Magnetic field sensor KMZ10C

DESCRIPTION

The KMZ10C is a magnetic field sensor, employing the magnetoresistive effect of thin-film permalloy. Its properties enable this sensor to be used in a wide range of applications for current and field measurement, revolution counters, angular or linear position measurement and proximity detectors, etc.

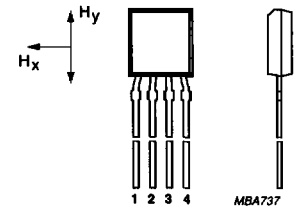


Fig.1 Simplified outline.

PINNING

PIN	SYMBOL	DESCRIPTION
1	$+V_O$	output voltage
2	GND	ground
3	$-V_O$	output voltage
4	V_{CC}	supply voltage

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{CC}	DC supply voltage	–	5	–	V
T_{bridge}	bridge operating temperature	–40	–	+150	°C
H_y	magnetic field strength	–7.5	–	+7.5	kA/m
H_x	auxiliary field	–	3	–	kA/m
S	sensitivity	–	1.5	–	$\frac{mV/V}{kA/m}$
R_{bridge}	bridge resistance	1	–	1.8	kΩ
V_{offset}	offset voltage	–1.5	–	+1.5	mV/V

CIRCUIT DIAGRAM

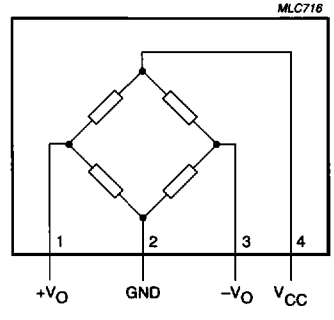


Fig.2 Simplified circuit diagram.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CC}	DC supply voltage		–	10	V
P_{tot}	total power dissipation	up to T_{amb} = 132 °C	–	100	mW
T_{stg}	storage temperature	note 1	–65	+150	°C
T_{bridge}	bridge operating temperature		–40	+150	°C

Note

1. Maximum operating temperature of the thin-film permalloy.

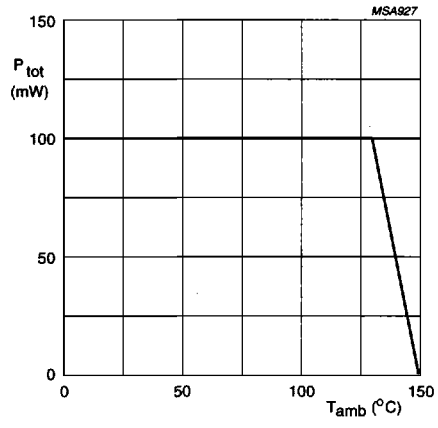


Fig.3 Power derating curve.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	180	K/W

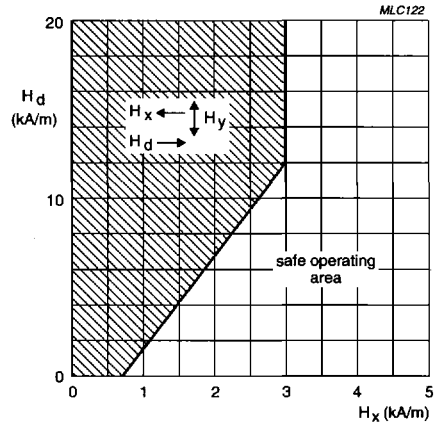
CHARACTERISTICS

T_{amb} = 25 °C; H_x = 3 kA/m; note 1; V_{CC} = 5 V unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
H_y	magnetic field strength		−7.5	−	+7.5	kA/m
S	sensitivity	notes 1 and 2	1	−	2	$\frac{mV/V}{kA/m}$
TCV_O	temperature coefficient of output voltage	V_{CC} = 5 V; T_{amb} = −25 to +125 °C	−	−0.5	−	%/K
		I_{CC} = 3 mA; T_{amb} = −25 to +125 °C	−	−0.15	−	%/K
R_{bridge}	bridge resistance		1	−	1.8	kΩ
TCR_{bridge}	temperature coefficient of bridge resistance	T_{bridge} = −25 to +125 °C	−	0.35	−	%/K
V_{offset}	offset voltage		−1.5	−	+1.5	mV/V
TCV_{offset}	temperature coefficient of offset voltage	T_{bridge} = −25 to +125 °C	−2	−	+2	(μV/V)/K
FL	linearity deviation of output voltage	H_y = 0 to ±3.75 kA/m	−	−	0.8	%·FS
		H_y = 0 to ±6.0 kA/m	−	−	2.4	%·FS
		H_y = 0 to ±7.5 kA/m	−	−	2.7	%·FS
FH	hysteresis of output voltage		−	−	0.5	%·FS
f	operating frequency		0	−	1	MHz

