



Product Brief

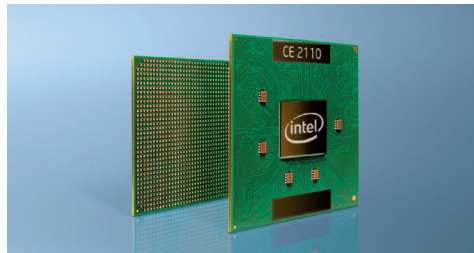
**Intel® CE 2110
Media Processor**

**Intel® CE 2110
Media Processor
Development Platform**

**Intel® CE 2110
Media Processor
Reference Platform**

Consumer Electronics

Intel® CE 2110 Media Processor



Interoperable consumer electronics products will enable consumers to create and consume personal/premium content and services that increase the value of their digital home experience. The Intel® CE 2110 Media Processor is Intel's first system-on-a-chip (SoC) designed for digital set top boxes and digital media recorders.

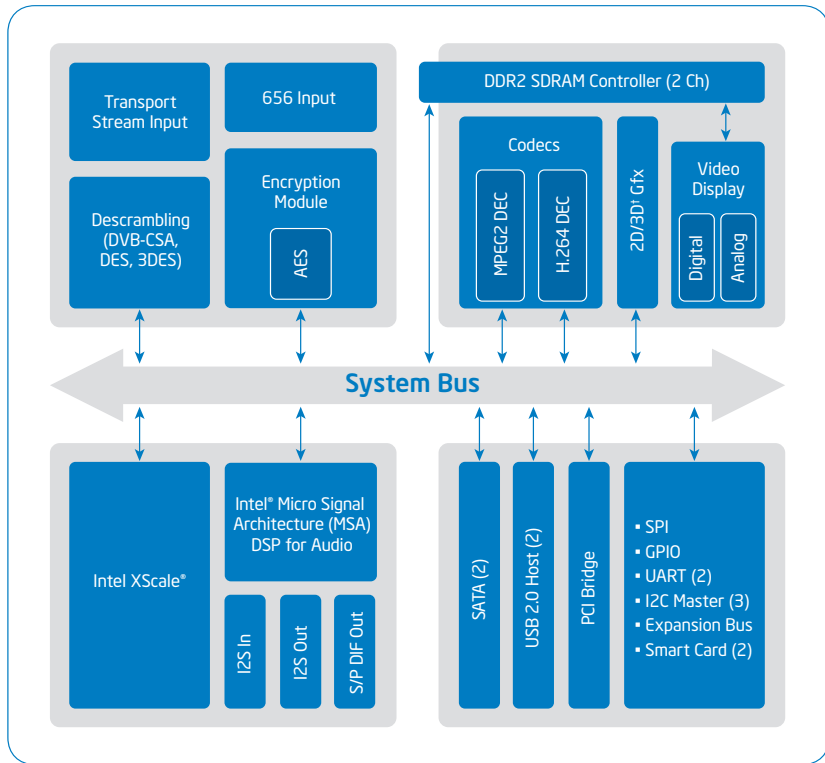
The highly integrated Intel CE 2110 Media Processor enables aggressive BOM cost reduction and helps to simplify the design of consumer electronics products. The integrated Intel XScale® processor core at 1 GHz provides processing performance and headroom to deploy new revenue generating applications. Hardware-based decode of widely used video codecs (MPEG-2, H.264) maximizes system-level performance by enabling the Intel XScale processor core to be used exclusively for applications.

In addition to the Intel XScale processor core, this highly integrated consumer electronics platform building block includes an Intel® Micro Signal Architecture (MSA) DSP core for audio codecs, a PowerVR* 2D/3D graphics accelerator, hardware accelerators for encryption and decryption, comprehensive peripheral interfaces, analog and digital input/output, and a transport interface for ATSC/DVB input.

The Intel® CE 2110 Media Processor development platform is designed to reduce time-to-market for new applications and support the transition to Intel® CE 2110 Media Processor SoC architecture. The platform provides a comprehensive hardware and software solution. The Intel® CE 2110 Media Processor reference platform provides the foundation for rapid development of new customer designs and product demonstrations.

Figure 1 - Intel® CE 2110 Media Processor

The Intel CE 2110 Media Processor provides integrated functionality for digital set top boxes and digital media players/recorders.



