



FCC RADIO TEST REPORT

FCC ID : 2AEUPBHAF031
Equipment : Floodlight Cam Wired Pro
Brand Name : Ring
Model Name : 5B28S4
Applicant : Ring LLC
1523 26th St Santa Monica, CA 90404 USA
Manufacturer : Ring LLC
1523 26th St Santa Monica, CA 90404 USA
Standard : FCC Part 15 Subpart C §15.249

The product was received on Feb 09, 2021 and testing was started from May 06, 2021 and completed on May 10, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Product Feature of Equipment Under Test.....	5
1.2 Modification of EUT	5
1.3 Testing Location	6
1.4 Applicable Standards.....	6
2 Test Configuration of Equipment Under Test	7
2.1 Carrier Frequency and Test Mode.....	7
2.2 Connection Diagram of Test System.....	7
2.3 EUT Operation Test Setup	8
3 Test Result	9
3.1 99% Bandwidth Measurement.....	9
3.2 Field Strength of Fundamental/Harmonics and Radiated Spurious Emission Measurement	10
3.3 AC Conducted Emission Measurement.....	14
3.4 Antenna Requirements	18
4 List of Measuring Equipment.....	19
5 Uncertainty of Evaluation	21
Appendix A. Radiated Spurious Emission	
Appendix B. Radiated Spurious Emission Plots	
Appendix C. Setup Photographs	



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.249(a) 15.249(d)	Field Strength of Fundamental and Radiated Spurious Emission	Pass	-
3.3	15.207	AC Conducted Emission	Pass	-
-	15.249(b)	Frequency Stability	Not Required	Note
3.4	15.203	Antenna Requirements	Pass	-

Note: Only applicable to fixed point to point systems.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

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.

Reviewed by: Yun Huang
Report Producer: Dara Chiu



1 General Description

1.1 Product Feature of Equipment Under Test

Bluetooth-LE, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, LoRa, and 24G Radar.

Product Feature		
Antenna Type	WLAN:	
	<Ant. 1>:	FPC Antenna
	<Ant. 2>:	FPC Antenna
	Bluetooth-LE:	FPC Antenna
	LoRa:	PCB Antenna
	24GHz Radar:	Patch Antenna
Antenna information		
24GHz Radar	Peak Gain (dBi)	2

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.



1.3 Testing Location

Test Site	Sporton International Inc. EMC Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan & Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	CO05-HY
Test Engineer	Tom Lee
Temperature (°C)	23~26
Relative Humidity (%)	40~50

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
	03CH19-HY (TAF Code: 3786)
Test Engineer	Leo Liu
Temperature (°C)	24~25
Relative Humidity (%)	50~55
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.249
- ♦ ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

- a. The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 5th harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower).
- b. AC power line Conducted Emission was tested under maximum output power.

