



Product Catalog

Advanced Magnetic Sensing and Switching Solutions

REDROCK™ RR110 TMR ANALOG SENSOR



RedRock™ RR110 TMR Analog Sensor

The RedRock 110 Series is an analog magnetic sensor, ideal for use in medical, industrial, automotive, and consumer applications. Based on patented Tunneling Magnetoresistance (TMR) technology, the RR110 Series excels even in low magnetic fields and with large air gaps. The RR110 Series offers high sensitivity in a small footprint package.

Features

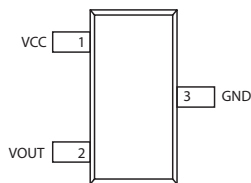
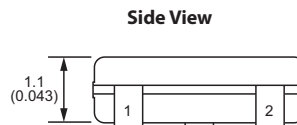
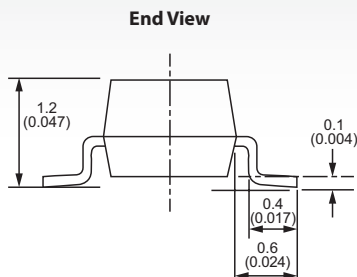
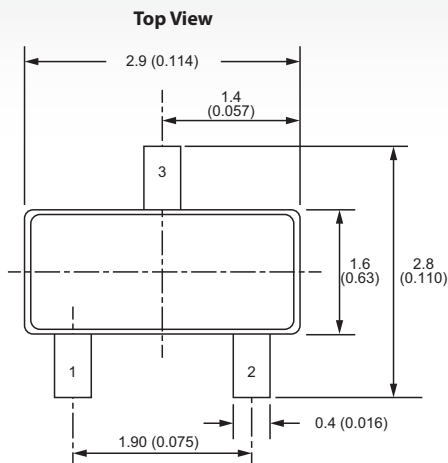
- ▶ High sensitivity
- ▶ Stable temperature performance
- ▶ Resistant to mechanical stress
- ▶ REACH Compliant
- ▶ RoHS Compliant

IDEAL APPLICATIONS

- ▶ Door or lid closure detection
- ▶ Smart phones, tablets and laptops
- ▶ Proximity detection
- ▶ Position sensing
- ▶ Water, electric and gas meters
- ▶ Fluid level detection

DIMENSIONS

in Millimeters (Inches)



Ordering Information

Part Number	RR110-A X 1 1-0 0
Model Number	
Magneto Resistance (Oe)	
A: 25kΩ @ 70 G, 45kΩ @ 10 G	
Temp Rating	
0 - Consumer (0-70)	
1 - Industrial (-40-85)	
Feature	
1 - Default Value	
Package	0 - SOT-23
Special Feature	0 - N/A
Sensitivity Pattern	1 = Unipolar

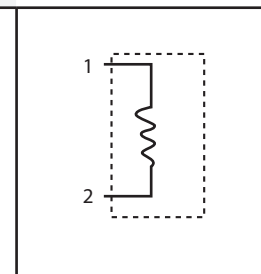
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REDROCK™ RR110 TMR ANALOG SENSOR

