

LCD COLOUR TV

SERVICE MANUAL

CHASSIS NO.: LS06w

Please read this manual carefully before service.

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Part I : Specifications and Composition

1. Models for this Chassis:

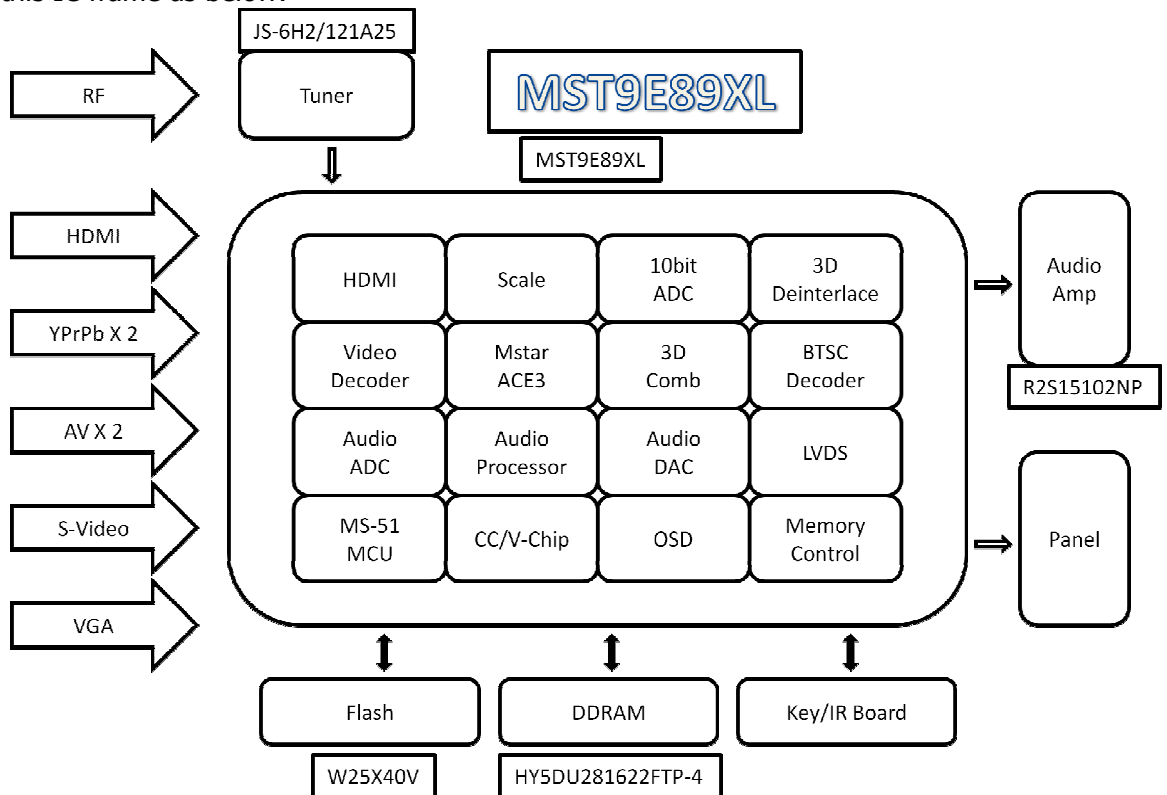
Region	Europe	America	Other Region
Model Number			

2. Main Feature:

Region		Europe	America	Australia
Radio Frequency Signal	Color system			PAL
	Sound system			PAL B/G、
Video system (or Y/C)				PAL,NTSC,NTSC4.43, SECAM
Channels preset				200 (0-199)
Audio output (THD≤7%)				7W+7W
Power source				220-240V
Teletext				100 Pages
VCHIP、CCD				None
Audio				NICAM
SCART Interface				None
VGA Signal Input				Yes
YPbPr High Definition Signal				X 2
HDMI Digital Input				Yes
earphone				None
OSD Language				English
Auto Off if no signal input		In TV mode, the LCD TV will automatically power off within 5 minutes and enter into the power energy saving mode if there is no signal input		

3. Unit IC Compositions:

This chassis LCD TV is Using a high performance and fully integrated chip MST9E89X,, see this IC frame as below:



Part II : **Brief Introduction of Main IC Function**

1. Main ICs and Functions:

Number	Location	Type	Main Function
1	TUNER100	JS-6H2/121	Tuner, audio output and picture video signal
2	N003	MST9E89AL-LF	Main chip
3	N008	HY5DU281622FTP-4	SDRAM, to storage the picture signal
4	N002	W25X40VSNIG	Flash
5	N005	24LC32A/ 24LC32AI	EEPROM
6	N004	TS5V330PW	Video Switch
7	N032	R2S15102NP	Digital audio amplifier
8	N018,N024	TL062CD	OA

2. IC And Main component Function Introduction

1. Tuner (JS-6H2/121)

Pin	Definition	Description
1	NC	NC
2	BT	NC
3	VCC	+5V power supply
4	SCL	IIC bus(clock)
5	SDA	IIC bus(data)
6	AS	ground
7	AFS	ground
8	NC	NC
9	NC	NC
10	NC	NC
11	SIF/Out	auto gain control (intermediate frequency of audio output)
12	Video/Out	CVBS signal output
13	VCC (+5V)	+5V power supply
14	Audio/Out	audio signal output

FEATURES

- LCD TV controller with PIP/POP display functions
- Input supports up to SXGA & 1080P
- Panel supports up to full HD panels (1920x1080)
- TV decoder with 3-D comb filter
- Multi-Standard TV sound demodulator and decoder
- 10-bit triple-ADC for TV and RGB/YPbPr
- 10-bit video data processing
- Integrated DVI/HDCP/HDMI compliant receiver
- High-quality dual scaling engines & 3-D video de-interlacers
- Full function PIP/PBP/POP ^{Note}
- MStarACE-3 picture/color processing engine
- Embedded On-screen display controller (OSD) engine
- Built-in MCU supports PWM & GPIO
- Built-in dual-link 8/10-bit LVDS transmitter
- 5 Volt tolerant inputs
- Low EMI and power saving features
- 256-pin LQFP
- **NTSC/PAL/SECAM Video Decoder**
 - Supports NTSC M, NTSC-J, NTSC-4.43, PAL (B,D,G,H,M,N,I,Nc), and SECAM
 - Automatic TV standard detection
 - Motion adaptive 3-D comb filter for NTSC/PAL
 - 8 configurable CVBS & Y/C S-video inputs
 - Supports Teletext level-1.5, WSS, VPS, Closed-caption, and V-chip
 - Macrovision detection
 - CVBS video output
- **Multi-Standard TV Sound Decoder**
 - Supports BTSC/NICAM/A2/EIA-J demodulation and decoding
 - FM stereo & SAP demodulation
 - L/Rx4, mono, and SIF audio input
 - L/R loudspeaker and line outputs
 - Supports sub-woofer output
 - Built-in audio output DAC's
 - Audio processing for loudspeaker channel, including volume, balance, mute, tone, EQ, and virtual stereo/surround
- **Digital Audio Interface**
 - I²S digital audio input & output
 - S/PDIF digital audio input & output
 - HDMI audio channel processing capability
 - Programmable delay for audio/video synchronization
- **Analog RGB Compliant Input Ports**
 - Three analog ports support up to 150MHz
 - Supports PC RGB input up to SXGA@75Hz
 - Fast blanking and function selection switch support full SCART functions
 - Supports HDTV RGB/YPbPr/YCbCr up to 1080P
 - Supports Composite Sync and SOG (Sync-on-Green) separator
 - Automatic color calibration
- **DVI/HDCP/HDMI Compliant Input Port**
 - Operates up to 150 MHz (up to SXGA @75Hz)
 - Single link on-chip DVI 1.0 compliant receiver
 - High-bandwidth Digital Content Protection (HDCP) 1.1 compliant receiver
 - High Definition Multimedia Interface (HDMI) 1.2 compliant receiver
 - Long-cable tolerant robust receiving
 - Support HDTV up to 1080P
- **Auto-Configuration/Auto-Detection**
 - Auto input signal format and mode detection
 - Auto-tuning function including phasing, positioning, offset, gain, and jitter detection
 - Sync Detection for H/V Sync
- **Digital Video Input Port**
 - One 4:2:2 ITU-R BT.656 8/10-bit digital video input port
 - One 4:2:2 ITU-R BT.601 16-bit digital video input port
- **High-Performance Scaling Engine**
 - Fully Programmable shrink/zoom capabilities
 - Nonlinear video scaling supports various modes including Panorama
 - Supports keystone correction for projectors
- **Video Processing & Conversion**
 - 3-D motion adaptive video de-interlacers
 - Edge-oriented adaptive algorithm for smooth low-angle edges