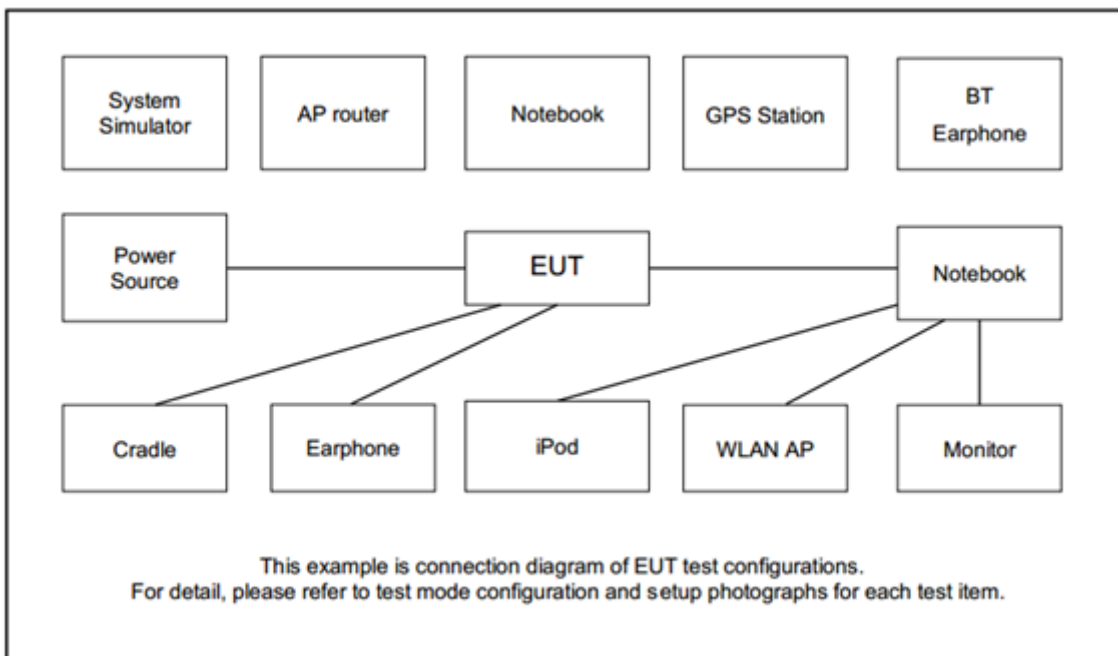
2.1 Carrier Frequency and Test Mode

Frequency Band	Frequency (MHz)	Modulation
24.05-24.25 GHz	24060	CW
24.05-24.25 GHz	24150	CW
24.05-24.25 GHz	24240	CW

Note: The 99%OBW is tested by using FMCW, and the rest of test cases use CW mode in accordance with FCC Part 15.31(c).

Test Cases	
AC Conducted Emission	Mode 1 :24G Radar TX

2.2 Connection Diagram of Test System





2.3 EUT Operation Test Setup

The RF test items, utility “Tera term” was installed in Notebook and connected to the EUT which was programmed in order to make the EUT get into the engineering modes for continuous transmitting signals.



3 Test Result

3.1 99% Bandwidth Measurement

3.1.1 Limit of 99% Bandwidth

For reference only.

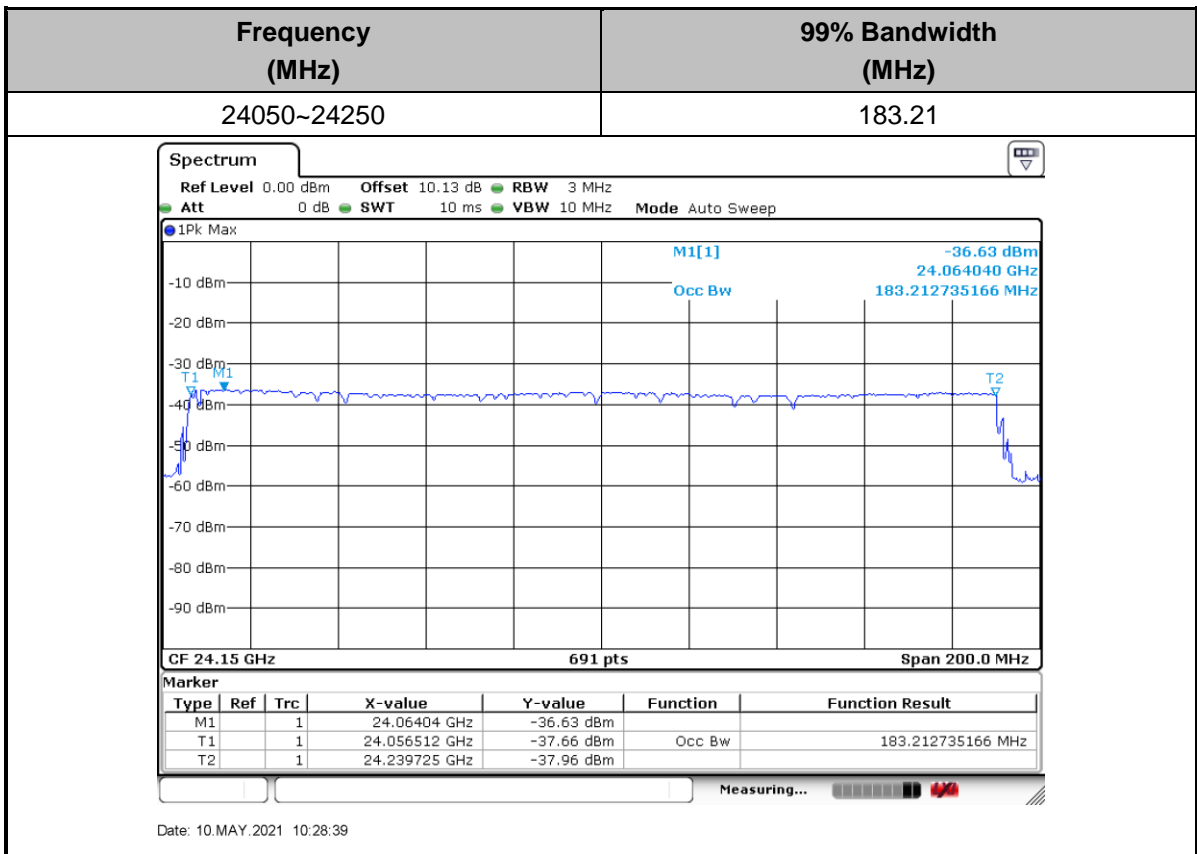
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3.
2. Enable the EUT transmit continuously under FMCW mode.
3. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
4. Measure and record the results in the test report.

