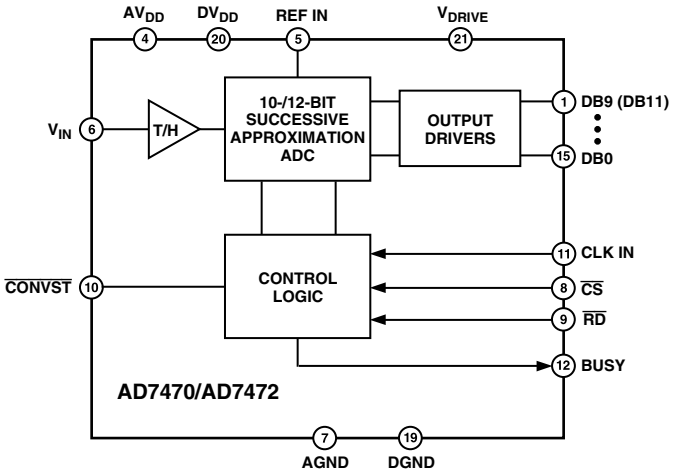
1.75 MSPS, 4 mW 10-Bit/12-Bit Parallel ADCs

AD7470/AD7472

FEATURES

Specified for V_{DD} of 2.7 V to 5.25 V
1.75 MSPS for AD7470 (10-Bit)
1.5 MSPS for AD7472 (12-Bit)
Low Power
AD7470: 3.34 mW Typ at 1.5 MSPS with 3 V Supplies
7.97 mW Typ at 1.75 MSPS with 5 V Supplies
AD7472: 3.54 mW Typ at 1.2 MSPS with 3 V Supplies
8.7 mW Typ at 1.5 MSPS with 5 V Supplies
Wide Input Bandwidth
70 dB Typ SNR at 500 kHz Input Frequency
Flexible Power/Throughput Rate Management
No Pipeline Delays
High Speed Parallel Interface
Sleep Mode: 50 nA Typ
24-Lead SOIC and TSSOP Packages

FUNCTIONAL BLOCK DIAGRAM



AD7470 IS A 10-BIT PART WITH DB0 TO DB9 AS OUTPUTS.
AD7472 IS A 12-BIT PART WITH DB0 TO DB11 AS OUTPUTS.

GENERAL DESCRIPTION

The AD7470/AD7472 are 10-bit/12-bit high speed, low power, successive approximation ADCs. The parts operate from a single 2.7 V to 5.25 V power supply and feature throughput rates up to 1.5 MSPS for the 12-bit AD7472 and up to 1.75 MSPS for the 10-bit AD7470. The parts contain a low noise, wide bandwidth track-and-hold amplifier that can handle input frequencies in excess of 1 MHz.

The conversion process and data acquisition are controlled using standard control inputs, allowing easy interfacing to microprocessors or DSPs. The input signal is sampled on the falling edge of $\overline{\text{CONVST}}$, and conversion is also initiated at this point. BUSY goes high at the start of conversion and goes low 531.66 ns after falling edge of $\overline{\text{CONVST}}$ (AD7472 with a clock frequency of 26 MHz) to indicate that the conversion is complete. There are no pipeline delays associated with the parts. The conversion result is accessed via standard $\overline{\text{CS}}$ and $\overline{\text{RD}}$ signals over a high speed parallel interface.

The AD7470/AD7472 use advanced design techniques to achieve very low power dissipation at high throughput rates. With 3 V supplies and 1.5 MSPS throughput rates, the AD7470 typically consumes, on average, just 1.1 mA. With 5 V supplies and 1.75 MSPS, the average current consumption is typically 1.6 mA. The part also offers flexible power/throughput rate management. Operating the AD7470 with 3 V supplies and 500 kSPS throughput reduces the current consumption to 713 μA. At 5 V supplies and 500 kSPS, the part consumes 944 μA.

It is also possible to operate the parts in an auto sleep mode, where the part wakes up to do a conversion and automatically enters sleep mode at the end of conversion. This method allows very low power dissipation numbers at lower throughput rates. In this mode, the AD7472 can be operated with 3 V supplies at 100 kSPS, and consume an average current of just 124 μA. At 5 V supplies and 100 kSPS, the average current consumption is 171 μA.

The analog input range for the part is 0 V to REF IN. The 2.5 V reference is applied externally to the REF IN pin. The conversion rate is determined by the externally-applied clock.

