

Certificate of Compliance

Certificate No: 6209420B-150727-1

Manufacturer: OML, Inc.

Model/Part No: M04HWD

Serial/ID No: 150727-1

Description: WR-04 Harmonic Mixer

Date of Test: August 24, 2020

Temperature: (23 +/- 5) deg C

Humidity: 20 to 65% RH

Procedure:

This certifies that the above product was tested in compliance with OML specifications using applicable OML's procedures.

As Received : Physical Condition: Good

Within Tolerance: Yes

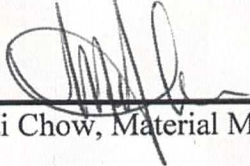
As Shipped: At the completion of the test, the product COMPLIED with the performance capability.

Remarks: Functional Verification Service

Traceability Information: Traceability is to national standards administered by U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories. Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements. Supporting documentation relative to traceability is available for review by appointment.

In the absence of power standards above 110 GHz, power measurements and conversion loss measurements above 110 GHz are to confirm operation functionality and traceable only to OML.

This certificate shall not be reproduced, except in full, without the written approval of OML.


Mitzi Chow, Material Manager

08/24/2020

Date

OML Inc.

300 Digital Drive, Morgan Hill, CA 95037 USA Tel. (408) 779 2698 Fax (408) 778 0491

Model M04HWD**Ser No. 150727-1**

8/24/2020

Conversion Loss Test Data

Frequency (GHz)	Conversion Loss (dB)
170.00	44.41
171.80	50.60
173.60	48.55
175.40	47.11
177.20	46.86
179.00	44.79
180.80	39.87
182.60	50.64
184.40	55.15
186.20	41.87
188.00	39.07
189.80	45.51
191.60	41.96
193.40	45.81
195.20	47.57
197.00	44.88
198.80	45.09

Frequency (GHz)	Conversion Loss (dB)
200.60	48.59
202.40	42.58
204.20	43.79
206.00	47.13
207.80	41.90
209.60	46.03
211.40	50.39
213.20	48.72
215.00	44.54
216.80	54.41
218.60	54.13
220.40	50.48
222.20	46.47
224.00	44.76
225.80	44.92
227.60	48.15
229.40	51.52

Frequency (GHz)	Conversion Loss (dB)
231.20	46.41
233.00	49.92
234.80	45.59
236.60	44.97
238.40	51.63
240.20	48.86
242.00	50.56
243.80	51.56
245.60	47.64
247.40	49.28
249.20	48.10
251.00	48.75
252.80	55.96
254.60	51.74
256.40	49.90
258.20	56.44
260.00	56.92

OML INC.Traceability only available $\leq$ 110 GHz

6209420B

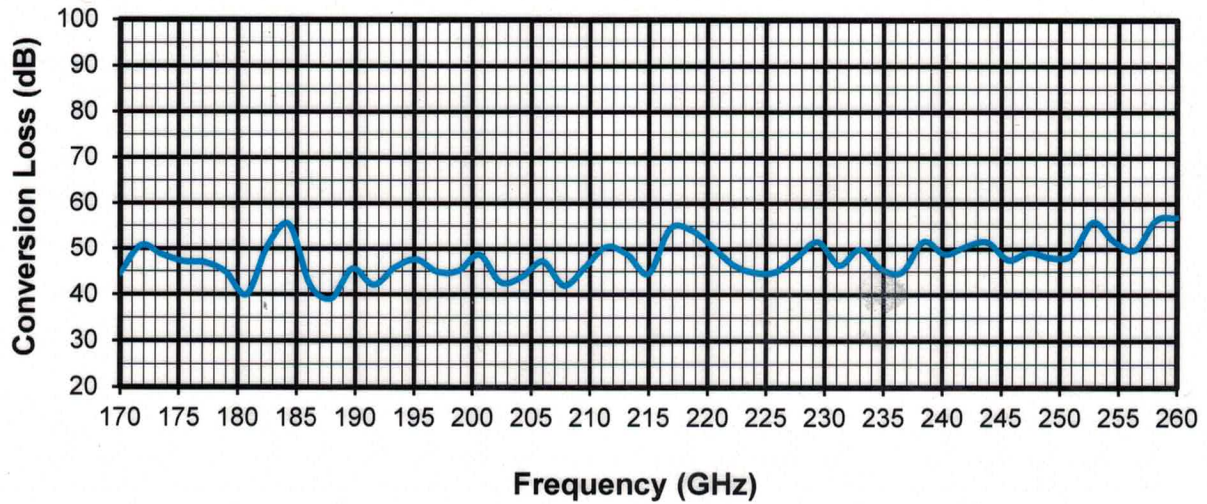
300 Digital Drive Morgan Hill, CA 95037

Model M04HWD

Ser No. 150727-1

8/24/2020

Conversion Loss Test Data



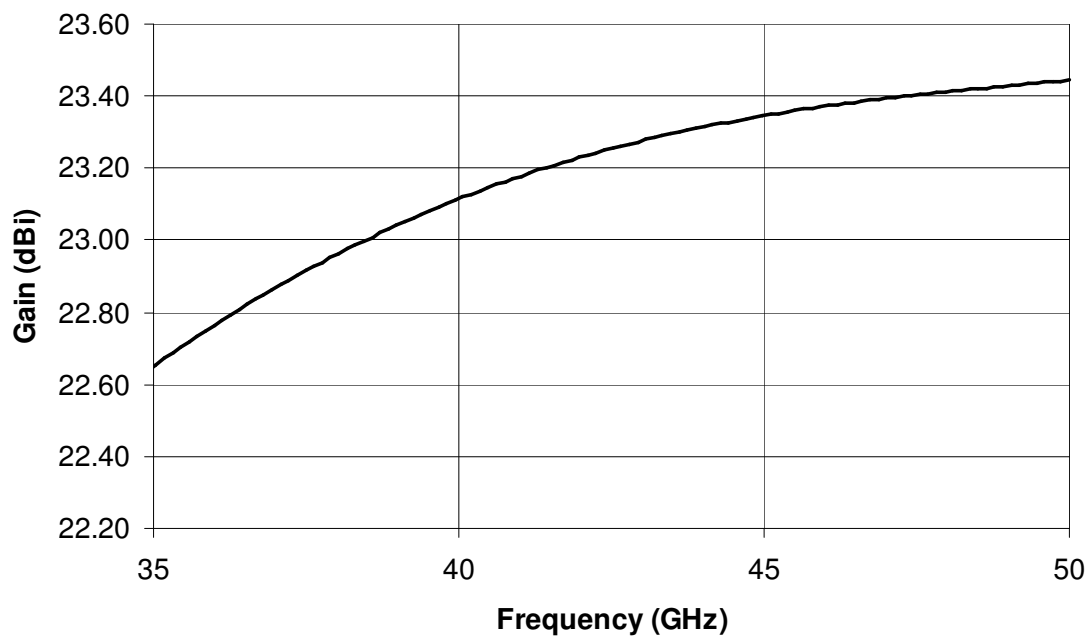
Optimized for Agilent PSA: R.F. = -30 dBm, L.O. = (RF+IF)/38 @ 15.5 dBm, I.F. = 321.4 MHz, Bias = 4.82 mA

OML INC.

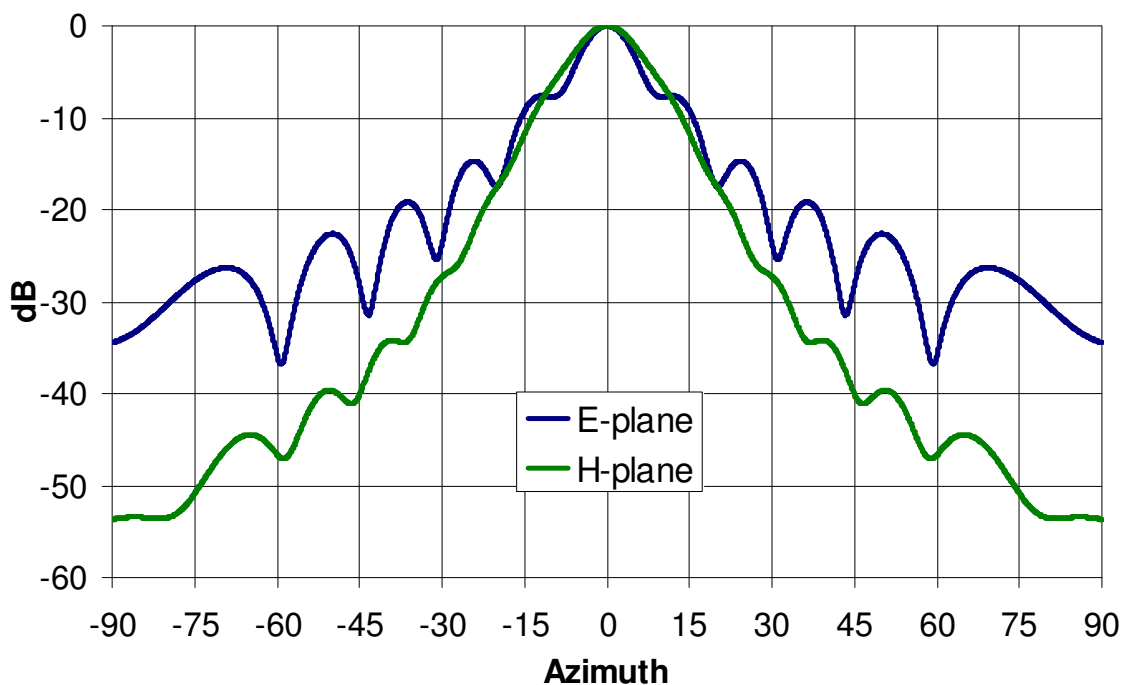
6209420B

300 Digital Drive Morgan Hill, CA 95037

H022 Simulated Gain Curve



H022 Radiation Pattern @ 41.5 GHz



$$ACF = 19.8 - (20 * \log(\lambda)) - (10 * \log(G_{num}))$$

λ = wavelength in meters = speed of light / frequency (Hz) $\Rightarrow v/f$

Speed of Light = 299792458 (m/sec) $\approx 3 \times 10^8$

G_{num} = Numeric Antenna Gain = $10^{(Gain_{dBi}/10)}$

Asset # i00484 (33 - 50 GHz Horn antenna)						
Frequency	Frequency	speed of light	wavelength	Ant Gain	Antenna Gain	ACF
GHz	Hz	m/sec	m	dBi	numeric	dB
33	33000000000	299792458	0.00908462	22.6	181.97	38.03
34	34000000000	299792458	0.008817425	22.6	181.97	38.29
35	35000000000	299792458	0.008565499	22.65	184.08	38.49
36	36000000000	299792458	0.008327568	22.8	190.55	38.59
37	37000000000	299792458	0.008102499	22.9	194.98	38.73
38	38000000000	299792458	0.007889275	23	199.53	38.86
39	39000000000	299792458	0.007686986	23.05	201.84	39.03
40	40000000000	299792458	0.007494811	23.1	204.17	39.20
41	41000000000	299792458	0.007312011	23.15	206.54	39.37
42	42000000000	299792458	0.007137916	23.2	208.93	39.53
43	43000000000	299792458	0.006971918	23.25	211.35	39.68
44	44000000000	299792458	0.006813465	23.3	213.80	39.83
45	45000000000	299792458	0.006662055	23.35	216.27	39.98
46	46000000000	299792458	0.006517227	23.38	217.77	40.14
47	47000000000	299792458	0.006378563	23.4	218.78	40.31
48	48000000000	299792458	0.006245676	23.41	219.28	40.48
49	49000000000	299792458	0.006118213	23.42	219.79	40.65
50	50000000000	299792458	0.005995849	23.45	221.31	40.79

Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.3-2006

Certificate Number 1-11561478968-1



Model Number N9038A
Manufacturer Keysight Technologies Inc
Description MXE EMI Receiver
Serial Number MY53220134

Date of Calibration 9 Sep 2019
Procedure TME-N7818A-E.09.03
Temperature (23 ± 5) °C
Humidity (50 ± 30) %RH

Customer
Compliance Testing LLC
1724 S Nevada Way
MESA AZ 85204-6624
United States

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 Z540.3-2006. The quality management system is registered to ISO 9001:2015.

As Received Conditions

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.

Action Taken

- The equipment was adjusted.
- The equipment was repaired.

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.

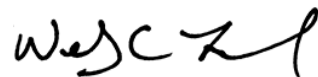
Remarks or Special Requirements

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 9 Sep 2020.



Traceability Information

Technician ID Number 00821225

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
10 MHz External Reference	Rubidium Standard	FS72533342	27 Feb 2020
11667A	DC-18 GHz power splitter, type N, 50 ohm	11667A57715	23 Aug 2020
11667B	Power splitter, DC to 26.5 GHz, 3.5 mm female connectors	11667B54389	25 Jun 2020
11667C	DC - 50 GHz power splitter, 50 ohm	11667C52516	12 Dec 2019
33250A	Function/Arbitrary Waveform Generator, 80 MHz	33250A13731	6 Jun 2020
3458A	Digital multimeter, 8.5 digit	3458A23849	18 Oct 2019
500-13438D	10MHz-1GHz Phase Lock Frequency Source Rev.D Input	500-1343831449	3 Dec 2019
53132A	Universal Counter, 225 MHz, 12 digit/s, 150 ps. GPIB, RS232	53132A01423	15 Mar 2020
8482A	Power Sensor, 100 kHz to 4.2 GHz, -30 to +20 dBm	8482A11442	19 Jun 2020
8485A	Power Sensor, 50 MHz to 26.5 GHz, -30 to +20 dBm	8485A90935	13 Feb 2020
8487D	Power Sensor, 50 MHz to 50 GHz, -70 to -20 dBm	8487D30001	13 Jun 2020
8487D	Power Sensor, 50 MHz to 50 GHz, -70 to -20 dBm	8487D91007	15 Oct 2020
8490D	Coaxial fixed attenuator, dc-50 GHz	8490D07480	7 Jan 2020
8491B	Coaxial attenuator, dc - 18 GHz, Type N	8491BA0299	29 May 2020
8491B	Coaxial attenuator, dc - 18 GHz, Type N	8491B64432	4 Dec 2019
8491B	Coaxial attenuator, dc - 18 GHz, Type N	8491BA0514	27 Sep 2020
8493C	Coaxial fixed attenuator, dc to 26.5 GHz	8493C05761	14 Mar 2020
8493C	Coaxial fixed attenuator, dc to 26.5 GHz	8493C73530	15 Nov 2020
8494G	0-11dB programmable step ATTENUATOR., dc-4GHz	8494G40782	8 Apr 2020
8496G	0-110dB programmable step attenuator, dc-4GHz	8496G40597	8 Apr 2020
85054B	Standard mechanical calibration kit, DC to 18 GHz, type-N	85054B00214	24 Apr 2020
85056A	Standard mechanical calibration kit, DC to 50 GHz, 2.4 mm	85056A00202	28 Jan 2020
86205A	50 Ohm RF bridge 300kHz to 6GHz	86205A03005	11 Dec 2019
E5071C	ENA Series Network analyzer	E5071C02659	12 Sep 2019
E8257D	PSG analog signal generator	E8257D11509	4 Oct 2019
E8257D	PSG analog signal generator	E8257D01598	24 Jul 2021
E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A40012	2 Oct 2020
E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A40010	1 Oct 2020
IGUU2916	EMI Calibration Pulse Generator	IGUU2916916238	26 Sep 2019

