Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 1-14111609947-1

AC-1498

Model Number	E9304A
Manufacturer	Keysight Technologies Inc
Description	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm
Serial Number	MY50300052
Customer Asset No.	E9304A00052

Customer
Keysight Technologies Inc
1200 Airport North Office Park, Units C/D
FORT WAYNE IN 46825
United States

Date of Calibration	3 Mar 2021
Procedure	STE-50114465-A.07.00
Temperature	(23 ± 5) °C
Humidity	(50 ± 30) %RH

Location of Calibration
Keysight Technologies Inc
10090 Foothills Blvd.
Roseville CA 95747-7102
UNITED STATES

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures and in compliance with ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994 (R2002). The quality management system is registered to ISO 9001:2015.

As Received Conditions
The measured values of the equipment were observed in specification at the points tested. Additionally, the expanded measurement uncertainty intervals about the measured values were in specification.

Action Taken
- Calibration Factors were updated.

As Completed Conditions
The measured values of the equipment were observed in specification at the points tested. Additionally, the expanded measurement uncertainty intervals about the measured values were in specification.

Remarks or Special Requirements

This calibration report shall not be reproduced, except in full. The documented results relate to the equipment calibrated only.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.
This calibration report may refer to equipment manufactured by HP, Agilent and Keysight as being manufactured by Keysight Technologies.

Based on the customer's request, the next calibration is due on 3 Mar 2022.

Keysight Technologies Inc
10090 Foothills Blvd.
Roseville CA 95747-7102
UNITED STATES

Wes Fischbach Roseville Serv. Cntr. Mgr.

Traceability Information

Technician ID N1015496

Measurements are traceable to the International System of Units (SI) via national metrology institutes (www.keysight.com/find/NMI) that are signatories to the CIPM Mutual Recognition Arrangement.

Calibration Equipment Used

Model Number	Model Description	Equipment ID	Cal Due Date
11667A	DC-18 GHz power splitter, type N, 50 ohm	11667A56950	16 Oct 2021
33250A	Function/Arbitrary Waveform Generator, 80 MHz	33250A32294	22 Sep 2021
33250A	Function/Arbitrary Waveform Generator, 80 MHz	33250A32284	2 Apr 2021
85032F	Standard mechanical calibration kit, DC to 9 GHz, type-N, 50 ohm	85032F97676	4 Aug 2021
85054B	Standard mechanical calibration kit, DC to 18 GHz, type-N	85054B00214	22 Apr 2021
E4417A	Power Meter - EPM-P series, dual channel	E4417A56017	22 Sep 2021
E5071C	ENA Series Network analyzer	E5071C18955	13 Jan 2022
E8257D	PSG analog signal generator	E8257D13045	3 Dec 2022
E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A95333	12 Aug 2021
E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A95406	6 Aug 2021
N1914A	Power Meter - Average, dual channel	N1914A66010	30 Jun 2021
N5230C	PNA-L network analyzer	N5230C02410	1 Jul 2021

Traceability Table

	Model	Model Description	Equipment ID	Certificate Number	Trace Value
W,R	11667A	DC-18 GHz power splitter, type N, 50 ohm	11667A56950	1-13317718913-1-ANAB:AC-1498	Reflection Coefficient
W,R	33250A	Function/Arbitrary Waveform Generator, 80 MHz	33250A32294	1-13224838680-1-ANAB:AC-1498	Frequency
W,R	33250A	Function/Arbitrary Waveform Generator, 80 MHz	33250A32284	1-12748848415-1-ANAB:AC-1498	Frequency
W,R	85032F	Standard mechanical calibration kit, DC to 9 GHz, type-N, 50 ohm	85032F97676	1-13909456203-1-ANAB:AC-1498	Reflection Coefficient
W,R	85054B	Standard mechanical calibration kit, DC to 18 GHz, type-N	85054B00214	1-12588404584-1-ANAB:AC-1498	Reflection Coefficient
W,R	E4417A	Power Meter - EPM-P series, dual channel	E4417A56017	1-13245972784-1-ANAB:AC-1498	RF Power
W,R	E5071C	ENA Series Network analyzer	E5071C18955	1-13827882565-1-ANAB:AC-1498	Attenuation Frequency Reflection Coefficient

Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 1-14111609947-1

AC-1498

	Model	Model Description	Equipment ID	Certificate Number	Trace Value
W,R	E8257D	PSG analog signal generator	E8257D13045	1-13534354172-1-ANAB:AC-1498	Frequency RF Power
W,R	E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A95333	1-12883377188-1-A2LA:2079.01	Calibration Factor RF Power
W,R	E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A95406	1-12934792041-1-A2LA:2079.01	Calibration Factor RF Power
W,R	N1914A	Power Meter - Average, dual channel	N1914A66010	1-12660507775-1-ANAB:AC-1498	RF Power
W,R	N5230C	PNA-L network analyzer	N5230C02410	1-12660507948-1-ANAB:AC-1498	Attenuation Frequency Reflection Coefficient

Legend

W - Working Standard The calibration equipment used for the calibration of the Model indicated on the first page of the Certificate of calibration.

