



# SERVICE MANUAL

DESKTOP CHARGER

**BC-119N**

MULTI-CHARGER

**BC-121N**

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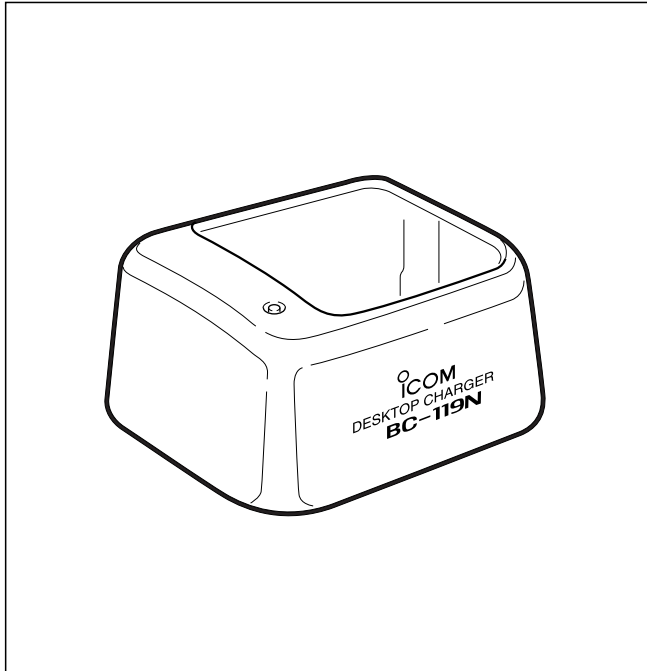
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## INTRODUCTION

This service manual describes the latest service information for the BC-119N DESKTOP CHARGER/BC-121N MULTI-CHARGER at the time of publication.

## VERSIONS

| Model          | Version   | Symbol  | Supplied batt. adap. | AC adapter |
|----------------|-----------|---------|----------------------|------------|
| BC-119N        | U.S.A.    | [USA]   | —                    | BC-145A    |
|                |           | [USA-1] | AD-75                |            |
|                | Europe    | [EUR]   | —                    | BC-145E    |
|                |           | [EUR-1] | AD-75                |            |
|                | Australia | [AUS]   | —                    | BC-145V    |
|                |           | [AUS-1] | AD-75                |            |
| United Kingdom | [UK]      | —       | BC-145UK             |            |
|                | [UK-1]    | AD-75   |                      |            |
| General        | [GEN]     | —       | —                    |            |
|                | [GEN-1]   | AD-75   |                      |            |
| BC-121N        | General   | [GEN]   | —                    | —          |



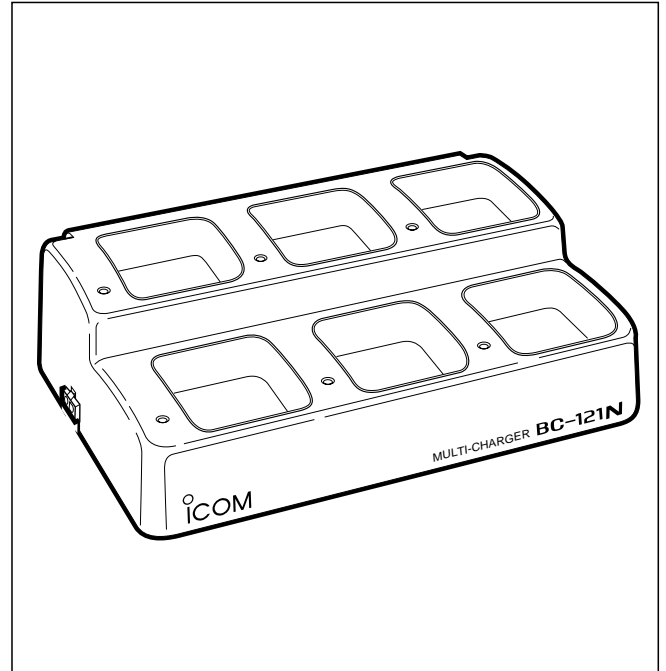
## DANGER

**NEVER** connect the charger to an AC adapter or a DC power supply that uses more than 20 V (BC-121N: 16 V). Such a connection could cause a fire hazard and/or electric shock.

**DO NOT** expose the charger to rain, snow or any liquids.

**DO NOT** expose the charger to rain, snow or any liquids.

**DO NOT** reverse the polarities of the power supply when connecting the charger.



## ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

### <SAMPLE ORDER>

|            |                      |         |             |          |
|------------|----------------------|---------|-------------|----------|
| 8010018700 | Case                 | BC-119N | Chassis     | 5 pieces |
| 8810008660 | Screw B0 3x8 NI-ZU   | BC-119N | Chassis     | 8 pieces |
| 1110004700 | S.IC S-80847ALNP-EEB | BC-121N | MAIN-A UNIT | 1 piece  |
| 8810008660 | Screw B0 3x8 NI-ZU   | BC-121N | 1800 cover  | 8 pieces |

Addresses are provided on the inside back cover for your convenience.

## REPAIR NOTES

1. Make sure a problem is internal before disassembling the charger box.
2. **DO NOT** open the chassis until the charger is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the charger is defective.
6. **READ** the instructions of test equipment thoroughly before connecting equipment to the charger.

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# SECTION 1 SPECIFICATIONS

## • BC-119N

- Power supply requirement : 12 V to 20 V DC (negative ground)
- Dimensions (projections not included) : 115(W)×60(H)×103(D) mm; 4 1/2(W) × 2 1/4(H) × 4 1/16(D) in.
- Weight (adapters not included) : 200 g; 7.1 oz; 0.4 lbs

## • BC-121N

- Power supply requirement : 12 V to 16 V DC (negative ground)
- Dimensions (projections not included) : 300(W)×93(H)×197(D) mm; 11 13/16(W) × 3 21/32(H) × 7 3/4(D) in.
- Weight (adapters not included) : 1.4 kg; 49.4 oz; 3.1 lbs

## • COMMON

- Rapid charging current : 840 mA ±10 %  
670 mA ±10 %  
540 mA ±10 %  
420 mA ±10 %
- Trickle charging current : 30 mA ±10 %
- Constant voltage (Lithium-ion battery) : 8.4 V ±0.1 V
- Electrostatic durability : Air discharge 8 kV  
Contact discharge 4 kV
- Usable temperature range : +10°C to +40°C; +50°F to +104°F
- Rapid charging time : 1–2 hours.

All stated specifications are subject to change without notice or obligation.

## SECTION 2 CIRCUIT DESCRIPTION

### 2-1 DC-DC CONVERTOR CIRCUIT (STEP-UP/DOWN CONVERTOR)

The DC-DC convertor circuit regulates the charging voltage from an AC adapter or a power supply to appropriate values for various battery pack.

The applied voltage from an AC adapter or a power supply is regulated at the step-up and down convertor circuit (Q5, D6, D7, L2). The regulated voltage is passed through the constant-current circuit.

#### • STEP-DOWN CONVERTOR CIRCUIT

The step-down convertor circuit activates when the charging voltage is lower than the applied voltage from an AC adapter or a power supply.

The applied voltage is chopped (turn ON and OFF) by the step-down convertor circuit. The chopper voltage (square wave) is passed through the smoothing circuit (C26) for conversion to DC voltage.

The step-down convertor circuit is controlled by the CPU (IC2) via the switching regulator (IC5, Q8, Q9) and driver (Q3, Q4, D4, D5) circuits.

