SERVICE MANUAL

LT2007



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1. SAFETY PREAUTIONS

1.1 GENERAL GUIDELINES

1. When servicing, observe the original lead dress. if a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.

2. After servicing, see to it that all the protective devices such as insulation barrier, insulation papers shields are properly installed.

3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

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

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially availabel discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices,place the assembly on a conductive surface such as alminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as anti-static (ESD protected)can generate electrical charge sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, alminum foil or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

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

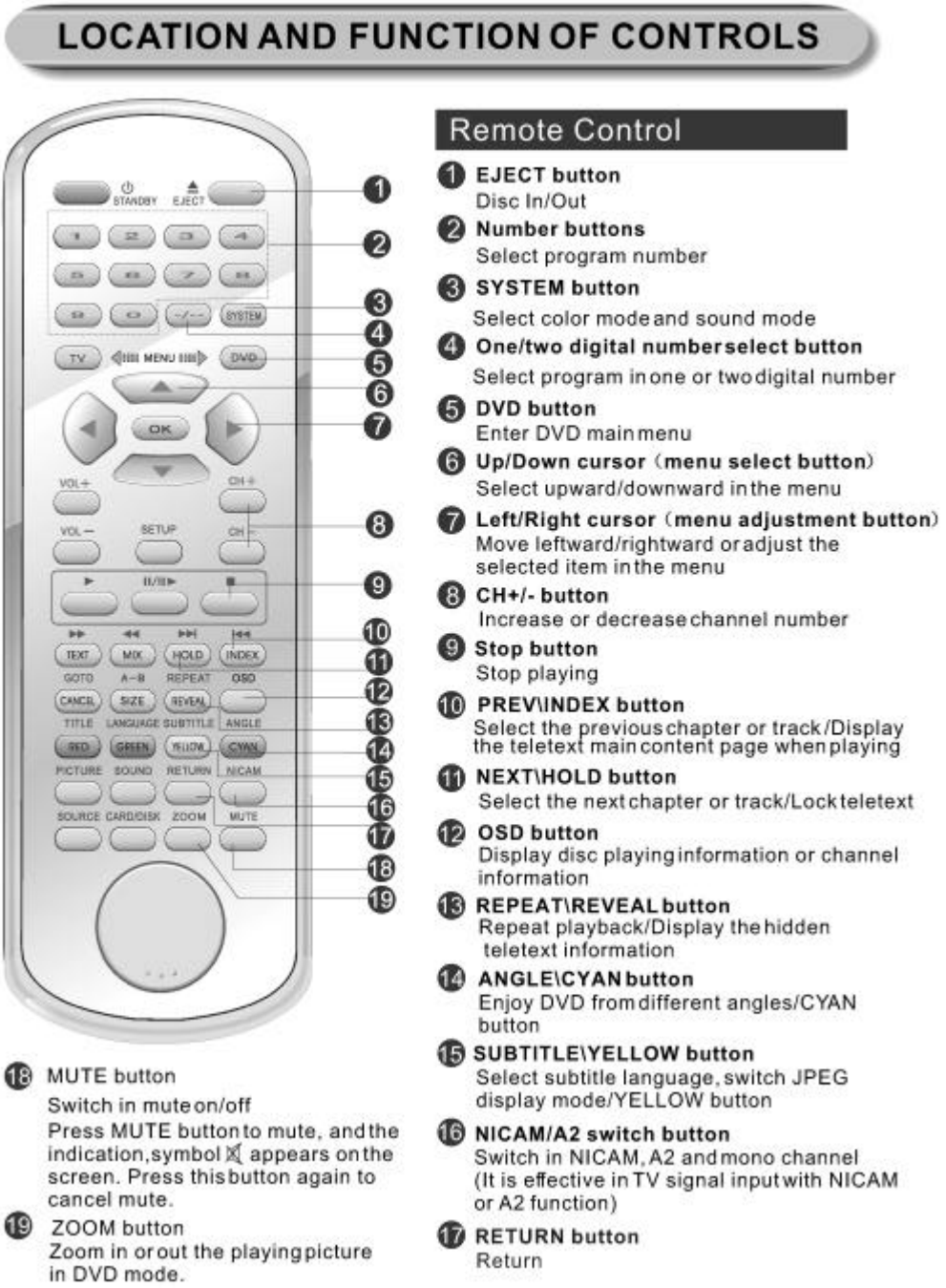
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity(ESD).

IMPORTANT SAFETY NOTICE

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

2. Control Button Locations and Explanations

Remote Control Illustration

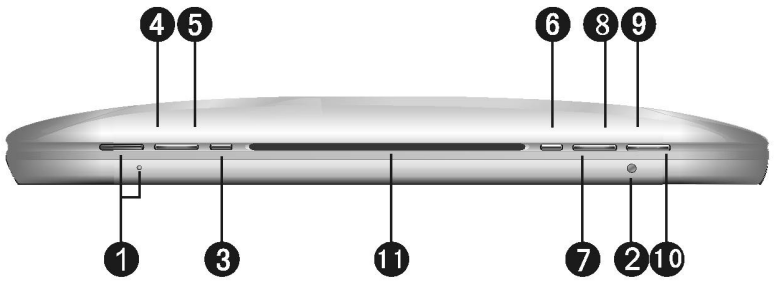


Front Panel Illustration

LOCATION AND FUNCTION OF CONTROLS

FRONT PANEL

Through adjusting the front panel, you may realize the basic control of the unit.

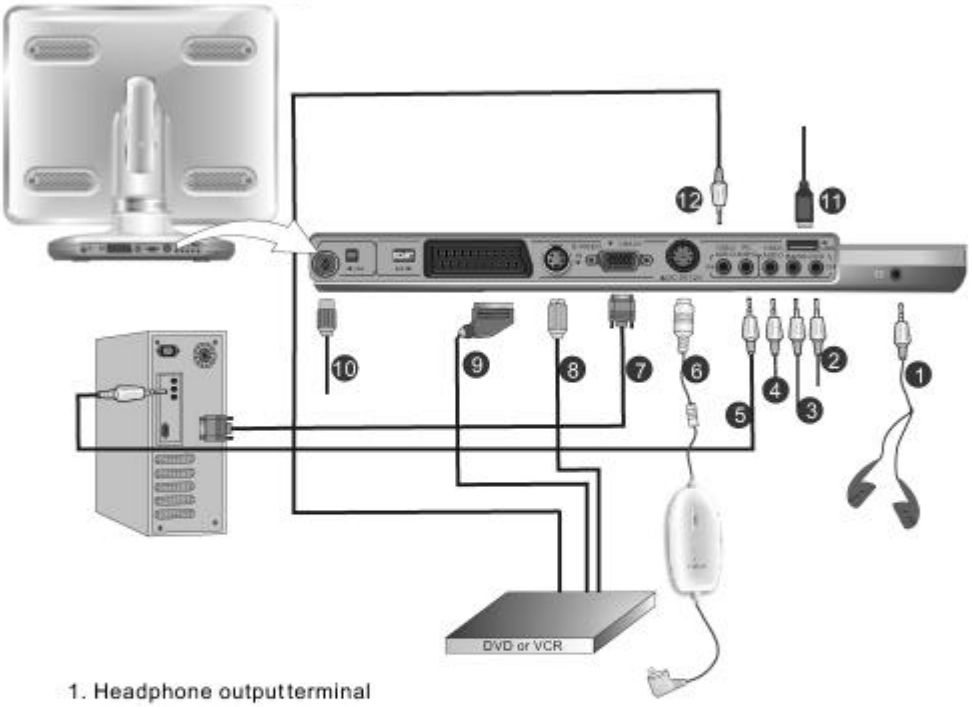


The functions of front panel buttons are as follows:

S.N.	Item	Description
1	POWER/ STANDBY	When no signals input within 2 minutes in VGA mode, this unit automatically enters standby mode. when no signals input within 5 minutes in other modes, this unit automatically enters standby mode, meanwhile the power indicator light becomes red. Press [POWER] button and this unit enters working mode.
2	IR sensor window	
3	SOURCE	Select in TV, VIDEO, VGA, S-VIDEO, SCART and DVD.
4	CH▼	Decrease the channhel unmber in TV mode; select menu item downward when menu displays.
5	CH▲	Increase the channhel unmber in TV mode; select menu item upwnward when menu displays.
6	OPEN/ CLOSE	Disc In/Out
7	VOL ◀	Decrease the menu adjustment item value and volume.
8	VOL ▶	Increase the menu adjustment item value and volume.
9	PAUSE/PLAY	Pause or play
10	STOP	Stop playing
11	DOOR	Disc In/Out door

INSTALLATION AND CONNECTION

CONNECTING FIGURE



1. Headphone output terminal
2. Coaxial digital audio output terminal
3. Subwoofer output terminal
4. AV signal output terminal
5. PC sound source input terminal
6. 5V, 12V DC power input terminal
7. VGA signal input terminal
8. S-video signal input terminal
9. SCART connecting terminal
10. TV signal input terminal
11. USB jack
12. AV input terminal

NOTE

After well connecting all cords, you may plug power cord.

TROUBLESHOOTING

DVD TROUBLESHOOTING

Symptom	Causes	Correction
Not play	1. Condensation on laser head 2. Disc not properly loaded 3. Disc not compatible with the unit	1. Switch on power and wait for 1 to 2 hours 2. Make sure label side of the disc facing up 3. Confirm whether this unit compatible with the placed disc
Sound distortion	1. Too large volume of connected device 2. Sound field mode not suitable for disc	1. Adjust the device volume 2. Adjust appropriate sound field
No sound	1. Disc warped or dirty 2. The unit in mute state	1. Clean the disc 2. Press MUTE button to cancel it.
No image	1. TV not set for proper system	1. Reset AV/TV state of TV
No color	1. TV system not right 2. TV color not well adjusted	1. Press P/N button on remote control to set 2. Reset the TV color
No disc reading	1. Disc warped or dirty 2. Disc not correctly placed 3. Condensation on laser head	1. Clean the disc 2. Reload a disc with label side facing up 3. Witch on power, unload disc and leave it for about 1 hour
Temporary function failure	1. Mal-fabricated disc used 2. Wrong buttons pressed 3. Static leakage into the unit from outside	1. Wait for 5 to 10 seconds to restore to normality automatically 2. Operate again 3. Power off for 1 to 2 minutes to power on again
No subtitle	1. No subtitle made in disc 2. The unit subtitle is turned off	1. Disc problem 2. Press SUBTITLE button to select it
Image rolling	1. System setup not suitable for disc	1. Adjust system

- If the above methods still cannot solve the problems or the troubles are special, please contact the local maintenance personnel.

DISPLAY MODE

SUPPORTED INPUT MODE				
Resolution	Hor scanning frequency (KHz)	Ver scanning frequency (Hz)	Pixel frequency (MHz)	Format
640×350	31.5	70.0	25.17	DOS
720×400	31.5	70.0	28.32	DOS
640×480	31.5	60.0	25.18	DOS
640×480	37.9	72.0	31.50	VESA
640×480	37.5	75.0	31.50	VESA
800×600	35.1	56.2	36.00	VESA
800×600	37.9	60.0	40.00	VESA
800×600	48.1	72.0	50.00	VESA
800×600	46.9	75.0	49.50	VESA

- This product does not support the display mode not listed above. In order to achieve the best display effect, please select the above-listed 9 display modes input signal.
- Because of the difference of display card output signal (especially non-standard signal output), the display image may appear little disturbance which can be adjusted through "▣" in the menu by users.
- To prolong this unit's service life, you are suggested to use power management function of computer.

NOTE

- Specifications and design are subject to change without notice.
- As for weight and size, please take actual object as standard.

TROUBLESHOOTING

Please check for causes of problems in accordance with the following chart before contacting any maintenance personnel.

IMAGE TROUBLE

Symptom	Causes and Correction
Black screen, power indicator light off	◆ Check whether power cord well connected, whether this unit power on
	◆ Check whether the signal cord of input device well connected ◆ Check whether input device power on
Image display flicker, unstable	◆ Check whether the input device signal in this unit's specification
	◆ Check computer output mode: control panel-display-setup ◆ If the setup does not accord with this unit's specification, please change the display setup
	◆ Ver scanning frequency: 30KHz~48KHz ◆ Hor scanning frequency: 56 Hz~75Hz ◆ Max display mode: 20":800X600@75 Hz

SOUND AND IMAGE TROUBLE

Symptom	Causes and Correction
Cannot power on	◆ Please make sure the well connecting of power cord
No sound	◆ Please make sure the well connecting of audio cord
	◆ Check volume
Volume too low	◆ Check volume
	◆ If volume is still too low when adjusting volume to maximum, please check whether the input device is well set
Snowy picture	◆ Input antenna damaged or not well connected
Remote control failure	◆ Check whether remote control battery used up ◆ Whether battery installation is correct ◆ Whether obstacles exists bwtween remote control and the unit's receiving window ◆ Check whether receiving window has strong light

Assembling and disassembling the mechanism unit

Test Scheme for LT2007

1. Description of purpose of the test scheme:

The electric functional part of LT1703/LT2003 LCD color TV set is composed of driving board, audio and video board, control key board and backlight power supply board. The backlight power supply is a bought module and the supplier and IQC of our company will check its function and consistency together; the other functional boards are designed and manufactured by us. This test scheme will make a guiding criterion of test method for these modules machined and manufactured by us.

After testing of all the functional modules, the assembled machine will be tested completely so as to confirm the indexes of all performance to be qualified or not.

This test scheme is only a guiding document which can not replace the operating manual book for the production. The test scope of the operating manual book shall be adjusted according to the real practice. However, the key technique index must reach the requirement prescribed by this test scheme.

2. The test scheme for driving board

1) Testing equipments

A. FLUKE 54200 TV signal generator one set
B. FLUKE45 multimeter one set
C. Special test host computer one set
D. DVD player with SCART terminal one set
E. Base unit in perfect condition one set
F. Testing frock one piece
G. Remote controller one piece

2) Testing flow

A. Tested driving board into clamp, then fulfill and affirm the related testing set-ups.

B. Switch on power, check the power supply voltage of +5、+3.3V、+2.5V boards by multimeter so as to affirm they are in normal status or not, then press key "POWER" on the control key board to start the machine.

C. Switch to "VGA" state by remote controller or "SOURCE' key on the control key board.

D. Check the display quality of all display modes under VGA mode, the character shall be clear and without distinct jamming.

E. Activate the special "DisplayMate for Windows" test software and select the "Set up Display", the exact requirements as follow① There isn't distinct jamming. on the tested pictures; ② All colors are in normal status; ③ The brightness and definition of pane picture of horizontal lines should be consistent with that of vertical lines; ④ The color of color stripe is correct and transition edge is clear; ⑤ The tested picture of DisplayMate Utilities is clear and arranged properly, focalized normally without distinct jamming.

F. Under TV mode, set RF level as 50dBμV and receive anyone of 48.25, 168.25 and 471.25MHZ frequencies. Awaiting until the normalization of pattern, then press "TEXT" key on remote controller, the related information of picture will appear; again press "INDEX" key to let picture return to the menu page; press "CHANNEL+" key to select picture's 101 pages, it will be refreshed page by page. Please observe the character or graphics of each refreshed page so as to confirm any imperfect character or image, it is required that less two pictures with imperfect character or image in each 10 pictures; please test respectively the functions of keys including "MIX"、"HOLD"、"CANCEL"、"SIZE"、"REVEAL" and "RED"、"GREEN"、"YELLOW"、"CYAN" and confirm them normal or

not.

G. Switch signal source to "AV" mode, start DVD Player and play the Panasonic demonstration disc so as to check the picture display quality under AV state, it is required that picture is stable, clear without distinct transverse and netted striation jamming.

H. Switch signal source to "S-Video" state, the items to be checked and requirements are as same as that of "AV" state.

I. Switch signal source to "SCART" mode, test the Video mode outputted by "SCART" under "CVBS"mode and "RGB"mode respectively. It is required that the picture is stable and clear without any jamming. At the same time, test the picture under RGB mode and it shall have advantage over that of CVBS mode. The identification of RGB of the machine is in normal state.

3) The qualified criterion and others

Only if the functions of all tested signal source channels have reached their related standards, the tested board shall be affirmed to be qualified, as to the board not qualified will be maintained and retested.

3. Testing of base unit

1) Testing equipments

A. FLUKE 54200 television signal generator	one set
B. HITACHI VC-6545 oscillograph	one set
C. Testing frock	one piece
D. Driving board in perfect condition	one piece
E. CATV antenna	one piece
F. TV set with AV input port	one set
G. 5MHz Twin channel audio oscillograph	one set
H. Amplifier with digital/coaxial input and subwoofer input	one set
I. Remote controller	one piece
J. Card reader	one piece

2) Testing flow

A. Put the tested audio & video board into clamp and link well signal connections of AV In/Out、S-Video 、TV、SCART (or linked by thimble of clamp). Install the related instruments and equipments and mark the often used fixed devices with symbol strip codes.

B. Switch LCD TV to TV receiving mode, set Pattern as "MULTI BURST"+"GREY SCALE"+"COLOR BAR", test respectively the watching situation on the three frequency points of 48.25、168.25、471.25MHz. It is required that under any Pattern mode, it can reach to the following statuses that the layer of Pattern is distinct, each grayscale is clear; the color of color strip is real and transition edge is clear; the brightness of each section of 0.5MHZ/1.0/2.0/4.0MHz of the multi-wave are consistent with each other, they are so clearly that the vertical lines inside pane can be identified, and so do 4.8MHZ (this section shall be a little darker under that of TV mode).

C. Set the sound mode as BG under TV mode, activate NICAM option as well, then adjust RF level to 45dB, test respectively the sound quality of FM MONO/DUAL/STEREO on 48.25、168.25、471.25MHZ, it is required that sound is clear without distinct noise，for example crack.

D. Set Pattern as "MULTI BURST", select one channel and input modes of AV、S-VIDEO、SCART, measure the wave profile between R908 and 7^{th} -contact by oscillograph, as indicated in the attached chart hereafter, it is required that the synchronizing header pulse wave profile of CVBS signal is square wave and its range of amplitude is $0.3+0.05/-0.1V_{pmp}$. The range of amplitude of whole video

frequency signal is 1.0±0.2$V_{P-P,the}$ range of amplitude of multi-wave at 4.0MHZ is as same as that of 1.0MHZ, the difference shall be ≤2dB(calculated according to 20lg $V_{4.0}/V_{1.0}$), the value of amplitude at 4.0MHz shall be prescribed by the project office.

E. Under SCART mode, use 54200 "Video" edit key to enter edit menu of Video, select CVBS and RGB from "SCAROUT" column in order to observe the image quality of picture, the transition edge of RGB's COLOR BAR shall be clear and frequency spectrum of multi-wave are clear and bright under the two modes of CVBS and RGB., the image quality in CABS mode is consistent with that of AV state, in the same time, please note that there is any sound outputted and the receiving status of TEXT in CABS mode.

F. Link 5MHz audio oscillograph to the output ports of loudspeaker, adjust RF signal with 1KHz audio frequency, tune up volume and let audio outputting wave profile be distorted just, then measure the peak value of wave profile, it is required that the value is not less than 10Vp-p.

G. Turn on /off the machine with "POWER" key on remote controller or control key board and confirm there is any "POP" noise while turning on/off it, there isn't any abnormal color block, flashing and astigmatism on picture as well.

H. In DVD mode, check error correction ability of disc reading, including whether disc scratching when reading, whether disc scratching when disc in/out, whether digital/coaxial has output, whether subwoofer has output and whether card reader is normal or not.

4. The test scheme for machine

1) Testing equipment

A. FLUKE 54200	one set
B. FLUKE 5418	one set
C. Special test host computer	one set
D. DVD Player	one set
E. TV set with AV input port	one set
F. CATV antenna	4 pieces
G. Amplifier with digital/coaxial input and subwoofer input	one set
H. Remote controller	several
I. Card reader	one piece

2) Testing requirement

The testing requirement for the related functions of PC and audio & video are consistent with that of above mentioned boards; the switch testing shall be done between all modes under PC mode (the refresh rates of 640×480、800×600、1024×768、1280×1024), and there will be no any abnormal grating during the switching.; The project office may arrange reasonably the testing stations according to exact status and change of capacity of the production line.

In addition, the color sensitivity and FM sound sensitivity also shall be tested while testing the receiving station of RF signal. The color sensitivity is ≤37db and FM sound sensitivity is≤30db.

As to the qualified finished products, the related indexes of at least two machines adopted in accordance with the sample standard shall be tested. The testing form, please refer to the attached page.

As to those products largely for exportation, it is suggested herein that a related placement test EMC should be done.

IC BLOCK DIAGRAM & DESCRIPTION

6.1 RTD2020

6.1.1 FEATURES

General
- Integrated Spread-Spectrum DCLK PLL
- Integrated 8-bit triple-channel 140MHz ADC/PLL
- Integrated programmable timing controller
- Integrated microcontroller compatible with the standard 8032
- 24 General-purpose input/outputs (GPIOs)
- Embedded fully functional multi-language OSD support
- Embedded DDC supports DDC1, DDC2B, and DDC/CI
- Supports ISP functionality on DDC channel
- 3 Embedded programmable PWM
- Zoom scaling up and down
- Embedded Pattern Generator
- No external memory required
- Requires only one crystal to generate all timing

Analog RGB Input Interface
- Supports up to 140MHz (SXGA @ 75Hz)
- Supports Sync On Green (SOG) and de-composite sync modes
- On-chip high-performance PLLs

Digital Input Interface
- Supports 24-bit pixel digital input up to 160MHz
- Supports 12-bit DVO input
- Supports 16/24-bit YUV422/444 video format input
- Supports 8-bit video format input
- Built-in YUV to RGB color space converter & de-interlace
- Capture window auto position & auto phase tracking capability

Auto Detection /Auto Calibration
- Input format detection
- Compatibility with standard VESA mode and support for user-defined mode
- Smart engine for Phase and Image position calibration

Scaling
- Fully programmable zoom ratios
- Independent horizontal/vertical scaling
- Advanced zoom algorithm provides high image quality
- Sharpness/Smooth filter enhancement

Color Processor
- Digital brightness and contrast adjustments
- Gamma correction
- Dithering logic for 18-bit panel color depth enhancement

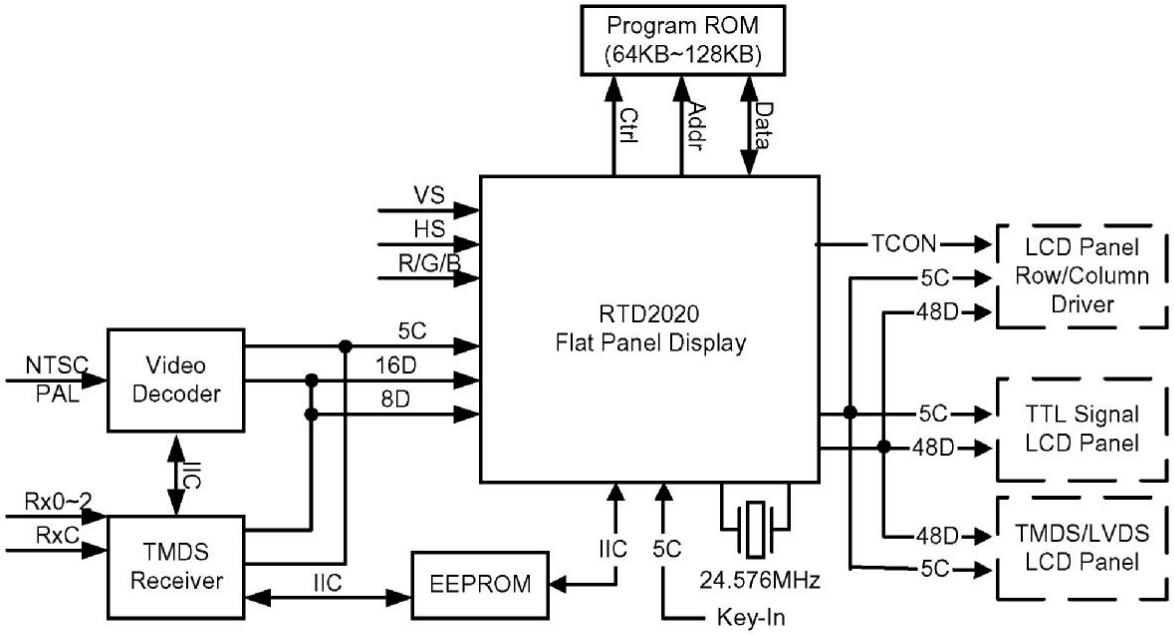
Output Interface
- Fully programmable, built-in display timing generator
- 1 and 2-pixel/clock panel support, up to 140MHz
- Pin swap, odd/even swap and red/blue group swap
- Programmable TCON function support
- Reduced EMI and Power saving features

Host Interface
- Supports 3/4 pins MCU serial bus interface
- Support parallel bus interface while using internal MCU

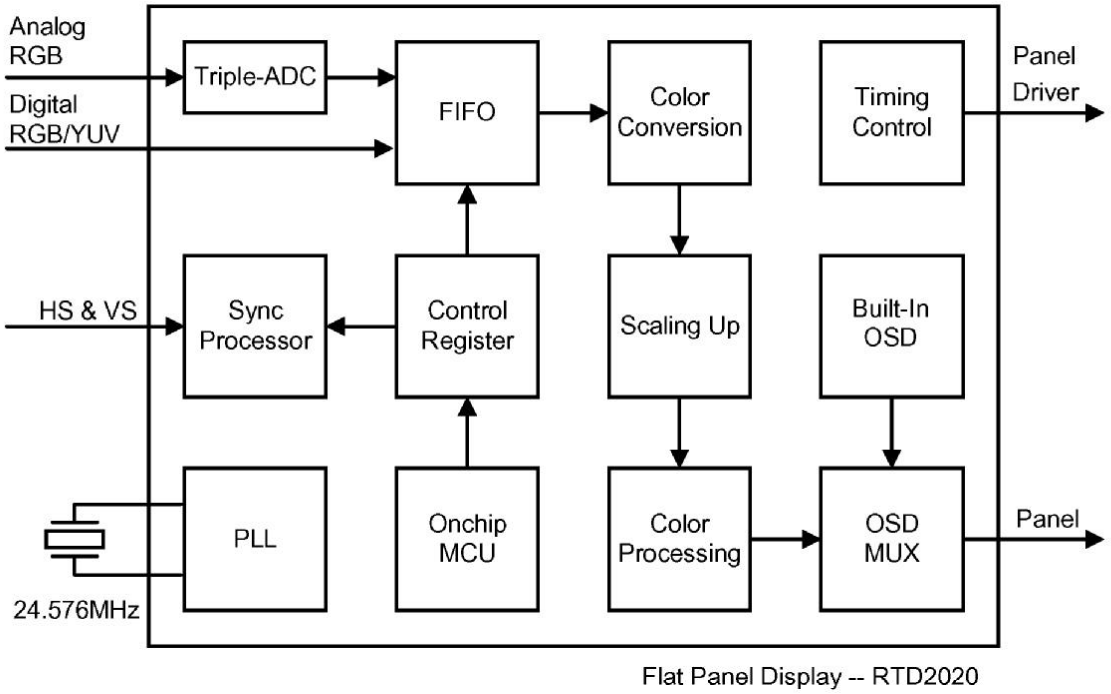
Embedded OSD
- 12*18 dot font per character
- Embedded 256 characters and symbols including 16 multi-color symbols
- User font RAM, which allows programming of 128 special symbols
- 7 background colors and 8 character colors
- Programmable width and height control
- 4 background windows
- Selectable shadow color for windows and characters
- Intensity, blinking effects
- Fade-in/out effect
- Frame shadowing and independent row shadowing
- Frame bordering and independent row bordering
- 4 channel 8-bits PWM output, and selectable PWM clock frequency
- Row-to-Row spacing to maintain constant display height
- Window alpha-blending effect

Power & Technology
- 2.5V/3.3V power supply
- 0.25µm CMOS process; 208-pin PQFP package

7.1.2 BLOCK DIAGRAM

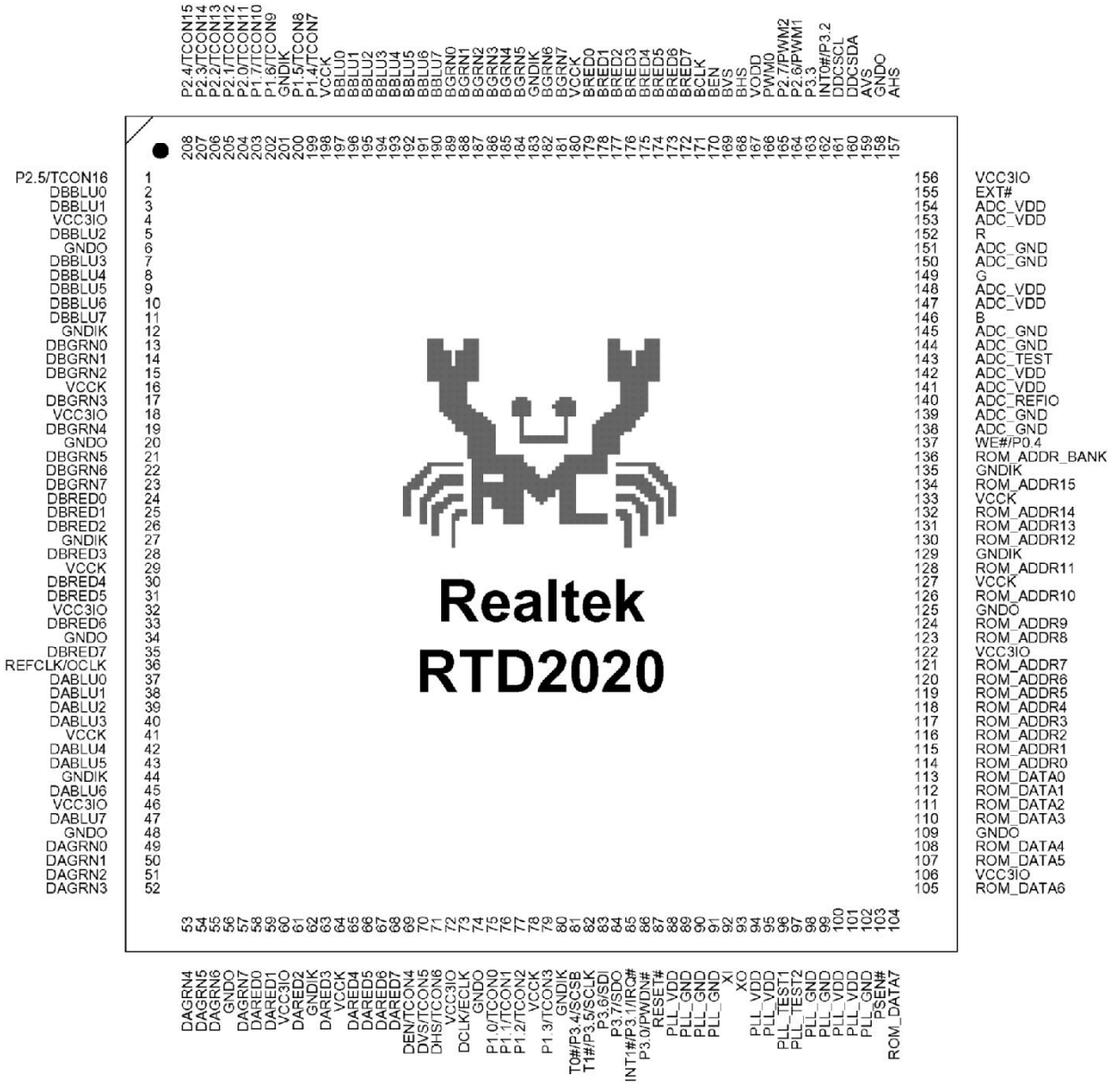


Application System Block Diagram



Chip Functional Block Diagram

7.1.3 PIN ASSIGNMENTSCONTENTS



RTD2020 Pin-Out Diagram

7.1.4 PIN DESCRIPTIONS

In order to reduce pin count, and therefore size and cost, some pins have multiple functions. In those cases, the functions are separated with a "/" symbol. Refer to the Pin Assignment diagram for a graphical representation.

