

LH216S92T SERVICE MANUAL

INDEX:

PART 1: Brief Introduction Of The LH216S92T

- ◆ Schematic Diagram Block
- ◆ Printed Circuit

PART 2: Exploded view

PART 3: IC Introduction

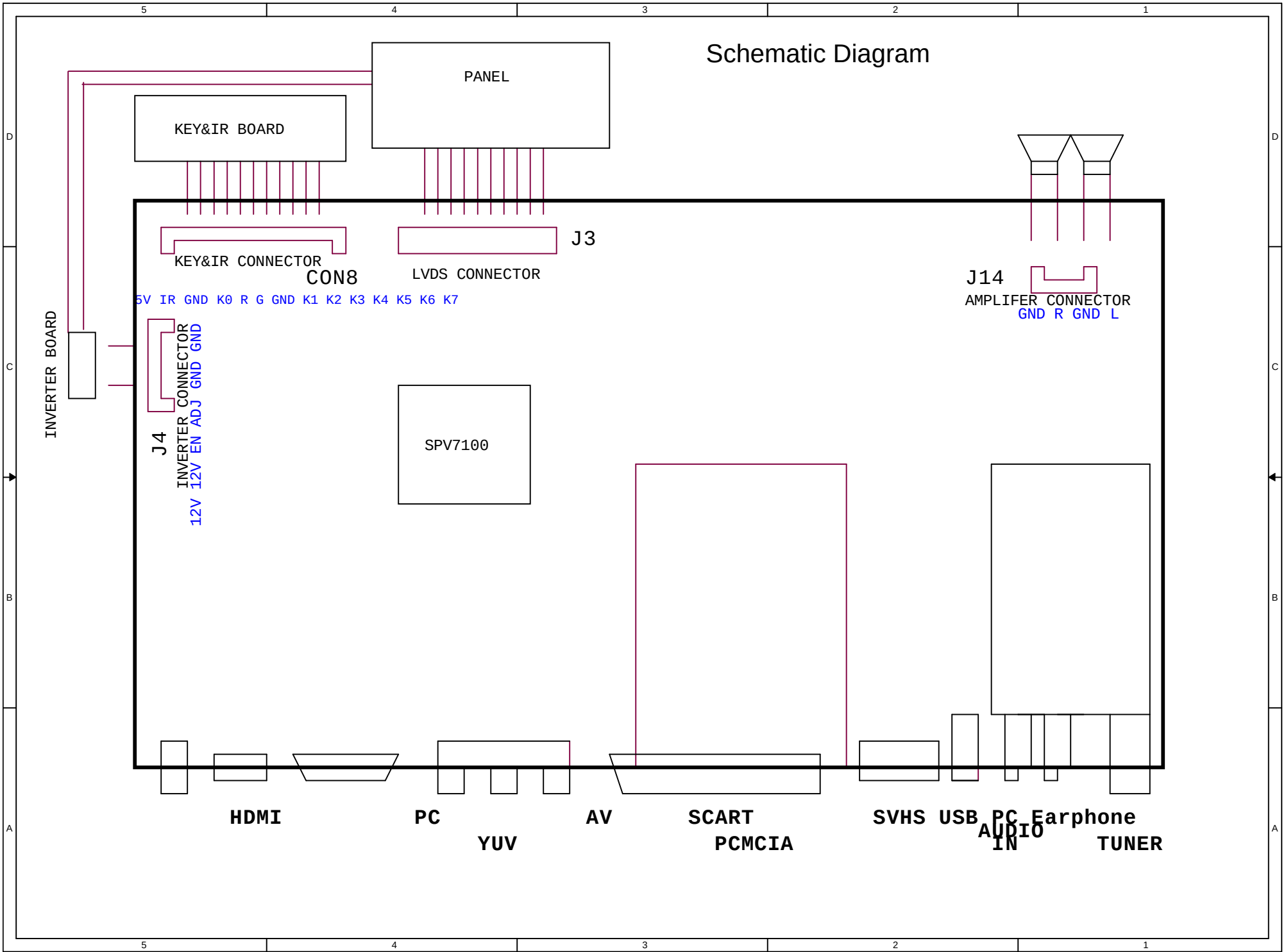
PART 4: Detailed Circuit

PART 5: Components List

PART6: Debug Instruction

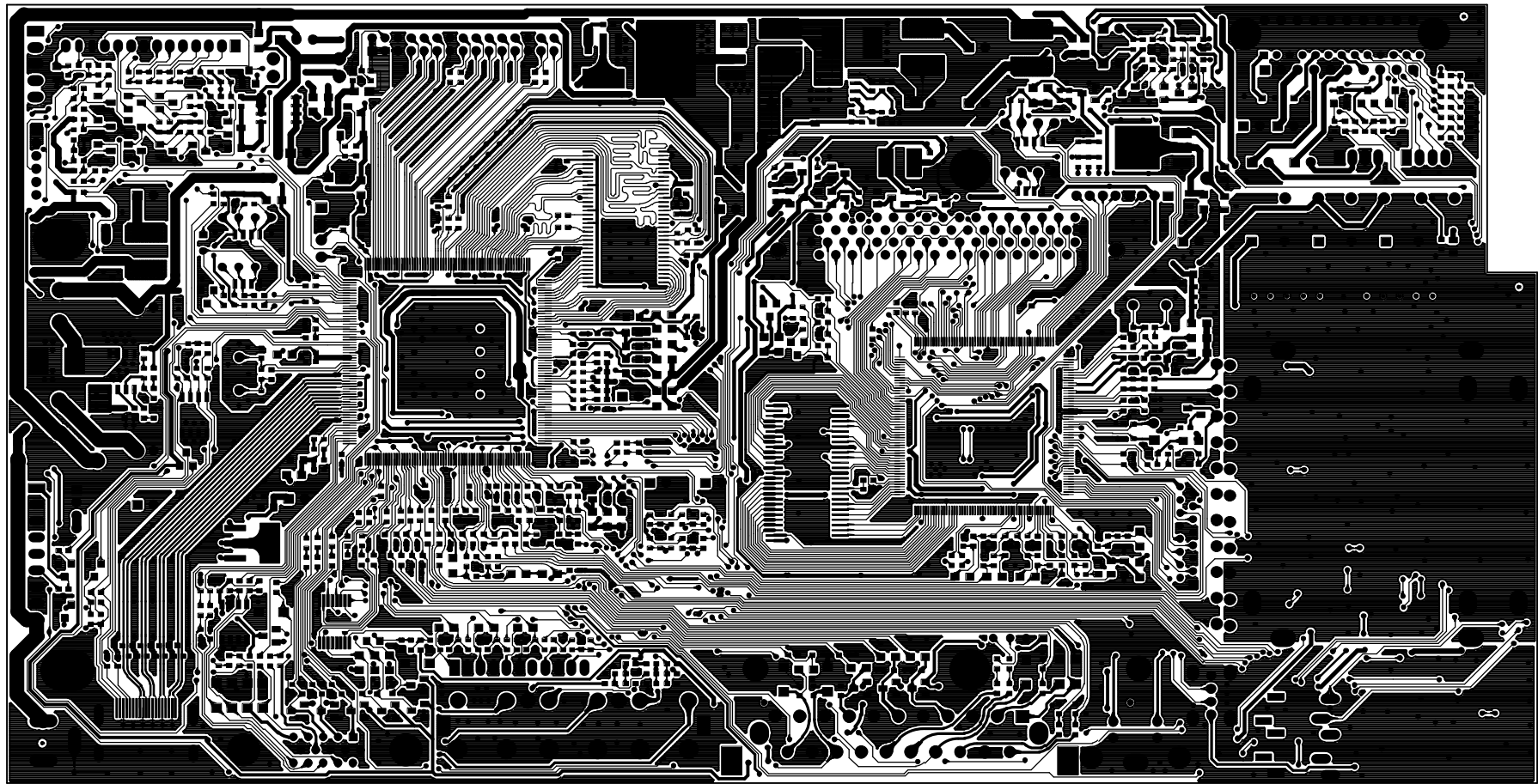
Part1:

Schematic Diagram

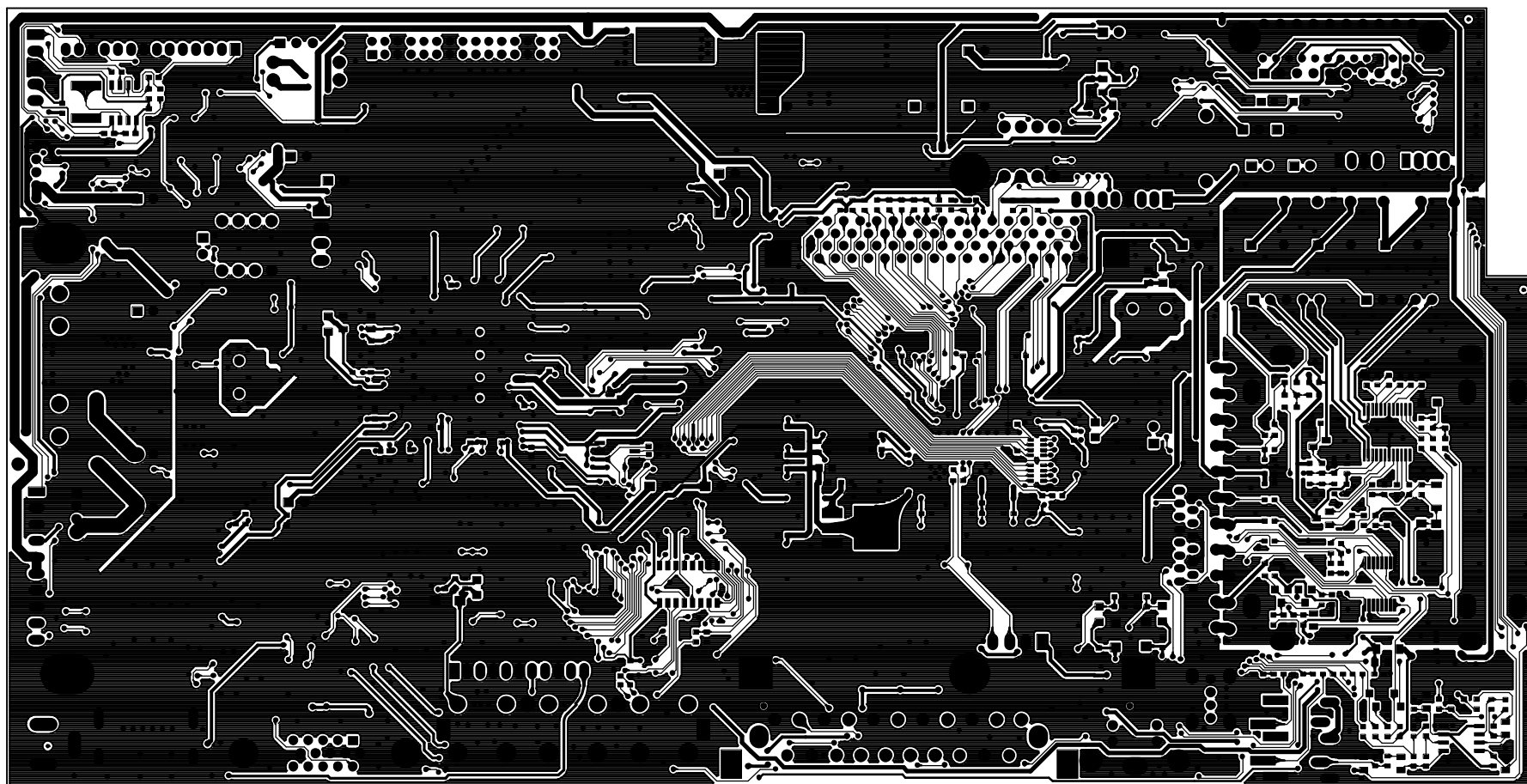


Printed Circuit

TV Main Board (Top View)



TV Main Board (Bottom view)





GHTech R & D CENTRE		TITLE LHE6592-EXPLOD			
MATERIAL		MODEL NO. LHE6592			
FINISH	A1	PART NO.	DRAWING NO.	REV. NO.	
	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	01	
SCALE		QTY.	SHEET 1 OF 1		



General Description

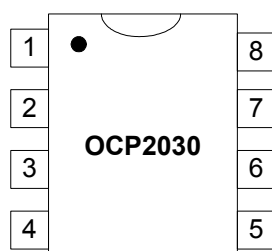
The OCP2030 is a buck topology of switching regulator for wide operating voltage applications field. The OCP2030 includes a high current P-MOSFET, high precision reference (0.5V) for comparing output voltage with feedback amplifier, an internal dead-time controller and oscillator for controlling the maximum duty cycle and PWM frequency, and has power-on programmable soft start time and short circuit PMOS turn-off and auto re-start protection functions.

Features

- Precision feedback reference voltage: 0.5V (2%)
- Wide supply voltage operating range: 3.6 to 20V
- Low current consumption: 3mA
- Internal fixed oscillator frequency: Typ. 360KHz
- Programmable Soft-Start function (SS)
- Short Circuit Shutdown and Auto Re-start function(ARSCP)
- Built-in P-MOSFET for 3A loading capability
- Package: SOP8

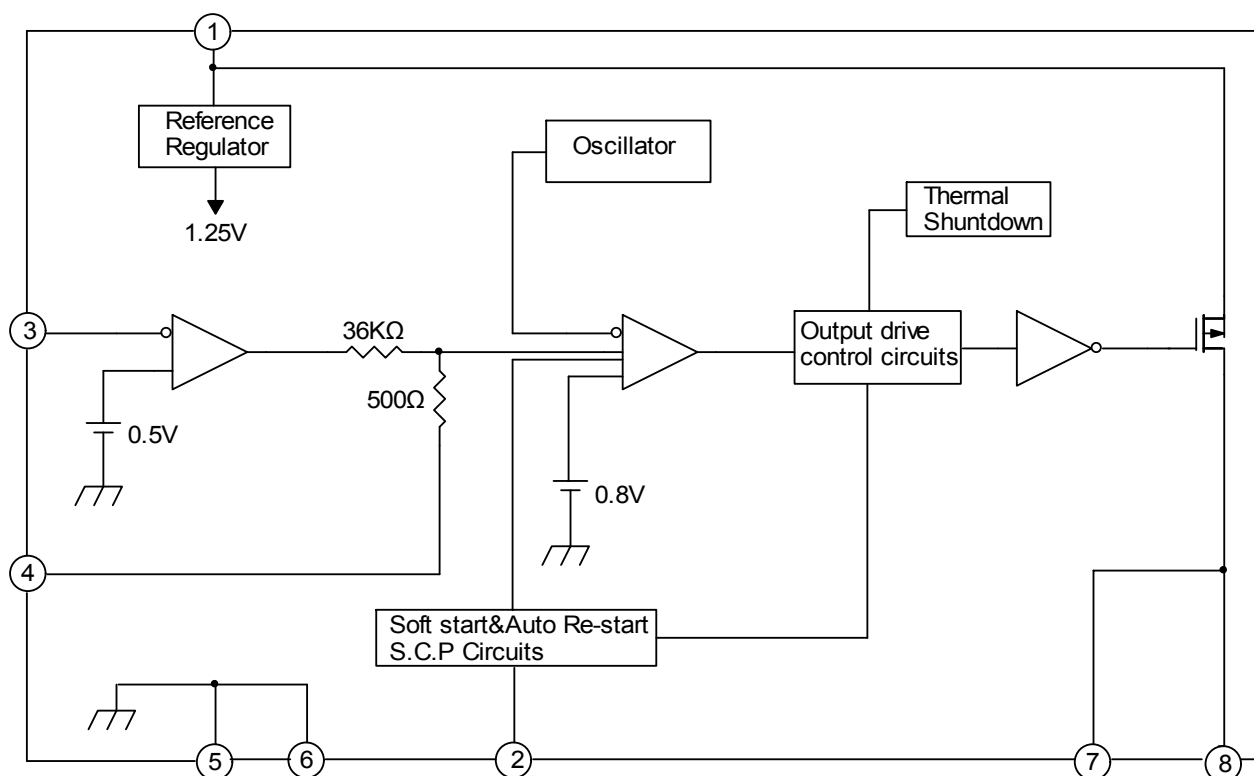
Pin Configuration

Top View



Name	No.	Status	Description
VCC	1	P	IC Power Supply (PMOS Source)
SS/SCP	2	I	Connecting with a Soft-start & ARSCP timing capacitor
IN-	3	I	Error Amplifier Inverting Input
FB	4	O	Error Amplifier Compensation Output
GND	5	P	IC Ground
	6		
LX	7	O	PMOS High Current Output
	8		

Block Diagram



Quad 1-of-2 multiplexer/demultiplexer

CBT3257

FEATURES

- 5 Ω switch connection between two ports
- TTL-compatible input levels
- Minimal propagation delay through the switch
- Latch-up protection exceeds 500 mA per JESD78
- ESD protection exceeds 2000 V HBM per JESD22-A114, 200 V MM per JESD22-A115 and 1000 V CDM per JESD22-C101

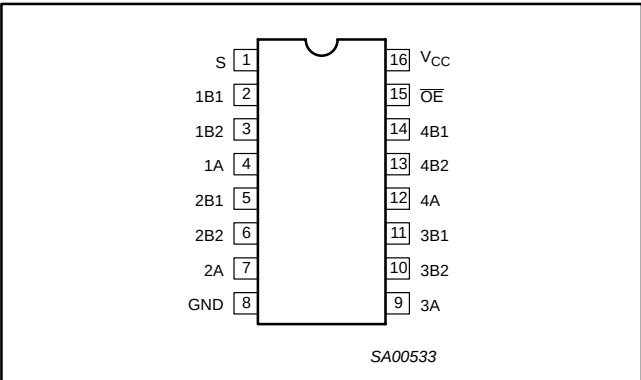
DESCRIPTION

The CBT3257 is a quad 1-of-2 high-speed TTL-compatible multiplexer/demultiplexer. The low on resistance of the switch allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise.

Output Enable ($\overline{OE}$) and select-control (S) inputs select the appropriate B1 and B2 outputs for the A-input data.

The CBT3257 is characterized for operation from -40 to +85 °C.

PIN CONFIGURATION



PIN DESCRIPTION

PIN NUMBER	SYMBOL	NAME AND FUNCTION
1	S	Select-control input
2, 3, 5, 6, 10, 11, 13, 14	1B1, 1B2, 2B1, 2B2, 3B1, 3B2, 4B1, 4B2	B outputs
4, 7, 9, 12	1A, 2A, 3A, 4A	A inputs
8	GND	Ground (0 V)
15	$\overline{OE}$	Output enable
16	V _{CC}	Positive supply voltage

ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	TOPSIDE MARK	DWG NUMBER
16-pin plastic SO	-40 to 85 °C	CBT3257D	CBT3257D	SOT109-1
16-pin plastic SSOP	-40 to 85 °C	CBT3257DB	CT3257	SOT338-1
16-pin plastic SSOP (QSOP)	-40 to 85 °C	CBT3257DS	CBT3257	SOT519-1
16-pin plastic TSSOP	-40 to 85 °C	CBT3257PW	CBT3257	SOT403-1

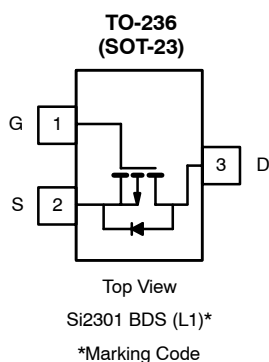
Standard packing quantities and other packaging data is available at www.philipslogic.com/packaging.



P-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^b
-20	0.100 @ $V_{GS} = -4.5$ V	-2.4
	0.150 @ $V_{GS} = -2.5$ V	-2.0



Ordering Information: Si2301BDS-T1

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		V _{DS}	-20		V
Gate-Source Voltage		V _{GS}	± 8		
Continuous Drain Current (T _J = 150°C) ^b	T _A = 25°C	I _D	-2.4	-2.2	A
	T _A = 70°C		-1.9	-1.8	
Pulsed Drain Current ^a		I _{DM}	-10		
Continuous Source Current (Diode Conduction) ^b		I _S	-0.72	-0.6	W
Power Dissipation ^b	T _A = 25°C	P _D	0.9	0.7	
	T _A = 70°C		0.57	0.45	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^b	R_{thJA}	120	145	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^c		140	175	

Notes

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, $t \leq 5$ sec.
- Surface Mounted on FR4 Board.

AP1084

5A Low Dropout Positive Adjustable or Fixed-Mode Regulator

■ Features

- 1.4V maximum dropout at full load current
- Built-in thermal shutdown
- Output current limiting
- Adjustable output voltage or fixed 1.5V, 1.8V, 2.5V, 3.3V, 5.0V
- Fast transient response
- Good noise rejection
- Package : TO252, TO263, TO220

■ General Description

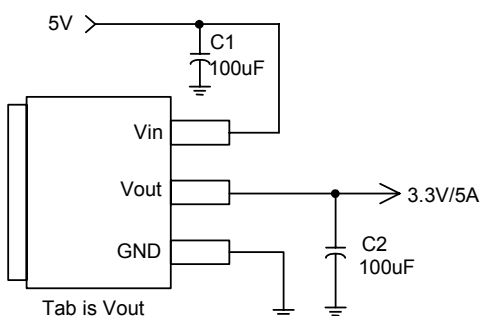
AP1084 is a low dropout positive adjustable or fixed-mode regulator with minimum of 5.0A output current capability. The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current 3.3V logic supply. AP1084 is also well suited for other applications such as VGA cards. AP1084 is guaranteed to have lower than 1.4V dropout at full load current making it ideal to provide well-regulated outputs of 1.25 to 3.3V with 4.7 to 12V input supply.

