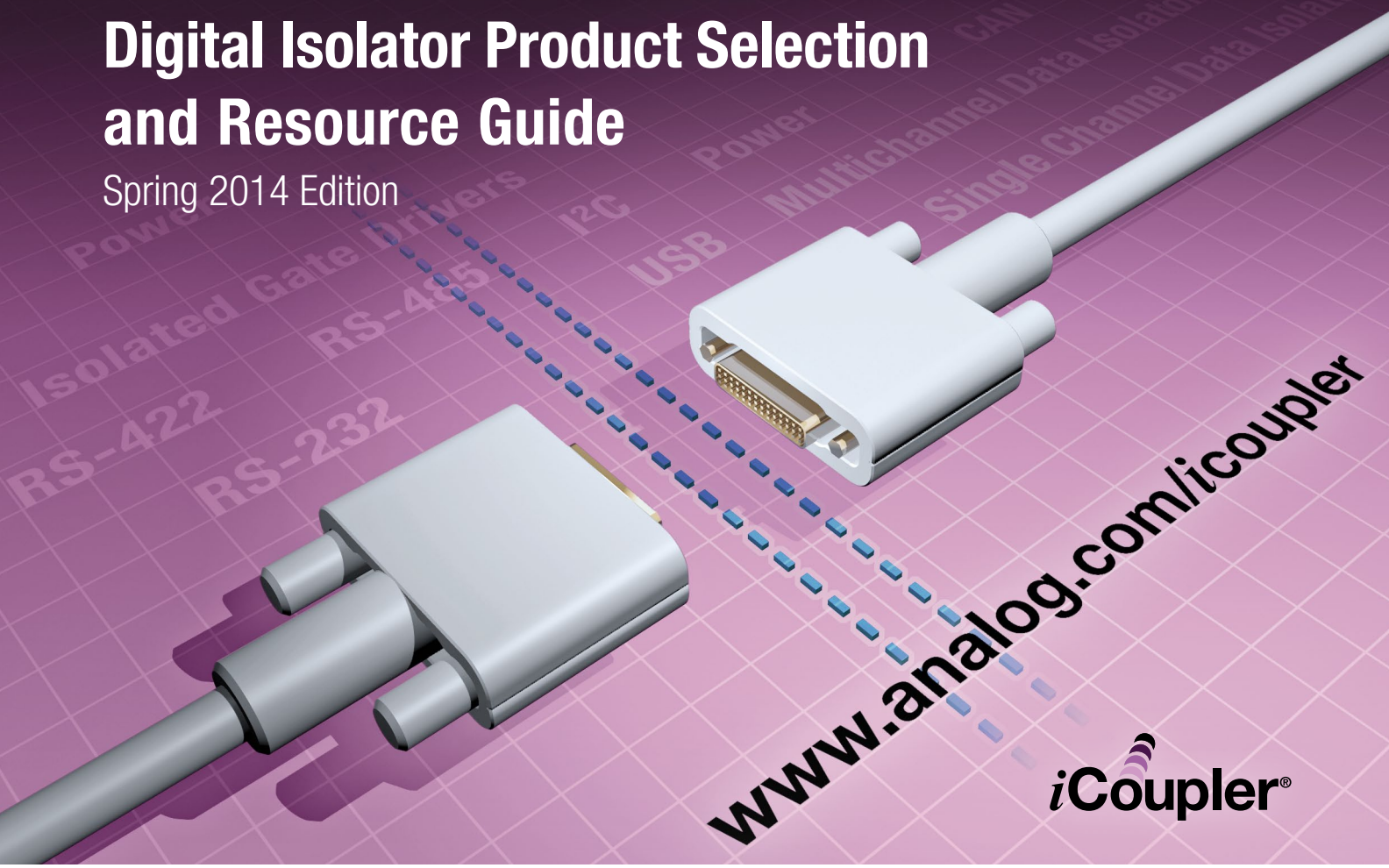
Digital Isolator Product Selection and Resource Guide

Spring 2014 Edition



Performance • Integration • Efficiency • Reliability • Safety

Digital isolators with *i*Coupler® technology enable designers to implement isolation in designs without the cost, size, power, performance, and reliability constraints found with optocouplers. *i*Coupler digital isolators also meet the wide range of creepage/clearance requirements and are the industry's only digital isolators with certified 8 mm creepage. With more than 1 billion channels shipped into the field, these magnetically isolated products meet the same rigid safety standards as optocouplers.

