HIGH-END CORE MODULES
WITH WIRED AND WIRELESS
NETWORK CONNECTIVITY



DIGI CONNECTCORE i.MX51 / Wi-i.MX51

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

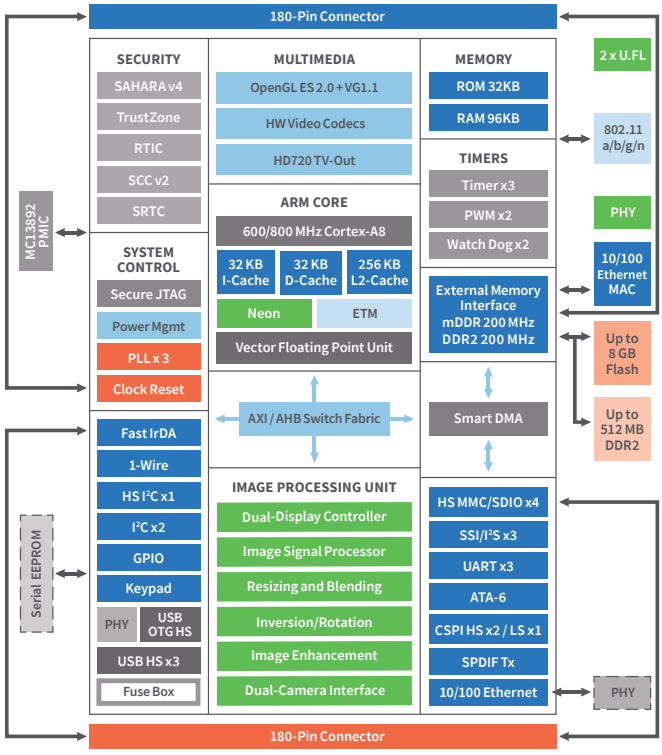
The network-enabled ConnectCore for i.MX51 family offers a highly integrated and future-proof System-on-Module (SOM) solution based on the new Freescale® i.MX515 application processor, which offers a high-performance ARM® Cortex™-A8 core, powerful multimedia options, and on-chip peripherals.

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, Windows Compact 7 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



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
- Industrial operating temperature available
- Low-emission design with FCC Class B compliance
- ZigBee®, cellular and satellite connectivity options
- Windows Embedded and Linux support

RELATED PRODUCTS


ConnectCore® Wi-i.MX53


ConnectCard® for i.MX28


ConnectCore® 6


Digi Remote Manager®


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 for 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

Microsoft Windows Embedded Compact 7 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 2008 development tools also support native and managed code applications using various programming languages.

The Digi JumpStart Kit for Microsoft Windows Embedded provides out-of-box support for Microsoft Windows Compact 7 and its predecessor Microsoft Windows Embedded CE 6.0 R3. It is a complete development kit with the hardware and software components needed for immediate product development. This includes support for all module platform features such as power management, multimedia interfaces and other peripherals.

- Complete kits for immediate Microsoft Windows Embedded development
- Out-of-box support for Microsoft Windows Embedded CE 6.0 R3 and Microsoft Windows Embedded Compact 7
- Full Digi Board Support Packages (BSPs) with source code
- Includes free 180-day Microsoft evaluation kit for CE 6.0 R3, Windows Compact 7 and Visual Studio 2005/2008



SOFTWARE PLATFORM	DIGI EMBEDDED LINUX	MICROSOFT WINDOWS EMBEDDED
MODULE	800 MHz ConnectCore Wi-i.MX51 with 512 MB NAND flash, 512 MB DDR2, dual Ethernet	
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, I2C/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, 9-30VDC 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	Microsoft Windows Embedded Compact 7 and Windows Embedded CE 6.0 R3 BSPs w/source code, Boot Loader (U-Boot) source code, sample code, documentation 180-day Microsoft Embedded Compact 7, Windows Embedded CE 6.0 R3 and Visual Studio 2005/2008 evaluation kits
DOCUMENTATION	Quick start guide, Digi Embedded Linux user's guide, hardware reference manual, development board schematics	Quick start guide, Digi Windows BSP user guides, 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	