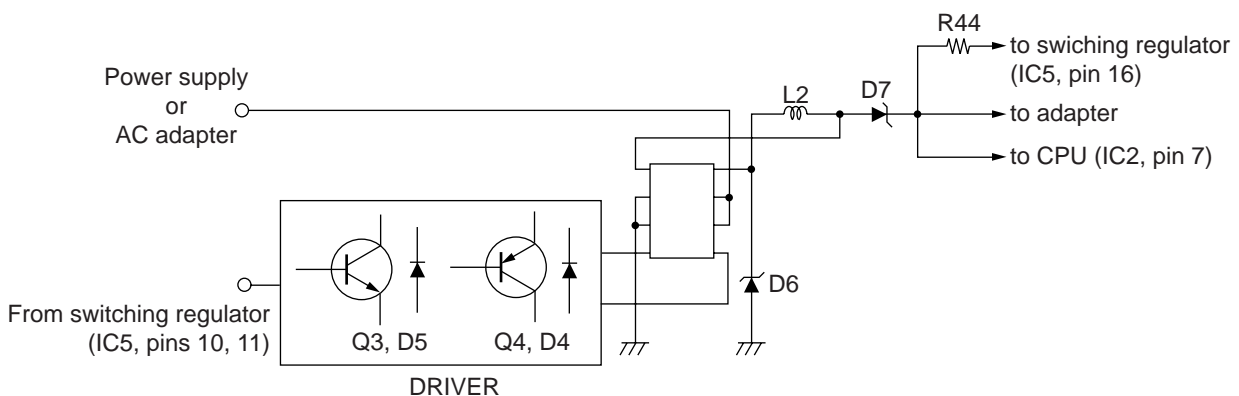
#### • STEP-UP CONVERTOR CIRCUIT

The step-up convertor circuit activates when the charging voltage is higher than the applied voltage from an AC adapter or a power supply.

The voltage passed through the step-up convertor circuit is chopped by the step-up convertor circuit.

Q5 is composed of two FETs (FET1 is pins 1–4, FET2 is pins 5–8). While FET2 is turned OFF, the same voltage as the applied voltage is output from the step-up convertor circuit. However, while FET2 is turned ON, stored energy at the coil (L2) is driven into flywheel diode (D7). In other words, a back electromotive force occurs when FET2 is turned ON. This electromotive force is used for the step-up voltage.

#### • STEP-UP/DOWN CONVERTOR CIRCUIT



### 2-2 CONSTANT-CURRENT CIRCUIT

The constant-current circuit consists of DC-DC convertor circuit (Q5, D6, D7, L2), IC4, IC5, R24, R44, and R45.

The current detector circuit (R24) detects a charging current and generates a voltage in proportion to the current. The generated voltage is applied to the amplifier section of IC4 (IC4a, pin 2).

The amplified voltage is applied to the CPU (IC2, pin 5) and the switching regulator (IC5, pin 1). The CPU (IC2) is output PWM signal from pin 2 to obtain stable output current. The signal is applied to the IC5 via the smoothing circuit (Q8, R32, C35) to convert to DC voltage. The DC voltage is applied to the switching regulator circuit (IC5, pins 2, 3, 15). The output current from switching regulator (IC5, pin 16) passes through the R44 and R45 to limit the maximum voltage. The output voltage is applied to the driver (Q3, Q4, D4, D5), and then applied to the DC-DC convertor circuit to obtain constant current.

### 2-3 REGULATOR CIRCUIT

Part of voltage from an AC adapter or a power supply are applied to the 1st regulator circuit (Q1, Q12) to convert to 12 V voltage signal. The 12 V signal is applied to the LED (DS1) and buffer amplifier (IC4b, pin 8).

Part of 12 V signals are applied to the 2nd regulator circuit (IC1, R25) to convert to the 5.15 V voltage signal. The 5.15 V signal is applied to the CPU (IC2, pin 25), voltage detector (IC3, pin 2), etc.

## 2-4 CHARGING CURRENT AND VOLTAGE CHART

| IC2 pin number |      |      |      |      |      |       |        | Rapid charging current | Low-battery | Max. voltage |
|----------------|------|------|------|------|------|-------|--------|------------------------|-------------|--------------|
| 12             | 15   | 16   | 17   | 18   | 26   | 27    | 28     |                        |             |              |
| AD-101         | SW   | BIT1 | BIT2 | BIT3 | BIT4 | BC-79 | BC-119 | (mA)                   | (V)         | (V)          |
| Low            | High | Low  | Low  | High | Low  | High  | Low    | 840                    | 6.1         | 8.4          |
| Low            | Low  | High | High | High | Low  | High  | Low    | 840                    | 3.0         | 11.5         |
| Low            | High | High | High | High | Low  | High  | Low    | 840                    | 6.1         | 8.4          |
| High           | High | Low  | Low  | High | Low  | High  | Low    | 840                    | 3.1         | 4.2          |
| High           | Low  | High | High | High | Low  | High  | Low    | 840                    | 6.1         | 8.4          |
| High           | High | High | High | Low  | Low  | Low   | High   | 840                    | 1.6         | 11.5         |
| High           | High | High | Low  | High | Low  | Low   | High   | 670                    | 1.6         | 11.5         |
| High           | High | Low  | High | High | Low  | Low   | High   | 420                    | 1.6         | 11.5         |
| High           | High | High | Low  | High | High | Low   | High   | 540                    | 4.0         | 19.0         |
| High           | High | Low  | High | High | High | Low   | High   | 420                    | 4.0         | 19.0         |
| High           | High | Low  | Low  | Low  | High | High  | High   | 670                    | 4.0         | 15.2         |
| High           | High | High | Low  | Low  | High | High  | High   | 670                    | 2.5         | 11.5         |
| High           | Low  | Low  | High | Low  | High | High  | High   | 840                    | 1.5         | 5.7          |
| High           | High | Low  | High | Low  | High | High  | High   | 420                    | 1.4         | 5.7          |
| High           | Low  | High | High | Low  | High | High  | High   | 670                    | 3.0         | 11.5         |
| High           | High | High | High | Low  | High | High  | High   | 840                    | 3.0         | 11.5         |
| High           | High | Low  | Low  | High | High | High  | High   | 540                    | 1.6         | 19.0         |
| High           | Low  | High | Low  | High | High | High  | High   | 420                    | 3.5         | 13.4         |
| High           | High | High | Low  | High | High | High  | High   | 840                    | 3.0         | 11.5         |
| High           | High | Low  | High | High | High | High  | High   | 840                    | 3.0         | 11.5         |
| High           | Low  | High | High | High | High | High  | High   | 670                    | 3.0         | 11.5         |
| High           | High | High | High | High | High | High  | High   | 540                    | 5.0         | 19.0         |
| High           | High | High | High | High | High | Low   | High   | Do not operate.        |             |              |

## 2-5 CPU PORT ALLOCATIONS (IC2)

| Pin number           | Port name                  | Description  |
|----------------------|----------------------------|--|
| 2                    | PWM                        | Outputs DC-DC convertor control signal. The signal is applied to the Q8 as "PWM" signal. |
| 5                    | CURRENT                    | Input port for current detector A/D signal.  |
| 12                   | AD-101                     | Input port for adapter select signal.  |
| 15<br>16<br>17<br>18 | SW<br>BIT1<br>BIT2<br>BIT3 | Input ports for adapter select signals.  |
| 19                   | RESET                      | Input port for the reset signal.   |
| 26<br>27<br>28       | BIT4<br>BC-79<br>BC-119    | Input ports for adapter select signals.  |

