

ConnectCore™ for i.MX51

High-End Core Modules with Wired and Wireless Network Connectivity



High-end Cortex-A8 System-on-Module solution delivers industry-leading performance, low-power operation, and fully integrated 802.11a/b/g/n + Ethernet networking.

Overview

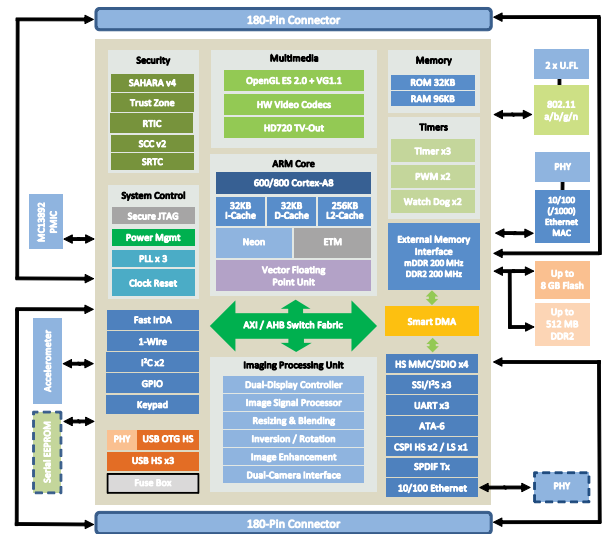
The network-enabled ConnectCore for i.MX51 family offers a highly integrated and future-proof System-on-Module (SOM) solution based on the new Freescale® i.MX51 application processor, which offers a high-performance ARM® Cortex™-A8 core, powerful multimedia options, and a complete set of on-chip peripherals and interfaces.

The modules combine the fast integration, reliability and design flexibility of an off-the-shelf SOM with complete out-of-the-box software development support for platforms such as Microsoft® Windows® Embedded CE 6.0 and Digi® Embedded Linux.

With industry-leading performance and key features such as a dual-display interface and a hardware encryption engine, the module is the ideal choice for a broad range of target markets including medical, digital signage, security/access control, retail, industrial/building automation, transportation and more.

Complete and cost-efficient Digi JumpStart Kits® allow immediate and professional embedded product development with dramatically reduced design risk and time-to-market.

Block Diagram



Features/Benefits

- High-end, low-power 32-bit System-on-Modules
- Integrated 10/100 Mbit Ethernet networking
- Pre-certified 802.11a/b/g/n wireless LAN interface
- On-chip hardware encryption engine
- Hardware accelerated high-definition multimedia
- Power Management IC and Accelerometer integrated
- Industrial operating temperature available
- Low-emission design with FCC Class B compliance
- ZigBee®, cellular and satellite connectivity options
- Windows Embedded CE 6.0 and Linux support

Related Items



Design Services



Accessory Kits



Support



Supported Software Platforms



Development Kits

Digi JumpStart Kits® Overview

Digi JumpStart Kit for Embedded Linux

Built around a standard Linux 2.6 kernel distribution, the Digi JumpStart Kit for Embedded Linux is tailored to the specific needs of embedded Linux development and provides an easy-to-use, complete off-the-shelf embedded development platform. It includes all components that are required to build secure network-enabled products based on the ConnectCore Wi-i.MX51.

The kit includes Digi ESP™ for Embedded Linux, a powerful and fully Linux-hosted Integrated Development Environment based on the open Eclipse™ framework. Ideal for new and experienced Linux developers, Digi ESP improves software design productivity by accelerating and greatly simplifying driver and application development through a user-friendly graphical interface.

- Complete Linux development platform for embedded systems
- Royalty-free and with optimized 2.6 kernel and services support
- Linux-based Digi ESP IDE for rapid product development
- Full Linux and Digi Board Support Package (BSP) source code included



Digi JumpStart Kit for Microsoft Windows Embedded CE 6.0

Microsoft Windows Embedded CE 6.0 is a highly componentized operating system, offering pre-tested technology components designed to create sophisticated embedded applications with minimized design effort and risk. It includes a wide range of ready-to-use components such as a graphical user interface, networking, web browser and multimedia. The professional Microsoft Visual Studio 2005 development tools also support native and managed code applications using various programming languages.

