KMZ10CM Linear Field Sensor

- **Magnetoresisitve sensor technology**
- **Linear signal output**
- **Over increased field range**
- **Very low hysteresis**
- **High sensititvity**
- **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

- Wheatsone 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

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 Hy=0 and 6 kA/m and Hx=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 Hy-field after premagnetization by negative and positive Hy=±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 Hy=3 kA/m from the average of Hy=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_1 = -25 °C; T_2= 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 °C; T_2= operating temperature:

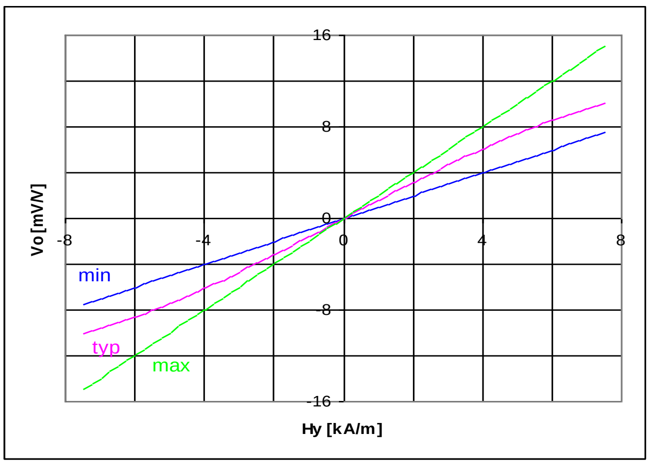
$$TCBR = \frac{1}{(T_2 - T_1)} * \frac{R(T_2) - R(T_1)}{R(T_1)} * 100\%$$

7) Temperature coefficient of offset voltage is defined as the voltage change per K expressed in µV/V:

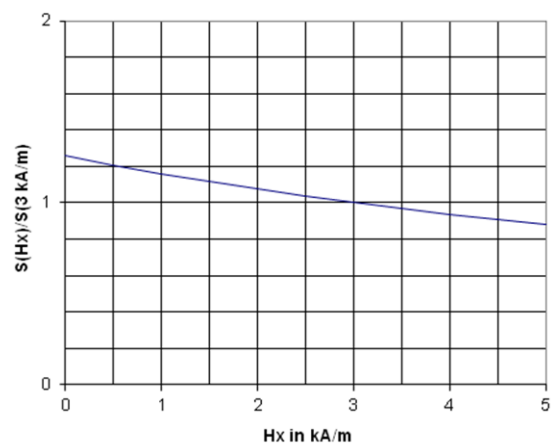
$$TCV_{off} = \frac{V_{off}(T_2) - V_{off}(T_1)}{(T_2 - T_1)}$$

8) Linear behaviour assumed

TYPICAL PERFORMANCE CURVES



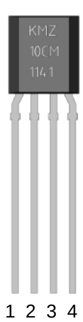
Typical output characteristic

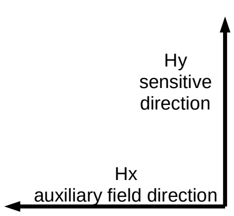


Sensitivity as a function of auxilliary field strength

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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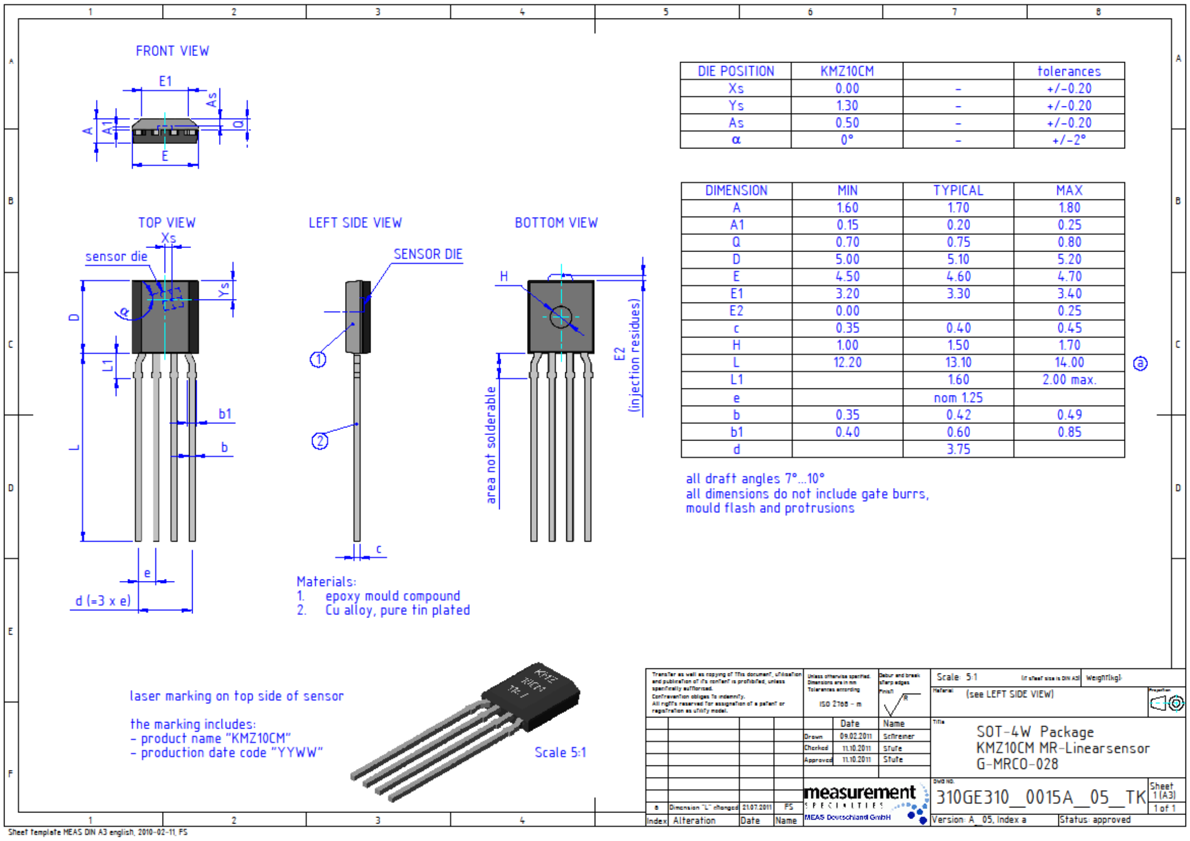
BLOCK DIAGRAM



ORDERING CODE

Product	Description
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