



## SILICON LABS

### Crystal Oscillators (XO/VCXO)

Silicon Labs' crystal oscillators and voltage-controlled crystal oscillators (XO/VCXOs) leverage advanced DSPLL® circuitry to provide a low jitter clock at frequencies from 100 kHz to 1.4 GHz. Silicon Labs XO/VCXOs offer superior jitter and power supply noise rejection performance and best-in-class reliability. Quick turn samples of any standard or custom frequency XO/VCXOs are available in under two weeks.

#### Crystal Oscillator (XO)

PART NUMBER	FREQUENCIES	FREQUENCY RANGE	JITTER (RMS)	STABILITY/APR (PPM)	FORMAT	VOLTAGE (V)	TEMP (°C)	PACKAGE SIZE (MM)
Si535/36	Single	Select freq. 100 - 312.5 MHz	0.2 ps	±20, ±31.5	LVDS, LVPECL	3.3, 2.5	-40 to 85	5 x 7
Si530/31	Single							
Si532/33	Dual	10 - 1417 MHz	0.3 ps	±20, ±31.5, ±61.5	CMOS, LVPECL, LVDS, CML	3.3, 2.5, 1.8	-40 to 85	5 x 7
Si534	Quad							
Si570	Any (I <sup>2</sup> C Prog)							
Si590/91	Single	10 - 810 MHz	0.5 ps	±20, ±30, ±50, ±100	CMOS, LVPECL, LVDS, CML	3.3, 2.5, 1.8	-40 to 85	5 x 7
Si598	Any (I <sup>2</sup> C Prog)							
Si510/11	Single	0.1 - 250 MHz	0.8 ps	±30, ±50, ±100	CMOS, Dual	3.3, 2.5, 1.8	-40 to 85	5 x 7
Si512/13	Dual				CMOS, LVPECL, LVDS, HCSL			3.2 x 5
Si514	Any (I <sup>2</sup> C Prog)							

#### Voltage-Controlled Oscillator (VCXO)

PART NUMBER	CENTER FREQUENCIES	FREQUENCY RANGE	JITTER (RMS)	STABILITY/APR (PPM)	FORMAT	VOLTAGE (V)	TEMP (°C)	PACKAGE SIZE (MM)
Si550	Single	10 - 1417 MHz	0.5 ps	±12 to ±375	CMOS, LVPECL, LVDS, CML	3.3, 2.5, 1.8	-40 to 85	5 x 7
Si552	Dual							
Si554	Quad							
Si571	Any (I <sup>2</sup> C Prog)							
Si595	Single	10 - 810 MHz	0.7 ps	±10 to ±370	CMOS, LVPECL, LVDS, CML	3.3, 2.5, 1.8	-40 to 85	5 x 7
Si597	Quad							
Si599	Any (I <sup>2</sup> C Prog)							
Si515	Single	0.1 - 250 MHz	1 ps	±30 to ±100	CMOS, Dual	3.3, 2.5	-40 to 85	5 x 7
Si516	Dual				CMOS, LVPECL, LVDS, HCSL			3.2 x 5



## Clock Generation

### Any-Frequency, Any-Output CMOS Clock Generators (Si5350A/C, Si5351A/C)

Silicon Labs' highly flexible factory and I2C programmable LVCMOS clock generators can be customized to generate multiple, independent non-integer-related frequencies with equivalent frequency synthesis capability of 8 PLLs, with exact frequency synthesis (0 ppm error), significantly lower jitter, lower power and smaller size than competing solutions.

PART NUMBER	CONTROL	CLOCK INPUT / OUTPUTS	INPUT FREQUENCY (MHz)	OUTPUT FREQUENCY (MHz)	PERIOD JITTER (PP)	VDD	VDDO	OUTPUT	PACKAGE
Si5350A	Pin	1/3 or 8	25/27 (Xtal)	2.5 kHz - 200 MHz	70 ps	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	MSOP10, QFN20
Si5350C	Pin	1/3 or 8	10 - 100 (Clock) 25/27 (Xtal)	2.5 kHz - 200 MHz	70 ps	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	MSOP10, QFN20
Si5351A	I <sup>2</sup> C	1/3 or 8	25/27 (Xtal)	2.5 kHz - 200 MHz	70 ps	2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	MSOP10, QFN20
Si5351C	I <sup>2</sup> C	1/3 or 8	10 - 100 (Clock) 25/27 (Xtal)	2.5 kHz - 200 MHz	70 ps	2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	MSOP10, QFN20

### Any-Frequency CMOS Clock Generators with Integrated VCXOs (Si5350B, Si5351B)

Integrated clock generator + VCXO devices feature an integrated voltage controlled oscillator (VCXO), while eliminating the need for custom, pullable crystals.

