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REVISION HISTORY

5/2017—Rev. A to Rev. B

Deleted ADR439	Throughout
Added Pin Configuration and Function Descriptions Section, Figure 2; Renumbered Sequentially, and Table 7	7
Changes to Typical Performance Characteristics Section.....	8

8/2010—Rev. 0 to Rev. A

Added ADR431-EP.....	Throughout
Added ADR435-EP.....	Throughout
Changes to Ordering Guide	8

7/2010—Revision 0: Initial Version

SPECIFICATIONS

ADR431-EP ELECTRICAL CHARACTERISTICS

$V_{IN} = 4.5\text{ V to }18\text{ V}$, $I_L = 0\text{ mA}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 2.

Parameter	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
OUTPUT VOLTAGE	V_O		2.499	2.500	2.501	V
INITIAL ACCURACY	V_{OERR}				± 1.0 ± 0.04	mV %
TEMPERATURE COEFFICIENT	TCV_O	$-55^\circ\text{C} < T_A < +125^\circ\text{C}$		1.5	5	ppm/ $^\circ\text{C}$
LINE REGULATION	$\Delta V_O / \Delta V_{IN}$	$-55^\circ\text{C} < T_A < +125^\circ\text{C}$		5	20	ppm/V
LOAD REGULATION	$\Delta V_O / \Delta I_L$	$I_L = 0\text{ mA to }10\text{ mA}$, $V_{IN} = 5\text{ V}$, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$ $I_L = -10\text{ mA to }0\text{ mA}$, $V_{IN} = 5\text{ V}$, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$			15 15	ppm/mA ppm/mA
QUIESCENT CURRENT	I_{IN}	No load, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$		580	800	μA
VOLTAGE NOISE	e_N p-p	0.1 Hz to 10.0 Hz		3.5		$\mu\text{V p-p}$
VOLTAGE NOISE DENSITY	e_N	1 kHz		80		nV/ $\sqrt{\text{Hz}}$
TURN ON SETTLING TIME	t_R	$C_L = 0\text{ }\mu\text{F}$		10		μs
LONG-TERM STABILITY ¹	ΔV_O	1000 hours		40		ppm
OUTPUT VOLTAGE HYSTERESIS	V_{O_HYS}			20		ppm
RIPPLE REJECTION RATIO	RRR	$f_{IN} = 1\text{ kHz}$		-70		dB
SHORT CIRCUIT TO GND	I_{SC}			40		mA
SUPPLY VOLTAGE OPERATING RANGE	V_{IN}		4.5		18	V
SUPPLY VOLTAGE HEADROOM	$V_{IN} - V_O$		2			V

¹ The long-term stability specification is noncumulative. The drift in subsequent 1000 hour periods is significantly lower than in the first 1000 hour period.

ADR434-EP ELECTRICAL CHARACTERISTICS

$V_{IN} = 6.1\text{ V to }18\text{ V}$, $I_L = 0\text{ mA}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 3.

Parameter	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
OUTPUT VOLTAGE	V_O		4.0945	4.096	4.0975	V
INITIAL ACCURACY	V_{OERR}				± 1.5 ± 0.04	mV %
TEMPERATURE COEFFICIENT	TCV_O	$-55^\circ\text{C} < T_A < +125^\circ\text{C}$		1	3	ppm/ $^\circ\text{C}$
LINE REGULATION	$\Delta V_O / \Delta V_{IN}$	$-55^\circ\text{C} < T_A < +125^\circ\text{C}$		5	20	ppm/V
LOAD REGULATION	$\Delta V_O / \Delta I_L$	$I_L = 0\text{ mA to }10\text{ mA}$, $V_{IN} = 7\text{ V}$, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$ $I_L = -10\text{ mA to }0\text{ mA}$, $V_{IN} = 7\text{ V}$, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$			15 15	ppm/mA ppm/mA
QUIESCENT CURRENT	I_{IN}	No load, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$		595	800	μA
VOLTAGE NOISE	e_N p-p	0.1 Hz to 10.0 Hz		6.25		$\mu\text{V p-p}$
VOLTAGE NOISE DENSITY	e_N	1 kHz		100		nV/ $\sqrt{\text{Hz}}$
TURN ON SETTLING TIME	t_R	$C_L = 0\text{ }\mu\text{F}$		10		μs
LONG-TERM STABILITY ¹	ΔV_O	1000 hours		40		ppm
OUTPUT VOLTAGE HYSTERESIS	V_{O_HYS}			20		ppm
RIPPLE REJECTION RATIO	RRR	$f_{IN} = 1\text{ kHz}$		-70		dB
SHORT CIRCUIT TO GND	I_{SC}			40		mA
SUPPLY VOLTAGE OPERATING RANGE	V_{IN}		6.1		18	V
SUPPLY VOLTAGE HEADROOM	$V_{IN} - V_O$		2			V

