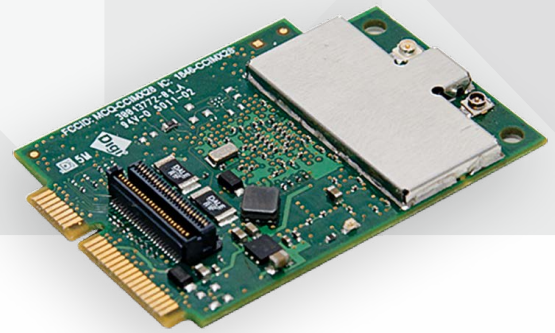




COMPACT CORE  
MODULE WITH  
WIRELESS AND WIRED  
CONNECTIVITY



# DIGI CONNECTCARD FOR i.MX28

Cost-effective small-footprint System-on-Module solution delivers performance, low-power operation and integrated 802.11a/b/g/n, Bluetooth 4.0 and Ethernet connectivity

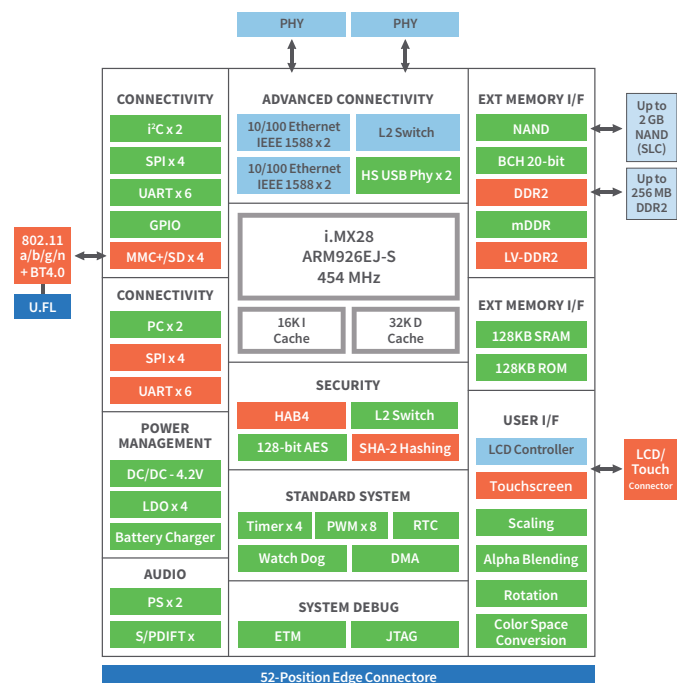
Based on the NXP i.MX28 processor family, the ConnectCard for i.MX28 is an ideal embedded platform solution for connected applications in medical and healthcare, energy, transportation and industrial/building automation.

It offers easy design integration and unique peripheral/interface flexibility in an extremely compact and cost-effective form factor. This module is suitable for a wide range of different devices, including battery powered product designs.

The module is equipped with a highly integrated 32-bit ARM core running at up to 454 MHz, on-chip power management, dual Ethernet and 802.11a/b/g/n networking options, Bluetooth 4.0 connectivity, dual FlexCAN options, GPIO, ADC, UART, USB high-speed, SPI, I2C, I2S, 1-Wire, PWM and JTAG/ETM.

The Digi JumpStart Kit® for Digi Embedded Linux provides a complete turnkey embedded development solution allowing immediate and successful product development with accelerated time-to-market and reduced design risk.

## BLOCK DIAGRAM



## BENEFITS

- Cost-effective design in compact form factor
- 32-bit ARM processor at up to 454 MHz
- Single/dual 10/100 Ethernet connectivity options
- Pre-approved 802.11a/b/g/n Wi-Fi + Bluetooth 4.0
  - Includes Wi-Fi® Access Point mode + Wi-Fi Direct™
  - Support for Bluetooth 3.0 + HS and Bluetooth LE
  - Ready for Cisco CCX and Wi-Fi Logo certification
- Digi Embedded Linux platform
  - Digi Remote Manager® enabled
  - Includes complete Digi BSP source code
- Long-term product availability
- Additional ZigBee®, 802.15.4, cellular and satellite connectivity options (off-module)

