

VIDEOCON INDUSTRIES LIMITED



SERVICE MANUAL

TRIDENT AX68 SOLUTION

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Over view

The SVP™AX family video processors are highly integrated system-on-a-chip devices for providing the highest performance, targeting the converging HDTV-ready and PC-ready LCD TV, PDP TV, and DLP TV applications where high precision processing of video and data are the requirements. SVP™AX contains triple 10-bit high precision and high speed video ADCs for both PC and video inputs, the high speed HDMI could support all HDMI inputs up to 162 MHz with HDCP format, the high-performance multi-format 3D digital comb video decoder that supports NTSC, PAL, and SECAM, a HDTV sync separator, and a motion adaptive de-interlacing engine. Trident's DCre™ – the 7th generation of Digital Cinema Reality engine, is integrated inside the SVP™AX to provide the most natural cinema-realistic images. The DCre™ technology integrates advanced 3D-comb video decoding, advanced motion adaptive de-interlacing, object-based digital noise reduction, advanced 7th generation scaler, film mode support, average picture level (APL), edge smoothing and dynamic sharpness enhancement.

Trident's patented Unified Memory Architecture (UMA) that allows frame rate conversion, 3D comb video decoding, and video enhancement processing to share the same memory buffer that is made up of high-speed and

Cost-effective PC graphic memory. All these advanced digital processing techniques combined with a true 10-bit video data processing for the most optimal video fidelity to provide the most natural and cinema quality video images. Designed for maximum system design flexibility, SVP™AX integrate all video interfaces to support converging digital video, analog video, and PC data applications. The users of Trident's single chip SVP™AX video processor(s) will benefit from many features while maintaining a price competitive advantage over the existing solution(s)

SVPTM AX PRODUCTOR FEATURES

■ SVPTMAX Product Features

Main Features

Brief Description of all features

Integrated HDMi Receiver with HDCP up to 162 MHz (UXGA)

Integrated 7th Generation Motion and Edge Adaptive De-interlacing

- 7th generation adaptive edge smoothing algorithm for enhancing image clarity and sharpness

- Pixel-based motion and edge-adaptive deinterlacing

Integrated ADC

- High-precision 10-bit ADC mode up to 108 MHz for SD/HD analog video input modes
- Direct support for CVBS/S-Video/Component and HD-D1/D2/D3/D4 modes
- Decode FB and FS signals for fully SCART functions

SRC (Scan Rate Conversion)

Improvements

- Motion Detection improvement
- Edge Detection improvement
- 32/22 Detection
- De-interlacing Clarity
- 32/22 Judder improvement
- Vertical scalar after the de-interlacer improvement

Auto Tune

- Auto phase detection
- Auto mode detection
- Auto white balance
- Auto clock phase adjustment for PC & HD component inputs
- Auto position for PC RGB inputs

Built-in single/dual 8/10-bit LVDS Transmitter

- Enhanced false color reduction circuitry

Inverse Color Space Conversion

Interlaced and Progressive Scan Refresh

- Programmable blank time control—optimal for HDTV format converter application
- Progressive Scan @ 50Hz to 75Hz

Frame Rate Conversion

- Support frame rate conversion for PC and video mode
- Both free-running and line-lock mode are supported

PWM

Built-in ADC to decode one FB and two

Advanced 7th Generation Cubic-4 Image Scaling Engine

DNR-Digital Temporal and Spatial Noise

Reduction Filter

Advanced Chroma Processing

Dynamic Contrast Function

PCM Engine (Perfect Color Management)

- Blue Stretch
- HSV Space Color Management
- Hue Gain, Saturation Gain, and Value Gain controlled by luma and saturation separately
- Center enable function could make center of the region with higher gain

RCR (Real Color Reproducer)

- The hue and saturation can be adaptive to the pixel's grey-level with 8-bit hue and saturation LUT

DCI (Dynamic Contrast Improvement)

- Histogram detection
- Dynamic Gamma Function
- UV Compensation. Adjust. UV based on Y.

Integrated 7th Generation Motion

Adaptive 3D Digital Comb Video

Decoder with Programmable Filter

- Supports NTSC, PAL, and SECAM formats
- Smooth 3D/2D image transition with Trident's proprietary object and motion adaptive detection
- Programmable comb filter adapts to all possible environments, and 2D Y/C separation
- Color edge enhancement circuit improves the chroma transient so that the chroma edge looks sharper than the original signal
- Enhanced NTSC/PAL/SECAM auto detection

FS signals to support dual SCART solutions

Teletext

- TCD3 decoder has built-in teletext data slicer that decodes and has an OSD page display up to 4.5K pages at 75Hz
- Supports Teletext 2.5 Specification.