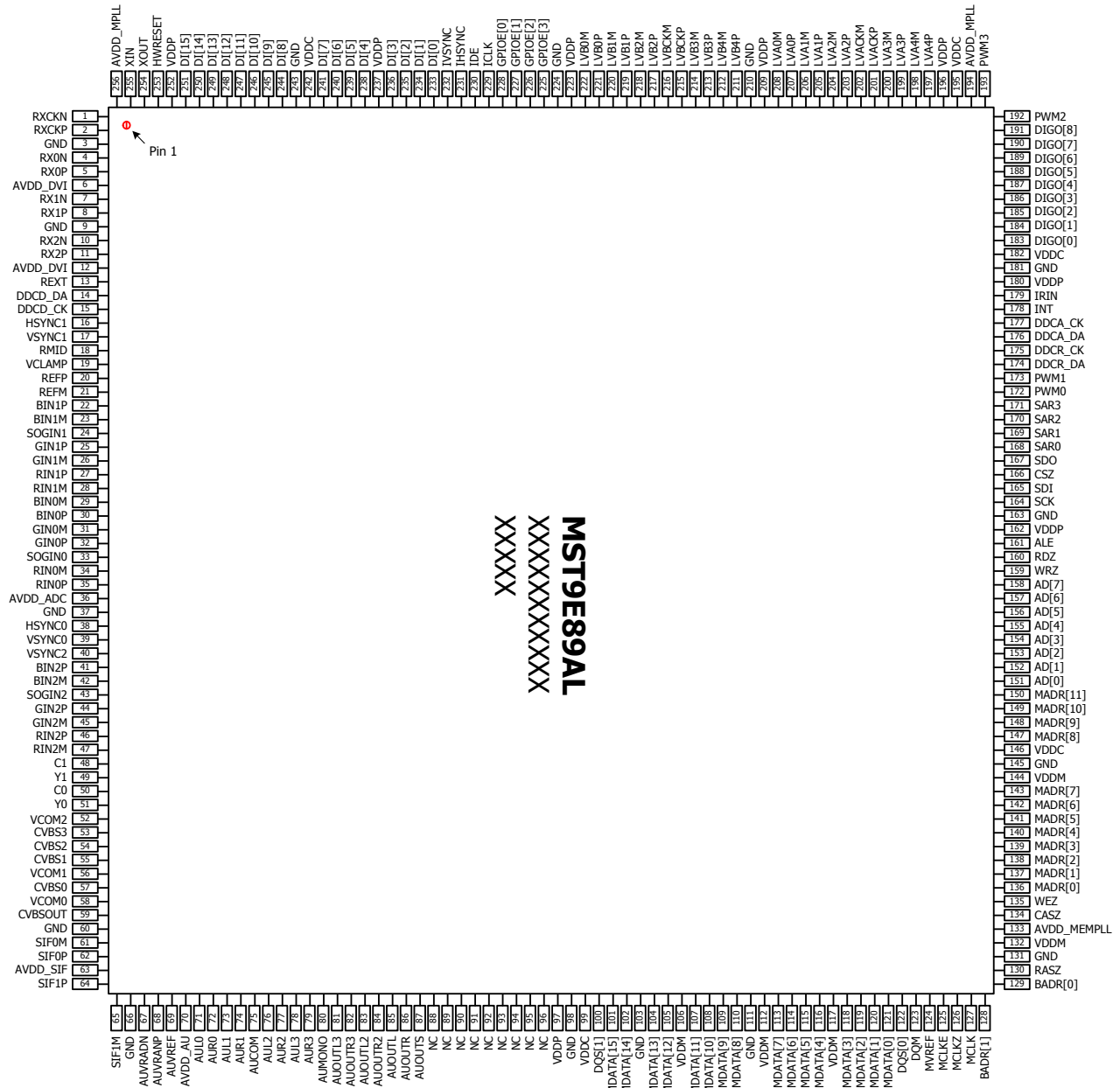
- Automatic 3:2 pull-down & 2:2 pull-down detection and recovery
- PIP/PBP/POP ^{Note} with programmable size and location, supports multi-video applications
- MStar 3rd Generation Advanced Color Engine (MStarACE-3) automatic picture enhancement gives:
 - Brilliant and fresh color
 - Intensified contrast and details
 - Vivid skin tone
 - Sharp edge
 - Enhanced depth of field perception
 - Accurate and independent color control
- sRGB compliance allows end-user to experience the same colors as viewed on CRTs and other displays
- Programmable 12-bit RGB gamma CLUT
- 3-D video noise reduction
- Frame rate conversion
- **On-Screen OSD Controller**
 - 16/256 color palette
 - 256/512 1-bit/pixel font
 - 128/256 4-bit/pixel font
 - Supports texture function
 - Supports 4K attribute/code
 - Horizontal and vertical stretch of OSD menus
 - Pattern generator for production test
 - Supports OSD MUX and alpha blending capability
 - Supports blinking and scrolling for closed caption applications
- **LVDS/TTL Panel Interface**
 - Supports 8/10-bit dual link LVDS up to full HD panel (1920x1080)
 - Supports 8-bit single TTL panel
 - Supports 2 data output formats: Thine & TI data mappings
 - Compatible with TIA/EIA
 - With 6/8 bits options
 - Reduced swing for LVDS for low EMI
 - Supports flexible spread spectrum frequency with 360Hz~11.8MHz and up to 25% modulation
- **Integrated Micro Controller**
 - Embedded 8032 micro controller
 - Configurable PWM's and GPIO's
 - Low-speed ADC inputs for system control
 - SPI bus for external flash
 - Supports external MCU option controlled through 4-wire double-data-rate direct MCU bus or 8-bit direct MCU bus
- **External Connection/Component**
 - 16-bit data bus for external frame buffer (SDR or DDR DRAM)
 - All system clocks synthesized from a single external clock

Note:
Availability of 3D video processing in some PIP/POP combinations is dependent on the selected DRAM speed and panel resolution.

GENERAL DESCRIPTION

The MST9E89AL is a high performance and fully integrated IC for multi-function LCD monitor/TV with resolutions up to full HD (1920x1080). It is configured with an integrated triple-ADC/PLL, an integrated DVI/HDCP/HDMI receiver, a multi-standard TV video and audio decoder, two video de-interlacers, two scaling engines, the MStarACE-3 color engine, an on-screen display controller, an 8-bit MCU and a built-in output panel interface. By use of external frame buffer, PIP/POP is provided for multimedia applications. Furthermore, 3-D video decoding and processing are fulfilled for high-quality TV applications. To further reduce system costs, the MST9E89AL also integrates intelligent power management control capability for green-mode requirements and spread-spectrum support for EMI management.

PIN DIAGRAM (MST9E89AL)



Note 1: This pin diagram is based LVDS output. For details, please see the Output Type vs. Pin Configuration at the end of Pin Description section.

PIN DESCRIPTION

MCU Interface

Pin Name	Pin Type	Function	Pin
HWRESET	Schmitt Trigger Input w/ 5V-tolerant	Hardware Reset, active high	253
ALE	I/O w/ 5V-tolerant	MCU Bus ALE, active high / General Purpose Input/Output (GPIOC[10])	161
RDZ	I/O w/ 5V-tolerant	MCU Bus RDZ, active low / General Purpose Input/Output (GPIOC[9])	160
WRZ	I/O w/ 5V-tolerant	MCU Bus WDZ, active low / General Purpose Input/Output (GPIOC[8])	159
INT	I/O w/ 5V-tolerant	MCU Bus Interrupt; 4mA driving strength / General Purpose Output (GPIOD[12])	178
AD[7:0]	I/O w/ 5V-tolerant	8051 bus AD[7:0]; 4mA driving strength / External Flash/RAM Data Bus (FLSHD[7:0]) / General Purpose Input/Output (GPIOC[7:0])	158-151

Analog Interface

Pin Name	Pin Type	Function	Pin
RMID		Mid-Scale Voltage Bypass	18
VCLAMP		CVBS/YC Mode Clamp Voltage Bypass	19
REFP		Internal ADC Top De-coupling Pin	20
REFM		Internal ADC Bottom De-coupling Pin	21
REXT	Analog Input	External Resistor 390 ohm to AVDD_DVI	13
HSYNC0	Schmitt Trigger Input w/ 5V-tolerant	Analog HSYNC Input from Channel 0 / Function Select Switch Input from Channel 0 (FSSW0)	38
VSYNC0	Schmitt Trigger Input w/ 5V-tolerant	Analog VSYNC Input from Channel 0 / Fast Blanking Input from Channel 0 (FBLK0)	39
BIN0M	Analog Input	Reference Ground for Analog Blue Input from Channel 0	29
BIN0P	Analog Input	Analog Blue Input from Channel 0	30
GIN0M	Analog Input	Reference Ground for Analog Green Input from Channel 0	31
GIN0P	Analog Input	Analog Green Input from Channel 0	32
SOGINO	Analog Input	Sync On Green Input from Channel 0	33
RIN0M	Analog Input	Reference Ground for Analog Red Input from Channel 0	34
RIN0P	Analog Input	Analog Red Input from Channel 0	35
HSYNC1	Schmitt Trigger Input w/ 5V-tolerant	Analog HSYNC Input from Channel 1 / Function Select Switch Input from Channel 1 (FSSW1)	16

Pin Name	Pin Type	Function	Pin
VSYNC1	Schmitt Trigger Input w/ 5V-tolerant	Analog VSYNC Input from Channel 1 / Fast Blanking Input from Channel 1 (FBLK1)	17
BIN1M	Analog Input	Reference Ground for Analog Blue Input from Channel 1	23
BIN1P	Analog Input	Analog Blue Input from Channel 1	22
SOGIN1	Analog Input	Sync On Green Input from Channel 1	24
GIN1M	Analog Input	Reference Ground for Analog Green Input from Channel 1	26
GIN1P	Analog Input	Analog Green Input from Channel 1	25
RIN1M	Analog Input	Reference Ground for Analog Red Input from Channel 1	28
RIN1P	Analog Input	Analog Red Input from Channel 1	27
BIN2M	Analog Input	Reference Ground for Analog Blue Input from Channel 2	42
BIN2P	Analog Input	Analog Blue Input from Channel 2	41
VSYNC2	Schmitt Trigger Input w/ 5V-tolerant	Analog VSYNC Input from Channel 2 / Fast Blanking Input from Channel 2 (FBLK2)	40
SOGIN2	Analog Input	Sync On Green Input from Channel 2 / Function Select Switch input from Channel 2 (FSSW2)	43
GIN2M	Analog Input	Reference Ground for Analog Green Input from Channel 2	45
GIN2P	Analog Input	Analog Green Input from Channel 2	44
RIN2M	Analog Input	Reference Ground for Analog Red Input from Channel 2	47
RIN2P	Analog Input	Analog Red Input from Channel 2	46

Analog Video Input/Output Interface

Pin Name	Pin Type	Function	Pin
C1	Analog Input	Chroma Video Input 1 / CVBS Input Channel 7 (CVBS7)	48
Y1	Analog Input	Luma Video Input 1 / CVBS Input Channel 5 (CVBS5)	49
C0	Analog Input	Chroma Video Input 0 / CVBS Input Channel 6 (CVBS6)	50
Y0	Analog Input	Luma Video Input 0 / CVBS Input Channel 4 (CVBS4)	51
VCOM2	Analog Input	YC Video Input Reference Ground	52
VCOM1	Analog Input	CVBS1, CVBS2, CVBS3 Video Input Reference Ground	56
VCOM0	Analog Input	CVBS0 Video Input Reference Ground	58
CVBS3	Analog Input	CVBS (Composite) Video Input Channel 3	53
CVBS2	Analog Input	CVBS (Composite) Video Input Channel 2	54
CVBS1	Analog Input	CVBS (Composite) Video Input Channel 1	55

Pin Name	Pin Type	Function	Pin
CVBS0	Analog Input	CVBS (Composite) Video Input Channel 0	57
CVBSOUT	Analog Output	CVBS (Composite) Video Output	59

