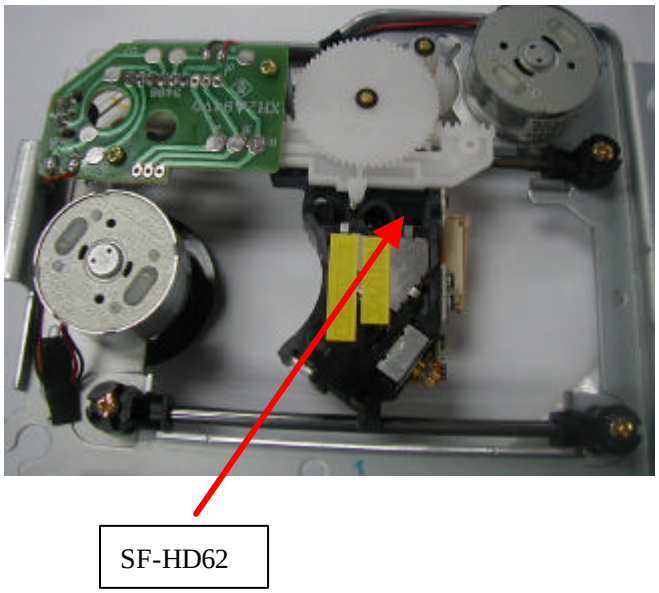
Principle and Maintenance of ABS535T

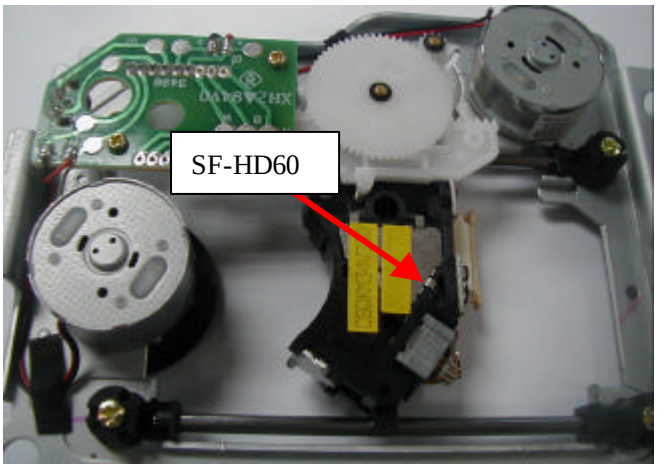
CONTENTS

Important prompt:

This type player employs two kinds of decks, SF-HD62 and SF-HD60, and corresponding software of these two types of decks are different, therefore please pay special attention during deck changing in the maintenance. Corresponding decks should be changed with the same type of original ones, otherwise the player will be out of order. Identification of decks is shown as figures:



SF-HD62



Operating Principle Analysis of ABS535T

Chapter I Overview of ABS535T

ABS535T is a medium- low-grade model integrating with video disc and power amplifier, with the following major features:

1. The layer adopts “Sanyo loader+MT1389” solution;

2. The power amplifier adopts the digital power amplification circuit, with the power IC of TAS5112DFD; it has low distortion level;

3. The audio process adopts TAS5508 , with high integration and high performance and price ratio;

4. It has the function of radio reception, and the tuner adopts Sanzhenxing DTS-44K（CE）module;

5. The power supply adopts the switching power, with compactness, high efficiency and stable performance;

6. Equipped with SCART（CVBS/RGB）port;

7. Accessory channel input/output function;

8. Headphone output function;

9. Karaoke and automatic accompaniment function

10. “RDS” function;

II. Block Diagram of ABS535T Complete Player and IC Function Table:

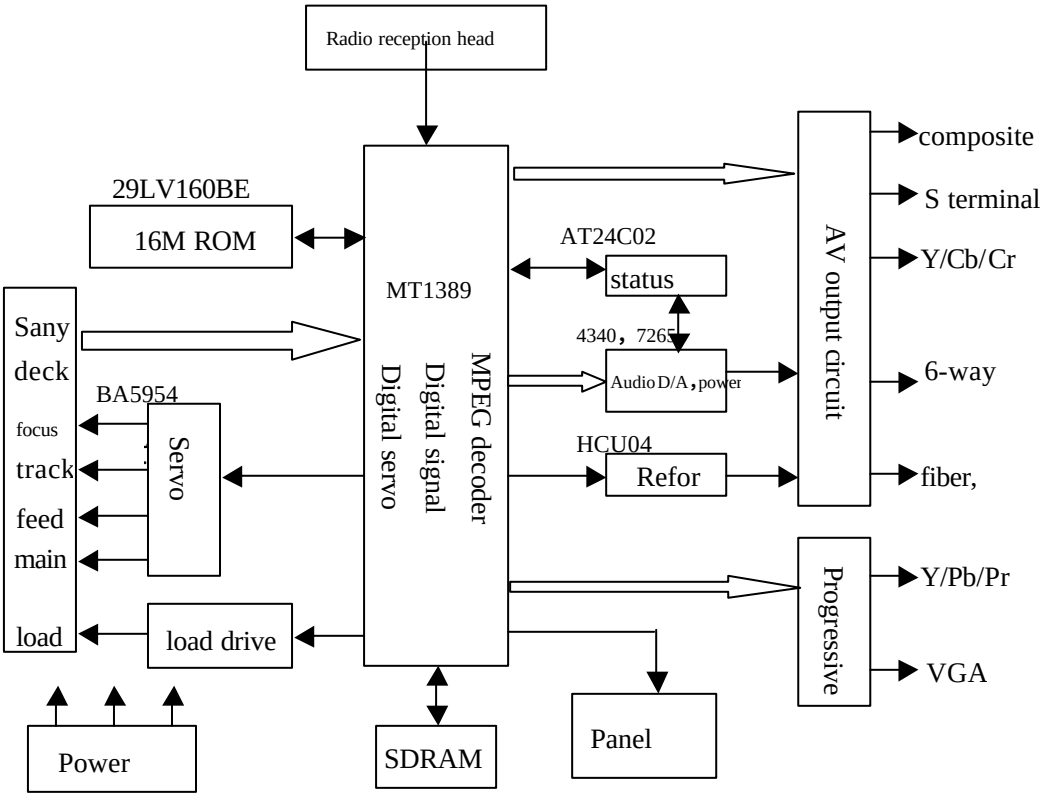


Figure 1

III. Function Table of ICs for ABS535T

Circuit Board	No	Name	Function
Deck		Sanyo	Pick-up of disc signal
Main Board	U201	MT1389	RF signal processing, digital signal processing, servo processing, MPEG decoding, line scan, system control
	U202	AT24C02	Series EEPROM, status memory
	U205	HCU04	Hex inverter
	U209	LM1117MP-1.8	1.8v voltage-regulated power supply
	U211	AE45164016	64Mbit SDRAM
	U214	29LV160BE	16Mbit FLASH ROM
	U302	D5954	4-channel servo driver circuit
Panel	N102	SD16311	Panel control, VFD display drive
	N103	REMOT	Remote receptor
Power Board	U501	0380	Switching power circuit
	U502	HS817	Photo-electric coupler
	U503	HA17431	2.5V reference voltage comparator
	U11	LM7805	5V 3-terminal voltage-regulated power supply
	U505	0880	Switching power circuit
	U506	HS817	Photo-electric coupler
	U507	LM431	2.5V reference voltage comparator
Amplifier board	N12	5508	Digital signal processing
	N13/14	5112	Power amplification
	N8/9 N10/11	TLV272 RC4580	Operational amplification Digital signal amplification

Chapter II Operating Principle of Servo Circuit

I. Digital Signal Processing Procedure

ABS535T adopts Sanyo double beam super error correction deck and MTK decoding solution, and its servo circuit mainly consists of preposition signal processing, digital servo processing, digital signal processing IC MT1389 and driver circuit BA5954. MT1389 is also a main part of the decoding circuit.

The A, B, C, D, E, F, SA, SB and RFO signal transmitted from the deck are mainly inputted

through the 2-13 pins of MT1389, and after amplifying treatment of built-in amplifier of MT 1389, the signals are treated in two parts within MT1389:

After being processed by the internal digital servo signal circuit of MT1389, part of the signal forms into corresponding servo control signal, and output focus (FOSO), tracking (TRSO), main shaft (DMSO) and feed (FMSO) servo control signal from the P42, P41, P37 and P38 of MT1389 and send them to the driver circuit BA5954 to amplify the drive. After drive amplification, the signals will drive the focus coil, tracking coil, main shaft motor and feed motor. The focus and tracking servos will be used to adjust the object lens and enable laser beam to identify signal from compact disc correctly; the feed servo will be used to drive the laser head to move longitudinally, and scan the compact disc; the main shaft servo is used to control the main shaft motor to read the signals in constant linear speed and drive the disc to rotate.

After being processed by the internal VGA voltage-controlled amplifier of MT1389 in amplification and balance frequency compensation; another part of the signals is converted into digital signal by the internal A/D converter. When the deck reads the CD/VCD signals, these signals will be EFM demodulated in MT1389, and after accomplishing CIRC error regulation in internal MT1389, output to the next grade to carry out audio and video decoding; when the deck reads the DVD signals, these signals will be ESM demodulated in MT1389, and after accomplishing RSPC error regulation in internal MT1389, output to the next grade to carry out audio and video decoding.

II. Processing Procedure of Control Signal

1. Automatic control of laser power, with the circuit shown as the Figure II:

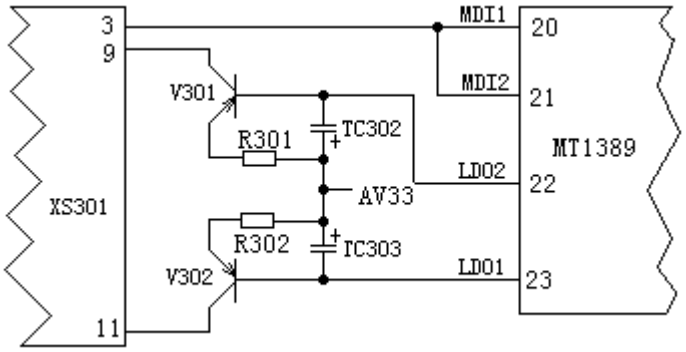


Figure II

MT1389 is integrated with APC (automatic light power control) circuit. Its Pin 20 is the pin for inputting VCD laser power rate detection signal, the Pin 21 is the pin for inputting DVD laser power rate detection signal, and the Pin 23 is the pin for outputting VCD laser power rate drive control. When the Pin 23 finds that the laser output power rate is too strong, the output voltage on Pin 23 will increase after the processing of internal circuit of MT1389, and then the conduction degree of V302 (2SB1132) and the voltage on its integration polar will decrease, which consequently lead to the decrease of voltage supplied to the laser tube, the weakening of laser head lighting, and thus achieve the automatic adjustment on laser output power. The Pin 22 is the pin for outputting DVD laser power drive control, with the specific control procedure similar to that of VCD.

2. The tray open/close control circuit is shown as the Figure III:

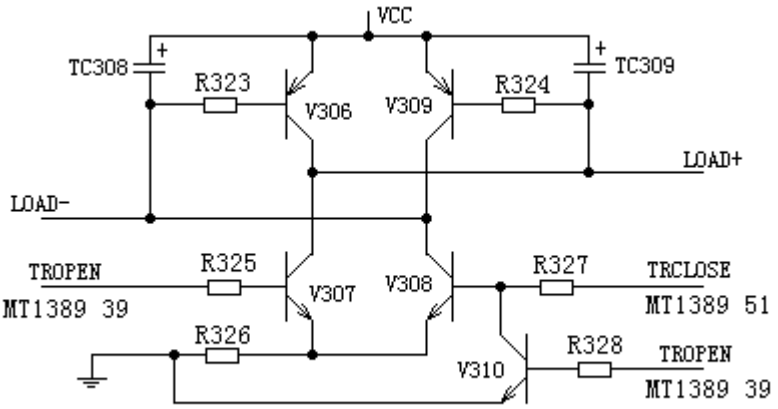


Figure III

Different from the circuit in former MTK solution, the MT1389 is integrated with preposition signal processing circuit, so the tray open/close control signals are accomplished by MT1389, that is to say, the close control signal is accomplished by the Pin 51 of MT1389, while the open control signal by Pin 39 of MT1389.

When we press the open button, the Pin 51 of MT1389 is in high power level, while the Pin 39 is in low power level, and then the triode V308 will be on-state. Through resistor R323, the base of V306 will be made to be in low power level, and V306 will be on-state, with the current direction as the following figure:

Power voltage VCC ? V306E-C junction ? motor negative terminal LOAD- ? motor positive Load +? V308 C-E junction ? grounding

So the motor will rotate clockwise to accomplish the action of tray closing.
When we press the open button, the Pin 51 of MT1389 is in low power level, while the Pin 39 is in high power level, and then the triode V307 will be conducted. Through resistor R324, the base of V309 will be made to be in low power level, and V309 will be conducted, with the current direction as the following figure:

Power voltage VCC ? V309E-C junction ? motor negative terminal LOAD- ? motor positive Load +? V307 C-E junction? grounding

So the motor will rotate anti-clockwise to accomplish the action of tray opening.

3. The main shaft motor braking circuit is as the Figure IV:

To prolong the lifespan of motor and reduce the influence of start-up impact current, with the installation of disc, our R&D personnel design the main shaft motor to be in the state of constant operation, so that even if the STOP button is pressed, the disc will not be stopped. Therefore, when we press the OPEN button, a braking signal is required to stop the rotation of main shaft motor immediately to accomplish the opening action in a short time.

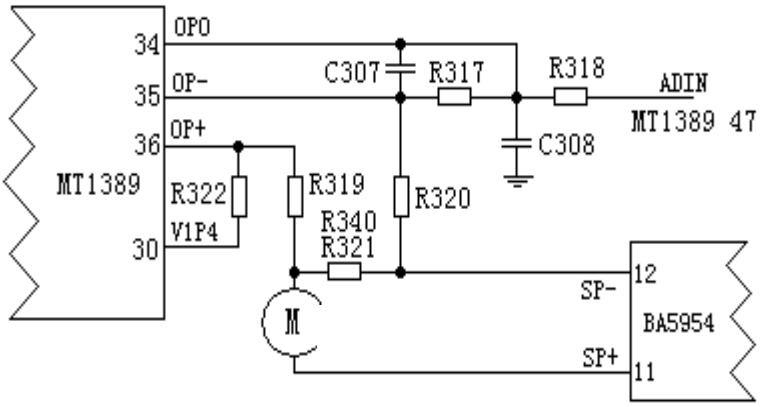


Figure IV

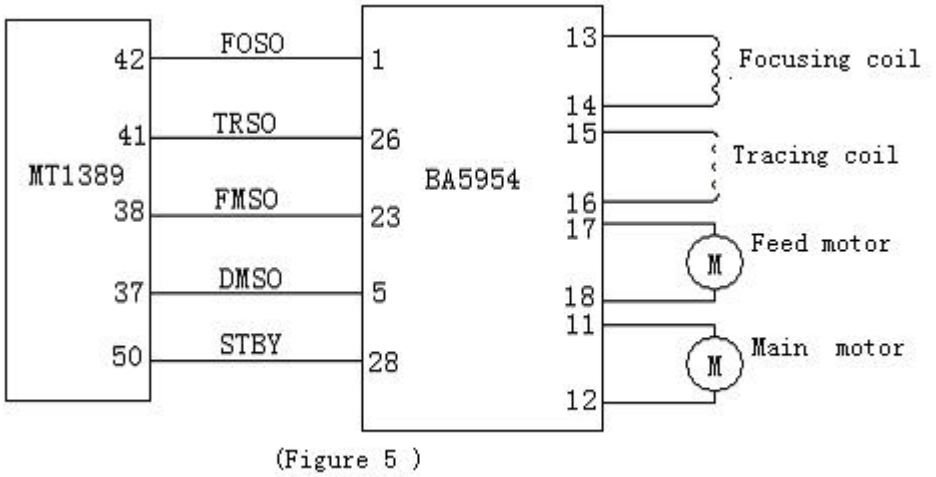
During playing, if we press the OPEN button, the main shaft drive signal will disappear, and because of inertia, the main shaft motor is still in operation. As the electromotive force generated in the operation of motor receives the induction voltage on sampling resistors R321 and R340, which, through the resistor R319 and R320, is added to the Pin 36 and Pin 35 of MT1389, and outputted from the Pin 34 after internal processing for amplification in MT1389, and delivered to Pin 47 of MT1389 through R318. After the internal A/D conversion and corresponding processing, an instant motor reversal braking signal will be outputted from the Pin 37 of MT1389 to stop the rotation of main shaft motor immediately, so as to ensure the standstill of the disc when opening the player.

III. Servo drive circuit

The servo drive of the player is accomplished through a piece of 4-channel dedicated drive circuit BA5954, with the circuit as Figure V:

The 4 servo control signals generated in digital servo circuit processing of MT1389, i.e. focusing control FOSO, tracking control TRSO, feed control FMSO and main shaft control DMSO signals, are added to the pins 1, 26, 23 and 5 of BA5954 respectively, and after drive amplification of BA5954, the focusing and tracking drive signals will be outputted from the pins 13 and 14 and pins 15 and 16 of BA5954 respectively, and added to the focusing and tracking coils to drive the light head to accomplish the actions of focusing and tracking.

The feed and main shaft drive signals will be outputted from the pins 17 and 18 and pins 11 and 12 of BA5954 respectively, and added to the feed motor and main shaft motor to drive the light head to move longitudinally and enable the disc to rotate in constant linear speed.



(Figure 5)

The STBY on Pin 28 of BA5954 is an output-enabling signal, and only when the pin is in high power level, there will be output of drive voltage on the output terminal.

Chapter III Operating Principle of Decoding Circuit

The decoding circuit of the player mainly consists of decoding chips (including MT1389, SDRAM AE45164016 and FLASH ROM 29LV160BE) and audio DAC CS4360.

I. Control Circuit of System

1. Reset circuit is as the Figure VI:

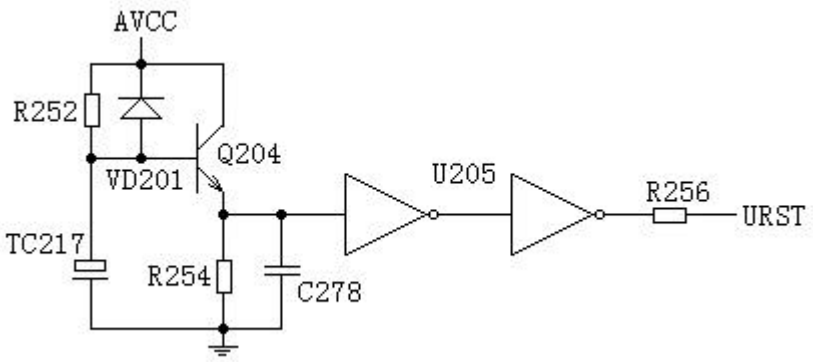


Figure VI

The reset circuit of the player consists of triode Q204 9014, reset capacitor TC217 100uF/16V and phase inverter U205 HCU04. In starting up, as the terminal voltage of capacitor cannot be changed suddenly, the basic of Q204 is in low power level. After the cut-off of Q204, its emission polar is in low power level, after secondary phase inversion by U205 and regulation, the low power level reset signal is outputted to the Pin 110 of MT1389 to reset MT 1389.

When the recharging of TC217 is finished, the base of Q204 will be in high power level, Q204 will be conducted, and the emission polar is in high power level. After the secondary phase inversion and regulation by U205, a high power level is outputted and added to the Pin 110 of MT1389 to maintain high power level during its normal operation.

2. Clock circuit

The crystal oscillator of X201 27MHz, C275/27PF, C276/27PF and phase inverter HCU04 form into clock oscillation circuit, and the clock signals generated are added to the pins 229 and 228 of MT1389 through R244 and 4248 to provide operating clock for MT1389.

3. Data communication circuit

The data communication circuit of the player consists of decoding chip MT1389, SDRAM, AE45164016 and FLASH ROM 29LV160BE, as the Figure VII:

MT1389 is a piece of super large integrated circuit, with the operation voltage of +3.3V and +1.8V. Its functions include: RF small signal preposition processing, digital servo, digital signal processing and accomplishing MPEG decoding and video coding. The built-in MCU of MT1389 is

also the system control circuit of the whole player.