Model Number	Model Description	Equipment ID	Cal Due Date
N1914A	Power Meter - Average, dual channel	N1914A50013	10 Aug 2020
N5230C	PNA-L network analyzer	N5230C02393	3 May 2020
N8487A	Power Sensor - Thermocouple, average, 50MHz to 50GHz	N8487A80008	16 Jun 2020
N8487A	Power Sensor - Thermocouple, average, 50MHz to 50GHz	N8487A10013	25 Apr 2021

Traceability Table

	Model	Model Description	Equipment ID	Certificate Number	Trace Value
W,R	10 MHz External Reference	Rubidium Standard	FS72533342	1-10907609122-1-ANAB:AC-1498.01	Frequency
W,R	11667A	DC-18 GHz power splitter, type N, 50 ohm	11667A57715	1-11553657402-1-ANAB:AC-1498	Reflection Coefficient
W,R	11667B	Power splitter, DC to 26.5 GHz, 3.5 mm female connectors	11667B54389	1-9999173906-1-ANAB:AC-1498	Reflection Coefficient
W,R	11667C	DC - 50 GHz power splitter, 50 ohm	11667C52516	1-10660921504-1-ANAB:AC-1498	Reflection Coefficient
W,R	33250A	Function/Arbitrary Waveform Generator, 80 MHz	33250A13731	1-11307766401-1-ANAB:AC-1498	AC Voltage Frequency
W,R	3458A	Digital multimeter, 8.5 digit	3458A23849	1-10417976162-1-ANAB:AC-1498.03	AC Voltage
W,R	500-13438D	10MHz-1GHz Phase Lock Frequency Source Rev.D Input	500-1343831449	1-10640792116-1-ANAB:AC-1498	Phase Noise
W,R	53132A	Universal Counter, 225 MHz, 12 digit/s, 150 ps. GPIB, RS232	53132A01423	1-9796975141-1-ANAB:AC-1498	Frequency
W,R	8482A	Power Sensor, 100 kHz to 4.2 GHz, -30 to +20 dBm	8482A11442	1-10667964493-1-ANAB:AC-1498	RF Power
W,R	8485A	Power Sensor, 50 MHz to 26.5 GHz, -30 to +20 dBm	8485A90935	1-10903564529-1-ANAB:AC-1498	RF Power
W,R	8487D	Power Sensor, 50 MHz to 50 GHz, -70 to -20 dBm	8487D91007	1-10432218506-1-ANAB:AC-1498	RF Power
W,R	8487D	Power Sensor, 50 MHz to 50 GHz, -70 to -20 dBm	8487D30001	1-10082236287-1-ANAB:AC-1498	RF Power
W,R	8490D	Coaxial fixed attenuator, dc-50 GHz	8490D07480	1-10765225307-1-ANAB:AC-1498	Attenuation
W,R	8491B	Coaxial attenuator, dc - 18 GHz, Type N	8491BA0299	1-11273972964-1-ANAB:AC-1498	Attenuation
W,R	8491B	Coaxial attenuator, dc - 18 GHz, Type N	8491B64432	1-10668206172-1-ANAB:AC-1498	Attenuation
W,R	8491B	Coaxial attenuator, dc - 18 GHz, Type N	8491BA0514	1-10449164270-1-ANAB:AC-1498	Attenuation
W,R	8493C	Coaxial fixed attenuator, dc to 26.5 GHz	8493C73530	1-10569576936-1-ANAB:AC-1498	Attenuation
W,R	8493C	Coaxial fixed attenuator, dc to 26.5 GHz	8493C05761	1-9800385023-1-ANAB:AC-1498	Attenuation
W,R	8494G	0-11dB programmable step ATTENUATOR., dc-4GHz	8494G40782	1-11112894720-2-ANAB:AC-1498	Attenuation

	Model	Model Description	Equipment ID	Certificate Number	Trace Value
W,R	8496G	0-110dB programmable step attenuator, dc-4GHz	8496G40597	1-11112894720-1-ANAB:AC-1498	Attenuation
W,R	85054B	Standard mechanical calibration kit, DC to 18 GHz, type-N	85054B00214	1-11125279654-1-ANAB:AC-1498	Reflection Coefficient
W,R	85056A	Standard mechanical calibration kit, DC to 50 GHz, 2.4 mm	85056A00202	1-10783639066-1-A2LA:2079.01	Reflection Coefficient
W	86205A	50 Ohm RF bridge 300kHz to 6GHz	86205A03005	1-10663915176-1	
R	85032B	50-Ohm Type-N calibration kit	85032B08649	1-10295375252-1-ANAB:AC-1498	Reflection Coefficient
W,R	E5071C	ENA Series Network analyzer	E5071C02659	1-10989177680-1-ANAB:AC-1498	Attenuation Frequency Reflection Coefficient
W,R	E8257D	PSG analog signal generator	E8257D01598	1-11409648492-1-ANAB:AC-1498	Frequency Phase Noise RF Power Spectral Purity
W,R	E8257D	PSG analog signal generator	E8257D11509	1-10421902838-1-ANAB:AC-1498	Frequency Phase Noise RF Power Spectral Purity
W,R	E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A40010	1-10449377539-1-ANAB:AC-1498	RF Power
W,R	E9304A	Power Sensor-Average, 9 kHz to 6 GHz, -60 to +20 dBm	E9304A40012	1-10449377791-1-ANAB:AC-1498	RF Power
W,R	IGUU2916	EMI Calibration Pulse Generator	IGUU2916916238	1-8948026950-1-NMI:PTB	RF Power
W,R	N1914A	Power Meter - Average, dual channel	N1914A50013	1-10316190942-1-ANAB:AC-1498	RF Power
W,R	N5230C	PNA-L network analyzer	N5230C02393	1-11202078100-1-ANAB:AC-1498	Attenuation Frequency Reflection Coefficient
W,R	N8487A	Power Sensor - Thermocouple, average, 50MHz to 50GHz	N8487A10013	1-11481229143-1-ANAB:AC-1498	RF Power
W,R	N8487A	Power Sensor - Thermocouple, average, 50MHz to 50GHz	N8487A80008	1-11456096598-1-ANAB:AC-1498	RF Power

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.

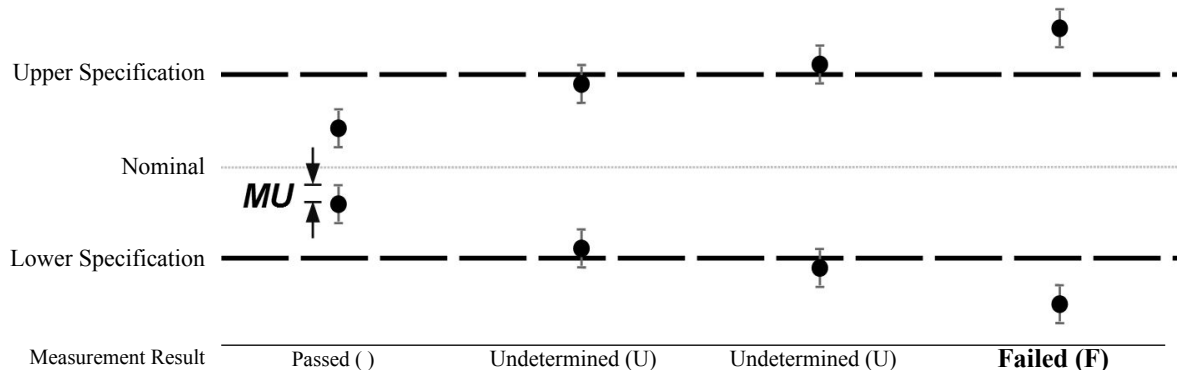
Compliance with Specification

The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2009. 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.
- Undetermined (U) - The expanded measurement uncertainty intervals about one or more measured values were in as well as out of specification. Consequently, neither compliance nor non-compliance with specification can 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.



() This result is indicated on the measurement report as a blank space in the column labeled "Status" or "Sts".
 MU = 95% expanded measurement uncertainty.

Acceptance Limit

The "Keysight Cal + Uncertainties + Guardbanding" service employs a guard band in the amount of the 95% expanded measurement uncertainty (MU). The resulting acceptance limit applied for Pass or Fail decisions, and for performing adjustments, is the difference of the specification and the guard band.

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 Completed Status
Frequency Reference Accuracy	Passed
Power Bandwidth Accuracy	Passed
Resolution Bandwidth Switching Uncertainty	Passed
Residual Responses	Passed
Displayed Average Noise Level	Passed
Frequency Readout Accuracy	Passed
Frequency Span Accuracy	Passed
Count Accuracy	Passed
IF Frequency Response	Passed
RBW Selectivity CISPR Bands	Passed
Phase Noise	Passed
Absolute Amplitude Accuracy at 50 MHz	Passed
Input Attenuation Switching Uncertainty	Passed
Display Scale Fidelity	Passed
Freq Resp Above 3.6 GHz Preamp On	Passed
IF Input Gain Accuracy Option EXM	Passed
LO Output Power Accuracy Option EXM	Passed
Spurious Responses	Passed
Freq Resp Above 3.6 GHz Preamp Off	Passed
Second Harmonic Intercept	Passed
Gain Compression	Passed
Third Order Intermodulation Distortion	Passed
Response To Pulses (Peak, Ave, RMS)	Passed
Variation With Pulse Repetition Freq (Ave, RMS)	Passed
Response To Intermittent Disturbances (Ave, RMS)	Passed
Radiated Band Sine Wave Accuracy	Passed
Freq Resp 50 MHz to 3.6 GHz	Passed
Freq Resp 9 kHz to 50 MHz	Passed
Conducted Band Sine Wave Accuracy	Passed
Freq Resp Below 300 kHz	Passed
Response To Pulses (Peak, Ave, RMS) Bands A/B/C/D	Passed
Q-P Detector Absolute Calibration	Passed
Q-P Detector Variation With Pulse Repetition Freq	Passed
Conducted Band VSWR	Passed
Radiated Band VSWR	Passed

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

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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 Completed Status
Internal Alignment	As Expected
MIL STD RBW Selectivity	As Expected
Effective DANL Option NFE	As Expected

Tested Configuration

Firmware Version	A.19.55
Tested Options	544 B24 CR3 DP2 EDP EMC EXM LSN NFE P44 PC4 PFR SSD W7X

i00555_10 MHz - 40 GHz Pre-amplifier			
from 1-13-2020 test data			
Freq	I/L		
GHz	dB		
1.000	-43.44		
1.045	-43.45		
1.090	-43.58		
1.135	-43.53		
1.180	-43.75		
1.225	-43.79		
1.270	-43.86		
1.315	-43.96		
1.360	-43.86		
1.405	-43.90		
1.450	-43.82		
1.495	-43.83		
1.540	-43.76		
1.585	-43.67		
1.630	-43.60		
1.675	-43.52		
1.720	-43.45		
1.765	-43.36		
1.810	-43.25		
1.855	-43.24		
1.900	-43.06		
1.945	-43.00		
1.990	-42.84		
2.035	-42.74		
2.080	-42.66		
2.125	-42.54		
2.170	-42.43		
2.215	-42.31		
2.260	-42.27		
2.305	-42.13		
2.350	-42.16		
2.395	-42.02		
2.440	-42.09		
2.485	-42.13		
2.530	-41.96		
2.575	-42.03		
2.620	-41.97		
2.665	-42.04		
2.710	-41.92		
2.755	-41.93		
2.800	-41.92		
2.845	-41.92		

1/13/2020

2.890	-41.88		
2.935	-41.82		
2.980	-41.85		
3.025	-41.79		
3.070	-41.78		
3.115	-41.71		
3.160	-41.79		
3.205	-41.72		
3.250	-41.77		
3.295	-41.74		
3.340	-41.67		
3.385	-41.69		
3.430	-41.61		
3.475	-41.69		
3.520	-41.59		
3.565	-41.59		
3.610	-41.52		
3.655	-41.56		
3.700	-41.51		
3.745	-41.52		
3.790	-41.52		
3.835	-41.48		
3.880	-41.49		
3.925	-41.41		
3.970	-41.52		
4.015	-41.50		
4.060	-41.46		
4.105	-41.47		
4.150	-41.38		
4.195	-41.42		
4.240	-41.31		
4.285	-41.31		
4.330	-41.27		
4.375	-41.30		
4.420	-41.30		
4.465	-41.20		
4.510	-41.15		
4.555	-41.15		
4.600	-41.15		
4.645	-41.02		
4.690	-41.00		
4.735	-41.04		
4.780	-40.87		
4.825	-40.96		
4.870	-40.78		
4.915	-40.76		
4.960	-40.73		

