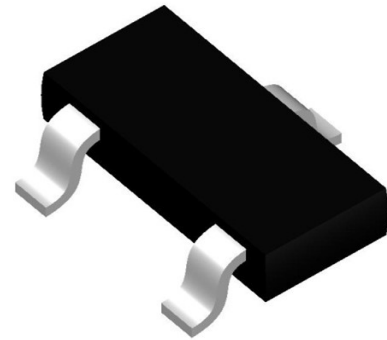


KTM1901

MagnetoResistive Switch Sensor

The KTM1901 is an omnipolar magnetic sensor with integrated tunneling magnetoresistance (TMR) and CMOS technology for use in industrial and consumer switch applications. The temperature compensation circuitry improves stability of magnetic switch points over the whole operating range. The KTM1901 has a wide operating voltage range and a wide operating temperature range. The sensor output is equipped with a push-pull stage and provides a high output frequency with a very low average power consumption.

The KTM1901 are available in SOT23-3L packages.



Product Overview

Article description	Variant	Package	Delivery Type
KTM1901TC-ST3	omnipolar	SOT23-3L	Tape and Reel (3000)

Quick Reference Guide

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{DD}	Supply voltage	1.8	-	5.5	V
I_{DD}	Current consumption	-	3.4	-	μ A
V_{OL}	Output low voltage (On)	-	0.02	0.1	V
V_{OH}	Output high voltage (Off)	$V_{DD} - 0.2$	$V_{DD} - 0.1$	-	V
f_S	Sampling frequency	-	1000	-	Hz
T_A	Ambiant Temperature	-40	-	+125	$^{\circ}$ C

Absolute Maximum Ratings

In accordance with the absolute maximum rating system (IEC60134).

Symbol	Parameter	Value	Unit
V_{DD}	Supply voltage	6	V
$V_{DD,REV}$	Reverse supply voltage	-0.3	V
I_{OUTPUT}	Output current	5	mA
B_{MAX}	Maximum external magnetic field (<5 min.)	3000	G
P_D	Package power dissipation	400	mW
$T_{J,MAX}$	Max. junction temperature	+150	$^{\circ}$ C
T_{STG}	Storage temperature range	-50...150	$^{\circ}$ C
T_{reflow}	Maximum reflow temperature	260	$^{\circ}$ C
ESD _{HBM}	ESD capability (HBM)	8	kV

Stresses beyond those listed under "Absolute maximum ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Features

- Omnipolar Operation
- Supply voltage range 1.8 V...5.5 V
- BOP = 17 G BRP = 10 G (South)
- BOP = -17 G BRP = -10 G (North)
- Average Supply Current = 3.4 μ A @VDD = 3.0V
- Ambient Temperature -40 ...+125 $^{\circ}$ C

Advantages

- High Magnetic Sensitivity
- High frequency performance
- Very low power consumption

Applications

- Non-contact end-point detection
- Water, electric and gas meters
- Switch detection for laptops



Magnetic Data

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
B _{OPS}	Magnetic field operation point	South pole	15	18	24	G
B _{RPS}	Magnetic field release point	South pole	9	12	15	G
B _{OPN}	Magnetic field operation point	North pole	-24	-18	-15	G
B _{RPN}	Magnetic field release point	North pole	-15	-12	-9	G
B _{HY}	Hysteresis	(B _{OPX} - B _{RPN})	-	6	-	G

Electrical Data

T_{amb} = 25 °C; V_{DD} = 3.0 V; unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{DD}	Supply voltage		1.8	-	5.5	V
I _{DD}	Current consumption	Average	-	3.4	-	μA
V _{OL}	Output low voltage (On)	I _{OUT} = 1 mA	-	0.02	0.1	V
V _{OH}	Output high voltage (Off)	I _{OUT} = 1 mA	V _{DD} -0.2	V _{DD} -0.1	-	V
f _s	Sampling frequency		-	1000	-	Hz

