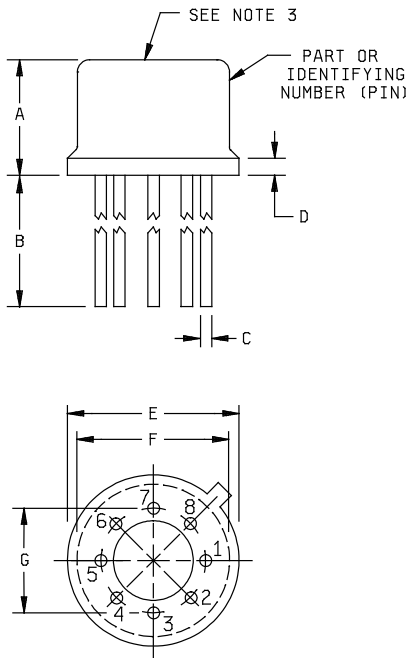


PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),  
 400 kHz THROUGH 60 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	NC
2	NC
3	NC
4	B - (GND/CASE) (See note 5)
5	OUTPUT
6	NC
7	NC
8	B+

Ltr	Inches		mm	
	Min	Max	Min	Max
A	---	.300	---	7.62
B	.480	---	12.19	---
C	.016	.020	0.41	0.51
D	---	.040	---	1.02
E	---	.410	---	10.41
F	---	.330	---	8.38
G	.195	.205	4.95	5.21

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Standard marking, except omit Part or Identifying Number (PIN) this location.
4. 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.
5. Case to be connected to base pin 4 to permit shielding of the oscillator.
6. All pins with NC function may be connected internally and are not to be used as external tie points or connections.
7. Pin numbers shown on package are for reference only and need not appear on part.

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: 0.175 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: See [table I](#).

Output waveform: Symmetrical square wave.

Supply voltage: +5 V dc  $\pm 10$  percent.

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

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

Output voltage: At designated TTL load (see [table I](#)).

Logic 1: 2.4 V dc, minimum.

Logic 0: 0.5 V dc, maximum.

Rise and fall times: See [table I](#).

Duty cycle: 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  $\pm 1$ °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  $\pm 1$ °C ( $f_{ref}$ ) instead of to the nominal frequency ( $f_{nom}$ ).

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TABLE I. Dash numbers and operating characteristics.

Dash number	Output frequency range	Input current max at 5.25 V $\pm 1\%$ <sup>1/</sup>	Pulse characteristics			Initial accuracy ppm at +23°C $\pm 1^\circ\text{C}$	Frequency aging ppm/year after 30 days	Frequency-temperature tolerance (ppm)		
			Rise and fall times max	Duty cycle at 1.4 V	Load <sup>2/</sup>			-55°C to +125°C	-55°C to +105°C	-20°C to +70°C
								A	B	C
01	400 kHz to 9 MHz	50	15	45 to 55	10 TTL	$\pm 15$	$\pm 5$	$\pm 50$	$\pm 40$	$\pm 25$
05	9 MHz to 25 MHz	50	15	45 to 55	10 TTL	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 80$	$\pm 50$
11	25 MHz to 60 MHz	30	15	40 to 60	10 TTL	$\pm 15$	$\pm 5$	$\pm 50$	$\pm 40$	$\pm 25$
15	400 kHz to 9 MHz	30	15	40 to 60	10 TTL	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 80$	$\pm 50$
21	9 MHz to 25 MHz	50	5	40 to 60	6 TTL	$\pm 15$	$\pm 5$	$\pm 50$	$\pm 40$	$\pm 25$
25	25 MHz to 60 MHz	50	5	40 to 60	6 TTL	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 80$	$\pm 50$

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

<sup>2/</sup> A TTL unit load is defined as: 1.6 mA sink, 0.04 mA source, and 2 pF capacitance.

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 a minimum of 30 days (see [table I](#)).

$\pm 5$  ppm per year maximum  
 $\pm 0.7$  ppm per 30 days  
 $\pm 1.5$  ppm per 90 days

$\pm 10$  ppm per year maximum  
 $\pm 1.5$  ppm per 30 days  
 $\pm 3$  ppm per 90 days

Terminal strength: [MIL-STD-202-211](#), 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 [MIL-STD-202-204](#). Nonoperating:

Test condition D.

Operating: Not required.

Ambient pressure:

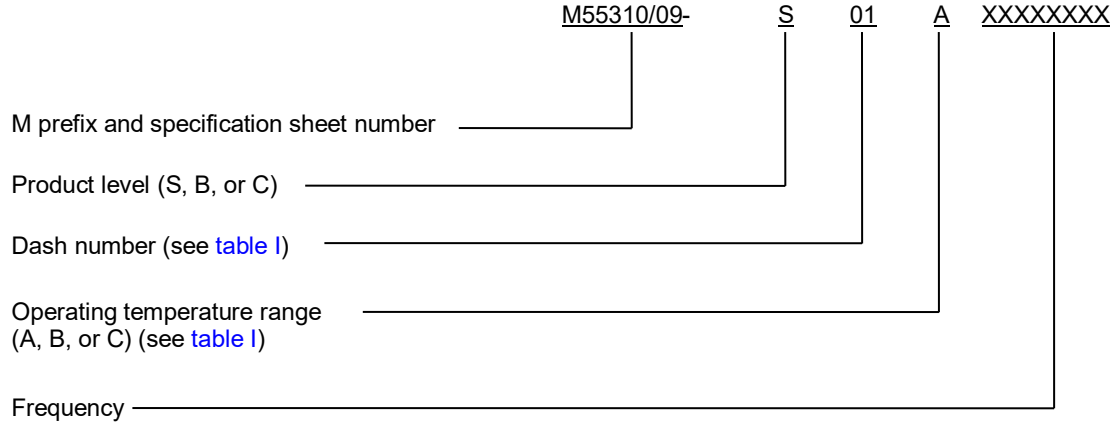
Nonoperating: In accordance with [MIL-PRF-55310](#).

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

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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



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

- [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 5955-2020-015)

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>.