AKAI

DVD PLAYER

Model:
A-5181

SERVICE MANUAL

www.akai.ru

Terminology & Abbreviations

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AC-3 The former name of the Dolby Digital audio-coding system . AC-3 followed AC-1 and AC-2. Still used in some standards documents.

Angle In DVD-video, a specific view of a scene, usually recorded from a certain camera angle. Different angles can be chosen while viewing the scene.

CD Short for compact disc, an optical disc storage format developed by Philips and Sony.

CD-DA Compact disc digital audio. The original music CD format, storing audio information as digital PCM data. Defined by the Red Book standard.

CD+G Compact disc plus graphics. A variation of CD which embeds graphical data in with the audio data, allowing video pictures to be displayed periodically as music is played. Primarily used for karaoke.

CD-R An extension of the CD format allowing data to be recorded once on a disc by using dye-sublimation technology. Defined by the Orange Book standard.

Channel A part of an audio track. Typically there is one channel allocated for each loudspeaker.

Chapter In DVD-Video, a division of a title. Technically called a part of title (PTT).

Closed Caption Text captions for video which are not normally visible, as opposed to open captions, which are a permanent part of the picture. In the United States, the official NTSC Closed Caption standard requires that all TVs larger than 13 inches include circuitry to decode and display caption information stored on line 21 of the video signal. DVD-Video can provide closed caption data, but the subpicture format is preferred for its versatility.

Component Video A video system containing three separate color component signals, either red/green/blue (RGB) or chroma/color difference (YGbCr, YPbPr, YUV), in analog or digital form. The MPEG-2 encoding system used by DVD is based on color-difference component digital video. Very few televisions have component video inputs.

Composite Video An analog video signal in which the luma and chroma components are combined (by frequency multiplexing), along with sync and burst. Also called CVBS. Most televisions and VCRs have composite video connectors, which are usually colored yellow.

CD-i Compact disc interactive. An extension of the CD format designed around a set-top computer that connects to a TV to provide interactive home entertainment, including digital audio and video, video games, and software applications. Defined by the Green Book standard. CD-i Assn.

Terminology & Abbreviations

Dolby Digital A perceptual coding system for audio, developed by Dolby Laboratories and accepted as an international standard. Dolby Digital is the most common means of encoding audio for DVD-Video and is the mandatory audio compression system for 525/60 (NTSC) discs.

Dolby Surround The standard for matrix encoding surround-sound channels in a stereo signal by applying a set of defined mathematical functions when combining center and surround channels with left and right channels. The center and surround channels can then be extracted by a decoder such as a Dolby Pro Logic circuit which applies the inverse of the mathematical functions. A Dolby Surround decoder extracts surround channels, while a Dolby Pro Logic decoder uses tially independent of the recording or transmission format. Both Dolby Digital and MPEG audio compression systems are compatible with Dolby Surround audio.

DTS Digital Theater Sound. A perceptual audio-coding system developed for theaters. A competitor to Dolby Digital and an optional audio track format for DVD-Video.

DVCD Stands for Double Video CD -- pretty popular format in mainland China.

Format itself is nothing new really, its just a regular VideoCD overburned to include 90 to 99mins per CD, compared to regular 74mins per CD in standard VideoCD format.

DVD An acronym that officially stands for nothing, but is often expanded as Digital Video Disc or Digital Versatile Disc. The audio/video/data storage system based on 12-and 8-cm optical discs.

DVD+R DVD+Recordable defines a standard for recordable DVD drives and media defined by the DVDRW Alliance. Often called "plus R", the format is write once (compared to DVD+RW wich can be erased and rewritten). The single sided discs can hold 4,700,000,000 bytes (4.38 Gigabytes at 1024 bytes to the kilobyte) with double sided discs holding twice as much. There are no dual layer single sided recordable discs. This format competes with the DVD Forum DVD-R specification. DVDRhelp DVDR information

JPEG Joint Photographic Experts Group. The international committee which created its namesake standard for compressing still images.

Karaoke Literally empty orchestra. The social sensation from Japan where sufficiently inebriated people embarrass themselves in public by singing along to a music track. Karaoke was largely responsible for the success of laserdisc in Japan, thus supporting it elsewhere.

Kodak Picture CD Kodak Picture CD is a CD that contains your pictures in JPEG format(.jpg) along with software that lets you view, enhance, share, and print your pictures from your computer. Some standalone DVD Players supports this format also, but then only for viewing. This format will also work on DVD Players that supports "JPEG file viewing" but you may lose some Kodak Picture CD specific features. Kodak Picture CD.

Macrovision An antitaping process that modifies a signal so that it appears unchanged on most televisions but is distorted and unwatchable when played back from a videotape recording. Macrovision takes advantage of characteristics of AGC circuits and burst decoder circuits in VCRs to interfere with the recording process.

Terminology & Abbreviations

MP3 MP3 is an acronym for MPEG-1 (or MPEG-2) Layer 3 audio encoding (it is not an acronym for MPEG3). MP3 is a popular compression format used for audio files on computers and portable devices.

The compression in MP3 works on the basis of a "psychoacoustic model" which means that parts of the audio that human ears cannot detect are discarded by the encoder. Although this is a LOSSY process, it can yield very high quality audio files are relatively high compression rates.

A typical MP3 file encoded at 128 kbit/s (12:1 compression) is near CD quality.

MP3 audio is increasingly being used in video production coupled with various MPEG-4 video codecs like divx. The audio may be encoded with a constant or variable bitrate.

Multiangle A DVD-Video program containing multiple angles allowing different views of a scene to selected during playback.

Multilanguage A DVD-Video program containing sound tracks and subtitle tracks for more than one language.

RGB Video information in the form of red, green, and blue tristimulus values. The combination of three values representing the intensity of each of the three colors can represent the entire range of visible light.

S/N Signal-to-noise ratio. Also called SNR.

SACD Super Audio CD is the next generation of audio disc, offering full-range, uncompressed digital multi-channel surround sound. SACD can also be backward compatible using so called hybrid discs with an extra layer that allows them to be played on conventional CD players but then only with ordinary CD quality. SACD can be played on SACD Players, DVD Players with SACD support and if using hybrid discs also CD Players. SACD is currently competing with DVD-Audio as the new audio defacto standard. Philips SACD information.

Subtitle A textual representation of the spoken audio in a video program. Subtitles are often used with foreign languages and do not serve the same purpose as captions for the hearing impaired.

SVCD SVCD stands for 'Super VideoCD'. A SVCD is very similiar to a VCD, it has the capacity to hold about 35-60 minutes on 74/80 min CDs of very good quality full-motion MPEG-2 video along with up to 2 stereo audio tracks and also 4 selectable subtitles. A SVCD can be played on many standalone DVD Players and of course on all computers with a DVD-ROM or CD-ROM drive with the help of a software based decoder / player. SVCDHelp.com.

S-video A video interface standard that carries separate luma and chroma signals, usually on a four-pin mini-DIN connector. Also called Y/C. The quality of s-video is significantly better than composite video since it does not require a comb filter to separate the signals, but it’s not quite as good as component video. Most high-end televisions have s-video inputs. S-video is often erroneously called S-VHS.

System menu The main menu of a DVD-Video disc, from which titles are selected. Also called the title selection menu or disc menu.

Terminology & Abbreviations

Title The largest unit of a DVD-Video disc (other than the entire volume or side). Usually a movie, TV program, music album, or so on. A disc can hold up to 99 titles, which can be selected from the disc menu.

VCD VCD stands for 'Video Compact Disc' and basically it is a CD that contains moving pictures and sound. If you're familiar with regular audio/music CDs, then you will know what a VCD looks like. A VCD has the capacity to hold up to 74/80 minutes on 650MB/700MB CDs respectively of full-motion video along with quality stereo sound. VCDs use an encoding standard called MPEG-1 to store the video and audio. A VCD can be played on almost all standalone DVD Players and of course on all computers with a DVD-ROM or CD-ROM drive with the help of a software based decoder / player. VCDHelp.com.

YUV In the general sense, any form of color-difference video signal containing one luma and two chroma components. Technically, YUV is applicable only to the process of encoding component video into composite video.

WMF Windows Media Format files are audio/video files encoded with the Windows Media Encoder, providing high quality and media security for streaming and download-and-play applications on PCs, set-top boxes, and portable devices. Windows Media Format comprises Windows Media Audio and Video codecs, an optional integrated digital rights management (DRM) system, and a file container. Microsoft WMF Information

CVD China Video Disk - a precursor to SVCD marketed since 1998. Resolutions are 352x480 NTSC, 352x576 PAL, 44.1khz audio (unlike 1/2 D1 DVD that is the same resolution at 48khz audio). Not all players will play CVD (compatible players). CVD Guide

DivX DivX™ is a new format for digital video, much like MP3 is a format for digital music. DivX™ is the brand name of a patent-pending video compression technology created by DivXNetworks, Inc., (also known as Project Mayo). The DivX™ codec is based on the MPEG-4 compression standard. This codec is so advanced that it can reduce an MPEG-2 video (the same format used for DVD or Pay-Per-View) to ten percent of its original size. DivX.com.

DVD+RW DVD+RW is a ReWriteable media format of the DVD+R standard.

DVD-Audio DVD-Audio or sometimes called DVD-A is a separate format from DVD-Video. It is a format specifically designed to provide the highest possible audio fidelity capable on DVD. DVD-Audio provides for audio in stereo and in multi-channel surround in a wide range of specifications. In addition to audio, a DVD-Audio disk can contain a limited amount of video, which can be used to display text, such as lyrics or notes. DVD-Audio can only be played on DVD Players with DVD-Audio support (most DVD Players do not support this format). DVD-Audio is currently competing with SACD as the new audio defacto standard. DigitalAudioGuide DVD Audio FAQ

DVD-R DVD-Recordable defines a standard for recordable DVD drives and media defined by the DVD Forum. Often called "minus R", the format is write once (compared to DVD-RW wich can be erased and rewritten). The single sided discs can hold 4,700,000,000 bytes (4.38 Gigabytes at 1024 bytes to the kilobyte) with double sided discs holding twice as much. There are no dual layer single sided recordable discs. This format competes with the DVD+R format. DVDRhelp DVDR information

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DVD-RAM A recordable format supported by the DVD Forum. It has superior recording features but it is not compatible with most DVD-ROM drives or DVD Video players. It works well when set up like a removable hard disk.

DVD-RW DVD-RW is a ReWriteable media format of the DVD-R standard.

DVD-Video DVD-Video is the video element of the DVD format. DVD Demystified DVD-Video Features.

DVD±R A term used to cover both the DVD-R and DVD+R standards in one word.

HDCD High Definition Compatible Digital® (HDCD®) is a patented encode/decode process for delivering the full richness and detail of the original microphone feed on Compact Discs and DVD-Audio. HDCD has been used in the recording of more than 5,000 CD titles, which include more than 250 Billboard Top 200 recordings and more than 175 GRAMMY® nominations, and account for more than 300 million CDs sold.

HDCD-encoded CDs sound better because they are encoded with 20 bits of real musical information, as compared with 16 bits for all other CDs. HDCD overcomes the limitation of the 16-bit CD format by using a sophisticated system to encode the additional 4 bits onto the CD while remaining completely compatible with the existing CD format. HDCD provides more dynamic range, a more focused 3-D soundstage, and extremely natural vocal and musical timbre. With HDCD, you get the body, depth, and emotion of the original performance not a flat, digital imitation.

SAFETY PRECAUTIONS

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following pre-
cautions when a set is being serviced.

·**Precautions during Servicing**

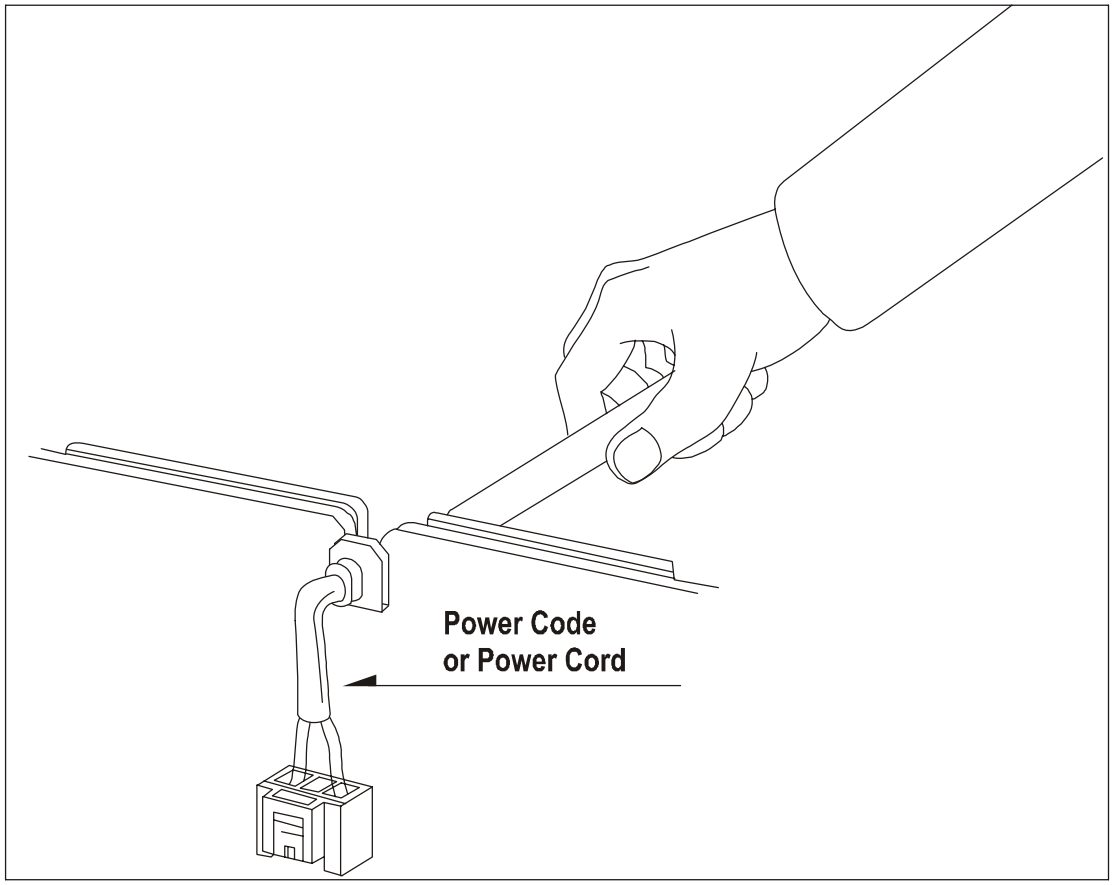
1. Locations requiring special caution are denoted by labels and inscriptions on the rear panel and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals .

2. Parts identified by the ⚠ symbol in schematic diagram parts are critical for safety.
   Replace only with specified part numbers.
   Note : Parts in this category also include those specified to comply with laser emission standards for Products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation.
3. Use Specified internal wiring. Note especially:
   1) Double insulated wires
   2)High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1)Insulation Tape
   2)PVC tubing
   3)Spacers
   4)Insulation sheets for transistor
5. Observe that wires do not contact heat producing
   PARTS (heatsinks, oxide metal film resistors ,fusible resistors ,etc .)

6.Check that replaced wires do not contact sharp edged or pointed parts .

7. 1)When a power cord has been replaced ,check that A mark is made on the cord ,under strain ,near the aperture ,and the flexible cord is subjected 100times to a pull of 40N for a duration of 1 second each .

2)During the test ,the cord shall not be displaced by more than 2mm



8.Also check areas surrounding repaired locations .

9. The internal wiring is secured so as not to approach the heating parts and high voltage parts by its shape. So, these wires must be restored to its former state.

10. After updated the hazardous live part or accessible part, if the clearance or creepage distance cann't accord with the safe request, then need adopt reinforced insulation method for ensure safety.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws ,parts and wires have been reterned to original positions .

Afterwards ,perform the following tests and confirm the specified values in order to verify compliance wit atfety standards .

SAFETY PRECAUTIONS

·**Insulation resistance test**

confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals ,antenna terminals ,video and audio input and output terminals ,microphone jacks ,earphone jacks ,etc .)See table below.

·**Dielectric strength test**

Confirm specified dielectric strength or greater between power cord prongs and exposed accessible parts of the set (RF terminals ,antenna terminals ,video and audio input and output terminals ,microphone jacks ,earphone jacks ,etc.)See table below .

·**Clearance distance**

When replacing primary circuit components ,confirm specified clearance distance (d),between soldered terminals ,and between terminals and surrounding metallic parts .See table below.

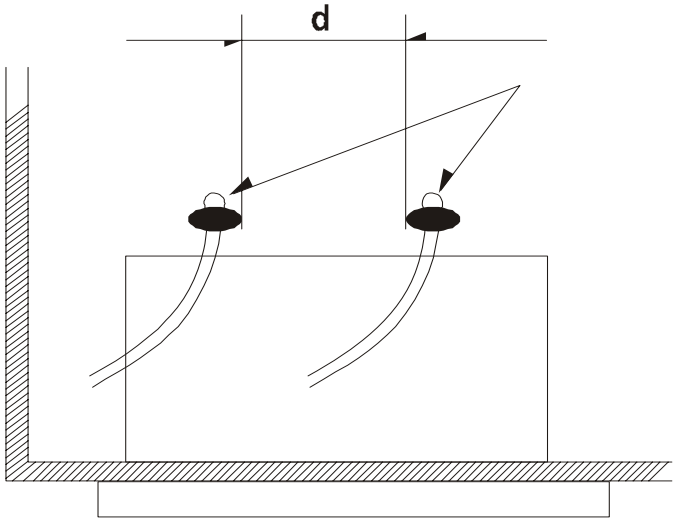


Table 1: Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Steength	Clearance Distance(d),(d)
*110 to 240 v 110 to 230 v	USA,Australia Europe	F 4M/500VDC	4kv/minute	F 6mm(d)

*Class ll model only .

Note . This table is unofficial and for reference only . Be sure to confirm the precise values for your particular country and locality.

· **Leakage Current test**

Confirm specified or lower leakage current between B(earth ground ,power cord plug prongs) and externally exposed accessible (RF terminals ,antenna terminals ,video and audio input and output terminals ,microphone jacks ,earphone jacks ,etc .)

SAFETY PRECAUTIONS

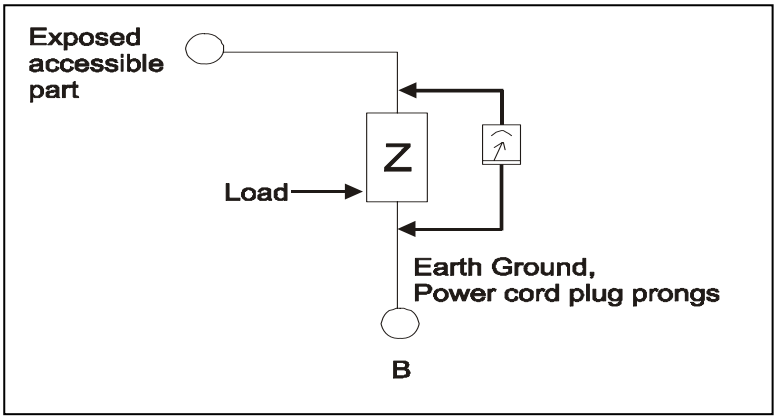
Measuring Method: (Power ON)

Insert load Z between B (earth ground ,power cord plug prongs)and exposed accessible parts .Use an AC voltmeter to measure across both terminals of load Z . See figure and following table .

Table 2: Leakage current ratings for selected areas .

AC Line Voltage	**Region**	**Load Z**	**Leakage Current(i)**	**Earth Ground (B) to :**
2k ohm 100 to 130 v 200 to 240 v 50k ohm	Europe Australia		<or= 0.7mA peak <or= 2mA DC	Antenna earth Terminals
			<or=0.7mA peak <or= 2mA DC	Other terminals

Note . This table is for IEC member only . Be sure to confirm the precise values for your particular country and locality.



Software Upgrade

MTK disc Upgrade Notice

1. The upgrading software must be recorded (burned) on a CD-R or CD-RW disc, and
   a) Volume ID of the disc must be “MEDIATEK”, in capital letters. All Recording (burning) software supports volume edit.
   b) The upgrading software must be renamed as “MTK.BIN”, also in capital letters. You can rename it on PC before recording.
   c) The upgrading software MTK.BIN must be in root directory. Recording mode must be ISO9660 (MODE1, LEVEL1), DO NOT SELECT JOLIET, LOOSEN ISOSTRICT.
2. Load the disc
3. DVD will read disc, and prompt upgrading. Press “PLAY” on remote to confirm upgrading.

