Quad Matched Resistor Network

Features

- High ESD Rating:
  3.5 kV HBM, 2 kV CDM
- Excellent Matching
  B Grade: 0.01% max (25 °C)
  0.0125% max (-40 °C to 125 °C)
  A Grade: 0.025% max (-40 °C to 125 °C)
- Matching Temperature Drift: 0.2 ppm/°C
- Operating Voltage: ±75 V (±80 V abs max)
- Absolute Resistor Value Temperature Drift: 10 ppm/°C
- Operating Temperature: -40 °C to 125 °C
- 8-Lead MSOP Package

Applications

- Difference Amplifier
- Reference Divider
- Precision Summing/Subtracting

Model	$R_2 = R_3$ (Ω)	$R_1 = R_4$ (Ω)
ZJM5400-1	10k	10k
ZJM5400-2	100k	100k
ZJM5400-3	10k	100k
ZJM5400-4	1k	1k
ZJM5400-5	1M	1M
ZJM5400-6	1k	5k
ZJM5400-7	1.25k	5k
ZJM5400-8	1k	9k

General Description

The ZJM5400 is a quad resistor network with excellent matching specifications over the entire temperature range. Matching is also specified when the ZJM5400 is configured in a difference amplifier. This enhanced matching specification guarantees CMRR performance to be up to 2X better than independently matched resistors.

All four resistors can be accessed and biased independently, making the ZJM5400 a convenient and versatile choice for any application that can benefit from matched resistors.

These resistor networks provide precise ratiometric stability required in highly accurate difference amplifiers, voltage references and bridge circuits.

The pins of ZJM5400 are all ESD protected up to 3.5 kV HBM and 2 kV CDM without any performance loss. The outstanding ESD specifications are achieved with the use of internal protection structure. Through elaborately designing, they have unparalleled matching and ultra-low-leakage characteristics and cannot be substituted by any external discrete devices.

The ZJM5400 is available in a space-saving 8-pin MSOP package, and is specified over the temperature range of -40 °C to 125 °C.

Typical Application

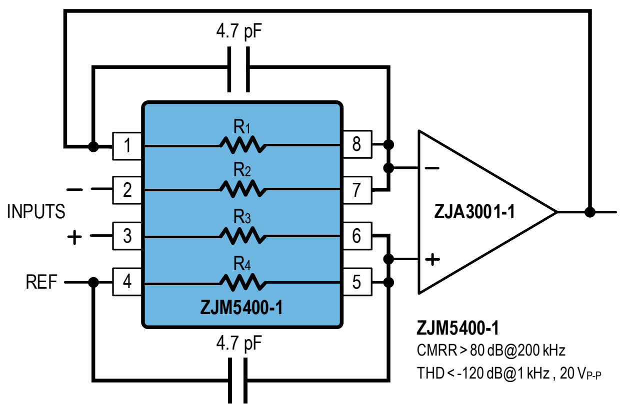

Figure 1. Building Difference Amplifier

Typical Characteristics

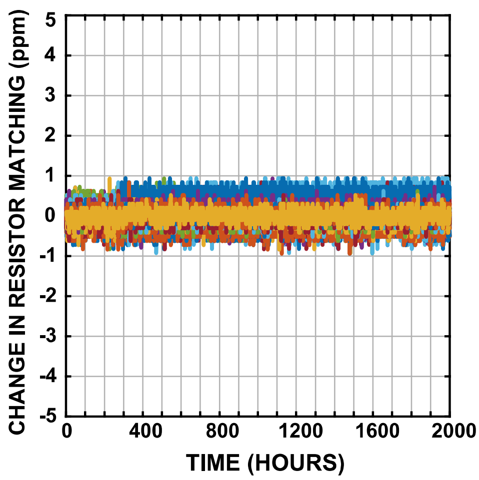

Figure 2. Change in Matching vs Time

Table of Contents

Version (Release D) [1]

Revision History

Mar. 2025 — Release D

Updated Ordering Guide Parts

Feb. 2025

ZJM5400-6BUABT and ZJM5400-8BUABT products in the Ordering Guide section has been updated from PREVIEW to ACTIVE.

Jan. 2025 — Release C

Changes to Figure 2 and updated Related Parts.

Nov. 2024

Added Figure 2 and update Figure 19, Outline Information, Ordering Guide and Related Parts.

Aug. 2024 — Release B

Added Typical Performance Characteristics and Applications Information.

Jul. 2024 — Release A

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Pin Configurations and Function

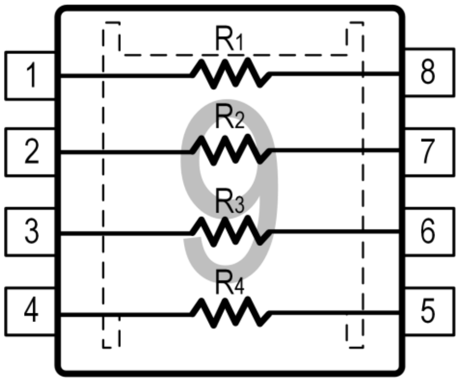

Figure 3. ZJM5400 Pin Configuration (8-lead MSOP)

Pin No.	I/O	Description
1	IO	R_1 Left Terminal.
2	IO	R_2 Left Terminal.
3	IO	R_3 Left Terminal.
4	IO	R_4 Left Terminal.
5	IO	R_4 Right Terminal.
6	IO	R_3 Right Terminal.
7	IO	R_2 Right Terminal.
8	IO	R_1 Right Terminal.
9	--	Heat Sink PAD.

Absolute Maximum Ratings [1]

Parameter	Rating
Total Voltage (Across Any 2 Pins)	±80 V
Power Dissipation (Each Resistor)	800 mW
Operating Temperature Range	-40 °C to 125 °C
Storage Temperature Range	-65 °C to 150 °C
Junction Temperature Range	-65 °C to 150 °C
Lead Temperature, Soldering (10 sec)	300 °C
ESD Rating (ESD) [2]	
Human Body Model (HBM) [3]	3.5 kV
Charge Device Model (CDM) [4]	2 kV

Thermal Resistance [5]

Package Type	θ_{JA}	θ_{JC}	Unit
8-lead MSOP	50	12.5	°C/W

[1] These ratings apply at 25°C, unless otherwise noted.
Stresses above these ratings may cause permanent damage. Exposure to absolute maximum conditions for extended periods may degrade device reliability. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those specified is not implied.

[2] Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

[3] ANSI/ESDA/JEDEC JS-001 Compliant

[4] ANSI/ESDA/JEDEC JS-002 Complaint

[5] θ_{JA} addresses the conditions for soldering devices onto circuit boards to achieve surface mount packaging.