PART NUMBER	CONTROL	CLOCK INPUT / OUTPUTS	INPUT FREQUENCY (MHz)	OUTPUT FREQUENCY (MHz)	PERIOD JITTER (PP)	VDD	VDDO	OUTPUT	PACKAGE
Si5350B	Pin	1/3 or 8	25/27 (Xtal)VCXO	2.5 kHz - 200 MHz	70 ps	2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	MSOP10, QFN20
Si5351B	I <sup>2</sup> C	1/8	25/27 (Xtal)VCXO	2.5 kHz - 200 MHz	70 ps	2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	QFN20

### Any-Frequency, Any-Output Differential/CMOS Clock Generators (Si5340/41, Si5335/38)

Differential + LVCMOS clock generators provide any rate, any output frequency synthesis, enabling a single device to replace multiple crystal oscillator and fixed-frequency clock generators.

PART NUMBER	CONTROL	CLOCK INPUT / OUTPUTS	INPUT FREQUENCY (MHz)	OUTPUT FREQUENCY (MHz)	PHASE JITTER (RMS)	VDD	VDDO	OUTPUT	PACKAGE
Si5340	I <sup>2</sup> C	1/4	10 - 750 (Clock), 25, 54 (Crystal)	100 Hz - 1028 MHz	0.09 ps	1.8, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS, LVDS, LVPECL, HCSL, SSTL, HSTL, CML	QFN44
Si5341	I <sup>2</sup> C	1/10	10 - 750 (Clock), 25, 54 (Crystal)	100 Hz - 1028 MHz	0.09 ps	1.8, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS, LVDS, LVPECL, HCSL, SSTL, HSTL, CML	QFN64
Si5335	Pin	1/4	10 - 350 (Clock), 25/27 (Xtal)	1 - 350 MHz	0.7 ps	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS, LVDS, LVPECL, HCSL, SSTL, HSTL, CML	QFN24
Si5338	I <sup>2</sup> C	1/4	5 - 710 (Clock), 8 - 30 (Xtal)	0.16 - 710 MHz 0.16 - 350 MHz 0.16 - 200 MHz	0.7 ps	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS, LVDS, LVPECL, HCSL, SSTL, HSTL, CML	QFN24

## PCI Express Clock Generators (PCIe)

(Clock Generation Cont.)

Silicon Labs offers the lowest power, highest performance PCI-Express clock generators on the market.

PART NUMBER	CONTROL	CLOCK INPUT / OUTPUTS	INPUT FREQUENCY (MHz)	OUTPUT FREQUENCY (MHz)	PHASE JITTER (RMS)	VDD	VDDO	OUTPUT	PACKAGE
Si52111	—	1/1	25 MHz	100 MHz	1.0 ps	3.3 V	3.3 V	HCSL	TDFN10
Si52112	—	1/2	25 MHz	100 MHz	1.0 ps	3.3 V	3.3 V	HCSL	TDFN10
Si52142	Pin/I <sup>2</sup> C	1/3	25 MHz	100 MHz, 25 MHz	1.0 ps	3.3 V	3.3 V	HSCL, LVCMOS	QFN24
Si52143	Pin/I <sup>2</sup> C	1/5	25 MHz	100 MHz, 25 MHz	1.0 ps	3.3 V	3.3 V	HSCL, LVCMOS	QFN24
Si52144	Pin/I <sup>2</sup> C	1/4	25 MHz	100 MHz	1.0 ps	3.3 V	3.3 V	HSCL	QFN24
Si52146	Pin/I <sup>2</sup> C	1/6	25 MHz	100 MHz	1.0 ps	3.3 V	3.3 V	HSCL	QFN32
Si52147	Pin/I <sup>2</sup> C	1/9	25 MHz	100 MHz	1.0 ps	3.3 V	3.3 V	HSCL	QFN48
Si5335	Pin	1/4	10 - 350 (Clock), 25/27 (Xtal)	1 - 350 MHz	1.0 ps	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS, LVDS, LVPECL, HCSL, SSTL, HSTL, CML	QFN24

## Tiny CMOS Clock Generators

Silicon Labs' highly flexible tiny clock LVCMOS generators can be customized to generate multiple frequencies with significantly lower jitter, power, & at smaller sizes than competing solutions.

