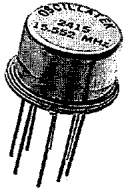


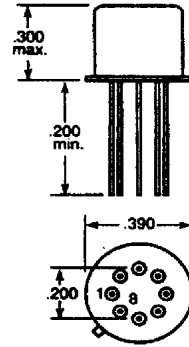
# QPL Clock Oscillators

## M55310/09



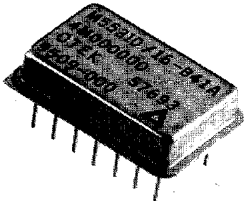
### Features

- QPL DESC approved for a variety of class B devices.
- Frequency range from 400 kHz to 30 MHz
- TTL



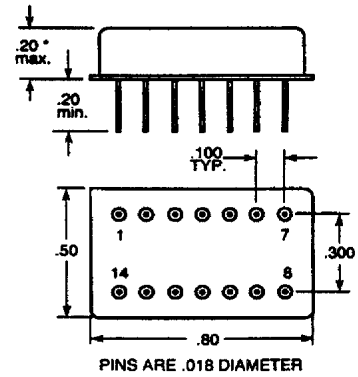
Note: dimensions in inches

## M55310/14 M55310/16 M55310/17



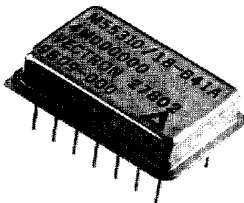
### Features

- QPL DESC approved for a variety of class B and class S devices.
- Frequency range from 0.1 Hz to 60 MHz
- TTL



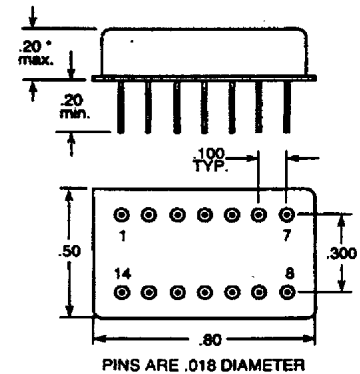
Note: dimensions in inches

## M55310/18 M55310/25 M55310/26



### Features

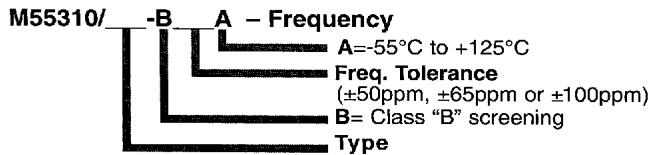
- QPL DESC approved for a variety of class B devices.
- Frequency range from 250 Hz to 175 MHz
- HCMOS and ECL outputs



Note: dimensions in inches

# QPL Clock Oscillators

## QPL Part Numbering



VI provides QPL parts with 100% Class "B" screening:

- |                         |                                  |
|-------------------------|----------------------------------|
| 1 Internal Visual       | 5 Seal Test                      |
| 2 Stabilization Bake    | 6 Electrical Test at +23°C       |
| 3 Temperature Cycling   | 7 160 Hour Burn-in Load          |
| 4 Constant Acceleration | 8 Electrical Test vs Temperature |

Consult factory for test details and current DESC specifications.

## Specifications

VI is an approved source of MIL-O-55310 hybrid oscillators and is currently qualified to the following "slash" numbers:

Type	Output	Package
M55310/09	TTL	TO-5
M55310/14	TTL	14 pin DIP
M55310/16	TTL	14 pin DIP
M55310/17	TTL	14 pin DIP
M55310/18	CMOS	14 pin DIP
M55310/25	ECL	4/14 pin DIP
M55310/26	HCMOS	4/14 pin DIP

The current issue of the appropriate military slash sheet should be consulted for further information on QPL products. Data on the current issue of the slash sheet may supercede data on this page.

Type	Frequency Range	Freq. Tolerance ppm		Pinouts			
		±50	±100	+5V	Gnd	Out	Gate
09	400 KHz - 9 MHz	01	05	8	4	5	na
09	9 MHz - 25 MHz	11	15	8	4	5	na
09	25 MHz - 30 MHz	21	25	8	4	5	na
14	0.1 Hz - 1 KHz	01	na	4	7	5	na
14	1 KHz - 150 KHz	02	na	4	7	5	na
14	150 KHz - 300 KHz	03	na	4	7	5	na
14	300 KHz - 600 KHz	04	na	4	7	5	na
14	600 KHz - 2.5 MHz	05	na	4	7	5	na
14	2.5 MHz - 5.0 MHz	06	na	4	7	5	na
14	5.0 MHz - 10 MHz	07	na	4	7	5	na
14	10 MHz - 15 MHz	08	na	4	7	5	na
14	15 MHz - 25 MHz	09	na	4	7	5	na
16	0.1 Hz - 250 Hz	01	04	14	7	8	na
16	250 Hz - 150 KHz	11	14	14	7	8	na
16	159 KHz - 5.0 MHz	21	24	14	7	8	na
16	4.0 MHz - 20 MHz	31	34	14	7	8	na
16	20 MHz - 60 MHz	41	44	14	7	8	na
17	250 KHz - 5 MHz	01	04	14	7	8	pin 9
17	4.0 MHz - 20 MHz	11	14	14	7	8	pin 9
17	20 MHz - 50 MHz	21	24	14	7	8	pin 9