Note: Do not turn off the player while under upgrading; do not let electricity cut off. Otherwise the player will halt and never be operate again.

If the DVD player cannot read the disc, please record some data file (trash files that the player cannot support) before recording upgrading software.

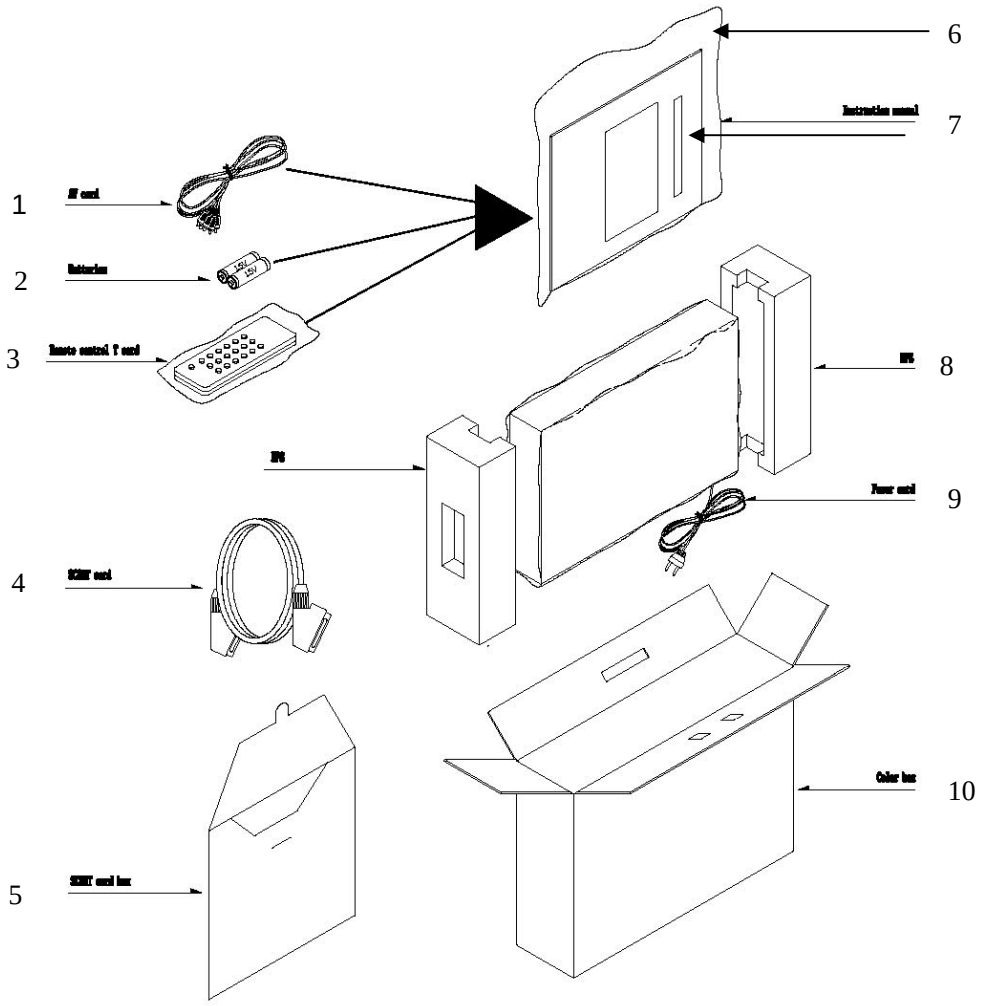
Electrical Performance Standards

No.		Test item			Requirement	
1	AUDIO FEATURE	Analog output level(V) (Virtual value)			1.0~2.0v	
2		Audio amplitude/frequency response (dB)	20Hz		±1	
			125Hz		±1	
			1KHz		±1	
			10KHz		±1	
			18KHz		±1	
			20KHz		±1	
3		Audio SNR (dB) (A)			≥90	
4		Audio distortion and noise (dB) (1KHz)			≤-65	
5		Dynamic Range (dB) (1KHz)			≥80	
6		Cross-Sound base wave (dB)			≥80	
7		1KHz Channel Balance (dB)			≤1	
8		Intermodulation Distortion (dB)			≤-50	
9		Frequency error (dB)			±0.02	
10		Level non-linear (dB)	0		±1	
			-10			
			-20			
			-40			
			-60			
11		Digital out level (V) (Vp-p)□			0.5±0.05	
12		De-bass function (dB) □disc 784□	□ 12 □		-4.53 1	
			□ 13 □		-9.04 1	
13		DTS Test DOLBY Test	DTS	0dB 1KHz output Level	Amplitude Response under 0dB output level (dB) (20Hz-20KHz)	
			DOLBY	Reference Level	Reference Level Amplitude Response +0.5/-1.0(dB) (20Hz-20KHz)	
			FL			
			FR			
			C			
			SL			
			SR			
			SW			
14	MIC	Output Intensity (iput 1KHz 20mVp-p)			2.5±0.5□V□	
15		Distortion and Noise (%)			≤0.5	
16		Frequency Response (dB)	120Hz		±3	
			5KHz		±3	
17		Frequency error (dB)			≥45	
18	other	Short Read Time (Sec)			≤5	
19		Long Read Time (Sec)			≤10	
20		Max Power Consumption (W)			15	

Electrical Performance Standards

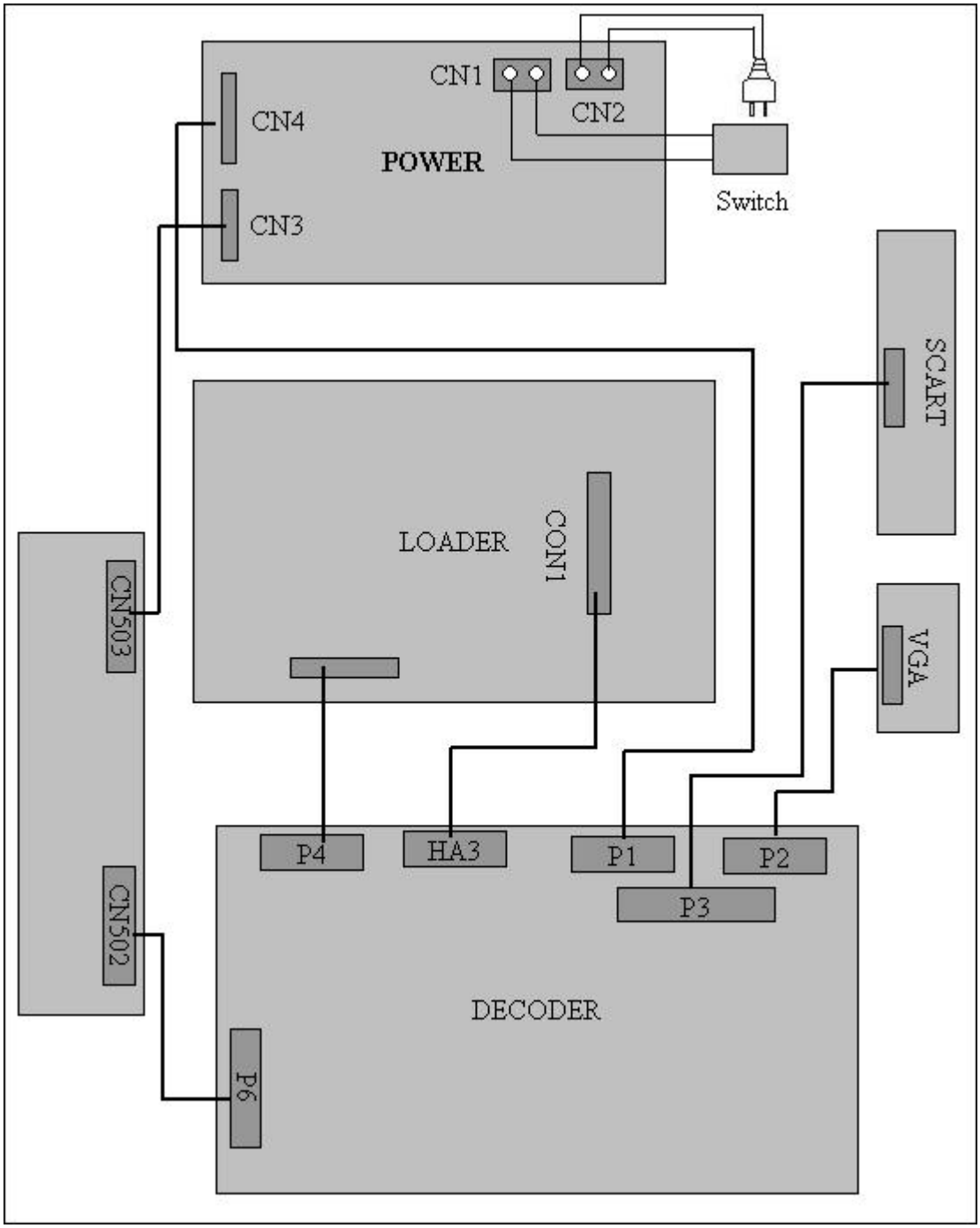
No.	Test item					Requirement
21	VIDEO FEATURE	CVBS FEATURE	Video Output Level Vp-p(V)	CVBS output		1.0±0.2
				Line Sync amplitude		0.3±0.05
22			Horizontal Definition (TV)	AV output	VCD	≥250
					SVCD	≥350
					DVD	≥450
				S video output	VCD	≥250
					SVCD	≥350
					DVD	≥500
23			Luminance channel bandwidth and Amplitude Response (MHz)	VCD		≥3.5□-20dB□
				SVCD		≥3.5□-20dB□
				DVD		≥5.5□-6dB□
24			Chroma channel bandwidth and amplitude response (MHz)	VCD		≥3.5□-23dB□
				SVCD		≥3.5□-24dB□
				DVD		≥1.5□-6dB□
25			Luminance non-linear distortion (%)			≤5
26			Luminance Wave distortion (%)			≤10
27			Luminance SNR (dB)			≥50□□□□□
28			Chroma SNR (dB)			AM□≥60 PM□≥50
29			Luminance/Chroma signal delay (ns)			≤100
30			Differential plus DG (%)			≤5
31			Differential Phase DP (°)			≤5
32		Y,U,V FEATURE	S-video signal amplitude Vp-p load (mV)	Y channel		700±140
				C channel	Chorma	880±176
					Chroma Sync	300±60
33			S-video signal bandwidth and amplitude response (MHz)	Y channel		≥5.5□-6dB□
				C channel		≥1.5□-6dB□
34			S-video signal SNR (Db)	Y channel		≥50□□□□□
				C channel		≥50
35			YUV output signal amplitude Vp-p load(mV)	Y channel		700±140
				U channel		700±140
				V channel		700±140
36			YUV output signal bandwidth and amplitude response (MHz)	Y channel		≥5.5□-6dB□
				U channel		≥2□-6dB□
				V channel		≥2□-6dB□
37			YUV output signal SNR (Db)	Y channel		≥50□□□□□
				U channel		≥50
				V channel		≥50
38			RGB output signal amplitude Vp-p load(mV)	R channel		700±140
				G channel		700±140
				B channel		700±140
39			RGB output signal bandwidth and amplitude response (MHz)	R channel		≥5.5□-6dB□
				G channel		≥5.5□-6dB□
				B channel		≥5.5□-6dB□
40			RGBoutput signal SNR (Db)	R channel		≥50
				G channel		
				B channel		≥50
				Y channel		≥50

Package (Inbox)and Block Diagrams



1. AV Cable
2. Batteries
3. Remote control
4. scart Cable
5. Scart cable box
6. Owner’s Manual bag
7. Owner’s Manual
8. EPS
9. Power cord
10. Color box

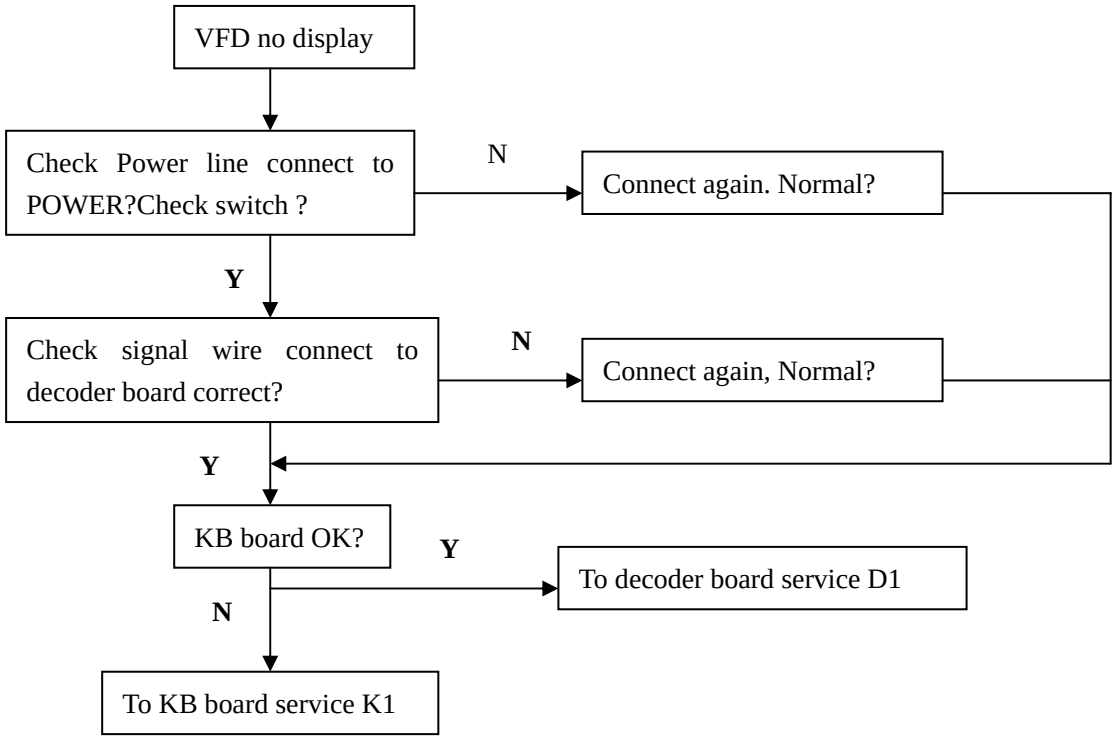
DVD Box Block Diagram



General Classification of Symptoms

Common phenomenon classification

1.



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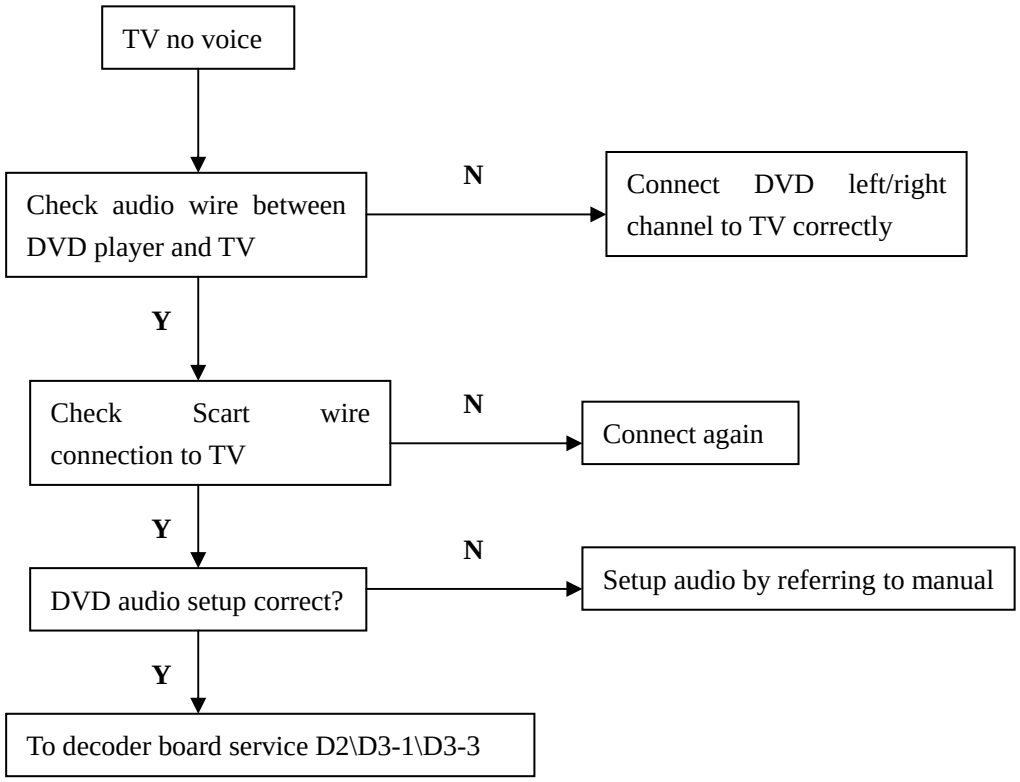
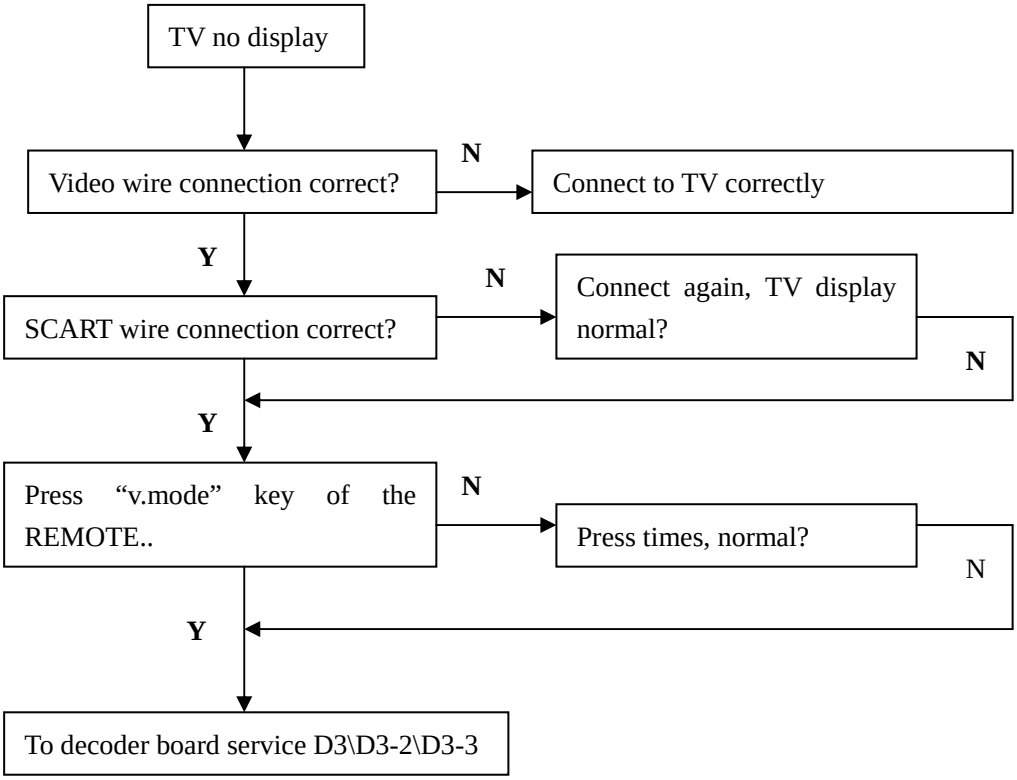


General Classification of Symptoms

3.



