

MPEG4 PLAYER

CO-285



Service **M**anual

GB

 **DOLBY**
DIGITAL

 **DVD**
VIDEO

 **COMPACT**
disc
DIGITAL AUDIO

 **KODAK**
PICTURE CD
COMPATIBLE

 **MP3**
PLAYER

 **Progressive**
scan

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1. PRECAUTIONS

1-1 Safety Precautions

1) Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

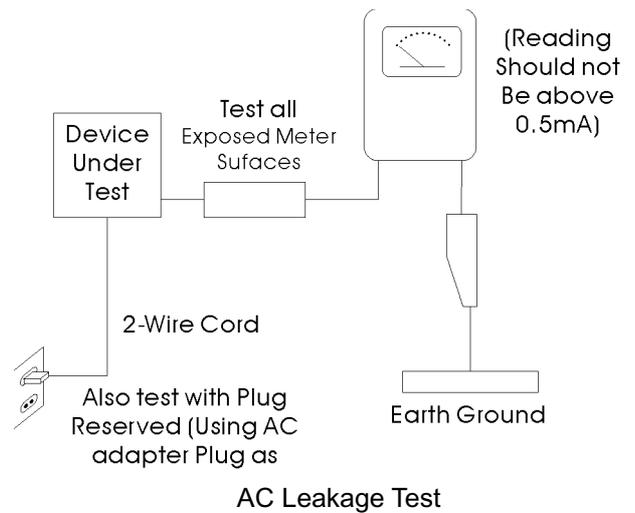
- (1) Be sure that no built-in protective devices are defective or have been defeated during servicing.
 - (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any remove for servicing convenience.
 - (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fish papers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

- (2) Be sure that there are no cabinet opening through which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

- (3) Leakage Current Hot Check-With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage.

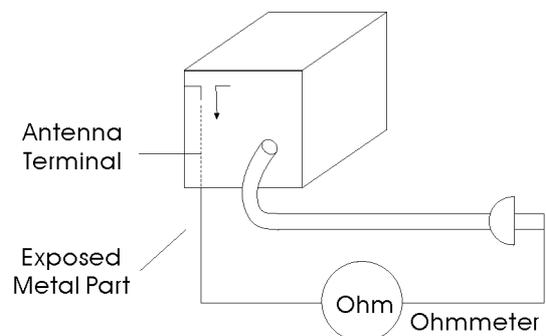
Current for Appliances and underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially and exposed metal parts that offer an electrical return path to the chassis.

Any current measured must not exceed 0.5mA. Reverse the instrument power cord plug in the outlet and repeat the test.



Any measurements not within the limits specified herein indicate a potential shock hazard that must be eliminated before returning the instrument to the customer.

- (4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be re-pared and rechecked before it is returned to the customer.



- 2) Read and comply with all caution and safety related notes non or inside the cabinet, or on the chassis.
- 3) Design Alteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the service, responsible for personal injury or property damage resulting there from.
- 4) Observe original lead dress. Take extra care to assure correct lead dress in the following areas:
 - (1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between a component and the printed-circuit board, Check the AC power cord for damage.
- 5) Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/or wiring that meet original specifications. Additionally determine the cause of overheating and/or damage and, if necessary, take corrective action to remove and potential safety hazard.
- 6) Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an () or a () on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

CAUTION: Before servicing Instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforeseen circumstance create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. Remember; Safety First

1-2-1 General Servicing Precautions

- (1) a. Always unplug the instrument's AC power cord from the AC power source before (1) removing or reinstalling any component, circuit board, module or any other instrument assembly. (2) disconnecting any instrument electrical plug or other electrical connection. (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
- b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
- c. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
- d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead

last.

Note: Refer to the Safety Precautions section ground lead last.

- (2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.
- (3) The components used in the unit have a specified flame resistance and dielectric strength. When replacing components, use components which have the same ratings, by () or by () in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.
- (4) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.
- (5) After servicing, always check that the removed screws, components, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plus and accessible conductive parts.

1-2-2 Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the

attachment plug and accessible conductive parts (see note) should be more than 1 Megohm.

Note: Accessible conductive parts include metal panels, input terminals, earphone jacks, etc.

1-3 ESD Precautions

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid static electricity) devices can be damaged easily by static electricity.

Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques of component damage caused by static electricity.

- (1) immediately before handling any semiconductor components or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, 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 ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
- (3) Use only a grounded-tip soldering iron to solder or unsolder ESD device.
- (4) Use only an anti-static solder removal devices.

Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.

- (5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
- (6) Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
- (7) Immediately before removing the protective materials from the leads of a replacement ESD 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 ESD 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 sufficient to damage an ESD device).

2. Reference Information

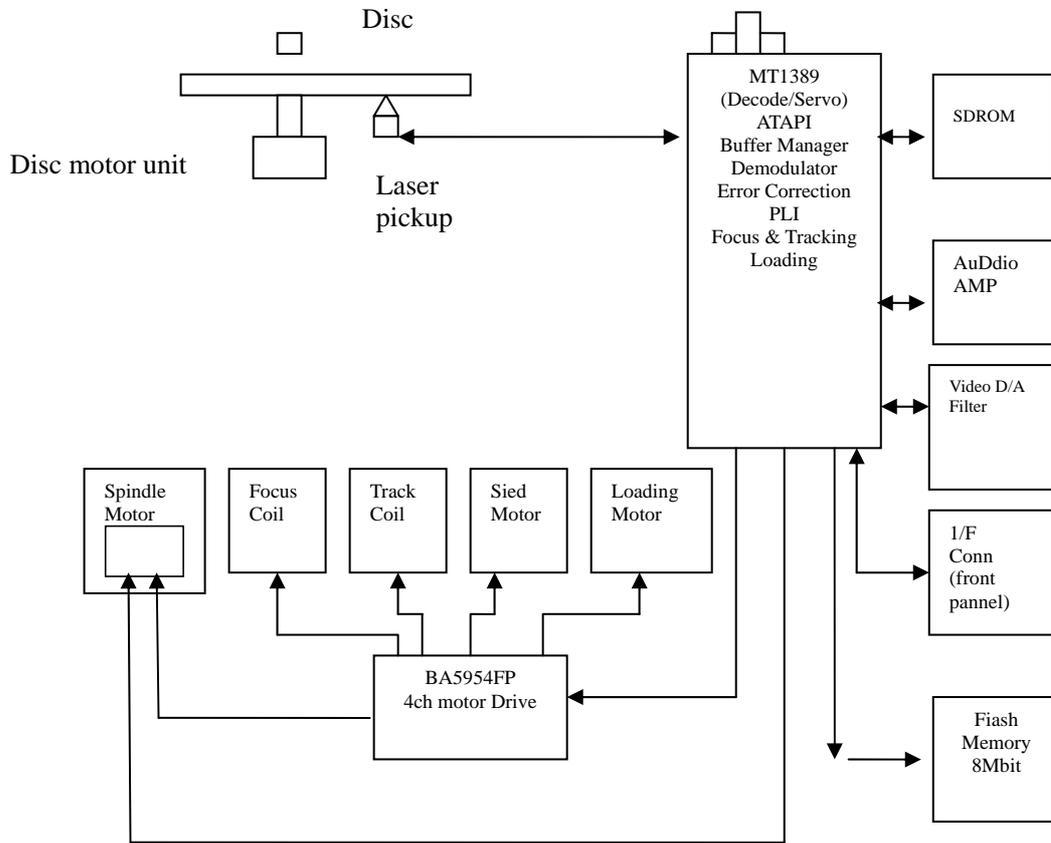
2-1 Component Descriptions

2-1-1 HITACH 1200X / SAMSUNG DL6

Connector Pin Definition

I/F Signals	I/O Pin #
F-	1
F+	2
T+	3
T-	4
C	5
D	6
CD/DVD	7
RF	8
A	9
B	10
F	11
GND-PD	12
VC	13
VCC	14
E	15
NC	16
VR-CD	17
VR-DVD	18
LD-CD	19
MD	20
HFM	21
NC	22
LD-DVD	23
GND-LD	24

Block Diagram



2-1-2 DVD Processor Chip MTK1389L

General Description

MediaTek MT1389L is a cost-effective DVD system-on-chip (SOC) which incorporates advanced features like MPEG-4 video decoder, high quality TV encoder and state-of-art de-interlace processing. The MT1389L enables consumer electronics manufacturers to build high quality, feature-rich DVD players, portable DVD players or any other home entertainment audio/video devices.

World-Leading Technology: Based on MediaTek's world-leading DVD player SOC architecture, the MT1389L is the New generation of the DVD player SOC. It integrates the MediaTek 3rd generation front-end digital RF amplifier and the Servo/MPEG AV decoder.

Rich Feature for High Valued Product: To enrich the feature of DVD player, the MT1389 equips a simplified MPEG-4 advanced simple profile (ASP) video decoder to fully support the DivX1 Home Theater profile. It makes the MT1389-based DVD player be capable of playback MPEG-4 content which become more and more popular.

Incredible Audio/Video Quality: The progressive scan of the MT1389L utilized advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback. It also supports a 3:2 pull down algorithm to give the best film effect. The 108MHz/12-bit video DAC provides users a whole new viewing experience. Built-in 6ch audio DACs and 2ch audio ADCs could give the variable function solutions.

