

**SERVICE MANUAL  
LM CHASSIS**

# **BEKO**

**COLOUR TELEVISIONS**



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# SAFETY PRECAUTIONS

## GENERAL GUIDELINES

1. Always use the manufacturer's replacement safety components. The critical safety components marked with ∇ on the schematics diagrams should not be by other substitutes. Other substitute may create the electrical shock , fire or other hazards. Take attention to replace the spacers with the originals. Furthermore where a short circuit has occurred , replace those components that indicate evidence of overheating.
2. After servicing , see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.
3. When the receiver is not being used for a long time of period of time , unplug the power cord of the Adaptor from the AC outlet.

*Color TFT LCD Module is very sensitive both electrically and physically. Users, therefore, are requested to follow the "Guidance of handling color TFT LCD Module" on the followings.*

**1 - Be careful not to make scratch on the polarizer.**

Surface of polarizer is soft and can be physically damaged easily.  
Please do not touch, push or rub polarizer surface with materials over HB hardness.

**2 - Keep clean the surface.**

Please wear rubber glove when touch the surface of LCD screen. Please use soft and anti-static material as cleaner.

**3 - Keep out of water.**

Water on/in the LCD may cause electrical short or corrosion. Please wipe out dry or water carefully.

**4 - Prevent swift Temperature & Humidity change.**

Instantaneous temperature and/or humidity change can make dew or ice which cause nonconformance such as malfunction.

**5 High temperature & high humidity reduce the life-time.**

LCD is not proper to be used at high temperature and high humidity. Please keep specified temperature and humidity condition.

**6 - Keep out of Corrosive Gas.**

Corrosive gas effect the polarizer and the circuit chemically and cause defects accordingly.

**7 - Electrostatic discharge can make Damage**

There are electro-static sensitive components such as CMOS in LCD Module. Please earth human body when handle the LCD. In addition, please do not touch the interface connector pin with bare.

**8 - Do not operate for a long time under the same pattern**

Operating LCD for a long time under the same pattern can cause image persistence and can damage it. Please follow following guidance.

1. Turn the power off when do not use.
2. Change the pattern periodically.

# Technical specifications chart

|                              |                               |
|------------------------------|-------------------------------|
| Picture tube size/type       | 27" 16:9<br>active matrix TFT |
| Sound outlet power (10% THD) | 2x7 W                         |
| Power consumption            | 120 W                         |
| Stand-by Power consumption   | 1 W                           |

## General technical specifications

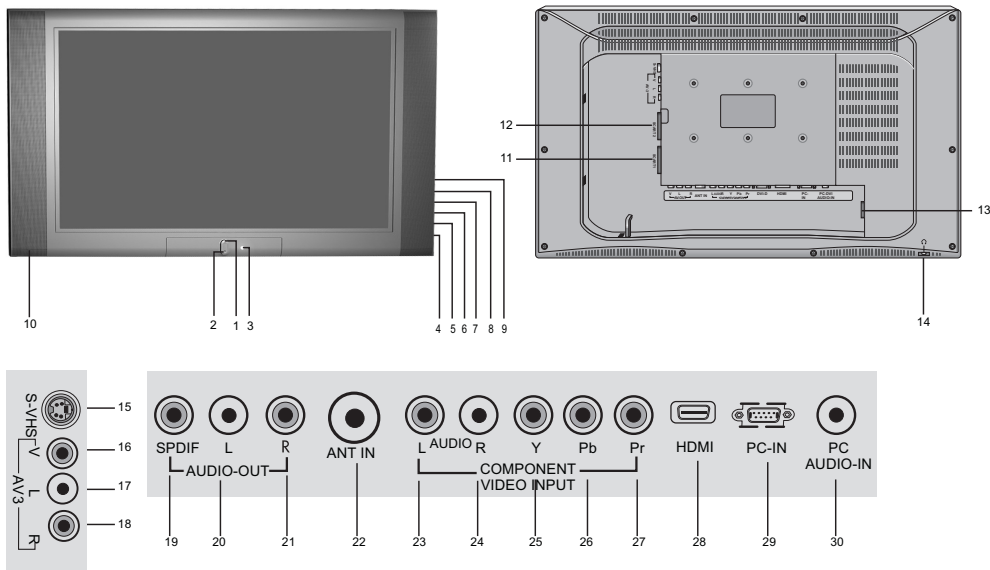
|                                            |                               |
|--------------------------------------------|-------------------------------|
| <b>Power supply</b>                        |                               |
| <b>AC:</b> .....                           | 230V~50 Hz                    |
| <b>Program memory:</b> .....               | 100                           |
| <b>RF Antenna input:</b> .....             | 75 Ohm (Co-axial)             |
| <b>Loudspeaker impedance:</b> .....        | 4 Ohm                         |
| <b>Sound systems:</b> .....                | Mono/Stereo/Nicam             |
| <b>Batteries:</b> .....                    | 2xUM - 4, IEC R03 or AAA 1.5V |
| <b>Received channels:</b> .....            | VHF (Band I channel 2-4)      |
| .....                                      | VHF (Band III channel 5-12)   |
| .....                                      | UHF (Channel 21-69)           |
| .....                                      | Cable TV (S1-S20/S21-S41)     |
| <b>Received broadcasting systems</b> ..... | PAL BG                        |
|                                            | PAL SECAM BG                  |
|                                            | PAL SECAM BG DK/DK'           |
|                                            | PAL SECAM BG LL'              |
|                                            | PAL I                         |

**Note:** Your television has been manufactured in accordance with your country by selecting from among the above mentioned broadcasting systems and this system cannot be changed by the user except the case described below: In countries where BG/DK and BG/LL' broadcasts are done (BG or DK / BG and LL'). For further information, see the settings part about your television.

## Your Television

### Features

- 27" TFT-LCD WXGA Panel
- Available for cable broadcasts
- 2x7 W Stereo sound
- 12 pages of teletext Feature
- PIP (Picture in Picture) Feature from AV
- Wide angle of vision
- Scart socket, AV Socket and external sound system connection
- S-VHS and Cinch inputs for S-Video connection
- PC connection
- Low energy consumption
- AVL
- ATS
- Programmable power off
- Graphic equalizer
- The feature of sharpness in Colour Transitions (CTI)
- Sharpness feature and picture resolution (LTI) in the black-white transitions
- A clear Picture made possible by the Digital Comb Filter
- On screen viewing of all settings, program numbers and all the processes
- Manual Fine Tuning
- 100 Program memory
- Infrared Remote Control equipped all the functions
- Child Lock
- Feature of viewing the NTSC broadcast to be entered via Scart
- Easy performance of the processes via the advanced menu system. Ability to choose 26 different menu languages.
- HDMI feature

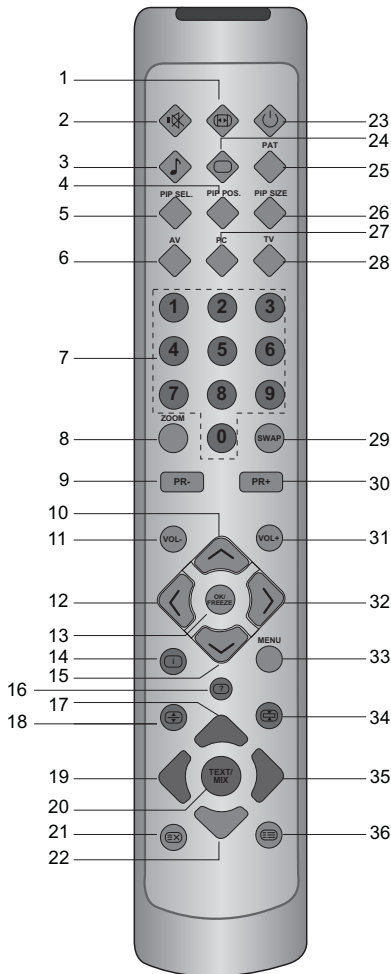


- |                                |                                           |
|--------------------------------|-------------------------------------------|
| 1. Standby status indicator    | 16. Video input CINCH connector           |
| 2. Network power on/off button | 17. Sound input CINCH connector (Left/L)  |
| 3. Remote control receiver     | 18. Sound input CINCH connector (Right/R) |
| 4. Volume turn-down button     | 19. SPDIF Digital audio output            |
| 5. Volume enhancement button   | 20. Sound output (Left/L)                 |
| 6. Menu Button                 | 21. Sound output (Right/R)                |
| 7. Source selection            | 22. Antenna input                         |
| 8. Program decrease button     | 23. Component sound input (L)             |
| 9. Program increase button     | 24. Component sound input (R)             |
| 10. Speaker                    | 25. Component video input (Y)             |
| 11. Scart 1                    | 26. Component video input (Pb)            |
| 12. Scart 2                    | 27. Component video input (Pr)            |
| 13. Power supply input         | 28. HDMI                                  |
| 14. Headphones output          | 29. VGA (PC connection input)             |
| 15. S-VHS connector            | 30. PC sound input                        |

**Note:**

- Please do not use the video RCA and S-Video connection simultaneously, in that case, these two devices might influence the picture quality of one another.
- RGB offers the best picture quality over the Scart.

## Remote Control



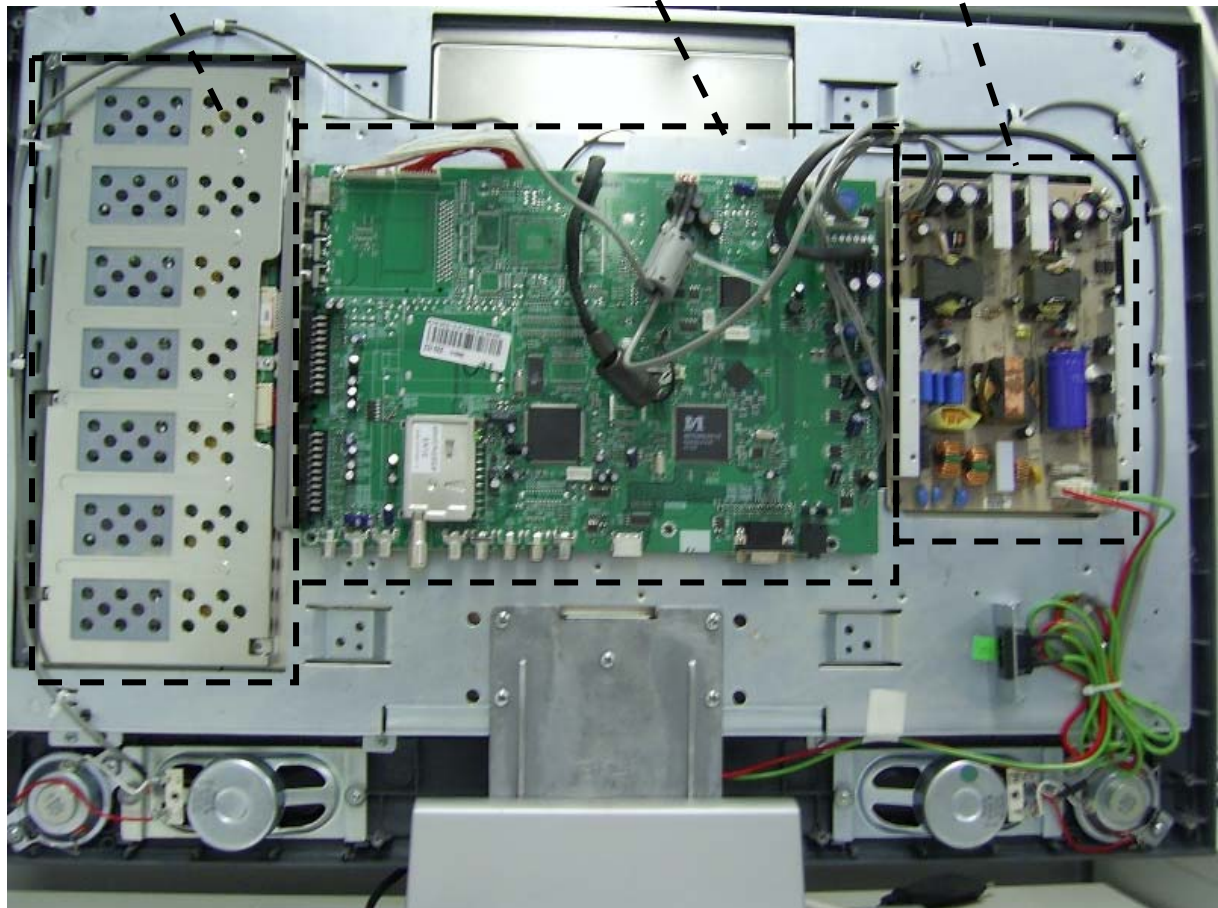
1. Picture Format selection button (🔍)
2. Temporary sound mute (Mute) button (🔇)
3. Equalizer selection button (🔊)
4. PIP Position selection button
5. PIP/PAP On-Off button
6. AV modes selection menu button
7. Numeric buttons
8. ZOOM mode selection button
9. Program down button (PR-)
10. Upward movement button (⬆️) (Menus)
11. Volume turn-down button (VOL-)
12. Left movement button (⬅️) (Menu)
13. Confirmation(OK) and Temporary picture freeze button (Freeze) (🔒)
14. Info / Txt index page button (📄)
15. Downward movement button (⬇️) (Menus)
16. Txt Question/Answer button (Reveal) (🔍)
17. Red teletext button (🔴)
18. Teletext page enlarge button (Double) (🔍)
19. Blue Teletext button (🔵)
20. Teletext / Mix selection buttons (📄)
21. UPDATE Button/Teletext time (🕒)
22. Yellow teletext button (🟡)
23. Stand-by On/Off button (🔌)
24. Picture Mode selection button (🔍)
25. PAT (Picture and Teletext) Mode Power On-Off button
26. PIP size selection button
27. PC mode access button
28. PC mode access button
29. Final program selection button (SWAP) (SWAP)
30. Program forward selection button (PR+)
31. Audio turn up button (VOL+)
32. Right movement button (➡️) (Menus)
33. MENU button
34. Txt Stop button (Hold) (🔒)
35. Green teletext button (🟢)
36. Sub page button (SUB PAGE) (📄)

## SET APPERANCE

INVERTOR(BUILT IN PANEL)

MAIN CHASSIS

POWER SUPPLY BOARD



## LM SERVICE MODE

### 1. Activating the Service Menu

When the menu is on the screen press '9', '3', '0', '1' on the remote controller. This will activate the service menu.