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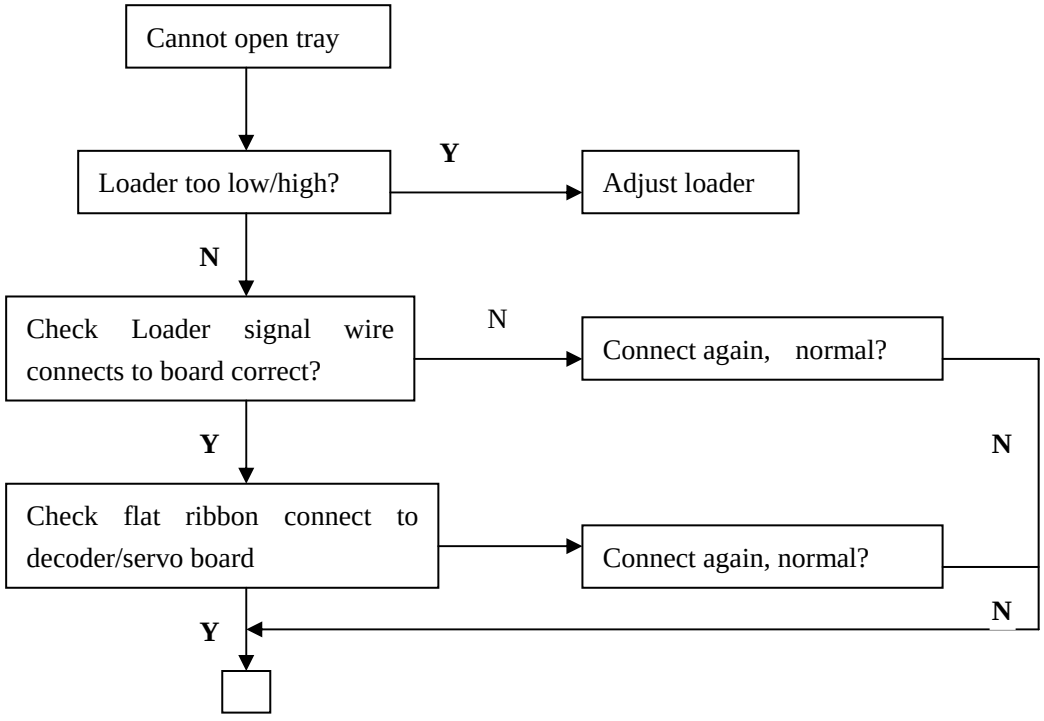

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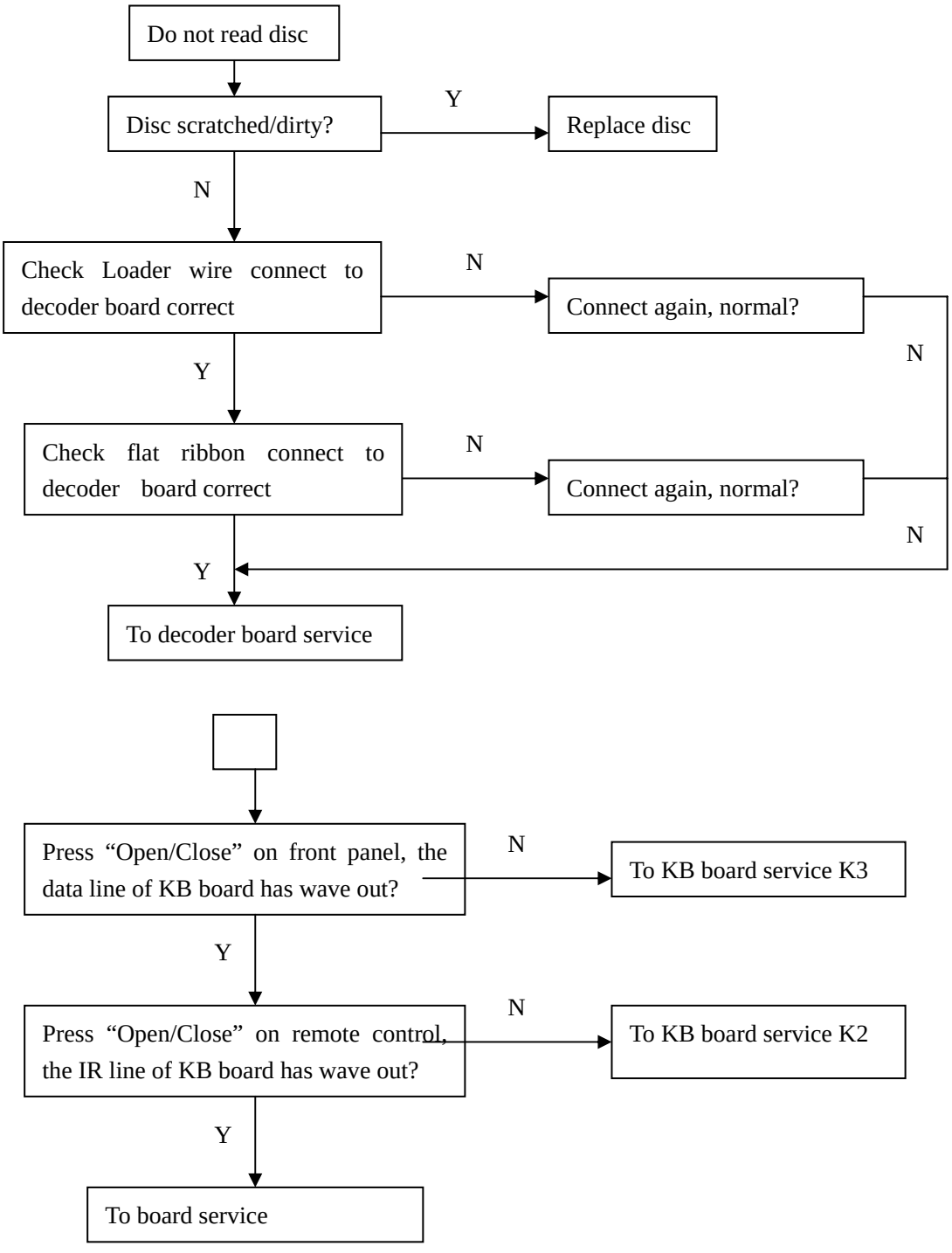
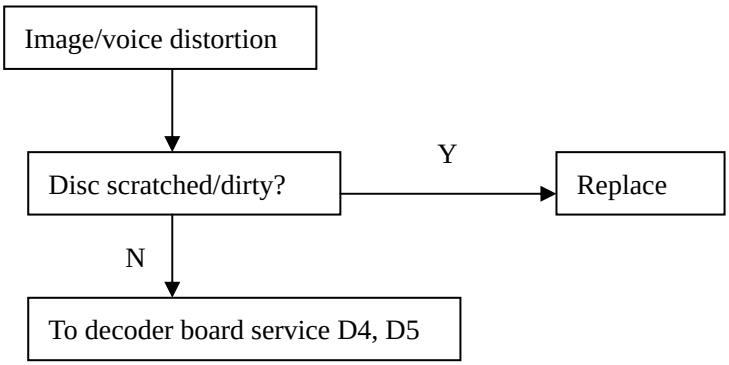

Do not read disc
Disc scratched/dirty?
Y
Replace disc
N
Check Loader wire connect to decoder board correct
N
Connect again, normal?
N
Y
Check flat ribbon connect to decoder board correct
N
Connect again, normal?
N
Y
To decoder board service
Press “Open/Close” on front panel, the data line of KB board has wave out?
N
To KB board service K3
Y
Press “Open/Close” on remote control, the IR line of KB board has wave out?
N
To KB board service K2
Y
To board service

General Classification of Symptoms

6.



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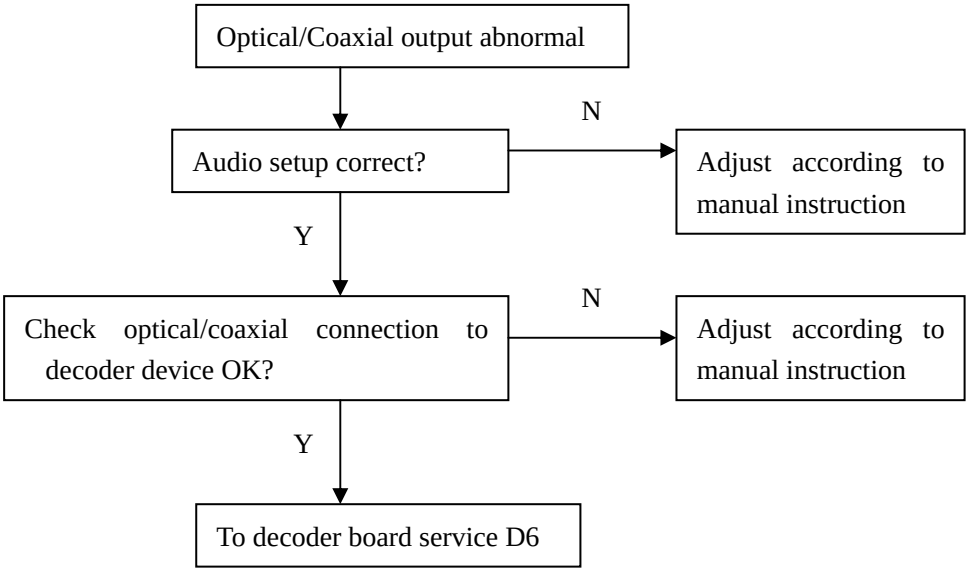

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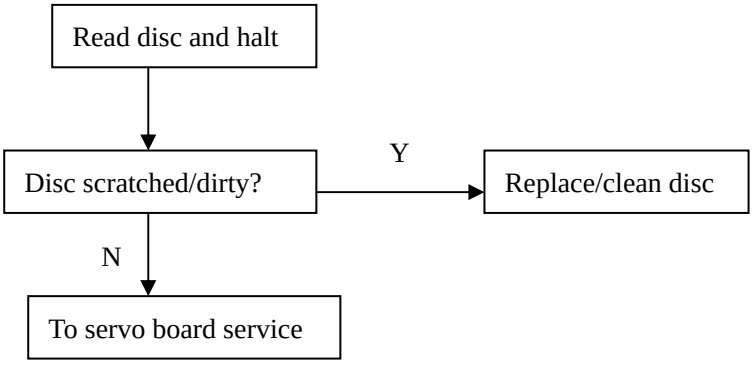


General Classification of Symptoms

9. Reading drag → To servo board service

10. Cannot operate by remote control → To KB board service K3

11. MIC no voice → To MIC service M1

12. MIC self activated → To MIC service M2

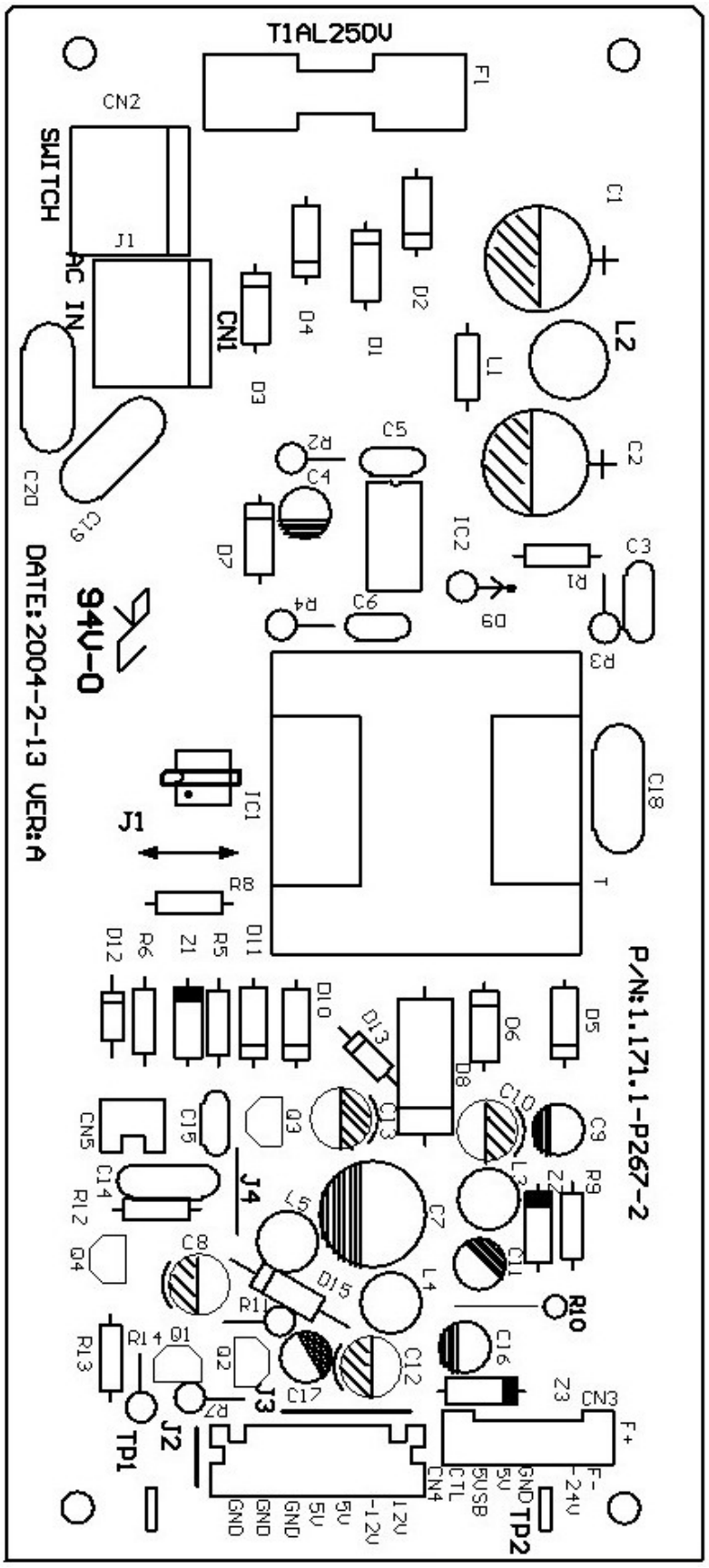
Judgment standard for loader damage

When below phenomenon exist, the loader may be damaged.

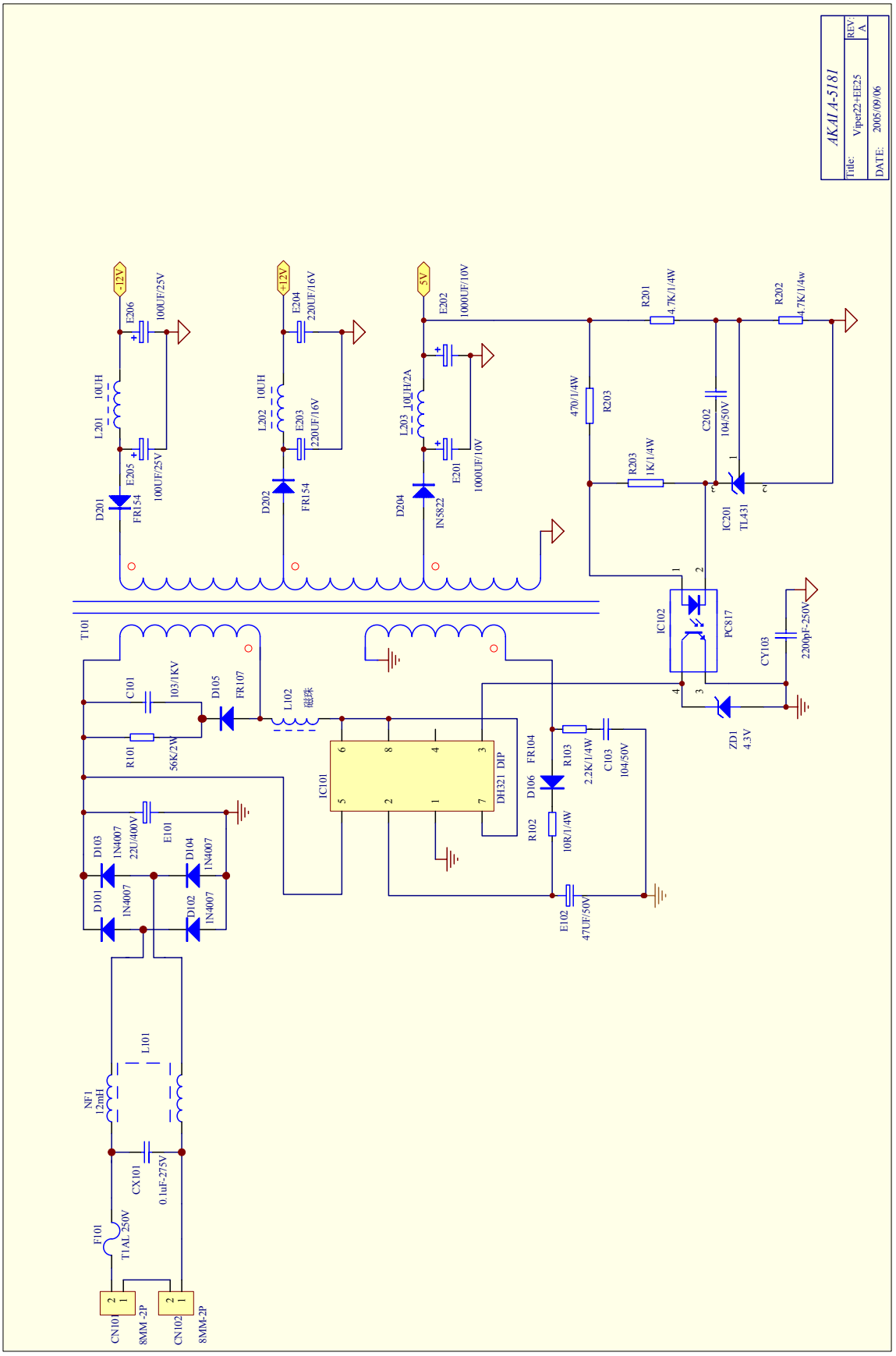
1. no spin
2. no laser
3. cannot open/close tray normally
4. main axis turning, but no pickup focus or gliding
5. cannot read discs

When above phenomenon exists, please try replacing loader to solve the problem.

8-1 Power Board Block Diagram



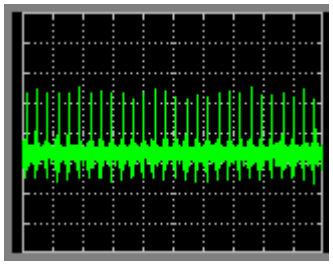
8-1 Power Board Block Diagram



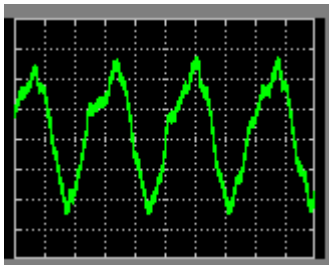
8

Main point waveforms and schematic diagrams of electronic components

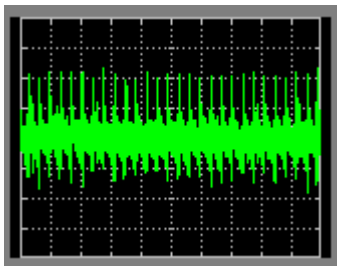
8-1 Reference waveform of key test point of power board



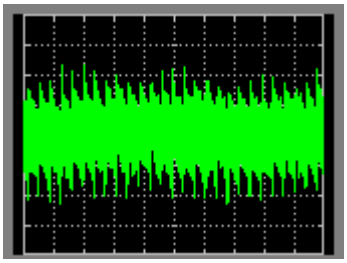
TP1+12V (no disc) 3-mVpp



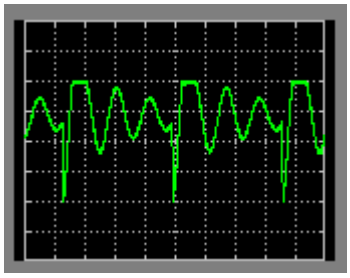
TP1 (reading disc) 250mVpp



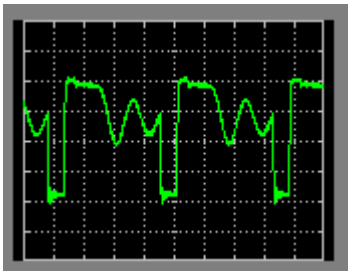
TP2+5V (no disc) 3-mVpp



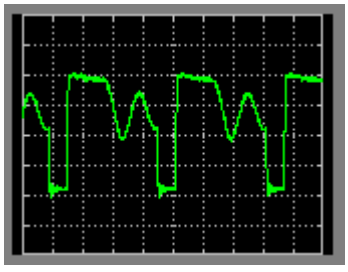
TP2+5V (reading disc) 40mVpp



TP3 (idle) 20Vpp



TP3 (no disc)20Vpp



TP3 (reading disc)20Vpp

Repair of Power Board

I. Power switch working principles

TinySwitch-II(TNY267) maintains the simplicity of the TinySwitchtopology, while providing a number of new enhancements tofurther reduce system cost and component count, and topractically eliminate audible noise. Like TinySwitch, a 700 Vpower MOSFET, oscillator, high voltage switched current source,current limit and thermal shutdown circuitry are integrated onto amonolithic device. The start-up and operating power are derived directly from the voltage on the DRAIN pin, eliminating the need for a bias winding and associated circuitry. In addition, the TinySwitch-II devices incorporate auto-restart, line undervoltage sense, and frequency jittering. An innovative design minimizes audio frequency components in the simple ON/OFF control scheme to practically eliminate audible noise with standard taped/varnished transformer construction. The fully integrated auto-restart circuit safely limits output power during fault conditions such as output short circuit or open loop, reducing component count and secondary feedback circuitry cost. An optional line sense resistor externally programs a line under-voltage threshold, which eliminates power down glitches caused by the slow discharge of input storage capacitors present in applications such as standby supplies. The operating frequency of 132 kHz is jittered to significantly reduce both the quasi-peak and average EMI, minimizing filtering cost.

