

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

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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:

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

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

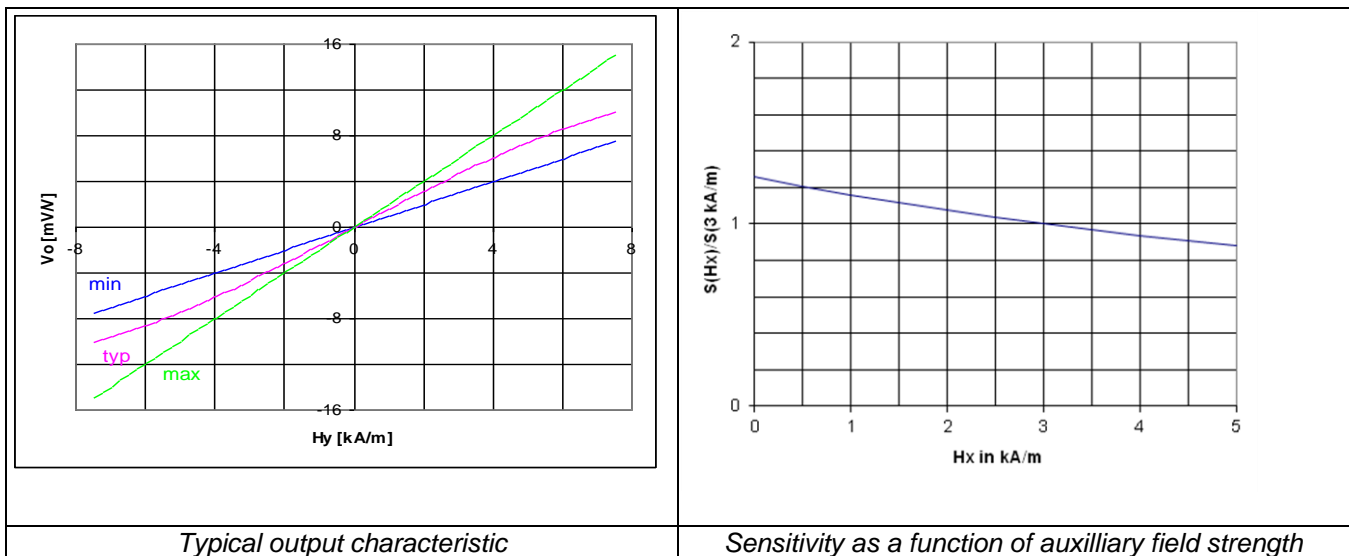
$$TCBR = \frac{1}{(T_2 - T_1)} * \frac{R(T_2) - R(T_1)}{R(T_1)} * 100\%$$

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

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

- 8) Linear behaviour assumed

TYPICAL PERFORMANCE CURVES

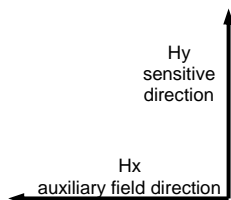


Typical output characteristic

Sensitivity as a function of auxiliary field strength

FUNCTION

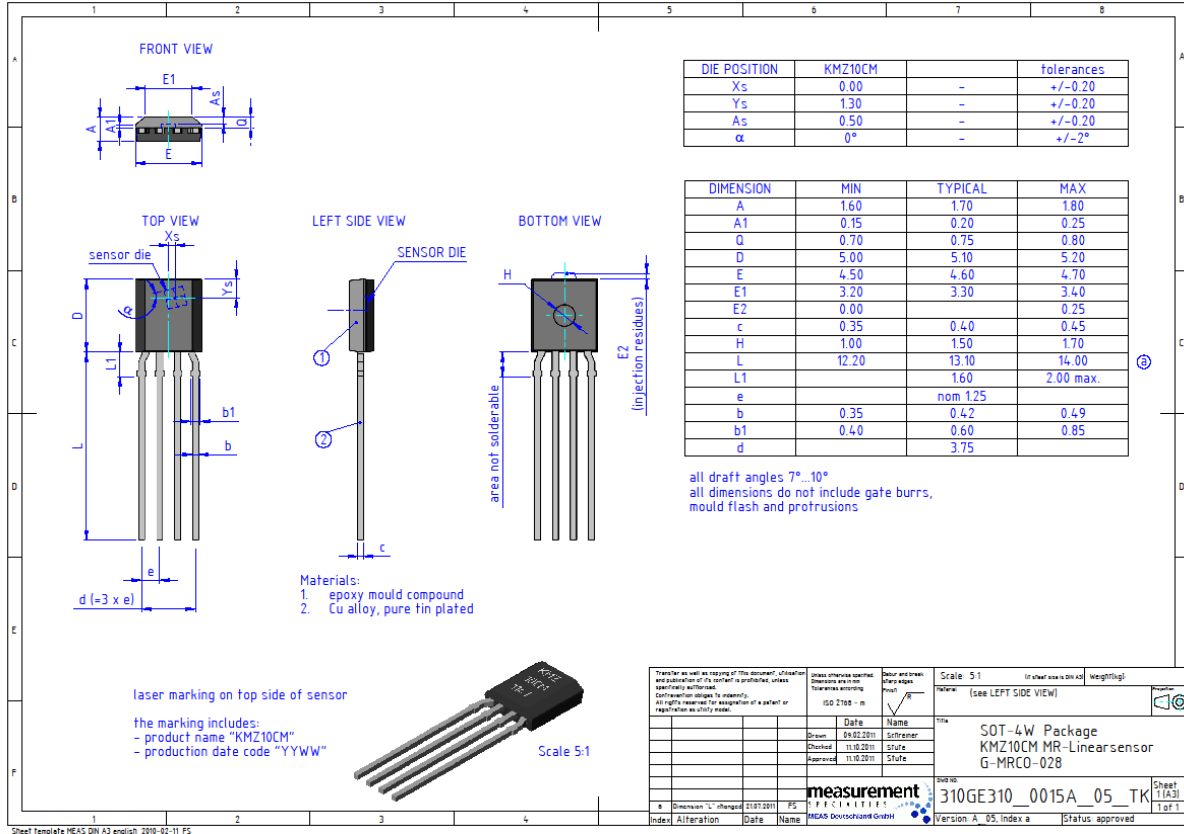
TERMINAL CONNECTIONS



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

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BLOCK DIAGRAM



ORDERING CODE

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