PRODUCT HIGHLIGHTS

1. High Throughput with Low Power Consumption. The AD7470 offers 1.75 MSPS throughput and the AD7472 offers 1.5 MSPS throughput rates with 4 mW power consumption.
2. Flexible Power/Throughput Rate Management. The conversion rate is determined by an externally-applied clock allowing the power to be reduced as the conversion rate is reduced. The part also features an auto sleep mode to maximize power efficiency at lower throughput rates.
3. No Pipeline Delay. The part features a standard successive approximation ADC with accurate control of the sampling instant via a $\overline{\text{CONVST}}$ input and once off conversion control.

REV. B

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AD7470–SPECIFICATIONS[1] (V_{DD} = 2.7 V to 5.25 V[2], REF IN = 2.5 V, f_{CLKIN} = 30 MHz @ 5 V and 24 MHz @ 3 V; $T_A = T_{MIN}$ to T_{MAX}[3], unless otherwise noted.)

Parameter	A Version[1]		Unit	Test Conditions/Comments
DYNAMIC PERFORMANCE	**5 V**	**3 V**		f_S = 1.75 MSPS @ 5 V, f_S = 1.5 MSPS @ 3 V
Signal to Noise + Distortion (SINAD)	60	60	dB min	f_{IN} = 500 kHz Sine Wave
	60	60	dB min	f_{IN} = 100 kHz Sine Wave
Signal-to-Noise Ratio (SNR)	60	60	dB min	f_{IN} = 500 kHz Sine Wave
	60	60	dB min	f_{IN} = 100 kHz Sine Wave
Total Harmonic Distortion (THD)	–83	–83	dB typ	f_{IN} = 500 kHz Sine Wave
	–75	–75	dB max	f_{IN} = 100 kHz Sine Wave
Peak Harmonic or Spurious Noise (SFDR)	–85	–85	dB typ	f_{IN} = 500 kHz Sine Wave
	–75	–75	dB max	f_{IN} = 100 kHz Sine Wave
Intermodulation Distortion (IMD)				
Second-Order Terms	–79	–75	dB typ	f_{IN} = 500 kHz Sine Wave
	–75	–75	dB max	f_{IN} = 100 kHz Sine Wave
Third-Order Terms	–77	–75	dB typ	f_{IN} = 500 kHz Sine Wave
	–75	–75	dB max	f_{IN} = 100 kHz Sine Wave
Aperture Delay	5	5	ns typ	
Aperture Jitter	15	15	ps typ	
Full Power Bandwidth	20	20	MHz typ	@ 3 dB
DC ACCURACY				f_S = 1.75 MSPS @ 5 V; f_S = 1.5 MSPS @ 3 V
Resolution	10	10	Bits	
Integral Nonlinearity	±1	±1	LSB max	
Differential Nonlinearity	±0.9	±0.9	LSB max	Guaranteed No Missed Codes to 10 Bits
Offset Error	±2.5	±2.5	LSB max	
Gain Error	±1	±1	LSB max	
ANALOG INPUT				
Input Voltage Ranges	0 to REF IN	0 to REF IN	V	
DC Leakage Current	±1	±1	µA max	
Input Capacitance	33	33	pF typ	
REFERENCE INPUT				
REF IN Input Voltage Range	2.5	2.5	V	±1% for Specified Performance
DC Leakage Current	±1	±1	µA max	
Input Capacitance	10/20	10/20	pF typ	Track-and-Hold Mode
LOGIC INPUTS				
Input High Voltage, V_{INH}	2.4	2.4	V min	
Input Low Voltage, V_{INL}	0.4	0.4	V max	
Input Current, I_{IN}	±1	±1	µA max	Typically 10 nA, V_{IN} = 0 V or V_{DD}
Input Capacitance, C_{IN}[4]	10	10	pF max	
LOGIC OUTPUTS				
Output High Voltage, V_{OH}	V_{DRIVE} – 0.2	V_{DRIVE} – 0.2	V min	I_{SOURCE} = 200 µA
Output Low Voltage, V_{OL}	0.4	0.4	V max	I_{SINK} = 200 µA
Floating-State Leakage Current	±10	±10	µA max	V_{DD} = 2.7 V to 5.25 V
Floating-State Output Capacitance	10	10	pF max	
Output Coding	Straight (Natural) Binary			
CONVERSION RATE				
Conversion Time	12	12	CLK IN Cycles (max)	
Track-and-Hold Acquisition Time	135	135	ns min	
Throughput Rate	1.75	1.5	MSPS max	Conversion Time + Acquisition Time CLK IN of 30 MHz @ 5 V and 24 MHz @ 3 V
POWER REQUIREMENTS				
V_{DD}	+2.7/+5.25		V min/max	
I_{DD}[5]				Digital Inputs = 0 V or DV_{DD}
Normal Mode	2.4		mA max	V_{DD} = 4.75 V to 5.25 V; f_S = 1.75 MSPS; Typ 2 mA
Quiescent Current	900		µA max	V_{DD} = 4.75 V to 5.25 V; f_S = 1.75 MSPS
Normal Mode	1.5		mA max	V_{DD} = 2.7 V to 3.3 V; f_S = 1.5 MSPS; Typ 1.3 mA
Quiescent Current	800		µA max	V_{DD} = 2.7 V to 3.3 V; f_S = 1.5 MSPS
Sleep Mode	1		µA max	CLK IN = 0 V or DV_{DD}
Power Dissipation[5]				Digital Inputs = 0 V or DV_{DD}
Normal Mode	12		mW max	V_{DD} = 5 V
	4.5		mW max	V_{DD} = 3 V
Sleep Mode	5		µW max	V_{DD} = 5 V; CLK IN = 0 V or DV_{DD}
	3		µW max	V_{DD} = 3 V; CLK IN = 0 V or DV_{DD}

