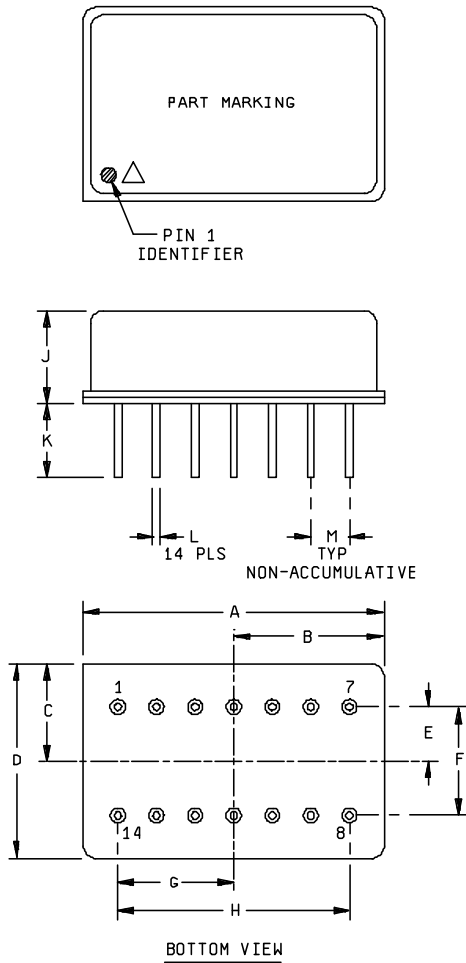


PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),  
50 Hz THROUGH 50 MHz, HERMETIC SEAL, SQUARE WAVE, TTL

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](#).



| Pin number | Function |
|------------|----------|
| 1          | Output   |
| 2          | Case     |
| 3          | NC       |
| 4          | NC       |
| 5          | NC       |
| 6          | NC       |
| 7          | NC       |
| 8          | B- (GND) |
| 9          | NC       |
| 10         | NC       |
| 11         | NC       |
| 12         | NC       |
| 13         | NC       |
| 14         | B+       |

FIGURE 1. Dimensions and configuration.

| Ltr | Inches |      | mm    |       |
|-----|--------|------|-------|-------|
|     | Min    | Max  | Min   | Max   |
| A   | ---    | .887 | ---   | 22.53 |
| B   | ---    | .44  | ---   | 11.2  |
| C   | ---    | .27  | ---   | 6.9   |
| D   | ---    | .54  | ---   | 13.7  |
| E   | .145   | .155 | 3.68  | 3.94  |
| F   | .295   | .305 | 7.49  | 7.75  |
| G   | .295   | .305 | 7.49  | 7.75  |
| H   | .595   | .605 | 15.11 | 15.37 |
| J   | ---    | .20  | ---   | 5.1   |
| K   | .20    | ---  | 5.1   | ---   |
| L   | .016   | .020 | 0.41  | 0.51  |
| M   | .095   | .105 | 2.41  | 2.67  |

## 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.
4. Case to be connected to base pin 2 to permit shielding of the oscillator.
5. All pins with NC function may be connected internally and are not to be used as external tie points or connections.
6. Color dot or square corner shall be used to indicate pin number 1.
7. ESD indicator, open triangle, shall be marked anywhere on the top of the oscillator.

FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS:

Interface and physical dimensions: See figure 1.

Mounting: See figure 1.

Terminals: See figure 1.

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

Weight: 0.5 ounce maximum.

Oscillator: 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: -62°C to +125°C.

Oscillator load: 1 to 10 standard TTL loads. A TTL unit load is defined as: 1.6 mA sink, 0.04 mA source and 2 pF capacitance.

Output waveform: Symmetrical square wave.

Supply voltage: See table I.

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

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

Output voltage:

Logic 1: See table I.

Logic 0: See table I.

Rise and fall times: See table I.

Duty cycle: See table I.

Initial accuracy at reference temperature:  $\pm 15$  ppm at +23°C  $\pm 1^\circ\text{C}$  up to 30 days after shipment.

Initial frequency-temperature accuracy (one-half temperature cycle): Verification applicable. 1/

Frequency-temperature tolerance (one-half temperature cycle, referenced to frequency measured at +23°C,  $\pm 1^\circ\text{C}$  immediately prior to starting of the test): See table I. Measurements taken at ten equally spaced increments over the specified operating temperature range. 1/

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  $\pm 1^\circ\text{C}$  ( $f_{\text{ref}}$ ) instead of to the nominal frequency ( $f_{\text{nom}}$ ).

