

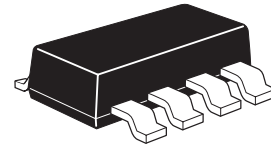
NOT RECOMMENDED FOR NEW DESIGN PLEASE USE ZMT32

ZMT31

ANGLE SENSOR

DESCRIPTION

The ZMT31 allows the contactless counting of the revolutions of a rotating magnet which is mounted on the axis of a wheel. Zero output voltages of the Wheatstone bridges are used as trigger signals. The sense of rotation of the wheel is taken into account by comparing the signal outputs of both Wheatstone bridges which are proportional to $\sin 2(\alpha)$ or $\sin 2(\alpha + 45^\circ)$. The angle can be determined by evaluating these signals. Alternatively it is possible to use the voltage signals of four half bridges which are trimmed on $V_B/2$.



SM8

FEATURES

- Measures the magnetic field hrot ($> 50\text{kA/m}$) generated by a permanent magnet which rotates over the sensor
- Magnetic field hrot parallel to the chip surface causes a sinusoidal output signal
- Package : SM-8 (available on 12mm tape)

APPLICATION

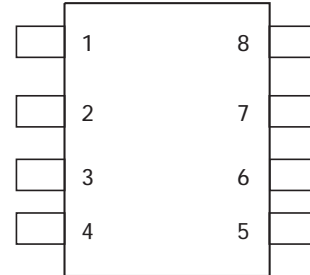
- Contactless counting of the revolutions of a rotating magnet (watermeters etc.)
- Contactless angular measurement
- Automotive (pedal position etc.)
- Contactless rotary switches
- Contactless potentiometer

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZMT31TA	7	12mm	1000
ZMT31TC	13	12mm	4000

DEVICE MARKING

- ZMT31



Bridge 1: pin 1: $-V_O$ pin 5: $+V_O$
pin 8: $-V_B$ (GND) pin 4: $+V_B$

Bridge 2: pin 2: $-V_O$ pin 6: $+V_O$
pin 7: $-V_B$ (GND) pin 3: $+V_B$

V_O - output voltage V_B - supply voltage

NOT RECOMMENDED FOR NEW DESIGN PLEASE USE ZMT32

ZMT31

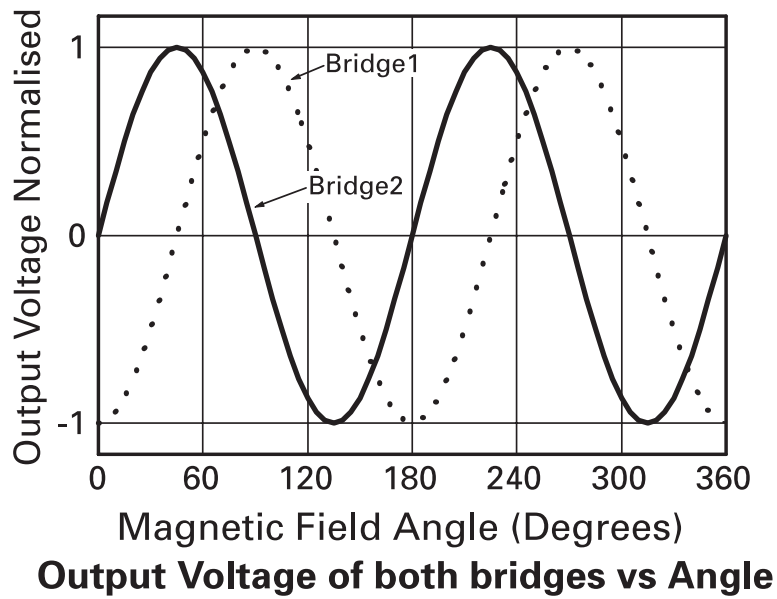
PARAMETER	SYMBOL	LIMIT	UNIT
Supply voltage	V_B	5	V
Total power dissipation	P_{tot}	120	mW
Operating temperature range	T_{amb}	-25 to +130	°C
Storage temperature range	T_{stg}	-40 to +130	°C
Sensor chip alignment error	α_e	≤ 2	°

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Bridge resistance	R_{br}	2.0	3.0	4.0	k Ω	
Offset voltage	V_{Off} / V_B	-2.0		+2.0	mV/V	bridge 1: $\alpha=45^\circ$; bridge 2: $\alpha=0^\circ$
Sensitivity	S_α	0.2			(mV/V)/°	bridge 1: $\alpha=0^\circ$; bridge 2: $\alpha=45^\circ$
Half bridge symmetry	$(V_S/2 - V_O)/V_B$	-2.0		+2.0	mV/V	bridge 1: $\alpha=0^\circ$; bridge 2: $\alpha=45^\circ$
Output voltage range	$(V_{max} + V_{min}) / V_B$	16			mV/V	
Zero offset angle hysteresis	$\Delta\alpha$			2	°	
Temperature coefficient of the bridge resistance -25°C < T_{amb} < 100°C	T_{CBR}	0.25	0.30	0.35	%/K	
Temperature coefficient of the open circuit sensitivity -25°C < T_{amb} < 100°C	T_{CSV}	-0.35	-0.30	-0.25	%/K	$V_B = \text{const.}$
	T_{CSI}	-0.05	0	0.05	%/K	$I_B = \text{const}$
Temperature coefficient of the offset voltage -25°C < T_{amb} < 100°C	T_{COFF}	-3		+3	(μ V/V)/K	

NOT RECOMMENDED FOR NEW DESIGN PLEASE USE ZMT32

ZMT31

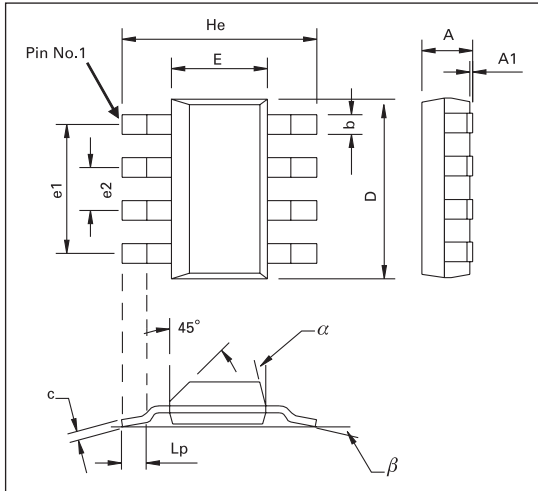
Output voltage of both Wheatstone bridges versus angle α of the magnetic field direction



NOT RECOMMENDED FOR NEW DESIGN PLEASE USE ZMT32

ZMT31

PACKAGE OUTLINE



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	Millimeters			Inches			DIM	Millimeters			Inches		
	Min	Max	Typ.	Min	Max	Typ.		Min	Max	Typ.	Min	Max	Typ.
A	-	1.7	-	-	0.067	-	e1	-	-	4.59	-	-	0.1807
A1	0.02	0.1	-	0.008	0.004	-	e2	-	-	1.53	-	-	0.0602
b	-	-	0.7	-	-	0.0275	He	6.7	7.3	-	0.264	0.287	-
c	0.24	0.32	-	0.009	0.013	-	Lp	0.9	-	-	0.035	-	-
D	6.3	6.7	-	0.248	0.264	-	α	-	15°	-	-	15°	-
E	3.3	3.7	-	0.130	0.145	-	β	-	-	10°	-	-	10°

© Zetex Semiconductors plc 2004

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex plc Lansdowne Road, Chadderton Oldham, OL9 9TY United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to www.zetex.com



ISSUE 4 - JUNE 2004