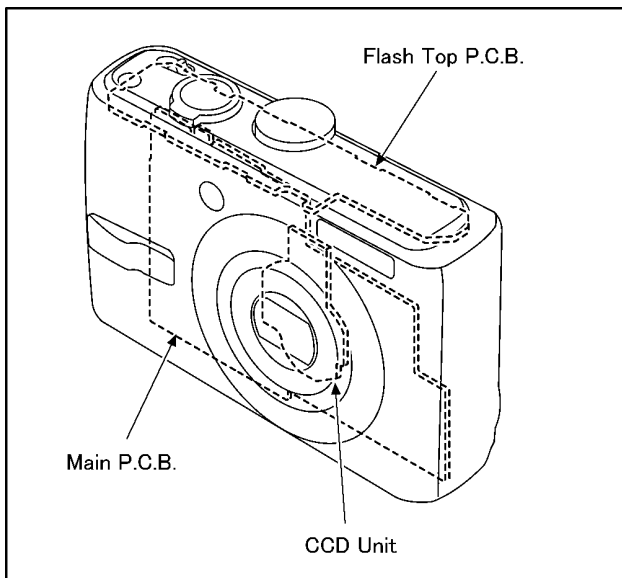
1. Be sure to discharge the capacitor on FLASH TOP PCB.  
Refer to “HOW TO DISCHARGE THE CAPACITOR ON FLASH TOP PCB”.  
The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on FLASH TOP PCB.
3. DO NOT allow other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

# 8 Disassembly and Assembly Instructions

## 8.1. Disassembly Flow Chart



## 8.2. PCB Location



### 8.3. Disassembly Procedure

| No. | Item             | Fig                | Removal   |
|-----|------------------|--------------------|---|
| 1   | Rear Case Unit   | Fig. D1            | Card<br>Battery<br>5 Screws (A)<br>FP9003(Flex)<br>FP9004(Flex)<br>Rear Case Unit |
| 2   | LCD Unit         | Fig. D2            | 1 Screw (B)<br>LCD Holder<br>LCD Unit   |
| 3   | SD Cover         | Fig. D3            | Rear Knob<br>LED Panel R<br>SD Earth Plate<br>Shaft<br>SD Cover                   |
| 4   | Front Case Unit  | Fig. D4            | 1 Screw (C)<br>FP9001(Flex)<br>FP9002(Flex)<br>Front Case Unit                    |
| 5   | Top Case Unit    | Fig. D5            | PP9001(Connector)<br>Top Case Unit  |
| 6   | Flash Top P.C.B. | Fig. D6<br>Fig. D7 | 2 Screws (D)<br>Top Operation Cover<br>Flash Top P.C.B.                           |
| 7   | Main P.C.B.      | Fig. D8            | 3 Screws (E)<br>Solder (5 points)<br>Main P.C.B.                                  |
| 8   | Lens Unit        | Fig. D9            | 3 Screws (F)<br>Lens Unit   |

### 8.3.1. Removal of the Rear Case Unit

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

- Card
- Battery
- Screw (A) × 5
- FP9003(Flex)
- FP9004(Flex)

**NOTE: (When Replacing)**  
When remove the flex, pull up the connector in the direction of arrow (1), and then remove the flex in the direction of arrow (2).

**Screw (A)**  
 5mm  
 (S): SILVER  
 (K): BLACK

Fig. D1

### 8.3.2. Removal of the LCD Unit

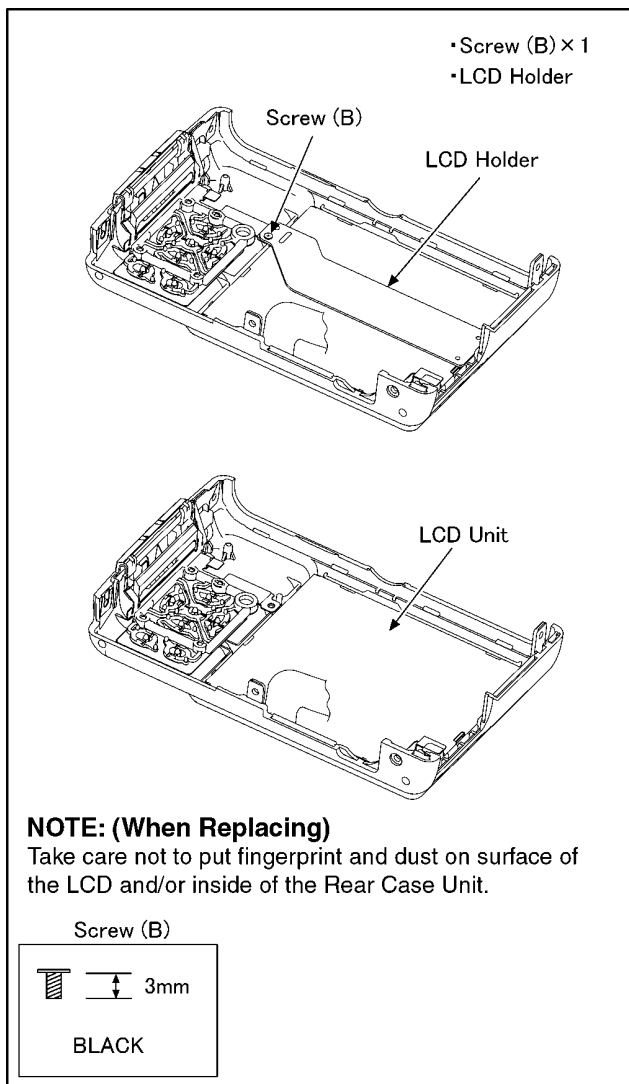


Fig. D2

### 8.3.3. Removal of the SD Cover

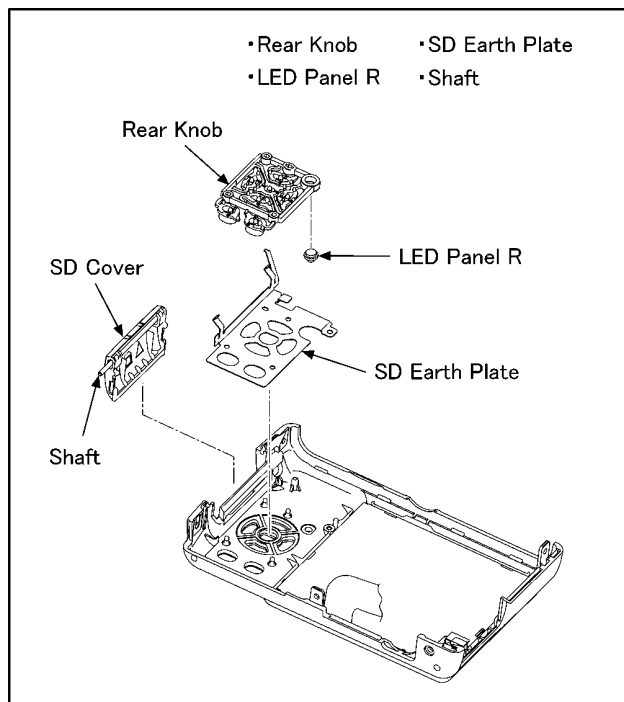


Fig. D3

### 8.3.4. Removal of the Front Case Unit

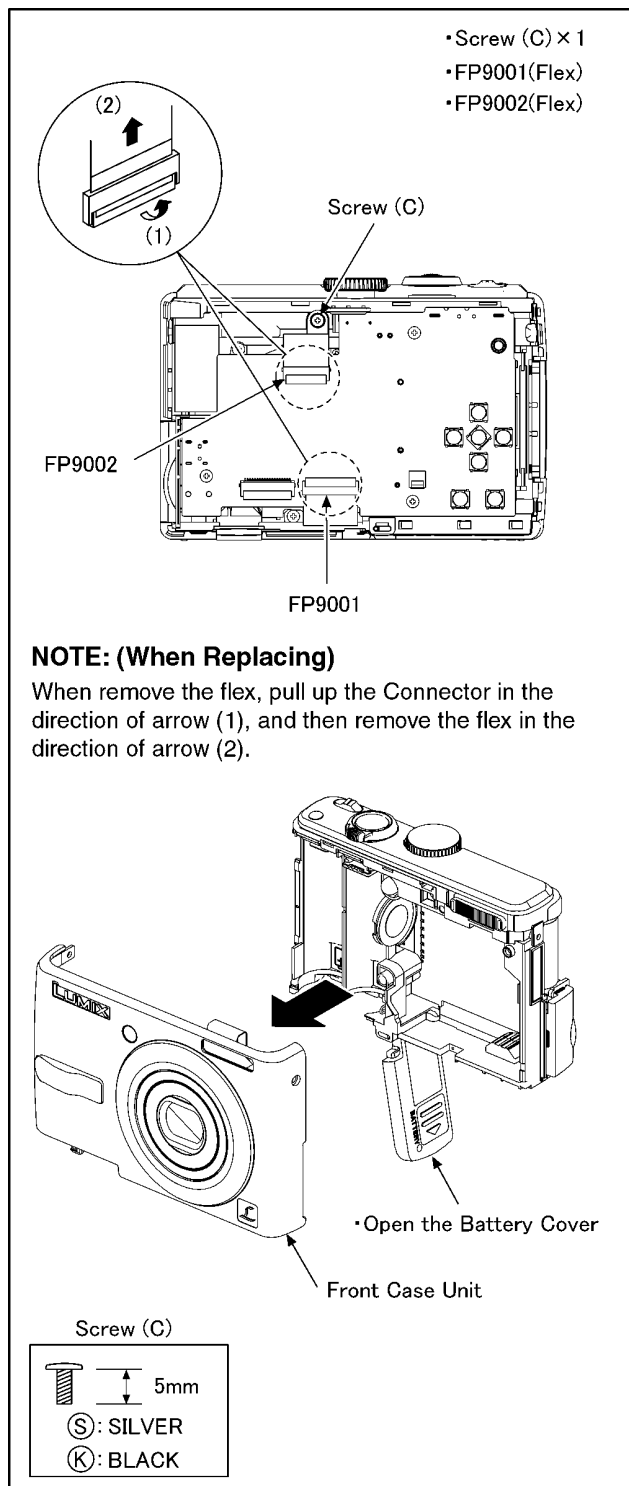


Fig. D4

### 8.3.5. Removal of the Top Case Unit

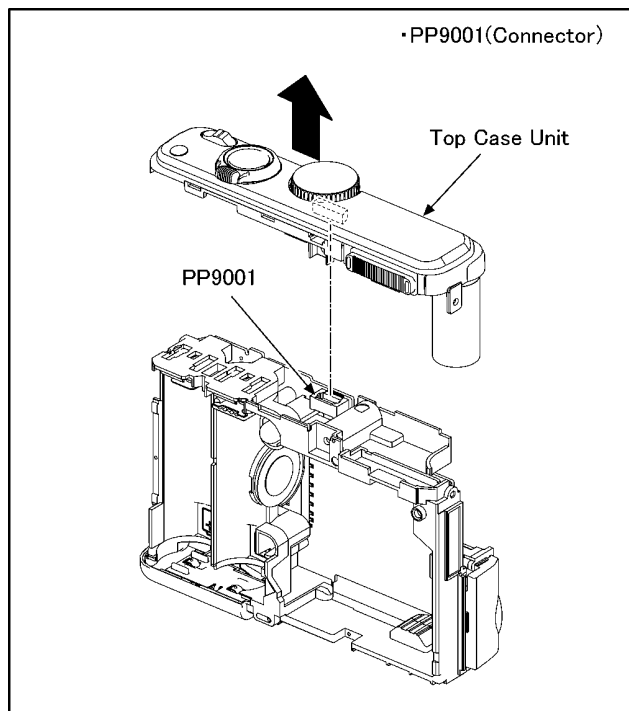


Fig. D5

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

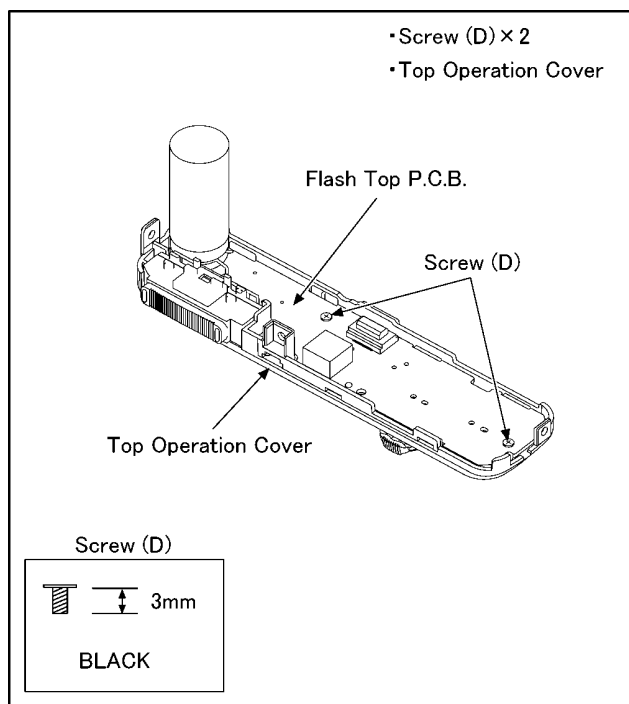
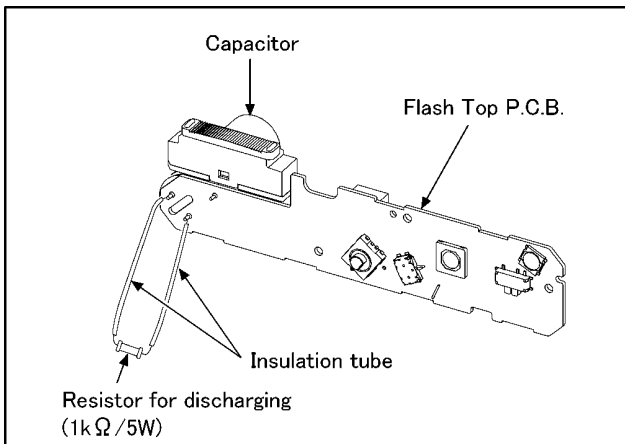


Fig. D6



**CAUTION**

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

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

**NOTE: (When Installing)**

Align the convex of power switch and groove of power knob.

