

2.3. Model : N9029AV06, S/N : SAX789



Measurement Report

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea 17383
 Tel :82-31-645-6900, www.hct.co.kr

보고서번호(Report No) : IC-2022-002777
 측정번호(Measurement No) : C-2022-003631

페이지(page) : 1 of 4

1. 의뢰자 (Client)

- 기관명 (Name) : 유엘코리아(주)
- 주소 (Address) : 경기도 수원시 영통구 매영로 218

2. 대상품목 (Measurement Item)

◇ HCT 등록번호 : 409608

- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식(Manufacturer and Model Name) : VDI / SAX WR6.5
- 기기번호 (Serial Number) : SAX789

3. 측정일자 (Measurement date) : 2022.01.16

4. 측정환경 (Environment)

- 온도(Temperature) : (22.5 ± 0.2) °C
- 습도(Humidity) : (46 ± 2) % R.H.

5. 측정방법 (Measurement method used)

상기 기기는 고주파 스펙트럼 분석기의 교정절차(HCT-CS-125-40641)에 따라 국가측정표준기관으로부터 측정의 소급성이 확보된 아래의 표준장비와 자체 점검된 장비를 이용하여 점검 되었음.

측정에 사용한 표준장비 명세 (List of used standards/specifications)

기기명 (Description)	제작회사 / 형식 (Manufacturer and Model Name)	기기번호 (Serial Number)	차기교정예정일자 (The due date of next Calibration)	교정기관 (Calibration laboratory)
EXG ANALOG SIGNAL GENERATOR	KEYSIGHT/N5173B	MY61252589	2022/10/15	(주)에이치시티
ERICKSON POWER METER	VDI/PM5	394V	자체점검	(주)에이치시티
WR-05 MULTIPLIER SOURCE MODULE	OML/S05MS-A	160419-1	자체점검	(주)에이치시티
WR-08 MULTIPLIER SOURCE MODULE	OML/S08MS-A	160419-1	자체점검	(주)에이치시티

6. 측정결과 (Measurement result) : 측정결과 참조 (Refer to attachment)

위 이 측정결과는 의뢰자가 제시한 시료 및 시료명에만 한정됩니다.
 The measurement results shown in this report refer only to the sample(s) measured unless otherwise stated.

확 인 (Affirmation)	작성자 (Tested by)	승인자 (Approved by)
	성명 (Name) : 고 형 재	직위 (Title) : 기술책임자(Technical Manager) 성명 (Name) : 김 광 철

이 성적서는 ILAC MRA 서명 기관인 KOLAS(Korea Laboratory Accreditation Scheme)와 A2LA (American Laboratory for Laboratory Accreditation)의 인정과 무관합니다. This calibration certificate is Not an accredited report by KOLAS(Korea Laboratory Accreditation Scheme) and A2LA(American Association for Laboratory Accreditation), a ILAC MRA signatory.

2022. 01. 17



(주)에이치시티 대표이사
 President, HCT Co., Ltd.



※ 측정결과는 측정기의 정밀정확도에 영향을 미치는 요소(과부하, 온도, 습도 등)의 급격한 변화가 발생한 경우에는 무효가 됩니다. If any significant instability or other adverse factor(overload, temperature, humidity etc.) manifests itself before, during or after calibration, and is likely to affect the validity of the calibration.

F-02P-02-010 (Rev.01)