Specifications

The ● denotes the specification which apply over the full operating temperature range, otherwise specifications are at T_A = 25 °C, unless otherwise noted.

Parameter	Symbol	Conditions		Min	Typ.	Max	Unit
Resistor Matching Ratio (Any Resistor to Any Other Resistor)	ΔR/R	B Grade				±0.010	%
			●			±0.0125	%
		A Grade	●			±0.025	%
Matching for CMRR [1]	$(\Delta R/R)_{CMRR}$	B Grade	●			±0.005	%
		A Grade	●			±0.015	%
Resistor Matching Ratio Temperature Drift	(ΔR/R)/ΔT		●		±0.2	±1	ppm/°C
Resistor Voltage Coefficient			●		<0.1		ppm/V
Absolute Resistor Tolerance	ΔR		●			±15	%
Distributed Capacitance		Resistor to Exposed Pad			2		pF
		Resistor to Resistor			2		pF
Absolute Resistor Value Temperature Drift	ΔR/ΔT		●		10	±35	ppm/°C
Resistor Matching Ratio Long-Term Drift		70 °C 2000 Hours, 10 mW			<2		ppm
Resistor Matching Ratio Moisture Resistance		85 °C 85% R.H. 168 Hours			<2		ppm
Resistor Matching Ratio Thermal Cycle Test (TCT) / Hysteresis		-65 °C to 150 °C, 500 Cycles			<2		ppm
		-65 °C to 150 °C, 1000 Cycles			<2		ppm
Resistor Matching Ratio IR Reflow		25 °C to 260 °C, 3 Cycles			<3		ppm
Resistor Matching Ratio High-Temperature Storage Life (HTSL)		150 °C, 1000 Hours			<2		ppm
Resistor Matching Ratio High-Temperature Operating Life (HTOL)		125 °C, 168 Hours, 160 mW			<3		ppm
		125 °C, 500 Hours, 160 mW			<4		ppm
		125 °C, 1000 Hours, 160 mW			<8		ppm
Harmonic Distortion		20 V_{P-P}, 1 kHz, Difference Amplifier			-120		dBc
Shelf Life		25 °C, Unbiased, 1 Year					ppm

[1] $(\Delta R/R)_{CMRR}$ (Matching for CMRR) is a metric for the contribution of error from the ZJM5400 when used in a difference configuration using the specific resistor pairs of R_1/R_2 and R_4/R_3. See Difference Amplifier, Instrumentation Amplifier, and Differential Amplifier circuits in the Typical Applications section for examples.

$$(\Delta R/R)_{CMRR} = \frac{1}{2} \times \left(\frac{R_2}{R_1} - \frac{R_3}{R_4}\right) \times \left(\frac{R_1}{R_2}\right)$$

The resistor contribution to CMRR can then be calculated in the following way:

$$CMRR = (\Delta R/R)_{CMRR} \times \left(\frac{4 \times \frac{R_2}{R_1}}{2 + \frac{R_2}{R_1} + \frac{R_3}{R_4}}\right)$$

For ZJM5400 options with resistor ratio 1:1, the resistor contribution to CMRR can be simplified:

$$CMRR \approx (\Delta R/R)_{CMRR}$$

Typical Performance Characteristics

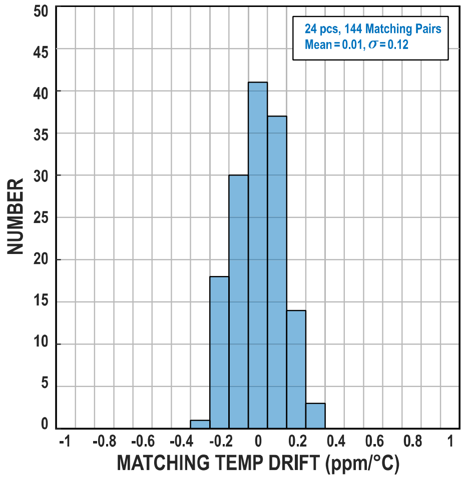

Figure 4. Distribution of Matching Temperature Drift

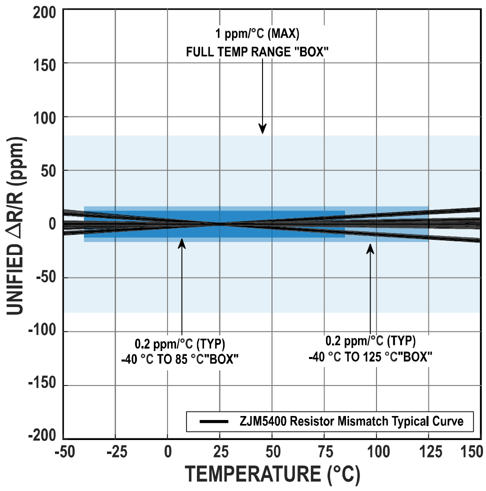

Figure 5. Resistor Mismatch vs. Temperature

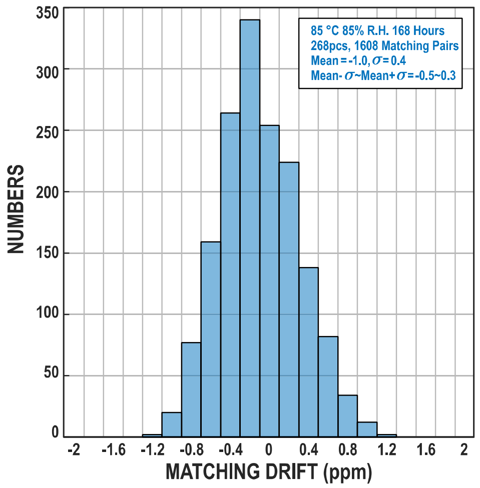

Figure 6. Distribution of Matching Moisture Resistance

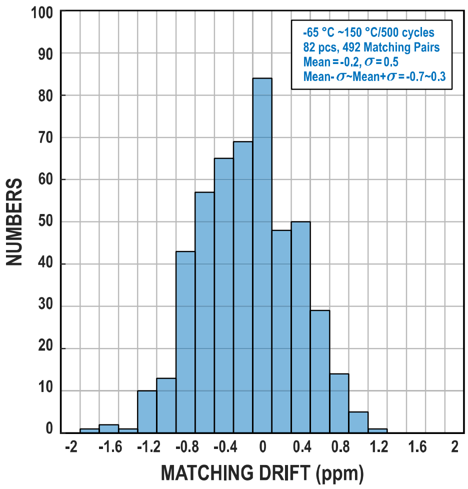

Figure 7. Distribution of Matching Drift after TCT500 [1]

