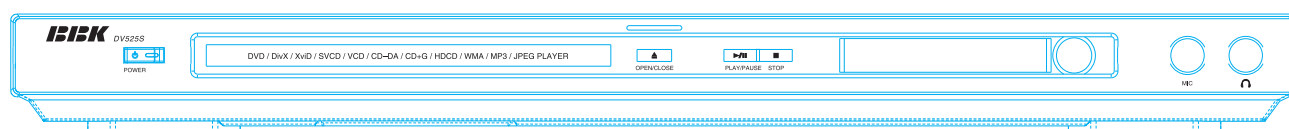


SERVICE MANUAL

DV525S



CONTENTS

1.	SAFETY PRECAUTIONS	1
2.	PREVENTION OF ELECTRO STATIC DISCHARGE(ESD)TO ELECTROSTATICALLY SENSITIVE(ES)DEVICES	1
3.	CONTROL BUTTON LOCATIONS AND EXPLANATIONS	2
4.	PREVENTION OF STATIC ELECTRICITY DISCHARGE	3
5.	ASSEMBLING AND DISASSEMBLING THE MECHANISM UNIT	4
5.1	OPTICAL PICKUP UNIT EXPLODED VIEW AND PART LIST	4
5.2	BRACKET EXPLODED VIEW AND PART LIST	6
5.3	MISCELLANEOUS	7
6.	ELECTRICAL CONFIRMATION	8
6.1	VIDEO OUTPUT (LUMINANCE SIGNAL) CONFIRMATION	8
6.2	VIDEO OUTPUT(CHROMINANCE SIGNAL) CONFIRMATION	9
7.	MPEG BOARD CHECK WAVEFORM	10
8.	29LV160BE-70PFTN	11
8.1	HY57V641620HG	16
8.2	MT1389	19
8.3	CD4052B	22
9.	SCHEMATIC & PCB WIRING DIAGRAM	26
10.	SPARE PARTS LIST	39
11 .	APPENDIX-AM/FM Tuner Specifcadtion	45

1. SAFETY PREAUTIONS

1.1 GENERAL GUIDELINES

1. When servicing, observe the original lead dress. if a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barrier, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

2.PREVENTION OF ELECTRO STATIC DISCHARGE(ESD)TO ELECTROSTATICALLY SENSITIVE(ES)DEVICES

Some semiconductor(solid state)devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive(ES)Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge(ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially availabel discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices,place the assembly on a conductive surface such as alminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as anti-static (ESD protected)can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, alminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

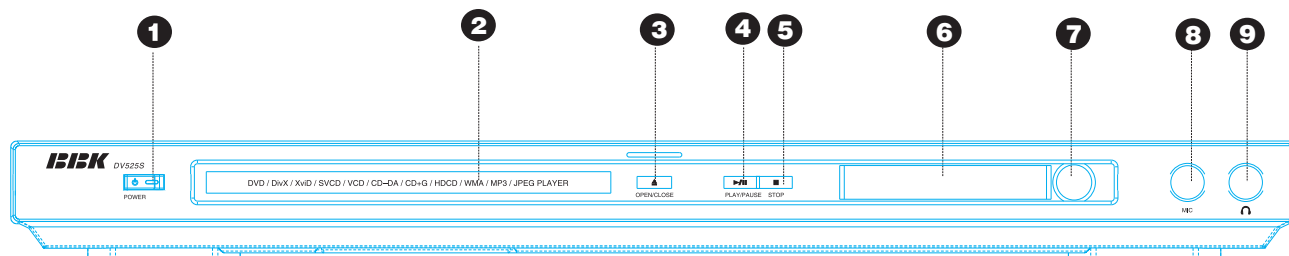
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity(ESD).

notice (1885x323x2 tiff)

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are imporant for safety. These parts are marked by $\triangle$ in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

■ Front Panel Illustration



1 POWER switch

2 Disc tray

3 OPEN/CLOSE button

4 PLAY/PAUSE button

5 STOP button

6 LED display window

7 Remote control signal sensor

8 MIC jack

9 Headphone jack

4. PREVENTION OF STATIC ELECTRICITY DISCHARGE

The laser diode in the traverse unit (optical pickup) may break down due to static electricity of clothes or human body. Use due caution to electrostatic breakdown when servicing and handling the laser diode.

4.1. Grounding for electrostatic breakdown prevention

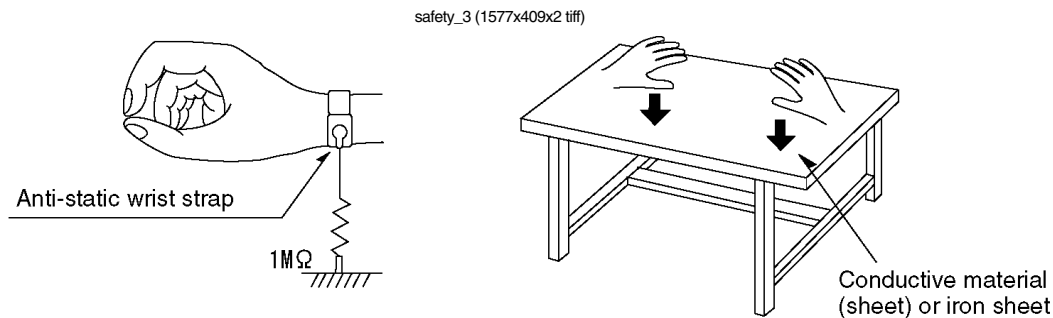
Some devices such as the DVD player use the optical pickup (laser diode) and the optical pickup will be damaged by static electricity in the working environment. Proceed servicing works under the working environment where grounding works is completed.

4.1.1. Worktable grounding

1. Put a conductive material (sheet) or iron sheet on the area where the optical pickup is placed, and ground the sheet.

4.1.2. Human body grounding

- 1 Use the anti-static wrist strap to discharge the static electricity from your body.



4.1.3. Handling of optical pickup

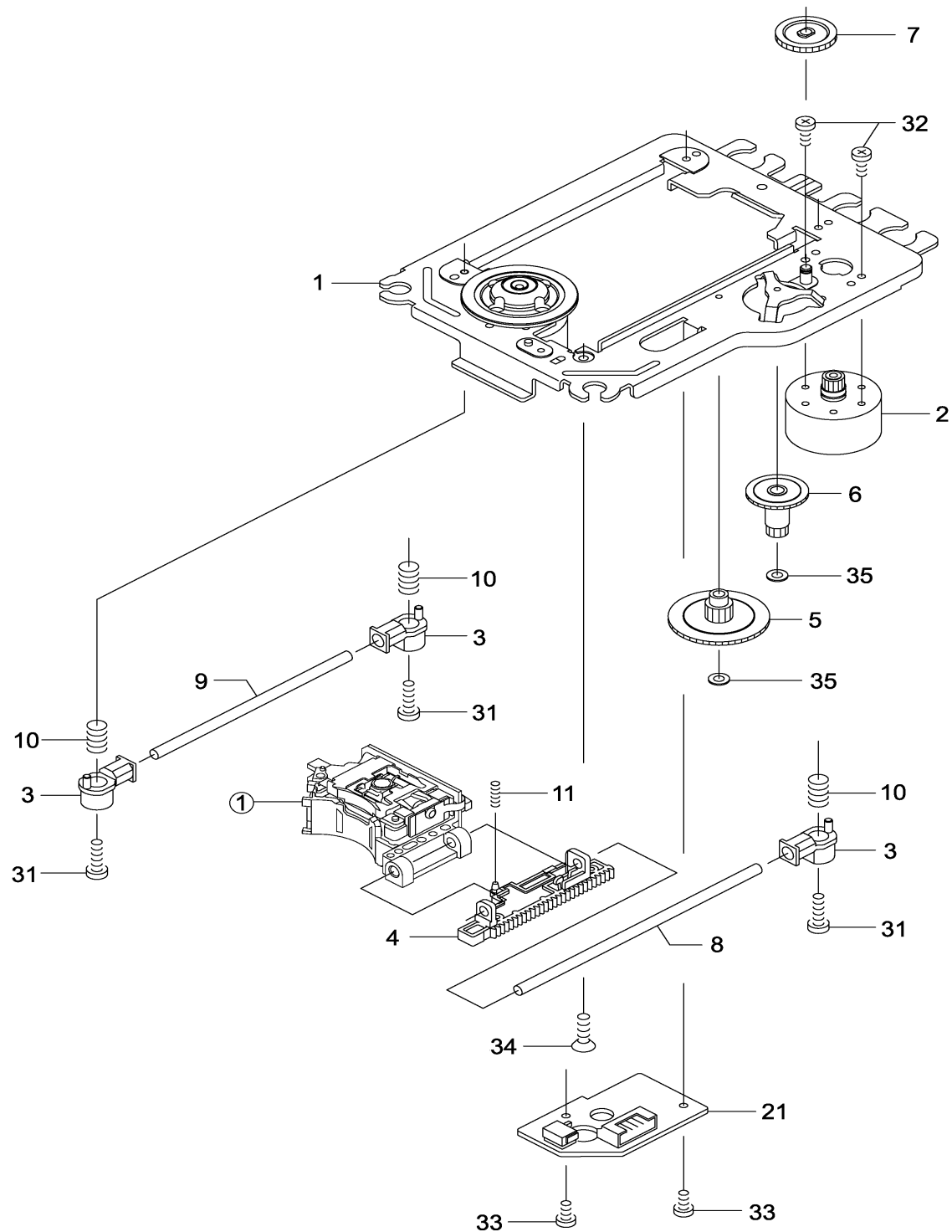
1. To keep the good quality of the optical pickup maintenance parts during transportation and before installation, the both ends of the laser diode are short-circuited. After replacing the parts with new ones, remove the short circuit according to the correct procedure. (See this Technical Guide).
2. Do not use a tester to check the laser diode for the optical pickup. Failure to do so will damage the laser diode due to the power supply in the tester.

4.2. Handling precautions for Traverse Unit (Optical Pickup)

1. Do not give a considerable shock to the traverse unit (optical pickup) as it has an extremely high-precision structure.
2. When replacing the optical pickup, install the flexible cable and cut its short lead with a nipper. See the optical pickup replacement procedure in this Technical Guide. Before replacing the traverse unit, remove the short pin for preventing static electricity and install a new unit. Connect the connector as short times as possible.
3. The flexible cable may be cut off if an excessive force is applied to it. Use caution when handling the cable.
4. The half-fixed resistor for laser power adjustment cannot be adjusted. Do not turn the resistor.

5. Assembling and disassembling the mechanism unit

5.1 Optical pickup Unit Exploded View and Part List



Pic (1)

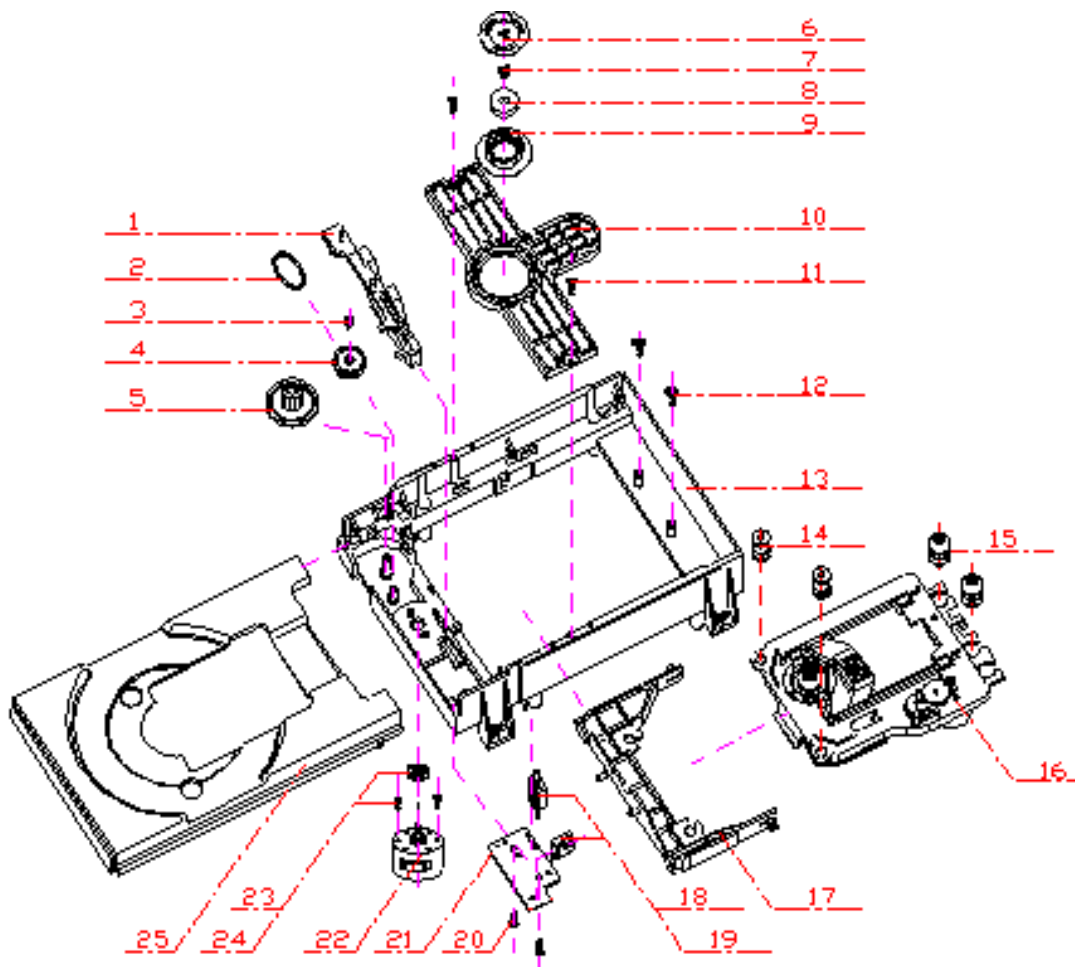
Materials to Pic (1)

No.	PARTS CODE	PARTS NAME	Q' ty
①	14692200	SF-HD62	1
1	1EA0311A06300	ASSY, CHASSIS, COMPLETE	1
2	1EA0M10A15500	ASSY, MOTOR, SLED	1
Or	1EA0M10A15501	ASSY, MOTOR, SLED	1
3	1EA2451A24700	HOLDER, SHAFT	3
4	1EA2511A29100	GEAR, RACK	1
5	1EA2511A29200	GEAR, DRIVE	1
6	1EA2511A29300	GEAR, MIDDLE, A	1
7	1EA2511A29400	GEAR, MIDDLE, B	1
8	1EA2744A03000	SHAFT, SLIDE	1
9	1EA2744A03100	SHAFT, SLIDE, SUB	1
10	1EA2812A15300	SPRING, COMP, TYOUSEI	3
11	1EA2812A15400	SPRING, COMP, RACK	1
21	1EA0B10B20100	ASSY, PWB	1
Or	1EA0B10B20200	ASSY, PWB	1
31	SEXEA25700---	SPECIAL SCREW BIN+-M2X11	3
32	SEXEA25900---	SPECIAL SCREW M1.7X2.2	2
33	SFBPN204R0SE-	SCR S-TPG PAN 2X4	2
34	SFSFN266R0SE-	SCR S-TPG FLT 2.6X6	1
35	SWXEA15400---	SPECIAL WASHER 1.8X4 X0.25	2

□ □

Note : This parts list is not for service parts supply.

5.2 Bracket Exploded View and Part List



Pic (2)

Materials to Pic(2)

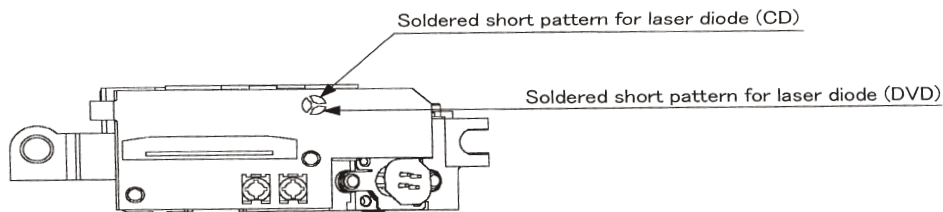
- | | |
|-----------------------------------|--------------------------|
| 1.bracket | 14. front silicon rubber |
| 2.belt | 15. Back silicon rubber |
| 3.screw | 16. Pick-up |
| 4.belt wheel | 17. Pick-up |
| 5.gearwheel | 18. switch |
| 6.iron chip | 19. Five-pin flat plug |
| 7. Immobility mechanism equipment | 20. screw |
| 8. Magnet | 21. PCB |
| 9. Platen | 22. motor |
| 10. Bridge bracket | 23. Motor wheel |
| 11. screw | 24. screw |
| 12. screw | 25.tray |
| 13. Big bracket | |

Before going process with disassembly and installation, please carefully both peruse the chart and confirm the materials.

5.3 MISCELLANEOUS

5.3.1 Protection of the LD(Laser diode)

Short the parts of LD circuit pattern by soldering.



5.3.2 Cautions on assembly and adjustment

Make sure that the workbenches, jigs, tips, tips of soldering irons and measuring instruments are grounded, and that personnel wear wrist straps for ground.

Open the LD short lands quickly with a soldering iron after a circuit is connected.

Keep the power source of the pick-up protected from internal and external sources of electrical noise.

Refrain from operation and storage in atmospheres containing corrosive gases (such as H_2S , SO_2 , NO_2 and Cl_2) or toxic gases or in locations containing substances (especially from the organic silicon, cyan, formalin and phenol groups) which emit toxic gases. It is particularly important to ensure that none of the above substances are present inside the unit. Otherwise, the motor may no longer run.

6.Electrical Confirmation

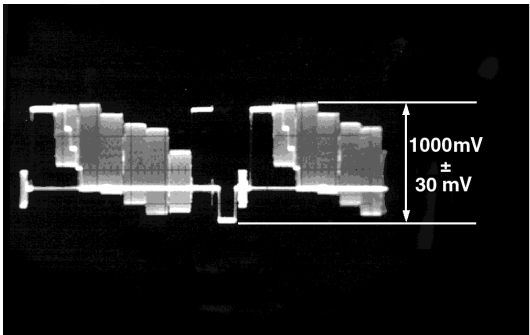
6.1. Video Output (Luminance Signal) Confirmation

DO this confirmation after replacing a P.C.B.

Measurement point	Mode	Disc
Video output terminal	Color bar 75% PLAY(Title 46):DVDT-S15 PLAY(Title 12):DVDT-S01	DVDT-S15 or DVDT-S01
Measuring equipment,tools	Confirmation value	
200mV/dir,10 μ sec/dir	1000mVp-p±30mV	

Purpose:To maintain video signal output compatibility.

- 1.Connect the oscilloscope to the video output terminal and terminate at 75 ohms.
- 2.Confirm that luminance signal(Y+S)level is 1000mVp-p±30mV



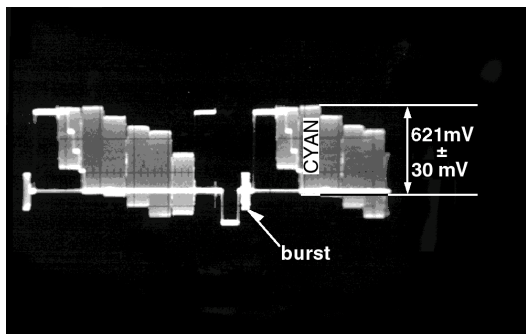
6.2 Video Output(Chrominance Signal) Confirmation

Do the confirmation after replacing P.C.B.

Measurement point	Mode	Disc
Video output terminal	Color bar 75% PLAY(Title 46):DVDT-S15 PLAY(Title 12):DVDT-S01	DVDT-S15 or DVDT-S01
Measuring equipment,tools	Confirmation value	
Screwdriver,Oscilloscope 200mV/dir,10 μ sec/dir	621mVp-p $\pm$ 30mV	

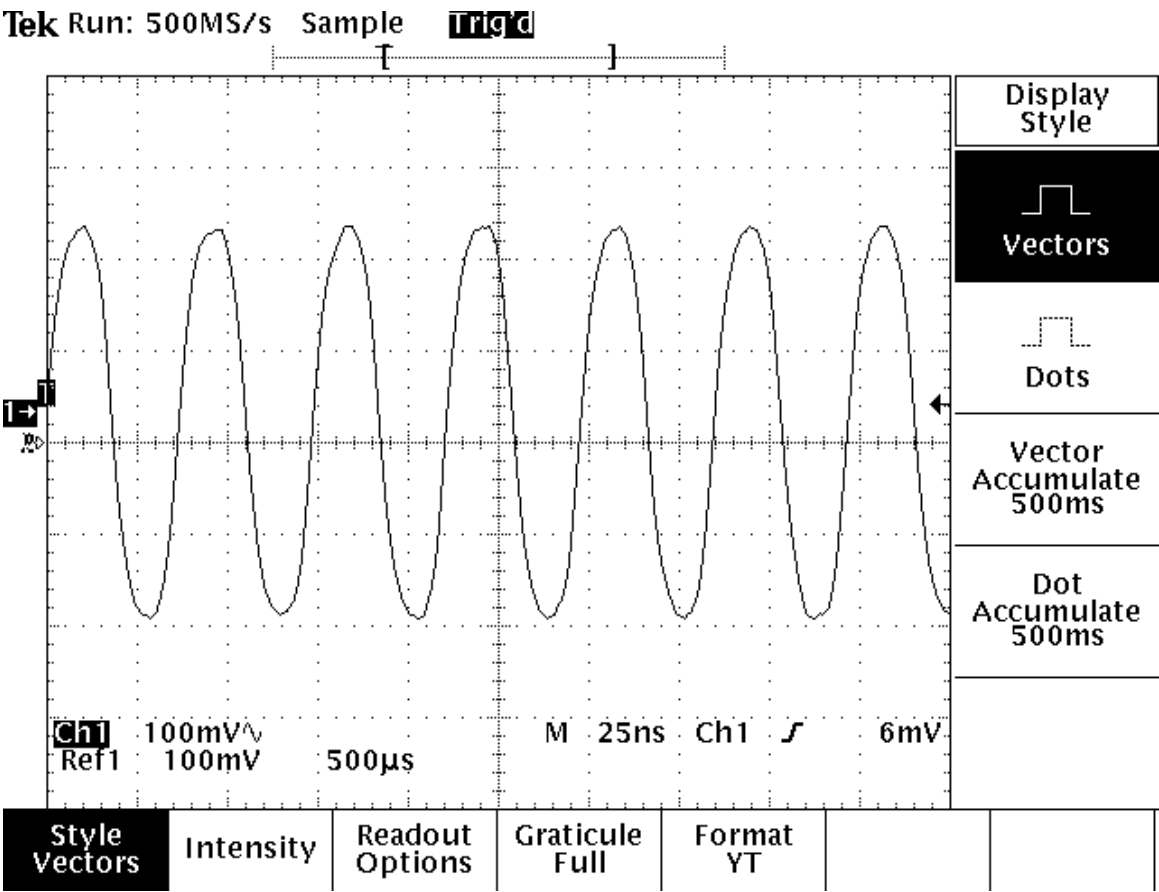
Purpose:To maintain video signal output compatibility.

