



New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR121-1A23-311/312 vs. RR122-1A23-511/512 and RR122-1A22-511/512

Download RR121-1A23-311/312 Datasheet
Download RR122-1A23-511/512 Datasheet

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1A23-511/512	°C	-40		125
Operating Temperature (T _{OP}) RR122-1A22-511/512	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (LGA-4)	°C/W		165	
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000 (±600)

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD}
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OLN})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50	
Average Supply Current @ V_{DD}= 1.7V, f_{SW}=10 Hz(I_{DD_AVG})²	nA		70	900
Average Supply Current @ V _{DD} = 3.0V, f _{SW} =10 Hz(I _{DD_AVG}) ²	nA		230 (85)	700 (900)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	7 (6)	10	13 (14)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time (t _{IDLE})	ms	71	100	166
Operate Point (B _{OPN})	G	8 (7)	9	12
Operate Point (B _{OPS})	G	-12	-9	-8 (-7)
Release Point (B _{RPN})	G	3	5	7
Release Point (B _{RPS})	G	-7	-5	-3
Hysteresis (B _{HYST}) ³	G	3	4	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (**1.7 V to 5.5 V**), T_A = **-40°C to +85°C (1A22)**, -40°C to +125°C (1A23). Typical values are V_{DD} = 3.0 V and T_A = +25°C.
- Conditions: t = 10 seconds
- Conditions: B_{HYST} = | B_{OP} - B_{RP} |

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior.
The two sensor series have exactly the same behavior relative to their output response vs. magnetic flux.



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New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR121-1A53-311 vs. RR122-1A53-511 and RR122-1A52-511

Download RR121-1A53-311 Datasheet
Download RR122-1A52(53)-511 Datasheet

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1A53-511	°C	-40		125
Operating Temperature (T _{OP}) RR122-1A52-511	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000 (±600)

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD} +0.3
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50 (70)	
Average Supply Current @V _{DD} = 1.7V, f _{SW} =250 Hz(I _{DD_AVE}) ²	µA		0.9	2.5
Average Supply Current @V _{DD} = 3.0V, f _{SW} =250 Hz(I _{DD_AVE}) ²	µA		1.1	2.5 (3.0)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	165 (150)	250	300 (350)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time @f _{SW} =250 Hz (t _{IDL})	ms	3.3 (2.8)	4.0	6.0 (6.7)
Operate Point (B _{OPN})	G	8 (7)	9	12
Operate Point (B _{OPS})	G	-12	-9	-8 (-7)
Release Point (B _{RPN})	G	3	5	7
Release Point (B _{RPS})	G	-7	-5	-3
Hysteresis (B _{HYST}) ³	G	3	4	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (1.7 V to 5.5 V), TA = -40°C to +85°C (1A52), -40°C to +125°C (1A53). Typical values are V_{DD} = 3.0 V and TA = +25°C
- Conditions: t = 10 seconds.
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior.
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REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR

RR121-1B13-311/312 vs. RR122-1B13-511/512 and RR122-1B12-511/512

[Download RR121-1B13-311/312 Datasheet](#)

[Download RR122-1B13-511/512 Datasheet](#)

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1B13-511/512	°C	-40		125
Operating Temperature (T _{OP}) RR122-1B12-511/512	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (LGA-4)	°C/W		165	
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD}
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OLN})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50	
Average Supply Current @V_{DD}= 1.7V, f_{SW}=2 Hz(I_{DD_AVG})²	nA		50	900
Average Supply Current @V_{DD}= 3.0V, f_{SW}=2 Hz(I_{DD_AVG})²	nA		200 (60)	700 (900)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	1	2	4
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time (t _{IDLE})	ms	250	500	1000
Operate Point (B _{OPN})	G	27 (23)	30	38
Operate Point (B _{OPS})	G	-38	-30	-27 (-23)
Release Point (B _{RPN})	G	18 (14)	20	27
Release Point (B _{RPS})	G	-27	-20	-18 (-14)
Hysteresis (B _{HYST}) ³	G	5	10	

Notes:

- Unless otherwise specified, VDD = 2.7 V to 3.6 V (**1.7 V to 5.5 V**), TA = -40°C to +85°C (**1B12**), -40°C to +125°C (**1B13**). Typical values are VDD = 3.0 V and TA = +25°C
- Conditions: t = 10 seconds
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior. The two sensor series have exactly the same behavior relative to their output response vs. magnetic flux.