■고객사 관리번호: SUW-E0253

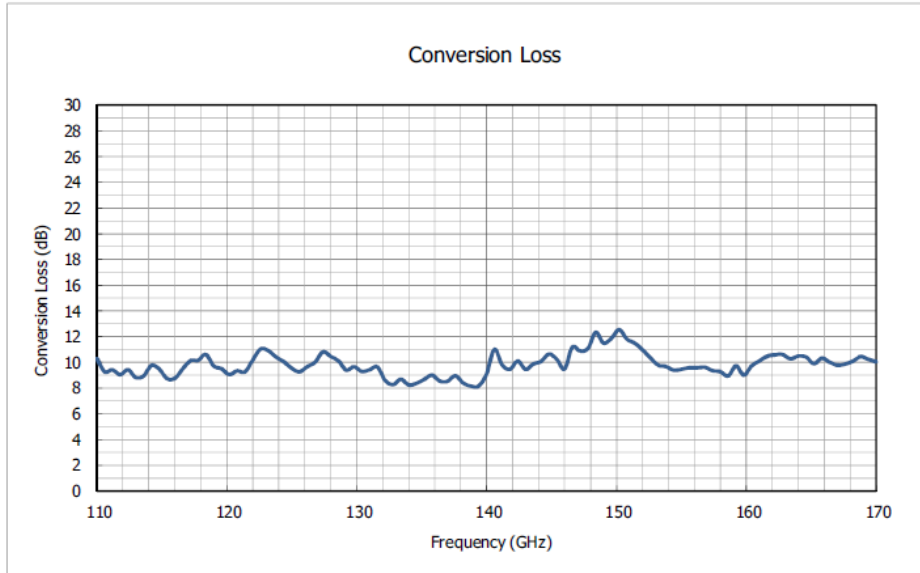
MEASUREMENT RESULT

보고서번호(Report No) : IC-2022-002777

페이지(page) : 2 of 4

측정번호(Measurement No) : C-2022-003631

1. Conversion Loss Graph



Note 1) Measurement Condition : RF = -30 dBm, Harmonic Order = 24, L.O. Level = 10 dBm, IF = 322.5 MHz, Bias Value = 0.00 mV

Note 2) This is the result of measuring the requested equipment and Keysight N9040B (SN MY60080268) together.

Note 3) In the absence of power standards above 110 GHz, power measurements above 110 GHz are to confirm operation functionality and traceable only to HCT.

Note 4) The above results were measured at the request of the customer.

F-02P-02-010 (Rev.01)

MEASUREMENT RESULT

보고서번호(Report No) : IC-2022-002777

페이지(page) : 3 of 4

측 정 번 호(Measurement No) : C-2022-003631

2. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
110.0	10.32	0.82	128.0	10.47	0.82
110.6	9.27	0.82	128.6	10.11	0.82
111.2	9.42	0.82	129.2	9.40	0.82
111.8	9.04	0.82	129.8	9.67	0.82
112.4	9.43	0.82	130.4	9.29	0.82
113.0	8.82	0.82	131.0	9.43	0.82
113.6	8.95	0.82	131.6	9.64	0.82
114.2	9.76	0.82	132.2	8.59	0.82
114.8	9.48	0.82	132.8	8.27	0.82
115.4	8.74	0.82	133.4	8.70	0.82
116.0	8.76	0.82	134.0	8.25	0.82
116.6	9.48	0.82	134.6	8.37	0.82
117.2	10.13	0.82	135.2	8.68	0.82
117.8	10.16	0.82	135.8	9.01	0.82
118.4	10.61	0.82	136.4	8.54	0.82
119.0	9.72	0.82	137.0	8.53	0.82
119.6	9.50	0.82	137.6	8.96	0.82
120.2	9.05	0.82	138.2	8.39	0.82
120.8	9.34	0.82	138.8	8.15	0.82
121.4	9.27	0.82	139.4	8.17	0.82
122.0	10.17	0.82	140.0	9.10	0.82
122.6	11.04	0.82	140.6	11.01	0.86
123.2	10.91	0.82	141.2	9.80	0.86
123.8	10.42	0.82	141.8	9.46	0.86
124.4	10.04	0.82	142.4	10.10	0.86
125.0	9.55	0.82	143.0	9.46	0.86
125.6	9.27	0.82	143.6	9.87	0.86
126.2	9.66	0.82	144.2	10.07	0.86
126.8	10.01	0.82	144.8	10.65	0.86
127.4	10.81	0.82	145.4	10.25	0.86
146.0	9.49	0.86	158.6	8.95	0.86
146.6	11.18	0.86	159.2	9.73	0.86
147.2	10.89	0.86	159.8	9.01	0.86
147.8	11.08	0.86	160.4	9.72	0.86
148.4	12.33	0.86	161.0	10.11	0.86
149.0	11.50	0.86	161.6	10.47	0.86
149.6	11.85	0.86	162.2	10.59	0.86

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MEASUREMENT RESULT

보고서번호(Report No) : IC-2022-002777

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측 정 번 호(Measurement No) : C-2022-003631

2. Conversion Loss Data (cont.)

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
150.2	12.54	0.86	162.8	10.61	0.86
150.8	11.81	0.86	163.4	10.27	0.86
151.4	11.49	0.86	164.0	10.50	0.86
152.0	10.98	0.86	164.6	10.41	0.86
152.6	10.36	0.86	165.2	9.89	0.86
153.2	9.80	0.86	165.8	10.32	0.86
153.8	9.68	0.86	166.4	10.02	0.86
154.4	9.40	0.86	167.0	9.78	0.86
155.0	9.47	0.86	167.6	9.88	0.86
155.6	9.57	0.86	168.2	10.10	0.86
156.2	9.57	0.86	168.8	10.45	0.86
156.8	9.62	0.86	169.4	10.22	0.86
157.4	9.36	0.86	170.0	10.05	0.86
158.0	9.28	0.86	-	-	-

END.

