



PPMS Service Note 1084-309

Verifying The Calibration of the Magnetic Field in the PPMS

Upon request by a user, Quantum Design can provide a Hall sensor which will verify the calibration of the magnetic field of the PPMS. The Hall sensor chip is mounted flat on a resistivity puck and is measured using the User Bridge. A table and a graph plotting a typical sensor resistance (V_{Hall}/I) versus magnetic field are provided below. The accuracy should be sufficient to verify the field calibration to within +/- 5%. Below is a diagram of the black GaAs-based Hall sensor chip from Toshiba (p/n THS122) soldered to a custom circuit board. This board fits on the puck for the Resistivity option and the user must solder leads from the contact pads on the edge of the board to the corresponding pads on the puck.

The sensors must be used at room temperature, and should not be subjected to cryogenic conditions as this can alter the calibration. It is recommended to measure Hall sensors at constant current (i.e., resistance bridge in current limited mode), with the following User Bridge settings:

current limit = 20 μA

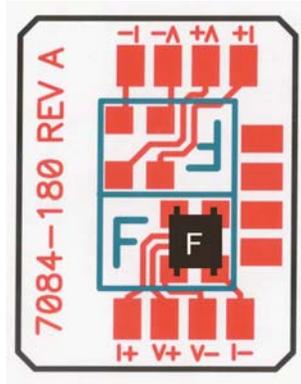
voltage limit = 95 mV

power limit = 1000 μW

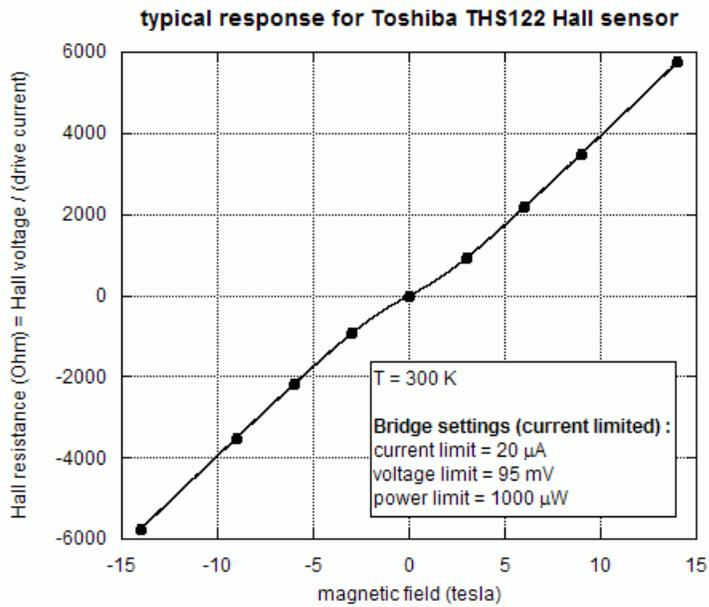
Using these parameters, the graph and table below were produced.

Contact your local service representative if you would like to obtain such a premounted Hall sensor (QD part number 3084-180T).

Please contact apps@qdusa.com if you wish to perform a more accurate field verification, or if you require the use of a field sensor at higher fields or low temperatures.



Hall sensor mounted on circuit board



field (tesla)	R (Ohms)
14	5960
9	3620
6	2250
3	965
0	0
-3	-965
-6	-2250
-9	-3620
-14	-5960