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Stocking Distributor

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Diodes Incorporated
ZMZ20

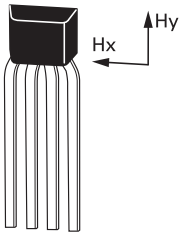
For any questions, you can email us directly:
sales@integrated-circuit.com

ZMZ20

MAGNETIC FIELD SENSORS

DESCRIPTION

The ZMZ20 is an extremely sensitive magnetic field sensor in a 4 pin E-Line package employing the magneto-resistive effects of thin film Permalloy. It allows the measurement of magnetic fields or the detection of metallic parts. The sensor consists of a chip covered with Permalloy stripes which form a Wheatstone bridge, whose output voltage is proportional to the magnetic field component Hy. A perpendicular field Hx is necessary to suppress the hysteresis and this can be provided by using a small permanent magnet.



E-LINE

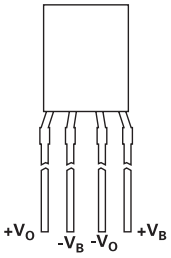
FEATURES

- 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 and speed sensing
- Metering of fluids by sensing rotation of impeller
- Traffic counting and vehicle-type sensing
- Measurement of current in a conductor without connection

PINOUT



SIDE VIEW

ORDERING INFORMATION

DEVICE	BOX
ZMZ20	Bulk in box (2,000 components per box)

