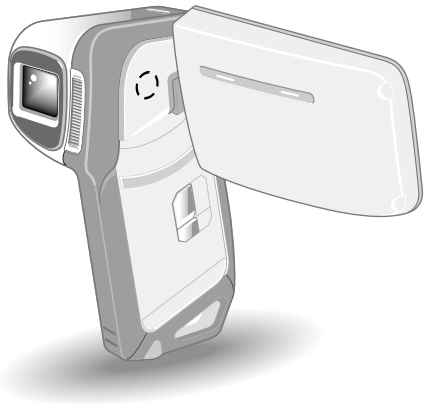
FILE NO.

SERVICE MANUAL

Digital Movie Camera



Contents

❗RoHS

- This product does not contain any hazardous substances prohibited by the RoHS Directive.

⚠WARNING

- You are requested to use RoHS compliant parts for maintenance or repair.
- You are requested to use lead-free solder.

(This product has been manufactured using lead-free solder. Be sure to follow the warning given on page 2 when carrying out repair work.)

CAUTION : Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Discard used batteries according to the manufacturer's instructions.

NOTE : 1. Parts order must contain model number, part number, and description.
2. Substitute parts may be supplied as the service parts.
3. N. S. P. : Not available as service parts.

Design and specification are subject to change without notice.

VPC-E2W

(Product Code : 168 148 02)
(U.S.A.) (Canada)

VPC-CA8EXW

(Product Code : 168 148 03)
(Europe) (U.K.) (South America)
(China) (Australia) (Hong Kong)
(Russia) (Middle East) (Africa)
(General) (Korea) (Taiwan)

VPC-CA8GXW

(Product Code : 168 148 04)
(South America) (China)
(Australia) (Hong Kong)
(General) (Korea) (Taiwan)

VPC-E2BL

(Product Code : 168 148 06)
(U.S.A.) (Canada)

VPC-CA8EXBL

(Product Code : 168 148 07)
(Europe) (U.K.) (South America)
(China) (Australia) (Hong Kong)
(Russia) (Middle East) (Africa)
(General) (Korea) (Taiwan)

VPC-CA8GXBL

(Product Code : 168 148 08)
(South America) (China)
(Australia) (Hong Kong)
(General) (Korea) (Taiwan)

VPC-E2BK

(Product Code : 168 148 10)
(U.S.A.) (Canada)

VPC-CA8EXBK

(Product Code : 168 148 11)
(Europe) (U.K.) (South America)
(China) (Australia) (Hong Kong)
(Russia) (Middle East) (Africa)
(General) (Korea) (Taiwan)

VPC-CA8GXBK

(Product Code : 168 148 12)
(South America) (China)
(Australia) (Hong Kong)
(General) (Korea) (Taiwan)

SG219/U, EX, GX, U2, EX2, GX2, U3, EX3, GX3 (R)

REFERENCE No. SM5310745

PRODUCT SAFETY NOTICE

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage, and voltage ratings shown.

WARNING

Do not use solder containing lead.

This product has been manufactured using lead-free solder in order to help preserve the environment.
Because of this, be sure to use lead-free solder when carrying out repair work, and never use solder containing lead.

Lead-free solder has a melting point that is 30 - 40°C (86 - 104°F) higher than solder containing lead, and moreover it does not contain lead which attaches easily to other metals. As a result, it does not melt as easily as solder containing lead, and soldering will be more difficult even if the temperature of the soldering iron is increased.
The extra difficulty in soldering means that soldering time will increase and damage to the components or the circuit board may easily occur.
Because of this, you should use a soldering iron and solder that satisfy the following conditions when carrying out repair work.

Soldering iron

Use a soldering iron which is 70 W or equivalent, and which lets you adjust the tip temperature up to 450°C (842°F). It should also have as good temperature recovery characteristics as possible.
Set the temperature to 350°C (662°F) or less for chip components, to 380°C (716°F) for lead wires and similar, and to 420°C (788°F) when installing and removing shield plates.
The tip of the soldering iron should have a C-cut shape or a driver shape so that it can contact the circuit board as flat or in a line as much as possible.

Solder

Use solder with the metal content and composition ratio by weight given in the table below. Do not use solders which do not meet these conditions.

Metal content	Tin (Sn)	Silver (Ag)	Copper (Cu)
Composition ratio by weight	96.5 %	3.0 %	0.5 %

Lead-free solder is available for purchase as a service tool.
Use the following part number when ordering:
Part name: Lead-free solder with resin (0.5 mm dia., 500 g)
Part number: VJ8-0270

Note:

If replacing existing solder containing lead with lead-free solder in the soldered parts of products that have been manufactured up until now, remove all of the existing solder at those parts before applying the lead-free solder.

1. OUTLINE OF CIRCUIT DESCRIPTION

1-1. CMOS CIRCUIT DESCRIPTION

1. IC Configuration

The CMOS peripheral circuit block basically consists of the following ICs.

IC911 (MT9N001I125TC)

CMOS imager
CDS, AGC, ADC built-in
H driver, V driver, serial communication circuit built-in

2. IC911 (CMOS)

[Structure]

The electric charges which are generated when each pixel is optically converted are in turn converted into signal voltages by the FD amplifier, and they are then transmitted by the built-in H driver and V driver. The signals are sampled and amplified by the CDS and PGA circuits at the point they are output, and then they are AD converted and output. The output uses the 12 bit parallel interface.

1/2.3-inch positive pixel array CMOS-type fixed imaging element

Effective pixels	3488 (H) X 2616 (V)

1-2. CP1 and VF1 CIRCUIT DESCRIPTION

1. Circuit Description

1-1. Digital clamp

The optical black section of the image sensor extracts averaged values from the subsequent data to make the black level of the image sensor output data uniform for each line. The optical black section of the image sensor averaged value for each line is taken as the sum of the value for the previous line multiplied by the coefficient k and the value for the current line multiplied by the coefficient 1-k.

1-2. Signal processor

1. γ correction circuit

This circuit performs (gamma) correction in order to maintain a linear relationship between the light input to the camera and the light output from the picture screen.

2. Color generation circuit

This circuit converts the image sensor data into RGB signals.

3. Matrix circuit

This circuit generates the Y signals, R-Y signals and B-Y signals from the RGB signals.

4. Horizontal and vertical aperture circuit

This circuit is used gemerate the aperture signal.

1-3. AE/AWB and AF computing circuit

The AE/AWB carries out computation based on a 64-segment screen, and the AF carries out computations based on a 6-segment screen.

1-4. SDRAM controller

This circuit outputs address, RAS, CAS and AS data for controlling the SDRAM. It also refreshes the SDRAM.

1-5. Communication control

1. SIO

This is the interface for the 8-bit microprocessor.

2. PIO/PWM/SIO for LCD

8-bit parallel input and output makes it possible to switch between individual input/output and PWM input/output.

1-6. TG/SG

Timing generated for image sensor control.

1-7. Digital encorder

It generates chroma signal from color difference signal.

2. Outline of Operation

When the shutter opens, the reset signals (ASIC and CPU) and the serial signals (“take a picture” commands) from the 8-bit microprocessor are input and operation starts.

When the TG/SG drives the image sensor, picture data passes through the A/D and CDS, and is then input to the ASIC. The AF, AE, AWB, shutter, and AGC value are computed from this data, and exposures are made to obtain the optimum picture. The data which has already been stored in the SDRAM is read by the CPU and color generation is carried out. Each pixel is interpolated from the surrounding data as being either R, G, and B primary color data to produce R, G and B data. At this time, correction of the lens distortion which is a characteristic of wide-angle lenses is carried out. After AWB and γ processing are carried out, a matrix is generated and aperture correction is carried out for the Y signal, and the data is then compressed by JPEG and is then written to card memory (SD card).

When the data is to be output to an external device, it is taken data from the memory and output via the USB I/F. When played back on the LCD and monitor, data is transferred from memery to the SDRAM, and the image is then elongated so that it is displayed over the SDRAM display area.

3. LCD Block

During EE, the YUV of 640 x 480 conversion is carried out for the 12-bit RGB data which is input from the A/D conversion block of the CCD to the ASIC in order to be displayed on the video, and then transferred to the SDRAM.

The data which has accumulated in the SDRAM is converted to digital YUV signal in conformity to ITUR-601 inside the ASIC by SDRAM control circuit inside the ASIC, the data is sent to the LCD driver IC and displayed the image to LCD panel after gamma conversion is carried out.

If the shutter button is pressed in this condition, the 12-bit data which is output from the A/D conversion block of the CCD is sent to the SDRAM (DMA transfer), and is displayed on the LCD as a freeze-frame image.

During playback, the JPEG image data which has accumulated in the SD card is converted to YUV signals. In the same way as for EE, the data is then sent to the SDRAM, converted to digital YUV signal in conformity to ITUR-601 inside the ASIC, the data is sent to the LCD driver IC built-in LCD and displayed the image to LCD panel.

The LCD driver is converted digital YUV signals to RGB signals from ASIC, and these RGB signals and the control signal which is output by the LCD driver are used to drive the LCD panel. The RGB signals are 1H transposed so that no DC component is present in the LCD element, and the two horizontal shift register clocks drive the horizontal shift registers inside the LCD panel so that the 1H/1V transposed RGB signals are applied to the LCD panel.

Because the LCD closes more as the difference in potential between the VCOM (common polar voltage: AC drive) and the R, G and B signals becomes greater, the display becomes darker; if the difference in potential is smaller, the element opens and the LCD become brighter. In addition, the brightness and contrast settings for the LCD can be varied by means of the serial data from the ASIC.

4. Lens drive block

4-1. Focus drive

The 16-bit serial data signals (LENS_SD) and (LENS_SCLK and LENS_EN) which are output from the ASIC (IC101) are used to drive (FOCUS A +, FOCUS A -, FOCUS B + and FOCUS B -) by the motor driver IC (IC951), and are then used to microstep-drive the stepping motor for focusing operation.
Detection of the standard focusing positions is carried out by photointerruptor (F_SENSE) inside the lens block.

4-2. Zoom drive

The 16-bit serial data signals (LENS_SD) and (LENS_SCLK and LENS_EN) which are output from the ASIC (IC101) are used to drive (ZOOM A +, ZOOM A -, ZOOM B + and ZOOM B -) by the motor driver IC (IC951), and are then used to microstep-drive the stepping motor for zooming operation.
Detection of the standard zooming positions is carried out by photointerruptor (Z_SENSE) inside the lens block.

4-3. ND filter drive

The ND filter drive signals (NDON and NDOFF) which are output from the ASIC (IC101) are used to drive (ND + and ND –) by the motor driver (IC951), and then the ND filter is inserted into and removed from the beam path.

4-4. Iris drive

The drive method is a galvanometer type without braking coil. The output from the Hall sensor inside the lens is amplified by the Hall amplifier circuit inside the IC971 lens drive IC, and the difference between the current and target aperture determined by the resulting output and the exposure amout output from the ASIC (IC101) is input to the servo amplifier circuit (IC971) to keep the aperture automatically controlled to the target aperture. The lens aperture control signal is output from IC971 and is input to lens drive IN6B of IC951. IC951 functions as the driver for driving the lens.

4-5. Shutter drive

Reverse voltage is applied to the above aperture drive coil to operate the shutter. When the shutter operates, the OC_EN and OC_CONT signals are maintained at a high level, it is input to IN6B of IC951 with low level.
At the same time the SHUTTER + signal that is output from the ASIC (IC101) becomes high (input to IN6A of IC951) and the shutter operates. IC951 functions as the driver for driving the lens.

5. Video clip recording and playback

5-1. Recording

The signals from the camera block are input to the ASIC where they are processed, and the image data that is stored in the IC121 SDRAM converts MPEG4 encoded data inside the ASIC, and the data is then written in sequence onto the SD card. At this time, the audio signals that are input to the built-in microphone are converted into digital data by the audio CODEC IC of IC182. The audio data is then encoded (AAC) inside the ASIC, and is then written in sequence onto the SD card together with the image signals described above.

5-2. Playback

The data is read from the SD card. The encoded data is decoded into image data inside the ASIC and then where it is displayed by the LCD or on a TV monitor. At this time, the audio data is also decoded, and it is input to IC182 as digital data. D/A conversion is carried out at IC182, and the sound is then output to the speaker or to the LINE OUT terminal.

6. Audio CODEC circuit (IC182)

The audio signals from the microphone are converted into 16-bit digital data. AD conversion is carried out at a maximum sampling frequency of 48 kHz.
During audio playback, the 16-bit digital data is converted into analog signals and these drive the speaker or line out system. DA conversion is carried out at a maximum sampling frequency of 48 kHz.

1-3. PWA POWER CIRCUIT DESCRIPTION

1. Outline

This is the main power circuit, and is comprised of the following blocks.
Switching controller (IC501)
Motor system power output (L5301)
Digital 3.25 V power output (L5002)
Digital and CMOS 1.8 V power output (L5003)
Backlight power output (Q5007, L5007)
Digital 1 V power output (IC502, L5004)
CMOS analog 2.8 V power output (IC503, L5005)

2. Switching Controller (IC501)

This is the basic circuit which is necessary for controlling the power supply for a PWM-type switching regulator, and is provided with seven built-in channels, only CH1 (motor system), CH2 (digital 3.25 V), CH3 (digital 1.8 V) and CH7 (backlight) are used.
Each power supply output is received, and the PWM duty is varied so that each one is maintained at the correct voltage setting level.
Feedback for the backlight power (CH7) is provided to the both ends voltage of registance so that regular current can be controlled to be current that was setting.

2-1. Short-circuit protection circuit

If output is short-circuited for the length of time determined by the condenser which is connected to Pin (A6) of IC501, all output is turned off. To reset, momentarily set the control signal (P ON) to repeat control, or temporarily disconnect the input power supply.

3. Motor System Power Output

BOOST 5.3 V is output. Feedback for the 5.3 V output is provided to the switching controller (Pin (B7) of IC501) so that PWM control can be carried out.

4. Digital 3.25 V Power Output

VDD3 is output. Feedback for the VDD3 is provided to the swiching controller (Pin (F3) of IC501) so that PWM control can be carried out.

5. Digital 1.8 V and CMOS 1.8 V Power Output

VDD 1.8 and CMOS 1.8 V are output. Feedback for the 1.8 V is provided to the switching controller (Pin (C3) of IC501) so that PWM control to be carried out.

6. Backlight Power Supply output

Regular current is being transmitted to LED for LCD backlight. Feedback for the both ends voltage of registance that is being positioned to in series LED are provided to the switching controller (Pin (C4) of IC501) so that PWM control to be carried out.

7. Digital 1 V Power Output

VDD 1.0 is output. Feedback for the VDD 1.0 is provided to the switching controller (Pin (11) of IC502) so that PWM control to be carried out.

8. CMOS Analog 2.8 V Power Output

VAA 2.8 is output. Feedback for the VAA 2.8 is provided to the switching controller (Pin (3) of IC503) so that PWM control to be carried out.

1-4. ST1 STROBE CIRCUIT DESCRIPTION

1. Charging Circuit

When UNREG power is supplied to the charge circuit and the CHG signal from microprocessor becomes High (3.3 V), the charging circuit starts operating and the main electorolytic capacitor is charged with high-voltage direct current.
However, when the CHG signal is Low (0 V), the charging circuit does not operate.

1-1. Charge switch

When the CHG signal switches to Hi, IC541 starts charging operation.

1-2. Power supply filter

C5401 constitutes the power supply filter. They smooth out ripples in the current which accompany the switching of the oscillation transformer.

1-3. Oscillation circuit

This circuit generates an AC voltage (pulse) in order to increase the UNREG power supply voltage when drops in current occur. This circuit generates a drive pulse with a frequency of approximately 200-300 kHz, and drive the oscillation transformer.

1-4. Oscillation transformer

The low-voltage alternating current which is generated by the oscillation control circuit is converted to a high-voltage alternating current by the oscillation transformer.

1-5. Rectifier circuit

The high-voltage alternating current which is generated at the secondary side of T5401 is rectified to produce a high-voltage direct current and is accumulated at electrolytic capacitor C5412.

1-6. Charge monitoring circuit

The functions programmed in the IC541 monitor oscillations and estimate the charging voltage. If the voltage exceeds the rated value, charging automatically stops. Then, the ZCHG_DONE signal is changed to Lo output and a "charging stopped" signal is sent to the microcomputer.

2. Light Emission Circuit

When FLCLT signal is input from the ASIC, the stroboscope emits light.

2-1. Emission control circuit

When the FLCLT signal is input to the emission control circuit, Q5402 switches on and preparation is made to the light emitting. Moreover, when a FLCLT signal becomes Lo, the stroboscope stops emitting light.

2-2. Trigger circuit

The Q5402 is turned ON by the FLCLT signal and light emission preparation is preformed. Simultaneously, high voltage pulses of several kV are emitted from the trigger coil and applied to the light emitter.

2-3. Light emitting element

When the high-voltage pulse form the trigger circuit is applied to the light emitting part, currnet flows to the light emitting element and light is emitted.

Beware of electric shocks.

1-5. SYA CIRCUIT DESCRIPTION

1. Configuration and Functions

For the overall configuration of the SYA block, refer to the block diagram. The SYA block centers around a 8-bit microprocessor (IC301), and controls camera system condition (mode).
The 8-bit microprocessor handles the following functions.
1. Operation key input, 2. Clock control and backup, 3. Power ON/OFF, 4. Storobe charge control

Pin	Signal	I/O	Outline
1	ASIC_SCK	O	Serial data clock output
2	ZCARD	I	SD card detection (L= SD card)
3	ZBACKUPCTL	O	Backup battery charge control (L= charge)
4	ZCHGDONE	I	Strobo condensor charge done detection (H → L= charge done)
5	HOT LINE	I	Hot line request from ASIC
6	TEST_MODE	I	Test mode terminal (L= starting up test mode)
7	NOT USED	O	-
8	LCDPWM	O	Backlight luminance variable
9	VDD2	-	VDD
10	VSS2	-	GND
11	RED_LED	O	Red LED (H= lighting)
12	GREEN_LED (G)	O	Green LED (H= lighting)
13	NAND RESET	O	OneNAND flash reset (L= reset)
14	NOT USED	O	-
15	BL ON	O	LCD backlight ON/OFF signal (H= backlight ON)
16	NOT USED	O	-
17	MAIN RESET	O	System reset (MRST)
18	PLLEN	O	ASIC PLL ON/OFF control
19	UTX	I	Debugger terminal
20	MR_OPEN	I	LCD panel open/close detection (H= panel open)
21	USB_DET	I	USB connection detection (L= connection)
22	COMREQ	I	Command request input
23	LCDDO_ZBOOT	I	BOOT → Lo output, normal starting up → Hi-z
24	KEY_1st	I	Key input 1st SHUTTER (L= input)
25	KEY_PLAY	I	Key input PLAY (L= input)
26	FRAME_VALID	I	VSYNC monitoring
27	ST_CHG	O	Strobo charge control (H= charge)
28	SW3.2 ON	O	SW 3.2 power ON/OFF signal (L= ON)
29	KEY_UP/TELE	I	Key input play → UP key, through → ZOOM TELE key
30	KEY_DOWN/WIDE	I	Key input play → DOWN key, through → ZOOM WIDE key
31	KEY_LEFT	I	Key input LEFT
32	KEY_RIGHT	I	Key input RIGHT
33	KEY_SET	I	Key input SET
34	KEY_VREC	I	Key input VREC
35	VSS3	-	GND
36	VDD3	-	VDD
37	RDSEL	I/O	Debugger terminal
38	CLK (SFW)	I/O	Debugger terminal
39	DATA0 (SFW)	I/O	Debugger terminal
40	P ON	O	D/D converter 1.8 V/3.3 V ON/OFF signal (H= ON)
41	PON2	O	D/D converter 1.0 V ON/OFF signal (H= ON)
42	NOT USED	O	-

See next page →

43	KEY_MENU	I	Key input MENU
44	MR_TURN	I	LCD panel rotation detection (L= panel inversion)
45	NOT USED	O	-
46	NOT USED	O	-
47	NOT USED	O	-
48	NOT USED	O	-
49	BAT_OFF	I	Battery OFF detection (L= battery OFF)
50	ZSREQ	I/O	Serial communication request signal
51	KEY_POWER	I	Key input POWER
52	KEY_2ND	I	Key input 2nd SHUTTER
53	#RESET	I	Microprocessor reset input (L= reset)
54	XCIN	I	Sub clock oscillation terminal (32.768 kHz)
55	XCOUT	O	Sub clock oscillation terminal (32.768 kHz)
56	VSS1	-	GND
57	XIN	I	Main clock oscillation terminal (4 MHz)
58	XOUT	O	Main clock oscillation terminal (4 MHz)
59	VDD1	-	VDD
60	UNREG SY	I	Camera power voltage input
61	ZAV JACK	I	AV JACK connection detection (L= connection)
62	TH_TEMP	I	Camera temperature detection
63	SO	O	Serial data output
64	SI	I	Serial data input

Table 5-1. 8-bit Microprocessor Port Specification

2. Internal Communication Bus

The SYA block carries out overall control of camera operation by detecting the input from the keyboard and the condition of the camera circuits. The 8-bit microprocessor reads the signals from each sensor element as input data and outputs this data to the camera circuits (ASIC) or to the LCD display device as operation mode setting data. Fig. 5-1 shows the internal communication between the 8-bit microprocessor, ASIC and SPARC lite circuits.

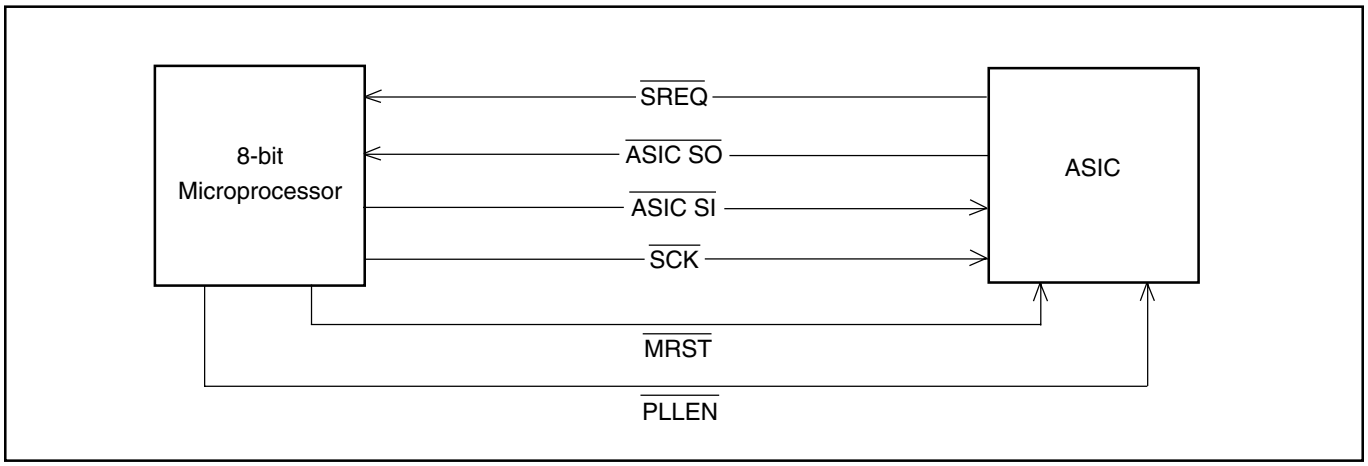


Fig. 5-1 Internal Bus Communication System

3. Power Supply Control

The 8-bit microprocessor controls the power supply for the overall system.

The following is a description of how the power supply is turned on and off. When the battery is attached, a regulated 3.2 V (power off: 2.4 V) voltage is normally input to the 8-bit microprocessor (IC301) by IC302, so that clock counting and key scanning is carried out even when the power switch is turned off, so that the camera can start up again. When the battery is removed, the 8-bit microprocessor operates in sleep mode using the backup battery. At this time, the 8-bit microprocessor only carries out clock counting, and waits in standby for the battery to be attached again. When a switch is operated, the 8-bit microprocessor supplies power to the system as required.

The 8-bit microprocessor first sets the P ON signal at pin (40) to high, and then turns on the DC/DC converter. After this, low signal is output from pin (17) so that the ASIC is set to the reset condition. After this these pins set to high, and set to active condition. Once it is completed, the ASIC returns to the reset condition, all DC/DC converters are turned off and the power supply to the whole system is halted.

