ConnectCore® for i.MX53

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

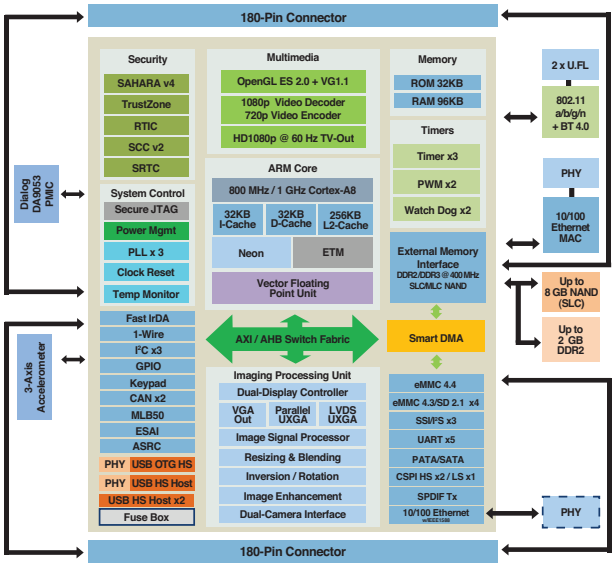
The network-enabled ConnectCore for i.MX53 module family is a highly integrated and future-proof System-on-Module (SoM) solution based on the new Freescale® i.MX53 application processor. It offers a high-performance 1 GHz ARM® Cortex™-A8 core, wired and wireless connectivity options, powerful 1080p/720p video encoding/decoding capabilities and a complete peripheral set.

The ConnectCore for i.MX53 family builds on the successful ConnectCore for i.MX51 modules by providing a form factor compatible option with significantly improved processing, memory, video and connectivity capabilities. It is a scalable and energy-efficient module family, ideal for medical devices, security/surveillance equipment, industrial applications and digital signage.

Complete and cost-efficient Digi JumpStart Kits® for Digi Embedded Linux, Timesys LinuxLink, Android and Microsoft Windows Embedded Compact 7 allow immediate and professional embedded product development with dramatically reduced design risk and time-to-market.

Related Items

Block Diagram



Features/Benefits

- High-performance 32-bit System-on-Module
- Long-term product availability solution
- Single and dual 10/100 Mbit Ethernet networking
- Pre-certified 802.11a/b/g/n Wi-Fi interface
- High-performance 2D/3D Graphics Processing Unit
- Hardware video processing with 1080p decoding
- Low-emission design with FCC Class B compliance
- ZigBee, cellular and satellite connectivity options
- Industrial operating temperature support

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.MX53.

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 2.6.35 kernel and services support
- Linux-based Digi ESP IDE for rapid product development
- Full Linux and Digi Board Support Package (BSP) with source code included

Digi JumpStart Kit for Microsoft Windows

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 Compact 7 provides a complete kit with all hardware and software components needed to start immediate software development on the ConnectCore for i.MX53 modules. This includes support for all processor platform features such as power management, multimedia interfaces and other peripherals.

- Complete kit for immediate Windows Embedded Compact 7 development
- Seamless integration into Microsoft Windows Embedded Compact environment
- Full Digi Board Support Package (BSP) with source code
- Includes 180-day Visual Studio 2008 and Windows Embedded Compact 7 eval kit

Digi JumpStart Kit for Android

Android is an ideal software platform to create professional and feature-complete products with significantly reduced software development effort and improved overall time-to-market. The Digi Application Development Kit for Android builds on the strong Android software foundation and its rich eco-system by providing a complete and easy-to-use Android application development solution that is designed to meet the specific needs of embedded developers.

Ready to use right out of the box, the kit supports the hardware capabilities of Digi's ConnectCore for i.MX module family with Digi extensions for Android allowing customers to design Android based products without the typically complex and often difficult low-level system development effort.

- Complete out-of-box Android application development
- Embedded specific API extension for Android
- Digi ESP IDE for Windows and Linux based app development
- Including kernel and rootfs customzation option (Linux only)

Development Kits

Software Platform	Digi Embedded Linux	Microsoft Windows Embedded Compact 7	Android
Module	1 GHz ConnectCore Wi-i.MX53 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 connector, 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, CAN bus, SATA, 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	Digi Windows Compact 7 CD: Microsoft Windows Embedded Compact 7 BSP w/source code, UniBoot Loader (U-Boot) source code, sample code, documentation; Microsoft Windows Embedded Compact 7 evaluation DVD: 180-day trial of Microsoft Embedded Compact 7, Platform Builder, Visual Studio 2008	Android 2.3.4 (Gingerbread), Eclipse-based Digi ESP IDE w/ADT extensions (Windows/Linux), Universal boot loader source code (U-Boot), Kernel and rootfs customzation option (Linux), sample code, documentation
Documentation	Quick start guide, Digi Embedded Linux user's guide, hardware reference manual, development board schematics	Quick start guide, Digi Windows Compact 7, BSP user's guide, hardware reference manual, development board schematics	Getting started guide, Digi Android API extensions, 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, serial cable		
Part Numbers	CC-WMX53-LX	CC-WMX53-CE	CC-WMX53-ANDRD

