

DATA SHEET

KMZ11B1 Magnetic field sensor

Preliminary specification
Supersedes data of 1996 Nov 08
File under Discrete Semiconductors, SC17

1996 Dec 11

Magnetic field sensor

KMZ11B1

DESCRIPTION

The KMZ11B1 is a sensitive 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 displacement sensors, proximity detectors, etc. The sensor can be operated at any frequency between DC and 1 MHz.

PINNING

PIN	SYMBOL	DESCRIPTION
1	+V _O	output voltage
2	GND	ground
3	-V _O	output voltage
4	V _{CC}	supply voltage
5 to 8	n.c.	not connected

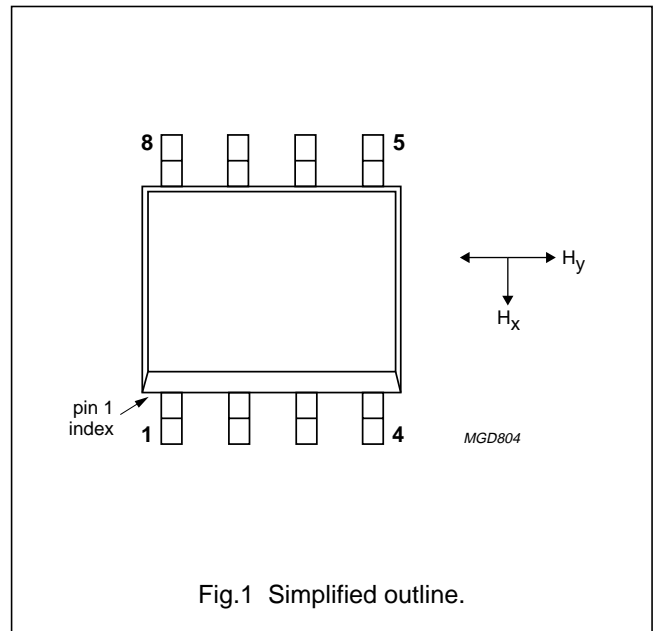


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V _{CC}	bridge supply voltage	-	5	-	V
H _y	magnetic field strength	-2	-	+2	kA/m
H _x	auxiliary field	-	3	-	kA/m
S	sensitivity	-	4	-	$\frac{mV/V}{kA/m}$
R _{bridge}	bridge resistance	1.9	-	2.9	kΩ
V _{offset}	offset voltage	-1.5	-	+1.5	mV/V

CIRCUIT DIAGRAM

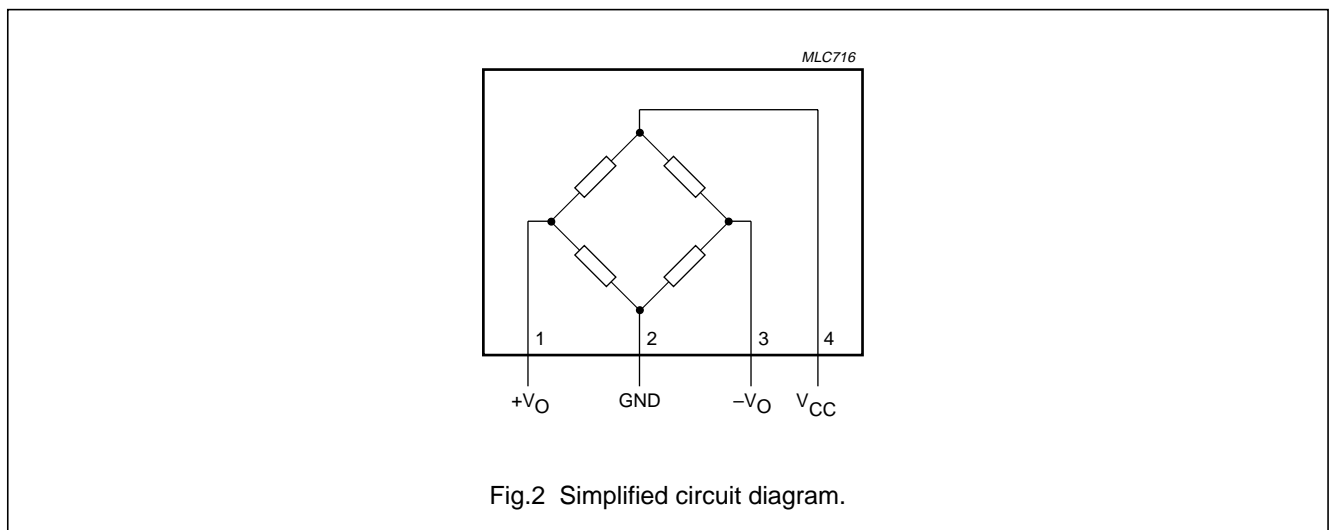


Fig.2 Simplified circuit diagram.

