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TEST REPORT

FCC 24 GHz Radar Test for SC300i
Certification

APPLICANT
VC Inc.

REPORT NO.
HCT-RF-2010-FC004

DATE OF ISSUE
October 14, 2020

Tested by
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Kwon Jeong

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Additional Model
-

Applicant	**VC Inc.** 3F-4F, Hwawon Building, 417, Nonhyeon-ro, Gangnam-gu, Seoul, Republic of Korea
Eut Type Model Name	Swing Caddie SC300i
FCC ID	2ABTKSC300I
Max. RF Output Power	95.42 dBuV/m @1 m
Modulation type	FSK
FCC Classification	Low Power communication Device Transmitter(DXX)
FCC Rule Part(s)	Part 15.245

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	October 14, 2020	Initial Release

Engineering Statement:
The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

CONTENTS

EUT DESCRIPTION

Model	SC300i	
EUT Type	Swing Caddie	
Power Supply	DC 3.70 V	
Frequency Range	24 075 MHz -24 175 MHz	
Operating Frequency	24 165 MHz	
Fundamental Field Strength Level	Peak	95.42 dBuV/m @1 m
	Average	95.00 dBuV/m @1 m
Modulation Type	FSK	
Antenna Specification	Antenna type: Patch antenna Peak Gain : 8.6 dBi Maximum Dimension : 4.55 cm	
Date(s) of Tests	September 14, 2020 ~ October 14, 2020	
EUT serial numbers	SC300B2002955	

2. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) Operating Under § 15.245" were used in the measurement.

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.245 under the FCC Rules Part 15 Subpart C.

2.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set far-field distance away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 of ANSI C63.10. (Version: 2013)

2.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil,
Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.
The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.
Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

4.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of § 15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
Occupied Bandwidth	§ 2.1049	N/A	RADIATED	PASS
Fundamental Field Strength Level	§ 15.245(b)	< 2500 mV/m		PASS
Harmonic Field Strength Level	§ 15.245(b)	< 25.0 mV/m		PASS
General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	§ 15.205, 15.209, 15.245(b)(3)	< 15.209 limits or 50dB below the level of the fundamental		PASS
AC Power line Conducted Emissions	§ 15.207	cf. Section 8.3	CONDUCTED	PASS

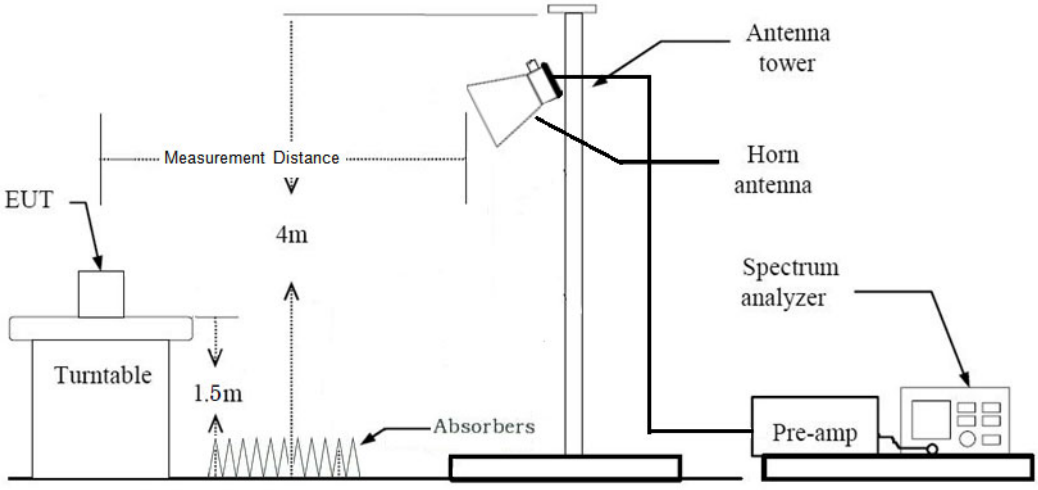
8. TEST RESULT

8.1 OCCUPIED BANDWIDTH MEASUREMENT

Test Requirements and limit, § 2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

RBW = 1% to 3% of the 99% bandwidth.