# SECTION 3 ADJUSTMENT PROCEDURES

## 5-1 PREPARATION

### ■ REQUIRED TEST EQUIPMENT

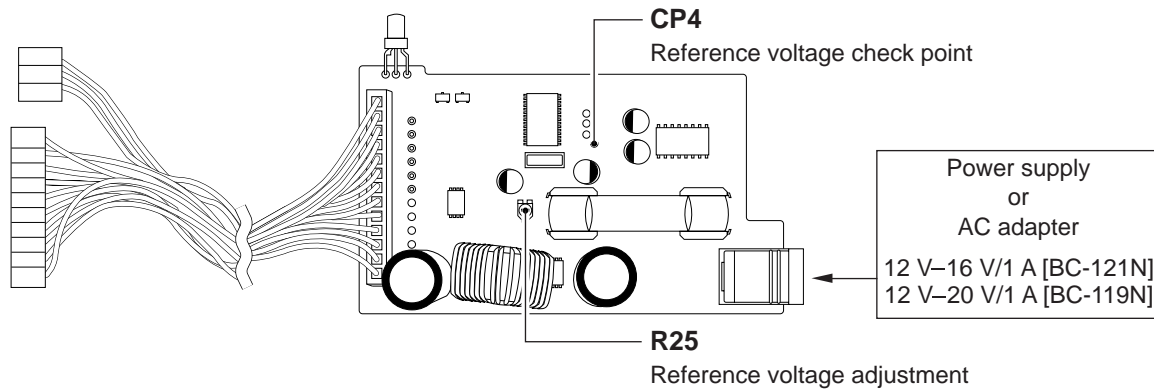
| EQUIPMENT       | GRADE AND RANGE   | EQUIPMENT    | GRADE AND RANGE  |
|-----------------|---|--------------|--|
| DC power supply | Output voltage : 12 V – 20 V DC<br>Current capacity : 1 A or more | DC voltmeter | Input impedance : 50 k $\Omega$ /V DC or better<br>Output level : 1–500 mV |

## 5-2 TRIMMER ADJUSTMENT

| ADJUSTMENT        | ADJUSTMENT CONDITIONS                                 | MEASUREMENT |  | VALUE  | ADJUSTMENT |        |
|-------------------|---|-------------|--|--------|------------|--------|
|                   |   | UNIT        | LOCATION                                       |        | UNIT       | ADJUST |
| REFERENCE VOLTAGE | 1 • Connect the power supply or AC adapter to the J1. | MAIN        | Connect a DC voltmeter to the check point CP4. | 5.15 V | MAIN       | R25    |

**[BC-121N ONLY]:** Same adjustment as step 1 for MAIN-A–MAIN-F units.

### • MAIN UNIT TOP VIEW



# SECTION 4 PARTS LIST

## [MAIN UNIT]

| REF NO. | ORDER NO.  | DESCRIPTION  |                         |
|---------|------------|--------------|-------------------------|
| IC1     | 1110005350 | S.IC         | NJM2870F05-TE1          |
| IC2     | 1140010280 | S.IC         | μPD789112AMC-512-5A4    |
| IC3     | 1110004700 | S.IC         | S-80847ALNP-EEB-T2      |
| IC4     | 1110005330 | S.IC         | NJM12904V-TE1           |
| IC5     | 1110003070 | S.IC         | μPC494GS-E1             |
|         |            |              |                         |
| Q1      | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R          |
| Q3      | 1530002060 | S.TRANSISTOR | 2SC4081 T107 R          |
| Q4      | 1510000510 | S.TRANSISTOR | 2SA1576A T106R          |
| Q5      | 1590003070 | S.FET        | UPA1890GR-9JG-E1        |
| Q6      | 1510000510 | S.TRANSISTOR | 2SA1576A T106R          |
| Q7      | 1510000510 | S.TRANSISTOR | 2SA1576A T106R          |
| Q8      | 1530002060 | S.TRANSISTOR | 2SC4081 T107 R          |
| Q9      | 1530002060 | S.TRANSISTOR | 2SC4081 T107 R          |
| Q10     | 1590000430 | S.TRANSISTOR | DTC144EUA T106          |
| Q11     | 1590000430 | S.TRANSISTOR | DTC144EUA T106          |
| Q12     | 1590001190 | S.TRANSISTOR | XP6501-(TX) .AB         |
|         |            |              |                         |
| D2      | 1160000070 | S.DIODE      | DAN202K T146            |
| D3      | 1160000070 | S.DIODE      | DAN202K T146            |
| D4      | 1750000550 | S.DIODE      | 1SS355 TE-17            |
| D5      | 1750000550 | S.DIODE      | 1SS355 TE-17            |
| D6      | 1790000680 | S.DIODE      | SB20-03P-TD             |
| D7      | 1790000680 | S.DIODE      | SB20-03P-TD             |
| D8      | 1750000550 | S.DIODE      | 1SS355 TE-17            |
|         |            |              |                         |
| X1      | 6060000790 | S.CERAMIC    | CSTCR4M91G              |
|         |            |              |                         |
| L1      | 6200007660 | S.COIL       | LL1608-FHR10J           |
| L2      | 6190001150 | COIL         | HK-08S050-2010          |
|         |            |              |                         |
| R1      | 7030000380 | S.RESISTOR   | MCR10EZJH 1 kΩ          |
| R2      | 7030000380 | S.RESISTOR   | MCR10EZJH 1 kΩ          |
| R3      | 7030003520 | S.RESISTOR   | ERJ3GEYJ 472 V (4.7 kΩ) |
| R4      | 7030003320 | S.RESISTOR   | ERJ3GEYJ 101 V (100 Ω)  |
| R5      | 7030003320 | S.RESISTOR   | ERJ3GEYJ 101 V (100 Ω)  |
| R6      | 7030003520 | S.RESISTOR   | ERJ3GEYJ 472 V (4.7 kΩ) |
| R7      | 7030003410 | S.RESISTOR   | ERJ3GEYJ 561 V (560 Ω)  |
| R8      | 7030003410 | S.RESISTOR   | ERJ3GEYJ 561 V (560 Ω)  |
| R9      | 7030003200 | S.RESISTOR   | ERJ3GEYJ 100 V (10 Ω)   |
| R10     | 7030003410 | S.RESISTOR   | ERJ3GEYJ 561 V (560 Ω)  |
| R11     | 7030005501 | S.RESISTOR   | ERA3YKD 124V            |
| R12     | 7030003560 | S.RESISTOR   | ERJ3GEYJ 103 V (10 kΩ)  |
| R14     | 7030005981 | S.RESISTOR   | ERA3YED 333V            |
| R15     | 7030007230 | S.RESISTOR   | ERA3YED 102V            |
| R16     | 7030003560 | S.RESISTOR   | ERJ3GEYJ 103 V (10 kΩ)  |
| R17     | 7030003800 | S.RESISTOR   | ERJ3GEYJ 105 V (1 MΩ)   |
| R18     | 7030003440 | S.RESISTOR   | ERJ3GEYJ 102 V (1 kΩ)   |
| R19     | 7030005671 | S.RESISTOR   | ERA3YKD 393V            |
| R20     | 7030005501 | S.RESISTOR   | ERA3YKD 124V            |
| R21     | 7410000950 | S.ARRAY      | EXB-V8V 102JV           |
| R22     | 7410000950 | S.ARRAY      | EXB-V8V 102JV           |
| R23     | 7030005321 | S.RESISTOR   | ERA3YED 103V            |
| R24     | 7030009580 | S.RESISTOR   | ERJ8RSJ R12V            |
| R25     | 7310002630 | S.TRIMMER    | RV-139 (RH03A3A12) 101  |
| R26     | 7030003460 | S.RESISTOR   | ERJ3GEYJ 152 V (1.5 kΩ) |
| R27     | 7030005671 | S.RESISTOR   | ERA3YKD 393V            |
| R28     | 7030005981 | S.RESISTOR   | ERA3YED 333V            |
| R29     | 7030006091 | S.RESISTOR   | ERA3YED 822V            |
| R30     | 7030003800 | S.RESISTOR   | ERJ3GEYJ 105 V (1 MΩ)   |
| R31     | 7030003800 | S.RESISTOR   | ERJ3GEYJ 105 V (1 MΩ)   |
| R32     | 7030003600 | S.RESISTOR   | ERJ3GEYJ 223 V (22 kΩ)  |
| R33     | 7030003440 | S.RESISTOR   | ERJ3GEYJ 102 V (1 kΩ)   |
| R34     | 7030003600 | S.RESISTOR   | ERJ3GEYJ 223 V (22 kΩ)  |
| R35     | 7030003520 | S.RESISTOR   | ERJ3GEYJ 472 V (4.7 kΩ) |
| R36     | 7030003600 | S.RESISTOR   | ERJ3GEYJ 223 V (22 kΩ)  |
| R37     | 7030003650 | S.RESISTOR   | ERJ3GEYJ 563 V (56 kΩ)  |
| R38     | 7030003600 | S.RESISTOR   | ERJ3GEYJ 223 V (22 kΩ)  |
| R39     | 7030003770 | S.RESISTOR   | ERJ3GEYJ 564 V (560 kΩ) |
| R40     | 7030003650 | S.RESISTOR   | ERJ3GEYJ 563 V (56 kΩ)  |
| R41     | 7030003770 | S.RESISTOR   | ERJ3GEYJ 564 V (560 kΩ) |