A = Analog P = Power
I = Input G = Ground
O = Output

ADC

Name	Type	Pin No	Description
ADC_REFIO	AI	140	**ADC Reference Pad**
ADC_TEST	AIO	143	**ADC Test Pin / SOG**
B	AI	146	**Analog Input from BLUE Channel**
G	AI	149	**Analog Input from GREEN Channel**
R	AI	152	**Analog Input from RED Channel**
ADC_VDD	AP	141,142 147,148 153,154	**ADC Analog Power**
ADC_GND	AG	138,139 144,145 150,151	**ADC Analog Ground**
			Total: 17 Pins

PLL

Name	Type	Pin No	Description
XI	AI	92	**Reference Clock Input**
XO	AO	93	**Reference Clock Output**
PLL_TEST1	AIO	96	**Test Pin 1**
PLL_TEST2	AIO	97	**Test Pin 2**
PLL_VDD	AP	88,94 95,100 101	**PLL Analog Power**
PLL_GND	AG	89,90 91,98 99,102	**PLL Analog Ground**
			Total: 15 Pins

Control Interface

Name	Type	Pin No	Description
(EXT# =0): SCSB (EXT# =1): GPIO_P3.4	I I/O	81	**Serial Control I/F Chip Select** **GPIO_P3.4 / T0#**
(EXT# =0): SCLK (EXT# =1): GPIO_P3.5	I I/O	82	**Serial Control I/F Clock** **GPIO_P3.5 / T1#**
(EXT# =0): SDI (EXT# =1): GPIO_P3.6	I I/O	83	**Serial Control I/F Data in** **GPIO_P3.6**
(EXT# =0): SDO (EXT# =1): GPIO_P3.7	O I/O	84	**Serial Control I/F Data out** **GPIO_P3.7**
(EXT# =0): IRQ# (EXT# =1): GPIO_P3.1	O I/O	85	**Controller's IRQ# Output;** **GPIO_P3.1 / INT#1**
(EXT# =0): PWDN# (EXT# =1): GPIO_P3.0	I I/O	86	**PowerDown# for Controller** **GPIO_P3.0**
RESET#	I	87	**(EXT#=0): RESET# for Controller;** **(EXT#=1): RESET# for MCU**
			Total: 7 Pins

Digital Input

Name	Type	Pin No	Description
AHS	I	158	**VGA-port Horizontal Sync**
AVS	I	160	**VGA-port Vertical Sync**
VODD	I	167	**Video ODD Signal**
BHS	I	168	**VGB-port Horizontal Sync**
BVS	I	169	**VGB-port Vertical Sync**
BENA	I	170	**VGB-port Input Data Enable**
BCLK	I	171	**VGB-port Input Clock**
BRED/YIN [7:0] / DVODATA [11:4] / VIDEO8	I	172,173 174,175 176,177 178,179	**VGB-port Input Data (Red/Y)**
BGRN [7:0] / DVODATA [3:0]	I	181,182 184,185 186,187 188,189	**VGB-port Input Data (Green)**
BBLU/UVIN [7:0]	I	190,191 192,193 194,195 196,197	**VGB-port Input Data (Blue/UV)**
			Total: 31 Pins

Display Port

Name	Type	Pin No	Description
DCLK	O	73	**Display clock; / TCON_ECLK**
DHS	O	71	**Display Horizontal Sync; / TCON_6**
DVS	O	70	**Display Vertical Sync; / TCON_5**
DEN	O	69	**Display Data Enable; / TCON_4**
DARED [7:0]	O	68, 67, 66 65, 63, 61 59, 58	**Display A-port RED Data**
DAGRN [7:0]	O	57, 55, 54 53, 52, 51 50, 49	**Display A-port GREEN Data**
DABLU [7:0]	O	47, 45, 43 42, 40, 39 38, 37	**Display A-port BLUE Data**
DBRED [7:0]	O	35, 33, 31 30, 28, 26 25, 24	**Display B-port RED Data**
DBGRN [7:0]	O	23, 22, 21 19, 17, 15 14, 13	**Display B-port GREEN Data**
DBBLU [7:0]	O	11, 10, 9, 8 7, 5, 3, 2	**Display B-port BLUE Data**
			Total: 52 Pins

Miscellaneous Interface

Name	Type	Pin No	Description
REFCLK	IO	36	**In/out Test Pin for DCLK; / TCON_OCLK**
PWM_0	O	166	**PWM_0 Output**
			Total: 2 Pins

DDC Channel

Name	Type	Pin No	Description
DDCSDA	I O	156	**DDC Serial Control I/F Data Input** **DDC Serial Control I/F Data Output**
DDCSCL	I	161	**DDC Serial Control I/F Clock**
			Total: 2 Pins

Power & Ground

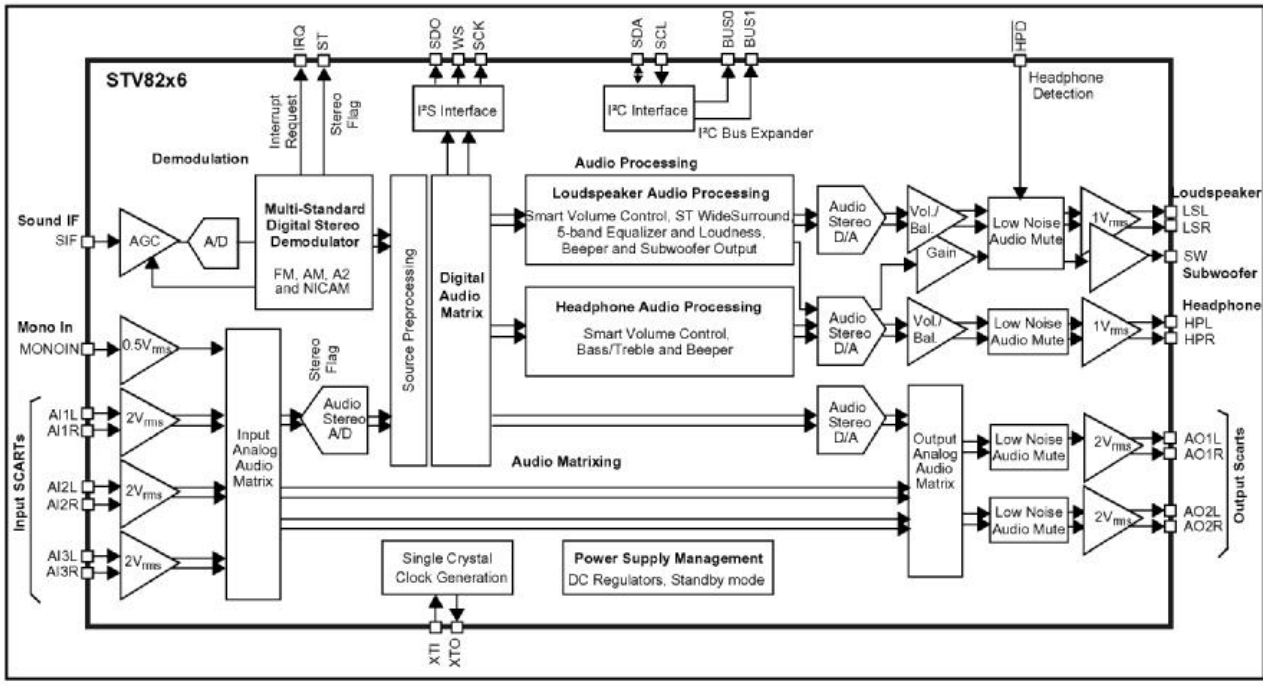
Name	Type	Pin No	Description
3.3V Power	P	4, 18 32, 46 60, 72 106,122 157	**VCC3IO: 9**
3.3V Ground	G	6, 20 34, 48 56, 74 109,125 159	**GNDO: 9**
2.5V Power	P	16, 29 41, 64 78,127 133,180 198	**VCCK: 9**
2.5V Ground	G	12, 27 44, 62 80,129 135,183 201	**GNDIK: 9**
			Total: 36 Pins

MCU Interface

Name	I/O	Pin No	Description
PSEN#	O	103	**Program Load Enable**
ROM_DATA [7:0]	IO	104,105,107 108,110,111 112,113	**ROM Data Input**
ROM_ADDR [15:9]	O I	134,132,131 130,128,126 124	**ROM Address Output** **DDC_CA latch**
ROM_ADDR [8:0]	O	123,121,120 119,118,117 116,115,114	**ROM Address Output**
ROM_ADDR_BANK	O	136	**XDATA/PROG# Bank Select**
GPIO_P0.4	I/O	137	**GPIO_P0.4 / WR#**
EXT#	I	155	**External MCU, Internal MCU Disable**
GPIO_P1.0	I/O	75	**GPIO_P1.0 / TCON_0**
GPIO_P1.1	I/O	76	**GPIO_P1.1 / TCON_1**
GPIO_P1.2	I/O	77	**GPIO_P1.3 / TCON_2**
GPIO_P1.3	I/O	79	**GPIO_P1.3 / TCON_3**
GPIO_P1.4	I/O	199	**GPIO_P1.4 / TCON_7**
GPIO_P1.5	I/O	200	**GPIO_P1.5 / TCON_8**
GPIO_P1.6	I/O	202	**GPIO_P1.6 / TCON_9**
GPIO_P1.7	I/O	203	**GPIO_P1.7 / TCON_10**
GPIO_P2.0	I/O	204	**GPIO_P2.0 / TCON_11**
GPIO_P2.1	I/O	205	**GPIO_P2.1 / TCON_12**
GPIO_P2.2	I/O	206	**GPIO_P2.2 / TCON_13**
GPIO_P2.3	I/O	207	**GPIO_P2.3 / TCON_14**
GPIO_P2.4	I/O	208	**GPIO_P2.4 / TCON_15**
GPIO_P2.5	I/O	1	**GPIO_P2.5 / TCON_16**
GPIO_P2.6	I/O	164	**GPIO_P2.6 / PWM1**
GPIO_P2.7	I/O	165	**GPIO_P2.7 / PWM2**
(EXT# =0): PWDN# (EXT# =1): GPIO_P3.0	I I/O	Share	**PowerDown# for Controller** **GPIO_P3.0**
(EXT# =0): IRQ# (EXT# =1): GPIO_P3.1	O I/O	Share	**Controller's IRQ# output;** **GPIO_P3.1 / INT1#**
GPIO_P3.2	I/O	162	**GPIO_P3.2 / INT0#**
GPIO_P3.3	I/O	163	**GPIO_P3.3**
(EXT# =0): SCSB (EXT# =1): GPIO_P3.4	I I/O	Share	**Serial control I/F chip select** **GPIO_P3.4 / T0#**
(EXT# =0): SCLK (EXT# =1): GPIO_P3.5	I I/O	Share	**Serial control I/F clock** **GPIO_P3.5 / T1#**
(EXT# =0): SDI (EXT# =1): GPIO_P3.6	I I/O	Share	**Serial control I/F data in** **GPIO_P3.6**
(EXT# =0): SDO (EXT# =1): GPIO_P3.7	O I/O	Share	**Serial control I/F data out** **GPIO_P3.7**
			Total: 46 pins (6 share)

7.2 STV82x6

Multistandard TV Audio Processor and Digital Sound Demodulator



This device incorporates the SRS (Sound Retrieval System) under licence from SRS Labs, Inc.

Key Features

- NICAM, AM, FM Mono and FM 2 Carrier Stereo Demodulators for all sound carriers between 4.5 and 7 MHz
- Mono input provided for optimum AM Demodulation performances
- Demodulation controlled by Automatic Standard Recognition System
- Sound IF AGC with wide range
- Overmodulation and Carrier Offset recovery
- Smart Volume Control
- 5-band Equalizer & Bass/Treble Control
- Automatic Loudness Control
- Loudspeaker and Headphone outputs with Volume/Balance Controls and Beeper
- Subwoofer output with Volume Control and Programmable Bandwidth
- Spatial Sound Effects (ST WideSurround and Pseudo-Stereo)
- SRS® 3D Surround
- 3-to-2 Analog Stereo Audio I/Os (SCART compatible) with Audio Matrix
- Low-noise Audio Mutes and Switches
- I²S Output to interface with Dolby® Pro Logic® Decoder
- I²C Bus-controlled
- Single and standard 27 MHz Crystal Oscillator
- Power supplies: 3.3 V Digital, 5 V or 8 V Analog
- Embedded 3.3 V Regulators
- Packages: SDIP56 or TQFP80

Table 1: STV82x6 Version List

Feature	STV8206	STV8216	STV8226	STV8236
AM-FM Mono	X	X	X	X
Zweiton	X	X	X	X
NICAM		X		X
ST WideSurround	X	X	X	X
SRS® 3D Surround			X	X

I/O Pin Description

Legend / Abbreviations for Table 2:

Type:

- AP = Analog Power Supply
- DP = Digital Power Supply
- I = Input
- O = Output
- OD = Open Drain
- B = Bidirectional
- A = Analog

Table 2: Pin Description

SDIP 56	TQFP 80	Name	Type	Function
1	73	SIF	A	Sound IF Input
2	74	VTOP	A	ADC V_{TOP} Decoupling Pin
3	75	VREFIF	A	AGC Voltage Reference Decoupling Pin
4	76	VDDIF	AP	3.3 V Power Supply for IF AGC & ADC
5	77	GNDIF	AP	0 V Power Supply for IF AGC & ADC
6	78	MONOIN	A	Mono Input
	79/80	N/C		Not Used
7	1	AO1L	A	Left SCART1 Audio Output
8	2	AO1R	A	Right SCART1 Audio Output
-	3/4/5/6	N/C		Not used
9	7	VDDC	AP	3.3 V Power Supply for Audio DAC/ADC
10	8	GNDC	AP	0 V Power Supply for DAC/ADC
11	9	AI1L	A	Left SCART1 Audio Input
12	10	AI1R	A	Right SCART1 Audio Input
13	11	VMC1	A	Switched V_{REF} Decoupling Pin for Audio Converters (VMCP)
14	13	VMC2	A	V_{REF} Decoupling Pin for Audio Converters (VMC)
15	14	AI2L	A	Left SCART2 Audio Input
16	15	AI2R	A	Right SCART2 Audio Input
17	16	VDDA	AP	3.3 V Power Supply for Audio Buffers, Matrix & Bias
18	17	GNDAH	AP	0 V Power Supply for Audio Buffers & SCART
19	18	AO2L	A	Left SCART2 Audio Output
20	19	AO2R	A	Right SCART2 Audio Output
21	20	VDDH	AP	8 V / 5 V Power Supply for SCART & Audio Buffers
-	21	N/C		Not Used
22	22	VREFA	A	Voltage Reference for Audio Buffers
23	23	AI3L	A	Left SCART3 Audio Input
24	24	AI3R	A	Right SCART3 Audio Input
-	25	N/C		Not Used
25	26	BGAP	A	Bandgap Voltage Source Decoupling
-	27	N/C		Not Used

Table 2: Pin Description (Continued)

SDIP 56	TQFP 80	Name	Type	Function
26	28	LSL	A	Left Loudspeaker Output
27	29	LSR	A	Right Loudspeaker Output
28	30	SW	A	Subwoofer Output
29	31	HPL	A	Left Headphone Output
30	32	HPR	A	Right Headphone Output
31	33	GNDSA	AP	Substrate Analog/Digital Shield
-	34	N/C		Not Used
32	35	$\overline{\text{HPD}}$	B	Headphone Detection Input (Active Low)
33	36	ADR	I	Hardware I²C Chip Address Control
-	37/38	N/C		Not Used
34	39	SCL	OD	I²C Serial Clock
35	40	SDA	OD	I²C Serial Data
-	41	N/C		Not Used
36	42	REG	A	5 V Power Regulator Control
37	43	$\overline{\text{RESET}}$	I	Hardware Reset (Active Low)
38	44	SYSCK	B	System Clock Output
39	45	MCK	B	I²S Master Clock Output
40	46	VDD1	DP	3.3V Power Supply for Digital Core & IO Cells
41	47	GND1	DP	0V Power Supply for Digital Core & IO Cells
-	48	N/C		Not Used
42	49	GNDSP	AP	Substrate Analog/Digital Shield for Clock-PLL
	50/51	N/C		Not Used
43	52	XTI	I	Crystal Oscillator Input
44	53	XTO	O	Crystal Oscillator Output
45	54	VDDP	AP	3.3 V Power Supply for Analog PLL Clock
46	55	GNDP	AP	0 V Power Supply for Analog PLL Clock
47	56	GND2	DP	0 V Power Supply for Digital Core, DSPs & IO Cells
48	57	VDD2	DP	3.3 V Power Supply for Digital Core, DSPs & IO Cells
49	58	CKTST	I	Must be Connected to 0 V
-	59/60	N/C		Not Used
50	61	SDO	B	I²S Bus Data Output
51	62	ST/SDI	B	Stereo Detection Output / I²S Bus Data Input
52	63	WS	B	I²S Bus Word Select Output
53	64	SCK	B	I²S Bus Clock Output
54	65	BUS1	B	I²C Bus Expander Output 1
-	66/67	N/C		Not Used
55	68	BUS0	B	I²C Bus Expander Output 2
56	69	IRQ	B	I²C Status Read Request
-	70	N/C		Not Used
-	71	N/C		Not Used
-	72	N/C		Not Used

ET-TVT0310A

Teletext Product Specification

PRELIMINARY

Approved By			
Name	Company	Date	Visa

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1. Introduction

1.1 Features

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- Single chip Teletext system with Integrated digital data slicer.
- Ten pages of on-chip display RAM.
- Multi-alphabet solution : Latin, Cyrillic, Arabic and Greek.
- Minimum software requirement.
- Automatic Full Level One Features (FLOF) & Table Of Pages (TOP) decoding.
- Flicker-free packet 26 processing on chip.
- Program delivery control (PDC).
- Menu page capability.
- Instantaneous page memory clear.
- Two Digital PLLs to manage the composite synchronization signal.
- Backward Software Compatible with other ET Teletext solutions.
- Direct access to subtitles.
- VPS data decoding.
- WSS data capture and store.

1.2 Description

The ET-TVT0310A device is a ten page intelligent single-chip Teletext decoder for use with 625 line TV transmissions having Teletext in the Vertical Blanking Interval (VBI). The device integrates an on-chip digital data slicer and a decoder to provide a flexible Teletext solution incorporating internal software to implement FLOF and TOP Teletext decoding automatically. Additionally, the ET-TVT0310A supports decoding of Video Programming System (VPS) signals, and Wide Screen Signaling (WSS) data capture and storage.

The ET-TVT0310A is part of the ET Teletext family of devices. This chip supports all the languages of the ET family of devices comprising the Latin, Cyrillic, Arabic and Greek alphabets. A full list of languages supported is shown on Page 16.

On-chip processing of packet 26 characters (flicker free) is automatically implemented as required. All Teletext including packet 26 is processed in 'real time' without the need for any additional memory. This allows the decoder to store up to ten pages of Teletext irrespective of the language selected and the mode of operation. The decoder is controlled by an on-chip 11.5 MIPs micro-coded processor which manages all the Teletext processing requirements, including ghost row processing and TOP table processing. The output of the device is RGB and blanking signals.

Device management is by simple high level commands for most features. The commands are described in the Software Application Guide and allow the TV micro-controller to communicate with ET-TVT0310A through an I2C interface. These commands have been designed to give a backward software compatibility between the single chip ET-TVT0310A and two chip solutions (e.g. ET206 + ET417).

In addition to the FLOF and TOP modes, the ET-TVT0310A decoder has a default Normal mode for any TV channel that is not transmitting FLOF or TOP. The decoder is ideally suited to VCR applications as it is able to receive and decode PDC information from packets 26 and 8/30 and store this information inside the decoder. In this mode of operation, memory can also be assigned for menu pages (pages downloaded from main microprocessor).

1.3 ET teletext devices family

ET provides two main families of teletext decoders :

- The first is the one-chip family. It is based on a fully digital chip including a digital decoder and a digital data slicer. The on-chip display memory can be 1, 8 or 10 pages and the alphabets can be Latin, Cyrillic, Arabic or Greek or all four depending on the selected device.
- The second is the two-chip family. It is based on one digital decoder and one stand alone analog data slicer. The on-chip display memory is 8 pages and the language character set can be Western and Eastern European or Cyrillic depending on the selected decoder.

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2. Internal block diagram of the ET-TVT0310A device

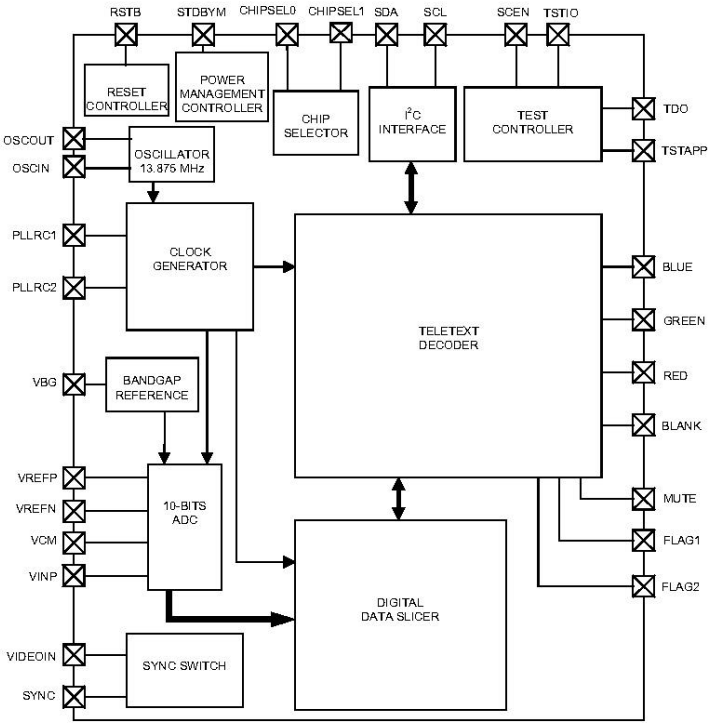


Figure 1: Internal bloc diagram

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3. Additional functions

In addition to the normal teletext functions, the ET-TVT0310A is able to

- Capture and store WSS data.
- Capture and store VPS data.

3.1 W.S.S. function

WSS data is transmitted in TV line 23.

The ET-TVT0310A is able to detect and indicate when TV line 23 occurs in the TV field. There is a choice of the type of indication given, the signal WIN23A being a '1'(high) during the whole of line 23, whilst the signal WIN23B is high only during data transmission on line 23. The pin FLAG1 can be programmed to output either of these two signals.

The recovered clock will be at the VPS rate of 5MHz, giving effectively 6 binary bits (elements) per WSS signaling bit. On receipt of the sliced WSS data and clock, the ET-TVT0310A device stores the data in RAM. This data may then be read from the ET-TVT0310A via the I2C bus by the TV microcontroller.

The ET-TVT0310A does not perform any further processing on the WSS data, so that it is in its raw form when read. It allows signal-processing techniques to be used in the TV microcontroller to optimize data recovery with weak (very noisy) signals.

The whole of the WSS data packet is available to be read.

For detailed software access to the WSS information, see the Software Application Guide, under the sections: SETREG, Status byte 2, SMENM, and WSS data storage.

3.2 V.P.S. function

The ET-TVT0310A is able to decode VPS signal. Indeed, this chip is able to detect and indicate if Teletext data or VPS data are available on TV line 16. The main differences between the Teletext and VPS data are the encoding transmission and the clock rate.

The Teletext data are transmitted in a binary way and at a 6.9375 MHz clock rate. The VPS data are transmitted in a bi-phased encoding way at a 5 MHz clock rate.

On receipt of the sliced VPS data and clock, the ET-TVT0310A device stores the data in RAM. These data may then be read from the ET-TVT0310A via the I2C bus by the TV microcontroller.

The whole of the VPS data packet is available to be read. Data are not interpreted by the ET-TVT0310A decoder, all interpretation must be done by the TV microcontroller. The VPS data are just sliced and stored in a reserved zone in the on-chip memory.

For detailed software access to the VPS information, see the Software Application Guide chapter 5.

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4. Page capture modes

The ET-TVT0310A decoder can operate in four main modes of operation depending upon the transmitted Teletext signal and the controlling microprocessor. These modes are:

- Normal
- FLOF
- TOP
- Favourite Page

In ET-TVT0310A, the on-chip processor will automatically select the pages to be stored in memory in all modes of operation except Favourite Page mode. ET-TVT0310A will implement an efficient page capture algorithm which will ensure that only one version of any page is stored in the memory and that all the pages will be kept updated with the latest data. When a page is received with the clear page bit set, or the page is received for the first time, the decoder will clear the relevant page store instantaneously. This allows the decoder to receive Teletext signals using 'advanced page headers' or 'magazine shuffle'.

In addition to the four main modes of operation, the decoder has two additional modes of operation:

- Menu Page.
- Sub Page.

In the Menu Page mode, the page stores 8 and 9 can be redefined as either two menu pages or as one menu page and one page as a store for non-display packets. This mode allows the chip to be used for PDC (Program Delivery Control) applications.

In the Sub Page mode, the decoder will capture the next two sub-pages of the display page.

In all modes, Teletext pages containing sub-titles can be directly selected.

The four modes of operation can be either selected directly or ET-TVT0310A can be set into an auto mode. In auto mode, after a channel change command, the decoder will initially be in normal mode. If a packet 27 designation code 0 for the display is received, the decoder will switch to FLOF mode. If the decoder is in normal mode and receives a basic TOP table, it will switch to TOP mode.

In all modes of operation, the row 24 display can be either generated on-chip or can be written to by the external microprocessor. The external microprocessor can also disable the display of row 24.

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10. Pin out

10.1 Pin description

Name	Type	Description
VDD5V1, VDD5V2	Power	Digital power supply.
VDD3V1, VDD3V2, VDD3V3, VDD3V4, VDD3V5	Power	Digital power supply.
VDDA1, VDDA2, VDDA3	Power	Analog power supply.
GND5V1, GND5V2	Power	Digital ground.
GNDA1A, GNDA1B, GNDA2, GNDA3	Power	Analog ground.
GND3V1, GND3V2, GND3V3, GND3V4, GND3V5	Power	Digital ground.
CHIPSEL0	Input	LSB of the chip select bus (see Table 9).
CHIPSEL1	Input	MSB of the chip select bus (see Table 9).
STDBYM	Input	Standby pin : active low.
RSTB	Input	Reset pin : active low. Internal pull-up to VDD5Vx
PLLRC1	Input	PLL1 input.
PLLRC2	Input	PLL2 input.
OSCIN	Input	Oscillator input.
TSTIO	Input	If TSTIO is high, RED, GREEN, BLUE, BLANK, MUTE are in high impedance state when ET-TVT0310A is in picture mode. If TSTIO is low, those outputs are active low when ET-TVT0310A is in picture mode.
SCEN	Input	Test pin. Must be always set to low.
TSTAPP	Input	Test pin. Must be always set to low.
VINP	Input	Analog input for video.
VIDEOIN	Input	Analog VIDEO input which is connected to SYNC when ET-TVT0310A is not in text mode.
SYNC	Output	Digital composite synchronization generated by ET-TVT0310A in text mode and VIDEOIN in other modes.
BLANK	Output	Blanking signal. This pin is high when teletext information is displayed on RGB lines.
BLUE	Output	Display signal.
GREEN	Output	Display signal.
RED	Output	Display signal.
MUTE	Output	Audio mute control. This signal is low when just text is display on the screen and bad video is detected. It is intended to be connected to the TV audio muting circuit.
OSCOUT	Output	Oscillator output.
TDO	Output	Test pin. Not connected.
VREFP	Output	Reference output voltage.
VREFN	Output	Reference output voltage.
VBG	Output	Reference output voltage.
VCM	Bi-directional	Input/output for common mode voltage decoupling and bypassing.
SCL	Bi-directional	I²C clock line. Open drain pin.
SDA	Bi-directional	I²C data line. Open drain pin.
FLAG1	Bi-directional	System information. User can configure this pin using the I²C commands to output Line23 flag.
FLAG2	Bi-directional	System information. User can configure this pin using the I²C commands to output ODD/EVEN field flag.

Table 14 : Pin description.