## RELATED PRODUCTS



| OVERVIEW                         | ConnectCard™ i.MX28                                                                                                      | ConnectCard™ Wi-i.MX28 |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------|
| PROCESSOR                        |                                                                                                                          |                        |
| PROCESSOR MODELS                 | NXP® i.MX280, i.MX287                                                                                                    |                        |
| SPEED GRADE                      | Up to 454 MHz                                                                                                            |                        |
| CORE TYPE                        | ARM926EJ-S                                                                                                               |                        |
| CACHE MEMORY                     | 16k I-Cache, 32k D-Cache                                                                                                 |                        |
| INTERNAL RAM                     | 128 KB SRAM                                                                                                              |                        |
| INTERNAL ROM (OCOTP)             | 1,280 Bits                                                                                                               |                        |
| MEMORY                           |                                                                                                                          |                        |
| FLASH                            | Up to 2 GB NAND flash                                                                                                    |                        |
| RAM                              | Up to 256 MB DDR2                                                                                                        |                        |
| DEBUG                            |                                                                                                                          |                        |
| JTAG                             | Yes                                                                                                                      |                        |
| ETM/ETB                          | Yes                                                                                                                      |                        |
| POWER MANAGEMENT                 |                                                                                                                          |                        |
| POWER MODES                      | Run, Standby, Deep Sleep                                                                                                 |                        |
| WAKE-UP EVENTS                   | RTC, GPIO, CAN, USB, Ethernet                                                                                            |                        |
| AUTO SLOW                        | Yes                                                                                                                      |                        |
| LI-ION BATTERY CHARGER / MONITOR | Yes                                                                                                                      |                        |
| CLOCK AND WATCHDOG               |                                                                                                                          |                        |
| REAL-TIME CLOCK                  | Yes                                                                                                                      |                        |
| ALARM                            | Yes                                                                                                                      |                        |
| WATCHDOG                         | Yes                                                                                                                      |                        |
| SECURITY                         |                                                                                                                          |                        |
| DATA CO-PROCESSOR (DCP)          | 128-bit AES encryption; SHA-1 / SHA256 hashing                                                                           |                        |
| FUSEBOX (OCOTP)                  | 1280 bits                                                                                                                |                        |
| HIGH-ASSURANCE BOOT (HAB4)       | Yes                                                                                                                      |                        |
| SECURE BOOT                      | 128-bit AES decryption                                                                                                   |                        |
| PERIPHERALS                      |                                                                                                                          |                        |
| UART                             | Up to 4 channels with bit rates up to 3.25 Mbps (AUART)<br>Up to 1 channel with bit rate up to 115 kbps (DUART)          |                        |
| CAN BUS                          | Up to 2 channels, CAN Bus 2.0B, bit rates up to 1 Mbps, 64 message buffers (0-8 bytes), low-power modes with wake-up     |                        |
| SPI                              | Up to 2, master/slave modes                                                                                              |                        |
| I2S                              | Up to 1                                                                                                                  |                        |
| I2C                              | Up to 2 channels, master/slave (7-/10-bit addressing), standard (100 kbps) and fast (400 kbps) mode                      |                        |
| SD/SDIO/MMC                      | Up to 4 ports, 1-/4-/8-bit modes, up to 48 MHz                                                                           |                        |
| USB 2.0 HIGH-SPEED               | Up to 1 USB 2.0 High-Speed Host (with PHY) ; Up to 1 USB 2.0 OTG port (with PHY)                                         |                        |
| 1-WIRE                           | Maxim DS2482-100+                                                                                                        |                        |
| PWM                              | Up to 4                                                                                                                  |                        |
| ADC                              | HSADC: Up to 1 channel, up to 2 Mbps sample rate, 8-/10-/12-bit resolution<br>LRADC: Up to 6 channels, 12-bit resolution |                        |
| GPIO                             | Up to 128 GPIOs, selectable voltage (1.8/3.3V), interrupt capable                                                        |                        |

## SPECIFICATIONS

## ConnectCard™ i.MX28

## | ConnectCard™ Wi-i.MX28

## DISPLAY

|                        |                  |
|------------------------|------------------|
| RESOLUTION             | 800x480 (WVGA)   |
| REFRESH RATE           | Up to 60 Hz      |
| COLOR DEPTH            | 8/16/24 bpp      |
| MODES                  | RGB/DOTCK/SYSTEM |
| COLOR SPACE CONVERSION | Yes              |
| SCALING                | Yes              |
| ROTATION               | Yes              |

## TOUCH SCREEN

|                         |                   |
|-------------------------|-------------------|
| TOUCH SCREEN CONTROLLER | 4-/5-wire (LRADC) |
|-------------------------|-------------------|

## ETHERNET

|                |                                   |
|----------------|-----------------------------------|
| PHYSICAL LAYER | 10/100Base-T                      |
| DATA RATES     | 10/100 Mbps, auto-sensing         |
| DUPLEX MODE    | Full or half duplex, auto-sensing |
| IEEE 1588      | Yes (i.MX287 only)                |

## POWER OVER ETHERNET (802.3AF)

|                     |                                                                           |
|---------------------|---------------------------------------------------------------------------|
| POWER OVER ETHERNET | Development board ready for 802.3af PoE application kit (sold separately) |
|---------------------|---------------------------------------------------------------------------|