### 2. Service Mode Options

There are 6 submenus in this mode:

OPTIONS0, OPTIONS1, SOUND OPTIONS, IF SETTINGS, DIMMING, ADJUSTMENTS

#### 2.1 OPTIONS0

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STANDBY</b>   | CUSTOME (Customer), FACTORY                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>TEXT</b>      | Teletext Type : FAST (Fasttext), FAST TOP (Fasttext and Toplevel)                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>TEXT TBL</b>  | AUTO : Selects the table according to the selected menu language<br>WEST: English-French-German-Turkish-Spanish-Italian-Finnish-Swedish<br>Norwegian, Danish<br>EAST : Polish-French-Hungarian-Czech-German-Slovenian-Italian-Romanian<br>GREE : WEST + Greek<br>CYRL : English-Russian-German-Czech-Estonian-Ukrainian-Latvian<br>ARAB : West + Arabian<br>FARS : West + Persian<br>HEBR : West + Hebrew                                                            |
| <b>LANGUAGE</b>  | A: English-German-French-Italian-Spanish-Portuguese-Greek-Turkish-Dutch-Swedish-<br>Danish-Norwegian-Finnish-Slovenian-Polish-Hungarian-Russian-Hebrew-Romanian-<br>Croatian-Czech-Slovak-Albanian-Bulgarian- Macedonian-Serbian<br>B: English-German-French-Italian-Spanish-Portuguese-Greek-Turkish-Dutch-Swedish-<br>Danish-Norwegian-Finnish-Slovenian-Polish-Hungarian-Russian-Romanian-Croatian-<br>Czech-Slovak-Albanian-Bulgarian- Macedonian-Arabic-Persian |
| <b>PANEL</b>     | Selects the software according to the panel name :<br>26 AU5, 32 AU3, 26 SS2, 32 SS3, 27 CH5, 32 CH2, 26 LP6, 37 LP2, 26<br>QD2, 32 QD2                                                                                                                                                                                                                                                                                                                              |
| <b>PIP</b>       | NO (PIP via AV is not on), AV (PIP via AV is on)                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>PLUG PLAY</b> | ON (Demo mode), OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

#### 2.2 OPTIONS1

|                   |                                                                   |
|-------------------|-------------------------------------------------------------------|
| <b>BLUEBACK</b>   | ON, OFF                                                           |
| <b>CTI</b>        | Colour Transient Improvement Feature : ON, OFF, MENU              |
| <b>DNR</b>        | Digital Noise Reduction : ON, OFF, MENU (selection via User Menu) |
| <b>PROTECTION</b> | ON, OFF                                                           |
| <b>PANORAMA</b>   | AVAIL (On), NAVAIL (Off)                                          |
| <b>RC UNIT</b>    | Remote Control Type: 43 Key, 45 key                               |
| <b>PAT</b>        | Picture and Text feature: AVAIL (On, Default), NAVAIL (Off)       |
| <b>HOTEL</b>      | Simple Hotel TV feature: AVAIL (On), NAVAIL (Off)                 |
| <b>HOTEL VOL</b>  | Maximum sound level for Hotel Mode                                |

## 2.3 SOUND OPTIONS

|                   |                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------|
| <b>BG</b>         | EUROPE, NEWZ (New Zealand) AUST (Australia), NAVAIL (no BG)                                      |
| <b>DK</b>         | AVAIL, NAVAIL                                                                                    |
| <b>L/L</b>        | AVAIL, NAVAIL                                                                                    |
| <b>DOLBY</b>      | AVAIL, NAVAIL                                                                                    |
| <b>BASS OPT</b>   | NONE (bass is not activated), DYN (Dinamic bass is activated),<br>SUBW (Subwoofer feature is on) |
| <b>HEADPHONE</b>  | AVAIL, NAVAIL                                                                                    |
| <b>CARRI MUTE</b> | MSP (for all markets except Turkey), MICRO (for Turkey)                                          |

## 2.4 IF SETTINGS

|                    |                                                                |
|--------------------|----------------------------------------------------------------|
| <b>TUNER</b>       | PS DA5, THOMSON, TEMIC, PS D44, ALPS, PHILIPS                  |
| <b>VHF III UHF</b> | AGC adjustment is 5 for this frequency band                    |
| <b>VHF I</b>       | AGC adjustment is 5 for this frequency band                    |
| <b>AGC Method</b>  | AGC adjustment method: FIXED, SYNC&PW, SYNC, S&PW&PD (Default) |
| <b>SECAM MTD</b>   | Secam decoding method : OLD, NEW (default)                     |

## 2.5 DIMMING

No adjustment will be made in this menu for service purposes. Default value is 0.

## 2.6 ADJUSTMENTS

No adjustment will be made in this menu for service purposes. Default values are given below:

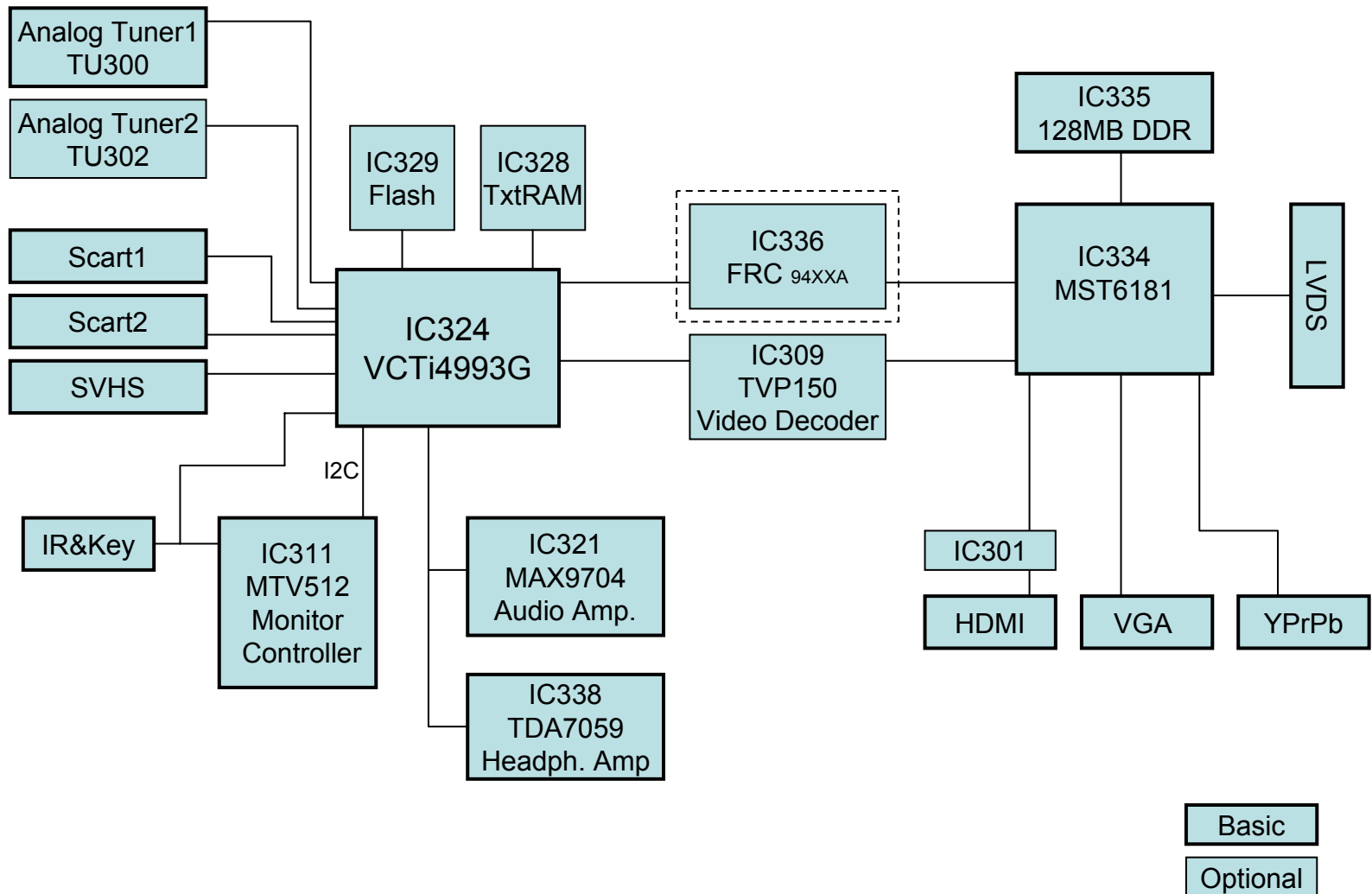
|             |            |            |     |
|-------------|------------|------------|-----|
| <u>VCTI</u> | BLE        | BLE MODE   | 3   |
|             |            | BLE GAIN   | 2   |
|             |            | BLE TILT   | 8   |
|             |            | BLE STATIC | 7   |
|             | FAC LTI    | LTI CORING | 0   |
|             |            | LTI GAIN   | 0   |
|             | SLL SUCARR | SLLTHDV    | 6   |
|             |            | SUBCARIER  | 19  |
|             | LUMA DELAY | DLY PAL    | 7   |
|             |            | DLY SECAM  | 10  |
|             |            | DLY NTSC   | 9   |
|             | SCART RGB  | BRI        | -14 |
|             |            | CONT       | 47  |
|             |            | CB SAT     | 50  |
|             |            | CR SAT     | 50  |
|             |            | TINT       | 0   |
|             |            | RGAIN      | 34  |
|             |            | GGAIN      | 33  |
|             |            | BGAIN      | 35  |

|               |          |     |
|---------------|----------|-----|
| <u>MSTAR</u>  | 6CR      | 5   |
|               | 6CG      | 5   |
|               | 6CB      | 8   |
|               | 6CC      | 0   |
|               | 6CM      | 3   |
|               | 6CY      | 2   |
|               | 6CF      | 5   |
|               | SPECTRUM | 1   |
| <u>ADJUST</u> | R GAIN   | 122 |
|               | G GAIN   | 128 |
|               | B GAIN   | 90  |
|               | R OFFSET | 125 |
|               | G OFFSET | 125 |
|               | B OFFSET | 126 |
|               | SUBCON   | 58  |
|               | SUB BRI  | 42  |

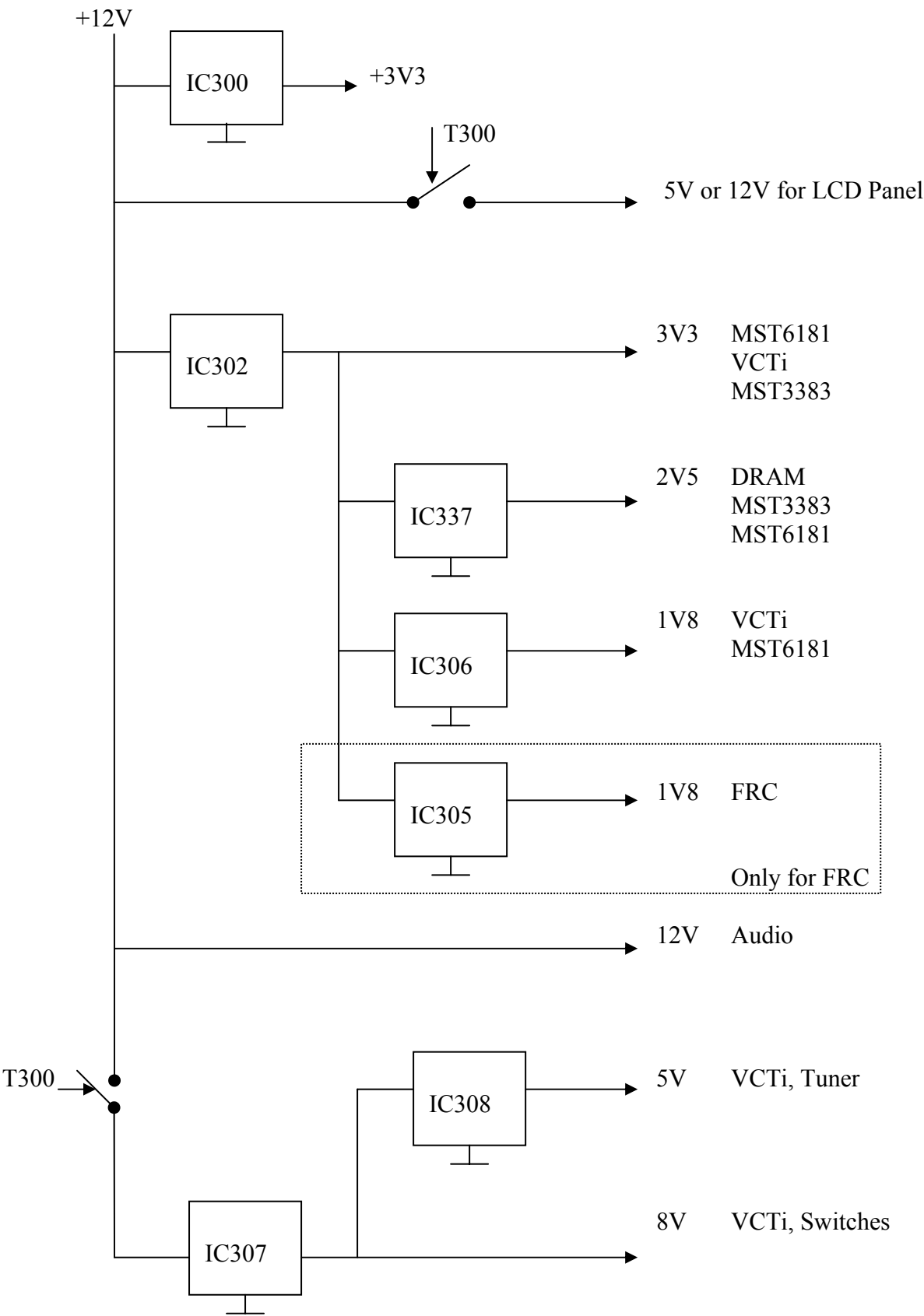
## 2.7 EEPROM EDIT

No adjustment will be made in this menu for service purposes.

# Chassis LM Block Diagram



# Power Supply Diagram



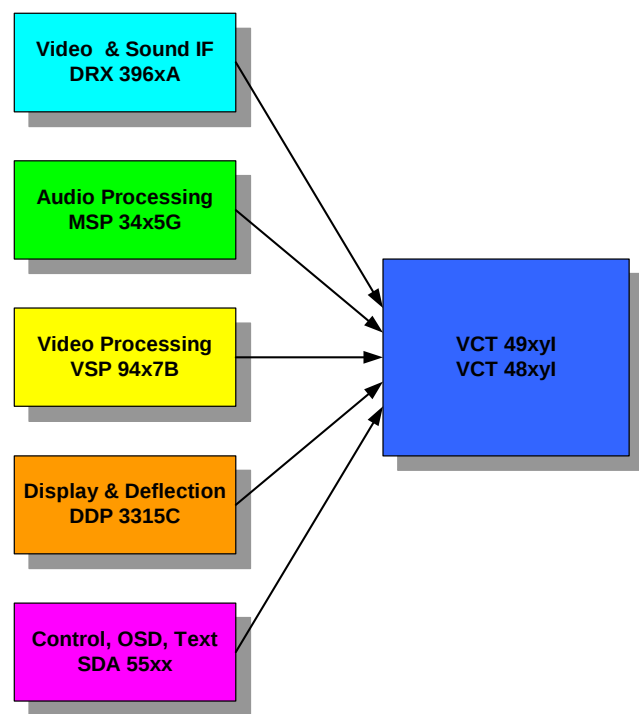
### General Description

**Release Note:** This data sheet describes functions and characteristics of the VCT 49xyl, VCT 48xyl version F1.

### 1. Introduction

The VCT 49xyl, VCT 48xyl is an IC family of high-quality single-chip TV processors. Modular design and deep-submicron technology allow the economic integration of features in all classes of single-scan TV sets. The VCT 49xyl, VCT 48xyl family is based on functional blocks contained and approved in existing products like DRX 396xA, MSP 34x5G, VSP 94x7B, DDP 3315C, and SDA 55xx.

Each member of the family contains the entire IF, audio, video, display, and deflection processing for 4:3 and 16:9 50/60-Hz mono and stereo TV sets. The integrated microcontroller is supported by a powerful OSD generator with integrated Teletext & CC acquisition including on-chip page memory.