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REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR121-1B53-311 vs. RR122-1B53-511 and RR122-1B52-511

Download [RR121-1B53-311 Datasheet](#)
Download [RR122-1B53-511 Datasheet](#)

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1B53-511	°C	-40		125
Operating Temperature (T _{OP}) RR122-1B52-511	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD}
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50	
Average Supply Current @V_{dd}= 1.7V, f_{SW}=250 Hz(I_{DD_AVG})²	µA		0.9	2.5
Average Supply Current @V _{dd} = 3.0V, f _{SW} =250 Hz(I _{DD_AVG}) ²	µA		1.4 (1.1)	2.5 (3.0)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	165 (150)	250	300 (350)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time (t _{IDLE})	ms	2.8	4.0	6.7
Operate Point (B _{OPN})	G	27 (23)	30	38
Operate Point (B _{OPS})	G	-38	-30	-27 (-23)
Release Point (B _{RPN})	G	18 (14)	20	27
Release Point (B _{RPS})	G	-27	-20	-18 (-14)
Hysteresis (B _{HYST}) ³	G	5	10	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (**1.7 V to 5.5 V**), TA = **-40°C to +85°C (1B52)**, -40°C to +125°C (1B53). Typical values are V_{DD} = 3.0 V and TA = +25°C
- Conditions: t = 10 seconds
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior. The two sensor series have exactly the same behavior relative to their output response vs. magnetic flux.





New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR121-1B93-312 vs. RR122-1B93-511/512 and RR122-1B92-511/512

Download RR121-1B93-312 Datasheet
Download RR122-1B92(93)-511/512 Datasheet

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1B93-511/512	°C	-40		125
Operating Temperature (T _{OP}) RR122-1B92-511/512	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (LGA-4)	°C/W		165	
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD} +0.3
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50 (70)	
Average Supply Current @V _{DD} = 1.7V, f _{SW} = 10 kHz(I _{DD_AVG}) ²	µA		45	
Average Supply Current @V _{DD} = 3.0V, f _{SW} = 10 kHz(I _{DD_AVG}) ²	µA		36 (50)	

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	kHz	7 (6)	10	13 (14)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time @f _{SW} = 10 kHz (t _{IDL})	µs	77 (71)	100	143 (167)
Operate Point (B _{OPN})	G	27 (23)	30	38
Operate Point (B _{OPS})	G	-38	-30	-27 (-23)
Release Point (B _{RPN})	G	18 (14)	20	27
Release Point (B _{RPS})	G	-27	-20	-18 (-14)
Hysteresis (B _{HYST}) ³	G	5	10	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (1.7 V to 5.5 V), TA = -40°C to +85°C (1B92), -40°C to +125°C (1B93). Typical values are V_{DD} = 3.0 V and TA = +25°C
- Conditions: t = 10 seconds.
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior. The two sensor series have exactly the same behavior relative to their output response vs. magnetic flux.