The Digi JumpStart Kit for Microsoft Windows Embedded CE 6.0 provides a complete kit with all hardware and software components needed to start immediate software development on the ConnectCore Wi-i.MX51 module platforms. This includes support for all processor platform features such as power management, multimedia interfaces, and other peripherals.

- Complete kit for immediate Windows Embedded CE 6.0 R3 development
- Seamless integration into Microsoft Windows Embedded CE environment
- Full Digi Board Support Package (BSP) source code included
- 180-day Visual Studio 2005 and Windows Embedded CE 6.0 evaluation



Early Availability Development Kits

| Software Platform | Embedded Linux | Microsoft Windows Embedded CE 6.0 |
|--------------------------|---|---|
| Module | 800 MHz ConnectCore Wi-i.MX51 with 512 MB NAND flash, 512 MB DDR2, dual Ethernet, accelerometer | |
| Development Board | 3 serial ports (1 x RS-232/422/485, 1 x RS-232 Tx/Rx, 1 x TTL), VGA connector, HDMI 1.3 connector, external LCD/Touchscreen connectors, external camera connectors, user/application connectors, Ethernet RJ-45 connector (primary), Ethernet header (secondary), WLAN antenna connectors (RP-SMA), SD/MMC slot, MicroSD slot, USB OTG, 4 x USB Host, I ² C/SPI headers, 1-Wire connector, audio: line in/out and microphone in (3.5 mm), Digi XBee® module socket (module sold separately), GPIO screw terminal, user push-buttons, user LEDs, battery, 802.3af (PoE) module socket (module sold separately), JTAG connector, 9-30 VDC power supply, power switch | |
| CD/DVD | Digi Embedded Linux with Live DVD support, Eclipse-based Digi ESP IDE, Linux and platform specific source code, Universal boot loader source code (U-Boot), sample code, documentation | Digi Windows CE 6.0 CD: Microsoft Windows Embedded CE 6.0 BSP w/source code, Universal Boot Loader (U-Boot) source code, sample code, documentation Microsoft Embedded Windows CE 6.0 R3 evaluation DVD: 180-day trial of Microsoft Embedded Windows CE 6.0 R3, Platform Builder, Visual Studio 2005 |
| Documentation | Quick start guide, Digi Embedded Linux user's guide, hardware reference manual, development board schematics | Quick start guide, Digi Windows CE 6.0 BSP user's guide, hardware reference manual, development board schematics |
| Accessories | 7" WVGA Sharp LCD (LQ070Y3DG3B) with touch screen, External wall power supply with interchangeable outlet adapters (North America, EU, UK, and Australia), Ethernet cable, antennas and serial cable | |
| Part Numbers | CC-WMX51-LX-EA | CC-WMX51-CE6-EA |

Please refer to the feature specs on the Digi website for detailed information about the specific software platform capabilities. Additional support for Timesys LinuxLink available. Please contact Digi or Timesys directly.

| Processor | |
|---------------------------------------|--|
| Processor Model | Freescale i.MX515 |
| Speed Grades | 600/800 MHz |
| Core Type | ARM Cortex-A8 |
| Cache Memory | 32k L1 I-Cache, 32k L1 D-Cache, 256k L2-Cache (unified) |
| Internal RAM | 128 KB (secure/non-secure) |
| Vector Floating Point | • |
| NEON Media Acceleration | • |
| Memory | |
| Flash | Up to 8 GB NAND flash |
| RAM | Up to 512 MB DDR2 |
| Debug | |
| Secure JTAG | • |
| ETM/ETB | • |
| Power Management | |
| Power Modes | Run, Wait, Stop, Low-power screen refresh |
| Wake-up Events | GPIO, keypad, RTC (day/time of day), SD card/USB cable insertion, battery/charger attach |
| Dynamic Voltage and Frequency Scaling | • |
| Backlight Drivers | 3 |
| Battery Management | • |
| Real Time Clock | |
| Battery Backup | • |
| Security | |
| Hardware Encryption/Decryption | AES, DES/3DES, RC4, C2 RSA, ECC MD5, SHA-1/224/256 |
| Random Number Generator | • |
| Run Time Integrity Checker | • |
| Secure RAM (internal) | • |
| Fuse Box (e-Fuses) | 64 Bits (application-specific use) |
| Physical Tamper Detectors | • |
| Timers | |
| General Purpose Timer | 32-bit up-counter with clock source selection 2 input capture channels 3 output compare channels, forced compare |
| Enhanced Periodic Interrupt Timer | 32-bit down-counter with clock source selection Set-and-forget/free-running modes Precision interrupt generation |
| Watchdog | • |

