CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Maury Microwave, Inc.
(Boonton Electronic, Holzworth Instrumentation, Noisecom)
9 Entin Rd., Suite 101
Parsippany, NJ 07054
(and satellite location as listed on the scope)

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

Jason Stine, Vice President

Expiry Date: 25 September 2026

Certificate Number: AC-2619

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Maury Microwave, Inc.
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CALIBRATION

Valid to: **September 25, 2026** Certificate Number: **AC-2619**

Electrical RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power Sensors Calibration Factor (CF) [1]	1.00 CF, 0 dBm reference (1 to 10) MHz (0.01 to 10) GHz (10 to 18) GHz (18 to 40) GHz	 1.2 % 1.3 % 1.7 % 3 %	Tegam F1130 Power Standard, Tegam 1830A Power Standard, 2510A Bolometer
RF Power Sensors Linearity 1 GHz	0 dBm (-50 to 0) dBm (0 to 20) dBm	0.058 dB 0.11 dB + 0.006 dB/dB 0.048 dB + 0.006 dB/dB	Boonton Model 2530 Calibrator
RF Power Sensors Reflection Coefficient [1]	$\geq 0 \lvert \Gamma \rvert \leq 0.3$ $\geq 1 \rho \leq 1.88$ (0.01 to 10) GHz (10 to 18) GHz (18 to 26.5) GHz (26.5 to 40) GHz	 0.19 0.019 0.028 0.028	Anritsu 560-97NF50 SWR Tester, Anritsu 560-98KF50 SWR Tester
RF Power Meters Linearity (Source) 1 GHz	0 dBm (-50 to 0) dBm (0 to 20) dBm	0.046 dB 0.014 dB + 0.006 dB/dB 0.07 dB + 0.006 dB/dB	Boonton Model 2530 Calibrator
RF Power Meters Linearity (Measure) 1 GHz Calibrator Output	(-34 to -20) dBm (-20 to 20) dBm	0.2 dB + 0.006 dB/dB 0.08 dB + 0.006 dB/dB	Boonton Model 4532A Power Meter w/ 51075 Sensor
RF Power Meters 1 GHz Calibrator Output	0 dBm	0.56 dB	HP 432A Power Meter w/ 478A H84 Thermistor Mount

Electrical RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power - Measure [2] (Absolute)	(-110 to 20) dB 10 Hz ≤ f < 10 MHz 10 MHz ≤ f < 50 MHz 50 MHz ≤ f < 3.5 GHz 3.5 GHz ≤ f < 5.2 GHz 5.2 GHz ≤ f < 13.6 GHz 13.6 GHz ≤ f < 17.1 GHz 17.1 GHz ≤ f < 22.0 GHz 22.0 GHz ≤ f < 26.5 GHz 26.5 GHz ≤ f < 34.5 GHz 34.5 GHz ≤ f < 50.0 GHz	 0.4 dB 0.35 dB 0.35 dB 0.75 dB 0.58 dB 0.62 dB 0.77 dB 0.88 dB 1.1 dB 1.5 dB	MXA9020B Signal Analyzer
Noise Sources ENR	(5, 15, 21) dB (0.01 to 8) GHz (8 to 26) GHz (26 to 40) GHz	 0.1 dB 0.13 dB 0.21 dB	HP346CK01, HP346C Noise Standards, Keysight PNA-X Network Analyzer
Noise Sources Reflection Coefficient[1]	≥ 0 $\lvert\Gamma\rvert$ ≤ 0.3 ≥ 1 ρ ≤ 1.88 (0.01 to 40) GHz	 0.18	HP346CK01, HP346C Noise Standards, Keysight PNA-X Network Analyzer
Phase Noise for Signal Analyzers Carrier 1 GHz 1 kHz 10 kHz 100 kHz 1 MHz 1 kHz 10 kHz 100 kHz 1 MHz 1 kHz 10 kHz 100 kHz 1 MHz 1 kHz 10 kHz 100 kHz 1 MHz	 0 dB > -140 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz 14 dB > -140 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz 28 dB > -140 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz 42 dB > -140 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz > -150 dBc/Hz	 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB 0.5 dB	Network Analyzer Mechanical Cal Kit Noise Standard Power Meter Power Sensor

Electrical RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Phase Noise 10 kHz Offset	(-5 to 20) dB 10 MHz to 40 GHz	2 dB	HA7062C/HA7062D Phase Noise Analyzer

