

Safety Precautions

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (\triangle) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

5. Leakage current check (Electrical shock hazard testing)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

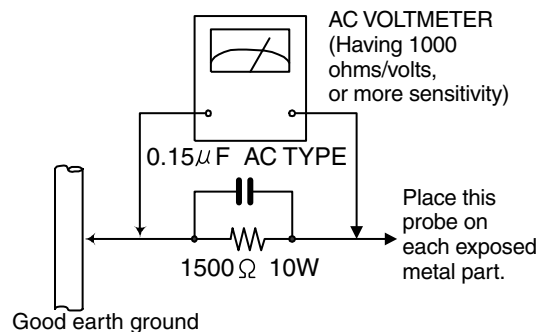
Do not use a line isolation transformer during this check.

- Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.).

- Alternate check method

Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500 Ω 10W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground. Measure the AC voltage across the resistor with the AC voltmeter.

Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.

CAUTION

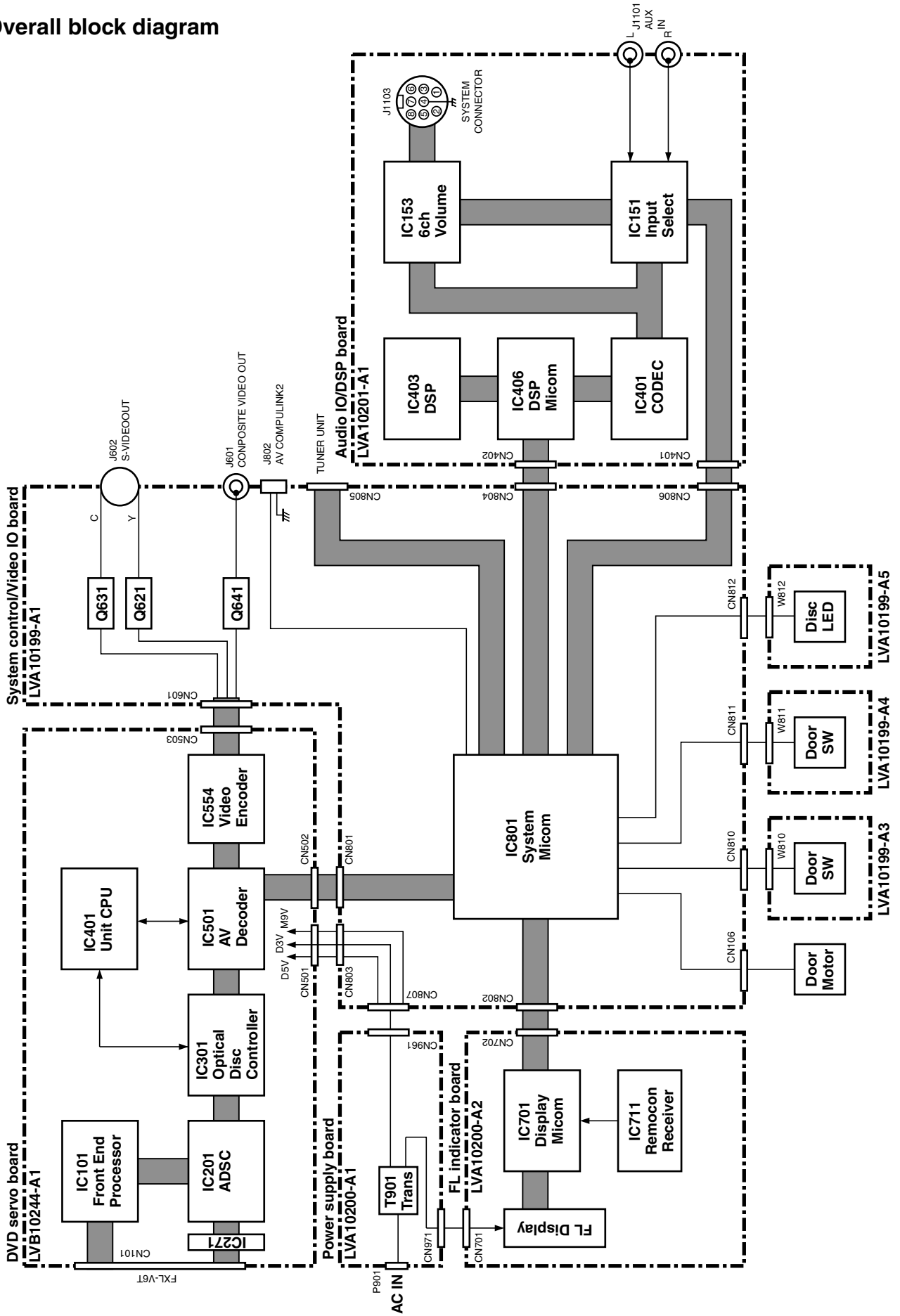
Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of performing repair of this system.

In regard with component parts appearing on the silk-screen printed side (parts side) of the PWB diagrams, the parts that are printed over with black such as the resistor (■), diode (▣) and ICP (●) or identified by the " \triangle " mark nearby are critical for safety.

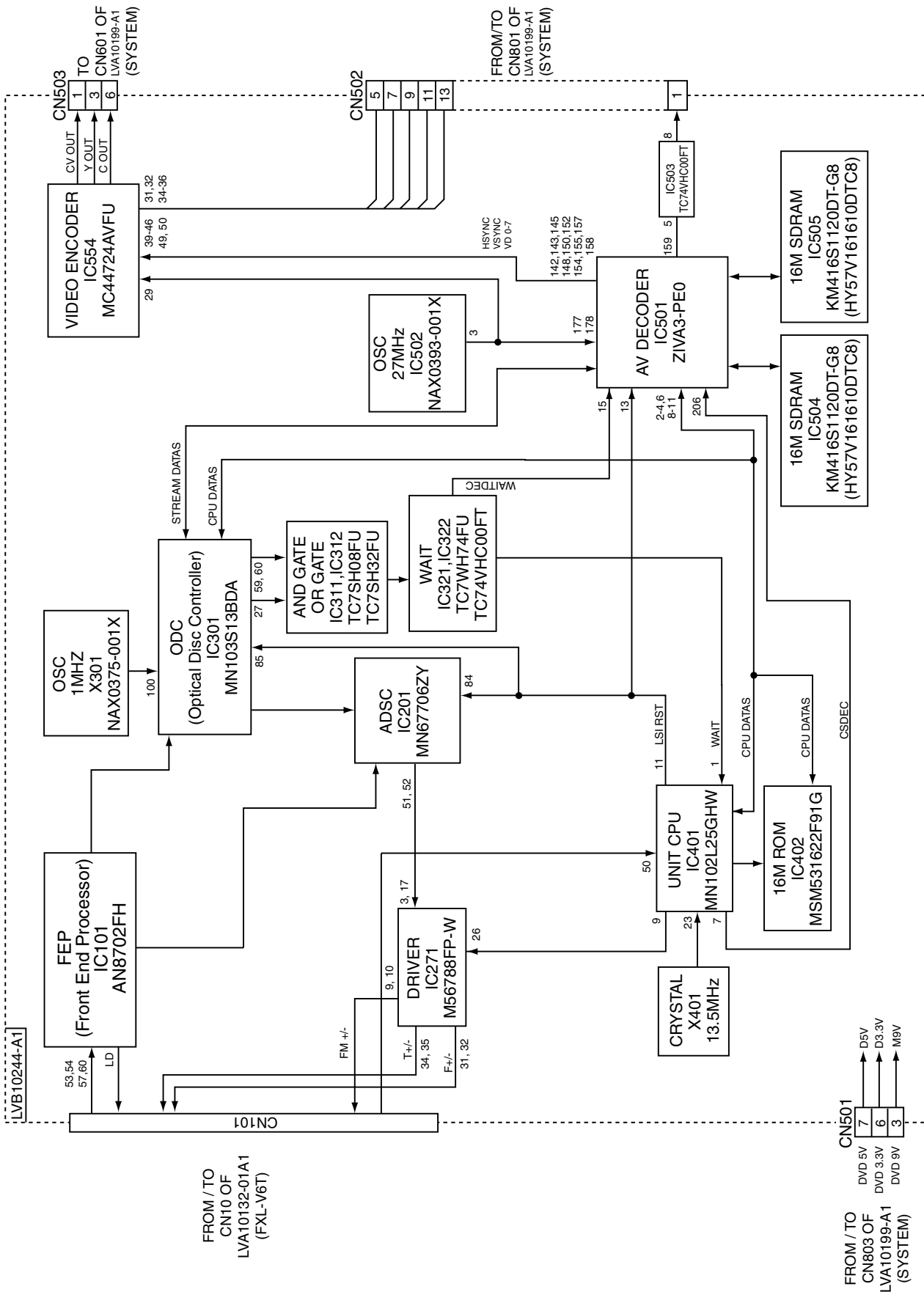
When replacing them, be sure to use the parts of the same type and rating as specified by the manufacturer. (Except the JC version)

