## Product Brief

**Intel®CE 6210**
**DVB-C Demodulator**

Consumer Electronics

# QAM Demodulator for Digital Cable Television



### Product Overview

The Intel® CE 6210 QAM (Quadrature Amplitude Modulation) cable demodulator addresses the growing digital cable television market segment and complies with DVB-C (Digital Video Broadcast-Cable) EN300429 and ITU-T (International Telecommunications Union-Telecommunications) J.83 annex a/c standards. The device is housed in a 7x7 mm, 64-pin QFP that is approximately half the size of most competing devices.

The Intel CE 6210 device offers power consumption of less than 300 mW. It handles symbol rates up to 9 Mbaud and features a high-speed blind scan and auto re-acquisition function built on a hardware-based state machine. The state machine enables the device to be controlled using a high-level command-driven interface, simplifying the design process and reducing the overhead on the receiver CPU.

The Intel CE 6210 demodulator includes additional digital IF (intermediate frequency) filtering that enables the full symbol rate range to be supported with a single 8 MHz external SAW filter. The chip includes an RF signal strength indicator, enabling download and reading of the TV signal strength directly at the receiver box.

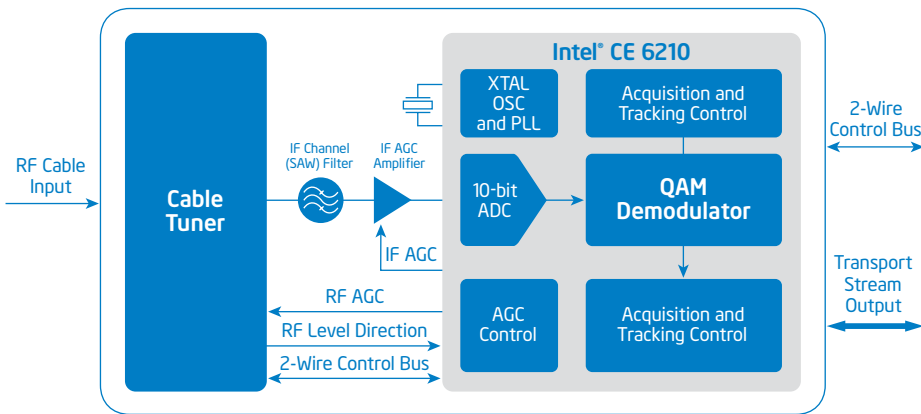### QAM Cable Demodulator Application

Intel works with module and digital set top box (DSTB) manufacturers to offer system designers a choice of complete front-end implementations. Intel is providing a new selection of reference designs with supporting design documentation, PC GUI and driver source code to let you easily design the demodulator directly onto the DSTB motherboard in combination with your preferred tuner solution.

The Intel CE 6210 device accepts an analog signal from the tuner, either at low or conventional IF up to 50 MHz and delivers an MPEG-2 compliant packet stream. It contains a single 10-bit ADC (analog-digital converter), a digital QAM demodulator and FEC (forward error correcting) decoder. The QAM demodulator supports constellations 16 to 256.

The analog to digital conversion is carried out at a fixed sample rate greater than or equal to four times the maximum symbol rate (sampling occurs at up to 28 MHz for 1 to 9 Mbaud applications). These 10-bit samples are first digitally mixed down to form baseband in-phase and quadrature channels.

The analog signal spectrum being sampled may be located near zero IF (typically centered at a frequency of approximately 5 MHz), or it can be at a conventional IF, typically 36 MHz. In the latter case, the 28 MHz sampling process will map the signal to 8 MHz. The digital down-converter can mix the above signals to in-phase and quadrature channels centered at zero frequency. The Intel CE 6210 demodulator's down-converter also has a built-in automatic frequency control that tracks

**QAM Cable Demodulator Application Diagram**



## Product Features

### Intel® CE 6210 DVB-C Demodulator

- DVB-C EN300429 & ITU J.83 annex a/c compliant QAM demodulator
- Constellations 16, 32, 64, 128, 256 QAM
- Symbol rates up to 9 Mbaud
- Power consumption <300 mW at 6.9 Mbaud

### Easy to Program

- Blind acquisition of all symbol rates and QAM constellations
- Fast auto-scan and acquisition technology
- Automatic spectral inversion detection
- RF level, BER (bit error rate) and C/N (carrier-noise) signal indicators
- Programmable RF AGC (auto gain control) takeover point
- Low software overhead
- Control via two-wire bus (5 Volt tolerant)
- Standby and sleep options under hardware/ software control

### Simplified Design

- Conventional IF and low-IF input
- Single IF filter bandwidth for all symbol rates
- Parallel and serial transport stream outputs
- Clock generation from single 10 MHz crystal or external 4 or 27 MHz clock
- Compact 7x7 mm 64-pin QFP

### Customer Support

- Offered with a range of reference designs using can-tuners from leading industry manufacturers

any frequency uncertainties in the input signal (up to approximately 300 KHz) caused by the tuner's frequency offset or tuning step-size.

Because the Intel CE 6210 chip provides all digital filtering needed to isolate 1 to 9 Mbaud channels, a single 8 MHz channel filter (SAW) is adequate for all applications. The Intel CE 6210 demodulator automatically adapts the filtering to acquire and track a QAM signal. The device operates with adjacent analog or digital channels at +10 dB (decibels).

The Intel CE 6210 demodulator can also automatically search for QAM channels in the 1 to 9 Mbaud band with integrated control and filter adaptation functions.



**For more information, visit the Intel Consumer Electronics home page at: www.intel.com/go/consumerelectronics**