

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.24

Vendor item drawing

REV																				
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PMIC N/A	PREPARED BY RICK OFFICER	DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 http://www.landandmaritime.dla.mil/	
Original date of drawing YY-MM-DD 12-12-12	CHECKED BY RAJESH PITHADIA	TITLE MICROCIRCUIT, LINEAR, 1 MHz TO 8 GHz, 70 dB LOGARITHMIC DETECTOR/CONTROLLER, MONOLITHIC SILICON	
	APPROVED BY CHARLES F. SAFFLE		
	SIZE A	CODE IDENT. NO. 16236	DWG NO. V62/12665
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1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance 1 MHz to 8GHz, 70 dB logarithmic detector/controller microcircuit, with an operating temperature range of -55°C to +105°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:

<u>V62/12665</u>	-	<u>01</u>	<u>X</u>	<u>E</u>
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(s).

<u>Device type</u>	<u>Generic</u>	<u>Circuit function</u>
01	AD8318	1 MHz to 8GHz, 70 dB logarithmic detector/controller

1.2.2 Case outline(s). The case outline(s) are as specified herein.

<u>Outline letter</u>	<u>Number of pins</u>	<u>JEDEC PUB 95</u>	<u>Package style</u>
X	16	MO-220-WGGC	Lead frame chip scale package

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

<u>Finish designator</u>	<u>Material</u>
A	Hot solder dip
B	Tin-lead plate
C	Gold plate
D	Palladium
E	Gold flash palladium
Z	Other

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1.3 Absolute maximum ratings. 1/

Supply voltage :

VPSO pin, VPSI pin	5.7 V
ENBL, V _{SET} voltage	0 to V _{POS}
Input power (single ended, reference 50 Ω)	12 dBm
Internal power dissipation (P _D)	0.73 W
Maximum junction temperature range (T _J)	130°C
Storage temperature range (T _{STG})	-65°C to +150°C

1.4 Recommended operating conditions. 2/

Operating free-air temperature range (T _A)	-55°C to +105°C
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1.5 Thermal characteristics.

Thermal resistance, junction to ambient (θ _{JA})	55°C/W
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- 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/ 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.

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2. APPLICABLE DOCUMENTS

JEDEC Solid State Technology Association

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Applications for copies should be addressed to the Electronic Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834 or online at <http://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 outline. The case outline 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.