Memory Interface

- Supports 16 bits DDR memory interface
- Memory clock support up to 250 MHz
- Supports memory size up to 16 Mbytes

DCRTM Advanced Image Processing

- Advanced LUMA processing for image enhancement

- White peak limitation
- Black and white extension
- Horizontal and vertical sharpness control
- User Friendly white balance adjustment for both MP and PIP channels
- Advanced linear and non-linear panorama scaling algorithms
- Integrated sync separator with line-locking PLL
- Programmable zoom viewer allows partial still pictures and live broadcast to be viewed in greater detail.
- Gamma correction with 10-bit per color lookup-table
- Picture controls such as hue, saturation, brightness, and contrast can be automatically adjusted to their optimal balance.
- sRGB support

Multi Screen Display Modes

OSD and VBI/Closed Caption

Advanced OSD Engine

- 4/8 bit color OSD display with two planes

- Hardware scrolling for CC and Teletext display

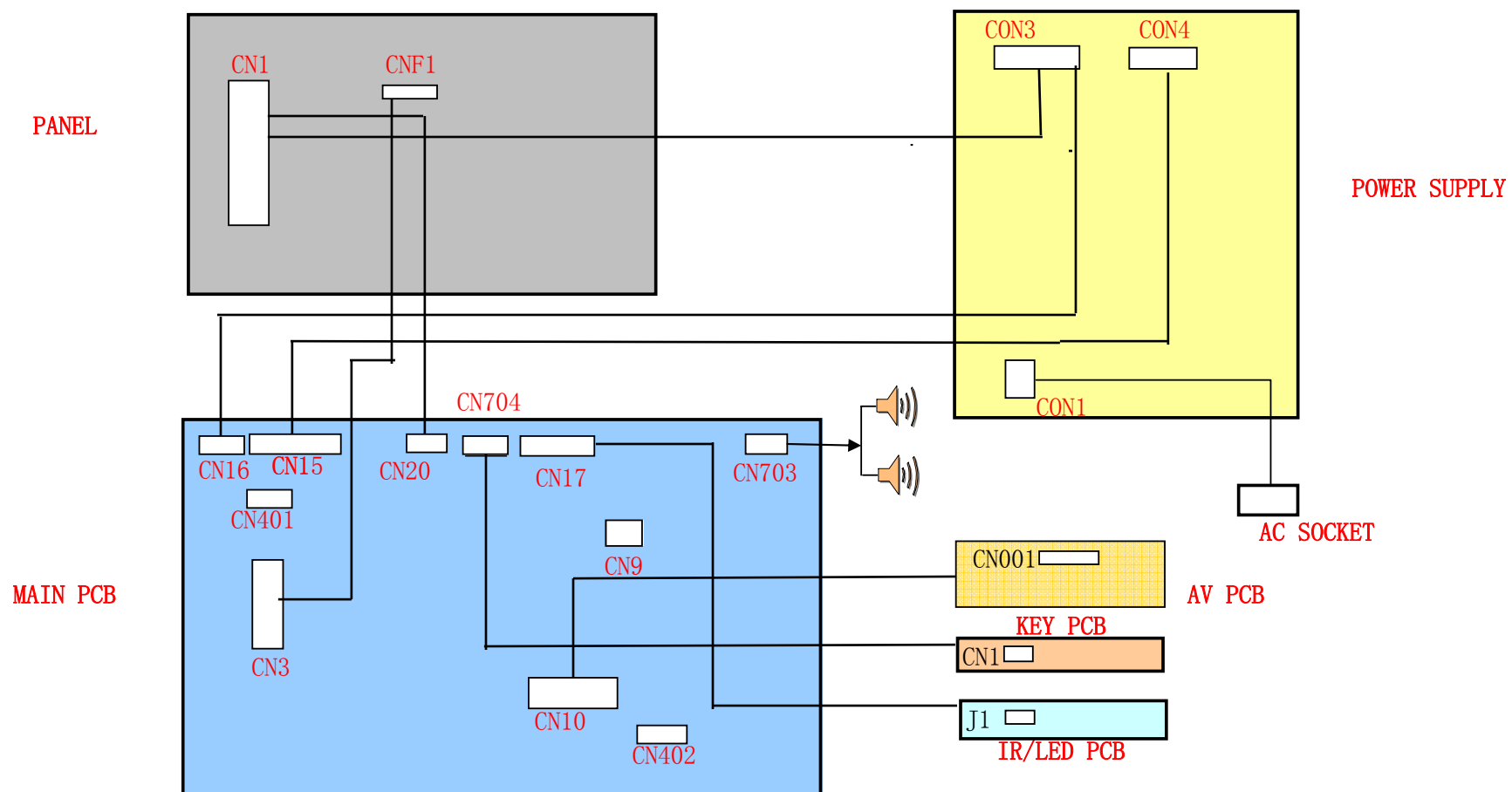
Audio

- Supports the following SIF standards:
NTSC(M) BTSC, NTSC(M) EIAJ, NTSC(M) Korea, PAL(B) A2, PAL(D) NICAM, PAL(G) NICAM, PAL(I) NICAM, SECAM(K) A2, SECAM(L) NICAM, SECAM-EAST A2, FMRadio
- Supports the stereo, mono, dual and SAP modes
- Supports the SIF and 4 sets stereo line-in analog inputs
- Supports I2S, SPDIF and HDMI digital inputs
- Supports speaker and headphone analog outputs
- Supports I2S and SPDIF digital output
- Supports reverb, 3D, 3 bands EQ, left and right sound matrix, quasi-peak detection, auto-volume control, soft-mute, beeper, lip sync, analog inputs to outputs router and pre-scale.