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V_{DD5Vx}=5V±10%;V_{DDAx}=3.3V±10%;V_{DD3Vx}=3.3V±10%;V_{SS}=0V;T_{AMB}=0 to +70°C

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Digital pin : inputs						
STDBYM, TSTIO, CHIPSEL0, CHIPSEL1						
V_{IL}	Low level input voltage		-300		800	mV
V_{IH}	High level input voltage		2.0		V_{DD5V}+0.3	V
I_{IL}	Low input current	$V_{IN}=V_{SS}$	-10		10	µA
I_{IH}	High input current	$V_{IN}=V_{DD5Vx}$	-10		10	µA
I_{LEAK}	Input leakage current	Standby mode		90		nA
FANIN	Input capacitance			5.75		pF
RSTB						
V_{IL}	Low level input voltage		-300		800	mV
V_{IH}	High level input voltage		2.0		V_{DD5V}+0.3	V
I_{IL}	Low input current	$V_{IN}=V_{SS}$	-600		-200	µA
I_{IH}	High input current	$V_{IN}=V_{DD5Vx}$	-10		10	µA
I_{LEAK}	Input leakage current	Standby mode		90		nA
FANIN	Input capacitance			5.75		pF
Digital pin : outputs						
SYNC						
V_{OL}	Low level output voltage	Sync mode		(V_{DD3Vx}/2)-0.5	(V_{DD3Vx}/2)-0.4	V
V_{OH}	High level output voltage	Sync mode	(V_{DD3Vx}/2)-0.1	V_{DD3Vx}/2		V
I_{OL}	Low output current	$V_{OUT}=V_{OL}$			100	µA
I_{OH}	High output current	$V_{OUT}=V_{OH}$			-100	µA
R_{SERIES}	VIDEOIN to SYNC resistance	Video mode			500	Ω
RED, GREEN, BLUE, BLANK, MUTE						
V_{OL}	Low level output voltage				400	mV
V_{OH}	High level output voltage		V_{DD5V}-0.8			V
I_{OL}	Low output current	$V_{OUT}=V_{OL}$			4	mA
I_{OH}	High output current	$V_{OUT}=V_{OH}$			-4	mA
O_{LEAK}	Output leakage current	Standby mode		100		nA
Digital pin : inputs/outputs						
SDA, SCL						
V_{IL}	Low level input voltage		-300		800	mV
V_{IH}	High level input voltage		2.0		V_{DD5V}+0.3	V
V_{OL}	Low level output voltage				400	mV
I_{IL}	Low input current	$V_{IN}=V_{SS}$	-10		10	µA
I_{IH}	High input current	$V_{IN}=V_{DD5Vx}$	-10		10	µA
I_{OL}	Low output current	$V_{OUT}=V_{OL}$			8	mA
FLAG1, FLAG2						
V_{IL}	Low level input voltage		-300		800	V
V_{IH}	High level input voltage		2.0		V_{DD5V}+0.3	V
V_{OL}	Low level output voltage				400	mV
V_{OH}	High level output voltage		V_{DD5V}-0.8			V
I_{OL}	Low output current	$V_{OUT}=V_{OL}$			2	mA
I_{OH}	High output current	$V_{OUT}=V_{OH}$			-2	mA

Table 16 : Operating conditions 2/4

PRELIMINARY

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V_{DD5Vx}=5V±10%;V_{DDAx}=3.3V±10%;V_{DD3Vx}=3.3V±10%;V_{SS}=0V;T_{AMB}=0 to +70°C

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Analog pin : inputs						
VINP						
Video input specification	Composite Video Amplitude(peak-to-peak)	I_{IN}=0	0.708	1.0	2.0	V
	Sync Amplitude		20	-	43	% Nominal Video (1)
	Sync Duration		4.5	4.7	4.9	µs (2)
	Sync Transition Times		0.2	0.25	0.3	µs (3)
	Front Porch		1.2	1.5	1.8	µs
	Under/Overshoots		-	-	20	% Nominal Video (4)
	Time between -ve sync & penultimate '1' of Clock Run-in		11	12	12.4	µs (5)
	Line Blanking		11.7	12.0	12.3	µs (6)
	Colour Burst Amplitude(peak-peak)		9	30	67	% Nominal Video
	Colour Burst Frequency		-	4.43	-	MHz
	Colour Burst Duration		1.95	2.25	2.55	µs
	Clock Run-in Amplitude		22	70	157	% Nominal Video (7)
	Number of Complete & Consecutive Clock Run-in cycles		4	-	8	(8)
	Bit rate - VPS		2.4997	2.5000	2.5003	Mbps
	Element rate - WSS		2.4997	2.5000	2.5003	Mbps
	Bit rate - Teletext		3.4686	3.4687	3.4688	Mbps
	Data "one" level		19	66	161	% Nominal Video
	Data "zero" level		-6	0	6	% Nominal Video (9)
I_{LEAK}	Input leakage current		-100		+100	nA
FANIN	Input capacitance			5.73		pF
VIDEOIN						
V_{IN}	Input voltage	I_{IN}=0		V_{DDAx}/2		V
I_{IL}	Low input current	V_{IN}=V_{SS}		-10		µA
I_{IH}	High input current	V_{IN}=V_{DDAx}		10		µA
I_{LEAK}	Input leakage current	Standby mode	-100		+100	nA
FANIN	Input capacitance			5.73		PF
R_{SERIES}	Videoin to sync series resistor		60	170	350	Ω
Analog pin : outputs						
VREFN						
V_{OUT}	Output voltage	I_{OUT}=0		1.18		V
VREFP						
V_{OUT}	Output voltage	I_{OUT}=0		2.18		V
VBG						
V_{OUT}	Output voltage	I_{OUT}=0	1.12	1.18	1.24	V
VCM						
V_{OUT}	Output voltage	I_{OUT}=0		V_{DDAx}/2		V

Table 17 : Operating conditions 3/4

PRELIMINARY

V_{DD5Vx}=5V±10%;V_{DDAx}=3.3V±10%;V_{DD3Vx}=3.3V±10%;V_{SS}=0V;T_{AMB}=0 to +70°C

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Crystal oscillator						
OSCIN						
V_{IL}	Low level input voltage		-0.3		$0.3*V_{DD3Vx}$	V
V_{IH}	High level input voltage		$0.7*V_{DD3Vx}$		V_{DD3Vx}+0.3	V
I_{IL}	Low input current	$V_{IN}=V_{SS}$			-10	µA
I_{IH}	High input current	$V_{IN}=V_{DD3Vx}$			10	µA
I_{LEAK}	Input leakage current	$V_{IN}=V_{SS}$ to V_{DD3Vx}		90		nA
OSCOUT						
V_{OL}	Low level output voltage	V_{OSCIN}=2V			Vss+0.1	V
V_{OH}	High level output voltage	V_{OSCIN}=0.2V	V_{DD3V}-0.1			V
I_{OL}	Low level output current	$V_{OUT}=V_{OL}$			1	mA
I_{OH}	High level output current	$V_{OUT}=V_{OH}$			-1	mA
O_{LEAK}	Output leakage current	$V_{OUT}=V_{OL}$ to V_{OH}		100		nA

Table 18 : Operating conditions 4/4

Note 1: Minimum value is: low frequency -3db and 25% sync.
Maximum value is: low frequency +3db and 30% sync
Note 2: As measured at 50% of the total sync. amplitude.
Note 3: As measured at 10% and 90% of the total sync. amplitude.
Note 4: Under/Overshoots are of order of 100nS duration.
Note 5: As measured at 50% of the negative sync transition and the peak of the penultimate "1"
Note 6: As measured at 50% of the negative and positive edges of adjacent peak white components which are respectively before and after a sync pulse.
Note 7: Clock run-in envelope - Raised cosine filter with centre frequency at 3.46875 for teletext or 2.5000MHz for VPS.
Skew symmetrical about 0.5 x bit rate and substantially reduced at 5MHz.
Note 8: A clock run-in cycle is complete if its amplitude equals or exceeds 22% of composite video.
Note 9: With the black level as a zero reference.

PRELIMINARY

12.3 Oscillator specification

The crystal oscillator specification is given below:

- 13.875MHZ Crystal Specification
- Oscillation mode — Fundamental parallel
- Frequency — 13.8750Mhz
- Crystal frequency stability — ±150ppm *
- Maximum crystal ESR (steady-state) — 60Ω
- Maximum crystal ESR (start-up) — 120Ω
- Maximum shunt capacitance — 7pF
- Maximum motional capacitance — 30pF
- Crystal load capacitance — 18pF
- Free air operating temperature range — 0 to 70°C
- Drive level — 1mW max
- Ageing — ±5ppm max. for first year

* includes temperature stability and manufacturing tolerance.

General Description

The LM4950 is a dual audio power amplifier primarily designed for demanding applications in flat panel monitors and TV's. It is capable of delivering 3.1 watts per channel to a 4Ω single-ended load with less than 1% THD+N or 7.5 watts mono BTL to an 8Ω load, with less than 10% THD+N from a $12V_{DC}$ power supply.

Boomer audio power amplifiers were designed specifically to provide high quality output power with a minimal amount of external components. The LM4950 does not require bootstrap capacitors or snubber circuits. Therefore, it is ideally suited for display applications requiring high power and minimal size.

The LM4950 features a low-power consumption active-low shutdown mode. Additionally, the LM4950 features an internal thermal shutdown protection mechanism along with short circuit protection.

The LM4950 contains advanced pop & click circuitry that eliminates noises which would otherwise occur during turn-on and turn-off transitions.

The LM4950 is a unity-gain stable and can be configured by external gain-setting resistors.

Key Specifications

- Quiscent Power Supply Current 16mA (typ)
- P_{OUT} (SE)
  V_{DD} = 12V, R_L = 4Ω, 1% THD+N 3.1W (typ)
- P_{OUT} (BTL)
  V_{DD} = 12V, R_L = 8Ω, 10% THD+N 7.5W (typ)
- Shutdown current 40µA (typ)

Features

- Pop & click circuitry eliminates noise during turn-on and turn-off transitions
- Low current, active-low shutdown mode
- Low quiescent current
- Stereo 3.1W output, R_L = 4Ω
- Mono 7.5W BTL output, R_L = 8Ω
- Short circuit protection
- Unity-gain stable
- External gain configuration capability

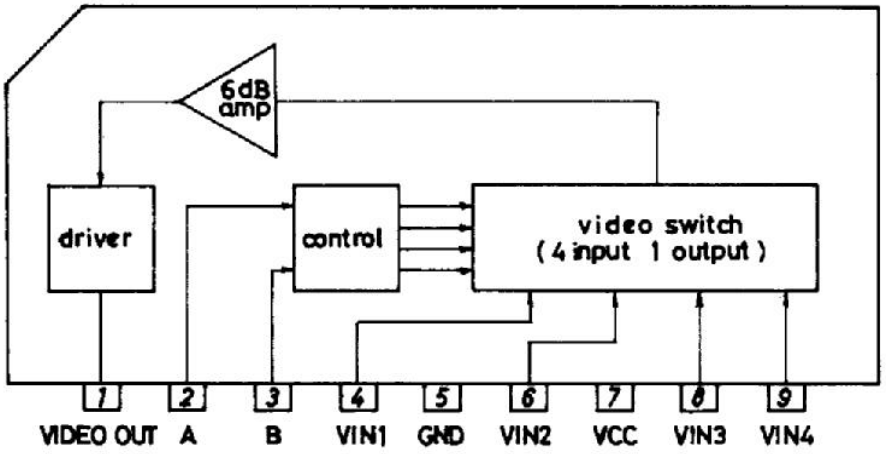
7.6 LA7952

Video Switch for TV/VCR Use

Features

- On-chip driver with 4 inputs, 1 output, 75Ω termination.
- On-chip 6dB amplifier.
- Excellent crosstalk characteristic.
- Wide band.
- Input with DC restoration circuit.

Equivalent Curcuit Block Diagram



Video Switch Truth Table

S2 (Pin 2)	S3 (Pin 3)	V_{IN1} (Pin 4)	V_{IN2} (Pin 6)	V_{IN3} (Pin 8)	V_{IN4} (Pin 9)
H	H	ON	OFF	OFF	OFF
L	H	OFF	ON	OFF	OFF
H	L	OFF	OFF	ON	OFF
L	L	OFF	OFF	OFF	ON

Note 1 : Refer to this Truth Table and make measurements by switching S2, S3.

3.

Abbr. :

SR : Slew Rate

PU : Pull Up

PD : Pull Down

SMT : Schmitt Trigger

2MA~16MA : Output buffer driving strength.

Pin	Main	Alt.	Type	Description
RF Interface (28)				
226	RFGND18		Ground	Analog ground
227	RFVDD18		Power	Analog power 1.8V
250	CEQP		Analog	
251	CEQN		Analog	
252	OSP		Analog	RF Offset cancellation capacitor connecting
253	OSN		Analog	RF Offset cancellation capacitor connecting
254	RFGC		Analog	RF AGC loop capacitor connecting for DVD-ROM
255	IREF		Analog Input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS!
256	AVDD3		Power	Analog power 3.3V
1	AGND		Ground	Analog ground
2	DVDA		Analog Input	AC coupled input path A
3	DVDB		Analog Input	AC coupled input path B
4	DVDC		Analog Input	AC coupled input path C
5	DVDD		Analog Input	AC coupled input path D
6	DVDRFIP		Analog Input	AC coupled DVD RF signal input RFIP
7	DVDRFIN		Analog Input	AC coupled DVD RF signal input RFIN
8	MA		Analog Input	DC coupled main-beam RF signal input A
9	MB		Analog Input	DC coupled main-beam RF signal input B
10	MC		Analog Input	DC coupled main-beam RF signal input C
11	MD		Analog Input	DC coupled main-beam RF signal input D
12	SA		Analog Input	DC coupled sub-beam RF signal input A
13	SB		Analog Input	DC coupled sub-beam RF signal input B
14	SC		Analog Input	DC coupled sub-beam RF signal input C
15	SD		Analog Input	DC coupled sub-beam RF signal input D
16	CDFON		Analog Input	CD focusing error negative input
17	CDFOP		Analog Input	CD focusing error positive input
18	TNI		Analog Input	3 beam satellite PD signal negative input
19	TPI		Analog Input	3 beam satellite PD signal positive input

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Pin	Main	Alt.	Type	Description
ALPC (4)				
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
ADC for SACD (5)				
239	ADCVDD3		Power	Analog 3.3V Power for ADC
240	S_VCM		Analog	
241	ADCVSS		Ground	Analog ground for ADC
242	S_VREFP		Analog	
243	S_VREFN		Analog	
Reference Voltage (3)				
28	V2REFO		Analog output	Reference voltage 2.8V
29	V20		Analog output	Reference voltage 2.0V
30	VREFO		Analog output	Reference voltage 1.4V
Analog Monitor Output (7)				
24	SVDD3		Power	Analog power 3.3V
25	CSO	RFOP		1) Central servo 2) Positive main beam summing output
26	RFLVL	RFON	Analog output	1) RFRP low pass, or 2) Negative main beam summing output
27	SGND		Ground	Analog ground
31	FEO		Analog output	Focus error monitor output, or
32	TEO		Analog output	Tracking error monitor output
33	TEZISLV		Analog	
Analog Servo Interface (6)				
244	RFVDD3		Power	Analog Power
245	RFRPDC		Analog output	RF ripple detect output
246	RFRPAC		Analog Input	RF ripple detect input(through AC-coupling)
247	HRFZC		Analog Input	High frequency RF ripple zero crossing
248	CRTPLP		Analog	Defect level filter capacitor connecting
249	RFGND		Ground	Analog Power
RF Data PLL Interface (9)				
230	JITFO		Analog output	The output terminal of RF jitter meter.
231	JITFN		Analog Input	The input terminal of RF jitter meter.
232	PLLVSS		Ground	Ground pin for data PLL and related analog circuitry.

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Pin	Main	Alt.	Type	Description
233	IDACEXLP		Analog	
234	PLLVDD3		Power	Power pin for data PLL and related analog circuitry.
235	LPFON		Analog Output	The negative output of loop filter amplifier
236	LPFIP		Analog Input	The positive input terminal of loop filter amplifier.
237	LPFIN		Analog Input	The negative input terminal of loop filter amplifier.
238	LPFOP		Analog Output	The positive output of loop filter amplifier
Motor and Actuator Driver Interface (10)				
34	OP_OUT		Analog output	Op amp output.
35	OP_INN		Analog input	Op amp negative input
36	OP_INP		Analog input	Op amp positive input
37	DMO		Analog Output	Disk motor control output. PWM output.
38	FMO		Analog Output	Feed motor control. PWM output.
39	TROPENPWM		Analog Output	Tray PWM output / Tray open output.
40	PWMOUT1	V_ADIN9	Analog Output	1) 1st General PWM output, or 2) Version AD input 9
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
47	FG (Diogital pin)	V_ADIN8	LVTTL 3.3V Input, Schmitt Input, pull up , with analog input path for V_ADIN8	1) Motor Hall sensor input, or 2) Version AD input 8
General Power/Ground (32)				
52,97,122,152,173,221	DVDD18		Power	1.8V power pin for internal digital circuitry
85,116,144,163,216	DVSS		Ground	1.8V Ground pin for internal digital circuitry
73,80,108,127,141,155,167,182,212	DVDD3		Power	3.3V power pin for internal digital circuitry
62,94,119,134,148,161,175,223	DVSS		Ground	3.3V Ground pin for internal digital circuitry
204	ADVDD3		Power	3.3V power pin Video DAC digital circuitry only
63	APLLCAP		Analog	APLL External Capacitance connection
64	APLLVSS		Ground	Ground pin for audio clock circuitry
65	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
Micro Controller and Flash Interface (48)				

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Pin	Main	Alt.	Type	Description
59	HIGHA0		Inout 2~16MA, SR PU	Microcontroller address 8
75	HIGHA1		Inout 2~16MA, SR PU	Microcontroller address 9
74	HIGHA2		Inout 2~16MA, SR PU	Microcontroller address 10
72	HIGHA3		Inout 2~16MA, SR PU	Microcontroller address 11
71	HIGHA4		Inout 2~16MA, SR PU	Microcontroller address 12
70	HIGHA5		Inout 2~16MA, SR PU	Microcontroller address 13
69	HIGHA6		Inout 2~16MA, SR PU	Microcontroller address 14
68	HIGHA7		Inout 2~16MA, SR PU	Microcontroller address 15
91	AD7		Inout 2~16MA, SR	Microcontroller address/data 7
88	AD6		Inout 2~16MA, SR	Microcontroller address/data 6
87	AD5		Inout 2~16MA, SR	Microcontroller address/data 5
86	AD4		Inout 2~16MA, SR	Microcontroller address/data 4
84	AD3		Inout 2~16MA, SR	Microcontroller address/data 3
83	AD2		Inout 2~16MA, SR	Microcontroller address/data 2
82	AD1		Inout 2~16MA, SR	Microcontroller address/data 1
81	AD0		Inout 2~16MA, SR	Microcontroller address/data 0
93	IOA0		Inout 2~16MA, SR PU	Microcontroller address 0 / IO
78	IOA1		Inout 2~16MA, SR PU	Microcontroller address 1 / IO

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Pin	Main	Alt.	Type	Description
53	IOA2		Inout 2~16MA, SR PU	Microcontroller address 2 / IO
54	IOA3		Inout 2~16MA, SR PU	Microcontroller address 3 / IO
55	IOA4		Inout 2~16MA, SR PU	Microcontroller address 4 / IO
56	IOA5		Inout 2~16MA, SR PU	Microcontroller address 5 / IO
57	IOA6		Inout 2~16MA, SR PU	Microcontroller address 6 / IO
58	IOA7		Inout 2~16MA, SR PU	Microcontroller address 7 / IO
67	A16		Output 2~16MA, SR	Flash address 16
92	A17		Output 2~16MA, SR	Flash address 17
60	IOA18		Inout 2~16MA, SR SMT	Flash address 18 / IO
61	IOA19		Inout 2~16MA, SR SMT	Flash address 19 / IO
76	IOA20		Inout 2~16MA, SR SMT	Flash address 20 / IO
89	IOA21	VI_ADIN0	Inout 2~16MA, SR SMT	1) Flash address 21 / IO 2) While External FLASH size <= 2MB: I) Version AD input port 0, or II) GPIO
90	ALE		Inout 2~16MA, SR PU, SMT	Microcontroller address latch enable
79	IOOE#		Inout 2~16MA, SR SMT	Flash output enable, active low / IO
66	IOWR#		Inout 2~16MA, SR SMT	Flash write enable, active low / IO
77	IOCS#		Inout 2~16MA, SR PU, SMT	Flash chip select, active low / IO

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Pin	Main	Alt.	Type	Description
95	UWR#		Inout 2~16MA, SR PU, SMT	Microcontroller write strobe, active low
96	URD#		Inout 2~16MA, SR PU, SMT	Microcontroller read strobe, active low
98	UP1_2		Inout 4MA, SR PU, SMT	Microcontroller port 1-2
99	UP1_3		Inout 4MA, SR PU, SMT	Microcontroller port 1-3
100	UP1_4		Inout 4MA, SR PU, SMT	Microcontroller port 1-4
101	UP1_5		Inout 4MA, SR PU, SMT	Microcontroller port 1-5
102	UP1_6	SCL	Inout 4MA, SR PU, SMT	1) Microcontroller port 1-6 2) I^2C clock pin
103	UP1_7	SDA	Inout 4MA, SR PU, SMT	1) Microcontroller port 1-7 2) I^2C data pin
104	UP3_0	RXD	Inout 4MA, SR PU, SMT	1) Microcontroller port 3-0 2) 8032 RS232 RXD
105	UP3_1	TXD	Inout 4MA, SR PU, SMT	1) Microcontroller port 3-1 2) 8032 RS232 TXD
106	UP3_4	RXD SCL	Inout 4MA, SR PU, SMT	1) Microcontroller port 3-4 2) Hardwired RD232 RXD 3) I^2C clock pin
107	UP3_5	TXD SDA	Inout 4MA, SR PU, SMT	1) Microcontroller port 3-5 2) Hardwired RD232 TXD 3) I^2C data pin
111	IR_I		Input SMT	IR control signal input
112	INT0#		Inout 2~16MA, SR PU, SMT	Microcontroller external interrupt 0, active low
Audio interface (14)				

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Pin	Main	Alt.	Type	Description
208	SPMCLK	SCLK0	Inout	1) Audio DAC master clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 clock pin II) GPIO
209	SPDATA	SDIN0	Inout	1) Audio data of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-in II) GPIO
210	SPLRCK	SDO0	Inout	1) Audio left/right channel clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-out II) GPIO
211	SPBCK	SDCS0 ASDATA5	Inout	1) Audio bit clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 chip select II) Audio serial data 5 part I : DSD data sub-woofer channel or Microphone output III) GPIO
213	ALRCK		Inout 4MA, PD, SMT	1) Audio left/right channel clock 2) Trap value in power-on reset: I) 1 : use external 373 II) 0 : use internal 373
214	ABCK	Fs64	Output 4MA	1) Audio bit clock 2) Phase de-modulation
215	ACLK		Inout 4MA	Audio DAC master clock
217	ASDATA0		Inout 4MA PD SMT	1) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data left channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation
218	ASDATA1		Inout 4MA PD SMT	1) Audio serial data 1 (Left-Surround/Right-Surround) 2) DSD data right channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) GPIO
219	ASDATA2		Inout 4MA PD SMT	1) Audio serial data 2 (Center/LFE) 2) DSD data left surround channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) GPIO

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Pin	Main	Alt.	Type	Description
220	ASDATA3		Inout 4MA PD SMT	1) Audio serial data 3 (Center-back/ Center-left-back/Center-right-back, in 6.1 or 7.1 mode) 2) DSD data right surround channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) GPIO
222	ASDATA4	INT1#	Inout 4MA PD SMT	1) Audio serial data 4 (Down-mixed Left/Right) 2) DSD data center channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) Microcontroller external interrupt 1 II) GPIO
224	MC_DATA	INT2#	Inout	1) Microphone serial input 2) While not support Microphone: I) Microcontroller external interrupt 2 II) GPIO
225	SPDIF		Output 2~16MA, SR : ON/OFF	SPDIF output
Video Interface (18)				
189	DACVDDC		Power	3.3V power pin for VIDEO DAC circuitry
190	VREF		Analog	Bandgap reference voltage
191	FS		Analog	Full scale adjustment
192	YUV0	CIN	Output 4MA, SR	1) Video data output bit 0 2) Compensation capacitor
193	DACVSSC		Ground	Ground pin for VIDEO DAC circuitry
194	YUV1	Y	Output 4MA, SR	1) Video data output bit 1 2) Analog Y output
195	DACVDDB		Power	3.3V power pin for VIDEO DAC circuitry
196	YUV2	C	Output 4MA, SR	1) Video data output bit 2 2) Analog chroma output
197	DACVSSB		Ground	Ground pin for VIDEO DAC circuitry
198	YUV3	CVBS	Output 4MA, SR	1) Video data output bit 3 2) Analog composite output
199	DACVDDA		Power	3.3V power pin for VIDEO DAC circuitry
200	YUV4	Y/G	Output 4MA, SR	1) Video data output bit 4 2) Green or Y
201	DACVSSA		Ground	Ground pin for VIDEO DAC circuitry
202	YUV5	B/Cb/Pb	Output 4MA, SR	1) Video data output bit 5 2) Blue or CB

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Pin	Main	Alt.	Type	Description
203	YUV6	R/Cr/Pr	Output 4MA, SR	1) Video data output bit 6 2) Red or CR
205	VSYN	V_ADIN1	Inout 4MA, SR SMT	1) Vertical sync input/output 2) While no External TV-encoder: I) Vertical sync for video-input II) Version AD input port 1 III) GPIO
206	YUV7	INT3# ASDATA5	Inout 4MA, SR SMT	1) Video data output bit 7 2) While no External TV-encoder: I) Microcontroller external interrupt 3 II) Audio serial data 5 part II : PCM data sub-woofer channel or Microphone output III) GPIO
207	HSYN	INT4# V_ADIN2	Inout 4MA, SR SMT	1) Horizontal sync input/output 2) While no External TV-encoder: I) Horizontal sync for video-input II) Microcontroller external interrupt 4 III) Version AD input port 2 IV) GPIO
MISC (8)				
43	USB_VSS			USB ground pin
44	USBP			USB port DPLUS analog pin
45	USBM			USB port DMINUS analog pin
46	USB_VDD3			USB Power pin 3.3V
110	PRST#		Input PU, SMT	Power on reset input, active low
109	ICE		Input PD, SMT	Microcontroller ICE mode enable
228	XTALO		Output	27M crystal out
229	XTALI		Input	27M crystal in
Dram Interface (63) (Sorted by position)				
188	RD16	LLC_CLK		1) DRAM data 16 2) While using 16-bits wide DRAM: I) Line Locked Clock input/output II) GPIO
187	RD17	YUVIN0		1) DRAM data 17 2) While using 16-bits wide DRAM: I) Video input data 0 II) GPIO
186	RD18	YUVIN1		1) DRAM data 18 2) While using 16-bits wide DRAM: I) Video input data 1 II) GPIO

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Pin	Main	Alt.	Type	Description
185	RD19	YUVIN2		1) DRAM data 19 2) While using 16-bits wide DRAM: I) Video input data 2 II) GPIO
184	RD20	YUVIN3		1) DRAM data 20 2) While using 16-bits wide DRAM: I) Video input data 3 II) GPIO
183	RD21	YUVIN4		1) DRAM data 21 2) While using 16-bits wide DRAM: I) Video input data 4 II) GPIO
181	RD22	YUVIN5		1) DRAM data 22 2) While using 16-bits wide DRAM: I) Video input data 5 II) GPIO
180	RD23	YUVIN6		1) DRAM data 23 2) While using 16-bits wide DRAM: I) Video input data 6 II) GPIO
179	DQM2	YUVIN7		1) Data Mask 2 2) While using 16-bits wide DRAM: I) Video input data 7 II) GPIO
178	DQM3	INT6# USB_CLK		1) Data Mask 3 2) While using 16-bits wide DRAM: I) Microcontroller external interrupt 6 II) USB port CLK input (48Mhz) part II III) GPIO
177	RD24	SDIN1 MS_BS		1) DRAM data 24 2) While using 16-bits wide DRAM: I) Serial interface port 1 data-in II) MS Card BS pin part II III) GPIO
176	RD25	SDO1 MS_SDIO		1) DRAM data 25 2) While using 16-bits wide DRAM: I) Serial interface port 1 data-out II) MS Card SDIO pin part II III) GPIO
174	RD26	SDCS1 MSCLK		1) DRAM data 26 2) While using 16-bits wide DRAM: I) Serial interface port 1 chip select II) Memory Stick Clock part II III) GPIO

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Pin	Main	Alt.	Type	Description
172	RD27	SCLK2 SDCLK		1) DRAM data 27 2) While using 16-bits wide DRAM: I) Serial interface port 2 clock pin II) Security Disk Clock part II III) GPIO
171	RD28	SDIN2 SD_CMD		1) DRAM data 28 2) While using 16-bits wide DRAM: I) Serial interface port 2 data-in II) SD Card CMD pin part II III) GPIO
170	RD29	SDO2 SD_DAT		1) DRAM data 29 2) While using 16-bits wide DRAM: I) Serial interface port 2 data-out II) SD Card Data pin part II III) GPIO
169	RD30	SDCS2		1) DRAM data 30 2) While using 16-bits wide DRAM: I) Serial interface port 2 chip select II) GPIO
168	RD31	INT5# ASDATA5		1) DRAM data 31 2) While using 16-bits wide DRAM: I) Microcontroller external interrupt 5 II) Audio serial data 5 part III : DSD data sub-woofer channel or Microphone output III) GPIO
166	RA4			DRAM address 4
165	RA5			DRAM address 5
164	RA6			DRAM address 6
162	RA7			DRAM address 7
160	RA8			DRAM address 8
159	RA9			DRAM address 9
158	RA11	GPIO		1) DRAM address bit 11 2) While using DRAM size <=4MB: I) GPIO
157	CKE			DRAM clock enable
156	RCLK			Dram clock
154	RCLKB	USB_CLK		1) Dram clock invert 2) While not using DDR: I) USB port CLK input (48Mhz) part I
153	RVREF	V_ADIN3		1) Reference voltage for DDR DRAM 2) While not using DDR : Version AD input port 3
151	RA3			DRAM address 3
150	RA2			DRAM address 2
149	RA1			DRAM address 1
147	RA0			DRAM address 0
146	RA10			DRAM address 10

