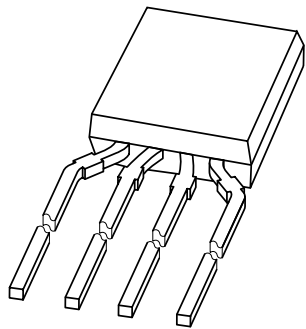


# DATA SHEET



## **KMZ10A** Magnetic field sensor

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

1998 Mar 24

# Magnetic field sensor

# KMZ10A

## DESCRIPTION

The KMZ10A is an extremely 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 navigation, current and field measurement, revolution counters, angular or linear position measurement and proximity detectors, etc.

## PINNING

PIN	SYMBOL	DESCRIPTION
1	+V <sub>O</sub>	output voltage
2	GND	ground
3	-V <sub>O</sub>	output voltage
4	V <sub>CC</sub>	supply voltage

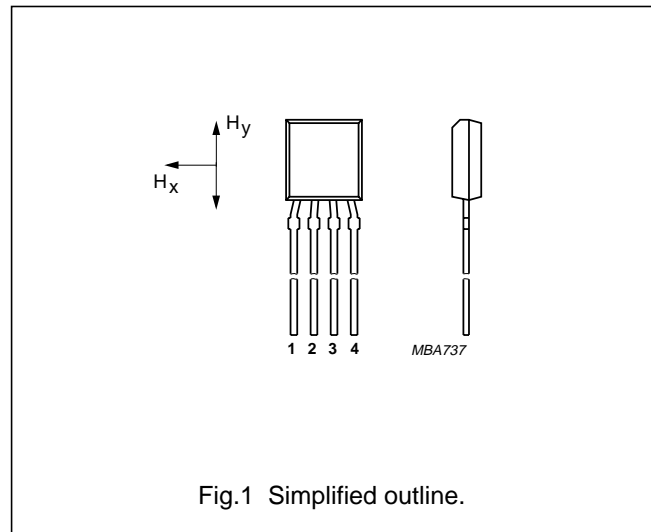


Fig.1 Simplified outline.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V <sub>CC</sub>	bridge supply voltage	-	5	-	V
T <sub>bridge</sub>	bridge operating temperature	-40	-	+150	°C
H <sub>y</sub>	magnetic field strength	-0.5	-	+0.5	kA/m
H <sub>x</sub>	auxiliary field	-	0.5	-	kA/m
S	sensitivity	-	16	-	$\frac{mV/V}{kA/m}$
R <sub>bridge</sub>	bridge resistance	0.8	-	1.6	kΩ
V <sub>offset</sub>	offset voltage	-1.5	-	+1.5	mV/V

## CIRCUIT DIAGRAM

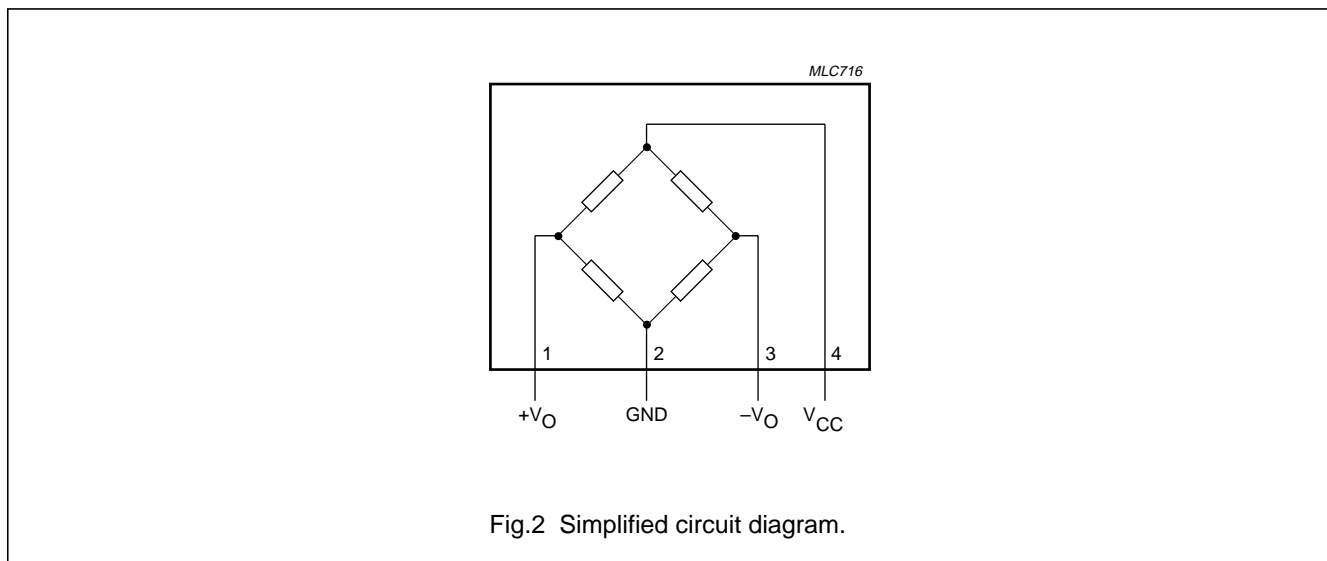


Fig.2 Simplified circuit diagram.