1. Conversion from a.c. to d.c. circuit

220V a.c. current flows restrictively through F1 fuse, and through D301~D304 to combine as bridge rectification. After C1 L2 C2 undergoes electrolytic filter, we can obtain a 320V d.c. voltage (Uhv).

2. Process to start up the software

The TinySwitch-II does not require a bias winding to providepower to the chip, because it draws the power directly from the DRAIN pin (see Functional Description above). This has twomain benefits. First, for a nominal application, this eliminatesthe cost of a bias winding and associated components.Secondly, for battery charger applications, the current-voltage characteristic often allows the output voltage to fall close tozero volts while still delivering power. This type of application normally requires a forward-bias winding which has many more associated components. With TinySwitch-II, neither are necessary. For applications that require a very low no-load power consumption (50 mW), a resistor from a bias winding to the BYPASS pin can provide the power to the chip. The minimum recommended current supplied is 750 µA. The BYPASS pin in this case will be clamped at 6.3 V. This method will eliminate the power draw from the DRAIN pin, thereby reducing the no-load power consumption and improving fullload efficiency. And check c5,it is very importance of starp up.

3. Bias winding

After starting the power, T P1~P2 bias winding supplies bias current and error current to the internal of IC2 , through D7 and C4 rectifier filter and through R2 light-electric coupler.Check IC2 BP pin (IC2 PIN1),it’s voltage is 6.3v.

4. Regulation process of output voltage

When the input current of control pin (5) IC2 decreases (or increases), oscillation waveform will be regulated automatically so that T ratio will increase (or decrease) and the output voltage will increase (or decrease).

Output voltage feedback circuit is completed by Z1 R8 D13

5 IC2 TNY267 introduction

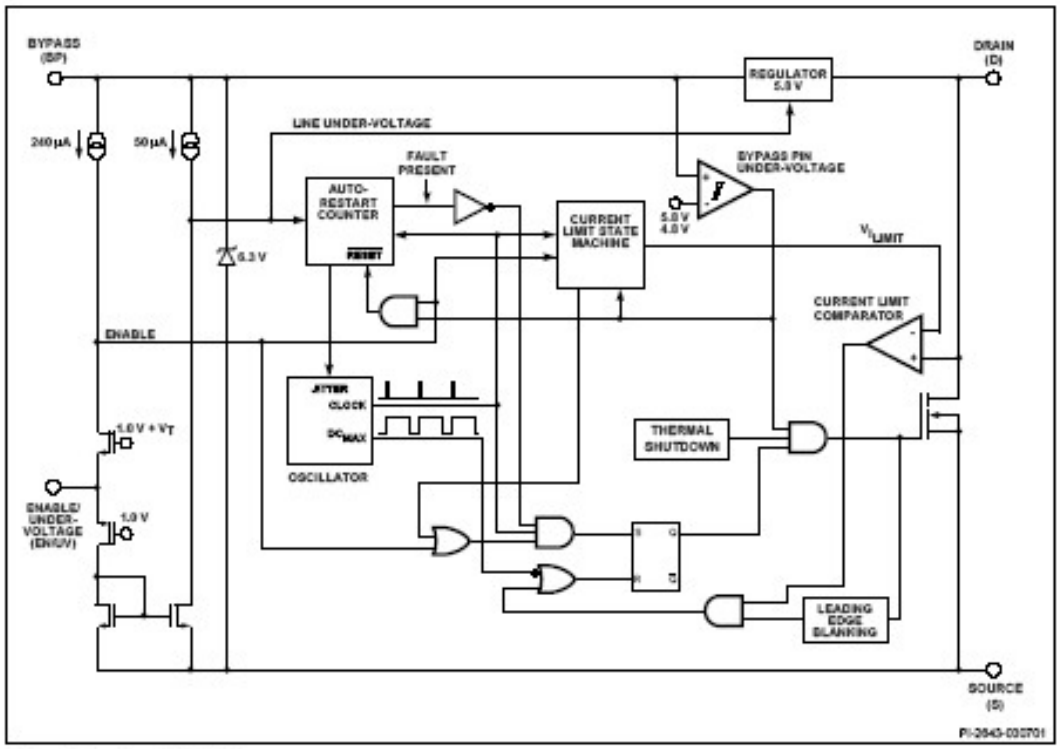


Figure 2. Functional Block Diagram.

Pin Functional Description

DRAIN (D) Pin:
Power MOSFET drain connection. Provides internal operating current for both start-up and steady-state operation.

BYPASS (BP) Pin:
Connection point for a 0.1 µF external bypass capacitor for the internally generated 5.8 V supply.

ENABLE/UNDER-VOLTAGE (EN/UV) Pin:
This pin has dual functions: enable input and line under-voltage sense. During normal operation, switching of the power MOSFET is controlled by this pin. MOSFET switching is terminated when a current greater than 240 µA is drawn from this pin. This pin also senses line under-voltage conditions through an external resistor connected to the DC line voltage. If there is no external resistor connected to this pin, *TinySwitch-II* detects its absence and disables the line under-voltage function.

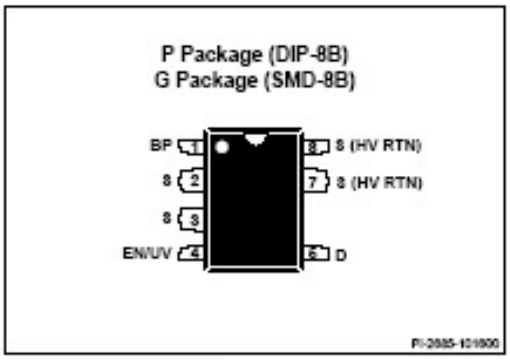
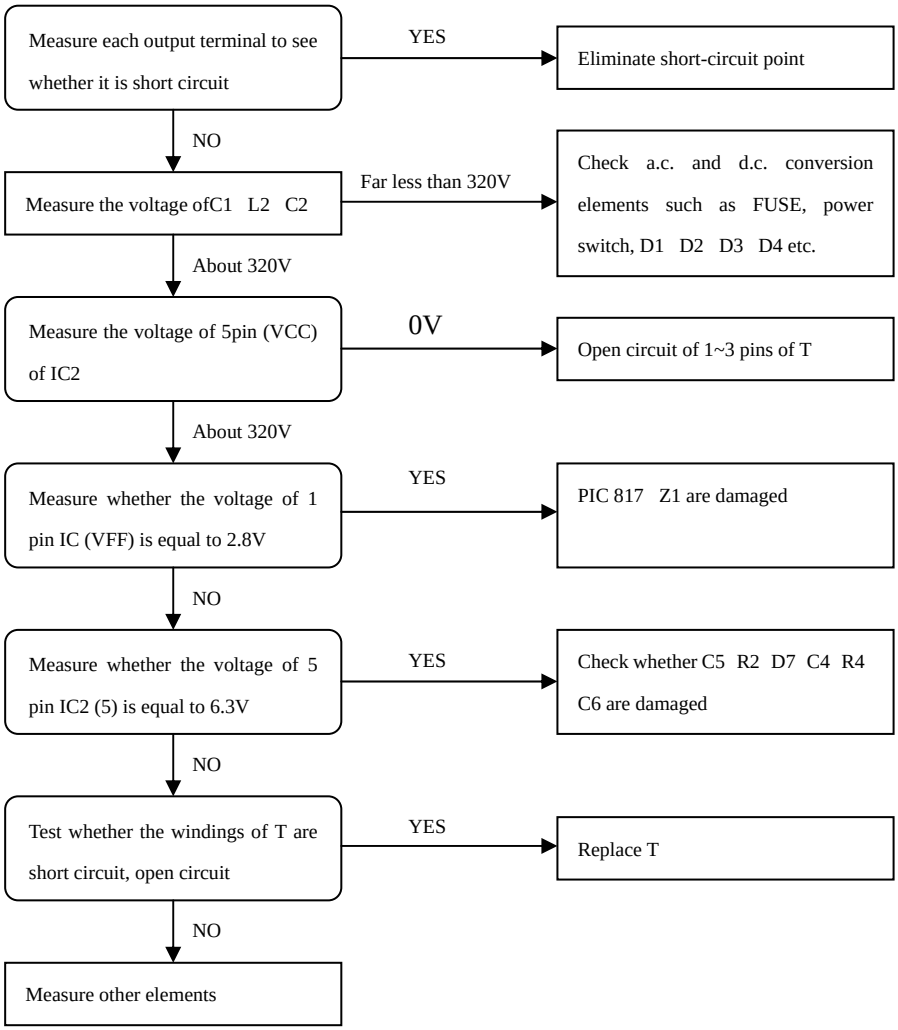


Figure 3. Pin Configuration.

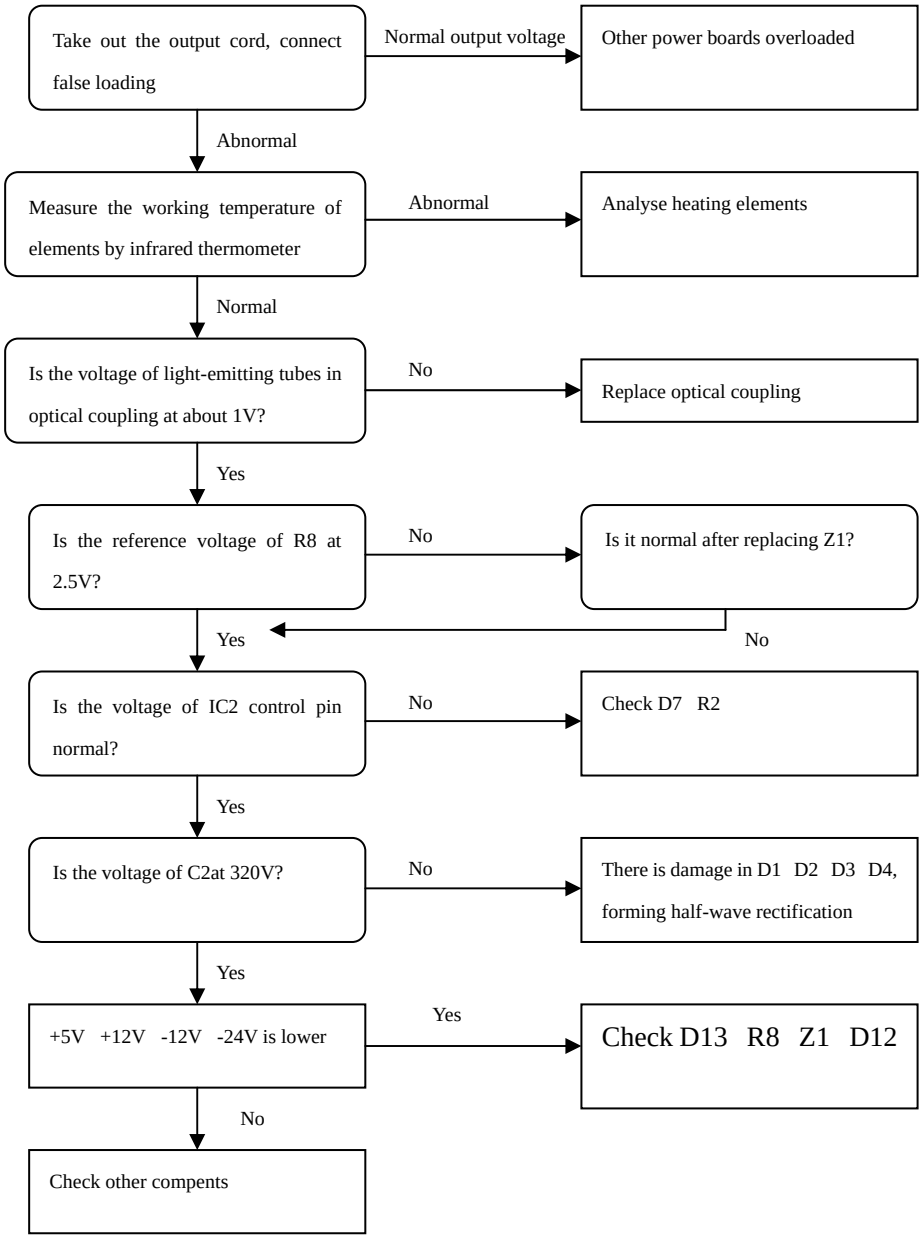
SOURCE (S) Pin:
Control circuit common, internally connected to output MOSFET source.

SOURCE (HV RTN) Pin:
Output MOSFET source connection for high voltage return.

1 No voltage output



1. 2 Unstable voltage output, decrease of carrier capability

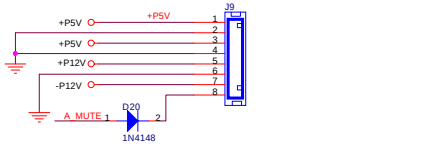


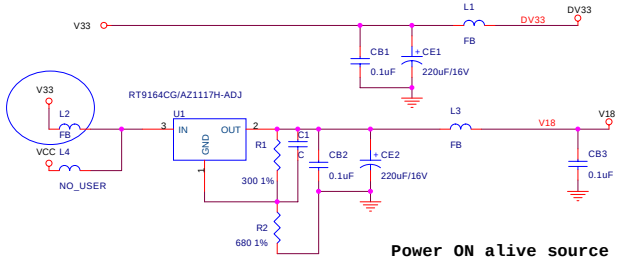
COMMON89D_KHM310_V5

MT1389D (LQFP216) DVD Demo Board for KHM310

1 INDEX & POWER, RESET
2 RF, SERVO & MPEG - MT1389E
3 MEMORY - SDRAM, FLASH/EEPROM
4 VIDEO OUT
5 AUDIO DAC WMA8766

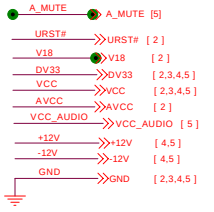
NAME	TYPE	DEVICE
VCC	Digital 5V	SUPPLY
DV33	Digital 3.3V	MT1389E
RFV33	Servo 3.3V	MT1389E
LDO_AV33	Laser Diode 3.3V	
AVCC	RF 5V	PICKUP HEADER
V18	Digital 1.8V	MT1389E
SD33	Digital 3.3V	SDRAM
+12V	Audio +12V	OP AMP.
-12V	Audio -12V	OP AMP.
AVDD	Audio 5V	Audio DAC
DVDD	Audio 3V3	Audio DAC

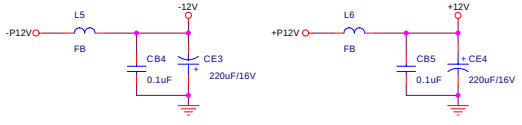


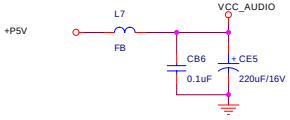


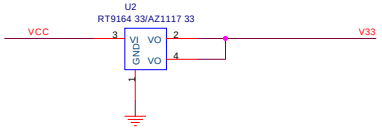
Power ON alive source

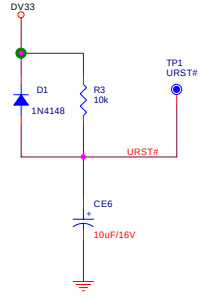
Regulator	R1	R2
Fix regulator	0 ohm	OFF
Adj regulator	300 1%	680 1%

