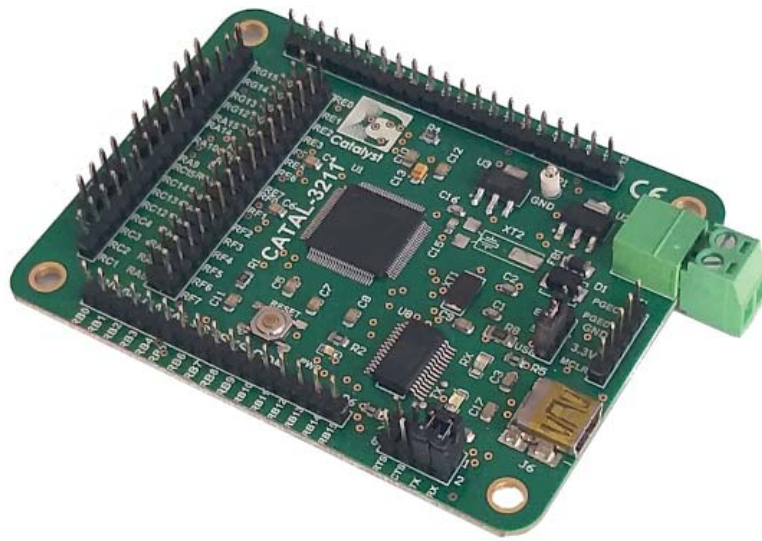


Development Systems

Catalyst

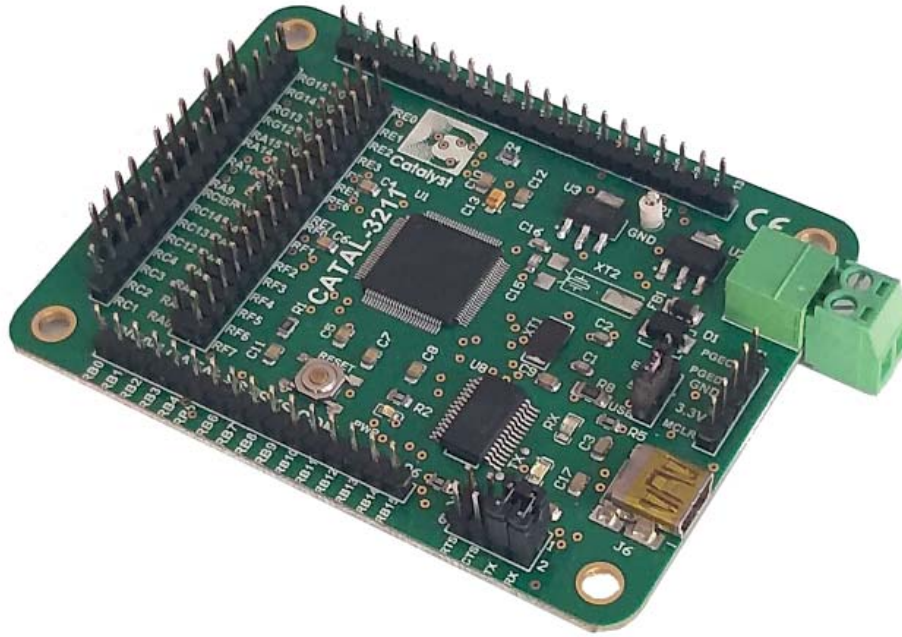


CATAL-3211

CATL-3211 is a microcontroller board based on the Microchip 32-bit microcontroller family



Development Systems



Overview

The CATAL-3211 is a microcontroller board based on the Microchip PIC32MX795F512L, a member of the 32-bit PIC32 microcontroller family. The CATAL-3211 is easy to use and suitable for both beginners and advanced users experimenting with electronics and embedded control systems. It features a USB serial port interface for connection to the IDE and can be powered via USB or an external power supply.

