

INCH-POUND

MIL-PRF-55310/25C

7 October 2004

SUPERSEDING

MIL-PRF-55310/25B

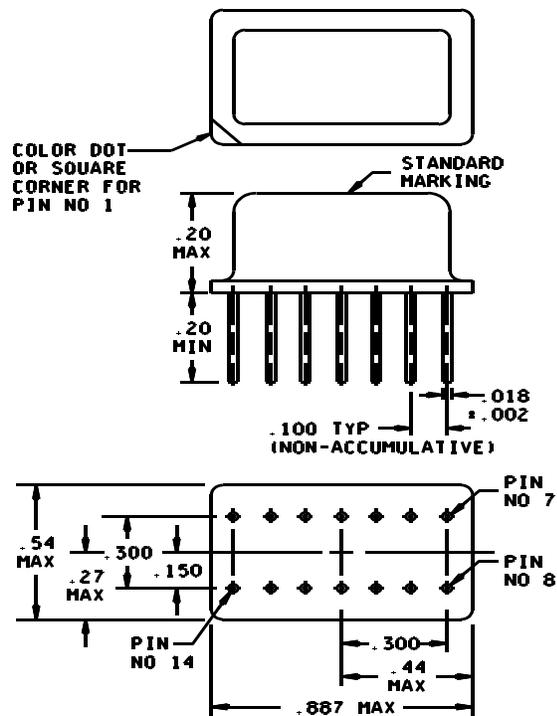
8 July 2002

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 and MIL-PRF-55310.

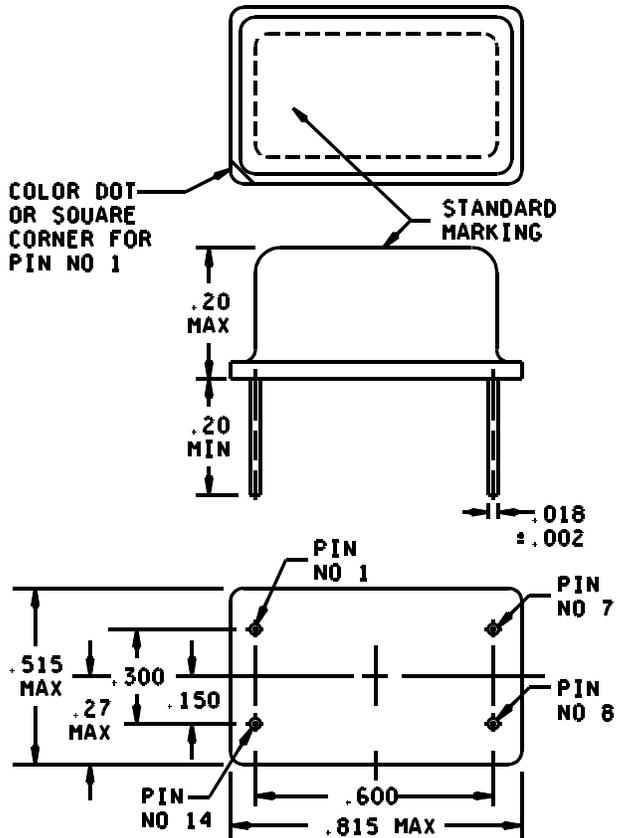


Pin number	Function
1	NC
2	NC
3	NC
4	NC
5	NC
6	NC
7	B-
8	OUTPUT
9	NC
10	NC
11	NC
12	NC
13	NC
14	GND/CASE

Inches	mm
.002	0.05
.018	0.46
.100	2.54
.150	3.81
.20	5.1
.27	6.9
.300	7.62
.44	11.2
.54	13.7
.887	22.53

Configuration A

FIGURE 1. Dimensions and configuration.



Pin number	Function
1	NC
7	B-
8	Output
14	GND/case

Inches	mm
.002	0.05
.018	0.46
.150	3.81
.20	5.1
.27	6.9
.300	7.62
.515	13.08
.600	15.24
.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.

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  $5 \times 10^{-8}$  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> $\pm 15$	<u>ppm</u> $\pm 5$	<u>ppm</u> $\pm 65$	<u>ppm</u> $\pm 55$	<u>ppm</u> $\pm 40$
06	07	25 MHz to 100 MHz	75	3.5	40 to 60	100	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
10	11	25 MHz to 100 MHz	50	3.5	40 to 60	50	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
14	15	25 MHz to 100 MHz	75	3.5	40 to 60	100	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
32	33	100 MHz to 125 MHz	60	3.5	40 to 60	50	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
36	37	100 MHz to 125 MHz	75	3.5	40 to 60	100	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
40	41	100 MHz to 125 MHz	60	3.5	40 to 60	50	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
44	45	100 MHz to 125 MHz	60	3.5	40 to 60	100	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
62	63	125 MHz to 175 MHz	70	3.0	40 to 60	50	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
66	67	125 MHz to 175 MHz	125	3.0	40 to 60	100	$\pm 15$	$\pm 5$	$\pm 65$	$\pm 55$	$\pm 40$
70	71	125 MHz to 175 MHz	70	3.0	40 to 60	50	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$
74	75	125 MHz to 175 MHz	125	3.0	40 to 60	100	$\pm 25$	$\pm 10$	$\pm 100$	$\pm 75$	$\pm 50$

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	$\pm 0.7$ 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.