Analog Audio Input/Output Interface

Pin Name	Pin Type	Function	Pin
SIF0M	Analog Input	Reference Ground for SIF Audio Input Channel 0	61
SIF0P	Analog Input	SIF Audio Input Channel 0	62
SIF1P	Analog Input	SIF Audio Input Channel 1	64
SIF1M	Analog Input	Reference Ground for SIF Audio Input Channel 1	65
AUVRADN		Negative Reference Ground for Audio ADC	67
AUVRADP		Positive Reference Voltage for Audio ADC	68
AUVREF		Reference Voltage for Audio Common Mode	69
AUL0	Analog Input	Audio Line Input Left Channel 0	71
AUR0	Analog Input	Audio Line Input Right Channel 0	72
AUL1	Analog Input	Audio Line Input Left Channel 1	73
AUR1	Analog Input	Audio Line Input Right Channel 1	74
AUCOM	Analog Input	Reference Ground for Audio Line Input	75
AUL2	Analog Input	Audio Line Input Left Channel 2	76
AUR2	Analog Input	Audio Line Input Right Channel 2	77
AUL3	Analog Input	Audio Line Input Left Channel 3	78
AUR3	Analog Input	Audio Line Input Right Channel 3	79
AUMONO	Analog Input	Mono Audio Input	80
AUOUTL3	Analog Output	Main Audio Output Left Channel 3	81
AUOUTR3	Analog Output	Main Audio Output Right Channel 3	82
AUOUTL2	Analog Output	Main Audio Output Left Channel 2	83
AUOUTR2	Analog Output	Main Audio Output Right Channel 2	84
AUOUTL	Analog Output	Main Audio Output Left Channel	85
AUOUTR	Analog Output	Main Audio Output Right Channel	86
AUOUTS	Analog Output	Main Audio Sub-Woofer Channel	87

DVI/HDMI Interface

Pin Name	Pin Type	Function	Pin
RX0N	Input	DVI/HDMI Channel 0 Negative Data Input	4
RX0P	Input	DVI/HDMI Channel 0 Positive Data Input	5
RX1N	Input	DVI/HDMI Channel 1 Negative Data Input	7

Pin Name	Pin Type	Function	Pin
RX1P	Input	DVI/HDMI Channel 1 Positive Data Input	8
RX2N	Input	DVI/HDMI Channel 2 Negative Data Input	10
RX2P	Input	DVI/HDMI Channel 2 Positive Data Input	11
RXCKN	Input	DVI/HDMI Negative Clock Input	1
RXCKP	Input	DVI/HDMI Positive Clock Input	2

LVDS Interface ^{Note 1}

Pin Name	Pin Type	Function	Pin
LVA0M	Output	LVDS A-Link Channel 0 Negative Data Output	208
LVA0P	Output	LVDS A-Link Channel 0 Positive Data Output	207
LVA1M	Output	LVDS A-Link Channel 1 Negative Data Output	206
LVA1P	Output	LVDS A-Link Channel 1 Positive Data Output	205
LVA2M	Output	LVDS A-Link Channel 2 Negative Data Output	204
LVA2P	Output	LVDS A-Link Channel 2 Positive Data Output	203
LVA3M	Output	LVDS A-Link Channel 3 Negative Data Output	200
LVA3P	Output	LVDS A-Link Channel 3 Positive Data Output	199
LVA4M	Output	LVDS A-Link Channel 3 Negative Data Output	198
LVA4P	Output	LVDS A-Link Channel 3 Positive Data Output	197
LVACKM	Output	LVDS A-Link Negative Clock Output	202
LVACKP	Output	LVDS A-Link Positive Clock Output	201
LVB0M	Output	LVDS B-Link Channel 0 Negative Data Output	222
LVB0P	Output	LVDS B-Link Channel 0 Positive Data Output	221
LVB1M	Output	LVDS B-Link Channel 1 Negative Data Output	220
LVB1P	Output	LVDS B-Link Channel 1 Positive Data Output	219
LVB2M	Output	LVDS B-Link Channel 2 Negative Data Output	218
LVB2P	Output	LVDS B-Link Channel 2 Positive Data Output	217
LVB3M	Output	LVDS B-Link Channel 3 Negative Data Output	214
LVB3P	Output	LVDS B-Link Channel 3 Positive Data Output	213
LVB4M	Output	LVDS B-Link Channel 3 Negative Data Output	212
LVB4P	Output	LVDS B-Link Channel 3 Positive Data Output	211
LVBCKM	Output	LVDS B-Link Negative Clock Output	216
LVBCKP	Output	LVDS B-Link Positive Clock Output	215

Note 1: Please see the Output Type vs. Pin Configuration at the end of Pin Description section.

TTL Interface Note 1

Pin Name	Pin Type	Function	Pin
LCK	Output w/ Pull-down Resistor	LCD Output Clock; 6mA driving strength	225
LDE	Output w/ Pull-down Resistor	LCD Data Enable Output; 6mA driving strength	226
LHSYNC	Output w/ Pull-down Resistor	LCD HSYNC; 6mA driving strength	227
LVSYNC	Output w/ Pull-down Resistor	LCD VSYNC; 6mA driving strength	228
RA[7:0]	Output w/ Pull-down Resistor	Port A Red Channel Bit[7:0]; 6mA driving strength	222-215
GA[7:0]	Output w/ Pull-down Resistor	Port A Green Channel Bit[7:0]; 6mA driving strength	214-211, 208-205
BA[7:0]	Output w/ Pull-down Resistor	Port A Blue Channel Bit[7:0]; 6mA driving strength	204-197

Note 1: Please see the Output Type vs. Pin Configuration at the end of Pin Description section.

Serial Flash Interface

Pin Name	Pin Type	Function	Pin
SCK	I/O w/ 5V-tolerant	SPI Flash Serial Clock / General Purpose Input/Output (GPIO[14])	164
SDI	I/O w/ 5V-tolerant	SPI Flash Serial Data Input (Output Pin) / General Purpose Input/Output (GPIO[15])	165
CSZ	I/O w/ 5V-tolerant	SPI Flash Chip select / General Purpose Input/Output (GPIO[16])	166
SDO	I/O w/ 5V-tolerant	SPI Flash Serial Data Output (Input Pin) / General Purpose Input/Output (GPIO[17])	167

GPIO Interface ^{Note 2}

Pin Name	Pin Type	Function	Pin
GPIOE[3:0]	I/O (not 5V-tolerant)	General Purpose Input/Output (GPIOE[3:0])	225-228
SAR3	I/O (not 5V-tolerant)	SAR Low Speed ADC Input 3 / General Purpose Input/Output (GPIOD[3])	171
SAR2	I/O (not 5V-tolerant)	SAR Low Speed ADC Input 2 / General Purpose Input/Output (GPIOD[2])	170
SAR1	I/O (not 5V-tolerant)	SAR Low Speed ADC Input 1 / General Purpose Input/Output (GPIOD[1])	169
SAR0	I/O (not 5V-tolerant)	SAR Low Speed ADC Input 0 / General Purpose Input/Output (GPIOD[0])	168
PWM3	I/O w/ 5V-Tolerant	Pulse Width Modulation Output 3; 4mA driving strength / General Purpose Output (GPIOD[7])	193
PWM2	I/O w/ 5V-Tolerant	Pulse Width Modulation Output 2; 4mA driving strength / General Purpose Output (GPIOD[6])	192
PWM1	I/O w/ 5V-Tolerant	Pulse Width Modulation Output 1; 4mA driving strength / General Purpose Output (GPIOD[5])	173
PWM0	I/O w/ 5V-Tolerant	Pulse Width Modulation Output 0; 4mA driving strength / General Purpose Output (GPIOD[4])	172
IRIN	I/O w/ 5V-tolerant	IR Receiver Input / General Purpose Output (GPIOD[13])	179
DIGO[8:6]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[8:6])	191-189
DIGO[5]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[5]) / Universal Asynchronous Transmitter 1 (UART1_TX)	188
DIGO[4]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[4]) / Universal Asynchronous Receiver 1 (UART1_RX)	187
DIGO[3]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[3]) / Programmable as Audio Serial Data Output 0 (AUSD0)	186
DIGO[2]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[2]) / Programmable as Audio Serial Clock Output (AUSCK)	185
DIGO[1]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[1]) / Programmable as Word Select Output (AUWS)	184
DIGO[0]	I/O w/ 5V-tolerant	General Purpose Input/Output (GPIOB[0]) / Programmable as Audio Master Clock Output (AUMCKO)	183
ICLK	I/O w/ 5V-tolerant	Digital Input Clock / Universal Asynchronous Receiver 0 (UART0_RX) / General Purpose Input/Output (GPIOA[24])	229
IDE	I/O w/ 5V-tolerant	Digital Input DE / Universal Asynchronous Transmitter 0 (UART0_TX) /	230

Pin Name	Pin Type	Function	Pin
		General Purpose Input/Output (GPIOA[25])	
IHSYNC	I/O w/ 5V-tolerant	Digital Input HSYNC / Universal Asynchronous Receiver 1 (UART1_RX) / General Purpose Input/Output (GPIOA[26])	231
IVSYNC	I/O w/ 5V-tolerant	Digital Input VSYNC / Universal Asynchronous Transmitter 1 (UART1_TX) / General Purpose Input/Output (GPIOA[27])	232
DI[15:0] ^{Note 3}	I/O w/ 5V-tolerant	Video Digital Input Port / Digital Audio Port / General Purpose Input/Output (GPIOA[15:0])	251-244, 241-238, 236-233

Note 2: Please see Pin Configuration vs. Function at the end of Pin Description section.

Note 3: Please see Digital Video Input Format Table at the end of Pin Description section.