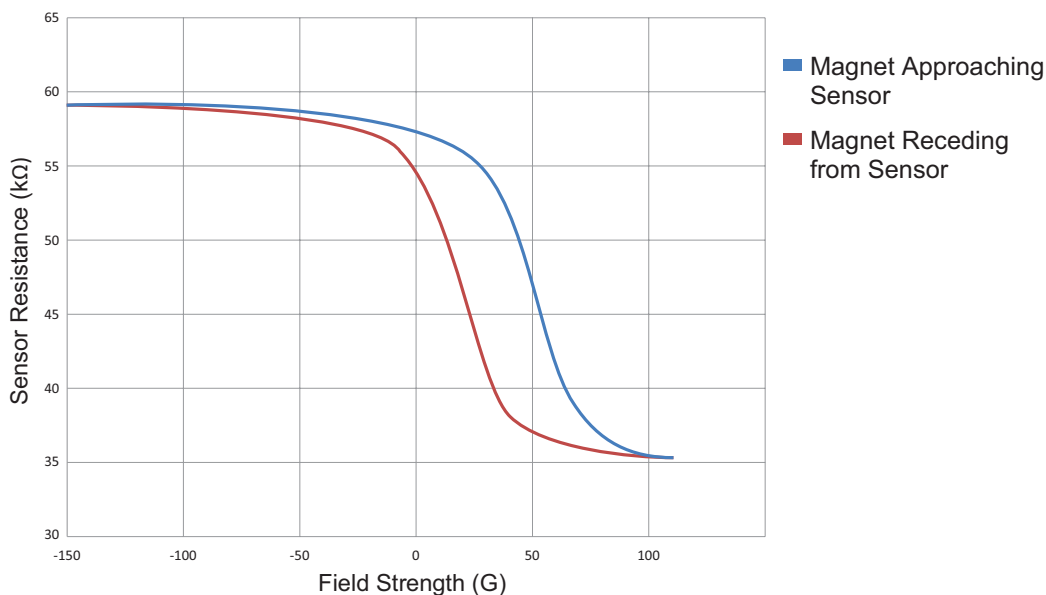
REDROCK™		RR110		
Parameters ¹	Units	Min	Typ	Max
OPERATING CHARACTERISTICS²				
Resistance @70 G	kΩ		25	
Resistance @10 G	kΩ		45	
Operate Time	nS		600	
Release Time	nS		600	
ELECTRICAL CHARACTERISTICS				
Supply Voltage	V _{cc}			15
Absolute Operating Current	mA			1
ENVIRONMENTAL RATINGS				
Operating Temperature: Consumer	°C	0		70
Industrial		-40		85
Storage Temperature	°C	-55		150
Soldering Temperature (3 cycles of 1 min.)	°C			260
ESD Level (HBM) ³	V			N/A

Notes:

1. Contact factory for more information on additional product offerings.
2. All characteristics as measured at 25°C
3. **ESD PRECAUTIONS MUST BE USED WHEN HANDLING.**



MAGNETIC SENSITIVITY TRANSFER CURVE



REDROCK™ RR120 TMR DIGITAL SENSOR



RedRock™ RR120 TMR Digital Sensor

The RedRock 120 Series is an integrated digital magnetic sensor ideal for use in medical, industrial, automotive and consumer switching applications. Based on patented Tunneling Magnetoresistance (TMR) technology with CMOS process, the RR120 Series can function even in low magnetic fields with large air gaps. The RR120 Series provides high sensitivity with low power consumption in a small footprint package.

Features

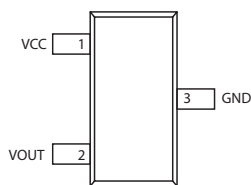
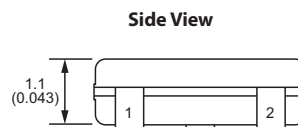
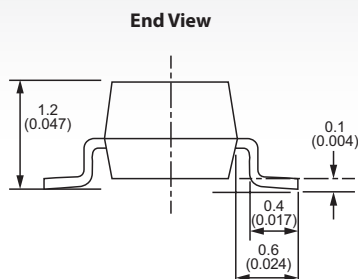
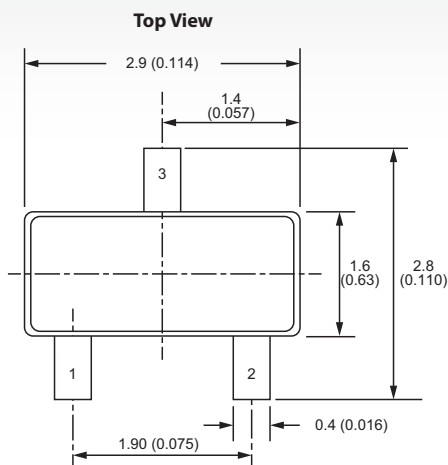
- ▶ High sensitivity
- ▶ Stable temperature performance
- ▶ Resistant to mechanical stress
- ▶ Low power consumption
- ▶ High frequency performance
- ▶ Logic output for design flexibility
- ▶ REACH Compliant
- ▶ RoHS Compliant

IDEAL APPLICATIONS

- ▶ Door or lid closure detection
- ▶ Smart phones, tablets and laptops
- ▶ Bare glass reed switch replacement
- ▶ Motor controllers
- ▶ Proximity detection
- ▶ Open-close detection
- ▶ Water, electric and gas meters
- ▶ Fluid level detection
- ▶ “Wake-Up” functionality

