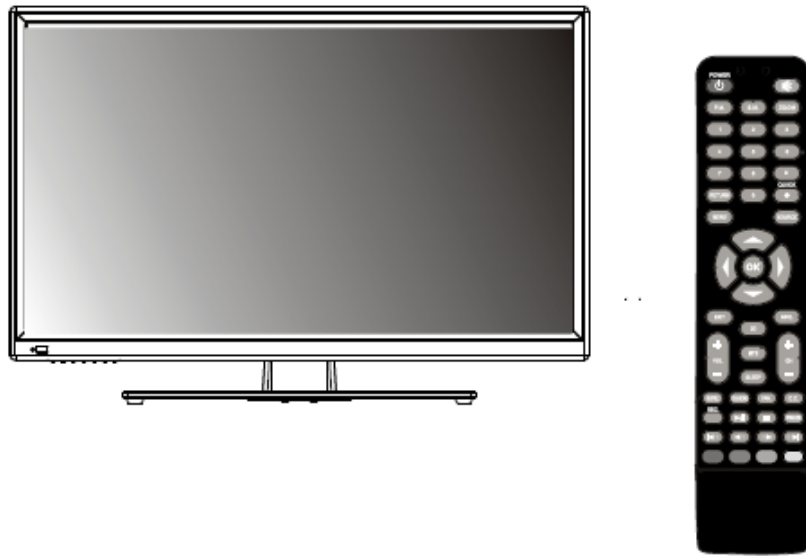


# SERVICE MANUAL

## 6M61E CHASSIS



Design and specifications are subject to change without prior notice. (Only Reference)

SIZE:A5

<b>Description: SERVICE MANUAL 6M61E</b>	
<b>MODEL.</b>	<b>Brand Name:</b>
<b>JOB NO.</b>	
<b>Engineering Dept:</b>	
<b>Artwork By:</b> 马杰	<b>Date:</b> 2013-8-8
<b>Checked By:</b>	<b>Date:</b>
<b>Approved By:</b>	<b>Date:</b>

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# Technical Specification

## 1. Application Area:

This product standard is use for LED 6M61E chassis.

## 2. Specification:

All the standard are measured under following conditions without other specification.

2.1 Ambient Temperature: 20+/-5°C

2.2 Relative Humidity: 65+-10%

2.3 Power Supply Voltage: Standard Input Voltage(100~240V AC 50/60HZ)

2.4 Adjust after 20 minutes warm-up.

## 3. Test and check method:

3.1 Capability: According to nation test standard

3.2 Safety: \_\_\_\_\_standard

3.3 EMC: \_\_\_\_\_standard

# Technical Specification

## 4. Safety and Regulation

NO.	Item	Min	Typ	Max	Unit	Remark
1.	Force Stability-Inclineplane Tip Test		10		deg	
2.	Force Stability-Level Tip Test		100		N	
3.	Isolation Gap AC-AC/AC-DC	3			mm	
4.	Isolation Gap	6			mm	
5.	Power consumption Max				W	
					W	
					W	
					W	
6.	Power consumption Standby			1	W	
7.	Dielectric Voltage	3			kV	
8.	Isolation Resistance	4			MΩ	
9.	Leakage Current		5		mApp	
10.	Power cord captivity		40		N	
11.	Flammability— Back Cover		PASS			
12.	Sharp edge		PASS			
13.	UL Compliance		NO			
14.	FCC Compliance		NO			
15.	CDRH Radiation Compliance		NO			
16.	CSA Compliance		NO			
17.	CEB Compliance		NO			
18.	CE Compliance					Base on different order
19.	CB Compliance		YES			

## 5. Video

NO.	Item	Min	Typ	Max	Unit	Remark
1.	Linearity Distortion,Verticl		1		%	
2.	Linearity Distortion,Horizontal		1		%	
3.	Trapezoidal Distortion,Verticl		1		%	
4.	Trapezoidal Distortion, Horizontal		1		%	
5.	Over scan, Verticl	93	95	97	%	
6.	Over scan, Horizontal	93	95	97	%	
7.	Brightness Maximum		280			
8.	Video Noise Limited Sensitivity(@S/N=30dB) VHF			51	dBuV	

# Technical Specification

9.	Video Noise Limited Sensitivity(@S/N=30dB) UHF			54	dBuV	
10.	Selectivity -1.5M	35			dB	
11.	Selectivity +8M	40			dB	
12.	Tuning Range	-0.7			MHz	
13.	Resolution Horizontal		1366		Lines	
14.	Resolution Vertical		768		Lines	

## 6. Chroma

NO.	Item	Min	Typ	Max	Unit	Remark
1.	White Balance, X axis					
2.	White Balance, Y axis					
3.	White Balance, Color Temperature	6500	9800	12500	kdeg	12500(266,276) 9800(280,290) 6500(313,329)
4.	Color Sensitivity		30		dB	
5.	Color Burst Lock-in Range	+/-300			Hz	
6.	Color Killer Sensitivity		30		dBuV	

## 7. Audio

NO.	Item	Min	Typ	Max	Unit	Remark
1.	Audio Noise Limited Sensitivity,VHF-L		25		dBuV	
2.	Audio Noise Limited Sensitivity,VHF-H		25		dBuV	
3.	Audio Noise Limited Sensitivity,UHF		28		dBuV	
4.	Buzz(S/N Ratio)		40		dB	
5.	Distortion		3		%	
6.	Audio output,L/R,at 10% THD		6		W	
7.	Audio output,Center		6		W	
8.	Stereo Separation		21		dB	
9.	Speaker Impedance		8		ohm	
10.	Speaker Power rating		8		W	

## 8. Power

NO.	Item	Min	Typ	Max	Unit	Remark
1.	DC Voltage, Audio		12		V	
2.	DC Voltage, Tuner		3.3		V	

# Technical Specification

## 9. External Interface

NO.	Item	Min	Typ	Max	Unit	Remark
1.	Video Input Level		1		Vpp	75 ohm
2.	Video Input Frequency Response	4.5			MHz	
3.	Video Input S/N		40		dB	
4.	Audio Input Level		0.5		Vrms	
5.	Audio Input Frequency Response			15	kHz	
6.	Audio Input S/N		40		dB	
7.	Audio Input Distortion		3		%	
8.	Audio Input Dynamic Range		2		V	
9.	Video output Level		1		Vpp	
10.	Video output Frequency Response		4.2		MHz	
11.	Video output S/N		50		dB	
12.	Audio output Level		0.5		Vrms	
13.	Audio output Frequency Response	80		12000	Hz	
14.	Audio output S/N		50		dB	
15.	Audio output Distortion		6		%	
16.	Video Input Level,R/G/B		0.7		VPP	
17.	Video Input Level,Component(Y,Pb,Pr)		0.7		VPP	
18.	RGB Input Resolution,Vertical			768	pixel	
19.	RGB Input Resolution,Horizontal			1366	pixel	
20.	RGB Input Horizontal Frequency			68	kHz	
21.	RGB Input Frame Rate			60	Hz	

## 10. The Others

NO.	Item	Min	Typ	Max	Unit	Remark
1.	Search sensitivity		40		dBuV	
2.	Clock,real time gain or loss(sec per day)		NO		sec	
3.	Software Functionality Test		YES			
4.	REMOCON Working sensitivity,Straight		8		m	
5.	REMOCON Working sensitivity,T/B/L/R		6		m	
6.	Close caption sensitivity		46		dBuV	
7.	Teletext sensitivity		46		dBm	
8.	Resonance of unit(sweep freq:50~1000)		NO			

# Technical Specification

## 11. Customer Menu Setup(as shipped condition)

NO.	Item	Specification	Remark
1.	PSM	Standard	
2.	SSM	Standard	
3.	Volum	20	
4.	Mute	off	
5.	Input Mode	RF	
6.	Customer menu language	Traditional Chinese	Base on different order
7.	AVL	off	
8.	Sleep Timer	off	
9.	Auto sleep	off	
10.	Blue back	NO	
11.	Surround	off	
12.	Caption	off	
13.	Noise Reducer	Middle	

## 12. Reliability

NO.	Item	Min	Typ	Max	Unit	Remark
1.	ESD		4		kV	IEC-1000-4-2
2.	EFT/Burst				kV	IEC-1000-4-4
3.	Surge Immunity				kV	IEC-1000-4-5
4.	Voltage Dip Test,10ms				%	IEC-1000-4-11
5.	Voltage Dip Test,100ms				%	IEC-1000-4-11
6.	Operation Temperature				deg	
7.	Operation Humidity				%	
8.	Storage Temperature				deg	
9.	MTBF(confidence Level:90%)				hour	

# Technical Specification

## DTV-Productions Specification

Model #	32"
Country( West Eu./East Eu./Russia/AP/US/S.A./Japan/...)	West Eu
Brand	ODM/Skyworth
Category (Monitor/TV/Combo/Portable TV...)	TV
Panel technology (LCD / PDP)	D-LED
Market Position (High/Mid/Access,,)	Class
Cabinet Design (Example: 01,23 series )	32E36
Product Nb	-
Chassis solution	MSD6306PUN
Chassis name	6M61E
Chassis PCB Standard	Skyworth RGB New Standard
Predecessor (replace)	-
MP date requested (ETD)	2013.8
MP date confirmed by supplier (ETD/ETA)	-
Status( Pre./Finish )	-
<b>Regional requirement</b>	
Homologation (Gostandard/CE/MPTT/CB/...)	VDE
RoHS	Yes
Power supply(100-240V AC +/-10%/...)	100-240V AC (-20%,+10%)
Power consumption working / Annual	-
Power consumption standby	<1W
Power plug(VDE/UL/BS/...)	VDE/2pins
<b>Picture display</b>	
Screen size : diagonale (inch)	32
Aspect ratio (16/9 // 4/3 // 15/9)	16:9
1st panel supplier : panel suppliers	Skyworth
1st panel supplier : panel reference	Skyworth
Panel Display Type(MVA/PVA/IPS/...)	TFT LCD
1st panel supplier : resolution	32"1366X768
Dynamic contrast ratio	>10000:1
<b>Video signal process</b>	
Comb Filter (2D/3D)	3D
Noise Reduction (adaptative/3D/...)	3D
Picture improvement ( LTI/CTI,BLE,WLE,...)	LTI/CTI



# Technical Specification

Color process (Gama correction/Skin correction /... )	Follow main IC
Colour preset (Cool/Neutral/Warm)	Cool/Neutral/Warm
Picture control ( Bright/Con./Sharpness/Color/Tint/...)	Yes
Picture presets : Normal/Bright/Soft/Personal	Normal/Bright/Soft/Personal
Picture freeze	Yes
Multi picture : PIP ( AV )/POPAV	NO
Dynamic Backlight Control	NO
LED Backlight	D-LED
Deinterlacer (No/linear/motion adaptive/motioncompensative)	3D motion adaptive
Film mode / reverse 3:2/2:2 pull down	Yes / Yes
Full HD support ( 1080P )	Yes
Single scan / Dual scan ( 120HZ )	Single scan
Zoom type : 4/3 format	YES
Zoom type : 14/9 Zoom	NO
Zoom type : 16/9 Zoom	YES
Zoom type : 16/9 Zoom up/down	YES
Zoom type : Cinerama	YES
Zoom type : 16/9 Format	YES
Zoom type : Auto ( by SCART Pin8 and WSS )	YES
Picture Auto adjustment (PC mode)	YES
3D Panel Type(PR / SG)	NO
3D Mode	NO
3D To 2D (Y/N)	NO
2D To 3D (Y/N)	NO
Left / Right Swap (For PR Panel)	NO
<b>Sound</b>	
Sound type ( Mono/AV stereo/Stereo )	stereo
Music Power (Watt)/RMS Power (Watt)	32":2X6W
Tone control ( Bass&Treble / Graphic Equalizer )	Bass&Treble
Special sound effect ( AVL / WIDE / Pseudo /... )	AVL
Suround system ( Dolby / VD / SRS / BBE / ... )	Built-in Surround

# Technical Specification

Sound control ( Volume , Balance , Mute )	Volume, Balance, Mute
Sound presets (Personal/Music/Film/News/Standard)	Personal/Music/Film/News/Standard
Headphone volume control ( Separated / linked )	Yes(Linked)
Sound quality ( High / Mid / Low )	
<b>Reception and Decoding capability</b>	
RF rangeATV	45MHz~866MHz
RF rangeDTV	VHF 177-213 MHz, UHF 473-803 MHz
Color System (PAL/SECAM/NTSC/PAL M,N )	PAL/SECAM/NTSC DK/I/BG/M
Audio Standard ( B/G/H/D/K/K'/I/L/L' )	PAL/SECAM/NTSC DK/I/BG/M
Stereo audio system ( Nicam,MTS,A2,...)	Nicam ,A2
Video standard NTSC 3.58 / 4.43 (AV)/PAL 60	NTSC 3.58/4.43 , PAL
DTV SD support (DVB-T/S/C , ATSC , QAM , ... )	DVB-T
DTV HD Support	MPEG2,MPEG4,H.264
MHEG5	NO
HD capability with YPbPr	Yes (720p; 1080i; 1080p@24/50/60Hz; 480i/p; 576i/p)
PC capability (up to maximum format)	32":1366X768Hz 60Hz
HDMI capability AV/PC Format)	Up to 1080P 24/50/60HZ
Compatible video format if DVD/USB: DviX/VCD/SVCD/JPEG/AVI/MPEG2/WMV- HD/SD	JPEG/MPEG2/MPEG4/H.264/DivX (depending on license)
Compatible audio format if DVD/USB:MP3/WMA/AAC/MPEG1/...	MP3/WMA(depending on license)
Playable Discs (CD/CD-R(RW)/CD-ROM/DVD+R/+RW/-R/-RW)	NO
Card reader format compatibility	NO
Macrovision	Yes
PVR	Yes
Network	NO
<b>User convenience</b>	
OSD Language*	English/TBD
OSD Positioning	No
OSD Transparency Adjust	No
OSD Timeout Adjust	No
Customer Brand name(LOGO)	Yes

