

CM3.0 Wireless Module

Amedia's Core Module 3.0 (CM3.0) reference design introduces a cost-effective and easy-to-integrate solution for high quality wireless video/audio applications. The CM3.0 incorporates Amedia's WVA5001 chipset, software and digital video interfaces to support popular HDTV, SDTV and multimedia processors. The WVA5001 chipset solution is based on Amedia's WiVi™ Technology, a proprietary broadband wireless multimedia distribution technology.

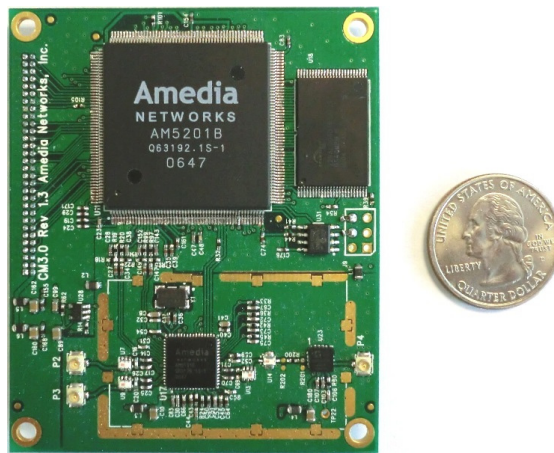


Figure 1: CM3.0 Wireless Module (7.5cm x 6.2cm)

System Overview

CM3.0 wireless module creates a proprietary 5 GHz wireless network for MPEG transport stream (TS) communication. The CM3.0 is a complete wireless transceiver module that can be integrated as video sender and video receiver according to the host platform. When used as video sender, CM3.0 can be embedded in a video source device (STB, DVR, DVD, PC, and camera, etc.); and when used as video receiver, CM3.0 can be embedded in a video display device (TV, flat panel, monitor, etc.). So a pair of the CM3.0 provides a complete, glueless wireless connection from TS (of video source) to TS (of video display) with guaranteed QoS.

The CM3.0 includes a configurable expansion connector (CEC). All I/O signals can be routed and configured through the CEC enabling easy integration with existing host systems.

Figure 2 gives a functional block diagram of the CM3.0 and associated personality module (PM). The personality module intends to simulate the host product platform in which the CM3.0 will be integrated. The PM supports demo and evaluation of the CM3.0 with a variety of video sources (analog and digital) for different applications. It also provides capabilities for test and debugging of the core module.

