AKAI

DVD PLAYER

Model:
DVP4785KDSM

SERVICE MANUAL

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CONTENTS

1. PRECAUTIONS

1-1 Safety Precautions

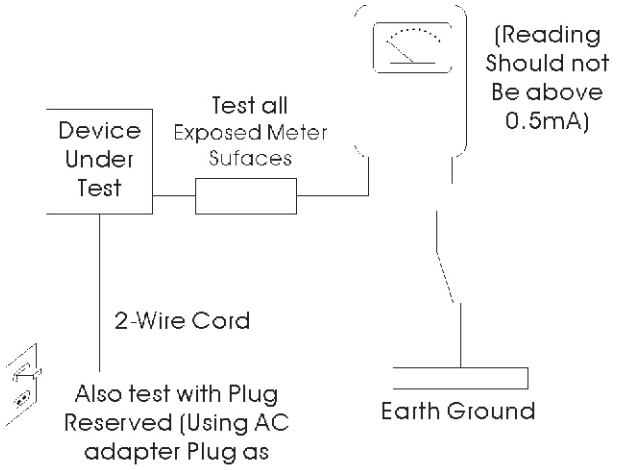
1) Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(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.

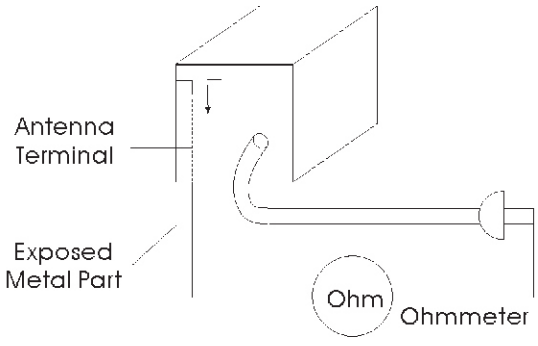
Current for Appliances and underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal 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.



AC Leakage 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 wore 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.



Insulation Resistance Test

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 of 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 created 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 circument 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 Serving 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 compo9nents 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 ES 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 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 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

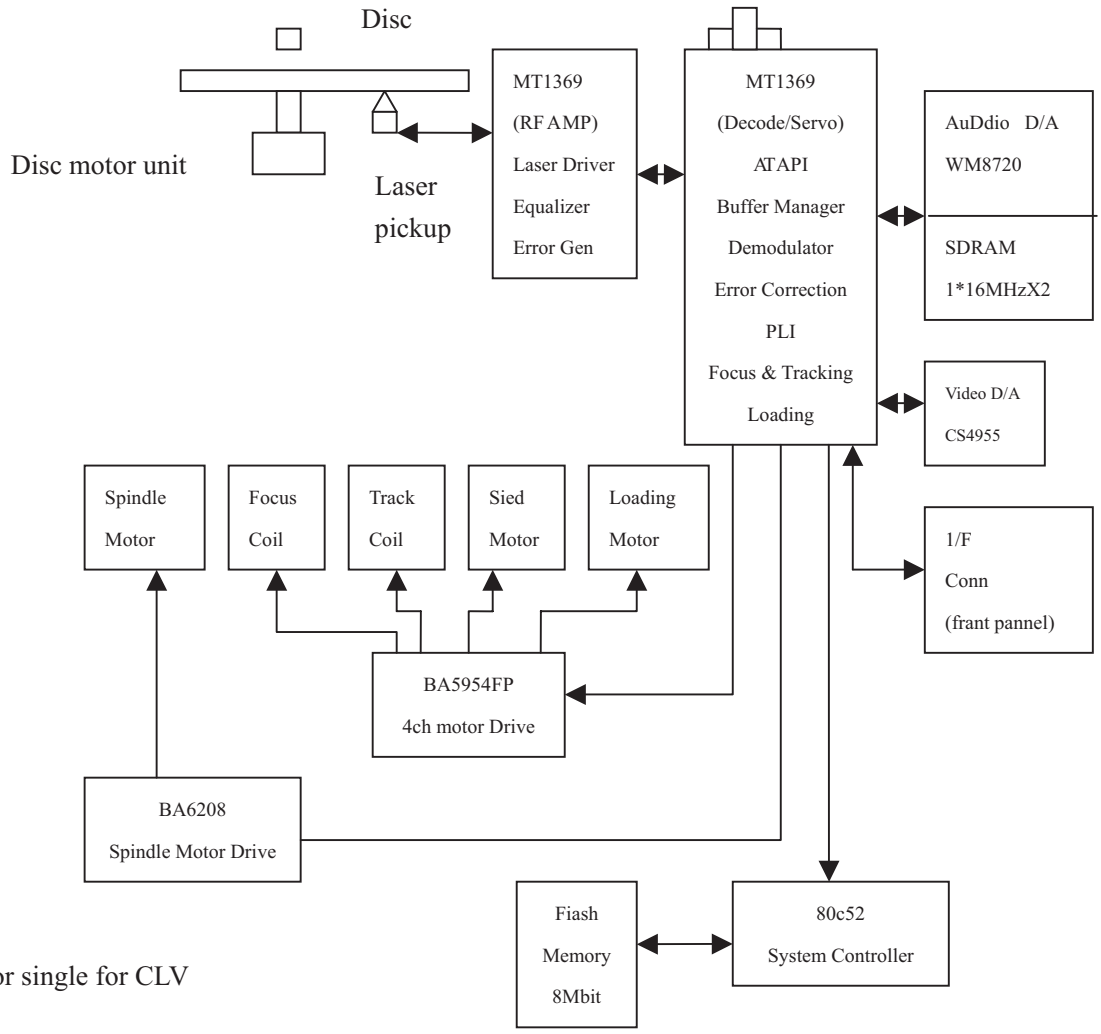
2-1 Component Descriptions

2-1-1 DVD SANYO HD60 PUH

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

4. Block Diagram



Spindle motor single for CLV

2-1-2 DVD Processor Chip MTK1389

Features

Super Integration DVD player single chip

- z High performance analog RF amplifier
- z Servo controller and data channel processing
- z MPEG-1/MPEG-2/JPEG video
- z Dolby AC-3/DTS/DVD-Audio
- z Unified memory architecture
- z Versatile video scaling & quality enhancement
- z OSD & Sub-picture
- z 2-D graphic engine

High Performance Analog RF Amplifier

- z Programmable fc
- z Dual automatic laser power control
- z Defect and blank detection
- z RF level signal generato

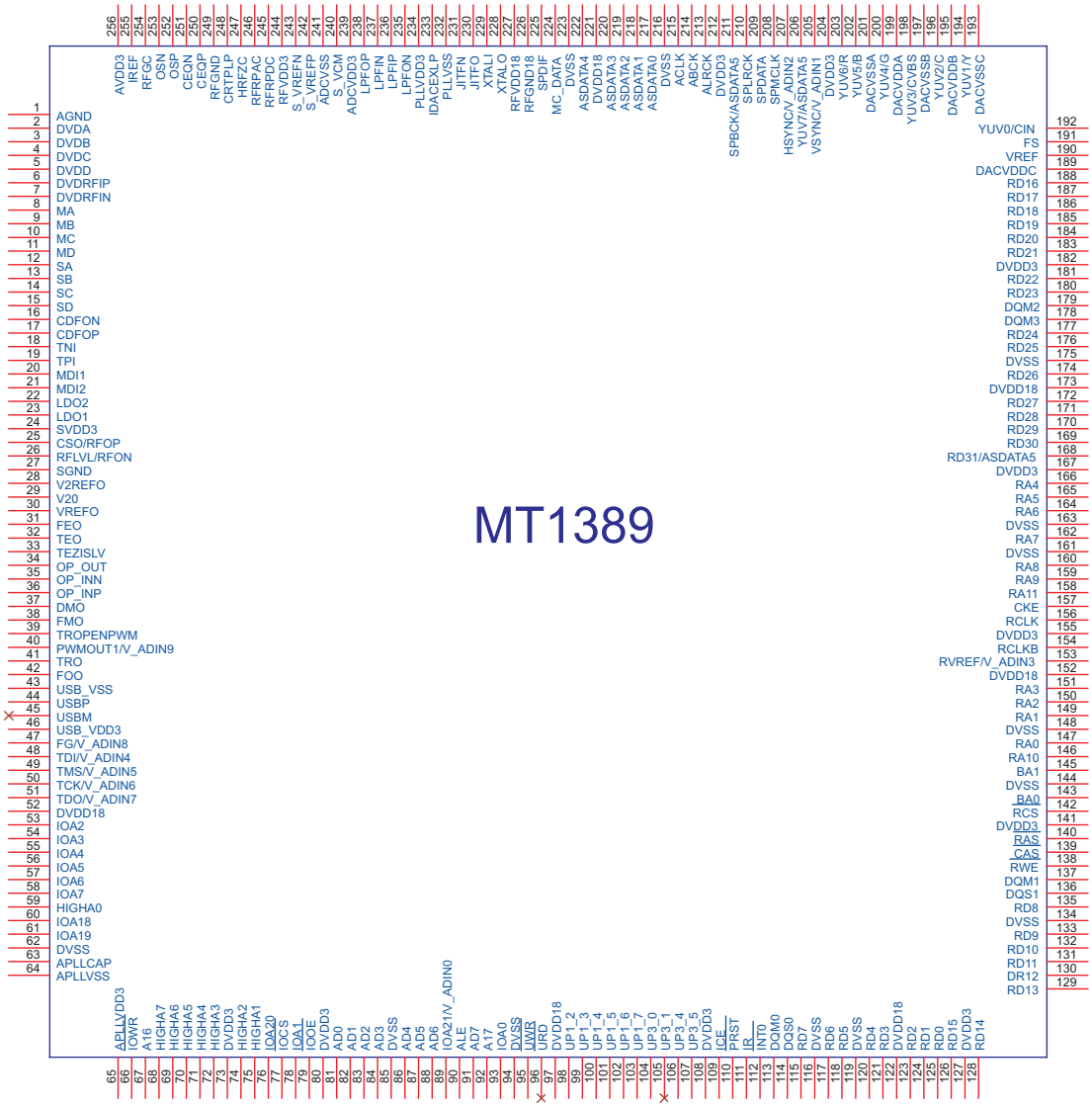
- Audio

- z Dolby Digital (AC -3)/EX decoding
- z DTS/DTS -ES decoding
- z MLP decoding for DVD-Audio
- z MPEG-1 layer 1/layer 2 audio decoding
- z MPEG-2 layer1/layer2 2-channel audio
- z High Definition Compatible Digital (HDCD)
- z Windows Media Audio (WMA)
- z Advanced Audio Coding (AAC)
- z Dolby ProLogic II
- z Concurrent multi-channel and downmix out
- z IEC 60958/61937 output

-TV Encod er

- z Six 108MHz/12bit DACs
- z Support NTSC, PAL-BDGHINM, PAL-60
- z Support 525p, 625p progressive TV format
- z Automatically turn off unconnected channels
- z Support PC monitor (VGA)
- z Support Macrovision 7.1 L1, Macrovision 525P
- z and 625P