- 1.Connect the oscilloscope to the video output terminal and terminate at 75 ohme.
- 2.Confirm that the chrominance signal(C)level is 621 mVp-p $\pm$ 30mV

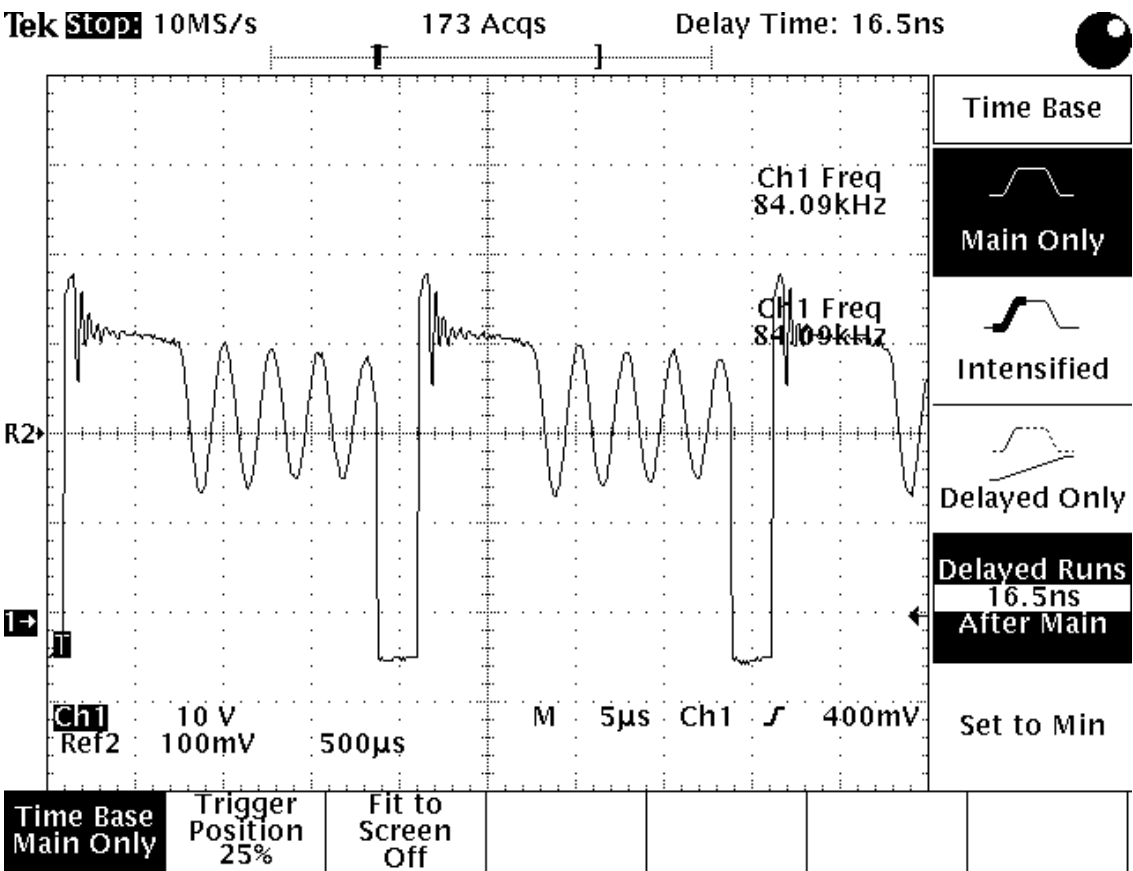


7.MPEG BOARD CHECK WAVEFORM

7.1 27MHz WAVEFORM



7.2 VIPER22A WAVEFORM DIAGRAM



8. 29LV160BE-70PFTN

16 Megabit (2 M x 8-Bit/1 M x 16-Bit) CMOS 3.0 Volt-only Boot Sector Flash Memory

DISTINCTIVE CHARACTERISTICS

■ Single power supply operation

- Full voltage range: 2.7 to 3.6 volt read and write operations for battery-powered applications
- Regulated voltage range: 3.0 to 3.6 volt read and write operations and for compatibility with high performance 3.3 volt microprocessors

■ Manufactured on 0.23 μ m process technology

- Fully compatible with 0.32 μ m Am29LV160B device

■ High performance

- Access times as fast as 70 ns

■ Ultra low power consumption (typical values at 5 MHz)

- 200 nA Automatic Sleep mode current
- 200 nA standby mode current
- 9 mA read current
- 20 mA program/erase current

■ Flexible sector architecture

- One 16 Kbyte, two 8 Kbyte, one 32 Kbyte, and thirty-one 64 Kbyte sectors (byte mode)
- One 8 Kword, two 4 Kword, one 16 Kword, and thirty-one 32 Kword sectors (word mode)
- Supports full chip erase
- Sector Protection features:
 - A hardware method of locking a sector to prevent any program or erase operations within that sector
 - Sectors can be locked in-system or via programming equipment
 - Temporary Sector Unprotect feature allows code changes in previously locked sectors

■ Unlock Bypass Program Command

- Reduces overall programming time when issuing multiple program command sequences

■ Top or bottom boot block configurations available

■ Embedded Algorithms

- Embedded Erase algorithm automatically preprograms and erases the entire chip or any combination of designated sectors
- Embedded Program algorithm automatically writes and verifies data at specified addresses

■ Minimum 1,000,000 write cycle guarantee per sector

■ 20-year data retention at 125°C

- Reliable operation for the life of the system

■ Package option

- 48-ball FBGA
- 48-pin TSOP
- 44-pin SO

■ CFI (Common Flash Interface) compliant

- Provides device-specific information to the system, allowing host software to easily reconfigure for different Flash devices

■ Compatibility with JEDEC standards

- Pinout and software compatible with single-power supply Flash
- Superior inadvertent write protection

■ Data# Polling and toggle bits

- Provides a software method of detecting program or erase operation completion

■ Ready/Busy# pin (RY/BY#)

- Provides a hardware method of detecting program or erase cycle completion (not available on 44-pin SO)

■ Erase Suspend/Erase Resume

- Suspends an erase operation to read data from, or program data to, a sector that is not being erased, then resumes the erase operation

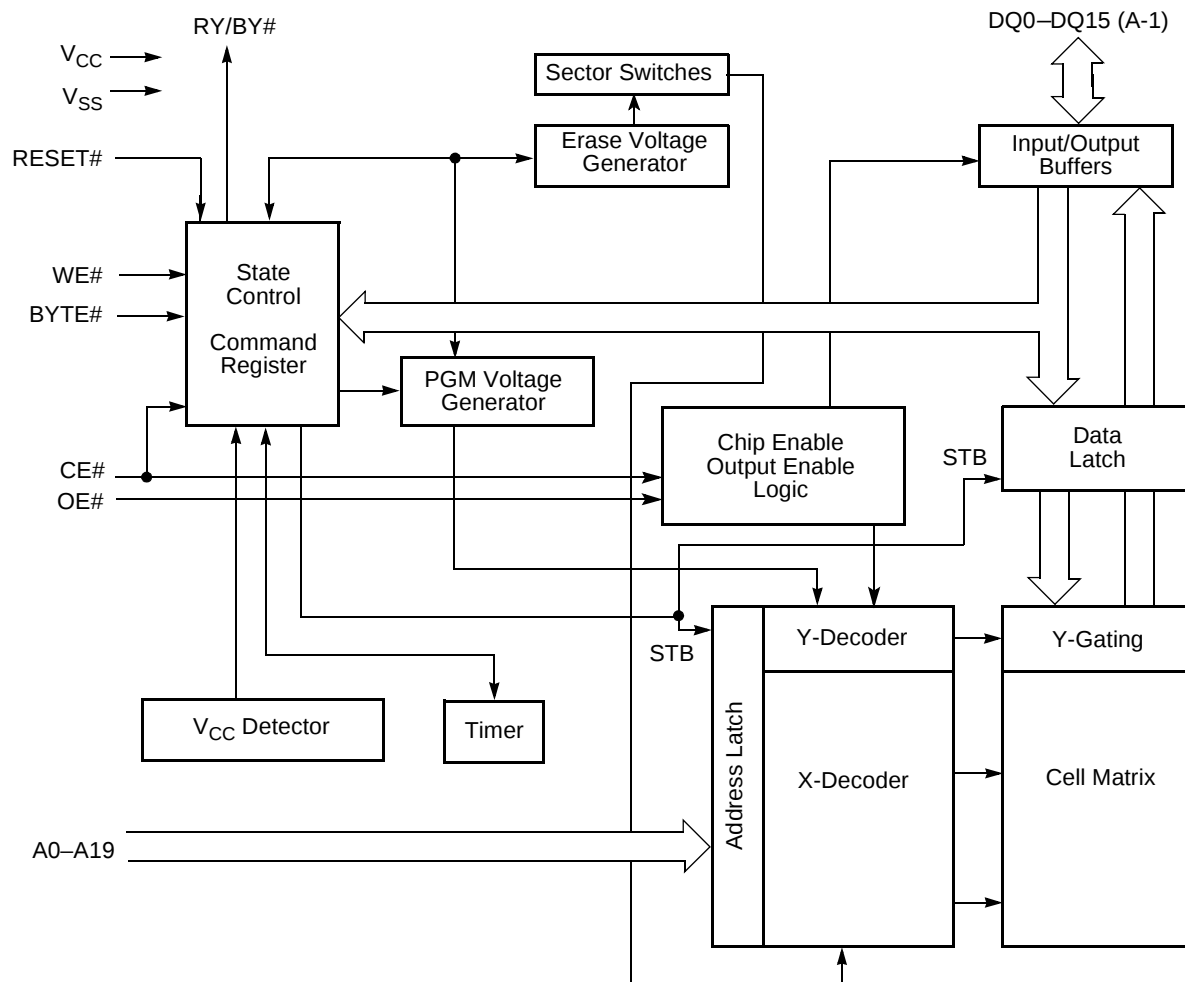
■ Hardware reset pin (RESET#)

- Hardware method to reset the device to reading array data

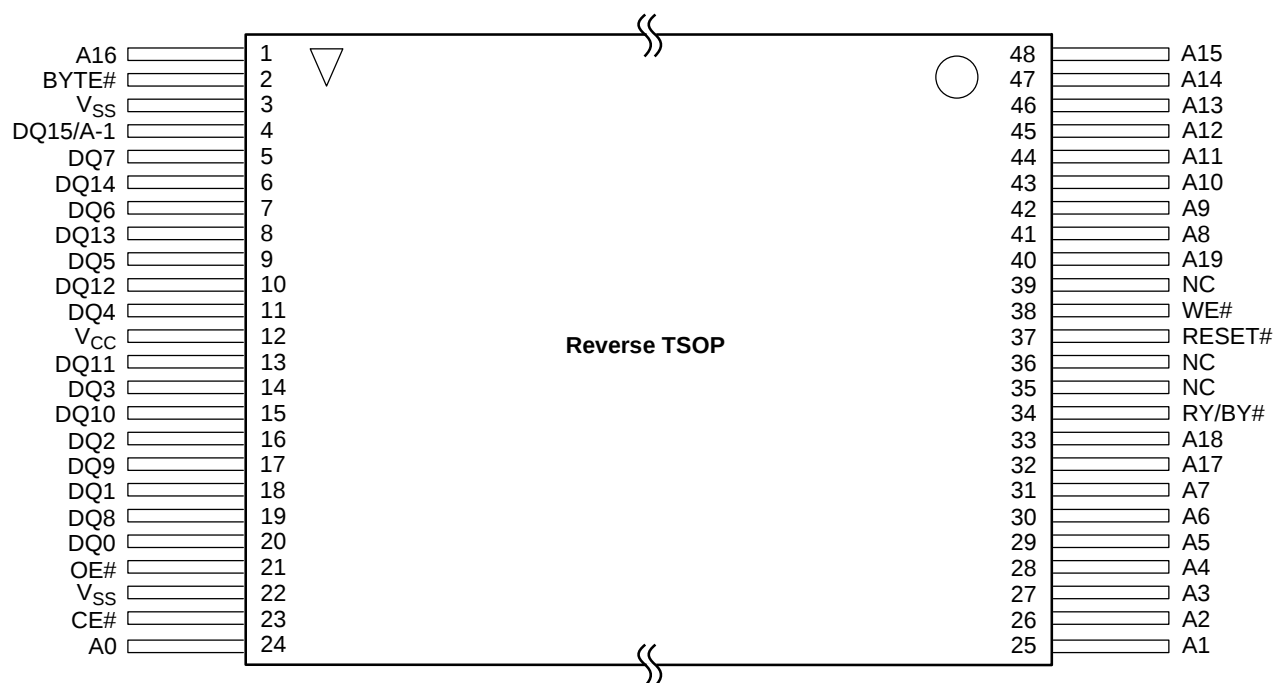
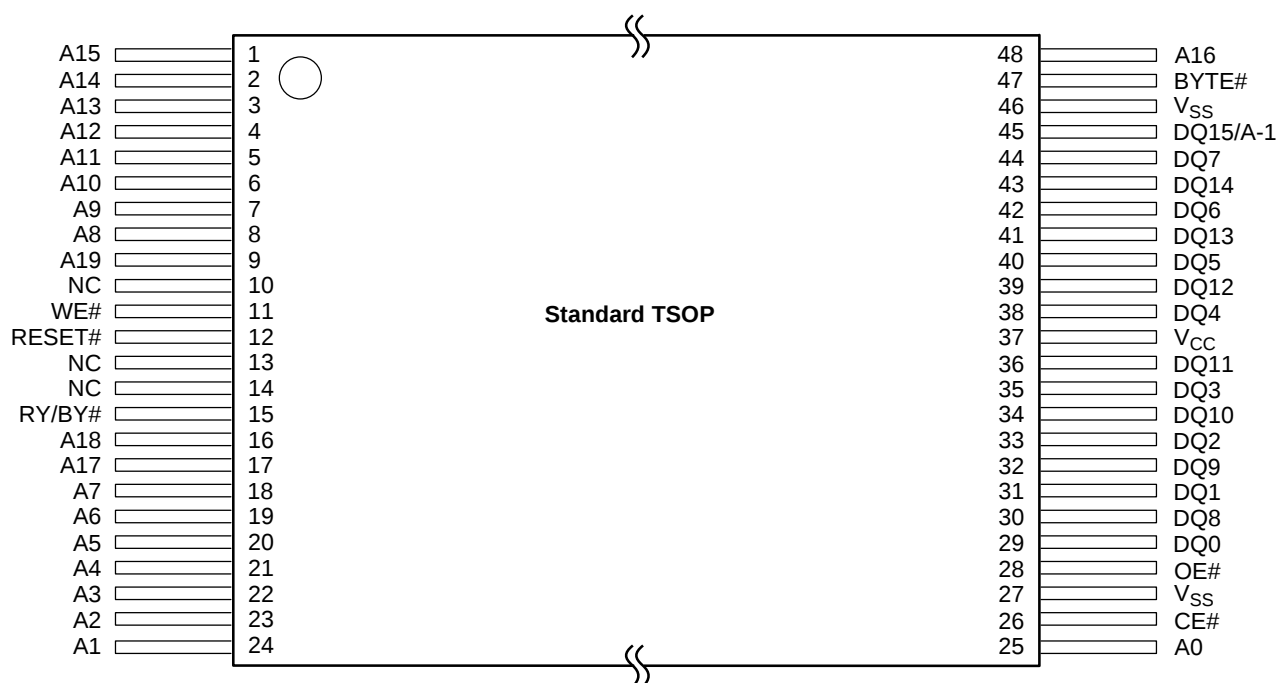
PRODUCT SELECTOR GUIDE

Family Part Number		Am29LV160D		
Speed Option	Voltage Range: $V_{CC} = 2.7\text{--}3.6\text{ V}$	-70	-90	-120
Max access time, ns (t_{ACC})		70	90	120
Max CE# access time, ns (t_{CE})		70	90	120
Max OE# access time, ns (t_{OE})		30	35	50

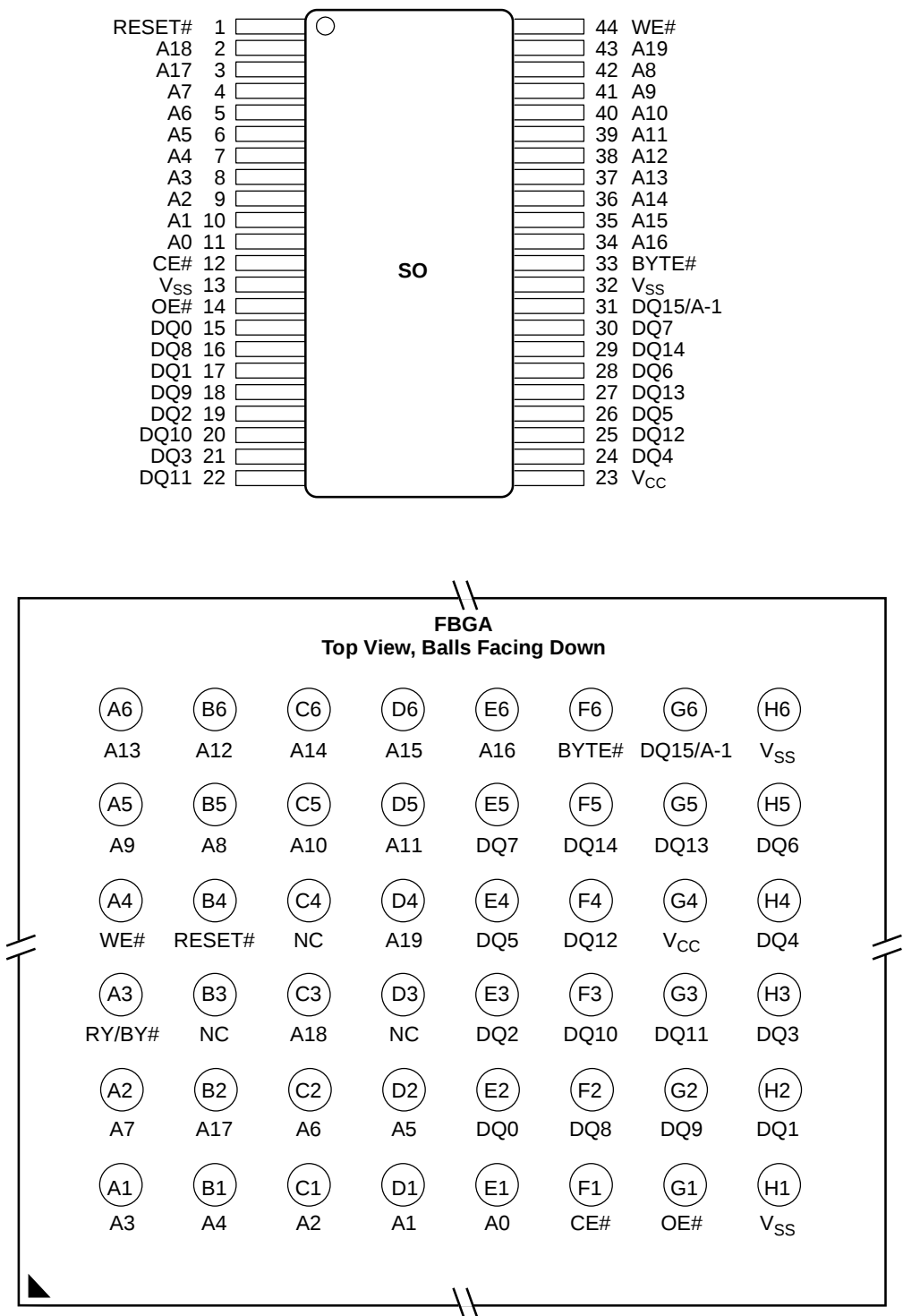
Note: See “AC Characteristics” for full specifications.

BLOCK DIAGRAM


CONNECTION DIAGRAMS



CONNECTION DIAGRAMS



Special Handling Instructions

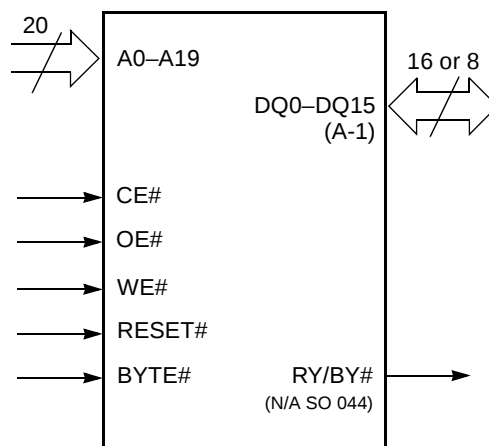
Special handling is required for Flash Memory products in FBGA packages.

Flash memory devices in FBGA packages may be damaged if exposed to ultrasonic cleaning methods. The package and/or data integrity may be compromised if the package body is exposed to temperatures above 150°C for prolonged periods of time.

PIN CONFIGURATION

A0–A19	=	20 addresses
DQ0–DQ14	=	15 data inputs/outputs
DQ15/A-1	=	DQ15 (data input/output, word mode), A-1 (LSB address input, byte mode)
BYTE#	=	Selects 8-bit or 16-bit mode
CE#	=	Chip enable
OE#	=	Output enable
WE#	=	Write enable
RESET#	=	Hardware reset pin
RY/BY#	=	Ready/Busy output (N/A SO 044)
V _{CC}	=	3.0 volt-only single power supply (see Product Selector Guide for speed options and voltage supply tolerances)
V _{SS}	=	Device ground
NC	=	Pin not connected internally

LOGIC SYMBOL



8.1 HY57V641620HG

DESCRIPTION

The Hyundai HY57V641620HG is a 67,108,864-bit CMOS Synchronous DRAM, ideally suited for the main memory applications which require large memory density and high bandwidth. HY57V641620HG is organized as 4banks of 1,048,576x16.

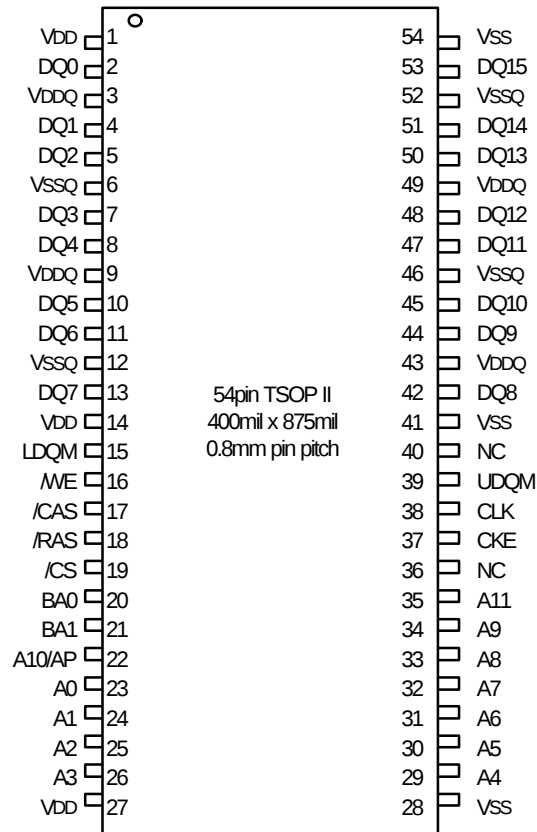
HY57V641620HG is offering fully synchronous operation referenced to a positive edge of the clock. All inputs and outputs are synchronized with the rising edge of the clock input. The data paths are internally pipelined to achieve very high bandwidth. All input and output voltage levels are compatible with LVTTL.

Programmable options include the length of pipeline (Read latency of 2 or 3), the number of consecutive read or write cycles initiated by a single control command (Burst length of 1,2,4,8 or Full page), and the burst count sequence(sequential or interleave). A burst of read or write cycles in progress can be terminated by a burst terminate command or can be interrupted and replaced by a new burst read or write command on any cycle. (This pipelined design is not restricted by a `2N` rule.)

FEATURES

- Single 3.3±0.3V power supply ^{Note)}
- All device pins are compatible with LVTTL interface
- JEDEC standard 400mil 54pin TSOP-II with 0.8mm of pin pitch
- All inputs and outputs referenced to positive edge of system clock
- Data mask function by UDQM or LDQM
- Internal four banks operation
- Auto refresh and self refresh
- 4096 refresh cycles / 64ms
- Programmable Burst Length and Burst Type
 - 1, 2, 4, 8 or Full page for Sequential Burst
 - 1, 2, 4 or 8 for Interleave Burst
- Programmable $\overline{\text{CAS}}$ Latency ; 2, 3 Clocks

PIN CONFIGURATION



PIN DESCRIPTION

PIN	PIN NAME	DESCRIPTION
CLK	Clock	The system clock input. All other inputs are registered to the SDRAM on the rising edge of CLK
CKE	Clock Enable	Controls internal clock signal and when deactivated, the SDRAM will be one of the states among power down, suspend or self refresh
$\overline{CS}$	Chip Select	Enables or disables all inputs except CLK, CKE and DQM
BA0,BA1	Bank Address	Selects bank to be activated during $\overline{RAS}$ activity Selects bank to be read/written during CAS activity
A0 ~ A11	Address	Row Address : RA0 ~ RA11, Column Address : CA0 ~ CA7 Auto-precharge flag : A10
$\overline{RAS}$, $\overline{CAS}$, $\overline{WE}$	Row Address Strobe, Column Address Strobe, Write Enable	$\overline{RAS}$, $\overline{CAS}$ and $\overline{WE}$ define the operation Refer function truth table for details
LDQM, UDQM	Data Input/Output Mask	Controls output buffers in read mode and masks input data in write mode
DQ0 ~ DQ15	Data Input/Output	Multiplexed data input / output pin
VDD/VSS	Power Supply/Ground	Power supply for internal circuits and input buffers
VDDQ/VSSQ	Data Output Power/Ground	Power supply for output buffers
NC	No Connection	No connection

1Mbit x 4banks x 16 I/O Synchronous DRAM



8.2 MT1389

MT1389

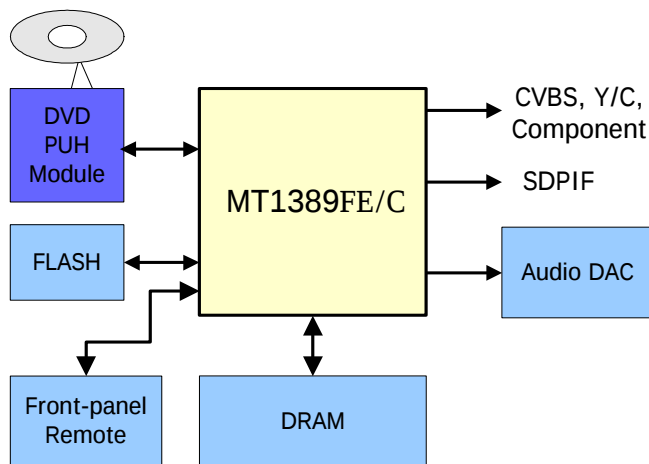
Progressive-Scan DVD Player SOC

Specifications are subject to change without notice

MediaTek MT1389 is a DVD player system-on-chip (SOC) which incorporates advanced features like high quality TV encoder and state-of-art de-interlace processing. The MT1389 enables consumer electronics manufacturers to build high quality, cost-effective DVD players, portable DVD players or any other home entertainment audio/video devices.