		ASIC, memory	CMOS	8 bit CPU	LCD MONITOR
Power voltage		3.3 V 1.8 V 1.0 V	1.8 V 2.8 V (A)	3.2 V (ALWAYS)	3.3 V 7 V
Power OFF		OFF	OFF	32KHz	OFF
CAMERA	Power switch ON- Auto power OFF	OFF	OFF	32KHz	OFF
	LCD monitor	ON	ON	4 MHz	ON
Play back		ON	OFF	4 MHz	ON

Table 5-2. Camera Mode

Note) 4 MHz = Main clock operation, 32 kHz = Sub clock operation

2. DISASSEMBLY

Note:

1. When disassembling and reassembling the main unit, the LCD and the battery cover, always be sure to use the air leak tester (VJ8-0303) to test for air leaks and to check that the waterproof mechanism is functioning normally. Refer to the Instruction Manual provided with the air leak test tool for details on how to carry out the air leak test.
2. This camera uses waterproof packing. It is recommended that you replace the waterproof packing approximately once every year. The waterproof packing is supplied in the COMPL, MENT KIT-SV-114 (P/No. 636 110 2131) shown in the table below. These parts can also be supplied as single parts.

Summary of waterproof maintenance parts kit

Parts name: COMPL, MENT KIT-SV-114

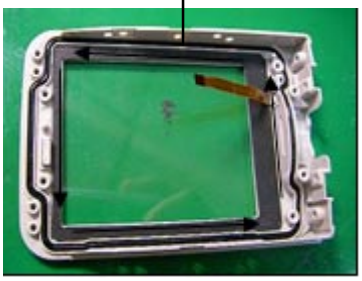
Parts code: 636 110 2131

SECTION	NO.	DESCRIPTION	PARTS NO.	NUMBER
CABINET	1	GASKET CABINET-SG114/J	6361040174	1
LCD	2	SPACER MIC2-SG114/J	6361073998	2
	3	GASKET LCD-SG114/J	6361040181	1
COVER BATTERY	4	PAD BATTERY-SG114/J	6361040198	1
	5	ADHESIVE COV BATT A-SG114	6361047173	1
	6	ADHESIVE COV BATT B-SG114	6361047180	1
	7	ADHESIVE COV BATT D-SG114	6361066044	1

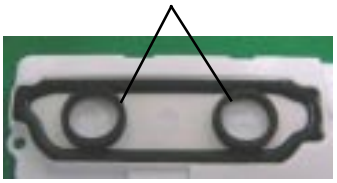
List of waterproof maintenance parts kit

GASKET CABINET-SG114/J

GASKET LCD-SG114/J



SPACER MIC2-SG114/J

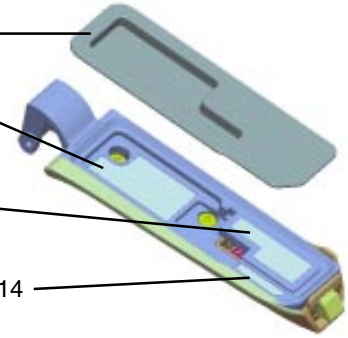


PAD BATTERY-SG114/J

ADHESIVE COV BATT A-SG114

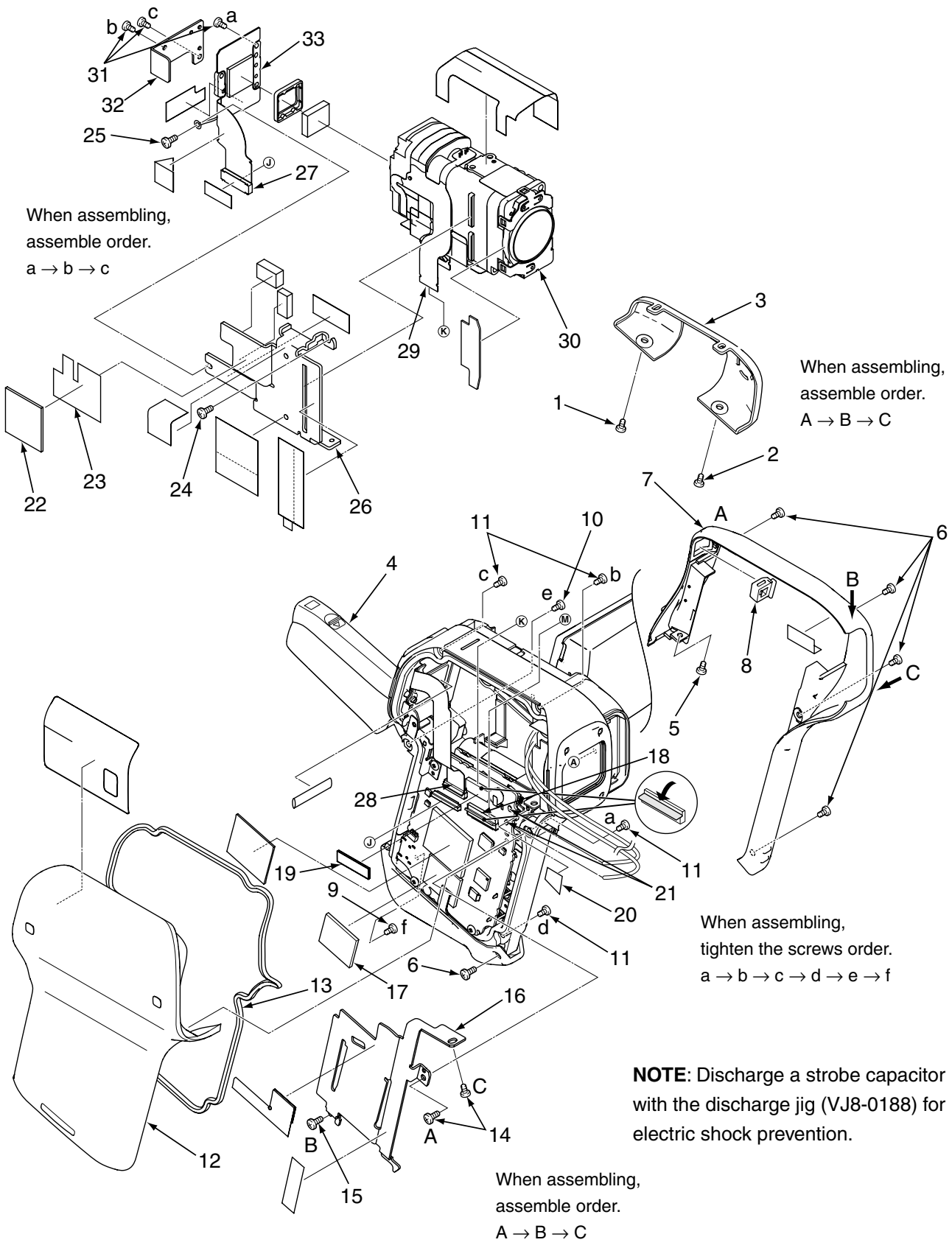
ADHESIVE COV BATT D-SG114

ADHESIVE COV BATT B-SG114



When doing an air leak test at the LCD, these parts must be replaced. (If these parts are not removed, it will not be possible to do the air leak test at the LCD.)

2-1. REMOVAL OF CABI LEFT AND LENS

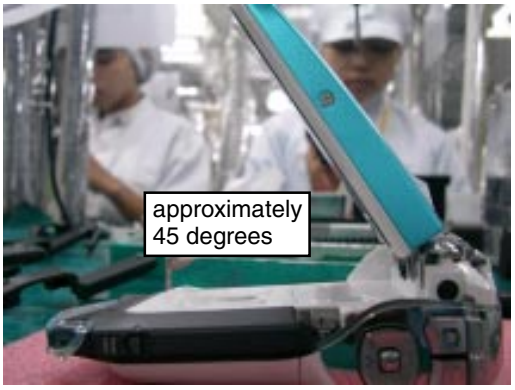


NOTE: Discharge a strobe capacitor with the discharge jig (VJ8-0188) for electric shock prevention.

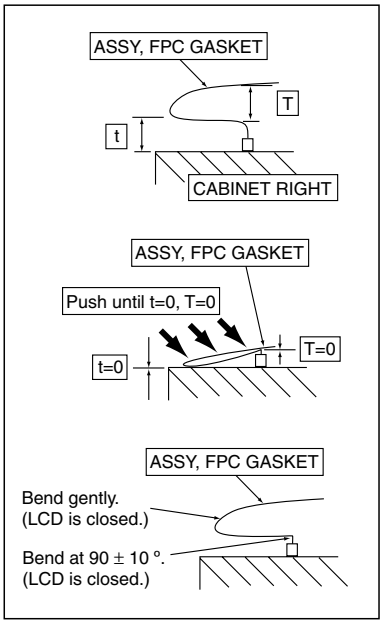
1. Screw 1.7 x 2.5
2. Screw 1.7 x 3.5
3. Cover joint base
4. Open the cover battery.
5. Screw 1.4 x 2.5
6. Five screws 1.7 x 5
7. Dec grip
8. Button menu
9. Screw 1.7 x 5
10. Screw 1.7 x 3.5
11. Four screws 1.7 x 4.5
12. Cabi left
13. Gasket cabinet
14. Two screws 1.7 x 2.5
15. Screw 1.7 x 6
16. Heat sink ASIC
17. Spacer power
18. FPC
19. Spacer CA1
20. Spacer ST1 wire
21. Remove the solder.
22. Heat sink rubber (0044)
23. Spacer heat sink
24. Screw 1.7 x 4.5
25. Screw 1.4 x 4
26. Heat sink CMOS 1
27. Connector
28. FPC
29. FPC
30. Lens assy
31. Three screws 1.4 x 4.5
32. Heat sink CMOS 2
33. Assy, flexible pwb CA1

When reassembling
The air leak test should be carried out between steps 8 and 9.
At this time, the battery cover should be closed and locked.

ASSY, FPC GASKET installing method (between steps 8 and 9 on page 12 and 13)

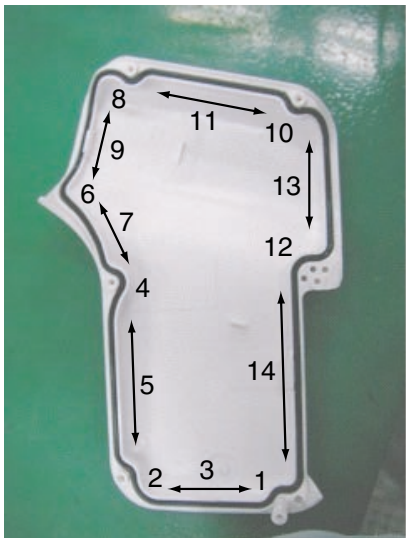


Tilt the LCD to approximately 45 degrees.
Next, push the ASSY, FPC GASKET gently with a finger until the clearance t between the bottom CABINET RIGHT edge of the ASSY, FPC GASKET and the CABINET RIGHT is 0.

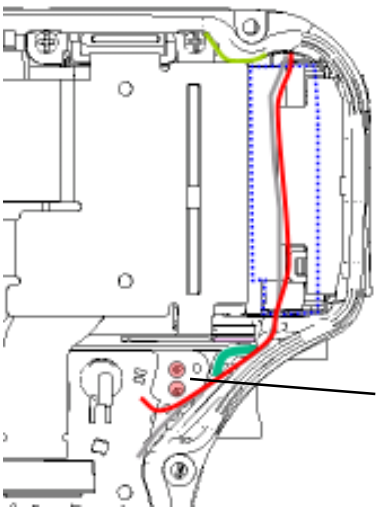


Installing the gasket cabinet (step 13 on page 12)

Install from directly above in the order of the numbers so that the gasket is not twisted.

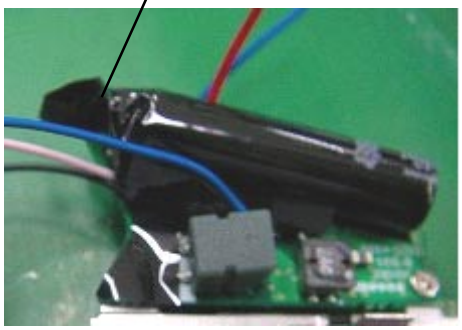


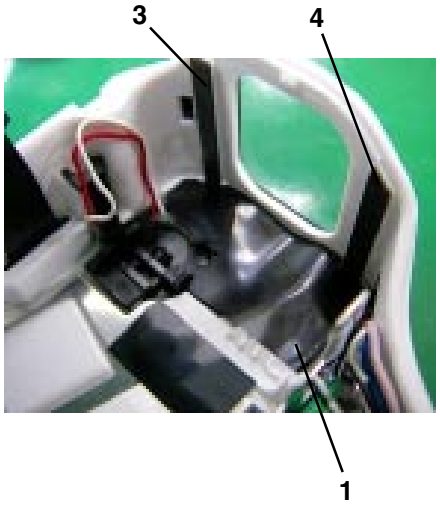
Lead wire of speaker dressing method (step 21 on page 12)



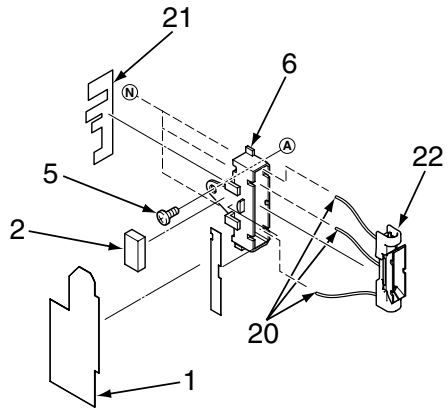
2-2. REMOVAL OF CP1 BOARD AND ST1 BOARD

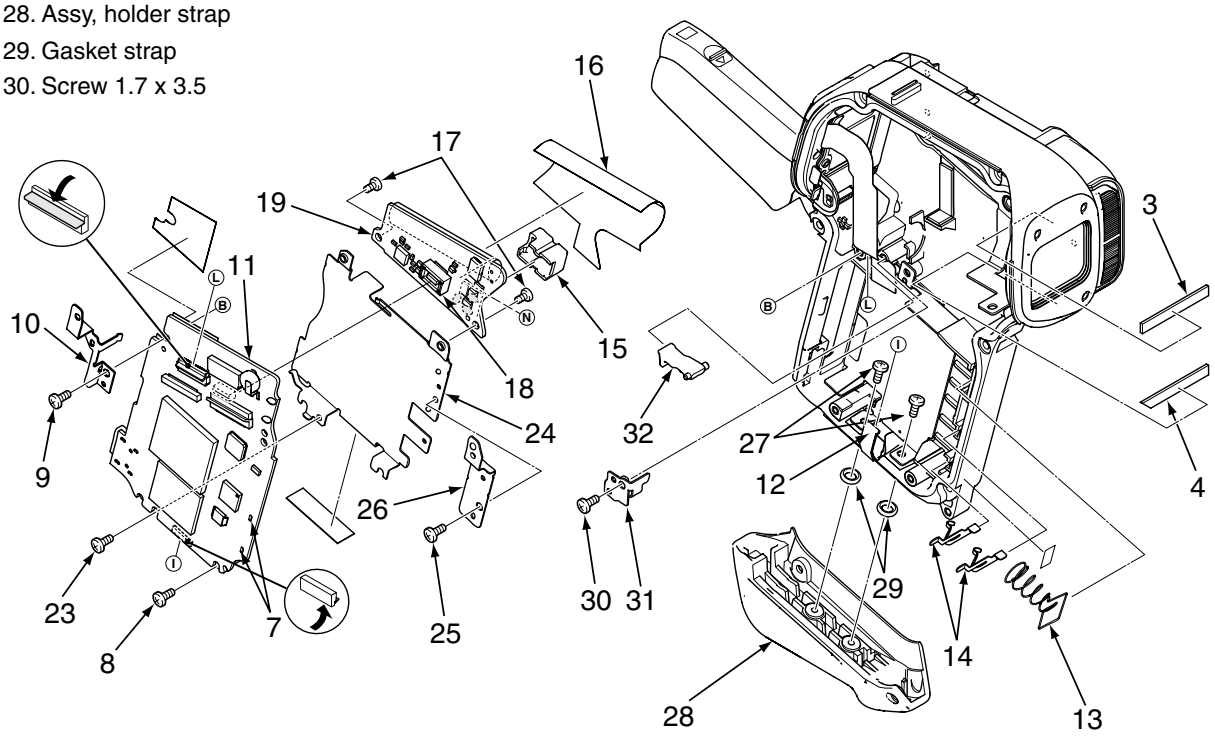
1. Spacer flash
2. Spacer holder flash
3. Spacer lens unit
4. Spacer lens unit 2
5. Screw 1.7 x 4
6. Holder flash
7. Remove the solder.
8. Screw 1.7 x 4
9. Screw 1.7 x 4
10. Earth joint
11. CP1 board
12. FPC
13. Spring batt eject
14. Terminal batt
15. Cover triger
16. Spacer ST1
17. Two screws 1.7 x 2
18. Connector
19. ST1 board
20. Remove the solder.
21. Spacer H flash B
22. Assy, lamp
23. Screw 1.7 x 2
24. Holder CP1
25. Screw 1.7 x 2
26. Holder CP1 2
27. Two screws 1.7 x 6
28. Assy, holder strap
29. Gasket strap
30. Screw 1.7 x 3.5
31. Spring lock lever
32. Lever batt lock





When assembling
The air leak test should be carried out between steps 26 and 27.
At this time, 12. Cabi left, 13 Gasket cabinet and 9, 10, 11 six screws on page 12 should be assembled to the main body, and carry out the air leak test. When the air leak test is finished, disassembling above parts.





2-3. REMOVAL OF LCD AND VF1 BOARD

When assembling,
tighten the screws order.
A → B

Installing the gasket LCD (step 36)
Install from directly above in the order of the numbers so that the FPC is not twisted.

When assembling,
tighten the screws
order.
A → B → C

When assembling,
tighten the screws order.
a → b → c → d

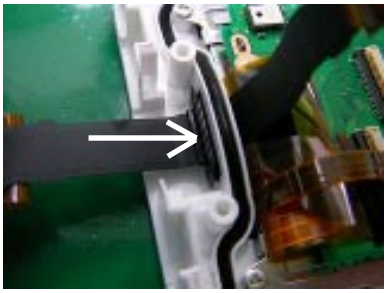
When assembling,
tighten the screws order.
A → B

1. Shaft cover batt
2. Spring cover batt
3. Compl, cover batt
4. Spacer holder joint
5. Two screws 1.7 x 4
6. Screw 1.7 x 2.5
7. Two screws 1.7 x 3.5
8. Cover joint inner
9. Two screws 1.7 x 3.5
10. Earth joint LCD
11. Pull the LCD from the body.
12. Holder LCD
13. Screw 1.7 x 3.5
14. Holder joint base
15. Two screws 1.7 x 2.5
16. Two screws 1.7 x 3.5
17. Two screws 1.7 x 4.5
18. Cover LCD back
19. Spacer mic 2
20. Dec LCD top
21. Four screws 1.7 x 2
22. Earth LCD A
23. Holder joint R
24. Holder joint L
25. Pull the assy joint from the LCD.
26. Four screws 1.7 x 3
27. Cover LCD inner
28. FPC
29. FPC
30. Four screws 1.7 x 2.5
31. FPC
32. LCD
33. Three screws 1.7 x 2
34. VF1 board
35. Holder LCD
36. Gasket LCD
37. Cover LCD front
38. Assy joint

When reassembling
The air leak test should be carried out between steps 20 and 21.

Installing the ASSY JOINT (RUBBER) to the COVER LCD FRONT (step 28)

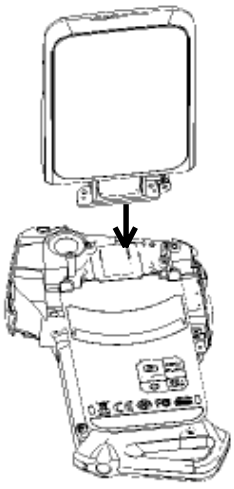
Install so that the rubber will not come out.



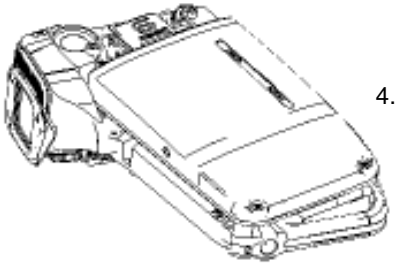
Installing the LCD to the CABI RIGHT (step 11)

1. Insert the FPC of the LCD into the CABI RIGHT.

2. Install the rubber of the ASSY JOINT to the cabinet.

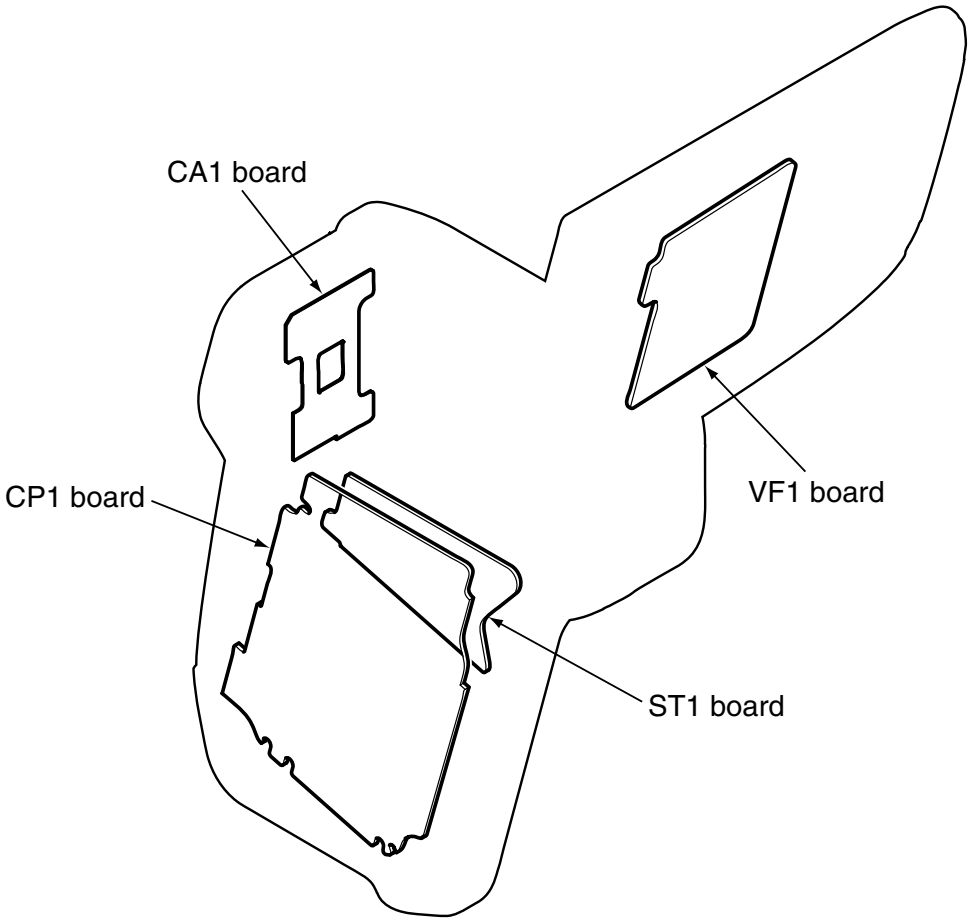


3. Install the LCD joint to the cabinet.



4. After installing, close the LCD.

2-4. BOARD LOCATION

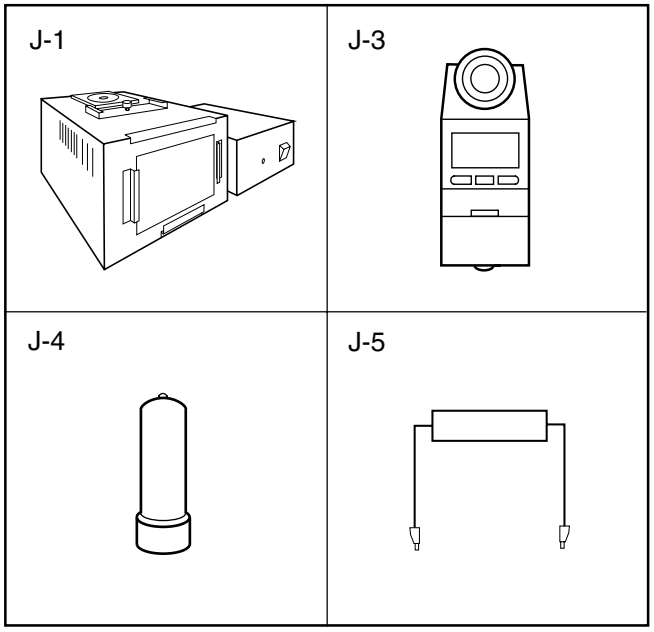


3. ELECTRICAL ADJUSTMENT

3-1. Table for Servicing Tools

Ref. No.	Name	Number	Part code
J-1	Pattern box (color viewer)	1	VJ8-0190
J-2	Calibration software	1	
J-3	Chroma meter	1	VJ8-0192
J-4	Spare lump (pattern box)	1	VJ8-0191
J-5	Discharge jig	1	VJ8-0188
J-6	Collimator	1	VJ8-0260
J-7	Spare lump (collimator)	1	VJ8-0282

Download the calibration software and the firmware from the following URL.
http://www.digital-sanyo.com/overseas/service/
Place the DscCalDi.exe file, camapi32.dll file and QrCodeInfo.dll file together into a folder of your choice.