## [MAIN UNIT]

| REF NO. | ORDER NO.  | DESCRIPTION    |                         |
|---------|------------|----------------|-------------------------|
| R42     | 7030003560 | S.RESISTOR     | ERJ3GEYJ 103 V (10 kΩ)  |
| R43     | 7030003690 | S.RESISTOR     | ERJ3GEYJ 124 V (120 kΩ) |
| R44     | 7030005501 | S.RESISTOR     | ERA3YKD 124V            |
| R45     | 7030005981 | S.RESISTOR     | ERA3YED 333V            |
| R46     | 7030003440 | S.RESISTOR     | ERJ3GEYJ 102 V (1 kΩ)   |
| R47     | 7030003520 | S.RESISTOR     | ERJ3GEYJ 472 V (4.7 kΩ) |
| R48     | 7030003360 | S.RESISTOR     | ERJ3GEYJ 221 V (220 Ω)  |
| R49     | 7030000380 | S.RESISTOR     | MCR10EZJH 1 kΩ          |
| R50     | 7030003640 | S.RESISTOR     | ERJ3GEYJ 473 V (47 kΩ)  |
| R51     | 7030003570 | S.RESISTOR     | ERJ3GEYJ 123 V (12 kΩ)  |
| R52     | 7030003580 | S.RESISTOR     | ERJ3GEYJ 153 V (15 kΩ)  |
| R53     | 7030003760 | S.RESISTOR     | ERJ3GEYJ 474 V (470 kΩ) |
|         |            |                |                         |
| C1      | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C3      | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C4      | 4510004630 | S.ELECTROLYTIC | ECEV1CA100SR            |
| C5      | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C6      | 4030011600 | S.CERAMIC      | C1608 JB 1E 104K-T-N    |
| C7      | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C8      | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C9      | 4510005430 | S.ELECTROLYTIC | ECEV0JA220SR            |
| C10     | 4510007920 | ELECTROLYTIC   | 25 MV 470 CA            |
| C11     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C12     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C13     | 4030011600 | S.CERAMIC      | C1608 JB 1E 104K-T-N    |
| C14     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C15     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C16     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C17     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C18     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C19     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C20     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C21     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C22     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C23     | 4030011600 | S.CERAMIC      | C1608 JB 1E 104K-T-N    |
| C25     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C26     | 4510007920 | ELECTROLYTIC   | 25 MV 470 CA            |
| C27     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C28     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C29     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C30     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C31     | 4030011600 | S.CERAMIC      | C1608 JB 1E 104K-T-N    |
| C32     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C33     | 4030006860 | S.CERAMIC      | C1608 JB 1H 102K-T-A    |
| C34     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C35     | 4510005430 | S.ELECTROLYTIC | ECEV0JA220SR            |
| C36     | 4510005430 | S.ELECTROLYTIC | ECEV0JA220SR            |
| C37     | 4030006860 | S.CERAMIC      | C1608 JB 1H 102K-T-A    |
| C38     | 4030011600 | S.CERAMIC      | C1608 JB 1E 104K-T-N    |
| C39     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C40     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C41     | 4030011600 | S.CERAMIC      | C1608 JB 1E 104K-T-N    |
| C42     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C43     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C44     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
| C45     | 4030006900 | S.CERAMIC      | C1608 JB 1H 103K-T-A    |
|         |            |                |                         |
| J1      | 6450000410 | CONNECTOR      | HEC0470-01-630          |
|         |            |                |                         |
| F1      | 5210000040 | FUSE           | FGB 2A                  |
| F2      | 5220000020 | HOLDER         | S-N5051                 |
| F3      | 5220000020 | HOLDER         | S-N5051                 |
|         |            |                |                         |
| DS1     | 5040002150 | LED            | VRPG3349S-734           |
|         |            |                |                         |
| W1      | 8900010880 | CABLE          | OPC-1103                |
|         |            |                |                         |
| EP1     | 0910054243 | PCB            | B 5712C                 |

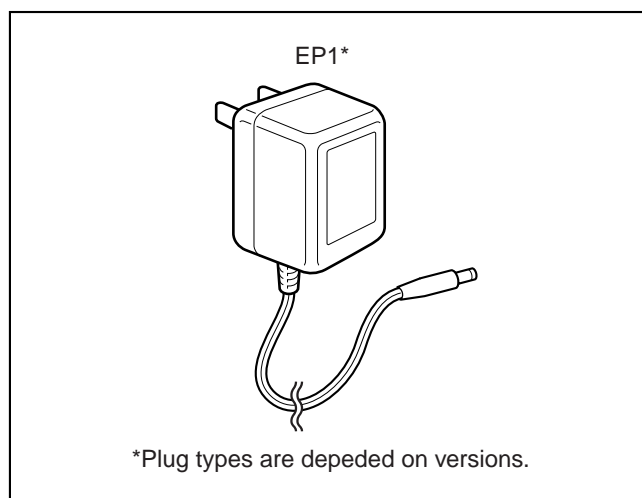
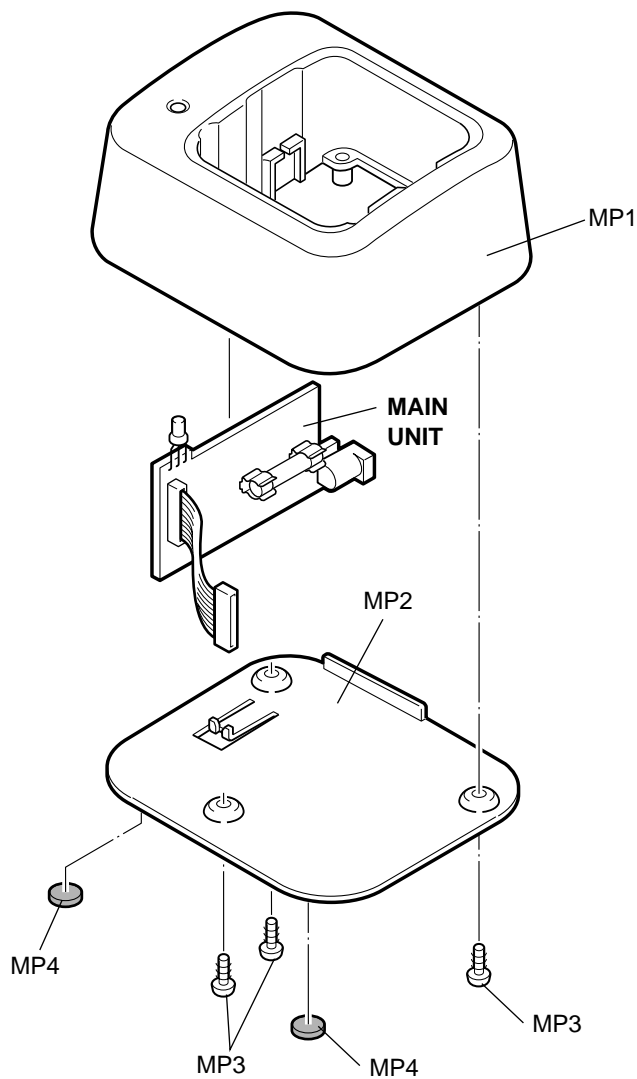
[BC-121N ONLY]: MAIN-A–MAIN-F units are same parts as this parts list.