Features

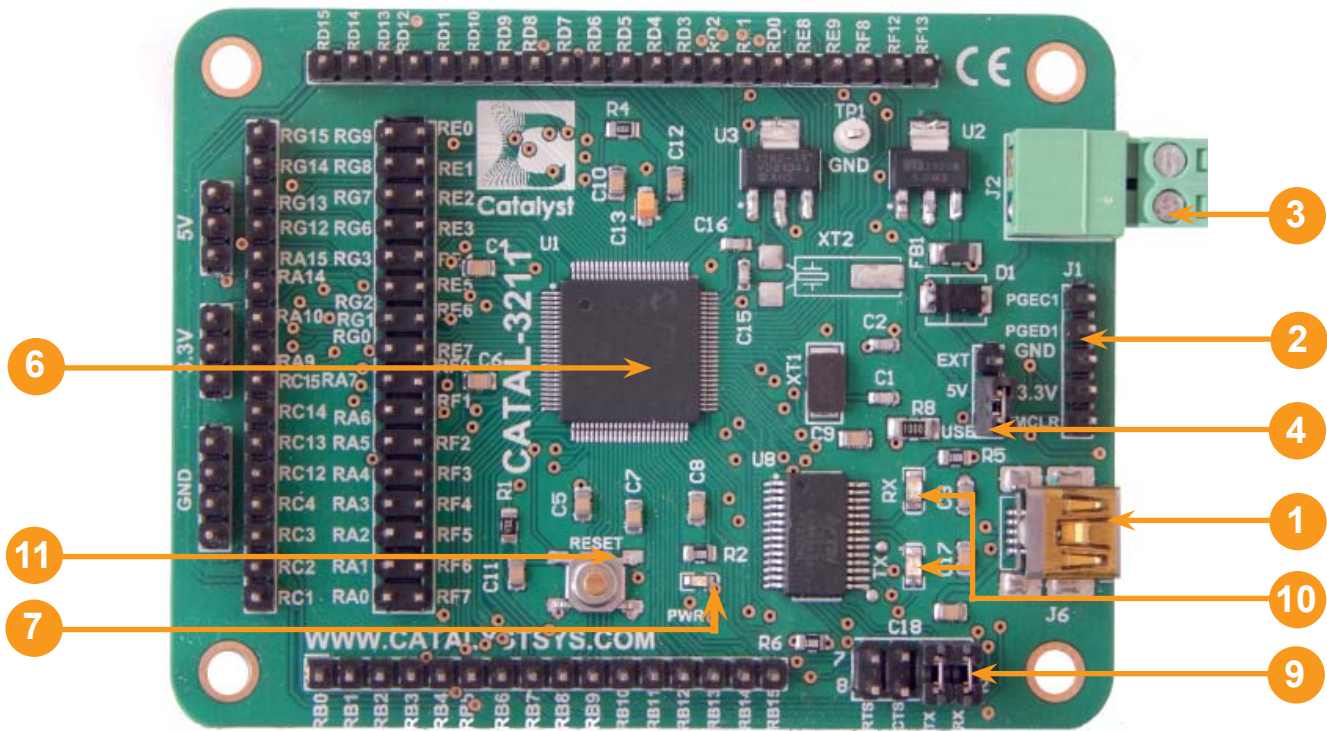
- A Microchip® PIC32MX795F512L microcontroller (80 MHz, 512K Flash, 128K RAM)
- 3.3V operating voltage
- 7V to 15V input voltage (recommended)
- 20V input voltage (maximum)
- 83 available I/O pins
- 16 analog inputs
- 0V to 3.3V analog input voltage range
- +/- 18mA DC current per pin
- a 10/100 Ethernet MAC
- a USB 2.0 full - speed OTG controller
- 2 CAN controllers

The CATAL-3211 can be programmed using the Multi-Platform Integrated Development Environment (MPIDE). It contains everything needed to start developing embedded applications. The CATAL-3211 has 83 I/O pins that support a number of peripheral functions, such as UART, SPI, I2C ports, and pulse width modulated outputs. Sixteen of the I/O pins can be used as analog inputs or as digital inputs and outputs.

The PIC32 microcontroller on the CATAL-3211 also provides a 10/100 Ethernet MAC, USB 2.0 full-speed OTG controller, and two CAN controllers. The CATAL-3211 can be powered via USB, an external DC power adapter, or batteries.

The CATAL-3211 can be supported by 100 pins (16-bit) or (32-bit) microcontroller a member of Pic24, Pic30, dsPic 33 or Pic32 families depending on user request.

CATAL-3211 Hardware overview



The CATL-3211 Development board has the following hardware features:

1. USB Connector for USB Serial Converter

This connects to a USB port on the PC to provide the communications port for the MPIDE to talk to the CATL-3211 board. This can also be used to power the CATL-3211 board when connected to the PC through the power Jumper.

2. J1: Microchip Debug Tool Connector

This connector is used to connect Microchip programmer/debugger tools, such as the PICkit™ 3, for in-circuit serial programming (ICSP). This allows the CATL-3211 board to be used as a traditional microcontroller development board using the Microchip MPLAB® IDE.