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Pin	Main	Alt.	Type	Description
145	BA1			DRAM bank address 1
143	BA0			DRAM bank address 0
142	RCS#			DRAM chip select, active low
140	RAS#			DRAM row address strobe, active low
139	CAS#			DRAM column address strobe, active low
138	RWE#			DRAM Write enable, active low
137	DQM1			Data mask 1
136	DQS1	INT7# MS_BS		1) Data strobe 1 for DDR DRAM 2) While not using DDR: I) Microcontroller external interrupt 7 II) MS Card BS pin part I III) GPIO
135	RD8			DRAM data 8
133	RD9			DRAM data 9
132	RD10			DRAM data 10
131	RD11			DRAM data 11
130	RD12			DRAM data 12
129	RD13			DRAM data 13
128	RD14			DRAM data 14
126	RD15			DRAM data 15
125	RD0			DRAM data 0
124	RD1			DRAM data 1
123	RD2			DRAM data 2
121	RD3			DRAM data 3
120	RD4			DRAM data 4
118	RD5			DRAM data 5
117	RD6			DRAM data 6
115	RD7			DRAM data 7
114	DQS0	SCLK1 MS_SDIO		1) Data strobe 0 for DDR DRAM 2) While not using DDR: I) Serial interface port 1 clock pin II) MS Card SDIO pin part I III) GPIO
113	DQM0			Data mask 0
JTAG Interface(4)				
48	TDI	SDO3 V_ADIN4 SD_DAT	Inout	1) JTAG data in 2) While not using Boundary Scan: I) Serial interface port 3 data-out II) Version AD input port 4 III) SD Card Data pin part I IV) GPIO

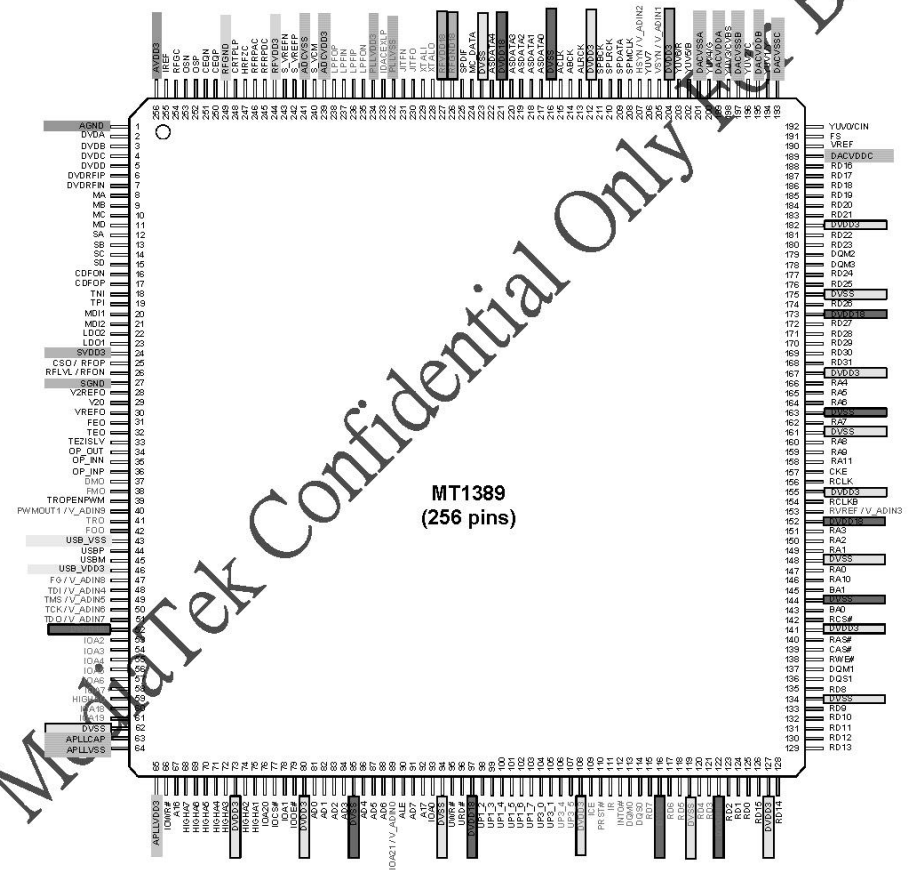
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Pin	Main	Alt.	Type	Description
49	TMS	SDIN3 V_ADIN5 SD_CMD	Inout	1) 2) While not using Boundary Scan: I) Serial interface port 3 data-in II) Version AD input port 5 III) SD Card CMD pin part I IV) GPIO
50	TCK	SCLK3 V_ADIN6 SDCLK	Inout	1) JTAG clock 2) While not using Boundary Scan: I) Serial interface port 3 clock pin II) Version AD input port 6 III) Security Disk Clock part I IV) GPIO
51	TDO	SDCS3 V_ADIN7 MSCLK	Inout	1) JTAG data out 2) While not using Boundary Scan: I) Serial interface port 3 chip-select II) Version AD input port 7 III) Memory Stick Clock part I IV) GPIO

Note:

1. The Main column is the main function, Alt. Means alternative function.
2. The multi-function GPIO pins are set to green characters.
3. The video input port and external TV encoder mode can not both use CCIR-601 mode, at least one of them should be in CCIR-656 mode.

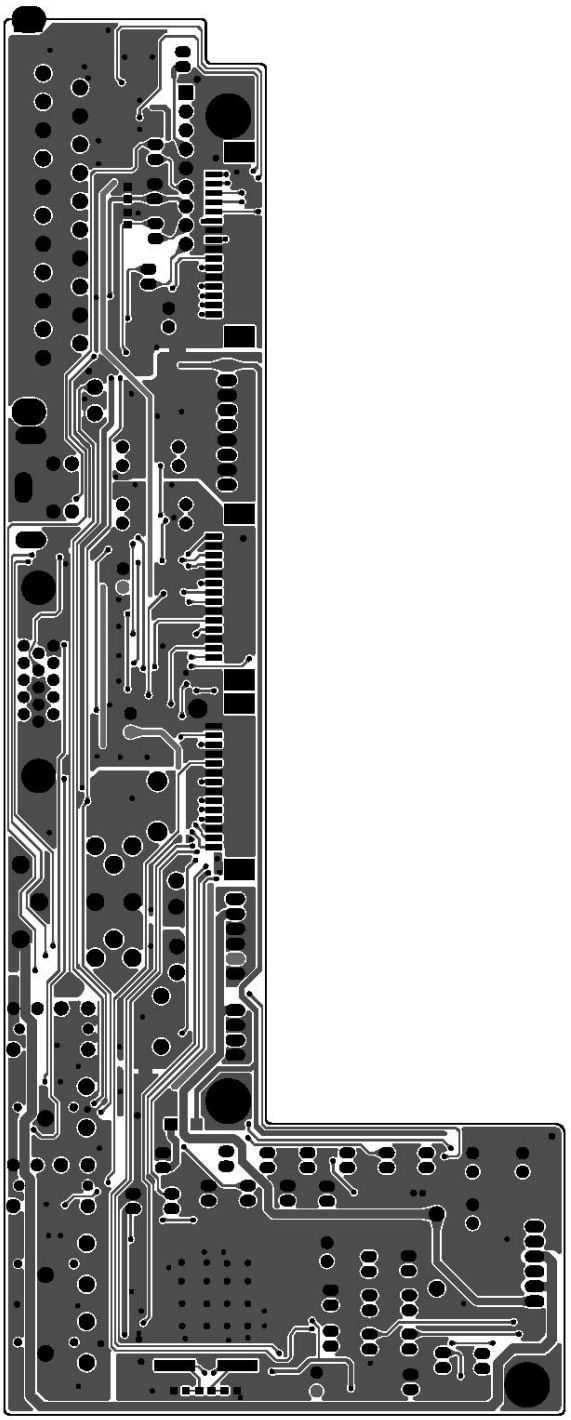
MediaTek Confidential Only For BBK

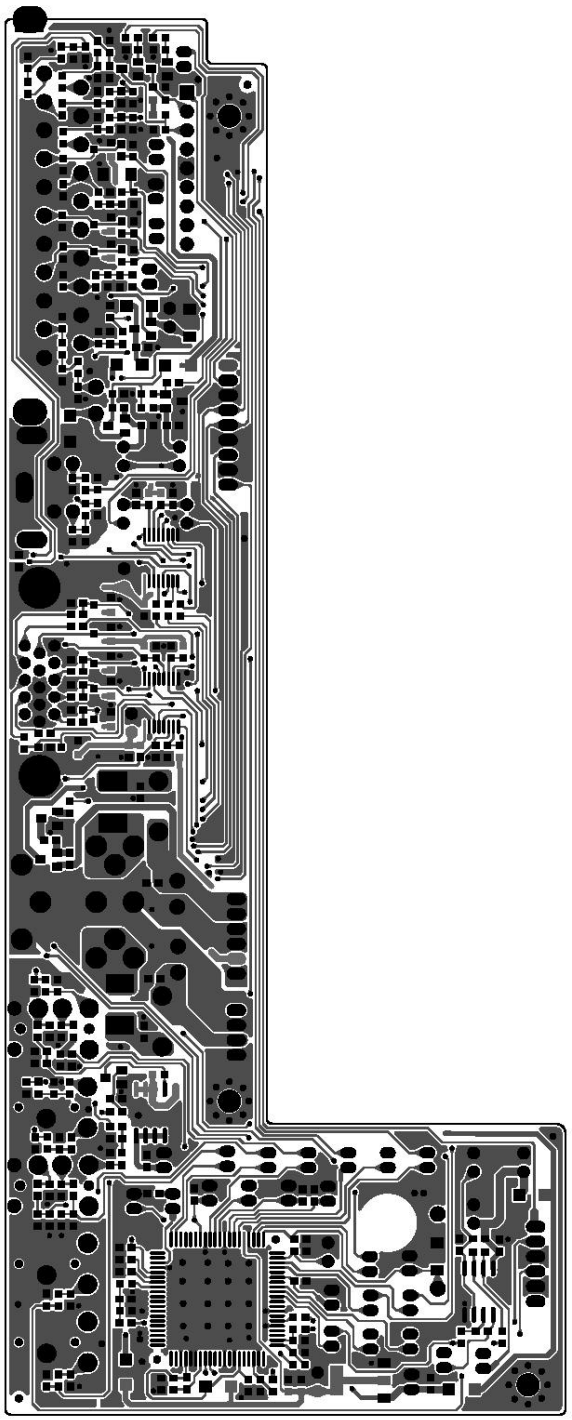


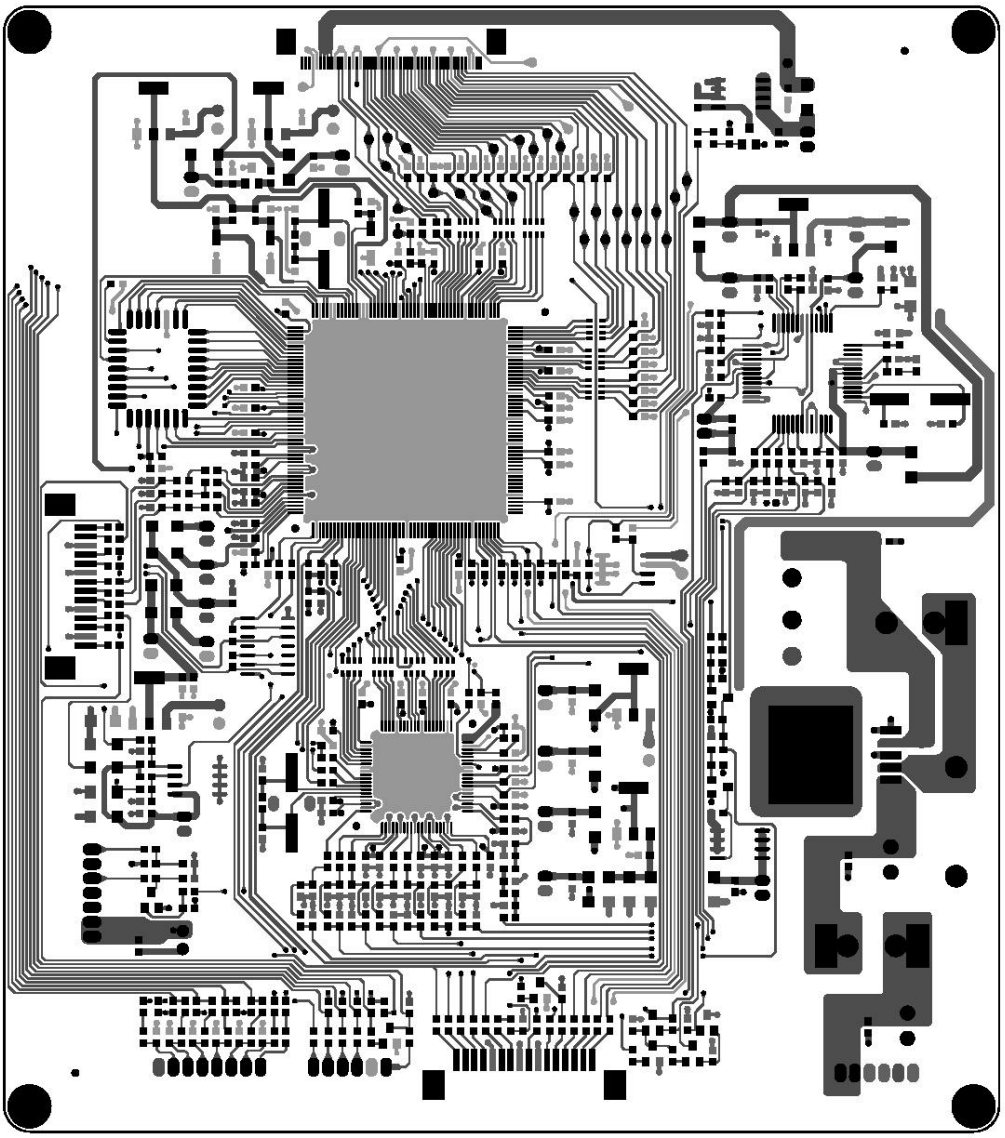
MediaTek Confidential Only for BBK

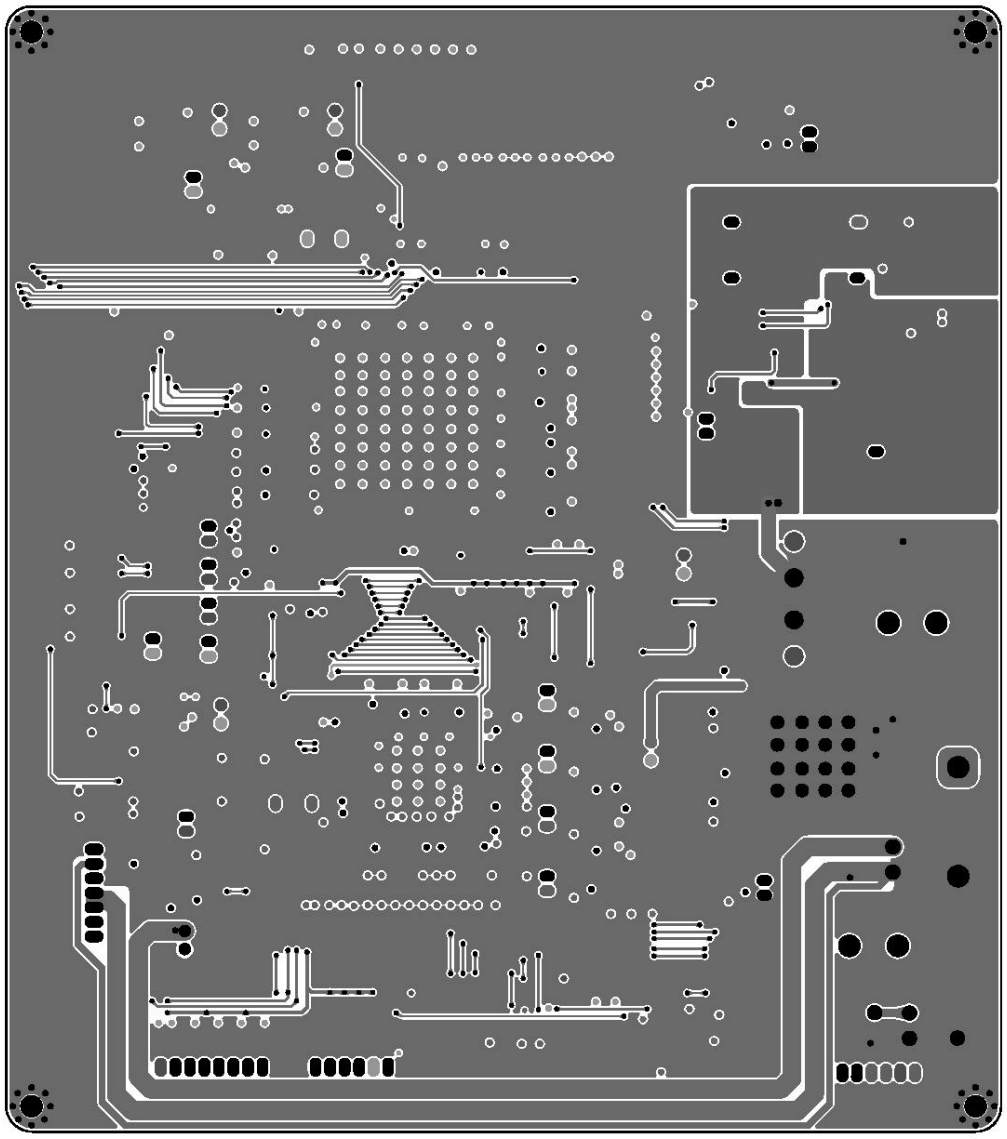
Pin	Main	Alt.	Type	Description
208	SPMCLK	SCLK0	Inout	1) Audio DAC master clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 clock pin II) GPIO
209	SPDATA	SDIN0	Inout	1) Audio data of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-in II) GPIO
210	SPLRCK	SDO0	Inout	1) Audio left/right channel clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-out II) GPIO
211	SPBCK	SDCS0 ASDATA5	Inout	1) Audio bit clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 chip select II) Audio serial data 5 part I : DSD data sub-woofer channel or Microphone output III) GPIO
213	ALRCK		Inout 4MA, PD, SMT	1) Audio left/right channel clock 2) Trap value in power-on reset: I) 1 : use external 373 II) 0 : use internal 373
214	ABCK	Fs64	Output 4MA	1) Audio bit clock 2) Phase de-modulation
215	ACLK		Inout 4MA	Audio DAC master clock
217	ASDATA0		Inout 4MA PD SMT	1) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data left channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation
218	ASDATA1		Inout 4MA PD SMT	1) Audio serial data 1 (Left-Surround/Right-Surround) 2) DSD data right channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) GPIO
219	ASDATA2		Inout 4MA PD SMT	1) Audio serial data 2 (Center/LFE) 2) DSD data left surround channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) GPIO

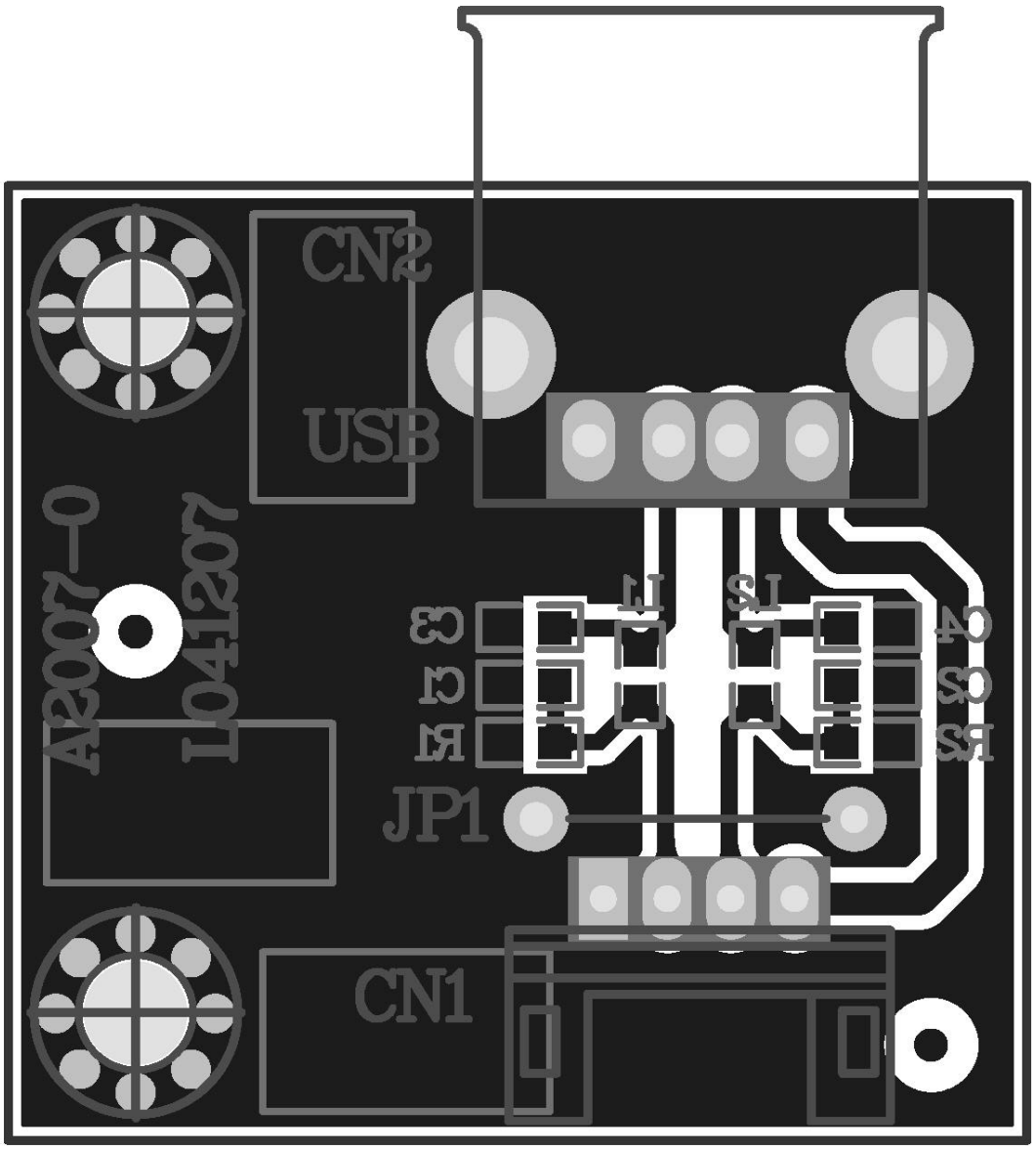
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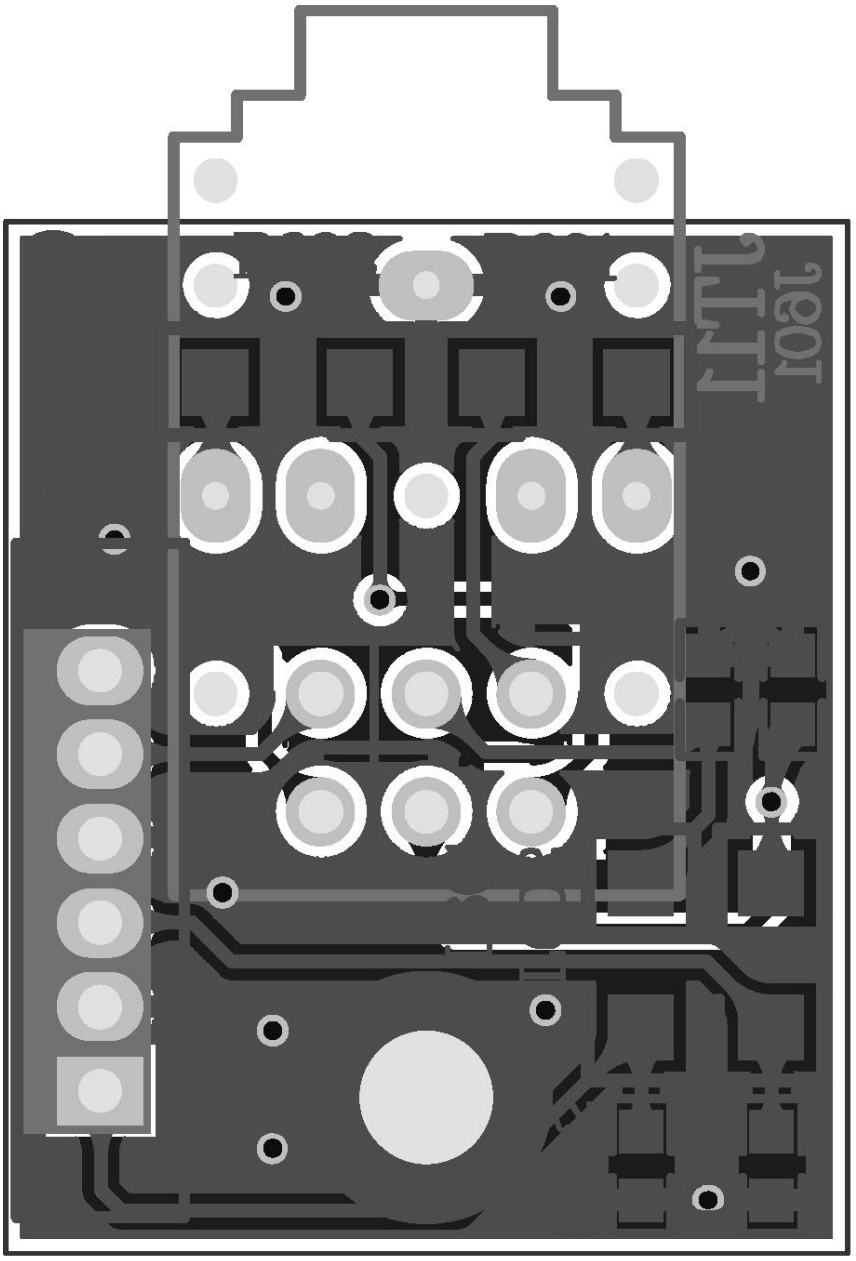






