EXAR
APPLICATIONS DICTIONARY

Exar's line of monolithic IC products cover a wide range of applications. This *Applications Dictionary* is intended as a brief selection guide for the IC user, to assist him in finding the Exar product most suited to his application.

The application categories, or classes, are listed in alphabetical order, dictionary style, to allow the user to locate the product he needs at a glance. In certain applications, *two* of Exar's products used in combination may be necessary to perform the complete function. In such a case, these products are grouped together as a pair. For example, to make a complete FSK Modem may require the XR-2206 Modulator and the XR-2211 Decoder. Thus, in the Applications Dictionary shown below, both of these products will be grouped under the Modem category as XR-2206/XR-2211.

In many of the applications, more than one product type is recommended. In such cases, the user can choose the device best suited to his specific application by either consulting with Exar's Applications Department, or by reviewing the electrical specifications of individual devices involved.

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APPLICATION	RECOMMENDED EXAR PRODUCT
Active Filters	XR-084, XR-094, XR-096 XR-346, XR-3403, XR-4202
Acoustical Couplers (Also See Modems)	XR-2206, XR-2207, XR-2211
A/D Conversion (Pulse Counting Type)	XR-2240
Amplitude Detection Phase-Locked AM Detection Synchronous AM Detection Amplitude Level Detection	XR-215/XR-2228, XR-2212/XR-2228 XR-S200, XR-2208, XR-2228 XR-2276
Amplitude Modulated Oscillator Crystal Controlled AM Oscillator	XR-205, XR-2206 XR-S200, XR-205
Amplitude Modulation	XR-2206, XR-2208, XR-2228, XR-13600
Analog Computation Analog Multiplication/Division Analog Square/Square-Root Operation	XR-2208, XR-2228 XR-2208
Analog-To-Frequency Conversion	XR-2209, XR-4151
Analog Sample–Hold	XR-13600/XR-082

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APPLICATION	RECOMMENDED EXAR PRODUCT
Analog Semi-Custom Design (Master Chips)	XR-A100, XR-B100, XR-C100, XR-D100 XR-F100, XR-G100, XR-X100
Appliance Timing	XR-555, XR-556, XR-558, XR-559, XR-2240, XR-2242
Audio Amplifier/Preamp	XR-5532, XR-5534
Audio Level Detector	XR-2276
Automatic Gain Control (AGC)	XR-2208, XR-2216, XR-2228, XR-13600

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APPLICATION	RECOMMENDED EXAR PRODUCT
Bar Graph Display	XR-2276
Battery Charger Timing	XR-2242
Battery Operated Instruments (Low Power) Timing Tone Detection	XR-L555, XR-L556 XR-L567
Bit-Pattern Generation	XR-2240

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Carrier Detection (Also See AM and Tone Detection) High Frequency (> 1 MHz) Low Frequency (< 1 MHz) Low Power	XR-215/XR-2228 XR-567, XR-2211, XR-2567 XR-L567
Carrier-Tone Transceiver	XR-2567
Clock Generation (Also See Oscillators) Low Frequency (< 1 MHz) Low Power High Frequency Phase-Locked	XR-555, XR-2209, XR-2242 XR-L555, XR-L556 XR-205 XR-215, XR-2212

APPLICATIONS	RECOMMENDED EXAR PRODUCT

Clock Extraction
    Phase-Locked
    PCM Signal Clock
	
	XR-210, XR-215, XR-2212
	XR-C262 , XR-C277

Clock Pattern Generation	XR-2240

Clock Sychronization
    High Frequency (> 1 MHz)
    Low Frequency (< 1 MHz)
	
	XR-210, XR-215
	XR-2212

Compandor (Speech/Data)	XR-2216
Current-to-Frequency Converter	XR-2206, XR-2207, XR-2209

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Darlington Arrays (High-Current, High-Voltage)	 XR-2200, XR-2201, XR-2202, XR-2203, XR-2204

Data Sychronization
    High Frequency (> 1 MHz)
    Low Frequency (< 1 MHz)
	
	XR-210, XR-215
	XR-2212

DC — DC Converter (Also See Switching Regulators)	XR-1524, XR-2524, XR-3524

Detector
    FM
    FSK
    Tone
    Amplitude Level
    Amplitude Modulation
	
	XR-215, XR-2212
	XR-210, XR-2211
	XR-567, XR-L567, XR-2211, XR-2567
	XR-2276
	XR-2208

Differential Multiplier	XR-2228
Digital Sample-Hold	XR-2240

Digital Semi-Custom Design (I^2L Gate Arrays)
    Complete Digital Design
    Combined Analog/Digital Design
	
