REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add case outline Y JEDEC MO-220-WGGC package. Update document paragraphs to current requirements. - ro	18-11-05	C. SAFFLE
B	Add typical limits to V_{OSI}, $\Delta V_{OSI}/\Delta T$, V_{OSO}, I_{IB}, I_{IO}, AD, PSRR, V_{OH}, V_{OL}, V_{OS}, $\Delta V_{OS}/\Delta T$, AOL, CMRR, I_Q, and I_{QSHDN} parameters specified in Table I. Update document to current requirements. - ro	24-01-18	J. ESCHMEYER

Prepared in accordance with ASME Y14.24

Vendor Item Drawing

Revision Status of Sheets

REV																						
SHEET																						
REV	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			

PMIC N/A

Original date of drawing

YY-MM-DD
12-12-05

PREPARED BY
RICK OFFICER

CHECKED BY
RAJESH PITHADIA

APPROVED BY
CHARLES F. SAFFLE

DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990
https://www.dla.mil/landandmaritime

TITLE
MICROCIRCUIT, LINEAR, ZERO DRIFT, DIGITALLY PROGRAMMABLE INSTRUMENTATION AMPLIFIER, MONOLITHIC SILICON

SIZE	CAGE CODE	DWG NO.
A	16236	V62/12646
REV B		PAGE 1 OF 19

AMSC N/A

5962-V162-23

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance zero drift, digitally programmable instrumentation amplifier microcircuit, with an operating temperature range of -55°C to +125°C.

1.2 Vendor Item Drawing Administrative Control Number. The manufacturer's PIN is the item of identification. The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation:

V62/12646	-	01	X	E
Drawing number		Device type (See 1.2.1)	Case outline (See 1.2.2)	Lead finish (See 1.2.3)

1.2.1 Device type.

Device type	Generic	Circuit function
01	AD8231	Zero drift, digitally programmable instrumentation amplifier

1.2.2 Case outlines. The case outlines are as specified herein.

Outline letter	Number of pins	JEDEC PUB 95	Package style
X	16	MO-220-VGGC	Lead frame chip scale quad package
Y	16	MO-220-WGGC	Lead frame chip scale quad package

1.2.3 Lead finishes. The lead finishes are as specified below or other lead finishes as provided by the device manufacturer:

Finish designator	Material
A	Hot solder dip
B	Tin-lead plate
C	Gold plate
D	Palladium
E	Gold flash palladium
F	Tin-lead alloy (BGA/CGA)
Z	Other

1.3 Absolute maximum ratings. 1/

Supply voltage (V_S)	6 V
Output short circuit current	Indefinite 2/
Input voltage (common mode)	$-V_S$ – 0.3 V to $+V_S$ + 0.3 V
Differential input voltage	$-V_S$ – 0.3 V to $+V_S$ + 0.3 V
Storage temperature range (T_{STG})	-65°C to +150°C
Package glass transition temperature	130°C
Junction temperature range (T_J)	130°C
Electrostatic discharge (ESD):	
Human body model (HBM)	1.5 kV
Charged device model (CDM)	1.5 kV
Machine model (MM)	0.2 kV

1/ Stresses beyond those listed under "absolute maximum rating" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

2/ For junction temperature between 105°C and 130°C, short circuit operation beyond 1000 hours can impact part reliability.

1.4 Recommended operating conditions. 3/

Operating free-air temperature range (T_A) ..... -55°C to +125°C

1.5 Thermal characteristics.

Thermal resistance, junction to case (θ_{JC}) ..... 6.3°C/W at the exposed pad
Thermal resistance, junction to ambient (θ_{JA}) :
Thermal pad soldered to board ..... 54°C/W
Thermal pad not soldered to board ..... 96°C/W

2. APPLICABLE DOCUMENTS

JEDEC Solid State Technology Association

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Copies of these documents are available online at https://www.jedec.org.)

3. REQUIREMENTS

3.1 Marking. Parts shall be permanently and legibly marked with the manufacturer's part number as shown in 6.3 herein and as follows:

A. Manufacturer's name, CAGE code, or logo
B. Pin 1 identifier
C. ESDS identification (optional)

3.2 Unit container. The unit container shall be marked with the manufacturer's part number and with items A and C (if applicable) above.

