

PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),  
0.75 MHz THROUGH 200 MHz, HERMETIC SEAL, SQUARE WAVE, ADVANCED CMOS

This specification is approved for use by all Departments  
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein  
shall consist of this specification sheet and [MIL-PRF-55310](#).

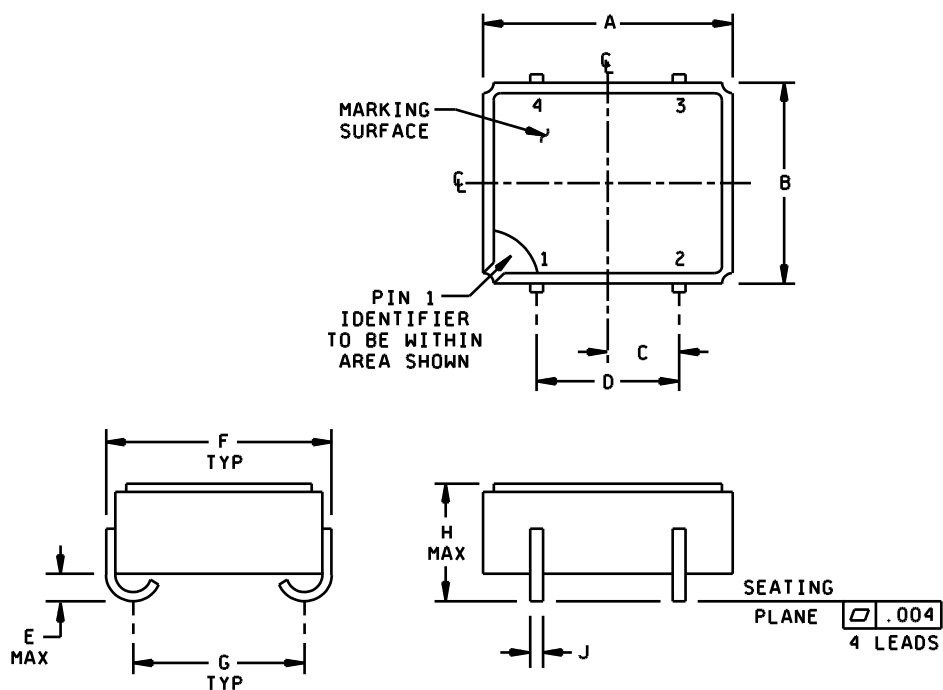


FIGURE 1. Interface and physical dimensions.



MIL-PRF-55310/31A  
w/AMENDMENT 1

Pin number	Function
1	Enable/disable
2	GND
3	Output
4	B+

Ltr	Inches		mm	
	Min	Max	Min	Max
A	.345 Typ	.355 Typ	8.76 Typ	9.02 Typ
B	.285 Typ	.295 Typ	7.24 Typ	7.50 Typ
C	.086	.114	2.18	2.90
D	.195	.205	4.95	5.20
E	---	.040	---	1.02
F	---	.320	---	8.13
G	.232	.248	5.89	6.30
H	---	.170	---	4.32
J	.015	.021	0.38	0.53

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are  $\pm 0.005$  (0.13 mm) for three place decimals and  $\pm 0.02$  (0.5 mm) for two place decimals.

FIGURE 1. Interface and physical dimensions - Continued.

MIL-PRF-55310/31A  
w/AMENDMENT 1

REQUIREMENTS:

Interface and physical dimensions: See [figure 1](#).

Mounting: See [figure 1](#).

Pads: See [figure 1](#).

Seal: Hermetic in accordance with [MIL-PRF-55310](#), maximum leakage rate  $5 \times 10^{-8}$  atm cc/s.

Weight: 3 grams, maximum.

Package: Class 2 or any class 1 or class 3 oscillator meeting all class 2 requirements and verification tests specified herein and in [MIL-PRF-55310](#).

Calibration: Manufacturer calibrated.

Screening: In accordance with [MIL-PRF-55310](#), product level B or S, as applicable.

Temperature:

Operating: See [table I](#).

Storage: -55°C to +125°C.

Load test circuit: See [figure 2](#).

Output waveform: Symmetrical square wave, AC MOS logic compatible (see [figure 3](#)).

Output logic voltage levels at designated AC MOS (see [figure 3](#)):

Logic 1: 90 percent of  $V_{DD}$ , minimum.

Logic 0: 10 percent of  $V_{DD}$ , maximum.

