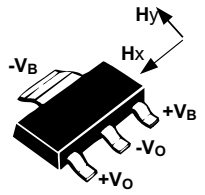
MAGNETIC FIELD SENSOR

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 Hy. A perpendicular field Hx is necessary to stabilize sensor operation. This can be done by using a small permanent magnet.



SOT223S

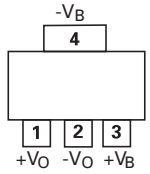
FEATURES

- Output voltage proportional to magnetic field Hy
- Adjustment of sensitivity and suppression of hysteresis by the auxiliary magnetic field Hx
- 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

PINOUT



V_B = SUPPLY VOLTAGE
V_O = OUTPUT VOLTAGE

Top View

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

ZMY20

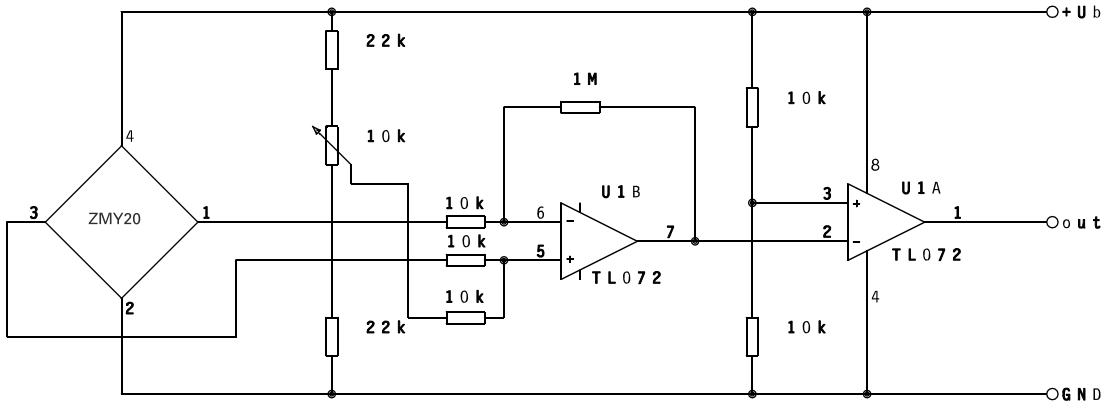
ABSOLUTE MAXIMUM RATINGS.

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

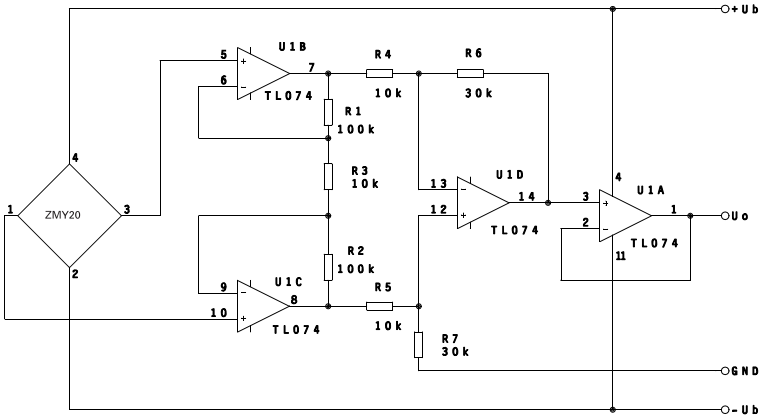
ELECTRICAL CHARACTERISTICS.(at T_{amb}=25°C and H_X=3 kA/m unless otherwise stated)

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≤ 2kA/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°C
Temp. Coeff. Of bridge resistance	TCR_{br}	0.25	0.3	0.35	%/K	T_{amb}= -25 to +125°C
Temp. Coeff. of open circuit sensitivity V_B=5V	TCS_V	-0.25	-0.3	-0.35	%/K	T_{amb}= -25 to +125°C
Temp. Coeff. of open circuit sensitivity I_B=3mA	TCS_I	-	-0.1	-	%/K	T_{amb}= -25 to +125°C

Application 1 (digital output)

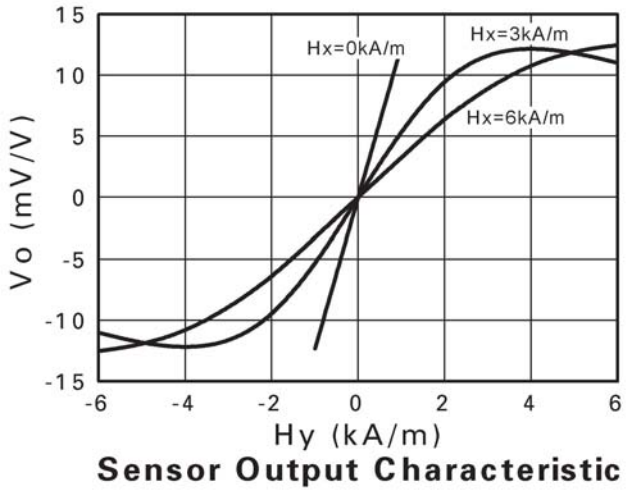


Application 2 (analog output)