Type	Frequency Range	Freq. Tolerance ppm			Pinouts			
		±50	±65	±100	Vcc	Gnd	Out	Gate
18	250 Hz - 8 MHz	01	—	02	14	7	8	na
18	250 Hz - 8 MHz	11	—	12	14	7	8	na
18	250 Hz - 8 MHz	21	—	22	14	7	8	na
18	250 Hz - 8 MHz	31	—	32	14	7	8	na
18	250 Hz - 5 MHz	41	—	42	14	7	8	na
25	25 MHz - 100 MHz	—	02, 03, 06, 07	10, 11, 14, 15	7	14	8	na
25	100 MHz - 125 MHz	—	32, 33, 36, 37	40, 41, 44, 45	7	14	8	na
25	125 MHz - 175 MHz	—	62, 63, 66, 67	70, 71, 74, 75	7	14	8	na
26	0.01 MHz - 1 MHz	—	02, 03	06, 07	14	7	8	na
26	1 MHz - 4 MHz	—	22, 23	26, 27	14	7	8	na
26	4 MHz - 20 MHz	—	32, 33	36, 37	14	7	8	na
26	20 MHz - 35 MHz	—	42, 43	46, 47	14	7	8	na
26	35 MHz - 50 MHz	—	52, 53	56, 57	14	7	8	na
26	50 MHz - 65 MHz	—	62, 63	66, 67	14	7	8	na

The above table is a summary of the -55°C to +125°C options offered by VI. Other temperature ranges and stabilities may be available. Stability tolerance is based on the +23°C calibration tolerance of ±15 PPM for ±50PPM vs Temperature.

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# Voltage Controlled Crystal Oscillators (VCXOs)

Voltage controlled crystal oscillators (VCXOs) are widely used in telecommunications, instrumentation and other electronic equipment where a stable but electrically tunable oscillator is required. Typical applications include frequency translation and data recovery or retiming. VCXOs are commonly imbedded into PLLs. In this case, specifications such as pull range, stability and linearity are key parameters. Vectron International manufactures several different lines of VCXOs that are uniquely tailored to individual applications, including for use in phase locking applications. Each line is described below.

## HIGH VOLUME SERIES

- Lowest cost for larger production volume OEM requirements.
- Tape and reel packaging for V,S and J types, tube packaging on F types and R types.
- Well-controlled processes with extensive quality control measures ensure very low rejection rate and low total cost.
- Custom designed crystal oscillator ASIC with patented chip tuning diode for high performance at low cost.

## CUSTOM HYBRID SERIES

- True hybrid construction with chip and wire bonding to ceramic substrate for high reliability and small size. Crystal resonator mounted onto supporting clips is bonded onto ceramic substrate.
- Many options for output, frequency, supply and other specifications.
- High reliability processing options available

## PACKAGED CRYSTAL SERIES

- The crystal is sealed in its own hermetic package for superior aging and temperature

performance. The balance of the circuitry is assembled on PCB using automatic pick and place equipment.

- Many custom options are available, including very low phase noise and jitter. Contact factory for more options.
- Potentially the lowest cost solution for custom requirements.

## SONET/SDH VCXOs

- High performance VCXOs are available at standard SONET/SDH frequencies ranging from 155.52 MHz to 2.488 GHz.

- Performance optimized for SONET data transmission. Choosing a standard SONET VCXO is generally less expensive than specifying a custom VCXO at a SONET frequency simply due to the larger volumes produced of standard parts.

- Internal frequency multiplication is based on either a higher frequency VCO imbedded into a PLL with a lower frequency crystal, or harmonic generation with subsequent filtering. The harmonic generator approach generally produces lower overall jitter, with the primary jitter component being subharmonics of the output frequency. PLL based products are also optimized for jitter performance, with feedthrough of the PLL being the dominant source of jitter.

## TEMPERATURE COMPENSATED VCXOs

- When the frequency stability requirements of a system are more stringent than what can be attained from a VCXO, a Temperature Compensated VCXO may be required. By incorporating temperature compensated circuit components in the oscillator, it is possible to improve the temperature stability of the VCXO significantly.

