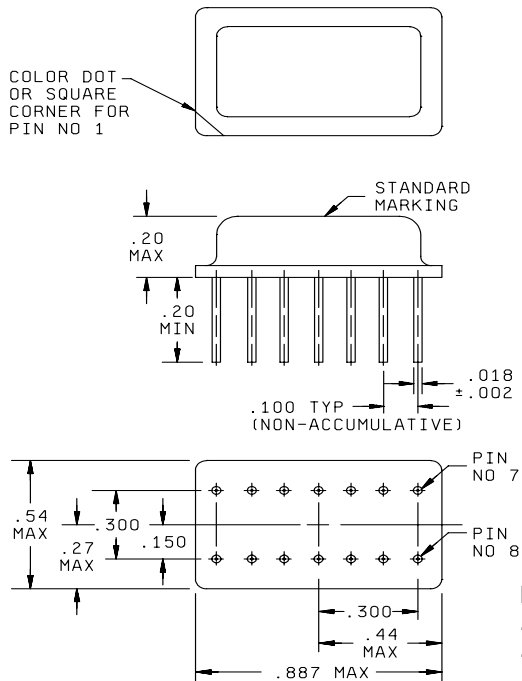


PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),  
 0.01 Hz THROUGH 15.0 MHz, HERMETIC SEAL, SQUARE WAVE, 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 and MIL-PRF-55310.



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

| Inches | mm   | Inches | mm    |
|--------|------|--------|-------|
| .002   | 0.05 | .27    | 6.9   |
| .018   | 0.46 | .300   | 7.62  |
| .100   | 2.54 | .44    | 11.2  |
| .150   | 3.81 | .54    | 13.7  |
| .20    | 5.1  | .887   | 22.53 |

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.
4. All pins with NC function may be connected internally and are not to be used as external tie points or connections.

FIGURE 1. Dimensions and configuration.

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 (see 1.2.3 of 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: 10 kilohms  $\pm 5$  percent shunted by 15 pF  $\pm 5$  percent capacitor for CMOS compatible square.

Output waveform: Symmetrical square wave.

Output voltage: At designated CMOS load.

Logic 1: See table I.

Logic 0: See table I.

Rise and fall times: See table I.

Duty cycle: 40 to 60 percent duty cycle.

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).

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

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

TABLE I. Dash numbers and operating characteristics.

| Dash number | Output frequency range | Supply voltage $\pm 10\%$ | Maximum Input current at maximum supply voltage <sup>1/</sup> | Output voltage        |                      | Rise and fall times (max) | Initial accuracy ppm at $+23^{\circ}\text{C}$ $\pm 1^{\circ}\text{C}$ | Frequency aging ppm/year after 30 days | 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          | 0.01 Hz to 15.0 MHz    | $\frac{V_{dc}}{+15}$      | $\frac{mA}{25}$   | $\frac{V_{dc}}{12.8}$ | $\frac{V_{dc}}{1.5}$ | $\frac{ns}{30}$           | $\pm 15$  | $\pm 5$                                | $\pm 50$                              | $\pm 40$        | $\pm 25$       |
| 02          |                        | +15                       | 25  | 12.8                  | 1.5                  | 30                        | $\pm 25$  | $\pm 10$                               | $\pm 100$                             | $\pm 80$        | $\pm 50$       |
| 11          | 0.01 Hz to 12.0 MHz    | +12                       | 20  | 10.2                  | 1.2                  | 35                        | $\pm 15$  | $\pm 5$                                | $\pm 50$                              | $\pm 40$        | $\pm 25$       |
| 12          |                        | +12                       | 20  | 10.2                  | 1.2                  | 35                        | $\pm 25$  | $\pm 10$                               | $\pm 100$                             | $\pm 80$        | $\pm 50$       |
| 21          | 0.01 Hz to 10.0 MHz    | +10                       | 15  | 8.5                   | 1.0                  | 40                        | $\pm 15$  | $\pm 5$                                | $\pm 50$                              | $\pm 40$        | $\pm 25$       |
| 22          |                        | +10                       | 15  | 8.5                   | 1.0                  | 40                        | $\pm 25$  | $\pm 10$                               | $\pm 100$                             | $\pm 80$        | $\pm 50$       |
| 31          | 0.01 Hz to 8.0 MHz     | +8                        | 10  | 6.8                   | 0.8                  | 50                        | $\pm 15$  | $\pm 5$                                | $\pm 50$                              | $\pm 40$        | $\pm 25$       |
| 32          |                        | +8                        | 10  | 6.8                   | 0.8                  | 50                        | $\pm 25$  | $\pm 10$                               | $\pm 100$                             | $\pm 80$        | $\pm 50$       |
| 41          | 0.01 Hz to 5.0 MHz     | +5                        | 3   | 4.2                   | 0.5                  | 70                        | $\pm 15$  | $\pm 5$                                | $\pm 50$                              | $\pm 40$        | $\pm 25$       |
| 42          |                        | +5                        | 3   | 4.2                   | 0.5                  | 70                        | $\pm 25$  | $\pm 10$                               | $\pm 100$                             | $\pm 80$        | $\pm 50$       |

<sup>1/</sup> Maximum input current for no load condition. Actual configuration of CMOS loads must be added to determine power supply requirements.

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Frequency-voltage tolerance:  $\pm 2$  ppm maximum for a  $\pm 10$  percent change in supply voltage. Measurements taken at reference temperature and operating temperature range end points.

Frequency aging: Measurements shall be taken at  $+70^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$  at intervals of not more than every 72 hours for 30 days minimum (see table I).

$\pm 5$  ppm per year, maximum

$\pm 10$  ppm per year, maximum

$\pm 0.7$  ppm per 30 days.  
 $\pm 1.5$  ppm per 90 days

$\pm 1.5$  ppm per 30 days  
 $\pm 3$  ppm per 90 days

Terminal strength: Method 211 of MIL-STD-202, test condition C.

Applied force: 2 pounds each terminal for 10 seconds.

Bends: Five at 45 degrees each.

Frequency-environmental tolerance: Not applicable.

Vibration, sinusoidal: In accordance with MIL-PRF-55310 and method 204 of MIL-STD-202.

Nonoperating: Test condition D.

Operating: Not required.

Ambient pressure:

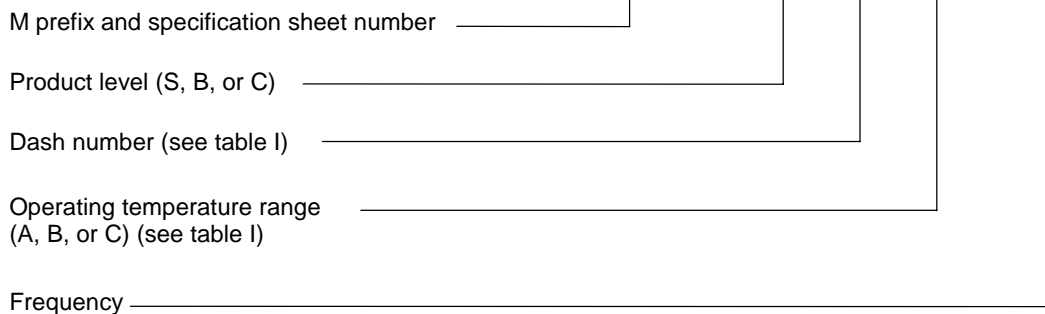
Nonoperating: In accordance with MIL-PRF-55310.

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:

EXAMPLE

M55310/18-      S      01      A      XXXXXXXX



The margins of this specification sheet are marked with asterisks 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 - 11

Review activities:

Army - AR, MI, SM  
Navy - AS, CG, MC  
Air Force - 19, 99  
NASA - NA

Preparing activity:

Army - CR

Agent:

DLA - CC

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