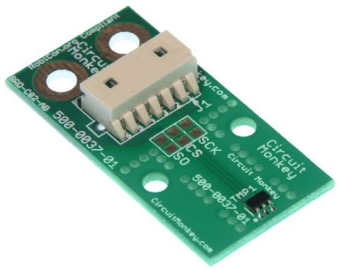
Digital Temperature Sensor with SPI Interface

Circuit Monkey model 0037 is a SPI compatible temperature sensor available as a *RobiCon.org* compliant module. The sensor is capable of measuring temperatures range of -40°C to +125°C to equal or better than 2°C of accuracy. The device operates from 2.7V to 5.5V with low supply current requirements.

500-0037-01

Temperature Sensor



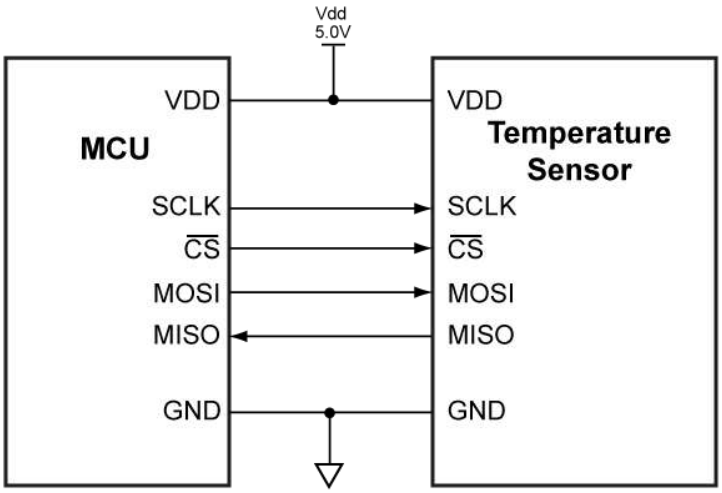
RobiCon Compliant Package: C02-AB

Features:

- SPI Compatible Digital Output
- 1.5C or 2C Accuracy
- -40°C to +125°C Measurement Range
- 10-bit or 12-bit (with Sign) resolution
- 0.0625°C resolution increment
- 1µA or 50µA(max) Low Quiescent Current
- 2.7V to 5.5V Wide Supply Range
- *RobiCon.org* compliant module: C02-AB
- Operates -55°C to 125°C

Ordering Information

Device	Feature
500-0037-01-123	12-bit, 1.5C Accuracy 50µA Quiescent Current
500-0037-01-125	10-bit, 2C Accuracy, One-Shot with 1µA Quiescent Current