Align the convex of mode dial switch and groove of mode dial. (Align the "D" cut part)

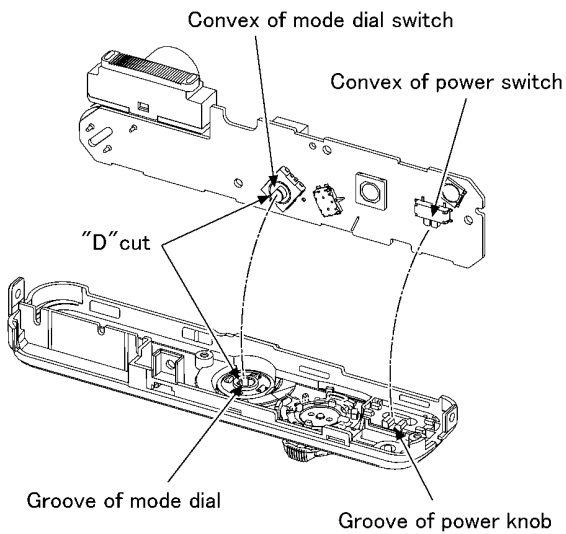


Fig. D7

**8.3.7. Removal of the Main P.C.B.**

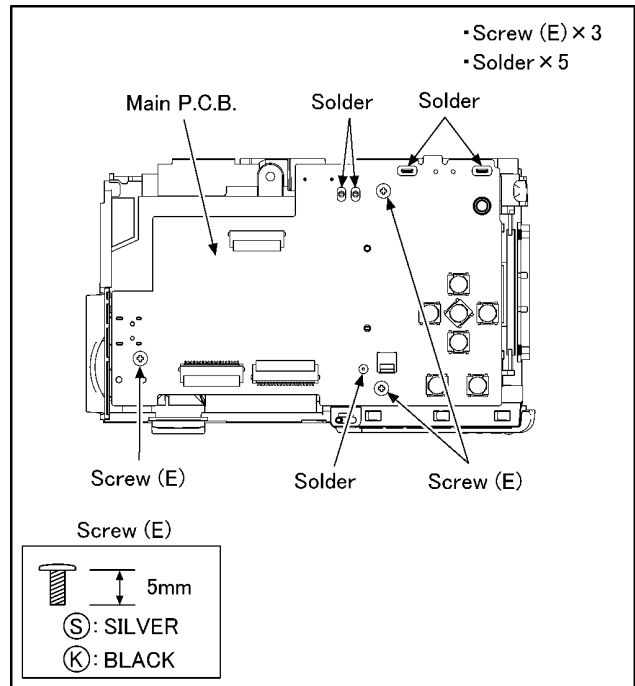


Fig. D8

**8.3.8. Removal of the Lens Unit**

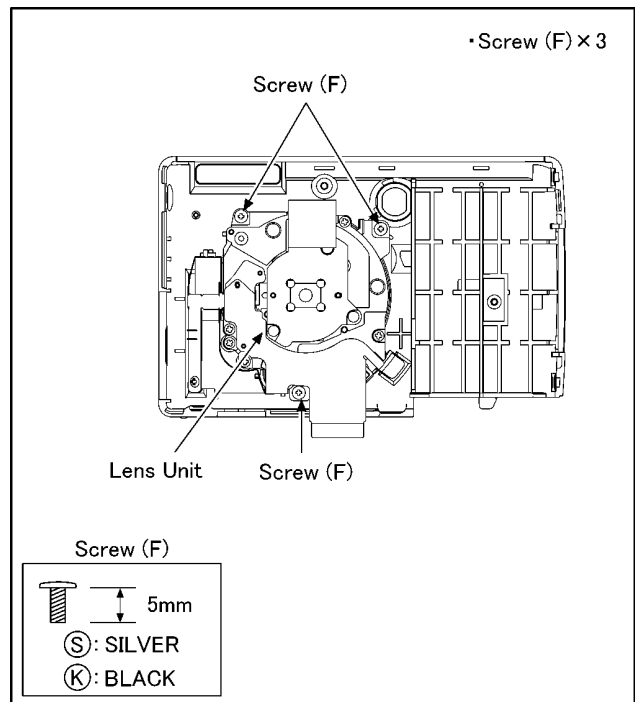


Fig. D9

**NOTE: (When Assembling)**

Be sure to confirm the following points when assembling.

- The Screw is tightened enough.
- Assembling conditions are fine. (No distortion, no illegal-space.)
- No dust and/or dirt on every Lens surfaces.
- LCD image is fine. (No dust and dirt on it, and no gradient images.)



## 8.4. Disassembly Procedure for the Lens

### NOTE: When Disassembling and Assembling for the Lens

1. To minimize the possibility of the CCD being dirt, perform disassemble and/or assemble under the condition of the CCD is being mounted.  
Disassembling procedures for the CCD unit, refer to item 8.6.
2. Take care that the dust and dirt are not entered into the lens.  
In case of the dust is putted on the lens, blow off them by airbrush.
3. Do not touch the surface of lens.
4. Use lens cleaning KIT (BK)(VFK1900BK).
5. Apply the grease to the point where is shown to "Grease apply" in the figure.

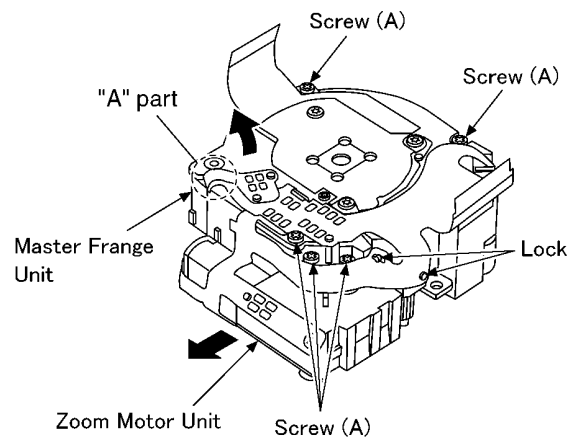
## 8.4.1. Removal of the Zoom Motor Unit, Direct Frame/Drive Frame Unit and 1st Lens Frame/2nd Lens Frame Unit

1. Remove the 2 locks.
2. Unscrew the 5 screws (A).
3. Turn the zoom motor unit to the indicated by arrow.
4. Remove the cover to the indicated by arrow.
5. Move the master frange unit to the indicated by arrow.

### CAUTION:

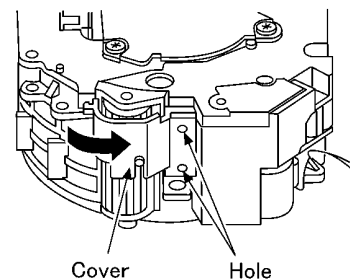
2nd lens frame move unit is connected with flex ("A" part).  
Take care not to damage the flex.

- Screw (A) × 5
- Lock × 2
- Cover



### NOTE: (When Disassembling)

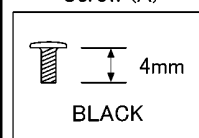
- When move the master frange unit to the indicated by arrow, take care not to damage the flex.



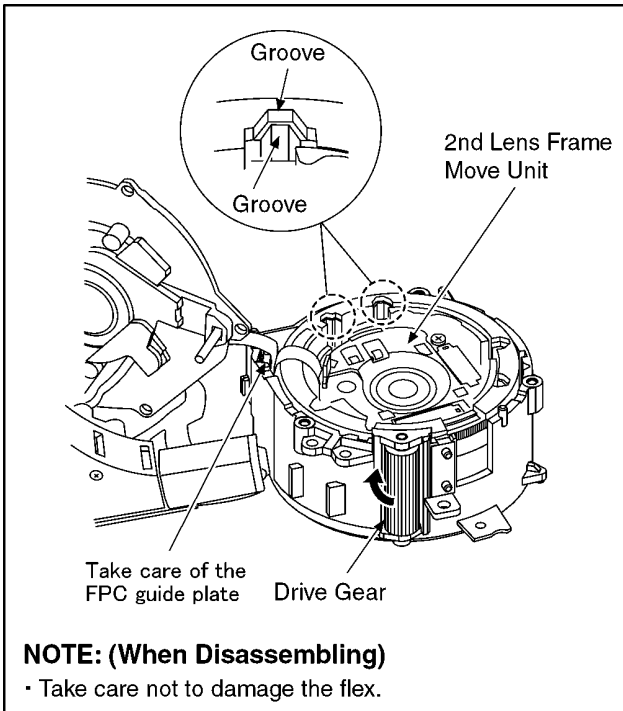
### NOTE: (When Installing)

- Refer to "THE APPLYMENT OF GREASE METHOD" when installing the master flange unit.
- Align the convex of fixed frame unit and hole of cover, and then install them.

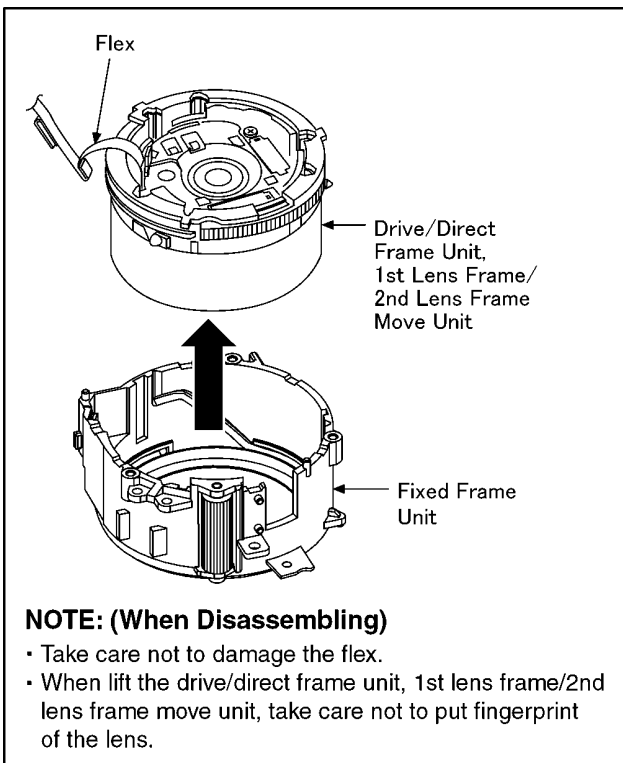
Screw (A)



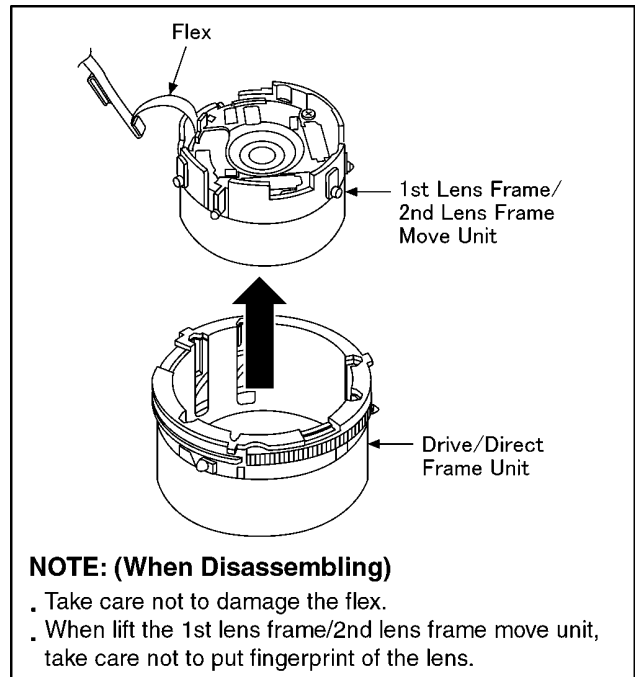
6. Turn the drive gear to the indicated by arrow fully.



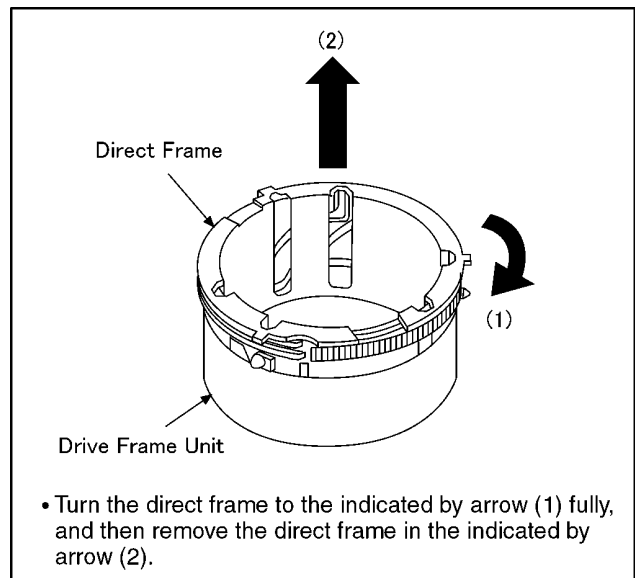
7. Push the drive frame unit to the indicated by arrow from lens front side, and then remove the drive/direct frame unit and 1st lens frame/2nd lens frame move unit from direct frame.



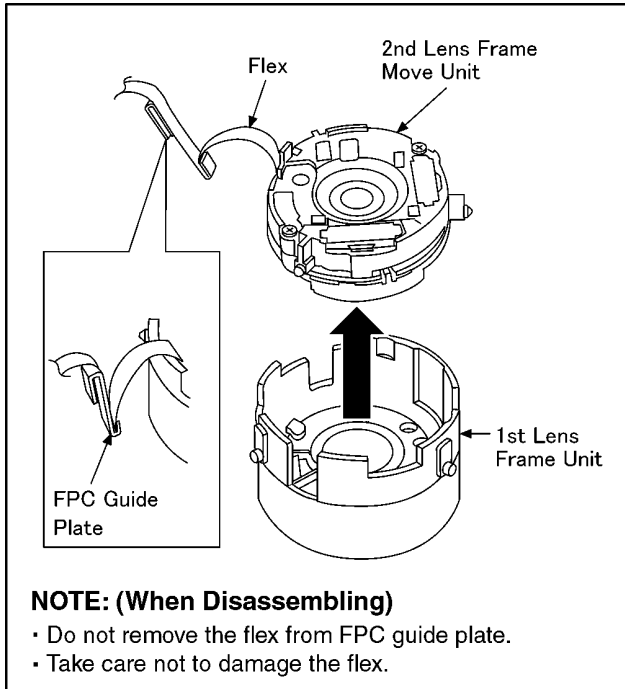
8. Push the 1st lens frame unit to the indicated by arrow from lens front side, and then remove the 1st lens frame/2nd lens frame move unit from drive/direct frame unit.



