

Feature

- MR+CMOS monolithic structure
- High sensitivity
 $B_{OP} = \pm 22\text{Gauss}$, $B_{RP} = \pm 19\text{Gauss}$
- Wide operating supply voltage range
3~26V
- Wide operating temperature range
-40~125°C
- High operation frequency:10KHz
- Internal 100K Ω pull-up resistor
- RoHs compliant 2011/65/EU

Application:

- Position Detection
- Proximity Detection
- Speed Detection

Product Description

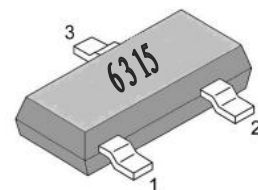
The MT6315 is a monolithic IC with built-in MR magneto-resistive element and CMOS switch. The IC internally includes a MR bridge, a voltage regulator for operation with supply voltage from 3.0V to 26V, a sleep/awake logic for timing control, small signal amplifier and Schmitt trigger comparator with dynamic offset cancellation, and an open drain output with internal 100K Ω pull-up resistor.

When combined with a magnet, it becomes a non-contact switch with wide operation voltage range, high sensitivity and reliability. A horizontal magnetic field parallel to the electrode of the package can be detected by an arbitrary polarity.

The MT6315 is ideal for use to gather speed and detect position, particularly suited for applications that require accurate duty cycle or accurate edge detection such as position detection in air cylinders.

Pin definition

Name	Number	Description
VDD	1	Power Supply
OUT	2	Output Signal
GND	3	Ground

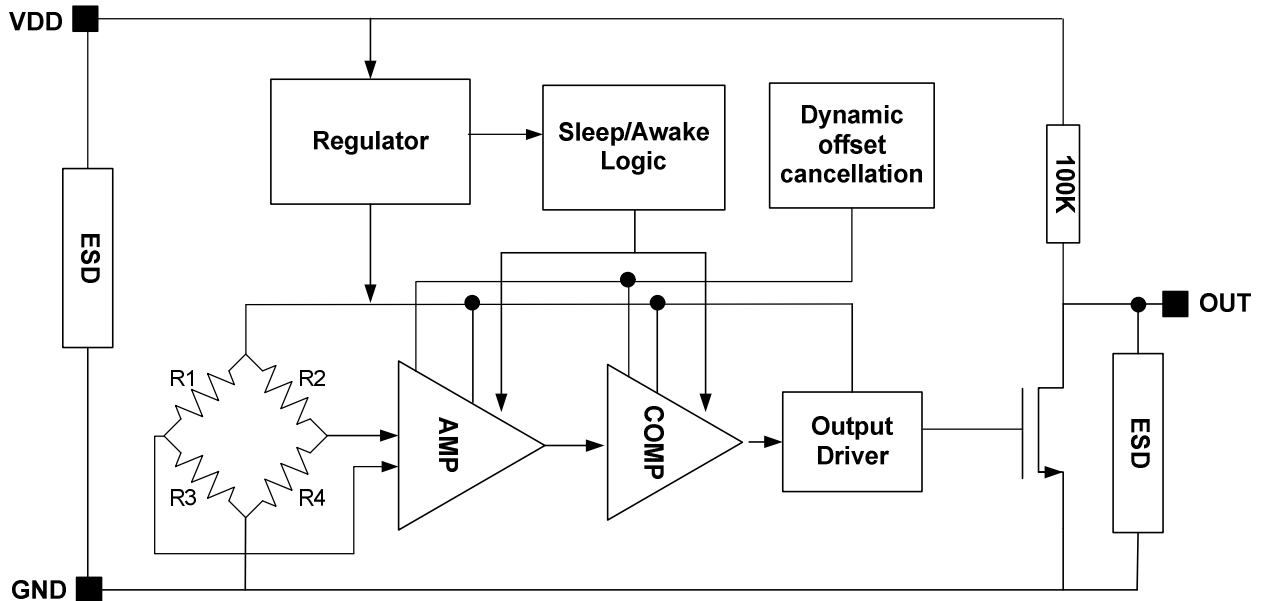


Family members

Part Number	Description
MT6315ET	SOT-23(thin outline) package ,tape and reel packaging(3000pcs/bag)

