

# ZMY20

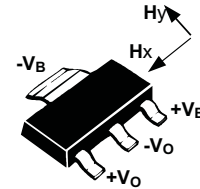
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## MAGNETIC FIELD SENSOR

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### 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.



SOT223S

### 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

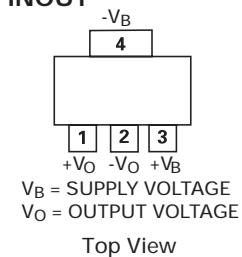
### APPLICATIONS

- 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
- Measurement of current in a conductor without connection

### ORDERING INFORMATION

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

### PINOUT



### DEVICE MARKING

- ZMY20

# ZMY20

## ABSOLUTE MAXIMUM RATINGS

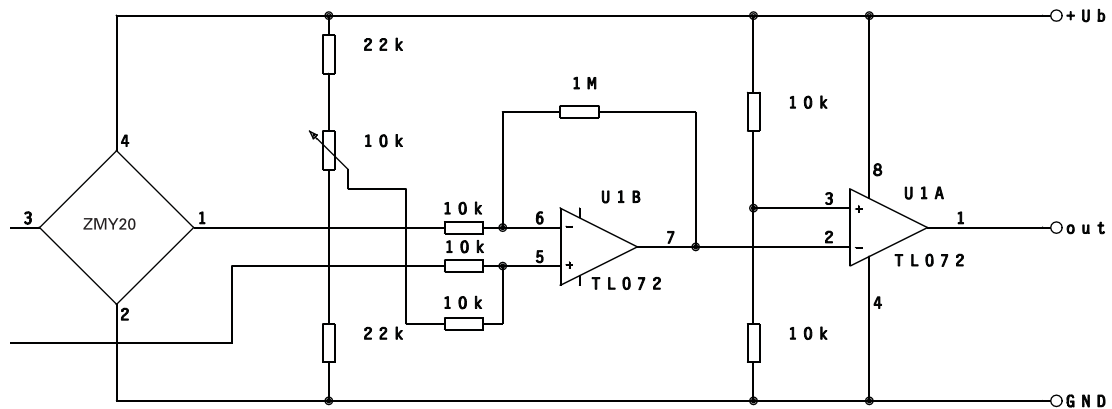
PARAMETER	SYMBOL	LIMIT	UNIT
Supply voltage	$V_B$	12	V
Total power dissipation	$P_{TOT}$	120	mW
Operating temperature range	$T_{amb}$	-40 to +150	°C
Storage temperature range	$T_{stg}$	-65 to +150	°C

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

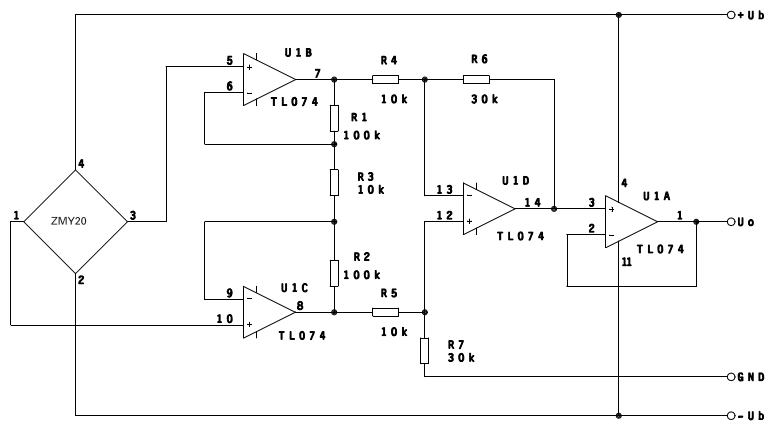
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Bridge resistance	$R_{br}$	1.2	1.7	2.2	$k\Omega$	
Output voltage range	$V_O/V_B$	16	20	24	mV/V	
Open circuit sensitivity	S	3.7	4.7	5.7	(mV/V)/(kA/m)	No disturbing field $H_d$ allowed
Hysteresis of output voltage	$V_{OH}/V_B$	-	-	50	$\mu\text{V/V}$	$H_y \leq 2\text{ kA/m}$
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 $+125^{\circ}\text{C}$