Portfolio Offerings

- Single and multichannel data isolators
- Digital isolators with isolated power: *iso*Power®
- USB isolators
- Isolated gate drivers
- Switching regulators
- I²C digital isolators
- Isolated CAN transceivers
- Isolated RS-485 transceivers
- Isolated RS-232 transceivers
- Isolated Σ-Δ modulators

Advantages of the Broadest Portfolio of Digital Isolators

Performance
4× improvement in data rate and timing specifications.

Integration
Multiple isolation channels integrated with other functions reduce size, cost, and design complexity.

Power Consumption
Operates at power levels up to 90% lower than optocouplers.

Ease of Use
Standard digital CMOS interfaces mean no external components needed to connect to other digital devices.

Reliability
Eliminates LED wearout traditionally found in optocouplers.

Safety
Meets same rigid safety standards as optocouplers, including reinforced insulation.

over 1,000,000,269 Channels of Isolation Shipped!

ANALOG DEVICES

1-Channel Digital Isolators

Part Number	Isolation Rating (kV rms)	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temperature (°C)	Package
								Default		EN		
		0	1	2	3			H	L	Z		
ADuM1100	2.5	•				0.35	25, 100	•			105, 125	8-lead SOIC_N
ADuM3100	2.5	•				2.64	25, 50	•			105	8-lead SOIC_N

2-Channel Digital Isolators

Part Number	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temperature (°C)	Package
							Default		EN		
	0	1	2	3			H	L	Z		
1 kV rms Isolation											
ADuM724x	•	•			4.29	1, 25	•			105	8-lead SOIC_N
2.5 kV rms Isolation											
ADuM120x*	•	•			1.11	1, 10, 25	•			105, 125	8-lead SOIC_N
ADuM1210	•				1.11	10		•		105	8-lead SOIC_N
ADuM128x*	•	•			4.8	1, 25, 100	•	•		125	8-lead SOIC_N
ADuM320x*	•	•			1.8	1, 10, 25	•			105, 125	8-lead SOIC_N
ADuM321x*	•	•			1.8	1, 10		•		105, 125	8-lead SOIC_N
3.75 kV rms Isolation											
ADuM124x	•	•			0.0003	2	•	•		125	20-lead SSOP
5 kV rms Isolation											
ADuM220x*	•	•			1.8	1, 10	•			105, 125	16-lead SOIC_W/16-lead SOIC_IC
ADuM221x*	•	•			1.8	1, 10		•		125	16-lead SOIC_W/16-lead SOIC_IC
ADuM228x	•	•			4.8	1, 25, 100	•	•		125	16-lead SOIC_IC

3-Channel Digital Isolators

Part Number	Isolation Rating (kV rms)	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temperature (°C)	Package
								Default		EN		
		0	1	2	3			H	L	Z		
ADuM130x*	2.5	•	•			1.11	1, 10, 90	•		•	105, 125	16-lead SOIC_W
ADuM131x	2.5	•	•			1.32	1, 10	•	•		105	16-lead SOIC_W
ADuM330x*	2.5	•	•			1.86	1, 10, 90	•		•	105, 125	16-lead SOIC_W