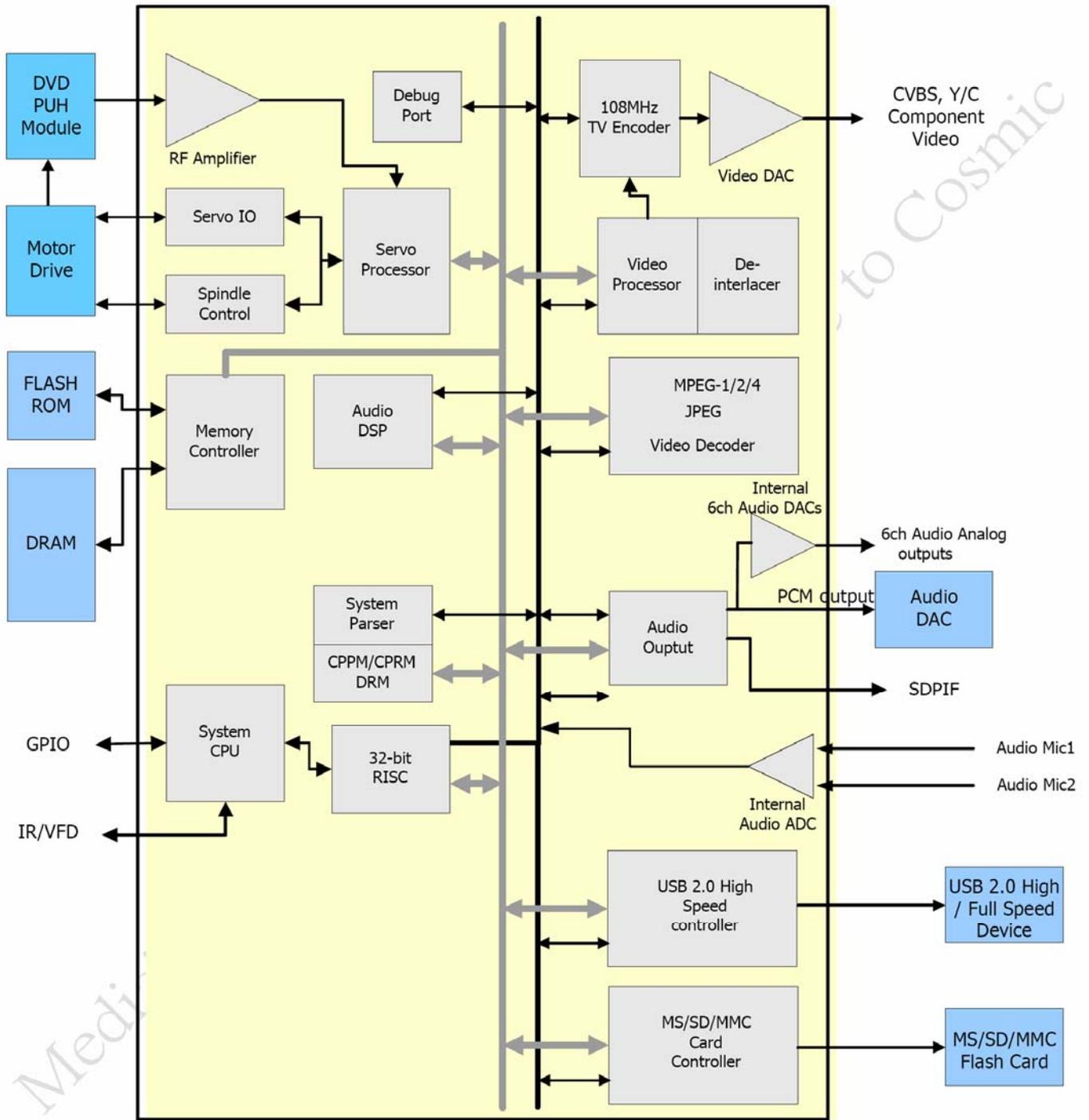
Key Features

- ◆ RF/Servo/MPEG Integration
- ◆ Embedded 6ch Audio DAC
- ◆ High Performance Audio Processor
- ◆ High Performance Progressive Video Processor
- ◆ Support Nero-Digital
- ◆ Support DivX Ultra
- ◆ High Quality 108MHz/12-bit, 4 CH TV Encoder

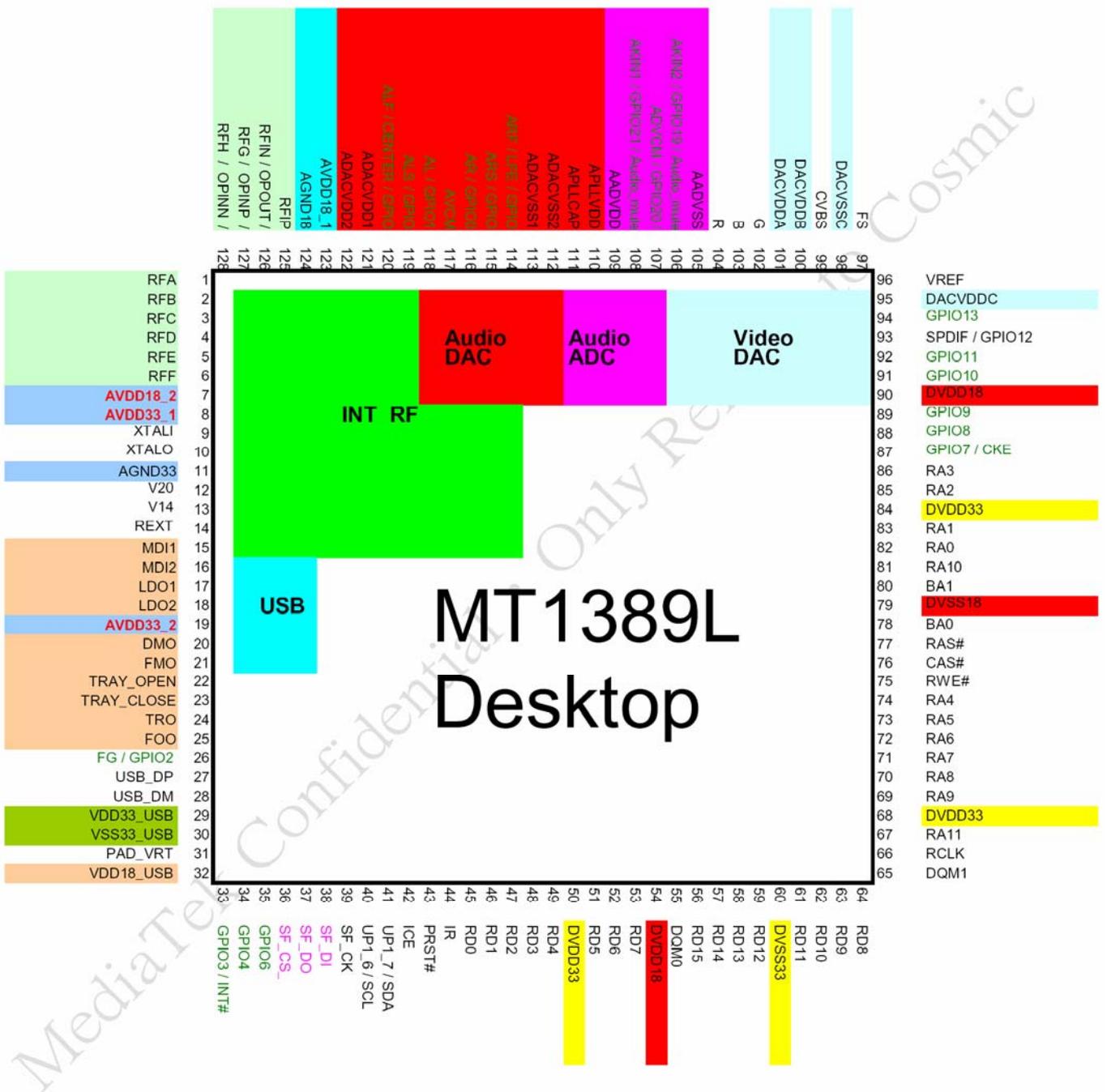
Applications

- ◆ Standard DVD Players
- ◆ DVD Players Home Theater Application
- ◆ Portable DVD Players
- ◆ TV/DVD Combo Systems

Functional Block



* Pin Assignment



PIN DESCRIPTON

Abbreviations:

- SR: Slew Rate
- PU: Pull Up
- PD: Pull Down
- SMT: Schmitt Trigger
- 4mA~16mA: Output buffer driving strength.

Pin	Main	Alt.	Type	Description
Analog Interface (66)				
125	RFIP		Analog Input	AC coupled DVD RF signal input RFIP
126	RFIN	OPOUT	Analog Input	AC coupled DVD RF signal input RFIN
127	RFG	OPINP	Analog Input	Main beam, RF AC input path
128	RFH	OPINN	Analog Input	Main beam, RF AC input path
1	RFA		Analog Input	RF main beam input A
2	RFB		Analog Input	RF main beam input B
3	RFC		Analog Input	RF main beam input C
4	RFD		Analog Input	RF main beam input D
5	RFE		Analog Input	RF sub beam input E
6	RFF		Analog Input	RF sub beam input E
7	AVDD18_2		Analog power	Analog 1.8V power
8	AVDD33_1		Analog Power	Analog 3.3V power
9	XTALI		Input	27MHz crystal input
10	XTALO		Output	27MHz crystal output
11	AGND33		Analog Ground	Analog Ground
12	V20		Analog output	Reference voltage 2.0V
13	V14		Analog output	Reference voltage 1.4V
14	REXT		Analog Input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS
15	MDI1		Analog Input	Laser power monitor input

Pin	Main	Alt.	Type	Description
16	MDI2		Analog Input	Laser power monitor input
17	LDO1		Analog Output	Laser driver output
18	LDO2		Analog Output	Laser driver output
19	AVDD33_2		Analog Power	Analog 3.3V power
20	DMO		Analog Output	Disk motor control output. PWM output
21	FMO		Analog Output	Feed motor control. PWM output
22	TRAY_OPEN		Analog Output	Tray PWM output/Tray open output
23	TRAY_CLOSE		Analog Output	Tray PWM output/Tray close output
24	TRO		Analog Output	Tracking servo output. PDM output of tracking servo compensator
25	FOO		Analog Output	Focus servo output. PDM output of focus servo compensator
26	FG	GPIO2	Analog	1) Motor Hall sensor input 2) GPIO
27	USB_DP		Analog Inout	USB port DPLUS analog pin
28	USB_DM		Analog Inout	USB port DMINUS analog pin
29	VDD33_USB		USB Power	USB Power pin 3.3V
30	VSS33_USB		USB Ground	USB ground pin
31	PAD_VRT		Analog Inout	USB generating reference current
32	VDD18_USB		USB Power	USB Power pin 1.8V
95	DACVDDC		Power	3.3V power pin for video DAC circuitry
96	VREF		Analog	Bandgap reference voltage
97	ES		Analog	Full scale adjustment (suggest to use 560 ohm)
98	DACVSSC		Ground	Ground pin for video DAC circuitry
99	CVBS		Analog	Analog CVBS or C
100	DACVDDB		Power	3.3V power pin for video DAC circuitry
101	DACVDDA		Power	3.3V power pin for video DAC circuitry
102	Y/G		Analog	Green, Y, SY, or CVBS
103	B/CB/PB		Analog	Blue, CB/PB, or SC

Pin	Main	Alt.	Type	Description
104	R/CR/PR		Analog	Red, CR/PR, CVBS, or SY
105	AADVSS		Ground	Ground pin for 2ch audio ADC circuitry
106	AKIN2		Analog	1) Audio ADC input 2 2) MS_CLK set B 3) MCDATA 4) Audio Mute 5) HSYN/VSYN output 6) C5 7) GPIO
107	ADVCM		Analog	1) 2ch audio ADC reference voltageC 2) C6 3) GPIO
108	AKIN1		Analog	1) Audio ADC input 1 2) MS_D0 set B 3) Audio Mute 4) HSYN/VSYN output 5) C7 6) GPIO
109	AADVDD		Power	3.3V power pin for 2ch audio ADC circuitry
110	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
111	APLLCAP		Analog InOut	APLL external capacitance connection
112	ADACVSS2		Ground	Ground pin for audio DAC circuitry
113	ADACVSS1		Ground	Ground pin for audio DAC circuitry
114	ARF / LFE	GPIO	Analog Output	1) Audio DAC sub-woofer channel output 2) While internal audio DAC not used: a. ACLK b. GPIO
115	ARS	GPIO	Analog Output	1) Audio DAC right Surround channel output 2) While internal audio DAC not used: a. ABCK b. GPIO

Pin	Main	Alt.	Type	Description
116	AR	GPIO	Analog Output	1) Audio DAC right channel output 2) While internal audio DAC not used: a. SDATA2 b. GPIO c. RXD2
117	AVCM		Analog	Audio DAC reference voltage
118	AL	GPIO	Analog Output	1) Audio DAC left channel output 2) While internal audio DAC not used: a. SDATA1 b. GPIO c. TXD2
119	ALS	GPIO	Analog Output	1) Audio DAC left Surround channel output 2) While internal audio DAC not used: a. ALRCK b. GPIO
120	ALF /CENTER	GPIO	Analog Output	1) Audio DAC center channel output 2) While internal audio DAC not used: a. ASDATA0 b. GPIO
121	ADACVDD1		Analog Power	3.3V power pin for audio DAC circuitry
122	ADACVDD2		Analog Power	3.3V power pin for audio DAC circuitry
123	AVDD18_1		Analog Power	Analog 1.8V power
124	AGND18		Analog Ground	Analog Ground
General Power/Ground (7)				
54, 90	DVDD18		Power	1.8V power pin for internal digital circuitry
79	DVSS18		Ground	1.8V Ground pin for internal digital circuitry
50, 68, 84	DVDD33		Power	3.3V power pin for internal digital circuitry
60	DVSS		Ground	3.3V Ground pin for internal digital circuitry
Micro Controller , Flash Interface and GPIO(12)				
33	GPIO3	INT#	InOut 8mA, SR PU, SMT	1) General purpose IO 3 2) Microcontroller port 3-1 3) Microcontroller external interrupt 1
34	GPIO4		InOut 4mA, PD	1) General purpose IO 4 2) Microcontroller port 3-4 (Internal Pull-Up)