SIZE:32*30MM

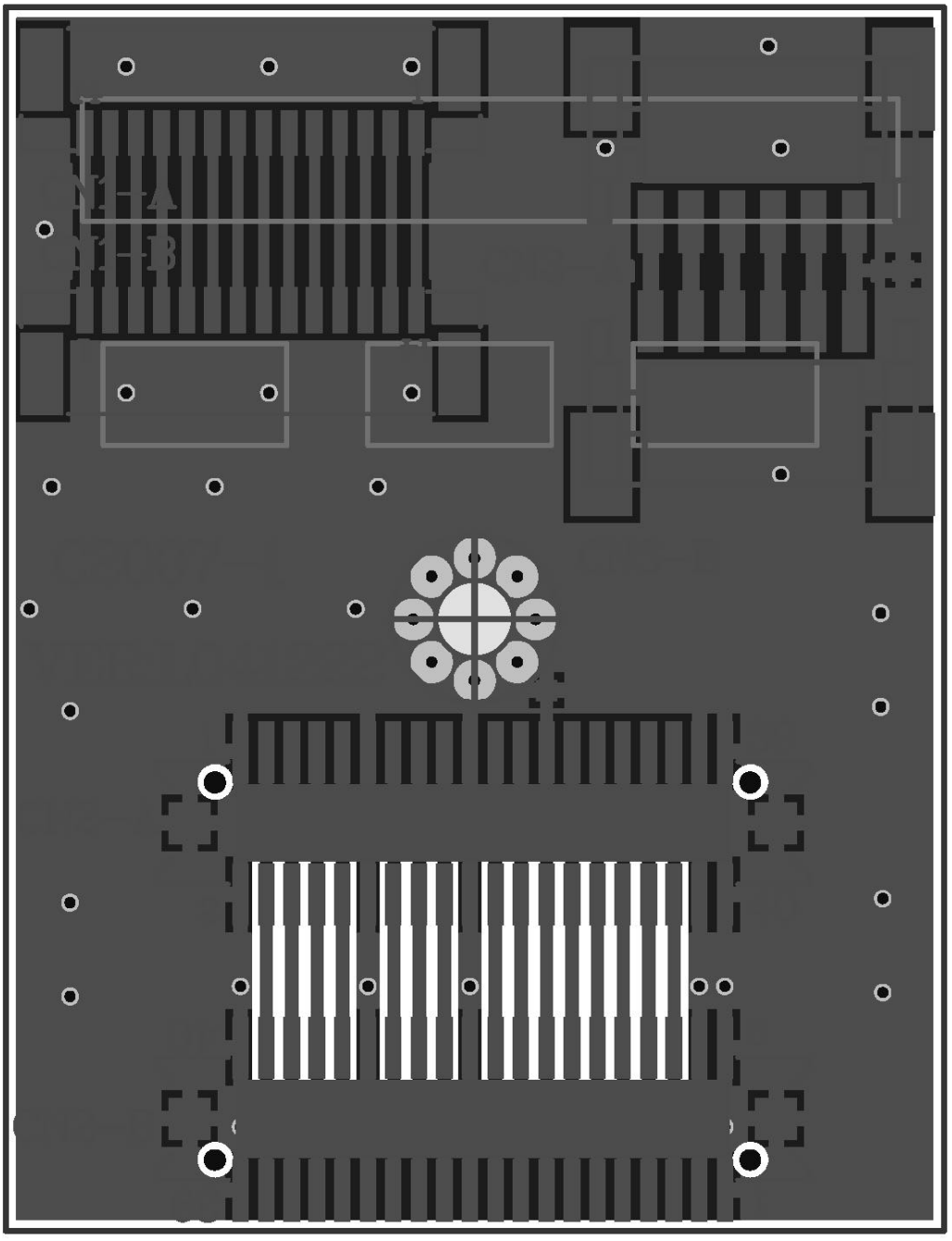
94V0 CU THK=1.6MM



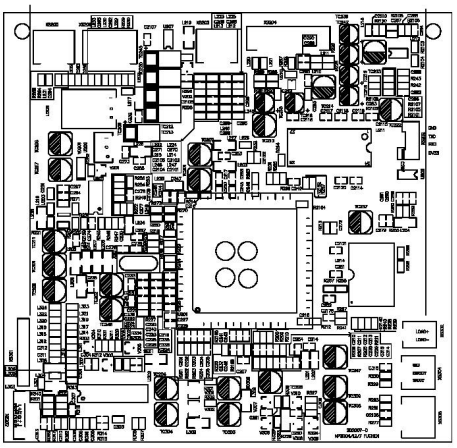
SIZE:24.5*20MM

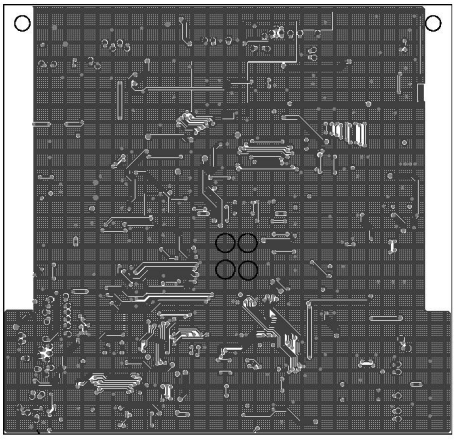
FR4 CU THK=1.2MM

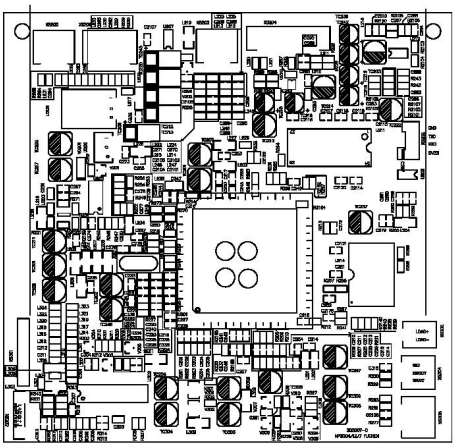
SIZE:60*46MM

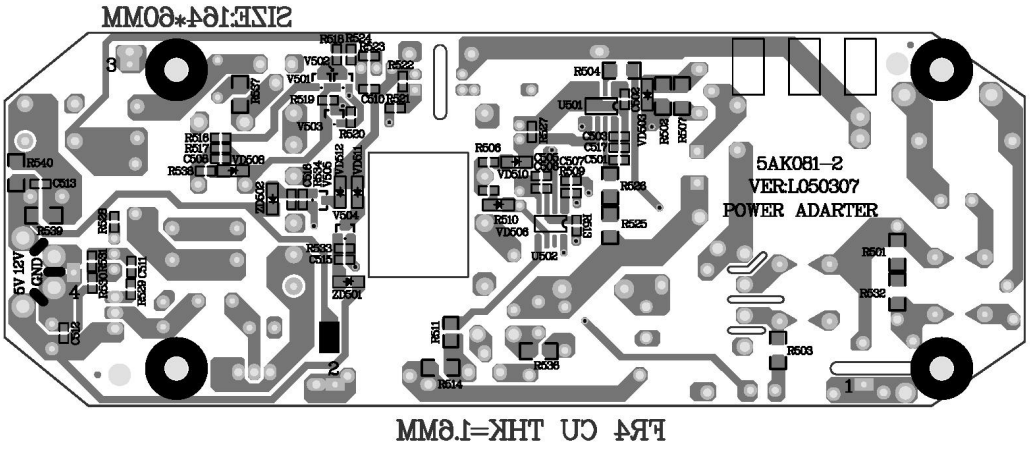


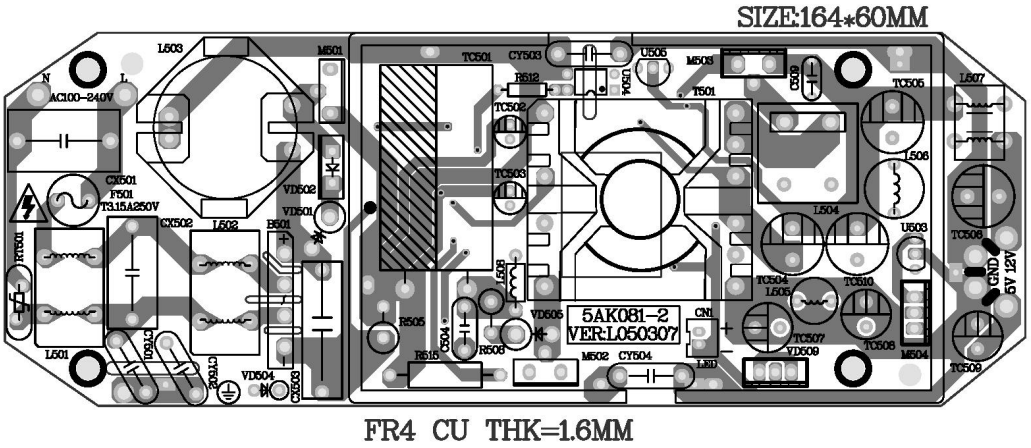
FR4 CU THK=1.6MM











BOM OF AUDIO BOARD FOR LT2007

VER3.2/VER2.3

0090001	SMD RESISTER	1/16W 0O ± 5% 0603	PCS	4	C864~C866,R908
0090538	SMD RESISTER	1/4W 120O± 5% 1206	PCS	2	R935,R901
0090135	SMD RESISTER	1/8W 100O ± 5% 1206	PCS	1	R932
0090181	SMD RESISTER	1/16W 100O ± 5% 0603	PCS	1	C804

0090023	SMD RESISTER	1/16W 10K ± 5% 0603	PCS	21	R905,R906,R810,R809,R310,R313,R512,R817,R821~R831,R502,R320
0090008	SMD RESISTER	1/16W 220O ± 5% 0603	PCS	2	R812,L802
0090019	SMD RESISTER	1/16W 4.7K ± 5% 0603	PCS	7	R311,R312,R933,R934,R931,R904,R902
0090006	SMD RESISTER	1/16W 75O ± 5% 0603	PCS	5	R910,R911,R820,R800,R838
0090109	SMD RESISTER	1/16W 1MO ± 5% 0603	PCS	1	R307
0090026	SMD RESISTER	1/16W 22K ± 5% 0603	PCS	2	R511,R501
0090014	SMD RESISTER	1/16W 1K ± 5% 0603	PCS	10	R913,R914,R811,R813~R816,R818,R819,R903
0090114	SMD RESISTER	1/8W 0O ± 5% 1206	PCS	1	L504
0090012	SMD RESISTER	1/16W 560O ± 5% 0603	PCS	3	R301,R304,R305
0090034	SMD RESISTER	1/16W 100K ± 5% 0603	PCS	12	R306,R302,R801~R808,R308,R309
0090104	SMD RESISTER	1/16W 2.7K ± 5% 0603	PCS	1	R503
0000276	CARBON FILM RESISTER	1/4W100O± 5% SHAPED 10	PCS	1	R708
0390282	SMD INDOUCTOR	10uH ± 5% 1608	PCS	2	L309,L301
0390286	SMD INDOUCTOR	5.6uH± 10% 1608	PCS	11	L801,L811~L814,L822~L825,L828,L829
0390287	SMD BEAD	19O/100mHZ ± 25% 1608	PCS	15	L803~L810,L816,L818,L819,L821,L830~L832
0390300	SMD BEAD	600O/100MHZ± 25% 1608	PCS	3	L817,L820,L815
0390301	SMD BEAD	600O/100MHZ± 25% 3216	PCS	6	L901,L902,L302,L305,L310,L303
0310047	SMD CAPACITOR	50V 101 ± 5% NPO 0603	PCS	3	C301,C330,C331
0310072	SMD CAPACITOR	50V 103 ± 10% X7R 0603	PCS	1	C302
0310085	SMD CAPACITOR	50V 20P ± 5% NPO 0603	PCS	2	C338,C337
0310188	SMD CAPACITOR	50V 10P ± 5% NPO 0603	PCS	19	C829~C842,C801,C802,C811,C812,C860
0310066	SMD CAPACITOR	50V 102 ± 10% X7R 0603	PCS	4	C843,C845,C847,C849
0310049	SMD CAPACITOR	50V 221 ± 5% NPO 0603	PCS	4	C844,C846,C848,C850
0310207	SMD CAPACITOR	50V 104 ± 20% X7R 0603	PCS	27	C340~C342,C310,C312,C309,C319,C321,C327,C329,C910,C904,C930,C931,C934,C

					935,C851,C347,C336,C339,C350,C352,C521,C520,C354,C858,C855
0310593	SMD CAPACITOR	10V 474 ± 10% X5R 0603	PCS	1	C334
0260063	CD	CD11 50V1U± 20%5× 11 2	PCS	8	C306,C307,C314,C315,C322,C323,C332,C333
0260102	CD	CD110 25V10U± 20%5× 11 2	PCS	14	C343,C303,C311,C313,C316,C317,C308,C328,C905~C908,C809,C810
0260027	CD	CD11 16V100U± 20%6× 12 2.5	PCS	10	C901,C346,C326,C355,C920,C856,C857,C859,C861,C349
0260029	CD	CD11 16V470U± 20%8× 123.5	PCS	1	C902
0260028	CD	CD11 16V220U± 20%6× 12 2.5	PCS	2	C903,C348
0260025	CD	CD11 16V47U± 20%5× 11 2	PCS	6	C318,C324,C320,C351,C519,C909
0260604	CD	CD112S 105℃ 25V220U± 20% 8× 12 3.5	PCS	2	C507,C503
0410153	CURRENT LIMITE INDOUCTOR	STAND 1.5uH ± 20% 7A 6mm	PCS	2	L501,L502
2300031	SMD FUSE	F7A 125V	PCS	1	F501
2300030	SMD FUSE	T3A 125V	PCS	1	F502
0700147	SMD REGULATEDIODE	8.2V ± 5% 1/2W	PCS	1	ZD301
0700148	SMD REGULATEDIODE	3.3V ± 5% 1/2W	PCS	1	ZD801
0700137	SMD REGULATEDIODE	11V ± 5% 1/2W MINIMELF	PCS	1	ZD901
0780198	SMD TRIDIODE	2SA1015	PCS	1	Q503
0780197	SMD TRIDIODE	C1815	PCS	7	Q507,Q902~Q904,Q907,Q502,Q901
0700064	SMD DIODE	BAV99LT1 SOT-23	PCS	7	D801~D807
0960236	SMD CRYSTAL	27.00MHz 49-S	PCS	1	X301
1860086	SCARTSOCKET	CS-112 L mode white	PCS	1	J806
1940044	SOCKET	9 PIN 2.0mm	PCS	1	CN808
1940022	SOCKET	4 PIN 2.0mm	PCS	1	CN803
1940005	SOCKET	6 PIN 2.0mm	PCS	2	CN804,CN802
1940247	SOCKET	16 PIN 1.25mm SMD	PCS	1	CN807

		STAND			
1940248	SOCKET	14 PIN 1.25mm SMD stand	PCS	2	CN805,CN806
1870046	POWER SUPPLY SOCKET	2DJ-0108PWA2 white	PCS	1	J805
1910181	CONNECTER SOCKET	SCONNECTER DSW-6 L shaped SHIELDED white	PCS	1	J811
1860113	VGASOCKET	15 PIN white	PCS	1	J807
1980071	HEADPHONE SOCKET	ST-066-060-300 white	PCS	5	J801,J809,J804,J803,J808
3540141	CONNECTER SHIELDED SHEET	LT2007	PCS	1	
0882030	IC	STV8216 TQFP	PCS	1	IC301
0881537	IC	TDA1308 SOP	PCS	1	IC302
0882061	IC	PI5V330 QSOP	PCS	2	IC801,IC802
0882167	IC	9435M SO8	PCS	1	Q506
0881867	IC	FDS9435A SOP	PCS	1	Q506
0882053	IC	AK33 SOT-223	PCS	1	IC303
0882112	IC	LA7952 SIP	PCS	1	IC901
1632532	PCB	12007-3	PCS	1	

BOM OF VIDEO BOARD FOR LT2007
VER2.9/VER2.3

0090181	SMD RESISTER	1/16W 100O ± 5% 0603	PCS	15	R122,R123,R101,R102,R220,R154,R155,R161,R162,R163,R113,R114,R615,R616,R601
0090001	SMD RESISTER	1/16W 0O ± 5 % 0603	PCS	7	R149,R510,R159,R612,R613,R605,R145
0090004	SMD RESISTER	1/16W 22O ± 5% 0603	PCS	2	R209,R210
0090114	SMD RESISTER	1/8W 0O ± 5% 1206	PCS	2	L503,R1
0090232	SMD RESISTER	1/16W 150O ± 5% 0603	PCS	1	R610
0090019	SMD RESISTER	1/16W 4.7K ± 5% 0603	PCS	19	R109,R126,R127,R129~R135,R137,R151,R153,R156,R157,R139,R140,R128 ,R141
0090013	SMD RESISTER	1/16W 680O ± 5% 0603	PCS	2	R211,L201

0090006	SMD RESISTER	1/16W 75O ± 5% 0603	PCS	8	R117~R119,R212,R214,R216,R218,R221
0090557	SMD RESISTER	1/4W 18O± 5% 1206	PCS	3	R250~R252
0090003	SMD RESISTER	1/16W 10O ± 5% 0603	PCS	1	R203
0090024	SMD RESISTER	1/16W 15K ± 5% 0603	PCS	1	R504
0090109	SMD RESISTER	1/16W 1MO ± 5% 0603	PCS	2	R206,R108
0090005	SMD RESISTER	1/16W 33O ± 5% 0603	PCS	8	R201,R202,R204,R103~R105,R106,R205
0090008	SMD RESISTER	1/16W 220O ± 5% 0603	PCS	14	R606~R608,R807,R801~R806,R213,R215,R217,R619
0090014	SMD RESISTER	1/16W 1K ± 5% 0603	PCS	5	R617,R609,R602,R603,R604
0090034	SMD RESISTER	1/16W 100K ± 5% 0603	PCS	2	R623,R624
0090026	SMD RESISTER	1/16W 22K ± 5% 0603	PCS	4	R501,R506,R180,R622
0090023	SMD RESISTER	1/16W 10K ± 5% 0603	PCS	14	R107,R110,R111,R158,R160,R208,R502,R507,R219,R165,R115,R618,R181,R625
0090017	SMD RESISTER	1/16W 2.2K ± 5% 0603	PCS	5	R503,R124,R125,R182,R116
0100019	SMD RESISTORS SERIES	1/16W33O ± 5% 8P	PCS	10	RP201~RP204,RP107~RP112
0390235	SMD INDOUCTOR	8.2uH± 10% 1608	PCS	6	L202~L207
0390177	SMD INDOUCTOR	2.2UH± 10% 1608	PCS	2	L215,L208
0410154	STAND SHIELDED FILTERING INDOUCTOR	100uH ± 20% 3A SMD	PCS	1	L502
0410153	CURRENT LIMITE INDOUCTOR	STAND 1.5uH ± 20% 7A 6mm	PCS	1	L501
0390287	SMD BEAD	19O/100mHZ ± 25% 1608	PCS	34	L801~L806,L120~L147
0390300	SMD BEAD	600O/100MHZ± 25% 1608	PCS	6	L101,L102,L105,L832,L831,L807

0390301	SMD BEAD	600O/100MHZ± 25% 3216	PCS	13	L107,L106,L209,L210,L212, L213,L115,L117,L119,R505 ,L601~L603
0310047	SMD CAPACITOR	50V 101 ± 5% NPO 0603	PCS	8	C158,C159,C222,C221,C189 ,C187,C616,C617
0310207	SMD CAPACITOR	50V 104 ± 20% X7R 0603	PCS	78	C202~C208,C258,C211~C2 19,C101,C106~C124,C130,C 131,C134,C160,C163,C164, C167,C247,C249,C152,C253 ,C252,C256,C186,C140~C14 4,C146,C509,C510,C504,C5 02,C515,C184,C508,C514,C 191,C500,C193,C528,C531, C619,C621,C622,C625,C614 ,C615,C601,C605
0310057	SMD CAPACITOR	16V 104 ± 10% X7R 0603	PCS	10	C147,C220,C223~C230
0310192	SMD CAPACITOR	50V 56P ± 5% NPO 0603	PCS	13	C231~C237,C240~C245
0310197	SMD CAPACITOR	50V 561 ± 10% X7R 0603	PCS	1	C246
0310051	SMD CAPACITOR	50V 331 ± 5% NPO 0603	PCS	2	C257, C238
0310042	SMD CAPACITOR	50V 15P ± 5% NPO 0603	PCS	27	C201,C100,C102,C133,C194 ~C199,C1100,C168~C178,C 181~C183,C151,C166
0310085	SMD CAPACITOR	50V 20P ± 5% NPO 0603	PCS	4	C209,C210,C103,C104
0310044	SMD CAPACITOR	50V 33P ± 5% NPO 0603	PCS	2	C610,C611
0310188	SMD CAPACITOR	50V 10P ± 5% NPO 0603	PCS	6	C859~C864
0310593	SMD CAPACITOR	10V 474 ± 10% X5R 0603	PCS	4	C148~C150,C620
0310202	SMD CAPACITOR	50V 223 ± 10% X7R 0603	PCS	2	C612,C603
0310068	SMD CAPACITOR	50V 222 ± 10% X7R 0603	PCS	2	C613,C604
0310072	SMD CAPACITOR	50V 103 ± 10% X7R 0603	PCS	3	C512,C513,C190
0310045	SMD CAPACITOR	50V 47P ± 5% NPO 0603	PCS	4	C606~C609
0260025	CD	CD11 16V47U± 20%5× 11 2	PCS	5	C105,C192,C624,C602,C623

0260200	CD	CD11C 16V47U± 20%5× 7 2	PCS	2	C139,C145
0260201	CD	CD11C 16V100U± 20%6× 7 2.5	PCS	17	C248,C161,C165,C128,C250 ,C251,C254,C255,C185,C51 6,C511,C136,C137,C529,C5 30, C138,C162
0260428	SMD CD	16V10U± 20%4× 4× 5.4	PCS	3	C125,C126,C129
0260593	CD	CD112 105℃ 25V220U± 20% 8× 12 3.5	PCS	2	C501,C503
0260604	CD	CD112S 105℃ 25V220U± 20% 8× 12 3.5	PCS	2	C501,C503
0260693	CD	CD288T 25V470U± 20%10× 12 5	PCS	2	C507,C506
0700007	SMD DIODE	1N4148	PCS	5	D106~D110
0680079	SCHOTTKY DIODE	1N5822 SHAPED 15	PCS	1	D501
0780198	SMD TRIDIODE	2SA1015	PCS	1	Q101
0780197	SMD TRIDIODE	C1815	PCS	6	Q102,Q103,Q501~Q503,Q1 04
0960235	SMD CRYSTAL	24.576MHz 49-S	PCS	1	X101
0960250	SMD CRYSTAL	13.875MHZ± 20PPM 49-S	PCS	1	X601
0960234	SMD CRYSTAL	14.31818MHZ 49-S	PCS	1	X201
1940211	CABLE SOCKET	50 PIN 0.5mm SMD	PCS	1	CN106
1940042	SOCKET	8 PIN 2.0mm "L"	PCS	1	CN102
1940209	SOCKET	7 PIN 2.0mm "L"	PCS	1	CN103
1940245	SOCKET	14 PIN 1.25mm SMD	PCS	1	CN107
1940135	SOCKET	6 PIN 2.0mm"L"	PCS	2	CN104,CN108
1940246	SOCKET	16 PIN 1.25mm SMD	PCS	1	CN105
0882167	IC	9435M SO8	PCS	2	Q504,Q505
0881867	IC	FDS9435A SOP	PCS	2	Q504,Q505
1850009	ICSOCKET	32P PLCC	PCS	1	IC102
0882151	IC	RTD2010 PQFP	PCS	1	IC101
0881388	IC	24C16 SOP	PCS	1	IC103

0882085	IC	LVC14A SOP	PCS	1	IC104
0882092	IC	74LVC14A SOP	PCS	1	IC104
0882053	IC	AK33 SOT-223	PCS	4	IC106,IC202,IC111,IC503
0882121	IC	AK18 SOT-223	PCS	1	IC203
0881146	IC	LM1117MP-1.8 SOT-223	PCS	1	IC203
0882052	IC	AK25 SOT-223	PCS	1	IC105
0882028	IC	AC1501 TO263-5L	PCS	1	IC501
0882376	IC	TVP5146M1 PQFP	PCS	1	IC201
0882431	IC	ET-TVT0310A PQFP	PCS	1	U2
1632471	PCB	22007-3	PCS	1	

TUNER BOARD FOR LT2007

VER1.0

0310070	SMT CAPACITOR	50V 332 ± 10% X7R 0603	PCS	1	R001
0090019	SMT RESISTOR	1/16W 4.7K ± 5% 0603	PCS	1	R002
0090006	SMT RESISTOR	1/16W 75O ± 5% 0603	PCS	1	R003
0090181	SMT RESISTOR	1/16W 100O ± 5% 0603	PCS	2	R004,R005
0390292	INDOUCTOR	22uH ± 20% 350mA 0307	PCS	2	L001,L002
0310047	SMT CAPACITOR	50V 101 ± 5% NPO 0603	PCS	2	C003,C004
0260028	CD	CD11 16V220U± 20%6× 12 2.5	PCS	2	C001,C002
1020028	TUNER	JS-6B2/121	PCS	1	U001
1940043	SOCKET	9pin 2.0mm L SHAPED	PCS	1	CN001
1632175	PCB	02007-2	PCS	1	

KEY1 BOARD FOR LT2007

VER1.0

0000676	CARBON RESISTOR	1/8W 330O± 5% SHAPED7.5	PCS	1	R401
0260019	CD	CD11 16V10U± 20%5× 11 2	PCS	1	C401
0570006	DIODE	1N4148	PCS	12	D401~D412
1940044	SOCKET	9pin 2.0mm	PCS	1	CN401
1940209	SOCKET	7pin 2.0mm L	PCS	1	CN402

		SHAPED			
1340154	SWITCH	TSVD-2	PCS	5	SW401~SW405
3029741	HOLDER	LT2007	PCS	1	
2360002	IR SENSER	HS0038B	PCS	1	S401
1632411	PCB	42007-3R	PCS	1	

KEY2 BOARD FOR LT2007

VER1.0

0000677	CARBON RESISTOR	1/8W 680O± 5% SHAPED7.5	PCS	1	R402
0000126	CARBON RESISTOR	1/6W560O± 5%SHAPED7.5	PCS	1	R403
0000678	CARBON RESISTOR	1/8W 47K± 5% SHAPED7.5	PCS	1	R404
0620086	DUAL COLOUR DIODE	2.5RG59HW-A× 5 G R	PCS	1	D401
0780304	TRANSISTOR	C1815Y TO-92 SHAPED2.5	PCS	2	Q401,Q402
1940209	SOCKET	7pin 2.0mm L SHAPED	PCS	1	CN403
1340154	SWITCH	TSVD-2	PCS	4	SW406~SW409
5233236	SOFT RUBBER	11× 5× 6	PCS	1	
1632410	PCB	42007-3L	PCS	1	

USB BOARD FOR LT2007

VERSION 1.0

0090023	SMT RESISTOR	1/16W 10K ± 5% 0603	PCS	2	R1,R2
0390300	SMT BEAD	600O/100MHZ± 25% 1608	PCS	2	L1,L2
2100004	CONDUCTER	F0.6 SHAPED 10mm	PCS	1	JP1
1860074	USB SOCKET	2UB-0001M000	PCS	1	CN2
1940095	SOCKET	4pin 2.0mm	PCS	1	CN1
1563456	PCB	A2007-0	PCS	1	

HEADPHONE BOARD FOR LT2007

1980061	HEADPHONE SOCKET	CKX-3.5-01K	PCS	1	J601
0090135	SMT RESISTOR	1/8W 100O ± 5% 1206	PCS	2	R601,R602
0310049	SMT CAPACITOR	50V 221 ± 5% NPO 0603	PCS	2	C603,C604
0310066	SMT CAPACITOR	50V 102 ± 10% X7R 0603	PCS	2	C601,C602
0090114	SMT RESISTOR	1/8W 0O ± 5% 1206	PCS	2	L601,L602

1940005	SOCKET	6pin 2.0mm	PCS	1	CN601
1632309	PCB	62007-2	PCS	1	

AUDIO BOARD FOR LT2007
MX-BBK2008(HK)-2
VERSION: 0.0
DATE 2005 07 19

0090016	SMT RESISTOR	1/16W 1.5K ± 5% 0603	PCS	2	R410,R411
0090023	SMT RESISTOR	1/16W 10K ± 5% 0603	PCS	4	R407,R408,R419,R420
0090179	SMT RESISTOR	1/16W 15O ± 5% 0603	PCS	2	R412,R413
0090188	SMT RESISTOR	1/16W 18K ± 5% 0603	PCS	1	R414
0090537	SMT RESISTOR	1/4W 180O± 5% 1206	PCS	1	R417
0090019	SMT RESISTOR	1/16W 4.7K ± 5% 0603	PCS	2	R421,R418
0090206	SMT RESISTOR	1/16W 360K ± 5% 0603	PCS	2	R402,R405
0090026	SMT RESISTOR	1/16W 22K ± 5% 0603	PCS	1	R406
0090027	SMT RESISTOR	1/16W 27K ± 5% 0603	PCS	2	R401,R404
0010257	METAL OXYGEN FILM RESISTOR	1/2W 2.2O± 5% R 12.5× 7	PCS	2	R415,R416
0010253	METAL OXYGEN FILM RESISTOR	3W 1.2O± 5% 20× 10	PCS	1	R409
0310072	SMT CAPACITOR	50V 103 ± 10% X7R 0603	PCS	2	C409,C410
0310084	SMT CAPACITOR	50V 104 +80% -20% Y5V 0603	PCS	1	C403
0310223	SMT CAPACITOR	25V 334 +80% -20% Y5V 0603	PCS	2	C404,C406
0310205	SMT CAPACITOR	50V 473 ± 10% X7R 0603	PCS	2	C411,C412
0260029	CD	CD11 16V470U± 20%8× 123.5	PCS	2	C401,C402
0260043	CD	CD11 25V470U± 20%10× 16 5	PCS	2	C407,C408
0260067	CD	CD11 50V2.2U± 20%5× 11 2	PCS	1	C405
0260028	CD	CD11	PCS	1	C413

		16V220U± 20%6× 12 2.5			
0570006	DIODE	1N4148	PCS	2	D401,D402
0780198	SMT TRANSISTOR	2SA1015	PCS	1	Q402
0780197	SMT TRANSISTOR	C1815	PCS	2	Q401,Q403
1250042	RELAY	HJR-2CL-12VDC	PCS	1	J401
1940003	SOCKET	4pin 2.5mm	PCS	1	CN401
1940005	SOCKET	6pin 2.0mm	PCS	2	CN402,CN1
0882110	IC	LM4950 TO-263	PCS	1	U401
1632171	PCB	D2007-1	PCS	1	

DVD BOARD FOR LT2007
:MX-LT2007
VERSION:2.3/Ver2.3
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0090001	SMD RESISTER	1/16W 0O ± 5% 0603	PCS	26	L212~L215,R201~R204,R212,R228,R245,R222,R251,R255,R257,R258,R297~R299,R303,R318,R331,R2159,R247,L217,L245
0090516	PRECISION SMD RESISTER	1/16W3.3K± 1% 0603	PCS	2	R234,R233
0090183	SMD RESISTER	1/16W 3K ± 5% 0603	PCS	1	R235
0090663	SMD RESISTER	1/8W2.2O± 5% 1206	PCS	1	R326
0090114	SMD RESISTER	1/8W 0O ± 5 % 1206	PCS	2	L219,L209
0090272	SMD RESISTER	1/16W1O± 5% 0603	PCS	6	R304~R307,R321,R340
0090003	SMD RESISTER	1/16W 10O ± 5% 0603	PCS	3	R301,R302,R262
0090005	SMD RESISTER	1/16W 33O ± 5% 0603	PCS	13	R231,R232,R256,R263~R267,R2162,R288,R289,R290,R291
0090181	SMD RESISTER	1/16W 100O ± 5% 0603	PCS	6	R277,R283,R323,R324,R325,R327
0090006	SMD RESISTER	1/16W 75O ± 5% 0603	PCS	4	R270,R273,R276,R280
0090009	SMD RESISTER	1/16W 330O ± 5% 0603	PCS	2	R225,R226

0090013	SMD RESISTER	1/16W 680O ± 5% 0603	PCS	2	R259,R260
0090014	SMD RESISTER	1/16W 1K ± 5% 0603	PCS	3	R213,R215,R254
0090249	SMD RESISTER	1/16W 510O ± 5% 0603	PCS	1	R214
0090646	SMD RESISTER	1/8W 33O± 5% 1206	PCS	1	L202
0090019	SMD RESISTER	1/16W 4.7K ± 5% 0603	PCS	6	R238~R240,R2140, R2107,R2108
0090023	SMD RESISTER	1/16W 10K ± 5% 0603	PCS	17	R208,R252,R309,R311,R313,R314,R329,R330,R339,R2164,R2106,R295,R2101,R2103,R2105,R242,R243
0090024	SMD RESISTER	1/16W 15K ± 5% 0603	PCS	2	R209,R223
0090025	SMD RESISTER	1/16W 20K ± 5% 0603	PCS	6	R211,R312,R315,R316,R2109,R2110
0090028	SMD RESISTER	1/16W 33K ± 5% 0603	PCS	1	R281
0090188	SMD RESISTER	1/16W 18K ± 5% 0603	PCS	1	R210
0090197	SMD RESISTER	1/16W 150K ± 5% 0603	PCS	2	R319,R320
0090231	PRECISION SMD RESISTER	1/16W 680K ± 1% 0603	PCS	2	R317,R322
0090319	PRECISION SMD RESISTER	1/16W 750K ± 1% 0603	PCS	1	R227
0090034	SMD RESISTER	1/16W 100K ± 5% 0603	PCS	5	R224,R308,R310,R246,R296
0260428	SMD CD	16V10U± 20%4× 4× 5.4	PCS	10	TC201,TC202,TC203,TC217,TC236,TC215,TC216,TC218,TC219,TC242
0260425	SMD CD	16V100U± 20%6.3× 6.3× 5.4	PCS	6	TC207,TC208,TC211,TC214,TC301,TC222
0310381	SMD TAN CAPACITOR	10V220U± 20%7343 (E)	PCS	5	TC212,TC213,TC220,TC245,TC209
0260426	SMD CD	16V47U± 20%5× 5× 5.4	PCS	12	TC204~TC206,TC210,TC237,TC302~TC304,TC308,TC309,TC247,TC248