4-Channel Digital Isolators

Part Number	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temperature (°C)	Package
							Default		EN		
	0	1	2	3			H	L	Z		
1 kV rms Isolation											
ADuM744x	•	•	•		3	1, 25	•		•	105	16-lead QSOP
2.5 kV rms Isolation											
ADuM140x*	•	•	•		1.11	1, 10, 90	•			105, 125	16-lead SOIC_W
ADuM141x	•	•	•		1.32	1, 10	•	•		105	16-lead SOIC_W
ADuM340x*	•	•	•		1.5	1, 10, 90	•		•	105, 125	16-lead SOIC_W
ADuM344x	•	•	•		2.41	150	•			105	16-lead SOIC_W
3.75 kV rms Isolation											
ADuM144x	•	•	•		0.0003	2	•	•		125	16-lead QSOP
ADuM348x	•	•	•		4.72	1, 25			•	125	20-lead SSOP
5 kV rms Isolation											
ADuM240x	•	•	•		1.11	1, 10, 90	•			105	16-lead SOIC_W/16-lead SOIC_IC
ADuM440x*	•	•	•		1.5	1, 10, 90	•		•	105, 125	16-lead SOIC_W/16-lead SOIC_IC

5-Channel Digital Isolators

Part Number	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temperature (°C)	Package
							Default		EN		
	0	1	2	3			H	L	Z		
1 kV rms Isolation											
ADuM7510	•				3.5	10		•		105	16-lead QSOP
2.5 kV rms Isolation											
ADuM1510	•				3.5	10		•		105	16-lead SOIC_W

6-Channel Digital Isolator

Part Number	Isolation Rating (kV rms)	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temperature (°C)	Package
								Default		EN		
		0	1	2	3			H	L	Z		
ADuM764x	1	•	•	•	•	4.06	1, 25	•			105	20-lead QSOP

Digital Isolators with Isolated Power, *iso*Power

Part Number	Number of Data Channels						Max Data Rate (Mbps)	Max Output Power (mW)	Max Temperature (°C)	Package
	Total	Reverse Direction Options								
		0	1	2	3	4				
2.5 kV rms Isolation										
ADuM5000*	0							500 at 5 V	105	16-lead SOIC_W
ADuM5010	0							150 at 5 V	105	20-lead SSOP
ADuM520x*	2	•	•	•			1, 25	500 at 5 V	105	16-lead SOIC_W
ADuM521x	2	•	•	•			1, 25, 100	150 at 5 V	105	20-lead SSOP
ADuM524x	2	•	•	•			1	50 at 5 V	105	8-lead SOIC_N
ADuM540x*	4	•	•	•	•	•	1, 25	500 at 5 V	105	16-lead SOIC_W
3.75 kV rms Isolation										
ADuM6010	0							150 at 5 V	105	20-lead SSOP
ADuM621x	2	•	•	•			1, 25, 100	150 at 5 V	105	20-lead SSOP
5 kV rms Isolation										
ADuM6000	0							400 at 5 V	105	16-lead SOIC_W/16-lead SOIC_IC
ADuM620x	2	•	•	•			1, 25	400 at 5 V	105	16-lead SOIC_W/16-lead SOIC_IC
ADuM640x	4	•	•	•	•	•	1, 25	400 at 5 V	105	16-lead SOIC_W/16-lead SOIC_IC

*Automotive qualified models available. Please visit product pages for more information.

Isolated Switching Regulators

Part Number	Number of Data Channels						Max Data Rate (Mbps)	Isolated Supply Output		Max Temperature (°C)	Package
	Total	Reverse Direction Options						Current (mA)	Range (V)		
		0	1	2	3	4					
2.5 kV rms Isolation											
ADuM3070	0							500	3.3 to 24	105	16-lead QSOP
ADuM347x*	4	•	•	•	•	•	1, 25	400	3.3 to 24	105	20-lead SSOP
5 kV rms Isolation											
ADuM4070	0							500	3.3 to 24	105	16-lead SOIC_IC
ADuM447x	4	•	•	•	•	•	1, 25	500	3.3 to 24	105	20-lead SOIC_IC