* Pinout Diagram



PIN DESCRIPTON

PIN	Symbol	Type	Description
1	AGND	Ground	Ground
2	DVDA	Analog input	AC coupled DVD RF signal input A
3	DVDB	Analog input t	AC coupled DVD RF signal input B
4	DVDC	Analog input	AC coupled DVD RF signal input C
5	DVDD	Analog input	AC coupled DVD RF signal input D
6	DVDRFIP	Analog input	Positive input of RF differential signal
7	DVDRFIN	Analog input	Negative input of RF differential signal
8	MA	Analog input	DC coupled DVD-RAM main-beam RF signal input A
9	MB	Analog input	DC coupled DVD-RAM main-beam RF signal input B
10	MC	Analog input	DC coupled DVD-RAM main-beam RF signal input C
11	MD	Analog input	DC coupled DVD-RAM main-beam RF signal input D
12	SA	Analog input	DC coupled DVD-RAM sub-beam RF signal input A
13	SB	Analog input	DC coupled DVD-RAM sub-beam RF signal input B
14	SC	Analog input	DC coupled DVD-RAM sub-beam RF signal input C
15	SD	Analog input	DC coupled DVD-RAM sub-beam RF signal input D
16	CDFON	Analog input	The general PWM output
17	CDFOP	Analog input	2.5V power
18	TN1	Analog input	3 beam satellite PD signal negative input
19	TPI	Analog input	3 beam satellite PD signal positive input
20	MDI1	Analog input	Laser power monitor input
21	MDI2	Analog input	Laser power monitor input
22	LDO2	Analog output	Laser driver output
23	LDO1	Analog output	Laser driver output
24	SVDD3	power	3.3v power
25	CSO/RFOP	Analog output	RF positive output
26	RFLVL/RFON	Analog output	RF negative output
27	SGND	Ground	Ground
28	V2REFO	power	2.8v power
29	V20	power	2.0v power
30	VREFO	power	1.4v power
31	FEO	Analog output	Focusing error output
32	TEO	Analog output	Tracking error output
33	TEZISLV	Inout	
34	OP_OUT	Inout	
35	OP_INN	Inout	
36	OP_INP	Inout	
37	DMO	Analog output	Disk motor control output.PWM output
38	FMO	Analog output	Feed motor control. PWM output
39	TROPENPWM	Analog output	Tray open output,controlled by microcontroller. This is PWM output for TRWMEN$_{27hRW2}$=1 or is digital output for TRWMEN$_{27Hrw2}$=0
40	PWMOUT1/V	Analog output	The general PWM output
41	TRO	Analog output	Tracking servo output.PDM output of tracking servo compensator
42	FOO	Analog output	Focus servo output. PDM output of focus servo compensator
43	USB_VSS	ground	ground
44	USBP		
45	USBM		
46	USB_VDD3	power	3.3v power
47	FG/V_ADIN8	Analog input	ADC input
48	TD/V_ADIN4	Analog input	ADC input
49	TMS/V_ADIN5	Analog input	ADC input
50	TCK/V_ADIN6	Analog input	ADC input
51	TDO/V_ADIN7	Analog input	ADC input
52	DVDD18	power	1.8v power
53	IOA2	Inout, pull up	Microcontroller address 0/GPIO2
54	IOA3	Inout, pull up	Microcontroller address 0/GPIO3

PIN	Symbol	Type	Description
55	IOA4	Inout, pull up	Microcontroller address 0/GPIO4
56	IOA5	Inout,pull up	Microcontroller address 0/GPIO5
57	IOA6	Inout, pull up	Microcontroller address 0/GPIO6
58	IOA7	Inout, pull up	Microcontroller address 0/GPIO7
59	HIGHA0	Inout,pull up	Microcontroller address 8
60	IOA18	nout,pull up	Microcontroller address 0/GPIO18
61	IOA19	Inout,pull up	Microcontroller address 0/GPIO19
62	DVSS	GND	GND
63	APLLCAP	Analogue out	Analogue output for PLL circuit
64	APLLVSS	gnd	gnd
65	APLLVDD3	Power	3.3V power
66	IOWR	inout	Flash write enable,active low /GPIO17
67	A16	output	Flash address 16
68	HIGHA7	Inout,pull up	Microcontroller address 15
69	HIGHA6	Inout,pull up	Microcontroller address 14
70	HIGHA5	Inout,pull up	Microcontroller address 13
71	HIGHA4	Inout, pull up	Microcontroller address 12
72	HIGHA3	Inout, pull up	Microcontroller address 11
73	DVDD3	Power	3.3V power
74	HIGHA2	Inout, pull up	Microcontroller address 10
75	HIGHA1	Inout,pull up	Microcontroller address 9
76	IOA20	Inout,pull up	Microcontroller address 0/GPIO20
77	IOCS	Inout,pull up	Flash chip select,active low /GPIO18
78	IOA1	Inout,pull up	Microcontroller address 0/GPIO2
79	IOOE	Inout,pull up	Flash output enable,active low /GPIO13
80	DVDD3	Power	3.3V power
81	AD0	Inout	Microcontroller address/data 0
82	AD1	Inout	Microcontroller address/data 1
83	AD2	Inout	Microcontroller address/data 2
84	AD3	Inout	Microcontroller address/data 3
85	DVSS	gnd	gnd
86	AD4	Inout	Microcontroller address/data 4
87	AD5	Inout	Microcontroller address/data 5
88	AD6	Inout	Microcontroller address/data 6
89	IOA21/V_ADIN 0	Inout, pull up	Microcontroller address 0/GPIO21
90	ALE	Inout, pull up	Microcontroller address latch enable
91	AD7	Inout	Microcontroller address/data 7
92	A17	output	Flash address 17
93	IOA0	Inout,pull up/down	Microcontroller address 0/GPIO0
94	DVSS	gnd	gnd
95	UWR	Inout,pull up/down	USB write
96	URD	Inout,pull up/down	USB read
97	DVDD18	Power	Power1.8V
98	UP1_2	Inout,pull up	Microcontroller port 1-2
99	UP1_3	Inout,pull up	Microcontroller port 1-3
100	UP1_4	Inout,pull up	Microcontroller port 1-4
101	UP1_5	Inout,pull up	Microcontroller port 1-5
102	UP1_6	Inout,pull up	Microcontroller port 1-6
103	UP1_7	Inout,pull up	Microcontroller port 1-7
104	UP3_0	Inout,pull up	Microcontroller port 3-0
105	UP3_1	Inout,pull up	Microcontroller port 3-1
106	UP3_4	Inout,pull up	Microcontroller port 3-4
107	UP3_5	Inout,pull up	Microcontroller port 3-5
108	DVDD3	Power	3.3V power
109	ICE	Inout,pull down	Microcontroller ICE mode enable
110	PRST	Inout,pull down	Power on reset input, active low
111	IR	input	IR control signal input
112	INT0	input	Microcontroller interrupt 0,active low
113	DQM0	Output	Mask for DRAM input/output byte 0

PIN	Symbol	Type	Description
114	DQS0	Output	Mask for DRAM input/output byte 4
115	RD7	Output	DRAM data 7
116	DVSS	gnd	gnd
117	RD6	Output	DRAM data 6
118	RD5	Output	DRAM data 5
119	DVSS	gnd	gnd
120	RD4	Output	DRAM data 4
121	RD3	Output	DRAM data 3
122	DVDD18	Power	1.8V Power
123	RD2	Output	DRAM data 2
124	RD1	Output	DRAM data 1
125	RD0	Output	DRAM data 0
126	RD15	Output	DRAM data 15
127	DVDD3	Power	3.3V power
128	RD14	Output	DRAM data 14
129	RD13	Output	DRAM data 13
130	RD12	Output	DRAM data 12
131	RD11	Output	DRAM data 11
132	RD10	Output	DRAM data 10
133	RD9	Output	DRAM data 9
134	DVSS	gnd	gnd
135	RD8	Output	DRAM data 8
136	DQS1	Output	Mask for DRAM input/output byte 3
137	DQM1	Output	Mask for DRAM input/output byte 1
138	RWE	Output	DRAM write enable,active low
139	CAS	Output	DRAM column address strobe,active low
140	RAS	Output	DRAM row address strobe,active low
141	DVDD3	Power	3.3V power
142	RCS	Output	DRAM chip select,active low
143	BA0	Output	DRAM bank address 0
144	DVSS	gnd	gnd
145	BA1	Output	DRAM bank address 1
146	RA10	Output	DRAM address 10
147	RA0	Output	DRAM address 0
148	DVSS	gnd	gnd
149	RA1	Output	DRAM address 1
150	RA2	Output	DRAM address 2
151	RA3	Output	DRAM address 3
152	DVDD18	Power	1.8V power
153	RVREF	Output	
154	RCLKB	Output	DRAM clock
155	DVDD3	Power	3.3V power
156	RCLK	Output	DRAM clock
157	CKE	Output	DRAM clock enable
158	RA11	Output	DRAM address 11
159	RA9	Output	DRAM address 9
160	RA8	Output	DRAM address 8
161	DVSS	gnd	gnd
162	RA7	Output	DRAM address 7
163	DVSS	Ground	Ground
164	RA6	Output	DRAM address 6
165	RA5	Output	DRAM address 5
166	RA4	Output	DRAM address 4
167	DVDD3	Power	3.3V power
168	RD31	Output	DRAM data 31
169	RD30	Output	DRAM data 30
170	RD29	Output	DRAM data 29
171	RD28	Output	DRAM data 28
172	RD27	Output	DRAM data 27

PIN	Symbol	Type	Description
173	DVDD18	Power	1.8V power
174	RD26	output	DRAM data 26
175	DVSS	GND	GND
176	RD25	output	DRAM data 25
177	RD24	output	DRAM data 24
178	DQM3	output	Mask for DRAM input/output byte 3
179	DQM2	output	Mask for DRAM input/output byte 2
180	RD23	output	DRAM data 23
181	RD22	output	DRAM data 22
182	DVDD3	Power	3.3V power
183	RD21	output	DRAM data 21
184	RD20	output	DRAM data 20
185	RD19	output	DRAM data 19
186	RD18	output	DRAM data 18
187	RD17	output	DRAM data 17
188	RD16	output	DRAM data 16
189	DACVDD3	Power	3.3V power
190	VREF	output	
191	FS		
192	YUV0		
193	DACVSSC	GND	GND
194	YUV1	Output	Video data output bit 1
195	DACVDDB	Power	3.3V power
196	YUV2	Output	Video data output bit 2
197	DACVSSB	GND	GND
198	YUV3	Output	Video data output bit 3
199	DACVDDA	Power	3.3V power
200	YUV4	Output	Video data output bit 4
201	DACVSSA	GND	GND
202	YUV5	Output	Video data output bit 5
203	YUV6	Output	Video data output bit 6
204	DVDD3	Power	3.3V power
205	VSYNC	Output	Vertical sync / GPIO16
206	YUV7	Output	Video data output bit 7
207	HSYNC	Output	Horizontal sync / GPIO15
208	SPMCLK	Inout	
209	SPDATA	Analog input	
210	SPLRCK	Input,pull down	
211	SPBCLK	Output	
212	DVDD3	Power	3.3V power
213	ALRCK	Input,pull down	(1) Audio left/right channel clock (2)Trap value in power-on reset. 1:use external 373, 0: use internal 373
214	ABCK	Output	Audio bit clock
215	ACLK	Inout	Audio DAC master clock (384/256 audio sample frequency)
216	DVSS	GND	GND
217	ASDATA0	Input,pull down	Audio serial data 0 (left/right channel)
218	ASDATA1	Input,pull down	Audio serial data 1 (surround left/surround right channel)
219	ASDATA2	Input,pull down	Audio serial data 2 (center/LFE channel)
220	ASDATA3	Input,pull down	
221	DVDD18	Power	1.8V power
222	ASDATA4	Input,pull down	
223	DVSS	GND	GND
224	MC_DATA	Input	Microphone serial input
225	SPDIF	Output	SPDIF output
226	RFGND18	GND	GND
227	RFVDD18	Power	1.8V power
228	XTAL0	Output	Crystal output
229	XTAL1	Input	Crystal input,27MHz
230	JITFO	Analog output	RF jitter meter output
231	JITFN	Analog input	Negative input of the operation amplifier for RF jigger meter

