

# Data Sheet

## *MS32*

FEATURES	APPLICATIONS
<ul style="list-style-type: none"> <li>• sensor based on solid state magneto-resistance effect</li> <li>• unipolar signal output</li> <li>• linear field response</li> <li>• high sensitivity, low hysteresis</li> <li>• temperature compensated switching point</li> <li>• small power consumption due to high bridge resistance</li> <li>• supply voltage up to 30V allowed</li> <li>• small TDFN package</li> </ul>	<p>contactless position (presence, open/close) detection in</p> <ul style="list-style-type: none"> <li>• industrial</li> <li>• consumer</li> <li>• automotive</li> </ul> <p>applications, like</p> <ul style="list-style-type: none"> <li>• small stroke pneumatic cylinders</li> <li>• cover positions of notebooks and mobiles</li> <li>• doors etc.</li> </ul>

**GENERAL DESCRIPTION**

The MS32 is a magnetic field sensor which is built in the form of a Wheatstone bridge. Each of its four resistors is made from *Permalloy*, a material that shows the *anisotropic magnetoresistance effect*. An unidirectional magnetic field in the surface parallel to the chip (x-y plane) along the y-axis will deliver a field dependent output signal. A **magnetic switching point**, which is almost **independent on temperature** is typically set to  $H_s=2$  kA/m. In addition, the characteristic curve is linear over a wide magnetic field range. Thus, the new MS32 simplifies the adaption of the sensor to different mechanical and magnetical environments. The sensor die is packaged in a modern TDFN package.

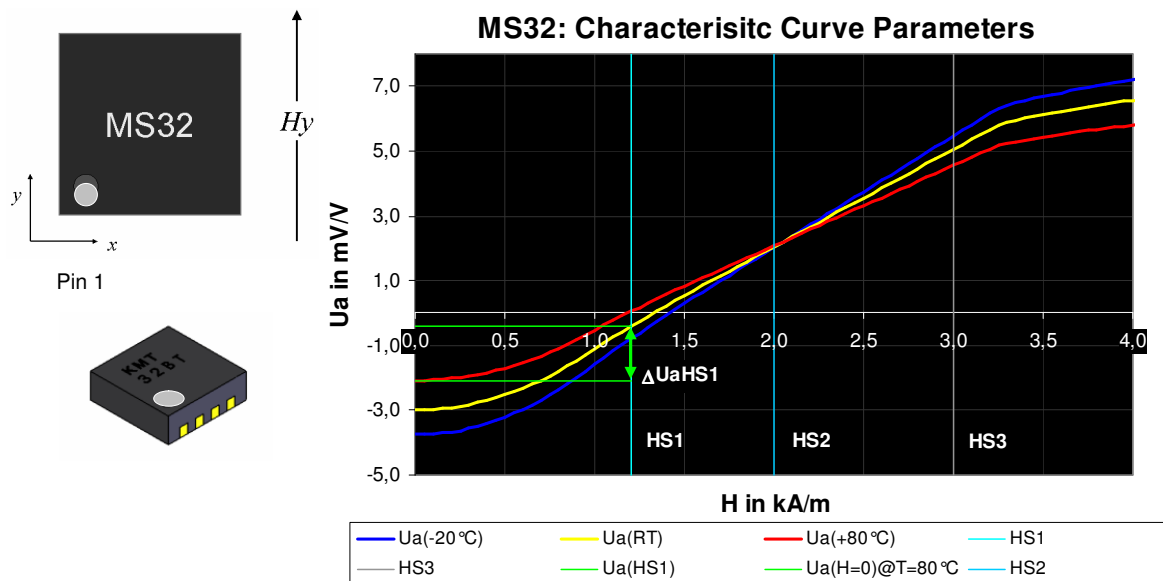


Figure 1: Characteristic curves for MS32 at different ambient temperatures (-20 °C, +25 °C, +80 °C)

