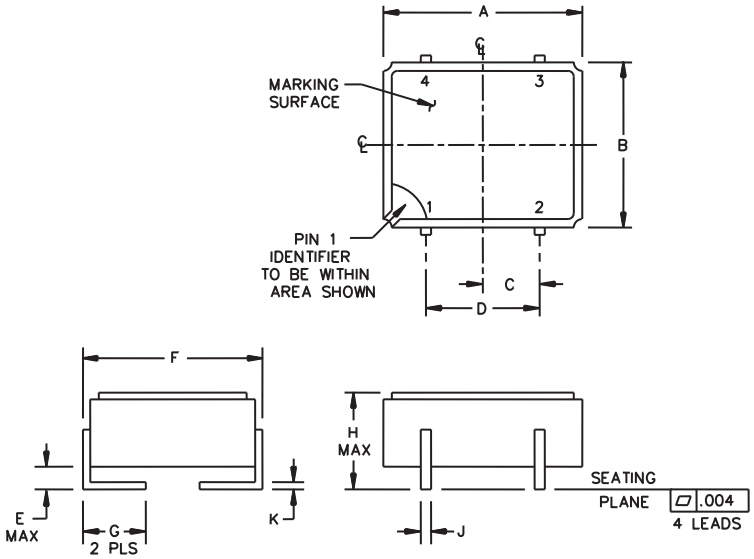
INCH-POUND
MIL-PRF-55310/38C
8 January 2018
SUPERSEDING
MIL-PRF-55310/38B
1 February 2013

PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)), 500 KHz THROUGH 150 MHz, HERMETIC SEAL, LOW VOLTAGE 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.



Pin number	Function
1	Enable/Disable
2	GND
3	Output
4	B+

Ltr	Inches		Millimeters	
	Min	Max	Min	Max
A	.345 Typ	.355 Typ	8.80 Typ	9.02 Typ
B	.285 Typ	.295 Typ	7.24 Typ	7.49 Typ
C	.086	.114	2.18	2.90
D	.195	.205	4.95	5.20
E	.050	.060	1.27	1.52
F	---	.320	---	8.13
G	.105 Typ	.115 Typ	2.67Typ	2.92Typ
H	---	.190	---	4.83
J	.015	.021	0.39	0.53
K	---	.008	---	0.20

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.005 (0.13 mm) for three place decimals and ±.02 (0.5 mm) for two place decimals.

FIGURE 1. Interface and physical dimensions.

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 x 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.

Output waveform: Symmetrical square wave, 3.3 volt CMOS logic compatible (see figure 3).

Output logic voltage levels at designated CMOS (see figure 3):

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

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

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 level 1-level 0 (see figure 3).

Duty cycle: See table I and figure 3.

Supply voltage: +3.3 V dc ±10 percent.

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

Enable/disable:

Output disabled (high impedance): Pin 1 input ≤ 0.3 V dc.

Output active: Pin 1 input ≥ 2.0 V dc or open.

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.

TABLE I. Dash numbers and operating characteristics.

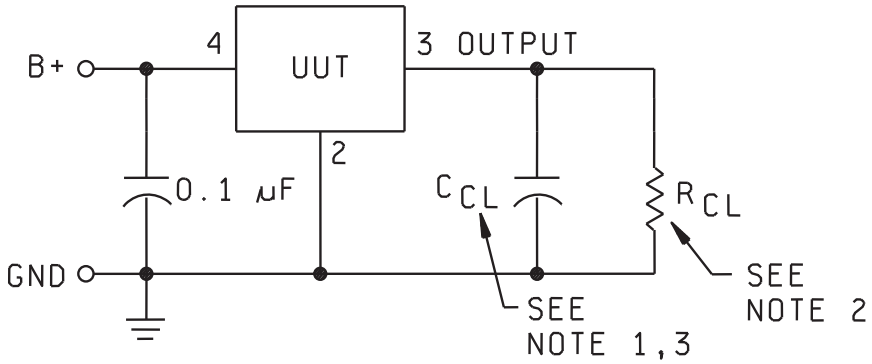
Dash number	Output frequency range	Input current (max) 2/	Pulse characteristics		Initial accuracy at +23°C ±1°C	Frequency-temperature tolerance (ppm) 1/		
			Rise and fall times (max) 3/	Duty cycle min-max 3/		-55°C to +125°C	-55°C to +105°C	-20°C to +70°C
						A	B	C
01	500 kHz to 15.999 MHz	6 mA	6 ns	45% to 55%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
04	500 kHz to 15.999 MHz	6 mA	6 ns	45% to 55%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
11	16.000 MHz to 31.999 MHz	10 mA	5 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
14	16.000 MHz to 31.999 MHz	10 mA	5 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
21	32.000 MHz to 39.999 MHz	15 mA	5 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
24	32.000 MHz to 39.999 MHz	15 mA	5 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
31	40.000 MHz to 64.999 MHz	20 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
34	40.000 MHz to 64.999 MHz	20 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
41	65.000 MHz to 99.999 MHz	30 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
44	65.000 MHz to 99.999 MHz	30 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
51	100.00 MHz to 129.999 MHz	40 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
54	100.00 MHz to 129.999 MHz	40 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
61	130.00 MHz to 150.00 MHz	45 mA	3 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
64	130.00 MHz to 150.00 MHz	45 mA	3 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm

1/ Temperature range A applicable for product level B oscillators only.
2/ Maximum input current for no load condition.
3/ See figure 3.

