



MEASUREMENT REPORT

FCC PART 30.203 RSE

FCC ID: 2ABGH-R678L5
Application: Reliance Communications LLC

Product: Orbic Myra
Model No.: R678L5
FCC Rule Part(s): Part 30.203
Test Date: May 26 ~ 27, 2021

Reviewed By:

Sunny Sun

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2105RSU077-U1	Rev. 01	Initial Report	05-27-2021	Invalid
2105RSU077-U1	Rev. 02	Added Extension Module Conversion Loss Data	05-29-2021	

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1. GENERAL INFORMATION

1.1. Applicant

Reliance Communications LLC
 91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States

1.2. Manufacturer

ZJY RIGHT SOURCE INDIA PRIVATE LIMITED
 MIDC industrial Area, Shiravane · Nerul, India

1.3. Testing Facility

<input checked="" type="checkbox"/>	<p>Test Site - MRT Suzhou Laboratory</p> <p>Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China</p> <p>Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China</p> <p>Laboratory Accreditations</p> <table data-bbox="256 1106 1489 1256"> <tr> <td>A2LA: 3628.01</td> <td>CNAS: L10551</td> </tr> <tr> <td>FCC: CN1166</td> <td>ISED: CN0001</td> </tr> <tr> <td colspan="2">VCCI: R-20025, G-20034, C-20020, T-20020</td> </tr> </table>	A2LA: 3628.01	CNAS: L10551	FCC: CN1166	ISED: CN0001	VCCI: R-20025, G-20034, C-20020, T-20020	
A2LA: 3628.01	CNAS: L10551						
FCC: CN1166	ISED: CN0001						
VCCI: R-20025, G-20034, C-20020, T-20020							
<input type="checkbox"/>	<p>Test Site - MRT Shenzhen Laboratory</p> <p>Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China</p> <p>Laboratory Accreditations</p> <table data-bbox="256 1473 1489 1570"> <tr> <td>A2LA: 3628.02</td> <td>CNAS: L10551</td> </tr> <tr> <td>FCC: CN1284</td> <td>ISED: CN0105</td> </tr> </table>	A2LA: 3628.02	CNAS: L10551	FCC: CN1284	ISED: CN0105		
A2LA: 3628.02	CNAS: L10551						
FCC: CN1284	ISED: CN0105						
<input type="checkbox"/>	<p>Test Site - MRT Taiwan Laboratory</p> <p>Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)</p> <p>Laboratory Accreditations</p> <table data-bbox="256 1787 1489 1879"> <tr> <td>TAF: L3261-190725</td> <td></td> </tr> <tr> <td>FCC: 291082, TW3261</td> <td>ISED: TW3261</td> </tr> </table>	TAF: L3261-190725		FCC: 291082, TW3261	ISED: TW3261		
TAF: L3261-190725							
FCC: 291082, TW3261	ISED: TW3261						

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	Orbic Myra
Model No.:	R678L5
IMEI:	357758890004155
Operating Temperature:	-10°C to +50°C
Power Type:	4.40VDC to 3.00VDC (nominal: 3.85VDC)
5G NR FR2 Specification	
Band:	n260
SCS for NR cell:	120kHz

2.2. Product Specification Subjective to this Report

Frequency Range:	n260: 37000 ~ 40000MHz
Support Bandwidth:	Single Carrier: 50MHz
Modulation:	DFT-s-OFDM: QPSK / 16QAM / 64QAM

Note: The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

2.3. Test Methodology

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26:2015
- FCC CFR 47 Part 30
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 842590 D01 Upper Microwave Flexible Use Service v01r01

2.4. Device Capabilities

The NR radio operation is controlled via software tool QRCT FTM mode (Factory mode). The EUT is forced to operate continuously (100% duty cycle) with maximum output power during the test.

2.5. Test Mode Applicability

Test Item	Beam ID	Axis (X, Y, Z)
n260		
Spurious Emission	161	Y

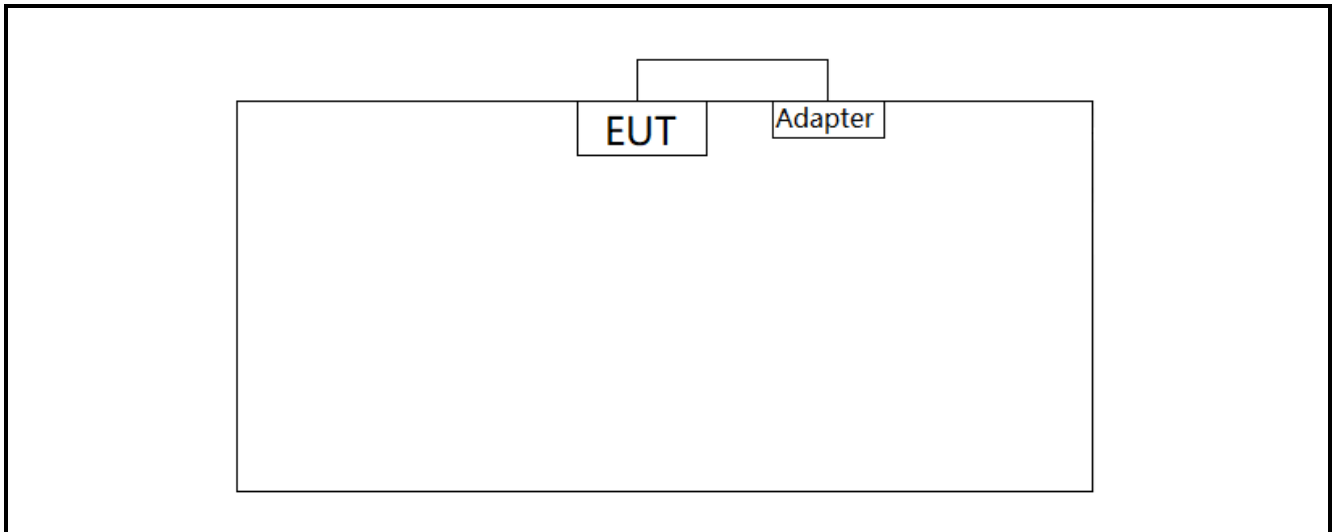
Test Item	BW (MHz)		Modulation				CH.	RB		
	50	100	BPSK	QPSK	16QAM	64QAM		1	Inner	Full
Spurious Emission	√	--	--	√	--	--	L, M, H	√	--	--