#### 8.4.2. Removal of the Direct Frame Unit

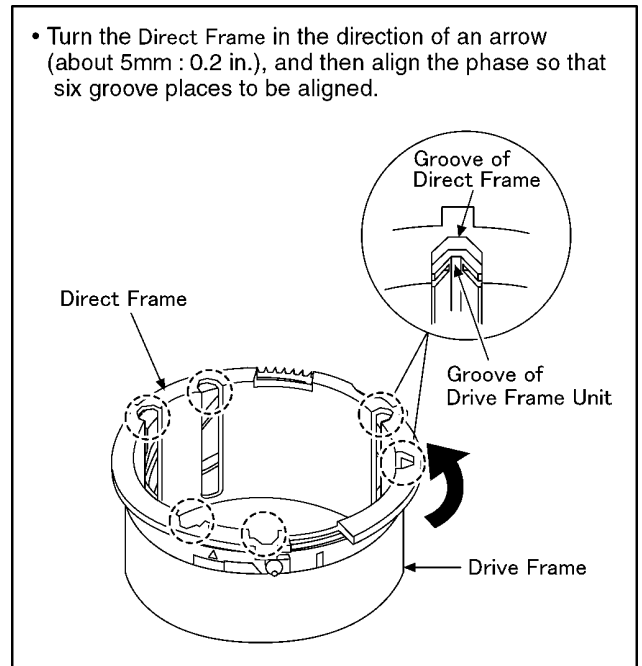
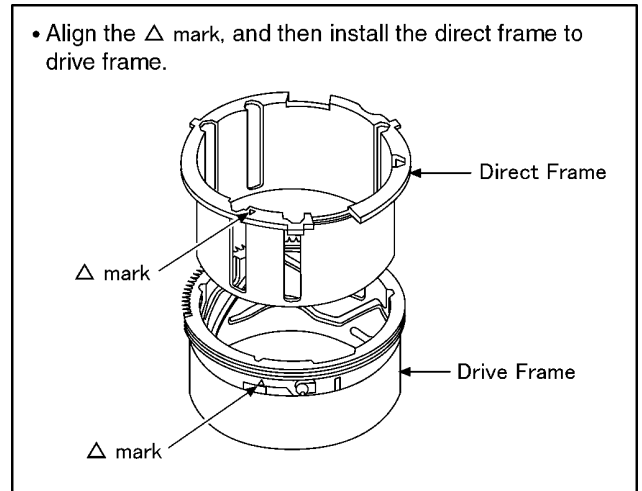


### 8.4.3. Removal of the 2nd Lens Frame Move Unit



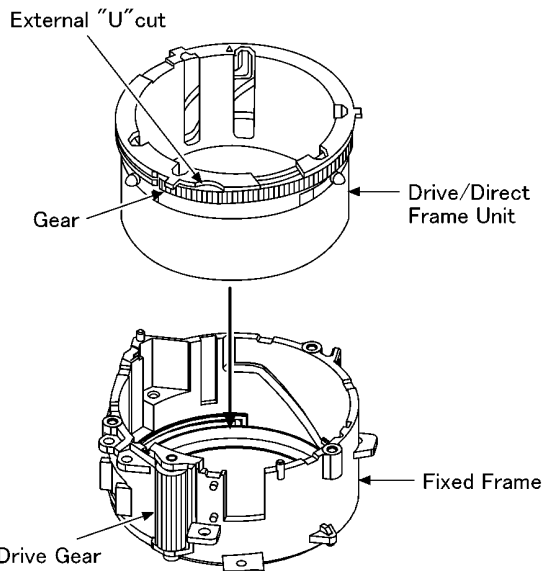
### 8.5. Assembly Procedure for the Lens

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



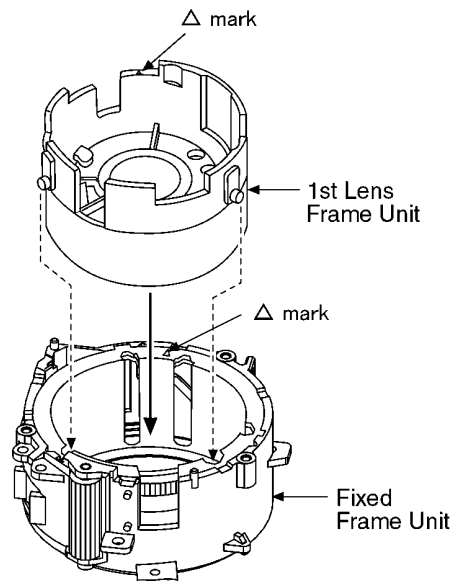
### 8.5.2. Phase alignment of the Direct/Drive Frame Unit and Fixed Frame

- Align the external "U" cut and drive gear, and then install the drive/direct frame unit to fixed frame unit.
- With aligning the phase of 6 grooves of the drive/direct frame unit, confirm the gear of drive/direct frame unit is engaged with the fixed frame firmly.



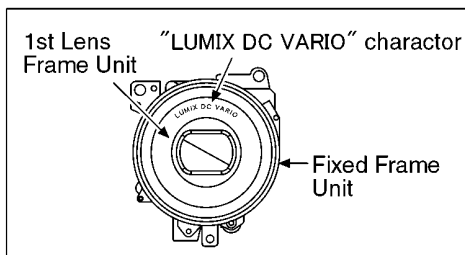
### 8.5.3. Assembly for the 1st Lens Frame Unit

- Align the  $\Delta$  mark, and then install the 1st lens frame unit to fixed frame unit.

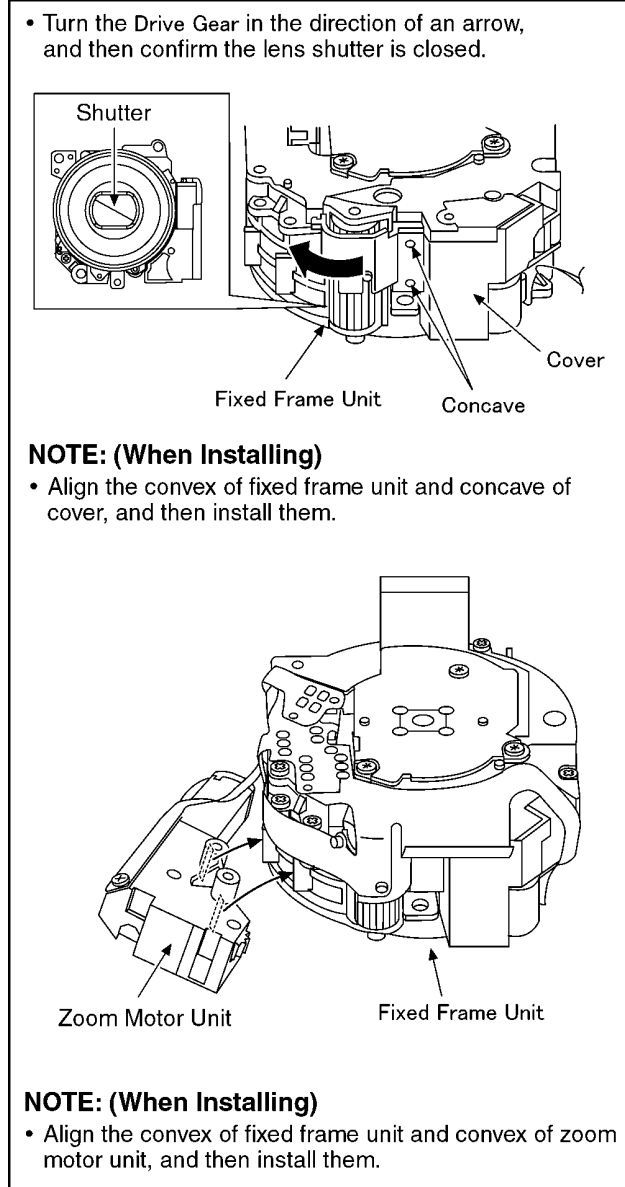
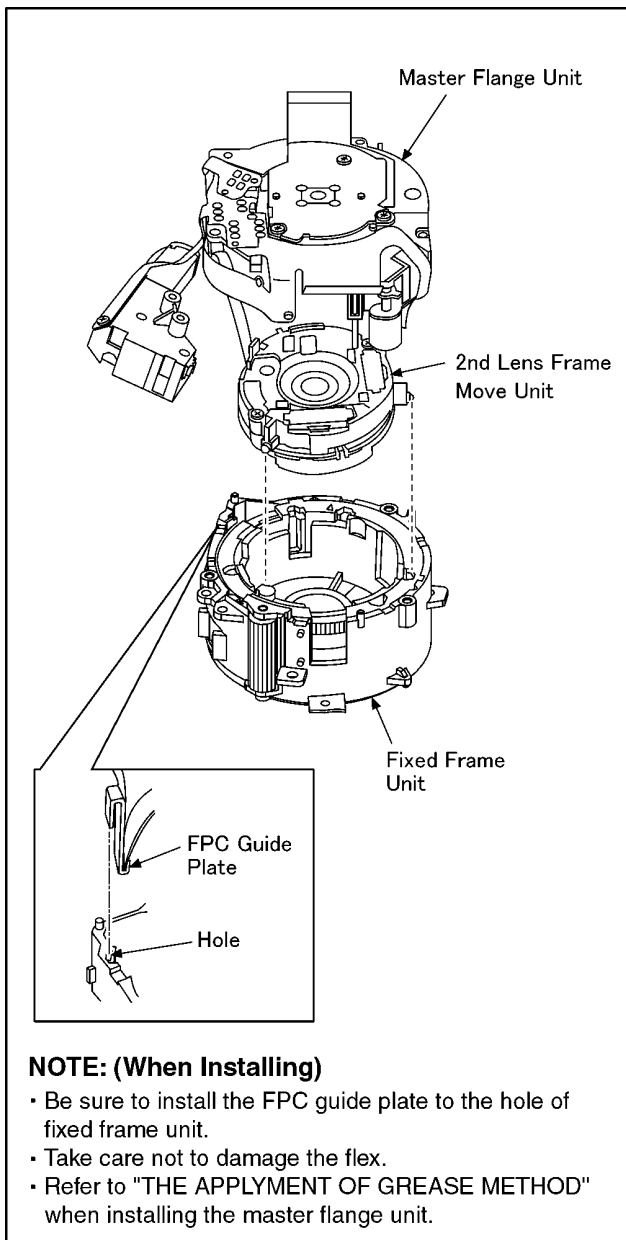


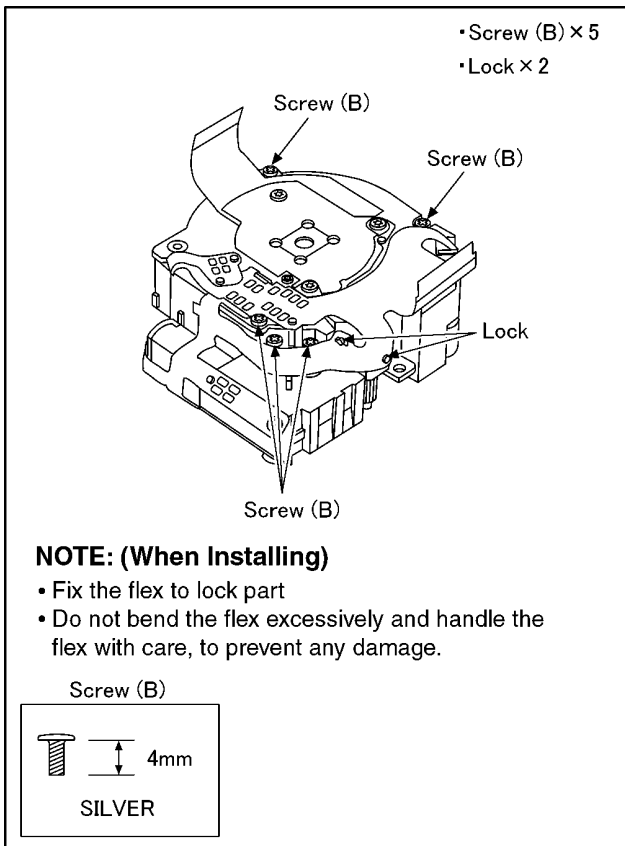
#### FRONT VIEW

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



### 8.5.4. Assembly for the 2nd Lens Frame Move Unit

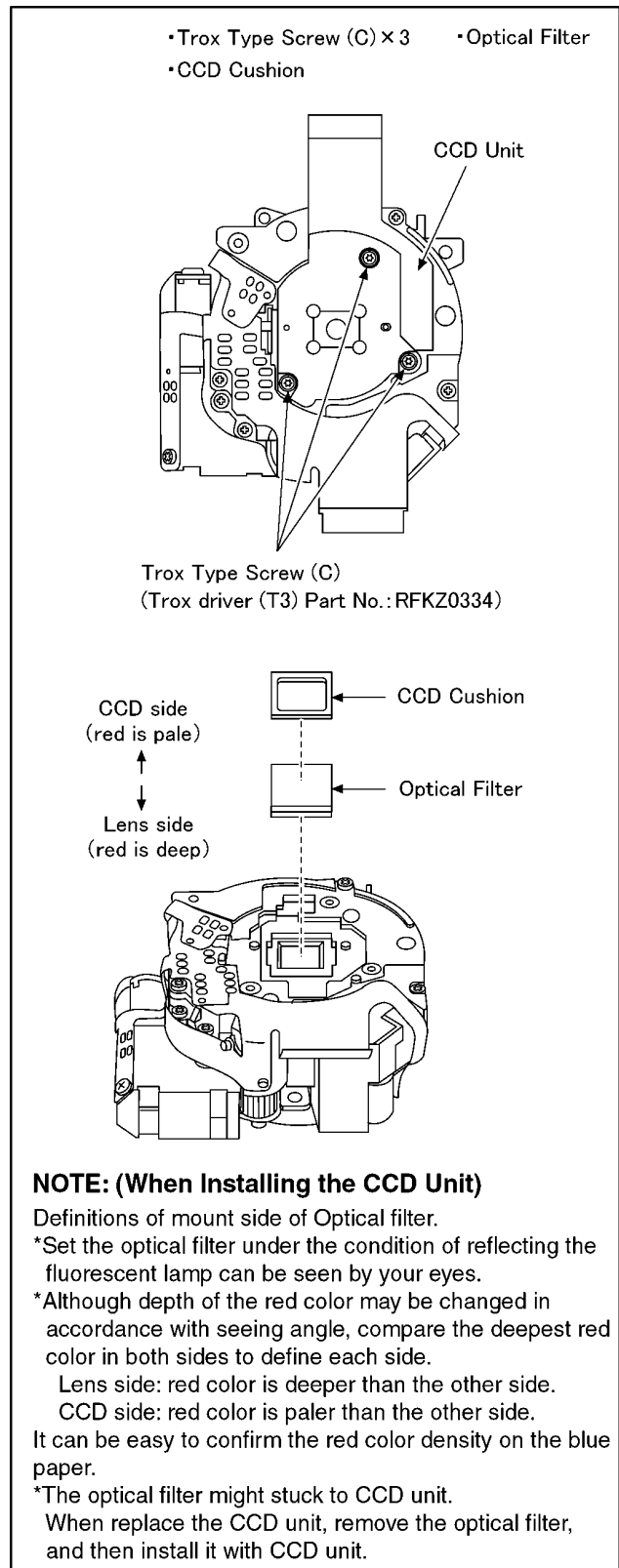




## 8.6. Removal of the CCD Unit

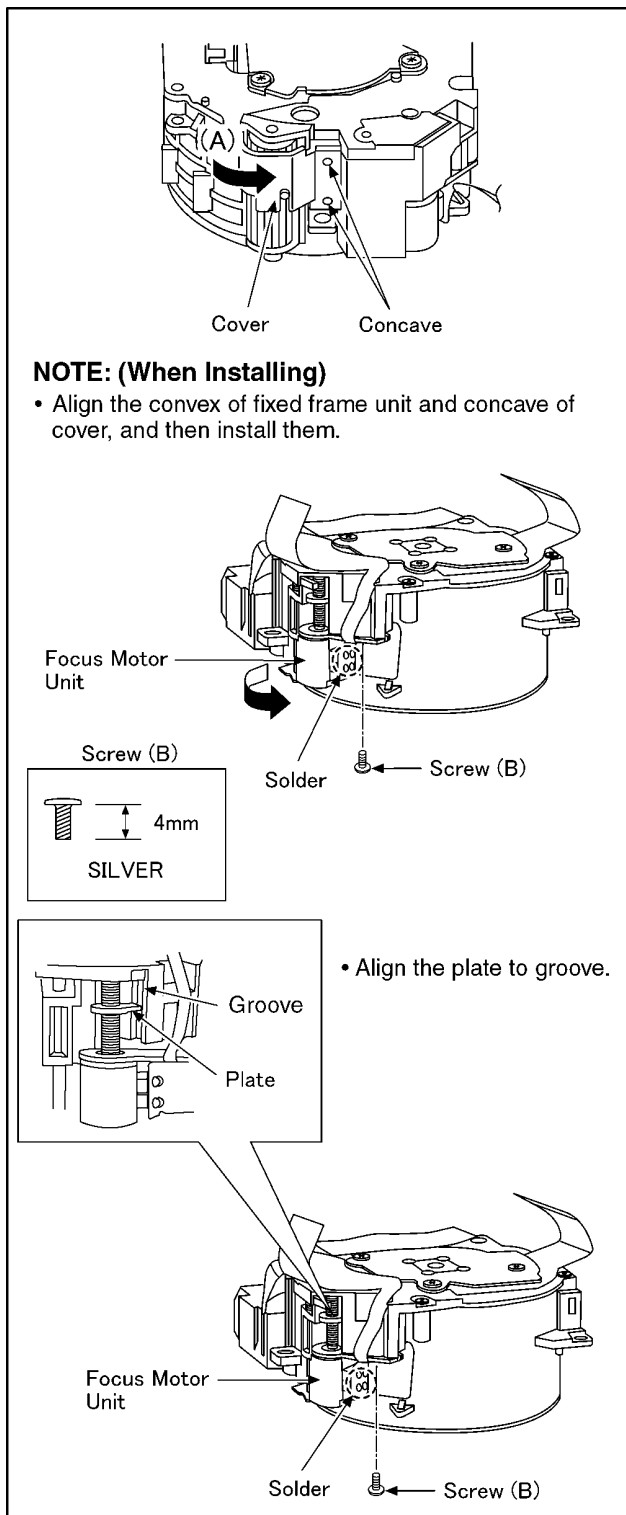
To prevent the CCD unit from catching the dust and dirt, do not remove the CCD unit except for replacing.

