

### Sensor specifications

The EGHSX02Q02 graphene Hall sensor is designed for use in cryogenic environments and can operate down to a temperature of 4K. It is also suitable for measuring strong magnetic fields and has a highly linear response up to 7T.

### Absolute maximum ratings

Parameter	Min	Max	Units
Supply voltage	-24	+24	V
Supply current	-5	+5	mA
Operating temperature *	4	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	$\mu$ A

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

### Performance characteristics

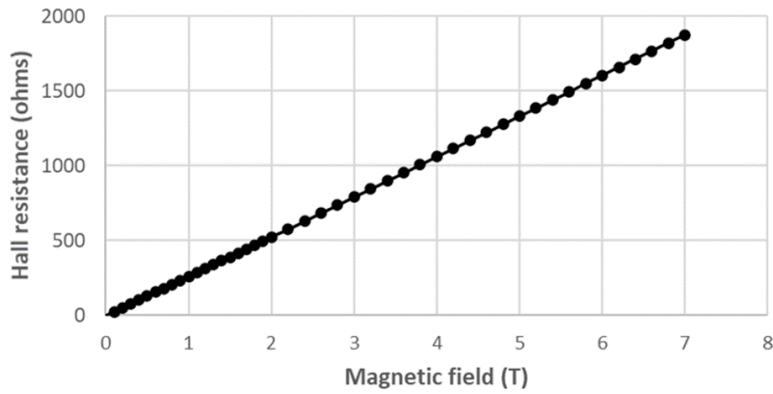
Ambient temperature = 300 K, unless otherwise specified.  $I_N = 200 \mu$ A.

Parameter	Test conditions/notes	Min	Typical	Max	Units
Measurable field range		$\pm 7$ (70)			T (kG)
Magnetic equivalent noise	1 T field at 1 Hz, $I = I_N$		175	835	$\mu$ T/VHz
Spectral noise density	at 1 Hz, $I = I_N$		10	50	$\mu$ V/VHz
Magnetic equivalent thermal noise floor	Freq > Corner frequency		0.15		$\mu$ T/VHz
Sensitivity	At ambient temperature	200 (20)	250 (25)	300 (30)	V/A.T (mV/A.G)
Linearity of Hall voltage	$I = I_N$ , at 300 K, $\pm 1$ T at 4 K, $\pm 1$ 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 $\Omega$
Ohmic Offset	$B = 0$ T		30	50	$\Omega$
Temperature coefficient of offset	$I = I_N$		0.1		$\Omega$ /K
Temperature coefficient of sensitivity	$I = I_N$ , at ambient temperature		0.2		%/K