DEVICE MARKING

- M20

ZMZ20

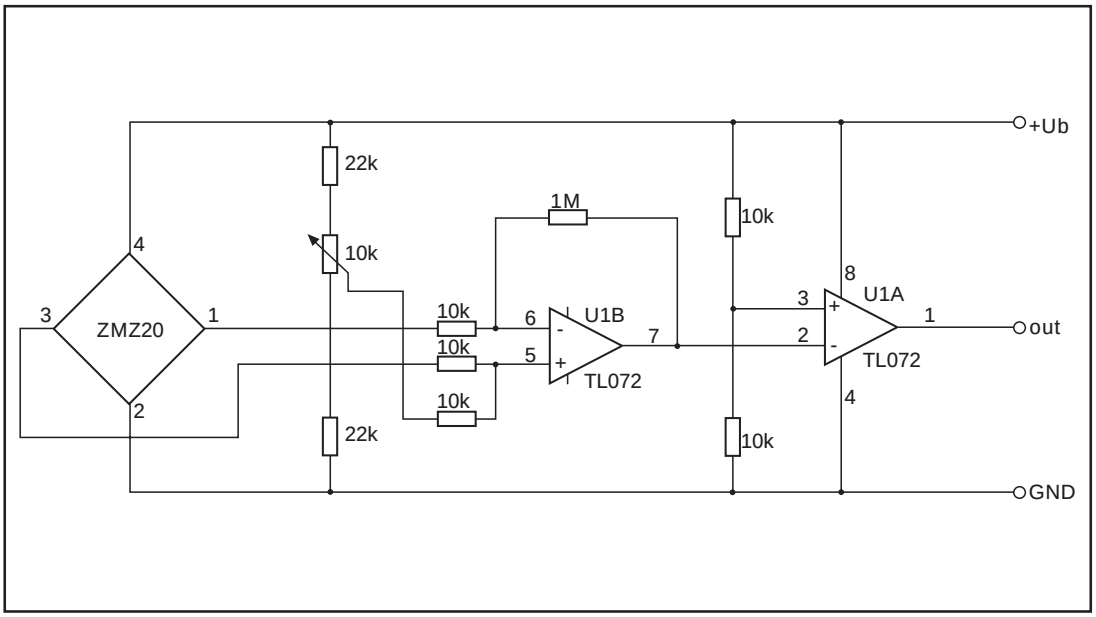
ABSOLUTE MAXIMUM RATINGS

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

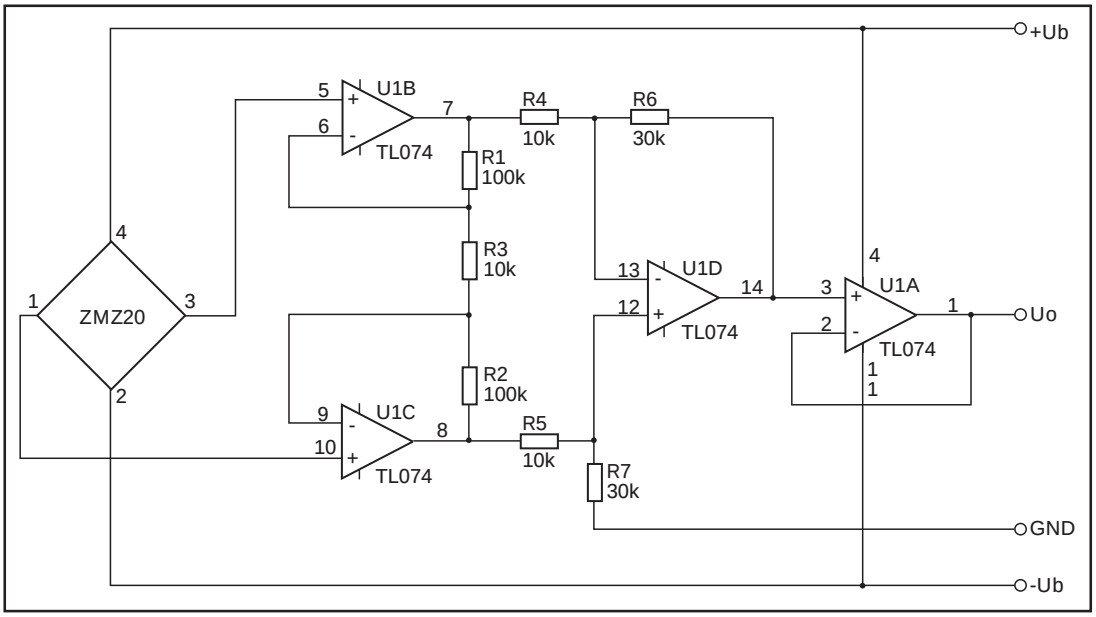
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C and Hx=3kA/m unless otherwise stated)

PARAMETER	SYMBO	MIN.	TYP.	MAX.	UNIT	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	
Temperature coefficient of offset voltages	TCV_{off}	-3	-	+3	(µV/V)/K	T_{amb} = -25 to +125°C
Temperature coefficient of bridge resistance	TCR_{br}	0.25	0.3	0.35	%/K	T_{amb} = -25 to +125°C
Temperature coefficient of open circuit sensitivity V_B =5V	TCS_V	-0.25	-0.3	-0.35	%/K	T_{amb} = -25 to +125°C
Temperature coefficient of open circuit sensitivity I_B=3mA	TCS_I	-	-0.1	-	%/K	T_{amb} = -25 to +125°C

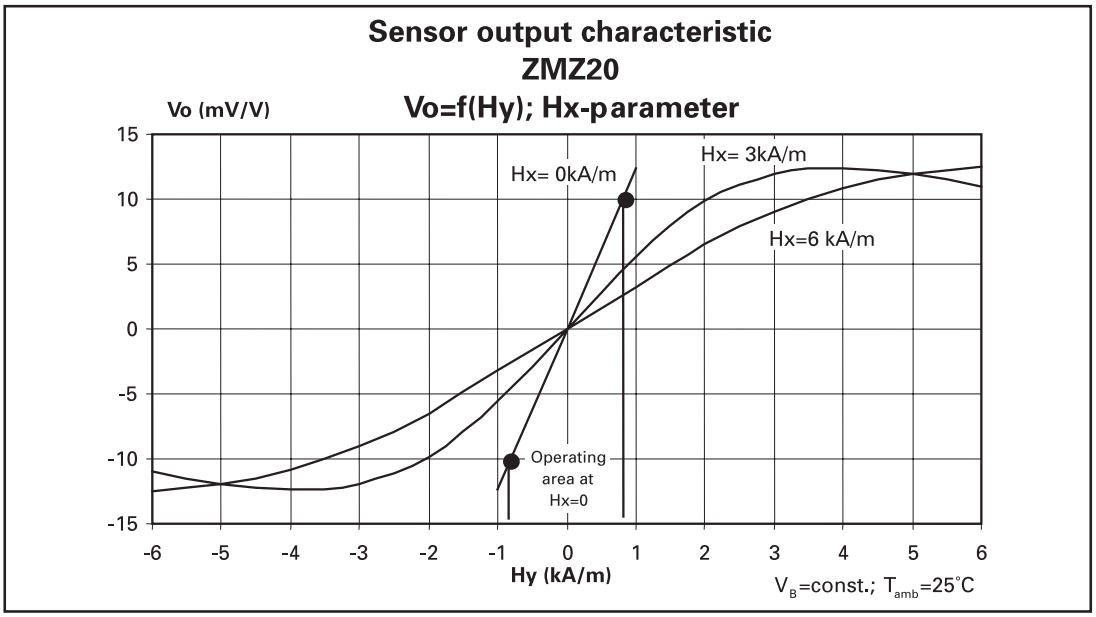
Application 1 (digital output)