3-2. Equipment

1. PC (IBMⓇ-compatible PC, Windows 2000 or XP or Vista)

3-3. Adjustment Items and Order

1. Lens Adjustment
2. AWB Adjustment
3. CCD White Point Defect Detect Adjustment
4. CCD Black Point And White Point Defect Detect Adjustment In Lighted

Note: Item 1-4 adjustments should be carried out in sequence.

3-4. Setup

1. System requirements

Windows 2000 or XP or Vista
IBMⓇ-compatible PC with pentium processor
CD-ROM drive
USB port
40 MB RAM
Hard disk drive with at least 15 MB available
VGA or SVGA monitor with at least 256-color display

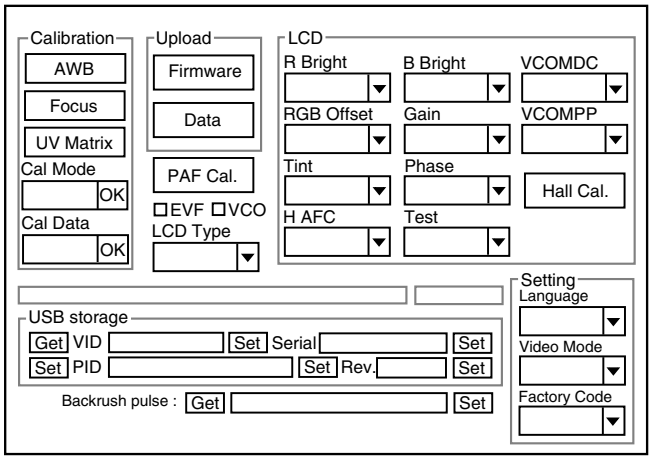
2. Installing USB driver

Install the USB driver with camera or connection kit for PC.

3. Pattern box (color viewer)

Turn on the switch and wait for 30 minutes for aging to take place before using Color Pure. It is used after adjusting the chroma meter (VJ8-0192) adjust color temperature to 3100 ± 20 K and luminosity to 900 ± 20 cd/m^2. Be careful of handling the lump and its circumference are high temperature during use and after power off for a while.

4. Computer screen during adjustment



3-5. Connecting the camera to the computer

This camera requires a DC adaptor (sold separately) in order to use an AC adaptor.

1. Insert the DC adaptor to the camera.
2. Insert the AC adaptor's cable to DC terminal of the DC adaptor.
3. Line up the arrow on the cable connector with the notch on the camera's USB port. Insert the connector.
4. Locate a USB port on your computer.
5. If "USB CONNECTION" is displayed, choose the "COM PUTER", and press the SET button.
   Next, choose the "CARD READER", and press the SET button.

3-6. The adjustment item which in necessary in part exchange

	Lens Adjustment	AWB Adjustment	CCD White Point Defect Detect Adjustment	CCD Black Point And White Point Defect Detect Adjustment In Lighted	Factory Cord Setting	Language Setting	USB storage information registration	Reset Setting
COMPL PWB CP-1	○	○	○	○	○	△	○	○
COMPL PWB ST-1								
COMPL PWB VF-1								
ASSY FLEXIBLE PWB CA1	○	○	○	○				
LENS ASSY	○	○						

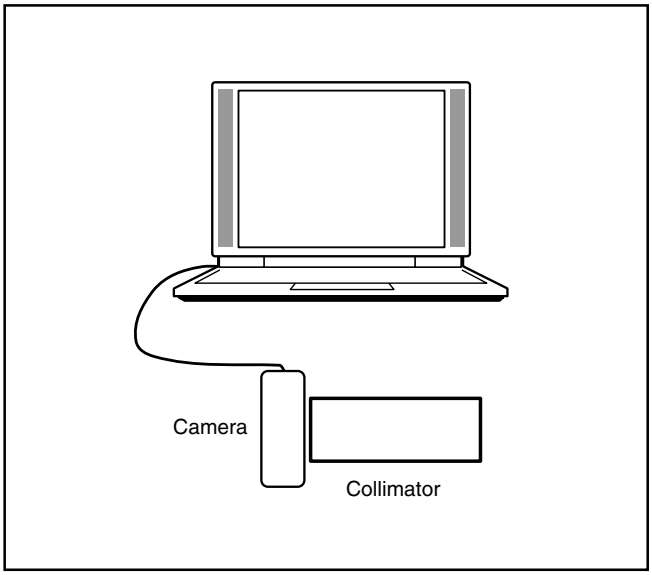
○ : Be sure to carry out the necessary adjustments after replacing the unit.
△ : Adjustment is possible from the menu setting screen of the camera and by using the calibration software.

3-7. Updating the firmware

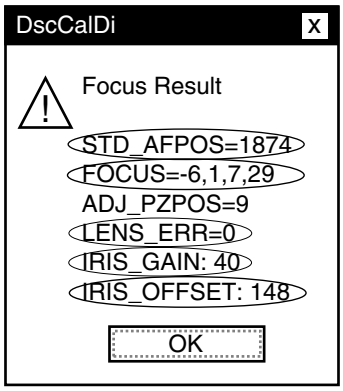
Check the firmware version immediately after the CP1 board has been replaced. If an old version is being used, interference and errors in operation may also occur. If an old version is being used, update it with a newer version.
Refer to 3-13. Firmware uploading procedure. (Page 22)

3-8. Adjust Specifications

1. Lens Adjustment

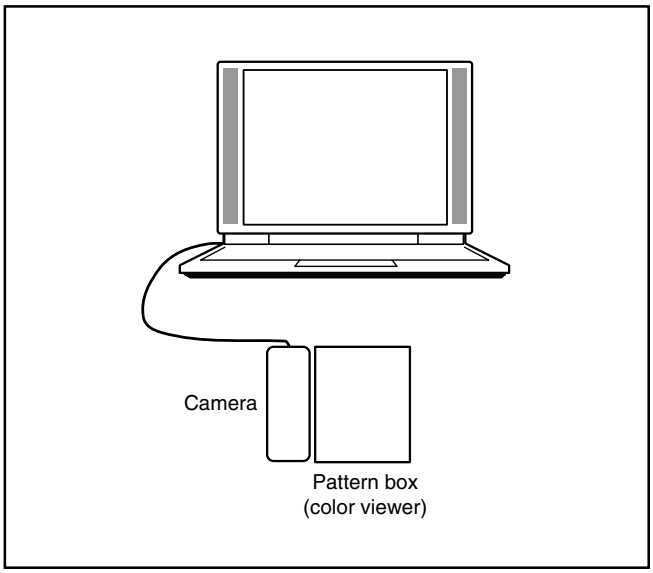


Preparation:
POWER switch: ON
If using a ready-made collimator, set to infinity.
Note:
Do not vibrate during the adjustment.
Adjustment method:
1. Set a distance of 0.5-1.0 cm between edge of the camera lens and edge of the collimator lens. Do not touch the each lens.
2. Set the camera so that it becomes center of the screen in the collimator.
3. Double-click on the DscCalDi.exe.
4. Click the Focus, and click the Yes.
5. Lens adjustment value will appear on the screen.
6. Click the OK.

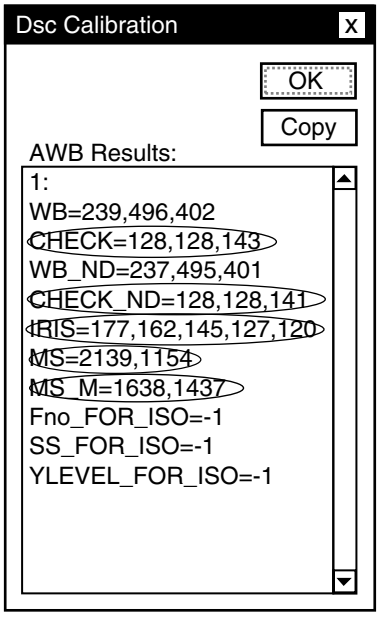


Adjustment value determination is effectuated using the "STD_AFPOS", "FOCUS", “LENS_ERR”, “IRIS_GAIN” and “IRIS_OFFSET” values.
If FOCUS=focus1, focus2, focus3, focus4 and the adjustment values fulfill the conditions below, they are determined as within specifications.
Adjustment value determination
1800<=STD_AFPOS<=2000
-100<=focus1<=+100, -100<focus2<+100,
-100<=focus3<=+100, -200<=focus4<=+200
lens_error=0
0<=g<=255
0<=o<=255

2. AWB Adjustment



Preparation:
POWER switch: ON
Adjusting method:
1. Set a distance of 2 ± 1 cm between the pattern box and the camera. (Do not enter any light.)
2. Double-click on the DscCalDi.exe.
3. Click the AWB, and click the Yes.
4. AWB adjustment value will appear on the screen.
5. Click the OK.



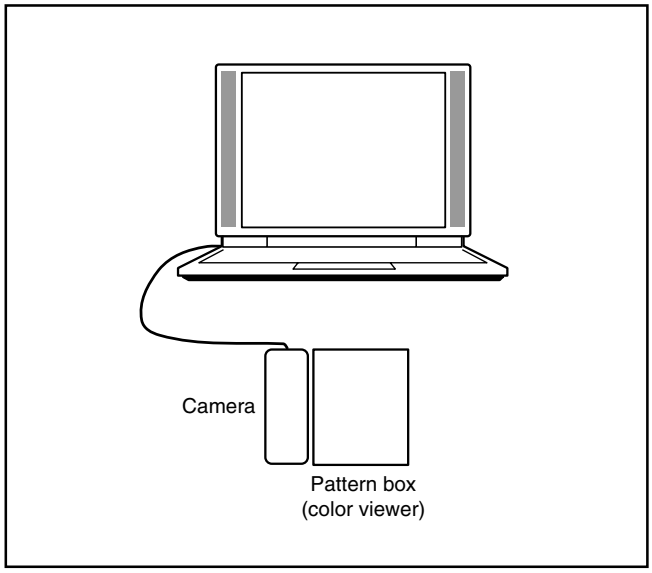
Adjustment value determination is effectuated using the "CHECK", "CHECK_ND", "MS", "MS_M" and "IRIS" values.
If CHECK= wc0, wc1, wc2, CHECK_ND= wnc0, wnc1, wnc2, MS= ms1, ms2, MS_M= ms3, ms4 and IRIS= s1, s2, s3, s4, s5, the adjustment values fulfill the conditions below, they are determined as within specifications.

Adjustment value determination
wc0=128 ± 2, wc1=128 ± 2, wc2=130 ± 40
wnc0=128 ± 2, wnc1=128 ± 2, wnc2=130 ± 40
1401<ms1<=3600, 801<ms2<=2500, 1251<ms3<=3100,
1201<ms4<=2900
100<=s1<=220, 100<=s2<=220, 100<=s3<=220,
100<=s4<=220, 100<=s5<=220
ms2<ms4<ms3<ms1
s1>s2>s3>s4>s5
Adjustment values other than the above are irrelevant.

3. CCD White Point Defect Detect Adjustment

Preparation:
POWER switch: ON
Adjustment method:
1. Double-click on the DscCalDi.exe.
2. Select "CCD Defect" on the LCD "Test", and click the "Yes".
3. After the adjustment is completed, OK will display.
4. Click the OK.

4. CCD Black Point And White Point Defect Detect Adjustment In Lighted



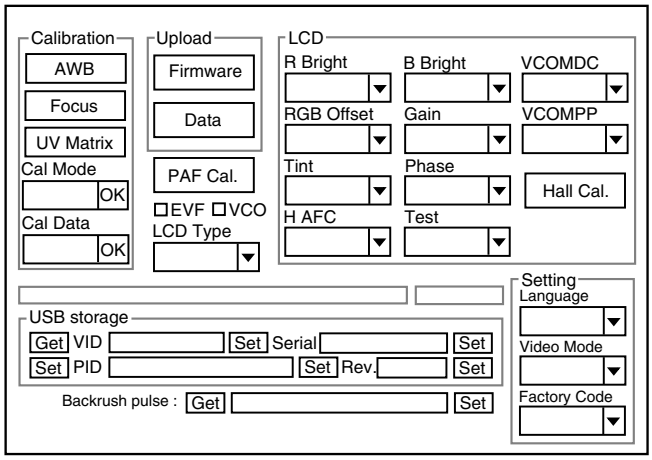
Preparation:
POWER switch: ON
Setting of pattern box:
Color temperature: 3100 ± 20 (K)
Luminance: 900 ± 20 (cd/m^2)
Adjusting method:
1. Set a distance of 2 ± 1 cm between the pattern box and the camera.
2. Double-click on the DscCalDi.exe.
3. Select "CCD Black" on the LCD "Test", and click the "Yes".
4. After the adjustment is completed, the number of defect will appear.

3-9. Factory Code Setting

1. Check the "Factory Code" display within the Setting group.
2. **For U.S.A., Canada and NTSC general area**
   If "FC_SANYO_U" does not appear, click on the "▼" mark located on the right of the "Factory Code" display BOX and select "FC_SANYO_U".
3. **For Europe and PAL general area**
   If "FC_SANYO_EX" does not appear, click on the "▼" mark located on the right of the "Factory Code" display BOX and select "FC_SANYO_EX".

3-10. Language Setting

1. Click on the "▼" mark located on the right of the "Language" display BOX.
2. Select language. (Default is English.)
3. End "DscCal" and remove the camera before turning the camera power OFF.



3-11. Reset Setting

Carry out reset settings after replacing CP1 board.

1. Turn on the camera.
2. Press the MENU button.
3. Press the left arrow button to display the OPTION MENU 3.
4. Choose the RESET SETTINGS, and press the SET button.
5. Select RESET, and press the SET button.

3-12. The Compulsive boot starting method

1. Keep MENU button, SET button, and SHUTTER button depressed while switching on the power.
2. Connect the camera and the computer with USB cable.

3-13. Firmware uploading procedure

1. Uploading the firmware should be carried out if the version number (COMPL PWB XX-X) on the replacement circuit board is lower than the version of the distributed firmware. For XX-X, enter the name of the circuit board containing the firmware.
2. The firmware is distributed by e-mail in self-extracting archive format. Change the extension of the distributed file to .EXE and save it in your preferred folder.
3. When you double-click the saved file, the firmware (binary file) will be saved in the same folder.
4. The firmware must not be distributed without permission.

1. Overwriting firmware from the SD card

Preparation:

SD card: SD card with firmware rewritten into the root directory
Data: S219Nxxx.BIN (xxx: version)

Overwriting method:

1. Insert the above SD card.
2. Turn on the camera.
3. Press the PLAY button.
4. Press the MENU button.
5. Press the left arrow button to display the OPTION MENU 3.
6. Choose the FORMAT.
7. Press the left arrow button for 2 seconds. FIRMWARE UPDATE will display.
8. Choose YES.
9. Press the SET button. Update is starting.

Note: Do not turn off the camera's power or remove the SD card while the firmware is being updated.
The power will turn off after the update is complete.

2. Overwriting firmware from the calibration software

Preparation:

PC with overwriting firmware copied to the preferred folder in the HD.
Data: S219Nxxx.BIN (xxx: version)

Overwriting method:

1. Connect the camera's USB/AV terminal to the computer' USB connector.
2. The USB Connection screen appears on the camera's LCD monitor. Choose the "CARD READER", and press the SET button.
3. Double-click on the DscCalDi.exe.
4. Click the Firmware.
5. Choose the fimware file to use for overwriting, and click the Yes.
6. Update is starting. The message will appear, and choose OK.
7. After the update is complete, disconnect the USB cable and turn the camera's power off.

Note: Do not turn off the camera's power while the firmware is being updated.

4. USB STORAGE INFORMATION REGISTRATION

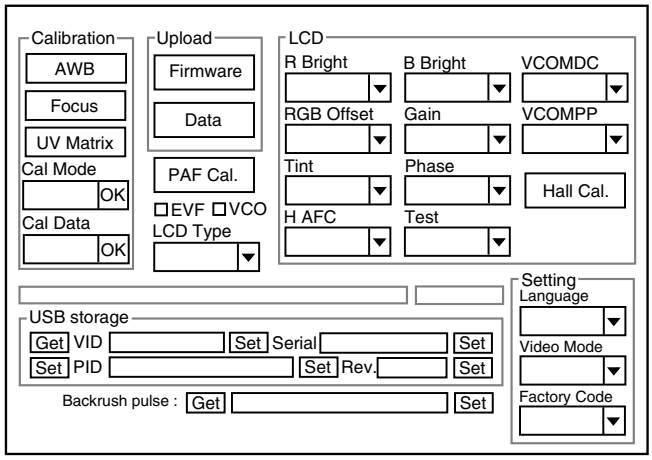
USB storage data is important for when the camera is connected to a computer via a USB connection.
If there are any errors in the USB storage data, or if it has not been saved, the USB specification conditions will not be satisfied, so always check and save the USB storage data.

Preparation:

POWER switch: ON

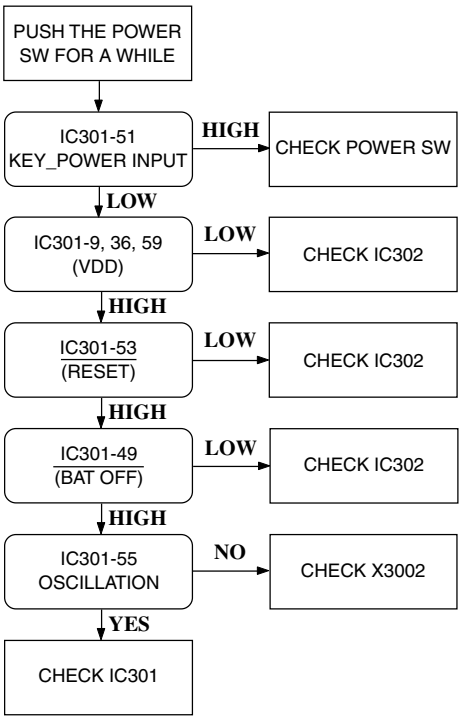
Adjustment method:

1. Connect the camera to a computer. (Refer to 3-5. Connecting the camera to the computer on the page 19.)
2. Double-click on the DscCalDi.exe.
3. Click on the Get button in the USB storage window and check the USB storage data.
   VID: SANYO
   PID: CA8
   (VPC-CA8EXW, VPC-CA8GXW, VPC-CA8EXBL, VPC-CA8GXBL, VPC-CA8EXBK, VPC-CA8GXBK)
   E2
   (VPC-E2W, VPC-E2BL, VPC-E2BK)
   Serial:
   Rev. : 1.00
4. Check the “Serial” in the above USB storage data. If the displayed value is different from the serial number printed on the base of the camera, enter the number on the base of the camera. Then click the Set button.
5. Next, check VID, PID and Rev. entries in the USB storage data. If any of them are different from the values in 3. above, make the changes and then click the corresponding Set button.

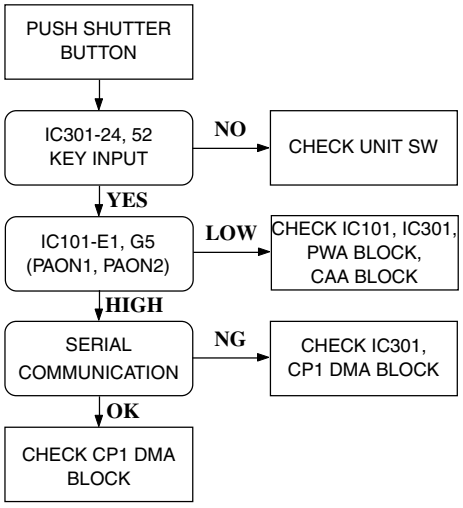


5. TROUBLESHOOTING GUIDE

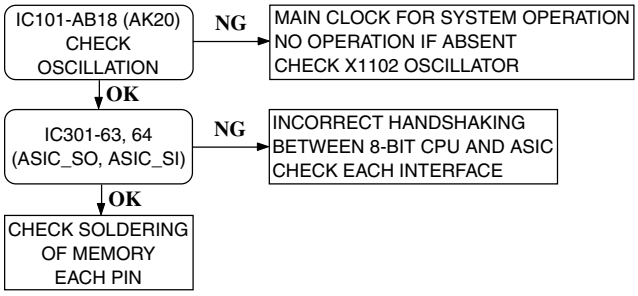
POWER LOSS INOPERTIVE



TAKING INOPERATIVE



NO PICTURE



MEMO

6. PARTS LIST

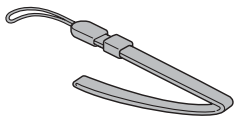
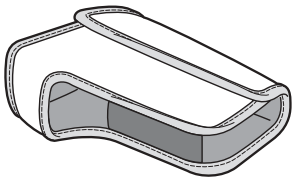
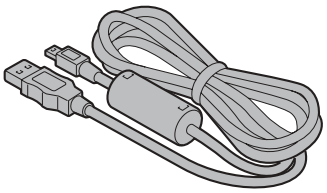
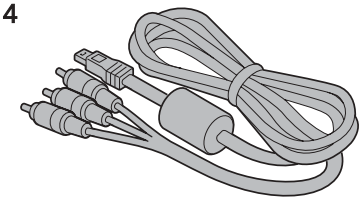
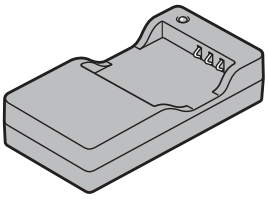
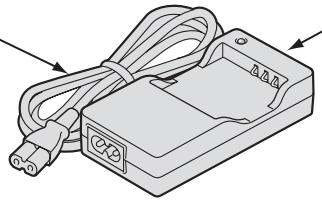
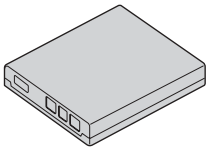
PACKING MATERIALS

LOCATION	PARTS NO.	DESCRIPTION
	636 115 1887	CARTON INNER-SG219/EX EXCEPT VPC-E2W,VPC-E2BL,VPC-E2BK
	636 115 1900	CARTON INNER-SG219/U2 VPC-E2W,VPC-E2BL,VPC-E2BK
	636 077 8139	CUSHION SHEET-SX774/KRO
	636 104 5742	REINFORCE PAD,A-SG114/J
	636 117 1052	LABEL WHITE MODEL-219/U VPC-E2W ONLY
	636 117 1076	LABEL BLACK MODEL-219/U3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
	636 117 1069	LABEL BLUE MODEL-219/EX2 VPC-CA8EXBL,VPC-CA8GXBL
	636 073 2087	LABEL CARTON BLACK 711EX2 VPC-CA8EXBK,VPC-CA8GXBK
	636 083 6532	LABEL CARTON BLUE-718EX2 VPC-CA8EXBL,VPC-CA8GXBL