- Torx driver (T3) Part No. RFKZ0334



## 8.7. Removal of the Focus Motor

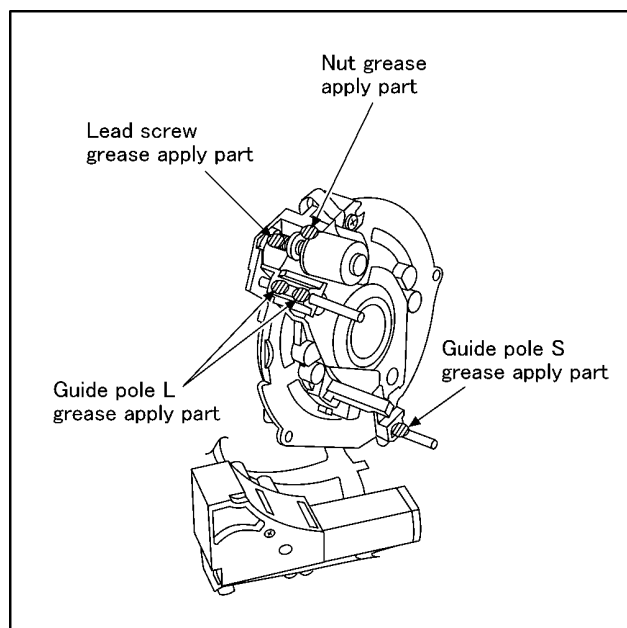
1. Remove the cover to the indicated by arrow (A).
2. Unscrew the 1 screw (B).
3. Unsolder (4 points).
4. Remove the focus motor.



## 8.8. The Appliment of Grease Method

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

- Lead screw
  - Grease: VFK1850 (Furoyl type)
  - Amount of apply: 2 - 4 mg
- Guide pole
  - Grease: VFK1829
  - Amount of apply: 2 - 4 mg



# 9 Measurements and Adjustments

## 9.1. Matrix Chart for Replaced Part and Necessary Adjustment

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

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

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

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

**NOTE:**

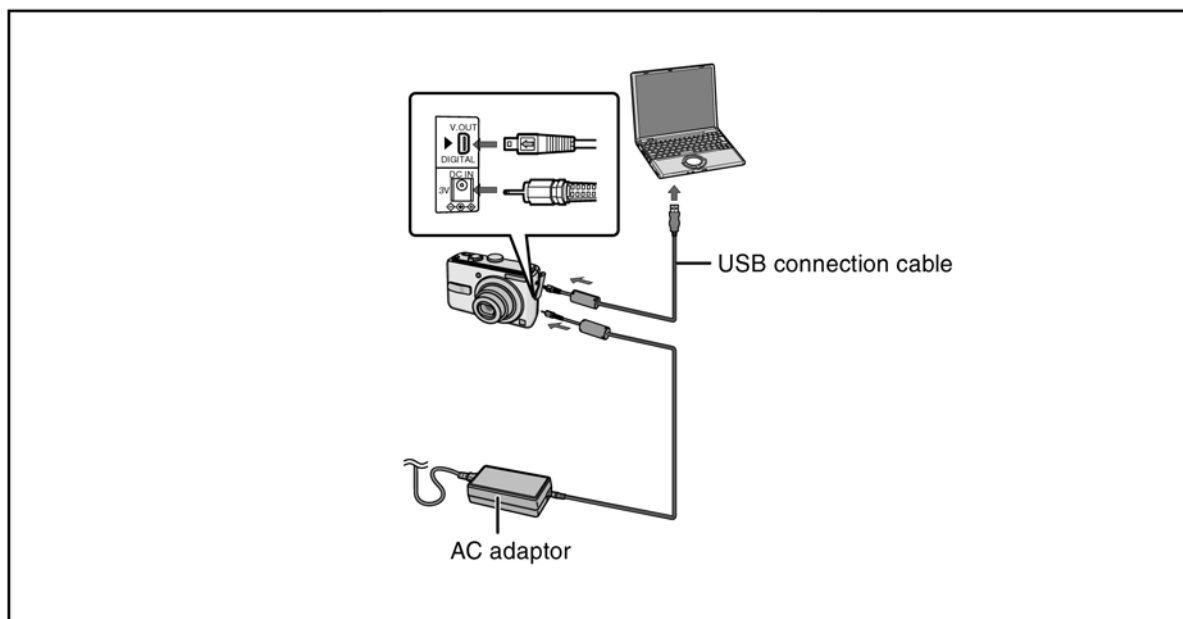
After adjustments have been terminated, make sure to achieve "INITIAL SETTINGS".

| Adjustment Item |   | Replaced Part |                |                    |                           |          |
|-----------------|---|---------------|----------------|--------------------|---------------------------|----------|
|                 |   | Main P.C.B.   | VENUS (IC6001) | Flash-ROM (IC6002) | Lens Part (Excluding CCD) | CCD Unit |
| Camera Section  | OIS hall element adjustment (OIS)                             | ○             | ○              | ○                  | ○                         |          |
|                 | Back focus adjustment (BF)                                    | ○             | ○              | ○                  | ○                         |          |
|                 | Shutter adjustment (SHT)                                      | ○             | ○              | ○                  | ○                         | ○        |
|                 | ISO sensitivity adjustment (ISO)                              | ○             | ○              | ○                  | ○                         | ○        |
|                 | AWB adjustment<br>High brightness coloration inspection (WBL) | ○             | ○              | ○                  | ○                         | ○        |
|                 | CCD white scratch compensation (WKI)                          | ○             | ○              | ○                  |                           | ○        |

**NOTE:**

\*There is no LCD adjustment in this model.

\*There is no CCD Black scratch compensation adjustment (BKI) in this model.





# 10 Maintenance

## 10.1. Cleaning Lens and LCD Panel

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

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

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

**Note:**

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

# Service Manual

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## Diagrams and Replacement Parts List

### Digital Camera

Model No.

|             |             |             |
|-------------|-------------|-------------|
| DMC-LS60PC  | DMC-LS70PC  | DMC-LS75PL  |
| DMC-LS60PL  | DMC-LS70PL  | DMC-LS75EB  |
| DMC-LS60EB  | DMC-LS70EB  | DMC-LS75EE  |
| DMC-LS60EE  | DMC-LS70EE  | DMC-LS75EF  |
| DMC-LS60EF  | DMC-LS70EG  | DMC-LS75EG  |
| DMC-LS60EG  | DMC-LS70EGM | DMC-LS75EGM |
| DMC-LS60EGM | DMC-LS70GC  | DMC-LS75GC  |
| DMC-LS60GC  | DMC-LS70GK  | DMC-LS75GK  |
| DMC-LS60GK  | DMC-LS70GN  | DMC-LS75GN  |
| DMC-LS60GN  | DMC-LS75P   |             |
| DMC-LS70P   | DMC-LS75PC  |             |

Vol. 1

Colour

(S).....Silver Type (except DMC-LS75PC)

(K).....Black Type (only DMC-LS75P/PC/EB/EE/EF/EG/EGM)

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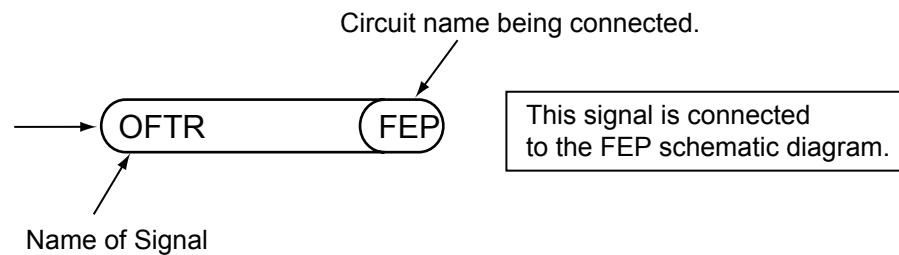
|  |      |  |      |
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## S1. About Indication of The Schematic Diagram

### S1.1. Important Safety Notice

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

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



## S2. Voltage Chart

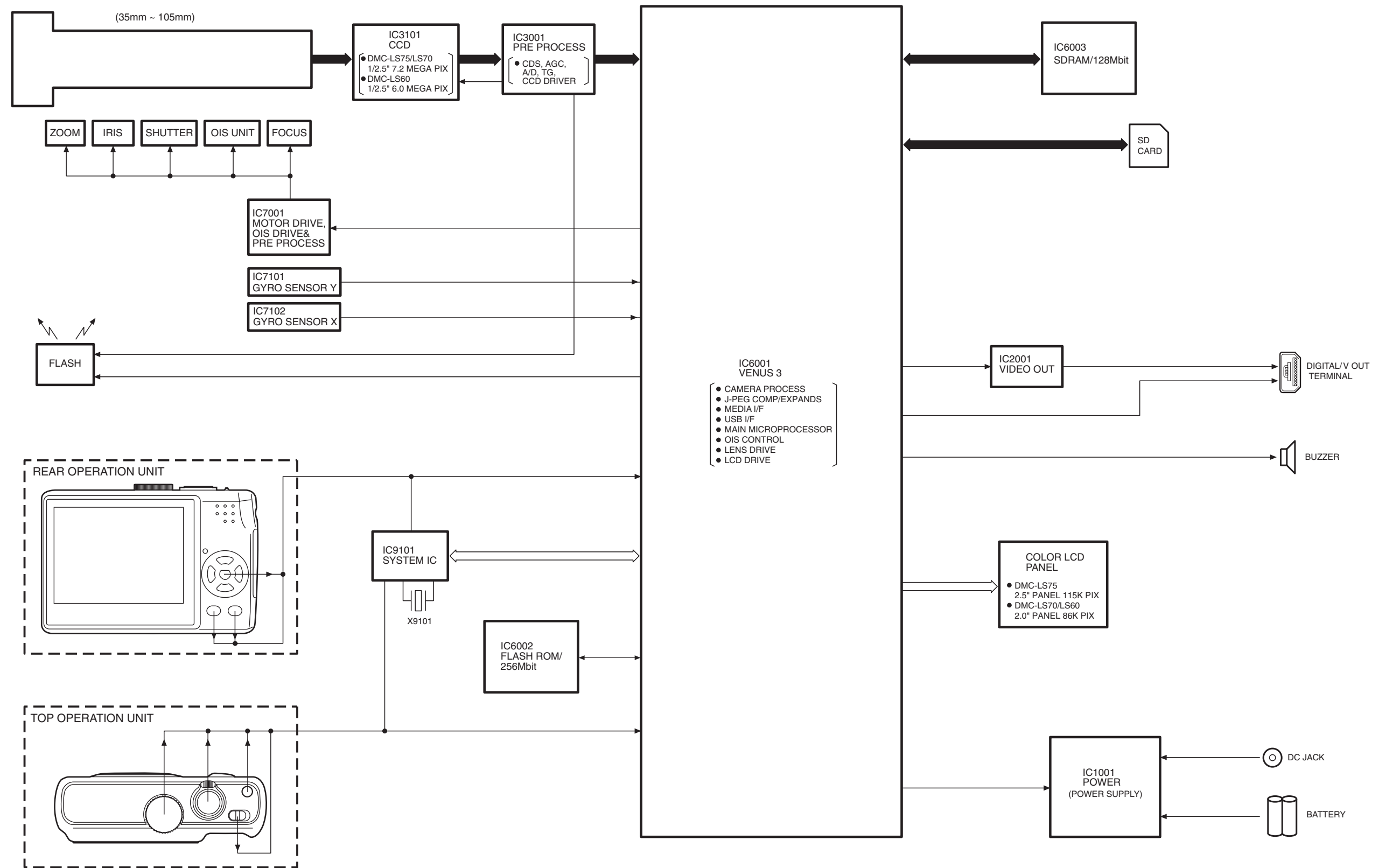
Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.  
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

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

| REF No. | PIN No. | POWER ON |
|---------|---------|----------|
| Q8002   | 1       | 0        |
| Q8002   | 2       | 0        |
| Q8002   | 3       | 0        |
| Q8002   | 4       | 0        |
| Q8002   | 5       | 0.1      |
| Q8002   | 6       | 0.1      |
| Q8002   | 7       | 0.1      |
| Q8002   | 8       | 0.1      |
| Q8009   | 1       | 3.4      |
| Q8009   | 2       | 3.4      |
| Q8009   | 3       | 0        |
| Q8009   | 4       | 0.1      |
| Q8009   | 5       | 3.4      |
| Q8009   | 6       | 3.4      |