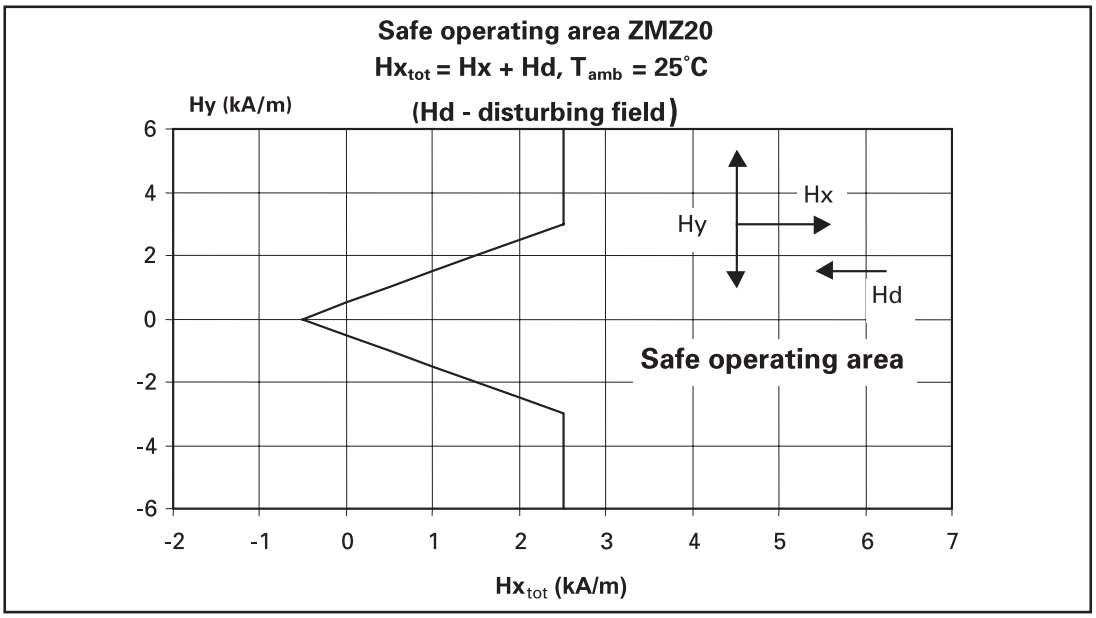


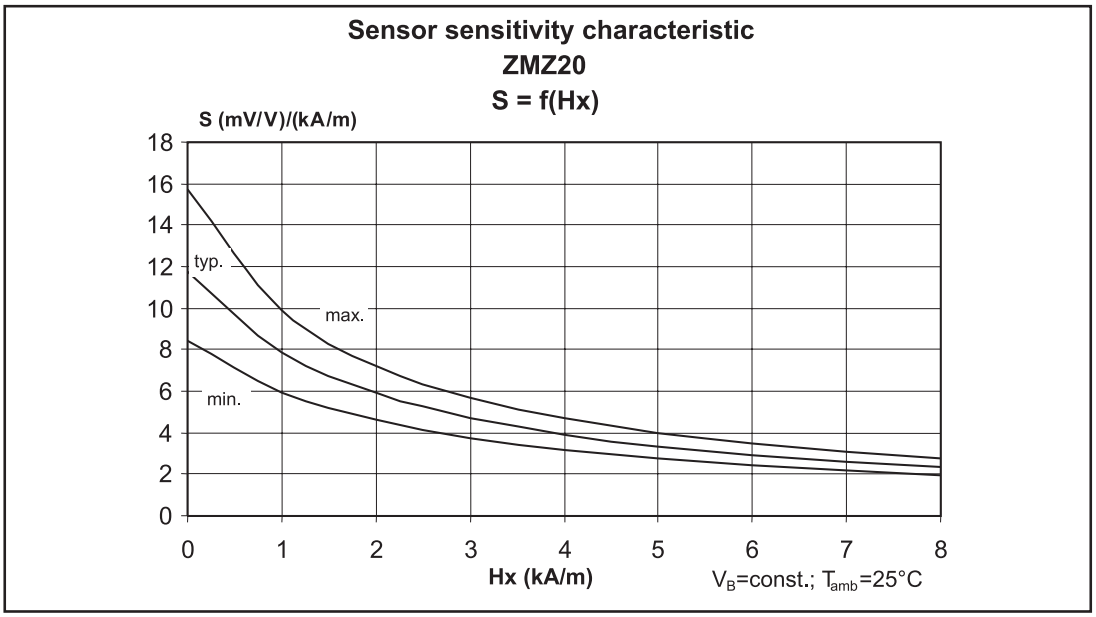
Application 2 (analog output)