ACCESSORIES

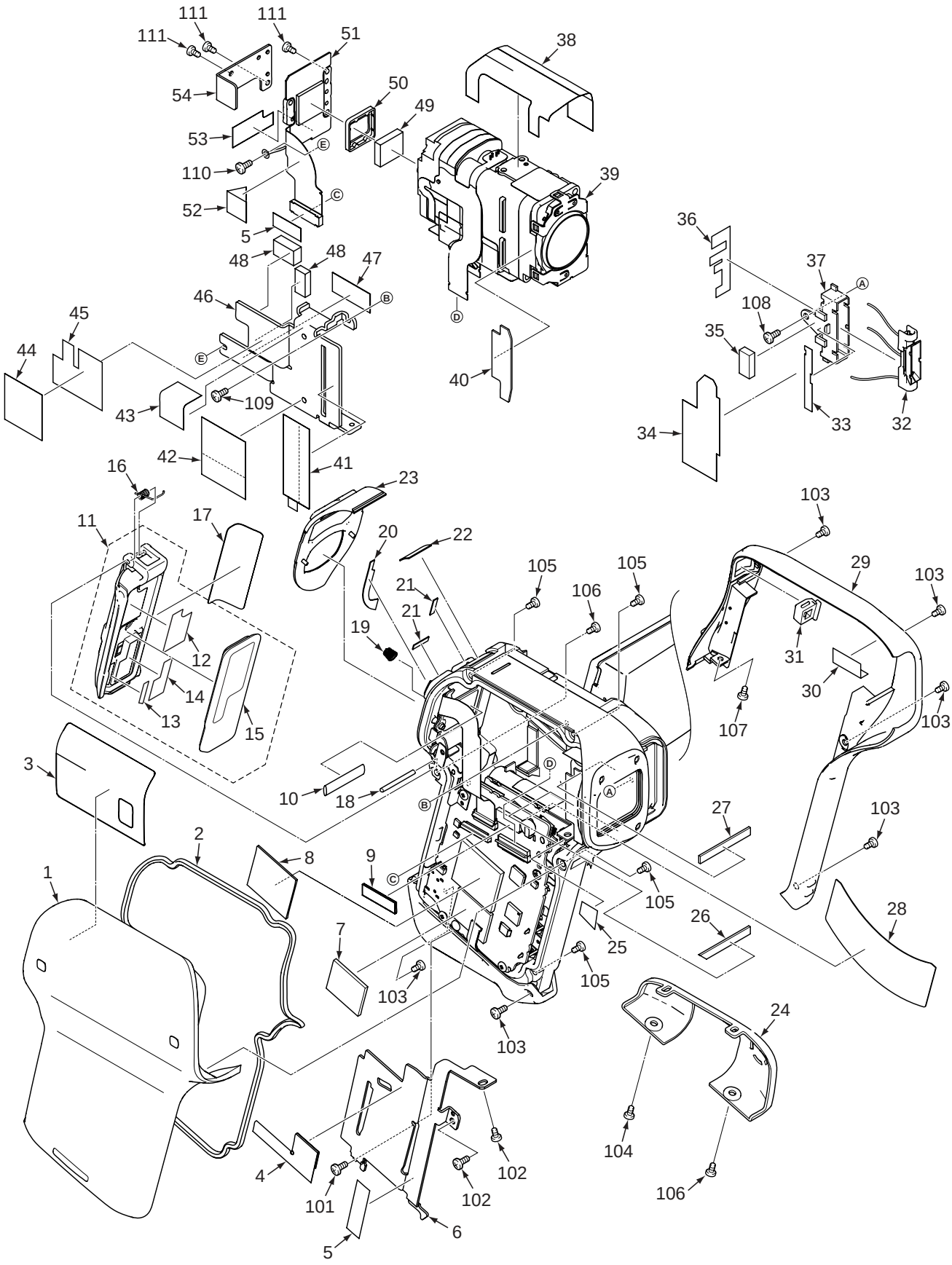
LOCATION		PARTS NO.	DESCRIPTION
Note: Refer to the table of accessories			
1		636 104 5841	STRAP -SG114/J
2		636 104 5834	CASE SOFT-SG114/J
3		645 087 1818	CABLE,DSC USB
4		645 087 1825	CABLE,DSC A/V
5	⚠	645 093 9624	BATTERY CHARGER VPC-E2BK,VPC-E2W,VPC-E2BL
6	⚠	645 083 6787	CORD,POWER-1.2MK VPC-CA8EXW,VPC-CA8EXBL,VPC-CA8EXBK
7	⚠	645 093 9617	BATTERY CHARGER EXCEPT VPC-E2BK,VPC-E2W,VPC-E2BL
8	⚠	645 089 8990	BATTERY,RECHARGE,LI-ION
9		636 115 1306	DISC,DVD XSD G219 EX (N.S.P.) EXCEPT VPC-E2W, VPC-E2BL,VPC-E2BK (Xacti DVD software), (PDF instruction manual: English, Spanish, German, French, Dutch, Italian, Russian, Portuguse, Korean, Chinese Traditional/ Simplified)
9		636 115 1290	DISC,DVD XSD G219 U (N.S.P.) VPC-E2W,VPC-E2BL,VPC-E2BK (Xacti DVD software),(PDF instruction manual: English, Spanish, French)
9053		636 115 5267	INSTRUCTION MANUAL Camera Software(English) EXCEPT VPC-E2W,VPC-E2BL,VPC-E2BK
9053		636 115 5229	INSTRUCTION MANUAL Camera Software(English) VPC-E2W,VPC-E2BL,VPC-E2BK

ACCESSORIES

1 	2 
3 	4 
5 	6 7 
8 	9 

CABINET AND CHASSIS PARTS 1

LOCATION	PARTS NO.	DESCRIPTION
1	636 115 0873	CABINET LEFT-SG219/J EXCEPT VPC-E2BK,VPC-CA8EXBK, VPC-CA8GXBK
1	636 115 0880	CABINET LEFT-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
2	636 104 0174	GASKET CABINET-SG114/J
3	636 115 7476	SHIELD LEFT-SG219/J
4	636 116 7901	SPACER HEAT A-SG219
5	636 116 7925	SPACER CA1 PWB-S219
6	636 114 7316	HEAT SINK ASIC-SG219/J
7	636 115 7117	SPACER POWER-SG219/J
8	636 109 3910	HEAT SINK RUBBER-SG211/J
9	636 104 7388	SPACER CA1-SG114/J
10	645 097 5998	PAD,GASKET(L=19)
11	636 115 1436	COMPL,COV BAT-SG219/J VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
11	636 115 1429	COMPL,COV BAT-SG219/J VPC-E2BL,VPC-CA8EXBL,VPC-CA8GXBL
11	636 115 1320	COMPL,COV BAT-SG219/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
12	636 104 7173	ADHESIVE COV BATT A-SG114
13	636 104 7180	ADHESIVE COV BATT B-SG114
14	636 106 6044	ADHESIVE COV BATT D-SG114
15	636 104 0198	PAD BATTERY-SG114/J
16	636 117 7726	SPRING COVER BATT-SG114/J
17	636 109 6331	LABEL ATTENTION-SG114/U
18	636 104 0723	SHAFT COVER BATT-SG114/J
19	636 116 8052	SPRING DEC BACK-SG219
20	636 117 0543	ADHESIVE DEC BACK 6-SG219
21	636 109 5754	ADHESIVE DEC BACK4-SG114
22	636 117 0536	ADHESIVE DEC BACK 5-SG219
23	636 104 0082	DEC BACK-SG114/J
24	636 103 9925	COVER JOINT BASE-SG114/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
24	636 115 1023	COVER JOINT BASE-SG219/J2 VPC-E2BL,VPC-CA8EXBL,VPC-CA8GXBL
24	636 115 1030	COVER JOINT BASE-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
25	636 116 7895	SPACER ST1 WIRE-SG219
26	636 107 9730	SPACER LENS UNIT2-SG114/J
27	636 104 8613	SPACER LENS UNIT-SG114/J
28	636 115 1009	DEC RIGHT-SG219/J EXCEPT VPC-E2BK,VPC-CA8EXBK, VPC-CA8GXBK
28	636 115 1016	DEC RIGHT-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
29	636 104 0068	DEC GRIP-SG114/J VPC-E2BL,VPC-CA8EXBL,VPC-CA8GXBL
29	636 115 0835	DEC GRIP-SG219/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
29	636 115 0842	DEC GRIP-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
30	636 109 3774	SPACER FPC GRIP2-SG114/J
31	636 104 3724	BUTTON MENU-SG114/J VPC-E2BL,VPC-CA8EXBL,VPC-CA8GXBL
31	636 115 0859	BUTTON MENU-SG219/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
31	636 115 0866	BUTTON MENU-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
32	645 097 5738	ASSY,LAMP-SG219
33	636 107 2496	SPACER H FLASH F-SG114/J
34	636 107 2526	SPACER FLASH-SG114/J
35	636 107 3431	SPACER HOLDER FLASH-SG114
36	636 107 2502	SPACER H FLASH B-SG114/J
37	636 104 0044	HOLDER FLASH-SG114/J
38	636 116 7499	SPACER LENZ TOP_SG219
39	645 097 6551	LENS(ASSY)
40	636 104 9498	SPACER LENS DUST-SG114/J
41	636 115 1146	SPACER HEAT C D-SG219/J
42	636 115 1092	SPACER HEAT C A-SG219/J
43	636 115 1115	SPACER HEAT C C-SG219/J
44	636 114 0621	HEAT SINK RUBBER-SG2F1/U
45	636 115 1160	SPACER HEAT SINK-SG219/J
46	636 114 7323	HEAT SINK CMOS1-SG219/J
47	636 115 1108	SPACER HEAT C B-SG219/J
48	636 117 0154	SPACER LENS LEFT 2-SG219
49	645 097 1563	OPTICAL FILTER
50	636 114 8214	SPACER SG219
51	636 115 1832	ASSY,FPC CA1 SV-SG219
52	636 116 7444	SHIELD TAPE CA1 FPC_SG219
53	636 117 1816	SPACER CA1-A-SG219
54	636 114 7330	HEAT SINK CMOS2-SG219/J
101	411 180 1808	SCR S-TPG PAN PCS 1.7X6.0
102	411 176 1003	SCR PAN PCS 1.7X2.5
103	411 215 5108	SCR S-TPG PAN PCS 1.7X5
104	312 070 9402	SPECIAL SCREW-1.7X2.5 PAN
105	411 215 3104	SCR S-TPG PAN PCS 1.7X4.5
106	411 214 0609	SCR S-TPG PAN PCS 1.7X3.5
107	411 216 9402	SCR PAN PCS 1.4X2.5
108	411 178 9403	SCR S-TPG PAN PCS 1.7X4.0
109	411 176 9405	SCR S-TPG PAN PCS 1.7X4.5
110	411 187 3508	SCR PAN PCS 1.4X4
111	411 191 1002	SCR S-TPG PAN PCS 1.4X4.5

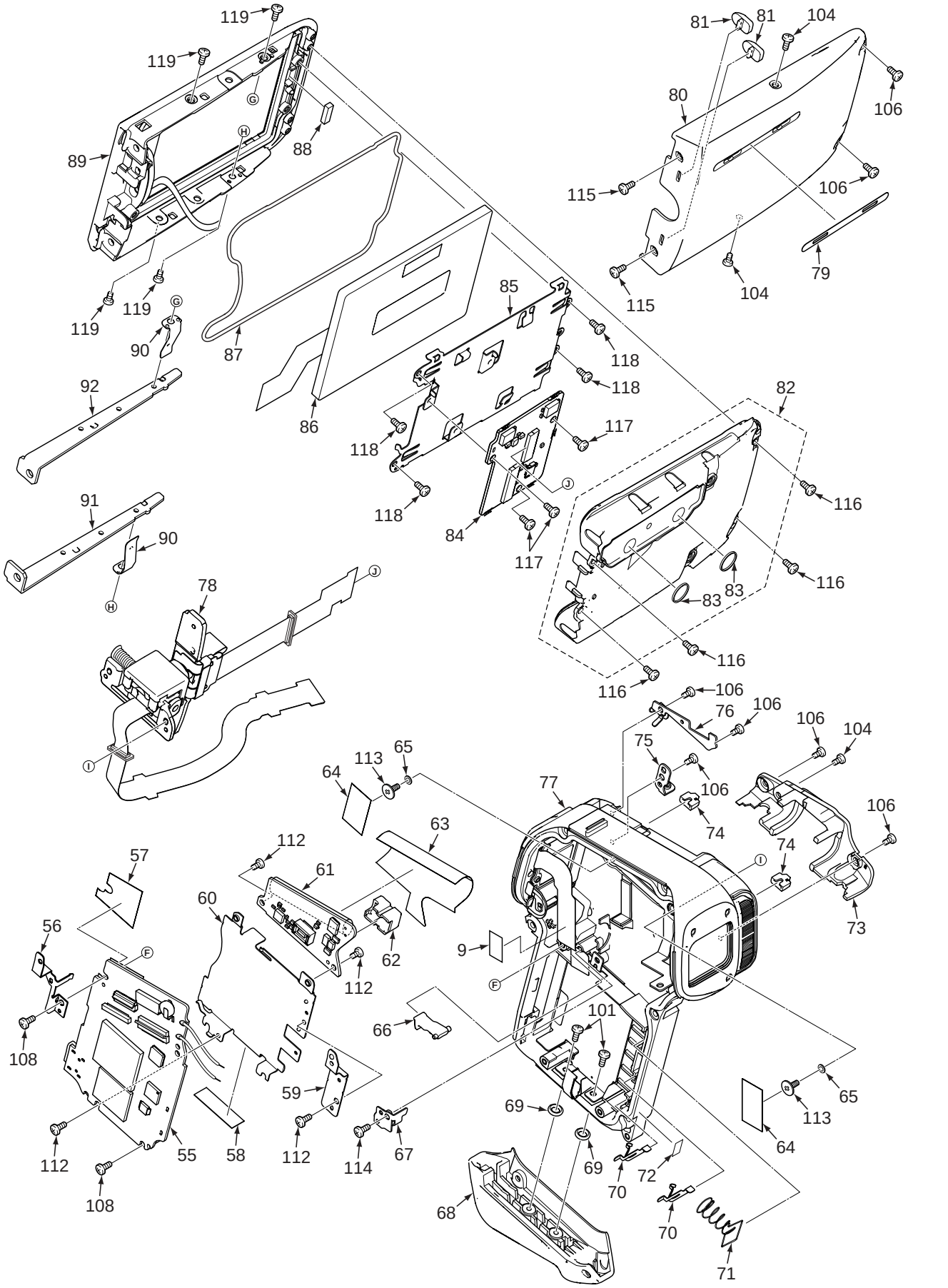


SG219/J PARTS LIST 1

CABINET AND CHASSIS PARTS 2

LOCATION	PARTS NO.	DESCRIPTION
9	636 104 7388	SPACER CA1-SG114/J
55	636 115 1719	COMPL PWB,CP-1 F/W
56	636 114 7354	EARTH JOINT-SG219/J
57	636 117 1830	SPACER CP1-SG219
58	636 104 7395	SPACER HOLDER CP1-SG114/J
59	636 104 0327	HOLDER CP1 2-SG114/J
60	636 116 1008	HOLDER CP1-SG219/J
61	636 114 6050	COMPL PWB,ST-1
62	636 068 0265	COVER TRIGER-SX612/J
63	636 105 3402	SPACER ST1-SG114/J
64	636 106 3708	SPACER HOLDER JOINT-SG114
65	636 109 7314	COMPL,GAS SCREW-SV-SG114
66	636 104 0129	LEVER BATT LOCK-SG114/J
67	636 112 7271	SPRING LOCK LEVER-SG114/J
68	636 115 1504	ASSY,HOLDER STRAP-SG219/J VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
68	636 115 1498	ASSY,HOLDER STRAP-SG219/J VPC-E2BL,VPC-CA8EXBL,VPC-CA8GXBL
68	636 115 1351	ASSY,HOLDER STRAP-SG219/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
69	636 118 5493	COMPL,GAS STRAP-SV-SG219
70	636 104 0556	TERMINAL BATT-SG114/J
71	636 108 2273	SPRING BATT EJECT-SG114/J
72	636 117 7719	SPACER DEC GRIP2-SG219/J
73	636 115 1344	ASSY,COVER JOINT IN-SG219
74	636 104 0280	HOLDER LCD-SG114/J EXCEPT VPC-E2BK,VPC-CA8EXBK, VPC-CA8GXBK
74	636 115 0927	HOLDER LCD-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
75	636 104 0358	HOLDER JOINT BASE-SG114/J
76	636 105 2368	EARTH JOINT LCD-SG114/J
77	636 117 7665	COMPL,BUTT BACK-SV-SG219J EXCEPT VPC-E2BK,VPC-CA8EXBK, VPC-CA8GXBK
77	636 117 7689	COMPL,BUTT BACK-SV-219J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
78	636 117 7702	ASSY,JOINT-SV-SG219
79	636 104 0570	DEC MIC-SG114/J
80	636 115 0972	COVER LCD BACK-SG219/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
80	636 115 0989	COVER LCD BACK-SG219/J2 VPC-E2BL,VPC-CA8EXBL,VPC-CA8GXBL
80	636 115 0996	COVER LCD BACK-SG219/J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
81	636 104 0167	DEC LCD TOP-SG114/J VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
81	636 105 5888	DEC LCD TOP-SG114/J2 EXCEPT VPC-E2W,VPC-CA8EXW,VPC-CA8GXW
82	636 109 7192	COMPL,COV LCD IN-SV-SG114
83	636 107 3998	SPACER MIC2-SG114/J
84	636 114 6067	COMPL PWB,VF-1
85	636 116 1015	HOLDER LCD-SG219/J
86	645 093 0331	LCD(TD025THEJ1)
87	636 104 0181	GASKET LCD-SG114/J
88	645 093 1260	MAGNET,ND6X2.8X2.1
89	636 117 7818	ASSY,COVER LCD F-SV-SG219 EXCEPT VPC-E2BK,VPC-CA8EXBK, VPC-CA8GXBK
89	636 117 7825	ASSY,COVER LCD F-SV-219J3 VPC-E2BK,VPC-CA8EXBK,VPC-CA8GXBK
90	636 104 0587	EARTH LCD A-SG114/J
91	636 104 8064	HOLDER JOINT L-SG114/J
92	636 104 8057	HOLDER JOINT R-SG114/J
101	411 180 1808	SCR S-TPG PAN PCS 1.7X6.0
104	312 070 9402	SPECIAL SCREW-1.7X2.5 PAN
106	411 214 0609	SCR S-TPG PAN PCS 1.7X3.5
108	411 178 9403	SCR S-TPG PAN PCS 1.7X4.0
112	411 188 7901	SCR PAN PCS 1.7X2
113	412 075 6700	SPECIAL SCREW-1.7X4
114	411 177 0906	SCR S-TPG PAN PCS 1.7X3.5
115	411 214 4805	SCR PAN PCS 1.7X4.5
116	411 215 2909	SCR S-TPG PAN PCS 1.7X3
117	411 199 0700	SCR TIN 1.7X2
118	411 176 6701	SCR S-TPG PAN PCS 1.7X2.5
119	411 215 9601	SCR TIN 1.7X2

CABINET AND CHASSIS PARTS 2



SG219/J PARTS LIST 2

ELECTRICAL PARTS

Note:

1. **Materials of Capacitors and Resistors are abbreviated as follows ;**

Resistors		Capacitors	
MT-FILM	Metallized Film Resistor	MT-POLYEST	Metallized Polyester Capacitor
MT-GLAZE	Metallized Glaze Resistor	MT-COMPO	Metallized Composite Capacitor
OXIDE-MT	Oxide Metallized Film Resistor	TA-SOLID	Tantalum Solid Capacitor
		AL-SOLID	Aluminum Solid Capacitor
		NP-ELECT	Non-Polarized Electrolytic Capacitor
		OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
		DL-ELECT	Double Layered Electrolytic Capacitor
		POS-SOLID	Polymerized Organic Semiconductor Capacitor

2. **Tolerance of Capacitor (10pF over) and Resistor are noted with follow symboles.**
   F .....1% G .....2% J .....5% K 10%
   M .....20% N .....30% Z .....+80% ~ -20%
3. **Capacitors**
   U : µF P : pF
4. **Inductors**
   UH : µH MH : mH
5. **N.S.P. : Not available as service parts.**

COMPL PWB,CP-1 F/W

636 115 1719

LOCATION	PARTS NO.	DESCRIPTION
	(SEMICONDUCTORS)	
Q1301	305 168 3703	TR DTC144EM
OR	305 216 1200	TR RN1104MFV
OR	305 172 4703	TR UNR32A3
Q1302	405 218 3902	TR UP0431300
OR	305 167 0406	TR EMD12
Q1401	405 218 3902	TR UP0431300
OR	305 167 0406	TR EMD12
Q3001	305 169 4501	TR DTC114EM
OR	305 216 1101	TR RN1102MFV
OR	305 172 4604	TR UNR32A1
Q3002	305 210 5709	TR UP0KG8D
OR	305 217 3906	TR HN2E07JE
OR	305 200 9007	TR EML17
Q3003	305 183 7700	TR EMH10
Q3004	305 168 4007	TR DTA114EM
OR	305 216 1408	TR RN2102MFV
OR	305 172 4802	TR UNR31A1
Q5003	405 218 4701	TR SSM3J120TU
Q5004	305 181 4909	TR 2SK3541
Q5005	305 184 6009	TR UP03396
Q5007	405 219 2706	TR MCH5835-E
Q5008	305 200 6006	TR UP03397
Q9001	405 220 5604	TR RUM003N02
Q9002	405 220 5604	TR RUM003N02
Q9003	305 168 3703	TR DTC144EM
OR	305 216 1200	TR RN1104MFV
OR	305 172 4703	TR UNR32A3
Q9501	305 184 6009	TR UP03396
	(INTEGRATED CIRCUITS)	
IC101	409 686 1903	IC EV2MA BGA (N.S.P)
OR	409 692 9702	IC EV2MB BGA (N.S.P)
IC121	410 641 7601	IC K5W1213LCM-AK75 BG A (N.S.P)
IC151	409 679 4003	IC NJM2561F1A
IC181	309 650 3509	IC TK70630HC-G
IC182	409 679 8001	IC AK4646EN-L
IC301	410 655 7604	IC LC87F2924BUFL64TBM-E BGA (N.S.P)
IC302	309 582 6203	IC BD4289FVM
IC501	410 644 3303	IC UPD168803FC-AN2-A BGA (N.S.P)
IC502	409 686 6205	IC SC4624MLT
IC503	409 691 1400	IC XC9235A28CE
IC902	409 690 7403	IC TC7SG126FE
IC911	409 690 0909	IC TK70628HC-G
IC913	409 690 0909	IC TK70628HC-G
IC914	409 690 7502	IC TC7SP3125TU
IC951	409 680 0506	IC BU2233GU BGA (N.S.P)
IC971	309 646 8709	IC AK7331

LOCATION	PARTS NO.	DESCRIPTION
	(DIODES)	
D5001	307 223 5509	DIODE MA2Z720
D5002	407 259 8106	DIODE RB496KA
D5003	307 248 0701	DIODE MA21D3800
D5301	307 248 0701	DIODE MA21D3800
	(CRYSTAL DEVICES)	
X1102	645 094 0170	OSC,CRYSTAL 48.00000MHZ
X3002	645 080 8708	OSC,CRYSTAL 32.768KHZ
	(RECHARGEABLE BATTERY)	
Z3001 ⚠	645 073 6544	BATTERY,RECHARGE
	(VARISTORS)	
VA101	308 050 1207	VARISTOR AVR-M1608C120MT
VA901	308 050 0507	VARISTOR AVR-M1005C080MT
VA902	308 050 0507	VARISTOR AVR-M1005C080MT
	(INDUCTORS)	
L1001	645 094 0521	IMPEDANCE,33 OHM P
L1002	645 094 0521	IMPEDANCE,33 OHM P
L1301	645 059 7596	IMPEDANCE,90 OHM P
L1302	945 020 1869	INDUCTOR,750 OHM
L1303	945 053 5414	IMPEDANCE,1000 OHM P
L1304	945 053 5414	IMPEDANCE,1000 OHM P
L5002	645 068 7136	INDUCTOR,4.7U N
L5003	645 068 7136	INDUCTOR,4.7U N
L5004	645 079 1253	INDUCTOR,2.1U M
L5005	645 084 1231	INDUCTOR,4.7U N
L5007	645 084 1262	INDUCTOR,6.8U N
L5301	645 091 0043	INDUCTOR,4.7U M
	(CAPACITORS)	
CB180	403 467 3704	CERAMIC 1U K 6.3V
CB971	403 467 3704	CERAMIC 1U K 6.3V
C1001	303 276 1307	CERAMIC 1000P K 50V
C1005	303 384 6409	CERAMIC 4.7U K 6.3V
C1006	303 338 0309	CERAMIC 0.1U K 10V
C1009	303 381 8109	CERAMIC 1U K 6.3V
C1010	303 338 0309	CERAMIC 0.1U K 10V
C1011	303 384 6409	CERAMIC 4.7U K 6.3V
C1012	303 384 6409	CERAMIC 4.7U K 6.3V
C1013	303 338 0309	CERAMIC 0.1U K 10V
C1014	303 338 0309	CERAMIC 0.1U K 10V
C1015	303 338 0309	CERAMIC 0.1U K 10V
C1047	303 384 6409	CERAMIC 4.7U K 6.3V
C1048	303 384 6409	CERAMIC 4.7U K 6.3V
C1051	303 338 0309	CERAMIC 0.1U K 10V
C1052	303 338 0309	CERAMIC 0.1U K 10V
C1053	303 338 0309	CERAMIC 0.1U K 10V
C1054	303 338 0309	CERAMIC 0.1U K 10V
C1055	303 338 0309	CERAMIC 0.1U K 10V
C1056	303 338 0309	CERAMIC 0.1U K 10V
C1057	303 338 0309	CERAMIC 0.1U K 10V
C1058	303 338 0309	CERAMIC 0.1U K 10V
C1063	303 338 0309	CERAMIC 0.1U K 10V

