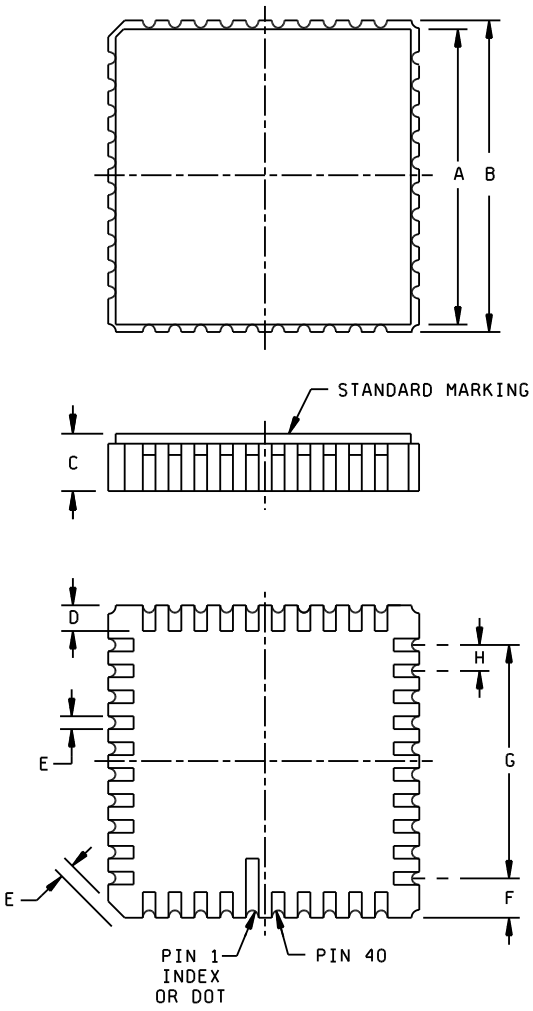
INCH-POUND
MIL-PRF-55310/19E
w/AMENDMENT 1
12 March 2020
SUPERSEDING
MIL-PRF-55310/19E
11 June 2009

PERFORMANCE SPECIFICATION SHEET

OSCILLATOR, CRYSTAL CONTROLLED, TYPE 1 (CRYSTAL OSCILLATOR (XO)), 1.0 MHz THROUGH 60.0 MHz, HERMETIC SEAL, SQUARE WAVE, TTL

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.



Pad number	Function
4	B+
10	B+
31	GND
37	GND
39	OUTPUT
1-3	NC
5-9	NC
11-30	NC
32-36	NC
38	NC
40	NC

FIGURE 1. Dimensions and configuration.

Ltr	Inches		mm	
	Min	Max	Min	Max
A	.452 TYP	.462 TYP	11.48 TYP	11.73 TYP
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 function may be 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.

Oscillator load: Standard TTL loads (see table I).

Output waveform: Symmetrical square wave.

Output voltage:

Logic 1: 2.4 V dc, minimum at 400 μA source.

Logic 0: 0.5 V dc, maximum with 16 mA sink.

Rise and fall times: See table I.

Duty cycle: See table I.

Supply voltage: 5.0 V dc ±10 percent.

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

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.

Initial frequency-temperature accuracy (one-half temperature cycle): Verification applicable. 1/

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/

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}).

TABLE I. Dash numbers and operating characteristics.

Dash number	Output frequency range	Input current max 1/	Pulse characteristics			Initial accuracy ppm at +23°C ±1°C	Frequency aging ppm/year after 30 days	Frequency-temperature tolerance (ppm)		
			Rise and fall times (max)	Duty cycle at 1.4 V	Load max 2/			-55°C to +125°C	-55°C to +105°C	-20°C to +70°C
								A	B	C
		mA	ns	percent						
01	1.0 MHz	75	15	40 to 60	10 TTL	±25	±10	±100	±75	±50
02	to	75	15	40 to 60	10 TTL	±25	±10	±200	±150	±100
03	16.0 MHz	75	15	40 to 60	10 TTL	±15	±5	±50	±40	±25
11	16.0 MHz	40	5	40 to 60	10 TTL	±25	±10	±100	±75	±50
12	to	40	5	40 to 60	10 TTL	±25	±10	±200	±150	±100
13	40.0 MHz	40	5	40 to 60	10 TTL	±15	±5	±50	±40	±25
21	40.0 MHz	70	5	40 to 60	10 TTL	±25	±10	±100	±75	±50
22	to	70	5	40 to 60	10 TTL	±25	±10	±200	±150	±100
23	60.0 MHz	70	5	40 to 60	10 TTL	±15	±5	±50	±40	±25

1/ Maximum input current for no load condition. Actual configuration of TTL loads must be added to determine power supply requirements.
2/ A TTL unit load is defined as: 1.6 mA sink, 0.04 mA source, and 2pF capacitance.

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 (see table I).

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

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:

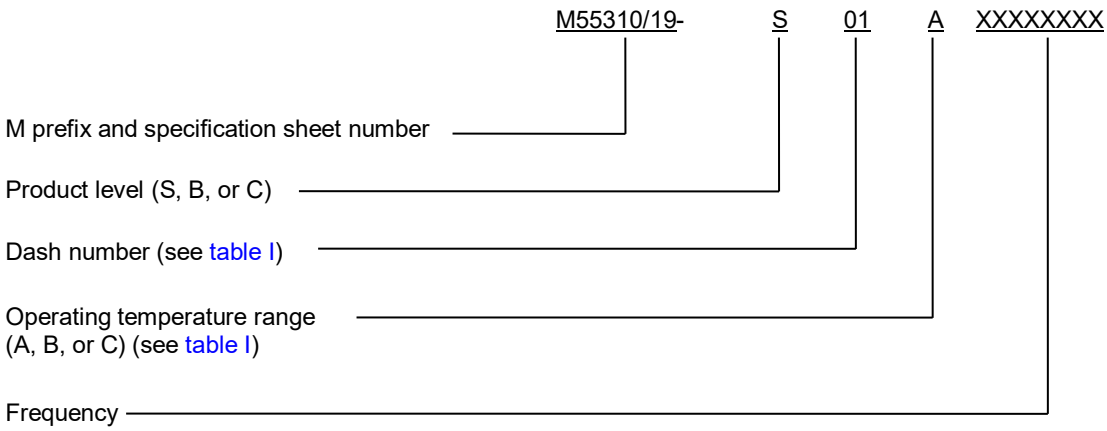
Nonoperating: In accordance with MIL-PRF-55310.

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

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

Amendment notations. The margins of this specification sheet 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

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

Preparing activity:
Army - CR

Agent:
DLA - CC

(Project 5955-2020-023)

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.