Based on MediaTek's world-leading DVD player SOC architecture, the MT1389 is the 3rd generation of the DVD player SOC. It integrates the MediaTek 2nd generation front-end analog RF amplifier and the Servo/MPEG AV decoder.

The progressive scan of the MT1389 utilized a proprietary advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback. It can easily detect 3:2/2:2 pull down source and restore the correct original pictures. It also supports a patent-pending edge-preserving algorithm to remove the saw-tooth effect.



DVD Player System Diagram Using MT1389

Key Features

- RF/Servo/MPEG Integration
- High Performance Audio Processor
- Motion-Adaptive, Edge-Preserving De-interlace
- 108MHz/12-bit, 6 CH TV Encoder

Applications

- Standard DVD Players
- Portable DVD Players

General Feature List

- Super Integration DVD player single chip
 - High performance analog RF amplifier
 - Servo controller and data channel processing
 - MPEG-1/MPEG-2/JPEG video
 - Dolby AC-3/DTS/DVD-Audio
 - Unified memory architecture
 - Versatile video scaling & quality enhancement
 - OSD & Sub-picture
 - 2-D graphic engine
 - Built-in clock generator
 - Built-in high quality TV encoder
 - Built-in progressive video processor
 - Audio effect post-processor
 - Audio input port
- High Performance Analog RF Amplifier
 - Programmable fc
 - Dual automatic laser power control
 - Defect and blank detection
 - RF level signal generator
- Speed Performance on Servo/Channel Decoding
 - DVD-ROM up to 4XS
 - CD-ROM up to 24XS
- Channel Data Processor
 - Digital data slicer for small jitter capability
 - Built-in high performance data PLL for channel data demodulation
 - EFM/EFM+ data demodulation
 - Enhanced channel data frame sync protection & DVD-ROM sector sync protection
- Servo Control and Spindle Motor Control
 - Programmable frequency error gain and phase error gain of spindle PLL to control spindle motor on CLV and CAV mode
 - Built-in ADCs and DACs for digital servo control
 - Provide 2 general PWM
 - Tray control can be PWM output or digital output
- Embedded Micro controller
 - Built-in 8032 micro controller
 - Built-in internal 373 and 8-bit programmable lower address port
- 1024-bytes on-chip RAM
- Up to 4M bytes FLASH-programming interface
- Supports 5/3.3-Volt. FLASH interface
- Supports power-down mode
- Supports additional serial port
- DVD-ROM/CD-ROM Decoding Logic
 - High-speed ECC logic capable of correcting one error per each P-codeword or Q-codeword
 - Automatic sector Mode and Form detection
 - Automatic sector Header verification
 - Decoder Error Notification Interrupt that signals various decoder errors
 - Provide error correction acceleration
- Buffer Memory Controller
 - Supports 16Mb/32Mb/64Mb/128Mb SDRAM
 - Supports 16-bit SDRAM data bus
 - Provide the self-refresh mode SDRAM
 - Block-based sector addressing
 - Support 3.3 Volt. DRAM Interface
- Video Decode
 - Decodes MPEG1 video and MPEG2 main level, main profile video (720/480 and 720x576)
 - Smooth digest view function with I, P and B picture decoding
 - Baseline, extended-sequential and progressive JPEG image decoding
 - Support CD-G titles
- Video/OSD/SPU/HLI Processor
 - Arbitrary ratio vertical/horizontal scaling of video, from 0.25X to 256X
 - 65535/256/16/4/2-color bitmap format OSD,
 - 256/16 color RLC format OSD
 - Automatic scrolling of OSD image
 - Slide show transition as DVD-Audio Specification
- 2-D Graphic Engine
 - Support decode Text and Bitmap
 - Support line, rectangle and gradient fill
 - Support bitblt
 - Chroma key copy operation
 - Clip mask

- Audio Effect Processing
 - Dolby Digital (AC-3)/EX decoding
 - DTS/DTS-ES decoding
 - MLP decoding for DVD-Audio
 - MPEG-1 layer 1/layer 2 audio decoding
 - MPEG-2 layer1/layer2 2-channel audio
 - High Definition Compatible Digital (HDCD)
 - Windows Media Audio (WMA)
 - Advanced Audio Coding (AAC)
 - Dolby ProLogic II
 - Concurrent multi-channel and downmix out
 - IEC 60958/61937 output
 - PCM / bit stream / mute mode
 - Custom IEC latency up to 2 frames
 - Pink noise and white noise generator
 - Karaoke functions
 - Microphone echo
 - Microphone tone control
 - Vocal mute/vocal assistant
 - Key shift up to +/- 8 keys
 - Chorus/Flanger/Harmony/Reverb
 - Channel equalizer
 - 3D surround processing include virtual surround and speaker separation
- TV Encoder
 - Six 108MHz/12bit DACs
 - Support NTSC, PAL-BDGHINM, PAL-60
 - Support 525p, 625p progressive TV format
 - Automatically turn off unconnected channels
 - Support PC monitor (VGA)
 - Support Macrovision 7.1 L1, Macrovision 525P and 625P
 - CGMS-A/WSS
 - Closed Caption
- Progressive Output
 - Automatic detect film or video source
 - 3:2 pull down source detection
 - Advanced Motion adaptive de-interlace
 - Edge Preserving
 - Minimum external memory requirement
- Audio Input
 - Line-in/SPDIF-in for versatile audio processing
- Outline
 - 256-pin LQFP package
 - 3.3/1.8-Volt. Dual operating voltages

**CMOS Analog Multiplexers/Demultiplexers
with Logic Level Conversion**

The CD4051B, CD4052B, and CD4053B analog multiplexers are digitally-controlled analog switches having low ON impedance and very low OFF leakage current. Control of analog signals up to $20V_{P-P}$ can be achieved by digital signal amplitudes of 4.5V to 20V (if $V_{DD}-V_{SS} = 3V$, a $V_{DD}-V_{EE}$ of up to 13V can be controlled; for $V_{DD}-V_{EE}$ level differences above 13V, a $V_{DD}-V_{SS}$ of at least 4.5V is required). For example, if $V_{DD} = +4.5V$, $V_{SS} = 0V$, and $V_{EE} = -13.5V$, analog signals from -13.5V to +4.5V can be controlled by digital inputs of 0V to 5V. These multiplexer circuits dissipate extremely low quiescent power over the full $V_{DD}-V_{SS}$ and $V_{DD}-V_{EE}$ supply-voltage ranges, independent of the logic state of the control signals. When a logic "1" is present at the inhibit input terminal, all channels are off.

The CD4051B is a single 8-Channel multiplexer having three binary control inputs, A, B, and C, and an inhibit input. The three binary signals select 1 of 8 channels to be turned on, and connect one of the 8 inputs to the output.

The CD4052B is a differential 4-Channel multiplexer having two binary control inputs, A and B, and an inhibit input. The two binary input signals select 1 of 4 pairs of channels to be turned on and connect the analog inputs to the outputs.

The CD4053B is a triple 2-Channel multiplexer having three separate digital control inputs, A, B, and C, and an inhibit input. Each control input selects one of a pair of channels which are connected in a single-pole, double-throw configuration.

When these devices are used as demultiplexers, the "CHANNEL IN/OUT" terminals are the outputs and the "COMMON OUT/IN" terminals are the inputs.

Features

- Wide Range of Digital and Analog Signal Levels
 - Digital 3V to 20V
 - Analog $\leq 20V_{P-P}$
- Low ON Resistance, 125 Ω (Typ) Over 15V_{P-P} Signal Input Range for $V_{DD}-V_{EE} = 18V$
- High OFF Resistance, Channel Leakage of $\pm 100pA$ (Typ) at $V_{DD}-V_{EE} = 18V$
- Logic-Level Conversion for Digital Addressing Signals of 3V to 20V ($V_{DD}-V_{SS} = 3V$ to 20V) to Switch Analog Signals to 20V_{P-P} ($V_{DD}-V_{EE} = 20V$)
- Matched Switch Characteristics, $r_{ON} = 5\Omega$ (Typ) for $V_{DD}-V_{EE} = 15V$
- Very Low Quiescent Power Dissipation Under All Digital-Control Input and Supply Conditions, 0.2 μW (Typ) at $V_{DD}-V_{SS} = V_{DD}-V_{EE} = 10V$
- Binary Address Decoding on Chip
- 5V, 10V and 15V Parametric Ratings
- 10% Tested for Quiescent Current at 20V
- Maximum Input Current of 1 μA at 18V Over Full Package Temperature Range, 100nA at 18V and 25°C
- Break-Before-Make Switching Eliminates Channel Overlap

Applications

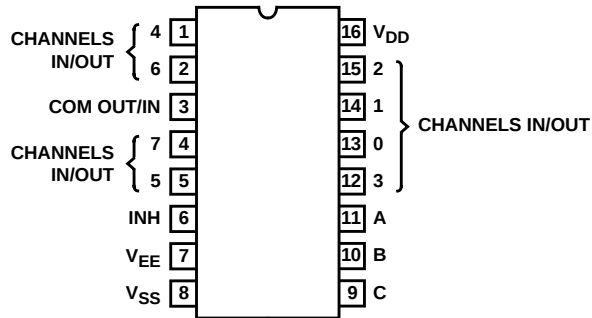
- Analog and Digital Multiplexing and Demultiplexing
- A/D and D/A Conversion
- Signal Gating

Ordering Information

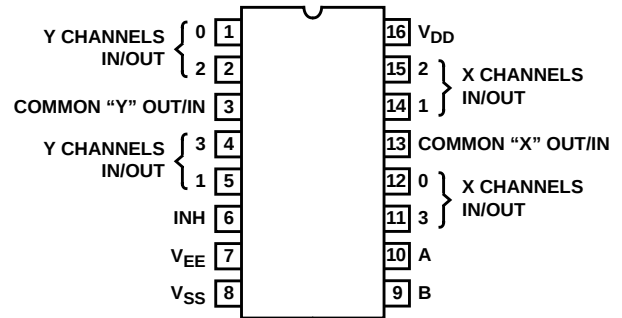
PART NUMBER	TEMP. RANGE (°C)	PACKAGE
CD4051BF, CD4052BF, CD4053BF	-55 to 125	16 Ld CERAMIC DIP
CD4051BE, CD4052BE, CD4053BE	-55 to 125	16 Ld PDIP
CD4051BM, CD4051BNS	-55 to 125	16 Ld SOIC
CD4051BPW, CD4052BPW, CD4053BPW	-55 to 125	16 Ld TSSOP

Pinouts

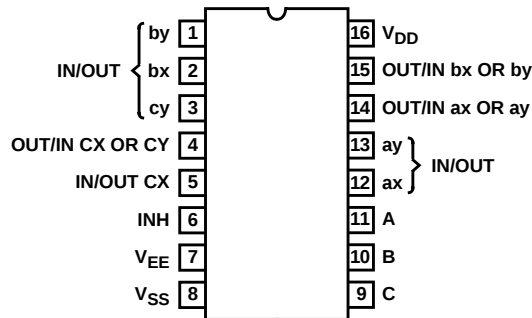
CD4051B (PDIP, CDIP, SOIC, TSSOP)
TOP VIEW



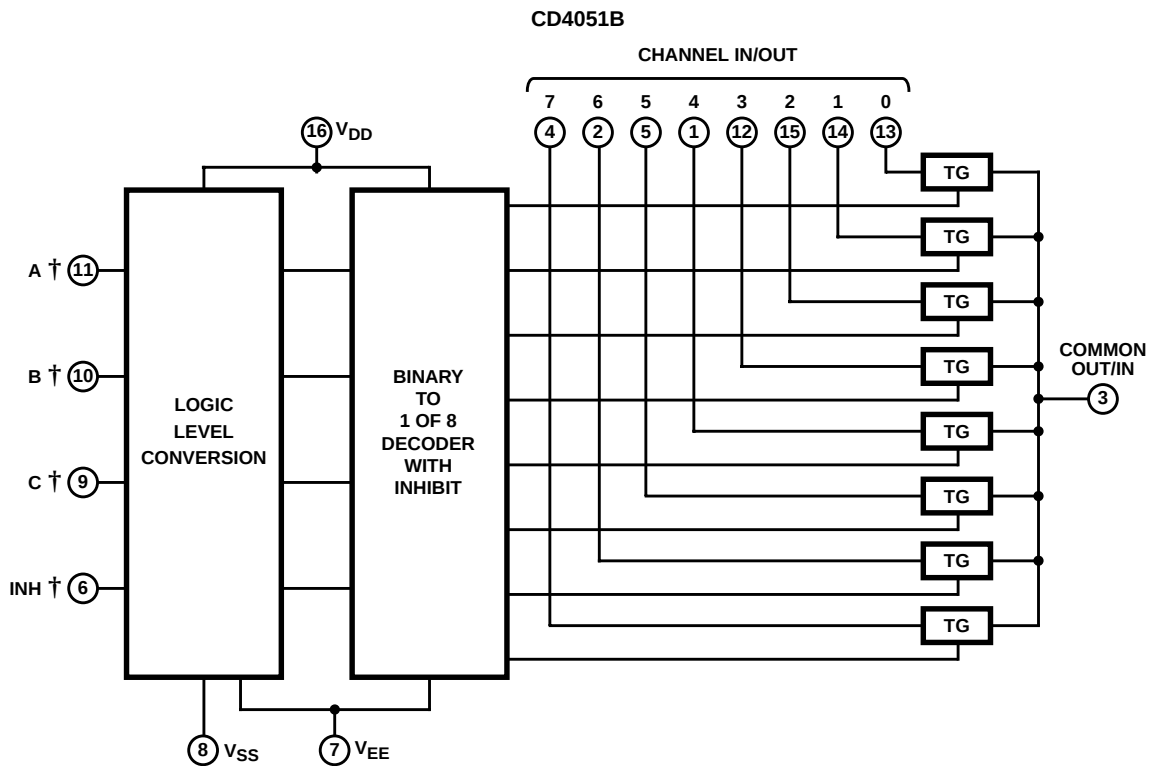
CD4052B (PDIP, CDIP, TSSOP)
TOP VIEW



CD4053B (PDIP, CDIP, TSSOP)
TOP VIEW



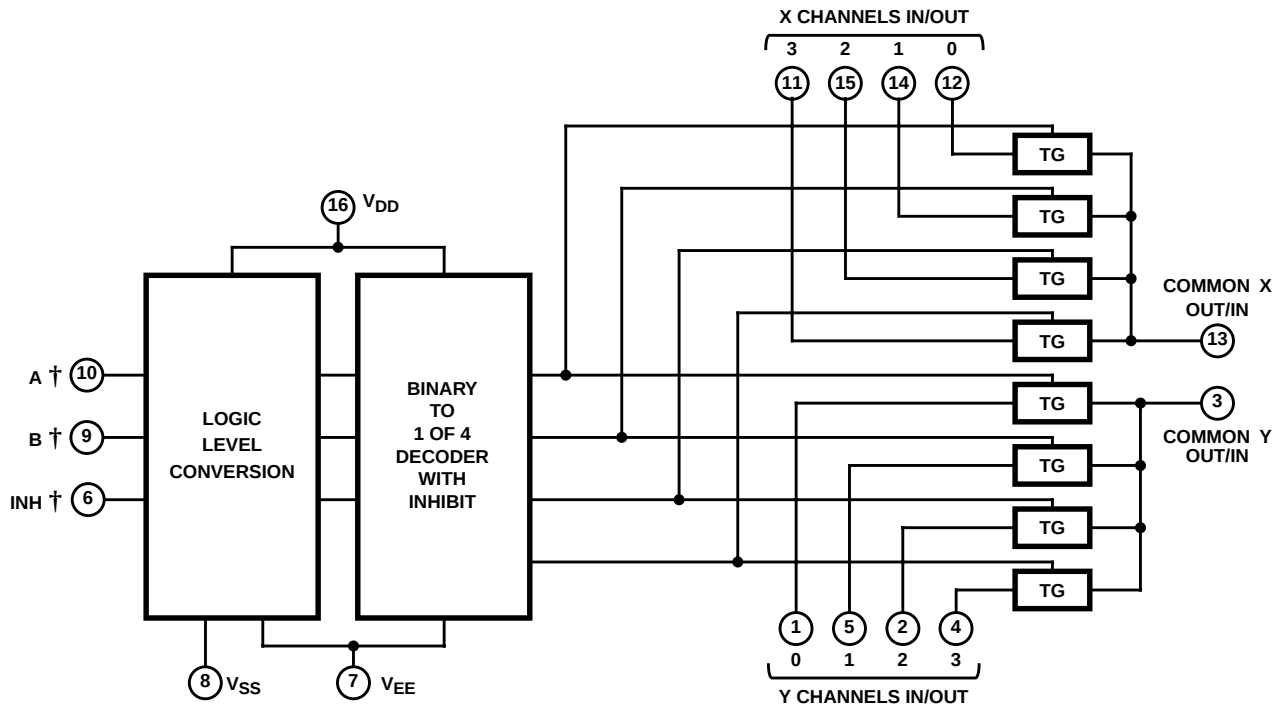
Functional Block Diagrams



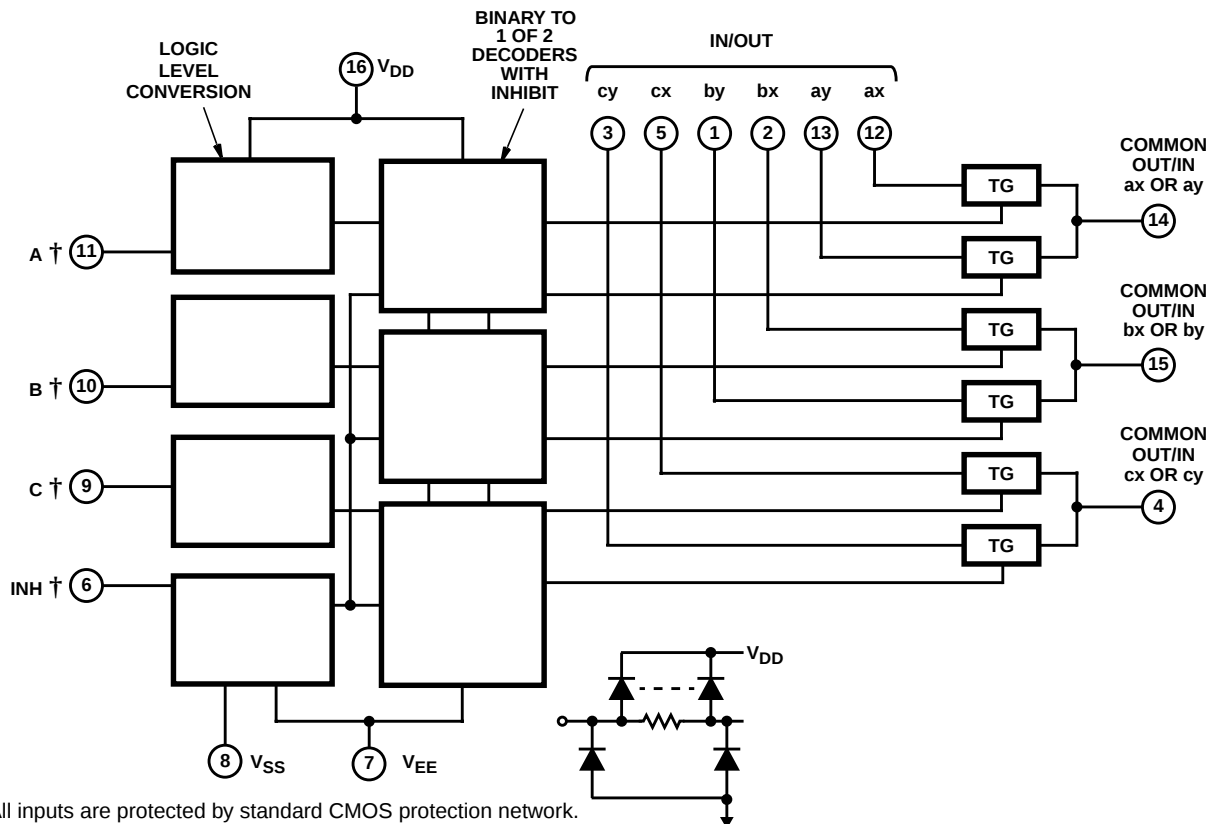
† All inputs are protected by standard CMOS protection network.