AE45164016 is a piece of 4M*16bit large capacity SDRAM, with the operation voltage of +3.3 V. In DV971, the 6ns module is adopted, with high speed and the maximum operation frequency up to 166MHz. Its main function is for operation buffer storage of decoding chip MT1389 to store the audio and video data stream in decoding.

29LV160BE is a piece of 16Mbit FLASH ROM, with the operation voltage of +3.3V, mainly for storing the user's information including OSD character information, operational microcode and LOGO in start-up.

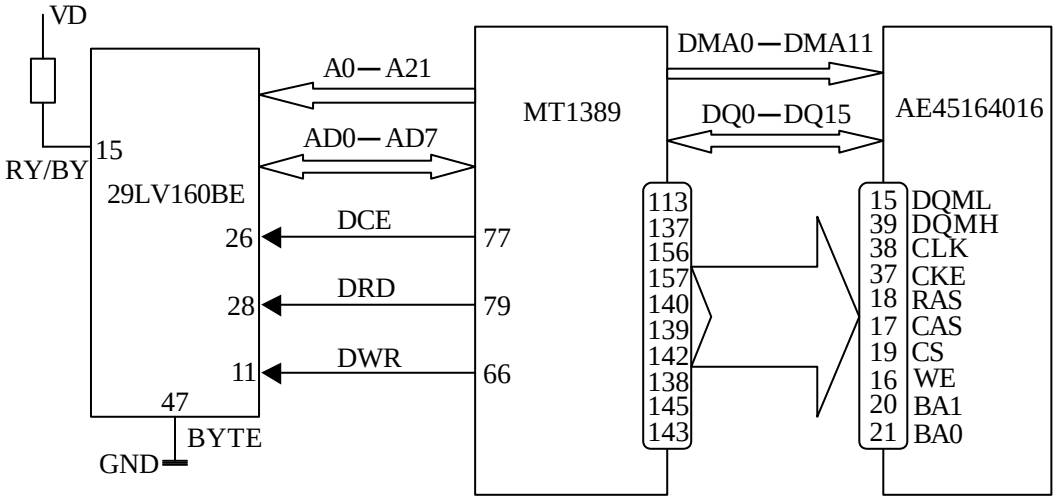


Figure VII

II. Audio and Video Output Circuit

1. Video output circuit

ABS535T can not only output three types of alternating-line video signal (including CVBS composite video, S terminal Y-C signal and Y/Cb/Cr color difference signal), but also output two types of progressive line video signal (including Y/Pb/Pr progressive line color difference signal and VGA progressive line signal).

The decoding chip MT1389 has built-in video encoding circuit for direct output of analogue composite video signal CVBS, S terminal, color difference signal and VGA signal.

The CVBS composite video signal is outputted from the Pin 198 of MT1389, the S terminal signal Y-C is outputted from the pins 194 and 196 of MT1389, the color difference signal and the R-B-G signal of VGA port is outputted from the pins 203, 202 and 200 of MT1389, the row and field synchronization signals of VGA port are outputted from the pins 207 and 205 of MT1389 respectively.

To mention specifically, the alternating-line color difference signal, the progressive line color difference signal and progressive line R-B-G signal are outputted from the same pin, therefore the signal output shall be selected according to the ports of TV, otherwise there will be only sound but without picture display.

2. Audio output circuit

Audio signals processed by MT1389 output 5-track data signals through pin 217, pin 218 and pin 219 and 5-channel clock signals through pin 214 and pin 215. These signals after passing through

IC 74HCT125 are transmitted to audio signal processing IC TAS5508 to be processed (specific IC data please refer to Attachment), then 10 groups of PWM signals are output, six of which are transmitted to power amplifying parts, two of which to headphone output and two of which to auxiliary channel output.

Six groups of signals transmitted to power amplifying IC are processed by surrounding and super DBB sharing an N13 IC TAS5508, and by main sound channel and center sharing an N14 IC TAS5508. Signals are amplified here, for they are digital high frequency signals, they have high efficiency; meanwhile power IC has low colorific value. Amplified signals are still digital signals, in order that they can be output through loudspeaker, amplified digital signals still have to be processed before outputting.

For PWM signals containing audio signals, since high frequency signals have high frequency and are beyond audibility range of human ears, we can ignore impacts of high frequency signals and reduce low frequency audio signals only during processing.

TAS5508 is an 8-channel pulse width modulated high performance IC, and applicable in processing most digital audio signals. Between 20Hz and 20KHz, it has excellent noise factor and dynamic range. It has following features:

1、 Automatically control clock speed and digital sampling speed;
2、 8 groups of audio input channels;
3、 8 groups of PWM output can be changed into 6-channel stereo line output or 8-channel line output;
4、 Line output is a different input open loop amplifier driven by a group of PWM signals.

IC TAS5112 is a high performance audio power amplifier. Bridging with 6O loading, each channel can output 50W. It has 95DB dynamic range, low distortion degree and low rate of heat generation with power efficiency up to 90%. It also has functions of low-voltage protection, high-temperature protection, overflow protection, etc. At the same time, it has built-in driving power adjustment gate circuit. It is applicable in family video, DVD receiver, mini music center, etc. Detailed IC introduction see Attachment.

When in normal disc reading, digital signals and clock signals from 1389 are transmitted to pin 26 to pin 31 of IC TAS5508 through IC 74HCT125 gating. If no headphone is inserted, PH-SEL is of high level, as well as when MUTE is normal. And pin 37 of TAS5508 is also of high level. All data lines and clock lines can be detected by oscilloscope. One group of signals from 5508 is transmitted to N8 and N9, then output through auxiliary channel. Another group is transmitted to headphone; other PWM signals are transmitted to amplifying parts of amplifier.
When headphone is inserted, PH-SEL signal is forcibly shorted to earth, and turns to low level, meanwhile amplifier is muted.
This amplifier has functions of radio reception, auxiliary channel output and karaoke. All external inputs after N3 CD4052 gating and N7 CS5340 analog-to-digital conversion are transmitted to MT1389. Rear processing and output is the same as the signal output flow in normal disc reading.
When in disc reading, system defaults to gate karaoke input, therefore you can open karaoke when playing disc. This amplifier also has automatic accompaniment function, when playing VCD, system detects external input and automatically screen to human sound signal in the disc, while only saves sound accompaniment.
ABS535T has the function of radio reception, and can also receive RDS signal. The radio head control lines CE, DI, CL and DO are controlled by 28 array lines connecting to MT1389 control.

When any of the controlling lines is in abnormality, the radio reception will be in malfunction. The RDS signal received by radio head will be delivered to the dedicated IC SAA6588 for processing.

Chapter IV Operating Principle of Power Board

I. Block Diagram

This amplifier has two groups of power supply; one is of low voltage for decoding board and low power ICS, the other is of higher voltage for power amplifying IC. But their design principles, we only draw one functional block diagram of them:

II. Introduction of Circuit Principle

220V alternating current is loaded on D501-D504 integrated bridging rectification circuit through power plug, fuse tube, voltage dependent resistor R501 and common mode rejection BC501 and L501. Diode adopts IN4007 which ahs better PPR and higher withstand voltage value than IN4001. Output 311V direct current after being bridging rectified is loaded on two transformers through TC501 filtering and transmitted to DRAIN control pins of switch modules U501 and U502.
Service voltage of power on IC after being directly rectified and filtered is divided by resistors to serve IC. Diode D508, capacitor C516 and resistor R516 form absorption circuit to provide discharge circuit of reverse electromotive force for 1-4 coils of transformers. Pin FB controlling IC is feedback control pin, so you should decide on/off time of pulse width according to current intensity on it to ensure stability of output voltage.
There are 5 branch circuits coupled to sub-grade through transformer.

1. Voltage output from pin 11 and pin 13 of transformer T501 outputs a group of +28V voltage for power amplifying IC after being rectified and filtered.
2. Voltage output from pin 16 of transformer T501 outputs a group of +12V voltage after being rectified and filtered. +12V voltage is stabilized into a group of +5V voltage by IC LM7805.
3. Voltage output from pin 14 of transformer T501 outputs +5V voltage and provide voltage for one end of photo-electric coupler U502 after being rectified and filtered.
4. Voltage output from pin 12 of transformer T501 outputs +3.3V voltage and provide a group of stable voltage for CPU after being rectified and filtered.
5. Voltage output from pin 9 of transformer T501 outputs a group of 21V voltage for displaying driving IC after being rectified and filtered. Clamp ZD501 of -21V provide heater voltage for panel display screen. Grounding direct voltage of FL+ and FL- is about -16V.

Operating principles of two groups of switch power are the same, therefore we will only analyze the group providing +3.3V voltage for CPU here:
Feedback sampling of this group comes from 3.3V and supplies for photocupler HS817 through D516 and R506. At the same time, it is divided through R508 and R509 for reference voltage pin R of 2.5V comparator. When 3.3V becomes higher, pin KA of comparator is on; and the voltage is transmitted to pin 4 of switch IC 5L0380R after photoelectric coupling through HS817 to reduce on time of internal switch tube. And thus it reduces transformer coupling and decreases output of 3.3V voltage to achieve automatic adjustment and control, and vice verse.

It has to be noted that in this switching power reference voltage comparator IC of two groups of switching power are different. For voltage of the group supplying power for amplifier is higher, it adopts LM431 which has better performance and higher withstand voltage. And voltage of the

group supplying power for 3.3V is lower, it adopts 17431. For two ICs are different, you should pay special attention to distinguish them from each other. They cannot be used mixing.

Chapter 5: Panel control and VFD display circuit

The panel mainly consists of VFD screen, driver ICD16311, remote receptor HS0038A2 and button and indicator display circuit, mainly for accomplishing man-player dialogue and display of operation status.

The structural drawing is as follows:

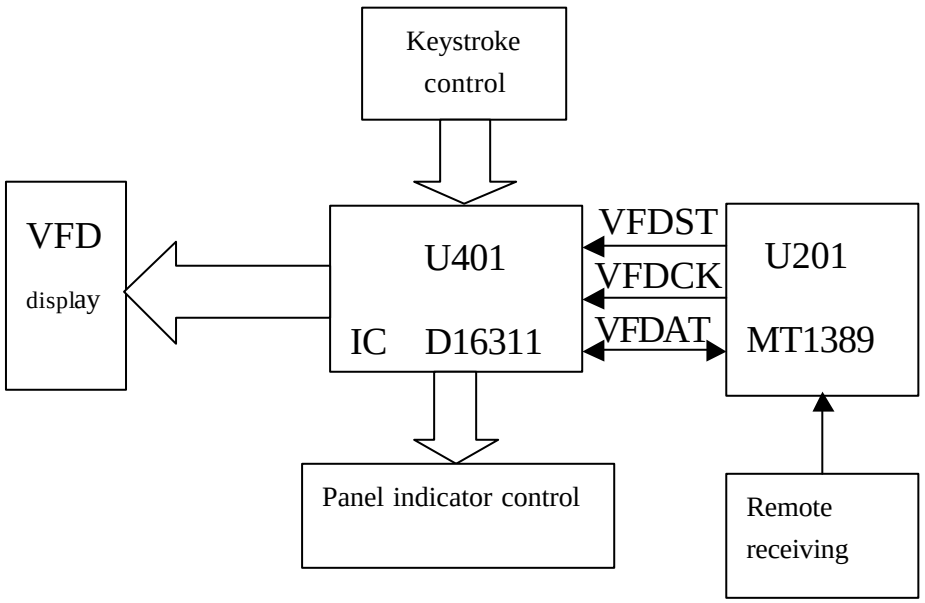


Figure XI

MT1389 will control the U401 IC D16311 to display the operation status of the player through the VFDST status, VFDCK clock and VFDAT data, under the control of CPU built in MT1389, receive the user control commands sent by D16311, and control the controlled circuit of the player to limit the player to operate in specified status.

When the user operates the panel buttons, the control command is sent to the IC D16311 through keyboard-scanning circuit, and through internal decoding drive, the IC D16311 outputs the control data from the pins 5 and 6 (VFDAT) to the built-in CPU of MT1389, which will realize the control on the controlled circuit, and control the VFD through IC D16311.

VFD401 is a vacuum fluorescence screen, and its biggest feature is its high brightness. Its operation principle is similar to the kinescope of TV. The pins 1, 2, 34 and 35 are for filament power supply; the pins 27-32 are GRID poles, each GRID has 16 different characters of display; the pins 4-19 are SEG poles, and the CPU control the SEG poles through its control on IC D16311, and display the characters of corresponding operation status on the screen.

The remote reception circuit mainly consists of remote receptors HS0038A2, of which the pin 1 is for grounding, the pin 2 for power supply, the pin 3 for output of reception signal, and they are all connected directly to the CPU in MT1389 to control the corresponding circuit.

This player has headphone output function. A pin in the headphone directly connects to TAS5508. When the headphone is inserted, detection line HDET grounds and turns into low level. When pin 12 of TAS5508 turns

into low level, parts of output of amplifier are muted. When in normal condition, this detection pin is of high level around 3.3V.

Troubleshooting

I. Voltage on key points of ABS535T

Demoding circuit:

Reset:

1. U205 (HCU04): 8 pins, around 5V;

2. MT1389: 110 pins, around 5V;

3. FLAHS ROM: 12 pins, around 5V

Clock:

27MHZ crystal oscillator two ends: Around 0.77V.

I^2C bus SDA: 3.3V

I^2C bus SCL 3.3V

Servo circuit:

LD01： 3.3V；LD02：3.3V

V301 and V302 electron collector LD voltage: 2.3V

BA5954 pin 4 base voltage: 1.4V

BA5954 pins 15 and 16 tracking drive output: Around 2.5V

BA5954 pins 17 and 18 feed drive output: Around 2.5V

BA5954 pins 13 and 14 focus drive signal output: Around 2.5V

BA5954 pins 11 and 12 main shaft drive output: Around 2.5V

BA5954 pin 1 focus control signal input: 1.4V

BA5954 pin 5 main shaft control signal input: 1.4V

BA5954 pin 26 tracking control signal input: 1.4V

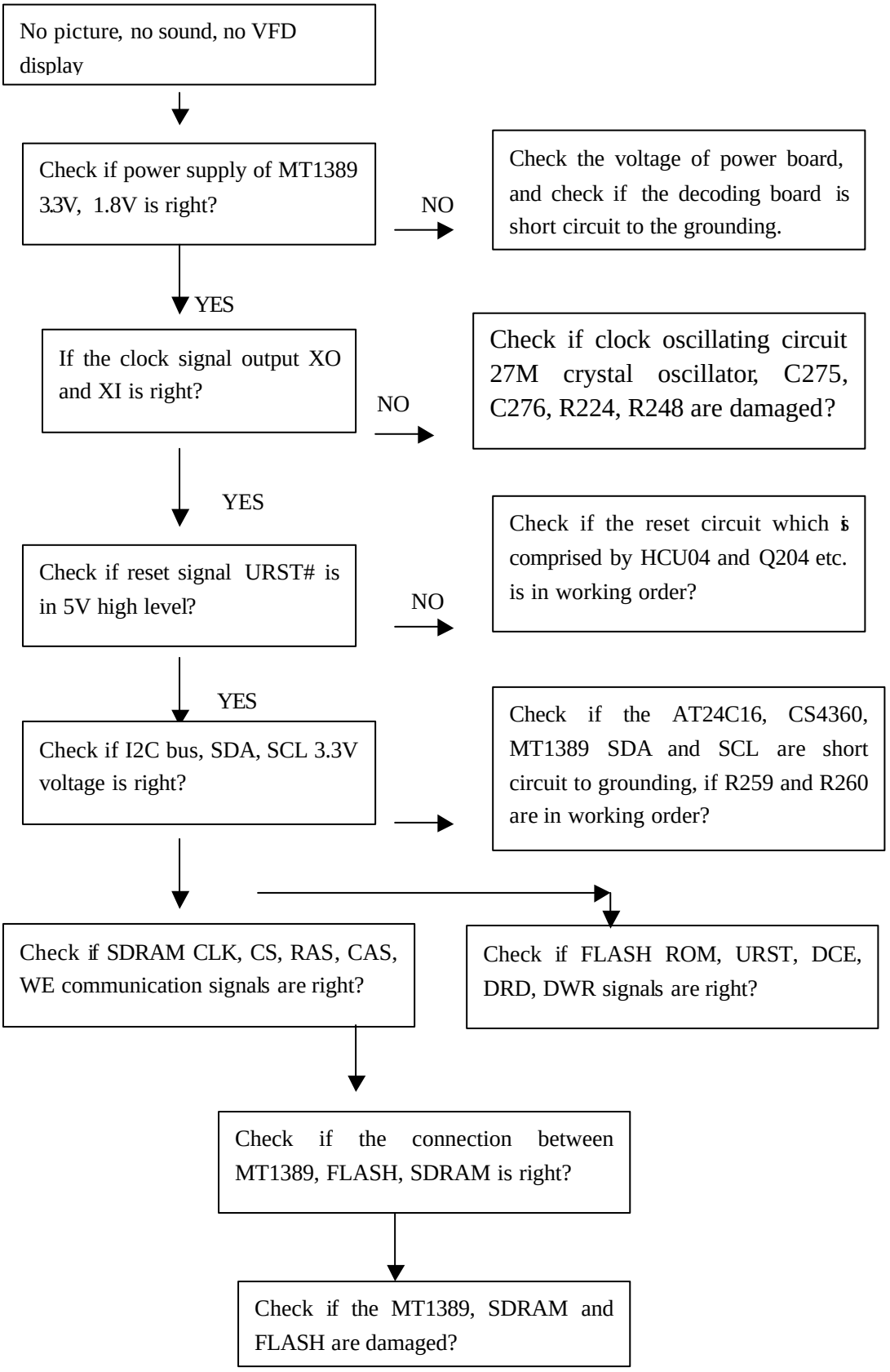
BA5954 pin 23 feed control signal input: 1.4V