LOCATION	PARTS NO.	DESCRIPTION
C1064	303 338 0309	CERAMIC 0.1U K 10V
C1065	303 338 0309	CERAMIC 0.1U K 10V
C1066	303 338 0309	CERAMIC 0.1U K 10V
C1067	303 338 0309	CERAMIC 0.1U K 10V
C1068	303 338 0309	CERAMIC 0.1U K 10V
C1121	303 279 2905	CERAMIC 6P D 50V
C1122	303 314 6400	CERAMIC 7P D 50V
C1203	303 338 0309	CERAMIC 0.1U K 10V
C1205	303 338 0309	CERAMIC 0.1U K 10V
C1206	303 338 0309	CERAMIC 0.1U K 10V
C1207	303 384 6409	CERAMIC 4.7U K 6.3V
C1209	303 338 0309	CERAMIC 0.1U K 10V
C1304	303 433 1102	CERAMIC 1U K 10V
C1401	303 338 0309	CERAMIC 0.1U K 10V
C1408	303 155 1800	CERAMIC 0.01U K 25V
C1501	303 338 0309	CERAMIC 0.1U K 10V
C1503	303 384 6409	CERAMIC 4.7U K 6.3V
C1774	303 338 0309	CERAMIC 0.1U K 10V
C1818	303 338 0309	CERAMIC 0.1U K 10V
C1819	303 384 6409	CERAMIC 4.7U K 6.3V
C1821	303 384 6409	CERAMIC 4.7U K 6.3V
C1822	303 381 8109	CERAMIC 1U K 6.3V
C1823	303 381 8109	CERAMIC 1U K 6.3V
C1824	303 338 0309	CERAMIC 0.1U K 10V
C1825	303 338 0309	CERAMIC 0.1U K 10V
C1826	303 279 5005	CERAMIC 4700P K 25V
C1827	303 439 8402	CERAMIC 2.2U K 6.3V
C3001	303 391 0506	CERAMIC 10U K 6.3V
C3003	303 338 0309	CERAMIC 0.1U K 10V
C3004	303 338 0309	CERAMIC 0.1U K 10V
C3005	303 338 0309	CERAMIC 0.1U K 10V
C3006	303 381 8109	CERAMIC 1U K 6.3V
C3007	303 381 8109	CERAMIC 1U K 6.3V
C3008	303 276 1901	CERAMIC 22P J 50V
C3009	303 381 8109	CERAMIC 1U K 6.3V
C3011	303 338 0309	CERAMIC 0.1U K 10V
C3012	303 433 1102	CERAMIC 1U K 10V
C3013	303 381 8109	CERAMIC 1U K 6.3V
C3014	303 317 2300	CERAMIC 20P J 50V
C3021	303 338 0309	CERAMIC 0.1U K 10V
C5001	303 338 0309	CERAMIC 0.1U K 10V
C5003	303 419 8903	CERAMIC 10U M 6.3V
C5004	303 320 0607	CERAMIC 220P J 25V
C5005	303 433 1102	CERAMIC 1U K 10V
C5006	303 338 0309	CERAMIC 0.1U K 10V
C5007	303 383 5007	CERAMIC 1U K 16V
C5009	303 338 0309	CERAMIC 0.1U K 10V
C5010	303 338 0309	CERAMIC 0.1U K 10V
C5021	303 393 2607	CERAMIC 22U M 6.3V
C5024	303 276 1901	CERAMIC 22P J 50V
C5031	303 393 2607	CERAMIC 22U M 6.3V
C5032	303 279 5104	CERAMIC 3300P K 50V
C5033	303 381 8109	CERAMIC 1U K 6.3V
C5036	303 376 9401	CERAMIC 1U K 6.3V
C5037	303 381 8109	CERAMIC 1U K 6.3V
C5071	303 408 5500	CERAMIC 2.2U K 16V
C5072	303 383 5007	CERAMIC 1U K 16V
C5073	303 276 1000	CERAMIC 0.01U K 16V
C5074	303 376 9401	CERAMIC 1U K 6.3V
C5101	303 393 2607	CERAMIC 22U M 6.3V
C5102	303 393 2607	CERAMIC 22U M 6.3V
C5105	303 338 0309	CERAMIC 0.1U K 10V
C5106	303 344 0409	CERAMIC 0.033U K 10V
C5107	303 338 0309	CERAMIC 0.1U K 10V
C5108	303 320 0706	CERAMIC 270P J 25V
C5109	303 308 3408	CERAMIC 390P K 50V
C5110	303 276 2106	CERAMIC 3P C 50V
C5111	303 384 6409	CERAMIC 4.7U K 6.3V
C5112	303 384 6508	CERAMIC 10U K 6.3V
C5301	303 384 6508	CERAMIC 10U K 6.3V
C5302	303 381 6204	POS-SOLID 33U M 8V
C5303	303 294 6100	CERAMIC 100P J 50V
C9004	303 338 0309	CERAMIC 0.1U K 10V
C9005	303 381 8109	CERAMIC 1U K 6.3V
C9006	303 376 9401	CERAMIC 1U K 6.3V
C9007	303 380 6601	CERAMIC 0.22U K 6.3V
C9008	303 381 8109	CERAMIC 1U K 6.3V

LOCATION	PARTS NO.	DESCRIPTION
C9009	303 419 8903	CERAMIC 10U M 6.3V
C9012	303 276 1307	CERAMIC 1000P K 50V
C9013	303 338 0309	CERAMIC 0.1U K 10V
C9014	303 338 0309	CERAMIC 0.1U K 10V
C9015	303 276 1307	CERAMIC 1000P K 50V
C9016	303 276 1307	CERAMIC 1000P K 50V
C9017	303 276 1307	CERAMIC 1000P K 50V
C9019	303 338 0309	CERAMIC 0.1U K 10V
C9023	303 384 6409	CERAMIC 4.7U K 6.3V
C9502	303 338 0309	CERAMIC 0.1U K 10V
C9504	303 338 0309	CERAMIC 0.1U K 10V
C9505	303 356 6208	CERAMIC 2.2U K 10V
C9506	303 338 0309	CERAMIC 0.1U K 10V
C9508	303 338 0309	CERAMIC 0.1U K 10V
C9701	303 338 0309	CERAMIC 0.1U K 10V
C9702	303 338 0309	CERAMIC 0.1U K 10V
C9703	303 279 5005	CERAMIC 4700P K 25V
C9704	303 282 5108	CERAMIC 470P K 50V
C9705	303 276 1307	CERAMIC 1000P K 50V
C9706	303 338 0309	CERAMIC 0.1U K 10V
C9707	303 338 0309	CERAMIC 0.1U K 10V
C9708	303 294 6100	CERAMIC 100P J 50V
C9711	303 381 8109	CERAMIC 1U K 6.3V
C9712	303 433 1102	CERAMIC 1U K 10V
	(RESISTOR PACKS)	
RB101	945 028 0710	R-NETWORK 10KX4 1/16W
RB102	645 078 4279	R-NETWORK 100X2 0.063W
RB103	945 028 0697	R-NETWORK 100X4 1/16W
RB104	945 028 0697	R-NETWORK 100X4 1/16W
RB116	945 037 4372	R-NETWORK 220X4 1/16W
RB141	945 028 0710	R-NETWORK 10KX4 1/16W
RB142	945 028 0710	R-NETWORK 10KX4 1/16W
RB145	945 028 0697	R-NETWORK 100X4 1/16W
RB181	645 091 5420	R-NETWORK 20KX2 0.063W
RB182	645 091 5451	R-NETWORK 200X2 0.063W
RB301	945 028 0703	R-NETWORK 1KX4 1/16W
RB303	945 032 8887	R-NETWORK 47KX4 1/32W
RB304	945 028 0703	R-NETWORK 1KX4 1/16W
RB305	945 028 0703	R-NETWORK 1KX4 1/16W
RB306	945 028 0727	R-NETWORK 100KX4 1/16W
RB311	645 068 6405	R-NETWORK 150KX2 1/16W
RB312	645 078 4620	R-NETWORK 22KX2 0.063W
RB313	945 028 0703	R-NETWORK 1KX4 1/16W
RB951	645 078 5054	R-NETWORK 56KX2 0.063W
RB952	645 078 4606	R-NETWORK 220X2 0.063W
RB971	945 042 8204	R-NETWORK 33KX4 1/32W
	(RESISTORS)	
R1001	301 277 5409	MT-GLAZE 75 DD 1/16W
R1002	301 237 2905	MT-GLAZE 51 JA 1/16W
R1004	301 224 9009	MT-GLAZE 10K JA 1/16W
R1005	301 225 1200	MT-GLAZE 4.7K JA 1/16W
R1008	301 224 9009	MT-GLAZE 10K JA 1/16W
R1012	301 225 1200	MT-GLAZE 4.7K JA 1/16W
R1013	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R1014	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R1017	301 224 9009	MT-GLAZE 10K JA 1/16W
R1018	301 224 9009	MT-GLAZE 10K JA 1/16W
R1019	301 224 9009	MT-GLAZE 10K JA 1/16W
R1022	301 224 8804	MT-GLAZE 100 JA 1/16W
R1027	301 224 8804	MT-GLAZE 100 JA 1/16W
R1028	301 224 9306	MT-GLAZE 1K JA 1/16W
R1032	301 224 9009	MT-GLAZE 10K JA 1/16W
R1033	301 224 9306	MT-GLAZE 1K JA 1/16W
R1041	301 275 1908	MT-GLAZE 2K DC 1/16W
R1051	301 224 8804	MT-GLAZE 100 JA 1/16W
R1052	301 224 8804	MT-GLAZE 100 JA 1/16W
R1053	301 283 7107	MT-GLAZE 100 DC 1/16W
R1056	301 225 7905	MT-GLAZE 220 JA 1/16W
R1088	301 224 9009	MT-GLAZE 10K JA 1/16W
R1090	401 343 5903	MT-GLAZE 3.4K DC 1/16W
R1121	301 262 2307	MT-GLAZE 1.0K DC 1/16W
R1122	301 224 9405	MT-GLAZE 1.0M JA 1/16W
R1256	301 224 8804	MT-GLAZE 100 JA 1/16W
R1301	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R1352	301 224 9009	MT-GLAZE 10K JA 1/16W
R1403	301 224 8804	MT-GLAZE 100 JA 1/16W
R1434	301 226 1506	MT-GLAZE 0.000 ZA 1/16W

LOCATION	PARTS NO.	DESCRIPTION
R1501	301 263 7400	MT-GLAZE 75 JA 1/16W
R1801	301 225 8100	MT-GLAZE 10 JA 1/16W
R1802	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R1804	301 224 8804	MT-GLAZE 100 JA 1/16W
R1805	301 224 8903	MT-GLAZE 100K JA 1/16W
R1806	301 224 8903	MT-GLAZE 100K JA 1/16W
R1810	301 224 9009	MT-GLAZE 10K JA 1/16W
R1811	301 224 9009	MT-GLAZE 10K JA 1/16W
R3002	301 225 8001	MT-GLAZE 330 JA 1/16W
R3003	301 224 9306	MT-GLAZE 1K JA 1/16W
R3007	301 225 0401	MT-GLAZE 330K JA 1/16W
R3008	301 263 2306	MT-GLAZE 750 JA 1/16W
R3010	301 224 9009	MT-GLAZE 10K JA 1/16W
R3011	301 262 0600	MT-GLAZE 22K DC 1/16W
R3013	301 225 7905	MT-GLAZE 220 JA 1/16W
R5001	301 262 8705	MT-GLAZE 910 DC 1/16W
R5002	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R5021	301 258 7101	MT-GLAZE 180K DC 1/16W
R5022	301 257 4002	MT-GLAZE 68K DC 1/16W
R5023	301 258 6708	MT-GLAZE 12K DC 1/16W
R5031	301 262 0907	MT-GLAZE 27K DC 1/16W
R5032	301 258 6906	MT-GLAZE 20K DC 1/16W
R5033	301 262 5209	MT-GLAZE 1.5K DC 1/16W
R5042	301 224 8903	MT-GLAZE 100K JA 1/16W
R5043	301 224 8804	MT-GLAZE 100 JA 1/16W
R5044	301 224 9009	MT-GLAZE 10K JA 1/16W
R5045	301 225 0104	MT-GLAZE 27K JA 1/16W
R5046	301 224 8903	MT-GLAZE 100K JA 1/16W
R5049	301 225 3808	MT-GLAZE 1.5K JA 1/16W
R5070	301 225 0203	MT-GLAZE 3.3K JA 1/16W
R5071	301 261 1806	MT-GLAZE 510K JA 1/16W
R5072	301 264 0004	MT-GLAZE 36K JA 1/16W
R5074	301 224 8903	MT-GLAZE 100K JA 1/16W
R5075	301 258 6807	MT-GLAZE 15K DC 1/16W
R5076	301 329 5302	MT-GLAZE 20 DD 1/16W
R5101	301 275 2004	MT-GLAZE 30K DC 1/16W
R5102	301 274 9707	MT-GLAZE 24K DC 1/16W
R5103	301 263 1903	MT-GLAZE 3.3K DC 1/16W
R5104	301 262 1300	MT-GLAZE 2.4K DC 1/16W
R5105	301 225 1408	MT-GLAZE 47K JA 1/16W
R5106	301 262 8903	MT-GLAZE 62K DC 1/16W
R5107	301 274 9707	MT-GLAZE 24K DC 1/16W
R5108	301 275 5906	MT-GLAZE 10 DD 1/16W
R5109	301 258 6906	MT-GLAZE 20K DC 1/16W
R5111	301 224 8903	MT-GLAZE 100K JA 1/16W
R5113	301 224 9306	MT-GLAZE 1K JA 1/16W
R5301	301 258 7101	MT-GLAZE 180K DC 1/16W
R5302	301 290 2706	MT-GLAZE 3K DC 1/16W
R5303	301 290 2409	MT-GLAZE 43K DC 1/16W
R5304	301 274 9707	MT-GLAZE 24K DC 1/16W
R9002	301 224 9009	MT-GLAZE 10K JA 1/16W
R9006	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R9007	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R9014	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R9015	301 224 9702	MT-GLAZE 22 JA 1/16W
R9016	301 225 3808	MT-GLAZE 1.5K JA 1/16W
R9017	301 224 9702	MT-GLAZE 22 JA 1/16W
R9018	301 225 3808	MT-GLAZE 1.5K JA 1/16W
R9026	301 224 9702	MT-GLAZE 22 JA 1/16W
R9027	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R9028	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R9029	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R9505	301 314 0503	MT-FILM 22 FD 1/6W
R9506	301 314 0503	MT-FILM 22 FD 1/6W
R9701	301 257 4101	MT-GLAZE 100K DC 1/16W
R9702	301 257 4101	MT-GLAZE 100K DC 1/16W
R9703	301 262 1904	MT-GLAZE 6.8K DC 1/16W
R9704	301 262 1607	MT-GLAZE 2.2K DC 1/16W
R9705	301 262 2307	MT-GLAZE 1.0K DC 1/16W
R9706	301 224 9504	MT-GLAZE 2.2K JA 1/16W
R9707	301 257 4101	MT-GLAZE 100K DC 1/16W
R9708	301 225 0500	MT-GLAZE 33K JA 1/16W
R9709	301 225 8100	MT-GLAZE 10 JA 1/16W
R9710	301 246 2101	MT-GLAZE 51K JA 1/16W
R9712	301 261 1509	MT-GLAZE 4.3K JA 1/16W
	(THERMISTOR)	
TH301	308 054 7700	TH NCP15WF104F03-RC

LOCATION	PARTS NO.	DESCRIPTION
	(FUSES)	
F5001	⚠ 323 031 5609	FUSE 32V 2A
F5002	⚠ 323 031 5609	FUSE 32V 2A
F5003	⚠ 423 033 6205	FUSE 32V 1.6A
F5004	⚠ 323 031 5609	FUSE 32V 2A
	(CONNECTORS)	
CN103	645 095 2098	SOCKET,FPC 31P (N.S.P)
CN105	645 092 4996	PLUG,PWB-PWB 20P (N.S.P)
CN110	645 086 0638	SOCKET,10P (N.S.P)
CN141	645 069 7548	SOCKET,CARD(SD) 1(N.S.P)
CN301	645 087 1535	SOCKET,FPC 23P (N.S.P)
CN302	645 095 8007	SOCKET,FPC 13P (N.S.P)
CN901	645 092 7836	PLUG,PWB-PWB 44P (N.S.P)
CN951	645 082 0250	SOCKET,FPC 23P (N.S.P)

COMPL PWB,VF-1

636 114 6067

	(INTEGRATED CIRCUIT)	
IC185	309 650 3509	IC TK70630HC-G
	(CAPACITORS)	
C1701	303 381 8109	CERAMIC 1U K 6.3V
C1702	303 433 1102	CERAMIC 1U K 10V
C1703	303 382 7804	CERAMIC 2.2U K 10V
C1704	303 382 7804	CERAMIC 2.2U K 10V
C1705	303 382 7804	CERAMIC 2.2U K 10V
C1706	303 382 7804	CERAMIC 2.2U K 10V
C1707	303 281 2405	CERAMIC 0.22U K 16V
C1708	303 281 2405	CERAMIC 0.22U K 16V
C1709	303 383 5007	CERAMIC 1U K 16V
C1710	303 383 5007	CERAMIC 1U K 16V
C1711	303 338 0309	CERAMIC 0.1U K 10V
C1852	303 384 6409	CERAMIC 4.7U K 6.3V
C1853	303 384 6409	CERAMIC 4.7U K 6.3V
C1855	303 380 6601	CERAMIC 0.22U K 6.3V
C1856	303 380 6601	CERAMIC 0.22U K 6.3V
C1857	303 338 0309	CERAMIC 0.1U K 10V
C1858	303 338 0309	CERAMIC 0.1U K 10V
	(RESISTORS)	
R1701	301 226 1506	MT-GLAZE 0.000 ZA 1/16W
R1702	301 228 4505	MT-GLAZE 2.2 JA 1/16W
R1703	301 224 8903	MT-GLAZE 100K JA 1/16W
R1851	301 290 2706	MT-GLAZE 3K DC 1/16W
R1852	301 290 2706	MT-GLAZE 3K DC 1/16W
	(MICROPHONES)	
MIC01	645 092 6051	MICROPHONE
MIC02	645 092 6051	MICROPHONE
	(CONNECTORS)	
CN171	645 093 9228	SOCKET,FPC 39P (N.S.P)
CN172	645 095 2098	SOCKET,FPC 31P (N.S.P)
CN173	645 084 3099	SOCKET,FPC 4P (N.S.P)

COMPL PWB,ST-1

636 114 6050

	(SEMICONDUCTOR)	
Q5402	406 021 5107	TR TIG032TS-S-TL-E
	(INTEGRATED CIRCUIT)	
IC541	309 671 6602	IC TPS65560RGT
	(DIODES)	
D5401	307 245 6805	DIODE FPSN4
D5402	407 255 9305	DIODE FV02R80
D5404	407 261 2802	DIODE RB521S-30FJ
OR	307 221 4108	DIODE MA2SD19
	(TRANSFORMERS)	
T5401	645 092 0462	TRANS,STEP UP
T5402	645 069 2420	TRANS,STEP UP
	(CAPACITORS)	
C5401	303 393 2607	CERAMIC 22U M 6.3V
C5402	303 276 1307	CERAMIC 1000P K 50V
C5403	303 381 8109	CERAMIC 1U K 6.3V
C5404	303 276 1307	CERAMIC 1000P K 50V
C5410	303 428 3401	CERAMIC 0.018U K 350V
C5411	303 428 3609	CERAMIC 0.01U K 350V
C5412	404 114 4808	ELECT 40U A 300V

LOCATION	PARTS NO.	DESCRIPTION
	(RESISTOR PACKS)	
RB541	645 078 5702	R-NETWORK 1KX2 0.063W
RB542	645 078 5719	R-NETWORK 10KX2 0.063W
	(RESISTORS)	
R5402	302 106 1609	MT-GLAZE 100K JD 1/8W
R5403	301 224 8804	MT-GLAZE 100 JA 1/16W
R5404	301 263 2108	MT-GLAZE 5.1K DC 1/16W
R5405	301 267 1008	MT-GLAZE 6.2K DC 1/16W
R5411	301 224 9306	MT-GLAZE 1K JA 1/16W
R5422	302 106 1708	MT-GLAZE 220K JD 1/8W
R5424	301 224 9009	MT-GLAZE 10K JA 1/16W
R5425	301 225 1804	MT-GLAZE 47 JA 1/16W
	(CONNECTORS)	
CN541	645 092 3906	SOCKET,PWB-PWB 20 (N.S.P)
	(MISCELLANEOUS)	
	636 104 6077	ADHESIVE CONDENSER-SG114

ASSY,FPC CA1 SV-SG219

636 115 1832

	(VARISTORS)	
VA911	308 050 0507	VARISTOR AVR-M1005C080MT4 (N.S.P)
VA912	408 049 9907	VARISTOR AVR-M1005C080MT4 (N.S.P)
	(INTEGRATED CIRCUIT)	
IC911	410 654 7100	IC MT9N001I12STC4 (N.S.P)
	(INDUCTORS)	
L9101	945 066 4725	IMPEDANCE,600 OHM P4 (N.S.P)
L9102	945 066 4725	IMPEDANCE,600 OHM P4 (N.S.P)
L9103	945 066 4725	IMPEDANCE,600 OHM P4 (N.S.P)
	(CAPACITORS)	
C9101	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9102	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9103	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9104	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9105	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9106	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9107	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9108	303 439 8402	CERAMIC 2.2U K 6.3V (N.S.P)
C9109	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9110	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9111	303 338 0309	CERAMIC 0.1U K 10V (N.S.P)
C9112	303 384 6409	CERAMIC 4.7U K 6.3V (N.S.P)
	(RESISTOR PACKS)	
RB911	945 037 0824	R-NETWORK 22X4 1/16W (N.S.P)
RB912	945 037 0824	R-NETWORK 22X4 1/16W (N.S.P)
RB913	945 037 0824	R-NETWORK 22X4 1/16W (N.S.P)
	(RESISTORS)	
R9101	301 226 1506	MT-GLAZE 0.000 ZA 1/16W (N.S.P)
R9102	301 226 1506	MT-GLAZE 0.000 ZA 1/16W (N.S.P)
R9103	301 226 1506	MT-GLAZE 0.000 ZA 1/16W (N.S.P)
R9104	301 226 1506	MT-GLAZE 0.000 ZA 1/16W (N.S.P)
R9105	301 226 1506	MT-GLAZE 0.000 ZA 1/16W (N.S.P)
	(CONNECTOR)	
CN911	645 092 7829	SOCKET,PWB-PWB 44 (N.S.P)
	(MISCELLANEOUS)	
	636 115 1948	MOUNTING LENS SG2194 (N.S.P)
	636 115 7957	SPACER LENS CMOS-SG2194 (N.S.P)
	636 115 7964	SPACER LENS ML-SG2194 (N.S.P)

CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS

TABLE OF CONTENTS

NOTES:

1. **All resistance values in "OHMS" unless otherwise noted.**
   (K=1,000 ; M=1,000,000)
2. **All capacitance values in "µF" unless otherwise noted.**
   p=pico farad ; µ ,u or U=micro farad
3. **All inductance values in "µH" unless otherwise noted.**
   µ ,u or U=micro henry ; m=milli henry

Figure of printed wiring boards

Multilayer board:

"Side A" means the view from A side of the board.

"Side B" means the view from B side of the board.

Singlelayer board:

View from the copper-foil side of the board, otherwise noted.

PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SYMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST.
DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

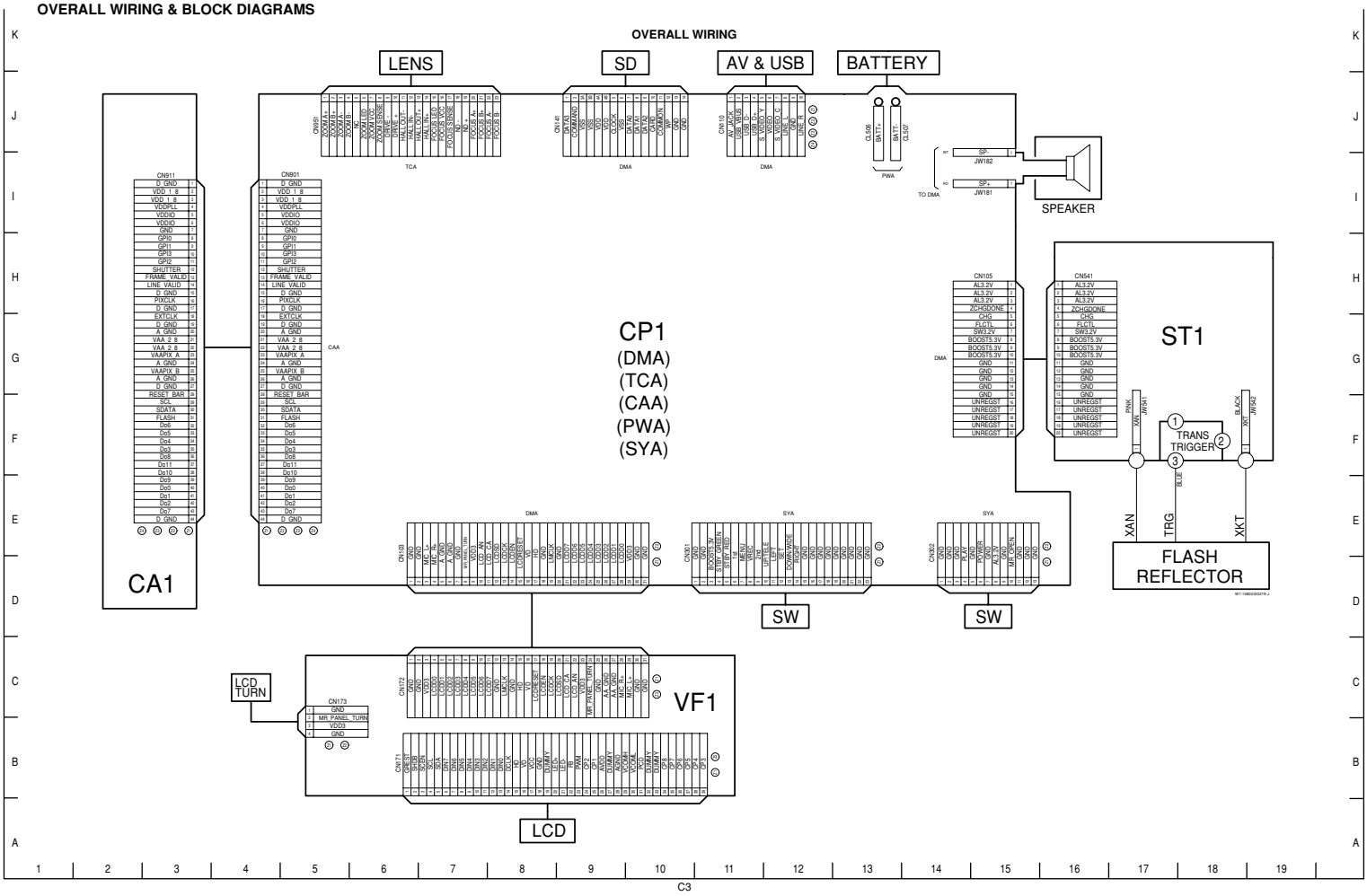
EXPLANATORY NOTES (EXAMPLES)

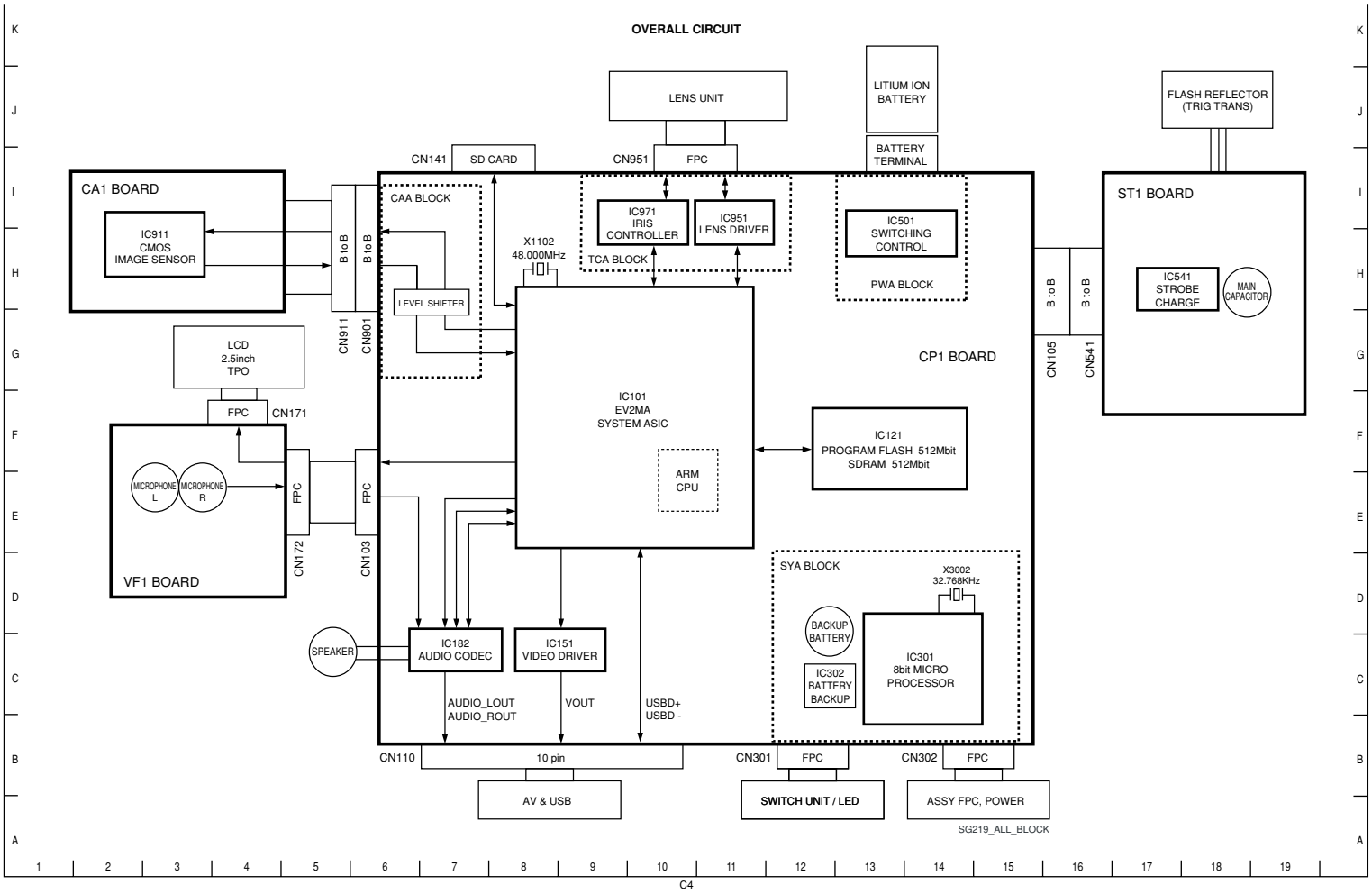
Resistor	**10K:1/16J means 10kilo ohm ±5%, 1/16watt max.**
	1M:1/10K means 1mega ohm ±10%, 1/10watt max.
Capacitor	**0.047:F means 0.047micro farad, Ftype.**
Electrolytic capacitor	
	10:16 means 10micro farad, 16volt max.
Inductor	**330:J means 330micro henry ±5%**
	470:K means 470micro henry ±10%
	No description J or K means ±5%

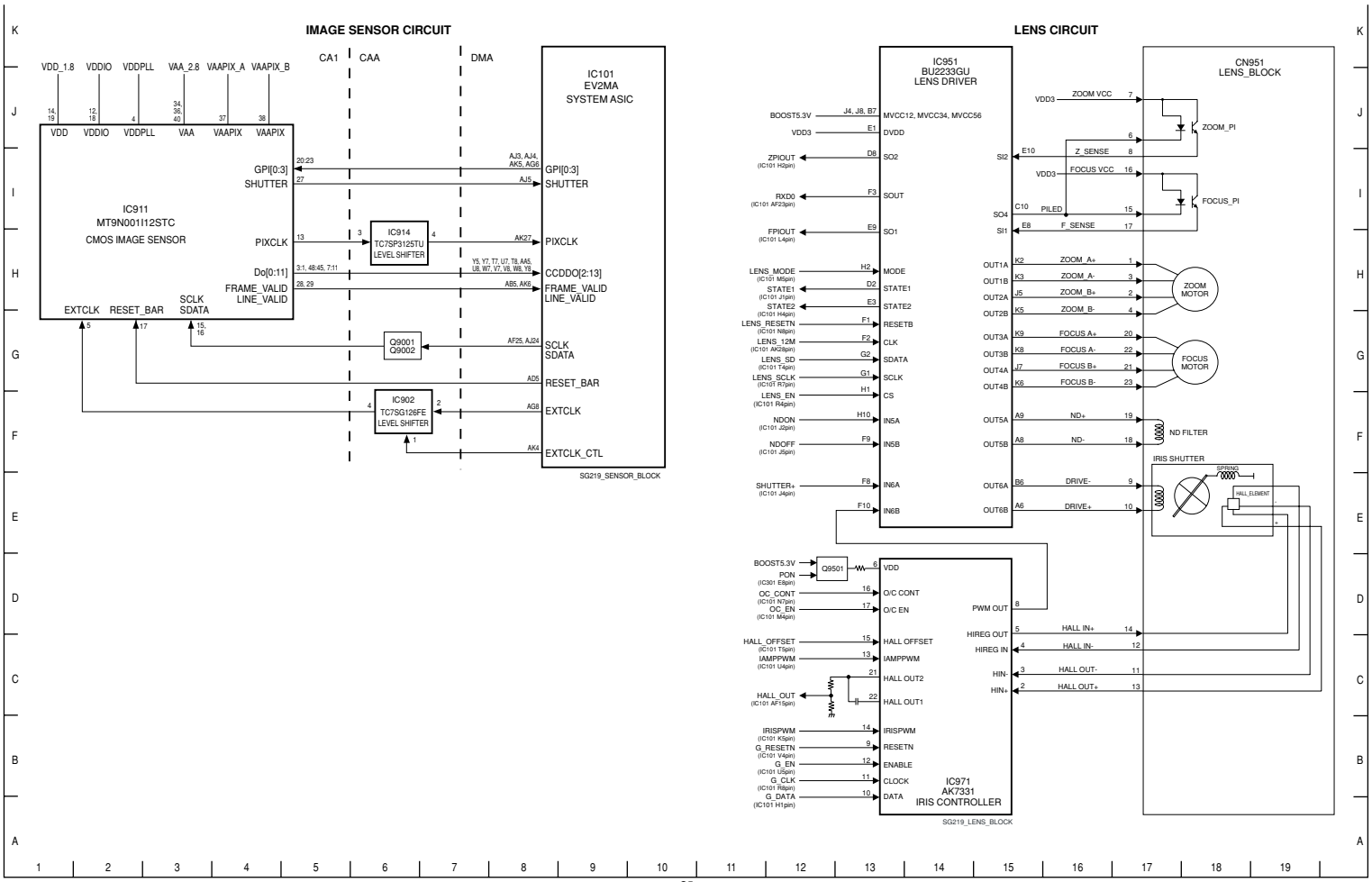
The number of "H=##" written in slant character, shows the voltage.
The number of "H=##" written in upright character, shows the height of the parts.