S.=Surface mount



# SECTION 5 MECHANICAL PARTS AND DISASSEMBLY

## 5-1 BC-119N



### [CHASSIS PARTS]

| REF NO. | ORDER NO.  | DESCRIPTION                  | QTY. |
|---------|------------|------------------------------|------|
| MP1     | 8010018700 | 2505 case                    | 1    |
| MP2     | 8110007620 | 2505 cover                   | 1    |
| MP3     | 8810008660 | Screw PH B0 3 × 8 NI-ZU (BT) | 3    |
| MP4     | 8930039620 | Leg cushion (A)              | 2    |

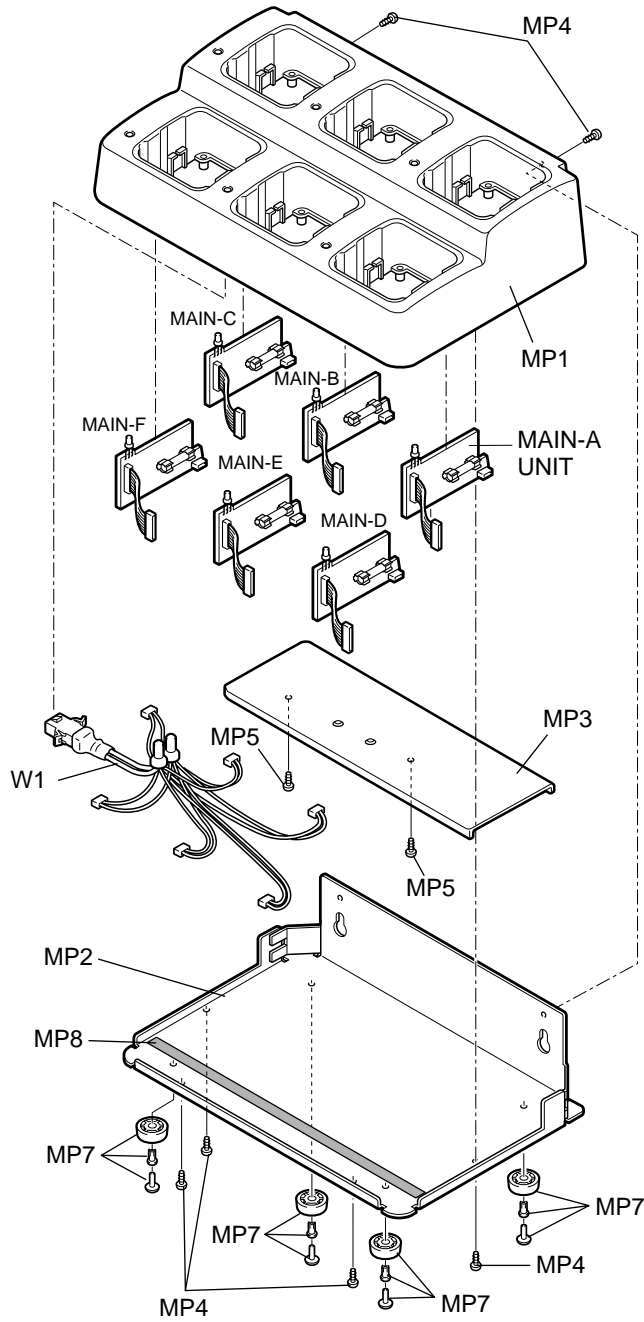
### Screw abbreviations

B0: Self-tapping PH: Pan head NI-ZU: Nickel-Zinc

### [ACCESSORIES]

| REF NO. | ORDER NO.        | DESCRIPTION   | QTY.             |
|---------|------------------|---|------------------|
| EP1     | Optional product | Charger BC-145A [USA], [USA-1]<br>Charger BC-145E [EUR], [EUR-1]<br>Charger BC-145V [AUS], [AUS-1]<br>Charger BC-145UK [UK], [UK-1] | 1<br>1<br>1<br>1 |

## 5-2 BC-121N



### [CHASSIS PARTS]

| REF NO. | ORDER NO.  | DESCRIPTION              | QTY. |
|---------|------------|--------------------------|------|
| MP1     | 8510014530 | 1800 case (B)            | 1    |
| MP2     | 8110005890 | 1800 cover               | 1    |
| MP3     | 8930057960 | 2571 plate               | 1    |
| MP4     | 8810008660 | Screw PH BT M3 × 8 NI-ZU | 6    |
| MP5     | 8810008660 | Screw PH BT M3 × 8 NI-ZU | 2    |
| MP7     | 8930040590 | Rubber foot (K)          | 4    |
| MP8     | 8930037900 | Sheet BB                 | 1    |
| W1      | 8900011310 | Cable OPC-1161           | 1    |

### [ACCESSORIES]

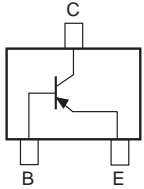
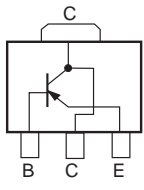
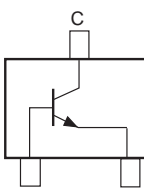
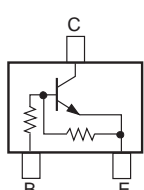
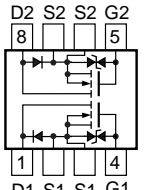
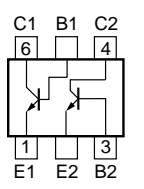
| REF NO. | ORDER NO.  | DESCRIPTION           | QTY. |
|---------|------------|-----------------------|------|
| MP1     | 8930041660 | Stand leg cushion (B) | 4    |

#### Screw abbreviations

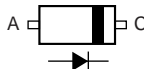
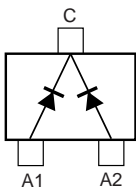
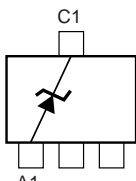
BT: Self-tapping PH: Pan head NI-ZU: Nickel-Zinc

# SECTION 6 SEMI-CONDUCTOR INFORMATION

## 6-1 TRANSISTORS

| NAME       | SYMBOL | INSIDE VIEW   |
|------------|--------|---|
| 2SA1576 R  | AEG    |    |
| 2SB1132 R  | BARB   |    |
| 2SC4081 R  | BR     |   |
| DTC144EU   | 26     |  |
| UPA1890 GR | A1890  |  |
| XP6501 AB  | 5N     |  |