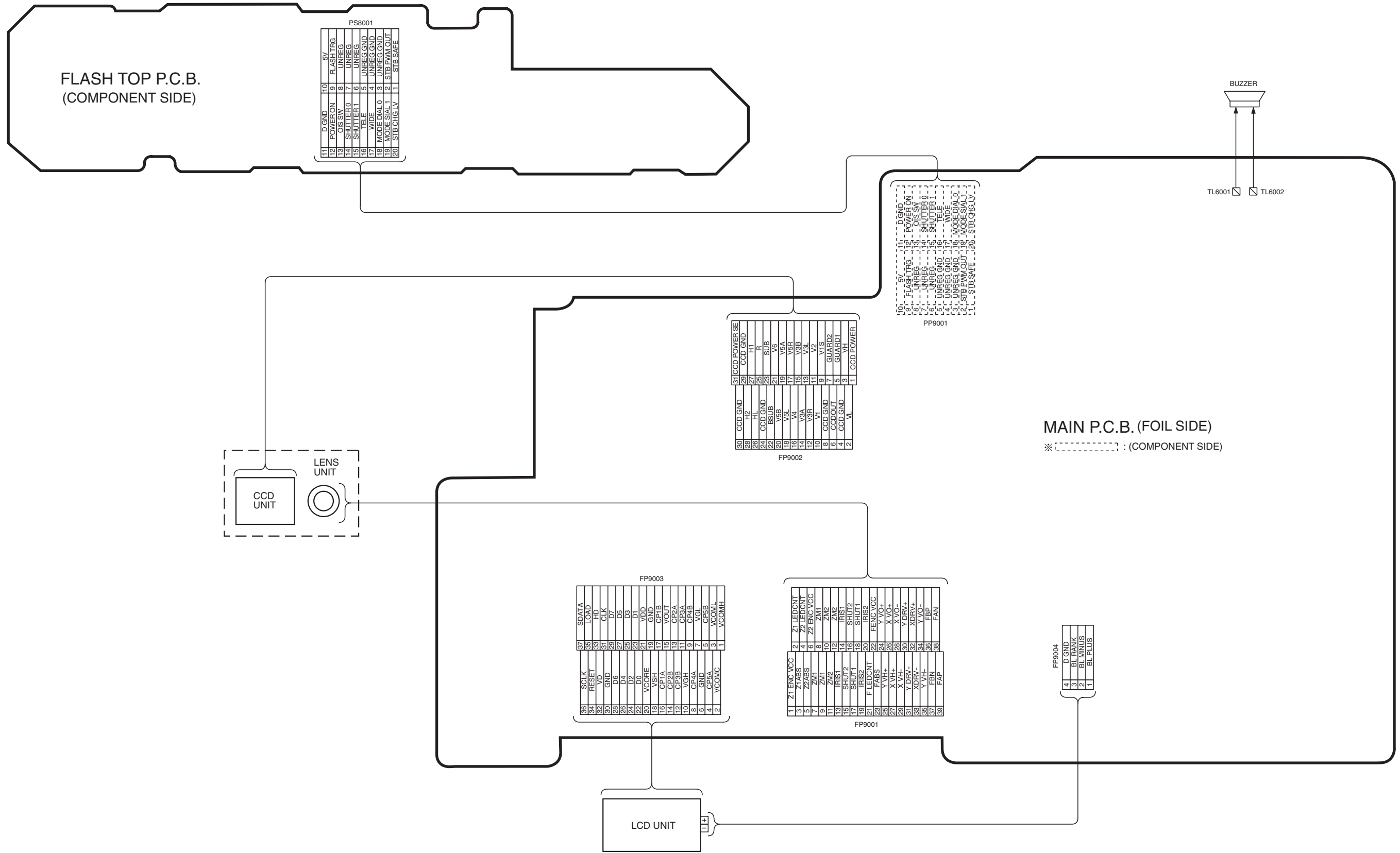
# S3. Block Diagram

## S3.1. Overall Block Diagram

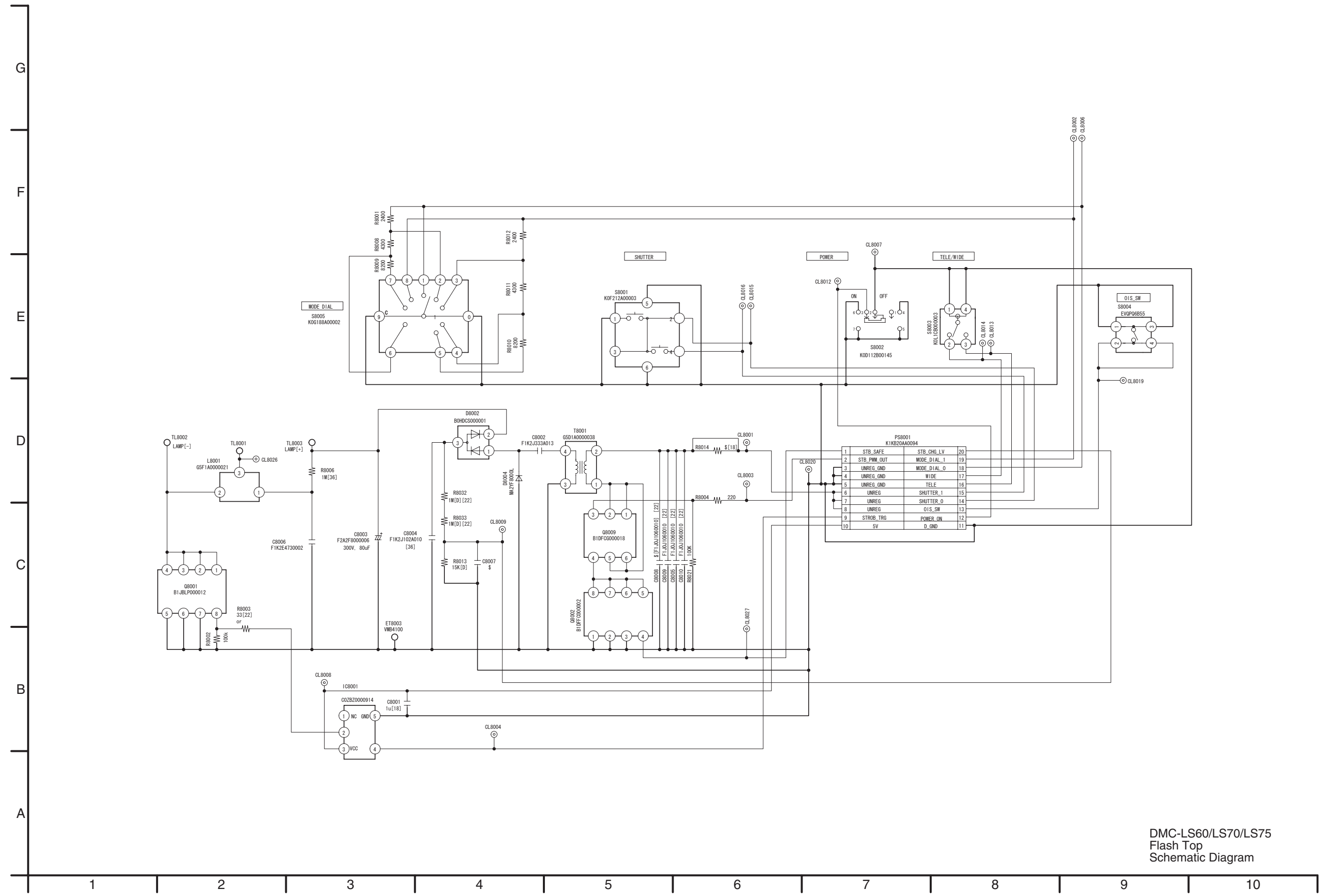


# S4. Schematic Diagram

## S4.1. Interconnection Diagram

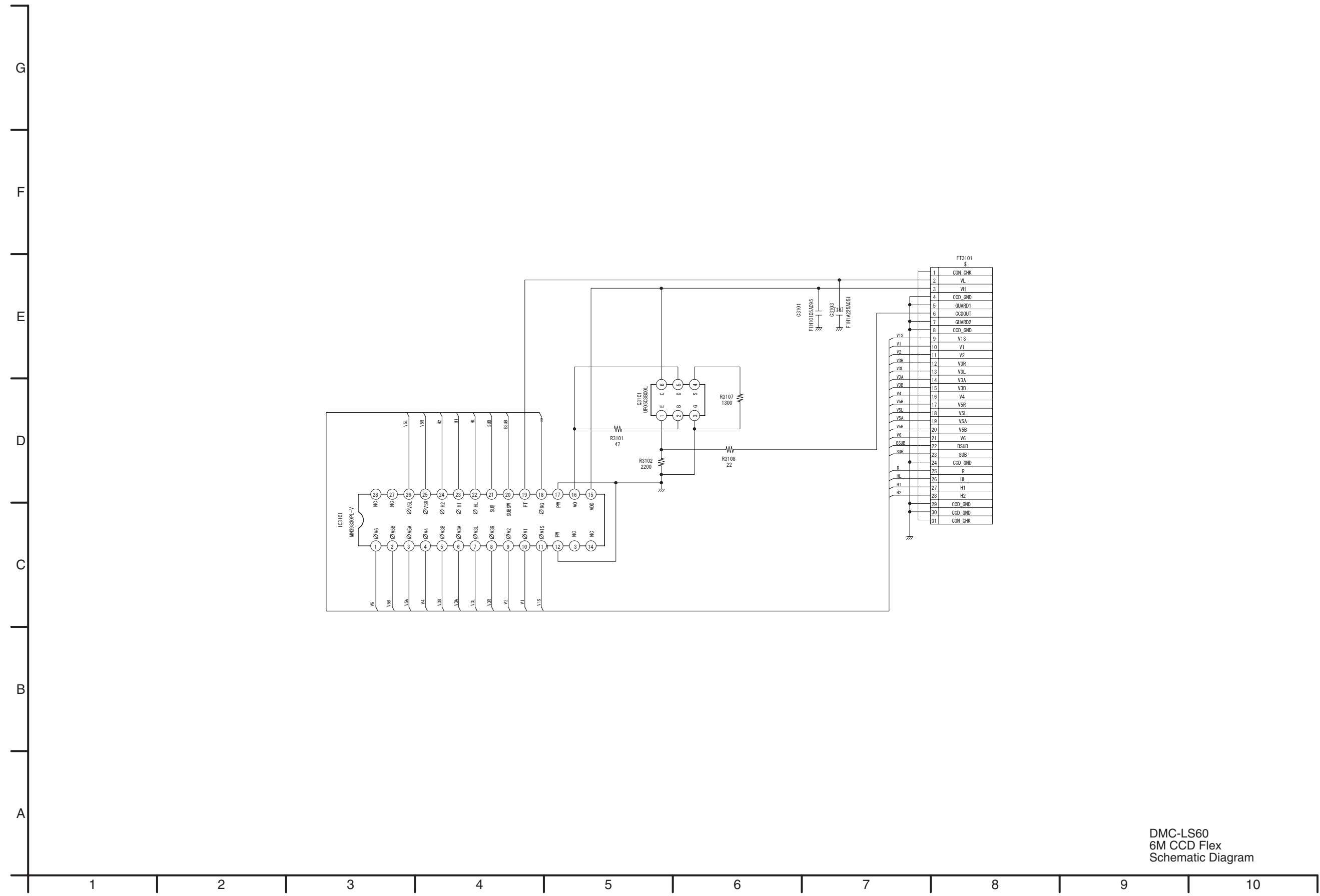


# S4.2. Flash Top Schematic Diagram



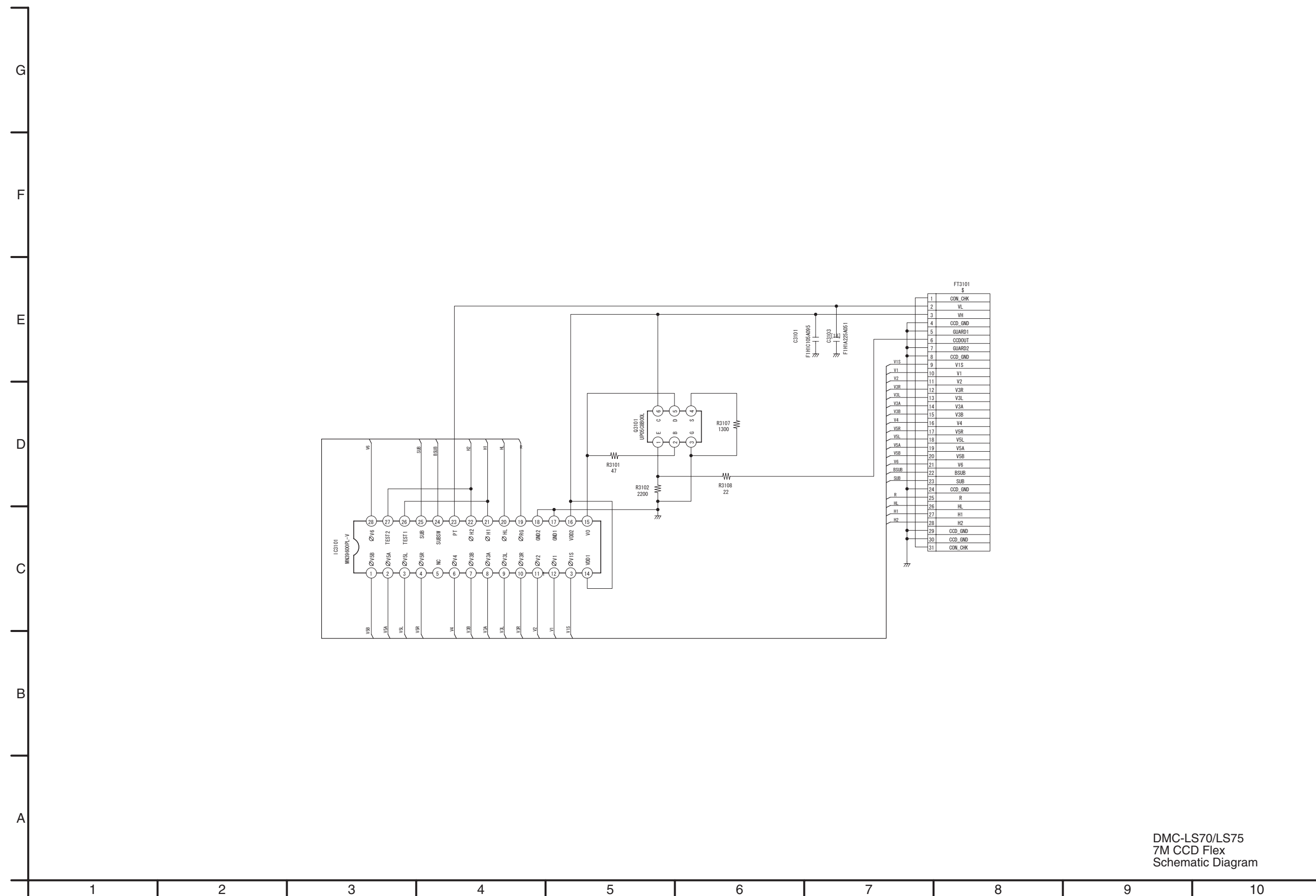
DMC-LS60/LS70/LS75  
Flash Top  
Schematic Diagram

