

1.1 Scope.

This specification covers the detail requirements for a monolithic 12-bit, 2 MHz A/D converter.

1.2 Part Number.

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

Device	Part Number
-1	AD671SD-500/883B
-2	AD671SD-750/883B

1.2.3 Case Outline.

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

Package	Description
D-24A	24-Lead Side Brazed Ceramic DIP (Single Width)

1.3 Absolute Maximum Ratings. ($T_A = +25^\circ\text{C}$ unless otherwise noted)

V_{CC} to ACOM	-0.5 V to +6.5 V
V_{EE} to ACOM	-6.5 V to +0.5 V
V_{LOGIC} to DCOM	-0.5 V to +6.5 V
ACOM to DCOM	-1 V to +1 V
V_{CC} to V_{LOGIC}	-6.5 V to +6.5 V
ENCODE to DCOM	-0.5 V to $V_{LOGIC} + 0.5$ V
REF IN to ACOM	-0.5 V to $V_{CC} + 0.5$ V
AIN, BPO/UPO to ACOM	-6.5 V to +11 V
Power Dissipation	1000 mW
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Lead Temperature (Soldering 10 sec)	$+300^\circ\text{C}$

1.5 Thermal Characteristics.

Thermal Resistance $\theta_{JC} = 25^\circ\text{C}/\text{W}$
 $\theta_{JA} = 80^\circ\text{C}/\text{W}$

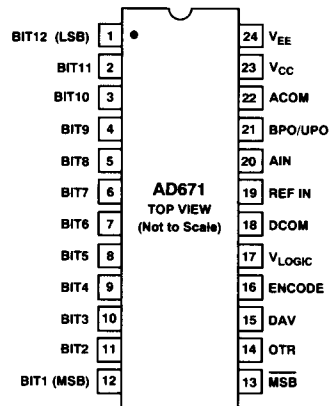
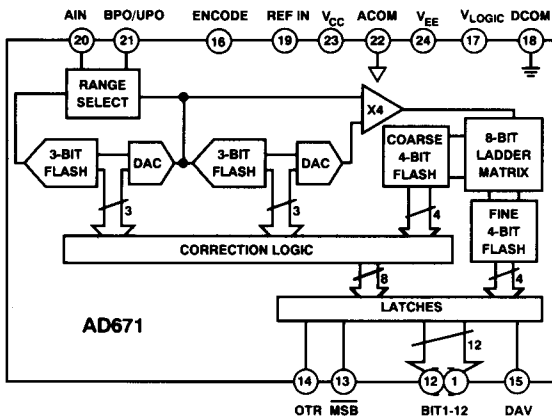
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Table 1.