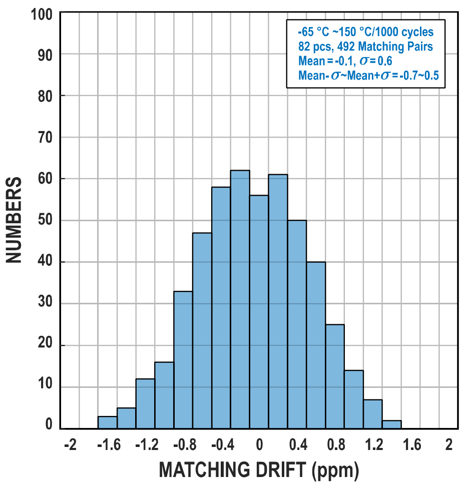

Figure 8. Distribution of Matching Drift after TCT1000 [2]

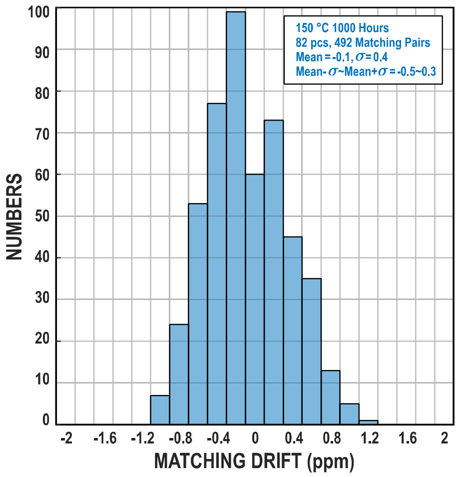

Figure 9. Distribution of Matching Drift after HTSL1000 [3]

[1] TCT500: Thermal Cycle Test, 500 cycles.
[2] TCT1000: Thermal Cycle Test, 1000 cycles
[3] HTSL1000: High-Temperature Storage Life, 1000 hours.

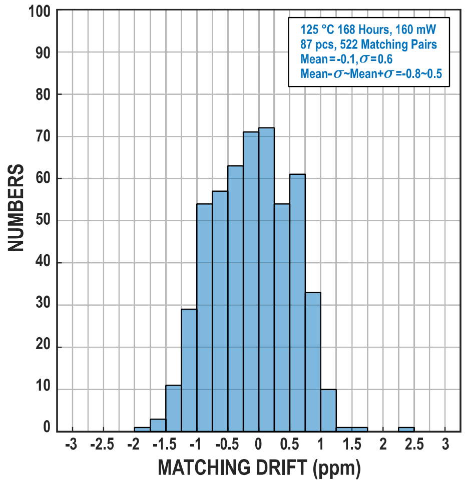

Figure 10. Distribution of Matching Drift after HTOL168 [1]

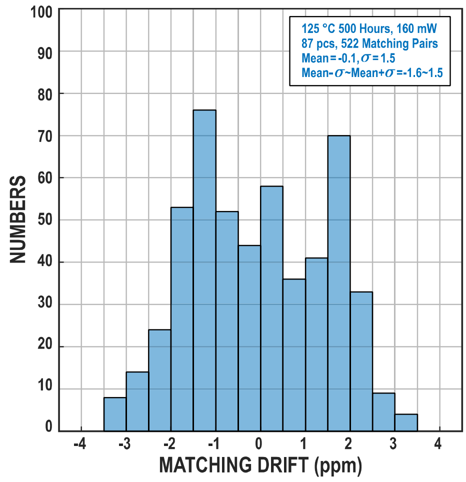

Figure 11. Distribution of Matching Drift after HTOL500 [2]

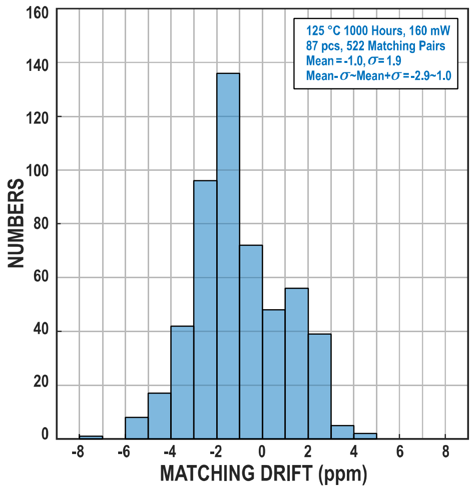

Figure 12. Distribution of Matching Drift after HTOL1000 [3]

[1] HTOL168: High-Temperature Operating Life, 168 hours.
[2] HTOL500: High-Temperature Operating Life, 500 hours.
[3] HTOL1000: High-Temperature Operating Life, 1000 hours.

Applications Information

ESD

Unlike commonly used discrete resistors made from either carbon, metal or a metal oxide film, the ZJM5400 is a matched resistor network based on semiconductor technology. It can withstand up to ±3.5 kV of electrostatic discharge (ESD, human body), achieving both high-precision matching and robustness.

To meet system robustness specifications, similar parts with a weak ESD rating would require additional external components, as shown in Figure 13. This adds both size and cost. More importantly, external components degrade the temperature drift of the entire circuit, increase leakage, and lead to inconsistent performance across boards or even channels within the same board. Using the ZJM5400 delivers higher performance, high reliability in a smaller size, at a lower cost, and with improved manufacturability.

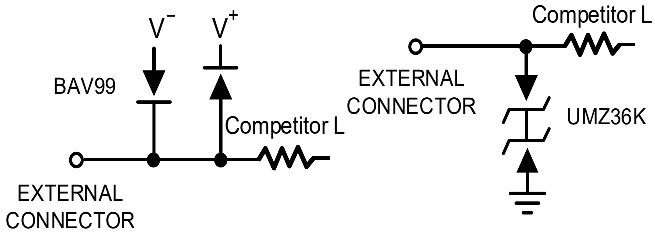

Figure 13. Competitor L's External Circuit to Get Higher ESD Rating Degrades Key Performances

Where to Connect the Exposed Pad

The exposed pad is not DC connected to any resistor terminal. Its main purpose is to reduce the internal temperature rise when the application calls for large amounts of dissipated power in the resistors. The exposed pad can be tied to any voltage (such as ground) as long as the absolute maximum ratings are observed.

There is capacitive coupling between the resistors and the exposed pad, as specified in the Electrical Characteristics table. To avoid interference, do not tie the exposed pad to noisy signals or noisy grounds.

