INCH-POUND

MIL-PRF-55310/27D
15 October 2008
SUPERSEDING
MIL-PRF-55310/27C
09 June 2008

PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)),
1.0 MHz THROUGH 85 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.

Pin number	Function
1	Enable/disable
2	GND
3	Output
4	B+
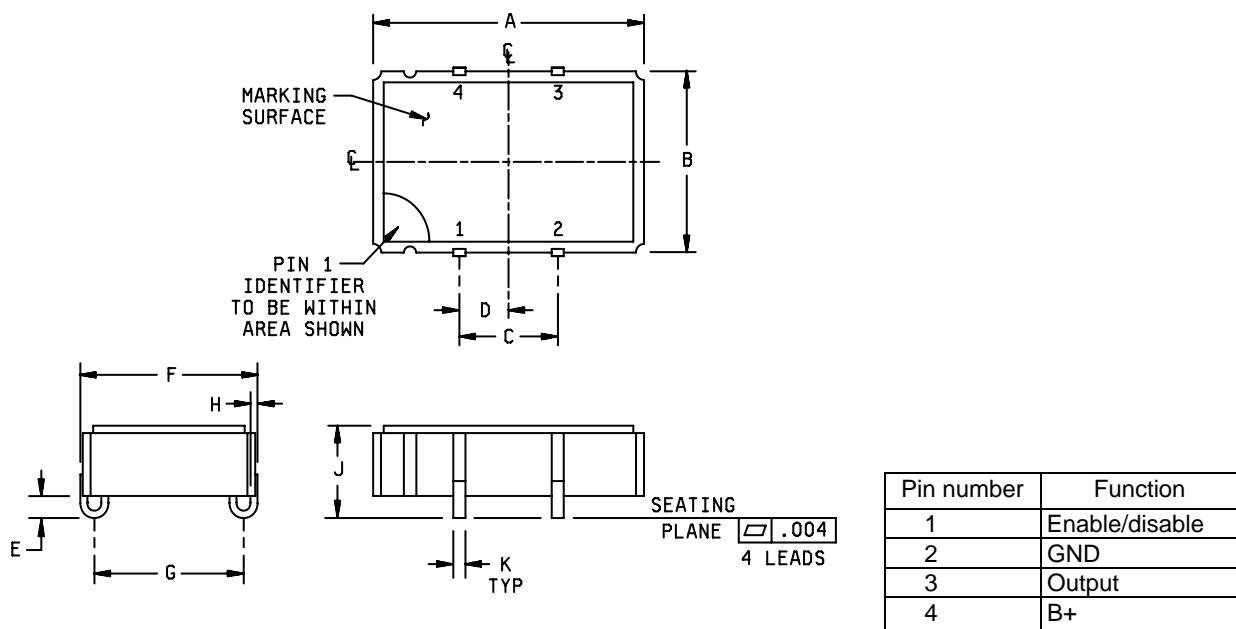
Ltr	Inches		mm	
	Min	Max	Min	Max
A	N/A	.560	N/A	14.22
B	N/A	.360	N/A	9.14
C	.195	.205	4.95	5.21
D	.086	.114	2.18	2.90
E	.025	.055	.635	1.40
F	N/A	.378	N/A	9.60
G	.292	.308	7.42	7.82
H	.007	.009	.178	.229
J	N/A	.188	N/A	4.78
K	.015	.021	.381	.533

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. Dimensions and configuration.

AMSC N/A   FSC 5955

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 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, HCMOS logic compatible (see figure 3).

Output logic voltage levels at designated HCMOS (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: +5.0 V dc $\pm$10 percent.

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

Enable/disable:

Output disabled (high impedance): Pin 1 input $\leq$ 0.8 V dc.

Output active: Pin 1 input $\geq$ 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) 1/	Pulse characteristics		Initial accuracy at +23°C ±1°C	Frequency-temperature tolerance (ppm)		
			Rise and fall times (max) 2/	Duty cycle min-max 2/		-55°C to +125°C	-55°C to +105°C	-20°C to +70°C
						A	B	C
01	1.000 MHz to 14.999 MHz	20 mA	10 ns	45% to 55%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
04	1.000 MHz to 14.999 MHz	20 mA	10 ns	45% to 55%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
11	15.000 MHz to 29.999 MHz	15 mA	10 ns	45% to 55%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
14	15.000 MHz to 29.999 MHz	15 mA	10 ns	45% to 55%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
21	30.000 MHz to 59.999 MHz	35 mA	5 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
24	30.000 MHz to 59.999 MHz	35 mA	5 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm
31	60.000 MHz to 85.000 MHz	45 mA	5 ns	40% to 60%	±15 ppm	±50 ppm	±40 ppm	±25 ppm
34	60.000 MHz to 85.000 MHz	45 mA	5 ns	40% to 60%	±25 ppm	±100 ppm	±80 ppm	±50 ppm

1/ Maximum input current for no load condition.
2/ 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.

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.

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

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

  Applied force: 8 ounces each terminal.

  Frequency-environmental tolerance: Not applicable.

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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}).