3.1.4 Test Result of 99% Occupied Bandwidth





3.2 Field Strength of Fundamental/Harmonics and Radiated Spurious Emission Measurement

3.2.1 Limit

The field strength measured at 3 meters shall not exceed the limits in the following table:

Rules and specifications	FCC CFR 47 Part 15 section 15.249	
Description	Field strength of fundamental	
24.0~24.25 (GHz)	Field strength of fundamental (millivolts/meter) at 3m	Field strength of fundamental (dBµV/m) at 3m
Average limits	250	107.95
Peak limits	-	127.95
Description	Field strength of harmonics	
24.0~24.25 (GHz)	Field strength of harmonics (microvolts/meter) at 3m	Field strength of harmonics (dBµV/m) at 3m
Average limits	2500	67.95
Peak limits	-	87.95
Note: Above 18GHz, the distance correction factor is used, 18GHz to 90GHz : $20\log(1m/3m) = -9.54dB$; 90GHz – 100GHz: $20\log(0.5m/3m) = -15.56dB$.		

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2 Measuring Instruments

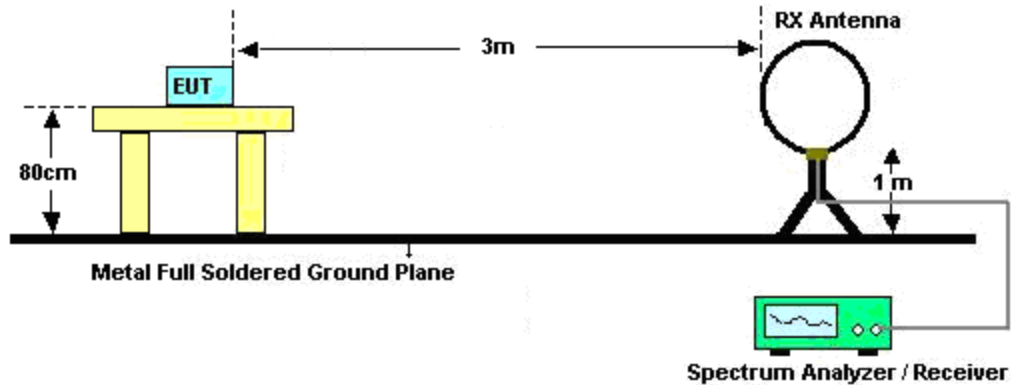
See list of measuring equipment of this test report.