	XR-200, XR-300, XR-500
	XR-400

Display Driver
    Fluorescent
    Bar-Graph
	
	XR-2271, XR-2272, XR-6118, XR-6128
	XR-2276

APPLICATION	RECOMMENDED EXAR PRODUCT
Division (Analog)	XR-2208
Division (Frequency)	XR-2240

Dual Operational Amplifiers
    Dual-741 Type
    Low Noise
    Bifet
    Transconductance
	
	XR-1458, XR-4558, XR-4739
	XR-5532, XR-5533
	XR-082, XR-083
	XR-13600

Dual Oscillator Low Power	XR-556, XR-2556, XR-2567 XR-L556
Dual Tone Detector	XR-2567

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APPLICATION	RECOMMENDED EXAR PRODUCT
Electronic Gain Control	XR-2208, XR-2216, XR-2228, XR-13600
Expandor (Speech/Data)	XR-2216

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APPLICATION	RECOMMENDED EXAR PRODUCT

Filters
    Active Filters
 	
    Tracking Filters (Phase-Locked)
	
	XR-084, XR-094, XR-346,
	XR-3403, XR-4202
	XR-S200, XR-215, XR-2212

Fluorescent Display Driver
    Medium Voltage ($\leqslant$ 50V)
    High Voltage ($>$ 50V)
    Bar-Graph Display
	
	XR-2271, XR-2272
	XR-6118, XR-6128
	XR-2276

Frequency Detection (Also See Tone Detection)
    High Frequency ($>$ 1 MHz)
    Low Frequency ($<$ 1 MHz)
    Multiple Frequency
	
	XR-215/XR-2228
	XR-567, XR-2211
	XR-2567

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Frequency Discriminator (Also See F/V Converter)	
High Frequency (> 1 MHz)	XR-215
Low Frequency (< 1 MHz)	XR-2212, XR-4151
Frequency Division	XR-320, XR-555, XR-2240, XR-2242
Frequency Doubling	XR-2208, XR-2228
FM Detection	
High Frequency (> 1 MHz)	XR-215
Low Frequency (< 1 MHz)	XR-215, XR-2212
FM Generation	
High Frequency (> 1 MHz)	XR-S200, XR-205
Low Frequency (< 1 MHz)	XR-2206, XR-2207, XR-2209, XR-8038
Frequency Multiplication (Synthesis)	
High Frequency (> 1 MHz)	XR-S200, XR-215
Low Frequency (< 1 MHz)	XR-2212
Frequency Translation	
High Frequency (> 1 MHz)	XR-215/XR-2228
Low Frequency (< 1 MHz)	XR-2212/XR-2228
Frequency/Voltage (F/V) Converter	
Wide Band	XR-4151
Narrow Band	XR-2212
FSK Detection (Decoding)	
High Frequency (> 1 MHz)	XR-210
Low Frequency (< 1 MHz)	XR-2211
FSK Generation (Encoding)	
High Frequency (> 1 MHz)	XR-210
Low Frequency (< 1 MHz)	XR-2206, XR-2207
Sinusoidal Output	XR-2206
Multiple Frequency Levels	XR-2207
FSK Modem (Modulator/Demodulator)	XR-2211/XR-2206, XR-2211/XR-2207

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Gate Arrays (I^2L) - (Also See Digital Semi-Custom)	XR-200, XR-300, XR-400, XR-500

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Generator (See Function Generators)	XR-205, XR-2206, XR-8038
Ground-Sensing Op Amps	XR-3403
Gyrator Design	XR-094, XR-346, XR-3403 XR-4202, XR-13600

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Hammer Driver (Also See High Current Drivers)	XR-2200, XR-2201, XR-2202 XR-2203, XR-2204
High Voltage Driver	XR-6118, XR-6128

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Indicator, Amplitude (Also See AM Detector, Level Detector)	XR-2208, XR-2228, XR2276
Indicator, Frequency (Also See Frequency Detector)	XR-215, XR-2212, XR-4151
Intercom	XR-2206/XR-2211, XR-2567
Interval Timing	XR-555, XR-L555, XR-556, XR-L556 XR-558, XR-559

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
LED Driver	XR-2200, XR-2201, XR-2202 XR-2203, XR-2204

APPLICATIONS	RECOMMENDED EXAR PRODUCT
Linear Ramp Generation	XR-320, XR-2207
Linear Sweep Oscillator	XR-2206, XR-2207, XR-2209
Line Compandor	XR-2216
Line Driver (RS-232C Spec)	XR-1488
Line Receiver (RS-232C Spec)	XR-1489A
Long Delay Generation	XR-2242
Low Power Oscillator	XR-L555
Low Power PLL	XR-L567
Low Power Timer	XR-L555, XR-L556
Low Voltage Timer/Oscillator	XR-L555, XR-L556

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APPLICATIONS	RECOMMENDED EXAR PRODUCT