Packaging

- 256 QFP
- Ordering part number

AX68 WIRING DIAGRAM



AX68 WIRING DIAGRAM

PANEL CONNECTOR define (SAMSUNG LTA320AB01)

CN1

+24 +24 +24 +24 +24 GND GND GND GND GND NC BKL_ON/OFF DIM_CNTRL NC

1 ↑

14 ↑

top

14

:

:

1

down

PANEL CN1

CNF1 (FI-X30SSL-HF JAE)

NC NC NC GND RXIN0- RXIN0+ GND RXIN1- RXIN1+ GND RXIN2- RXIN2+ GND RXCLK- RXCLK+ GND RXIN3- RXIN3+ GND NC LVDS_OPT NC NC NC GND Vin Vin Vin Vin Vin

1 ↑

30 ↑

NOTE :- Pin Configuration may be vary depending on Panel.

MAIN PCB CONNECTOR define

CN3

CONNECT TO PANEL CNF1

2 ↓

30 ↓

VCC VCC GND TA1+ TB1+ TC1+ GND TCLK1+ TD1+ TA2- TB2- TC2- GND TCLK2- TD2-
VCC VCC GND TA1- TB1- TC1- GND TCLK1- TD1- TA2+ TB2+ TC2+ GND TCLK2+ TD2+