Functional Block Diagrams (Continued)

CD4052B



CD4053B

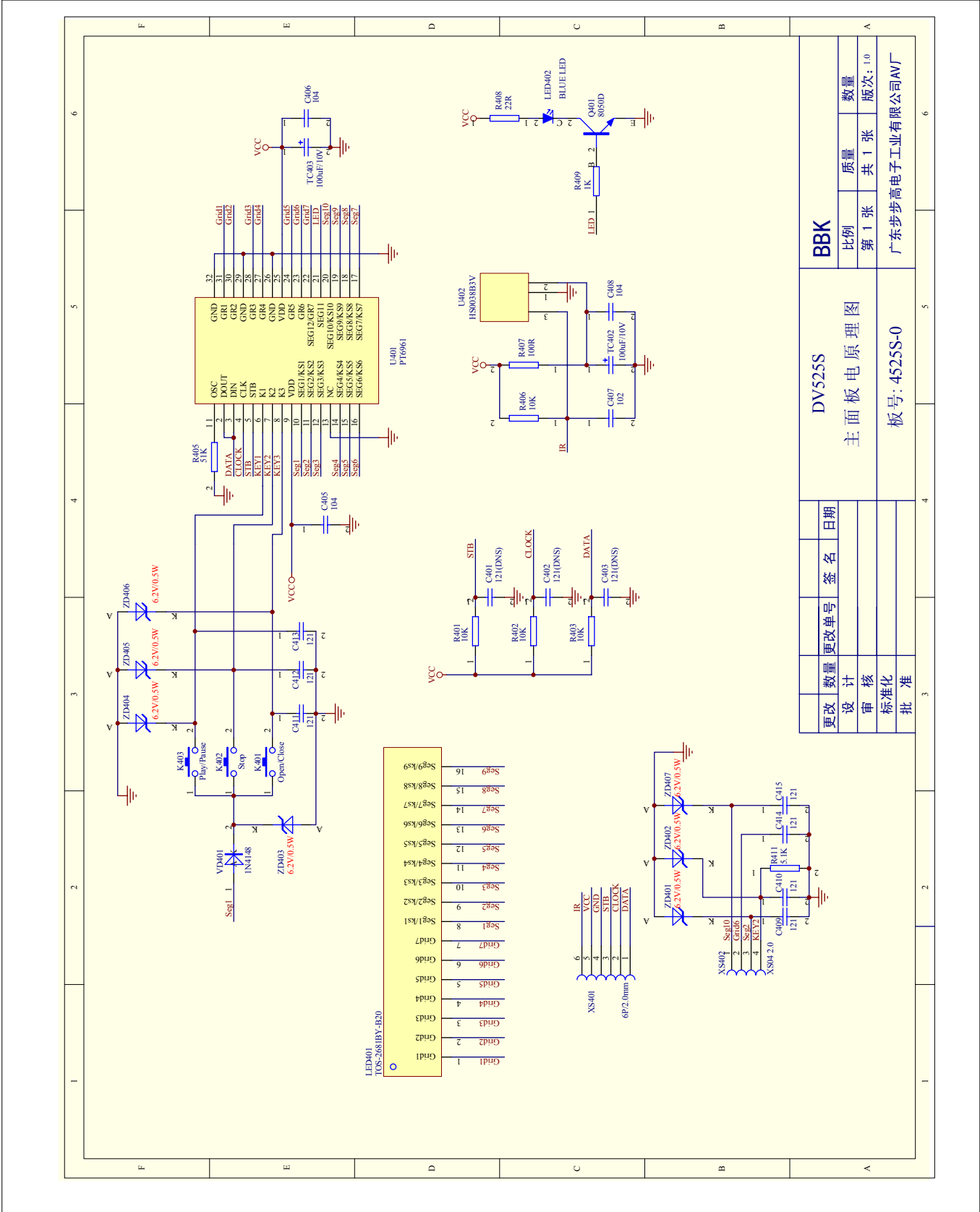
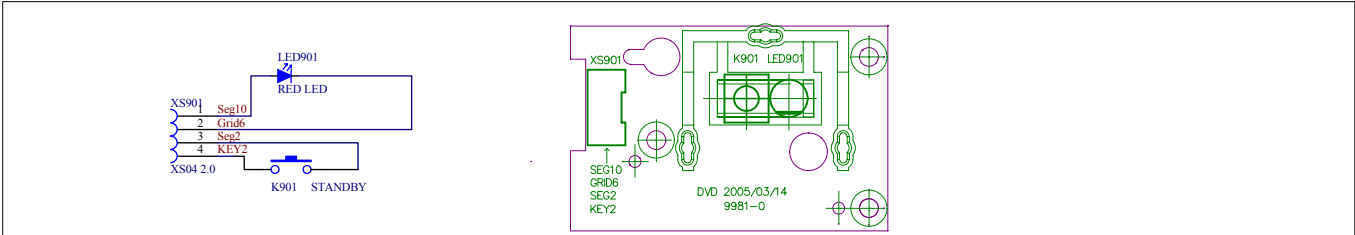


TRUTH TABLES

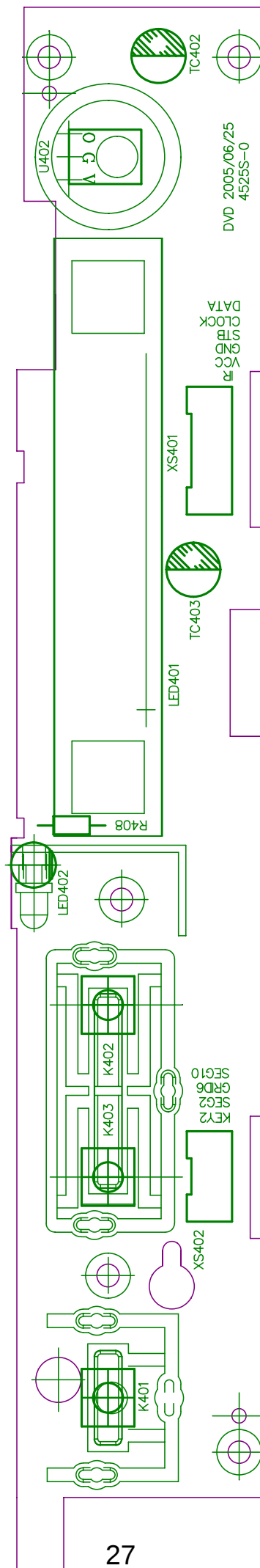
INPUT STATES				“ON” CHANNEL(S)
INHIBIT	C	B	A	
CD4051B				
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	None
CD4052B				
INHIBIT	B		A	
0	0		0	0x, 0y
0	0		1	1x, 1y
0	1		0	2x, 2y
0	1		1	3x, 3y
1	X		X	None
CD4053B				
INHIBIT	A OR B OR C			
0	0			ax or bx or cx
0	1			ay or by or cy
1	X			None

X = Don't Care

9. SCHEMATIC & PCB WIRING DIAGRAM
FRONT SCHEMATIC DIAGRAM



FRONT SCHEMATIC DIAGRAM



The diagram illustrates the internal circuitry of a switching power supply, model DV977K. It includes a detailed schematic of the power conversion stages, from the AC input through a transformer, a full-bridge rectifier, a power MOSFET switching stage, and a full-bridge output rectifier. Key components include electrolytic capacitors for input and output filtering, a high-frequency switching capacitor, and various resistors for current sensing and timing. The output section provides multiple regulated voltages: +5V, -5V, -12V, and -24V. The schematic also shows the connection points for a microphone board and a microcontroller (MICDET). A table at the bottom right provides a summary of the components used, including their quantities, designations, and dates.

更改	数量	更改单号	签名	日期
设计				
审核				
标准化				
批准				

2004.4.16

BBK

DV977K

开关电源原理图

比例

数量

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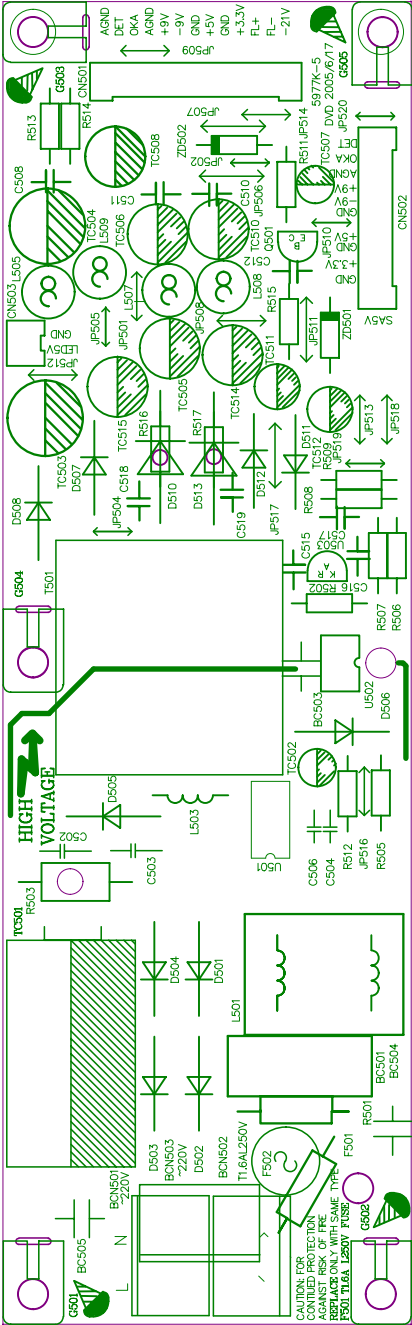
共 1 张

版次: 1.0

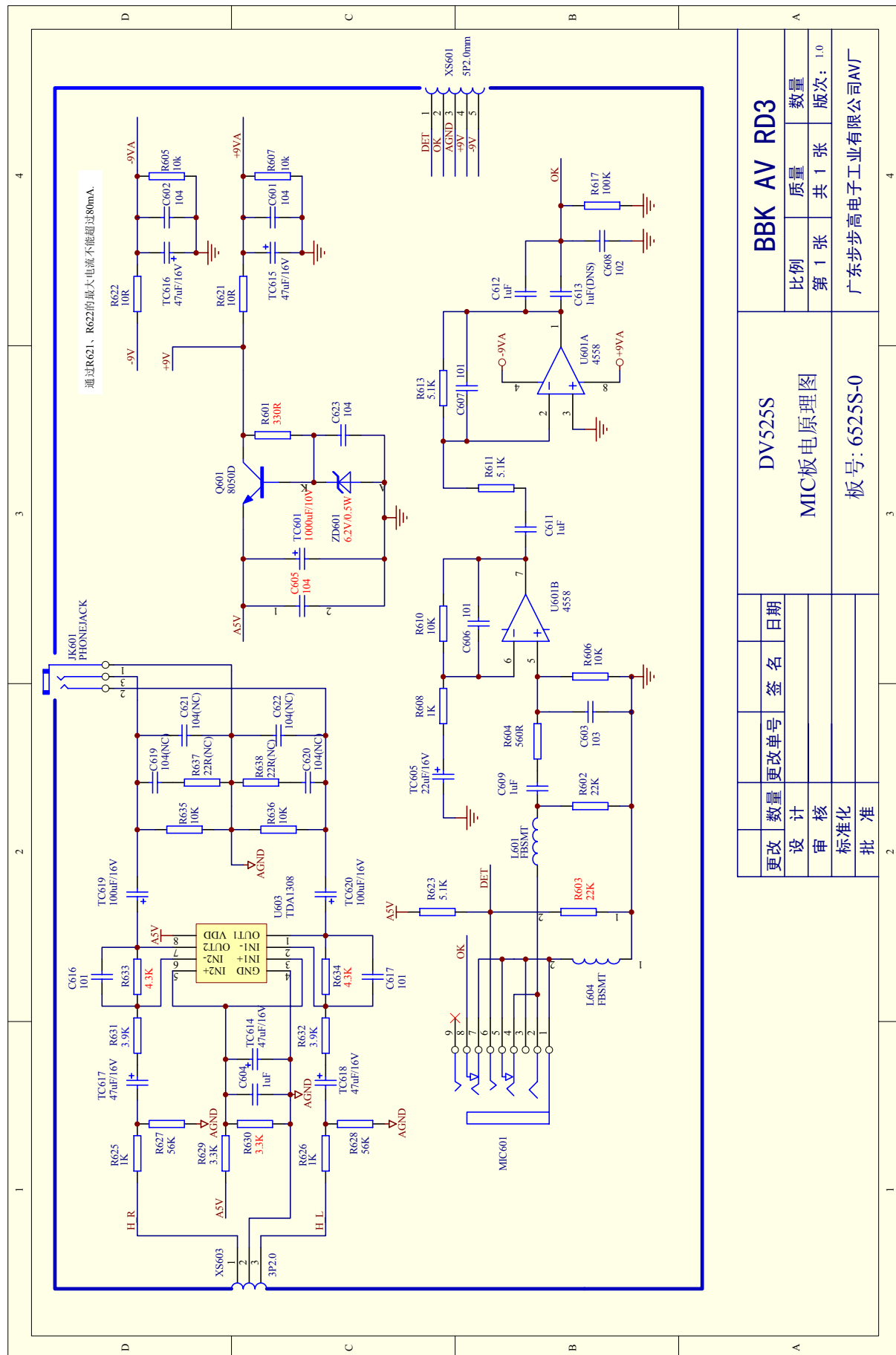
广东步步高电子工业有限公司AV厂

板号: 5977K-3

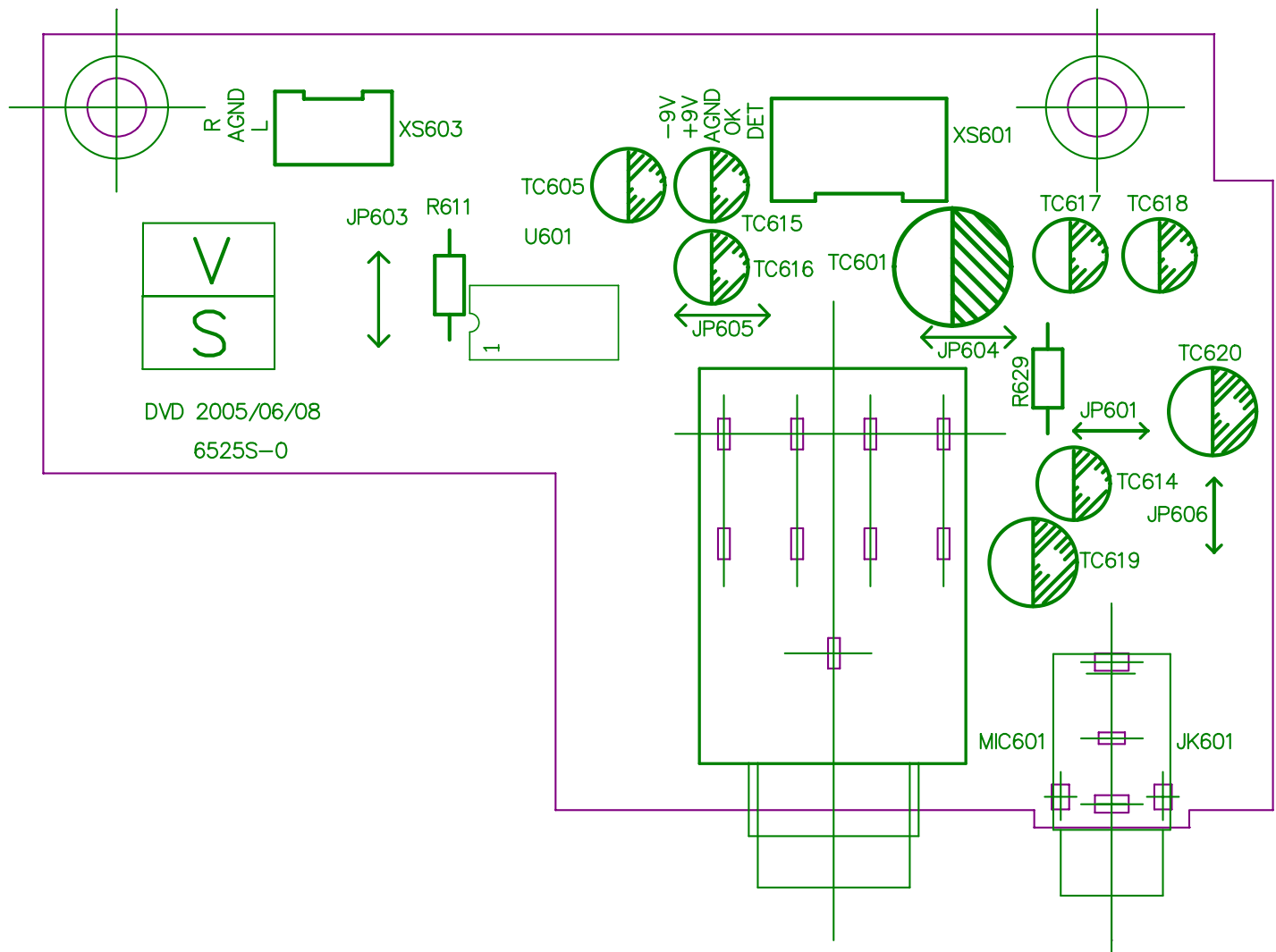
POWER BOARD SCHEMATIC DIAGRAM



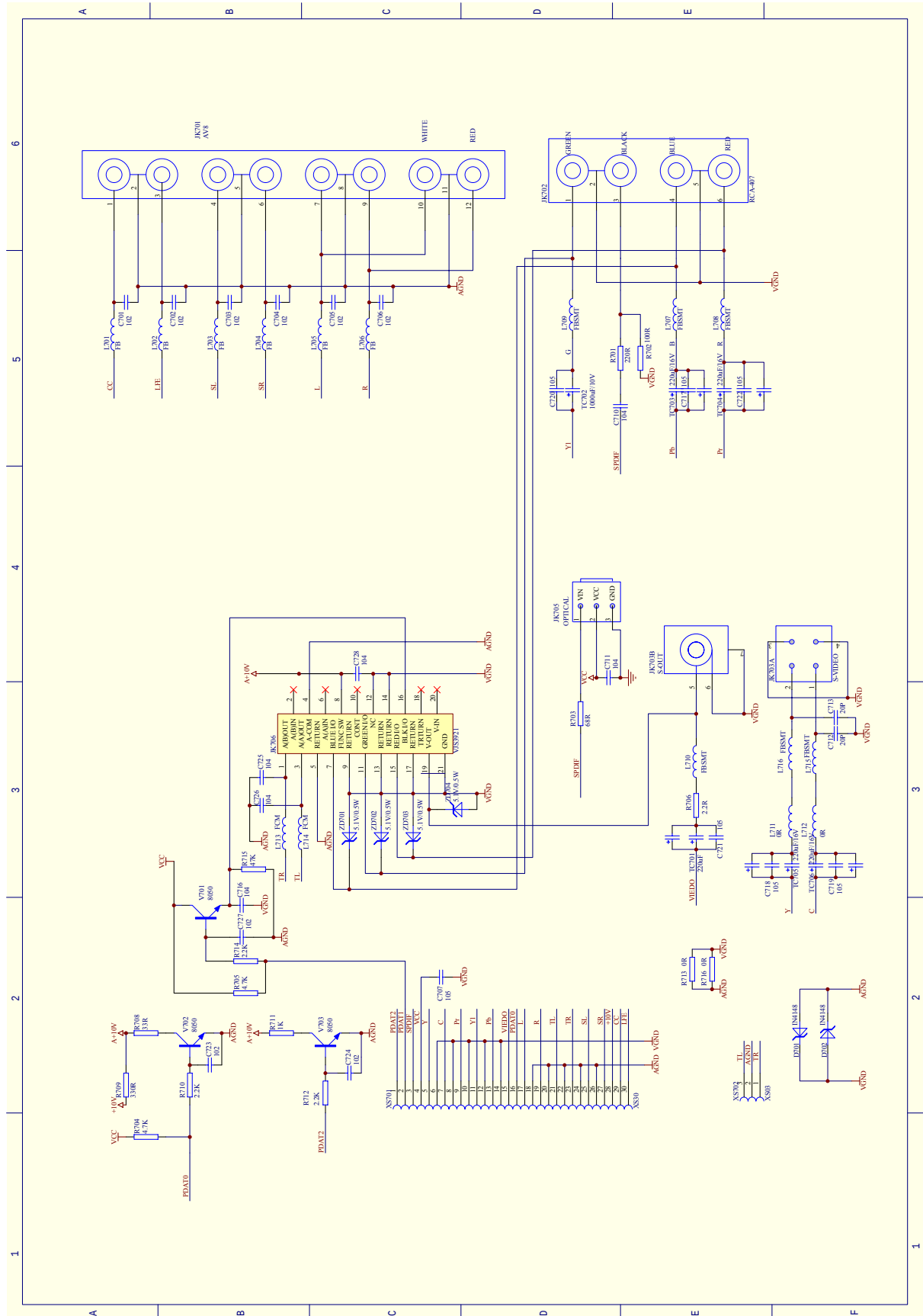
OK SCHEMATIC DIAGRAM



OK SCHEMATIC DIAGRAM



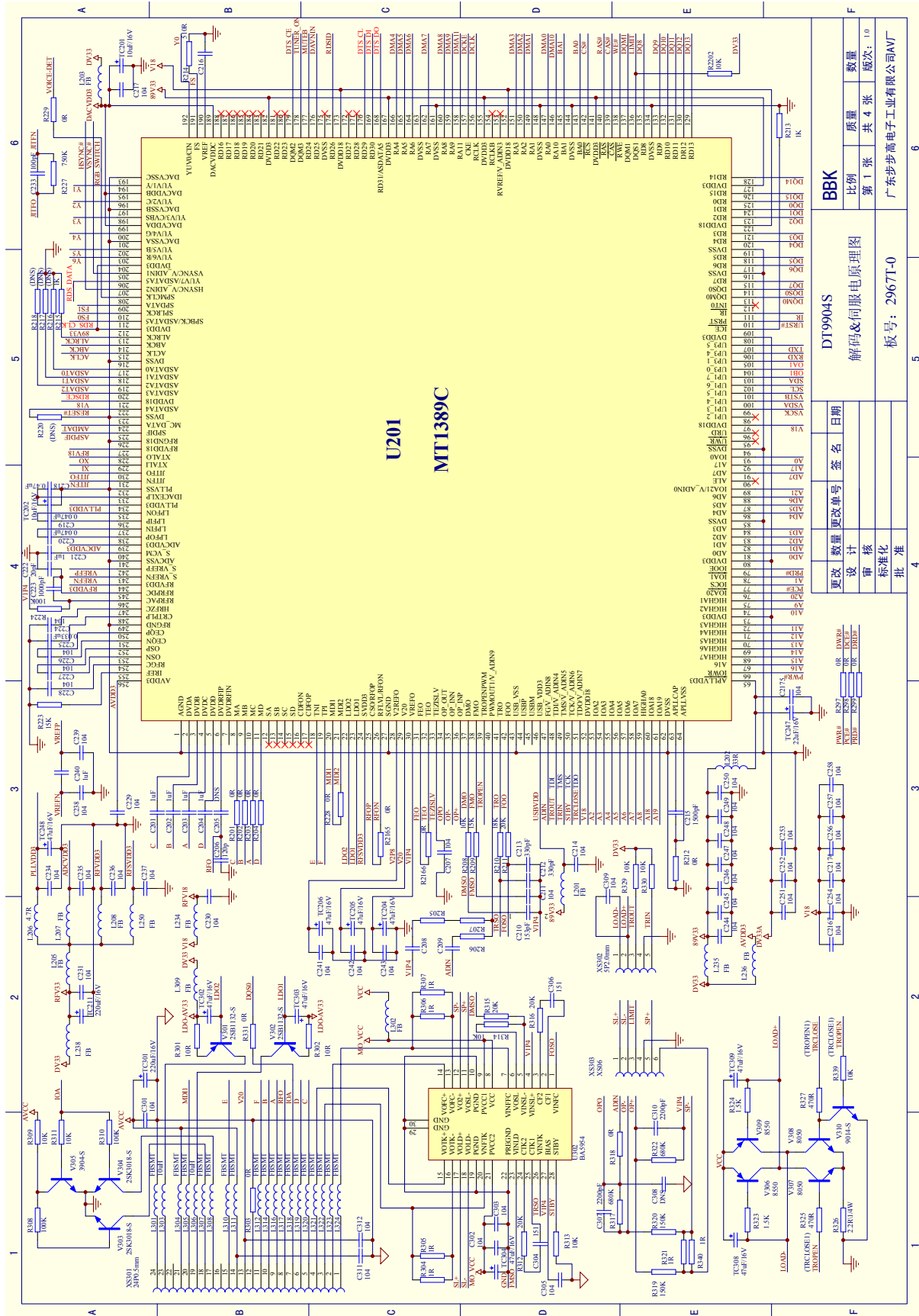
OUTPUT BOARD SCHEMATIC DIAGRAM



The schematic diagram illustrates the electrical layout of the DVD 2004/B/3 circuit board. It features a central horizontal strip representing the board's components, with various electronic parts labeled and connected by lines. Key components include:

- Resistors:** R701, R702, R703, R704, R705, R706, R707, R708, R709, R710, R711, R712, R713, R714.
- Capacitors:** C701, C702, C703, C704, C705, C706.
- Inductors:** L701, L702, L703, L704, L705, L706.
- Integrated Circuits (ICs):** IC701, IC702, IC703, IC704, IC705, IC706.
- Other Components:** J701, J702, J703, J704, J705, J706, J707, J708, J709, J710, J711, J712, J713, J714, J715, J716, J717, J718, J719, J720, J721, J722, J723, J724, J725, J726, J727, J728, J729, J730, J731, J732, J733, J734, J735, J736, J737, J738, J739, J740, J741, J742, J743, J744, J745, J746, J747, J748, J749, J750, J751, J752, J753, J754, J755, J756, J757, J758, J759, J760, J761, J762, J763, J764, J765, J766, J767, J768, J769, J770, J771, J772, J773, J774, J775, J776, J777, J778, J779, J780, J781, J782, J783, J784, J785, J786, J787, J788, J789, J790, J791, J792, J793, J794, J795, J796, J797, J798, J799, J800, J801, J802, J803, J804, J805, J806, J807, J808, J809, J810, J811, J812, J813, J814, J815, J816, J817, J818, J819, J820, J821, J822, J823, J824, J825, J826, J827, J828, J829, J830, J831, J832, J833, J834, J835, J836, J837, J838, J839, J840, J841, J842, J843, J844, J845, J846, J847, J848, J849, J850, J851, J852, J853, J854, J855, J856, J857, J858, J859, J860, J861, J862, J863, J864, J865, J866, J867, J868, J869, J870, J871, J872, J873, J874, J875, J876, J877, J878, J879, J880, J881, J882, J883, J884, J885, J886, J887, J888, J889, J890, J891, J892, J893, J894, J895, J896, J897, J898, J899, J900, J901, J902, J903, J904, J905, J906, J907, J908, J909, J910, J911, J912, J913, J914, J915, J916, J917, J918, J919, J920, J921, J922, J923, J924, J925, J926, J927, J928, J929, J930, J931, J932, J933, J934, J935, J936, J937, J938, J939, J940, J941, J942, J943, J944, J945, J946, J947, J948, J949, J950, J951, J952, J953, J954, J955, J956, J957, J958, J959, J960, J961, J962, J963, J964, J965, J966, J967, J968, J969, J970, J971, J972, J973, J974, J975, J976, J977, J978, J979, J980, J981, J982, J983, J984, J985, J986, J987, J988, J989, J990, J991, J992, J993, J994, J995, J996, J997, J998, J999, J1000.

