

INCH-POUND

MIL-PRF-55310/25D
w/AMENDMENT 1
12 March 2020

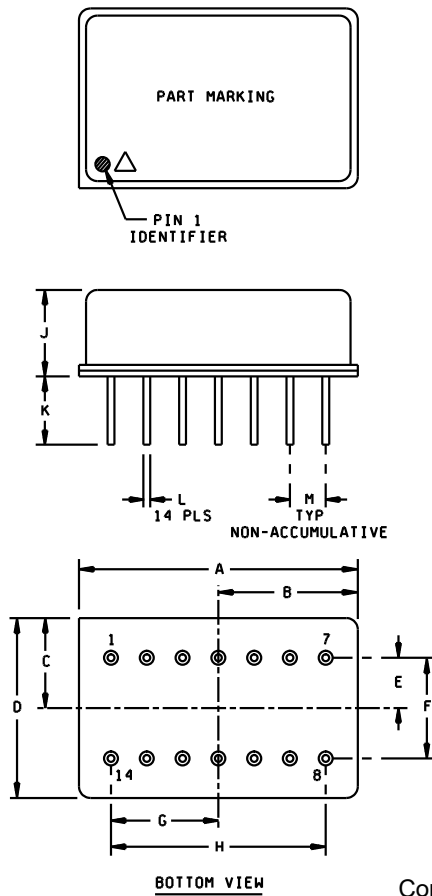
SUPERSEDING
MIL-PRF-55310/25D
11 June 2009

PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),
25 MHz THROUGH 175 MHz, HERMETIC SEAL, SQUARE WAVE, EMITTER COUPLED LOGIC

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	NC
5	NC
6	NC
7	B-
8	OUTPUT
9	NC
10	NC
11	NC
12	NC
13	NC
14	GND/CASE

FIGURE 1. Dimensions and configuration.

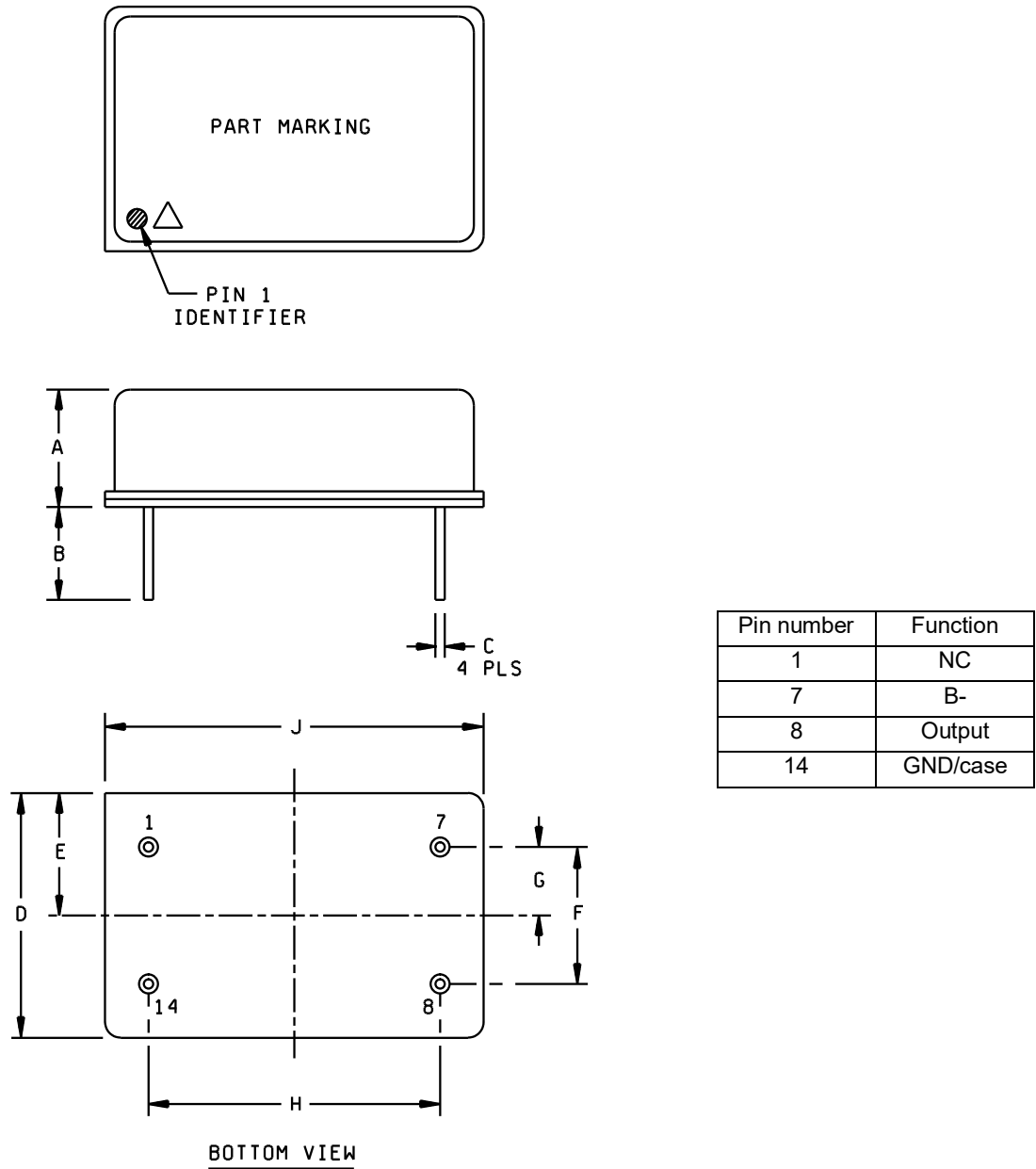


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Ltr	Inches		mm	
	Min	Max	Min	Max
A	---	.887	---	22.53
B	---	.44	---	11.2
C	---	.27	---	6.8
D	---	.54	---	13.7
E	.145	.155	3.68	3.94
F	.295	.305	7.49	7.75
G	.295	.305	7.49	7.75
H	.595	.605	5.11	5.37
J	---	.20	---	5.1
K	.20	---	5.1	---
L	.016	.020	0.41	0.51
M	.095	.105	2.41	2.67

Configuration A

FIGURE 1. Dimensions and configuration - Continued.



Configuration B

FIGURE 1. Dimensions and configurations - Continued.

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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 $\pm .005$ (0.13 mm) for three place decimals and $\pm .02$ (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.

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REQUIREMENTS:

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

Package configuration: See [figure 1](#).

Terminals: See [figure 1](#).

Weight: 0.5 ounces (14.175 grams), 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 5×10^{-8} atm cc/s.

Supply voltage (B-): -5.2 V dc \pm 5 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: See [figure 3](#).

Logic 1: -1.15 V dc minimum.

Logic 0: -1.54 V dc maximum.

Output waveform: Symmetrical square wave, emitter coupled 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 20 percent and 80 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.

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TABLE I. Dash numbers and operating characteristics.

Dash number		Output frequency range	Input current max at 5.25 V $\pm 5\%$ <u>2/</u>	Pulse characteristics			Initial accuracy at +23°C $\pm 1^\circ\text{C}$ <u>3/</u>	Frequency aging per year (max) <u>4/</u>	Frequency-temperature tolerance (ppm)		
Config-uration				Rise and fall times max <u>1/</u>	Duty cycle min-max <u>1/</u>	Load (test) to -2.0 V dc <u>2/</u>			-55°C to +125°C	-55°C to +105°C	-20°C to +70°C
A	B								A	B	C
02	03	25 MHz to 100 MHz	<u>mA</u> 50	<u>ns</u> 3.5	<u>percent</u> 40 to 60	<u>ohms</u> 50	<u>ppm</u> ± 15	<u>ppm</u> ± 5	<u>ppm</u> ± 65	<u>ppm</u> ± 55	<u>ppm</u> ± 40
06	07	25 MHz to 100 MHz	75	3.5	40 to 60	100	± 15	± 5	± 65	± 55	± 40
10	11	25 MHz to 100 MHz	50	3.5	40 to 60	50	± 25	± 10	± 100	± 75	± 50
14	15	25 MHz to 100 MHz	75	3.5	40 to 60	100	± 25	± 10	± 100	± 75	± 50
32	33	100 MHz to 125 MHz	60	3.5	40 to 60	50	± 15	± 5	± 65	± 55	± 40
36	37	100 MHz to 125 MHz	75	3.5	40 to 60	100	± 15	± 5	± 65	± 55	± 40
40	41	100 MHz to 125 MHz	60	3.5	40 to 60	50	± 25	± 10	± 100	± 75	± 50
44	45	100 MHz to 125 MHz	60	3.5	40 to 60	100	± 25	± 10	± 100	± 75	± 50
62	63	125 MHz to 175 MHz	70	3.0	40 to 60	50	± 15	± 5	± 65	± 55	± 40
66	67	125 MHz to 175 MHz	125	3.0	40 to 60	100	± 15	± 5	± 65	± 55	± 40
70	71	125 MHz to 175 MHz	70	3.0	40 to 60	50	± 25	± 10	± 100	± 75	± 50
74	75	125 MHz to 175 MHz	125	3.0	40 to 60	100	± 25	± 10	± 100	± 75	± 50

1/ See [figure 3](#).

2/ See [figure 2](#).

3/ Up to 30 days following shipment.

4/ After 30 days following shipment.

TABLE II. Frequency aging limits.

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

1/ See [table I](#).

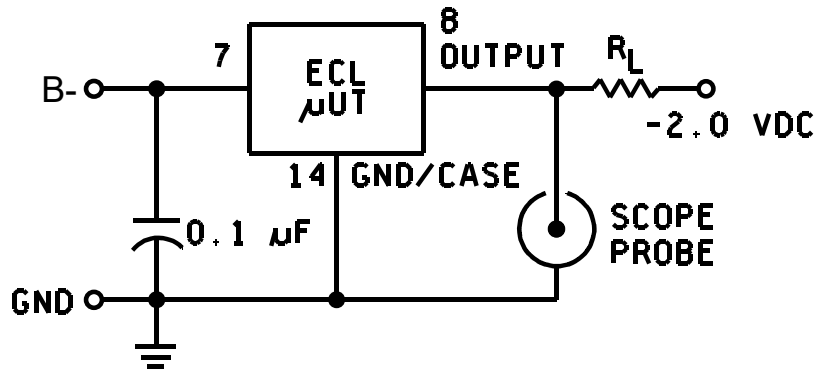
Frequency-voltage tolerance ± 1 ppm maximum for a ± 5 percent change in supply voltage. Measurements shall be taken at reference temperature and operating temperature range endpoints.

Frequency-environmental tolerance: ± 3 ppm.

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

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

Nonoperating: Test condition D.



NOTE: $R_L = 50\Omega$ or 100Ω (see [table I](#)).

FIGURE 2. Load test circuit.

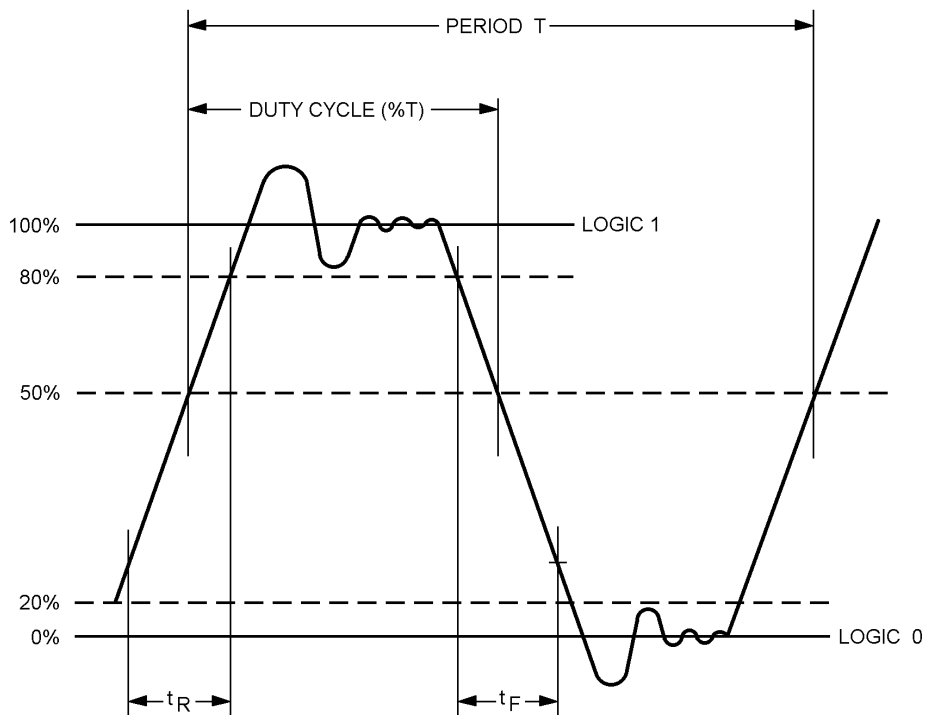


FIGURE 3. Waveform.

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Operating: Not required.

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

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

Ambient pressure:

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

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

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

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

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

Applied force: 2 pounds each terminal for 10 seconds.

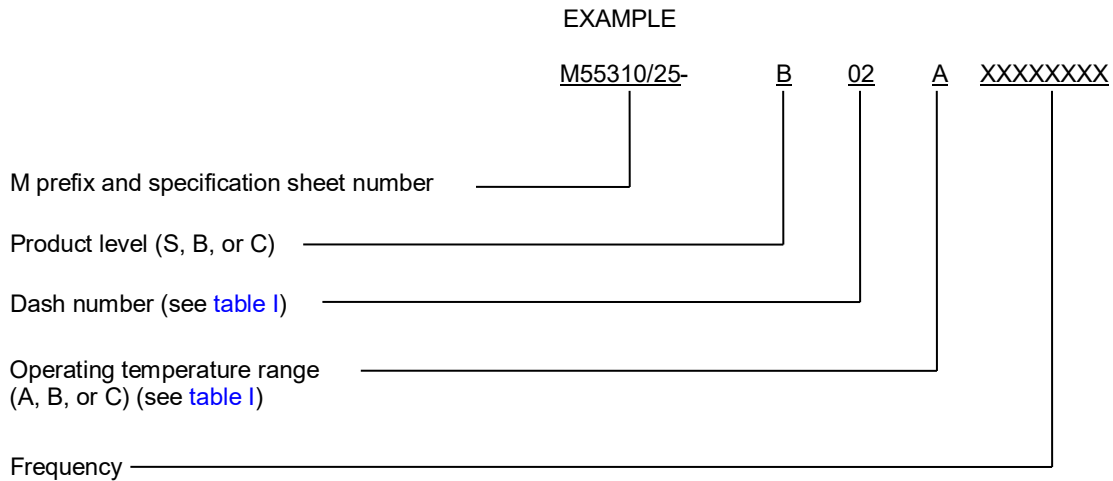
Bends: 5 at 45 degrees each.

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

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

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:



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

[MIL-STD-202-105](#)
[MIL-STD-202-106](#)
[MIL-STD-202-107](#)
[MIL-STD-202-204](#)
[MIL-STD-202-208](#)
[MIL-STD-202-210](#)
[MIL-STD-202-211](#)
[MIL-STD-202-213](#)
[MIL-STD-202-215](#)

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 5955-2020-024)

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>.