ANALOG DEVICES

Integrated Circuit True RMS-to-DC Converter

AD536A

1.1 Scope.

This specification covers the detail requirements for a complete monolithic integrated circuit which performs true rms-to-dc conversion with the following transfer function:

$$V_{OUT} = \sqrt{AVG.(V_{IN})^2}$$

1.2 Part Number.

The complete part number per Table 1 of this specification is as follows:

Device	Part Number[1]
−1	AD536AS(X)/883B

NOTE
[1]See paragraph 1.2.3 for package identifier.

1.2.3 Case Outline.

See Appendix 1 of General Specification ADI-M-1000 package outline:

(X)	Package	Description
D	D-14	14-Pin DIP
H	H-10A	10-Pin Metal Package
E	E-20A	20-Pin Leadless Chip Carrier
Q	Q-14	14-Pin Cerdip

1.3 Absolute Maximum Ratings. (T_A = +25°C unless otherwise noted)

Supply Voltage	±18V
Input Voltage	±25V
Internal Power Dissipation	700mW
Output Short Circuit Duration	Indefinite
Rated Operating Temperature Range	−55°C to +125°C
Storage Temperature Range	−65°C to +150°C
Lead Temperature (Soldering 10sec)	+300°C

1.5 Thermal Characteristics.

Thermal Resistance θ_{JC} = 25°C/W for H-10A
θ_{JA} = 150°C/W for H-10A
θ_{JC} = 25°C/W for D-14, E-20A
θ_{JA} = 95°C/W for D-14, E-20A
θ_{JC} = 30°C/W for Q-14
θ_{JA} = 110°C/W for Q-14

Table 1.

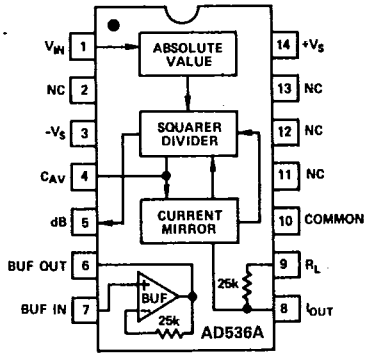
Test	Symbol	Device	Design Limit @ +25°C	Sub Group 1	Sub Group 2, 3	Sub Group 4	Test Condition[1]	Units
Total Error	E_T	−1	5	5			V_{IN} = ±300mV to ±10V	±mV +
		−1	0.5	0.5				±% of Reading. max
Total Error vs. Temperature 70°C to 125°C	dE_T/dT	−1	0.3		0.3		V_{IN} = ±300mV to ±10V	±mV +
		−1	0.005		0.005			±% of Reading/°C. max
Total Error vs. Temperature T_{min} to 70°C	dE_T/dT	−1	0.1		0.1		V_{IN} = ±300mV to ±10V	±mV +
		−1	0.005		0.005			±% of Reading/°C. max
Input Resistance	R_I	−1	13.33					kΩ min to max
		−1	20.87					
Input Offset Voltage	V_{OSI}	−1	2					±mV max
Buffer Output Offset Voltage	V_{OSO}	−1	2	2			I_{OUT} to BUF_{IN}, V_{IN} = 0V	±mV max
Buffer Output Offset Drift	$\Delta V_{OS}/\Delta T$	−1	0.2		0.2		I_{OUT} to BUF_{IN}, V_{IN} = 0V	±mV/°C max
Buffer Output Voltage Swing	V_{OP}	−1	+11	+11			I_{OUT} to BUF_{IN}	V min + Output Only
Buffer Output Current	I_{OUT}	−1	5					mA min
Buffer Output Resistance	R_{OUT}	−1	0.5					Ω max
dB Output Error	E_{dB}	−1	0.6	0.6			±7mV≤V_{IN}≤+7V	±dB max
I_{REF} for 0dB = 1Vrms	I_{REF0}	−1	5	5				µA min to max
		−1	80	80				
I_{REF} Range	I_{REF}	−1	1					µA min to max
		−1	100					
Buffer Input Offset Voltage	V_{OSO}	−1	4	4			R_S = 25kΩ	±mV max
Buffer Input Bias Current	I_{IB}	−1	60	60				nA max
Power Supply Range, Dual Supply	V_S	−1	3					±V min to max
		−1	18	18				
Power Supply Range, Single Supply	V_S	−1	5					V min to max
		−1	36	36				
Quiescent Current	I_Q	−1	2	2	2		±5V≤V_S≤±18V	mA max

NOTE
[1]T_A = +25°C and V_S = ±15V dc, unless otherwise specified.

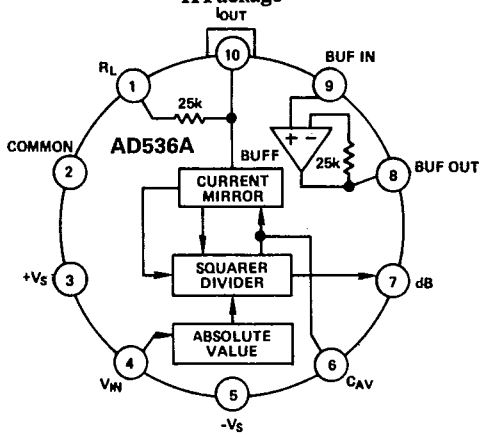
3.2.1 Functional Block Diagram and Terminal Assignments.

Top View

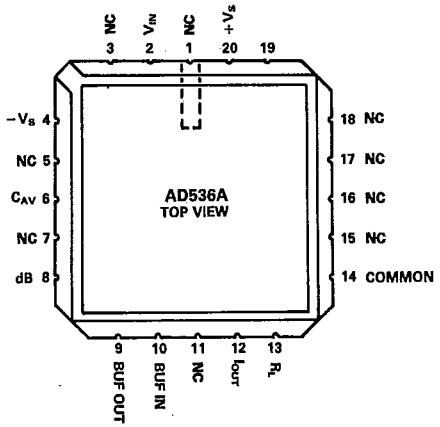
D and Q Packages



H Package



E Package



3.2.4 Microcircuit Technology Group.

This microcircuit is covered by technology group (49).

4.2.1 Life Test/Burn-In Circuit.

Steady state life test is per MIL-STD-883 Method 1005. Burn-in is per MIL-STD-883 Method 1015 test condition (B).