5.005	-40.66		
5.050	-40.58		
5.095	-40.52		
5.140	-40.51		
5.185	-40.42		
5.230	-40.41		
5.275	-40.35		
5.320	-40.34		
5.365	-40.35		
5.410	-40.26		
5.455	-40.32		
5.500	-40.15		
5.545	-40.21		
5.590	-40.11		
5.635	-40.02		
5.680	-40.06		
5.725	-40.01		
5.770	-39.99		
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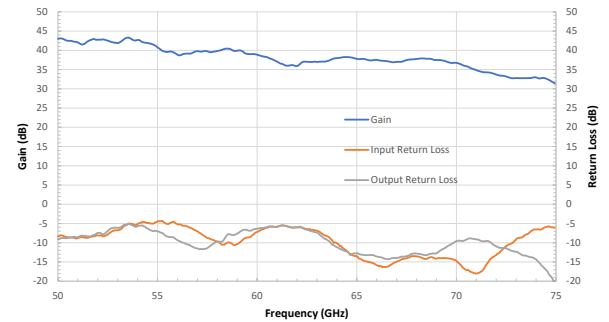
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Eravant	SBL-5037533550-1515-E1(06648-01) Raw Test Data				50 - 75 GHz Pre-Amplifier				5.934
Gain	Input Return Loss	Output Return Loss	Gain Ref:	35	Freq	Gain	Input Return Loss	Output Return Loss	
5000000000	7.982	5000000000	-8.378	50000000000	-9.125	42.982	-8.378	-9.125	
50062344140	8.084	50062344140	-8.281	50062344140	-9.018	43.084	-8.281	-9.018	
50124688279	8.103	50124688279	-8.13	50124688279	-8.897	43.103	-8.13	-8.897	
50187032419	8.072	50187032419	-8.119	50187032419	-8.806	43.072	-8.119	-8.806	
50249376559	7.993	50249376559	-8.183	50249376559	-8.795	42.993	-8.183	-8.795	
50311720698	7.842	50311720698	-8.325	50311720698	-8.779	42.842	-8.325	-8.779	
50374064838	7.674	50374064838	-8.435	50374064838	-8.825	42.674	-8.435	-8.825	
50436408978	7.548	50436408978	-8.537	50436408978	-8.828	42.548	-8.537	-8.828	
50498753117	7.488	50498753117	-8.592	50498753117	-8.732	42.488	-8.592	-8.732	
50561097257	7.471	50561097257	-8.595	50561097257	-8.641	42.471	-8.595	-8.641	
50623441397	7.468	50623441397	-8.641	50623441397	-8.68	42.468	-8.641	-8.68	
50685785536	7.441	50685785536	-8.652	50685785536	-8.61	42.441	-8.652	-8.61	
50748129676	7.328	50748129676	-8.682	50748129676	-8.531	42.328	-8.682	-8.531	
50810473815	7.242	50810473815	-8.638	50810473815	-8.44	42.242	-8.638	-8.44	
50872817955	7.221	50872817955	-8.885	50872817955	-8.528	42.221	-8.885	-8.528	
50935162095	7.18	50935162095	-8.861	50935162095	-8.575	42.18	-8.861	-8.575	
50997506234	7.045	50997506234	-8.79	50997506234	-8.529	42.045	-8.79	-8.529	
51059850374	6.87	51059850374	-8.654	51059850374	-8.415	41.87	-8.654	-8.415	
51122194514	6.666	51122194514	-8.591	51122194514	-8.259	41.666	-8.591	-8.259	
51184538653	6.532	51184538653	-8.545	51184538653	-8.144	41.532	-8.545	-8.144	
51246882793	6.534	51246882793	-8.599	51246882793	-8.196	41.534	-8.599	-8.196	
51309226933	6.639	51309226933	-8.668	51309226933	-8.262	41.639	-8.668	-8.262	
51371571072	6.825	51371571072	-8.672	51371571072	-8.227	41.825	-8.672	-8.227	
51433915212	7.097	51433915212	-8.757	51433915212	-8.268	42.097	-8.757	-8.268	
51496259352	7.336	51496259352	-8.702	51496259352	-8.369	42.336	-8.702	-8.369	
51558603491	7.515	51558603491	-8.63	51558603491	-8.347	42.515	-8.63	-8.347	
51620947631	7.641	51620947631	-8.495	51620947631	-8.366	42.641	-8.495	-8.366	
51683291771	7.765	51683291771	-8.419	51683291771	-8.232	42.765	-8.419	-8.232	
51745635910	7.899	51745635910	-8.367	51745635910	-8.095	42.899	-8.367	-8.095	
51807980050	7.94	51807980050	-8.33	51807980050	-7.968	42.94	-8.33	-7.968	
51870324190	7.822	51870324190	-8.262	51870324190	-7.863	42.822	-8.262	-7.863	
51932668329	7.729	51932668329	-8.125	51932668329	-7.625	42.729	-8.125	-7.625	
51995012469	7.767	51995012469	-8.045	51995012469	-7.424	42.767	-8.045	-7.424	
52057356608	7.767	52057356608	-8.149	52057356608	-7.446	42.767	-8.149	-7.446	
52119700748	7.756	52119700748	-8.125	52119700748	-7.493	42.756	-8.125	-7.493	
52182044888	7.784	52182044888	-8.111	52182044888	-7.619	42.784	-8.111	-7.619	
52244389027	7.836	52244389027	-8.309	52244389027	-7.861	42.836	-8.309	-7.861	
52306733167	7.812	52306733167	-8.254	52306733167	-7.743	42.812	-8.254	-7.743	
52369077307	7.713	52369077307	-8.216	52369077307	-7.562	42.713	-8.216	-7.562	
52431421446	7.617	52431421446	-8.05	52431421446	-7.251	42.617	-8.05	-7.251	
52493765586	7.532	52493765586	-7.858	52493765586	-6.979	42.532	-7.858	-6.979	
52556109726	7.411	52556109726	-7.594	52556109726	-6.702	42.411	-7.594	-6.702	
52618453865	7.292	52618453865	-7.391	52618453865	-6.452	42.292	-7.391	-6.452	
52680798005	7.185	52680798005	-7.168	52680798005	-6.237	42.185	-7.168	-6.237	
52743142145	7.097	52743142145	-6.969	52743142145	-6.183	42.097	-6.969	-6.183	
52805486284	7.034	52805486284	-6.897	52805486284	-6.119	42.034	-6.897	-6.119	
52867830424	6.977	52867830424	-6.749	52867830424	-6.101	41.977	-6.749	-6.101	
52930174564	6.932	52930174564	-6.776	52930174564	-6.092	41.932	-6.776	-6.092	
52992518703	6.905	52992518703	-6.792	52992518703	-6.141	41.905	-6.792	-6.141	
53054862843	6.952	53054862843	-6.705	53054862843	-6.136	41.952	-6.705	-6.136	
53117206983	7.136	53117206983	-6.565	53117206983	-6.037	42.136	-6.565	-6.037	
53179551122	7.342	53179551122	-6.438	53179551122	-5.867	42.342	-6.438	-5.867	
53241895262	7.572	53241895262	-6.051	53241895262	-5.655	42.572	-6.051	-5.655	
53304239401	7.842	53304239401	-5.716	53304239401	-5.37	42.842	-5.716	-5.37	
53366583541	8.067	53366583541	-5.527	53366583541	-5.318	43.067	-5.527	-5.318	
53428927681	8.198	53428927681	-5.469	53428927681	-5.337	43.198	-5.469	-5.337	
53491271820	8.3	53491271820	-5.2	53491271820	-5.203	43.3	-5.2	-5.203	
53553615960	8.284	53553615960	-4.985	53553615960	-5.1	43.284	-4.985	-5.1	
53615960100	8.166	53615960100	-5.128	53615960100	-5.243	43.166	-5.128	-5.243	
53678304239	7.981	53678304239	-5.032	53678304239	-5.31	42.981	-5.032	-5.31	
53740648379	7.765	53740648379	-5.163	53740648379	-5.474	42.765	-5.163	-5.474	
53802992519	7.622	53802992519	-5.235	53802992519	-5.652	42.622	-5.235	-5.652	
53865336658	7.554	53865336658	-5.416	53865336658	-5.828	42.554	-5.416	-5.828	
53927680798	7.606	53927680798	-5.408	53927680798	-5.875	42.606	-5.408	-5.875	
53990024938	7.676	53990024938	-5.153	53990024938	-5.694	42.676	-5.153	-5.694	
54052369077	7.699	54052369077	-5.015	54052369077	-5.586	42.699	-5.015	-5.586	
54114713217	7.556	54114713217	-4.881	54114713217	-5.559	42.556	-4.881	-5.559	
54177057357	7.342	54177057357	-4.788	54177057357	-5.565	42.342	-4.788	-5.565	
54239401496	7.15	54239401496	-4.56	54239401496	-5.496	42.15	-4.56	-5.496	
54301745636	7.059	54301745636	-4.658	54301745636	-5.729	42.059	-4.658	-5.729	
54364089776	7.004	54364089776	-4.623	54364089776	-5.821	42.004	-4.623	-5.821	
54426433915	6.944	54426433915	-4.832	54426433915	-6.194	41.944	-4.832	-6.194	

Gain and Return Loss vs. Frequency

Bias: +8 V_{DC}/151 mA



54488778055	6.917	54488778055	-4.859	54488778055	-6.273
54551122195	6.856	54551122195	-4.818	54551122195	-6.457
54613466334	6.757	54613466334	-4.972	54613466334	-6.696
54675810474	6.727	54675810474	-4.999	54675810474	-6.787
54738154613	6.584	54738154613	-5.059	54738154613	-6.943
54800498753	6.449	54800498753	-4.999	54800498753	-6.999
54862842893	6.288	54862842893	-4.768	54862842893	-6.85
54925187032	6.076	54925187032	-4.675	54925187032	-6.985
54987531172	5.812	54987531172	-4.541	54987531172	-7.056
55049875312	5.582	55049875312	-4.367	55049875312	-7.05
55112219451	5.386	55112219451	-4.445	55112219451	-7.276
55174563591	5.087	55174563591	-4.386	55174563591	-7.41
55236907731	4.895	55236907731	-4.342	55236907731	-7.479
55299251870	4.762	55299251870	-4.62	55299251870	-7.743
55361596010	4.666	55361596010	-4.842	55361596010	-7.976
55423940150	4.587	55423940150	-5.008	55423940150	-8.271
55486284289	4.59	55486284289	-5.12	55486284289	-8.369
55548628429	4.628	55548628429	-5.13	55548628429	-8.476
55610972569	4.691	55610972569	-4.897	55610972569	-8.537
55673316708	4.683	55673316708	-4.823	55673316708	-8.526
55735660848	4.603	55735660848	-4.584	55735660848	-8.572
55798004988	4.483	55798004988	-4.587	55798004988	-8.603
55860349127	4.304	55860349127	-4.73	55860349127	-8.825
55922693267	4.12	55922693267	-5.018	55922693267	-9.08
55985037406	3.906	55985037406	-5.125	55985037406	-9.311
56047381546	3.741	56047381546	-5.266	56047381546	-9.473
56109725686	3.697	56109725686	-5.249	56109725686	-9.586
56172069825	3.777	56172069825	-5.296	56172069825	-9.778
56234413965	3.927	56234413965	-5.531	56234413965	-9.926
56296758105	4.056	56296758105	-5.582	56296758105	-9.998
56359102244	4.117	56359102244	-5.57	56359102244	-10.129
56421446384	4.145	56421446384	-5.638	56421446384	-10.335
56483790524	4.14	56483790524	-5.787	56483790524	-10.404
56546134663	4.167	56546134663	-5.889	56546134663	-10.534
56608478803	4.128	56608478803	-6.059	56608478803	-10.569
56670822943	4.172	56670822943	-6.197	56670822943	-10.844
56733167082	4.294	56733167082	-6.29	56733167082	-10.971
56795511222	4.469	56795511222	-6.537	56795511222	-11.187
56857855362	4.615	56857855362	-6.674	56857855362	-11.261
56920199501	4.73	56920199501	-6.853	56920199501	-11.467
56982543641	4.771	56982543641	-6.976	56982543641	-11.445
57044887781	4.752	57044887781	-7.193	57044887781	-11.574
57107231920	4.699	57107231920	-7.438	57107231920	-11.682
57169576060	4.655	57169576060	-7.605	57169576060	-11.593
57231920200	4.691	57231920200	-7.886	57231920200	-11.742
57294264339	4.763	57294264339	-8.07	57294264339	-11.588
57356608479	4.804	57356608479	-8.284	57356608479	-11.613
57418952618	4.81	57418952618	-8.509	57418952618	-11.561
57481296758	4.757	57481296758	-8.712	57481296758	-11.434
57543640898	4.664	57543640898	-8.809	57543640898	-11.215
57605985037	4.546	57605985037	-8.93	57605985037	-10.973
57668329177	4.524	57668329177	-9.073	57668329177	-10.732
57730673317	4.559	57730673317	-9.196	57730673317	-10.49
57793017456	4.625	57793017456	-9.295	57793017456	-10.281
57855361596	4.686	57855361596	-9.405	57855361596	-10.07
57917705736	4.727	57917705736	-9.624	57917705736	-9.846
57980049875	4.798	57980049875	-9.605	57980049875	-9.742
58042394015	4.873	58042394015	-9.789	58042394015	-9.723
58104738155	4.944	58104738155	-9.976	58104738155	-9.72
58167082294	5.026	58167082294	-10.25	58167082294	-9.75
58229426434	5.117	58229426434	-10.503	58229426434	-9.717
58291770574	5.258	58291770574	-10.506	58291770574	-9.473
58354114713	5.364	58354114713	-10.446	58354114713	-9.004
58416458853	5.438	58416458853	-10.253	58416458853	-8.487
58478802993	5.435	58478802993	-10.064	58478802993	-8.059
58541147132	5.444	58541147132	-9.921	58541147132	-7.817
58603491272	5.389	58603491272	-9.924	58603491272	-7.754
58665835411	5.295	58665835411	-10.053	58665835411	-7.881
58728179551	5.115	58728179551	-10.259	58728179551	-7.979
58790523691	4.949	58790523691	-10.512	58790523691	-8.023
58852867830	4.847	58852867830	-10.591	58852867830	-7.993
58915211970	4.84	58915211970	-10.569	58915211970	-7.842
58977556110	4.889	58977556110	-10.399	58977556110	-7.691
59039900249	4.947	59039900249	-10.264	59039900249	-7.504

54.48878	41.917	-4.859	-6.273
54.55112	41.856	-4.818	-6.457
54.61347	41.757	-4.972	-6.696
54.67581	41.727	-4.999	-6.787
54.73815	41.584	-5.059	-6.943
54.8005	41.449	-4.999	-6.999
54.86284	41.288	-4.768	-6.85
54.92519	41.076	-4.675	-6.985
54.98753	40.812	-4.541	-7.056
55.04988	40.582	-4.367	-7.05
55.11222	40.386	-4.445	-7.276
55.17456	40.087	-4.386	-7.41
55.23691	39.895	-4.342	-7.479
55.29925	39.762	-4.62	-7.743
55.3616	39.666	-4.842	-7.976
55.42394	39.587	-5.008	-8.271
55.48628	39.59	-5.12	-8.369
55.54863	39.628	-5.13	-8.476
55.61097	39.691	-4.897	-8.537
55.67332	39.683	-4.823	-8.526
55.73566	39.603	-4.584	-8.572
55.798	39.483	-4.587	-8.603
55.86035	39.304	-4.73	-8.825
55.92269	39.12	-5.018	-9.08
55.98504	38.906	-5.125	-9.311
56.04738	38.741	-5.266	-9.473
56.10973	38.697	-5.249	-9.586
56.17207	38.777	-5.296	-9.778
56.23441	38.927	-5.531	-9.926
56.29676	39.056	-5.582	-9.998
56.3591	39.117	-5.57	-10.129
56.42145	39.145	-5.638	-10.335
56.48379	39.14	-5.787	-10.404
56.54613	39.167	-5.889	-10.534
56.60848	39.128	-6.059	-10.569
56.67082	39.172	-6.197	-10.844
56.73317	39.294	-6.29	-10.971
56.79551	39.469	-6.537	-11.187
56.85786	39.615	-6.674	-11.261
56.9201	39.73	-6.853	-11.467
56.98254	39.771	-6.976	-11.445
57.04489	39.752	-7.193	-11.574
57.10723	39.699	-7.438	-11.682
57.16958	39.655	-7.605	-11.593
57.23192	39.691	-7.886	-11.742
57.29426	39.763	-8.07	-11.588
57.35661	39.804	-8.284	-11.613
57.41895	39.81	-8.509	-11.561
57.4813	39.757	-8.712	-11.434
57.54364	39.664	-8.809	-11.215
57.60599	39.546	-8.93	-10.973
57.66833	39.524	-9.073	-10.732
57.73067	39.559	-9.196	-10.49
57.79302	39.625	-9.295	-10.281
57.85536	39.686	-9.405	-10.07
57.91771	39.727	-9.624	-9.846
57.98005	39.798	-9.605	-9.742
58.04239	39.873	-9.789	-9.723
58.10474	39.944	-9.976	-9.72
58.16708	40.026	-10.25	-9.75
58.22943	40.117	-10.503	-9.717
58.29177	40.258	-10.506	-9.473
58.35411	40.364	-10.446	-9.004
58.41646	40.438	-10.253	-8.487
58.4788	40.435	-10.064	-8.059
58.54115	40.444	-9.921	-7.817
58.60349	40.389	-9.924	-7.754
58.66584	40.295	-10.053	-7.881
58.72818	40.115	-10.259	-7.979
58.79052	39.949	-10.512	-8.023
58.85287	39.847	-10.591	-7.993
58.91521	39.84	-10.569	-7.842
58.97756	39.889	-10.399	-7.691
59.0399	39.947	-10.264	-7.504