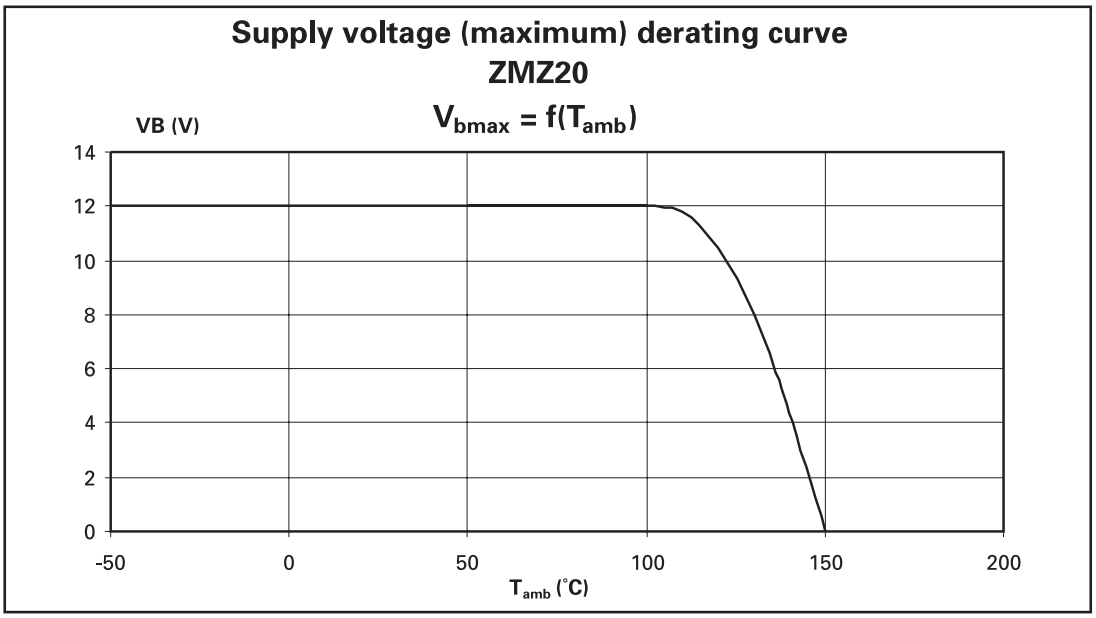


ZMZ20


Sensor output characteristic
ZMZ20
Vo=f(Hy); Hx-parameter
Vo (mV/V)
15
10
5
0
-5
-10
-15
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
Hy (kA/m)
Hx= 0kA/m
Hx= 3kA/m
Hx=6 kA/m
Operating
area at
Hx=0
V_B=const.; T_amb=25°C


Safe operating area ZMZ20
Hx_tot = Hx + Hd, T_amb = 25°C
(Hd - disturbing field)
Hy (kA/m)
6
4
2
0
-2
-4
-6
-2
-1
0
1
2
3
4
5
6
7
Hx_tot (kA/m)
Hx
Hy
Hd
Safe operating area


Sensor sensitivity characteristic
ZMZ20
S = f(Hx)
S (mV/V)/(kA/m)
18
16
14
12
10
8
6
4
2
0
typ.
max.
min.
0
1
2
3
4
5
6
7
8
Hx (kA/m)
VB=const.; Tamb=25°C


Supply voltage (maximum) derating curve
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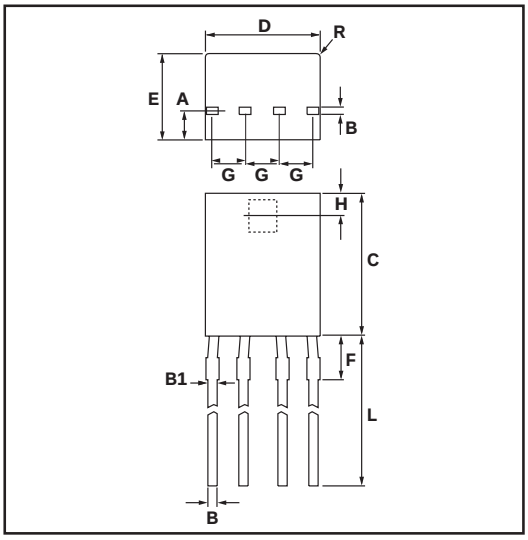
Vbmax = f(Tamb)
VB (V)
14
12
10
8
6
4
2
0
-50
0
50
100
150
200
Tamb (°C)

ZMZ20

PACKAGE OUTLINE



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.8	1.0	0.032	0.039
B	0.35	0.48	0.014	0.019
B1	0.45	0.60	0.018	0.024
C	4.0	4.4	0.158	0.173
D	3.8	4.2	0.150	0.165
E	2.4	2.8	0.094	0.110
F	1.2	-	0.047	-
G	1.25	-	0.049	-

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