

ZMY20

MAGNETIC FIELD SENSOR

DESCRIPTION

The ZMY20 is an extremely sensitive magnetic sensor employing the magneto-resistive effect of thin film permalloy. It allows the measurement of magnetic fields or the detection of magnetic parts. The highly sensitive and small size magnetoresistive sensors consist of a chip covered with thin film permalloy stripes. These stripes form a Wheatstone bridge, whose output voltage is proportional to the magnetic field component H_y . A perpendicular field H_x is necessary to stabilize sensor operation. This can be done by using a small permanent magnet.

FEATURES

- Output voltage proportional to magnetic field H_y
- Adjustment of sensitivity and suppression of hysteresis by the auxiliary magnetic field H_x
- Magnetic fields vertical to the chip level are not effective

APPLICATIONS

- Linear position sensors for process control, door interlocks, proximity detectors, machine tool sensing
- Scalar measurement for compassing
- Automotive – door switches, engine position & speed sensing
- Metering of fluids by sensing rotation of impeller
- Traffic counting & vehicle-type sensing

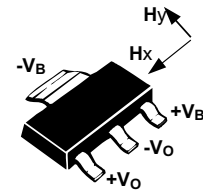
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZMY20TA	7"	12mm	1000 units
ZMY20TC	13"	12mm	4000 units

- Measurement of current in a conductor without connection

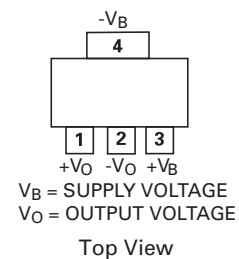
DEVICE MARKING

- ZMY20



SOT223S

PINOUT



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ABSOLUTE MAXIMUM RATINGS.

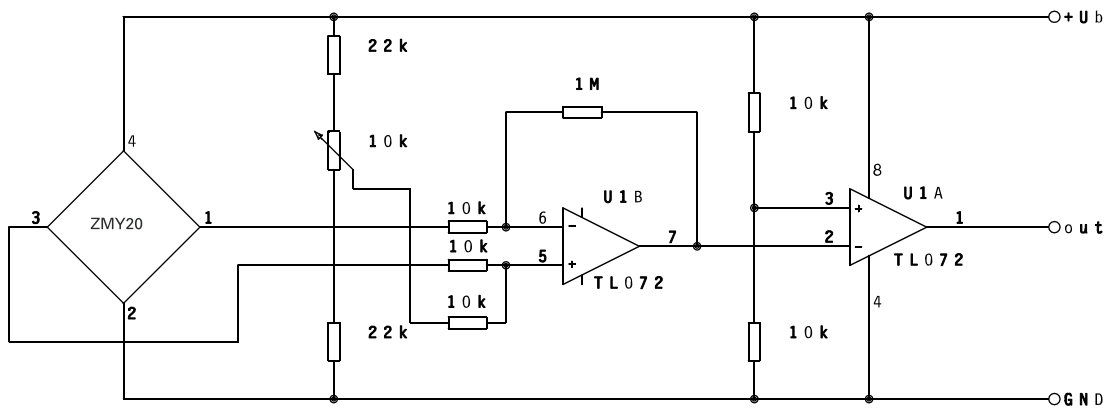
PARAMETER	SYMBOL	LIMIT	UNIT
Supply Voltage	V_B	12	V
Total power dissipation	P_{TOT}	120	mW
Operating Temperature Range	T_{amb}	-40 to +150	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

ELECTRICAL CHARACTERISTICS.(at $T_{amb}=25^{\circ}\text{C}$ and $H_X=3\text{ kA/m}$ unless otherwise stated)

