

# 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

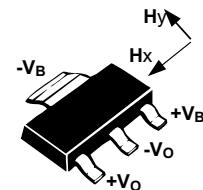
### ORDERING INFORMATION

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

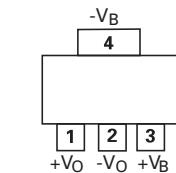
### DEVICE MARKING

- ZMY20



SOT223S

### PINOUT



$V_B$  = SUPPLY VOLTAGE  
 $V_O$  = OUTPUT VOLTAGE

Top View

# ZMY20

## ABSOLUTE MAXIMUM RATINGS.

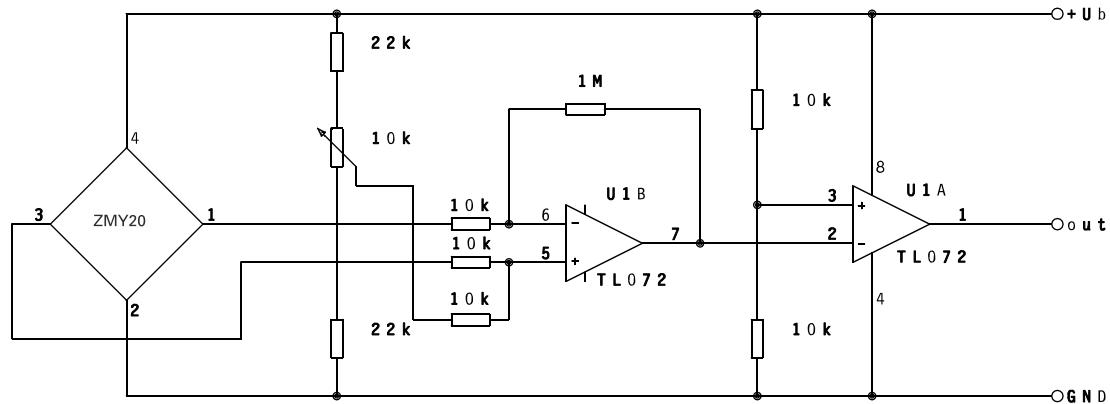
PARAMETER	SYMBOL	LIMIT	UNIT
Supply Voltage	$V_B$	12	V
Total power dissipation	$P_{TOT}$	120	mW
Operating Temperature Range	$T_{amb}$	-40 to +150	°C
Storage Temperature Range	$T_{stg}$	-65 to +150	°C

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

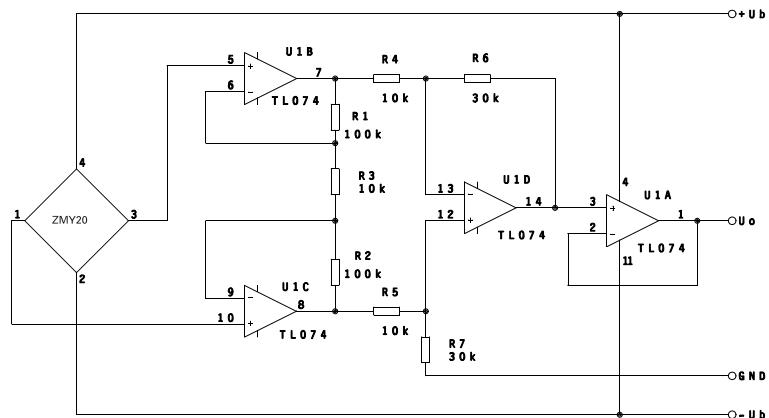
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Bridge resistance	$R_{br}$	1.2	1.7	2.2	kΩ	
Output voltage range	$V_O/V_B$	16	20	24	mV/V	
Open circuit sensitivity	$S$	3.7	4.7	5.7	(mV/V)/(kA/m)	No disturbing field $H_d$ allowed
Hysteresis of output voltage	$V_{OH}/V_B$	-	-	50	μV/V	$Hy \leq 2\text{ kA/m}$
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	(μV/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)