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2.4. Model : N9029AV04, S/N : SAX791



Measurement Report

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea 17383
 Tel :82-31-645-6900, www.hct.co.kr

보고서번호(Report No) : IC-2022-002781
 측정번호(Measurement No) : C-2022-003635

페이지(page) : 1 of 4

1. 의뢰자 (Client)

- 기관명 (Name) : 유엘코리아(주)
- 주소 (Address) : 경기도 수원시 영통구 매영로 218

2. 대상 품목 (Measurement Item)

- ◇ HCT 등록번호 : 409612
- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식(Manufacturer and Model Name) : VDI / SAX WR4.3
- 기기번호 (Serial Number) : SAX791

3. 측정일자 (Measurement date) : 2022.01.15

4. 측정환경 (Environment)

- 온도(Temperature) : (22.4 ± 0.2) °C
- 습도(Humidity) : (45 ± 2) % R.H.

5. 측정방법 (Measurement method used)

상기 기기는 고주파 스펙트럼 분석기의 교정절차(HCT-CS-125-40641)에 따라 국가측정표준기관으로부터 측정의 소급성이 확보된 아래의 표준장비와 자체 점검된 장비를 이용하여 점검 되었습니다.

측정에 사용한 표준장비 명세 (List of used standards/specifications)

기기명 (Description)	제작회사 / 형식 (Manufacturer and Model Name)	기기번호 (Serial Number)	차기교정예정일자 (The due date of next Calibration)	교정기관 (Calibration laboratory)
EXG ANALOG SIGNAL GENERATOR	KEYSIGHT/N5173B	MY61252589	2022/10/15	(주)에이치시티
ERICKSON POWER METER	VDI/PM5	394V	자체점검	(주)에이치시티
WR-03 MULTIPLIER SOURCE MODULE	OML/S03MS-A	160419-1	자체점검	(주)에이치시티
WR-05 MULTIPLIER SOURCE MODULE	OML/S05MS-A	160419-1	자체점검	(주)에이치시티

6. 측정결과 (Measurement result)

: 측정결과 참조 (Refer to attachment)

위 측정결과는 의뢰자가 제시한 시료 및 시료명에만 한정됩니다.
 The measurement results shown in this report refer only to the sample(s) measured unless otherwise stated.

확 인 (Affirmation)	작성 자 (Tested by)	승인 자 (Approved by)
	성명 (Name) : 고 형 재	직위 (Title) : 기술책임자(Technical Manager) 성명 (Name) : 김 광 철

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2022. 01. 17



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 President, HCT Co., Ltd.



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F-02P-02-010 (Rev.01)

