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DAC/ADC
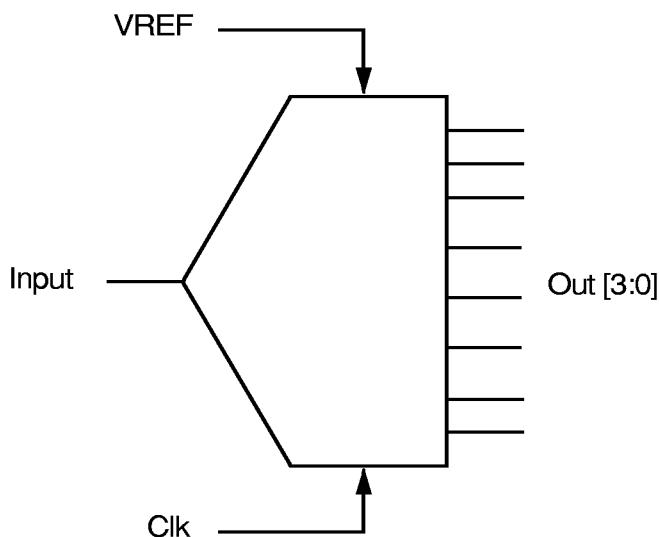
ADC04R01
3.0V to +3.6V, 4-Bit 44 MSPS, Flash ADC

AMI 0.8 micron CMOS

Features

• 44 MSPS

• 4-bit unsigned binary output

• Analog supply voltage 3.0V to 3.6V

Functional Block Diagram

VREF

Input

Out [3:0]

Clk

Note: AVDD: Nominal 3.3V (3.0 to 3.6V).
   AVSS: Analog ground.
   Input: 11MHz bandlimted signal with a 750mV DC offset and a 1V peak to
   peak full scale amplitude.
   CK: 44MHz sampling clock.
   Vref: Nominal 1.5V analog reference.
   OUT[3:0]: ADC conversion results. Unsigned binary output.

General Descripton

The flash ADC04R01 is intended to oversample an 11MHz bandlimted signal with a 750mV DC offset and a 1V peak to peak amplitude. The conversion range is .25V to 1.25V with 62.5mV steps. A nominal 1.5V external reference and a 44MHz sampling clock are required.

Applications

• Fast data acquisition

• Instrumentation

• DSP control loop

• Audio processing

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Electrical Characteristics

PARAMETER	TEMP	MIN	TYP	MAX	UNITS
RESOLUTION					Bits

DC ACCURACY
  Differential Linearity
  Integral Linearity
 	
  No Missing Codes
	+25°C
	+25°C
	Full
			Guaranteed		LSB
					LSB
					LSB

INITIAL OFFSET ERROR
  Top of Reference Ladder
  Bottom of Reference Ladder
  Offset Drift Coefficient
	+25°C
	+25°C
					LSB
					LSB
					LSB
					uV/°C

ANALOG INPUT
  Input Bias Current (latched)
  Input Bias Current (sampling)
  Input Resistance
  Input Capacitance
  Large Signal Bandwidth
  Input Slew Rate
					uA
					uA
					k Ohm
					pF
					Hz
					V/ms

REFERENCE INPUT
  Reference Ladder Resistance
  Reference Input Bandwidth
	+25°C
	+25°C
					Ohm
					MHz

DYNAMIC PERFORMANCE
  Conversion Rate
  Output Delay (t_{PD})
  Transient Response
  Overvoltage Recovery Time
  Output Rise Time
  Output Fall Time
	
	+25°C
	+25°C
	+25°C
	+25°C
				44	MSPS
					ns
					ns
					ns
					ns
					ns

ENCODE INPUT
  Logic "1" Voltage
  Logic "0" Voltage
  Logic "1" Current
  Logic "0" Current
  Input Capacitance
  Encode Pulse Width (Low)
  Encode Pulse Width (High)
	
	+25°C
	+25°C
					V
					V
					mA
					mA
					pF
					ns
					ns

OVERFLOW INHIBIT INPUT 0 V Input Current	Full				mA
AC LINEARITY Effective Number of Bits (ENOB)					Bits

Continued

PARAMETER	TEMP	MIN	TYP	MAX	UNITS
In-Band Harmonics					
dc to X.X MHz					dB
dc to X.X MHz					dB
dc to X.X MHz					dB
Signal-to-Noise + Distortion (S/(N+D))			24.5		dB
Intermodulation Distortion IMD[1]			-37		dB
Spurious Free Dynamic Range (SFDR)		-50 @ 5MHz input tone		-30 @ 5MHz input tone	dB
Total Harmonic Distortion (THD)[3]					dB

PARAMETER	TEMP	MIN	TYP	MAX	UNITS
POWER SUPPLY					
Operating Voltage					
AV_{DD}					Volts
AV_{SS}					Volts
VREF			1.5		V
Operating Current					
IA_{DD} [2]			12		mA
ID_{DD}					mA
Standby Mode					mA
POWER CONSUMPTION					
Operating Mode					mA
Standby Mode					mA

Notes: [1] 5.5 & 6 MHz two tone test. [2] 44 MHz sampling rate. [3] 5MHz input tone.

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Absolute Maximum Ratings

PARAMETERS		
Supply Voltage (–VS)		V
Analog-to-Digital Supply Voltage Differential		V
Analog Input Voltage		V
Digital Input Voltage		V
Reference Input Voltage (+VREF – VREF)		V
Differential Reference Voltage		V
Reference Midpoint Current		mA
Digital Output Current		mA
Operating Temperature Range		°C
Storage Temperature Range		°C
Junction Temperature		°C
Lead Soldering Temperature (10 Sec.)		°C

Recommended Operating Conditions

PARAMETERS	INPUT VOLTAGE		
	MIN	NOMINAL	MAX
–VS			
+VREF			
–VREF			
Analog Input			

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