Typical Performance Graph

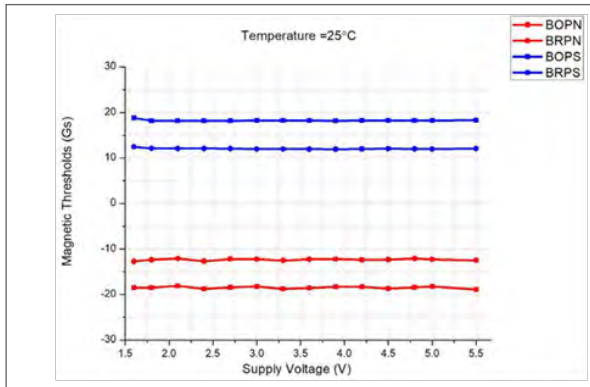


Fig 1.: Magnetic field thresholds vs. supply voltage
@T_A = 25 °C

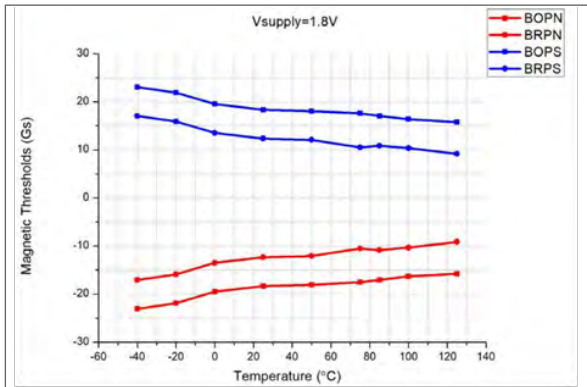


Fig 2.: Magnetic field thresholds vs. temperature
@V_{DD} = 1.8 V

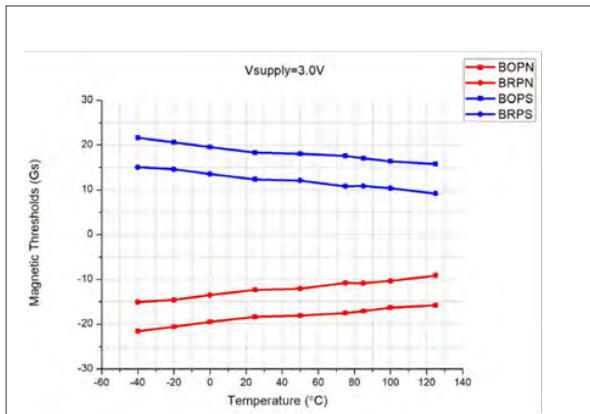


Fig 3.: Magnetic field thresholds vs. temperature
@V_{DD} = 3.0 V

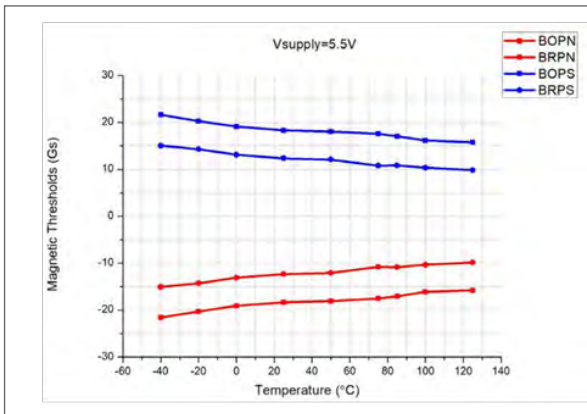


Fig 4.: Magnetic field thresholds vs. temperature
@V_{DD} = 5.5 V

Application information

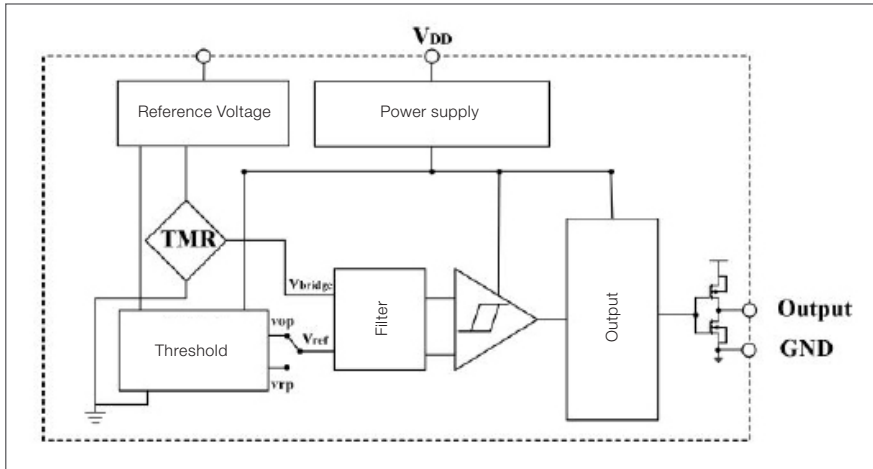


Fig 5.: Block diagram of the KTM1901

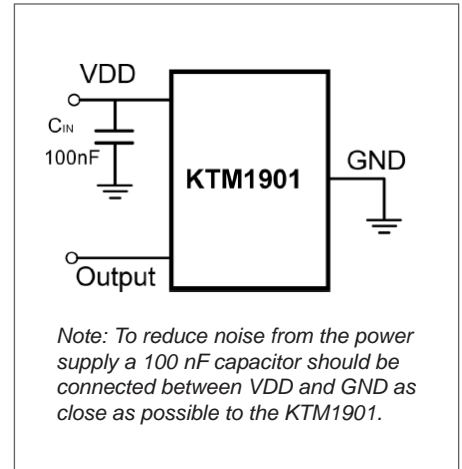


Fig 6.: Application circuit schematic

Switching characteristics

The KTM1901 sensor detects a magnetic field parallel to the surface of the sensor (see picture below).