**CHARACTERISTIC VALUES (PRELIMINARY)**

PARAMETER	SYMBOL	UNIT	MIN	TYP	MAX	CONDITION
<b>Geometrical Dimensions</b>						
Package footprint		mm*mm		<b>2.5*2.5</b>		See end of document
Package thickness		mm		<b>0.75</b>		
Pad size		mm*mm		<b>0.25*0.30</b>		matte tin
<b>Operating Limits</b>						
Max. supply voltage	$V_{cc,max}$	V			<b>30</b>	
Storage temperature	$T_{st}$	°C	<b>-25</b>		<b>+125</b>	
Operating temperature	$T_{op}$	°C	<b>-20</b>		<b>+80</b>	
<b>Sensor Specifications (Condition A)</b>						
Supply voltage	$V_{cc}$	V		<b>3.3</b>	<b>6</b>	
Applicable switching field	$HS1, HS3$	kA/m	<b>1.2</b>		<b>3.0</b>	
Resistance	$R_b$	$\Omega$	<b>9000</b>	<b>10500</b>		
Offset	$U_{off}$	mV/V	<b>-8</b>	<b>-3</b>	<b>+2</b>	preset mismatch
Sensitivity	$S$	(mV/V)/ (kA/m)	<b>2</b>	<b>3</b>		
Max. output amplitude	$/U_{a,max}/$	mV/V			<b>8</b>	within (HS1, HS3)
Temperature compensated switching field	$HS2$	kA/m		<b>2</b>		
Preset interval	$\Delta U_{aHS1}$	mV/V	<b>0.55</b>			
Hysteresis	$Hyst$	kA/m			<b>0.3</b>	
<b>Sensor Specifications (T=-25 °C; +85 °C ; Conditions A&amp;C)</b>						
TC of amplitude	$TCSV$	%/K	<b>-0.36</b>	<b>-0.32</b>	<b>-0.28</b>	
TC of resistance	$TCBR$	%/K	<b>+0.27</b>	<b>+0.32</b>	<b>+0.37</b>	

**LEGAL DISCLAIMER**

This product is not designed for use in life support appliances, devices or systems where malfunction of this product can reasonably be expected to result in personal injury. HL Planartechnik GmbH customers using or selling this product for use in such applications do so at their own risk and agree to fully indemnify HL Planartechnik GmbH for any damages resulting from such improper use or sale.

This data sheet contains target specifications for product development which may be subject to changes without notice.

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**MEASUREMENT CONDITIONS**

PARAMETER	SYMBOL	UNIT	CONDITION
<b>A. Set Up Conditions</b>			
ambient temperature	$T$	°C	$T = 23 \pm 5$ °C (unless otherwise noted)
supply voltage	$V_{cc}$	V	$V_{cc} = 5$ V
applied magnetic field	$H_y$	kA/m	$H_y = -7 \dots +7$ kA/m; along y direction; $ H_x  < 100$ A/m Pre-magnetization along x-direction with $H_x > 5$ kA/m
<b>B. Sensor Specifications at Room Temperature</b>			
Max. output amplitude	$ U_{a,max} $	mV/V	$U_{a,max} :=  U_a(HS3, RT) $
Sensitivity	$S$	mV/V/ kA/m	$S := U_a(H=2.0 \text{ kA/m}) - U_a(H=1.0 \text{ kA/m})$
Preset interval	$\Delta U_{aHS1}$	mV/V	$\Delta U_{aHS1} := U_a(HS1, RT) - U_a(0, +85^\circ\text{C})$
<b>C. Sensor Specifications (T=-25 °C, +85 °C)</b>			
ambient temperatures	$T$	°C	$T_1 = -25, T_0 = +25, T_2 = +85$ °C
TC of amplitude	$TCSV$	%/K	$TCV = \frac{1}{(T_2 - T_1)} \cdot \frac{V_a(T_2) - V_a(T_1)}{V_a(T_1)} \cdot 100\%$
TC of resistance	$TCBR$	%/K	$TCR = \frac{1}{(T_2 - T_1)} \cdot \frac{R(T_2) - R(T_1)}{R(T_1)} \cdot 100\%$
TC of offset	$TCV_{off}$	µV/(VK)	$TCV_{off} = \frac{V_{off}(T_2) - V_{off}(T_1)}{(T_2 - T_1)}$