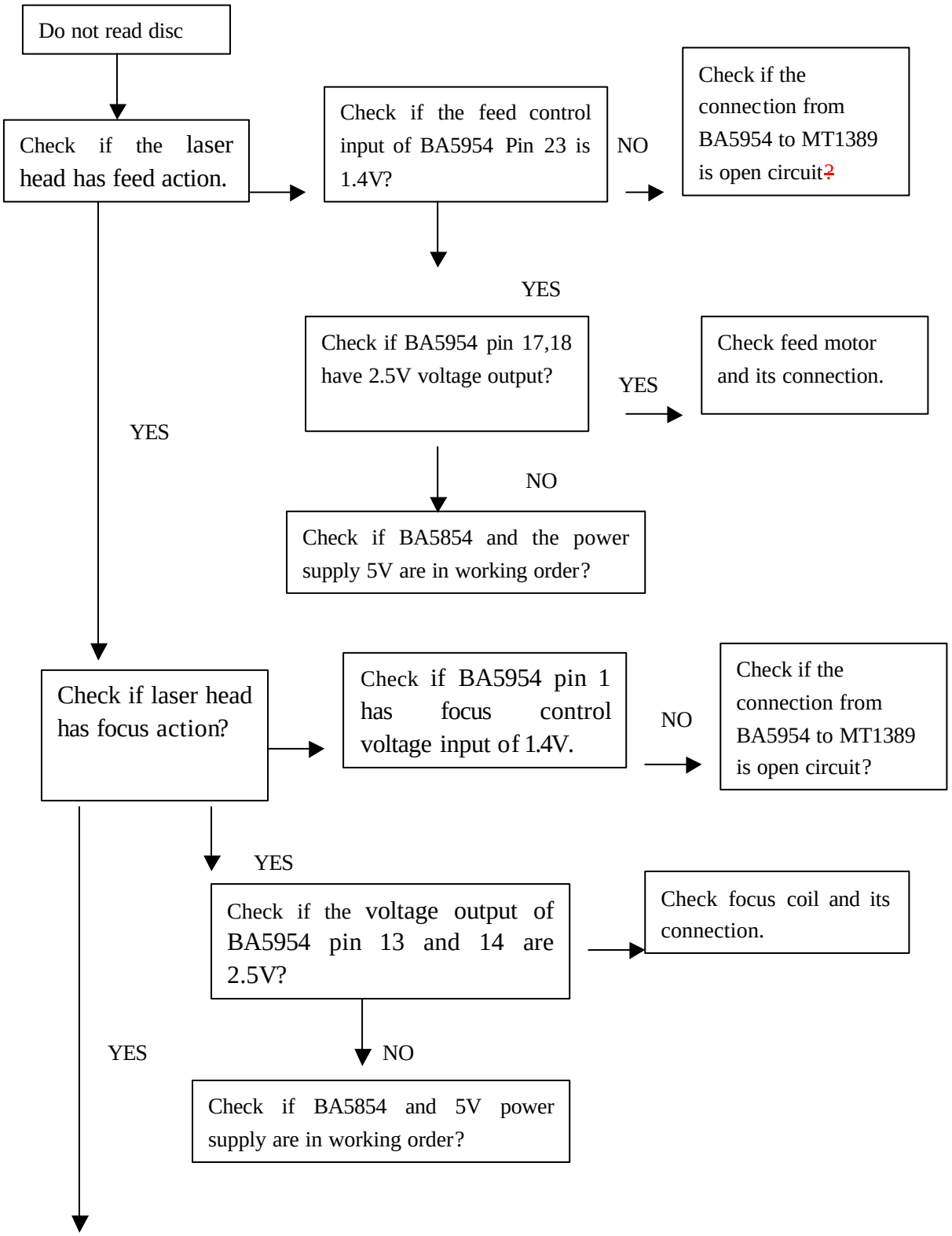
Amplifier circuit：

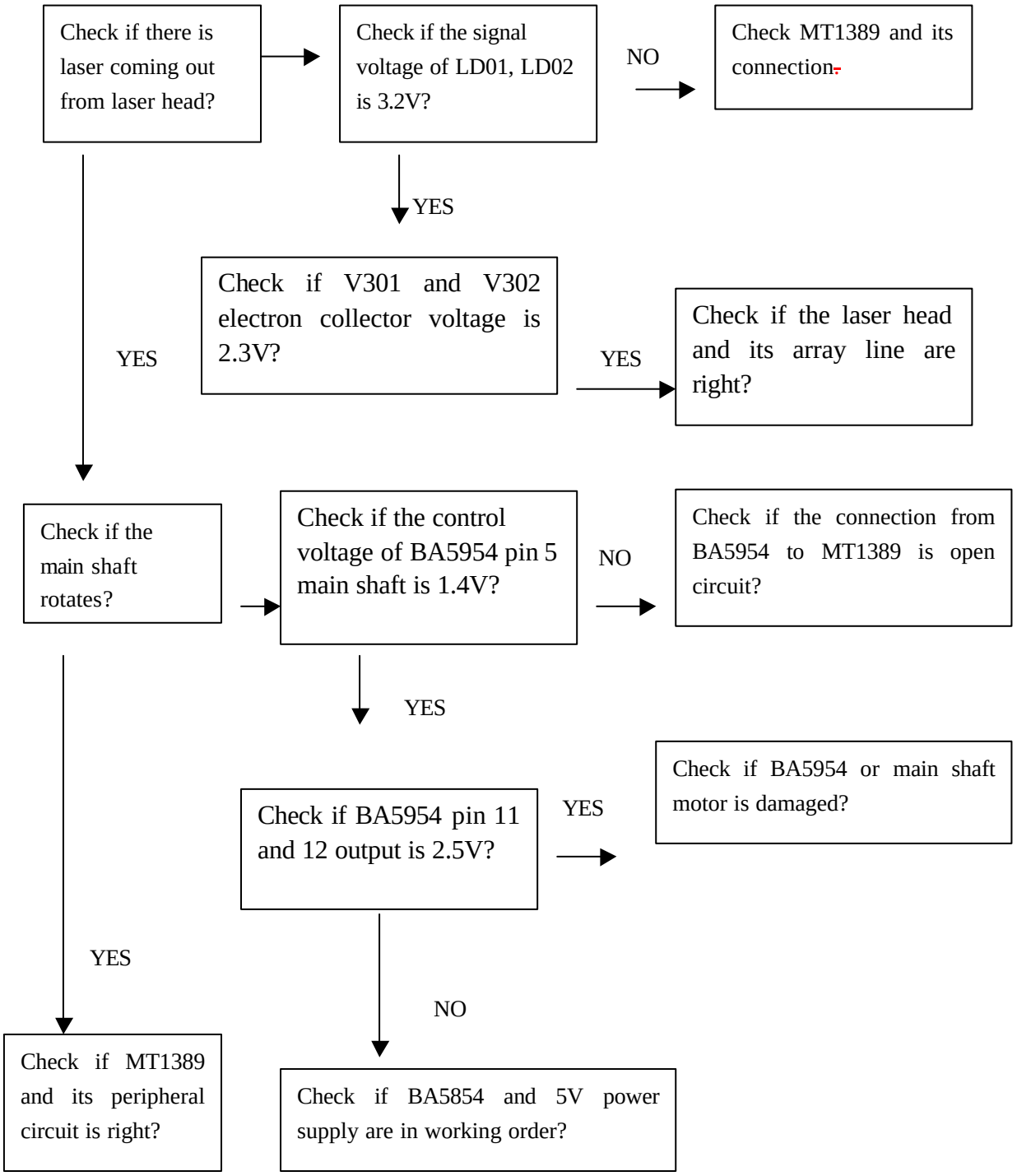
TAS5508 pin 9 power supply pin 3.3V

TAS5112 32、33、40、41、44、45、52、53, 28V。\

II. Troubleshooting of main troubles




Do not read disc
Check if the laser head has feed action.
Check if the feed control input of BA5954 Pin 23 is 1.4V?
NO
Check if the connection from BA5954 to MT1389 is open circuit?
YES
Check if BA5954 pin 17,18 have 2.5V voltage output?
YES
Check feed motor and its connection.
YES
NO
Check if BA5854 and the power supply 5V are in working order?
Check if laser head has focus action?
Check if BA5954 pin 1 has focus control voltage input of 1.4V.
NO
Check if the connection from BA5954 to MT1389 is open circuit?
YES
Check if the voltage output of BA5954 pin 13 and 14 are 2.5V?
Check focus coil and its connection.
YES
NO
Check if BA5854 and 5V power supply are in working order?


Check if there is laser coming out from laser head?
Check if the signal voltage of LD01, LD02 is 3.2V?
NO
Check MT1389 and its connection.
YES
Check if V301 and V302 electron collector voltage is 2.3V?
YES
Check if the laser head and its array line are right?
YES
Check if the main shaft rotates?
Check if the control voltage of BA5954 pin 5 main shaft is 1.4V?
NO
Check if the connection from BA5954 to MT1389 is open circuit?
YES
Check if BA5954 pin 11 and 12 output is 2.5V?
YES
Check if BA5954 or main shaft motor is damaged?
YES
NO
Check if MT1389 and its peripheral circuit is right?
Check if BA5854 and 5V power supply are in working order?

Attachment ：Brief Introduction to IC Pins

I. MT1389

MT1389 adopts the LQFP 256 pin packaging and 3.3V/1.8V double voltage operation mode. It is a piece of large-scale CD-ROM and DVD-ROM preposition processing CMOS integrated circuit with excellent performance, and a single chip dedicated to CD/VCD/DVD player. It contains focusing servo error amplification, tracking servo error amplification and RF level output servo control, including the following main functions:

RF small signal preposition processing, mainly for carrying our corresponding processing and amplification on the RF signals transmitted from the light head part, adjusting the laser output power automatically, and identifying the VCD disc and DVD disc.

Digital servo processing can generate focusing, tracking, feed and main shaft servo control signals; digital signal processing, accomplishing the EFM/EFM + demodulating of RF signals.

MPEG-1/MPEG-2/MPEG4/JPEG Video decoding chip, which can not only realize the decoding of VCD and DVD, but also realize MPEG 4 network video decoding, being compatible to “network movie” disc, and decipher JPED pictures to realize the function of digital photo album play.

On audio aspect, it can not only realize AC-3/DTS double decoding, decipher MP3, and is also compatible to DVD-Audio decoding to achieve high-resolution sound restoration in 1000 times higher than CD.

By utilizing the 8032 microprocessor with built-in chip, MT1369E can also realize the system control function of player, which simplifies the circuit design substantially.

The pin functions of MT1389 are as the following table:

Pin	Name	Function
1	AGND	Analogue grounding
2	DVDA	DVD-RF high-frequency AC coupling signal A
3	DVDB	DVD-RF high-frequency AC coupling signal B
4	DVDC	DVD-RF high-frequency AC coupling signal C
5	DVDD	DVD-RF high-frequency AC coupling signal D
6	DVDRFIP	DVD-RF high-frequency AC coupling signal RFIP input
7	DVDRFIN	DVD-RF high-frequency AC coupling signal RFIN input
8	MA	DVD-RAM main light beam RF DC signal input A

9	MB	DVD-RAM main light beam RF DC signal input B
10	MC	DVD-RAM main light beam RF DC signal input C
11	MD	DVD-RAM main light beam RF DC signal input D
12	SA	DVD-RAM auxiliary light beam RF DC signal input A
13	SB	DVD-RAM auxiliary light beam RF DC signal input B
14	SC	DVD-RAM auxiliary light beam RF DC signal input C
15	SD	DVD-RAM auxiliary light beam RF DC signal input D
16	CDFON	CD focusing error phase inversion input
17	CDFOP	CD focusing error phase input
18	TNI	3 light beam auxiliary PD signal phase inversion input
19	TPI	4 light beam auxiliary PD signal phase input
20	MDI1	Laser power monitoring input 1
21	MDI2	Laser power monitoring input 2
22	LDO2	Laser power monitoring output 2
23	LDO1	Laser power monitoring output 1
24	SVDD3	Servo 3.3V power supply
25	CSO/RFOP	Main servo signal output/RF phase output
26	RFLVL/RFON	RF level output/RF phase inversion output
27	SGND	Servo grounding
28	V2REFO	Reference voltage 2.8V
29	V20	Reference voltage 2.0V
30	VREFO	Reference voltage 1.4V
31	FEO	Focusing error signal output
32	TEO	Tracking error signal output

33	TEZISLV	Tracking zero crossover error input
34	OP_OUT	Sensing signal amplification output
35	OP_INN	Sensing signal phase inversion input
36	OP_INP	Sensing signal non-inverting input
37	DMO	Main shaft control signal output
38	FMO	Feed control signal output
39	TROPEN PWM	Tray Open signal output
40	PWMOUT1/ADIN9	First-route pulse width demodulating signal output/AD universal input
41	TRO	Tracking control signal output
42	FOO	Focusing control signal output
43	USB_VSS	USB grounding
44	USBP	USB data
45	USBM	USB data
46	USB_VDD3	USB 3.3V power supply
47	FG/ADIN8	Motor sensing signal input/AD universal input
48	TDI/ADIN4	Open position detecting signal input/AD universal input
49	TMS/ADIN5	Close position detecting signal input/AD universal input
50	TCK/ADIN6	BA5954 enabling signal output/AD universal output
51	TDO/ADIN7	Tray close signal output/AD universal input
52、97、122、152、173、221	DVDD18	Digital 1.8V power supply
53-58	IOA2-7	Micro-controller address bit 2-7
59	HIGHA0	Micro-controller address bit 0
60、61	IOA18-19	Micro-controller address 18-19
62、85、94、116、119、134、144、148、161、163、175、216、223	DVSS	Digital grounding
63	APLLCAP	Analogue phase lock loop external

		capacitor
64	APLLVSS	Analogue phase lock loop grounding
65	APLLVDD3	Analogue phase lock 3.3V power supply
66	IOWR	FLASH read control signal
67-72	HIGHA3-7	Micro-controller address bit 3-7
73、80、108、127、141、155、167、182、204、212	DVDD3	Digital 3.3V power supply
74、75	HIGHA1-2	Micro-controller address bit 1-2
76	IOA20	Micro-controller address bit 20
77	IOCS	FLASH chip selection
78	IOA1	Micro-controller address bit 1
79	IOOE	FLASH output enabling
81-84	AD0-3	Micro-controller address/data bit 0-3
86-88	AD4-6	Micro-controller address/data bit 4-6
89	IOA21/ADIN0	Micro-controller address bit 21/AD universal input
90	ALE	Micro-controller address enabling
91	AD7	Micro-controller address/data bit 7
92	A17	FLASH address bit 17
93	IOA0	Micro-controller address bit 0
95	UWR	Micro-processor reading operation
96	URD	Micro-processor reading operation
98	UP1_2-1_7	Micro-processor port
104	UP3_0	Micro-processor port
105	UP3_1	Micro-processor port
106	UP3_4	Micro-processor port
107	UP3_5	Micro-processor port
109	ICE	Micro-processor correction mode enabling
110	PRST	Reset input
111	IR	Remote control signal input

112	INT0	Micro-processor interruption 0
113	DQM0	DRAM input output shielding signal
114	DQS0	DRAM input output shielding signal
115	RD7	DRAM data
117-118	RD5-6	DRAM data
120-121	RD3-4	DRAM data
123-125	RD0-2	DRAM data
126	RD15	DRAM data
128-133	RD9-14	DRAM data
135	RD8	DRAM data
136	DQS1	DRAM input output shielding signal
137	DQM1	DRAM input output shielding signal
138	RWE	DRAM writing enabling
139	CAS	DRAM column address selection
140	RAS	DRAM row address selection
142	RCS	DRAM chip selection
143	BA0	DRAM section address 0
145	BA1	DRAM section address 1
146	RA10	DRAM address
147	RA0	DRAM address
149	RA1-3	DRAM address
153	RVREF/ADIN3	Reference voltage/AD universal input
154	RCLKB	DRAM clock
156	RCLK	DRAM clock
157	CKE	DRAM clock enabling
158	RA11	DRAM address
159-160	RA8-9	DRAM address
162	RA7	DRAM address
164	RA4-6	DRAM address
168	RD13/ASDATA5	DRAM data/audio series data
169	RD27-30	DRAM data

174	RD26	DRAM data
176-177	RD24-25	DRAM data
178-179	DQM2-3	DRAM I/O shielding signal
180-181	RD22-23	DRAM data
183-188	RD16-21	DRAM data
189	DACVDDC	D/A conversion 3.3V power supply
190	VREF	Reference voltage
191	FS	
192	YUV0/CIN	
193	DACVSSC	D/A conversion grounding
194	YUV1/Y	Video signal YUV1 output/Y signal output
195	DACVDDB	D/A conversion 3.3V power supply
196	YUV2/C	Video signal YUV2 output/C signal output
197	DACVSSB	D/A conversion grounding
198	YUV3/CVBS	Video signal YUV3 output/CVBS signal output
199	DACVDDA	D/A conversion 3.3V power supply
200	YUV4/G	Video signal YUV4 output/G signal output
201	DACVSSA	D/A conversion grounding
202	TUV5/B	Video signal YUV5 output/B signal output
203	YUV6/R	Video signal YUV6 output/R signal output
205	VSYNC/ADIN1	Field synchronization signal output/AD universal input
206	YUV7/ASDATA5	Video signal YUV7 output/audio series data
207	HSYNC/ADIN2	Row synchronization output/AD universal input
208	SPMCLK	
209	SPDATA	

210	SPLRCK	
211	SPBCK/ASDATA5	
213	ALRCK	Audio left and right sound channel clock
214	ABCK	Audio bit clock
215	ACLK	Audio DAC external clock
217-220	ASDATA0-3	Audio series data
222	ASDATA4	Audio series data
224	MC_DATA	Microphone digital audio input
225	SPDIF	Digital audio signal output
226	RFGND18	RF signal grounding
227	RFVDD18	RF signal 1.8V power supply
228	XTALO	Clock output
229	XTALI	Clock input
230	JITFO	RF small signal output
231	JITFN	RF small signal phase inversion and amplification input
232	PLLVSS	Phase lock loop grounding
233	IDACEXLP	
234	PLLVDD3	Phase lock loop 3.3V power supply
235	LPFON	Amplifier loop wave filtration output
236	LPFIP	Amplifier loop wave filtration input
237	LPFIN	Amplifier loop wave filtration input
238	LPFOP	Amplifier loop wave filtration output
239	ADCVDD3	A/D conversion 3.3V power supply
240	S_VCM	
241	ADCVSS	A/D conversion grounding
242	S_VREFP	
243	S_VREFN	
244	RFVDD3	RF 3.3V power supply
245	RFRPDC	DC RF error signal input
246	RFRPAC	AC RF error signal input
247	HRFZC	High-frequency RF signal zero

		crossover checking
248	CRTPLP	
249	RFGND	RF grounding
250	CEQP	
251	CEQN	
252	OSP	
253	OSN	
254	RFGC	
255	IREF	Reference current
256	AVDD3	Analogue 3.3V power supply

Ⅱ.BA5954

BA5954 is a piece of servo drive single-piece integrated circuit, with built-in 4-channel BTL drive circuit. It can receive directly the PWM control signal output by digital servo IC, and with internal wave filter and drive amplifier, it pushes the execution part in the servo mechanism to accomplish the focusing, tracking, feed and main shaft drives. BA5954 adopts the packaging of 28 pins.

Note: The 28 pins of BA5954 are for outputting effective control signal, which is provided by the 50 pins of MT1389. When the signal is in high power level, BA5954 output is in validity, while the signal is in low power level, BA5954 will not be activated, and its output ports are in the state of cutoff.

The functions of pins of BA5954 are as the following table:

Pin	Name	Function
1	VINFC	Focusing control signal input
2	CF1	External feedback loop
3	CF2	External feedback loop
4	VINSL+	Forward control input, connected to the reference voltage
5	VINSL-	Main shaft control signal input
6	VOSL	External feedback resistance
7	VINFFC	Focusing feedback signal input
8	VCC	5V power supply
9	PVCC1	5V power supply
10	PGND	Grounding

11	VOSL-	Main shaft drive inverse voltage output
12	VO2+	Main shaft forward voltage output
13	VOFC-	Focusing drive inverse voltage output
14	VOSC+	Focusing drive forward voltage output
15	VOTK+	Tracking drive forward voltage output
16	VOTK-	Tracking drive inverse voltage output
17	VOLD+	Feed drive forward voltage output
18	VOLD-	Feed drive inverse voltage output
19	PGND	Grounding
20	VINFTK	Tracking feedback signal input
21	PVCC2	5V voltage
22	PREGND	Grounding
23	VINLD	Feed control signal input
24	CTK2	External feedback loop
25	CTK1	External feedback loop
26	VINTK	Tracking control signal input
27	BIAS	1.4 reference voltage input
28	STBY	Enabling control signal

III. 29LV160BE

29LV160BE is a type of 16Mbit FLASH memory manufactured via 0.23um technology, with 16 byte width DQ0-DQ15, memory capacity of 16M bit, operation voltage of 3.3V, and packaging method of 48 pins TSOP. The specific operation mode is as the following table:

Operation status	CE	OE	WE	RESET	A0~A19	DQ0~QD7	DQ8~DQ15	
							BYTE：high level	BYTE: Low level
Read	L	L	H	H	Ain	Dout	Dout	High resistance
Write	L	H	L	H	Ain	Din	Din	High resistance
Waiting	H	×	×	H	×	high resistance	high resistance	high resistance
Output forbidden	L	H	H	H	×	High resistance	High resistance	High resistance

Reset	×	×	×	L	×	High resistance	High resistance	High resistance

The functions of pins of 29LV160BE are as the following table:

Pin	Name	Function
15	RY/BY	Ready/system is busy
1~9、16~25 、48	A0~A19	20-byte address bus
26	CE	Chip enabling
27、46	VSS	Grounding
28	OE	Output enabling
29~36、38~44	DQ0~DQ14	15-byte data bus
37	VCC	5V power supply
45	DQ15/A-1	Character extension mode as the data line; byte expansion mode as the address line
47	BYTE	Adopting 8-byte (in low level) or 16-byte output mode (in high level)
11	WE	Write enabling
12	RESET	Reset, valid in low level
10、13、14	NC	Neutral pin

IV. AE45164016

AE45164016 is a type of 64Mb (4Banks× 1M× 16bit) CMOS synchronization DRAM, featured with large memory and high speed. Its operation power voltage is 3.0V~3.6V, and it is packaged in 54-pin TSOP.