0310085	SMD CAPACITOR	50V 20P ± 5% NPO 0603	PCS	3	C222,C246,C2122
0310190	SMD CAPACITOR	50V 27P ± 5% NPO 0603	PCS	2	C275,C276
0310045	SMD CAPACITOR	50V 47P ± 5% NPO 0603	PCS	13	C262~C266,C295,C296,C298,C299,C2101,C2102,C2104,C2105
0310047	SMD CAPACITOR	50V 101 ± 5% NPO 0603	PCS	4	C233,C206,C286,C287
0310051	SMD CAPACITOR	50V 331 ± 5% NPO 0603	PCS	2	C212,C213
0310048	SMD CAPACITOR	50V 151 ± 5% NPO 0603	PCS	2	C304,C306
0310207	SMD CAPACITOR	50V 104 ± 20% X7R 0603	PCS	74	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C245,C247~C254,C256~C259,C267,C272~C274,C279~C281,C301~C303,C305,C309,C311,C312,C2106,C2175,C313~C316,C2107,C2108,2110,C2114~C2119,C2120,C2121,C232,C255,C288,C291,C292,C293,C294,R282
0310234	SMD CAPACITOR	16V 105 +80% -20% Y5V 0603	PCS	6	C201~C204,C221,C240
0310066	SMD CAPACITOR	50V 102 ± 10% X7R 0603	PCS	4	C223,C278,C282,C284
0310067	SMD CAPACITOR	50V 152 ± 10% X7R 0603	PCS	3	C215,C285,C283
0310068	SMD CAPACITOR	50V 222 ± 10% X7R 0603	PCS	2	C307,C310
0310201	SMD CAPACITOR	50V 153 ± 10% X7R 0603	PCS	1	C210
0310055	SMD CAPACITOR	16V 333 ± 10% X7R 0603	PCS	1	C225
0310056	SMD CAPACITOR	16V 473 ± 10% X7R 0603	PCS	2	C219,C220
0310362	SMD CAPACITOR	16V 474 +80% -20%	PCS	1	C218

		Y5V 0603			
0390044	SMD INDOUCTOR	10UH ± 10% 2012	PCS	2	L303,L306
0390096	SMD INDOUCTOR	1.8UH ± 10% 1608	PCS	3	L246~L248
0390300	SMD BEAD	600O/100MHZ± 25 % 1608	PCS	36	R285,R284,L210,L211,L230~L233,L301,L304,L305,L307,L308,L310~L312,L314,L316~L324,L216,L220~L225,R287,L218,L226
0390301	SMD BEAD	600O/100MHZ± 25 % 3216	PCS	14	L205,L227~L228,L302,L201,L203,L207~L208,L238,L250,L309,L234~L236
0090111	SMD RESISTER	1/10W 4.7O ± 5% 0805	PCS	1	L206
0700007	SMD DIODE	1N4148	PCS	1	VD201
0780085	SMD TRIDIODE	8050D	PCS	2	V307,V308
0780130	SMD TRIDIODE	STC3265	PCS	2	V307,V308
0780150	SMD TRIDIODE	UTC 8050S（D9-D）	PCS	2	V307,V308
0780129	SMD TRIDIODE	8550D(160-300) SOT-23	PCS	3	V306,V309,V201
0780062	SMD TRIDIODE	9014C	PCS	1	V310
0780197	SMD TRIDIODE	C1815	PCS	1	V202
0780040	SMD TRIDIODE	3904(100-300) SOT-23	PCS	1	V305
0780193	SMD TRIDIODE	2SK3018	PCS	2	V303,V304
0780115	SMD TRIDIODE	2SB1132	PCS	2	V301,V302
0880185	IC	NJM4558M SOP	PCS	1	U212
0880562	IC	4580 SOP	PCS	1	U212
0880361	IC	4558 SOP	PCS	1	U212
0880768	IC	C4558 SOP	PCS	1	U212
0880322	IC	MM74HCU04M SOP	PCS	1	U205
0880513	IC	HCU04 SOP	PCS	1	U205
0881415	IC	HY57V641620HGT-7 TSOP	PCS	1	U211
0881157	IC	HY57V641620HGT-H TSOP	PCS	1	U211
0881182	IC	LM1117MP-ADJ SOT-223	PCS	1	U209
0882282	IC	AMS1117-ADJ SOT-223	PCS	1	U209

0882076	IC	LM1085-3.3 SOT-263	PCS	1	U208
0882472	IC	AZ1084S-3.3 TO-263	PCS	1	U208
0882167	IC	9435M SO8	PCS	1	U207
0881867	IC	FDS9435A SOP	PCS	1	U207
0881914	IC	RT9701CB SOT25	PCS	1	U203
0882380	IC	CS4344 TSSOP	PCS	1	U210
0881031	IC	24C02N SOP	PCS	1	U202
0882150	IC	24CC02A SOP	PCS	1	U202
0881990	IC	MT1389FE/B（B VERSION）QFP	PCS	1	U201
0881378	IC	BA5954FP HSOP	PCS	1	U302
0881459	IC	D5954 SOP	PCS	1	U302
0960236	SMD CRYSTAL	27.00MHz 49-S	PCS	1	X201
1940245	SOCKET	14 PIN 1.25mm SMD	PCS	1	XS204
1940242	SOCKET	3 PIN 2.0mm SMD	PCS	1	XS304
1940241	SOCKET	4 PIN 2.0mm SMD	PCS	3	XS203,XS305,XS205
1940094	CABLE SOCKET	24 PIN 0.5mmSMD	PCS	1	XS301
1940243	SOCKET	2 PIN 2.0mm SMD	PCS	1	XS302
1940244	SOCKET	6 PIN 2.0mm SMD	PCS	1	XS201
1940195	CABLE SOCKET	6 PIN 1.0mmSMD	PCS	1	XS303
1632527	PCB	2D2007-3	PCS	1	

POWER BOARD FOR LT2007 : MX- AK087

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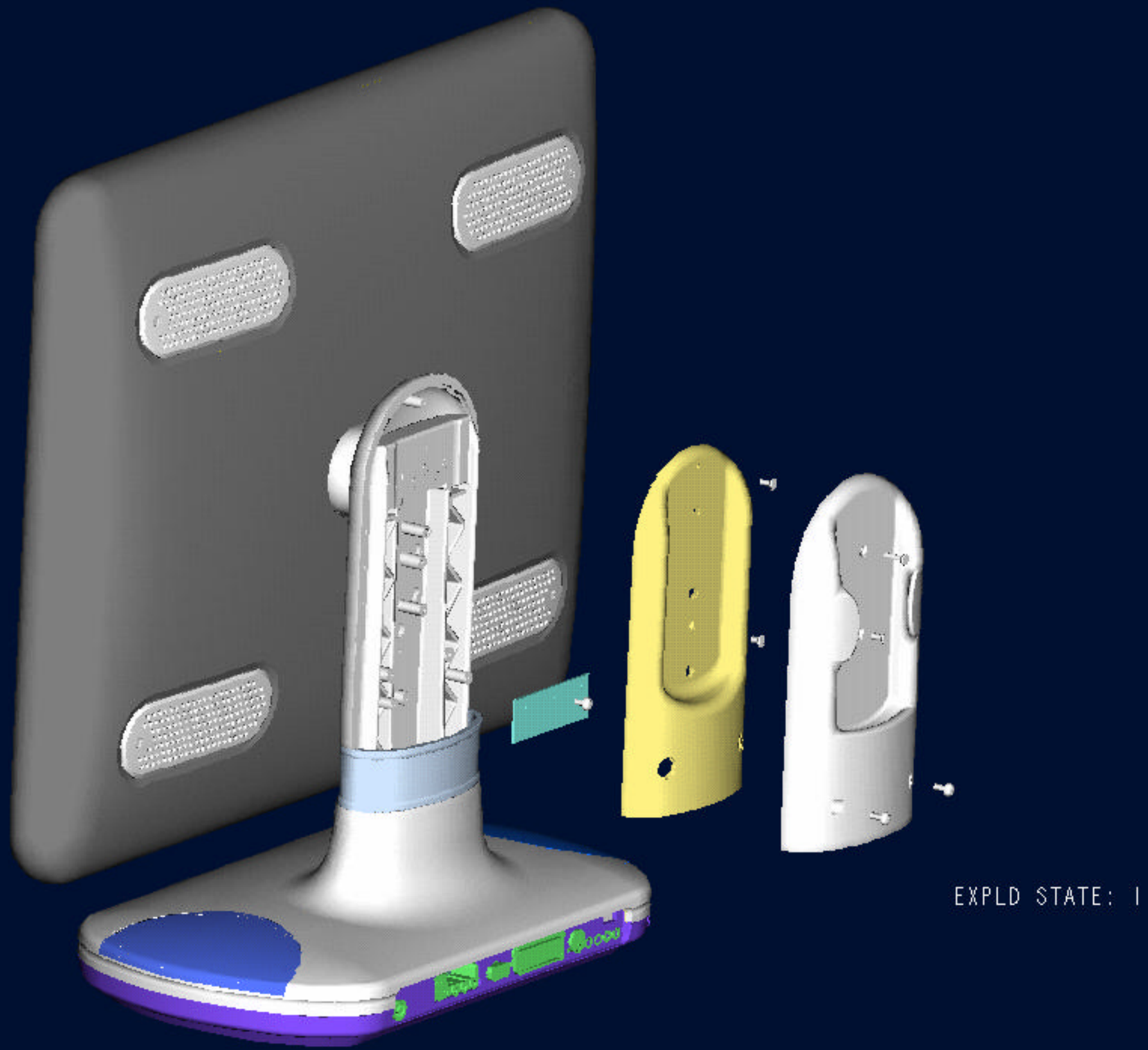
0210182	Anti interfereCAPACITOR	MKP61 X2 275VAC 474± 10% 15	PCS	1	CX501
0210116	Anti interfereCAPACITOR	MKP61 X2 275VAC 104± 20%15	PCS	1	CX502
0200341	CERAMIC CAPACITOR	CT81 250VAC 102± 20% 10mm	PCS	3	CY501,CY502 ,CY503
0390044	SMD INDOUCTOR	10UH ± 10% 2012	PCS	1	R511
0020005	RESISTER	3W0.39O± 5%	PCS	1	R515
0010286	METAL OXIDE FILM RESISTER	3W 47K± 5%	PCS	1	R508
0090153	SMD RESISTER	1/10W 160O ± 5%	PCS	1	R513

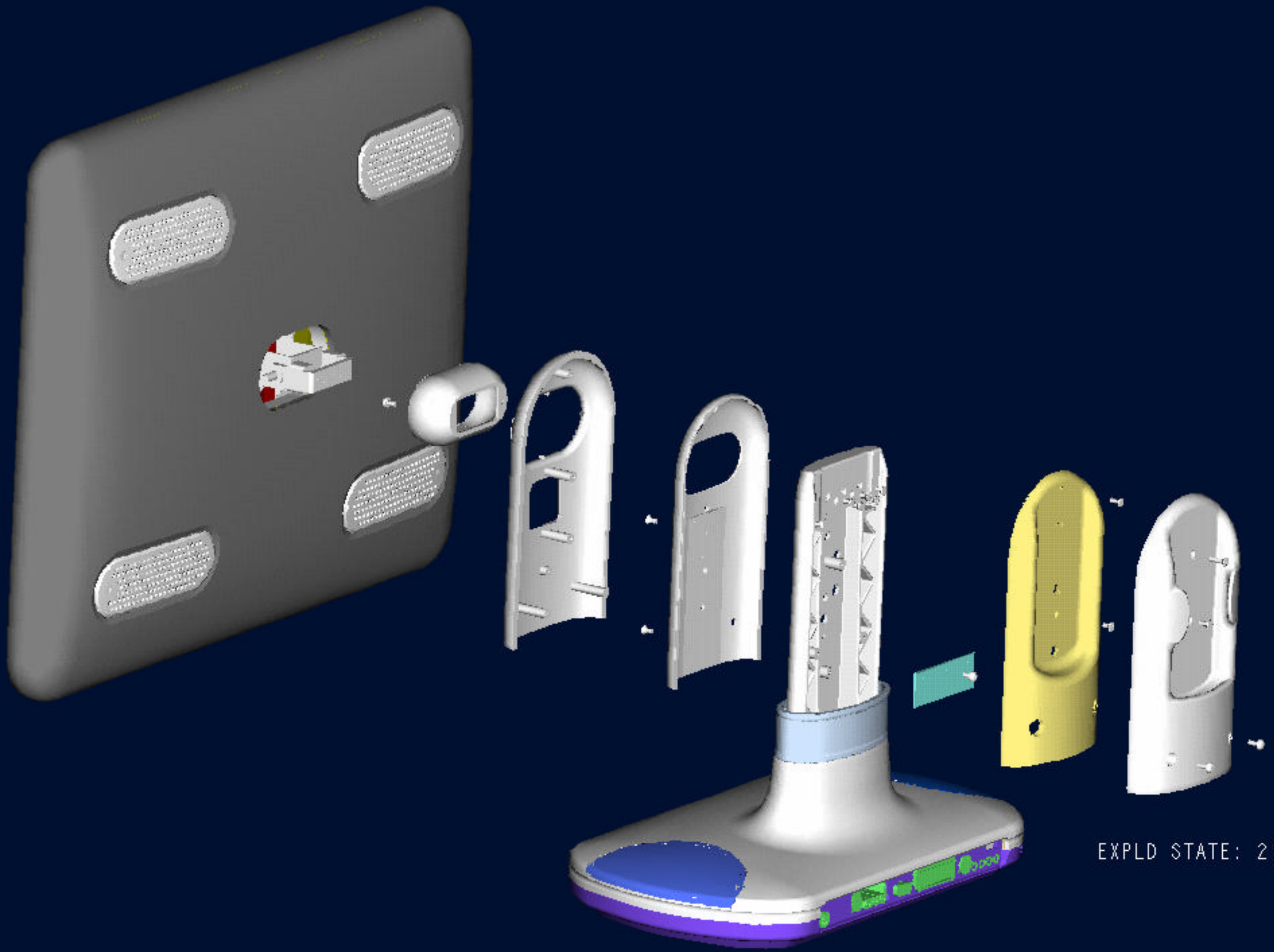
		0805			
0090171	SMD RESISTER	1/8W 1K ± 5% 1206	PCS	1	R503
0090050	SMD RESISTER	1/10W 1K ± 5% 0805	PCS	6	R528,R529,R522, R521 ,R533,R534
0090721	PRECISION SMD RESISTER	1/10W 3K ± 1% 0805	PCS	1	R531
0090722	PRECISION SMD RESISTER	1/10W 3.16K ± 1% 0805	PCS	1	R523
0090723	PRECISION SMD RESISTER	1/10W 3.3K ± 1% 0805	PCS	1	R530
0090719	PRECISION SMD RESISTER	1/10W 12K ± 1% 0805	PCS	1	R524
0090656	SMD RESISTER	1/4W 820K± 5% 1206	PCS	2	R501,R502
0090514	SMD RESISTER	1/8W 10K± 5% 1206	PCS	1	R514
0090072	SMD RESISTER	1/10W 39K ± 5% 0805	PCS	1	R509
0090661	SMD RESISTER	1/4W 4.7O± 5% 1206	PCS	1	R536
0090114	SMD RESISTER	1/8W 0O ± 5% 1206	PCS	3	R537,R538,R539
0000163	CARBON FILM RESISTER	1/4W10O± 5%	PCS	1	R512
0090057	SMD RESISTER	1/10W 4.7K ± 5% 0805	PCS	1	R525
0090662	SMD RESISTER	1/4W 47O± 5% 1206	PCS	1	R510
0310101	SMD CAPACITOR	50V 101 ± 5% NPO 0805	PCS	2	C505,C506
0310144	SMD CAPACITOR	50V 104 ± 10% X7R 0805	PCS	4	C510,C511, C515,C516
0310108	SMD CAPACITOR	50V 104 +80% -20% Y5V 1206	PCS	1	C512
0310169	SMD CAPACITOR	50V 105 +80% -20% 0805	PCS	1	C513
0200303	CERAMIC CAPACITOR	1000V 222± 20% NPO7.5mm	PCS	1	C504
0570005	DIODE	1N4007	PCS	1	VD504
0680076	SCHOTTKY DIODE	MBR20100CT320XC TO-220	PCS	2	VD508,VD510
0680064	SCHOTTKY DIODE	MBR2045 Golden TO-220	PCS	1	VD509
0700001	SMD DIODE	LS4148	PCS	2	VD511,VD512
0570075	DIODE	FR103	PCS	1	VD506

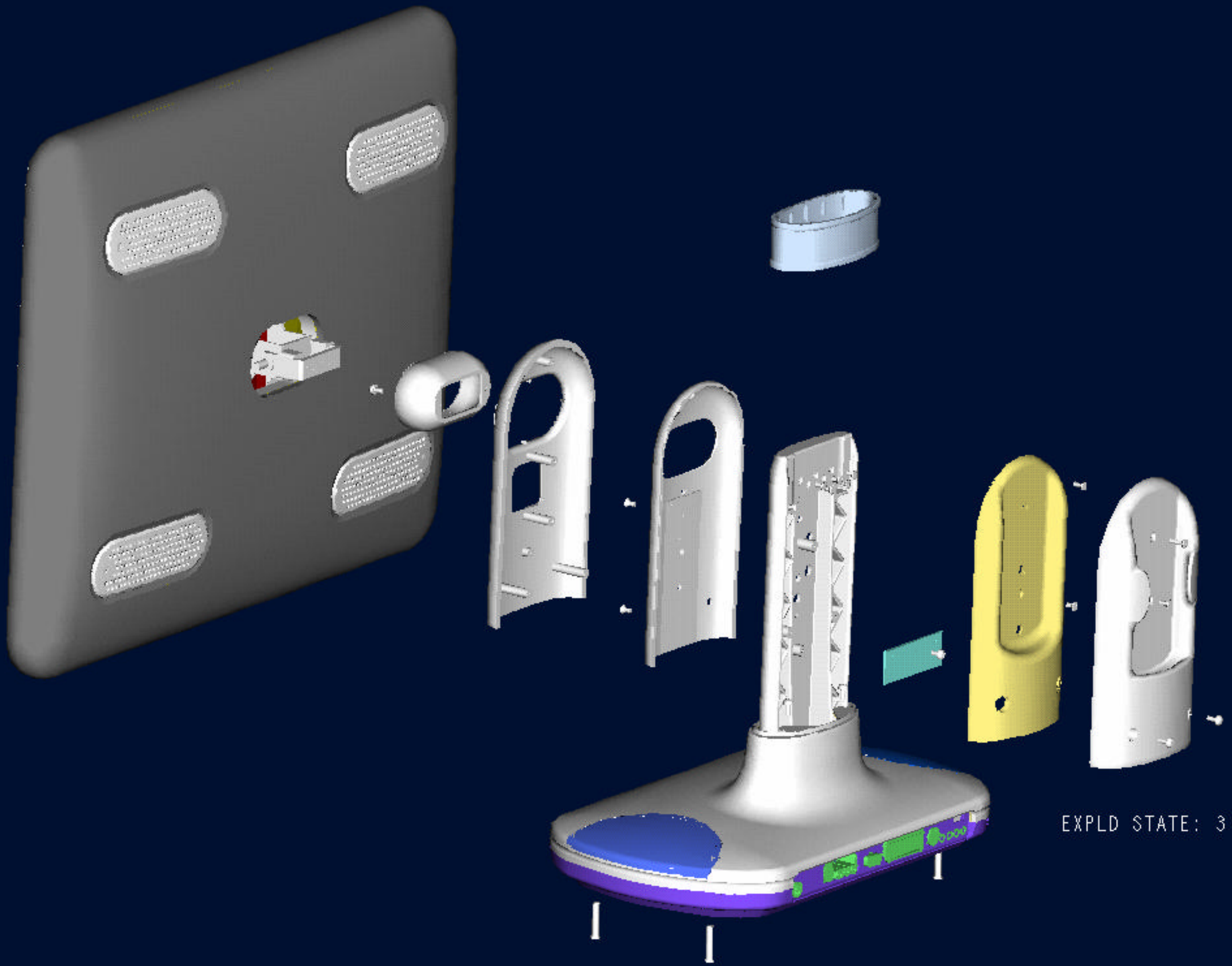
0570072	DIODE	HER207	PCS	1	VD505
0700008	SMD REGULATEDIODE	5.6V ± 5% 1/2W	PCS	1	ZD501
0700140	SMD REGULATEDIODE	13V ± 5% 1/2W MINIMELF	PCS	1	ZD502
0410194	Common Current limited inductor	22mH 2A F18× F10× 8 9	PCS	1	L502
0410197	Common Current limited inductor	16mH 2A F18×F10×8	PCS	1	L501
0410160	Common Current limited inductor	90UH 5A F9× F5× 4	PCS	1	L507
0410011	CURRENT LIMITE INDOUCTOR	10UH 2A 5mm	PCS	1	L505
2300024	FUSE	T3.15A 250V	PCS	1	F501
1050010	Heat sensitiveRESISTER	NTC 3O(5A)± 20% 10D 5	PCS	1	RT501
0260678	CD	CD288H 25V22U± 20% 5× 11 2	PCS	1	TC503
0260709	CD	HP 400V150U± 20%30*26 10	PCS	1	TC501
0260712	CD	KF 16V1000u± 20% 8× 20 2.5	PCS	2	TC507,TC508
0260679	CD	CD288H 10V 470U± 20% 8× 12 3.5	PCS	1	TC509
0260711	CD	CD288H 16V2200U± 20%10× 25 5	PCS	3	TC505,TC506 ,TC504
0780040	SMD TRIDIODE	3904(100-300) SOT-23	PCS	2	V504,V505
0670011	Silicon bridge	GBU805 Y336	PCS	1	B501
0790051	MOS	SPA11N80C3 TO-220	PCS	1	M502
0790025	MOS	AP40N03P TO-220	PCS	1	M504
1080011	Optical coupler	HS817	PCS	1	U504
0882405	IC	NCP1207 SOP	PCS	1	U502
0880863	IC	HA17431VP TO-92	PCS	2	U505,U503
0882041	IC	MIK431C TO-92	PCS	2	U505,U503
0882462	IC	AZ431AZ-A TO-92	PCS	2	U505,U503
0882628	IC	TL431AC TO-92	PCS	2	U505,U503
0460507	SWITCHPOWER	PQ32-093	PCS	1	T501

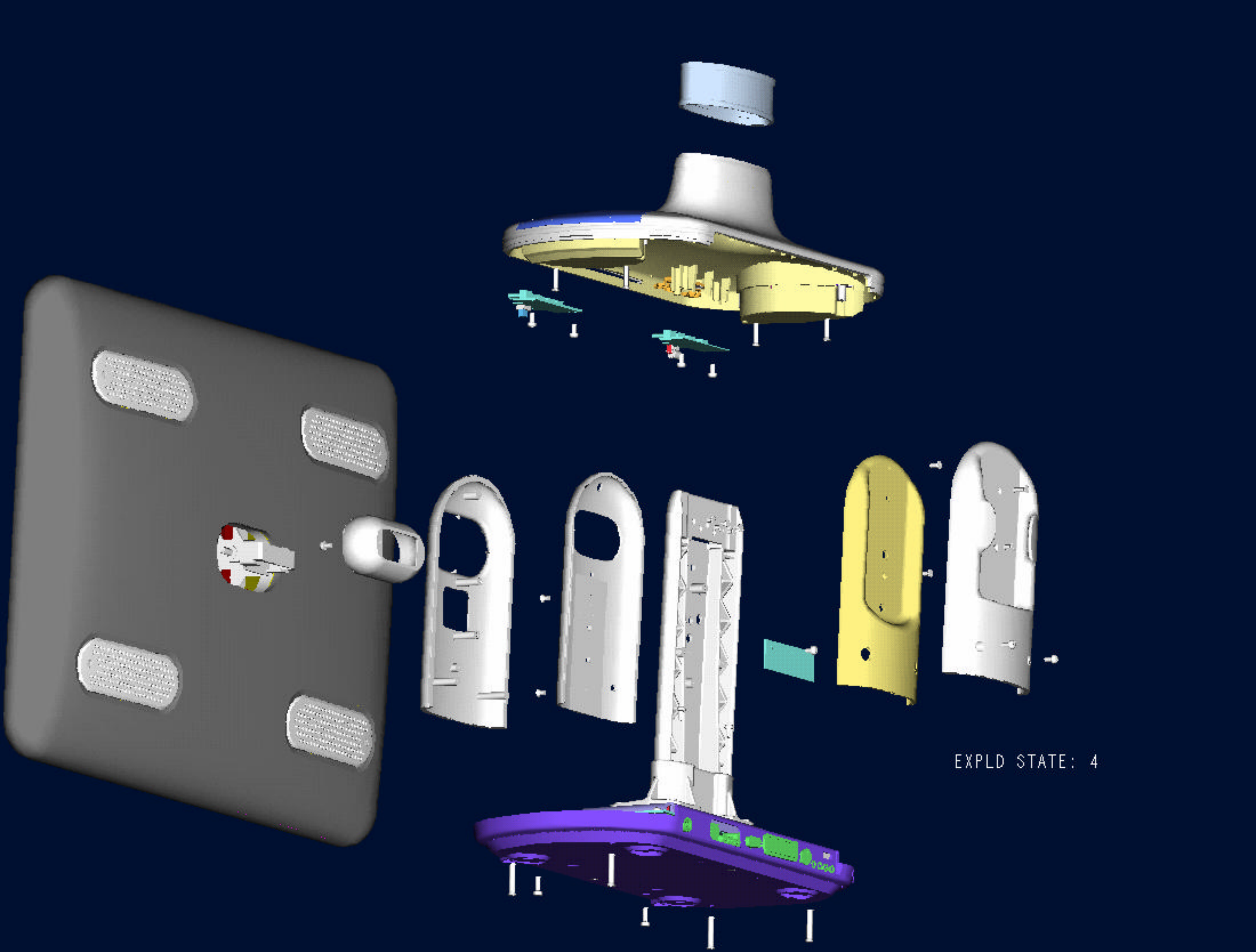
	SUPPLY TRANSFORMER				
0390057	BEADINDOUCTOR	RH354708	PCS	1	L508
5233883	PIPE	f 1	PCS	2	JP1,JP2
2100050	Lead	f0.6× 30	PCS	2	JP1,JP2
2100049	Lead	F1.2 30mm (YELLOW Green)	PCS	1	JP4
3029748	LED HOLDER	H=15mm L=2.5mm black	PCS	1	
0620004	Lighting DIODE	F3 Green	PCS	1	LED1
0090653	SMD RESISTER	1/8W 2K± 5% 1206	PCS	1	R535
1710025	MAGNETIC RING	?3.5× ?3× 1.5 black	PCS	4	VD508,VD509 ,M502 ,VD510
1563844	#N/A	#N/A	###	1	
2140209	POWER SUPPLY CORD	4P 1.9M 8 PIN SCONNECTER MAGNETIC RING WHITE	PCS	1	
1870036	POWER SUPPLY SOCKET	2111-2-P7S WHITE	PCS	1	XS1
5232540	HOLDER	19× 13.2× 0.3 ?3.2	PCS	4	
5232541	HOLDER	?3 WHITE AK080	PCS	4	
5120749	Green GLUE	VA-450	kg	0.004	