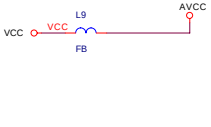


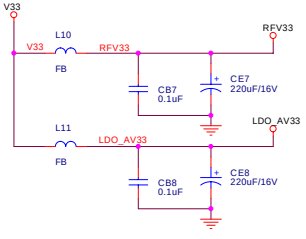


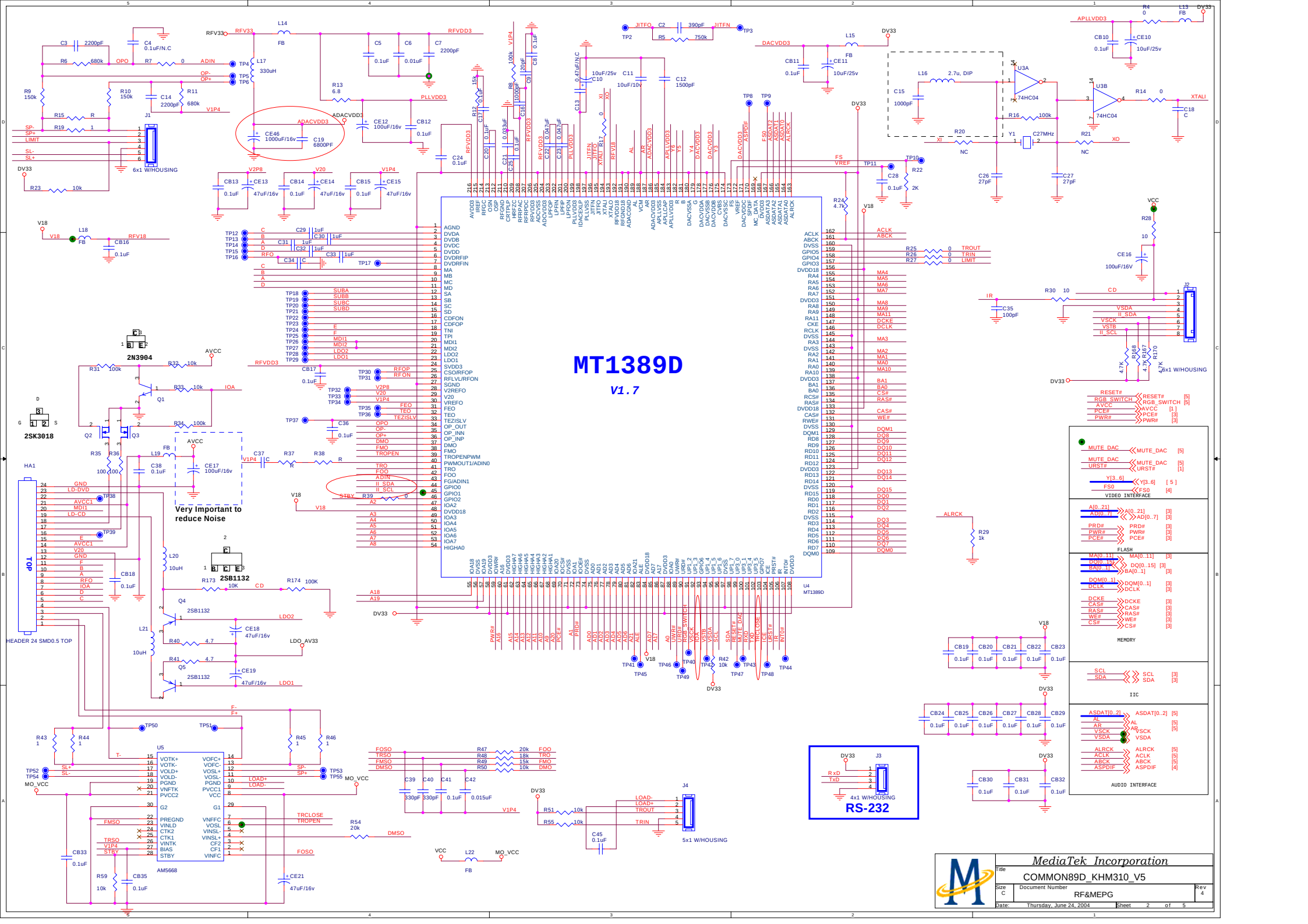


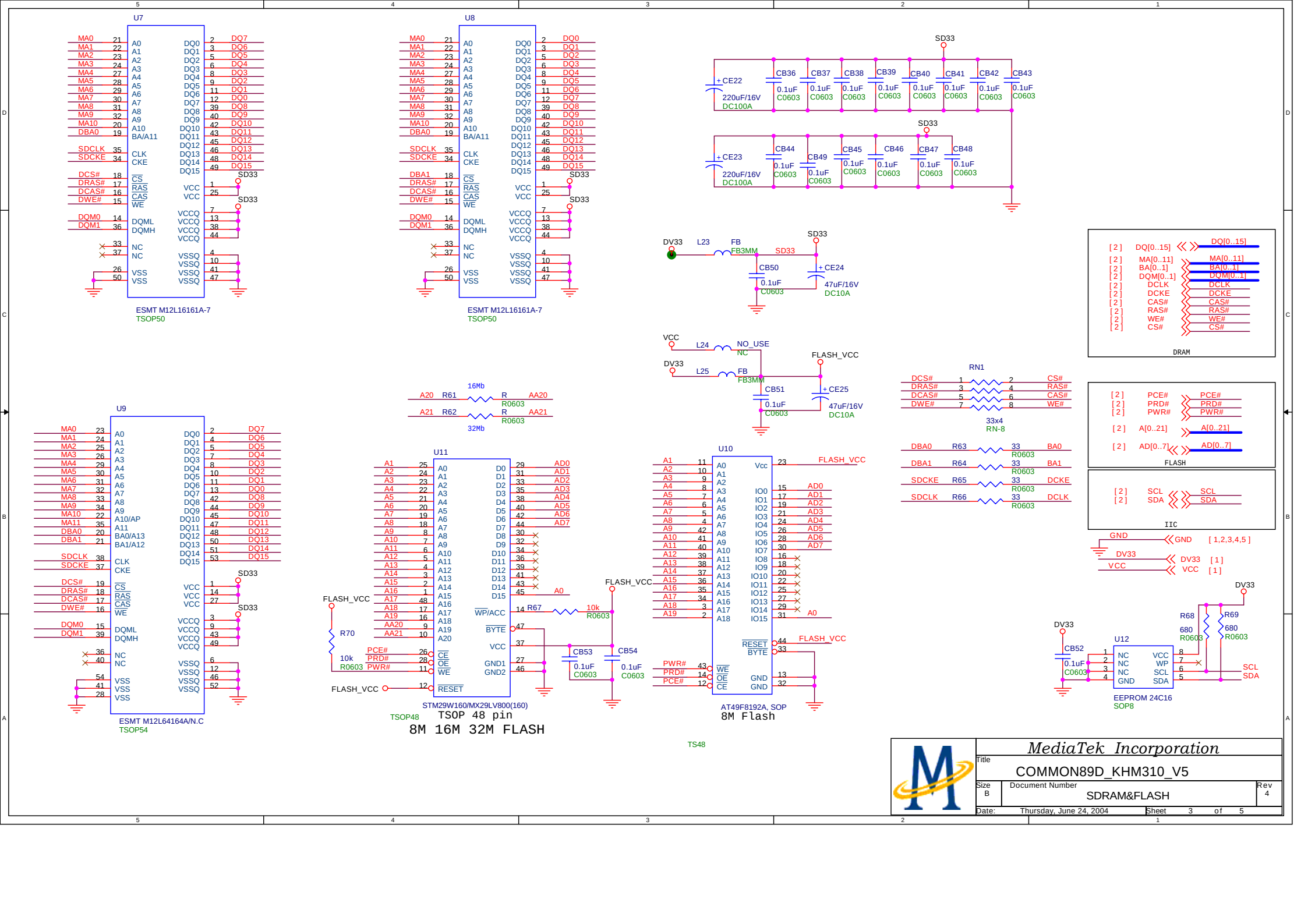









MT1389D
V1.7
2N3904
2SK3018
2SB1132
Very Important to reduce Noise
HEADER 24 SMD0.5 TOP
AM5668
6x1 W/HOUSING
4x1 W/HOUSING
5x1 W/HOUSING
RS-232
74HC04
VIDEO INTERFACE
FLASH
MEMORY
IIC
AUDIO INTERFACE
MediaTek Incorporation
COMMON89D_KHM310_V5
RF&MEPG
Thursday, June 24, 2004



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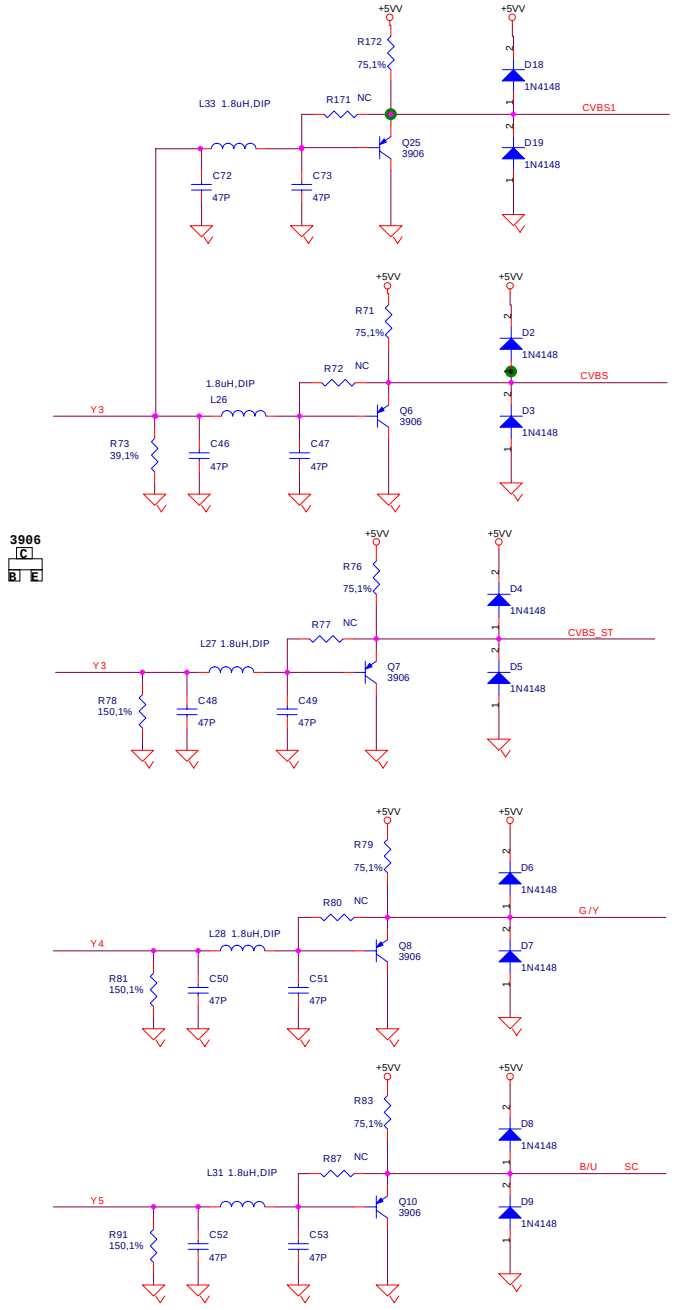
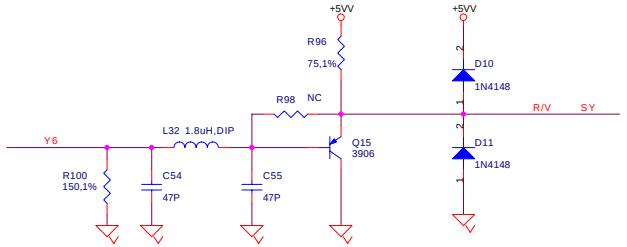
Rev	4
Date: Thursday, June 24, 2004	Sheet 3 of 5



3906

C
B E



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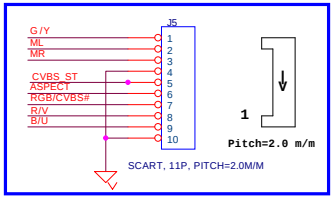

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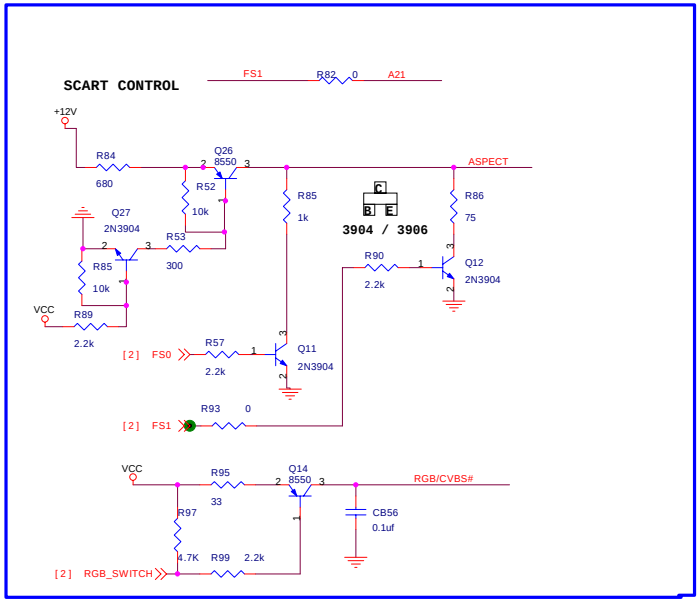

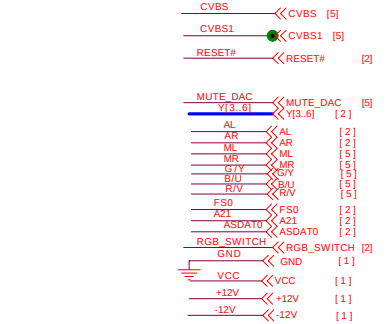

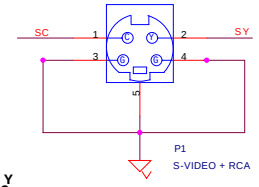

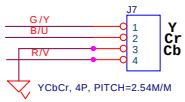

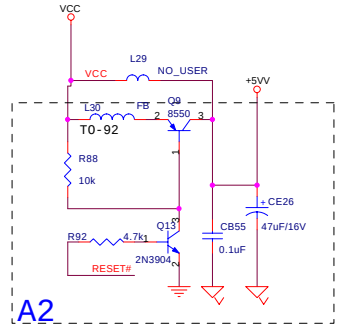

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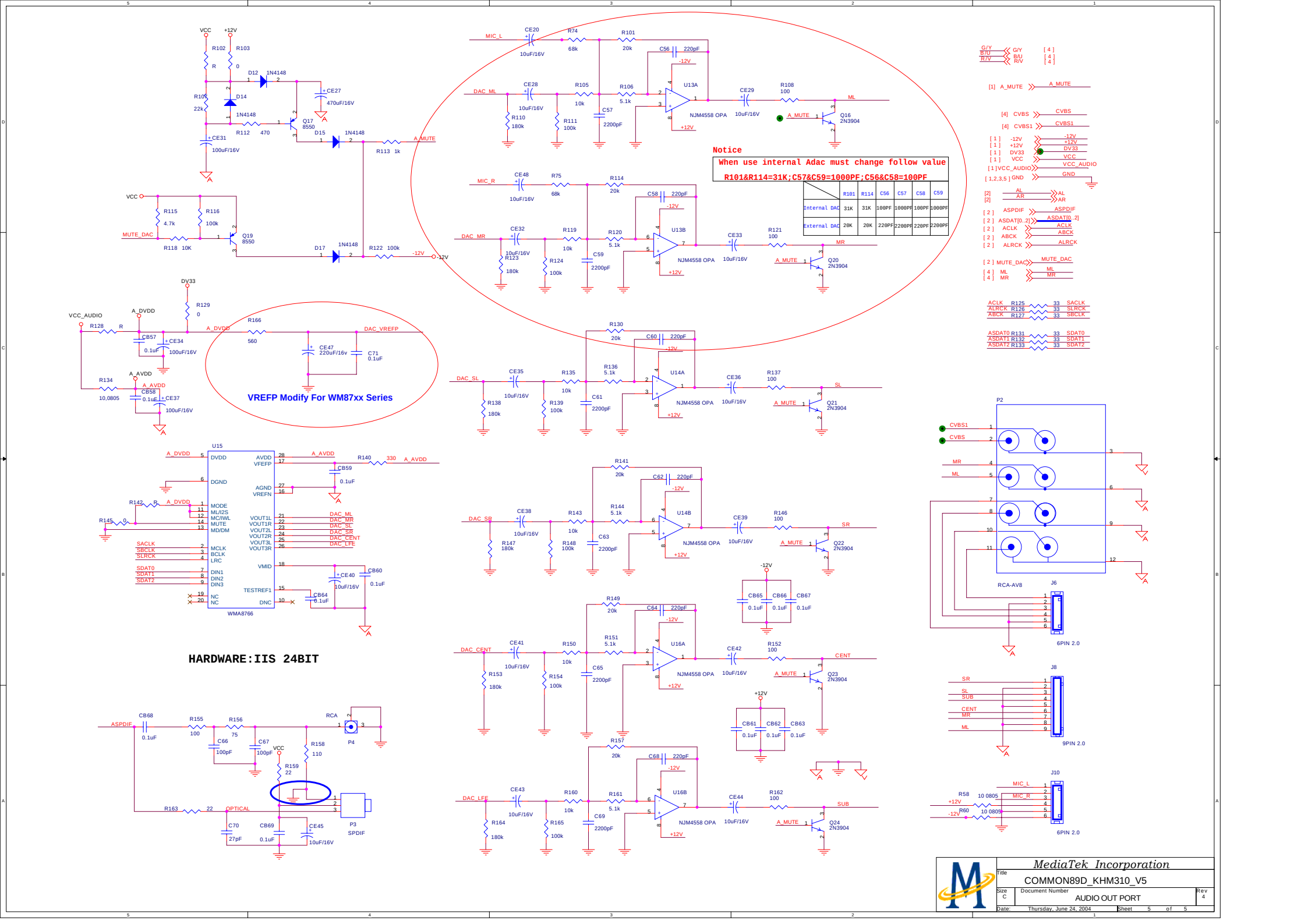

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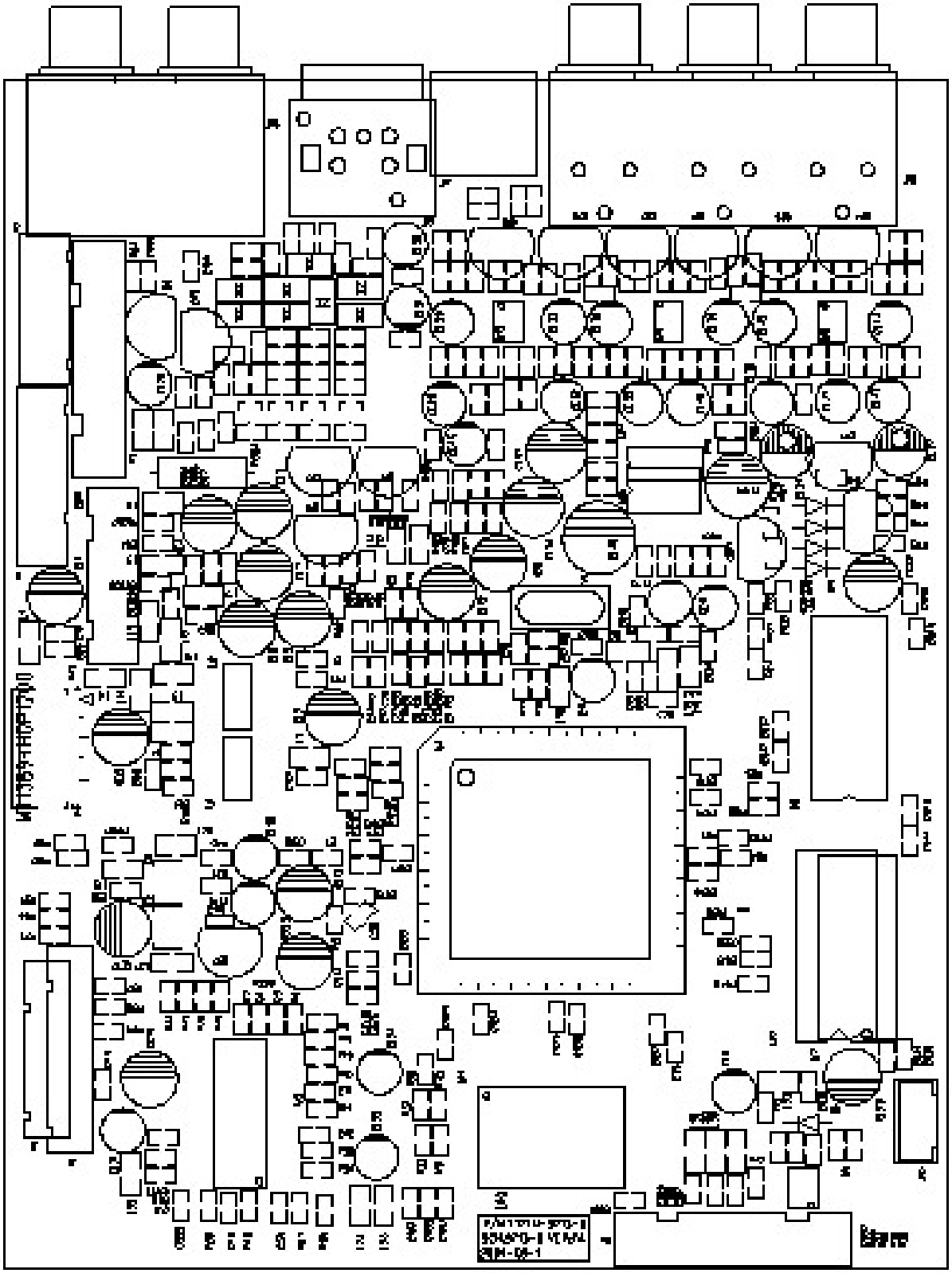
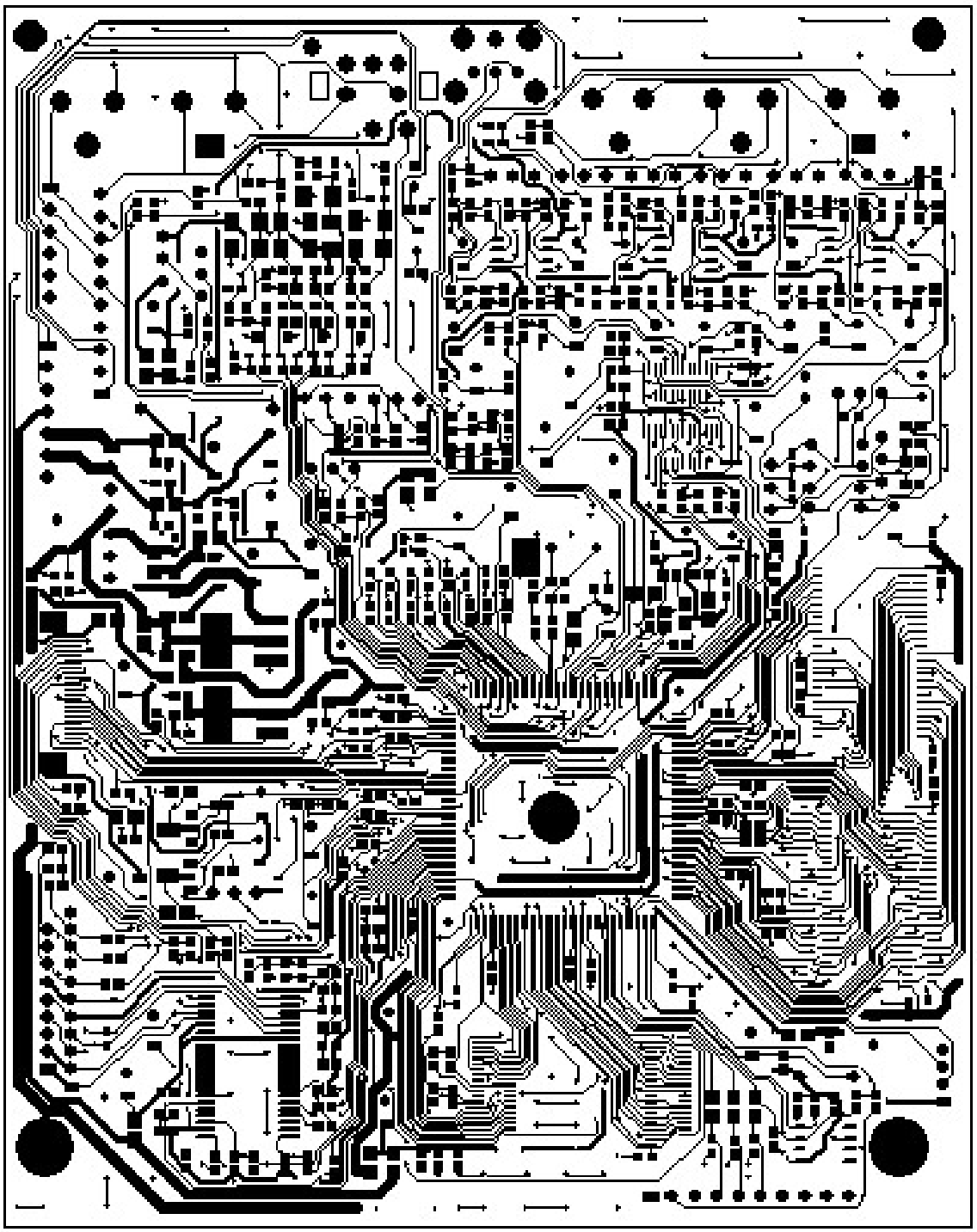
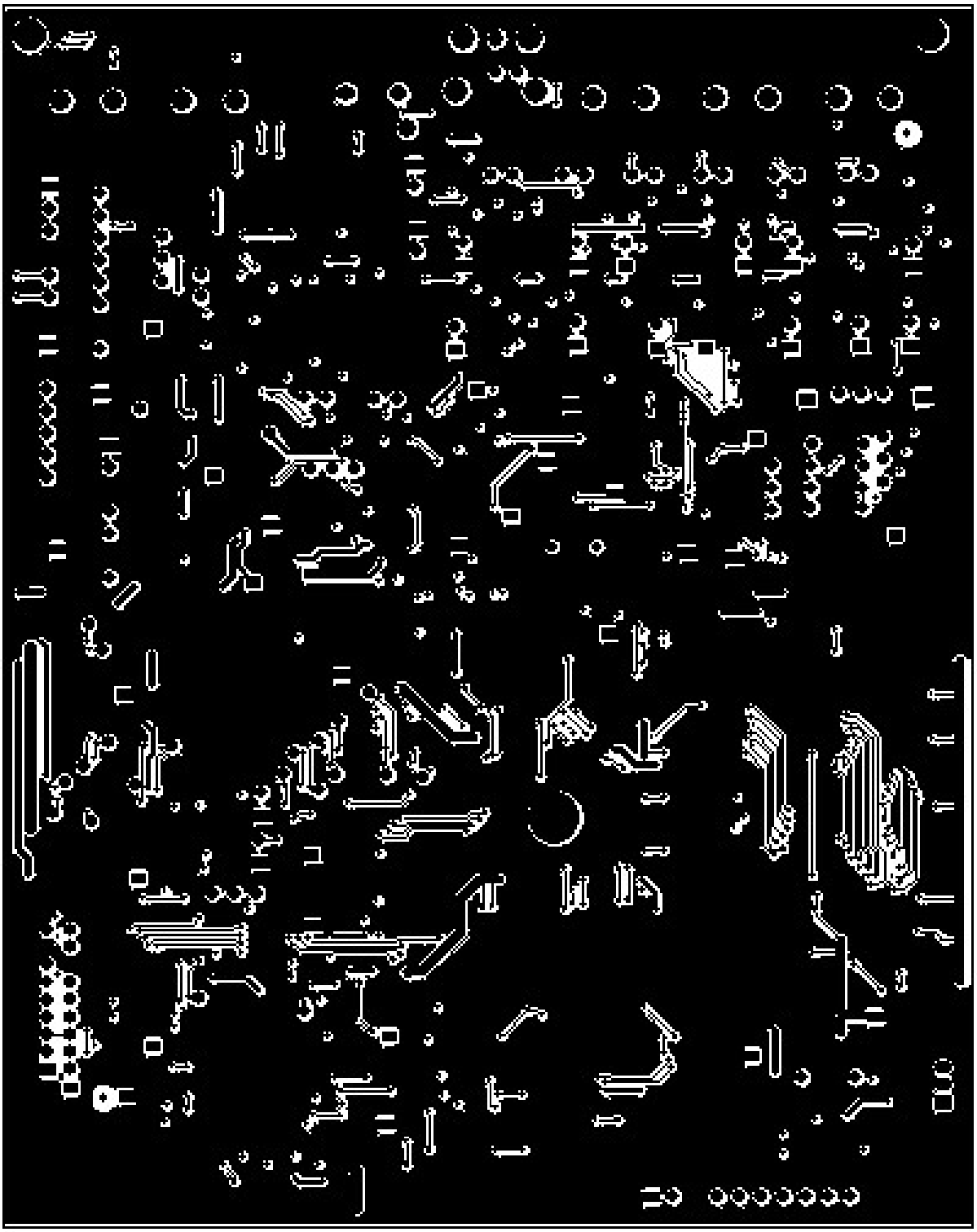