The functions of pins of AE45164016 are as the following table:

Pin	Name	Function
1、14、27	VDD	+3.3V power supply
2、4、5、7、8、10、11、13、42、44、45、47、48、50、51、53	DQ[0~15]	16-byte data bus
3、9、43、49	VDDQ	+3.3V power supply
6、12、46、52	VSSQ	Grounding
28、41、54	VSS	Grounding

15	LDQM	Data I/O shielding signal
16	WE	Write control signal
17	CAS	Column address gate signal
18	RAS	Row address gate signal
19	CS	Chip selection signal
20	SD-BS0	Section address 0 gate signal
21	SD-BS1	Section address 1 gate signal
22~26、29~35	MA[0~11]	12-byte address bus
36、40	NC	Neutral pin
37	CKE	Clock enabling signal
38	CLK	System clock input
39	UDQM	Data I/O shielding signal

V. Pin Functions of TAS5508

TAS5508 is a high performance audio signal processing IC provided by TI. It has 8-channel PWM processing function, perfect protective functions, low distortion degree and excellent dynamic characteristics.

1	**VRA_PLL**	Provide 1.8V reference voltage for PLL
2	**PLL_FLT_RET**	PLL external filtering circuit
3	**PLL_FLTM**	PLL inverted input pin
4	**PLL_FLTP**	PLL non-inverted output pin
5	**AVSS**	Analog grounding
6	**AVSS**	Analog grounding
7	**VRD_PLL**	Provide 1.8V reference voltage for PLL
8	**AVSS_PLL**	PLL analog grounding
9	**AVDD_PLL**	PLL provides 3.3V voltage
10	**VBGAP**	Provide 1.2 V reference voltage
11	**RESET**	System reset signal, valid in low level
12	**HP_SEL**	Microphone input/output selection
13	**PDN**	Switch-off voltage, valid in low level
14	**MUTE**	Software muting control, valid in low level
15	**DVDD**	3.3V digital power supply
16	**DVSS**	Digital grounding pin
17	**VR_DPLL**	Provide 1.8V reference voltage for PLL
18	**OSC_CAP**	Oscillation capacitance
19	**XTL_OUT**	Crystal oscillation output pin
20	**XTL_IN**	Crystal oscillation input pin
21	**RESERVED**	Connect to digital grounding
22	**TBASE_SEL**	Connect to digital grounding

23	**RESERVED**	Connect to digital grounding
24	**SDA**	Digital signal
25	**SCL**	Clock signal
26	**LRCLK**	RF channel clock signal
27	**SCLK**	Audio clock signal
28	**SDIN4**	Audio data input pin
29	**SDIN3**	Audio data input pin
30	**SDIN2**	Audio data input pin
31	**SDIN1**	Audio data input pin
32	**PSVC**	Control PWM signal output
33	**VR_DIG**	1.8V reference voltage of digital core
34	**DVSS**	Digital grounding
35	**DVSS**	Digital grounding
36	**DVDD**	3.3Vdigital service voltage
37	**BKND_ERR**	Logic error control pin, valid in low level
38	**DVSS**	Digital grounding
39	**VALID**	Output PWM signal is displayed normall valid in high level
40	**PWM_M_1**	PWM signal output 1
41	**PWM_P_1**	PWM signal output 1
42	**PWM_M_2**	PWM signal output 2
43	**PWM_P_2**	PWM signal output 2
44	**PWM_M_3**	PWM signal output 3
45	**PWM_P_3**	PWM signal output 3
46	**PWM_M_4**	PWM signal output 4
47	**PWM_P_4**	PWM signal output 4
48	**VR_PWM**	1.8V reference voltage of PWM core
49	**PWM_M_7**	PWM signal output 7
50	**PWM_P_7**	PWM signal output 7
51	**PWM_M_8**	PWM signal output 8
52	**PWM_P_8**	PWM signal output 8
53	**DVSS_PWM**	Digital grounding for PWM signal
54	**DVDD_PWM**	3.3V voltage for PWM signal
55	**PWM_M_5**	PWM signal output 5
56	**PWM_P_5**	PWM signal output 5
57	**PWM_M_6**	PWM signal output 6
58	**PWM_P_6**	PWM signal output 6
59	**PWM_HPML**	Headphone output PWM left channel
60	**PWM_HPPL**	Headphone output PWM left channel
61	**PWM_HPMR**	Headphone output PWM right channel
62	**PWM_HPPR**	Headphone output PWM right channel
63	**MCLK**	3.3V clock input
64	**RESERVED**	Connect to digital grounding

IV. IC TAS5112

IC TAS5112 is an audio power amplifier of high performance made by TI. Bridging with 6O loading, each channel can output 50W. It has 95DB dynamic range, low distortion degree and low rate of heat generation with power efficiency up to 90%. It also has functions of low-voltage protection, high-temperature protection, overflow protection, etc. At the same time, it has built-in driving power adjustment gate circuit. Basic functions of its pins are as shown in the following table:

Pin	Name	Function
31	BST_A	Auxiliary power
42	BST_B	Auxiliary power
43	BST_C	Auxiliary power
54	BST_D	Auxiliary power
23	DGND	Digital input output reference
16	DREG	Digital service voltage adjustment circuit
12	DREG_RTN	Digital service voltage adjustment circuit
25	DVDD	Input output reference
1，2，22，24，28，29，27，36，37，48，49，56	GND	Grounding
3，26	GREG	Driving voltage adjustment of gate circuit
30，55	GVDD	Digital voltage adjustment
15	M1(TST0)	Mode selection
14	M2	Mode selection
13	M2	Mode selection
4	OTW	Protective pin in the high temperature
34，35	OUT_A	Output pin A
38，39	OUT_B	Output pin B
46，47	OUT_C	Output pin C
50，51	OUT_D	Output pin D
32,33	PVDD_A	Service voltage of half bridge A
40,41	PVDD_B	Service voltage of half bridge B
44,45	PVDD_C	Service voltage of half bridge C
52,53	PVDD_D	Service voltage of half bridge D
20	PWM_AM	Inverted input pin
21	PWM_AP	Non-inverted input pin
18	PWM_BM	Inverted input pin
17	PWM_BP	Non-inverted input pin
10	PWM_CM	Inverted input pin
11	PWM_CP	Non-inverted input pin
8	PWM_DM	Inverted input pin
7	PWM_DP	Non-inverted input pin

19	RESET_AB	Reset signal , valid in low level
9	RESET_CD	Reset signal , valid in low level
6	SD_AB	Signal switch off control
5	SD_CD	Signal switch off control

IIV. IC SE5532

IC SE5532 is an amplified IC with dual channels and low noise. Compared to most other amplified ICs, it has lower noise, better output performance and power bandwidth. Its main features are: small-signal bandwidth; its direct voltage gain can be up to 50000 and alternating voltage gain can be up to 2200 under 10KHz; its power bandwidth can be up to 140KHz; relatively larger power supply range; fast slewing rate. Basic functions of its pins are as shown in the following table:

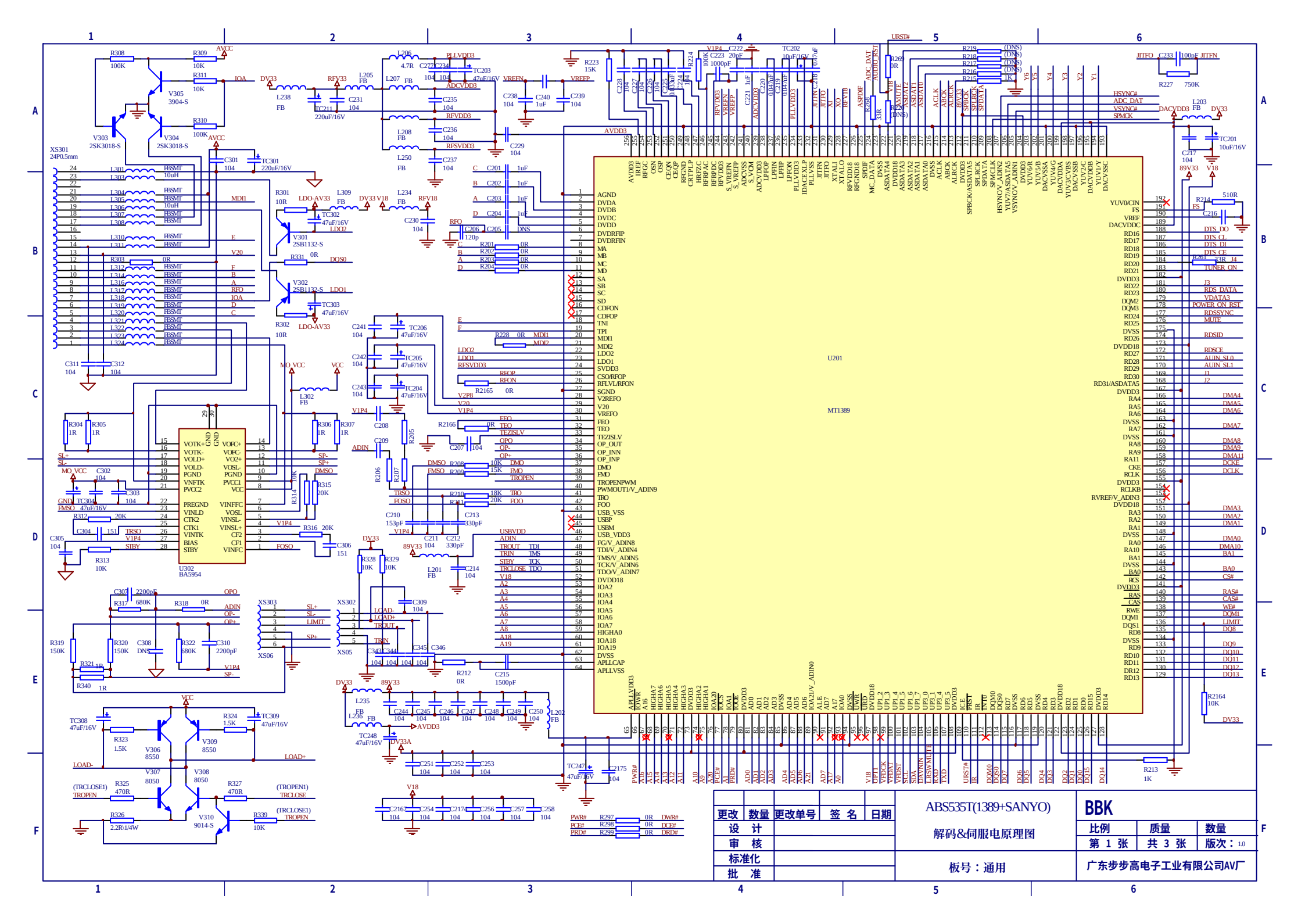
Pin	Name	Function description
1	OUTPUT-A	Output channel A
2	INVERTING INPUT-A	Inverted input A
3	NON-INVERTING INPUT-A	Non-inverted input A
4	V-	Negative power supply
5	NON-INVERTING INPUT-B	Non-inverted input B
6	INVERTING INPUT-B	Inverted input B
7	OUTPUT-B	Output channel B
8	V+	Positive power supply

IIIV、CS 5340

CS 5340 is an IC of analog/digital conversion; it can be applied to sample, analog-to-digital conversion and filter. During continuous input, its sampling frequency can be up to 200KHz. Its main features are as follows:

24 bytes conversion; supported audio frequency can be up to 192KHz; under power of 5V, its dynamic range can be up to 101DB; it has high pass filter to filter direct current. Functions of its pins are as follows:

Pins	Name	Function description
1	M0	Mode selection
16	M1	Mode selection
2	MCLK	Master clock signal
3	VL	Logic voltage power supply
4	SDOUT	Audio data output
5，14	GND	Grounding
6	VD	Digital power
7	SCLK	DRAM clock signal
8	LRCK	RF clock signal
9	RST	Reset signal
10	AINL	Analog input
12	AINR	Analog input
11	VQ	Quiescent voltage
13	VA	Analog power
15	FILT+	Reference voltage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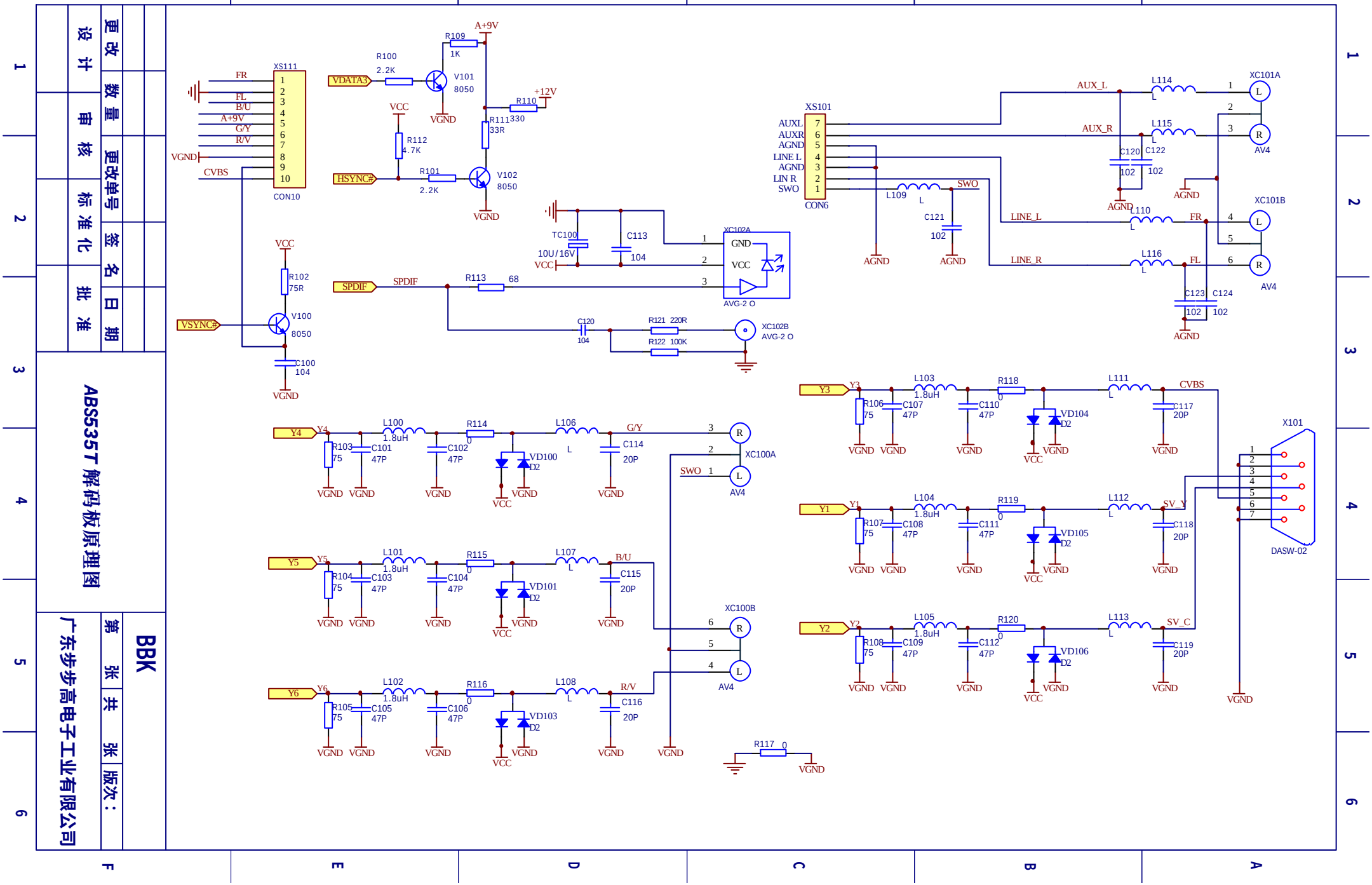
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VD100 D2
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XC100A
Y5
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R115 0
L107
B/U
R104 75
C103 47P
C104 47P
VD101 D2
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XC100B
Y6
L102 1.8uH
R116 0
L108
R/V
R105 75
C105 47P
C106 47P
VD103 D2
C116 20P
R117 0
Y3
L103 1.8uH
R118 0
L111
CVBS
R106 75
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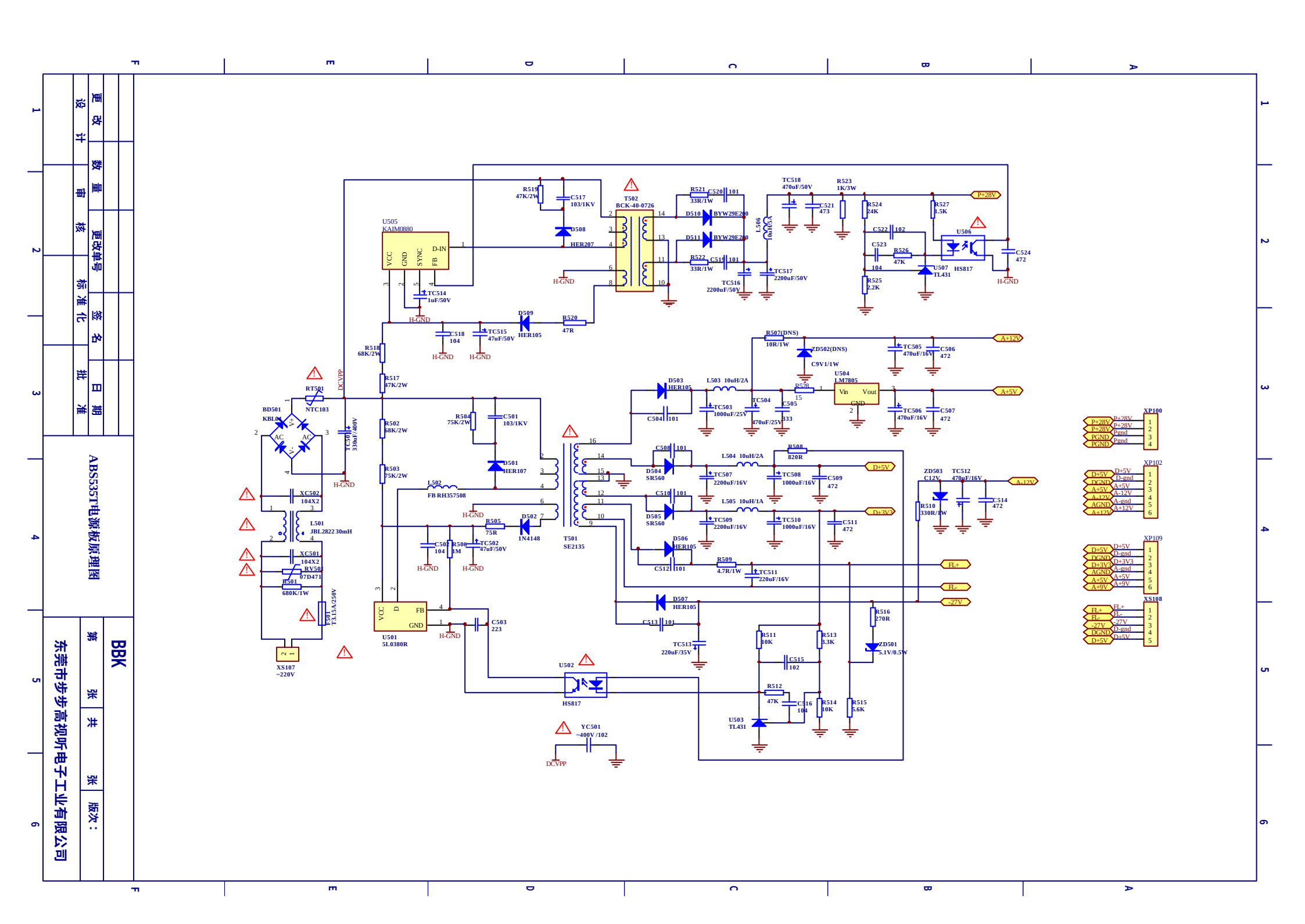
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H-GND
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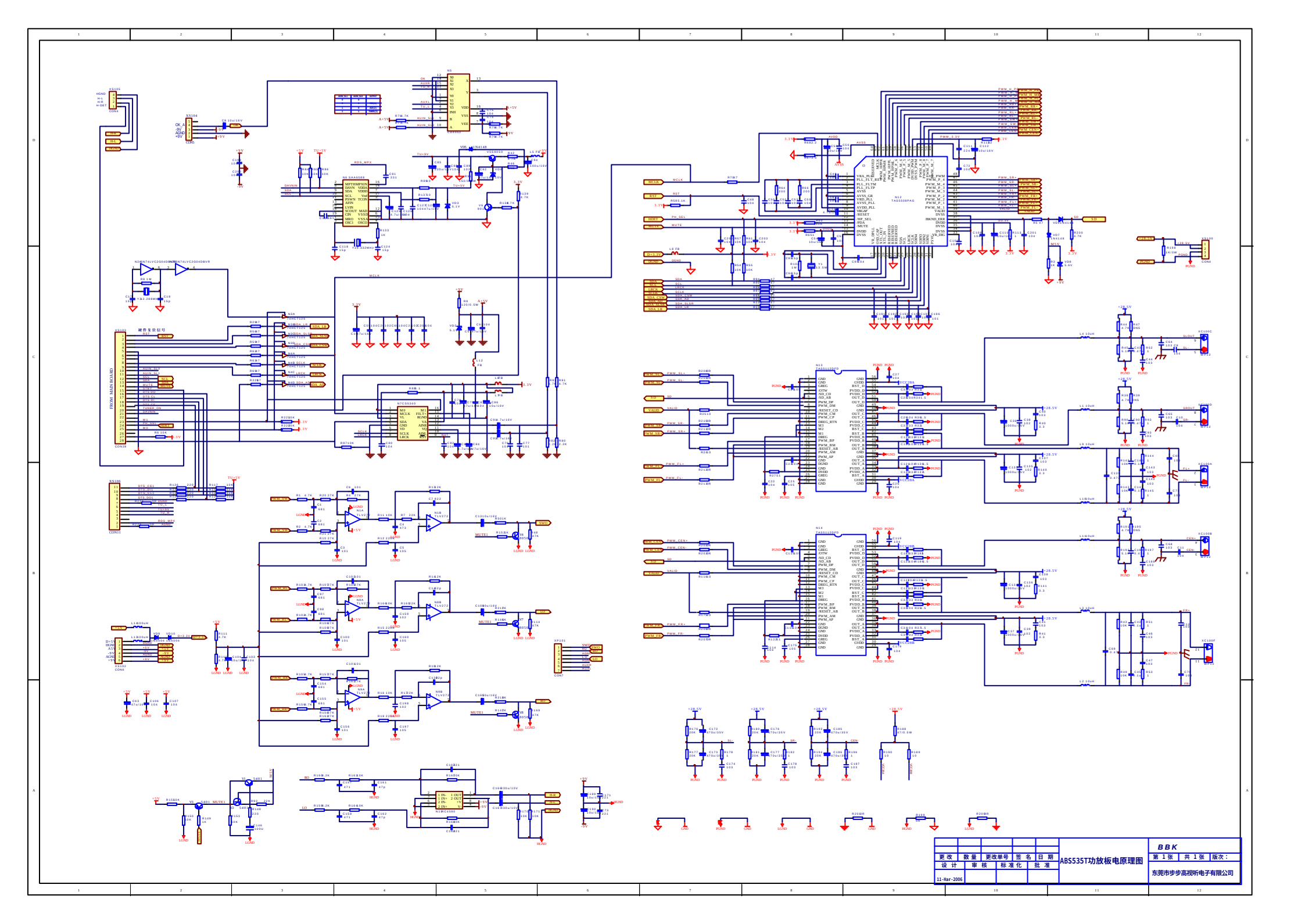
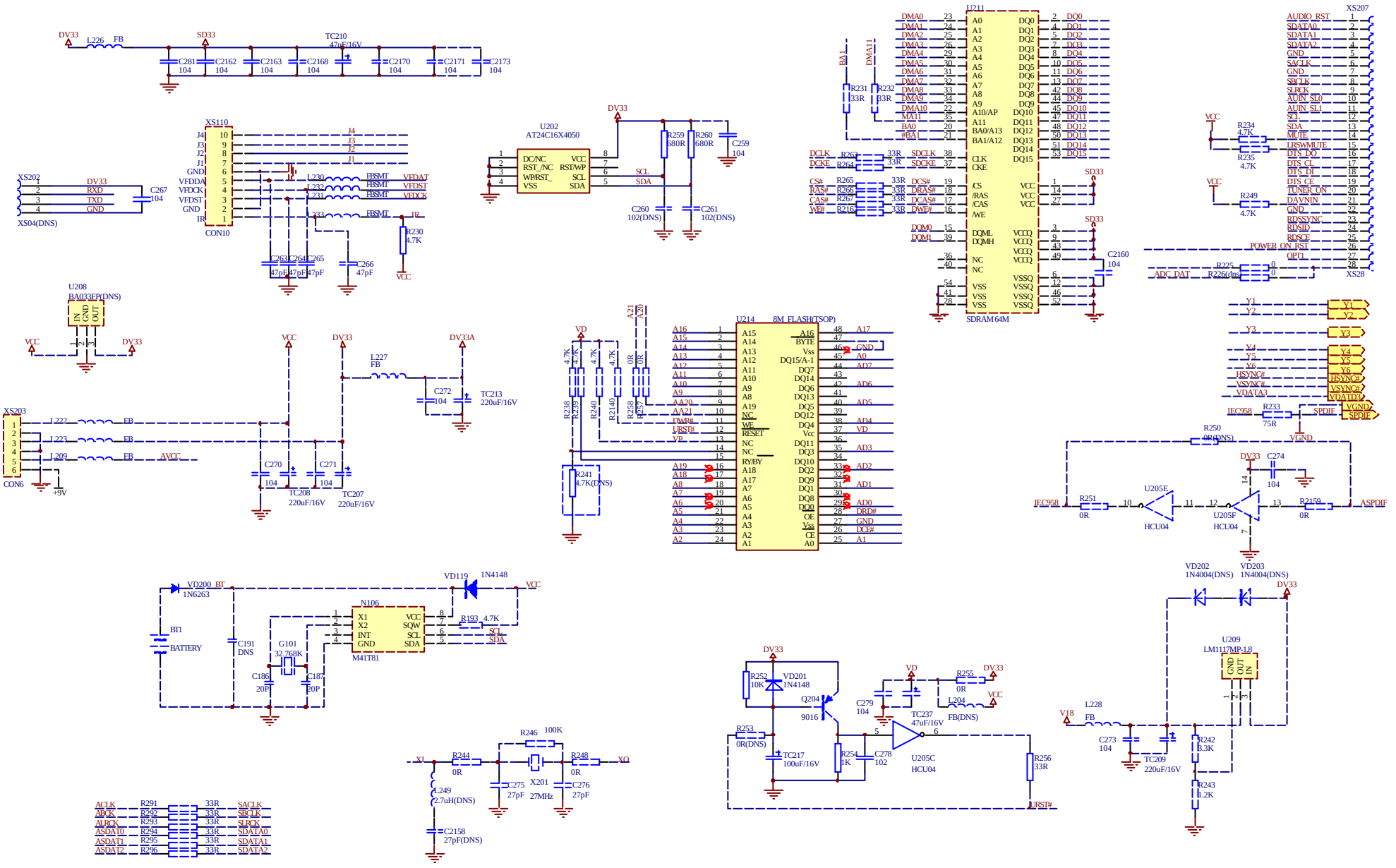
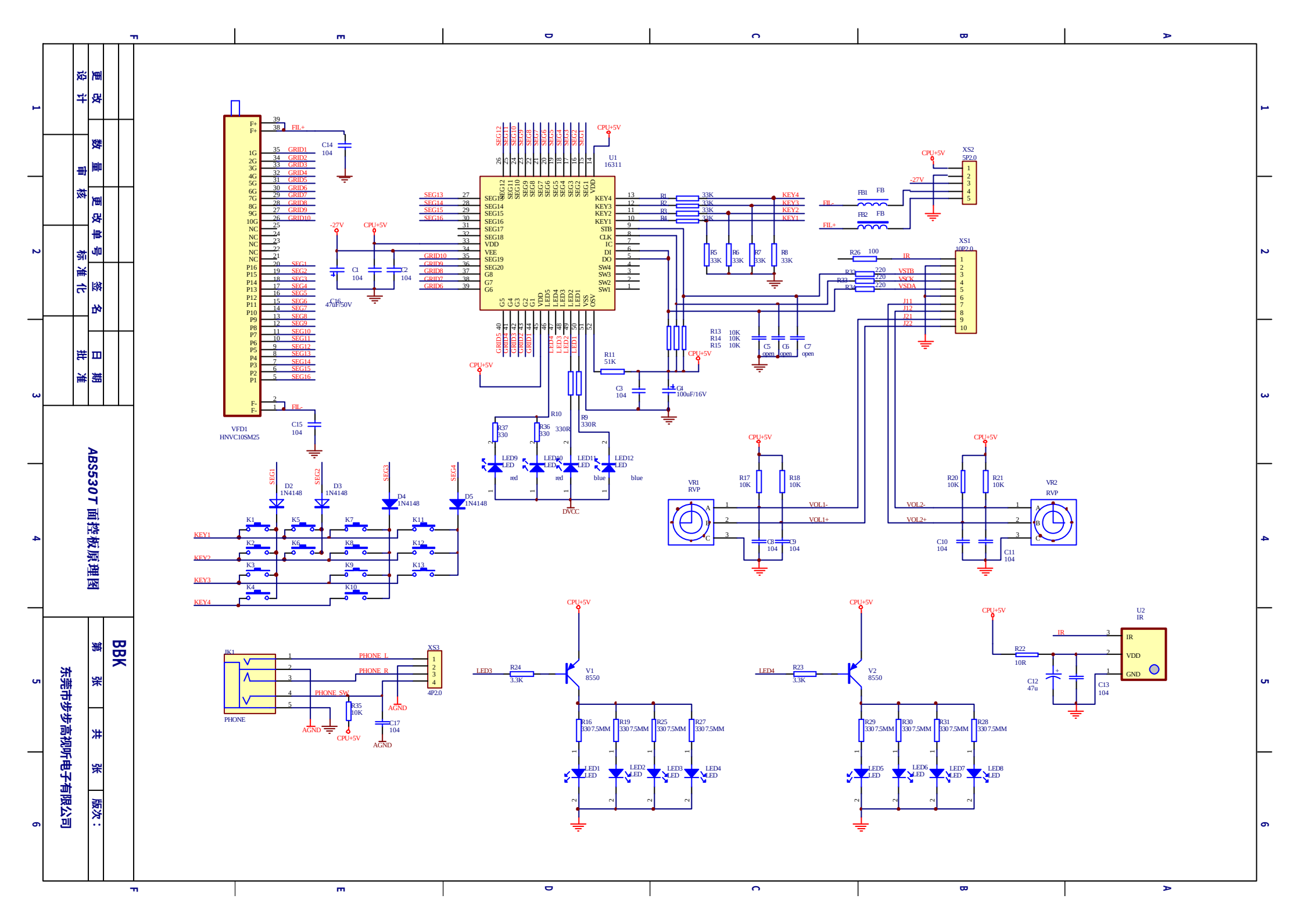
A+12V
A+5V
D+5V
D+3V3
-27V
FL+
FL-
XP100
XP102
XP109
XS108



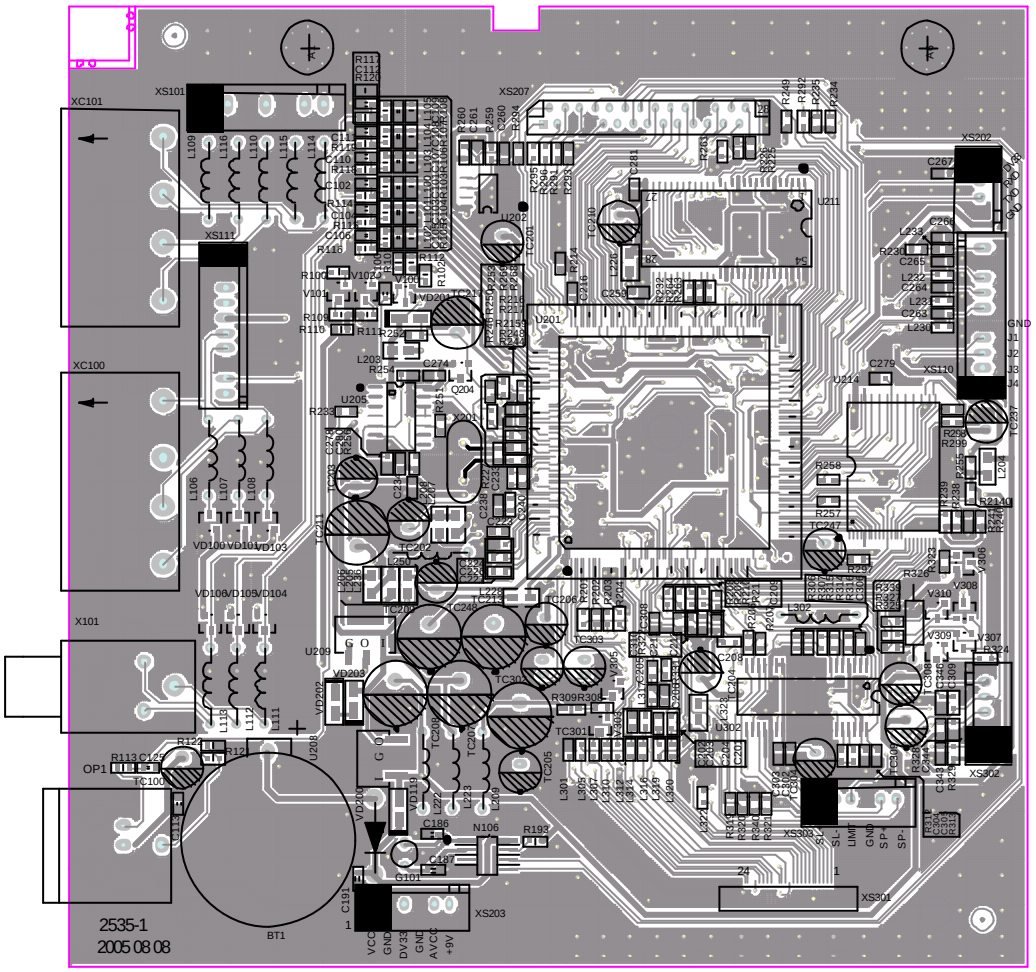
更改	数量	更改单号	签名	日期	ABS535T功放板电原理图	BBK
设计		审核	标准化	批准		第 1 张 共 1 张 版次：
11-Mar-2006						东莞市步步高视听电子有限公司



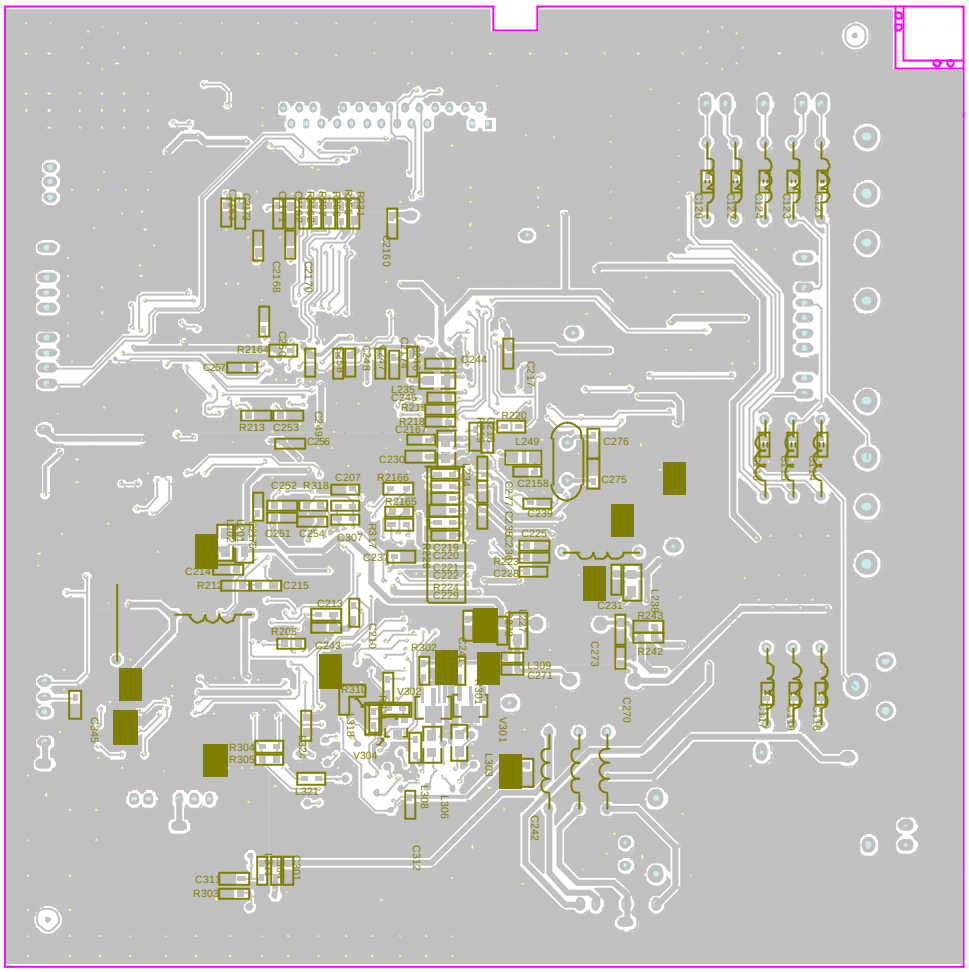
更改	数量	更改单号	签 名	日期	ABS535T 解码&伺服电原理图	BBK	
设 计						比例	质量	数量
审 核						第 2 张	共 3 张	版次：1.0
标准化					板号：2535-0	广东步步高电子工业有限公司AV厂		
批 准								


ABS5307面控板原理图
BBK
东莞市步步高视听电子有限公司
更改
设计
数量
审核
更改单号
标准化
签名
日期
批准
第 张
共 张
版次：
VFD1
HNVC10SM25
U1
16311
C14 104
C15 104
C16 47uF/50V
C1 104
C2 104
-27V
CPU+5V
FIL+
FIL-
GRID1
GRID2
GRID3
GRID4
GRID5
GRID6
GRID7
GRID8
GRID9
GRID10
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
SEG9
SEG10
SEG11
SEG12
SEG13
SEG14
SEG15
SEG16
KEY1
KEY2
KEY3
KEY4
R1 33K
R2 33K
R3 33K
R4 33K
R5 33K
R6 33K
R7 33K
R8 33K
R9 330R
R10 330R
R11 51K
R13 10K
R14 10K
R15 10K
C3 104
C4 100uF/16V
C5 open
C6 open
C7 open
XS1
10P2.0
XS2
5P2.0
FB1 FB
FB2 FB
R26 100
R33 220
R34 220
IR
VSTB
VSCK
VSDA
J11
J12
J21
J22
D2 1N4148
D3 1N4148
D4 1N4148
D5 1N4148
K1
K2
K3
K4
K5
K6
K7
K8
K9
K10
K11
K12
K13
LED9 red
LED10 red
LED11 blue
LED12 blue
R37 330
R36 330
VR1 RVP
VR2 RVP
R17 10K
R18 10K
R20 10K
R21 10K
VOL1-
VOL1+
VOL2-
VOL2+
C8 104
C9 104
C10 104
C11 104
IK1
PHONE
XS3
4P2.0
PHONE_L
PHONE_R
PHONE_SW
R35 10K
C17 104
AGND
V1 8550
V2 8550
R24 3.3K
R23 3.3K
LED3
LED4
R16 330 7.5MM
R19 330 7.5MM
R25 330 7.5MM
R27 330 7.5MM
R29 330 7.5MM
R30 330 7.5MM
R31 330 7.5MM
R28 330 7.5MM
LED1 LED
LED2 LED
LED3 LED
LED4 LED
LED5 LED
LED6 LED
LED7 LED
LED8 LED
U2
IR
R22 10R
C12 47u
C13 104
VDD
GND
DVCC

