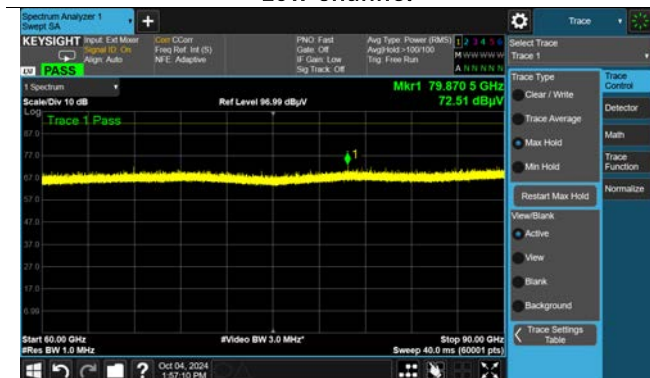


Antenna 0(M patch), n258b

60 GHz ~ 90 GHz

Low Channel

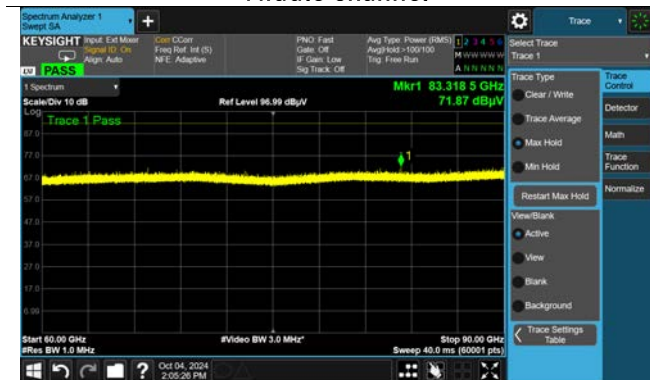


90 GHz ~ 100 GHz

Low Channel



Middle Channel



Middle Channel



High Channel



High Channel



Test Results: Tabular Data of Radiated Spurious Emissions
DFT-s OFDM (SISO or SISO Dual)

3. n260

30 MHz ~ 1 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	50.77	3	-44.46
		100	38499.96	Mid	H+V	BPSK	V	52.33	3	-42.90
		50	39975.00	High	H+V	BPSK	V	52.41	3	-42.82
1 GHz ~ 3 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	59.50	3	-35.73
		100	38499.96	Mid	H+V	BPSK	H	59.12	3	-36.11
		50	39975.00	High	H+V	BPSK	H	59.76	3	-35.47
3 GHz ~ 18 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	60.92	3	-34.31
		100	38499.96	Mid	H+V	BPSK	H	61.31	3	-33.92
		50	39975.00	High	H+V	BPSK	H	61.00	3	-34.23
18 GHz ~ 27 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	56.59	3	-38.64
		100	38499.96	Mid	H+V	BPSK	V	56.40	3	-38.83
		50	39975.00	High	H+V	BPSK	H	57.19	3	-38.04

27 GHz ~ 36.6 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	62.73	3	-32.50
		100	38499.96	Mid	H+V	BPSK	H	62.82	3	-32.41
		50	39975.00	High	H+V	BPSK	V	63.84	3	-31.39
40.20 GHz ~ 60 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	H	72.27	1.5	-28.98
		100	38499.96	Mid	H+V	BPSK	V	72.85	1.5	-28.40
		50	39975.00	High	H+V	BPSK	V	72.39	1.5	-28.86
60 GHz ~ 90 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	H	73.01	1	-31.76
		100	38499.96	Mid	H+V	BPSK	V	72.00	1	-32.77
		50	39975.00	High	H+V	BPSK	H	72.63	1	-32.14
90 GHz ~ 140 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	H	78.07	1	-26.70
		100	38499.96	Mid	H+V	BPSK	V	76.80	1	-27.97
		50	39975.00	High	H+V	BPSK	V	81.17	1	-23.60

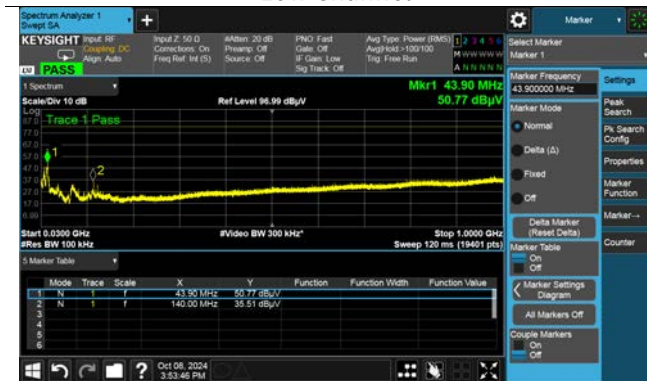
140 GHz ~ 170 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	80.07	0.5	-30.72
		100	38499.96	Mid	H+V	BPSK	H	80.08	0.5	-30.71
		50	39975.00	High	H+V	BPSK	H	81.96	0.5	-28.83

170 GHz ~ 200 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	50	37025.04	Low	H+V	BPSK	V	80.42	0.5	-30.37
		100	38499.96	Mid	H+V	BPSK	H	81.06	0.5	-29.73
		50	39975.00	High	H+V	BPSK	V	79.35	0.5	-31.44

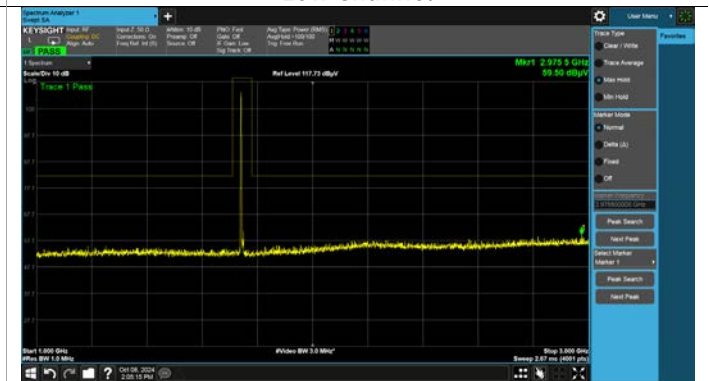
DFT-s OFDM (SISO or SISO Dual) Plot data of Radiated Spurious Emissions