VBW ≥ 3 x RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

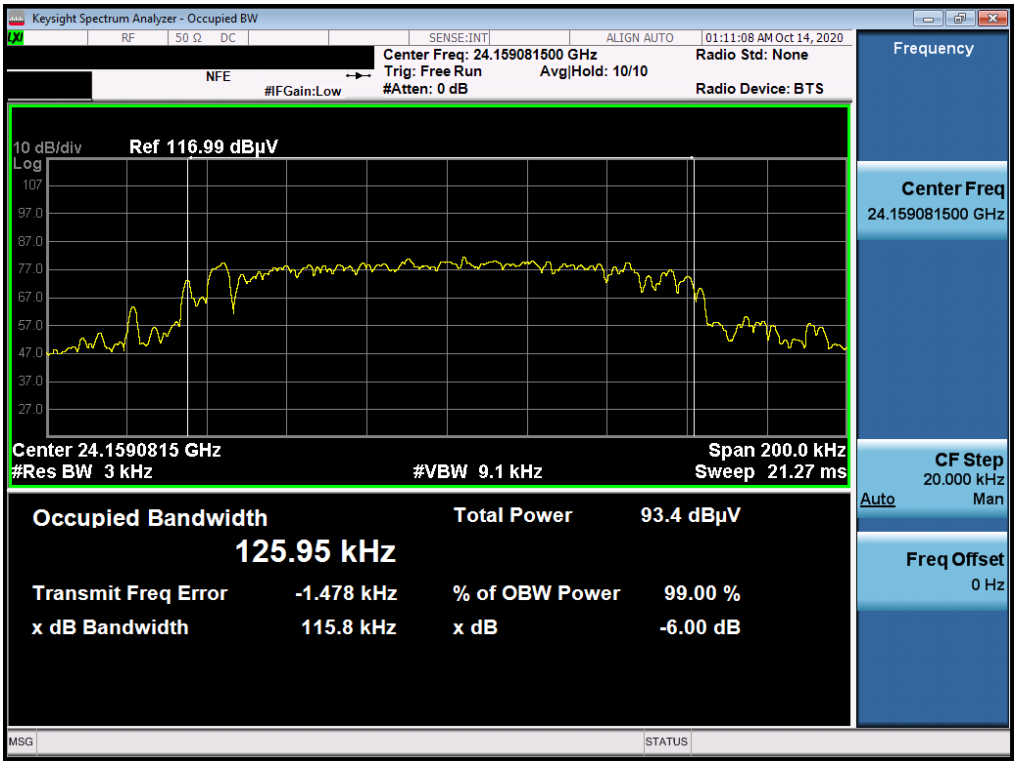
Allow the trace to stabilize

Note : 1. We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

2. Measured distance : 1 m

▣ RESULT PLOTS

Occupied Bandwidth plot



8.2 RADIATED MEASUREMENT.

Test Requirements and limit, § 15.245(b)

(a) Operation within the bands 902–928 MHz, 2435–2465 MHz, 5785–5815 MHZ, 10500-10550 MHz, and 24075–24175 GHz.

(b) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (millivolts/meter)
902-928 MHz	500	1.6
2435-2465 MHz	500	1.6
5785-5815 MHz	500	1.6
10500-10550 MHz	2500	25.0
24075-24175 MHz	2500	25.0

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in § 15.205, shall not exceed the field strength limits shown in § 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

(ii) For all other field disturbance sensors, 7.5 mV/m.

(iii) Field disturbance sensors designed to be used in motor vehicles or aircraft must include features to prevent continuous operation unless their emissions in the restricted bands, other than the second and third harmonics from devices operating in the 24075-24175 MHz band, fully comply with the limits given in § 15.209. Continuous operation of field disturbance sensors designed to be used in farm equipment, vehicles such as fork lifts that are intended primarily for use indoors or for very specialized operations, or railroad locomotives, railroad cars and other equipment which travels on fixed tracks is permitted. A field disturbance sensor will be considered not to be operating in a

continuous mode if its operation is limited to specific activities of limited duration (e.g., putting a vehicle into reverse gear, activating a turn signal, etc.).

(2) Field strength limits are specified at a distance of 3 meters.

(3) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

(4) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.

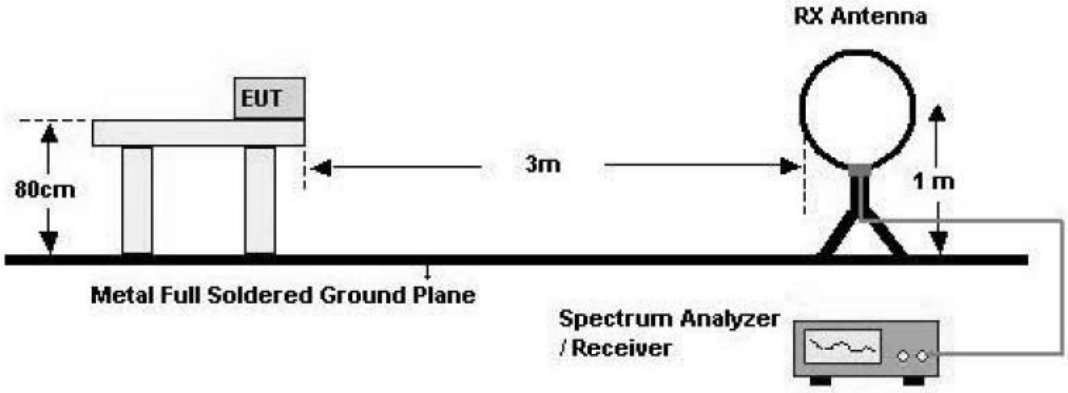
Test Procedure

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. In case from 9 kHz to 18 GHz, EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
   In case from 18 GHz to 60 GHz, EUT is set 1 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
   In case above 60 GHz, EUT is set 1.5 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. Measured Distance

