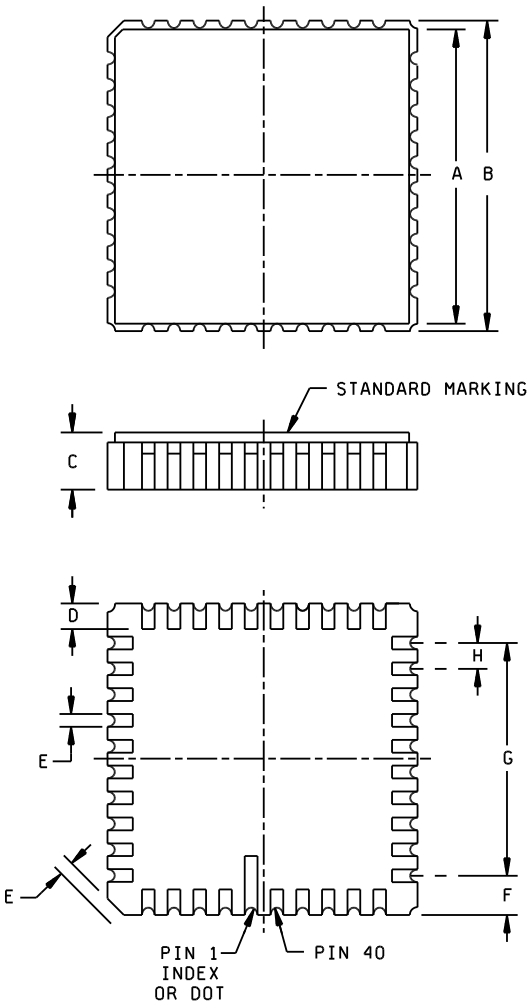
INCH-POUND
MIL-PRF-55310/29C
25 March 2011
SUPERSEDING
MIL-PRF-55310/29B
24 February 2005

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.

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	11.94
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 ±.005 (0.13 mm) for three place decimals and ±.02 (0.5 mm) for two place decimals.
4 All pads with NC functions are not connected externally.

FIGURE 1. Dimensions and configuration - Continued.

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.

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.

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 5.0 MHz	10 mA 10 mA	10 ns 10 ns	45% to 55%	±15 ppm ±25 ppm	±5 ppm ±10 ppm	±65 ppm ±100 ppm	±55 ppm ±75 ppm	±40 ppm ±50 ppm
11 to 12	5.0 MHz 25.0 MHz	20 mA 20 mA	10 ns 10 ns	45% to 55%	±15 ppm ±25 ppm	±5 ppm ±10 ppm	±65 ppm ±100 ppm	±55 ppm ±75 ppm	±40 ppm ±50 ppm
21 to 22	25.0 MHz 40.0 MHz	30 mA 30 mA	5 ns 5 ns	45% to 55%	±15 ppm ±25 ppm	±5 ppm ±10 ppm	±65 ppm ±100 ppm	±55 ppm ±75 ppm	±40 ppm ±50 ppm
31 to 32	40.0 MHz 60.0 MHz	40 mA 40 mA	5 ns 5 ns	40% to 60%	±15 ppm ±25 ppm	±5 ppm ±10 ppm	±65 ppm ±100 ppm	±55 ppm ±75 ppm	±40 ppm ±50 ppm
41 to 42	60.0 MHz 85.0 MHz	60 mA 60 mA	5 ns 5 ns	40% to 60%	±15 ppm ±25 ppm	±5 ppm ±10 ppm	±65 ppm ±100 ppm	±55 ppm ±75 ppm	±40 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 1/	±10 ppm per year 1/
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.

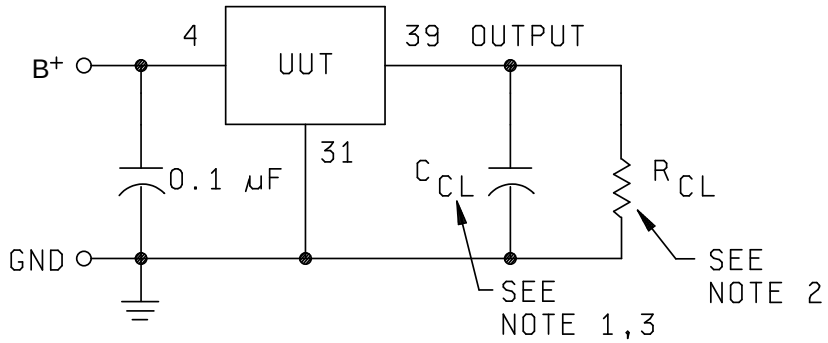
Frequency - voltage tolerance for ±10 percent change in supply voltage:

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.