■고객사 관리번호: SUW-E0254

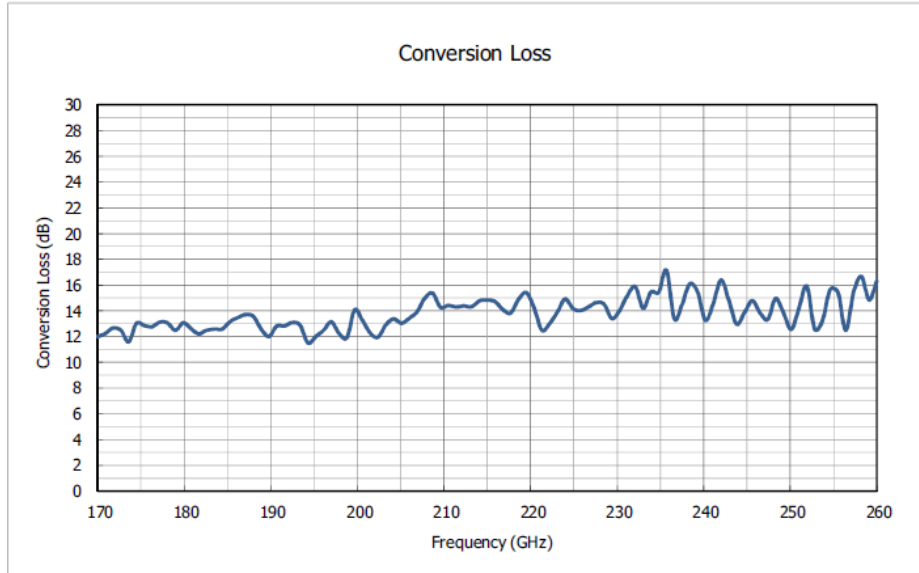
MEASUREMENT RESULT

보고서번호(Report No) : IC-2022-002781

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측정번호(Measurement No) : C-2022-003635

1. Conversion Loss Graph



Note 1) Measurement Condition : RF = -30 dBm, Harmonic Order = 36, L.O. Level = 10 dBm, IF = 322.5 MHz, Bias Value = 0.00 mV

Note 2) This is the result of measuring the requested equipment and Keysight N9040B (SN MY60080268) together.

Note 3) In the absence of power standards above 110 GHz, power measurements above 110 GHz are to confirm operation functionality and traceable only to HCT.

Note 4) The above results were measured at the request of the customer.

F-02P-02-010 (Rev.01)

MEASUREMENT RESULT

보고서번호(Report No) : IC-2022-002781

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측 정 번 호(Measurement No) : C-2022-003635

2. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
170.0	11.99	0.86	197.0	13.14	0.86
170.9	12.24	0.86	197.9	12.24	0.86
171.8	12.66	0.86	198.8	11.92	0.86
172.7	12.48	0.86	199.7	14.07	0.86
173.6	11.60	0.86	200.6	13.24	0.86
174.5	13.02	0.86	201.5	12.27	0.86
175.4	12.85	0.86	202.4	11.95	0.86
176.3	12.76	0.86	203.3	12.91	0.86
177.2	13.13	0.86	204.2	13.37	0.86
178.1	13.04	0.86	205.1	13.04	0.86
179.0	12.48	0.86	206.0	13.42	0.86
179.9	13.07	0.86	206.9	13.92	0.86
180.8	12.61	0.86	207.8	14.99	0.86
181.7	12.21	0.86	208.7	15.36	0.86
182.6	12.49	0.86	209.6	14.27	0.86
183.5	12.58	0.86	210.5	14.41	0.86
184.4	12.58	0.86	211.4	14.30	0.86
185.3	13.16	0.86	212.3	14.38	0.86
186.2	13.47	0.86	213.2	14.32	0.86
187.1	13.70	0.86	214.1	14.77	0.86
188.0	13.56	0.86	215.0	14.83	0.86
188.9	12.57	0.86	215.9	14.71	0.86
189.8	12.00	0.86	216.8	14.10	0.86
190.7	12.82	0.86	217.7	13.83	0.86
191.6	12.82	0.86	218.6	14.88	0.86
192.5	13.09	0.86	219.5	15.42	0.86
193.4	12.88	0.86	220.4	14.24	0.98
194.3	11.50	0.86	221.3	12.50	0.98
195.2	12.01	0.86	222.2	13.01	0.98
196.1	12.48	0.86	223.1	13.89	0.98
224.0	14.92	0.98	242.9	14.82	0.98
224.9	14.17	0.98	243.8	12.96	0.98
225.8	14.03	0.98	244.7	13.85	0.98
226.7	14.30	0.98	245.6	14.79	0.98
227.6	14.64	0.98	246.5	13.85	0.98
228.5	14.50	0.98	247.4	13.34	0.98
229.4	13.39	0.98	248.3	14.95	0.98

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2. Conversion Loss Data (cont.)