1 ↑

29 ↑

CN20

BKT_CNTL BKT_CNTL H/L GND

CONNECT TO PANEL CN1

1 ↑

4 ↑

CN15

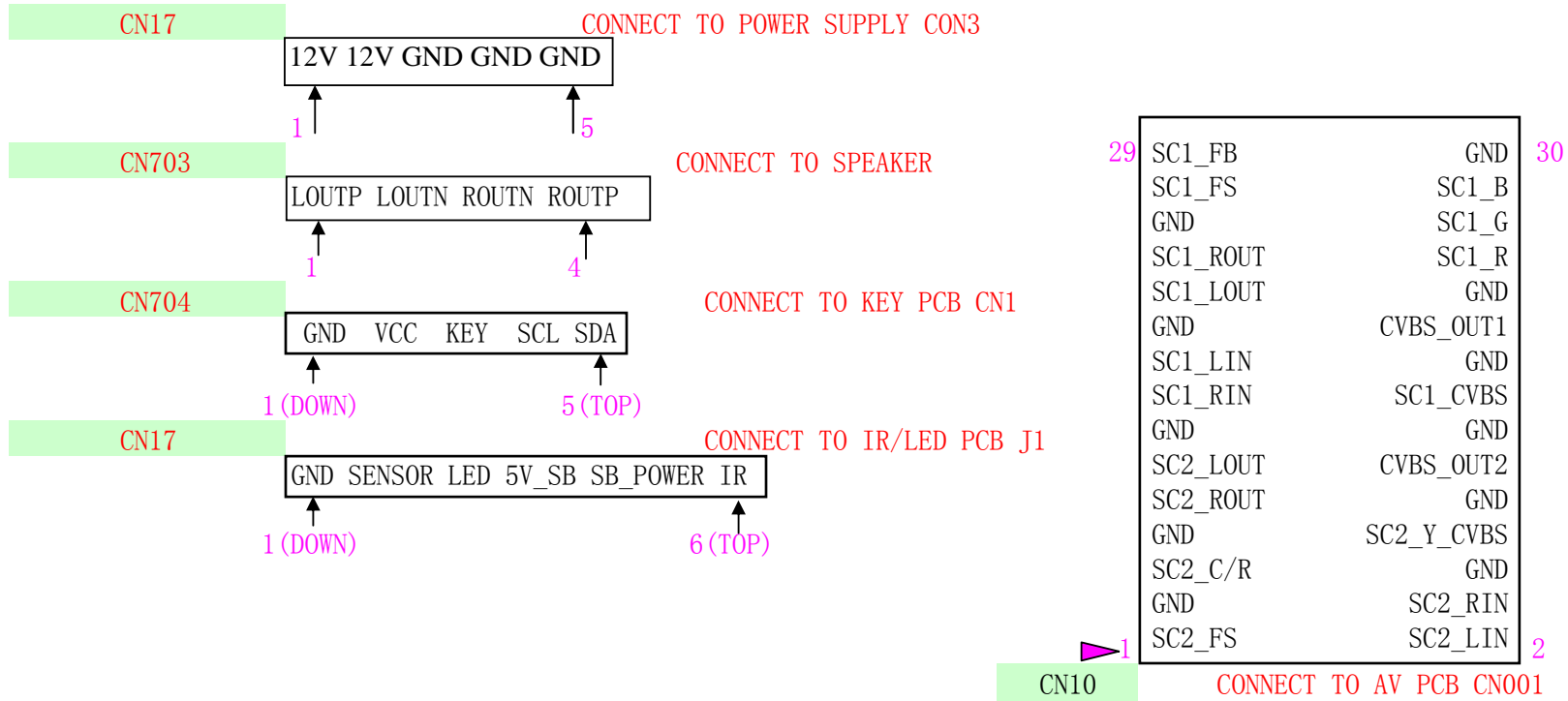
GND +5V +5V +5V GND GND STB5V GND STB

CONNECT TO POWER SUPPLY CON4

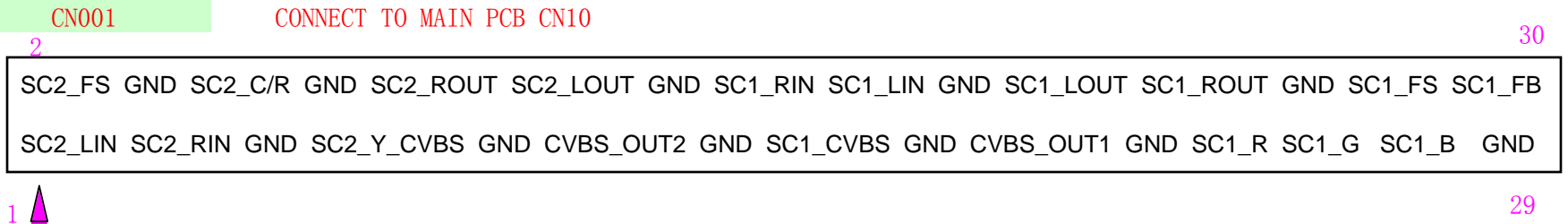
1 ↑

9 ↑

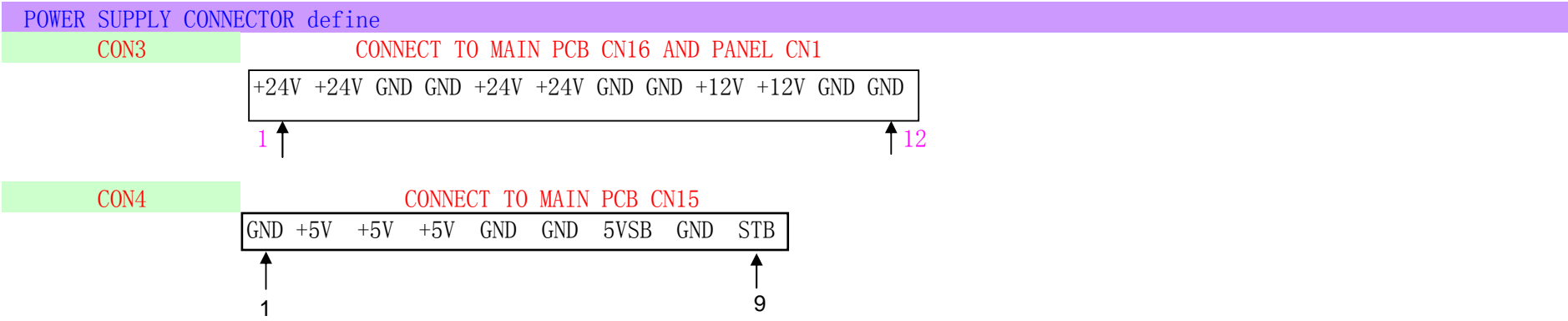
AX68 WIRING DIAGRAM



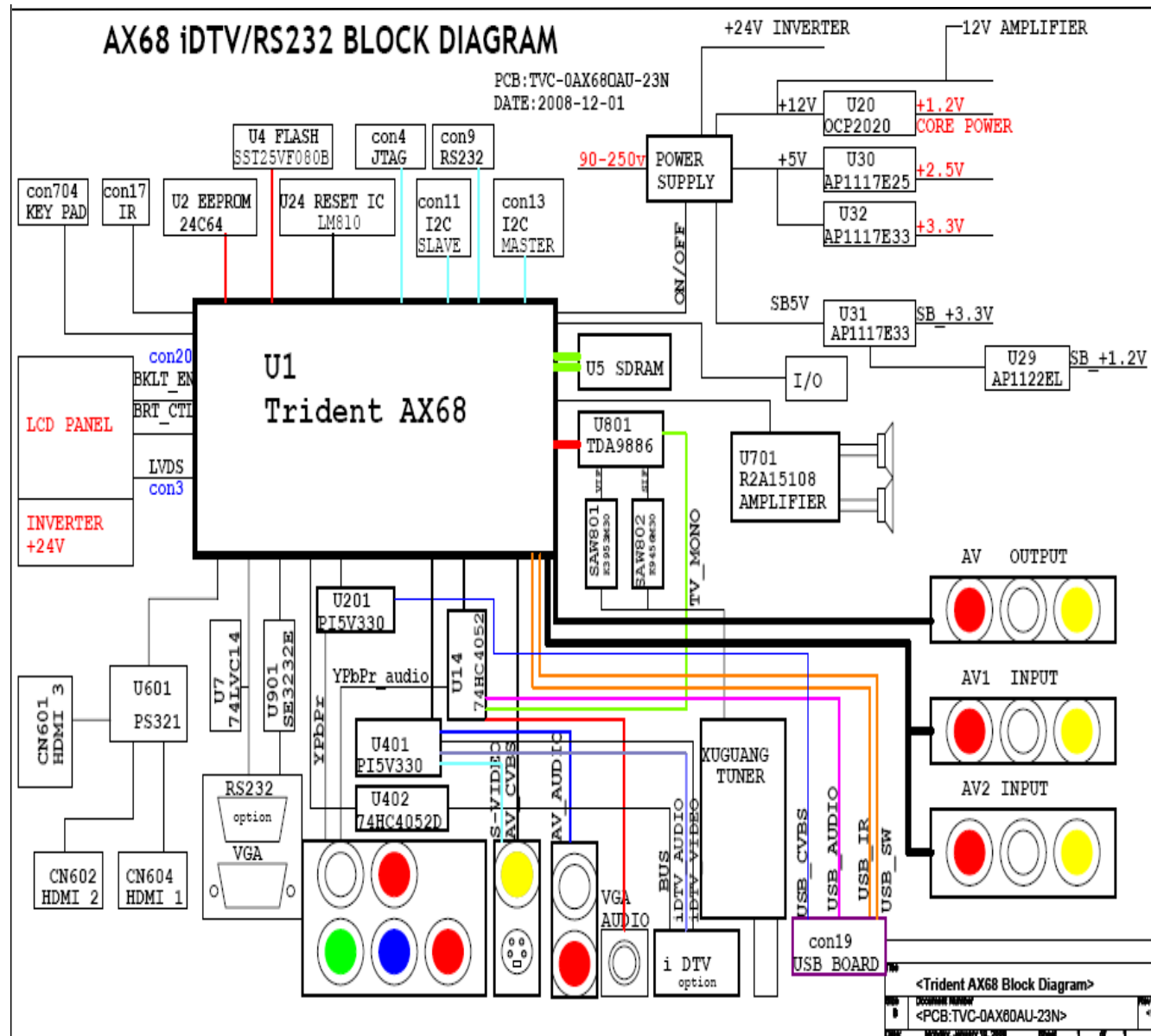
AV PCB CONNECTOR define



AX68 WIRING DIAGRAM



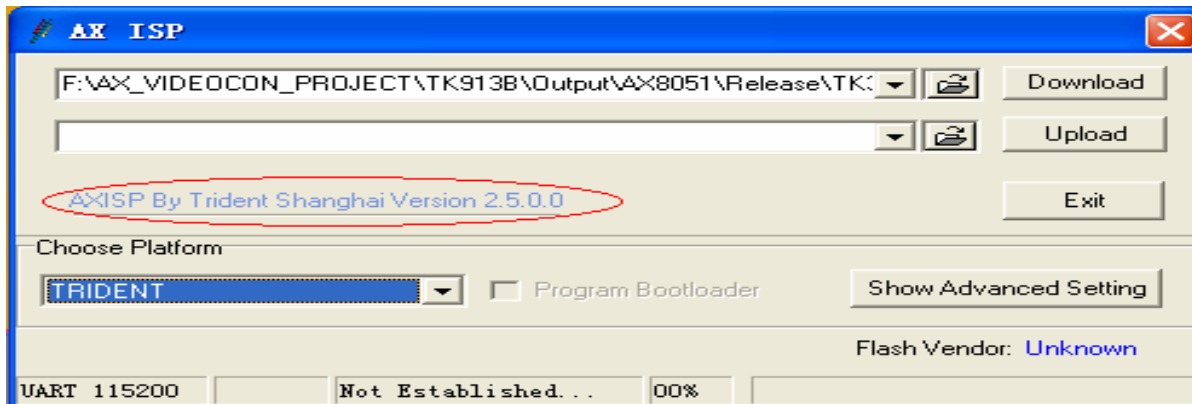
AX68 BLOCK DIAGRAM



