

# 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
<b>A. Operating Limits 1)</b>						
max. supply voltage	$V_{CC,max}$				10	V
operating temperature	$T_{op}$		-40		+150	°C
storage temperature	$T_{st}$		-65		+165	°C
<b>B. Sensor Specifications (T = 25 °C ; H<sub>x</sub> = 3 kA/m)</b>						
supply voltage	$V_{CC}$			5	10	V
bridge resistance	$R_b$		1000	1400	1800	Ω
offset voltage	$V_{OFF}/V_{CC}$	H <sub>x</sub> =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	%
<b>C. Sensor Specifications (T<sub>low</sub> = 30 °C ; T<sub>high</sub> = 80 °C ; H<sub>x</sub> = 3 kA/m ; V<sub>CC</sub> = 5 V)</b>						
TC of sensitivity	TCS	note 5	-	- 0.35	-	%/K
TC of resistance	TCBR	note 6	-	+ 0.45	-	%/K
TC of offset	TCV <sub>off</sub>	note 7,8, H <sub>x</sub> =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<sub>y</sub>=0 and 6 kA/m and H<sub>x</sub>=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<sub>y</sub>-field after premagnetization by negative and positive H<sub>y</sub>=±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<sub>y</sub>=3 kA/m from the average of H<sub>y</sub>=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 T<sub>1</sub> = -25 °C; T<sub>2</sub>= 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  $T_1 = -25\text{ °C}$ ;  $T_2 =$  operating temperature:

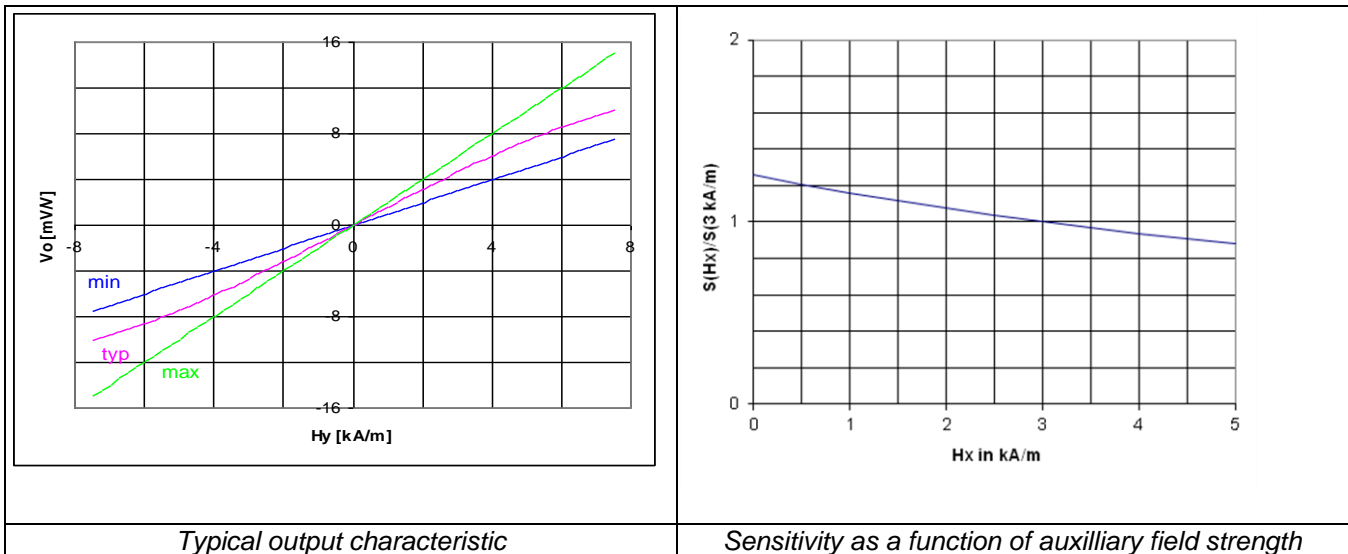
$$TCBR = \frac{1}{(T_2 - T_1)} * \frac{R(T_2) - R(T_1)}{R(T_1)} * 100\%$$

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

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

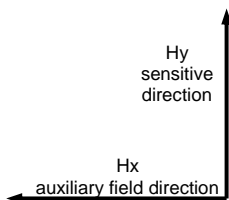
- 8) Linear behaviour assumed

## TYPICAL PERFORMANCE CURVES



## FUNCTION

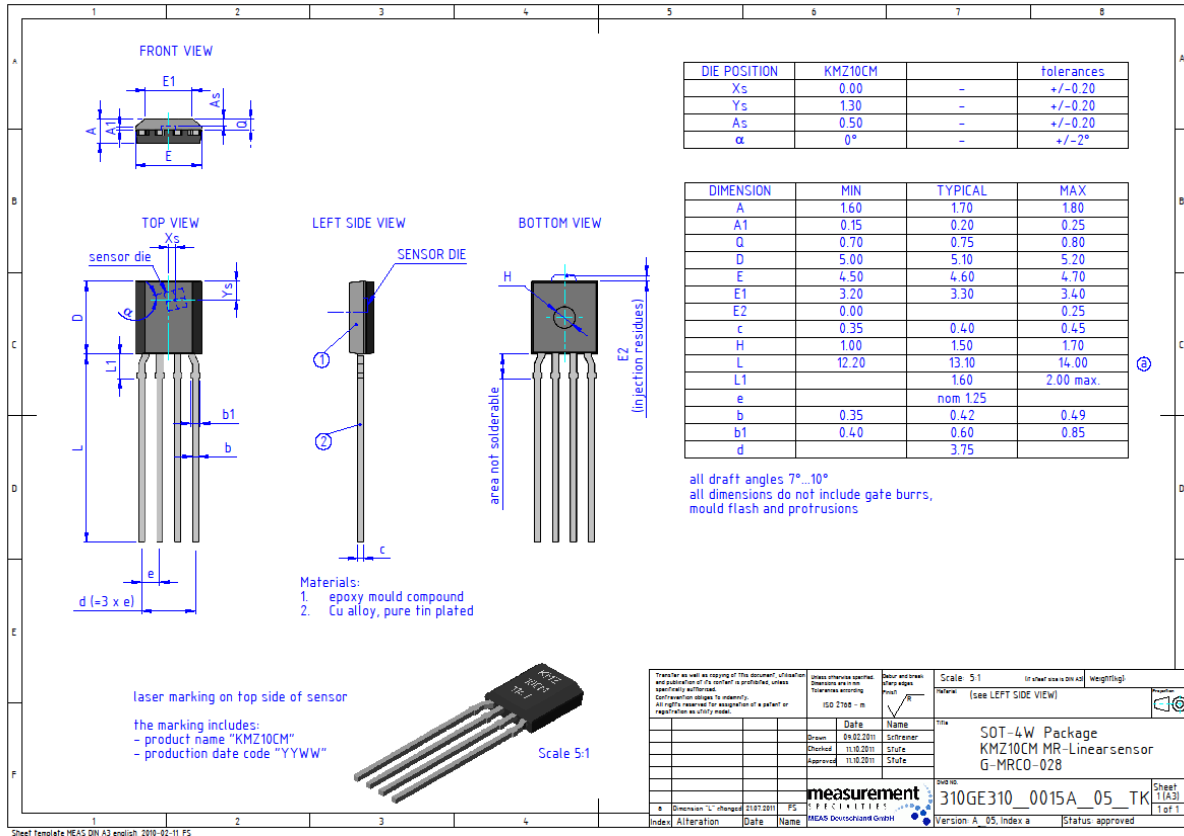
### TERMINAL CONNECTIONS



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

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