### S4.3. 6M CCD Flex Schematic Diagram



DMC-LS60  
6M CCD Flex  
Schematic Diagram

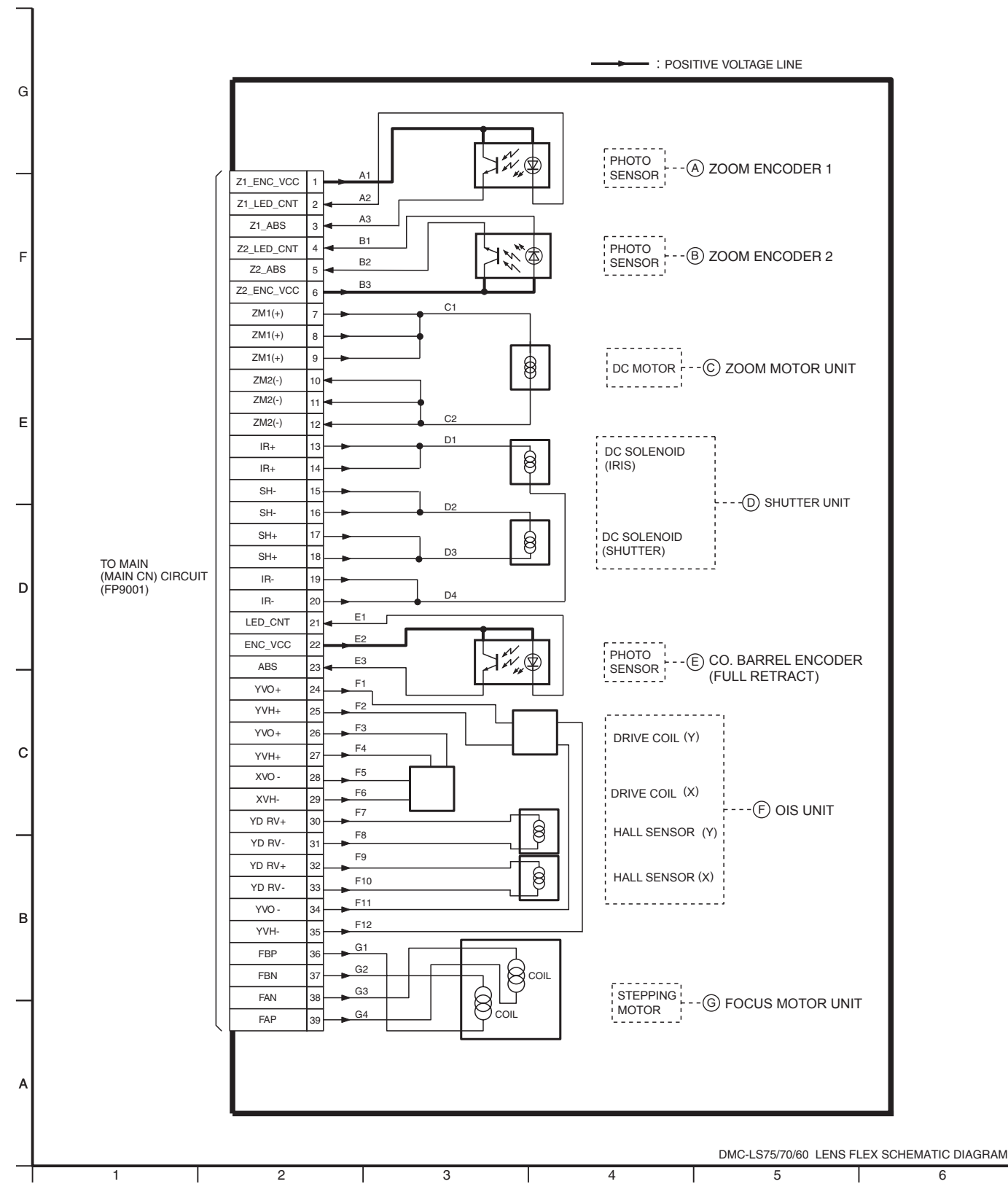
# S4.4. 7M CCD Flex Schematic Diagram



DMC-LS70/LS75  
7M CCD Flex  
Schematic Diagram

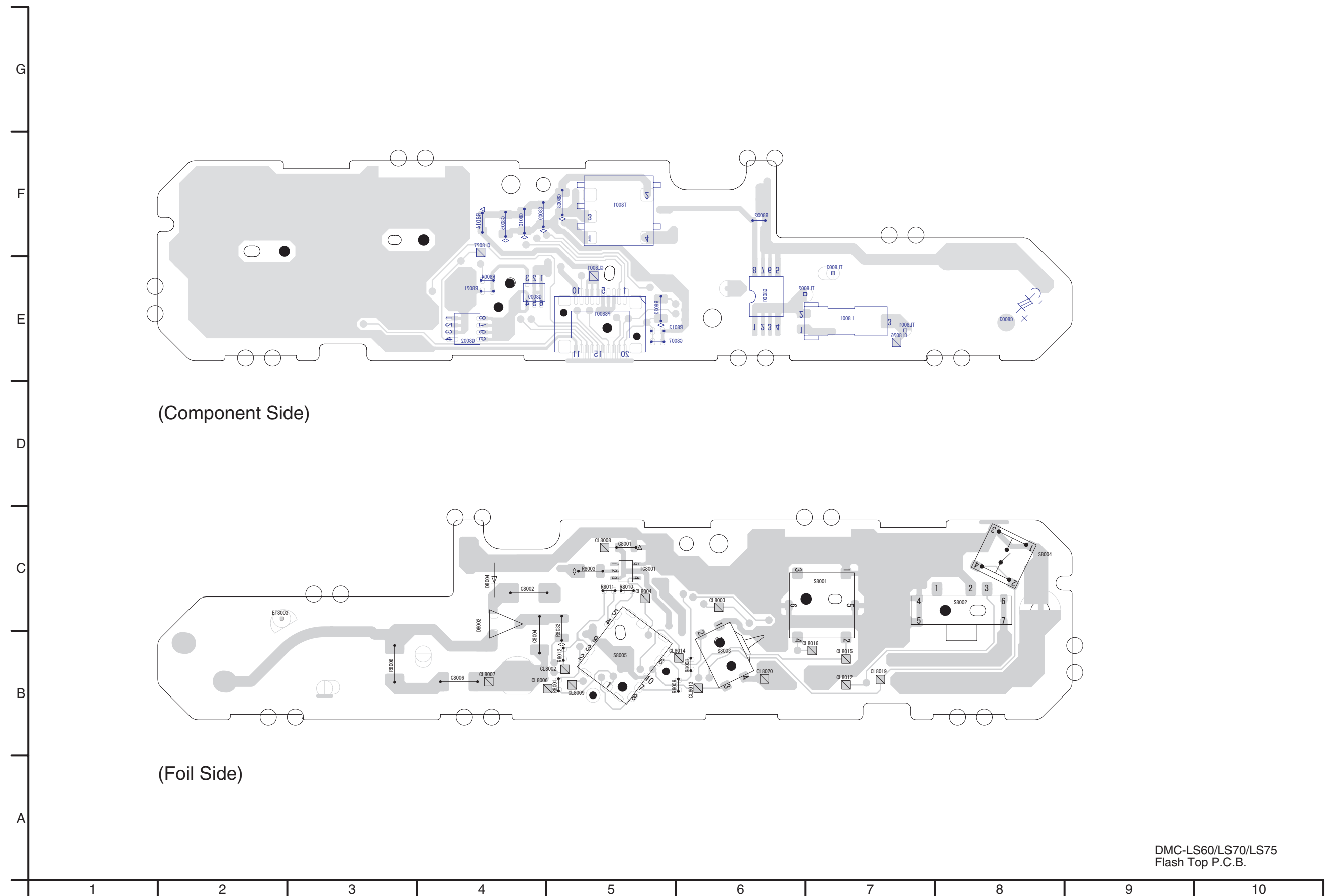


# S4.5. Lens Flex Schematic Diagram



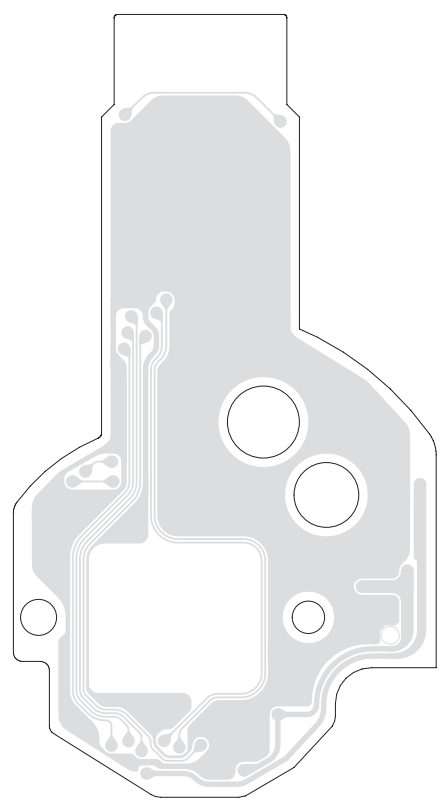
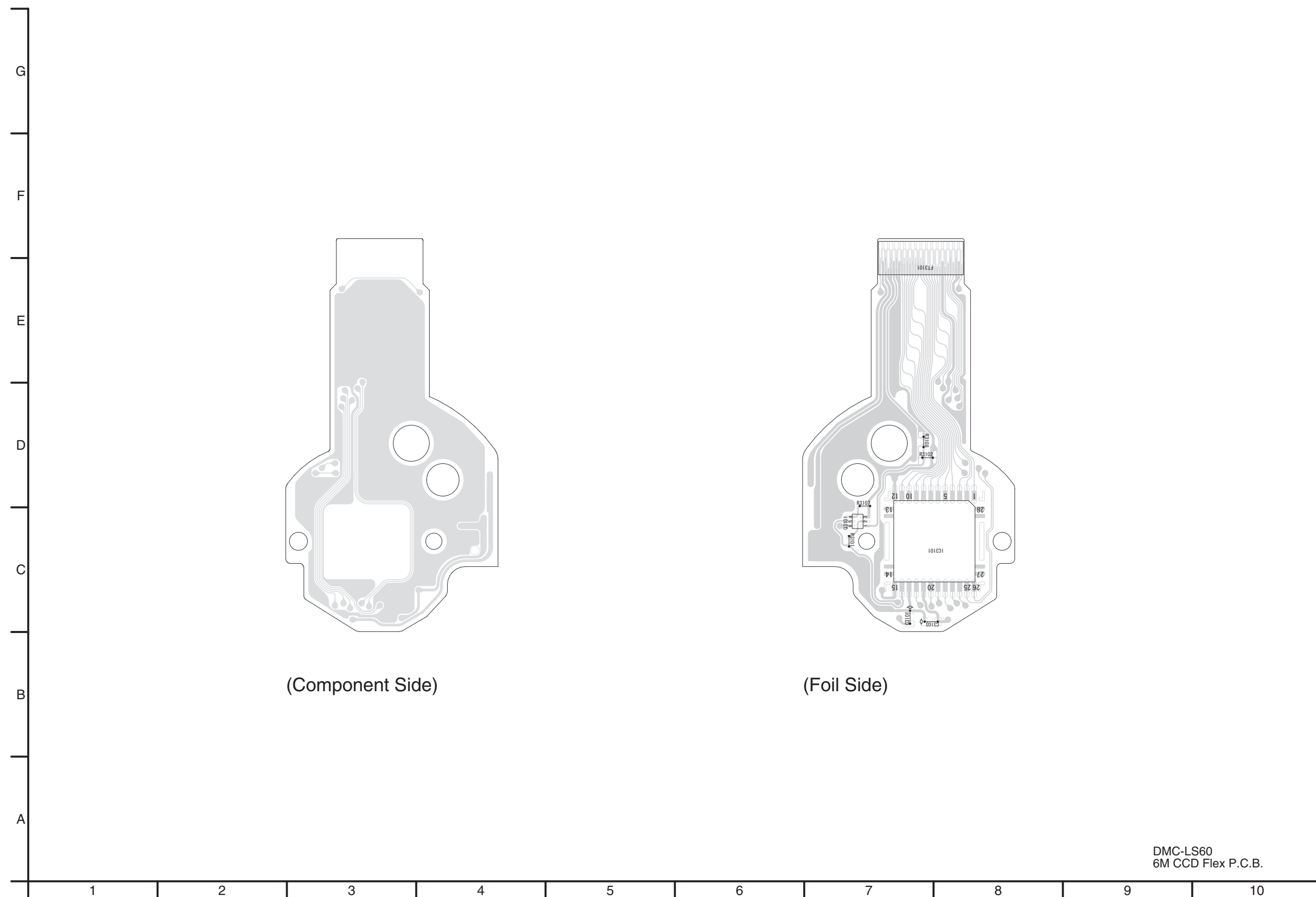
# S5. Print Circuit Board

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

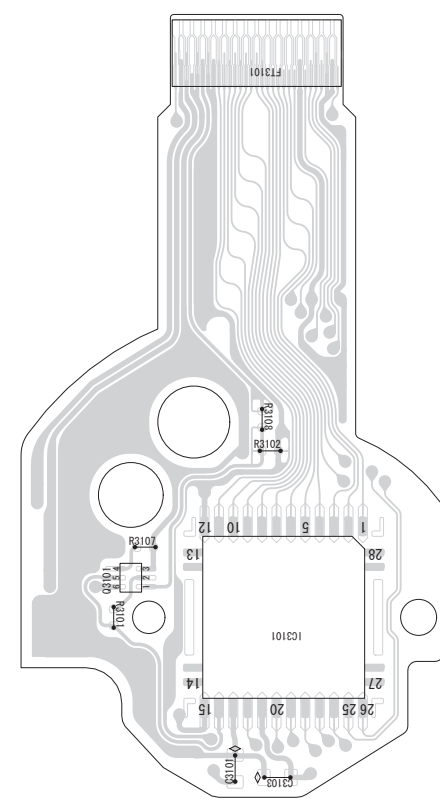


DMC-LS60/LS70/LS75  
Flash Top P.C.B.

S5.2. 6M CCD Flex P.C.B.

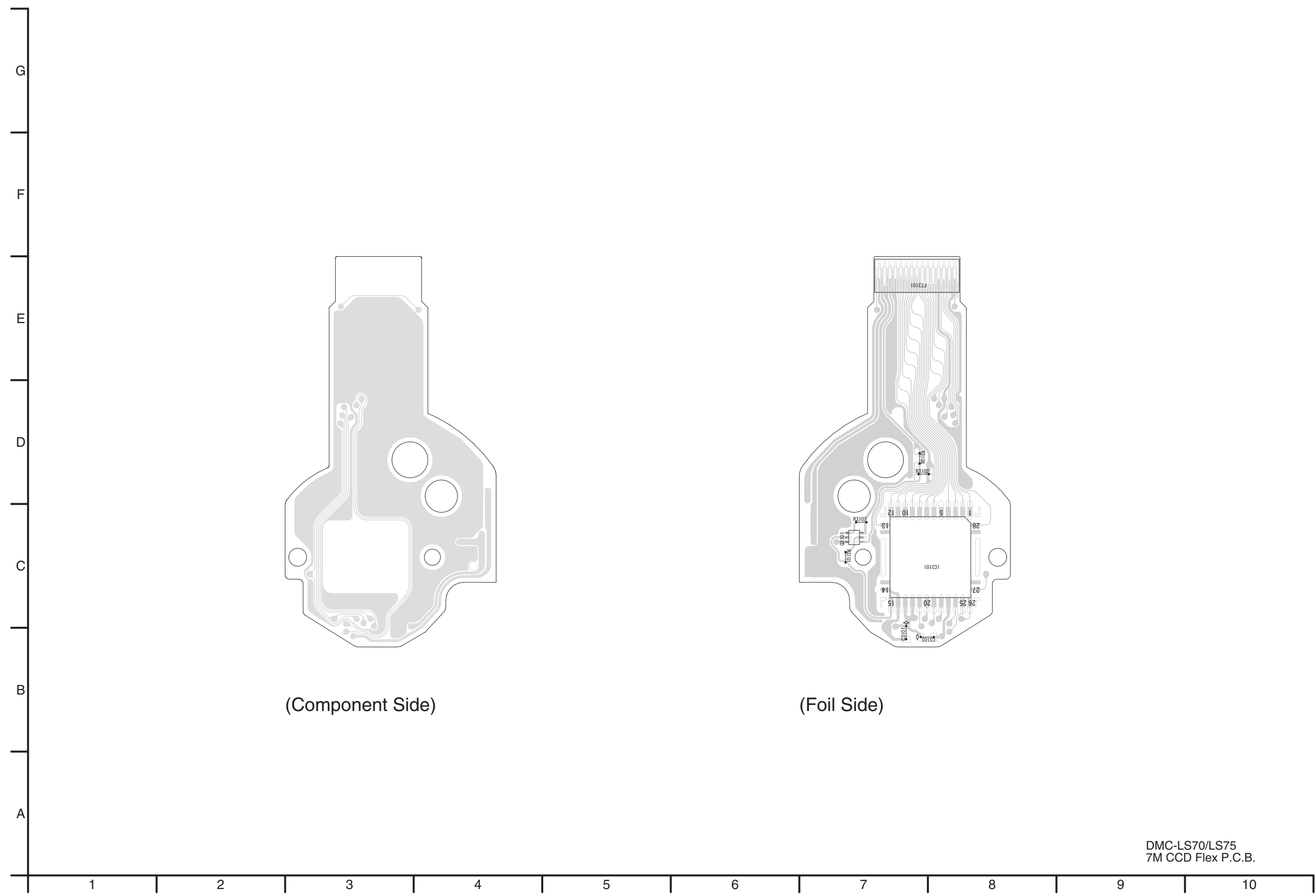


(Component Side)