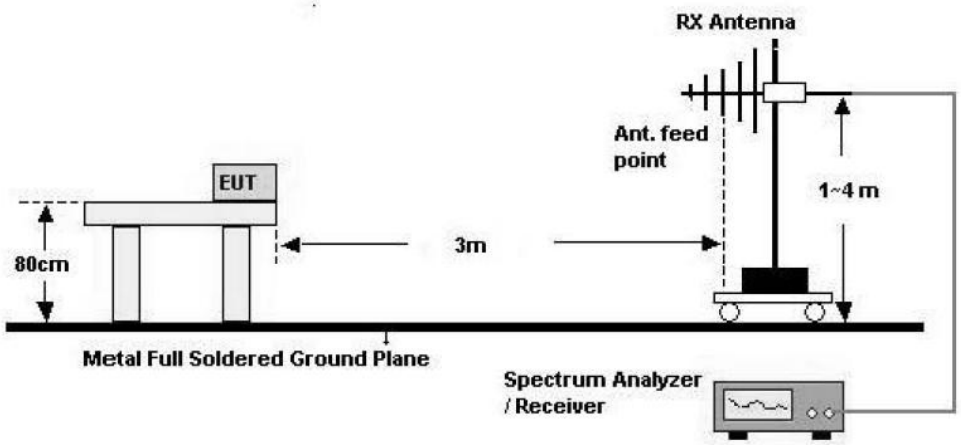
Frequency Range(GHz)	Frequency (MHz)	Antenna Size(m)	Far Field Distance(m)	Measured Distance(m)
24.075 ~ 24.175	24125	0.045486262	0.332764167	1
18 ~ 40	40000		0.551733333	1
40 ~ 60	60000		0.8276	1
60 ~ 90	90000		1.2414	1.5
90 ~ 100	100000		1.379333333	1.5