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.MX53	ConnectCore® Wi-i.MX53
Processor		
Processor Model	Freescale® i.MX53 (i.MX535/i.MX537)	
Speed Grades	800/1000 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 2 GB 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 (External)	•	
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	•	
Thermal Management		
Temperature Monitor	On-chip sensor, precision 0 to 135°C ±5°C Software support for thermal-aware Dyamic Frequency and Voltage Scaling (DFVS)	

• Module Feature

Specifications	ConnectCore® i.MX53	ConnectCore® Wi-i.MX53
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)	
CAN	CAN 2.0b, up to 2 channels, up to 1 Mbps each	
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/eMMC	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) eMMC 4.4: Ultra high speed, up to 832 Mbps	
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)	
SATA	SATA II, up to 1.5 Gbps	
USB 2.0 High-Speed	Up to 3 USB 2.0 High-Speed Host ports, one with integrated PHY Up to 1 USB 2.0 OTG port with integrated PHY	
Media Local Bus (MLB)	MOST (Media Oriented Systems Transport) interface, up to 50 Mbps	
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	Two parallel camera ports, up to 20-bit, up to 120 MHz peak	
Display	Five interfaces available - with total rate of all interfaces up to 180 Mpixels/sec, 24 bpp Up to two displays can be driven simultaneously (screen refresh) Concurrent asynchronous access to two additional devices, e.g. display controllers and smart displays Parellel: Two 24-bit display ports, up to 165 Mpixels/sec, e.g. UXGA @ 60 Hz LVDS: One port up to 165 Mpixels/sec or two ports up to 85 Mpixels/sec, e.g. WXGA @ 60 Hz One TV-out/VGA port, up to 150 Mpixels/sec, e.g. 1080p60	
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 1080p30 decode, 720p30 encode	
GPU (2D/3D)	33 million triangles/sec, 200 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)	•	
I²S/AC97/SSI	Up to 3 channels	
ESAI	Multi-channel digital audio, up to 1.4 Mbps each channel	
ASRC	•	

• Module Feature

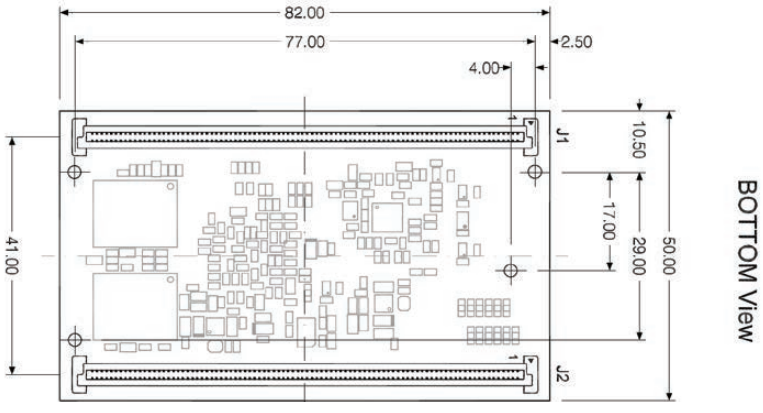
Specifications	ConnectCore® i.MX53	ConnectCore® Wi-i.MX53
Ethernet		
Physical Layer	10/100Base-T	
Data Rates	10/100 Mbps, auto-sensing	
Duplex Mode	Full or half duplex, auto-sensing	
IEEE 1588	Yes, primary interface only	
Power over Ethernet (802.3af)		
Power over Ethernet	Development board ready for 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 (2.4/5 GHz)
Antenna Connectors	N/A	2 x U.FL
Dual Diversity	N/A	•
Frequency Bands	N/A	2.412 - 2.484 GHz 4.900 - 5.850 GHz
Data Rates	N/A	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 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 802.11g/n: 15 dBm typical 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) (Future Option)	N/A	USA, Canada, EU, Japan
Bluetooth (Future Option)		
Bluetooth 2.1 + EDR	N/A	•
Bluetooth 3.0 + HS	N/A	•
Bluetooth 4.0 w/Bluetooth Low Energy	N/A	•
Class	N/A	1.5
HCI	N/A	•
Power Requirements[1]		
Typical / Idle	700 mA @ 3.75 V / 200 mA @ 3.75 V	

[1] Baseline power consumption based on standard use case without WLAN and Ethernet. See Hardware Reference Manual for more detailed information.

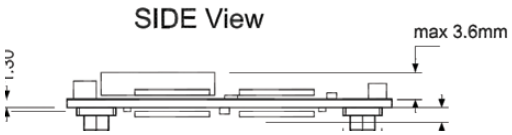
[2] Contact your local distributor or Digi sales office for details.

• Module Feature

Specifications	ConnectCore® i.MX53	ConnectCore® Wi-i.MX53
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 (800 MHz) -20°C to +70°C (1000 MHz)	
Storage Temperature	-40° C up to +85° C (-40° F to +185° F)	
Relative Humidity	5% to 90% (non-condensing)	
Altitude	12,000 feet (3,658 meters)	
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)	
Vibration / Shock Tests	IEC 60068-2-6 Method Fc, IEC 60068-2-64 Method Fh, IEC 60068-2-27 Method Ea	
Regulatory Approvals		
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



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