**Fig. 1-1:** Single-chip VCT 49xyl, VCT 48xyl

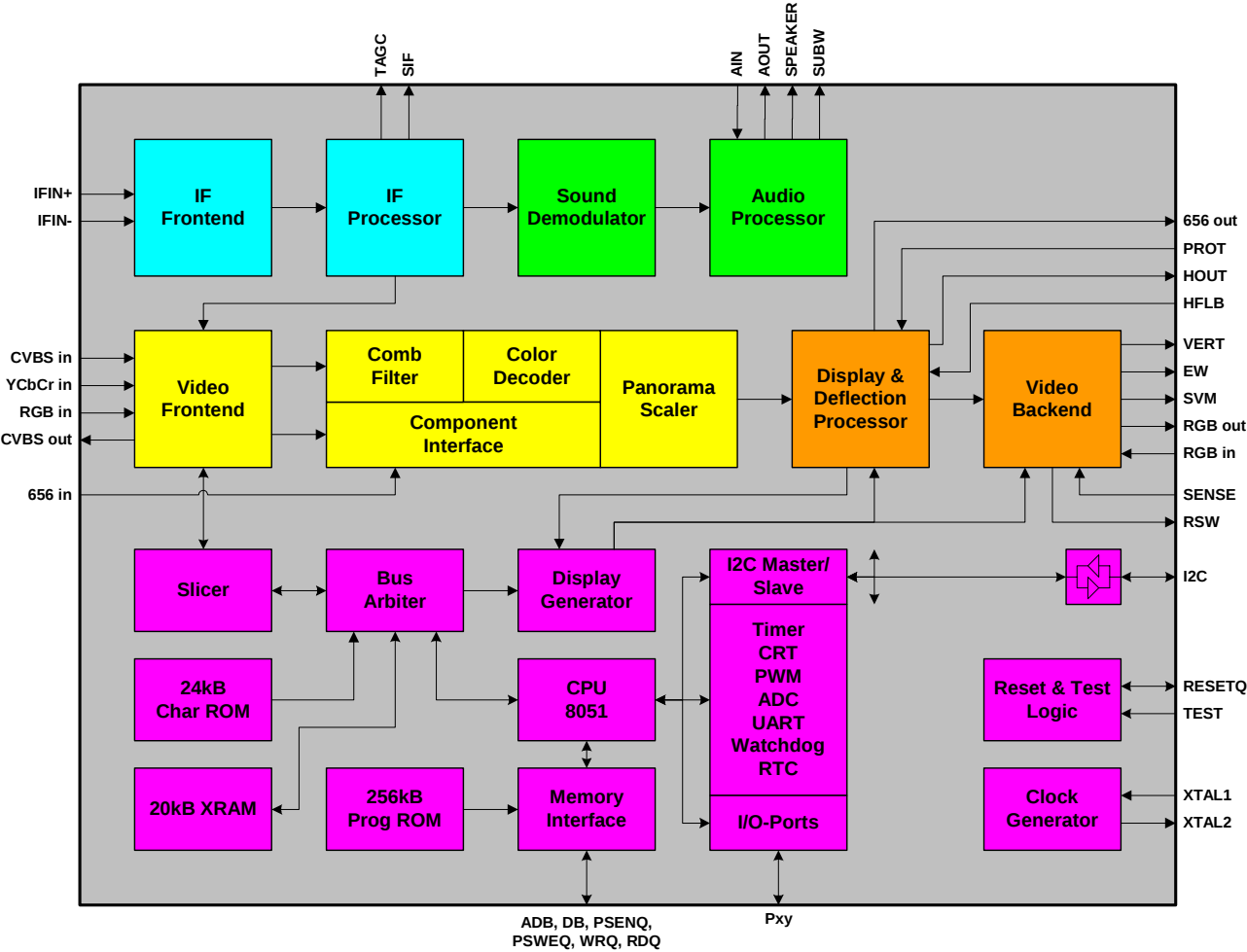
### 1.1. Features

The VCT 49xyl, VCT 48xyl family offers a rich feature set, covering the whole range of state-of-the-art 50/60 Hz TV applications.

- PSSDIP88-1 package
- PMQFP144-2 package

- Submicron CMOS technology
- Low-power standby mode
- Single 20.25 MHz reference crystal
- 8-bit 8051 instruction set compatible CPU
- Up to 256 kB on-chip program ROM
- WST, PDC, VPS, and WSS acquisition
- Closed Caption and V-chip acquisition
- Up to 10 pages on-chip teletext memory
- Multi-standard QSS IF processing with single SAW
- FM Radio and RDS with standard TV tuner
- TV-sound demodulation:
  - all A2 standards
  - all NICAM standards
  - BTSC/SAP with MNR (DBX optional)
  - EIA-J
- Baseband sound processing for loudspeaker channel:
  - volume and balance
  - bass/treble or equalizer
  - loudness and spatial effect (e.g. pseudo stereo)
  - Micronas AROUND (virtual Dolby optional)
  - Micronas BASS and Subwoofer output
  - further optional and licence requiring sound enhancements as BBE, SRS Wow and Micronas VOICE
- CVBS, S-VHS, YC<sub>b</sub>C<sub>r</sub> and RGB inputs
- ITU656 input
- 4H adaptive comb filter (PAL/NTSC)
- multi-standard color decoder (PAL/NTSC/SECAM)
- Macrovision Detection
- Nonlinear horizontal scaling “panorama vision”
- Luma and chroma transient improvement (LTI, CTI)
- Non-linear color space enhancement (NCE)
- Dynamic black level expander (BLE)
- Selective Color Enhancer (SCE)
- 8/10 bit ITU656 output
- Scan velocity modulation output
- Soft start/stop of H-drive
- Vertical angle and bow correction
- Average and peak beam current limiter
- Nonlinear and dynamic EHT compensation
- Black switch off procedure (BSO)

1.2. Chip Architecture



**Fig. 1-2:** Block diagram of the VCT 49xyl, VCT 48xyl

## FEATURES

- Input supports up to UXGA & 1080P
- Panel supports up to SXGA/WXGA
- Integrated 8-bit triple-ADC/PLL
- Integrated DVI/HDCP/HDMI compliant receiver
- RGB/YUV 444 and YUV422 digital video input ports
- Dual high-quality scaling engines
- Built-in 3-D video de-interlacer
- Video-over-graphic PIP
- Video-by-graphic split screen
- MStarACE-2 picture/color processing engine
- Embedded On-screen display controller (OSD) engine
- Digital audio I/O & sync processor
- Built-in dual-link LVDS transmitter
- 5 Volt tolerant inputs
- Low EMI and power saving features
- Supports PWM & GPO controls
- 256-pin LQFP
- **Analog RGB Compliant Input Ports**
  - Dual analog ports support up to 165Mhz
  - Supports PC RGB input up to UXGA@60Hz
  - Supports HDTV RGB/YPbPr/YCbCr up to 1080P
  - On-chip high-performance PLLs
  - Supports Composite Sync and SOG (Sync-on-Green) separator
  - Automatic color calibration
- **DVI/HDCP/HDMI Compliant Input Port**
  - Operates up to 165 MHz (up to UXGA @60Hz)
  - Single link on-chip DVI 1.0 compliant receiver
  - High-bandwidth Digital Content Protection (HDCP) 1.1 compliant receiver
  - High Definition Multimedia Interface (HDMI) 1.0 compliant receiver with I2S and S/PDIF digital audio outputs
  - Long-cable tolerant robust receiving
- **Video Input Port**
  - One RGB/YUV 4:4:4 24-bit and one 4:2:2 ITU-R BT.656 8-bit digital video input ports
  - 24-bit port supports 8/16-bit YUV 4:2:2 or 24-bit RGB/YUV 4:4:4 interlaced/ progressive video input up to 1080i/720P
- **Auto-Configuration/Auto-Detection**
  - Auto input signal format (SOG, Composite, Separated HSYNC, VSYNC, and DE), and input mode (all VESA & IBM modes w/ resolution and polarity) detection
  - Auto-tuning function including phasing, positioning, offset, gain, and jitter detection
  - Sync Detection for H/V Sync
- **Dual High-Performance Scaling Engine**
  - Fully Programmable shrink/zoom capabilities
  - Nonlinear video scaling supports various modes including Panorama
  - Flexible independent control of sharpness for TV and graphic windows
- **Video Processing & Conversion**
  - 3-D motion adaptive video de-interlacer with upgraded edge-oriented adaptive algorithm for smooth low-angle edges
  - Automatic 3:2 pull-down & 2:2 pull-down detection and recovery
  - PIP with programmable size and location, supports multi-video applications
  - Video-over-graphic overlay
  - Video-by-graphic split screen
  - Frame rate conversion for both main window and sub window
  - MStar 2<sup>nd</sup> Generation Advanced Color Engine (MStarACE-2) automatic picture enhancement gives:
    - Brilliant and fresh color
    - Intensified contrast and details
    - Vivid skin tone
    - Sharp edge
    - Enhanced depth of field perception
    - Accurate and independent color control
  - Independent picture control for main and sub windows
  - sRGB compliance allows end-user to experience the same colors as viewed on CRTs and other displays
  - Programmable 10-bit RGB gamma CLUT
  - 3-D video noise reduction

**■ On-Screen OSD Controller**

- 16/256 color palette
- 256/512 1-bit/pixel font
- 128/256/512 4-bit/pixel font
- Supports texture function
- Supports 4K attribute/code
- Horizontal and vertical stretch of OSD menus
- Supports button function
- Pattern generator for production test
- Supports OSD MUX and alpha blending capability
- Supports blinking and scrolling for closed caption applications

**■ LVDS Panel Interface**

- Supports dual link up to 135MHz dot clock for SXGA

- Supports 2 data output formats: Thine & TI data mappings
- Compatible with TIA/EIA
- With 6/8 bits options
- Reduced swing for LVDS for low EMI
- Supports flexible spread spectrum frequency with 360Hz~11.8MHz and up to 25% modulation

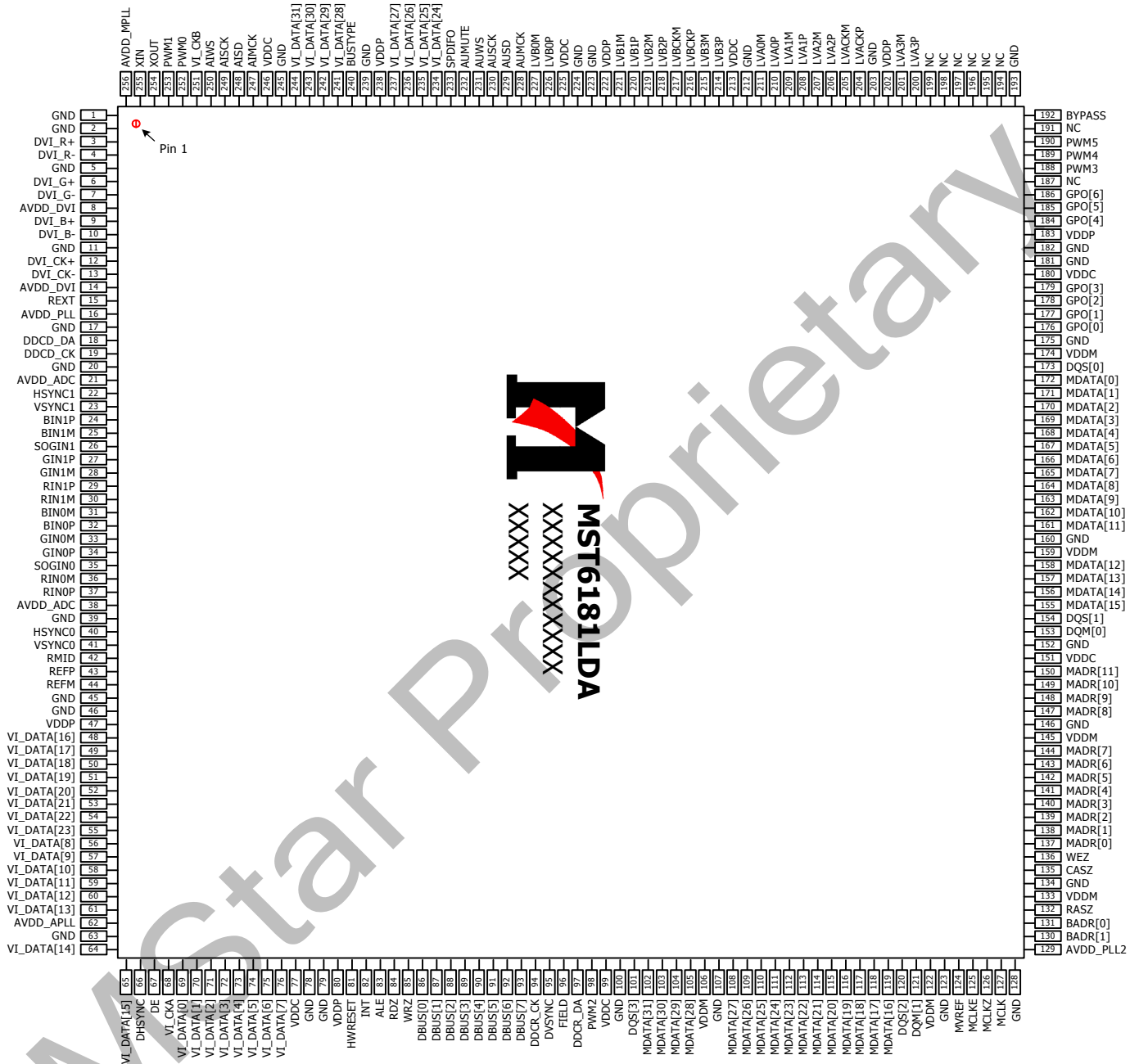
**■ External Connection/Component**

- Support 8051 parallel MCU bus
- Supports 4-wire double-data-rate direct MCU bus
- 32-bit data bus for external frame buffer (SDR or DDR DRAM)
- All system clocks synthesized from a single external clock

**GENERAL DESCRIPTION**

The MST6181LDA is a high performance and fully integrated graphics processing IC solution for multi-function LCD monitor/TV with resolutions up to SXGA/WXGA. It is configured with an integrated triple-ADC/PLL, an integrated DVI/HDCP/HDMI receiver, a video de-interlacer, two high quality scaling engines, an on-screen display controller, and a built-in output clock generator. By use of external frame buffer, PIP is provided for multimedia applications. It supports de-interlaced full-screen video, video-on-graphic overlay, split screen, frame rate conversion, and aspect ratio conversion for various video sources. To further reduce system costs, the MST6181LDA also integrates intelligent power management control capability for green-mode requirements and spread-spectrum support for EMI management.