Test Configuration

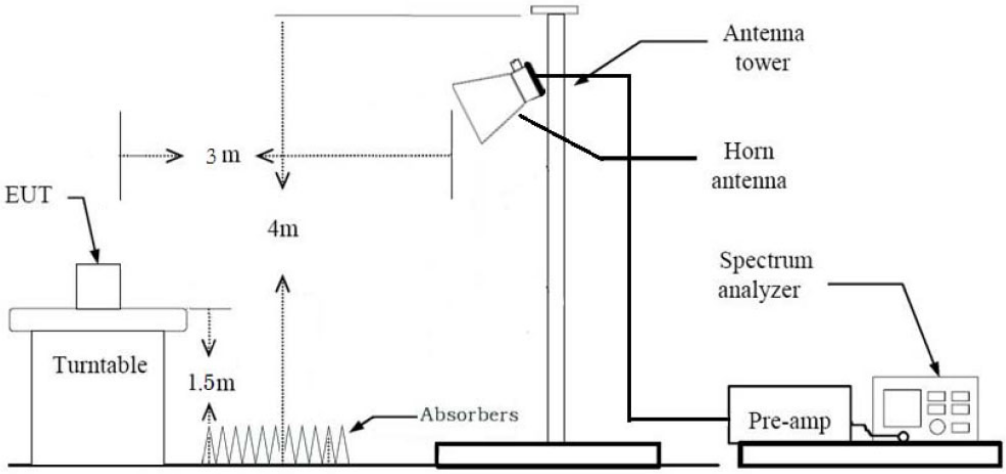
Below 30 MHz



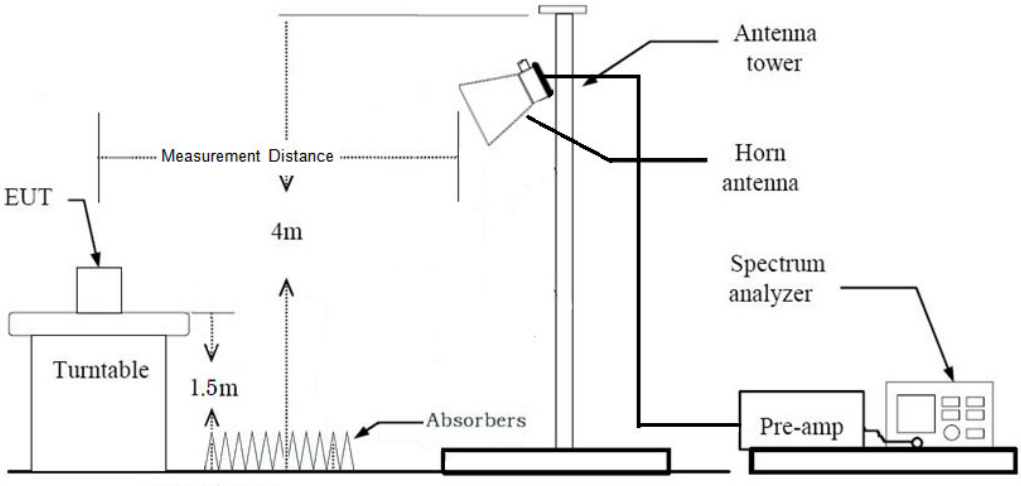
30 MHz - 1 GHz



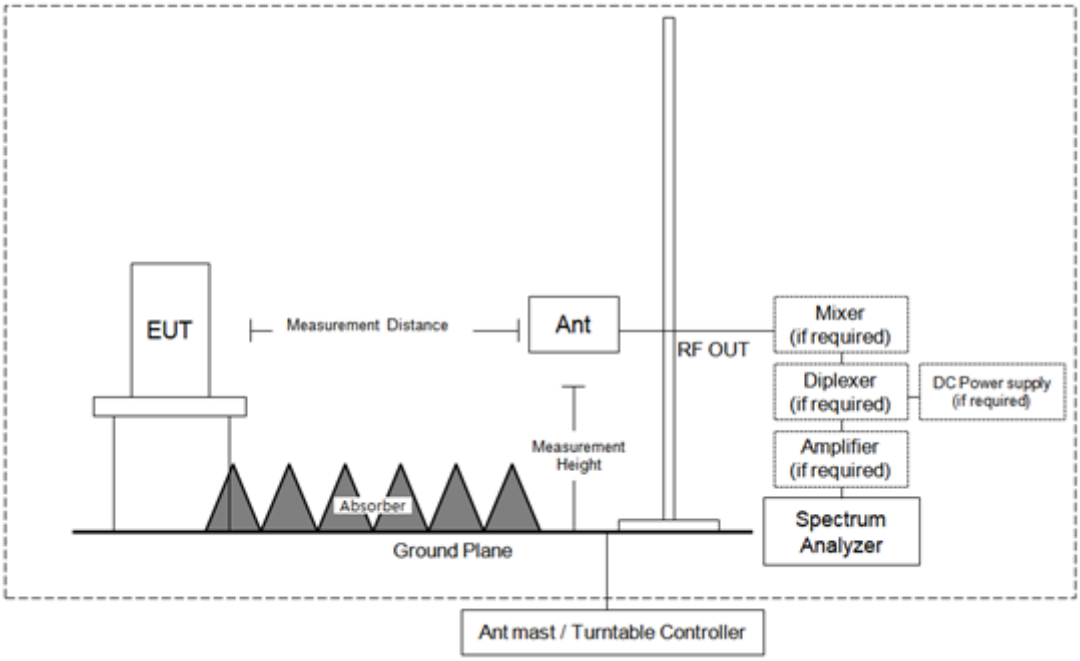
1 GHz – 18 GHz



18 GHz – 40 GHz



40 GHz – 100 GHz



▣ FIELD STRENGTH OF FUNDAMENTAL TEST RESULTS

Frequency [GHz]	Reading [dBuV/m]	A.F.+C.L. [dB]	Ant. Pol. [H/V]	D.E.F [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
24.165	59.28	45.68	H	-9.54	95.42	147.96	52.54	PK
24.165	58.87	45.68	H	-9.54	95.00	127.96	32.96	AV

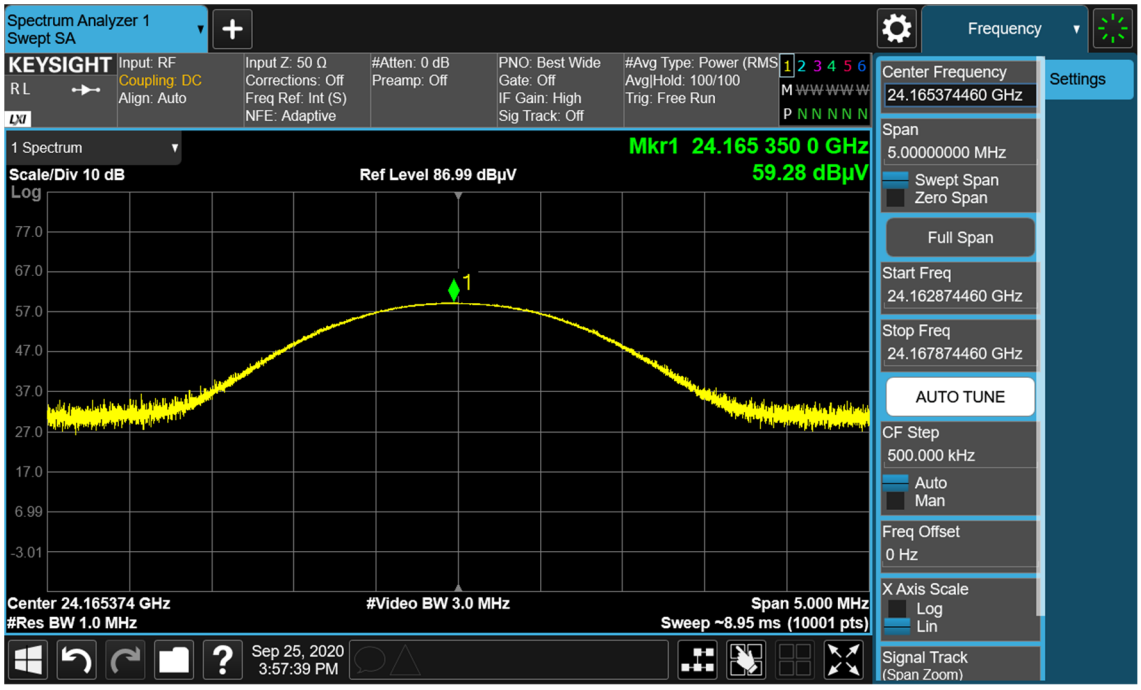
※ A·F: ANTENNA FACTOR
C·L: CABLE LOSS

Note :