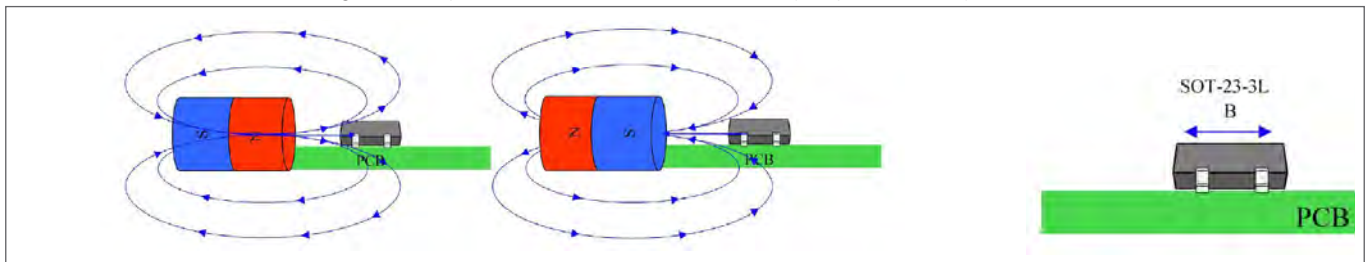


Fig. 7: Sensitive magnetic direction of the KTM1901

Output characteristics

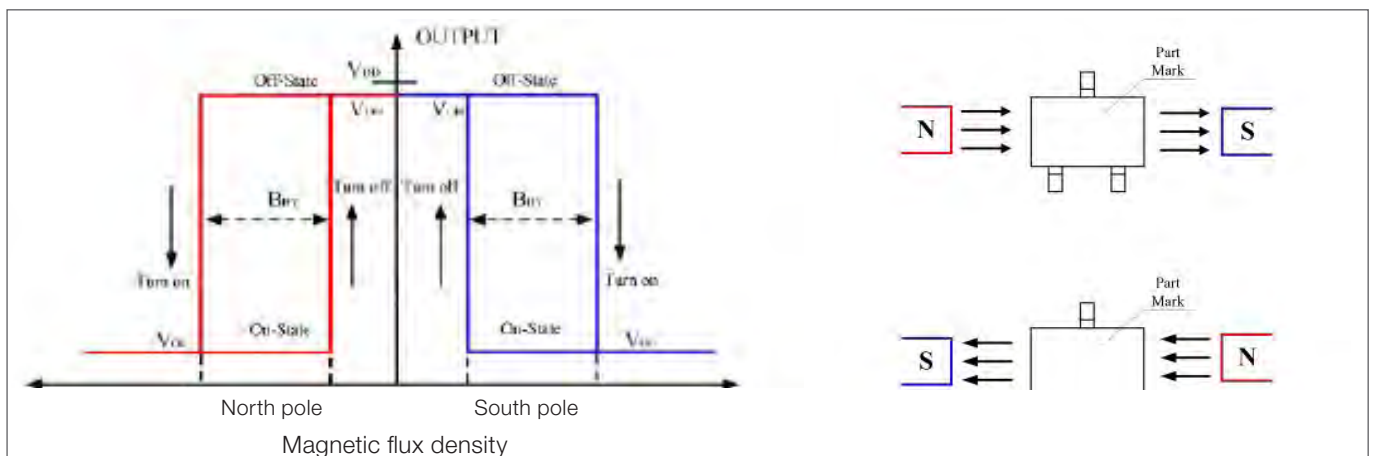


Fig 8.: Output characteristics of the KTM1901

KTM1901 SOT23-3L Package

Pinning

Pad	Symbol	Parameter
1	V _{DD}	Supply power
2	Output	Switch output
3	GND	Ground