Block diagrams

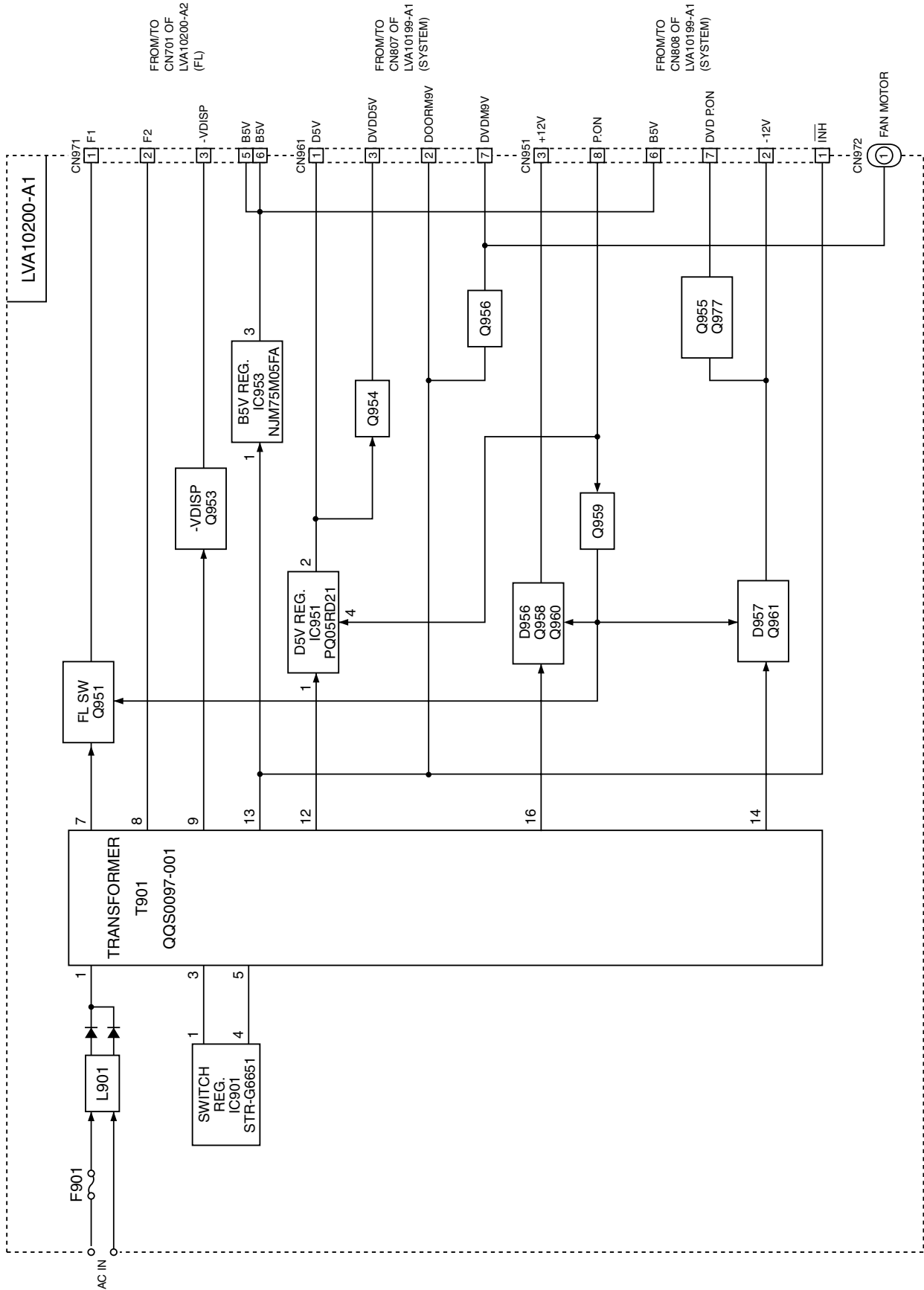
Overall block diagram



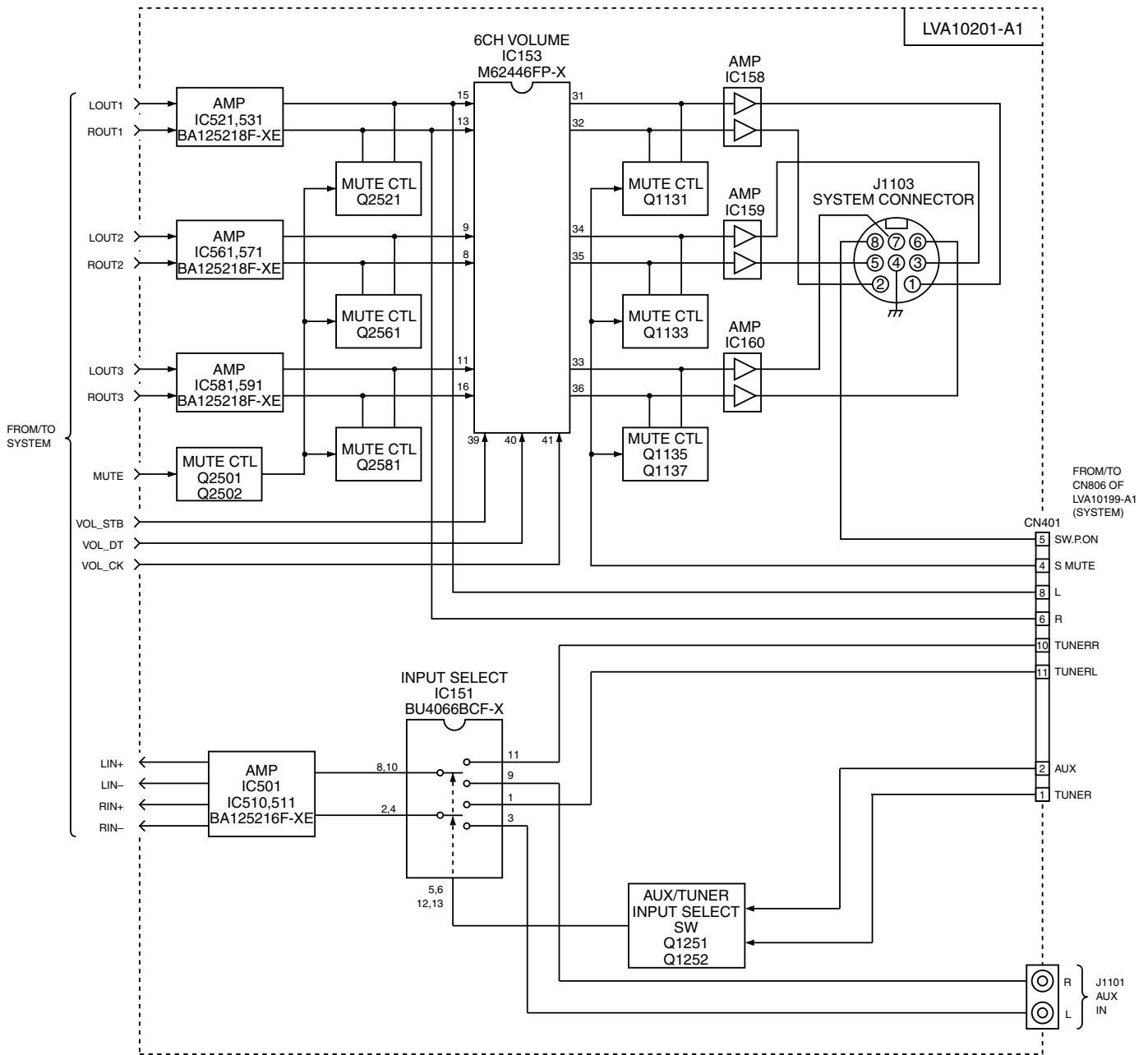
Overall block diagram



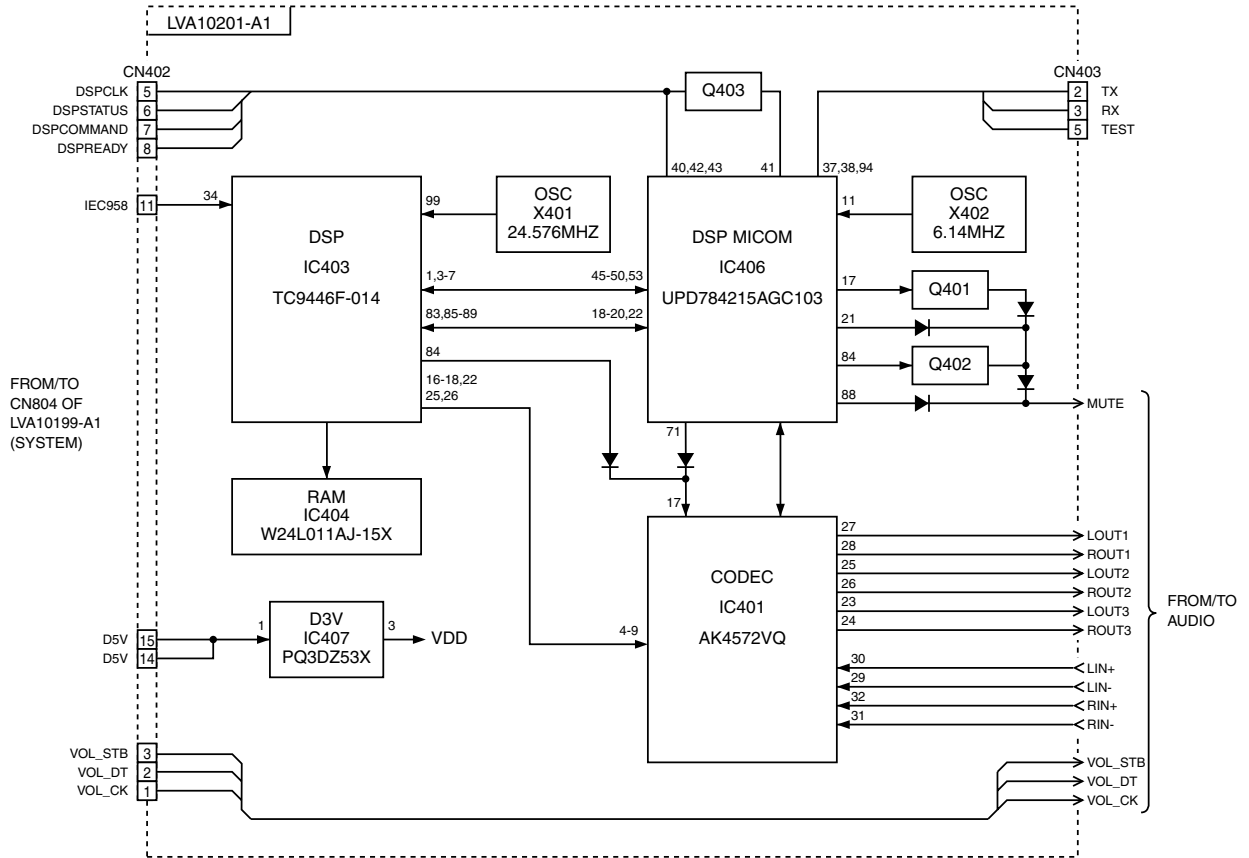
■ Block diagram (power supply section)



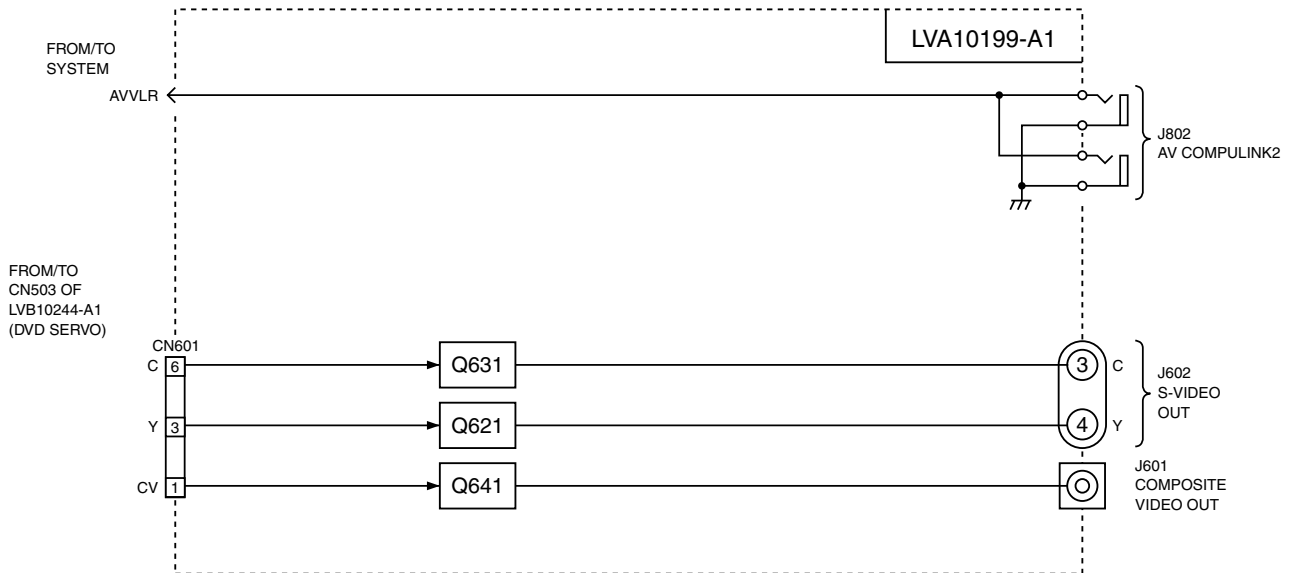
■ Block diagram (audio input/output section)



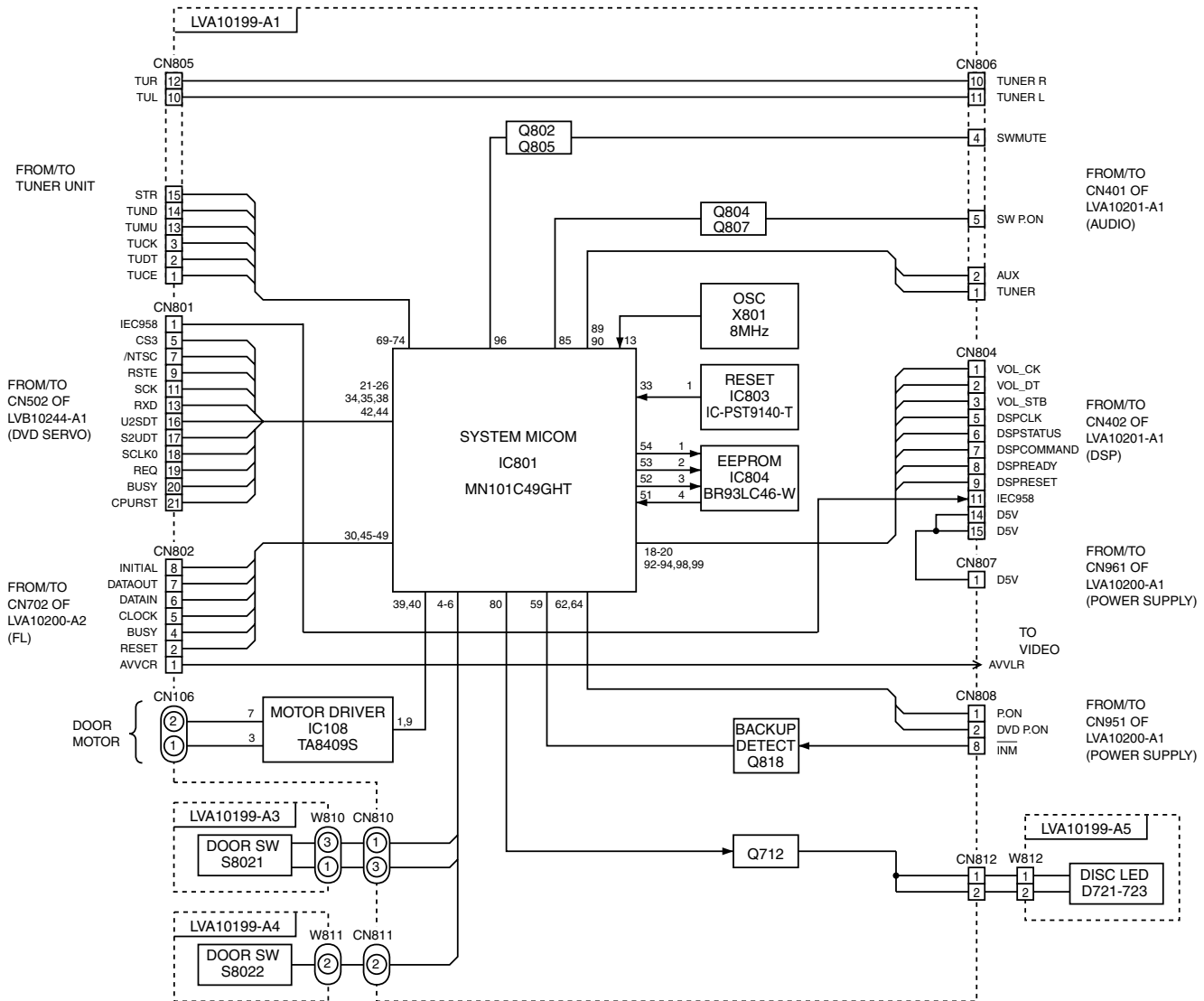
■ Block diagram (DSP section)