WI-FI<sup>2</sup>

|                          |     |                                                                                                                                                   |
|--------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 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; 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: 15, 30, 45, 60, 90, 120, 135, 150 Mbps<br>(HT40, MCS 0-7) |
| MODULATION               | N/A | DBPSK, DQPSK, CCK, BPSK, QPSK, 16-QAM, 64-QAM                                                                                                     |
| TRANSMIT POWER (±2 DBM)  | N/A | 802.11b: 17 dBm typical<br>802.11g/n: 15 dBm typical<br>802.11a/n: 12 dBm typical                                                                 |
| SECURITY                 | N/A | WEP, WPA-PSK/WPA2-Personal, WPA/WPA2 Enterprise, 802.11i                                                                                          |
| WI-FI LOGO CERTIFICATION | N/A | Ready                                                                                                                                             |
| CCXV4 ASD                | N/A | Ready                                                                                                                                             |

BLUETOOTH<sup>2</sup>

|             |     |                                                                                          |
|-------------|-----|------------------------------------------------------------------------------------------|
| MODES       | N/A | Bluetooth 4.0 (Bluetooth 2.1 + EDR, Bluetooth 3.0 + HS 802.11 AMP, Bluetooth Low Energy) |
| CLASS       | N/A | 1.5                                                                                      |
| PROFILES    | N/A | GAP, SPP, HSP, HFP, FTP, PAN, OPP, HID, A2DP, AVRCP, HDP                                 |
| COEXISTENCE | N/A | Yes                                                                                      |

## SPECIFICATIONS

## ConnectCard™ i.MX28

## | ConnectCard™ Wi-i.MX28

## POWER REQUIREMENTS (USE-CASE ESTIMATES)

|                                                        |             |
|--------------------------------------------------------|-------------|
| WI-FI 2.4 GHZ TRANSMIT, CPU 454 MHZ @ 50%, UART ACTIVE | 406 mA @ 5V |
| WI-FI 2.4 GHZ RECEIVE, CPU IDLE (AUTO SLOW)            | 100 mA @ 5V |
| WI-FI STANDBY (SLEEP), CPU STANDBY (IRQ)               | 8 mA @ 5V   |
| WI-FI STANDBY (HOST OFF), CPU DEEP SLEEP (RTC)         | 112 µA @ 5V |

MODULE VARIANTS<sup>1</sup>

## POPULATION OPTIONS

Processor models (i.MX280, i.MX281, i.MX283, i.MX285, i.MX286, i.MX287), flash, RAM, Single 10/100 Ethernet, dual 10/100 Ethernet w/1588, 802.11a/b/g/n Wi-Fi with Bluetooth 4.0, 1-Wire, LCD connector, CAN bus

## MECHANICAL

|                                               |                                                |                      |
|-----------------------------------------------|------------------------------------------------|----------------------|
| DIMENSIONS (L X W X H) W/O JTAG/LCD CONNECTOR | 51 mm x 35 mm x 2.6 mm                         | 51 mm x 35 mm x 3 mm |
| MATING CONNECTOR FOR MODULE                   | Molex, P/N 67910-5700; Tyco, P/N 2041119-x     |                      |
| RETAINING CLIP FOR MODULE (OPTIONAL)          | Molex, P/N 480995701; Tyco, P/N 1717832        |                      |
| JTAG/LCD CONNECTOR ON MODULE (OPTIONAL)       | FCI, P/N SFV31R-1STE1LF; Tyco, P/N 3-1734839-1 |                      |

## ENVIRONMENTAL

|                       |                                                                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OPERATING TEMPERATURE | -40° C up to +85° C (-40° F to +185° F) Upper temperature ceilings may require active and/or passive thermal management such as lower clock speed, thermal pads, airflow, etc. |
| STORAGE TEMPERATURE   | -40° C up to +85° C (-40° F to +185° F)                                                                                                                                        |
| RELATIVE HUMIDITY     | 5% to 90% (non-condensing)                                                                                                                                                     |

## APPROVALS AND CERTIFICATIONS

|                 |                                                                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMISSIONS       | FCC Part 15 Class B, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, ICES-003 Class B, VCCI Class II, AS 3548, FCC Part 15 Subpart C Section 15.247, IC (Industry Canada), RSS-210 Issue 5 Section 6.2.2(o), EN 300 328, EN 301 489-17 |
| IMMUNITY        | EN 55024, EN 301 489-3                                                                                                                                                                                                               |
| SAFETY          | UL/UR, or equivalent                                                                                                                                                                                                                 |
| RADIO           | US, Canada, EU, Japan, Australia/New Zealand                                                                                                                                                                                         |
| TEMPERATURE     | IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-78                                                                                                                                                                                         |
| VIBRATION/SHOCK | IEC 60068-2-6, IEC 60068-2-64, IEC 60068-2-27                                                                                                                                                                                        |
| DESIGN TEST     | HALT                                                                                                                                                                                                                                 |