DIMENSIONS

in Millimeters (Inches)



Ordering Information

Part Number	RR120-A X 1 X-X 0	Package	0 - SOT-23
Model Number		Special Feature	0 - N/A
Magnetic Sensitivity (G)	A - Op = 30 Rel = 15	Sensitivity Pattern	0 = Omnipolar 1 = Unipolar
Temp Rating	0 - Consumer (0-85) 1 - Industrial (40-85) 2 - Military (55-125)		
Power Rating	1 - Default Value		

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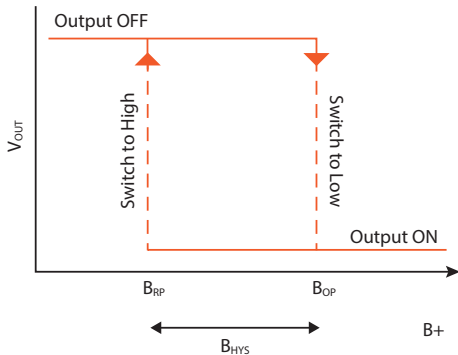
REDROCK™ RR120 TMR DIGITAL SENSOR

REDROCK™		RR120		
Parameters	Units	Min	Typ	Max
OPERATING CHARACTERISTICS¹				
Operate Sensitivity	G	20	30	40
Release Sensitivity	G	8	15	25
Hysteresis	%		40	
Operate Time	nS		600	
Release Time	nS		600	
ELECTRICAL CHARACTERISTICS¹				
Supply Voltage	V _{cc}	2.7	3.0	3.3
Current Drain	nA		300	
Output Voltage (High) ²	V _{outh}		2.7 V	
Output Voltage (Low) ²	V _{outl}		0.2 V	
ABSOLUTE ENVIRONMENTAL RATINGS				
Operating Temperature: Consumer	°C	0		70
Industrial	°C	-40		85
Storage Temperature	°C	-55		150
Soldering Temperature (3 cycles, 1 min.)	°C			260
ESD Level (HBM)	V			4000

Notes:

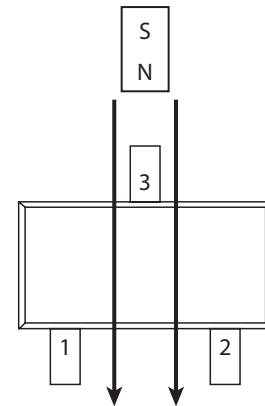
1. All characteristics as measured at 25°C
2. See "Output Behavior vs. Magnetic Field" below for more details.

OUTPUT BEHAVIOR VS. MAGNETIC FIELD

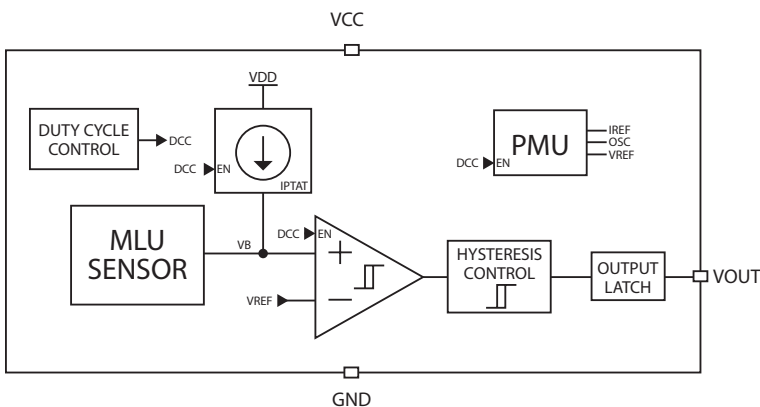


Characteristic	Conditions	Output
South Pole ²	B > B _{OP}	Low
Null or weak magnetic field	B < B _{RP}	Low
North Pole	B > B _{OP}	High

