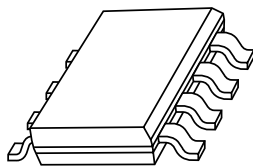


DATA SHEET



KMZ41 Magnetic field sensor

Product specification
Supersedes data of 1996 Dec 11
File under Discrete Semiconductors, SC17

1998 Mar 26

Magnetic field sensor

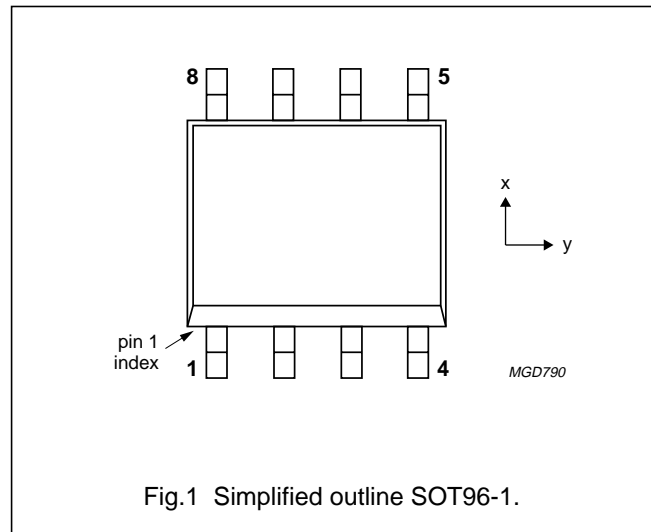
KMZ41

DESCRIPTION

The KMZ41 is a sensitive magnetic field sensor, employing the magnetoresistive effect of thin-film permalloy. The sensor contains two galvanic separated Wheatstone bridges. Its properties enable this sensor to be used in angle measurement applications under strong field conditions. A rotating magnetic field (strength > 100 kA/m) in the x-y plane will deliver a sinusoidal output signal. The sensor can be operated at any frequency between DC and 1 MHz.

PINNING

PIN	SYMBOL	DESCRIPTION
1	-V _{O1}	output voltage bridge 1
2	-V _{O2}	output voltage bridge 2
3	V _{CC2}	supply voltage bridge 2
4	V _{CC1}	supply voltage bridge 1
5	+V _{O1}	output voltage bridge 1
6	+V _{O2}	output voltage bridge 2
7	GND2	ground 2
8	GND1	ground 1



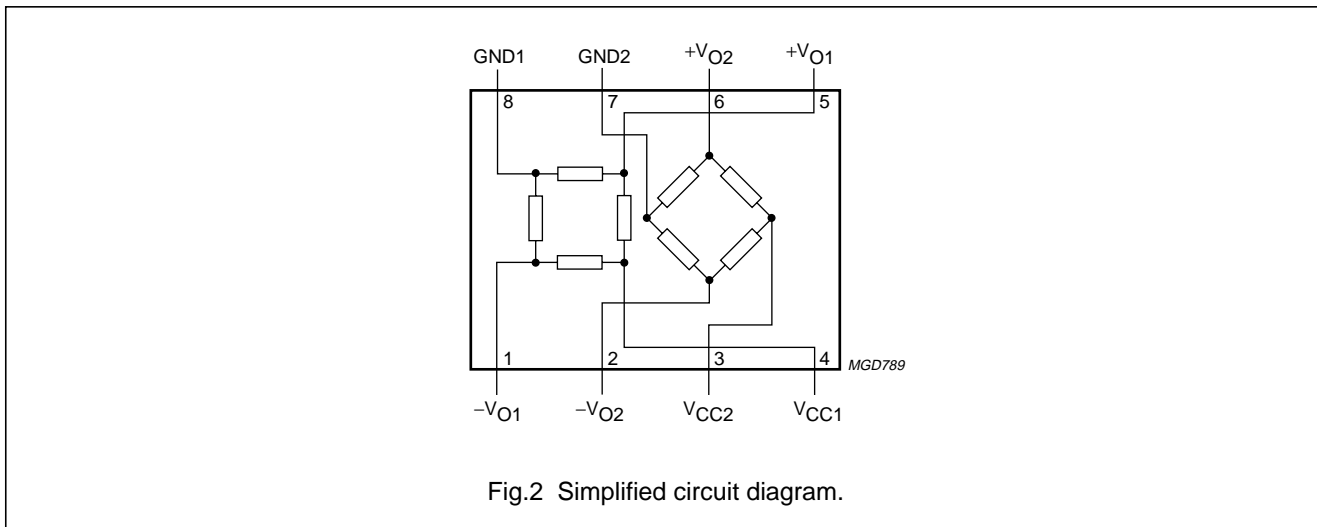
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V _{CC1}	bridge supply voltage	-	5	9	V
V _{CC2}	bridge supply voltage	-	5	9	V
S	sensitivity ($\alpha = 0^\circ, 45^\circ$)	-	2.86	-	mV/°
R _{bridge}	bridge resistance	2	-	3	kΩ
V _{offset1}	offset voltage	-8	-	+8	mV/V
V _{offset2}	offset voltage	-8	-	+8	mV/V