NOTES

[1]Temperature ranges as follows: A Version: –40°C to +85°C.

[2]The AD7470 functionally works at 2.35 V. Typical specifications @ 25°C for SNR (100 kHz) = 59 dB; THD (100 kHz) = –84 dB; INL ±0.8 LSB.

[3]The AD7470 will typically maintain A-grade performance up to 125°C, with a reduced CLK of 20 MHz @ 5 V and 16 MHz @ 3 V. Typical sleep mode current @ 125°C is 700 nA.

[4]Sample tested @ 25°C to ensure compliance.

[5]See Power vs. Throughput Rate section.

Specifications subject to change without notice.

AD7472–SPECIFICATIONS[1]

(V_{DD} = 2.7 V to 5.25 V[2], REF IN = 2.5 V, A and B Versions: f_{CLKIN} = 26 MHz @ 5 V and 20 MHz @ 3 V, T_A = T_{MIN} to T_{MAX}, unless otherwise noted.)

Parameter	A Version[1]		B Version[1]		Unit	Test Conditions/Comments
DYNAMIC PERFORMANCE	**5 V**	**3 V**	**5 V**	**3 V**		f_S = 1.5 MSPS @ 5 V, f_S = 1.2 MSPS @ 3 V
Signal to Noise + Distortion (SINAD)	69	69	69	69	dB typ	f_{IN} = 500 kHz Sine Wave
	68	68	68	68	dB min	f_{IN} = 100 kHz Sine Wave
Signal-to-Noise Ratio (SNR)	70	70	70	70	dB typ	f_{IN} = 500 kHz Sine Wave
	68	68	68	68	dB min	f_{IN} = 100 kHz Sine Wave
Total Harmonic Distortion (THD)	–83	–78	–83	–78	dB typ	f_{IN} = 500 kHz Sine Wave
	–83	–84	–83	–84	dB typ	f_{IN} = 100 kHz Sine Wave
	–75	–75	–75	–75	dB max	f_{IN} = 100 kHz Sine Wave
Peak Harmonic or Spurious Noise (SFDR)	–86	–81	–86	–81	dB typ	f_{IN} = 500 kHz Sine Wave
	–86	–86	–86	–86	dB typ	f_{IN} = 100 kHz Sine Wave
	–76	–76	–76	–76	dB max	f_{IN} = 100 kHz Sine Wave
Intermodulation Distortion (IMD)						
Second-Order Terms	–77	–77	–77	–77	dB typ	f_{IN} = 500 kHz Sine Wave
	–86	–86	–86	–86	dB typ	f_{IN} = 100 kHz Sine Wave
Third-Order Terms	–77	–77	–77	–77	dB typ	f_{IN} = 500 kHz Sine Wave
	–86	–86	–86	–86	dB typ	f_{IN} = 100 kHz Sine Wave
Aperture Delay	5	5	5	5	ns typ	
Aperture Jitter	15	15	15	15	ps typ	
Full Power Bandwidth	20	20	20	20	MHz typ	@ 3 dB
DC ACCURACY						f_S = 1.5 MSPS @ 5 V, f_S = 1.2 MSPS @ 3 V
Resolution	12	12	12	12	Bits	
Integral Nonlinearity	±2	±2	±1	±1	LSB max	Guaranteed No Missed Codes to 11 Bits (A Version)
Differential Nonlinearity	±1.8	±1.8	±0.9	±0.9	LSB max	Guaranteed No Missed Codes to 12 Bits (B Version)
Offset Error	±10	±10	±10	±10	LSB max	
Gain Error	±2	±2	±2	±2	LSB max	