Antenna 0(M patch), n260

30 MHz ~ 1 GHz Low Channel



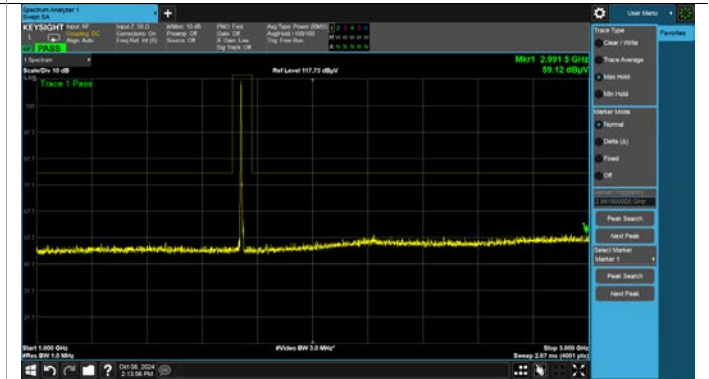
1 GHz ~ 3 GHz Low Channel



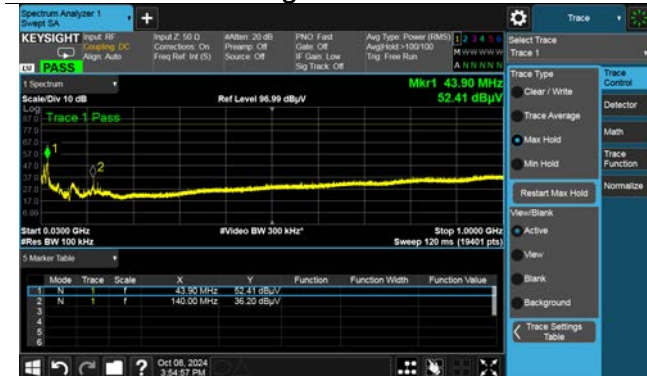
Middle Channel



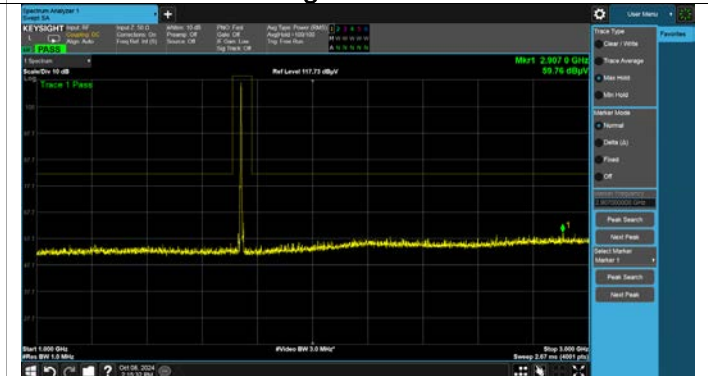
Middle Channel



High Channel

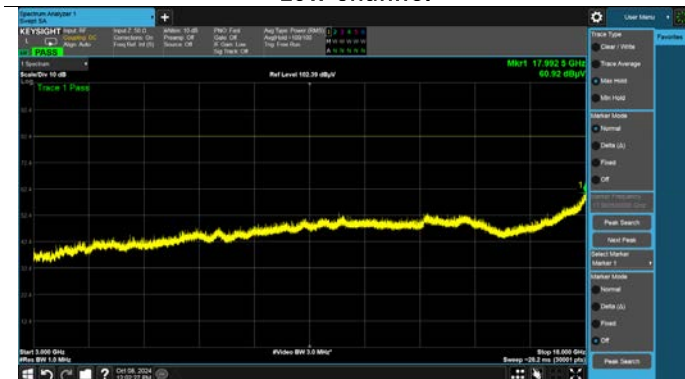


High Channel



Antenna 0(M patch), n260

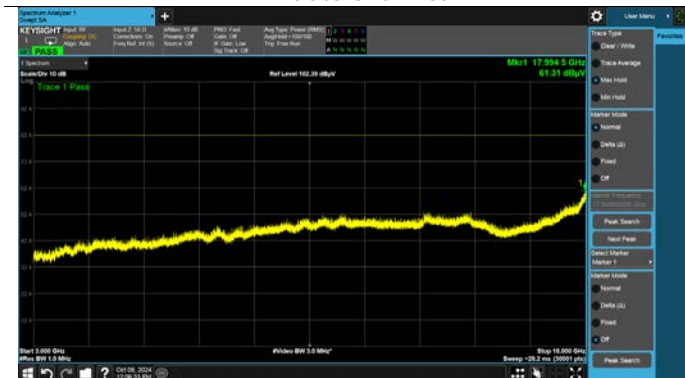
3 GHz ~ 18 GHz Low Channel



18 GHz ~ 27 GHz Low Channel



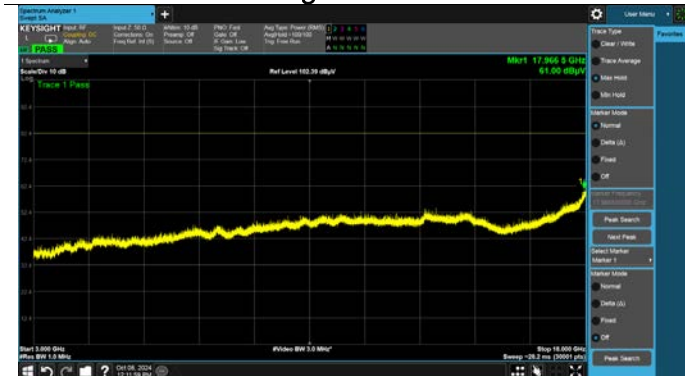
Middle Channel



Middle Channel



High Channel



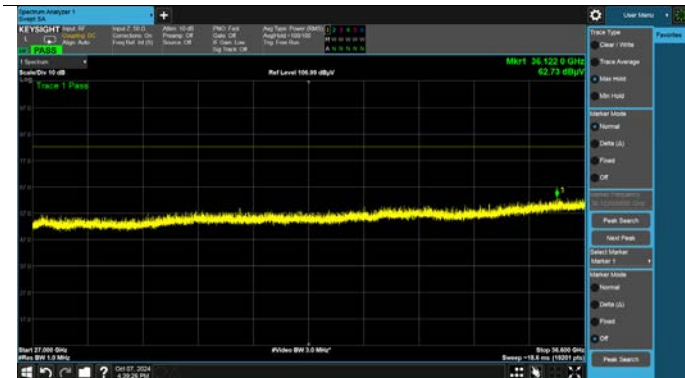
High Channel



Antenna 0(M patch), n260

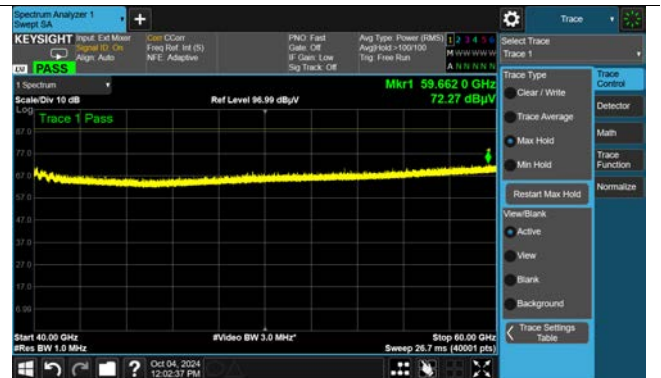
27 GHz ~ 36.6 GHz

Low Channel

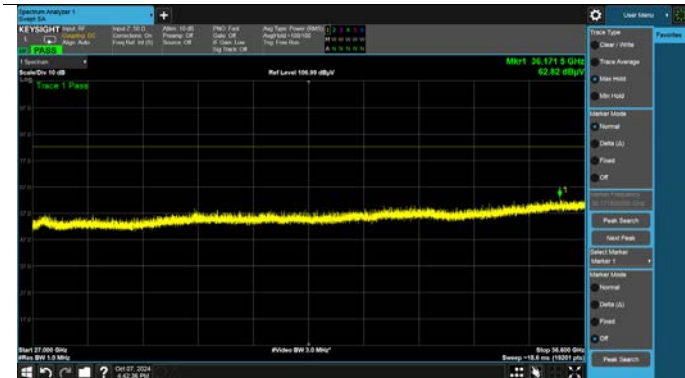


40 GHz ~ 60 GHz

Low Channel



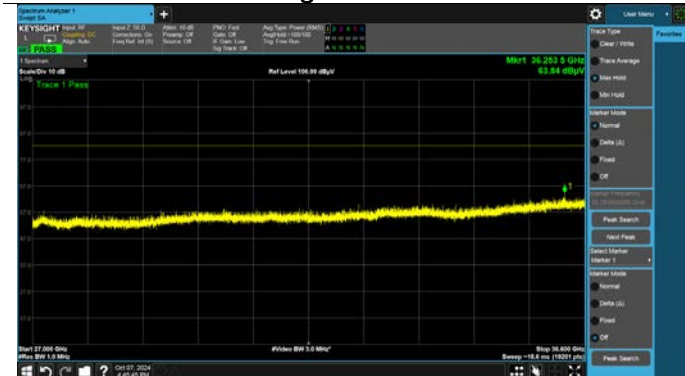
Middle Channel



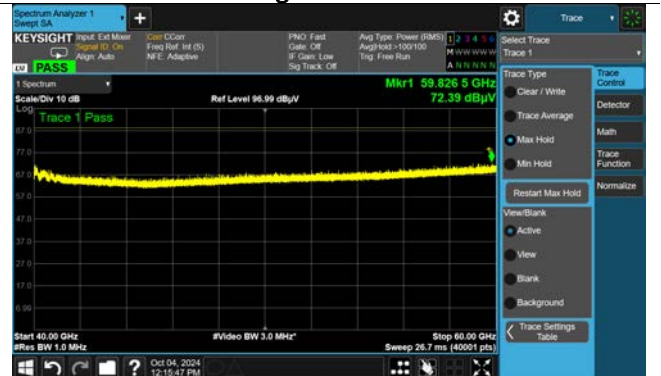
Middle Channel



High Channel



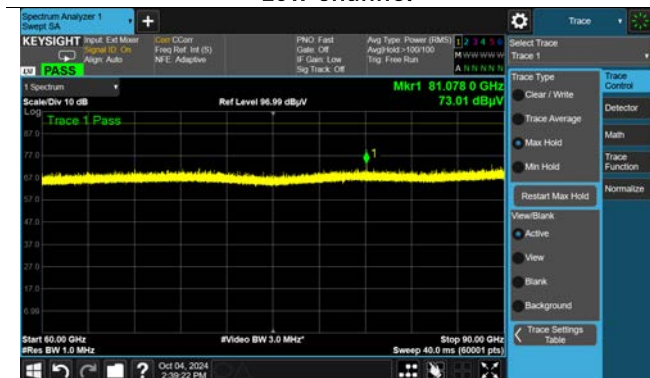
High Channel



Antenna 0(M patch), n260

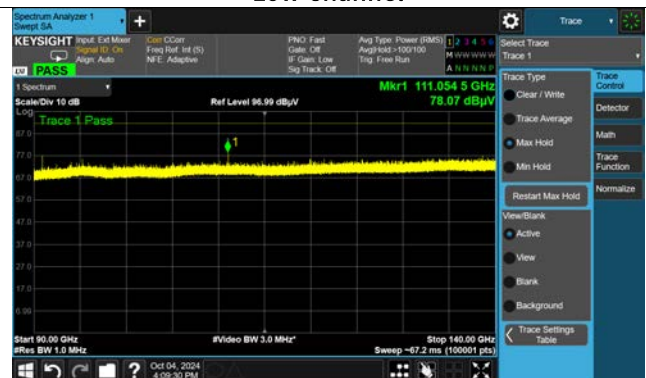
60 GHz ~ 90 GHz

Low Channel

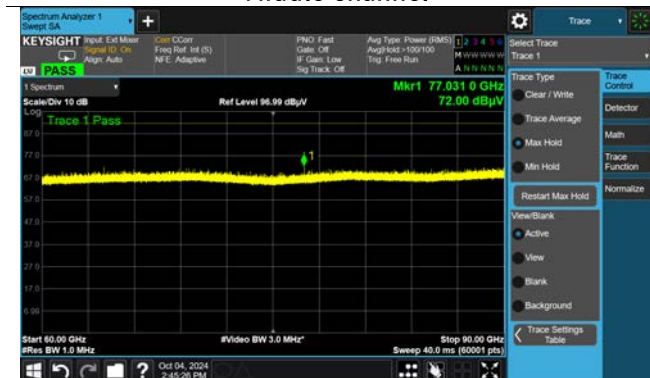


90 GHz ~ 140 GHz

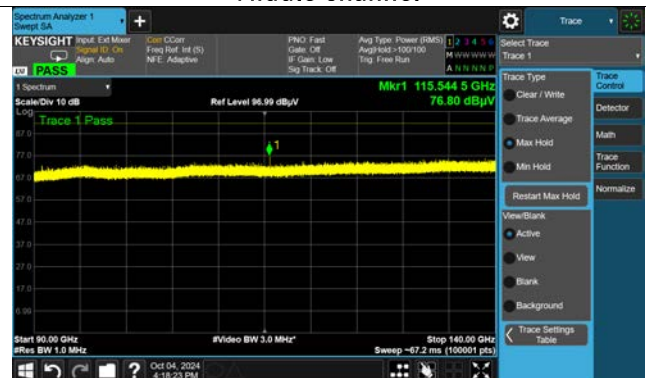
Low Channel



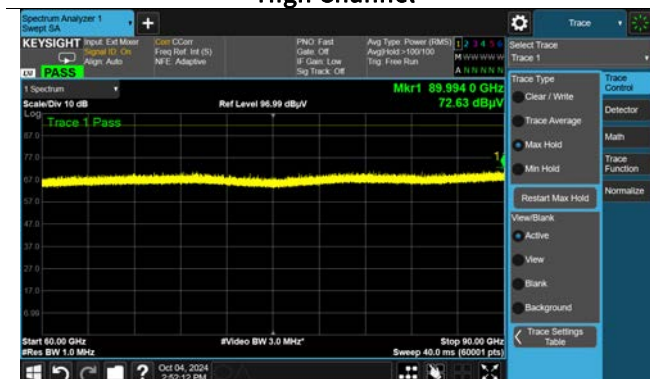
Middle Channel



Middle Channel



High Channel



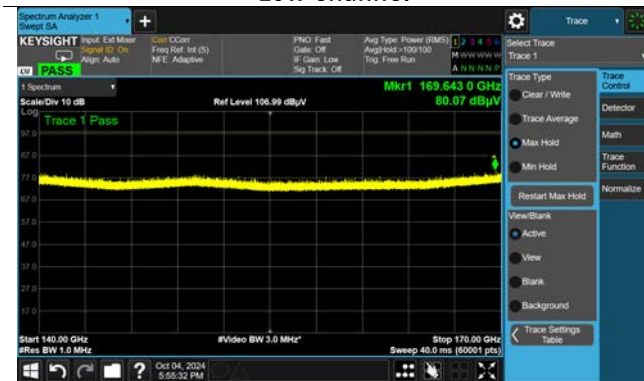
High Channel



Antenna 0(M patch), n260

140 GHz ~ 170 GHz

Low Channel

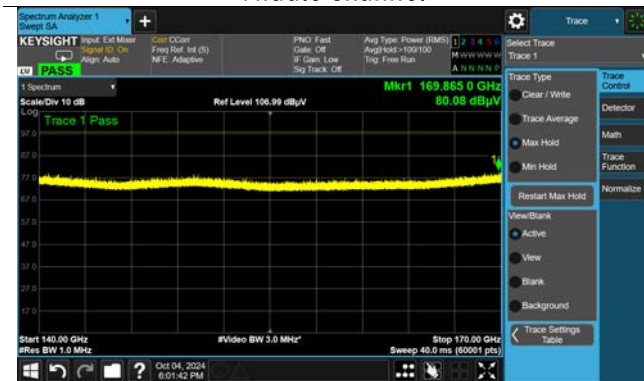


170 GHz ~ 200 GHz

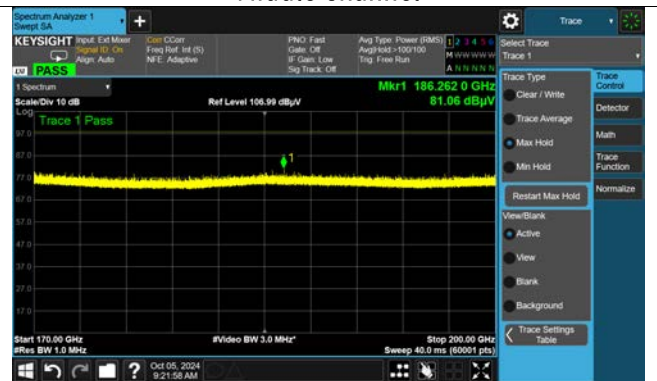
Low Channel



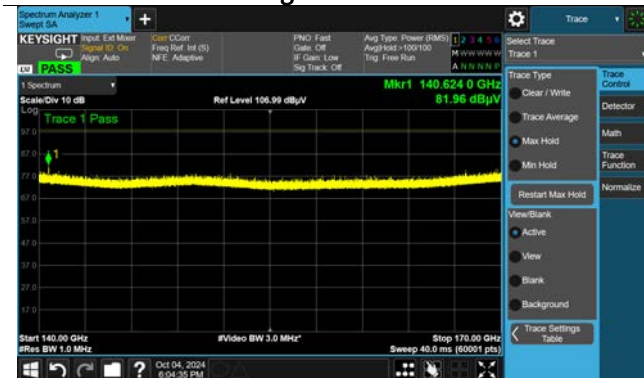
Middle Channel



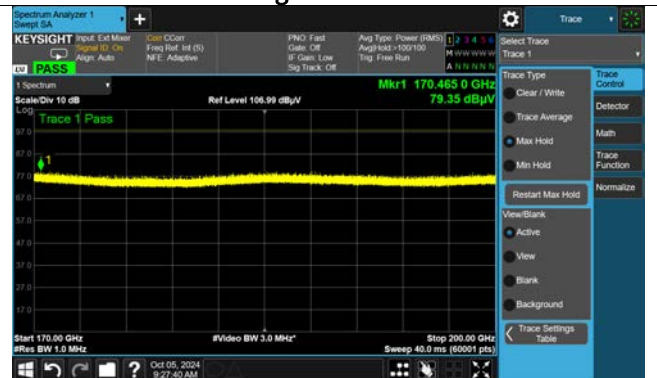
Middle Channel



High Channel



High Channel



