

# ConnectCore<sup>®</sup> 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<sup>®</sup> i.MX515 application processor, which offers a high-performance ARM<sup>®</sup> Cortex<sup>™</sup>-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<sup>®</sup> Windows<sup>®</sup> Embedded CE 6.0, Windows Compact 7 and Digi<sup>®</sup> 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<sup>®</sup> allow immediate and professional embedded product development with dramatically reduced design risk and time-to-market.

### Related Items



Design Services



Accessory Kits

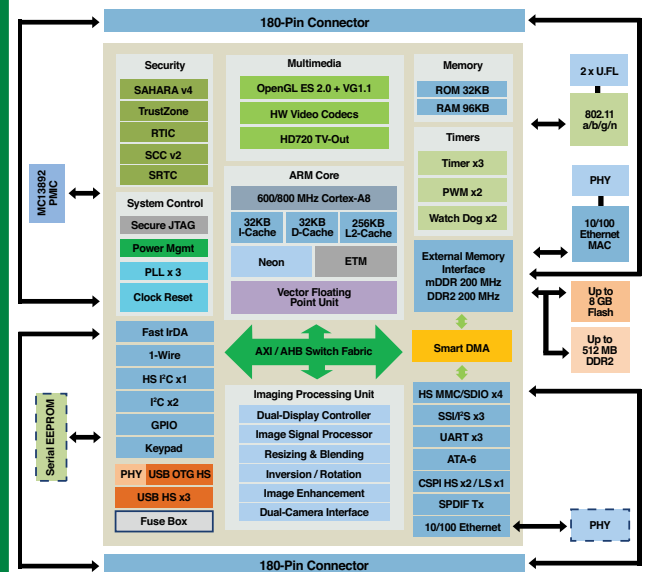


Support



Supported Software Platforms

## 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<sup>®</sup>, cellular and satellite connectivity options
- Windows Embedded and Linux 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.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



## Development Kits

| Software Platform        | Digi Embedded Linux                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Microsoft Windows Embedded                                                                                                                                                                                                                                         |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module</b>            | 800 MHz ConnectCore Wi-i.MX51 with 512 MB NAND flash, 512 MB DDR2, dual Ethernet, accelerometer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                    |
| <b>Development Board</b> | 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 <sup>2</sup> 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, 9-30VDC power supply, power switch |                                                                                                                                                                                                                                                                    |
| <b>CD/DVD</b>            | 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 |
| <b>Documentation</b>     | 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                                                                                                                                                           |
| <b>Accessories</b>       | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                    |
| <b>Part Numbers</b>      | CC-WMX51-LX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CC-WMX51-CE                                                                                                                                                                                                                                                        |

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                 | •                                                                                                                      |                     |                        |
| 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<br>RSA, ECC<br>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<br>2 input capture channels<br>3 output compare channels, forced compare |                     |                        |
| Enhanced Periodic Interrupt Timer     | 32-bit down-counter with clock source selection<br>Set-and-forget/free-running modes<br>Precision interrupt generation |                     |                        |
| Watchdog                              | •                                                                                                                      |                     |                        |

●●Module Feature

| Specifications                 |                                                                                                                                                                                                                                                                                                                                                   | ConnectCore® i.MX51 | ConnectCore® Wi-i.MX51 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------|
| 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<br>Bit rate up to 25 Mbps (master)                                                                                                                                                                                                                                                                                          |                     |                        |
| eCSPI                          | Up to 2 eCSPI channels, master and slave mode<br>Bit rates up to 66.5 Mbps (master)                                                                                                                                                                                                                                                               |                     |                        |
| I <sup>2</sup> C               | Up to 3 channels, master/slave (7-/10-bit addressing)<br>All: Standard (100 kbps) and fast (400 kbps) mode                                                                                                                                                                                                                                        |                     |                        |
| SD/SDIO/MMC                    | Up to 4 ports, 1-/4-/8-bit modes<br>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<br>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)<br>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<br>16-bit or 32-bit data/28-bit address in multiplexed address/data mode                                                                                                                                                                                                          |                     |                        |
| Multimedia                     |                                                                                                                                                                                                                                                                                                                                                   |                     |                        |
| Camera                         | 2 camera ports<br>Bayer RGB, Full RGB, YUV 4:4:4, YUV 4:2:2, Gray scale, Generic data<br>Parallel interface (up to 522 Mbps) or fast serial interface (up to 1.44 Gbps)<br>Fast serial: Up to 6M pixels @ 15 fps (Bayer), Parallel: Up to 8M pixels @ 15 fps (Bayer)<br>Window-of-interest selection, frame rate reduction, color depth reduction |                     |                        |
| Display                        | Primary and secondary display support / TV out (SD/HD)<br>Up to 24 bit color depth, software contrast control<br>Up to XGA (1024x768) @ 100 fps/720p (1280x720) @ 60 fps/1080i (1920x1080) @ 30 fps<br>3-/4-/5-wire serial interface, parallel, parallel bidirectional, DSI (4 lanes/4 channels)                                                  |                     |                        |
| Image Processing Unit          | Image enhancements, video/graphics combining, resizing,<br>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<br>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 <sup>2</sup> 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



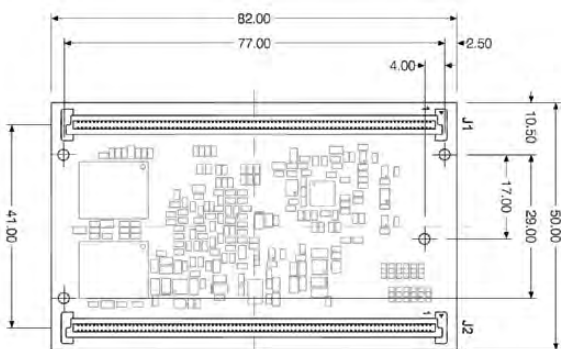
| Specifications                         |                                                                           | ConnectCore® i.MX51                                          | ConnectCore® Wi-i.MX51 |
|----------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------|------------------------|
| 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<br>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 <sup>1</sup>                   | 700 mA @ 3.75V                                                            |                                                              |                        |
| Idle <sup>1</sup>                      | 200 mA @ 3.75V                                                            |                                                              |                        |
| Module Population Options <sup>2</sup> |                                                                           |                                                              |                        |
| Processor Speed Grade                  | •                                                                         |                                                              |                        |
| Memory (Flash/RAM)                     | •                                                                         |                                                              |                        |
| Network Interfaces                     | Single 10/100 Ethernet, dual 10/100 Ethernet, 802.11a/b/g/n WLAN          |                                                              |                        |

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

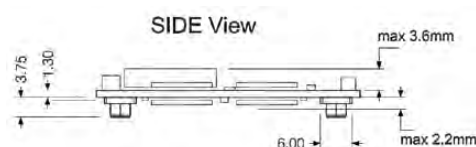
<sup>2</sup> Contact your local distributor or Digi sales office for details.

| Specifications                      |                                                                                                                                                                         | ConnectCore® i.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<br>(Mating connector FCI P/N 61083-184409LF or similar)                                                             |                     |                        |
| Environmental                       |                                                                                                                                                                         |                     |                        |
| Operating Temperature               | -40° C to +85° C (600 MHz)<br>-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)                                                                                                                                              |                     |                        |
| 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),<br>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                 | •                                                                                                                                                                       |                     |                        |
| 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



SIDE View



You can purchase with confidence knowing that Digi is always available to serve you with expert technical support and our industry leading warranty. For detailed information visit [www.digi.com/support](http://www.digi.com/support)

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Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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