59102244389	4.977	59102244389	-10.031	59102244389	-7.287
59164588529	4.957	59164588529	-9.767	59164588529	-7.051
59226932668	4.85	59226932668	-9.492	59226932668	-6.861
59289276808	4.644	59289276808	-9.149	59289276808	-6.672
59351620948	4.381	59351620948	-8.927	59351620948	-6.59
59413965087	4.191	59413965087	-8.748	59413965087	-6.642
59476309227	4.109	59476309227	-8.668	59476309227	-6.663
59538653367	4.046	59538653367	-8.641	59538653367	-6.787
59600997506	4.013	59600997506	-8.564	59600997506	-6.872
59663341646	4.013	59663341646	-8.465	59663341646	-6.899
59725685786	4.011	59725685786	-8.216	59725685786	-6.774
59788029925	4.037	59788029925	-7.96	59788029925	-6.617
59850374065	4.024	59850374065	-7.668	59850374065	-6.457
59912718204	3.967	59912718204	-7.391	59912718204	-6.421
59975062344	3.897	59975062344	-7.254	59975062344	-6.356
60037406484	3.787	60037406484	-7.119	60037406484	-6.331
60099750623	3.708	60099750623	-6.949	60099750623	-6.287
60162094763	3.606	60162094763	-6.754	60162094763	-6.166
60224438903	3.522	60224438903	-6.617	60224438903	-6.15
60286783042	3.422	60286783042	-6.523	60286783042	-6.155
60349127182	3.37	60349127182	-6.381	60349127182	-6.114
60411471322	3.307	60411471322	-6.175	60411471322	-6.015
60473815461	3.239	60473815461	-6.144	60473815461	-5.976
60536159601	3.142	60536159601	-6.029	60536159601	-5.853
60598503741	2.969	60598503741	-5.84	60598503741	-5.771
60600847880	2.845	60600847880	-5.809	60600847880	-5.76
60723192020	2.746	60723192020	-5.829	60723192020	-5.829
60785536160	2.598	60785536160	-5.754	60785536160	-5.823
60847880299	2.428	60847880299	-5.892	60847880299	-5.867
60910224439	2.294	60910224439	-5.897	60910224439	-5.836
60972568579	2.128	60972568579	-5.927	60972568579	-5.842
61034912718	1.947	61034912718	-5.792	61034912718	-5.779
61097256858	1.785	61097256858	-5.683	61097256858	-5.711
61159600998	1.585	61159600998	-5.593	61159600998	-5.647
61221945137	1.508	61221945137	-5.48	61221945137	-5.56
61284289277	1.414	61284289277	-5.471	61284289277	-5.559
61346633416	1.247	61346633416	-5.549	61346633416	-5.557
61408977556	1.11	61408977556	-5.6	61408977556	-5.614
61471321696	1.006	61471321696	-5.642	61471321696	-5.714
61533665835	1.002	61533665835	-5.798	61533665835	-5.771
61596009975	1.036	61596009975	-5.908	61596009975	-5.847
61658354115	1.101	61658354115	-5.966	61658354115	-5.93
61720698254	1.161	61720698254	-6.072	61720698254	-6.026
61783042394	1.148	61783042394	-6.034	61783042394	-6.051
61845386534	1.066	61845386534	-6.092	61845386534	-6.1
61907730673	0.959	61907730673	-5.968	61907730673	-6.051
61970074813	0.898	61970074813	-5.979	61970074813	-6.04
62032418953	0.981	62032418953	-5.985	62032418953	-6.023
62094763092	1.2	62094763092	-5.99	62094763092	-6.004
62157107232	1.486	62157107232	-5.82	62157107232	-5.987
62219451372	1.772	62219451372	-6.057	62219451372	-6.046
62281795511	1.961	62281795511	-6.079	62281795511	-6.172
62344139651	2.036	62344139651	-6.232	62344139651	-6.372
62406483791	2.063	62406483791	-6.37	62406483791	-6.524
62468827930	2.033	62468827930	-6.391	62468827930	-6.589
62531172070	2.008	62531172070	-6.507	62531172070	-6.691
62593516209	1.994	62593516209	-6.512	62593516209	-6.765
62655860349	1.972	62655860349	-6.48	62655860349	-6.919
62718204489	1.963	62718204489	-6.656	62718204489	-7.007
62780548628	1.98	62780548628	-6.655	62780548628	-7.089
62842892768	2.054	62842892768	-6.708	62842892768	-7.175
62905236908	2.049	62905236908	-6.776	62905236908	-7.248
62967581047	1.992	62967581047	-6.828	62967581047	-7.325
63029925187	1.992	63029925187	-6.935	63029925187	-7.482
63092269327	2.025	63092269327	-7.098	63092269327	-7.669
63154613466	2.049	63154613466	-7.246	63154613466	-8.034
63216957606	2.074	63216957606	-7.545	63216957606	-8.253
63279301746	2.068	63279301746	-7.704	63279301746	-8.517
63341645885	2.06	63341645885	-7.981	63341645885	-8.825
63403990025	2.088	63403990025	-8.106	63403990025	-9.018
63466334165	2.132	63466334165	-8.199	63466334165	-9.1
63528678304	2.206	63528678304	-8.339	63528678304	-9.341
63591022444	2.323	63591022444	-8.488	63591022444	-9.515
63653366584	2.448	63653366584	-8.82	63653366584	-9.784

59.10224	39.977	-10.031	-7.287
59.16459	39.957	-9.767	-7.051
59.22693	39.85	-9.492	-6.861
59.28928	39.644	-9.149	-6.672
59.35162	39.381	-8.927	-6.59
59.41397	39.191	-8.748	-6.642
59.47631	39.109	-8.668	-6.663
59.53865	39.046	-8.641	-6.787
59.601	39.013	-8.564	-6.872
59.66334	39.013	-8.465	-6.899
59.72569	39.011	-8.216	-6.774
59.78803	39.037	-7.96	-6.617
59.85037	39.024	-7.668	-6.457
59.91272	38.967	-7.391	-6.421
59.97506	38.897	-7.254	-6.356
60.03741	38.787	-7.119	-6.331
60.09975	38.708	-6.949	-6.287
60.16209	38.606	-6.754	-6.166
60.22444	38.522	-6.617	-6.15
60.28678	38.422	-6.523	-6.155
60.34913	38.37	-6.381	-6.114
60.41147	38.307	-6.175	-6.015
60.47382	38.239	-6.144	-5.976
60.53616	38.142	-6.029	-5.853
60.5985	37.969	-5.84	-5.771
60.66085	37.845	-5.809	-5.76
60.72319	37.746	-5.829	-5.829
60.78554	37.598	-5.754	-5.823
60.84788	37.428	-5.892	-5.867
60.91022	37.294	-5.897	-5.836
60.97257	37.128	-5.927	-5.842
61.03491	36.947	-5.792	-5.779
61.09726	36.785	-5.683	-5.711
61.1596	36.585	-5.593	-5.647
61.22195	36.508	-5.48	-5.56
61.28429	36.414	-5.471	-5.559
61.34663	36.247	-5.549	-5.557
61.40898	36.11	-5.6	-5.614
61.47132	36.006	-5.642	-5.714
61.53367	36.002	-5.798	-5.771
61.59601	36.036	-5.908	-5.847
61.65835	36.101	-5.966	-5.93
61.7207	36.161	-6.072	-6.026
61.78304	36.148	-6.034	-6.051
61.84539	36.066	-6.092	-6.1
61.90773	35.959	-5.968	-6.051
61.97007	35.898	-5.979	-6.04
62.03242	35.981	-5.985	-6.023
62.09476	36.2	-5.99	-6.004
62.15711	36.486	-5.82	-5.987
62.21945	36.772	-6.057	-6.046
62.2818	36.961	-6.079	-6.172
62.34414	37.036	-6.232	-6.372
62.40648	37.063	-6.37	-6.524
62.46883	37.033	-6.391	-6.589
62.53117	37.008	-6.507	-6.691
62.59352	36.994	-6.512	-6.765
62.65586	36.972	-6.48	-6.919
62.7182	36.963	-6.656	-7.007
62.78055	36.98	-6.655	-7.089
62.84289	37.054	-6.708	-7.175
62.90524	37.049	-6.776	-7.248
62.96758	36.992	-6.828	-7.325
63.02993	36.992	-6.935	-7.482
63.09227	37.025	-7.098	-7.669
63.15461	37.049	-7.246	-8.034
63.21696	37.074	-7.545	-8.253
63.2793	37.068	-7.704	-8.517
63.34165	37.06	-7.981	-8.825
63.40399	37.088	-8.106	-9.018
63.46633	37.132	-8.199	-9.1
63.52868	37.206	-8.339	-9.341
63.59102	37.323	-8.488	-9.515
63.65337	37.448	-8.82	-9.784

63715710723	2.601	63715710723	-9.124	63715710723	-10.28
63778054863	2.73	63778054863	-9.476	63778054863	-10.517
63840399002	2.856	63840399002	-10.056	63840399002	-10.666
63902743142	2.934	63902743142	-9.899	63902743142	-10.907
63965087282	2.947	63965087282	-10.011	63965087282	-11.061
64027431421	2.996	64027431421	-10.258	64027431421	-11.228
64089775561	3.035	64089775561	-10.44	64089775561	-11.352
64152119701	3.048	64152119701	-10.899	64152119701	-11.674
64214463840	3.118	64214463840	-10.88	64214463840	-11.635
64276807980	3.189	64276807980	-11.291	64276807980	-11.915
64339152120	3.23	64339152120	-11.509	64339152120	-12.017
64401496259	3.252	64401496259	-11.786	64401496259	-12.145
64463840399	3.258	64463840399	-11.92	64463840399	-12.22
64526184539	3.233	64526184539	-12.283	64526184539	-12.357
64588528678	3.228	64588528678	-12.599	64588528678	-12.555
64650872818	3.211	64650872818	-13.104	64650872818	-12.994
64713216958	3.139	64713216958	-13.137	64713216958	-12.915
64775561097	3.09	64775561097	-13.201	64775561097	-12.863
64837905237	3.016	64837905237	-13.379	64837905237	-12.805
64900249377	2.919	64900249377	-13.428	64900249377	-12.764
64962593516	2.837	64962593516	-13.547	64962593516	-12.838
65024937656	2.766	65024937656	-13.5	65024937656	-12.651
65087281796	2.714	65087281796	-14.052	65087281796	-12.91
65149625935	2.705	65149625935	-14.181	65149625935	-13.011
65211970075	2.755	65211970075	-14.319	65211970075	-13.091
65274314214	2.769	65274314214	-14.472	65274314214	-13.107
65336658354	2.774	65336658354	-14.643	65336658354	-13.212
65399002494	2.722	65399002494	-14.793	65399002494	-13.206
65461346633	2.626	65461346633	-14.802	65461346633	-13.206
65523690773	2.532	65523690773	-14.945	65523690773	-13.233
65586034913	2.447	65586034913	-15.003	65586034913	-13.245
65648379052	2.403	65648379052	-15.002	65648379052	-13.181
65710723192	2.384	65710723192	-15.189	65710723192	-13.217
65773067332	2.398	65773067332	-15.214	65773067332	-13.217
65835411471	2.461	65835411471	-15.373	65835411471	-13.208
65897755611	2.496	65897755611	-15.497	65897755611	-13.388
65960099751	2.538	65960099751	-15.755	65960099751	-13.53
66022443890	2.502	66022443890	-15.9	66022443890	-13.607
66084788030	2.43	66084788030	-16.038	66084788030	-13.717
66147132170	2.367	66147132170	-16.145	66147132170	-13.725
66209476309	2.326	66209476309	-16.008	66209476309	-13.772
66271820449	2.291	66271820449	-16.364	66271820449	-13.887
66334164589	2.264	66334164589	-16.277	66334164589	-13.992
66396508728	2.244	66396508728	-16.29	66396508728	-14.172
66458852868	2.216	66458852868	-16.321	66458852868	-14.214
66521197007	2.165	66521197007	-16.236	66521197007	-14.272
66583541147	2.123	66583541147	-16.161	66583541147	-14.252
66645885287	2.06	66645885287	-15.958	66645885287	-14.241
66708229426	1.989	66708229426	-15.727	66708229426	-14.099
66770573566	1.923	66770573566	-15.558	66770573566	-14.022
66832917706	1.9	66832917706	-15.285	66832917706	-13.989
66895261845	1.925	66895261845	-15.118	66895261845	-13.967
66957605985	1.975	66957605985	-15.09	66957605985	-14.008
67019950125	2.013	67019950125	-14.848	67019950125	-13.901
67082294264	2.016	67082294264	-14.769	67082294264	-13.948
67144638404	2.005	67144638404	-14.626	67144638404	-13.753
67206982544	2.002	67206982544	-14.475	67206982544	-13.689
67269326683	2.058	67269326683	-14.239	67269326683	-13.566
67331670823	2.157	67331670823	-14.263	67331670823	-13.686
67394014963	2.296	67394014963	-14.145	67394014963	-13.58
67456359102	2.412	67456359102	-14.06	67456359102	-13.535
67518703242	2.488	67518703242	-13.984	67518703242	-13.462
67581047382	2.552	67581047382	-13.87	67581047382	-13.381
67643391521	2.601	67643391521	-13.805	67643391521	-13.217
67705735661	2.634	67705735661	-13.599	67705735661	-12.975
67768079800	2.642	67768079800	-13.511	67768079800	-12.953
67830423940	2.667	67830423940	-13.475	67830423940	-12.821
67892768080	2.695	67892768080	-13.505	67892768080	-12.758
67955112219	2.714	67955112219	-13.486	67955112219	-12.813
68017456359	2.755	68017456359	-13.587	68017456359	-12.829
68079800499	2.796	68079800499	-13.577	68079800499	-12.884
68142144638	2.848	68142144638	-13.684	68142144638	-12.912
68204488778	2.887	68204488778	-13.8	68204488778	-12.97
68266832918	2.906	68266832918	-13.926	68266832918	-13.061