Test Results: Tabular Data of Radiated Spurious Emissions
DFT-s OFDM (SISO or SISO Dual)

4. n261

30 MHz ~ 1 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	V	51.83	3	-43.40
		100	27924.96	Mid	H+V	BPSK	V	52.11	3	-43.12
		50	28324.92	High	H+V	QPSK	V	51.22	3	-44.01
1 GHz ~ 3 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	V	59.57	3	-35.66
		100	27924.96	Mid	H+V	BPSK	V	58.87	3	-36.36
		50	28324.92	High	H+V	QPSK	V	59.47	3	-35.76
3 GHz ~ 18 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	H	61.87	3	-33.36
		100	27924.96	Mid	H+V	BPSK	V	60.77	3	-34.46
		50	28324.92	High	H+V	QPSK	V	60.90	3	-34.33
18 GHz ~ 27 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	H	65.90	3	-29.33
		100	27924.96	Mid	H+V	BPSK	V	66.78	3	-28.45
		50	28324.92	High	H+V	QPSK	V	56.69	3	-38.54

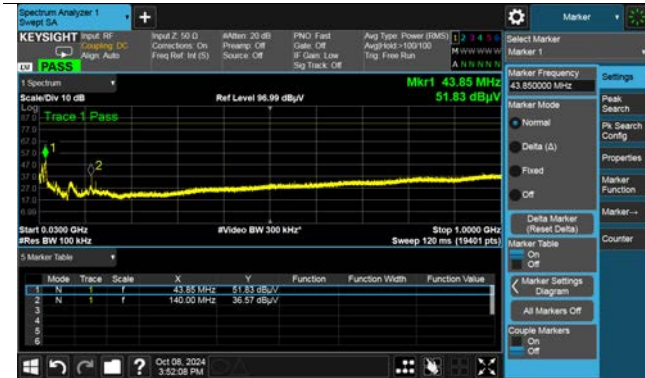
28.8 GHz ~ 40 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	V	72.07	3	-23.16
		100	27924.96	Mid	H+V	BPSK	H	71.86	3	-23.37
		50	28324.92	High	H+V	QPSK	H	71.75	3	-23.48
40 GHz ~ 60 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	V	72.73	1.5	-28.52
		100	27924.96	Mid	H+V	BPSK	H	72.97	1.5	-28.28
		50	28324.92	High	H+V	QPSK	V	72.15	1.5	-29.10
60 GHz ~ 90 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	H	72.07	1	-32.70
		100	27924.96	Mid	H+V	BPSK	H	72.31	1	-32.46
		50	28324.92	High	H+V	QPSK	V	71.94	1	-32.83
90 GHz ~ 100 GHz										
Ant. (Patch)	CCs active	BW [MHz]	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	Measured Value [dBuV]	Distance [m]	Conversion Value Result [dBm]
0 (M)	1	100	27550.08	Low	H+V	BPSK	H	75.41	1	-29.36
		100	27924.96	Mid	H+V	BPSK	H	74.32	1	-30.45
		50	28324.92	High	H+V	QPSK	H	74.57	1	-30.20