ANALOG INPUT						
Input Voltage Ranges	0 to REF IN	0 to REF IN	0 to REF IN	0 to REF IN	V	
DC Leakage Current	±1	±1	±1	±1	µA max	
Input Capacitance	33	33	33	33	pF typ	
REFERENCE INPUT						
REF IN Input Voltage Range	2.5	2.5	2.5	2.5	V	±1% for Specified Performance
DC Leakage Current	±1	±1	±1	±1	µA max	
Input Capacitance	10/20	10/20	10/20	10/20	pF typ	Track-and-Hold Mode
LOGIC INPUTS						
Input High Voltage, V_{INH}	2.4	2.4	2.4	2.4	V min	
Input Low Voltage, V_{INL}	0.4	0.4	0.4	0.4	V max	
Input Current, I_{IN}	±1	±1	±1	±1	µA max	Typically 10 nA, V_{IN} = 0 V or V_{DD}
Input Capacitance, C_{IN}[3]	10	10	10	10	pF max	
LOGIC OUTPUTS						
Output High Voltage, V_{OH}	V_{DRIVE} – 0.2	V_{DRIVE} – 0.2	V_{DRIVE} – 0.2	V_{DRIVE} – 0.2	V min	I_{SOURCE} = 200 µA
Output Low Voltage, V_{OL}	0.4	0.4	0.4	0.4	V max	I_{SINK} = 200 µA
Floating-State Leakage Current	±10	±10	±10	±10	µA max	V_{DD} = 2.7 V to 5.25 V
Floating-State Output Capacitance	10	10	10	10	pF max	
Output Coding	Straight (Natural) Binary		Straight (Natural) Binary			
CONVERSION RATE						
Conversion Time	14	14	14	14	CLK IN Cycles (max)	
Track-and-Hold Acquisition Time	135	135	135	135	ns min	
Throughput Rate	1.5	1.2	1.5	1.2	MSPS max	Conversion Time + Acquisition Time
POWER REQUIREMENTS						
V_{DD}	+2.7/+5.25		+2.7/+5.25		V min/max	
I_{DD}[4]						Digital Inputs = 0 V or DV_{DD}
Normal Mode	2.4		2.4		mA max	V_{DD} = 4.75 V to 5.25 V; Typ 2 mA; f_S = 1.5 MSPS
Quiescent Current	900		900		µA max	V_{DD} = 4.75 V to 5.25 V; f_S = 1.5 MSPS
Normal Mode	1.5		1.5		mA max	V_{DD} = 2.7 V to 3.3 V; Typ 1.3 mA; f_S = 1.2 MSPS
Quiescent Current	800		800		µA max	V_{DD} = 2.7 V to 3.3 V; f_S = 1.2 MSPS
Sleep Mode	1		1		µA max	CLK IN = 0 V or DV_{DD}
Power Dissipation[4]						Digital Inputs = 0 V or DV_{DD}
Normal Mode	12		12		mW max	V_{DD} = 5 V
	4.5		4.5		mW max	V_{DD} = 3 V
Sleep Mode	5		5		µW max	V_{DD} = 5 V; CLK IN = 0 V or DV_{DD}
	3		3		µW max	V_{DD} = 3 V; CLK IN = 0 V or DV_{DD}

NOTES

[1]Temperature ranges as follows: A and B Versions: –40°C to +85°C.

[2]The AD7472 functionally works at 2.35 V. Typical specifications @ 25°C for SNR (100 kHz) = 68 dB; THD (100 kHz) = –84 dB; INL ±0.8 LSB.

[3]Sample tested @ 25°C to ensure compliance.