Note: The mark "√" means that this configuration is chosen for testing.

2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.7. Configuration of Tested System



2.8. Calculations of Measurement Result

EIRP Calculation

$$\text{EIRP (dBm)} = \text{Spectrum Analyzer Level(dBm)} - \text{Antenna Gain (dBi)} + \text{Converter Loss(dB)} + 20\log(F) + 20\log(D) - 27.56$$

Where:

F: frequency (MHz)

D: Distance (m)

Example:

The frequency we select is 111.077GHz and the distance is 1m.

$$\begin{aligned} \text{Offset} &= - \text{Antenna Gain (dBi)} + \text{converter Loss(dB)} + 20\log(F) + 20\log(D) - 27.56 \\ &= -24.70 + 11.60 + 100.91 + 20\log (1) - 27.56 \\ &= 60.25 \text{ dB} \end{aligned}$$

The test results in the screenshot already include this offset.

2.9. Minimum Measurement Distance Evaluation

According to KDB842590 D01, the measurements of the fundamental emission, out of band, harmonics and spurious emissions shall be made in the far field of the measurement antenna. The far-field boundary for mmW antennas is greater than or equal to $2D^2/\lambda$ (with D being the largest dimension of the antenna, and λ the wavelength of the emission). When the selected far-field measurement distance is different than the distance at which the applicable limit is specified, a linear inverse distance attenuation factor (20 dB/decade of distance change for field strength) shall be applied.

For fundamental or out-of-band emissions the largest far-field distance of either the EUT antenna or measurement antenna shall be used. For spurious emissions the far-field distance will be based on the measurement antenna.

Spurious Emission

Frequency Range GHz)	Measurement Distance (m)
110 ~ 140	1
140 ~ 220	1

2.10. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 75%RH

3. TEST EQUIPMENT CALIBRATION DATE

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Asset No.
EXA Signal Analyzer	Keysight	N9030B	MY57140549	3Hz-50GHz	2020/08/31	2021/08/30	MRTSUE06395
Micro-Wave Antenna	MI-WWAVE	261F-25	385	90~140GHz	2016/12/26	N/A	MRTSUE06275
Micro-Wave Antenna	MI-WWAVE	261G	387	140~220GHz	2016/12/26	N/A	MRTSUE06274
SA Extension Module	Keysight	N9029AV06	US53250010	110-170GH	N/A	N/A	MRTSUE06368
SA Extension Module	Keysight	N9029AV05	US53250008	140-220 GHz	N/A	N/A	MRTSUE06367
Thermal Hygrometer	testo	608-H1	1945229024	T: 0~50°C; H: 10~95%RH	2020/12/04	2021/12/03	MRTSUE06622
Anechoic Chamber	RIKEN	SIP-AC3	N/A	N/A	2020/12/25	2021/12/24	MRTSUE06782

4. TEST RESULT

4.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
30.203	Spurious Emission	< -13dBm	Radiated	Pass	Section 4.2

Note: Per 2.1057(a)(2), spurious emissions were investigated up to 200GHz for n260.

4.2. Radiated Spurious Emissions Measurements

4.2.1. Test Limit

All out of band emissions are measured in a radiated test setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The conductive power or total radiated power of any emissions outside a licensee's frequency block shall be -13dBm/1MHz.