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

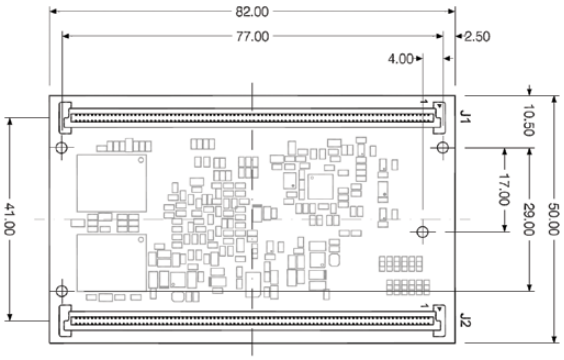
SPECIFICATIONS	ConnectCore® i.MX51 | ConnectCore® Wi-i.MX51
PROCESSOR	
PROCESSOR MODEL	Freescale i.MX515/i.MX512
SPEED GRADES	600/800 MHz
CORE TYPE	ARM® Cortex™-A8
CACHE MEMORY	32k L1 I-Cache, 32k L1 D-Cache, 256k L2-Cache (unified)
INTERNAL RAM	128 KB (secure/non-secure)
VECTOR FLOATING POINT	Yes
NEON MEDIA ACCELERATION	Yes
MEMORY	
FLASH	Up to 8 GB NAND flash
RAM	Up to 512 MB DDR2
DEBUG	
SECURE JTAG	Yes
ETM/ETB	Yes
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	Yes
BACKLIGHT DRIVERS	3
BATTERY MANAGEMENT	Yes
REAL-TIME CLOCK	
BATTERY BACKUP	Yes
SECURITY	
HARDWARE ENCRYPTION/DECRYPTION	AES, DES/3DES, RC4, C2; RSA, ECC; MD5, SHA-1/224/256
RANDOM NUMBER GENERATOR	Yes
RUN TIME INTEGRITY CHECKER	Yes
SECURE RAM (INTERNAL)	Yes
FUSE BOX (E-FUSES)	64 Bits (application-specific use)
PHYSICAL TAMPER DETECTORS	Yes
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	Yes
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)
I2C	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)
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	Yes
ISO 7816 (SIM/SMART CARD)	Yes
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

SPECIFICATIONS	ConnectCore® i.MX51	ConnectCore® Wi-i.MX51
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)	27 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)	Yes	
SPDIF (TX)	Yes	
I2S/AC97/SSI	Up to 3 channels	
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)	
WIRELESS LAN		
STANDARD	N/A	802.11a/b/g/n
ANTENNA CONNECTORS	N/A	2 x U.FL
DUAL DIVERSITY	N/A	Yes
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	Yes
RADIO CERTIFCATIONS (PENDING)	N/A	USA, Canada, EU, Japan
POWER REQUIREMENTS		
TYPICAL[1]	700 mA @ 3.75V	
IDLE[1]	200 mA @ 3.75V	
MODULE POPULATION OPTIONS[2]		
PROCESSOR SPEED GRADE	Yes	
MEMORY (FLASH/RAM)	Yes	
NETWORK INTERFACES	Single 10/100 Ethernet, dual 10/100 Ethernet, 802.11a/b/g/n WLAN	

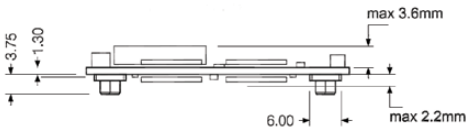
1 Baseline power consumption based on standard use case without WLAN and Ethernet. See Hardware Reference Manual for more detailed information.
2 Contact your local distributor or Digi sales office for details.

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 (600 MHz); -20° C to +85° C (800 MHz)	
STORAGE TEMPERATURE	-40° C up to +85° C (-40° F to +185° F)	
RELATIVE HUMIDITY	5% to 90% (non-condensing)	
TEMPERATURE/CLIMATE TESTS	IEC 60068-2-1 (Ab/Ad Cold: 16 h with -40° C), IEC 60068-2-2 (Bb/Bd: Dry heat: 16 h with +85° C), IEC 60068-2-78 (Damp heat steady state: 16h with +40° C and 93% rH)	
SHOCK/VIBRATION TESTS	IEC 60068-2-6 Method Fc, IEC 60068-2-64 Method Fh, IEC 60068-2-27 Method Ea	
REGULATORY APPROVALS (PENDING)		
FCC PART 15 CLASS B	Yes	
FCC PART 15 SUB C SECTION 15.247	Yes	
IC RSS-210 ISSUE 5 SECTION 6.2.2(O)	Yes	
EN55022:2006 CLASS B	Yes	
ICES-003, CLASS B	Yes	
VCCI, CLASS B	Yes	
EN55024:1998 +A1:2001, A2:2003	Yes	
EN61000-3-2:2006	Yes	
EN61000-3-3:1995 +A1:2001, A2:2005	Yes	
EN60950-1:2001 (UL60950-EQUIVALENT)	Yes	
CSA C22.2, NO. 60950	Yes	
WARRANTY		
PRODUCT WARRANTY	3 years	

BOTTOM View



SIDE View



PART NUMBERS	DESCRIPTION
CC-WMX51-CE	ConnectCore for i.MX51 JumpStart Kit for Windows Embedded CE 6.0R3 and Windows Embedded Compact 7, Download of 180-day evaluation version of Microsoft Visual Studio/Platform Builder, 7" WVGA LCD panel w/touchscreen
CC-WMX51-LL	ConnectCore for i.MX51 Development Kit for Timesys LinuxLink, 7" WVGA LCD panel with touchscreen

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