63.71571	37.601	-9.124	-10.28
63.77805	37.73	-9.476	-10.517
63.8404	37.856	-10.056	-10.666
63.90274	37.934	-9.899	-10.907
63.96509	37.947	-10.011	-11.061
64.02743	37.996	-10.258	-11.228
64.08978	38.035	-10.44	-11.352
64.15212	38.048	-10.899	-11.674
64.21446	38.118	-10.88	-11.635
64.27681	38.189	-11.291	-11.915
64.33915	38.23	-11.509	-12.017
64.4015	38.252	-11.786	-12.145
64.46384	38.258	-11.92	-12.22
64.52618	38.233	-12.283	-12.357
64.58853	38.228	-12.599	-12.555
64.65087	38.211	-13.104	-12.994
64.71322	38.139	-13.137	-12.915
64.77556	38.09	-13.201	-12.863
64.83791	38.016	-13.379	-12.805
64.90025	37.919	-13.428	-12.764
64.96259	37.837	-13.547	-12.838
65.02494	37.766	-13.5	-12.651
65.08728	37.714	-14.052	-12.91
65.14963	37.705	-14.181	-13.011
65.21197	37.755	-14.319	-13.091
65.27431	37.769	-14.472	-13.107
65.33666	37.774	-14.643	-13.212
65.399	37.722	-14.793	-13.206
65.46135	37.626	-14.802	-13.206
65.52369	37.532	-14.945	-13.233
65.58603	37.447	-15.003	-13.245
65.64838	37.403	-15.002	-13.181
65.71072	37.384	-15.189	-13.217
65.77307	37.398	-15.214	-13.217
65.83541	37.461	-15.373	-13.208
65.89776	37.496	-15.497	-13.388
65.9601	37.538	-15.755	-13.53
66.02244	37.502	-15.9	-13.607
66.08479	37.43	-16.038	-13.717
66.14713	37.367	-16.145	-13.725
66.20948	37.326	-16.008	-13.772
66.27182	37.291	-16.364	-13.887
66.33416	37.264	-16.277	-13.992
66.39651	37.244	-16.29	-14.172
66.45885	37.216	-16.321	-14.214
66.5212	37.165	-16.236	-14.272
66.58354	37.123	-16.161	-14.252
66.64589	37.06	-15.958	-14.241
66.70823	36.989	-15.727	-14.099
66.77057	36.923	-15.558	-14.022
66.83292	36.9	-15.285	-13.989
66.89526	36.925	-15.118	-13.967
66.95761	36.975	-15.09	-14.008
67.01995	37.013	-14.848	-13.901
67.08229	37.016	-14.769	-13.948
67.14464	37.005	-14.626	-13.753
67.20698	37.002	-14.475	-13.689
67.26933	37.058	-14.239	-13.566
67.33167	37.157	-14.263	-13.686
67.39401	37.296	-14.145	-13.58
67.45636	37.412	-14.06	-13.535
67.5187	37.488	-13.984	-13.462
67.58105	37.552	-13.87	-13.381
67.64339	37.601	-13.805	-13.217
67.70574	37.634	-13.599	-12.975
67.76808	37.642	-13.511	-12.953
67.83042	37.667	-13.475	-12.821
67.89277	37.695	-13.505	-12.758
67.95511	37.714	-13.486	-12.813
68.01746	37.755	-13.587	-12.829
68.0798	37.796	-13.577	-12.884
68.14214	37.848	-13.684	-12.912
68.20449	37.887	-13.8	-12.97
68.26683	37.906	-13.926	-13.061

68329177057	2.878	68329177057	-14.063	68329177057	-13.088
68391521197	2.878	68391521197	-14.167	68391521197	-13.247
68453865337	2.849	68453865337	-14.236	68453865337	-13.187
68516209476	2.818	68516209476	-14.143	68516209476	-13.223
68578553616	2.809	68578553616	-14.039	68578553616	-13.064
68640897756	2.815	68640897756	-13.895	68640897756	-12.983
68703241895	2.783	68703241895	-13.769	68703241895	-12.854
68765586035	2.711	68765586035	-13.758	68765586035	-12.876
68827930175	2.62	68827930175	-13.873	68827930175	-12.747
68890274314	2.505	68890274314	-14	68890274314	-12.821
68952618454	2.483	68952618454	-14.142	68952618454	-12.821
69014962594	2.492	69014962594	-14.107	69014962594	-12.701
69077306733	2.472	69077306733	-14.003	69077306733	-12.484
69139650873	2.477	69139650873	-14	69139650873	-12.234
69201995012	2.461	69201995012	-14.011	69201995012	-12.003
69264339152	2.403	69264339152	-14.021	69264339152	-11.772
69326683292	2.337	69326683292	-13.97	69326683292	-11.641
69389027431	2.28	69389027431	-14.024	69389027431	-11.467
69451371571	2.17	69451371571	-13.986	69451371571	-11.292
69513715711	2.06	69513715711	-14.024	69513715711	-11.052
69576059850	1.928	69576059850	-14.063	69576059850	-10.811
69638403990	1.846	69638403990	-14.104	69638403990	-10.668
69700748130	1.764	69700748130	-14.159	69700748130	-10.506
69763092269	1.717	69763092269	-14.219	69763092269	-10.275
69825436409	1.72	69825436409	-14.354	69825436409	-10.154
69887780549	1.771	69887780549	-14.42	69887780549	-9.907
69950124688	1.772	69950124688	-14.538	69950124688	-9.715
70012468828	1.725	70012468828	-14.777	70012468828	-9.57
70074812968	1.661	70074812968	-15.112	70074812968	-9.495
70137157107	1.544	70137157107	-15.398	70137157107	-9.457
70199501247	1.428	70199501247	-15.708	70199501247	-9.467
70261845387	1.294	70261845387	-16.052	70261845387	-9.553
70324189526	1.134	70324189526	-16.477	70324189526	-9.545
70386533666	1.005	70386533666	-16.711	70386533666	-9.432
70448877805	0.923	70448877805	-16.972	70448877805	-9.314
70511221945	0.859	70511221945	-17.09	70511221945	-9.16
70573566085	0.753	70573566085	-17.065	70573566085	-9.014
70635910224	0.588	70635910224	-17.293	70635910224	-8.885
70698254364	0.406	70698254364	-17.521	70698254364	-8.869
70760598504	0.28	70760598504	-17.636	70760598504	-8.908
70822942643	0.178	70822942643	-17.771	70822942643	-8.976
70885286783	0.071	70885286783	-17.908	70885286783	-9.025
70947630923	-0.044	70947630923	-17.969	70947630923	-9.067
71009975062	-0.173	71009975062	-17.999	71009975062	-9.135
71072319202	-0.286	71072319202	-17.922	71072319202	-9.174
71134663342	-0.395	71134663342	-17.785	71134663342	-9.281
71197007481	-0.489	71197007481	-17.617	71197007481	-9.446
71259351621	-0.571	71259351621	-17.461	71259351621	-9.575
71321695761	-0.64	71321695761	-17.177	71321695761	-9.621
71384039900	-0.703	71384039900	-16.692	71384039900	-9.641
71446384040	-0.719	71446384040	-16.184	71446384040	-9.583
71508728180	-0.714	71508728180	-15.634	71508728180	-9.559
71571072319	-0.734	71571072319	-15.222	71571072319	-9.556
71633416459	-0.766	71633416459	-14.766	71633416459	-9.666
71695760599	-0.813	71695760599	-14.305	71695760599	-9.872
71758104738	-0.893	71758104738	-14.013	71758104738	-10.091
71820448878	-0.984	71820448878	-13.747	71820448878	-10.385
71882793017	-1.082	71882793017	-13.604	71882793017	-10.651
71945137157	-1.206	71945137157	-13.351	71945137157	-10.734
72007481297	-1.327	72007481297	-13.143	72007481297	-11.031
72069825436	-1.406	72069825436	-12.78	72069825436	-11.036
72132169576	-1.5	72132169576	-12.714	72132169576	-11.321
72194513716	-1.563	72194513716	-12.365	72194513716	-11.297
72256857855	-1.587	72256857855	-12.036	72256857855	-11.322
72319201995	-1.607	72319201995	-11.729	72319201995	-11.402
72381546135	-1.648	72381546135	-11.398	72381546135	-11.385
72443890274	-1.731	72443890274	-11.088	72443890274	-11.445
72506234414	-1.804	72506234414	-10.844	72506234414	-11.44
72568578554	-1.931	72568578554	-10.66	72568578554	-11.637
72630922693	-2.038	72630922693	-10.457	72630922693	-11.737
72693266833	-2.156	72693266833	-10.338	72693266833	-11.945
72755610973	-2.228	72755610973	-10.215	72755610973	-12.061
72817955112	-2.264	72817955112	-10.061	72817955112	-12.151
72880299252	-2.249	72880299252	-9.742	72880299252	-12.225

68.32918	37.878	-14.063	-13.088
68.39152	37.878	-14.167	-13.247
68.45387	37.849	-14.236	-13.187
68.51621	37.818	-14.143	-13.223
68.57855	37.809	-14.039	-13.064
68.6409	37.815	-13.895	-12.983
68.70324	37.783	-13.769	-12.854
68.76559	37.711	-13.758	-12.876
68.82793	37.62	-13.873	-12.747
68.89027	37.505	-14	-12.821
68.95262	37.483	-14.142	-12.821
69.01496	37.492	-14.107	-12.701
69.07731	37.472	-14.003	-12.484
69.13965	37.477	-14	-12.234
69.202	37.461	-14.011	-12.003
69.26434	37.403	-14.021	-11.772
69.32668	37.337	-13.97	-11.641
69.38903	37.28	-14.024	-11.467
69.45137	37.17	-13.986	-11.292
69.51372	37.06	-14.024	-11.052
69.57606	36.928	-14.063	-10.811
69.6384	36.846	-14.104	-10.668
69.70075	36.764	-14.159	-10.506
69.76309	36.717	-14.219	-10.275
69.82544	36.72	-14.354	-10.154
69.88778	36.771	-14.42	-9.907
69.95012	36.772	-14.538	-9.715
70.01247	36.725	-14.777	-9.57
70.07481	36.661	-15.112	-9.495
70.13716	36.544	-15.398	-9.457
70.1995	36.428	-15.708	-9.467
70.26185	36.294	-16.052	-9.553
70.32419	36.134	-16.477	-9.545
70.38653	36.005	-16.711	-9.432
70.44888	35.923	-16.972	-9.314
70.51122	35.859	-17.09	-9.16
70.57357	35.753	-17.065	-9.014
70.63591	35.588	-17.293	-8.885
70.69825	35.406	-17.521	-8.869
70.7606	35.28	-17.636	-8.908
70.82294	35.178	-17.771	-8.976
70.88529	35.071	-17.908	-9.025
70.94763	34.956	-17.969	-9.067
71.00998	34.827	-17.999	-9.135
71.07232	34.714	-17.922	-9.174
71.13466	34.605	-17.785	-9.281
71.19701	34.511	-17.617	-9.446
71.25935	34.429	-17.461	-9.575
71.3217	34.36	-17.177	-9.621
71.38404	34.297	-16.692	-9.641
71.44638	34.281	-16.184	-9.583
71.50873	34.286	-15.634	-9.559
71.57107	34.266	-15.222	-9.556
71.63342	34.234	-14.766	-9.666
71.69576	34.187	-14.305	-9.872
71.7581	34.107	-14.013	-10.091
71.82045	34.016	-13.747	-10.385
71.88279	33.918	-13.604	-10.651
71.94514	33.794	-13.351	-10.734
72.00748	33.673	-13.143	-11.031
72.06983	33.594	-12.78	-11.036
72.13217	33.5	-12.714	-11.321
72.19451	33.437	-12.365	-11.297
72.25686	33.413	-12.036	-11.322
72.3192	33.393	-11.729	-11.402
72.38155	33.352	-11.398	-11.385
72.44389	33.269	-11.088	-11.445
72.50623	33.196	-10.844	-11.44
72.56858	33.069	-10.66	-11.637
72.63092	32.962	-10.457	-11.737
72.69327	32.844	-10.338	-11.945
72.75561	32.772	-12.061	-12.061
72.81796	32.736	-10.061	-12.151
72.8803	32.751	-9.742	-12.225

72942643392	-2.233	72942643392	-9.485	72942643392	-12.369	72.94264	32.767	-9.485	-12.369
73004987531	-2.211	73004987531	-9.028	73004987531	-12.343	73.00499	32.789	-9.028	-12.343
73067331671	-2.203	73067331671	-8.847	73067331671	-12.456	73.06733	32.797	-8.847	-12.456
73129675810	-2.234	73129675810	-8.801	73129675810	-12.687	73.12968	32.766	-8.801	-12.687
73192019950	-2.241	73192019950	-8.658	73192019950	-12.874	73.19202	32.759	-8.658	-12.874
73254364090	-2.238	73254364090	-8.674	73254364090	-13.101	73.25436	32.762	-8.674	-13.101
73316708229	-2.244	73316708229	-8.512	73316708229	-13.236	73.31671	32.756	-8.512	-13.236
73379052369	-2.233	73379052369	-8.298	73379052369	-13.36	73.37905	32.767	-8.298	-13.36
73441396509	-2.222	73441396509	-7.99	73441396509	-13.288	73.4414	32.778	-7.99	-13.288
73503740648	-2.25	73503740648	-7.864	73503740648	-13.431	73.50374	32.75	-7.864	-13.431
73566084788	-2.217	73566084788	-7.742	73566084788	-13.516	73.56608	32.783	-7.742	-13.516
73628428928	-2.214	73628428928	-7.543	73628428928	-13.637	73.62843	32.786	-7.543	-13.637
73690773067	-2.205	73690773067	-7.235	73690773067	-13.755	73.69077	32.795	-7.235	-13.755
73753117207	-2.184	73753117207	-6.949	73753117207	-13.75	73.75312	32.816	-6.949	-13.75
73815461347	-2.096	73815461347	-6.796	73815461347	-13.852	73.81546	32.904	-6.796	-13.852
73877805486	-2.033	73877805486	-6.581	73877805486	-13.954	73.87781	32.967	-6.581	-13.954
73940149626	-2	73940149626	-6.545	73940149626	-14.186	73.94015	33	-6.545	-14.186
74002493766	-2.049	74002493766	-6.562	74002493766	-14.355	74.00249	32.951	-6.562	-14.355
74064837905	-2.159	74064837905	-6.496	74064837905	-14.698	74.06484	32.841	-6.496	-14.698
74127182045	-2.28	74127182045	-6.543	74127182045	-15.074	74.12718	32.72	-6.543	-15.074
74189526185	-2.315	74189526185	-6.611	74189526185	-15.337	74.18953	32.685	-6.611	-15.337
74251870324	-2.22	74251870324	-6.537	74251870324	-15.813	74.25187	32.78	-6.537	-15.813
74314214464	-2.186	74314214464	-6.386	74314214464	-16.098	74.31421	32.814	-6.386	-16.098
74376558603	-2.189	74376558603	-6.147	74376558603	-16.417	74.37656	32.811	-6.147	-16.417
74438902743	-2.238	74438902743	-6.037	74438902743	-16.733	74.4389	32.762	-6.037	-16.733
74501246883	-2.354	74501246883	-5.906	74501246883	-17.118	74.50125	32.646	-5.906	-17.118
74563591022	-2.486	74563591022	-5.891	74563591022	-17.405	74.56359	32.514	-5.891	-17.405
74625935162	-2.637	74625935162	-5.729	74625935162	-18.034	74.62594	32.363	-5.729	-18.034
74688279302	-2.815	74688279302	-5.853	74688279302	-18.537	74.68828	32.185	-5.853	-18.537
74750623441	-3.016	74750623441	-5.955	74750623441	-18.787	74.75062	31.984	-5.955	-18.787
74812967581	-3.217	74812967581	-5.998	74812967581	-19.279	74.81297	31.783	-5.998	-19.279
74875311721	-3.384	74875311721	-6.032	74875311721	-19.911	74.87531	31.616	-6.032	-19.911
74937655860	-3.568	74937655860	-6.128	74937655860	-20.017	74.93766	31.432	-6.128	-20.017

