Preliminary Data Sheet
KMT32B

Axel Bartos

HL PLANARTECHNIK GmbH • Hauert 13 • 44227 Dortmund • Germany • www.hlplanar.de
service@hlplanar.de • phone: +49-(0)231-97400 • fax: +49-(0)231-974020

LEGAL DISCLAIMER

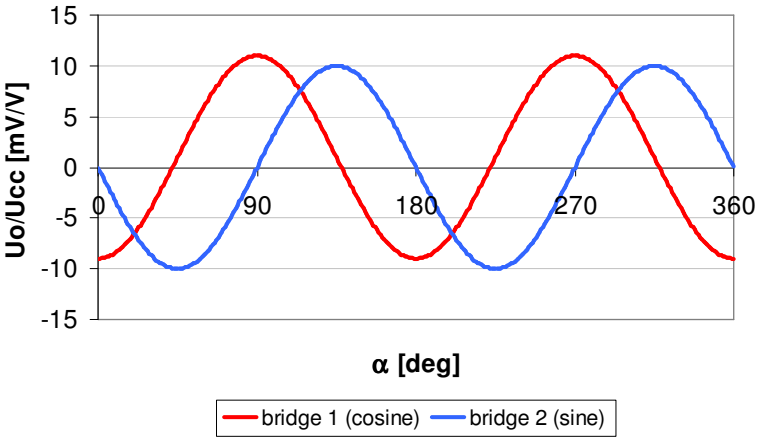
This product is not designed for use in life support appliances, devices or systems where malfunction of this product can reasonably be expected to result in personal injury. HL Planartechnik GmbH customers using or selling this product for use in such applications do so at their own risk and agree to fully indemnify HL Planartechnik GmbH for any damages resulting from such improper use or sale.

This data sheet contains target specifications for product development which my be subject to changes without notice.

GENERAL DESCRIPTION

The KMT32B is a magnetic field sensor based on the anisotropic magnetoresistance effect. The sensor contains two parallel supplied Wheatstone bridges, which enclose a sensitive angle of 45 degrees.

A rotating magnetic field in the surface parallel to the chip (x-y plane) will deliver two independent sinusoidal output signals, one following a cos(2α) and the second following a sin(2α) function, α being the angle between sensor and field direction (see figure 2).



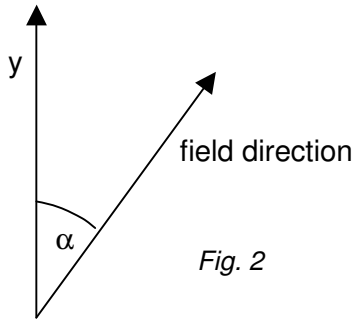


Fig. 2

Figure 1: Characteristic curves for KMT32B

The KMT32B is suited for high precision angle measurement applications under low field conditions (regular 25 kA/m, with reduced accuracy applicable down to 8 kA/m; beware of earth's magnetic field !).

CIRCUIT DIAGRAM

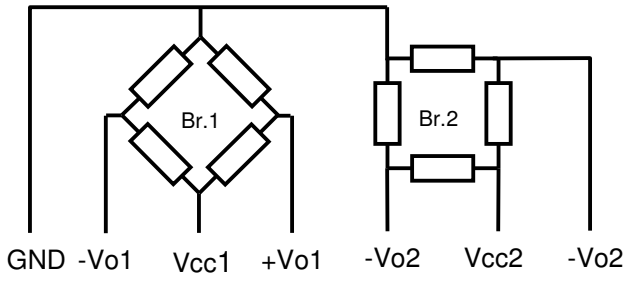


Fig. 3

CHARACTERISTIC VALUES (PRELIMINARY)

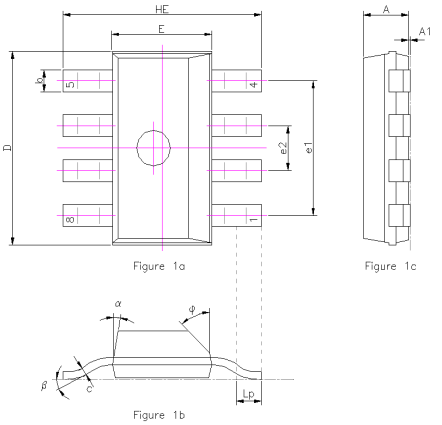
PARAMETER	SYMBOL	UNIT	MIN	TYP	MAX	CONDITION
A. Operating Limits						
max. supply voltage	$V_{cc,max}$	V			10	
max. current (single bridge)	$I_{cc,max}$	mA			4	
power dissipation	P_{tot}	mW			TBD	@T= TBD °C
operating temperature	T_{op}	°C	-40		+150	
storage temperature	T_{st}	°C	-25		+150	
B. Sensor Specifications (T=25 °C)						
Supply voltage	V_{cc}	V		5	8.5	
Resistance (single bridge)	R_b	Ω	2400	3000	3600	
Signal amplitude	$\Delta V/V_{cc}$	mV/V	17	20		Condition A, B
Offset voltage	V_{off}	mV/V	-1	0	+1	Condition A, B
angular inaccuracy	$\Delta\alpha$	deg		0.05	0.2	Condition A, B
angular hysteresis	$\Delta\alpha H$	deg			0.1	Condition A, B
C. Sensor Specifications						
TC of amplitude	*TCSV*	%/K	-0.36	-0.32	-0.28	Condition A, C
TC of resistance	*TCBR*	%/K	+0.27	+0.32	+0.37	Condition A, C
TC of offset	*TCVoff*	µV/V/K	-4	0	+4	Condition A, C