[4]See Power vs. Throughput Rate section.

Specifications subject to change without notice.

AD7472–SPECIFICATIONS[1] (V_{DD} = 2.7 V to 5.25 V[2], REF IN = 2.5 V,Y Version: f_{CLKIN} = 20 MHz @ 5 V and 14 MHz @ 3 V; $T_A = T_{MIN}$ to T_{MAX}, unless otherwise noted.)

Parameter	Y Version[1]		Unit	Test Conditions/Comments
DYNAMIC PERFORMANCE	**5 V**	**3 V**		f_S = 1.2 MSPS @ 5 V, f_S = 875 kSPS @ 3 V
Signal to Noise + Distortion (SINAD)	69	69	dB typ	f_{IN} = 500 kHz Sine Wave
	68	68	dB min	f_{IN} = 100 kHz Sine Wave
Signal-to-Noise Ratio (SNR)	70	70	dB typ	f_{IN} = 500 kHz Sine Wave
	68	68	dB min	f_{IN} = 100 kHz Sine Wave
Total Harmonic Distortion (THD)	–83	–78	dB typ	f_{IN} = 500 kHz Sine Wave
	–83	–84	dB typ	f_{IN} = 100 kHz Sine Wave
	–75	–75	dB max	f_{IN} = 100 kHz Sine Wave
Peak Harmonic or Spurious Noise (SFDR)	–86	–81	dB typ	f_{IN} = 500 kHz Sine Wave
	–86	–86	dB typ	f_{IN} = 100 kHz Sine Wave
	–76	–76	dB max	f_{IN} = 100 kHz Sine Wave
Intermodulation Distortion (IMD)				
Second-Order Terms	–77	–77	dB typ	f_{IN} = 500 kHz Sine Wave
	–86	–86	dB typ	f_{IN} = 100 kHz Sine Wave
Third-Order Terms	–77	–77	dB typ	f_{IN} = 500 kHz Sine Wave
	–86	–86	dB typ	f_{IN} = 100 kHz Sine Wave
Aperture Delay	5	5	ns typ	
Aperture Jitter	15	15	ps typ	
Full Power Bandwidth	20	20	MHz typ	@ 3 dB
DC ACCURACY				f_S = 1.2 MSPS @ 5 V; f_S = 875 kSPS @ 3 V
Resolution	12	12	Bits	
Integral Nonlinearity	±2	±2	LSB max	
Differential Nonlinearity	±1.8	±1.8	LSB max	Guaranteed No Missed Codes to 11 Bits
Offset Error	±10	±10	LSB max	
Gain Error	±2	±2	LSB max	
ANALOG INPUT				
Input Voltage Ranges	0 to REF IN	0 to REF IN	V	
DC Leakage Current	±1	±1	µA max	
Input Capacitance	33	33	pF typ	
REFERENCE INPUT				
REF IN Input Voltage Range	2.5	2.5	V	±1% for Specified Performance
DC Leakage Current	±1	±1	µA max	
Input Capacitance	10/20	10/20	pF typ	Track-and-Hold Mode
LOGIC INPUTS				
Input High Voltage, V_{INH}	2.4	2.4	V min	
Input Low Voltage, V_{INL}	0.4	0.4	V max	
Input Current, I_{IN}	±1	±1	µA max	Typically 10 nA, V_{IN} = 0 V or V_{DD}
Input Capacitance, C_{IN}[3]	10	10	pF max	
LOGIC OUTPUTS				
Output High Voltage, V_{OH}	V_{DRIVE} – 0.2	V_{DRIVE} – 0.2	V min	I_{SOURCE} = 200 µA
Output Low Voltage, V_{OL}	0.4	0.4	V max	I_{SINK} = 200 µA
Floating-State Leakage Current	±10	±10	µA max	V_{DD} = 2.7 V to 5.25 V
Floating-State Output Capacitance	10	10	pF max	
Output Coding	Straight (Natural) Binary			
CONVERSION RATE				
Conversion Time	14	14	CLK IN Cycles (max)	
Track-and-Hold Acquisition Time	140	140	ns min	
Throughput Rate	1200	875	kSPS max	Conversion Time + Acquisition Time
POWER REQUIREMENTS				
V_{DD}	+2.7/+5.25		V min/max	
I_{DD}[4]				Digital Inputs = 0 V or DV_{DD}
Normal Mode	2.4		mA max	V_{DD} = 4.75 V to 5.25 V; f_S = 1.2 MSPS; Typ 2 mA
Quiescent Current	900		µA max	V_{DD} = 4.75 V to 5.25 V; f_S = 1.2 MSPS
Normal Mode	1.5		mA max	V_{DD} = 2.7 V to 3.3 V; f_S = 875 kSPS; Typ 1.3 mA
Quiescent Current	800		µA max	V_{DD} = 2.7 V to 3.3 V; f_S = 875 kSPS
Sleep Mode	2		µA max	CLK IN = 0 V or DV_{DD}
Power Dissipation[4]				Digital Inputs = 0 V or DV_{DD}
Normal Mode	12		mW max	V_{DD} = 5 V
	4.5		mW max	V_{DD} = 3 V
Sleep Mode	10		µW max	V_{DD} = 5 V; CLK IN = 0 V or DV_{DD}
	6		µW max	V_{DD} = 3 V; CLK IN = 0 V or DV_{DD}