PIN	Symbol	Type	Description
232	PLLVSS	GND	GND
233	IDACEXLP		
234	PLLVDD3	Power	3.3V power
235	LPFON	Analog output	Negative output of the low pass filter
236	LPFIP	Analog input	Positive input of loop filter amplifier
237	LPFIN	Analog input	Negative input of loop filter amplifier
238	LPFOP	Analog output	Positive output of the low pass filter
239	ADCVDD3	Power	3.3V power
240	S_VCM	GND	GND
241	ADCVSS	GND	GND
242	S_VREFP		
243	S_VREFN		
244	RFVDD3	Power	3.3V power
245	RFRPDC	Analog input	RF ripple detect input
246	RFRPAC	Analog input	RF ripple detect input (through AC coupling)
247	HFRZC	Analog input	High frequency RF ripple zero crossing
248	CRTPLP		
249	RFGND	GND	GND
250	CEQP	Analog output	
251	CEQN	Analog output	
252	OSP	Analog output	
253	OSN	Analog output	
254	RFGC		
255	IREF	Analog Input	Current reference input.it generate reference current for data PLL Connect an external 100K resistor to this pin and PLLVSS.
256	AVDD3	Power	3.3V power

2-1-3 20-Pin, 24-Bit, 192kHz D/A with Volume Control (WM8766)

High Resolution:

16/18/20/24/32 Bit Selectable

High Performance:

THD+N: -98 dB

Dynamic Range: 100dB

S/N Ratio: 108dB

Channel Separation: 100dB

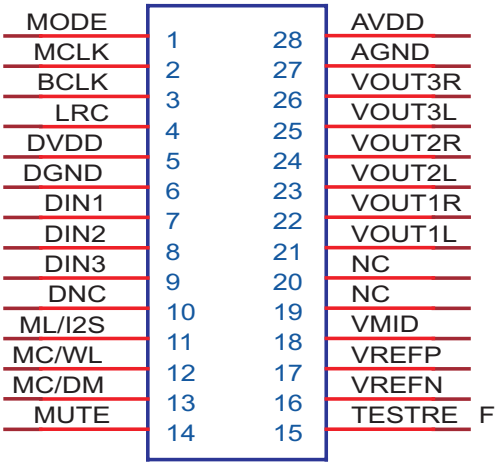
High Integration:

- 6 Audio Channels, each contains:
  - Oversampling Digital Filter
  - High-Resolution Delta Sigma DAC
  - Analog Low Pass Filter
  - Output Amplifier

High Versatility

- Control via 3-Wire Interface or Hardware Pins
- Left/Right-justified/IIS Format Selectable
- Selectable De-emphasis Sampling Rate:
  - 16KHz, 22.05KHz, 24KHz
  - 32KHz, 44.1KHz, 48KHz
  - 64KHz, 88.2KHz, 96KHz
- Selectable Multiple Functions:
  - Soft Mute
  - Attenuation
  - De-emphasis
  - Zero Detection On/Off Control
- Selectable Output Operation Mode:
  - Left, Right, Mono, Mute

PIN CONFIGURATION



PIN DESCRIPTIONS

PIN	NAME	TYPE	DESCRIPTION
1	MODE	Digital input	Control format selection 0=Software control 1=Hardwar e control
2	MCLK	Digital input	Master clock:256,384,512 or 768f s (f s = word clock frequency)
3	BCLK	Digital input/output	Audio interface bit clock
4	LRCLK	Digital input/output	Audio left/right word clock
5	DVDD	Supply	Digital positive supply
6	DGND	Supply	Digital negative supply
7	DIN1	Digital input	DAC channel 1 data input
8	DIN2	Digital input	DAC channel 2 data input
9	DIN3	Digital input	DAC channel 3 data input
10	DNC	Do not connect	Do not connect
11	ML/I2S	Digital input	Software Mode: Serial interface Latch signal Hardware Mode: Input Audio Data Format
12	MC/IWL	Digital input	Software Mode: Serial control interface clock Hardware Mode: Audio data input word length
13	MD/DM	Digital input	Software Mode: Serial interfacedata Hardware Mode: De-empahsis selection
14	MUTE	Digital input/output	DAC Zero flag output or DAC mute input
15	TESTREF1	Digital input	Test pin
16	VREFN	Supply	Digital negative supply and substrate connection
17	VREFP	Supply	Digital positive reference supply
18	VMID	Analog output	Midrail divider decoupling pin; 10uf external decoupling
19	NC	Do not connect	Do not connect
20	NC	Do not connect	Do not connect
21	VOUT1L	Analog output	DAC channel 1left output
22	VOUT1R	Analog output	DAC channel 1right output
23	VOUT2L	Analog output	DAC channel 2 left output
24	VOUT2R	Analog output	DAC channel 2 right output
25	VOUT3L	Analog output	DAC channel 3 left output
26	VOUT3R	Analog output	DAC channel 3 right output
27	AGND	Supply	Analogue negative supply and substrate connection
28	AVDD	Supply	Analogue positive reference supply

Note:

Digital input pins have Schmitt trigger input buffers.

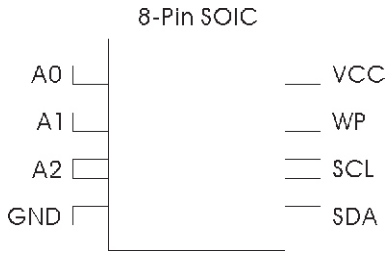
2-1-4 Serial EEPROM, 2K (256 x 8) (24C02) or 16 K (2048 x 8) (24C16)

24C02 is used for DVD player while 24C16 is for DVD receiver. The capacity is the only difference between two kinds of serial EEPROM. Both of them use same package and have same pin configuration.

*** Features**

- z Low-Voltage and Standard-Voltage Operation
  -5.0 (V CC = 4.5V to 5.5V)
  -2.7 (V CC = 2.7V to 5.5V)
  -2.5 (V CC = 2.5V to 5.5V)
  -1.8 (V CC = 1.8V to 5.5V)
- z Internally Organized 128 x 8 (1K), 256 x 8 (2K), 512 x 8 (4K), 1024 x 8 (8K) or 2048 x 8 (16K)
- z 2-Wire Serial Interface
- z Schmitt Trigger, Filtered Inputs for Noise Suppression
- z Bi-directional Data Transfer Protocol
- z 100 kHz (1.8v, 2.5V, 2.7V) and 400 kHz (5V) Compatibility
- z Write Protect Pin for Hardware Data Protection
- z 8-Byte Page (1K, 2K), 16-Byte Page (4K, 8K, 16K) Write Modes
- z Partial Page Writes Are Allowed
- z Self-Timed Write Cycle (10 ms max)
- z High Reliability
  - Endurance: 1 Million Write Cycles
  - Data Retention: 100 Years
  - ESD Protection: >3000V
- z Automotive Grade and Extended Temperature Devices Available
- z 8-Pin and 14-Pin JEDEC SOIC, 8-Pin PDIP, 8-Pin MSOP, and 8-Pin TSSOP Packages

*** Pin Configurations**



*** Pin Description**

Pin Name	Function
A0-A2	Address Inputs
SDA	Serial Data
SCL	Serial Clock input
WP	Write Protect
NC	No Connect

2-1-5 8M-BIT [1Mx8/512Kx16] CMOS FLASH MEMORY

FEATURES

- 1,048,576 x 8/524,288 x 16 switchable
- Single power supply operation
  - 5.0V only operation for read, erase and program

operation

- Fast access time: 70/90/120ns
- Low power consumption
  - 50mA maximum active current
  - 0.2uA typical standby current

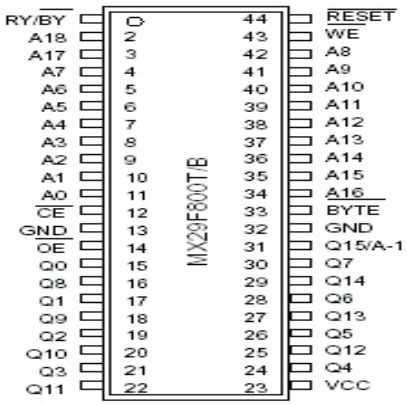
• Command register architecture
- Byte/word Programming (7us/12us typical)
- Sector Erase (Sector structure 16K-Bytex1, 8K-Bytex2, 32K-Bytex1, and 64K-Byte x15)
• Auto Erase (chip & sector) and Auto Program
- Automatically erase any combination of sectors with **Erase Suspend capability.**
- Automatically program and verify data at specified **address**
• Erase suspend/Erase Resume
- Suspends sector erase operation to read data from, or program data to, another sector that is not being erased, then resumes the erase.

• Status Reply

- Data polling & Toggle bit for detection of program and erase operation completion.
• Ready/Busy pin (RY/BY)
- Provides a hardware method of detecting program or erase operation completion.
• Sector protection
- Sector protect/chip unprotect for 5V/12V system.
- Hardware method to disable any combination of sectors from program or erase operations
- Tempory sector unprotect allows code changes in previously locked sectors.
• 100,000 minimum erase/program cycles
• Latch-up protected to 100mA from -1V to VCC+1V
• Boot Code Sector Architecture
- T = Top Boot Sector
- B = Bottom Boot Sector
• Low VCC write inhibit is equal to or less than 3.2V
• Package type:
- 44-pin SOP
- 48-pin TSOP
• Compatibility with JEDEC standard
- Pinout and software compatible with single-power supply Flash

PIN CONFIGURATIONS

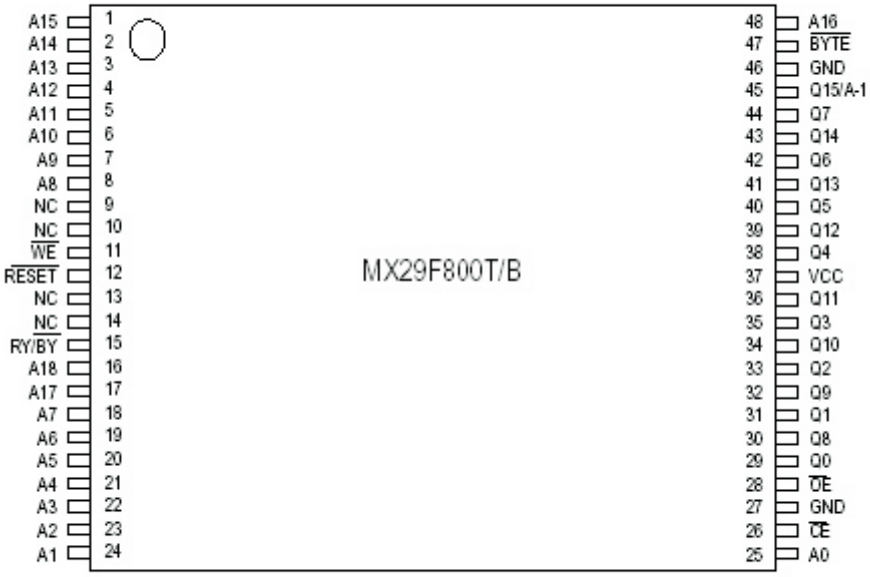
44 SOP(500 mil)