Eravant				75 - 110 GHz Pre-amplifier				SBL-7531143550-1010-E1[06649-01] Raw Test Data			
				Gain Ref: 35				Freq Gain Input Return Loss Output Return Loss			
75000000000	10.621	75000000000	-13.969	75000000000	-14.378	Gain Ref: 35		75 45.621	-13.969	-14.378	
75087281796	10.737	75087281796	-14.986	75087281796	-13.728	Tested By: LB		75.08728	45.737	-14.986	
75174653591	10.121	75174653591	-15.052	75174653591	-15.052	Date: 9/15/2020		75.17465	45.954	-15.052	
75261845387	11.201	75261845387	-16.062	75261845387	-13.937			75.26185	46.201	-16.062	
75349127182	11.355	75349127182	-16.595	75349127182	-13.538			75.34913	46.355	-16.595	
75436408978	11.429	75436408978	-15.17	75436408978	-12.969			75.43641	46.429	-15.17	
75523690773	11.476	75523690773	-16.4	75523690773	-12.593			75.52369	46.476	-16.4	
75610972569	11.566	75610972569	-16.901	75610972569	-12.676			75.61097	46.566	-16.901	
75698254364	11.731	75698254364	-17.588	75698254364	-13.071			75.69825	46.731	-17.588	
75785356160	11.893	75785356160	-18.141	75785356160	-12.805			75.78535	46.893	-18.141	
75872817955	12.014	75872817955	-19.221	75872817955	-12.849			75.87282	47.014	-19.221	
75960099751	12.097	75960099751	-17.106	75960099751	-12.967			75.96009	47.097	-17.106	
76047381546	12.154	76047381546	-17.532	76047381546	-13.371			76.04738	47.154	-17.532	
76134663342	12.154	76134663342	-17.213	76134663342	-13.317			76.13466	47.154	-17.213	
76221945137	12.063	76221945137	-16.842	76221945137	-13.318			76.22195	47.063	-16.842	
76309226933	11.986	76309226933	-16.288	76309226933	-13.552			76.30923	46.986	-16.288	
76396508728	11.932	76396508728	-16.37	76396508728	-13.351			76.39651	46.932	-16.37	
76483790524	11.833	76483790524	-15.439	76483790524	-13.846			76.48379	46.833	-15.439	
76571072139	11.813	76571072139	-16.464	76571072139	-14.626			76.57107	46.813	-16.464	
76658354115	11.83	76658354115	-15.557	76658354115	-15.567			76.65835	46.83	-15.557	
76745635910	11.786	76745635910	-15.864	76745635910	-14.914			76.74564	46.786	-15.864	
76832917706	11.717	76832917706	-14.868	76832917706	-15.488			76.83292	46.717	-14.868	
76920199501	11.643	76920199501	-14.714	76920199501	-15.474			76.92019	46.643	-14.714	
77007481297	11.506	77007481297	-14.296	77007481297	-14.939			77.00748	46.506	-14.296	
77094763092	11.407	77094763092	-14.54	77094763092	-14.987			77.09476	46.407	-14.54	
77182044888	11.409	77182044888	-13.722	77182044888	-14.502			77.18204	46.409	-13.722	
77269326683	11.437	77269326683	-13.286	77269326683	-14.156			77.26933	46.437	-13.286	
77356608479	11.462	77356608479	-13.168	77356608479	-14.555			77.35661	46.462	-13.168	
77443890274	11.457	77443890274	-12.874	77443890274	-14.289			77.44389	46.457	-12.874	
77531172070	11.511	77531172070	-12.885	77531172070	-14.173			77.53117	46.421	-12.885	
77618453865	11.566	77618453865	-12.689	77618453865	-13.717			77.61845	46.566	-12.689	
77705735661	11.623	77705735661	-12.215	77705735661	-13.193			77.70574	46.623	-12.215	
77793017456	11.673	77793017456	-11.916	77793017456	-12.943			77.79302	46.673	-11.916	
77880299252	11.717	77880299252	-11.662	77880299252	-13.079			77.88029	46.717	-11.662	
77967581047	11.8	77967581047	-11.544	77967581047	-12.804			77.96758	46.8	-11.544	
78054062943	11.865	78054062943	-11.544	78054062943	-12.335			78.05406	46.868	-11.544	
78142144638	11.782	78142144638	-10.891	78142144638	-12.454			78.14214	46.978	-10.891	
78229426434	12.016	78229426434	-11.011	78229426434	-12.349			78.22943	47.016	-11.011	
78316708229	11.978	78316708229	-10.668	78316708229	-12.036			78.31671	46.978	-10.668	
78403990025	11.973	78403990025	-10.506	78403990025	-12.341			78.40399	46.973	-10.506	
78491271820	12.025	78491271820	-10.471	78491271820	-13.105			78.49127	47.025	-10.471	
78578535616	12.041	78578535616	-10.464	78578535616	-12.277			78.57853	47.041	-10.464	
78665835411	12.014	78665835411	-9.96	78665835411	-12.179			78.66584	47.014	-9.96	
78753117207	11.916	78753117207	-9.724	78753117207	-12.292			78.75312	46.916	-9.724	
78840399002	11.827	78840399002	-9.704	78840399002	-12.174			78.8404	46.827	-9.704	
78927680798	11.756	78927680798	-9.456	78927680798	-12.56			78.92768	46.756	-9.456	
79014062954	11.714	79014062954	-9.544	79014062954	-12.624			79.01406	46.724	-9.544	
79102244389	11.736	79102244389	-9.091	79102244389	-12.788			79.10224	46.736	-9.091	
79189526185	11.756	79189526185	-8.971	79189526185	-12.857			79.18953	46.756	-8.971	
79276807980	11.715	79276807980	-8.952	79276807980	-13.05			79.27681	46.715	-8.952	
79364089776	11.624	79364089776	-9.042	79364089776	-13.376			79.36409	46.624	-9.042	
79451371571	11.421	79451371571	-8.869	79451371571	-13.129			79.45137	46.621	-8.869	
79538653367	11.212	79538653367	-8.717	79538653367	-13.198			79.53865	46.622	-8.717	
79625935162	11.102	79625935162	-8.712	79625935162	-12.648			79.62594	46.102	-8.712	
79713216958	11.14	79713216958	-8.326	79713216958	-13.259			79.71322	46.14	-8.326	
79800498753	11.286	79800498753	-8.144	79800498753	-12.923			79.8005	46.286	-8.144	
79887780549	11.418	79887780549	-8.257	79887780549	-13.05			79.88778	46.418	-8.257	
79975052344	11.413	79975052344	-8.07	79975052344	-13.135			79.97506	46.431	-8.07	
80062344140	11.331	80062344140	-7.905	80062344140	-13.074			80.06234	46.31	-7.905	
80149625935	11.187	80149625935	-8.193	80149625935	-12.873			80.14963	46.187	-8.193	
80236907731	11.138	80236907731	-8.141	80236907731	-12.94			80.23691	46.138	-8.141	
80324189526	11.157	80324189526	-8.742	80324189526	-13.005			80.32419	46.157	-8.742	
80411471322	11.167	80411471322	-8.525	80411471322	-12.623			80.41147	46.167	-8.525	
80498753117	11.212	80498753117	-8.653	80498753117	-12.849			80.49875	46.212	-8.653	
80586340913	11.245	80586340913	-8.805	80586340913	-12.788			80.58634	46.245	-8.805	
80673316708	11.234	80673316708	-8.973	80673316708	-12.827			80.67332	46.234	-8.973	
80760598504	11.154	80760598504	-9.641	80760598504	-12.789			80.7605	46.154	-9.641	
80847880299	11.055	80847880299	-10.231	80847880299	-13.544			80.84788	46.055	-10.231	
80935162095	10.954	80935162095	-10.762	80935162095	-13.423			80.93516	45.954	-10.762	
81022443990	10.858	81022443990	-10.517	81022443990	-13.846			81.02244	45.858	-10.517	
81109725686	10.734	81109725686	-11.171	81109725686	-13.717			81.10973	45.734	-11.171	
81197007481	10.633	81197007481	-11.552	81197007481	-13.615			81.19701	45.633	-11.552	
81284289277	10.517	81284289277	-12.187	81284289277	-13.305			81.28429	45.517	-12.187	
81371571072	10.407	81371571072	-12.596	81371571072	-14.063			81.37157	45.407	-12.596	
81458825968	10.3	81458825968	-12.734	81458825968	-13.937			81.45883	45.3	-12.734	
81546134663	10.195	81546134663	-13.225	81546134663	-14.002			81.54613	45.195	-13.225	
81633416459	10.048	81633416459	-13.3	81633416459	-14.135			81.63342	45.048	-13.3	
81720698254	9.835	81720698254	-13.659	81720698254	-14.044			81.7207	44.835	-13.659	
81807980050	9.616	81807980050	-14.002	81807980050	-14.7			81.80798	44.616	-14.002	
81895261845	9.429	81895261845	-14.162	81895261845	-14.945			81.89526	44.429	-14.162	
81982543641	9.3	81982543641	-13.966	81982543641	-14.779			81.98254	44.3	-13.966	
82069825436	9.169	82069825436	-13.889	82069825436	-15.005			82.06983	44.169	-13.889	
82157107232	9.135	82157107232	-13.898	82157107232	-15.151			82.15711	44.135	-13.898	
82244389027	9.067	82244389027	-14.209	82244389027	-15.799			82.24439	44.067	-14.209	
82331670823	8.902	82331670823	-14.395	82331670823	-15.409			82.33167	43.902	-14.395	
82418952618	8.683	82418952618	-14.417	82418952618	-15.376			82.41895	43.683	-14.417	
82506234414	8.432	82506234414	-13.777	82506234414	-15.515			82.50623	43.432	-13.777	
82593516209	8.185	82593516209	-13.407	82593516209	-14.083			82.59352	43.185	-13.407	
82680798005	7.998	82680798005	-13.225	82680798005	-14.365			82.6808	42.998	-13.225	
82768079800	7.891	82768079800	-13.788	82768079800	-13.752			82.76808	42.891	-13.788	
82855361596	7.806	82855361596	-13.436	82855361596	-13.563			82.85536	42.806	-13.436	
82942643392	7.64	82942643392	-12.797	82942643392	-13.26			82.94264	42.68	-12.797	