4.2.2. Test Procedure Used

ANSI C63.26-2015 - Section 5.7.4

KDB 842590 D01 v01 Section 4.4.2 and Section 4.4.3

4.2.3. Test Setting

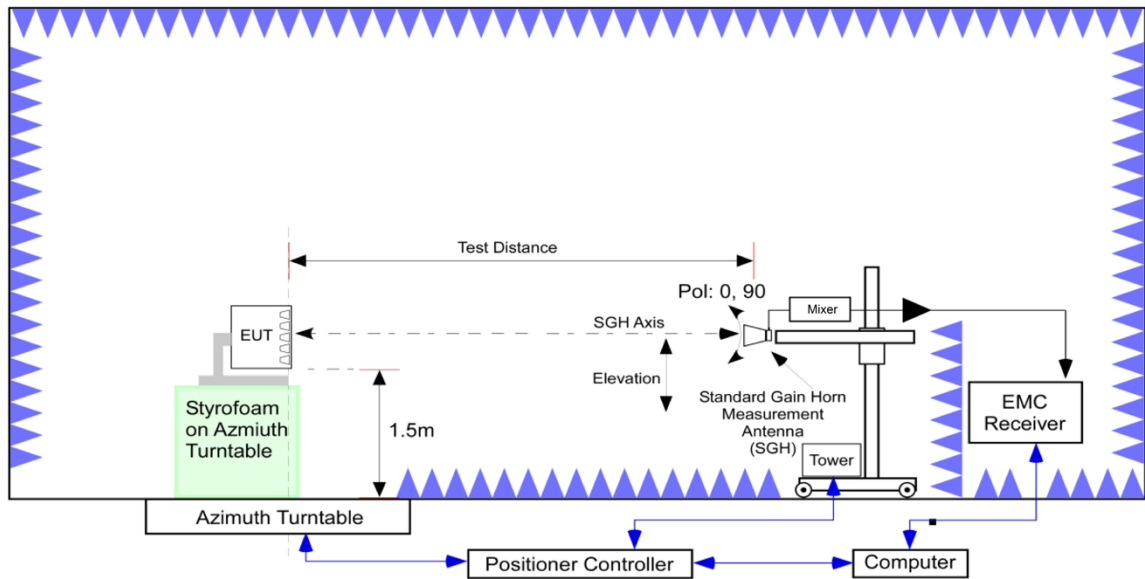
1. RBW = 1MHz
2. VBW $\geq 3 \times$ RBW
3. Sweep time $\geq 10 \times$ (number of points in sweep) \times (transmission symbol period)
4. Detector = RMS
5. Trace mode = Trace Average
6. The trace was allowed to stabilize

Test Note:

- 1) All radiated spurious emissions were measured as EIRP to compare with the §30.203 TRP limits.
- 2) The plots from 110-200GHz show corrected average EIRP levels and Harmonic Mixer Conversion Loss was also applied to the spectrum analyzer.

4.2.4. Test Setup

110GHz ~ 200GHz Test Setup:



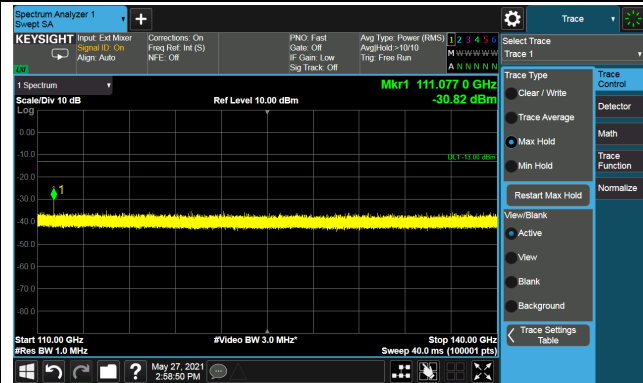
4.2.5. Test Result

Product	Orbic Myra	Test Site	SIP-AC3
Test Engineer	Andy Zhu	Test Date	2021/05/26 ~ 2021/05/27
Test Mode	n260_SISO Mode_Beam ID 161_110GHz ~ 140GHz		

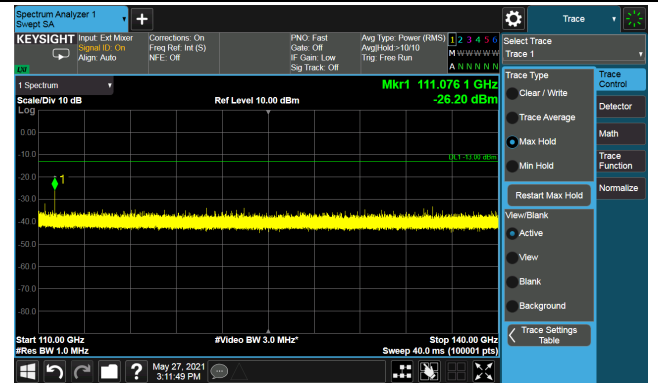
CH	BW (MHz)	RB	EIRP (dBm)		Limit (dBm)	Result
			H	V		
Low	50	1RB	-30.82	-26.20	≤ -13.00	Pass
Middle		1RB	-33.16	-32.87	≤ -13.00	Pass
High		1RB	-29.82	-28.86	≤ -13.00	Pass

Radiated Spurious Emissions - 50MHz

Low Channel_1RB (Horizontal)



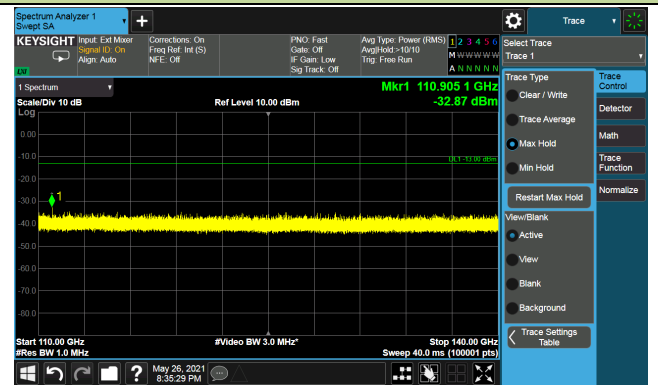
Low Channel_1RB (Vertical)