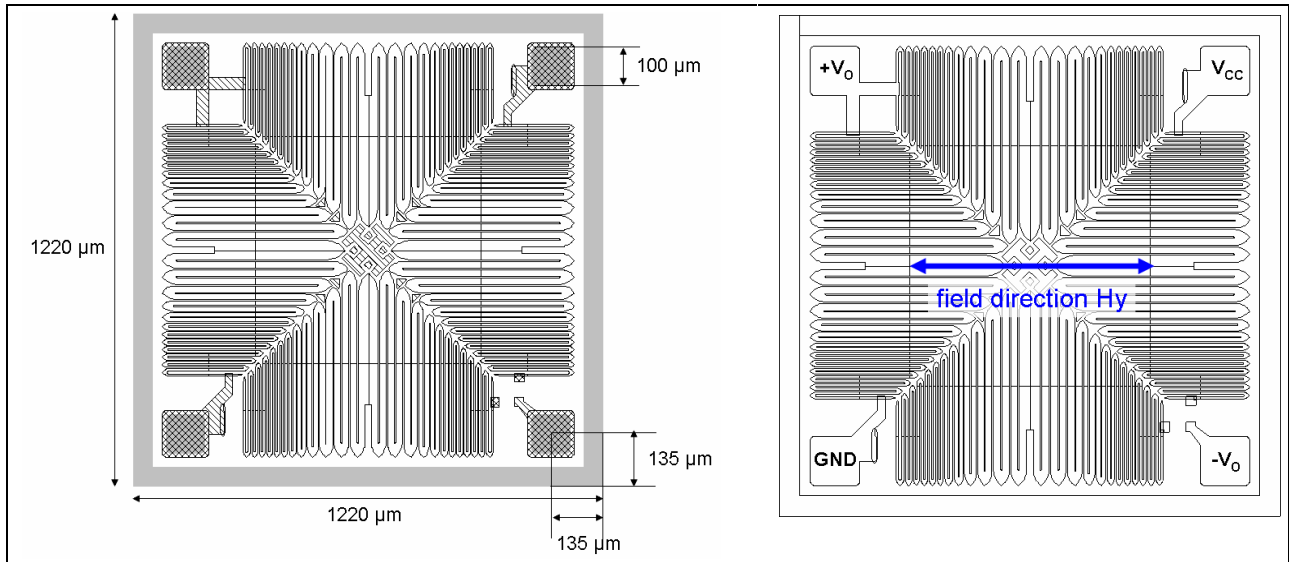
**ORDERING CODE**

	ARTICLE	PACKAGE	PART NUMBER
1	<b>MS32</b>	die	TBD
2	<b>MS32/TD</b>	TDFN 2.5x2.5	TBD

北京赛斯维测控技术有限公司  
 北京市朝阳区望京西路48号  
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 电话：+86 010 8477 5646  
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<http://www.sensorway.cn>

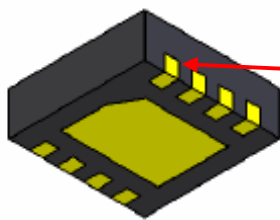
**PACKAGE**

**DIE**

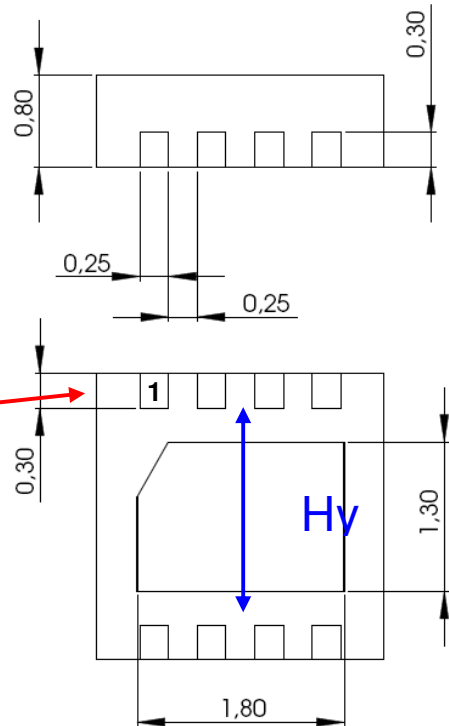


**TDFN PACKAGE**

PIN	SYMBOL	DESCRIPTION
1	-Vo	negative output bridge
4	GND	ground
5	+Vo	positive output bridge
8	Vcc	supply voltage bridge



Pin 1



Package dimensions are 2.5x2.5x0.8 mm<sup>3</sup>.