

Sensor specifications

The EGHSX01Q02 graphene Hall sensor is designed for use in ultra-low cryogenic temperatures and high field environments: it can measure magnetic fields up to the 10s of Tesla, and still operates down at mK temperatures.

Absolute maximum ratings

Parameter	Min	Max	Units
Supply voltage	-24	+24	V
Supply current	-5	+5	mA
Operating temperature *	<1	350	K
Storage temperature	230	350	K

* Specifications may change at extreme low temperatures.

Recommended operating conditions

Parameter	Min	Typical	Max	Units
Supply current *		200	5000	μ A

* A higher current supply will give a larger voltage output for a given sensitivity and field, based on V/AT sensitivity.

Performance characteristics

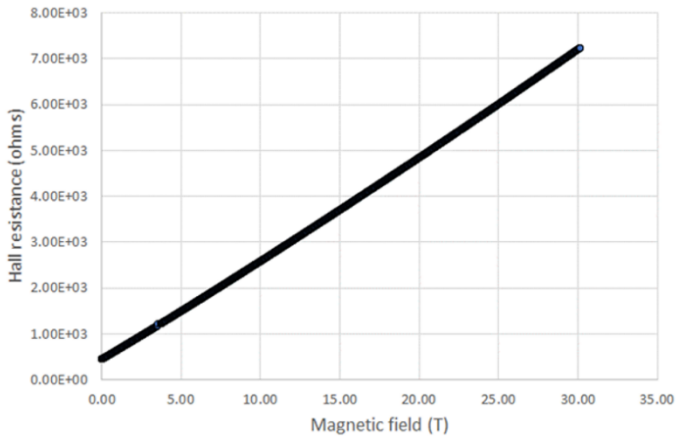
Ambient temperature = 300 K, unless otherwise specified. $I_N = 200 \mu$ A.

Parameter	Test conditions/notes	Min	Typical	Max	Units
Measurable field range		± 30 (300)			T (kG)
Magnetic equivalent noise	1 T field at 1 Hz, $I = I_N$		250	1250	μ T/VHz
Spectral noise density	at 1 Hz, $I = I_N$		10	50	μ V/VHz
Magnetic equivalent thermal noise floor	Freq > Corner frequency		0.3		μ T/VHz
Sensitivity	At ambient temperature	100 (10)	175 (17.5)	200 (20)	V/A.T (mV/A.G)
Linearity of Hall voltage	$I = I_N$, at 300 K, ± 1 T at 4 K, ± 1 T		0.2 1		%
Internal resistance	Between pin 1/2 and 5/6, and between pin 3/4 and 7/8, at field $B = 0$ T		5	8	k Ω
Ohmic Offset	$B = 0$ T		30	50	Ω
Temperature coefficient of offset	$I = I_N$ at ambient temperature		0.1		Ω /K
Temperature coefficient of sensitivity	$I = I_N$ at ambient temperature		0.2		%/K

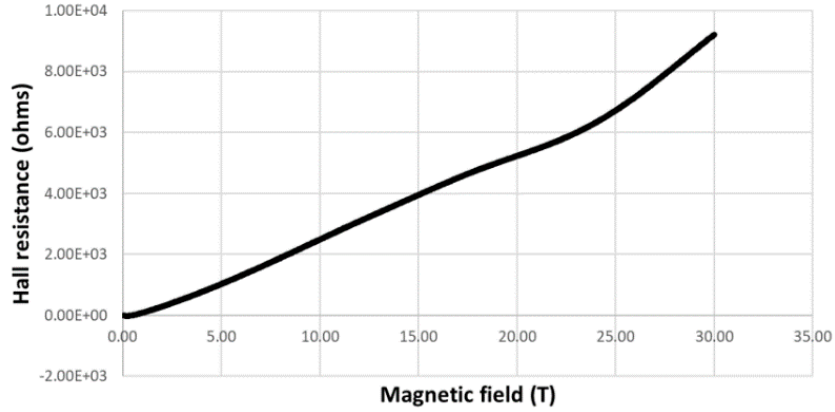


Typical performance graphs

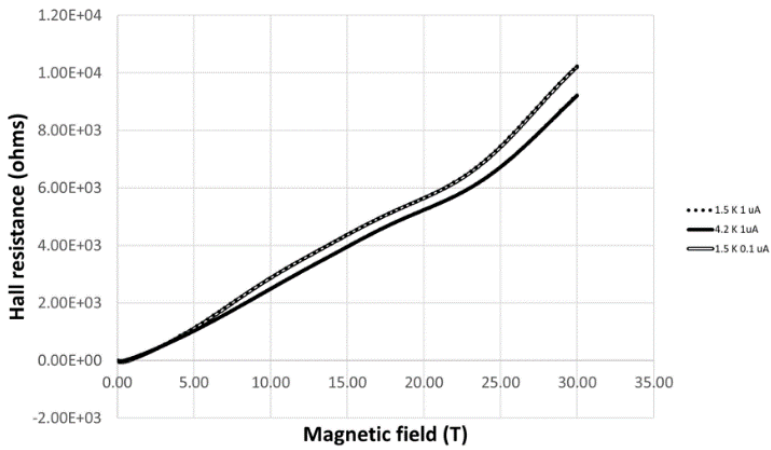
Typical Hall resistance to 30 T at 300 K