Connecting the exposed pad to a quiet AC ground is recommended as it acts as an AC shield and reduces the amount of resistor-resistor capacitance.

Thermal Considerations

Each resistor is rated for relatively high power dissipation, as listed in the Absolute Maximum Ratings section of this data sheet. To calculate the internal temperature rise inside the package, add together the power dissipated in all of the resistors, and multiply by the thermal resistance coefficient of the package (θ_{JA} or θ_{JC} as applicable).

For example, if each resistor dissipates 250 mW, for a total of 1W, the total temperature rise inside the package equals 50 °C. All 4 resistors will be at the same temperature, regardless of which resistor dissipates more power. The junction temperature must be kept within the Absolute Maximum Rating. At elevated ambient temperatures, this places a limit on the maximum power dissipation.

In addition to limiting the maximum power dissipation, the maximum voltage across any two pins must also be kept less than the absolute maximum rating.

Matching Specification

The ZJM5400 specifies matching in the most conservative possible way. In each device, the ratio error of the largest of the four resistors to the smallest of the four resistors meets the specified matching level. Looser definitions would compare each resistor value to the average of the resistor values, which would typically result in specifications that appear twice as good as they are per the ZJM5400'smore conservative definition. The following two examples illustrate this point.

In an inverting gain-of-1 amplifier, if the largest resistor is allowed to deviate only 0.01% from the smallest resistor, then the worst-case gain can be -1.00005 / 0.99995 = -1.0001, which is a 0.01% error from the ideal -1.0000.

That is the ZJM5400 definition. In a looser definition, if each resistor would be allowed to deviate by 0.01% from the average, then the worst-case gain could be -1.0001/0.9999=-1.0002, which is a 0.02% error from the ideal -1.0000.

In a divide-by-2 resistor divider network, if the largest resistor is allowed to deviate only 0.01% from the smallest resistor, then the worst-case ratio can be 1.00005 / (1.00005 + 0.99995) = 0.500025, which is a 0.005% error from the ideal 0.50000. That is the ZJM5400 definition. In a looser definition, if each resistor would be allowed to deviate by 0.01% from the average, then the worst-case ratio could be 1.0001 / (1.0001 + 0.9999) = 0.50005, which is a 0.01% error from the ideal 0.50000.

ZJM5400's matching ratio and drift include the performance of both the resistor network and internal ESD. Unlike ZJM5400, Competitor L requires external circuits (shown in Figure 13) to achieve the same ESD rating. This leads to a significantly worse matching ratio and drift than the datasheet specifications, as they only cover the internal resistor network.

ZJM5400's higher integration provides the system with superior performance and consistency.

Typical Applications

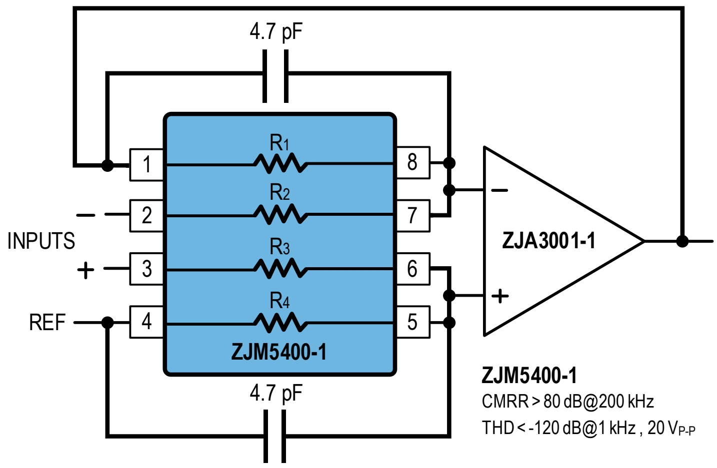

Figure 14. Building Difference Amplifier

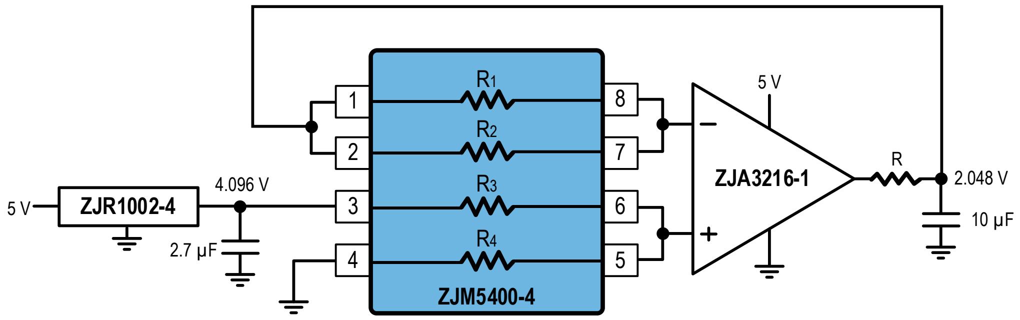

Figure 15. Low Noise Reference Divider with Op Amp Input Bias Current Balancing

The ZJM5400-4, with its 1 kΩ resistance, is used to get lower noise. The ZJA3216's low noise and ±150 mA output current create a low-noise voltage reference with high drive capability. To optimize noise performance while maintaining circuit stability, a small resistor value, typically between 10 Ω and 33 Ω, is recommended for resistor R in the figure.

