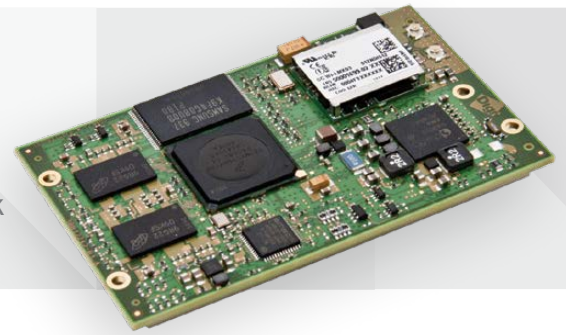




HIGH-END CORE  
MODULES WITH WIRED  
AND WIRELESS NETWORK  
CONNECTIVITY



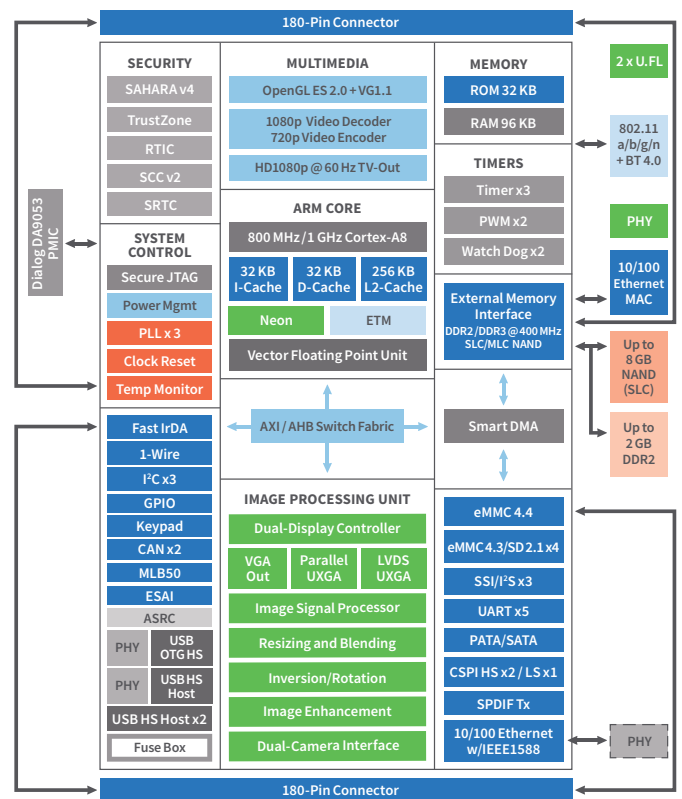
# DIGI CONNECTCORE i.MX53 / Wi-i.MX53

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.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.

## BLOCK DIAGRAM



## 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

## RELATED PRODUCTS



ConnectCore® 6

ConnectCore® 6 SBC

ConnectCard™ for i.MX28

ConnectCore® for i.MX51

Development Kits

## 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                 | Yes   |
| NEON MEDIA ACCELERATION               | Yes   |
| MEMORY                                |   |
| FLASH                                 | Up to 8 GB NAND flash   |
| RAM                                   | Up to 2 GB 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 (EXTERNAL)             | 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   |
| THERMAL MANAGEMENT                    |   |
| TEMPERATURE MONITOR                   | On-chip sensor, precision 0 to 135°C ±5°C; Software support for thermal-aware Dynamic Frequency and Voltage Scaling (DFVS)                          |
| 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 (available on i.MX537 variant)  |
| 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                                | Yes   |
| ISO 7816 (SIM/SMART CARD)             | Yes   |

## SPECIFICATIONS

## ConnectCore® i.MX53

## | ConnectCore® Wi-i.MX53

## CONNECTIVITY - CONTINUED

|                                 |  |  |
|---------------------------------|--|--|
| 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<br>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                         | 5 interfaces available - with total rate of all interfaces up to 180 Mpixels/sec, 24 bpp<br>Up to 2 displays can be driven simultaneously (screen refresh)<br>Concurrent asynchronous access to 2 additional devices, e.g. display controllers and smart displays<br>Parallel: 2 24-bit display ports, up to 165 Mpixels/sec, e.g. UXGA @ 60 Hz<br>LVDS: 1 port up to 165 Mpixels/sec or 2 ports up to 85 Mpixels/sec, e.g. WXGA @ 60 Hz<br>1 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)  | Yes  |  |
| SPDIF (TX)                      | Yes  |  |
| I <sup>2</sup> S/AC97/SSI       | Up to 3 channels   |  |
| ESAI                            | Multi-channel digital audio, up to 1.4 Mbps each channel   |  |
| ASRC                            | Yes  |  |
| 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 (available on i.MX537 variant)   |  |
| 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 (2.4/5 GHz)  |
| ANTENNA CONNECTORS              | N/A  | 2 x U.FL   |
| DUAL DIVERSITY                  | N/A  | Yes  |
| 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<br>802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>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;<br>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 CERTIFICATIONS            | N/A  | USA, Canada, EU, Japan   |
| POWER REQUIREMENTS <sup>1</sup> |  |  |
| TYPICAL / IDLE                  | 700 mA @ 3.75 V / 200 mA @ 3.75 V  |  |

<sup>1</sup> Baseline power consumption based on standard use case without WLAN and Ethernet. See Hardware Reference Manual for more detailed information.