PIN DESCRIPTION

SYMBOL	PIN NAME
A0~A18	Address Input
Q0~Q14	Data Input/Output
Q15/A-1	Q15(Word mode)/LSB addr(Byte mode)
$\overline{CE}$	Chip Enable Input
$\overline{WE}$	Write Enable Input
$\overline{BYTE}$	Word/Byte Selction input
$\overline{RESET}$	Hardware Reset Pin/Sector Protect Unlock
$\overline{OE}$	Output Enable Input
RY/$\overline{BY}$	Ready/Busy Output
VCC	Power Supply Pin (+5V)
GND	Ground Pin

48 TSOP (Standard Type) (12mm x 20mm)

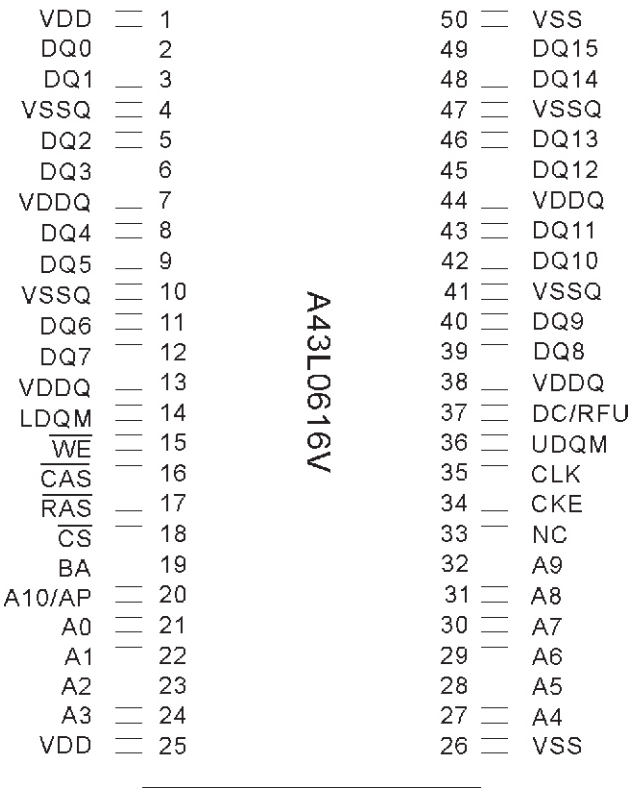


2-1-6 512K X 16 Bit X 2 Banks Synchronous DRAM (A43L0616)

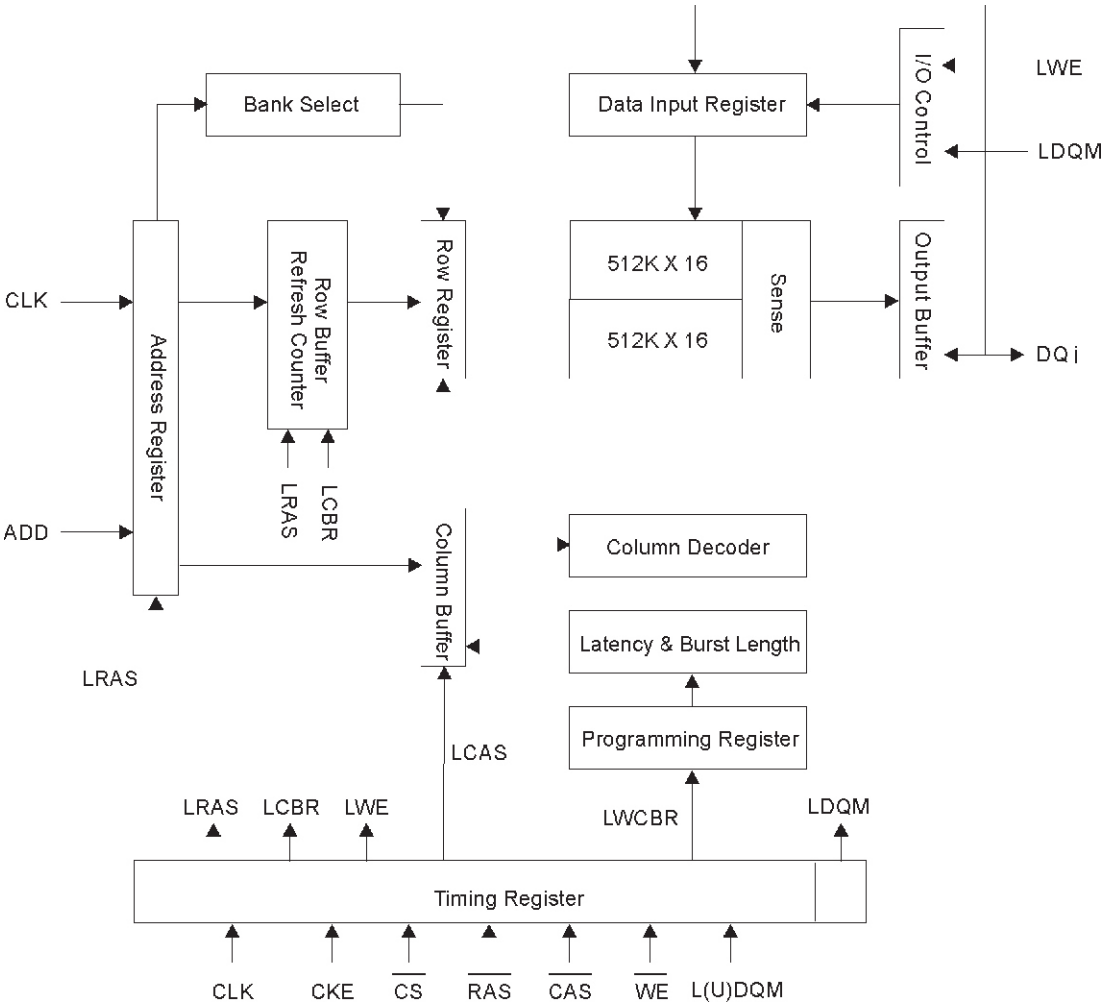
Features

- JEDEC standard 3.3V power supply
- LVTTL 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


VDD 1
DQ0 2
DQ1 3
VSSQ 4
DQ2 5
DQ3 6
VDDQ 7
DQ4 8
DQ5 9
VSSQ 10
DQ6 11
DQ7 12
VDDQ 13
LDQM 14
WE 15
CAS 16
RAS 17
CS 18
BA 19
A10/AP 20
A0 21
A1 22
A2 23
A3 24
VDD 25
50 VSS
49 DQ15
48 DQ14
47 VSSQ
46 DQ13
45 DQ12
44 VDDQ
43 DQ11
42 DQ10
41 VSSQ
40 DQ9
39 DQ8
38 VDDQ
37 DC/RFU
36 UDQM
35 CLK
34 CKE
33 NC
32 A9
31 A8
30 A7
29 A6
28 A5
27 A4
26 VSS
A43L0616V

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.

Symbol	Name	Description
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: fs 48/96KHz, 4Hz~22/44KHz Video CD: fs 44.1KHz, 4Hz~20KHz Audio CD: fs 44.1KHz, 4Hz~20KHz
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	AC100~255V, 50/60Hz
Power Consumption	<25 Watt

Set

Dimensions (W X H X D)	430 X 52 X 295 (mm)
Net Weight	2.6 Kg
Gross Weight	4.0 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 go to the PREFERENCE item by pressing left button, then press 5 buttons in turn: 4,9,5,4,0
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. And then press SETUP button to exit (FOR 1379)
4. A item named VERSION will be displayed, get into the page, you can change the region code to 1-6 with UP/DOWN button, the num 0 means REGION FREE. And then press SETUP button to exit (for 1369)

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

¡ñ Do not touch the playing side of a disc

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

How to clean discs

¡ñ 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.

¡ñ Cloth and with dry cloth, Any kind of solvent, such as dilute agent, gasoline, liquid detergent, gasoline liquid detergent anti – static aerosol used for vinylon LP, may cause disc damage.

How to protect discs

¡ñ Keep away from the direct sunshine or any heat source.

¡ñ 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

¡ñ 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 player 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 5, which indicates the applicable. The disc with code number other than 5 cannot be player 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

Problems and Solutions

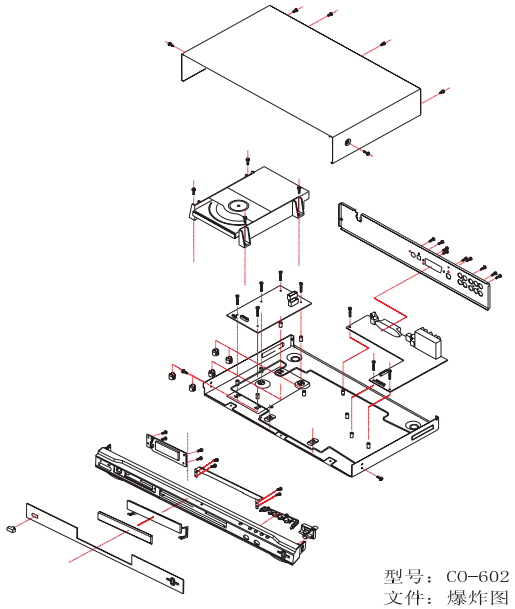
If a fault occurs, first check the points listed below before taking the set for repair.
If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

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:
This produce incorporates copyright protection technology that is protected by method claims of certain of certain U.S. patent and other intellectual Property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation and is intended for home and other limited viewing users only, unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

6.Disassembly and Reassembly



型号：CO-602
文件：爆炸图

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. Electrical Part List

CO-602 PRODUCT DESIGN PACKAGE LIST

Item	Name of Components	Specification	Qty.		Location
1	lines				
	A□line				
	24PIN/0.5mm	L=70mm	1		loader to MPEG board
	5PIN/2.0mm	L=140mm	1		loader to MPEG board
	6PIN/2.0mm	L=60mm	1		loader to MPEG board
	5PIN/2.54mm	L=500mm	1		MPEG board
	4PIN/2.54mm	L=250mm	1		control panel to power board
	6PIN/2.54mm	L=300mm	1		control panel to MPEG board
	13PIN/2.0mm	L=170mm	1		output board to MPEG board
	14PIN/2.0mm	L=220mm	1		output board to MPEG board
	2PIN/3.96mm	L=620mm	1		red, double insulated
	B□power supply wire	L=1700mm	1		(black□two-round-pin□double insulated□KS certificate)
2	other electronic components				
	power supply switch	TV-5	1		

	fastening wire	Nylon fastening wire	4		
	fastening wire	black,120mm	1		for fastening power supply wire
3	loader sets				
	CO-DJA1389XE+SANYO 5.1CH MPEG board	MTK1389DE 5.1channel	1		MTK1389DE_5V power supply
	DS-600MA DVD loader	SANYO DVD loader	1		
	power supply board	CO-DPA118	1		0320 transformer and TDA1522
	CO-DCA602 control panel	CO-DCA602 control panel	1		
	AV output board	CO-DOB802-5	1		with SCART,Optical and KARAOKE, without earphone
4	plastical sets				
	front panel	CO-602 front panel	1		
	power supply button	CO-602	1		ABS silver
	MIC volume button	CO-602	2		ABS silver
	8 keys set	CO-602	1		ABS silver
	mirror	CO-602	1		PVC
	transfering bar	CO-602	1		for SANYO loader
	disc tray	CO-602	1		ABS silver
	DVD logo stick		1		black ground silver chars
	PCB support	ABS 9.0mm			5 for power board,3 for output board