DFT-s OFDM (SISO or SISO Dual) Plot data of Radiated Spurious Emissions

Antenna 0(M patch), n261

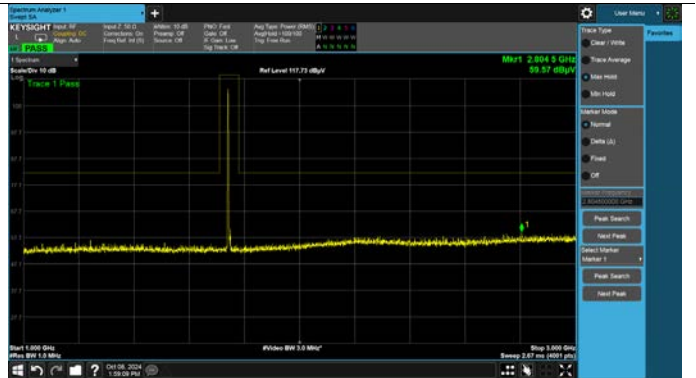
30 MHz ~ 1 GHz

Low Channel

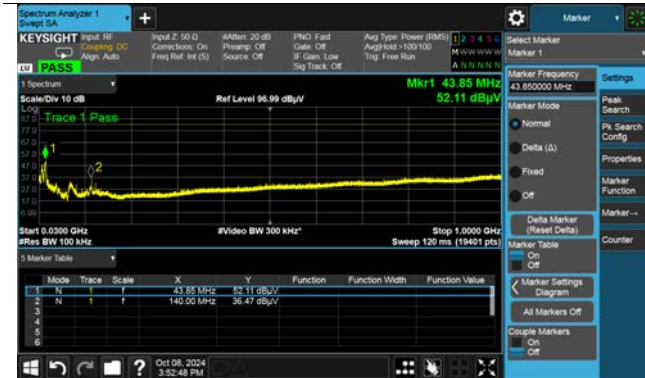


1 GHz ~ 3 GHz

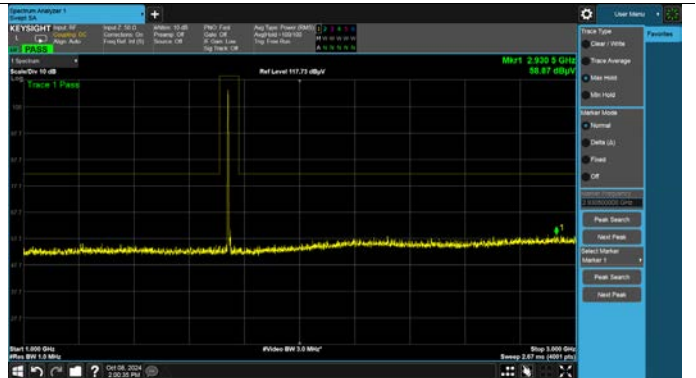
Low Channel



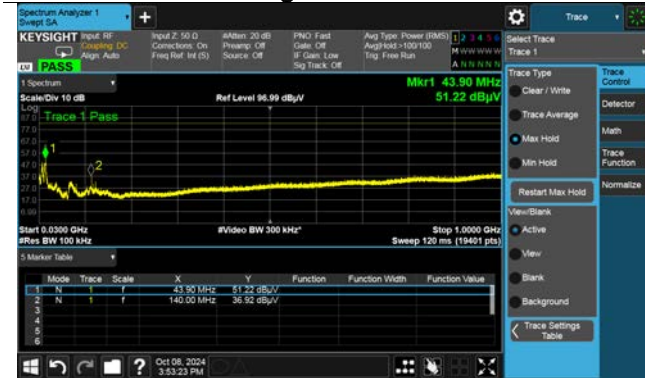
Middle Channel



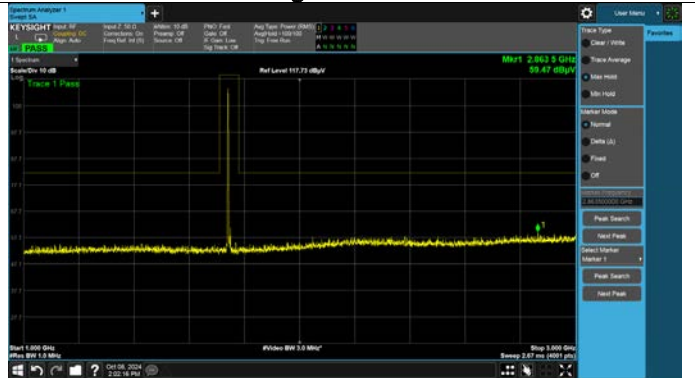
Middle Channel



High Channel

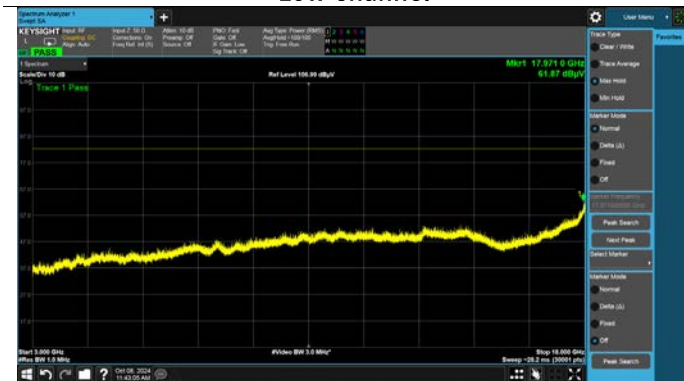


High Channel



Antenna 0(M patch), n261

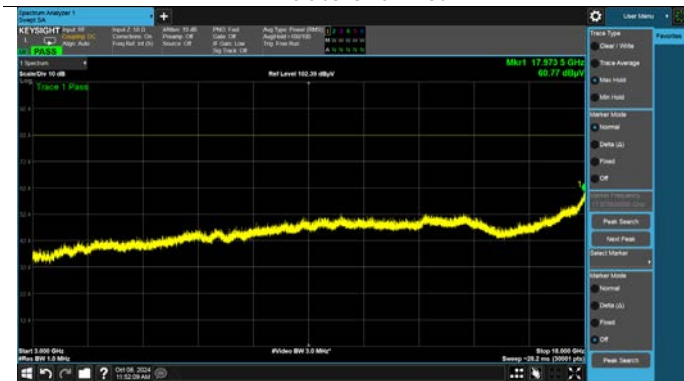
3 GHz ~ 18 GHz Low Channel



18 GHz ~ 27 GHz Low Channel



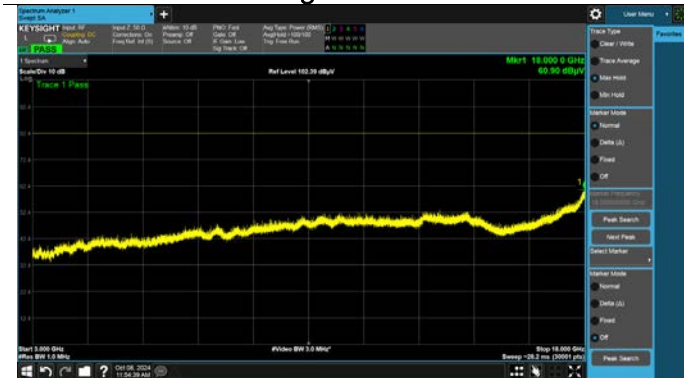
Middle Channel



Middle Channel



High Channel



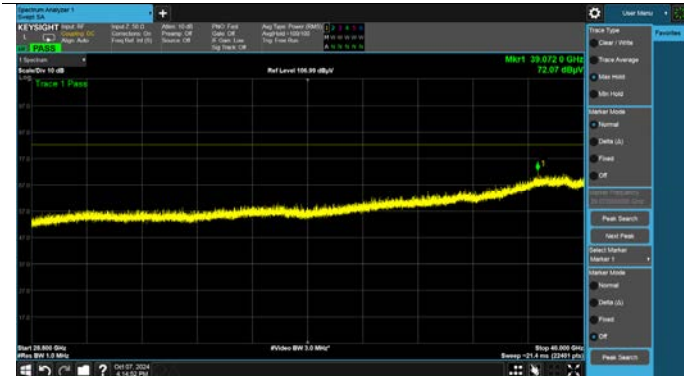
High Channel



Antenna 0(M patch), n261

28.8 GHz ~ 40 GHz

Low Channel

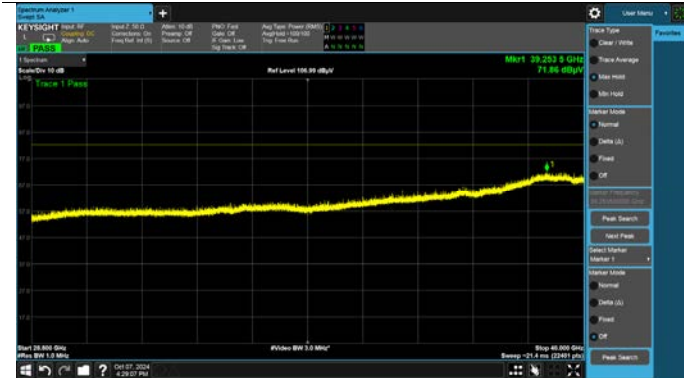


40 GHz ~ 60 GHz

Low Channel



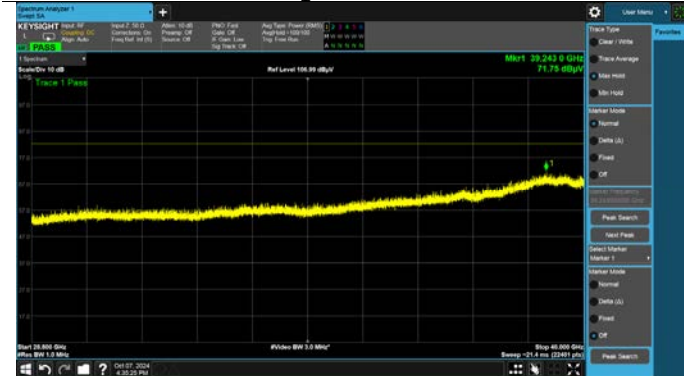
Middle Channel



Middle Channel



High Channel



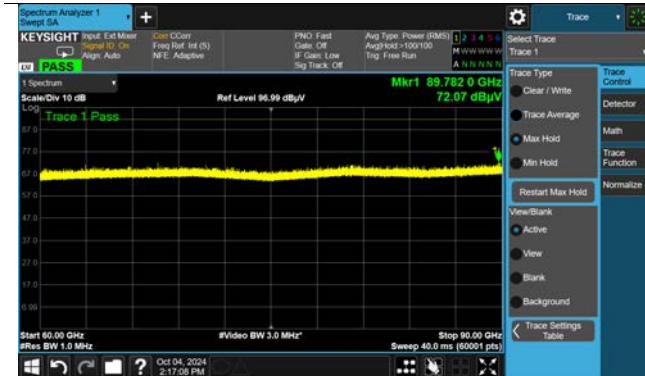
High Channel



Antenna 0(M patch), n261

60 GHz ~ 90 GHz

Low Channel



90 GHz ~ 100 GHz

Low Channel



Middle Channel



Middle Channel



High Channel



High Channel



5.5. FREQUENCY STABILITY

FCC Rules

Test Requirements:

§ 2.1055 Measurements required: Frequency stability

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015.

The frequency stability of the transmitter is measured by:

1. Temperature:

- The temperature is varied from -30 °C to +50 °C in 10 °C increments using an environmental chamber.

2. Primary Supply Voltage:

- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.
- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Procedure

- ANSI C63.26-2015 Section 5.6
- KDB 842590 D01 v01r02 Section 4.5

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20 °C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Note:

- 1) The results of the frequency stability test shown above the frequency deviation measured values are very small and similar trend for each path, so we are attached only the worst case data.
- 2) We were performed the test using call simulator.

Test Results:

Voltage(100%) = DC 3.880 V

Batt. Endpoint = DC 3.300 V

n258a Band Antenna 0(M patch)

Low Frequency = 24 275.04 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	24275 040 000	8.906	0.000	0.00000
	-30	24275 040 001	1.435	0.000	0.00000
	-20	24275 040 009	9.071	7.635	0.00031
	-10	24275 040 001	1.447	0.012	0.00000
	0	24275 040 005	4.679	3.244	0.00013
	+10	24275 040 007	6.875	5.439	0.00022
	+30	24275 040 008	7.986	6.551	0.00027
	+40	24275 040 010	9.556	8.120	0.00033
	+50	24275 040 001	0.902	-0.533	-0.00002
Batt. Endpoint	+20	24275 040 006	5.688	4.253	0.00018

High Frequency = 24 424.92 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	24424 920 000	2.129	0.000	0.00000
	-30	24424 920 002	2.345	0.909	0.00004
	-20	24424 920 008	7.615	6.179	0.00025
	-10	24424 920 008	8.332	6.897	0.00028
	0	24424 920 006	6.181	4.745	0.00019
	+10	24424 920 001	0.785	-0.651	-0.00003
	+30	24424 920 007	6.779	5.344	0.00022
	+40	24424 920 002	1.868	0.432	0.00002
	+50	24424 920 006	6.063	4.628	0.00019
Batt. Endpoint	+20	24424 920 003	3.005	1.570	0.00006

n258b Band Antenna 0(M patch)

Low Frequency = 24 775.08 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	24775 080 000	0.836	0.000	0.00000
	-30	24775 080 007	6.773	0.000	0.00000
	-20	24775 080 010	9.796	3.023	0.00012
	-10	24775 080 008	7.817	1.044	0.00004
	0	24775 080 003	2.901	-3.873	-0.00016
	+10	24775 080 003	2.651	-4.123	-0.00017
	+30	24775 080 009	8.896	2.123	0.00009
	+40	24775 080 006	6.096	-0.677	-0.00003
	+50	24775 080 008	8.322	1.548	0.00006
Batt. Endpoint	+20	24775 080 008	7.950	1.176	0.00005

High Frequency = 25 224.96 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	25224 960 000	1.437	0.000	0.00000
	-30	25224 960 006	5.823	-0.950	-0.00004
	-20	25224 960 005	4.940	-1.833	-0.00007
	-10	25224 960 009	8.553	1.780	0.00007
	0	25224 960 006	6.416	-0.358	-0.00001
	+10	25224 960 002	2.291	-4.482	-0.00018
	+30	25224 960 003	2.683	-4.090	-0.00016
	+40	25224 960 001	1.183	-5.590	-0.00022
	+50	25224 960 009	9.004	2.231	0.00009
Batt. Endpoint	+20	25224 960 009	9.346	2.573	0.00010

n260 Band Antenna 0(M patch)

Low Frequency = 37 025.04 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	37025 040 000	0.905	0.000	0.00000
	-30	37025 040 009	8.886	0.000	0.00000
	-20	37025 040 001	1.357	-7.529	-0.00020
	-10	37025 040 007	7.408	-1.478	-0.00004
	0	37025 040 008	7.599	-1.287	-0.00003
	+10	37025 040 008	7.794	-1.091	-0.00003
	+30	37025 040 001	1.058	-7.827	-0.00021
	+40	37025 040 007	7.269	-1.617	-0.00004
	+50	37025 040 001	1.046	-7.839	-0.00021
Batt. Endpoint	+20	37025 040 004	4.429	-4.457	-0.00012

High Frequency = 39 975.00 MHz

Voltage	rTemp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	39975 000 000	6.373	0.000	0.00000
	-30	39975 000 008	8.342	-0.544	-0.00001
	-20	39975 000 004	3.808	-5.077	-0.00013
	-10	39975 000 009	8.749	-0.136	0.00000
	0	39975 000 003	3.220	-5.666	-0.00014
	+10	39975 000 007	7.005	-1.881	-0.00005
	+30	39975 000 006	6.243	-2.643	-0.00007
	+40	39975 000 003	3.347	-5.539	-0.00014
	+50	39975 000 004	4.220	-4.666	-0.00012
Batt. Endpoint	+20	39975 000 005	5.000	-3.886	-0.00010

n261 Band Antenna 0(M patch)

Low Frequency = 27 525.00 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	27525 000 000	9.999	0.000	0.00000
	-30	27525 000 008	7.630	0.000	0.00000
	-20	27525 000 007	6.566	-1.064	-0.00004
	-10	27525 000 002	2.182	-5.448	-0.00020
	0	27525 000 004	4.276	-3.354	-0.00012
	+10	27525 000 009	9.059	1.430	0.00005
	+30	27525 000 007	7.058	-0.571	-0.00002
	+40	27525 000 000	0.376	-7.253	-0.00026
	+50	27525 000 009	9.143	1.514	0.00005
HIGH	+20	27525 000 001	1.129	-6.501	-0.00024