3.3 Electrical characteristics. The maximum and recommended operating conditions and electrical performance characteristics are as specified in 1.3, 1.4, and table I herein.

3.4 Design, construction, and physical dimension. The design, construction, and physical dimensions are as specified herein.

3.5 Diagrams.

3.5.1 Case outlines. The case outlines shall be as shown in 1.2.2 and figure 1.

3.5.2 Terminal connections. The terminal connections shall be as shown in figure 2.

3/ Use of this product beyond the manufacturers design rules or stated parameters is done at the user's risk. The manufacturer and/or distributor maintain no responsibility or liability for product used beyond the stated limits.

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions V_S = 5 V, V_{REF} = 2.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier.							
Input offset voltage	V_{OSI}	V_{OS} RTI = V_{OSI} + V_{OSO} / G	+25°C	01		15	µV
					4	typical	
Input offset voltage average temperature drift	ΔV_{OSI} / ΔT	V_{OS} RTI = V_{OSI} + V_{OSO} / G	-55°C to +125°C	01		0.05	µV/°C
					0.01	typical	
Output offset voltage	V_{OSO}	V_{OS} RTI = V_{OSI} + V_{OSO} / G	+25°C	01		30	µV
					15	typical	
Output offset voltage average temperature drift	ΔV_{OSO} / ΔT	V_{OS} RTI = V_{OSI} + V_{OSO} / G	-55°C to +125°C	01		0.5	µV/°C
					0.05	typical	
Input bias current	I_{IB}		+25°C	01		500	pA
					250	typical	
			-55°C to +125°C			5	nA
Input offset current	I_{IO}		+25°C	01		100	pA
					20	typical	
			-55°C to +125°C			0.5	nA
Gains. 1, 2, 4, 8, 16, 32, 64, or 128							
Gain error	AE	G = 1	+25°C	01		0.05	%
		G = 2 to 128				0.8	
Gain drift	AD	G = 1 to 32	-55°C to +125°C	01		10	ppm/°C
					3	typical	
		G = 64				20	
					4	typical	
		G = 128				30	
					10	typical	
Linearity		0.2 V to 4.8 V, 10 kΩ load	+25°C	01	3	typical	ppm
		0.2 V to 4.8 V, 2 kΩ load			5	typical	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 5 V, V_{REF} = 2.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier – continued.							
Common mode rejection ratio	CMRR	G = 1	+25°C	01	80		dB
		G = 2			86		
		G = 4			92		
		G = 8			98		
		G = 16			104		
		G = 32			110		
		G = 64			110		
		G = 128			110		
Noise		$en = \sqrt{(e_{ni}^2 + (e_{no}/G)^2)}$, $+V_{IN}$, $-V_{IN}$ = 2.5 V					
Input voltage noise	e_{ni}	f = 1 kHz	+25°C	01	32 typical		nV / $\sqrt{Hz}$
		f = 1 kHz	-55°C		27 typical		
		f = 1 kHz	+125°C		39 typical		
		f = 0.1 Hz to 10 Hz	+25°C		0.7 typical		μVpp
Output voltage noise	e_{no}	f = 1 kHz	+25°C	01	58 typical		nV / $\sqrt{Hz}$
		f = 1 kHz	-55°C		50 typical		
		f = 1 kHz	+125°C		70 typical		
		f = 0.1 Hz to 10 Hz	+25°C		1.1 typical		μVpp
Current noise		f = 10 Hz	+25°C	01	20 typical		fA / $\sqrt{Hz}$
Other input characteristics.							
Common mode 2/ input impedance			+25°C	01	10||5 typical		GΩ||pF
Power supply rejection ratio	PSRR		+25°C	01	100		dB
					115 typical		
Input operating voltage range			+25°C	01	0.05	4.95	V
Reference input.							
Input impedance			+25°C	01	28 typical		kΩ
Voltage range			+25°C	01	-0.2	+5.2	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 5 V, V_{REF} = 2.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier - continued.							
Dynamic performance.							
Bandwidth	BW	G = 1	+25°C	01	2.7 typical		MHz
		G = 2			2.5 typical		
Gain bandwidth	GBW	G = 4 to 128	+25°C	01	7 typical		MHz
Slew rate	SR		+25°C	01	1.1 typical		V/μs
Output characteristics.							
Output voltage high	V_{OH}	R_L = 100 kΩ to ground	+25°C	01	4.9		V
					4.94 typical		
		R_L = 10 kΩ to ground			4.8		
					4.88 typical		
Output voltage low	V_{OL}	R_L = 100 kΩ to 5 V	+25°C	01		100	mV
					60 typical		
		R_L = 10 kΩ to 5 V				200	
					80 typical		
Short circuit current	I_{SC}		+25°C	01	70 typical		mA
Digital interface.							
Input voltage low	V_{IL}		-55°C to +125°C	01		1.0	V
Input voltage high	V_{IH}		-55°C to +125°C	01	4.0		V
Setup time to $\overline{CS}$ high			-55°C to +125°C	01	50		ns
Hold time after $\overline{CS}$ high			-55°C to +125°C	01	20		ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 5 V, V_{REF} = 2.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Operational amplifier.							
Input characteristics.							
Offset voltage	V_{OS}		+25°C	01		15	µV
					5	typical	
Offset voltage temperature drift	ΔV_{OS} / ΔT		-55°C to +125°C	01		0.06	µV/°C
					0.01	typical	
Input bias current	I_{IB}		+25°C	01		500	pA
					250	typical	
			-55°C to +125°C			5	nA
Input offset current	I_{IO}		+25°C	01		100	pA
					20	typical	
			-55°C to +125°C			0.5	nA
Input voltage range	VINR		+25°C	01	0.05	4.95	V
Open loop gain	AOL		+25°C	01	100		V/mV
					120	typical	
Common mode rejection ratio	CMRR		+25°C	01	100		dB
					120	typical	
Power supply rejection ratio	PSRR		+25°C	01	100		dB
					110	typical	
Voltage noise density			+25°C	01	20	typical	nV/$\sqrt{Hz}$
Voltage noise		f = 0.1 Hz to 10 Hz	+25°C	01	0.4	typical	µVp-p
Dynamic performance.							
Gain bandwidth product	GBWP		+25°C	01	1	typical	MHz
Slew rate	SR		+25°C	01	0.5	typical	V/µs