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
230.3	14.04	0.98	249.2	13.85	0.98
231.2	15.20	0.98	250.1	12.55	0.98
232.1	15.87	0.98	251.0	14.22	0.98
233.0	14.19	0.98	251.9	15.92	0.98
233.9	15.47	0.98	252.8	12.60	0.98
234.8	15.43	0.98	253.7	13.21	0.98
235.7	17.15	0.98	254.6	15.66	0.98
236.6	13.38	0.98	255.5	15.43	0.98
237.5	14.49	0.98	256.4	12.48	0.98
238.4	16.11	0.98	257.3	15.42	0.98
239.3	15.44	0.98	258.2	16.66	0.98
240.2	13.26	0.98	259.1	14.85	0.98
241.1	14.56	0.98	260.0	16.33	0.98
242.0	16.39	0.98	-	-	-

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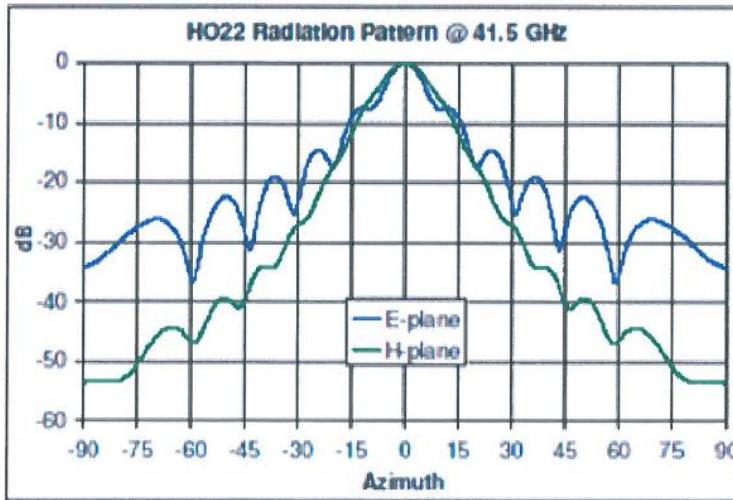
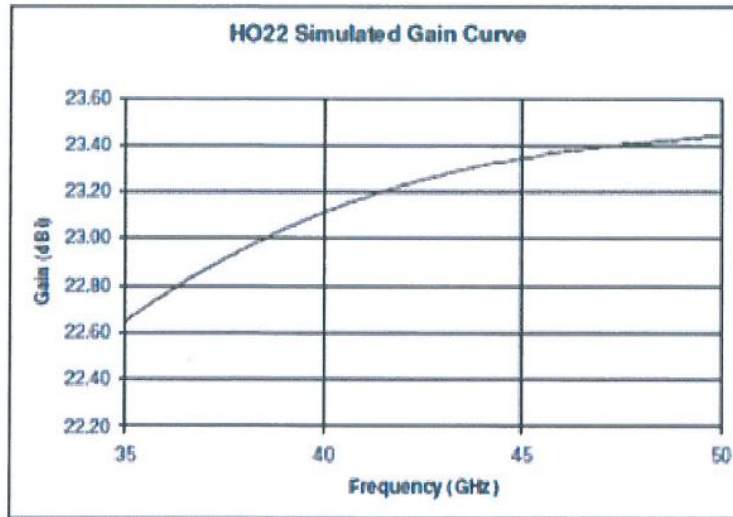
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3. CMI Horn Antenna gain