# Technical Specification

IB languages	English
ATV Program Numbers (example: 99+3AV input )	100+7AV
DTV Program Numbers	200
Program edit ( naming , sorting , skip , swap .... )	Naming / Skip / Swap
Auto Naming/Auto Sorting	No
TV Guide(DTV EPG)	EPG(next Seven-day)
Favorite program	Yes
Number of buttons on cabinet (Power; Vol+/-; Pr+/-,Menu )	Vol+/-; Pr+/-, Menu ,Source,Power
Main switch button (yes/No)	No
CCD(Closed Caption)/V-CHIP	No /No
Text Standard: (Top, FLOF,,)	No
Teletext Level: 2.5 / 1.5	Yes
Pages for teletext	Yes
Teletext character sets ****	Yes
DVB-T teletext	Yes
Real clock	From DTV
Sleep timer	10-240 Min
Timer	Turn On / Off, Program Switch
Parent Control -Source and Channel lock (Input code forcertain channel)	Yes
Parent Control - Child lock (set the lock of the keyboard,only the RCU can control the TV)	Yes
Parent Control - Kid pass (preset the ontime, channel foreach day of the week)	No
Parent Control - Channel lock (For digital transmissionand DVD program, to filter some programms)	Yes
Calendar / Games	No
No program auto switch off	Yes
Hotel mode (Y/N)	Yes
DVD player (No/slot/tray)	No
Tuner FM (yes/No)	No
software download(RS232/CI/USB/OAD)	USB
Factory reset	Yes(in factory menu,reset the setting to shipment state )
Screen saver	Yes

# Technical Specification

<b>Blue Back</b>	<b>Yes</b>
<b>LED indicator(Power on/Standby)</b>	<b>Blue / Red</b>
<b>Connectors -Rear</b>	
<b>RF Input (Antenna): Air/ Cable/ 2in1</b>	<b>Antenna</b>
<b>Scart : CVBS in&amp;out / RGB / S-VIDEO</b>	<b>No</b>
<b>CINCH video in / outAV1</b>	<b>1/ 0</b>
<b>CINCH audio in / out (No volumpe control on Audioout/can be jack 3,5mm)</b>	<b>1/1</b>
<b>S-video in</b>	<b>No</b>
<b>Component Video Input (YCrCb/YPrPb)</b>	<b>1</b>
<b>Component Audio Input (YCrCb/YPrPb)</b>	<b>1</b>
<b>VGA in / Audio L/R in / Jack audio in 3.5mm</b>	<b>VGA + dia. 3.5mm for audio</b>
<b>HDMI</b>	<b>2</b>
<b>DVI</b>	<b>No</b>
<b>Audio input for DVI</b>	<b>No</b>
<b>CINCH subwoofer out / Coaxial out (S/PDIF)</b>	<b>No</b>
<b>Headphone output connector (mm)</b>	<b>1</b>
<b>RS232 ( Y/N , VGA or DB9 port ...)</b>	<b>No</b>
<b>Card Readers</b>	<b>No</b>
<b>USB slot (No/1.1/2.0)</b>	<b>2</b>
<b>DVB-CI (common interface)</b>	<b>No</b>
<b>External power converter input</b>	<b>No</b>
<b>Connectors -Side</b>	
<b>HDMI</b>	<b>1</b>
<b>AV-IN</b>	<b>1</b>
<b>AV-OUT</b>	<b>NO</b>
<b>Component Video Input (YCrCb/YPrPb)</b>	<b>1</b>
<b>Component Audio Input (YCrCb/YPrPb)</b>	<b>1</b>
<b>Headphone output connector (dia.mm)</b>	<b>1</b>
<b>CINCH subwoofer out / Coaxial out (S/PDIF)</b>	<b>NO</b>
<b>USB slot (No/1.1/2)</b>	<b>1</b>
<b>DVB-CI (common interface)</b>	<b>NO</b>
<b>DLNA</b>	<b>NO</b>
<b>RF Input (Antenna): Air/ Cable/ 2in1</b>	<b>Antenna</b>
<b>VGA in / Audio L/R in / Jack audio in 3.5mm</b>	<b>VGA + dia. 3.5mm for audio in</b>

# Technical Specification

<b>UI/RC</b>	
UI design (font/pixel, 2D/3D graphic engine..)	SOD Standard
RC Model	Commend RCU
RC system	RGB Standard
RC # of keys	
<b>Accessories included</b>	
Carton	Traditional Chinese
IB	Traditional Chinese
Circuit diagram	No
Batteries	No
Product registration Card	Yes(Traditional Chinese)
AC Cable Length	1.8m
Audio Cord (Jack 3.5mm)	No
VGA Cord	No
Wallmount frame	Optional
Antenna Cable	No
6 in 1(YPbPr & CVBS) cable adapter	No
3D Glasses	YES(If have 3D mode)
<b>General Data</b>	
Size (W x H x D, with stand) in mm	
Size (W x H x D, without stand) in mm	
Package Size (W x H x D, without stand) in mm	
Net Weight in kg	
Gross Weight in Kg	
<b>Design / Mechanical</b>	
Wallmount VESA compatible (standard reference)	Yes
Adaptor for VESA wallmount compatibility	Yes
Desktop Stand (included/optionnal + ref/No)	included
Panel Tilt (Fowards/Backwards/Rotation)	No
Swivel function desktop stand (yes/No) + motorized?	No
Docking station (yes/No)	No
Floor Stand (included/optionnal + ref/No)	No
Glass shield (yes/No)	No
Finish on Front	-

# Technical Specification

<b>Finish on side</b>	-
<b>Finish on back</b>	-
<b>Finish on stand</b>	-
<b>number of colors on carton box</b>	
<b>Brand logo</b>	<b>Customer Inlet</b>
<b>Other logo</b>	<b>No</b>
<b>External AC/DC Power with DC power cord (yes/No)</b>	<b>No</b>
<b>Handle (yes/No)</b>	<b>No</b>
<b>Detachable speaker (yes/No)</b>	<b>No</b>
<b>Rating Label langages</b>	<b>English</b>

机型								
NO	名称	位号	生产厂家	厂家型号	规格	P/N(参考)	认证标记	
1	接收头	IR1	海格科技	SDR138		5300-147438-0S00		
2	扬声器	SPEAKER	中山声力	SL411-01F		5631-108104-0180		
3	晶振	Y1/Y2	陕西壹加壹	HC-49U/S		4900-124053-R000		
4	高频头	U10	Silicon lab	SI2157		471J-SI2150-0280		
5	所有 IC	U6	芯智	MSD6306PUN		475C-M63061-1280		
		U7	CFEON	EN25Q32B		471R-N25323-0080		
		U1	唯隆	AOZ3015PI		4786-A30151-0080		
		U12	新晔电子	TPA3113		4722-T31130-0280		
		U13	帕太	BH3544F-E2		4740-B35440-0080		
		U5/U11	A1 半导体	AS1117L-3.3/TR-HF		47B6-A11170-03		
		U4	A1 半导体	AS1117L-3.3/ADJ		47B6-A11174-0300		
		U3	亿思达国际	MP1470GJ-Z		476A-M14700-0060		
		QA1	沛裕电子	AP2181DWG-7		47C5-A21810-0050		

# IC Block Diagram

## 1. AOZ3015PI



AOZ1051PI

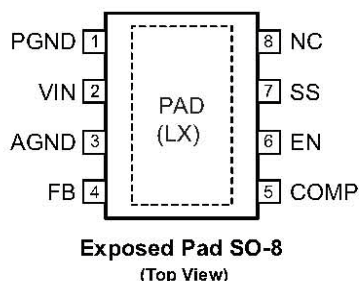
### Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ1051PI	-40 °C to +85 °C	EPAD SO-8	Green Product



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant. Please visit [www.aosmd.com/web/quality/rohs\\_compliant.jsp](http://www.aosmd.com/web/quality/rohs_compliant.jsp) for additional information.

### Pin Configuration

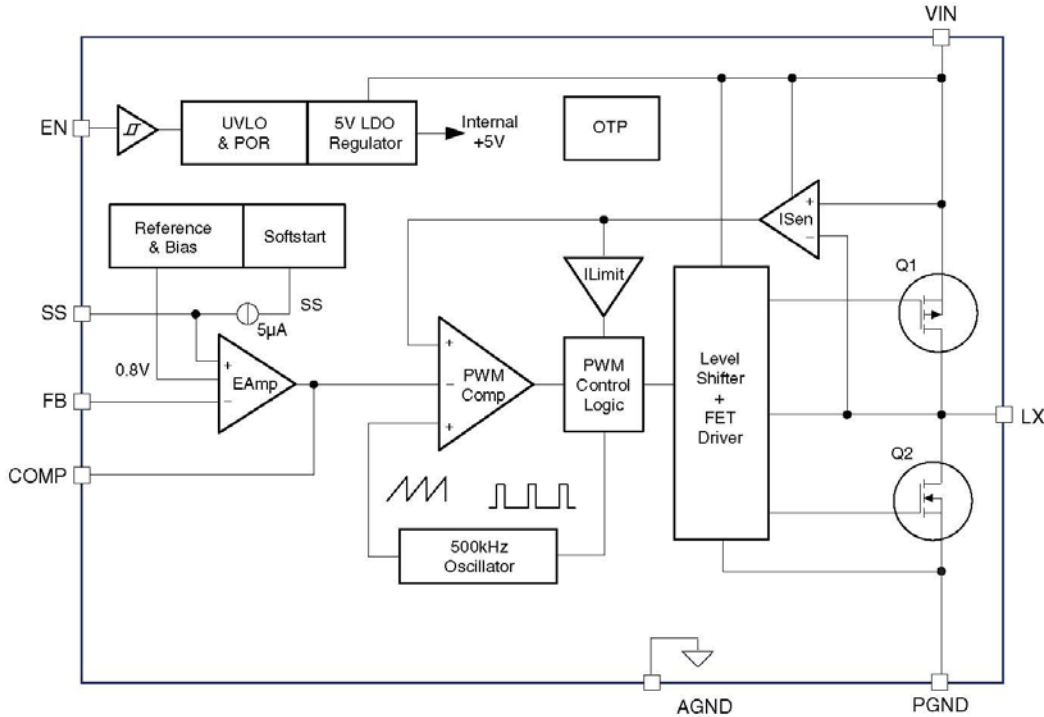


### Pin Description

Pin Number	Pin Name	Pin Function
1	PGND	Power ground. PGND needs to be electrically connected to AGND.
2	VIN	Supply voltage input. When VIN rises above the UVLO threshold and EN is logic high, the device starts up.
3	AGND	Analog ground. AGND is the reference point for controller section. AGND needs to be electrically connected to PGND.
4	FB	Feedback input. The FB pin is used to set the output voltage via a resistive voltage divider between the output and AGND.
5	COMP	External loop compensation pin. Connect a RC network between COMP and AGND to compensate the control loop.
6	EN	Enable pin. Pull EN to logic high to enable the device. Pull EN to logic low to disable the device. If on/off control is not needed, connect EN to VIN and do not leave it open.
7	SS	Soft-start pin. 5 $\mu$ A current charging current.
8	NC	No Connect Pin. Pin 8 is not internally connected. Connect this pin externally to LX and use it for better thermal performance.
Exposed pad	LX	Switching node. LX is the drain of the internal PFET. LX is used as the thermal pad of the power stage.



**Block Diagram**



**Absolute Maximum Ratings**

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
Supply Voltage ( $V_{IN}$ )	20 V
LX to AGND	-0.7 V to $V_{IN}+0.3$ V
LX to AGND (20 ns)	-5 V to 22 V
EN to AGND	-0.3 V to $V_{IN}+0.3$ V
FB, SS, COMP to AGND	-0.3 V to 6.0 V
PGND to AGND	-0.3 V to +0.3 V
Junction Temperature ( $T_J$ )	+150 °C
Storage Temperature ( $T_S$ )	-65 °C to +150 °C
ESD Rating <sup>(1)</sup>	2.0 kV

**Note:**

1. Devices are inherently ESD sensitive, handling precautions are required. Human body model rating: 1.5 k $\Omega$  in series with 100 pF.

**Recommended Operating Conditions**

The device is not guaranteed to operate beyond the Maximum Recommended Operating Conditions.

Parameter	Rating
Supply Voltage ( $V_{IN}$ )	4.5 V to 18 V
Output Voltage Range	0.8 V to $0.85 \cdot V_{IN}$
Ambient Temperature ( $T_A$ )	-40 °C to +85 °C
Package Thermal Resistance Exposed Pad SO-8 ( $\Theta_{JA}$ ) <sup>(2)</sup>	50 °C/W

**Note:**

2. The value of  $\Theta_{JA}$  is measured with the device mounted on a 1-in<sup>2</sup> FR-4 board with 2 oz. Copper, in a still air environment with  $T_A = 25$  °C. The value in any given application depends on the user's specific board design.

2. ME9435A

\*. 2009.5.26

**Matsuki Electric**  
30V P-Channel Enhancement Mode MOSFET

**ME9435A**

**GENERAL DESCRIPTION**

The ME9435A is the P-Channel logic enhancement mode power field effect transistors, using high cell density, DMOS trench technology.

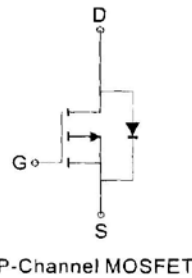
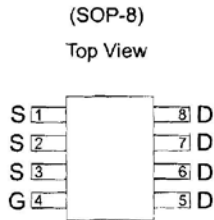
This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone, notebook computer power management and other battery powered circuits, and lower power loss that are needed in a very small outline surface mount package.

**FEATURES**

1.  $R_{DS(ON)} \leq 40m\Omega @ V_{GS} = -10V$
2.  $R_{DS(ON)} \leq 60m\Omega @ V_{GS} = -4.5V$

**PIN CONFIGURATION**



**Absolute Maximum Ratings** ( $T_A = 25^\circ C$  Unless Otherwise Noted)

Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	$V_{DS}$		-30	V
Gate-Source Voltage	$V_{GS}$		$\pm 20$	V
Continuous Drain Current	$I_D$		-6.3	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$		-30	A
Maximum Power Dissipation	$P_D$		2.5	W
Operating Junction Temperature	$T_J$		-55 to 150	$^\circ C$
Junction-to-Case Thermal Resistance	$R_{\theta JC}$		28	$^\circ C/W$
Junction-to-Ambient Thermal Resistance*	$R_{\theta JA}$	$T_r = 10 \text{ sec}$	34	$^\circ C/W$
		Steady State	62	

\*The device mounted on 1in2 FR4 board with 2 oz copper

3. ME4953

# Matsuki Electric

# ME4953

## Dual P-Channel 30V (D-S) MOSFET

### GENERAL DESCRIPTION

The ME4953 is the Dual P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and low in-line power loss are needed in a very small outline surface mount package.