## PIN DIAGRAM (MST6181LDA)



## PIN DESCRIPTION

### MCU Interface

| Pin Name  | Pin Type                             | Function                                                                                                                                                               | Pin   |
|-----------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| HWRESET   | Schmitt Trigger Input w/ 5V-tolerant | Hardware Reset, active high                                                                                                                                            | 81    |
| DBUS[7:0] | I/O w/ 5V-tolerant                   | MCU Direct bus; 4mA driving strength                                                                                                                                   | 93-86 |
| ALE       | I w/ 5V-tolerant                     | MCU Bus ALE, active high                                                                                                                                               | 83    |
| RDZ       | I w/ 5V-tolerant                     | MCU Bus RDZ, active high                                                                                                                                               | 84    |
| WRZ       | I w/ 5V-tolerant                     | MCU Bus WDZ, active high                                                                                                                                               | 85    |
| INT       | Output                               | MCU Bus Interrupt; 4mA driving strength                                                                                                                                | 82    |
| BUSTYPE   | Input (not 5V-tolerant)              | MCU bus type selection <ul style="list-style-type: none"> <li>Low (0V): 4-bit (DBUS[3:0]) DDR Direct Bus</li> <li>High (3.3V): 8-bit (DBUS[7:0]) Direct Bus</li> </ul> | 240   |

### Analog Interface

| Pin Name | Pin Type                             | Function                                               | Pin |
|----------|--------------------------------------|--------------------------------------------------------|-----|
| RMID     |                                      | Mid-Scale Voltage Bypass                               | 42  |
| REFP     |                                      | Internal ADC Top De-coupling Pin                       | 43  |
| REFM     |                                      | Internal ADC Bottom De-coupling Pin                    | 44  |
| REXT     | Analog Input                         | External Resister 390 ohm to AVDD_DVI                  | 15  |
| HSYNC0   | Schmitt Trigger Input w/ 5V-tolerant | Analog HSYNC Input from Channel 0                      | 40  |
| VSYNC0   | Schmitt Trigger Input w/ 5V-tolerant | Analog VSYNC Input from Channel 0                      | 41  |
| BIN0M    | Analog Input                         | Reference Ground for Analog Blue Input from Channel 0  | 31  |
| BIN0P    | Analog Input                         | Analog Blue Input from Channel 0                       | 32  |
| GIN0M    | Analog Input                         | Reference Ground for Analog Green Input from Channel 0 | 33  |
| GIN0P    | Analog Input                         | Analog Green Input from Channel 0                      | 34  |
| SOGIN0   | Analog Input                         | Sync On Green Input from Channel 0                     | 35  |
| RIN0M    | Analog Input                         | Reference Ground for Analog Red Input from Channel 0   | 36  |
| RIN0P    | Analog Input                         | Analog Red Input from Channel 0                        | 37  |
| HSYNC1   | Schmitt Trigger Input w/ 5V-tolerant | Analog HSYNC Input from Channel 1                      | 22  |
| VSYNC1   | Schmitt Trigger Input w/ 5V-tolerant | Analog VSYNC Input from Channel 1                      | 23  |
| BIN1M    | Analog Input                         | Reference Ground for Analog Blue Input from Channel 1  | 25  |

| Pin Name | Pin Type     | Function                                               | Pin |
|----------|--------------|--------------------------------------------------------|-----|
| BIN1P    | Analog Input | Analog Blue Input from Channel 1                       | 24  |
| SOGIN1   | Analog Input | Sync On Green Input from Channel 1                     | 26  |
| GIN1M    | Analog Input | Reference Ground for Analog Green Input from Channel 1 | 28  |
| GIN1P    | Analog Input | Analog Green Input from Channel 1                      | 27  |
| RIN1M    | Analog Input | Reference Ground for Analog Red Input from Channel 1   | 30  |
| RIN1P    | Analog Input | Analog Red Input from Channel 1                        | 29  |

### DVI/HDMI Interface

| Pin Name | Pin Type | Function                       | Pin |
|----------|----------|--------------------------------|-----|
| DVI_R+   | Input    | DVI/HDMI Input Channel Red +   | 3   |
| DVI_R-   | Input    | DVI/HDMI Input Channel Red -   | 4   |
| DVI_G+   | Input    | DVI/HDMI Input Channel Green + | 6   |
| DVI_G-   | Input    | DVI/HDMI Input Channel Green - | 7   |
| DVI_B+   | Input    | DVI/HDMI Input Channel Blue +  | 9   |
| DVI_B-   | Input    | DVI/HDMI Input Channel Blue -  | 10  |
| DVI_CK+  | Input    | DVI/HDMI Input Clock +         | 12  |
| DVI_CK-  | Input    | DVI/HDMI Input Clock -         | 13  |

### Video Interface

| Pin Name       | Pin Type             | Function                                     | Pin                            |
|----------------|----------------------|----------------------------------------------|--------------------------------|
| VI_CKA         | Input w/ 5V-tolerant | Digital Video Input Clock for VI_DATA[23:0]  | 68                             |
| VI_CKB         | Input w/ 5V-tolerant | Digital Video Input Clock for VI_DATA[31:24] | 251                            |
| VI_DATA[23:0]  | Input w/ 5V-tolerant | Digital Video Input Data[23:0]               | 55-48, 65, 64,<br>61-56, 76-69 |
| VI_DATA[31:24] | Input                | Digital Video Input Data[31:24]              | 244-241, 237-234               |
| FIELD          | Input w/ 5V-tolerant | FIELD Input                                  | 96                             |
| DVSYNC         | Input w/ 5V-tolerant | Digital VSYNC Input                          | 95                             |
| DHSYNC         | Input w/ 5V-tolerant | Digital HSYNC Input                          | 66                             |
| DE             | Input w/ 5V-tolerant | DE Input                                     | 67                             |

### Digital Audio Interface

| Pin Name | Pin Type | Function                                        | Pin |
|----------|----------|-------------------------------------------------|-----|
| AUMCK    | Output   | Audio Master Clock Output                       | 228 |
| AUSD     | Output   | Audio Serial Data Output; 4mA driving strength  | 229 |
| AUSCK    | Output   | Audio Serial Clock Output; 4mA driving strength | 230 |

| Pin Name | Pin Type             | Function                                  | Pin |
|----------|----------------------|-------------------------------------------|-----|
| AUWS     | Output               | Word Select Output; 4mA driving strength  | 231 |
| AUMUTE   | Output               | Audio Output Mute Control                 | 232 |
| SPDIFO   | Output               | S/PDIF Audio Output; 4mA driving strength | 233 |
| AIMCK    | Input w/ 5V-tolerant | Audio Master Clock Input                  | 247 |
| AISD     | Input w/ 5V-tolerant | Audio Serial Data Input                   | 248 |
| AISCK    | Input w/ 5V-tolerant | Audio Serial Clock Input                  | 249 |
| AIWS     | Input w/ 5V-tolerant | Word Select Input                         | 250 |

### LVDS Interface

| Pin Name | Pin Type | Function                                      | Pin |
|----------|----------|-----------------------------------------------|-----|
| LVA0M    | Output   | A-Link Negative LVDS Differential Data Output | 211 |
| LVA0P    | Output   | A-Link Positive LVDS Differential Data Output | 210 |
| LVA1M    | Output   | A-Link Negative LVDS Differential Data Output | 209 |
| LVA1P    | Output   | A-Link Positive LVDS Differential Data Output | 208 |
| LVA2M    | Output   | A-Link Negative LVDS Differential Data Output | 207 |
| LVA2P    | Output   | A-Link Positive LVDS Differential Data Output | 205 |
| LVA3M    | Output   | A-Link Negative LVDS Differential Data Output | 201 |
| LVA3P    | Output   | A-Link Positive LVDS Differential Data Output | 200 |
| LVACKM   | Output   | A-Link Negative LVDS Differential Data Output | 205 |
| LVACKP   | Output   | A-Link Positive LVDS Differential Data Output | 204 |
| LVB0M    | Output   | B-Link Negative LVDS Differential Data Output | 227 |
| LVB0P    | Output   | B-Link Positive LVDS Differential Data Output | 226 |
| LVB1M    | Output   | B-Link Negative LVDS Differential Data Output | 221 |
| LVB1P    | Output   | B-Link Positive LVDS Differential Data Output | 220 |
| LVB2M    | Output   | B-Link Negative LVDS Differential Data Output | 219 |
| LVB2P    | Output   | B-Link Positive LVDS Differential Data Output | 218 |
| LVB3M    | Output   | B-Link Negative LVDS Differential Data Output | 215 |
| LVB3P    | Output   | B-Link Positive LVDS Differential Data Output | 214 |
| LVBCKM   | Output   | B-Link Negative LVDS Differential Data Output | 217 |
| LVBCKP   | Output   | B-Link Positive LVDS Differential Data Output | 216 |

## GPO Interface

| Pin Name    | Pin Type | Function                                    | Pin                 |
|-------------|----------|---------------------------------------------|---------------------|
| PWM0        | Output   | PWM; 4mA driving strength                   | 252                 |
| PWM1        | Output   | PWM; 4mA driving strength                   | 253                 |
| PWM2        | Output   | PWM; 4mA driving strength                   | 98                  |
| PWM3/GPO[7] | Output   | GPO with PWM Function; 6mA driving strength | 188                 |
| PWM4/GPO[8] | Output   | GPO with PWM Function; 6mA driving strength | 189                 |
| PWM5/GPO[9] | Output   | GPO with PWM Function; 6mA driving strength | 190                 |
| GPO[6:0]    | Output   | GPO; 6mA driving strength                   | 186-184,<br>179-176 |

## DRAM Interface

| Pin Name    | Pin Type | Function                                                             | Pin                                   |
|-------------|----------|----------------------------------------------------------------------|---------------------------------------|
| MVREF       | Input    | Reference Voltage for DDR SDRAM Interface                            | 124                                   |
| MCLKE       | Output   | DRAM Memory Clock Enable                                             | 125                                   |
| MCLKZ       | Output   | DRAM Memory Clock Complementary / Input<br>(for differential clocks) | 126                                   |
| MCLK        | Output   | DRAM Memory Clock                                                    | 127                                   |
| RASZ        | Output   | Row Address Strobe, active low                                       | 132                                   |
| CASZ        | Output   | Column Address Strobe, active low                                    | 135                                   |
| WEZ         | Output   | Write Enable, active low                                             | 136                                   |
| DQM[1:0]    | Output   | Data Mask Byte Enable                                                | 121, 153                              |
| DQS[3:0]    | Output   | Data Strobe                                                          | 101, 120, 154, 173                    |
| BADR[1:0]   | Output   | Memory Bank Address                                                  | 130, 131                              |
| MADR[11:0]  | Output   | Memory Address                                                       | 150-147, 144-137                      |
| MDATA[31:0] | I/O      | Memory Data                                                          | 102-105, 108-119,<br>155-158, 161-172 |

## Misc. Interface

| Pin Name | Pin Type             | Function                                                           | Pin |
|----------|----------------------|--------------------------------------------------------------------|-----|
| DDCD_DA  | I/O w/ 5V-tolerant   | HDCEP Serial Bus Data / DDC Data of DVI Port; 4mA driving strength | 18  |
| DDCD_CK  | Input w/ 5V-tolerant | HDCEP Serial Bus Data / DDC Clock of DVI Port                      | 19  |
| DDCR_CK  | Input w/ 5V-tolerant | DDC Clock for ROM                                                  | 94  |
| DDCR_DA  | I/O w/ 5V-tolerant   | DDC Data for ROM                                                   | 97  |
| BYPASS   |                      | For External Bypass Capacitor                                      | 192 |

| Pin Name | Pin Type                  | Function | Pin |
|----------|---------------------------|----------|-----|
| XIN      | Crystal Oscillator Input  | Xin      | 255 |
| XOUT     | Crystal Oscillator Output | Xout     | 254 |

#### Power Pins

| Pin Name  | Pin Type                                 | Function               | Pin                                                                                                                                                  |
|-----------|------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| AVDD_DVI  | 3.3V Power                               | DVI/HDMI Power         | 8, 14                                                                                                                                                |
| AVDD_ADC  | 3.3V Power                               | ADC Power              | 21, 38                                                                                                                                               |
| AVDD_PLL  | 3.3V Power                               | PLL Power              | 16                                                                                                                                                   |
| AVDD_PLL2 | 3.3V Power                               | PLL Power              | 129                                                                                                                                                  |
| AVDD_APLL | 1.8V Power                               | Audio PLL Power        | 62                                                                                                                                                   |
| AVDD_MPLL | 3.3V Power                               | PLL Power              | 256                                                                                                                                                  |
| VDDM      | 2.5V Power (DDR) /<br>3.3V Power (SDRAM) | Memory Interface Power | 106, 122, 133, 145, 159,<br>174                                                                                                                      |
| VDDP      | 3.3V Power                               | Digital Output Power   | 47, 80, 183, 202, 222,<br>238                                                                                                                        |
| VDDC      | 1.8V Power                               | Digital Core Power     | 77, 99, 151, 180, 213,<br>225, 246                                                                                                                   |
| GND       | Ground                                   | Ground                 | 1, 2, 5, 11, 17, 20, 39,<br>45, 46, 63, 78, 79, 100,<br>107, 123, 128, 134, 146,<br>152, 160, 175, 181, 182,<br>193, 203, 212, 223, 224,<br>239, 245 |

#### No Connects

| Pin Name | Pin Type | Function                               | Pin               |
|----------|----------|----------------------------------------|-------------------|
| NC       |          | No connect. Leave these pins floating. | 187, 191, 194-199 |

# 8051 Embedded Monitor Controller with 64K Flash ROM

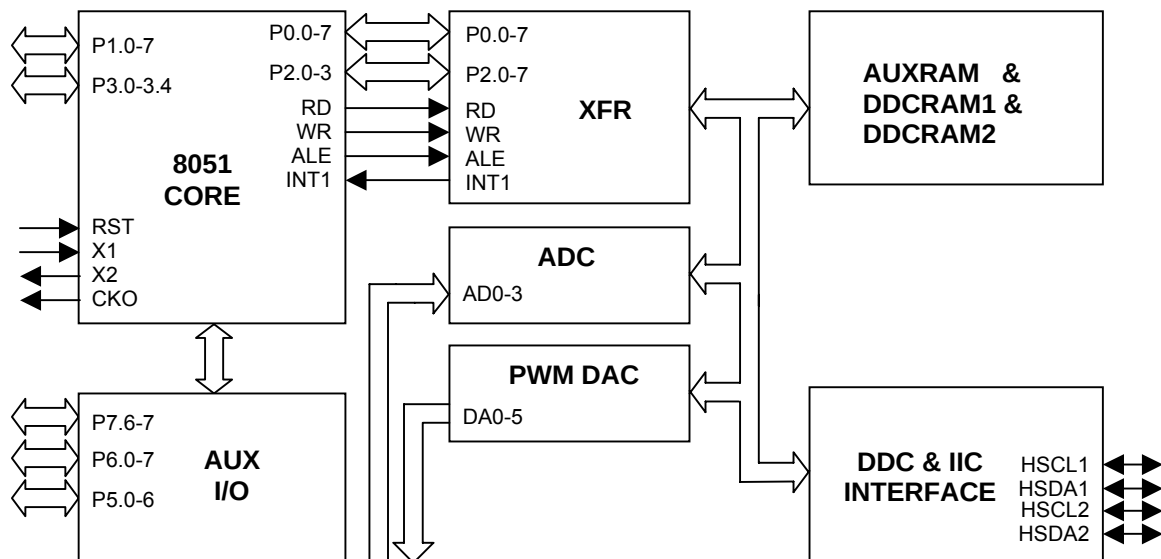
## GENERAL DESCRIPTIONS

The MTV512M micro-controller is an 8051 CPU core embedded device especially tailored for flat panel display applications. It includes an 8051 CPU core, 768-byte SRAM, 4 channels of 6-bit ADC, 3 external counters/timers, 6 channels of PWM DAC, VESA DDC interface, and a 64K-byte internal program Flash-ROM memory.