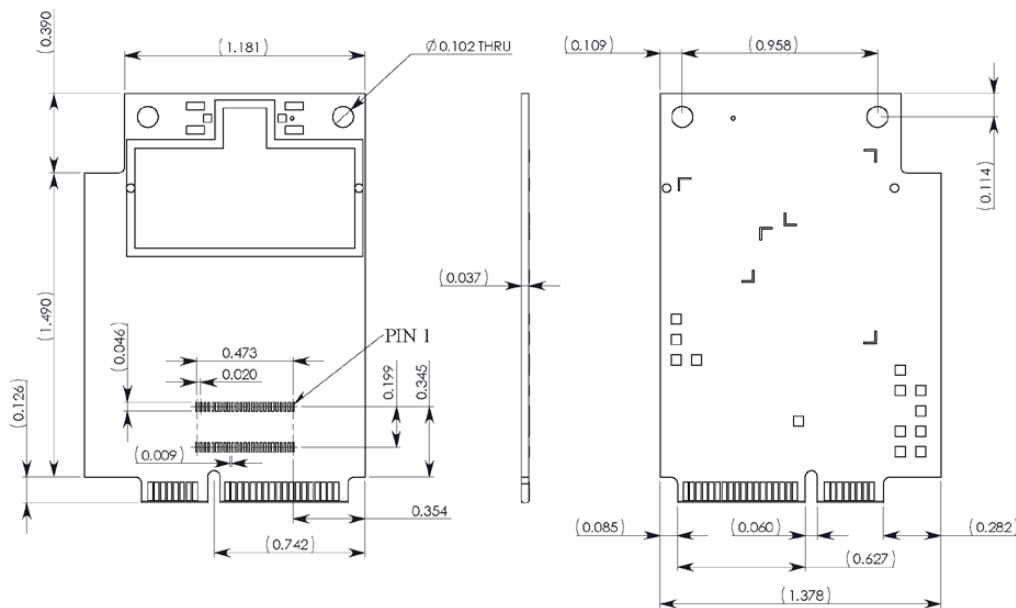
## WARRANTY

|                  |         |
|------------------|---------|
| PRODUCT WARRANTY | 3 years |
|------------------|---------|

<sup>1</sup> All options available on development module. Production modules may require custom variants. Contact your local distributor or Digi sales office for details.

<sup>2</sup> Transmit power and channel availability depending on regulatory requirements and corresponding module variants.

## PRODUCT DIMENSIONS



| PART NUMBERS   | DESCRIPTION                                                                                                                                              |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>KITS</b>    |                                                                                                                                                          |
| CC-ACC-LCDW-70 | 7" WGA LCD application kit w/resistive touch screen for ConnectCore for i.MX51/i.MX53 and ConnectCard for i.MX28 family                                  |
| <b>MODULES</b> |                                                                                                                                                          |
| CC-WMX-PF47-VM | ConnectCard for i.MX28 module, i.MX287, 454 MHz, up to 85°C, 128 MB flash, 128 MB DDR2, 802.11abgn, Ethernet, LCD                                        |
| CC-WMX-PF58-JT | ConnectCard for i.MX28 module, i.MX287, 454 MHz, up to 85°C, 256 MB flash, 256 MB DDR2, 802.11a/b/g/n, Bluetooth 4.0, dual Ethernet, LCD                 |
| CC-WMX-PF58-QK | ConnectCard for i.MX28 module, i.MX287, 454 MHz, up to 85°C, 256 MB flash, 256 MB DDR2, 802.11a/b/g/n, Bluetooth 4.0, dual Ethernet, LCD (International) |
| CC-MX-PF47-ZK  | ConnectCore for i.MX28 module, i.MX287, 454 MHz, up to 85°C, 128 MB flash, 128 MB DDR2, dual Ethernet, LCD                                               |
| CC-MX-PF58-ZK  | ConnectCore for i.MX28 module, i.MX287, 454 MHz, up to 85°C, 256 MB flash, 256 MB DDR2, dual Ethernet, LCD                                               |
| CC-WMX-PE47-JT | ConnectCard for i.MX28 module, i.MX280, 454 MHz, up to 85°C, 128 MB flash, 128 MB DDR2, 802.11abgn, Ethernet                                             |

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Электрон  
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**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331