■ Ordering Information

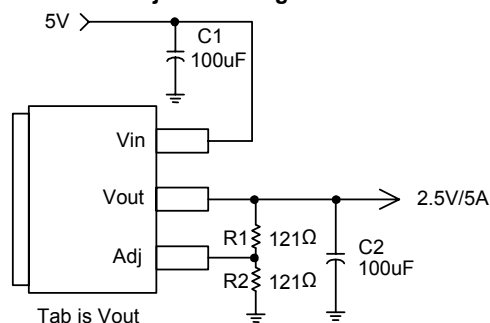
AP1084 X X X				
Low Dropout Regulator	Package	Vout	Lead Free	Packing
	D : TO252-3L K : TO263-3L T : TO220-3L	Blank : Adj 15 = 1.5V 18 = 1.8V 25 = 2.5V 33 = 3.3V 50 = 5.0V	Blank : Normal L : Lead Free Package	Blank : Tube A : Taping

■ Typical Circuit

5.0V to 3.3V Fixed Mode Regulator



Adjustable Regulator



Note: $V_o = V_{REF} * (1 + \frac{R_2}{R_1})$

AP1117

1A Low Dropout Positive Adjustable or Fixed-Mode Regulator

■ Features

- 1.4V maximum dropout at full load current
- Fast transient response
- Output current limiting
- Built-in thermal shutdown
- Packages: SOT223, TO263, TO252, TO220, SOT89
- Good noise rejection
- 3-Terminal Adjustable or Fixed 1.5V, 1.8V, 1.9V, 2.5V, 3.3V, 5.0V

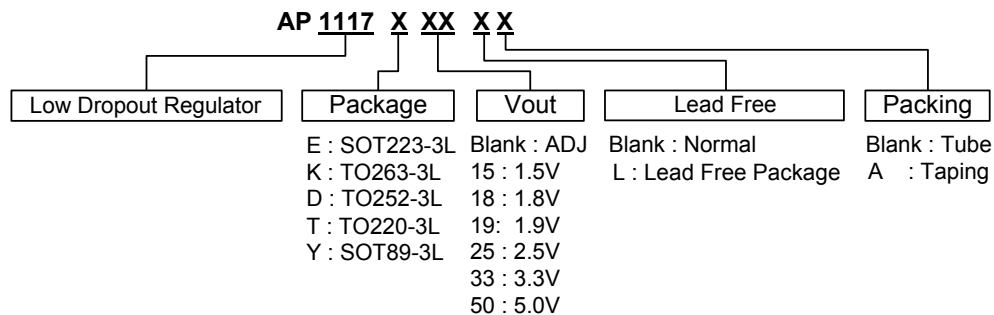
■ Applications

- PC peripheral
- Communication

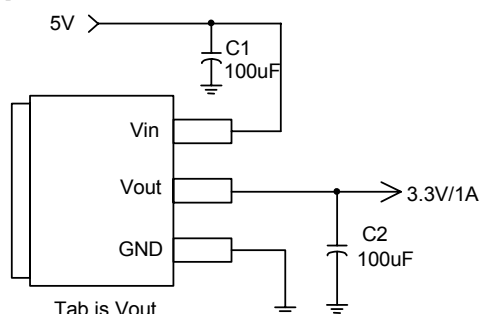
■ General Description

AP1117 is a low dropout positive adjustable or fixed-mode regulator with minimum of 1A output current capability. The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current 3.3V logic supply. AP1117 is also well suited for other applications such as VGA cards. AP1117 is guaranteed to have lower than 1.4V dropout at full load current making it ideal to provide well-regulated outputs of 1.25 to 5.0 with 6.4V to 12V input supply.

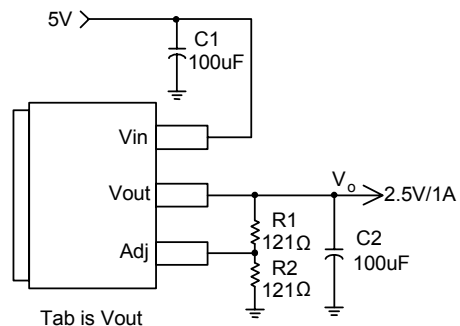
■ Ordering Information



■ Typical Circuit



(5V/3.3V fixed output)

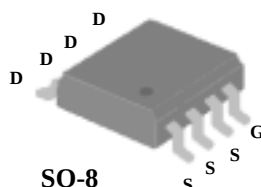


(5V/2.5V ADJ output)

Note: $V_o = V_{REF} * (1 + \frac{R_2}{R_1})$



- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ Fast Switching

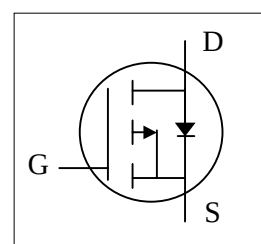


BV_{DSS}	-30V
$R_{DS(ON)}$	50m Ω
I_D	-5.3A

Description

The Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SO-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ³	-5.3	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ³	-4.7	A
I_{DM}	Pulsed Drain Current ¹	-20	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	2.5	W
	Linear Derating Factor	0.02	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	Thermal Resistance Junction-ambient ³ Max.	50	$^\circ\text{C}/\text{W}$

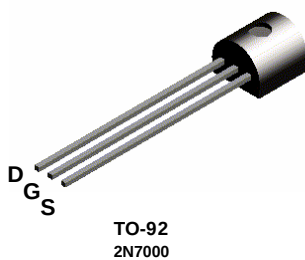
2N7000 / 2N7002 / NDS7002A N-Channel Enhancement Mode Field Effect Transistor

General Description

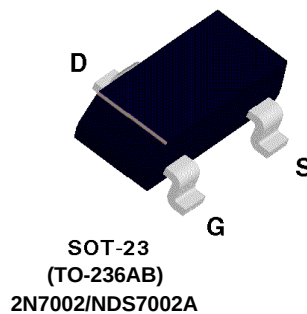
These N-Channel enhancement mode field effect transistors are produced using Fairchild's proprietary, high cell density, DMOS technology. These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance. They can be used in most applications requiring up to 400mA DC and can deliver pulsed currents up to 2A. These products are particularly suited for low voltage, low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

Features

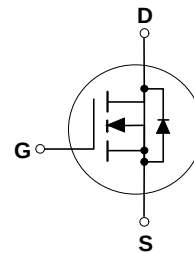
- High density cell design for low $R_{DS(ON)}$.
- Voltage controlled small signal switch.
- Rugged and reliable.
- High saturation current capability.



TO-92
2N7000



SOT-23
(TO-236AB)
2N7002/NDS7002A



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	2N7000	2N7002	NDS7002A	Units
V _{DSS}	Drain-Source Voltage	60			V
V _{DGR}	Drain-Gate Voltage (R _{GS} ≤ 1 MΩ)	60			V
V _{GSS}	Gate-Source Voltage - Continuous	±20			V
	- Non Repetitive (tp < 50μs)	±40			
I _D	Maximum Drain Current - Continuous	200	115	280	mA
	- Pulsed	500	800	1500	
P _D	Maximum Power Dissipation	400	200	300	mW
	Derated above 25°C	3.2	1.6	2.4	mW/°C
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to 150			°C
T _L	Maximum Lead Temperature for Soldering Purposes, 1/16" from Case for 10 Seconds	300			°C

THERMAL CHARACTERISTICS

Symbol	Parameter	2N7000	2N7002	NDS7002A	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	312.5	625	417	$^\circ\text{C/W}$

2 × 6 W stereo power amplifier**TDA1517; TDA1517P****FEATURES**

- Requires very few external components
- High output power
- Fixed gain
- Good ripple rejection
- Mute/standby switch
- AC and DC short-circuit safe to ground and V_P
- Thermally protected
- Reverse polarity safe
- Capability to handle high energy on outputs ($V_P = 0$ V)
- No switch-on/switch-off plop
- Electrostatic discharge protection.

GENERAL DESCRIPTION

The TDA1517 is an integrated class-B dual output amplifier in a plastic single in-line medium power package with fin (SIL9MPF) and a plastic heat-dissipating dual in-line package (HDIP18). The device is primarily developed for multi-media applications.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_P	supply voltage		6.0	14.4	18.0	V
I_{ORM}	repetitive peak output current		–	–	2.5	A
$I_{q(tot)}$	total quiescent current		–	40	80	mA
I_{sb}	standby current		–	0.1	100	μ A
I_{sw}	switch-on current		–	–	40	μ A
$ Z_i $	input impedance		50	–	–	k Ω
P_o	output power	$R_L = 4 \Omega$; THD = 0.5%	–	5	–	W
		$R_L = 4 \Omega$; THD = 10%	–	6	–	W
SVRR	supply voltage ripple rejection	$f_i = 100$ Hz to 10 kHz	48	–	–	dB
α_{cs}	channel separation		40	–	–	dB
G_v	closed loop voltage gain		19	20	21	dB
$V_{no(rms)}$	noise output voltage (RMS value)		–	50	–	μ V
T_c	crystal temperature		–	–	150	$^{\circ}$ C

ORDERING INFORMATION

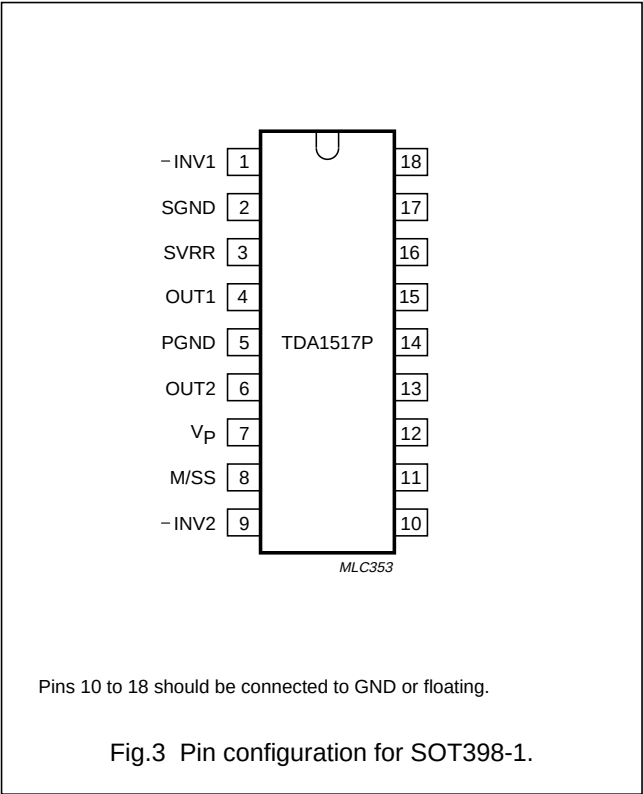
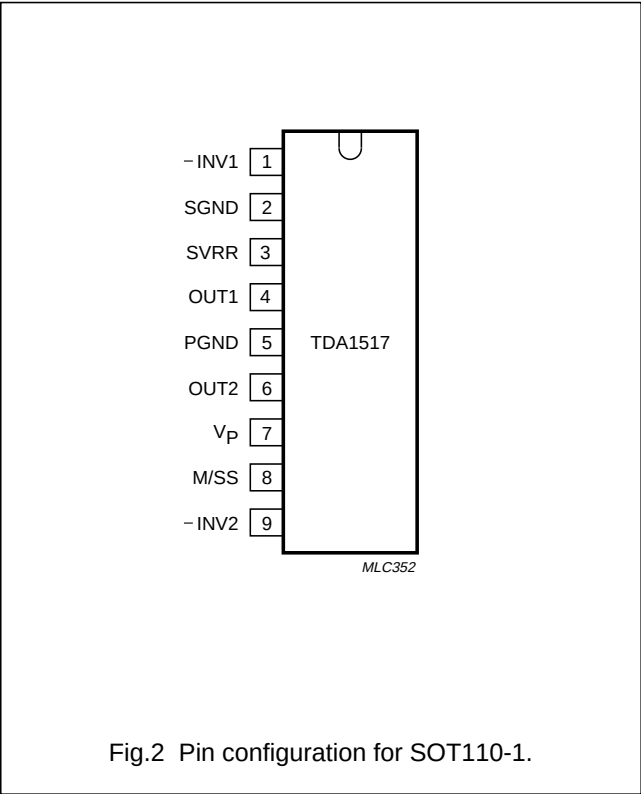
TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA1517	SIL9MPF	plastic single in-line medium power package with fin; 9 leads	SOT110-1
TDA1517P	HDIP18	plastic heat-dissipating dual in-line package; 18 leads	SOT398-1

2 × 6 W stereo power amplifier

TDA1517; TDA1517P

PINNING

SYMBOL	PIN	DESCRIPTION
–INV1	1	non-inverting input 1
SGND	2	signal ground
SVRR	3	supply voltage ripple rejection output
OUT1	4	output 1
PGND	5	power ground
OUT2	6	output 2
V _P	7	supply voltage
M/SS	8	mute/standby switch input
–INV2	9	non-inverting input 2



FUNCTIONAL DESCRIPTION

The TDA1517 contains two identical amplifiers with differential input stages. The gain of each amplifier is fixed at 20 dB. A special feature of the device is the mute/standby switch which has the following features:

- Low standby current (<100 µA)
- Low mute/standby switching current (low cost supply switch)
- Mute condition.

FEATURES

- ❑ Low voltage and low power operations:
 - FT24C02/04/08/16: $V_{CC} = 2.5V$ to $5.5V$
 - FT24C02A/04A/08A/16A: $V_{CC} = 1.8V$ to $5.5V$
- ❑ Maximum Standby current $< 1\mu A$ (typically $0.02\mu A$ and $0.06\mu A$ @ $1.8V$ and $5.5V$ respectively).
- ❑ 16 bytes page write mode.
- ❑ Partial page write operation allowed.
- ❑ Internally organized: 256×8 (2K), 512×8 (4K), 1024×8 (8K), 2048×8 (16K).
- ❑ Standard 2-wire bi-directional serial interface.
- ❑ Schmitt trigger, filtered inputs for noise protection.
- ❑ Self-timed programming cycle (5ms maximum).
- ❑ Automatic erase before write operation.
- ❑ Write protect pin for hardware data protection.
- ❑ High reliability: typically 800,000 cycles endurance.
- ❑ 100 years data retention.
- ❑ Industrial temperature range ($-40^{\circ}C$ to $85^{\circ}C$).
- ❑ Standard 8-pin PDIP/SOIC/TSSOP Pb-free packages.

and

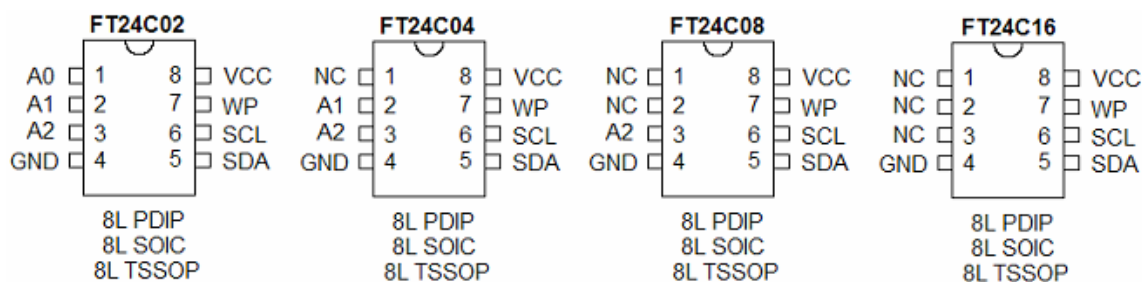
DESCRIPTION

The FT24C02/04/08/16 series are 2048/4096/8192/16384 bits of serial Electrical Erasable and Programmable Read Only Memory, commonly known as EEPROM. They are organized as 256/512/1024/2048 words of 8 bits (1 byte) each. The devices are fabricated with proprietary advanced CMOS process for low power and low voltage applications. These devices are available in standard 8-lead PDIP, 8-lead JEDEC SOIC and 8-lead TSSOP packages. A standard 2-wire serial interface is used to address all read and write functions. Our extended V_{CC} range ($1.8V$ to $5.5V$) devices enables wide spectrum of applications.

PIN CONFIGURATION

Pin Name	Pin Function
A2, A1, A0	Device Address Inputs
SDA	Serial Data Input / Open Drain Output
SCL	Serial Clock Input
WP	Write Protect
NC	No-Connect

All three packaging types come in conventional or Pb-free certified.



DESCRIPTION

The HY5DU281622FT(P) is a 134,217,728-bit CMOS Double Data Rate(DDR) Synchronous DRAM, ideally suited for the main memory applications which requires large memory density and high bandwidth.

This Hynix 128Mb DDR SDRAMs offer fully synchronous operations referenced to both rising and falling edges of the clock. While all addresses and control inputs are latched on the rising edges of the CK (falling edges of the /CK), Data, Data strobes and Write data masks inputs are sampled on both rising and falling edges of it. The data paths are internally pipelined and 2-bit prefetched to achieve very high bandwidth. All input and output voltage levels are compatible with SSTL_2.

FEATURES

- $V_{DD}, V_{DDQ} = 2.3V \text{ min} \sim 2.7V \text{ max}$
(Typical 2.5V Operation $\pm 0.2V$ for DDR266, 333)
- $V_{DD}, V_{DDQ} = 2.4V \text{ min} \sim 2.7V \text{ max}$
(Typical 2.6V Operation $\pm 0.1V$ for DDR400 and 400Mbps/pin product)
- All inputs and outputs are compatible with SSTL_2 interface
- Fully differential clock inputs (CK, /CK) operation
- Double data rate interface
- Source synchronous - data transaction aligned to bidirectional data strobe (DQS)
- x16 device has two byte-wide data strobes (UDQS, LDQS) per each x8 I/O
- Data outputs on DQS edges when read (edged DQ)
Data inputs on DQS centers when write (centered DQ)
- On chip DLL align DQ and DQS transition with CK transition
- DM mask write data-in at the both rising and falling edges of the data strobe
- All addresses and control inputs except data, data strobes and data masks latched on the rising edges of the clock
- Programmable CAS latency 2/2.5 (DDR266, 333) and 3 (DDR400 and 400Mbps/pin product) supported
- Programmable burst length 2/4/8 with both sequential and interleave mode
- Internal four bank operations with single pulsed /RAS
- Auto refresh and self refresh supported
- tRAS lock out function supported
- 4096 refresh cycles/64ms
- JEDEC standard 400mil 66pin TSOP-II with 0.65mm pin pitch
- Lead free (*ROHS Compliant)

ORDERING INFORMATION

Part No.	Configuration	Package
HY5DU281622F(L)TP-X*	8Mx16	400mil 66pin TSOP-II**

* X means speed grade

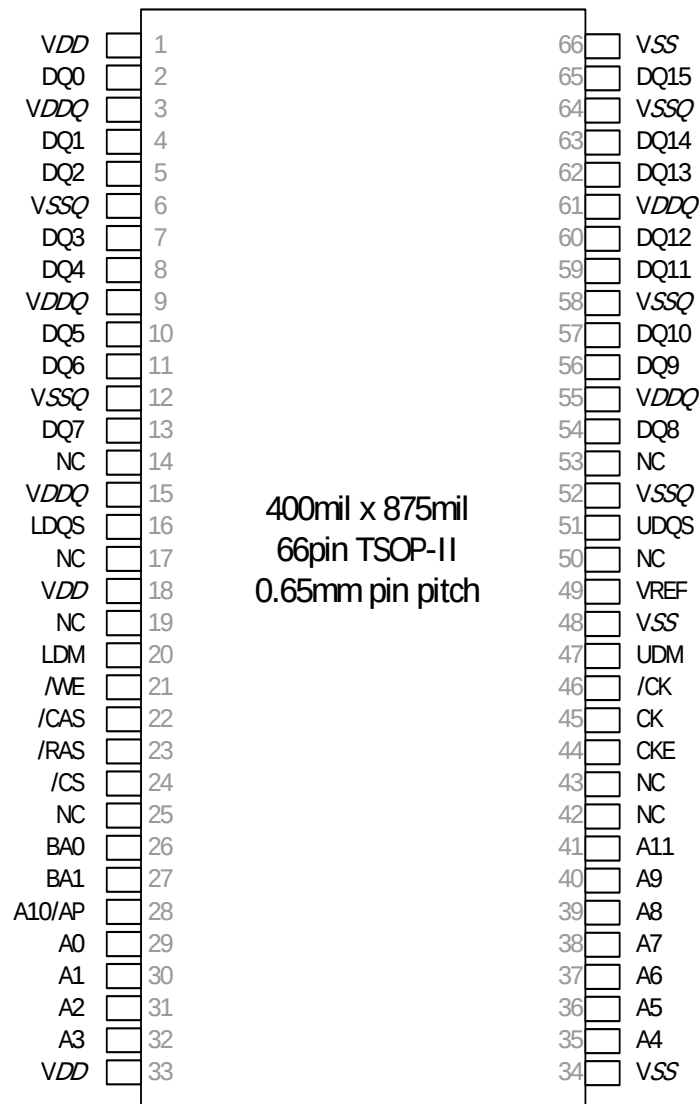
** Lead-free product

*ROHS (Restriction Of Hazardous Substances)

OPERATING FREQUENCY

Grade	Clock Rate		Remark
-5	200MHz@CL3		400Mbps/pin (maximum Data rate)
-D43	200MHz@CL3		DDR400B (3-3-3)
-D4	200MHz@CL3		DDR400 (3-4-4)
-J	133MHz@CL2	166MHz @CL2.5 & @CL3	DDR333 (2.5-3-3) DDR333 (3-3-3)
-K	133MHz@CL2	133MHz@CL2.5	DDR266A (2-3-3)
-H	100MHz@CL2	133MHz@CL2.5	DDR266B (2.5-3-3)

PIN CONFIGURATION



ROW AND COLUMN ADDRESS INFORMATION

- Organization : 2M x 16 x 4banks
- Row Address : A0 - A11
- Column Address : A0 - A8
- Bank Address : BA0, BA1
- Auto Precharge Flag : A10
- Refresh : 4K

SHENZHEN TENA ELECTRONICS CO., LTD.		PRODUCT SPECIFICATION	MODEL TNDT1A1200F	PAGE 1
			DESCRIPTION DVB-T	
TNDT1A1200F TNDT1A2200F FOR DIGITAL TERRESTRIAL RECEPTION CUSTOMER APPROVAL				
A	Original Release			
REV	DESCRIPTION		DATE	SIGN
DESCRIPTION EUROPEAN DIGITAL TERRESTRIAL STANDARD		APPROVAL DATE	CHECK DATE	DESIGN DATE 2008-10-16
DRAWING NO				
REVISIONS	PAGES TOTAL 17			
1.0				

SHENZHEN TENA ELECTRONICS CO., LTD.		PRODUCT SPECIFICATION	MODEL TNDT1A1200F	PAGE 2
			DESCRIPTION DVB-T	
NO	SPECIFICATION			
1	FEATURES 1. +5V supply voltage only; no external tuning voltage required. 2. Tuners for horizontal and vertical mounting available. 3. Option with DC-power output through input connector (e. g. indoor antenna supply) 4. Tuners comply with relevant CENELEC standards with regard to requirements concerning signal handling capability and immunity 5. Superior low noise and high sensitivity performance 6. RF-in to RF-out loopthrough amplifiers 7. low noise and excellent linearity 8. VHF high to UHF frequency range coverage 9. Standard connectors for in-and output e. g. IEC, F-connector. RCA 10. full UHF /VHF-H frequency coverage 11. Pattem generator included 12. I²C programmable 13. 400KHz Bus compliant 14. Stand-by mode addressable 15. High performance and cost effective single conversion tuner 16. I²C programmable 17. 400KHz Bus compliant 18. Fast PLL tuning speed (programmable step size e.g.62.5KHz and 166.67KHz) 19. Flat overall frequency response 20. High PLL loop bandwidth which ensures very low oscillator phase noise 21. SAW-filter and IF-amplifier included a) Switchable 7/8 MHz SAW filter (full band tuners) b) Fixed 8 MHz SAW filter (UHF only tuners) c) IF-amplification controllable over a wide range 22. Differential, filtered (SAW)‘digital’ IF-output to directly drive the channel decoder			

Dual 4-channel analog multiplexer, demultiplexer

74HC4052; 74HCT4052

FEATURES

- Wide analog input voltage range from -5 V to $+5\text{ V}$
- Low ON-resistance:
 - $80\ \Omega$ (typical) at $V_{CC} - V_{EE} = 4.5\text{ V}$
 - $70\ \Omega$ (typical) at $V_{CC} - V_{EE} = 6.0\text{ V}$
 - $60\ \Omega$ (typical) at $V_{CC} - V_{EE} = 9.0\text{ V}$
- Logic level translation: to enable 5 V logic to communicate with $\pm 5\text{ V}$ analog signals
- Typical “break before make” built in
- Complies with JEDEC standard no. 7A
- ESD protection:
 - HBM EIA/JESD22-A114-B exceeds 2000 V
 - MM EIA/JESD22-A115-A exceeds 200 V .
- Specified from $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ and $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$.

