

KMZ10CM Linear Field Sensor



- Magnetoresistive sensor technology
- Linear signal output
- Over increased field range
- Very low hysteresis
- High sensitivity
- Substitutes KMZ10C / NXP

DESCRIPTION

Due to its featured properties - high sensitivity and almost no hysteresis – the **KMZ10CM** sensor is used in a wide range of applications, like magnetic field measurement, revolution counters, proximity detecting, and position measurement.

FEATURES

- Wheatstone bridge
- Passive output signal
- Linear signal output proportional to magnetic field strength
- 4 lead package for measurement of z direction

APPLICATIONS

Detection of small magnetic fields, as in:

- Contactless switch
 - Contactless displacement measurement
 - Current measurement
- Polarity detection of small magnetic fields

KMZ10CM Linear Field Sensor

PERFORMANCE SPECS

Parameter	Symbol	Condition	Min	Typ	Max	Unit
A. Operating Limits 1)						
max. supply voltage	$V_{CC,max}$				10	V
operating temperature	T_{op}		-40		+150	°C
storage temperature	T_{st}		-65		+165	°C
B. Sensor Specifications (T = 25 °C ; H_x = 3 kA/m)						
supply voltage	V_{CC}			5	10	V
bridge resistance	R_b		1000	1400	1800	Ω
offset voltage	V_{OFF}/V_{CC}	H _x =0	-1.5	0	+1.5	mV/V
sensitivity	S	note 2	1	1.2	2	(mV/V)/(kA/m)
hysteresis	V_{HYST}	note 3	-	-	100	μV/V
linearity deviation	FL	note 4	-	-	6.5	%
C. Sensor Specifications (T_{low} = 30 °C ; T_{high} = 80 °C ; H_x = 3 kA/m ; V_{CC} = 5 V)						
TC of sensitivity	TCS	note 5	-	- 0.35	-	%/K
TC of resistance	TCBR	note 6	-	+ 0.45	-	%/K
TC of offset	TCV _{off}	note 7,8, H _x =0	-4	0	+4	μV/V/K

- 1) Stress above one or more of the limiting values may cause permanent damage to the device. Exposure to limiting values for extended periods may affect device reliability.
- 2) The sensitivity is defined as the average slope of characteristic between H_y=0 and 6 kA/m and H_x=3kA/m:

$$S = \frac{V_0(H_y = 6kA/m) - V_0(H_y = 0)}{6 * V_{CC}}$$

- 3) Hysteresis is defined as the difference between offset voltages measured without H_y-field after premagnetization by negative and positive H_y=±6 kA/m field:

$$V_{HYST} = V_0(H_1 \rightarrow H_0) - V_0(-H_1 \rightarrow H_0); H_0 = 0; H_1 = 6 \frac{kA}{m}; H_x = 3 \frac{kA}{m}; V_{CC} = 5V$$

- 4) The linearity error is the deviation of output voltage measured at H_y=3 kA/m from the average of H_y=0 and 6 kA/m output voltages, expressed as percentage of the output voltage difference measured between 0 and 6 kA/m:

$$FL = \left| \frac{1}{2} - \frac{V_0(H_y = 3kA/m) - V_0(H_y = 0)}{V_0(H_y = 6kA/m) - V_0(H_y = 0)} \right| * 100\%$$

- 5) The temperature coefficient of sensitivity is defined as the percentage change of the sensitivity per K referred to the value at T₁ = -25 °C; T₂= operating temperature:

$$TCS = \frac{1}{(T_2 - T_1)} * \frac{S(T_2) - S(T_1)}{S(T_1)} * 100\%$$

KMZ10CM Linear Field Sensor

- 6) The temperature coefficient of resistance is defined as the percentage change of the resistance per K referred to the value at $T_1 = -25\text{ °C}$; $T_2 =$ operating temperature:

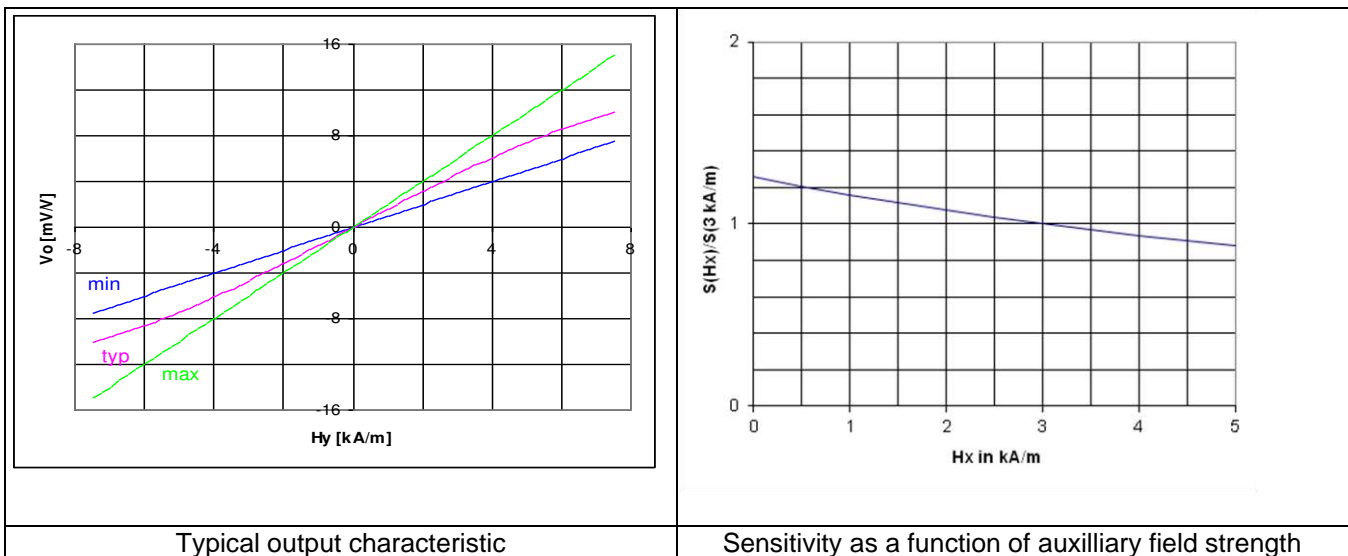
$$TCBR = \frac{1}{(T_2 - T_1)} * \frac{R(T_2) - R(T_1)}{R(T_1)} * 100\%$$

- 7) Temperature coefficient of offset voltage is defined as the voltage change per K expressed in $\mu\text{V/V}$:

$$TCV_{\text{off}} = \frac{V_{\text{off}}(T_2) - V_{\text{off}}(T_1)}{(T_2 - T_1)}$$