R - Reference Standard The Reference Standard (Accredited or NMI-calibrated ETE) used to provide traceability to the SI-Units for the calibration parameters listed.

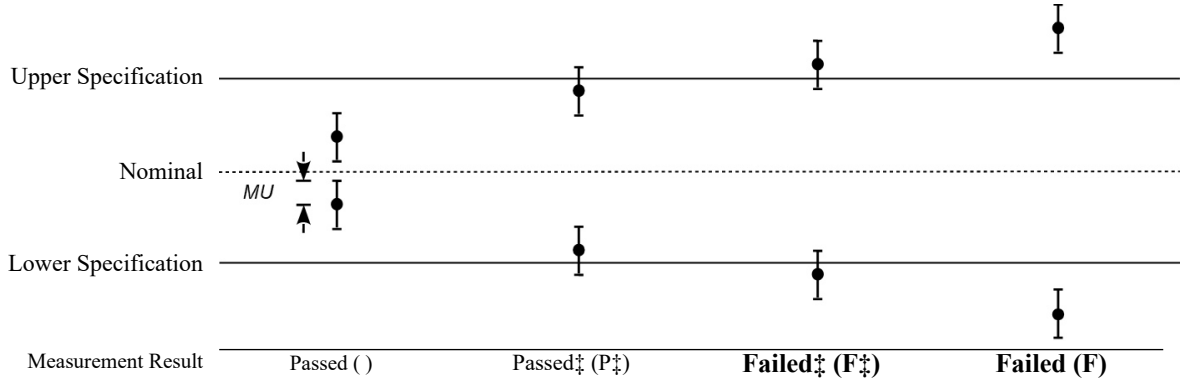
Compliance with Specification

The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:09/2019. If the expanded measurement uncertainty intervals centered about one or more measured values were both in as well as out of specification (upper or lower), it is not possible to state compliance or non-compliance based on a 95% coverage probability for the expanded measurement uncertainty.

An overall statement of compliance for all tests performed as received, and as completed (if any adjustments / repairs were performed) is included at the beginning of this report. Statements of compliance apply only to warranted specifications. When functional verification tests are performed, results are reported in the “Functional Test” section, and do not affect these statements of compliance.
The status summaries relate to the tested item only. A final decision about whether the item's performance actually satisfies requirements of the user can only be made by the user.

Measurement results are reported as:

- Passed ( ) - The measured values of the equipment were observed in specification at the points tested. Additionally, the expanded measurement uncertainty intervals about the measured values were in specification.
- Passed‡ (P‡) - The measured values of the equipment were observed in specification at the points tested. However, a portion of the expanded measurement uncertainty intervals about one or more measured values exceeded specification. Consequently, compliance with specification cannot be declared based on the stated coverage probability.
- Failed‡ (F‡) - One or more measured values of the equipment were observed out of specification at the points tested. However, a portion of the expanded measurement uncertainty intervals about one or more measured values were in specification. Consequently, non-compliance with specification cannot be declared based on the stated coverage probability.
- Failed (F) - One or more measured values of the equipment were observed out of specification at the points tested. Additionally, the expanded measurement uncertainty intervals about one or more measured values were entirely outside the specification.



MU = 95% expanded measurement uncertainty.
( ) This result is indicated on the measurement report as a blank space in the column labeled “Status” or “Sts”.
Note: For more information on the level of risk such as false accept and false reject and statistical assumptions of these statements of conformity, please visit: www.keysight.com/find/decisionrules.

Uncertainty of Measurement

The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008 (GUM). The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This probability corresponds to a coverage factor of k=2 for a normal distribution.

Calibration Test Results Summary

Test Name	As Received Status
VOLTAGE REFLECTION COEFFICIENT	Passed
LINEARITY	Passed
CALIBRATION FACTOR	Done

Functional Test Results Summary

The following functional test results are not part of an accredited delivery, even if they are part of an otherwise accredited calibration report.

The following tests document the functional verification of the instruments' non-warranted performance. Neither a statement of conformance or decision rule is used for a Functional Test, measurement uncertainties are only provided by exception. For a "Functional Test" the test results are reported as "As Expected" when showing expected performance and "Not As Expected" otherwise. "As Expected" results of individual test points are indicated in the measurement report by a blank space in the column labeled "Status" to allow easier recognition of any "Not As Expected" points. If a functional test result is reported as "Not As Expected", repair and/or adjustment is recommended. Test results reported as "Done" are possible if no limits are applied. For qualitative or quantitative "Functional Tests" the test results are not warranted, and no judgment is made. The "actual" measured results are helpful to users for some applications.