3.1. HO22R (33 GHz – 50 GHz)



24 Boston Court
Longmead, CO 01051
303.661.0707 (P)
303.661.0711 (F)
www.custommicrowaves.com





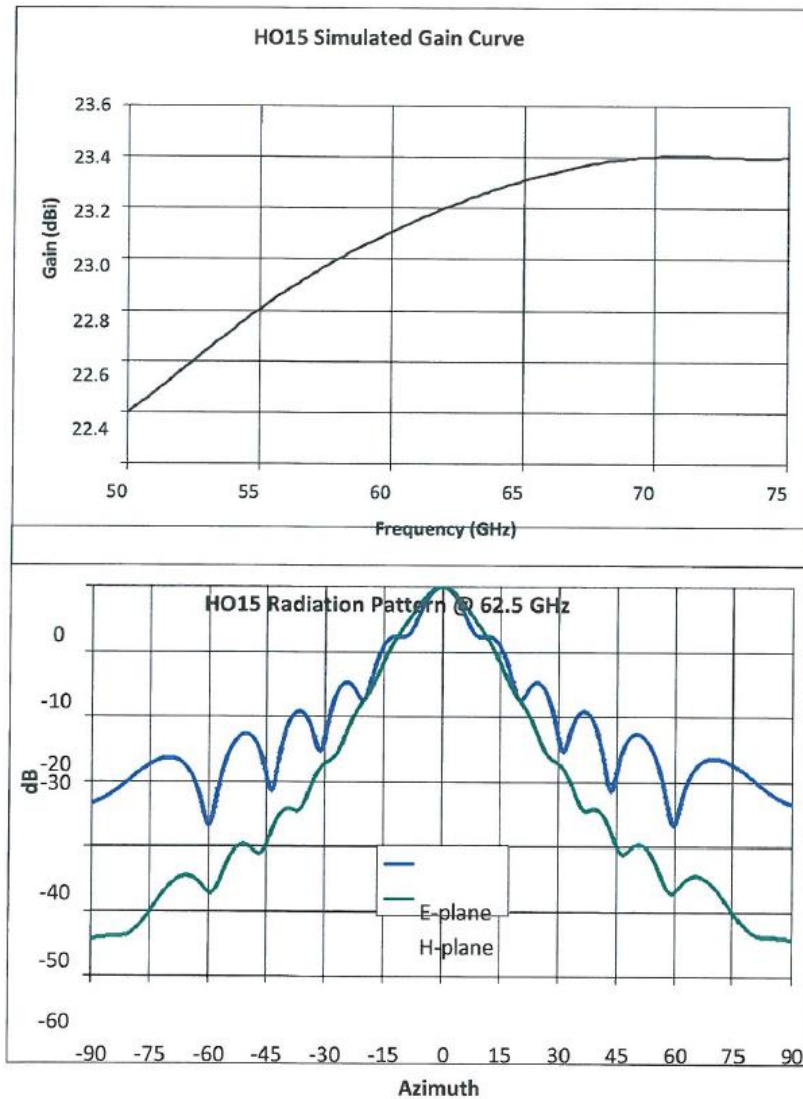
24 Boston Court
Longmont, CO 80501
303 651-0707(P)
303 651-0706(F)
www.custommicrowave.com

Model	HO22R
Frequency(GHz)	Gain(dBi)
33.00	22.40
33.85	22.50
34.70	22.60
35.55	22.70
36.40	22.80
37.25	22.90
38.10	23.00
38.95	23.05
39.80	23.10
40.65	23.15
41.50	23.20
42.35	23.25
43.20	23.27
44.05	23.30
44.90	23.35
45.75	23.37
46.60	23.39
47.45	23.41
48.30	23.42
49.15	23.43
50.00	23.44

3.1. HO15R (50 GHz – 75 GHz)



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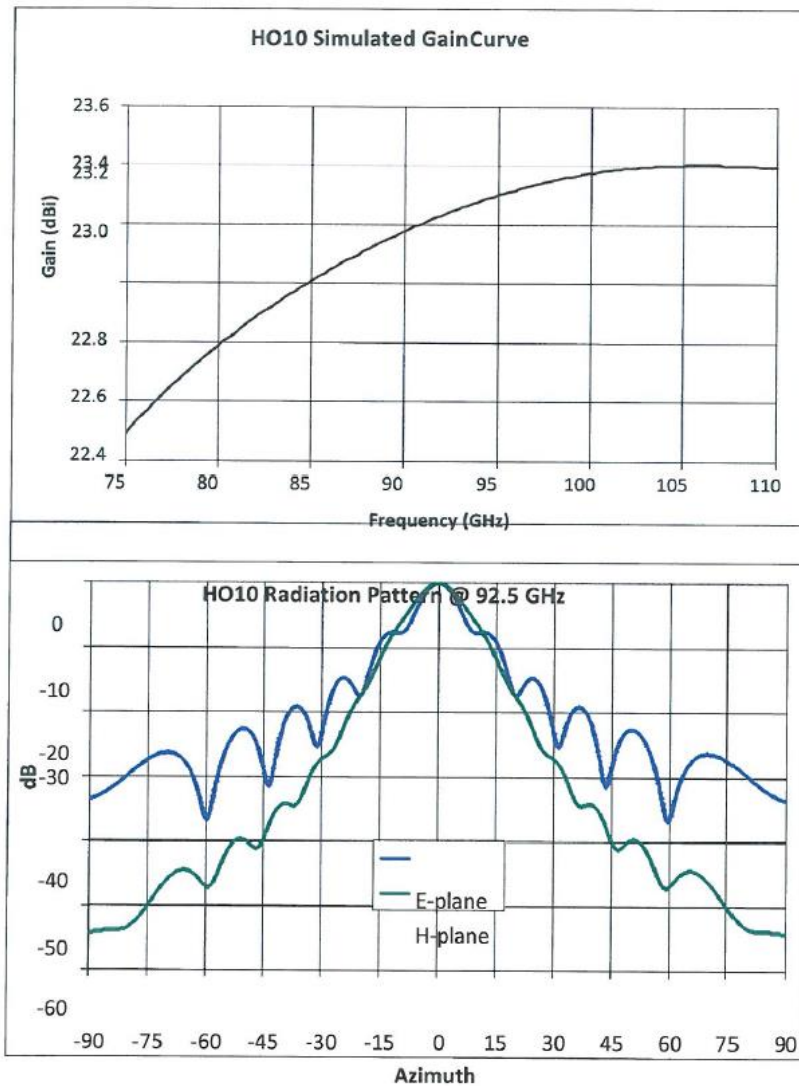
24 Boston Court
Longmont, CO 80501
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Model	HO15R
Frequency(GHz)	Gain(dBi)
50.00	22.4
51.25	22.5
52.50	22.6
53.75	22.7
55.00	22.8
56.25	22.9
57.50	23.0
58.75	23.0
60.00	23.1
61.25	23.2
62.50	23.2
63.75	23.3
65.00	23.3
66.25	23.3
67.50	23.4
68.75	23.4
70.00	23.4
71.25	23.4
72.50	23.4
73.75	23.4
75.00	23.4

