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Diodes Incorporated
ZMT31TA

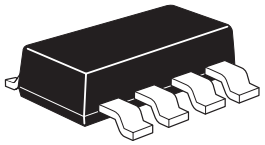
For any questions, you can email us directly:
sales@integrated-circuit.com

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 Wheatstones 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 sin2(α) or sin2(α+45°). 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 (> 50kA/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

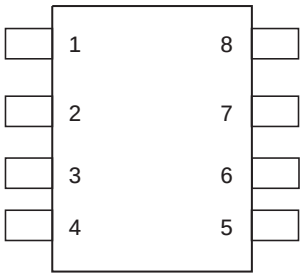
- Contactless counting of the revolutions of a rotating magnet (watermeters etc.)
- Contactless angular measurement
- Automotive (pedal position etc.)
- Contactless rotary switches
- Contactless potentiometer

ORDERING INFORMATION

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

DEVICE MARKING

- ZMT31



Bridge1: pin 1: -V_O pin 5: +VO
pin 8: -V_B (GND) pin 4: +VB

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

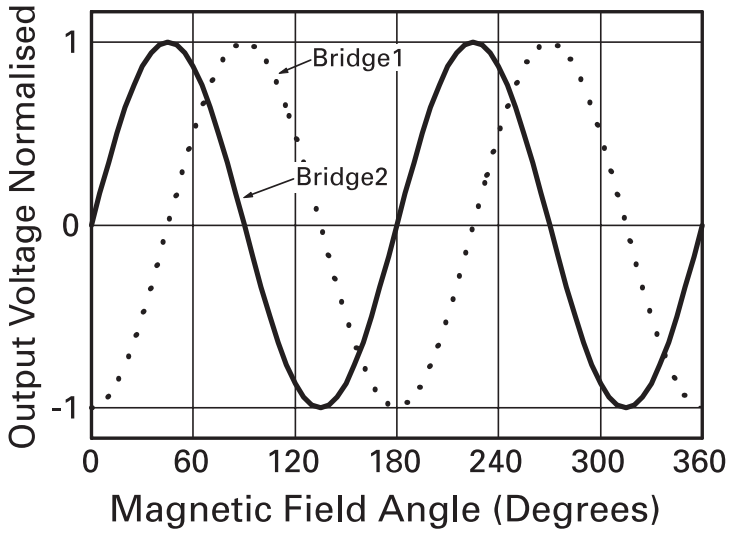
V_O - output voltage V_B - supply voltage

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	kΩ	
Offset voltage	V_{Off} / V_B	-2.0		+2.0	mV/V	bridge 1: α=45°; bridge 2: α=0°
Sensitivity	S_α	0.2			(mV/V)/°	bridge 1: α=0°; bridge 2: α=45°
Half bridge symmetry	$(V_S/2-V_O)/V_B$	-2.0		+2.0	mV/V	bridge 1: α=0°; bridge 2: α=45°
Output voltage range	$(\|Vmax\|+\|Vmin\|)/V_B$	16			mV/V	
Zero offset angle hysteresis	Δα			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 = const.
	T_{CSI}	-0.05	0	0.05	%/K	I_B = const
Temperature coefficient of the offset voltage -25°C <T_{amb} <100°C	T_{COFF}	-3		+3	(μV/V)/K	

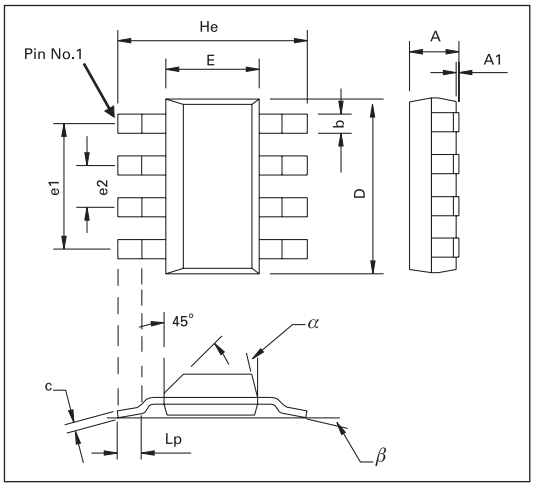
Output voltage of both Wheatstone bridges versus angle α of the magnetic field direction



Output Voltage of both bridges vs Angle

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°

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