3. J2: External Power Connector

This is used to power the CATL-3211 board from an external power supply. It is wired with the center terminal as the positive supply voltage. The power supply voltage must be in the range of 7V to 15V.

4. P1: Power Select Jumper

This jumper is used to route power from the external power connector through the on-board 5V voltage regulator or USB connector.

5. Shield Power Connector

This connector provides power to I/O expansion shields connected to the board.

6. PIC32 Microcontroller

The PIC32MX795F512L microcontroller is the main processor for the board.

7. Power LED

LED connected to Power connection.

8. IO Signal Connectors

These are shown as six connectors in the CATL-3211 schematic. There is a single connector loaded across all six connectors when the board is assembled. These provide 5V power, ground, and access to digital I/O pins on the microcontroller to shields connected to the board.

Independent crystals for precision microcontroller clocking (8 MHz) and RTCC operation (32.768 kHz) The new RTCC module and a 32 kHz clock crystal are used to provide the Real-Time Clock.

Independent crystals for precision microcontroller clocking (8 MHz) and RTCC operation (32.768 kHz) The new RTCC module and a 32 kHz clock crystal are used to provide the Real-Time Clock.

9. Communications pins selector

It is possible to use these pins to connect to any other UART port of the microcontroller.

10. Communications Status LEDs

These LEDs indicate activity on the USB serial interface.

11. Reset Button

This button can be used to reset the microcontroller, restarting operation from the boot loader.

USB Serial Communication

The serial port on the CATL-3211 board is implemented using an FTDI FT232R USB serial converter. Before attempting to use the MPIDE to communicate with the CATL-3211, the appropriate USB device driver must be installed.

The CATL-3211 board uses a standard mini-USB connector for connection to a USB port on the PC.

Asynchronous serial port. Pin 1 (TX0), Pin 5 (RX0). These pins are connected to I/O connector P16 and are also connected to the FT232R USB serial converter. It is possible to use these pins to connect to any other UART port of the microcontroller or an external serial device when not using the USB serial interface. This uses UART1 (RF2 (RX), RF8 (TX)) on

The PIC32 microcontroller as a default port.

The header connector P16 provides access to the other serial handshaking signals (RD15 (U1RTS), RD14 (U1CTS)).

Two LEDs (LD1 and LD2) will blink when data is being sent or received between the CATL-3211 and the PC over the serial connection.

Input output ports

There are several header connectors connected to each pin of the microcontroller. It is distributed as a group connected to two male IDC10 (2X16) headers, two single header connector (1X16), and a single header connector (1X21).

The following table describes microcontroller pins and its functions:

Pin name and functions

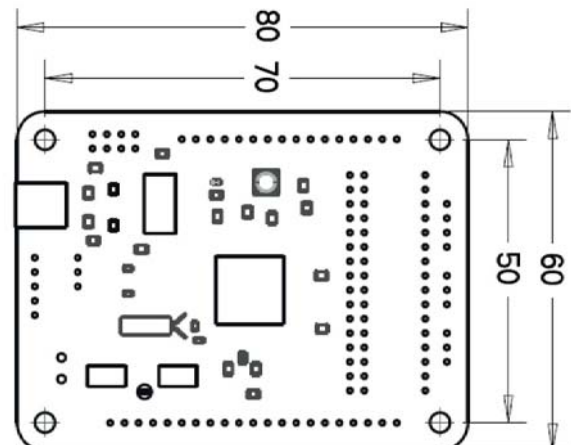
N	Pin	Description
1	RG15	AERXERR/RG15
2	VDD	VDD
3	RE5	PMD5/RE5
4	RE6	PMD6/RE6
5	RE7	PMD7/RE7
6	RC1	T2CK/RC1
7	RC2	T3CK/AC2TX/RC2
8	RC3	T4CK/AC2RX/RC3
9	RC4	T5CK/SDI1/RC4
10	RG6	ECOL/SCK2/U6TX/U3RTS/PMA5/CN8/RG6
11	RG7	ECRS/SDA4/SDI2/U3RX/PMA4/CN9/RG7
12	RG8	ERXDV/AERXDV/ECRSDV/AE-CRSDV/SCL4/SDO2/U3TX/PMA3/CN10/RG8
13	MCLR	MCLR
14	RG9	ERXCLK/AERXCLK/EREFCLK/AEREFCLK/SS2/U6RX/U3CTS/PMA2/CN11/RG9
15	VSS	VSS
16	VDD	VDD
17	RA0	TMS/RA0
18	RE8	AERXD0/INT1/RE8
19	RE9	AERXD1/INT2/RE9
20	RB5	AN5/C1IN+/VBUSON/CN7/RB5
21	RB4	AN4/C1IN-/CN6/RB4
22	RB3	AN3/C2IN+/CN5/RB3
23	RB2	AN2/C2IN-/CN4/RB2
24	RB1	PGEC1/AN1/CN3/RB1
25	RB0	PGED1/AN0/CN2/RB0
26	RB6	PGEC2/AN6/OCFA/RB6
27	RB7	PGED2/AN7/RB7
28	RA9	VREF-/CVREF-/AERXD2/PMA7/RA9
29	RA10	VREF+/CVREF+/AERXD3/PMA6/RA10
30	AVDD	AVDD
31	AVSS	AVSS
32	RB8	AN8/C1OUT/RB8
33	RB9	AN9/C2OUT/RB9
34	RB10	AN10/CVREFOUT/PMA13/RB10
35	RB11	AN11/ERXERR/AETXERR/PMA12/RB11

