

MPL115A2 (I2C) Barometric Pressure

Technical Manual Rev 1r0



The I2C Barometric Pressure is a Digital Barometer based on Freescale MPL115A2 sensor. With 50 to 115 kPa absolute pressure, +/- 1 kPa accuracy compensated with host microcontroller. An ADC converts the temperature and pressure sensor readings via I2C port. Useful as a weather station atmospheric pressure monitor, altimeter, and other applications that may require measurements of ambient pressure.

FEATURES:

- Powered by MPL115A2 free scale sensor
- 50 kPa to 115 kPa absolute pressure
- +/- 1 kPa accuracy with host controller compensation.
- Integrated ADC
- Monotonic pressure and temperature data outputs
- Compatible in gizDuino/Arduino shield.

GENERAL SPECIFICATION:

Power Supply : 2.375 V - 5.5 VDC

I/O Interface : I2C
(Operates up to 400 kHz)

Conversion Resolution:
• 7-bit I2C address = 0x60

PCB Dimension:
• 25.5W x 25.5L mm

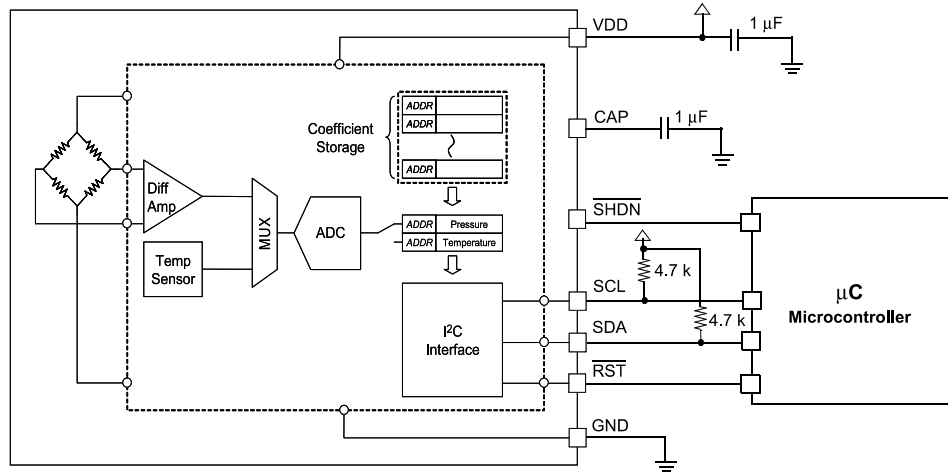


Figure 1. Block Diagram MPL115A2 (used 4.7k pullup resistor for I2C Communication.)

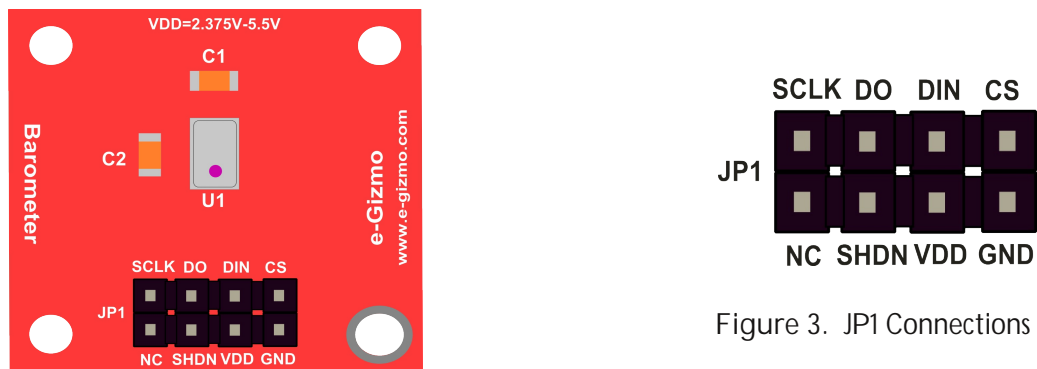


Figure 2. MPL115A2 I2C Barometric Pressure

Table 1. JP1 PIN Descriptions

Pin Name	Description
VDD	Power supply connection : VDD = 2.375 V to 5.5 VDC
GND	Ground
SHDN	Shutdown: Connect to GND to disable the device. When shutdown all part draws 1uA current and all communications pins are high impedance. Connect to VDD for normal operation.
CS	Reset: Connect to GND to disable I2C communications.
NC	No Connection
DIN	Serial data I/O line
SCLK	I2C Serial Clock Input
DO	No Connection