| Connectivity | |
|--------------------------------|---|
| UART | Up to 3 channels with bit rates up to 4 MHz, IrDA 1.0 support |
| IrDA Infrared | Medium InfraRed (0.576/1.152 Mbps), Fast InfraRed (4 Mbps) |
| CSPI | Master and slave mode Bit rate up to 25 Mbps (master) |
| eCSPI | Up to 2 eCSPI channels, master and slave mode Bit rates up to 66.5 Mbps (master) |
| I ² C | Up to 3 channels, master/slave (7-/10-bit addressing) All: Standard (100 kbps) and fast (400 kbps) mode |
| SD/SDIO/MMC | Up to 4 ports, 1-/4-/8-bit modes MMC: Up to 416 Mbps (8-bit mode), SD/SDIO: Up to 200 Mbps (4-bit mode) CE-ATA mode support (1 port) |
| P-ATA | Up to 66 MB/s data rate PIO mode (0,1,2,3,4), multi-word DMA mode (0,1,2), Ultra DMA mode (0,1,2,3,4,5) |
| USB 2.0 High-Speed | Up to 3 USB 2.0 High-Speed Host ports (transceiver-less) Up to 1 USB 2.0 OTG port with PHY |
| 1-Wire | • |
| ISO 7816 (SIM/Smart Card) | • |
| Keypad | 8x8 keypad matrix |
| PWM | 2 |
| ADC (10-bit) | Up to 4 channels |
| GPIO | Up to 128 GPIOs |
| External Memory Bus | 16-bit data/28-bit address in non-multiplexed address/data mode 16-bit or 32-bit data/28-bit address in multiplexed address/data mode |
| Multimedia | |
| Camera | 2 camera ports Bayer RGB, Full RGB, YUV 4:4:4, YUV 4:2:2, Gray scale, Generic data Parallel interface (up to 522 Mbps) or fast serial interface (up to 1.44 Gbps) Fast serial: Up to 6M pixels @ 15 fps (Bayer), Parallel: Up to 8M pixels @ 15 fps (Bayer) Window-of-interest selection, frame rate reduction, color depth reduction |
| Display | Primary and secondary display support / TV out (SD/HD) Up to 24 bit color depth, software contrast control Up to XGA (1024x768) @ 100 fps/720p (1280x720) @ 60 fps/1080i (1920x1080) @ 30 fps 3-/4-/5-wire serial interface, parallel, parallel bidirectional, DSI (4 lanes/4 channels) |
| Image Processing Unit | Image enhancements, video/graphics combining, resizing, rotation/inversion, color conversion/correction |
| Video Processing Unit | MPEG-4, H.263, H.264, MPEG-2, VC-1, DivX, RV10, MJPEG |
| GPU (2D/3D) | 227 million triangles/sec, 166 million pixels/sec raw OpenVG 1.0, OpenGL ES Common Profile v1.0/v1.1/Direct3D Mobile, OpenGL ES Profile v2.0 |
| Touchscreen Interface (4-wire) | • |
| SPDIF (Tx) | • |
| I ² S/AC97/SSI | Up to 3 channels |

Not all signals available at the same time due to muxing dependencies. Please refer to user documentation for more information.