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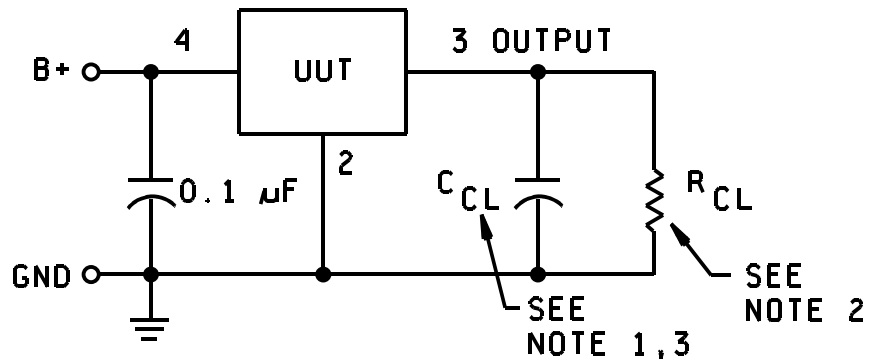
NOTES:
1. For HCMOS: C_{CL} = 15 pF ±5 percent.
2. For HCMOS: R_{CL} = 10 kΩ ±5 percent.
3. C_{CL} includes scope capacitance.

FIGURE 2. Load test circuit.

FIGURE 3. Waveform

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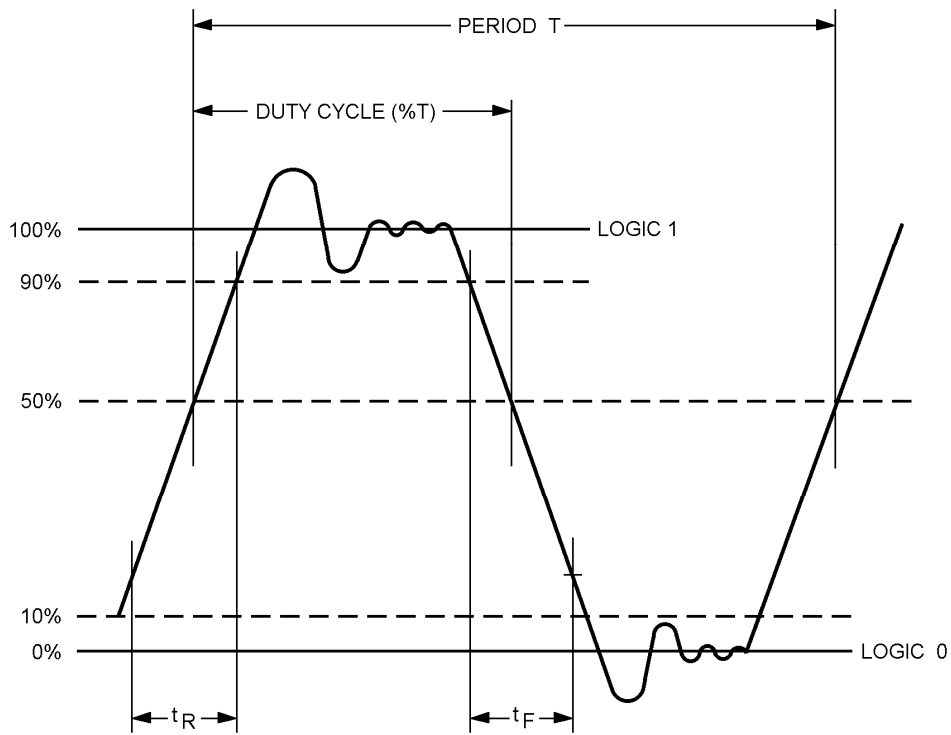
Vibration, sinusoidal: In accordance with MIL-PRF-55310 and method 204 of MIL-STD-202.

Nonoperating: Test condition D.

Operating: Not required.

Ambient pressure:
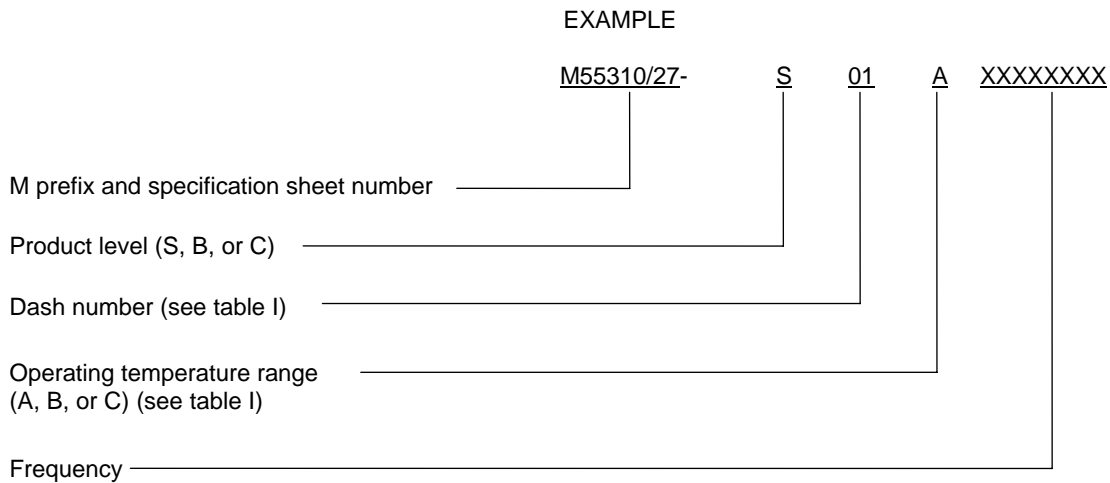
Nonoperating: In accordance with MIL-PRF-55310.

Operating: Method 105 of MIL-STD-202, 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:

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EXAMPLE

M55310/27-   S   01   A   XXXXXXXX

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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 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.

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Custodians:
    Army - CR
    Navy - EC
    Air Force - 99
    DLA - CC

Review activities:
    Army - AR, MI, SM
    Navy - AS, CG, MC
    Air Force - 19, 84
    NASA - NA

Preparing activity:
    Army - CR

Agent:
    DLA - CC

(Project 5955-2008-007)

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