Electrical – RF/Microwave

Parameter/ Equipment	RF Power Measure								
Reference Standard, Method, and/or Equipment	N1913A, E4418 Power Meter, N8485A and N8487A Power Sensors								
Range	**Expanded Uncertainty of Measurement (+/-)**								
Power Range	Frequency Ranges (uncertainties in dB)								
	10 MHz ≤ f < 30 MHz	30 MHz ≤ f < 500 MHz	500 MHz ≤ f < 1.2 GHz	1.2 GHz ≤ f < 6 GHz	6 GHz ≤ f < 14 GHz	14 GHz ≤ f < 18 GHz	18 GHz ≤ f < 26.5 GHz	26.5 GHz ≤ f < 33 GHz	33 GHz ≤ f < 40 GHz
-20 dBm ≤ P < -10 dBm	0.05	0.07	0.07	0.07	0.08	0.09	0.12	0.12	0.15
-10 dBm ≤ P < -2 dBm	0.05	0.07	0.07	0.07	0.08	0.09	0.12	0.12	0.13
-2 dBm ≤ P < 15 dBm	0.06	0.07	0.07	0.07	0.08	0.09	0.12	0.12	0.13
15 dBm ≤ P < 20 dBm	0.06	0.07	0.08	0.08	0.09	0.1	0.13	0.12	0.13

Services performed at satellite location

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Electrical RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Phase Noise 10 kHz Offset	(-5 to 20) dB 10 MHz to 40 GHz	2 dB	HA7062C/HA7062D Phase Noise Analyzer

Electrical RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Phase Noise for Signal Analyzers			Network Analyzer Mechanical Cal Kit Noise Standard Power Meter Power Sensor
Carrier 1 GHz	0 dB		
1 kHz	> -140 dBc/Hz	0.5 dB	
10 kHz	> -150 dBc/Hz	0.5 dB	
100 kHz	> -150 dBc/Hz	0.5 dB	
1 MHz	> -150 dBc/Hz	0.5 dB	
	14 dB		
1 kHz	> -140 dBc/Hz	0.5 dB	
10 kHz	> -150 dBc/Hz	0.5 dB	
100 kHz	> -150 dBc/Hz	0.5 dB	
1 MHz	> -150 dBc/Hz	0.5 dB	
	28 dB		
1 kHz	> -140 dBc/Hz	0.5 dB	
10 kHz	> -150 dBc/Hz	0.5 dB	
100 kHz	> -150 dBc/Hz	0.5 dB	
1 MHz	> -150 dBc/Hz	0.5 dB	
	42 dB		
1 kHz	> -140 dBc/Hz	0.5 dB	
10 kHz	> -150 dBc/Hz	0.5 dB	
100 kHz	> -150 dBc/Hz	0.5 dB	
1 MHz	> -150 dBc/Hz	0.5 dB	
RF Power - Measure [2] (Absolute)	(-110 to 20) dB		MXA9020B Signal Analyzer
	10 Hz ≤ f < 10 MHz	0.4 dB	
	10 MHz ≤ f < 50 MHz	0.35 dB	
	50 MHz ≤ f < 3.5 GHz	0.35 dB	
	3.5 GHz ≤ f < 5.2 GHz	0.75 dB	
	5.2 GHz ≤ f < 13.6 GHz	0.58 dB	
	13.6 GHz ≤ f < 17.1 GHz	0.62 dB	
	17.1 GHz ≤ f < 22.0 GHz	0.77 dB	
	22.0 GHz ≤ f < 26.5 GHz	0.88 dB	
	26.5 GHz ≤ f < 34.5 GHz	1.1 dB	
	34.5 GHz ≤ f < 50.0 GHz	1.5 dB	

Electrical – RF/Microwave

Parameter/ Equipment	RF Power Measure								
Reference Standard, Method, and/or Equipment	N1913A, E4418 Power Meter, N8485A and N8487A Power Sensors								
Range	**Expanded Uncertainty of Measurement (+/-)**								
Power Range	Frequency Ranges (uncertainties in dB)								
	10 MHz ≤ f < 30 MHz	30 MHz ≤ f < 500 MHz	500 MHz ≤ f < 1.2 GHz	1.2 GHz ≤ f < 6 GHz	6 GHz ≤ f < 14 GHz	14 GHz ≤ f < 18 GHz	18 GHz ≤ f < 26.5 GHz	26.5 GHz ≤ f < 33 GHz	33 GHz ≤ f < 40 GHz
-20 dBm ≤ P < -10 dBm	0.05	0.07	0.07	0.07	0.08	0.09	0.12	0.12	0.15
-10 dBm ≤ P < -2 dBm	0.05	0.07	0.07	0.07	0.08	0.09	0.12	0.12	0.13
-2 dBm ≤ P < 15 dBm	0.06	0.07	0.07	0.07	0.08	0.09	0.12	0.12	0.13
15 dBm ≤ P < 20 dBm	0.06	0.07	0.08	0.08	0.09	0.1	0.13	0.12	0.13

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. Unitless linear measure.
2. f = frequency, P = power.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-2619.

Jason Stine, Vice President