86957605985	9.665	86957605985	-3.928	86957605985	-14.832	86.87032	44.646	-4.032	-13.7
87044887781	9.708	87044887781	-3.628	87044887781	-15.675	86.95761	44.665	-3.928	-14.832
87132169576	9.716	87132169576	-3.491	87132169576	-16.397	87.00489	44.718	-3.628	-15.675
87219451372	9.671	87219451372	-3.417	87219451372	-18.392	87.13212	44.706	-3.491	-16.397
87306733167	9.627	87306733167	-3.499	87306733167	-19.026	87.21945	44.671	-3.417	-18.392
87394014963	9.633	87394014963	-3.711	87394014963	-20.655	87.30673	44.627	-3.499	-19.026
87481296758	9.663	87481296758	-3.969	87481296758	-23.613	87.39401	44.633	-3.711	-20.655
87568578554	9.611	87568578554	-3.93	87568578554	-25.241	87.4813	44.663	-3.969	-23.613
87655860349	9.641	87655860349	-3.933	87655860349	-24.377	87.56858	44.611	-3.93	-25.241
87743142145	9.589	87743142145	-4.414	87743142145	-24.665	87.65586	44.641	-3.933	-24.377
87830423940	9.465	87830423940	-4.466	87830423940	-23.097	87.74314	44.589	-4.414	-24.665
87917705736	9.3	87917705736	-4.518	87917705736	-24.165	87.83042	44.465	-4.466	-23.097
88004987531	9.21	88004987531	-4.504	88004987531	-23.97	87.91771	44.3	-4.518	-24.165
88092269327	9.207	88092269327	-4.559	88092269327	-24.016	88.00499	44.21	-4.504	-4.504
88179551122	9.262	88179551122	-4.532	88179551122	-21.743	88.09227	44.207	-4.559	-24.016
88266832918	9.168	88266832918	-4.507	88266832918	-19.627	88.17955	44.262	-4.532	-21.743
88354114713	9.868	88354114713	-4.762	88354114713	-20.045	88.26683	44.168	-4.597	-19.627
88441396509	8.778	88441396509	-4.991	88441396509	-16.983	88.35411	43.968	-4.762	-20.045
88528678304	8.666	88528678304	-5.073	88528678304	-16.505	88.4414	43.778	-4.991	-16.983
88615960100	8.643	88615960100	-5.057	88615960100	-16.236	88.52868	43.666	-5.073	-16.505
88703241895	8.641	88703241895	-5.188	88703241895	-15.458	88.61596	43.643	-5.057	-16.236
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88877805486	8.816	88877805486	-5.243	88877805486	-14.249	88.79052	43.718	-5.117	-14.89
88965087282	8.91	88965087282	-5.386	88965087282	-12.939	88.87781	43.816	-5.243	-14.249
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89226932668	8.992	89226932668	-5.595	89226932668	-11.523	89.13965	44.006	-5.598	-12.384
89314214464	8.946	89314214464	-5.752	89314214464	-10.858	89.22693	43.992	-5.595	-11.523
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90448877805	9.088	90448877805	-10.157	90448877805	-6.8	90.3616	43.987	-9.592	-6.815
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91059805074	9.801	91059805074	-13.297	91059805074	-6.375	90.97327	44.778	-13.011	-6.592
91147132170	9.852	91147132170	-13.901	91147132170	-6.373	91.05985	44.801	-13.297	-6.375
91234413965	9.951	91234413965	-14.214	91234413965	-6.304	91.14713	44.852	-13.901	-6.373
91321695761	10.099	91321695761	-14.53	91321695761	-6.312	91.23441	44.951	-14.214	-6.304
91408977556	10.228	91408977556	-15.187	91408977556	-6.244	91.3217	45.099	-14.53	-6.312
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91583514147	10.322	91583514147	-16.231	91583514147	-6.183	91.49626	45.327	-15.461	-6.189
91670822943	10.242	91670822943	-17.431	91670822943	-6.104	91.58354	45.322	-16.231	-6.183
91758104738	10.063	91758104738	-17.016	91758104738	-6.015	91.67082	45.242	-17.431	-6.104
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92019950125	9.507	92019950125	-19.202	92019950125	-5.721	91.93267	44.825	-19.504	-5.77
92107231920	9.457	92107231920	-19.856	92107231920	-5.647	92.01995	44.907	-19.202	-5.721
92194513716	9.405	92194513716	-18.581	92194513716	-5.521	92.10723	44.457	-19.856	-5.647
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92369077307	9.042	92369077307	-18.051	92369077307	-5.345	92.2818	44.358	-20.726	-5.4
92456359102	9.264	92456359102	-17.216	92456359102	-5.279	92.36908	44.262	-18.051	-5.345
92545460898	8.707	92545460898	-16.894	92545460898	-5.147	92.45636	44.044	-17.216	-5.279
92630922693	8.361	92630922693	-16.31	92630922693	-4.738	92.54364	43.707	-16.894	-5.147
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92892768080	7.768	92892768080	-13.456	92892768080	-4.7	92.80549	42.867	-13.992	-4.653
92980498785	7.748	92980498785	-12.967	92980498785	-4.84	92.89277	42.768	-13.456	-4.7
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93329177057	7.587	93329177057	-10.58	93329177057	-4.782	93.2419	42.672	-11.124	-4.736
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93503740648	7.279	93503740648	-9.931	93503740648	-4.864	93.41636	42.466	-9.809	-4.809
93591022444	7.13	93591022444	-9.443	93591022444	-4.85	93.50374	42.279	-9.931	-4.864
93678304239	7.034	93678304239	-9.182	93678304239	-5.227	93.59102	42.13	-9.443	-4.85
93765586035	6.974	93765586035	-8.819	93765586035	-5.188	93.6783	42.034	-9.182	-5.227
93852867830	6.949	93852867830	-8.652	93852867830	-5.303	93.76559	41.974	-8.819	-5.188
93940149626	6.917	93940149626	-8.603	93940149626	-5.515	93.85287	41.949	-8.652	-5.303
94027431421	6.817	94027431421	-8.452	94027431421	-5.916	93.94015	41.917	-8.603	-5.515
94114713217	6.68	94114713217	-8.371	94114713217	-6.061	94.02743	41.817	-8.452	-5.916
94201995012	6.504	94201995012	-8.012	94201995012	-6.026	94.11471	41.68	-8.371	-6.061
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94376558603	6.109	94376558603	-7.548	94376558603	-5.969	94.28928	41.336	-7.718	-5.886
94463840399	5.872	94463840399	-7.41	94463840399	-6.012	94.37656	41.109	-7.548	-5.969
94551122195	5.634	94551122195	-7.251	94551122195	-6.201	94.46384	40.872	-7.41	-6.012
94638403990	5.455	94638403990	-7.221	94638403990	-6.375	94.55112	40.634	-7.251	-6.201
94725685786	5.397	94725685786	-7.004	94725685786	-6.414	94.6384	40.455	-7.221	-6.375
94812967581	5.45	94812967581	-6.878	94812967581	-6.323	94.72569	40.397	-7.004	-6.414
94900249377	5.509	94900249377	-6.548	94900249377	-6.205	94.81297	40.45	-6.878	-6.323
94987531172	5.491	94987531172	-6.493	94987531172	-6.342	94.90025	40.509	-6.548	-6.205
9507812968	5.365	9507812968	-6.38	9507812968	-6.479	94.98753	40.491	-6.493	-6.342
95162094763	5.117	95162094763	-6.329	95162094763	-6.45	95.07481	40.365	-6.38	-6.479
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9533658354	4.593	9533658354	-5.889	9533658354	-5.889	95.24938	39.857	-6.09	-6.389
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1.04501e+11 -2.711 1.04501e+11 -7.43 1.04501e+11 -4.206
1.04589e+11 -2.719 1.04589e+11 -7.034 1.04589e+11 -4.093
1.04676e+11 -2.725 1.04676e+11 -6.741 1.04676e+11 -3.906
1.04763e+11 -2.764 1.04763e+11 -6.361 1.04763e+11 -3.758
1.0485e+11 -2.941 1.0485e+11 -6.139 1.0485e+11 -3.656
1.04938e+11 -3.15 1.04938e+11 -5.587 1.04938e+11 -3.521
1.05025e+11 -3.335 1.05025e+11 -5.199 1.05025e+11 -3.367
1.05112e+11 -3.419 1.05112e+11 -4.933 1.05112e+11 -3.137
1.052e+11 -3.389 1.052e+11 -4.688 1.052e+11 -2.966
1.05287e+11 -3.409 1.05287e+11 -4.346 1.05287e+11 -2.753
1.05374e+11 -3.375 1.05374e+11 -4.15 1.05374e+11 -2.65
1.05461e+11 -3.42 1.05461e+11 -4.104 1.05461e+11 -2.708
1.05549e+11 -3.549 1.05549e+11 -3.93 1.05549e+11 -2.686
1.05636e+11 -3.82 1.05636e+11 -3.722 1.05636e+11 -2.571
1.05723e+11 -4.142 1.05723e+11 -3.471 1.05723e+11 -2.414
1.0581e+11 -4.512 1.0581e+11 -3.31 1.0581e+11 -2.319
1.05898e+11 -4.776 1.05898e+11 -3.145 1.05898e+11 -2.211
1.05985e+11 -5.112 1.05985e+11 -2.955 1.05985e+11 -2.062
1.06072e+11 -5.433 1.06072e+11 -2.75 1.06072e+11 -1.912
1.0616e+11 -5.711 1.0616e+11 -2.703 1.0616e+11 -1.923
1.06247e+11 -6.043 1.06247e+11 -2.629 1.06247e+11 -1.959
1.06334e+11 -6.26 1.06334e+11 -2.56 1.06334e+11 -1.928
1.06421e+11 -6.545 1.06421e+11 -2.357 1.06421e+11 -1.816
1.06509e+11 -6.889 1.06509e+11 -2.228 1.06509e+11 -1.711
1.06596e+11 -7.166 1.06596e+11 -2.033 1.06596e+11 -1.582
1.06683e+11 -7.573 1.06683e+11 -1.848 1.06683e+11 -1.502
1.06771e+11 -7.743 1.06771e+11 -1.95 1.06771e+11 -1.672
1.06858e+11 -7.911 1.06858e+11 -2.15 1.06858e+11 -1.933
1.06945e+11 -7.946 1.06945e+11 -2.186 1.06945e+11 -2.01
1.07032e+11 -7.877 1.07032e+11 -1.994 1.07032e+11 -1.854
1.0712e+11 -7.885 1.0712e+11 -1.838 1.0712e+11 -1.728
1.07207e+11 -8.306 1.07207e+11 -1.78 1.07207e+11 -1.697
1.07294e+11 -8.468 1.07294e+11 -1.741 1.07294e+11 -1.714
1.07382e+11 -8.518 1.07382e+11 -1.7 1.07382e+11 -1.763
1.07469e+11 -8.652 1.07469e+11 -1.662 1.07469e+11 -1.747
1.07556e+11 -8.616 1.07556e+11 -1.703 1.07556e+11 -1.796
1.07643e+11 -8.553 1.07643e+11 -1.634 1.07643e+11 -1.706
1.07731e+11 -8.762 1.07731e+11 -1.654 1.07731e+11 -1.849
1.07818e+11 -8.652 1.07818e+11 -1.774 1.07818e+11 -2.013
1.07905e+11 -8.655 1.07905e+11 -2.076 1.07905e+11 -2.28
1.07993e+11 -8.789 1.07993e+11 -2.249 1.07993e+11 -2.483
1.0808e+11 -8.765 1.0808e+11 -2.102 1.0808e+11 -2.371
1.08167e+11 -8.902 1.08167e+11 -1.944 1.08167e+11 -2.134
1.08254e+11 -9.029 1.08254e+11 -1.782 1.08254e+11 -2.052
1.08342e+11 -9.564 1.08342e+11 -1.563 1.08342e+11 -1.912
1.08429e+11 -10.1 1.08429e+11 -1.5 1.08429e+11 -1.859
1.08516e+11 -10.483 1.08516e+11 -1.593 1.08516e+11 -1.942
1.08603e+11 -10.682 1.08603e+11 -1.744 1.08603e+11 -2.439
1.08691e+11 -10.734 1.08691e+11 -2.101 1.08691e+11 -2.524
1.08778e+11 -10.643 1.08778e+11 -1.854 1.08778e+11 -2.203
1.08865e+11 -10.341 1.08865e+11 -1.709 1.08865e+11 -2.096
1.08953e+11 -10.171 1.08953e+11 -1.646 1.08953e+11 -2.074
1.0904e+11 -9.973 1.0904e+11 -1.662 1.0904e+11 -2.126
1.09127e+11 -10.13 1.09127e+11 -1.539 1.09127e+11 -2.082
1.09214e+11 -10.319 1.09214e+11 -1.461 1.09214e+11 -2.013
1.09302e+11 -10.481 1.09302e+11 -1.422 1.09302e+11 -1.969
1.09389e+11 -10.572 1.09389e+11 -0.997 1.09389e+11 -1.832
1.09476e+11 -10.396 1.09476e+11 -0.835 1.09476e+11 -1.741
1.09564e+11 -10.201 1.09564e+11 -1.195 1.09564e+11 -1.777
1.09651e+11 -9.803 1.09651e+11 -1.28 1.09651e+11 -1.931
1.09738e+11 -9.386 1.09738e+11 -1.214 1.09738e+11 -1.862
1.09825e+11 -9.04 1.09825e+11 -1.102 1.09825e+11 -1.829
1.09913e+11 -9.158 1.09913e+11 -0.675 1.09913e+11 -1.439

98.91521 37.307 -2.629 -6.996
99.00249 37.43 -2.722 -7.09
99.08978 37.599 -2.805 -7.317
99.17706 37.807 -2.829 -7.446
99.26434 38.043 -2.719 -7.567
99.35162 38.2 -2.747 -7.663
99.4389 38.326 -2.763 -7.869
99.52618 38.425 -2.774 -8.135
99.61347 38.516 -2.843 -8.268
99.70075 38.593 -2.851 -8.597
99.78803 38.645 -2.845 -8.764
99.87531 38.725 -2.878 -9.146
99.96259 38.848 -2.972 -9.446
100.0499 38.958 -3.133 -9.816
100.1372 39.038 -3.257 -10.13
100.2244 39.079 -3.326 -10.613
100.3117 39.059 -3.422 -11.19
100.399 38.9 -3.496 -11.739
100.4863 38.683 -3.548 -12.077
100.5736 38.464 -3.647 -12.761
100.6608 38.294 -3.705 -13.609
100.7481 38.153 -3.862 -14.113
100.8354 38.027 -4.034 -15.062
100.9227 37.925 -4.167 -16.941
101.01 37.832 -4.304 -17.614
101.0973 37.669 -4.455 -18.897
101.1845 37.544 -4.653 -21.63
101.2718 37.453 -4.779 -22.366
101.3591 37.134 -4.963 -23.171
101.4464 36.977 -5.422 -22.185
101.5337 36.865 -5.562 -23.712
101.6209 36.76 -5.642 -24.294
101.7082 36.7 -5.762 -24.294
101.7955 36.574 -6.029 -23.506
101.8828 36.434 -6.334 -21.904
101.9701 36.28 -6.751 -18.878
102.0574 36.145 -7.048 -17.17
102.1446 36.047 -7.421 -16.103
102.2319 35.907 -8.045 -14.382
102.3192 35.785 -8.603 -13.665
102.4065 35.58 -9.009 -12.536
102.4938 35.459 -9.627 -11.374
102.581 35.322 -10.374 -10.926
102.6683 35.14 -11.319 -10.165
102.7556 35.019 -12.396 -9.548
102.8429 35 -13.009 -8.987
102.9302 34.975 -13.662 -8.352
103.0175 35.019 -14.187 -7.899
103.1047 34.956 -14.384 -7.509
103.192 34.858 -14.456 -7.136
103.2793 34.657 -14.357 -6.878
103.3666 34.428 -13.769 -6.594
103.4539 34.236 -13.272 -6.317
103.5411 34.124 -12.616 -6.093
103.6284 34.096 -12.022 -5.968
103.7157 34.044 -11.451 -5.831
103.803 33.987 -10.913 -5.307
103.8903 33.863 -10.13 -5.068
103.9786 33.671 -9.633 -4.785
104.0648 33.513 -9.105 -4.587
104.1521 32.946 -8.682 -4.587
104.2394 32.638 -8.336 -4.414
104.3267 32.476 -8.067 -4.34
104.414 32.33 -7.809 -4.357
104.5012 32.289 -7.43 -4.206
104.5885 32.281 -7.034 -4.093
104.6758 32.275 -6.741 -3.906
104.7631 32.236 -6.361 -3.758
104.8504 32.059 -6.139 -3.656
104.9377 31.85 -5.587 -3.521
105.0249 31.665 -5.199 -3.367
105.1122 31.581 -4.933 -3.137
105.1995 31.611 -4.688 -2.966
105.2868 31.591 -4.346 -2.753
105.3741 31.625 -4.15 -2.65
105.4613 31.58 -4.104 -2.686
105.5486 31.451 -3.93 -2.708
105.6359 31.18 -3.722 -2.571
105.7232 30.858 -3.471 -2.414
105.8105 30.488 -3.31 -2.319
105.8978 30.224 -3.145 -2.211
105.985 29.888 -2.952 -2.062
106.0723 29.567 -2.75 -1.912
106.1596 29.289 -2.703 -1.923
106.2469 28.97 -2.629 -1.959
106.3342 28.74 -2.56 -1.928
106.4214 28.455 -2.437 -1.763
106.5087 28.111 -2.228 -1.711
106.596 27.834 -2.033 -1.582
106.6833 27.427 -1.848 -1.502
106.7706 27.257 -1.95 -1.672
106.8579 27.089 -2.15 -1.933
106.9451 27.054 -2.186 -2.01
107.0324 27.123 -1.994 -1.854
107.1197 27.115 -1.838 -1.728
107.207 26.694 -1.78 -1.697
107.2943 26.532 -1.741 -1.714
107.3815 26.482 -1.7 -1.763
107.4688 26.348 -1.662 -1.747
107.5561 26.384 -1.703 -1.796
107.6434 26.447 -1.634 -1.706
107.7307 26.238 -1.654 -1.849
107.818 26.348 -1.774 -2.013
107.9052 26.345 -2.076 -2.28
107.9925 26.211 -2.249 -2.483
108.0798 26.235 -2.102 -2.371
108.1671 26.098 -1.944 -2.134
108.2544 25.971 -1.782 -2.052
108.3416 25.436 -1.563 -1.912
108.4289 24.9 -1.5 -1.859
108.5162 24.519 -1.593 -1.942
108.6035 24.318 -1.744 -2.439
108.6908 24.266 -2.101 -2.524
108.7781 24.357 -1.854 -2.203
108.8653 24.659 -2.096 -2.074
108.9526 24.829 -1.646 -2.074
109.0399 25.027 -1.662 -2.126
109.1272 24.87 -1.539 -2.082
109.2145 24.681 -1.461 -2.013
109.3017 24.519 -1.422 -1.969
109.389 24.428 -1.397 -1.997
109.4763 24.604 -0.835 -1.741
109.5636 24.799 -1.195 -1.777
109.6509 25.197 -1.28 -1.931
109.7382 25.614 -1.214 -1.862
109.8254 25.96 -1.02 -1.829
109.9127 25.842 -0.675 -1.439



15385 OXNARD ST
VAN NUYS, CA 91411

CERTIFICATE OF CONFORMANCE

Model Number:	KT-E8257DS10
Serial Number:	US52140176
Asset Number:	1320457C
Description:	75GHz-110GHz Millimeter Source module
Test Date:	02/27/19
Calibration Facility:	ELECTRO RENT CORPORATION (WDC) 15385 OXNARD ST VAN NUYS, CA 91411

The equipment listed above meets or exceeds published specifications and has been tested or otherwise verified using industry accepted methods. This certification shall not be reproduced except in full, without the written approval of Electro Rent Corporation.'