High Frequency = 28 324.92 MHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	28324 920 000	8.426	0.000	0.00000
	-30	28324 920 004	4.230	-3.400	-0.00012
	-20	28324 920 005	4.635	-2.995	-0.00011
	-10	28324 920 010	9.972	2.343	0.00008
	0	28324 920 006	5.503	-2.127	-0.00008
	+10	28324 920 005	5.259	-2.371	-0.00008
	+30	28324 920 007	6.665	-0.965	-0.00003
	+40	28324 920 004	4.421	-3.208	-0.00011
	+50	28324 920 007	7.037	-0.593	-0.00002
Batt. Endpoint	+20	28324 920 007	6.518	-1.112	-0.00004

6. SAX VERIFICATION CERTIFICATE & CHECK



교정성적서

CALIBRATION CERTIFICATE

경기도 이천시 마장면 서이천로 578번길 74
TEL : 031-645-6900, FAX : 031-645-6969



성적서발급번호(Certificate No) : IC-2024-020989

교정번호(Calibration No) : C-2024-023906

페이지(page) : 1 of 3

1. 의뢰자 (Client)

- 기관명 (Name) : (주)에이치시티
- 주소 (Address) : 경기도 이천시 마장면 서이천로 578번길 74

2. 측정기 (Calibration Subject)

◇ 등록번호 : 415233

- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식(Manufacturer and Model Name) : VDI / SAX WR19
- 기기번호 (Serial Number) : SAX 771

3. 교정일자 (Date of Calibration)

차기교정예정일자 : 2025.03.06
(The due date of next Calibration)

4. 교정환경 (Environment)

- 온도(Temperature) : (22.7 ± 0.4) °C - 습도(Humidity) : (48 ± 4) % R.H.
- 교정장소 (Location) : 고정표준실(Permanent Calibration Lab)
(주소: 경기도 이천시 마장면 서이천로 578번길 74)

5. 측정표준의 소급성 (Traceability) ◇Field code : 40641(RF SPECTRUM ANALYZER)

교정방법 및 소급성 서술 (Calibration method and/or brief description)

상기 기기는 고주파 스펙트럼 분석기의 교정절차(HCT-CS-125-40641)에 따라 국가측정표준기관으로부터 측정의 소급성이 확보된 아래의 표준장비를 이용하여 교정 되었음.

교정에 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)
PSG ANALOG SIGNAL GENERATOR	AGILENT/E8257D	MY46130629	2024/10/25	(주)에이치시티
EPM SERIES POWER METER	AGILENT/E4419B	GB42420565	2024/10/25	(주)에이치시티
POWER SENSOR	AGILENT/N8487A	MY52420003	2025/01/16	(주)에이치시티
POWER SENSOR	KEYSIGHT/V8486A	MY56330017	2024/11/03	Keysight Technologies
WR-19 MULTIPLIER SOURCE MODULE	OML/S19MS-A	160516-1	2024/07/19	(주)에이치시티
PXA SIGNAL ANALYZER	AGILENT/N9030A	US51350310	2024/03/13	(주)에이치시티

6. 교정결과 (Calibration result)

: 교정결과 참조 (Refer to attachment)

7. 측정불확도 (Measurement uncertainty)

: 교정결과 참조 (Refer to attachment)

신뢰수준 약 95 %, $k = 2$ (Confidence level about 95 %, $k = 2$)

확 인 (affirmation)	작성자 (Measurements performed by)	승인자 (Approved by)
	성명 (Name) 강석훈	직위 (Title) 기술책임자(Technical Cal. Manager) 성명 (Name) 김광철

위 성적서는 국제시험기관인정협력체(International Laboratory Accreditation Cooperation) 상호인정협정(Mutual Recognition Arrangement)에 서명한 한국인정기구(KOLAS)로부터 공인 받은 분야의 교정결과입니다.

한국인정기구 인정
Accredited by KOLAS, Republic of KOREA

2024. 03. 07

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



※ 위 성적서는 측정기의 정밀정확도에 영향을 미치는 요소(과부하, 온도, 습도 등)의 급격한 변화가 발생한 경우에는 무효가 됩니다.

※ 고객전문사이트(<http://www.callab.co.kr>)에서 성적서의 진위여부 확인이 가능합니다.

※ 성적서의 유효본 상단에 HCT홈로그인이 부착된 위변조 방지 용지에 인쇄되어 발급되며, 유효본 복사시에는 복사본이라는 표시가 처리됩니다.

F-02P-02-008 (Rev.02)

교정결과 CALIBRATION RESULT

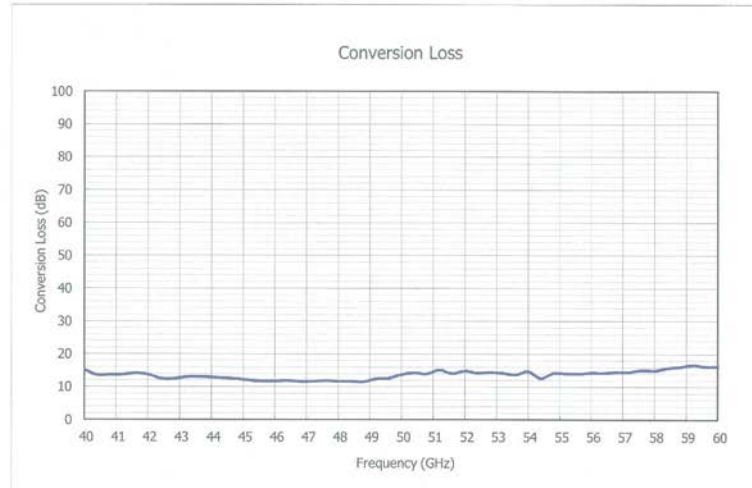


성적서발급번호(Certificate No) : IC-2024-020989

교정번호(Calibration No) : C-2024-023906

페이지(page) : 2 of 3

※ Conversion Loss Curve



[Note]

1. Measurement Condition : RF = -30 dBm, Harmonic Order = 8, L.O. Level = 10 dBm, IF = 322.5 MHz, Bias Value = 0.00 mA

F-02P-02-008 (Rev.02)

교 정 결 과
CALIBRATION RESULT

성적서발급번호(Certificate No) : IC-2024-020989

교 정 번 호(Calibration No) : C-2024-023906

페이지(page) : 3 of 3

1. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
40.0	15.12	0.82	50.4	14.25	0.82
40.4	13.56	0.82	50.8	13.93	0.82
40.8	13.66	0.82	51.2	15.10	0.82
41.2	13.66	0.82	51.6	14.02	0.82
41.6	14.12	0.82	52.0	14.84	0.82
42.0	13.72	0.82	52.4	14.22	0.82
42.4	12.53	0.82	52.8	14.44	0.82
42.8	12.38	0.82	53.2	14.19	0.82
43.2	13.01	0.82	53.6	13.67	0.82
43.6	13.08	0.82	54.0	14.70	0.82
44.0	12.88	0.82	54.4	12.62	0.82
44.4	12.61	0.82	54.8	14.11	0.82
44.8	12.38	0.82	55.2	14.04	0.82
45.2	11.95	0.82	55.6	13.99	0.82
45.6	11.74	0.82	56.0	14.27	0.82
46.0	11.72	0.82	56.4	14.23	0.82
46.4	11.87	0.82	56.8	14.56	0.82
46.8	11.59	0.82	57.2	14.56	0.82
47.2	11.70	0.82	57.6	15.10	0.82
47.6	11.87	0.82	58.0	14.97	0.82
48.0	11.68	0.82	58.4	15.76	0.82
48.4	11.66	0.82	58.8	16.07	0.82
48.8	11.51	0.82	59.2	16.71	0.82
49.2	12.44	0.82	59.6	16.21	0.82
49.6	12.58	0.82	60.0	16.24	0.82
50.0	13.71	0.82	-	-	-

끝.

F-02P-02-008 (Rev.02)

열람용

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교정성적서

CALIBRATION CERTIFICATE

경기도 이천시 마장면 서이천로 578번길 74
TEL : 031-645-6900, FAX : 031-645-6969

성적서발급번호(Certificate No) : IC-2024-020988

교정번호(Calibration No) : C-2024-023905

페이지(page) : 1 of 4

1. 의뢰자 (Client)

- 기관명 (Name) : (주)에이치시티
- 주소 (Address) : 경기도 이천시 마장면 서이천로 578번길 74

2. 측정기 (Calibration Subject)

◇ 등록번호 : 415873

- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식 (Manufacturer and Model Name) : VDI / SAX WR12
- 기기번호 (Serial Number) : SAX773

3. 교정일자 (Date of Calibration) : 2024.03.06

차기교정예정일자 : 2025.03.06

(The due date of next Calibration)

4. 교정환경 (Environment)

- 온도(Temperature) : (22.8 ± 0.3) °C - 습도(Humidity) : (49 ± 3) % R.H.
- 교정장소 (Location) : 교정표준실(Permanent Calibration Lab)
(주소: 경기도 이천시 마장면 서이천로 578번길 74)

5. 측정표준의 소급성 (Traceability) ◇ Field code : 40641(RF SPECTRUM ANALYZER)

교정방법 및 소급성 서술 (Calibration method and/or brief description)

상기 기기는 고주파 스펙트럼 분석기의 교정절차(HCT-CS-125-40641)에 따라 국가측정표준기관으로부터 측정의 소급성이 확
보된 아래의 표준장비를 이용하여 교정 되었음.

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

기기명 (Description)	제조회사 / 형식 (Manufacturer and Model Name)	기기번호 (Serial Number)	차기교정예정일자 (The due date of next Calibration)	교정기관 (Calibration laboratory)
PSG ANALOG SIGNAL GENERATOR	AGILENT/E8257D	MY46130629	2024/10/25	(주)에이치시티
EPM SERIES POWER METER	AGILENT/E4419B	GB42420565	2024/10/25	(주)에이치시티
POWER SENSOR	KEYSIGHT/V8486A	MY56330017	2024/11/03	Keysight Technologies
POWER SENSOR	KEYSIGHT/W8486A	MY56370005	2024/11/09	Keysight Technologies
WR-12 MULTIPLIER SOURCE MODULE	OML/S12MS-A	160419-1	2024/07/19	(주)에이치시티
PXA SIGNAL ANALYZER	AGILENT/N9030A	US51350310	2024/03/13	(주)에이치시티

6. 교정결과 (Calibration result)

: 교정결과 참조 (Refer to attachment)

7. 측정불확도 (Measurement uncertainty)

: 교정결과 참조 (Refer to attachment)

신뢰수준 약 95 %, k = 2 (Confidence level about 95 %, k = 2)

확인 (affirmation)	작성자 (Measurements performed by)	승인자 (Approved by)
	성명 (Name) 강석훈	직위 (Title) 기술책임자(Technical Cal. Manager) 김광철

위 성적서는 국제시험기관인정협력체(International Laboratory Accreditation Cooperation) 상호인정협정(Mutual Recognition Arrangement)에 서명한 한국인정기구(KOLAS)로부터 공인 받은 분야의 교정결과입니다.