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CIRCUIT DIAGRAM



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 °C	–	120	mW
T _{stg}	storage temperature		–65	+150	°C
T _{bridge}	bridge operating temperature		–40	+150	°C

THERMAL CHARACTERISTICS

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

Magnetic field sensor

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CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$; $H_{rotation} = 100\text{ kA/m}$; $V_{CC1} = 5\text{ V}$; $V_{CC2} = 5\text{ V}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CC1}	bridge supply voltage		–	5	9	V
V_{CC2}	bridge supply voltage		–	5	9	V
S	sensitivity	open circuit, note 1; $\alpha = 0^{\circ}$ (bridge 2); $\alpha = 90^{\circ}$ (bridge 1)	2.62	2.86	3.10	mV/ $^{\circ}$
$V_{peak\ 1}$	peak voltage		75	82	89	mV
$V_{peak\ 2}$	peak voltage		75	82	89	mV
TCV_O	temperature coefficient of output voltage	$V_{CC} = 5\text{ V}$; $T_{amb} = -25\text{ to }+125\text{ }^{\circ}\text{C}$	–	–0.4	–	%/K
		$I_{CC} = 3\text{ mA}$; $T_{amb} = -25\text{ to }+125\text{ }^{\circ}\text{C}$	–	–0.1	–	%/K
R_{bridge}	bridge resistance		2	–	3	k Ω
TCR_{bridge}	temperature coefficient of bridge resistance	$T_{bridge} = -25\text{ to }+125\text{ }^{\circ}\text{C}$	–	0.3	–	%/K
V_{offset}	offset voltage		–8	–	+8	mV/V
TCV_{offset}	temperature coefficient of offset voltage	$T_{bridge} = -25\text{ to }+125\text{ }^{\circ}\text{C}$	–3	–	+3	$\frac{\mu\text{V}/\text{V}}{\text{K}}$
FH	hysteresis of output voltage		–	–	0.5	%-FS
f	operating frequency		0	–	1	MHz