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 3 V, V_{REF} = 1.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier.							
Output characteristics.							
Output voltage high	V_{OH}	R_L = 100 kΩ to ground	+25°C	01	4.9		V
					4.96	typical	
		R_L = 10 kΩ to ground			4.8		
					4.92	typical	
Output voltage low	V_{OL}	R_L = 100 kΩ to 5 V	+25°C	01		100	mV
					60	typical	
		R_L = 10 kΩ to 5 V				200	
					80	typical	
Short circuit current	I_{SC}		+25°C	01	70	typical	mA
Both amplifiers.							
Power supply.							
Quiescent current	I_Q		+25°C	01		5	mA
					4	typical	
Quiescent current (shutdown)			+25°C	01		1	µA
					0.01	typical	
Input offset voltage	V_{OSI}	V_{OS} RTI = V_{OSI} + V_{OSO} / G	+25°C	01		15	µV
					4	typical	
Input offset voltage average temperature drift	ΔV_{OSI} / ΔT	V_{OS} RTI = V_{OSI} + V_{OSO} / G	-55°C to +125°C	01		0.05	µV/°C
					0.01	typical	
Output offset voltage	V_{OSO}	V_{OS} RTI = V_{OSI} + V_{OSO} / G	+25°C	01		30	µV
					15	typical	
Output offset voltage average temperature drift	ΔV_{OSO} / ΔT	V_{OS} RTI = V_{OSI} + V_{OSO} / G	-55°C to +125°C	01		0.5	µV/°C
					0.05	typical	
Input bias current	I_{IB}		+25°C	01		500	pA
					250	typical	
			-55°C to +125°C			5	nA