# ZMY20

Application 1 (digital output)

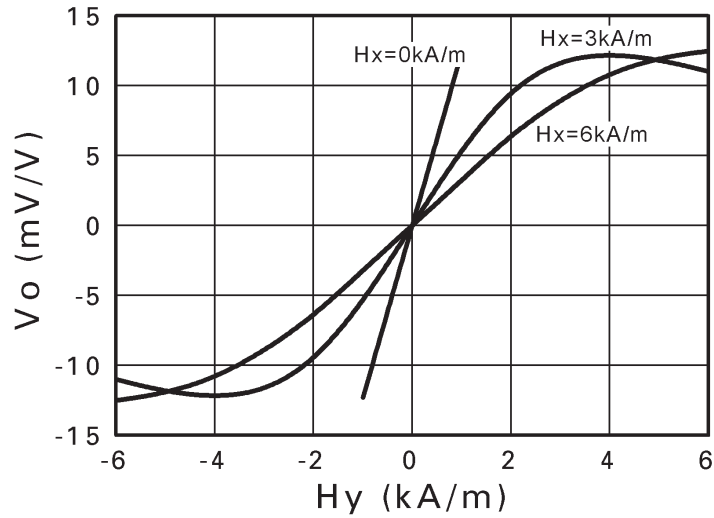


Application 2 (analog output)