APPLICATIONS

- Analog multiplexing and demultiplexing
- Digital multiplexing and demultiplexing
- Signal gating.

DESCRIPTION

The 74HC4052 and 74HCT4052 are high-speed Si-gate CMOS devices and are pin compatible with the HEF4052B. They are specified in compliance with JEDEC standard no. 7A.

The 74HC4052 and 74HCT4052 are dual 4-channel analog multiplexers or demultiplexers with common select logic. Each multiplexer has four independent inputs/outputs (pins nY0 to nY3) and a common input/output (pin nZ). The common channel select logics include two digital select inputs (pins S0 and S1) and an active LOW enable input (pin $\bar{E}$). When pin $\bar{E} = \text{LOW}$, one of the four switches is selected (low-impedance ON-state) with pins S0 and S1. When pin $\bar{E} = \text{HIGH}$, all switches are in the high-impedance OFF-state, independent of pins S0 and S1.

V_{CC} and GND are the supply voltage pins for the digital control inputs (pins S0, S1, and $\bar{E}$). The V_{CC} to GND ranges are 2.0 V to 10.0 V for 74HC4052 and 4.5 V to 5.5 V for 74HCT4052. The analog inputs/outputs (pins nY0 to nY3 and nZ) can swing between V_{CC} as a positive limit and V_{EE} as a negative limit. $V_{CC} - V_{EE}$ may not exceed 10.0 V .

For operation as a digital multiplexer/demultiplexer, V_{EE} is connected to GND (typically ground).

FUNCTION TABLE

INPUT ⁽¹⁾			CHANNEL BETWEEN
$\bar{E}$	S1	S0	
L	L	L	nY0 and nZ
L	L	H	nY1 and nZ
L	H	L	nY2 and nZ
L	H	H	nY3 and nZ
H	X	X	none

Note

1. H = HIGH voltage level
L = LOW voltage level
X = don't care.

HIGHLY INTEGRATED LCD TV PROCESSOR

1. GENERAL DESCRIPTION

The SPV7100A is a highly integrated solution for the mainstream LCD TV applications. The SPV7100A provides on-chip functions including a high-speed triple-ADC and PLL, HDMI **PanelLink™** Cinema receiver, TV decoder with 3-D comb filter, 4-pair Audio Line-In, 2-pair Audio Line-Out, one SIF demodulator and audio decoder, 3D motion adaptive de-interlacing, 2:2/3:2 film mode detection, video on graphic PIP/POP, SDRAM/DDR controller, color management control, sRGB color management, bitmap-based and font-based OSD engine, embedded CPU and a dual channels LVDS transmitter. The chip could support LCD TV up to 1080P input resolution and 1080p output resolution.

Note: PanelLink is the Trade Mark of Silicon Image Inc.

2. FEATURES

2.1. Graphics and Video Input Port

- Integrate 150MHz 10-bit ADC/PLL
- Dual CCIR656 digital video ports to support 2 input or 1 input/1 output
- Support SDTV at 480i/576i and 480p/576p
- Support HDTV at 720p and 1080i and 1080p
- Support PC graphics VGA, SVGA, XGA, WXGA, SXGA@75Hz (135MHz)
- Build-in sync. processor for separate, composite or sync on Y/G
- Support Video/Graphics PIP/DW
- Channel swap for any source input
- Image Format Detection/Auto Image Positioning/Auto Phase Detection
- Full SCART support including RGB fast blank

2.2. HDMI

- HDMI 1.2 compliant and DVI 1.0 compliant receiver
- HDCP 1.1 compliant receiver
- Support DTV resolutions (480i/576i/480p/576p/720p/1080i/1080p)
- S/PDIF output supports PCM, Dolby Digital, DTS digital audio with bypass mode
- Four I2S audio outputs to SSD(Stereo Sound Decoder) with bypass mode
- Auto audio error detection with programmable soft mute
- Build-in OTP for HDCP key

2.3. 3D Video Decoder

- NTSC/PAL/SECAM video decoder
- 3D comb filter for NTSC, PAL I (B,G,H,D,N), PAL-M, PAL-N
- Enhanced NTSC/PAL/SECAM auto detection
- 4 analog inputs and one analog video output
- Cross-color reduction for NTSC by 3-line comb filtering
- Cross-color reduction for PAL by 5-line comb filtering
- Motion adaptive 3D Y/C separation comb filter for NTSC/PAL system
- Multi-standard VBI data decoder, Teletext 2.5, WSS, VPS, Closed-caption and V-chip
- Macrovision detection
- VBI data (C.C, TTX2.5, V-chip) overlay display

2.4. High Quality Video Processing

- Enhanced Pixel-based 3D motion adaptive de-interlacing (SDTV/HDTV)
- Enhanced 2:2/3:2 film mode detection
- Support Graphics mode frame rate conversion
- Support Video mode frame rate conversion
- 2D Edge enhancement
- Dynamic Peaking Filter
- Enhanced Digital Luminance Transient Improvement (DLTI)
- Digital Color Transient Improvement (DCTI)
- Black/White Level Expansion and Dynamic Contrast
- RGBYMC color adjustment
- Dark and Gray area UV Suppression
- Enhanced 3D motion adaptive noise reduction
- De-blocking and de-mosquito filters
- Color management/Color temperature adjustment
- Brightness/Contrast/hue/Saturation adjustment
- Support sRGB color correction
- Build-in three 256-point gamma tables with 10 bits resolution
- Color space conversion, both YCbCr to RGB and RGB to YCbCr
- Build-in temporal/spatial color dithering
- 10-bit video/image processing

2.5. High Quality Video Scaling Engine

- Advanced third-generation scaling engine
- Support 4:3 / 16:9 with non-linear scaling
- Support Moiré Canceling

2.6. Multi-standard TV Sound Decoder

- Field proven TV sound decoder
- Support BTSC, A2/Zweiton, NICAM, EIAJ, SECAM, FM stereo
- Automatic TV-standard detection (ASD)
- Non-standard carrier compatible
- SAP decoding where applicable
- Auto fallback from NICAM where applicable

2.7. Embedded OSD and VBI Controller

- Build-in programmable OSD engine for two OSD windows (bit map OSD)
- 1,2,4 and 8-bit per pixel (bit-map OSD)
- Support hardware cursor
- Support programmable 512 font-based OSD and graphics-based OSD
- Support VBI decoder (CC,V-Chip and Teletext)
- Support VBI CC/TTX/Menu with more than 1000 char-fonts

2.8. Embedded DDR/SDRAM Controller

- Integrated DDR/SDRAM controller with DLL (DDR)
- Support 32-bit DRAM bus with memory size from 16Mb (limited functions) to 256Mb

2.9. Programmable Digital Output for LCD

- Support output sequence mapping for TI and Thine
- Build-in dual channels 8-bit LVDS Tx or single channel 10-bit LVDS Tx
- Support display output up to 1920x1200 @60Hz (165Mhz WUXGA reduced blanking)
- Support Power Down Sequence
- 4-ch PWM backlight intensity control

2.10. CPU

- Powerful 32-bit RISC CPU
- Simple memory management stub (SMMU)

- MIPS-I instruction with DSP instruction set extension
- 2K bytes 2-way instruction cache
- 4K bytes direct-mapped data cache
- 8K bytes data memory for DMA operation
- EJTAG interface
- One UART up to 115200 baud rate
- Four 24-bit up/down timers
- 3K Bytes IMem for power saving mode

2.11. Audio Processor

- Support SPDIF input
- Support SPDIF output (signal could come from SPDIF input or SSD)
- Support up to 8 channels I2S I/O
- 4 channels audio DAC output
- 4 channels audio ADC input
- Channel: L, R, C, S, Sub, Aux1, 2 and 3 @ 32 kHz
- 5- band Equalizer
- 3-D surround sound
- Bass management
- Volume control
- Support sub-woofer output
- Sample rate conversion
- SSD could output up to 3 sources
- Virtual Dolby Surround (VDSII 422 and 423) (support by SPV7100AxD)
- SRS TruSurround (XT, WOW, 3D Sound) (support by SPV7100 AxS)

2.12. Misc

- Build-in TV remote control 1 infra-red receiver interface
- 2-channels 6-bits ADC for key scan function
- Build-in pattern generator for auto testing
- 256-pin LQFP for LCD application

4.3. List of Packages and Pins

4.3.1. 256- LQFP Package

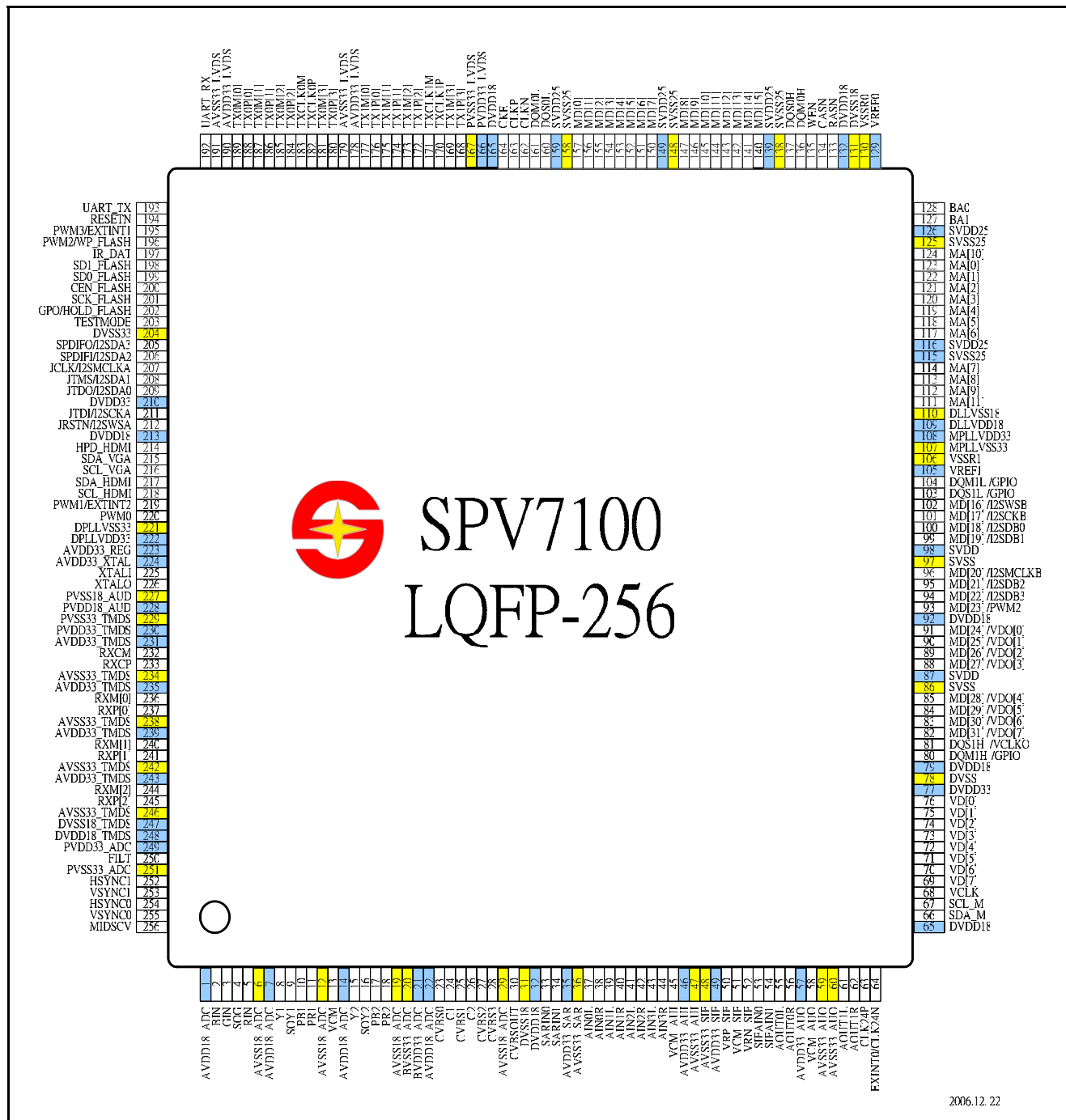


Figure 4-1 SPV7100A Pin Configuration

5 Function

5-1 General Description

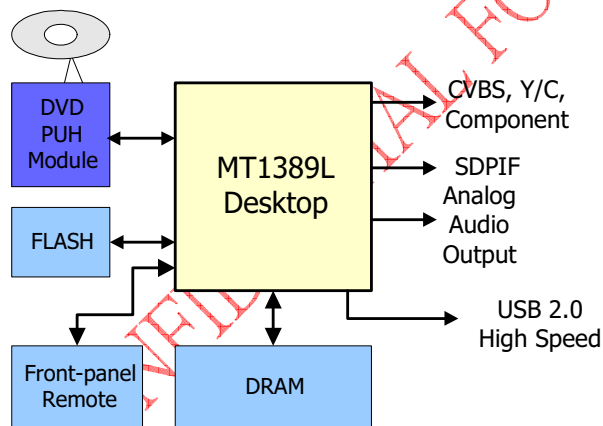
MediaTek MT1389L is a cost-effective DVD system-on-chip (SOC) which incorporates advanced features like MPEG-4 video decoder, high quality TV encoder and state-of-art de-interlace processing. The MT1389L enables consumer electronics manufacturers to build high quality, USB2.0, MS/SD/MMC reader, feature-rich DVD players, portable DVD players or any other home entertainment audio/video devices.

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

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

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

High Performance Memory Storage Device: As the core of Portable DVD players need more capability to support current multimedia contents. The MT1389L provides the interface for the 3-in-1 card reader, which supports Memory-Stick, Secure Digital Memory Card, and MultiMediaCard, to connect with the mainstream digital camera FLASH cards. For the USB application, we adopt **USB2.0 High speed** specification to reach rich-contents transference. **USB 2.0 High speed** will support for high-speed devices. **USB 2.0 High Speed** is suitable for high-performance devices such as high-density storage devices. In addition, **USB 2.0 High Speed** supports old USB 1.0/1.1 software and peripherals, offering impressive and even better compatibility to customers



DVD Player System Diagram Using MT1389L

Key Features

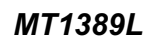
- RF/Servo/MPEG Integration
- DivX Home Theater Level MPEG4 ASP Video decoder
- Support Nero-Digital
- Support DivX Ultra
- High Performance Audio Processor
- Progressive Scan
- 108MHz/12-bit, 4 CH TV Encoder
- Internal 6CH Audio DAC
- Internal 2CH Audio ADC
- USB2.0 High Speed (Host/Device)
- 3-in-1 MS/SD/MMC reader

Applications

Standard DVD Players

¹ DivX is a trademark of DivXNetworks

² **USB High Speed** : 480Mbit/sec. USB Full Speed : 12Mbit/sec.

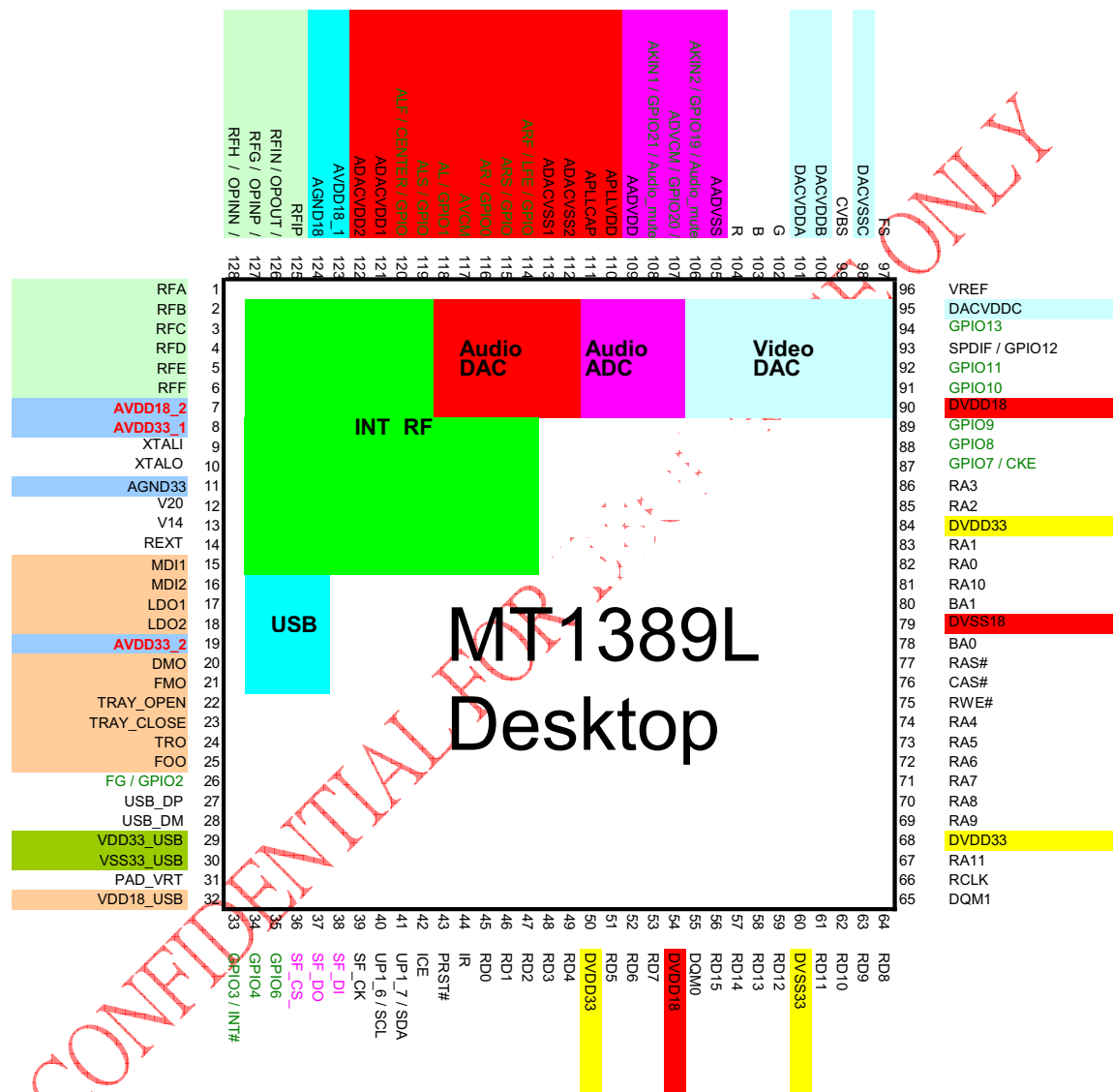


Desktop DVD Player SOC

PRELIMINARY. SUBJECT TO CHANGE WITHOUT NOTICE

MTK CONFIDENTIAL. NO DISCLOSURE

6 Pin Assignment



**EN25B16****16 Mbit Serial Flash Memory with Boot and Parameter Sectors****FEATURES**

- Single power supply operation
 - Full voltage range: 2.7-3.6 volt
- 16 M-bit Serial Flash
 - 16 M-bit/2048 K-byte/8192 pages
 - 256 bytes per programmable page
- High performance
 - 75MHz clock rate
- Low power consumption
 - 5 mA typical active current
 - 1 μ A typical power down current
- Flexible Sector Architecture:
 - Two 4-Kbyte, one 8-Kbyte, one 16-Kbyte, one 32-Kbyte, and thirty one 64-Kbyte sectors
- Software and Hardware Write Protection:
 - Write Protect all or portion of memory via software
 - Enable/Disable protection with WP# pin
- High performance program/erase speed
 - Byte program time: 7 μ s typical
 - Page program time: 1.5ms typical
 - Sector erase time: 300 to 800ms typical
 - Chip erase time: 18 Seconds typical
- Minimum 100K endurance cycle
- Package Options
 - 8 pins SOP 200mil body width
 - 8 contact VDFN
 - 16 pin SOP 300mil body width
 - All Pb-free packages are RoHS compliant
- Commercial and industrial temperature Range

GENERAL DESCRIPTION

The EN25B16 is a 16M-bit (2048K-byte) Serial Flash memory, with advanced write protection mechanisms, accessed by a high speed SPI-compatible bus. The memory can be programmed 1 to 256 bytes at a time, using the Page Program instruction.

The EN25B16 has thirty six sectors including thirty one sectors of 64KB, one sector of 32KB, one sector of 16KB, one sector of 8KB and two sectors of 4KB. This device is designed to allow either single Sector at a time or full chip erase operation. The EN25B16 can protect boot code stored in the small sectors for either bottom or top boot configurations. The device can sustain a minimum of 100K program/erase cycles on each sector.

