

# 100MHz Low Noise/Low G-Sensitivity OCXO

## NA-100M-6800 series

### NA-100M-6800 Series in 25.4x25.4mm DIP package

NA-100M-6800 series is a 100.000 MHz high performance (VC)OCXO offering low phase noise(LPN), low G sensitivity(LGS) and tight frequency stability down to  $\pm 50$ ppb(-20°C to +70°C). The part comes in a small hermetically sealed through hole package which makes it suitable for humid environmental conditions



RoHS Compliant Standard

### FEATURES

- **Low Phase Noise & Low G-Sensitivity**
- Small Hermetically Sealed Package
- Tight Frequency Stability
- Low Power Consumption
- Fast Warm-up Time
- Electrical Frequency Tuning Input
- Reference Voltage Output
- RoHS-Compliant (lead-free)

### APPLICATIONS

- Instrument Reference
- Microwave Communication
- Clock Reference for Microwave Signal Source
- Test & Measurement
- Telecom Systems
- Radar Systems

### ELECTRICAL SPECIFICATIONS

#### 1. OUTPUT (PIN = "R.F. OUTPUT")

|      | Parameter                  | Min.       | Typ. | Max. | Unit     | Test Condition   |
|------|----------------------------|------------|------|------|----------|--|
| 1.1. | Frequency                  | 100.000000 |      |      | MHz      |  |
| 1.2. | Initial Accuracy           | -0.3       |      | +0.3 | ppm      | @ +25 $\pm$ 1°C<br>after turn on power 60 minutes<br>Vc=+5V        |
| 1.3. | Waveform                   | Sine wave  |      |      |          |  |
| 1.4. | Level                      | +10        |      |      | dBm      | Option C<br>Option A, B<br>Refer to Table 1 : Ordering Information |
|      |                            | +13        |      |      |          |  |
| 1.5. | Load                       |            | 50   |      | $\Omega$ |  |
| 1.6. | Harmonics                  |            |      | -30  | dBc      |  |
| 1.7. | Spurious                   |            |      | -100 | dBc      |  |
| 1.8. | G-Sensitivity (all 3 axis) |            |      | 1    | ppb/g    | Option, Refer to Table 1 : Ordering Information                    |

## 2. FREQUENCY STABILITY

|      | Parameter          | Min.                           | Typ.     | Max.     | Unit   | Test Condition                          |   |  |
|------|--------------------|--------------------------------|----------|----------|--------|---|---|--|
| 2.1. | Ambient            | ±50, ±100                      |          |          | ppb    | referenced to 25°C                      | Refer to Table 1 : Ordering Information |  |
|      |                    | -20°C ~ +70°C<br>-40°C ~ +85°C |          |          | °C     |   |   |  |
| 2.2. | Aging              |                                |          |          |        |   |   |  |
|      | Daily              | -5                             |          | +5       | ppb    | after 30 days                           |   |  |
|      | Yearly             | -500                           |          | +500     | ppb    |   |   |  |
|      | 15 Years           | -2                             |          | +2       | ppm    |   |   |  |
| 2.3. | Voltage            | -5                             |          | +5       | ppb    | ±5% change                              |   |  |
| 2.4. | Short term         |                                |          | 0.05     | ppb    | root Allan variance for $\tau=1$ sec    |   |  |
| 2.5. | Load               | -5                             |          | +5       | ppb    | ±10% change                             |   |  |
| 2.6. | Warm-up            | -50                            |          | +50      | ppb    | in 5 minutes @ +25 ±1°C                 | referenced to 1 hour                    |  |
| 2.7. | Phase Noise (Max.) | Option A                       | Option B | Option C |        | Refer to Table 1 : Ordering Information |   |  |
|      |                    | -93                            | -97      | -100     | dBc/Hz | @ 10Hz                                  |   |  |
|      |                    | -125                           | -130     | -135     | dBc/Hz | @ 100Hz                                 |   |  |
|      |                    | -157                           | -160     | -162     | dBc/Hz | @ 1KHz                                  |   |  |
|      |                    | -173                           | -173     | -170     | dBc/Hz | @ 10KHz                                 |   |  |
|      |                    | -177                           | -175     | -172     | dBc/Hz | @ 100KHz                                |   |  |
|      |                    | -180                           | -178     | -175     | dBc/Hz | @ 1MHz                                  |   |  |