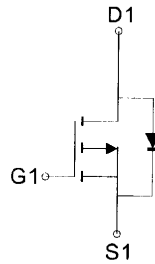
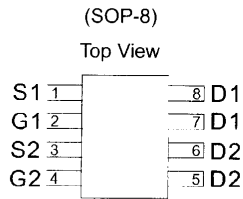
### FEATURES

- $R_{DS(ON)} \leq 50m\Omega @ V_{GS} = -10V$
- $R_{DS(ON)} \leq 80m\Omega @ V_{GS} = -4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

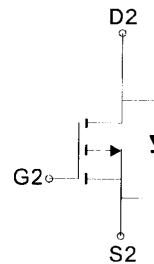
### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### PIN CONFIGURATION



P-Channel MOSFET



P-Channel MOSFET

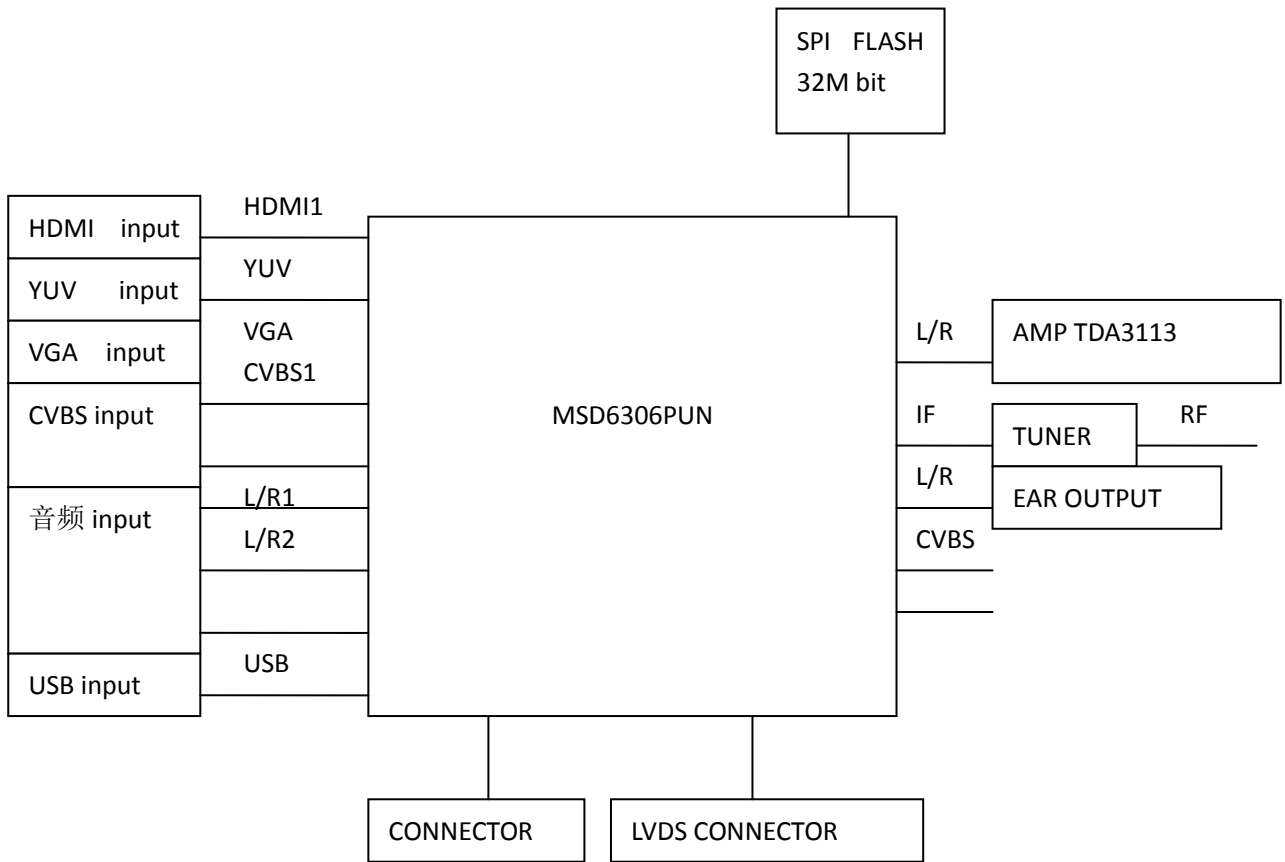


### Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tj=150°C)	$I_D$	$T_c = 25^\circ C$	-6
		$T_c = 70^\circ C$	-5
Pulsed Drain Current	$I_{DM}$	-30	A
Continuous Source Current (Diode Conduction)	$I_S$	-1.7	A
Maximum Power Dissipation	$P_D$	$T_c = 25^\circ C$	2.5
		$T_c = 70^\circ C$	1.3
Operating Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature Range	$T_{stg}$	-55 to 150	°C
Thermal Resistance-Junction to Ambient*	$R_{\theta JA}$	$T \leq 10 \text{ sec}$	47
		Steady State	75
Thermal Resistance-Junction to Case	$R_{\theta JC}$	45	°C/W

\*The device mounted on 1in<sup>2</sup> FR4 board with 2-oz copper

#### 4. MSD6306PUN

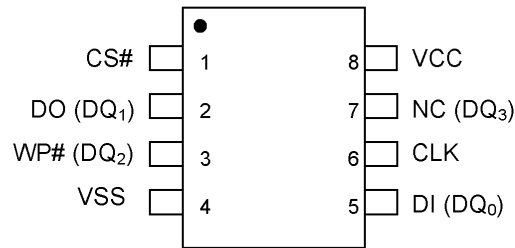


## 5. EN25Q64-104HIP

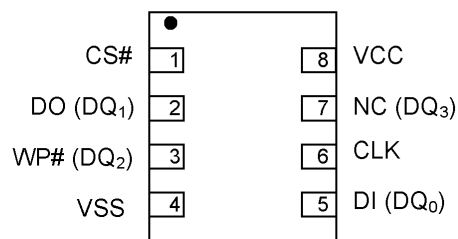


EN25Q64

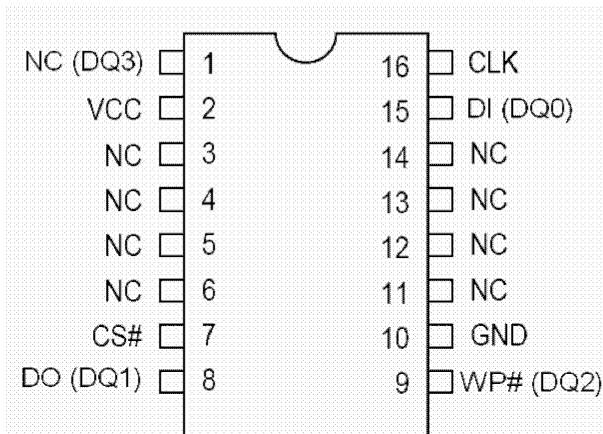
Figure.1 CONNECTION DIAGRAMS



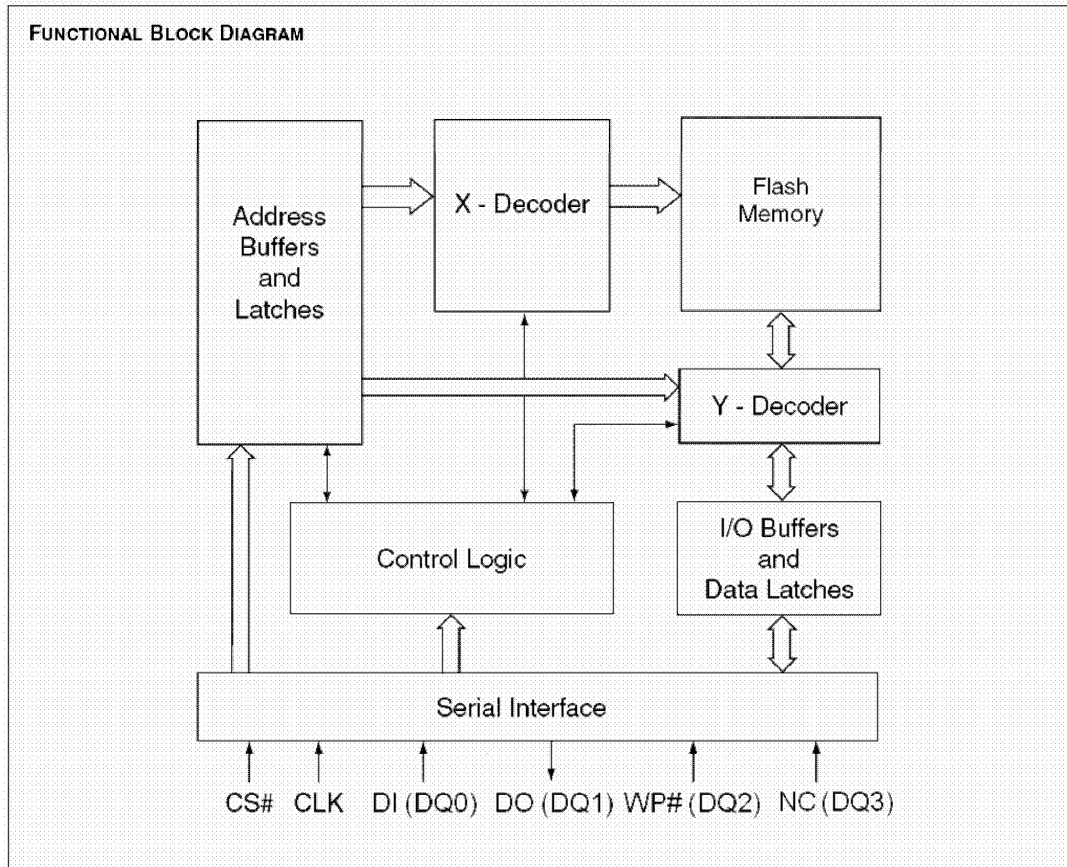
8 - LEAD SOP / PDIP



8 - LEAD VDFN



16 - LEAD SOP

**Figure 2. BLOCK DIAGRAM**

**Note:**

1. DQ<sub>0</sub> and DQ<sub>1</sub> are used for Dual and Quad instructions.
2. DQ<sub>0</sub> ~ DQ<sub>3</sub> are used for Quad instructions.



Table 1. Pin Names

Symbol	Pin Name
CLK	Serial Clock Input
DI (DQ <sub>0</sub> )	Serial Data Input (Data Input Output 0) *1
DO (DQ <sub>1</sub> )	Serial Data Output (Data Input Output 1) *1
CS#	Chip Enable
WP# (DQ <sub>2</sub> )	Write Protect (Data Input Output 2) *2
NC(DQ <sub>3</sub> )	Not Connect (Data Input Output 3) *2
Vcc	Supply Voltage (2.7-3.6V)
Vss	Ground
NC	No Connect

## Note:

1. DQ<sub>0</sub> and DQ<sub>1</sub> are used for Dual and Quad instructions.
2. DQ<sub>0</sub> ~ DQ<sub>3</sub> are used for Quad instructions.

**SIGNAL DESCRIPTION****Serial Data Input, Output and IOs (DI, DO and DQ<sub>0</sub>, DQ<sub>1</sub>, DQ<sub>2</sub>, DQ<sub>3</sub>)**

The EN25Q64 support standard SPI, Dual SPI and Quad SPI operation. Standard SPI instructions use the unidirectional DI (input) pin to serially write instructions, addresses or data to the device on the rising edge of the Serial Clock (CLK) input pin. Standard SPI also uses the unidirectional DO (output) to read data or status from the device on the falling edge CLK.

Dual and Quad SPI instruction use the bidirectional IO pins to serially write instruction, addresses or data to the device on the rising edge of CLK and read data or status from the device on the falling edge of CLK.

**Serial Clock (CLK)**

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

**Chip Select (CS#)**

The SPI Chip Select (CS#) pin enables and disables device operation. When CS# is high the device is deselected and the Serial Data Output (DO, or DQ<sub>0</sub>, DQ<sub>1</sub>, DQ<sub>2</sub> and DQ<sub>3</sub>) pins are at high impedance. When deselected, the devices power consumption will be at standby levels unless an internal erase, program or status register cycle is in progress. When CS# is brought low the device will be selected, power consumption will increase to active levels and instructions can be written to and data read from the device. After power-up, CS# must transition from high to low before a new instruction will be accepted.

**Write Protect (WP#)**

The Write Protect (WP#) pin can be used to prevent the Status Register from being written. Used in conjunction with the Status Register's Block Protect (BP0, BP1, BP2 and BP3) bits and Status Register Protect (SRP) bits, a portion or the entire memory array can be hardware protected. The WP# function is only available for standard SPI and Dual SPI operation, when during Quad SPI, this pin is the Serial Data IO (DQ<sub>2</sub>) for Quad I/O operation.

