

10MHz Low Noise/Low G-Sensitivity OCXO

NA-10M-6800 series

NA-10M-6800 Series in 25.4x25.4mm DIP package

NA-10M-6800 series is a 10.000 MHz high performance (VC)OCXO with low phase noise(LPN) and low G sensitivity(LGS). It has excellent temperature versus frequency stability with many available options. The part is housed in a hermetically sealed RoHS package which protects it from extreme changes in external humidity and pressure.



FEATURES

- **Low Phase Noise**
- 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

RoHS Compliant Standard

ELECTRICAL SPECIFICATIONS

Test conditions: VDC = +12 V; VCO = +5 V; at +25 ± 3°C unless otherwise identified

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

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
1.1.	Frequency (Fo)	10.000000			MHz	
1.2.	Initial Accuracy	-0.1		+0.1	ppm	@ +25 ±1°C after turn on power 60 minutes Vco=+5V
1.3.	Waveform	Sine wave				
1.4.	Level	+8	+10	+12	dBm	
1.5.	Load		50		Ω	
1.6.	Harmonics			-30	dBc	
1.7.	Spurious			-80	dBc	10Hz to 1MHz from carrier

2. FREQUENCY STABILITY

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
2.1.	Ambient	±5, ±10, ±20, ±30, ±50, ±100			ppb	referenced to 25°C	Refer to Table 1 : Ordering Information
		-20°C ~ +70°C -40°C ~ +85°C			°C		
2.2.	Aging						
	Daily	-0.5		+0.5	ppb	after 30 days	
	Yearly	-50		+50	ppb		
	10 Years	-0.3		+0.3	ppm		
2.3.	Voltage	-1		+1	ppb	±5% change	
2.4.	Short term		0.002		ppb	root Allan variance for τ=1 sec	
2.5.	Load	-1		+1	ppb	±5% change	
2.6.	Warm-up	-50		+50	ppb	in 5 minutes @ +25 ±1°C	referenced to 1 hour
2.7.	G-Sensitivity (each axis)			1	ppb/g	Option, Refer to Table 1 : Ordering Information	
2.8.	Phase Noise (Max.)	Option A	Option B	Option C		Refer to Table 1 : Ordering Information	
		-105	-110	-115	dBc/Hz	@ 1Hz	
		-135	-140	-142	dBc/Hz	@ 10Hz	
		-155	-155	-155	dBc/Hz	@ 100Hz	
		-165	-165	-165	dBc/Hz	@ 1KHz	
		-170	-170	-170	dBc/Hz	@ 10KHz	
		-170	-170	-170	dBc/Hz	@ 100KHz	
		-170	-170	-170	dBc/Hz	@ 1MHz	

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

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
3.1.	Tuning Range	$\pm 0.4^*$			ppm	Referenced to frequency at nominal Center Voltage	
3.2.	Control Voltage	0.5		+9.5	V		
3.3.	Slope	Positive					
3.4.	Center Voltage		+5.0		V		
3.5.	Linearity	-10		+10	%		

* Sufficient to adjust the oscillator to nominal frequency for 10 years. Some unit will have $\pm 0.7\text{ppm}$ tuning range.

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			2.0	W	@ $+25^{\circ}\text{C}$, operating $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$	Refer to Table 1 : Ordering Information
				2.3		@ $+25^{\circ}\text{C}$, operating $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$	
	During Warm-Up			400	mA	@ $+25^{\circ}\text{C}$, operating $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$	
				500		@ $+25^{\circ}\text{C}$, operating $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$	

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

	Parameter	Min.	Typ.	Max.	Units	Test Condition	
5.1.	Voltage	+9.25	+9.5	+9.75	V		
5.2.	Source Resistance			100	Ohm		
5.3.	Load Impedance	10			Kohm		

