

PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),  
10 KHz THROUGH 65 MHz, HERMETIC SEAL, SQUARE WAVE, HIGH SPEED 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](#).

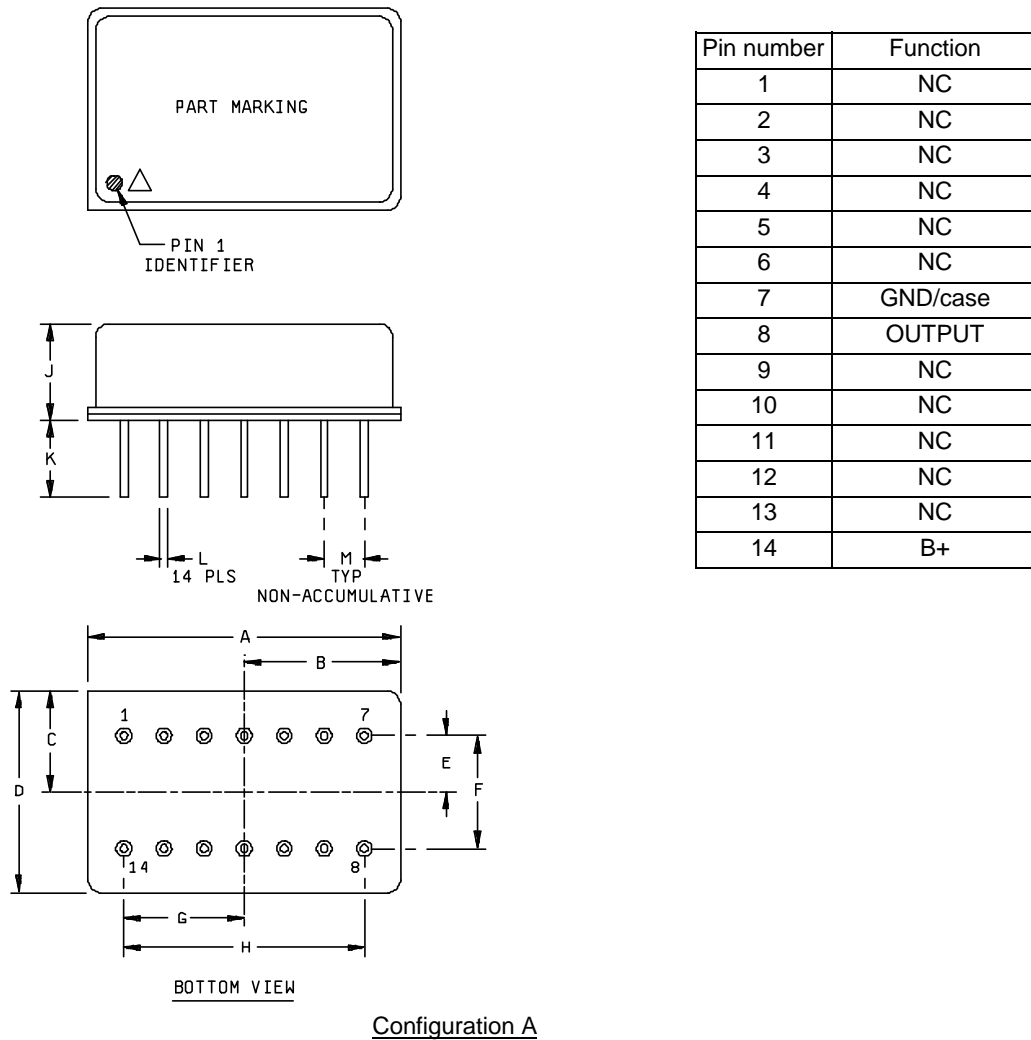


FIGURE 1. Dimensions and configuration.

Ltr	Inches		mm	
	Min	Max	Min	Max
A	---	.887	---	22.53
B	---	.44	---	11.2
C	---	.27	---	6.8
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	5.11	5.37
J	---	.20	---	5.1
K	.20	---	5.1	---
L	.016	.020	0.41	0.51
M	.095	.105	2.41	2.67

Configuration A

FIGURE 1. Dimensions and configuration.

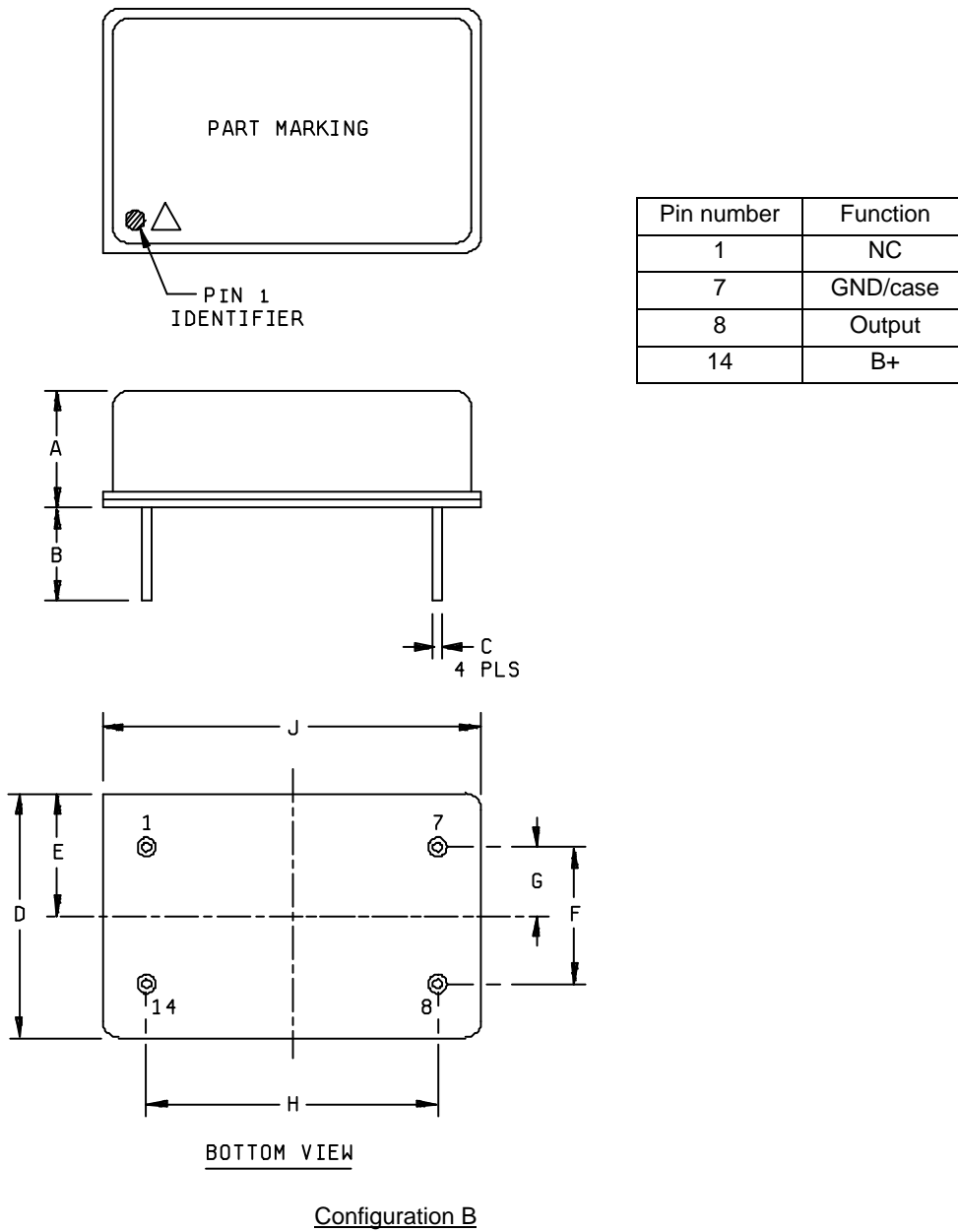


FIGURE 1. Dimensions and configurations - Continued.

Ltr	Inches		mm	
	Min	Max	Min	Max
A	---	.20	---	5.1
B	.20	---	5.1	---
C	.016	.020	0.41	0.51
D	---	.515	---	13.08
E	---	.27	---	6.8
F	.295	.305	7.49	7.75
G	.145	.155	3.68	3.94
H	.595	.605	15.11	15.37
J	---	.815	---	20.70

Configuration B

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

FIGURE 1. Dimensions and configurations - Continued.

REQUIREMENTS:

Interface and physical dimensions: See figure 1.

Package configuration: See figure 1.

Terminals: See figure 1.

Weight: 0.5 ounces (14.2 grams-mass), 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.

Load test circuit: See figure 2.

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

Supply voltage (B+): 5.0 V dc  $\pm 10$  percent.

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

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

Start-up time: 15 milliseconds maximum, measurement shall be taken at reference temperature and operating temperature range endpoints.

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

Output logic voltage levels at designated HCMOS load: See figure 3.

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

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

Output waveform: Symmetrical square wave, HCMOS logic compatible (see figure 3).

Duty cycle: See table I and figure 3.

Rise and fall times (see table I): Measurements shall be taken at the 10 percent and 90 percent peak-to-peak output voltage levels, with peak-to-peak output defined as Logic 1 - Logic 0 (see figure 3).

Initial accuracy at reference temperature: See table I.

Initial frequency-temperature accuracy (1/2 temperature cycle): See table I. Measurements shall be taken at ten equally spaced increments over the specified operating temperature range.

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

MIL-PRF-55310/26D

TABLE I. Dash numbers and operating characteristics.

Dash number		Output frequency range	Input current (max) at 5.0 V <u>3/</u>	Pulse characteristics <u>1/</u>		Initial accuracy at 23°C $\pm 1^\circ\text{C}$ <u>2/</u>	Frequency aging per year (max) <u>4/</u>	Initial frequency temperature accuracy		
Config-uration				Rise/fall time (max)	Duty cycle min-max			-55°C to +125°C	-55°C to +105°C	-20°C to +70°C
A	B							A	B	C
02	03	.01 MHz to 1.0 MHz	10 mA	10 ns	<u>percent</u> 45 to 55	<u>ppm</u> $\pm 15$	<u>ppm</u> $\pm 5$	<u>ppm</u> $\pm 65$	<u>ppm</u> $\pm 55$	<u>ppm</u> $\pm 40$
06	07	.01 MHz to 1.0 MHz	10 mA	10 ns	45 to 55	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
22	23	1 MHz to 4 MHz	15 mA	10 ns	45 to 55	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
26	27	1 MHz to 4 MHz	15 mA	10 ns	45 to 55	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
32	33	4 MHz to 20 MHz	20 mA	10 ns	40 to 60	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
36	37	4 MHz to 20 MHz	20 mA	10 ns	40 to 60	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
42	43	20 MHz to 35 MHz	35 mA	10 ns	40 to 60	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
46	47	20 MHz to 35 MHz	35 mA	10 ns	40 to 60	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
52	53	35 MHz to 50 MHz	40 mA	5 ns	40 to 60	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
56	57	35 MHz to 50 MHz	40 mA	5 ns	40 to 60	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
62	63	50 MHz to 65 MHz	70 mA	5 ns	40 to 60	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
66	67	50 MHz to 65 MHz	70 mA	5 ns	40 to 60	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$

1/ See figure 3.

2/ Up to 30 days following shipment, see table II.

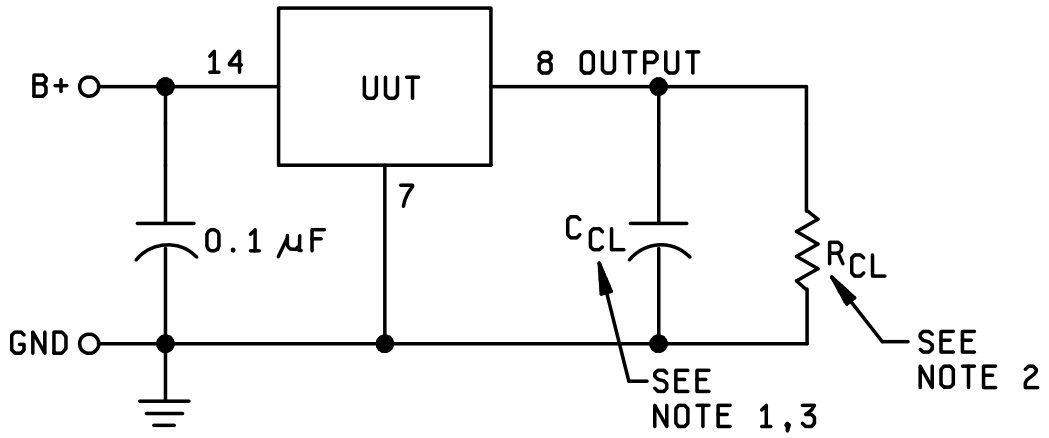
3/ No load condition.

4/ After 30 days following shipment, see table II.

TABLE II. Frequency aging limits.

	5 ppm per year <u>1/</u>	10 ppm per year <u>1/</u>
Maximum change over 30 days	$\pm 0.7$ ppm	$\pm 1.5$ ppm
Projected maximum change for 1 year after 30 days	$\pm 5.0$ ppm	$\pm 10.0$ ppm

1/ See table I.



NOTES:

1. For HCMOS:  $C_{CL} = 15 \text{ pF} \pm 5 \text{ percent}$ .
2. For HCMOS:  $R_{CL} = 10 \text{ k}\Omega \pm 5 \text{ percent}$ .
3.  $C_{CL}$  includes scope capacitance.

FIGURE 2. Load test circuit.

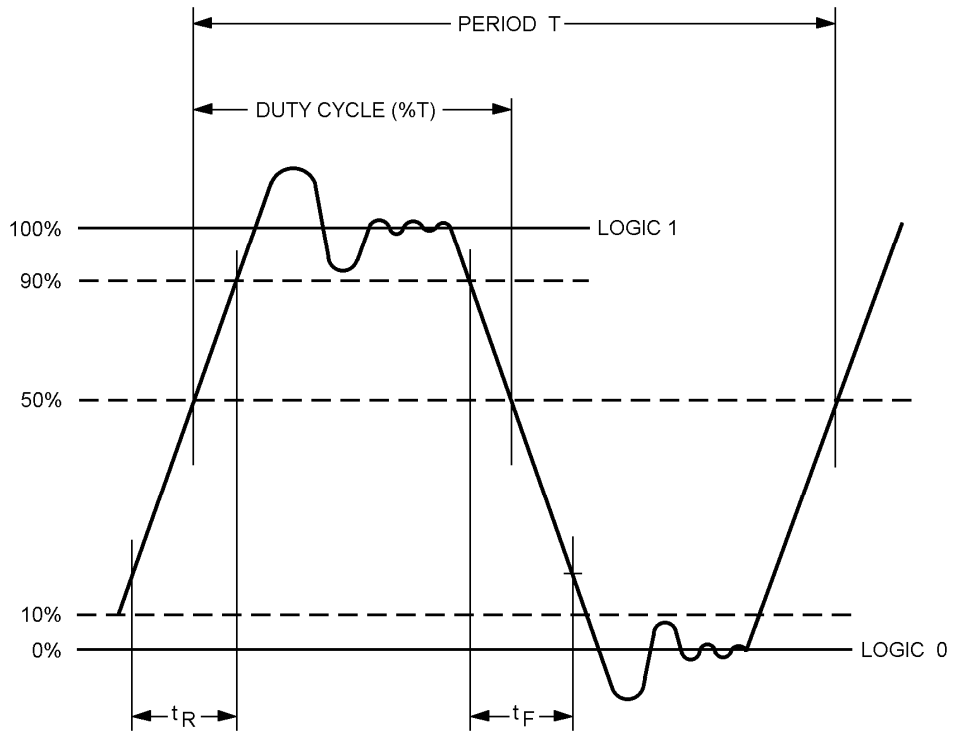


FIGURE 3. Waveform.

MIL-PRF-55310/26D

Frequency-environmental tolerance:  $\pm 3$  ppm.

Frequency aging: Frequency aging shall be in accordance with [MIL-PRF-55310](#) and shall meet the limits of table II.

Vibration, sinusoidal: [Method 204 of MIL-STD-202](#).

Nonoperating: Test condition D.

Operating: Not required.

Shock (nonoperating): [Method 213 of MIL-STD-202](#), test condition I.

Thermal shock (nonoperating): [Method 107 of MIL-STD-202](#), test condition B.

Ambient pressure:

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

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

Resistance to soldering heat: [Method 210 of MIL-STD-202](#), test condition E.

Moisture resistance: [Method 106 of MIL-STD-202](#).

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

Applied force: 2 pounds each terminal for 10 seconds.

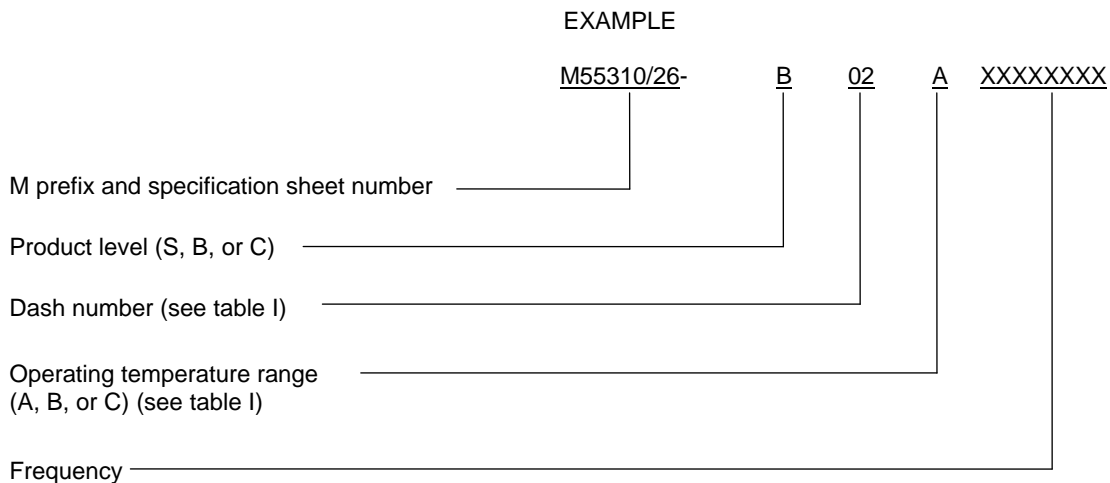
Bends: 5 at 45 degrees each.

Solderability: [Method 208 of MIL-STD-202](#).

Resistance to solvents: [Method 215 of MIL-STD-202](#).

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

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

(Project 5955-2009-021)

Review activities:

Army - AR, MI, SM  
Navy - AS, CG, MC  
Air Force - 19, 84

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