Pin	Main	Alt.	Type	Description
35	GPIO6		InOut 4mA, PD	1) General purpose IO 6 2) Microcontroller port 3-5 (Internal Pull-Up)
36	SF_CS_		InOut 8mA, SR PU, SMT	Serial Flash Chip Select
37	SF_DO		InOut 8mA, SR PD, SMT	Serial Flash Dout
38	SF_DI		InOut 8mA, SR PU, SMT	Serial Flash Din
39	SF_CK		InOut 8mA, SR PD, SMT	Serial Flash Clock
40	UP1_6	SCL	InOut 4mA, SR PU, SMT	1) Microcontroller port 1-6 2) I ² C clock pin
41	UP1_7	SDA	InOut 4mA, SR PU, SMT	1) Microcontroller port 1-7 2) I ² C data pin
42	ICE		Input PD, SMT	Microcontroller ICE mode enable
43	PRST#		Input PU, SMT	Power on reset input, active low
44	IR		Input SMT	IR control signal input
Dram Interface (37) (Sorted by position)				
45	RD0		InOut, 4mA	DRAM data 0

Pin	Main	Alt.	Type	Description
46	RD1		InOut 4mA	DRAM data 1
47	RD2		InOut 4mA	DRAM data 2
48	RD3		InOut 4mA	DRAM data 3
49	RD4		InOut 4mA	DRAM data 4
51	RD5		InOut 4mA	DRAM data 5
52	RD6		InOut 4mA	DRAM data 6
53	RD7		InOut 4mA	DRAM data 7
55	DQM0		InOut 4mA, PD	Data mask 0
56	RD15		InOut 4mA	DRAM data 15
57	RD14		InOut 4mA	DRAM data 14
58	RD13		InOut 4mA	DRAM data 13
59	RD12		InOut 4mA	DRAM data 12
61	RD11		InOut 4mA	DRAM data 11
62	RD10		InOut 4mA	DRAM data 10
63	RD9		InOut 4mA	DRAM data 9
64	RD8		InOut 4mA	DRAM data 8

Pin	Main	Alt.	Type	Description
65	DQM1		InOut 4mA, PD	Data mask 1
66	RCLK		InOut 4mA, PD	Dram clock
67	RA11		InOut 4mA, PD	DRAM address bit 11
69	RA9		InOut 4mA, PD	DRAM address 9
70	RA8		InOut 4mA, PD	DRAM address 8
71	RA7		InOut 4mA, PD	DRAM address 7
72	RA6		InOut 4mA, PD	DRAM address 6
73	RA5		InOut 4mA, PD	DRAM address 5
74	RA4		InOut 4mA, PD	DRAM address 4
75	RWE#		Output 4mA, PD	DRAM Write enable, active low
76	CAS#		Output 4mA, PD	DRAM column address strobe, active low
77	RAS#		Output 4mA, PD	DRAM row address strobe, active low
78	BA0		InOut 4mA, PD	DRAM bank address 0
80	BA1		InOut 4mA, PD	DRAM bank address 1
81	RA10		InOut 4mA, PD	DRAM address 10

Pin	Main	Alt.	Type	Description
82	RA0		InOut 4mA, PD	DRAM address 0
83	RA1		InOut 4mA, PD	DRAM address 1
85	RA2		InOut 4mA, PD	DRAM address 2
86	RA3		InOut 4mA, PD	DRAM address 3
87	GPIO7	CKE	InOut 4mA, PD	1) GPIO 7 2) Dram Clock Enable 3) MS_CLK set A 4) Audio Mute 5) HSYN/VSYN input 6) C0 7) Microcontroller port 1-4 (Internal Pull-Up)
GPIO (6)				
88	GPIO8		InOut 4mA, PD	1) GPIO8 2) MS_BS set A 3) SD_CLK set A 4) ASDATA2 5) ACLK 6) Audio Mute 7) HSYN/VSYN input 8) C1 9) Microcontroller port 1-5 (Internal Pull-Up)
89	GPIO9		InOut 4mA, PU	1) GPIO9 2) MS_D0 set A 3) SD_CMD set A 4) ASDATA1 5) ABCK 6) C2 7) RXD1

Pin	Main	Alt.	Type	Description
91	GPIO10		InOut 4mA, PD	1) GPIO10 2) SD_CLK set B 3) SD_D0 set A 4) ASDATA0 5) ALRCK 6) HSYN/VSYN output 7) C3 8) TXD1
92	GPIO11		InOut 4mA, PD	1) GPIO11 2) SD_CMD set B 3) MS_BS set B 4) Audio Mute 5) HSYN/VSYN output 6) C4 7) Microcontroller port 3-0 (Internal Pull-Up)
93	SPDIF	GPIO12	InOut 2mA, PD	1) SPDIF output 2) GPIO12
94	GPIO13		InOut 4mA, PD	1) GPIO13 2) SD_D0 set B 3) ALRCK 4) Audio Mute 5) YUVCLK

Note:

1. The Main column is the main function, Alt. means alternative function.
2. The multi-function GPIO pins are set to **green characters**.

2-1-3 FLASH MEMORY EN25B80

GENERAL DESCRIPTION

The EN25B80 is a 8M-bit (1024K-byte) Serial Flash memory, with advanced write protection mechanisms, accessed by a high speed SPI-compatible bus. The memory can be programmed 1 to 256 bytes at a time, using the Page Program instruction.

The EN25B80 has twenty sectors including fifteen sectors of 64KB, one sector of 32KB, one sector of 16KB, one sector of 8KB and two sectors of 4KB. This device is designed to allow either single Sector at a time or full chip erase operation. The EN25B80 can protect boot code stored in the small sectors for either bottom or top boot configurations. The device can sustain a minimum of 100K program/erase cycles on each sector.

Figure.1 CONNECTION DIAGRAMS

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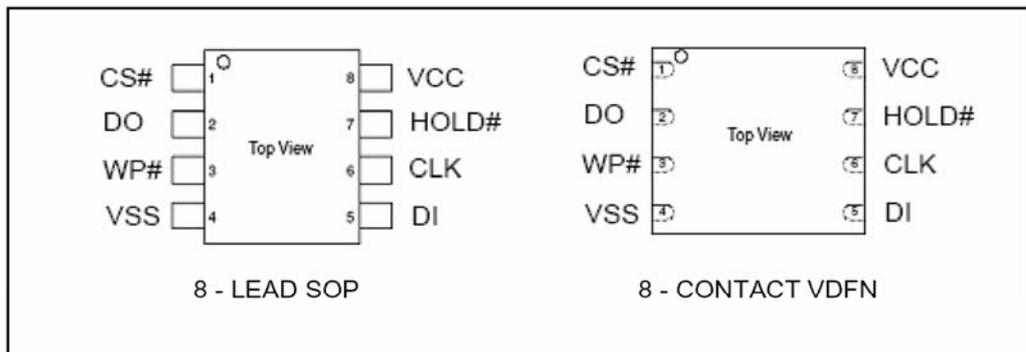
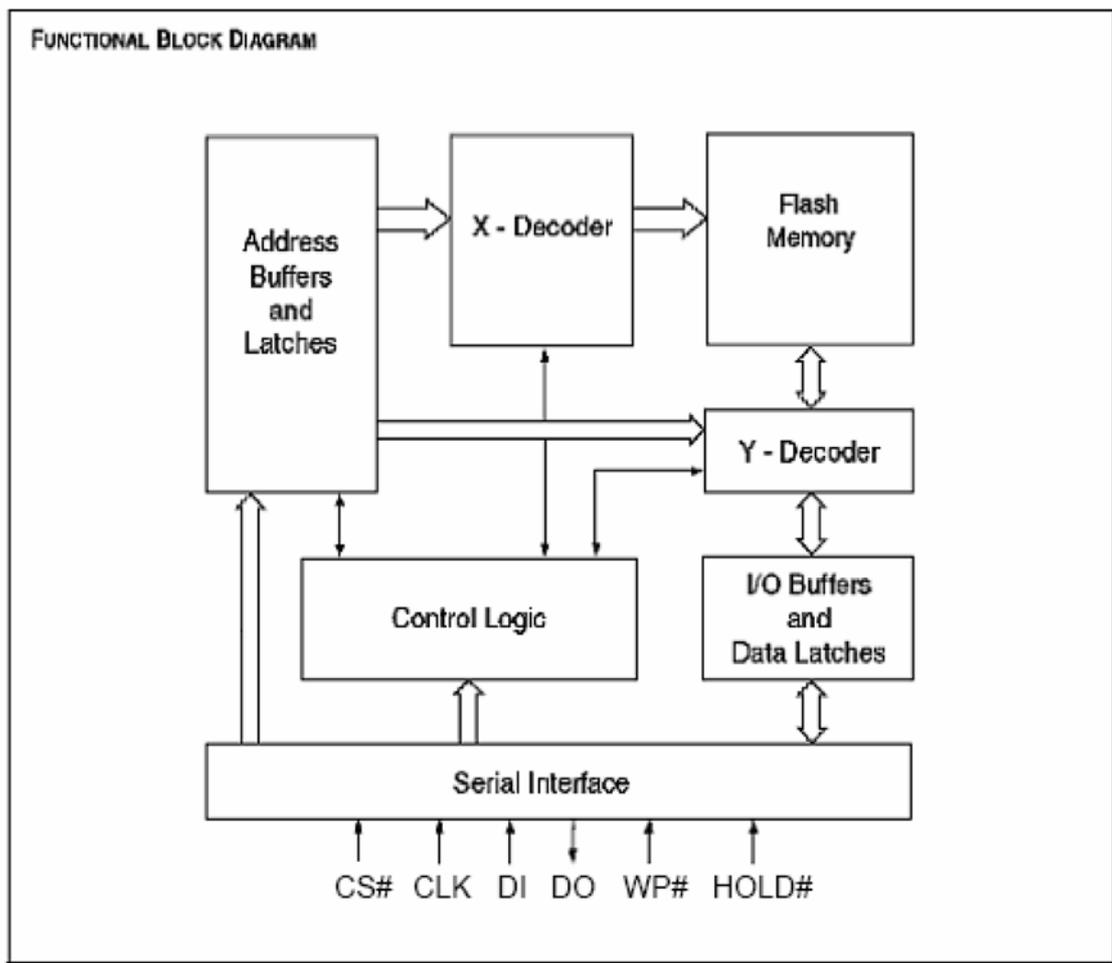


Figure 2. BLOCK DIAGRAM



SIGNAL DESCRIPTION

Serial Data Input (DI)

The SPI Serial Data Input (DI) pin provides a means for instructions, addresses and data to be serially written to (shifted into) the device. Data is latched on the rising edge of the Serial Clock (CLK) input pin.