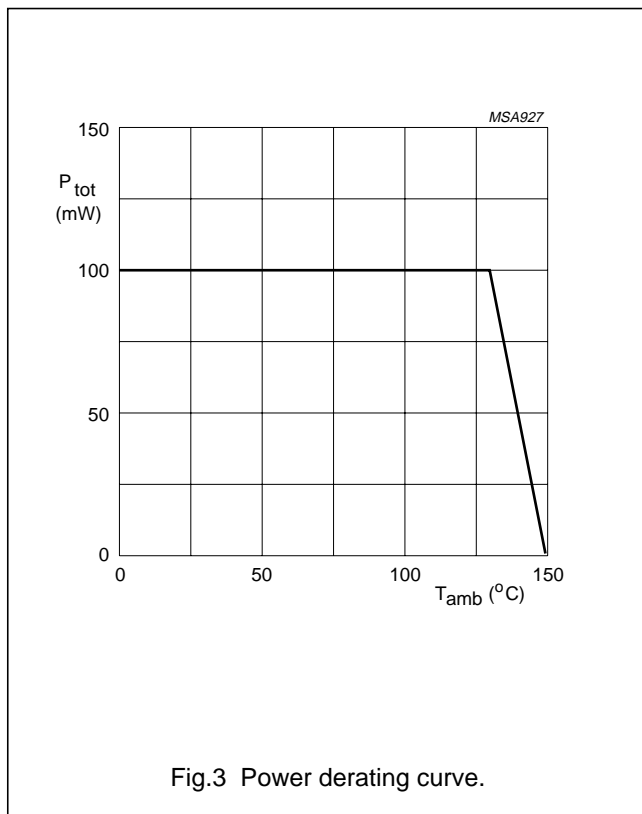
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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CC}	bridge supply voltage		–	12	V
P_{tot}	total power dissipation	up to $T_{amb} = 130\text{ °C}$	–	120	mW
T_{stg}	storage temperature		–65	+150	°C
T_{bridge}	bridge operating temperature		–40	+150	°C



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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	155	K/W