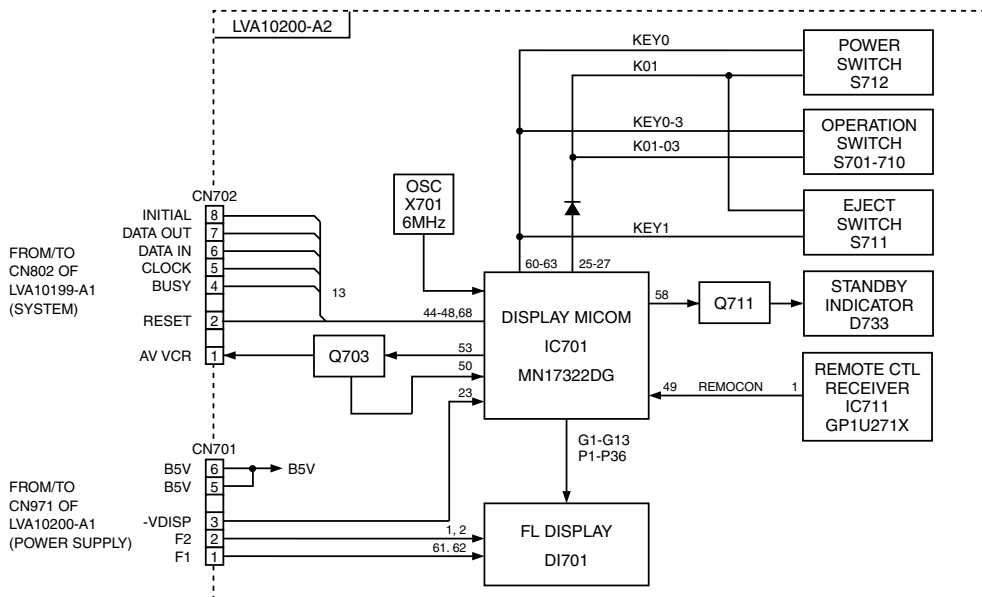
■ Block diagram (video input/output section)



■ Block diagram (system control section)



■ Block diagram (FL section)



Standard schematic diagrams

System control circuit

7
6
5
4
3
2
1

TO DVD (INTERFACE)

TO CN502 OF LVA10244-A1 (SHEET 8/9)

TO DVD (POWER)

TO CN501 OF LVA10244-A1 (SHEET 7/9)

TO POWER

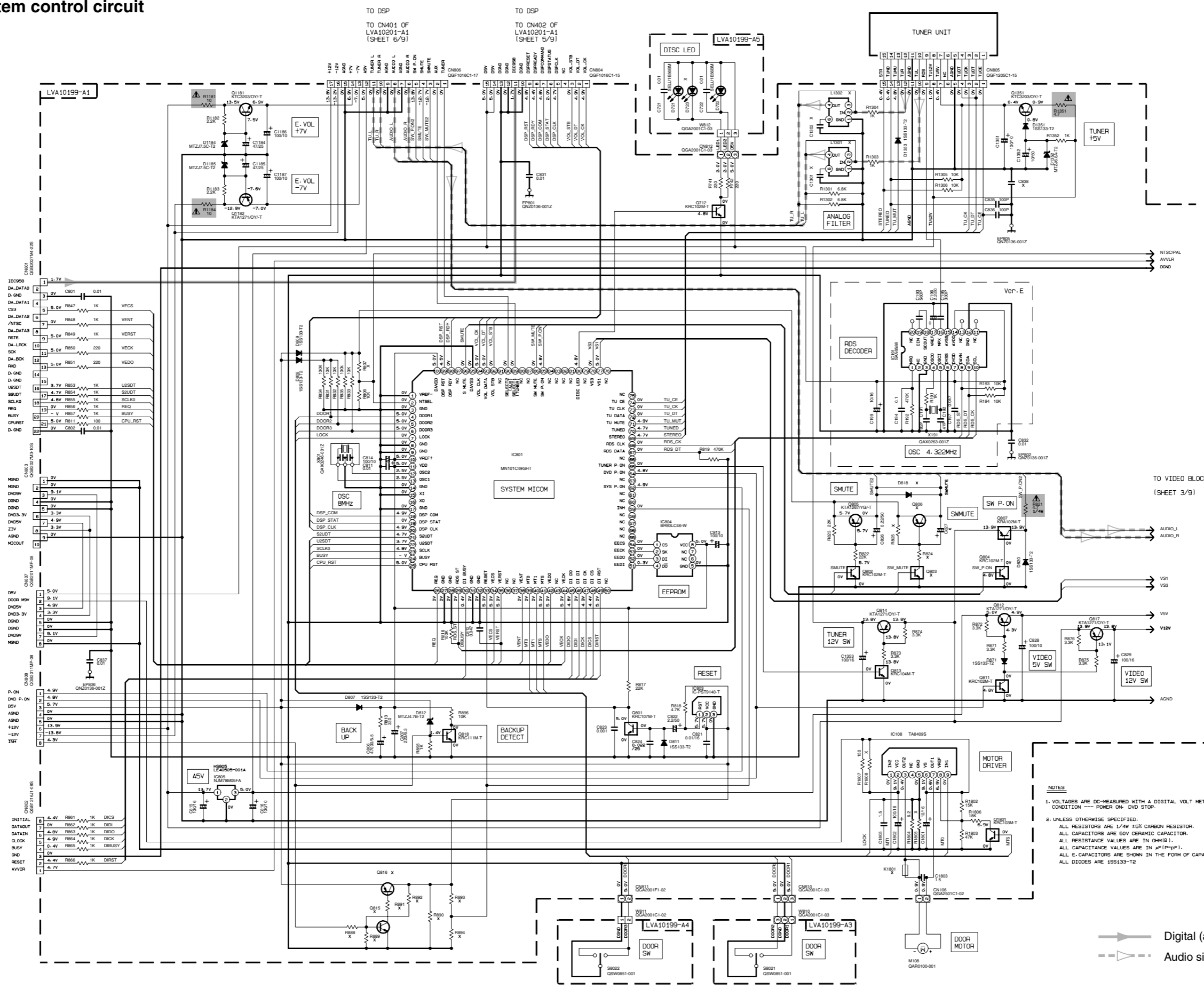
TO CN961 OF LVA10200-A1 (SHEET 1/9)

TO POWER

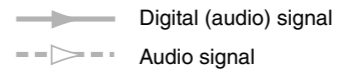
TO CN951 OF LVA10200-A1 (SHEET 1/9)

TO FRONT

TO CN702 OF LVA10200-A2 (SHEET 4/9)



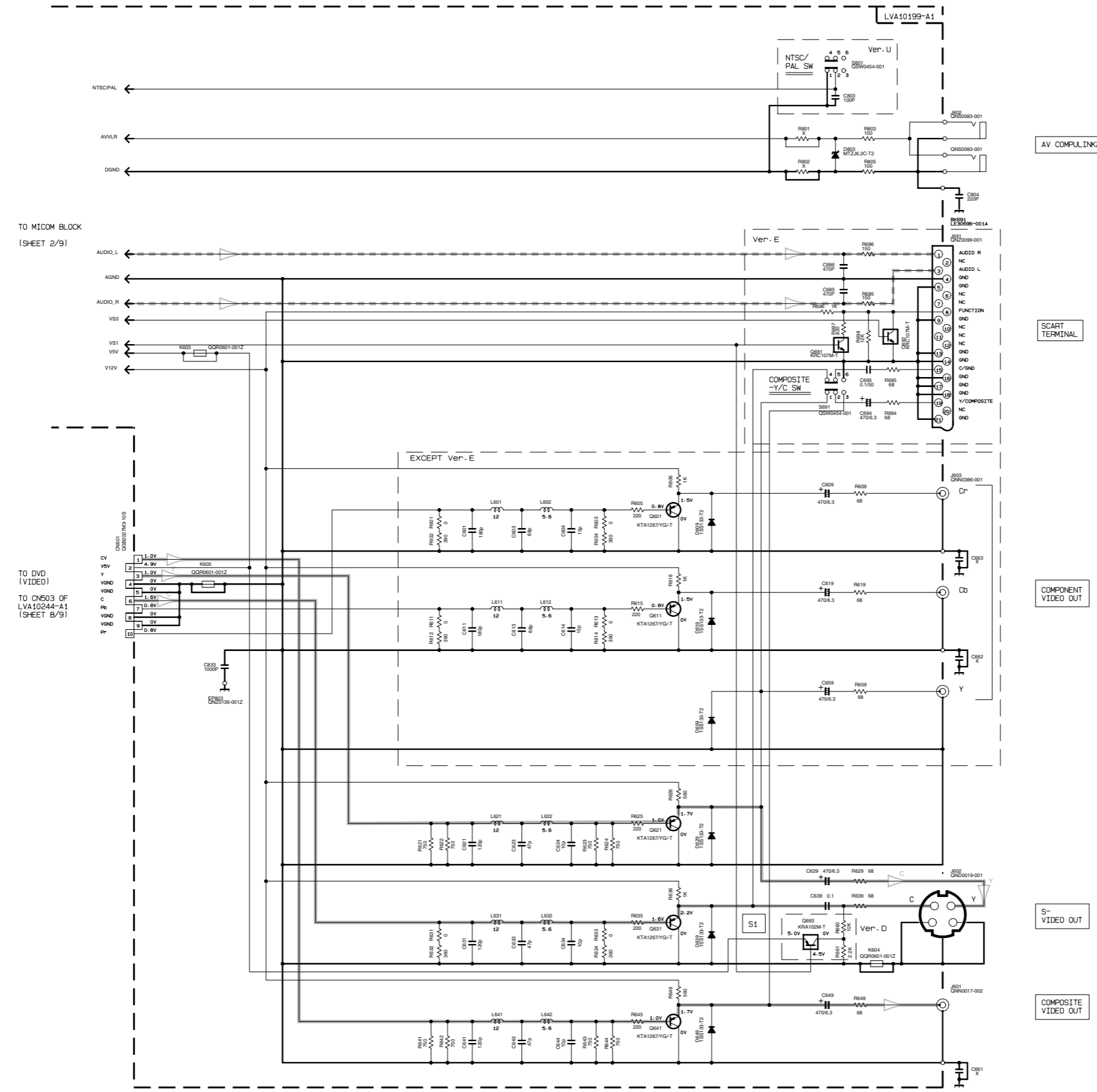
- NOTES**
1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL. CONDITION --- POWER ON, DVD STOP.
 2. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE 1/4W ±5% CARBON RESISTOR.
ALL CAPACITORS ARE 50V CERAMIC CAPACITOR.
ALL RESISTANCE VALUES ARE IN OHM(Ω).
ALL CAPACITANCE VALUES ARE IN μF(μF).
ALL E-CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(μF)/RATED VOLTAGE (V).
ALL DIODES ARE 1SS133-T2



A B C D E F G H I J

Video input/output circuit

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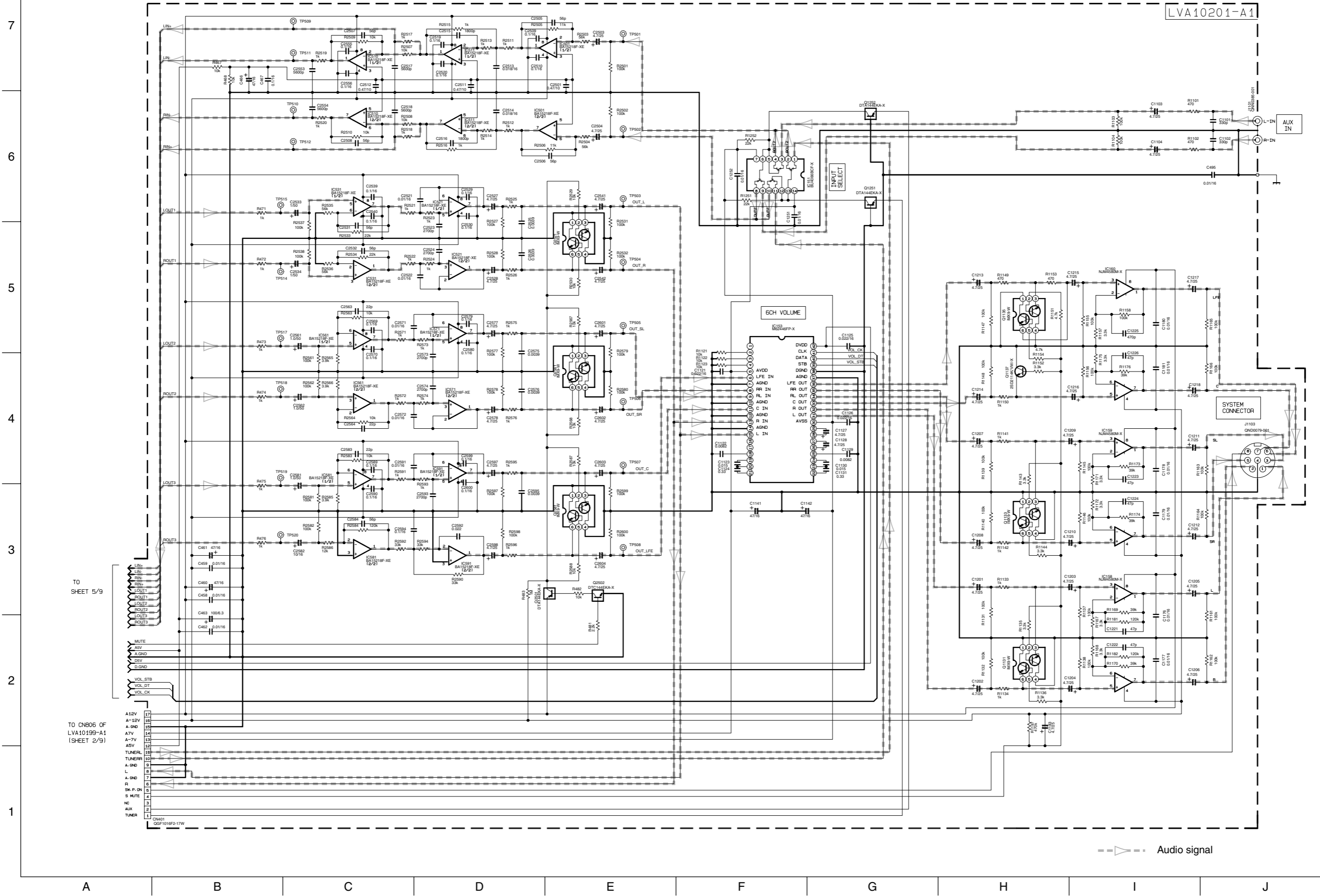


Video (composite) signal
 Video (Y) signal
 Video (C) signal
 Audio signal

NOTES
 1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL.
 CONDITION — POWER ON DVD STOP.
 2. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS ARE 1/4W 5% CARBON RESISTOR.
 ALL CAPACITORS ARE 50V CERAMIC CAPACITOR.
 ALL RESISTANCE VALUES ARE IN OHM(S).
 ALL CAPACITANCE VALUES ARE IN UF(PMF1).
 ALL CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE (UF)/RATED VOLTAGE (V).
 ALL DIODES ARE 1SS133-12.