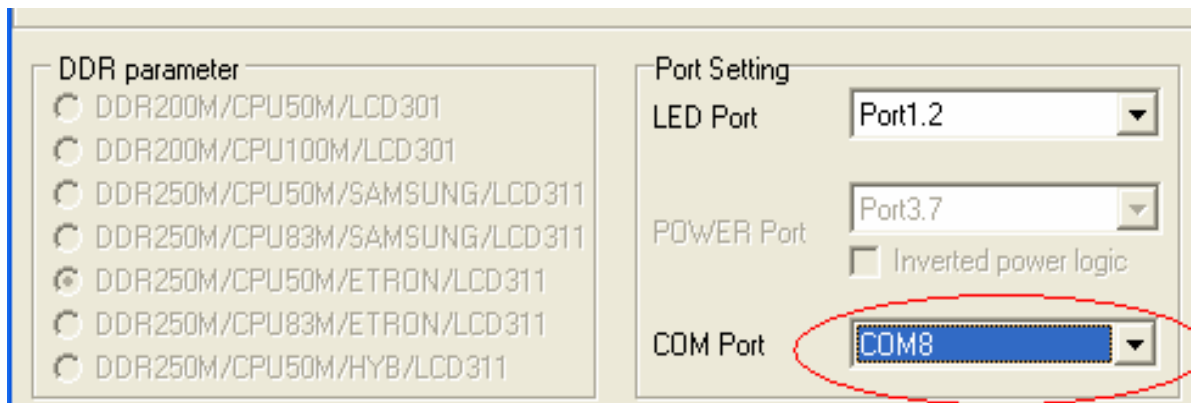
SW LOADING PROCEDURE FOR AX68

Install "PXSDKToolkitV1.0.6.exe" tool kit
Install USB driver "CP210x_VCP_Win2K_XP.exe"
Copy & paste "Uart115200_RevC Supported" folder on your system
Connect USB port of SW loading jig to USB port of CPU/Laptop
Connect VGA port of SW loading jig to VGA port of TV Set

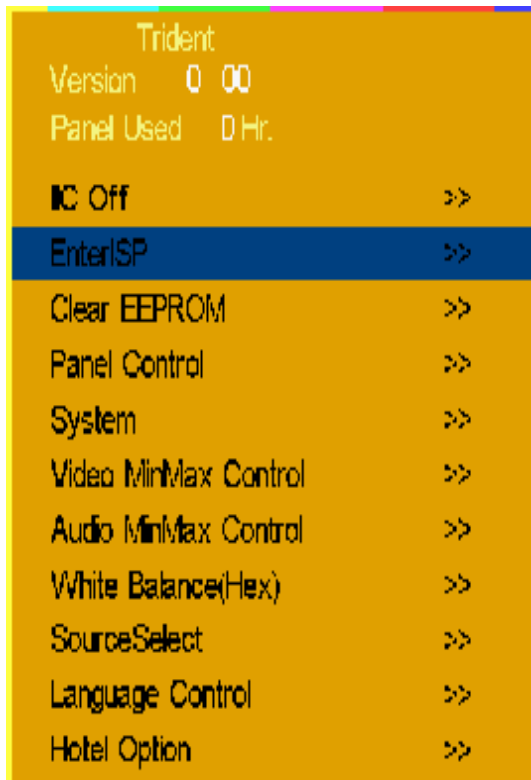
Open AXISP from "Uart115200_RevC Supported" folder . Press the red flag button , AXISP version is 2.5.0.0