MIAN SCHEMATIC DIAGRAM

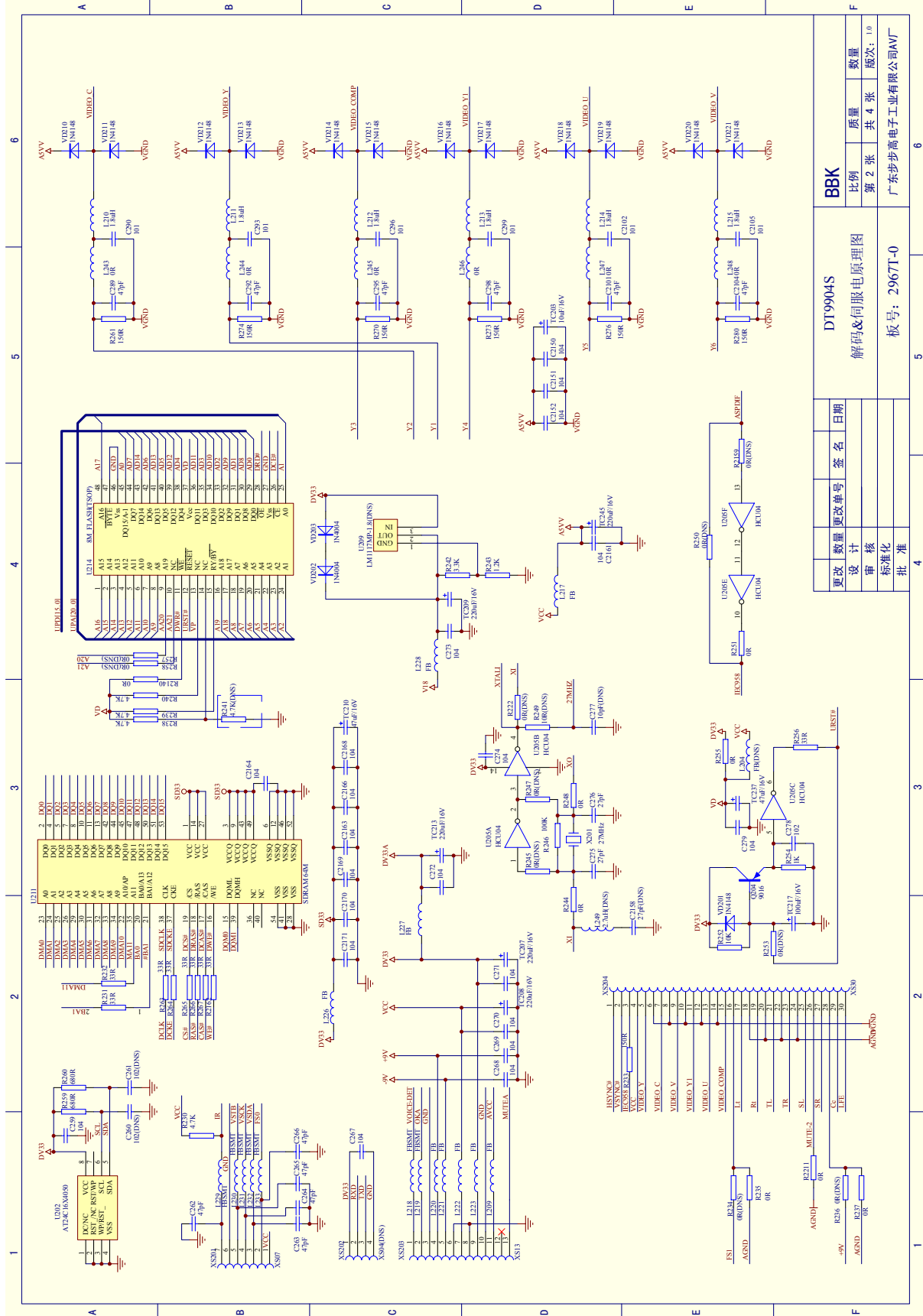


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審核			
標準化			
批准			

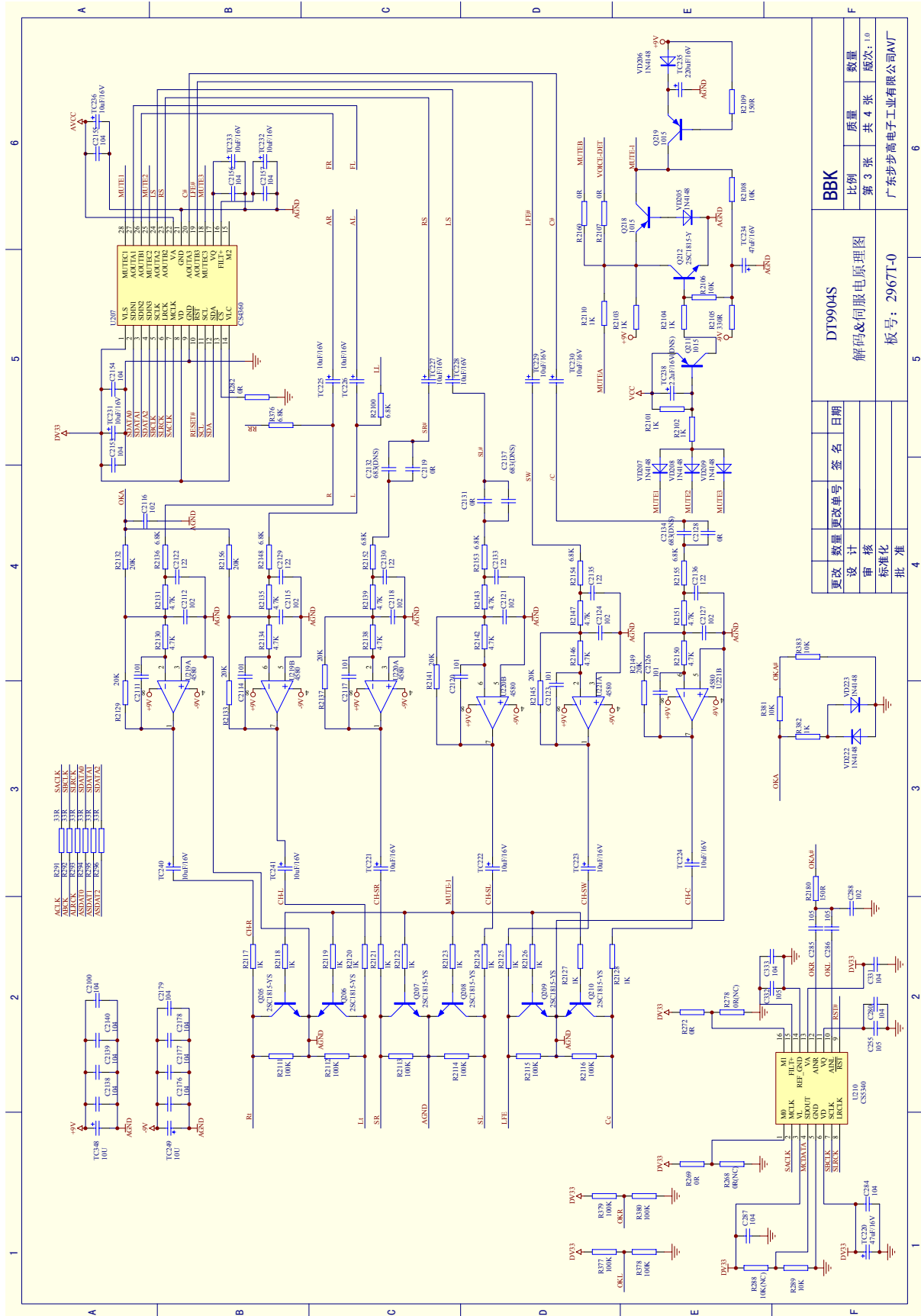
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板号: 29671-0

广东步步高电子工业有限公司AVI



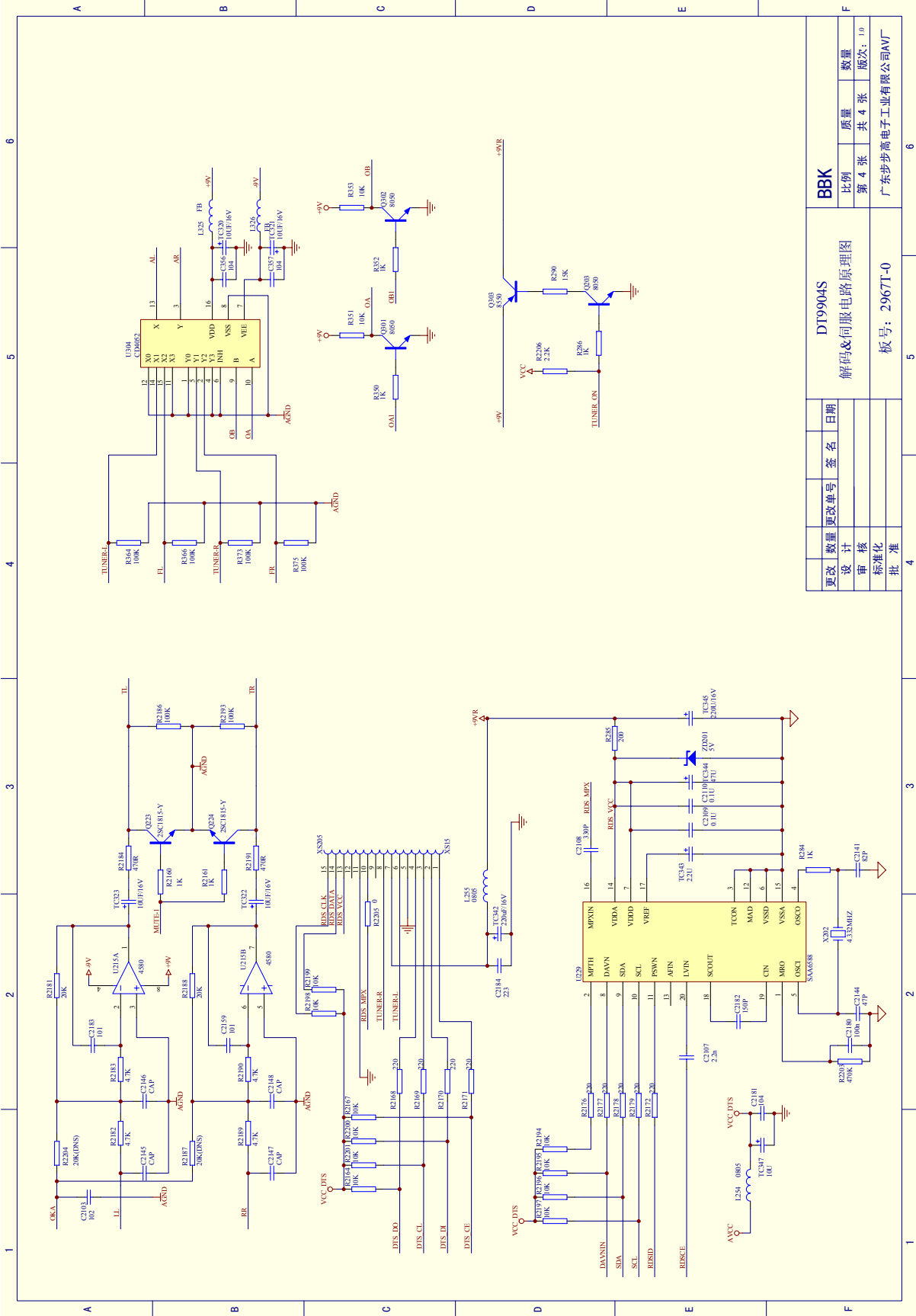
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批准					



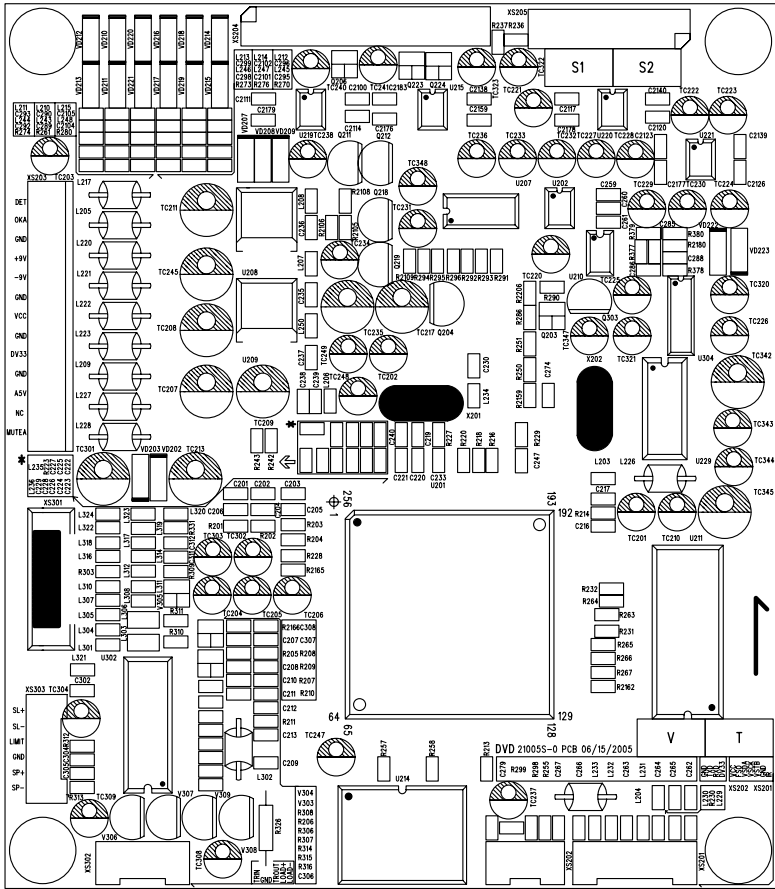
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DT9904S			BBK		
解码及伺服电机原理图			板号: 29671-0		
广东步步高电子有限公司AVI					

MIAN SCHEMATIC DIAGRAM



MIAN SCHEMATIC DIAGRAM



10. SPARE PARTS LIST

DV525S MATERIAL LIST

1. MAIN PANEL

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	UNIT	QTY	LOCATION
5233749	SOFT SPONGE SPACER	14×8×1.5 DOUBLE-FACED HARD	PCS	2	BETWEEB LED SCREEN AND MAIN PANEL
5233677	SOFT SPONGE SPACER	7×7×5 DOUBLE-FACED HARD	PCS	1	BETWEEN IR RECEIVING HEAD AND PANEL
0000481	CARBON FILM RESISTOR	1/6W33 Ω±5% SHAPED 7.5	PCS	1	R408
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6×6×1	PCS	3	K401~K403
0260254	CD	CD11C 10V100U±20%6×5 2.5	PCS	2	TC402,TC403
1200739	LED SCREEN	TOS-2681BG-B20	PCS	1	LED401
2360016	RECEIVING HEAD	HS0038B3V	PCS	1	U402
0881426	IC	PT6961 SOP	PCS	1	U401
0620076	LIGHT RADIATION DIODE	3B3HC COLORLESS WITH BLUE	PCS	1	LED402
2121899	FLAT CABLE	6-7P70 2.0 2PLUG WITH L NEEDLE THE SAME DIRECTION 6P	PCS	1	XS401
2121785	SOFT FLAT CABLE	4P260 2.0 2PLUG WITH L NEEDLE REVERSE	PCS	1	XS402
0700007	SMD DIODE	1N4148	PCS	1	VD401
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	PCS	1	R409
0780085	SMD TRIODE	8050D	PCS	1	Q401
90181	SMD RESISTOR	1/16W 100Ω ±5% 0603	PCS	1	R407
0090020	SMD RESISTOR	1/16W 5.1K ±5% 0603	PCS	1	R411
0090023	SMD RESISTOR	1/16W 10K ±5% 0603	PCS	4	R401~R403, R406
90192	SMD RESISTOR	1/16W 51K ±5% 0603	PCS	1	R405
0310598	SMD CAPACITOR	50V 102 ±20% X7R 0603	PCS	1	C407
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	PCS	3	C405,C406,C408
0310596	SMD CAPACITOR	50V 121 ±20% X7R 0603	PCS	10	C409~C415,C401~C403
0700004	SMD VOLTAGE REGULATOR DIODE	5.1V ±5% 1/2W	PCS	7	ZD401~ZD406,ZD407
1632398	PCB	4525S-0	PCS	1	

2. POWER BOARD

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	UNIT	QTY	LOCATION
2100010	CONNECTION CORDS	Φ0.6 SHAPED 5mm	PCS	4	JP502,JP510,JP519,JP520
2100003	CONNECTION CORDS	Φ0.6 SHAPED 7.5mm	PCS	5	JP501,JP509,JP514,JP516,JP518
2100004	CONNECTION CORDS	Φ0.6 SHAPED 10mm	PCS	1	JP511
0000273	CARBON FILM RESISTOR	1/4W33 Ω±5% SHAPED 10	PCS	1	R505
0000362	CARBON FILM RESISTOR	1/4W220 Ω±5% SHAPED 10	PCS	1	R515
0000278	CARBON FILM RESISTOR	1/4W330 Ω±5% SHAPED 10	PCS	1	R506
0000279	CARBON FILM RESISTOR	1/4W470 Ω±5% SHAPED 10	PCS	1	R514
0000284	CARBON FILM RESISTOR	1/4W1.5K±5% SHAPED 10	PCS	1	R511
0000461	CARBON FILM RESISTOR	1/4W9.1K±5% SHAPED 10	PCS	1	R512
0000283	CARBON FILM RESISTOR	1/4W1K±5% SHAPED 10	PCS	1	R502
0010115	METAL FILM RESISTOR	1/4W3.3K±1% SHAPED 10	PCS	1	R508
0010064	METAL FILM RESISTOR	1/4W10K±1% SHAPED 10	PCS	1	R509
0010159	METAL OXIDE FILM RESISTOR	2W39K±5% SHAPED FLAT 15×7	PCS	1	R503
0070001	HIGH VOLTAGE RESISTOR	1/2W680K±5%	PCS	1	R501
0200136	PORCELAIN CAPACITOR	50V 473 ±20% 5mm	PCS	1	C506
0200138	PORCELAIN CAPACITOR	50V 104 ±20% 5mm	PCS	6	C504,C508,C510~C512,C515
0200268	CERAMIC CAPACITOR	CT81 250VAC221±10% 10mm	PCS	2	BC503,BC505
0200267	CERAMIC CAPACITOR	CT81 250VAC221±20% 10mm	PCS	2	BC503,BC505
0200223	PORCELAIN CAPACITOR	1000V 101 +80%-20% 7.5mm	PCS	1	C503
0200228	PORCELAIN CAPACITOR	1000V 101 ±10% 7.5mm	PCS	1	C503
0200224	PORCELAIN CAPACITOR	1000V 103 +80%-20% 7.5mm	PCS	1	C502
0210116	ANTI-DISTURBANCE CAPACITOR	MKP61 X2 275VAC 104±20%15	PCS	1	BC501
0210066	TERYLENE CAPACITOR	275V 104 ±20% 15mm	PCS	1	BC501
0210070	TERYLENE CAPACITOR	275V 104 ±10% 15mm	PCS	1	BC501
0260557	CD	CD11T 16V100u±20%6×12 2.5	PCS	1	TC507
0260558	CD	CD11T 25V470u±20%10×16 5	PCS	2	TC503,TC504
0260559	CD	CD11T 50V47u±20%6×12 2.5	PCS	2	TC502,TC512
0260560	CD	CD11T 10V1000u±20%8×16 3.5	PCS	4	TC505,TC506,TC510,TC514
0260605	CD	KM 400V47U±20%16×25 7.5	PCS	1	TC501
0410010	CHOKE COIL	VERTICAL 10UH 1A 5mm	PCS	2	L505,L509
0410011	CHOKE COIL	VERTICAL 10UH 2A 5mm	PCS	2	L507,L508
0570013	DIODE	HER105	PCS	3	D506,508,D511
0680007	SCHOTTKY DIODE	SR360	PCS	2	D510, D513
0570014	DIODE	HER107	PCS	1	D505
0570005	DIODE	1N4007	PCS	4	D501~D504

0580006	VOLTAGE REGULATOR DIODE	5.1V ±5% 1/2W	PCS	1	ZD501
0580032	VOLTAGE REGULATOR DIODE	10V ±5% 1/2W	PCS	1	ZD502
0881933	IC	VIPER22A DIP8	PCS	1	U501
0880553	IC	LM431ACZ TO-92	PCS	1	U503
0880581	IC	TL431C TO-226AA(LP)	PCS	1	U503
0880800	IC	431L TO-92	PCS	1	U503
0882041	IC	MIK431C TO-92	PCS	1	U503
0390057	MAGNETIC BEADS INDUCTOR	RH354708	PCS	1	L503
1080011	PHOTOELECTRIC COUPLER	HS817	PCS	1	U502
1080006	PHOTOELECTRIC COUPLER	PC817	PCS	1	U502
0780049	TRIODE	S8550D	PCS	1	Q501
1000022	POWER GRID FILTER	JLB1153 33uH + ∞-0%	PCS	1	L501
0460543	SWITCHING POWER TRANSFORMER	@BCK-28-700S VDE	PCS	1	T501
1940077	SOCKET	11P 2.0mm	PCS	1	CN502
1940045	SOCKET	2P 8.0mm 2#	PCS	1	BCN501
1940024	SOCKET	5P 2.0mm	PCS	1	CN501
2300021	PROTECTOR TUBE	T1.6AL 250V	PCS	1	F501
2300028	FUSE	T1.6AL 250V WITH LEAD	PCS	1	F502
3870115	GROUND CHIP OF POWER BOARD	AB903	PCS	2	G501,G505
1563850	PCB	@5977K-5 UL	PCS	1	

3. AV BOARD

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	UNIT	QTY	LOCATION
0090181	SMD RESISTOR	1/16W 100Ω ±5% 0603	PCS	1	R702
0090002	SMD RESISTOR	1/16W 2.2Ω ±5% 0603	PCS	1	R706
0310066	SMD CAPACITOR	50V 102 ±10% 0603	PCS	13	C701~C706,C716,C723~C728
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	PCS	1	C710
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	PCS	1	C710
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	PCS	1	C710
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	PCS	8	L701~L704,L706,L708,L715,L716
0310085	SMD CAPACITOR	50V 20P ±5% NPO 0603	PCS	1	C713
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	PCS	1	R704
0090029	SMD RESISTOR	1/16W 47K ±5% 0603	PCS	1	R715
0090017	SMD RESISTOR	1/16W 2.2K ±5% 0603	PCS	1	R710
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	PCS	2	C707,C711
0090001	SMD RESISTOR	1/16W 0Ω ±5% 0603	PCS	8	L711,L712,C717~C722
0700007	SMD DIODE	1N4148	PCS	2	D701,D702
0700001	SMD DIODE	LS4148	PCS	2	D701,D702
0700002	SMD DIODE	LL4148	PCS	2	D701,D702
0700004	SMD VOLTAGE REGULATOR DIODE	5.1V 1/2W	PCS	4	ZD701~ZD704
1563192	PCB	7969A-3	PCS	1	
0000171	CARBON FILM RESISTOR	1/4W68Ω±5%	PCS	1	R703
0000181	CARBON FILM RESISTOR	1/4W220Ω±5%	PCS	1	R701
0000286	CARBON FILM RESISTOR	1/4W2.2K±5% SHAPED 10	PCS	1	R711
0000132	CARBON FILM RESISTOR	1/6W2.2K±5% SHAPED 7.5	PCS	2	R712,R714
0000278	CARBON FILM RESISTOR	1/4W330 Ω ±5% SHAPED 10	PCS	1	R709
0000133	CARBON FILM RESISTOR	1/6W4.7K±5% SHAPED 7.5	PCS	1	R705
0390057	MAGNETIC BEADS INDUCTOR	RH354708	PCS	6	L705,L707,L709,L710,L713,L714

