

Short Information

DRX 3960A**Digital Receiver Front-end** (44-Pin PMQFP Package)

The Digital Receiver Front-end DRX 3960A performs the entire multistandard Quasi Split Sound (QSS) TV IF processing, AGC, video demodulation, and generation of the second sound IF (SIF) with only one SAW filter. The IC is designed for applications in TV sets, VCRs, PC cards, and TV tuners.

The alignment-free DRX 3960A needs no special external components. All control functions and status registers are accessible via I²C bus interface. Therefore, it simplifies the design of high-quality, highly standardized IF stages.

Due to its mixed signal structure and the digital demodulation, the IC offers unique features and is prepared for digital TV.

Features

- Multistandard QSS IF processing with a single SAW
- Highly reduced amount of external components (no tank circuit, no potentiometers, no SAW switching)
- Programmable IF frequency (38.9 MHz, 45.75 MHz, 32.9 MHz, 36.125 MHz etc.)
- Digital IF processing for the following standards: B/G, D/K, I, L/L', and M/N
- Standard specific digital post filtering
- Standard specific digital video/audio splitting
- Standard specific digital picture carrier recovery:
 - alignment-free
 - quartz-stable and accurate
 - stable frequency lock at 100 % modulation and overmodulation up to 115 %
 - quartz-accurate AFC information
- Programmable standard specific digital group delay equalizing
- Automatically frequency-adjusted Nyquist slope, therefore optimal picture and sound performance over complete lock in frequency range
- Standard-specific digital AGC and delayed tuner AGC with programmable tuner Take Over Point
- Fast AGC due to linear structure
- Adaptive back porch control, therefore fast positive modulation AGC
- No sound traps needed at video output
- Second SIF output with standard dependent pre-filtering and amplitude controlled output level
- Optimal sound SNR due to carrier recovery without quadrature distortions
- FM radio capability without external components and with standard TV tuner
- Prepared for digital TV (DVB-C, DVB-T, ATSC)
- I²C bus interface

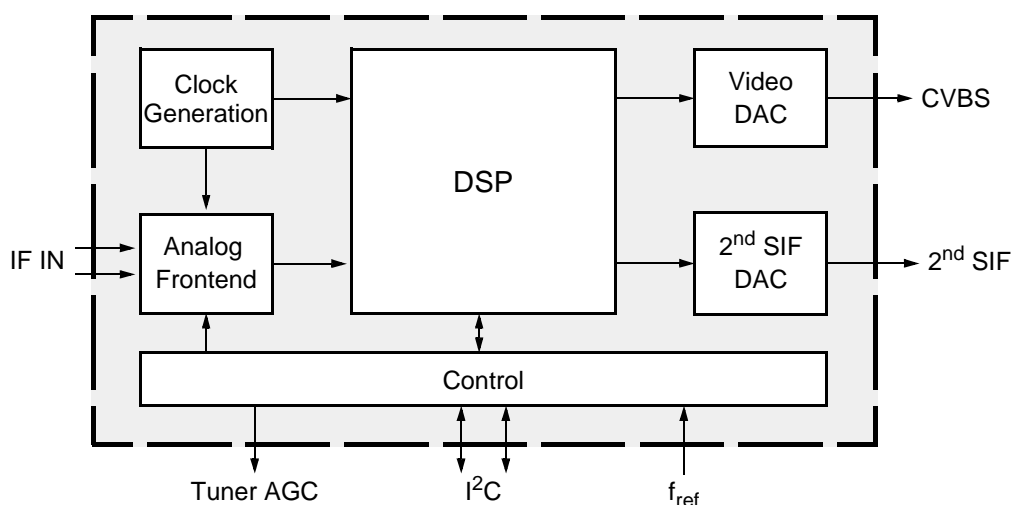


Fig. 1: Block diagram of the DRX 3960A

Analog TV Application

The Digital Receiver Front-end DRX 3960A is able to replace a conventional IF IC including several SAWs. Nevertheless, quasi split sound processing is performed with standard specific internal filtering and group delay equalizing.

The input signal of the DRX 3960A is the TV IF with its carrier at:

- 38.9 MHz (B/G, D/K, I, L, and M/N in multistandard applications)
- 32.9 MHz (L')
- 45.75 MHz (M/N in single standard applications)
- other frequencies are also programmable
- 36.125 MHz (DVB-C or DVB-T in further versions)

These signals are available from conventional tuners. For pre-filtering, one 8-MHz channel SAW filter must be used, e.g. the Epcos X6966M. Nevertheless, the entire multistandard processing is performed. The pre-filter limits the signal bandwidth to 8 MHz and suppresses major parts of the adjacent channels.

After the desired standard information is transferred into the DRX 3960A, the following standard specific procedures are performed:

- Adjacent channel suppression
- Carrier locking including AFC information generation

- Nyquist slope adjustment
- Video/sound splitting
- Video AGC, including delayed tuner AGC
- Group delay post distortion
- Video and sound frequency shaping
- Video demodulation
- Second SIF generation and AGC

Similar to conventional analog front-ends, the tuner gain is controlled by the DRX 3960A. New AGC algorithms have been implemented for superior level tracking for both positive and negative video modulation.

The demodulated CVBS signal and the second sound IF (SIF) are available as analog output signals.

If an FM radio channel is transferred to the IF inputs, down-mixed by means of a standard TV tuner, it can be preselected and further down-mixed by the DRX 3960A. Thus, a succeeding sound demodulator, e.g. the MSP, will be able to demodulate that channel.

The DRX 3960A operates with its own quartz or with appropriate external clocks, e.g.:

- 13.5, 20.25, 27 MHz from an employed video IC
- 1, 4 MHz from the tuner.

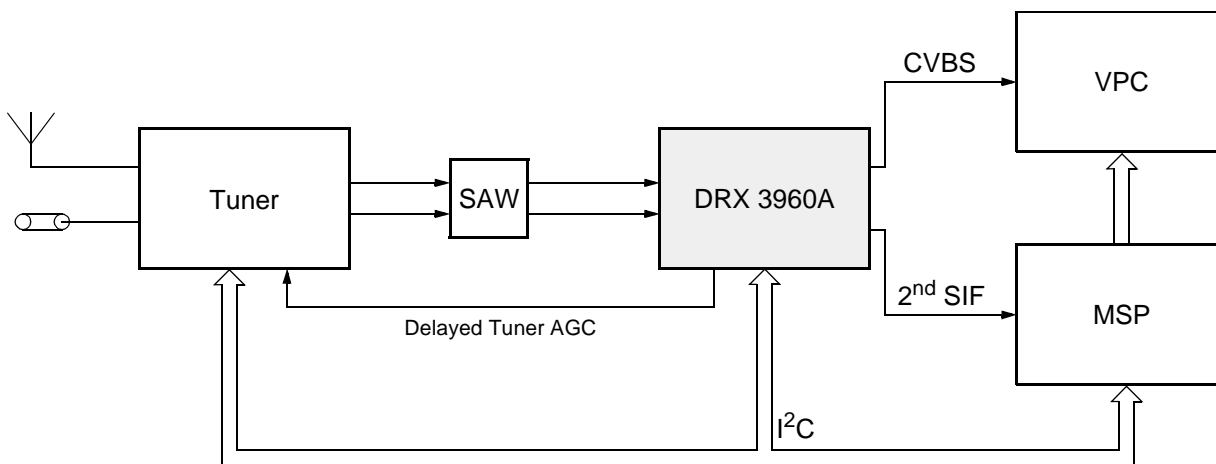


Fig. 2: Multistandard video and sound IF processing with DRX 3960A

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