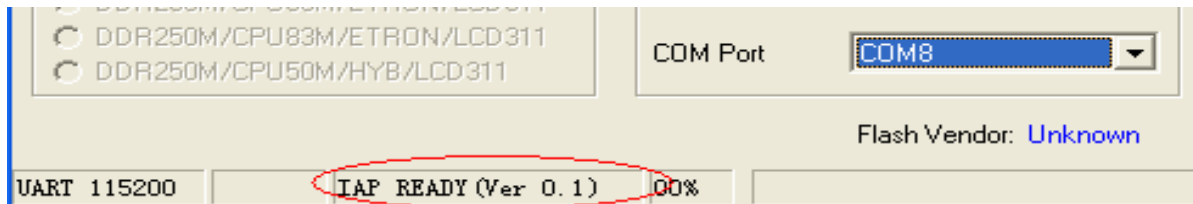
1. Chose the right Com interface.(Recommend COM1)



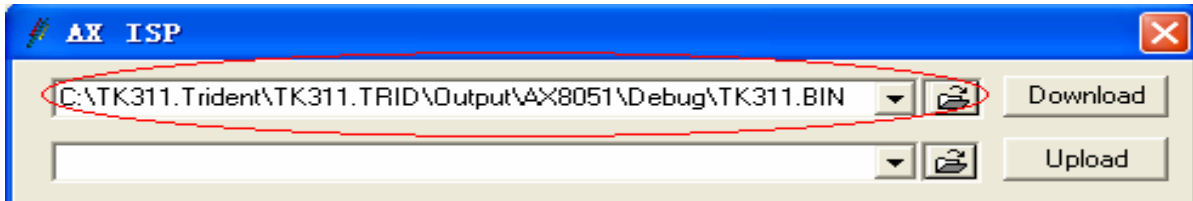
2. Enter factory mode like by pressing Menu ->Vol+ ->Ch'8532 Chose EnterISP option & Press VOL+ key.



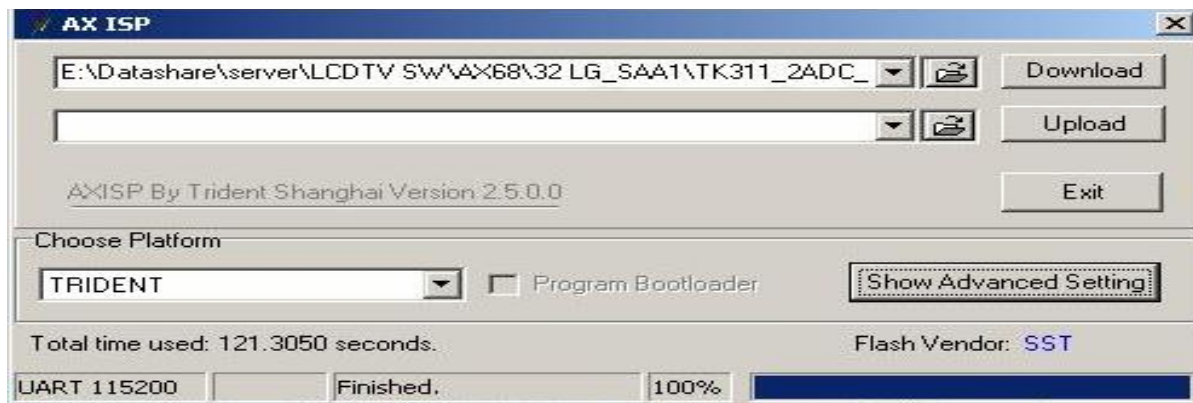
3. It is successful to connect the TV with the display like the red flag on the tool.



4. Browse & Chose the Bin file to download.



5. Press the Dowload button, after completion of process "Finished" will be displayed



DESIGN DATA FOR AX68 LCDTV SET (26" & 32")

NOTE :- Design Data may be vary for different Models & Panels.

To enter into design data press MENU key then enter into AUDIO menu + 8532

To exit from design data press MENU key

FACTORY MENU

Version: This shows the version of Software.

Panel Used: This shows which panel is used in the LCD TV set.

