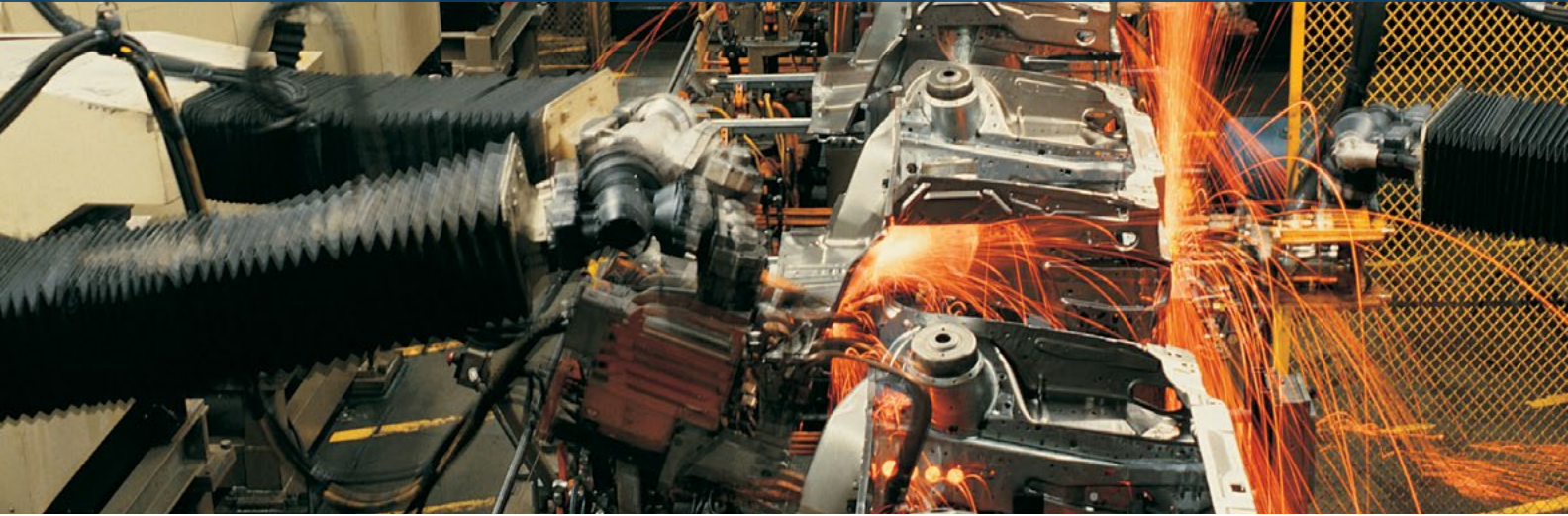


DIGITAL ISOLATOR PRODUCT SELECTION AND RESOURCE GUIDE

Summer 2016 Edition



Choose *iCoupler* Technology!

Digital isolators with *iCoupler*® technology enable designers to implement isolation in designs without the cost, size, power, performance, and reliability constraints found with optocouplers. A broad portfolio offering spanning data isolators, *isoPower*® solutions, communications, gate drivers, Σ - Δ modulators, isolated amplifiers, and energy metrology, isolation is integrated into compact, robust, and reliable solutions that solve data transmission and power isolation challenges. *iCoupler* digital isolators also meet the wide range of creepage/clearance requirements and provide up to 8 mm creepage. With nearly 2 billion channels shipped into the field, these magnetically isolated products meet the stringent safety standards required of digital isolators.

Industry's Fastest LVDS Digital Isolators

Analog Devices low voltage differential signaling (LVDS) drop-in isolators offer designers robust, high speed differential signaling for point-to-point and multidrop applications. Extending *iCoupler* chip scale transformer technology for ultrahigh speed data encoding, these LVDS isolators support up to a 600 Mbps data rate. In contrast to expensive fiber implementations, deserialized links over standard digital isolators or optocouplers, and design-intensive bespoke solutions using transformers or high voltage capacitors, ADI LVDS isolators offer the only comprehensive, high performance drop-in isolation at 600 Mbps.

