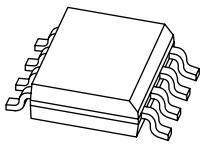
Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



KMZ43T

Magnetic field sensor

Rev. 05 — 4 March 2009 Product data sheet

1. Product profile

1.1 General description

The KMZ43T is a sensitive magnetic field sensor, employing the magnetoresistive effect of thin-film permalloy. The sensor contains two galvanic separated Wheatstone bridges, at a relative angle of 45° to one another.

A rotating magnetic field in the x-y plane will produce two independent sinusoidal output signals, one a function of +cos(2α) and the second a function of +sin(2α), α being the angle between sensor and field direction (see Figure 2). The KMZ43T is suited to high precision angle measurement applications under low field conditions (saturation field strength 25 kA/m).

The sensor can be operated at any frequency between 0 Hz and 1 MHz.

1.2 Features

- Accurate and reliable angle measurement
- Mechanical robustness, contactless principle
- Wear-free operation
- Accuracy independent of mechanical tolerances
- Extended temperature range

1.3 Applications

- Steering angle and torsion
- Headlight adjustment
- Motor positioning
- Window wipers
- Fuel level
- Mirror positioning

1.4 Quick reference data

Table 1. Quick reference data

T_{amb} = 25 °C and H_{ext} = 25 kA/m; V_{CC} = 5 V; unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CC}	supply voltage		[1]	-	5	9	V
V_{peak}	peak output voltage	see Figure 2	[1]	60	67	75	mV
V_{offset}	offset voltage	per supply voltage; see Figure 2	[1]	–2	-	+2	mV/V
R_{bridge}	bridge resistance		[1][2]	2.7	3.2	3.7	kΩ

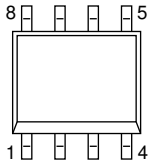
[1] Applicable for bridge 1 and bridge 2.

[2] Bridge resistance between pin 4 to pin 8, pin 3 to pin 7, pin 1 to pin 5 and pin 2 to pin 6.

2. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline
1	ON1	output voltage bridge 1	
2	ON2	output voltage bridge 2	
3	V_{CC2}	supply voltage bridge 2	
4	V_{CC1}	supply voltage bridge 1	
5	OP1	output voltage bridge 1	
6	OP2	output voltage bridge 2	
7	GND2	ground 2	
8	GND1	ground 1	



3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
KMZ43T	SO8	plastic small outline package; 8 leads; body width 3.9 mm	SOT96-1

4. Circuit diagram

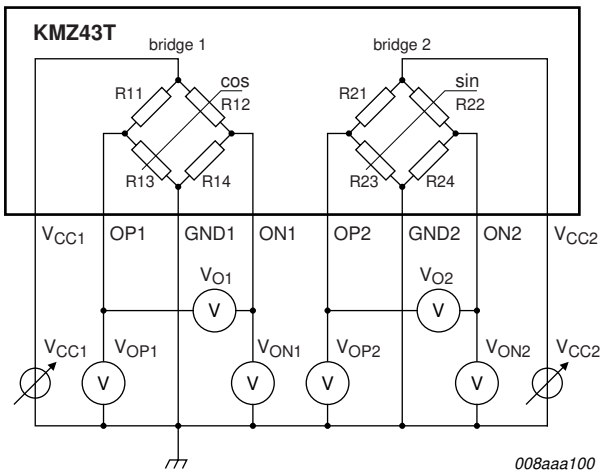


Fig 1. Device and test circuit diagram

5. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage	[1]	-	9	V
H_{ext}	external magnetic field strength		25	-	kA/m
T_{amb}	ambient temperature		−40	+150	°C
T_{stg}	storage temperature		−65	+150	°C

[1] Applicable for bridge 1 and bridge 2.

6. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		155	K/W

7. Characteristics

Table 6. Characteristics

T_{amb} = 25 °C and H_{ext} = 25 kA/m; V_{CC} = 5 V; unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CC}	supply voltage		[1]	-	5	9	V
V_{peak}	peak output voltage	see Figure 2	[1]	60	67	75	mV
TC_{Vpeak}	temperature coefficient of peak output voltage	T_{amb} = −40 °C to +150 °C	[1][2]	−0.3	−0.36	−0.42	%/K
R_{bridge}	bridge resistance		[1][3]	2.7	3.2	3.7	kΩ
$TC_{Rbridge}$	temperature coefficient of bridge resistance	T_{amb} = −40 °C to +150 °C	[1][4]	0.24	0.26	0.29	%/K
V_{offset}	offset voltage	per supply voltage; see Figure 2	[1]	−2	-	+2	mV/V
$TC_{Voffset}$	temperature coefficient of offset voltage	per supply voltage; T_{amb} = −40 °C to +150 °C; see Figure 2	[1][5]	−4	-	+4	(μV/V)/K
FH	hysteresis of output voltage	see Figure 3	[1][6]	0	0.05	0.18	%FS
k	amplitude synchronism		[7]	99.5	100	100.5	%
TC_k	temperature coefficient of amplitude synchronism	T_{amb} = −40 °C to +150 °C	[8]	−0.01	-	+0.01	%/K
Δα	angular inaccuracy		[9]	0	0.05	0.1	deg

[1] Applicable for bridge 1 and bridge 2.

[2] $$TC_{Vpeak} = 100 \times \frac{V_{peak}(at\ 150\ °C) - V_{peak}(at\ -40\ °C)}{V_{peak}(at\ 25\ °C) \times (150\ °C - (-40\ °C))}$$

[3] Bridge resistance between pin 4 to pin 8, pin 3 to pin 7, pin 1 to pin 5 and pin 2 to pin 6.

[4] $$TC_{Rbridge} = 100 \times \frac{R_{bridge}(at\ 150\ °C) - R_{bridge}(at\ -40\ °C)}{R_{bridge}(at\ 25\ °C) \times (150\ °C - (-40\ °C))}$$

[5] $$TC_{Voffset} = \frac{V_{offset}(at\ 150\ °C) - V_{offset}(at\ -40\ °C)}{150\ °C - (-40\ °C)}$$

[6] $$FH_1 = 100 \times \left| \frac{V_{O1}(67.5°)135° \rightarrow 45° - V_{O1}(67.5°)45° \rightarrow 135°}{2 \times V_{peak1}} \right|$$

$$FH_2 = 100 \times \left| \frac{V_{O2}(22.5°)90° \rightarrow 0° - V_{O2}(22.5°)0° \rightarrow 90°}{2 \times V_{peak2}} \right|$$

[7] $$k = 100 \times \frac{V_{peak1}}{V_{peak2}}$$

[8] $$TC_k = 100 \times \frac{k(at\ 150\ °C) - k(at\ -40\ °C)}{k(at\ 25\ °C) \times (150\ °C - (-40\ °C))}$$

[9] $\Delta\alpha = |\alpha_{real} - \alpha_{meas}|$; V_{offset} = 0 V; inaccuracy of angular measurement due to deviations from ideal sinusoidal characteristics, calculated from the third and fifth harmonics of the spectrum V_O.