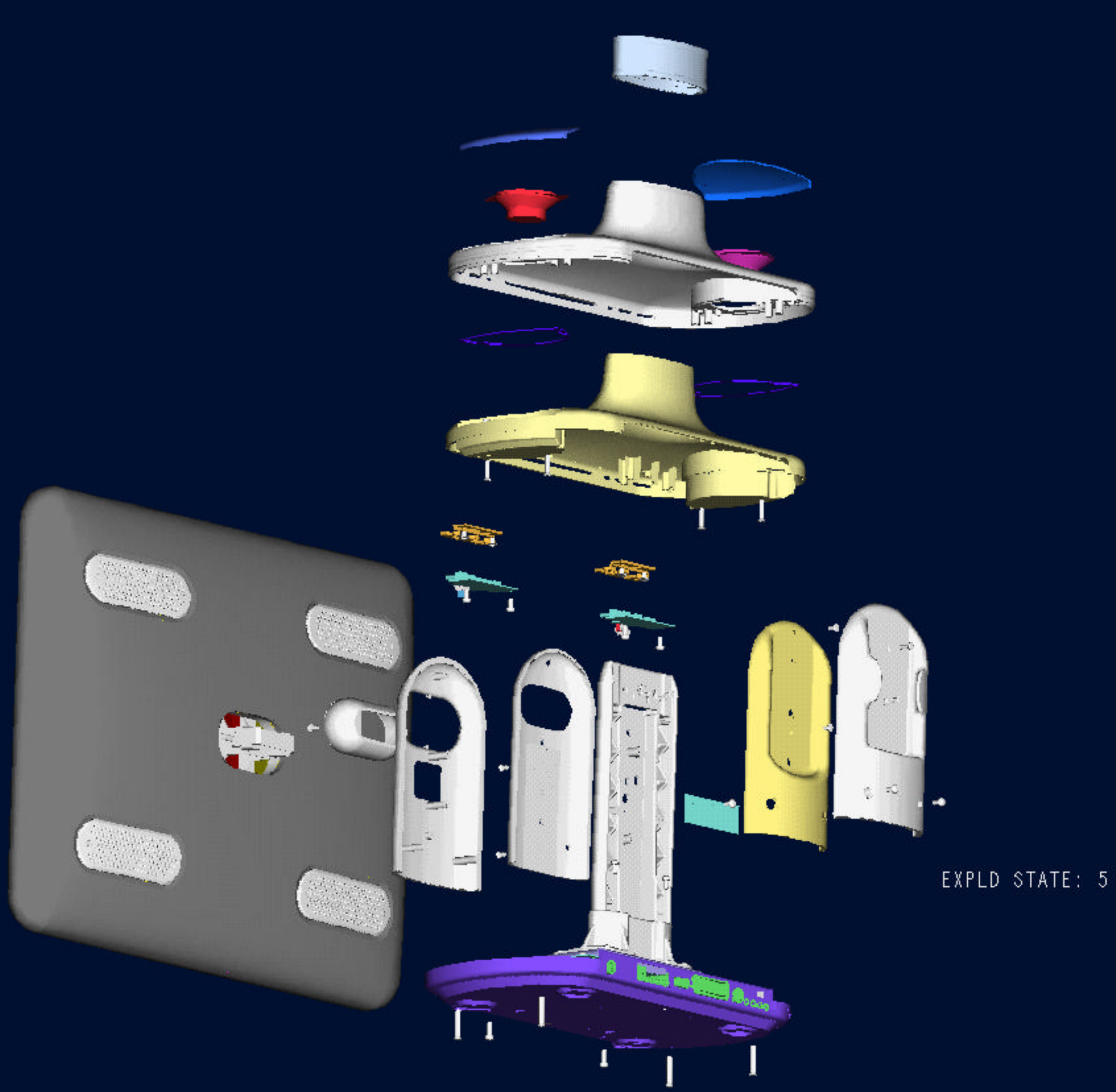


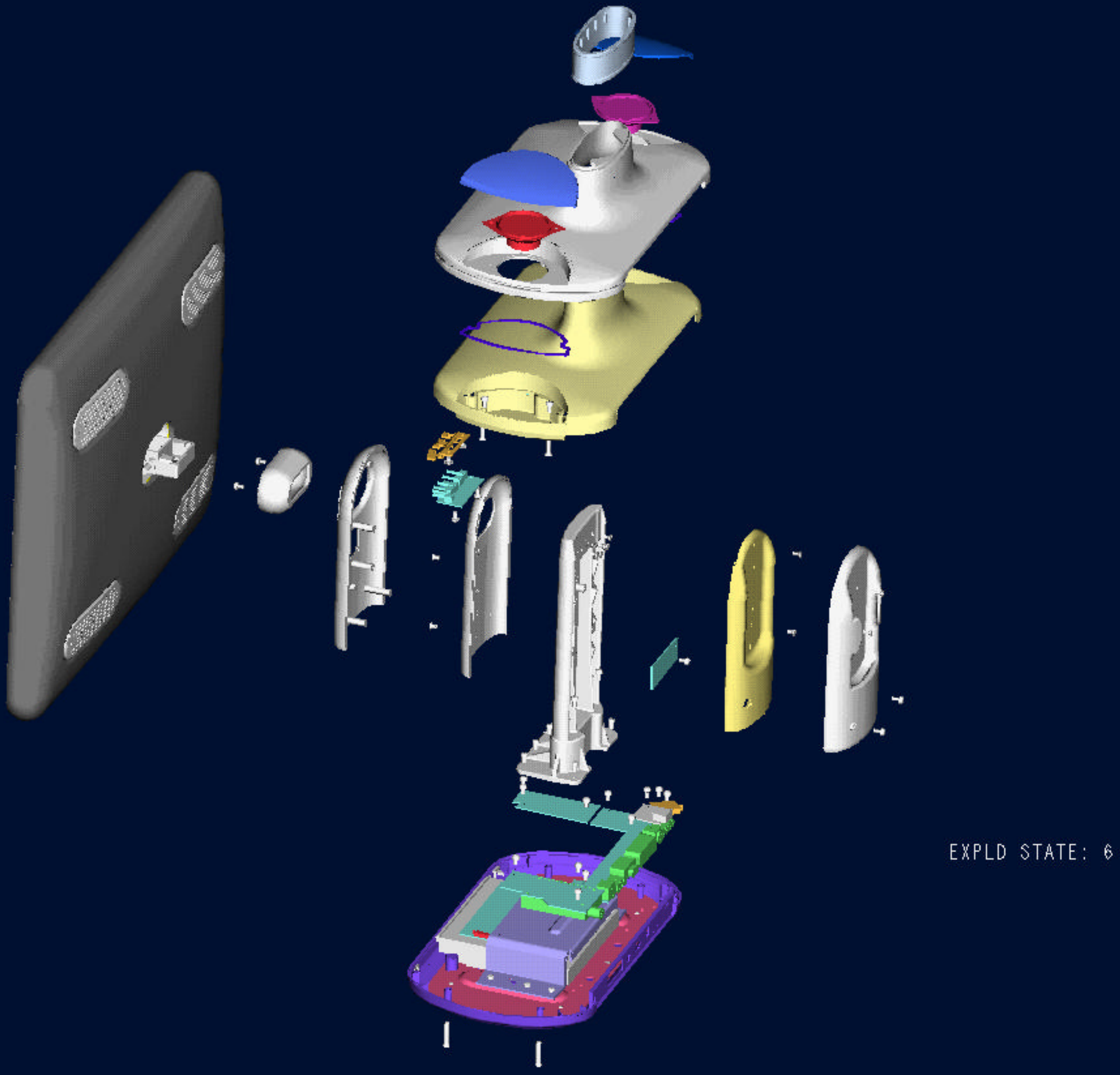

EXPLD STATE: I


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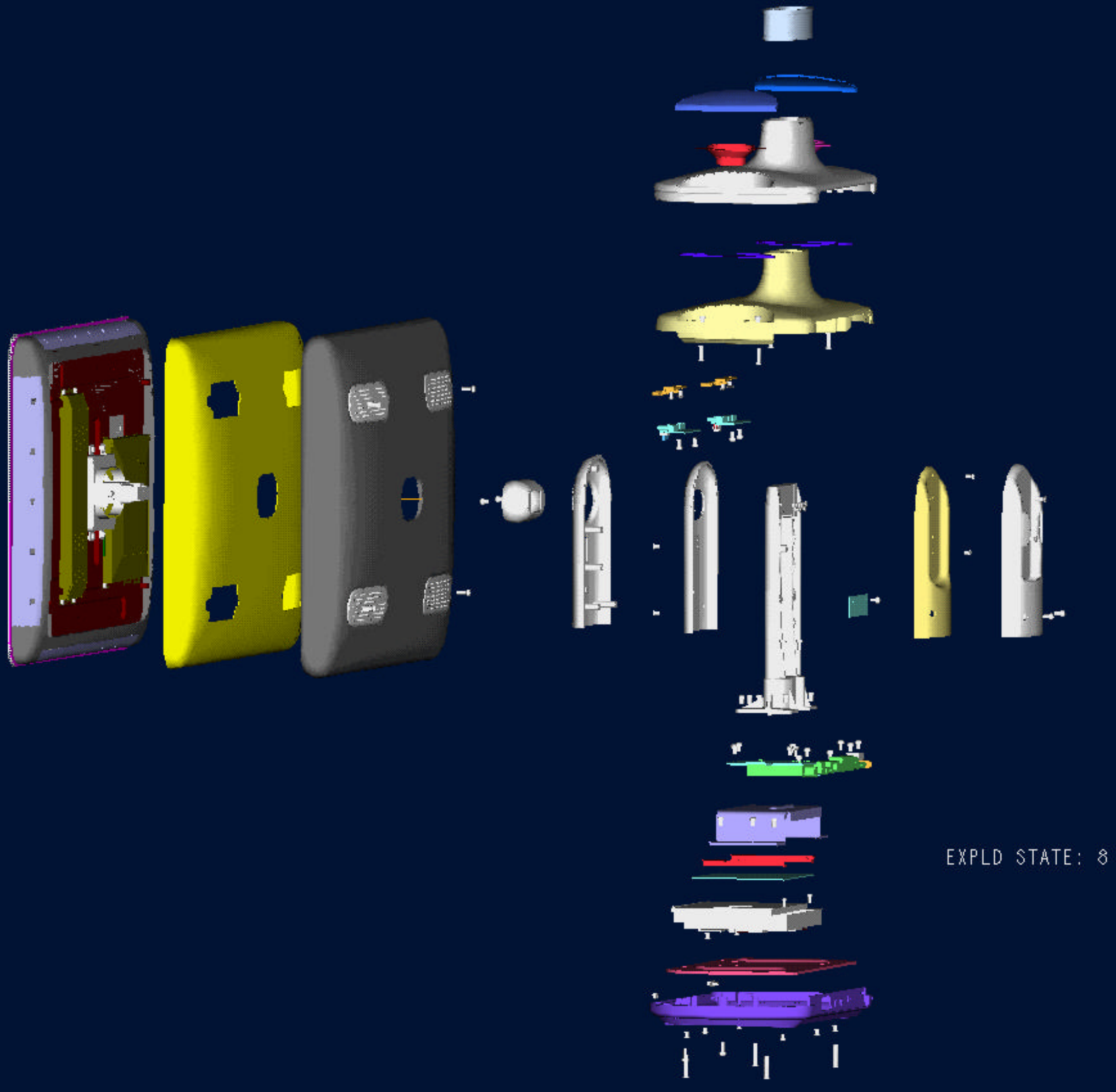

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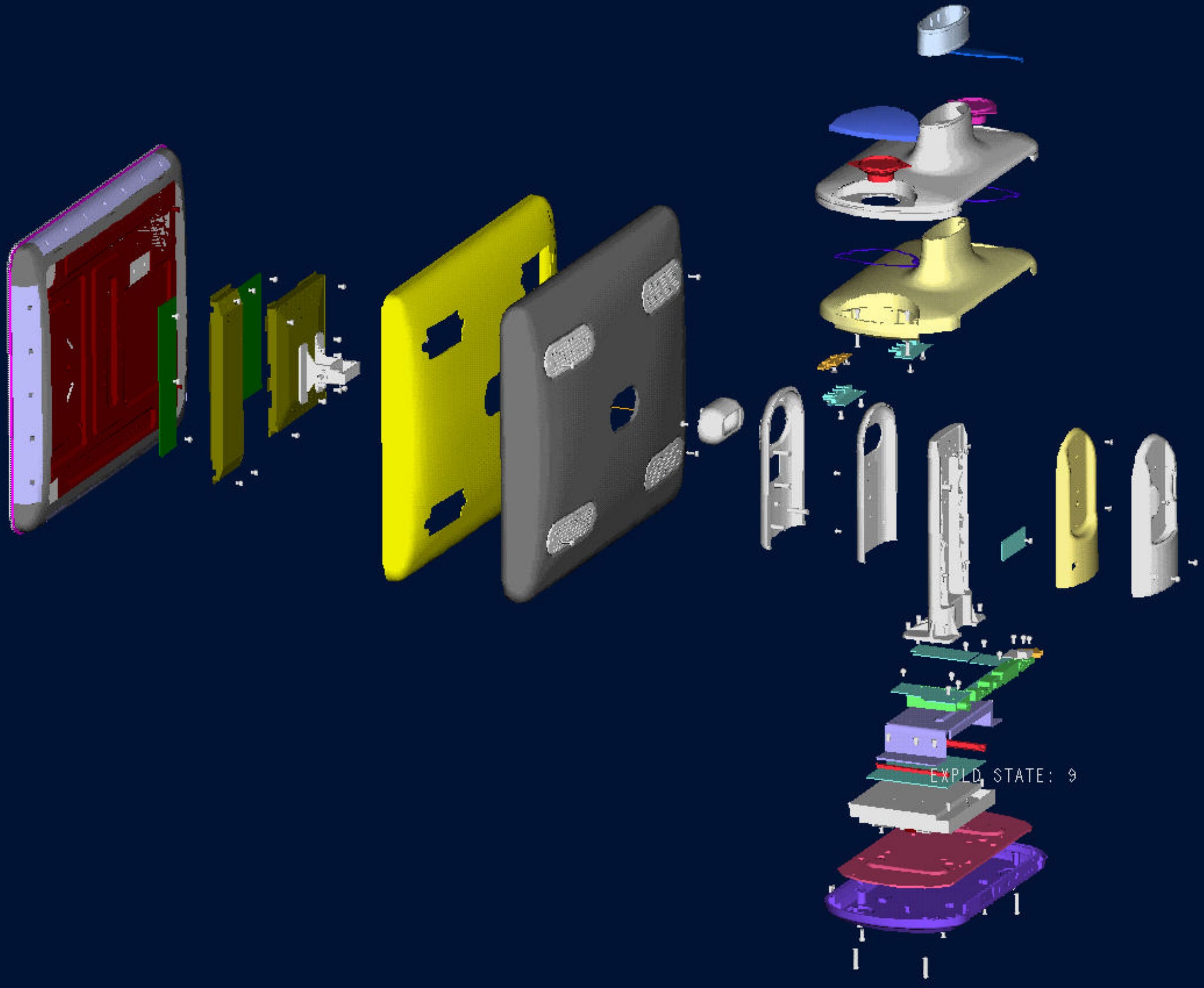

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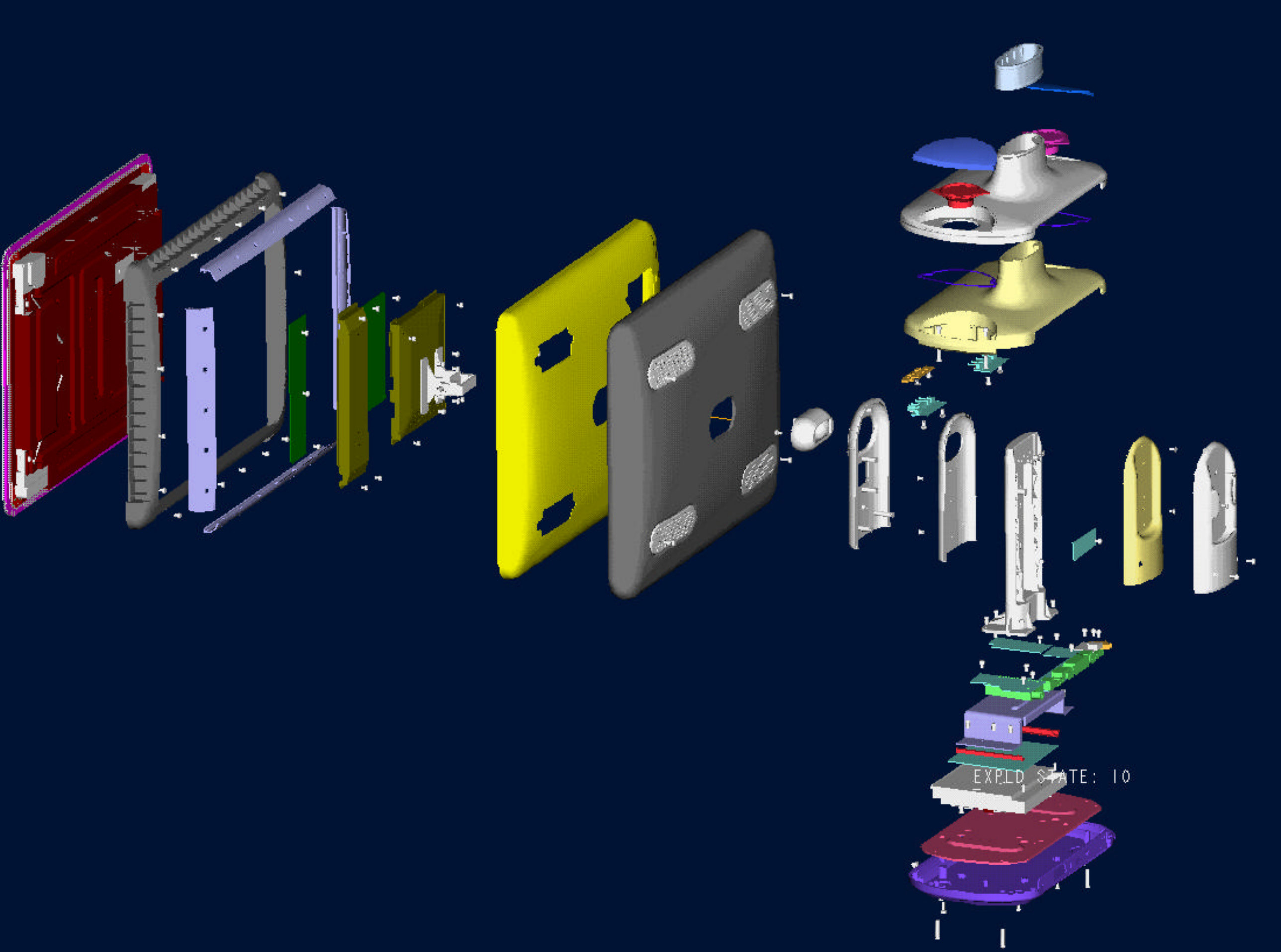

EXPLD STATE: 5

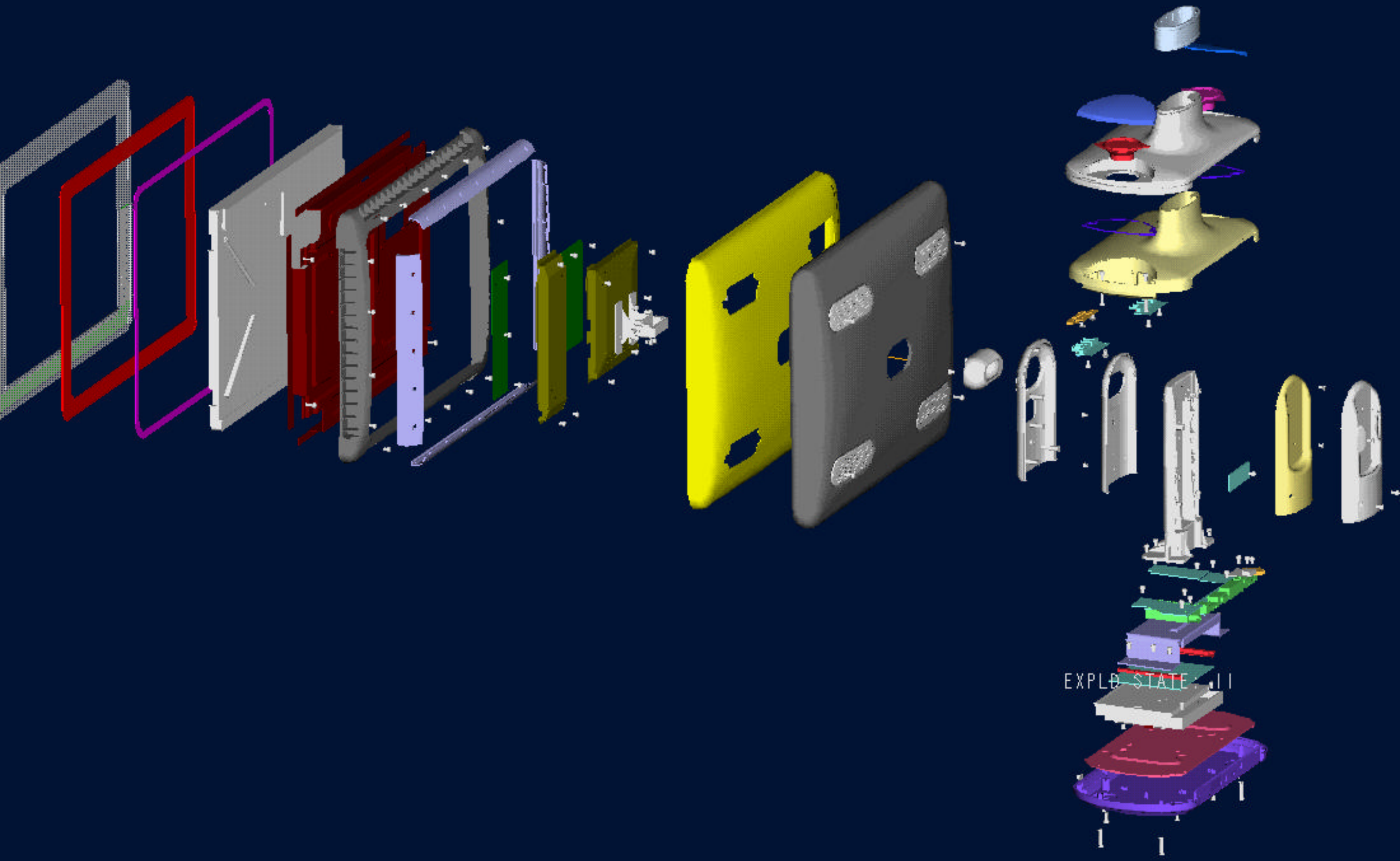

EXPLD STATE: 6


EXPLD STATE: 7


EXPLD STATE: 8


EXPLD STATE: 9


EXPLD STATE: 10


EXPLD STATE 11

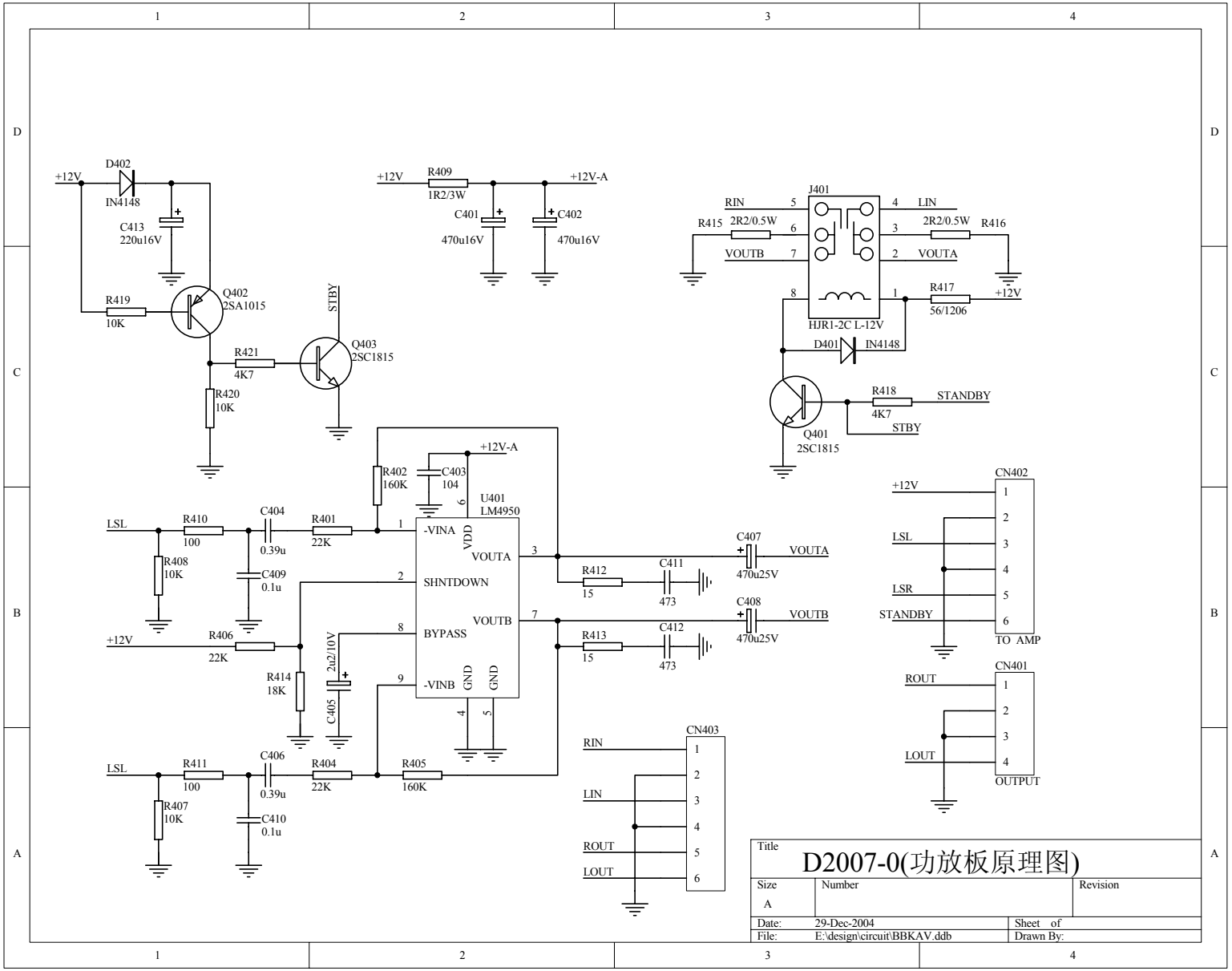
SCHEMATIC & P.C.B WIRING DIAGRAM

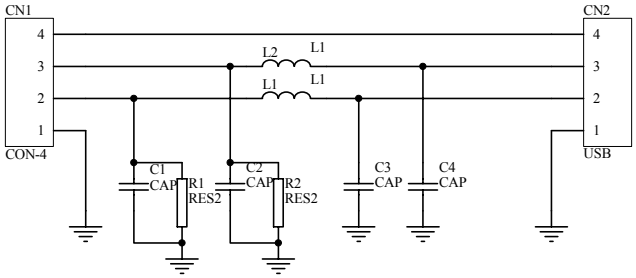
AUDIO DECODE BOARD FOR LT2007

VIDEO DECODE BOARD FOR LT2007

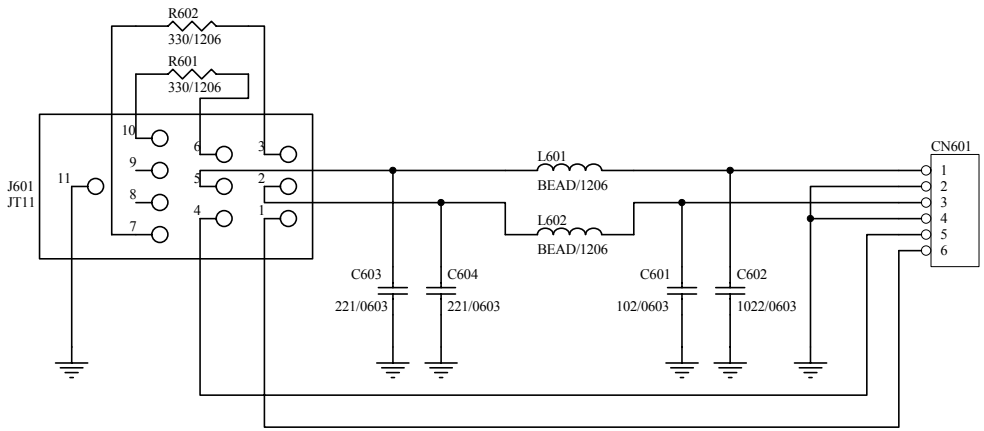
DVD BOARD FOR LT2007

AND…

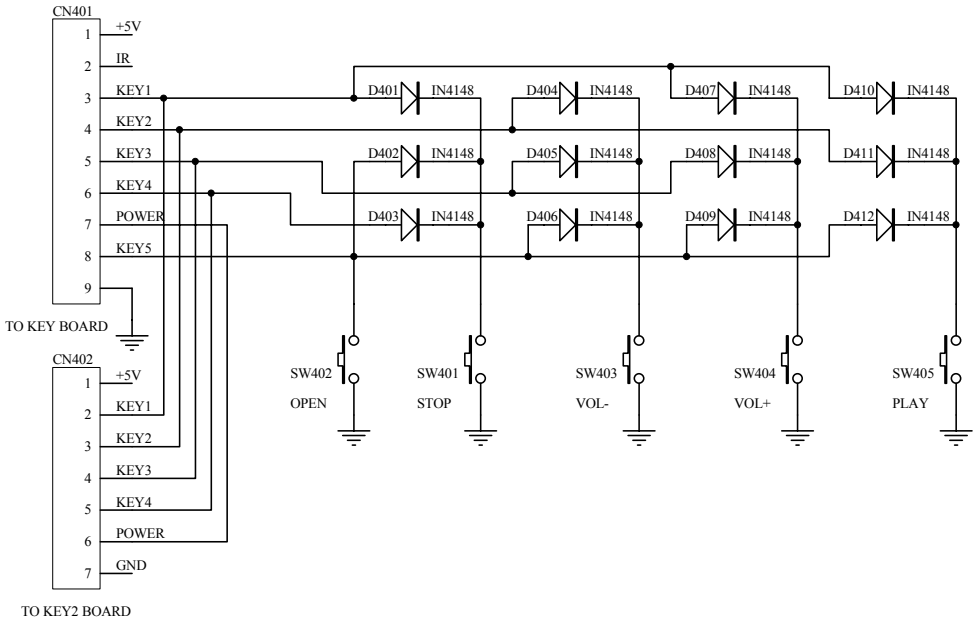

D402
IN4148
+12V
C413
220u16V
R419
10K
Q402
2SA1015
STBY
Q403
2SC1815
R421
4K7
R420
10K
+12V
R409
1R2/3W
+12V-A
C401
470u16V
C402
470u16V
J401
RIN
LIN
R415
2R2/0.5W
R416
2R2/0.5W
VOUTB
VOUTA
R417
56/1206
+12V
HJR1-2C L-12V
D401
IN4148
R418
4K7
STANDBY
STBY
Q401
2SC1815
+12V-A
R402
160K
C403
104
U401
LM4950
-VINA
VDD
VOUTA
SHNTDOWN
BYPASS
VOUTB
-VINB
GND
GND
LSL
R410
100
C404
0.39u
R401
22K
R408
10K
C409
0.1u
+12V
R406
22K
R414
18K
2u2/10V
C405
LSL
R411
100
C406
0.39u
R404
22K
R405
160K
R407
10K
C410
0.1u
C407
470u25V
VOUTA
R412
15
C411
473
C408
470u25V
VOUTB
R413
15
C412
473
CN403
RIN
LIN
ROUT
LOUT
CN402
+12V
LSL
LSR
STANDBY
TO AMP
CN401
ROUT
LOUT
OUTPUT
Title
D2007-0(功放板原理图)
Size
A
Number
Revision
Date:
29-Dec-2004
Sheet of
File:
E:\design\circuit\BBKAV.ddb
Drawn By:

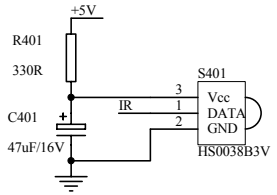


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Size A	Number		Revision
Date:	29-Dec-2004	Sheet of	
File:	E:\design\circuit\BBKAV.ddb	Drawn By:	