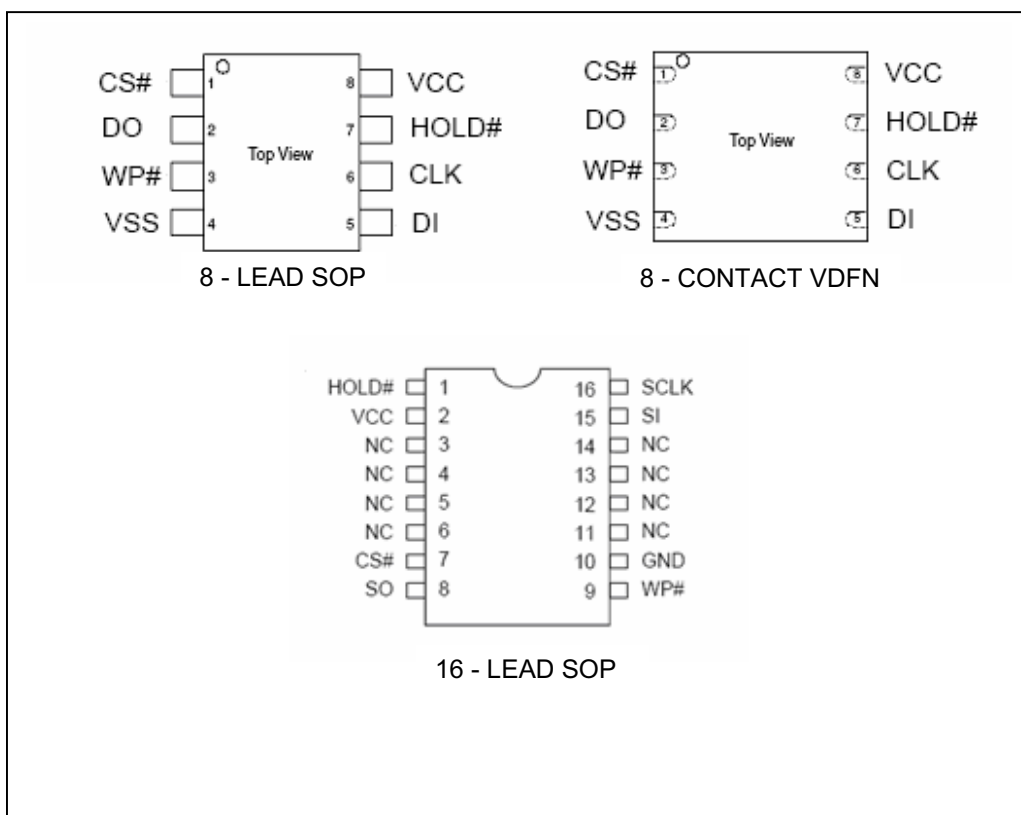
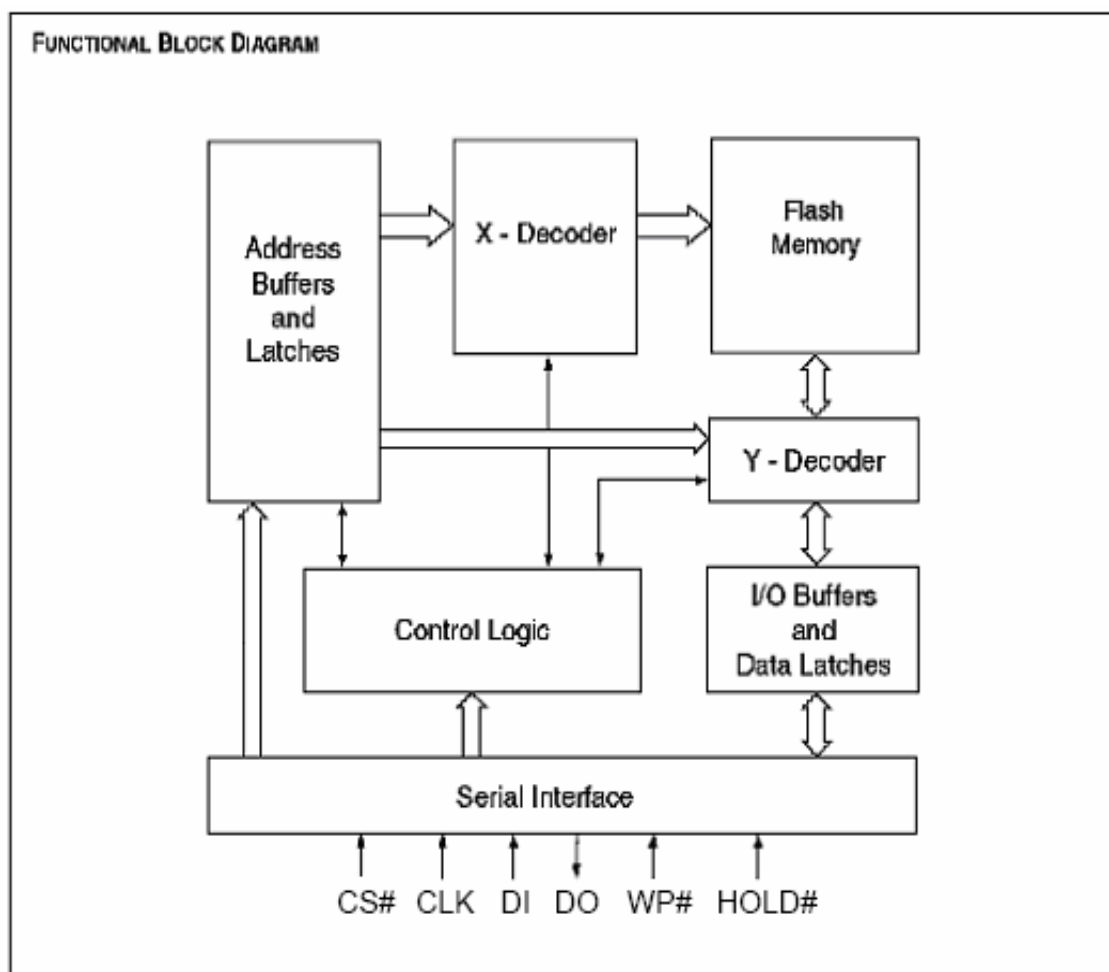
Figure.1 CONNECTION DIAGRAMS


Figure 2. BLOCK DIAGRAM



4M x 4Bit x 4 / 2M x 8Bit x 4 / 1M x 16Bit x 4 Banks SDRAM**FEATURES**

- JEDEC standard 3.3V power supply
- LVTTTL compatible with multiplexed address
- Four banks operation
- MRS cycle with address key programs
 - CAS latency (2 & 3)
 - Burst length (1, 2, 4, 8 & Full page)
 - Burst type (Sequential & Interleave)
- All inputs are sampled at the positive going edge of the system clock
- Burst read single-bit write operation
- DQM (x4,x8) & L(U)DQM (x16) for masking
- Auto & self refresh
- 64ms refresh period (4K cycle)

GENERAL DESCRIPTION

The K4S640432H / K4S640832H / K4S641632H is 67,108,864 bits synchronous high data rate Dynamic RAM organized as 4 x 4,194,304 words by 4 bits, / 4 x 2,097,152 words by 8 bits, / 4 x 1,048,576 words by 16 bits, fabricated with SAMSUNG's high performance CMOS technology. Synchronous design allows precise cycle control with the use of system clock I/O transactions are possible on every clock cycle. Range of operating frequencies, programmable burst length and programmable latencies allow the same device to be useful for a variety of high bandwidth, high performance memory system applications.

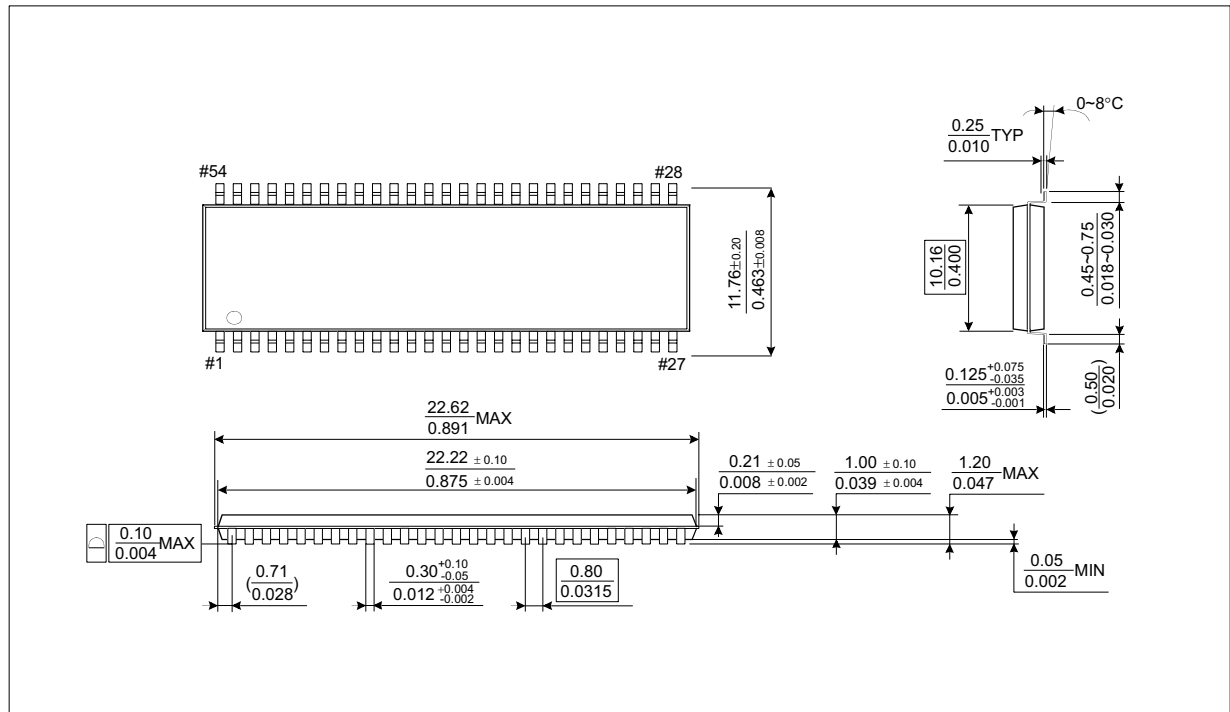
Ordering Information

Part No.	Organization	Max Freq.	Interface	Package
K4S640432H-TC(L)75	16Mb x 4	133MHz(CL=3)	LVTTTL	54pin TSOP(II)
K4S640832H-TC(L)75	8Mb x 8	133MHz(CL=3)		
K4S641632H-TC(L)60	4Mb x 16	166MHz(CL=3)		
K4S641632H-TC(L)70		143MHz(CL=3)		
K4S641632H-TC(L)75		133MHz(CL=3)		

Organization	Row Address	Column Address
16Mx4	A0~A11	A0-A9
8Mx8	A0~A11	A0-A8
4Mx16	A0~A11	A0-A7

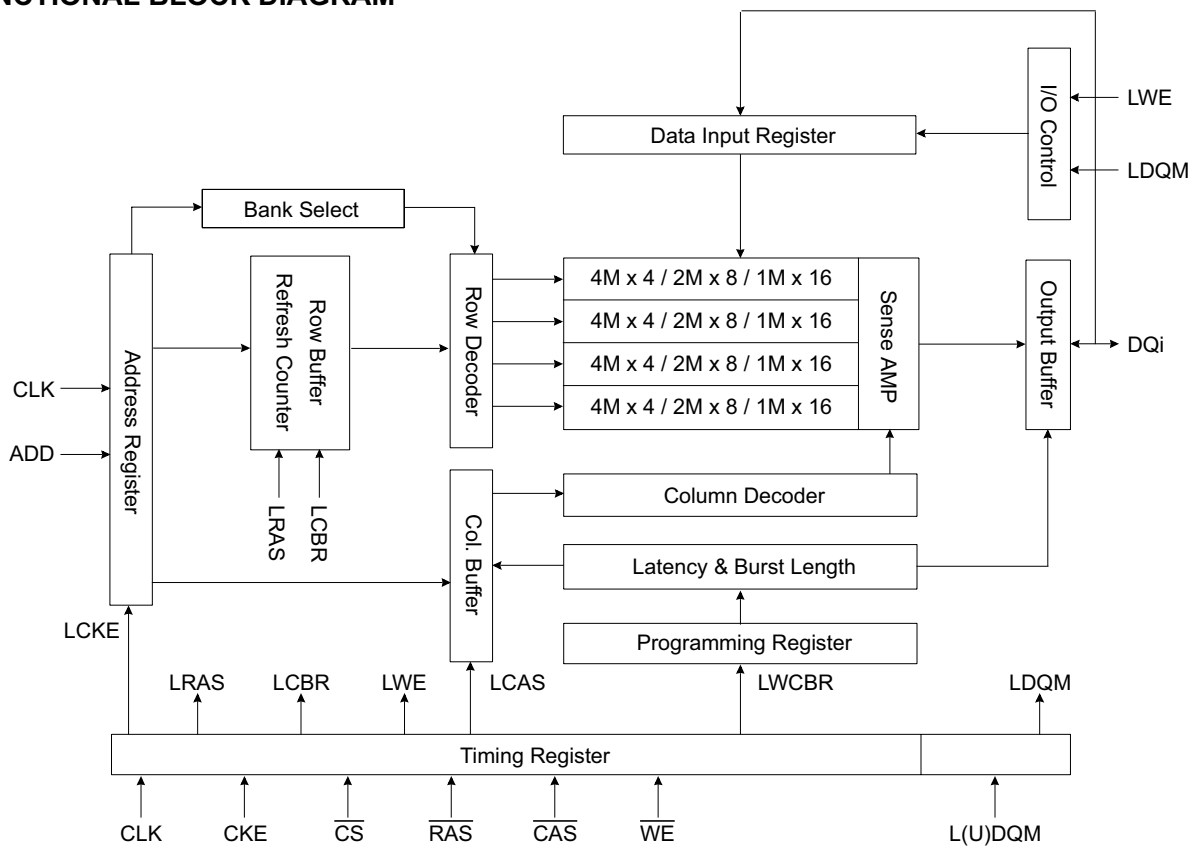
Row & Column address configuration

Package Physical Dimension

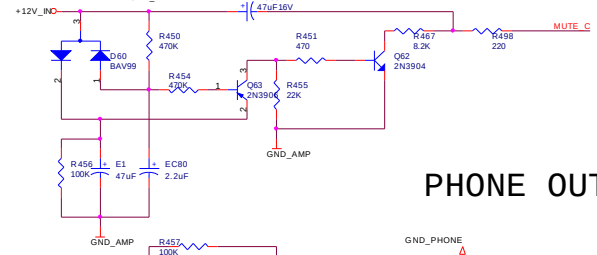
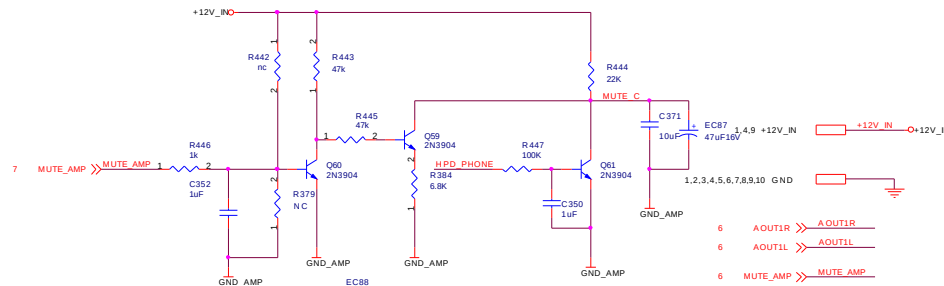
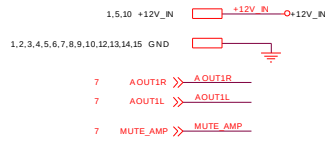


54Pin TSOP(II) Package Dimension

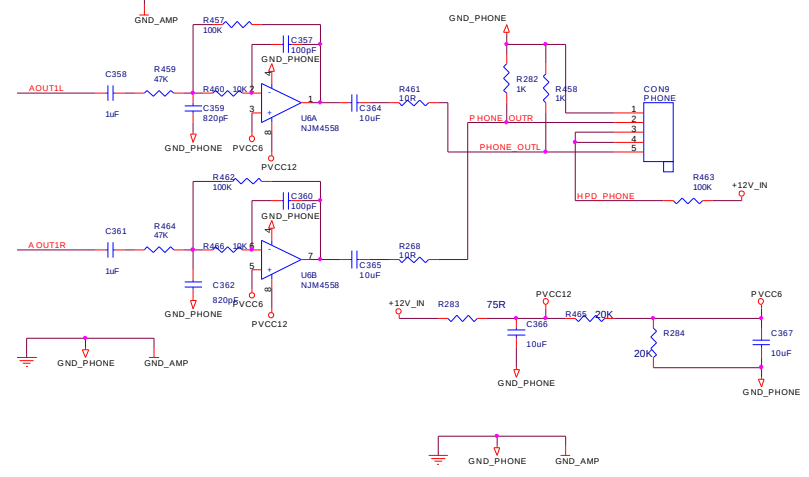
FUNCTIONAL BLOCK DIAGRAM



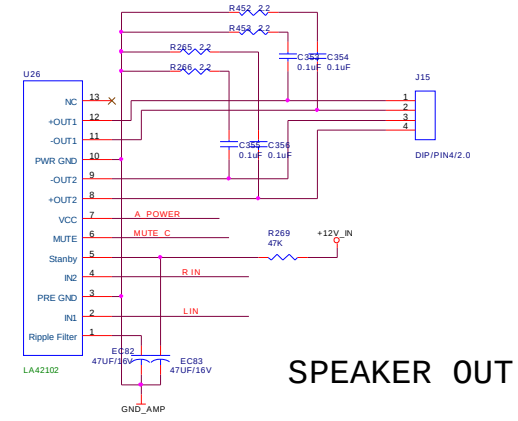
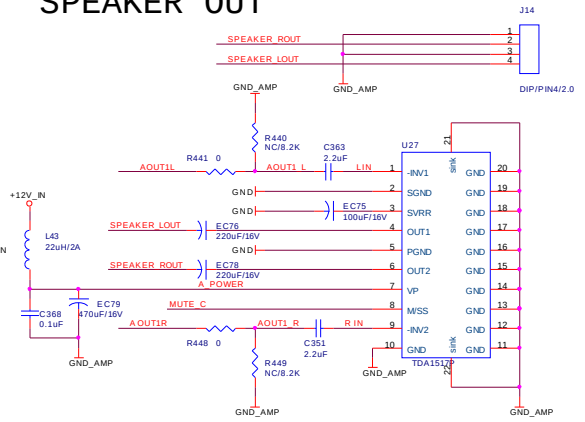
* Samsung Electronics reserves the right to change products or specification without notice.



PHONE OUT

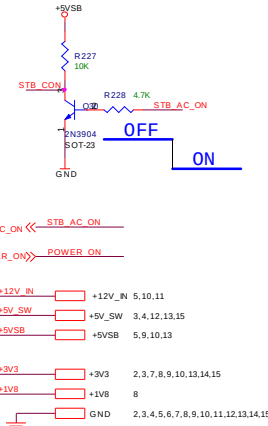
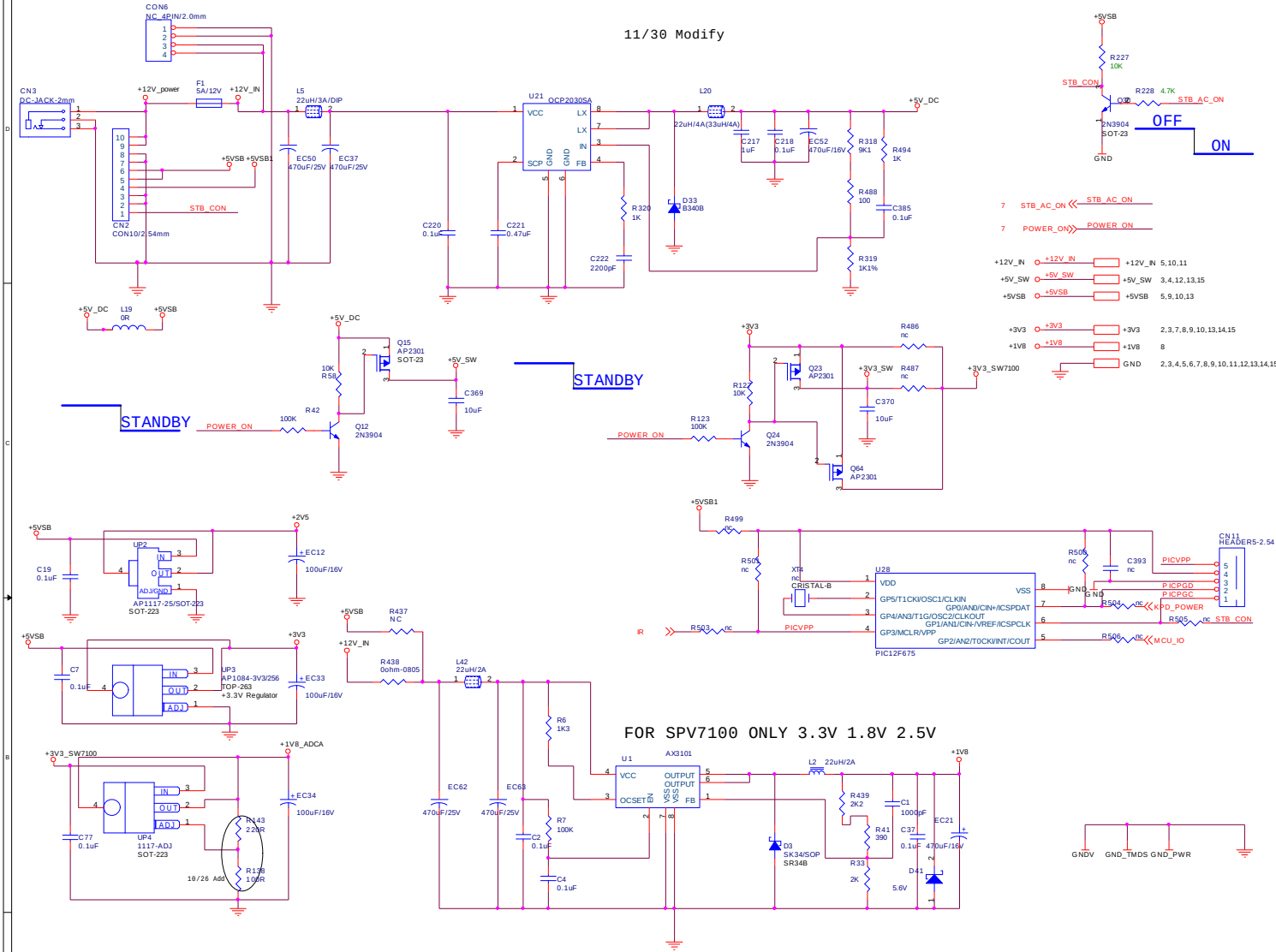