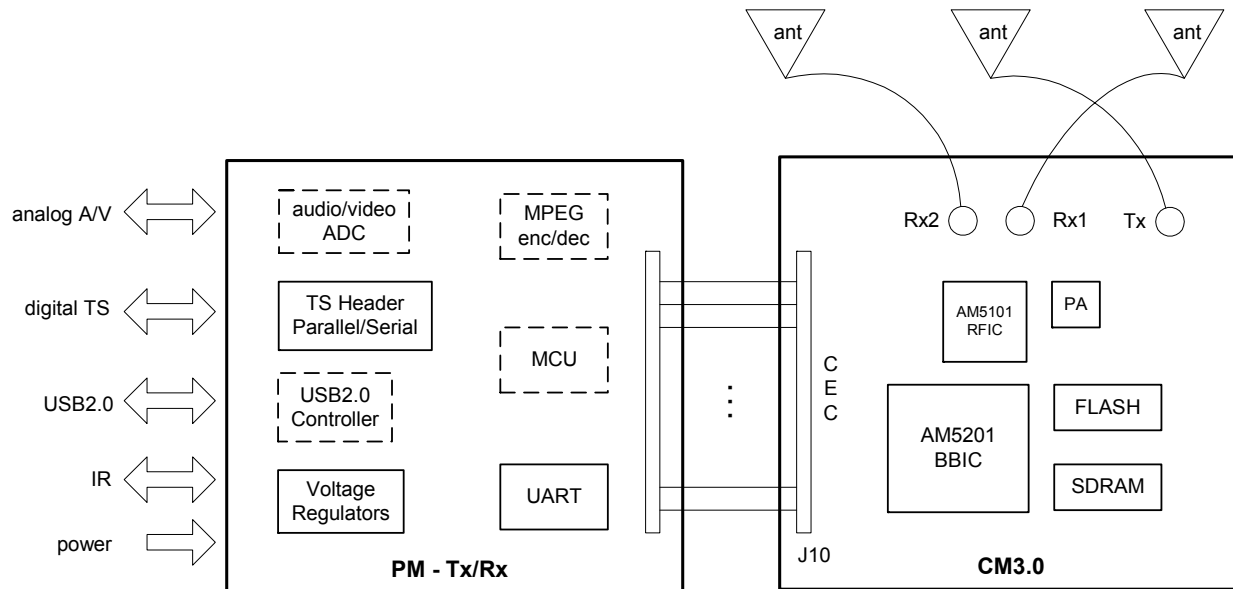


Figure 2: System Diagram of CM3.0 and Personality Module

Features

- Complete transceiver design of digital wireless communication at 5 GHz with space-time diversity technology
- Support 4.9 to 5.9 GHz frequency band and is controlled by software to comply with different country spectrum requirements
- Synchronous TDMA network to guarantee QoS - truly real time and jitterless
- Dynamic frequency selection to resist interferences
- Close-loop power control to minimize power consumption and be a friendly neighbor to other wireless devices in 5 GHz band
- Secure networking to assure privacy and content rights protection
- Support most of the digital video formats including MPEG-2, MPEG-4, H.264, VC-1, etc.
- Support point-to-point video connection as well as point-to-multipoint video broadcasting
- Multiple pairing technology allows one sender to pair with multiple receivers
- Configurable expansion I/O connector enabling easy integration with existing host system
- HCI interface to the host CPU to enable flexible application development at the host level
- Support IR relay and other control signals to the video source devices from the receiver location
- Secure network with advanced encryption standard (128-bit AES)

Functional Specifications

- Support standard MPEG transport stream (TS) data in either parallel or serial mode
- Support data rates from 6Mbps to 60Mbps, and video bit rates from 3Mbps to 45Mbps
- Support a maximum transmission power of +28dBm (700mW)
- Receive sensitivity: -90dBm for video rate of 6Mbps, and -82dBm for video rate of 20Mbps
- Overall video delay introduced by the CM3.0 is less than 30ms

Host-less mode and HCI mode

The CM3.0 system can be operated in two control modes: Hostless mode and HCI (host control interface) mode.

The Hostless mode assumes that beside the baseband IC (AM5201)'s on-chip CPU, there is no host CPU in the product or there is no communication needed between the on-chip CPU and the host CPU (if any). In the Hostless mode, the on-chip CPU shall have all controls on external components and functions including MPEG encoder, decoder, and related AV components, IR relay and other application layer functions. The HCI function is disabled in the Hostless mode.

HCI mode assumes that there are host CPUs on both Tx-unit and Rx-unit. The communication between the host CPUs and on-chip CPU can be done through the HCI protocol using UART1 hardware port. In HCI mode, the host CPU shall control all application layer functions. The on-chip CPU shall be slaved to the host CPU in the HCI mode.

CM3.0 I/O Signals Definition

Figure 3 and Table 1 give the details of the 60-pin configurable expansion connector (CEC). The data I/O (HPI) supports serial and parallel Transport Stream. The control I/O includes UART, I²C, GPIO, and IR.