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 3 V, V_{REF} = 1.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier.							
Input offset current	I_{IO}		+25°C	01		100	pA
					20	typical	
			-55°C to +125°C			0.5	nA
Gains. 1, 2, 4, 8, 16, 32, 64, or 128							
Gain error	AE	G = 1	+25°C	01		0.05	%
		G = 2 to 128				0.8	
Gain drift	AD	G = 1 to 32	-55°C to +125°C	01		10	ppm/°C
					3	typical	
		G = 64				20	
					4	typical	
		G = 128				30	
					10	typical	
Common mode rejection ratio	CMRR	G = 1	+25°C	01	80		dB
		G = 2			86		
		G = 4			92		
		G = 8			98		
		G = 16			104		
		G = 32			110		
		G = 64			110		
		G = 128			110		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 3 V, V_{REF} = 1.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier - continued.							
Noise		$en = \sqrt{(e_{ni}^2 + (e_{no}/G)^2)}$, $+V_{IN}$, $-V_{IN}$ = 2.5 V					
Input voltage noise	e_{ni}	f = 1 kHz	+25°C	01	40 typical		nV / $\sqrt{Hz}$
		f = 1 kHz	-55°C		35 typical		
		f = 1 kHz	+125°C		48 typical		
		f = 0.1 Hz to 10 Hz	+25°C		0.8 typical		μVpp
Output voltage noise	e_{no}	f = 1 kHz	+25°C	01	72 typical		nV / $\sqrt{Hz}$
		f = 1 kHz	-55°C		62 typical		
		f = 1 kHz	+125°C		83 typical		
		f = 0.1 Hz to 10 Hz	+25°C		1.4 typical		μVp-p
Current noise		f = 10 Hz	+25°C	01	20 typical		fA / $\sqrt{Hz}$
Other input characteristics.							
Common mode 2/ input impedance			+25°C	01	10||5 typical		GΩ||pF
Power supply rejection ratio	PSRR		+25°C	01	100		dB
					115 typical		
Input operating voltage range			+25°C	01	0.05	2.95	V
Reference input.							
Input impedance			+25°C	01	28 typical		kΩ
Voltage range			+25°C	01	-0.2	+3.2	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 3 V, V_{REF} = 1.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Instrumentation amplifier - continued.							
Dynamic performance							
Bandwidth	BW	G = 1	+25°C	01	2.7 typical		MHz
		G = 2			2.5 typical		
Gain bandwidth	GBW	G = 4 to 128	+25°C	01	7 typical		MHz
Slew rate	SR		+25°C	01	1.1 typical		V/μs
Output characteristics.							
Output voltage high	V_{OH}	R_L = 100 kΩ to ground	+25°C	01	2.9		V
					2.94 typical		
		R_L = 10 kΩ to ground			2.8		
					2.88 typical		
Output voltage low	V_{OL}	R_L = 100 kΩ to 3 V	+25°C	01		100	mV
					60 typical		
		R_L = 10 kΩ to 3 V				200	
					80 typical		
Short circuit current	I_{SC}		+25°C	01	40 typical		mA
Digital interface.							
Input voltage low	V_{IL}		-55°C to +125°C	01		0.7	V
Input voltage high	V_{IH}		-55°C to +125°C	01	2.3		V
Setup time to $\overline{CS}$ high			-55°C to +125°C	01	60		ns
Hold time after $\overline{CS}$ high			-55°C to +125°C	01	20		ns
Operational amplifier.							
Input characteristics.							
Offset voltage	V_{OS}		+25°C	01		15	μV
					5 typical		
Offset voltage temperature drift	$\Delta V_{OS}/\Delta T$		-55°C to +125°C	01		0.06	μV/°C
					0.01 typical		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 3 V, V_{REF} = 1.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Operational amplifier - continued.							
Input characteristics - continued.							
Input bias current	I_{IB}		+25°C	01		500	pA
					250	typical	
			-55°C to +125°C			5	nA
Input offset current	I_{IO}		+25°C	01		100	pA
					20	typical	
			-55°C to +125°C			0.5	nA
Input voltage range	VINR		+25°C	01	0.05	2.95	V
Open loop gain	AOL		+25°C	01	100		V/mV
					120	typical	
Common mode rejection ratio	CMRR		+25°C	01	100		dB
					120	typical	
Power supply rejection ratio	PSRR		+25°C	01	100		dB
					110	typical	
Voltage noise density			+25°C	01	27	typical	nV/$\sqrt{Hz}$
Voltage noise		f = 0.1 Hz to 10 Hz	+25°C	01	0.6	typical	μVpp
Dynamic performance.							
Gain bandwidth product	GBWP		+25°C	01	1	typical	MHz
Slew rate	SR		+25°C	01	0.5	typical	V/μs
Output characteristics.							
Output voltage high	V_{OH}	R_L = 100 kΩ to ground	+25°C	01	2.9		V
					2.96	typical	
		R_L = 10 kΩ to ground			2.8		
					2.82	typical	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_S = 3 V, V_{REF} = 1.5 V, G = 1, R_L = 10 kΩ, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Both amplifiers.							
Output characteristics - continued.							
Output voltage low	V_{OL}	R_L = 100 kΩ to 3 V	+25°C	01		100	mV
						60 typical	
		R_L = 10 kΩ to 3 V				200	
						80 typical	
Short circuit current	I_{SC}		+25°C	01		40 typical	mA
Power supply							
Quiescent current	I_Q		+25°C	01		4.5	mA
						3.5 typical	
Quiescent current (shutdown)	I_{QSHDN}		+25°C	01		1	μA
						0.01 typical	