The MT6315ET is provided in a SOT23 (thin outline) package that is RoHS compliant

Block Diagram



Function Description

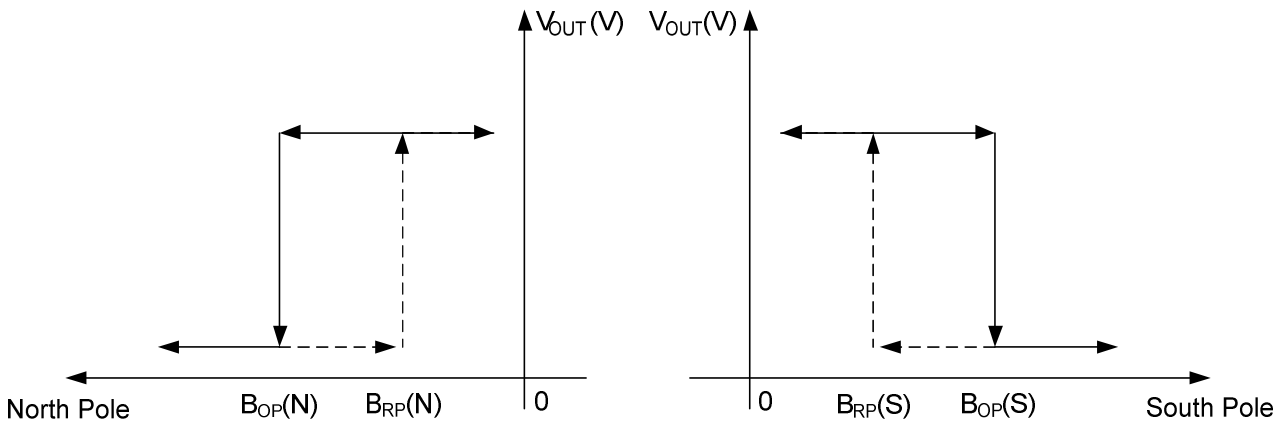
Definition of magnetic parameters

B_{OP} : Operating point, magnetic flux density that turns the output driver ON(V_{OUT} =Low)

B_{RP} : Release point, magnetic flux density that turns the output driver OFF(V_{OUT} =High)

B_{HYST} : Hysteresis window, $|B_{OP}-B_{RP}|$

Definition of Switching Function



Absolute Maximum Rating

Absolute maximum ratings are limiting values to be applied individually, and beyond which the serviceability of the circuit may be impaired. Functional operability is not necessarily implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability.

Absolute maximum ratings: all voltages listed are referenced to GND

Symbol	Parameters	Min	Max	Units
V _{DD}	Supply Voltage	-0.5	30	V
I _{OUT}	Continuous Output Current	-	35	mA
V _{OUT}	Output Voltage	-0.5	30	V
B	Magnetic flux	-	3000	Gauss
T _A	Operating Temperature Range	-40	+125	°C
T _S	Storage Temperature Range	-50	+150	°C

Electrical Characteristics

At T_A=-40°C to 125°C, V_{DD}=3.0V to 26V (Unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units
V _{DD}	Supply voltage		3.0	-	26	V
I _{DD}	Supply current	V _{DD} =12V	-	0.45	0.6	mA
V _{SON}	Output saturation voltage	I _{OUT} =25mA, B > B _{OP}	-	-	0.4	V
I _{OFF}	Output leakage current	V _{OUT} =26V, B < B _{RP}	-	-	1.0	uA
F _{SW}	Maximum switching frequency		10	-	-	KHz
R _{TH}	SOT-23package thermal resistance		-	301	-	°C/W
ESD	Electro-Static Discharge	HBM:AEC-Q100-002	±4000		V	
		MM:AEC-Q100-003	±500		V	

