Mtron™
Innovative RF Solutions

XO5503-100MHz
e-Vibe® Compensated OCXO
With Integrated PLL

Features	Applications
Frequency: 100MHz Vibration Compensated Low Phase Noise Low Aging	Radar Satcom Electronic Warfare Munitions

Electrical Specifications at 100MHz

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Nominal Frequency	F_0		100		MHz	

Frequency Stabilities

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency Stability	ΔF/F	-500		+500	ppb	Over the operating temperature range
vs. Supply Voltage variation		-15		+15	ppb	±5% change in V
vs. Load Change		-100		+100	ppb	
Aging (After 30-days power on)		-250 -200		+250 +200	ppb ppb	1st year Per year after 1st year

RF Output

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Output Type			Sinewave			
Output Level		+5	+7	+9	dBm	Into a nominal 50Ω load
Output Load			50		Ω	±5%
Harmonics				-30	dBc	

Frequency Adjustment

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Adjustment Method		External Voltage				
Adjustment Voltage	V_{TUNE}	0		+5	V	
Adjustment Range			±2.5		ppm	
Input Impedance		25		kΩ		
Adjustment Slope		Positive				

RF External Reference (10MHz)

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
RF Input Level		-3	0	+3	dBm	Customer to choose the signal level between 0 ±3dB
RF Input Lock Range				±1	ppm	10MHz external would need to be within ±1ppm from nominal 10MHz to lock

Note* Phase noise below the loop bandwidth will be dominated by customer provided 10MHz reference.

Phase Noise

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
SSB Phase Noise (Under Static Conditions)				-97	dBc/Hz	10 Hz Offset
				-127	dBc/Hz	100 Hz Offset
				-150	dBc/Hz	1 kHz Offset
				-162	dBc/Hz	10 kHz Offset
				-165	dBc/Hz	100 kHz Offset
SSB Phase Noise – With Random Vibration (operational, any axis)				-95	dBc/Hz	10 Hz Offset
				-123	dBc/Hz	100 Hz Offset
				-150	dBc/Hz	1 kHz Offset
				-152	dBc/Hz	2 kHz Offset
				-165	dBc/Hz	10 kHz Offset
				-170	dBc/Hz	100 kHz Offset

Random Vibration (operational)

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Power Spectral Density			0.0018		g^2/Hz	10 Hz
			0.0018			60 Hz
			0.001			70 Hz
			0.001			200 Hz
			1E-5			210 Hz
			1.4289E-5			300 Hz
			3.96354E-5			500 Hz
			1.0231E-4			600 Hz
			1.0231E-4			610 Hz
			5.9E-7			688 Hz
			2.4037E-5			764 Hz
			4E-6			1000 Hz
			8.74137E-7			1075 Hz
			2.27379E-7			1726 Hz
			2E-6			1837 Hz
			2.635E-6			2000 Hz