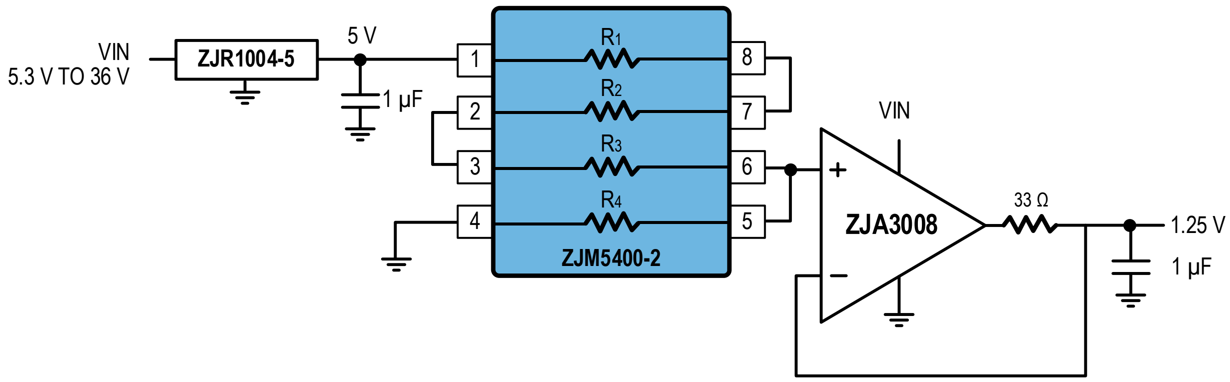

Figure 16. Micropower Reference Divide-by-4

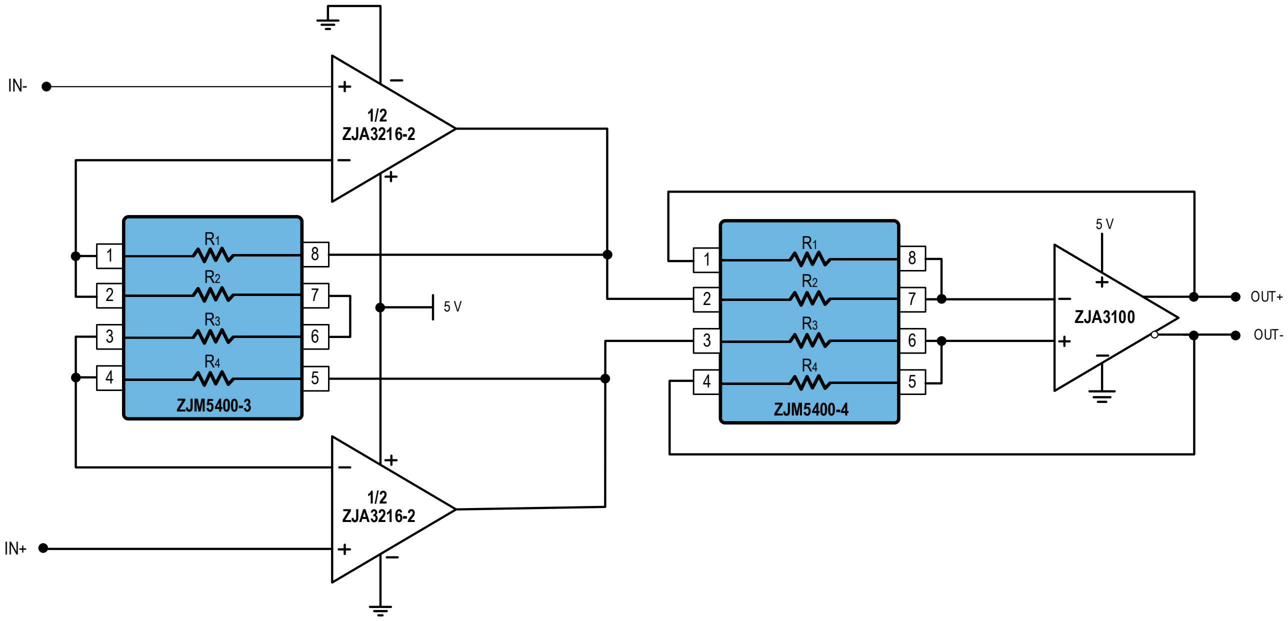

Figure 17. Gain of 10, 106 dB min CMRR, Fully-Differential Instrumentation Amplifier

A fully differential instrumentation amplifier has been constructed. To achieve optimal common-mode rejection ratio (CMRR), precise matching of the output stage is crucial. The ZJM5400-4, with its maximum matching error of ±0.005%, contributes to a CMRR of at least 86 dB over the temperature range of -40 °C to 125 °C.

$$CMRR = (\Delta R/R)_{CMRR} \times \left(\frac{4 \times \frac{R_2}{R_1}}{2 + \frac{R_2}{R_1} + \frac{R_3}{R_4}} \right)$$

The CMRR calculation, 0.005% * ((4*1) / (2+1+1)) = 0.005%, corresponds to 86 dB.

By employing the ZJM5400-3, a gain of 10 is achieved, resulting in a minimum CMRR of 106 dB for the differential instrumentation amplifier at a gain of 10, over the temperature range of -40 °C to 125 °C. The ZJM5400-3 and ZJM5400-4, as shown in Figure 17, ensure guaranteed CMRR and gain stability.