3.2. HO10R (75 GHz – 110 GHz)



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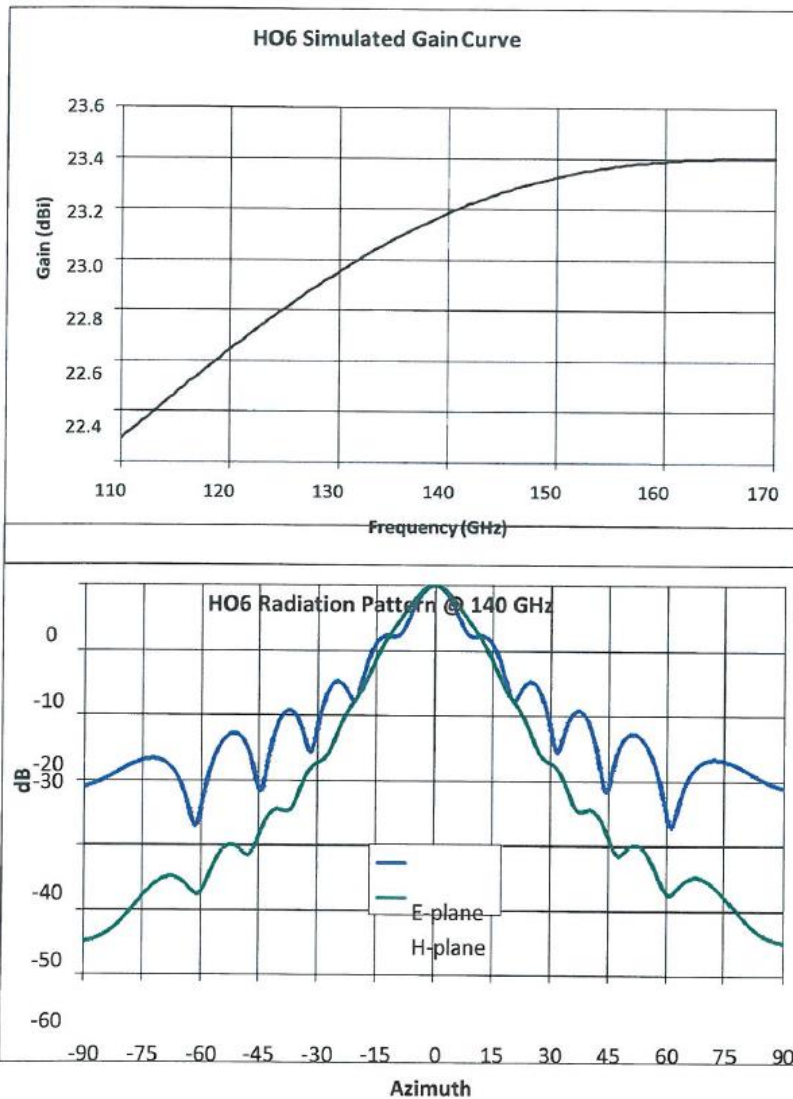
Model	HO10R
Frequency(GHz)	Gain(dBi)
75.00	22.5
76.75	22.6
78.50	22.7
80.25	22.8
82.00	22.9
83.75	23.0
85.50	23.0
87.25	23.1
89.00	23.1
90.75	23.2
92.50	23.3
94.25	23.3
96.00	23.3
97.75	23.3
99.50	23.4
101.25	23.4
103.00	23.4
104.75	23.4
106.50	23.4
108.25	23.4
110.00	23.4