Test Name	As Received Status
STORED CALIBRATION FACTORS	Done
CALIBRATION FACTOR DEVIATION	As Expected

Tested Configuration

Tested Options	H19
	(As Rec) H19

VOLTAGE REFLECTION COEFFICIENT — Passed

The PHASE column is the measured PHASE(Degree).
The MEASURED column is the measured MAGNITUDE.
The MAXIMUM column is the specification of MAGNITUDE.
The UNCERT column (if it is present) is the uncertainty for MAGNITUDE.

FREQUENCY	PHASE	MEASURED	MAXIMUM	UNCERT.	Status
9.0 kHz	−180.0°	0.002	0.070	0.0052	
30.0 kHz	−179.9°	0.002	0.070	0.0052	
50.0 kHz	179.9°	0.002	0.070	0.0052	
100.0 kHz	−179.8°	0.002	0.070	0.0052	
300.0 kHz	180.0°	0.002	0.070	0.0052	
500.0 kHz	−179.9°	0.002	0.070	0.0052	
1.0 MHz	−179.9°	0.002	0.070	0.0052	
3.0 MHz	−179.4°	0.002	0.070	0.0052	
5.0 MHz	−178.5°	0.002	0.070	0.0052	
10.0 MHz	−176.4°	0.002	0.070	0.0052	
30.0 MHz	−168.1°	0.002	0.070	0.0052	
50.0 MHz	−162.9°	0.002	0.070	0.0052	
100.0 MHz	−159.9°	0.003	0.070	0.0052	
300.0 MHz	−167.5°	0.002	0.070	0.0055	
500.0 MHz	−160.7°	0.002	0.070	0.0056	
800.0 MHz	−176.1°	0.004	0.070	0.0057	
1.0 GHz	167.8°	0.005	0.070	0.0058	
1.2 GHz	150.8°	0.006	0.070	0.0059	
1.5 GHz	127.0°	0.007	0.070	0.0060	
2.0 GHz	96.6°	0.010	0.070	0.0063	
3.0 GHz	29.0°	0.019	0.070	0.0084	
4.0 GHz	−49.0°	0.022	0.070	0.0088	
5.0 GHz	−127.4°	0.026	0.070	0.0092	
6.0 GHz	131.4°	0.025	0.070	0.0095	
7.0 GHz	46.7°	0.021	0.070	0.0099	
8.0 GHz	−35.0°	0.014	0.111	0.010	
9.0 GHz	−20.9°	0.010	0.111	0.011	
10.0 GHz	−82.0°	0.023	0.111	0.011	
11.0 GHz	−167.3°	0.042	0.111	0.012	
12.0 GHz	97.4°	0.056	0.111	0.012	
12.4 GHz	64.2°	0.060	0.123	0.013	
13.0 GHz	15.9°	0.067	0.123	0.013	
14.0 GHz	−68.6°	0.067	0.123	0.014	
15.0 GHz	−153.6°	0.039	0.123	0.014	
16.0 GHz	120.4°	0.003	0.123	0.014	
17.0 GHz	−142.0°	0.018	0.123	0.014	
18.0 GHz	89.1°	0.040	0.123	0.015	

PHASE uncertainty can be determined from
Arcsin(UNCERT/MEASURED) degree
except if MEASURED is less than UNCERT,
in which case the PHASE uncertainty is

VOLTAGE REFLECTION COEFFICIENT (cont.)

+/- 180 degree.