<sup>2</sup> Contact your local distributor or Digi sales office for details.

## SPECIFICATIONS

# ConnectCore® i.MX53

# | ConnectCore® Wi-i.MX53

### MECHANICAL

|                               |  |                      |
|-------------------------------|--|----------------------|
| <b>DIMENSIONS (L X W X H)</b> | 82 mm x 50 mm x 6.5 mm   | 82 mm x 50 mm x 8 mm |
| <b>MODULE CONNECTORS</b>      | 2 x 180-pin board-to-board connectors, 0.8 mm pitch (Mating connector FCI P/N 61083-184409LF or similar) |                      |

### ENVIRONMENTAL

|                                    |  |
|------------------------------------|--|
| <b>OPERATING TEMPERATURE</b>       | -40°C to +85°C (i.MX537 variant, 800 MHz); -20°C to +70°C (i.MX535 variant, 1 GHz)   |
| <b>STORAGE TEMPERATURE</b>         | -40° C up to +85° C (-40° F to +185° F)  |
| <b>RELATIVE HUMIDITY</b>           | 5% to 90% (non-condensing)   |
| <b>TEMPERATURE / CLIMATE TESTS</b> | 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) |
| <b>VIBRATION / SHOCK TESTS</b>     | IEC 60068-2-6 Method Fc, IEC 60068-2-64 Method Fh, IEC 60068-2-27 Method Ea  |

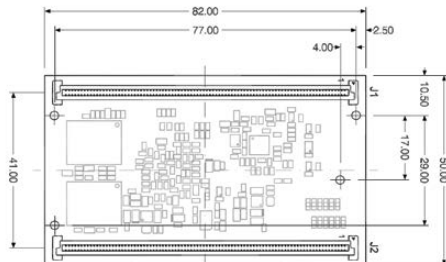
### REGULATORY APPROVALS

|  |     |
|--|-----|
| <b>FCC PART 15 CLASS B</b>                 | Yes |
| <b>FCC PART 15 SUB C SECTION 15.247</b>    | Yes |
| <b>IC RSS-210 ISSUE 5 SECTION 6.2.2(O)</b> | Yes |
| <b>EN55022:2006 CLASS B</b>                | Yes |
| <b>ICES-003, CLASS B</b>                   | Yes |
| <b>VCCI, CLASS B</b>                       | Yes |
| <b>EN55024:1998 +A1:2001, A2:2003</b>      | Yes |
| <b>EN61000-3-2:2006</b>                    | Yes |
| <b>EN61000-3-3:1995 +A1:2001, A2:2005</b>  | Yes |
| <b>EN60950-1:2001 (UL60950-EQUIVALENT)</b> | Yes |
| <b>CSA C22.2, NO. 60950</b>                | Yes |

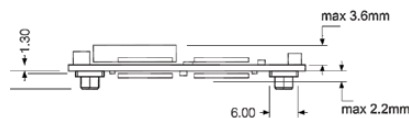
### WARRANTY

|                         |         |
|-------------------------|---------|
| <b>PRODUCT WARRANTY</b> | 3 years |
|-------------------------|---------|

**BOTTOM View**



**SIDE View**



## PART NUMBERS

## DESCRIPTION

|                         |   |
|-------------------------|---|
| <b>CC-WMX-KD69-VK</b>   | ConnectCore Wi-i.MX53 module, 1 GHz, 512 MB Flash, 512 MB RAM, 2x Ethernet, 802.11abgn, single pack       |
| <b>CC-WMX-KD69-VM</b>   | ConnectCore Wi-i.MX53 module, 1 GHz, 512 MB Flash, 512 MB RAM, 1x Ethernet, 802.11abgn, single pack       |
| <b>CC-WMX-KD69-VM-B</b> | ConnectCore Wi-i.MX53 module, 1 GHz, 512 MB Flash, 512 MB RAM, 1xEthernet, 802.11abgn, 25-piece bulk pack |
| <b>CC-WMX-KD79-VK</b>   | ConnectCore Wi-i.MX53 module, 1 GHz, 512 MB Flash, 1 GB RAM, 2x Ethernet, 802.11abgn, single pack         |
| <b>CC-WMX-KD79-VK-B</b> | ConnectCore Wi-i.MX53 module, 1 GHz, 512 MB Flash, 1 GB RAM, 2x Ethernet, 802.11abgn, 25-piece bulk pack  |
| <b>CC-MX-LD6A-ZM</b>    | ConnectCore i.MX53 module, 800 MHz, 1 GB Flash, 512 MB RAM, 1x Ethernet, Industrial Temp, single pack     |
| <b>CC-MX-LD79-ZK</b>    | ConnectCore i.MX53 module, 800 MHz, 512 MB Flash, 1 GB RAM, 2x Ethernet, Industrial Temp, single pack     |

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877-912-3444 / 952-912-3444 / [www.digi.com](http://www.digi.com)

**DIGI INTERNATIONAL GERMANY**  
+49-89-540-428-0

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**DIGI INTERNATIONAL SINGAPORE**  
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