1/ Testing and other quality control techniques are used to the extent deemed necessary to assure product performance over the specified temperature range. Product may not necessarily be tested across the full temperature range and all parameters may not necessarily be tested. In the absence of specific parametric testing, product performance is assured by characterization and/or design.

2/ The || symbolizes that the input impedance is being represented as the resistance value is in parallel with the capacitance.

Case X

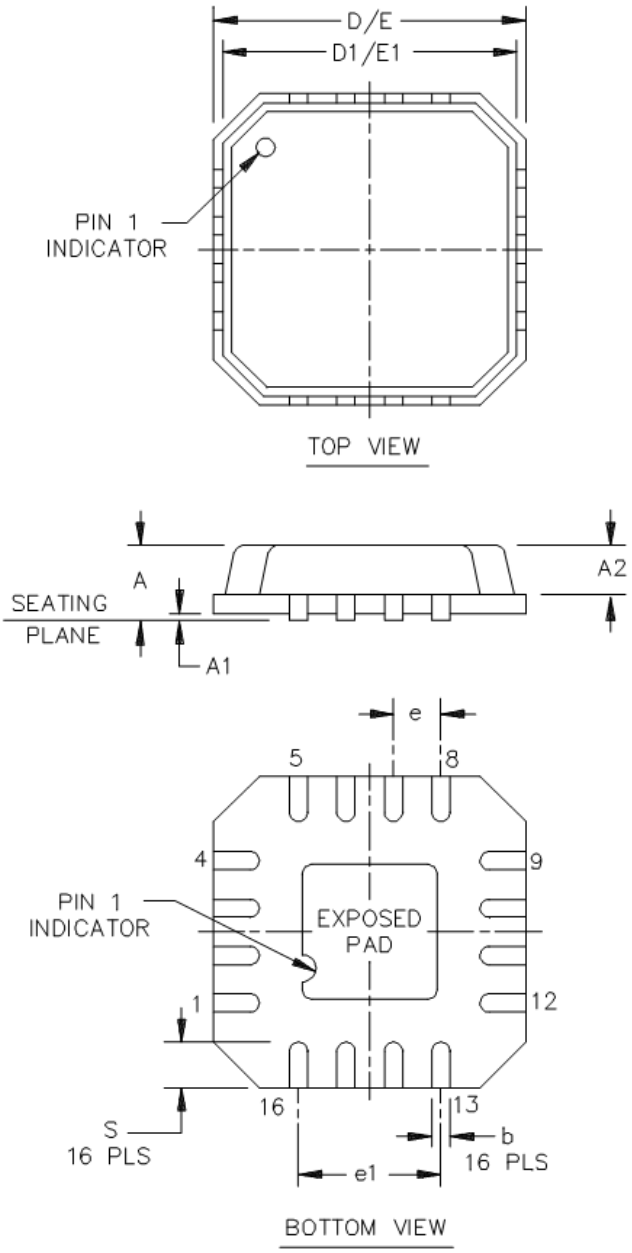

FIGURE 1. Case outlines.

