

**Maury Microwave**

Certificate of Calibration

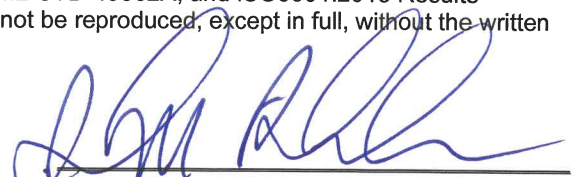
Certificate Number: 23337 - 1**Issue Date:** 21-Aug-24**Page:** 1 of 1

Customer:	The EMC Shop		
Customer Address:	3830 Atherton Rd., Rocklin, CA 95765, USA		
Customer PO#	190		
Date Received:	01-Jul-24	Sales Order#	23337
Calibration Lab:	Maury Microwave Inc, 9 Entin Road, Suite 101, Parsippany, NJ 07054 USA		
Type of Calibration	ANSI/NCSL Z540.1		

Device Identification:

Description:	Peak Power Analyzer		
Manufacturer:	Boonton	Calibration Date:	15-Jul-24
Model:	4500B - 01	Calibration Due:	15-Jul-25
Serial No.	15110	Calibration Interval:	1 Yr.
Asset No.	NA		
Procedure:	4500B_Final_Rack Ver 2018.09.24.2		
Temperature:	23.9° C	Humidity:	< 80% Non Condensing
		Performed by:	VO
As Received Condition:	Inoperable	As Completed Condition:	In-Spec
Notes:	See Service Record		

Calibration has been performed at Maury Microwave, Inc. in Parsippany, NJ. This instrument has been calibrated using standards traceable to SI units through the National Institute of Standards and Technology (NIST) or other National Metrological Institute (NMI). The method of calibration is direct comparison to a known standard, derived from natural physical constants, ratio measurements or compared to consensus standards. Reported uncertainties are expressed as expanded uncertainty values at an approximately 95% confidence level using a coverage factor of k=2. Maury Microwave, Inc. Calibration Management System conforms to ISO/IEC 17025:2017 and meets the requirement of ANSI/NCSL Z540-1, ISO10012:2003, MIL-STD-45562A, and ISO9001:2015 Results contained in this document relate only to the item calibrated. This certificate shall not be reproduced, except in full, without the written permission of Maury Microwave Inc.


Quality Representative

Service Report

Customer:	The EMC Shop
Date:	21-Aug-24
RO#:	51395
RMA#:	23337
PO#:	190
Model:	4500B - 01
Serial Number:	15110
Customer Complaint:	unit fails to boot up
Initial Inspection:	confirmed, unit ioperable
Action Taken:	Replaced CMOS battery, and updated BIOS. calibrated, unit now passes all final tests



Quality Representative

BOONTON

A WIRELESS TELECOM GROUP COMPANY

4500B RF Peak Power Analyzer Test Record (2023.8.03)

Final Test

Serial Number: 15110
Technician: V. Otero
Options: Opt 01
Test Software: 4500B_Final_Rack
Report Date: 7/15/2024

Firmware Version: 20150807

Version: 2018.09.24.2

Standards Used During Calibration

Description	Manufacturer	Model	Serial Number	Cal Due Date
Power Meter	Boonton	4532	10374	8/4/2024
Frequency Counter	HP	53131A	MY40002510	6/30/2025
Power Meter	HP	432A	1848A21173	6/30/2025
RF Probe	Boonton	952001	29009	4/30/2025
Function Generator	Agilent	33250A	MY40019320	6/30/2025
Multimeter	Agilent	34401A	MY45015899	6/30/2025
Multimeter	Agilent	34401A	MY45022796	6/30/2025
Thermistor Mount	HP	8478B	2106A24207	7/31/2024
Capacitance Meter	Boonton	7200	12678	4/17/2025
CW Power Sensor	Boonton	51075	34399	4/3/2025
Peak Power Sensor	Boonton	59318	7851	11/15/2024
RF Calibrator	Boonton	2530	1247	12/18/2024

Calibrator Linearity Test

Date: 7/15/2024
Temp (°C): 23.93
RH(%): 53.61

Model: 4500B
Serial Number: 15110

<u>Level (dBm)</u>	<u>Minimum (dBm)</u>	<u>Reading (dBm)</u>	<u>Maximum (dBm)</u>	<u>Pass/Fail</u>
-50.000	-50.335	-50.018	-49.665	Pass
-45.000	-45.335	-45.001	-44.665	Pass
-40.000	-40.305	-40.032	-39.695	Pass
-35.000	-35.275	-35.037	-34.725	Pass
-30.000	-30.245	-30.023	-29.755	Pass
-25.000	-25.215	-25.030	-24.785	Pass
-20.000	-20.185	-19.998	-19.815	Pass
-15.000	-15.155	-15.004	-14.845	Pass
-10.000	-10.125	-9.992	-9.875	Pass
-5.000	-5.095	-4.996	-4.905	Pass
0.000	-0.065	0.001	0.065	Pass
5.000	4.905	4.984	5.095	Pass
10.000	9.875	9.995	10.125	Pass
15.000	14.845	14.975	15.155	Pass
20.000	19.815	19.993	20.185	Pass

Calibrator Reference Level Test

Date: 7/15/2024
Temp (°C): 23.15
RH(%): 50.66

Global Cal Factor: 0.21

	<u>Minimum</u>	<u>Reading</u>	<u>Maximum</u>	<u>Pass/Fail</u>
Level (mW)*	0.996	1.0000	1.004	Pass
SWR	1.00	1.108	1.20	Pass
Frequency (GHz)	1.0239	1.023998	1.0241	Pass

*Guardbanded tolerance.