LVDS Isolators

Part Number	Max Data Rate (Mbps)	Max Prop Delay (ns)	Number of Channels	Inputs		Insulation Rating (kV rms)	Min Transient Immunity at Output (kV/ μ s)	Max Temp (°C)	Special Features	Package
				Side 1	Side 2					
ADN4650 <i>New</i>	600	4.5	2	2	0	5	25	125	—	16-lead SOIC_W
ADN4651 <i>New</i>	600	4.5	2	1	1	5	25	125	Fail safe	16-lead SOIC_W
ADN4652 <i>New</i>	600	4.5	2	1	1	5	25	125	Fail safe	16-lead SOIC_W

Wide Range of Applications

With over a decade of innovation integrating isolation with power, signaling, and gate drivers, *iCoupler* digital isolators are used in applications such as:

- ▶ Process control automation
- ▶ Motor drives
- ▶ Industrial field buses
- ▶ Instrumentation devices
- ▶ Communication infrastructures
- ▶ Automotive systems
- ▶ Solar/wind energy
- ▶ Power supply/regulation systems
- ▶ Medical devices
- ▶ Metering
- ▶ Light and building controls
- ▶ Battery charging systems
- ▶ Industrial IoT

INDUSTRY'S FASTEST LVDS DIGITAL ISOLATORS

- ▶ 600 Mbps throughput
- ▶ 4.5 ns max propagation delay
- ▶ 70 ps total jitter



Digital Isolators

Part Number	Number of Channels	Isolation Rating (kV rms)	Reverse Direction Options				Typical Quiescent Power Dissipation per Channel (mW)	Max Data Rate (Mbps)	Output			Max Temp (°C)	Package
			0	1	2	3			Default		EN		
									H	L	Z		
ADuM110N <i>New</i>	1	3	•				4.9	150	•	•		125	8-lead SOIC_N
ADuM210N <i>New</i>	1	5	•				4.1	150	•	•		125	8-lead SOIC_N
ADuM1100	1	2.5	•				0.35	25, 100	•			105, 125	8-lead SOIC_N
ADuM3100	1	2.5	•				2.64	25, 50	•			105	8-lead SOIC_N
ADuM12x ¹ <i>New</i>	2	3	•	•			2.6	150	•	•		125	8-lead SOIC_N
ADuM22x <i>New</i>	2	5	•	•			2.6	150	•	•		125	16-lead SOIC_W/8-lead SOIC_IC
ADuM724x	2	1	•	•			4.29	1, 25	•			105	8-lead SOIC_N
ADuM120x ^{1,3}	2	2.5	•	•			1.11	1, 10, 25	•			105, 125	8-lead SOIC_N
ADuM1210	2	2.5	•	•			1.11	10		•		105	8-lead SOIC_N
ADuM128x ¹	2	2.5	•	•			4.8	1, 25, 100	•	•		125	8-lead SOIC_N
ADuM320x ^{1,3}	2	2.5	•	•			1.8	1, 10, 25	•			105, 125	8-lead SOIC_N
ADuM321x ^{1,3}	2	2.5	•	•			1.8	1, 10		•		105, 125	8-lead SOIC_N
ADuM124x	2	3.75	•	•			0.0003	2	•	•		125	20-lead SSOP
ADuM220x ¹	2	5	•	•			1.8	1, 10	•			105, 125	16-lead SOIC_W/16-lead SOIC_IC
ADuM221x ¹	2	5	•	•			1.8	1, 10		•		125	16-lead SOIC_W/16-lead SOIC_IC
ADuM228x	2	5	•	•			4.8	1, 25, 100	•	•		125	16-lead SOIC_IC
ADuM13x <i>New</i>	3	3 to 3.75	•	•			2.9	150	•	•	•	125	16-lead SOIC_N/16-lead SOIC_W
ADuM23x <i>New</i>	3	5	•	•			2.9	150	•	•	•	125	16-lead SOIC_W/16-lead SOIC_IC
ADuM130x ¹	3	2.5	•	•			1.11	1, 10, 90	•		•	105, 125	16-lead SOIC_W
ADuM131x	3	2.5	•	•			1.32	1, 10	•	•		105	16-lead SOIC_W
ADuM330x ¹	3	2.5	•	•			1.86	1, 10, 90	•		•	105, 125	16-lead SOIC_W
ADuM14x ¹ <i>New</i>	4	3 to 3.75	•	•	•		2.1	150	•	•	•	125	16-lead SOIC_N/16-lead SOIC_W
ADuM24x ¹ <i>New</i>	4	5	•	•	•		2.1	150	•	•	•	125	16-lead SOIC_W/16-lead SOIC_IC
ADuM744x	4	1	•	•	•		3	1, 25	•		•	105	16-lead QSOP
ADuM140x ¹	4	2.5	•	•	•		1.11	1, 10, 90	•			105, 125	16-lead SOIC_W
ADuM141x	4	2.5	•	•	•		1.32	1, 10	•	•		105	16-lead SOIC_W
ADuM340x ^{1,3}	4	2.5	•	•	•		1.5	1, 10, 90	•		•	105, 125	16-lead SOIC_W
ADuM144x	4	3.75	•	•	•		0.0003	2	•	•		125	16-lead QSOP
ADuM348x	4	3.75	•	•	•		4.72	1, 25			•	125	20-lead SSOP
ADuM240x	4	5	•	•	•		1.11	1, 10, 90	•			105	16-lead SOIC_W/16-lead SOIC_IC
ADuM440x ¹	4	5	•	•	•		1.5	1, 10, 90	•		•	105, 125	16-lead SOIC_W/16-lead SOIC_IC
ADuM15x <i>New</i>	5	3	•	•	•		2.2	150	•	•		125	16-lead SOIC_N
ADuM7510	5	1	•				3.5	10		•		105	16-lead QSOP
ADuM1510	5	2.5	•				3.5	10		•		105	16-lead SOIC_W
ADuM16x <i>New</i>	6	3	•	•	•	•	2.3	150	•	•		125	16-lead SOIC_N
ADuM764x	6	1	•	•	•	•	4.06	1, 25	•			105	20-lead QSOP