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TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions <u>2/</u>	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Signal input interface.		INHI pin and INLO pin.					
Specified frequency range			+25°C	01	0.001	8	GHz
DC common mode voltage					V _{POS} – 1.8 typical		V
Measurement mode.		V _{OUT} pin shorted to V _{SET} pin, sinusoidal input signal.					
f = 900 MHz, R _{TADJ} = 500 Ω.							
Input impedance		<u>3/</u>	+25°C	01	957 0.71 typical		Ω pF
±3 dB dynamic range			+25°C	01	65 typical		dB
			-55°C to +105°C		63 typical		
±1 dB dynamic range			+25°C	01	57 typical		dB
Maximum input level		±1 dB error	-55°C to +105°C	01	-1 typical		dBm
Minimum input level		±1 dB error	-55°C to +105°C	01	-58 typical		dBm
Slope			-55°C to +105°C	01	-26	-23	mV/dB
Intercept			-55°C to +105°C	01	19.5	24	dBm
Output voltage - high power in		P _{IN} = -10 dBm	-55°C to +105°C	01	0.7	0.86	V
Output voltage - low power in		P _{IN} = -40 dBm	-55°C to +105°C	01	1.42	1.62	V
Temperature sensitivity		P _{IN} = -10 dBm	+25°C to +105°C	01	0.0071 typical		dB/°C
			-55°C to +25°C		0.0031 typical		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions 2/	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Measurement mode.		V _{OUT} pin shorted to V _{SET} pin, sinusoidal input signal.					
		f = 1.9 GHz, R _{TADJ} = 500 Ω.					
Input impedance		3/	+25°C	01	523 0.68 typical		Ω pF
±3 dB dynamic range			+25°C	01	65 typical		dB
			-55°C to +105°C		63 typical		
±1 dB dynamic range			+25°C	01	57 typical		dB
Maximum input level		±1 dB error	-55°C to +105°C	01	-2 typical		dBm
Minimum input level		±1 dB error	-55°C to +105°C	01	-59 typical		dBm
Slope			-55°C to +105°C	01	-27	-22	mV/dB
Intercept			-55°C to +105°C	01	17	24	dBm
Output voltage - high power in		P _{IN} = -10 dBm	-55°C to +105°C	01	0.63	0.83	V
Output voltage - low power in		P _{IN} = -35 dBm	-55°C to +105°C	01	1.2	1.5	V
Temperature sensitivity		P _{IN} = -10 dBm	+25°C to +105°C	01	0.0056 typical		dB/°C
			-55°C to +25°C		0.0004 typical		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions 2/	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Measurement mode. V _{OUT} pin shorted to V _{SET} pin, sinusoidal input signal.							
f = 2.2 GHz, R _{TADJ} = 500 Ω.							
Input impedance		3/	+25°C	01	391 0.66 typical		Ω pF
±3 dB dynamic range			+25°C	01	65 typical		dB
			-55°C to +105°C		62 typical		
±1 dB dynamic range			+25°C	01	58 typical		dB
Maximum input level		±1 dB error	-55°C to +105°C	01	-2 typical		dBm
Minimum input level		±1 dB error	-55°C to +105°C	01	-60 typical		dBm
Slope			-55°C to +105°C	01	-28	-21.5	mV/dB
Intercept			-55°C to +105°C	01	15	25	dBm
Output voltage - high power in		P _{IN} = -10 dBm	-55°C to +105°C	01	0.63	0.84	V
Output voltage - low power in		P _{IN} = -35 dBm	-55°C to +105°C	01	1.2	1.5	V
Temperature sensitivity		P _{IN} = -10 dBm	+25°C to +105°C	01	0.0052 typical		dB/°C
			-55°C to +25°C		0.0034 typical		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions 2/	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Measurement mode.		V _{OUT} pin shorted to V _{SET} pin, sinusoidal input signal.					
		f = 3.6 GHz, R _{TADJ} = 51 Ω.					
Input impedance		3/	+25°C	01	119 0.7 typical		Ω pF
±3 dB dynamic range			+25°C	01	70 typical		dB
			-55°C to +105°C		61 typical		
±1 dB dynamic range			+25°C	01	58 typical		dB
Maximum input level		±1 dB error	-55°C to +105°C	01	-2 typical		dBm
Minimum input level		±1 dB error	-55°C to +105°C	01	-60 typical		dBm
Slope			-55°C to +105°C	01	-24.3 typical		mV/dB
Intercept			-55°C to +105°C	01	19.8 typical		dBm
Output voltage - high power in		P _{IN} = -10 dBm	-55°C to +105°C	01	0.717 typical		V
Output voltage - low power in		P _{IN} = -40 dBm	-55°C to +105°C	01	1.46 typical		V
Temperature sensitivity		P _{IN} = -10 dBm	+25°C to +105°C	01	0.0012 typical		dB/°C
			-55°C to +25°C		0.009 typical		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions 2/	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Measurement mode.		V _{OUT} pin shorted to V _{SET} pin, sinusoidal input signal.					
		f = 5.8 GHz, R _{TADJ} = 1000 Ω.					
Input impedance		3/	+25°C	01	33 0.59 typical		Ω pF
±3 dB dynamic range			+25°C	01	70 typical		dB
			-55°C to +105°C		62 typical		
±1 dB dynamic range			+25°C	01	57 typical		dB
Maximum input level		±1 dB error	-55°C to +105°C	01	-1 typical		dBm
Minimum input level		±1 dB error	-55°C to +105°C	01	-58 typical		dBm
Slope			-55°C to +105°C	01	-24.3 typical		mV/dB
Intercept			-55°C to +105°C	01	25 typical		dBm
Output voltage - high power in		P _{IN} = -10 dBm	-55°C to +105°C	01	0.86 typical		V
Output voltage - low power in		P _{IN} = -40 dBm	-55°C to +105°C	01	1.59 typical		V
Temperature sensitivity		P _{IN} = -10 dBm	+25°C to +105°C	01	0.019 typical		dB/°C
			-55°C to +25°C		0.0096 typical		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions <u>2/</u>	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Measurement mode.		V _{OUT} pin shorted to V _{SET} pin, sinusoidal input signal.					
		f = 8.0 GHz, R _{TADJ} = 500 Ω.					
±3 dB dynamic range			+25°C	01	60 typical		dB
			-55°C to +105°C		58 typical		
Maximum input level		±1 dB error	-55°C to +105°C	01	3 typical		dBm
Minimum input level		±1 dB error	-55°C to +105°C	01	-55 typical		dBm
Slope			-55°C to +105°C	01	-23 typical		mV/dB
Intercept			-55°C to +105°C	01	37 typical		dBm
Output voltage - high power in		P _{IN} = -10 dBm	-55°C to +105°C	01	1.06 typical		V
Output voltage - low power in		P _{IN} = -40 dBm	-55°C to +105°C	01	1.78 typical		V
Temperature sensitivity		P _{IN} = -10 dBm	+25°C to +105°C	01	0.032 typical		dB/°C
			-55°C to +25°C		0.0078 typical		
Output interface.		V _{OUT} pin.					
Voltage swing		V _{SET} = 0 V, P _{IN} = -10 dBm, <u>4/</u> no load	-55°C to +105°C	01	4.9 typical		V
		V _{SET} = 2.1 V, P _{IN} = -10 dBm, <u>4/</u> no load			25 typical		
Output current drive		V _{SET} = 1.5 V, P _{IN} = -50 dBm	-55°C to +105°C	01	60 typical		mA
Small signal bandwidth	SSBW	P _{IN} = -10 dBm, from CLPF to V _{OUT}	-55°C to +105°C	01	60 typical		MHz
Video bandwidth or envelope bandwidth			-55°C to +105°C	01	45 typical		MHz
Output noise		P _{IN} = 2.2 GHz, -10 dBm, f _{NOISE} = 100 kHz, C _{LPF} = 220 pF	-55°C to +105°C	01	90 typical		nV / √Hz
Fall time	t _F	P _{IN} = off to -10 dBm, 90% to 10%	-55°C to +105°C	01	10 typical		ns
Rise time	t _R	P _{IN} = -10 dBm to off, 10% to 90%	-55°C to +105°C	01	12 typical		ns

