



Welcome to [E-XFL.COM](http://E-XFL.COM)

### Understanding [Embedded - Microcontroller, Microprocessor, FPGA Modules](#)

Embedded - Microcontroller, Microprocessor, and FPGA Modules are fundamental components in modern electronic systems, offering a wide range of functionalities and capabilities. Microcontrollers are compact integrated circuits designed to execute specific control tasks within an embedded system. They typically include a processor, memory, and input/output peripherals on a single chip. Microprocessors, on the other hand, are more powerful processing units used in complex computing tasks, often requiring external memory and peripherals. FPGAs (Field Programmable Gate Arrays) are highly flexible devices that can be configured by the user to perform specific logic functions, making them invaluable in applications requiring customization and adaptability.

### Applications of [Embedded - Microcontroller,](#)

#### Details

|                       |   |
|-----------------------|---|
| Product Status        | Obsolete  |
| Module/Board Type     | MCU, Ethernet Core  |
| Core Processor        | ColdFire 5282   |
| Co-Processor          | -   |
| Speed                 | 66MHz   |
| Flash Size            | 512KB   |
| RAM Size              | 8.064MB   |
| Connector Type        | RJ-45, 2x50 Header  |
| Size / Dimension      | 2.6" x 2" (66.04mm x 50.8mm)  |
| Operating Temperature | 0°C ~ 70°C  |
| Purchase URL          | <a href="https://www.e-xfl.com/product-detail/netburner/mod5282-100">https://www.e-xfl.com/product-detail/netburner/mod5282-100</a> |

# MOD5282

## Ethernet Core Module

100 Version with RJ-45 | 200 version with 10-pin header



# DATASHEET

### Key Points

- Use as a high-performance single board computer or add Ethernet connectivity to a new or existing design
- Customize with a development kit and begin writing application code immediately!
- Industrial temperature range (-40°C to 85°C)

### Device Connectivity

- 10/100Mbps Ethernet
- 3 UARTs, I<sup>2</sup>C, CAN and SPI
- SD/MMC flash card ready
- 50 digital I/Os
- Eight 10-bit analog-to-digital converters (ADC)
- 16-bit address and data bus with 3 chip selects

### Performance and memory

- 32-bit 66 MHz Processor
- 8MB SDRAM and 512KB Flash

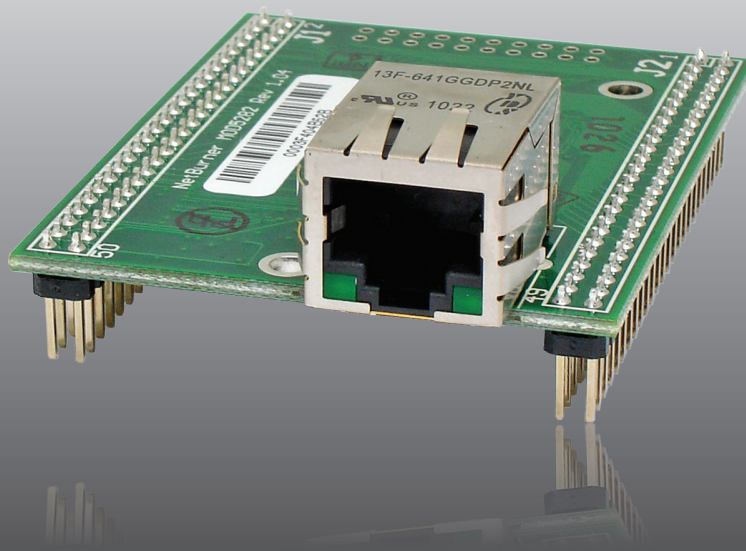
### Companion development kit

*The following is available with the development kit:*

- Customize any aspect of operation including web pages, data filtering, or custom network applications
- Development software: NB Eclipse IDE, Graphical debugger, deployment tools, and examples
- Communication software: TCP/IP stack, HTTP web server, FTP, E-mail, and flash file system
- System software: uC/OS RTOS, ANSI C/C++ compiler and linker

*The following optional software modules are not included with kit and are sold separately:*

- SNMP



## Specifications

### Processor and Memory

32-bit Freescale ColdFire 5282 running at 66MHz with 8MB SDRAM, 512KB Flash, and 64Kb SRAM.