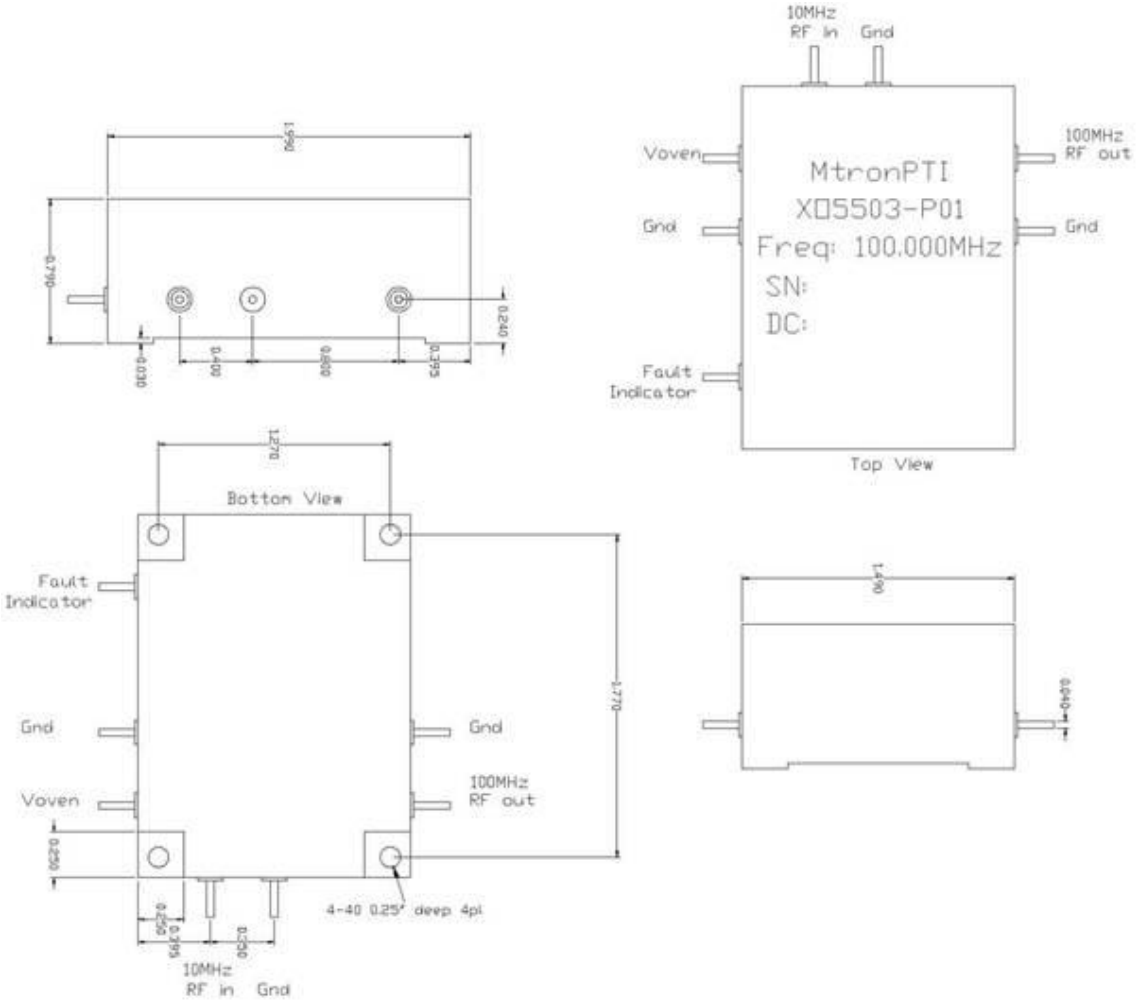
Temperature, Supply Voltage & Power Consumption

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Operating Temperature	OTR	-40		+85	°C	Full Specification Compliance
Operating Voltage	V_{CC}	+11.4	+12.0	+12.6	V	
Power Consumption				3	W	Steady state @ 25°C, In Still Air
				6	W	@ Start-up