SPEAKER OUT



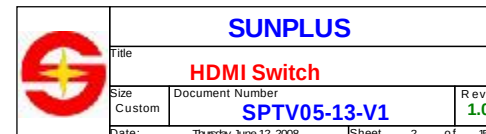
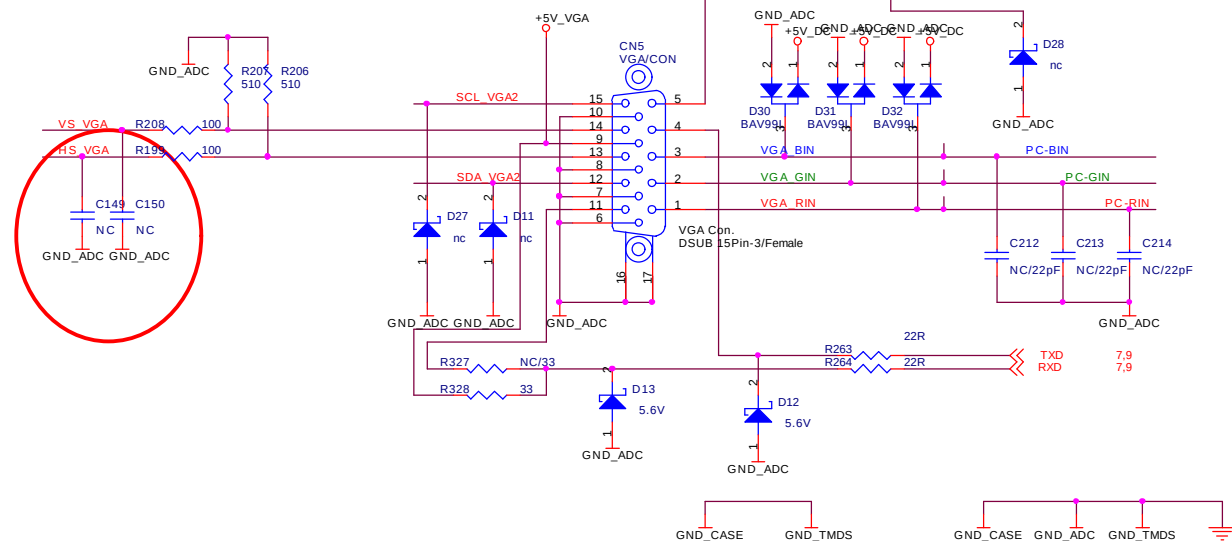
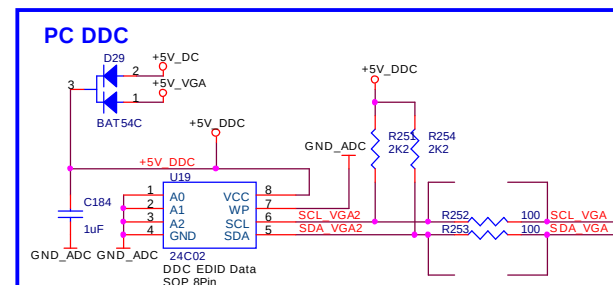
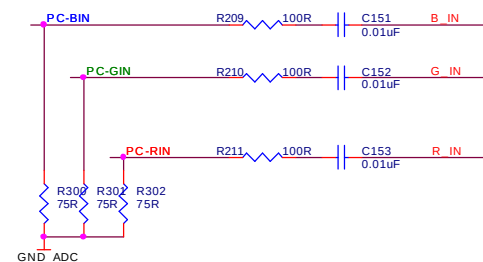
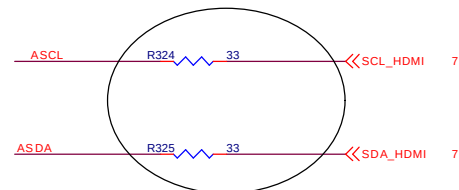
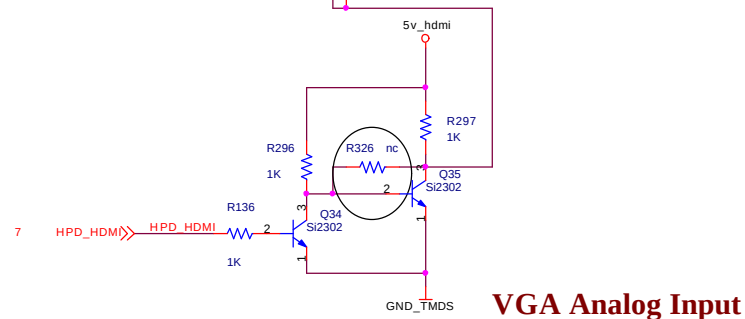
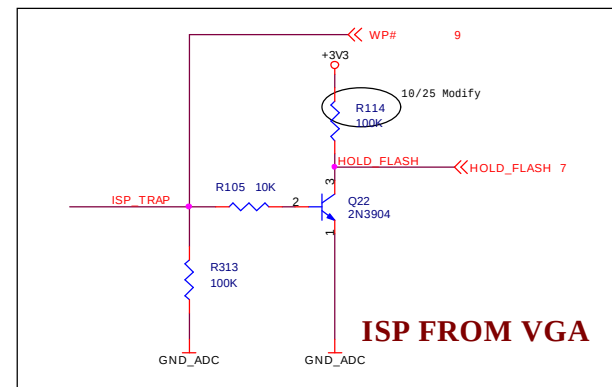
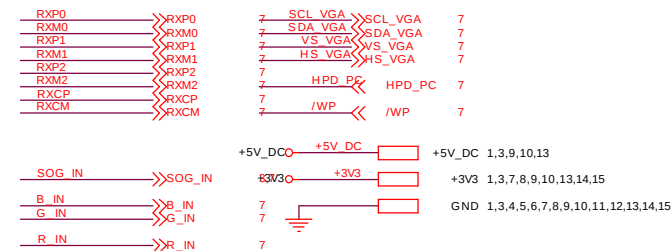
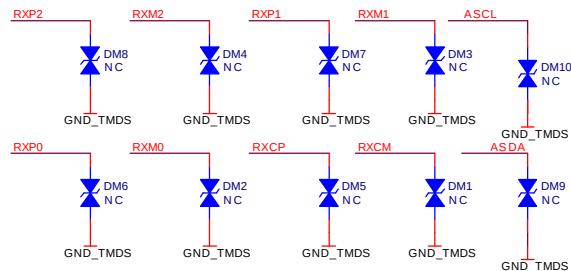
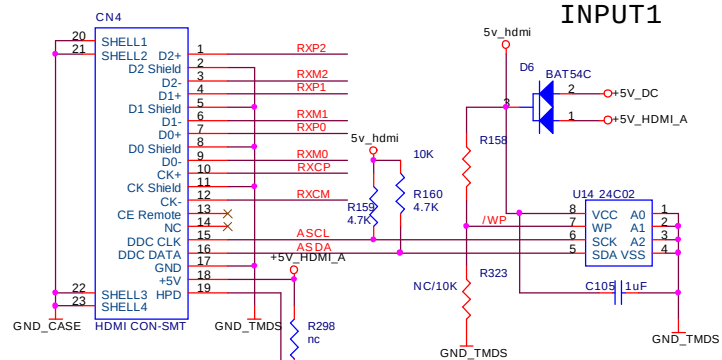
SPEAKER OUT

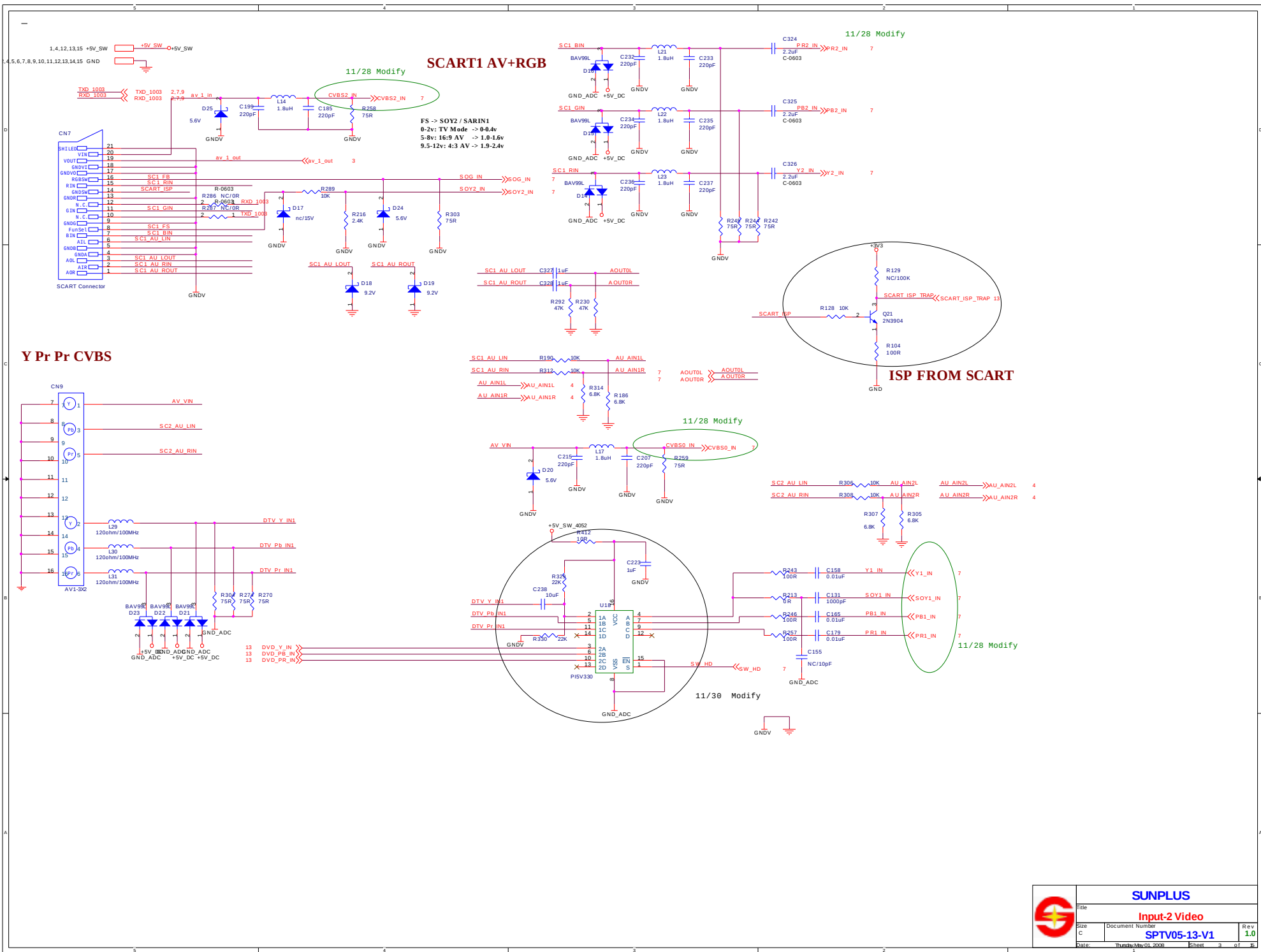
11/30 Modify



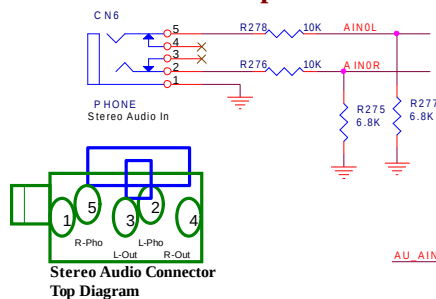
EDID Default: NOT write protect

INPUT1





PC Audio Input



4052 ch0:SCART
4052 ch1:YPrPr,CVBS
4052 ch2:PC output
4052 ch3:TV MONO

PC-->SPV7100 :NC
DVD-->SPV7100 :CH1
4052-->SPV7100 :CH2
DVB-->SPV7100 :CH3

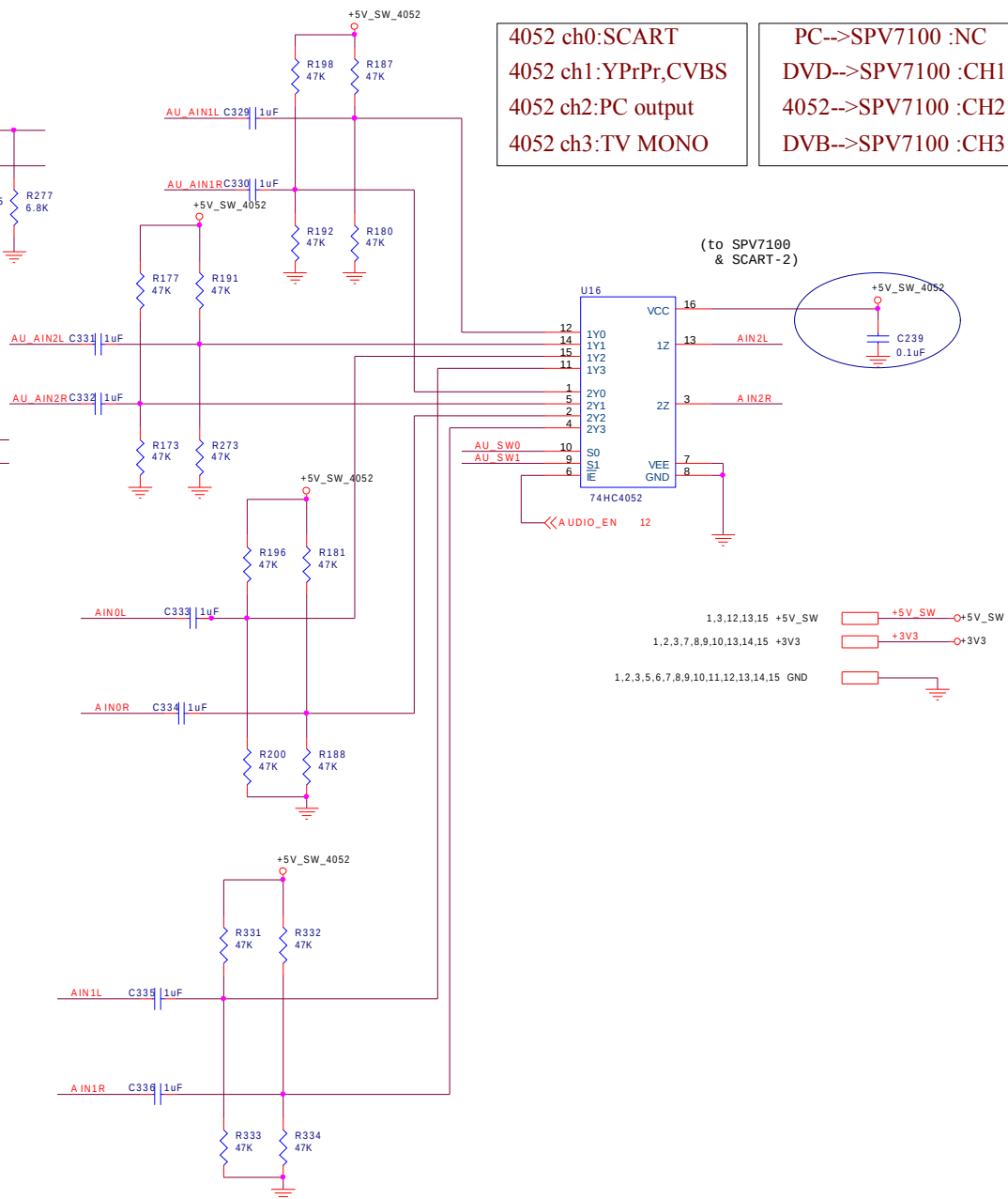
13 DVB_AL_OUT >> AIN3L
13 DVB_AR_OUT >> AIN3R

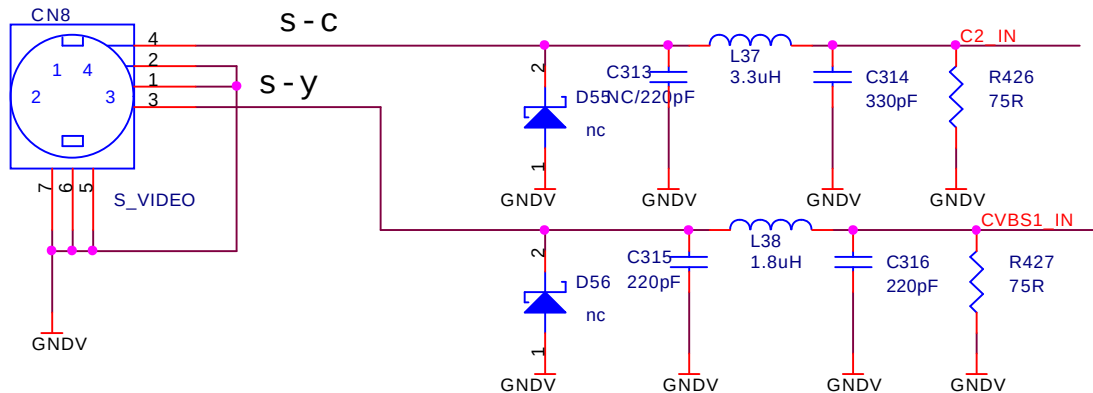
AIN2L >> AIN2L 7
AIN2R >> AIN2R 7
AIN3L >> AIN3L 7
AIN3R >> AIN3R 7

AU_SW0 >> AU_SW0 7
AU_SW1 >> AU_SW1 7
AU_AIN1L >> AU_AIN1L 3
AU_AIN1R >> AU_AIN1R 3

AU_AIN2L >> AU_AIN2L 3
AU_AIN2R >> AU_AIN2R 3
GNDV >> GND

AIN1L >> AIN1L 5
AIN1R >> AIN1R 5

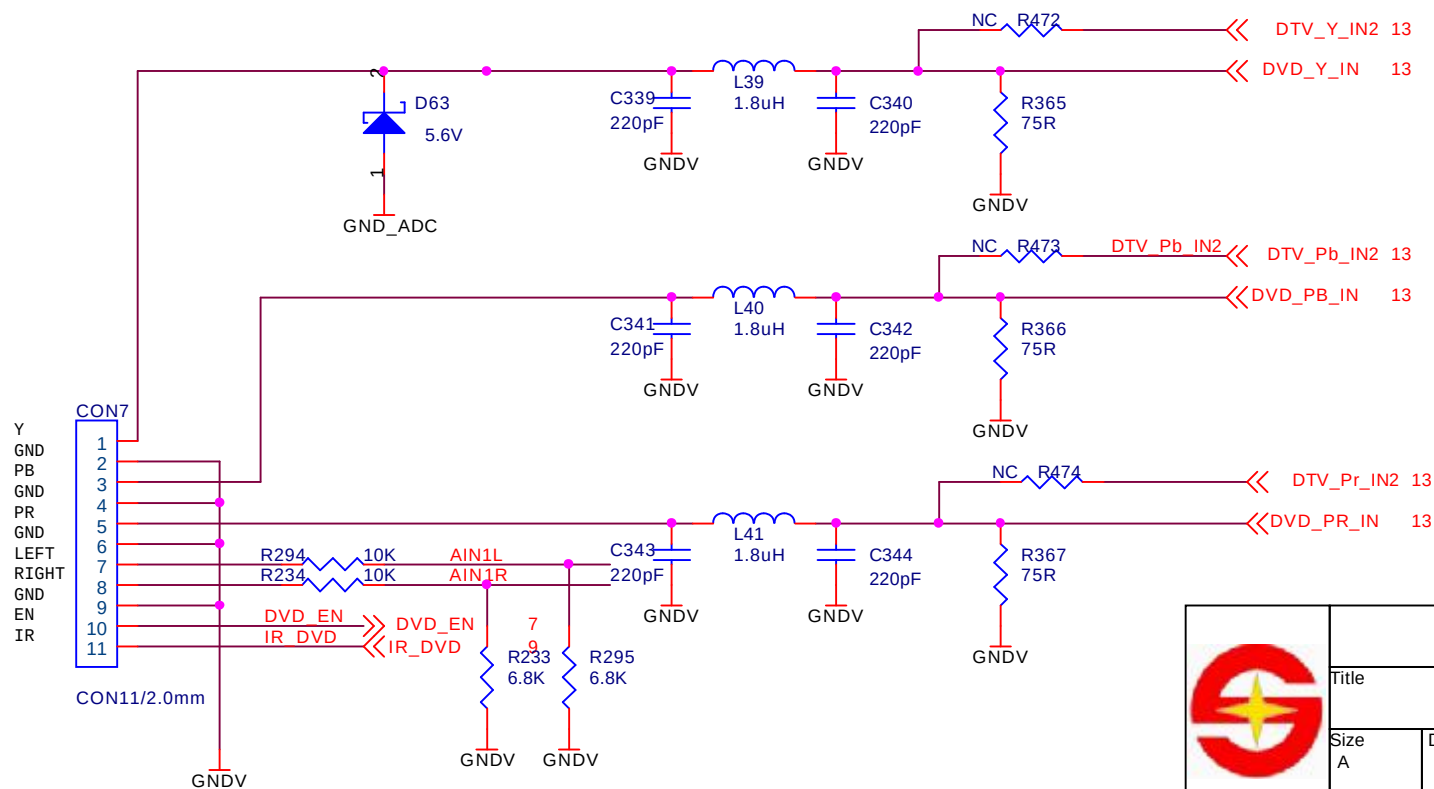




CVBS1_IN >> CVBS1_IN 7
 C2_IN >> C2_IN 7
 AIN1L >> AIN1L 4
 AIN1R >> AIN1R 4

1,3,4,12,13,15 +5V_SW >> +5V_SW >> +5V_SW

1,2,3,4,6,7,8,9,10,11,12,13,14,15 GND >> GND

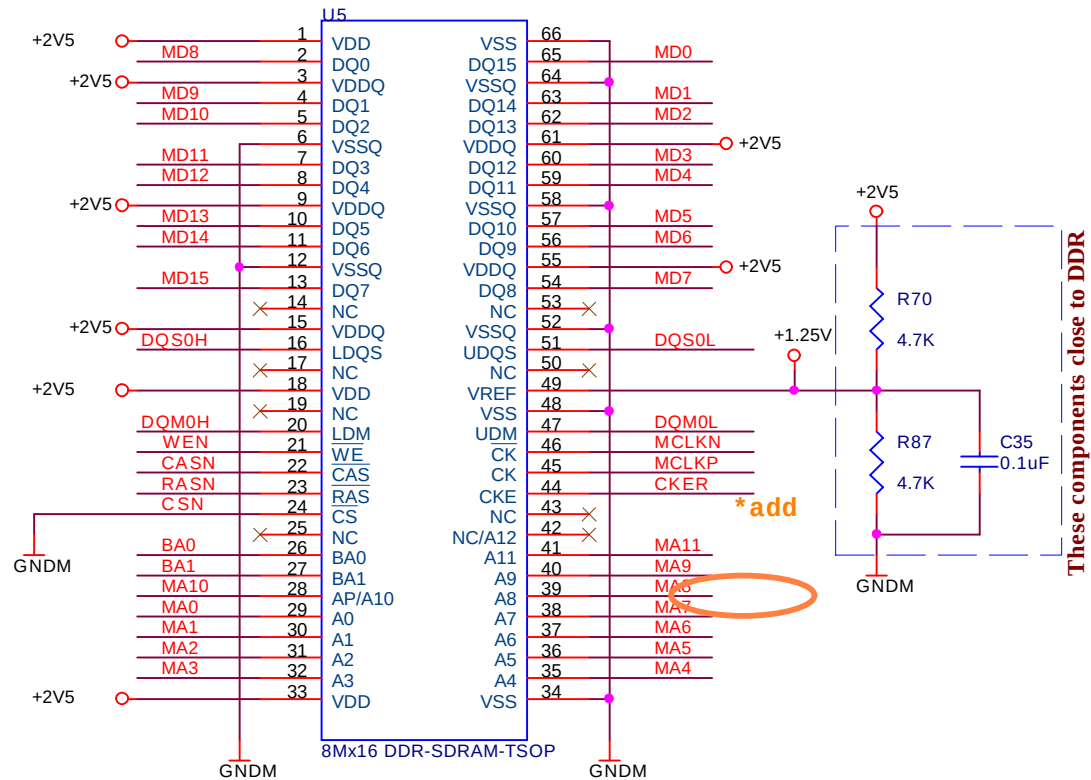
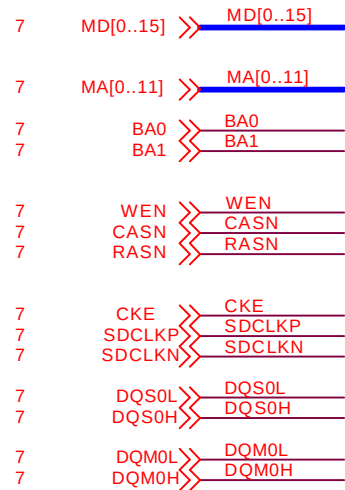