PAL-F-EX

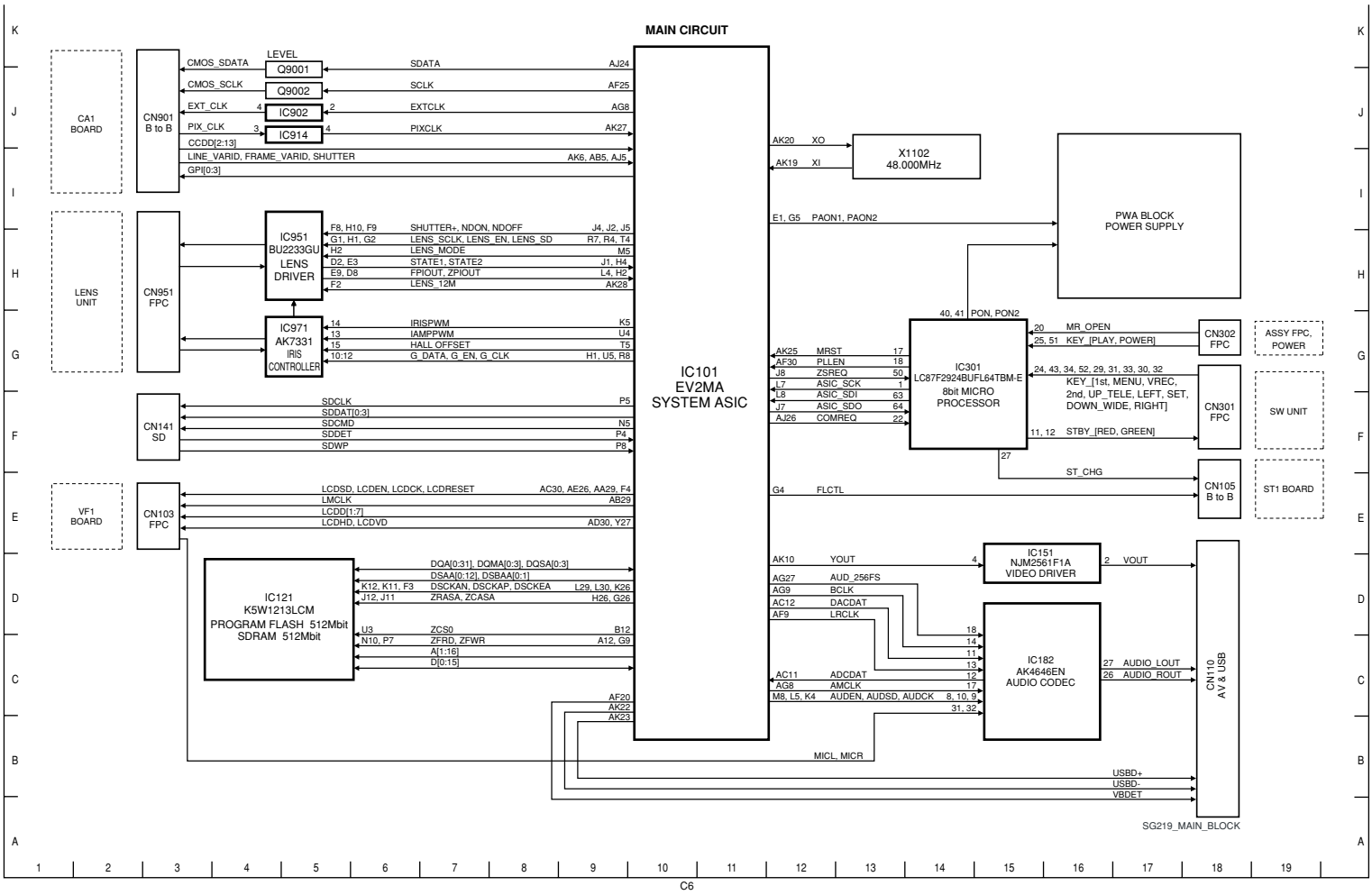
OVERALL WIRING & BLOCK DIAGRAMS

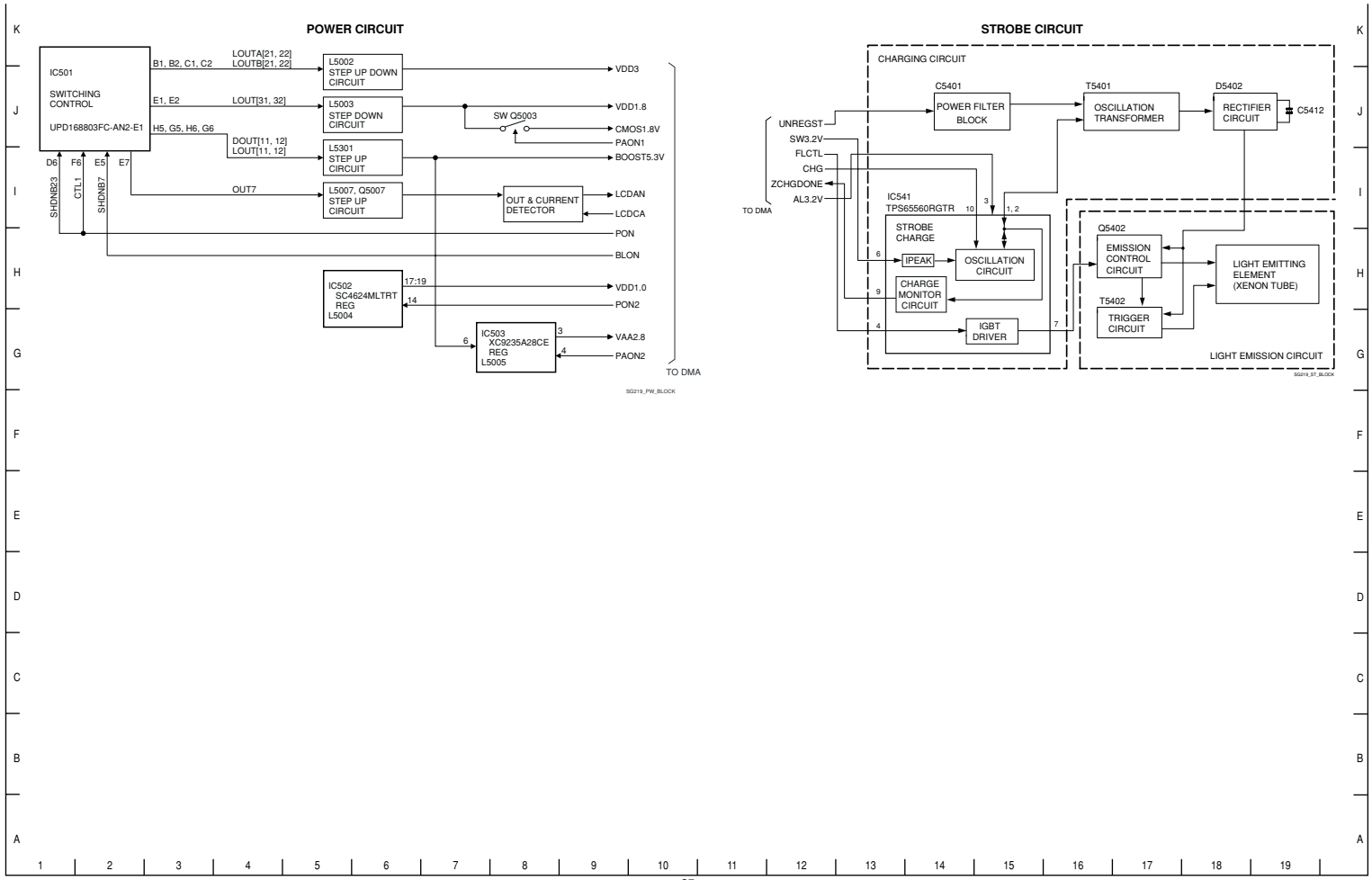




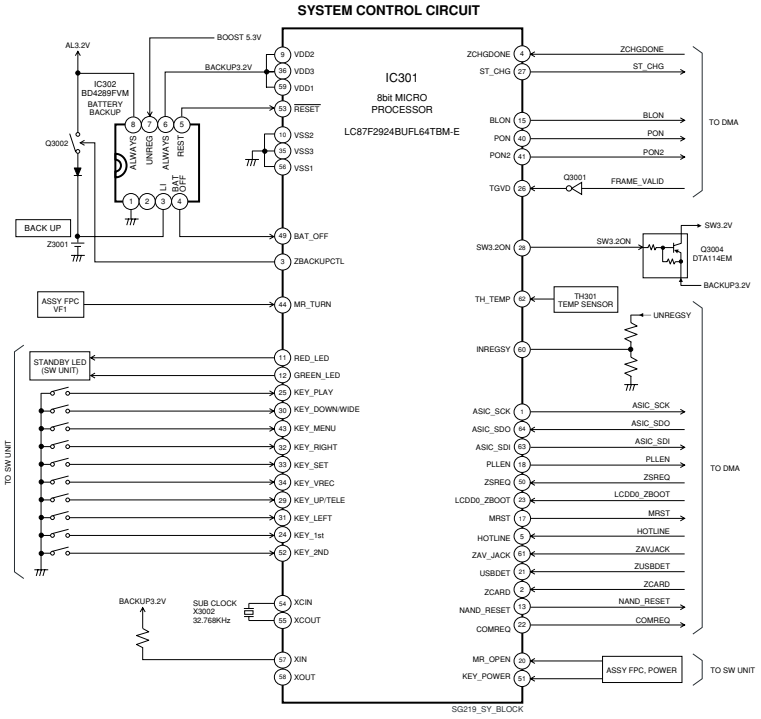


C5





SYSTEM CONTROL CIRCUIT



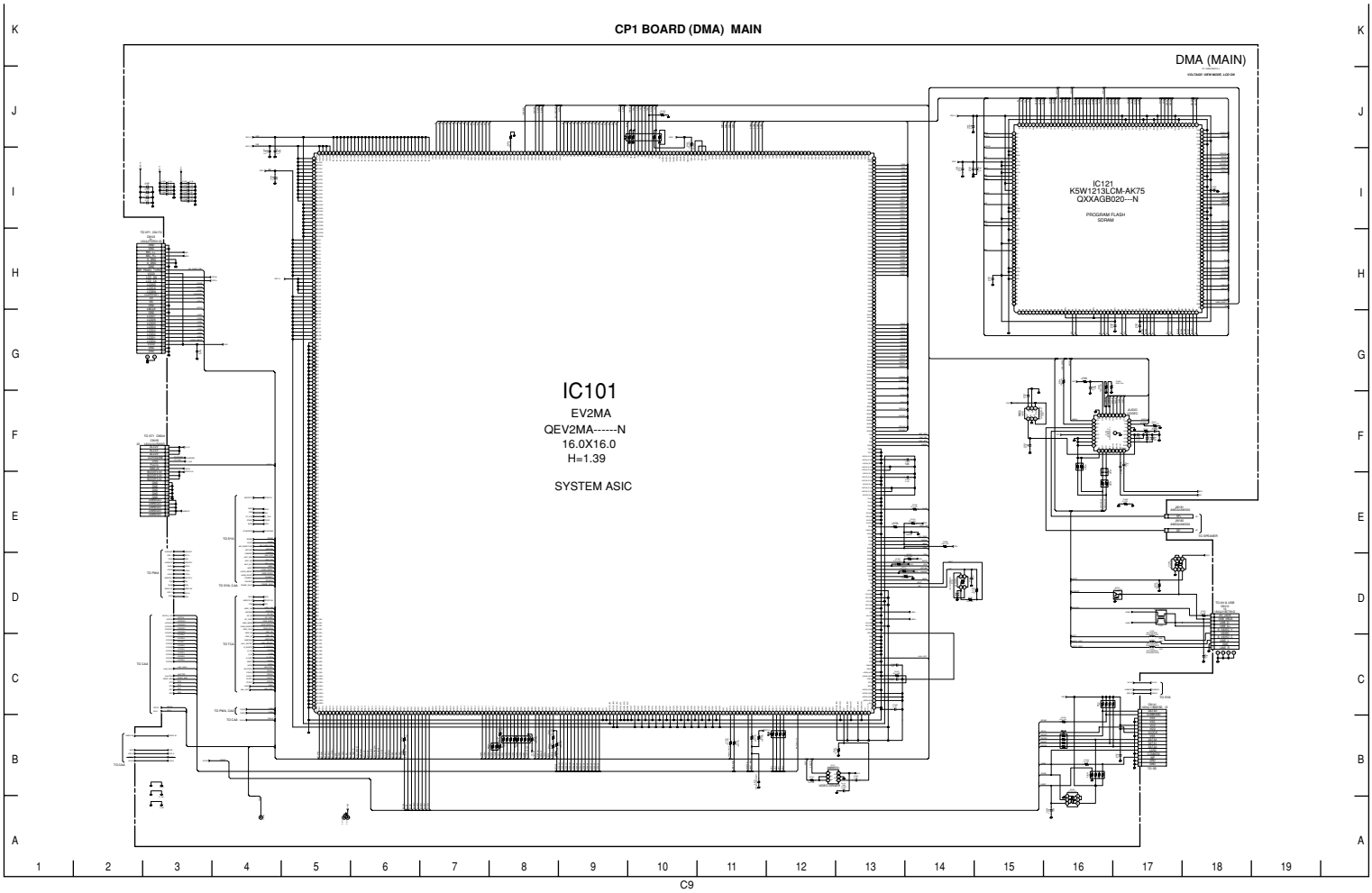
CIRCUIT DIAGRAMS

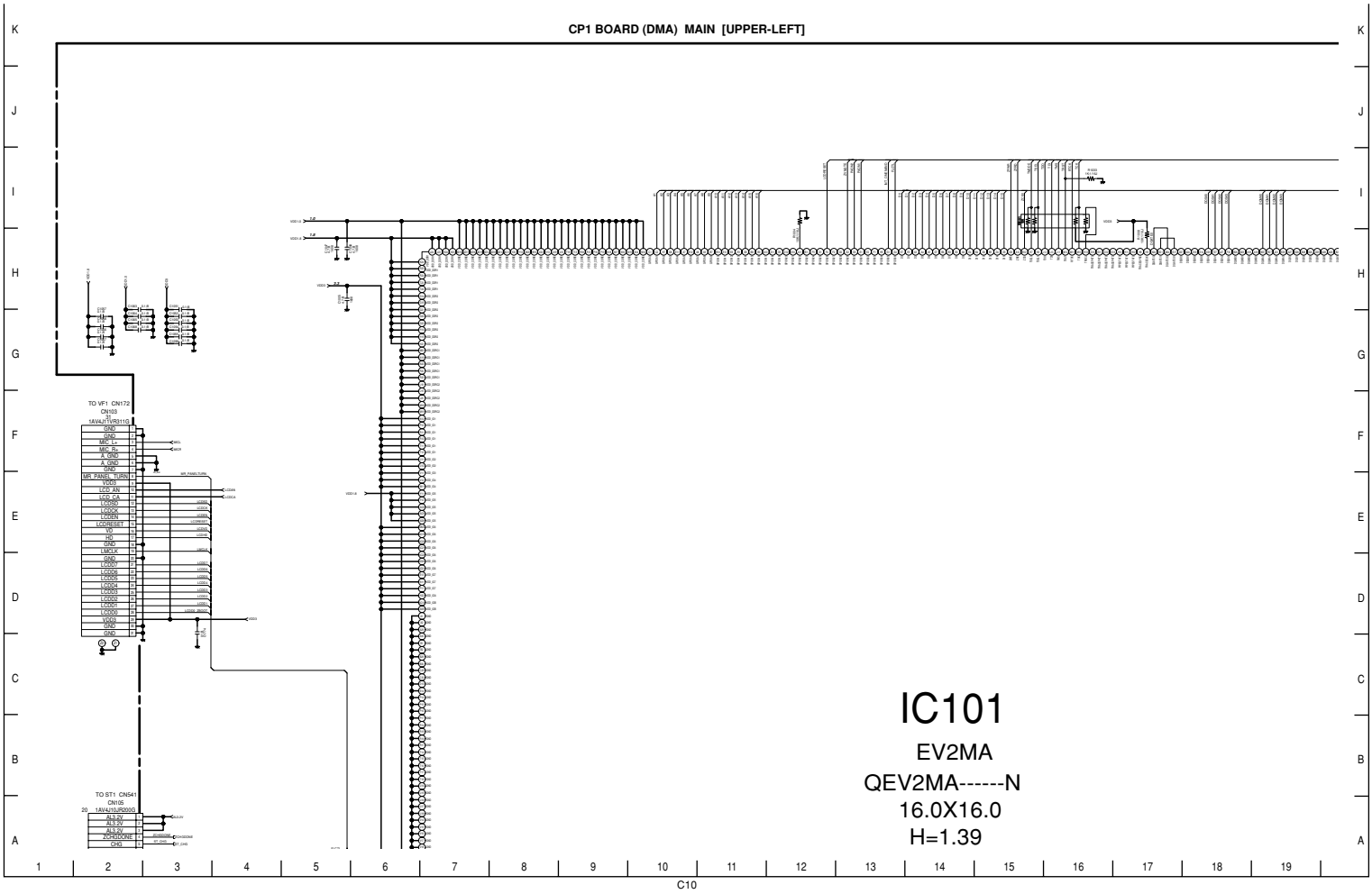
CIRCUIT WAVEFORMS

TEST POINT LOCATION	WAVEFORM	TEST POINT LOCATION	WAVEFORM
IC101 PIN AB18 XO 1V/div 10ns/div		CN171 PIN 16 VD 1V/div 5ms/div	
IC101 PIN AK28 LENS_12M 1V/div 20ns/div		IC301 PIN 55 XCOUT 1V/div 10µs/div	
CN171 PIN 14 DCLK 1V/div 50ns/div			
CN171 PIN 15 HD 1V/div 20µs/div			

WF-SG219

CP1 BOARD (DMA) MAIN





CP1 BOARD (DMA) MAIN [UPPER-RIGHT]

DMA (MAIN)