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions <u>2/</u>	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
V _{SET} interface.		V _{SET} pin.					
Nominal input range		P _{IN} = 0 dBm, <u>5/</u> measurement mode	-55°C to +105°C	01	0.5 typical		V
		P _{IN} = -65 dBm, <u>5/</u> measurement mode			2.1 typical		
Logarithmic scale factor			-55°C to +105°C	01	-0.04 typical		dB/ mV
Bias current source		P _{IN} = -10 dBm, V _{SET} = 2.1 V	-55°C to +105°C	01	2.5 typical		μA
Temperature reference		TEMP pin					
Output voltage		R _{LOAD} = 10 kΩ	+25°C	01	0.57	0.63	V
Temperature slope		R _{LOAD} = 10 kΩ	-55°C to +105°C	01	2 typical		mV/ °C
Source current			+25°C	01	10 typical		mA
Sink current			+25°C	01	0.1 typical		mA
Power down interface		ENBL pin					
Logic level to enable to enable device			-55°C to +105°C	01	1.7 typical		V
ENBL current when enabled		ENBL = 5 V	-55°C to +105°C	01	<1 typical		μA
ENBL current when disabled		ENBL = 0 V, sourcing	-55°C to +105°C	01	15 typical		μA

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions <u>2/</u>	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Power interface.		VPSI pins, VPSO pin.					
Supply voltage			-55°C to +105°C	01	4.5	5.5	V
Quiescent current		ENBL = 5 V	-55°C to +105°C	01	50	82	mA
Quiescent current versus temperature			-55°C to +105°C	01	150 typical		μA/ °C
Supply current when disabled		ENBL = 0 V, total currents for VPSI and VPSO	-55°C to +105°C	01	260 typical		μA
Supply current when disabled versus temperature			-55°C to +105°C	01	350 typical		μA

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/ Unless otherwise specified, V_{POS} = 5 V, C_{LPF} = 220 pF, T_A = 25C, and 52.3 Ω termination resistor at INHI.

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

4/ Controller mode.

5/ Gain = 1. For other gains, see the device datasheet.

