

QUALIFICATION CERTIFICATE

NovAtel OEM719

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Document Change Log

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1.0	09-11-2021	SEAN	Initial release
1.1	09-11-2021	LAV	Updated with mechanical shock test at 1500G

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1. Introduction

1.1 Purpose

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

- 104791 - NovAtel OEM719 GNSS Receiver

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 Reference
Structural and Mechanical	Random Vibration
	Sinusoidal Vibration
	Mechanical Shock
	Quasi static
Thermal	Thermal Ambient
	Thermal Vacuum
Radiation TID	ESCC 22900
Thermal Stress	ECSS-Q-ST-70-38C

2. Qualification tests

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

2.1 Structural and Mechanical tests

Test Condition: Tested as part of integrated satellite.

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	0,026
	50	0,16
	800	0,16
	2000	0,026
Overall		14,1G RMS
Duration: 120 Seconds on each axis		

Shock Response Spectrum (SRS) Qualification Levels	
Shock levels based on Q = 10 quality factor	
Frequency [Hz]	Level [g] (+/- 6db)
100	40
1000	1000
2000	1500
10000	1500

Remarks: None

2.2 Thermal Vacuum Test

Test condition: Tested as part of integrated satellite.

Thermal Vacuum Qualification levels		
Temperature range: -5°C to +50°C		
Pressure level: < 1.0 x 10 ⁻⁵ mbar		
Number of Cycles: 4		
Thermal Vacuum Test	CFT	Temperature [°C]
	1	10
	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: -20°C to +35°C		
Pressure level: < 1.0 x 10 ⁻⁵ mbar		
Number of Cycles: 5		
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

Test condition: Radiation tested at PCBA level without additional shielding.

Total Ionizing Dose		
Dose Rate:	14,09kRad/h	
Dose	85,1min	18 kRad (SI)
Annealing	>24 hours	25 degC
Aging	168 hours	85 degC

Remarks: None

2.4 Flight Heritage

The NovAtel OEM719 is TRL 9 and has extensive flight heritage including GomSpace missions like GOMX4 as well as many customer missions.

3. Conclusion

The NovAtel OEM719 is tested according to the above-mentioned conditions and is fully functional and has the expected performance.

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