## 3. ELECTRICAL FREQUENCY ADJUSTMENT (PIN = "VCO INPUT")

|      | Parameter       | Min.     | Typ. | Max.  | Unit | Test Condition     |   |
|------|-----------------|----------|------|-------|------|--------------------|---|
| 3.1. | Tuning Range    |          |      | -3    | ppm  | VCO @ Min. Voltage | Referenced to frequency at nominal Center Voltage |
|      |                 | +3       |      |       | ppm  | VCO @ Max. Voltage |   |
| 3.2. | Control Voltage | 0        |      | +10.0 | V    |                    |   |
| 3.3. | Slope           | Positive |      |       |      |                    |   |
| 3.4. | Center Voltage  |          | +5   |       | V    |                    |   |
| 3.5. | Linearity       | -10      |      | +10   | %    |                    |   |

## 4. INPUT POWER (PIN = "+VDC")

|      | Parameter      | Min.  | Typ. | Max.                           | Unit | Test Condition                 |  |
|------|----------------|-------|------|--------------------------------|------|--------------------------------|--|
| 4.1. | Voltage        | +11.4 | +12  | +12.6                          | V    |                                |  |
| 4.2. | Current        |       |      |                                |      |                                |  |
|      | Steady State   |       |      | 1.5                            | W    | @ +25°C, operating -20°C~+70°C |  |
|      |                |       |      | 2.0                            |      | @ +25°C, operating -40°C~+85°C |  |
|      | During Warm-Up |       |      | 300                            | mA   | @ +25°C, operating -20°C~+70°C |  |
|      |                |       | 380  | @ +25°C, operating -40°C~+85°C |      |                                |  |

## 5. REFERENCE VOLTAGE (PIN = "REFERENCE VOLTAGE")

|      | Parameter | Min. | Typ. | Max.  | Units | Test Condition |  |
|------|-----------|------|------|-------|-------|----------------|--|
| 5.1. | Voltage   | +9.5 | +10  | +10.5 | V     |                |  |

## 6. ENVIRONMENTAL

|      | Parameter                 | Reference Std.                               | Test Condition                            |
|------|---------------------------|--|---|
| 6.1. | Operable Temperature      | -40°C to +85°C                               | Note 1                                    |
| 6.2. | Storage Temperature       | -55°C to +105°C                              |   |
| 6.3. | Humidity                  | MIL-STD-202, Method 103<br>Test Condition A  | 95% RH @ +40°C, non-condensing, 240 hours |
| 6.4. | Vibration (non-operating) | MIL-STD-202, Method 201                      | 0.06" Total p-p, 10 to 55 Hz              |
| 6.5. | Shock (non-operating)     | MIL-STD-202, Method 213,<br>Test Condition J | 30g, 11ms, half-sine                      |