CHARACTERISTICS

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

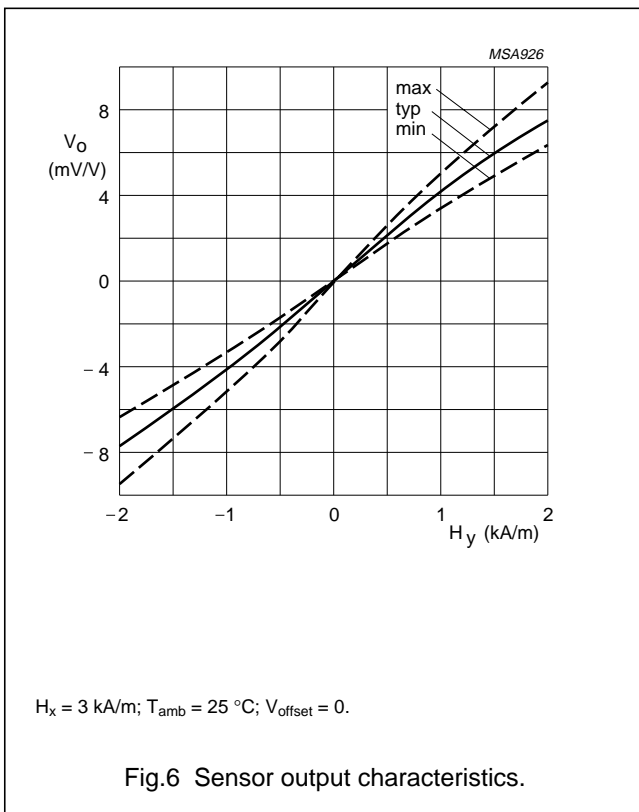
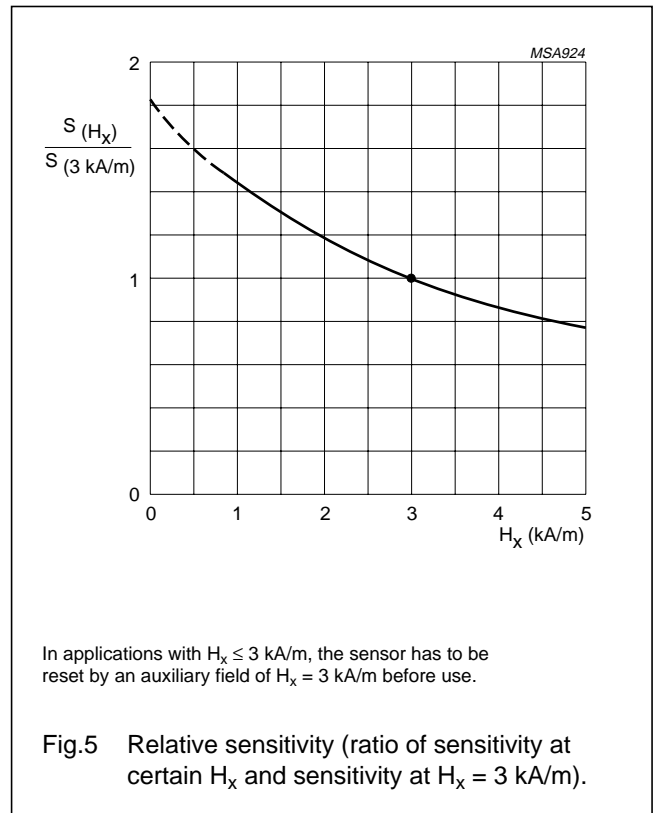
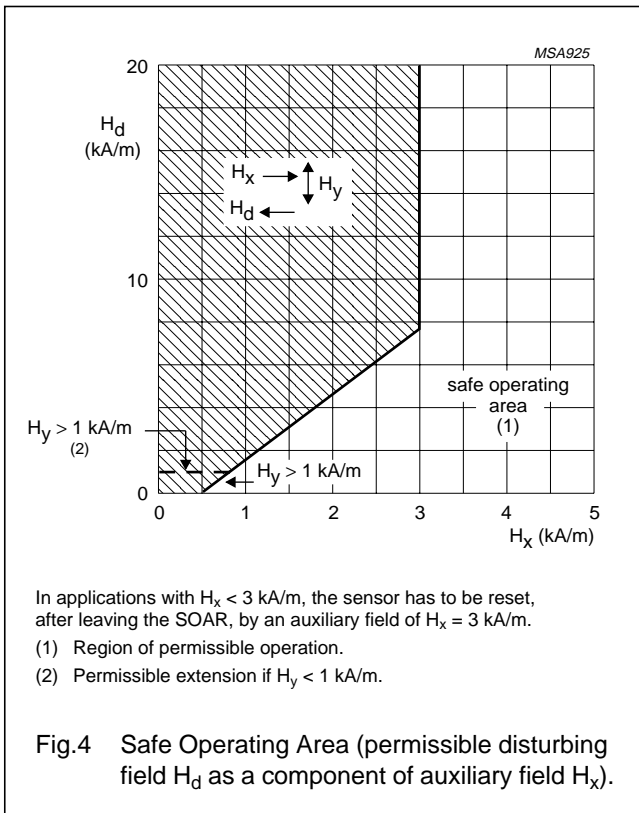
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CC}	bridge supply voltage		–	5	–	V
H_y	magnetic field strength		–2	–	+2	kA/m
S	sensitivity	open circuit	3.2	–	4.8	$\frac{mV/V}{kA/m}$
TCV_O	temperature coefficient of output voltage	$V_{CC} = 5\text{ V}$; $T_{amb} = -25\text{ to }+125\text{ °C}$	–	–0.4	–	%/K
		$I_{CC} = 3\text{ mA}$; $T_{amb} = -25\text{ to }+125\text{ °C}$	–	–0.1	–	%/K
R_{bridge}	bridge resistance		1.9	–	2.9	k Ω
TCR_{bridge}	temperature coefficient of bridge resistance	$T_{bridge} = -25\text{ to }+125\text{ °C}$	–	0.3	–	%/K
V_{offset}	offset voltage		–1.5	–	+1.5	mV/V
TCV_{offset}	offset voltage drift	$T_{bridge} = -25\text{ to }+125\text{ °C}$	–3	–	+3	$\frac{\mu V/V}{K}$
FL	linearity deviation of output voltage	$H_y = 0\text{ to } \pm 1\text{ kA/m}$	–	–	± 0.5	%-FS
		$H_y = 0\text{ to } \pm 1.6\text{ kA/m}$	–	–	± 1.7	%-FS
		$H_y = 0\text{ to } \pm 2\text{ kA/m}$	–	–	± 4	%-FS
FH	hysteresis of output voltage		–	–	1	%-FS
f	operating frequency		0	–	1	MHz