3.2.3 Test Procedures

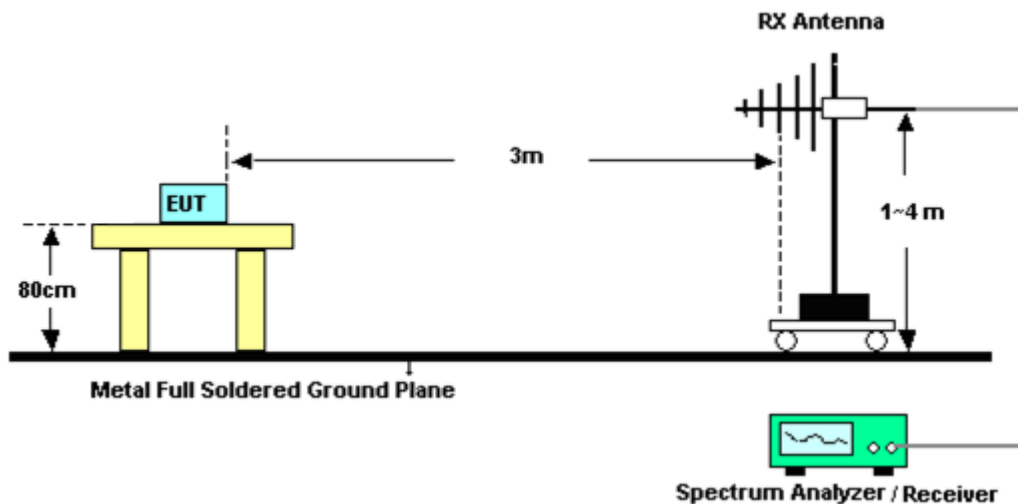
For emissions 9KHz to 40GHz, ANSI C63.10 Section 6.3 Radiated emissions testing follows, and for emissions 40GHz to 100GHz, ANSI C63.10 Section 9.8 and 9.9 radiated measurements follows. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and with 1.5 meter height for frequency above 1GHz, and was arranged test distance as shown in Section 3.4 Test Setup, respectively. For emissions, test results are attenuated more than 20 dB below the permissible value need not be reported in accordance with FCC Part 15.31(O).