Test	Symbol	Device	Design Limit @ +25°C	Sub Group 1	Sub Group 2, 3	Test Condition	Units
Resolution	RES	-1, 2	12	12	12		Bits
Integral Nonlinearity	INL	-1, 2	4	4	4	All Codes Histogram Test	±LSB
			2.5	2.5	2.5		
Differential Nonlinearity	DNL	-1, 2	10	10	10	All Codes Histogram Test	Bits
			11	11	11		
Unipolar Offset Error	V _{OSE}	-1, 2	4	4		5 V, 10 V Span	±LSB
Unipolar Offset Drift	TC _{VOS}	-1, 2	10		10	5 V, 10 V Span	±ppm/°C
Gain Error	A _E	-1, 2	0.25	0.25		Unipolar & Bipolar	% FSR
Gain Drift	TC _A	-1, 2	20		20	Unipolar & Bipolar	±ppm/°C
Bipolar Zero	B _{POE}	-1, 2	10	10		±5 V Mode	±LSB
Bipolar Zero Drift	TC _{BPO}	-1, 2	15		15	±5 V Mode	±ppm/°C
Analog Input Ranges	V _{IN}	-1, 2	5	5	5		V Unipolar
			10	10	10		
			5	5	5		±V Bipolar
Input Resistance (5 V Range)	R _{IN5}	-1, 2	0.5				kΩ min
			1				kΩ max
Input Resistance (10 V Range)	R _{IN10}	-1, 2	1				kΩ min
			2				kΩ max
Reference Input Resistance	R _{REF}	-1, 2	2.4				kΩ min
			4.7				kΩ max
Input Capacitance	C _{IN}	-1, 2	10				pF
Power Dissipation	P _D	-1, 2	621	621	621		mW
Power Supply Current	I _{CC}	-1, 2	56	56	56	Tested Under Static Conditions	mA max
	I _{EE}		56	56	56		-mA min
	I _{DD}		6	6	6		mA max
Operating Voltage Range	V _{CC}	-1, 2	4.75 5.25				V min V max
	V _{EE}		4.75 5.25				-V max -V min
	V _{DD}		4.5 5.5				V min V max
PSRR	V _{CC}	-1, 2	1	1	1	Full-Scale Change Measured	±LSB
	V _{EE}		1	1	1		
	V _{DD}		1	1	1		
Input Logic Levels	V _{IH}	-1, 2	2	2	2	Encode Input	V min
	V _{IL}		0.8	0.8	0.8		V max
Input Logic Currents	I _{IH}	-1, 2	10	10	10	Encode Input	±μA
	I _{IL}		10	10	10		
Logic Outputs	V _{OH}	-1, 2	2.4	2.4	2.4	I _{OH} = 500 μA	V min
	V _{OL}		0.4	0.4	0.4	I _{OL} = -1.6 mA	V max
	I _{OH}		500	500	500		μA
	I _{OL}		1.6	1.6	1.6		-mA

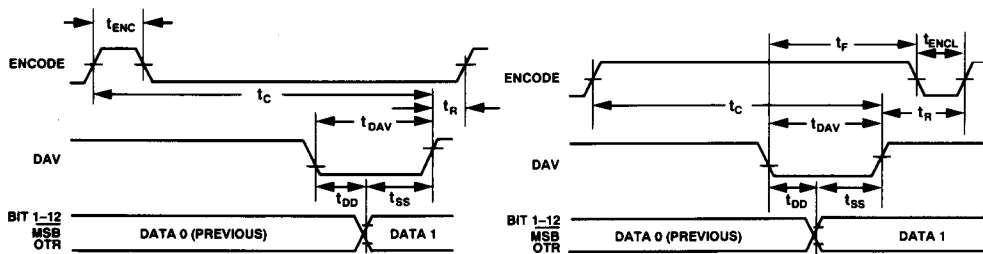
Test	Symbol	Device	Design Limit @ +25°C	Sub Group 9	Sub Group 10, 11	Test Condition	Units
Conversion Time	T_{CONV}	-1	500	500	500		ns max
		-2	750	750	750		ns max
Encode Width High (Short Encode)	t_{ENC}	-1, 2	20			See Figure 1a	ns min
		-1	30	30	30		ns max
		-2	50	50	50		ns max
Encode Width Low (Long Encode)	t_{ENCL}	-1, 2	20			See Figure 1b	ns min
DAV Width	t_{DAV}	-1, 2	75	75	75		ns min
		-1	200	200	200		ns max
		-2	300	300	300		ns max
Encode Falling Edge Delay	t_F	-1, 2	0				ns min
Start New Conversion Delay	t_R	-1, 2	0				ns min
Data Update Delay from DAV ↓	t_{DD}	-1, 2	20	20	20		ns min
Data Update Delay from DAV ↑	t_{SS}	-1, 2	20	20	20		ns min

3.2.1 Functional Block Diagram and Terminal Assignments



3.2.4 Microcircuit Technology Group

This circuit is covered by technology group (93).



a. Encode Pulse HIGH

b. Encode Pulse LOW

Figure 1. AD671 Timing Diagram

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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).