A B C D E F G H I J

Audio input/output circuit



TO SHEET 5/9

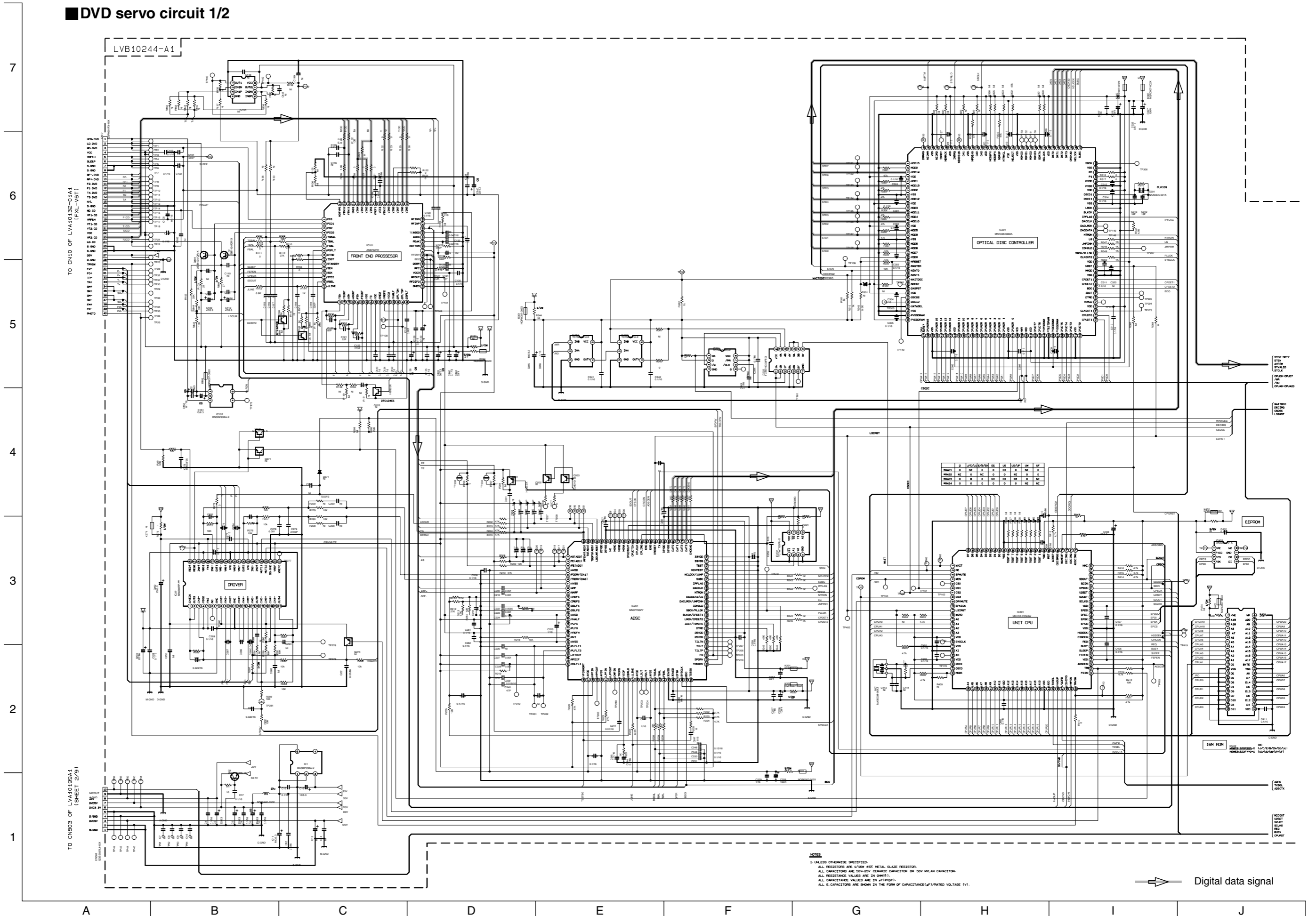
TO CN805 OF LVA10199-A1 (SHEET 2/9)

- 17 A12V
- 16 A-12V
- 15 A.GND
- 14 A+V
- 13 A-7V
- 12 ASV
- 11 TUNERL
- 10 TUNERR
- 9 A.GND
- 8 L
- 7 A.GND
- 6 R
- 5 SK P.ON
- 4 S MUTE
- 3 NC
- 2 AUX
- 1 TUNER

CN801 QGF1018F2-17W

--- Audio signal

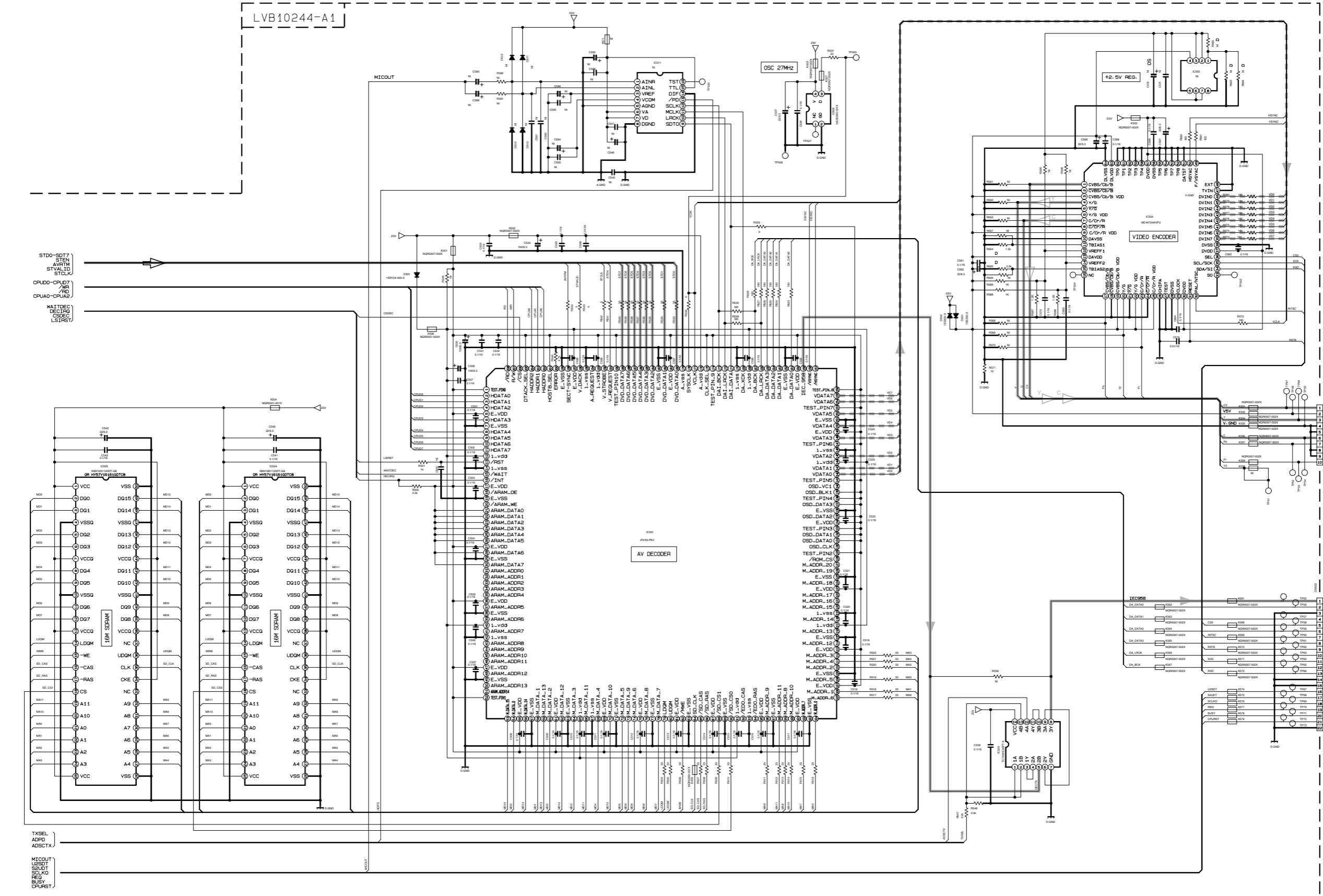
DVD servo circuit 1/2



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS ARE 1/16W 45K METAL GLAZE RESISTOR.
 ALL CAPACITORS ARE 50V 20% CERAMIC CAPACITOR OR 50V MICLAR CAPACITOR.
 ALL RESISTANCE VALUES ARE IN OHMS (Ω).
 ALL CAPACITANCE VALUES ARE IN μF (μF).
 ALL CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE (μF)/RATED VOLTAGE (V).

DVD servo circuit 2/2

7
6
5
4
3
2
1



TO CN601 OF LVA10199A1 (SHEET 3/9)

TO CN601 OF LVA10199A1 (SHEET 2/9)

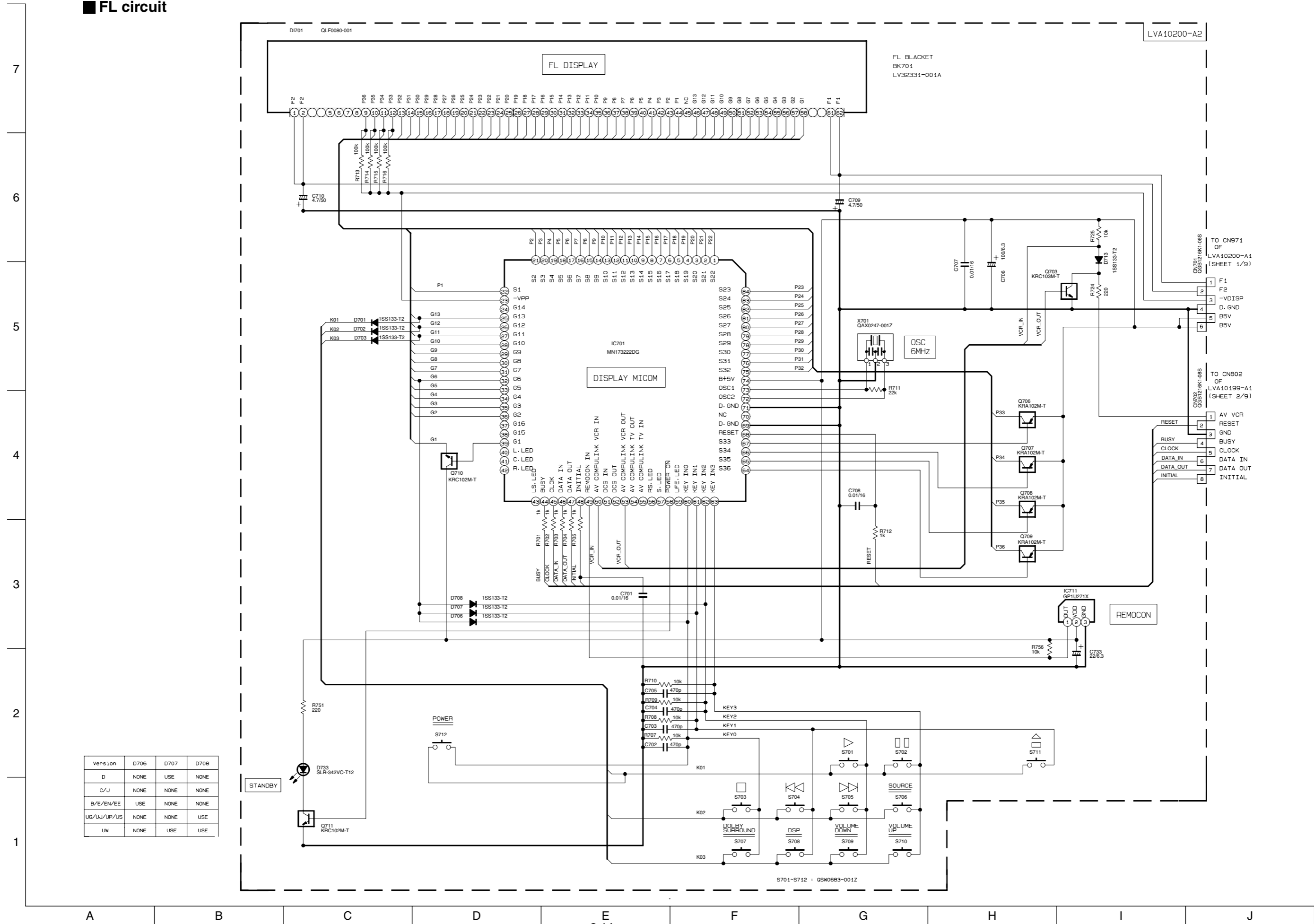


NOTES
 1- UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS ARE 1/8W ±5% METAL GLAZE RESISTOR.
 ALL CAPACITORS ARE 50V, 25V CERAMIC CAPACITOR OR 50V MYLAR CAPACITOR.
 ALL RESISTANCE VALUES ARE IN OHMS (Ω).
 ALL CAPACITANCE VALUES ARE IN PICOFARAD (PF).
 ALL E. CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE (μF)/RATED VOLTAGE (V).