			8		
	plastical bolt cap		8		5 for power board,3 for output board
	rubber mat	Φ 12*2	2		hardness 64
	rubber mat	19.5*9.5*3.5	2	hardness 64	
5	metals				
	upper cover	CO-602 upper cover	1		siver
	bottom cover	CO-602DZ	1	silver-gray	
	rearpanel	CO-602HBA	1	black	
	bolt	Φ 3*8BAUU	12		9 for control panel,2 for power botton,1 for bracket
	bolt	Φ 3*8BAUU	8		8 for Audio output jack
	bolt	Φ 3*15BBHE	8		5 for power board, 3 for AV output board
	bolt	Φ 3*6WBHE	11		4 for upper cover, 4 for rear panel,3 for front panel
	bolt	Φ 3*6WBHE	4		4 for loader
	bolt	Φ 3*6BBHE	2		2 for rear panel
	bolt	Φ 2.6*6CB	3		3 for MPEG board
	bolt	M3*6KMHE	—2		2 for front panel side
6	prints		—		
	A□package		—		
	foam		1set		foam(same with CO-602)
	handle	white	1set		

	giftbox		1		
	carton	1	1	1 players in 1 PE	
	bag	05*80*160mm	1	for power supply wire	
	bag	05*80*260mm	1	for remote control	
	bag	0.5*180*260mm	1	for owner's manual	
	bag	480*580mm	1	pearl cotton	
	B□appendix				
	remote control		1		
	remote control batteries	7#	1 set		
	manual		1		
	Video connection wire	1.5M	1		
	Audio connection wire	1.5M	1		
	C□others				
	serial stick		3		
7	others				
	solder tin		some		
	heat-melting-glue		some		
	red glue		some		
	yellow glue		some		
	black glue		some		
	heat-dissipating oil		some		

	glue paper		some		
	heat-contracting tube	4mmX15mm	2		
	heat-contracting tube	Φ22X30mm	1		
	jumper(Φ0.6mm)		1		
	double-color LED	Φ 3mm	1		
8	Components of MPEG board				
			.		
	SMD Capacitor	0603 0.1UF 25V +80%-20% X7R	74	C7 C8 C9 C12 C13 C21 C29 C30 C33 C34 C36 C39 C43 C44 C45 C46 CB1 CB2 CB4 CB5 CB10 CB12 CB13 CB15 CB16 CB17 CB18 CB19 CB20 CB21 CB22 CB23 CB24 CB25 CB26 CB27 CB28 CB29 CB30 CB31 CB32 CB33 CB34 CB35 CB36 CB37 CB40 CB41 CB42 CB43 CB44 CB45 CB47 CB49 CB50 CB51 CB52 CB53 CB54 CB56 CB57 CB58 CB59 CB60 CB61 CB62 CB67 CB68 CB72 CB73 CB74 CB75 CB76 CB85	
	SMD Capacitor	0603 20PF 25V ±5% NPO	1	C4	
	SMD Capacitor	0603 33PF 25V ±5% NPO	2	C10 C11	
	SMD Capacitor	0603 47PF 25V ±5% NPO	14	C47 C48 C49 C50 C51 C52 C53 C54 C55 C56 C57 C58 C82 C83	
	SMD Capacitor	0603 100PF 25V ±5% NPO	1	C22	
	SMD Capacitor	0603 330PF 25V ±5% NPO	2	C37 C38	
	SMD Capacitor	0603 390PF 25V ±5% NPO	1	C1	
	SMD Capacitor	0603 120PF 25V ±5% NPO	1	C28	
	SMD Capacitor	0603 150PF 25V ±5% NPO	2	C41 C42	

	SMD Capacitor	0603 1000PF 25V ¡À5% NPO	2	C5□C6
	SMD Capacitor	0603 1500PF 25V¡À10% X7R	1	C35
	SMD Capacitor	0603 2200PF 25V ¡À10% X7R	2	C3□C74
	SMD Capacitor	0603 0.015uF 25V¡À10% X7R	1	C40
	SMD Capacitor	0603 0.033uF 25V¡À10% X7R	1	C14
	SMD Capacitor	0603 0.047uF 25V¡À10% X7R	2	C17□C18
	SMD Capacitor	0805 0.47uF 25V¡À10% X7R	1	C19
	SMD Capacitor	0805 1uF 16V -20%+80% Y5V	6	C15□C16□C23□C24□C25□C26□
	Electrolytic capacitor	10UF 16V ¡À20% 4*7mm	5	CE1□CE15□CE24□CE48□CE6
	Electrolytic capacitor	22UF 25V ¡À20% 6*7mm	1	CE3
	Electrolytic capacitor	100UF 10V ¡À20% 5*7mm	4	CE11□CE20□CE42□CE43
	Electrolytic capacitor	220UF 10V ¡À20% 6*7mm	7	CE9□CE12□CE13□CE4□CE2□E25□CE26
	Electrolytic capacitor	47UF 16V ¡À20% 4*7mm	9	CE16□CE17□CE18□CE33□CE21□ CE22□CE23□CE27□CE28□
	SMD Diode	1n4148	15	D3□D4□D5□D6□D7□D8□D9□D10□D11 □D12□D13□D14□D15□D16□D17
	DIP inductor	0805 10UH	2	L21□L22
	SMD inductor	0805 1.8uH	7	L28□L29□L32□L33□L34□L35□L1
	SMD inductor	0805 2.7uH	1	L42
	SMD bead	0805 45E OHM 100MHZ	16	L2□L6□L7□L8□L9□L10□L11□L19□ L36□L3□L20□L24□L25□L26□L30□L38
	SMD triode	2SK3018 SOT-23	2	Q2□Q3
	SMD triode	2SB1132 SOT-89	2	Q4□Q5
	SMD triode	2N3904 SOT-23	1	Q1
	SMD triode	2N3906 SOT-23	2	Q12□Q26
	crystal	27MHz 49S 27P¡À10PPM(basi c frequency)	1	Y1

	SMD resistor	0603 33E*4±5%	1	RN1
	SMD resistor	0603 0E±5%	2	R186、R88
	SMD resistor	0603 1E±5%	1	R22
	SMD resistor	0805 1E±5%	4	R42、R43、R44、R45
	SMD resistor	0603 10E±5%	6	R23、R24、R120、R126、R39、R41
	SMD resistor	0603 33E±5%	11	R63、R64、R65、R66、R76、R138、 R139、R142、R143、R144、R145
	SMD resistor	0603 38E±1%	1	R91
	SMD resistor	0603 75E±1%	7	R96、R213、R73、R75、R81、R84、R94
	SMD resistor	0603 680E±5%	2	R68、R69
	SMD resistor	0603 1.0K±5%	2	R13、R48
	SMD resistor	0603 560E±5%	1	R25
	SMD resistor	0603 10k±5%	14	R1、R2、R52、R60、R67、R70、R33 、R34、R50、R54、R55、R57、R58、R59
	SMD resistor	0603 15k±5%	2	R14、R49
	SMD resistor	0603 18k±5%	1	R47
	SMD resistor	0603 20k±5%	4	R51、R53、R56、R46
	SMD resistor	0603 100K ±5%	3	R7、R32、R35
	SMD resistor	0603 150K ±5%	2	R17、R19
	SMD resistor	0603 680K ±5%	2	R10、R15
	SMD resistor	0603 750K±5%	1	R3
	SMD resistor	0603 1M±5%	1	R16
	jack	5PIN/2.0MM	1	CN4
	jack	6PIN/2.0MM	1	CN5
	jack	5PIN/2.54MM	1	CN2
	jack	6PIN/2.54MM	1	CN3
	jack	13PIN/2.0MM	1	CN6

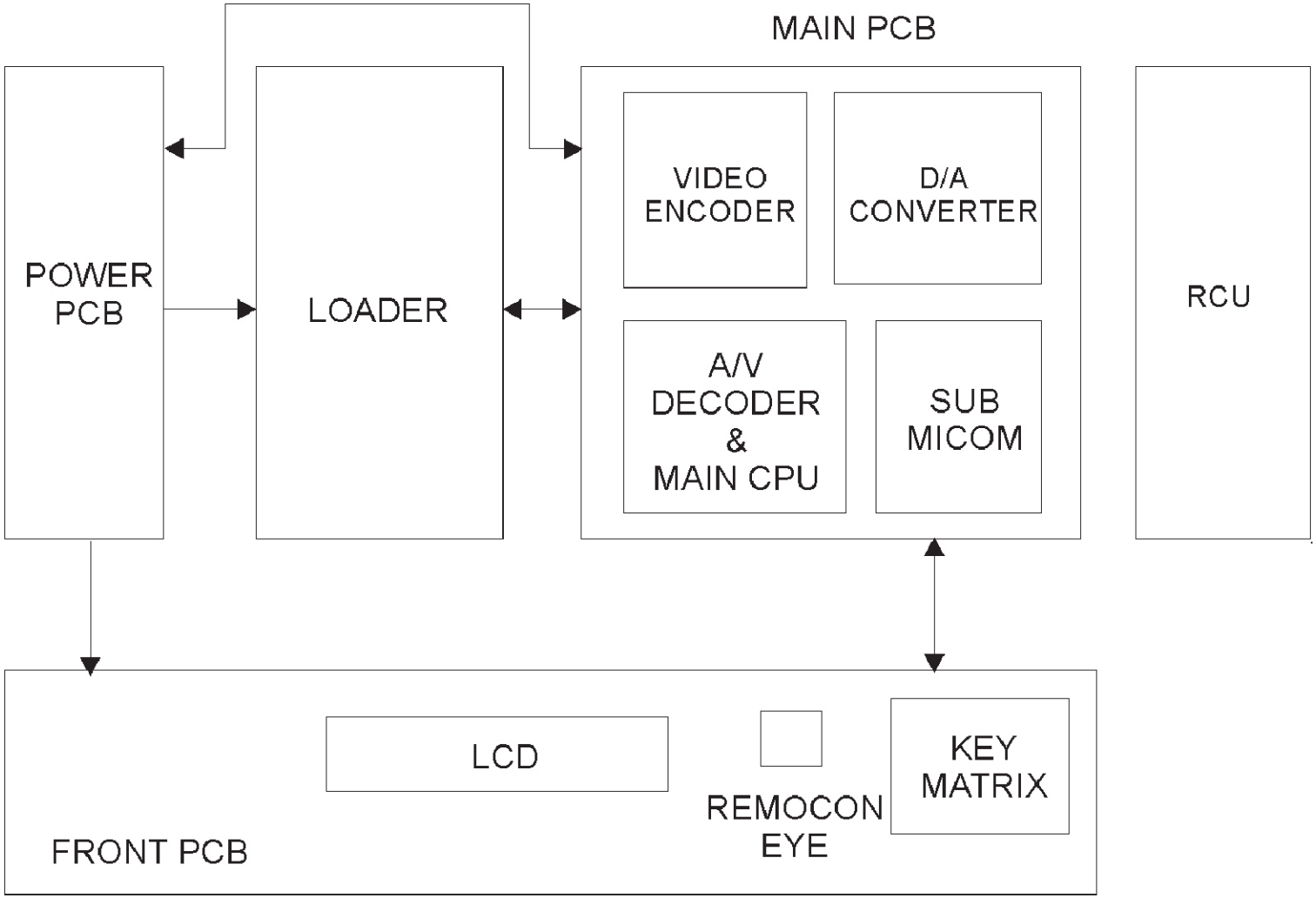
	jack	14PIN/2.0MM	1		CN1
	jack	24PIN/0.5MM SFHD-60(bottom)	1		HA1
	IC	SDRAM HY57V161610DTC-7 TSOP 16M	2		U7、U8
	IC	SC-62 BA5954	1		U5
	IC	SOT-8 BA6208F	1		U3
	IC	MT1389 256PIN	1		U4
	5.1CH	WM8766 5.1CH AUDIO DAC 28PIN SOP	1		U14：WM8766 SOP
	2CH	DA1131 2CH AUDIO DAC 14PIN SOP	1		U13：WM8714 SOP
	IC	MX29F800-70：8MFLASETSOP（5V）	1		U10 or U11(29F800TA-70)
	IC	EEPROM 24C02 ST-S08 （5V）	1		U12
	IC	AZ1117H_1.8V OUTPUT	1		U1 or H13A304BJ
	IC	CO-DJA1389XE+SANYO 2003-11-12	1		PCB
9	Components of Power Board				
	Jack	4PIN/2.54mm	1		CN1
	Jack	5PIN/2.54mm	1		CN5
	Jack	10PIN/2.54mm	1		CN3(4)
	Jack	3PIN/3.96mm	1		BCN1,BCN2
	Ceramic capacitor	330pF 63V +/-10% 5mm	1		C1
	Ceramic capacitor	0.1uF 63V +/-20% 5mm	1		C15
	Ceramic capacitor	100pF 63V +/-20% Y5P 5mm	3		C11,C12,C13
	Ceramic capacitor	10nF 1KV +/_%10 5mm	1		C8
	Electrolytic capacitor	220UF 16V +/-20% 6X11mm	1		C10(none H L-D116 VFD)
	Electrolytic capacitor	470UF 16V +/-20% 8X11mm	1		C24(none for co-dja1369 MPEG board
	Electrolytic capacitor	330UF 25V +/-20% 8X14mm	2		C22,C23