Micropower Circuits (Also See Low Power)
    Micropower Oscillator
    Micropower Tone Decoder (PLL)
    Micropower Timer
	
	XR-L555, XR-L556
	XR-L567
	XR-L555, XR-L556

Missing Pulse Detection	XR-320, XR-555, XR-L555
Modem Filter Design	XR-346, XR-3403, XR-4202
Modem (Frequency-Shift Keyed)	XR-210, XR-2206, XR-2207, XR-2211

Modulators (Also See Multipliers)
    Amplitude Modulator
    FSK Modulator
    Frequency Modulator
    Phase Modulator
	
	XR-2212
	XR-2206, XR-2207
	XR-205, XR-2206, XR-2209
	XR-2212

Motor Speed Control	XR-2208, XR-2212
Multi-Function PLL	XR-S200
Multiplier, Analog	XR-2208, XR-2228

APPLICATIONS	RECOMMENDED EXAR PRODUCT
Operational Amplifiers	
Single Op Amp	XR-5534
Dual Op Amp	XR-082, XR-083, XR-1458
	XR-4558, XR-4739
Quad Op Amp	XR-084, XR-3403,
	XR-4136, XR-4212, XR-4741
Programmable Op Amp	XR-094, XR-095, XR-096
	XR-346, XR-4202
Ground Sensing Quad Op Amp	XR-3403
Ultra Low Noise Op Amp	XR-5532, XR-5333, XR-5534
Bifet Op Amps	
Dual Bifet	XR-082, XR-083
Quad Bifet	XR-084
Programmable Bifet	XR-094, XR-095, XR-096
Operational Transconductance Amplifier (OTA)	XR-13600
Oscillators (Also See Function Generators)	
High Frequency Oscillator (> 1 MHz)	XR-205, XR-210, XR-215
Low Frequency Oscillator (< 1 MHz)	XR-2206, XR-2207, XR-2209, XR-8038
High Current Output Oscillator	XR-567
Low Cost Oscillator	XR-555, XR-L555
Low Power Oscillator (Single)	XR-L555, XR-L567
Low Power Oscillator	XR-L556
Quad Oscillator	XR-558, XR-559
Sinusoidal Output	XR-205, XR-2206, XR-8038
FSK Keyed Oscillator	XR-2206, XR-2207
Oscillator with Quadrature Outputs	XR-2212

APPLICATIONS	RECOMMENDED EXAR PRODUCT
PCM Repeater (See Regenerator)	XR-C240, XR-C262, XR-C277
Phase-Comparator (Phase-Detector)	XR-2208, XR-2228
Phase-Locked Loop	
High Frequency (> 1 MHz)	XR-S200, XR-210, XR-215
Low Frequency (< 1 MHz)	XR-567, XR-L567, XR-2567
	XR-2211, XR-2212
Ultra-Stable	XR-2211, XR-2212
FM Detector	XR-215, XR-2212
FSK Detector	XR-210, XR-2211
Tone Detector	XR-567, XR-L567, XR-2567
Low Power	XR-L567
AM Detector	XR-215/XR-2228, XR-2212/XR-2228
Stereo Decoder	XR-1310

APPLICATIONS	RECOMMENDED EXAR PRODUCT
Power-On Reset	XR-320, XR-555, XR-L555
Precision Oscillator	XR-2206, XR-2209
Precision PLL	XR-2212
Process Controller	XR-2206/XR-2211, XR-2240, XR-4151

Programmable Op Amp (Also See Op Amps)
    Quad Bipolar
    Quad Bifet
	
	XR-346, XR-346-2, XR-4202
	XR-094, XR-095, XR-096

Programmable Oscillator	XR-2206, XR-2207
Programmable Timer	XR-2240
PSK Generation (Bi-phase)	XR-205, XR-2206, XR-2228
Pulse-Blanking	XR-556, XR-2556
Pulse-Code Modulation (PCM) Regenerator	XR-C240, XR-C262, XR-C277
Pulse Counting	XR-2240
Pulse Generation	XR-320, XR-555, XR-L555, XR-556
Pulse-Position Modulation (PPM)	XR-320
Pulse-Proportional Servo Controller	XR-2264, XR-2265, XR-2266
Pulse Shaping	XR-555, XR-556, XR-558, XR-559
Pulse Stretching	XR-320, XR-555, XR-556
Pulse-Width Modulation (PWM)	XR-320, XR-555
Pulse-Width Modulating Regulator	XR-1524, XR-2524, XR-3524

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Quadrature AM Detector	XR-2208, XR-2228
Quadrature-Output Oscillator	XR-2212