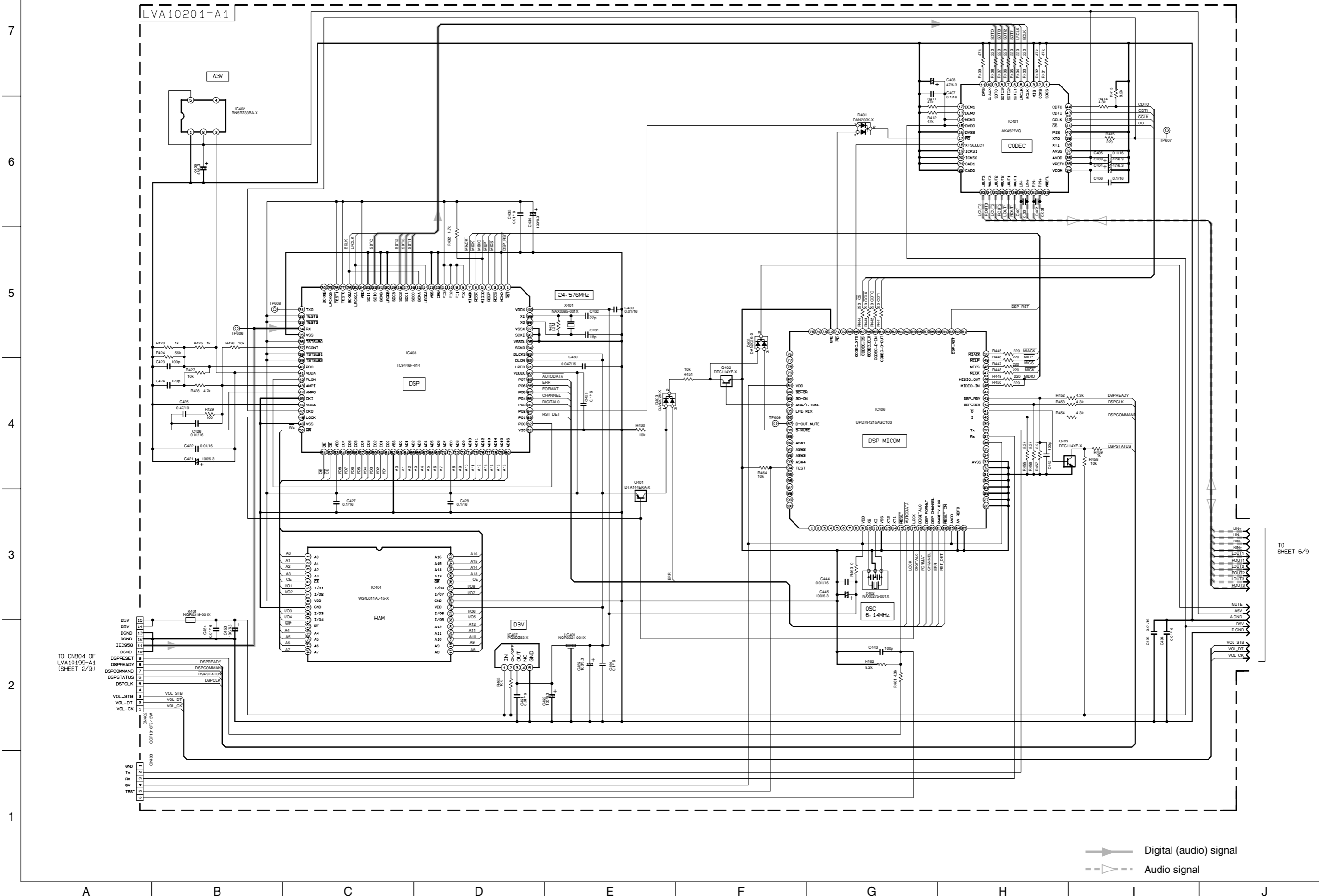
A B C D E F G H I J

TH-A9R

FL circuit



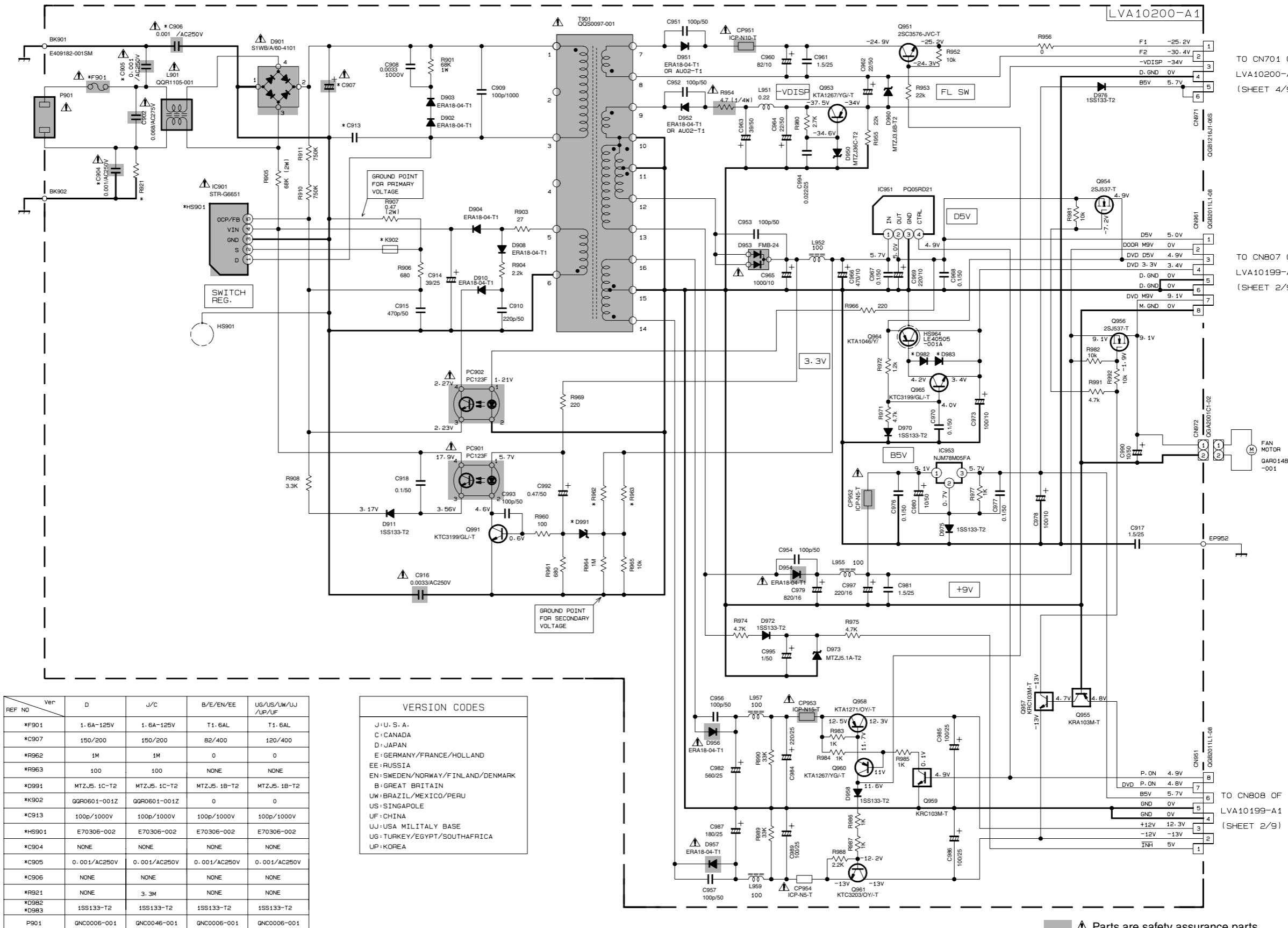
DSP circuit



TO SHEET 6/9

Power supply circuit

- Ver. J/C
120V 60Hz
- Ver. D
100V 50/60Hz
- Ver. B/E/EN/EE
230V 50Hz
- Ver. UG/US/UW/UJ
110~240V 50/60Hz
- Ver. UP
220V 60Hz
- Ver. UF
220V 50Hz



REF NO	Ver	D	J/C	B/E/EN/EE	UG/US/UW/UJ /UP/UF
*F901	1.6A-125V	1.6A-125V	T1-6AL	T1-6AL	
*C907	150/200	150/200	B2/400	120/400	
*R962	1M	1M	0	0	
*R963	100	100	NONE	NONE	
*D991	MTZJ5.1C-T2	MTZJ5.1C-T2	MTZJ5.1B-T2	MTZJ5.1B-T2	
*K902	QGR0601-001Z	QGR0601-001Z	0	0	
*C913	100p/1000V	100p/1000V	100p/1000V	100p/1000V	
*HS901	E70306-002	E70306-002	E70306-002	E70306-002	
*C904	NONE	NONE	NONE	NONE	
*C905	0.001/AC250V	0.001/AC250V	0.001/AC250V	0.001/AC250V	
*C906	NONE	NONE	NONE	NONE	
*R921	NONE	3.3M	NONE	NONE	
*D982	1SS133-T2	1SS133-T2	1SS133-T2	1SS133-T2	
*D983	1SS133-T2	1SS133-T2	1SS133-T2	1SS133-T2	
P901	QNC0006-001	QNC0046-001	QNC0006-001	QNC0006-001	

VERSION CODES	
J	U.S.A.
C	CANADA
D	JAPAN
E	GERMANY/FRANCE/HOLLAND
EE	RUSSIA
EN	SWEDEN/NORWAY/FINLAND/DENMARK
B	GREAT BRITAIN
UW	BRAZIL/MEXICO/PERU
US	SINGAPOLE
UF	CHINA
UJ	USA MILITARY BASE
UG	TURKEY/EGYPT/SOUTHAFRICA
UP	KOREA

Parts are safety assurance parts. When replacing those parts make sure to use the specified one.

TO CN701 OF LVA10200-A2 (SHEET 4/9)

TO CN807 OF LVA10199-A1 (SHEET 2/9)

TO CN808 OF LVA10199-A1 (SHEET 2/9)

Voltage value table

IC102

NO	DC(V)
1	0V
2	5.0V
3	0V
4	4.3V
5	0V

IC101

NO	DC(V)	NO	DC(V)	NO	DC(V)	NO	DC(V)
1	0V	17	1.7V	33	0V	49	2.2V
2	4.2V	18	1.7V	34	1.3V	50	2.2V
3	0V	19	1.7V	35	2.4V	51	2.2V
4	4.3V	20	1.7V	36	3.3V	52	2.2V
5	1.7V	21	1.7V	37	1.9V	53	2.2V
6	1.7V	22	1.7V	38	2.4V	54	2.2V
7	1.7V	23	0V	39	0V	55	4.8V
8	4.1V	24	1.7V	40	0V	56	2.2V
9	3.3V	25	3.3V	41	1.7V	57	2.2V
10	0V	26	0V	42	1.5V	58	2.2V
11	4.9V	27	2.1V	43	1.6V	59	2.2V
12	4.9V	28	4.8V	44	1.1V	60	2.2V
13	4.9V	29	4.8V	45	2.5V	61	0V
14	4.9V	30	2.1V	46	2.1V	62	2.2V
15	1.2V	31	2.1V	47	2.1V	63	2.2V
16	1.7V	32	2.0V	48	2.1V	64	1.6V

IC311

NO	DC(V)
1	5.0V
2	4.6V
3	0V
4	4.7V
5	5.0V

IC312

NO	DC(V)
1	5.0V
2	4.7V
3	0V
4	5.0V
5	5.0V

IC321

NO	DC(V)
1	5.0V
2	5.0V
3	5.0V
4	0V
5	0V
6	0V
7	5.0V
8	5.0V

IC322

NO	DC(V)
1	5.0V
2	5.0V
3	0V
4	0V
5	0V
6	5.0V
7	0V
8	5.0V
9	0V
10	0V
11	0V
12	5.0V
13	5.0V
14	5.0V

IC271

NO	DC(V)	NO	DC(V)
1	0V	22	1.37V
2	0V	23	1.37V
3	0V	24	0V
4	9V	25	5.0V
5	9V	26	5.0V
6	0V	27	1.37V
7	0V	28	1.37V
8	1.37V	29	0V
9	3.9V	30	1.41V
10	3.4V	31	2.37V
11	0V	32	2.56V
12	3.4V	33	0V
13	4.5V	34	2.39V
14	5.7V	35	2.56V
15	3V	36	1.34V
16	0V	37	1.37V
17	0V	38	4.93V
18	0V	39	9V
19	0V	40	1.37V
20	1.37V	41	3.2V
21	0V	42	3V