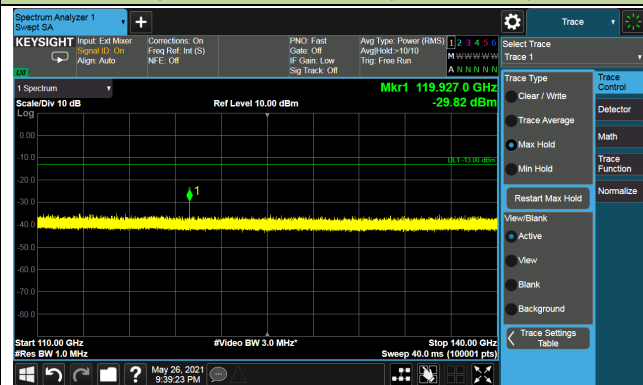
Middle Channel_1RB (Horizontal)



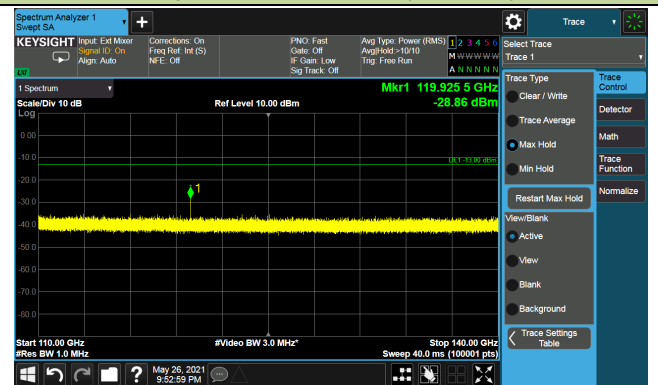
Middle Channel_1RB (Vertical)



High Channel_1RB (Horizontal)



High Channel_1RB (Vertical)

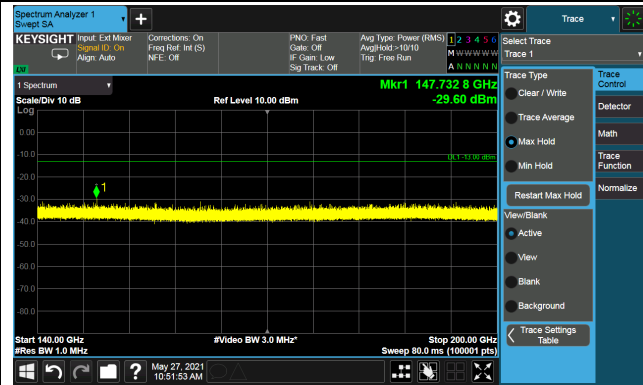


Product	Orbic Myra	Test Site	SIP-AC3
Test Engineer	Andy Zhu	Test Date	2021/05/26 ~ 2021/05/27
Test Mode	n260_SISO Mode_Beam ID 161_140GHz ~ 200GHz		

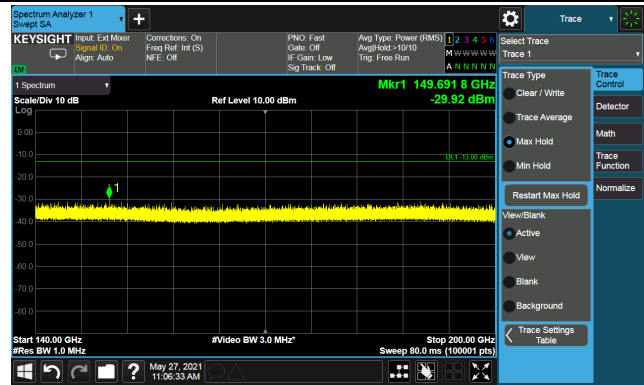
CH	BW (MHz)	RB	EIRP (dBm)		Limit (dBm)	Result
			H	V		
Low	50	1RB	-29.60	-29.92	≤ -13.00	Pass
Middle		1RB	-29.79	-29.59	≤ -13.00	Pass
High		1RB	-30.00	-29.47	≤ -13.00	Pass

Radiated Spurious Emissions - 50MHz

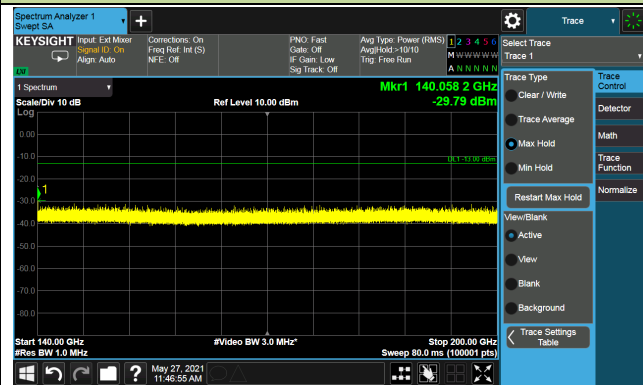
Low Channel_1RB (Horizontal)



Low Channel_1RB (Vertical)