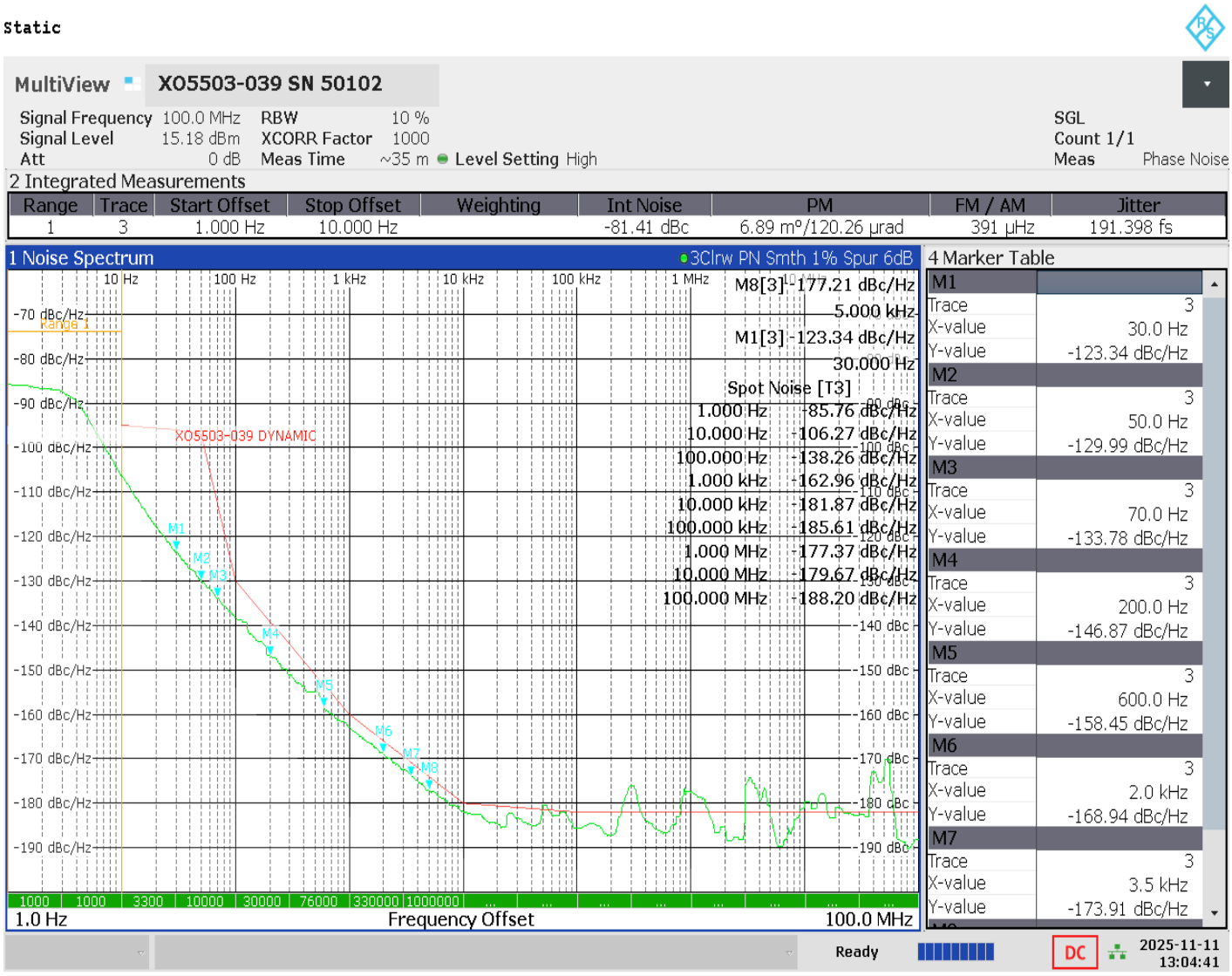
Marking information

Part Marking
Mtron
XO5503
100.000MHz
Serial Number
Date Code

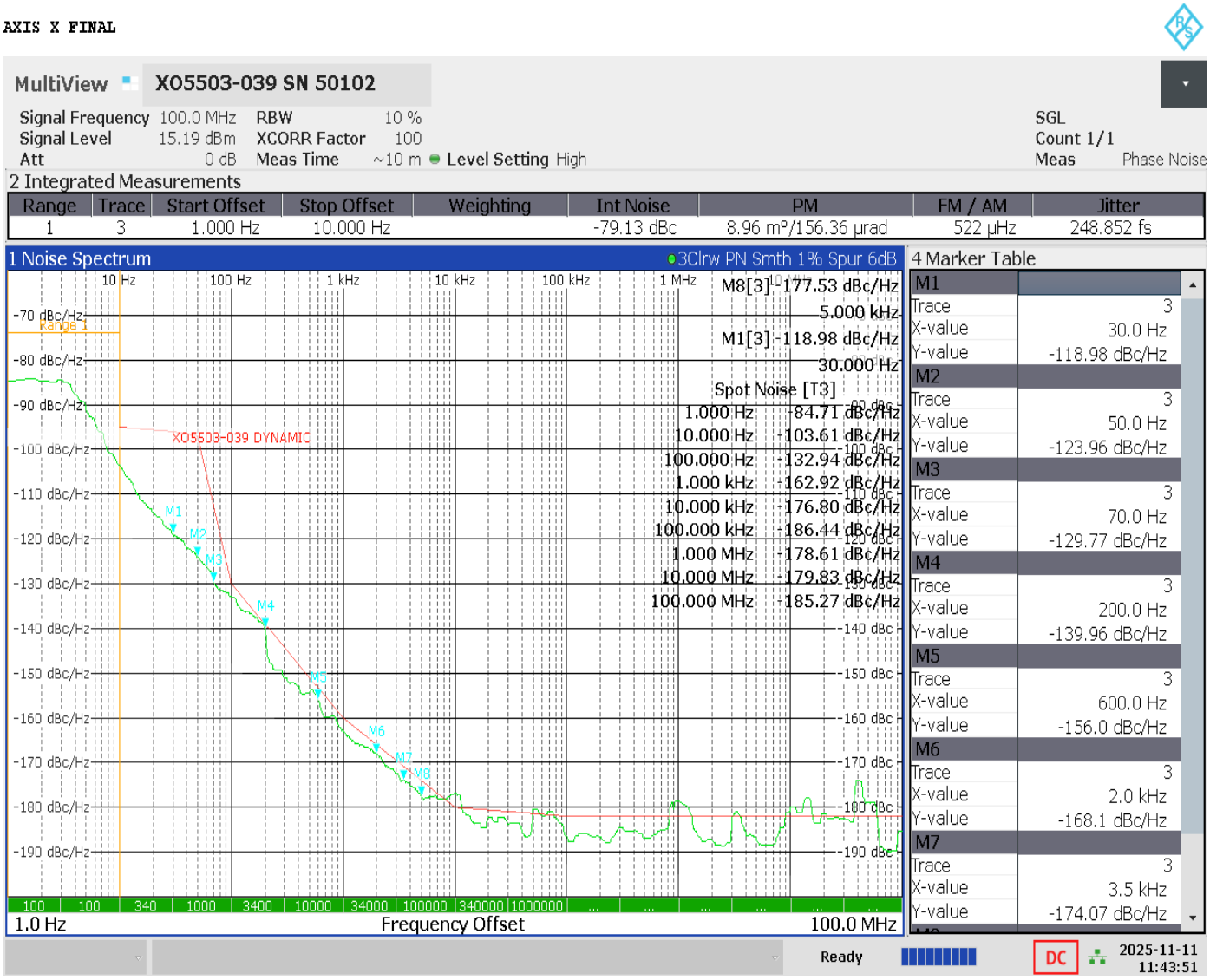
Mechanical Outline



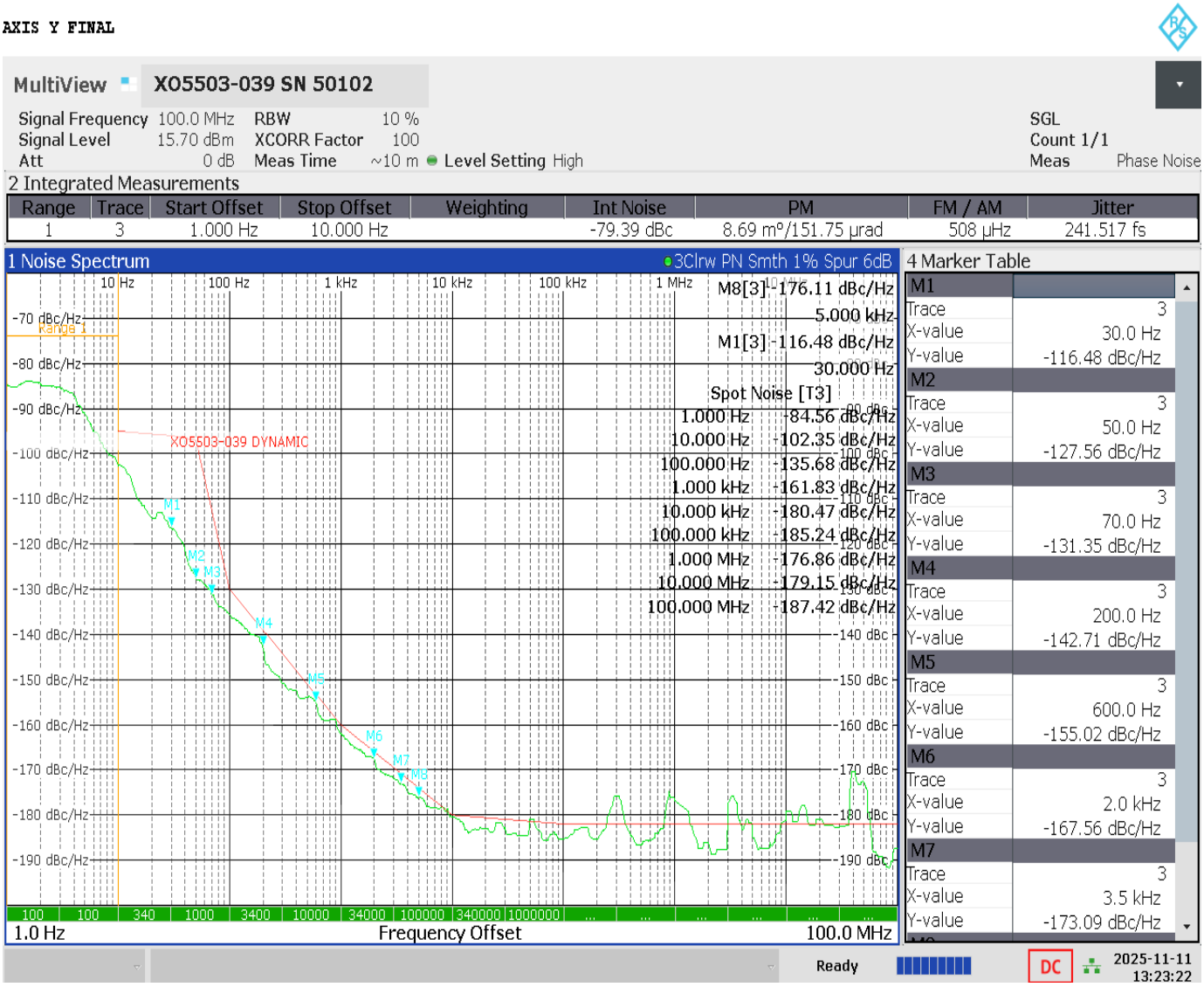
Phase Noise Performance



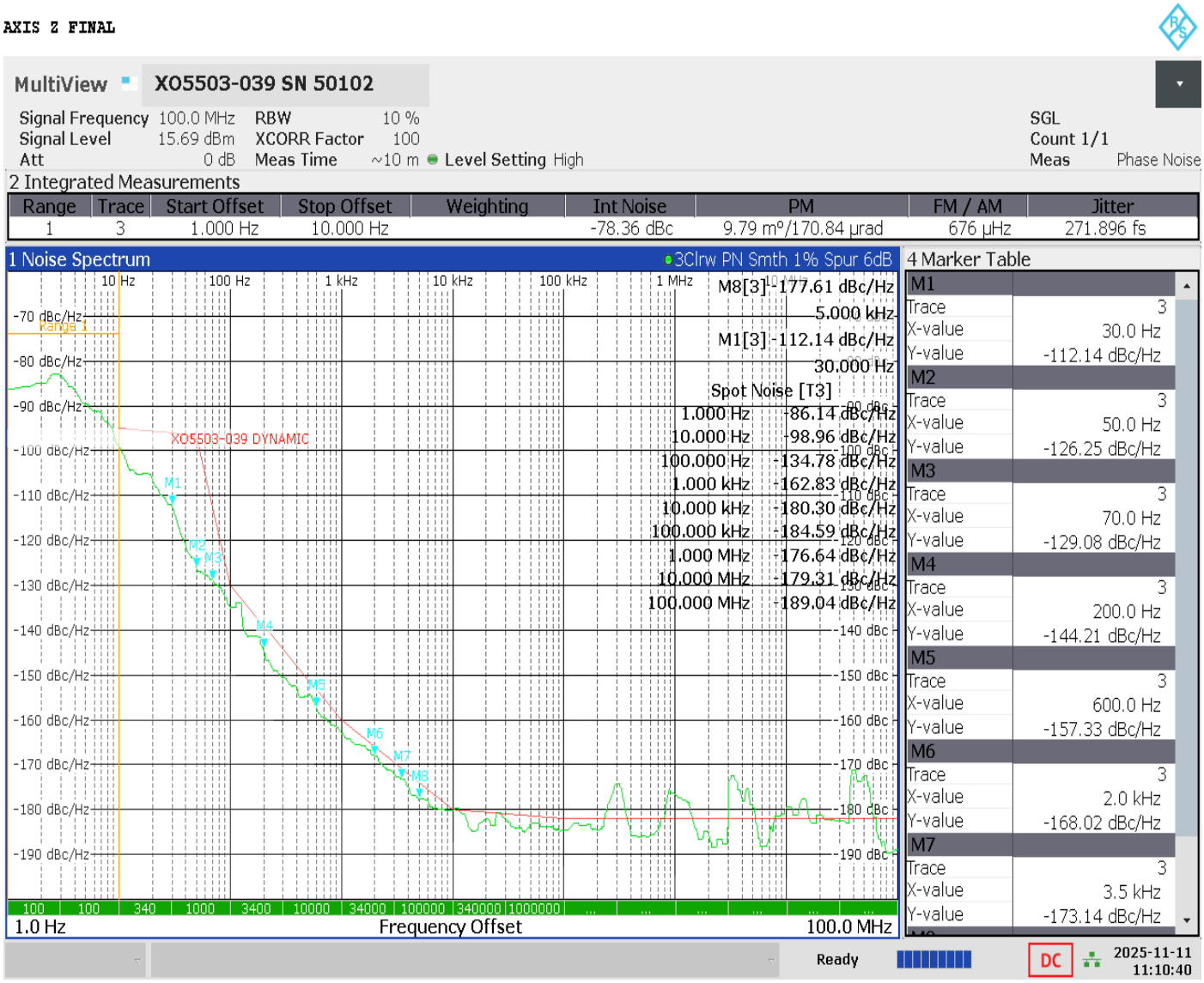
AXIS X FINAL


MultiView
XO5503-039 SN 50102
Signal Frequency 100.0 MHz