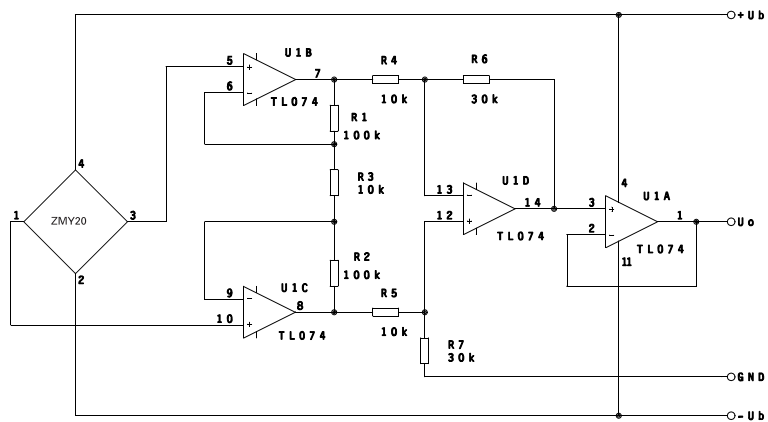
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Bridge resistance	R_{br}	1.2	1.7	2.2	$k\Omega$	
Output voltage range	V_O/V_B	16	20	24	mV/V	
Open circuit sensitivity	S	3.7	4.7	5.7	(mV/V)/(kA/m)	No disturbing field H_d allowed
Hysteresis of output voltage	V_{OH}/V_B	-	-	50	$\mu\text{V/V}$	$H_y \leq 2\text{ kA/m}$
Offset Voltage	V_{off}/V_B	-1.0	-	+1.0	mV/V	
Operating Frequency	f_{max}	0	-	1	MHz	
Temp. Coeff. of offset voltage	TCV_{off}	-3	-	+3	($\mu\text{V/V}$)/K	$T_{amb} = -25$ to $+125^{\circ}\text{C}$
Temp. Coeff. Of bridge resistance	TCR_{br}	0.25	0.3	0.35	%/K	$T_{amb} = -25$ to $+125^{\circ}\text{C}$
Temp. Coeff. of open circuit sensitivity $V_B=5\text{V}$	TCS_V	-0.25	-0.3	-0.35	%/K	$T_{amb} = -25$ to $+125^{\circ}\text{C}$
Temp. Coeff. of open circuit sensitivity $I_B=3\text{mA}$	TCS_I	-	-0.1	-	%/K	$T_{amb} = -25$ to $+125^{\circ}\text{C}$

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Application 1 (digital output)

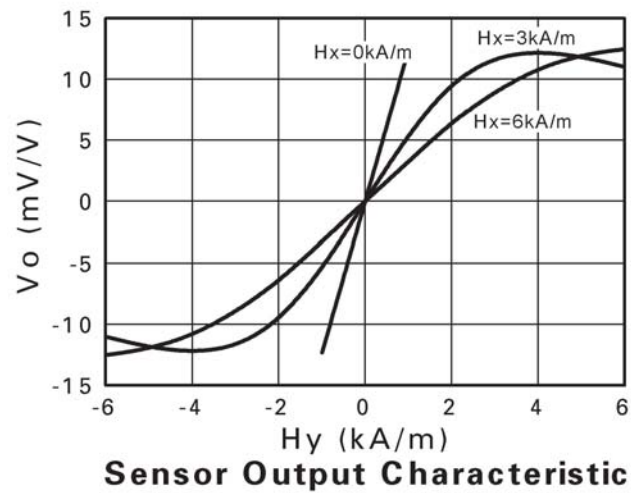


Application 2 (analog output)

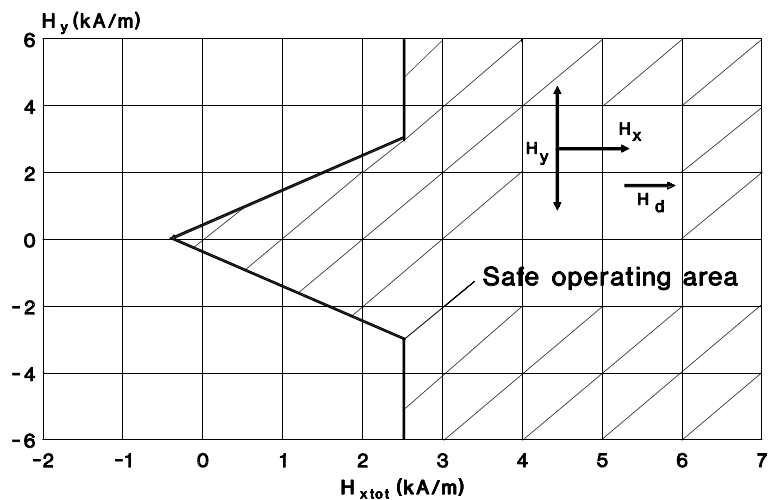


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Sensor output characteristic
 $V_O = f(H_Y)$; H_X -parameter
 $V_B = \text{const}$; $T_{\text{amb}} = 25^\circ\text{C}$