Note

- In applications with $H_x < 3\text{ kA/m}$ the sensor has to be reset before first operation by application of an auxiliary field $H_x = 3\text{ kA/m}$.

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APPLICATION INFORMATION

The leadframe material is a copper alloy containing 2% iron. In applications with magnetic fields outside the specified operating range an increasing hysteresis effect will arise due to magnetization effects in the leadframe. However, in angular measurement applications of the KMZ11B1 in combination with strong magnetic fields $H > 50$ kA/m there is no additional hysteresis present.

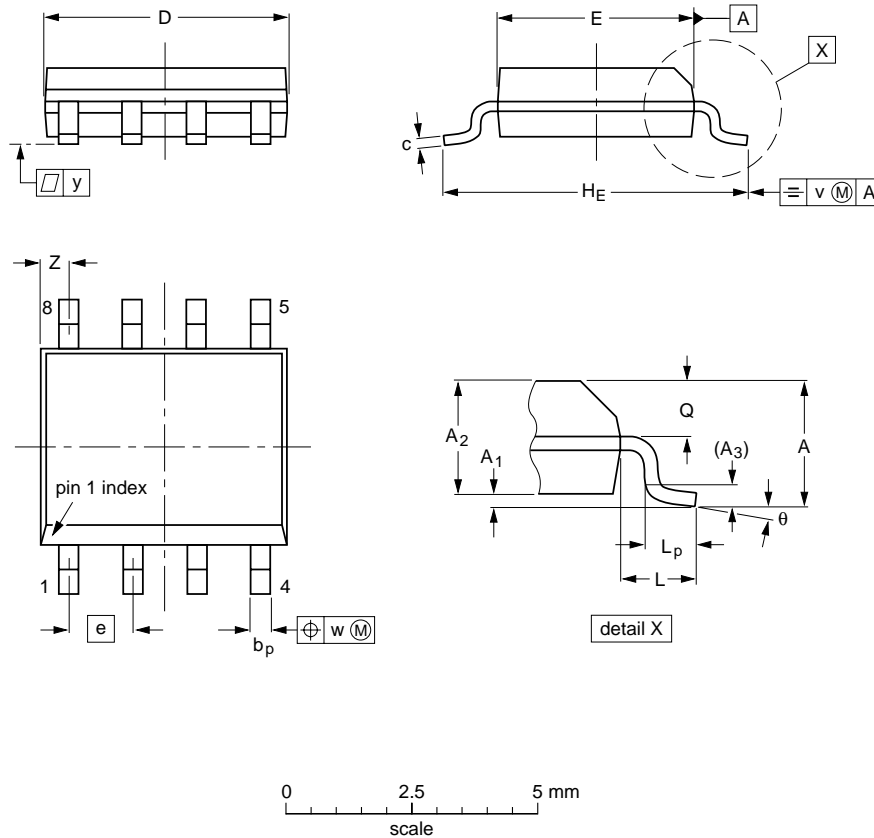
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PACKAGE OUTLINE

SO8: plastic small outline package; 8 leads; body width 3.9 mm

SOT96-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A ₁	A ₂	A ₃	b _p	c	D ⁽¹⁾	E ⁽²⁾	e	H _E	L	L _p	Q	v	w	y	Z ⁽¹⁾	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	5.0 4.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.20 0.19	0.16 0.15	0.050	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Notes

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT96-1	076E03S	MS-012AA				95-02-04 97-05-22

Magnetic field sensor**KMZ11B1**

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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