1090045	ELECTRO-OPTICAL TRANSFORMER	TX179ATW	PCS	1	JK705
1090024	ELECTRO-OPTICAL TRANSFORMER	TX179AT	PCS	1	JK705
1910078	TERMINAL SOCKET	AV4-8.4-6G-3	PCS	1	JK702
1910129	TERMINAL SOCKET	SA-001-012 BLACK IRON-PIECE SCREEN-SHIELDED	PCS	1	JK703
1910079	TERMINAL SOCKET	AV8-8.4-6G-3	PCS	1	JK701
1940193	CABLE SOCKET	15P 1.0mm DUAL LINE CONTACT POINT STRAIGHT PLUG	PCS	1	XS701
2100010	CONNECTION CORDS	Φ0.6 SHAPED 5mm	PCS	11	JP701,JP704,JP711~JP712,JP721~JP727
2100003	CONNECTION CORDS	Φ0.6 SHAPED 7.5mm	PCS	8	JP703,JP713~JP718,JP720
2100004	CONNECTION CORDS	Φ0.6 SHAPED 10mm	PCS	3	JP705,JP709,JP719
2100006	CONNECTION CORDS	Φ0.6 SHAPED 12.5mm	PCS	1	JP702
1860029	SCART SOCKET	SCART-01	PCS	1	JK706
1940026	SOCKET	3P 2.0mm	PCS	1	XS702
0200031	PORCELAIN CAPACITOR	50V 20P ±10% NPO 5mm	PCS	1	C712
0780050	TRIODE	S8050D	PCS	3	V701~V703
0000167	CARBON FILM RESISTOR	1/4W33Ω±5%	PCS	1	R708

4. OK BOARD

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	UNIT	QTY	LOCATION
0090003	SMD RESISTOR	1/16W 10Ω ±5% 0603	PCS	2	R621,R622
0090009	SMD RESISTOR	1/16W 330Ω ±5% 0603	PCS	1	R601
0090012	SMD RESISTOR	1/16W 560Ω ±5% 0603	PCS	1	R604
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	PCS	3	R608,R625,R626
0090018	SMD RESISTOR	1/16W 3.3K ±5% 0603	PCS	1	R630
0090224	SMD RESISTOR	1/16W 3.9K ±5% 0603	PCS	2	R631, R632
0090184	SMD RESISTOR	1/16W 4.3K ±5% 0603	PCS	2	R633, R634
0090020	SMD RESISTOR	1/16W 5.1K ±5% 0603	PCS	3	R602, R613, R623
0090023	SMD RESISTOR	1/16W 10K ±5% 0603	PCS	4	R606,R610,R635,R636
0090026	SMD RESISTOR	1/16W 22K ±5% 0603	PCS	1	R603
0090030	SMD RESISTOR	1/16W 56K ±5% 0603	PCS	2	R627,R628
0090034	SMD RESISTOR	1/16W 100K ±5% 0603	PCS	1	R617
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	PCS	4	C606, C607, C616, C617
0310066	SMD CAPACITOR	50V 102 ±10% X7R 0603	PCS	1	C608
0310072	SMD CAPACITOR	50V 103 ±10% X7R 0603	PCS	1	C603
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	PCS	5	C601,C602,C604,C605,C623
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	PCS	5	C601,C602,C604,C605,C623
0310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	PCS	3	C609,C611,C612
0000339	CARBON FILM RESISTOR	1/6W3.3K±5% SHAPED 7.5	PCS	1	R629
0000134	CARBON FILM RESISTOR	1/6W5.1K±5% SHAPED 7.5	PCS	1	R611
0260094	CD	CD110 16V47U±20%5×11 2	PCS	5	TC614 ~ TC618
0260025	CD	CD11 16V47U±20%5×11 2	PCS	5	TC614 ~ TC618
0260200	CD	CD11C 16V47U±20%5×7 2	PCS	5	TC614 ~ TC618
0260327	CD	GZ16V100U±20%6×12 2.5	PCS	2	TC619, TC620
0260027	CD	CD11 16V100U±20%6×12 2.5	PCS	2	TC619, TC620
0260096	CD	CD110 16V100U±20%6×12 2.5	PCS	2	TC619, TC620
0260175	CD	CD11C 16V100U+20%-15%6×7 2.5	PCS	2	TC619, TC620
0260201	CD	CD11C 16V100U±20%6×7 2.5	PCS	2	TC619, TC620
0260021	CD	CD11 16V22U±20%5×11 2	PCS	1	TC605
0260037	CD	CD11 25V22U±20%5×11 2	PCS	1	TC605
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	PCS	2	L601, L604
0260237	CD	CD11 10V1000U±20%8×14 3.5	PCS	1	TC601
0260352	CD	GS 10V1000U±20%8×14 3.5	PCS	1	TC601
0700020	SMD VOLTAGE REGULATOR DIODE	6.2V ±5% 1/2W	PCS	1	ZD601
0780085	SMD TRIODE	8050D	PCS	1	Q601
0880124	IC	NJM4558D DIP	PCS	1	U601
0880308	IC	KA4558 DIP	PCS	1	U601
0881537	IC	TDA1308 SOP	PCS	1	U603

1980034	MIC SOCKET	CK3-6.35-4	PCS	1	MIC601
2121900	FLAT CABLE	5P50 2.0 2PLUG WITH L NEEDLE REVERSE	PCS	1	XS601
2121901	FLAT CABLE	3P280 2.0 2PLUG WITH L NEEDLE REVERSE	PCS	1	XS603
1563829	PCB	6525S-0	PCS	1	
2100010	CONNECTION CORDS	Φ0.6 SHAPED 5mm	PCS	2	JP601, JP606
2100003	CONNECTION CORDS	Φ0.6 SHAPED 7.5mm	PCS	3	JP603~ JP605
1980046	HEADPHONE SOCKET	ST-301-030-100	PCS	1	JK601

5. SUBSIDIARY PANEL

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	UNIT	QTY	LOCATION
1563673	PCB	9981-0	PCS	1	
1940022	SOCKET	4P 2.0mm	PCS	1	XS901
0620106	LIGHT RADIATION DIODE	3R 4HD RED LEAD WITH UNLIMITED POSITIONM	PCS	1	LED901
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6×6×1	PCS	1	K901

6. DECODE BOARD

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	UNIT	QTY	LOCATION
0090001	SMD RESISTOR	1/16W 0Ω ±5% 0603	PCS	35	C2119,C2128,C2131,L210~L215,R201~R204,R212,R228,R234,R236,R245,R247,R222,R251,R255,R257,R258,R282,R298,R299,R303,R318,R331,R2159,R297,R2210,R279,R269
0090006	SMD RESISTOR	1/16W 75Ω ±5% 0603	PCS	7	R233,R261,R270,R273,R274,R276,R280
0000375	CARBON FILM RESISTOR	1/4W2.2Ω±5%	PCS	1	R326
0090272	SMD RESISTOR	1/16W1Ω±5% 0603	PCS	6	R304~R307,R321,R340
0090003	SMD RESISTOR	1/16W 10Ω ±5% 0603	PCS	2	R301,R302
0090005	SMD RESISTOR	1/16W 33Ω ±5% 0603	PCS	16	R231,R232,R256,R263~R267,R291~R296,R2162 ,L202
0090232	SMD RESISTOR	1/16W 150Ω ±5% 0603	PCS	1	R2180
0090008	SMD RESISTOR	1/16W 220Ω ±5% 0603	PCS	4	R2168~R2171
90011	SMD RESISTOR	1/16W 470Ω ±5% 0603	PCS	2	R325,R327
0090013	SMD RESISTOR	1/16W 680Ω ±5% 0603	PCS	2	R259,R260
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	PCS	25	R213,R215,R2104,R2117,R2118~R2128,R254,R2184,R2160,R2161,R2191,R350,R352,R286,R2109,R382
0090223	SMD RESISTOR	1/16W 2K ±5% 0603	PCS	1	R2103
0090016	SMD RESISTOR	1/16W 1.5K ±5% 0603	PCS	3	R323,R324,R243
0090249	SMD RESISTOR	1/16W 510Ω ±5% 0603	PCS	1	R214
0090018	SMD RESISTOR	1/16W 3.3K ±5% 0603	PCS	1	R242
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	PCS	21	R238~R240,R2130,R2131,R2134,R2135,R2138~R2140,R2142,R2143,R2146,R2147,R2150,R2151,R2182,R2183,R2189,R2190,R2206
0090021	SMD RESISTOR	1/16W 6.8K ±5% 0603	PCS	8	R2136,R2148,R2152~R2155,R376,R2100
90023	SMD RESISTOR	1/16W 10K ±5% 0603	PCS	25	R208,R229,R252,R309,R311,R313,R314,R329,R330,R339,R2164,R2200,R2201,R2167,R351,R353,R290,R2202,R2106,R2108,R2101,R2102,R2105,R289,R381
0090024	SMD RESISTOR	1/16W 15K ±5% 0603	PCS	2	R209,R223
0090025	SMD RESISTOR	1/16W 20K ±5% 0603	PCS	5	R211,R312,R315,R316,R383
0090255	SMD RESISTOR	1/16W24K±5% 0603	PCS	8	R2129,R2133,R2137,R2141,R2145,R2149,R2181,R2188
0090188	SMD RESISTOR	1/16W 18K ±5% 0603	PCS	1	R210
0090197	SMD RESISTOR	1/16W 150K ±5% 0603	PCS	2	R319,R320
0090231	PRECISION SMD RESISTOR	1/16W 680K ±1% 0603	PCS	2	R317,R322
0090319	PRECISION SMD RESISTOR	1/16W 750K ±1% 0603	PCS	1	R227
0090034	SMD RESISTOR	1/16W 100K ±5% 0603	PCS	20	R224,R308,R310,R2111~R2116,R246,R2186,R2193,R364,R366,R373,R375,R377~R380
0260019	CD	CD11 16V10U±20%5×11 2	PCS	27	TC201,TC202,TC217,TC221~TC233,TC236,TC240,TC241,TC323,TC322,TC347,TC320,TC321,TC348,TC249,TC203

0260028	CD	CD11 16V220U±20%6×12 2.5	PCS	10	TC207~TC209,TC211,TC213,TC235,TC345,TC301,TC342,TC245
0260025	CD	CD11 16V47U±20%5×11 2	PCS	14	TC204~TC206,TC210,TC234,TC237,TC302~TC304,TC308,TC309,TC247,TC248,TC220
0310085	SMD CAPACITOR	50V 20P ±5% NPO 0603	PCS	1	C222
0310190	SMD CAPACITOR	50V 27P ±5% NPO 0603	PCS	2	C275,C276
0310045	SMD CAPACITOR	50V 47P ±5% NPO 0603	PCS	16	C289,C290,C292,C293,C295,C296,C298,C299,C2101,C2102,C2104,C2105,C262~C265
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	PCS	11	C233,C2111,C2114,C2117,C2120,C2123,C2126,C206,C2159,C2183,C288
310051	SMD CAPACITOR	50V 331 ±5% NPO 0603	PCS	2	C212,C213
0310048	SMD CAPACITOR	50V 151 ±5% NPO 0603	PCS	2	C304,C306
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	PCS	86	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267~C274,C279,C301~C303,C305,C309,C311,C312,C2138~C2140,C2153~C2157,C2161,C2163,C2169,C2166,C2174,C2175,C2168,C2100,C2179,C2181,C356,C357,C2164,C2171,C2167,C2176,C2177,C2178,C2150~C2152,C287,C284,C331,C333,C280
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	PCS	86	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267~C274,C279,C301~C303,C305,C309,C311,C312,C2138~C2140,C2153~C2157,C2161,C2163,C2169,C2166,C2174,C2175,C2168,C2100,C2179,C2181,C356,C357,C2164,C2171,C2167,C2176,C2177,C2178,C2150~C2152,C287,C284,C331,C333,C280
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	PCS	86	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267~C274,C279,C301~C303,C305,C309,C311,C312,C2138~C2140,C2153~C2157,C2161,C2163,C2169,C2166,C2174,C2175,C2168,C2100,C2179,C2181,C356,C357,C2164,C2171,C2167,C2176,C2177,C2178,C2150~C2152,C287,C284,C331,C333,C280
310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	PCS	10	~C204,C221,C240,C285,C286 ,C332,C
0310066	SMD CAPACITOR	50V 102 ±10% X7R 0603	PCS	10	C2112,C2115,C2118,C2121,C2124,C2127,C223,C278,C2146,C2148
0310231	SMD CAPACITOR	50V 122 ±10% X7R 0603	PCS	8	C2122,C2129,C2130,C2133,C2135,C2136,C2145,C2147
0310067	SMD CAPACITOR	50V 152 ±10% X7R 0603	PCS	1	C215
0310068	SMD CAPACITOR	50V 222 ±10% X7R 0603	PCS	2	C307,C310
0310201	SMD CAPACITOR	50V 153 ±10% X7R 0603	PCS	1	C210
0310202	SMD CAPACITOR	50V 223 ±10% X7R 0603	PCS	1	C2184
0310055	SMD CAPACITOR	16V 333 ±10% X7R 0603	PCS	1	C225
310056	SMD CAPACITOR	16V 473 ±10% X7R 0603	PCS	2	C219,C220
0310362	SMD CAPACITOR	16V 474 +80%-20% Y5V 0603	PCS	1	C218
0390044	SMD INDUCTOR	10UH ±10% 2012	PCS	2	L303,L306
0390096	SMD INDUCTOR	1.8UH ±10% 1608	PCS	6	L243~L248
0390057	MAGNETIC BEADS INDUCTOR	RH354708	PCS	11	L205,L209,L217,L220,L221,L222,L223,L227,L228,L226,L302
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	PCS	36	L201,L203,L207,L208,L234~L236,L238,L250,L309,L229~L232,L301,L304,L305,L307,L308,L310~L312,L314,L316~L324 ,L325,L326,L218,L219
0390087	SMD MAGNETIC BEADS	FCM2012V-221T07	PCS	2	L254,L255
0090106	SMD RESISTOR	1/16W 4.7Ω ±5% 0603	PCS	1	L206
0700007	SMD DIODE	1N4148	PCS	20	VD201,VD205~VD223
700001	SMD DIODE	LS4148	PCS	20	VD201,VD205~VD223

0700002	SMD DIODE	LL4148	PCS	20	VD201,VD205~VD223
0780085	SMD TRIODE	8050D	PCS	3	Q301,Q302,Q203
0780029	TRIODE	C8050	PCS	2	V307,V308
0780030	TRIODE	8550C(120-200) TO-92	PCS	3	V306,V309,Q303
0780062	SMD TRIODE	9014C	PCS	1	V310
0780033	TRIODE	9015C(200-600) TO-92	PCS	1	Q204
0780020	TRIODE	C1815Y	PCS	1	Q212
780197	SMD TRIODE	C1815	PCS	8	Q205~Q210,Q223,Q224
0780043	TRIODE	2SA1015	PCS	3	Q211,Q218,Q219
0780040	SMD TRIODE	3904(100-300) SOT-23	PCS	1	V305
0780193	SMD TRIODE	2SK3018	PCS	2	V303,V304
0780115	SMD TRIODE	2SB1132	PCS	2	V301,V302
0880185	IC	NJM4558M SOP	PCS	4	U219,U220,U221,U215
0880562	IC	4580 SOP	PCS	4	U219,U220,U221,U215
0880361	IC	4558 SOP	PCS	4	U219,U220,U221,U215
0880322	IC	MM74HCU04M SOP	PCS	1	U205
880513	IC	HCU04 SOP	PCS	1	U205
0881415	IC	HY57V641620HGT-7 TSOP	PCS	1	U211
0881872	IC	KSV464P4JA-70 TSOP	PCS	1	U211
0881182	IC	LM1117MP-ADJ SOT-223	PCS	1	U209
0881057	IC	CS4360 SSOP	PCS	1	U207
0882353	IC	CS5340 TSSOP	PCS	1	U210
0881031	IC	24C02N SOP	PCS	1	U202
882257	IC	MT1389FE/C (C VERSION) QFP	PCS	1	U201
0881378	IC	BA5954FP HSOP	PCS	1	U302
0881886	IC	36C7T 3MCD4052BM SOP	PCS	1	U304
0960020	CRYSTAL OSCILLATOR	27.00MHz 49-S	PCS	1	X201
1940072	CABLE SOCKET	6/5P 1.25mm DUAL LINE STRAIGHT PLUG	PCS	1	XS205
1940193	CABLE SOCKET	15P 1.0mm STRAIGHT DUAL LINE PLUG CONTACT POINT	PCS	1	XS204
1632446	PCB	21005S-0	PCS	1	
1940024	SOCKET	5P 2.0mm	PCS	1	XS302
1940023	SOCKET	7P 2.0mm	PCS	1	XS201
1940005	SOCKET	6P 2.0mm	PCS	1	XS303
1940171	SOCKET	13P 2.5mm	PCS	1	XS203
1940094	CABLE SOCKET	24P 0.5mm SMD WITH CLASP	PCS	1	XS301

11. APPENDIX-AM/FM Tuner Specificadtion

AM/FM Tuner Specification

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			TFCFIU800A
END CUST	CUST	CUST MODEL NO.	ALPS MODEL NO.

					APPD	CHKD	DSGD		
								TITLE	PRODUCT
								TFCF1U SPECIFICATION	
					DOCUMENT NO.				
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.	0/11				

AM/FM Tuner Specification

1.Application product P/N TFCF1U TYPE FM/AM TUNER

1-1.Manufacturing location Japan and People Republic of China and Malaysia

2.Specification Customer Specification USA / CND Version

3.Test conditions

Usual standard test with next condition

Measurement shall be started to minutes after power applied

The apply voltege must be regulated +9 v $\pm$ 2%

Condition Temperature :5 $^{\circ}$ $\pm$ 35 $^{\circ}$

Humidity :45 $^{\circ}$ $\pm$ 85 % Rh

If there is an objection to test result, they set up with next test condition

Condition Temperature :20 $\pm$ 2 $^{\circ}$

Humidity :60 $^{\circ}$ $\pm$ 70 % Rh

Unit: Scale / Tolerance

	Components	Materials Finish/ Specifications				Components	Materials Finish/ Specifications		
1			6						
2			7						
3			8						
4			9						
5			1		0				

					DSGD.			
					CHKD.	TITLE PRODUCT TFCF1U SPECIFICATION		
					APPD	(1/11)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

4.General Specifications

4-1.FM Tuner General Specifications

Frequency Range	87.5MHz. #108.0MHz
STEP Frequency	50KHz/100KHz
Intermediate Frequency	10.7MHz(Upper Heterodyne)
Operating Temperature	40C20. #1 #70.
ANT Input Impedance	75 Unbalanced

4-2. PLL General Specifications

Cutout port function		B01	B02					
		FM/AM	o I					
Seral date	0	AM	o I					
	1	FM	o I					

Crystal Frequency :75KHz

					DSGD.			
					CHKD.	TITLE TFCF1U	PRODUCT SPECIFICATION	
					APPD			
						(2/11)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

4-3.AM Tuner General Specifications

Frequency Range	530KHz。†1710KHz
STEP Frequency	10KHz or 9KHz
Intermediate Frequency	450KHz]Ƴ(Upper Heterodyne)
Operating Temperature	4C20。†1†70。
ANT Input Impedance	Use Dummy antenna which specified If there hanppened,should use loop antenna

5. Mechanical specifications

Dimensions	See Assembly drawing
Core torque	3.0 ± 30 mN·m
Variable Resistor Torque	3.0 ± 30 mN·m
Antenna Connector	FMJ 2 Sticker S DIN 45325/F AMJ 2 SMK LPR0210-XX09 or 変換アネキ

					DSGD.			
					CHKD.	TITLE	PRODUCT	
					APPD	(3/11)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

6-1. Terminal load connections

Specified jig should be used for measurement

Jig circuit follows 10-2

During FM measurement, use specified by IHF T-200 (200Hz, ± 15 KHz B.P.F)

Filter for audio output of filter *Less than 200Hz ≥ 18 dB/act.out

*220Hz and 15KHz ≥ 3 dB MIN

19KHz ≥ 30 dB MAX

6-2. Standard connection diagram

FM section

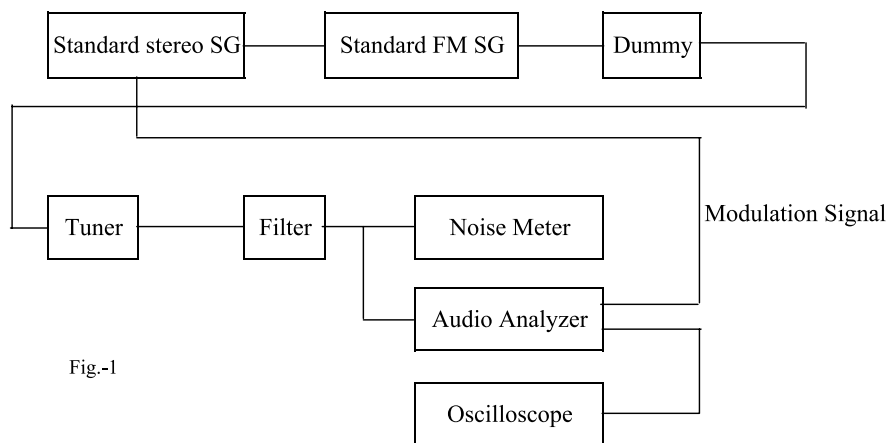


Fig.-1

					DSGD.			
					CHKD.	TITLE PRODUCT TFCF1U SPECIFICATION		
					APPD	(4/11)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

6-3. Test Modulation

FM J MONO 1KHz	75.0KHz dev	AM J 4400hz 30% mod
STEREO 1KHz L/R	67.5KHz dev	Use Dummy antenna which specified by ALPS.
PILOT	7.5KHz dev	RF Input level J 94dBu (ANT Input)
Antenna Input	7577 Opened SSG-Dummy los	
RF Input Level	60dBu	

7. DC Specification

ITEM	TEST Condition	SPEO ケ 紹			UNIT
		MIN	TYP	MAX	
Supply Voltage J 9v	Off Station	8.5	9	9.5	V
Supply Currant J 9v	Off Station	0.1	65	90	mA

					DSGD.			
					CHKD.			
					APPD	TITLE PRODUCT TFCF1U SPECIFICATION		
								(5/11)
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

8.FM Tuner Electrical Specification (Measurement Points Unless Otherwise Stated are 87.5,98,100MHz.
Concerning MONORAL test shall be at L out terminal)

ITEM	TEST Condition		SPEC 仕様			UNIT 単位
			MIN	TYP	MAX	
50dB S/N Sensitivity		87.5MHz	0.1	17	25	dBu
		98.0MHz	—	15	25	
		106.0MHz	0.1	17	25	
IHF Sensitivity	Distortion 3%	87.5MHz	0.1	14	20	dBu
		98.0MHz	0.1	12	20	
		106.0MHz	0.1	14	20	
Max S/N Ratio	MONO	98.0MHz	65	72	0.1	dB
		STEREO	98.0MHz	60	67	
Distortion	MONO	98.0MHz	0.1	0.2	1.5	%
		STEREO	98.0MHz	0.1	0.3	
Distortion with strong signal	120dBu	MONO	98.0MHz	0.1	0.2	%
		STEREO	98.0MHz	0.1	0.3	
Audio Output Level	L and R out	MONO	98.0MHz	0	3	dBs
		STEREO	98.0MHz	-1	2	
Stereo Separation		98.0MHz	25	40	—	dB
Stereo Work Level	SDCOJ 10 SDCTJ 10	98.0MHz	10	18	27	dBu
Tuned Level	SDCOJ 10 SDCTJ 10	98.0MHz	10	18	27	dBu
Auto Stop Level	SDCOJ 10 SDCTJ 10	98.0MHz	10	20	33	dBu

					DSGD.			
					CHKD.	TITLE PRODUCT TFCF1U SPECIFICATION		
					APPD			
								(6/11)
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