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.

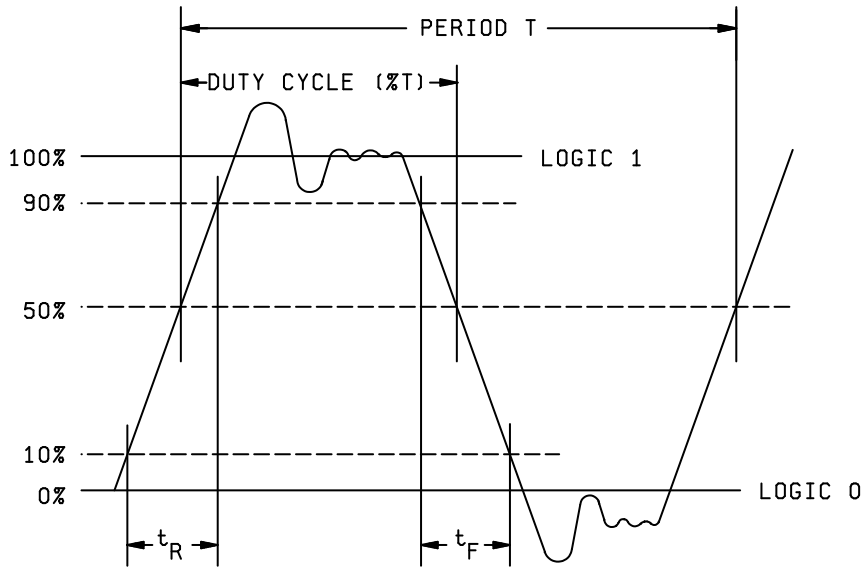


FIGURE 3. Waveform.

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

Nonoperating: Test condition D.

Operating: Not required.

Shock, non-operating: Method 213 of MIL-STD-202, condition I.

Thermal shock: Method 107 of MIL-STD-202, condition B.

Ambient pressure:

Nonoperating: In accordance with MIL-PRF-55310.

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

Storage temperature: In accordance with MIL-PRF-55310.

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

Moisture resistance: Method 106 of MIL-STD-202.

Pad strength: In accordance with method 2004 of MIL-STD-883, condition D.

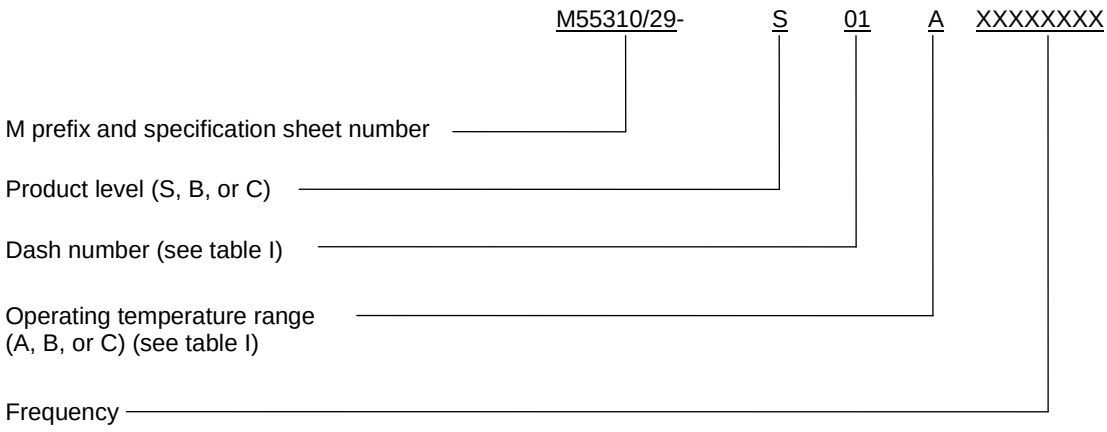
Solderability: Method 208 of MIL-STD-202.

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



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

MIL-STD-202
MIL-STD-883

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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

(5955-2011-016)

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