2024. 03. 07

한국인정기구 인정
Accredited by KOLAS, Republic of KOREA(주)에이치시티 대표이사
President, HCT Co., Ltd.

※ 이 성적서는 측정기의 정밀정확도에 영향을 미치는 요소(과부하, 온도, 습도 등)의 급격한 변화가 발생한 경우에는 무효가 됩니다.

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※ 성적서의 원본은 상단에 HCT로그가 들어간 위변조 방지 장치에 인쇄되어 발급되며, 원본 복사시에는 복사본이라는 표시가 처리됩니다.

F-02P-02-008 (Rev.02)

교 정 결 과 CALIBRATION RESULT

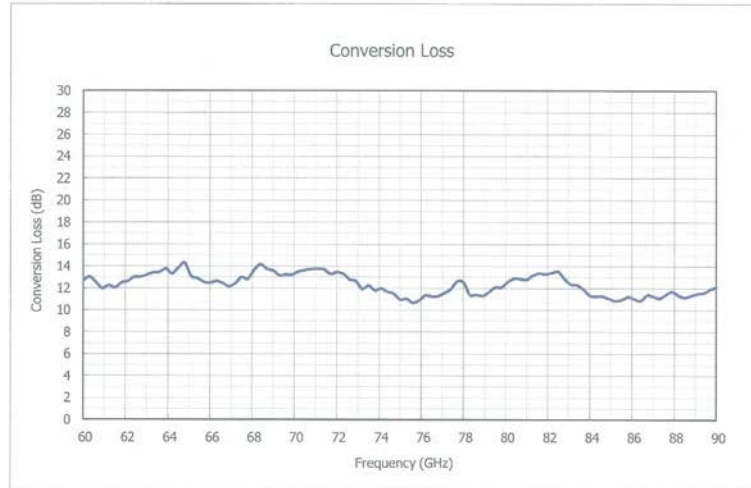


정적서발급번호(Certificate No) : IC-2024-020988

교 정 번 호(Calibration No) : C-2024-023905

페이지(page) : 2 of 4

※ Conversion Loss Curve



[Note]

1. Measurement Condition : RF = -30 dBm, Harmonic Order = 12, L.O. Level = 10 dBm, IF = 322.5 MHz, Bias Value = 0.00 mA

F-02P-02-008 (Rev.02)

교 정 결 과
CALIBRATION RESULT

성적서발급번호(Certificate No) : IC-2024-020988

교 정 번 호(Calibration No) : C-2024-023905

페이지(page) : 3 of 4

1. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
60.0	12.69	0.82	71.1	13.77	0.82
60.3	13.01	0.82	71.4	13.71	0.82
60.6	12.52	0.82	71.7	13.29	0.82
60.9	11.96	0.82	72.0	13.44	0.82
61.2	12.25	0.82	72.3	13.32	0.82
61.5	12.02	0.82	72.6	12.79	0.82
61.8	12.48	0.82	72.9	12.64	0.82
62.1	12.62	0.82	73.2	11.92	0.82
62.4	12.98	0.82	73.5	12.23	0.82
62.7	13.02	0.82	73.8	11.79	0.82
63.0	13.19	0.82	74.1	11.97	0.82
63.3	13.40	0.82	74.4	11.66	0.82
63.6	13.45	0.82	74.7	11.48	0.82
63.9	13.76	0.82	75.0	10.94	0.82
64.2	13.32	0.82	75.3	11.02	0.82
64.5	13.84	0.82	75.6	10.66	0.82
64.8	14.29	0.82	75.9	10.88	0.82
65.1	13.12	0.82	76.2	11.32	0.82
65.4	12.89	0.82	76.5	11.24	0.82
65.7	12.57	0.82	76.8	11.27	0.82
66.0	12.49	0.82	77.1	11.55	0.82
66.3	12.64	0.82	77.4	11.89	0.82
66.6	12.46	0.82	77.7	12.61	0.82
66.9	12.16	0.82	78.0	12.52	0.82
67.2	12.44	0.82	78.3	11.39	0.82
67.5	12.99	0.82	78.6	11.39	0.82
67.8	12.82	0.82	78.9	11.30	0.82
68.1	13.66	0.82	79.2	11.62	0.82
68.4	14.17	0.82	79.5	12.07	0.82
68.7	13.74	0.82	79.8	12.07	0.82
69.0	13.59	0.82	80.1	12.57	0.82
69.3	13.15	0.82	80.4	12.90	0.82
69.6	13.23	0.82	80.7	12.84	0.82
69.9	13.23	0.82	81.0	12.80	0.82
70.2	13.50	0.82	81.3	13.16	0.82
70.5	13.64	0.82	81.6	13.36	0.82
70.8	13.73	0.82	81.9	13.28	0.82

F-02P-02-008 (Rev.02)

교 정 결 과

CALIBRATION RESULT



성적서발급번호(Certificate No) : IC-2024-020988

교 정 번 호(Calibration No) : C-2024-023905

페이지(page) : 4 of 4

1. Conversion Loss Data (cont.)

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
82.2	13.40	0.82	86.4	10.86	0.82
82.5	13.52	0.82	86.7	11.36	0.82
82.8	12.86	0.82	87.0	11.26	0.82
83.1	12.36	0.82	87.3	11.09	0.82
83.4	12.29	0.82	87.6	11.42	0.82
83.7	11.88	0.82	87.9	11.69	0.82
84.0	11.34	0.82	88.2	11.36	0.82
84.3	11.28	0.82	88.5	11.18	0.82
84.6	11.28	0.82	88.8	11.33	0.82
84.9	11.05	0.82	89.1	11.50	0.82
85.2	10.86	0.82	89.4	11.58	0.82
85.5	10.94	0.82	89.7	11.91	0.82
85.8	11.22	0.82	90.0	12.09	0.82
86.1	11.03	0.82	-	-	-

끝.

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열람용

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교정성적서

CALIBRATION CERTIFICATE

경기도 이천시 마장면 서이천로 578번길 74
TLL : 031-645-6900, FAX : 031-645-6969



성적서발급번호(Certificate No) : IC-2024-020986
교정번호(Calibration No) : C-2024-023903

페이지(page) : 1 of 3

1. 의뢰자 (Client)

- 기관명 (Name) : (주)에이치시티
- 주소 (Address) : 경기도 이천시 마장면 서이천로 578번길 74

2. 측정기 (Calibration Subject)

◇ 등록번호 : 415877

- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식(Manufacturer and Model Name) : VDI / SAX WR8.0
- 기기번호 (Serial Number) : SAX779

3. 교정일자 (Date of Calibration)

2024.03.06
차기교정예정일자 : 2025.03.06
(The due date of next Calibration)

4. 교정환경 (Environment)

- 온도(Temperature) : (22.4 ± 0.4) °C - 습도(Humidity) : (46 ± 4) % R.H.
- 교정장소 (Location) : 교정표준실(Permanent Calibration Lab)
(주소: 경기도 이천시 마장면 서이천로 578번길 74)

5. 측정표준의 소급성 (Traceability)

◇ Field code : 40641(RF SPECTRUM ANALYZER)

교정방법 및 소급성 서술 (Calibration method and/or brief description)

상기 기기는 고주파 스펙트럼 분석기의 교정절차(HCT-CS-125-40641)에 따라 국가측정표준기관으로부터 측정의 소급성이 확보된 아래의 표준장비를 이용하여 교정 되었음.

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

기기명 (Description)	제조사 / 형식 (Manufacturer and Model Name)	기기번호 (Serial Number)	차기교정예정일자 (The due date of next Calibration)	교정기관 (Calibration laboratory)
PSG ANALOG SIGNAL GENERATOR	AGILENT/E8257D	MY46130629	2024/10/25	(주)에이치시티
EPM SERIES POWER METER	AGILENT/E4419B	GB42420565	2024/10/25	(주)에이치시티
POWER SENSOR	KEYSIGHT/W8486A	MY56370005	2024/11/09	Keysight Technologies
WR-08 MULTIPLIER SOURCE MODULE	OML/S08MS-A	160419-1	2024/07/19	(주)에이치시티
SIGNAL & SPECTRUM ANALYZER	ROHDE & SCHWARZ/FSW43	102337	2024/07/11	(주)에이치시티

6. 교정결과 (Calibration result)

: 교정결과 참조 (Refer to attachment)

7. 측정불확도 (Measurement uncertainty)

: 교정결과 참조 (Refer to attachment)

신뢰수준 약 95 %, $k = 2$ (Confidence level about 95 %, $k = 2$)

확인 (affirmation)	작성자 (Measurements performed by)	승인자 (Approved by)
	성명 (Name) 강석훈	직위 (Title) 기술책임자(Technical Cal. Manager) 김광철 성명 (Name) 김광철

위 성적서는 국제시험기관인정협력체(International Laboratory Accreditation Cooperation) 상호인정협정(Mutual Recognition Arrangement)에 서명한 한국인정기구(KOLAS)로부터 공인 받은 분야의 교정결과입니다.

2024. 03. 07

한국인정기구 인정
Accredited by KOLAS, Republic of KOREA

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



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※ 성적서의 유효성은 상단에 HCT로고마크가 들어간 워터마크 방지 용지에 인쇄되어 발급되며, 원본 복사시에는 복사본이라는 표시가 처리됩니다.

F-02P-02-008 (Rev.02)

교 정 결 과 CALIBRATION RESULT

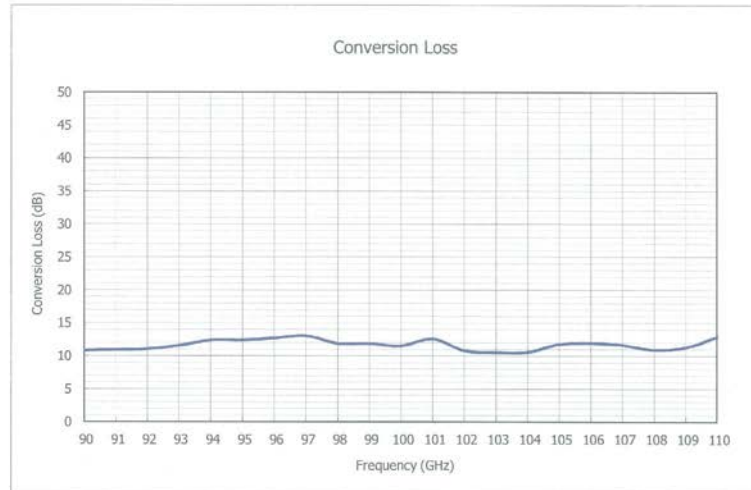


정적서발급번호(Certificate No) : IC-2024-020986

교 정 번 호(Calibration No) : C-2024-023903

페이지(page) : 2 of 3

※ Conversion Loss Curve



[Note]

1. Measurement Condition : RF = -30 dBm, Harmonic Order = 12, L.O. Level = 10 dBm, IF = 322.5 MHz, Bias Value = 0.00 mA

F-02P-02-008 (Rev.02)

교 정 결 과

CALIBRATION RESULT



성적서발급번호(Certificate No) : IC-2024-020986

교 정 번 호(Calibration No) : C-2024-023903

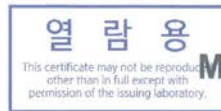
페이지(page) : 3 of 3

1. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)	Frequency (GHz)	Conversion Loss (dB)	Measurement Uncertainty (dB)
90.0	10.81	0.82	101.0	12.57	0.82
91.0	10.94	0.82	102.0	10.82	0.82
92.0	11.03	0.82	103.0	10.53	0.82
93.0	11.56	0.82	104.0	10.58	0.82
94.0	12.37	0.82	105.0	11.78	0.82
95.0	12.39	0.82	106.0	11.95	0.82
96.0	12.71	0.82	107.0	11.66	0.82
97.0	13.04	0.82	108.0	10.93	0.82
98.0	11.90	0.82	109.0	11.30	0.82
99.0	11.88	0.82	110.0	12.87	0.82
100.0	11.53	0.82	-	-	-

끝.