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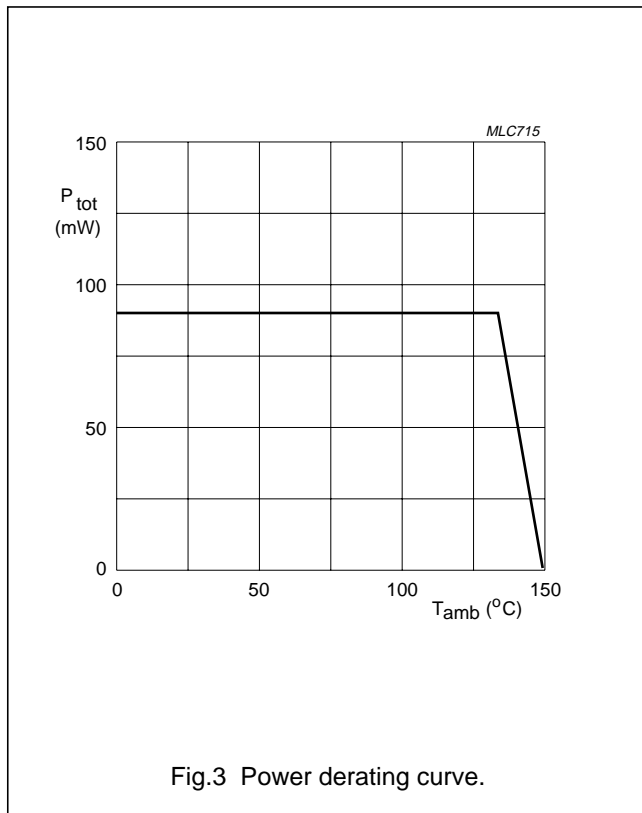
**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CC</sub>	bridge supply voltage		–	9	V
P <sub>tot</sub>	total power dissipation	up to T <sub>amb</sub> = 134 °C	–	90	mW
T <sub>stg</sub>	storage temperature	note 1	–65	+150	°C
T <sub>bridge</sub>	bridge operating temperature		–40	+150	°C

**Note**

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



## Magnetic field sensor

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## THERMAL CHARACTERISTICS

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

## CHARACTERISTICS

$T_{amb} = 25\text{ °C}$ ;  $H_x = 0.5\text{ kA/m}$ ; notes 1 and 2;  $V_{CC} = 5\text{ V}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$H_y$	magnetic field strength	note 2	-0.5	-	+0.5	kA/m
S	sensitivity	notes 2 and 3	13	-	19	$\frac{mV/V}{kA/m}$
TCV <sub>O</sub>	temperature coefficient of output voltage	$V_{CC} = 5\text{ V}$ ; $T_{amb} = -25\text{ to }+125\text{ °C}$	-	-0.4	-	%/K
		$I_{CC} = 3\text{ mA}$ ; $T_{amb} = -25\text{ to }+125\text{ °C}$	-	-0.15	-	%/K
$R_{bridge}$	bridge resistance		0.8	-	1.6	k $\Omega$
TCR <sub>bridge</sub>	temperature coefficient of bridge resistance	$T_{bridge} = -25\text{ to }+125\text{ °C}$	-	0.25	-	%/K
$V_{offset}$	offset voltage		-1.5	-	+1.5	mV/V
TCV <sub>offset</sub>	offset voltage drift	$T_{bridge} = -25\text{ to }+125\text{ °C}$	-6	-	+6	$\frac{\mu V/V}{K}$
FL	linearity deviation of output voltage	$H_y = 0\text{ to } \pm 0.25\text{ kA/m}$	-	-	0.8	%-FS
		$H_y = 0\text{ to } \pm 0.4\text{ kA/m}$	-	-	2.5	%-FS
		$H_y = 0\text{ to } \pm 0.5\text{ kA/m}$	-	-	4.0	%-FS
FH	hysteresis of output voltage		-	-	0.5	%-FS
f	operating frequency		0	-	1	MHz