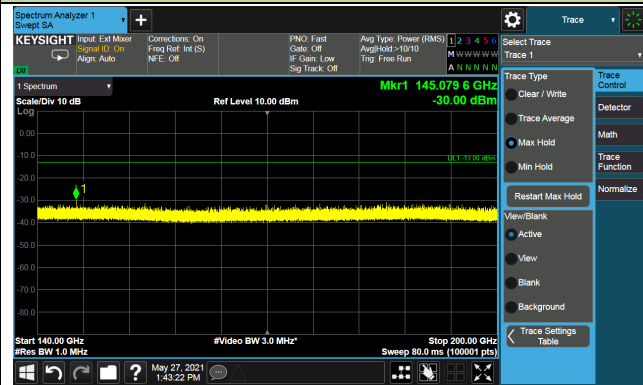
Middle Channel_1RB (Horizontal)



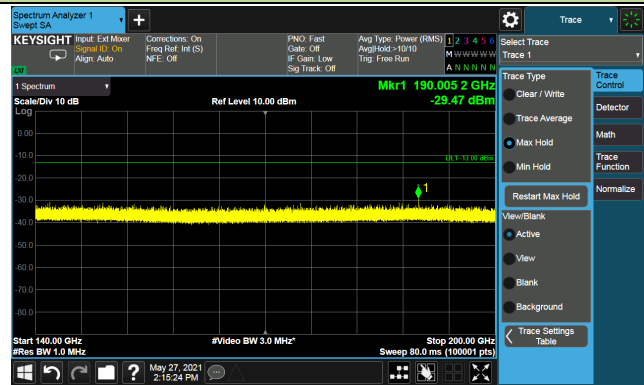
Middle Channel_1RB (Vertical)



High Channel_1RB (Horizontal)



High Channel_1RB (Vertical)



The End

Appendix A - Test Setup Photograph

Refer to "2015RSU077-ET" file.

Appendix B - Equipment Calibration Certificate

Micro-Wave Antenna - 90 - 140G

MI-WAVE

Millimeter Products Inc.

2200 Tall Pines Drive
Suite 100
Largo, FL 33771
Tel. (727) 536-0033
Fax. (727) 536-0012

Test Data Sheet
261F-25/385

Specifications

Frequency Range 90 to 140 GHz WR-08

Frequency (GHz)	Gain (db)
90.0	23.4
95.0	23.7
100.0	24.1
105.0	24.4
110.0	24.7
115.0	25.0
120.0	25.2
125.0	25.4
130.0	25.5
135.0	25.7
140.0	25.9

Tested by _____ Date _____

Micro-Wave Antenna - 140 - 220G

MI-WAVE**Millimeter Products Inc.**

2200 Tall Pines Drive
Suite 100
Largo, Fl. 33771
Tel. (727) 536-0033
Fax. (727) 536-0012

Test Data Sheet
261G-25/387

Specifications

Frequency Range 140 to 220 GHz WR-05

Frequency (GHz)	Gain (db)
140.0	23.5
145.0	23.7
150.0	23.9
155.0	24.1
160.0	24.3
165.0	24.6
170.0	24.8
175.0	25.0
180.0	25.1
190.0	25.4
200.0	25.6
210.0	25.7
220.0	25.8

Tested by _____ Date _____

N9029AV06 Conversion Loss Data

SAX 176 Conversion Loss

Note: Out of band data is not guaranteed to be accurate.