DRAM Interface

Pin Name	Pin Type	Function	Pin
MVREF	Input	Reference Voltage for DDR SDRAM Interface	124
MCLKE	Output	DRAM Memory Clock Enable	125
MCLKZ	Output	DRAM Memory Clock Complementary / Output (For Differential Clocks)	126
MCLK	Output	DRAM Memory Clock	127
BADR[1:0]	Output	DRAM Memory Bank Address	128, 129
RASZ	Output	Row Address Strobe, active low	130
CASZ	Output	Column Address Strobe, active low	134
WEZ	Output	Write Enable, active low	135
DQS[1:0]	Output	Data Strobe	100, 122
DQM	Output	Data Mask Byte Enable	123
MADR[11:0]	Output	DRAM Memory Address	150-147, 143-136
MDATA[15:0]	Input/Output	DRAM Memory Data Bus	101, 102, 104, 105, 107-110, 113-116, 118-121

Misc. Interface

Pin Name	Pin Type	Function	Pin
DDCD_DA	I/O w/ 5V-tolerant	HDCP Serial Bus Data / DDC Data of DVI Port	14
DDCD_CK	Input w/ 5V-tolerant	HDCP Serial Bus Clock / DDC Clock of DVI Port	15
DDCA_CK	I/O w/ 5V-tolerant	DDC Clock for Analog port / Universal Asynchronous Receiver 0 (UART0_RX)/ General Purpose Output (GPIOD[11])	177

Pin Name	Pin Type	Function	Pin
DDCA_DA	I/O w/ 5V-tolerant	DDC Data for Analog port / Universal Asynchronous Transmitter 0 (UART0_TX) / General Purpose Output (GPIOD[10])	176
DDCR_CK	I/O w/ 5V-tolerant	DDC Clock for ROM / General Purpose Output (GPIOD[9])	175
DDCR_DA	I/O w/ 5V-tolerant	DDC Data for ROM / General Purpose Output (GPIOD[8])	174
XIN	Crystal Oscillator Input	Crystal Oscillator Input	255
XOUT	Crystal Oscillator Output	Crystal Oscillator Output	254

Power Pins

Pin Name	Pin Type	Function	Pin
AVDD_DVI	3.3V Power	DVI/HDMI Power	6, 12
AVDD_ADC	3.3V Power	ADC Power	36
AVDD_SIF	3.3V Power	SIF Power	63
AVDD_AU	3.3V Power	Audio Power	70
AVDD_MEMPLL	3.3V Power	PLL Power	133
AVDD_MPLL	3.3V Power	PLL Power	194, 256
VDDM	3.3V Power (SDRAM) / 2.5V Power (DDR)	Memory Interface Power	106, 112, 117, 132, 144
VDDP	3.3V Power	Digital Output Power	97, 162, 180, 196, 209, 223, 237, 252
VDDC	1.8V Power	Digital Core Power	99, 146, 182, 195, 242
GND	Ground	Ground	3, 9, 37, 60, 66, 98, 103, 111, 131, 145, 163, 181, 210, 224, 243

No Connects

Pin Name	Pin Type	Function	Pin
NC		No connect. Leave these pins floating.	88-96

Note 1: This NC pin table is based on LVDS output. For details, please see the Output Type vs. Configuration at the end of Pin Description section.

Note 1:

Output Type vs. Pin Configuration

Pin #197-228	LVDS	TTL	Pin #197-228	LVDS	TTL
197	LVA4P	BA[0]	213	LVB3P	GA[6]
198	LVA4M	BA[1]	214	LVB3M	GA[7]
199	LVA3P	BA[2]	215	LVBCKP	RA[0]
200	LVA3M	BA[3]	216	LVBCKM	RA[1]
201	LVACKP	BA[4]	217	LVB2P	RA[2]
202	LVACKM	BA[5]	218	LVB2M	RA[3]
203	LVA2P	BA[6]	219	LVB1P	RA[4]
204	LVA2M	BA[7]	220	LVB1M	RA[5]
205	LVA1P	GA[0]	221	LVB0P	RA[6]
206	LVA1M	GA[1]	222	LVB0M	RA[7]
207	LVA0P	GA[2]	223	VDDP	VDDP
208	LVA0M	GA[3]	224	GND	GND
209	VDDP	VDDP	225	GPIOE[3]	LCK
210	GND	GND	226	GPIOE[2]	LDE
211	LVB4P	GA[4]	227	GPIOE[1]	LHSYNC
212	LVB4M	GA[5]	228	GPIOE[0]	LVSYN

Note 2:

Pin Configuration vs. Function

Pin #	Digital Video Input Data	Digital Audio I/O (AU_SWAP=0)	Digital Audio I/O (AU_SWAP=1)
233	DI[0]	SPDIFO	
234	DI[1]	AUMCKO	
235	DI[2]	AUMUTE	
236	DI[3]	AUWS	
238	DI[4]	AUSCK	
239	DI[5]	AUSD	
240	DI[6]		
241	DI[7]		
244	DI[8]	SPDIFI	SPDIFO
245	DI[9]	AIWS	AUMCKO
246	DI[10]	AISCK	AUMUTE
247	DI[11]	AISD	AUWS

Pin #	Digital Video Input Data	Digital Audio I/O (AU_SWAP=0)	Digital Audio I/O (AU_SWAP=1)
248	DI[12]		AUSCK
249	DI[13]		AUSD
250	DI[14]		
251	DI[15]		

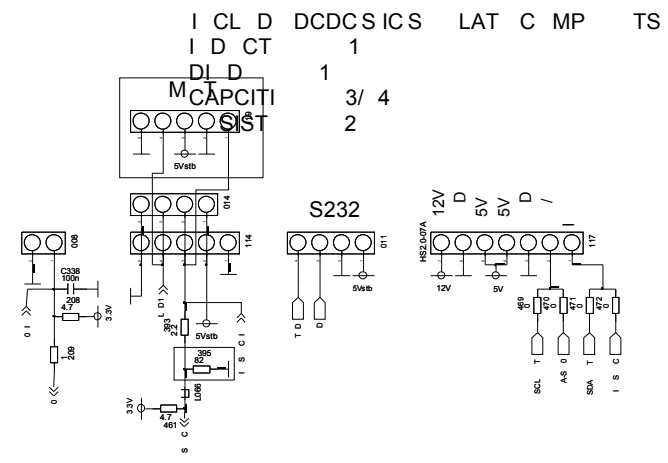
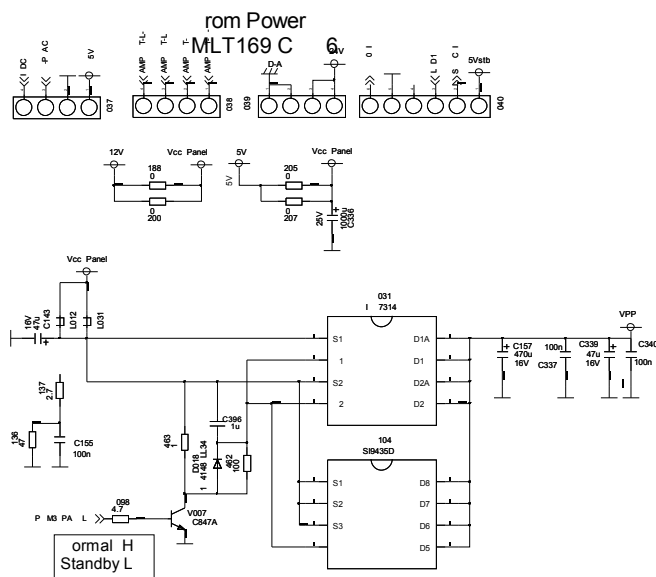
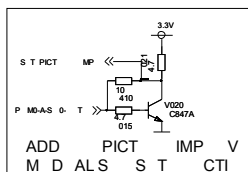
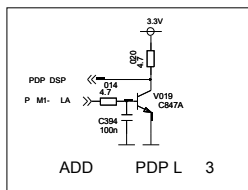
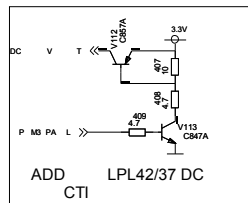
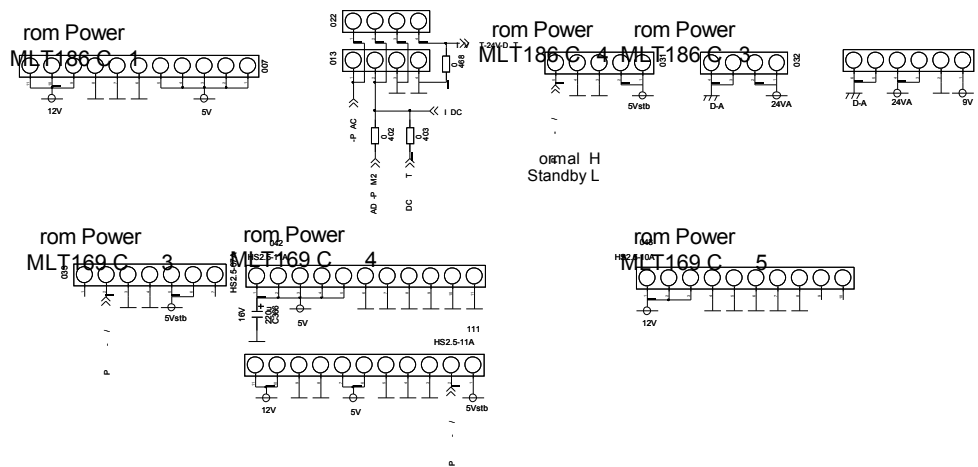
Audio Interface

Pin Name	Pin Type	Function
AUSD	Output	Audio Serial Data Output
AUSCK	Output	Audio Serial Clock Output
AUWS	Output	Audio Serial Word Select Output
AUMUTE	Output	Audio Output Mute Control
AUMCKO	Output	Audio Master Clock Output
SPDIFO	Output	Audio S/PDIF Output
AISCK	Input	Audio Serial Clock Input
AIWS	Input	Audio Word Select Input
AISD	Input	Audio Serial Data Input
SPDIFI	Input	Audio S/PDIF Audio Input

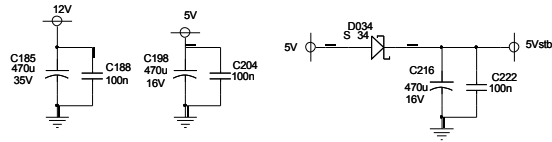
Note 3:**Digital Video Input Format Table**