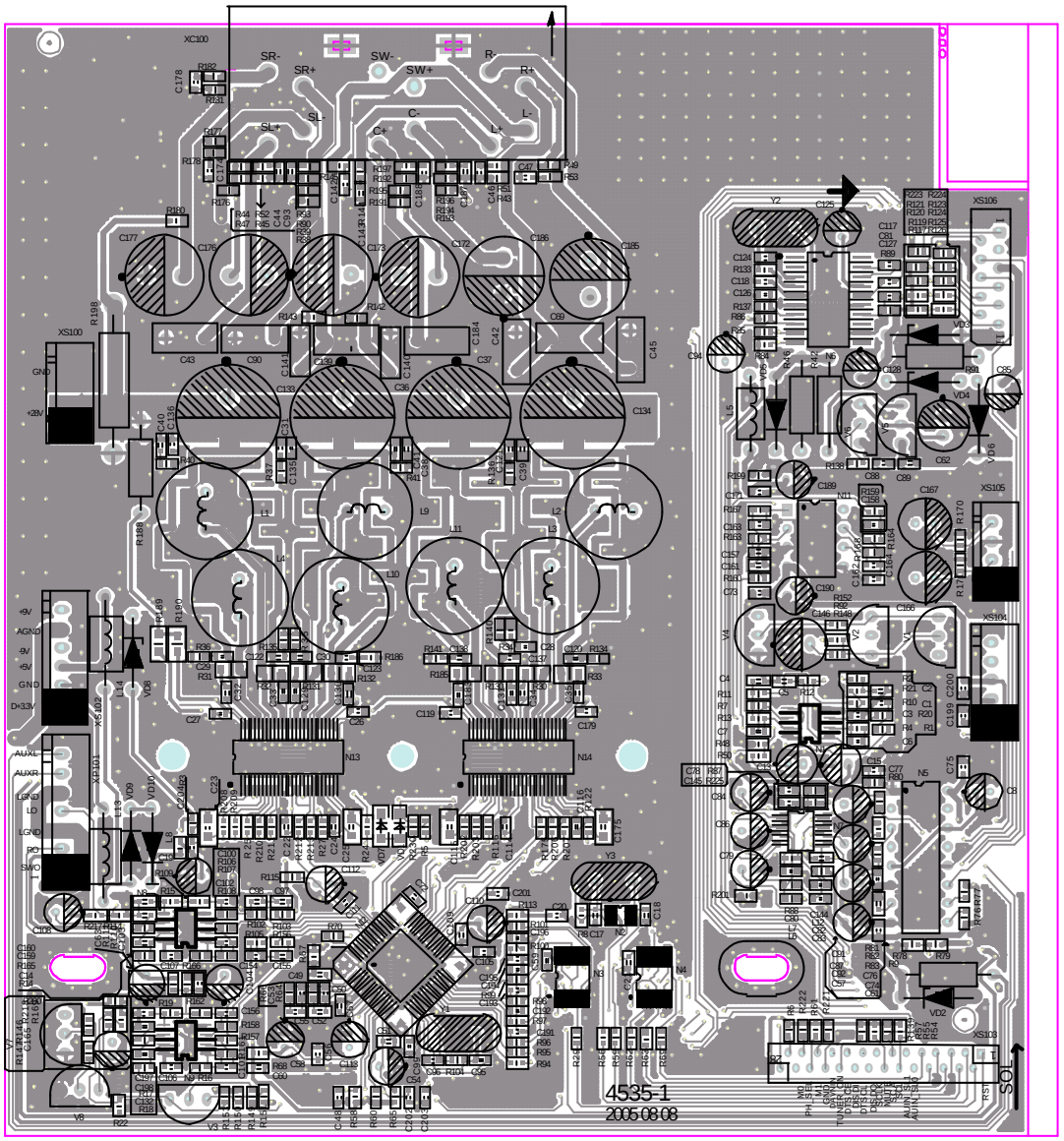
Surface layer of MPEG&SERVO Board



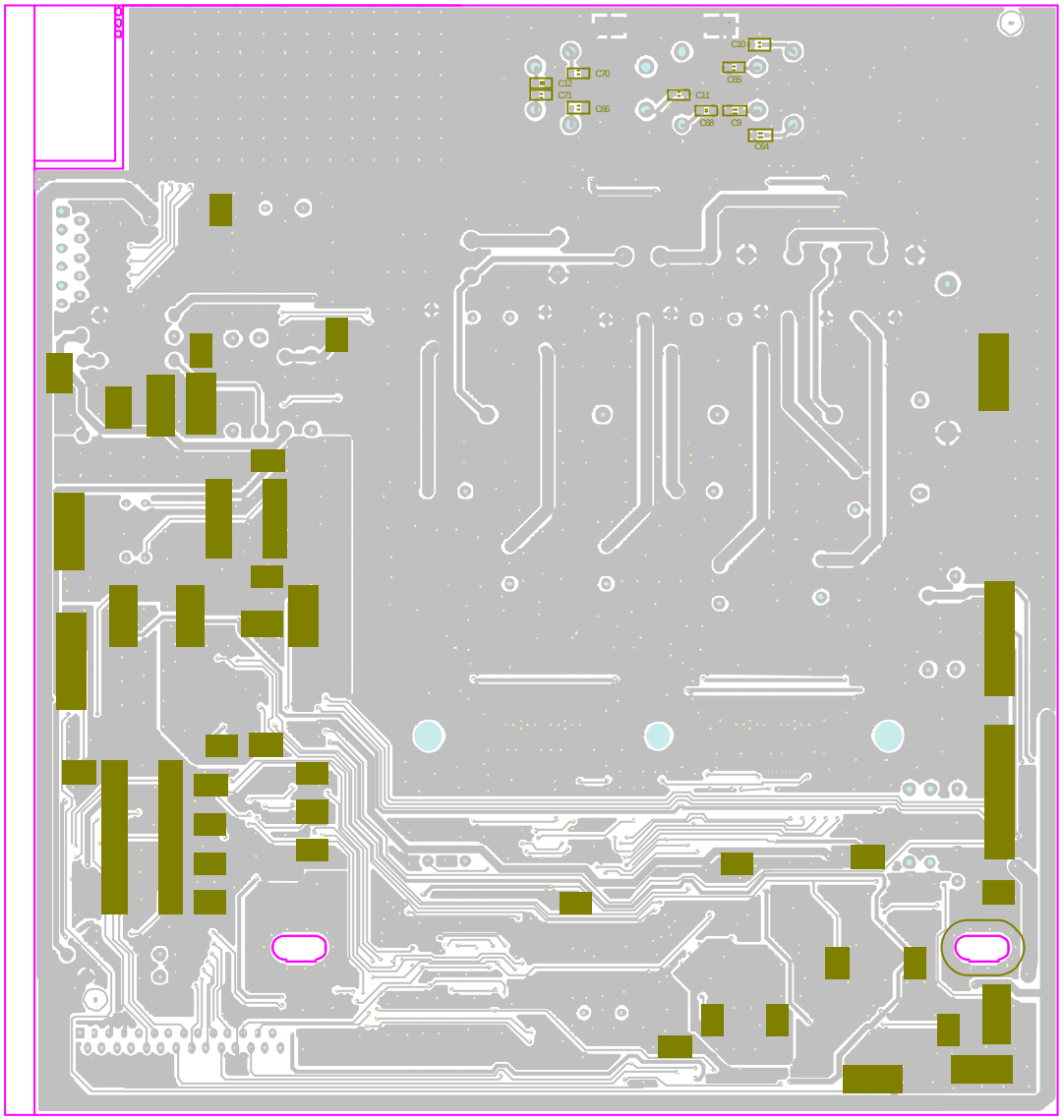
Bottom layer of MPEG&SERVO Board



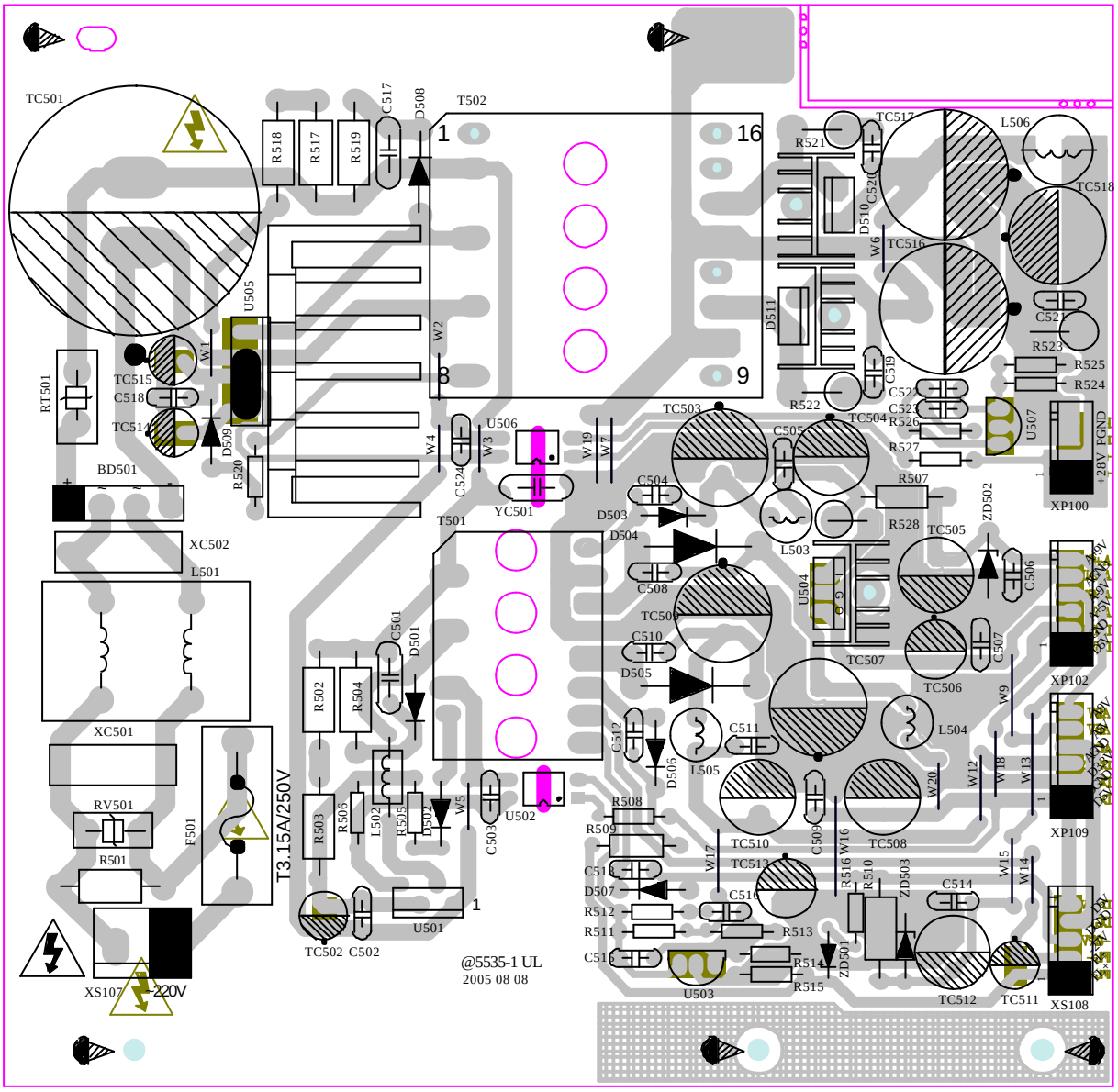
Surface layer of audio power amplifying Board

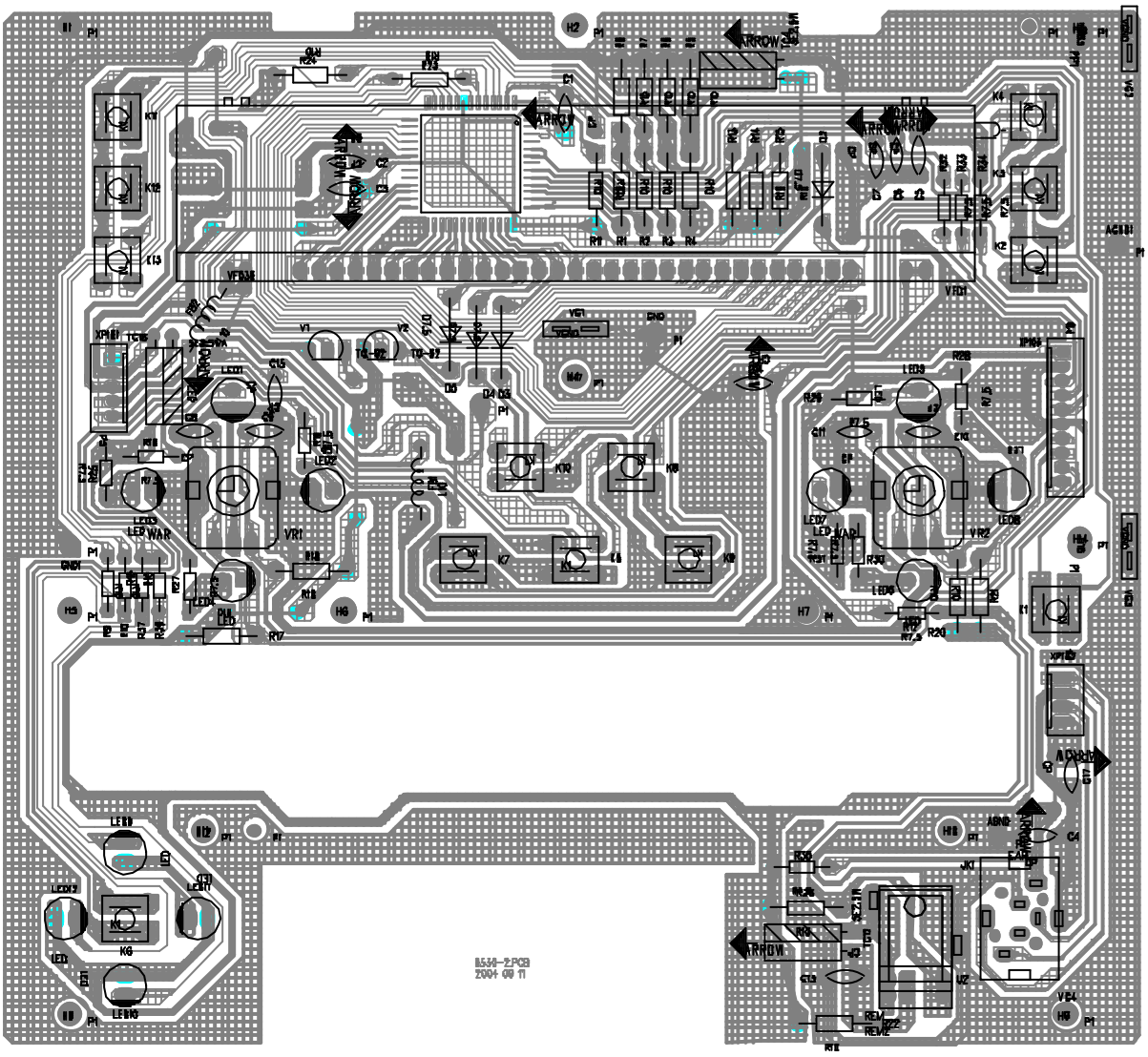


Bottom layer of audio power amplifying Board

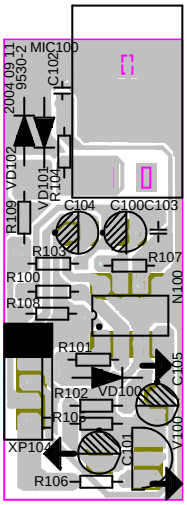


Power Board


TC501
T502
1
16
8
9
R518
R517
R519
C517
D508
W2
U505
W1
RT501
TC515
C518
TC514
D509
R520
BD501
XC502
L501
XC501
RV501
R501
F501
T3.15A/250V
XS107
220V
T501
YC501
U506
W4
W3
C524
W19
W7
R502
R504
C501
D501
R503
R506
L502
R505
D502
W5
C503
U502
U501
TC502
C502
1
@5535-1 UL
2005 08 08
TC503
C504
D503
D504
C508
TC509
C510
D505
C512
D506
L505
C511
R508
R509
C513
D507
R512
R511
C516
U503
W17
TC510
TC513
C509
W16
R516
R510
R513
R514
R515
ZD501
ZD503
C514
TC512
TC511
XS108
W15
W14
R521
TC517
C520
D510
W6
TC516
D511
C519
R522
TC504
C505
L503
U504
W10
R507
R528
TC505
ZD502
C506
C507
TC506
TC507
L504
W9
W20
W12
W18
W13
XP102
XP109
L506
TC518
C521
R523
R525
R524
C522
C523
R526
R527
U507
XP100
+28V
PGND



6530-2.pcb - Sat Mar 11 08:52:14 2006


MIC100
2004.09-11
9530-2
C102
VD102
VD101
R104
R109
C104
C100
C103
R103
R107
R100
R108
N100
R101
C105
R102
VD100
R105
V100
XP104
C101
R106

BOM list

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
DECODE BOARD			
0000375	CARBON FILM RESISTOR	1/4W2.2O± 5%	R326
0260196	CD	CD11C 16V10U± 20%4× 7 1.5	TC202,TC100
0260613	CD	CD11C 16V220U± 20% 8× 7 3.5	TC207~TC209,TC211,TC213,TC301
0260200	CD	CD11C 16V47U± 20%5× 7 2	TC201,TC302,TC303,TC205,TC206,TC203~TC204,TC210,TC247,TC248,TC237,TC304,TC308,TC309
0260201	CD	CD11C 16V100U± 20%6× 7 2.5	TC217
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L209,L222,L223,L302,L250,L106~L116
0960020	CRYSTAL OSCILLATOR	27.00MHz 49-S	X201
1940140	CABLE SOCKET	14P 1.0mm STRAIGHT DUAL LINE PLUG	XS207
0680062	SCHOTTKY DIODE	1N6263	VD200
1480017	FASTENER BATTERY	CR2032A	
3630281	BATTEMETAL OXIDE FILM RESISTOR HOLDER	1403G7-GBK4B	BT1
0960017	CRYSTAL OSCILLATOR	32.768KHz 3× 9	G101
1940046	SOCKET	10P 2.0mm	XS111,XS110
1940160	SOCKET	5P 2.0mm STRAIGHT FLEX	XS302
1940005	SOCKET	6P 2.0mm	XS303
1940007	SOCKET	7P 2.5mm	XS101
1910225	TERMINAL SOCKET	AV4-8.4-13/PB-1	XC101
1910176	TERMINAL SOCKET	AV4-8.4-13/PB-23	XC100
1910159	TERMINAL SOCKET	CS TERMINAL DASW-02	X101
1090077	ELECTRO-OPTIC TRANSFORMER	TX179AT-2	OP1
1910195	TERMINAL SOCKET	AVG-2-07 BLACK	OP1
2121903	FLAT CABLE	6P 360 2.0/2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XS203
5446913	PCB SEMI-FINISHED PRODUCT	2535-0-SMD ABS535T	
DECODE BOARD-SMD			
0090001	SMD RESISTOR	1/16W 0O ± 5% 0603	R201~R204,R244,R248,R251,R255,R297,R298,R299,R331,R212,R228,R303,R318,R2165,R2166,R226,R257,R258,R2159,R114~R116,R118~R120
0090006	SMD RESISTOR	1/16W 75O ± 5% 0603	R233,R102~R108
0090272	SMD RESISTOR	1/16W1O± 5% 0603	R304~R307,R321,R340
0090003	SMD RESISTOR	1/16W 10O ± 5% 0603	R301,R302