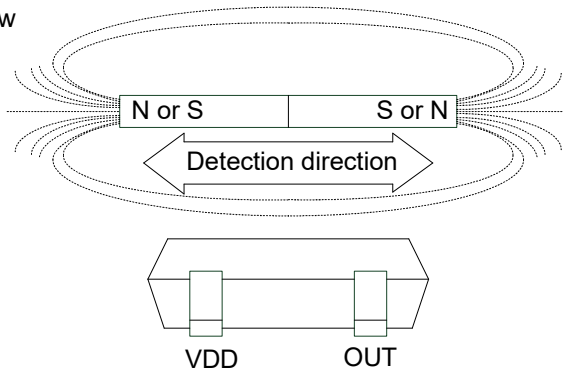
Magnetic Characteristics

At V_{DD}=3.0V to 26V

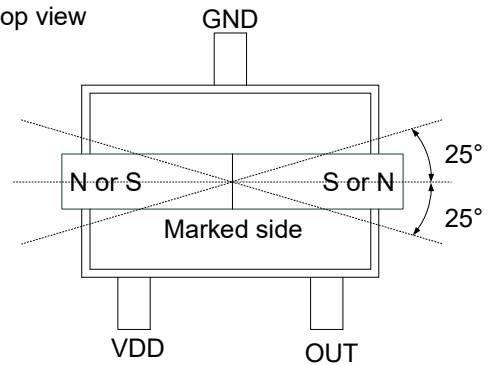
Symbol	Parameters	Test Conditions	Min	Typ	Max	Units
B _{OP}	Magnetic operating point	At T _A =25°C	±13	±22	±29	Gauss
B _{RP}	Magnetic release point	At T _A =25°C	±10	±19	±26	Gauss
B _{HYST}	Hysteresis window	At T _A =25°C	1	3	7	Gauss

Drawing Illustrating Detectable Magnetic Field

Front view

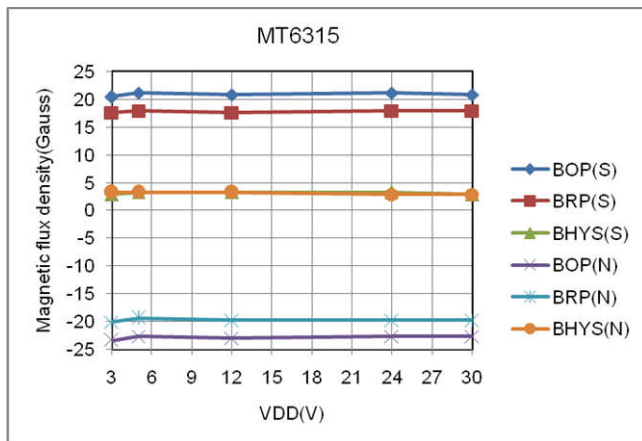


Top view

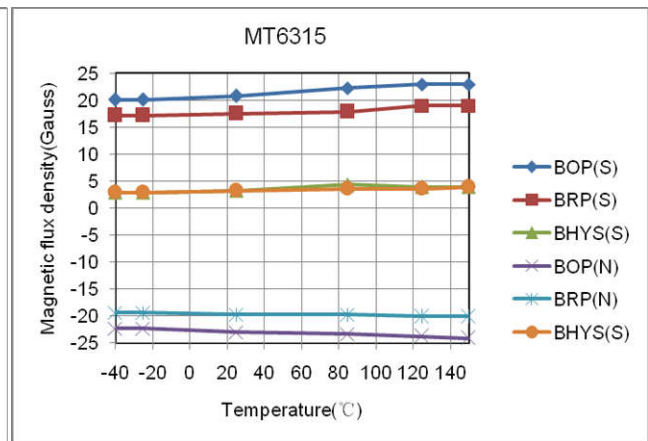


Characteristic Performance

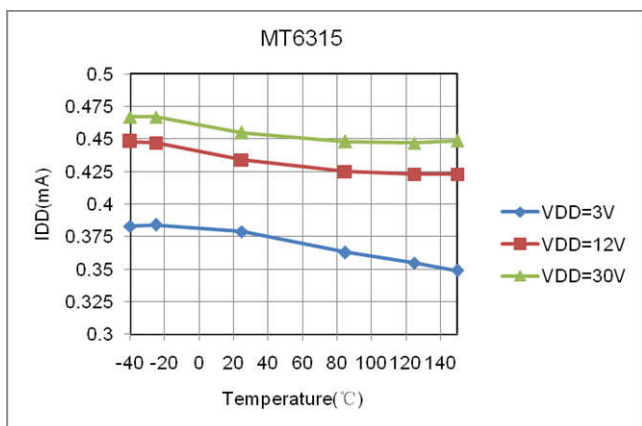
Magnetic Characteristics versus Supply Voltage
($T_A=25^\circ\text{C}$)