Format	8-Bit ITU656		10-Bit ITU656		8-Bit ITU601			
YC Swap	X	X	X	X	0	0	1	1
ML Swap	0	1	0	1	0	1	0	1
ICLK	ICLK	ICLK	ICLK	ICLK	ICLK	ICLK	ICLK	ICLK
IDE					IDE	IDE	IDE	IDE
IHSYNC					IHSYNC	IHSYNC	IHSYNC	IHSYNC
IVSYNC					IVSYNC	IVSYNC	IVSYNC	IVSYNC
DI[0]	YCbCr[0]	YCbCr[7]	YCbCr[2]	YCbCr[7]	Y[0]	Y[7]	CbCr[0]	CbCr[7]
DI[1]	YCbCr[1]	YCbCr[6]	YCbCr[3]	YCbCr[6]	Y[1]	Y[6]	CbCr[1]	CbCr[6]
DI[2]	YCbCr[2]	YCbCr[5]	YCbCr[4]	YCbCr[5]	Y[2]	Y[5]	CbCr[2]	CbCr[5]
DI[3]	YCbCr[3]	YCbCr[4]	YCbCr[5]	YCbCr[4]	Y[3]	Y[4]	CbCr[3]	CbCr[4]
DI[4]	YCbCr[4]	YCbCr[3]	YCbCr[6]	YCbCr[3]	Y[4]	Y[3]	CbCr[4]	CbCr[3]
DI[5]	YCbCr[5]	YCbCr[2]	YCbCr[7]	YCbCr[2]	Y[5]	Y[2]	CbCr[5]	CbCr[2]
DI[6]	YCbCr[6]	YCbCr[1]	YCbCr[8]	YCbCr[1]	Y[6]	Y[1]	CbCr[6]	CbCr[1]
DI[7]	YCbCr[7]	YCbCr[0]	YCbCr[9]	YCbCr[0]	Y[7]	Y[0]	CbCr[7]	CbCr[0]
DI[8]			YCbCr[0]	YCbCr[9]	CbCr[0]	CbCr[7]	Y[0]	Y[7]
DI[9]			YCbCr[1]	YCbCr[8]	CbCr[1]	CbCr[6]	Y[1]	Y[6]
DI[10]					CbCr[2]	CbCr[5]	Y[2]	Y[5]
DI[11]					CbCr[3]	CbCr[4]	Y[3]	Y[4]
DI[12]					CbCr[4]	CbCr[3]	Y[4]	Y[3]
DI[13]					CbCr[5]	CbCr[2]	Y[5]	Y[2]
DI[14]					CbCr[6]	CbCr[1]	Y[6]	Y[1]
DI[15]					CbCr[7]	CbCr[0]	Y[7]	Y[0]

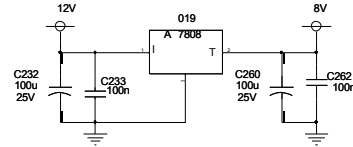
rom Panel- ire
ranch 2.5mm pitch



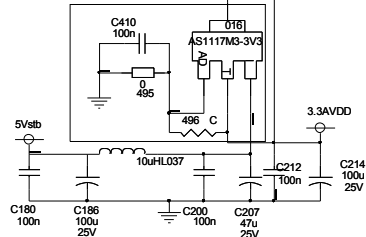
	MLT169	MLT186	H S P
042	S		
031		S	
045			S
033	S		
043	S		
007		S	
040			S/
014	S	S	
010	S	S	S
011	S	S	S
008	S	S	
046			/ S
037			S
013	S	S	
039	S		
032		S	
033			S
034			S
035			S
041			S
034			S
035			S



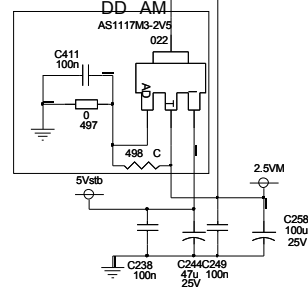
8V or 74HC4052 S ITCH A DI



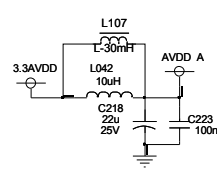
Vcc3.3 or MST5151A
analog



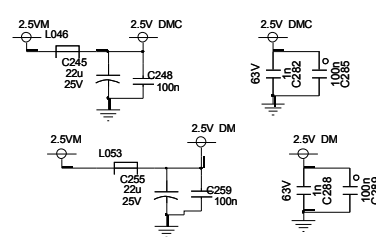
2.5V or MST5151A and
DD AM



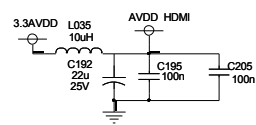
3.3AVDD or
AVDD A



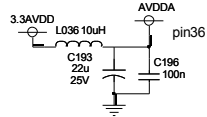
2.5V or DD AM



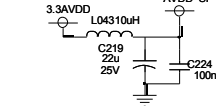
3.3AVDD or
AVDD pin12



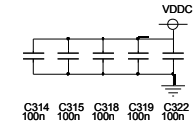
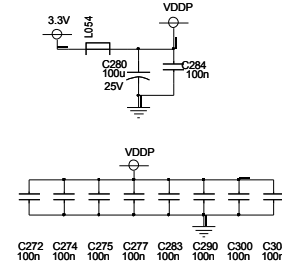
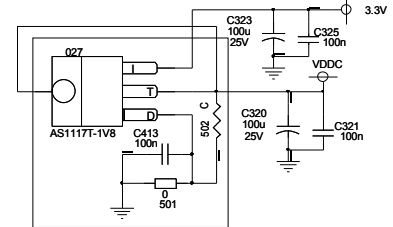
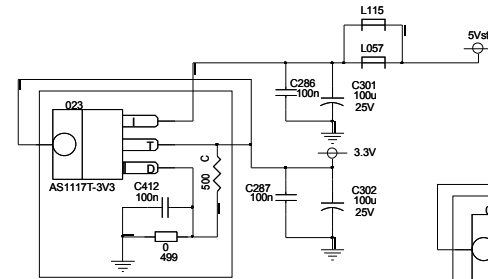
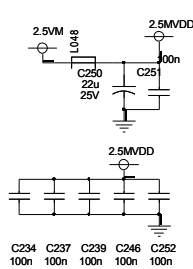
3.3AVDD or
AVDDA