Isolated Gate Drivers

Part Number	Isolated Channels	Insulation Rating (kV rms)	Min Pulse Width (ns)	Output Voltage Range (V)	Output Current (A _{PEAK})	Power Level (mW)	Input Logic Levels	Max Temp (°C)	Package
ADuM3123 <i>New</i>	1	3	50	4.5 to 18	4		CMOS	125	8-lead SOIC_N
ADuM4135 <i>New</i>	1	5	50	12 to 35	4		CMOS	125	16-lead SOIC_W
ADuM4136 <i>New</i>	1	5	50	12 to 35	4		CMOS	125	16-lead SOIC_W
ADuM6132	1	3.7	50	12.5 to 17	0.2	275	CMOS	85	16-lead SOIC_W
ADuM7234	2	1	100	12 to 18	4		CMOS	105	16-lead SOIC_N
ADuM1233	2	2.5	80	12 to 18	0.1		TTL	105	16-lead SOIC_W
ADuM1234	2	2.5	100	12 to 18	0.1		CMOS	105	16-lead SOIC_W
ADuM3220 ¹	2	2.5	50	4.5 to 18	4		CMOS	125	8-lead SOIC_N
ADuM3221 ¹	2	2.5	50	4.5 to 18	4		CMOS	125	8-lead SOIC_N
ADuM5230 ¹	2	2.5	100	12 to 18	0.1	150	CMOS	105	16-lead SOIC_W
ADuM7223	2	2.5	50	4.5 to 18	4		CMOS	125	14-lead LGA
ADuM3223 ¹	2	3	50	4.5 to 18	4		CMOS	125	16-lead SOIC_N
ADuM3224 ^{1,2}	2	3	50	4.5 to 18	4		CMOS	125	16-lead SOIC_N
ADuM4223 ¹	2	5	50	4.5 to 18	4		CMOS	125	16-lead SOIC_W
ADuM4224 ^{1,2}	2	5	50	4.5 to 18	4		CMOS	125	16-lead SOIC_W

¹ Automotive qualified models available. Please visit product page for more information.² The ADuM3224 and ADuM4224 are versions of the ADuM3223 and ADuM4223. Unlike the ADuM3223 and ADuM4223, they do not offer thermal shutdown.³ Enhanced products (EP) qualified models available. Please visit product page for more information.

Isolated RS-485 Transceivers

Part Number	Insulation Rating (kV rms)	Full Duplex	Half Duplex	Max Data Rate	Integrated <i>iso</i> Power	Integrated Transformer Driver	Power Supply (V)		Max Temp (°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 CAN Transceivers

Part Number	Insulation Rating (kV rms)	High Voltage Bus Side Regulator	Max Data Rate (Mbps)	Integrated <i>iso</i> Power	Power Supply (V)		Max Temp (°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 ¹	5		1		3 to 5.5	5	125	16-lead SOIC_W

Isolated RS-232 Transceivers

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

Isolated I²C-Compliant Bidirectional Digital Isolators

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

USB 2.0 Certified Isolators

Part Number	Insulation Rating (kV rms)	Data Rate		Max Temp (°C)	Package
ADuM3160 ¹	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

SPI Digital Isolators (SPISolator®)

Part Number	Product Description	Insulation Rating (kV rms)	No. Auxiliary Inputs		Slave Ports	Max SPI CLK Rate (MHz)	Max Temp (°C)	Package
			Side 1	Side 2				
ADuM3150	High speed	3.75	1	1	1	40	125	20-lead SSOP
ADuM3151	Auxiliary channels	3.75	2	1	1	17	125	20-lead SSOP
ADuM3152	Auxiliary channels	3.75	1	2	1	17	125	20-lead SSOP
ADuM3153	Auxiliary channels	3.75	0	3	1	17	125	20-lead SSOP
ADuM3154	Multiple slave support	3.75	0	0	4	17	125	20-lead SSOP
ADuM4150	High speed	5	1	1	1	40	125	20-lead SOIC_IC
ADuM4151	Auxiliary channels	5	2	1	1	17	125	20-lead SOIC_IC
ADuM4152	Auxiliary channels	5	1	2	1	17	125	20-lead SOIC_IC
ADuM4153	Auxiliary channels	5	0	3	1	17	125	20-lead SOIC_IC
ADuM4154	Multiple slave support	5	0	0	4	17	125	20-lead SOIC_IC

¹ Automotive qualified models available. Please visit product page for more information.