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Case X

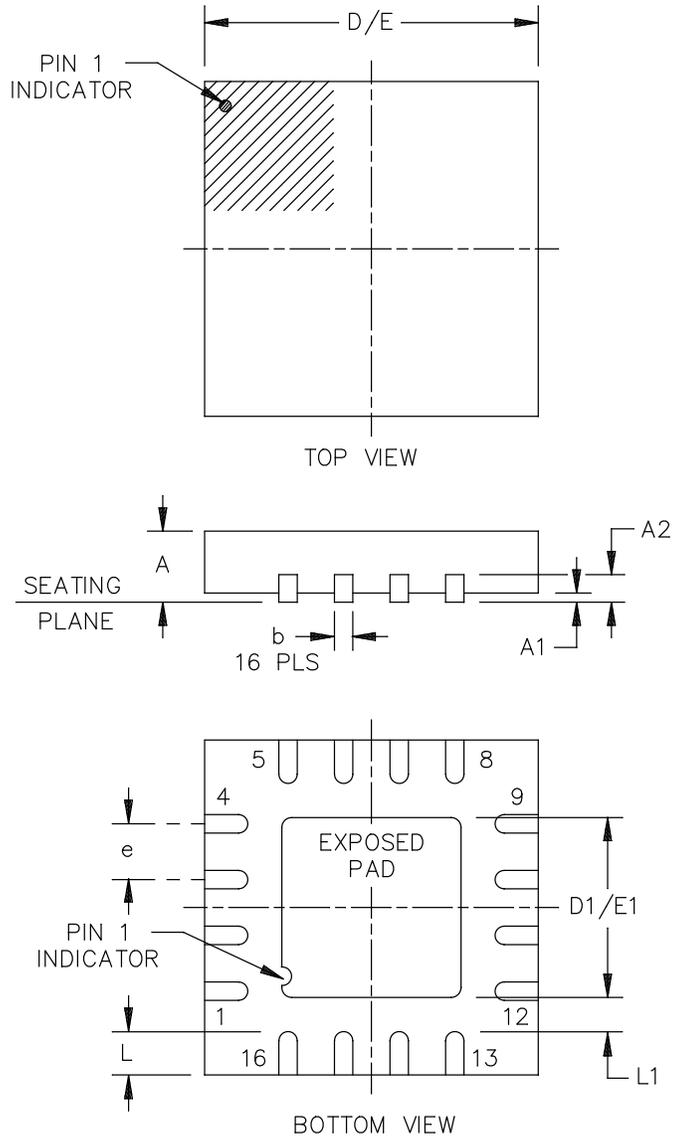


FIGURE 1. Case outline.

<p>DLA LAND AND MARITIME COLUMBUS, OHIO</p>	<p>SIZE A</p>	<p>CODE IDENT NO. 16236</p>	<p>DWG NO. V62/12665</p>
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Case X

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.027	.031	0.70	0.80
A1	.0007	.001	0.02	0.05
A2	.007 REF		0.20 REF	
b	.009	.013	0.25	0.35
D/E	.153	.161	3.90	4.10
D1/E1	.076	.088	1.95	2.25
e	.025 BSC		0.65 BSC	
L	.019	.027	0.50	0.70
L1	.009	---	0.25	---

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..
4. Falls within reference to JEDEC MO-220-WGGC.

FIGURE 1. Case outline - Continued.

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Device type	01
Case outline	X
Terminal number	Terminal symbol
1	CMIP
2	CMIP
3	VPSI
4	VPSI
5	CLPF
6	V _{OUT}
7	V _{SET}
8	CMOP
9	VPSO
10	TADJ
11	CMIP
12	CMIP
13	TEMP
14	INHI
15	INLO
16	ENBL

NOTE. The exposed pad is internally connected to CMIP (soldered to ground)

FIGURE 2. Terminal connections.

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Terminal symbol	Description
CMIP	Device common (input system ground).
VPSI	Positive supply voltage (input system): 4.5 V to 5.5 V. Voltage on both VPSI pins and VPSO pin should be equal.
CLPF	Loop filter capacitor.
V _{OUT}	Measurement and controller output.
V _{SET}	Setpoint input for controller mode or feedback input for measurement mode.
CMOP	Device common (output system ground).
VPSO	Positive supply voltage (output system): 4.5 V to 5.5 V. Voltage on both VPSI pins and VPSO pin should be equal.
TADJ	Temperature compensation adjustment.
TEMP	Temperature sensor output.
INHI	RF input. Nominal input range: -60 dBm to 0 dBm (reference 50 Ω), ac coupled.
INLO	RF common for INHI. AC coupled RF common.
ENBL	Device enable. Connect to VPSI for normal operation. Connect pin to ground for disable mode.
Exposed pad	The exposed pad is internally connected to CMIP (solder to ground).

FIGURE 2. Terminal connections - Continued.

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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 <http://www.landandmaritime.dla.mil/Programs/Smcr/>.

Vendor item drawing administrative control number <u>1/</u>	Device manufacturer CAGE code	Vendor part number
V62/12665-01XE	24355	AD8318SCPZ-EP

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

CAGE code

24355

Source of supply

Analog Devices
 Route 1 Industrial Park
 P.O. Box 9106
 Norwood, MA 02062
 Point of contact: Raheen Business Park
 Limerick, Ireland

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