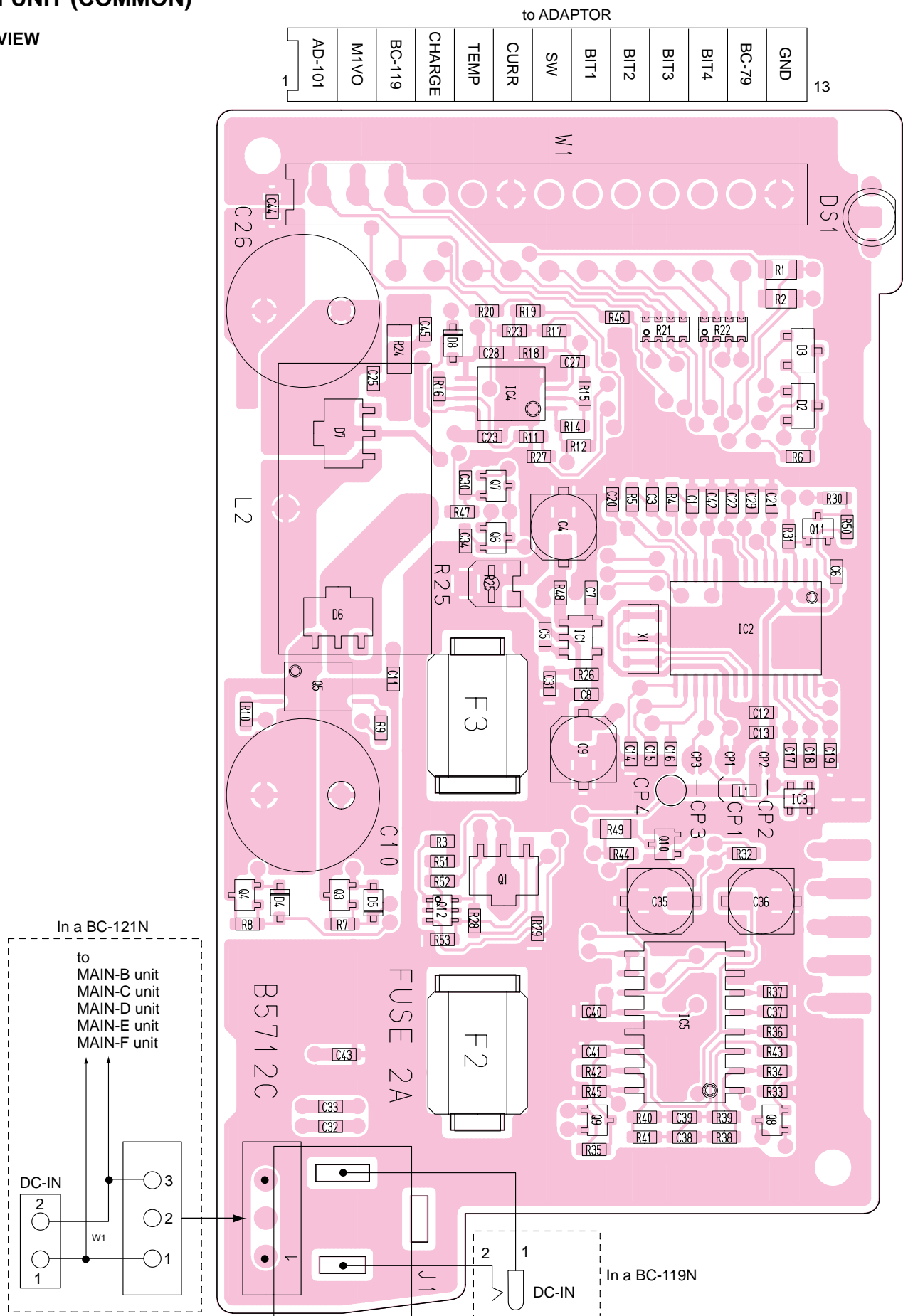
## 6-2 DIODES

| NAME     | SYMBOL | INSIDE VIEW   |
|----------|--------|---|
| 1SS355   | A      |    |
| DAN202K  | N      |    |
| SB20-03P | SC     |  |