3.2.4 Test Setup

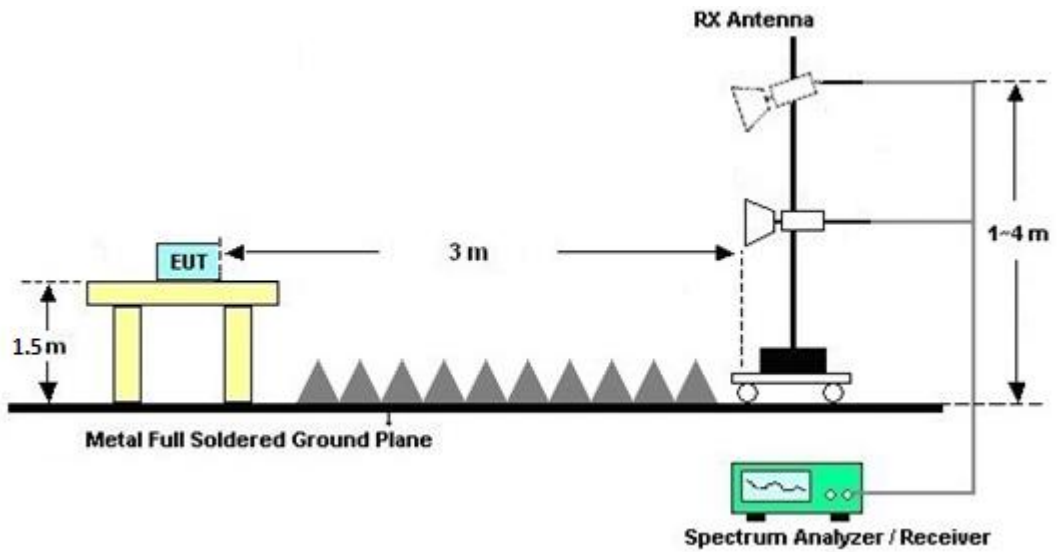
<For radiated emissions below 30MHz>



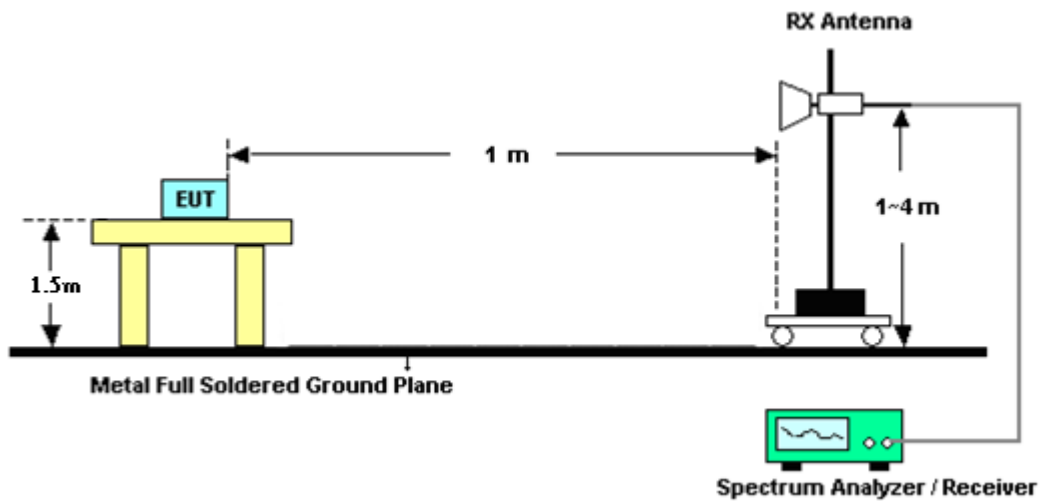
<For radiated emissions from 30MHz ~ 1GHz>



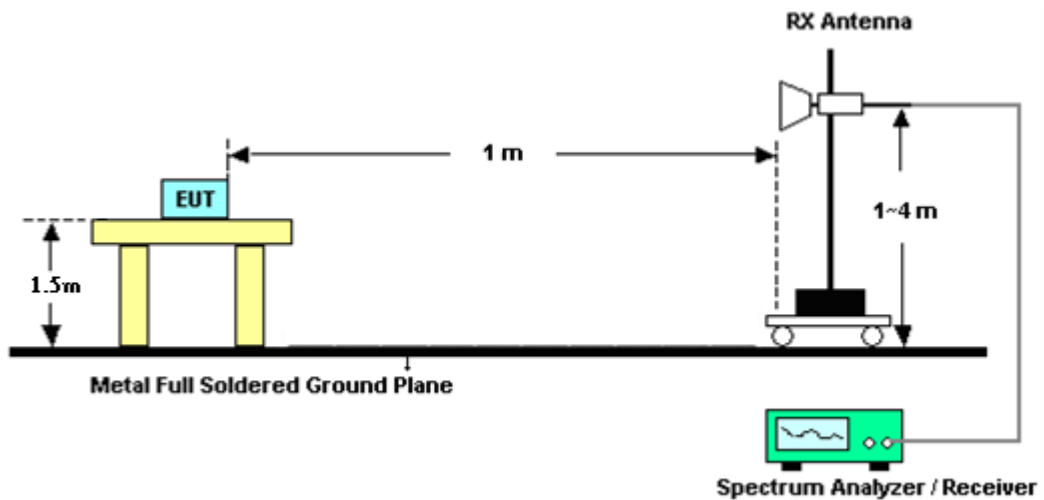
<For radiated emissions from 1 ~ 18GHz>



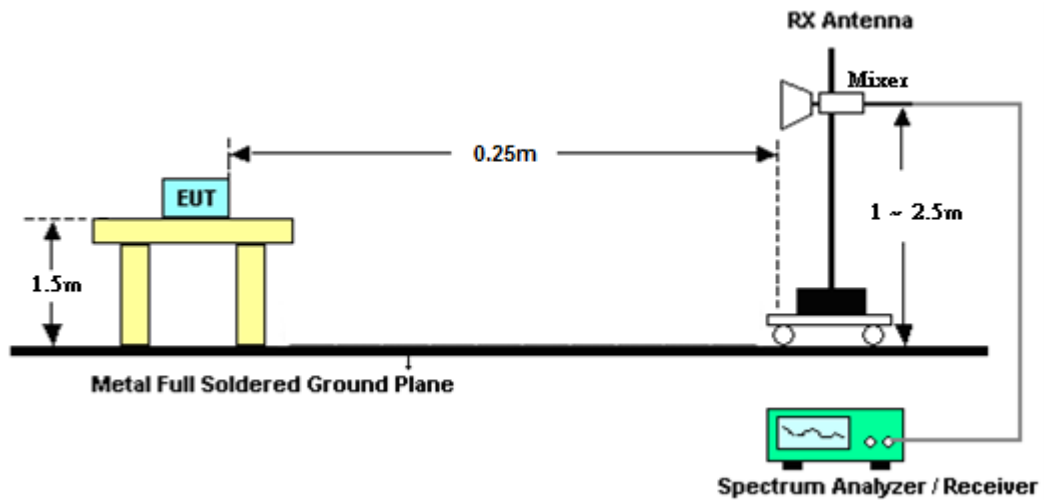
<For radiated emissions from 18 ~ 40GHz>