Features	Benefits
Up to 1GHz** Intel XScale Processor Core	High performance and scalable frequency to suit a broad range of application requirements
MPEG2 and H.264 Hard Decoders	Dedicated hardware for widely used codecs so that the Intel XScale processor core can be used exclusively to run applications
Programmable Intel® Micro Signal Architecture DSP for Audio Encoding, Decoding and Other Audio Tasks	Flexibility to address emerging audio codecs
Two 32-bit 500 MT/s DDR2 SDRAM Interfaces	Adequate memory bandwidth for optimum operation of hardware codecs
PowerVR MBX Lite* 2D/3D Graphics Accelerator	Rich graphical user interfaces Excellent display quality

Product Highlights

Intel® CE 2110 Media Processor

- Up to 1GHz** Intel XScale processor core
- Hard decode for HD MPEG-2 and H.264
- Soft-decode on Intel XScale processor for other codecs
- Intel® Micro Signal Architecture DSP core for audio codecs
- 2D/3D graphics accelerator†
- Memory support
 - Flash support on the 8/16-bit expansion bus interface
 - Two 32-bit 500 MT/s DDR2 SDRAM interfaces (configurations from 64 MB to 512 MB)
- Hardware accelerators for encryption/decryption
 - DVB-CSA, DES, 3DES, AES
- Video/audio inputs
 - Transport stream interface for ATSC/DVB tuner inputs
 - BT.656 input (NTSC/PAL analog video in) + I2S (analog audio in)
- Video/audio outputs
 - Analog component, or S-Video & composite (supports closed captioning, Macrovision* 7.1 & CGMS-A copy protection)
 - Interface for external HDMI transmitter with HDCP
 - 2-channel, 6-channel I2S out
 - S/PDIF out
- Standard system interfaces
 - 33MHz 32-bit PCI 2.2 host with support for 4 external masters
 - 2 serial ATA interfaces for HDD or DVD drives
 - USB 2.0 host
- On-chip interface peripherals
 - 11 dedicated GPIO (plus 82 MUXed GPIO)
 - Two integrated UARTs
 - Watchdog and system timers
 - 3 I2C interfaces for system control
 - One SPI high-speed serial bus
 - Two integrated ISO7816 interfaces for smart cards
- Manufactured on Intel's 90nm process
- 35mm Pb-free FC-BGA package

Performance for CE Applications

Based on the Intel XScale processor core at 1 GHz, the Intel CE 2110 Media Processor provides the performance to run computationally intensive applications that enable a range of compelling usage models. These applications include VoIP, video phone, casual and online games, Karaoke, Internet browsing with a Web-connected digital set top box, and the ability to easily share personal digital photos, video and music with networked CE devices.

DDR2 Memory Support

The highly integrated chip includes two 32-bit 500 MT/s (mega transfers per second) DDR2 SDRAM interfaces that provide the memory bandwidth needed for optimum operation of the hardware-based video codecs. DDR2 memory configurations range from 64 MB to 512 MB. The chip also supports up to 128 MB of flash memory on its 8/16-bit expansion bus interface.

2D/3D Graphics Accelerator†

Emerging digital home usage models rely on rich graphical user interfaces designed to promote intuitive user interaction in a 10-foot (typical living room) viewing environment. The display engine has five display planes (background plane, two graphics planes and two video planes) with support for picture-in-picture (PIP), picture-on-picture (POP), independent video plane scaling and per-pixel alpha blending. The graphics planes are supported by a dedicated 2D/3D graphics accelerator† that can enable enhanced EPGs as well as attractive 3D games.



Intel® CE 2110 Media Processor Development Platform

Primarily used for developing new software applications, the development platform provides the flexibility developers need to evaluate innovative consumer electronics usage models. The development kit includes a motherboard, tuner cards, power supply, documentation, and software support package and Linux* operating system support.

Intel® CE 2110 Media Processor Reference Platform

This hybrid IP digital set top box reference design provides the foundation for fast time-to-market development of new customer designs. The platform is ideal for creating product demonstrations to showcase new products. The reference platform kit includes a motherboard, front panel, power supply, chassis, remote control, documentation, software support package, with support for the Linux* operating system.