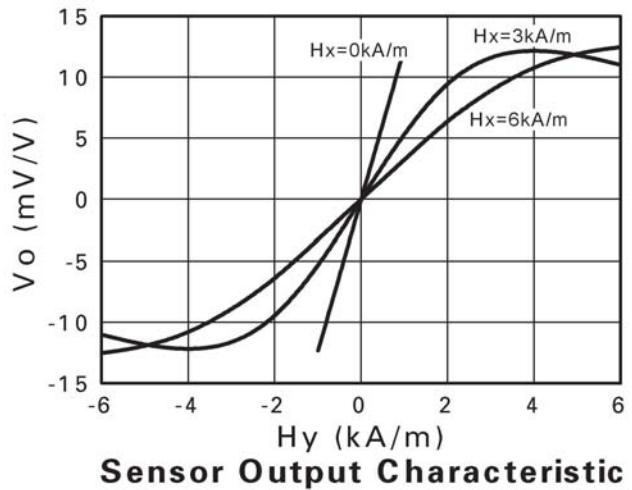


Application 2 (analog output)

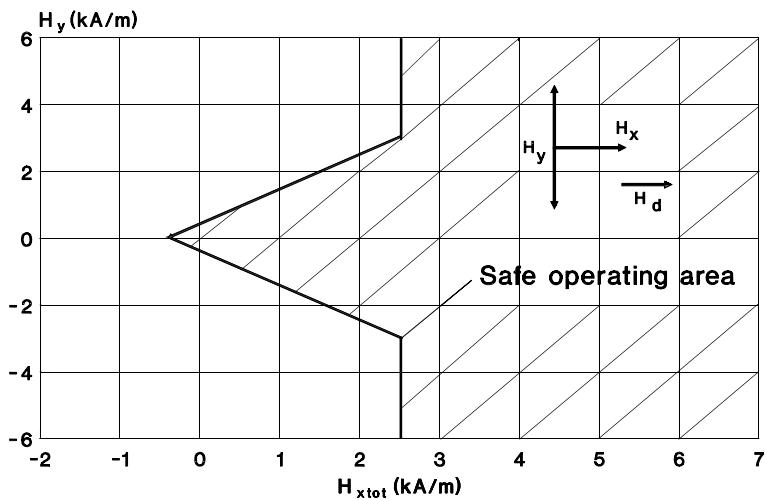


## ZMY20

Sensor output characteristic  
 $V_O=f(H_y)$ ;  $H_x$ -parameter  
 $V_b=\text{const}$ ;  $T_{\text{amb}}=25^\circ\text{C}$



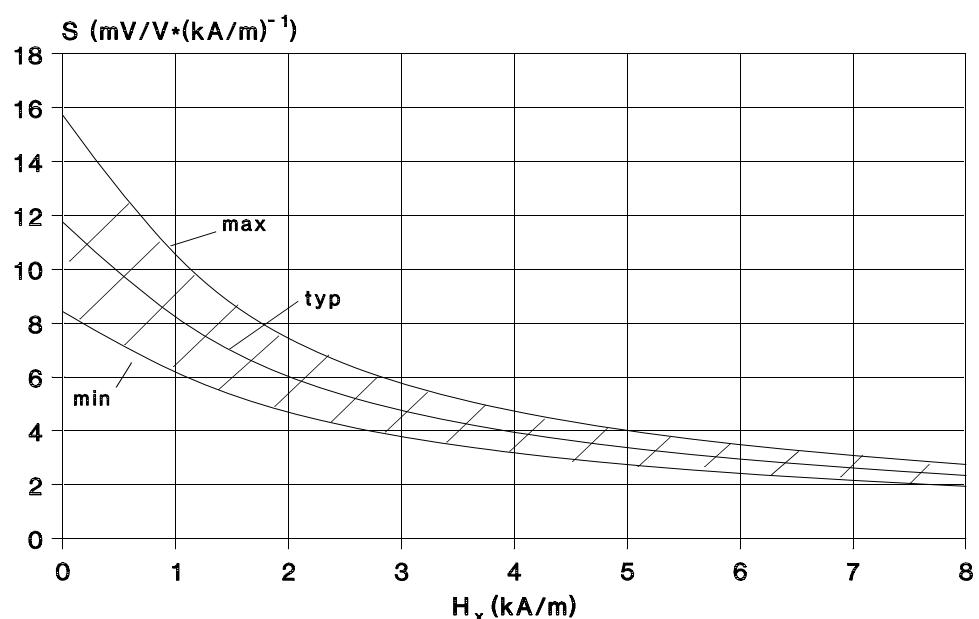
Safe operating area  
 $H_{\text{tot}}=H_x + H_d$ ;  $T_{\text{amb}}=25^\circ\text{C}$ ; ( $H_d$ =disturbing field)