DLA LAND AND MARITIME COLUMBUS, OHIO	SIZE A	CAGE CODE 16236	DWG NO. V62/12646
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Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.031	.039	0.80	1.00
A1	.0007	.001	0.02	0.05
A2	.025	.031	0.65	0.80
b	.009	.013	0.25	0.35
D/E	.157 BSC		4.00 BSC	
D1/E1	.147 BSC		3.75 BSC	
e	.025 BSC		0.65 BSC	
e1	.076	.088	1.95	2.25
s	.019	.029	0.50	0.75

NOTES:
1. Controlling dimensions are millimeter, inch dimensions are given for reference only.
2. For proper connection of the exposed pad, refer to the pin configuration and function descriptions section of the manufacturers datasheet.
3. Falls within reference to JEDEC MO-220-VGGC.

FIGURE 1. Case outlines - Continued.

Case Y

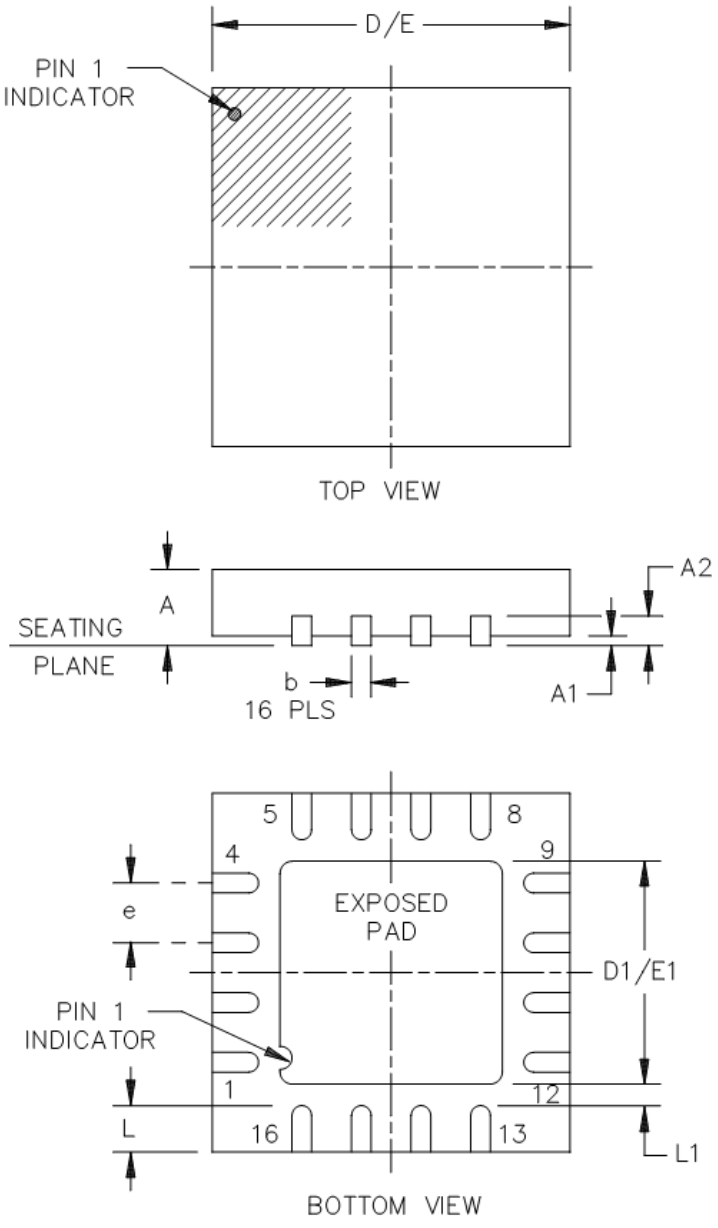

FIGURE 1. Case outlines - Continued.