SUNPLUS

Input-2 Video

Title		
Document Number		
SPTV05-13-V1		
Size A	Date:	Rev 1.0
Thursday, May 01, 2008		
Sheet 5 of 15		

SDRAM Data Bus

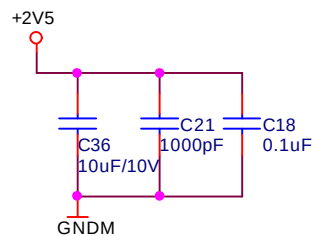


All traces must have the same length
HY5DU281622ETP (128Mb/2Mx16x4B)

*Short these ground planes on PCB

CLOSE TO 7100

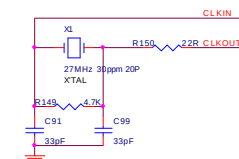
CLOSE TO DDR



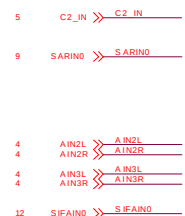
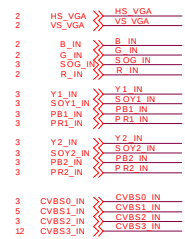
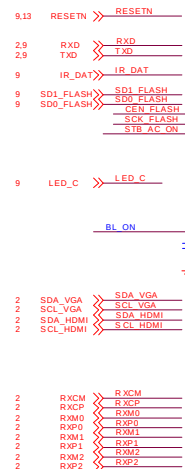
SUNPLUS

Title		
DDR PART		
Size	Document Number	Rev
A	SPTV05-13-V1	1.0
Date:	Thursday, June 12, 2008	Sheet 6 of 15

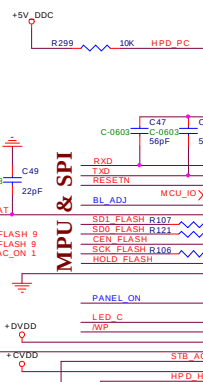
Crystal Circuit



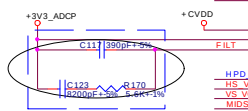
These components close to SPV7100



+3V3_LVDS LVDS Output



HDMI Input



These components close to SPV7100

1 1/30 Note

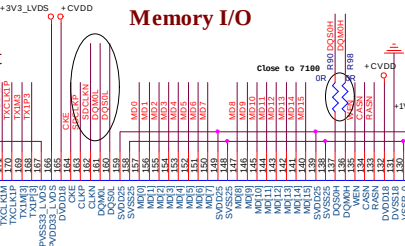
VGA/YUV Input Video Input Audio Input **Audio Output**



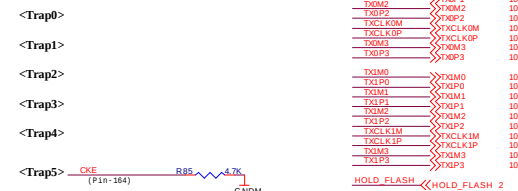
* change C200-203 net:

***Short these ground planes on PCB**

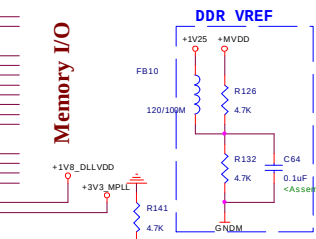
Memory I/O



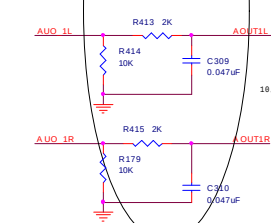
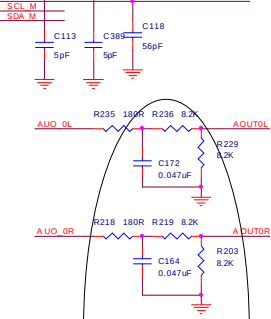
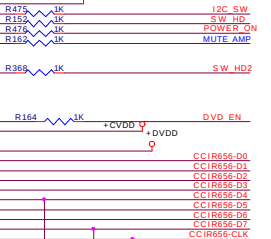
IO Trap



Memory I/O



Default Pull Settings



TXDM0	TXDM0	10
TXDP0	TXDP0	10
TXDM1	TXDM1	10
TXDP1	TXDP1	10
TXDM2	TXDM2	10
TXDP2	TXDP2	10
TXCLK0M	TXCLK0M	10
TXCLK0P	TXCLK0P	10
TXDM3	TXDM3	10
TXDP3	TXDP3	10

TXLM0	TXLM0	10
TXLP0	TXLP0	10
TXM1	TXM1	10
TXLP1	TXLP1	10
TXM2	TXM2	10
TXLP2	TXLP2	10
TXCLK1M	TXCLK1M	10
TXCLK1P	TXCLK1P	10
TXM3	TXM3	10
TXLP3	TXLP3	10

HOLD_FLASH << **HOLD_FLASH** 2

CKE >> **CKE** 6

SDCLKP >> **SDCLKP** 6

MD[0..15]	MD[0..15]	6
WEN	WEN	6
CASN	CASN	6
RASN	RASN	6
MA[0..11]	MA[0..11]	6
BA0	BA0	6
BA1	BA1	6

Signal	Pin
DVD_EN	5
DOM0H	6
DQS0H	6
DOM0L	6
DQS0L	6
SDCLKN	6

Default Pull Setting

Signal	Direction	Pin
I/WP	Input	2
PANEL_ON	Input	10
POWER_ON	Input	1

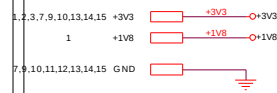
<u>BL_ADJ</u>	>>>BL_ADJ	10
<u>BL_ON</u>	>>>BL_ON	10
<u>MUTE_AMP</u>	>>>MUTE_AMP	11
<u>S_W_HD</u>	>>>S_W_HD	3
		10/24 Add
<u>S_W_HD2</u>		

HPD_HDMI	HPD_HDMI	2
HPD_PC	HPD_PC	2
SCL_M	SCL_M	9,12,13
SDA_M	SDA_M	9,12,13
AU_SW0	AU_SW0	4
AU_SW1	AU_SW1	4

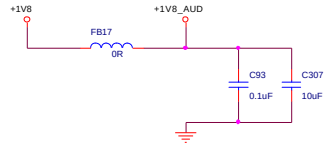
AOUT0L	»»»	AOUT0L	3
AOUT0R	»»»	AOUT0R	3
AOUT1L	»»»	AOUT1L	11
AOUT1R	»»»	AOUT1R	11
CCIR656-D[0..7]	»»»	CCIR656-D[0..7]	13
CCIR656-CLK	»»»	CCIR656-CLK	13



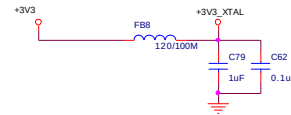
SUNPLUS			
Title			
SPV7100 Part-1			
Size C	Document Number		Rev
	SPTV05-13-V1		1.0
Date:	Thursday, May 01, 2008	Sheet	7 of 7



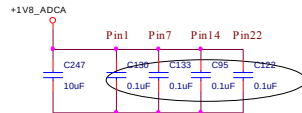
TMDS AUD PLL POWER/GND (1.8V)



XTAL POWER/GND (3.3V)



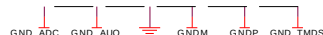
ADC POWER/GND (1.8V/3.3V)



11/30 Modify

Ferrite Beed Spec:

FB : Rdc=0.2, Z=300/100MHz, Idc=500mA ~ MCB2012S301H
FB_L : Rdc=0.015, Z=120/100MHz, Idc=6000mA ~ MHC3216S121W
FB_S : Rdc=0.35, Z=75/100MHz, Idc=300mA ~ MCB1608U750F



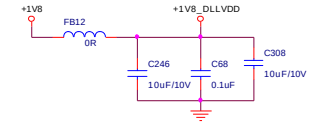
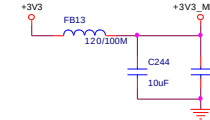
*Short these ground planes on PCB

Power Plane : +5V, +5VSB, +3V3, +3V3_SPV, +3V3_MC, +2V5, +1V8, +VCC_PNL, +AVDD_ADC

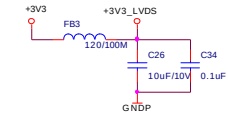
Power Line : +12V, +3V3_ADCP, +3V3_ADCB, +3V3_MPLL, +3V3_DPLL, +1V8_DLLVDD, +1V8_TMDSP, +1V8_TMS, +1V8_AUD

Ground Plane: GND, GND_ADC, GND_TMS, GNDV, GNDM, GNDP, ND_LVDS, GND_AUO, GND_AMP

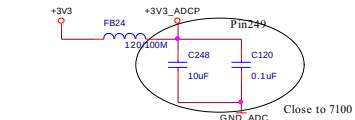
PLL POWER/GND (3.3V/1.8V)



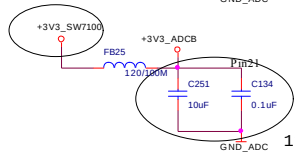
LVDS POWER/GND (3.3V)



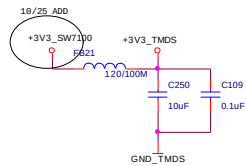
TMDS POWER/GND (1.8V/3.3V)



Close to 7100



11/30 Modify



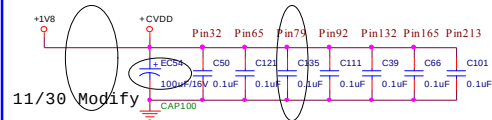
Pin231 Pin235 Pin239 Pin243

SPV7100 E-Pad

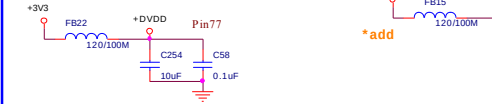
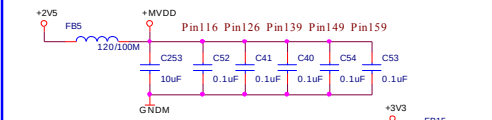
U9B			
257	E-Pad	298	
258	E-Pad	299	
259	E-Pad	300	
260	E-Pad	301	
261	E-Pad	302	
262	E-Pad	303	
263	E-Pad	304	
264	E-Pad	305	
265	E-Pad	306	
266	E-Pad	307	
267	E-Pad	308	
268	E-Pad	309	
269	E-Pad	310	
270	E-Pad	311	
271	E-Pad	312	
272	E-Pad	313	
273	E-Pad	314	
274	E-Pad	315	
275	E-Pad	316	
276	E-Pad	317	
277	E-Pad	318	
278	E-Pad	319	
279	E-Pad	320	
280	E-Pad	321	
281	E-Pad	322	
282	E-Pad	323	
283	E-Pad	324	
284	E-Pad	325	
285	E-Pad	326	
286	E-Pad	327	
287	E-Pad	328	
288	E-Pad	329	
289	E-Pad	330	
290	E-Pad	331	
291	E-Pad	332	
292	E-Pad	333	
293	E-Pad	334	
294	E-Pad	335	
295	E-Pad	336	
296	E-Pad	337	
297	E-Pad		

SPV7100A-LQFP256

SOURCE POWER/GND (1.8V/2.5V/3.3V)

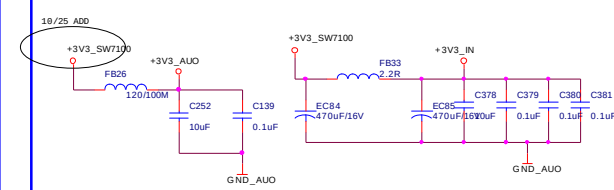


11/30 Modify



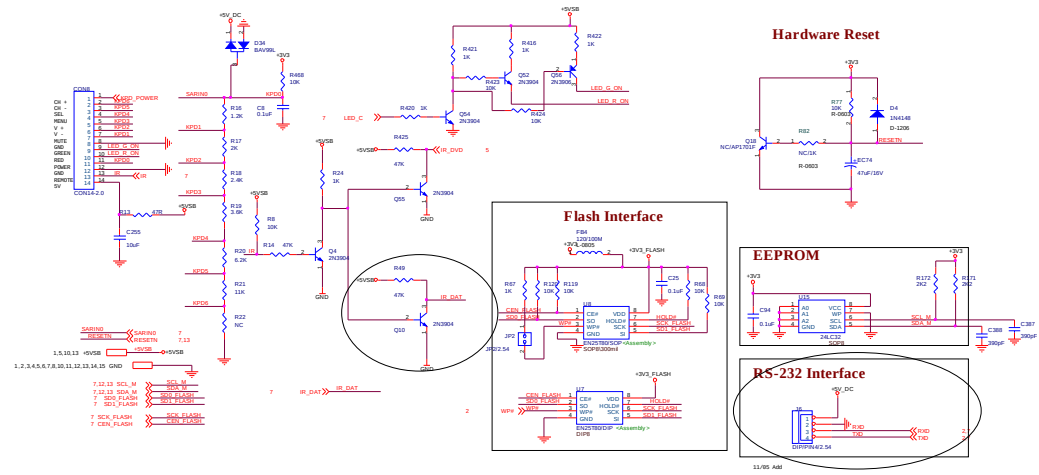
*add

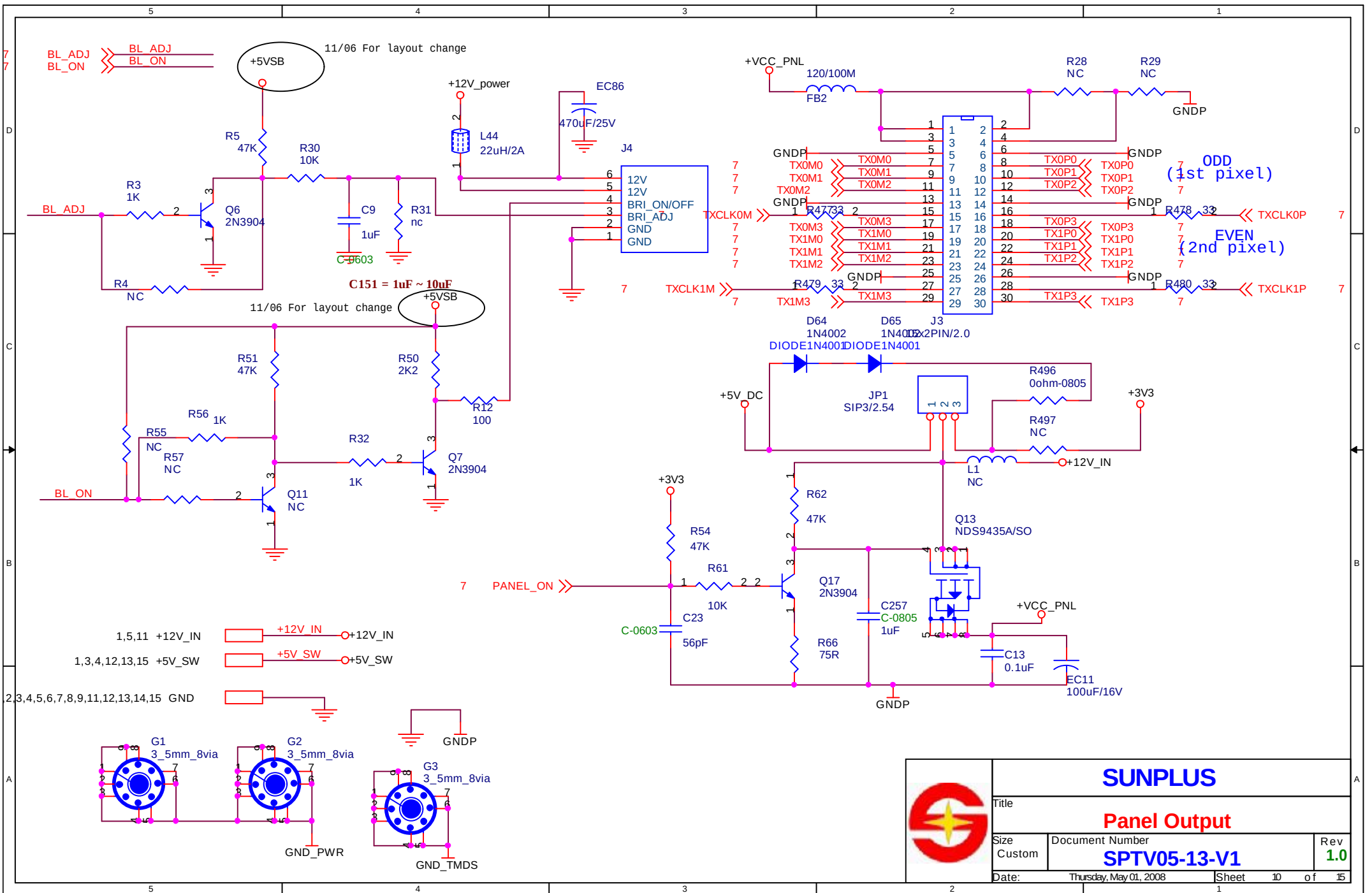
SARADC/SIF/AUDIO POWER/GND (3.3V)



SUNPLUS			
File	SPV7100 Part-2		
Size	Document Number	Rev	
Custom	SPTV05-13-V1	1.0	
Date:	Thursday, May 01, 2008	Sheet	8 of 10