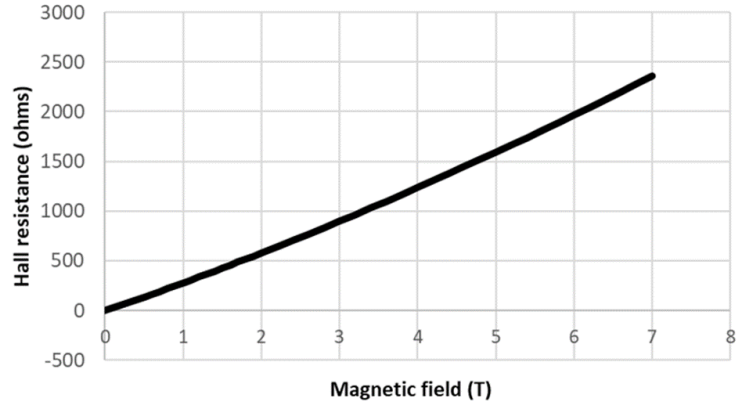


## Typical performance graphs

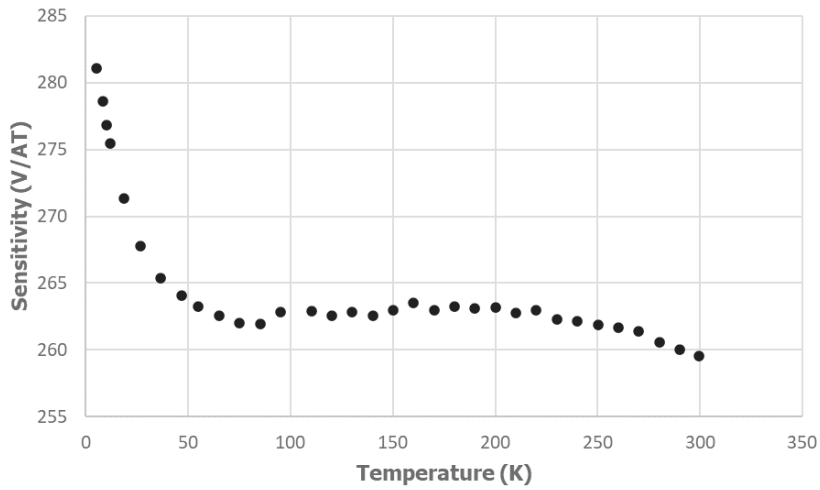
Typical Hall resistance to 7 T at 300 K



Typical Hall resistance to 7 T at 4 K



Typical sensitivity from 4K to 300 K

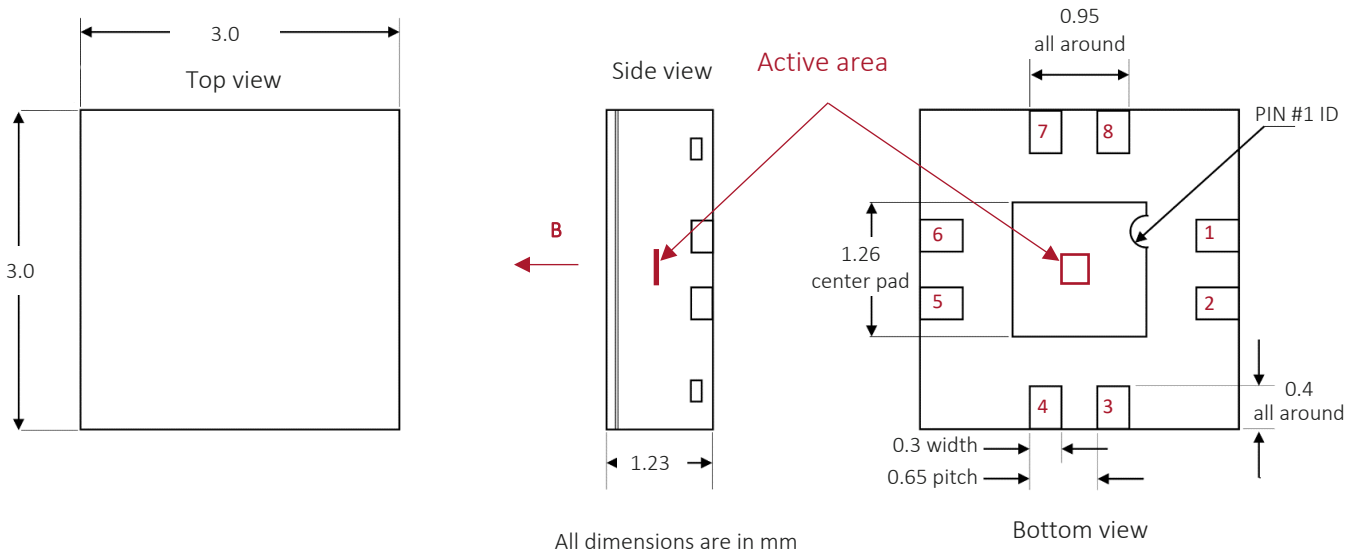
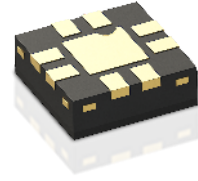


## Packaging information

**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.

For further information, please contact us:



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