¹ The long-term stability specification is noncumulative. The drift in subsequent 1000 hour periods is significantly lower than in the first 1000 hour period.

ADR435-EP ELECTRICAL CHARACTERISTICS

$V_{IN} = 7.0\text{ V to }18\text{ V}$, $I_L = 0\text{ mA}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 4.

Parameter	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
OUTPUT VOLTAGE	V_O		4.998	5.000	5.002	V
INITIAL ACCURACY	V_{OERR}				± 2.0 ± 0.04	mV %
TEMPERATURE COEFFICIENT	TCV_O	$-55^\circ\text{C} < T_A < +125^\circ\text{C}$		1	3	ppm/ $^\circ\text{C}$
LINE REGULATION	$\Delta V_O / \Delta V_{IN}$	$-55^\circ\text{C} < T_A < +125^\circ\text{C}$		5	20	ppm/V
LOAD REGULATION	$\Delta V_O / \Delta I_L$	$I_L = 0\text{ mA to }10\text{ mA}$, $V_{IN} = 8\text{ V}$, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$ $I_L = -10\text{ mA to }0\text{ mA}$, $V_{IN} = 8\text{ V}$, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$			15 15	ppm/mA ppm/mA
QUIESCENT CURRENT	I_{IN}	No load, $-55^\circ\text{C} < T_A < +125^\circ\text{C}$		620	800	μA
VOLTAGE NOISE	e_N p-p	0.1 Hz to 10.0 Hz		8		$\mu\text{V p-p}$
VOLTAGE NOISE DENSITY	e_N	1 kHz		115		nV/ $\sqrt{\text{Hz}}$
TURN ON SETTLING TIME	t_R	$C_L = 0\text{ }\mu\text{F}$		10		μs
LONG-TERM STABILITY ¹	ΔV_O	1000 hours		40		ppm
OUTPUT VOLTAGE HYSTERESIS	V_{O_HYS}			20		ppm
RIPPLE REJECTION RATIO	RRR	$f_{IN} = 1\text{ kHz}$		-70		dB
SHORT CIRCUIT TO GND	I_{SC}			40		mA
SUPPLY VOLTAGE OPERATING RANGE	V_{IN}		7.0		18	V
SUPPLY VOLTAGE HEADROOM	$V_{IN} - V_O$		2			V

¹ The long-term stability specification is noncumulative. The drift in subsequent 1000 hour periods is significantly lower than in the first 1000 hour period.

ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 5.

Parameter	Rating
Supply Voltage	20 V
Output Short-Circuit Duration to GND	Indefinite
Storage Temperature Range	-65°C to $+125^\circ\text{C}$
Operating Temperature Range	-55°C to $+125^\circ\text{C}$
Junction Temperature Range	-65°C to $+150^\circ\text{C}$
Lead Temperature, Soldering (60 sec)	300°C

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

THERMAL RESISTANCE

θ_{JA} is specified for the worst-case conditions, that is, a device soldered in a circuit board for surface-mount packages.

Table 6. Thermal Resistance

Package Type	θ_{JA}	θ_{JC}	Unit
8-Lead SOIC_N (R-8)	130	43	$^\circ\text{C}/\text{W}$

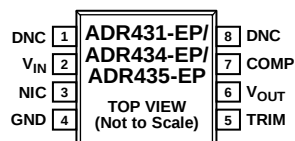
ESD CAUTION



ESD (electrostatic discharge) sensitive device.

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.