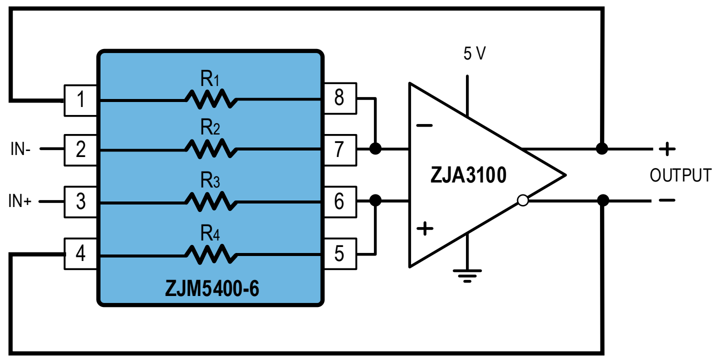

Figure 18. Gain of 5, Fully-Differential Amplifier

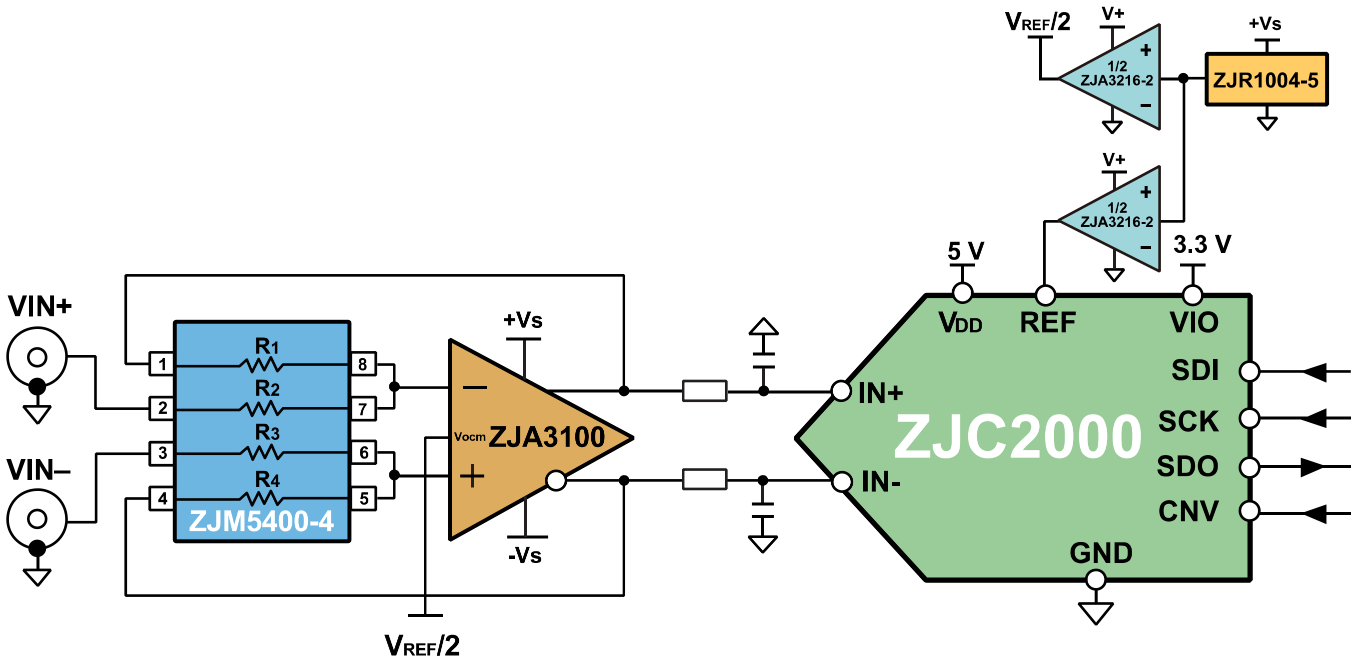

Figure 19. Using ZJM5400 with ZJC2000

The ZJC2000 is an 18-bit, 400 kSPS analog-to-digital converter (ADC). In combination with the ZJA3100 fully differential amplifier and the ZJM5400-4, it delivers exceptional DC and AC performance across a wide temperature range.

Layout Example

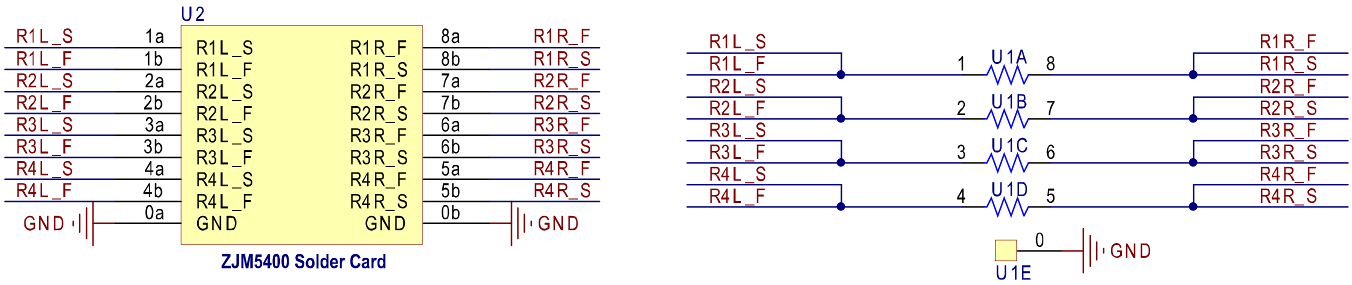

Figure 21. ZJM5400 Evaluation Board Schematic

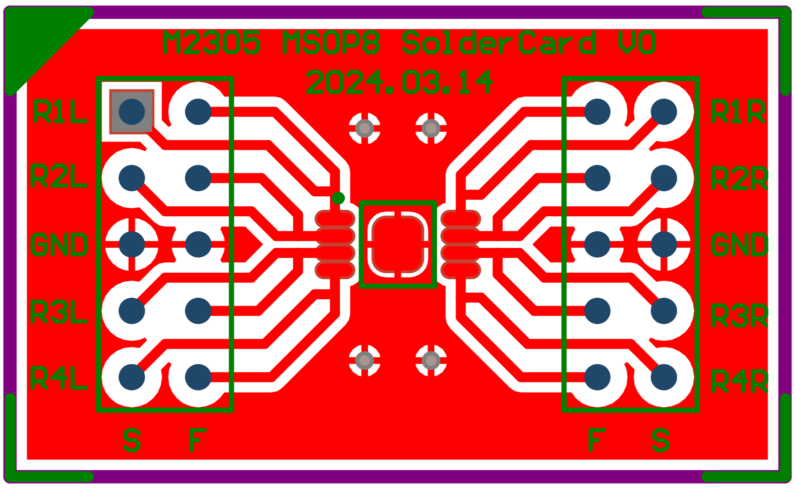

Figure 22. ZJM5400 Evaluation Board Layout (Top Layer)

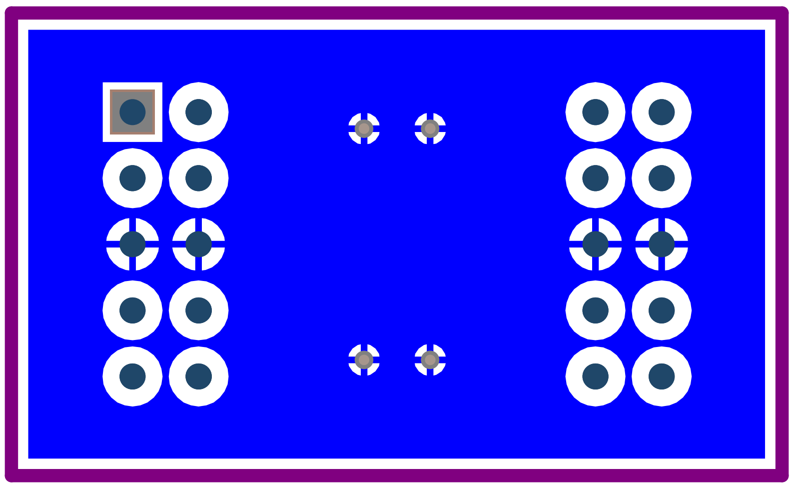

Figure 23. ZJM5400 Evaluation Board Layout (Bottom Layer)