PART NUMBER	CONTROL	CLOCK INPUT / OUTPUTS	INPUT FREQUENCY (MHz)	OUTPUT FREQUENCY (MHz)	PERIOD JITTER (PP)	VDD	VDDO	OUTPUT	PACKAGE
Si51210	Pin	1/2	3 - 166 (Clock), 8 - 48 (Xtal)	3 to 200 MHz	—	2.5 to 3.3 V	—	LVCMOS	TDFN6
Si51211	Pin	1/3	3 - 166 (Clock), 8 - 48 (Xtal)	3 to 200 MHz	—	2.5 to 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	TDFN8
Si51214	Pin	1/2	3 - 166 (Clock), 8 - 48 (Xtal)	3 to 133 MHz	—	1.8 V	—	LVCMOS	TDFN6
Si51218	Pin	1/3	3 - 166 (Clock), 8 - 48 (xtal)	32 kHz to 200 MHz	—	2.5 to 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	TDFN8
Si51219	Pin	1/3	3 - 166 (Clock), 8 - 48 (Xtal)	3 to 200 MHz	—	2.5 to 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	TSSOP8

## Jitter Attenuators

### Single / Multi-DSPLL Jitter Attenuators

Silicon Labs' jitter attenuators generate any combination of output frequencies from any input frequency with industry-leading jitter performance (100 fs RMS). Based on Silicon Labs' innovative 4th-generation DSPLL architecture, these devices simplify clock tree design by replacing multiple clocks and oscillators, thereby minimizing BOM count and complexity.

PART NUMBER	# OF PLLS	CONTROL	CLOCK INPUTS / OUTPUTS	INPUT FREQUENCY (MHz)	OUTPUT FREQUENCY (MHz)	JITTER (PS)	PLL BANDWIDTH	HITLESS SWITCHING	DIGITAL HOLD	SIGNAL FORMAT	PACKAGE
Si5380	1	I <sup>2</sup> C/SPI	4/12	10 - 750	0.48 - 1474	0.07 ps	0.1 Hz - 100 Hz	✓	✓	LVPECL, LVDS, CML, LVCMOS, HCSL	QFN64
Si5342	1	I <sup>2</sup> C/SPI	4/2	0.008 - 750	0.001 - 1028	0.09 ps	0.1 Hz - 4 kHz	✓	✓	LVPECL, LVDS, CML, LVCMOS, HCSL	QFN44
Si5344	1	I <sup>2</sup> C/SPI	4/4	0.008 - 750	0.001 - 1028	0.09 ps	0.1 Hz - 4 kHz	✓	✓	LVPECL, LVDS, CML, LVCMOS, HCSL	QFN64
Si5345	1	I <sup>2</sup> C/SPI	4/10	0.008 - 750	0.001 - 1028	0.09 ps	0.1 Hz - 4 kHz	✓	✓	LVPECL, LVDS, CML, LVCMOS, HCSL	QFN64
Si5346	2	I <sup>2</sup> C/SPI	4/4	0.008 - 750	0.001 - 712.5	0.095 ps	0.1 Hz - 4 kHz	✓	✓	LVPECL, LVDS, CML, LVCMOS, HCSL	QFN44
Si5347	4	I <sup>2</sup> C/SPI	4/8 or 4	0.008 - 750	0.001 - 712.5	0.095 ps	0.1 Hz - 4 kHz	✓	✓	LVPECL, LVDS, CML, LVCMOS, HCSL	QFN64

## Clock Buffers / Level Translators

### Universal Clock Buffers / Level Translators

Silicon Labs' Universal family of low-jitter clock buffers and level translators (Si533XX) delivers multiple output clock formats from any input clock format (supports LVDS, LVPECL, CML, LVCMOS, SSTL, HCSL and HSTL)