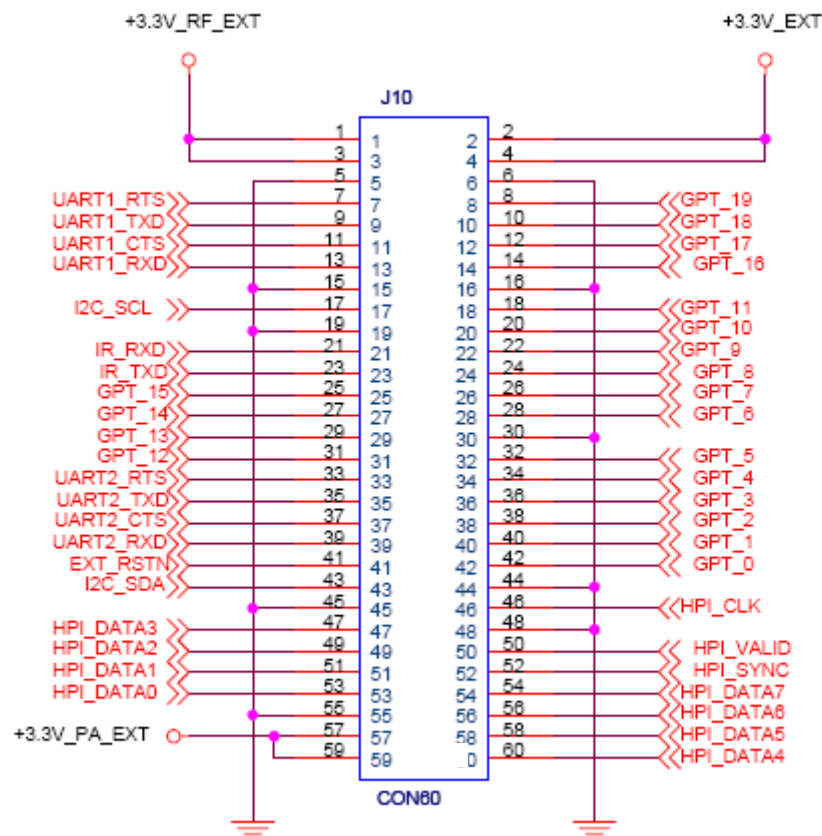


Figure 3: Diagram of the Connector Signals

Table 1: Wireless Module Connector Signals Definition

Pin	Signal Name	Description	Pin	Signal Name	Description
1	+3.3V_RF_EXT	3.3 Volt Supply for RF	2	+3.3V_EXT	3.3 Volt Digital Supply
3	+3.3V_RF_EXT	3.3 Volt Supply for RF	4	+3.3V_EXT	3.3 Volt Digital Supply
5	GND	Ground	6	GND	Ground
7	UART1_RTS	UART 1 RTS (HCI)	8	GPT_19	GPIO 19
9	UART1_TXD	UART 1 Tx Data (HCI)	10	GPT_18	GPIO 18
11	UART1_CTS	UART 1 CTS (HCI)	12	GPT_17	GPIO 17
13	UART1_RXD	UART 1 Rx Data (HCI)	14	GPT_16	GPIO 16
15	GND	Ground	16	GND	Ground
17	I2C_SCL	I2C Clock	18	GPT_11	GPIO 11
19	GND	Ground	20	GPT_10	GPIO 10
21	IR_RXD	Infrared Relay Rx (MT)	22	GPT_9	GPIO 9
23	IR_TXD	Infrared Relay Tx (AP)	24	GPT_8	GPIO 8
25	GPT_15	GPIO 15	26	GPT_7	GPIO 7
27	GPT_14	GPIO 14	28	GPT_6	GPIO 6
29	GPT_13	GPIO 13	30	GND	Ground
31	GPT_12	GPIO 12	32	GPT_5	GPIO 5
33	UART2_RTS	UART 2 RTS	34	GPT_4	GPIO 4
35	UART2_TXD	UART 2 Tx Data	36	GPT_3	GPIO 3
37	UART2_CTS	UART 2 CTS	38	GPT_2	GPIO 2
39	UART2_RXD	UART 2 Rx Data	40	GPT_1	GPIO 1
41	EXT_RSTN	External Reset	42	GPT_0	GPIO 0
43	I2C_SDA	I2C Data	44	GND	Ground
45	GND	Ground	46	HPI_CLK	Transport Stream Clock
47	HPI_DATA_3	Transport Stream Data 3	48	GND	Ground
49	HPI_DATA_2	Transport Stream Data 2	50	HPI_VALID	Transport Stream Valid
51	HPI_DATA_1	Transport Stream Data 1	52	HPI_SYNC	Transport Stream Sync
53	HPI_DATA_0	Transport Stream Data 0	54	HPI_DATA7	Transport Stream Data 7
55	GND	Ground	56	HPI_DATA_6	Transport Stream Data 6
57	+3.3V_PA_EXT	3.3 Volt Supply for PA	58	HPI_DATA_5	Transport Stream Data 5
59	+3.3V_PA_EXT	3.3 Volt Supply for PA	60	HPI_DATA_4	Transport Stream Data 4

CM3.0 Power Consumption

Mode	Peak Current Consumption
AP Transmit (at +20 dBm)	550 mA
AP Receive	260 mA
MT Transmit (at +20 dBm)	370 mA
MT Receive	480 mA