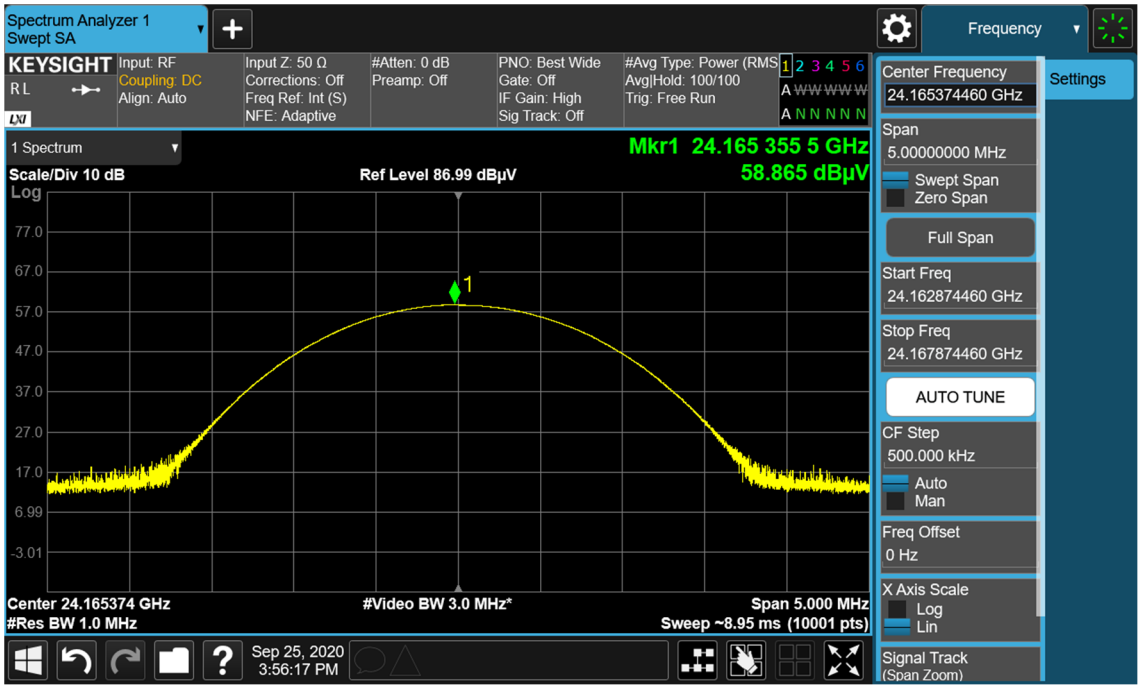
1. Total = Reading Value + Antenna Factor + Cable Loss + Distance Factor
2. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
3. Measured Distance : 1 m
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

▣ RESULT PLOTS

Fundamental Field Strength plot (Peak - Horizontal)



Fundamental Field Strength plot (Average - Horizontal)



▣ FIELD STRENGTH OF HARMONICS and RADIATED SPURIOUS EMISSIONS TEST RESULTS

9 kHz – 30MHz

Operation Mode: Continuous TX Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
6. The test results for below 30 MHz is correlated to an open site.
   The result on OATS is about 2 dB higher than semi-anechoic chamber(10 m chamber)

TEST RESULTS

Below 1 GHz

Operation Mode: Continuous TX Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

1 GHz – 18 GHz

Operation Frequency: Continuous TX Mode

Frequency [MHz]	Reading [dBuV/m]	A.F.+C.L.-AMP G +D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
No Critical peaks found							

※ A·F: ANTENNA FACTOR
C·L: CABLE LOSS
AMP G: AMPLIFIER GAIN

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss – Amplifier Gain + Distance Factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
6. Measurement distance : 3.0 m

18 GHz – 40 GHz

Operation Frequency: Continuous TX Mode

Frequency [GHz]	Reading [dBuV/m]	A.F.+C.L. [dB]	Ant. Pol. [H/V]	D.E.F [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
#23.867	35.25	45.68	H	-9.54	71.39	78.40	7.01	PK
#23.822	2.24	45.68	H	-9.54	38.37	58.40	20.03	AV
#24.328	34.79	45.68	H	-9.54	70.93	78.40	7.47	PK
#24.427	1.14	45.68	H	-9.54	37.28	58.40	21.12	AV

※ A·F: ANTENNA FACTOR
C·L: CABLE LOSS

Note :

1. Total = Reading Value + Antenna Factor + Cable Loss + Distance Factor
2. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
3. Measured Distance : 1 m
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
   Worst case is y plane and vertical polarization.
5. '#' is band edge frequency.

