

# NAN054415

## Ethernet Core Module

200 Version



# DATASHEET

### Key points

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

### Device connectivity

- 10/100Mbps Ethernet
- 8 UARTs, 4 I<sup>2</sup>C, 2 CAN, 3 SPI, and 1-Wire® support
- SD/MMC and MicroSD flash card ready
- 30 digital I/Os
- Six 12-bit analog-to-digital converters (ADC)
- Two 12-bit digital-to-analog converters (DAC)
- Eight pulse width modulators (PWM)

### Performance and memory

- 32-bit 250 MHz processor
- 64MB DDR2 RAM and 8MB Flash

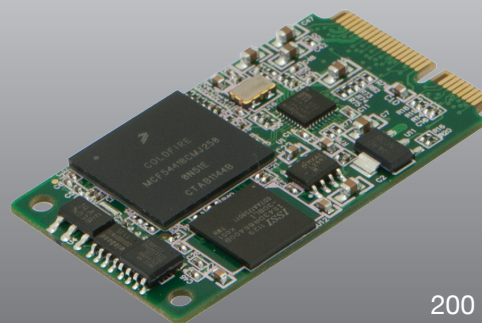
### Companion development kit

*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:*

- Embedded SSL & SSH Security Suite (Module License Version)
- SNMP



200 Version  
with Mini PCI express connector

## Specifications

### Processor and Memory

32-bit Freescale ColdFire 54415 CPU running at 250MHz with 64MB DDR2 RAM and 8MB Flash

### Network Interface

10/100 BaseT

### Data I/O Interface (P1)

- Up to 8 UARTs
- Up to 4 I<sup>2</sup>C
- Up to 2 CAN 2.0b controllers
- Up to 3 SPI
- Up to 30 digital I/O
- Up to six 12-bit analog-to-digital converters (ADC)
- Up to two 12-bit digital-to-analog converters (DAC)
- Up to 8 pulse width modulators (PWM)
- Up to 4 external timer in or outputs
- MicroSD flash card ready
- 1-Wire® interface

### 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:

- Up to 8 TTL ports
- Add external level shifter for RS-232
- Add external level shifter for RS-422/485 (up to three ports)

Note: UART 0/1/2 also provides RTS/CTS hardware handshaking signals.

### Physical Characteristics

Dimensions (inches): 2.00" x 1.1875"

Weight: 1 oz.

### Power

DC Input Voltage: 3.3V @ 500mA typical

### 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.

### Agency Approvals

UL, C/UL, CE, FCC



## Part Numbers

### **NANO54415 Ethernet Core Module (200 Version, with PCIeMini Connector)**

Part Number: NANO54415-200IR

### **NANO Break out Board**

Part Number: NANO-BOB-200IR

### **NANO54415 Development Kit**

Part Number: NNDK-NANO54415-KIT

Kit includes all the hardware and software you need to customize the included platform hardware. See NetBurner Store product page for package contents.

### **Embedded SSL & SSH Security Suite (Module License Version)**

Part Number: NBLIC-SSL-MODULE

Only required if you are using a development kit.

### **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)

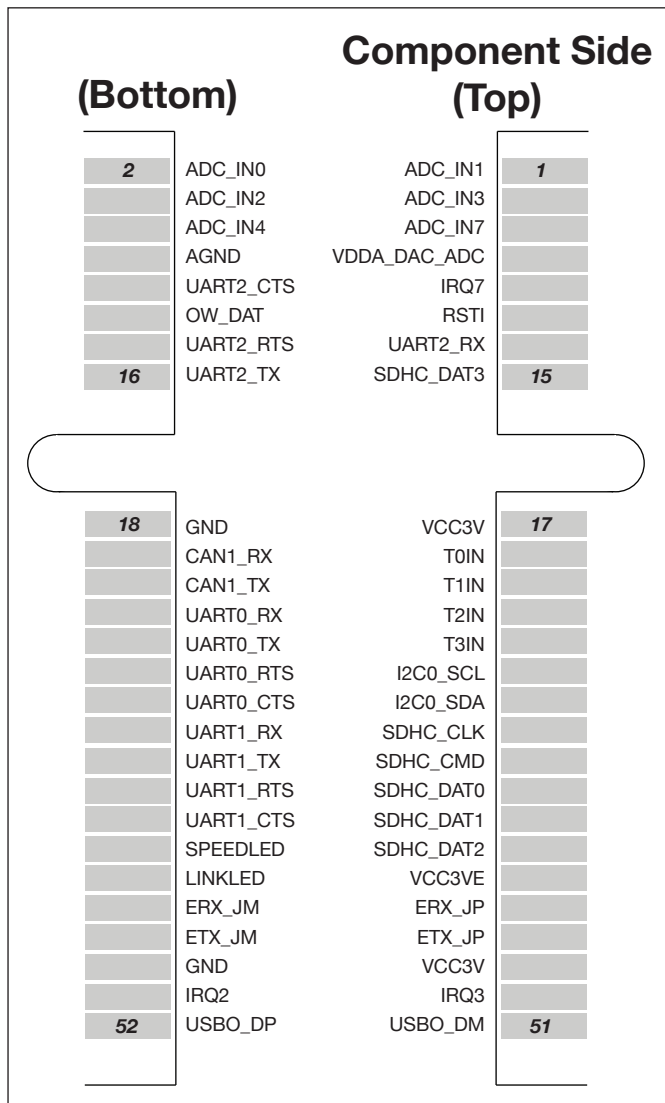
Online Store: [www.NetBurner.com](http://www.NetBurner.com)

Telephone: 1-800-695-6828

## Pinout and Signal Description

The module has one 52-pin Mini PCI express connector that is designed to interface with a standard 52-pin mini PCI Express socket. Figure 1 shows the location of pin one and primary function. Table 1 provides a connector pinout and detailed primary and alternate function descriptions. Reference Freescale Manual for additional CPU pin function details.