Outline Information

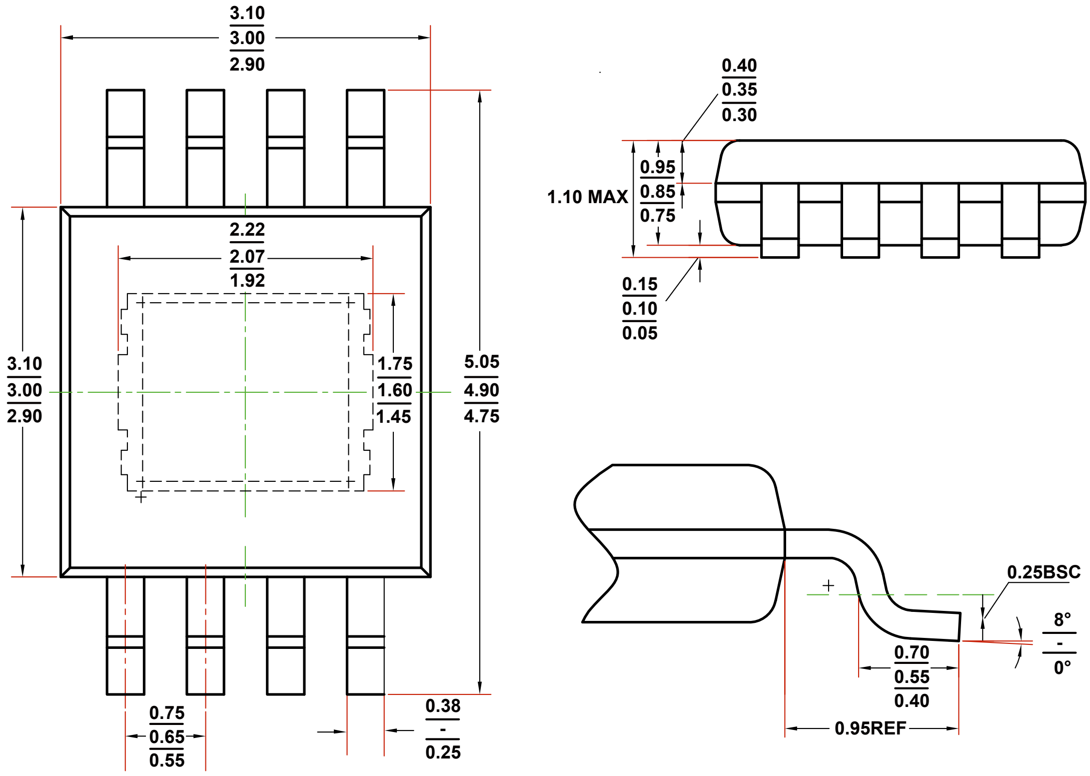

Figure 24. 8-Lead MSOP Package Dimensions shown in millimeters

Ordering Guide

Model	Orderable Device	$R_2 = R_3$ (Ω)	$R_1 = R_4$ (Ω)	Resistor Ratio	Package	Specified Temperature Range (°C)	External Package
ZJM5400-1	ZJM5400-1BUABT	10k	10k	1:1	MSOP-8	-40 to +125	Tube
	ZJM5400-1BUABR						13” reel
	ZJM5400-1AUABT						Tube
	ZJM5400-1AUABR						13” reel
ZJM5400-2	ZJM5400-2BUABT	100k	100k	1:1	MSOP-8	-40 to +125	Tube
	ZJM5400-2BUABR						13” reel
	ZJM5400-2AUABT						Tube
	ZJM5400-2AUABR						13” reel
ZJM5400-3	ZJM5400-3BUABT	10k	100k	1:10	MSOP-8	-40 to +125	Tube
	ZJM5400-3BUABR						13” reel
	ZJM5400-3AUABT						Tube
	ZJM5400-3AUABR						13” reel
ZJM5400-4	ZJM5400-4BUABT	1k	1k	1:1	MSOP-8	-40 to +125	Tube
	ZJM5400-4BUABR						13” reel
	ZJM5400-4AUABT						Tube
	ZJM5400-4AUABR						13” reel
ZJM5400-5	ZJM5400-5BUABT	1M	1M	1:1	MSOP-8	-40 to +125	Tube
	ZJM5400-5BUABR						13” reel
	ZJM5400-5AUABT						Tube
	ZJM5400-5AUABR						13” reel
ZJM5400-6	ZJM5400-6BUABT	1k	5k	1:5	MSOP-8	-40 to +125	Tube
	ZJM5400-6BUABR						13” reel
	ZJM5400-6AUABT						Tube
	ZJM5400-6AUABR						13” reel
ZJM5400-7	ZJM5400-7BUABT	1.25k	5k	1:4	MSOP-8	-40 to +125	Tube
	ZJM5400-7BUABR						13” reel
	ZJM5400-7AUABT						Tube
	ZJM5400-7AUABR						13” reel
ZJM5400-8	ZJM5400-8BUABT	1k	9k	1:9	MSOP-8	-40 to +125	Tube
	ZJM5400-8BUABR						13” reel
	ZJM5400-8AUABT						Tube
	ZJM5400-8AUABR						13” reel

Product Order Model

ZJXXXXX X X X X X Q1

- Q1: Automotive Grade
- External package: T=Tube; R=Reel
- Temperature range: A= -40°C to 125°C Automotive Grade 1; B= -40°C to 125°C; E= -40°C to 85°C
- Number of pins: R=3; K=5; T=6, A=8; B=10; D=14; E=16; P=20
- Package type: S=SOIC; U=MSOP, TSSOP, SOT (3 to 6 pins); T=DFN, QFN; K=SOT (8 pins)
- Grade: B grade is better than A grade
- Base: R=Voltage reference; A=Amplifier; C=Data Converter; G=Switches and Multiplexers, M=Others