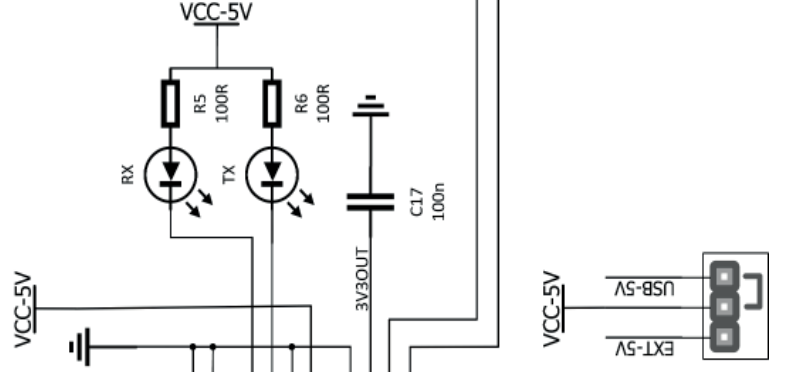
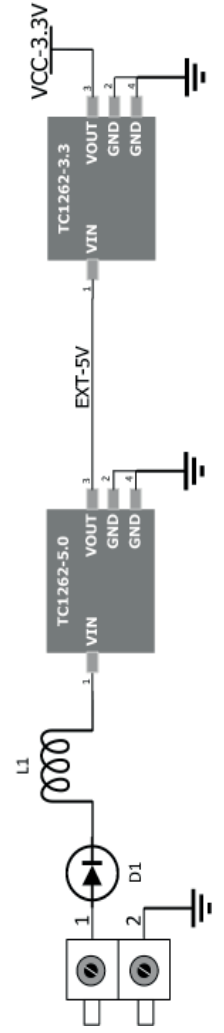
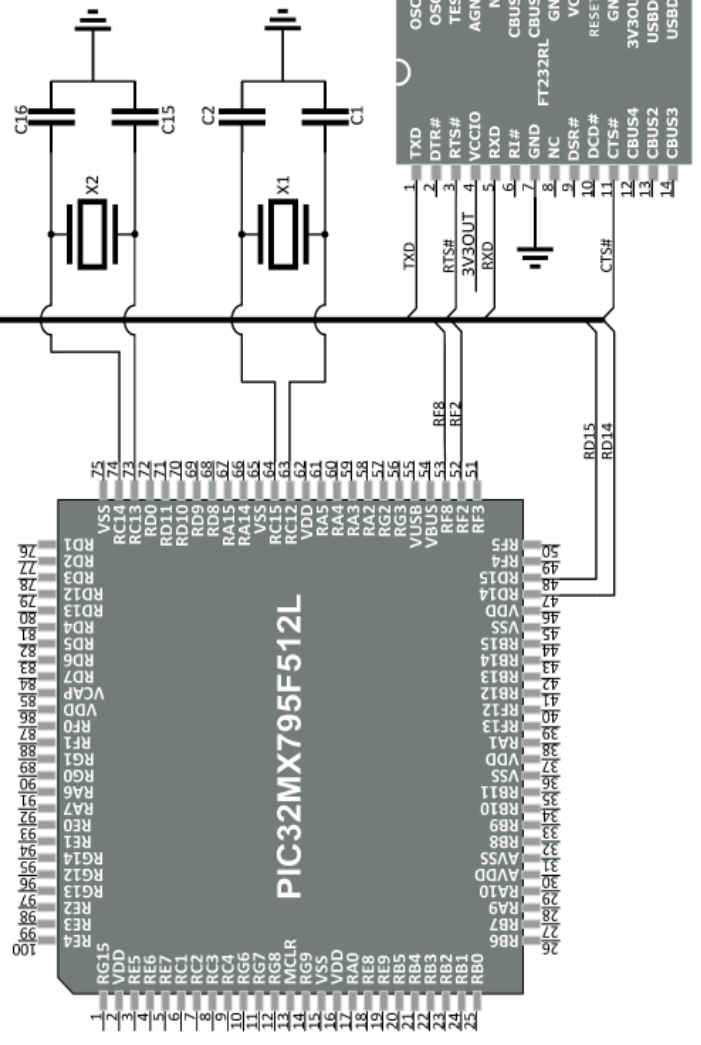
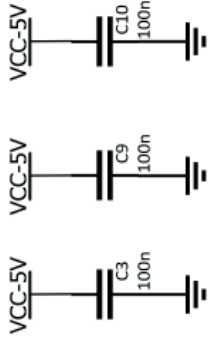
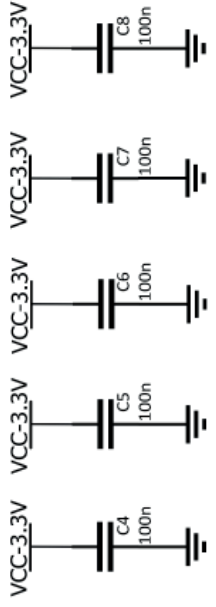
Pin name and functions cont.