Freq(GHz)	*A* LQIF Input/Output	*B* Standard Input	*C* High Freq. Input	High Freq. Intrinsic Mixer Loss	Standard Freq. Intrinsic Mixer Loss
140.00	11.4588	-1.4689	-1.1281	10.66788047	10.36615107
140.80	11.5383	-1.3966	-0.8949	10.88445437	10.46186817
141.60	11.0189	-1.8996	-1.9279	9.962309889	10.0161337
142.40	10.8230	-2.0928	-2.1223	10.0455533	10.0609166
143.20	10.2839	-2.6194	-2.6477	9.508234121	9.546945621
144.00	10.5276	-2.3855	-2.5330	9.458753579	9.608467179
144.80	10.7186	-2.2001	-2.4504	9.609950087	9.881112787
145.60	10.8598	-2.0535	-2.0581	10.19231355	10.16894805
146.40	10.8396	-2.0897	-2.0531	10.19016384	10.17169774
147.20	10.3411	-2.5892	-2.7161	9.437689045	9.574288845
148.00	10.1682	-2.7440	-2.7252	9.408286151	9.392292651
148.80	10.4312	-2.4774	-2.4081	9.79993444	9.67248044
149.60	11.1054	-1.8015	-1.7468	10.52887381	10.44524801
150.40	10.9527	-1.9540	-1.9272	10.34188617	10.33444037
151.20	10.3938	-2.5121	-2.4870	9.969389872	9.670622072
152.00	10.0649	-2.8426	-2.8004	9.303334237	9.210159837
152.80	10.0625	-2.8467	-2.8216	9.28854158	9.218848958
153.60	10.9989	-1.8028	-1.8725	10.41448511	10.35928111
154.40	10.6115	-2.2663	-2.2781	9.98289159	9.98084519
155.20	9.9906	-2.9172	-2.9040	9.232475278	9.223703778
156.00	9.5977	-3.3441	-3.3780	8.631205481	8.638550281
156.80	9.6287	-3.2796	-3.2513	8.78514206	8.71267446
157.60	9.8245	-2.9870	-2.9418	9.281546722	9.160326222
158.40	10.3302	-2.5753	-2.5254	9.689105406	9.611893206
159.20	9.7828	-3.1165	-3.0783	9.083578478	9.043654878
160.00	9.6837	-3.2248	-3.1909	8.886140831	8.840970031
160.80	9.8528	-3.2572	-3.1940	9.911378848	9.816688548
161.60	10.0687	-2.8443	-2.7812	9.426544062	9.330216262
162.40	10.1788	-2.7300	-2.6757	9.551188073	9.490809673
163.20	10.1639	-2.7477	-2.7008	9.480541232	9.421341632
164.00	9.7690	-3.1477	-3.1004	9.014170048	8.932272048
164.80	9.8200	-3.0928	-3.0789	9.029248704	8.974455004
165.60	9.8428	-3.2897	-3.3014	8.77746016	8.78549898
166.40	10.1895	-2.7244	-2.8486	9.286234378	9.404854578
167.20	10.4734	-2.4413	-2.8359	9.343438032	9.591399132
168.00	10.5109	-2.4007	-2.8911	9.235984312	9.733901412
168.80	10.4358	-2.4741	-3.1097	9.677928285	9.610299785
169.60	10.2394	-2.6723	-2.7157	9.382580716	9.427808916
170.40	9.7855	-3.1266	-3.1283	8.953232776	8.921142476
171.20	10.1972	-2.7088	-2.7452	9.354368723	9.390848423
172.00	10.4727	-2.4353	-2.4847	9.658711115	9.675122015
172.80	9.8584	-2.9546	-3.0205	9.054821716	9.10789416
173.60	9.8533	-3.0535	-3.0679	9.655593372	9.002038172
174.40	10.0012	-2.9077	-2.8314	9.10793709	9.13874748
175.20	10.0303	-2.8807	-2.8791	9.175037865	9.172098065
176.00	9.8435	-3.0670	-3.0647	8.9984844	8.990178
176.80	9.9023	-3.0076	-3.0454	9.003381543	9.046049543
177.60	9.7478	-3.1641	-3.1713	8.824558927	8.880734327
178.40	10.0611	-2.8518	-3.0974	9.625458423	9.191780023
179.20	9.8826	-3.0488	-3.1822	8.845248548	9.980053448
180.00	10.3755	-2.5384	-3.0120	9.029815844	9.524103744
180.80	10.5314	-2.3831	-3.0691	9.820277037	9.869018137
181.60	9.9890	-2.9225	-3.4418	8.533230484	9.086123884
182.40	10.5806	-2.3181	-3.3588	8.640489768	9.714027368
183.20	10.2080	-2.7072	-3.1000	9.850815175	9.354088475
184.00	10.2501	-2.8607	-2.9562	9.133575293	9.424542593
184.80	10.1688	-2.7125	-2.7617	9.378246845	9.427821345
185.60	10.0237	-2.8884	-2.9445	9.174109124	9.221868424
186.40	10.1178	-2.7959	-2.8354	9.289582295	9.325865895
187.20	9.9116	-2.8994	-3.0523	9.085384894	9.119477464
188.00	10.2098	-2.7005	-2.7483	9.434581485	9.468879185
188.80	10.6880	-2.2278	-2.2225	10.009038823	10.00143813
189.60	10.7574	-2.1584	-2.1584	10.08530002	10.08454792
190.40	10.5986	-2.3148	-2.3551	9.848088812	9.869417112

181.20	10.8515	-2.2597	-2.5395	9.596112581	9.835388381
182.00	10.3762	-2.5347	-2.8489	9.233843018	9.509887518
182.80	10.7083	-2.2067	-2.5091	9.927841926	9.939343326
183.60	10.8837	-2.0458	-2.3240	9.834861264	10.07647596
184.40	10.7557	-2.1589	-2.4970	9.840362477	9.958975877
185.20	10.2193	-2.6975	-2.8702	9.178648947	9.353598347
186.00	9.8135	-3.1019	-3.1988	8.758904457	8.849940857
186.80	9.5998	-3.3150	-3.3476	8.563703458	8.588409458
187.60	9.6098	-3.3054	-3.2870	8.621510827	8.592115427
188.40	9.4016	-3.5132	-3.5036	8.382574022	8.362881022
189.20	9.8133	-3.3037	-3.3083	8.618485337	8.628573137
200.00	9.5727	-3.3428	-3.3266	8.583992575	8.528602975
200.80	9.3390	-3.5772	-3.5687	8.288918047	8.284485547
201.60	9.2757	-3.6425	-3.6303	8.20791295	8.20144825
202.40	9.1883	-3.7203	-3.7082	8.123187399	8.108725599
203.20	9.0726	-3.8420	-3.8361	7.980378757	7.987916757
204.00	9.2989	-3.6217	-3.6117	8.264910727	8.246487927
204.80	9.7615	-3.1578	-3.1471	8.750031069	8.746040169
205.60	9.5844	-3.3309	-3.3189	8.547339897	8.538325497
206.40	9.6159	-3.2975	-3.2884	8.6038188	8.5929101
207.20	9.6157	-3.3059	-3.3010	8.612665198	8.590490598
208.00	9.8286	-3.2908	-3.2821	8.682428982	8.680478282
208.80	9.8952	-3.0234	-3.0145	8.853587078	8.864641578
209.60	10.0502	-2.8666	-2.8589	9.11055119	9.10742358
210.40	10.1977	-2.7188	-2.7033	9.208525342	9.198636042
211.20	9.9833	-2.9544	-2.9384	8.94524481	8.93983491
212.00	10.0197	-2.8945	-2.8813	9.001238918	8.998306918
212.80	10.1718	-2.7425	-2.7240	9.173380152	9.147048352
213.60	10.2939	-2.6181	-2.6015	9.326128482	9.308896882
214.40	10.3931	-2.5179	-2.4978	9.40018897	9.39856807
215.20	10.5424	-2.3655	-2.3485	9.591691957	9.581215557
216.00	10.5280	-2.3849	-2.3649	9.545030582	9.509073882
216.80	10.7628	-2.1532	-2.1237	9.803154612	9.724883912
217.60	10.5425	-2.3716	-2.3583	9.477087775	9.447100775
218.40	10.6178	-2.2950	-2.2767	9.529118206	9.504559306
219.20	10.6078	-2.3078	-2.2875	9.544223225	9.539591525
220.00	10.7875	-2.1217	-2.1098	9.74300038	9.74548638



