

# 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

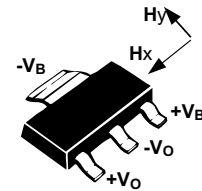
### ORDERING INFORMATION

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

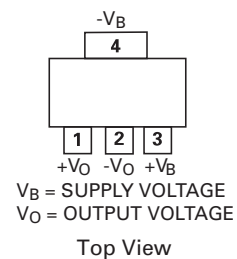
### DEVICE MARKING

- ZMY20



SOT223S

### PINOUT



# ZMY20

## ABSOLUTE MAXIMUM RATINGS.

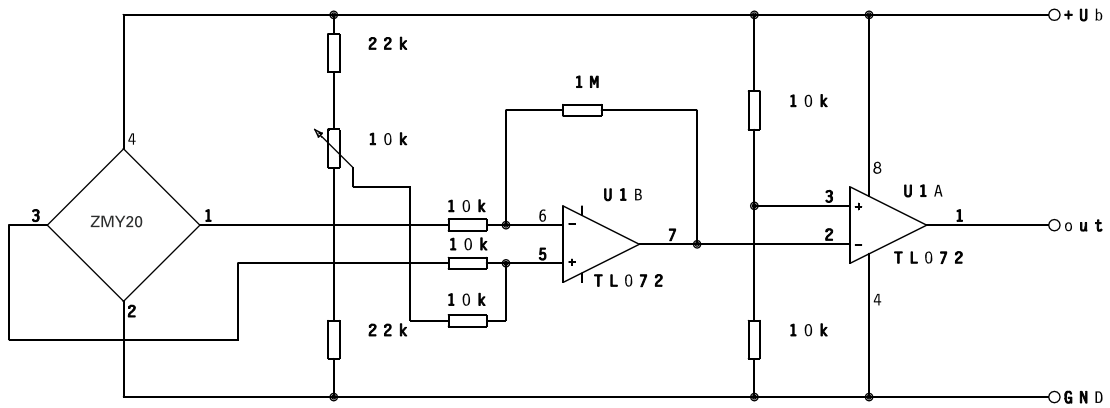
PARAMETER	SYMBOL	LIMIT	UNIT
Supply Voltage	$V_B$	12	V
Total power dissipation	$P_{TOT}$	120	mW
Operating Temperature Range	$T_{amb}$	-40 to +150	°C
Storage Temperature Range	$T_{stg}$	-65 to +150	°C

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

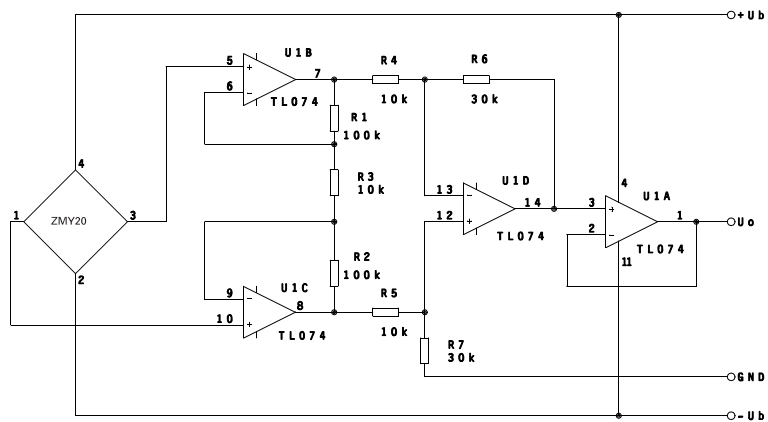
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Bridge resistance	$R_{br}$	1.2	1.7	2.2	$k\Omega$	
Output voltage range	$V_O/V_B$	16	20	24	mV/V	
Open circuit sensitivity	S	3.7	4.7	5.7	(mV/V)/(kA/m)	No disturbing field $H_d$ allowed
Hysteresis of output voltage	$V_{OH}/V_B$	-	-	50	$\mu\text{V/V}$	$H_y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

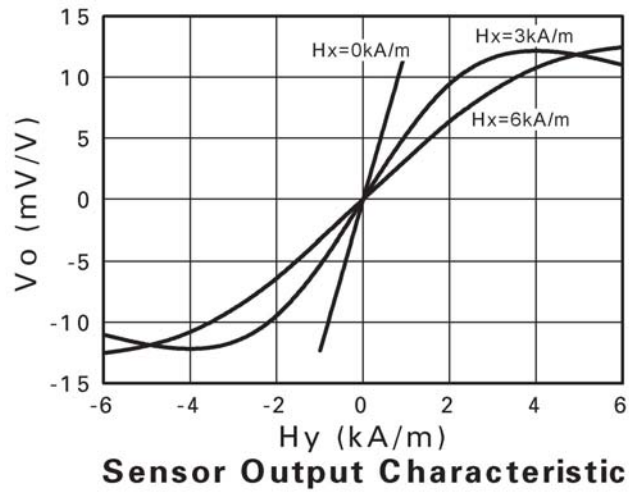


Application 2 (analog output)