	Electrolytic capacitor	470UF 25V +/-20% 8X12mm	2		C16,C18
	Electrolytic capacitor	100UF 50V +/-20% 8X14mm	2		C6,C7
	Electrolytic capacitor	47UF 400V +/-20% 22X23mm	1		C9
	Electrolytic capacitor(high frequency)	1000uF 10V +/-20%	2		C20,C21
	Safety Regulation capacitor	680UF 400V +/-20% Y1	1		BC6
	Safety Regulation capacitor	2200UF 400V +/-20% Y1 UL 10mm	2		BC3,BC4
	Safety Regulation capacitor	0.1UF 275V +/-10% 15mm	2		BC1,BC2
	Polyester capacitor	47nF 100V +/-10% Y5P 5mm	2		C2,C3
	Ceramic capacitor	0.1uF 50V +/-20% 5mm	2		C4,C5
	Diode	IN4007	4		D1,D2.D3,D4
	Diode	IN5404	2		D13,D14
	Diode	SR560	1		D10
	Schottky Diode	HER107	5		D6,D7,D8,D9,D12
	Schottky Diode	UF4007	1		D5
	Zener Diode	3.3V 1/2W	1		DZ1
	Fuse	T2A T-D 250V PL UL CSA VDE	1		F1
	Fuse Jack	BLX-A	1		F501
	Bead	3.5X4.7X0.8mm	2		L2,L3
	Inductor(I-shape)	1A 10UH P5MM D6MM	2		L4,L7
	Inductor(I-shape)	2A 10UH P5MM D6MM	1		L5

	Common-mode Inductor	>10mH R<4.5E	1		L1	
	Transformer	CO-BYBYDAP118A/B/C KBEC28-21178	1		T1	
	Carbon Film Resistor	2W 27K +/-5%	1		R7	
	Carbon Film Resistor	1W 1E +/-5%	1		R6	
	Carbon Film Resistor	1/4W 10K +/-5%	2		R12,R13	
	Carbon Film Resistor	1/4W 300E +/-5%	1		R5	
	Carbon Film Resistor	1/4W 3K +/-5%	1		R11	
	Carbon Film Resistor	1/4W 470E +/-5%	1		R10	
	Carbon Film Resistor	1/4W 4.7K +/-5%	1		R9	
	Carbon Film Resistor	1/4W 5.1K +/-5%	1		R1	
	Carbon Film Resistor	1/4W 6.8K +/-5%	1		R2	
	Carbon Film Resistor	1/4W 75K +/-5%	1		R8	
	Press-sensitive Resistor	07 471	1		RV1	
	Grounding solder slice	D3.2 mm	3		1,2,3	
	IC	TEA1523P	1		U1	
	IC	TL431 TO-92 decal	1		U3	
	Photo-electric Couple	PC817	1		U2	
	Power Board PCB	C0-DPA118 2002-09-09	1		PCB	
	Jumper	10mm	2		J1,J3	
	Jumper	15mm	1		J4	
	Jumper	16mm	1		J2	

10	Components of Control Panel				
	Carbon Film Resistor	1/4W 10E +/-10%	2		R1□ R9
	Carbon Film Resistor	1/4W 10K +/-10%	7		R2~R4□ R6~R8□ R10
	Carbon Film Resistor	1/4W 56K +/-10%	1		R5
	Ceramic capacitor	50V104 +80/-20%	1		C3
	Electrolytic capacitor	16V 47U F 20%	2		C1,C2
	Diode	1N4148 Axial 0.4	5		D1,D2,D3,D4,D5
	IC	16312 QFP44 (AD16312)	1		U1
	VFD	SAMSUNG	1		IC1
	R/M	TD138	1		RMC1
	Button	6*6*5	10		NEXT□STOP□PREV□OPEN□REV□FWD□PAUSE□ PLAY□ STOP1□ PLAY1
	Potentiometer	RV0902N-15FD1-A20K-P	2		VOL1,VOL2
	Jumper	6mm	4		JMP1□ JMP3□ JMP6□ JMP17
	Jumper	7mm	2		JMP7□ JMP8
	Jumper	8mm	3		JMP2□ JMP15□ JMP16
	Jumper	10mm	2		JMP5□ JMP11
	Jumper	12mm	2		JMP4□ JMP9
	Jumper	13mm	1		JMP10
	sponge mat for R/M	10*8*7mm	1		
	sponge mat for VFD	12*12*3mm	1		
	PCB	□CO-DCA602	1		

9. Block Diagram


MAIN PCB
POWER PCB
LOADER
VIDEO ENCODER
D/A CONVERTER
A/V DECODER & MAIN CPU
SUB MICOM
RCU
LCD
REMOCON EYE
KEY MATRIX
FRONT PCB

10. Circuit Diagrams

1. Control Part

2. Index

3. SDRAM & FLASH

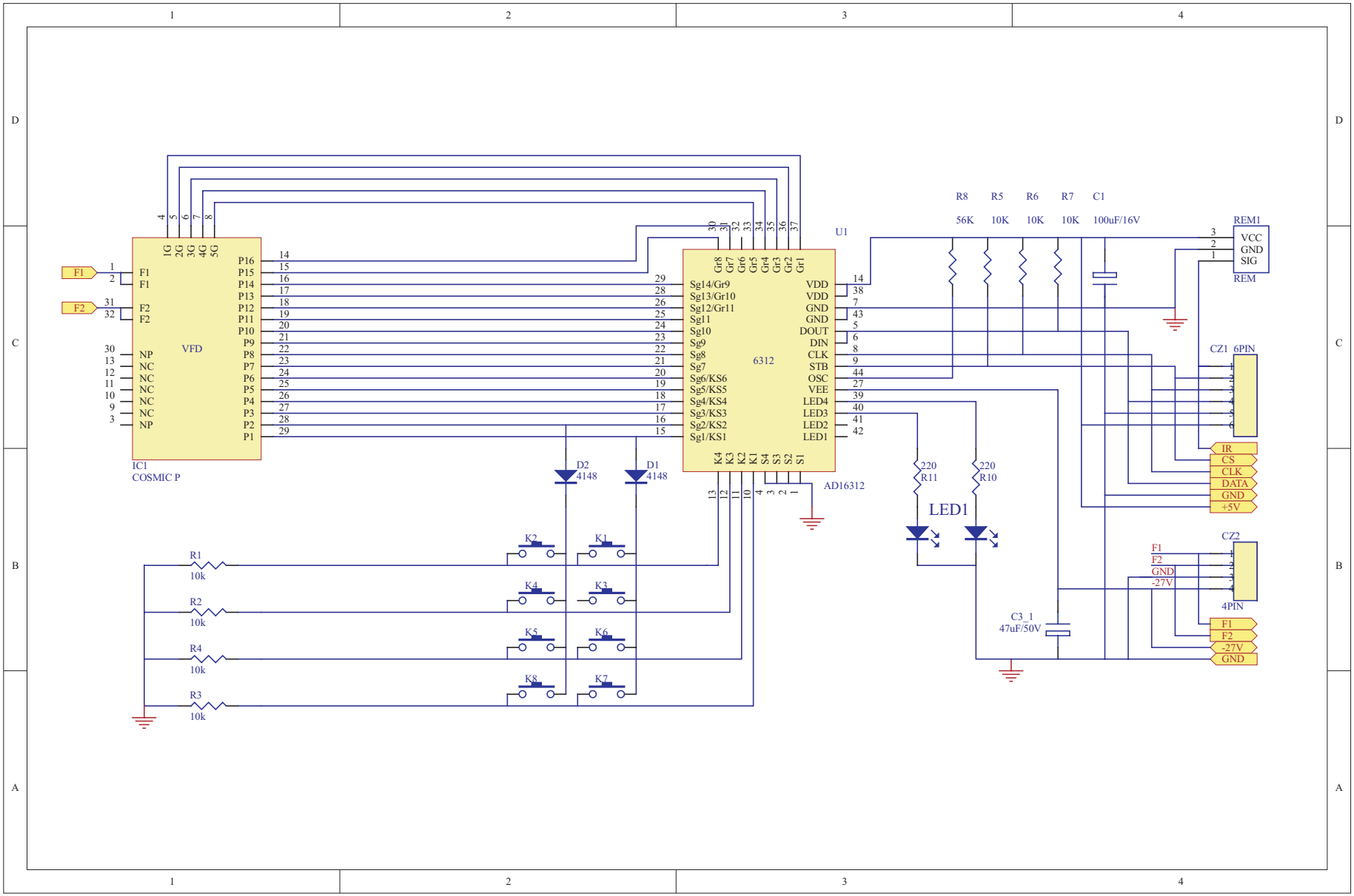
4. Servo-DSP MPEG

5. **Video Output**

6. Audio Output

7.**Power Part**

1.Control Part



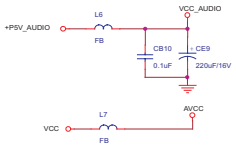
2. INDEX

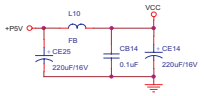
COMMOND89_HD60_V2

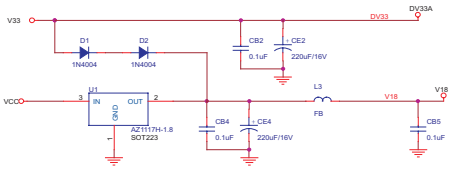
MT1389E (LQFP256) DVD Demo Board for Sanyo Slim HD60 PUH

NAME	TYPE	DEVICE
VCC	Digital 5V	SUPPLY
DV33	Digital 3.3V	MT1389E
RFV33	Servo 3.3V	MT1389E
LDO_AV33	Laser Diode 3.3V	
AVCC	RF 5V	PICKUP HEADER
V18	Digital 1.8V	MT1389E
SD33	Digital 3.3V	SDRAM
AVDD	Audio 5V	Audio DAC
DVDD	Audio 5V	Audio DAC