ITEM	TEST Condition		SPEC 仕様			UNIT 単位
			MIN	TYP	MAX	
Image Rejection	MONO	98.0MHz	17	23	—	dB
Carrier Leak		98.0MHz	28	33	—	dB
Emphasis	-12.29 IHF Filter Off	98.0MHz	-3	0	3	dB
Pilot Margin		98.0MHz	4	10	—	dB
Adjacent Channel Selectivity	±400KHz	98.0MHz	20	30	—	dB
AM Rejection		98.0MHz	40	60	—	dB
I.F. Rejection		98.0MHz	60	90	—	dB
Spurious Response Ratio		98.0MHz	40	50	—	dB
Spurious Radiation	Meat FOC Requirements Note1.		3	10	—	dB
Antenna Leakage	Meat FOC Requirements Note1.		3	8	—	dB

Note1. Spurious Radiation and Antenna Leakage : Use Radio Set Provided by CUSTOMER

					DSGD.			
					CHKD.	TITLE PRODUCT TFCF1U SPECIFICATION		
					APPD			
						(7/11)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

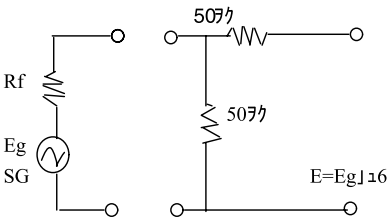
9.AM Tuner Electrical Specification (Test shall be at L out Terminal)

ITEM	TEST Condition		SPEC 仕様			UNIT 単位
			MIN	TYP	MAX	
S/N 20dB Sensitivity		620KHz	—	54	61	dBu
		1050KHz	—	48	57	
		1490KHz	—	48	56	
Max S/N		1050KHz	43	54	—	dB
Distortion		1050KHz	—	1.3	2.5	%
Distortion with Strong Signal	104dBu RF Input Level	1050KHz	—	1.3	2.5	%
Audio Output Level	L.R OUT	1050KHz	-11	-7	—	dBs
One Signal Selectivity	±10KHz	1050KHz	18	27	—	dB
Image Rejection		1050KHz	30	36	—	dB
I.F. Rejection		1050KHz	45	55	—	dB
AGC Form		1050KHz	44	50	—	dB
Audio Frequency Response	O Point 400Hz	100Hz	1050KHz	-10	-5.5	dB
	Ref 10400Hz	4KHz	1050KHz	-22	-16	
Auto stop level		1050KHz	—	50	66	dBu
Tuned Level		1050KHz	—	52	61	dBu

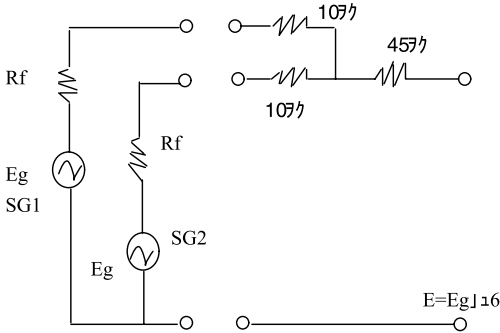
					DSGD.			
					CHKD.	TITLE TFCF1U	PRODUCT SPECIFICATION	
					APPD			
						(8/11)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

10-1.ANT PAD

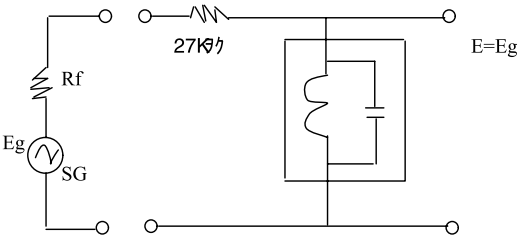
(1).FM1 SIGNAL



(2).FM2 SIGNAL



(3).AM1 SIGNAL



Trans mand TOKO
(L=15.2uH , C=30PF)

ANT Input Signal Voltage is Open Voltage ON SSG

NOTE] Use Test jig which specified

$R_f = 50\Omega$

					DSGD.			
					CHKD.	TITLE PRODUCT TFCF1U SPECIFICATION		
					APPD			
								(9/11)
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

11. Printed-Wiring Board Material

ITEM	Contents		
Material Supplier	Hitachi Chemical CO.,LTD	Hitachi Chemical CO.,LTD	Hitachi Chemical CO.,LTD
Trade Name	MCL — 437F	MCL — 437F	MCL — 437F
UL Grade	94V — 0	94V — 0	94V — 0
Edging Supplier	NIPPON ELEC Co.,LTD	NIPPON ELEC Co.,LTD	PNE PCB LTD.
UL Type Designation	NE 49S△	NE M PF2△	PNE — 1B
UL File NO.	E41166 (S)	E41166 (S)	E67640

Material Supplier	SUZHOU Matsushita Electric Work Co.,LTD	Suzhou Matsushita Electric Work Co.,LTD
Trade Name	R8700	R8700
UL Grade	94V — 0	94V — 0
Etching Supplier	Yamanashi Matsushita Electric Work Co.,LTD	Suzhou Matsushita Electric Works(PWB) Co.,LTD
UL Type Designation	NTP—N870A—T YMEW—N870A—T	SMEW—N870A—T
UL File NO.	E107496 (S)	E164387 (S)

Dimension of Print-Wiring Board	56 × 49
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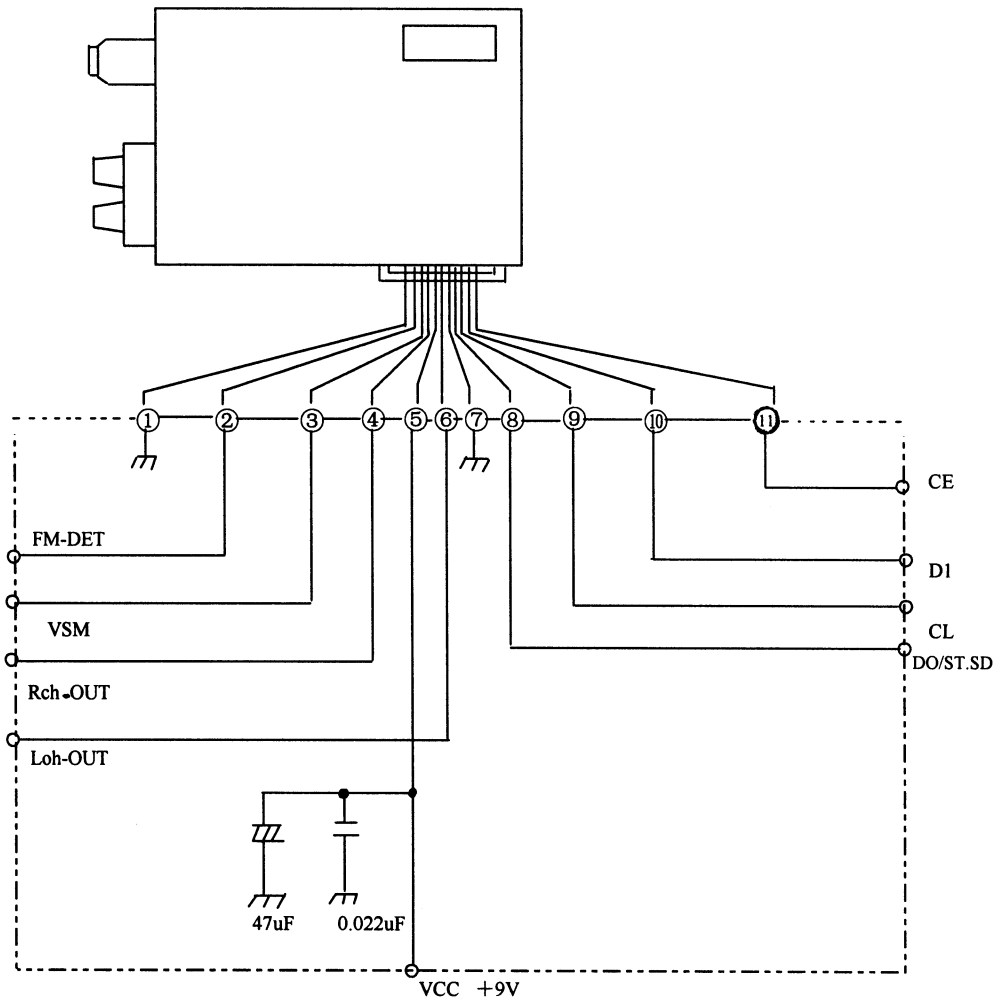
					DSGD.			
					CHKD.			
					APPD	TITLE	PRODUCT	
						TFCF1U	SPECIFICATION	
								(11/E)
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

Description of DI control Data

No.	Control block data	Description	Related data																																																																																					
(1)	Programmable divider data P0 to P15 DVS,SNS	- Data to set the dividing number of programmable divider Binary value with P15 assued to be MSB. LSB varies according to DVS and SNS. (*: don't care) <table><tr><th>DVS</th><th>SNS</th><th>LSB</th><th>set dividing number(N)</th><th>actual dividing number</th></tr><tr><td>1</td><td>*</td><td>P0</td><td>272 to 65535</td><td>Twice the set value</td></tr><tr><td>0</td><td>1</td><td>P0</td><td>272 to 65535</td><td>Set value</td></tr><tr><td>0</td><td>0</td><td>P4</td><td>4 to 4095</td><td>Set value</td></tr></table> * P0 to P3 invalid when LSB:P4 - To select the signal input (FMIN, AMIN) to the programmable divider and to change the input frequency range. (*: don't care) <table><tr><th>DVS</th><th>SNS</th><th>Input</th><th>Operation frequency range</th></tr><tr><td>1</td><td>*</td><td>FMIN</td><td>10 to 160MHz</td></tr><tr><td>0</td><td>1</td><td>AMIN</td><td>2 to 40MHz</td></tr><tr><td>0</td><td>0</td><td>AMIN</td><td>0.5 to 10MHz</td></tr></table>	DVS	SNS	LSB	set dividing number(N)	actual dividing number	1	*	P0	272 to 65535	Twice the set value	0	1	P0	272 to 65535	Set value	0	0	P4	4 to 4095	Set value	DVS	SNS	Input	Operation frequency range	1	*	FMIN	10 to 160MHz	0	1	AMIN	2 to 40MHz	0	0	AMIN	0.5 to 10MHz																																																		
DVS	SNS	LSB	set dividing number(N)	actual dividing number																																																																																				
1	*	P0	272 to 65535	Twice the set value																																																																																				
0	1	P0	272 to 65535	Set value																																																																																				
0	0	P4	4 to 4095	Set value																																																																																				
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0	1	AMIN	2 to 40MHz																																																																																					
0	0	AMIN	0.5 to 10MHz																																																																																					
(2)	Reference divider data R0 to R3	- Reference frequency (fref) selection data <table><tr><th>R3</th><th>R2</th><th>R1</th><th>R0</th><th>Reference frequency</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>25 kHz</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>25</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>25</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>25</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>12.5</td></tr><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>6.25</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>3.125</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>3.125</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>5</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>5</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>5</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td><td>3</td></tr><tr><td>1</td><td>1</td><td>0</td><td>1</td><td>15</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>PLL INHIBIT + X'tal OSC STOP</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>PLL INHIBIT</td></tr></table> * PLL INHIBIT - The programmable divider and IF counter stop, with FMIN,AMIN, and IFIN inputs being in the pull-down condition (GND), and the charge pump has the high impedance.	R3	R2	R1	R0	Reference frequency	0	0	0	0	25 kHz	0	0	0	1	25	0	0	1	0	25	0	0	1	1	25	0	1	0	0	12.5	0	1	0	1	6.25	0	1	1	0	3.125	0	1	1	1	3.125	1	0	0	0	5	1	0	0	1	5	1	0	1	0	5	1	0	1	1	1	1	1	0	0	3	1	1	0	1	15	1	1	1	0	PLL INHIBIT + X'tal OSC STOP	1	1	1	1	PLL INHIBIT	
R3	R2	R1	R0	Reference frequency																																																																																				
0	0	0	0	25 kHz																																																																																				
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1	0	1	1	1																																																																																				
1	1	0	0	3																																																																																				
1	1	0	1	15																																																																																				
1	1	1	0	PLL INHIBIT + X'tal OSC STOP																																																																																				
1	1	1	1	PLL INHIBIT																																																																																				

10-2. TEST JIG

NOTE: Use Test jig which specified

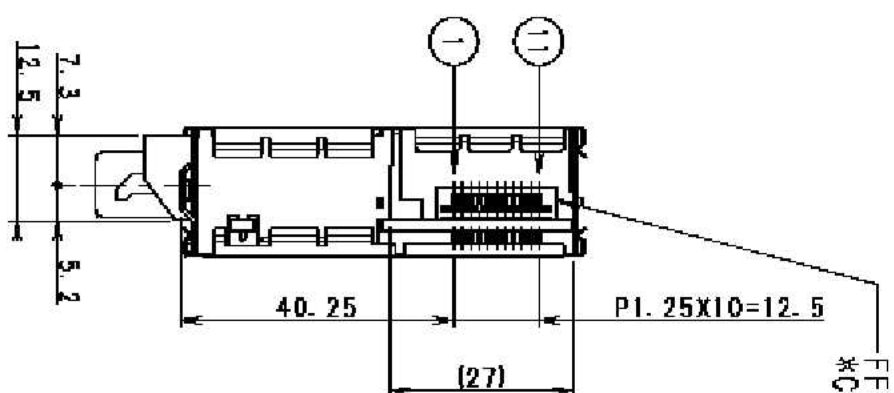
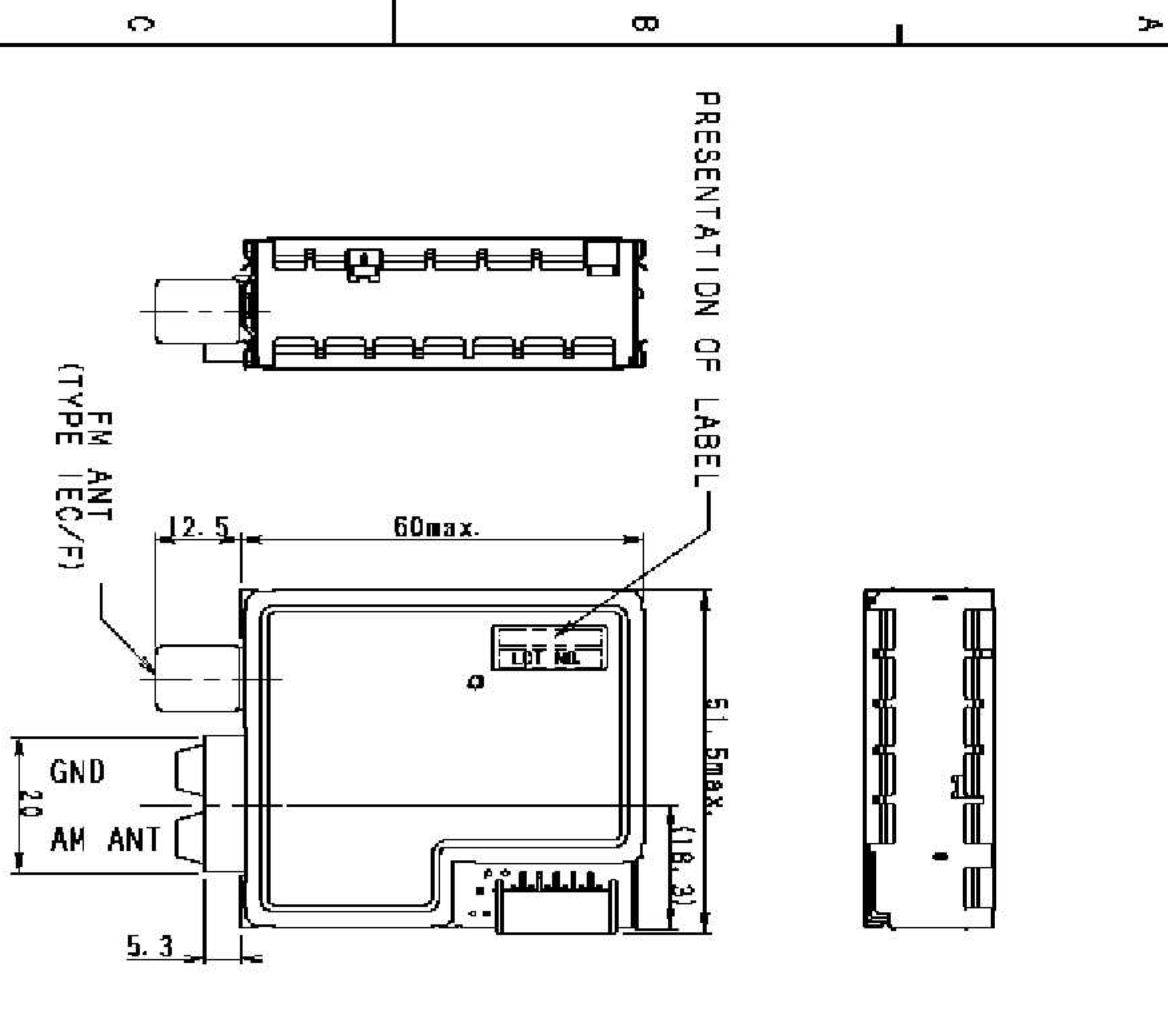


					DSGD.			
					CHKD.			
					APPD	TITLE	PRODUCT	
						TFCF1U	SPECIFICATION	
								(10/11)
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				

11. Printed-Wiring Board Material

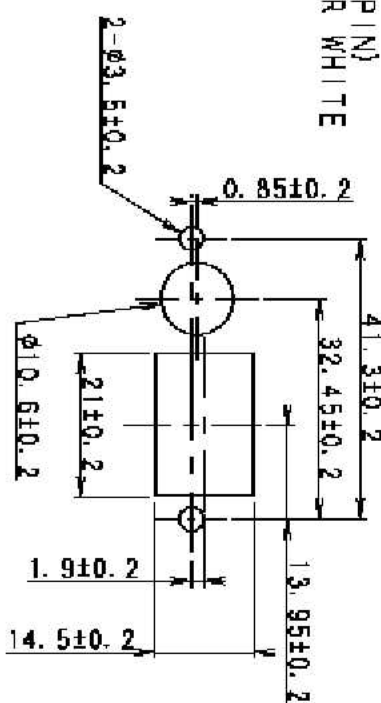
ITEM	Contents		
Material Supplier	Hitachi Chemical CO.,LTD	Hitachi Chemical CO.,LTD	Hitachi Chemical CO.,LTD
Trade Name	MCL J1 437F	MCL J1 437F	MCL J1 437F
UL Grade	94V J1 0	94V J1 0	94V J1 0
Edging Supplier	NIPPON ELEC Co.,LTD	NIPPON ELEC Co.,LTD	PNE PCB LTD.
UL Type Designation	NE 49S.	NE M PF2.	PNE J1 1B
UL File NO.	E41166 (S)	E41166 (S)	E67640
Material Supplier	SUZHOU Matsushita Electric Work Co.,LTD	Suzhou Matsushita Electric Work Co.,LTD	
Trade Name	R8700	R8700	
UL Grade	94V J1 0	94V J1 0	
Etching Supplier	Yamanashi Matsushita Electric Work Co.,LTD	Suzhou Matsushita Electric Works(PWB) Co.,LTD	
UL Type Designation	NTPJ1N870AJ1T YMEWJ1N870AJ1T	SMEWJ1N870AJ1T	
UL File NO.	E107496 (S)	E164387 (S)	
Dimension of Print-Wiring Board	56 × 49		

					DSGD.			
					CHKD.	TITLE	PRODUCT	
						TFCF1U SPECIFICATION		
					APPD	(11/E)		
SYNB.	DATE CR NO.	APPD	CHKD.	DSGD.				



*COLOR IS BRACK OR WHITE

RECOMMENDED MOUNTING HOLE (REFERENCE ONLY)



NOTE 1. TOLERANCES ARE $\pm 0.5\text{mm}$

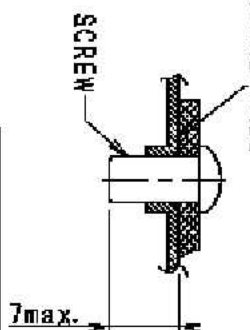
UNLESS OTHERWISE SPECIFIED.

2. ALPS CAN ALTER COVER HOLE DESIGN

WITHOUT NOTICE IF NO ELECTRICAL DEGRADATION

3. SCREW LENGTH FROM MOUNTING FACE IS 8mm MAX.

MOUNTING FACE

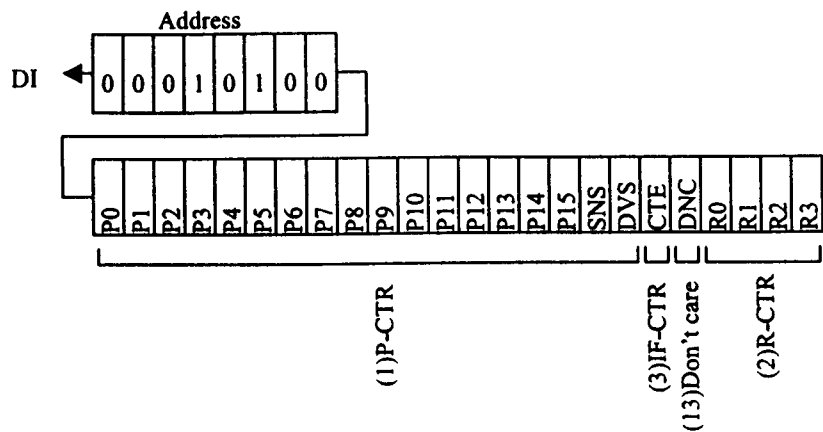


No.	NAME
①	GND
②	FM DET
③	VSM
④	Rch OUT
⑤	Vcc
⑥	Lch OUT
⑦	GND
⑧	DO
⑨	CL
⑩	DI
⑪	CE

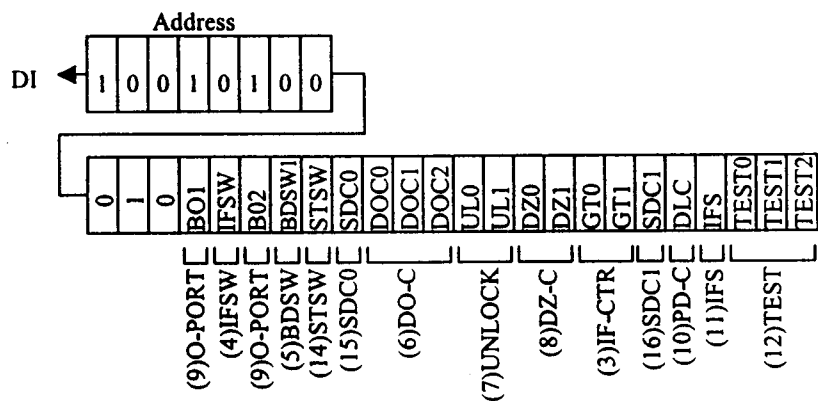
[illegible]

Composition of DI control data (serial data input)

