

**Amplifiers (Continued)**

**Comparators**

Mfr.'s Type	Propagation Delay Max. (ns)	Dispersion (ps)	Logic	Vos Max. (mV)	Single Dual Quad
AD96685BQ	3.5	50	ECL	2.0	S
AD96687BQ	3.5	50	ECL	2.0	D
AD790JN	45.0	—	TTL	1.0	S

Mfr.'s Type	Propagation Delay Max. (ns)	Dispersion (ps)	Logic	Vos Max. (mV)	Single Dual Quad
AD790JR	45.0	—	TTL	1.0	S
CMP04FP	300.0	—	TTL	1.0	S
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**Analog Multipliers/Dividers**

Analog Multipliers/Dividers are devices that can accept analog voltages and multiply, divide, square and/or square-root them. These devices can process signals over a wide frequency range, from DC to over 500MHz, and with varying degrees of accuracy, from 0.4% full scale to 2% full scale, depending on the device selected. Most of these devices are referred to as "4-quadrant multipliers," meaning that these devices can accept any combination of input signal polarity

and provide output signals of appropriate polarity. Analog Multipliers can be used to implement a wide variety of signal processing functions including modulation and demodulation, fixed and variable remote gain adjustment, power measurement and mathematical operations in analog computing, curve fitting and linearizing.

Mfr.'s Type	BW Typ. (MHz)	Total Error Max. (% FS)	Supply Voltage Range	Output Voltage Swing Min.
AD534JD	1	±1.00	±8.00 V to ±18.00 V	±11.0 V
AD534JH	1	±1.00	±8.00 V to ±18.00 V	±11.0 V
AD633JN	1	±2.00	±8.00 V to ±18.00 V	±11.0 V
AD633JR	1	±2.00	±8.00 V to ±18.00 V	±11.0 V
MLT04GS	8	±5.00	±4.75 V to ±5.25 V	±3.0 V

Mfr.'s Type	BW Typ. (MHz)	Total Error Max. (% FS)	Supply Voltage Range	Output Voltage Swing Min.
AD734AN	10	±0.40	±8.00 V to ±16.50 V	±12.0 V
AD734AQ	10	±0.40	±8.00 V to ±16.50 V	±12.0 V
AD835AN	250	NS	±4.50 V to ±5.50 V	±2.2 V
AD835AR	250	NS	±4.50 V to ±5.50 V	±2.2 V
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**Modulator/Demodulator**

This category is unusual in that it includes a single product, the AD630. The AD630 is a fast, flexible switched dual-input op amp with an on-chip comparator. The AD630 is intended to operate in wide-band, low level and wide-dynamic range instrumentation applications and coherent systems. The AD630 is capable of many analog signal processing functions such as balanced modulation and demodulation, phase detection, square-wave multiplication, absolute-value

amplification, and two-channel precision multiplexing. It can also be used as a lock-in amplifier, synchronous detector, rectifier, and much more. The AD630 essentially provides a complete, solution, with on-chip scaling resistors and requires little or no additional circuitry.

Mfr.'s Type	Unity Gain Channel BW Typ. (MHz)*	Open Loop Gain Min. /dB	Input Offset Voltage Max. /µV	Output Voltage Swing Min.
AD630JN	2	90	500	±10 V
AD630KN	2	100	100	±10 V

\*Unity gain small signal bandwidth.

Mfr.'s Type	Unity Gain Channel BW Typ. (MHz)*	Open Loop Gain Min. /dB	Input Offset Voltage Max. /µV	Output Voltage Swing Min.
AD630BD	2	100	100	±10 V
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\*Unity gain small signal bandwidth.

**RMS-to-DC Converters**

Mfr.'s Type	Conversion Accuracy mV ±% Read Max.	Full-Scale Range (V RMS)	dB Output Error dB Max
AD737JN	±0.4±0.5	0.2	—
AD637KQ	±0.5±0.2	7.0	±0.3 typ.
AD736JN	±0.5±0.5	0.2	—
AD736JR	±0.5±0.5	0.2	—
AD637JQ	±1.0±0.5	7.0	±0.5 typ.

Mfr.'s Type	Conversion Accuracy mV ±% Read Max.	Full-Scale Range (V RMS)	dB Output Error dB Max
AD637JR	±1.0±0.5	7.0	±0.5 typ.
AD536AKD	±2.0±0.2	7.0	±0.3
AD536AJD	±5.0±0.5	7.0	±0.6
AD536AJH	±5.0±0.5	7.0	±0.6
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**Signal Compression**

Signal compression products fall into two categories: variable gain amplifiers and logarithmic amplifiers. Logarithmic amplifiers like the AD606 and the AD640 provide an output voltage proportional to the logarithm of the input voltage for signals from dc to 120 MHz. Variable gain amplifiers like the AD600/602 and AD603 use a patented X-AMP technology which allows the amplifier gain to be varied as the dynamic range of the input signal changes.

Logarithmic amplifiers are excellent in all applications that require compression of wide-range analog input data. Variable gain amplifiers are typically employed as fast-response automatic gain control (AGC) elements in RF and IF systems. Alternatively, they can be used to provide time gain control (TGC) in applications such as commercial sonar.

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**Variable Gain Amplifiers**

Mfr.'s Type	Gain Range	Gain Accuracy Max.	Bandwidth Typ. (MHz)
AD600JN	0 dB to +40 dB	±0.5 dB*	35
AD603AQ	-11 dB to +31 dB	±1.0 dB	90
AD603AR	-11 dB to +31 dB	±1.0 dB	90
AD605AR	-14 dB to +34 dB or 0 dB to +48 dB	±1.0 dB	40

\*Gain accuracy measured over the 3 dB to 37 dB gain range.

**Interface Products**

The ADM2XXL family is designed to meet the EIA-232E specifications while operating from a single +5 V power supply. This is achieved by the use of an on-chip voltage doubler. Older generation RS-232 drivers required three separate power supplies: +5 V, +12 V, and -12 V, resulting in large bulky power supply units. Linear voltage regulators tend to be inefficient and are wasteful of power. This is especially a problem in today's portable equipment which operates with

battery powered supplies. Ideally the single power supply should be used which can easily be derived from a battery pack. A new design, Analog Devices' process for the 5 V RS-232 market offers lowest ICC, lowest I shutdown and the highest speed in its class. Our ADM23XL series of line drivers/receivers are major upgrades.

**Line Drivers/Receivers, RS-232**

Mfr.'s Type	Power Supply Voltage (V)	No. of Drivers	No. of Receivers	External Capacitors	Low Power Shutdown	TTL Three-State Enable
ADM202JRN	+5	2	2	Y	N	N
ADM232LJN	+5	2	2	Y	N	N
ADM232LJR	+5	2	2	Y	N	N
ADM232AAN	+5	2	2	Y	N	N
ADM232LJN	+5	2	2	N	N	N

**Transceivers, EIA RS-485**

Mfr.'s Type	Transmission Type	Drivers/Receivers Per Line	Max. Cable Length (ft.)	Min. Driver Output Voltage	Driver Load Impedance	Receiver Input Resistance	Receiver Input Sensitivity	Receiver Input Voltage Range	Data Rate
ADM485JN	Differential	32/32	4000	±1.5 V	54 Ω	12 KΩ min.	±200 mV	-7 V to +12 V	5 Mb/s
ADM485AN	Differential	32/32	4000	±1.5 V	54 Ω	12 KΩ min.	±200 mV	-7 V to +12 V	5 Mb/s