Symbol	Dimensions					
	Inches			Millimeters		
	Minimum	Nominal	Maximum	Minimum	Nominal	Maximum
A	.027	.029	.031	0.70	0.75	0.80
A1		.0007 NOM	.001		0.02 NOM	0.05
A2	.007 REF			0.20 REF		
b	.009	.011	.013	0.25	0.30	0.35
D/E	.153	.157	.161	3.90	4.00	4.10
D1/E1	.098	.102	.106	2.50	2.60	2.70
e	.025 BSC			0.65 BSC		
L	.013	.015	.017	0.35	0.40	0.45
L1	.007	---	---	0.20	---	---

NOTES:
1. Controlling dimensions are millimeter, inch dimensions are given for reference only.
2. For proper connection of the exposed pad, refer to the pin configuration and function descriptions section of the manufacturer's datasheet.
3. Falls within reference to JEDEC MO-220-WGGC.

FIGURE 1. Case outlines - Continued.

Device type	01	
Case outlines	X and Y	
Terminal number	Terminal symbol	Descriptive
1	NC	No connect. Do not connect to this pin.
2	-IN A (IN-AMP –IN)	Instrumentation amplifier negative input.
3	+IN A (IN-AMP +IN)	Instrumentation amplifier positive input.
4	NC	No connect. Do not connect to this pin.
5	$\overline{SDN}$	Shutdown.
6	+IN B	Operational amplifier positive input.
7	-IN B	Operational amplifier negative input.
8	OUT B (OP AMP OUT)	Operational amplifier output.
9	REF	Instrumentation amplifier reference pin. It should be driven with a low impedance. Output is referred to this pin.
10	OUT A (IN-AMP OUT)	Instrumentation amplifier output.
11	$-V_S$	Negative power supply. Connect to ground in single supply applications.
12	$+V_S$	Positive power supply.
13	$\overline{CS}$	Chip select. Enables digital logic interface.
14	A0	Gain settling bit (LSB).
15	A1	Gain settling bit.
16	A2	Gain setting bit (MSB).
	EPAD	Exposed pad. Can be connected to the negative supply ($-V_S$) or left floating.

FIGURE 2. Terminal connections.

4. VERIFICATION

4.1 Product assurance requirements. The manufacturer is responsible for performing all inspection and test requirements as indicated in their internal documentation. Such procedures should include proper handling of electrostatic sensitive devices, classification, packaging, and labeling of moisture sensitive devices, as applicable.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Preservation, packaging, labeling, and marking shall be in accordance with the manufacturer's standard commercial practices for electrostatic discharge sensitive devices.

6. NOTES

6.1 ESDS. Devices are electrostatic discharge sensitive and are classified as ESDS class 1 minimum.

6.2 Configuration control. The data contained herein is based on the salient characteristics of the device manufacturer's data book. The device manufacturer reserves the right to make changes without notice. This drawing will be modified as changes are provided.

6.3 Suggested source(s) of supply. Identification of the suggested source(s) of supply herein is not to be construed as a guarantee of present or continued availability as a source of supply for the item. DLA Land and Maritime maintains an online database of all current sources of supply at https://landandmaritimeapps.dla.mil/programs/smcr/.

Vendor item drawing administrative control number 1/	Device manufacturer CAGE code	Mode of transportation and quantity	Vendor part number
V62/12646-01XE	24355	Reel, 1500	AD8231TCPZ-EP-R7
V62/12646-01YE	24355	Reel, 1500	AD8231TCPZ-EP-R7

1/ The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation.

CAGE code	Source of supply
24355	Analog Devices Route 1 Industrial Park P.O. Box 9106 Norwood, MA 02062 Point of contact: 20 Alpha Road Chelmsford, MA 01824-4123