40 GHz – 100 GHz

Operation Frequency: Continuous TX Mode

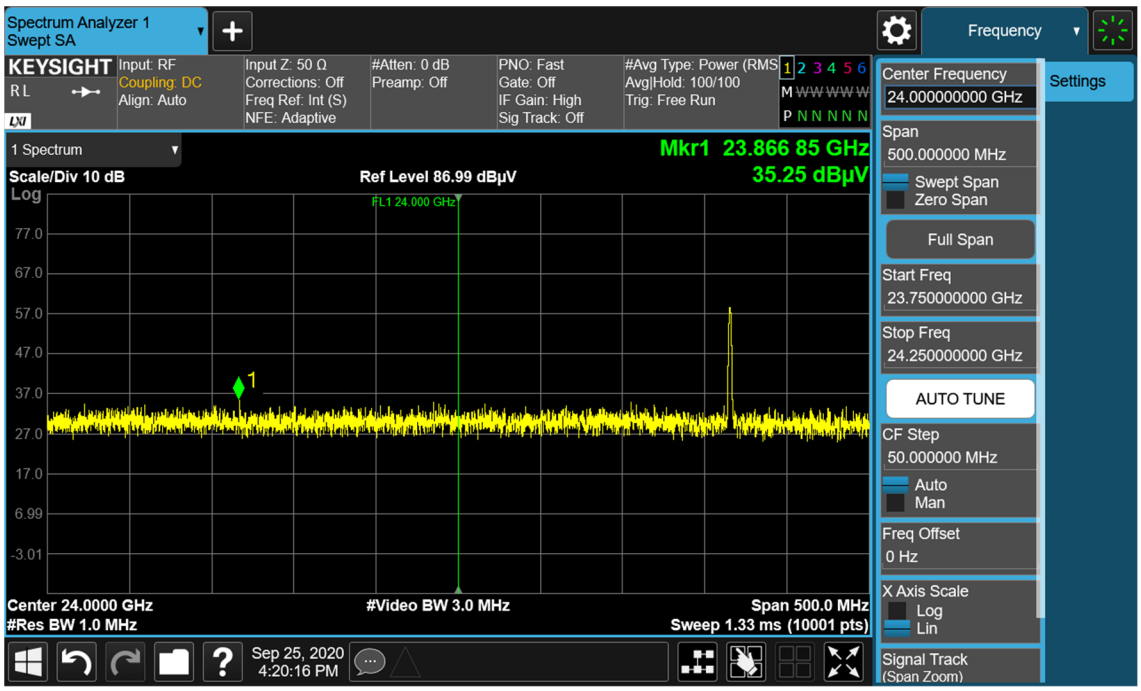
Frequency [MHz]	Reading [dBuV/m]	A.F.+C.L.-AMP G +D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
No Critical peaks found							

Note :

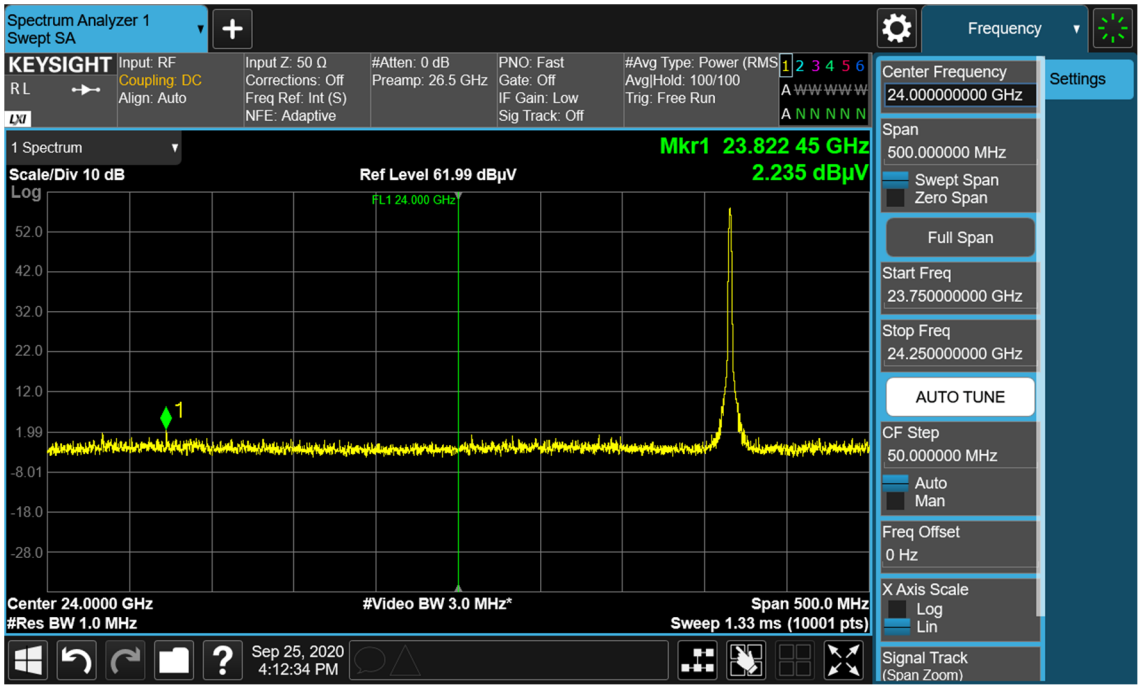
1. Total(dBuV/m) = Reading Value(dBm) + AFCL(dB) + Conversion Factor(dB)
   (cf. ANSI C63.10_2013 section 9.5)
2. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
3. Measured Distance : 1 m(40 GHz – 60 GHz), 1.5 m(60 GHz – 100 GHz)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
   Worst case is y plane and horizontal polarization.
5. In this test, AFCL factor consists of antenna factor, cable loss, mixer loss, amplifier gain
6. Conversion Factor = 20 log(D)-104.77 = 95.2 dB(where, distance is 3 m.)
7. Because of no critical emissions are detected in the test, only peak value is recorded in this report.

▣ RESULT PLOTS

Band Edge Plot(peak, Horizontal)



Band Edge Plot(average, Horizontal)



Note : Only the worst case plots for Radiated Spurious Emissions.