USB 2.0 Certified Isolators

Part Number	Insulation Rating (kV rms)	Data Rate		Max Temperature (°C)	Package
ADuM3160	2.5	Low speed: 1.5 Mbps	Full speed: 12 Mbps	105	16-lead SOIC_W
ADuM4160	5	Low speed: 1.5 Mbps	Full speed: 12 Mbps	105	16-lead SOIC_W/16-lead SOIC_IC

Isolated Gate Drivers

Part Number	Isolated Channels	Insulation Rating (kV rms)	Frequency (MHz)	Output Voltage Range (V)	Max Output Current (A_{PEAK})	Power Level (mW)	Input Logic Levels	Max Temperature (°C)	Package
ADuM6132	1	3.7	1	12.5 to 17	0.2	275	CMOS	85	16-lead SOIC_W
ADuM7234	2	1	1	12 to 18	4		CMOS	105	16-lead SOIC_N
ADuM1233	2	2.5	5	12 to 18	0.1		TTL	105	16-lead SOIC_W
ADuM1234	2	2.5	5	12 to 18	0.1		CMOS	105	16-lead SOIC_W
ADuM3220*	2	2.5	1	4.5 to 18	4		CMOS	125	8-lead SOIC_N
ADuM3221*	2	2.5	1	4.5 to 18	4		CMOS	125	8-lead SOIC_N
ADuM5230*	2	2.5	1	12 to 18	0.1	150	CMOS	105	16-lead SOIC_W
ADuM7223	2	2.5	1	4.5 to 18	4		CMOS	125	14-lead LGA
ADuM3223*	2	3	1	4.5 to 18	4		CMOS	125	16-lead SOIC_N
ADuM3224*†	2	3	1	4.5 to 18	4		CMOS	125	16-lead SOIC_N
ADuM4223	2	5	1	4.5 to 18	4		CMOS	125	16-lead SOIC_W
ADuM4224*†	2	5	1	4.5 to 18	4		CMOS	125	16-lead SOIC_W

Isolated I²C-Compliant Bidirectional Digital Isolators

Part Number	Insulation Rating (kV rms)	Serial Data	Serial Clock	Max Data Rate (Mbps)	Integrated *iso*Power	Max Temperature (°C)	Package
ADM3260	2.5	Bidirectional	Bidirectional	1	•	105	20-Lead SSOP
ADuM1250*	2.5	Bidirectional	Bidirectional	1		105, 125	8-lead SOIC_N
ADuM1251*	2.5	Bidirectional	Unidirectional	1		105, 125	8-lead SOIC_N
ADuM2250	5	Bidirectional	Bidirectional	1		105	16-lead SOIC_W/16-lead SOIC_IC
ADuM2251	5	Bidirectional	Unidirectional	1		105	16-lead SOIC_W/16-lead SOIC_IC

Linear Isolators

Part Number	Insulation Rating (kV rms)	–3 dB Bandwidth (kHz)	Accuracy (%)	V_{IN} Min (mV)	V_{IN} Max (V)	V_{OUT} Min (mV)	V_{OUT} Max (V)	Package
ADuM3190	2.5	400	1	400	1.5	400	5	16-lead QSOP
ADuM4190	5	400	1	400	1.5	400	5	16-lead SOIC_IC

Isolated CAN Transceivers

Part Number	Insulation Rating (kV rms)	High Voltage Bus Side Regulator	Max Data Rate (Mbps)	Integrated *iso*Power	Power Supply (V)		Max Temperature (°C)	Package
					Logic Side	Bus Side		
ADM3052	5	•	1		3 to 5.5	24	85	16-lead SOIC_W
ADM3053	2.5		1	•	5		85	20-lead SOIC_W
ADM3054*	5		1		3 to 5.5	5	125	16-lead SOIC_W