3.3. HO06R (110 GHz – 170 GHz)



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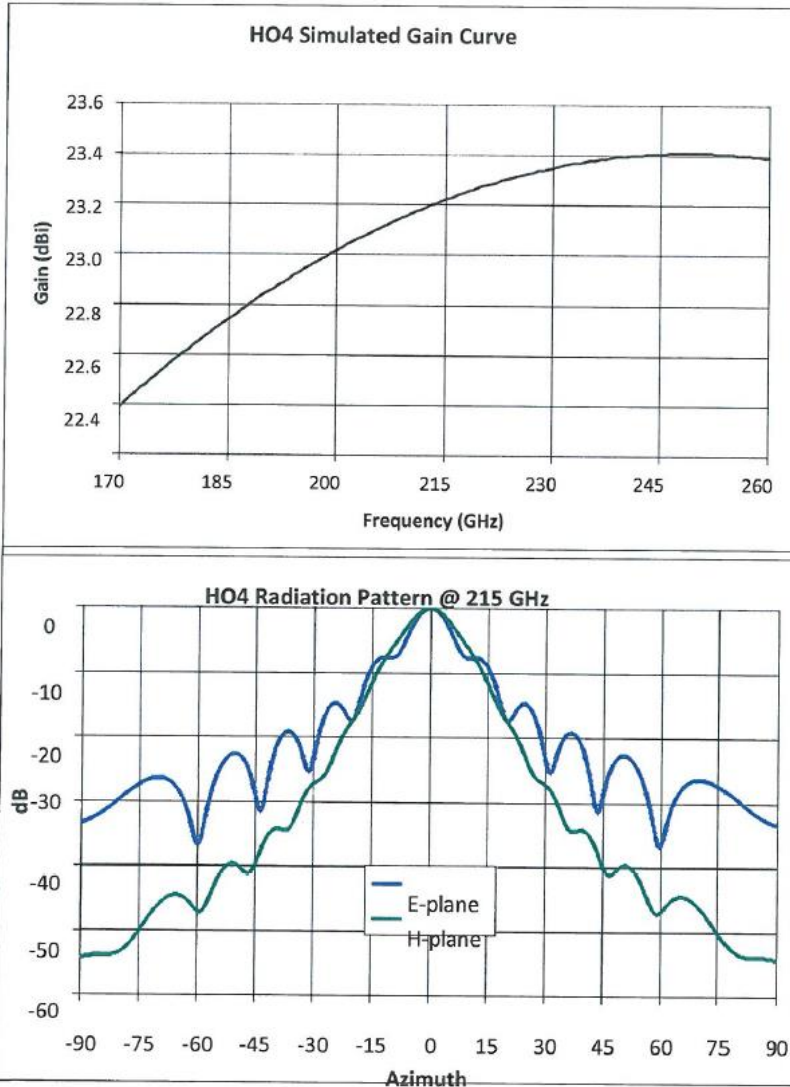
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Model	HO6R
Frequency(GHz)	Gain(dBi)
110.00	22.3
113.00	22.4
116.00	22.5
119.00	22.6
122.00	22.7
125.00	22.8
128.00	22.9
131.00	23.0
134.00	23.1
137.00	23.1
140.00	23.2
143.00	23.2
146.00	23.3
149.00	23.3
152.00	23.3
155.00	23.4
158.00	23.4
161.00	23.4
164.00	23.4
167.00	23.4
170.00	23.4

3.4. HO4R (170 GHz – 260 GHz)



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Model	HO4R
Frequency(GHz)	Gain(dBi)
170.00	22.4
174.50	22.5
179.00	22.6
183.50	22.7
188.00	22.8
192.50	22.9
197.00	23.0
201.50	23.0
206.00	23.1
210.50	23.2
215.00	23.2
219.50	23.3
224.00	23.3
228.50	23.3
233.00	23.4
237.50	23.4
242.00	23.4
246.50	23.4
251.00	23.4
255.50	23.4
260.00	23.4

END OF TEST REPORT