8.3 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, § 15.207

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[a]	56 to 46[a]
0.50 to 5	56	46
5 to 30	60	50

[a]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

▣ RESULT PLOTS

Conducted Emissions (Line 1)

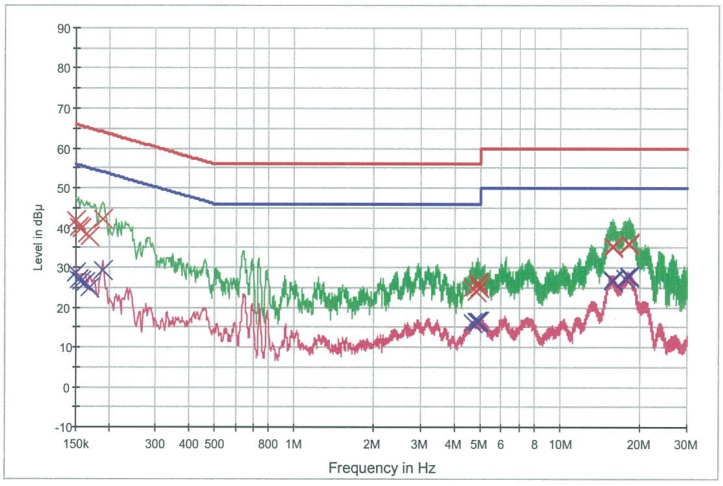
L1 1 / 2

HCT TEST Report

Common Information

EUT:	SC300i
Manufacturer:	VC Inc.
Test Site:	SHIELD ROOM
Operating Conditions:	L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	41.7	9.000	Off	L1	9.8	24.3	66.0
0.154000	40.2	9.000	Off	L1	9.8	25.6	65.8
0.158000	39.9	9.000	Off	L1	9.8	25.6	65.6
0.164000	38.5	9.000	Off	L1	9.8	26.7	65.3
0.168000	37.9	9.000	Off	L1	9.8	27.1	65.1
0.190000	42.1	9.000	Off	L1	9.8	22.0	64.0
4.656000	24.8	9.000	Off	L1	10.0	31.2	56.0
4.812000	24.0	9.000	Off	L1	10.0	32.0	56.0
4.886000	26.3	9.000	Off	L1	10.0	29.7	56.0
4.906000	25.7	9.000	Off	L1	10.0	30.3	56.0
4.918000	25.5	9.000	Off	L1	10.0	30.5	56.0
4.932000	25.0	9.000	Off	L1	10.0	31.0	56.0
15.684000	35.4	9.000	Off	L1	10.4	24.6	60.0
15.856000	35.2	9.000	Off	L1	10.4	24.8	60.0
18.076000	35.9	9.000	Off	L1	10.5	24.1	60.0
18.122000	36.3	9.000	Off	L1	10.5	23.7	60.0
18.160000	36.2	9.000	Off	L1	10.5	23.8	60.0
18.180000	36.1	9.000	Off	L1	10.5	23.9	60.0

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L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	28.5	9.000	Off	L1	9.8	27.5	56.0
0.154000	26.9	9.000	Off	L1	9.8	28.9	55.8
0.158000	26.5	9.000	Off	L1	9.8	29.1	55.6
0.162000	26.1	9.000	Off	L1	9.8	29.2	55.4
0.168000	25.1	9.000	Off	L1	9.8	30.0	55.1
0.190000	29.2	9.000	Off	L1	9.8	24.9	54.0
4.656000	16.1	9.000	Off	L1	10.0	29.9	46.0
4.840000	16.3	9.000	Off	L1	10.0	29.7	46.0
4.868000	16.3	9.000	Off	L1	10.0	29.7	46.0
4.886000	16.4	9.000	Off	L1	10.0	29.6	46.0
4.906000	16.5	9.000	Off	L1	10.0	29.5	46.0
4.938000	16.3	9.000	Off	L1	10.0	29.7	46.0
15.684000	26.9	9.000	Off	L1	10.4	23.1	50.0
15.856000	26.5	9.000	Off	L1	10.4	23.5	50.0
17.540000	27.3	9.000	Off	L1	10.4	22.7	50.0
18.076000	27.8	9.000	Off	L1	10.5	22.2	50.0
18.122000	27.8	9.000	Off	L1	10.5	22.2	50.0
18.174000	27.6	9.000	Off	L1	10.5	22.4	50.0

2020-10-08 오전 9:15:37

Conducted Emissions (Line 2)