### Network Interface

10/100 BaseT with RJ-45 connector (100 Version)

10-pin header (200 Version)

### Data I/O Interface (J1 and J2)

- Up to 3 UARTs
- Up to 50 digital I/O
- Up to 6 PWM outputs ( via general purpose timers)
- Up to eight 10-bit analog-to-digital converters (ADC) with an input range of 0 - 5V
- 16-bit address bus and 16-bit data bus with 3 chip selects
- Up to 4 external timer in and up to 4 timer outputs
- Up to 8 external general purpose timers
- Up to 4 external IRQs
- I<sup>2</sup>C interface
- SPI interface
- CAN interface
- SD/MMC flash card ready

### Flash Card Support

FAT32 support for SD Cards up to 8GB (requires exclusive use of SPI signals). Card types include SD/MMC (up to 2GB) and SDHC.

### Serial Configurations

The UARTs can be configured in the following way:

- 3 TTL ports
- Add external level shifter for RS-232
- Add external level shifter for RS-422/485 (up to two ports)

Note: UART 0/1 also provides RTS/CTS hardware handshaking signals.

### LEDs

Link and Speed (100 Version only, on RJ-45)

### Physical Characteristics

Dimensions (inches): 2.60" x 2.00"

Weight: 1 oz.

Mounting Holes: 2 x 0.125" dia.

### Power

DC Input Voltage (with Ethernet):

3.3V @ 380mA typical

3.3V @ 630mA max

### Environmental Operating Temperature

-40° to 85° C

### RoHS Compliance

The Restriction of Hazardous Substances guidelines ensure that electronics are manufactured with fewer environment harming materials.

## Part Numbers

### **MOD5282 Ethernet Core Module (100 Version, with RJ-45)**

Part Number: MOD5282-100IR

### **MOD5282 Ethernet Core Module (200 Version, with 10-pin header)**

Part Number: MOD5282-200IR

### **MOD5282 Development Kit**

Part Number: NNDK-MOD5282-KIT

Kit includes all the hardware and software you need to customize the included platform hardware. See NetBurner Store product page for package contents. Note: Includes the MOD-DEV-100 development board.

### **SNMP V1 (Module License Version)**

Part Number: NBLIC-SNMP

Available as an option if you are using a development kit.

## Ordering Information

E-mail: [sales@netburner.com](mailto:sales@netburner.com)

Online Store: [www.Netburner.com](http://www.Netburner.com)

Telephone: 1-800-695-6828

## Pinout and Signal Description

The 200 version board has a 10-pin header instead of an RJ-45 jack. This header enables you to relocate the jack to another location or to add a different jack with power over ethernet (PoE) capabilities to your module. Table 1 provides descriptions of pin function of the 10-pin header.

Table 1: Pinout and Signal Descriptions for JP2 Header <sup>(1)</sup>

| Pin | Signal           | Description   |
|-----|------------------|---------------|
| 1   | TX-              | Transmit -    |
| 2   | TX+              | Transmit +    |
| 3   | VCC <sup>1</sup> | 2.5V          |
| 4   | RX+              | Recieve +     |
| 5   | RX-              | Recieve -     |
| 6   | VCC <sup>1</sup> | 2.5V          |
| 7   | GND              | Ground        |
| 8   | N/C              | Not Connected |
| 9   | LED              | Link LED      |
| 10  | LED              | Speed LED     |

**Note:**

1. The 2.5V pins are used for the magnetics taps and LED power.

The module has two dual in-line 50 pin headers which enable you to connect to one of our standard NetBurner Carrier Boards, or a board you create on your own. Table 2-3 provides descriptions of pin function of the module header.