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RR121-1E73-311 vs. RR122-1E73-511 and RR122-1E72-511

[Download RR121-1E73-311 Datasheet](#)
[Download RR122-1E73-511 Datasheet](#)

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1E73-511	°C	-40		125
Operating Temperature (T _{OP}) RR122-1E72-511	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT,FP})	V	-0.3		V _{DD}
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) _s (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) _s (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO,RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO,FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV,HYST})	mV		50	
Average Supply Current @V_{dd}= 1.7V, f_{SW}=2500 Hz(I_{DD,AVG})²	µA		9	
Average Supply Current @V _{dd} = 3.0V, f _{SW} =2500 Hz(I _{DD,AVG}) ²	µA		8 (11.5)	13 (N/A)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	1630 (1500)	2500	3250 (3500)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time (t _{IDLE})	µs	308 (285)	400	614 (667)
Operate Point (B _{OPN})	G	13 (11)	15	18
Operate Point (B _{OPS})	G	-18	-15	-13 (-11)
Release Point (B _{RPN})	G	8 (6)	10	13
Release Point (B _{RPS})	G	-13	-10	-8 (-6)
Hysteresis (B _{HYST}) ³	G	3	5	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (**1.7 V to 5.5 V**), T_A = -40°C to +85°C (**1E72**), -40°C to +125°C (**1E73**). Typical values are V_{DD} = 3.0 V and T_A = +25°C
- Conditions: t = 10 seconds
- Conditions: B_{HYST} = | B_{OP} - B_{RP} |

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RR121-1F23-311 vs. RR122-1F23-511 and RR122-1F22-511

Download RR121-1F23-311 Datasheet
Download RR122-1F22(23)-511 Datasheet

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-1F23-511	°C	-40		125
Operating Temperature (T _{OP}) RR122-1F22-511	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD} +0.3
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) _s (V _{OUT_H})	V	90% V _{DD}		
Output Voltage (Low) _s (V _{OUT_L})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50 (70)	
Average Supply Current @V _{DD} = 1.7V, f _{SW} =10 Hz(I _{DD_AVG}) ²	nA		70	900
Average Supply Current @V _{DD} = 3.0V, f _{SW} =10 Hz(I _{DD_AVG}) ²	nA		230 (85)	700 (900)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	7 (6)	10	13 (14)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time @f _{SW} =10 Hz (t _{IDLE})	ms	77 (71)	100	143 (166)
Operate Point (B _{OPN})	G	62	70	78
Operate Point (B _{OPS})	G	-78	-70	-62
Release Point (B _{RPN})	G	42	50	60
Release Point (B _{RPS})	G	-60	-50	-42
Hysteresis (B _{HYST}) ³	G	12	20	

Notes:

- Unless otherwise specified, VDD = 2.7 V to 3.6 V (1.7 V to 5.5 V), TA = -40°C to +85°C (1F22), -40°C to +125°C (1F23). Typical values are VDD = 3.0 V and TA = +25°C
- Conditions: t = 10 seconds.
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior.
The two sensor series have exactly the same behavior relative to their output response vs. magnetic flux.



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New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR121-3C63-311 vs. RR122-3C63-511 and RR122-3C62-511

Download RR121-3C63-311 Datasheet
Download RR122-3C63-511 Datasheet

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-3C63-511	°C	-40		125
Operating Temperature (T _{OP}) RR122-3C62-511	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOI})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		215	
Magnetic Field Exposure	G			2000 (±600)

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT_PP})	V	-0.3		V _{DD}
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics⁴

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ₃ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ₃ (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO_RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO_FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV_HYST})	mV		50	
Average Supply Current @ V _{DD} = 1.7V, f _{SW} =500 Hz(I _{DD_AVG}) ²	µA		2.1	
Average Supply Current @ V _{DD} = 3.0V, f _{SW} =500 Hz(I _{DD_AVG}) ²	µA		1.7 (2.4)	3.3 (N/A)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- Conditions: t = 10 seconds
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	325 (300)	500	600 (700)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time (t _{IDLE})	ms	1.4	2	3.3
Operate Point (B _{OPS})	G	-14 (-13)	-10	-8 (-7)
Release Point (B _{RPN})	G	8 (7)	10	14 (13)

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (1.7 V to 5.5 V), TA = -40°C to +85°C (3C62), -40°C to +125°C (3C63). Typical values are V_{DD} = 3.0 V and TA = +25°C
- Conditions: t = 10 seconds
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