IC201

NO	DC(V)	NO	DC(V)	NO	DC(V)	NO	DC(V)
1	1.7V	26	2.1V	76	1.7V	51	1.7V
2	1.7V	27	3.2V	77	1.1V	52	1.7V
3	1.7V	28	1.7V	78	1.1V	53	3.2V
4	3.2V	29	0V	79	1.1V	54	0V
5	1.7V	30	0V	80	1.1V	55	0V
6	1.7V	31	1.7V	81	0V	56	0V
7	0V	32	0V	82	3.3V	57	0V
8	1.6V	33	1.7V	83	3.3V	58	2.6V
9	1.6V	34	1.7V	84	4.8V	59	0V
10	1.5V	35	0.1V	85	4.9V	60	0V
11	1.5V	36	1.6V	86	4.9V	61	0V
12	1.7V	37	1.7V	87	3.3V	62	0V
13	1.5V	38	3.2V	88	4.9V	63	0V
14	3.2V	39	1.6V	89	4.9V	64	0V
15	1.7V	40	1.6V	90	0.5V	65	0V
16	2.7V	41	0V	91	1.7V	66	0V
17	0.2V	42	1.7V	92	2.5V	67	3.3V
18	2.2V	43	1.7V	93	3.3V	68	1.7V
19	1.5V	44	1.7V	94	0.7V	69	3.3V
20	0V	45	0V	95	0V	70	2.5V
21	1.6V	46	3.3V	96	2.6V	71	0V
22	1.6V	47	0V	97	1.8V	72	0V
23	1.5V	48	1.7V	98	1.6V	73	0V
24	1.7V	49	0V	99	1.6V	74	0V
25	1.5V	50	0.3V	100	1.7V	75	3.3V

IC202

NO	DC(V)
1	0V
2	3.3V
3	4.9V
4	0V
5	0V
6	4.9V
7	0V
8	4.9V

IC301

NO	DC(V)	NO	DC(V)	NO	DC(V)	NO	DC(V)
1	3.3V	37	0V	73	0.8V	109	2.5V
2	3.3V	38	0.3V	74	0.8V	110	0V
3	3.3V	39	0V	75	1.7V	111	1.7V
4	3.3V	40	4.1V	76	3.3V	112	1.1V
5	0V	41	4.3V	77	0V	113	1.1V
6	3.3V	42	4.2V	78	3.3V	114	1.1V
7	3.3V	43	1.6V	79	0V	115	1.1V
8	0V	44	2.6V	80	3.3V	116	3.3V
9	3.3V	45	3.3V	81	0V	117	3.3V
10	3.6V	46	3.6V	82	0V	118	3.3V
11	3.3V	47	3.7V	83	0V	119	0V
12	3.3V	48	3.8V	84	0V	120	0V
13	3.3V	49	3.7V	85	4.8V	121	0V
14	3.3V	50	3.8V	86	2.6V	122	0V
15	3.3V	51	1.0V	87	1.7V	123	0V
16	3.3V	52	1.0V	88	0V	124	3.3V
17	3.3V	53	3.6V	89	0V	125	2.6V
18	0V	54	3.8V	90	0V	126	1.3V
19	0V	55	1.0V	91	0V	127	0V
20	3.3V	56	0V	92	3.3V	128	1.4V
21	3.3V	57	0.7V	93	0V	129	1.1V
22	4.5V	58	4.9V	94	3.3V	130	3.3V
23	4.5V	59	4.9V	95	0V	131	1.6V
24	0V	60	4.4V	96	3.3V	132	3.3V
25	0.1V	61	3.3V	97	0V	133	0V
26	4.9V	62	1.2V	98	0V	134	0V
27	4.9V	63	2.4V	99	0V	135	3.3V
28	1.4V	64	0V	100	1.6V	136	1.3V
29	0V	65	0V	101	1.6V	137	0V
30	3.3V	66	2.6V	102	3.3V	138	3.3V
31	0V	67	0V	103	0V	139	1.3V
32	3.3V	68	1.0V	104	3.3V	140	1.0V
33	0V	69	2.1V	105	3.3V	141	1.1V
34	0V	70	1.0V	106	3.3V	142	0V
35	0V	71	0V	107	0V	143	3.3V
36	2.6V	72	2.3V	108	0V	144	3.3V

IC403

NO	DC(V)
1	4.9V
2	5.0V
3	0V
4	0V
5	0V
6	1.0V
7	0V
8	0V

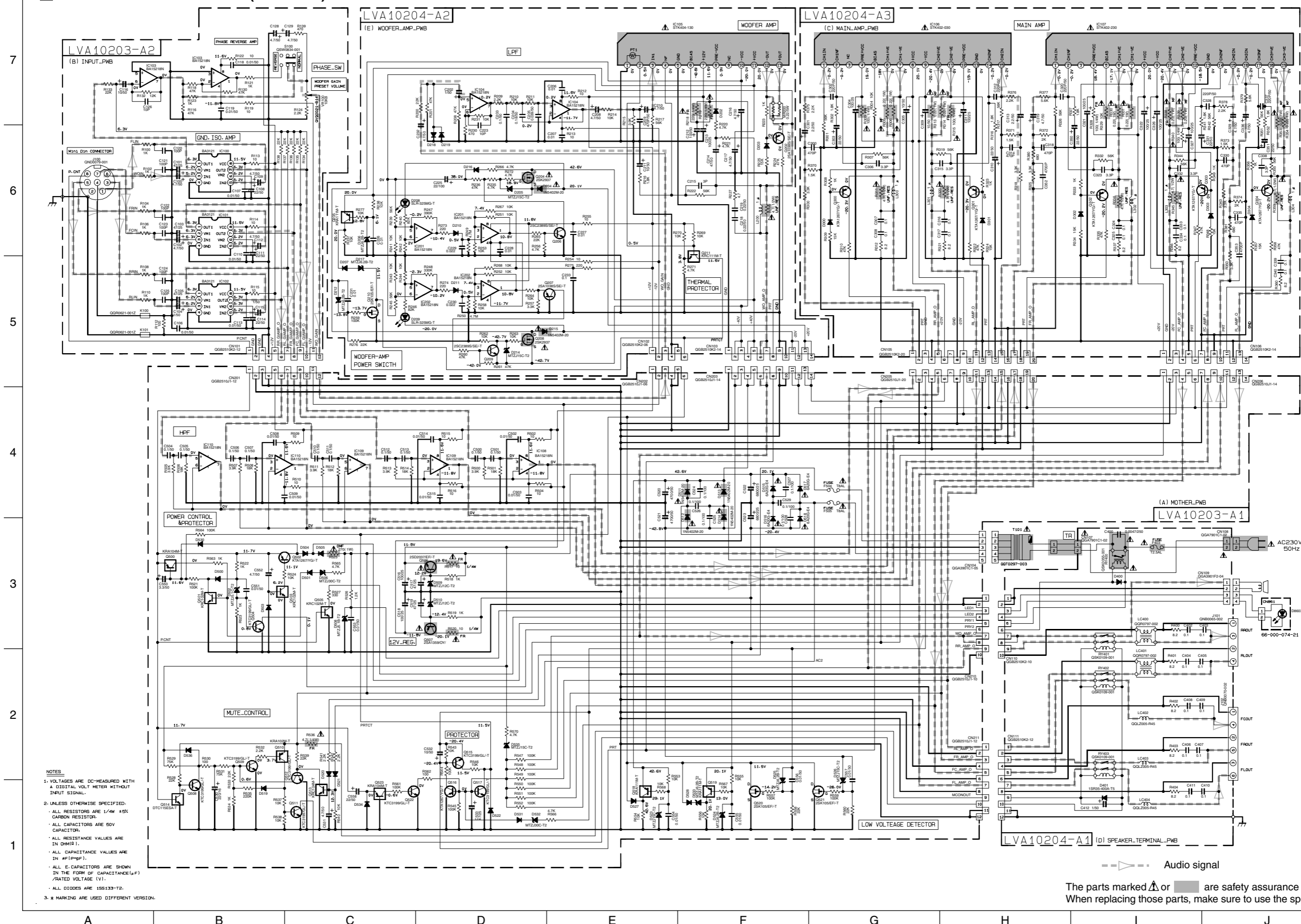
IC402

NO	DC(V)	NO	DC(V)
1	4.9V	23	5V
2	0V	24	2.3V
3	0V	25	0V
4	3.5V	26	2.3V
5	1.7V	27	0V
6	2.1V	28	2.3V
7	1.8V	29	0V
8	2.7V	30	2.4V
9	1.9V	31	0V
10	2.1V	32	0V
11	0V	33	0V
12	4.6V	34	0V
13	0V	35	5V
14	4.2V	36	0V
15	1.1V	37	4V
16	0V	38	4.3V
17	1.5V	39	2.6V
18	0V	40	2V
19	0V	41	2.1V
20	0V	42	3.5V
21	0V	43	0V
22	0V	44	0V

IC501

NO	DC(V)	NO	DC(V)	NO	DC(V)	NO	DC(V)
1	3.1V	53	0.7V	105	0V	157	0.9V
2	1.7V	54	0.7V	106	0V	158	0.9V
3	0.7V	55	3.1V	107	3.1V	159	0V
4	2.0V	56	0.6V	108	0V	160	3.1V
5	3.1V	57	0V	109	0V	161	0V
6	1.6V	58	0.6V	110	0V	162	0V
7	0V	59	0.5V	111	0V	163	0V
8	0V	60	0.5V	112	0V	164	0V
9	2.4V	61	3.1V	113	3.1V	165	0V
10	2.9V	62	0.6V	114	0V	166	0V
11	2.6V	63	0V	115	0V	167	0V
12	2.5V	64	0.6V	116	0V	168	2.5V
13	5.0V	65	2.5V	117	2.5V	169	0.9V
14	0V	66	0.7V	118	0V	170	0V
15	5.0V	67	0V	119	0V	171	0V
16	3.1V	68	0.7V	120	0V	172	1.6V
17	3.1V	69	3.1V	121	0V	173	1.6V
18	3.1V	70	0.6V	122	0V	174	3.1V
19	0V	71	0V	123	3.1V	175	3.1V
20	3.1V	72	0.7V	124	0V	176	3.1V
21	3.1V	73	0.7V	125	0V	177	1.6V
22	3.1V	74	0.6V	126	0V	178	3.1V
23	3.1V	75	3.1V	127	0V	179	0V
24	3.1V	76	0.7V	128	0.8V	180	5.0V
25	3.1V	77	0V	129	3.1V	181	3.1V
26	3.1V	78	0.8V	130	3.1V	182	5.0V
27	3.1V	79	3.2V	131	3.1V	183	0V
28	3.1V	80	3.2V	132	3.1V	184	5.0V
29	0V	81	3.1V	133	3.1V	185	5.0V
30	3.1V	82	3.2V	134	3.1V	186	5.0V
31	0V	83	0V	135	3.1V	187	5.0V
32	0V	84	0V	136	0V	188	5.0V
33	0V	85	3.2V	137	3.1V	189	5.0V
34	0V	86	0V	138	3.1V	190	3.1V
35	3.1V	87	3.1V	139	3.1V	191	3.1V
36	3.1V	88	0V	140	0.8V	192	2.6V
37	0V	89	0V	141	3.1V	193	3.1V
38	0V	90	3.1V	142	0.9V	194	0V
39	0V	91	2.5V	143	0.9V	195	0V
40	2.5V	92	3.1V	144	2.5V	196	0V
41	3.1V	93	0V	145	0.9V	197	2.5V
42	0V	94	3.1V	146	0V	198	5.0V
43	3.1V	95	3.1V	147	3.1V	199	0V
44	0V	96	0V	148	0.9V	200	0V
45	3.1V	97	0V	149	3.1V	201	3.1V
46	3.1V	98	0V	150	0.9V	202	2.2V
47	0V	99	0V	151	0V	203	2.4V
48	3.1V	100	0V	152	0.9V	204	2.5V
49	0V	101					

Powered subwoofer circuit (SP-PWA9)



- NOTES**
1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL.
 2. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4W ±5% CARBON RESISTOR.
 3. ALL CAPACITORS ARE 50V CAPACITOR.
 4. ALL RESISTANCE VALUES ARE IN OHM(Ω).
 5. ALL CAPACITANCE VALUES ARE IN #F(pF).
 6. ALL E-CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(μF) /RATED VOLTAGE (V).
 7. ALL DIODES ARE 1SS133-T2.
 8. * MARKING ARE USED DIFFERENT VERSION.