Magnetic Characteristics versus Temperature
($V_{DD}=12\text{V}$)

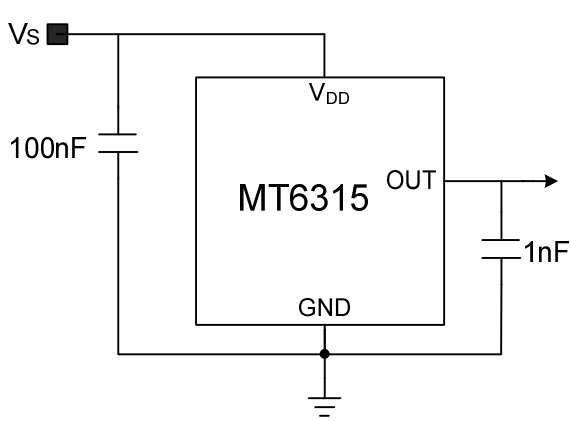


Average Supply Current versus Temperature

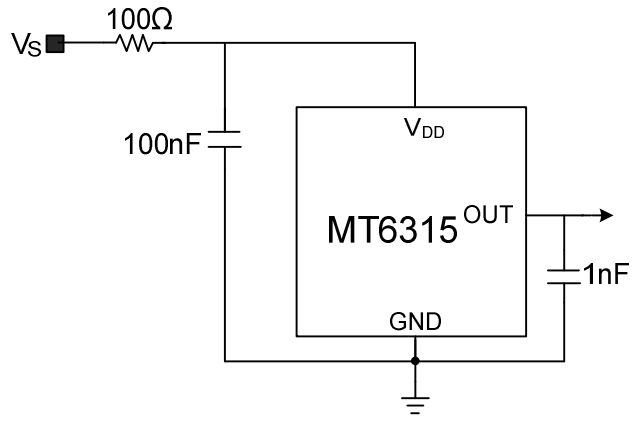


Application Information

Application Circuit

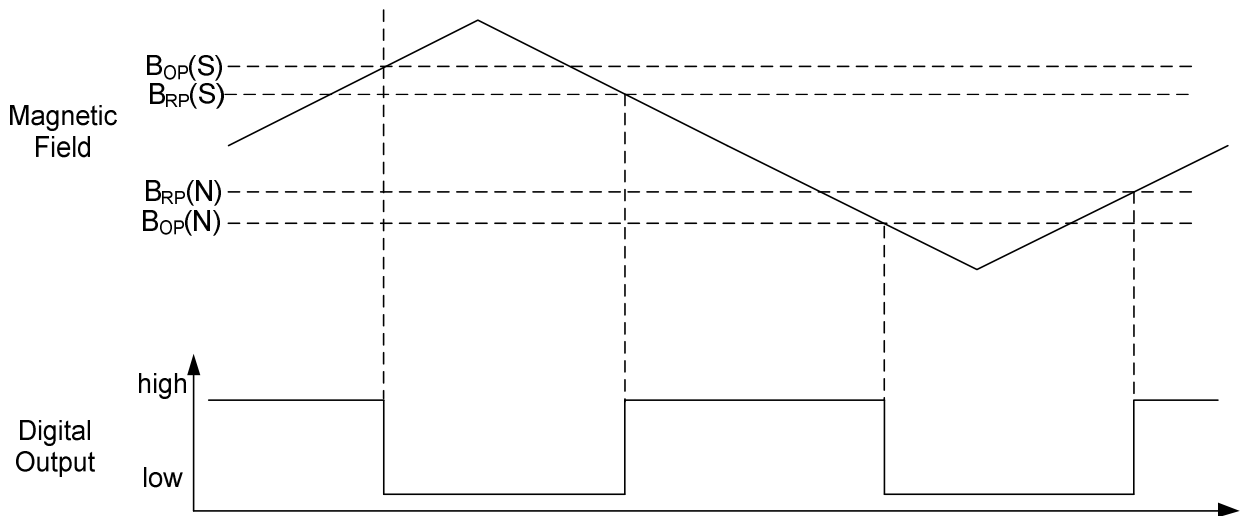


Typical application

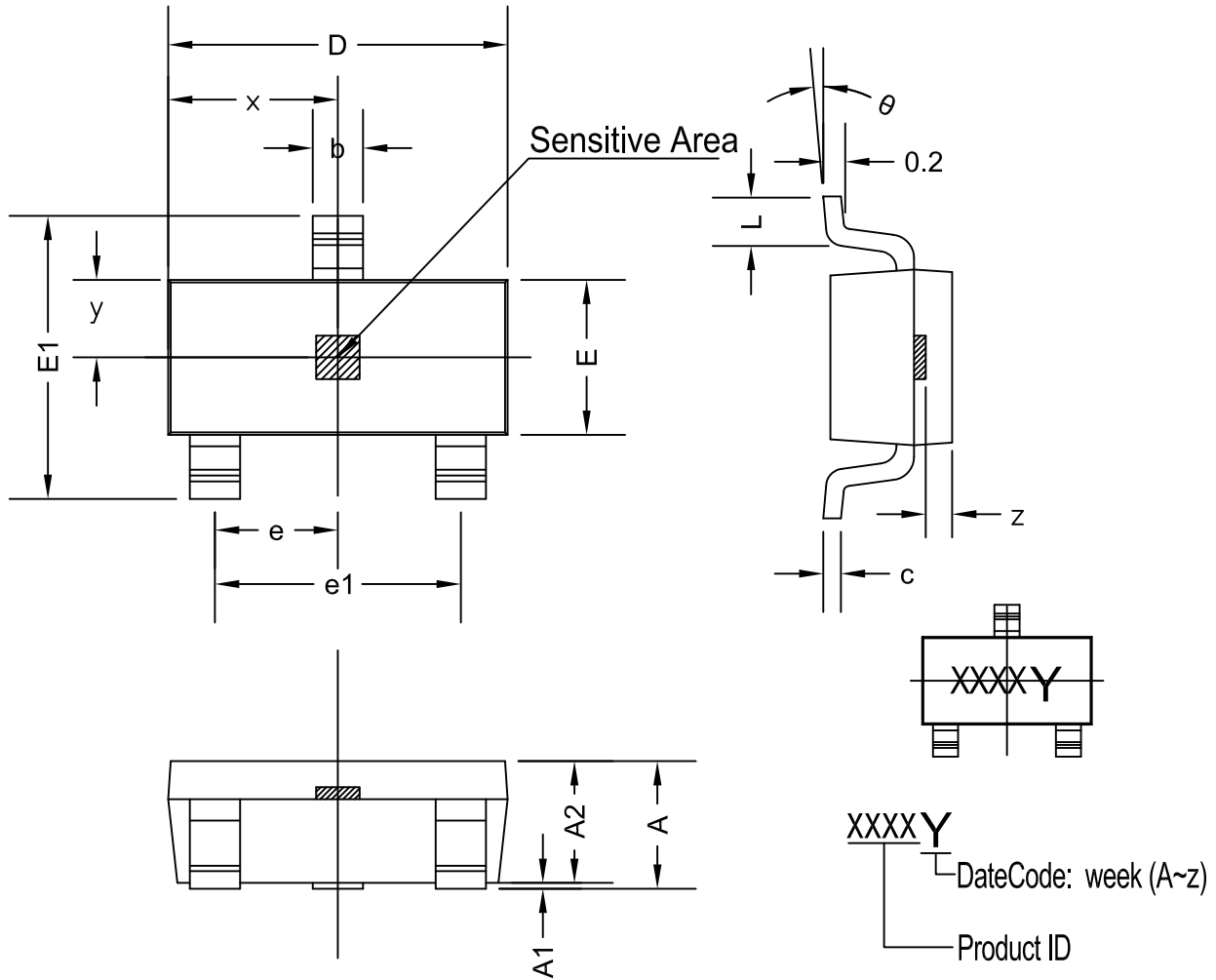


High voltage ($\geq 18V$), noisy and harsh environment application

Operating Waveform



PACKAGE DESIGNATOR (MT6315ET)SOT-23(thin outline)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
x	1.460TYP		0.057TYP	
y	0.650TYP		0.026 TYP	
z	0.500TYP		0.020TYP	
θ	0°	8°	0°	8°

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