Note

1. Sensitivity changes with angle due to sinusoidal output.

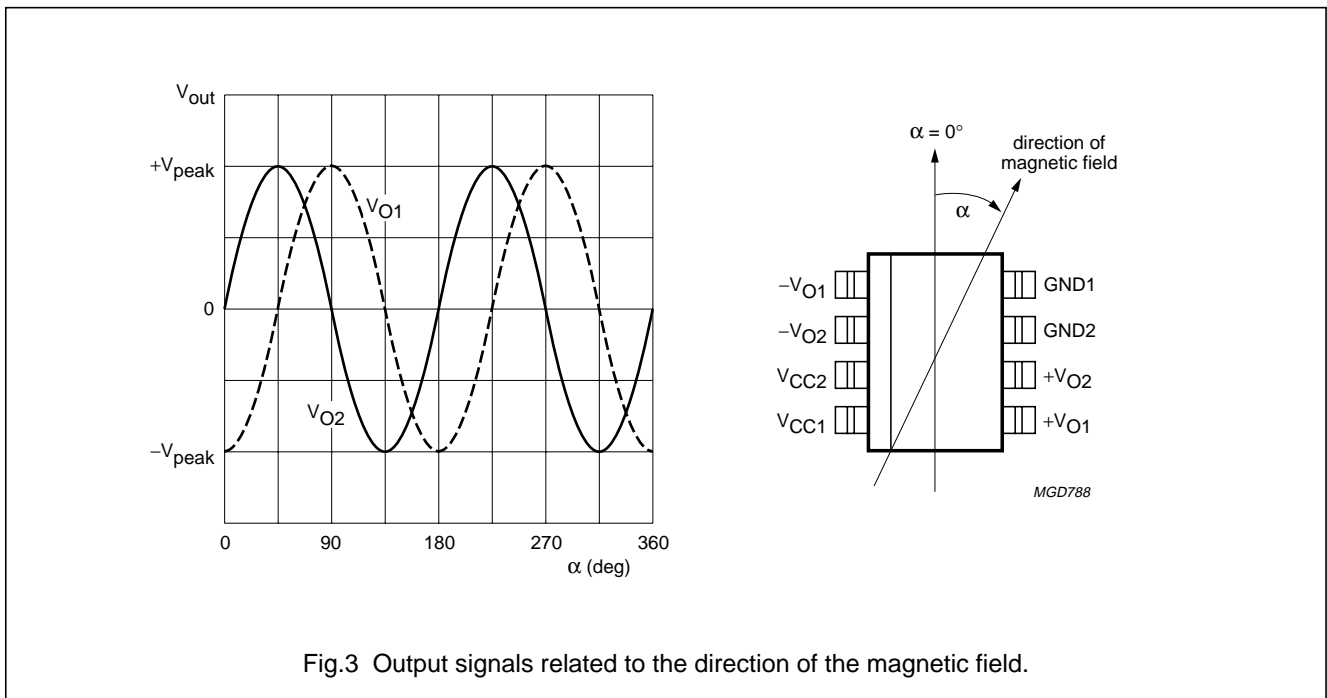


Fig.3 Output signals related to the direction of the magnetic field.

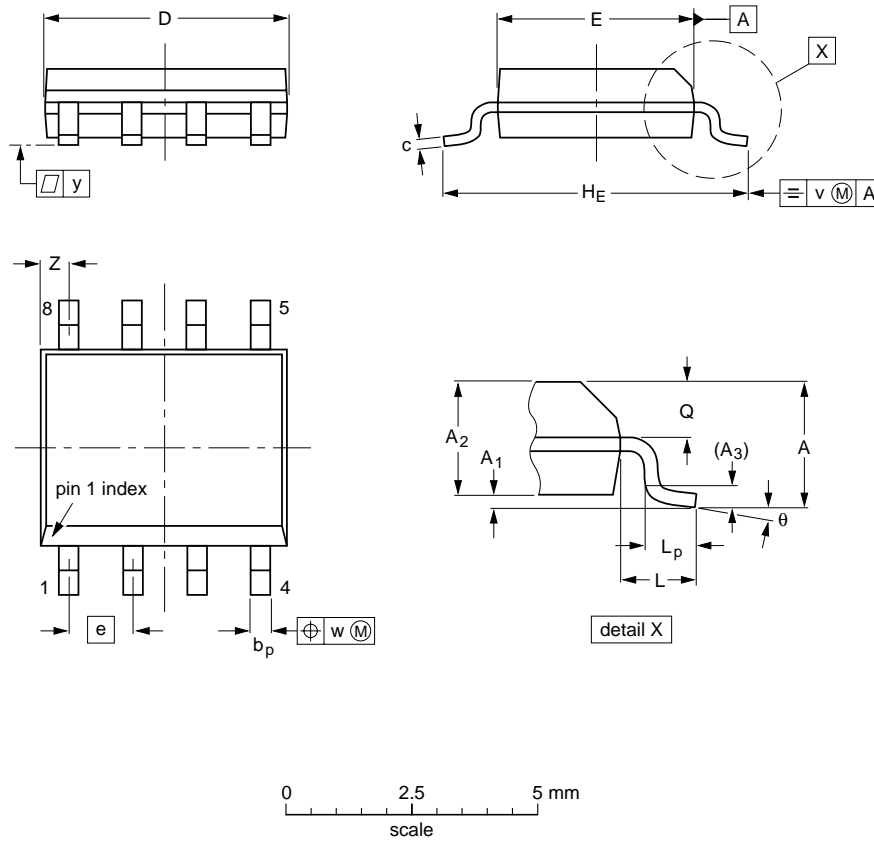
Magnetic field sensor

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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

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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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Magnetic field sensor

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