PART NUMBER	CLOCK INPUT / OUTPUTS	ADDITIVE JITTER (RMS)	MAX FREQUENCY (MHz)	VDD	VDDO	OUTPUT	PACKAGE
Si53301	2/6	45 fs	1 - 725 Mhz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVPECL, LVDS, HCSL, LVCMOS, CML	QFN32
Si53302	2/10	45 fs	1 - 725 Mhz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVPECL, LVDS, HCSL, LVCMOS, CML	QFN44
Si53306	1/4	45 fs	1 - 725 Mhz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVPECL, LVDS, HCSL, LVCMOS, CML	QFN16
Si53307	2/2	45 fs	1 - 725 Mhz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVPECL, LVDS, HCSL, LVCMOS, CML	QFN16
Si53320	2/10	45 fs	1 - 725 Mhz	2.5, 3.3 V	2.5, 3.3 V	LVPECL	TSSOP20
Si53321	2/10	45 fs	DC - 1250 MHz	2.5, 3.3 V	2.5, 3.3 V	LVPECL	QFN32, QFP32
Si53322	1/2	45 fs	DC - 1250 MHz	2.5, 3.3 V	2.5, 3.3 V	LVPECL	QFN16
Si53323	2/4	45 fs	DC - 1250 MHz	2.5, 3.3 V	2.5, 3.3 V	LVPECL	QFN16
Si53340	2/4	45 fs	DC - 1250 MHz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVDS	QFN16
Si53360	1/8	100 fs	1 - 200 MHz	1.8, 2.5, 3.3 V	1.8, 2.5 V	LVCMOS	TSSOP16
Si53365	1/8	100 fs	1 - 200 MHz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVCMOS	TSSOP16
Si5330	1/4	150 fs	1 - 710 Mhz	1.8, 2.5, 3.3 V	1.8, 2.5, 3.3 V	LVPECL, LVDS, HCSL, SSTL, HSTL	QFN24

### PCI Express (PCIe) Fanout - Zero Delay Buffers

Silicon Labs offers a portfolio of low-power fanout / zero delay buffers meeting PCI-Express Gen1/2/3 specifications. All devices feature low power push-pull output buffer technology, providing benefits of low power consumption, reduced external terminating resistors and small packaging.

PART NUMBER	CLOCK INPUT / OUTPUTS	CONTROL	MAX FREQUENCY (MHz)	PHASE JITTER (RMS)	VDD	VDDO	OUTPUT	PACKAGE
Si53152	1/2	Pin / I <sup>2</sup> C	100 MHz	0.1 ps	3.3 V	3.3 V	Push-Pull HCSL	QFN24
Si53154	1/4	Pin / I <sup>2</sup> C	100 MHz	0.1 ps	3.3 V	3.3 V	Push-Pull HCSL	QFN24
Si53156	1/6	Pin / I <sup>2</sup> C	100 MHz	0.1 ps	3.3 V	3.3 V	Push-Pull HCSL	QFN32
Si53159	1/9	Pin / I <sup>2</sup> C	100 MHz	0.1 ps	3.3 V	3.3 V	Push-Pull HCSL	QFN48
Si53102	1/2	—	100 MHz	0.2 ps	2.5, 3.3 V	—	Push-Pull HCSL	TDFN8
Si53108	1 / 8	Pin / I <sup>2</sup> C	100 MHz, 133 MHz	0.45 ps	—	—	Push-Pull HCSL	QFN48
Si53112	1 / 12	Pin / I <sup>2</sup> C	100 MHz, 133 MHz	0.45 ps	—	—	Push-Pull HCSL	QFN64
Si53115	1 / 15	Pin / I <sup>2</sup> C	100 MHz, 133 MHz	0.45 ps	—	—	Push-Pull HCSL	QFN64
Si53119	1 / 19	Pin / I <sup>2</sup> C	100 MHz, 133 MHz	0.5 ps	—	—	Push-Pull HCSL	QFN72
Si53106	1 / 6	Pin / I <sup>2</sup> C	100 MHz, 133 MHz	0.6 ps	—	—	Push-Pull HCSL	QFN40
Si53019	1 / 19	Pin / I <sup>2</sup> C	100 MHz, 133 MHz	0.6 ps	—	—	Constant Current HCSL	QFN72