Table 2: Pinout and Signal Descriptions for J1 Connector <sup>(1)</sup>

| J1 Connector |         |                  |            |                     |   |             |
|--------------|---------|------------------|------------|---------------------|---|-------------|
| Pin          | CPU Pin | Function 1       | Function 2 | General Purpose I/O | Description   | Max Voltage |
| 1            |         | GND              |            |                     | Ground  | -           |
| 2            |         | GND              |            |                     | Ground  | -           |
| 3            |         | VCC3V            |            |                     | Input Power 3.3V  | 3.3VDC      |
| 4            | N15     | R/W              |            | PE4                 | Read / NOT Write <sup>1</sup>   | 3.3VDC      |
| 5            | L14     | $\overline{CS1}$ |            | PJ1                 | Chip Select 1 <sup>1</sup>  | 3.3VDC      |
| 6            | L15     | $\overline{CS2}$ |            | PJ2                 | Chip Select 2 <sup>1</sup>  | 3.3VDC      |
| 7            | L16     | $\overline{CS3}$ |            | PJ3                 | Chip Select 3 <sup>1</sup>  | 3.3VDC      |
| 8            | N16     | $\overline{OE}$  |            | PE7                 | Output Enable <sup>1</sup>  | 3.3VDC      |
| 9            | T15     | $\overline{BS2}$ |            |                     | Byte Strobe for D16 to D23 (8 bits) <sup>1</sup>                      | 3.3VDC      |
| 10           | P14     | $\overline{BS3}$ |            |                     | Byte Strobe for D24 to D31 (8 bits) <sup>1</sup>                      | 3.3VDC      |
| 11           | M14     | $\overline{TIP}$ | SYNCB      | PE0                 | Transfer in Progress <sup>1</sup> or GP Timer B Synchronization Input | 3.3VDC      |
| 12           | K3      | D16              |            |                     | Data Bus - Data 16  | 3.3VDC      |
| 13           | P16     | $\overline{TA}$  |            | PE6                 | Transfer Acknowledge <sup>1</sup>                                     | 3.3VDC      |
| 14           | K1      | D18              |            |                     | Data Bus - Data 18  | 3.3VDC      |
| 15           | K2      | D17              |            |                     | Data Bus - Data 17  | 3.3VDC      |
| 16           | J3      | D20              |            |                     | Data Bus - Data 20  | 3.3VDC      |
| 17           | J4      | D19              |            |                     | Data Bus - Data 19  | 3.3VDC      |
| 18           | J1      | D22              |            |                     | Data Bus - Data 22  | 3.3VDC      |
| 19           | J2      | D21              |            |                     | Data Bus - Data 21  | 3.3VDC      |
| 20           | H3      | D24              |            |                     | Data Bus - Data 24  | 3.3VDC      |
| 21           | H4      | D23              |            |                     | Data Bus - Data 23  | 3.3VDC      |
| 22           | H1      | D26              |            |                     | Data Bus - Data 26  | 3.3VDC      |
| 23           | H2      | D25              |            |                     | Data Bus - Data 25  | 3.3VDC      |
| 24           | G3      | D28              |            |                     | Data Bus - Data 28  | 3.3VDC      |
| 25           | G4      | D27              |            |                     | Data Bus - Data 27  | 3.3VDC      |

**Note:**

- Active low signals, such as  $\overline{RESET}$ , are indicated with an overbar.