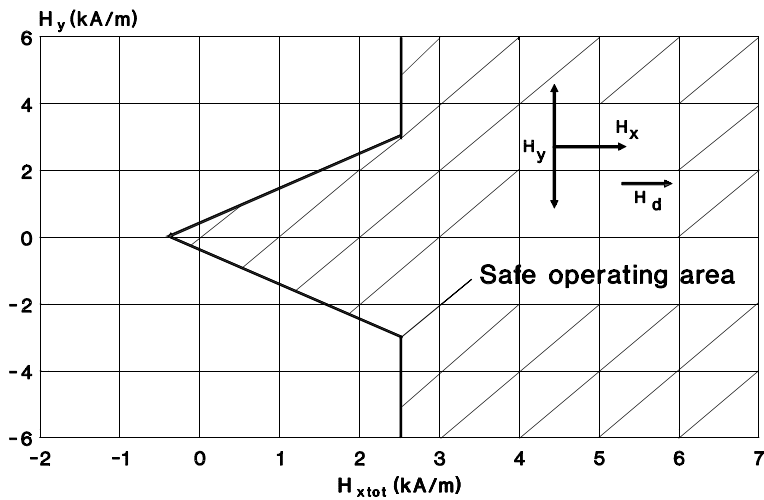


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Sensor output characteristic  
 $V_O = f(H_Y)$ ;  $H_X$ -parameter  
 $V_B = \text{const}$ ;  $T_{\text{amb}} = 25^\circ\text{C}$



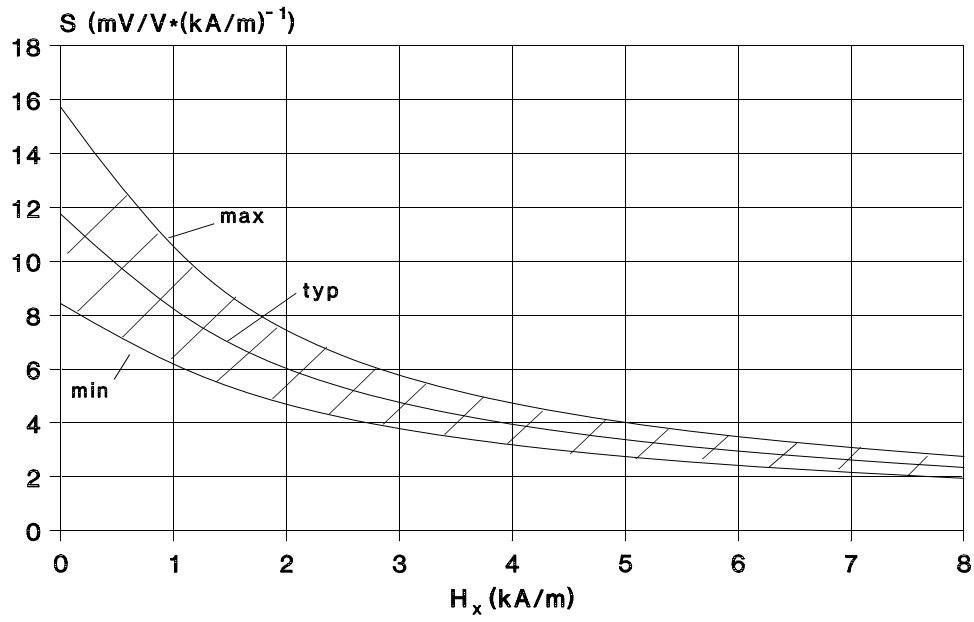
Safe operating area  
 $H_{X\text{tot}} = H_X + H_d$ ;  $T_{\text{amb}} = 25^\circ\text{C}$ ; ( $H_d$ =disturbing field)



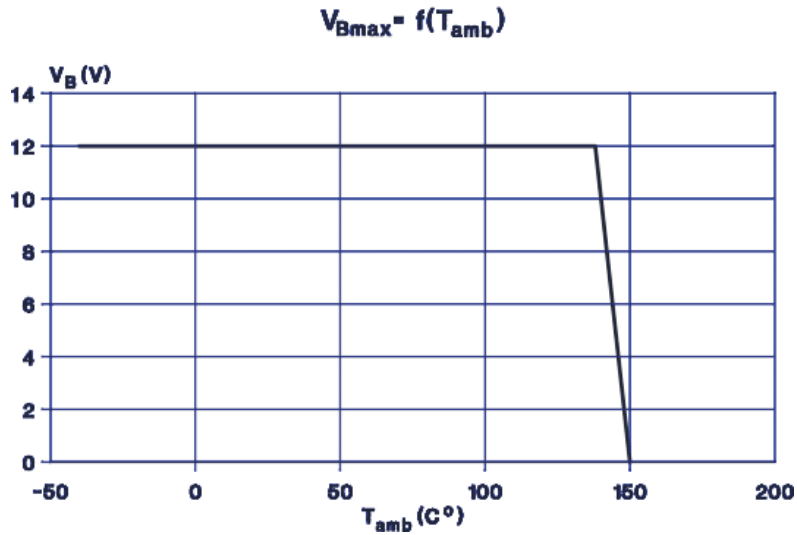
The sensor has to be reset after leaving the safe operating area by an auxiliary field of  $H_X = 3 \text{ kA/m}$

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



Supply voltage (maximum) derating curve  
 $V_{Bmax}=f(T_{amb})$



Device mounted on 40 x 40 mm<sup>2</sup> board (copper area 600mm<sup>2</sup>)

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

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"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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"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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