PIN CONFIGURATION AND FUNCTION DESCRIPTIONS



NOTES

1. NIC = NOT INTERNALLY CONNECTED. THIS PIN IS NOT CONNECTED INTERNALLY.
2. DNC = DO NOT CONNECT. DO NOT CONNECT TO THIS PIN.

0921B-101

Figure 2. Pin Configuration

Table 7. Pin Function Descriptions

Pin No.	Mnemonic	Description
1, 8	DNC	Do Not Connect. Do not connect to this pin.
2	V _{IN}	Input Voltage Connection.
3	NIC	Not Internally Connected. This pin is not connected internally.
4	GND	Ground.
5	TRIM	Output Voltage Trim.
6	V _{OUT}	Output Voltage.
7	COMP	Compensation Input. Connect a series resistor capacitor network from COMP to V _{OUT} to reduce overall noise.

TYPICAL PERFORMANCE CHARACTERISTICS

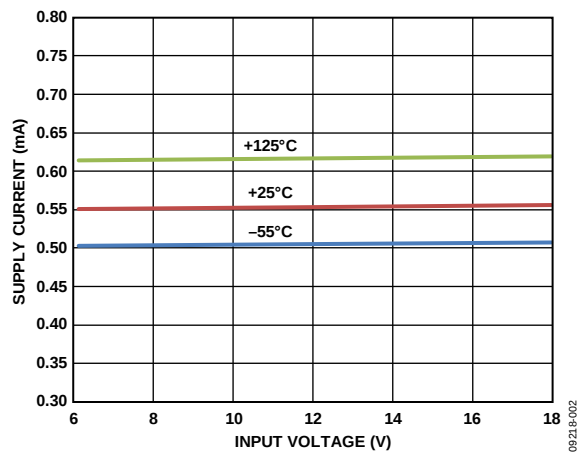
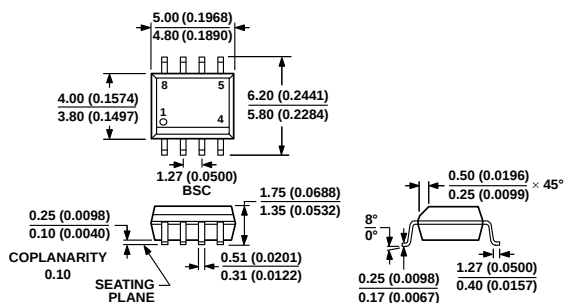


Figure 3. Supply Current vs. Input Voltage at Various Temperatures

OUTLINE DIMENSIONS



COMPLIANT TO JEDEC STANDARDS MS-012-AA
CONTROLLING DIMENSIONS ARE IN MILLIMETERS; INCH DIMENSIONS
(IN PARENTHESES) ARE ROUNDED-OFF MILLIMETER EQUIVALENTS FOR
REFERENCE ONLY AND ARE NOT APPROPRIATE FOR USE IN DESIGN.

Figure 4. 8-Lead Standard Small Outline Package [SOIC_N]
Narrow Body
(R-8)

Dimensions shown in millimeters and (inches)

ORDERING GUIDE

Model ¹	Output Voltage (V)	Initial Accuracy, ±		Temperature Coefficient Package (ppm/°C)	Temperature Range	Package Description	Package Option	Ordering Quantity
		(mV)	(%)					
ADR431TRZ-EP	2.500	1.0	0.04	5	−55°C to +125°C	8-Lead SOIC_N	R-8	98
ADR431TRZ-EP-R7	2.500	1.0	0.04	5	−55°C to +125°C	8-Lead SOIC_N	R-8	1,000
ADR434TRZ-EP	4.096	1.5	0.04	3	−55°C to +125°C	8-Lead SOIC_N	R-8	98
ADR434TRZ-EP-R7	4.096	1.5	0.04	3	−55°C to +125°C	8-Lead SOIC_N	R-8	1,000
ADR435TRZ-EP	5.000	2.0	0.04	3	−55°C to +125°C	8-Lead SOIC_N	R-8	98
ADR435TRZ-EP-R7	5.000	2.0	0.04	3	−55°C to +125°C	8-Lead SOIC_N	R-8	1,000

¹ Z = RoHS Compliant Part.