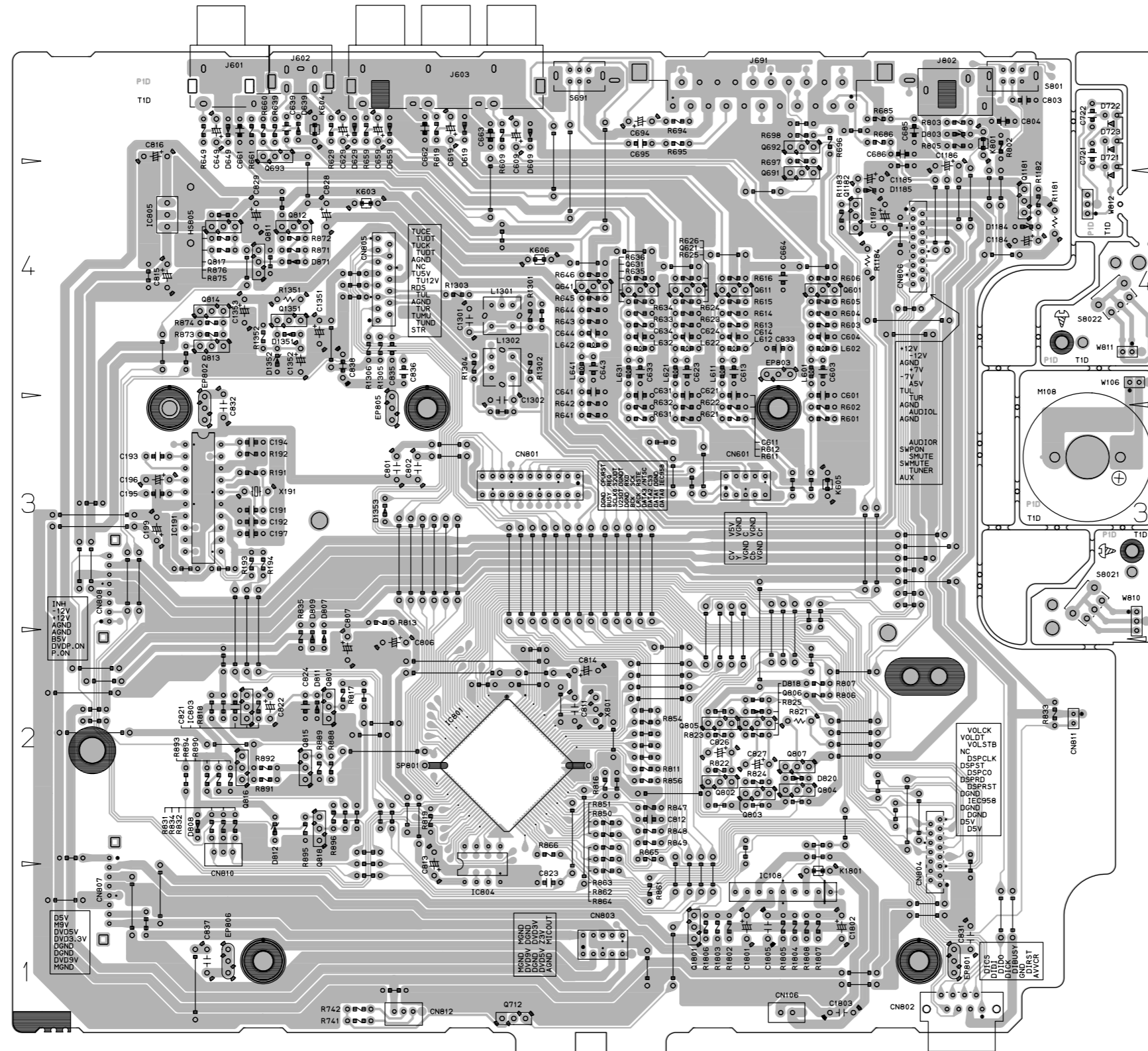
---▶--- Audio signal

The parts marked **▲** or **■** are safety assurance parts. When replacing those parts, make sure to use the specified one.

Printed circuit boards

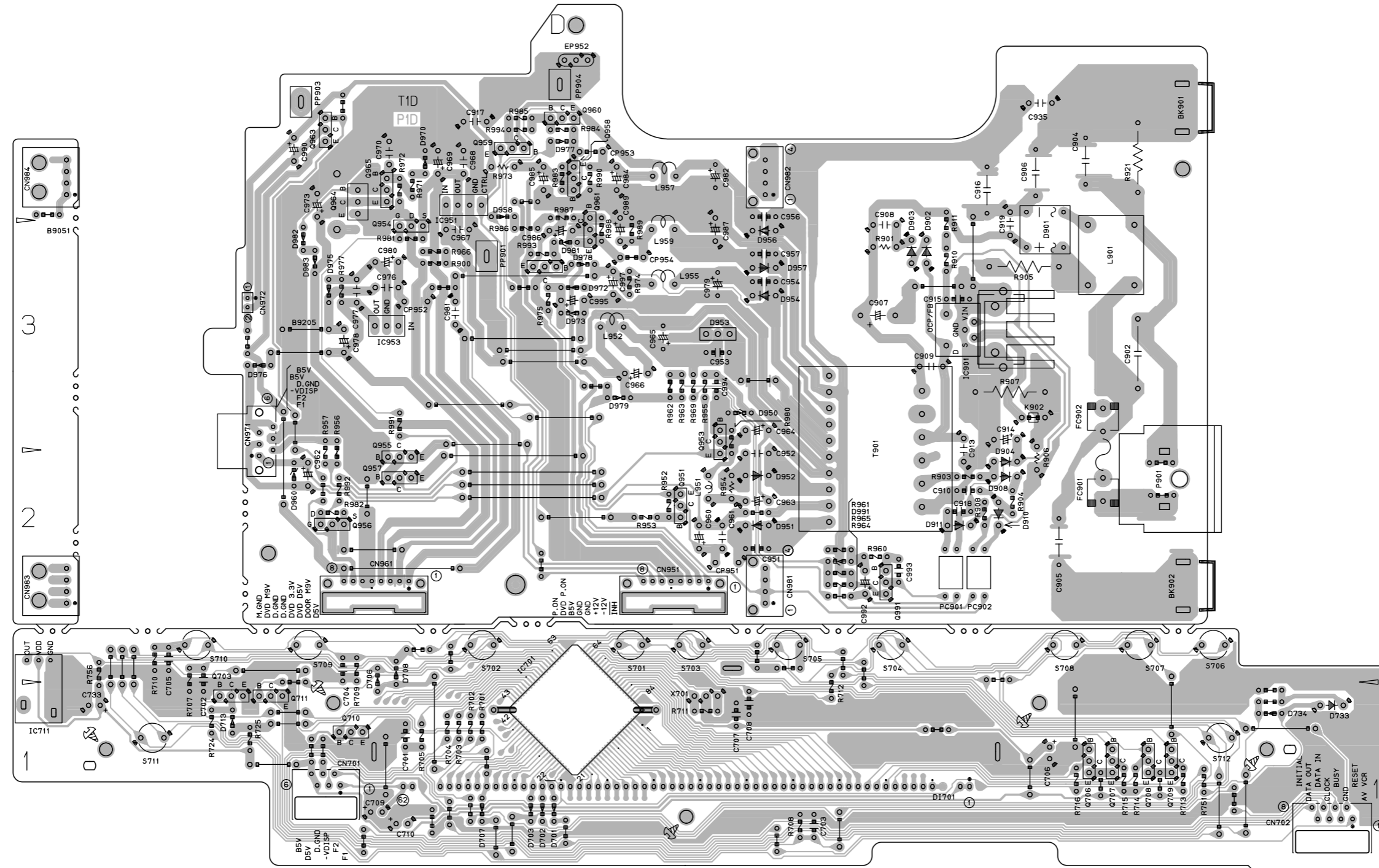
■ Main board

7
6
5
4
3
2
1



A B C D E F G H I J

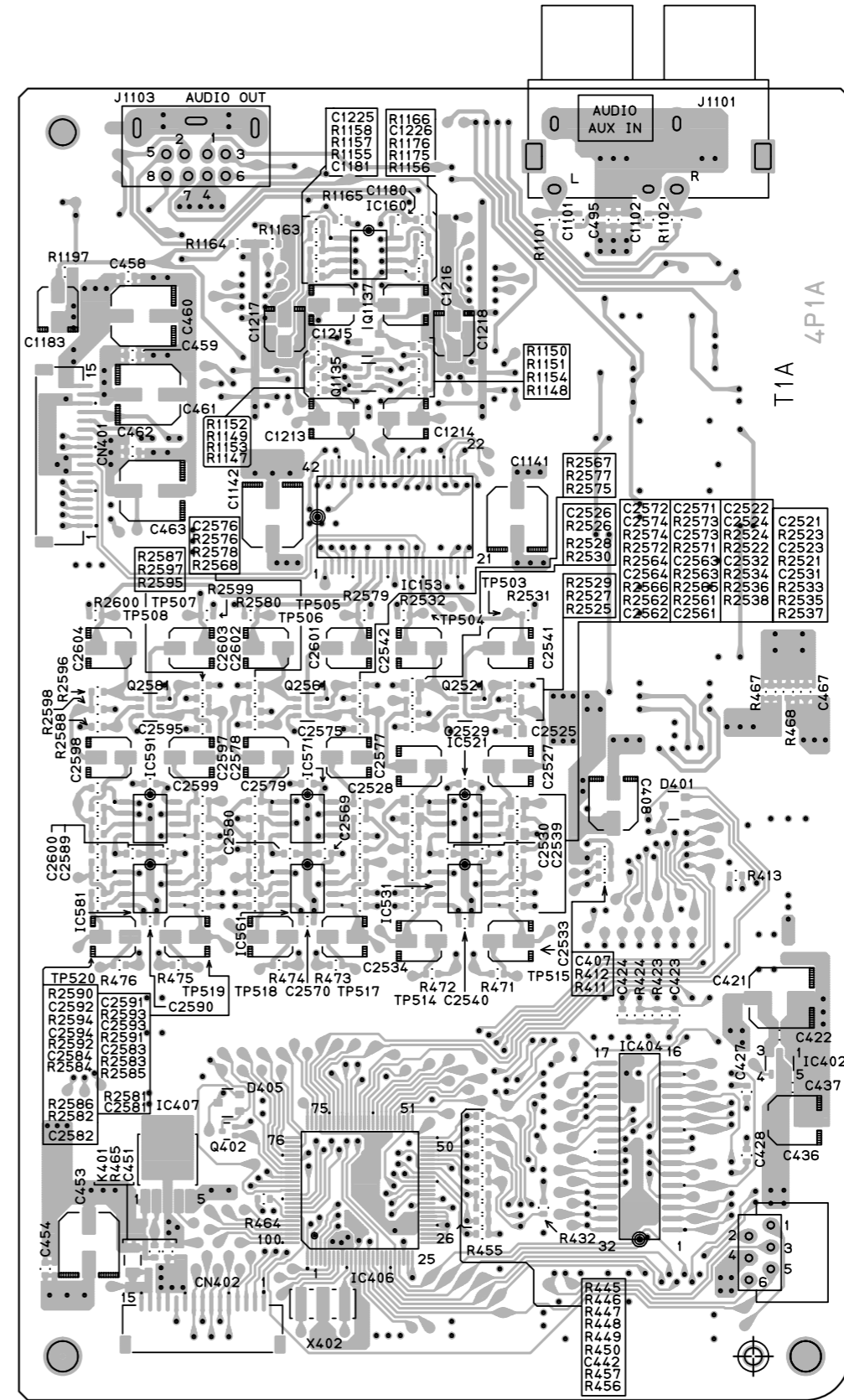
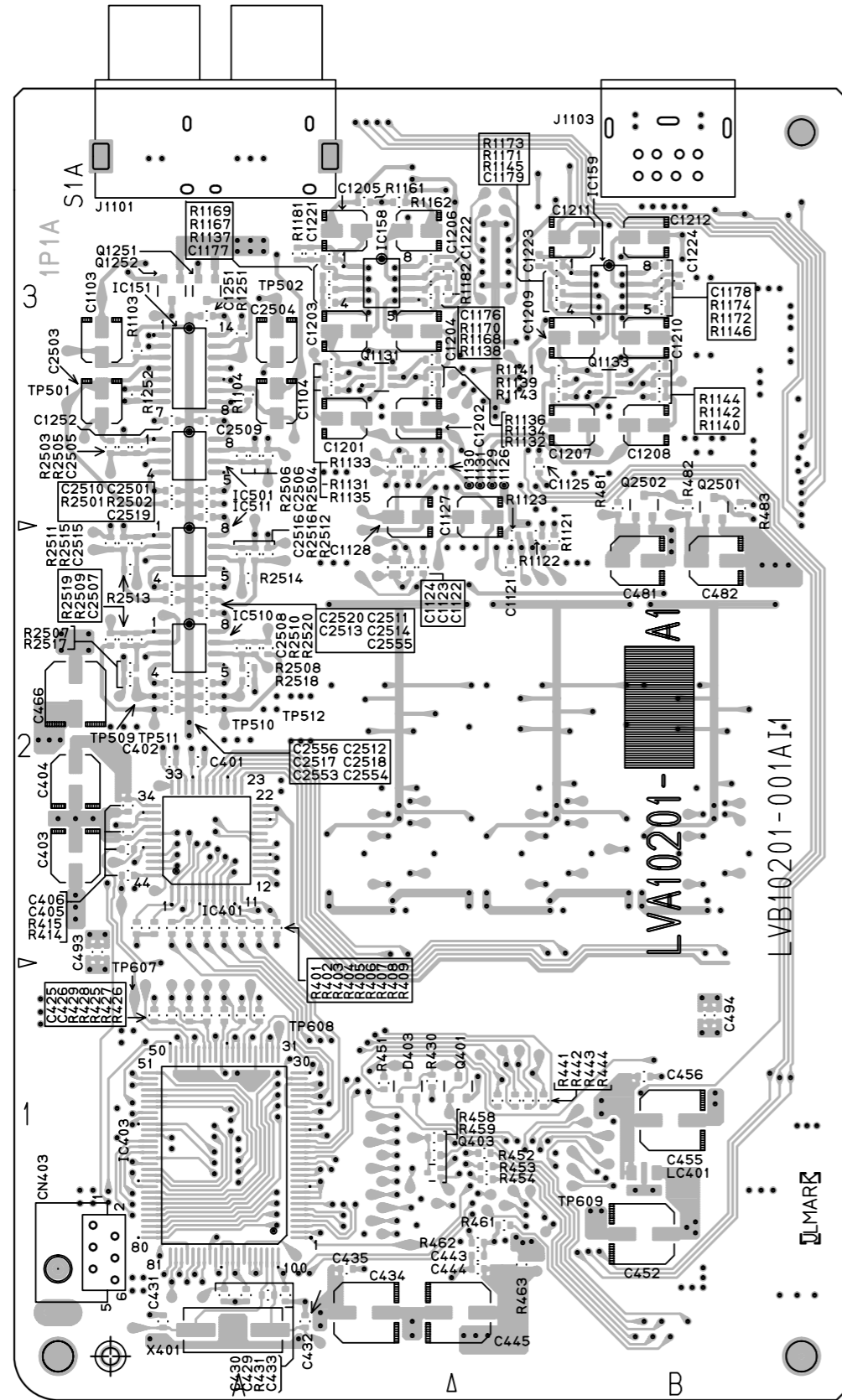
■ Power supply and front panel boards



