ANALOG DEVICES

Low Cost, High Speed 12-Bit Monolithic D/A Converter

AD566A

T-51-09-12

1.1 Scope.

This specification covers the detail requirements for a precision, high speed current output 12-bit resolution D/A converter.

1.2 Part Number.

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

Device	Part Number
−1	AD566ASD/883B
−2	AD566ATD/883B

1.2.3 Case Outline.

See Appendix 1 of General Specification ADI-M-1000: package outline: D-24.

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

V_{EE} to Power Ground	0 to −18V
Voltage on DAC Output (Pin 9)	−3V to +12V
Digital Inputs (Pins 13 to 24) to Power Ground	−1.0V to +7.0V
Ref In to Reference Ground	±12V
Bipolar Offset to Reference Ground	±12V
10V Span R to Reference Ground	±12V
20V Span R to Reference Ground	±24V
Power Dissipation	1000mW
Storage Temperature Range	−65°C to +150°C
Lead Temperature Range (Soldering 10sec)	+300°C

1.5 Thermal Characteristics.

Thermal Resistance θ_{JC} = 25°C/W
θ_{JA} = 48°C/W

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Test	Symbol	Device	Design Limit @ +25°C	Sub Group 1	Sub Group 2, 3	Sub Group 4	Test Condition[1]	Units
Relative Accuracy	RA	–1	1/2	1/2	3/4		All Bits with Positive Errors On. All Bits with Negative Errors On.	± LSB max
		–2	1/4	1/2	1/2	1/4		
Differential Nonlinearity	DNL	–1	3/4	3/4	1		Major Transitions	± LSB max
		–2	1/2	3/4	1	1/2		
Gain Error	A_E	–1, 2	0.25	0.25			R_{REF} = 50Ω Fixed	± % of FS max
Gain Error Temperature	TC_{AE}	–1			10			± ppm of FS/°C max
		–2			5			
Offset Error	V_{OS}	–1, 2	0.05	0.05				± % of FS max
Offset Error Temperature Coefficient	TCV_{OS}	–1, 2			2			± ppm of FS/°C max
Bipolar Zero Error[2]	B_{PZE}	–1	0.15	0.15			R_{BO} = 50Ω Fixed	± % of FS max
		–2	0.10	0.15		0.10		
B/P Zero Error[2] Temperature Coefficient	TCB_{PZE}	–1, 2			10			± ppm of FS/°C max
Input Resistance	R_{IN}	–1, 2	15					kΩ min
			25					kΩ max
Full Scale Transition	t_{FS}	–1, 2	30				10% to 90% Delay Plus Rise Time	ns max
			50				90% to 10% Delay Plus Fall Time	
Output Current Settling Time	t_{SL}	–1, 2	350					ns max
Compliance Voltage	CV	–1, 2	1.5				–55°C to +125°C	–V min
			10					+V max
Output Resistance	R_{OUT}	–1, 2	6				Exclusive of Span Resistors	kΩ min
			10					kΩ max
Output Current	I_{OUT}	–1, 2	1.6	1.6			Unipolar (All Bits On)	–mA min
			2.4	2.4				–mA max
			0.8	0.8			Bipolar (All Bits On)	–mA min
			1.2	1.2				–mA max
Power Supply Rejection Ratio[3]	PSRR	–1, 2	25	25				± ppm of FS/% max
Power Supply Current[3]	I_{EE}	–1, 2	18	18				–mA max
Power Dissipation	P_D	–1, 2	300	300				mW max
Digital Input High Voltage	V_{IH}	–1, 2	2.0	2.0				+V min
			5.5	5.5				+V max
Digital Input Low Voltage	V_{IL}	–1, 2	0.8	0.8				+V max
Digital Input High Current	I_{IH}	–1, 2	300	300			V_{IH} = 5.5V	+μA max
Digital Input Low Current	I_{IL}	–1, 2	100	100			V_{IL} = 0V	+μA max

NOTES
[1]V_{EE} = –15V, V_{IH} = 2.0V, V_{IL} = 0.8V, T_A = +25°C unless otherwise indicated.
V_{IH} = 2.0V, V_{IL} = 0.8V guaranteed design limits at –55°C to +125°C.
[2]MSB on; all other bits off.
[3]Guaranteed for $-11.4 \geq V_{EE} \geq -16.5$V.

Table 1.

REV. B

3.2.1 Functional Block Diagram and Terminal Assignments.

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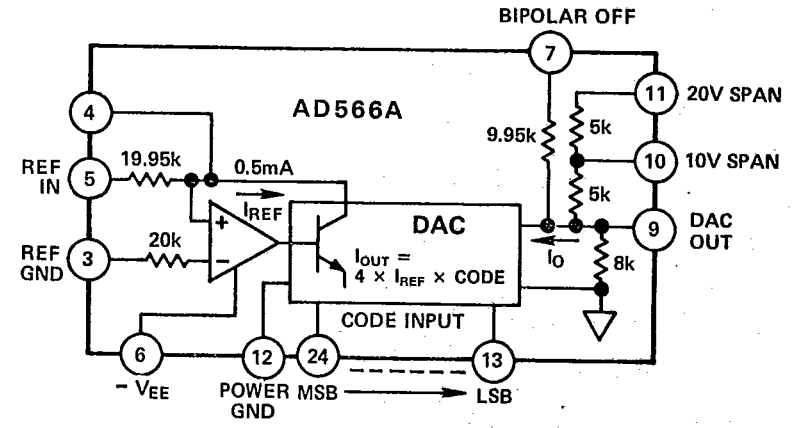

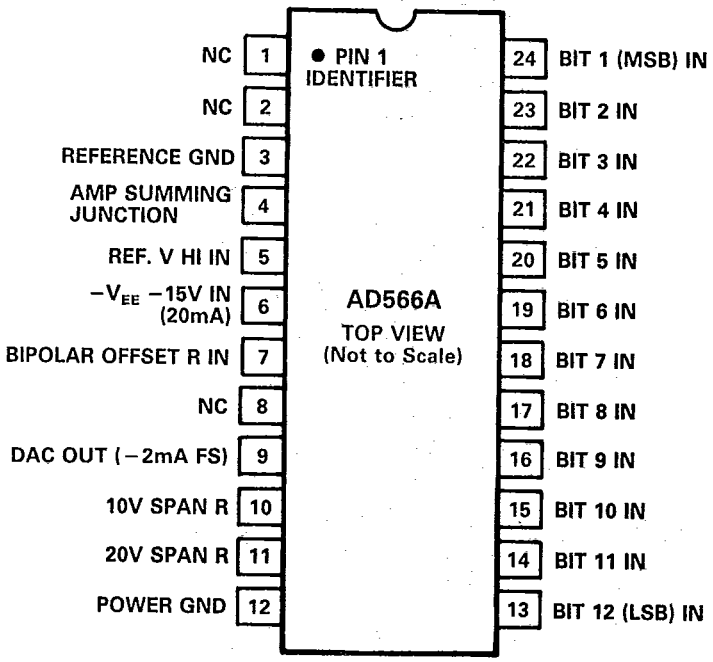

3.2.4 Microcircuit Technology Group.

This microcircuit is covered by technology group (56).

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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).