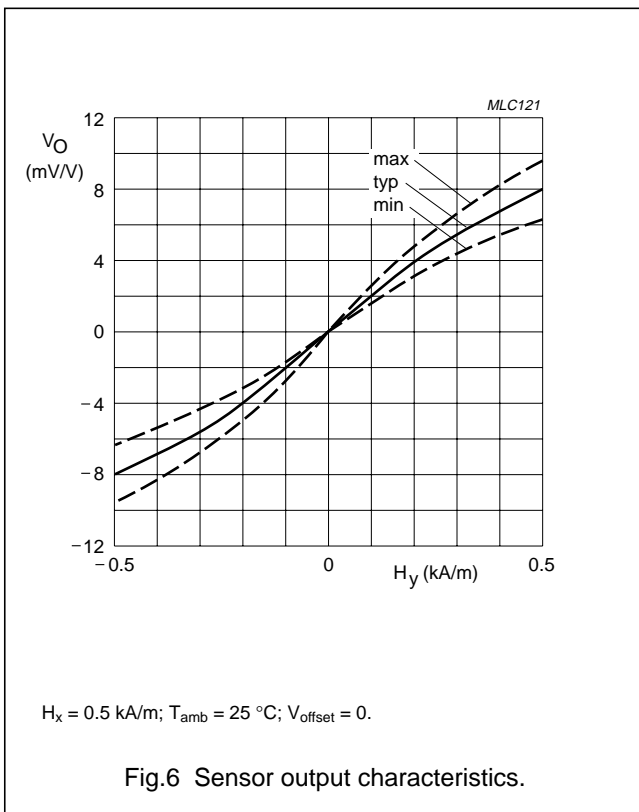
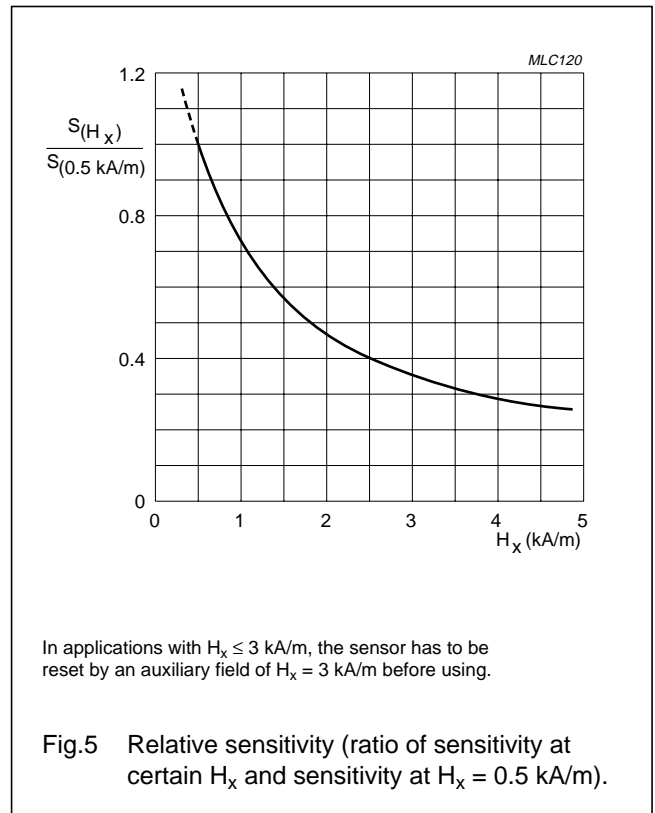
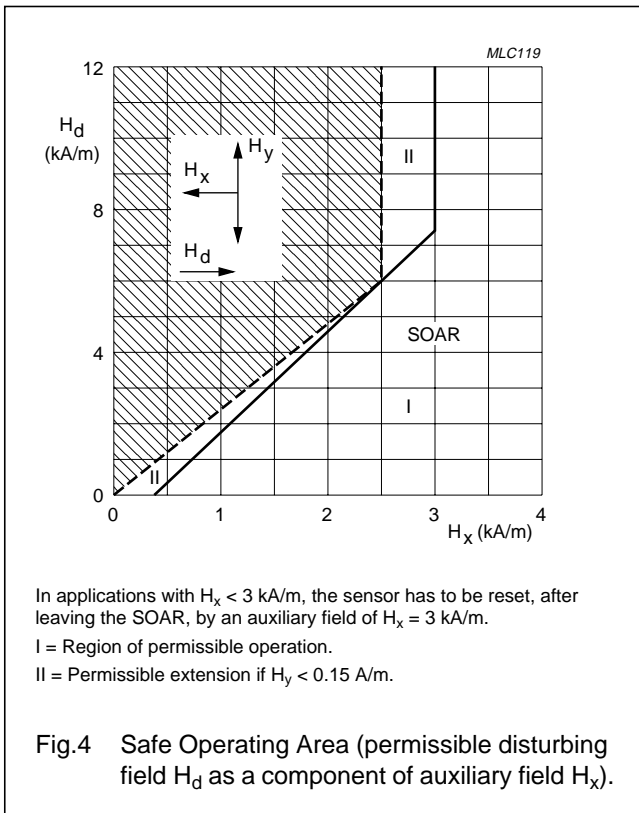
## Notes