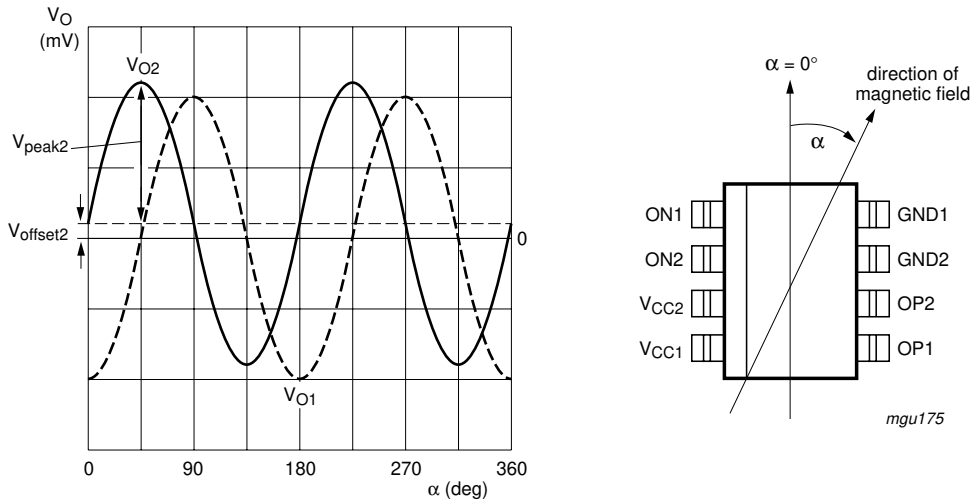


Fig 2. Output signals related to the direction of the magnetic field

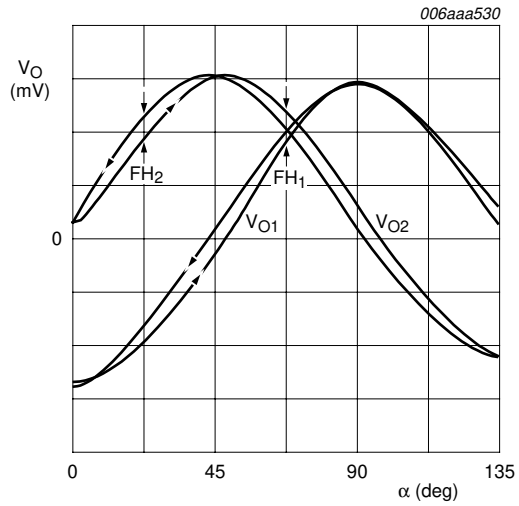


Fig 3. Definition of hysteresis

8. Package outline

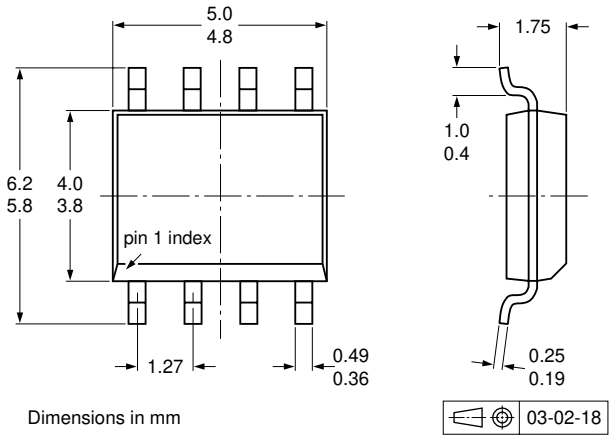


Fig 4. Minimized package outline SOT96-1

9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
KMZ43T_5	20090304	Product data sheet	-	KMZ43T_4
Modifications:	• Table 6: TC_{Vpeak} and $TC_{Rbridge}$ values adapted to 25 °C reference point			
KMZ43T_4	20080326	Product data sheet	-	KMZ43T_3
KMZ43T_3	20030915	Product specification	-	KMZ43T_2
KMZ43T_2	20030326	Preliminary specification	-	KMZ43_1
KMZ43_1	20000824	Objective specification	-	-

10. Legal information

10.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

10.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

10.3 Disclaimers

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

10.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

11. Contact information

For more information, please visit: **http://www.nxp.com**

For sales office addresses, please send an email to: **salesaddresses@nxp.com**

12. Contents

1	**Product profile**	**1**
1.1	General description	1
1.2	Features	1
1.3	Applications	1
1.4	Quick reference data	1
2	**Pinning information**	**2**
3	**Ordering information**	**2**
4	**Circuit diagram**	**2**
5	**Limiting values**	**3**
6	**Thermal characteristics**	**3**
7	**Characteristics**	**4**
8	**Package outline**	**6**
9	**Revision history**	**6**
10	**Legal information**	**7**
10.1	Data sheet status	7
10.2	Definitions	7
10.3	Disclaimers	7
10.4	Trademarks	7
11	**Contact information**	**7**
12	**Contents**	**8**

For more information, please visit: http://www.nxp.com
For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 4 March 2009
Document identifier: KMZ43T_5