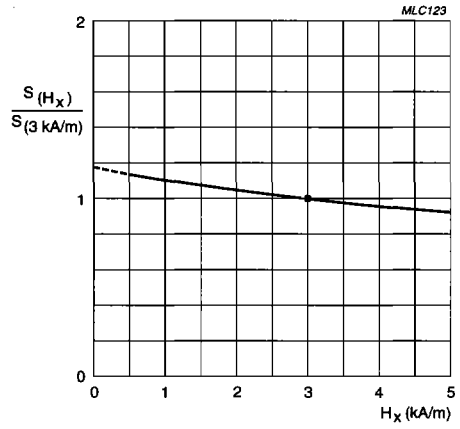
Notes

1. In applications with H_x < 3 kA/m the sensor has to be reset before first operation by application of an auxiliary field H_x = 3 kA/m.
2. $S = \frac{(V_O \text{ at } H_y = 6\ kA/m) - (V_O \text{ at } H_y = 0)}{6 \times V_{CC}}$.



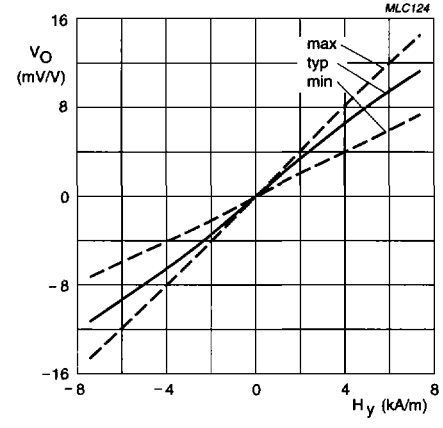
In applications with $H_x < 3$ kA/m, the sensor has to be reset, after leaving the SOAR, by an auxiliary field of $H_x = 3$ kA/m.

Fig.4 Safe Operating Area (permissible disturbing field H_d as a component of auxiliary field H_x).



In applications with $H_x \leq 3$ kA/m, the sensor has to be reset by an auxiliary field of $H_x = 3$ kA/m before using.

Fig.5 Relative sensitivity (ratio of sensitivity at certain H_x and sensitivity at $H_x = 3$ kA/m).

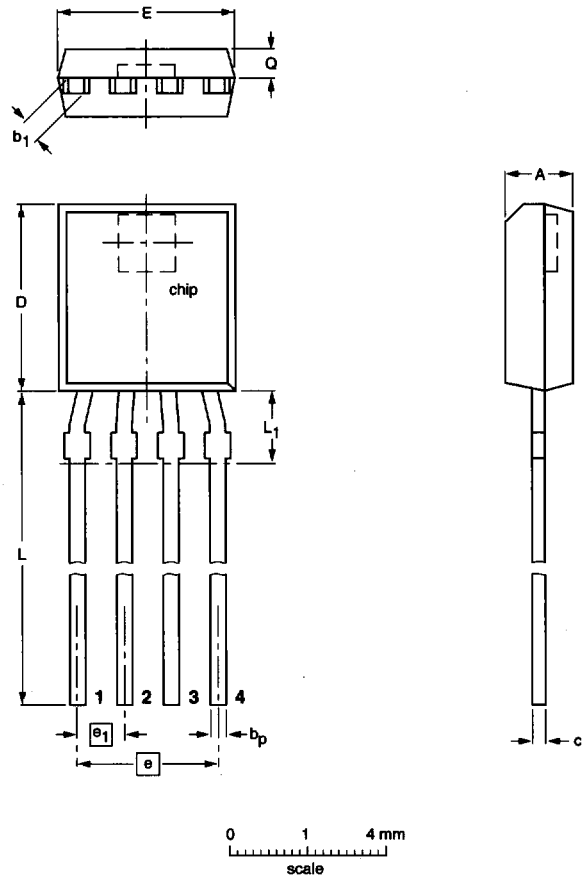


$H_x = 3$ kA/m; $T_{amb} = 25$ °C; $V_{offset} = 0$.

Fig.6 Sensor output characteristics.

PACKAGE OUTLINE

Plastic single-ended flat package; 4 in-line leads **SOT195**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	b_1	c	D	E	e	e_1	L	L_1[1] max.	Q
mm	1.8 1.6	0.48 0.40	0.7 0.5	0.45 0.39	5.2 5.0	4.8 4.4	3.75	1.25	14.5 12.7	2	0.8 0.7

Notes

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT195						97-06-02