1. Before first operation or after operation outside the SOAR (Fig.4) the sensor has to be reset by application of an auxiliary field  $H_x = 3\text{ kA/m}$ .
2. No disturbing field ( $H_d$ ) allowed; for stable operation under disturbing conditions see Fig.4 (SOAR) and see Fig.5 for decrease of sensitivity.

$$3. S = \frac{(V_O \text{ at } H_y = 0.4\text{ kA/m}) - (V_O \text{ at } H_y = 0)}{0.4 \times V_{CC}} .$$

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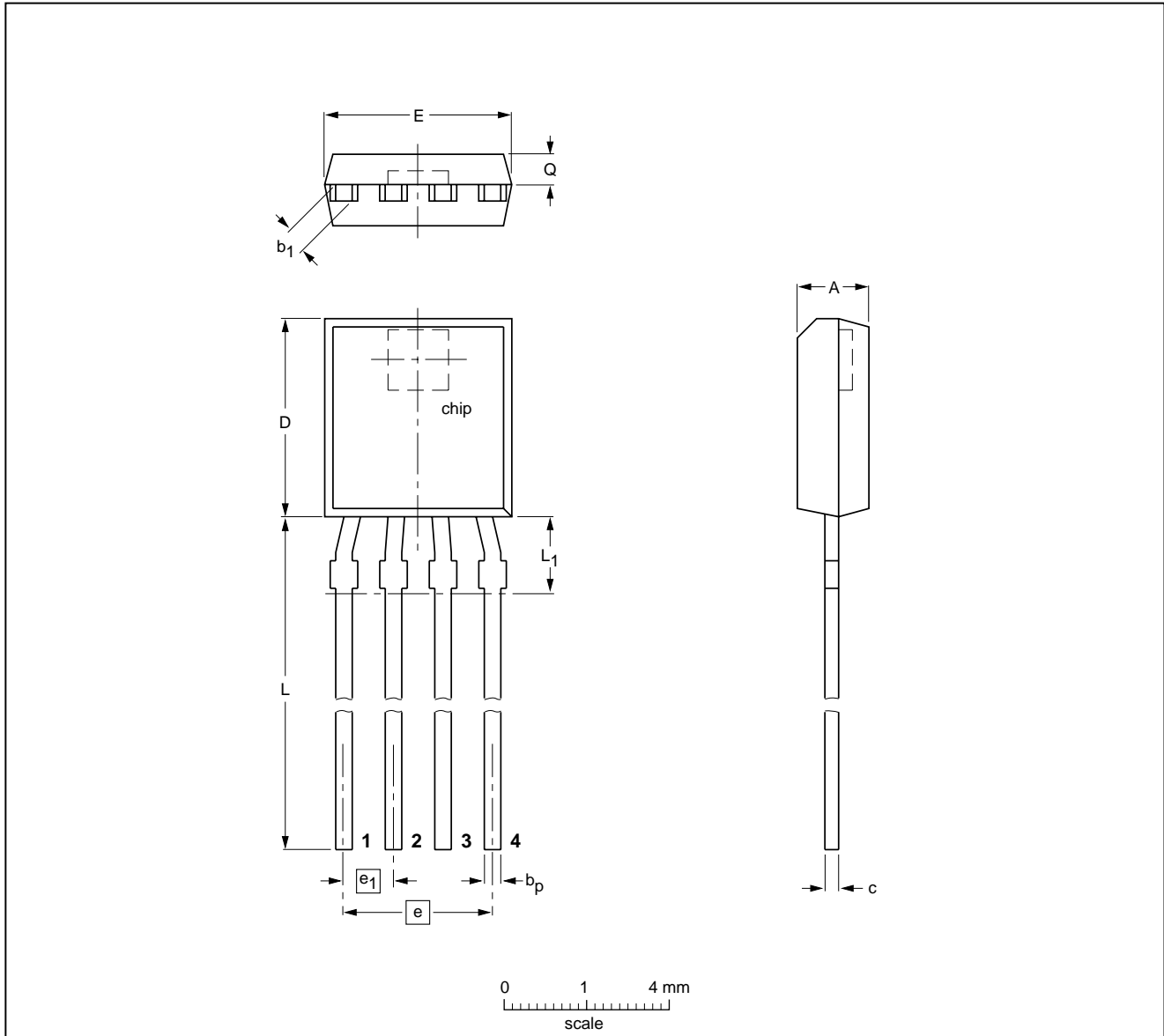
Magnetic field sensor

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PACKAGE OUTLINE

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

SOT195



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>p</sub>	b <sub>1</sub>	c	D	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup> 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

## Magnetic field sensor

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**DEFINITIONS**

<b>Data Sheet Status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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