| J1 Connector (continued) |         |                            |                     |                                     |             |
|--------------------------|---------|----------------------------|---------------------|-------------------------------------|-------------|
| Pin                      | CPU Pin | Function                   | General Purpose I/O | Description                         | Max Voltage |
| 26                       | G1      | D30                        |                     | Data Bus - Data 30                  | 3.3VDC      |
| 27                       | G2      | D29                        |                     | Data Bus - Data 29                  | 3.3VDC      |
| 28                       | R11     | $\overline{\text{RESET}}$  |                     | Processor Reset Input <sup>1</sup>  | 3.3VDC      |
| 29                       | F3      | D31                        |                     | Data Bus - Data 31                  | 3.3VDC      |
| 30                       | P11     | $\overline{\text{RSTOUT}}$ |                     | Processor Reset Output <sup>1</sup> | 3.3VDC      |
| 31                       | N7      | CLK_OUT                    |                     | Clock Out (CLKOUT-66.355 Mhz)       | 3.3VDC      |
| 32                       | F2      | A0                         |                     | Data Bus - Address 0                | 3.3VDC      |
| 33                       | F1      | A1                         |                     | Data Bus - Address 1                | 3.3VDC      |
| 34                       | E4      | A2                         |                     | Data Bus - Address 2                | 3.3VDC      |
| 35                       | E3      | A3                         |                     | Data Bus - Address 3                | 3.3VDC      |
| 36                       | E2      | A4                         |                     | Data Bus - Address 4                | 3.3VDC      |
| 37                       | E1      | A5                         |                     | Data Bus - Address 5                | 3.3VDC      |
| 38                       | D4      | A6                         |                     | Data Bus - Address 6                | 3.3VDC      |
| 39                       | D3      | A7                         |                     | Data Bus - Address 7                | 3.3VDC      |
| 40                       | D2      | A8                         |                     | Data Bus - Address 8                | 3.3VDC      |
| 41                       | D1      | A9                         |                     | Data Bus - Address 9                | 3.3VDC      |
| 42                       | C3      | A10                        |                     | Data Bus - Address 10               | 3.3VDC      |
| 43                       | C2      | A11                        |                     | Data Bus - Address 11               | 3.3VDC      |
| 44                       | C1      | A12                        |                     | Data Bus - Address 12               | 3.3VDC      |
| 45                       | B2      | A13                        |                     | Data Bus - Address 13               | 3.3VDC      |
| 46                       | B1      | A14                        |                     | Data Bus - Address 14               | 3.3VDC      |
| 47                       | A2      | A15                        |                     | Data Bus - Address 15               | 3.3VDC      |
| 48                       |         | VCC3V                      |                     | Input power 3.3V                    | 3.3VDC      |
| 49                       |         | GND                        |                     | Ground                              | -           |
| 50                       |         | GND                        |                     | Ground                              | -           |

**Note:**

1. Active low signals, such as  $\overline{\text{RESET}}$ , are indicated with an overbar.

Table 3: Pinout and Signal Descriptions for J2 Connector <sup>(1)</sup>

| J2 Connector |         |            |            |            |                     |                                      |             |
|--------------|---------|------------|------------|------------|---------------------|--------------------------------------|-------------|
| Pin          | CPU Pin | Function 1 | Function 2 | Function 3 | General Purpose I/O | Description                          | Max Voltage |
| 1            |         | GND        |            |            |                     | Ground                               | -           |
| 2            |         | VCC3V      |            |            |                     | Input power 3.3V                     | 3.3VDC      |
| 3            | N6      | UART0_RX   |            |            | PUA1                | UART 0 Receive <sup>4</sup>          | 3.3VDC      |
| 4            | T7      | UART0_TX   |            |            | PUA0                | UART 0 Transmit <sup>4</sup>         | 3.3VDC      |
| 5            |         | ADVCC      |            |            |                     | ADVCC                                | 5V          |
| 6            | R1      | ADC_IN3    |            |            | PQB3                | Analog to Digital Converter Input 3  | 5V          |
| 7            | R2      | ADC_IN1    |            |            | PQB1                | Analog to Digital Converter Input 1  | 5V          |
| 8            | T2      | ADC_IN2    |            |            | PQB2                | Analog to Digital Converter Input 2  | 5V          |
| 9            | R3      | ADC_IN56   |            |            | PQA4                | Analog to Digital Converter Input 56 | 5V          |
| 10           | T3      | ADC_IN0    |            |            | PQB0                | Analog to Digital Converter Input 0  | 5V          |
| 11           | T4      | ADC_IN53   |            |            | PQA1                | Analog to Digital Converter Input 53 | 5V          |
| 12           | R4      | ADC_IN52   |            |            | PQA0                | Analog to Digital Converter Input 52 | 5V          |
| 13           | P3      | ADC_IN55   |            |            | PQA3                | Analog to Digital Converter Input 55 | 5V          |
| 14           |         | GND        |            |            |                     | Ground                               | -           |
| 15           | T13     | GPTA3      |            |            | PTA3                | General Purpose Timer A3             | 3.3VDC      |
| 16           | T12     | GPTB3      |            |            | PTB3                | General Purpose Timer B3             | 3.3VDC      |
| 17           | R13     | GPTA2      |            |            | PTA2                | General Purpose Timer A2             | 3.3VDC      |
| 18           | R12     | GPTB2      |            |            | PTN2                | General Purpose Timer B2             | 3.3VDC      |
| 19           | P13     | GPTA1      |            |            | PTA1                | General Purpose Timer A1             | 3.3VDC      |
| 20           | P12     | GPTB1      |            |            | PTB1                | General Purpose Timer B1             | 3.3VDC      |
| 21           | R7      | UART1_RX   |            |            | PUA3                | UART 1 Receive <sup>4</sup>          | 3.3VDC      |
| 22           | P7      | UART1_TX   |            |            | PUA1                | UART 1 Transmit <sup>4</sup>         | 3.3VDC      |
| 23           | N13     | GPTA0      |            |            | PTA0                | General Purpose Timer A0             | 3.3VDC      |
| 24           | N12     | GPTB0      |            |            | PTB0                | General Purpose Timer B0             | 3.3VDC      |
| 25           | F14     | SPI_CLK    |            |            | PQS2                | SPI Clock                            | 3.3VDC      |