APPLICATION INFORMATION

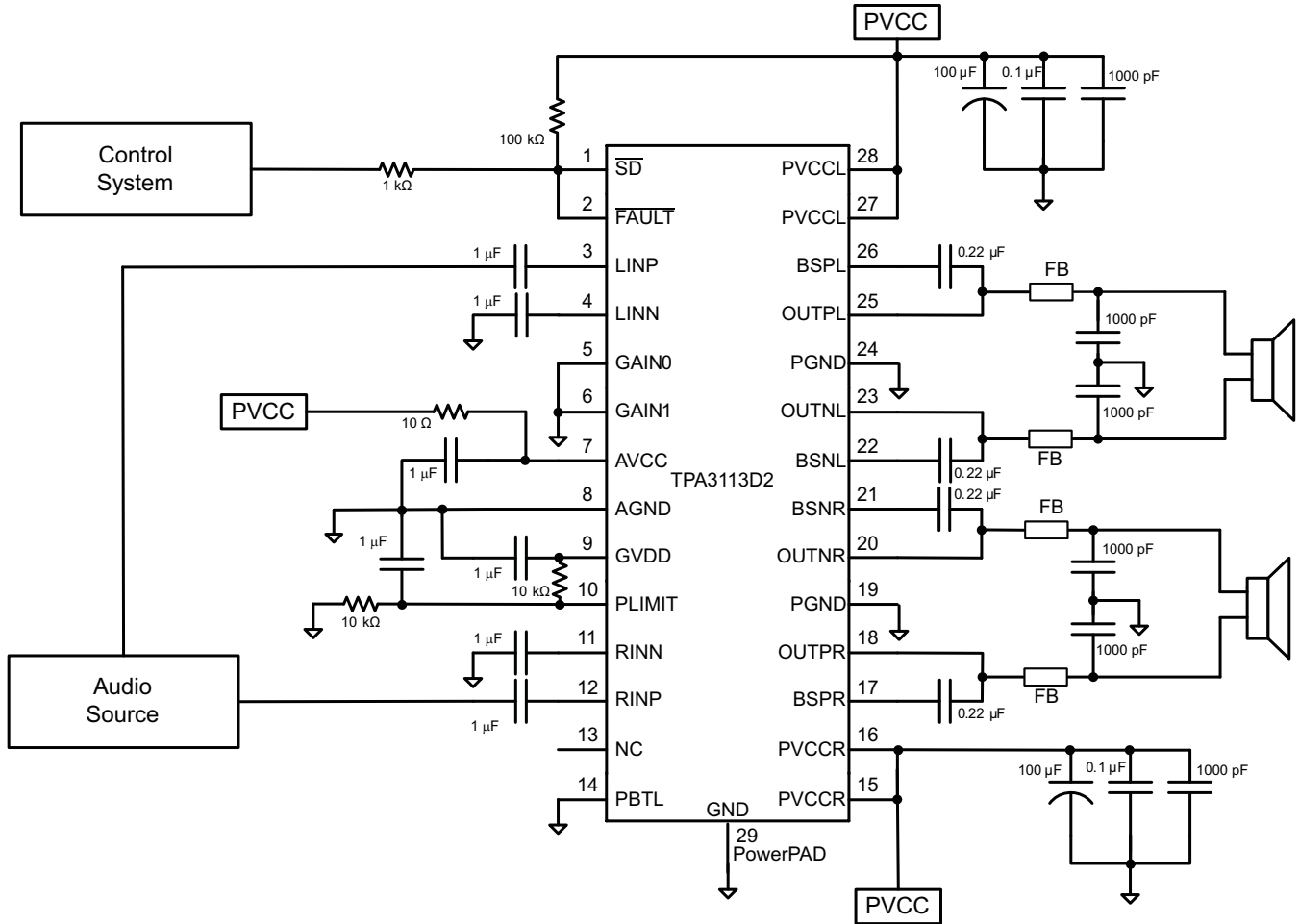


Figure 33. Stereo Class-D Amplifier with BTL Output and Single-Ended Inputs



**PIN FUNCTIONS**

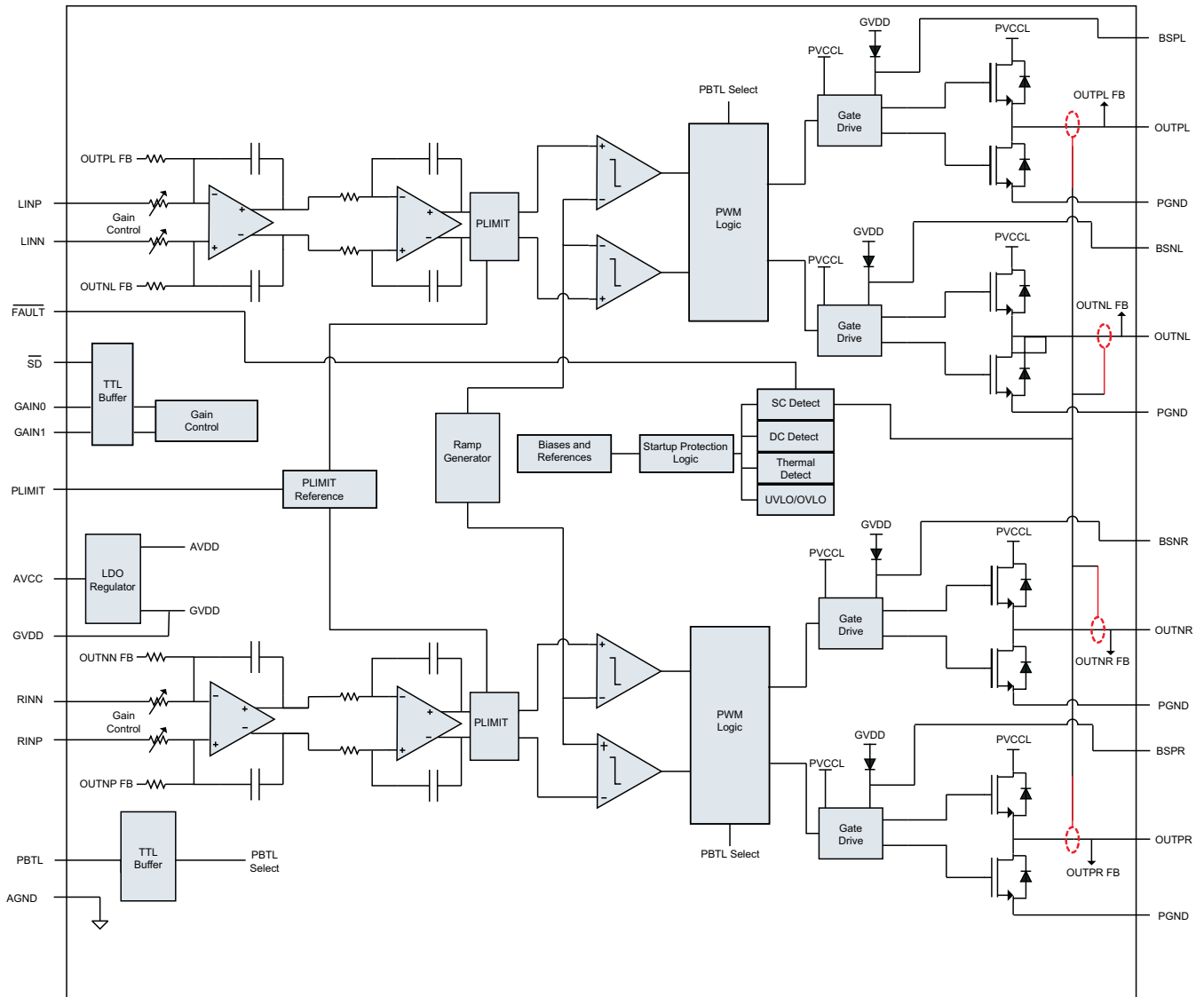
PIN		I/O/P	DESCRIPTION
NAME	Pin Number		
$\overline{SD}$	1	I	Shutdown logic input for audio amp (LOW = outputs Hi-Z, HIGH = outputs enabled). TTL logic levels with compliance to AVCC.
$\overline{FAULT}$	2	O	Open drain output used to display short circuit or dc detect fault status. Voltage compliant to AVCC. Short circuit faults can be set to auto-recovery by connecting FAULT pin to $\overline{SD}$ pin. Otherwise, both short circuit faults and dc detect faults must be reset by cycling PVCC.
LINP	3	I	Positive audio input for left channel. Biased at 3V.
LINN	4	I	Negative audio input for left channel. Biased at 3V.
GAIN0	5	I	Gain select least significant bit. TTL logic levels with compliance to AVCC.
GAIN1	6	I	Gain select most significant bit. TTL logic levels with compliance to AVCC.
AVCC	7	P	Analog supply
AGND	8		Analog signal ground. Connect to the thermal pad.
GVDD	9	O	High-side FET gate drive supply. Nominal voltage is 7V. Also should be used as supply for PLIMIT function
PLIMIT	10	I	Power limit level adjust. Connect a resistor divider from GVDD to GND to set power limit. Connect directly to GVDD for no power limit.
RINN	11	I	Negative audio input for right channel. Biased at 3V.
RINP	12	I	Positive audio input for right channel. Biased at 3V.
NC	13		Not connected
PBTL	14	I	Parallel BTL mode switch
PVCCR	15	P	Power supply for right channel H-bridge. Right channel and left channel power supply inputs are connect internally.
PVCCR	16	P	Power supply for right channel H-bridge. Right channel and left channel power supply inputs are connect internally.
BSPR	17	I	Bootstrap I/O for right channel, positive high-side FET.
OUTPR	18	O	Class-D H-bridge positive output for right channel.
PGND	19		Power ground for the H-bridges.
OUTNR	20	O	Class-D H-bridge negative output for right channel.
BSNR	21	I	Bootstrap I/O for right channel, negative high-side FET.
BSNL	22	I	Bootstrap I/O for left channel, negative high-side FET.
OUTNL	23	O	Class-D H-bridge negative output for left channel.
PGND	24		Power ground for the H-bridges.
OUTPL	25	O	Class-D H-bridge positive output for left channel.
BSPL	26	I	Bootstrap I/O for left channel, positive high-side FET.
PVACL	27	P	Power supply for left channel H-bridge. Right channel and left channel power supply inputs are connect internally.
PVACL	28	P	Power supply for left channel H-bridge. Right channel and left channel power supply inputs are connect internally.

TPA3113D2

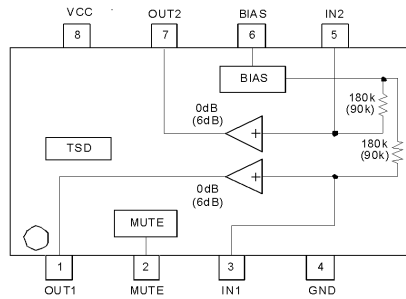
SLOS650B–AUGUST 2009–REVISED SEPTEMBER 2009

www.ti.com

FUNCTIONAL BLOCK DIAGRAM



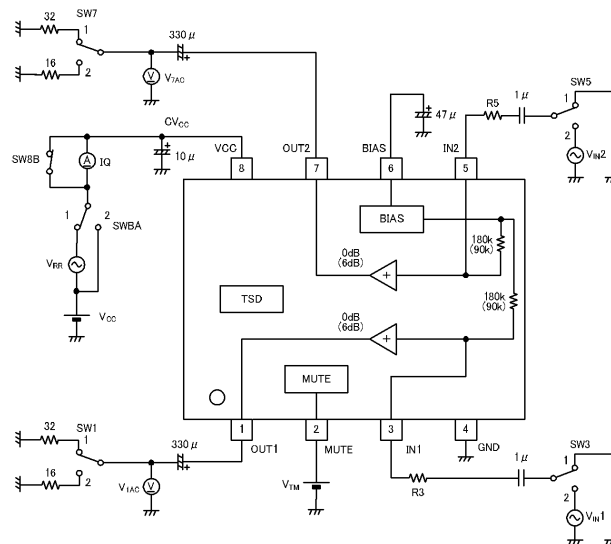
● Block diagram



( ) are BH3544F, BH3547F, BH3548F values.

Fig. 13

● Measurement circuit



( ) are BH3544F, BH3547F, BH3548F values.

Fig. 14

### ● Application circuit

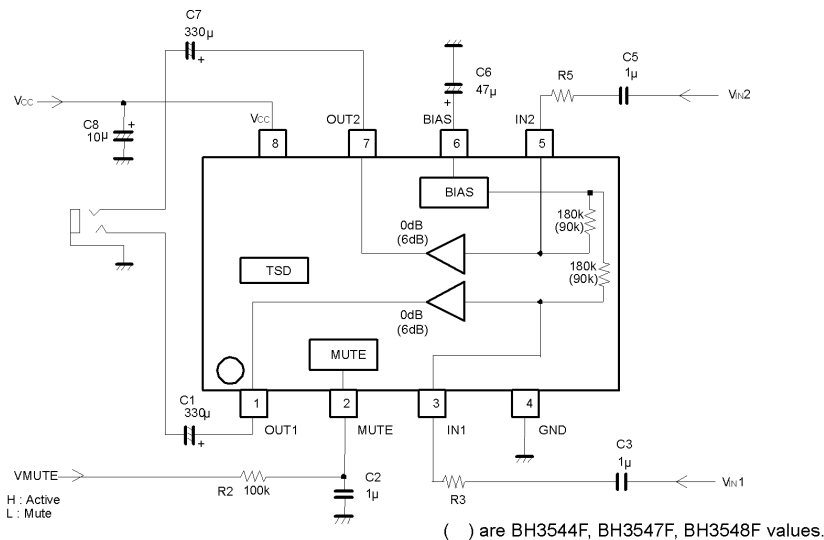


Fig. 15

### ● Description of external components.

#### 1) Input coupling capacitors (C3, C5)

These are determined according to the lower cutoff frequency  $f_c$ . Moreover, since lowering the capacitance can cause the occurrence of pop noise, when changing this, determine it after adequate checking.

Since the input impedance of the BH3541F is 180kΩ and that of the BH3544F, BH3547F, BH3548F is 90kΩ, these are found by the expressions below, although drift, temperature characteristics, and other considerations are necessary. (Layered ceramic capacitors are recommended.)

$$C3(C5) = 1 / (2\pi \times 180k\Omega \times f_c) \quad [\text{BH3541F}]$$

$$C3(C5) = 1 / (2\pi \times 90k\Omega \times f_c) \quad [\text{BH3544F, BH3547F, BH3548F}]$$

#### 2) Bias capacitor (C6)

When  $V_{CC}=5V$ , 47µF is recommended. Since lowering the capacitance too much can cause worsening of electrical characteristics or the occurrence of pop noise, when changing this, determine it after checking this adequately.

#### 3) Mute pin pop noise countermeasures (R2, C2)

Since the BH3541F, BH3544F, BH3548F has an impedance of 190kΩ against GND and the BH3547F has 200kΩ, it may be impossible to cancel mute mode if R2 is made too large.