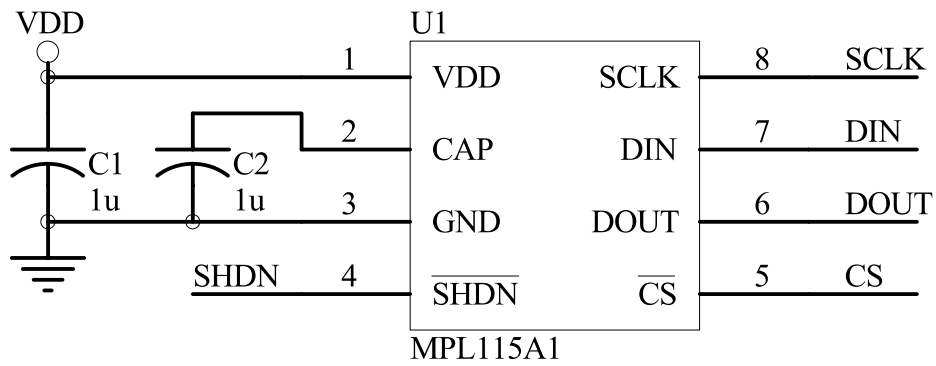
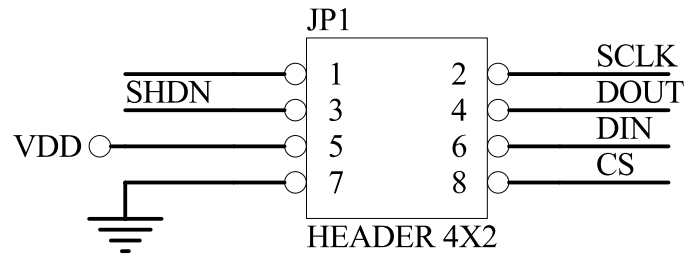


Figure 4. Schematic diagram of MPL115A2 Barometric Pressure breakoutboard.