MTK DECODER

MTK1389D decoder board service manual

Please check the power supply to decoder board is normal before checking the decoder board.

Check the power supply voltage has the normal wave.

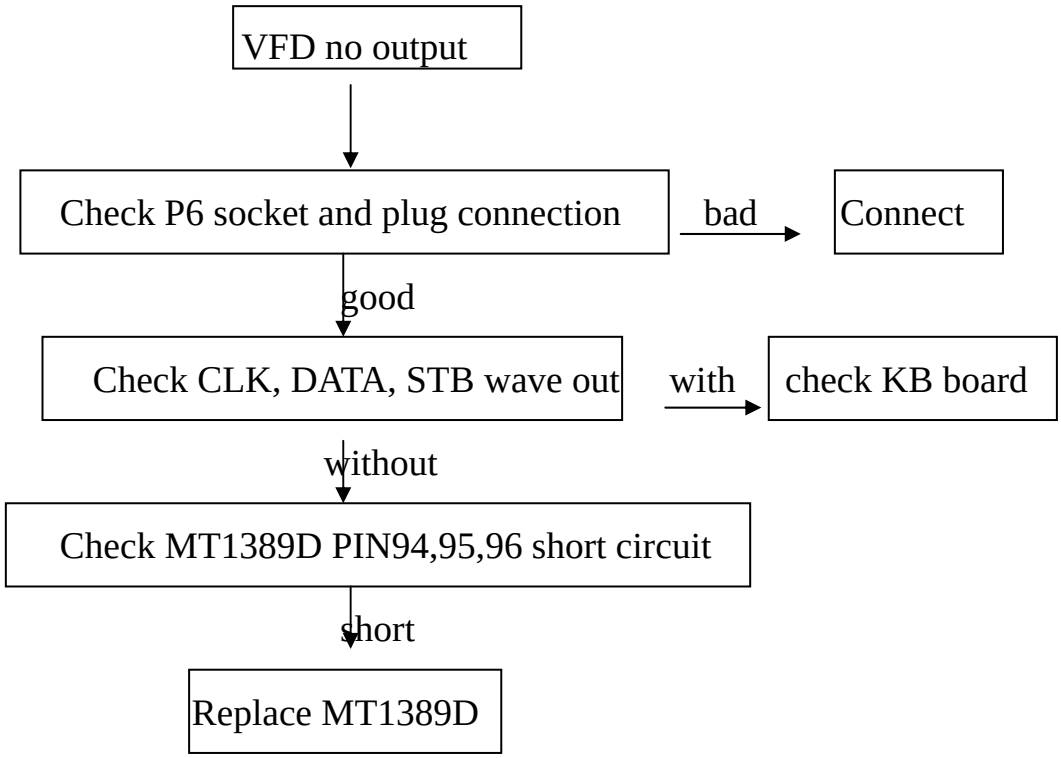
+5V +12V -12V 3.3V(U2), 1.8V(U1)

Check reset circuit (reset at high electrical level)

Check crystal circuit (27MHz) and SDRAM frequency (108MHz)

Decoder board repair flow chart: (Diagram not included)

1.



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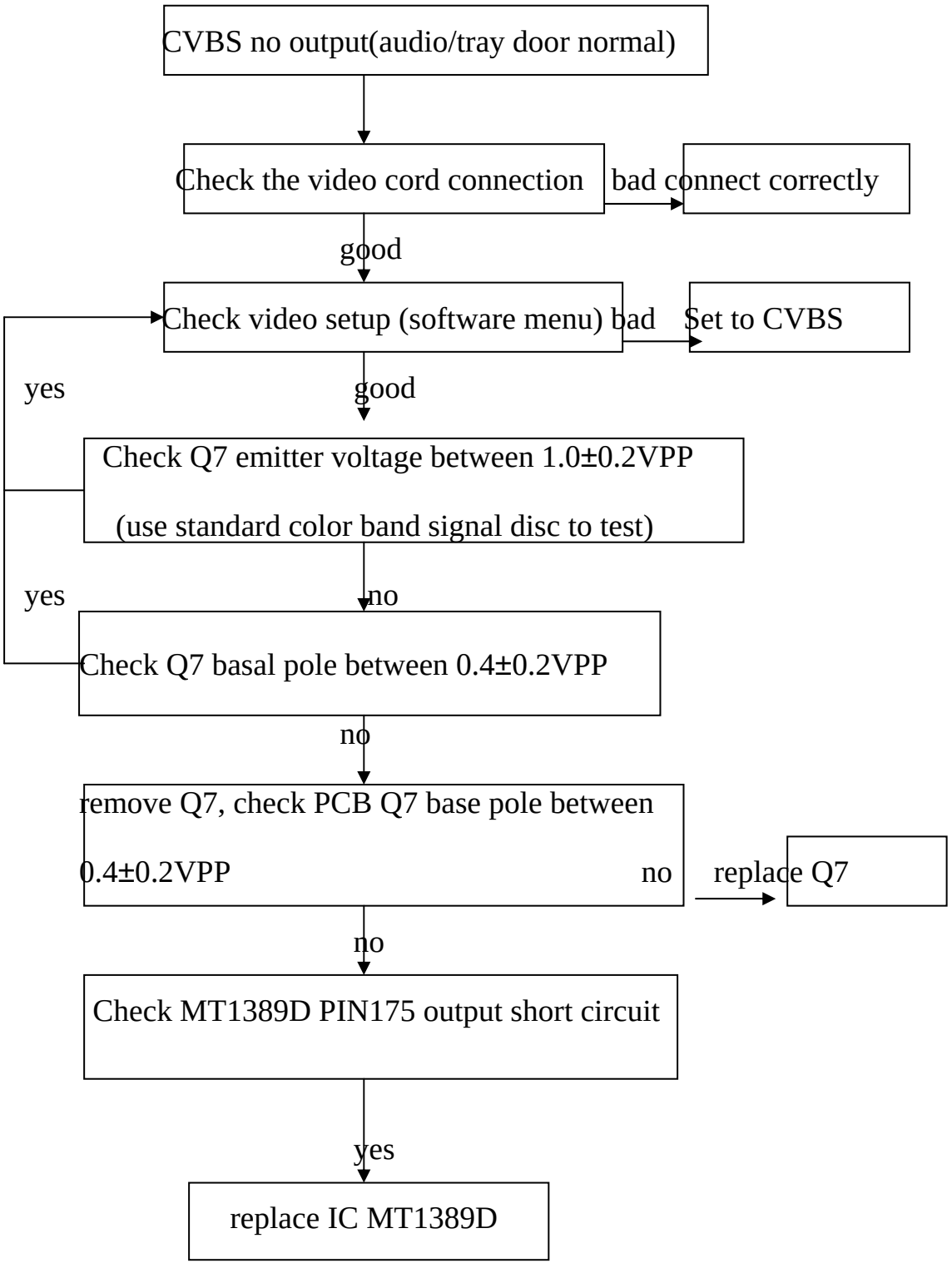
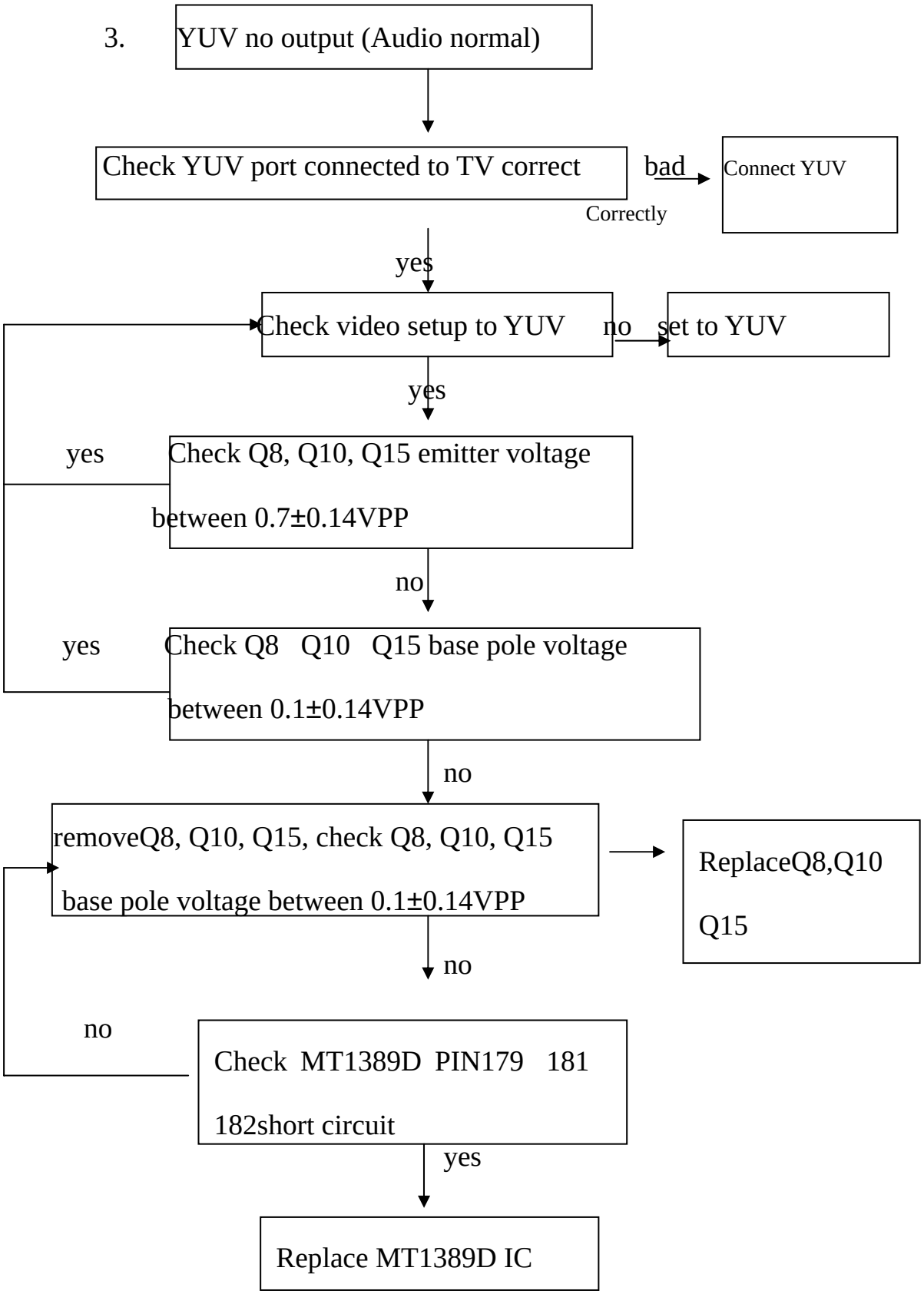
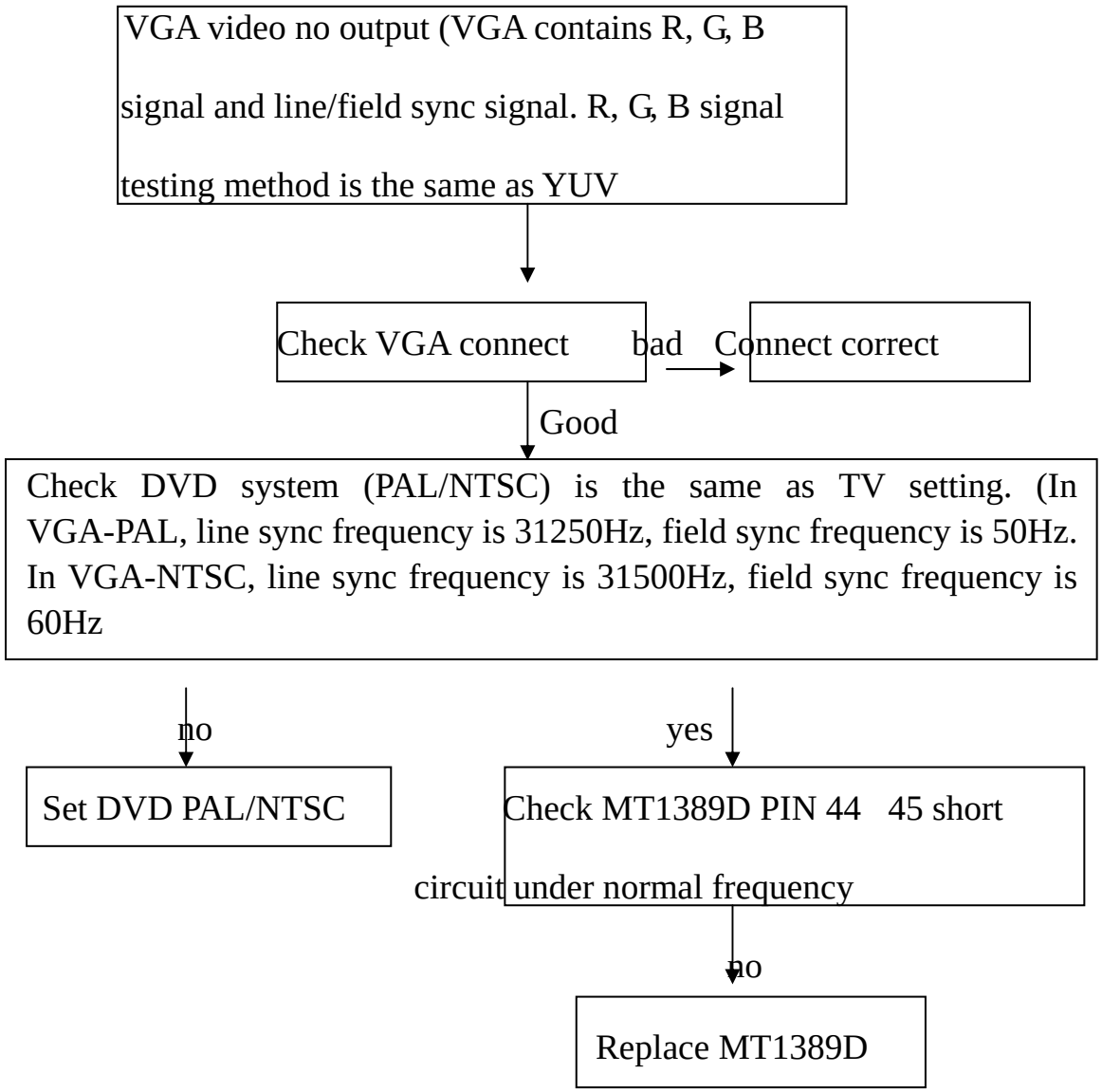
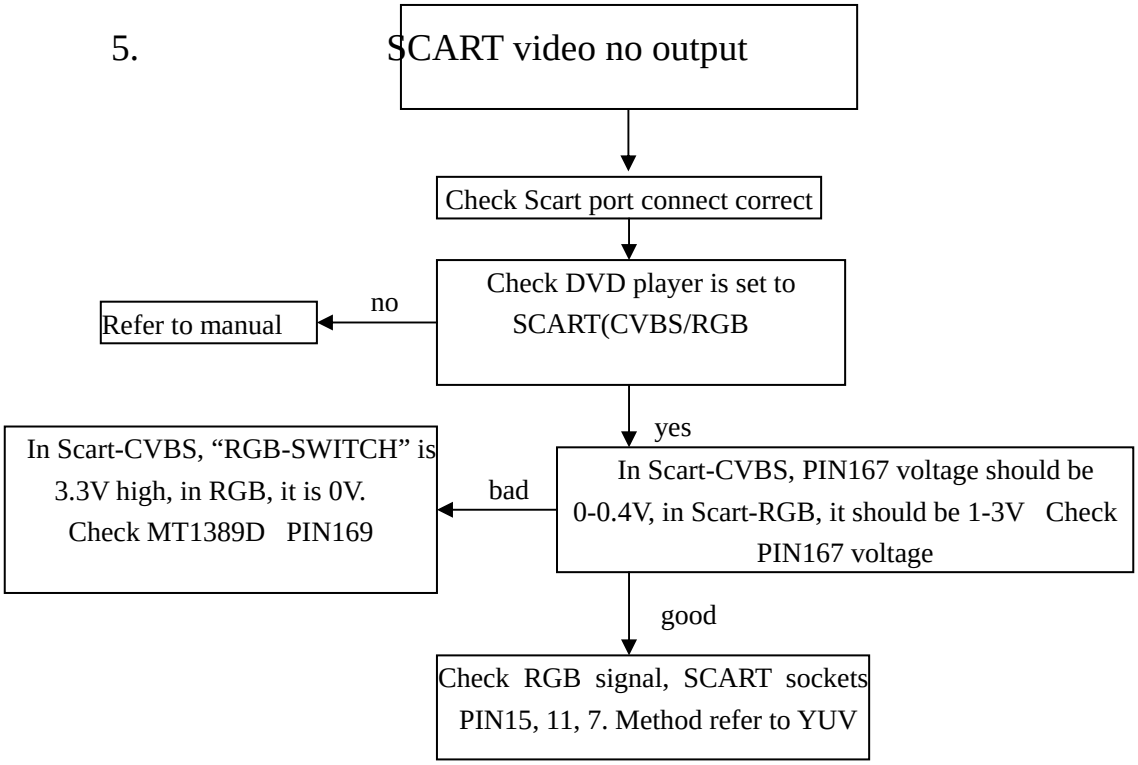

CVBS no output(audio/tray door normal)
Check the video cord connection
bad connect correctly
good
Check video setup (software menu)
bad
Set to CVBS
yes
good
Check Q7 emitter voltage between 1.0±0.2VPP
(use standard color band signal disc to test)
yes
no
Check Q7 basal pole between 0.4±0.2VPP
no
remove Q7, check PCB Q7 base pole between
0.4±0.2VPP
no
replace Q7
no
Check MT1389D PIN175 output short circuit
yes
replace IC MT1389D

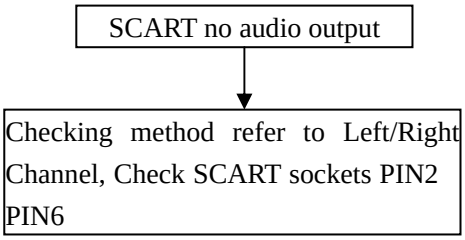

3.
YUV no output (Audio normal)
Check YUV port connected to TV correct
bad
Correctly
Connect YUV
yes
Check video setup to YUV
no
set to YUV
yes
yes
Check Q8, Q10, Q15 emitter voltage
between 0.7±0.14VPP
no
yes
Check Q8 Q10 Q15 base pole voltage
between 0.1±0.14VPP
no
removeQ8, Q10, Q15, check Q8, Q10, Q15
base pole voltage between 0.1±0.14VPP
ReplaceQ8,Q10
Q15
no
no
Check MT1389D PIN179 181
182short circuit
yes
Replace MT1389D IC

4.