LINEARITY

Passed

TEST CONDITIONS	MINIMUM	MEASURED	MAXIMUM	UNCERT.	Status
Low Range:					
−36 dBm	−3.0 %	−0.9 %	+3.0 %	0.77 %	
−35 dBm	−3.0 %	−0.6 %	+3.0 %	0.75 %	
−34 dBm	−3.0 %	−0.2 %	+3.0 %	0.72 %	
−33 dBm	−3.0 %	−0.1 %	+3.0 %	0.71 %	
−32 dBm	−3.0 %	0.4 %	+3.0 %	0.68 %	
−31 dBm	−3.0 %	0.2 %	+3.0 %	0.67 %	
−30 dBm	−3.0 %	0.5 %	+3.0 %	0.66 %	
−29 dBm	−3.0 %	0.4 %	+3.0 %	0.80 %	
−28 dBm	−3.0 %	0.3 %	+3.0 %	0.74 %	
−27 dBm	−3.0 %	0.6 %	+3.0 %	0.69 %	
−26 dBm	−3.0 %	0.5 %	+3.0 %	0.66 %	
−25 dBm	−3.0 %	0.3 %	+3.0 %	0.65 %	
−24 dBm	−3.0 %	0.5 %	+3.0 %	0.62 %	
−23 dBm	−3.0 %	0.5 %	+3.0 %	0.61 %	
−22 dBm	−3.0 %	0.6 %	+3.0 %	0.59 %	
−21 dBm	−3.0 %	0.5 %	+3.0 %	0.58 %	
−20 dBm	−3.0 %	0.6 %	+3.0 %	0.58 %	
−19 dBm	−3.0 %	0.2 %	+3.0 %	0.73 %	
−18 dBm	−3.0 %	0.4 %	+3.0 %	0.67 %	
−17 dBm	−3.0 %	0.5 %	+3.0 %	0.62 %	
−16 dBm	−3.0 %	0.6 %	+3.0 %	0.59 %	
−15 dBm	−3.0 %	0.5 %	+3.0 %	0.57 %	
−14 dBm	−3.0 %	0.5 %	+3.0 %	0.56 %	
−13 dBm	−3.0 %	0.5 %	+3.0 %	0.55 %	
−12 dBm	−3.0 %	0.5 %	+3.0 %	0.54 %	
−11 dBm	−3.0 %	0.5 %	+3.0 %	0.53 %	
−10 dBm	−3.0 %	0.5 %	+3.0 %	0.54 %	
−9 dBm	−3.0 %	0.4 %	+3.0 %	0.70 %	
−8 dBm	−3.0 %	0.5 %	+3.0 %	0.63 %	
−7 dBm	−3.0 %	0.5 %	+3.0 %	0.58 %	
−6 dBm	−3.0 %	0.5 %	+3.0 %	0.56 %	
−5 dBm	−3.0 %	0.5 %	+3.0 %	0.55 %	
−4 dBm	−3.0 %	0.6 %	+3.0 %	0.52 %	
−3 dBm	−3.0 %	0.6 %	+3.0 %	0.50 %	
−2 dBm	−3.0 %	0.6 %	+3.0 %	0.50 %	
−1 dBm	−3.0 %	0.6 %	+3.0 %	0.51 %	
0 dBm	−3.0 %	0.0 %	+3.0 %	0.49 %	
High Range:					
0 dBm	−2.5 %	1.8 %	+2.5 %	0.49 %	
+1 dBm	−2.5 %	0.0 %	+2.5 %	0.66 %	

LINEARITY (cont.)

TEST CONDITIONS	MINIMUM	MEASURED	MAXIMUM	UNCERT.	Status
+2 dBm	−2.5 %	0.0 %	+2.5 %	0.60 %	
+3 dBm	−2.5 %	0.1 %	+2.5 %	0.55 %	
+4 dBm	−2.5 %	0.0 %	+2.5 %	0.52 %	
+5 dBm	−2.5 %	0.0 %	+2.5 %	0.49 %	
+6 dBm	−2.5 %	0.1 %	+2.5 %	0.48 %	
+7 dBm	−2.5 %	0.1 %	+2.5 %	0.48 %	
+8 dBm	−2.5 %	0.0 %	+2.5 %	0.48 %	
+9 dBm	−2.5 %	−0.1 %	+2.5 %	0.48 %	
+10 dBm	−2.0 %	−0.1 %	+2.0 %	0.48 %	
+11 dBm	−2.0 %	0.0 %	+2.0 %	0.67 %	
+12 dBm	−2.0 %	0.0 %	+2.0 %	0.62 %	
+13 dBm	−2.0 %	0.0 %	+2.0 %	0.59 %	
+14 dBm	−2.0 %	0.0 %	+2.0 %	0.59 %	
+15 dBm	−2.0 %	0.0 %	+2.0 %	0.59 %	
+16 dBm	−2.0 %	0.0 %	+2.0 %	0.59 %	
+17 dBm	−2.0 %	0.1 %	+2.0 %	0.61 %	
+18 dBm	−2.0 %	0.0 %	+2.0 %	0.65 %	
+19 dBm	−2.0 %	0.1 %	+2.0 %	0.71 %	
+20 dBm	−2.0 %	0.3 %	+2.0 %	0.78 %	

The linearity errors shown in this report have not been entered into the Power Sensors EEPROM.

