Sensor specifications

The EGHSX03Q02 graphene Hall sensor is designed for use in extreme cryogenic environments with high sensitivities. It can operate down to mK temperatures while keeping very high sensitivity.

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	µA

* 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 µA.

| Parameter	Test conditions/notes	Min	Typical	Max	Units
Measurable field range	(Estimated – testing ongoing)	±0.5 (5)			T (kG)
Magnetic equivalent noise	1 T field at 1 Hz, I = I_N		50	315	µT/√Hz
Spectral noise density	at 1 Hz, I = I_N		10	50	µV/√Hz
Magnetic equivalent thermal noise floor	Freq > Corner frequency		0.06		µT/√Hz
Sensitivity	At ambient temperature		800 (80)		V/A.T (mV/A.G)
Linearity of Hall voltage	I = I_N, at 300 K, at 4 K,		0.2 1		% of full scale
Internal resistance	Between pin 1/2 and 5/6, and between pin 3/4 and 7/8, at field B = 0 T		5	8	kΩ
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

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.

All dimensions are in mm
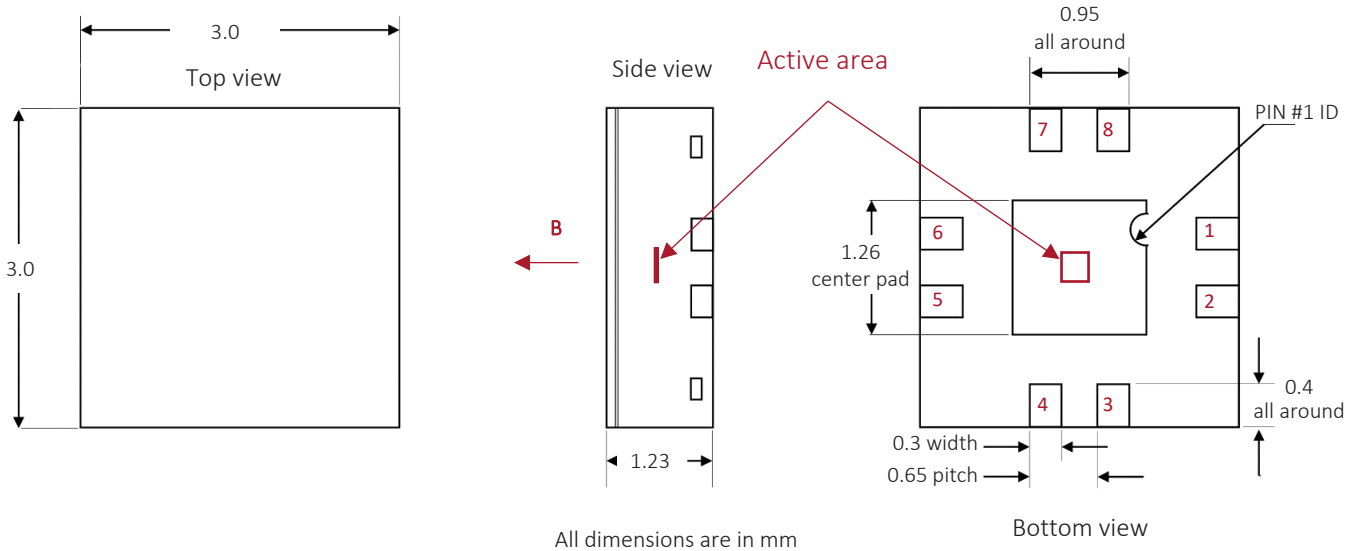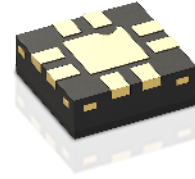
Pin	Signal
1/2 or 5/6	A+
5/6 or 1/2	A-
3/4 or 7/8	B+
7/8 or 3/4	B-

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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