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Honeywell Aerospace
12001 State Highway 55
Plymouth, MN 55441

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Subject: Product Change Note for HMC1053 Magnetic sensor

Dear Valued Honeywell Customer:

As you are aware, the Honeywell HMC1053 magnetic sensor has been on Production Hold due to semi-conductor supply chain challenges. Due to a component obsolescence, Honeywell has undertaken a design update and is moving forward with qualification efforts.

Due to the component obsolescence, there are some changes compared to the earlier version of the device. A technical note on the changes is attached herewithin, as Annexure-I.

For any technical queries, customers may reach out to PlymouthSupport@Honeywell.com.

If you require further information regarding this notice, please contact

- OEM Principal Accounts Manager, Kim Olson at Kim.Olson@Honeywell.com
- APAC Business Manager, Jon Tan at Jon.Tan@Honeywell.com.
- Channel Partner Sales Director, Fred Duncan at Frederick.Duncan@honeywell.com

We value your feedback, and would be happy to discuss any related issues.
We appreciate your understanding and value your business with Honeywell.

Best Regards,

Jeevish G Gurumoorthi
Honeywell Aerospace
Sr. Offering Manager (Navigation & Sensors)
Magnetic & Pressure Sensors PL
JeevishGlastine.Gurumoorthi@Honeywell.com

TECHNICAL NOTE

Honeywell is getting ready to restart production of the HMC1053 3-axis Magnetic Sensor. Due to the changes in the supply chain it became necessary to replace one of its internal components. As a result of this change the following specification parameters have changed for all HMC1053 shipped after 2022:

- 1) The resistance value between the Pin 15 OFF+(A,B,C) and Pin 7 OFF-(C) changes from 15 to 8 Ohm. The Offset Constant for the C bridge (related to the current forced between these pins) changes from 11.5 mA/gauss to 10 mA/gauss.
Please see the schematic below that shows the affected component and the redlines for the proposed datasheet changes. The existing datasheet specification table for the HMC1051/HMC1052/HMC1053 products will be split in two: for the HMC1051/HMC1052 and for the HMC1053.

This change does not affect HMC1053 customers who don't use the Offset Strap functionality. Those customers that do use the Offset Straps most likely would not need to do any changes to their application circuits. The lower Offset Strap resistance and lower Offset Constant value can be considered as a beneficial change since it allows to achieve the same result with less applied current and thermal heating. Minor changes to operating procedures or control software might be needed. Please see the redlined specification table below.

- 2) Honeywell also changes the maximum allowable current for the Set/Reset Strap from 4 to 2 Amps. This change will be applied to the HMC1053 only. It is done to reduce the risk of overstressing the sensors. Practically, since the HMC1053 is typically used in low voltage applications with 3.3VDC or 5VDC supply, the maximum Set/Reset peak current is limited to less than 1.66 Amps.

Please see the redlined specification table below. For your reference, here is a description of the Offset Strap from the datasheet:

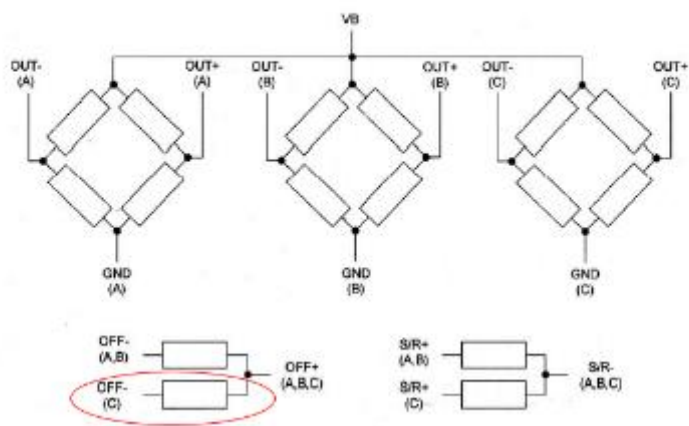
"The offset strap is a spiral of metallization that couples in the sensor element's sensitive axis. In two-axis designs, the strap is common to both bridges and must be multiplexed if each bridge requires a different strap current. In three-axis designs (HMC1053), the A and B bridges are together with the C bridge sharing a common node for series driving all three bridges' offset straps. Each offset strap measures nominally 15 ohms, and requires 10mA for each gauss of induced field. The straps will easily handle currents to buck or boost fields through the ± 6 gauss linear measurement range, but designers should note the extreme thermal heating on the die when doing so.

With most applications, the offset strap is not utilized and can be ignored. Designers can leave one or both strap connections (Off- and Off+) open circuited, or ground one connection node. Do not tie both strap connections together to avoid shorted turn magnetic circuits."

"The offset strap allows for several modes of operation when a direct current is driven through it. These modes are: 1) Subtraction (bucking) of an unwanted external magnetic field, 2) nulling of the bridge offset voltage, 3) Closed loop field cancellation, and 4) Auto-calibration of bridge gain."

Set/Reset Strap					
Resistance ⁽²⁾	Measured from S/R+ to S/R-	3	4.5	6	ohms
Current ⁽³⁾	0.1% duty cycle, or less, 2μsec current pulse	0.44	0.5	4 2	Amp
Resistance Tempco ⁽³⁾	T _A = -40 to 125°C		2350		ppm/°C
Offset Strap					
Resistance ⁽²⁾	Measured from OFFSET+ to OFFSET-	12	15	18	Ohms
Resistance, A,B ⁽²⁾	Measured from OFF+(A,B,C) to OFF-(A,B)	12	15	18	Ohms
Resistance, C ⁽²⁾	Measured from OFF+(A,B,C) to OFF-(C)	5	8	11	Ohms
Offset Constant, A,B ⁽³⁾	DC Current		11.5		mA/gauss
Offset Constant, C ⁽³⁾	Field applied in sensitive direction		10		mA/gauss
Resistance Tempco ⁽³⁾	T _A = -40 to 125°C		3300		ppm/°C

HMC1053



- 3) The polarity of C-axis sensor is reversed vs. one for the legacy HMC1053 parts. Red arrow indicates direction of applied field that generates a positive output voltage after a SET pulse.

HMC1053 Pinout