#### 4) Output coupling capacitors (C1, C7)

These are determined by the lower cutoff frequency. If  $R_L$  is the output load resistance (assuming a resistance  $R_x$  is put in for output protection or current restriction), these are found by the expression below.

$$C1(C7) = 1 / (2\pi \times (R_L + R_x) \times f_c)$$

#### 5) Input gain adjustment resistances (R3, R5) (BH3544F, BH3547F)

Externally attached resistances (R3, R5) make input gain adjustment possible. The gain found by the expression below can be set.

$$G_{VC} = 6 + 20 \log(90k\Omega / (90k\Omega + R3[R5])) \quad [\text{dB}]$$

When input gain is not accommodated, these resistors have no use.

### ● Notes for use

- 1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
- 2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
- 3) Absolute maximum ratings  
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.

- 4) GND potential  
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
- 5) Thermal design  
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
- 6) Shorts between pins and misinstallation  
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.
- 7) Operation in strong magnetic fields  
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.
- 8) Pop noise countermeasures  
In order to prevent the pop noise that occurs when the power supply turns ON or OFF, make the rise and fall with reference to the timing diagram shown below.

1)BH3541F/ BH3544F/ BH3548F

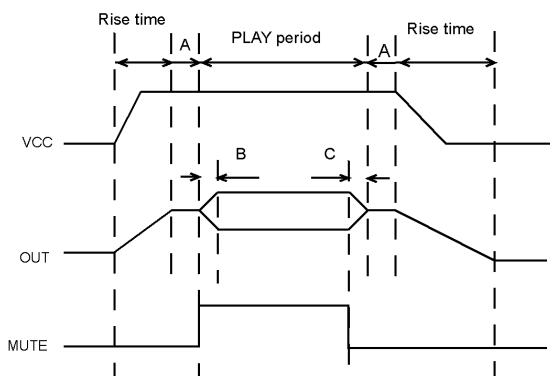


Fig. 16

- (A):Mute period (Use as pop noise countermeasure when power supply turns ON/OFF by makingVMUTE=Lo.)
- (B):Mute cancellation period (This has a time constant because it is used by the externally attached C2 and R2 as a pop noise countermeasure on mute cancellation, so be careful of the timing.)
- (C):Mute start time (As on cancellation, this has a time constant.)

2)BH3547F

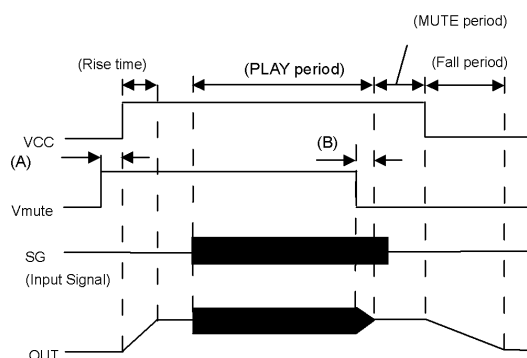


Fig. 17

- (A):Before VCC rise (or at the same time as VCC) make mute cancelled (VMUTE=Hi).
- (B):Soft mute period (This time can be set by externally attached R2 and C2)



REG. DATE : 2011.08.08

**SPECIFICATION**

REV.NO : 1.0

REV. DATE : 2011.08.08

MODEL NAME : **TDST-G070D**

PAGE : 5 / 15

**4. GENERAL SPECIFICATION****4-1 Supporting System**

: DVB-T2, DVB-T, DVB-C &amp; PAL(B/G, D/K, I)

**4-2. Receiving channel**

: 45MHz ~ 866MHz

**4-3. Input/ Output conditions**

- ANT Input impedance : 75 ohm unbalance
- Digital Low IF output Frequency Range : 3~5MHz

**5. OPERATING TEST CONDITIONS**

PARAMETER		MIN	TYP	MAX	UNIT
Voltage	+B1	3.15	3.3	3.45	V
Ambient Temperature ( $T_A$ )		0	-	60	℃
Relative Humidity (RH) (at 40℃)		-	-	85	%

**6. STORAGE CONDITIONS**

PARAMETER		MIN	TYP	MAX	UNIT
Ambient Temperature ( $T_A$ )		-10	-	+80	℃
Relative Humidity (RH) (at 40℃)		-	-	95	%

REG. DATE : 2011.08.08

**SPECIFICATION**

REV.NO : 1.0

REV. DATE : 2011.08.08

**MODEL NAME : TDST-G070D**

PAGE : 10 / 15

**11. PIN DESCRIPTIONS**

PIN NO	NAME	DESCRIPTION
1	Ant Power	Ant Power
2	N.C	Not Connected
3	SDA	I <sup>2</sup> C Bus serial Data input/output
4	SCL	I <sup>2</sup> C Bus serial Clock input
5	+B1(3.3V)	3.3V Power Supply for Tuner IC.
6	N.C	Not Connected
7	N.C	Not Connected
8	N.C	Not Connected
9	IF AGC	IF AGC
10	DIF	Digital IF(P) Output
11	DIF	Digital IF(N) Output



REG. DATE : 2012. 07. 09

**SPECIFICATION**

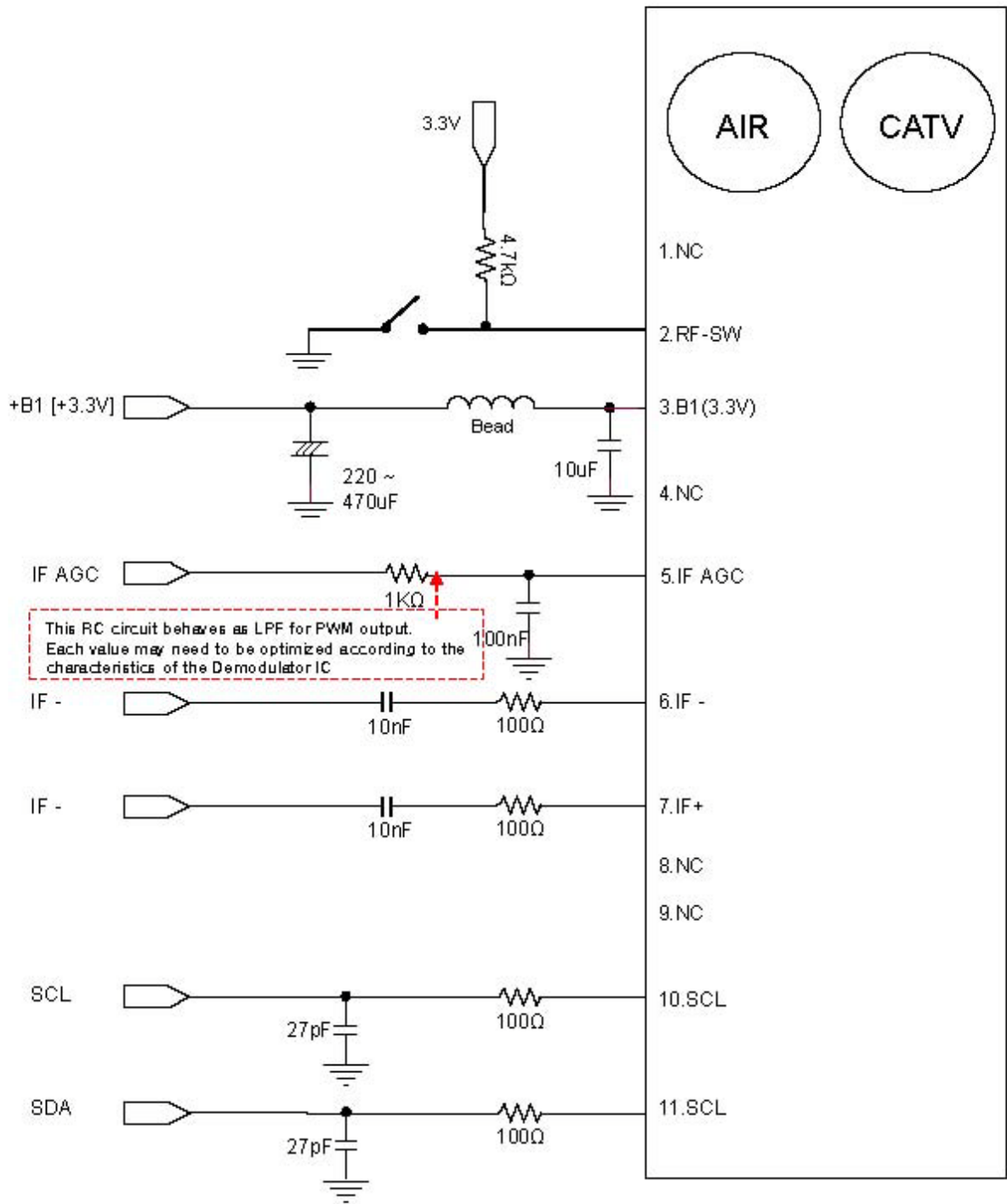
REV. NO. : 1.0

REV. DATE : 2012. 07. 09

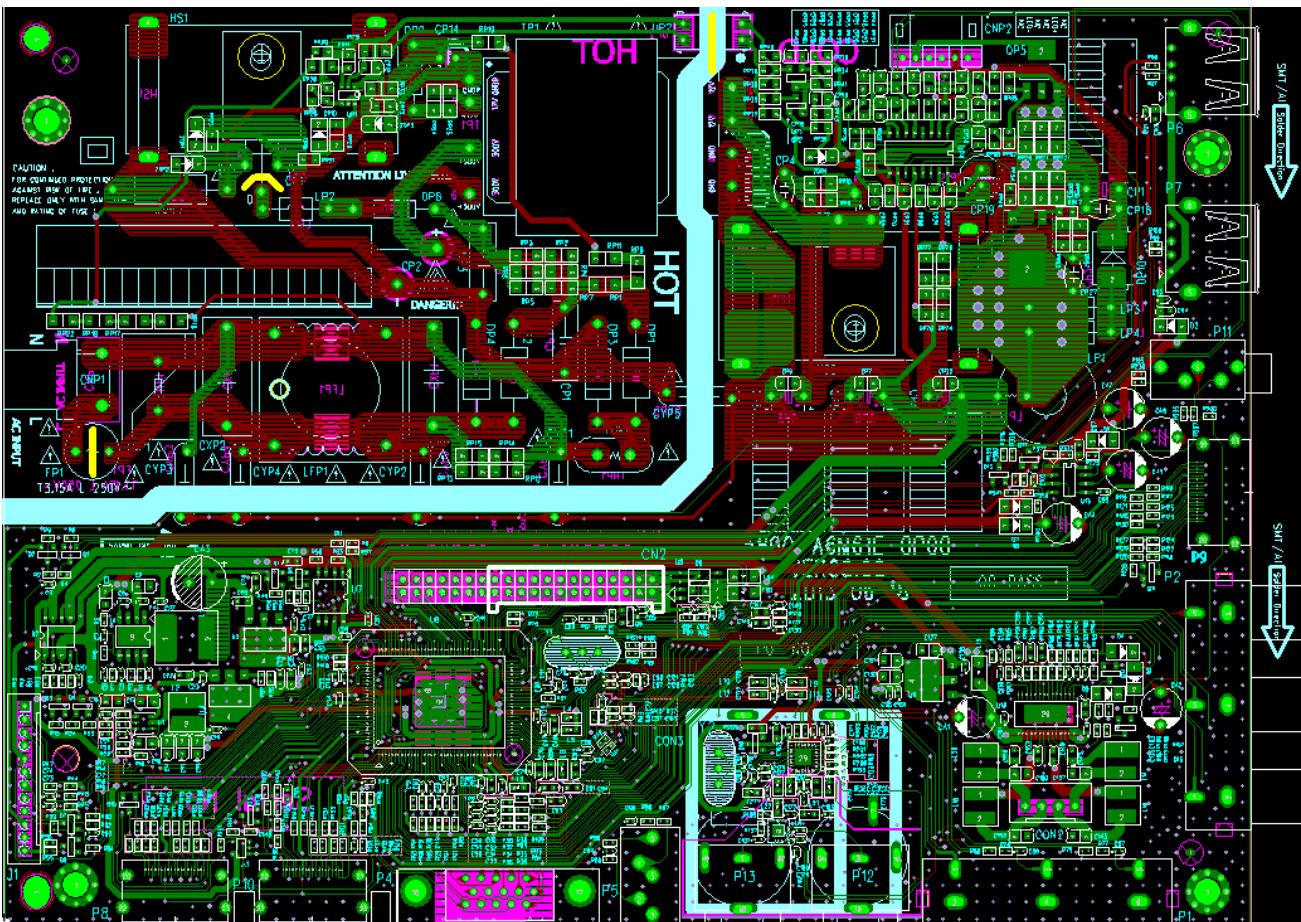
MODEL NAME : TDSK-T070F

PAGE : 10 / 13

**13. Application Circuit**



# Main PCB Top



## 6M61E Factory Adjust Menu

(V0.0)

### 1. Description

Enter factory mode :

Open source menu , and then press digital button “3”, “1”, “9” , “5” in turns to enter the factory menu. Press ↑ and ↓ button to choose the item, press OK button enter the submenu, **press MENU to return to**

**upper menu** , press ← and → button to adjust the value,

#### **Leave factory mode:**

Press menu button to back to upper menu until leave factory mode.

#### **Software information:**

Enter factory mode, you can get the software information from the bottom of **the** menu.

#### **Panel information:**

Enter factory mode, enter “**Panel SETTING**” item, you can get the panel information from the bottom of **this** menu.

#### **Aging mode:**

You can press the shortcut key in the factory remote control to open or close the aging mode.

#### **ADC adjusts:**

YPBPR source ADC:

Switch to YPBPR source, input 100% color bar pattern, enter factory, select “**AUTO ADC**” item in the “**ADC CALIBRATION**” menu, press → button to begin auto adjust. When it is finish, it will show “OK” or “FAILE”. If “FAILE” is showed, you need to try again.