Rise and fall times: (See [table I](#)) Measurements shall be taken at the 20 percent and 80 percent peak-to-peak output voltage levels, with peak-to-peak output defined as level 1-level 0 (see [figure 3](#)).

Duty cycle: See [table I](#) and [figure 3](#).

Supply voltage: +3.3 V dc  $\pm 5$  percent.

Input current: At designated supply voltage (see [table I](#)).

Enable/disable:

Output disabled (high impedance): Pin 1 input  $\leq 0.8$  V dc.

Output active: Pin 1 input  $\geq 2.0$  V dc or open.

Output frequency: Frequency as designated at time of acquisition (see [table I](#)).

Initial accuracy at reference temperature (up to 30 days after shipment): See [table I](#).

MIL-PRF-55310/31A  
w/AMENDMENT 1

TABLE I. Dash numbers and operating characteristics.

Dash number	Output frequency range	Input current (max) <u>1/</u>	Pulse characteristics		Initial accuracy at +23°C ±1°C	Frequency-temperature tolerance (ppm)		
			Rise and fall times (max) <u>2/</u>	Duty cycle min-max <u>2/</u>		-55°C to +125°C	-55°C to +105°C	-20°C to +55°C
						A	B	C
01	.7500 MHz to 24.999 MHz	40 mA	6 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
04	.7500 MHz to 24.999 MHz	40 mA	6 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
11	25 MHz to 59.999 MHz	60 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
14	25 MHz to 59.999 MHz	60 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
21	60 MHz to 94.999 MHz	60 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
24	60 MHz to 94.999 MHz	60 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
31	95 MHz to 129.999 MHz	60 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
34	95 MHz to 129.999 MHz	60 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
41	130 MHz to 164.999 MHz	60 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
44	130 MHz to 164.999 MHz	60 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
51	165 MHz to 200 MHz	60 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
54	165 MHz to 200 MHz	60 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm

1/ Maximum input current for no load condition.

2/ See [figure 3](#).

Frequency-temperature tolerance (one-half temperature cycle, referenced to frequency measured at +23°C ±1°C, immediately prior to starting of the test): See [table I](#). Measurements taken at ten equally spaced increments over the specified operating temperature range. 1/

Frequency-voltage tolerance: ±4 ppm maximum for a ±10 percent change in supply voltage. Measurements taken at reference temperature and operating temperature range end points.

Frequency aging: Measurements shall be taken at +70°C ±0.2°C at intervals of not more than every 72 hours for 30 days minimum.

±5 ppm per year, maximum

±1.5 ppm per 30 days.

±3 ppm per 90 days.

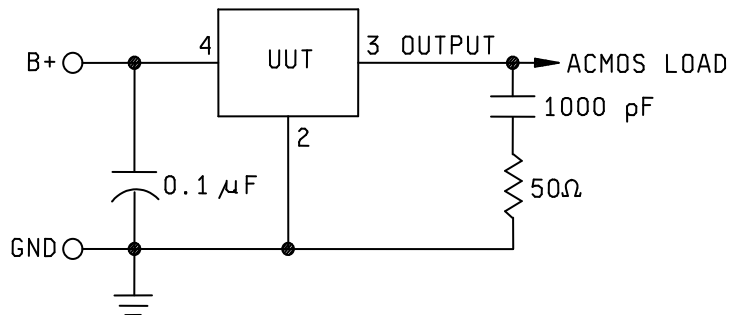
1/ For the purpose of transitioning this device to [MIL-PRF-55310](#), 'Frequency stability versus temperature' has been renamed 'Frequency-temperature tolerance'. The verification requirements of 'initial frequency-temperature accuracy (one-half temperature cycle)' shall apply except that frequency measurements shall be referenced to the frequency measured at +23°C ±1°C ( $f_{ref}$ ) instead of to the nominal frequency ( $f_{nom}$ ).

MIL-PRF-55310/31A  
w/AMENDMENT 1

Terminal strength: [MIL-STD-202-211](#), test condition A.

Applied force: 8 ounces each terminal.

Frequency-environmental tolerance: Not applicable.



NOTE: Pull-up is internal at 60K where normal mode is *fixed*. Optional mode: *Tristate*.

FIGURE 2. Load test circuit.