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TABLE I. Dash numbers and operating characteristics.

| Dash number | Output frequency range | Supply voltage      | Input current (max) | Output voltage           |                        | Rise and fall times (max) | Duty cycle at 1.4 V | Frequency-temperature tolerance (ppm) |                 |                |
|-------------|------------------------|---------------------|---------------------|--------------------------|------------------------|---------------------------|---------------------|---------------------------------------|-----------------|----------------|
|             |                        |                     |                     | Logic: 1 (min)           | Logic: 0 (max)         |                           |                     | -55°C to +125°C                       | -55°C to +105°C | -20°C to +70°C |
|             |                        |                     |                     |                          |                        |                           |                     | A                                     | B               | C              |
| 01          | 1 kHz to 150 kHz       | V dc<br>+5<br>±0.25 | mA<br>158           | 2.4 V dc at 400µA source | 0.5 V dc at 16 mA sink | ns<br>15                  | percent<br>45 to 55 | ±50                                   | ±40             | ±25            |
| 02          | 150 kHz to 300 kHz     | +5<br>±0.25         | 94                  |                          |                        | 15                        | 45 to 55            | ±50                                   | ±40             | ±25            |
| 03          | 300 kHz to 600 kHz     | +5<br>±0.25         | 94                  |                          |                        | 15                        | 45 to 55            | ±50                                   | ±40             | ±25            |
| 04          | 600 kHz to 2.5 MHz     | +5<br>±0.25         | 50                  |                          |                        | 15                        | 45 to 55            | ±50                                   | ±40             | ±25            |
| 05          | 2.5 MHz to 5 MHz       | +5<br>±0.25         | 50                  |                          |                        | 15                        | 45 to 55            | ±50                                   | ±40             | ±25            |
| 06          | 5 MHz to 10 MHz        | +5<br>±0.25         | 35                  |                          |                        | 15                        | 40 to 60            | ±50                                   | ±40             | ±25            |
| 07          | 10 MHz to 20 MHz       | +5<br>±0.25         | 25                  |                          |                        | 15                        | 40 to 60            | ±50                                   | ±40             | ±25            |
| 08          | 20 MHz to 30 MHz       | +5<br>±0.25         | 35                  |                          |                        | 5                         | 40 to 60            | ±50                                   | ±40             | ±25            |
| 09          | 30 MHz to 50 MHz       | +5<br>±0.25         | 50                  |                          |                        | 5                         | 40 to 60            | ±50                                   | ±40             | ±25            |
| 10          | 50 Hz to 1 kHz         | +5<br>±0.25         | 158                 |                          |                        | 15                        | 40 to 60            | ±50                                   | ±40             | ±25            |

Frequency-voltage tolerance: ±2 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.

|                                 |                             |
|---------------------------------|-----------------------------|
| <u>5 Hz to 4.9 MHz</u>          | <u>5MHz to 50 MHz</u>       |
| ±1 ppm per 30 days, maximum.    | ±2 ppm per 30 days, maximum |
| ±2 ppm per 90 days, maximum. 2/ | ±4 ppm per 90 days, maximum |
| ±5 ppm per year, maximum. 2/    | ±10 ppm per year, maximum   |

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

Applied force: 2 pounds each terminal for 10 seconds.

Bends: Five at 45 degrees each.

Frequency-environmental tolerance: Not applicable.

2/ This is a performance requirement of the oscillator. Support data shall be presented showing that this requirement shall be met.

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

Nonoperating: Test condition D.

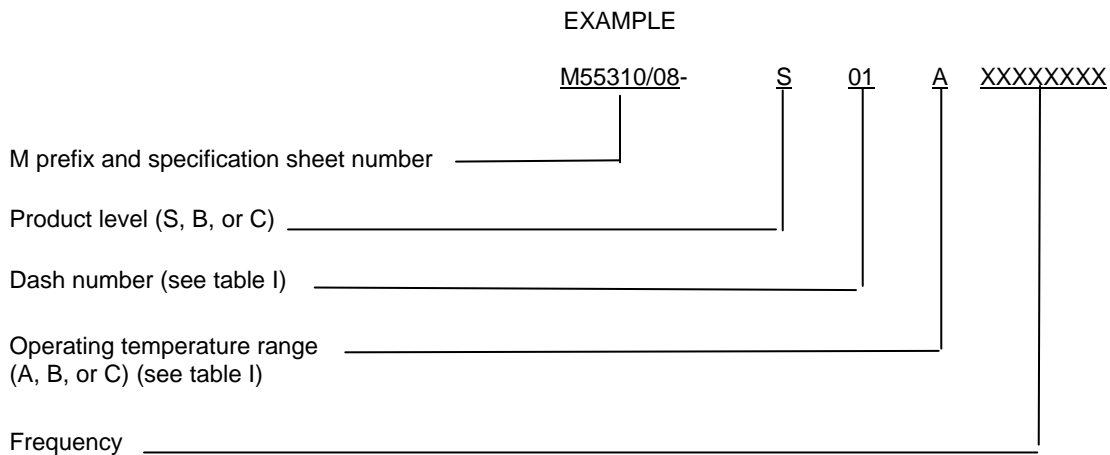
Operating: Not required.

Ambient pressure:

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

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

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



Reference documents. In addition to [MIL-PRF-55310](#), this document references the following:  
[MIL-STD-202](#)

The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. 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 and relationship to the last previous issue.

Custodians:  
Army - CR  
Navy - EC  
Air Force - 99  
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 5955-2009-009)

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 <http://assist.daps.dla.mil>.