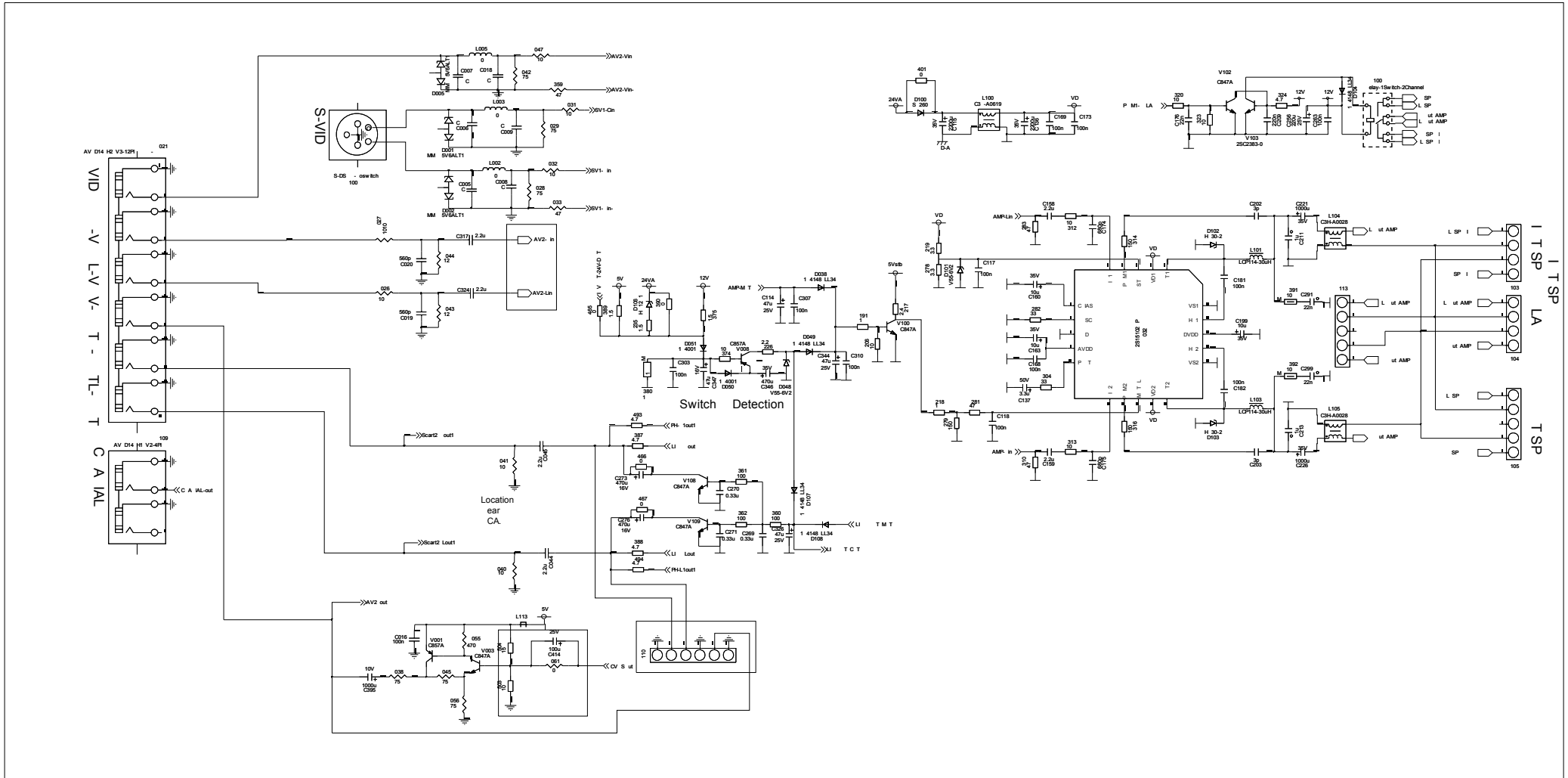


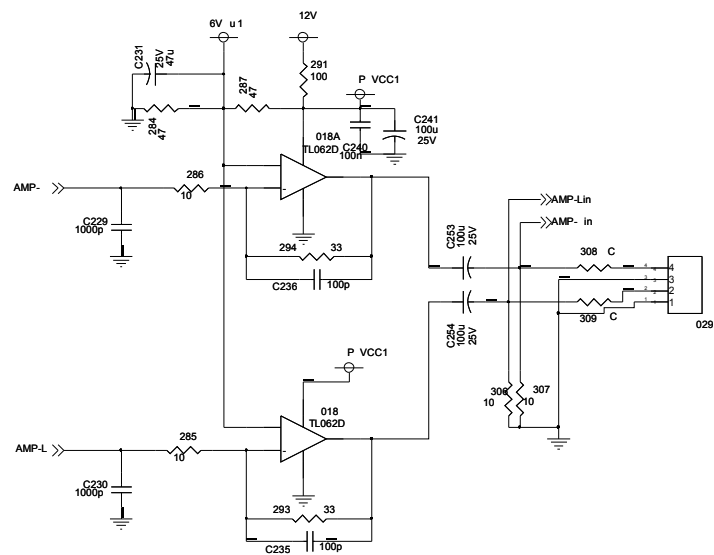
3.3AVDD
or AVDD SI



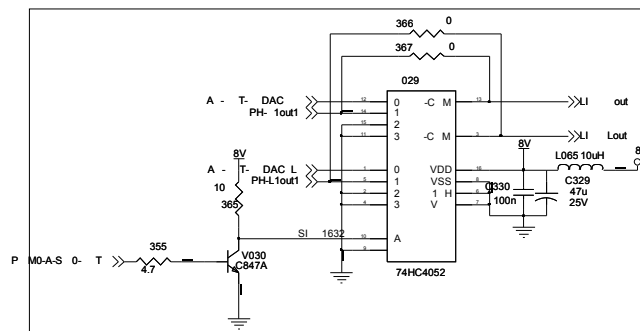
2.5V or MST5151A

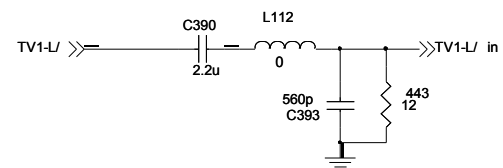
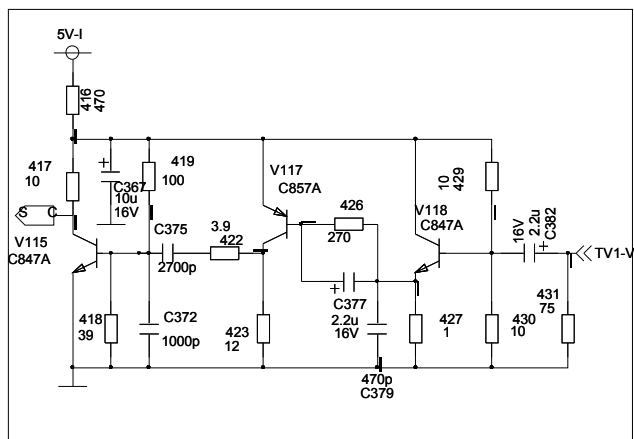


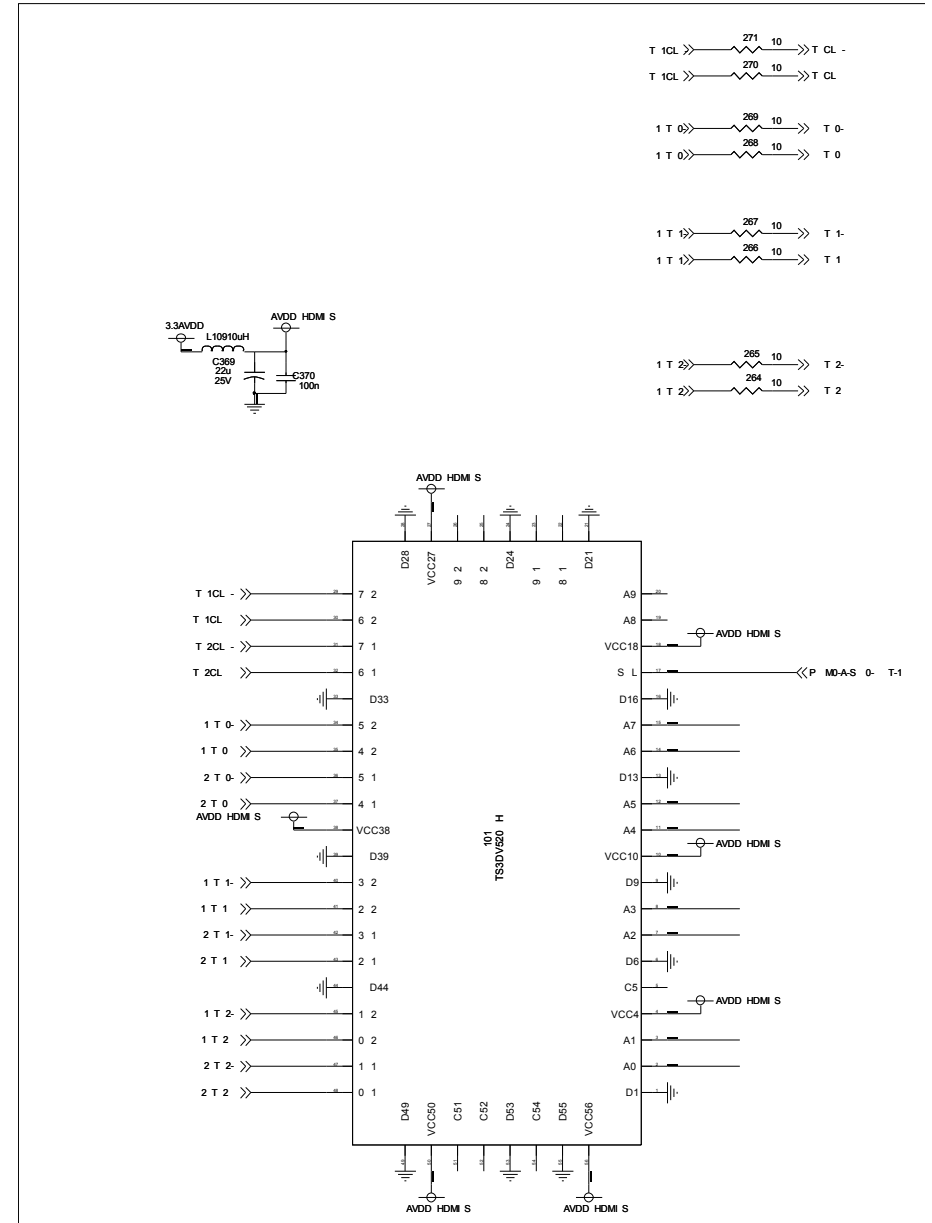
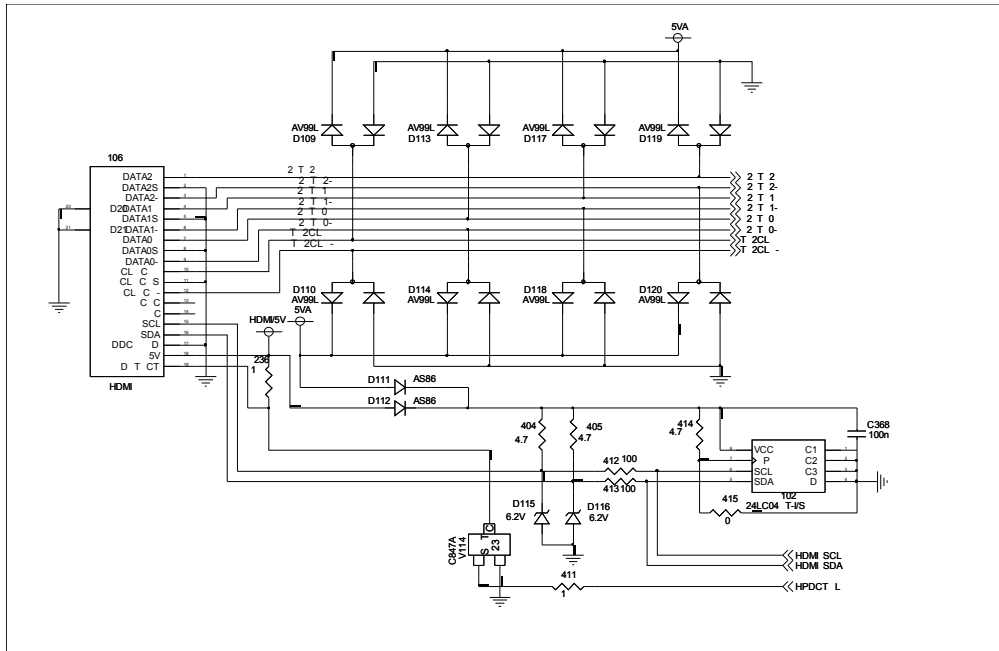
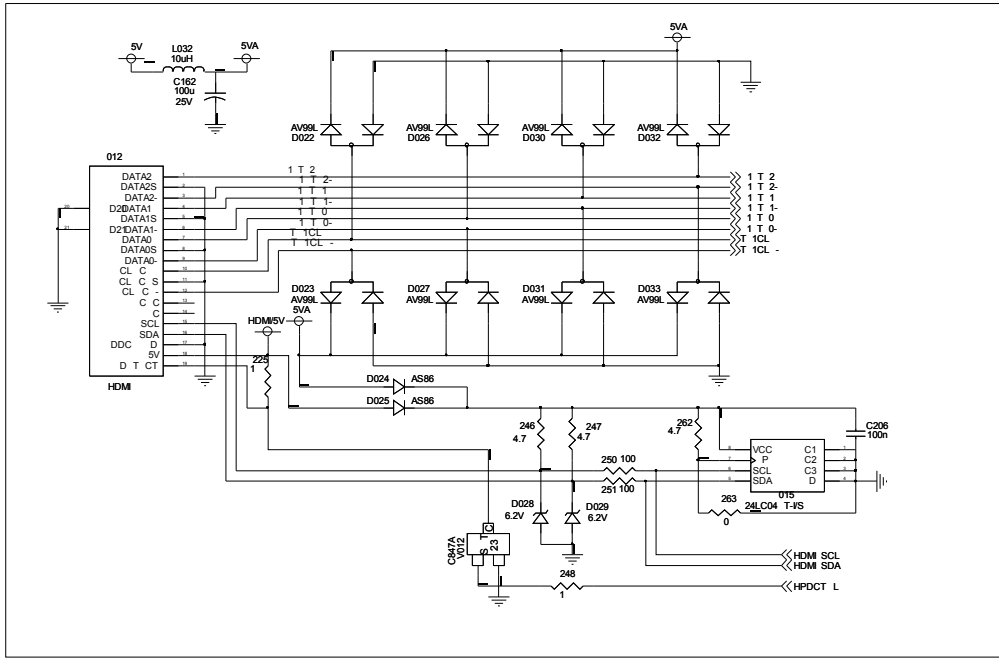