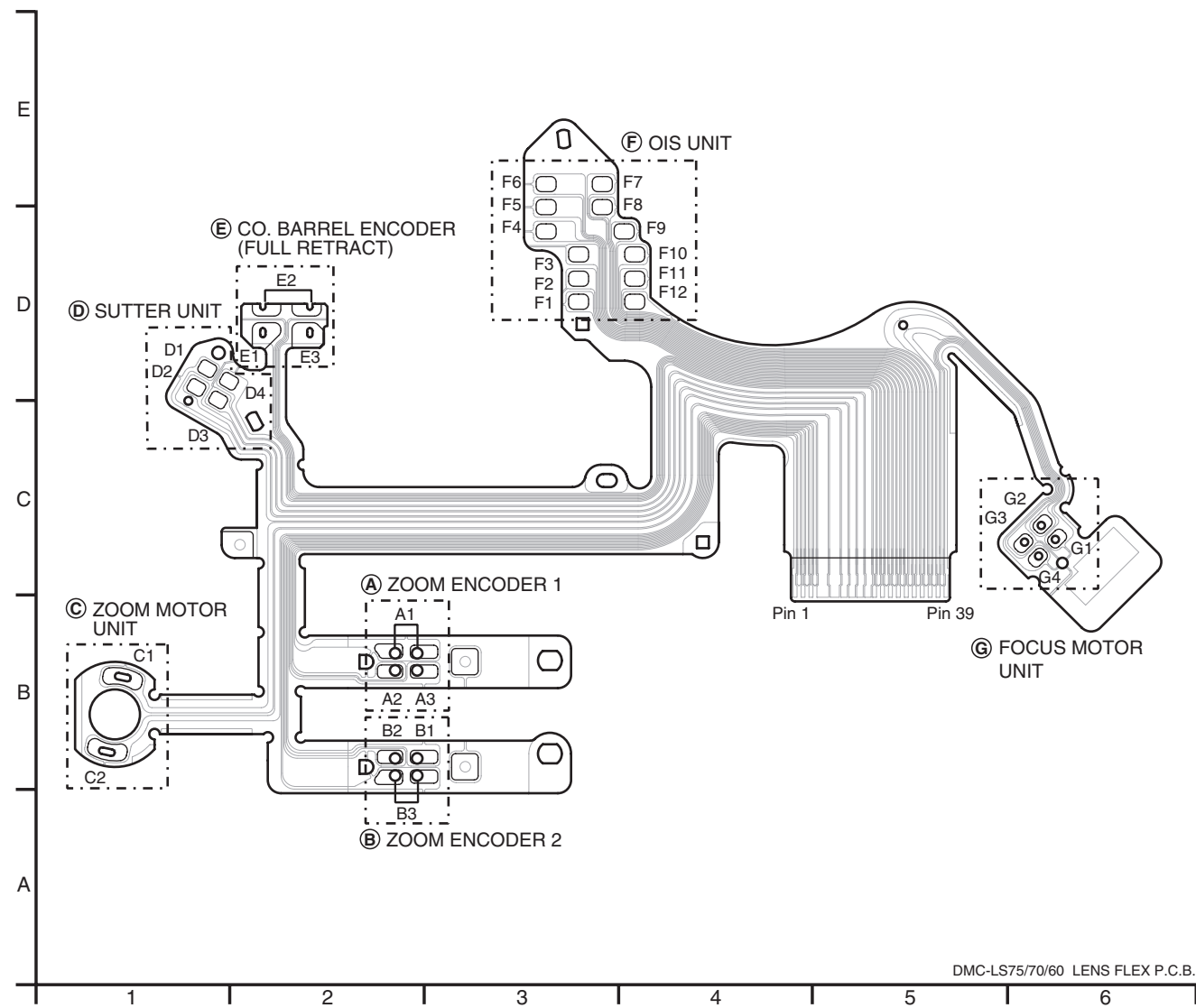
(Foil Side)

S5.3. 7M CCD Flex P.C.B.



DMC-LS70/LS75  
7M 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.

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

**Definition of Parts supplier:**

1. Parts marked with [MBI] in the remarks column are supplied from  
“Matsushita Battery Industrial Co., Ltd.”
  
2. Parts marked with [PAVC-CSG] in the remarks column are supplied from  
PAVC COMPANY CS Group (PAVC-CSG).  
Others are supplied from "PAVCSG" (ASPC).

| Ref.No. | Part No.     | Part Name & Description  | Pcs | Remarks                  |
|---------|--------------|--------------------------|-----|--------------------------|
| ##      | VEP56043B    | MAIN PCB UNIT            | 1   | LS60/70 [RTL]E.S.D.      |
| ##      | VEP56043A    | MAIN PCB UNIT            | 1   | LS75 [RTL]E.S.D.         |
| ##      | VEP58037A    | TOP OPERATION PCB UNIT   | 1   | [RTL]E.S.D.              |
| ##      | VEK0K91      | CCD UNIT                 | 1   | LS60 E.S.D.[PAVC-CSG]    |
| ##      | VEK0K92      | CCD UNIT                 | 1   | LS70/75 E.S.D.[PAVC-CSG] |
| ##      | VEP58037A    | TOP OPERATION PCB UNIT   | 1   | [RTL]E.S.D.              |
| C8001   | ECJ1VB0J105K | C.CAPACITOR CH 6.3V 1U   | 1   |                          |
| C8002   | F1K2J333A013 | C.CAPACITOR 630V 0.033U  | 1   |                          |
| C8004   | F1K2J102A010 | C.CAPACITOR 630V 1000P   | 1   |                          |
| C8005   | F1J0J1060010 | C.CAPACITOR CH 6.3V 10U  | 1   |                          |
| C8006   | F1K2E4730002 | C.CAPACITOR 250V 0.047U  | 1   |                          |
| C8009   | F1J0J1060010 | C.CAPACITOR CH 6.3V 10U  | 1   |                          |
| C8010   | F1J0J1060010 | C.CAPACITOR CH 6.3V 10U  | 1   |                          |
| D8002   | B0HDCS000001 | DIODE                    | 1   | E.S.D.                   |
| D8004   | MA2YF8000L   | DIODE                    | 1   | E.S.D.                   |
| IC8001  | C0ZBZ0000914 | IC                       | 1   | E.S.D.                   |
| L8001   | G5F1A0000021 | COIL                     | 1   |                          |
| PS8001  | K1KB20AA0094 | CONNECTOR 20P            | 1   |                          |
| Q8001   | B1JBLP000012 | TRANSISTOR               | 1   | E.S.D.                   |
| Q8002   | B1DFFC000002 | TRANSISTOR               | 1   | E.S.D.                   |
| Q8009   | B1DFCG000018 | TRANSISTOR               | 1   | E.S.D.                   |
| R8001   | ERJ2GEJ242X  | M.RESISTOR CH 1/16W 2.4K | 1   |                          |
| R8002   | ERJ2GEJ104X  | M.RESISTOR CH 1/16W 100K | 1   |                          |
| R8003   | ERJ6GEYJ330V | M.RESISTOR CH 1/10W 33   | 1   |                          |
| R8004   | ERJ2GEJ221X  | M.RESISTOR CH 1/16W 220  | 1   |                          |
| R8006   | ERJ8GEYJ105V | M.RESISTOR CH 1/8W 1M    | 1   |                          |
| R8008   | ERJ2GEJ432X  | M.RESISTOR CH 1/16W 4.3K | 1   |                          |
| R8009   | ERJ2GEJ822X  | M.RESISTOR CH 1/16W 8.2K | 1   |                          |
| R8010   | ERJ2GEJ822X  | M.RESISTOR CH 1/16W 8.2K | 1   |                          |
| R8011   | ERJ2GEJ432X  | M.RESISTOR CH 1/16W 4.3K | 1   |                          |
| R8012   | ERJ2GEJ242X  | M.RESISTOR CH 1/16W 2.4K | 1   |                          |
| R8013   | ERJ2RHD153X  | M.RESISTOR CH 1/16W 15K  | 1   |                          |
| R8021   | ERJ2GEJ104X  | M.RESISTOR CH 1/16W 100K | 1   |                          |
| R8032   | ERJ6RED105V  | M.RESISTOR CH 1/16W 1M   | 1   |                          |
| R8033   | ERJ6RED105V  | M.RESISTOR CH 1/16W 1M   | 1   |                          |
| S8001   | K0F212A00003 | SWITCH                   | 1   |                          |
| S8002   | K0D112B00145 | SWITCH                   | 1   |                          |
| S8003   | K0L1CB000003 | SWITCH                   | 1   |                          |
| S8004   | EVQP06B55    | SWITCH                   | 1   |                          |
| S8005   | K0G188A00002 | SWITCH                   | 1   |                          |
| T8001   | G5D1A0000038 | TRANSFORMER              | 1   |                          |
| ##      | VEK0K91      | CCD UNIT                 | 1   | LS60 E.S.D.[PAVC-CSG]    |
| C3101   | ECJ1VB1C105K | C.CAPACITOR CH 16V 1U    | 1   | [PAVC-CSG]               |
| C3103   | F1H1A225A051 | C.CAPACITOR CH 10V 2.2U  | 1   | [PAVC-CSG]               |
| Q3101   | UP05C8B00L   | TRANSISTOR               | 1   | E.S.D.[PAVC-CSG]         |
| R3101   | ERJ2GEJ470   | M.RESISTOR CH 1/16W 47   | 1   | [PAVC-CSG]               |
| R3102   | ERJ2GEJ222   | M.RESISTOR CH 1/16W 2.2K | 1   | [PAVC-CSG]               |
| R3107   | ERJ2GEJ132   | M.RESISTOR CH 1/16W 1.3K | 1   | [PAVC-CSG]               |
| R3108   | ERJ2GEJ220   | M.RESISTOR CH 1/16W 22   | 1   | [PAVC-CSG]               |

| Ref.No. | Part No.     | Part Name & Description  | Pcs | Remarks                  |
|---------|--------------|--------------------------|-----|--------------------------|
| ##      | VEK0K92      | CCD UNIT                 | 1   | LS70/75 E.S.D.[PAVC-CSG] |
| C3101   | ECJ1VB1C105K | C.CAPACITOR CH 16V 1U    | 1   | [PAVC-CSG]               |
| C3103   | F1H1A225A051 | C.CAPACITOR CH 10V 2.2U  | 1   | [PAVC-CSG]               |
| Q3101   | UP05C8B00L   | TRANSISTOR               | 1   | E.S.D.[PAVC-CSG]         |
| R3101   | ERJ2GEJ470   | M.RESISTOR CH 1/16W 47   | 1   | [PAVC-CSG]               |
| R3102   | ERJ2GEJ222   | M.RESISTOR CH 1/16W 2.2K | 1   | [PAVC-CSG]               |
| R3107   | ERJ2GEJ132   | M.RESISTOR CH 1/16W 1.3K | 1   | [PAVC-CSG]               |
| R3108   | ERJ2GEJ220   | M.RESISTOR CH 1/16W 22   | 1   | [PAVC-CSG]               |

| Ref.No. | Part No.     | Part Name & Description | Pcs | Remarks                  | Ref.No. | Part No.    | Part Name & Description | Pcs | Remarks    |
|---------|--------------|-------------------------|-----|--------------------------|---------|-------------|-------------------------|-----|------------|
| 1       | L0DCDD000008 | BUZZER                  | 1   |                          | B203    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 2       | LNG8A4CN8A   | LED                     | 1   |                          | B204    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 3       | ML614S/F9FE  | BUTTON BATTERY          | 1   | [MBI](B9101)             | B205    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 4       | VGQ8891      | LENS SHEET              | 1   |                          | B206    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 5       | VJH1255      | BATTERY TERMINAL        | 1   |                          | B207    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 6       | VKF4172      | JACK COVER              | 1   | (-S)                     | B208    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 6       | VKF4176      | JACK COVER              | 1   | (-K)                     | B209    | XQN14+CJ4FJ | SCREW                   | 1   | [PAVC-CSG] |
| 7       | VMB4099      | EARTH SPRING            | 1   |                          |         |             |                         |     |            |
| 8       | VMP8789      | FRAME                   | 1   |                          |         |             |                         |     |            |
| 9       | VMS7813      | BATT.DOOR SHAFT         | 1   |                          |         |             |                         |     |            |
| 10      | VXQ1419      | BATT TERMINALE+U        | 1   |                          |         |             |                         |     |            |
| 11      | VYF3132      | BATT.DOOR UNIT          | 1   | (-S)                     |         |             |                         |     |            |
| 11      | VYF3133      | BATT.DOOR UNIT          | 1   | (-K)                     |         |             |                         |     |            |
| 12      | VYK2A74      | FRONT CASE UNIT         | 1   | (-S)                     |         |             |                         |     |            |
| 12      | VYK2A79      | FRONT CASE UNIT         | 1   | (-K)                     |         |             |                         |     |            |
| 15      | VGL1231      | LED PANEL (R)           | 1   |                          |         |             |                         |     |            |
| 16      | VGU0A93      | REAR KNOB               | 1   | (-S)                     |         |             |                         |     |            |
| 16      | VGU0A96      | REAR KNOB               | 1   | (-K)                     |         |             |                         |     |            |
| 17      | VKF4171      | SD COVER                | 1   | (-S)                     |         |             |                         |     |            |
| 17      | VKF4175      | SD COVER                | 1   | (-K)                     |         |             |                         |     |            |
| 18      | VUKM7074A    | REAR CASE U 1           | 1   | LS60/70                  |         |             |                         |     |            |
| 18      | VUKM7074B    | REAR CASE U 1           | 1   | (-S)LS75                 |         |             |                         |     |            |
| 18      | VUKM7078B    | REAR CASE U 1           | 1   | (-K)LS75                 |         |             |                         |     |            |
| 19      | VMA0V28      | LCD HOLDER              | 1   |                          |         |             |                         |     |            |
| 20      | VMA0V29      | EARTH PLATE             | 1   |                          |         |             |                         |     |            |
| 21      | VMS7812      | JACK SHAFT              | 1   |                          |         |             |                         |     |            |
| 23      | VYQ3935      | LCD UNIT                | 1   | LS60/70                  |         |             |                         |     |            |
| 23      | VYQ3930      | LCD UNIT                | 1   | LS75                     |         |             |                         |     |            |
| 25      | EFN-AMW50ZD  | FLASH UNIT              | 1   |                          |         |             |                         |     |            |
| 26      | F2A2F8000006 | CAPACITOR               | 1   | (C8003)                  |         |             |                         |     |            |
| 27      | VGU0A90      | POWER KNOB              | 1   |                          |         |             |                         |     |            |
| 28      | VGU0A95      | Q.ZOOM BTN              | 1   |                          |         |             |                         |     |            |
| 29      | VMB4100      | C-EARTH SPRING          | 1   |                          |         |             |                         |     |            |
| 30      | VYK2B10      | TOP CASE ASSY           | 1   | LS60                     |         |             |                         |     |            |
| 30      | VYK2C35      | TOP CASE ASSY           | 1   | LS70                     |         |             |                         |     |            |
| 30      | VYK2A77      | TOP CASE ASSY           | 1   | LS75                     |         |             |                         |     |            |
| 31      | VEP56043B    | MAIN PCB UNIT           | 1   | [RTL]E.S.D.(LS60/70)     |         |             |                         |     |            |
| 31      | VEP56043A    | MAIN PCB UNIT           | 1   | [RTL]E.S.D.(LS75)        |         |             |                         |     |            |
| 32      | VEP58037A    | TOP OPERATION PCB UNIT  | 1   |                          |         |             |                         |     |            |
| 33      | VGH4938      | CAUTION LABEL           | 1   |                          |         |             |                         |     |            |
| 34      | VUMP8790     | LCD FRAME U             | 1   | LS60/70                  |         |             |                         |     |            |
| 201     | VDL1603      | OPTICAL FILTER          | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 202     | VEK0K91      | CCD UNIT                | 1   | LS60 E.S.D.[PAVC-CSG]    |         |             |                         |     |            |
| 202     | VEK0K92      | CCD UNIT                | 1   | LS70/75 E.S.D.[PAVC-CSG] |         |             |                         |     |            |
| 203     | VXW0865      | LENS UNIT(W/O CCD)      | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 204     | L6DA8BEC0001 | ZOOM MOTOR UNIT         | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 205     | B3NAA0000074 | PHOTO SENSOR            | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 206     | B3NAA0000091 | PHOTO SENSOR            | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 207     | B3NAA0000091 | PHOTO SENSOR            | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 208     | VMA0V34      | COVER                   | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 209     | VXP2724      | 1ST LENS FRAME UNIT     | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 210     | VXP2731      | DIRECT FRAME            | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 211     | VXQ1493      | FIX FRAME UNIT          | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 212     | 06SS56F3NM   | FOCUS MOTOR UNIT        | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 213     | VDW1426      | DRIVE FRAME             | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| 214     | VMX3529      | CCD CUSHION RUBBER      | 1   | [PAVC-CSG]               |         |             |                         |     |            |
|         |              |                         |     |                          |         |             |                         |     |            |
| B2      | VHD1909      | SCREW                   | 1   |                          |         |             |                         |     |            |
| B3      | VHD1909      | SCREW                   | 1   |                          |         |             |                         |     |            |
| B4      | VHD1909      | SCREW                   | 1   |                          |         |             |                         |     |            |
| B5      | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B6      | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B7      | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B8      | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B9      | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B10     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B11     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B12     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B13     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B14     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B15     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B16     | XQN16+BJ5FN  | SCREW                   | 1   |                          |         |             |                         |     |            |
| B201    | XQN14+CJ25FJ | SCREW                   | 1   | [PAVC-CSG]               |         |             |                         |     |            |
| B202    | XQN14+CJ25FJ | SCREW                   | 1   | [PAVC-CSG]               |         |             |                         |     |            |
|         |              |                         |     |                          |         |             |                         |     |            |
|         |              |                         |     |                          |         |             |                         |     |            |