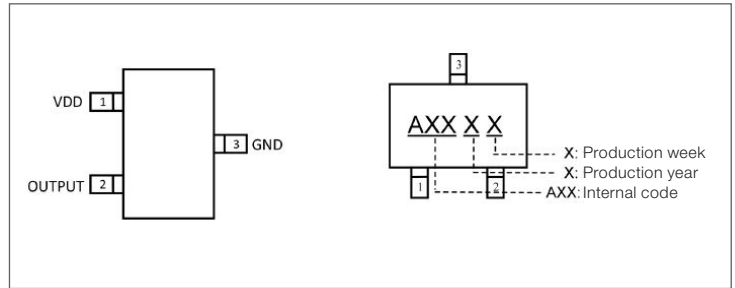


Fig 9.: Pin definition and marking information

Mechanical Data

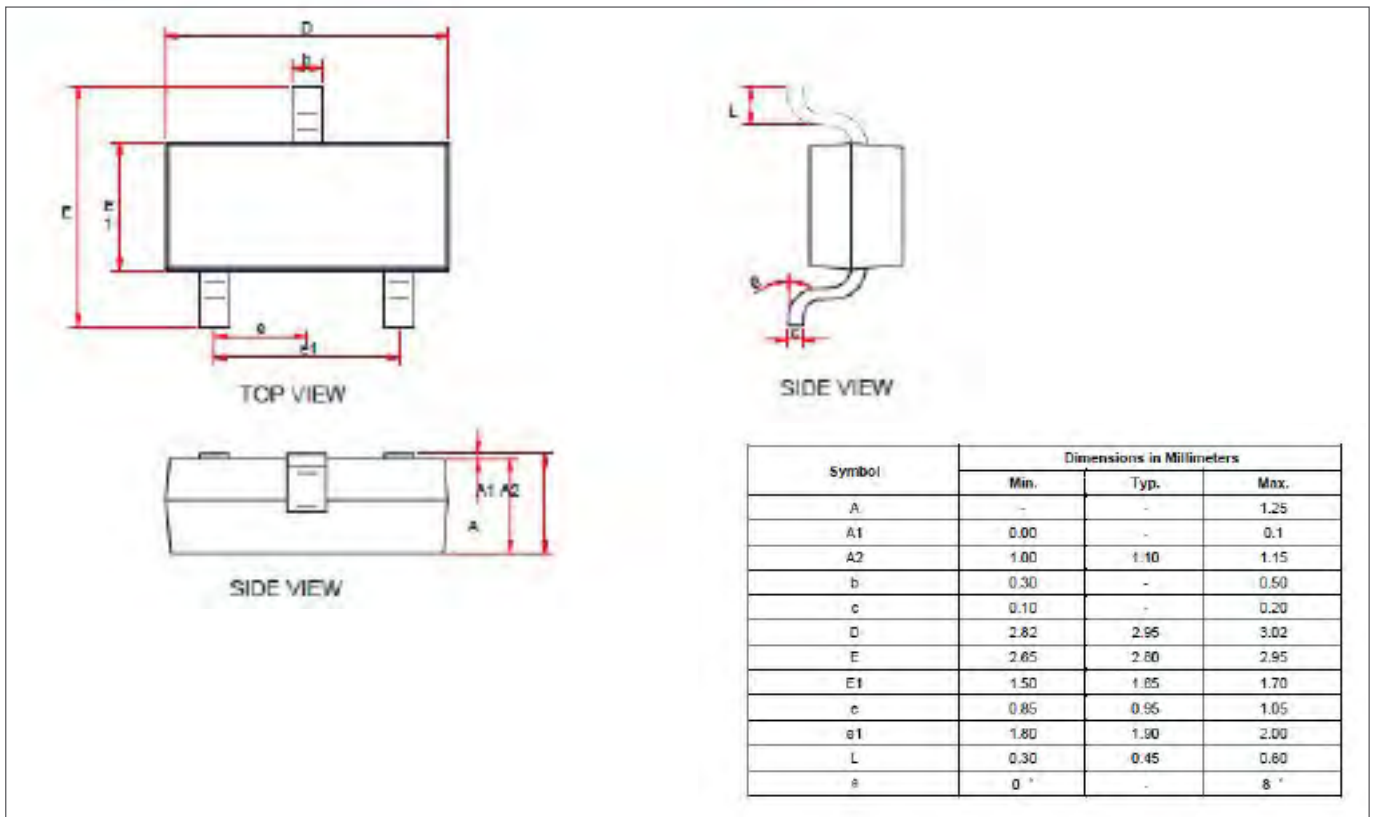


Fig 10.: Package outline dimensions of KTM1901

KTM1901 SOT23-3L Tape & Reel

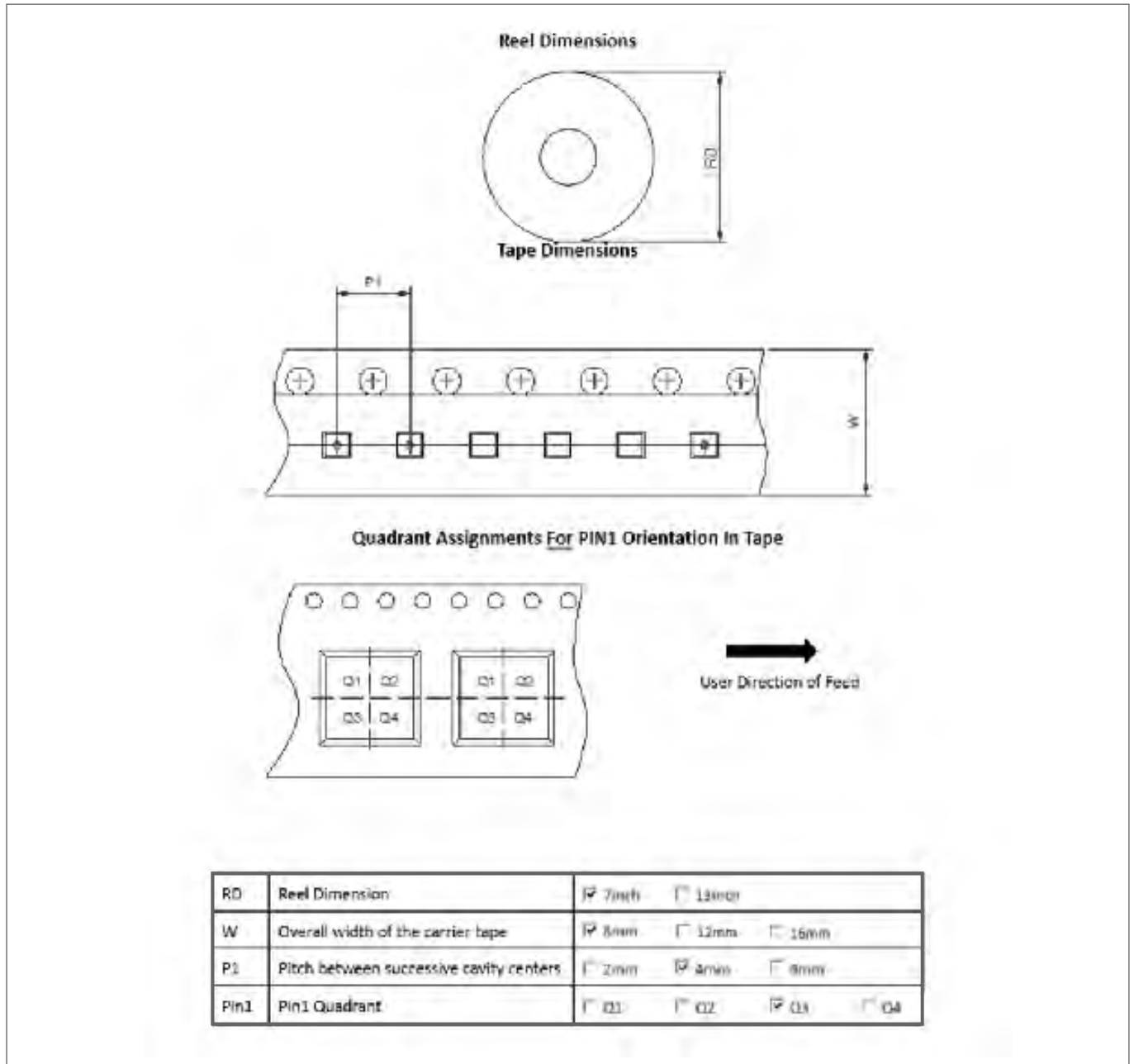


Fig 11.: Tape & Reel information of KTM1901

General Information

Product Status

Article	Status
KTM1901TC-ST3	The product is in series production.

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Changelist

Version	Description of the Change	Date
KTM1901.DSE.00	Original (pp. 1-7)	03/2022

Sensitec GmbH

Schanzenfeldstr. 2 · 35578 Wetzlar · Germany
Tel. +49 6441 5291-0 · Fax +49 6441 5291-117
www.sensitec.com · sensitec@sensitec.com