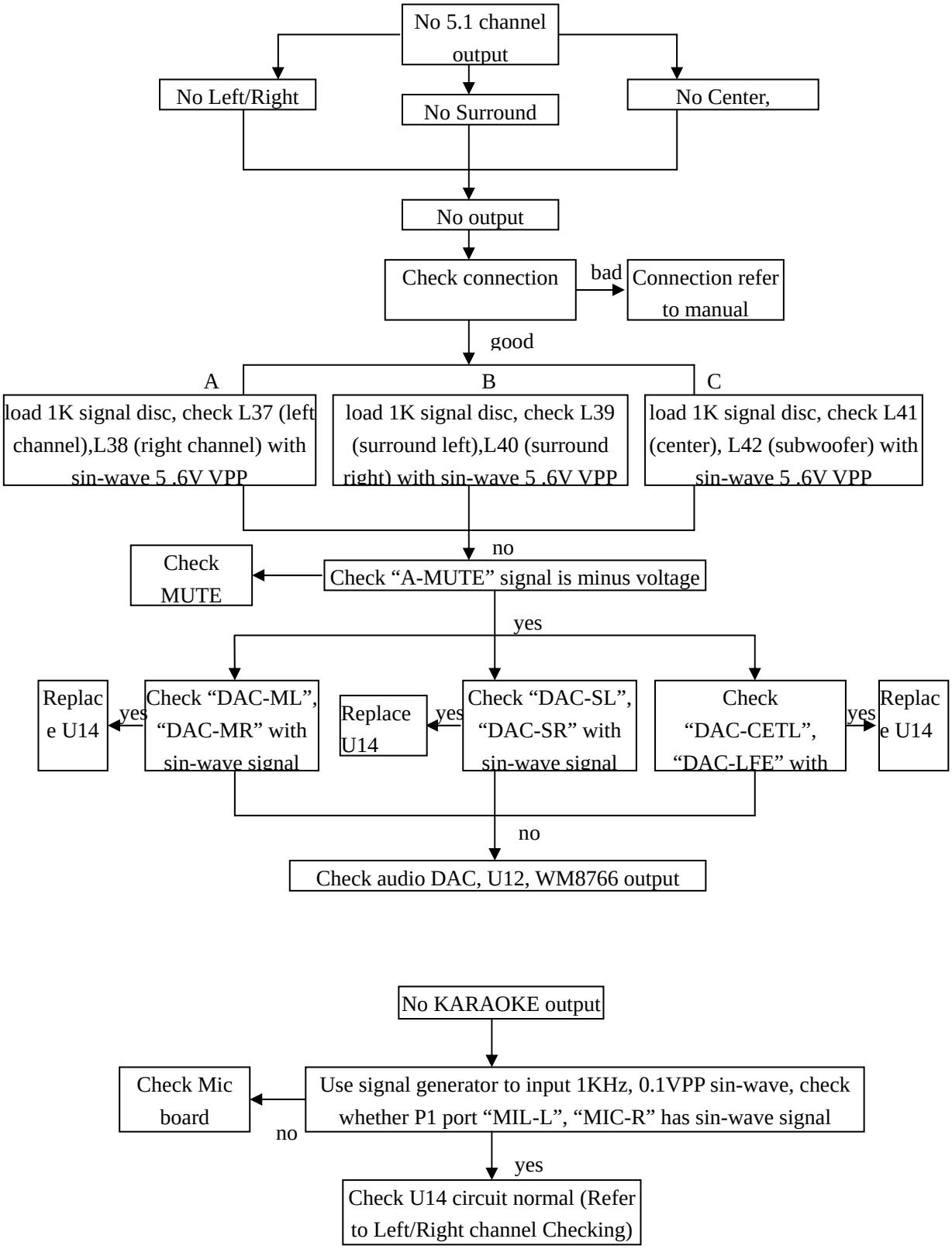

VGA video no output (VGA contains R, G, B signal and line/field sync signal. R, G, B signal testing method is the same as YUV
Check VGA connect
bad
Connect correct
Good
Check DVD system (PAL/NTSC) is the same as TV setting. (In VGA-PAL, line sync frequency is 31250Hz, field sync frequency is 50Hz. In VGA-NTSC, line sync frequency is 31500Hz, field sync frequency is 60Hz
no
yes
Set DVD PAL/NTSC
Check MT1389D PIN 44 45 short circuit under normal frequency
no
Replace MT1389D

5. SCART video no output

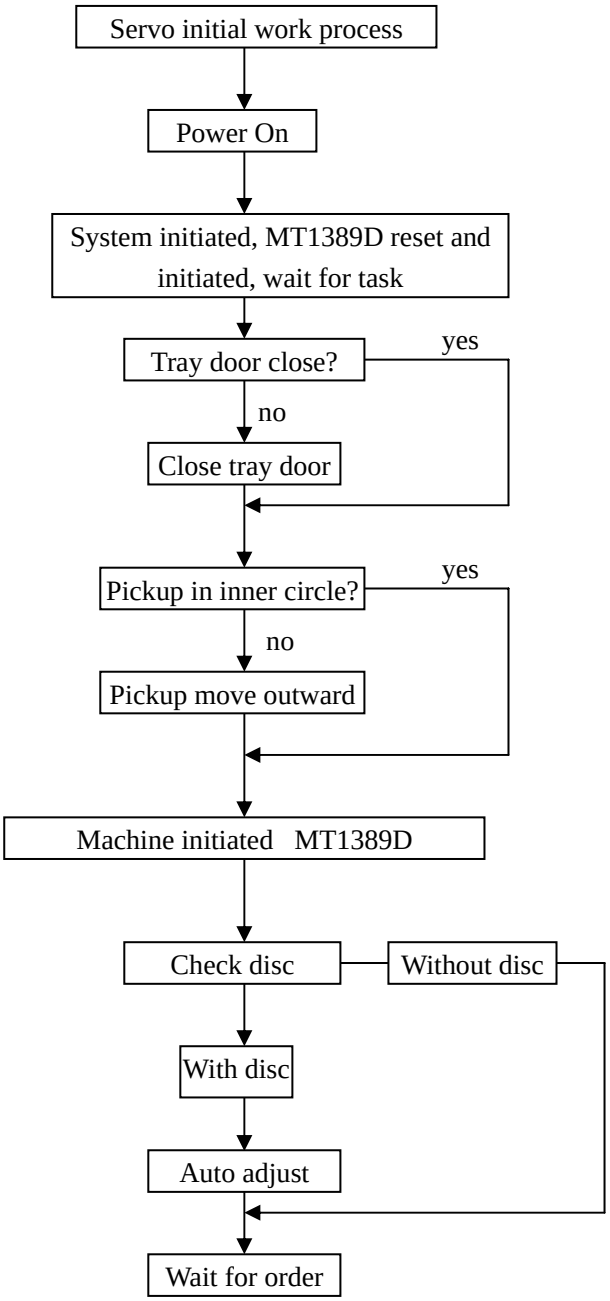


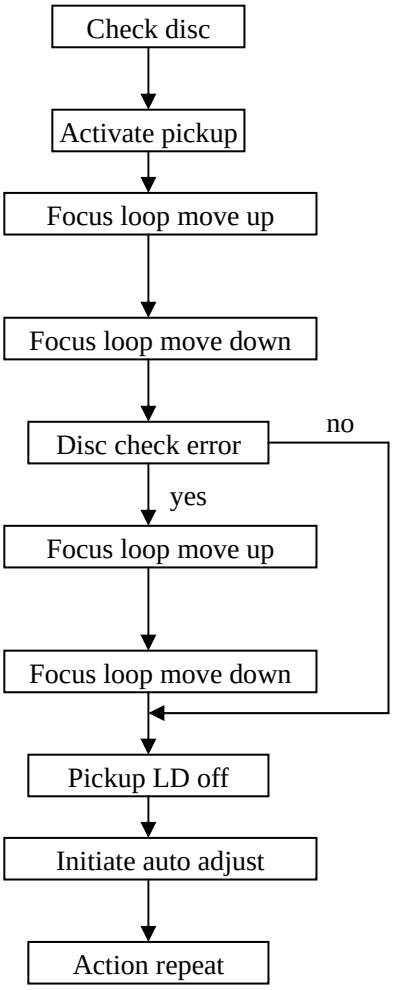


6.

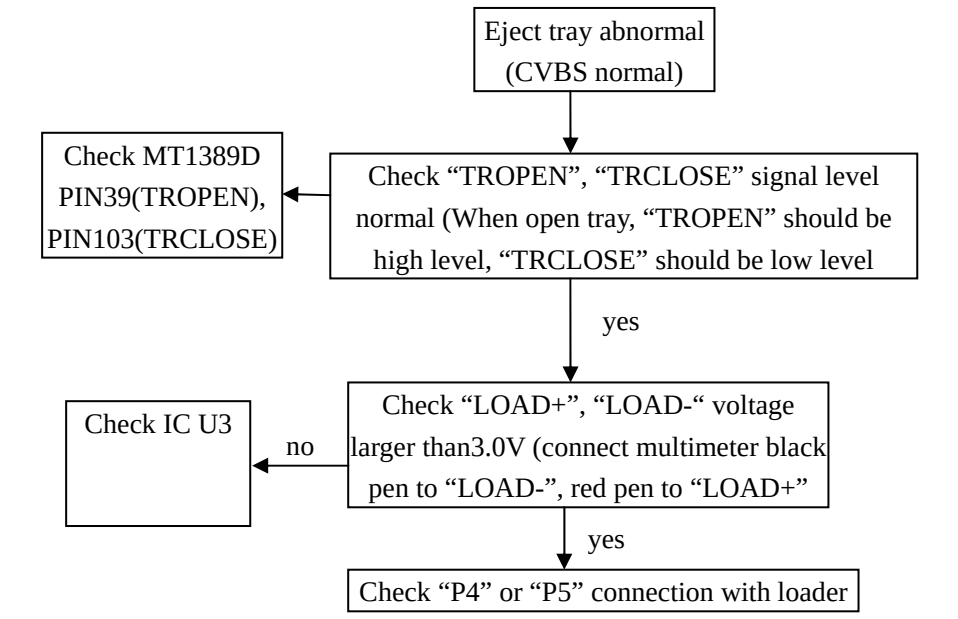

No 5.1 channel output
No Left/Right
No Surround
No Center,
No output
Check connection
bad
Connection refer to manual
good
A
B
C
load 1K signal disc, check L37 (left channel),L38 (right channel) with sin-wave 5 .6V VPP
load 1K signal disc, check L39 (surround left),L40 (surround right) with sin-wave 5 .6V VPP
load 1K signal disc, check L41 (center), L42 (subwoofer) with sin-wave 5 .6V VPP
no
Check MUTE
Check “A-MUTE” signal is minus voltage
yes
Replac e U14
yes
Check “DAC-ML”, “DAC-MR” with sin-wave signal
Replace U14
yes
Check “DAC-SL”, “DAC-SR” with sin-wave signal
Check “DAC-CETL”, “DAC-LFE” with
yes
Replac e U14
no
Check audio DAC, U12, WM8766 output
No KARAOKE output
Check Mic board
no
Use signal generator to input 1KHz, 0.1VPP sin-wave, check whether P1 port “MIL-L”, “MIC-R” has sin-wave signal
yes
Check U14 circuit normal (Refer to Left/Right channel Checking)

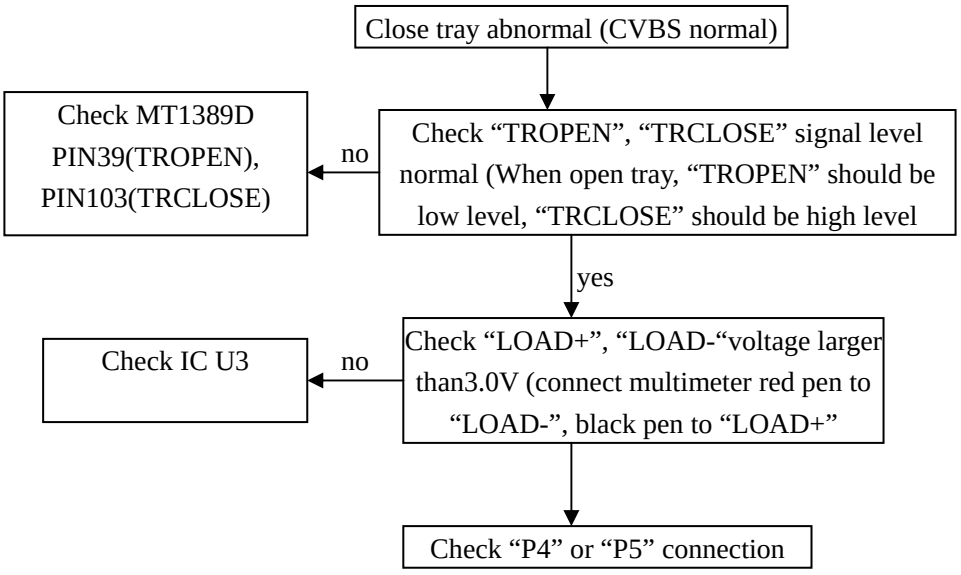
7.


Servo initial work process
Power On
System initiated, MT1389D reset and initiated, wait for task
Tray door close?
yes
no
Close tray door
Pickup in inner circle?
yes
no
Pickup move outward
Machine initiated MT1389D
Check disc
Without disc
With disc
Auto adjust
Wait for order

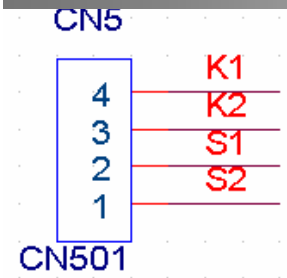

Check disc
Activate pickup
Focus loop move up
Focus loop move down
Disc check error
no
yes
Focus loop move up
Focus loop move down
Pickup LD off
Initiate auto adjust
Action repeat

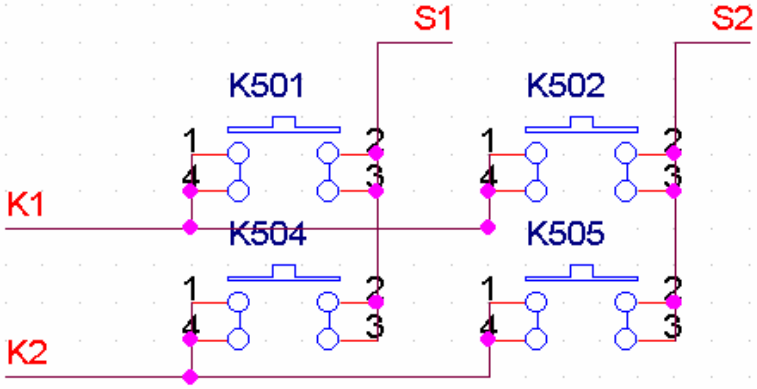
8.