F-02P-02-008 (Rev.02)



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-2024-020990

페이지(page) : 1 of 3

측 정 번 호(Measurement No) : C-2024-023907

1. 의뢰자 (Client)

- 기관명 (Name) : (주)에이치시티
- 주소 (Address) : 경기도 이천시 마장면 서이천로 578번길 74

2. 대상품목 (Measurement Item)

◇ HCT 등록번호 : 416612

- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식(Manufacturer and Model Name) : VDI / SAX WR8.0
- 기기번호 (Serial Number) : SAX779

3. 측정일자 (Measurement date) : 2024.03.06

4. 측정환경 (Environment)

- 온도(Temperature) : (22.7 ± 0.1) ℃ - 습도(Humidity) : (48 ± 1) % R.H.

5. 측정방법 (Measurement method used)

상기기기는 고객의 요구사항에 따라 아래의 표준장비를 이용하여 점검되었습니다.

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)
PSG ANALOG SIGNAL GENERATOR	AGILENT/E8257D	MY46130629	2024/10/25	(주)에이치시티
SIGNAL & SPECTRUM ANALYZER	ROHDE & SCHWARZ/FSW43	102337	2024/07/11	(주)에이치시티
ERICKSON POWER METER	VDI/PM5	394V	Not calibrated	(주)에이치시티
WR-08 MULTIPLIER SOURCE MODULE	OML/S08MS-A	160419-1	Not calibrated	(주)에이치시티

6. 측정결과 (Measurement result)

: 측정결과 참조 (Refer to attachment)

※ 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) : 강 석 훈	직위 (Title) 기술책임자(Technical Manager)
		성명 (Name) 김 광 철

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2024. 03. 07

HCT

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



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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.

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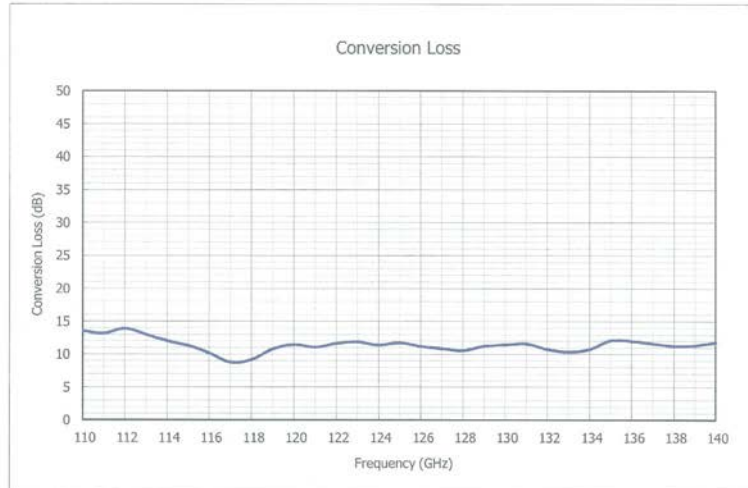
Measurement Result

보고서번호(Report No) : IC-2024-020990

페이지(page) : 2 of 3

측정번호(Measurement No) : C-2024-023907

※ Conversion Loss Curve



[Note]

1. Measurement Condition : RF = -30 dBm, Harmonic Order = 12, L.O. Level = 10 dBm, IF = 322.5 MHz, Bias Value = 0.00 mA

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

Measurement Result

보고서번호(Report No) : IC-2024-020990

측 정 번 호(Measurement No) : C-2024-023907

페이지(page) : 3 of 3

1. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Frequency (GHz)	Conversion Loss (dB)
110.0	13.55	126.0	11.18
111.0	13.16	127.0	10.85
112.0	13.91	128.0	10.57
113.0	12.98	129.0	11.23
114.0	12.03	130.0	11.43
115.0	11.32	131.0	11.59
116.0	10.17	132.0	10.75
117.0	8.78	133.0	10.37
118.0	9.15	134.0	10.76
119.0	10.78	135.0	12.08
120.0	11.47	136.0	12.01
121.0	11.07	137.0	11.62
122.0	11.64	138.0	11.27
123.0	11.89	139.0	11.35
124.0	11.40	140.0	11.81
125.0	11.74	-	-

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열 람 용

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Measurement Report

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Tel : 82-31-645-6900, www.hct.co.kr

보고서번호(Report No) : IC-2024-020987
측 정 번 호(Measurement No) : C-2024-023904

페이지(page) : 1 of 4

1. 의뢰자 (Client)

- 기관명 (Name) : (주)에이치시티
- 주소 (Address) : 경기도 이천시 마장면 서이천로 578번길 74

2. 대상품목 (Measurement Item)

◇ HCT 등록번호 : 415876

- 기기명 (Description) : SA EXTENSION MODULE
- 제작회사 및 형식(Manufacturer and Model Name) : VDI / SAX WR5.1
- 기기번호 (Serial Number) : SAX774

3. 측정일자 (Measurement date) : 2024.03.06

4. 측정환경 (Environment)

- 온도(Temperature) : (22.8 ± 0.1) °C - 습도(Humidity) : (47 ± 2) % R.H.

5. 측정방법 (Measurement method used)

상기기기는 고객의 요구사항에 따라 아래의 표준장비를 이용하여 점검되었습니다.

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)
PSG ANALOG SIGNAL GENERATOR	AGILENT/E8257D	MY46130629	2024/10/25	(주)에이치시티
PXA SIGNAL ANALYZER	AGILENT/N9030A	US51350310	2024/03/13	(주)에이치시티
ERICKSON POWER METER	VDI/PM5	394V	Not calibrated	(주)에이치시티
WR-05 MULTIPLIER SOURCE MODULE	OML/S05MS-A	160419-1	Not calibrated	(주)에이치시티

6. 측정결과 (Measurement result)

: 측정결과 참조 (Refer to attachment)

※ 이 측정결과는 의뢰자가 제시한 시료 및 시료명에만 한정됩니다.

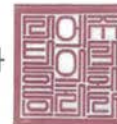
The measurement results shown in this report refer only to the sample(s) measured unless otherwise stated.

확 인 (Affirmation)	작성자 (Tested by)	승인자 (Approved by)
	성명 (Name) : 강 석 훈	직위 (Title) 기술책임자(Technical Manager)
		성명 (Name) 김 광 철

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President, HCT Co., Ltd.

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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.

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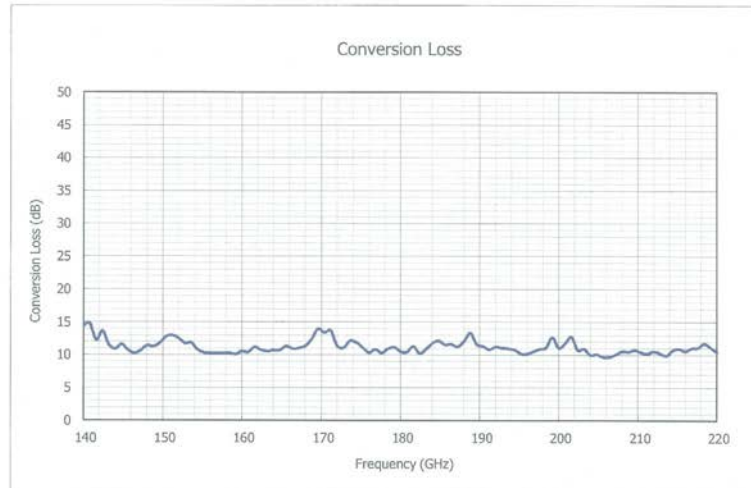
Measurement Result

보고서번호(Report No) : IC-2024-020987

페이지(page) : 2 of 4

측정번호(Measurement No) : C-2024-023904

※ Conversion Loss Curve



[Note]

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

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

Measurement Result

보고서번호(Report No) : IC-2024-020987

측정번호(Measurement No) : C-2024-023904

페이지(page) : 3 of 4

1. Conversion Loss Data

Frequency (GHz)	Conversion Loss (dB)	Frequency (GHz)	Conversion Loss (dB)
140.0	14.37	169.6	13.94
140.8	14.76	170.4	13.37
141.6	12.21	171.2	13.67
142.4	13.62	172.0	11.33
143.2	11.52	172.8	11.07
144.0	10.89	173.6	12.08
144.8	11.60	174.4	11.89
145.6	10.72	175.2	11.09
146.4	10.24	176.0	10.33
147.2	10.63	176.8	10.80
148.0	11.42	177.6	10.27
148.8	11.27	178.4	10.88
149.6	11.78	179.2	11.13
150.4	12.76	180.0	10.48
151.2	12.94	180.8	10.41
152.0	12.51	181.6	11.28
152.8	11.73	182.4	10.19
153.6	11.83	183.2	10.83
154.4	10.76	184.0	11.72
155.2	10.35	184.8	12.11
156.0	10.21	185.6	11.53
156.8	10.24	186.4	11.61
157.6	10.19	187.2	11.23
158.4	10.28	188.0	12.03
159.2	10.08	188.8	13.34
160.0	10.53	189.6	11.61
160.8	10.41	190.4	11.30
161.6	11.14	191.2	10.80
162.4	10.74	192.0	11.21
163.2	10.55	192.8	11.05
164.0	10.67	193.6	10.94
164.8	10.69	194.4	10.74
165.6	11.32	195.2	10.17
166.4	10.91	196.0	10.14
167.2	11.03	196.8	10.51
168.0	11.34	197.6	10.87
168.8	12.37	198.4	11.10

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

Measurement Result

보고서번호(Report No) : IC-2024-020987

측 정 번 호(Measurement No) : C-2024-023904

페이지(page) : 4 of 4

1. Conversion Loss Data (cont.)

Frequency (GHz)	Conversion Loss (dB)	Frequency (GHz)	Conversion Loss (dB)
199.2	12.66	210.4	10.36
200.0	11.07	211.2	10.22
200.8	11.72	212.0	10.55
201.6	12.75	212.8	10.23
202.4	10.75	213.6	9.90
203.2	10.91	214.4	10.70
204.0	9.98	215.2	10.92
204.8	10.10	216.0	10.56
205.6	9.67	216.8	11.03
206.4	9.70	217.6	11.10
207.2	10.07	218.4	11.71
208.0	10.55	219.2	11.13
208.8	10.47	220.0	10.44
209.6	10.73	-	-

끝.