Serial Data Output (DO)

The SPI Serial Data Output (DO) pin provides a means for data and status to be serially read from (shifted out of) the device. Data is shifted out on the falling edge of the Serial Clock (CLK) input pin.

Serial Clock (CLK)

The SPI Serial Clock Input (CLK) pin provides the timing for serial input and output operations. ("See SPI Mode")

Chip Select (CS#)

The SPI Chip Select (CS#) pin enables and disables device operation. When CS# is high the device is deselected and the Serial Data Output (DO) pin is at high impedance. When deselected, the devices power consumption will be at standby levels unless an internal erase, program or status register cycle is in progress. When CS# is brought low the device will be selected, power consumption will increase to active levels and instructions can be written to and data read from the device. After power-up, CS# must transition from high to low before a new instruction will be accepted.

Hold (HOLD#)

The HOLD pin allows the device to be paused while it is actively selected. When HOLD is brought low, while CS# is low, the DO pin will be at high impedance and signals on the DI and CLK pins will be ignored (don't care). The hold function can be useful when multiple devices are sharing the same SPI signals.

Write Protect (WP#)

The Write Protect (WP#) pin can be used to prevent the Status Register from being written. Used in conjunction with the Status Register's Block Protect (BP0, BP1 and BP2) bits and Status Register Protect (SRP) bits, a portion or the entire memory array can be hardware protected.

PIN Names

Symbol	Pin Name
CLK	Serial Clock Input
DI	Serial Data Input
DO	Serial Data Output
CS#	Chip Enable
WP#	Write Protect
HOLD#	Hold Input
Vcc	Supply Voltage (2.7-3.6V)
Vss	Ground

MEMORY ORGANIZATION

The memory is organized as:

- 1,048,576 bytes

- Flexible Sector Architecture

- Two 4-Kbyte, one 8-Kbyte, one 16-Kbyte, one 32-Kbyte, and fifteen 64-Kbyte sectors

- Bottom or top boot configurations

- 4096 pages (256 bytes each)

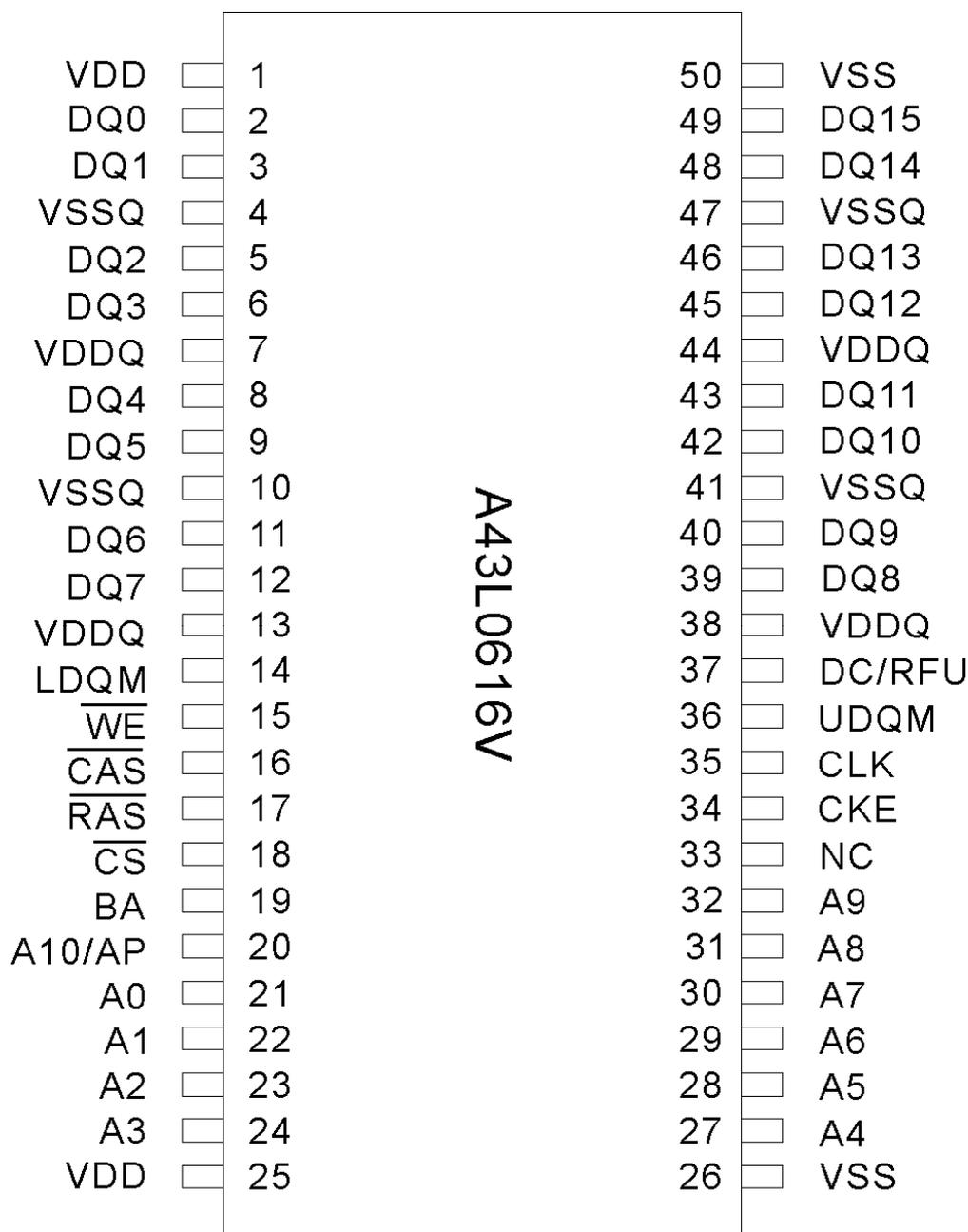
Each page can be individually programmed (bits are programmed from 1 to 0). The device is Sector or Bulk Erasable but not Page Erasable.

2-1-4 512K X 16 Bit X 2 Banks Synchronous DRAM (A43L0616)

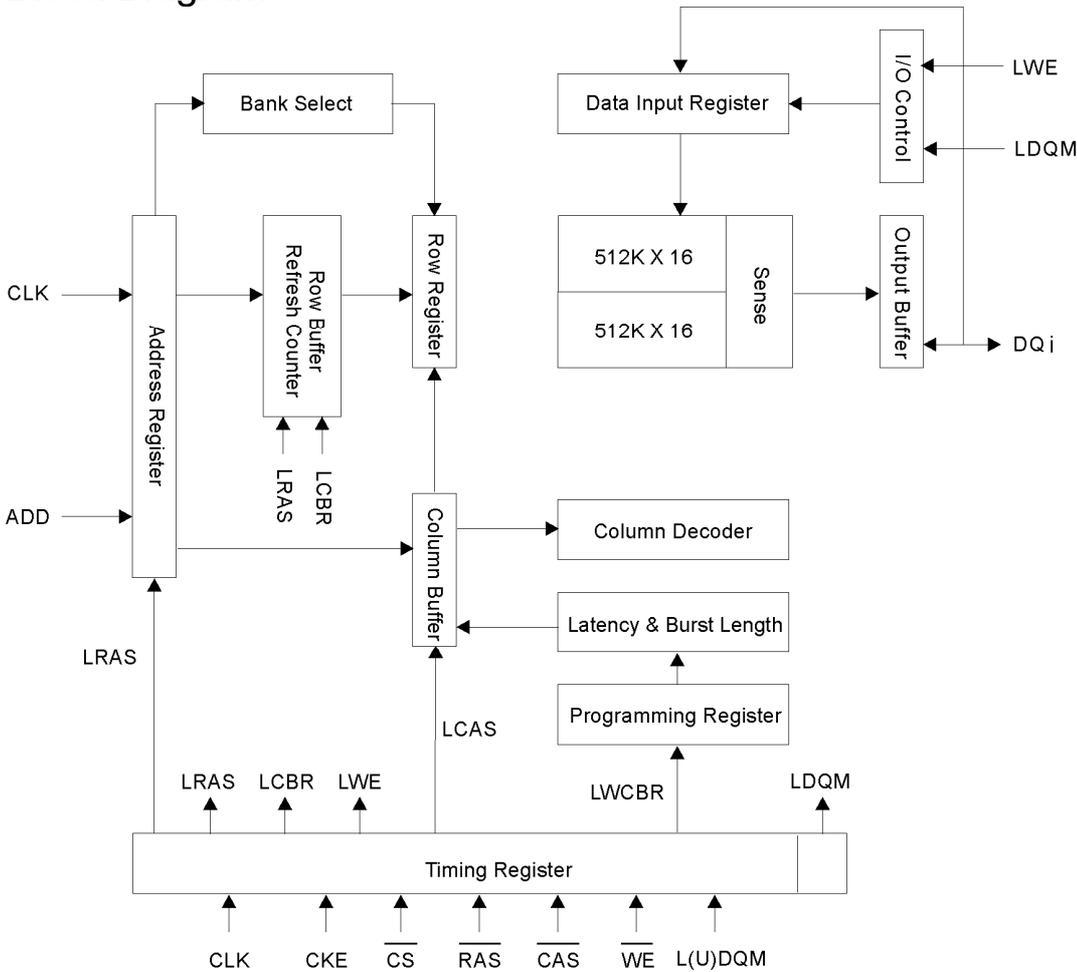
Features

- JEDEC standard 3.3V power supply
- LVTTTL compatible with multiplexed address
- Dual banks / Pulse RAS
- MRS cycle with address key programs
 - CAS Latency (2,3)
 - Burst Length (1,2,4,8 & full page)
 - Burst Type (Sequential & interleave)
- All inputs are sampled at the positive going edge of the system clock
- Burst Read Single-bit Write operation
- DQM for masking
- Auto & self refresh
- 64ms refresh period (4K cycle)
- 50 Pin TSOP (II)

Pin Configuration



Block Diagram



Pin Descriptions

Symbol	Name	Description
CLK	System Clock	Active on the positive going edge to sample all inputs
CS	Chip Select	Disables or Enables device operation by masking or enabling all inputs except CLK, CKE and L(U)DQM
CKE	Clock Enable	Masks system clock to freeze operation from the next clock cycle. CKE should be enabled at least one clock + tss prior to new command. Disable input buffers for power down in standby.
A0~A10/AP	Address	Row/Column addresses are multiplexed on the same pins. Row address: RA0 ~ RA10, Column address: CA0 ~ CA7
BA	Bank Select Address	Selects bank to be activated during row address latch time. Selects band for read/write during column address latch time.
RAS	Row address Strobe	Latches row addresses on the positive going edge of the CLK with RAS low. Enables row access & precharge.
CAS	Column Address Strobe	Latches column addresses on the positive going edge of the CLK with CAS low. Enables column access.
WE	Write Enable	Enables write operation and Row precharge.
L(U)DQM	Data Input/Output Mask	Makes data output Hi-Z, t SHZ after the clock and masks the output. Blocks data input when L(U)DQM active.
DW0-15	Data Input/Output	Data inputs/outputs are multiplexed on the same pins.
VDD/VSS	Power Supply/Ground	Power Supply: +3.3V±0.3V/Ground
VDDQ/VSSQ	Data Output Power/Ground	Provide isolated Power/Ground to DQs for improved noise immunity.
NC/RFU	No Connection	