<For radiated emissions above 40-90GHz>



<For radiated emissions above 90-100GHz>



3.2.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.2.6 Test Result of Field Strength of Fundamental and Radiated Spurious Emission

Please refer to Appendix A and B.



3.3 AC Conducted Emission Measurement

3.3.1 Limit of AC Conducted Emission

For equipment 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.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

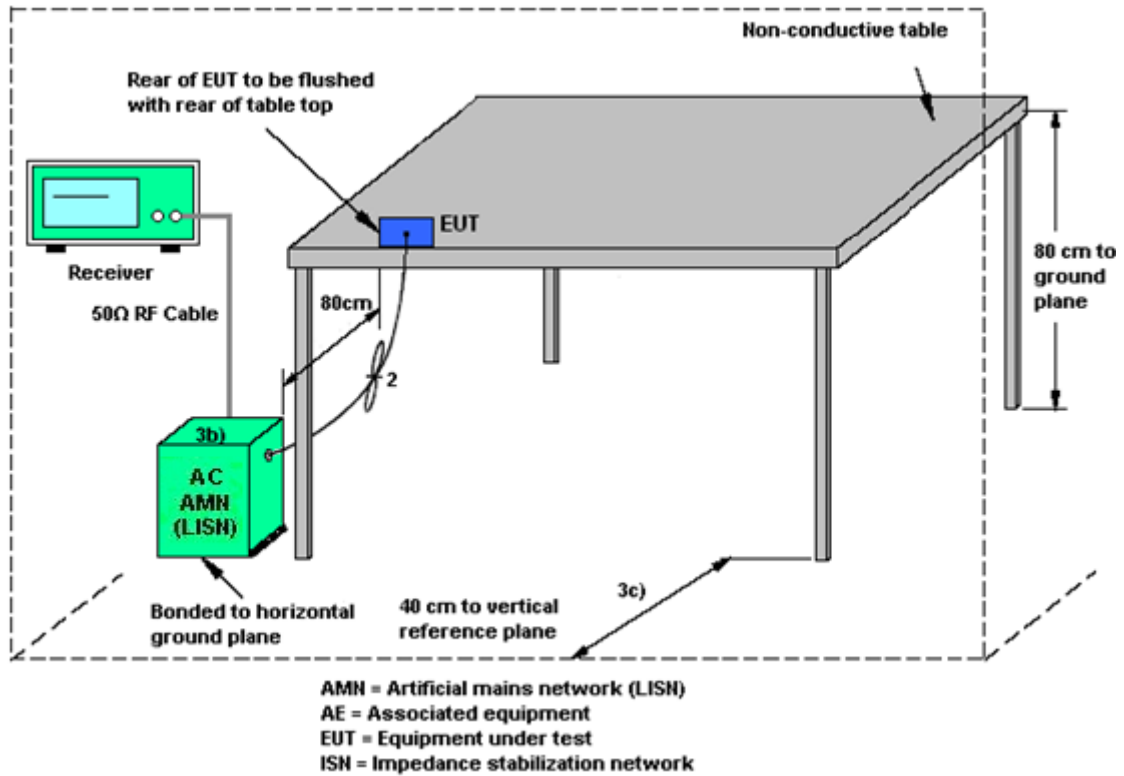
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