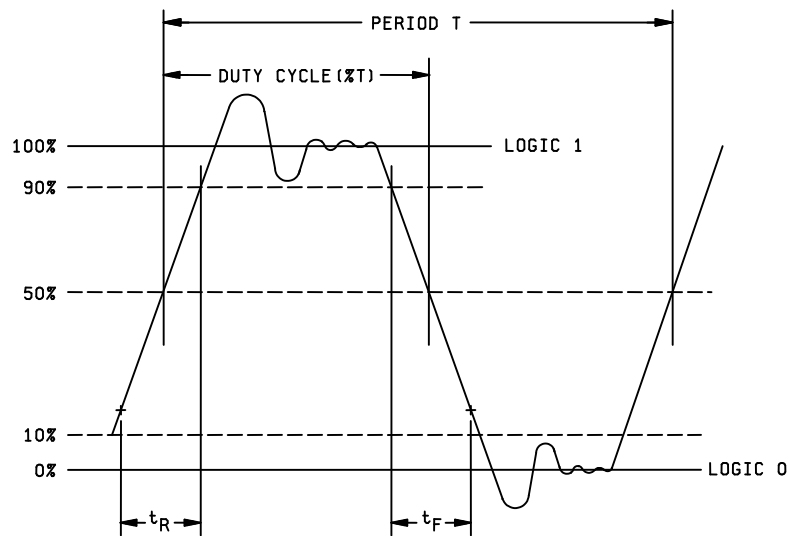


FIGURE 3. Waveform

MIL-PRF-55310/31A  
w/AMENDMENT 1

Vibration, sinusoidal: In accordance with [MIL-PRF-55310](#) and [MIL-STD-202-204](#).

Nonoperating: Test condition G.

Operating: Not required.

Ambient pressure:

Nonoperating: In accordance with [MIL-PRF-55310](#).

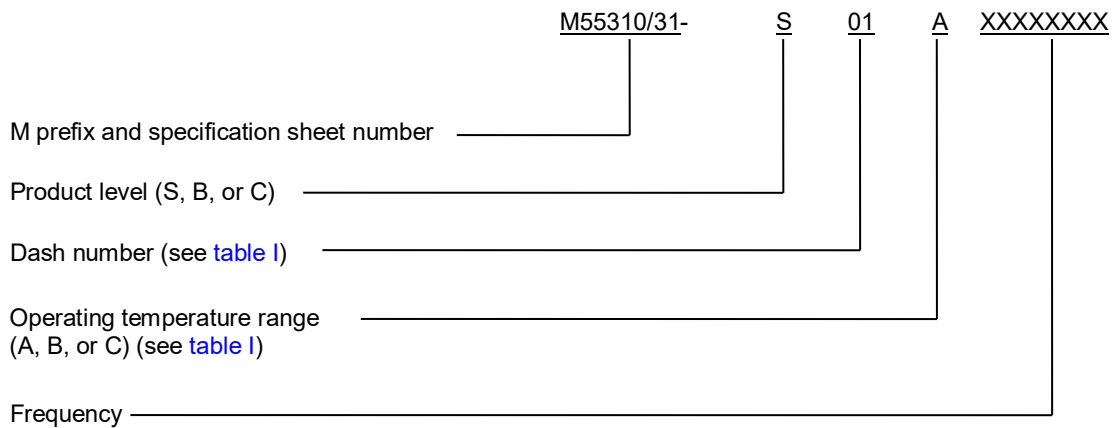
Operating: [MIL-STD-202-105](#), test condition C.

Exposure time: 5 minutes.

Reflow soldering: Reflow soldering of the unit at  $+230^{\circ}\text{C} \pm 10^{\circ}\text{C}$  for 15 seconds shall not degrade the performance.

Part or Identifying Number (PIN): Consists of "M" prefix followed by specification sheet number, a dash and coded alphas, and numeric number. See example:

EXAMPLE



MIL-PRF-55310/31A  
w/AMENDMENT 1

Referenced documents. In addition to [MIL-PRF-55310](#), this document references  
[MIL-STD-202-105](#)  
[MIL-STD-202-204](#)  
[MIL-STD-202-211](#)

**Amendment notations.** The margins of this specification sheet are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Custodians:  
Army - CR  
Navy - EC  
Air Force - 85  
DLA - CC

Preparing activity:  
Army - CR

Agent:  
DLA - CC

Review activities:  
Army - AR, MI, SM  
Navy - AS, CG, MC  
Air Force - 19, 84  
NASA - NA

(Project 5955-2020-026)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.