3. Product Specifications

Playback System

DVD Video
Video CD (1.1, 2.0, 3.0)
SVCD and CVD
CDDA
CD-ROM with MP3 data
PICTURE CD

Television Signal System

NTSC/PAL

Video Performance

Video Out	1 Vpp into 75 ohm
S-Video Out	Y: 1Vpp into 75 ohm C: 0.286 Vpp into 75 ohm
D/A Converter	27MHz/10bit

Audio Performance

Frequency Response	DVD VIDEO (PCM 96KHz) 20Hz~44KHz(±1dB) DVD VIDEO (PCM 48KHz) 20Hz~22KHz(±0.5dB) CD: 20Hz~22KHz(±0.5dB)
Output Level	Analog: 2Vrms(1KHZ) Digital: 1.15 Vpp
D/A Converter	96KHz/24bit
S/N Ratio	90dB

Connections

Coaxial digital out	X1
Audio Analog out for 2-channel	X1
S-Video out	X1

Power Supply

Power Source	~ 100-240V, 50/60Hz
Power Consumption	12 Watt

Set

Dimensions (W X H X D)	360 X 38 X 215 (mm)
Net Weight	2.2 Kg
Gross Weight	3.0 Kg

4. Upgrading System and Changing the Region Code

MTK upgrade:

1. Name upgrade file as "MTK.BIN"(must be in big caps)
2. Record it in a CD-R/W (It can be enclosed a sub-directory which size is about 30M, and the file content can be letter or non used file.)
disc Format: (advise to use the tool NERO burning ROM)
Disc volume: MEDiatek, ISO9660 LEVEL1, MODE1, not JOILET.
3. Put the recorded disc into the DVD player, on the TV will show "upgrade?" after loading. Press PLAY button, the player will automatically upgrade.
4. Do not shut down the player during upgrade, it will restart automatically after upgrade.
5. Upgrade finish!

How to change the region code:

1. Power on the machine, and press OPEN button to push the tray out.
2. Press SETUP button to enter the SETUP menu, and on the GENERAL item press 4 number buttons in turn: 1,3,8,9
3. A edit box will be displayed, you can change the region code to 1-6 with UP/DOWN button, (the num 0 means REGION FREE),
4. Press PLAY(ENTER) button to save the change.
5. And then press SETUP button to exit (FOR 1389L)

5. Operating Instruction

Please refer to the User’s Manual for the operating instruction of the system.

Maintenance & Troubleshooting

How to handle discs

- To handle, clean and protect discs
- Do not touch the playing side of a disc



- Do not stick any paper or glue strip on a disc.



How to clean discs

- Finger prints and dust on surface can affect the sound and picture quality. Clean discs regularly with a soft cotton cloth from disc center to outside.



- For sticky dust, wipe it with wet cloth and with dry cloth, Any kind of solvent, such as diluting agent, gasoline, liquid detergent, gasoline liquid detergent anti – static aerosol used for vinylon LP, may cause disc damage.

How to protect discs

- Keep away from the direct sunshine or any heat source.
- Do not put discs in damp or dirty places, such as bathroom or near humidifiers. Store discs vertically in disc box and store in a dry place. Piling discs on to top of each other or excess weight load on disc box may cause the disc to warp.

Disc Compatibility

- Some DVD discs may have special requirements for playing, with which this player may not be compatible. Please refer to specifications on individual disc.

DISC TYPE	Content	Size	Total Play time
DVD	AUDIO/ VIDEO	12CM	About 2hrs. (Single side & single layer)
			About 4hrs. (Single side & double layer)
			About 4hrs. (Double side & Single layer)
			About 8hrs. (Double side & double layer)
CD-DA	AUDIO	12CM	About 74 minutes
MP3	AUDIO	12CM	About 300 minutes

Discs types

This DVD player can play the following types of discs: Discs other than listed above cannot be played by this player. This player uses NTSC/PAL color system. It cannot play discs recorded with other systems, such as SECAM.

Region code

The region code for this player is 4, which indicates the applicable. The disc with code number other than 5 cannot be played on this player and screen will indicate the unconformity.

Copyright

According to the related law, DVD discs without proper authorization are not allowed to be copied, broadcast, cable broadcast, played publicly or rented. As DVD discs are anti-piracy the copied content is distorted.

TV system

Connect this player to a PAL/NTSC compatible TV.

Problems and Solutions

If a fault occurs, first check the points listed below before taking the set for repair.

If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

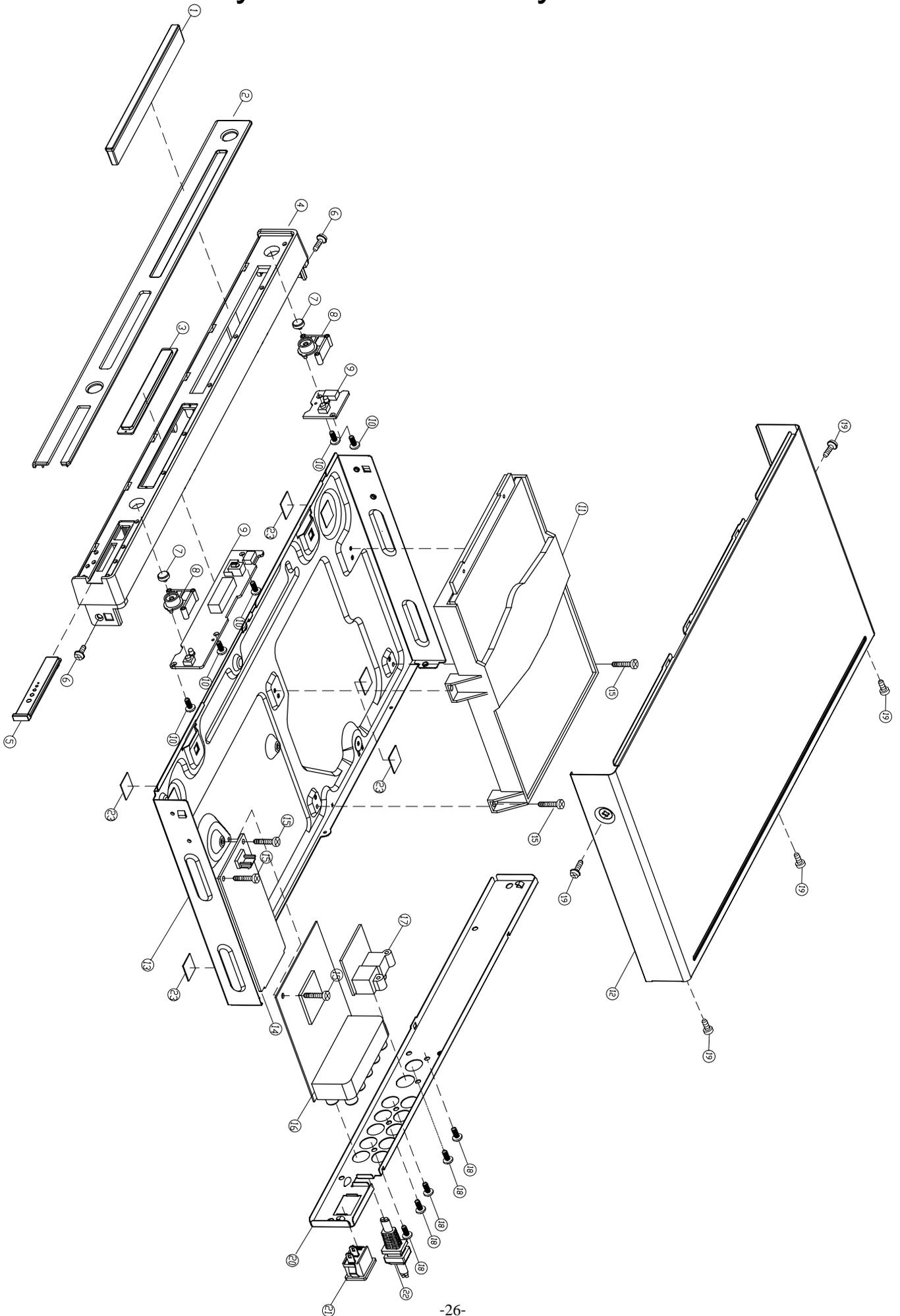
WARNING: Under no circumstances should you try to repair the set yourself, as this would invalidate the guarantee.

Problems	Cause	Solution
No power indication	Power plug not connected	Plug the power cord into the power supply
No picture	TV has not been set to the correct video input	Set correct TV video input format for receiving the player's output signals.
	Video cable not firmly connected.	Firmly insert the video cable ends to the related terminals.
No sound	Audio cable not connected tightly	Firmly insert the audio cable ends to the related terminals.
	Power of audio apparatus is off	Turn on the power of audio apparatus.
	Audio output setting is incorrect	Setup audio output correctly via the setup menu.
Picture distortion	Disc is dirty	Take out the disc and clean.
	Fast forward/backward is activated	The picture may be distorted during fast forward /backward playback.
Brightness unstable or noisy	Affected by anti-piracy circuit	Connect the player directly to TV.
The player does not work	No disc	Load a disc.
	Disc not compatible	Load a compatible disc (Check the disc format and its colour system).
	The disc is placed upside down	Load a compatible disc (Check the disc format and its colour system).
	The disc not put in the tray correctly	Check disc is put in correctly.
	Disc is dirty	Clean the disc.
	Player setting are incorrect	Change the setting via the setup menu.
	Parental lock is in effect	Disable this function or reset the rating level.
No response to key press	Interference of power wave or other factors such as static interference	Turn off the main switch or pull out the power plug, plug it in and turn on the power again.
Remote control does not work	The remote control not pointed at the remote sensor on the front panel of the player	Point the remote control at the remote sensor.
	The remote control is out of specified range	Make sure the remote control range within 7 meters to the remote sensor.
	Battery power exhausted	Replace with new batteries.

