The latest development in Philips Semiconductors' one-chip TV family, the TDA93xx Ultimate One-Chip range offers dramatic savings in the production of low-end TV sets. Part of the Global TV concept, it combines TV signal processing, teletext/CC functions and a microcontroller on a single chip. It delivers real savings in design time, component count and manufacturing cost, giving customers a clear edge in the mature analog TV market.

TDA935x/6x/8x 'Ultimate one-chip'

Family of TV signal processor and teletext decoders with embedded 80C51 microcontroller

Features

- Single-chip TV processor, teletext decoder and microcontroller
- Significant cost savings for low-end 90º and 110º sets
- Single 12 MHz reference crystal
- Full multistandard (PAL/NTSC/SECAM) signal processing
- Versions with mono intercarrier sound FM demodulator or QSS IF amplifier
- H/V geometry processing and zoom function for 16:9 applications
- Enhanced 80C51 microcontroller core
- 16 to 128 K, late programmed 8-bit OTP ROM; 3 to 12 K auxiliary 8-bit RAM
- 1- and 10-page text versions
- Supports US Closed Captioning, 525/625 line WST, VPS (PDC system A) and WSS
- Enhanced OSD capabilities and display features
- OSD microcontroller-only versions
- I^2C-bus control

Applications

- Low-to-mid end analog TVs with varying feature sets
- Integrated lower-cost DTV receivers

The acknowledged leader in developing systems on silicon for TVs, Philips Semiconductors has again taken things one step further with its 'Ultimate One-Chip' TV processor. Essentially a complete 'TV on a chip' and a clear demonstration of leading-edge competence in systems integration, it is the latest extension to the 'One-Chip TV' family originally introduced in 1991 - of which over 200 million have been manufactured to date.

With all core functions for low-to-mid range TVs on a single IC, the TDA93xx family delivers exactly the sustained cost reductions needed by set makers to ensure continued success in a mature analog TV market. And as the TV market migrates to Digital TV, it forms an ideal TV processing core for second generation IDTV receivers, helping lower the cost of DTV sets.

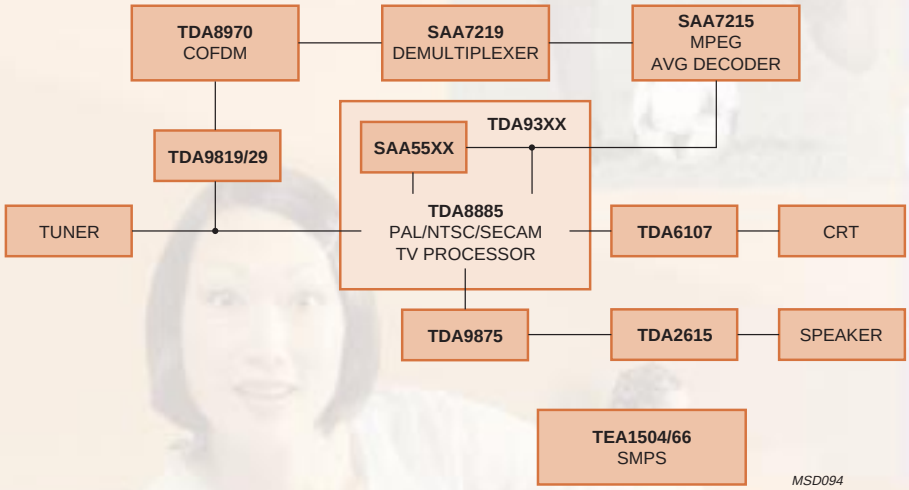
Developed as part of Philips' unique hardware and software Global TV Concept, variants cover all combinations of worldwide standards and economy TV set feature sets. All devices are pin-compatible and provide total integration for a low-end chassis, which not only lowers total component count and thus bill-of materials significantly, but allows the manufacture of TVs to be standardized. All types of economy sets can be built using fewer, simpler chassis designs, in a single manufacturing location; and software development is simpler, resulting in faster manufacturing throughput, faster time-to-market and a simplified logistics chain. They are all alignment free, to simplify set manufacture further, and are low power to answer consumer's demands for increased energy efficiency.

The TDA93xx family is designed as part of a complete system so you can deal with a single source, and demoboards with software are available - along with our systems design expertise. In a market starting the switch from analog to digital, this new family of TV ICs demonstrates Philips Semiconductors' continuing commitment to delivering exactly the solutions needed by analog set makers.

TODAY'S MOST HIGHLY INTEGRATED SINGLE-CHIP TV PROCESSOR

Particularly in the low-end analog market, cost is a driving issue for TV set makers. By including all the functionality needed for a range of low-end TVs with a variety of feature sets in a single device, the TDA93xx address directly the most important success factor for TV OEMs today.

DVB-T Reference design



Key features

Key features

TV-signal processing

- PAL/NTSC or full multistandard decoder with automatic search system
- Multistandard vision IF circuit with alignment-free PLL demodulator
- Alignment-free multi-standard FM sound demodulator (4.5 MHz to 6.5 MHz)
- Audio switch
- Source selection between 'internal' CVBS and external CVBS or Y/C signals
- Automatic Volume Levelling (AVL) circuit
- Internal baseband delay line
- Asymmetrical peaking in the luminance channel
- Integrated luminance delay line (adjustable)
- Integrated chrominance trap circuit
- Black stretching of non-standard CVBS or luminance signals
- Blue stretch circuit which offsets colours near white towards blue
- RGB control circuit with 'Continuous Cathode Calibration' and white point adjustment
- I^2C-bus control of various functions

Teletext and display

- 1- and 10-page versions available
- Closed captioning and non-text versions available
- Acquisition of 525/625 line WST, VPS and WSS
- Automatic Fastext and packet 26
- Programmable teletext language coverage
- Enhanced display features including meshing, shadowing, underlining, italics and smooth scrolling
- OSD character masked into program ROM (thus total number only limited by overall ROM size)
- 8 foreground and background colours definable from a palette of 64
- OSD possible over teletext
- Part-screen text/OSD

Microcontroller

- Enhanced 80C51 microcontroller core
- 16 K - 128 K late programmed ROM shared between program and OSD characters
- 2 K - 10 Kbytes internal RAM shared between program RAM and teletext/closed caption/OSD page storage
- 14-bit PWM for Voltage Synthesis Tuning
- Four 8-bit A/D converters
- Two high current outputs for directly driving LEDs etc.
- Two interrupts and two internal timers
- Port pins programmable pull up/push pull

Cost savings in set design and manufacture

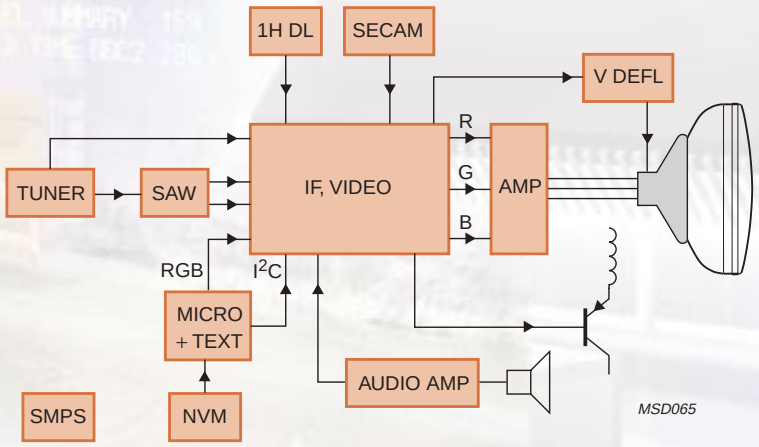
Cost savings in set design and manufacture

The TDA93xx family delivers substantial cost savings on each TV chassis. Its high level of integration automatically reduces the number of components needed. It allows a reduction in PCB area, allowing even stereo chassis to be built on one PCB, including the tube base. And it reduces manufacturing throughput time and the need for hand insertion of components.

Technical improvements have also eliminated the need for some components. The IF VCO coil is eliminated completely, as is the need for sound bandpass filters for each TV standard supported and their selection transistors. Only one crystal is needed compared to three for existing European applications, for example.

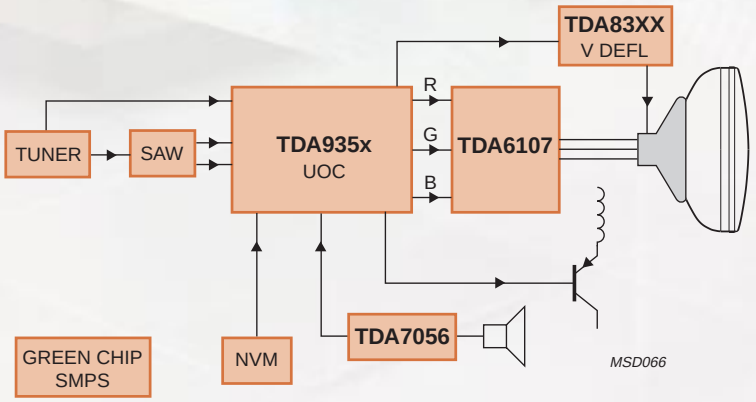
Combining the microcontroller with video processing saves many components, including OSD drive transistors, pull-up resistors, buffering transistors on the microcontroller ports and flash protection resistors and capacitors.

EXISTING MONO TV SYSTEM



Typical existing mono TV configuration …

UOC MONO TV SYSTEM



… and a more compact design based on the TDA935x.

Philips' unique Global TV hardware and software concept simplifies the whole business of making sets for global markets. It allows the manufacture of TVs to be standardized, with regional variations accommodated through the use of simple pin-compatible slot-in replacements for TV-controllers, video processors, sound decoders and tuner ICs. To complete this concept, we offer a library of tested software modules with standardized architecture and interfaces - by simply selecting the appropriate silicon and software component, manufacturers can quickly create a board for any broadcast standard or feature set based on a single master PCB.

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