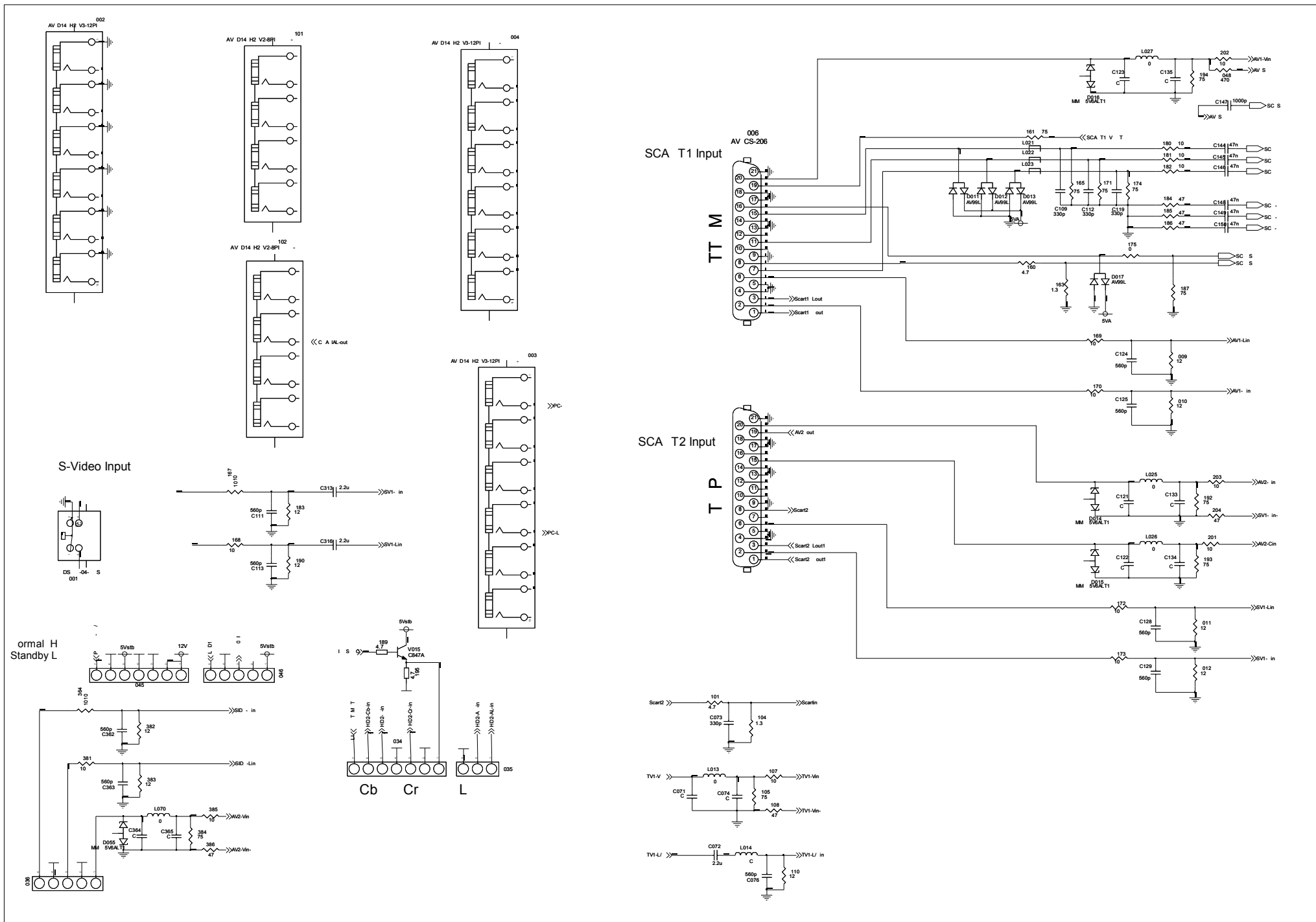


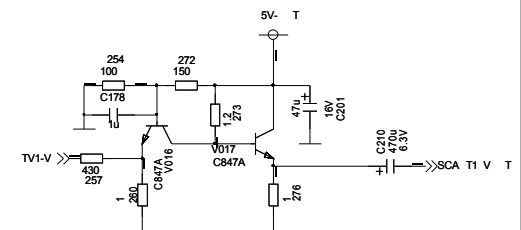
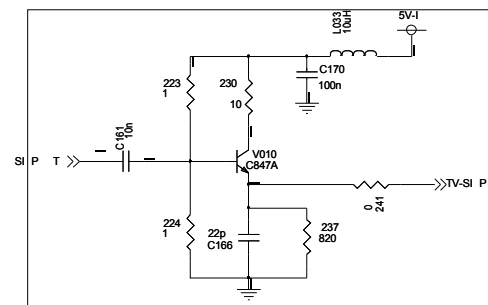
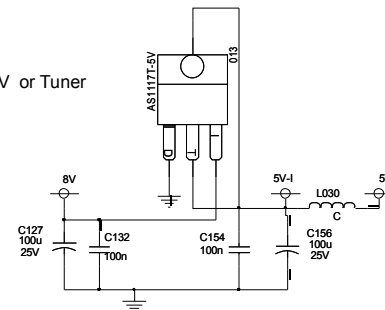
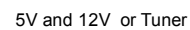
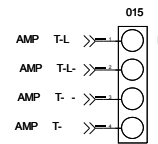
ear MST9688L PI











Part IV: Part Lists

序	PartNumber	Qty	Location	Type	Description
1	329-61431-20	1	G001,	Crystal	14.31818MHz_20pF± 20PPM_HC-49/US
2	340-00001-34	7	D018,D035,D036,D038,D049,D 107,D108,	Diode	FDLL4148
3	340-00003-00	2	D050,D051,	Diode	1N4001
4	340-BAS86-00	2	D024,D025,	Diode	LLSD103A
5	340-BAV99-L0	12	D010,D022,D023,D026,D027,D 030,D031,D032,D033,D039,D04	Diode	BAV99
6	340-BZ030-00	2	D102,D103,	Zener diode	BZV55-30V
7	340-BZA62-00	4	D028,D029,D048,D101,	Zener diode	BZV55-6.2V
8	340-DZA56-00	11	D001,D002,D003,D004,D005,D 006,D007,D008,D009,D037,D10	Zener diode	MMBZ5V6ALT1G
9	340-SK340-00	1	D034,	Power diode	SK34
10	340-SR260-00	1	D100,	Diode	SB260E
11	342-08470-90	16	V003,V007,V012,V019,V021,V1 00,V101,V104,V108,V109,V111, V113,V115,V116,V118,V119,	Transistor	①BC847AW ②MMBT3904
12	342-08570-90	8	V001,V002,V004,V005,V006,V0 08,V112,V117,	Transistor	①BC857AW ②MMBT3906
13	352-1117M-2V5	1	N022,	IC	①AS1117M3-2V5 ②SPX1117M3-2V5
14	352-1117M-3V3	1	N016,	IC	①AS1117M3-3V3 ②SPX1117M3-3V3
15	352-1117T-1V8	1	N027,	IC	①AZ1084S-1.8E1 ②AZ1084S2-1.8E1
16	352-1117T-3V3	1	N023,	IC	①AZ1084S-3.3E1 ②AZ1084S2-3.3E1
17	352-15102-00	1	N032,	IC	R2S15102NP
18	352-24LC02-00	1	N017,	IC	24LC02
19	352-24LC04-00	2	N007,N015,	IC	24LC04
20	352-24LC32-00	1	N005,	IC	24LC32A
21	352-25040-00	1	N002,	IC	W25X40VSNIG
22	352-5V330-00	1	N004,	IC	TS5V330PW
23	352-74HC4052-00	1	N001,	IC	74HC4052D
24	352-78050-00	1	N103,	IC	TA78M05P KA7805
25	352-94350-00	1	N104,	IC	FDS9435A
26	352-9E89A-LF	1	N003,	IC	MST9E89AL-LF
27	352-DS2816-F4	1	N008,	IC	HY5DU281622FTP-4
28	352-TL062-00	2	N018,N024,	IC	TL062CD
29	364-11110-00	1	X109,	RCA Jack	RCA Jack
30	364-2X20-20	1	X016,	Connecter	CON-2X20-2.0mm
31	364-44220-00	1	X020,	RCA Jack	RCA Jack
32	364-66330-00	1	X019,	RCA Jack	RCA Jack

33	364-66330-01	1	X021,	RCA Jack	RCA Jack
34	364-91204-00	1	X028,	VGA Jack	VGA Jack
35	364-91206-01	1	X100,	S Jack	S Jack without switch
36	364-CKX11-00	1	X009,	Earphone Jack	CKX_Blue
37	364-H8842-R41	1	X012,	HDMI Jack	HDMI-R41-8842
38	364-PHS02-20	1	X008,	Connector	2P_PH_2.0mm
39	364-PHS04-20	3	X011,X022,X032,	Connector	4P_PH_2.0mm
40	364-PHS05-20	2	X010,X114,	Connector	5P_PH_2.0mm
41	364-PHS09-20	1	X116,	Connector	9P_PH_2.0mm
42	364-XHS05-25	1	X113,	Connector	5P_XH_2.5mm
43	364-XHS11-25	1	X111	Connector	11P_XH_2.5mm
44	455-12000-H0	19	R058,R263,R295,R302,R303,R344,R397,R402,R406,R428,R464,R465,R482,R490,R491,R495,R497,R499,R501,	Chip Resistor	1/10W_0_±5%
45	455-12010-H0	24	R031,R032,R047,R141,R142,R143,R144,R264,R265,R266,R267,R268,R269,R270,R271,R329,R330,R331,R424,R441,R483,R	Chip Resistor	1/10W_10_±5%
46	455-12033-H0	11	R051,R052,R053,R054,R093,R115,R116,R117,R280,R299,R30	Chip Resistor	1/10W_33_±5%
47	455-12047-H0	6	R033,R332,R333,R334,R359,R	Chip Resistor	1/10W_47_±5%
48	455-12075-H0	26	R028,R029,R038,R042,R045,R049,R056,R057,R060,R062,R065,R066,R145,R146,R147,R311,R315,R322,R340,R437,R473,R474,R475,R487,R488,R489,	Chip Resistor	1/10W_75_±5%
49	455-12110-H0	27	R011,R070,R092,R138,R139,R150,R151,R158,R159,R176,R177,R250,R251,R291,R328,R343,R360,R361,R362,R363,R398,R433,R434,R436,R450,R470,R47	Chip Resistor	1/10W_100_±5%
50	455-12115-H0	1	R166,	Chip Resistor	1/10W_150_±5%
51	455-12139-H0	1	R046,	Chip Resistor	1/10W_390_±5%
52	455-12147-H0	6	R055,R111,R114,R131,R325,R	Chip Resistor	1/10W_470_±5%
53	455-12182-H0	1	R425,	Chip Resistor	1/10W_820_±5%
54	455-12210-H0	17	R088,R191,R196,R197,R198,R199,R209,R218,R225,R248,R318,R319,R420,R421,R427,R438,	Chip Resistor	1/10W_1K_±5%
55	455-12222-H0	4	R226,R305,R321,R393,	Chip Resistor	1/10W_2.2K_±5%
56	455-12224-H0	1	R217,	Chip Resistor	1/10W_2.4K_±5%
57	455-12233-H0	2	R219,R278,	Chip Resistor	1/10W_3.3K_±5%
58	455-12239-H0	1	R422,	Chip Resistor	1/10W_3.9K_±5%
59	455-12247-H0	21	R014,R016,R020,R098,R162,R208,R246,R247,R262,R290,R292,R317,R335,R338,R408,R409,R455,R456,R461,R493,R494,	Chip Resistor	1/10W_4.7K_±5%