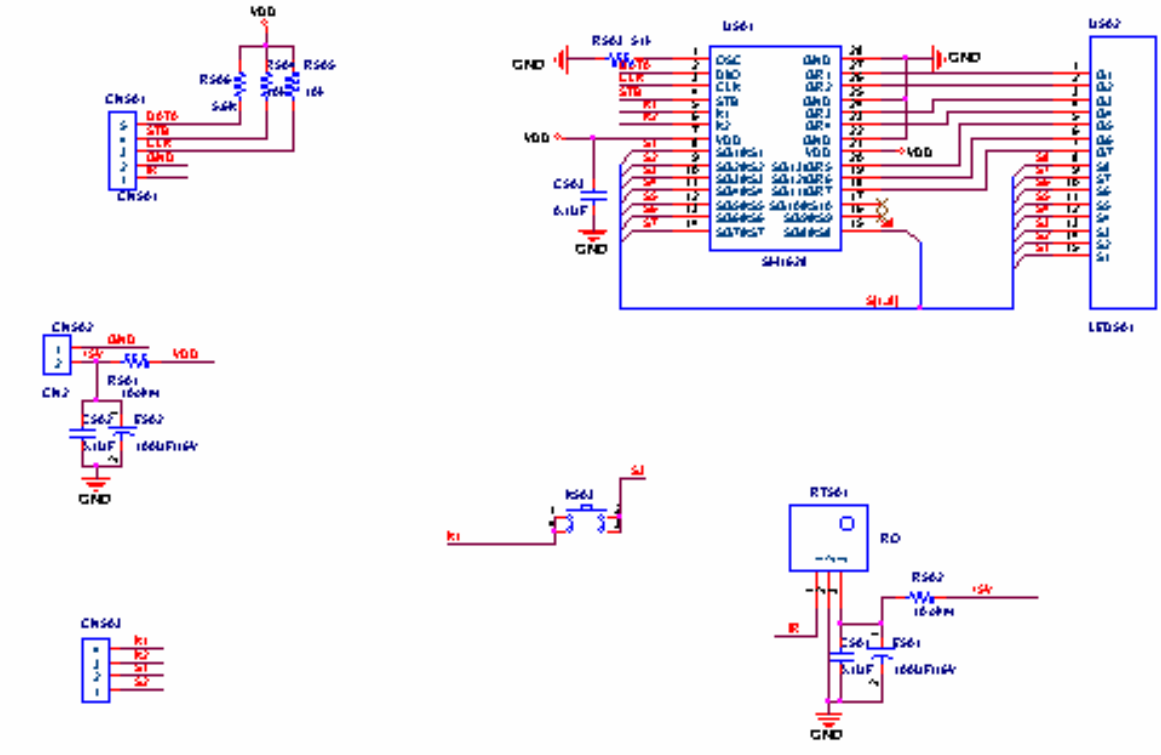

Eject tray abnormal (CVBS normal)
Check MT1389D PIN39(TROPEN), PIN103(TRCLOSE)
Check “TROPEN”, “TRCLOSE” signal level normal (When open tray, “TROPEN” should be high level, “TRCLOSE” should be low level
yes
Check IC U3
no
Check “LOAD+”, “LOAD-“ voltage larger than3.0V (connect multimeter black pen to “LOAD-”, red pen to “LOAD+”
yes
Check “P4” or “P5” connection with loader


Close tray abnormal (CVBS normal)
Check MT1389D PIN39(TROPEN), PIN103(TRCLOSE)
no
Check “TROPEN”, “TRCLOSE” signal level normal (When open tray, “TROPEN” should be low level, “TRCLOSE” should be high level
yes
Check IC U3
no
Check “LOAD+”, “LOAD-“voltage larger than3.0V (connect multimeter red pen to “LOAD-”, black pen to “LOAD+”
Check “P4” or “P5” connection

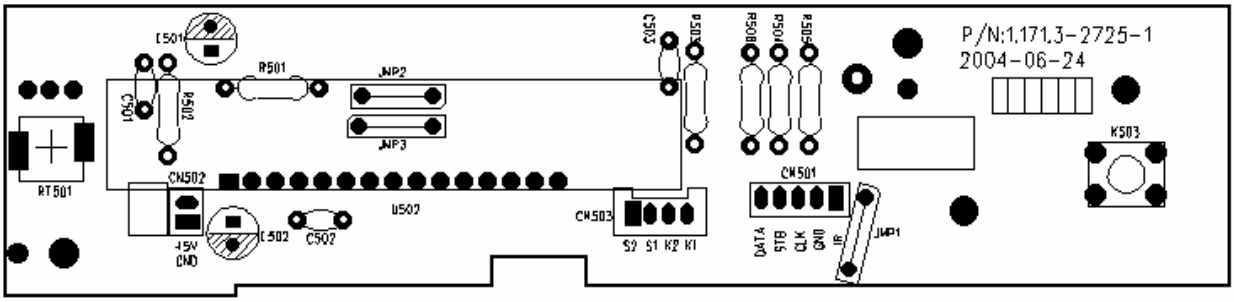
8 Repair of key board

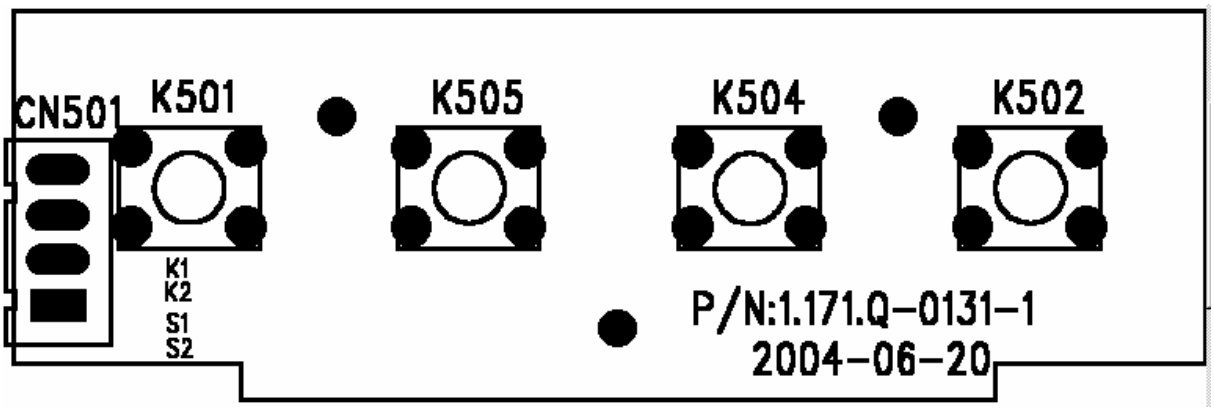






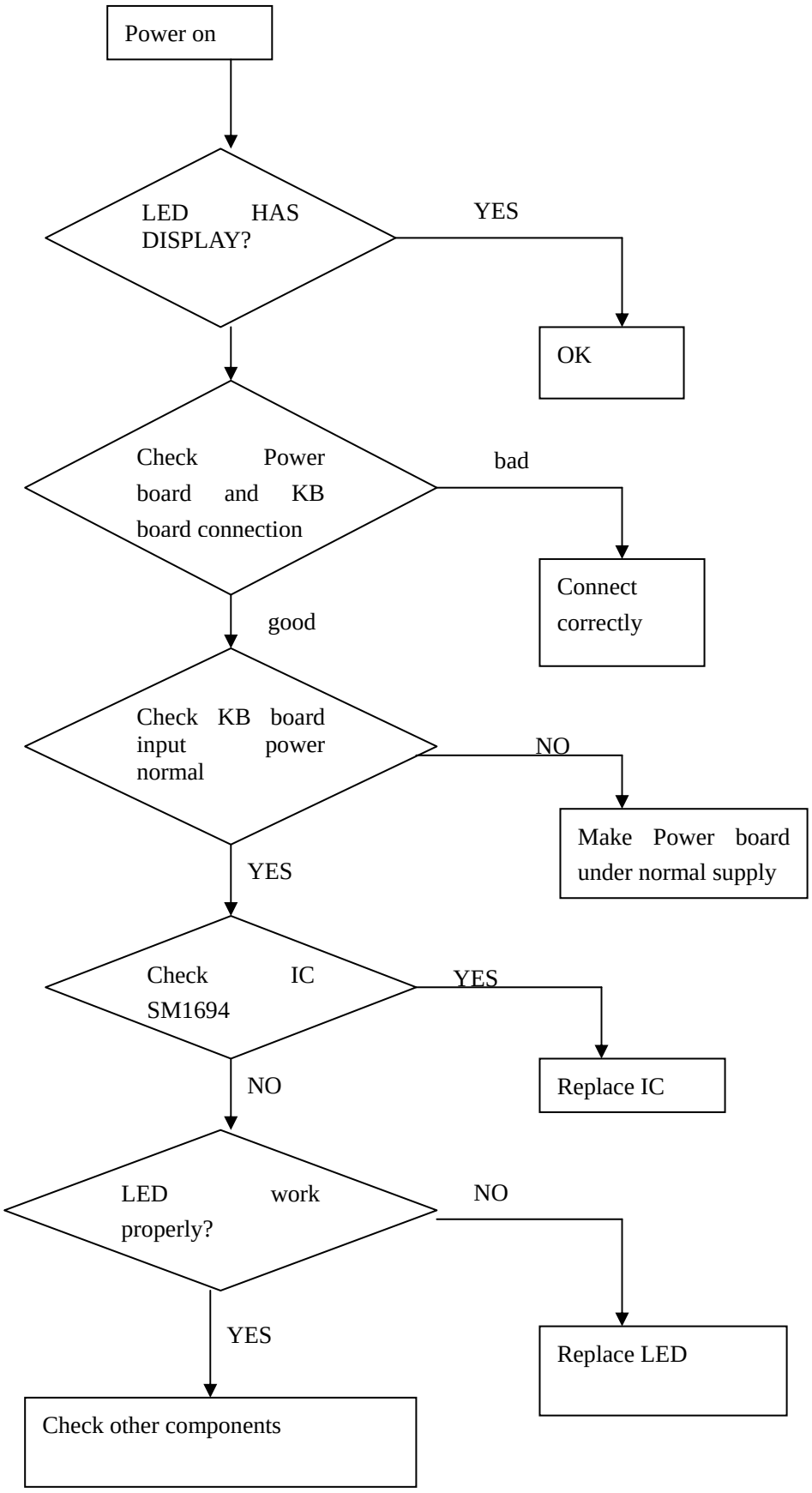
8 Repair of key board



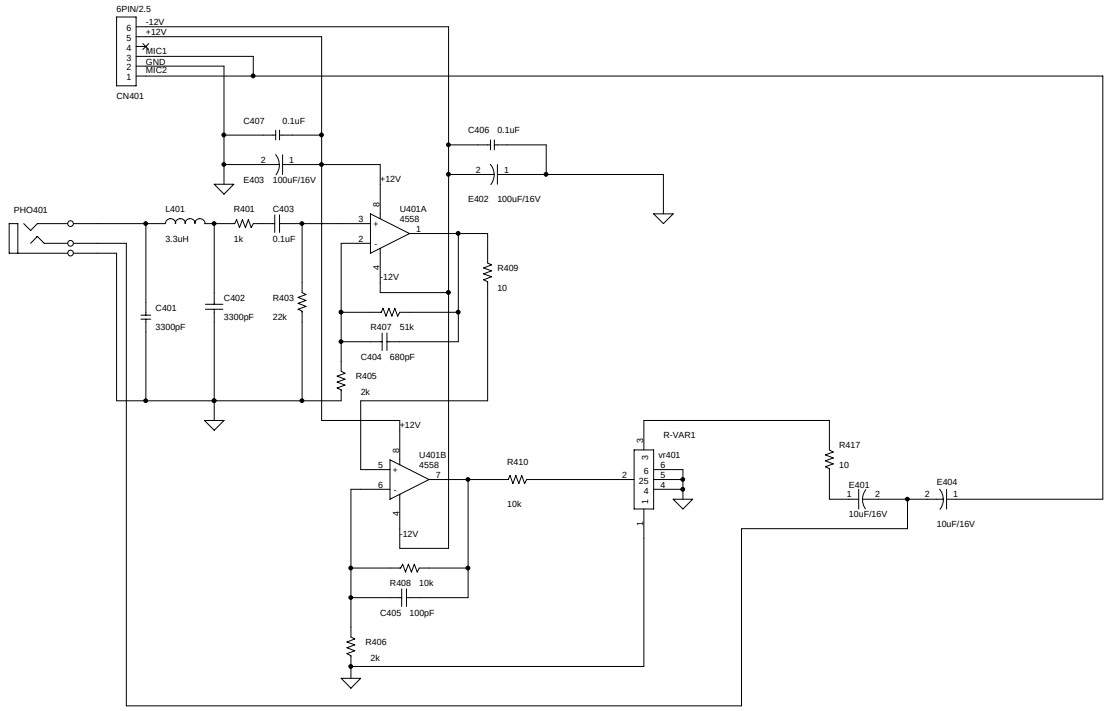


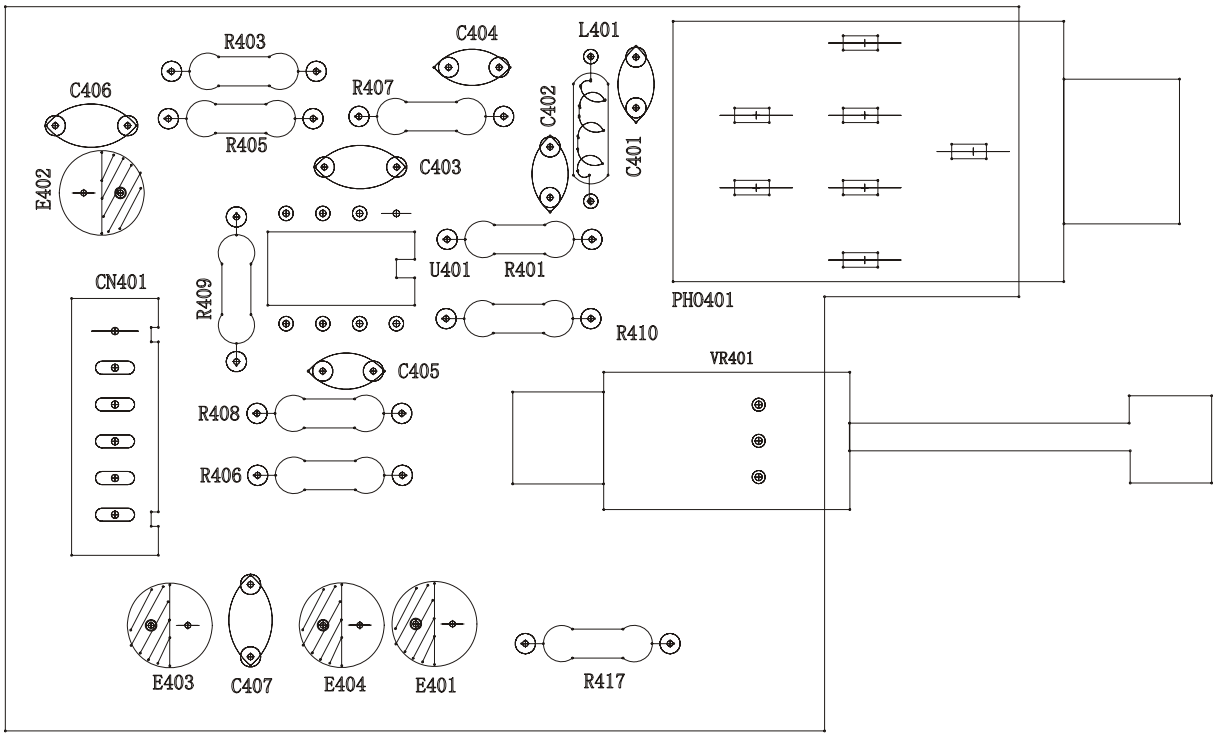
Repair of key board

KB BOARD SERVICE PROCEDURE



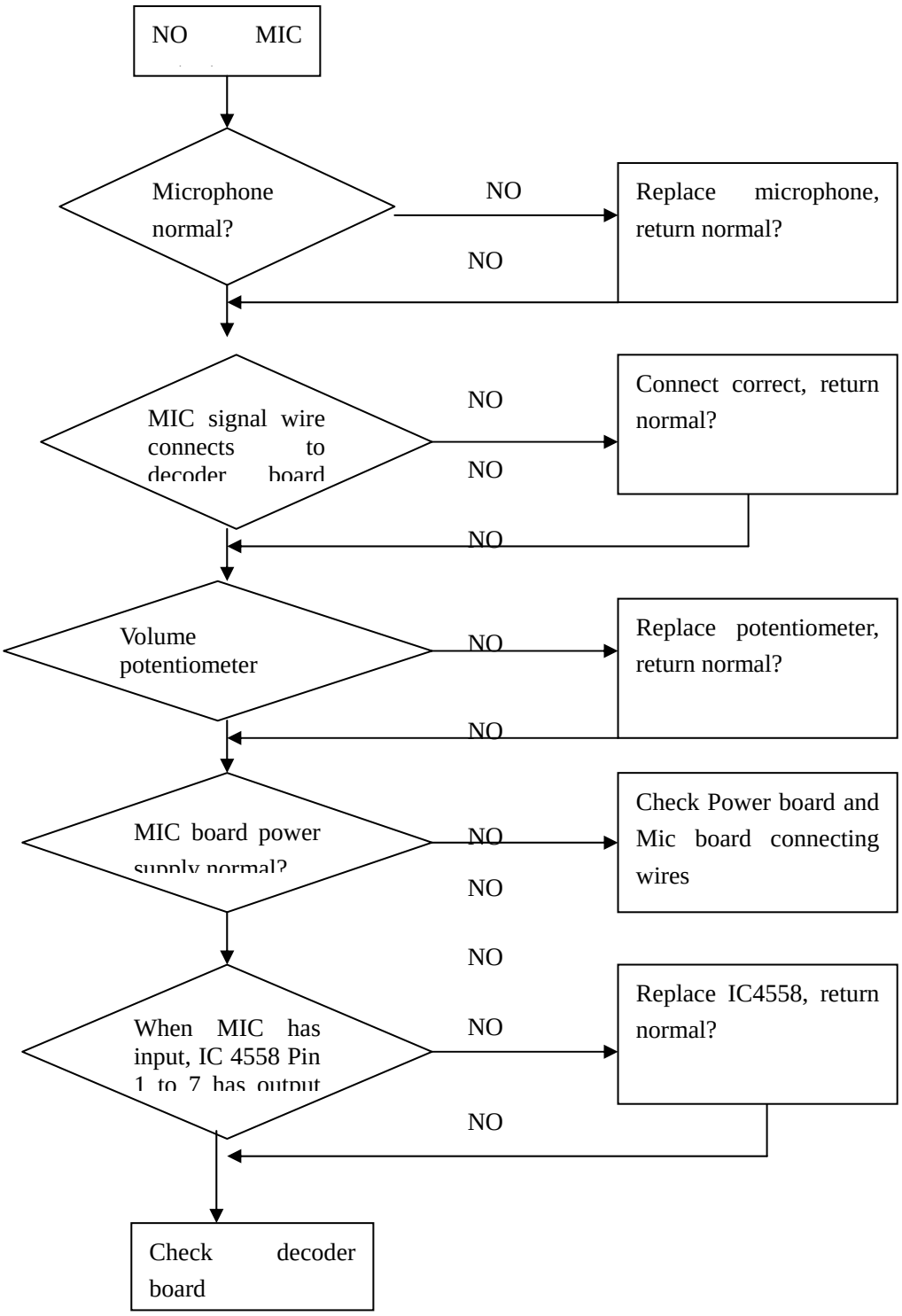
Repair of MIC board

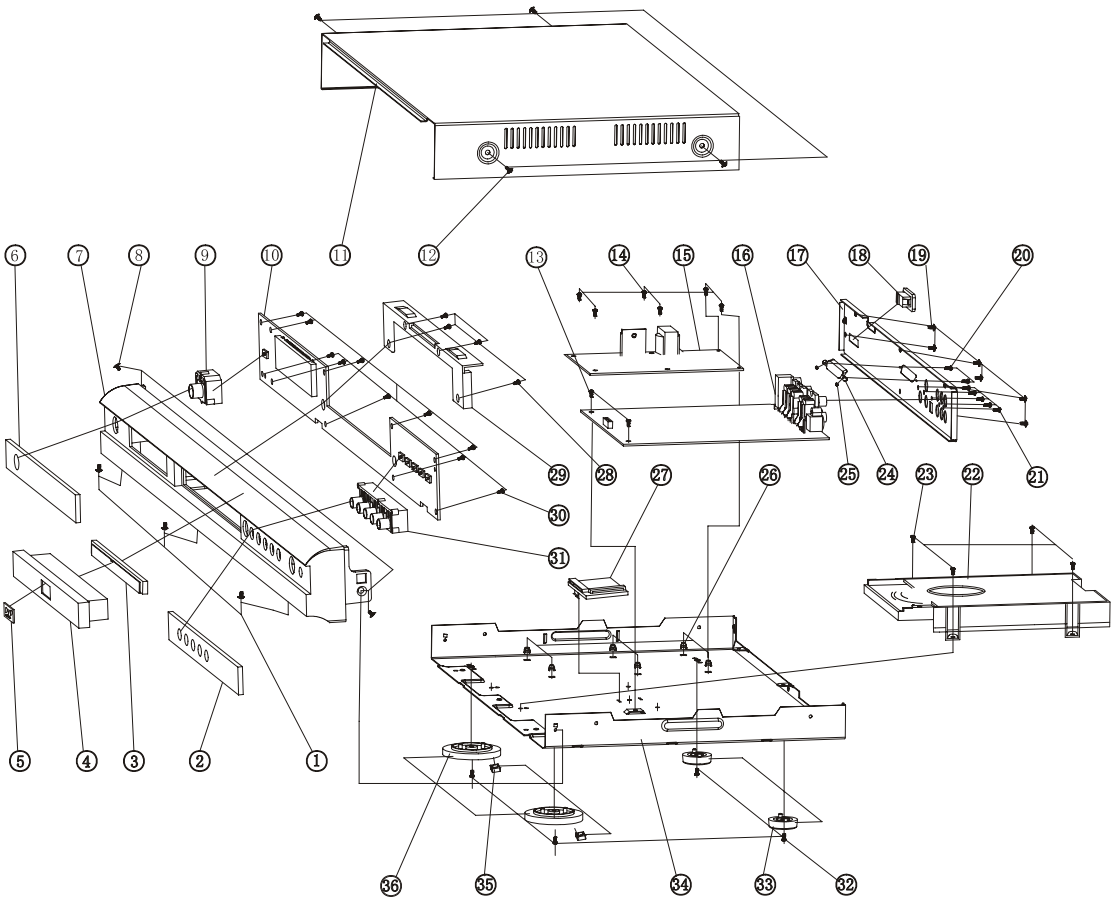




Repair of MIC board

MIC BOARD SERVICE PROCEDURE

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