NOTES

[1]Temperature ranges as follows: Y Version: –40°C to +125°C.

[2]The AD7472 functionally works at 2.35 V. Typical specifications @ 25°C for SNR (100 kHz) = 68 dB; THD (100 kHz) = –84 dB; INL ±0.8 LSB.

[3]Sample tested @ 25°C to ensure compliance.

[4]See Power vs. Throughput Rate section.

Specifications subject to change without notice.

TIMING SPECIFICATIONS[1] (V_{DD} = 2.7 V to 5.25 V, REF IN = 2.5 V; T_A = T_{MIN} to T_{MAX}, unless otherwise noted.)

Parameter	Limit at T_{MIN}, T_{MAX} AD7470	AD7472	Unit	Description
f_{CLK} [2]	10	10	kHz min	
	30	26	MHz max	
$t_{CONVERT}$	436.42	531.66	ns min	$t_{CLK} = 1/f_{CLK\ IN}$
t_{WAKEUP}	1	1	µs max	Wake-Up Time
t_1	10	10	ns min	$\overline{CONVST}$ Pulse Width
t_2				$\overline{CONVST}$ to BUSY Delay,
	10	10	ns max	V_{DD} = 5 V, A and B Versions
		15	ns max	V_{DD} = 5 V, Y Version
	30	30	ns max	V_{DD} = 3 V, A and B Versions
		35	ns max	V_{DD} = 3 V, Y Version
t_3	0	0	ns max	BUSY to $\overline{CS}$ Setup Time
t_4 [3]	0	0	ns max	$\overline{CS}$ to $\overline{RD}$ Setup Time
t_5	20	20	ns min	$\overline{RD}$ Pulse Width
t_6 [3]	15	15	ns min	Data Access Time After Falling Edge of $\overline{RD}$
t_7 [4]	8	8	ns max	Bus Relinquish Time After Rising Edge of $\overline{RD}$
t_8	0	0	ns max	$\overline{CS}$ to $\overline{RD}$ Hold Time
t_9				Acquisition Time
	135	135	ns max	A and B Versions
		140	ns max	Y Version
t_{10}	100	100	ns min	Quiet Time

NOTES

[1]Sample tested at 25°C to ensure compliance. All input signals are specified with tr = tf = 5 ns (10% to 90% of V_{DD}) and timed from a voltage level of 1.6 V. See Figure 1.

[2]Mark/Space ratio for the CLK inputs is 40/60 to 60/40. First CLK pulse should be 10 ns min from falling edge of $\overline{CONVST}$.

[3]Measured with the load circuit of Figure 1 and defined as the time required for the output to cross 0.8 V or 2.0 V.

[4]t_7 is derived from the measured time taken by the data outputs to change 0.5 V when loaded with the circuit of Figure 1. The measured number is then extrapolated back to remove the effects of charging or discharging the 50 pF capacitor. This means that the time, t_7, quoted in the timing characteristics, is the true bus relinquish time of the part and is independent of the bus loading.

Specifications subject to change without notice.

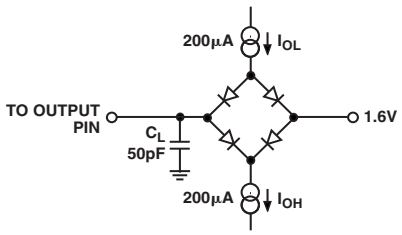

Figure 1. Load Circuit for Digital Output Timing Specifications

ABSOLUTE MAXIMUM RATINGS[1]
(T_A = 25°C unless otherwise noted.)