Isolated RS-485 Transceivers

Part Number	Insulation Rating (kV rms)	Full Duplex	Half Duplex	Max Data Rate	Integrated *iso*Power	Integrated Transformer Driver	Power Supply (V)		Max Temperature (°C)	Package
							Logic Side	Bus Side		
ADM2481	2.5		•	500 kbps			3.0 to 5.0	5	85	16-lead SOIC_W
ADM2482E	2.5	•	•	16 Mbps		•	3.0 to 5.0	3.3	85	16-lead SOIC_W
ADM2483	2.5		•	500 kbps			3.0 to 5.0	5	85	16-lead SOIC_W
ADM2484E	5	•	•	500 kbps			3.0 to 5.0	3.3	85	16-lead SOIC_W
ADM2485	2.5		•	16 Mbps		•	3.0 to 5.0	5	85	16-lead SOIC_W
ADM2486	2.5		•	20 Mbps			3.0 to 5.0	5	85	16-lead SOIC_W
ADM2487E	2.5	•	•	500 kbps		•	3.0 to 5.0	3.3	85	16-lead SOIC_W
ADM2490E	5	•		16 Mbps			3.0 to 5.0	5	105	16-lead SOIC_W
ADM2491E	5	•	•	16 Mbps			3.0 to 5.0	5	85	16-lead SOIC_W
ADM2582E	2.5	•	•	16 Mbps	•		3.0 to 5.0	—	85	20-lead SOIC W
ADM2587E	2.5	•	•	500 kbps	•		3.0 to 5.0	—	85	20-lead SOIC W
ADM2682E	5	•	•	16 Mbps	•		3.0 to 5.0	—	85	16-lead SOIC_IC
ADM2687E	5	•	•	500 kbps	•		3.0 to 5.0	—	85	16-lead SOIC_IC

Isolated RS-232 Transceivers

Part Number	Insulation Rating (kV rms)	ESD Protection (kV)	Max Data Rate (kbps)	Number Tx	Number Rx	Integrated *iso*Power	Max Temperature (°C)	Package
ADM3251E	2.5	15	460	1	1	•	85	20-lead SOIC_W
ADM3252E	2.5	15	460	2	2	•	85	BGA

Isolated Σ-Δ ADCs

Part Number	Insulation Rating (kV rms)	Resolution (Bits)	Clock Rate (MHz)	Clock Source	Power (mW)	Power Supply (V)		Package
						Bus Side	ADC Side	
AD7400	5	16	10	Internal	72	3.0 to 5.0	5.0	16-lead SOIC_W
AD7400A	5	16	10	Internal	75	3.0 to 5.0	5.0	16-lead SOIC_W
AD7401	5	16	20	External	72	3.0 to 5.0	5.0	16-lead SOIC_W
AD7401A	5	16	20	External	72	3.0 to 5.0	5.0	16-lead SOIC_W

*Automotive qualified models available. Please visit product pages for more information.

†The ADuM3224 and ADuM4224 are versions of the ADuM3223 and ADuM4223. Unlike the ADuM3223 and ADuM4223, they do not offer thermal shutdown.

Wide Range of Applications

With over 1 billion channels of isolation shipped into the field, *i*Coupler digital isolators are used in applications such as:

- Medical devices
- Power supply/regulation systems
- Instrumentation devices
- Networking equipment
- Metering
- Battery charging systems
- Light and building controls
- Industrial process controls
- Motor drives
- Solar/wind energy
- Communications
- Industrial field buses
- Automotive systems
  - All *i*Coupler devices can undergo automotive qualification. Please contact your local sales representative for more information.

*i*Coupler Support Resources

To learn more about *i*Coupler digital isolators, visit *www.analog.com/icoupler*. This page will provide you with information on items like:

- Existing application notes such as:
  - AN-1109 Application Note, *Recommendations for Control of Radiated Emissions with i*Coupler *Devices*
  - AN-0971 Application Note, *Recommendations for Control of Radiated Emissions with iso*Power *Devices*
- Evaluation boards
- Safety standards/certifications
- Technical articles
- Quarterly newsletter archives
- Circuits from the Lab® Reference Circuits
- Webcasts and training videos

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I²C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).

Printed in the U.S.A. G10665-1.5-2/14(C)

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