CALIBRATION FACTOR

Done

Frequency	Cal. Factor	Cal. Fac. Uncert.	Refl Coef Mag	Refl Coef Phase
HIGH PATH: (+1 dBm)				
Ref	100.0 %	REF		
9.0 kHz	98.8 %	0.81 %	0.002	−180.0°
30.0 kHz	98.2 %	0.8 %	0.002	−179.9°
50.0 kHz	98.3 %	0.81 %	0.002	179.9°
100.0 kHz	98.6 %	0.81 %	0.002	−179.8°
300.0 kHz	98.4 %	0.81 %	0.002	180.0°
500.0 kHz	98.3 %	0.81 %	0.002	−179.9°
1.0 MHz	98.5 %	0.81 %	0.002	−179.9°
3.0 MHz	96.5 %	0.8 %	0.002	−179.4°
5.0 MHz	98.2 %	0.81 %	0.002	−178.5°
10.0 MHz	97.1 %	0.85 %	0.002	−176.4°
30.0 MHz	99.7 %	0.87 %	0.002	−168.1°
50.0 MHz	100.0 %	REF	0.002	−162.9°
100.0 MHz	99.6 %	0.77 %	0.003	−159.9°
300.0 MHz	99.1 %	0.77 %	0.002	−167.5°
500.0 MHz	99.0 %	0.78 %	0.002	−160.7°
800.0 MHz	99.4 %	0.79 %	0.004	−176.1°
1.0 GHz	100.7 %	0.8 %	0.005	167.8°
1.2 GHz	101.5 %	0.81 %	0.006	150.8°

CALIBRATION FACTOR (cont.)

Frequency	Cal. Factor	Cal. Fac. Uncert.	Refl Coef Mag	Refl Coef Phase
1.5 GHz	102.3 %	0.82 %	0.007	127.0°
2.0 GHz	101.6 %	0.83 %	0.010	96.6°
3.0 GHz	101.0 %	0.9 %	0.019	29.0°
4.0 GHz	100.2 %	0.93 %	0.022	−49.0°
5.0 GHz	99.6 %	0.96 %	0.026	−127.4°
6.0 GHz	99.6 %	1 %	0.025	131.4°
7.0 GHz	99.3 %	1 %	0.021	46.7°
8.0 GHz	98.8 %	1.1 %	0.014	−35.0°
9.0 GHz	99.1 %	1.2 %	0.010	−20.9°
10.0 GHz	97.3 %	1.2 %	0.023	−82.0°
11.0 GHz	98.3 %	1.2 %	0.042	−167.3°
12.0 GHz	96.5 %	1.3 %	0.056	97.4°
12.4 GHz	96.0 %	1.3 %	0.060	64.2°
13.0 GHz	95.4 %	1.3 %	0.067	15.9°
14.0 GHz	96.2 %	1.4 %	0.067	−68.6°
15.0 GHz	97.8 %	1.4 %	0.039	−153.6°
16.0 GHz	97.8 %	1.5 %	0.003	120.4°
17.0 GHz	98.4 %	1.6 %	0.018	−142.0°
18.0 GHz	101.5 %	1.8 %	0.040	89.1°
LOW PATH (-9 dBm):				
Ref	100.0 %	REF		
9.0 kHz	99.7 %	0.81 %	0.002	−180.0°
30.0 kHz	99.5 %	0.81 %	0.002	−179.9°
50.0 kHz	99.5 %	0.81 %	0.002	179.9°
100.0 kHz	99.6 %	0.81 %	0.002	−179.8°
300.0 kHz	99.6 %	0.81 %	0.002	180.0°
500.0 kHz	99.6 %	0.81 %	0.002	−179.9°
1.0 MHz	99.6 %	0.81 %	0.002	−179.9°
3.0 MHz	99.6 %	0.81 %	0.002	−179.4°
5.0 MHz	99.6 %	0.81 %	0.002	−178.5°
10.0 MHz	99.6 %	0.86 %	0.002	−176.4°
30.0 MHz	100.1 %	0.86 %	0.002	−168.1°
50.0 MHz	100.0 %	REF	0.002	−162.9°
100.0 MHz	99.9 %	0.77 %	0.003	−159.9°
300.0 MHz	99.3 %	0.77 %	0.002	−167.5°
500.0 MHz	99.0 %	0.77 %	0.002	−160.7°
800.0 MHz	98.8 %	0.78 %	0.004	−176.1°
1.0 GHz	99.0 %	0.78 %	0.005	167.8°
1.2 GHz	99.0 %	0.79 %	0.006	150.8°
1.5 GHz	98.9 %	0.8 %	0.007	127.0°
2.0 GHz	98.4 %	0.81 %	0.010	96.6°
3.0 GHz	97.7 %	0.88 %	0.019	29.0°
4.0 GHz	97.2 %	0.91 %	0.022	−49.0°
5.0 GHz	96.6 %	0.94 %	0.026	−127.4°
6.0 GHz	96.5 %	0.98 %	0.025	131.4°
7.0 GHz	96.1 %	1 %	0.021	46.7°
8.0 GHz	96.0 %	1.1 %	0.014	−35.0°
9.0 GHz	95.7 %	1.1 %	0.010	−20.9°
10.0 GHz	94.9 %	1.2 %	0.023	−82.0°

CALIBRATION FACTOR (cont.)