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New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR121-3C73-311 vs. [RR122-3C73-511/512](#) and [RR122-3C72-511/512](#)

[Download RR121-3C73-311 Datasheet](#)
[Download RR122-3C73-511/512 Datasheet](#)

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR122-3C73-511/512	°C	-40		125
Operating Temperature (T _{OP}) RR122-3C72-511/512	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SD})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (LGA-4)	°C/W		165	
Junction-to Ambient Thermal Resistance (SOT-23)	°C/W		202	
Magnetic Field Exposure	G			2000 (±600)

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Push-pull Output (Active Low)(V _{OUT,PP})	V	-0.3		V _{DD}
Input and Output Current (I _{IN/OUT})	mA	-10 (N/A)		10 (±20)

Operating Electrical Characteristics⁴

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) _S (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) _S (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO,RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO,FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV,HYST})	mV		50	
Average Supply Current @V_{DD}= 1.7V, f_{SW}=2500 Hz(I_{DD,AVG})²	µA		9	
Average Supply Current @V_{DD}= 3.0V, f_{SW}=2500 Hz(I_{DD,AVG})²	µA		8 (11.5)	13 (N/A)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- Conditions: t = 10 seconds
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	1630 (1500)	2500	3250 (3500)
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time (t _{IDLE})	µs	308 (285)	400	614 (667)
Operate Point (B _{OPS})	G	-14 (-13)	-10	-8 (-7)
Release Point (B _{RPN})	G	8 (7)	10	14 (13)

Notes:

- Unless otherwise specified, VDD = 2.7 V to 3.6 V (**1.7 V to 5.5 V**), TA = **-40°C to +85°C (3C72)**, -40°C to +125°C (3C73). Typical values are VDD = 3.0 V and TA = +25°C

Output Response vs. Magnetic Flux

The two sensor series also have the same magnetic lobe performance relative x, y and z behavior.
The two sensor series have exactly the same behavior relative to their output response vs. magnetic flux.



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New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
 RR131-1B13-351 vs. [RR132-1B13-551/552](#) and [RR132-1B12-551/552](#)

Download [RR131-1B13-351 Datasheet](#)
 Download [RR132-1B12\(13\)-551/552 Datasheet](#)

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR132-1B13-551/552	°C	-40		125
Operating Temperature (T _{OP}) RR132-1B12-551/552	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SO})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		±4000 (N/A)
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (LGA-4)	°C/W		165	
Junction-to Ambient Thermal Resistance (SOT-23-3)	°C/W		202	
Maximum Magnetic Field Exposure (B _{MAX})	G			±2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Open Drain Output Voltage (Active Low)(V _{OUT,OD})	V	-0.3		5.5 (6.0)
Input and Output Current (I _{IN/OUT})	mA	-20		10 (±20)

Operating Electrical Characteristics⁴

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUT,H})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OUT,L})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO,RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO,FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV,HYST})	mV		50	
Average Supply Current @V _{DD} = 1.7V, f _{SW} =2 Hz(I _{DD,AVG}) ²	nA		50	900
Average Supply Current @V _{DD} = 3.0V, f _{SW} =2 Hz(I _{DD,AVG}) ²	nA		200 (70)	700 (900)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- Conditions: t = 10 seconds
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	1	2	4
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time @f _{SW} =2 Hz (t _{IDL})	ms	250	500	1000
Operate Point (B _{OPN})	G	27 (23)	30	38
Operate Point (B _{OPS})	G	-38	-30	-27 (-23)
Release Point (B _{RPN})	G	18 (14)	20	27
Release Point (B _{RPS})	G	-27	-20	-18 (-14)
Hysteresis (B _{HYST}) ²	G	5	10	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (1.7 V to 5.5 V), TA = -40°C to +85°C (1B12), -40°C to +125°C (1B13). Typical values are V_{DD} = 3.0 V and TA = +25°C
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