Related Parts

Part Number	Description	Comments
ADC		
ZJC2020	20-bit 350 kSPS SAR ADC	Fully differential input, SINAD 101.4 dB, THD -118 dB
ZJC2000/2010	18-bit 400 kSPS/200 kSPS SAR ADC	Fully differential input, SINAD 99.3 dB, THD -113 dB
ZJC2001/2011	16-bit 500 kSPS/250 kSPS SAR ADC	Fully differential input, SINAD 95.3 dB, THD -113 dB
ZJC2002/2012 ZJC2003/2013	16-bit 500 kSPS/250 kSPS SAR ADC	Pseudo-differential unipolar input, SINAD 91.7 dB, THD -105 dB Pseudo-differential bipolar input, SINAD 91.7 dB, THD -105 dB
ZJC2004/2014 ZJC2005/2015	18-bit 400 kSPS/200 kSPS SAR ADC	Pseudo-differential unipolar input, SINAD 94.2 dB, THD -105 dB Pseudo-differential bipolar input, SINAD 94.2 dB, THD -105 dB
ZJC2007/2017 ZJC2008/2018	14-bit 600 kSPS/300 kSPS SAR ADC	Pseudo-differential unipolar input, SINAD 85 dB, THD -105 dB Pseudo-differential bipolar input, SINAD 85 dB, THD -105 dB
ZJC2009	Small size, 12-bit 1 MSPS SAR ADC	Single-ended input, SOT23-6, 2.3 V to 5 V, SINAD 73 dB, THD -89 dB
ZJC2100/1-18 ZJC2100/1-16	18-bit 400 kSPS/200 kSPS 4-ch differential SAR ADC, SINAD 99.3 dB, THD -113 dB 16-bit 500 kSPS/250 kSPS 4-ch differential SAR ADC, SINAD 95.3 dB, THD -113 dB	
ZJC2102/3-18 ZJC2102/3-16 ZJC2102/3-14	18-bit 400 kSPS/200 kSPS 8-ch pseudo-differential SAR ADC, SINAD 94.2 dB, THD -105 dB 16-bit 500 kSPS/250 kSPS 8-ch pseudo-differential SAR ADC, SINAD 91.7 dB, THD -105 dB 14-bit 600 kSPS/300 kSPS 8-ch pseudo-differential SAR ADC, SINAD 85 dB, THD -105 dB	
ZJC2104/5-18 ZJC2104/5-16	18-bit 400 kSPS/200 kSPS 4-ch pseudo-differential SAR ADC, SINAD 94.2 dB, THD -105 dB 16-bit 500 kSPS/250 kSPS 4-ch pseudo-differential SAR ADC, SINAD 91.7 dB, THD -105 dB	
DAC		
ZJC2541-18/16/14 ZJC2543-18/16/14	18/16/14-bit 1 MSPS single channel DAC with unipolar output	Power on reset to 0 V (ZJC2541) or V_{REF}/2 (ZJC2543), 1 nV-S glitch, SOIC-8, MSOP-10/8, DFN-10 packages
ZJC2542-18/16/14 ZJC2544-18/16/14	18/16/14-bit 1 MSPS single channel DAC with bipolar output	Power on reset to 0 V (ZJC2542) or V_{REF}/2 (ZJC2544), 1 nV-S glitch, SOIC-14, TSSOP-16, QFN 16 packages
Amplifier		
ZJA3000-1/2/4 ZJA3001-1/2/4	Single/Dual/Quad 36 V low bias current precision Op Amps	3 MHz, 35 µV max Vos, 0.5 µV/°C max TCVos, 25 pA max Ibias, 1 mA/ch, input to V- (ZJA3000 only), RRO, 4.5 V to 36 V
ZJA3018-2 ZJA3008-2	OVP ±75 V, 36 V, Low Power, High Precision Op Amp 36 V, Low Power, High Precision Op Amp	1.3 MHz, 10 µV max Vos, 0.5 µV/°C max TCVos, 25 pA max Ibias, 0.5 mA/ch, OVP ±75 V (ZJA3018 only), RRO, 4.5 V to 36 V
ZJA3512-2	Dual 36 V 7 MHz precision JFET Op Amps	7 MHz, 35 V/µS, 50 µV max Vos, 1 µV/°C max TCVos, 2 mA/ch, RRO, 9 V to 36 V
ZJA3206/06/02-1/2	Precision 24/11.6/5.3 MHz CMOS RRIO Op Amps	24/11.6/5.3 MHz, RRIO, 30 µV max Vos, 1 µV/°C max TCVos, 0.6 pA Ib, 2.7 V to 5.5 V
ZJA3600/1	36 V ultra-high precision in-amp	CMRR 105 dB min (G = 1), 25 pA max Ib, 25 µV max Vosi, ±2.4 V to ±18 V, -40 °C to 125 °C
ZJA3611, ZJA3609	36 V precision wider bandwidth precision in-amp (G ≥ 10)	CMRR 120 dB min (G = 10), 25 pA max Ibias, 25 µV max Vosi, 1.2 MHz BW (G = 10)
ZJA3676/7 ZJA3678/9	Low power, G = 1 Single/Dual 36 V difference amplifier Low power, G = 0.5/2 Single/Dual 36 V difference amplifier	Input protection to ±65 V, CMRR 104 dB min (G = 1), Vos 100 µV max, gain error 15 ppm max, 500 kHz BW (G = 1), 330 µA/channel, 2.7 V to 36 V
ZJA3669	High Common-Mode Voltage Difference Amplifier	±270 V CMV, 2.5 kV ESD, 96 dB min CMRR, 450 kHz BW, 4 V to 36 V, SOIC-8
ZJA3100	15 V precision fully differential amplifier	145 MHz, 447 V/µS, 50 nS to 16-bit, 50 µV max Vos, 4.6 mA Iq, SOIC/MSOP-8, QFN-16
ZJA3236/26/22-2	Low-cost 22/10/5 MHz CMOS RRIO Op Amps	22/11/5 MHz, RRIO, 2 mV max Vos, 6 µV/°C max TCVos, 0.6 pA Ib, 2.7 V to 5.5 V
ZJA3622/8	36 V low-cost precision in-amp	0.5 nA max Ibias, 125 µV max Vosi, 625 kHz BW (G = 10), 3.3 mA Iq, ±2.4 V to ±18 V
Voltage Reference		
ZJR1004	40 V supply precision voltage reference	V_{OUT} = 2.048/2.5/3/3.3/4.096/5/10 V, 5 ppm/°C max drift -40 °C to 125 °C
ZJR1001/2 ZJR1003	5.5 V low power voltage reference (ZJR1001 with noise filter option)	V_{OUT} = 2.048/2.5/3/3.3/4.096/5 V, 5 ppm/°C max drift -40 °C to 125 °C, ±0.05% initial error, 130 µA, ZJR1001/2 in SOT23-6, ZJR1003 in SOIC/MSOP-8
ZJR1302	5.5 V low power compact precision voltage reference	V_{OUT} = 2.048/2.5/3/3.3/4.096 V, 30 ppm/°C max drift -40 °C to 125 °C, 130 µA, SOT23-3
Switches and Multiplexers		
ZJG4438/4439	36 V fault protection 8:1/dual 4:1 multiplexer	Protection to ±50 V power on & off, latch-up immune, Ron 270 Ω, 14.8 pC, t_{ON} 166 nS
ZJG4428/4429	36 V 8:1/dual 4:1 multiplexer	Latch-up immune, Ron 270 Ω, 14.8 pC charge injection, t_{ON} 166 nS
Quad Matching Resistor		
ZJM5400	±75 V precision match resistors	Mismatch < 100 ppm, 10k:10k:10k:10k, 100k:100k:100k:100k, 100k:10k:10k:100k, 1k:1k:1k:1k, 1M:1M:1M:1M, 5k:1k:1k:5k, 5k:1.25k:1.25k:5k, 9k:1k:1k:9k, ESD: 3.5 kV