Frequency	Cal. Factor	Cal. Fac. Uncert.	Refl Coef Mag	Refl Coef Phase
11.0 GHz	94.7 %	1.2 %	0.042	−167.3°
12.0 GHz	93.6 %	1.2 %	0.056	97.4°
12.4 GHz	93.6 %	1.3 %	0.060	64.2°
13.0 GHz	93.3 %	1.3 %	0.067	15.9°
14.0 GHz	93.7 %	1.4 %	0.067	−68.6°
15.0 GHz	94.1 %	1.4 %	0.039	−153.6°
16.0 GHz	95.3 %	1.4 %	0.003	120.4°
17.0 GHz	96.8 %	1.6 %	0.018	−142.0°
18.0 GHz	98.2 %	1.8 %	0.040	89.1°

The CAL FACTOR UNCERTAINTY (if it is present)
is stated as an ABSOLUTE uncertainty.
The RELATIVE uncertainty can be derived from
the ABSOLUTE uncertainty by the following equation:
RELATIVE CAL FACTOR UNCERTAINTY =
100%*(ABSOLUTE CAL FACTOR UNCERTAINTY)/(CAL FACTOR)

STORED CALIBRATION FACTORS

Done

Frequency	Old Cal. Factor	New Cal. Factor	Difference
HIGH PATH: (+1 dBm)			
9.0 kHz	98.86 %	98.78 %	−0.08 %
30.0 kHz	98.58 %	98.21 %	−0.37 %
50.0 kHz	98.35 %	98.34 %	−0.01 %
100.0 kHz	98.05 %	98.58 %	+0.53 %
300.0 kHz	98.43 %	98.38 %	−0.05 %
500.0 kHz	98.21 %	98.29 %	+0.08 %
1.0 MHz	98.38 %	98.47 %	+0.09 %
3.0 MHz	96.27 %	96.47 %	+0.20 %
5.0 MHz	98.05 %	98.15 %	+0.10 %
10.0 MHz	96.59 %	97.07 %	+0.48 %
30.0 MHz	99.44 %	99.68 %	+0.24 %
50.0 MHz	100.00 %	100.00 %	+0.00 %
100.0 MHz	99.76 %	99.57 %	−0.19 %
300.0 MHz	99.19 %	99.14 %	−0.05 %
500.0 MHz	99.01 %	99.03 %	+0.02 %
800.0 MHz	98.71 %	99.41 %	+0.70 %
1.0 GHz	100.44 %	100.73 %	+0.29 %
1.2 GHz	101.42 %	101.46 %	+0.04 %
1.5 GHz	102.19 %	102.31 %	+0.12 %
2.0 GHz	101.42 %	101.56 %	+0.14 %
3.0 GHz	100.29 %	101.00 %	+0.71 %
4.0 GHz	99.93 %	100.22 %	+0.29 %
5.0 GHz	99.28 %	99.62 %	+0.34 %
6.0 GHz	99.21 %	99.55 %	+0.34 %

STORED CALIBRATION FACTORS (cont.)

Frequency	Old Cal. Factor	New Cal. Factor	Difference
7.0 GHz	99.23 %	99.31 %	+0.08 %
8.0 GHz	98.46 %	98.76 %	+0.30 %
9.0 GHz	98.73 %	99.09 %	+0.36 %
10.0 GHz	97.15 %	97.35 %	+0.20 %
11.0 GHz	97.80 %	98.27 %	+0.47 %
12.0 GHz	96.19 %	96.46 %	+0.27 %
12.4 GHz	95.94 %	95.98 %	+0.04 %
13.0 GHz	95.11 %	95.41 %	+0.30 %
14.0 GHz	95.95 %	96.23 %	+0.28 %
15.0 GHz	97.41 %	97.84 %	+0.43 %
16.0 GHz	97.11 %	97.84 %	+0.73 %
17.0 GHz	97.65 %	98.41 %	+0.76 %
18.0 GHz	101.37 %	101.51 %	+0.14 %
LOW PATH (-9 dBm):			
9.0 kHz	99.35 %	99.75 %	+0.40 %
30.0 kHz	99.71 %	99.50 %	−0.21 %
50.0 kHz	99.54 %	99.52 %	−0.02 %
100.0 kHz	99.52 %	99.64 %	+0.12 %
300.0 kHz	99.56 %	99.57 %	+0.01 %
500.0 kHz	99.66 %	99.62 %	−0.04 %
1.0 MHz	99.57 %	99.61 %	+0.04 %
3.0 MHz	99.70 %	99.55 %	−0.15 %
5.0 MHz	99.77 %	99.59 %	−0.18 %
10.0 MHz	99.58 %	99.57 %	−0.01 %
30.0 MHz	99.95 %	100.05 %	+0.10 %
50.0 MHz	100.00 %	100.00 %	+0.00 %
100.0 MHz	99.98 %	99.92 %	−0.06 %
300.0 MHz	99.39 %	99.35 %	−0.04 %
500.0 MHz	98.96 %	98.95 %	−0.01 %
800.0 MHz	98.74 %	98.83 %	+0.09 %
1.0 GHz	98.79 %	99.04 %	+0.25 %
1.2 GHz	98.85 %	98.99 %	+0.14 %
1.5 GHz	98.91 %	98.93 %	+0.02 %
2.0 GHz	98.34 %	98.38 %	+0.04 %
3.0 GHz	97.43 %	97.75 %	+0.32 %
4.0 GHz	96.84 %	97.20 %	+0.36 %
5.0 GHz	96.44 %	96.57 %	+0.13 %
6.0 GHz	96.39 %	96.49 %	+0.10 %
7.0 GHz	96.12 %	96.13 %	+0.01 %
8.0 GHz	95.86 %	95.97 %	+0.11 %
9.0 GHz	95.57 %	95.65 %	+0.08 %
10.0 GHz	94.92 %	94.87 %	−0.05 %
11.0 GHz	94.34 %	94.67 %	+0.33 %
12.0 GHz	93.55 %	93.56 %	+0.01 %
12.4 GHz	93.40 %	93.57 %	+0.17 %
13.0 GHz	93.25 %	93.29 %	+0.04 %
14.0 GHz	93.42 %	93.69 %	+0.27 %
15.0 GHz	94.20 %	94.12 %	−0.08 %
16.0 GHz	94.92 %	95.26 %	+0.34 %
17.0 GHz	96.34 %	96.83 %	+0.49 %

