

QUALIFICATION CERTIFICATE

NanoCom ANT-6F

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Table of Contents

1.	INTRODUCTION	4
1.1	PURPOSE	4
1.2	REFERENCES STANDARDS.....	4
2.	QUALIFICATION TESTS	5
2.1	STRUCTURAL AND MECHANICAL TESTS	5
2.2	THERMAL VACUUM TEST	6
2.3	RADIATION TID TESTS.....	6
2.4	FLIGHT HERITAGE	6
3.	CONCLUSION	6

1. Introduction

1.1 Purpose

This document describes the environmental qualification tests carried out on the following product:

- 200286 - NanoCom ANT-6F UHF
- 200287 - NanoCom ANT-6F VHF

In the following sections, the tests and the corresponding test results are described.

1.2 References Standards

Table 1 presents the tests included in the Qualification Program with reference to ECSS documentation.

Table 1: Reference Standards

Test		ECSS/ESCC Reference
Structural and Mechanical	Random Vibration	ECSS-E-ST-10-03C
	Sinusoidal Vibration	ECSS-E-ST-10-03C
	Mechanical Shock	ECSS-E-ST-10-03C
	Quasi static	ECSS-E-ST-10-03C
Thermal	Thermal Ambient	ECSS-E-ST-10-03C
	Thermal Vacuum	ECSS-E-ST-10-03C
Radiation TID		ESCC 22900

2. Qualification tests

It is hereby certified that the product mentioned above has been subjected to the tests executed in relation to the standards mentions in section 1.2

2.1 Structural and Mechanical tests

Sinusoidal Vibration		
Sine Sweep Vibration	Frequency [Hz]	Level [g]
	5-8	20mm peak-peak
	8-100	4,5
Sweep rate: 2 Octaves per minute		

Random Vibration		
Sine Sweep Vibration	Frequency [Hz]	ASD Level [g^2/Hz]
	20	0,057
	20-50	+3,39dB/oct
	50-800	0,16
	800-2000	-6dB/Oct
	2000	0,026
	Overall	14,1G rms
Duration: 120 Seconds on each axis		

Mechanical shock			
Mechanical shock	Type	Duration [ms]	Level [g]
	Half sine	2	35G
No. of pulses: 1 on each axis			

Mechanical Quasi-Static			
Sine Burst	Frequency [Hz]	Cycles	Level[g]
	15	19	10G
No. of burst: 8 ($\approx 10sec$)			

Remarks: None

2.2 Thermal Vacuum Test

Thermal Vacuum Qualification levels		
Temperature range: -5°C - 50°C		
Pressure level: < 1.0 x 10 ⁻⁵ mbar		
Number of Cycles: 12		
Thermal Vacuum Test	CFT	Temperature [°C]
	1	22
	2	50
	3	-5
	4	50
	5	15
	6	-5
	7	35
	8	-5
	9	50
	10	-5
	11	8
	12	22

Thermal Vacuum Qualification levels		
Temperature range: -25°C - 38°C		
Pressure level: < 1.0 x 10 ⁻⁵ mbar		
Number of Cycles: 11		
Thermal Vacuum Test	CFT	Temperature [°C]
	1	20
	2	35
	3	-20
	4	35
	5	-20
	6	35
	7	-20
	8	35
	9	-20
	10	35
	11	-20

Remarks: None

2.3 Radiation TID Tests

Total Ionizing Dose	
Dose Rate:	Standard: 10kRad/hour
Dose	20 kRad (SI)
Annealing	>24 hours, 25degC
Aging	168 hours, 85degC

Remarks: None

2.4 Flight Heritage

The NanoCom ANT-6F UHF/VHF is TRL 9 and has extensive flight heritage including GomSpace missions like GOMX4 as well as many customer missions.

3. Conclusion

The NanoCom ANT-6F UHF/VHF is tested according to the above-mentioned conditions and is fully functional and have the expected performance.

This certificate ensures that performance, test condition and test equipment are according to GomSpace quality.