**NOTE:** YPBPR ADC need to do twice by use 576P and 720P signal separate.

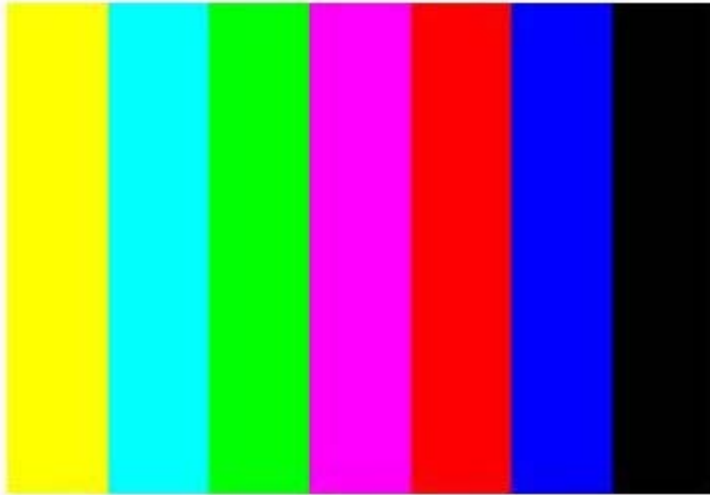


Figure 1. Color calibration chart

VGA source ADC:

Switch to PC source, input tessellated white and black signal, enter factory, select “**AUTO ADC**” item in the “**ADC CALIBRATION**” menu, press → button to begin auto adjust. When it is finish, it will show “OK” or “FAILE”. If “FAILE” is showed, you need to try again.



**White balance:**

Enter factory mode, enter “**W/B ADJUST**” item, you can adjust white balance in this menu.

**Over scanning:**

Enter factory mode, enter “**Panel SETTING**” submenu, enter “**OVERSCAN**” submenu, you can adjust the over scan in these menu.

**OutFactory reset:**

Enter factory mode, enter “**SYSTEM SETTING**” item, select “**OUT FACTORY SET**” item and press OK button to reset the flash memory. TV set will restart when it is finish.

**INIT EEPROM :**

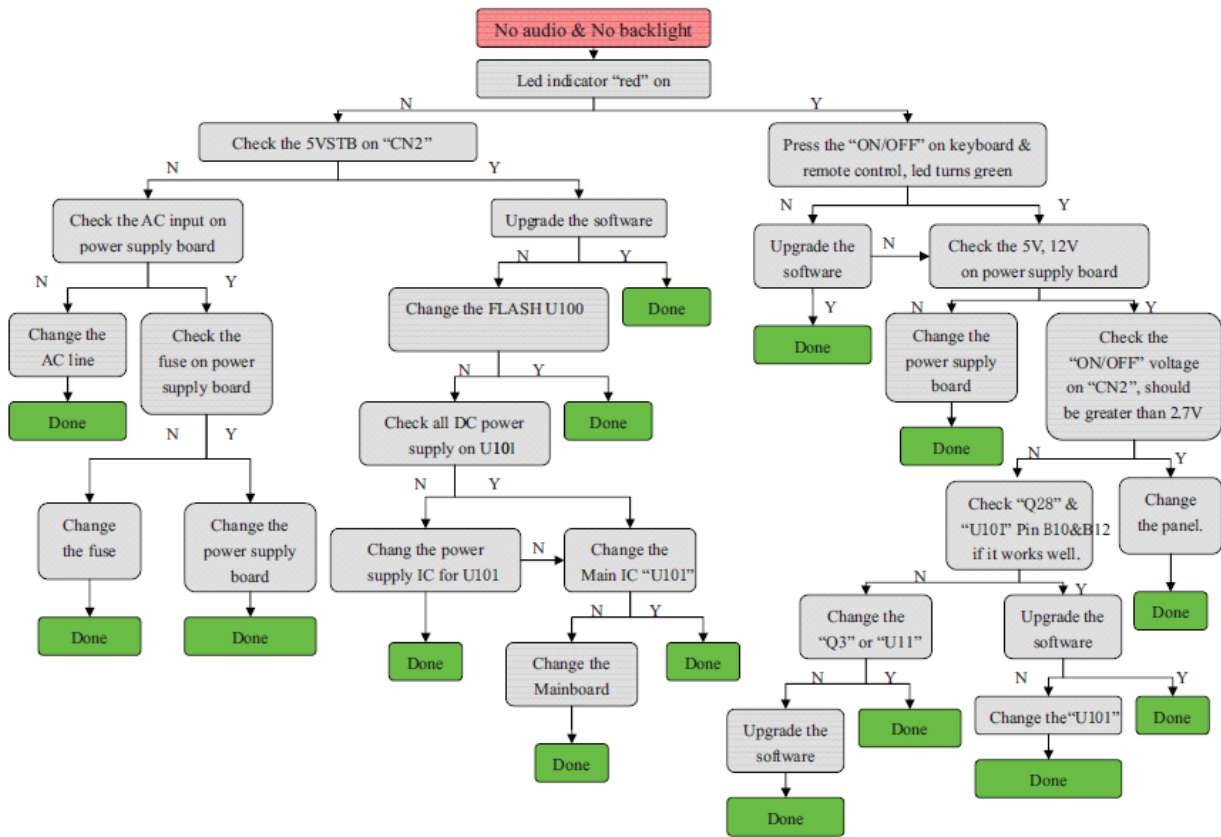
Enter factory mode, enter “**SYSTEM SETTING**” item, select “**FAC RESET DEFAULT**” item and press OK button to reset the EEPROM. TV set will restart when it is finish.

**Update software (by USB):**

Copy the new software (name by “**MERGE.bin**”) to the root directory of USB drive. Plug the drive to the **USB2** socket (if there are two USB socket, make sure you use the socket 2). Enter factory, select “**Software Update (USB)**” item and press OK button to begin update. TV set will restart when finish. Note, you need to restart the TV set again by AC power.

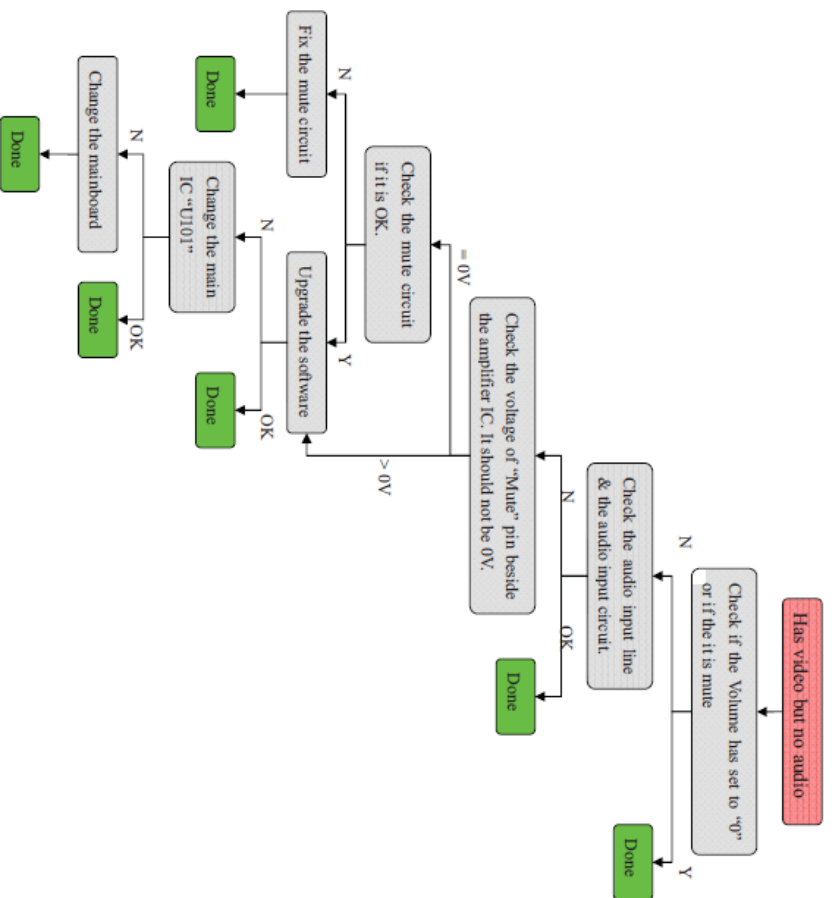
We suggest you need to do “**INIT EEPROM**” and “**Factory reset**” after software update

# Service Flow Chart



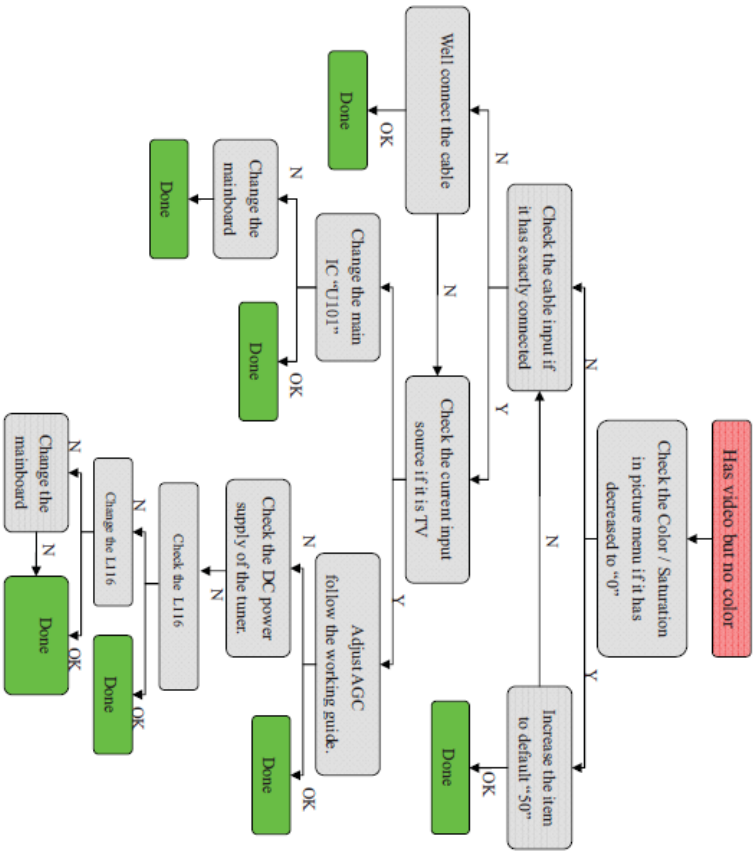
## Service Flow Chart

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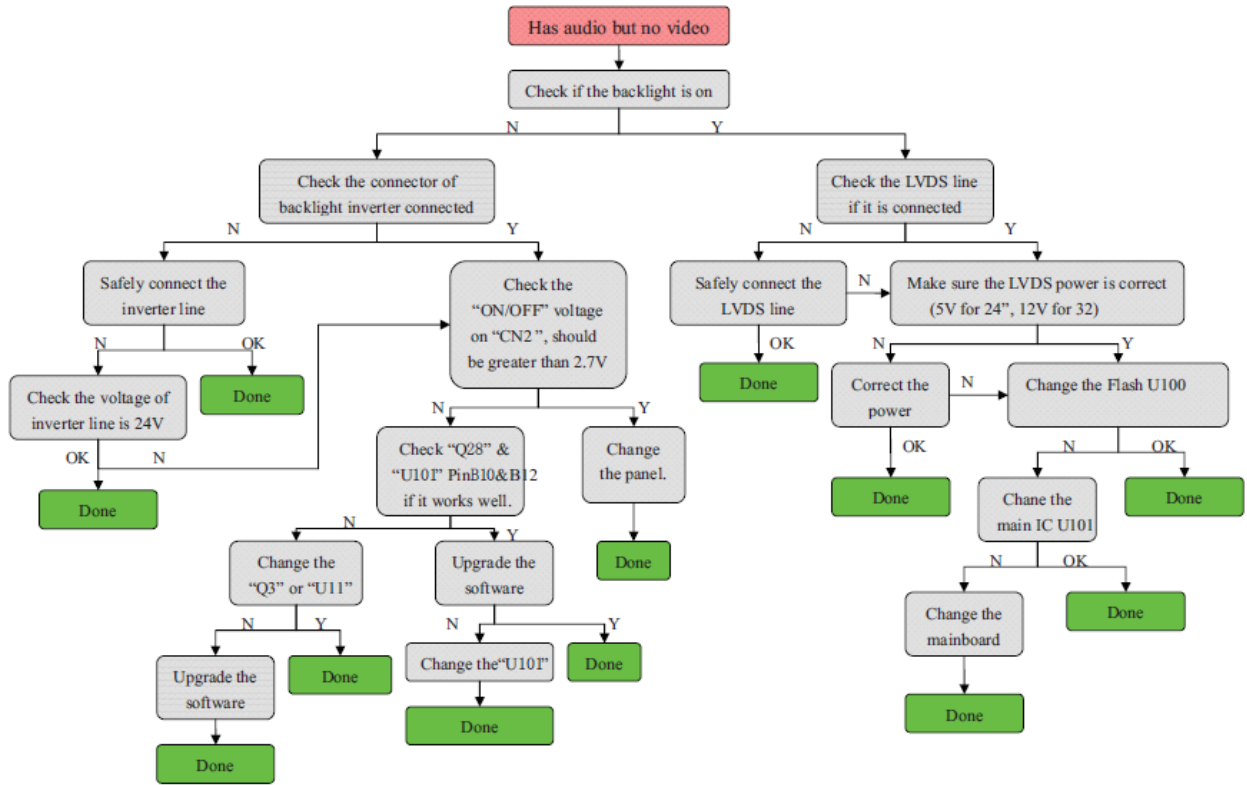
# Service Flow Chart

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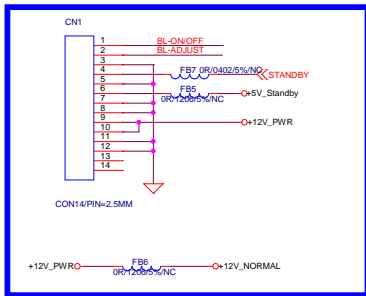