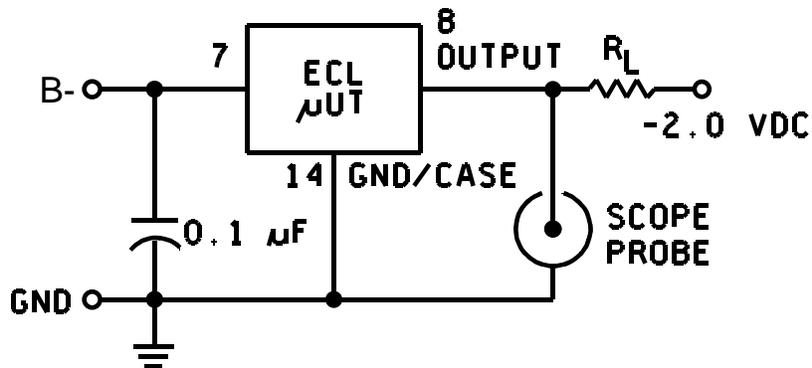
Frequency-voltage tolerance  $\pm 1$  ppm maximum for a  $\pm 5$  percent change in supply voltage. Measurements shall be taken at reference temperature and operating temperature range endpoints.

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.



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

FIGURE 2. Load test circuit.

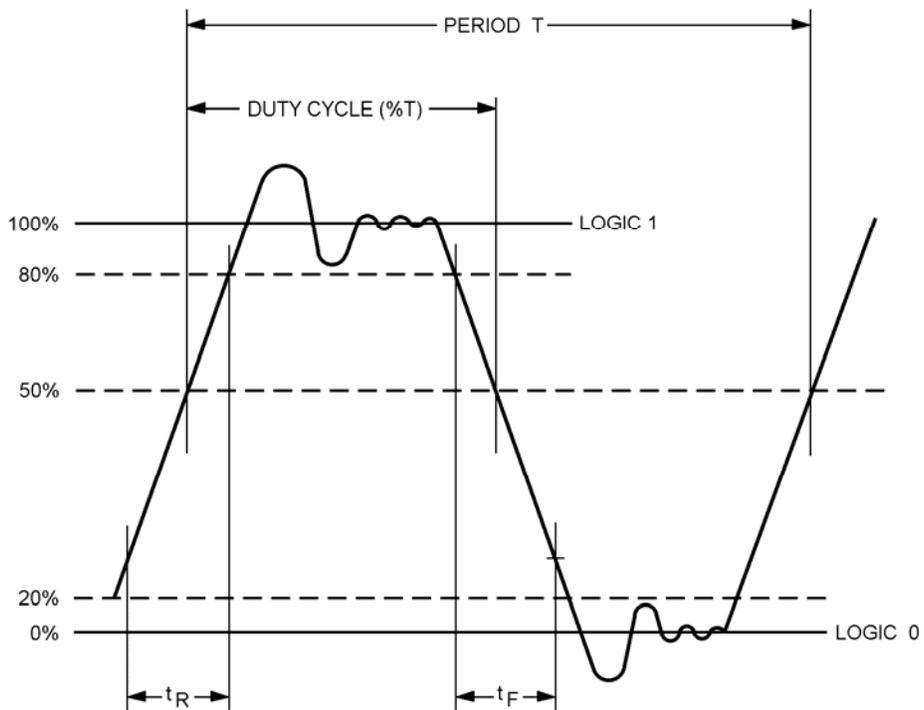


FIGURE 3. Waveform.

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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, 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:

EXAMPLE

M55310/25-      B      02      A      XXXXXXXX

M prefix and specification sheet number

Product level (S, B, or C)

Dash number (see table I)

Operating temperature range  
(A, B, or C) (see table I)

Frequency

\* Reference documents. In addition to MIL-PRF-55310, this document references the following:

MIL-STD-202

The margins of this specification sheet are marked with asterisks 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 -11  
DLA - CC

Preparing activity:  
Army - CR

Agent:  
DLA - CC

Review activities:  
Army - AR, MI, SM  
Navy - AS, CG, MC  
Air Force - 19, 99  
NASA - NA

(Project 5955-0770)

\* 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 [www.dodssp.daps.mil](http://www.dodssp.daps.mil).