60	455-12310-H0	57	R022,R023,R024,R025,R026,R027,R030,R040,R041,R050,R076,R077,R078,R079,R080,R081,R082,R083,R084,R085,R086,R087,R091,R100,R102,R106,R109,R135,R148,R149,R206,R285,R286,R288,R289,R296,R300,R306,R307,R312,R313,R326,R327,R336,R337,R374,R407,R417,R429,R430,R476,R477,R478,R	Chip Resistor	1/10W_10K_±5%
61	455-12312-H0	9	R034,R035,R036,R037,R043,R044,R297,R298,R423,	Chip Resistor	1/10W_12K_±5%
62	455-12315-H0	1	R504,	Chip Resistor	1/10W_15K_±5%
63	455-12322-H0	5	R153,R154,R178,R179,R339,	Chip Resistor	1/10W_22K_±5%
64	455-12324-H0	1	R439,	Chip Resistor	1/10W_24K_±5%
65	455-12333-H0	6	R282,R293,R294,R304,R346,R	Chip Resistor	1/10W_33K_±5%
66	455-12339-H0	1	R418,	Chip Resistor	1/10W_39K_±5%
67	455-12347-H0	5	R281,R283,R284,R287,R310,	Chip Resistor	1/10W_47K_±5%
68	455-12382-H0	1	R395,	Chip Resistor	1/10W_82K_±5%
69	455-12410-H0	11	R001,R002,R008,R009,R071,R072,R073,R074,R419,R440,R46	Chip Resistor	1/10W_100K_±5%
70	455-12415-H0	3	R279,R314,R316,	Chip Resistor	1/10W_150K_±5%
71	455-12427-H0	1	R426,	Chip Resistor	1/10W_270K_±5%
72	455-12510-H0	1	R075,	Chip Resistor	1/10W_1M_±5%
73	455-12533-H0	1	R505,	Chip Resistor	1/10W_3.3M_±5%
74	455-1D000-H0	4	R205,R207,R451,R460,	Chip Resistor	1/4W_0_±5%
75	455-4X033-H0	16	R094,R095,R096,R097,R120,R121,R122,R123,R124,R125,R126,R127,R128,R129,R130,R133,	Chip Resistor	RA03_33Ω*4_±5%
76	455-4X110-H0	1	R039,	Chip Resistor	RA03_100Ω*4_±5%
77	455-4X247-H0	5	R059,R067,R132,R134,R140,	Chip Resistor	RA03_4.7K*4_±5%
78	456-0522M-08	20	C044,C045,C051,C052,C053,C054,C055,C056,C057,C058,C059,C103,C104,C141,C142,C158,C159,C317,C324,C390,	Chip Capacitor	Y5V_10V_2.2uF_+80%-20%
79	456-1433M-06	4	C269,C270,C271,C312,	Chip Capacitor	Y5V_16V_330nF_+80%-20%
80	456-1447M-06	1	C042,	Chip Capacitor	Y5V_16V_470nF_+80%-20%
81	456-1510M-06	3	C183,C215,C396,	Chip Capacitor	Y5V_16V_1uF_+80%-20%
82	456-3003H-06	2	C202,C203,	Chip Capacitor	NPO_50V_3pF_±0.5pF
83	456-3022H-06	1	C376,	Chip Capacitor	NPO_50V_22pF_±5%
84	456-3033H-06	3	C062,C063,C264,	Chip Capacitor	NPO_50V_33pF_±5%
85	456-3110H-06	12	C070,C152,C153,C190,C217,C225,C235,C236,C305,C306,C38	Chip Capacitor	NPO_50V_100pF_±5%
86	456-3147K-06	1	C379,	Chip Capacitor	X7R_50V_470pF_±10%

87	456-3156K-06	9	C011,C012,C013,C014,C019,C020,C242,C243,C393,	Chip Capacitor	X7R_50V_560pF_±10%
88	456-3168K-06	2	C174,C175,	Chip Capacitor	X7R_50V_680pF_±10%
89	456-3210K-06	8	C089,C229,C230,C278,C279,C295,C372,C406,	Chip Capacitor	X7R_50V_1nF_±10%
90	456-3222K-06	4	C098,C099,C130,C131,	Chip Capacitor	X7R_50V_2.2nF_±10%
91	456-3227K-06	1	C375,	Chip Capacitor	X7R_50V_2.7nF_±10%
92	456-3310K-06	2	C371,C389,	Chip Capacitor	X7R_50V_10nF_±10%
93	456-3347K-06	18	C086,C087,C088,C090,C091,C092,C292,C293,C294,C296,C297,C298,C403,C404,C405,C407,	Chip Capacitor	X7R_50V_47nF_±10%
94	456-3410M-06	103	C001,C002,C015,C016,C025,C026,C027,C028,C029,C030,C031,C033,C035,C036,C037,C038,C046,C047,C075,C078,C083,C100,C101,C102,C107,C108,C110,C116,C117,C118,C120,C126,C139,C140,C168,C169,C173,C180,C181,C182,C188,C195,C196,C197,C200,C204,C205,C206,C212,C220,C222,C223,C224,C227,C228,C234,C237,C238,C239,C240,C246,C247,C248,C249,C251,C252,C259,C261,C265,C268,C272,C274,C275,C277,C283,C284,C286,C287,C290,C300,C303,C304,C307,C308,C310,C311,C314,C315,C318,C319,C321,C322,C325,C337,C338,C340,C361,C374,C378,C380,C385,C	Chip Capacitor	Y5V_50V_100nF_+80%-20%
95	459-2210K-00	2	C282,C288,	Chip Porcelain Capacitor	50V或63V_1nF_±10%
96	462-ME322-K0	2	C291,C299,	Capacitor	MPE_50V或63V_22nF_±10%
97	462-ME410-K0	2	C285,C289,	Capacitor	MPE_50V或63V_100nF_±10%
98	462-ME510-K0	2	C211,C213,	Capacitor	MPE_50V或63V_1uF_±10%
99	464-60522-50	2	C377,C382,	Electrolytic Capacitor	50V_2.2uF_±20%_105℃
100	464-60533-50	1	C137,	Electrolytic Capacitor	50V_3.3uF_±20%_105℃

101	464-60547-50	1	C039,	Electrolytic Capacitor	50V_4.7uF_±20%_105 °C
102	464-60610-50	8	C010,C017,C077,C160,C163,C199,C367,C392,	Electrolytic Capacitor	50V_10uF_±20%_105°C
103	464-6D722-50	1	C366,	Electrolytic Capacitor	16V_220uF_±20%_105 °C
104	464-6D747-50	6	C157,C198,C216,C273,C276,C387,	Electrolytic Capacitor	16V_470uF_±20%_105 °C
105	464-6D810-50	1	C395,	Electrolytic Capacitor	16V_1000uF_±20%_105 °C
106	464-6E622-50	7	C192,C193,C218,C219,C245,C250,C255,	Electrolytic Capacitor	25V_22uF_±20%_105°C
107	464-6E647-50	16	C064,C065,C066,C067,C068,C069,C143,C207,C231,C244,C326,C339,C344,C400,C401,C402,	Electrolytic Capacitor	25V_47uF_±20%_105°C
108	464-6E710-50	18	C050,C162,C186,C214,C241,C253,C254,C258,C280,C281,C301,C302,C309,C320,C323,C373,	Electrolytic Capacitor	25V_100uF_±20%_105 °C
109	464-6E810-50	2	C024,C336,	Electrolytic Capacitor	25V_1000uF_±20%_105 °C
110	464-6F747-50	2	C185,C346,	Electrolytic Capacitor	35V_470uF_±20%_105 °C
111	464-6F810-50	4	C115,C136,C221,C226,	Electrolytic Capacitor	35V_1000uF_±20%_105 °C
112	467-1E010-H0	2	R391,R392,	Resistor	1/2W_10Ω_±5%
113	467-1E210-H0	1	R380,	Resistor	1/2W_1K_±5%
114	471-1206FB-00	42	L002,L003,L005,L006,L007,L008,L009,L010,L011,L012,L015,L019,L020,L028,L029,L031,L032,L034,L035,L036,L037,L041,L042,L043,L044,L045,L046,L047,L048,L049,L050,L051,L052,L053,L054,L057,L066,L108,L111,L113,L	Chip choke	120Ω_100MHz_1A
115	471-A0028-01	2	L104,L105,	Common Mode Choke	LCL4.5-21uH±50%
116	471-A0619-01	1	L100,	Common Mode Choke	LCL-H21301HA
117	477-LCP114-30	2	L101,L103,	Inductor	LCP114-30uH
118	520-LT9X8X-J10A	1		PCB	Two lays PCB_247mmX145mm_1.0mm
119	590-6H2121-A25	1	TUNER100,	Tuner	JS-6H2/121A25_
121	742-110712-00	1	for N023,	HeatSink	11*7*12
122	742-221026-00	1	for N103,	HeatSink	22*10*26_
123	742-62801-00	1	for N003,	HeatSink	28*28*8_
124	750-S1715-00	1	for N003,for N023,	silica gel for heat conduction	GO-1715-1

Part V: Factory Setup and notice

1. Enter into factory menu

Turn on the TV power, make LCD be in working condition,

Press "Pic mode" + "5" + "8" + "0" key on the remote control panel can enter the factory menu.

Press "Menu" key of remote control can leave factory menu.

(1) factory menu display is below :

	Item	Advance		
1	Source	Source selection		
2	ADC Adjust	ADC value adjust		
3	PIC.Mode	Picture mode presetting		
4	Color Temp	Color tone adjusting		
5	Hotel Lock	Homtel mode control	CH PRESET LOCK	TV function setting lock
			Volume Max	Maximum Volume limit
			AV Lock	AV source lock
			Panel Lock	Key Board control lock
			RF Auto	Osd remind while No TV signal
6	Option		PowerOnLogo	Logo display control
			Back Light	Backlight level control
			SSC Adjust	Spread Spectrum Control
			Shop Out	Default setting for Shopping out
7	Dev Debug	HDCPKEY/register Reading		
8	Heat Run	Heat run, press "Power" key of key Board to return		
9	Design Menu	Register Setting		

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