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New RR122 Series TMR Sensor Comparison Reference

REDROCK® TMR DIGITAL PUSH-PULL MAGNETIC SENSOR
RR131-2E23-351 vs. RR132-2E23-551 and RR132-2E22-551

Download RR131-2E23-351 Datasheet
Download RR132-2E22(23)-551 Datasheet

Absolute Environmental Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Operating Temperature (T _{OP}) RR132-2E23-551	°C	-40		125
Operating Temperature (T _{OP}) RR132-2E22-551	°C	-40		85
Storage Temperature (T _{STG})	°C	-65		150
Junction Temperature (T _J)	°C			150
Soldering Temperature (3 cycles, 1 min.) (T _{SOJ})	°C			260
ESD Level Human Body Model per JESD22-A114	V	±4000		±4000 (N/A)
ESD Level Charged Device Model (CDM) per JESD22-C1010	V	±500		
Junction-to Ambient Thermal Resistance (SOT-23-3)	°C/W		202	
Maximum Magnetic Field Exposure (B _{MAX})	G			±2000

Absolute Electrical Ratings^{1,2}

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	-0.3		4.0 (6.0)
Open Drain Output Voltage (Active Low)(V _{OUT,OD})	V	-0.3		5.5 (6.0)
Input and Output Current (I _{IN/OUT})	mA			10 (±20)

Operating Electrical Characteristics³

Parameters	Units	Min	Typ	Max
Supply Voltage (V _{DD})	V	2.7 (1.7)	3.0	3.6 (5.5)
Power-On Time (t _{ON})(V _{DD} > 2.7V)	µs		500 (50)	75
Peak Power-On Current	mA			1.4
Output Voltage (High) ³ (V _{OUTH})	V	90% V _{DD}		
Output Voltage (Low) ³ (V _{OUTL})	V			10% V _{DD}
Under-Voltage Lockout Threshold Rising V _{DD} (V _{UVLO,RISE})	V		2.20 (1.60)	2.60 (1.64)
Under-Voltage Lockout Threshold Falling V _{DD} (V _{UVLO,FALL})	V	1.90 (1.44)	2.15 (1.53)	
Under-Voltage Lockout Hysteresis (V _{UV,HYST})	mV		50 (70)	
Average Supply Current @V _{DD} = 1.7V, f _{SW} =10 Hz(I _{DD,AVG}) ²	nA		70	900
Average Supply Current @V _{DD} = 3.0V, f _{SW} =10 Hz(I _{DD,AVG}) ²	nA		230 (85)	700 (900)

Notes:

- Exceeding Absolute Ratings may cause permanent damage to the device. Exposure at the maximum rated conditions for extended periods of time may also affect device reliability.
- Unless otherwise specified, all characteristics are measured at 25°C.
- See "Magnetic Field vs. Output Status" for more details.

ESD Note: This product uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, proper ESD precautions should be taken to avoid performance degradation or loss of functionality. Damage due to inappropriate handling is not covered under warranty.

Operating Characteristics¹

Parameters	Units	Min	Typ	Max
Switching Frequency (f _{SW})	Hz	6	10	14
Active Mode Time (t _{ACT})	µs		1.4 (2.6)	
Idle Mode Time @f _{SW} =2 Hz (t _{IDLE})	ms	71	100	167 (166)
Operate Point (B _{OPS})	G	-18 (-19)	-15	-13 (-11)
Release Point (B _{RPS})	G	-13 (-14)	-10	-8 (-6)
Hysteresis (B _{HYST}) ²	G	3	5	

Notes:

- Unless otherwise specified, V_{DD} = 2.7 V to 3.6 V (1.7 V to 5.5 V), T_A = -40°C to +85°C (2E22), -40°C to +125°C (2E23). Typical values are V_{DD} = 3.0 V and T_A = +25°C
- Conditions: B_{HYST} = |B_{OP} - B_{RP}|

Output Response vs. Magnetic Flux

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