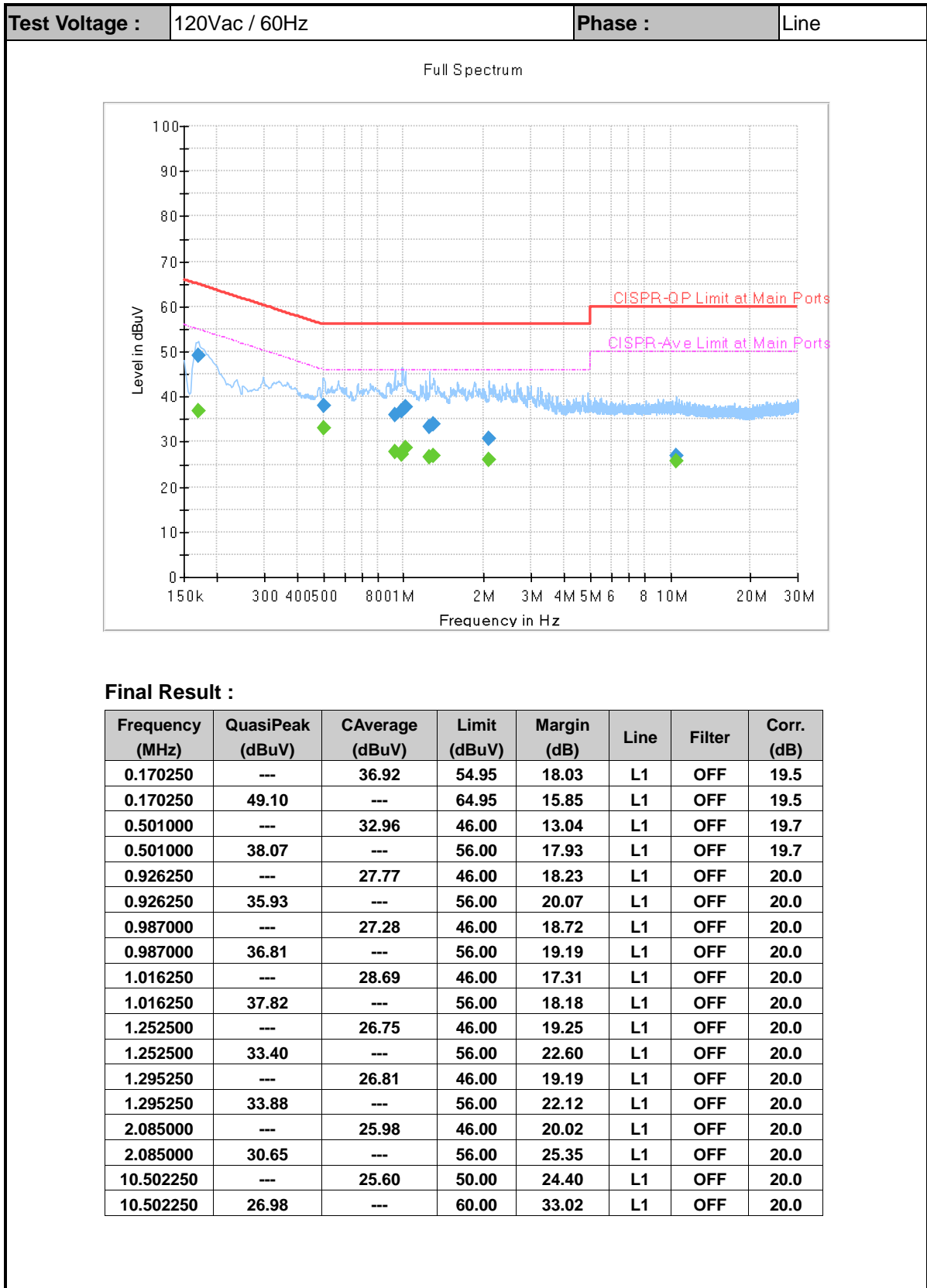
1. Connect EUT to the power mains through a line impedance stabilization network (LISN).
2. All the support units are connecting to the other LISN.
3. The LISN provides 50 ohm coupling impedance for the measuring instrument.
4. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
5. Both sides of AC line were checked for maximum conducted interference.
6. The frequency range from 150 kHz to 30 MHz was searched.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.3.4 Test Setup