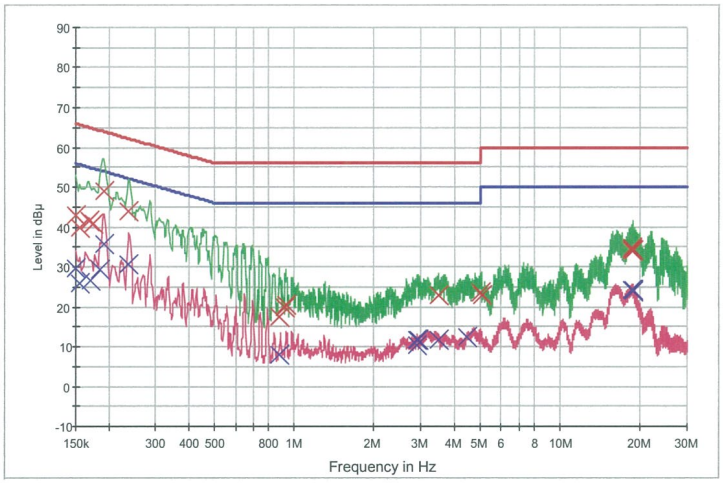
N 1 / 2

HCT TEST Report

Common Information

EUT:	SC300i
Manufacturer:	VC Inc.
Test Site:	SHIELD ROOM
Operating Conditions:	N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	42.9	9.000	Off	N	9.8	23.1	66.0
0.156000	39.8	9.000	Off	N	9.8	25.8	65.7
0.168000	41.7	9.000	Off	N	9.8	23.4	65.1
0.174000	40.9	9.000	Off	N	9.8	23.8	64.8
0.192000	48.9	9.000	Off	N	9.8	15.0	63.9
0.238000	43.8	9.000	Off	N	9.8	18.4	62.2
0.880000	17.6	9.000	Off	N	9.8	38.4	56.0
0.924000	19.9	9.000	Off	N	9.8	36.1	56.0
0.928000	20.4	9.000	Off	N	9.8	35.6	56.0
3.482000	23.0	9.000	Off	N	9.9	33.0	56.0
5.012000	23.7	9.000	Off	N	10.0	36.3	60.0
5.042000	23.0	9.000	Off	N	10.0	37.0	60.0
18.482000	34.4	9.000	Off	N	10.6	25.6	60.0
18.530000	34.6	9.000	Off	N	10.6	25.4	60.0
18.676000	34.1	9.000	Off	N	10.6	25.9	60.0
18.730000	34.1	9.000	Off	N	10.6	25.9	60.0
18.752000	34.1	9.000	Off	N	10.6	25.9	60.0
18.760000	33.9	9.000	Off	N	10.6	26.1	60.0

2020-10-08 오전 9:03:42

N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	29.7	9.000	Off	N	9.8	26.3	56.0
0.156000	26.0	9.000	Off	N	9.8	29.7	55.7
0.170000	26.6	9.000	Off	N	9.8	28.4	55.0
0.186000	29.3	9.000	Off	N	9.8	24.9	54.2
0.192000	35.8	9.000	Off	N	9.8	18.1	53.9
0.238000	30.7	9.000	Off	N	9.8	21.5	52.2
0.880000	8.0	9.000	Off	N	9.8	38.0	46.0
2.900000	11.6	9.000	Off	N	9.9	34.4	46.0
2.908000	10.3	9.000	Off	N	9.9	35.7	46.0
2.940000	11.8	9.000	Off	N	9.9	34.2	46.0
3.494000	11.7	9.000	Off	N	9.9	34.3	46.0
4.452000	12.4	9.000	Off	N	10.0	33.6	46.0
18.676000	24.4	9.000	Off	N	10.6	25.6	50.0
18.680000	24.4	9.000	Off	N	10.6	25.6	50.0
18.730000	24.4	9.000	Off	N	10.6	25.6	50.0
18.734000	24.2	9.000	Off	N	10.6	25.8	50.0
18.752000	24.2	9.000	Off	N	10.6	25.8	50.0
18.814000	24.0	9.000	Off	N	10.6	26.0	50.0

2020-10-08 오전 9:03:42

9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Agilent	N9030B / PXA Signal Analyzer	06/04/2020	Annual	MY55480167
Schwarzbeck	BBHA 9170 / Horn Antenna	11/29/2019	Biennial	BBHA9170541
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Rohde&Schwarz	FSW / Spectrum Analyzer	09/09/2020	Annual	101256
Rohde&Schwarz	FSP / Spectrum Analyzer	09/14/2020	Annual	836650/016
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	06/28/2019	Biennial	9120D-1300
OML INC.	WR-19 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M19RH-160419-2
OML INC.	WR-19 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M19RH-160419-1
OML INC.	WR-12 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M12RH-160419-1
OML INC.	WR-12 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M12RH-160419-2
OML INC.	WR-08 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M08RH-160419-2
OML INC.	WR-08 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M08RH-160419-1
OML INC.	WR-05 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M05RH-160419-1
OML INC.	WR-05 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M05RH-160419-2
OML INC.	OML WR19 / Harmonic Mixer	09/09/2020	Annual	M19HWD
OML INC.	OML WR12 / Harmonic Mixer	09/09/2020	Annual	M12HWD
OML INC.	OML WR08 / Harmonic Mixer	09/09/2020	Annual	M08HWD
OML INC.	OML WR05 / Harmonic Mixer	09/09/2020	Annual	M05HWD
OML INC.	OML WR19 / Harmonic Mixer	09/09/2020	Annual	M19HWD
OML INC.	OML WR12 / Harmonic Mixer	09/09/2020	Annual	M12HWD

OML INC.	OML WR08 / Harmonic Mixer	09/09/2020	Annual	M08HWD
OML INC.	OML WR05 / Harmonic Mixer	09/09/2020	Annual	M05HWD
OML INC.	Diplexer L.O / Diplexer	07/14/2020	Annual	DPL518-160419-1
CERNEX	CBL18265035/ POWER AMP	12/26/2019	Annual	21873
CERNEX	CBL18265035 / POWER AMP	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956
TESTEK	TK-PA1840H / AMPLIFIER	11/13/2019	Annual	170011-L
Rohde & Schwarz	ENV216 / LISN	09/04/2020	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/05/2020	Annual	100033
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

10. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2010-FC004-P