Electro Rent Corporation
Authorized Signature
KARL HAYNES

A handwritten signature in black ink, appearing to read 'Karl Haynes', is written over a horizontal line.

Certificate of Compliance

Certificate No: 9502719A-160728-3

Manufacturer: OML, Inc.

Model/Part No: S10MS-AG

Serial/ID No: 160728-3

Description: WR-10 Millimeter Wave Source Module, 75-110 GHz

Keysight P/N: 0955-1811

Date of Test: February 14, 2019

Temperature: (23 +/- 5) deg C

Humidity: 20 to 65% RH

Procedure:

This certifies that the above product was tested in compliance with OML specifications using applicable OML's procedures.

As Received : Physical Condition: Good
Within Tolerance: No

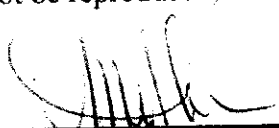
As Shipped: At the completion of the test, the product COMPLIED with the performance capability.

Remarks: Repair Service

Traceability Information: Traceability is to national standards administered by U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories. Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements. Supporting documentation relative to traceability is available for review by appointment.

In the absence of power standards above 110 GHz, power measurements and conversion loss measurements above 110 GHz are to confirm operation functionality and traceable only to OML.

This certificate shall not be reproduced, except in full, without the written approval of OML.



Mitzi Chow, Material Manager

02/15/2019

Date

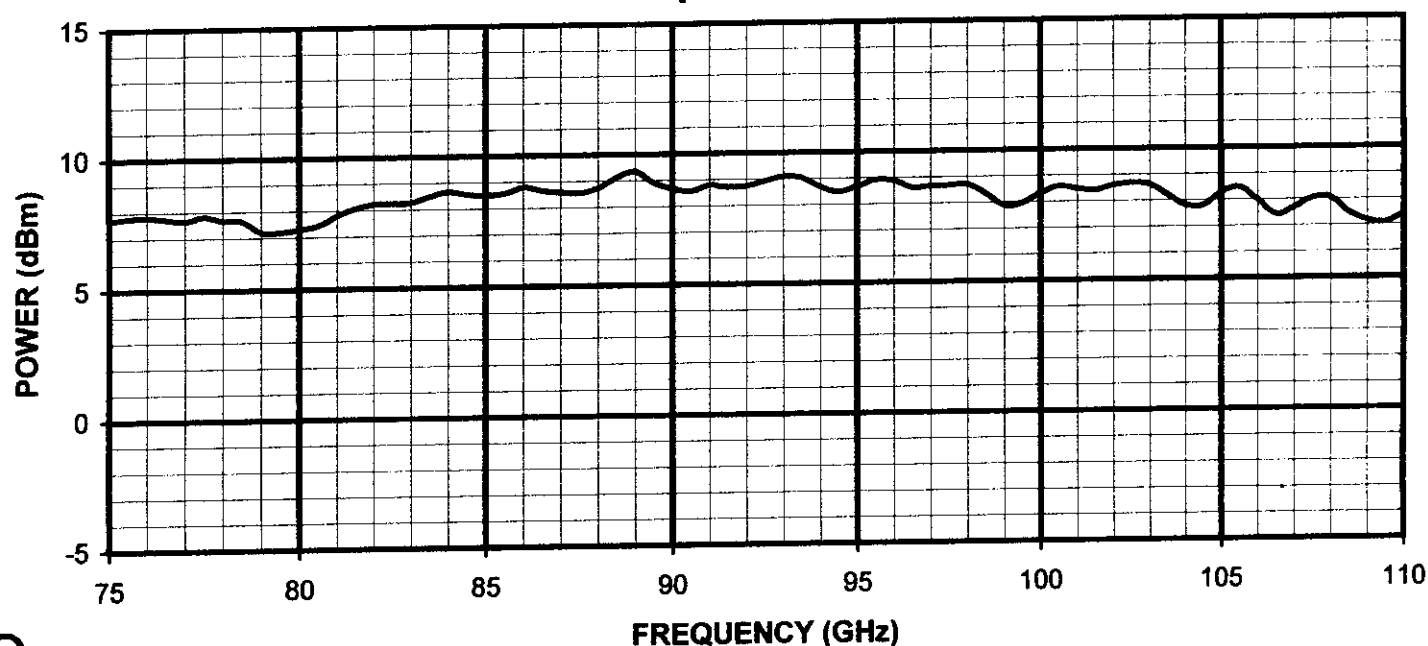
OML Inc.

300 Digital Drive, Morgan Hill, CA 95037 USA Tel. (408) 779 2698 Fax (408) 778 0491

S10MS-AG S/N: 160728-3

2/14/2019

Output Power



OML INC.

300 Digital Drive, Morgan Hill, CA 95037

Model S10MS-AG

S/N: 160728-3

2/14/2019

Tested By: LV

Output Power Test Data

Frequency (GHz)	Pwr Out (dBm)
75.00	7.69
75.50	7.78
76.00	7.81
76.50	7.73
77.00	7.65
77.50	7.82
78.00	7.66
78.50	7.63
79.00	7.20
79.50	7.19
80.00	7.28
80.50	7.43
81.00	7.80
81.50	8.07
82.00	8.22
82.50	8.23
83.00	8.27
83.50	8.48

Frequency (GHz)	Pwr Out (dBm)
84.00	8.65
84.50	8.55
85.00	8.49
85.50	8.56
86.00	8.79
86.50	8.65
87.00	8.59
87.50	8.54
88.00	8.73
88.50	9.14
89.00	9.35
89.50	8.90
90.00	8.68
90.50	8.57
91.00	8.79
91.50	8.70
92.00	8.74
92.50	8.92

Frequency (GHz)	Pwr Out (dBm)
93.00	9.09
93.50	9.05
94.00	8.68
94.50	8.48
95.00	8.68
95.50	8.92
96.00	8.88
96.50	8.61
97.00	8.66
97.50	8.68
98.00	8.71
98.50	8.34
99.00	7.87
99.50	7.96
100.00	8.32
100.50	8.58
101.00	8.48
101.50	8.42

Frequency (GHz)	Pwr Out (dBm)
102.00	8.61
102.50	8.68
103.00	8.62
103.50	8.20
104.00	7.81
104.50	7.80
105.00	8.28
105.50	8.47
106.00	7.98
106.50	7.43
107.00	7.69
107.50	8.04
108.00	8.05
108.50	7.47
109.00	7.18
109.50	7.09
110.00	7.42

OML INC.

9502719A

300 Digital Drive, Morgan Hill, CA 95037



15385 OXNARD ST
VAN NUYS, CA 91411

CERTIFICATE OF CONFORMANCE

Model Number: KT-E8257DS15
Serial Number: US52140139
Asset Number: 1608082A
Description: 50GHz-75GHz Millimeter Source
module
Test Date: 12/15/17
Calibration Facility: ELECTRO RENT CORPORATION (WDC)
15385 OXNARD ST
VAN NUYS, CA 91411

The equipment listed above meets or exceeds published specifications and has been tested or otherwise verified using industry accepted methods. This certification shall not be reproduced except in full, without the written approval of Electro Rent Corporation.

Electro Rent Corporation
Authorized Signature
KARL HAYNES

A handwritten signature in black ink, appearing to read 'Karl Haynes', is written over a horizontal line.

Certificate of Compliance

Certificate No: 6517717A-140312-1

Manufacturer: OML, Inc.

Model/Part No: S15MS-AG (Funct Verif)

Serial/ID No: 140312-1

Description: Module Source Millimeter Wave, WR-15, 50-75 GHz (Functional Verification)

Keysight P/N: 0955-1809 (Funct Verif)

Date of Test: December 4, 2017

Temperature: (23 +/- 5) deg C

Humidity: 20 to 65% RH

Procedure:

This certifies that the above product was tested in compliance with OML specifications using applicable OML's procedures.

As Received : Physical Condition: Good
Within Tolerance: Yes

As Shipped: At the completion of the test, the product **COMPLIED** with the performance capability.

Remarks:

Traceability Information: Traceability is to national standards administered by U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories. Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements. Supporting documentation relative to traceability is available for review by appointment.

In the absence of power standards above 110 GHz, power measurements and conversion loss measurements above 110 GHz are to confirm operation functionality and traceable only to OML.

This certificate shall not be reproduced, except in full, without the written approval of OML.



Mitzi Chow, Material Manager

12/05/2017

Date

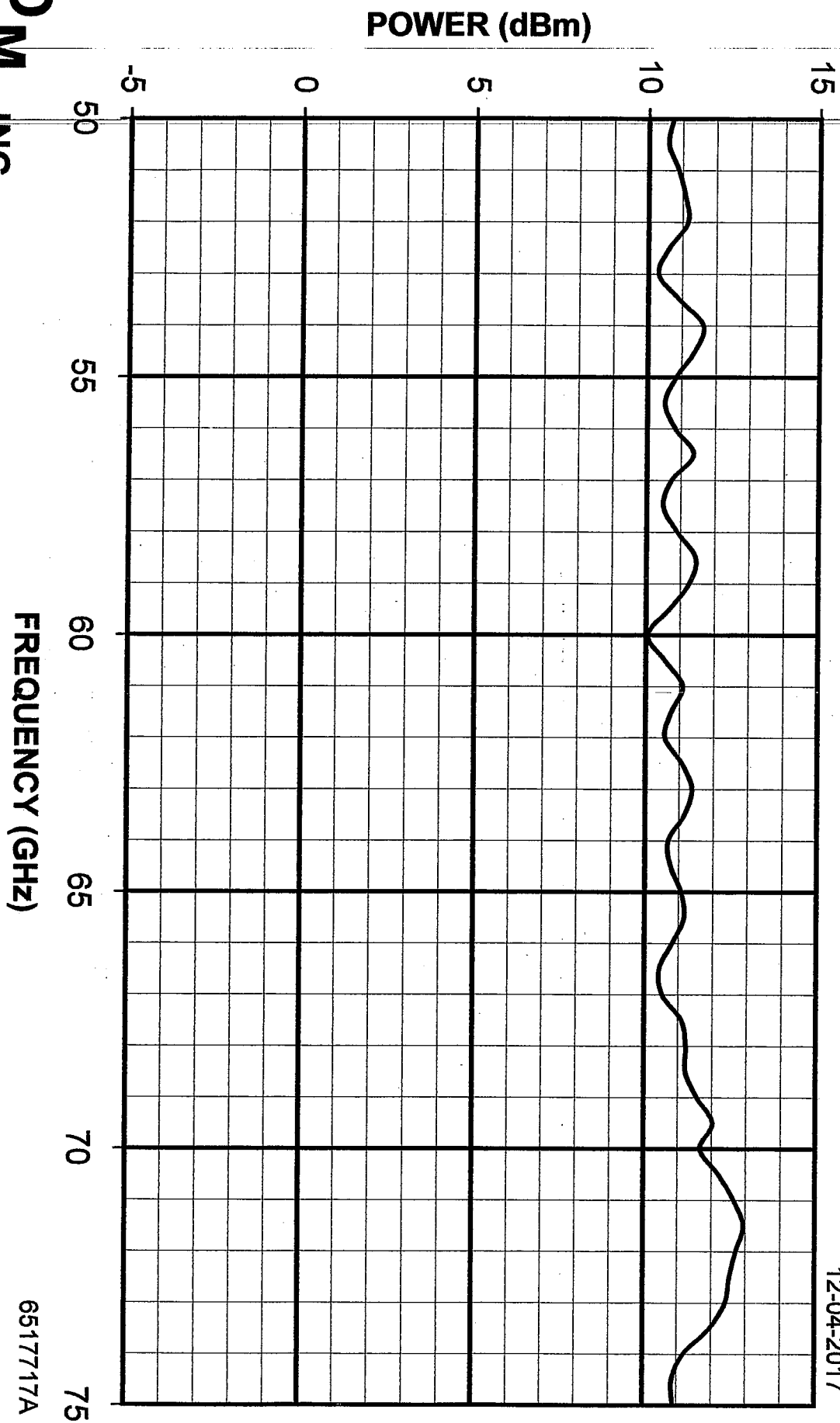
OML Inc.

300 Digital Drive, Morgan Hill, CA 95037 USA Tel. (408) 779 2698 Fax (408) 778 0491

S15MS-AG Power Output

Ser No. 140312-1

12-04-2017



OML INC.

FREQUENCY (GHz)

POWER (dBm)

6517717A

Morgan Hill, CA 95037



15385 OXNARD ST
VAN NUYS, CA 91411

CALIBRATION CERTIFICATE

Certificate Number: 1778667D-07/22/19

Calibration Date: 07/22/19

Procedure Method: VENDOR CAL

Revision Level: REMARKS

Calibration Facility:

ROHDE & SCHWARZ
zavod Vimperk, s.r.o.
SPIDROVA 49, CZ-385 01
VIMPERK, CZECH REPUBLIC

The equipment listed has been calibrated using the method identified above.

Measurements are traceable to the SI as defined by the documentary standards to which compliance is claimed through the calibration equipment identified on the following page, or the supplier's certificate.

Reported results of calibration are based on calibration procedure test limits, test ratios or measurement uncertainty and decision risk rules of the documentary standards to which compliance is claimed. Electro Rent Corp. does not report indeterminate results.

Calibration measurement results with units of measurement and associated measurement uncertainty information calculated using GUM methods, or as provided by the calibration procedure are identified with the asset number in order to ensure that the page(s) is (are) recognized as a part of this calibration certificate.

This certificate and associated report may not be reproduced except in full without approval of Electro Rent Corporation.

Electro Rent West Coast Distribution Center quality management system implements ISO 9001 and is registered. Our calibration system implements ISO/IEC 17025, ANSI Z540-1, and MIL-STD-45662A.

This calibration certificate and any associated report is not intended to demonstrate traceability per ILAC P10.

Manufacturer:	Rohde & Schwarz
Model Number:	SMW200A-44
Serial Number:	107056
Asset Number:	1778667D
Description:	100kHz to 44GHz Vector Signal Generator
Customer:	COMPLIANCE TESTING 1724 S. NEVADA WAY MESA, AZ 85204
Customer PO:	6424
Performance upon receipt:	WITHIN MFR SPECS
Results of calibration:	IN TOL NO ADJ
Ambient Temp:	70.0F
Relative Humidity:	50.00%
Date of Issue:	04/21/20
Calib Due Date:	07/22/22
OS Build:	NA
Firmware:	4.60.092.24SP2

Laboratory Manager:
Alejandra Salazar

Technician:
Bernardo Gonzalez

CALIBRATION CERTIFICATE

Model Number: SMW200A-44

Asset Number: 1778667D

Certificate Number: 1778667D-07/22/19

Serial Number: 107056

Calibration Date: 07/22/19

Calibration Equipment

Description	Model	Asset	Certificate Number	Cal. Due
N/A	N/A	N/A	N/A	N/A

Remarks:

VENDOR CALIBRATION CERTIFICATE NO. 17-818537-C