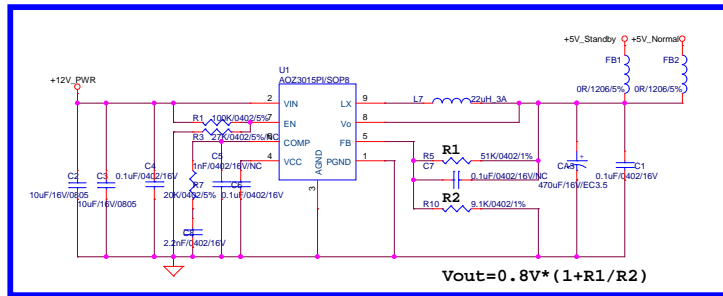
# Service Flow Chart



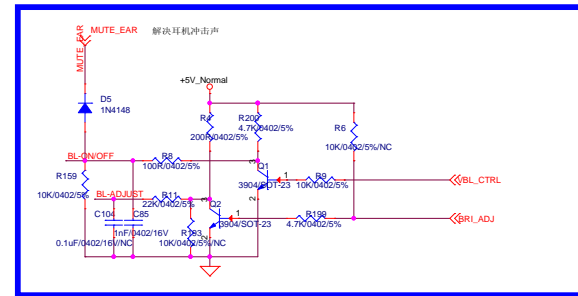
### Connetor



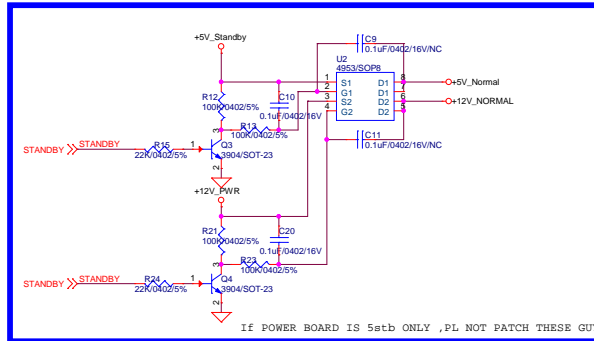
### 5V Standby Power(option) 3A



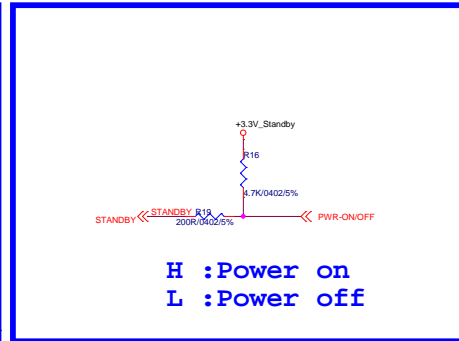
### Inverter controller



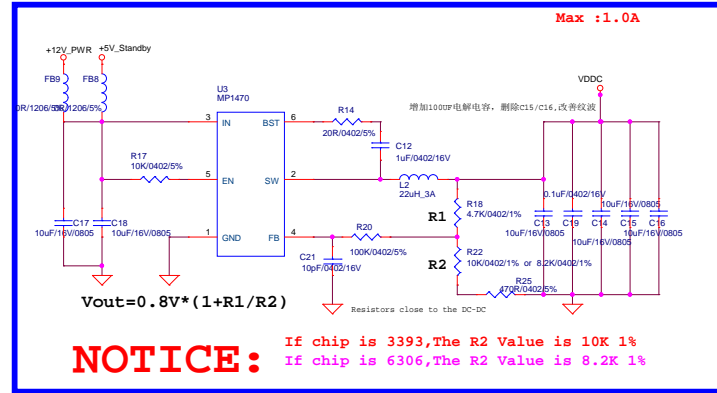
### Power Switch



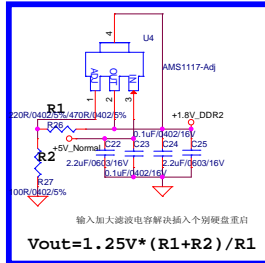
### Standby controller



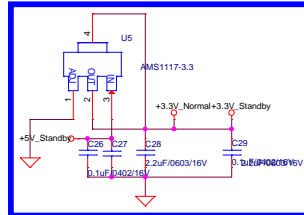
### 1.15V Core Power



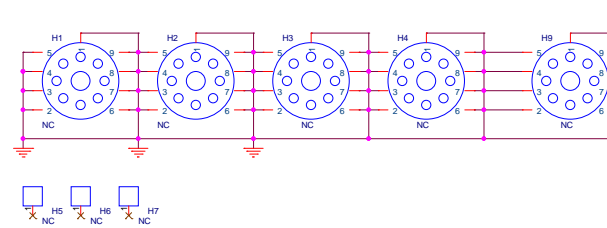
### 1.5V/1.8V Power\_Normal



### 3.3V Power

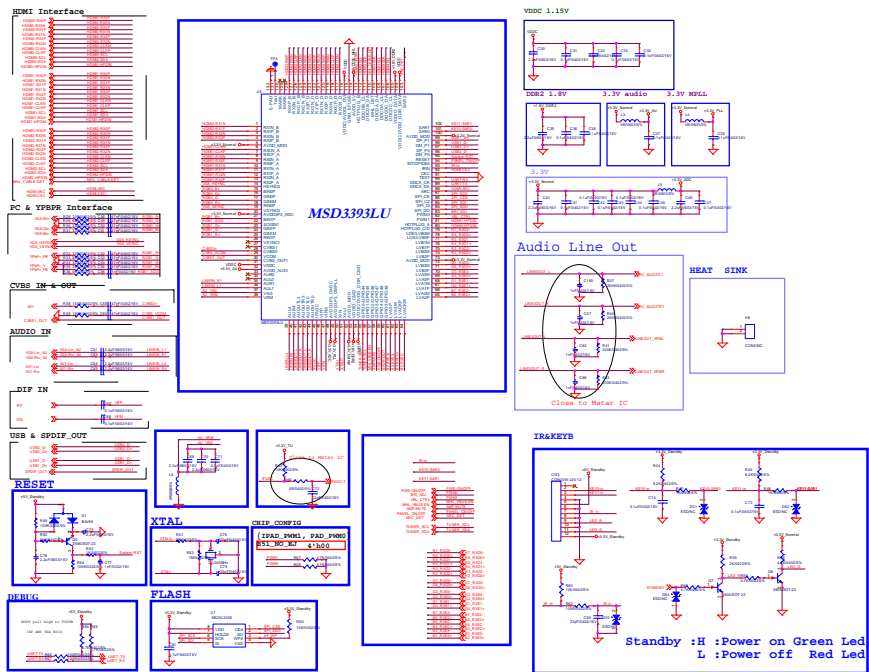


### Test Point & MARK



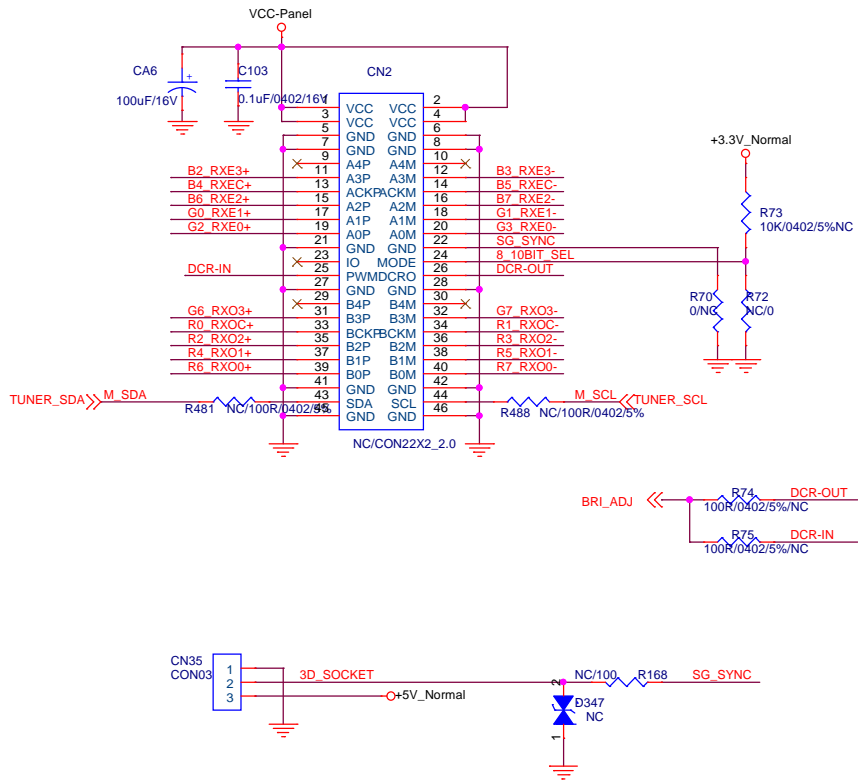
**NOTICE:** If chip is 3393, The R1 Value is 220R 5% Vout=1.8V  
If chip is 6306, The R1 Value is 470R 5% Vout=1.5V

Title		MSD3393	
Size	Document Number	System power	
Custom			Rev 1.0
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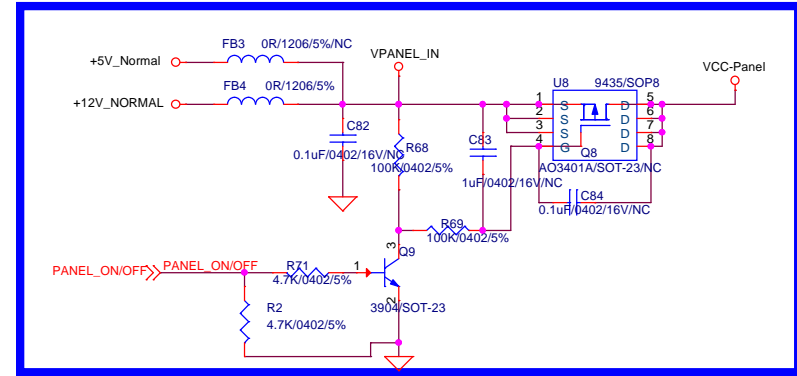


# LVDS CONNECTOR ( 1 DIP + 2 SMT OPTIONAL )

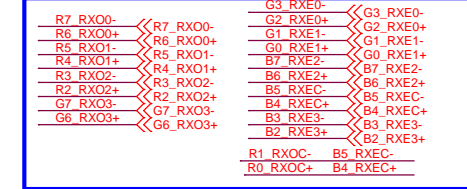
## HI CONNECTOR



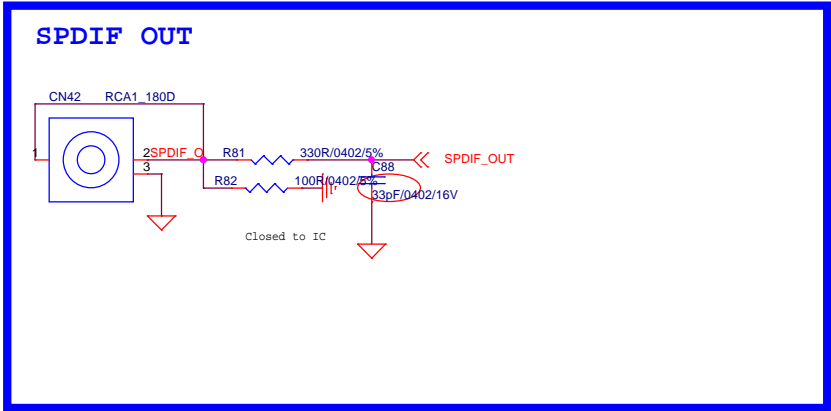
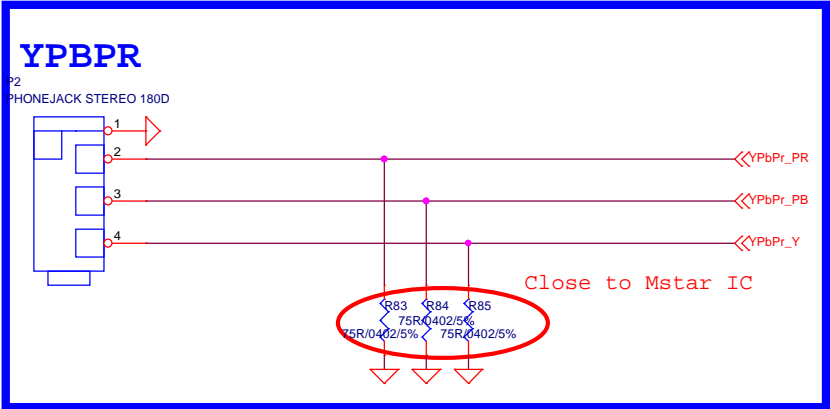
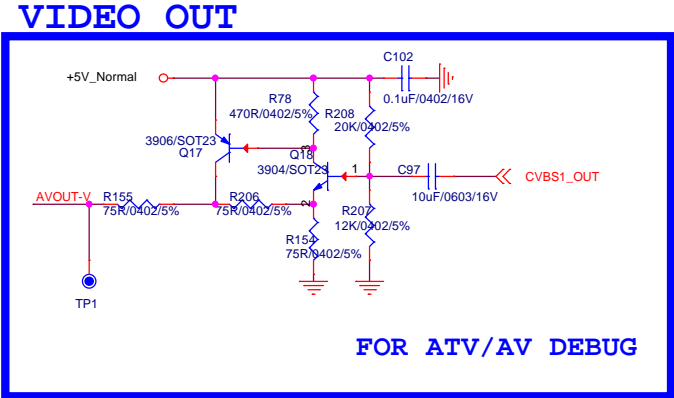
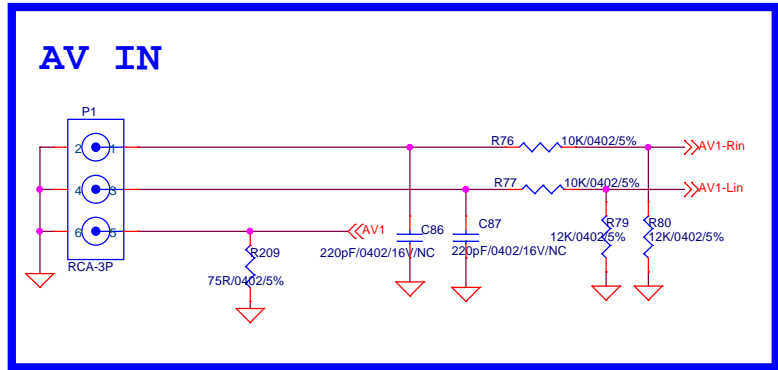
## Power for panel