Signal Level 15.19 dBm
Att 0 dB
RBW 10 %
XCORR Factor 100
Meas Time ~10 m
Level Setting High
SGL
Count 1/1
Meas Phase Noise
2 Integrated Measurements
Range | Trace | Start Offset | Stop Offset | Weighting | Int Noise | PM | FM / AM | Jitter
1 | 3 | 1.000 Hz | 10.000 Hz | | -79.13 dBc | 8.96 m°/156.36 µrad | 522 µHz | 248.852 fs
1 Noise Spectrum
3Clrw PN Smth 1% Spur 6dB
M8[3] -177.53 dBc/Hz
5.000 kHz
M1[3] -118.98 dBc/Hz
30.000 Hz
Spot Noise [T3]
1.000 Hz -84.71 dBc/Hz
10.000 Hz -103.61 dBc/Hz
100.000 Hz -132.94 dBc/Hz
1.000 kHz -162.92 dBc/Hz
10.000 kHz -176.80 dBc/Hz
100.000 kHz -186.44 dBc/Hz
1.000 MHz -178.61 dBc/Hz
10.000 MHz -179.83 dBc/Hz
100.000 MHz -185.27 dBc/Hz
XO5503-039 DYNAMIC
1.0 Hz
Frequency Offset
100.0 MHz
4 Marker Table
M1 Trace 3 X-value 30.0 Hz Y-value -118.98 dBc/Hz
M2 Trace 3 X-value 50.0 Hz Y-value -123.96 dBc/Hz
M3 Trace 3 X-value 70.0 Hz Y-value -129.77 dBc/Hz
M4 Trace 3 X-value 200.0 Hz Y-value -139.96 dBc/Hz
M5 Trace 3 X-value 600.0 Hz Y-value -156.0 dBc/Hz
M6 Trace 3 X-value 2.0 kHz Y-value -168.1 dBc/Hz
M7 Trace 3 X-value 3.5 kHz Y-value -174.07 dBc/Hz
Ready
DC
2025-11-11
11:43:51