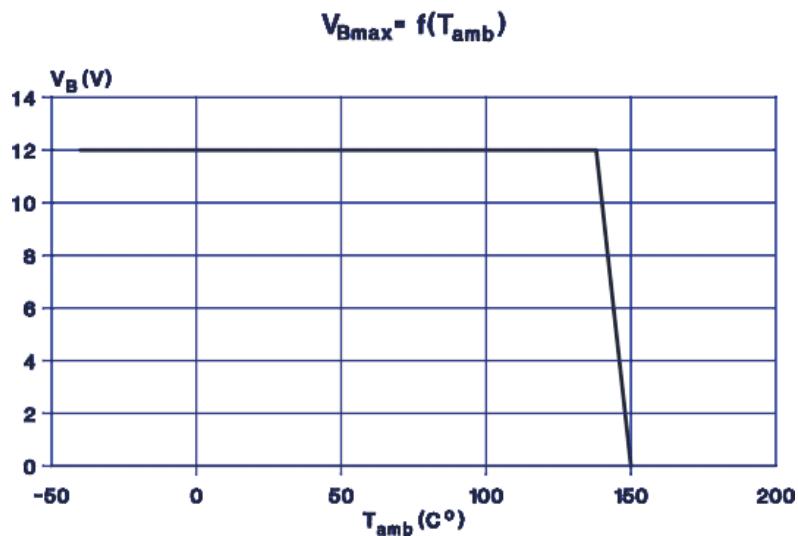
The sensor has to be reset after leaving the safe operating area by an auxiliary field of  $H_x=3\text{kA/m}$

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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  
 $V_{\text{Bmax}}=f(T_{\text{amb}})$

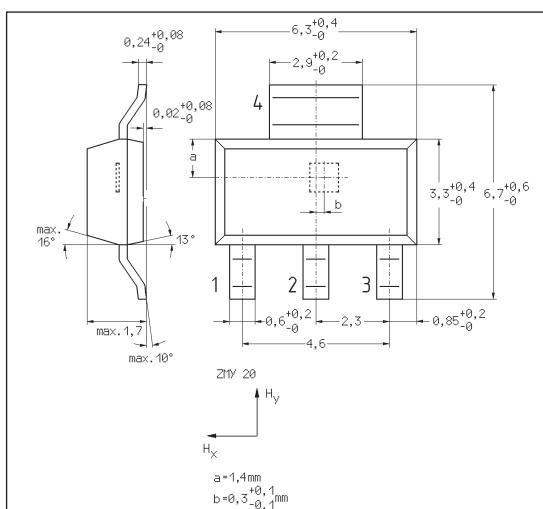


Device mounted on  $40 \times 40 \text{ mm}^2$  board (copper area  $600\text{mm}^2$ )

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## PACKAGE OUTLINE



## CONTROLLING DIMENSIONS IN MILLIMETRES APPROX CONVERSIONS INCHES.

# ZMY20

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- or
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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.

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