N	Pin	Description
36	VSS	VSS
37	VDD	VDD
38	RA1	TCK/RA1
39	RF13	AC1TX/SCK4/U5TX/U2RTS/RF13
40	RF12	AC1RX/SS4/U5RX/U2CTS/RF12
41	RB12	AN12/ERXD0/AECRS/PMA11/RB12
42	RB13	AN13/ERXD1/AECOL/PMA10/RB13
43	RB14	AN14/ERXD2/AETXD3/PMALH/PMA1/RB14
44	RB15	AN15/ERXD3/AETXD2/OCFB/PMALL/PMA0/CN12/RB15
45	VSS	VSS
46	VDD	VDD
47	RD14	AETXD0/SS3/U4RX/U1CTS/CN20/RD14
48	RD15	AETXD1/SCK3/U4TX/U1RTS/CN21/RD15
49	RF4	SDA5/SDI4/U2RX/PMA9/CN17/RF4
50	RF5	SCL5/SDO4/U2TX/PMA8/CN18/RF5
51	RF3	USBID/RF3
52	RF2	SDA3/SDI3/U1RX/RF2
53	RF8	SCL3/SDO3/U1TX/RF8
54	VBUS	VBUS
55	VUSB	VUSB
56	RG3	D-/RG3
57	RG2	D+/RG2
58	RA2	SCL2/RA2
59	RA3	SDA2/RA3
60	RA4	TDI/RA4
61	RA5	TDO/RA5
62	VDD	VDD
63	RC12	OSC1/CLKI/RC12
64	RC15	OSC2/CLKO/RC15
65	VSS	VSS
66	RA14	AETXCLK/SCL1/INT3/RA14
67	RA15	AETXEN/SDA1/INT4/RA15
68	RD8	RTCC/EMDIO/AEMDIO/IC1/RD8
69	RD9	SS1/IC2/RD9
70	RD10	SCK1/IC3/PMCS2/PMA15/RD10