Time Base Test

Date: 7/15/2024
Temp (°C): 23.17
RH(%): 50.53

Model: 4500B
Serial Number: 15110

<u>Period (ms)</u>	<u>Minimum (ms)</u>	<u>Reading (ms)</u>	<u>Maximum (ms)</u>	<u>Pass/Fail</u>
1.000000	0.99990	0.999990	1.00010	Pass

Trigger Tests

Date: 7/15/2024
Temp (°C): 23.16
RH(%): 50.47

<u>Test</u>	<u>Required (Y/N)</u>	<u>Pass/Fail</u>
External Trigger 1 $\pm$ 5V Range	Yes	Pass
External Trigger 1 $\pm$ 50V Range	Yes	Pass
External Trigger 2 $\pm$ 5V Range	Yes	Pass
External Trigger 2 $\pm$ 50V Range	Yes	Pass
Calibrator External Trigger	Yes	Pass
Trigger Out 1	No	N/A
Trigger Out 2	No	N/A
Trigger 1 Capacitance	Yes	Pass
Trigger 2 Capacitance	Yes	Pass

Channel 1 Rise Time Test

Date: 7/15/2024
Temp (°C): 23.99
RH(%): 53.71
Cable Length (ft): 5

Model: 4500B
Serial Number: 15110

<u>Level(dBm)</u>	<u>Minimum (ns)</u>	<u>High Bandwidth Reading(ns)</u>	<u>Maximum (ns)</u>	<u>Pass/Fail</u>
20	N/A	5.77	10.0	Pass
15	N/A	5.74	10.0	Pass
10	N/A	6.24	10.0	Pass
5	N/A	6.96	10.0	Pass
0	N/A	7.05	10.0	Pass

<u>Level(dBm)</u>	<u>Minimum (ns)</u>	<u>Low Bandwidth Reading(ns)</u>	<u>Maximum (ns)</u>	<u>Pass/Fail</u>
20	5000	6943.00	20000.0	Pass
15	5000	6725.00	20000.0	Pass
10	5000	7321.00	20000.0	Pass
5	5000	6819.00	20000.0	Pass
0	5000	6037.00	20000.0	Pass

Channel 1 Linearity Test

<u>Level (dBm)</u>	<u>Minimum (dBm)</u>	<u>Reading (dBm)</u>	<u>Maximum (dBm)</u>	<u>Pass/Fail</u>
-34.0	-37.05	-33.850	-30.95	Pass
-30.0	-31.52	-29.940	-28.48	Pass
-25.0	-25.59	-24.980	-24.41	Pass
-20.0	-20.26	-19.970	-19.74	Pass
-15.0	-15.14	-14.990	-14.86	Pass
-10.0	-10.11	-10.000	-9.89	Pass
-5.0	-5.09	-5.000	-4.91	Pass
0.0	-0.09	0.000	0.09	Pass
5.0	4.91	4.990	5.09	Pass
10.0	9.91	10.020	10.09	Pass
15.0	14.91	14.970	15.09	Pass
20.0	19.91	19.990	20.09	Pass

Channel 2 Rise Time Test

Date: 7/15/2024
Temp (°C): 24.25
RH(%): 55.38
Cable Length (ft): 5

Model: 4500B
Serial Number: 15110

<u>Level(dBm)</u>	<u>Minimum (ns)</u>	<u>High Bandwidth Reading(ns)</u>	<u>Maximum (ns)</u>	<u>Pass/Fail</u>
20	N/A	5.39	10.0	Pass
15	N/A	5.24	10.0	Pass
10	N/A	5.96	10.0	Pass
5	N/A	6.72	10.0	Pass
0	N/A	7.40	10.0	Pass

<u>Level(dBm)</u>	<u>Minimum (ns)</u>	<u>Low Bandwidth Reading(ns)</u>	<u>Maximum (ns)</u>	<u>Pass/Fail</u>
20	5000	6920.00	20000.0	Pass
15	5000	6695.00	20000.0	Pass
10	5000	7276.00	20000.0	Pass
5	5000	6822.00	20000.0	Pass
0	5000	6028.00	20000.0	Pass

Channel 2 Linearity Test

<u>Level (dBm)</u>	<u>Minimum (dBm)</u>	<u>Reading (dBm)</u>	<u>Maximum (dBm)</u>	<u>Pass/Fail</u>
-34.0	-37.05	-34.050	-30.95	Pass
-30.0	-31.52	-29.920	-28.48	Pass
-25.0	-25.59	-24.960	-24.41	Pass
-20.0	-20.26	-19.970	-19.74	Pass
-15.0	-15.14	-14.980	-14.86	Pass
-10.0	-10.11	-9.990	-9.89	Pass
-5.0	-5.09	-4.990	-4.91	Pass
0.0	-0.09	0.010	0.09	Pass
5.0	4.91	5.000	5.09	Pass
10.0	9.91	10.020	10.09	Pass
15.0	14.91	14.970	15.09	Pass
20.0	19.91	19.970	20.09	Pass