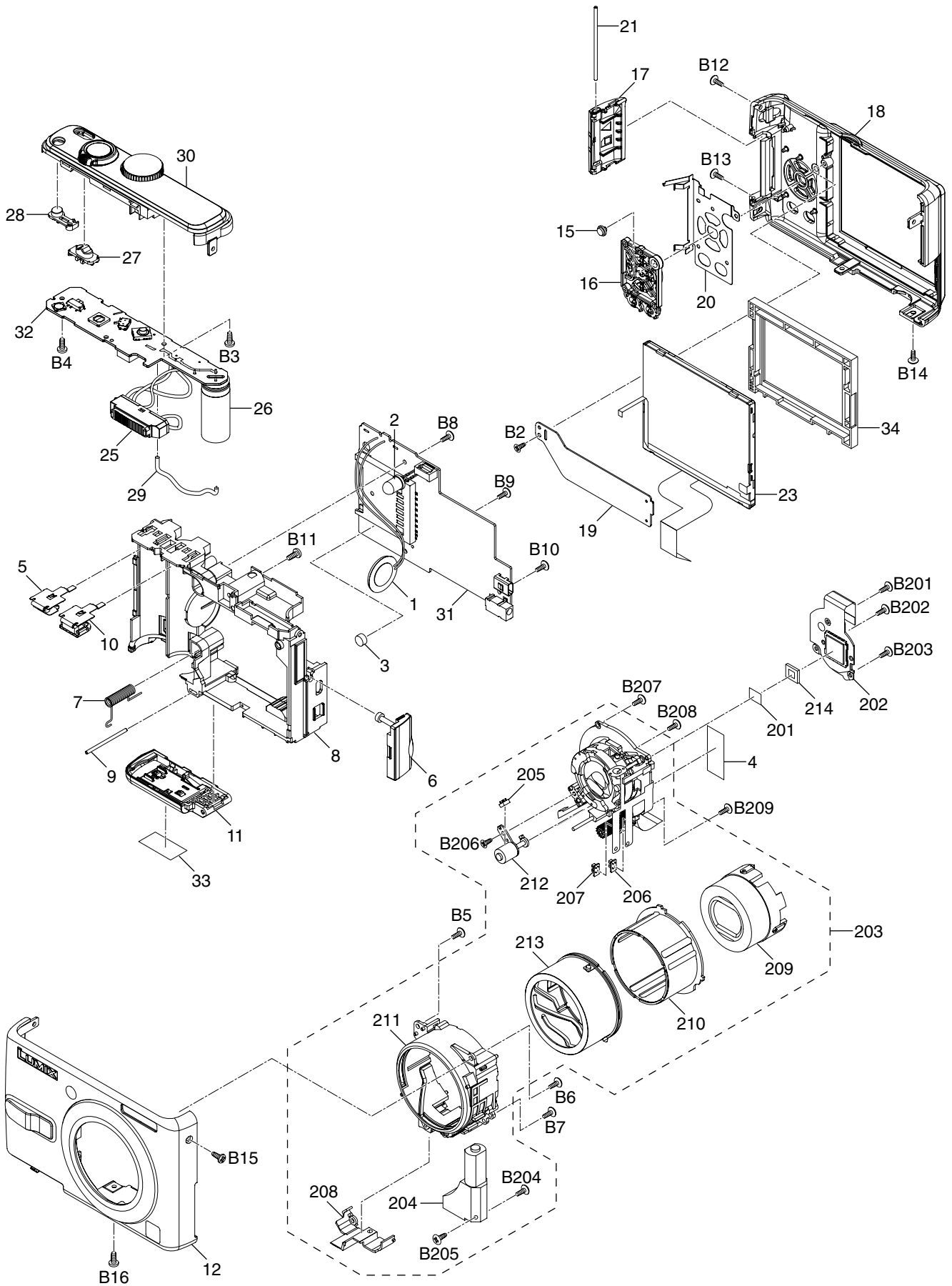


| Ref.No. | Part No.     | Part Name & Description                                     | Pcs | Remarks  |
|---------|--------------|---|-----|--|
| 103     | K1HA08CD0013 | USB CABLE   | 1   |  |
| 104     | K1HA08CD0015 | VIDEO CABLE   | 1   |  |
| 105     | VFC4090      | HAND STRAP  | 1   |  |
| 106     | VFF0361-S    | CD-ROM  | 1   | [PAVC-CSG]<br>LS60(EXCEPT PC)<br>LS70(EXCEPT P/PC)<br>LS75(EXCEPT P/PC)  |
| 106     | VFF0360-S    | CD-ROM  | 1   | [PAVC-CSG]<br>LS60PC<br>LS70P/PC<br>LS75P/PC                             |
| 107     | VPF1100      | BAG, POLYETHYLENE   | 1   | LS60EB/EE/GK/GN/PC/EF<br>LS70EB/EE/GK/GN/PC/P<br>LS75EB/EE/GK/GN/PC/P/EF |
| 107     | VPF1132      | BAG, POLYETHYLENE   | 1   | LS60EGM/EG/GC/PL<br>LS70EGM/EG/GC/PL<br>LS75EGM/EG/GC/PL                 |
| △ 108   | VQT1C63      | INSTRUCTION BOOK<br>(ENGLISH)                               | 1   | LS60PC/70PC/70P/75P  |
| △ 108   | VQT1C64      | INSTRUCTION BOOK<br>(CANADIAN FRENCH)                       | 1   | LS60PC/70PC/75PC   |
| △ 108   | VQT1C65      | INSTRUCTION BOOK<br>(ENGLISH)                               | 1   | LS60PL/70PL/75PL   |
| △ 108   | VQT1C66      | INSTRUCTION BOOK<br>(SPANISH)                               | 1   | LS60PL/70PL/75PL   |
| △ 108   | VQT1C67      | INSTRUCTION BOOK<br>(PORTUGUESE)                            | 1   | LS60PL/70PL/75PL   |
| △ 108   | VQT1C68      | INSTRUCTION BOOK<br>(GERMAN)                                | 1   | LS60EG/70EG/75EG   |
| △ 108   | VQT1C69      | INSTRUCTION BOOK<br>(FRENCH)                                | 1   | LS60EF/60EG/70EF/70EG/<br>75EF/75EG                                      |
| △ 108   | VQT1C70      | INSTRUCTION BOOK<br>(ITALIAN)                               | 1   | LS60EG/70EG/75EG   |
| △ 108   | VQT1C71      | INSTRUCTION BOOK<br>(DUTCH)                                 | 1   | LS60EG/70EG/75EG   |
| △ 108   | VQT1C72      | INSTRUCTION BOOK<br>(SPANISH)                               | 1   | LS60EGM/70EGM/75EGM  |
| △ 108   | VQT1C73      | INSTRUCTION BOOK<br>(PORTUGUESE)                            | 1   | LS60EGM/70EGM/75EGM  |
| △ 108   | VQT1C74      | INSTRUCTION BOOK<br>(SWEDISH)                               | 1   | LS60EGM/70EGM/75EGM  |
| △ 108   | VQT1C75      | INSTRUCTION BOOK<br>(DANISH)                                | 1   | LS60EGM/70EGM/75EGM  |
| △ 108   | VQT1C76      | INSTRUCTION BOOK<br>(ENGLISH)                               | 1   | LS60EB/70EB/75EB   |
| △ 108   | VQT1C77      | INSTRUCTION BOOK<br>(RUSSIAN)                               | 1   | LS60EE/70EE/75EE   |
| △ 108   | VQT1C78      | INSTRUCTION BOOK<br>(UKRANIAN)                              | 1   | LS60EE/70EE/75EE   |
| △ 108   | VQT1C79      | INSTRUCTION BOOK<br>(ENGLISH)                               | 1   | LS60GC/LS70GC/75GC   |
| △ 108   | VQT1C80      | INSTRUCTION BOOK<br>(CHINESE(TRADITIONAL))                  | 1   | LS60GC/LS70GC/75GC   |
| △ 108   | VQT1C81      | INSTRUCTION BOOK<br>(ARABIC)                                | 1   | LS60GC/LS70GC/75GC   |
| △ 108   | VQT1C83      | INSTRUCTION BOOK<br>(CHINESE(SIMPLIFIED))                   | 1   | LS60GK/LS70GK/75GK   |
| △ 108   | VQT1C84      | INSTRUCTION BOOK<br>(ENGLISH)                               | 1   | LS60GN/70GN/75GN   |
| △ 108   | VQT1C96      | INSTRUCTION BOOK<br>(PERSIAN)                               | 1   | LS60GC/LS70GC/75GC   |
| △ 108   | VQT1E30      | INSTRUCTION BOOK<br>(SPANISH)                               | 1   | LS70P/75P  |
| 109     | VQT1D44      | O/I PC CONNECTION<br>(ENGLISH)                              | 1   | LS60PC/70PC/70P/75P/75PC   |
| 109     | VQT1D45      | O/I PC CONNECTION<br>(ENGLISH/SPANISH/<br>PORTUGUESE)       | 1   | LS60PL/70PL/75PL   |
| 109     | VQT1D46      | O/I PC CONNECTION<br>(GERMAN/FRENCH/ITALIAN/<br>DUTCH)      | 1   | LS60EG/70EG/75EG   |
| 109     | VQT1D47      | O/I PC CONNECTION<br>(SPANISH/PORTUGUESE/<br>SWEDISH/DUTCH) | 1   | LS60EGM/70EGM/75EGM  |

| Ref.No. | Part No. | Part Name & Description  | Pcs | Remarks                                  |
|---------|----------|--|-----|--|
| 109     | VQT1D48  | O/I PC CONNECTION<br>(FRENCH)  | 1   | LS60EF/70EF/75EF                         |
| 109     | VQT1D49  | O/I PC CONNECTION<br>(ENGLISH)   | 1   | LS60EB/60GN/<br>70EB/70GN/75EB/75GN      |
| 109     | VQT1D50  | O/I PC CONNECTION<br>(RUSSIAN/UKRANIAN)                                | 1   | LS60EE/70EE/75EE                         |
| 109     | VQT1D51  | O/I PC CONNECTION<br>(ENGLISH/ARABIC/PERSIAN/<br>CHINESE(TRADITIONAL)) | 1   | LS60GC/LS70GC/75GC                       |
| 109     | VQT1E39  | O/I PC CONNECTION<br>(CANADIAN FRENCH)                                 | 1   | LS60PC/70PC/75PC                         |
| 109     | VQT1F34  | O/I PC CONNECTION<br>(CHINESE(SIMPLIFIED))                             | 1   | LS60GK/LS70GK/75GK                       |
| 110     | VQT1D84  | O/I SOFTWARE<br>(ENGLISH/CANADIAN FRENCH)                              | 1   | LS60PC/70PC/70P/75P/75PC                 |
| 110     | VQT1D85  | O/I SOFTWARE<br>(ENGLISH/SPANISH/<br>PORTUGUESE)                       | 1   | LS60PL/70PL/75PL                         |
| 110     | VQT1D86  | O/I SOFTWARE<br>(GERMAN/FRENCH/ITALIAN/<br>DUTCH)                      | 1   | LS60EG/70EG/75EG                         |
| 110     | VQT1D87  | O/I SOFTWARE<br>(SPANISH/PORTUGUESE/<br>SWEDISH/DUTCH)                 | 1   | LS60EGM/70EGM/75EGM                      |
| 110     | VQT1D88  | O/I SOFTWARE<br>(FRENCH)   | 1   | LS60EF/70EF/75EF                         |
| 110     | VQT1D89  | O/I SOFTWARE<br>(ENGLISH)  | 1   | LS60EB/60GN/<br>70EB/70GN/75EB/75GN      |
| 110     | VQT1D90  | O/I SOFTWARE<br>(RUSSIAN/UKRANIAN)                                     | 1   | LS60EE/70EE/75EE                         |
| 110     | VQT1D91  | O/I SOFTWARE<br>(ENGLISH/ARABIC/PERSIAN/<br>CHINESE(TRADITIONAL))      | 1   | LS60GC/LS70GC/75GC                       |
| 110     | VQT1D92  | O/I SOFTWARE<br>(CHINESE(SIMPLIFIED))                                  | 1   | LS60GK/LS70GK/75GK                       |
| 111     | VPFW0004 | CAMERA BAG   | 1   |  |
| 112     | VPK3249  | PACKING CASE   | 1   | LS60(EXCEPT PC/GK)                       |
| 112     | VPK3250  | PACKING CASE   | 1   | LS60GK                                   |
| 112     | VPK3248  | PACKING CASE   | 1   | LS60PC                                   |
| 112     | VPK3330  | PACKING CASE   | 1   | LS70EB/EE/EGM/EG/GC/GN/<br>PL/EF         |
| 112     | VPK3332  | PACKING CASE   | 1   | LS70GK                                   |
| 112     | VPK3329  | PACKING CASE   | 1   | LS70PC/P                                 |
| 112     | VPK3246  | PACKING CASE   | 1   | LS75EBS/EES/EGS/EGMS/<br>GCS/GNS/PLS/EFs |
| 112     | VPK3291  | PACKING CASE   | 1   | LS75EBK/EEK/EGK/EGMK                     |
| 112     | VPK3247  | PACKING CASE   | 1   | LS75GKS                                  |
| 112     | VPK3290  | PACKING CASE   | 1   | LS75PCK/PK                               |
| 112     | VPK3245  | PACKING CASE   | 1   | LS75PS                                   |
| 113     | VPN6545  | PAD  | 1   |  |

# S7. Exploded View

## S7.1. Frame and Casing Section



## S7.2. Packing Parts and Accessories Section