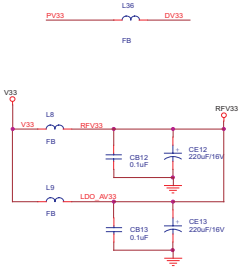
Rev	History	P#	Date
V1	The original released.		2003.6.15
V2	Change CE11 from 10uF to 100uF Change C5 from C to 2200pF Change C2 from 0.1uF to C Change R10,r15 from 750k to 680k Change R17,R19 from 390k to 150k Add C74 2200pF Change R37 from 0 to R Change R38 from 0 to R Change C32 from 15nF to C Change PIN 47 from LIMIT to ADIN Add CE15uF Change R15 from 1.5k to 1.8k Remove T4M04 Change the LIMIT singalfrom PIN 46 to PIN136 Change R84,R5,R6,R8,R12 from 1k to R Chang the TRIN4TROUT pullhigh power from 5V to 3V3 Add LC circuit Change agnlf output powr Add the Audio DAC power to reference filtering		2003.7.17

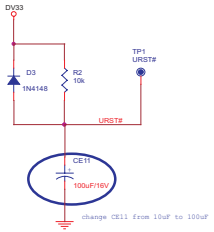


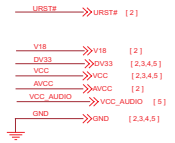


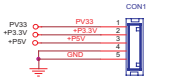


Power ON alive source

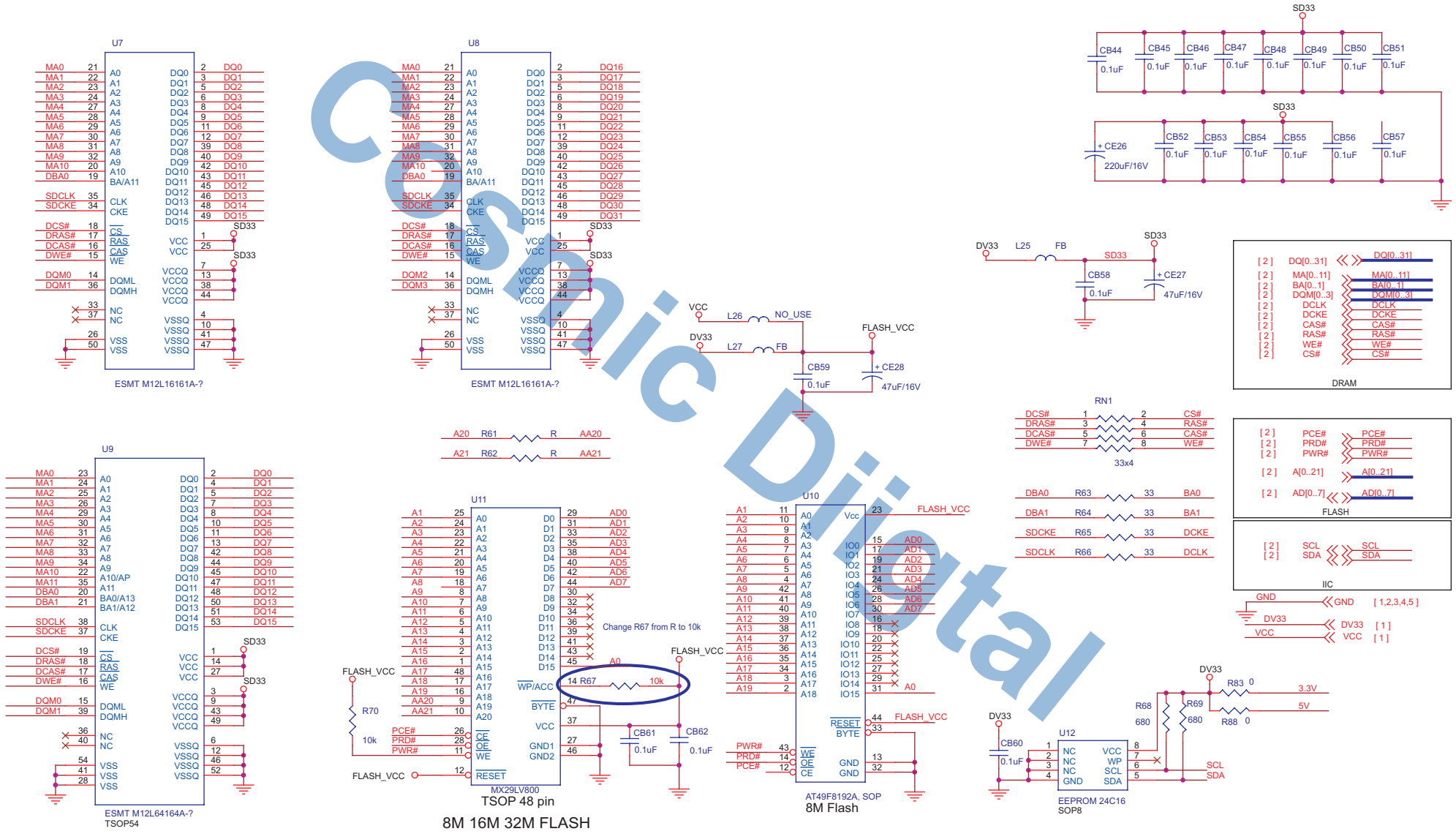




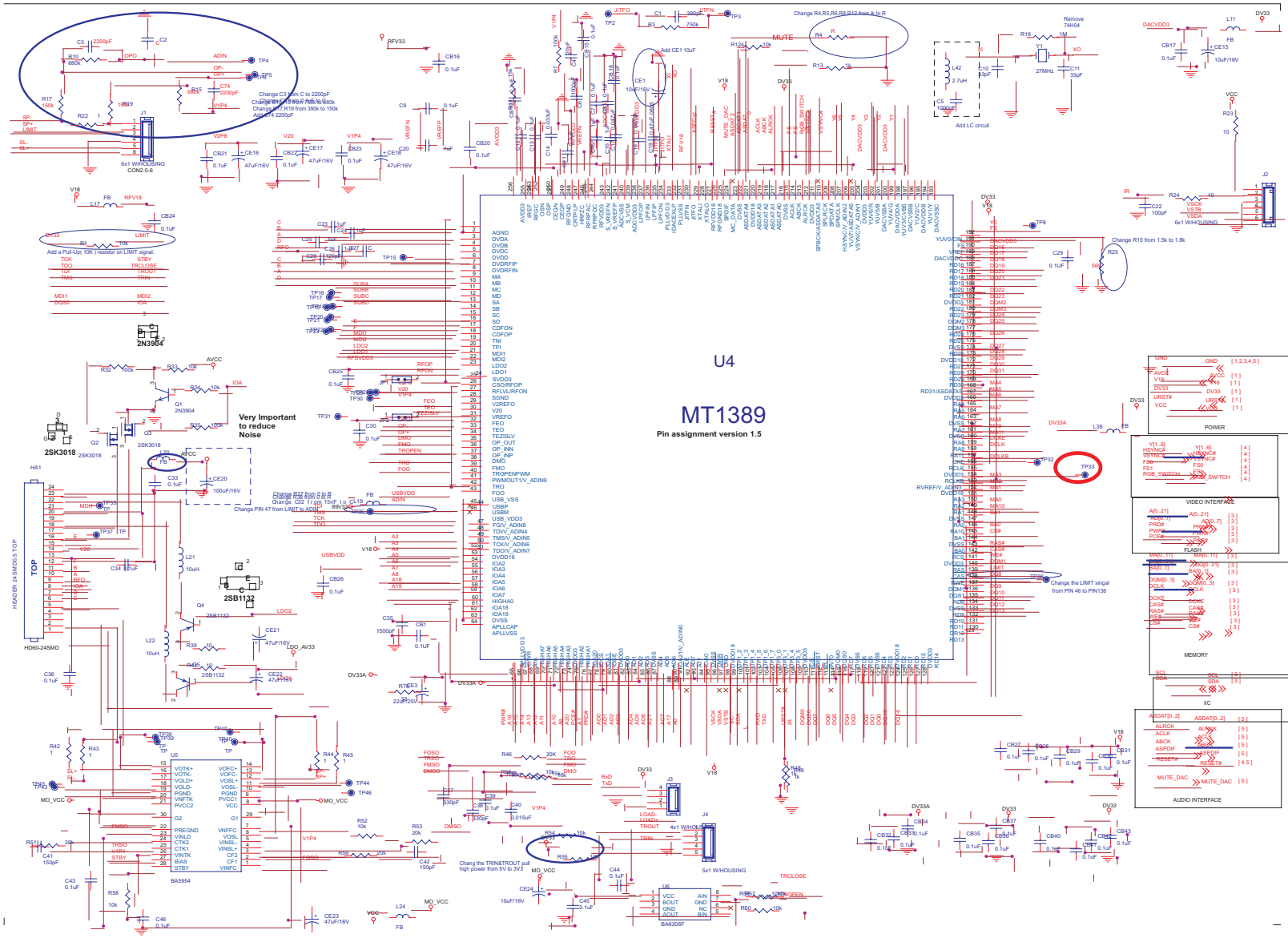




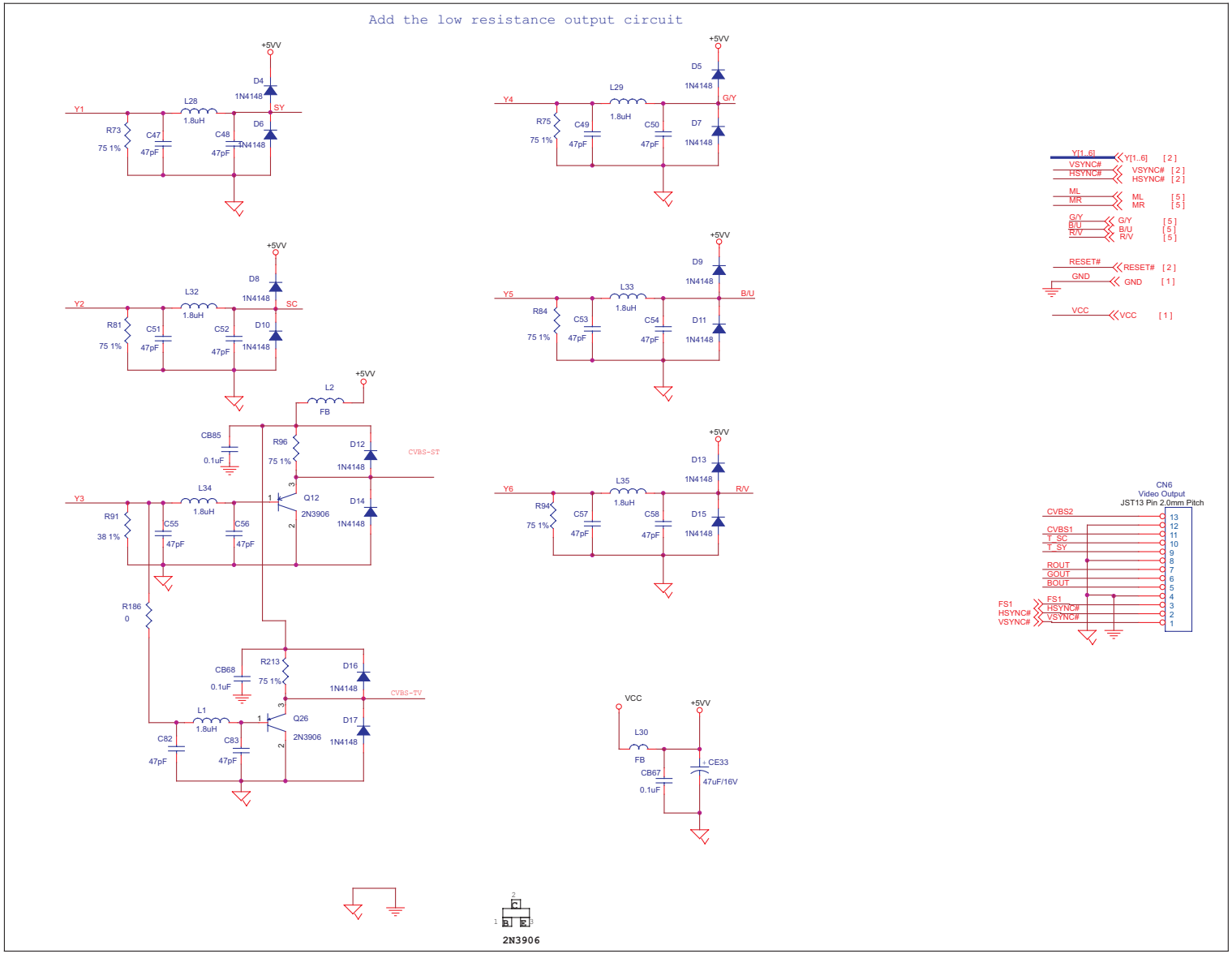
3. SDRAM & FLASH



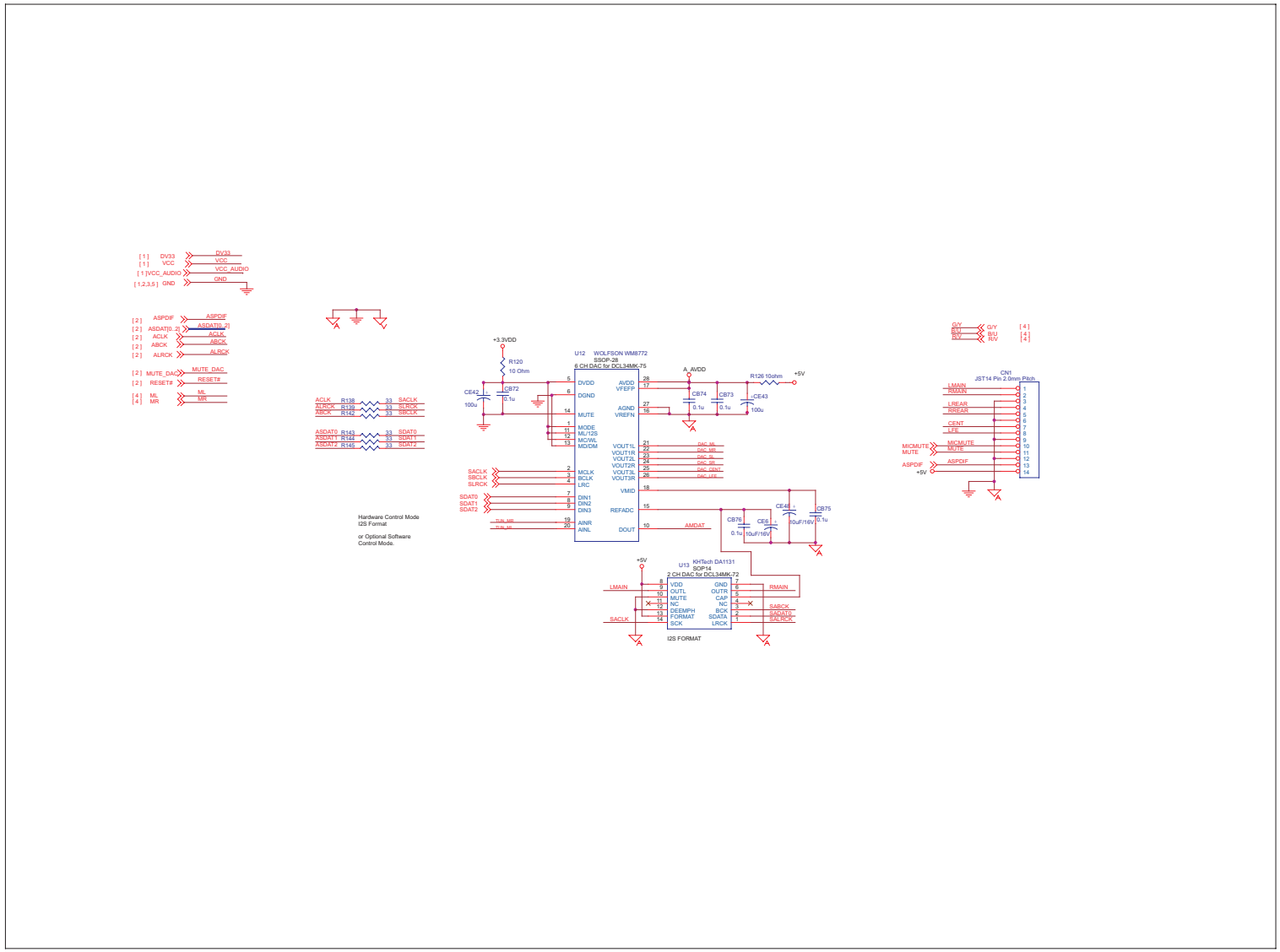
4.Servo-DSP MPEG



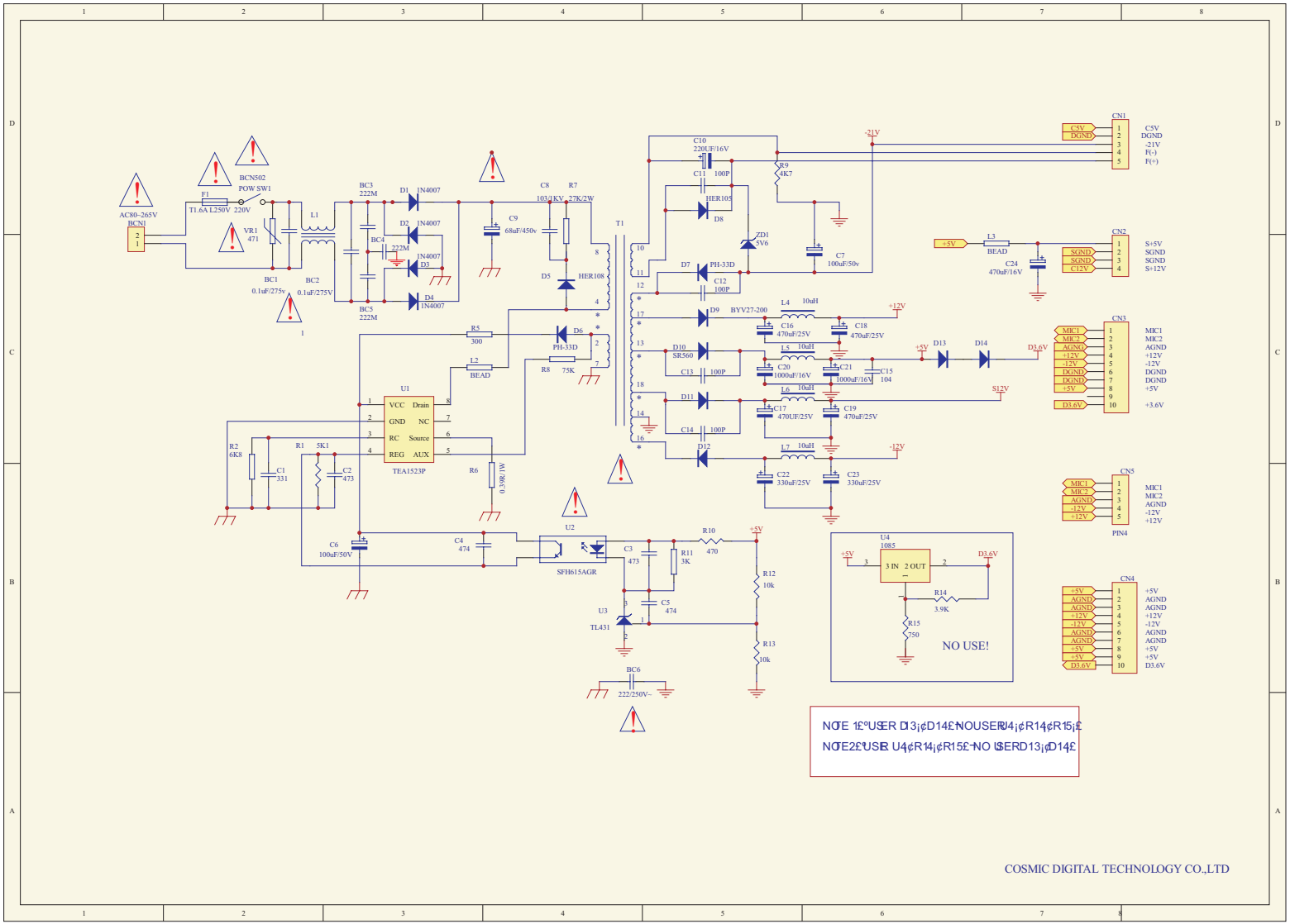
5. Video Output



6.Audio Output



7.Power Part


AC80-265V
BCN1
F1
T1.6A L250V