Flash Interface



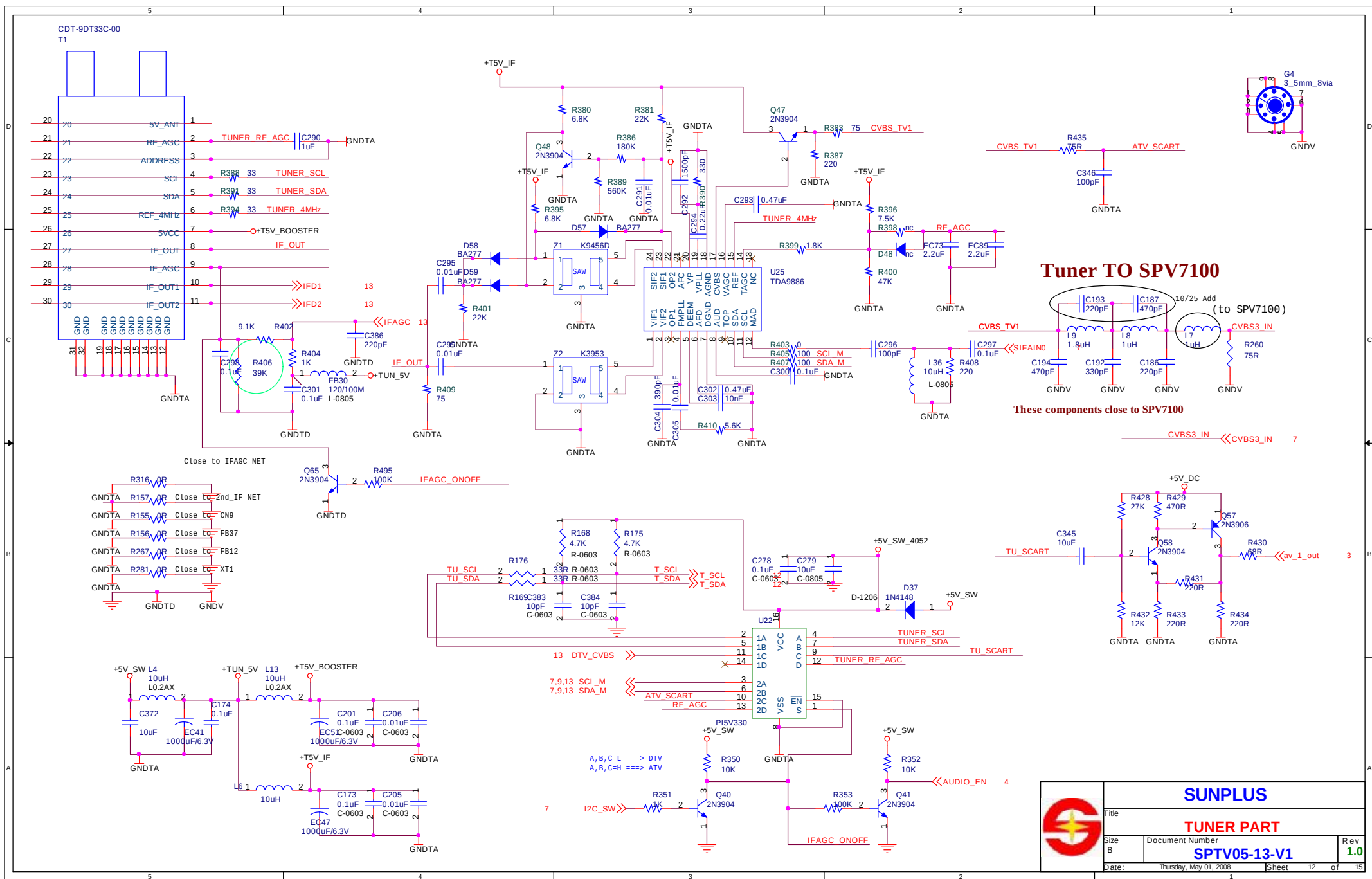


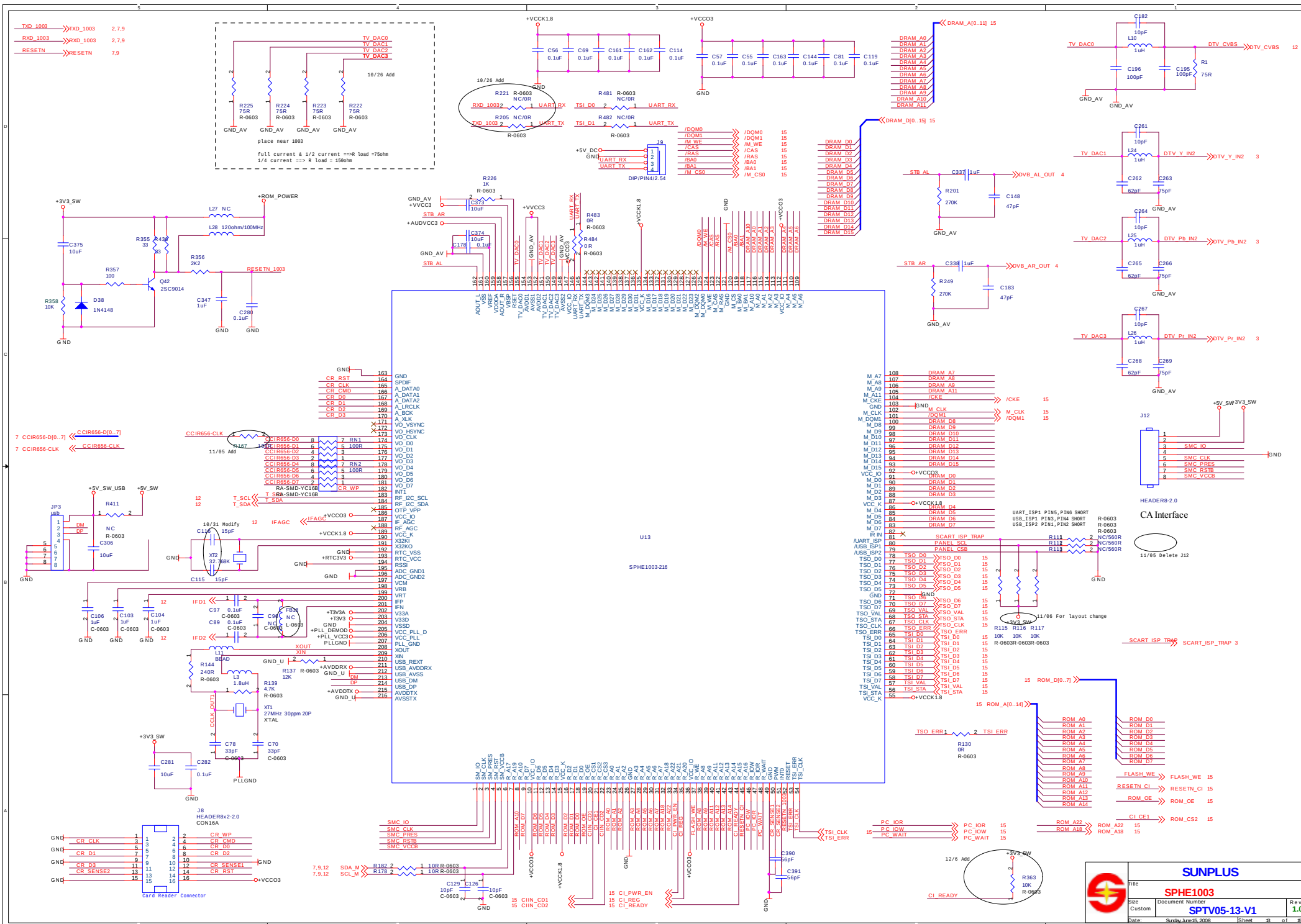
SUNPLUS

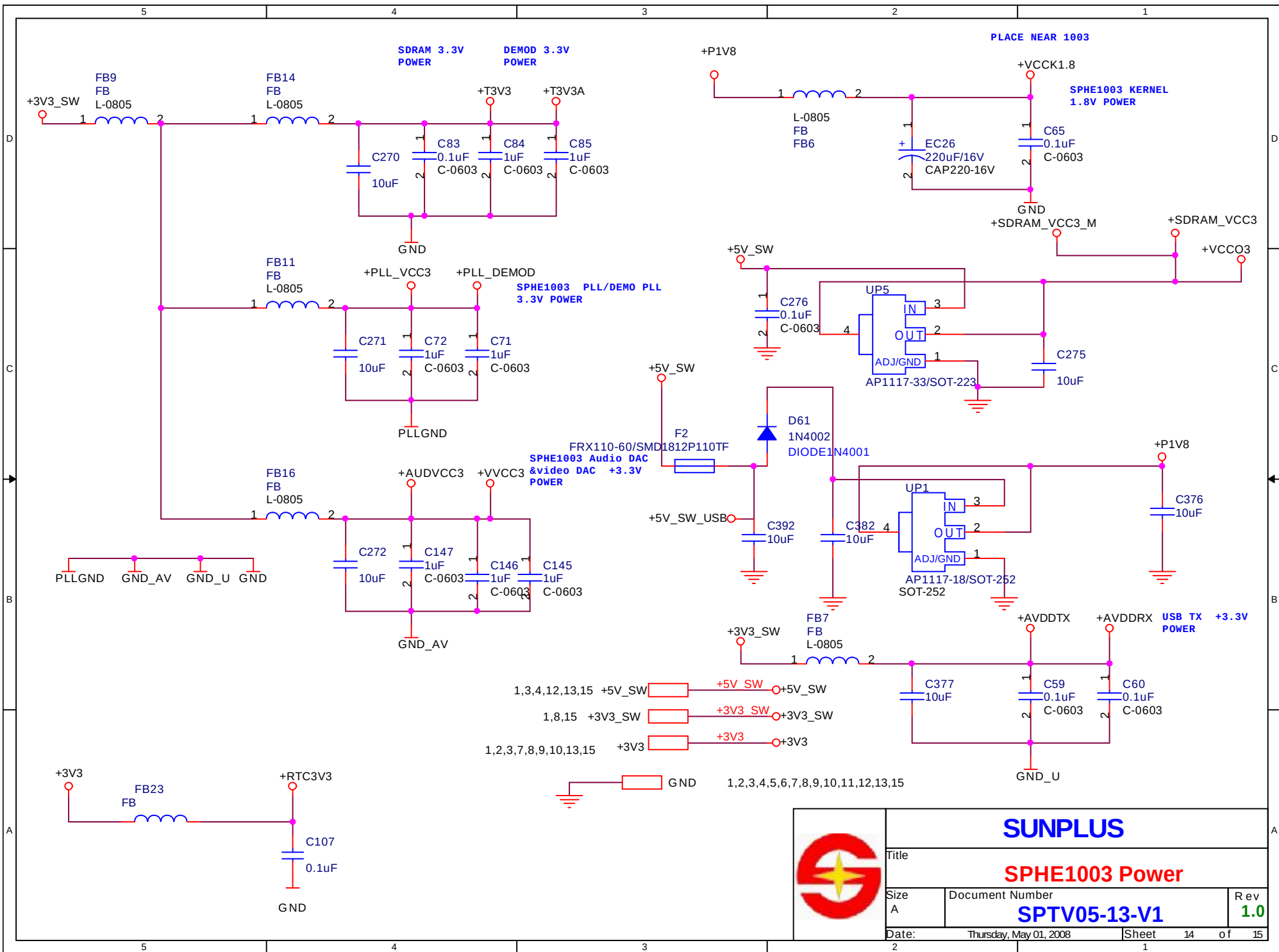
Panel Output

SPTV05-13-V1

Title		Document Number		Rev	
Size Custom		SPTV05-13-V1		1.0	
Date:		Thursday, May 01, 2008		Sheet 10 of 15	



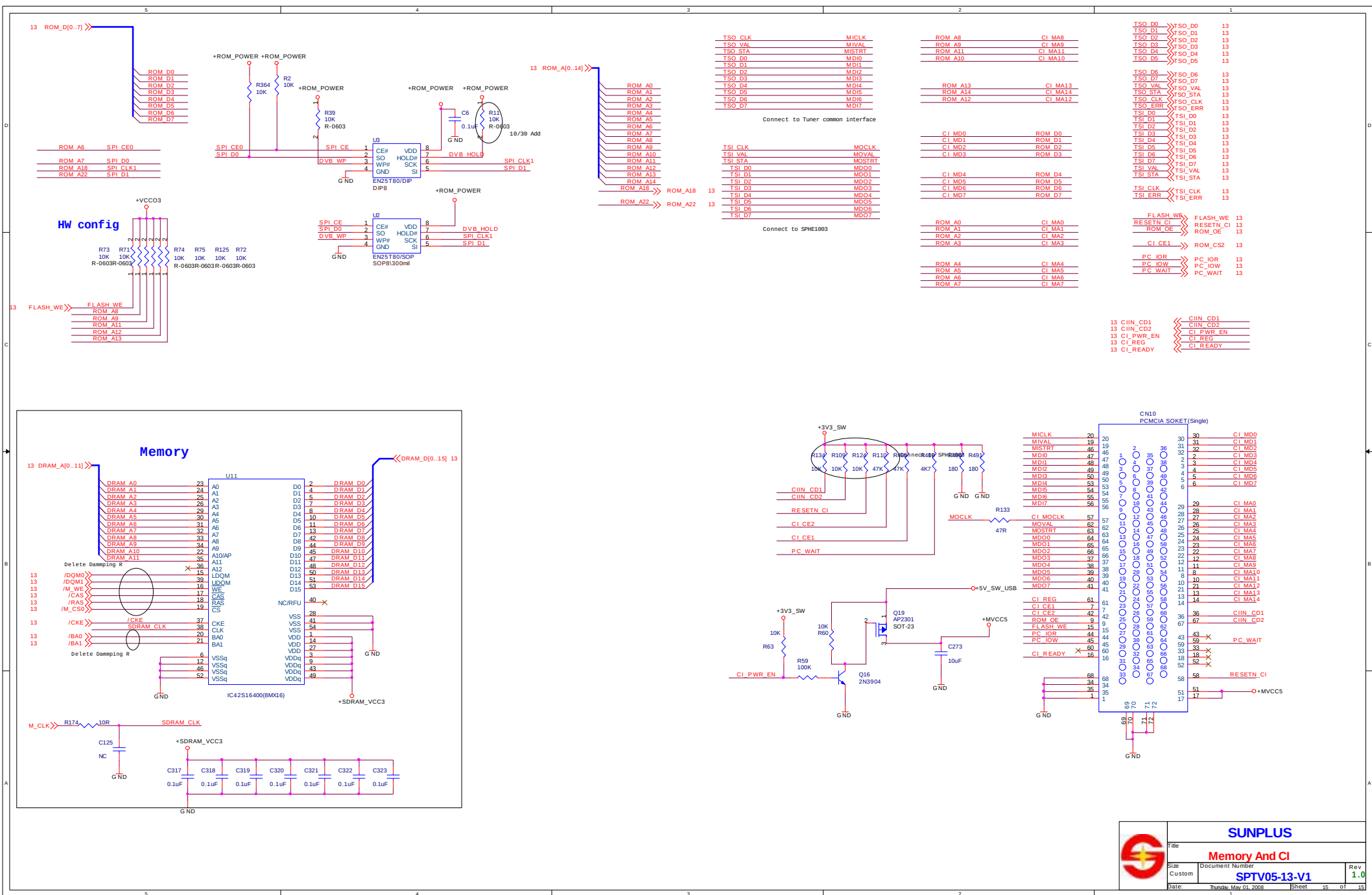




SUNPLUS

SPHE1003 Power

Title		
SPHE1003 Power		
Size	Document Number	
A	SPTV05-13-V1	
Date:	Thursday, May 01, 2008	Sheet 14 of 15
Rev	1.0	



HK-HDMI-CI-SUNTV-V2.55 -EURO(RoHS)

	Name	Type	Part Reference	Dosage	Total Dosage
socket					
	HEADER 2	2P pin (linker2.54mm distance) no clasp, stand	JP2	1	
	HEADER 3	3P pin (linker2.54mm distance) no clasp, stand	JP1	1	
	CON4/2.0mm	4P pin (linker2.0mm distance) no clasp, stand	J14, CON6	2	
	CON6/2.0mm	6P pin (linker2.0mm distance) no clasp, stand	J4	1	
	CON11/2.0mm	11P pin (linker2.0mm distance) no clasp, stand	CON7	1	
	CON14/2.0mm	14P pin (linker2.0mm distance) no clasp, stand	CON8	1	
	CON4/2.54mm	4P pin (linker2.54mm distance) no clasp, stand	J9, J6	2	
	CON10/2.54mm	10P pin (linker2.54mm distance) no clasp, stand	CN2	1	
	DB15	DZ11A31-B8 (15P-Dsub,30X8mm)	CN5	1	
	BNC	Dcpower socket2.0mm	CN3	1	
	PHONE JACK	Audio input socket	CON9, CN6	2	
	15x2PIN	15X2Pin (linker2.0 diatance)	J3	1	
	HDMI J	HDMI JACK	CN4	1	
	USB-JACK	USB JACK	JP3	1	
	S-VIDEO JACK	S-VIDEO JACK	CN8	1	
	component	6 hole double row AV jack(top line Green Blue Red,dowm line Yellow White Red)	CN9	1	
	SCART	SCART JACK	CN7	1	
	PCMCIA SOKET	PCMCIA NON-PUSH	CN10	1	
	YX438901	SURFACE ACOUSTIC WAVE FILTER	Z2	1	
	YX938908	SURFACE ACOUSTIC WAVE FILTER	Z1	1	
	crystal				
	32.768K	32.768KHZ quartz crystal surge	XT2	1	
	27.000MT	27MHZ quartz crystal surge(49S) 30ppm	XT1, X1	2	
	diode				
	SSM5822/SK34	commute diode60V/3Asoon restore,	D3	1	
	1N4148	patch diode	D4, D37, D38	3	
	1N4002/1N4004(DIP)	patch diode	D61, D64, D65	3	
	BA277	brand patch diode	D57, D58, D59	3	
	9.1V	diode 9.1V	D18, D19	2	
	5.6V	diode 5.6V	D12, D13, D20, D24, D25, D41, D63	7	
	SK34	commute diode60V/3Asoon restore,	D33	1	
	audion				
	BAV99	ESD patch double diode	D14, D15, D16, D21, D22, D23, D30, D31, D32, D34, D60	11	

	2N3906	patch audion,SOT23,PNP TR,VCEO=40V/IC=200mA,DII/AUK	Q56,Q57,Q63	3	
	2N3904	patch audion,SOT23,NPN TR,VCEO=40V/IC=200mA,DII/AUK	Q4,Q6,Q7,Q10,Q12,Q16,Q17,Q21,Q22,Q24,Q30,Q40,Q41,Q 47,Q48,Q52,Q54,Q55,Q58,Q59,Q60,Q61,Q62,Q65	24	
	BAT54C	patch double diode,SOT23	D6,D29	2	
	SI2301	patch audion,SOT23,MOS pipe	Q15,Q19,Q23,Q64	4	
	SI2302	patch audion,SOT23,MOS pipe	Q34,Q35	2	
	9014	patch double diode,SOT23	Q42	1	
	electrolyse capacitance				
	47uF/16V	electrolyse capacitance(5X7) 16V $\pm$ 20%	EC74,E1,EC88	3	
	100uF/16V	electrolyse capacitance(5X7) 16V $\pm$ 20%	EC12,EC33,EC34,EC54,EC75	5	
	100uF/16V	electrolyse capacitance(6.3X5) 16V $\pm$ 20%	EC11	1	
	220uF/16V	electrolyse capacitance(6.3X7) 16V $\pm$ 20%	EC26,EC76,EC78	3	
	470uF/16V	electrolyse capacitance(8X9) 16V $\pm$ 20%	EC21,EC52,EC79,EC84,EC85,EC37,EC50,EC62,EC63,EC86	10	
	1000uF/6.3V	electrolyse capacitance(8X12) 6.3V $\pm$ 20%	EC41,EC47,EC51	3	
	inductance				
	22uH/2A	inductance 8*7, SMD	L2,L42,L43,L44	4	
	22uH/3A	horizontalcircle inductance 33 μ H $\pm$ 20%	L5	1	
	22uH/4A	horizontalcircle inductance 33 μ H $\pm$ 20%	L20	1	
	1uH	inductance 0805, SMD	L7,L8,L10,L24,L25,L26	6	
	1.8uH	inductance 0805, SMD	L9,L14,L17,L38,L39,L40,L41,L21,L22,L23	10	
	3.3uH	inductance 0805, SMD	L37	1	
	10uH	inductance 4*6MM DIP	L4,L6,L13,	3	
	10uH	inductance 0805,SMD	L36	1	
	Fuse				
	PTC thermistor	FRX110-60&SMD1812P110TF(1.1A),SMD	F2	1	
	fuse	12V/ 5 A, DIP	F1	1	
	BEAD				
	120/100M	0805 BEAD,SMD	FB3,FB4,FB5,FB8,FB10,FB13,FB15,FB21,FB22,FB24,FB25 ,FB26,FB30,L28,FB6,FB7,FB9,FB11,FB14,FB16,FB23,L29 ,L30,L31,FB2	25	
	120/100M	0603 BEAD,SMD	L3,L11	2	
	Resistance				
	100R $\times$ 4	4 x resistor KX0603 1/16W $\pm$ 5%	RN1,RN2	2	
	Resistance				
	OR	resistor KX0603 1/16W $\pm$ 5%	R90,R98,R130,R155,R156,R213,R281,R316,R483,R484,R4 03,R441,R448	13	
	OR 0805	resistor KX0805 1/16W $\pm$ 5%	FB12,FB17,R438,L19,R496	5	
	2.2R	resistor KX0603 1/16W $\pm$ 5%	R265,R266,R452,R453	4	
	2.2R 0805	resistor KX0805 1/16W $\pm$ 5%	FB33	1	
	10R	resistor KX0603 1/16W $\pm$ 5%	R86,R93,R94,R174,R178,R182,R268,R412,R461	9	
	22R	resistor KX0603 1/16W $\pm$ 5%	R150,R263,R264	3	

	33R	resistor KX0603 1/16W ±5%	R106, R107, R121, R169, R176, R324, R325, R328, R355, R388, R391, R394, R436, R477, R478, R479, R480	17	
	47R	resistor KX0603 1/16W ±5%	R133, R13, R95, R99,	4	
	68R	resistor KX0603 1/16W ±5%	R430	1	
	75R	resistor KX0603 1/16W ±5%	R1, R66, R222, R223, R224, R225, R242, R244, R245, R258, R259, R260, R270, R274, R283, R300, R301, R302, R303, R304, R335, R365, R366, R367, R426, R427, R435, R409, R383	29	
	100R	resistor KX0603 1/16W ±5%	R12, R104, R138, R167, R209, R210, R211, R243, R246, R257, R199, R208, R357, R405, R407, R488, R252, R253	18	
	180R	resistor KX0603 1/16W ±5%	R218, R235, R490, R491	4	
	220R	resistor KX0603 1/16W ±5%	R143, R431, R433, R434, R387, R408, R498	7	
	240R	resistor KX0603 1/16W ±5%	R144	1	
	330R	resistor KX0603 1/16W ±5%	R390	1	
	390R	resistor KX0603 1/16W ±5%	R41	1	
	470R	resistor KX0603 1/16W ±5%	R429, R451	2	
	510R	resistor KX0603 1/16W ±5%	R206, R207	2	
	1K	resistor KX0603 1/16W ±5%	R3, R32, R56, R67, R136, R152, R162, R164, R183, R226, R282, R296, R297, R320, R336, R337, R338, R339, R351, R368, R404, R416, R420, R421, R422, R446, R458, R475, R476, R494, R24,	31	
	1.2K	resistor KX0603 1/16W ±5%	R16	1	
	1.3K	resistor KX0603 1/16W ±5%	R6	1	
	1.8K	resistor KX0603 1/16W ±5%	R399	1	
	2K	resistor KX0603 1/16W ±5%	R17, R33, R413, R415	4	
	1K 1%	resistor KX0603 1/16W ±1%	R319	1	
	2.2K	resistor KX0603 1/16W ±5%	R50, R171, R172, R251, R254, R356, R439	7	
	2.4K	resistor KX0603 1/16W ±5%	R18, R216	2	
	3.6K	resistor KX0603 1/16W ±5%	R19	1	
	4.7K	resistor KX0603 1/16W ±5%	R70, R85, R87, R126, R132, R139, R141, R149, R159, R160, R168, R175, R228, R489	14	
	5.6K	resistor KX0603 1/16W ±5%	R410	1	
	5.6K 1%	resistor KX0603 1/16W ±1%	R170	1	
	6.2K	resistor KX0603 1/16W ±5%	R20	1	
	6.8K	resistor KX0603 1/16W ±5%	R186, R233, R275, R277, R295, R305, R307, R314, R380, R384, R395	11	
	7.5K	resistor KX0603 1/16W ±5%	R396	1	
	8.2K	resistor KX0603 1/16W ±5%	R203, R219, R229, R236, R467	5	
	9.1K	resistor KX0603 1/16W ±5%	R402, R318	2	
	10K	resistor KX0603 1/16W ±5%	R2, R11, R30, R39, R58, R60, R61, R63, R68, R69, R71, R72, R73, R74, R75, R77, R105, R109, R115, R116, R117, R119, R120, R124, R125, R127, R128, R134, R142, R153, R154, R158, R179, R190, R227, R234, R276, R278, R289, R294, R299, R306, R308, R311, R312, R317, R350, R352, R358, R363, R364, R369, R370, R414, R423, R424, R460, R466, R468, R8	60	
	11K	resistor KX0603 1/16W ±5%	R21	1	
	12K	resistor KX0603 1/16W ±5%	R137, R432	2	