N9029AV05 Conversion Loss Data

SAX 177 Conversion Loss

Note: Out of band data is not guaranteed to be accurate.

Freq(GHz)	*A* LO/F Input/Output	*B* Standard Input	*C* High Freq. Input	High Freq. Intrinsic Mixer Loss	Standard Freq. Intrinsic Mixer Loss
110	11.69394112	-3.383080078	-3.284527978	10.15474872	10.08337012
110.6	11.57308777	-3.498883729	-3.568193529	9.794878271	9.884229971
111.2	11.991107	-3.0770951	-3.2918364	9.878209	10.1049851
111.8	11.98779418	-3.074686436	-2.975434636	10.08663260	10.02448926
112.4	11.00529689	-4.068990307	-4.025038407	9.266936593	9.237336893
113	10.8932281	-4.210285397	-4.217390897	9.255584503	9.263078203
113.6	10.81497407	-4.162371434	-4.168123534	9.318568966	9.329251366
114.2	10.98089864	-4.084266657	-4.083900257	9.409154243	9.408753643
114.8	11.06061826	-4.015066241	-4.004458541	8.432385059	8.428768159
115.4	11.35193185	-3.720155048	-3.648222748	9.542657852	9.495904952
116	11.41763792	-3.654806184	-3.617458484	9.814491316	9.600500416
116.6	11.46837949	-3.809815605	-3.612824805	9.744009295	9.748827795
117.2	11.24994817	-3.832973226	-3.858941326	9.598371174	9.626489574
117.8	12.13468057	-2.939075634	-2.967265634	10.62186057	10.64800317
118.4	11.81514805	-3.281666348	-3.283169949	10.28307455	10.31377575
119	11.07245991	-4.001813685	-4.040085185	9.433749615	9.475085215
119.6	10.6021445	-4.475087598	-4.462485498	8.848882102	8.849794802
120.2	10.87841275	-4.398393646	-4.368865446	8.914752254	8.901209254
120.8	10.54034826	-4.635781244	-4.503172944	8.733091458	8.713703958
121.4	10.43898939	-4.639304805	-4.641873005	8.723823495	8.731438295
122	10.73766783	-4.34008807	-4.38364627	9.06399843	9.08444773
122.6	11.18180133	-3.80750617	-3.93438927	9.60312263	9.64052633
123.2	10.98582437	-4.09134563	-4.13101613	9.38273377	9.42317707
123.8	10.60572598	-4.473785537	-4.509993337	8.908536963	8.951818863
124.4	10.26158773	-4.814082667	-4.814838667	8.527585333	8.547649433
125	10.29704907	-4.778142334	-4.744799034	8.503953466	8.487753966
125.6	10.2894205	-4.784598796	-4.769808196	8.504213204	8.500806604
126.2	10.14617007	-4.930938233	-4.935063433	8.412498067	8.427475267
126.8	10.32517229	-4.763898515	-4.762939815	8.680832985	8.723357985
127.4	10.72703083	-4.350809068	-4.391482668	9.108328532	9.151334732
128	10.59098882	-4.488057181	-4.554195581	8.916502319	8.989968219
128.6	10.29146755	-4.789838747	-4.852441347	8.543852553	8.621792853
129.2	10.13747132	-4.940275684	-4.954822484	8.358197716	8.383355616
129.8	10.13804141	-4.84301379	-4.82917239	8.31752111	8.31847441
130.4	10.05111355	-5.02571785	-4.99910985	8.20328965	8.18416085
131	9.844265812	-5.134197988	-5.131907288	8.135189812	8.144953112
131.6	9.819267062	-5.158011838	-5.171745638	8.150525602	8.171902802
132.2	10.21798389	-4.864689005	-4.889313705	8.488845195	8.501053695
132.8	10.17548614	-4.901746898	-4.933984598	8.420893002	8.464122902
133.4	10.13821303	-4.942454274	-4.951791874	8.302748726	8.328267426
134	10.12951225	-4.84837645	-4.86958725	8.29808545	8.33451345
134.6	10.18168064	-4.894931257	-4.906888757	8.344387243	8.367777443
135.2	9.971954358	-5.104816044	-5.117878744	8.110247358	8.131887958
135.8	9.807437586	-5.268872504	-5.278411704	7.954848998	7.978983298
136.4	9.697643456	-5.379426544	-5.403232944	7.851486756	7.883915856
137	9.860205948	-5.116276252	-5.148837452	8.127309348	8.165217948
137.6	9.825817484	-5.151427516	-5.178410316	8.081951784	8.116921984
138.2	9.919354108	-5.158658792	-5.188668192	8.073004208	8.118487708
138.8	10.23777035	-4.839845954	-4.868235954	8.398365246	8.432570246
139.4	10.13998518	-4.938238138	-4.967744738	8.274453482	8.312944482
140	10.08040165	-4.996442152	-5.018328252	8.192915048	8.227040348
140.6	9.898714896	-5.087688934	-5.109378534	8.100458896	8.134820996
141.2	10.12940486	-4.947642842	-4.968378442	8.259190758	8.291700658
141.8	10.25036338	-4.827805798	-4.852789398	8.392201804	8.427210804
142.4	10.18987487	-4.908530031	-4.930509131	8.324533469	8.355295569
143	10.1487116	-4.930242597	-4.956637797	8.273785103	8.313417903
143.6	10.05827483	-5.017984267	-5.046291167	8.207837633	8.246257233
144.2	10.0936837	-4.983466998	-5.011733298	8.258377602	8.294802302
144.8	10.08779964	-4.988928863	-5.021805163	8.258250237	8.303108537
145.4	10.14393933	-4.833785874	-4.951389374	8.297843626	8.330268026
146	10.19878762	-4.879904076	-4.918414776	8.415587724	8.468979124
146.6	10.33665906	-4.738089742	-4.788201342	8.598551858	8.657389158
147.2	10.28622714	-4.777755558	-4.824343158	8.547858641	8.605455341
147.8	10.40400017	-4.872716727	-4.722047627	8.653449973	8.716958773