Note:

1. Active low signals, such as  $\overline{\text{RESET}}$ , are indicated with an overbar.
2. If using I<sup>2</sup>C, pull-up resistors must be added to SDA/SCL.
3. The third UART (UART2) can be routed to either of the two pin configurations: replacing CAN RX and TX, or I<sup>2</sup>C SDA and SCL.
4. TIN0, TIN1 and TIN2 can be used as external baud rate clocks for UART0, UART1 and UART2



| J2 Connector (continued) |         |                              |                                |                                |                     |  |             |
|--------------------------|---------|------------------------------|--------------------------------|--------------------------------|---------------------|--|-------------|
| Pin                      | CPU Pin | Function 1                   | Function 2                     | Function 3                     | General Purpose I/O | Description  | Max Voltage |
| 26                       | G14     | $\overline{\text{SPI\_CS3}}$ |                                |                                | PQS6                | SPI Chip Select 3  | 3.3VDC      |
| 27                       | E16     | SPI_DIN                      |                                |                                | PQS1                | SPI Data In  | 3.3VDC      |
| 28                       | F13     | SPI_DOUT                     |                                |                                | PQS0                | SPI Data Out   | 3.3VDC      |
| 29                       | K14     | T2IN                         | $\overline{\text{UART1\_CTS}}$ | $\overline{\text{UART0\_CTS}}$ | PTC1                | Timer 2 <sup>4</sup> Input or UART 1 Clear to Send <sup>4</sup> or UART 0 Clear to Send <sup>4</sup>         | 3.3VDC      |
| 30                       | F15     | SPI_CS0                      |                                |                                | PQS3                | SPI Chip Select 0  | 3.3VDC      |
| 31                       | J14     | T0IN                         | $\overline{\text{UART1\_CTS}}$ | $\overline{\text{UART0\_CTS}}$ | PTD1                | Timer 0 <sup>4</sup> Input or UART 1 Clear to Send <sup>1,4</sup> or UART 0 Clear to Send <sup>1,4</sup>     | 3.3VDC      |
| 32                       | K15     | T3OUT                        | $\overline{\text{UART1\_RTS}}$ | $\overline{\text{UART0\_RTS}}$ | PTC2                | Timer 3 Output or UART 1 Request to Send <sup>1,4</sup> or UART 0 Request to Send <sup>1,4</sup>             | 3.3VDC      |
| 33                       | K13     | T2OUT                        | $\overline{\text{UART1\_CTS}}$ | $\overline{\text{UART0\_CTS}}$ | PTC0                | Timer 2 Output or UART 1 Clear to Send <sup>1,4</sup> or UART 0 Clear to Send <sup>1,4</sup>                 | 3.3VDC      |
| 34                       | J15     | T1OUT                        | $\overline{\text{UART1\_RTS}}$ | $\overline{\text{UART0\_RTS}}$ | PTD2                | Timer 1 Output or UART 1 Request to Send <sup>1,4</sup> or UART 0 Request to Send <sup>1,4</sup>             | 3.3VDC      |
| 35                       | G13     | SPI_CS2                      |                                |                                | PQS5                | SPI Chip Select 2  | 3.3VDC      |
| 36                       | J13     | T0OUT                        | $\overline{\text{UART1\_CTS}}$ | $\overline{\text{UART0\_CTS}}$ | PTD0                | Timer 0 Output or UART 1 Clear to Send <sup>1,4</sup> or UART 0 Clear to Send <sup>1,4</sup>                 | 3.3VDC      |