(1) IN mode



(2) IN2 mode



Description of DI control Data

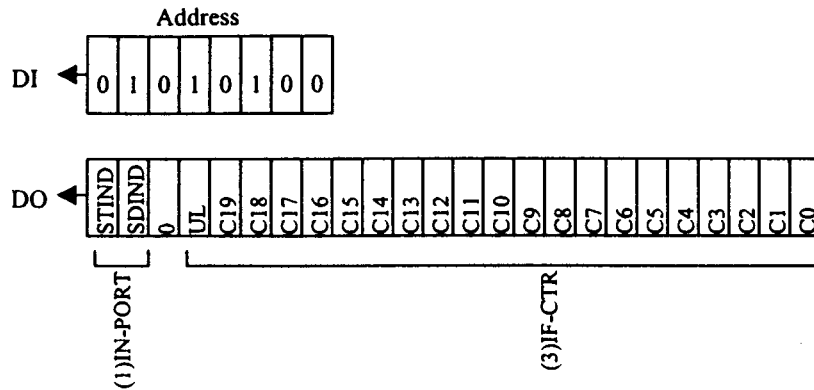
No.	Control block data	Description	Related data																																																																																					
(1)	Programmable divider data P0 to P15 DVS,SNS	• Data to set the dividing number of programmable divider Binary value with P15 assued to be MSB. LSB varies according to DVS and SNS. (*: don't care) <table><tr><th>DVS</th><th>SNS</th><th>LSB</th><th>set dividing number(N)</th><th>actual dividing number</th></tr><tr><td>1</td><td>*</td><td>P0</td><td>272 to 65535</td><td>Twice the set value</td></tr><tr><td>0</td><td>1</td><td>P0</td><td>272 to 65535</td><td>Set value</td></tr><tr><td>0</td><td>0</td><td>P4</td><td>4 to 4095</td><td>Set value</td></tr></table> * P0 to P3 invalid when LSB:P4 • To select the signal input (FMIN, AMIN) to the programmable divider and to change the input frequency range. (*: don't care) <table><tr><th>DVS</th><th>SNS</th><th>Input</th><th>Operation frequency range</th></tr><tr><td>1</td><td>*</td><td>FMIN</td><td>10 to 160MHz</td></tr><tr><td>0</td><td>1</td><td>AMIN</td><td>2 to 40MHz</td></tr><tr><td>0</td><td>0</td><td>AMIN</td><td>0.5 to 10MHz</td></tr></table>	DVS	SNS	LSB	set dividing number(N)	actual dividing number	1	*	P0	272 to 65535	Twice the set value	0	1	P0	272 to 65535	Set value	0	0	P4	4 to 4095	Set value	DVS	SNS	Input	Operation frequency range	1	*	FMIN	10 to 160MHz	0	1	AMIN	2 to 40MHz	0	0	AMIN	0.5 to 10MHz																																																		
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(2)	Reference divider data R0 to R3	• Reference frequency (fref) selection data <table><tr><th>R3</th><th>R2</th><th>R1</th><th>R0</th><th>Reference frequency</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>25 kHz</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>25</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>25</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>25</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>12.5</td></tr><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>6.25</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>3.125</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>3.125</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>5</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>5</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>5</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td><td>3</td></tr><tr><td>1</td><td>1</td><td>0</td><td>1</td><td>15</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>PLL INHIBIT + X'tal OSC STOP</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>PLL INHIBIT</td></tr></table> * PLL INHIBIT • The programmable divider and IF counter stop, with FMIN,AMIN, and IFIN inputs being in the pull-down condition (GND), and the charge pump has the high impedance.	R3	R2	R1	R0	Reference frequency	0	0	0	0	25 kHz	0	0	0	1	25	0	0	1	0	25	0	0	1	1	25	0	1	0	0	12.5	0	1	0	1	6.25	0	1	1	0	3.125	0	1	1	1	3.125	1	0	0	0	5	1	0	0	1	5	1	0	1	0	5	1	0	1	1	1	1	1	0	0	3	1	1	0	1	15	1	1	1	0	PLL INHIBIT + X'tal OSC STOP	1	1	1	1	PLL INHIBIT	
R3	R2	R1	R0	Reference frequency																																																																																				
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0	1	0	0	12.5																																																																																				
0	1	0	1	6.25																																																																																				
0	1	1	0	3.125																																																																																				
0	1	1	1	3.125																																																																																				
1	0	0	0	5																																																																																				
1	0	0	1	5																																																																																				
1	0	1	0	5																																																																																				
1	0	1	1	1																																																																																				
1	1	0	0	3																																																																																				
1	1	0	1	15																																																																																				
1	1	1	0	PLL INHIBIT + X'tal OSC STOP																																																																																				
1	1	1	1	PLL INHIBIT																																																																																				

(3)	CTE GT0,GT1	<table border="1"> <tr> <th>GT1</th><th>GT0</th><th>Counting time</th><th>Wait time</th></tr> <tr> <td>0</td><td>0</td><td>4 ms</td><td>3 to 4 ms</td></tr> <tr> <td>0</td><td>1</td><td>8</td><td>3 to 4</td></tr> <tr> <td>1</td><td>0</td><td>16</td><td>3 to 4</td></tr> <tr> <td>1</td><td>1</td><td>32</td><td>3 to 4</td></tr> </table>	GT1	GT0	Counting time	Wait time	0	0	4 ms	3 to 4 ms	0	1	8	3 to 4	1	0	16	3 to 4	1	1	32	3 to 4	IFS																
GT1	GT0	Counting time	Wait time																																				
0	0	4 ms	3 to 4 ms																																				
0	1	8	3 to 4																																				
1	0	16	3 to 4																																				
1	1	32	3 to 4																																				
(4)	MUTE control data IFSW	Data to determine the output of output port IFSW, controlling the MUTE function. "Data"=0: at receiving 1: MUTE																																					
(5)	FM/AM BAND selection control data BDSW	Data to determine the output of output port BDSW, controlling selection of BAND. "Data"=0: AM 1: FM																																					
(6)	DO pin control data DOC0 DOC1 DOC2	- Data to control DO pin output <table border="1"> <tr> <th>DOC2</th><th>DOC1</th><th>DOC0</th><th>DO pin condition</th></tr> <tr> <td>0</td><td>0</td><td>0</td><td>Open</td></tr> <tr> <td>0</td><td>0</td><td>1</td><td>Low when unlock is detected.</td></tr> <tr> <td>0</td><td>1</td><td>0</td><td>end-UC(See the item with asterisk below)</td></tr> <tr> <td>0</td><td>1</td><td>1</td><td>Open</td></tr> <tr> <td>1</td><td>0</td><td>0</td><td>Open</td></tr> <tr> <td>1</td><td>0</td><td>1</td><td>Low when SDON</td></tr> <tr> <td>1</td><td>1</td><td>0</td><td>Low when stereo</td></tr> <tr> <td>1</td><td>1</td><td>1</td><td>Open</td></tr> </table> - The open condition is selected at power ON/reset. * IF counter counting end check ①Counting start ②Counting end ③CE: HI ① With end-UC set and IF counter starting (CTE=0→1), DO pin opens automatically. ② At end of counting of the IF counter, DO pin goes LOW and check on counting end can be made. ③ DO pin opens when serial data is entered/output (CE pin: Hi) Note: DO pin is always in the open condition during data input (IN1 and IN2 modes, during CE: Hi period), regardless of DO pin control data (DOC0 to 2). In the DO pin condition during data output (OUT mode, CE-Hi period), the content of internal DO serial data is output in synchronization with CL, regardless of DO pin control data (DOC).	DOC2	DOC1	DOC0	DO pin condition	0	0	0	Open	0	0	1	Low when unlock is detected.	0	1	0	end-UC(See the item with asterisk below)	0	1	1	Open	1	0	0	Open	1	0	1	Low when SDON	1	1	0	Low when stereo	1	1	1	Open	UL0,UL1 CTE
DOC2	DOC1	DOC0	DO pin condition																																				
0	0	0	Open																																				
0	0	1	Low when unlock is detected.																																				
0	1	0	end-UC(See the item with asterisk below)																																				
0	1	1	Open																																				
1	0	0	Open																																				
1	0	1	Low when SDON																																				
1	1	0	Low when stereo																																				
1	1	1	Open																																				

No.	Control block data	Description	Related data																
(7)	Unlock detection data UL0,UL1	Phase error (ϕE) detection width selection data to judge if PLL is locked. Phase error exceeding the detection width is judged that PLL is locked (*:don't care) <table><tr><th>UL1</th><th>UL0</th><th>ϕE Detection width</th><th>Detection output</th></tr><tr><td>0</td><td>0</td><td>Stop</td><td>Open</td></tr><tr><td>0</td><td>1</td><td>0</td><td>Direct output of ϕE</td></tr><tr><td>1</td><td>*</td><td>$\pm 6.6\mu$</td><td>ϕE extended by 1 to 2 ms</td></tr></table> * DO pin is LOW. Serial data output: UL = 0.	UL1	UL0	ϕE Detection width	Detection output	0	0	Stop	Open	0	1	0	Direct output of ϕE	1	*	$\pm 6.6\mu$	ϕE extended by 1 to 2 ms	DOC0 DOC1 DOC2
UL1	UL0	ϕE Detection width	Detection output																
0	0	Stop	Open																
0	1	0	Direct output of ϕE																
1	*	$\pm 6.6\mu$	ϕE extended by 1 to 2 ms																
(8)	Phase comparator control data DZ0,DZ1	Data to control the dead zone of phase comparator <table><tr><th>DZ1</th><th>DZ0</th><th>Dead zone mode</th></tr><tr><td>0</td><td>0</td><td>DZA</td></tr><tr><td>0</td><td>1</td><td>DZB</td></tr><tr><td>1</td><td>0</td><td>DZC</td></tr><tr><td>1</td><td>1</td><td>DZD</td></tr></table> Dead zone width: DZA<DZB<DZC<DZD	DZ1	DZ0	Dead zone mode	0	0	DZA	0	1	DZB	1	0	DZC	1	1	DZD		
DZ1	DZ0	Dead zone mode																	
0	0	DZA																	
0	1	DZB																	
1	0	DZC																	
1	1	DZD																	
(9)	Output port data $\overline{BO1}, \overline{BO2}$	Data to determine the output of output ports $\overline{BO1}$ and $\overline{BO2}$ "Data"=0: OPEN 1: Low																	
(10)	Charge pump control data DLC	Data to enforce control of charge pump output <table><tr><th>DLC</th><th>Charge pump output</th></tr><tr><td>0</td><td>Normal</td></tr><tr><td>1</td><td>Forced to LOW</td></tr></table> In case of dead lock because of VCO oscillation stop when the VCO control voltage (Vtune) is 0 V, it is possible to clear dead lock by setting the charge pump output to LOW and V tune to Vcc. (Dead lock clear circuit)	DLC	Charge pump output	0	Normal	1	Forced to LOW											
DLC	Charge pump output																		
0	Normal																		
1	Forced to LOW																		
(11)	IFS	Normally, set Data = 1. Setting Data = 0 causes the input sensitivity worsening mode and the sensitivity decreases by about 10 to 30mVrms.																	
(12)	LSI test data TEST0 to 2	LSI test data <table><tr><td>TEST0</td><td rowspan="3">All to be set to "0"</td></tr><tr><td>TEST1</td></tr><tr><td>TEST2</td></tr></table> All set to zero at power ON/reset	TEST0	All to be set to "0"	TEST1	TEST2													
TEST0	All to be set to "0"																		
TEST1																			
TEST2																			
(13)	DNC	Set data = 0.																	
(14)	Forced monaural control data STSW	Data to determine the output of output port STSW, controlling the forced stereo functions. "Data"=0: MONO 1: STEREO																	
(15) (16)	SD sensitivity control data SDC0 SDC1	Data to determine the output of output ports SDC0 and SDC1, controlling the SD sensitivity "Data"=SDC0: 0, SDC1: 0 → SD sensitivity = 42dBuV (Typ) SDC0: 0, SDC1: 1 → SD sensitivity = 45dBuV (Typ) SDC0: 1, SDC1: 0 → SD sensitivity = 51dBuV (Typ) SDC0: 1, SDC1: 1 → SD sensitivity = 56dBuV (Typ)																	

DO control data (serial data output) composition

(1) OUT mode

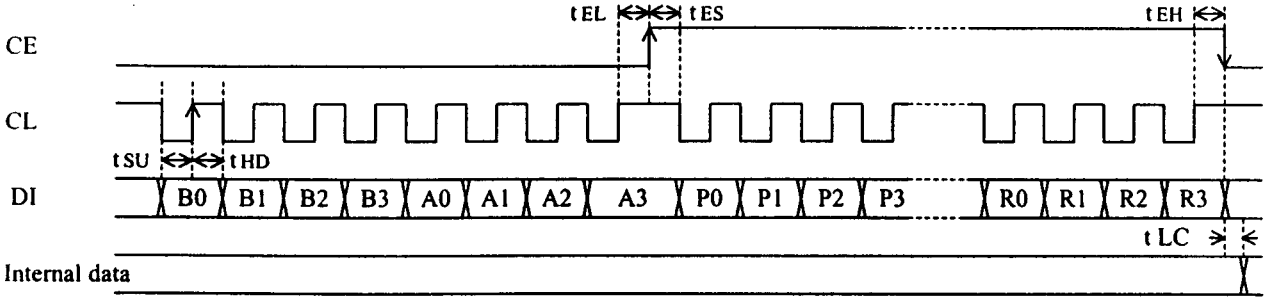


Description of the DO output data

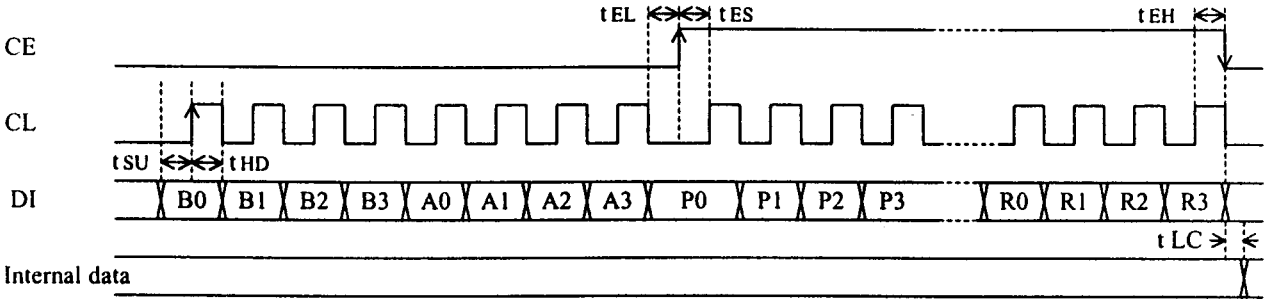
No.	Control block data	Description	Related data
(1)	Stereo and SD indicators control data STIND, SDIND	- Data latching stereo and SD indicator conditions. - Latching made in the data output (OUT) mode. - STIND ← Stereo indicator condition 0: ST ON, 1: ST OFF - SDIND ← SD indicator condition 0: SD ON, 1: SD OFF	
(2)	PLL unlock data UL	- Data latching the content of unlock detection circuit - UL ← 0: At unlock 1: At lock or detection stop mode	UL0 UL1
(3)	IF counter, binary counter C19 to C0	- Data latching the content of IF counter (20-bit binary counter) - C19 ← MSB of binary counter - C0 ← LSB of binary counter	CTE GT0 GT1

Serial data input (IN1/IN2) $t_{SU}, t_{HD}, t_{EL}, t_{ES}, t_{EH} \geq 0.75 \mu s$ $t_{LC} < 0.75 \mu s$

① CL: Normally HI

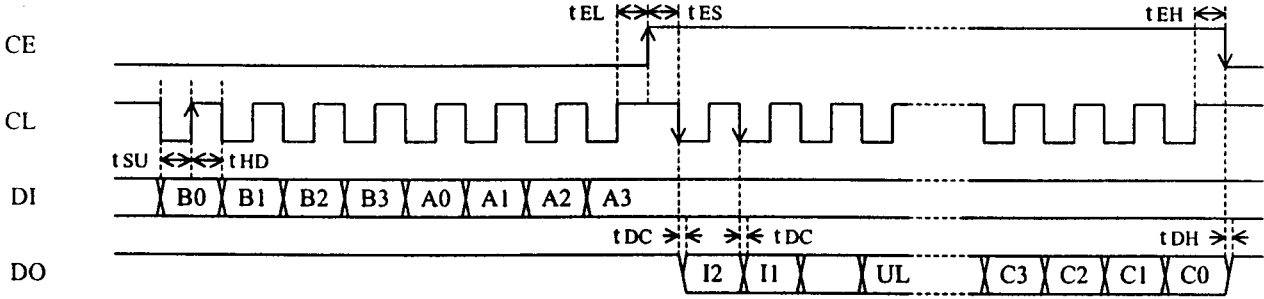


② CL: Normally LOW

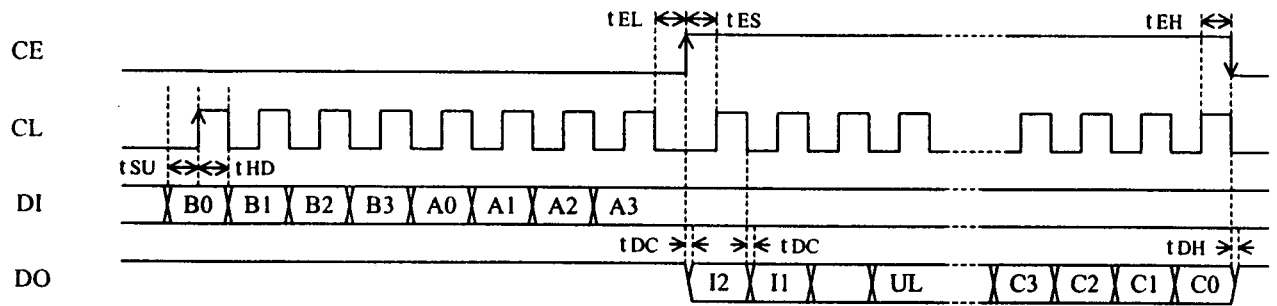


Serial data output (OUT) $t_{SU}, t_{HD}, t_{EL}, t_{ES}, t_{EH} \geq 0.75 \mu s$ $t_{DC}, t_{DH} < 0.35 \mu s$

① CL: Normally Hi

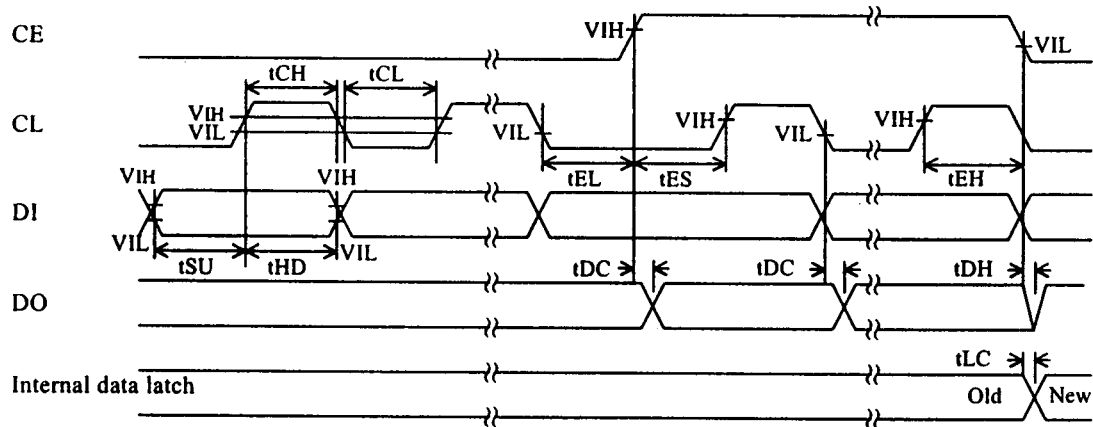


② CL: Normally low

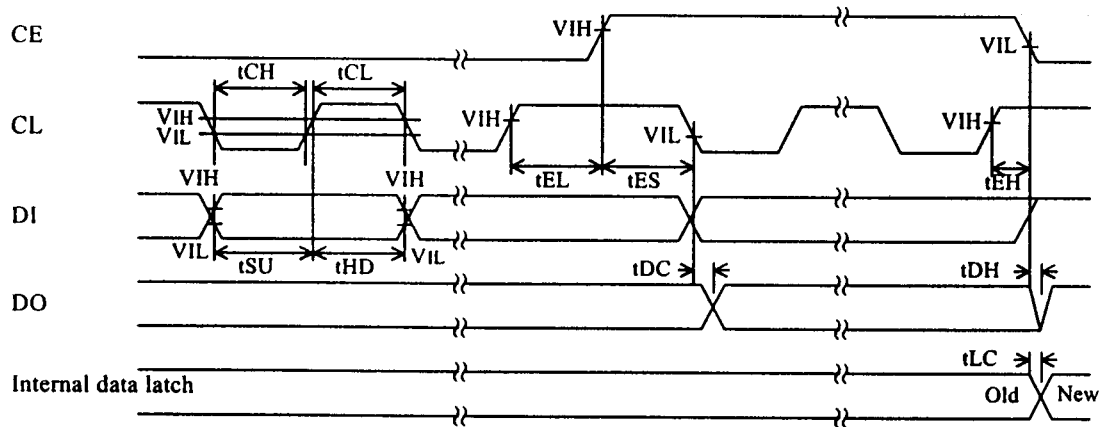


(Note) DO pin is an Nch open drain pin, so that the data varying time (t_{DC} and t_{DH}) differs depending on the pull-up resistance and substrate capacity.

Serial data timing



<< When CL stops at the "L" level >>



<< When CL stops at the "H" level >>

Parameter	Symbol	Pin	Conditions	Min	Typ	Max	Unit
Data setup time	tSU	DI,CL		0.75			μs
Data hold time	tHD	DI,CL		0.75			μs
Clock "L" level time	tCL	CL		0.75			μs
Clock "H" level time	tCH	CL		0.75			μs
CE wait time	tEL	CE,CL		0.75			μs
CE setup time	tES	CE,CL		0.75			μs
CE hold time	tEH	CE,CL		0.75			μs
Data latch change time	tLC					0.75	μs
Data output time	tDC	DO,CL	Differs depending on the pull-up resistance and substrate capacity			0.35	μs
	tDH	DO,CE					

最新カスタムIC搭載により容積30%減（当社従来品比）の小形化を実現。
30 % less volume than our traditional models thanks to state-of-the-art customized IC.



■ 特長

- 独自開発のICを搭載し、当社従来品容積比約30%減の小形化（60ml）を達成。
- ANTコネクタ部を直出構造とし、内部をフルシールド化することにより、優れたノイズ除去能力を発揮。

■ 用途

- マイコンコンポーネントステレオ、MDラジカセ、DVD、オーディオレシーバなど多機能化、小形化傾向の進む、各種オーディオ機器、ミニコンポーネントステレオ、各種多機能オーディオ機器。

■ Features

- Uniquely developed IC has achieved a small volume of 60 ml, 30 % less than our traditional models.
- Fully shielded structure with ANT connector effectively filters out noise.

■ Applications

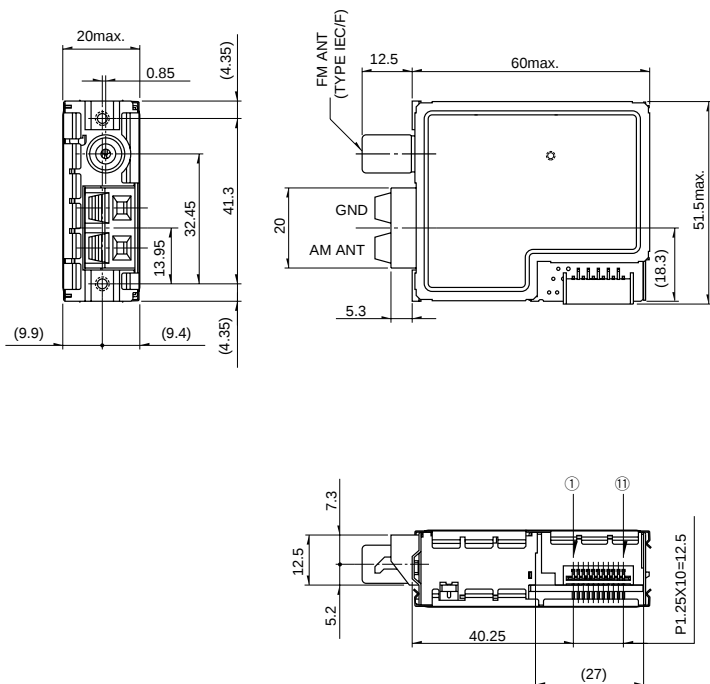
- Offers a wide range applications to audio equipment, especially multi-functional, compact audio equipment, such as mini- and micro-component stereo equipment, MD radio cassette recorders, DVDs and audio receivers.

■ 主な仕様 Typical Specifications

Items		Specifications
Receiving frequency range	AM (kHz)	530 to 1710
	FM (MHz)	87.5 to 108
Input impedance (Ω)	AM	—
	FM	75
Receive sensitivity (dB μ)	AM@SN20dB	51
	FM@SN50dB	15
Stereo separation (dB)	FM	45
Output level (dBs)	AM	-7.5
	FM	2.5
Total harmonic distortion (%)	AM	1.2
	FM	0.25
Power consumption (V/W)		9/500
Volume (ml)		60

■外形図 Dimensions

Unit : mm



Terminal No.	Terminal name
①	GND
②	FM DET
③	VSM
④	Rch OUT
⑤	Vcc
⑥	Lch OUT
⑦	GND
⑧	DO
⑨	CL
⑩	DI
⑪	CE

■回路ブロックダイアグラム Circuit Block Diagram