## FEATURES

- 8051 core, CPU operating frequency up to 24MHz
- 3.3V power supply
- 768-byte RAM; 64K-byte program Flash memory
- Maximum 6 channels of PWM DAC
- Compliant with VESA DDC1/2B/2Bi/2B+/C1 standard
- Watchdog timer with programmable interval
- Support external counters/timers, T0, T1, and ET2
- Single/double frequency clock output
- Two clock output ports
- Two external interrupts, INT1 is shared with Slave IIC interrupt source
- Maximum 4 channels of 6-bit ADC
- Flash-ROM code protection selection
- Hardware ISP (In System Programming), no Boot Code required
- Embedded Dual Ports DDCRAM (128-byte x 2)
- 40-pin PDIP, 42-pin SDIP, or 44-pin PLCC/QFP package
- Green products like Pb-Free Packages or All Green Packages available

## BLOCK DIAGRAM



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### PIN CONFIGURATION & DESCRIPTION

A “CMOS output pin” means it can sink and drive at least 4mA current. It is not recommended to use such pin as input function.

An “open drain pin” means it can sink at least 4mA current. It can be used as input or output function and needs an external pull up resistor.

An “8051 standard pin” is a pseudo open drain pin. It can sink at least 4mA current when output is at low level, and drives at least 4mA current for 160nS when output transits from low to high, then keeps driving at 120  $\mu$  A to maintain the pin at high level. It can be used as input or output function. It needs an external pull up resistor when driving heavy load device.

There is an internal pull-up resistance on each CMOS PAD and an internal pull-down resistance on each input PAD. It is recommended to add a pull high resistance on each open drain pin.

| Name           | Pin No. |     |      |      | Direction | Default Direction | Default Output Value* | Internal Pull Up/Down | Pin Type             | Description                                          |
|----------------|---------|-----|------|------|-----------|-------------------|-----------------------|-----------------------|----------------------|------------------------------------------------------|
|                | PLCC    | QFP | PDIP | SDIP |           |                   |                       |                       |                      |                                                      |
| NC             | 1       | 39  | -    | 1    | -         | -                 | -                     | -                     | -                    | No connection                                        |
| DA0/P5.0       | 2       | 40  | 1    | 2    | I/O       | O                 | 1(DA0)                | -                     | Open Drain           | PWM DAC output/General purpose I/O (open drain)      |
| DA1/P5.1       | 3       | 41  | 2    | 3    | I/O       | O                 | 1(DA1)                | -                     | Open Drain           | PWM DAC output/General purpose I/O (open drain)      |
| DA2/P5.2       | 4       | 42  | 3    | 4    | I/O       | O                 | 1(DA2)                | -                     | Open Drain           | PWM DAC output/General purpose I/O (open drain)      |
| DA3/P5.3       | 5       | 43  | 4    | 5    | I/O       | O                 | 1(DA3)                | -                     | Open Drain           | PWM DAC output/General purpose I/O (open drain)      |
| DA4/ P5.4      | 6       | 44  | 5    | 6    | I/O       | O                 | 1(DA4)                | -                     | Open Drain           | PWM DAC output/General purpose I/O (open drain)      |
| DA5/P5.5       | 7       | 1   | 6    | 7    | I/O       | O                 | 1(DA5)                | -                     | Open Drain           | PWM DAC output/General purpose I/O (open drain)      |
| P5.6/HSCL2     | 8       | 2   | 7    | 8    | I/O       | I                 | Z(P5.6)               | -                     | Open Drain w/ filter | General purpose I/O/Slave IIC1 SCL2 (open drain)     |
| P5.7/HSDA2     | 9       | 3   | 8    | 9    | I/O       | I                 | Z(P5.7)               | -                     | Open Drain w/ filter | General purpose Output/Slave IIC1 SDA2 (open drain)  |
| RST            | 10      | 4   | 9    | 10   | I         | I                 | 0                     | down                  | Input                | High Active RESET                                    |
| HSCL1/P3.0/RXD | 11      | 5   | 10   | 11   | I/O       | I/O               | Z(HSCL1)              | -                     | Open Drain w/ filter | Slave IIC clock/General purpose I/O/Rxd (open drain) |
| NC             | 12      | 6   | -    | -    | -         | -                 |                       | -                     | -                    | No connection                                        |
| HSDA1/P3.1/TXD | 13      | 7   | 11   | 12   | I/O       | I/O               | Z(HSDA1)              | -                     | Open Drain w/ filter | Slave IIC data/General purpose I/O/Txd (open drain)  |

# 1 TVP5150A Introduction

The TVP5150A device is an ultralow power NTSC/PAL/SECAM video decoder. Available in a space saving 32-pin TQFP package, the TVP5150A decoder converts NTSC, PAL, and SECAM video signals to 8-bit ITU-R BT.656 format. Discrete syncs are also available. The optimized architecture of the TVP5150A decoder allows for ultralow-power consumption. The decoder consumes 115 mW of power in typical operation and consumes less than 1 mW in power-down mode, considerably increasing battery life in portable applications. The decoder uses just one crystal for all supported standards. The TVP5150A decoder can be programmed using an I<sup>2</sup>C serial interface. The decoder uses a 1.8-V supply for its analog and digital supplies, and a 3.3-V supply for its I/O.

The TVP5150A decoder converts baseband analog video into digital YCbCr 4:2:2 component video. Composite and S-video inputs are supported. The TVP5150A decoder includes one 9-bit analog-to-digital converter (ADC) with 2x sampling. Sampling is ITU-R BT.601 (27.0 MHz, generated from the 14.31818-MHz crystal or oscillator input) and is line-locked. The output formats can be 8-bit 4:2:2 or 8-bit ITU-R BT.656 with embedded synchronization.

The TVP5150A decoder utilizes Texas Instruments patented technology for locking to weak, noisy, or unstable signals. A Genlock/real-time control (RTC) output is generated for synchronizing downstream video encoders.

Complementary 4-line adaptive comb filtering is available for both the luma and chroma data paths to reduce both cross-luma and cross-chroma artifacts; a chroma trap filter is also available.

Video characteristics including hue, contrast, brightness, saturation, and sharpness may be programmed using the industry standard I<sup>2</sup>C serial interface. The TVP5150A decoder generates synchronization, blanking, lock, and clock signals in addition to digital video outputs. The TVP5150A decoder includes methods for advanced vertical blanking interval (VBI) data retrieval. The VBI data processor slices, parses, and performs error checking on teletext, closed caption, and other data in several formats.

The TVP5150A decoder detects copy-protected input signals according to the Macrovision™ standard and detects Type 1, 2, 3, and colorstripe pulses.

The main blocks of the TVP5150A decoder include:

- Robust sync detector
- ADC with analog processor
- Y/C separation using 4-line adaptive comb filter
- Chrominance processor
- Luminance processor
- Video clock/timing processor and power-down control
- Output formatter
- I<sup>2</sup>C interface
- VBI data processor
- Macrovision™ detection for composite and S-video

## 1.1 Features

- Accepts NTSC (M, 4.43), PAL (B, D, G, H, I, M, N), and SECAM (B, D, G, K, K1, L) video data
- Supports ITU-R BT.601 standard sampling
- High-speed 9-bit ADC
- Two composite inputs or one S-video input

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Other trademarks are the property of their respective owners.

- Fully differential CMOS analog preprocessing channels with clamping and automatic gain control (AGC) for best signal-to-noise (S/N) performance
- Ultralow power consumption: 115 mW typical
- 32-pin TQFP package
- Power-down mode: <1 mW
- Brightness, contrast, saturation, hue, and sharpness control through I<sup>2</sup>C
- Complementary 4-line (3-H delay) adaptive comb filters for both cross-luminance and cross-chrominance noise reduction
- Patented architecture for locking to weak, noisy, or unstable signals
- Single 14.31818-MHz crystal for all standards
- Internal phase-locked loop (PLL) for line-locked clock and sampling
- Subcarrier Genlock output for synchronizing color subcarrier of external encoder
- Standard programmable video output format:
  - ITU-R BT.656, 8-bit 4:2:2 with embedded syncs
  - 8-bit 4:2:2 with discrete syncs
- Macrovision™ copy protection detection
- Advanced programmable video output formats:
  - 2x oversampled raw VBI data during active video
  - Sliced VBI data during horizontal blanking or active video
- VBI modes supported
  - Teletext (NABTS, WST)
  - Closed-caption decode with FIFO, and extended data services (EDS)
  - Wide screen signaling, video program system, CGMS, vertical interval time code
  - Gemstar 1x/2x electronic program guide compatible mode
  - Custom configuration mode that allows the user to program the slice engine for unique VBI data signals
- Power-on reset

## 1.2 Product Family

This data manual covers three devices in the TVP5150A product family: the TVP5150APBS, the TVP5150AM1PBS, and the TVP5150AM1ZQC. The hardware for these three devices is identical. The following software changes are the differences between these two devices. For the remainder of this document, unless otherwise noted, TVP5150A refers to all three devices.

- TVP5150APBS
  - ROM version 3.21
  - SECAM is masked from the autoswitch process in the default mode of register 0x04
  - Only supports ITU-R BT656.4 timing
- TVP5150AM1PBS/TVP5150AM1ZQC
  - ROM version 4.00
  - SECAM is unmasked from the autoswitch process in the default mode of register 0x04
  - Addition of register 0x30 to select ITU-R BT656.3 or ITU-R BT656.4 timing

### 1.3 Applications

The following is a partial list of suggested applications:

- Digital television
- PDA
- Notebook PCs
- Cell phones
- Video recorder/players
- Internet appliances/web pads
- Handheld games

### 1.4 Related Products

- *TVP5146 NTSC/PAL/SECAM 4x10-Bit Digital Video Decoder With Macrovision™ Detection, YPbPr/RGB Inputs, 5-Line Comb Filter and SCART/Digital RGB Overlay Support Decoder With Robust Sync Detector, Literature Number SLES084*

### 1.5 Ordering Information

| T <sub>A</sub> | PACKAGED DEVICES | PACKAGE OPTION |
|----------------|------------------|----------------|
|                | 32TQFP-PBS       |                |
| 0°C to 70°C    | TVP5150APBS      | Tray           |
| 0°C to 70°C    | TVP5150APBSR     | Tape and reel  |
| 0°C to 70°C    | TVP5150AM1PBS    | Tray           |
| 0°C to 70°C    | TVP5150AM1PBSR   | Tape and reel  |
| 0°C to 70°C    | TVP5150AM1ZQC    | Tray           |
| 0°C to 70°C    | TVP5150AM1ZQCR   | Tape and reel  |

1.6 Functional Block Diagram

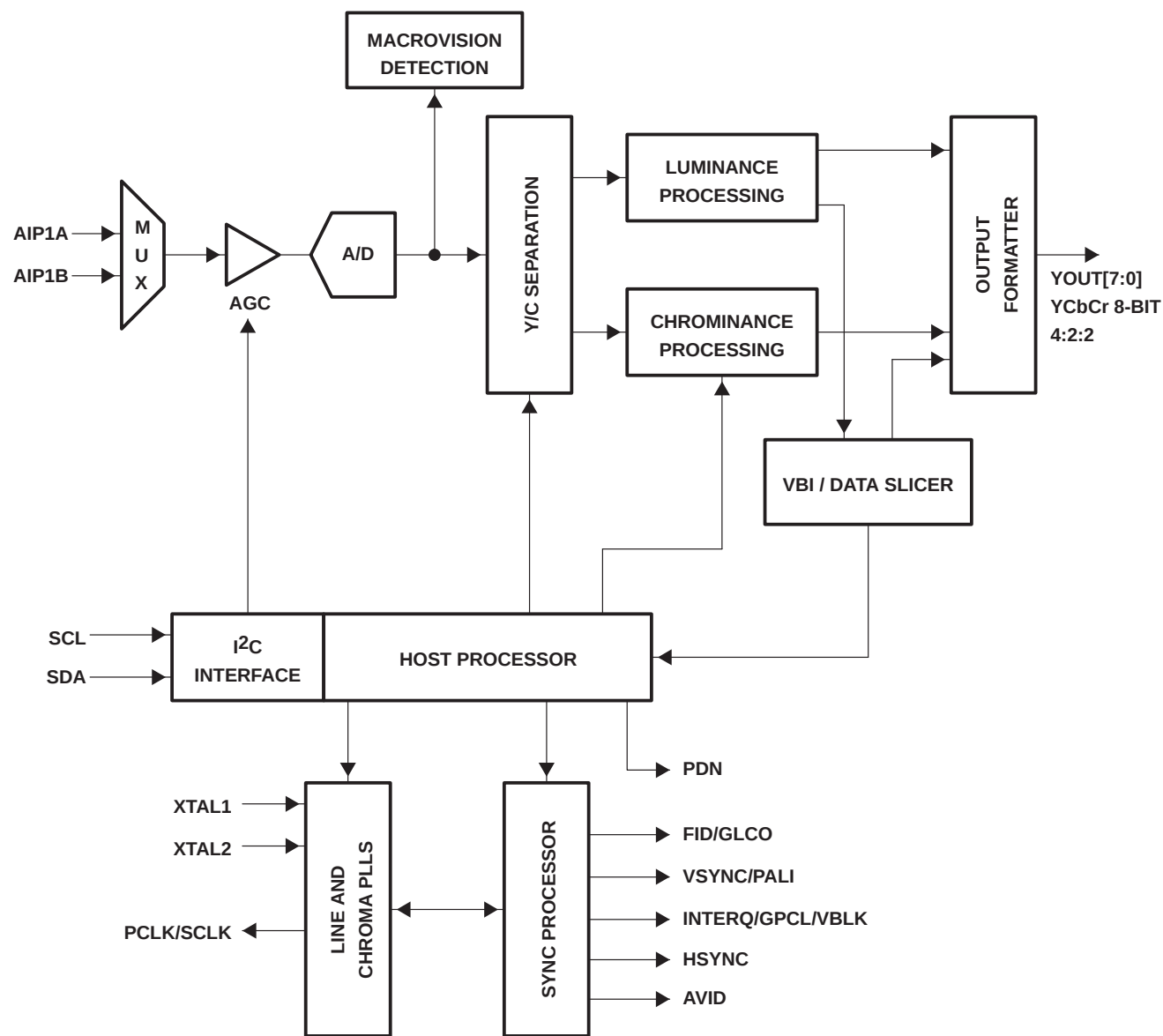
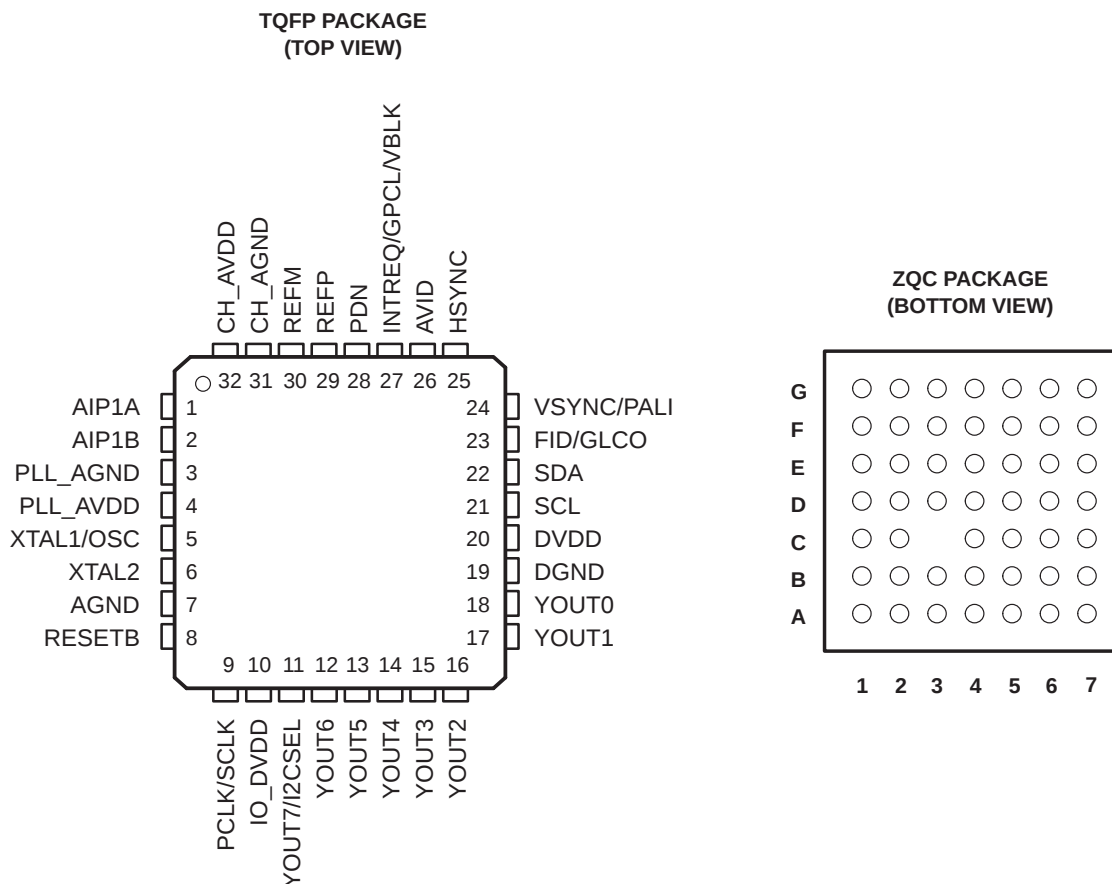


Figure 1-1. Functional Block Diagram

## 1.7 Terminal Assignments



## 1.8 Terminal Functions

**Table 1–1. Terminal Functions**

| TERMINAL       |        |                                              | I/O | DESCRIPTION                                                                                                                                                                                                                                                                         |
|----------------|--------|----------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NAME           | NUMBER |                                              |     |                                                                                                                                                                                                                                                                                     |
|                | PBS    | ZQC                                          |     |                                                                                                                                                                                                                                                                                     |
| Analog Section |        |                                              |     |                                                                                                                                                                                                                                                                                     |
| AGND           | 7      | E1                                           | I   | Substrate. Connect to analog ground.                                                                                                                                                                                                                                                |
| AIP1A          | 1      | A1                                           | I   | Analog input. Connect to the video analog input via 0.1-μF capacitor. The maximum input range is 0–0.75 V <sub>PP</sub> , and may require an attenuator to reduce the input amplitude to the desired level. If not used, connect to AGND via 0.1-μF capacitor. Refer to Figure 5–1. |
| AIP1B          | 2      | B1                                           | I   | Analog input. Connect to the video analog input via 0.1-μF capacitor. The maximum input range is 0–0.75 V <sub>PP</sub> , and may require an attenuator to reduce the input amplitude to the desired level. If not used, connect to AGND via 0.1-μF capacitor. Refer to Figure 5–1. |
| CH_AGND        | 31     | A3                                           | I   | Analog ground                                                                                                                                                                                                                                                                       |
| CH_AVDD        | 32     | A2                                           | I   | Analog supply. Connect to 1.8-V analog supply.                                                                                                                                                                                                                                      |
| NC             | –      | B2, B3, B6, C4, C5, D3–D6, E2–E5, F2, F5, F6 | –   | No connect                                                                                                                                                                                                                                                                          |
| PLL_AGND       | 3      | C2                                           | I   | PLL ground. Connect to analog ground.                                                                                                                                                                                                                                               |
| PLL_AVDD       | 4      | C1                                           | I   | PLL supply. Connect to 1.8-V analog supply.                                                                                                                                                                                                                                         |

**Table 1–1. Terminal Functions (Continued)**

| TERMINAL                   |                                        |                                        | I/O    | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|----------------------------------------|----------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NAME                       | NUMBER                                 |                                        |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                            | PBS                                    | ZQC                                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Analog Section (continued) |                                        |                                        |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| REFM                       | 30                                     | A4                                     | I      | A/D reference ground. Connect to analog ground through 1-μF capacitor. Also, it is recommended to connect directly to REFP through 1-μF capacitor. Refer to Figure 5–1.                                                                                                                                                                                                                                                                           |
| REFP                       | 29                                     | B4                                     | I      | A/D reference supply. Connect to analog ground through 1-μF capacitor. Refer to Figure 5–1.                                                                                                                                                                                                                                                                                                                                                       |
| Digital Section            |                                        |                                        |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AVID                       | 26                                     | A6                                     | O      | Active video indicator. This signal is high during the horizontal active time of the video output. AVID toggling during vertical blanking intervals is controlled by bit 2 of the active video cropping start pixel LSB register at address 12h (see Section 2.20.17).                                                                                                                                                                            |
| DGND                       | 19                                     | E6                                     | I      | Digital ground                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DVDD                       | 20                                     | E7                                     | I      | Digital supply. Connect to 1.8-V digital supply                                                                                                                                                                                                                                                                                                                                                                                                   |
| FID/GLCO                   | 23                                     | C6                                     | O      | FID: Odd/even field indicator or vertical lock indicator. For the odd/even indicator, a 1 indicates the odd field.<br>GLCO: This serial output carries color PLL information. A slave device can decode the information to allow chroma frequency control from the TVP5150A decoder. Data is transmitted at the SCLK rate in Genlock mode. In RTC mode, SCLK/4 is used.                                                                           |
| HSYNC                      | 25                                     | A7                                     | O      | Horizontal synchronization signal                                                                                                                                                                                                                                                                                                                                                                                                                 |
| INTREQ/GPCL/VBLK           | 27                                     | B5                                     | I/O    | INTREQ: Interrupt request output.<br>GPCL/VBLK: General-purpose control logic. This terminal has two functions:<br>1. GPCL: General-purpose output. In this mode the state of GPCL is directly programmed via I <sup>2</sup> C.<br>2. VBLK: Vertical blank output. In this mode the GPCL terminal indicates the vertical blanking interval of the output video. The beginning and end times of this signal are programmable via I <sup>2</sup> C. |
| IO_DVDD                    | 10                                     | G2                                     | I      | Digital supply. Connect to 3.3 V.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| PCLK/SCLK                  | 9                                      | G1                                     | O      | System clock at either 1x or 2x the frequency of the pixel clock.                                                                                                                                                                                                                                                                                                                                                                                 |
| PDN                        | 28                                     | A5                                     | I      | Power-down terminal (active low). Puts the decoder in standby mode. Preserves the value of the registers.                                                                                                                                                                                                                                                                                                                                         |
| RESETB                     | 8                                      | F1                                     | I      | Active-low reset. RESETB can be used only when PDN = 1.<br>When RESETB is pulled low, it resets all the registers and restarts the internal microprocessor.                                                                                                                                                                                                                                                                                       |
| SCL                        | 21                                     | D7                                     | I/O    | I <sup>2</sup> C serial clock (open drain)                                                                                                                                                                                                                                                                                                                                                                                                        |
| SDA                        | 22                                     | C7                                     | I/O    | I <sup>2</sup> C serial data (open drain)                                                                                                                                                                                                                                                                                                                                                                                                         |
| VSYNC/PALI                 | 24                                     | B7                                     | O      | VSYNC: Vertical synchronization signal<br>PALI: PAL line indicator or horizontal lock indicator<br>For the PAL line indicator:<br>1 = Indicates a noninverted line<br>0 = Indicates an inverted line                                                                                                                                                                                                                                              |
| XTAL1/OSC<br>XTAL2         | 5<br>6                                 | D2<br>D1                               | I<br>O | External clock reference. The user may connect XTAL1 to an oscillator or to one terminal of a crystal oscillator. The user may connect XTAL2 to the other terminal of the crystal oscillator or not connect XTAL2 at all. One single 14.31818-MHz crystal or oscillator is needed for ITU-R BT.601 sampling, for all supported standards.                                                                                                         |
| YOUT[6:0]                  | 12<br>13<br>14<br>15<br>16<br>17<br>18 | G3<br>F4<br>G4<br>G5<br>G6<br>G7<br>F7 | I/O    | Output decoded ITU-R BT.656 output/YCbCr 4:2:2 output with discrete sync.                                                                                                                                                                                                                                                                                                                                                                         |
| YOUT7/I2CSEL               | 11                                     | F3                                     | I/O    | I2CSEL: Determines address for I <sup>2</sup> C (sampled during reset). A pullup or pulldown register is needed (>1 kΩ) to program the terminal to the desired address.<br>1 = Address is 0xBA<br>0 = Address is 0xB8<br>YOUT7: MSB of output decoded ITU-R BT.656 output/YCbCr 4:2:2 output.                                                                                                                                                     |

# PARTS LIST

**Note:** For parts other than those of chassis (cosmetic parts and auxiliary boards like power supply etc) please see the parts lists in the web page.

| Position          | Parts code | Description                        | Position | Parts code | Description                         |
|-------------------|------------|------------------------------------|----------|------------|-------------------------------------|
| <b>CAPACITORS</b> |            |                                    | C376     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C1                | 202476R    | CC 4.7NF M 250VAC Y5U R:10         | C378     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C1                | 251105R    | EC 10UF 16V 5*3.5 R:5              | C379     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C26               | 251106R    | EC 10UF 100V 11*6.3 R:5            | C380     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |
| C187              | 293113R    | CC-CHIP 10NF K 50V /0603 X7R       | C381     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C225              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C382     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C300              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C383     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C301              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C384     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C302              | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R    | C385     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C303              | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R    | C386     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C304              | 290223R    | CC-CHIP 22PF J 50V /0603 NPO TAPE  | C387     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C305              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C388     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C306              | 293113R    | CC-CHIP 10NF K 50V /0603 X7R       | C389     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C307              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C390     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C308              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C391     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C309              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C392     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C310              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C393     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C311              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C394     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C312              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C395     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C315              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C396     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C316              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C397     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C317              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C398     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C318              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C399     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C319              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C400     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C320              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C401     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C321              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C402     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C322              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C403     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C323              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C404     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C324              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C405     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C326              | 290223R    | CC-CHIP 22PF J 50V /0603 NPO TAPE  | C406     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C327              | 290223R    | CC-CHIP 22PF J 50V /0603 NPO TAPE  | C407     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C328              | 290335R    | CC-CHIP 33PF J 50V /0603 NPO TAPE  | C408     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C329              | 290335R    | CC-CHIP 33PF J 50V /0603 NPO TAPE  | C409     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C330              | 294685R    | CC-CHIP 1UF K 25V X7R 0805         | C410     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C331              | 295114R    | CC-CHIP 1UF K 10V /0603 X5R        | C411     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C332              | 295114R    | CC-CHIP 1UF K 10V /0603 X5R        | C412     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C333              | 295114R    | CC-CHIP 1UF K 10V /0603 X5R        | C413     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C334              | 295114R    | CC-CHIP 1UF K 10V /0603 X5R        | C414     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C335              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C416     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C336              | 295114R    | CC-CHIP 1UF K 10V /0603 X5R        | C418     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C337              | 295114R    | CC-CHIP 1UF K 10V /0603 X5R        | C420     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C338              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C421     | 290562R    | CC-CHIP 56PF J 50V/0603 NPO TAPE    |
| C339              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C422     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C340              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C424     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C341              | 253115R    | EC 1000UF 16V 20*10 R:5            | C431     | 252112R    | EC 100UF 16V 11*6 R:5               |
| C350              | 251107R    | EC 10UF M 16V 11*5 R:5             | C432     | 252229R    | EC 220UF 16V 11*8 R:5               |
| C351              | 293113R    | CC-CHIP 10NF K 50V /0603 X7R       | C433     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        |
| C352              | 293113R    | CC-CHIP 10NF K 50V /0603 X7R       | C436     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C353              | 293113R    | CC-CHIP 10NF K 50V /0603 X7R       | C437     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C354              | 293113R    | CC-CHIP 10NF K 50V /0603 X7R       | C441     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C355              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C442     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C356              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C443     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C357              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C444     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C358              | 290688R    | CC-CHIP 68PF J 50V /0603 NPO TAPE  | C445     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C359              | 290688R    | CC-CHIP 68PF J 50V /0603 NPO TAPE  | C446     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C360              | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE | C447     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C361              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C448     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C362              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C450     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C363              | 252112R    | EC 100UF 16V 11*6 R:5              | C451     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C364              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C452     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C365              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C465     | 252250R    | EC 220UF 25V %20 11*8 R:5MM LOW ESR |
| C366              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C467     | 252250R    | EC 220UF 25V %20 11*8 R:5MM LOW ESR |
| C367              | 252112R    | EC 100UF 16V 11*6 R:5              | C469     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C368              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C471     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C369              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C472     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C370              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C473     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C371              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C474     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C372              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C475     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C373              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C476     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C374              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C477     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |
| C375              | 294121R    | CC-CHIP 100NF J 50V /0603 NPO      | C478     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        |

| Position | Parts code | Description                         | Position | Parts code | Description                         |
|----------|------------|-------------------------------------|----------|------------|-------------------------------------|
| C479     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        | C602     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |
| C480     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        | C605     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C481     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        | C606     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C491     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        | C609     | 034107R    | TUBE PVC 1*.25 YELLOW               |
| C492     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        | C609     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C494     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        | C610     | 034107R    | TUBE PVC 1*.25 YELLOW               |
| C497     | 299112R    | CC-CHIP 22UF Z 10V /1210 Y5V        | C610     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C498     | 299112R    | CC-CHIP 22UF Z 10V /1210 Y5V        | C611     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C503     | 299112R    | CC-CHIP 22UF Z 10V /1210 Y5V        | C612     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C504     | 299112R    | CC-CHIP 22UF Z 10V /1210 Y5V        | C613     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C505     | 253115R    | EC 1000UF 16V 20*10 R:5             | C614     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C507     | 252250R    | EC 220UF 25V %20 11*8 R:5MM LOW ESR | C615     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C509     | 252112R    | EC 100UF 16V 11*6 R:5               | C616     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C510     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C617     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C511     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C618     | 250470R    | EC 4.7UF 16V 11*5 R:5               |
| C512     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C619     | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R     |
| C513     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C620     | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R     |
| C515     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C621     | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R     |
| C516     | 295114R    | CC-CHIP 1UF K 10V /0603 X5R         | C622     | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R     |
| C517     | 295114R    | CC-CHIP 1UF K 10V /0603 X5R         | C627     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C518     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C628     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C519     | 295114R    | CC-CHIP 1UF K 10V /0603 X5R         | C629     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C521     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C630     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C522     | 251107R    | EC 10UF M 16V 11*5 R:5              | C631     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C523     | 250470R    | EC 4.7UF 16V 11*5 R:5               | C632     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C524     | 250332R    | EC 3.3UF 50V 11*5 R:5               | C634     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C525     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        | C635     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C526     | 293235R    | CC-CHIP 22NF J 16V /0603 X7R        | C638     | 252250R    | EC 220UF 25V %20 11*8 R:5MM LOW ESR |
| C531     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C639     | 252250R    | EC 220UF 25V %20 11*8 R:5MM LOW ESR |
| C532     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C649     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          |
| C533     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C650     | 252476R    | EC 470UF 25V 11*10 R:5              |
| C534     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C657     | 290223R    | CC-CHIP 22PF J 50V /0603 NPO TAPE   |
| C535     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C671     | 291104R    | CC-CHIP 100PF J 50V /0603 NPO       |
| C536     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C672     | 291104R    | CC-CHIP 100PF J 50V /0603 NPO       |
| C537     | 290159R    | CC-CHIP 15PF J 50V /0603 NPO        | C673     | 251225R    | EC 22UF 16V 11*5 R:5                |
| C538     | 290159R    | CC-CHIP 15PF J 50V /0603 NPO        | C674     | 251225R    | EC 22UF 16V 11*5 R:5                |
| C541     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       | C675     | 251225R    | EC 22UF 16V 11*5 R:5                |
| C542     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C676     | 251225R    | EC 22UF 16V 11*5 R:5                |
| C543     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        | C677     | 251225R    | EC 22UF 16V 11*5 R:5                |
| C544     | 293113R    | CC-CHIP 10NF K 50V /0603 X7R        | C678     | 251225R    | EC 22UF 16V 11*5 R:5                |
| C545     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C679     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C546     | 252112R    | EC 100UF 16V 11*6 R:5               | C680     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C547     | 290201R    | CC-CHIP 20PF J 50V/0603             | C681     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C548     | 290201R    | CC-CHIP 20PF J 50V/0603             | C682     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C553     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C683     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C554     | 295114R    | CC-CHIP 1UF K 10V /0603 X5R         | C684     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C555     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C685     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C556     | 290159R    | CC-CHIP 15PF J 50V /0603 NPO        | C686     | 293478R    | CC-CHIP 47NF K 25V /0603 X7R TAPE   |
| C558     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C689     | 251107R    | EC 10UF M 16V 11*5 R:5              |
| C561     | 295114R    | CC-CHIP 1UF K 10V /0603 X5R         | C692     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C562     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C693     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C563     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C702     | 252112R    | EC 100UF 16V 11*6 R:5               |
| C564     | 294685R    | CC-CHIP 1UF K 25V X7R 0805          | C703     | 252112R    | EC 100UF 16V 11*6 R:5               |
| C572     | 290335R    | CC-CHIP 33PF J 50V /0603 NPO TAPE   | C704     | 252112R    | EC 100UF 16V 11*6 R:5               |
| C573     | 290335R    | CC-CHIP 33PF J 50V /0603 NPO TAPE   | C706     | 252112R    | EC 100UF 16V 11*6 R:5               |
| C577     | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R     | C708     | 251478R    | EC 47UF 16V 11*5 R:5                |
| C578     | 292103R    | CC-CHIP 1NF J 50V /0603 NPO T&R     | C709     | 251478R    | EC 47UF 16V 11*5 R:5                |
| C583     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C710     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C586     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C711     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C587     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C712     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C588     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C714     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C589     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C715     | 259103R    | EC 10UF 50V 7*5 R:5                 |
| C590     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C716     | 294480R    | CC-CHIP 470NF K 10V /0603 X5R       |
| C591     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C719     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C592     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C720     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C593     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C722     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C594     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C729     | 294121R    | CC-CHIP 100NF J 50V /0603 NPO       |
| C595     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C731     | 290107R    | CC-CHIP 10PF J 50V /0603 NPO TAPE   |
| C596     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  | C732     | 290107R    | CC-CHIP 10PF J 50V /0603 NPO TAPE   |
| C597     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |          |            |                                     |
| C598     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |          |            |                                     |
| C599     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |          |            |                                     |
| C600     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |          |            |                                     |
| C601     | 292153R    | CC-CHIP 1.5NF K 50V /0603 X7R TAPE  |          |            |                                     |

| Position                   | Parts code | Description                              | Position         | Parts code | Description                           |
|----------------------------|------------|------------------------------------------|------------------|------------|---------------------------------------|
| <b>DIODES</b>              |            |                                          | L354             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| D1                         | 7S2204F    | HOLD.LED 28K15                           | L355             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D1                         | 303883R    | LED 5MM L5B47UWCLD2 WHITE 3V 5MA P.LIGH  | L356             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D300                       | 303464R    | DIODE-CHIP STPS340U                      | L357             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| D303                       | 303464R    | DIODE-CHIP STPS340U                      | L359             | 053804R    | COIL-CHIP 10UH K 0805                 |
| D305                       | 303497R    | DIODE CHIP IMBD4148 SOT 23               | L360             | 053804R    | COIL-CHIP 10UH K 0805                 |
| D314                       | 303818R    | DIODE-CHIP BAV99LT1 SOT23 T&R            | L361             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D315                       | 303818R    | DIODE-CHIP BAV99LT1 SOT23 T&R            | L362             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D316                       | 303818R    | DIODE-CHIP BAV99LT1 SOT23 T&R            | L363             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D326                       | 300107R    | DIODE-CHIP BAV70LT1 SOT23                | L364             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D327                       | 300107R    | DIODE-CHIP BAV70LT1 SOT23                | L365             | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803    |
| D331                       | 303817R    | DIODE-CHIP Z. 33V SOD-106                | L366             | 053872R    | COIL-CH 4.7UH(NL3225-22T-4R7J-SM1210) |
| <b>INTEGRATED CIRCUITS</b> |            |                                          | L367             | 053805R    | COIL-CHIP 1UH K /0805                 |
| IC300                      | 453032R    | IC-CHIP NCP1117ST3T3TG SOT-223 T&R       | L368             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ3A       |
| IC301                      | 450534R    | IC-CHIP CM2021-00TR TSSOP-38             | L369             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC302                      | 453553R    | IC-CHIP MP1593DN-LF-Z DC-DC CONV SOIC8N  | L370             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC304                      | 453553R    | IC-CHIP MP1593DN-LF-Z DC-DC CONV SOIC8N  | L371             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC306                      | 453295R    | IC-CHIP NCP1117DT18RK G TO252 (T&R)      | L373             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC307                      | 453095R    | IC-CHIP NCP1117DTARK G (DPAK) T&R TO252  | L374             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC308                      | 453095R    | IC-CHIP NCP1117DTARK G (DPAK) T&R TO252  | L375             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC309                      | 453538R    | IC-CHIP TVP5150AM1PBSRG4 PQFP VIDEO DEC  | L376             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC310                      | 453537R    | IC-CHIP MAX810STRG SOT23 RESET IC        | L377             | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A      |
| IC311                      | 453536R    | IC-CHIP MTV512GMV64 PLCC 8051 MON.CO T&R | L381             | 053580R    | COIL-CHIP 560NH K 0805 MLF2012DR56    |
| IC312                      | 451885R-1  | IC TL431CLPRA G                          | L382             | 053580R    | COIL-CHIP 560NH K 0805 MLF2012DR56    |
| IC314                      | 453031R-2  | IC-CHIP AT24C08AN-10SU-2.7 (ATMEL) TAPE& | <b>RESISTORS</b> |            |                                       |
| IC315                      | 453031R-2  | IC-CHIP AT24C08AN-10SU-2.7 (ATMEL) TAPE& | R1               | 101163R    | CFR 150R J 1/4W 26MM                  |
| IC317                      | 453412R    | IC-CHIP CS4334-KSZR SO8 T&R              | R2               | 101163R    | CFR 150R J 1/4W 26MM                  |
| IC319                      | 453535R    | IC-CHIP 74HC4052D SO16                   | R3               | 101343R    | CFR 330R J 1/4W /6 26MM               |
| IC320                      | 453535R    | IC-CHIP 74HC4052D SO16                   | R4               | 101282R    | CFR 270R J 1/4W /6 26MM               |
| IC321                      | 454311R    | IC-CHIP MAX9704 ST CLASS-D AUD AMP TQFN  | R5               | 101189R    | CFR 180R J 1/4W /6 26MM               |
| IC323                      | 453077R-1  | IC-CHIP AT24C32AN-10SU-2.7 (T&R)         | R6               | 102141R    | CFR 1K J 1/4W /6 26MM                 |
| IC324                      | S-SLM512   | SW IC LM BEKO VCT4993G-XM                | R7               | 101494R    | CFR 470R J 1/4W /6 26MM               |
| IC325                      | 453529R    | IC-CHIP MM74HC4066MX SO14 ANALOG SWITCH  | R8               | 140472R    | CFR 47R J 1/4W /3.2 26MM              |
| IC326                      | 453529R    | IC-CHIP MM74HC4066MX SO14 ANALOG SWITCH  | R9               | 102572R    | CFR 5.6K J 1/4W /6 26MM               |
| IC327                      | 056298R    | SAW FILTER X6966M                        | R104             | 171224R    | RC-CHIP 220R J 1/16W/0603 TAPE        |
| IC334                      | 453531R    | IC-CHIP MST6181LDA-LF LQFP LCD MON.CONT. | R124             | 173100R    | RC-CHIP 10K J 1/10W /0603             |
| IC335                      | 453530R    | IC-CHIP HY5DU283222BFP-33 FBGA SDRAM     | R231             | 170474R    | RC-CHIP 47R J 1/16W /0603 TAPE        |
| IC337                      | 453073R    | IC-CHIP KF25BDT(T&R)                     | R232             | 170754R    | RC-CHIP 75R J 1/16W /0603             |
| IC338                      | 453528R    | IC-CHIP TDA7053AT SO16 2*0.5W ST. AMP.   | R300             | 172473R    | RC-CHIP 4.7K J 1/10W /0603            |
| <b>COILS</b>               |            |                                          | R301             | 183100R    | RM-CHIP 10K %1 1/16W /0603            |
| L107                       | 053725R    | COIL-CHIP 10UH %20/0805                  | R302             | 172473R    | RC-CHIP 4.7K J 1/10W /0603            |
| L300                       | 053383R    | COIL 1.2MH R:5                           | R303             | 183100R    | RM-CHIP 10K %1 1/16W /0603            |
| L301                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R304             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L302                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R305             | 172343R    | RC-CHIP 3.3K %1 1/16W /0603           |
| L303                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R306             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L304                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R307             | 172933R    | RC-CHIP 15K %1 1/16W /0603 SERITLI    |
| L306                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R308             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L308                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R309             | 172567R    | RC-CHIP 5.6K J 1/16W /0603 TAPE       |
| L309                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R310             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L310                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R311             | 172228R    | RC-CHIP 2.2K J 1/10W /0603            |
| L311                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R312             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L312                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R313             | 173300R    | RC-CHIP 30K J 1/16W /0603             |
| L313                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R314             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L314                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R315             | 172751R    | RC-CHIP 7.5K J 1/16W /0603            |
| L316                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R316             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L317                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R317             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L323                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R318             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L325                       | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803       | R319             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L326                       | 053875R    | COIL 3.3UH 2.9A RADIAL                   | R320             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L327                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R321             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L330                       | 053875R    | COIL 3.3UH 2.9A RADIAL                   | R322             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L331                       | 053946R    | COIL-CHIP B82464G4223M EPCOS             | R323             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L332                       | 053946R    | COIL-CHIP B82464G4223M EPCOS             | R324             | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE        |
| L333                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R325             | 172473R    | RC-CHIP 4.7K J 1/10W /0603            |
| L334                       | 053875R    | COIL 3.3UH 2.9A RADIAL                   | R328             | 170105R    | RC-CHIP 10R J 1/16W /0603             |
| L335                       | 053516R    | COIL 22UH RADIAL                         | R329             | 170391R    | RC-CHIP 39R J 1/10W /0603             |
| L339                       | 053516R    | COIL 22UH RADIAL                         | R330             | 172125R    | RC-CHIP 1.2K J 1/16W/0603 TAPE        |
| L340                       | 053516R    | COIL 22UH RADIAL                         | R331             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L341                       | 053516R    | COIL 22UH RADIAL                         | R332             | 173100R    | RC-CHIP 10K J 1/10W /0603             |
| L344                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R334             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L345                       | 055626R    | FERRITE BEAD-CHIP 120R/100MHZ 3A/1206    | R335             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L346                       | 055547R    | FERRIT-CHIP MI0603J680R-00 68R 1A /0603  | R337             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |
| L347                       | 055547R    | FERRIT-CHIP MI0603J680R-00 68R 1A /0603  | R338             | 173100R    | RC-CHIP 10K J 1/10W /0603             |
| L348                       | 055547R    | FERRIT-CHIP MI0603J680R-00 68R 1A /0603  | R339             | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE         |

| Position | Parts code | Description                     | Position | Parts code | Description                     |
|----------|------------|---------------------------------|----------|------------|---------------------------------|
| R340     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R436     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   |
| R342     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R437     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   |
| R343     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R442     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R344     | 172228R    | RC-CHIP 2.2K J 1/10W /0603      | R443     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R345     | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE  | R445     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R348     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R446     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R349     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R447     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R357     | 173100R    | RC-CHIP 10K J 1/10W /0603       | R448     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R358     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R449     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R359     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R450     | 172104R    | RC-CHIP 1K J 1/16W /0603        |
| R360     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R451     | 172104R    | RC-CHIP 1K J 1/16W /0603        |
| R361     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R452     | 170754R    | RC-CHIP 75R J 1/16W /0603       |
| R362     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R454     | 172104R    | RC-CHIP 1K J 1/16W /0603        |
| R363     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R455     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R364     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R456     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R365     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R457     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R366     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R458     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R367     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R459     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R368     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R460     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R370     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R461     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      |
| R371     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R464     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   |
| R372     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R466     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   |
| R375     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R467     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R376     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      | R468     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R377     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      | R469     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R378     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      | R470     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R379     | 172473R    | RC-CHIP 4.7K J 1/10W /0603      | R471     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R381     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R472     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R382     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R473     | 170225R    | RC-CHIP 22R J 1/10W /0603       |
| R383     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R474     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R384     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R475     | 171336R    | RC-CHIP 330R J 1/16W /0603 TAPE |
| R387     | 171472R    | RC-CHIP 470R J 1/16W /0603 TAPE | R476     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R390     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R477     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R391     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R478     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R392     | 171107R    | RC-CHIP 100R J 1/16W /0603      | R479     | 171336R    | RC-CHIP 330R J 1/16W /0603 TAPE |
| R394     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R480     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R395     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R481     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R396     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R482     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R397     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R483     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R398     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R484     | 173478R    | RC-CHIP 47K J 1/16W /0603 TAPE  |
| R399     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R485     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R400     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R486     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R401     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R487     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R402     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R488     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R403     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R489     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R404     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R490     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R405     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R491     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R406     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R493     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R407     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R494     | 173563R    | RC-CHIP 56K J 1/16W /0603       |
| R408     | 172104R    | RC-CHIP 1K J 1/16W /0603        | R495     | 173563R    | RC-CHIP 56K J 1/16W /0603       |
| R409     | 173100R    | RC-CHIP 10K J 1/10W /0603       | R501     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R410     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R502     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R411     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R504     | 171472R    | RC-CHIP 470R J 1/16W /0603 TAPE |
| R412     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R505     | 175105R    | RC-CHIP 1M J 1/16W/0603 T&R     |
| R413     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R507     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   |
| R414     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R510     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R415     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R511     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R416     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R512     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R417     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R513     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R418     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R517     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R419     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R518     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R420     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R519     | 172112R    | RC-CHIP 1K 1% 1/10W /0603       |
| R421     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R520     | 183100R    | RM-CHIP 10K %1 1/16W /0603      |
| R422     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R521     | 183100R    | RM-CHIP 10K %1 1/16W /0603      |
| R423     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R522     | 172278R    | RC-CHIP 2.7K %1 1/16W /0603     |
| R424     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R523     | 172336R    | RC-CHIP 3.3K J 1/16W /0603      |
| R425     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R524     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   |
| R427     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R528     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R428     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R529     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R429     | 170754R    | RC-CHIP 75R J 1/16W /0603       | R530     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R430     | 170391R    | RC-CHIP 39R J 1/10W /0603       | R531     | 171107R    | RC-CHIP 100R J 1/16W /0603      |
| R431     | 170391R    | RC-CHIP 39R J 1/10W /0603       | R532     | 173100R    | RC-CHIP 10K J 1/10W /0603       |
| R434     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R533     | 172336R    | RC-CHIP 3.3K J 1/16W /0603      |
| R435     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE   | R534     | 173100R    | RC-CHIP 10K J 1/10W /0603       |

| Position | Parts code | Description                        | Position | Parts code | Description                        |
|----------|------------|------------------------------------|----------|------------|------------------------------------|
| R535     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R656     | 171127R    | RC-CHIP 120R J 1/16W /0603 TAPE    |
| R536     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R658     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R537     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R659     | 172104R    | RC-CHIP 1K J 1/16W /0603           |
| R538     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R661     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R539     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R669     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R540     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE      | R675     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R541     | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803 | R676     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R542     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         | R677     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R543     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         | R678     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R544     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         | R681     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R548     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE      | R685     | 174273R    | RC-CHIP 270K J 1/16W /0603 TAPE    |
| R557     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R686     | 174273R    | RC-CHIP 270K J 1/16W /0603 TAPE    |
| R558     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R689     | 172104R    | RC-CHIP 1K J 1/16W /0603           |
| R561     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R690     | 172104R    | RC-CHIP 1K J 1/16W /0603           |
| R562     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R695     | 173100R    | RC-CHIP 10K J 1/10W /0603          |
| R567     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R696     | 173100R    | RC-CHIP 10K J 1/10W /0603          |
| R568     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R699     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         |
| R569     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R700     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         |
| R570     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R701     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R571     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R712     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R572     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R713     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R573     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R714     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R574     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R717     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R575     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R718     | 173153R    | RC-CHIP 15K J 1/16W /0603 TAPE     |
| R576     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         | R719     | 172824R    | RC-CHIP 8.2K J 1/16W /0603 TAPE    |
| R577     | 172104R    | RC-CHIP 1K J 1/16W /0603           | R724     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         |
| R578     | 179827R    | RC-CHIP 6.2K J 1/16W /0603         | R725     | 172473R    | RC-CHIP 4.7K J 1/10W /0603         |
| R579     | 179827R    | RC-CHIP 6.2K J 1/16W /0603         | R726     | 171107R    | RC-CHIP 100R J 1/16W /0603         |
| R580     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R728     | 172104R    | RC-CHIP 1K J 1/16W /0603           |
| R581     | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE     | R736     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE      |
| R582     | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE     | R737     | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803 |
| R583     | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE     | R738     | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803 |
| R584     | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE     | R739     | 055529R    | FERRIT-CHIP 600R/100MHZ 500MA/0803 |
| R585     | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE     | R746     | 172104R    | RC-CHIP 1K J 1/16W /0603           |
| R586     | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE     | R747     | 173100R    | RC-CHIP 10K J 1/10W /0603          |
| R587     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R756     | 171154R    | RC-CHIP 150R J 1/16W /0603         |
| R588     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R757     | 171154R    | RC-CHIP 150R J 1/16W /0603         |
| R589     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R758     | 171154R    | RC-CHIP 150R J 1/16W /0603         |
| R590     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R759     | 171154R    | RC-CHIP 150R J 1/16W /0603         |
| R591     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R760     | 173183R    | RC-CHIP 18K J 1/16W /0603 TAPE     |
| R592     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R761     | 173183R    | RC-CHIP 18K J 1/16W /0603 TAPE     |
| R593     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R762     | 172276R    | RC-CHIP 2.7K J 1/16W /0603         |
| R594     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R763     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R595     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R764     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R596     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R765     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R597     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R766     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R598     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R767     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R599     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R768     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R600     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R769     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R601     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R770     | 170105R    | RC-CHIP 10R J 1/16W /0603          |
| R602     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R771     | 172336R    | RC-CHIP 3.3K J 1/16W /0603         |
| R610     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R772     | 172336R    | RC-CHIP 3.3K J 1/16W /0603         |
| R611     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R773     | 171336R    | RC-CHIP 330R J 1/16W /0603 TAPE    |
| R612     | 171107R    | RC-CHIP 100R J 1/16W /0603         | R774     | 171336R    | RC-CHIP 330R J 1/16W /0603 TAPE    |
| R625     | 179827R    | RC-CHIP 6.2K J 1/16W /0603         | R775     | 171336R    | RC-CHIP 330R J 1/16W /0603 TAPE    |
| R626     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R776     | 171336R    | RC-CHIP 330R J 1/16W /0603 TAPE    |
| R627     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R777     | 173563R    | RC-CHIP 56K J 1/16W /0603          |
| R628     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R778     | 173563R    | RC-CHIP 56K J 1/16W /0603          |
| R629     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R779     | 173563R    | RC-CHIP 56K J 1/16W /0603          |
| R630     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R780     | 173563R    | RC-CHIP 56K J 1/16W /0603          |
| R631     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R781     | 172104R    | RC-CHIP 1K J 1/16W /0603           |
| R632     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R782     | 171395R    | RC-CHIP 390R J 1/16W /0603 TAPE    |
| R633     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R783     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R634     | 173100R    | RC-CHIP 10K J 1/10W /0603          | R784     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R637     | 172104R    | RC-CHIP 1K J 1/16W /0603           | R785     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R639     | 172104R    | RC-CHIP 1K J 1/16W /0603           | R786     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R641     | 171154R    | RC-CHIP 150R J 1/16W /0603         | R787     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R642     | 172824R    | RC-CHIP 8.2K J 1/16W /0603 TAPE    | R788     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R643     | 173114R    | RC-CHIP 100K J 1/16W /0603         | R789     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R644     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE      | R790     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R645     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE      | R791     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R646     | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE      | R792     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R654     | 171224R    | RC-CHIP 220R J 1/16W /0603 TAPE    | R793     | 170225R    | RC-CHIP 22R J 1/10W /0603          |
| R655     | 171363R    | RC-CHIP 365R %1 1/16W /0603 TAPE   | R794     | 170225R    | RC-CHIP 22R J 1/10W /0603          |

| Position          | Parts code | Description                              | Position             | Parts code | Description                           |
|-------------------|------------|------------------------------------------|----------------------|------------|---------------------------------------|
| R795              | 170225R    | RC-CHIP 22R J 1/10W /0603                | <b>TRANSISTORS</b>   |            |                                       |
| R796              | 170225R    | RC-CHIP 22R J 1/10W /0603                | T102                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R797              | 170225R    | RC-CHIP 22R J 1/10W /0603                | T106                 | 401142R    | TRN-CHIP BC858BLT1G SOT23             |
| R798              | 170225R    | RC-CHIP 22R J 1/10W /0603                | T300                 | 401372R    | TRN FDS9933A                          |
| R799              | 170225R    | RC-CHIP 22R J 1/10W /0603                | T301                 | 401460R    | TRN-CHIP BC847BWT1 G SOT323           |
| R800              | 170333R    | RC-CHIP 33R J 1/16W /0603 TAPE           | T302                 | 401460R    | TRN-CHIP BC847BWT1 G SOT323           |
| R802              | 172128R    | RC-CHIP 1.2K %1 1/16W/0603 TAPE          | T303                 | 401472R    | TRN-CHIP 2N7002 N-CHANNEL SOT23       |
| R803              | 172112R    | RC-CHIP 1K 1% 1/10W /0603                | T304                 | 401192R    | TRN-CHIP BC846BLT1 G SOT23 S-8        |
| R805              | 170754R    | RC-CHIP 75R J 1/16W /0603                | T305                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R824              | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE            | T306                 | 401472R    | TRN-CHIP 2N7002 N-CHANNEL SOT23       |
| R826              | 171107R    | RC-CHIP 100R J 1/16W /0603               | T307                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R827              | 171107R    | RC-CHIP 100R J 1/16W /0603               | T308                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R828              | 171107R    | RC-CHIP 100R J 1/16W /0603               | T309                 | 401460R    | TRN-CHIP BC847BWT1 G SOT323           |
| R829              | 171107R    | RC-CHIP 100R J 1/16W /0603               | T310                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R832              | 179005R    | RC-CHIP 0R /0603 1.6*0.8 TAPE            | T311                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R940              | 141332R    | CFR 330R J 1/4W /3.2 26MM                | T312                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| R941              | 141332R    | CFR 330R J 1/4W /3.2 26MM                | T313                 | 401460R    | TRN-CHIP BC847BWT1 G SOT323           |
| RA301             | 190471R    | R-ARRAY-CHIP 47R*4/YC16                  | T314                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| RA302             | 190471R    | R-ARRAY-CHIP 47R*4/YC16                  | T315                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| RA314             | 170339R    | RC-CHIP-ARRAY 4*33R /YC16                | T316                 | 401460R    | TRN-CHIP BC847BWT1 G SOT323           |
| RA315             | 170339R    | RC-CHIP-ARRAY 4*33R /YC16                | T317                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| RA316             | 193105R    | R-ARRAY-CHIP 0R*4                        | T318                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| RA317             | 193105R    | R-ARRAY-CHIP 0R*4                        | T319                 | 401472R    | TRN-CHIP 2N7002 N-CHANNEL SOT23       |
| RA322             | 055631R    | FERRIT ARRAY 68R BK32164L680-T/1206 T&R  | T320                 | 401142R    | TRN-CHIP BC858BLT1G SOT23             |
| RA323             | 055631R    | FERRIT ARRAY 68R BK32164L680-T/1206 T&R  | T321                 | 401142R    | TRN-CHIP BC858BLT1G SOT23             |
| RA324             | 055631R    | FERRIT ARRAY 68R BK32164L680-T/1206 T&R  | T322                 | 401141R    | TRN-CHIP BC848BLT1G SOT23             |
| RA325             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | T323                 | 401472R    | TRN-CHIP 2N7002 N-CHANNEL SOT23       |
| RA327             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | T329                 | 401192R    | TRN-CHIP BC846BLT1 G SOT23 S-8        |
| RA328             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | <b>MISCELLANEOUS</b> |            |                                       |
| RA329             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | MENU                 | 010844R    | TACT SWITCH 2 LEG (MTSB)              |
| RA330             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | P-                   | 010844R    | TACT SWITCH 2 LEG (MTSB)              |
| RA331             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | P+                   | 010844R    | TACT SWITCH 2 LEG (MTSB)              |
| RA332             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | V-                   | 010844R    | TACT SWITCH 2 LEG (MTSB)              |
| RA333             | 170228R    | RC-CHIP-ARRAY 4*22R /YC16                | V+                   | 010844R    | TACT SWITCH 2 LEG (MTSB)              |
| RA340             | 170339R    | RC-CHIP-ARRAY 4*33R /YC16                | SOURCE               | 010844R    | TACT SWITCH 2 LEG (MTSB)              |
| RA341             | 170339R    | RC-CHIP-ARRAY 4*33R /YC16                | IR1                  | 452521R-1  | IR RECEIVER TSOP34838 SS1A            |
| <b>CONNECTORS</b> |            |                                          | SW1                  | 010773R    | POWER SWITCH ALPS SDKLA10300 5A       |
| CN1               | 031294R    | CONN.HOUS.JST 2317-4R WHITE              | TU301                | Z1J138R    | TUNER PANASONIC ENV57K23G3F           |
| CN2               | 031245R    | CONN.HOUS.2P 2317-2S JST B 2B-XH-A WHITE | X301                 | 056863R    | CRYSTALL Q 14.318180-SMU4-22-30/50 T1 |
| CN3               | 031396R    | CON.CINCH SST 396G1-R 3LU YATIK/2PIN     | X302                 | 056269R    | CRYSTAL-CHIP 20.250MHZ SMU-13-30/50   |
| CN3               | 032997R    | CONN.HOUS.2 PIN 2317-2R JST 2B-XH-A      | Y301                 | 056863R    | CRYSTALL Q 14.318180-SMU4-22-30/50 T1 |
| CN4               | 031245R    | CONN.HOUS.2P 2317-2S JST B 2B-XH-A WHITE |                      | Z1U117     | SPK.CABLE ASSY 8R 10W(NOM)/15W        |
| JA300             | 031164R    | KONN. CINCH ..... RED HOR.14.1           |                      | ZF7107R    | SPEAKER 8R 10W(NOM)/15W 58x165MM      |
| JA301             | 031163R    | KONN. CINCH ..... WHITE HOR.14.1         |                      | 038921R    | MAIN CABLE PC/MONITOR 2MT EURO        |
| JA302             | 032979R    | CONN.CINCH FRONT GREEN                   |                      | Z1J820     | CIRCUIT DIAGRAM LM                    |
| JA303             | 031164R    | KONN. CINCH ..... RED HOR.14.1           |                      |            |                                       |
| JA304             | 032978R    | CONN.CINCH FRONT BLUE                    |                      |            |                                       |
| JA305             | 031163R    | KONN. CINCH ..... WHITE HOR.14.1         |                      |            |                                       |
| JA306             | 031164R    | KONN. CINCH ..... RED HOR.14.1           |                      |            |                                       |
| JA307             | 031165R    | KONN. CINCH ..... YELLOW HOR.14.1        |                      |            |                                       |
| JA308             | 031163R    | KONN. CINCH ..... WHITE HOR.14.1         |                      |            |                                       |
| JA309             | 031164R    | KONN. CINCH ..... RED HOR.14.1           |                      |            |                                       |
| P100              | 032937R    | CONN. CINCH .....BLACK HOR. L6B          |                      |            |                                       |
| S304              | 031476R    | CONN.HOUSING.12P 2MM 89400-1210 MOLEX    |                      |            |                                       |
| S305              | 031658R    | CONN.HOUSING.10P 2MMM 89400-1010 MOLEX   |                      |            |                                       |
| S307              | 032951R    | CONN.HOUSING.7.LI MOLEX 89400-0710       |                      |            |                                       |
| S308              | 031194R    | CONN.HOUS.4P 2317-4S JST B 4B-XH-A WHITE |                      |            |                                       |
| S309              | 031224R    | CONN.HOUS.3P 2317-3S JST B 3B-XH-A WHITE |                      |            |                                       |
| S311              | 031423R    | HEADPHONE JACK YKB21-5103                |                      |            |                                       |
| S312              | 031358R    | CONN. VGA B10B                           |                      |            |                                       |
| S313              | 031251R    | SCART SOCKET 14.1                        |                      |            |                                       |
| S314              | 031251R    | SCART SOCKET 14.1                        |                      |            |                                       |
| S315              | 031281R    | CON.MALE 7.LI 2317-7S JST B 7B-XH-A WHIT |                      |            |                                       |
| S316              | 031646R    | CONN.HOUS.3P 2317-3S JST B 3B-XH-A RED   |                      |            |                                       |
| S317              | 032988R    | CON.500254-1927 MOLEX HDMI               |                      |            |                                       |
| S318              | 031795R    | CONN.S-VHS                               |                      |            |                                       |
| S320              | 032449R    | KONN.MALE 2*15 30.LU SST                 |                      |            |                                       |
| S322              | 032450R    | TERMINAL MALE 6.3MM FIXED                |                      |            |                                       |
| X940              | 031224R    | CONN.HOUS.3P 2317-3S JST B 3B-XH-A WHITE |                      |            |                                       |
| X941              | 032150R    | HP JACK 17 LCD TV (OLD-8R9185)           |                      |            |                                       |
| X941              | 011424R    | LOAF HEAD JACK                           |                      |            |                                       |