[illegible]

		ColMin ColMid ColMax TntMin TntMid TntMax ShpMin ShpMid ShpMax	>> >> >> >> >> >> >> >> >>	0H 5BH 7AH 0H 7FH FFH 0H 50H 7FH			
AudioMinMaxControl	>>	VolMin VolMidL VolMidH VolMax TreMin TreMid TreMax BasMin BasMid BasMax EarMin EarMid EarMax SIFNICAMPre SIFMONOPre CODEINPre I2SPre DTPre	>> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >>	0H CH 28H 2FH 0H 30H 64H 0H 30H 35H 0H 30H 64H 7H 7H 73H 40H EEH			
WhiteBalance(HEX)	>>	Red Gain Green Gain Blue Gain Red Offset Green Offset Blue Offset Reset	>> >> >> >> >> >> >>	80H 80H 7BH 80H 80H 80H TO SET			
Source Select	>>	TV AV AV1 AV2 AV3 SCART SCART1AV SCART2AV SCART2YC SCART3AV S-VIDEO S-VIDEO1	>> >> >> >> >> >> >> >> >> >> >> >> >>	ON OFF ON ON ON OFF OFF OFF OFF OFF ON ON	S-VIDEO2 USB HDTV HDTV1 HDTV2 HDTV3 VGA HDMI HDMI1 HDMI2 HDMI3 DTV	>> >> >> >> >> >> >> >> >> >> >> >> >>	OFF OFF ON OFF OFF ON OFF ON ON OFF OFF OFF
Language Control	>>	ENGLISH FRENCH GERMAN SPANISH SCHINESE ITALIAN RUSSIAN DUTCH GREEK PORTUGES SWEDISH NORWEGIA DANISH POLISH TCHINESE Romanian	>> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >>	ON ON ON ON OFF ON ON OFF ON ON OFF OFF OFF ON OFF ON	Hungarian Bulgarian Czech Serbian Slovakia Turkish Croatia Persian	>> >> >> >> >> >> >> >>	ON ON ON ON ON ON ON OFF

Hotel Option	>>	
Register Edit	>>	
Logo Control	>>	

AX68 SPECIFICATIONS (26" & 32" LCDTV SET)

	PARAMETERS	SPECS	REMARKS
TUNING	NUMBER OF PROGRAMS	200	
	TUNING SYSTEM	FS	
	COLOUR SYSTEM	PAL	
	NTSC PLAYBACK	YES	
	SOUND SYSTEM	I/BG/DK/L/L'	
	TURBO TUNING	NO	
	PLUG & PLAY	NO	
PICTURE	SELECTABLE PICTURE MODES	5 MODES	DYNAMIC / STANDARD / MILD / GAME / USER
	WHITE PEAK LIMITER	YES	IN BUILT FEATURE
	BLACK STRETCH	YES	IN BUILT FEATURE
	BLUE STRETCH	YES	IN BUILT FEATURE
	DYN. SKIN TONE	YES	As flesh tone
	ZOOM MODE	ORIGINAL / 4:3 / ZOOM / 16:9	
	FAVOURITE COLOUR CONTROL	YES	FLESH /GREEN /BLUE TONE CONTROL
	PICTURE IMPROVEMENT	YES	ACI (Dynamic Contrats Improvement)
	DCDI	NO	
	MADI MODE	NO	
	CCS MODE	YES	IN BUILT FEATURE
	ACTIVE COLOUR MANAGEMENT	YES	
	ADAPTIVE CONTRAST AND COLOUR	YES	
	AUTOMATIC IMAGE OPTIMIZATION	YES	
	FLESH TONE ADJUST	YES	
	GREEN TONE ADJUST	YES	
	BLUE TONE ADJUST	YES	
	DE-INTERLACING	YES	
	3:2 2:2 PULL DOWN	YES	
	DIGITAL COMB FILTER	YES	3D
	AVERAGE PICTURE LEVEL (APL)	YES	BUILT IN FEATURE
	PIP	NO	
	DYNAMIC CONTRAST (DCI)	YES	
	3D NOISE REDUCTION	YES	
	TEMPORAL NR MODE	YES	
	MPEG NOISE REDUCER MODE	NO	
AUDIO	SELECTABLE SOUND MODES	6 MODES	USER / SURROUND / FLAT / MUSIC / MOVIE / SPORT
	AUTO VOLUME LEVELLER	YES	
	AUDIO OUTPUT(RMS)	2 X 10W	(+/-2W)
	MUSIC MODE	NO	
	REVERB	NO	
	STEREO PLAYBACK	YES	
	BASS / TREBLE / BALANCE	YES	
	EQUALIZER	NO	

	PARAMETERS	SPECS	REMARKS
AUDIO	INCREDIBLE STEREO	NO	
	SOUND BOOSTER	NO	
	LOUDNESS	NO	
	SURROUND	NO	
	VOLUME PP	NO	
	NO.OF SPEAKERS	4	
	FRONT SPEAKER	NO	
	TWEETER	NO	
	WOOFER	NO	
H/W FEAATURES	MAGIC EYE	NO	
	SVM	NA	
	PICTURE TILT	NA	
	WOOFER	NA	
	FM	NO	
	DTH/DVB	NO	
	PANEL COMPABILITY	YES	
	PANEL BRIGHTNESS	YES	
FEATURES	MESSAGE	NO	
	TELEPHONE DIARY	NO	
	CALENDAR	NO	
	PROGRAM SURFING	NO	
	PROGRAM NAME	YES	7 CHARACTERS
	PROGRAM DIRECTORY	NO	
	CHANNEL ON DEMAND (COD)	NO	
	LOGO	NO	
	SCREEN SAVER	NO	
	CURTAIN EFFECT	NO	
	SCAN	NO	
	SORT	NO	
	SKIP	YES	
	SWAP	NO	
	QUICK VIEW	YES	
	FREEZE	YES	
	FAVOURITE	NO	
	CLOCK	YES	
	ON/OFF TIMER	YES	
	ON CHANNEL	YES	
	ALARM	NO	
	REMINDER TIMER	YES	