**CONTACT FACTORY FOR AVAILABLE SPECIFICATIONS AND OPTIONS**

# Voltage Controlled Crystal Oscillators (VCXOs)

## VCXOs – Product Offering

(VCXOs)	Frequency Range	Output	Tune Voltage	Slope	Package	Features
<b>HIGH VOLUME</b>						
V-Type	1 MHz to 65 MHz	TTL/CMOS	0.5 to 4.5V	Positive	6 pin leadless ceramic chip carrier	ASIC technology, smallest VCXO available, tri-state option
J-Type	1 MHz to 155 MHz	TTL/CMOS	0 to +5V	Positive	J lead ceramic SMD	ASIC technology, industry standard J lead, tri-state option
S-Type	1 MHz to 52 MHz	TTL/CMOS	0 to +5V	Positive	6 pin ceramic DIP/SMD	ASIC technology, tri-state option
R-Type	1 MHz to 52 MHz	TTL/CMOS	0 to +5V	Positive	14 pin DIP footprint, 4 pin ceramic pkg.	ASIC technology
FTV-Type	1 MHz to 30 MHz	TTL/CMOS	0 to +5V	Positive	4 pin DIP	ASIC technology
<b>CUSTOM HYBRID</b>						
CO-401V/441V	32 kHz to 75 MHz	TTL/HC/ACMOS	0 to +5V	Positive	4 pin DIP	3 point mount crystal, bipolar option
CO-402V/442V	32 kHz to 75 MHz	TTL/HC/ACMOS	0 to +5V	Positive	14 pin DIP	3 point mount crystal, bipolar option
CO-464V/467V	8 MHz to 200 MHz	ECL	0 to -3.3V	Negative	16 pin flatpack and 14 pin DDIP	-3.3V supply
CO-434V/454V	8 MHz to 200 MHz	ECL	0 to -5V	Negative	16 pin DDIP	10K, 10KH, 100K, ECLinPS, 10E/EL 100E/EL, bipolar option
CO-434VH/454VH	201 MHz to 640 MHz	ECL	0 to -5V	Negative	24 pin DDIP	10K, 10KH, 100K, ECLinPS, 10E/EL 100E/EL, bipolar option
CO-445V	100 kHz to 50 MHz	HCMOS	0 to 5V	Positive	16 pin DDIP	Wide deviation to ±500ppm, bipolar option
CO-484V/487V	8 MHz to 200 MHz	SINE	0 to 6V	Positive	16 pin DDIP and 14 pin flatpack	Flatpack available, bipolar option
<b>PACKAGED CRYSTAL</b>						
VCXO-1070	2 MHz to 30 MHz	HCMOS	+0.5 to +4.5V	Positive	4 pin 1/2 DIP (8.5 mm ht.)	
VCXO-2070/4085	2 MHz to 51.84 MHz	HCMOS	+0.5 to +4.5V	Positive	4 pin DIP (8.5 mm ht.)	
V-600	2 MHz to 38.88 MHz	HCMOS	+0.5 to +4.5V	Positive	Plastic SMD (19.2 x 13.1 mm)	Surface mount device
VCXO-SM100/SM100A	2 MHz to 26 MHz	HCMOS	+0.5 to +4.5V	Positive	Plastic SMD (14 x 9.3 mm)	Surface mount device
VCXO-S122	622.08 MHz	PECL	+0.5 to +4.5V	Positive	Solder sealed CO-8	±10ppm aging over 10 years
CO-223V/233VH	8 MHz to 200 MHz	SINE	0 to 6V	Optional	Solder seal metal can	1.5" x 1.5" x 0.625", bipolar option
CO-223VF/233VFW	8 MHz to 400 MHz	SINE	0 to 6V	Optional	Solder seal metal can	2" x 2" x .75", bipolar option
CO-286VW/286VP	400.1 MHz to 1200 MHz	SINE	0 to 6V	Optional	Solder seal metal can	1" x 2" x 0.6", SMA connector option
CO-287VW	1.3 GHz to 2.488 GHz	SINE	0 to 6V	Optional	Solder seal metal can	High frequency
<b>SONET/SDH</b>						
434Y2600	622.08 MHz	ECL/PECL	0.5 to ±5V	Optional	24 pin DDIP	Convent'l harmonic generation technique
430Y3100	155.52 MHz, 622.08 MHz	ECL/PECL	0.5 to ±5V	Optional	4 pin DIP, SMT, flatpack	Singlended output, PLL multiplier
430Y3200	155.52 MHz, 622.08 MHz	ECL/PECL	0.5 to ±5V	Optional	5 pin DIP, SMT, flatpack	Complementary output, PLL based
430Y5200	1.244 GHz	ECL/PECL	0.5 to ±5V	Optional	5 pin DIP, 14 pin flatpack	Complementary output
487Y4300	2.488 GHz	Sinewave	0.5 to +5V	Positive	16 pin flatpack	High Frequency
<b>TEMP. COMPENSATED</b>						
CO-351 Series	To 20 MHz	TTL/HC/MOS/Sinewave	0.5 to ±5V	Optional	Solder seal metal can	Voltage controlled, wide deviation
CO-352 Series	20.1 MHz to 800 MHz	TTL/HC/MOS/Sinewave	0.5 to ±5V	Optional	Solder seal metal can	Voltage controlled, wide deviation

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