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090005	SMD RESISTOR	1/16W 33O ± 5% 0603	R232,R256,R261,R263,R264,R268,R292~R296,R231,R265~R267,R2162,R111,R220
0090238	SMD RESISTOR	1/16W 68O ± 5% 0603	R113
0090181	SMD RESISTOR	1/16W 100O ± 5% 0603	R291
0090008	SMD RESISTOR	1/16W 220O ± 5%	R121
0090009	SMD RESISTOR	1/16W 330O ± 5% 0603	R110
0090011	SMD RESISTOR	1/16W 470O ± 5% 0603	R325,R327
0090014	SMD RESISTOR	1/16W 1K ± 5% 0603	R213,R215,R254,R109
0090016	SMD RESISTOR	1/16W 1.5K ± 5% 0603	R323,R324,R243
0090123	SMD RESISTOR	1/10W 33O ± 5% 0805	L202
0090249	SMD RESISTOR	1/16W 510O ± 5% 0603	R214
0090017	SMD RESISTOR	1/16W 2.2K ± 5% 0603	R100,R101
0090018	SMD RESISTOR	1/16W 3.3K ± 5% 0603	R242
0090019	SMD RESISTOR	1/16W 4.7K ± 5% 0603	R238~R240,R234,R249,R230,R2140,R112,R193
0090023	SMD RESISTOR	1/16W 10K ± 5% 0603	R208,R252,R309,R311,R313,R314,R339,R2164 ,R328,R329,R259,R260
0090024	SMD RESISTOR	1/16W 15K ± 5% 0603	R209,R223
0090025	SMD RESISTOR	1/16W 20K ± 5% 0603	R211,R312,R315,R316
0090188	SMD RESISTOR	1/16W 18K ± 5% 0603	R210
0090197	SMD RESISTOR	1/16W 150K ± 5% 0603	R319,R320
0090231	PRECISION SMD RESISTOR	1/16W 680K ± 1% 0603	R317,R322
0090319	PRECISION SMD RESISTOR	1/16W 750K ± 1% 0603	R227
0090034	SMD RESISTOR	1/16W 100K ± 5% 0603	R224,R308,R310,R246,R122
0090111	SMD RESISTOR	1/10W 4.7O ± 5% 0805	L206
0310085	SMD CAPACITOR	50V 20P ± 5% NPO 0603	C222,C114~C119,C186,C187
0310190	SMD CAPACITOR	50V 27P ± 5% NPO 0603	C275,C276
0310045	SMD CAPACITOR	50V 47P ± 5% NPO 0603	C263~C266,C101~C112
0310051	SMD CAPACITOR	50V 331 ± 5% NPO 0603	C212,C213
0310048	SMD CAPACITOR	50V 151 ± 5% NPO 0603	C304,C306
0310084	SMD CAPACITOR	50V 104 +80%-20% 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C277,C343~C345,C280,C100,C113,C125

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310058	SMD CAPACITOR	25V 104 +80%-20% 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C277,C343~C345,C280,C100,C113,C125
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C201~C204,C221,C240
0310066	SMD CAPACITOR	50V 102 ± 10% 0603	C278,C223,C120~C124
0310067	SMD CAPACITOR	50V 152 ± 10% 0603	C215
0310068	SMD CAPACITOR	50V 222 ± 10% 0603	C307,C310
0310201	SMD CAPACITOR	50V 153 ± 10% 0603	C210
0310047	SMD CAPACITOR	50V 101 ± 5% NPO 0603	C233
0310055	SMD CAPACITOR	16V 333 ± 10% 0603	C225
0310056	SMD CAPACITOR	16V 473 ± 10% 0603	C219,C220
0310362	SMD CAPACITOR	16V474 +80%-20% 0603	C218
0390044	SMD INDUCTOR	10UH ± 10% 2012	L303,L306
0310245	SMD CAPACITOR	50V 121 ± 10% X7R 0603	C206
0390163	SMD INDUCTOR	3.3uH ± 10% 1608	L249
0390096	SMD INDUCTOR	1.8UH ± 10% 1608	L100~L105
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L309,L228,L236,L230~L233,L301,L305,L307,L310,L312,L314,L316,L317,L319,L320,L304,L308,L318,L322,L324,L311,L321,L323
0390087	SMD MAGNETIC BEADS	FCM2012V-221T07	L201,L203,L205,L207,L208,L226,L227,L234,L235、L238
0700007	SMD DIODE	1N4148	VD201,VD119
0700001	SMD DIODE	LS4148	VD201
0700002	SMD DIODE	LL4148	VD201
0780062	SMD TRIODE	9014C	V310
0780040	SMD TRIODE	3904(100-300) SOT-23	V305
0780193	SMD TRIODE	2SK3018	V303,V304
0780115	SMD TRIODE	2SB1132	V301,V302
0780085	SMD TRIODE	8050D	V100~V102,V307,V308
0780063	SMD TRIODE	9015C	Q204
0780129	SMD TRIODE	8550D	V306,V309
0700056	SMD DOUBLE DIODE	MMBD4148SE SOT-23	VD100,VD101,VD103~VD106
0880165	IC	74HCU04D SOP	U205
0880322	IC	MM74HCU04M SOP	U205
0880513	IC	HCU04 SOP	U205

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0881157	IC	HY57V641620HGT-H TSOP	U211
0881661	IC	IC42S16400-7T TSOP	U211
0881969	IC	IP1117-ADJ SOT-223	U209
0881182	IC	LM1117MP-ADJ SOT-223	U209
0881031	IC	24C02N SOP	U202
0881990	IC	MT1389FE/B（B）QFP	U201
0881897	IC	MT1389EE QFP	U201
0881459	IC	D5954 SOP	U302
0881378	IC	BA5954FP HSOP	U302
0881968	IC	M41T81 SOP	N106
1940094	CABLE SOCKET	24P 0.5mm SMD WITH CLASP	XS301
1632563	PCB	2535-1	
INPUT BOARD			
0200167	PORCELAIN CAPACITOR	50V 20P ± 10% NPO 2.5mm	C100~C105
1860064	SCART SOCKET	SC107	XC100
2121601	SOFT FLAT CABLE	10P160 2.0/2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP101
1563412	PCB	1530-1	
POWER BOARD			
2100003	CONNECTED CORDS	F0.6 SHAPED 7.5mm	W1,W2,W3,W4,W5,W6,W14,W20
2100004	CONNECTED CORDS	F0.6 SHAPED 10mm	W7,W15,W18,W19,W12,W17
2100006	CONNECTION CORDS	F0.6 SHAPED 12.5mm	R507,W9
2100007	CONNECTION CORDS	F0.6 SHAPEN 15mm	W16,W13
0000274	CARBON FILM RESISTOR	1/4W47O± 5% SHAPED 10	R520
0000431	CARBON FILM RESISTOR	1/4W75O± 5% SHAPED 10	R505
0000433	CARBON FILM RESISTOR	1/4W270O± 5% SHAPED 10	R516
0000282	CARBON FILM RESISTOR	1/4W820O± 5% SHAPED 10	R508
0000284	CARBON FILM RESISTOR	1/4W1.5K± 5% SHAPED 10	R527
0000291	CARBON FILM RESISTOR	1/4W5.6K± 5% SHAPED 10	R515
0000294	CARBON FILM RESISTOR	1/4W10K± 5% SHAPED 10	R511
0000301	CARBON FILM RESISTOR	1/4W47K± 5% SHAPED 10	R512,R526
0000310	CARBON FILM RESISTOR	1/4W1MO± 5% SHAPED 10	R506
0010134	METAL OXIDE FILM RESISTOR	1W330O± 5%SHAPED R 15×8	R510
0000615	CARBON FILM RESISTOR	1W15O± 5% SHAPED VERTICAL 5	R528
0010062	METAL FILM RESISTOR	1/4W2.2K± 1% SHAPED 10	R525

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0010063	METAL FILM RESISTOR	1/4W4.7K± 1% SHAPED 10	R513
0010101	METAL FILM RESISTOR	1/4W12K± 1% SHAPED 10	R514
0010273	METAL FILM RESISTOR	1/4W24K± 1% SHAPED 10	R524
0010306	METAL OXIDE FILM RESISTOR	@1W680K± 5% SHAPED 15 UL	R501
0010274	METAL FILM RESISTOR	1W10O± 1% SHAPED 12.5	R509
0010275	METAL OXIDE FILM RESISTOR	1W33O± 5% SHAPED VERTICAL 7.5	R521,R522
0010147	METAL OXIDE FILM RESISTOR	2W47K± 5% SHAPED FLAT 15× 7	R517,R519
0010157	METAL OXIDE FILM RESISTOR	2W68K± 5%SHAPED FLAT 15× 7	R502,R518
0010263	METAL OXIDE FILM RESISTOR	2W75K± 5% SHAPED FLAT 15× 7	R503,R504
0010281	METAL OXIDE FILM RESISTOR	3W1K± 5% SHAPED VERTICAL 7.5	R523
0200105	PORCELAIN CAPACITOR	50V 100P ± 10% 5mm	C504,C508,C510,C512,C513,C519,C520
0200123	PORCELAIN CAPACITOR	50V 102 ± 10% 5mm	C515,C522
0200134	PORCELAIN CAPACITOR	50V 223 ± 20% 5mm	C503
0200138	PORCELAIN CAPACITOR	50V 104 ± 20% 5mm	C502,C516,C518,C523
0200224	PORCELAIN CAPACITOR	1000V 103 +80%-20% 7.5mm	C501,C517
0210158	TERYLENE CAPACITOR	100V 472± 10% SHAPED 5mm	C506,C507,C509,C511,C514
0210024	TERYLENE CAPACITOR	100V 333 ± 10% 5mm	C505
0210148	TERYLENE CAPACITOR	100V 473 ± 10% SHAPED 5mm	C521,C524
0210204	ANTI-JAMMING CAPACITOR	@MKP61 X2 275VAC 104M 15 UL	XC501,XC502
0200353	CERAMIC CAPACITOR	@Y1 400VAC 102± 10% 10mm UL	YC501
0260614	CD	EZ 400V330U± 20% 35× 35 10	TC501
0260664	CD	CD11K 16V220U± 20% 6.3× 11 2.5	TC511
0260653	CD	CD11K 16V470U± 20%8× 14 3.5	TC505,TC506,TC512
0260661	CD	CD288H 16V2200U± 20%13× 20 5	TC507,TC509
0260597	CD	CD11 105℃ 16V1000U± 20%10× 20 5	TC508,TC510
0260558	CD	CD11T 25V470u± 20%10× 16 5	TC504
0260665	CD	CD11K 25V1000U± 20% 13× 20 5	TC503
0260667	CD	CD11K 50V1U± 20% 5× 11 2	TC514
0260663	CD	CD11K 35V220U± 20% 8× 12 3.5	TC513
0260666	CD	CD11K 50V47U± 20% 6.3× 11 2.5	TC515
0260601	CD	CD11C 105℃ 50V22U± 20%6× 7 2.5	TC502
0260668	CD	CD11K 50V470U± 20% 13× 20 5	TC518
0260677	CD	CD11K 50V2200U± 20% 16× 30 7.5	TC516,TC517
0390154	MAGNETIC BEADS INDUCTOR	RH-357508	L502

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0390340	VERTICAL INDUCTOR	10uH ± 10% 5A 12.5× 26.5 10mm	L506
0410010	CHOKE COIL	VERTICAL 10UH 1A 5mm	L505
0410011	CHOKE COIL	VERTICAL 10UH 2A 5mm	L503,L504
0460533	SWITCH POWER TRANSFORMER	@SE2135 UL	T501
0460441	SWITCH POWER TRANSFORMER	BCK-40-0726	T502
0680065	SCHOTTKY DIODE	SR560 DO-27 SHAPED 20mm	D504,D505
0570006	DIODE	1N4148	D502
0570013	DIODE	HER105	D503,D506,D507,D509
0570014	DIODE	HER107	D501
0570042	DIODE	HER207 SHAPED 12.5mm	D508
0570045	DIODE	BYW29E-200 TO-220	D510,D511
05800069	VOLTAGE REGULATOR DIODE	5.1V ± 5% 1/2W BELT	ZD501
0580022	VOLTAGE REGULATOR DIODE	12V ± 5% 1W	ZD503
0670013	SILICON BRIDGE	KBL04	BD501
1570146	PCB	@5535-1 UL	
0880379	IC	LM7805 GOLD SEALED TO-220	U504
0880247	IC	MC7805CT GOLD SEALED TO-220	U504
0880499	IC	L7805CV GOLD SEALED TO-220	U504
0880863	IC	HA17431VP TO-92	U503
0882462	IC	AZ431AZ-A TO-92	U503
0880553	IC	LM431ACZ TO-92	U507
0882462	IC	AZ431AZ-A TO-92	U507
0880765	IC	5L0380R YDTU	U501
0881500	IC	KA1M0880BTU TO-3P-5L	U505
1030007	PRESS SENSITIVITY RESISTOR	7D 471 ± 10% 5mm	RV501
1050002	HEAT SENSITIVITY RESISTOR	NTC SCK-104MS± 20%	RT501
1080032	PHOTOELECTRIC COUPLER	@HS817 VDE	U502,U506
1000010	POWER GRID FILTER	JBL2822 30mH± 20%	L501
2121574	FLAT CABLE	4P150 2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION 22# CORD	XP100
1940004	SOCKET	5P 2.5mm	XS108
1940006	SOCKET	6P 2.5mm	XP109
1940074	SOCKET	2P 7.92mm	XS107
2120886	FLAT CABLE	6P120 2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP102

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
2300033	FUSE	@T3.15AL 250V VDE	F501
3020402	FUSE HOLDER	BLX-2	F501
3580086	HEAT RADIATION BOARD	11×15×25 BLACK SINGLE HOLE	D510,D511
3580091	HEAT RADIATION BOARD	11×15×31 LFDR9905	U504
3580156	HEAT RADIATION BOARD	40×20×35 DVR938-2	U505
4000453	SELF-TAPPING SCREW	BT 3×8H WHITE NICKEL	D510,D511,U504
4000564	SELF-TAPPING SCREW	PWT 3×12×7H WHITE NICKEL	U505
4000627	SELF-TAPPING SCREW	PWT 2.6×6×5H BLACK ZINC	U505
POWER SUPPLY SWITCH BOARD			
1780019	SWITCH DOWN-LEAD	2P 390mm	XP106
0200230	CERAMIC CAPACITOR	400VAC 102 ± 10% 10mm	C100
1563413	PCB	A530-1	
AMPLIFIER BOARD			
2100006	CONNECTION CORDS	F0.6 SHAPED 12.5mm	R42
0000540	CARBON FILM RESISTOR	1/2W150O± 5% SHAPED 12.5	R91,R9
0010233	METAL OXIDE FILM RESISTOR	1/2W47O± 5% SHAPED 12.5	R188,R46
0210145	METAL POLYESTER FILM CAPACITOR	CL21X 100V 104K C5	C140,C141,C42,C45
0210165	METAL POLYESTER FILM CAPACITOR	CL23X 63V 474 ± 5% 5	C43,C90,C139,C184,C69
0010282	METAL OXIDE FILM RESISTOR	3W1K± 5% SHAPED R 20×8	R198
0260127	CD	CD11 16V4.7U± 20%5×11 2	C84,C87,C91,C92,C113,C125
0260019	CD	CD11 16V10U± 20%5×11 2	C8,C13,C54,C58,C86,C104,C108,C110,C112,C165
0260025	CD	CD11 16V47U± 20%5×11 2	C19,C57,C63,C79,C128,C62
0260028	CD	CD11 16V220U± 20%6×12 2.5	C189,C190,C94,C85,C146,C15
0260618	CD	CD11 10V330U± 20%6.3×11 2.5	C166,C167
0260048	CD	CD11 35V470U± 20%10×20 5	C172,C173,C176,C177,C185,C186
0260491	CD	CD11K 35V680U± 20% 13×20 5	C36,C37,C133,C134
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L5
0390168	INDUCTOR	100UH± 10% 0410 SHAPED 12.5mm	L14
0410176	VERTICAL SCREEN SHIELD FILTERING INDUCTOR	10uH ± 10% 4A 5mm	L1~L4,L9~L11
0570004	DIODE	1N4004	VD9,VD10
0570006	DIODE	1N4148	VD6
05800069	VOLTAGE REGULATOR DIODE	5.1V ± 5% 1/2W BELT	VD3,VD2
00580009	VOLTAGE REGULATOR DIODE	9.1V ± 5% 1/2W	VD8，VD4

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780032	TRIODE	9014C	V6
0780029	TRIODE	C8050	V4,V5,V7,V8
0780138	TRIODE	8050D	V4,V5,V7,V8
0780025	TRIODE	2N5401	V1~V3
0960226	CRYSTAL OSCILLATOR	4.332MHz 49-s	Y2
0960182	CRYSTAL OSCILLATOR	12.288MHz 49-S	Y3
0960171	CRYSTAL OSCILLATOR	13.50MHZ 49-S	Y1
0881429	IC	CD4052BE DIP	N5
0880443	IC	CD4052BCN DIP	N5
0882375	IC	RC4580 DIP	N11
0881743	IC	F4558 DIP	N11
0882351	IC	NE4580 DIP	N11
1940003	SOCKET	4P 2.5mm	XS100,XS105
2150246	FLAT CABLE	7P290 2.5 T2 2/3P SHIELD,WITH NEEDLE,THE SAME DIRECTION	XP101
1940140	CABLE SOCKET	14P 1.0mm STRAIGHT DUAL LINE PLUG	XS103
1940033	CABLE SOCKET	11P 1.25mm STRAIGHT DUAL LINE PLUG	XS106
1940006	SOCKET	6P 2.5mm	XS102
1990038	OUTER CONNECTION SOCKET	5PZ-7A	XC100
1940004	SOCKET	5P 2.5mm	XS104
3580186	RADIATOR	78×49×30 DVR938 NOT OXIDATION	
5230707	SOFT SPONGE SPACER	10×10×2 SINGLE-FACED,HARD	
4490001	SPRING PAD	F3	
4450012	BOLT PAD	F3×7.2×0.5	
4210005	MACHINE-TAPPING SCREW	PM 3×8 BLACK	
5233174	RUBBER SPACER	9×9×1 SINGLE-FACED WITH GLUE IN REAR SIDE,CENTER HOLE f 3	
5446915	PCB SEMI-FINISHED PRODUCT	4535-0-SMD	
AMPLIFIER BOARD－SMD			
0090001	SMD RESISTOR	1/16W 0O ±5% 0603	R199,R200,R202,R203,R206~R213,R223,R224
0090272	SMD RESISTOR	1/16W1O±5% 0603	R51~R53,R65,R93,R113,R144,R145,R178,R182,R196,R197
0090540	SMD RESISTOR	1/16W1.5O±5% 0603	R34~R37,R134~R136,R186
0090002	SMD RESISTOR	1/16W 2.2O ±5%	R68
0090616	SMD RESISTOR	1/16W 3.3O±5% 0603	R40,R41,R67,R140,R141
0090314	SMD RESISTOR	1/16W 5.1O ±5% 0603	R88