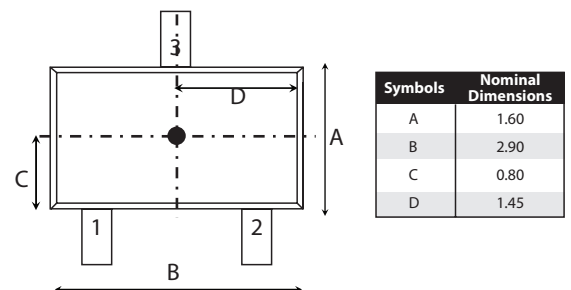
SENSOR POLARITY DIAGRAM



RR120 DIGITAL FUNCTION BLOCK DIAGRAM

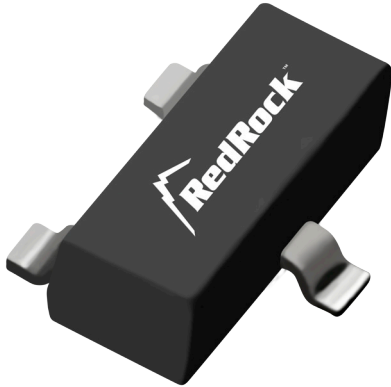


MLU SENSOR LOCATION DIAGRAM



rev. 09052016

REDROCK™ RR130 TMR DIGITAL SWITCH



RedRock™ RR130 TMR Digital Switch

The RedRock 130 Series is an integrated digital magnetic switch ideal for use in medical, industrial, automotive and consumer switching applications. It is based on patented Tunneling Magnetoresistance (TMR) technology with integrated CMOS process. The RR130 Series can operate in low magnetic fields with large air gaps. The open drain output can interface with a system voltage up to 6V for added design flexibility. The RR130 Series provides high sensitivity with low power consumption in a small footprint package.

Features

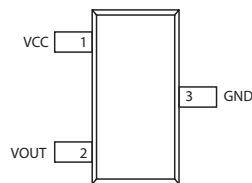
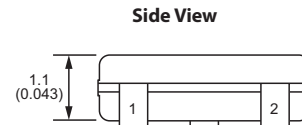
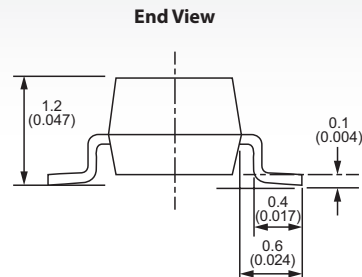
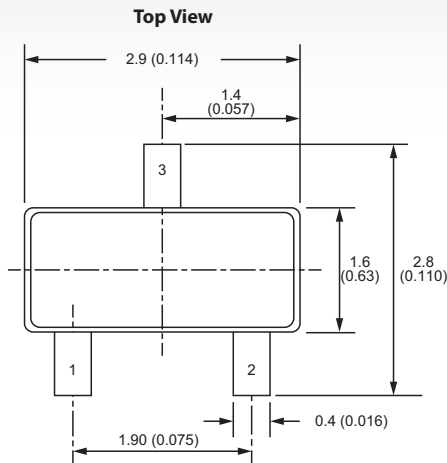
- ▶ High sensitivity
- ▶ Stable temperature performance
- ▶ Resistant to mechanical stress
- ▶ Low power consumption
- ▶ High frequency performance
- ▶ Open drain MOSFET for design flexibility
- ▶ REACH Compliant
- ▶ RoHS Compliant

IDEAL APPLICATIONS

- ▶ Door or lid closure detection
- ▶ Smart phones, tablets and laptops
- ▶ Bare glass reed switch replacement
- ▶ Motor controllers
- ▶ Proximity detection
- ▶ Power switch or open-close detection
- ▶ Water, electric and gas meters
- ▶ Fluid level detection
- ▶ “Wake-Up” functionality

DIMENSIONS

in Millimeters (Inches)



Ordering Information

Part Number	RR130-A X 1 X-X 0	Package	0 - SOT-23
Model Number		Special Feature	0 - N/A
Magnetic Sensitivity (G)	A - Op = 30 Rel = 15	Sensitivity Pattern	0 = Omnipolar 1 = Unipolar
Temp Rating	0 - Consumer (-40-+85) 1 - Industrial (-40-+85) 2 - Military (-55-+125)		
Power Rating	1 - Default Value		

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REDROCK™ RR130 TMR DIGITAL SWITCH