• Module Feature

| Ethernet | | |
|--------------------------------|---|---|
| Physical Layer | 10/100Base-T | |
| Data Rates | 10/100 Mbps, auto-sensing | |
| Duplex Mode | Full or half duplex, auto-sensing | |
| Power over Ethernet (802.3af) | | |
| Power Over Ethernet | Development board ready for 802.3af PoE application kit (sold separately) | |
| Accelerometer | | |
| Three Axis Accelerometer | ±2g/±4g/±8g Three Axis Low-g Freescale MA7455L | |
| Wireless LAN | | |
| Standard | N/A | 802.11a/b/g/n |
| Antenna Connectors | N/A | 2 x U.FL |
| Dual Diversity | N/A | • |
| Frequency Bands | N/A | 2.412 - 2.484 GHz |
| | N/A | 4.900 - 5.850 GHz |
| Data Rates | N/A | 802.11b: 1, 2, 5.5, 11 Mbps |
| | N/A | 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps |
| | N/A | 802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps (MCS 0-7) |
| Modulation | N/A | DBPSK, DQPSK, CCK, BPSK, QPSK, 16-QAM, 64-QAM |
| 802.11n Features | N/A | A-MPDU / A-MSDU, PSMP, MTBA, STBC, Greenfield Preamble, RIFS |
| Transmit Power (±2 dBm) | N/A | 802.11b: 17 dBm typical |
| | N/A | 802.11g/n: 15 dBm typical |
| | N/A | 802.11a: 12 dBm typical |
| Security | N/A | WEP, WPA-PSK/WPA2-Personal, WPA/WPA2 Enterprise, 802.11i |
| QoS | N/A | WMM, WMM-PS, 802.11e |
| Roaming Enhancements | N/A | 802.11k/r |
| Extended Range (802.11n) | N/A | • |
| Radio Certifications (Pending) | N/A | USA, Canada, EU, Japan |
| Power Requirements | | |
| Typical | TBD | TBD |
| Suspend | TBD | TBD |
| Module Population Options* | | |
| Processor Speed Grade | • | |
| Memory (Flash/RAM) | • | |
| Network Interfaces | Single 10/100 Ethernet, dual 10/100 Ethernet, 802.11a/b/g/n WLAN | |

* Contact your local distributor or Digi sales office for details.

• Module Feature

Specifications

ConnectCore™ i.MX51

ConnectCore™ Wi-i.MX51

Mechanical

| | | |
|------------------------|---|----------------------|
| Dimensions (L x W x H) | 82 mm x 50 mm x 6.5 mm | 82 mm x 50 mm x 8 mm |
| Module Connectors | 2 x 180-pin board-to-board connectors, 0.8 mm pitch (Mating connector FCI P/N 61083-184409LF or similar) | |

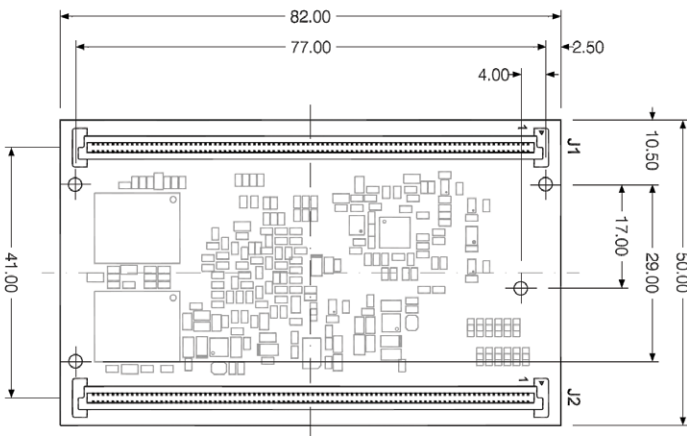
Environmental

| | |
|-----------------------|--|
| Operating Temperature | -40° C to +85° C / -40° F to +185° F (600 MHz) 0° to +70° C / +32° F to +158° F (800 MHz) |
| Storage Temperature | -50° C to +125° C (-58° F to +257° F) |
| Relative Humidity | 5% to 90% (non-condensing) |
| Altitude | 12,000 feet (3,658 meters) |

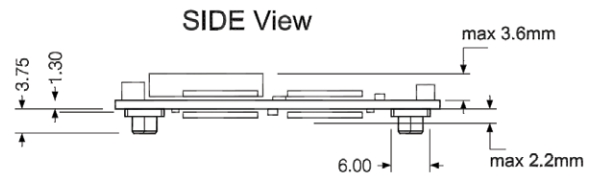
Regulatory Approvals (Pending)

| | |
|-------------------------------------|---|
| FCC Part 15 Class B | • |
| FCC Part 15 Sub C Section 15.247 | • |
| IC RSS-210 Issue 5 Section 6.2.2(o) | • |
| EN55022:2006 Class B | • |
| ICES-003, Class B | • |
| VCCI, Class B | • |
| EN55024:1998 +A1:2001, A2:2003 | • |
| EN61000-3-2:2006 | • |
| EN61000-3-3:1995 +A1:2001, A2:2005 | • |
| EN60950-1:2001 (UL60950-equivalent) | • |
| CSA C22.2, No. 60950 | • |

• Module Feature



BOTTOM View



Visit www.digiembedded.com for part numbers.

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