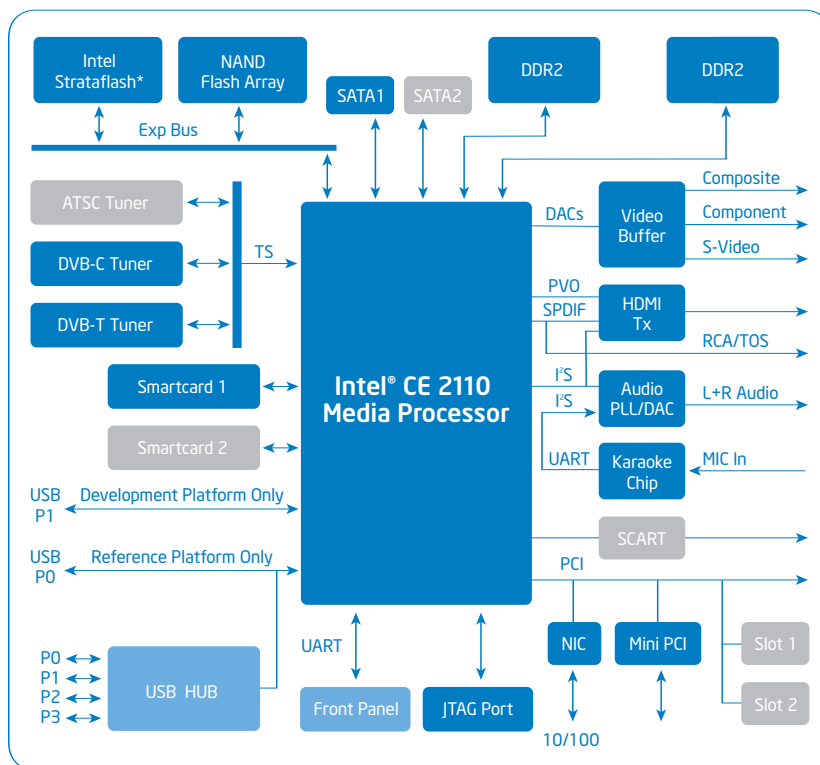


Figure 2 - Intel® CE 2110 Media Processor Platforms Block Diagram

The Intel CE 2110 Media Processor development platform and the Intel CE 2110 Media Processor reference platform provide comprehensive hardware and software solutions that can help customers reduce time-to-market.

Features	Development Board	Reference Design
Intel CE 2110 Media Processor SOC with JTAG interface for debugger	Yes	Yes
NIM/Tuner Support	Via FEB boards	DVB-C/DVB-T tuners integrated
ISO 7816 Smartcard support	Two	One
Audio codec—2/6 channel and SPDIF	Yes	Yes
UART Interface	Two	Two
HDMI Transmitter	Yes	Yes
TV Outputs: Composite, Component, S-Video	Yes	Yes
USB Support	Two USB 1.1 or One USB 2.0	Four USB 2.0 via hub
10/100 Ethernet support	Yes	Yes
SATA connectors	Two	One
Linux board support package	Yes	Yes
Main board	4-layer	4-layer
Chassis	No	Yes
Remote Control	No	Yes

Intel® CE 2110 Media Processor Software Development Kit (SDK)

Intel supports rapid platform development on the Intel CE 2110 Media Processor platform with comprehensive software building blocks. Deliverables include a platform support package for the Linux operating system, media drivers, platform drivers, display drivers, and the software development kit (SDK). The SDK is based on an open multi-media development framework. This SDK provides an open-source framework for application development that enables rapid porting of selected software solutions to the baseline platform.

The SDK includes:

- Integrated Device Library (IDL)
 - Low level API for controlling devices integrated into the Intel CE 2110 Media Processor silicon
- External Device Library (EDL)
 - Low level API for controlling devices that are part of the platform, but external to Intel CE 2110 Media Processor silicon
- Graphics Device Library (GDL)
 - API for applications to control the graphics subsystem
- Streaming Media Drivers (SMD)
 - External software interface & high-level API for media-processing tasks that can be performed on the platform

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

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* Other names and brands may be claimed as the property of others.

** To be available in multiple SKUs.

† PowerVR MBX Lite* 2D/3D graphics accelerator