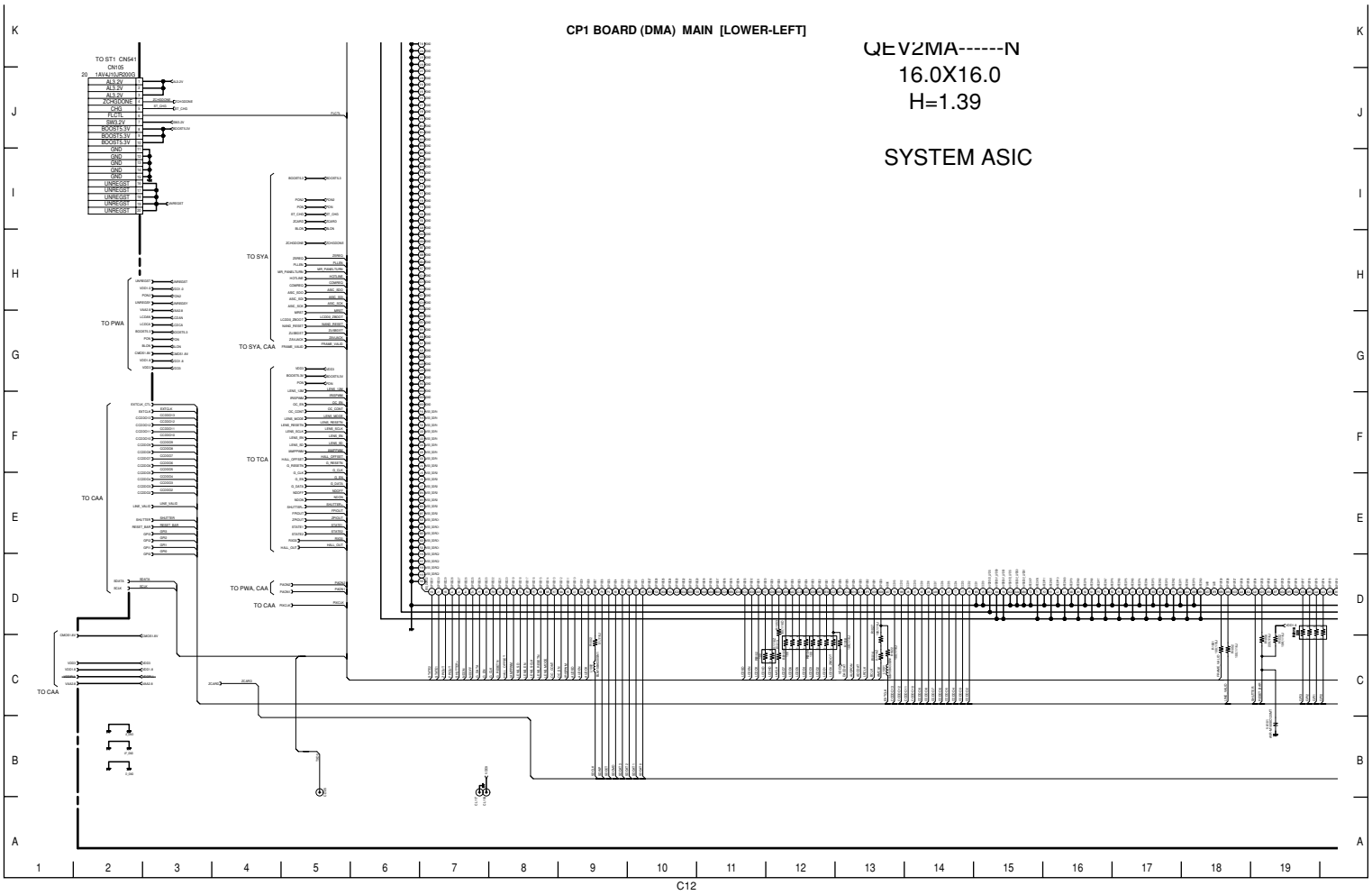
VOLTAGE: VIEW MODE, LCD ON

IC121
K5W1213LCM-AK75
QXXAGB020---N

PROGRAM FLASH
SDRAM

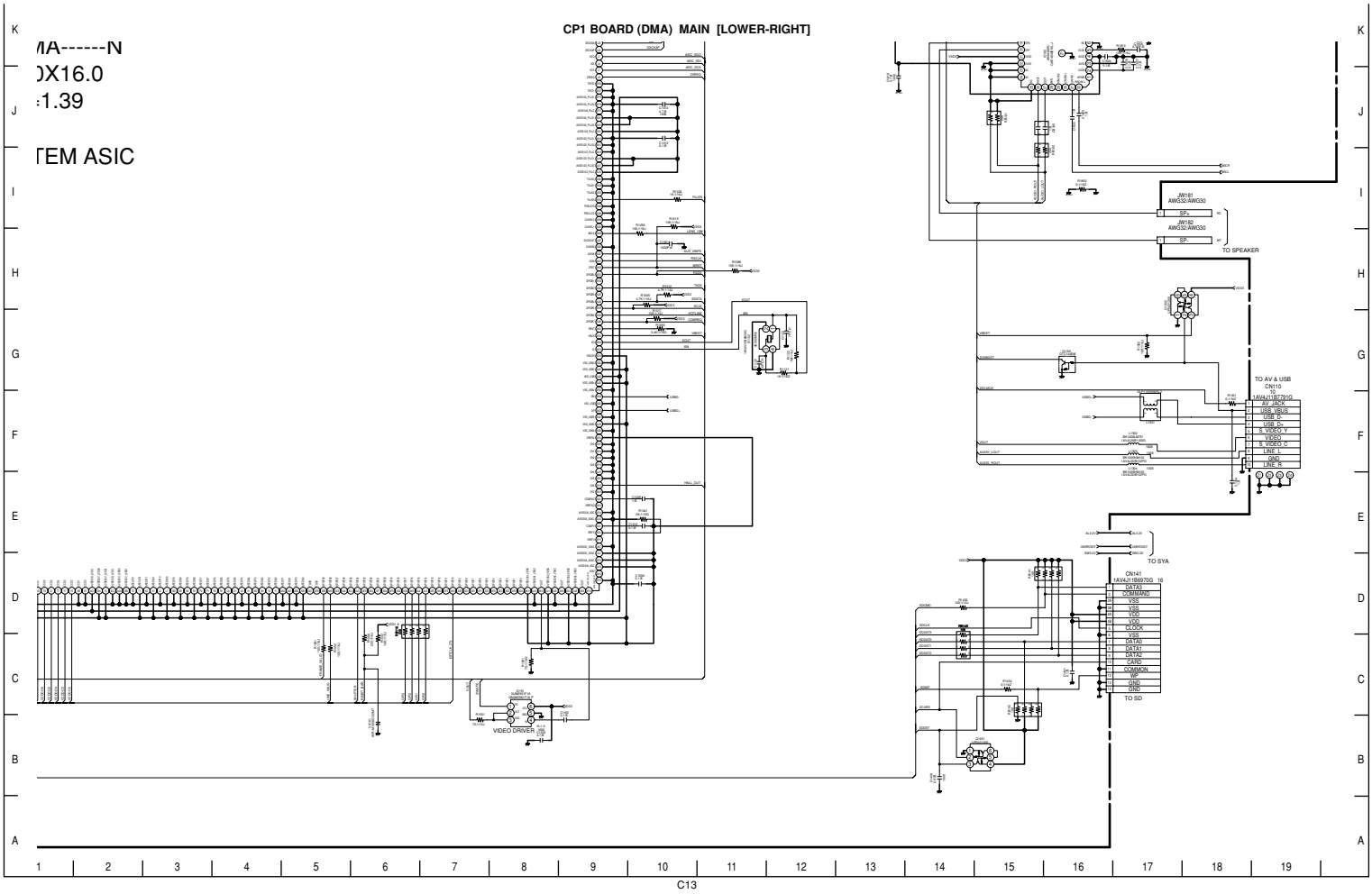
AUDIO CODEC

:101
V2MA
MA------N
)X16.0
:1.39

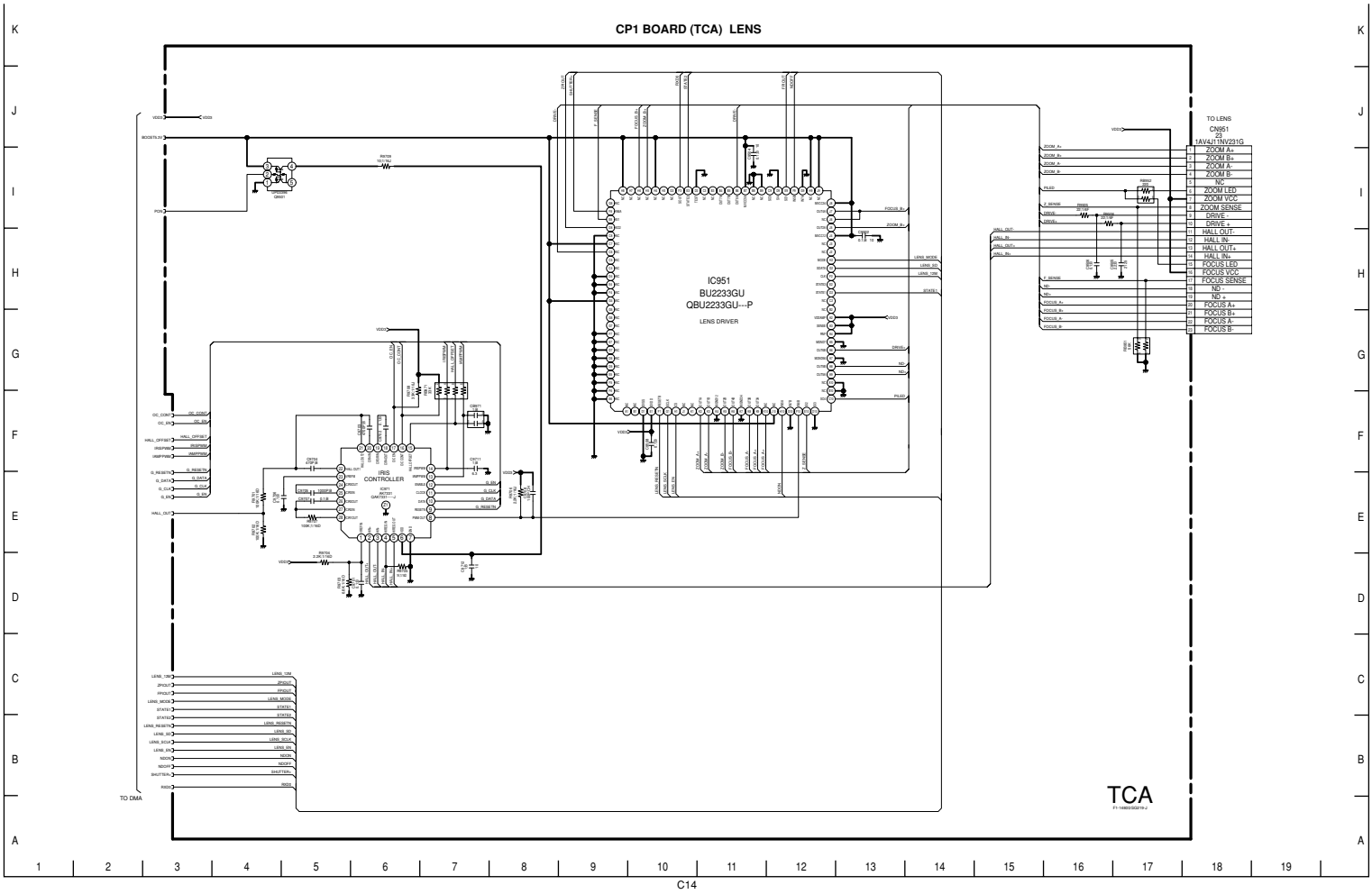


/IA------N
)X16.0
:1.39

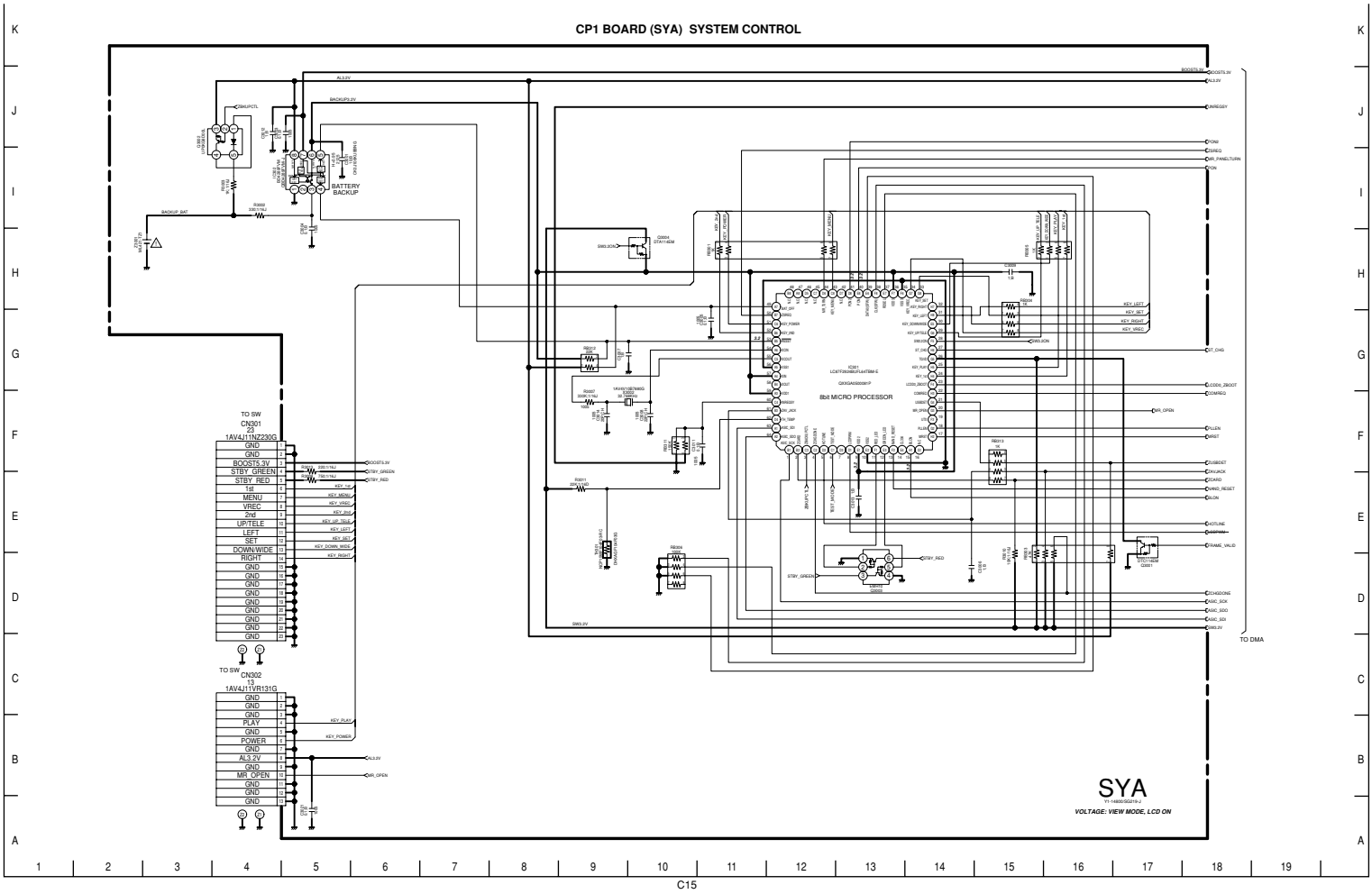
TEM ASIC

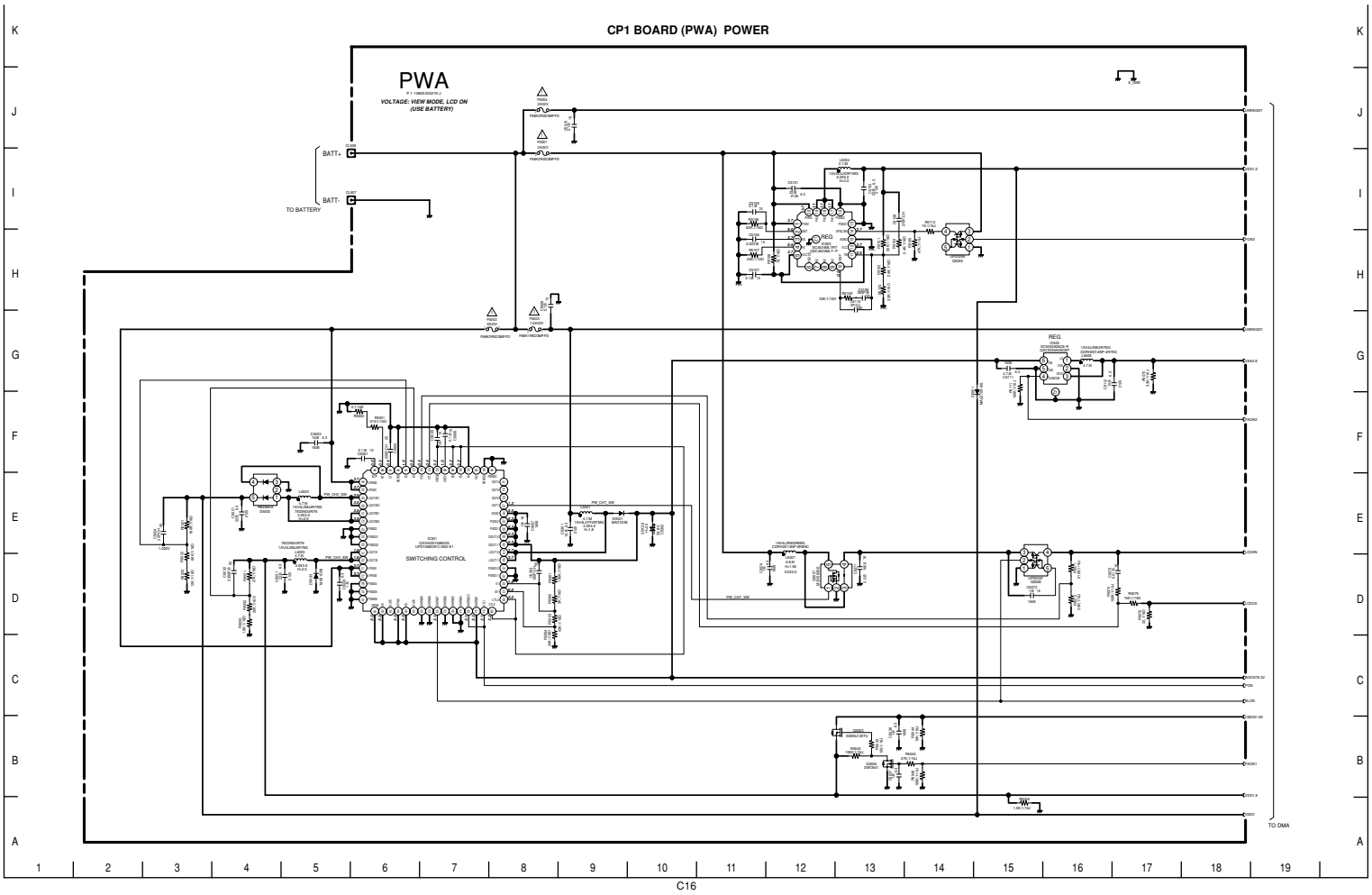


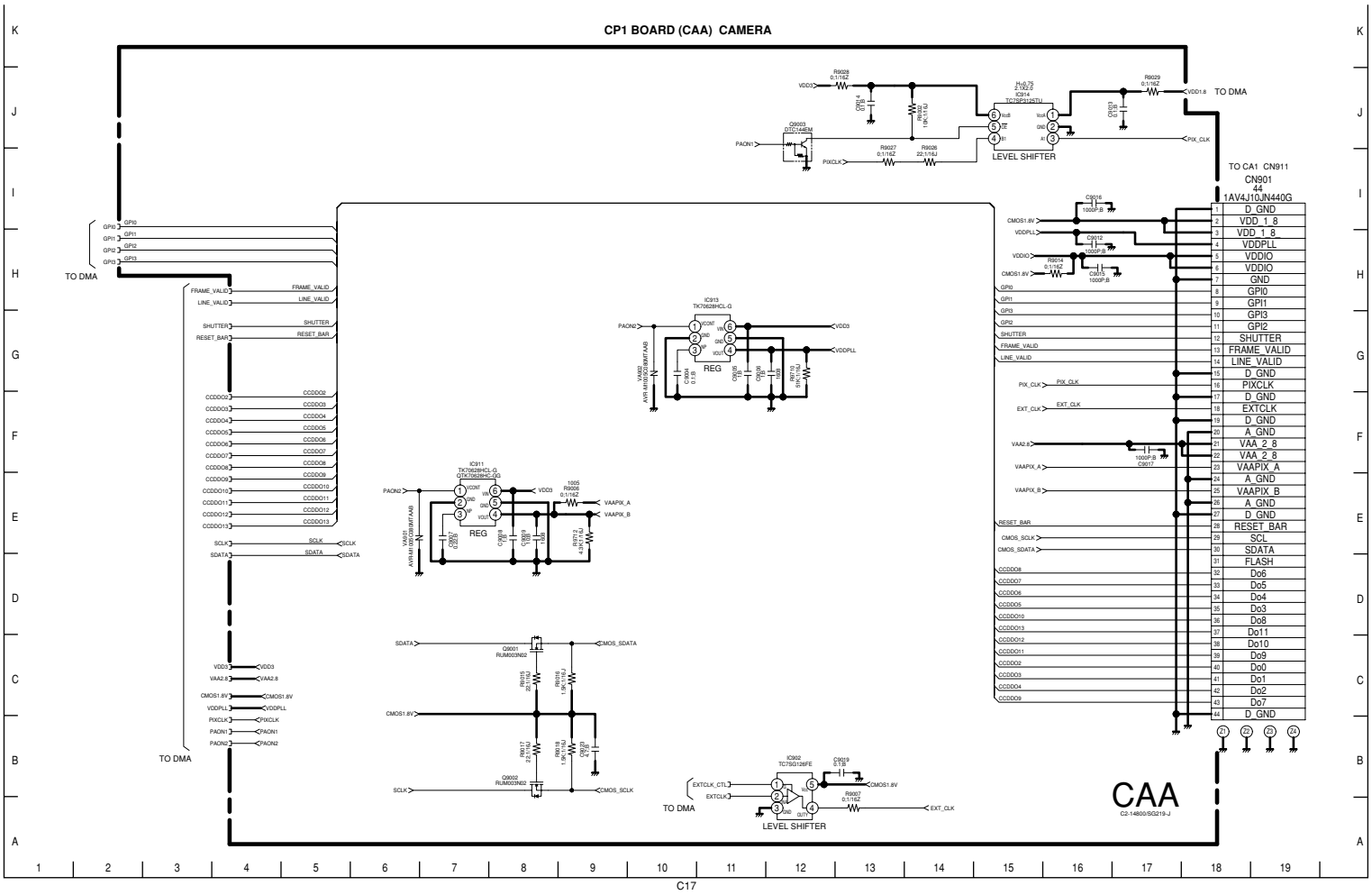
CP1 BOARD (TCA) LENS

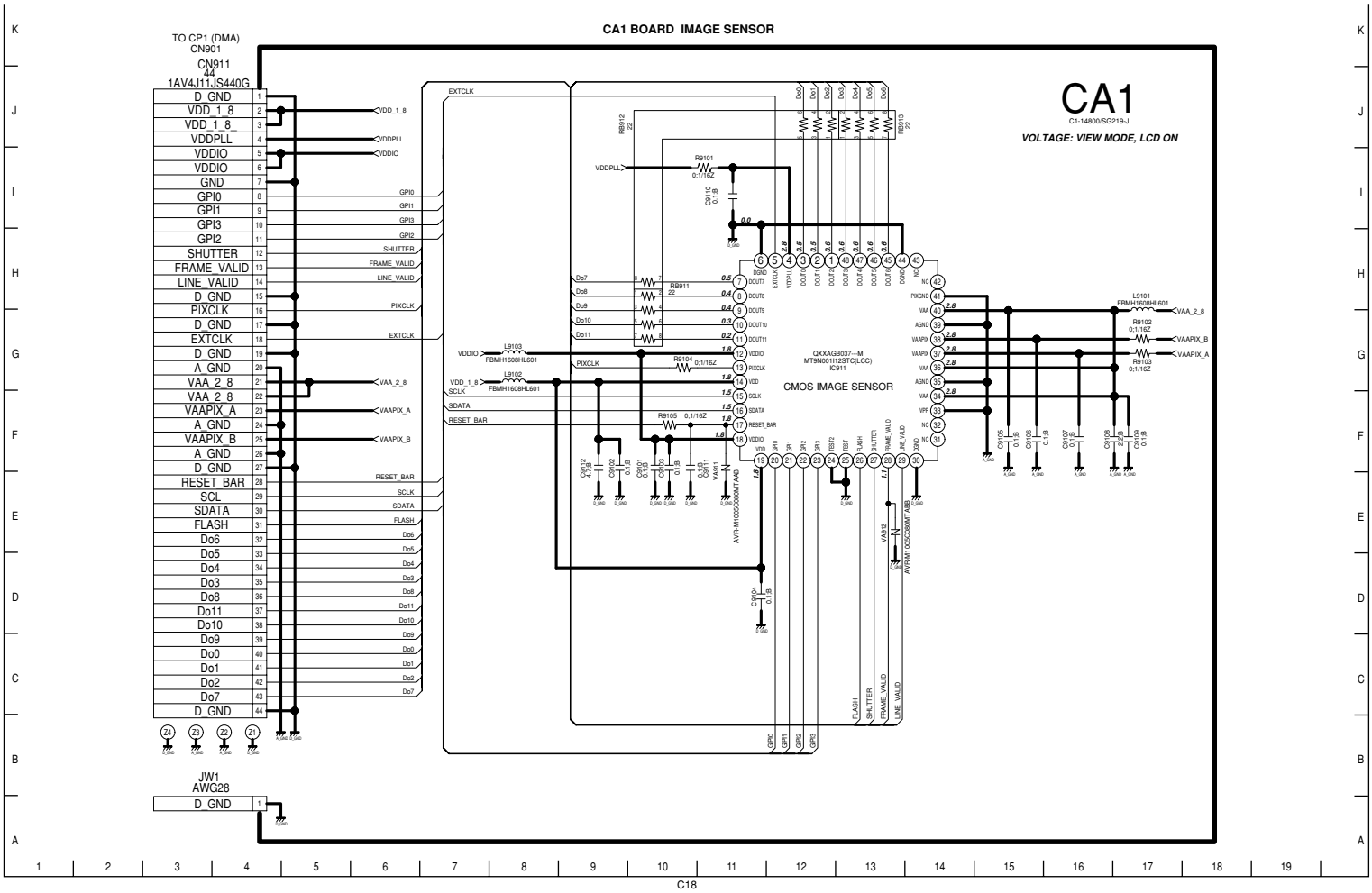


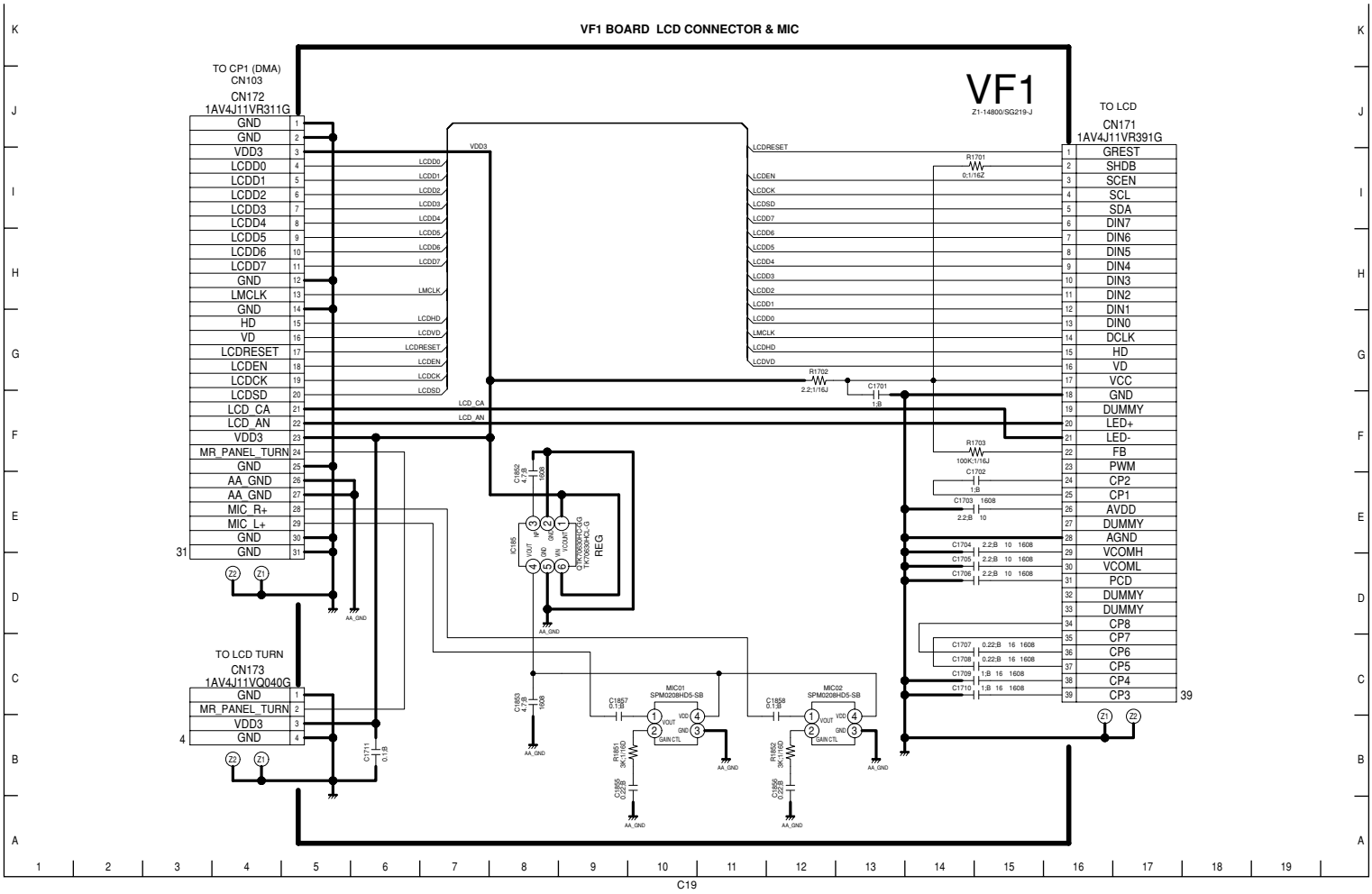
C14

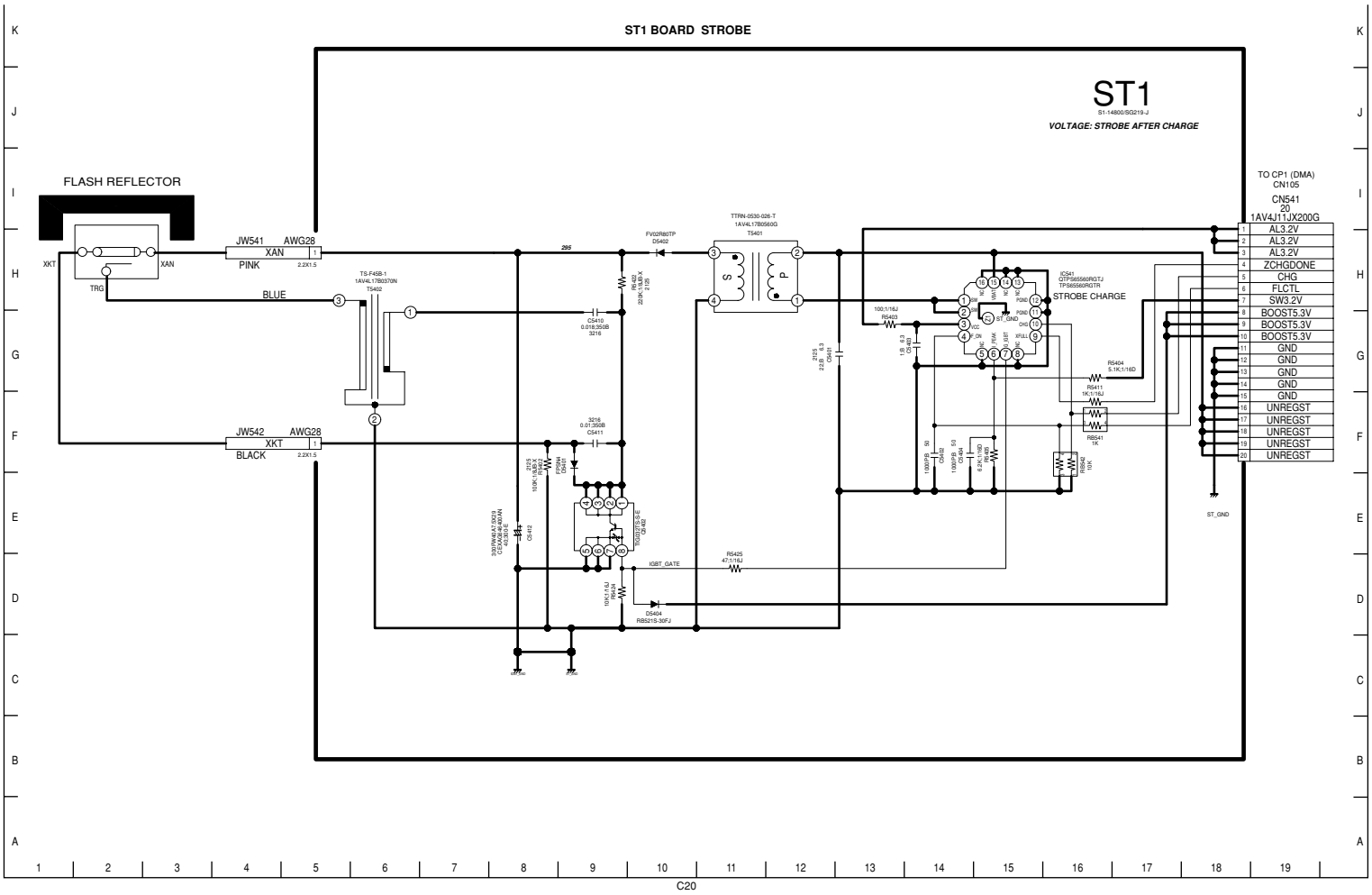






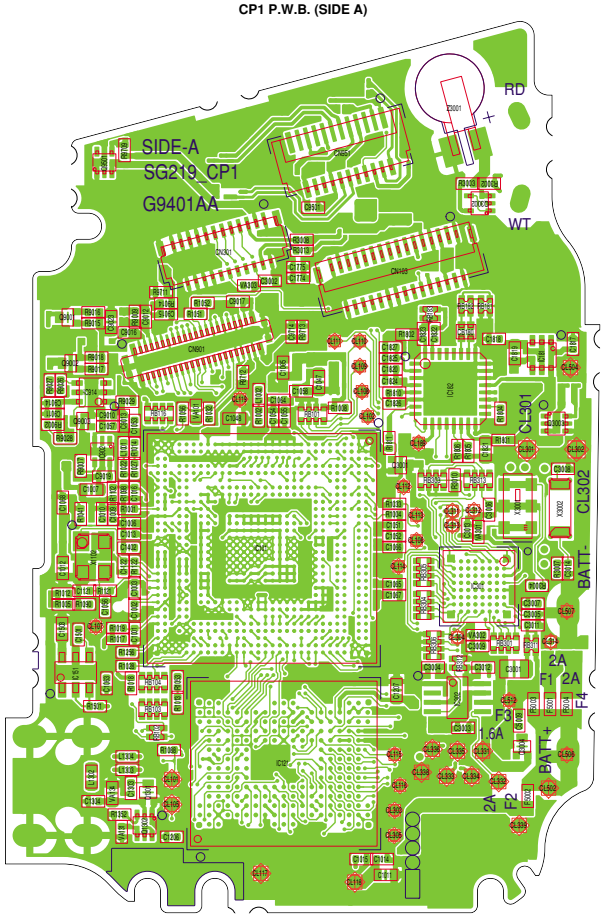




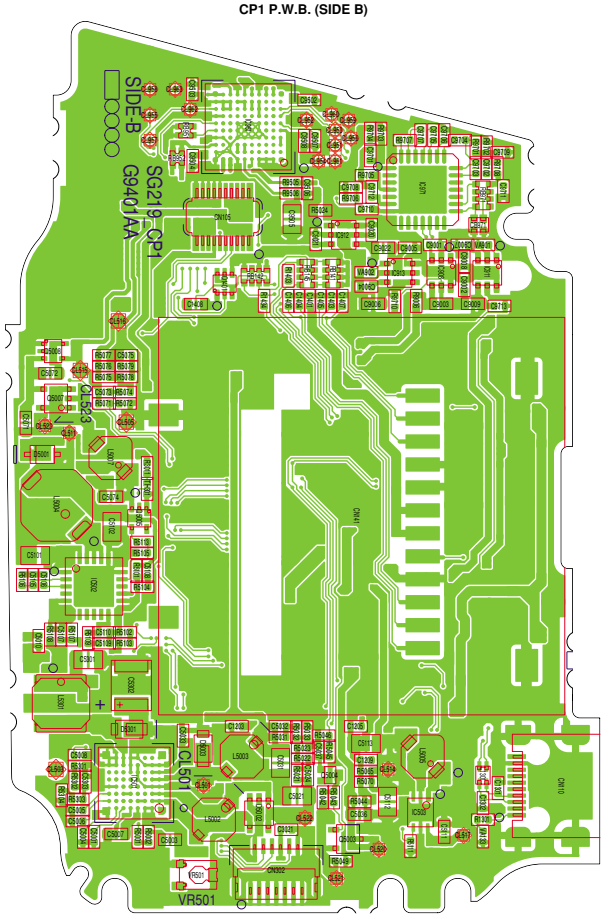


PRINTED WIRING BOARDS (P.W.B.)

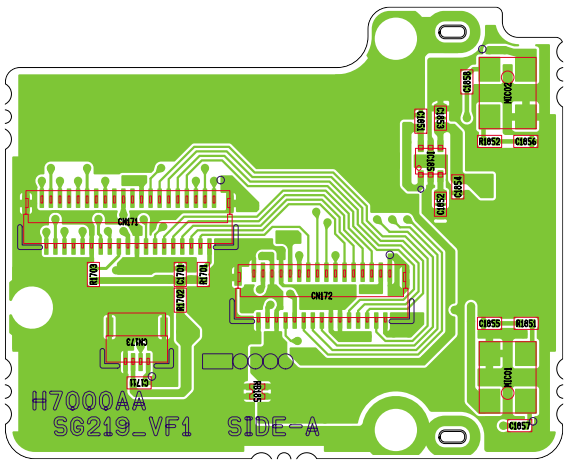
CP1 P.W.B. (SIDE A)



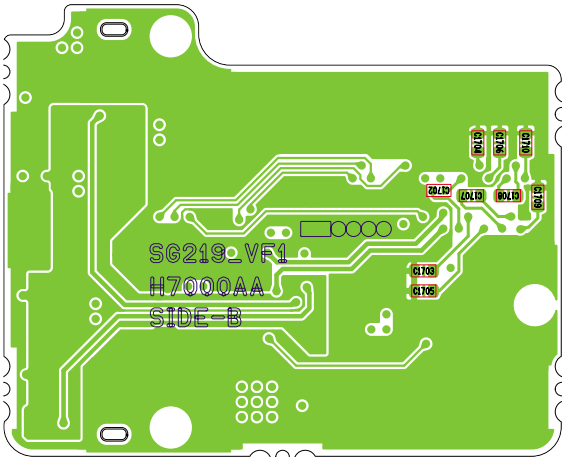
CP1 P.W.B. (SIDE B)



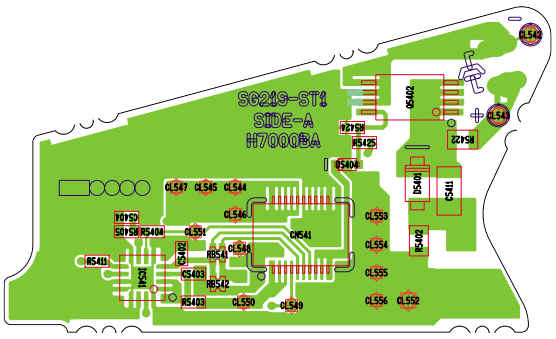
VF1 P.W.B. (SIDE A)



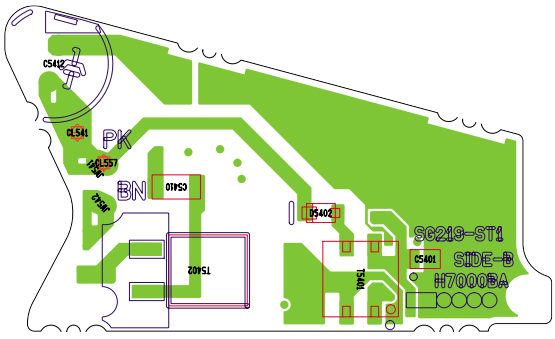
VF1 P.W.B. (SIDE B)



ST1 P.W.B. (SIDE A)

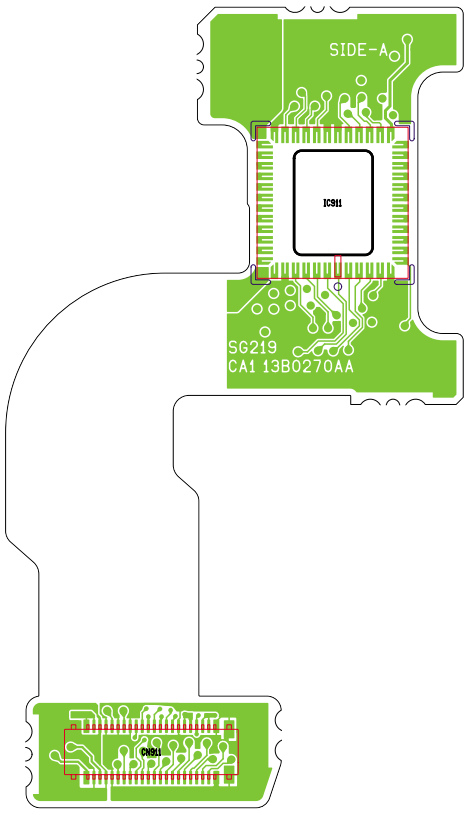


ST1 P.W.B. (SIDE B)

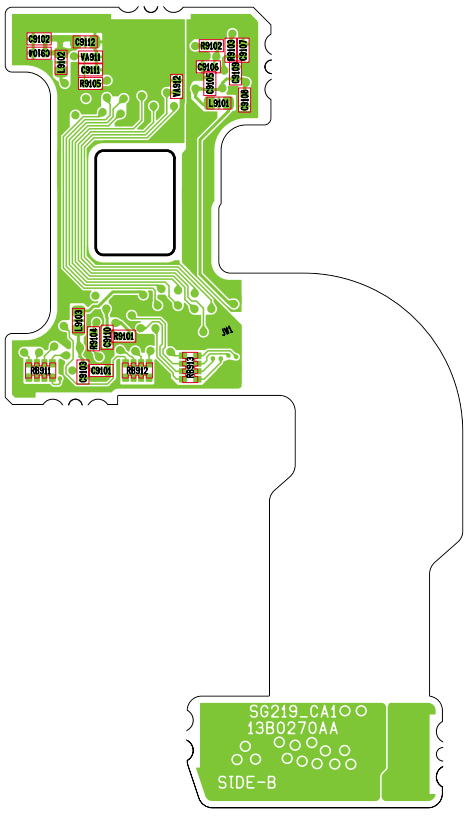


C22

CA1 P.W.B. (SIDE A)



CA1 P.W.B. (SIDE B)



SANYO

SANYO Electric Co., Ltd.
Osaka, Japan

Apr./'08 Printed in Japan