AXIS Y FINAL


MultiView
XO5503-039 SN 50102
Signal Frequency 100.0 MHz
Signal Level 15.70 dBm
Att 0 dB
RBW 10 %
XCORR Factor 100
Meas Time ~10 m
Level Setting High
SGL
Count 1/1
Meas Phase Noise
2 Integrated Measurements
Range 1 | Trace 3 | Start Offset 1.000 Hz | Stop Offset 10.000 Hz | Weighting | Int Noise -79.39 dBc | PM 8.69 m°/151.75 µrad | FM / AM 508 µHz | Jitter 241.517 fs
1 Noise Spectrum
3Clrw PN Smth 1% Spur 6dB
M8[3] -176.11 dBc/Hz
5.000 kHz
M1[3] -116.48 dBc/Hz
30.000 Hz
Spot Noise [T3]
1.000 Hz -84.56 dBc/Hz
10.000 Hz -102.35 dBc/Hz
100.000 Hz -135.68 dBc/Hz
1.000 kHz -161.83 dBc/Hz
10.000 kHz -180.47 dBc/Hz
100.000 kHz -185.24 dBc/Hz
1.000 MHz -176.86 dBc/Hz
10.000 MHz -179.15 dBc/Hz
100.000 MHz -187.42 dBc/Hz
XO5503-039 DYNAMIC
1.0 Hz
Frequency Offset
100.0 MHz
4 Marker Table
M1 Trace 3 X-value 30.0 Hz Y-value -116.48 dBc/Hz
M2 Trace 3 X-value 50.0 Hz Y-value -127.56 dBc/Hz
M3 Trace 3 X-value 70.0 Hz Y-value -131.35 dBc/Hz
M4 Trace 3 X-value 200.0 Hz Y-value -142.71 dBc/Hz
M5 Trace 3 X-value 600.0 Hz Y-value -155.02 dBc/Hz
M6 Trace 3 X-value 2.0 kHz Y-value -167.56 dBc/Hz
M7 Trace 3 X-value 3.5 kHz Y-value -173.09 dBc/Hz
Ready
DC
2025-11-11
13:23:22

AXIS Z FINAL


MultiView
XO5503-039 SN 50102
Signal Frequency 100.0 MHz
Signal Level 15.69 dBm
Att 0 dB
RBW 10 %
XCORR Factor 100
Meas Time ~10 m
Level Setting High
SGL
Count 1/1
Meas Phase Noise
2 Integrated Measurements
Range | Trace | Start Offset | Stop Offset | Weighting | Int Noise | PM | FM / AM | Jitter
1 | 3 | 1.000 Hz | 10.000 Hz | | -78.36 dBc | 9.79 m°/170.84 µrad | 676 µHz | 271.896 fs
1 Noise Spectrum
3Clrw PN Smth 1% Spur 6dB
M8[3] -177.61 dBc/Hz
5.000 kHz
M1[3] -112.14 dBc/Hz
30.000 Hz
Spot Noise [T3]
1.000 Hz -86.14 dBc/Hz
10.000 Hz -98.96 dBc/Hz
100.000 Hz -134.78 dBc/Hz
1.000 kHz -162.83 dBc/Hz
10.000 kHz -180.30 dBc/Hz
100.000 kHz -184.59 dBc/Hz
1.000 MHz -176.64 dBc/Hz
10.000 MHz -179.31 dBc/Hz
100.000 MHz -189.04 dBc/Hz
XO5503-039 DYNAMIC
1.0 Hz
Frequency Offset
100.0 MHz
4 Marker Table
M1 Trace 3 X-value 30.0 Hz Y-value -112.14 dBc/Hz
M2 Trace 3 X-value 50.0 Hz Y-value -126.25 dBc/Hz
M3 Trace 3 X-value 70.0 Hz Y-value -129.08 dBc/Hz
M4 Trace 3 X-value 200.0 Hz Y-value -144.21 dBc/Hz
M5 Trace 3 X-value 600.0 Hz Y-value -157.33 dBc/Hz
M6 Trace 3 X-value 2.0 kHz Y-value -168.02 dBc/Hz
M7 Trace 3 X-value 3.5 kHz Y-value -173.14 dBc/Hz
Ready
DC
2025-11-11
11:10:40