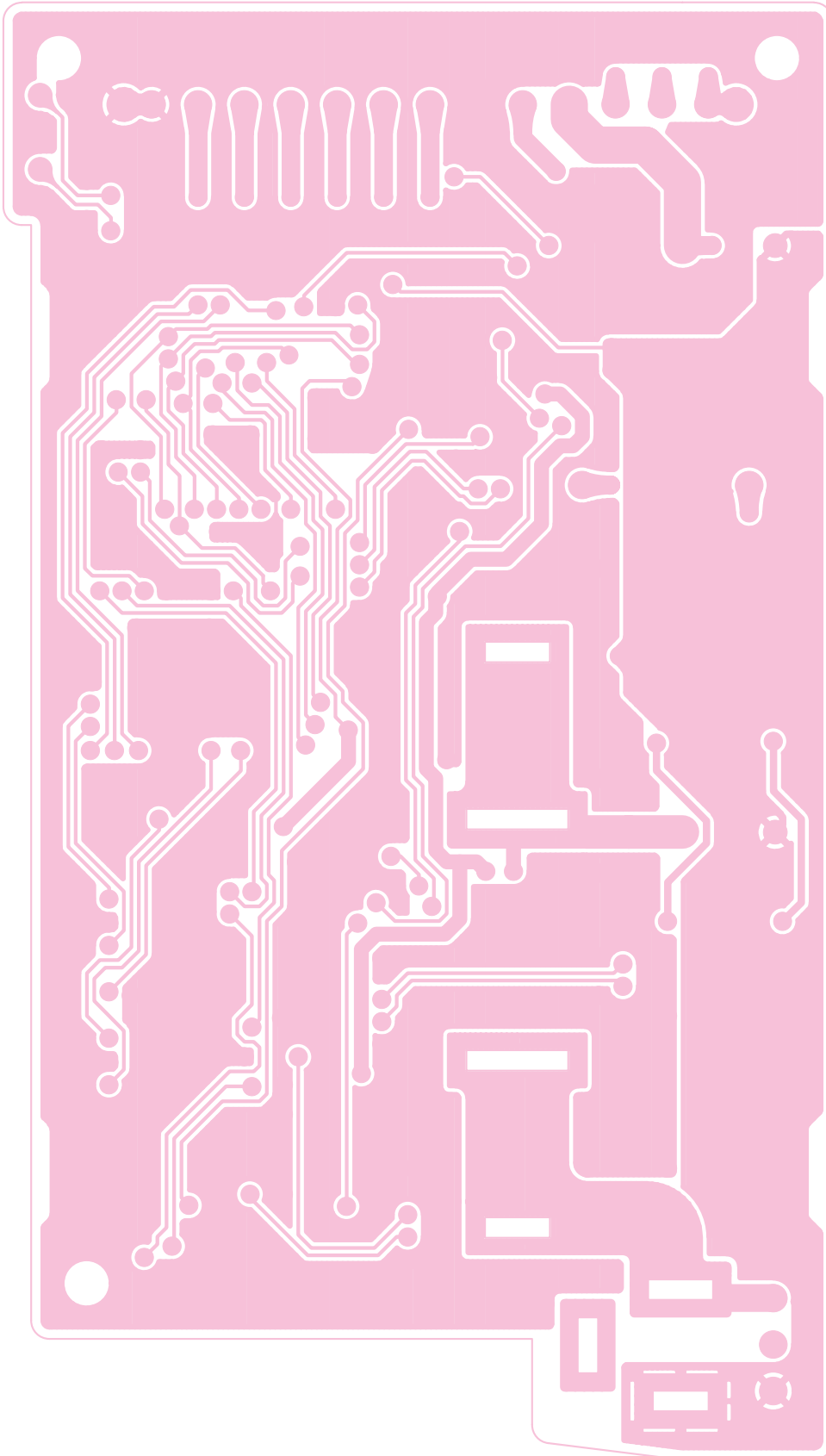
# SECTION 7 BOARD LAYOUTS

## MAIN UNIT (COMMON)

• TOP VIEW

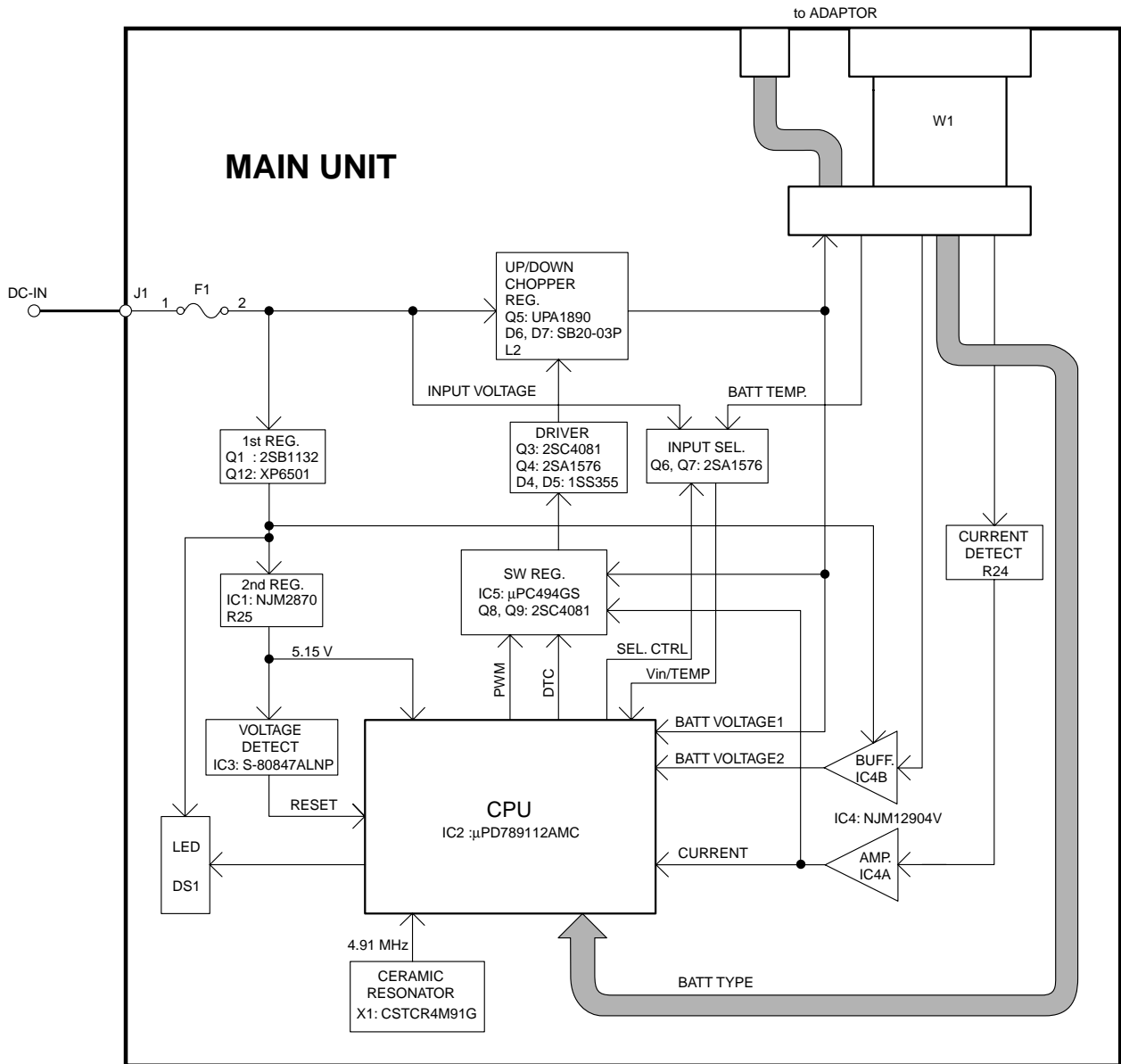


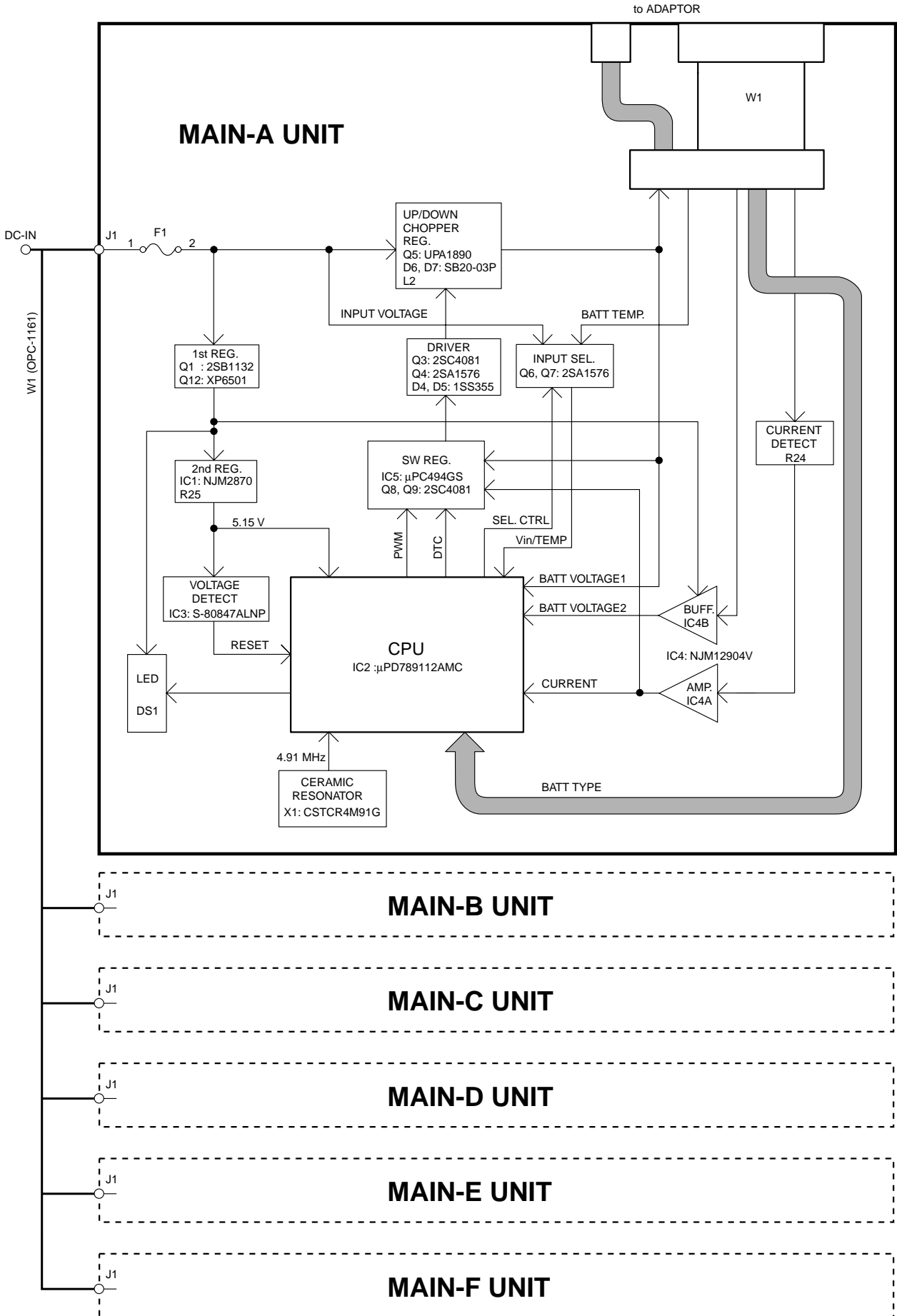
• **BOTTOM VIEW**



# SECTION 8 BLOCK DIAGRAM

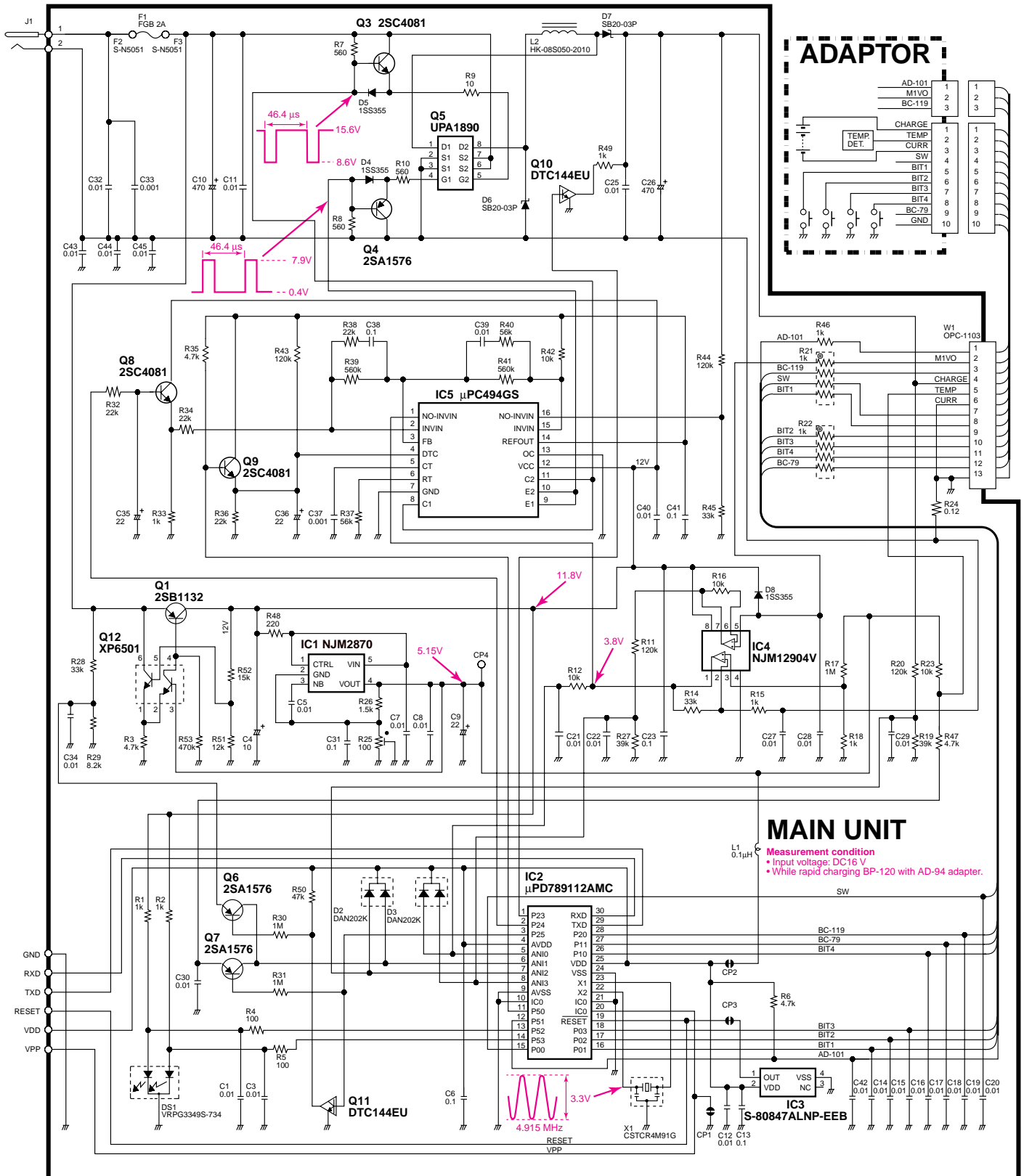
## 8-1 BC-119N





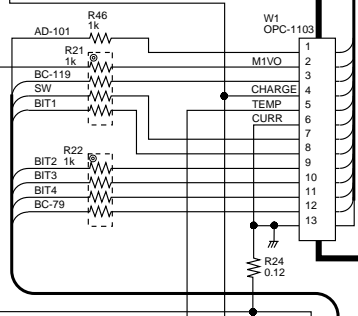
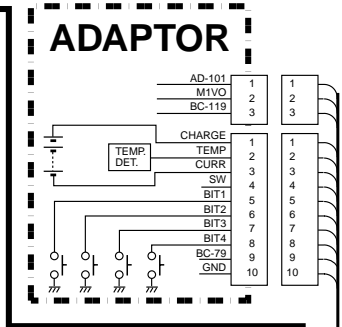
