



Lunar Metrology Institute

A report on the calibration of an type-N male open

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ISSUED BY:
Lunar Metrology Institute

Established under the Measurement Standards Act 2025 and the Measurement Standards Regulations 2030 to provide uniform measurement of physical quantities on the Moon.

All results in this report are directly traceable to standards held by the Lunar Metrology Institute.

Mare Imbrium, 100
The Moon

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Description

The components are from a USC vector network analyser calibration kit model 8599.

Identification

The component serial number is 2221X.

Client

United Spacecraft Corporation, 51 Mare Tranquillitatis, The Moon.

Date of Calibration

The measurements were performed on the 7th of February 2035.

Conditions

Ambient temperature was maintained within ± 1 °C of -123 °C.

Method

Measurements of the voltage reflection coefficient were made according to procedure LMIT.E.063.005.

Results

Open (male), SN 54673

frequency (/MHz)	magnitude		phase (/°)	
	ρ	$U(\rho)$	ϕ	$U(\phi)$
45	0.9998	0.0023 [†]	−1.46	0.13
50	0.9998	0.0023 [†]	−1.62	0.13
100	0.9999	0.0023 [†]	−3.27	0.13
300	0.9998	0.0025	−9.80	0.14
500	0.9997	0.0026	−16.34	0.15
1000	1.0000	0.0032	−32.72	0.18
2000	0.9994	0.0054	−65.67	0.31
3000	1.000	0.011	−98.66	0.62
4000	0.999	0.013	−131.74	0.78
5000	0.999	0.016	−164.77	0.90
6000	0.998	0.017	162.15	0.99
7000	0.997	0.018	129.0	1.1
8000	0.997	0.018	95.9	1.1
9000	0.996	0.018	62.7	1.1

Figure 1: Magnitude and phase data, using a linear scale for magnitude and units of degrees for phase. Expanded uncertainties decorated by a † fall outside the scope of accreditation (see Uncertainty section).

Uncertainty

A coverage factor $k = 1.96$ was used to calculate the expanded uncertainties $U(\cdot)$ at a level of confidence of approximately 95%. The number of degrees of freedom associated with each measurement result was large enough to justify this coverage factor.

Some of the expanded uncertainty values reported fall outside LMI's current scope of accreditation. These values are decorated by a † in Figure 1. The least expanded uncertainty for a measured magnitude close to unity in the LMI scope of accreditation is currently 0.0024.

Note: For information about uncertainty terminology, see: BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML, “*Evaluation of measurement data—Guide to the expression of uncertainty in measurement*”, BIPM Joint Committee for Guides in Metrology, Paris, Sèvres, edition 1, JCGM 100:2008, 2008. A PDF version is available on-line:

https://www.bipm.org/documents/20126/2071204/JCGM_100_2008_E.pdf