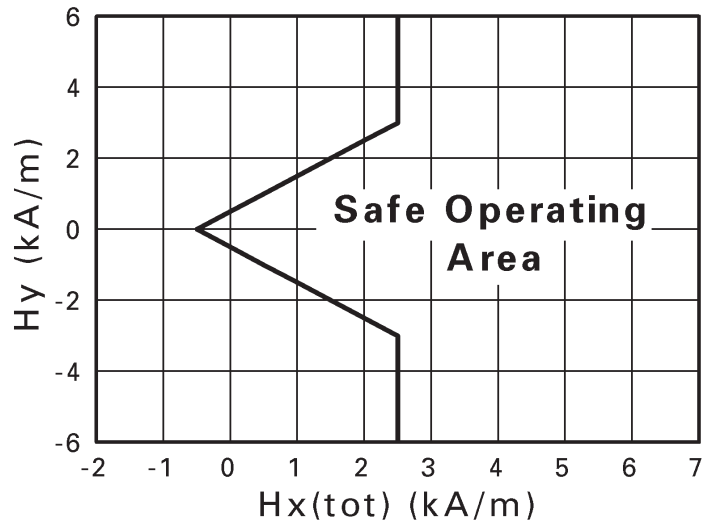
# ZMY20

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



**Sensor Output Characteristic**

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

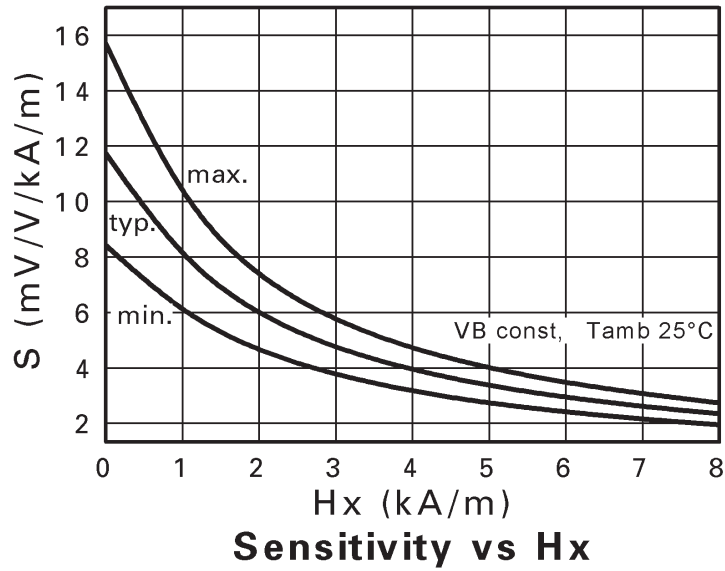


**Safe Operating Area**

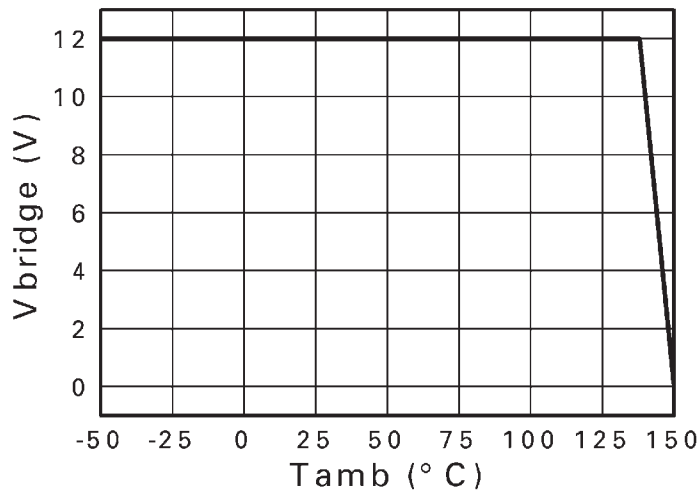
The sensor has to be reset after leaving the safe operating area by an auxiliary field of  $H_x = 3 \text{ kA/m}$

# ZMY20

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



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

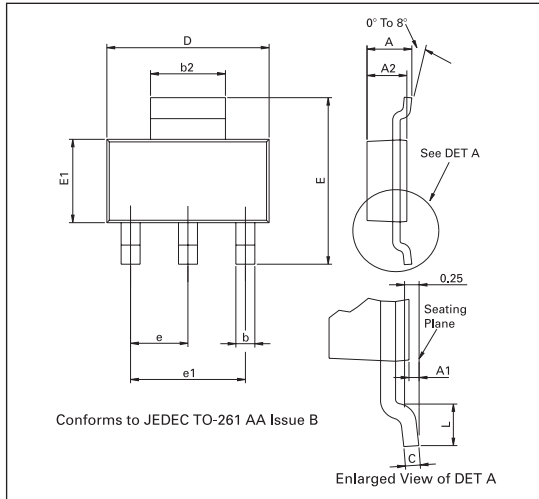


**Supply Voltage (max) Derating Curve**

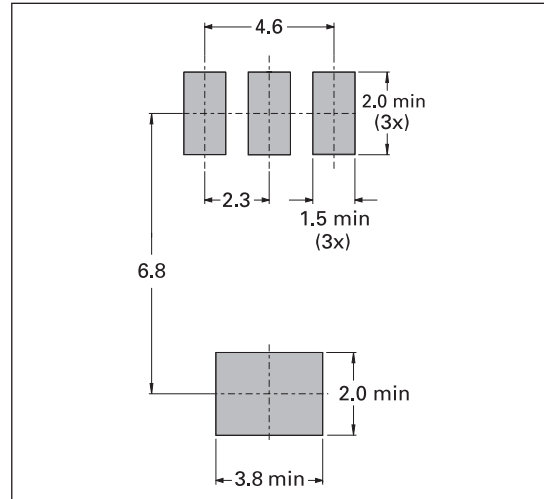
Device mounted on 40 x 40 mm<sup>2</sup> board (copper area 600mm<sup>2</sup>)

# ZMY20

## PACKAGE OUTLINE



## PAD LAYOUT



CONTROLLING DIMENSIONS IN MILLIMETERS APPROX CONVERSIONS INCHES

## PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-

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