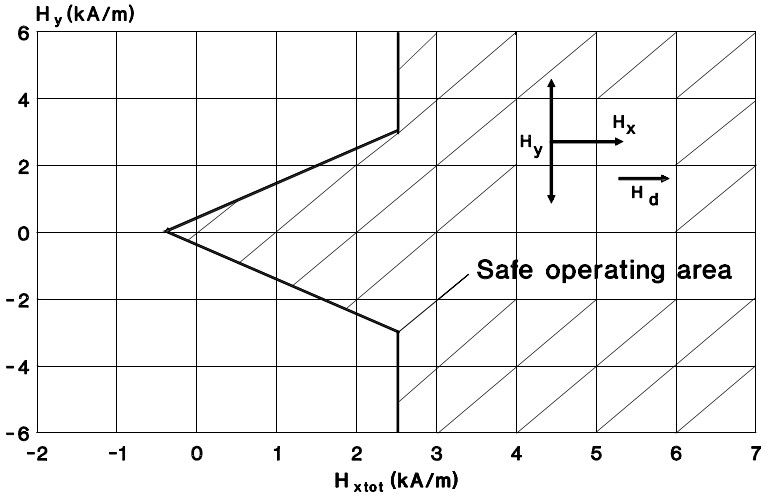
ZMY20

Sensor output characteristic
$V_O=f(H_Y)$; H_X-parameter
V_b=const; T_{amb}=25°C



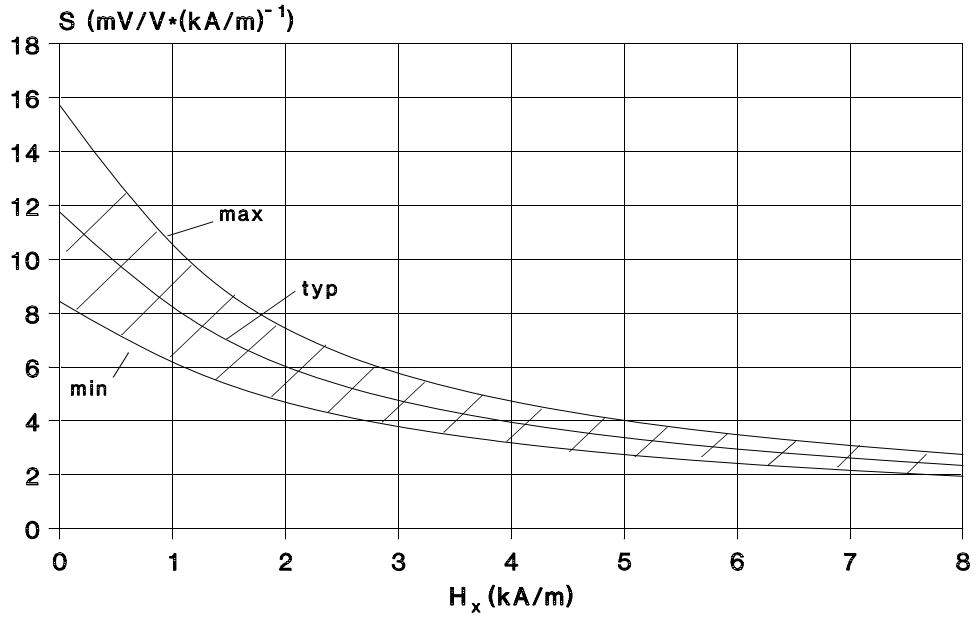
Sensor Output Characteristic

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

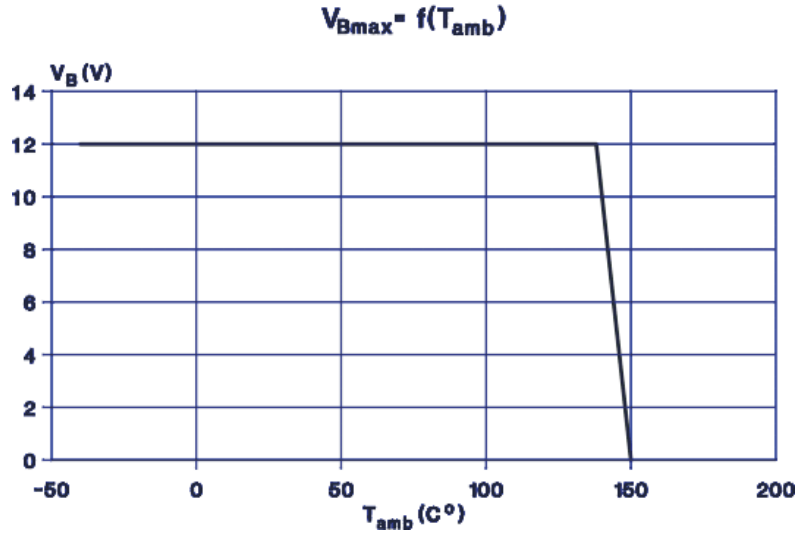


The sensor has to be reset after leaving the safe operating area by an auxiliary field of H_X=3kA/m

Sensor sensitivity characteristic
$S=f(H_X)$
V_b=const; T_{amb}=25°C



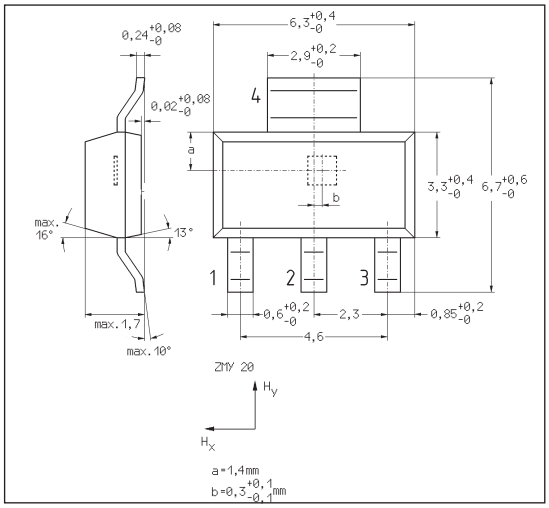
Supply voltage (maximum) derating curve
$V_{Bmax}=f(T_{amb})$



Device mounted on 40 x 40 mm^2 board (copper area 600mm^2)

ZMY20

PACKAGE OUTLINE



CONTROLLING DIMENSIONS IN MILLIMETRES APPROX CONVERSIONS INCHES.

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