- 8) Linear behaviour assumed

TYPICAL PERFORMANCE CURVES

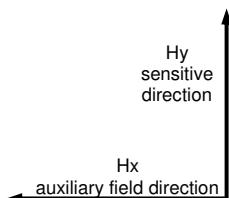


Typical output characteristic

Sensitivity as a function of auxiliary field strength

FUNCTION

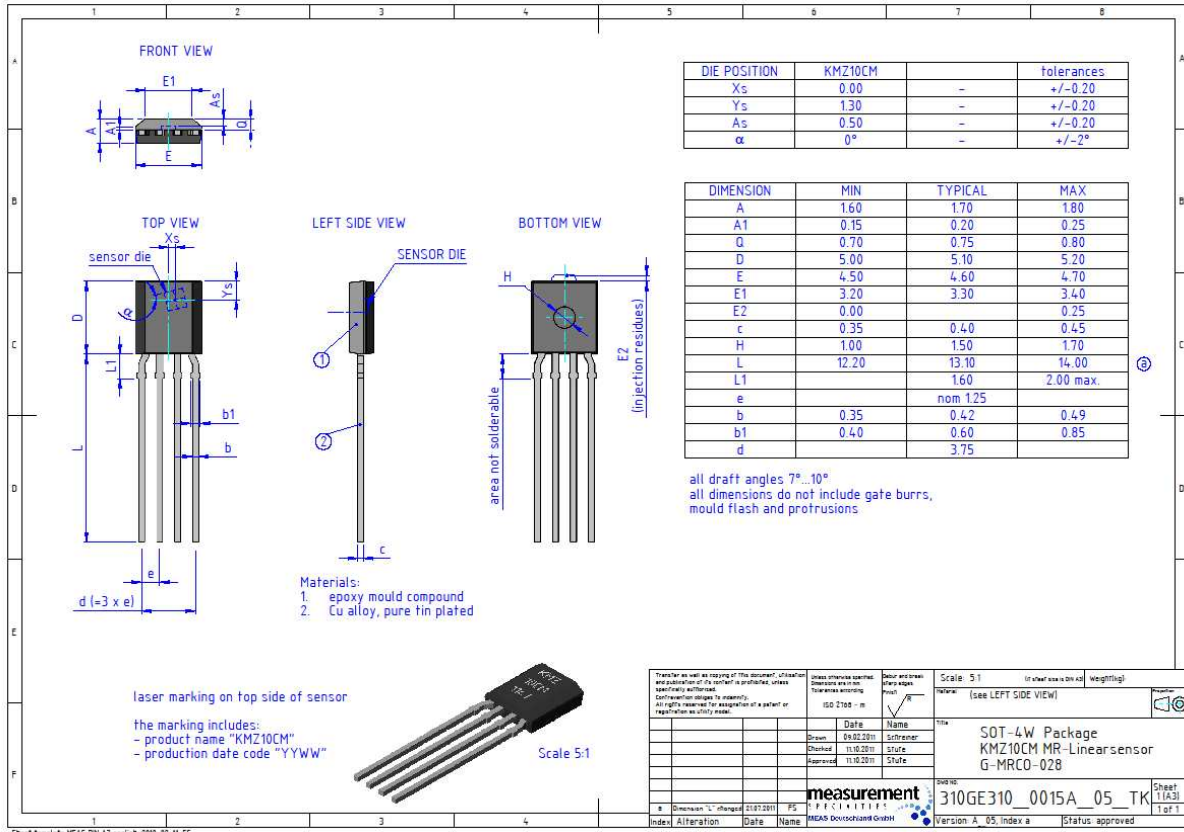
TERMINAL CONNECTIONS



Pin	Symbol	Function
1	+Vo	positive output voltage
2	GND	negative supply voltage
3	-Vo	negative output voltage
4	+Vcc	positive supply voltage

KMZ10CM Linear Field Sensor

BLOCK DIAGRAM



ORDERING CODE

Product	Description	Part number
KMZ10CM	KMZ10 CM Linear Field Sensor	G-MRCO-028

KMZ10CM Linear Field Sensor

TECHNICAL CONTACT INFORMATION

NORTH AMERICA	EUROPE	ASIA
Measurement Specialties, Inc. 1000 Lucas Way Hampton, VA 23666 United States Phone: +1-800-745-8008 Fax: +1-757-766-4297 Email: sales@meas-spec.com Web: www.meas-spec.com	MEAS Deutschland GmbH Hauert 13 D-44227 Dortmund Germany Phone: +49-(0)231-9740-0 Fax: +49-(0)231-9740-20 Email: info.de@meas-spec.com Web: www.meas-spec.com	Measurement Specialties China Ltd. No. 26, Langshan Road High-tech Park (North) Nanshan District, Shenzhen 518057 China Phone: +86-755-33305088 Fax: +86-755-33305099 Email: info.cn@meas-spec.com Web: www.meas-spec.com

The information in this sheet has been carefully reviewed and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Furthermore, this information does not convey to the purchaser of such devices any license under the patent rights to the manufacturer. Measurement Specialties, Inc. reserves the right to make changes without further notice to any product herein. Measurement Specialties, Inc. makes no warranty, representation or guarantee regarding the suitability of its product for any particular purpose, nor does Measurement Specialties, Inc. assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Typical parameters can and do vary in different applications. All operating parameters must be validated for each customer application by customer's technical experts. Measurement Specialties, Inc. does not convey any license under its patent rights nor the rights of others.

The status of this datasheet is PRELIMINARY