Digital Isolators with Isolated Power, *isoPower*

Part Number	Number of Channels	Isolation Rating (kV rms)	Reverse Direction Options					Max Data Rate (Mbps)	Max Output Power (mW)	Max Temp (°C)	Package
			0	1	2	3	4				
ADuM541x <i>New</i>	4	2.5	•	•	•			150	150	105	24-lead SSOP
ADuM641x <i>New</i>	4	3.75	•	•	•			150	150	105	24-lead SSOP
ADuM5000 ¹	0	2.5						—	500 @ 5 V	105	16-lead SOIC_W
ADuM5010	0	2.5						—	150 @ 5 V	105	20-lead SSOP
ADuM520x ¹	2	2.5	•	•	•			1, 25	500 @ 5 V	105	16-lead SOIC_W
ADuM521x	2	2.5	•	•	•			1, 25, 100	150 @ 5 V	105	20-lead SSOP
ADuM524x	2	2.5	•	•	•			1	50 @ 5 V	105	8-lead SOIC_N
ADuM540x ¹	4	2.5	•	•	•	•	•	1, 25	500 @ 5 V	105	16-lead SOIC_W
ADuM6010	0	3.75						—	150 @ 5 V	105	20-lead SSOP
ADuM621x	2	3.75	•	•	•			1, 25, 100	150 @ 5 V	105	20-lead SSOP
ADuM6000	0	5						—	400 @ 5 V	105	16-lead SOIC_W/16-lead SOIC_IC
ADuM620x	2	5	•	•	•			1, 25	400 @ 5 V	105	16-lead SOIC_W/16-lead SOIC_IC
ADuM640x	4	5	•	•	•	•	•	1, 25	400 @ 5 V	105	16-lead SOIC_W/16-lead SOIC_IC

Isolated Switching Regulators

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

Isolated Amplifiers

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)	Max Temp (°C)	Package
ADuM3190 ¹	2.5	400	1	400	1.5	400	5	125	16-lead QSOP
ADuM4190 ³	5	400	1	400	1.5	400	5	125	16-lead SOIC_IC

Isolated Analog-to-Digital Converters

Part Number	Insulation Rating (kV rms)	Resolution (Bits)	Clock Rate (MHz)	Clock Source	ADC SNR typ (dB)	SINAD typ (dB)	Config/Programming Interface	Power Supply Bus	Max Temp (°C)	Package
AD7402-8	5	16	10	Internal	87	82	CMOS, serial	3.0 to 5.5	105	8-lead SOIC_W
AD7403-8	5	16	20	External	88	87	CMOS, serial	3.0 to 5.5	105	8-lead SOIC_IC
AD7400	5	16	10	Internal	71	70	CMOS, serial	3.0 to 5.5	105	16-lead SOIC_W
AD7400A	5	16	10	Internal	80	78	CMOS, serial	3.0 to 5.5	125	16-lead SOIC_W
AD7401	5	16	20	External	82	81	CMOS, serial	3.0 to 5.5	105	16-lead SOIC_W
AD7401A	5	16	20	External	83	82	CMOS, serial	3.0 to 5.5	125	16-lead SOIC_W
AD7403	5	16	20	External	88	87	CMOS, serial	3.0 to 5.5	125	16-lead SOIC_IC
AD7405	5	16	20	External	88	87	LVDS, serial	3.0 to 5.5	105	16-lead SOIC_IC
ADE7912	5	24	4	External	74	73	Serial	3.3	85	20-lead SOIC_IC
ADE7913	5	24	4	External	74	73	Serial	3.3	85	20-lead SOIC_IC

¹ Automotive qualified models available. Please visit product page for more information.

³ Enhanced products (EP) qualified models available. Please visit product page for more information.

Safety Certifications

The *iCoupler* family of digital isolation products has been tested and approved by various regulatory agencies, including UL, CSA, VDE, TÜV, and now CQC. For a full listing and downloadable PDF, visit analog.com/iCouplerSafety.



iCoupler Support Resources

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

- ▶ Evaluation boards
- ▶ Safety standards/certifications
- ▶ Technical articles

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