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열람용

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CALIBRATION CERTIFICATE

경기도 이천시 마장면 서이천로 578번길 74
TEL : 031-645-6900, FAX : 031-645-6969



성적서발급번호(Certificate No) : IC-2024-036091

교정번호(Calibration No) : C-2024-041758

페이지(page) : 1 of 4

1. 의뢰자 (Client)

- 기관명 (Name) : (주)에이치시티
- 주소 (Address) : 경기도 이천시 마장면 서이천로 578번길 74

2. 측정기 (Calibration Subject)

◇ 등록번호 : 400353

- 기기명 (Description) : RF SWITCHING SYSTEM
- 제작회사 및 형식 (Manufacturer and Model Name) : T&M SYSTEM / FBSR-04C(LNA)
- 기기번호 (Serial Number) : S4L4

3. 교정일자 (Date of Calibration) : 2024.04.11

차기교정예정일자 : 2025.04.11

(The due date of next Calibration)

4. 교정환경 (Environment)

- 온도(Temperature) : (23.2 ± 0.1) °C - 습도(Humidity) : (48 ± 3) % R.H.
- 교정장소 (Location) : 교정표준실(Permanent Calibration Lab)
(주소: 경기도 이천시 마장면 서이천로 578번길 74)

5. 측정표준의 소급성 (Traceability) ◇Field code : 40601(RF AMPLIFIER)

교정방법 및 소급성 서술 (Calibration method and/or brief description)

상기 기기는 고주파 증폭기의 교정절차(HCT-CS-105-40601)에 따라 국가측정표준기관으로부터 측정의 소급성이 확보된 아래
의 표준장비를 이용하여 교정 되었음.

교정에 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)
NETWORK ANALYZER	AGILENT/E5061B	MY49203861	2024/09/27	(주)에이치시티
CALIBRATION KIT	H.P/85054B	3106A01829	2025/02/07	교정기술원 주식회사
NETWORK ANALYZER	AGILENT/N5230C	MY49001853	2024/09/27	(주)에이치시티

6. 교정결과 (Calibration result)

: 교정결과 참조 (Refer to attachment)

7. 측정불확도 (Measurement uncertainty)

: 교정결과 참조 (Refer to attachment)

신뢰수준 약 95 %, $k = 2$ (Confidence level about 95 %, $k = 2$)

확 인 (affirmation)	작성자 (Measurements performed by)	승인자 (Approved by)
	성명 (Name) 유 성 노	직위 (Title) 기술책임자(Technical Cal. Manager) 성명 (Name) 김 광 철

위 성적서는 국제시험기관인정협력체(International Laboratory Accreditation Cooperation) 상호인정협정(Mutual Recognition Arrangement)에 서명한 한국인정기구(KOLAS)로부터 공인 받은 분야의 교정결과입니다.

2024. 04. 11

한국인정기구 인정
Accredited by KOLAS, Republic of KOREA

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



(※ 이 성적서는 측정기의 정밀정확도에 영향을 미치는 요소(과부하, 온도, 습도 등)의 급격한 변화가 발생한 경우에는 무효가 됩니다.

※ 고객연용사이트(<http://www.callab.co.kr>)에서 성적서의 진위여부 확인이 가능합니다.

※ 성적서의 원본은 상단에 HCT홀로그램이 들어간 워터마크 방지 용지에 인쇄되어 발급되며, 원본 복사시에는 복사본이라는 표시가 처리됩니다.

F-02P-02-008 (Rev.02)

교 정 결 과

CALIBRATION RESULT

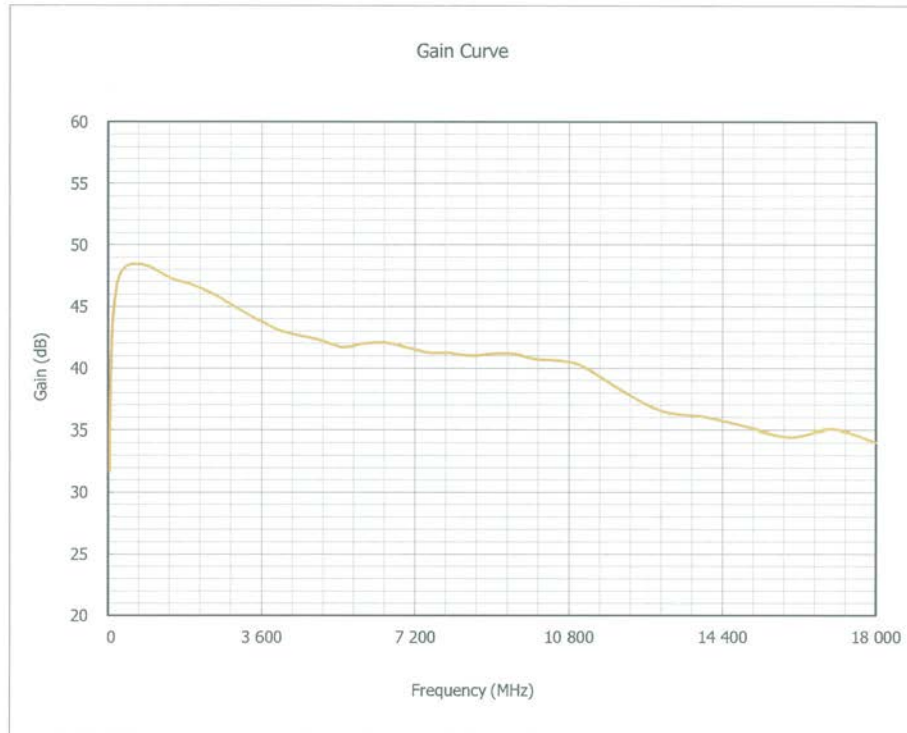


성적서발급번호(Certificate No) : IC-2024-036091

교 정 번 호(Calibration No) : C-2024-041758

페이지(page) : 2 of 4

※ Measurement Curve



F-02P-02-008 (Rev.02)

교 정 결 과
CALIBRATION RESULT

성적서발급번호(Certificate No) : IC-2024-036091

교 정 번 호(Calibration No) : C-2024-041758

페이지(page) : 3 of 4

1. Gain Calibration

Frequency	Measured Value	Measurement Uncertainty
30 MHz	31.65 dB	0.21 dB
50 MHz	37.45 dB	0.21 dB
100 MHz	43.28 dB	0.21 dB
200 MHz	46.62 dB	0.21 dB
300 MHz	47.76 dB	0.21 dB
400 MHz	48.17 dB	0.21 dB
500 MHz	48.38 dB	0.21 dB
600 MHz	48.44 dB	0.21 dB
700 MHz	48.43 dB	0.21 dB
800 MHz	48.41 dB	0.21 dB
900 MHz	48.29 dB	0.21 dB
1.0 GHz	48.20 dB	0.21 dB
1.5 GHz	47.26 dB	0.21 dB
2.0 GHz	46.73 dB	0.21 dB
2.5 GHz	45.95 dB	0.21 dB
3.0 GHz	44.92 dB	0.21 dB
3.5 GHz	43.94 dB	0.21 dB
4.0 GHz	43.08 dB	0.21 dB
4.5 GHz	42.64 dB	0.21 dB
5.0 GHz	42.26 dB	0.21 dB
5.5 GHz	41.70 dB	0.21 dB
6.0 GHz	41.99 dB	0.21 dB
6.5 GHz	42.07 dB	0.21 dB
7.0 GHz	41.70 dB	0.21 dB
7.5 GHz	41.26 dB	0.21 dB
8.0 GHz	41.22 dB	0.21 dB
8.5 GHz	41.01 dB	0.21 dB
9.0 GHz	41.15 dB	0.21 dB
9.5 GHz	41.16 dB	0.21 dB
10.0 GHz	40.74 dB	0.21 dB
11.0 GHz	40.32 dB	0.32 dB
12.0 GHz	38.25 dB	0.32 dB
13.0 GHz	36.49 dB	0.32 dB
14.0 GHz	36.02 dB	0.32 dB
15.0 GHz	35.21 dB	0.32 dB
16.0 GHz	34.46 dB	0.32 dB

F-02P-02-008 (Rev.02)

교 정 결 과

CALIBRATION RESULT



성적서발급번호(Certificate No) : IC-2024-036091

교 정 번 호(Calibration No) : C-2024-041758

페이지(page) : 4 of 4

1. Gain Calibration (cont.)

Frequency	Measured Value	Measurement Uncertainty	
17.0 GHz	35.05 dB	0.32 dB	끝.
18.0 GHz	34.04 dB	0.32 dB	

F-02P-02-008 (Rev.02)

7. ISO 17025 CERTIFICATE

* The highest frequency of ANSI C63.26 test method is 325GHz.

Korea Laboratory Accreditation Scheme

CERTIFICATE OF ACCREDITATION

HCT Co., Ltd.

Accreditation No. : KT197

Corporation Registration No. : 134411-0015635

Address of (Branch site) 2-6, 73, 74 Seoicheon-ro 578beon-gil, Majang-
Laboratory : myeon, Icheon-si, Gyeonggi-do
(Satellite facilities-2) 37, Cheoldobangmulgwan-ro, Uiwang-si,
Gyeonggi-do, Republic of Korea
(Satellite facilities-3) 304, Sinwon-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, Republic of Korea

Date of Initial Accreditation : March 28, 2003

Validity of Accreditation : December 22, 2023 ~ December 21, 2027

Scope of Accreditation : Attached Annex

Date of issue : October 10, 2024

This testing laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to Joint ISO-ILAC-IAF Communiqué).



CHIN CHONGWOOK

Head

Korea Laboratory Accreditation Scheme

Korea Laboratory Accreditation Scheme(KOLAS) is a signatory to the ILAC Mutual Recognition Arrangement

1/209

Korea Laboratory Accreditation Scheme

No. KT197

Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
ANSI C63.19:2011	Wired/wireless communicatio n devices	American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids	H Field:10 mA/m ~ 2 A/m E Field:2 V/m ~ 1 000 V/m	BS	N
ANSI C63.19:2019	Wired/wireless communicatio n devices	American National Standard Methods of Measurements of Compatability between wireless Communications devices and Hearing Aids	H Field:10 mA/m ~ 2 A/m E Field:2 V/m ~ 1 000 V/m	BS	N
ANSI C63.26:2015	Wired/wireless communicatio n devices	American National Standard for Compliance Testing of Transmitters Use in Licensed Radio Services	9 kHz - 325 GHz	BS	N
ANSI C63.4:2009	Wired/wireless communicatio n devices	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	9 kHz ~ 40 GHz	BS	N
ANSI C63.4:2014	Wired/wireless communicatio n devices	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	9 kHz ~ 40 GHz	BS	N
ANSI/TIA- 5050:2018	Wired/wireless communicatio n devices	Telecommunications Communications Products Receive Volume Control Requirements for Wireless (Mobile) Devices	100 Hz ~ 8 kHz	BS	N
ANSI/TIA-603- D:2010	Wired/wireless communicatio n devices	Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards	9 kHz ~ 40 GHz	BS	N
ANSI/TIA-603- E:2016	Wired/wireless communicatio n devices	Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards	9 kHz ~ 40 GHz	BS	N

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92/209

8. Annex A_EUT AND TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2410-FC018-P