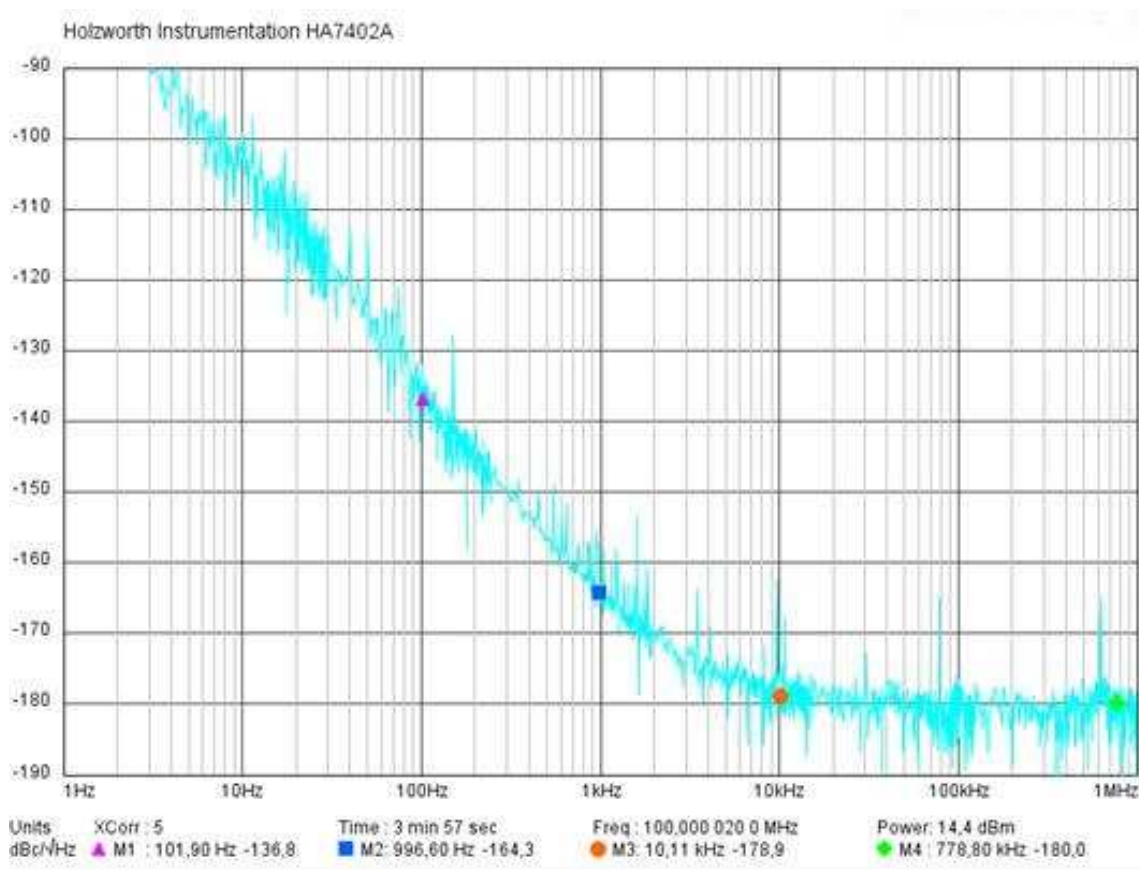
**Note 1 :** Output maintained over this temperature range. Other requirements of this specification may not be met when operating outside the temperature range in 2.1.

**Table 1 : ORDERING INFORMATION**

| Ambient<br>Temp. (°C) | Option   | Phase Noise Option |              |              | G-Sensitivity<br>Option |
|-----------------------|----------|--------------------|--------------|--------------|-------------------------|
|                       |          | A                  | B            | C            |                         |
| -20°C ~ +70°C         | ±100 ppb | NA-100M-6800       | NA-100M-6801 | NA-100M-6802 | Y                       |
|                       |          | NA-100M-6805       | NA-100M-6806 | NA-100M-6807 | N                       |
|                       | ±50 ppb  | NA-100M-6810       | NA-100M-6811 | NA-100M-6812 | Y                       |
|                       |          | NA-100M-6815       | NA-100M-6816 | NA-100M-6817 | N                       |
| -40°C ~ +85°C         | ±100 ppb | NA-100M-6820       | NA-100M-6821 | NA-100M-6822 | Y                       |
|                       |          | NA-100M-6825       | NA-100M-6826 | NA-100M-6827 | N                       |
|                       | ±50 ppb  | Not Available      |              |              |                         |

Other specifications may be available upon request.

## Phase Noise Test Data



# OUTLINE DRAWING