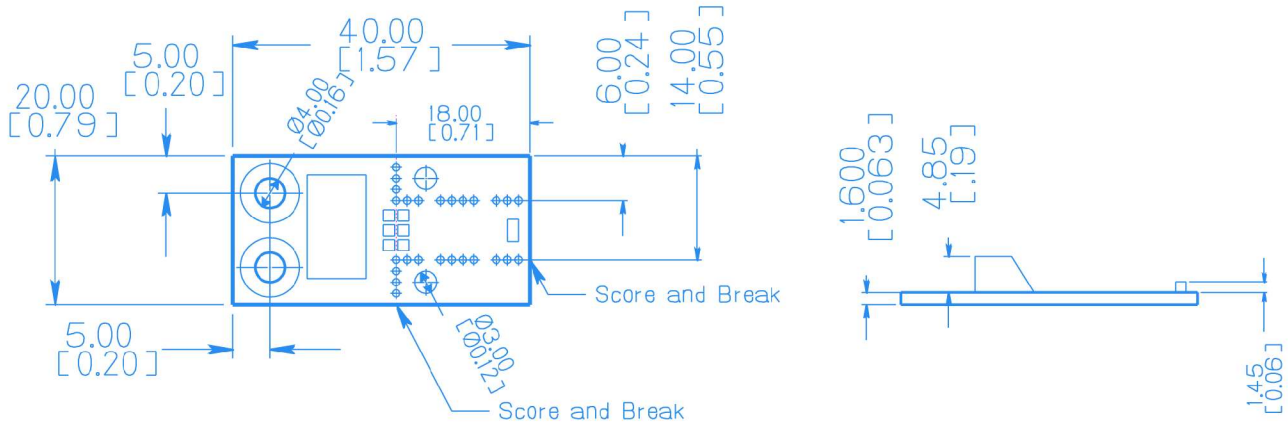


Pin Connections

Pin	Pin Name	Formal Name	Definition
1	CS	Chip Select	Device Enabled on Low Signal
2	MOSI	Sensor In	Digital Input to Sensor (-125 version only)
3	MISO	Sensor Out	Digital Output from Sensor
4	SCLK	Clock	Clock
5	VCC	Supply Voltage	Voltage Supply Input
6	GND	Ground	Ground for Logic, Analog and Power.

Mechanical Specification

(Dimensions in mm)



Other Characteristics

The 0037 module contains either a *Texas Instruments* TMP123 or TMP125 temperature measurement chip, depending on module part number. Please consult the data sheet for the chips for more information on Electrical Characteristics, Functional Diagram, Internal Registers, Timing Diagrams and Communication Protocol.

See the below table for links to the chip data sheets.

Model	Chip	Variant	Link
-123	TMP123	12-bit Read Only	http://focus.ti.com/docs/prod/folders/print/tmp123.html
-125	TMP125	10-bit with One-Shot Trigger Feature	http://focus.ti.com/docs/prod/folders/print/tmp125.html

Application Information

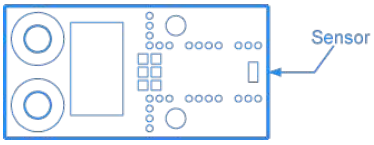
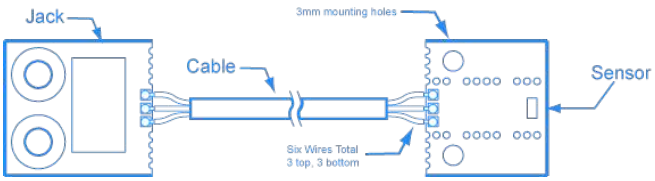
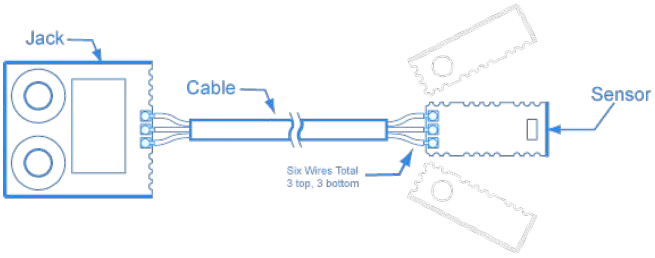
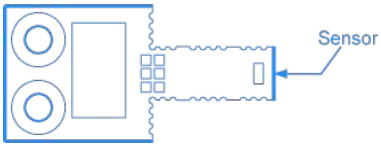
Code

The 0037 Temperature Module has been tested to work on an Atmel Atmega328P. Test code can be found at the link below and further information can be found at the Circuit Monkey web site.

ZIP file with sample code

Mechanical Configurations

The 0037 Temperature Module is designed for configurability for a variety of applications. Shown below are illustrations of possible configurations.

Type	Configuration	Description
Basic		Basic configuration.
Split		Split board at vertical perforation. Extend sensor by using a 6 conductor cable. Use 3mm holes to secure sensor. **Note:** Area between pads and perforations must be pre-scored with a sharp knife. Do not attempt to simply "snap" it apart. Parts and fingers are fragile, be careful when cutting.
Micro		Split board at vertical perforation. Cut away mounting tabs and discard. Extend sensor by using a 6 conductor cable. **Note:** Area between pads must be separated by scoring with a sharp knife. Do not attempt to simply "snap" it apart.Parts and fingers are fragile, be careful when cutting.
Snoot		Carefully Cut along the perforations using a sharp blade or jeweler's saw.

Revision History

Revision	Date	Description
1	05/05/10	Create Document