STORED CALIBRATION FACTORS (cont.)

Frequency	Old Cal. Factor	New Cal. Factor	Difference
18.0 GHz	97.91 %	98.17 %	+0.26 %

CALIBRATION FACTOR DEVIATION

As Expected

TEST COND.	Old_CF	New_CF	Minimum	Measured	Maximum	Status
HIGH PATH: (+1 dBm)						
9.0 kHz	98.86 %	98.78 %	−2.55 %	−0.08 %	2.55 %	
30.0 kHz	98.58 %	98.21 %	−2.55 %	−0.37 %	2.55 %	
50.0 kHz	98.35 %	98.34 %	−2.55 %	−0.01 %	2.55 %	
100.0 kHz	98.05 %	98.58 %	−2.55 %	0.55 %	2.55 %	
300.0 kHz	98.43 %	98.38 %	−2.55 %	−0.05 %	2.55 %	
500.0 kHz	98.21 %	98.29 %	−2.55 %	0.08 %	2.55 %	
1.0 MHz	98.38 %	98.47 %	−2.55 %	0.09 %	2.55 %	
3.0 MHz	96.27 %	96.47 %	−2.55 %	0.20 %	2.55 %	
5.0 MHz	98.05 %	98.15 %	−2.55 %	0.11 %	2.55 %	
10.0 MHz	96.59 %	97.07 %	−2.55 %	0.50 %	2.55 %	
30.0 MHz	99.44 %	99.68 %	−2.55 %	0.24 %	2.55 %	
50.0 MHz	100.00 %	100.00 %		Reference		
100.0 MHz	99.76 %	99.57 %	−2.55 %	−0.19 %	2.55 %	
300.0 MHz	99.19 %	99.14 %	−2.55 %	−0.05 %	2.55 %	
500.0 MHz	99.01 %	99.03 %	−2.55 %	0.02 %	2.55 %	
800.0 MHz	98.71 %	99.41 %	−3.25 %	0.70 %	3.25 %	
1.0 GHz	100.44 %	100.73 %	−3.25 %	0.29 %	3.25 %	
1.2 GHz	101.42 %	101.46 %	−3.25 %	0.04 %	3.25 %	
1.5 GHz	102.19 %	102.31 %	−2.55 %	0.11 %	2.55 %	
2.0 GHz	101.42 %	101.56 %	−2.55 %	0.14 %	2.55 %	
3.0 GHz	100.29 %	101.00 %	−2.55 %	0.70 %	2.55 %	
4.0 GHz	99.93 %	100.22 %	−2.55 %	0.29 %	2.55 %	
5.0 GHz	99.28 %	99.62 %	−2.55 %	0.34 %	2.55 %	
6.0 GHz	99.21 %	99.55 %	−2.55 %	0.34 %	2.55 %	
7.0 GHz	99.23 %	99.31 %	−2.69 %	0.08 %	2.69 %	
8.0 GHz	98.46 %	98.76 %	−2.69 %	0.31 %	2.69 %	
9.0 GHz	98.73 %	99.09 %	−2.69 %	0.36 %	2.69 %	
10.0 GHz	97.15 %	97.35 %	−2.69 %	0.20 %	2.69 %	
11.0 GHz	97.80 %	98.27 %	−2.69 %	0.48 %	2.69 %	
12.0 GHz	96.19 %	96.46 %	−2.69 %	0.28 %	2.69 %	
12.4 GHz	95.94 %	95.98 %	−2.69 %	0.04 %	2.69 %	
13.0 GHz	95.11 %	95.41 %	−2.69 %	0.31 %	2.69 %	
14.0 GHz	95.95 %	96.23 %	−2.69 %	0.29 %	2.69 %	
15.0 GHz	97.41 %	97.84 %	−3.11 %	0.44 %	3.11 %	
16.0 GHz	97.11 %	97.84 %	−3.11 %	0.75 %	3.11 %	
17.0 GHz	97.65 %	98.41 %	−3.11 %	0.78 %	3.11 %	
18.0 GHz	101.37 %	101.51 %	−3.11 %	0.13 %	3.11 %	