AV_{DD} to AGND/DGND . . . . . –0.3 V to +7 V
DV_{DD} to AGND/DGND . . . . . –0.3 V to +7 V
V_{DRIVE} to AGND/DGND . . . . . –0.3 V to +7 V
AV_{DD} to DV_{DD} . . . . . –0.3 V to +0.3 V
V_{DRIVE} to DV_{DD} . . . . . –0.3 V to DV_{DD} + 0.3 V
AGND to DGND . . . . . –0.3 V to +0.3 V
Analog Input Voltage to AGND . . . . –0.3 V to AV_{DD} + 0.3 V
Digital Input Voltage to DGND . . . . –0.3 V to DV_{DD} + 0.3 V
REF IN to AGND . . . . . –0.3 V to AV_{DD} + 0.3 V
Input Current to Any Pin Except Supplies[2] . . . . . ±10 mA
Operating Temperature Range
  Commercial (A and B Versions) . . . . . –40°C to +85°C
  Industrial (Y Version) . . . . . –40°C to +125°C
  Storage Temperature Range . . . . . –65°C to +150°C
Junction Temperature . . . . . 150°C
  θ_{JA} Thermal Impedance . . . . . 75°C/W (SOIC)
  . . . . . 115°C/W (TSSOP)
  θ_{JC} Thermal Impedance . . . . . 25°C/W (SOIC)
  . . . . . 35°C/W (TSSOP)
Lead Temperature, Soldering
  Vapor Phase (60 sec) . . . . . 215°C
  Infrared (15 sec) . . . . . 220°C
ESD . . . . . 1.5 kV

NOTES
[1]Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.
[2]Transient currents of up to 100 mA will not cause SCR latch-up.

ORDERING GUIDE

Model	Temperature Range	Resolution (Bits)	Package Options[1]	Package Description
AD7470ARU	–40°C to +85°C	10	RU-24	TSSOP
AD7470ARU-REEL	–40°C to +85°C	10	RU-24	TSSOP
AD7470ARU-REEL7	–40°C to +85°C	10	RU-24	TSSOP
AD7472AR	–40°C to +85°C	12	R-24	SOIC
AD7472AR-REEL	–40°C to +85°C	12	R-24	SOIC
AD7472AR-REEL7	–40°C to +85°C	12	R-24	SOIC
AD7472ARU	–40°C to +85°C	12	RU-24	TSSOP
AD7472ARU-REEL	–40°C to +85°C	12	RU-24	TSSOP
AD7472ARU-REEL7	–40°C to +85°C	12	RU-24	TSSOP
AD7472BR	–40°C to +85°C	12	R-24	SOIC
AD7472BR-REEL	–40°C to +85°C	12	R-24	SOIC
AD7472BRU	–40°C to +85°C	12	RU-24	TSSOP
AD7472BRU-REEL	–40°C to +85°C	12	RU-24	TSSOP
AD7472BRU-REEL7	–40°C to +85°C	12	RU-24	TSSOP
AD7472YR	–40°C to +125°C	12	R-24	SOIC
AD7472YR-REEL	–40°C to +125°C	12	R-24	SOIC
AD7472YRU	–40°C to +125°C	12	RU-24	TSSOP
AD7472YRU-REEL	–40°C to +125°C	12	RU-24	TSSOP
AD7472YRU-REEL7	–40°C to +125°C	12	RU-24	TSSOP
EVAL-AD7470CB[2]				Evaluation Board
EVAL-AD7472CB[2]				Evaluation Board
EVAL CONTROL BRD2[3]				Controller Board

NOTES
[1]R = SOIC; RU = TSSOP.
[2]This can be used as a standalone evaluation board or in conjunction with the EVAL-CONTROL BOARD for evaluation/demonstration purposes.
[3]This board is a complete unit allowing a PC to control and communicate with all Analog Devices evaluation boards ending in the CB designators. To order a complete evaluation kit, you need to order the specific ADC evaluation board, for example, EVAL-AD7472CB, the EVAL CONTROL BRD2, and a 12 V ac transformer. See the relevant evaluation board application note for more information.

CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although the AD7470/AD7472 features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.