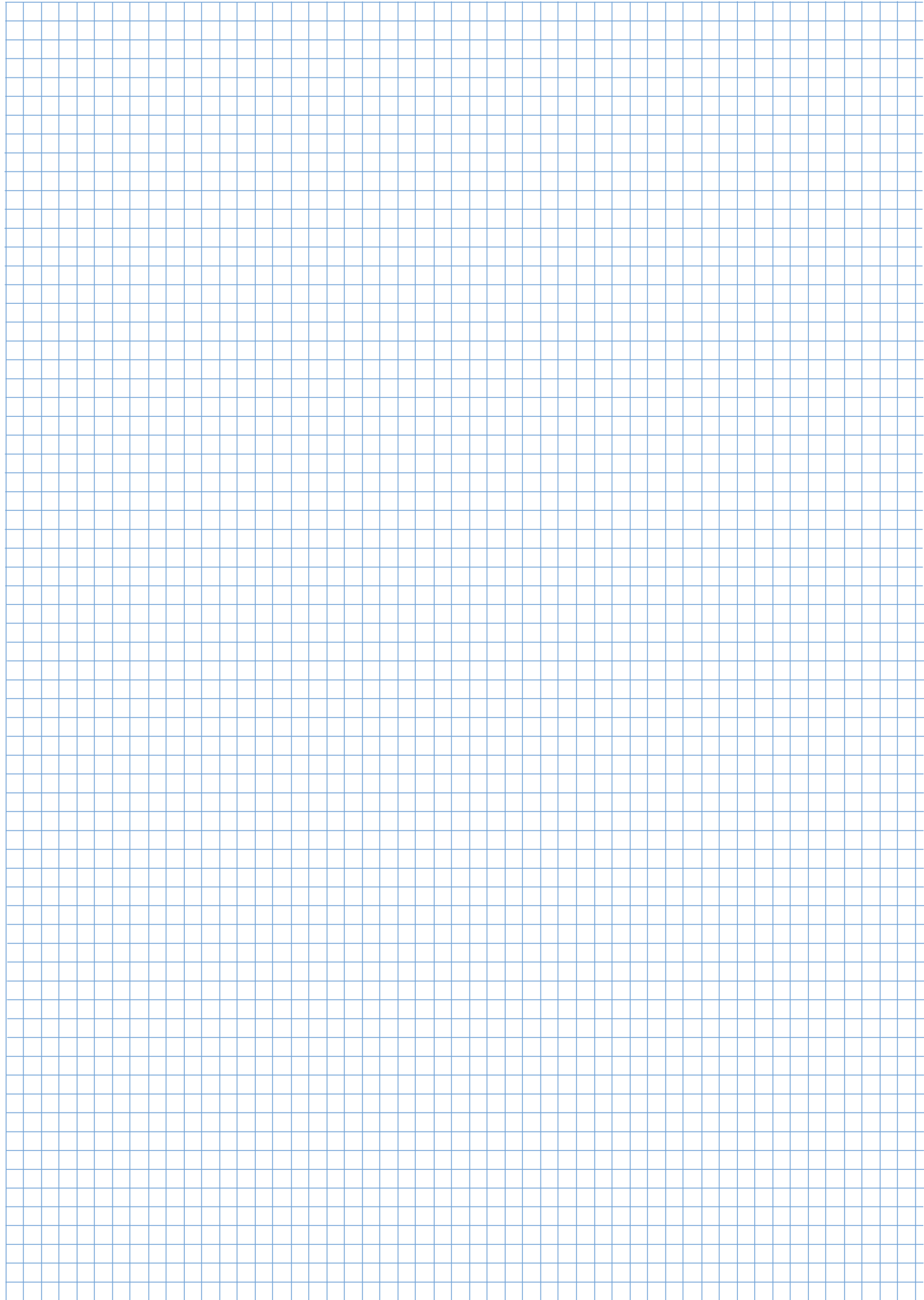
N	Pin	Description
71	RD11	EMDC/AEMDC/IC4/PMCS1/PMA14/RD11
72	RA0	SDO1/OC1/INT0/RD0
73	RC13	SOSCI/CN1/RC13
74	RC14	SOSCO/T1CK/CN0/RC14
75	VSS	VSS
76	RD1	OC2/RD1
77	RD2	OC3/RD2
78	RD3	OC4/RD3
79	RD12	ETXD2/IC5/PMD12/RD12
80	RD13	ETXD3/PMD13/CN19/RD13
81	RD4	OC5/PMWR/CN13/RD4
82	RD5	PMRD/CN14/RD5
83	RD6	ETXEN/PMD14/CN15/RD6
84	RD7	ETXCLK/PMD15/CN16/RD7
85	VCAP	VCAP/VCORE
86	VDD	VDD
87	RF0	C1RX/ETXD1/PMD11/RF0
88	RF1	C1TX/ETXD0/PMD10/RF1
89	RG1	C2TX/ETXERR/PMD9/RG1
90	RG0	C2RX/PMD8/RG0
91	RA6	TRCLK/RA6
92	RA7	TRD3/RA7
93	RE0	PMD0/RE0
94	RE1	PMD1/RE1
95	RG14	TRD2/RG14
96	RG12	TRD1/RG12
97	RG13	TRD0/RG13
98	RE2	PMD2/RE2
99	RE3	PMD3/RE3
100	RE4	PMD4/RE4

Mechanical dimension





Notes:



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us at support@catalystsys.com