BCN502
POW SW1
220V
VR1
471
L1
BC1
0.1uF/275v
BC2
0.1uF/275V
BC3
222M
BC4
222M
BC5
222M
D1 1N4007
D2 1N4007
D3 1N4007
D4 1N4007
C9
68uF/450v
C8
103/1KV
R7
27K/2W
T1
D5
HER108
D6
PH-33D
R8
75K
R5
300
L2
BEAD
U1
VCC Drain
GND NC
RC Source
REG AUX
TEA1523P
R2
6K8
C1
331
R1
5K1
C2
473
R6
0.39R/1W
C6
100uF/50V
C4
474
U2
SFH615AGR
C3
473
R10
470
R11
3K
R12
10k
R13
10k
U3
TL431
C5
474
BC6
222/250V~
C10
220UF/16V
C11
100P
R9
4K7
HER105
D8
ZD1
5V6
C7
100uF/50v
D7
PH-33D
C12
100P
D9
BYV27-200
D10
SR560
C13
100P
D11
C14
100P
D12
L4
10uH
L5
10uH
L6
10uH
L7
10uH
C16
470uF/25V
C18
470uF/25V
C20
1000uF/16V
C21
1000uF/16V
C15
104
C17
470UF/25V
C19
470uF/25V
C22
330uF/25V
C23
330uF/25V
-21V
+12V
-12V
+5V
S12V
D13
D14
D3.6V
+5V
L3
BEAD
C24
470uF/16V
U4
1085
3 IN 2 OUT
R14
3.9K
R15
750
NO USE!
CN1
C5V
DGND
-21V
F(+)
CN2
S+5V
SGND
SGND
S+12V
CN3
MIC1
MIC2
AGND
+12V
-12V
DGND
DGND
+5V
+3.6V
CN5
MIC1
MIC2
AGND
-12V
+12V
PIN4
CN4
+5V
AGND
AGND
+12V
-12V
AGND
AGND
+5V
+5V
D3.6V
NOTE 1:USER D13¡¢D14:NOUSERU4¡¢R14¡¢R15¡£
NOTE2:USER U4¡¢R14¡¢R15:NO USERD13¡¢D14¡£
COSMIC DIGITAL TECHNOLOGY CO.,LTD

11. Wiring Diagram

CO-602 (CUSTOMER MODEL):