CALIBRATION FACTOR DEVIATION (cont.)

TEST COND.	Old_CF	New_CF	Minimum	Measured	Maximum	Status
LOW PATH (-9 dBm):						
9.0 kHz	99.35 %	99.75 %	−2.26 %	0.40 %	2.26 %	
30.0 kHz	99.71 %	99.50 %	−2.26 %	−0.21 %	2.26 %	
50.0 kHz	99.54 %	99.52 %	−2.26 %	−0.02 %	2.26 %	
100.0 kHz	99.52 %	99.64 %	−2.26 %	0.12 %	2.26 %	
300.0 kHz	99.56 %	99.57 %	−2.26 %	0.01 %	2.26 %	
500.0 kHz	99.66 %	99.62 %	−2.26 %	−0.04 %	2.26 %	
1.0 MHz	99.57 %	99.61 %	−2.26 %	0.04 %	2.26 %	
3.0 MHz	99.70 %	99.55 %	−2.26 %	−0.15 %	2.26 %	
5.0 MHz	99.77 %	99.59 %	−2.26 %	−0.18 %	2.26 %	
10.0 MHz	99.58 %	99.57 %	−2.26 %	−0.01 %	2.26 %	
30.0 MHz	99.95 %	100.05 %	−2.26 %	0.10 %	2.26 %	
50.0 MHz	100.00 %	100.00 %		Reference		
100.0 MHz	99.98 %	99.92 %	−2.26 %	−0.06 %	2.26 %	
300.0 MHz	99.39 %	99.35 %	−2.26 %	−0.04 %	2.26 %	
500.0 MHz	98.96 %	98.95 %	−2.26 %	−0.01 %	2.26 %	
800.0 MHz	98.74 %	98.83 %	−2.55 %	0.09 %	2.55 %	
1.0 GHz	98.79 %	99.04 %	−2.55 %	0.25 %	2.55 %	
1.2 GHz	98.85 %	98.99 %	−2.55 %	0.14 %	2.55 %	
1.5 GHz	98.91 %	98.93 %	−2.40 %	0.02 %	2.40 %	
2.0 GHz	98.34 %	98.38 %	−2.40 %	0.04 %	2.40 %	
3.0 GHz	97.43 %	97.75 %	−2.40 %	0.32 %	2.40 %	
4.0 GHz	96.84 %	97.20 %	−2.40 %	0.37 %	2.40 %	
5.0 GHz	96.44 %	96.57 %	−2.40 %	0.13 %	2.40 %	
6.0 GHz	96.39 %	96.49 %	−2.40 %	0.10 %	2.40 %	
7.0 GHz	96.12 %	96.13 %	−2.55 %	0.01 %	2.55 %	
8.0 GHz	95.86 %	95.97 %	−2.55 %	0.11 %	2.55 %	
9.0 GHz	95.57 %	95.65 %	−2.55 %	0.08 %	2.55 %	
10.0 GHz	94.92 %	94.87 %	−2.55 %	−0.06 %	2.55 %	
11.0 GHz	94.34 %	94.67 %	−2.55 %	0.35 %	2.55 %	
12.0 GHz	93.55 %	93.56 %	−2.55 %	0.01 %	2.55 %	
12.4 GHz	93.40 %	93.57 %	−2.55 %	0.18 %	2.55 %	
13.0 GHz	93.25 %	93.29 %	−2.55 %	0.04 %	2.55 %	
14.0 GHz	93.42 %	93.69 %	−2.55 %	0.29 %	2.55 %	
15.0 GHz	94.20 %	94.12 %	−2.83 %	−0.09 %	2.83 %	
16.0 GHz	94.92 %	95.26 %	−2.83 %	0.36 %	2.83 %	
17.0 GHz	96.34 %	96.83 %	−2.83 %	0.51 %	2.83 %	
18.0 GHz	97.91 %	98.17 %	−2.83 %	0.26 %	2.83 %	