Frequency-temperature tolerance (one-half temperature cycle, referenced to frequency measured at +23°C ±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/

Frequency-voltage tolerance: ±4 ppm maximum for a ±10 percent change in supply voltage. Measurements taken at reference temperature and operating temperature range end points.

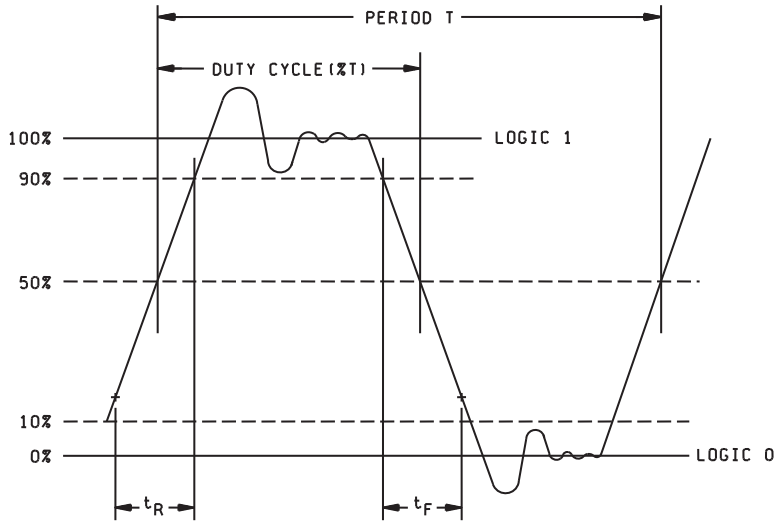
1/ For the purpose of transitioning this device to MIL-PRF-55310, 'Frequency stability versus temperature' has been renamed 'Frequency-temperature tolerance'. The verification requirements of 'initial frequency-temperature accuracy (one-half temperature cycle)' shall apply except that frequency measurements shall be referenced to the frequency measured at +23°C ±1°C (f_{ref}) instead of to the nominal frequency (f_{nom}).



NOTES:
1. For C_{CL} = 15 pF ±5 percent.
2. For R_{CL} = 10 kΩ ±5 percent.
3. C_{CL} includes scope capacitance.

FIGURE 2. Load test circuit.

FIGURE 3. Waveform



Frequency aging: Measurements shall be taken at +70°C ±0.2°C at intervals of not more than every 72 hours for 30 days minimum (Except one maximum interval of 96 hours per 30 days is permitted).

±10 ppm per year, maximum
±1.5 ppm per 30 days.
±3 ppm per 90 days.

Terminal strength: MIL-STD-202-211, test condition A.

Applied force: 8 ounces each terminal.

Frequency-environmental tolerance: Not applicable.

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

Nonoperating: Test condition G.

Operating: Not required.

Ambient pressure:

Nonoperating: In accordance with MIL-PRF-55310.

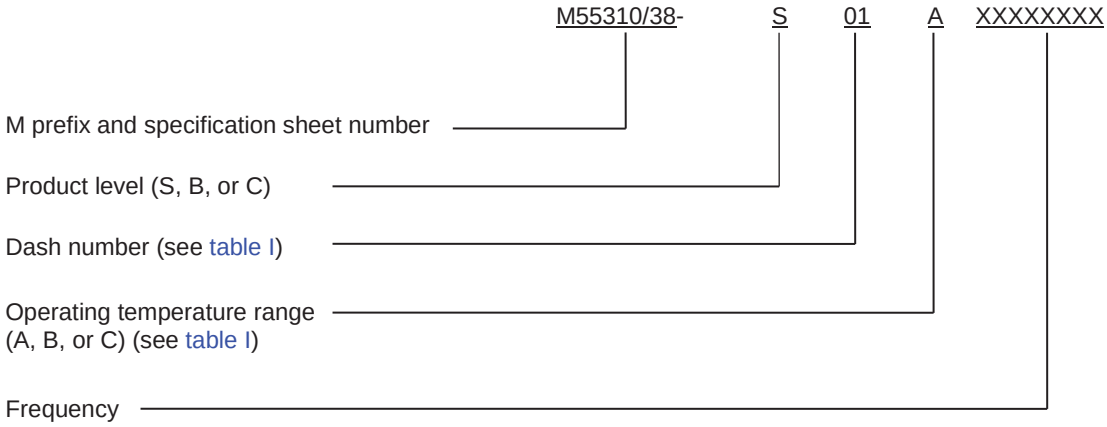
Operating: MIL-STD-202-105, test condition C.

Exposure time: 5 minutes.

Reflow soldering: Reflow soldering of the unit at +230°C ±10°C for 15 seconds shall not degrade the performance.

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

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

Review activities:
Army - AR, MI, SM
Navy - AS, CG, MC
Air Force - 19
NASA - NA

Preparing activity:
Army - CR

Agent:
DLA - CC

(Project 5955-2018-011)

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