6. ENVIRONMENTAL

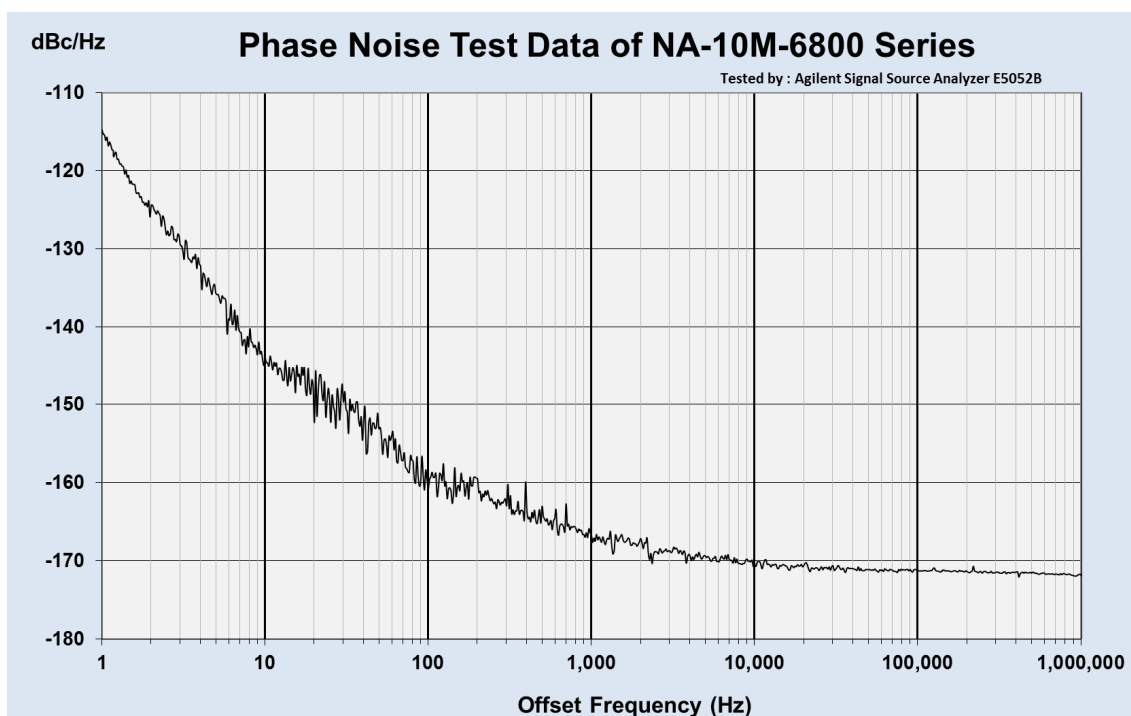
	Parameter	Reference Std.	Test Condition
6.1.	Operable Temperature	-45°C to +90°C	Note 1
6.2.	Storage Temperature	-50°C to +95°C	
6.3.	Humidity	MIL-STD-202, Method 103 Test Condition A	95% RH @ +40°C, non-condensing, 240 hours
6.4.	Vibration (non-operating)	MIL-STD-202, Method 201	0.06" Total p-p, 10 to 55 Hz
6.5.	Shock (non-operating)	MIL-STD-202, Method 213, 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 Temp. (°C)	Option	Phase Noise Option			G-Sensitivity Option
		A	B	C	
-20°C ~ +70°C	±30 ppb	NA-10M-6810	NA-10M-6811	NA-10M-6812	Y
		NA-10M-6815	NA-10M-6816	NA-10M-6817	N
	±20 ppb	NA-10M-6820	NA-10M-6821	NA-10M-6822	Y
		NA-10M-6825	NA-10M-6826	NA-10M-6827	N
	±10 ppb	NA-10M-6830	NA-10M-6831	NA-10M-6832	Y
		NA-10M-6835	NA-10M-6836	NA-10M-6837	N
	±5 ppb	NA-10M-6840	NA-10M-6841	NA-10M-6842	Y
		NA-10M-6845	NA-10M-6846	NA-10M-6847	N
	±100 ppb	NA-10M-6860	NA-10M-6861	NA-10M-6862	Y
		NA-10M-6865	NA-10M-6866	NA-10M-6867	N
-40°C ~ +85°C	±50 ppb	NA-10M-6870	NA-10M-6871	NA-10M-6872	Y
		NA-10M-6875	NA-10M-6876	NA-10M-6877	N
	±30 ppb	NA-10M-6880	NA-10M-6881	NA-10M-6882	Y
		NA-10M-6885	NA-10M-6886	NA-10M-6887	N
	±20 ppb	NA-10M-6890	NA-10M-6891	NA-10M-6892	Y
		NA-10M-6895	NA-10M-6896	NA-10M-6897	N

Phase Noise Test Data



OUTLINE DRAWING