Note:

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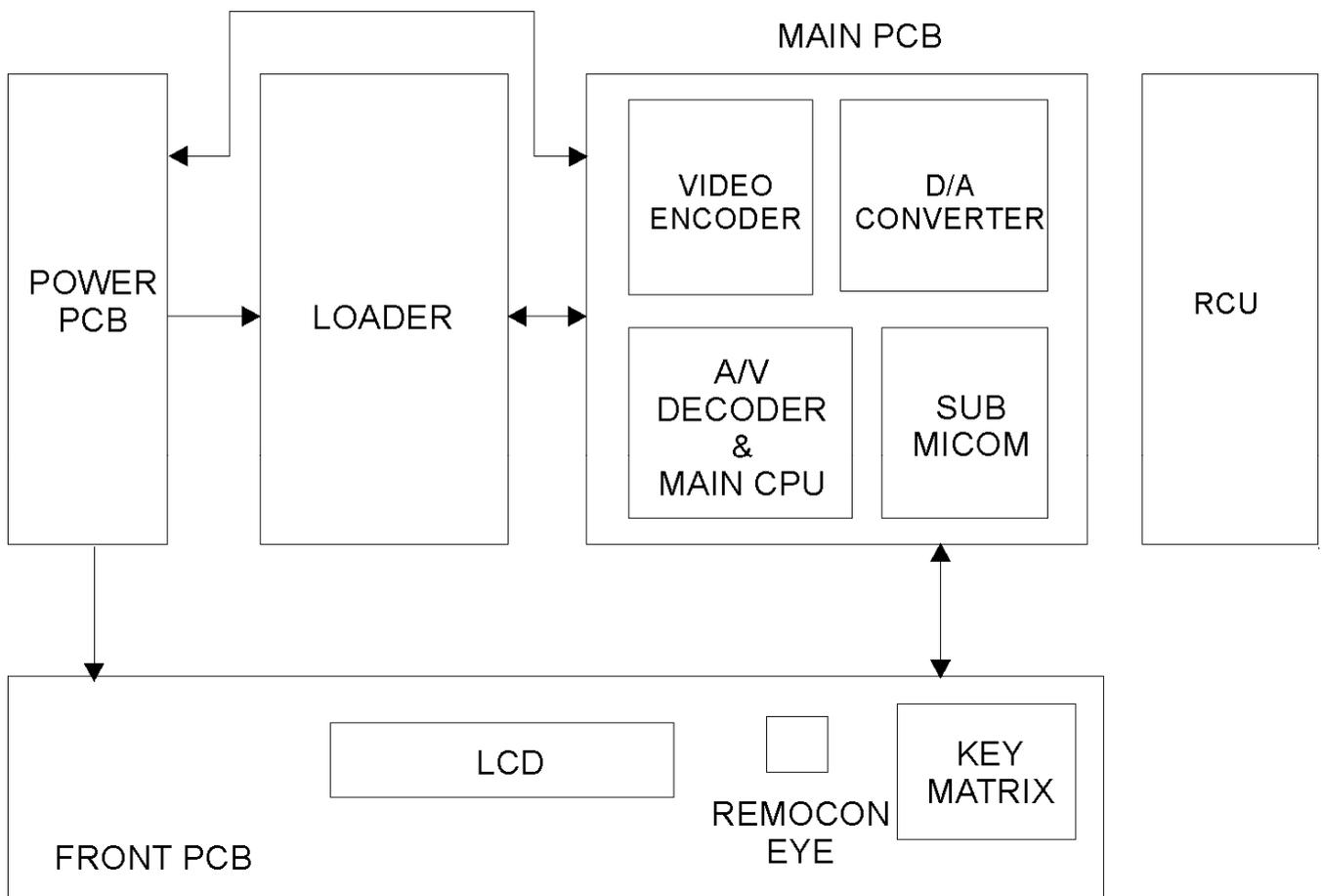
6. Disassembly and Reassembly



7. Troubleshooting

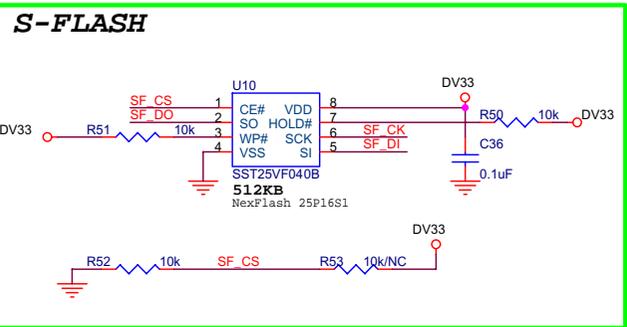
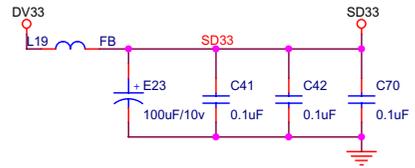
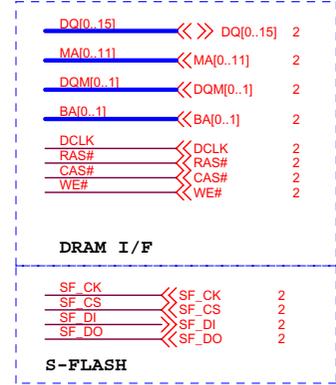
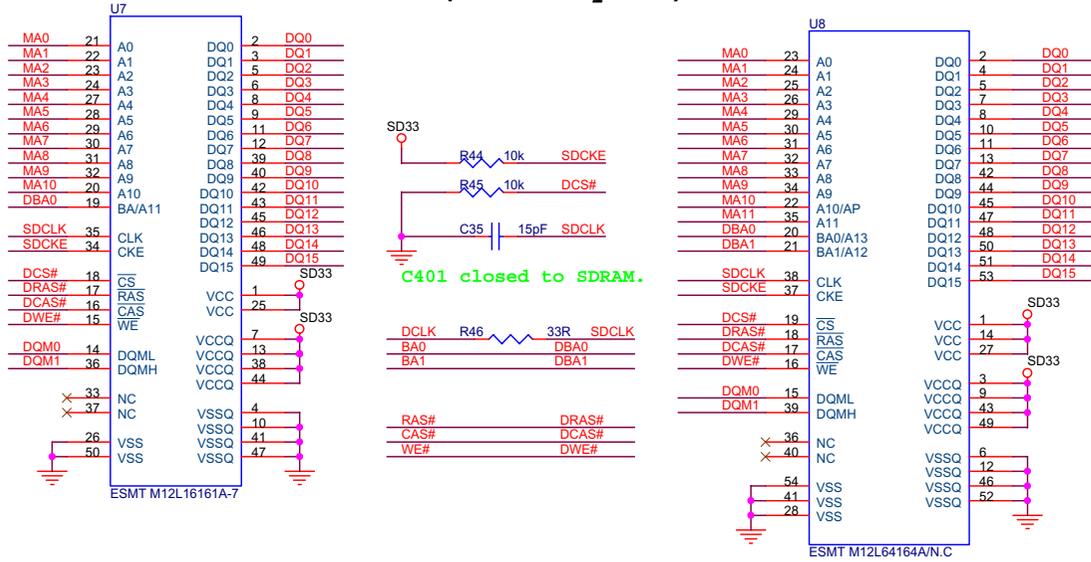
No power	Insert the AC power plug securely into the power outlet.
No picture	Make sure that the equipment is connected properly. Make sure that the input setting for TV is Video (AV).
No sound	Make sure that the equipment is connected properly.
Distorted sound	Make sure that the input settings for the TV and stereo system are correct.
No fast forward or fast reverse	Some discs may have sections that prohibit fast forward or fast reverse.
No proper aspect ratio	Select the correct setup for TV aspect ratio that matches your TV set.
No operations can be performed with the remote controller	Check the batteries are installed with the correct polarities. Point the remote control unit at the remote control sensor and operate. Remove the obstacles between the remote control unit and remote control sensor.
No button operation	Set the POWER button to OFF and then back to ON. Alternatively, turn off the power, disconnect the power plug and then reconnect it.
Audio soundtrack and/or Subtitle language is not the one you selected.	If the audio soundtrack and /or subtitle language does not exist on the disc, the language selected at the initial settings will not be seen.
No Angle change	This function is dependent on software availability. Even if a disc has a number of angles recorded, these angles may be recorded for specific scenes only.

8. Block Diagram

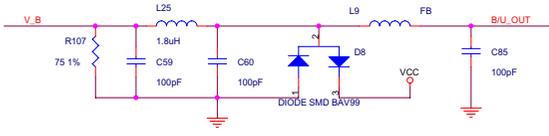
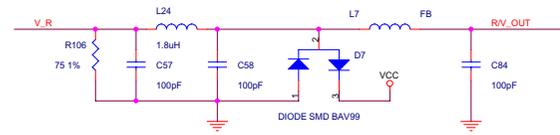
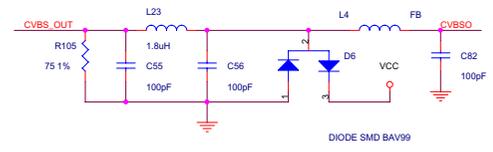
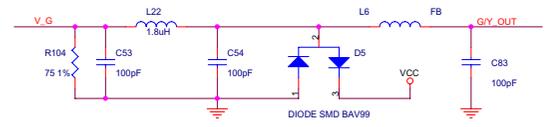


9. Circuit Diagrams

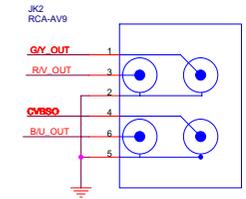
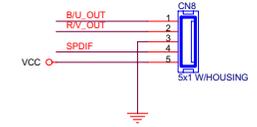
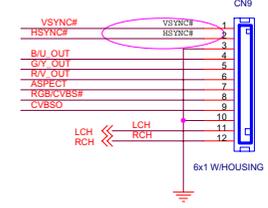
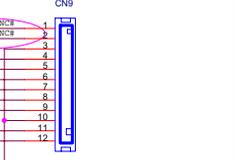
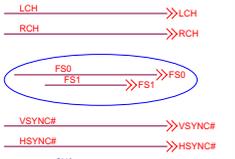
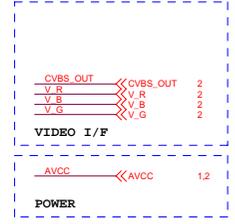
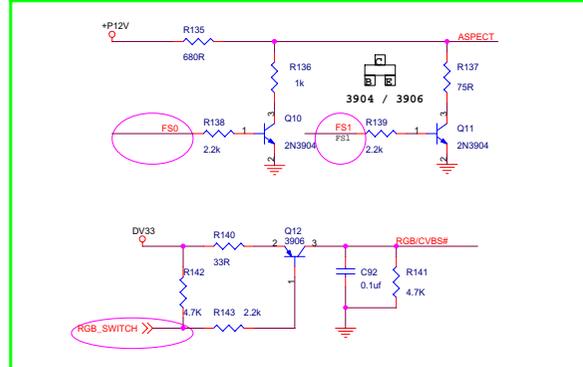
SDRAM (Dual Layout)