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 this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

MEASUREMENT CONDITIONS

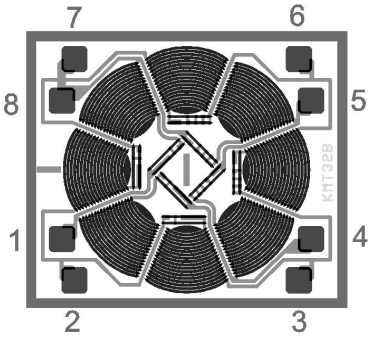
PARAMETER	SYMBOL	UNIT	CONDITION
A. Set Up Conditions			
ambient temperature	T	℃	T = 23±5 ℃ (unless otherwise noted)
supply voltage	V_{cc}	V	Vcc=5 V
applied magnetic field	H	kA/m	H=25 kA/m
B. Sensor Specifications (T=25 ℃, 360° turn , H=25 kA/m , Vo_{max}>0, Vo_{min}<0)			
signal amplitude	$\Delta V/V$	mV/V	$\Delta V/V=Vo_{max} - Vo_{min}$
signal offset	*Voff*	mV/V	$Voff=Vo_{max} + Vo_{min}$
angular hysteresis	$\Delta\alpha H$	deg	$\Delta\alpha H$ = MAX$\lvert\alpha_{left\ turn} - \alpha_{right\ turn}\rvert$ max. angular difference between left and right turn
angular inaccuracy	$\Delta\alpha$	deg	$\Delta\alpha=MAX\lvert\alpha_0-\alpha\rvert$ max. angular difference between actual value α_0 and measured angle; offset voltage error contributions not included
C. Sensor Specifications (T=-25℃, +125℃)			
ambient temperatures	T	℃	T1=-25 ℃, T0=+25 ℃, T2=+125 ℃
TC of amplitude	*TCSV*	%/K	$TCV = \frac{1}{(T_2 - T_1)} \cdot \frac{\frac{\Delta V}{V}(T_2) - \frac{\Delta V}{V}(T_1)}{\frac{\Delta V}{V}(T_1)} \cdot 100\%$
TC of resistance	*TCBR*	%/K	$TCR = \frac{1}{(T_2 - T_1)} \cdot \frac{R(T_2) - R(T_1)}{R(T_1)} \cdot 100\%$
TC of offset	*TCVoff*	µV/(VK)	$TCVoff = \frac{Voff(T_2) - Voff(T_1)}{(T_2 - T_1)}$

PIN LAYOUT KMT32B

LAYOUT	PIN	SYMBOL	DESCRIPTION
	1	-Vo1	negative output bridge 1 (sin)
	2	-Vo2	negative output bridge 2 (cos)
	3	Vcc2	positive supply voltage bridge 2
	4	Vcc1	positive supply voltage bridge 1
	5	+Vo1	positive output bridge 1 (sin)
	6	+Vo2	positive output bridge 2 (cos)
	7	GND	common ground
	8	GND	common ground

Dim.	Millimeter			Inches		
	min.	typ.	max.	min.	typ.	max.
A			1.7			0.067
A1	0.02		0.1	0.0008		0.004
b		0.7			0.028	
c	0.24		0.32	0.009		0.013
D	6.3		6.7	0.248		0.264
E	3.3		3.7	0.130		0.145
HE	6.7		7.3	0.264		0.287
e1	NOM. 4.59			NOM. 0.18		
e2	NOM. 1.53			NOM. 0.06		
Lp	0.9			0.035		
α			15°			15°
β		10°			10°	
φ		45°			45°	

PAD LAYOUT KMT32B CHIP

LAYOUT	PAD	SYMBOL	DESCRIPTION
	1	-Vo1	negative output bridge 1 (sin)
	2	-Vo2	negative output bridge 2 (cos)
	3	Vcc2	positive supply voltage bridge 2
	4	Vcc1	positive supply voltage bridge 1
	5	+Vo1	positive output bridge 1 (sin)
	6	+Vo2	positive output bridge 2 (cos)
	7	GND	common ground
	8	GND	common ground

ORDERING CODE

KMT32B chip	**TBD**
KMT32B SM8	**TBD**

HL PLANARTECHNIK GmbH • Hauert 13 • 44227 Dortmund • Germany • www.hlplanar.de
service@hlplanar.de • phone: +49-(0)231-97400 • fax: +49-(0)231-974020