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148.4	10.41871373	-4.055994760	-4.701166668	8.690555834	8.716235734
149	10.61704995	-4.45634625	-4.49627305	8.89344215	8.94058145
149.6	10.78381732	-4.287180877	-4.326787077	9.082489423	9.139747823
150.2	10.91422847	-4.154844731	-4.201813831	9.243608789	9.303173869
150.8	10.89784612	-4.177070275	-4.218218975	9.226124325	9.279521225
151.4	11.03332666	-4.045804506	-4.112178606	9.321604294	9.394774394
152	11.04539127	-4.023083433	-4.089204333	9.332892267	9.418491867
152.6	10.64526085	-4.429078151	-4.489656051	8.871888749	8.957024449
153.2	10.26146891	-4.782218881	-4.833392881	8.478825509	8.549272809
153.8	10.18745393	-4.880304071	-4.921833271	8.364928529	8.417208029
154.4	10.26688537	-4.806173332	-4.838881932	8.439852788	8.487441588
155	10.18598004	-4.910518985	-4.940348465	8.306378035	8.353188035
155.6	10.2248956	-4.8492024	-4.8873778	8.3736428	8.4067188
156.2	9.984389189	-5.091653101	-5.095343001	8.100506899	8.112460389
156.8	9.936263262	-5.139303038	-5.149130538	8.058394362	8.078223262
157.4	10.10350448	-4.974325217	-4.976439617	8.203510983	8.217241383
158	10.01580289	-5.059739813	-5.056429713	8.083083087	8.101893287
158.6	10.04992727	-5.028637534	-5.021229834	8.134158168	8.143541068
159.2	9.999188909	-5.079774791	-5.073828391	8.084533109	8.091975109
159.8	10.26292388	-4.811482617	-4.825544117	8.400794483	8.422885583
160.4	10.42051028	-4.654485639	-4.674805839	8.635616881	8.668203961
161	10.40855468	-4.689038023	-4.698050523	8.649440877	8.684748877
161.6	10.5859407	-4.4875449	-4.5083804	8.832814	8.8608311
162.2	10.58910213	-4.485138288	-4.500858188	8.781372232	8.810040232
162.8	10.23480207	-4.841260135	-4.794720735	8.381583585	8.335323885
163.4	10.78013128	-4.315841219	-4.243530019	8.800906881	8.745507281
164	10.7436443	-4.331558504	-4.308102804	8.816804798	8.812476398
164.6	10.39260314	-4.682340061	-4.690930261	8.508988339	8.529903439
165.2	10.7390084	-4.390418604	-4.350948504	8.812247498	8.840071698
165.8	10.7744961	-4.2844983	-4.3188387	8.971459	9.0040597
166.4	10.68898975	-4.404105245	-4.414225845	8.851824455	8.888804855
167	10.6084867	-4.463358295	-4.459720395	8.744884205	8.740988805
167.6	11.01030085	-4.082801647	-4.067280247	9.001789853	9.007694853
168.2	11.72842324	-3.347318758	-3.306085858	9.053628442	9.818054842
168.8	11.39978122	-3.674839879	-3.634377579	9.382207421	9.329430421
169.4	11.05544431	-4.015085485	-3.982721885	9.104862415	9.094423915
170	11.12089528	-3.951708841	-3.952433341	9.228127259	9.237770759