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090003	SMD RESISTOR	1/16W 10O ± 5% 0603	R24,R25,R89,R116,R137,R175
0090004	SMD RESISTOR	1/16W 22O ± 5% 0603	R115
0090230	SMD RESISTOR	1/16W 47O ± 5% 0603	R29,R56,R59,R62,R63,R69,R70,R94~R101,R225,R5
0090220	SMD RESISTOR	1/16W 51O ± 5% 0603	R27,R122
0090239	SMD RESISTOR	1/16W 200O ± 5% 0603	R64,R66
0090008	SMD RESISTOR	1/16W 220O ± 5%	R123~R126,R148
0090014	SMD RESISTOR	1/16W 1K ± 5% 0603	R3,R50,R133,R217,R218,R146,R147,R149, R150~R152
0090019	SMD RESISTOR	1/16W 4.7K ± 5% 0603	R76~R77,R80,R82,R102,R103,R105,R110,R111,R139,R156,R230,R1,R2,R38,R44,R191
0090020	SMD RESISTOR	1/16W 5.1K ± 5% 0603	R58,R45,R90,R192
0090225	SMD RESISTOR	1/16W 5.6K ± 5% 0603	R78
0090022	SMD RESISTOR	1/16W 8.2K ± 5%	R79
0090023	SMD RESISTOR	1/16W 10K ± 5% 0603	R6,R11,R16,R43,R49,R54,R55,R57,R60,R61,
0090187	SMD RESISTOR	1/16W 12K ± 5%	R13,R14,R18
0090025	SMD RESISTOR	1/16W 20K ± 5% 0603	R176,R180,R193,R177,R181,R194
0090026	SMD RESISTOR	1/16W 22K ± 5% 0603	R7,R17,R165,R92
0090027	SMD RESISTOR	1/16W 27K ± 5% 0603	R106~R108,R157,R158,R161,R4, R10, R20,R21
0090028	SMD RESISTOR	1/16W 33K ± 5% 0603	R109,R162
0090029	SMD RESISTOR	1/16W 47K ± 5% 0603	R114,R169,R48
0090030	SMD RESISTOR	1/16W 56K ± 5% 0603	R22
0090201	SMD RESISTOR	1/16W 220K ± 5% 0603	R15,R19,R12
0090109	SMD RESISTOR	1/16W 1MO ± 5% 0603	R8,R104
0090147	SMD RESISTOR	1/10W 1O ± 5% 0805	R30,R31,R32,R33,R130,R131,R132,R185
0090039	SMD RESISTOR	1/10W 10O ± 5% 0805	R189,R190
0310046	SMD CAPACITOR	50V 82P ± 5% NPO 0603	C14,C132
0310045	SMD CAPACITOR	50V 47P ± 5% NPO 0603	C161,C162
0310042	SMD CAPACITOR	50V 15P ± 5% NPO 0603	C17,C18,C95,C96,C118,C124
0310047	SMD CAPACITOR	50V 101 ± 5% NPO 0603	C3,C6,C76,C77,C100~C102,C156,C191~C196
0310049	SMD CAPACITOR	50V 221 ± 5% NPO 0603	C73,C163,C164,C171
0310051	SMD CAPACITOR	50V 331 ± 5% NPO 0603	C81
0310196	SMD CAPACITOR	50V 471 ± 10% 0603	
0310471	SMD CAPACITOR	50V 561± 5% NPO 0603	C117
0310054	SMD CAPACITOR	50V 681 ± 5% NPO 0603	C1,C2C97,C98,C154,C155
0310066	SMD CAPACITOR	50V 102 ± 10% 0603	C20,C21,C38,C39,C89,C135,C136,

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310067	SMD CAPACITOR	50V 152 ± 10% 0603	C159,C198
0310072	SMD CAPACITOR	50V 103 ± 10% 0603	C40,C41,C44,C46,C47,C50,C53,C64~C66,C68,C70~C71,C93,C137,C138,C142,C143,C174,C178,C187,C188,C12
0310084	SMD CAPACITOR	50V 104 +80%-20% 0603	C9~C11,C22,C24,C26~C31,C48,C49,C51,C52,C55,C56,C59~C61,C67,C72,C74,C75,C78,C80,C82,C83,C88,C99,C103,C105~C107,C109,C114,C116,C119~C123,C126,C127,C179,C199,C200,C201,C202,C203,C204,C144,C145,R201
0310112	SMD CAPACITOR	16V 224 ± 10% 0603	C111
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C160,C197,C5
0310673	SMD CAPACITOR	50V 333 ± 5% X7R 0603	C32~C35,C129,C130,C131,C183
0310368	SMD CAPACITOR	25V 105 +80%-20% Y5V 0805	C23,C25,C115,C175
0310056	SMD CAPACITOR	16V 473 ± 10% 0603	C4
0310201	SMD CAPACITOR	50V 153 ± 10% 0603	C7
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L6,L8,L12,R160,R159
0700007	SMD DIODE	1N4148	VD1,VD7
0882353	IC	CS5340 TSSOP	N7
0881456	IC	SAA6588 SO20	N6
0882349	IC	TAS5112 TSSOP	N13,N14
0882350	IC	TAS5508 TQFP	N12
0882352	IC	TLV272 SOP	N8,N9,N1
0882372	IC	74HCT125 TSSOP	N3,N4
0882373	IC	SN74LVC2G04DBVR SOT-23	N2
1632564	PCB	4535-1	
MICROPHONE HOLDER BOARD			
0000133	CARBON FILM RESISTOR	1/6W4.7K± 5% SHAPED 7.5	R104,R103,R109
0000148	CARBON FILM RESISTOR	1/6W200K± 5% SHAPED 7.5	R101
0000379	CARBON FILM RESISTOR	1/6W2K± 5% SHAPED 7.5	R100
0000589	CARBON FILM RESISTOR	1/6W82K± 5% BELT	R107
0000146	CARBON FILM RESISTOR	1/6W100K± 5% SHAPED 7.5	R108
0200305	POLYPROPYLENE CAPACITOR	50V 22P± 10% SHAPED 5mm	C103
0200308	POLYPROPYLENE CAPACITOR	50V 221± 10% SHAPED 5mm	C102
0260057	CD	CD11 50V0.47U± 20%5× 11 2	C100
0260200	CD	CD11C 16V47U± 20%5× 7 2	C105,C104
0570006	DIODE	1N4148	VD101,VD102
0881227	IC	RC4558P DIP	N100

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0880445	IC	4558C DIP	N100
0881743	IC	F4558 DIP	N100
1980030	MICROPHONE SOCKET	CK3-6.35-19	MIC100
2150259	FLAT CABLE	5P280 2.5 2 PIN 3P SHIELD,WITH L NEEDLE,THE SAME DIRECTION	XP104
1563411	PCB	9530-2	
SURFACE CONTROL BOARD			
2100003	CONNECTED CORDS	F0.6 SHAPED 7.5mm	J5,J6,J7
2100004	CONNECTED CORDS	F0.6 SHAPED 10mm	J8,J9,J10,J14,J16,J17,J18,J19,J20,J22
2100006	CONNECTION CORDS	F0.6 SHAPED 12.5mm	J1,J2,J3,J4
0000122	CARBON FILM RESISTOR	1/6W100O± 5% SHAPED 7.5	R32~R34,R12
0000123	CARBON FILM RESISTOR	1/6W330O± 5% SHAPED 7.5	R9,R10,R16,R19,R25,R27,R28,R29,R30,R31,R36,R37
0000137	CARBON FILM RESISTOR	1/6W10K± 5% SHAPED 7.5	R35
0000270	CARBON FILM RESISTOR	1/4W10O± 5% SHAPED 10	R22
0000287	CARBON FILM RESISTOR	1/4W3.3K± 5% SHAPED 10	R23,R24
0000294	CARBON FILM RESISTOR	1/4W10K± 5% SHAPED 10	R13,R14,R15,R17,R18,R20,R21,R26
0000300	CARBON FILM RESISTOR	1/4W33K± 5% SHAPED 10	R1,R2,R3,R4,R5,R6,R7,R8
0000302	CARBON FILM RESISTOR	1/4W51K± 5% SHAPED 10	R11
0200138	PORCELAIN CAPACITOR	50V 104 ± 20% 5mm	C1~C4,C8,C9,C10,C11,C13,C14,C15,C17
0200307	POLYPROPYLENE CAPACITOR	50V 101± 10% SHAPED 5mm	C5~C7
0260025	CD	CD11 16V47U± 20%5× 11 2	TC12
0260027	CD	CD11 16V100U± 20%6× 12 2.5	TC4
0260163	CD	CD11 50V47U± 20%6× 12 2.5	TC16
0390057	MAGNETIC BEADS INDUCTOR	RH354708	FB1,FB2
0570006	DIODE	1N4148	D2,D3,D4,D5
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	LED1,LED2,LED3,LED4,LED5,LED6,LED7,LED8,LED11,LED12
0620092	RADIATION DIODE	3R 2HD RED	LED9,LED10
0780030	TRIODE	8550C	V1,V2
0780151	TRIODE	8550D	V1,V2
0880251	IC	D16311GC QFP	U1
0881563	IC	S0791GC QFP	U1
1200356	DISPLAY SCREEN	HNVC10SM25	VFD1
3870115	GROUND CHIP OF POWER BOARD	AB903	VG2,VG3
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6× 6× 1	K1~K13

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1980028	EARPHONE SOCKET	CKX-3.5-241	JK1
2121979	FLAT CABLE	10P210 2.0 2 PIN,WITH L NEEDLE,THE SAME DIRECTION	XP103
2121980	FLAT CABLE	5P205 2.5/2.0 2 PIN,WITH L NEEDLE,REVERSE	XP101
2150266	FLAT CABLE	4P220 2.0/2.5 T2 2P SHIELD,WITH L NEEDLE,THE SAME DIRECTION	XP102
2360011	IR SENSOR	HS0038A2	U2
5230143	VFD SPONGE SPACER	10×10×6	
1563896	PCB	6530-4	
REMOTE CONEROLLER			
0090272	SMD RESISTOR	1/16W1O± 5% 0603	R801
0310048	SMD CAPACITOR	50V 151 ± 5% NPO 0603	C802,C803
0630009	EMISSION PIPE	TSAL4400	LED801
0700007	SMD DIODE	1N4148	D801~D803
0700001	SMD DIODE	LS4148	D801~D803
0700002	SMD DIODE	LL4148	D801~D803
0780130	SMD TRIODE	STC3265	Q801
0880220	IC	PT2222 SOP	U801
0970003	CERAMIC RESONATOR	455E	X801
1563233	PCB	8965-4	
3031118	SURFACE CASING OF REMOTE CONTROL	RC019-01 GREY	
3040813	REMOTE CONTROL BOTTOM CASING	RC019-01 GREY	
3050701	BATTEMETAL OXIDE FILM RESISTOR CASE DOOR OF	RC019-01 GREY	
3850063	ANODE SPRING	RC019-01 3#	
3850064	CATHODE SPRING	RC019-01 3#	
3850065	ANODE CATHODE SPRING	RC019-01 3#	
4630900	CONDUCT GLUE OF REMOTE CONTROL	ABS535T(RU)	
5070809	GLUE BAG FOR ENVIRONMENTAL PROTECTION	70×230×0.05 PE	
5155307	SURFACE STICKER OF REMOTE CONTROL	ABS535T(RU)	
5154411	BOTTOM CASING LABEL	ABS530T(RU)	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS
PANEL UNITS		
0160188	DIGITAL POTENTIOMETER	EC12P24L15F
3001915	PANEL	HF830 SILVER WHITE,SPRAY PAINT
3025708	POWER BUTTON GUIDING LIGHE LOOP	HF830 TRANSPARENCE
3025709	BIG KNOB GUIDING LIGHT RING	HF830 TRANSPARENCE
3025711	LEFT DECORATIVE STRIP	HF830 SILVER WHITE,PLATING
3025712	RIGHT DECORATIVE STRIP	HF830 SILVER WHITE,PLATING
3025713	EJECT BUTTON	HF830 SILVER WHITE,PLATING
3025714	5-DIRECTION BUTTON	HF830 SILVER WHITE,PLATING
3025715	LEFT 3-DIRECTION BUTTON	HF830 SILVER WHITE,PLATING
3025716	RIGHT 3-DIRECTION BUTTON	HF830 SILVER WHITE,PLATING
3029379	POWER BUTTON	ABS530T SILVER WHITE,PLATING
3025721	KNOB	HF830 SILVER WHITE, PLATING
3110481	ALUMINUM ALLOY PANEL	ABS535T(RU) SILVER WHITE
3070711	UPPER GLASS	ABS535T(RU) LENS COVER
3070710	LOWER GLASS	ABS535T(RU) LENS COVER
3025725	DISPLAY WINDOW GLASS	HF830 GRAMAMETAL OXIDE FILM RESISTOR LENS
4000048	SELF-TAPPING SCREW	PB 3×8 COLOR ZINC
4000120	SELF-TAPPING SCREW	PB 3×10 COLOR ZINC
3871118	MICROPHONE PRESSING PIECE	ABS530T SILVER GREY
3810070	GROUNDING SPRING	F8×7 F0.3
2110552	LEAD	22# 140/140mm BLACK,WITH F3.2 WELD PIECE
2110553	LEAD	22# 140/170mm BLACK,WITH F3.2 WELD PIECE
5446917	PCB SEMI-FINISHED PRODUCT	9530-2 ABS535T
5447378	PCB SEMI-FINISHED PRODUCT	6530-3 ABS535T
NET COVER		
4650214	NET CLOTH	RC-801K31
ASSEMBLY		
2250190	FLAT CABLE CORD	11P 110mm 1.25mm THE SAME DIRECTION
1020037	DIGITAL RECEIVE TUNER	TAF-11MFR
2250177	FLAT CABLE CORD	28P 150mm 1.0mm REVERSE
1350066	POWER SUPPLY SWITCH	PS8-11-C-048B/BH
1710038	MAGNETISM RING	L361 UH16×28×9 WITH CLASP
1870041	8 GRAPHEMIC POWER SUPPLY SOCKET	RF-180-BB

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS
2121324	SOFT FLAT CABLE	6P180 2.0 2 PIN,THE SAME DIRECTION
2121668	FLAT CABLE	5P140 2.0 2 PIN,THE SAME DIRECTION
5233636	PVC PIECE	55×55×0.25 SILVER GREY,SINGLE-FACED WITH GLUE IN REAR SIDE
2140116	POWER CORD	2P 1.5m 2.5A RVVB CIRCLE HEAD(VD)
2250144	FLAT CABLE CORD	24P 230mm 0.5mm REVERSE
2380245	DVD LOADER	COSMIC DV342S
2380245	DVD LOADER	COSMIC DV342S
3022336	PLASTIC BRACKET	10mm WITH CLASP
3025710	FOOT	HF830 SILVER WHITE,OIL-SPRAYED
3025718	DOOR（SANYO）	HF830 SILVER WHITE,SPRAY PAINT
3070712	GLASS OF GATE	ABS535T(RU) LENS COVER
3029130	PROTECT COVER OF POWER	ABS530T BLACK
3060222	DVD LOADER	ASA8110（WITHOUT SERVO /PICKUP）
3060240	SANYO LOADER BRACKET (LEFT)	HF830
3060241	SANYO LOADER BRACKET (RIGHT)	HF830
3101945	UPPER COVER	ABS535T(RU) SILVER WHITE
3100792	LOWER COVER	HF830 GREY
3871507	REAR BOARD	ABS535T(RU)
3870610	MIDDLE BRACKET	HF830 GREY
3871532	LEFT BRACKET	ABS535T(RU)
3871533	RIGHT BRACKET	ABS535T(RU)
5234130	PVC PIECE	@156×115.1×0.3 UL
4000515	SELF-TAPPING SCREW	PWT 3×16×7H WHITE NICKEL,TOOTH LONGTH 9
4000452	SELF-TAPPING SCREW	PWT 3×6×7H WHITE NICKEL
4000453	SELF-TAPPING SCREW	BT 3×8H WHITE NICKEL
4000462	SELF-TAPPING SCREW	BT 3×6H WHITE NICKEL
4000463	SELF-TAPPING SCREW	CB 3×6H WHITE NICKEL
4000618	SELF-TAPPING SCREW	PB 3×12 BLACK
4040051	SELF-TAPPING SCREW	FB 3×6H BLACK
4210169	MACHINE-TAPPING SCREW	PWM3×8×7 BLACK
4330026	SELF-TAPPING SCREW	HA3×6 WHITE NICKEL
5233093	NYLON BANDAGE	120mm
5233125	FOOT SPACER(BEHIND)	f 15.5×3 SPONGE(RIGIDITY 65)
5233126	FOOT SPACER(FRONT)	f 20.5×3 SPONGE(RIGIDITY 65)

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS
5446912	PCB SEMI-FINISHED PRODUCT	2535-0 ABS535T
5446919	PCB SEMI-FINISHED PRODUCT	A530-0 ABS535T
5446918	PCB SEMI-FINISHED PRODUCT	5535-0 ABS535T
5445586	PCB SEMI-FINISHED PRODUCT	1530-0 ABS530T
5446914	PCB SEMI-FINISHED PRODUCT	4535-0 ABS535T
5462014	PANEL UNITS	ABS535T SILVER WHITE
SPEAKER BODY-L		
5233946	PVC PEEL	SF00859-HLPC
5233951	PVC PEEL	P21010-01
5233947	RUBBER FEMALE CLASP	DK-009 BLACK
4660086	INVERTED TUBE	DJ-214 WITH 150mm INSIDE BLACK PAPER DUCT AND NET CLOTH
SPEAKER BODY-R		
5233946	PVC PEEL	SF00859-HLPC
5233951	PVC PEEL	P21010-01
5233947	RUBBER FEMALE CLASP	DK-009 BLACK
4660086	INVERTED TUBE	DJ-214 WITH 150mm INSIDE BLACK PAPER DUCT AND NET CLOTH
PACKAGE MATERIAL		
1440002	BATTERY	7# AAA
2160136	AV CORD	1.2M AUDIO
2160017	AV CORD	1m AUDIO,DUAL-HEAD WITH F3.5 EARPHONE PLUG
2160130	SPEAKER CORD	f 0.15/17 2M TRANSPARENCE,WITH LINE NIP
2160131	SPEAKER CORD	f 0.15/17 5M TRANSPARENCE,WITH LINE NIP
2170021	AV CORD	1.2M VIDEO
2180029	FM ANTENNA	1.5m WITH CATV FEMALE SLUG 2#
2180030	AM ANTENNA	FRAME WITH BRACKET 15uH± 20%
5013086	GIFT BOX	ABS535T
5180014	SEALING STICKER OF CARTON BOX	0
5040923	FOAM	FM-015303 2#
5040924	FOAM	FM-025303 2#
5070443	HANDLED DRAW	32.5× 85.5× 8 WHITE
5070320	PLASTIC BAG FOR ENVIRONMENTAL PROTECTION (WITH WARNING WORDS)	195× 260 × 0.023 PO
5070322	SELF-SEALED GLUE BAG（WORNING）	230× 335
5071113	PEARL COTTON BAG FOR ENVIRONMENTAL PROTECTION (WITH HOLE)	390× 530× 0.5 PE

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS
5071032	GLUE BAG FOR ENVIRONMENTAL PROTECTION (WITH HOLE)	1100× 740× 0.05 PE ENGLISH
5142076	SN LABEL	CURRENCY FOR RUSSIA
5180181	STICKER	BBK ENGLISH 25× 10 2#
5193737	USER MANUAL	ABS535T(RU) ENGLISH/RUSSIA
5210336	WARRANTY CARD	CURRENCY FOR RUSSIA 3#
5231504	MICROPHONE SPONGE	226× 90× 56
5455905	SATELLITE SPEAKER INDIVIDUAL 1	ABS535T SILVER WHITE
5455906	SATELLITE SPEAKER INDIVIDUAL 2	ABS535T SILVER WHITE
5471389	REMOTE CONTROL	ABS535T(RU)
5680228	PACKED DVD DISC(RU)	BBK 3#
2160174	MICROPHONE CORD	2.5m WITHOUT SHIELD(P0.08× 12)
5456123	UNPACKED MICROPHONE	DM-998（WITHOUT DOWN-LEAD)
5500407	UNPACKED SPEAKER	ABS535T SILVER GREY
5231424	FOOT SPACER	f 15× 2 SPONGE
SOFEWARE PROGRAM		
0881998	IC	AT49BV162A 70TI TSOP
0881754	IC	29LV160BE-70NC TSOP
SUPPLEMENT MODULE		
2100002	CONNECTION CORDS	F0.6
5110002	ELECTRO WELDING WIRE	F1.0
5110003	ELECTRO WELDING WIRE	
5110004	ADHESIVE TAPE	
5110018	ELECTRO WELDING WIRE	f 2.0
5120001	THINNER	
5120004	SOLDERING FLUX	
5120011	WIPING WATER	
5120012	RED GLUEWATER	
5120013	YELLOW GLUEWATER	
5120067	GLUEWATER	502
5120096	PEANUT OIL	
5120209	PVC GLUE	
5120332	SILICONE GREASE HEAT CONDUCT OIL	GB-304
5180452	QA ENVELOP CASE STICKER	QA PASS 110× 45
5230021	SCOTCH TAPE	12mm

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS
5230022	SEALING PAPER	COLORLESS
5230452	FIBRE ADHESIVE TAPE	18mm
5231454	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:6mm
5231455	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:12mm
5231456	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:24mm
5231514	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:20mm