Figure 1: Edge Connector Pinout for P1 Connector



### Alternate Monitor Boot Jumper

The boot jumper is a pair of circular pads located near the middle line of the board near the connector. It can be used to recover from a software or configuration fault.

Table 1: Pinout and Signal Descriptions for P1 Connector <sup>(1)</sup>

P1 Connector							
Pin	CPU Pin	Function 1	Function 2	Function 3	General Purpose I/O	Description	Max Voltage
1	J1	ADC_IN1				Analog to Digital Converter 1 Input	3.3VDC
2	H1	ADC_IN0				Analog to Digital Converter 0 Input	3.3VDC
3	K4	ADC_IN3	DAC0_OUT			Analog to Digital Converter 3 Input or Digital to Analog Converter 0 Output	3.3VDC
4	J2	ADC_IN2				Analog to Digital Converter 2 Input	3.3VDC
5	K3	ADC_IN7	DAC1_OUT			Analog to Digital Converter 7 Input or Digital to Analog Converter 1 Output	3.3VDC
6	G4	ADC_IN4				Analog to Digital Converter 4 Input	3.3VDC
7	J4	VDDA_DAC_ADC				ADC and DAC Supply Voltage 3.3V@24mA. By default VDDA_DAC_ADC is used as the analog reference. If you wish to use a different reference voltage value, the alternate references inputs are: ADC_IN0 for ADC_IN1-3, ADC_IN4 for ADC_IN5-7	3.3VDC
8	H5 J5	AGND				ADC and DAC Reference Ground (required when using ADC or DAC)	-
9	F12	IRQ7			PC6	External Interrupt 7	3.3VDC
10	M4	UART2_CTS	UART6_TX	SSI1_BCLK	PE6/RGPIO14	UART 2 Clear To Send or UART 6 Transmit or SSI 1 Serial Bit Clock <sup>2</sup>	3.3VDC
11	K15	RST1				Processor Reset Input	3.3VDC
12	N11	OW_DAT	DACK0		PD3/RGPIO0	1-Wire Data Signal or DMA Acknowledge 0	3.3VDC
13	P1	UART2_RX	PWM_A3	SSI1_RX	PE4	UART 2 Receive or PWM A3 Output Signal/Input Capture or SSI 1 Serial Receive <sup>2</sup>	3.3VDC
14	M3	UART2_RTS	UART6_RX	SSI1_FS	PE5/RGPIO15	UART 2 Request To Send or UART 6 Receive or SSI 1 Serial Frame Sync <sup>2</sup>	3.3VDC
15	B13	SDHC_DAT3	PWM_A1	SPI1_PCS0	PF2	SDHC DAT3 Line / Card Detection or PWM A1 Output Signal/Input Capture or SPI 1 Chip Select 0	3.3VDC
16	N2	UART2_TX	PWM_B3	SSI1_TX	PE3	UART 2 Transmit or PWM B3 Output Signal/Input Capture or SSI 1 Serial Transmit <sup>2</sup>	3.3VDC
17		VCC3V				Input power 3.3 VDC	3.3VDC
18		GND				Ground	-
19	H15	T0IN	T0OUT	USBO_VBUS_OC	PE7/RGPIO4	Timer Input 0 or Timer Output 0 or USB On-The-Go VBUS Over-Current	3.3VDC
20	D15	CAN1_RX	UART9_RX	I2C1_SDA	PC7	CAN 1 Receive or UART 9 Receive or I <sup>2</sup> C 1 Serial Data <sup>2,3</sup>	3.3VDC
21	H13	T1IN	T1OUT	SDHC_DAT1	PD0/RGPIO3	Timer Input 1 or Timer Output 1 or SDHC DAT1 Line / Interrupt Detect	3.3VDC
22	D14	CAN1_TX	UART9_TX	I2C1_SCL	PB0	CAN 1 Transmit or UART 9 Transmit or I <sup>2</sup> C 1 Clock <sup>2,3</sup>	3.3VDC
23	H14	T2IN	T2OUT	SDHC_DAT2	PD1/RGPIO2	Timer Input 2 or Timer Output 2 or SDHC DAT2 Line / Read Wait	3.3VDC

Note:

- Active low signals, such as **RESET**, are indicated with an overbar.
- Each UART can be clocked from an internal or external source. For external clocks, each UARTn can be clocked by the corresponding Tn\_IN vnpin pin.
- If using I2C, pull-up resistors must be added to open drain SDA/SCL signals.