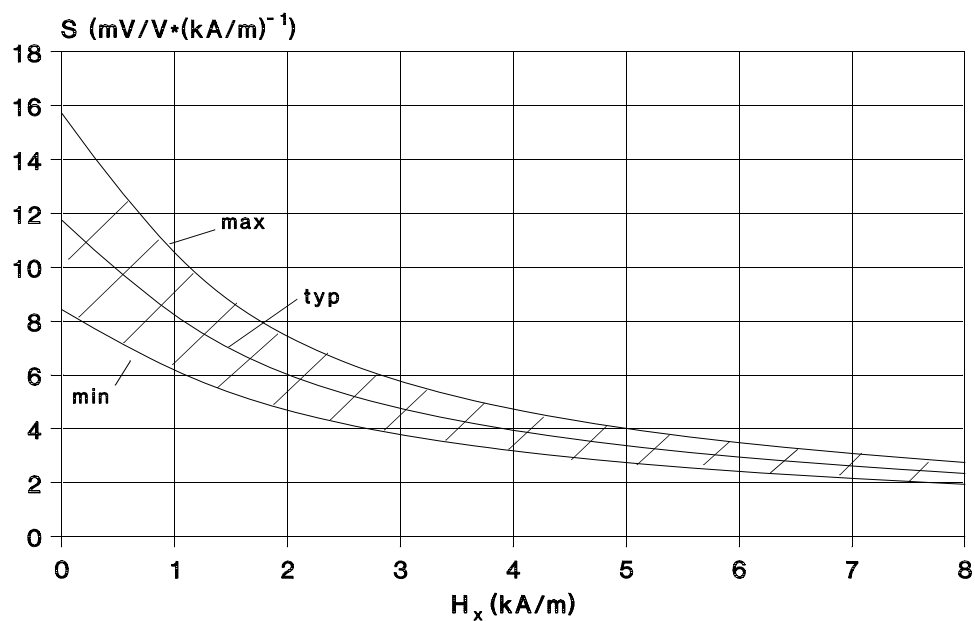
Safe operating area
 $H_{\text{xtot}} = H_X + H_d$; $T_{\text{amb}} = 25^\circ\text{C}$; (H_d =disturbing field)



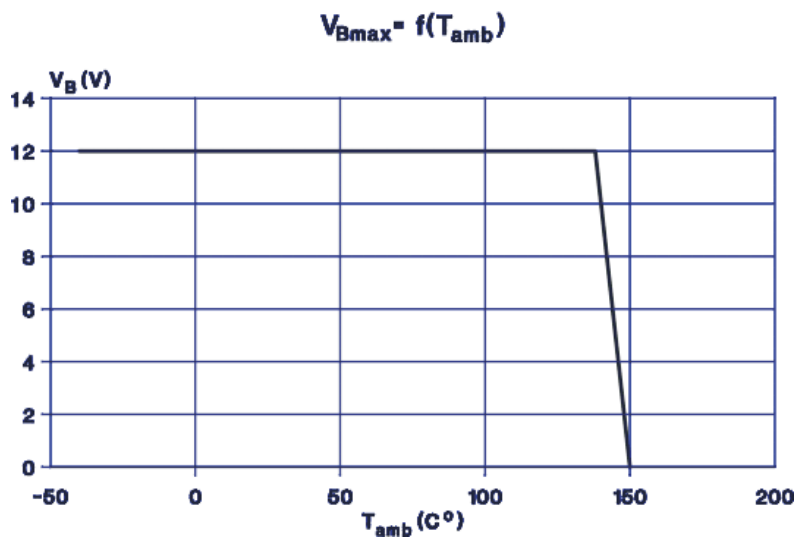
The sensor has to be reset after leaving the safe operating area by an auxiliary field of $H_X = 3 \text{ kA/m}$

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Sensor sensitivity characteristic
 $S=f(H_x)$
 $V_b=\text{const}; T_{\text{amb}}=25^\circ\text{C}$



Supply voltage (maximum) derating curve
 $V_{B\text{max}}=f(T_{\text{amb}})$

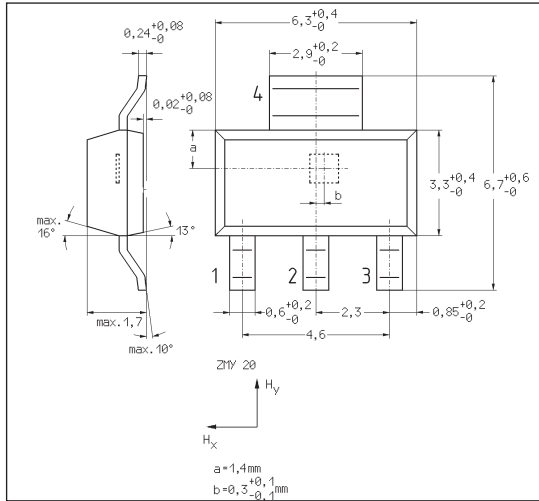


Device mounted on 40 x 40 mm² board (copper area 600mm²)

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PACKAGE OUTLINE



CONTROLLING DIMENSIONS IN MILLIMETRES
APPROX CONVERSIONS INCHES.

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"Preview"Future device intended for production at some point. Samples may be available

"Active"Product status recommended for new designs

"Last time buy (LTB)"Device will be discontinued and last time buy period and delivery is in effect

"Not recommended for new designs"Device is still in production to support existing designs and production

"Obsolete"Production has been discontinued

Datasheet status key:

"Draft version" This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.

"Provisional version" This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice.

"Issue" This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice.

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