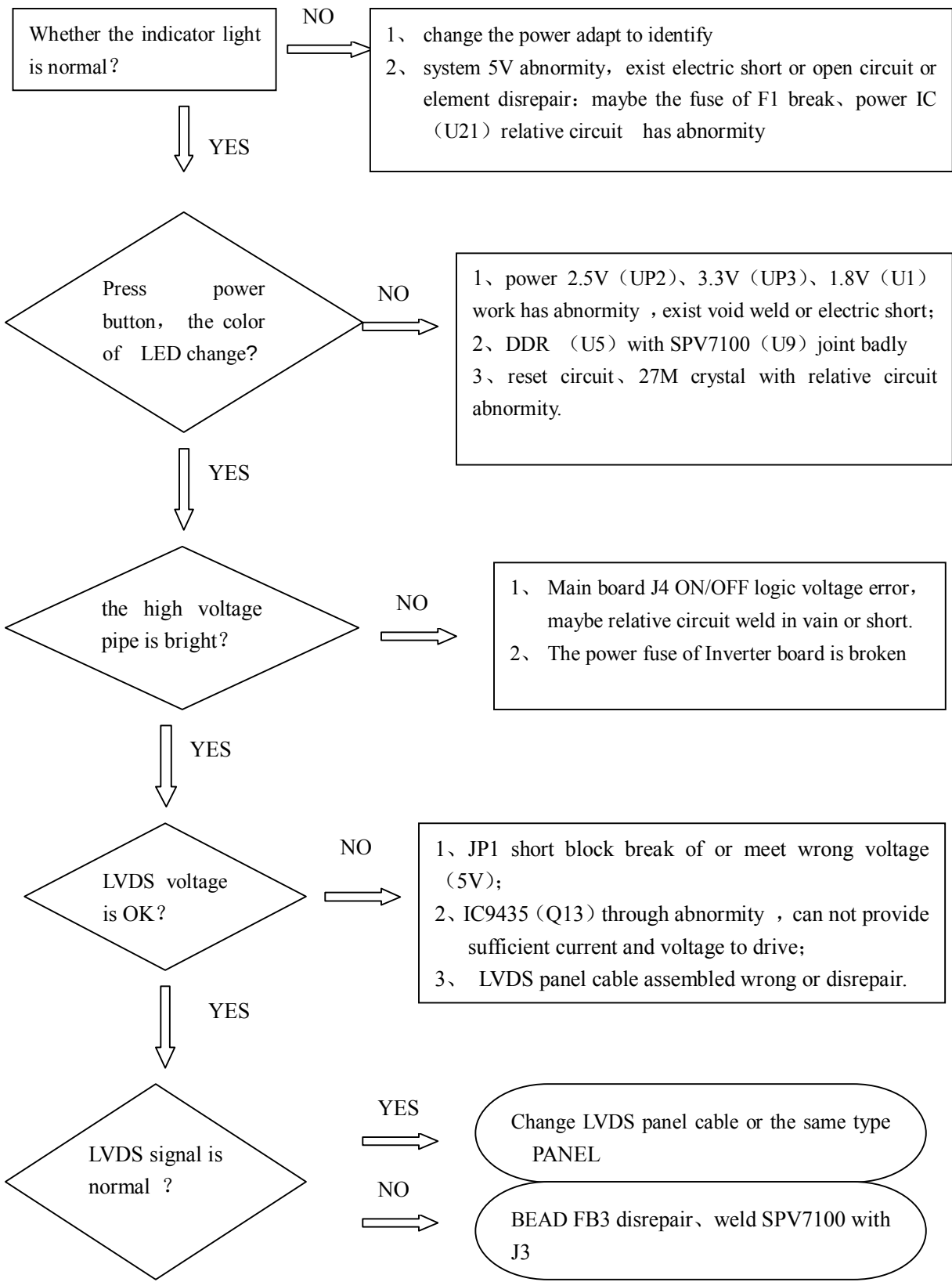
20K	resistor KX0603 1/16W ±5%	R284, R465	2	
22K	resistor KX0603 1/16W ±5%	R103, R329, R330, R381, R401, R444, R455	7	
27K	resistor KX0603 1/16W ±5%	R428	1	
39K	resistor KX0603 1/16W ±5%	R406	1	
47K	resistor KX0603 1/16W ±5%	R5, R49, R51, R54, R62, R110, R173, R177, R180, R181, R187, R188, R191, R192, R196, R198, R200, R230, R269, R273, R292, R331, R332, R333, R334, R400, R425, R443, R445, R464, R459, R485, R14,	33	
100K	resistor KX0603 1/16W ±5%	R7, R42, R59, R114, R123, R313, R353, R447, R456, R463, R495, R457, R462	13	
180K	resistor KX0603 1/16W ±5%	R386	1	
270K	resistor KX0603 1/16W ±5%	R201, R249	2	
200K	resistor KX0603 1/16W ±5%	R359, R360, R361, R362	4	
470K	resistor KX0603 1/16W ±5%	R454, R450	2	
560K	resistor KX0603 1/16W ±5%	R389	1	
capacitance				
5pF	capacitance CC41-0603 16V±5%	C113, C389	2	
10pF	capacitance CC41-0603 16V±5%	C126, C129, C182, C261, C264, C267, C383, C384	8	
15pF	capacitance CC41-0603 16V±5%	C116, C115	2	
22pF	capacitance CC41-0603 16V±5%	C49	1	
33pF	capacitance CC41-0603 16V±5%	C70, C78, C91, C99	4	
47pF	capacitance CC41-0603 16V±5%	C148, C183	2	
56pF	capacitance CC41-0603 16V±5%	C23, C46, C47, C61, C63, C76, C142, C390, C391	9	
62pF	capacitance CC41-0603 16V±5%	C262, C265, C268	3	
75pF	capacitance CC41-0603 16V±5%	C263, C266, C269	3	
100pF	capacitance CC41-0603 16V±5%	C195, C196, C296, C346, C357, C360	6	
220pF	capacitance CC41-0603 16V±10%	C185, C186, C193, C199, C207, C215, C232, C233, C234, C235, C236, C237, C315, C316, C339, C340, C341, C342, C343, C344, C386	21	
330pF	capacitance CC41-0603 16V±10%	C192, C314	2	
390pF	capacitance CC41-0603 16V±10%	C117	1	
390pF	capacitance CC41-0603 16V±10%	C304, C387, C388	3	
470pF	capacitance CC41-0603 16V±10%	C194, C187	2	
1nF	capacitance CC41-0603 16V±10%	C1, C21, C131	3	
1.5nF	capacitance CC41-0603 16V±10%	C292	1	
2.2nF	capacitance CC41-0603 16V±10%	C222	1	
10nF	capacitance CC41-0603 16V±10%	C151, C152, C153, C158, C165, C179, C205, C206, C291, C295, C299, C305, C303	13	
47nF	capacitance CC41-0603 16V±10%	C164, C172, C309, C310	4	
8200pF	capacitance CC41-0603 16V±10%	C123	1	

	0.1uF	capacitance CC41-0603 6V-20%+80%	C2, C4, C6, C7, C8, C13, C18, C19, C25, C34, C35, C39, C40, C41, C50, C52, C53, C54, C55, C56, C57, C58, C59, C60, C62, C64, C65, C66, C67, C68, C69, C77, C80, C81, C83, C89, C93, C94, C95, C97, C101, C107, C109, C111, C114, C119, C120, C121, C122, C130, C133, C134, C135, C137, C138, C139, C140, C144, C161, C162, C163, C169, C170, C173, C174, C178, C201, C218, C220, C239, C276, C278, C280, C282, C297, C298, C300, C301, C317, C318, C319, C320, C321, C322, C323, C353, C354, C355, C356, C368, C379, C380, C381, C385	94	
	0.1uF 0805	capacitance CC41-0805 16V-20%+80%	C37	1	
	0.22uF	capacitance CC41-0603 16V-20%+80%	C294	1	
	0.47uF	capacitance CC41-0603 16V-20%+80%	C221, C293, C302	3	
	1uF	capacitance CC41-0603 10V-20%+80%	C9, C71, C72, C79, C84, C85, C103, C104, C105, C106, C124, C145, C146, C147, C157, C184, C217, C223, C290, C327, C328, C329, C330, C331, C332, C333, C334, C335, C336, C337, C338, C347, C350, C352, C358, C361	36	
	1uF 0805	capacitance CC41-0805 6V-20%+80%	C257	1	
	2.2uF	capacitance CC41-0603 10V-20%+80%	EC80, C159, C160, C166, C167, C168, C180, C181, C189, C190, C324, C325, C326, C351, C363	15	
	2.2uF 0805	capacitance CC41-0805 6V-20%+80%	EC73, EC89	2	
	10uF/10V	capacitance CC41-0805	C26, C36, C246, C308	4	
	10uF	capacitance CC41-0805	C238, C242, C243, C244, C247, C248, C250, C251, C252, C253, C254, C255, C270, C271, C272, C273, C275, C279, C281, C306, C307, C364, C365, C366, C367, C369, C370, C371, C372, C373, C374, C375, C376, C377, C378, C382, C392, C345	38	
PCB					
	PCB	HK-HDMI-CI-SUNTV-V2.52			
	Dispel heat metal	28*28*6	U9	1	
	Dispel heat metal	26*9*5	U27	1	
IC					
	HY5DU281622FTP-5	8Mx16 DDR	U5	1	
	W9812G6GH-6	8MX16 SDRAM	U11	1	
	NJM4558	integrate circuit	U6	1	
	SPHE1003A	integrate circuit	U13	1	
	AX3101	integrate circuit	U1	1	
	SPV7100E	QFP256-0.4-PADB	U9	1	
	74HC4052D	integrate circuit	U16	1	
	PI5V330/CT3257A	integrate circuit	U22, U18	2	
	FT24C02(A)	integrate circuit(2K ROM)	U19, U14	2	
	FT24C032(A)	integrate circuit(32K ROM)	U15	1	
	EN25T80/SOP	Flash	U2	1	
	EN25T80/DIP	Flash	U7	1	
	OCP2030SA	integrate circuit	U21	1	
	TDA9886TS	integrate circuit	U25	1	

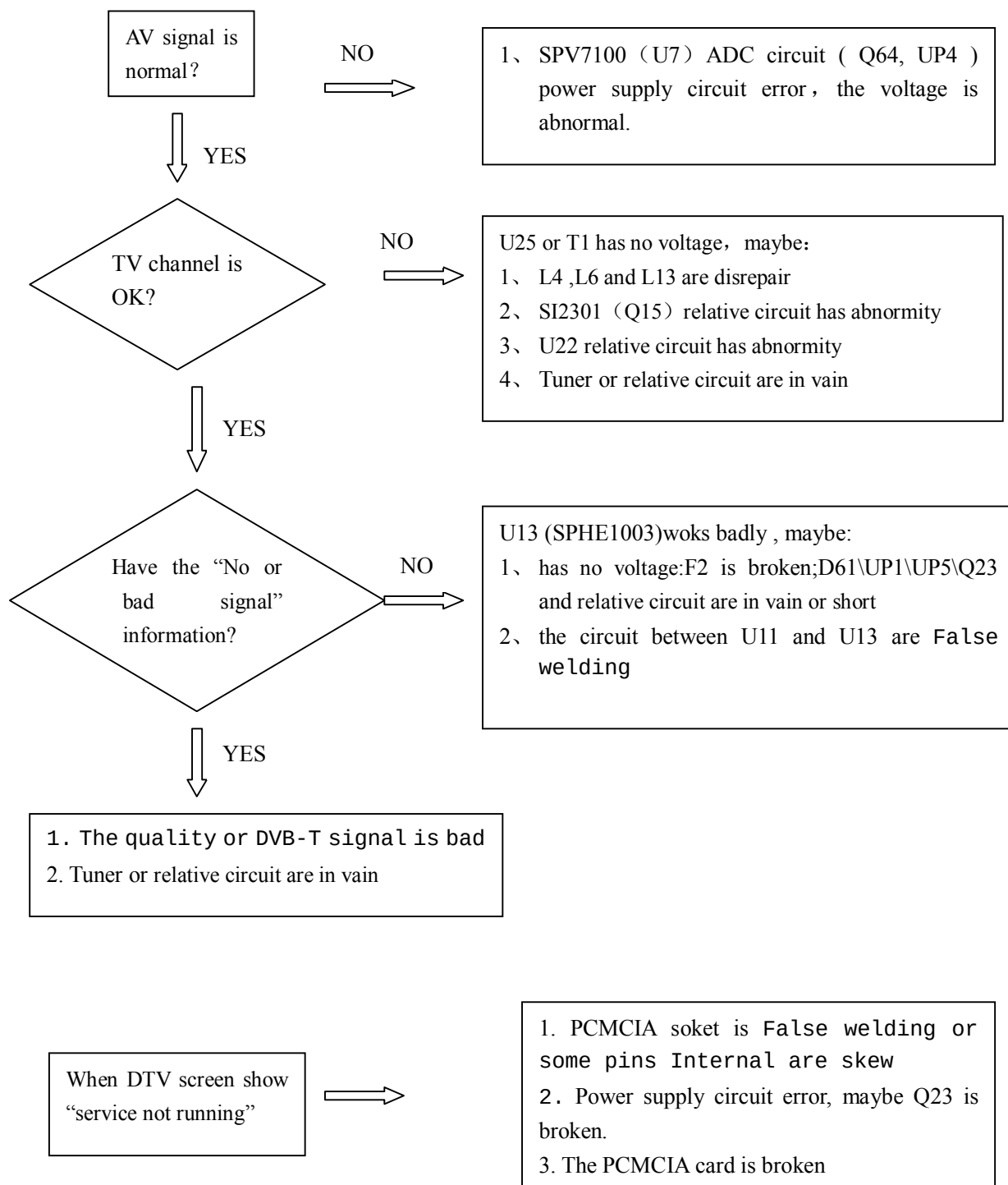
	AME1117-ADJ/T	integrate circuit	UP4	1	
	BM1084-33/T0-263	integrate circuit	UP3	1	
	AME1117AS18X/T	integrate circuit	UP1	1	
	AEM1117AS25X/T	integrate circuit	UP2	1	
	AEM1117AS33/T	integrate circuit	UP5	1	
	D1517P	integrate circuit	U27	1	
	SI9435	integrate circuit	Q13	1	
	CDT-9DT33C-40	integrate circuit	T1	1	

HK-HDMI-CI-SUNTV-V2.55 TV MainBoard Debug Guide

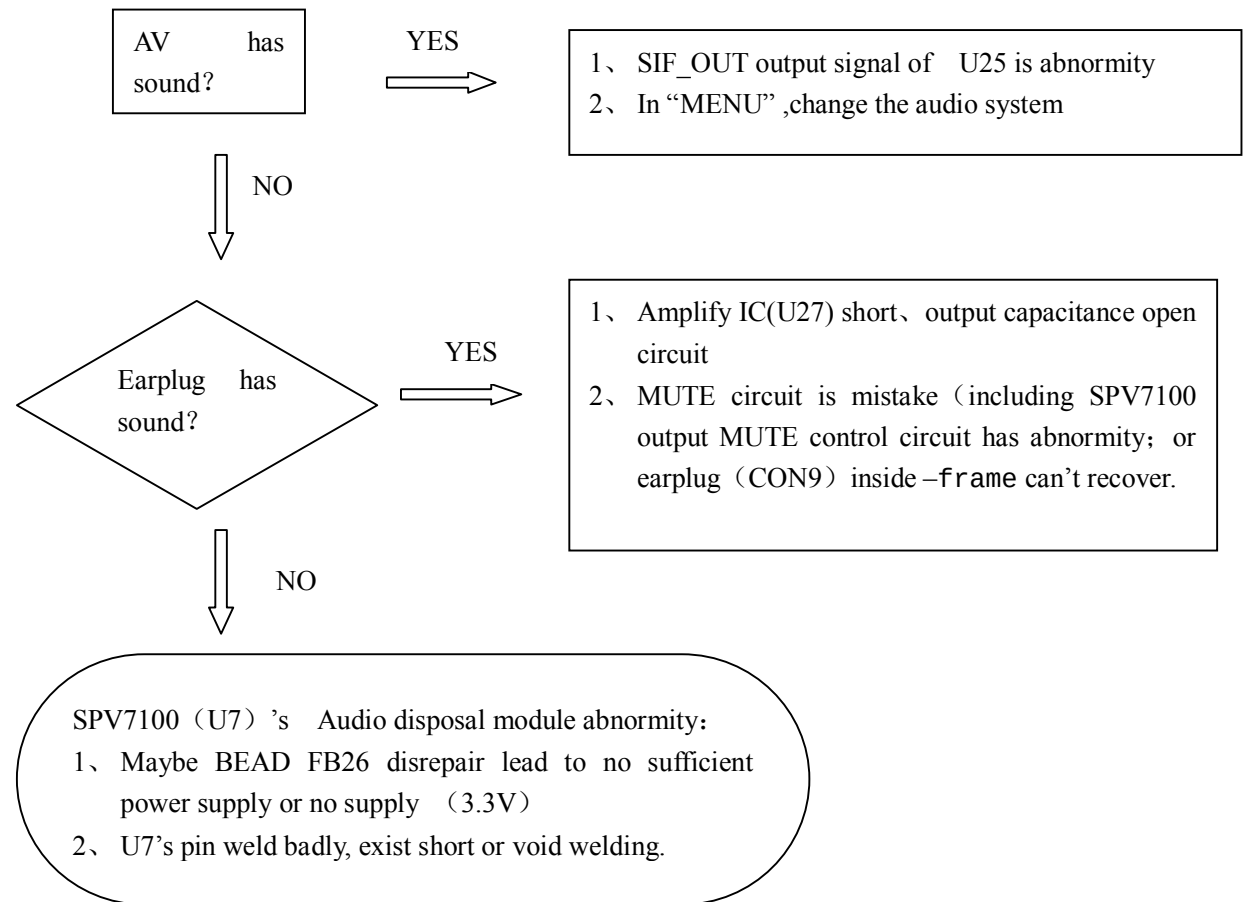
Trouble 1: black screen



Trouble 2: have no DTV signal



Trouble3: TV with no sound

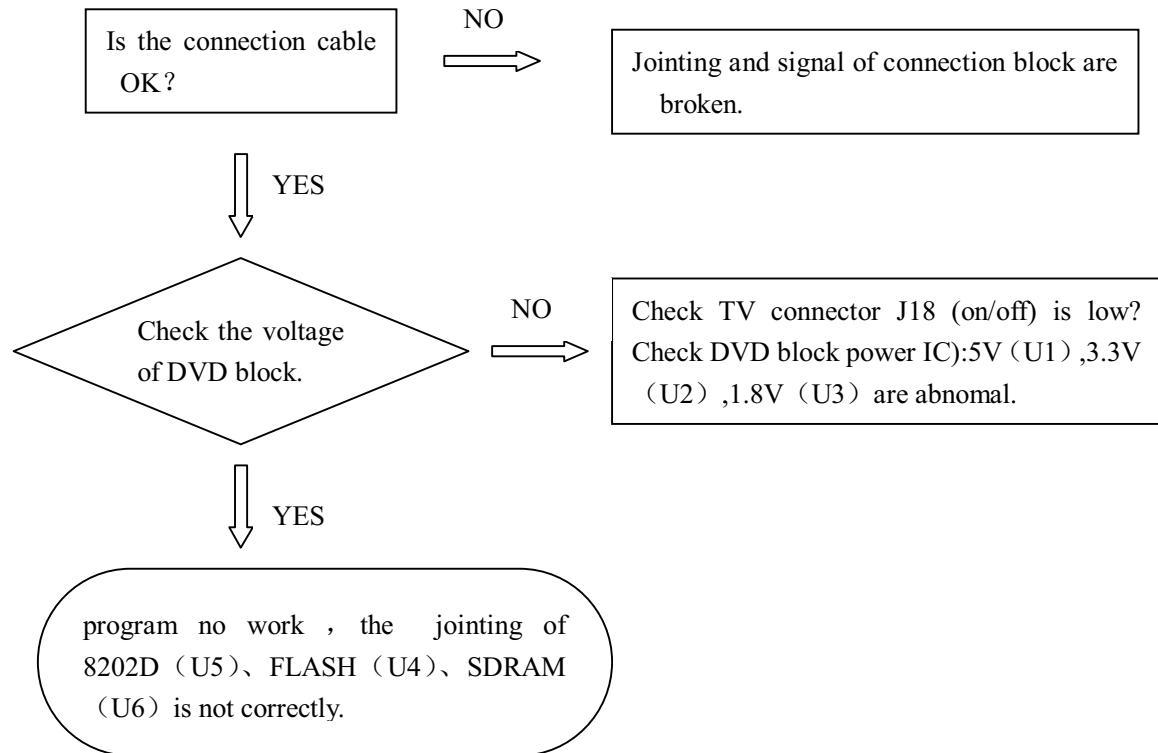


Trouble 4: HDMI is abnormal

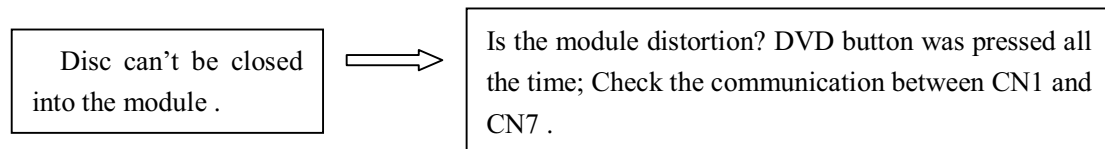
- 1、No picture appears: Check HDMI jack and cable connection
- 2、Sounds with no picture: Is EDID OK? (In TV mode ,enter factory menu and then EDID RESET

DVD BLOCK DEBUG INSTRUCTION

1.DVD NO PICTURE



2. DVD MODULE CAN'T CLOSE



3. DISC CAN'T BE READ