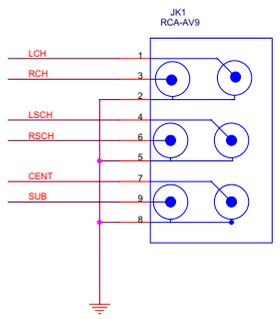
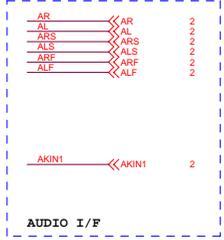
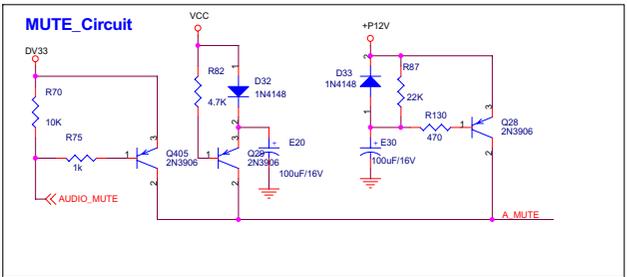
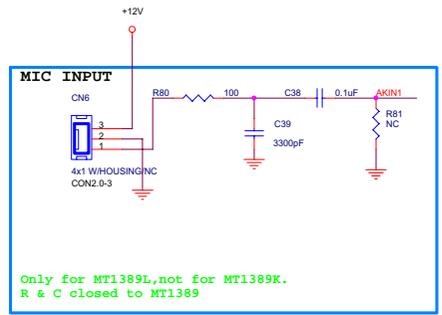
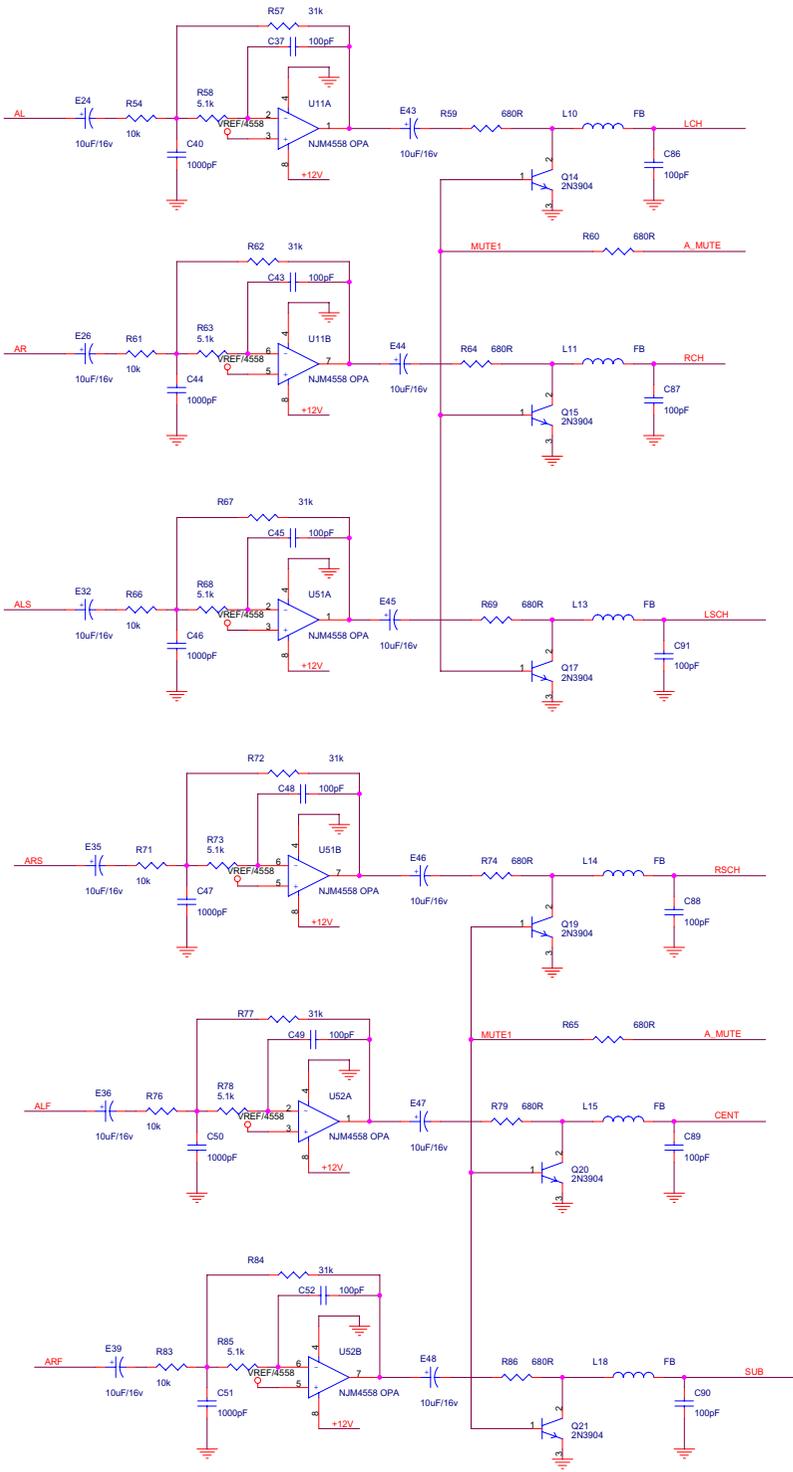
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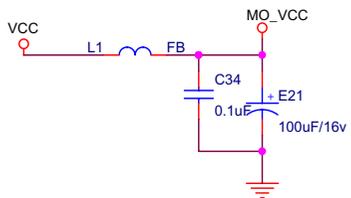
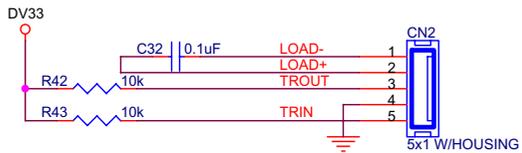
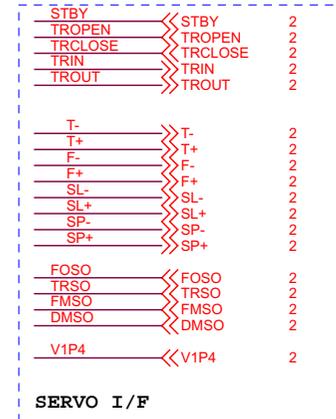
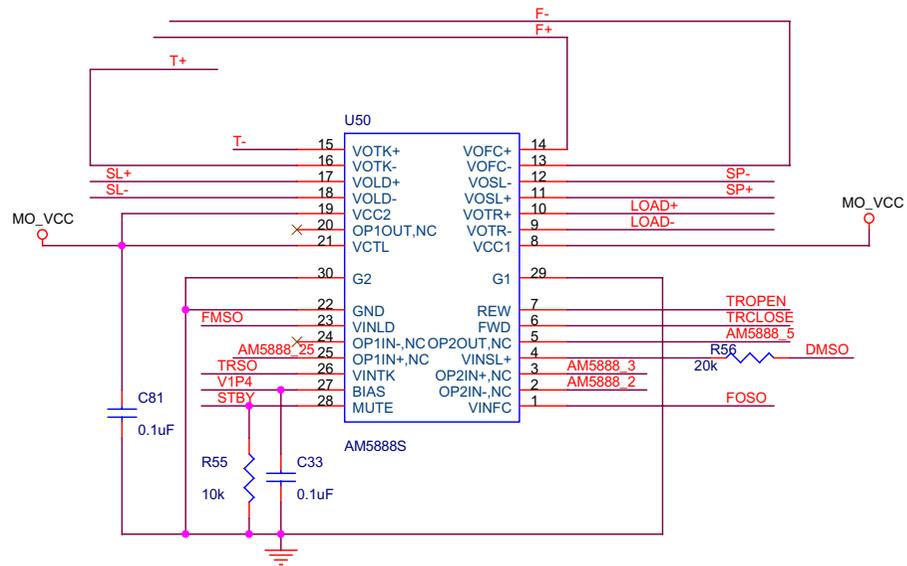
SCART CONTROL



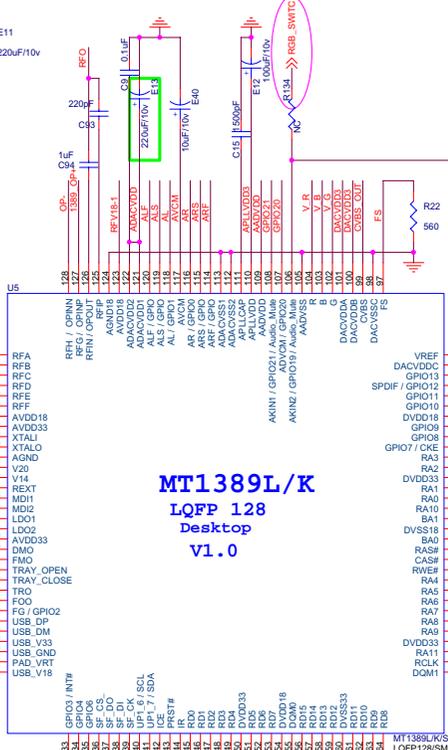
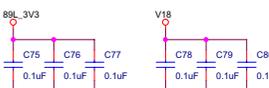
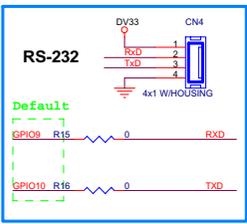
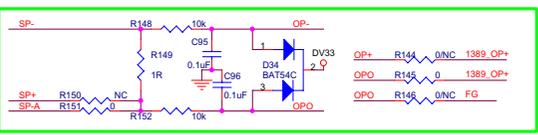
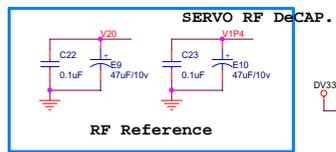
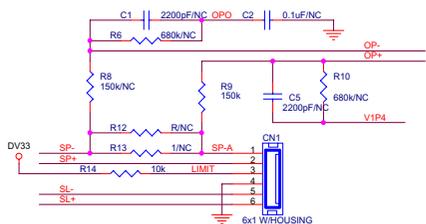
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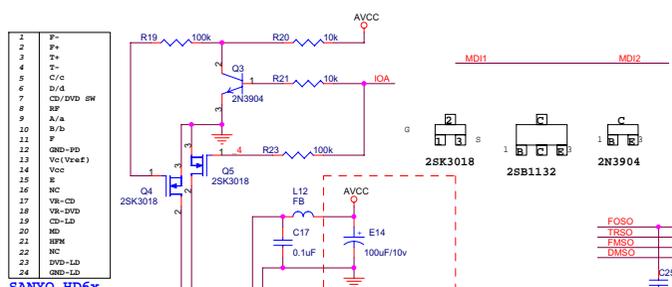
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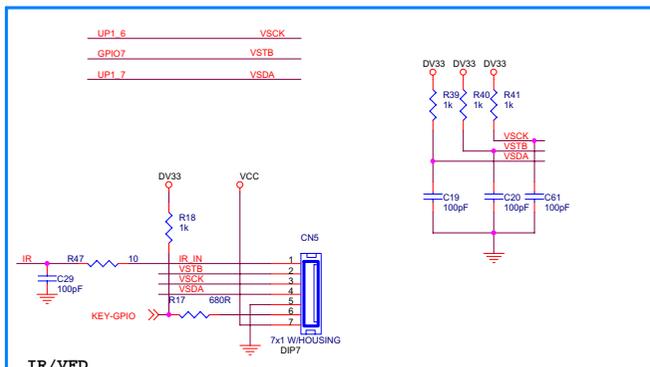
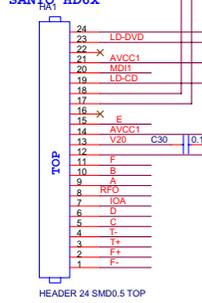
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DQ0_15	<<>	DQ0_15	4
MA0_11	<<>	MA0_11	4
DM0_1	<<>	DM0_1	4
BA0_1	<<>	BA0_1	4
DCLK	<<>	DCLK	4
RAS#	<<>	RAS#	4
CAS#	<<>	CAS#	4
WE#	<<>	WE#	4
DRAM I/F			
SF_CK	<<>	SF_CK	4
SF_CS	<<>	SF_CS	4
SF_DI	<<>	SF_DI	4
SF_DO	<<>	SF_DO	4
S-FLASH			
AR	<<>	AR	5
AL	<<>	AL	5
ARF	<<>	ARF	5
ALF	<<>	ALF	5
ARS	<<>	ARS	5
ALS	<<>	ALS	5
AUDIO I/F			
CVBS_OUT	<<>	CVBS_OUT	7
V_R	<<>	V_R	6
V_B	<<>	V_B	6
V_G	<<>	V_G	6
VIDEO I/F			
STBY	<<>	STBY	3
TRCLOSE	<<>	TRCLOSE	3
TRIN	<<>	TRIN	3
TROUT	<<>	TROUT	3
T+	<<>	T+	3
T-	<<>	T-	3
F+	<<>	F+	3
F-	<<>	F-	3
SL+	<<>	SL+	3
SL-	<<>	SL-	3
SP+	<<>	SP+	3
SP-	<<>	SP-	3
FOSO	<<>	FOSO	3
TRSO	<<>	TRSO	3
FMSO	<<>	FMSO	3
DMSO	<<>	DMSO	3
VI4	<<>	VI4	3
SERVO I/F			
URST#	<<>	URST#	1
AVCC	<<>	AVCC	1.6
AKIN1	<<>	AKIN1	5



