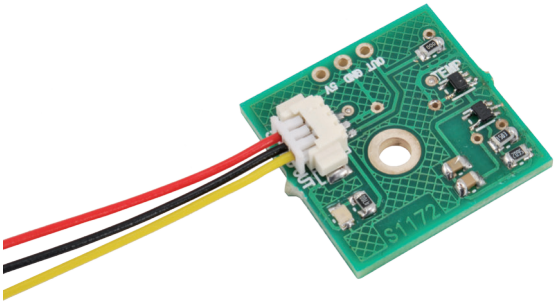
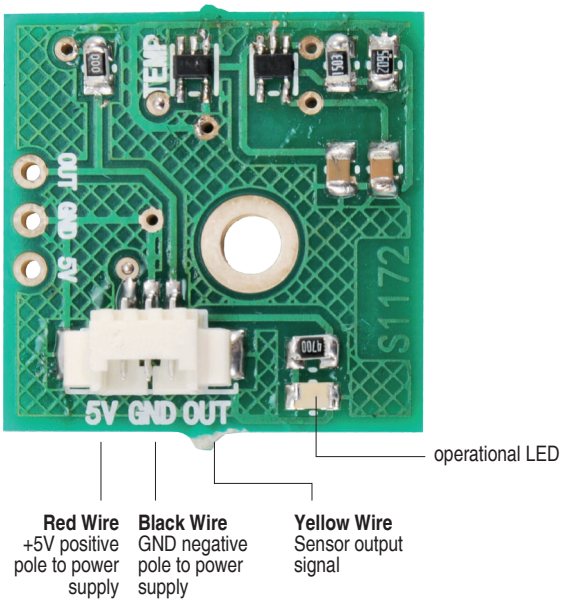
USER MANUAL AUGUST 2016

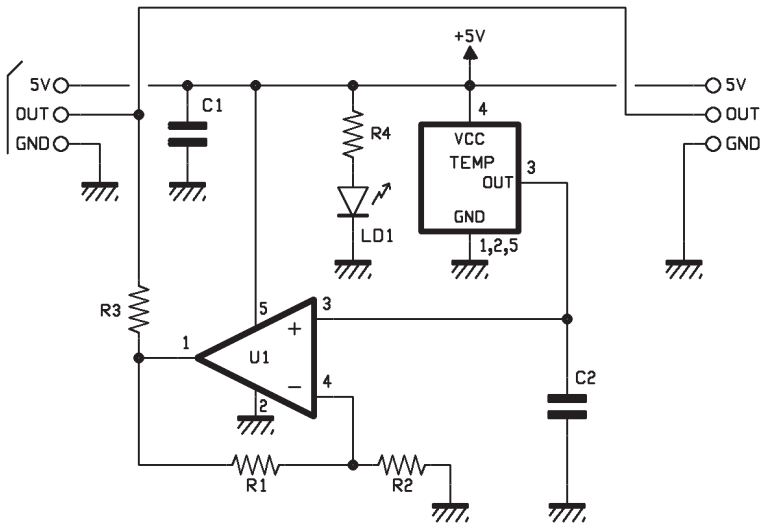
ANALOG TEMPERATURE SENSOR BOARD
MM111

In addition to the analog sensor, the breakout is based on MCP6L01T-E / LT operational amplifier by Microchip. The sensor is able to ensure a linear correlation between temperature and output voltage and has a measuring accuracy of 0.4 ° C only. The voltage output varies according to the temperature measured by following a linear constant value of typically 21 mV / ° C, starting from a maximum of 5 V at -50 ° C. At a temperature of zero Celsius degrees the output voltage is slightly higher than 1 volt.
Table 1 shows the typical output voltage values for the different temperatures. The component can operate with really low input power supply voltages (from 1.5V to 5.5 volts) and in a wide temperature range (-50 to 150 ° C).





The extremely low power absorption when there is no load connected to the output, 5.4 uA only, makes the integrated circuit perfectly suitable for low power or battery powered boards. The board houses on its side a miniature connector with 1.25 mm pitch for the power supply and the output signal; the PCB has been designed to offer also 2,54mm pitch holes useful to weld on them a pin-strip, to allow the breakout board connection to other boards that could use the temperature sensor. The power line
is noise filtered by means of C1 ceramic capacitor; The C2 capacitor filters the sensor output signal, introducing so a minimum delay (just 1 millisecond) between the temperature variation and the following output voltage. On the power line it has been inserted the LD1 LED which, when is on, indicates if the circuit is powered and active or not.



TEMP (°C)	V_{OUT} (mV)	TEMP (°C)	V_{OUT} (mV)	TEMP (°C)	V_{OUT} (mV)	TEMP (°C)	V_{OUT} (mV)	TEMP (°C)	V_{OUT} (mV)
-50	5,01	-10	4,19	30	3,35	70	2,49	110	1,61
-49	4,99	-9	4,17	31	3,33	71	2,47	111	1,59
-48	4,97	-8	4,14	32	3,31	72	2,45	112	1,56
-47	4,95	-7	4,13	33	3,29	73	2,42	113	1,54
-46	4,92	-6	4,11	34	3,27	74	2,41	114	1,52
-45	4,90	-5	4,09	35	3,25	75	2,38	115	1,50
-44	4,89	-4	4,06	36	3,23	76	2,36	116	1,48
-43	4,87	-3	4,04	37	3,20	77	2,34	117	1,45
-42	4,84	-2	4,02	38	3,18	78	2,32	118	1,43
-41	4,82	-1	4,00	39	3,16	79	2,29	119	1,41
-40	4,80	0	3,98	40	3,14	80	2,27	120	1,39

Table 1 *- Matching between measured temperature and output voltage by the integrated circuit LMT84DCKT.*