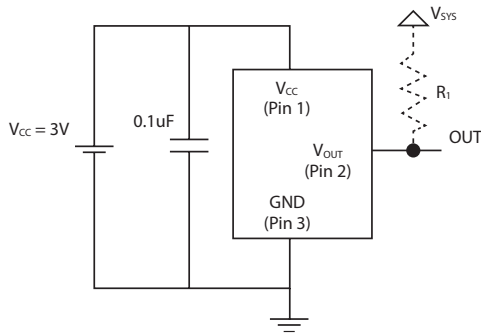
REDROCK™		RR130		
Parameters	Units	Min	Typ	Max
OPERATING CHARACTERISTICS¹				
Operate Sensitivity	G	20	30	40
Release Sensitivity	G	8	15	25
Hysteresis	%		40	
Operate Time	nS		600	
Release Time	nS		600	
ELECTRICAL CHARACTERISTICS¹				
Supply Voltage ² (V _{cc})	V	2.7	3.0	3.3
Current Drain	nA		300	
System Voltage ² (V _{sys})	V			6
System Current ² (I _{sys})	mA			15
ABSOLUTE ENVIRONMENTAL RATINGS				
Operating Temperature: Consumer Industrial	°C	0 -40		70 85
Storage Temperature	°C	-55		150
Soldering Temperature	°C			260
Max. Exposed Magnetic Field	G			10000
ESD Level (HBM)	V			4000

Notes:

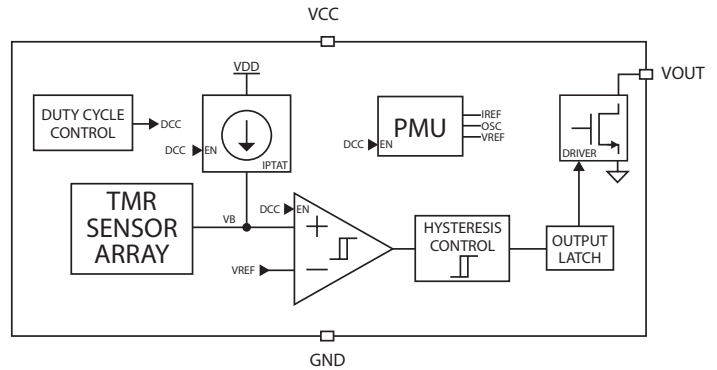
1. All characteristics as measured at 25°C
2. See "Application Circuit" for more information.

APPLICATION CIRCUIT

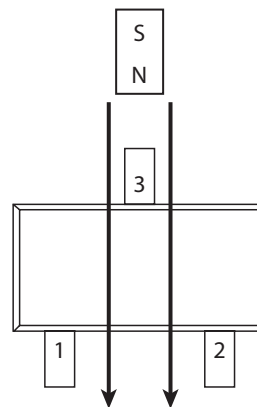
RR130 Open Drain Output Application Circuit
With the open drain output, the system voltage can range up to 6V. Please keep in mind the supply to the RR130 must remain at 3V. A decoupling capacitor between the supply voltage and ground is recommended with placement close to the magnetic sensor. A typical capacitor value of 0.1 uF will suffice.



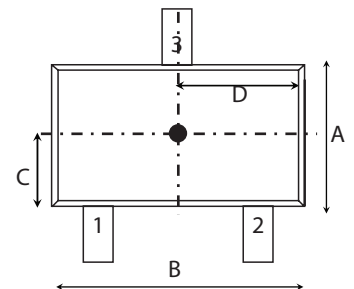
RR130 DIGITAL FUNCTION BLOCK DIAGRAM



SENSOR POLARITY DIAGRAM

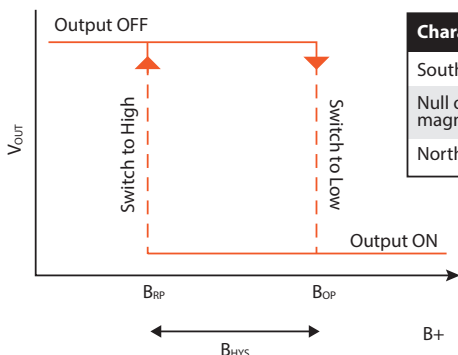


MLU SENSOR LOCATION DIAGRAM



Symbols	Nominal Dimensions
A	1.60
B	2.90
C	0.80
D	1.45

OUTPUT BEHAVIOR VS. MAGNETIC FIELD



Characteristic	Conditions	Output
South Pole ²	B > B _{OP}	Low
Null or weak magnetic field	B < B _{RP}	Low
North Pole	B > B _{OP}	High

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