■ Audio input/output and DSP boards

(Surface view)

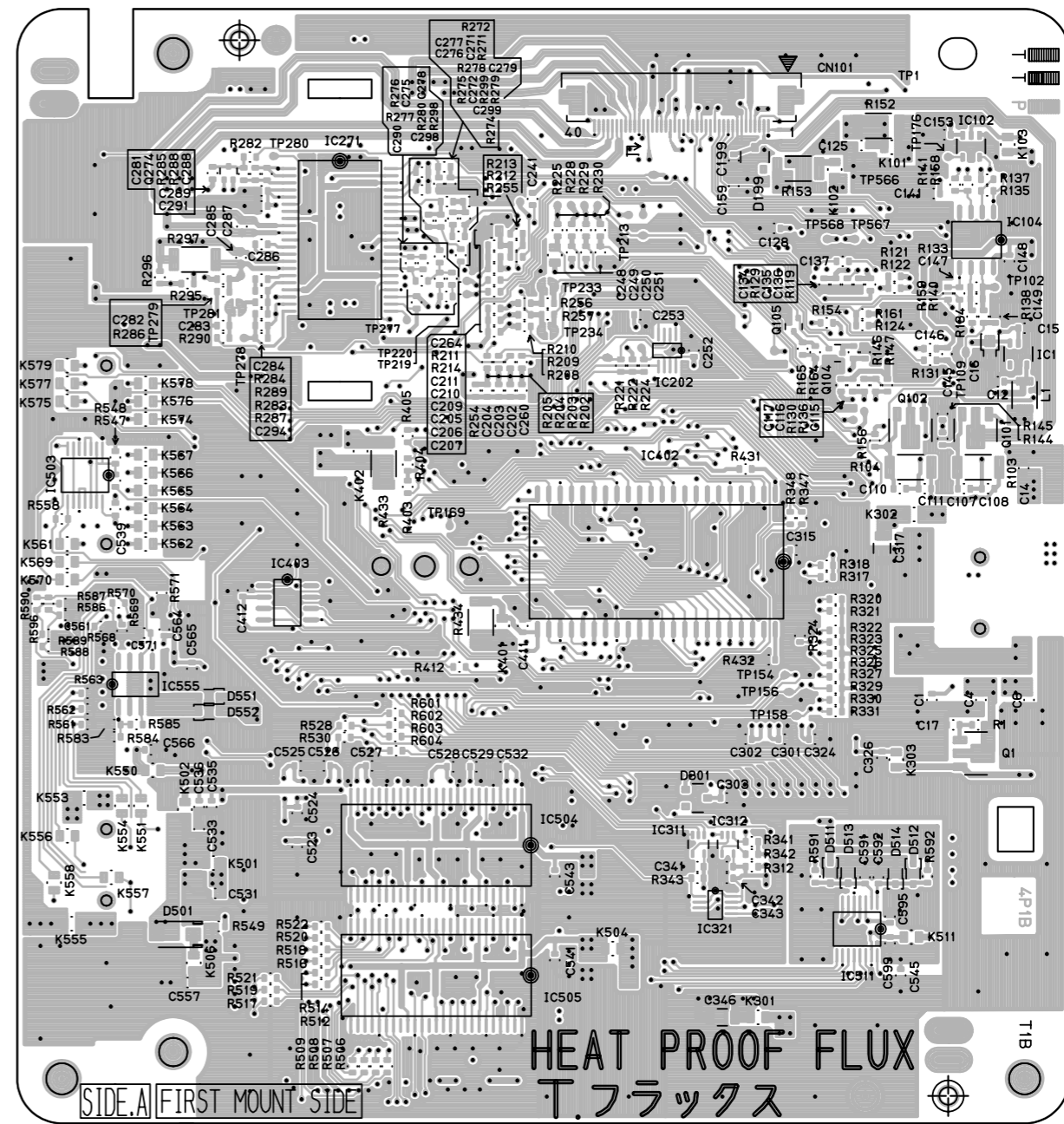
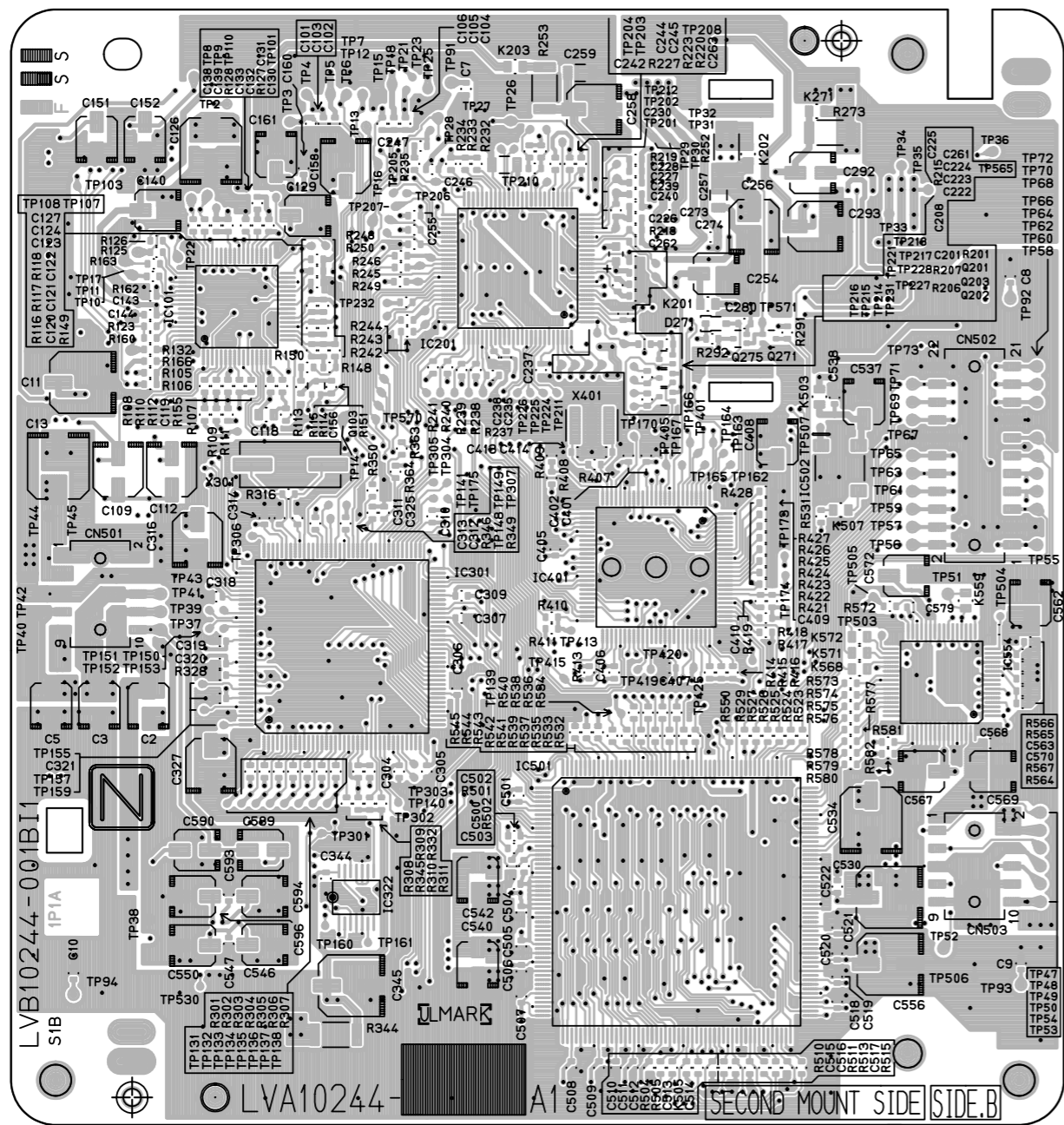
(Bottom view)



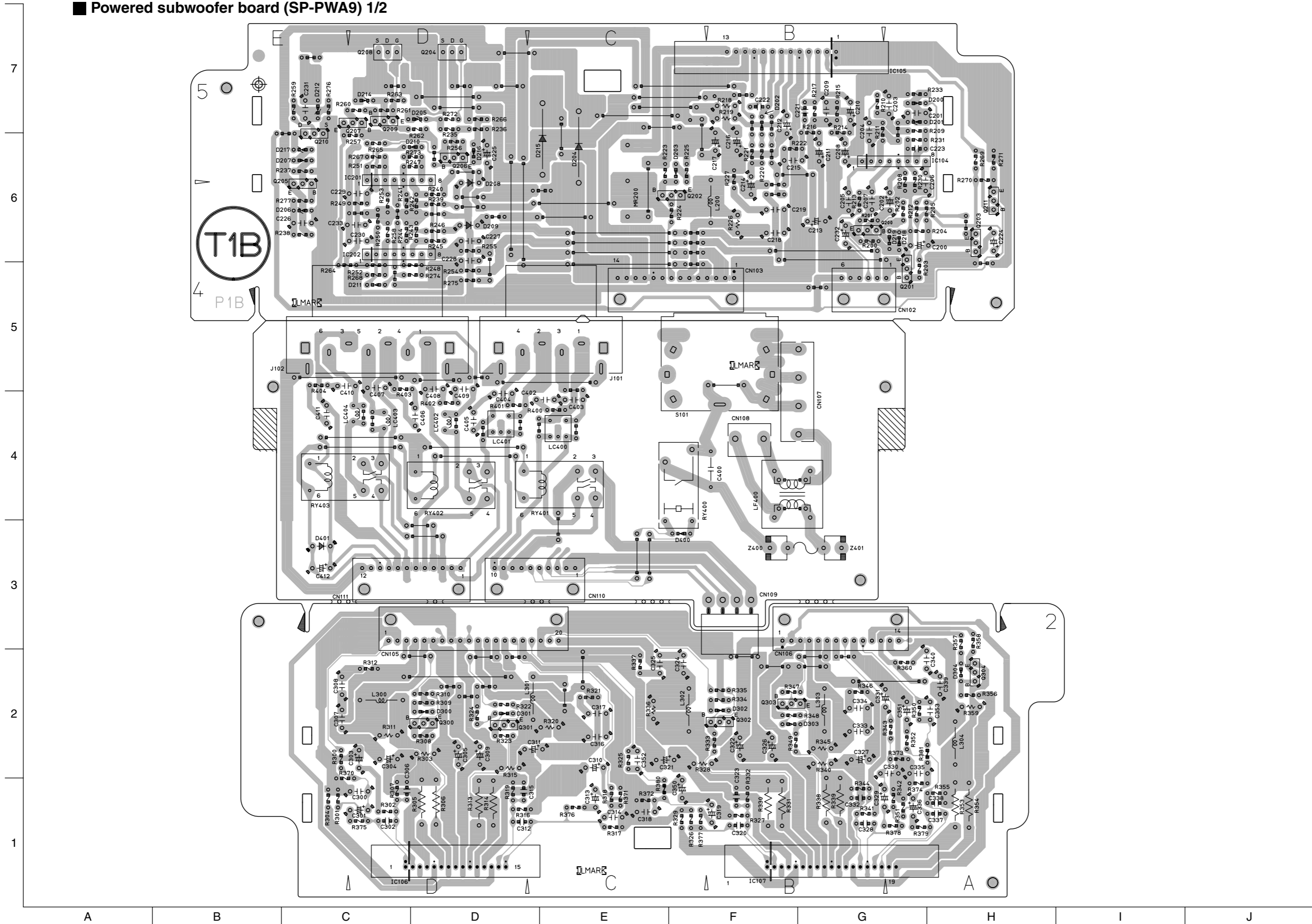
DVD servo board

(Surface view)

(Bottom view)



■ Powered subwoofer board (SP-PWA9) 1/2



■ Powered subwoofer board (SP-PWA9) 2/2