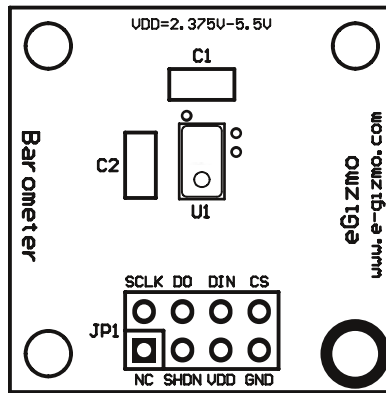


Figure 5. Parts Placement

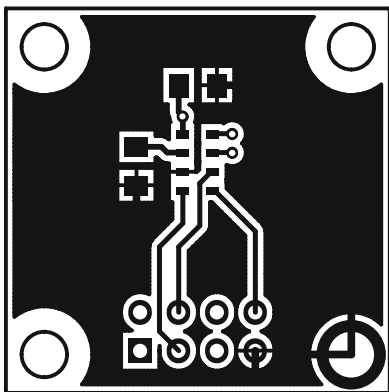


Figure 6. PCB Top Layer

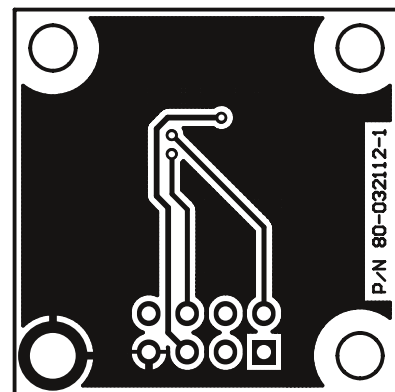


Figure 7. PCB Bottom Layer

MPL115A2 Breakout Board GIZDUINO

VDD		+5Vcc		
GND		GND		
CS/RESET		A2		
SHDN		A3		
DIN/SDA		A4		+5Vcc
SCLK/SCL		A5		+5Vcc

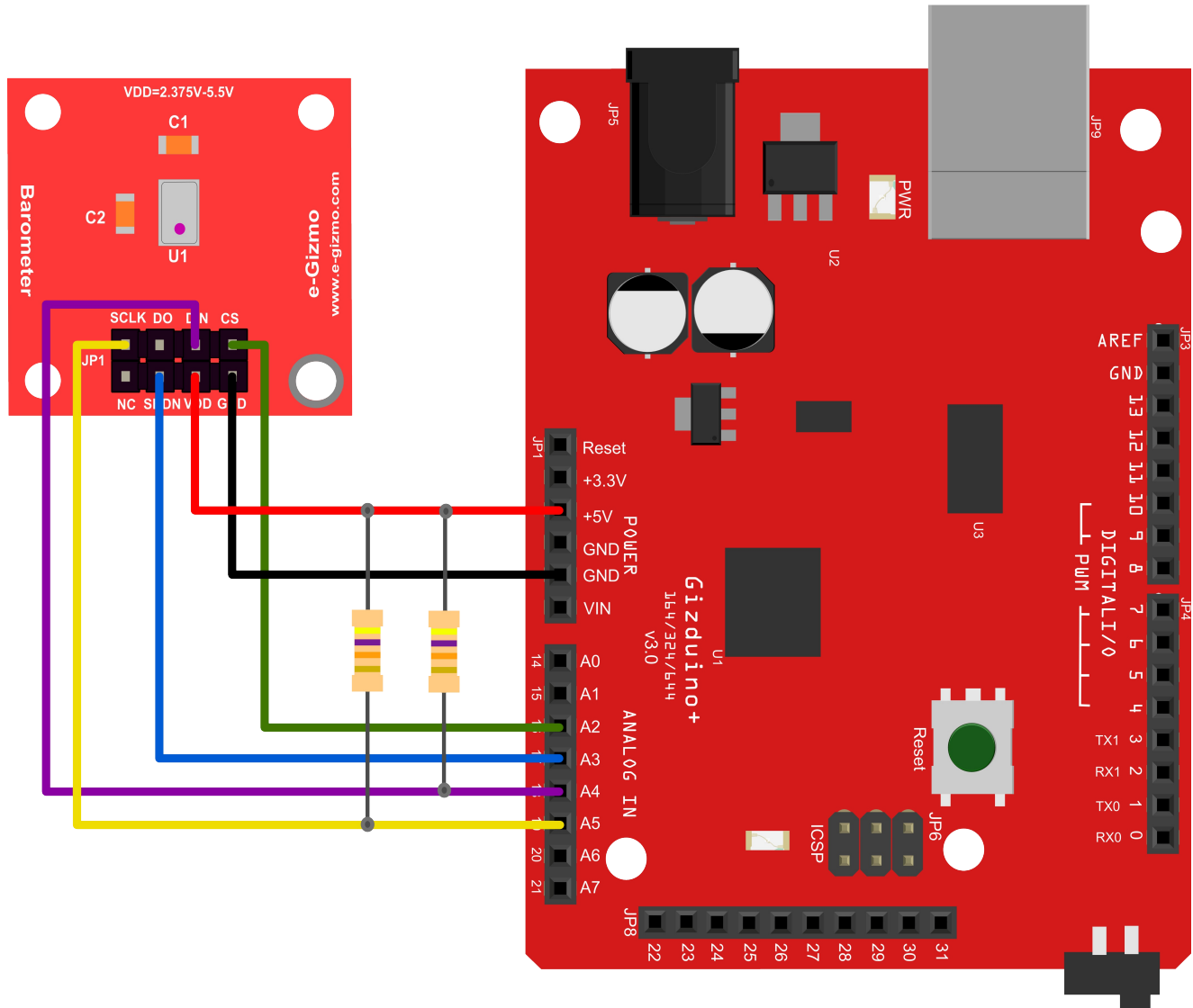


Figure 8. Sample Application of MPL115A2 Barometric Pressure with Gizduino + 644 (*Base on Figure 1. The Block Diagram of MLP115A2.)

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MPL115A2 I2C DIGITAL BAROMETER

- This is a sample code for MPL115A2 Barometer
  utilizing MPL115A2.h library.
- The output of this IC are Pressure (in kPa)
  and Temperature (in Celcius).
  
```

MPL115A2 functions:

- readBoth(&P, &T) - Simultaneously read pressure (P) and temperature (T) from the chip.
- readPressure() - returns the pressure reading from the chip.
- readTemperature()- returns the temperature reading from the chip.
- *Both returned values are floating points.

Wiring Connection:

MPL115A2 BREAKOUT BOARD	GIZDUINO
VCC <----->	VCC
GND <----->	GND
CS/RESET <----->	A2
SHDN <----->	A3
DIN/SDA <---->	A4 <-- 4.7kohms --> VCC
SCLK/SCL <---->	A5 <-- 4.7k ohms--> VCC

Created On: 23 Apr 2014

By: e-Gizmo Mechatronics Central

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```

#include <I2C.h>
#include "MPL115A2.h"

#define ResetBar A2
#define SHDNBar A3

MPL115A2 m2;
float Pressure_kPa, Temperature_Celsius,
Pressure_kPa2, Temperature_Celsius2;

void setup()
{
  Serial.begin(9600);

  pinMode(ResetBar,OUTPUT);
  pinMode(SHDNBar, OUTPUT);
  delay(1);
  analogWrite(ResetBar, 255); // Set MPL115A2
  RST' (CS in Barometer breakout board) pin HIGH
  to Enable I2C Communication.
  analog Write(SHDNBar, 255); // Set MPL115A2
  SHDN' (SHDN in Barometer breakout board) pin
  HIGH for normal operation.

  m2.begin();
}

void loop()
{
  Pressure_kPa = m2.readPressure();
  Temperature_Celcius = m2.readTemperature();
  Serial.print("Pressure = ");
  Serial.print(Pressure_kPa, 2);
  Serial.println(" kPa");
  Serial.print("Temperature = ");
  Serial.print(Temperature_Celsius, 2);
  Serial.println(" C");

  m2.readBoth(&Pressure_kPa,
  &Temperature_Celsius2);
  Serial.print("Simulataneously: P = ");
  Serial.print(Pressure_kPa2, 2);
  Serial.print("kPa T =");
  Serial.print(Temperature_Celsius, 2);
  Serial.println("C");
  delay(1000);
}
  
```