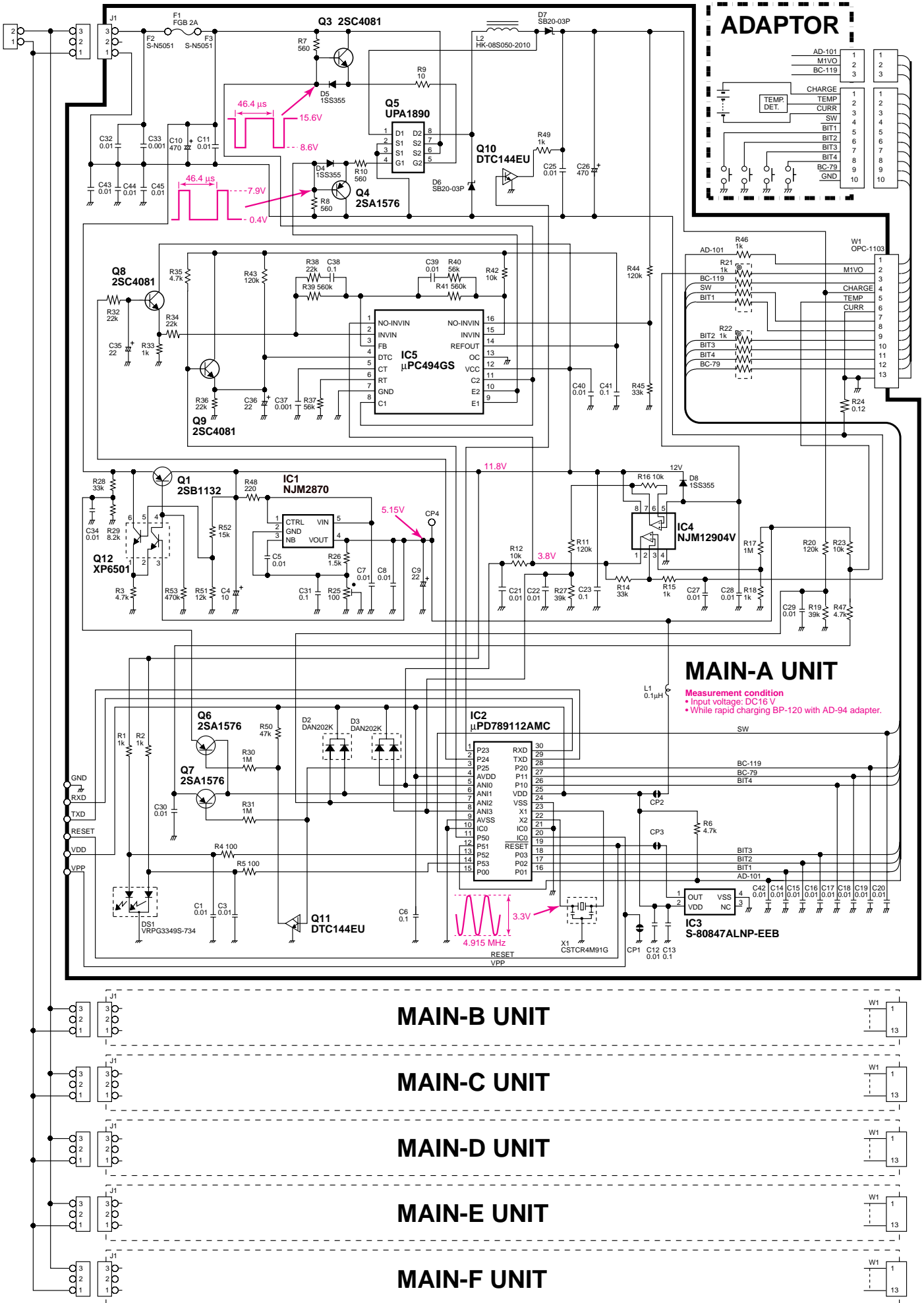
# SECTION 9 VOLTAGE DIAGRAMS

## 9-1 BC-119N





# 9-2 BC-121N



## MAIN-A UNIT

**Measurement condition**  
 • Input voltage: DC16 V  
 • While rapid charging BP-120 with AD-94 adaptor.

MAIN-B UNIT

MAIN-C UNIT

MAIN-D UNIT

MAIN-E UNIT

MAIN-F UNIT

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