## Net to other page

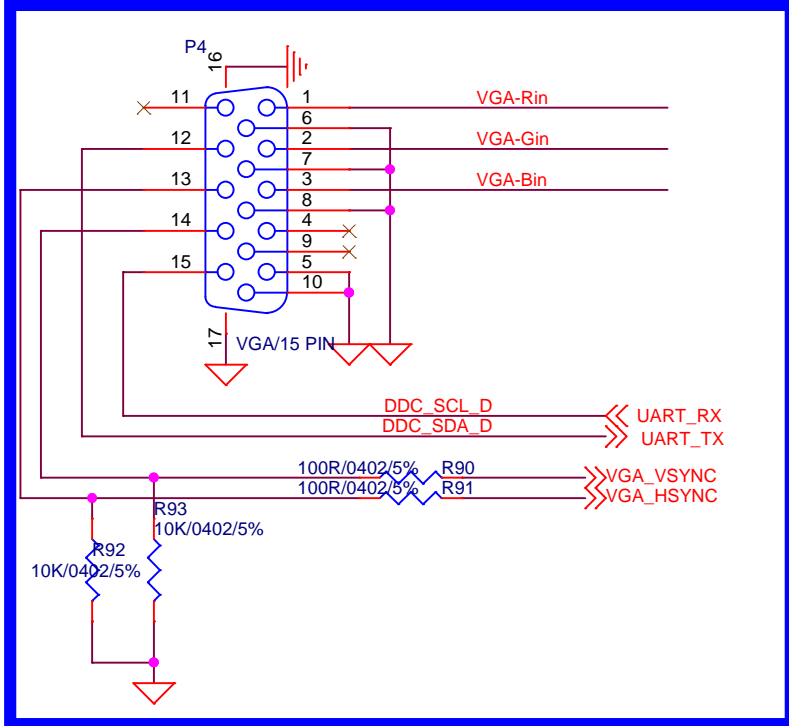


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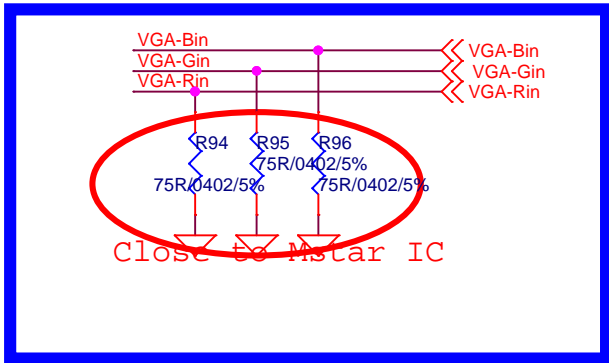
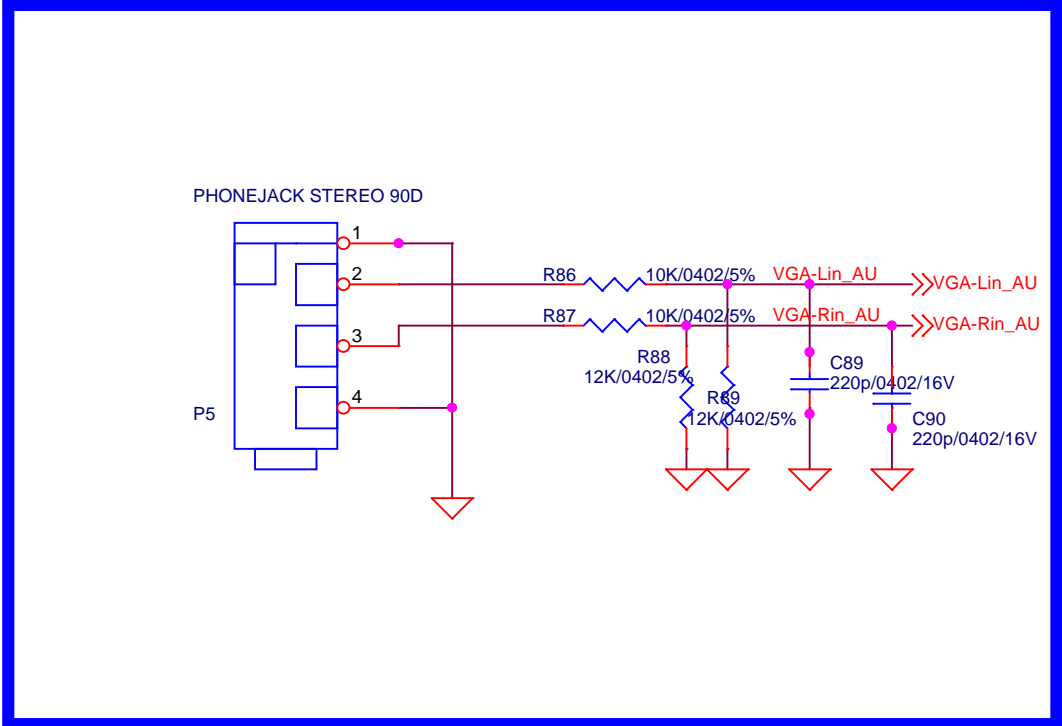


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Size	Document Number	Video Interface			Rev
B					1.0
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# VGA

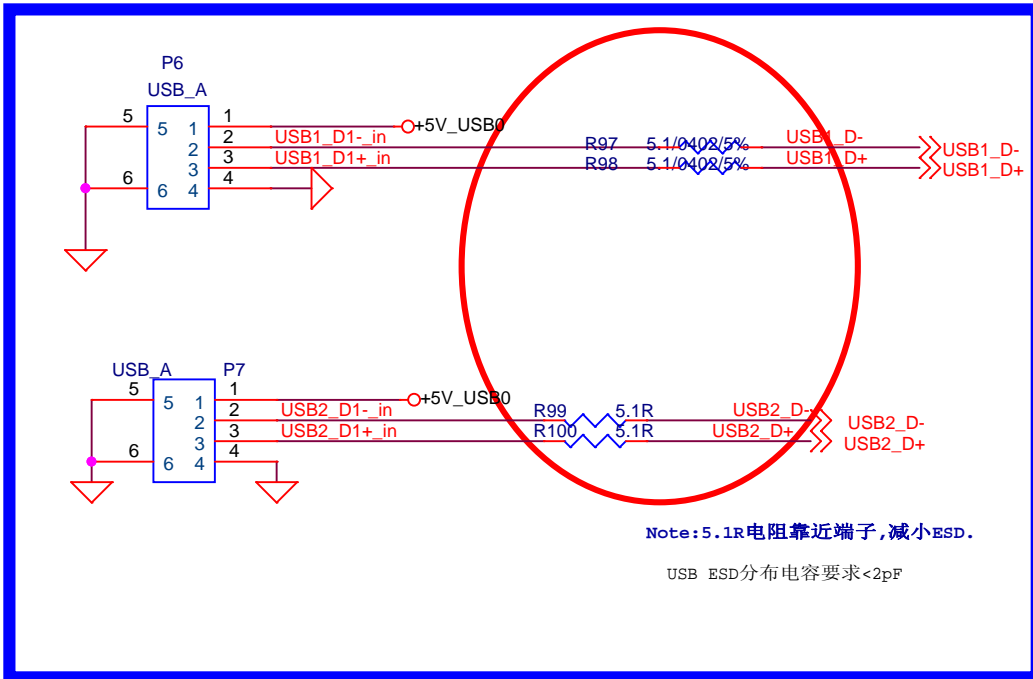


# VGA AUDIO TN

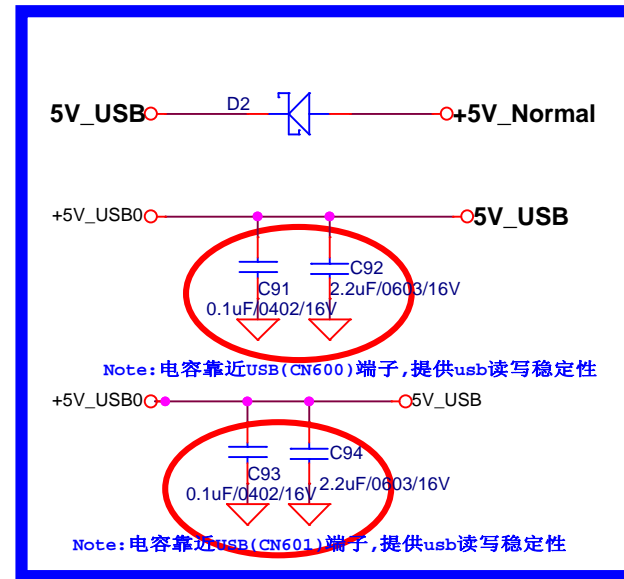


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Size	Document Number				Rev
A	<b>VGA Interface</b>				1.0
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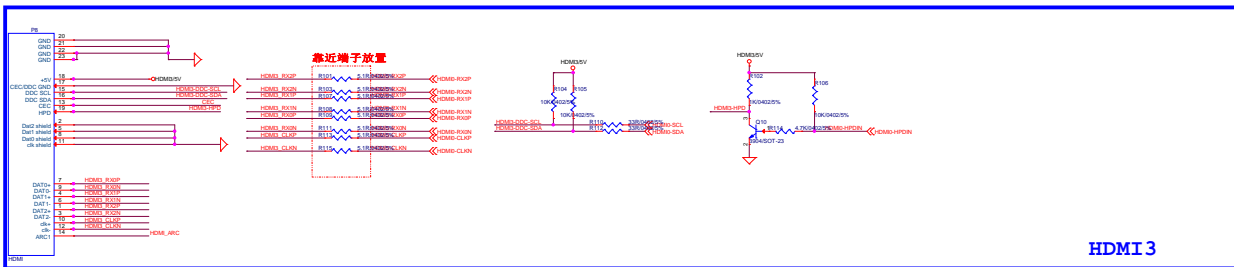
# USB INTERFACE



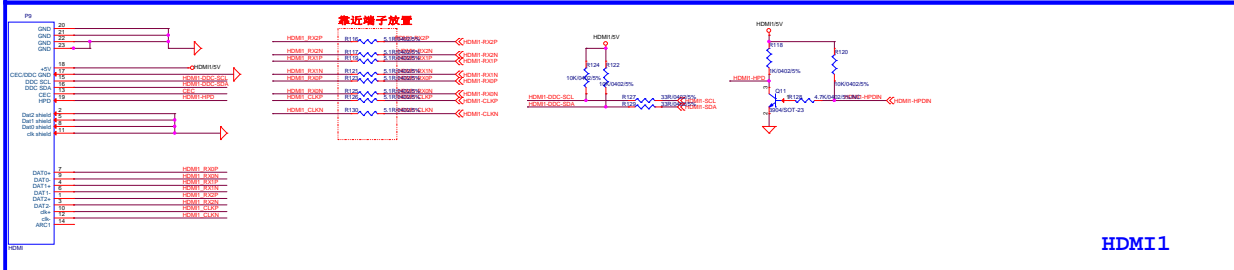
# USB POWER



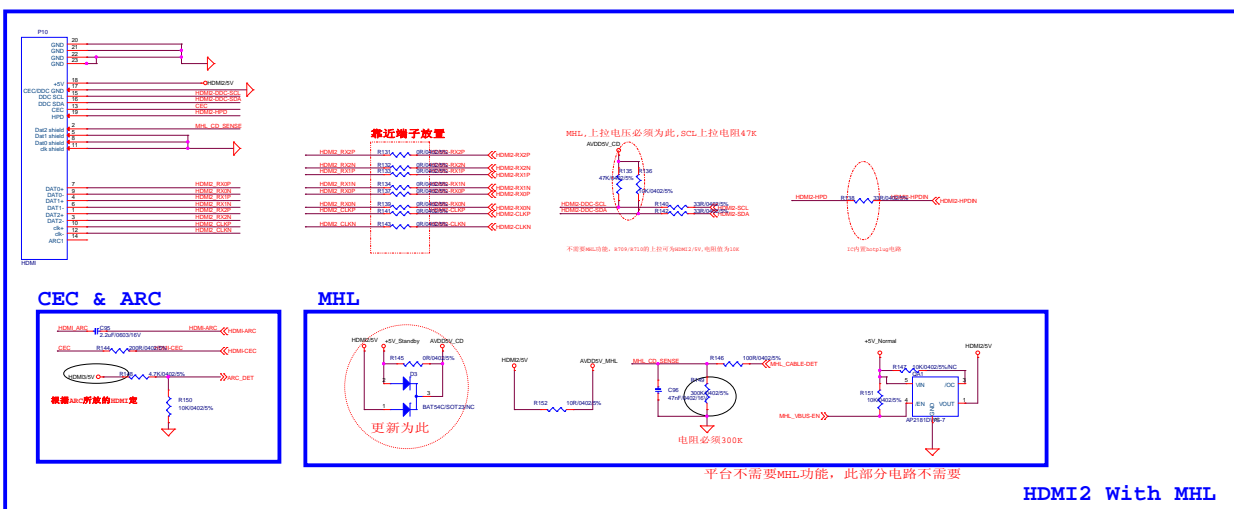
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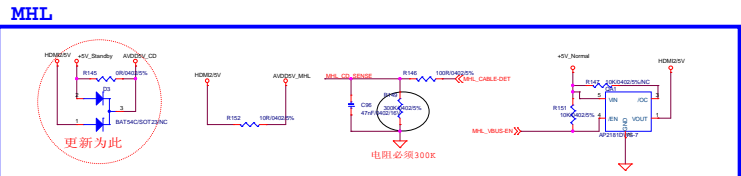
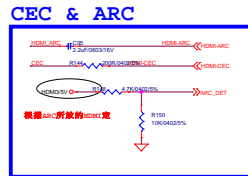
HDMI3



HDMI1



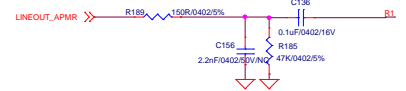
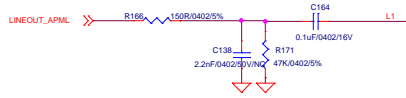
HDMI2 With MHL







### AU. AMP



### TPA3110