Very Important to reduce Noise



- 1 INDEX & POWER, RESET
- 2 MT1389L/K LQFP128
- 3 MOTOR DRV
- 4 SDRAM & FLASH
- 5 AUDIO I/F
- 6 VIDEO I/F
- 7 USB

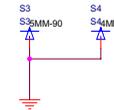
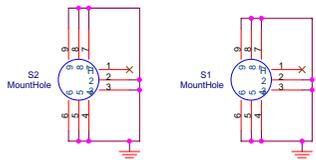
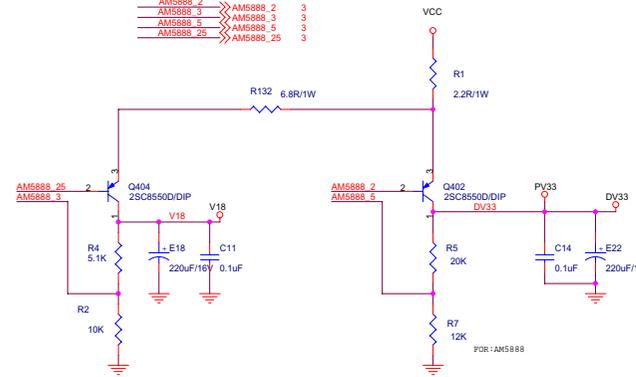
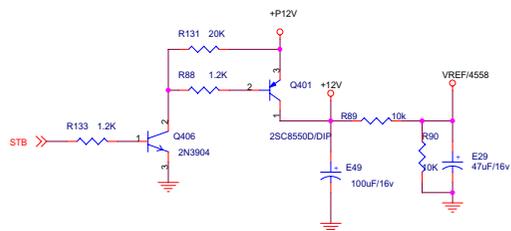
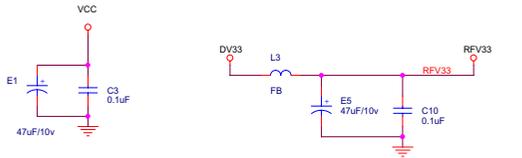
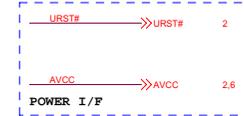
MT1389L/K Features Support List (MIC/USB Only for MT1389L)

Item	Features
1	5.1CH + USB + LED + AMUTE
2	
3	
4	

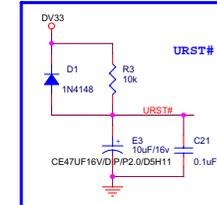
Rev	History	Date
V1	The original released. Base on 3-SYH189LSD1-V10.DSN	2006/1/29

MT1389L/K General GPIO List

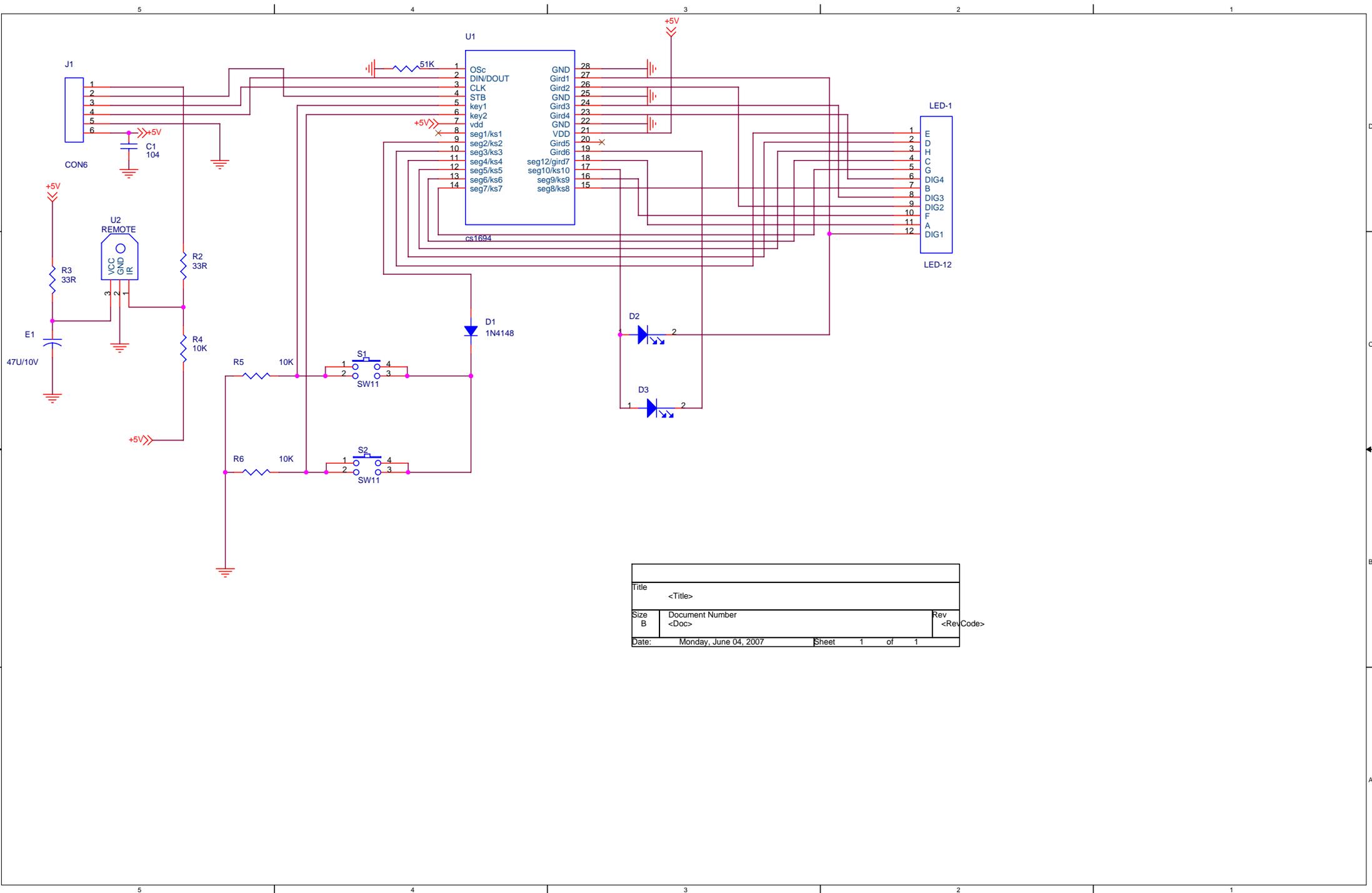
Name	PIN	Features
GPIO3	33	TROUT
GPIO4	34	LIMIT
GPIO6	35	TROPEN
GPIO7	87	VSDA
GPO_A	22	STBY
GPO_B	23	IOA
GPIO2	26	OPO
GPIO8	88	TRCLOSE
GPIO9	89	RXD/FS1/HSYNC#
GPIO10	91	TXD/FS0/VSYNC#
GPIO11	92	TRIN
GPIO12	93	ASPDIF
GPIO13	94	AUDIO_MUTE/STB
GPIO19	106	RGB_SWITCH
GPIO20	107	ADVCM
GPIO21	108	AKIN1
GPIOK0	27	Only for 89K
GPIOK1	28	Only for 89K
GPIOK2	31	Only for 89K



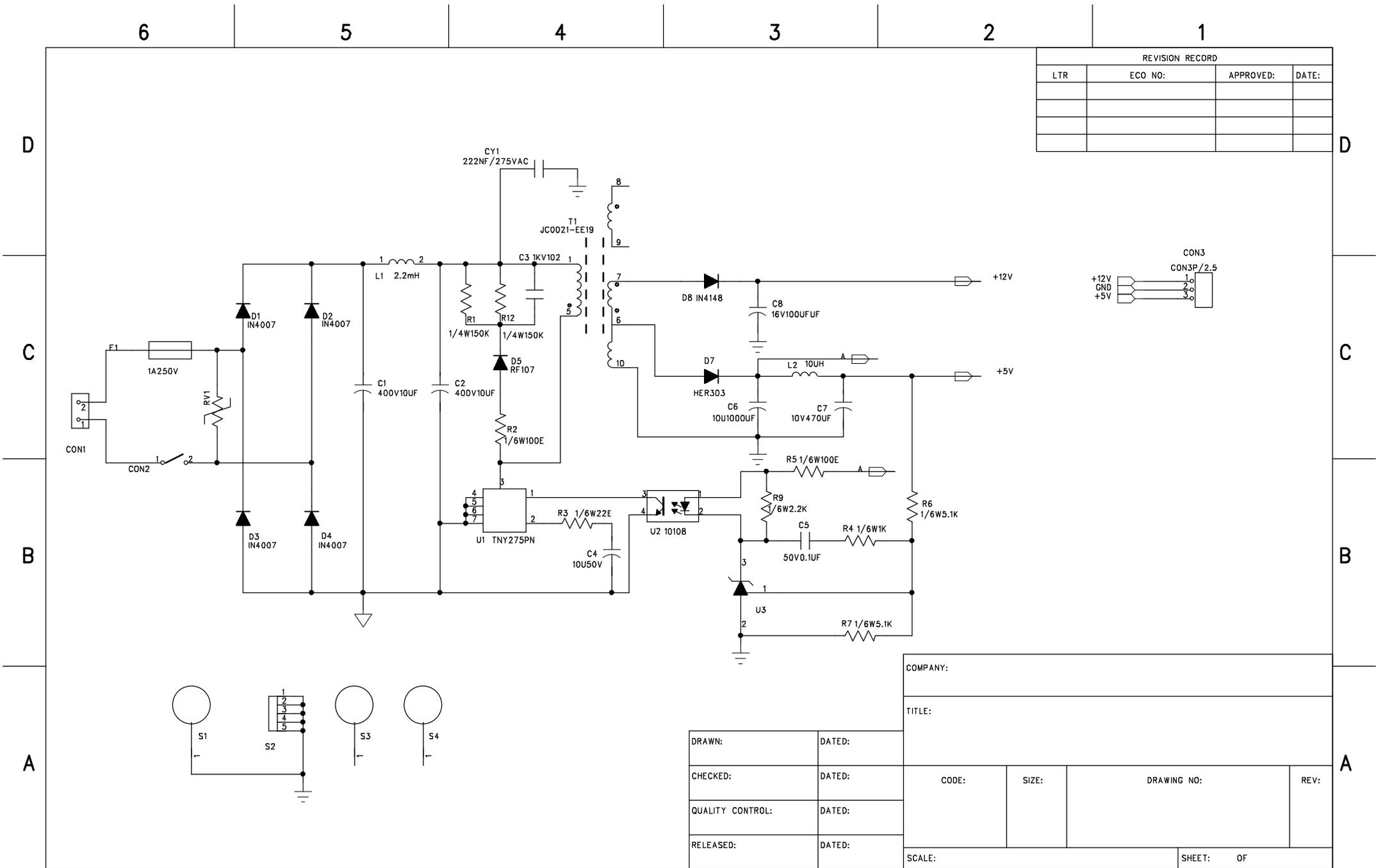
RESET Circuit



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10. Wiring Diagram:

