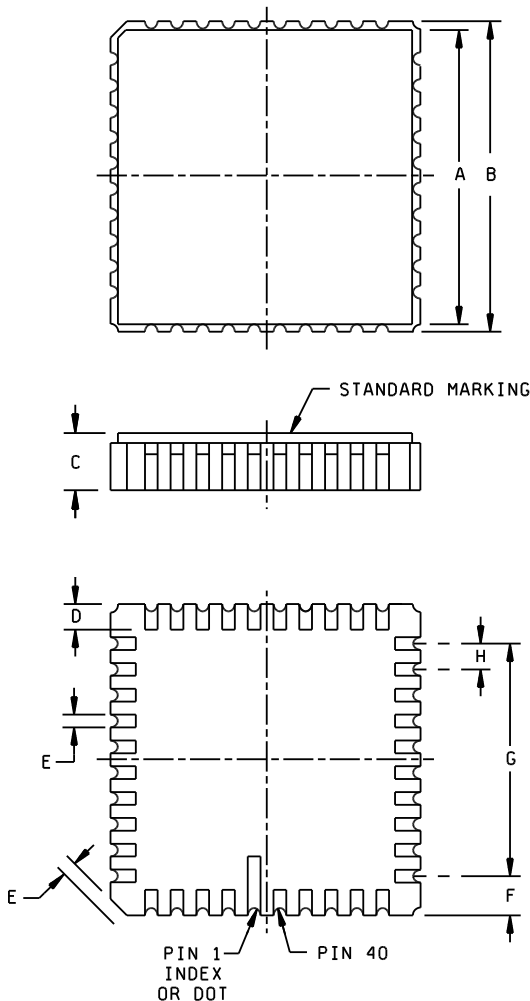


PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),
0.2 MHz THROUGH 85 MHz, HERMETIC SEAL, SQUARE WAVE, HCMOS

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
4	B+
10	B+
31	GND
32	Disable/enable
37	GND
39	Output
1-3	NC
5-9	NC
11-30	NC
33-36	NC
38	NC
40	NC

FIGURE 1. Dimensions and configuration.



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Ltr	Inches		mm	
	Min	Max	Min	Max
A	.454	.466	11.53	11.84
B	.465 SQ	.495 SQ	11.81 SQ	12.57 SQ
C	---	.085	---	2.16
D	.033	.047	0.84	1.19
E	.015	.025	0.38	0.63
F	.055	.070	1.40	1.78
G	.355 SQ	.365 SQ	9.02 SQ	9.27 SQ
H	.035	.045	0.89	1.14

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ± 0.005 (0.13 mm) for three place decimals and ± 0.02 (0.5 mm) for two place decimals.
4. All pads with NC functions are not connected externally.

FIGURE 1. Dimensions and configuration - Continued.

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REQUIREMENTS:

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

Mounting: See [figure 1](#).

Pads: See [figure 1](#).

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

Weight: 3 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](#).

Supply voltage: +5.0 V dc ± 10 percent.

Supply current: See [table I](#).

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

Start-up time: 15 ms maximum, measurement shall be taken at reference temperature and operating temperature range end points.

Nominal output frequency: Specified nominal frequency (see [table I](#)).

Output levels at designated load: See [figure 3](#).

Logic 1: 0.9 V_{DD}, minimum.

Logic 0: 0.1 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](#) and [figure 3](#).

Enable/disable:

Output disabled (high impedance): Pad 32 input = 0.8 V dc maximum.
Output enabled: Pad 32 input = 2.0 V dc minimum.

Initial frequency accuracy at +23°C: See [table I](#).

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TABLE I. Dash numbers and operating characteristics.

Dash number	Output frequency range	Input current (max) 1/	Pulse characteristics		Initial accuracy at +23°C ±1°C 2/	Frequency aging ppm/year (max) 3/	Frequency-temperature tolerance (ppm)		
			Rise and fall times (max)	Duty Cycle min-max 4/			-55/C to +125/C	-55/C to +105/C	-20/C to +70/C
							A	B	C
01 to 02	0.2 MHz	10 mA	10 ns	45% to 55%	±15 ppm	±5 ppm	±65 ppm	±55 ppm	±40 ppm
	5.0 MHz	10 mA	10 ns		±25 ppm	±10 ppm	±100 ppm	±75 ppm	±50 ppm
11 to 12	5.0 MHz	20 mA	10 ns	45% to 55%	±15 ppm	±5 ppm	±65 ppm	±55 ppm	±40 ppm
	25.0 MHz	20 mA	10 ns		±25 ppm	±10 ppm	±100 ppm	±75 ppm	±50 ppm
21 to 22	25.0 MHz	30 mA	5 ns	45% to 55%	±15 ppm	±5 ppm	±65 ppm	±55 ppm	±40 ppm
	40.0 MHz	30 mA	5 ns		±25 ppm	±10 ppm	±100 ppm	±75 ppm	±50 ppm
31 to 32	40.0 MHz	40 mA	5 ns	40% to 60%	±15 ppm	±5 ppm	±65 ppm	±55 ppm	±40 ppm
	60.0 MHz	40 mA	5 ns		±25 ppm	±10 ppm	±100 ppm	±75 ppm	±50 ppm
41 to 42	60.0 MHz	60 mA	5 ns	40% to 60%	±15 ppm	±5 ppm	±65 ppm	±55 ppm	±40 ppm
	85.0 MHz	60 mA	5 ns		±25 ppm	±10 ppm	±100 ppm	±75 ppm	±50 ppm

1/ Maximum input current for no load condition.

2/ Up to 30 days following shipment.

3/ After 30 days following shipment.

4/ See [figure 3](#).

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.

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 for ±10 percent change in supply voltage:

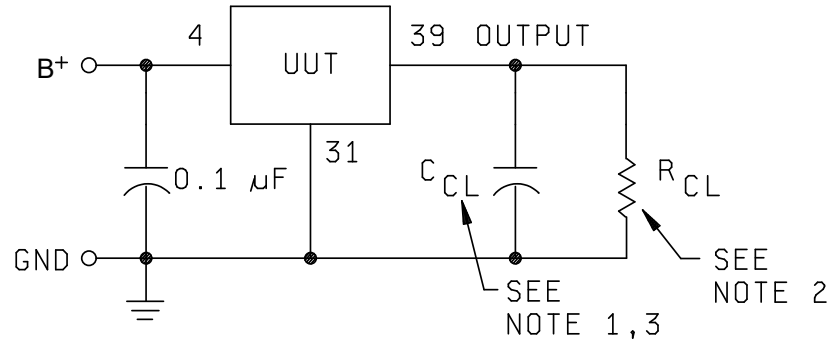
For output frequency ≤ 40.0 MHz: ±2 ppm, maximum.

For output frequency ≥ 40.0 MHz: ±4 ppm, maximum.

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](#).

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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.

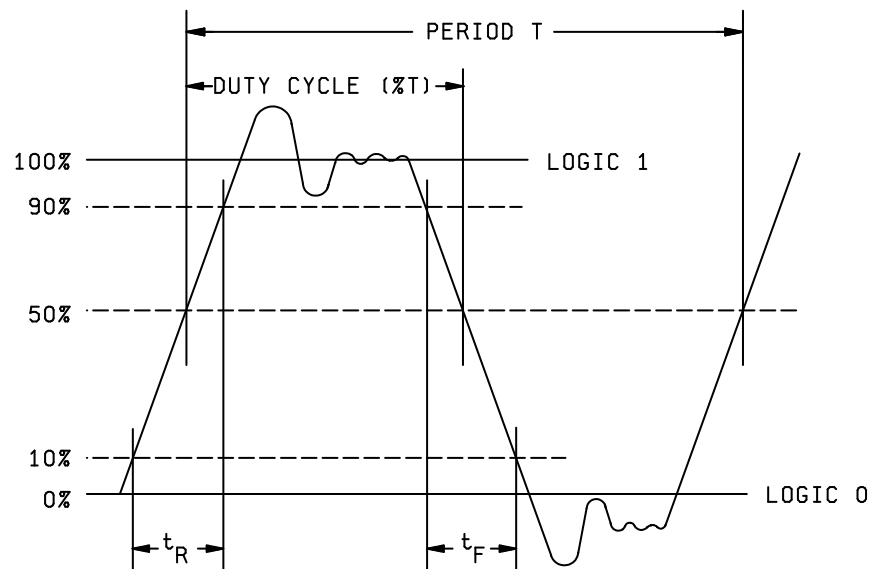


FIGURE 3. Waveform.

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

Nonoperating: Test condition D.

Operating: Not required.

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

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

Ambient pressure:

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

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

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

Reflow soldering: Reflow soldering of the unit at $+230^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for 15 seconds shall not degrade the performance.

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

Pad strength: In accordance with of [MIL-STD-883-2 method 2004](#), condition D.

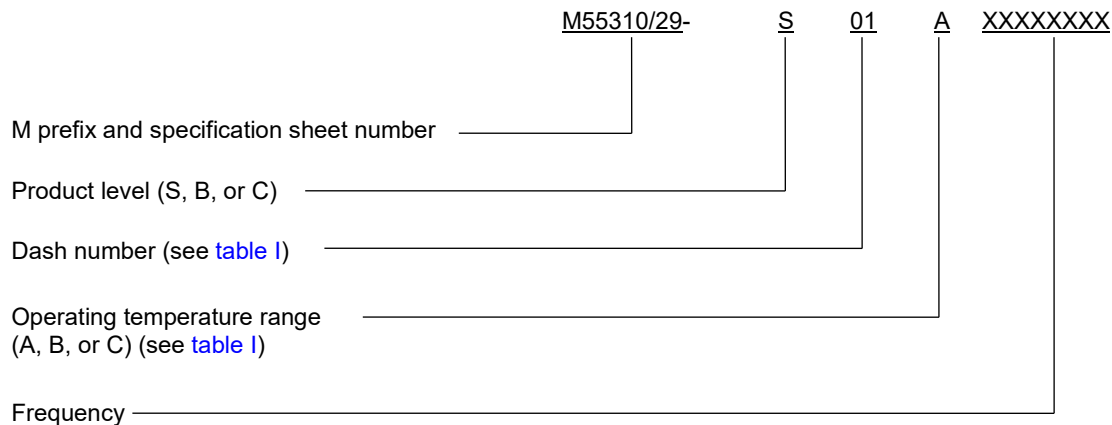
Solderability: [MIL-STD-202-208](#).

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:

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-202-204	MIL-STD-202-107
MIL-STD-202-208	MIL-STD-202-213	MIL-STD-202-215	MIL-STD-883-2

Amendment notations. The margins of this specification 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 5955-2020-032)

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/>.