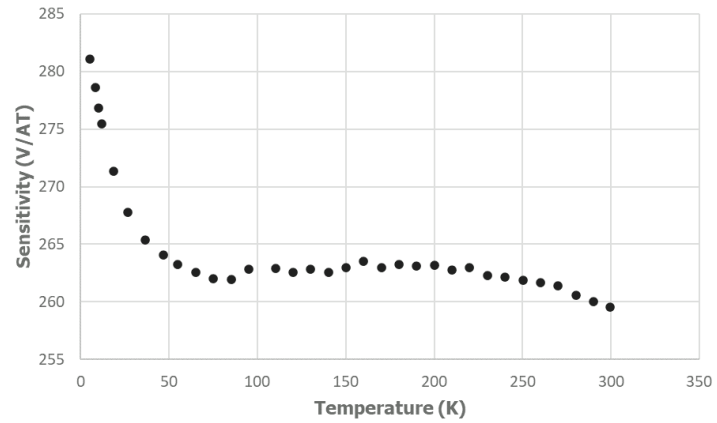
Typical Hall resistance to 30 T at 4 K



Typical Hall resistance to 30 T at 4 K vs at 1.5 K



Typical sensitivity to 300 K

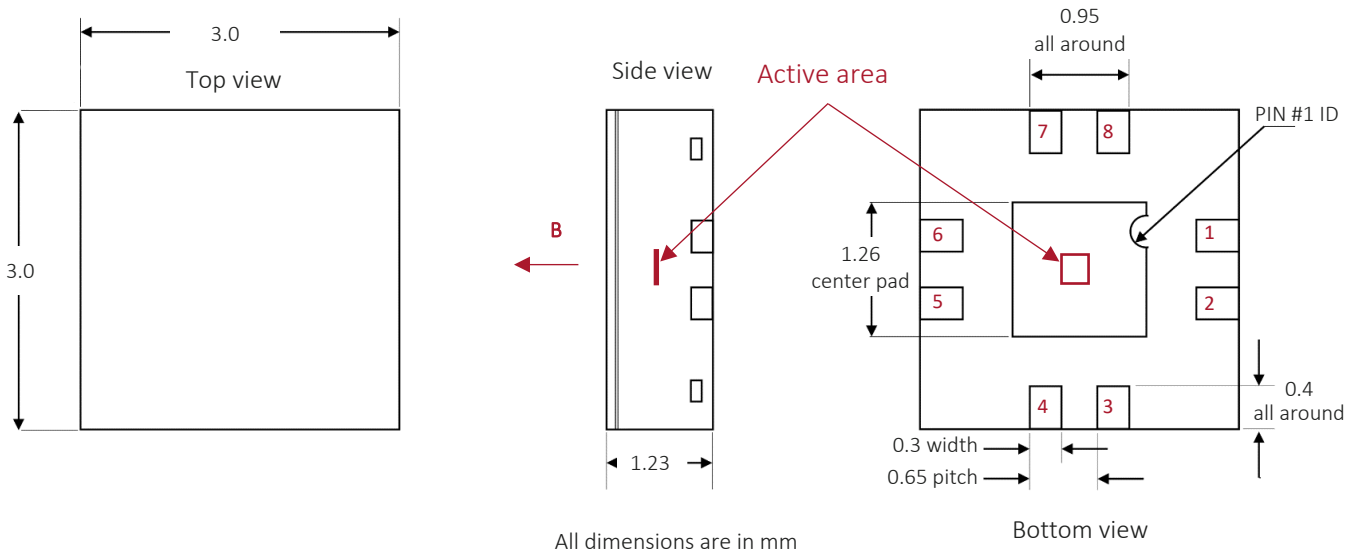
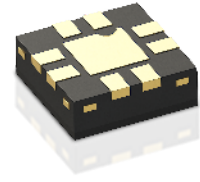


Packaging information

Package type: 8-pin QFN, ceramic, Ni-free, surface mount.

Recommended soldering method: reflow soldering with maximum peak temperature of 150-175°C and 40-80s maximum for temperature >138°C.

Active area: <100 µm x 100 µm located at the centre of the package and 450 µm from the top of the package.



Pin	Signal
1/2 or 5/6	A+
5/6 or 1/2	A-
3/4 or 7/8	B+
7/8 or 3/4	B-

Note 1: Pin 1 and 2, pin 3 and 4, 5 and 6, 7 and 8 are connected to each other within the package.

Note 2: Input voltage can be supplied with either polarity. Hall voltage polarity will depend on V_{IN} polarity and field polarity.

- A and B can be used as V_{IN} (input) or V_H (output) interchangeably.
- Polarity of each pair can also be flipped interchangeably.

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