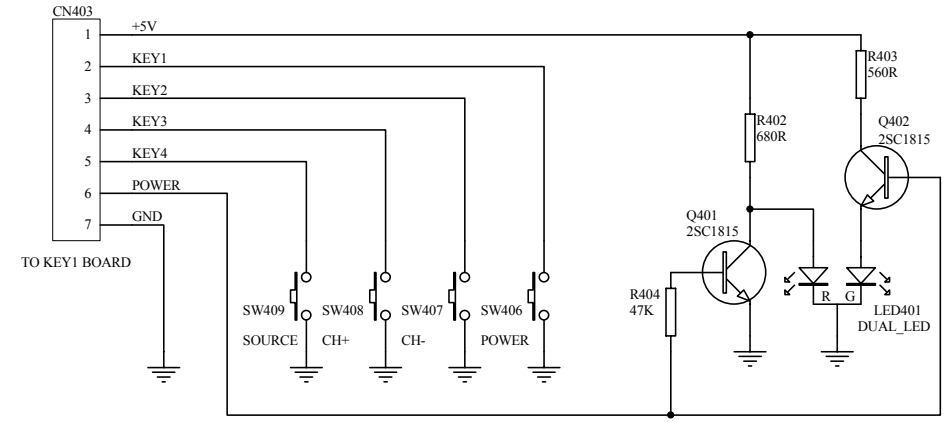


Title	62007-0(耳机板原理图)		
Size A	Number		Revision
Date:	3-Jan-2005	Sheet of	
File:	E:\design\circuit\BBKAV.ddb	Drawn By:	



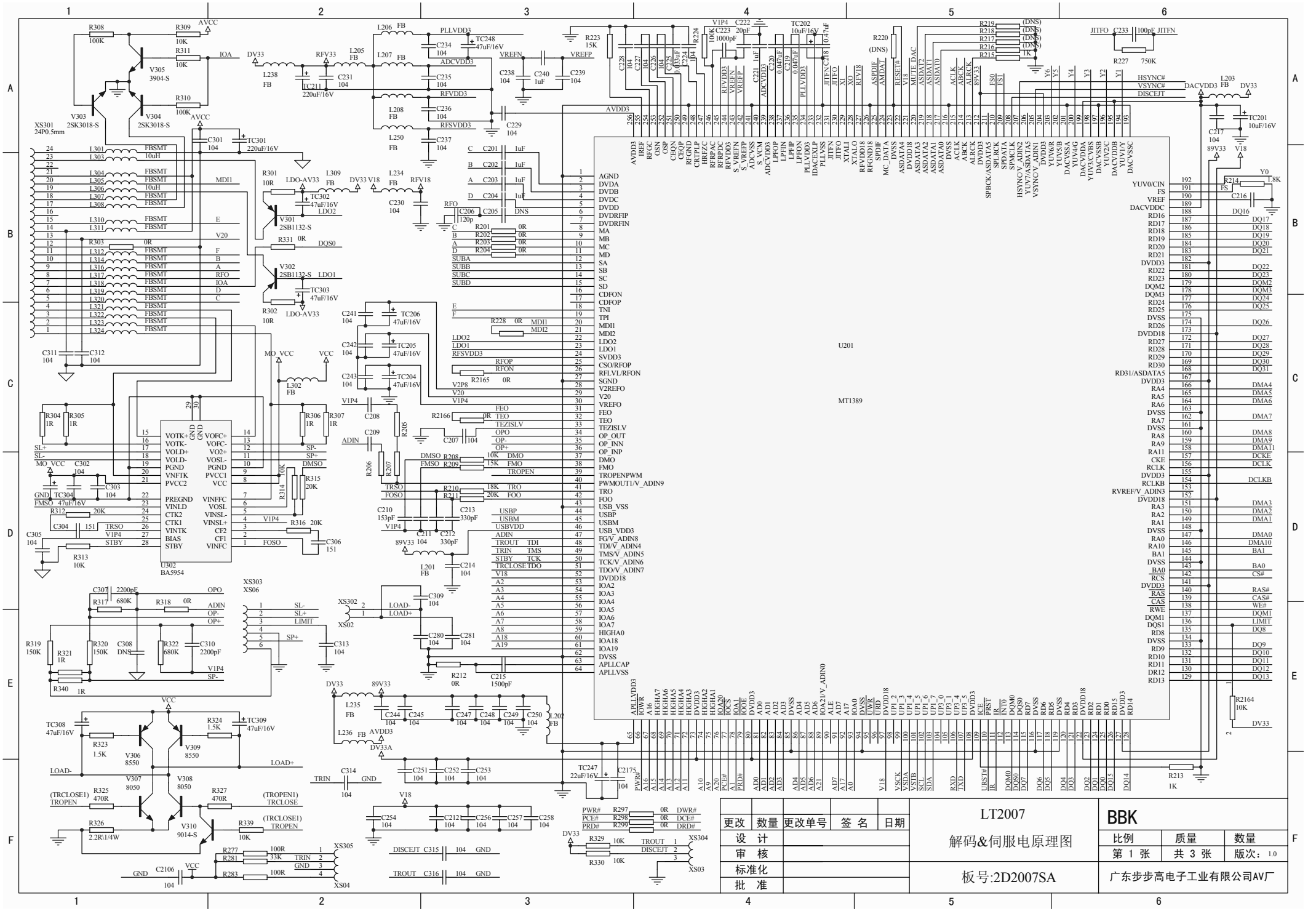


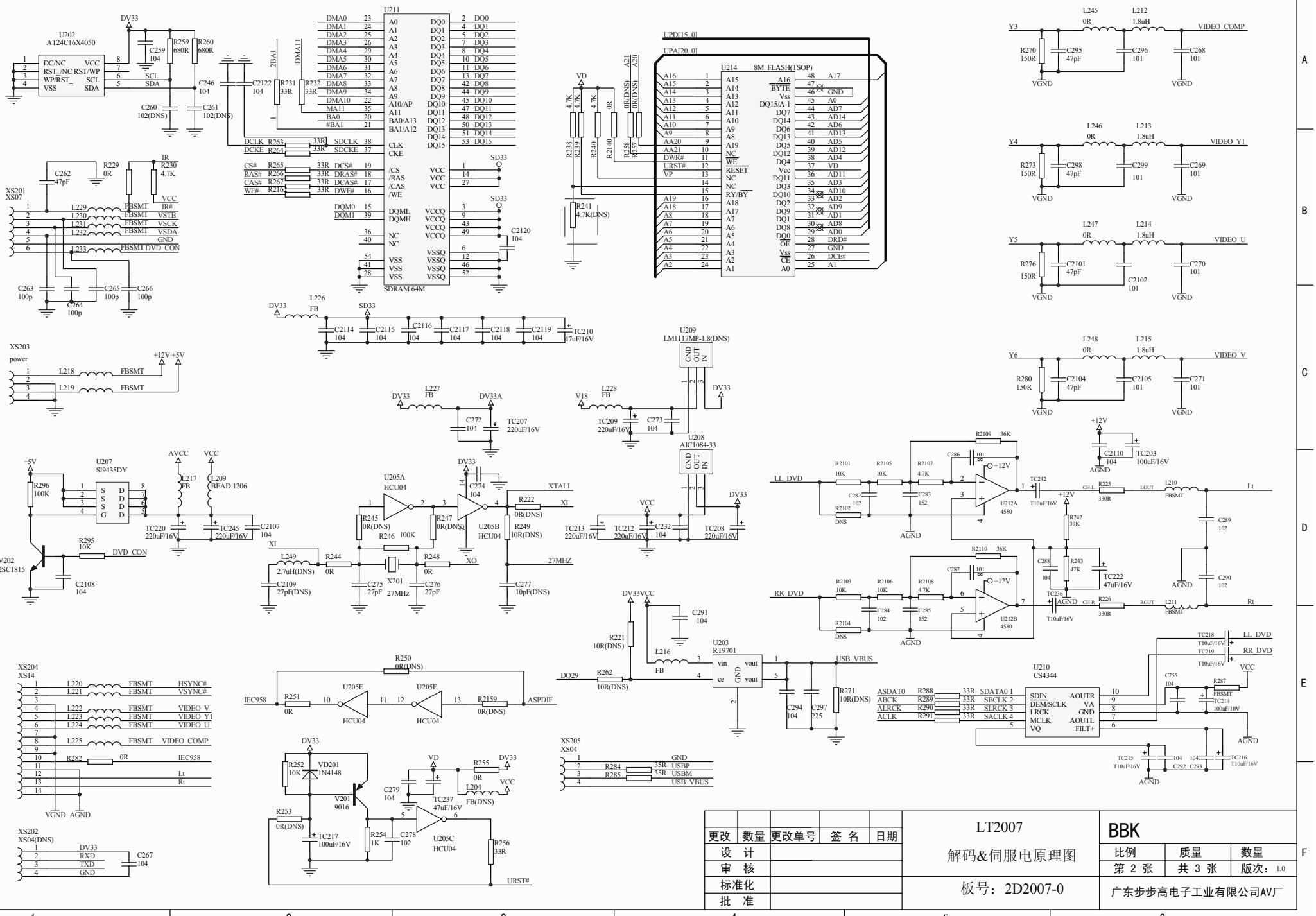
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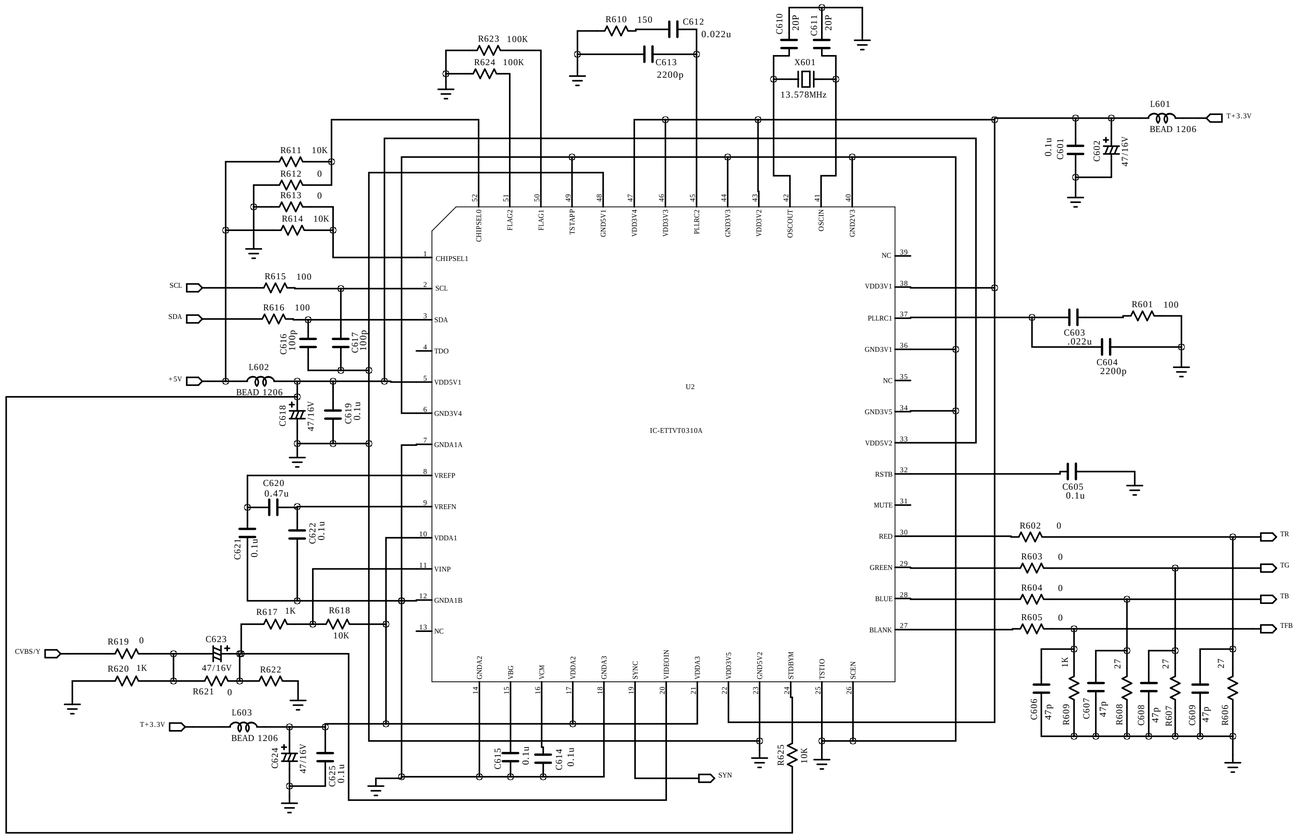
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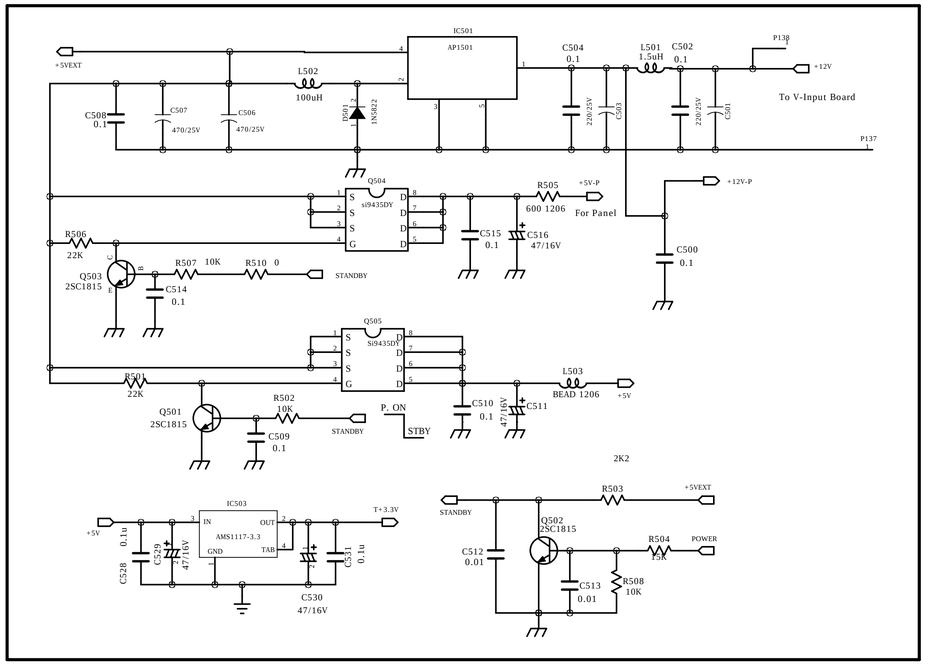
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Size: A4	Number	Revision
Date: 29-Dec-2004		Sheet of
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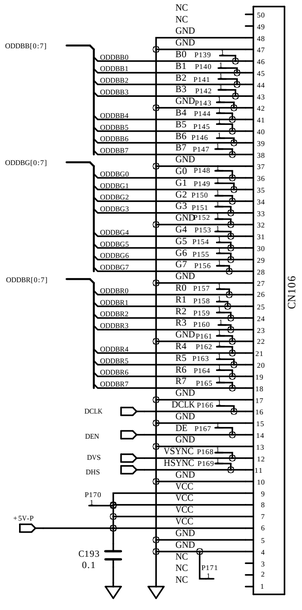

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MT1389
U302
BA5954
XS301
24P0.5mm
XS303
XS06
XS305
XS304
XS03
XS02
V301
2SB1132-S
V302
2SB1132-S
V303
2SK3018-S
V304
2SK3018-S
V305
3904-S
V306
8550
V307
8050
V308
8050
V309
8550
V310
9014-S
LDO-AV33
LDO2
LDO1
AVCC
VCC
AVDD3
DV33
DV33A
V18
89V33
MO_VCC
LOAD+
LOAD-
SP+
SP-
SL+
SL-
LIMIT
ADIN
OP+
OP-
IOA
MDI1
DQS0
E
F
B
A
D
C
RFO
TRSO
FOSO
TROUT
TRIN
TRCLOSE
TROPEN
DISCEJT
HSYNC#
VSYNC#
JITFO
JITFN
DQ16
DQ17
DQ18
DQ19
DQ20
DQ21
DQ22
DQ23
DQM2
DQM3
DQ24
DQ25
DQ26
DQ27
DQ28
DQ29
DQ30
DQ31
DMA4
DMA5
DMA6
DMA7
DMA8
DMA9
DMA11
DCKE
DCLK
DCLKB
DMA3
DMA2
DMA1
DMA0
DMA10
BA1
BA0
CS#
RAS#
CAS#
WE#
DQM1
LIMIT
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
LT2007
解码&伺服电原理图
板号:2D2007SA
BBK
广东步步高电子工业有限公司AV厂
比例
质量
数量
第 1 张
共 3 张
版次: 1.0
更改
数量
更改单号
签 名
日期
设 计
审 核
标准化
批 准

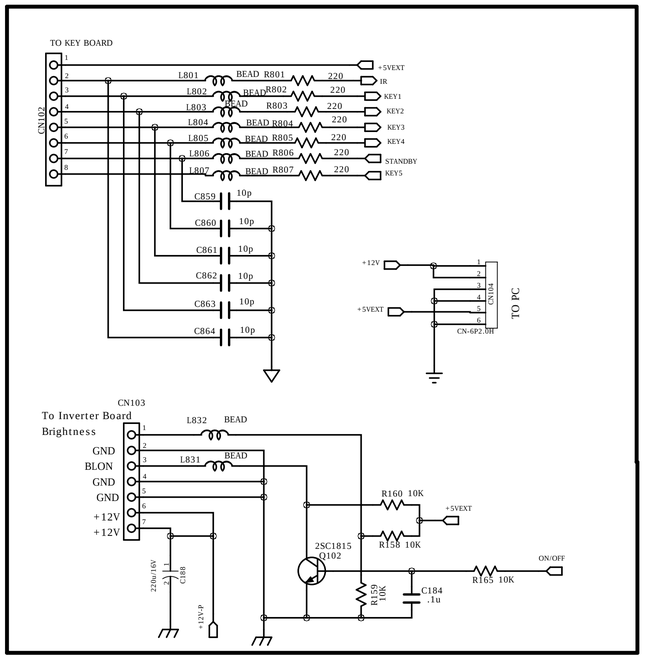

U202
AT24C16X4050
U211
SDRAM 64M
U214
8M_FLASH(TSOP)
U207
SI9435DY
U205A
HCU04
U205B
HCU04
U205E
HCU04
U205F
HCU04
U205C
HCU04
U209
LM1117MP-1.8(DNS)
U208
AIC1084-33
U203
RT9701
U210
CS4344
U212A
4580
U212B
4580
XS201
XS07
XS203
power
XS204
XS14
XS205
XS04
XS202
XS04(DNS)
V202
2SC1815
V201
9016
VD201
1N4148
X201
27MHz
DV33
DV33A
AVCC
VCC
VGND
AGND
SD33
IR
+5V
+12V
+12V +5V
VD
VCC
DV33VCC
UPD[15..0]
UPA[20..0]
DMA0
DMA1
DMA2
DMA3
DMA4
DMA5
DMA6
DMA7
DMA8
DMA9
DMA10
MA11
BA0
#BA1
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
DCLK
DCKE
SDCLK
SDCKE
CS#
RAS#
CAS#
WE#
DRAS#
DCAS#
DWE#
DQM0
DQM1
SDRAM 64M
FBSMT
DVD_CON
VSTB
VSCK
VSDA
GND
IR#
HSYNC#
VSYNC#
VIDEO_V
VIDEO_Y1
VIDEO_U
VIDEO_COMP
IEC958
ASPDIF
USB_VBUS
USBP
USBM
XTALI
XI
XO
27MHZ
LL_DVD
RR_DVD
Lt
Rt
VIDEO_COMP
VIDEO_Y1
VIDEO_U
VIDEO_V
LOUT
ROUT
CH-L
CH-R
SDATA0
SBCLK
SLRCK
SACLK
ASDAT0
ABCK
ALRCK
ACLK
SDIN
DEM/SCLK
LRCK
MCLK
VQ
AOUTR
VA
AOUTL
FILT+
URST#
LT2007
解码&伺服电原理图
板号：2D2007-0
BBK
广东步步高电子工业有限公司AV厂
比例
质量
数量
第 2 张
共 3 张
版次：1.0
更改
数量
更改单号
签 名
日期
设 计
审 核
标准化
批 准

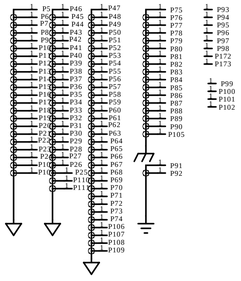
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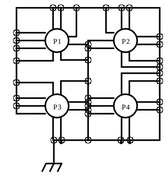


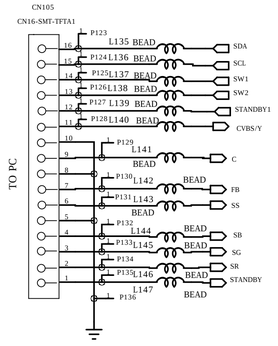












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TITLE:	22007-3		
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CHECKED:	DATED:		
QUALITY CONTROL:	DATED:		
RELEASED:	DATED:	SCALE:	SHEET:1 OF 2

REVISION RECORD			
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SCALE:	SHEET:2 OF 2	

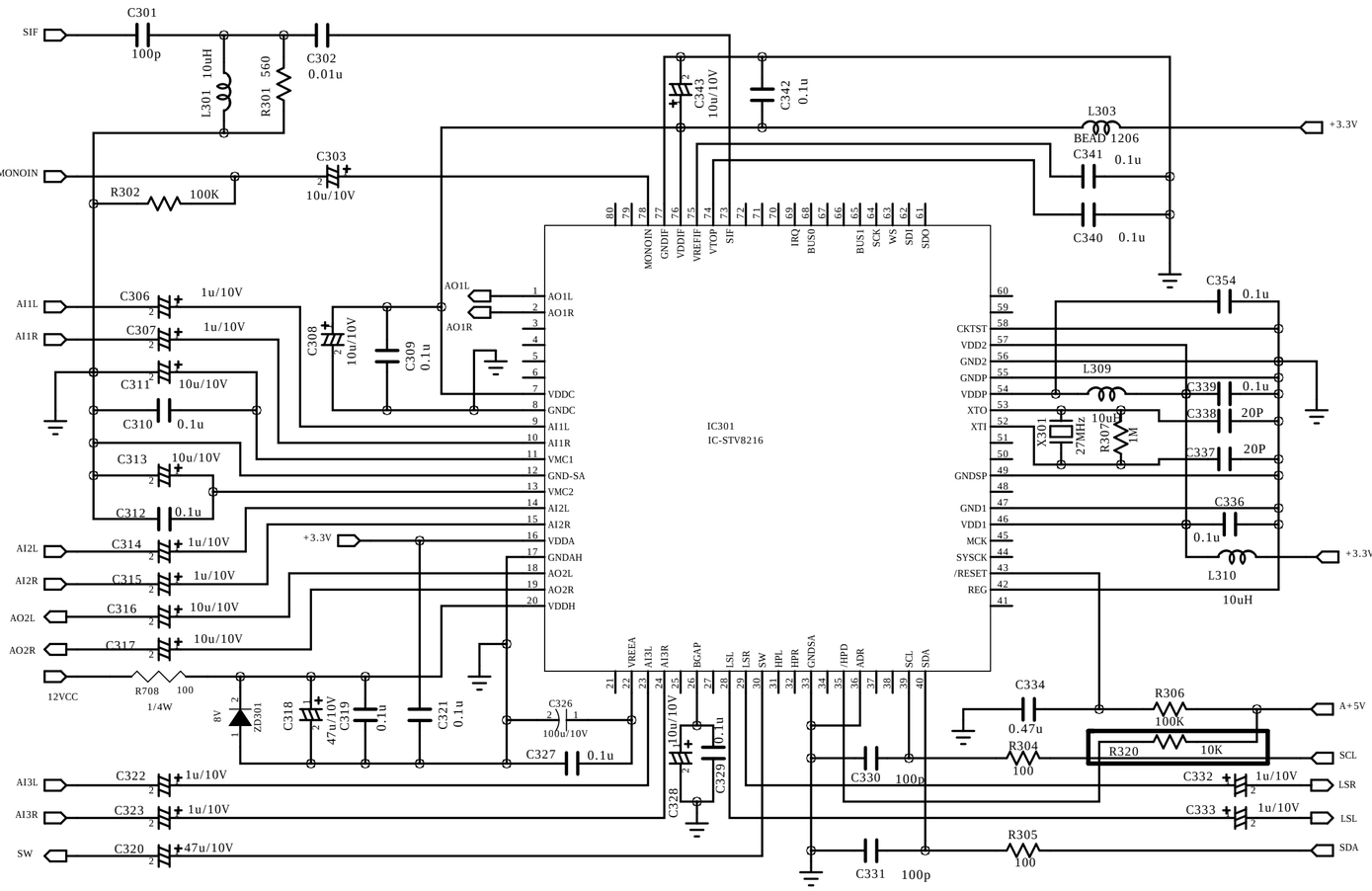
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L	H	OFF	ON	OFF	OFF
H	L	OFF	OFF	ON	OFF
L	L	OFF	OFF	OFF	ON

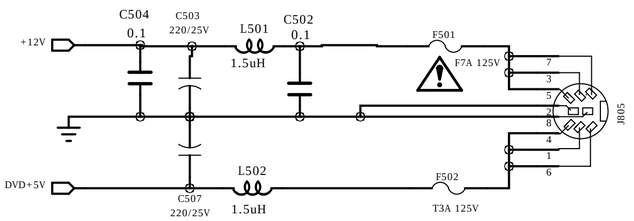
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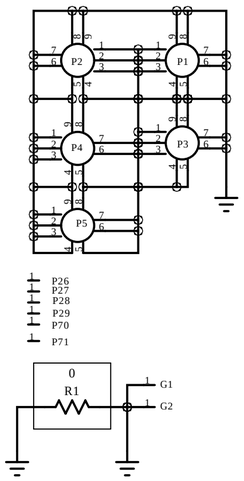
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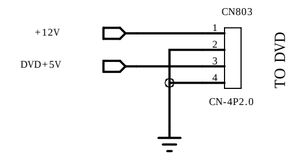
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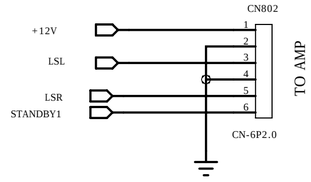
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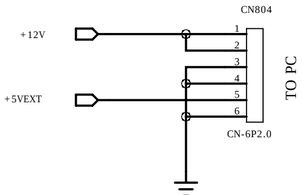


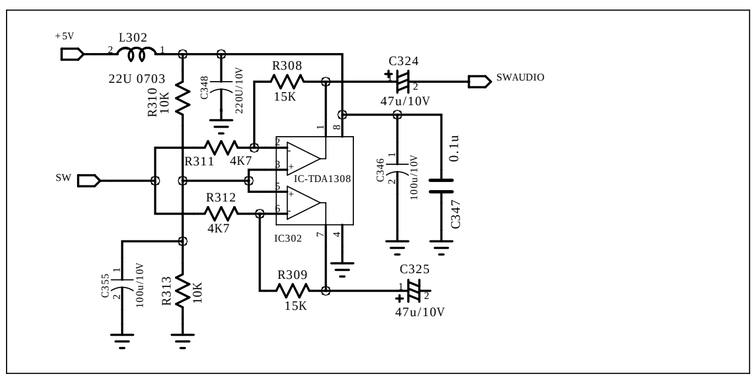


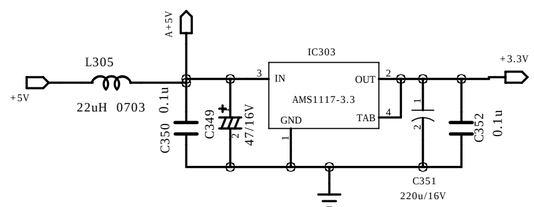


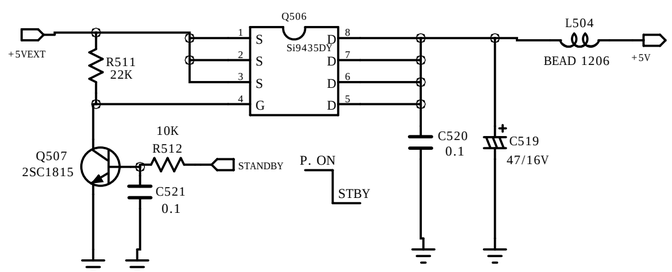




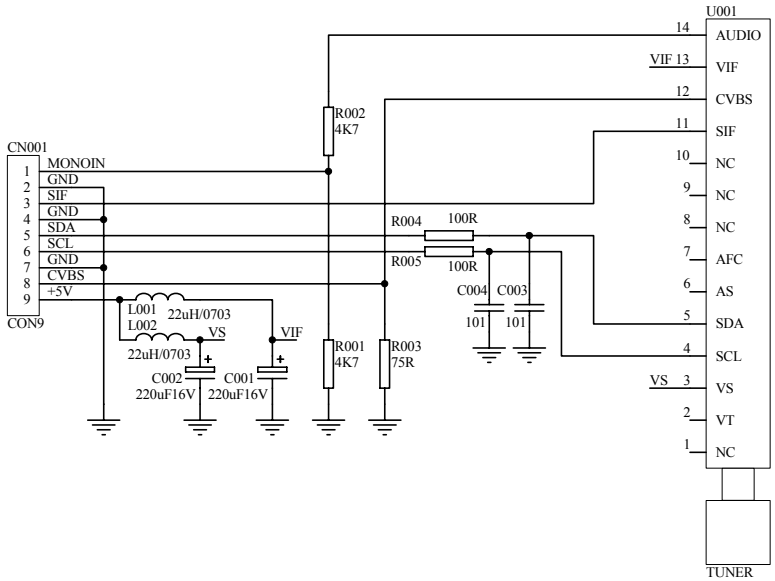








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RELEASED:	DATED:	SCALE:	SHEET: 2 OF 2



Title	02007-0(TUNER板原理图)	
Size A	Number	Revision
Date: 29-Dec-2004		Sheet of
File: E:\design\circuit\BBKAV.ddb		Drawn By: