

Video Front End

Overview

Video front-end ICs are the interface between the antenna or cable and cable set-top boxes, cable modems, TVs, VCRs, and DVD players. They perform the demodulation or remodulation of TV or data signals.

The two major product families are:

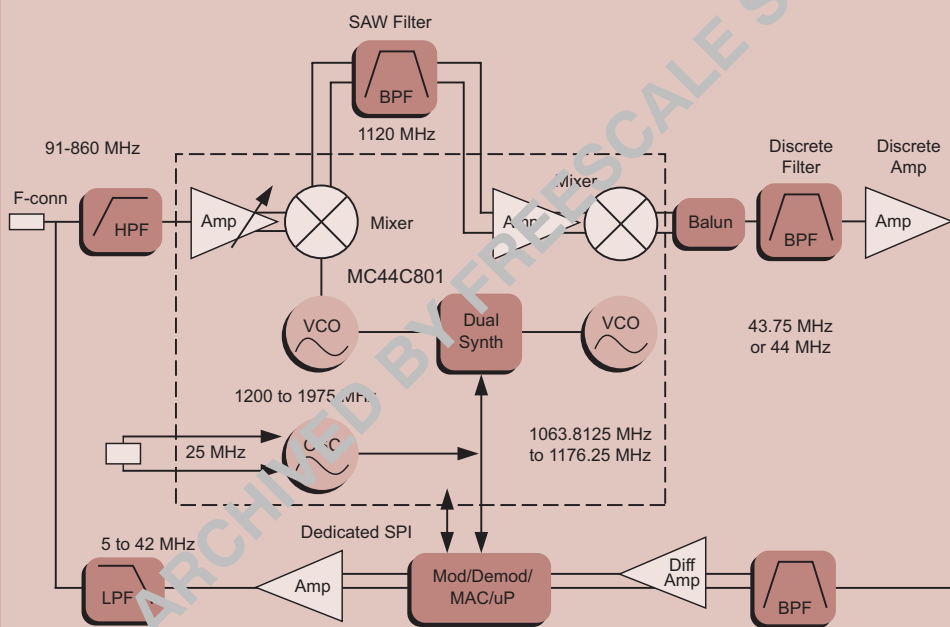
- > For down conversion from RF to IF, the silicon tuners MC44C800 and MC44C801
- > For remodulation from baseband to RF, the Modulator ICs MC44BC37x

This application describes the three product families. Common to these three families is their high degree of integration. They require no tuned, aligned, or special external components; and most critical signal paths have been integrated. Therefore, they are extremely easy to implement in a tuner, and on a main board with significant savings in design and manufacturing costs.

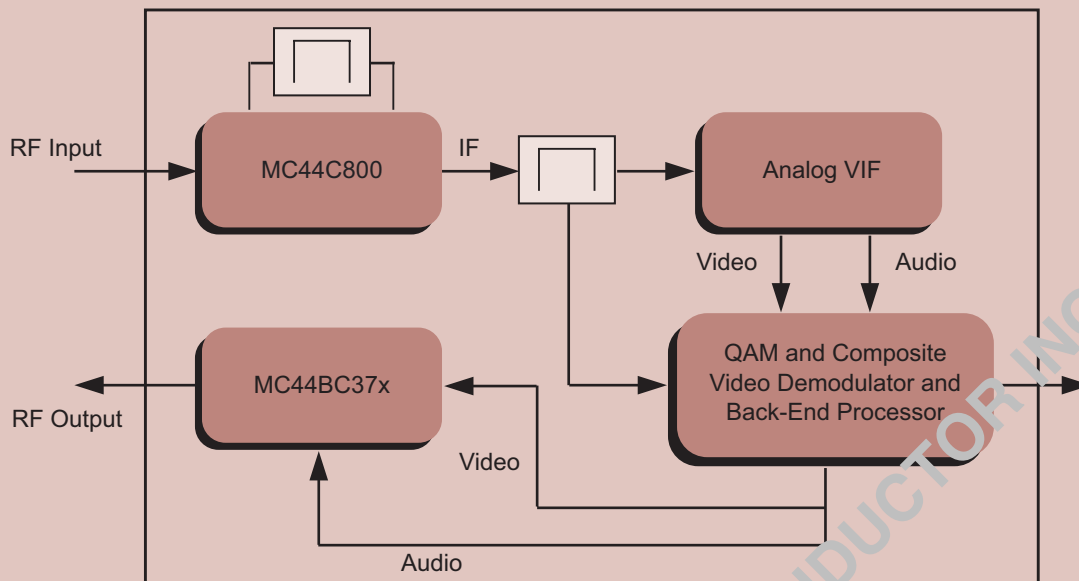
Key Benefits

- > Fully automated production: no tuned or aligned external components
- > Very high integration level
- > Broad product range covering all regions of the world with high compatibility
- > Easy module design or integration on a main board

TYPICAL CABLE MODEM BLOCK DIAGRAM



CABLE SET-TOP BOX APPLICATION



Freescale Ordering Information

Part Number	Product Highlights	Additional Information
Silicon Tuners		
MC44C800 MC44C801	Designed in low-cost CMOS technology, the silicon tuners replace the RF portion of a tuner. The dual conversion architecture allows the suppression of all tracking filters. Filtering and image rejection are performed by an external inexpensive surface acoustic wave (SAW) filter at 1120 MHz.	www.freescale.com ^{Note}
RF Modulator ICs		
MC44BC37x	Our modulator ICs integrate all channel and sound VCOs with their varicaps and coils. The 24-pin versions feature an antenna booster and splitter and a combiner as well. Several versions are in development for global application.	www.freescale.com ^{Note}

Note: Search on the listed part number.

Design Challenges

Historically, two major issues kept the design and manufacturing cost of modules high or prevented video front-end ICs from being integrated onto main boards. They were:

- > The need for manual operations (such as tracking filter alignment or the tuning of the VCO tank circuits) during system manufacturing requires a skilled and trained workforce.
- > The highly specialized design resource needed for printed circuit board (PCB) layout due to the external RF signal paths (VCOs with their external varicaps and coils, discrete antenna booster-splitters, etc.).

Freescale Semiconductor Solution

Thanks to cutting edge technologies initially developed for mobile phones, Freescale Semiconductor is now able to integrate most critical components inside the video front-end ICs. This dramatically reduces design cycle times and manufacturing costs, as well as board space. Our evaluation board designs can be used for production, and we can provide PCB schematics (Gerber files) free of charge.

Development Tools

Tool Type	Product Name	Vendor	Description
Application Board, 10 Samples, Control Software, User Manual	MC44C800EVK	Freescale Semiconductor	Silicon Tuner without LNA
Application Board, 10 Samples, Control Software, User Manual	MC44C801EVK	Freescale Semiconductor	Silicon Tuner with LNA (Includes a Diplexer)
Application Board, 10 Samples, User Manual, Set of Measures	MC44BC375EVK	Freescale Semiconductor	VHF Modulators
Application Board, 10 Samples, Control Software, I ² C bus Interface, User Manual, Set of Measures	MC44BC373EVK	Freescale Semiconductor	UHF-VHF Bus-Controlled Modulators

Related Information

MC44C800 and MC44C801 Silicon Tuners

There are two versions of the silicon tuner:

- > The MC44C800 without low noise amplifier (LNA) for analog applications (analog or mixed-mode cable set-top boxes)
- > MC44C801 with an integrated LNA for digital applications (cable modems and digital cable set-top boxes)
- > A version for terrestrial television is in development

MC44BC37x: RF Modulator ICs

Several versions are available or in development to cover all regions of the world:

- > MC44BC375U: the Americas and parts of SEA (systems B/G and M/N, channels 3 and 4)
- > MC44BC375J: Japan (systems B/G and M/N, channels 1 and 2)
- > MC44BC375T: Taiwan (systems B/G and M/N, channel 13)
- > MC44BC374: Europe and Asia Pacific (systems B/G, I, D/K, H and M/N, all VHF and UHF channels), with integrated antenna booster and splitter and combiner

- > MC44BC373: same as above with system L as well (for France)
- > MC44BC3735: same as above with two TV outputs (for BSkyB-type set-top boxes)
- > MC44BC374C: same as MC44BC374 without the antenna booster and splitter
- > MC44BC373C: same as above with system L as well (for France)
- > MC44BC380: stand-alone antenna booster and splitter

ARCHIVED BY FREESCALE SEMICONDUCTOR

Notes

ARCHIVED BY FREESCALE SEMICONDUCTOR INC.

Learn More: Contact the Technical Information Center at +1-800-521-6247 or +1-480-768-2130.
For more information about Freescale products, please visit www.freescale.com.