| 37                       | J16     | T1IN                         | $\overline{\text{UART1\_RTS}}$ | $\overline{\text{UART0\_RTS}}$ | PTD3                | Timer 1 <sup>4</sup> Input or UART 1 Request to Send <sup>1,4</sup> or UART 0 Request to Send <sup>1,4</sup> | 3.3VDC      |
| 38                       | K16     | T3IN                         | $\overline{\text{UART1\_RTS}}$ | $\overline{\text{UART0\_RTS}}$ | PTC3                | Timer 3 Input or UART 1 Request to Send <sup>1,4</sup> or UART 0 Request to Send <sup>1,4</sup>              | 3.3VDC      |
| 39                       | E14     | I2C_SDA                      | UART2_RX                       |                                | PAS1                | I <sup>2</sup> C Serial Data <sup>2</sup> or UART 2 Receive <sup>3,4</sup>                                   | 3.3VDC      |
| 40                       | F16     | SPI_CS1                      |                                |                                | PQS4                | SPI Chip Select 1  | 3.3VDC      |
| 41                       | D16     | CAN_RX                       | UART2_RX                       |                                | PAS3                | CAN Receive or UART 2 Receive <sup>3,4</sup>   | 3.3VDC      |
| 42                       | E15     | I2C_SCL                      | UART2_TX                       |                                | PAS0                | I <sup>2</sup> C Serial Clock <sup>2</sup> or UART 2 Transmit <sup>3,4</sup>                                 | 3.3VDC      |
| 43                       | D15     | $\overline{\text{IRQ1}}$     |                                |                                | PNQ1                | External Interrupt 1 <sup>1</sup>  | 3.3VDC      |
| 44                       | E13     | CAN_TX                       | UART2_TX                       |                                | PAS2                | CAN Transmit or UART 2 Transmit <sup>3,4</sup>   | 3.3VDC      |
| 45                       | C16     | $\overline{\text{IRQ3}}$     |                                |                                | PNQ3                | External Interrupt 3 <sup>1</sup>  | 3.3VDC      |
| 46                       |         | GND                          |                                |                                |                     | Ground   | 3.3VDC      |
| 47                       | C14     | $\overline{\text{IRQ5}}$     |                                |                                | PNQ5                | External Interrupt 5 <sup>1</sup>  | 3.3VDC      |
| 48                       | B15     | $\overline{\text{IRQ7}}$     |                                |                                | PNQ7                | External Interrupt 7 <sup>1</sup>  | 3.3VDC      |
| 49                       |         | GND                          |                                |                                |                     | Ground   | -           |
| 50                       |         | VCC3V                        |                                |                                |                     | Input power 3.3V   | 3.3VDC      |

Note:

- Active low signals, such as  $\overline{\text{RESET}}$ , are indicated with an overbar.
- If using I<sup>2</sup>C, pull-up resistors must be added to SDA/SCL.
- The third UART (UART2) can be routed to either of the two pin configurations: replacing CAN RX and TX, or I<sup>2</sup>C SDA and SCL.
- TIN0, TIN1 and TIN2 can be used as external baud rate clocks for UART0, UART1 and UART2