	PARAMETERS	SPECS	REMARKS
FEATURES	REMIND CHANNEL	YES	
	SLEEP TIMER	YES	0,10,20,30,60,90,120,180,240 MIN
	HOTEL MODE	YES	FORCED POS, FORCED VIDEO, SEARVH DISABLE, MAX VOLUME, MENU LOCK
	VOLUME LOCK	YES	
	CHILD LOCK	YES	
	TUNING LOCK	YES	
	PANEL LOCK	YES	
	AV LOCK	YES	
	TV LOCK	YES	
	MENU LOCK	YES	
	HELP	NO	
	GAME	NO	
	SELF DEMO	NO	
	OSD LANGUAGES	17(OPTIONAL)	ENGLISH, FRENCH, GERMAN, SPANISH, ITALIAN, PORTUGUESE, TURKISH, POLISH, SERBIAN, CROATIAN, HUNGERIAN, CZECH, ROMANIAN, SLOVENIAN, BULGARIAN, RUSSIAN, GREEK
	OSD TRANSPARENCY	YES	
	CLOCK , PHASE ADJUST IN PC MODE	YES	
	PICTURE WIPER	NA	
	SCREEN SAVE MODE	NO	
	TELETEXT	NO	
	NICAM A2 STEREO	NO	
CONNECTIVITY	AV IN (FRONT/SIDE)	3	2 SIDE & 1 BACK
	AV OUT	YES	
	S-VIDEO IN	1	
	DVD COMPATIBILITY (YPbPr/YCbCr)	1	
	EARPHONE SOCKET	NO	
	CORDLESS HEADPHONE	NO	
	EURO SCART IN	NO	
	USB INPUT	NO	
	HDMI INPUT	2	480I, 480i x2, 480p, 576i(50Hz), 576i x2, 576P(50Hz), 720P(60Hz), 1080i(50,60Hz),
	OPTICAL OUT	NO	
	DVI INPUT	NO	
	D-SUB 15(VGA IN)	1	640X480 (60HZ, 72HZ, 75HZ) 800X600 (56HZ, 60HZ, 72HZ, 75HZ) 1024X768(60HZ, 70HZ, 75HZ), 1280x960(60HZ), 1280X1024 (60HZ) 1600X1200 (60HZ)
	PC AUDIO IN	1	

	PARAMETERS	SPECS	REMARKS
PANEL SPECIFICATIONS	PANEL MODEL NO	SAMSUNG LTA320AB01	SPECIFICATION ARE SUBJECT TO CHANGE WITH PANEL TYPE NO
	SCREEN SIZE	32"	
	ASPECT RATIO	16:9	
	RESOLUTION	1366 X 768	
	DISPLAY AREA(H x V)	697.6845 (H) x 392.256 (V)ȳ	
	PIXEL PITCH	0.36375 mm x 0.36375 mm	
	DISPLAY COLOURS	16.7 MILLION colors	
	SUPER CONTRAST RATIO	30000:1	
	CONTRAST RATIO	3000:1	
	BRIGHTNESS	450Cd/M2	
	VIEWING ANGLE	178(H)/178(V)	
	RESPONSE TIME	8 ms	
	LAMP LIFE	50000 hr	
RATING	OPERATING VOLTAGE	100V~240V@ 50/60Hz	
	POWER CONSUMPTION	175W ON FULL LOAD LESS THAN 1 W ON NO LOAD	
ACCESSORIES	REMOTE HANDSET	YES	
	BATTERY CELL	YES	
	RF CABLE	NO	
	HDMI CABLE	NO	
	VGA CABLE	NO	
	RCA CABLE	NO	
	SCART TO AV ADAPTOR	NO	
	FM ANTENNA	NO	
	USER'S GUIDE BOOK	YES	

NOTE :- Specifications are vary depending on Models.

AX68 CHASSIS MAIN ICs

Partcode	Description
1100030406	IC,CHIP,SO-16,74HC4052D,TP
1100030408	IC,CHIP,SOP-8,24C64A,TP
1100043548	IC,CHIP,SOP8,AS1002,TP
1100043549	IC,CHIP,SOT23,2.93V,LM810/IMP810/P,TP
1100043550	IC,CHIP,SOT223,SE1122EL/AP1122EL,TP
1100043551	IC,CHIP,SOT223,SE8117E25/AP1117E25,TP
1100043552	IC,CHIP,SOT223,SE8117E33/AP1117E33,TP
1100043552	IC,CHIP,SOT223,SE8117E33/AP1117E33,TP
1100043546	IC,CHIP,SOP-8,SST25VF080B/S25FL008A,TP
1100043554	IC,CHIP,TSSOP16,PI5V330A,TP
1100030406	IC,CHIP,SO-16,74HC4052D,TP
1100043547	IC,CHIP,TSOP66,HY5DU281622FTP,TP
1100043562	IC,CHIP,TQFP80,PS321_A1,TP
1100030405	IC,CHIP,SO-14,SN74LVC14A,TP
1100043563	IC,CHIP,HTQFP48,R2A15108FP,TP
1100034800	IC,CHIP,SSOP24-9885,TDA9886TS/V3,TP
1100040079	IC,CHIP,TO263,L7805
1100040107	IC,CHIP,SOT23,A03401