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Radio-Controlled Servo Driver	XR-2264, XR-2265, XR-2266
Radio — FM I.F. Demodulation — AM I.F. Detection	XR-215 XR-2228
Relay Driver (Also See Hammer Driver)	XR-2200, XR-2201, XR-2202 XR-2203, XR-2204
Remote-Control Timer/Sequencer	XR-L555, XR-L556, XR-2240
Remote-Control Transceiver	XR-567, XR-L567, XR-2567
Reset Controller (Also See Power-On Reset)	XR-L555, XR-L556

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Sample-Hold Amplifier (Also See Bifet Op Amps)	XR-082, XR-084
Saw-Tooth Generator	XR-320, XR-2207

Semi-Custom Design
    Linear Master Chips
 	
    Digital (I^{2}L) Master Chips
	XR-A100, XR-B100, XR-C100
	XR-D100, XR-F100, XR-X100
	XR-200, XR-300, XR-400, XR-500

Sequential Timing	XR-556, XR-L556, XR-558, XR-559
Sequential Tone Decoding	XR-567, XR-L567, XR-2567
Servo Controller/Driver	XR-2264, XR-2266

Signal Conditioning
    High Frequency (> 1 MHz)
    Low Frequency (< 1 MHz)
	XR-S200, XR-215, XR-2212
	XR-2212

Simultaneous AM/FM Detection	XR-215/XR-2228, XR-2212/XR-2228
Simultaneous AM/FM Generation	XR-205, XR-2206
Sine Wave Converter	XR-2212/XR-2228
Sine Wave Generator	XR-205, XR-2206, XR-8038
Solonoid Driver (Also See Relay Driver)	XR-2200, XR-2201, XR-2202 XR-2203, XR-2204

APPLICATIONS	RECOMMENDED EXAR PRODUCT
Speech Compandor	XR-2216
Square-Root Extraction	XR-2208
Squaring (Analog)	XR-2208, XR-2228
Stable PLL	XR-2211, XR-2212
Stereo Demodulator (Decoder)	XR-1310
Suppressed Carrier AM Generator	XR-205, XR-2206, XR-2208, XR-2228
Sweep Generation (Also See Saw-Tooth Generation)	XR-320, XR-2207
Synchronization (Clock Frequency)	XR-215, XR-2212
Synchronous AM Detection	XR-215/XR-2228, XR-2212/XR-2228

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Telecommunication Circuits	
PCM Repeater (T-1 Type)	XR-C240, XR-C262, XR-C277
Speech Compandor	XR-2216
Tone Decoder (PLL Type)	XR-567, XR-L567, XR-2211, XR-2567
Tone Encoder	XR-2206, XR-2207
Timing Circuits (Timers)	
General Purpose Timers - Single	XR-320, XR-555
General Purpose Timers - Dual	XR-556, XR-2556
General Purpose Timers - Quad	XR-558, XR-559
Low Power Timers	XR-L555, XR-L556
Long Delay Timer	XR-2242
Programmable Timer	XR-2240
Tone Decoder (PLL Type)	
General Purpose - Single	XR-567
General Purpose - Dual	XR-2567
Precision	XR-2211
Low Power	XR-L567
Tone Encoder	XR-2206, XR-2207
Tracking Filter	
High Frequency (> 1 MHz)	XR-S200, XR-215
Low Frequency (< 1 MHz)	XR-2212

Tracking Regulator	XR-1468, XR-4194, XR-4195
Transceiver (Wireless Intercom)	XR-2567
Triangle-to-Sine Wave Converter	XR-2208, XR-2228
Triangle-Wave Oscillator	XR-2206, XR-2207, XR-2209, XR-8038
TV Sound Detection	XR-215

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Ultra-Low Frequency Oscillator	XR-2242
Ultra-Sonic Remote Control	XR-567, XR-2211, XR-2567
Universal Sine Wave Converter	XR-2212/XR-2228

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Voltage-Controlled Amplifier	XR-2208, XR-2228, XR-13600
Voltage-Controlled Oscillator (VCO) High Frequency (> 1 MHz) Low Frequency (< 1 MHz) Ultra-Stable Sinusoidal Output Wide Linear Sweep	XR-S200, XR-205 XR-2206, XR-2207, XR-2209, XR-8038 XR-2206, XR-2207, XR-2209 XR-2206, XR-8038 XR-2207, XR-2209
Voltage-to-Current Conversion	XR-13600
Voltage-to-Frequency (V/F) Conversion	XR-2209, XR-4151

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APPLICATIONS	RECOMMENDED EXAR PRODUCT
Waveform Generator (Also See Oscillators) High Frequency (> 1 MHz) Low Frequency (< 1 MHz)	XR-205 XR-2206, XR-2209, XR-8038
Waveform Shaping/Modulation	XR-2208, XR-2228
Wide Band Discriminator (FM) High Frequency (> 1 MHz) Low Frequency (< 1 MHz)	XR-S200, XR-215 XR-2212, XR-4151
Wireless Intercom	XR-215, XR-567, XR-2212