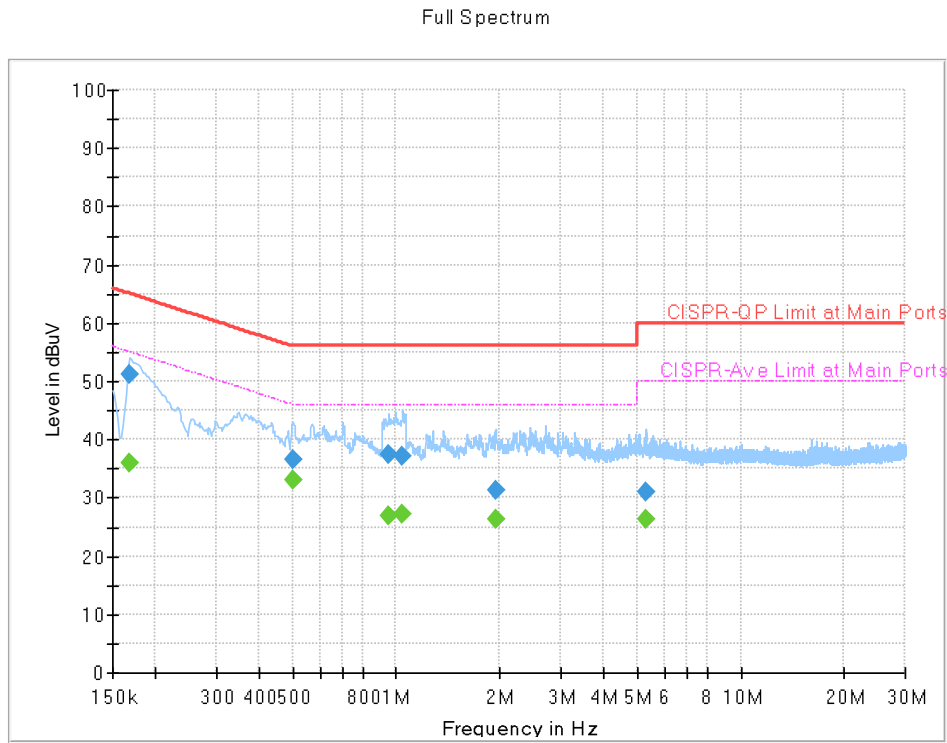


3.3.5 Test Result of AC Conducted Emission





Test Voltage :	120Vac / 60Hz	Phase :	Neutral
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Final Result :

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.168000	---	35.89	55.06	19.17	N	OFF	19.5
0.168000	51.29	---	65.06	13.77	N	OFF	19.5
0.501000	---	33.03	46.00	12.97	N	OFF	19.7
0.501000	36.42	---	56.00	19.58	N	OFF	19.7
0.948750	---	26.92	46.00	19.08	N	OFF	20.0
0.948750	37.56	---	56.00	18.44	N	OFF	20.0
1.043250	---	27.13	46.00	18.87	N	OFF	20.1
1.043250	37.12	---	56.00	18.88	N	OFF	20.1
1.938750	---	26.22	46.00	19.78	N	OFF	20.0
1.938750	31.31	---	56.00	24.69	N	OFF	20.0
5.322750	---	26.44	50.00	23.56	N	OFF	19.9
5.322750	30.93	---	60.00	29.07	N	OFF	19.9



3.4 Antenna Requirements

3.4.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

3.4.2 Antenna Connector Construction

Embedded in Antenna.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Preamplifier	COM-POWER	PAM-103	18020199	1MHz-1000MHz	Jan. 04, 2021	May 06, 2021 ~ May 10, 2021	Jan. 03, 2022	Radiation (03CH19-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	55608 & 09	30MHz~1GHz	Oct. 22, 2020	May 06, 2021 ~ May 10, 2021	Oct. 21, 2021	Radiation (03CH19-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02294	1GHz~18GHz	Jun. 09, 2020	May 06, 2021 ~ May 10, 2021	Jun. 08, 2021	Radiation (03CH19-HY)
Preamplifier	Jet-Power	JAP00101800-30-10P	160118550004	1GHz~18GHz	Mar. 01, 2021	May 06, 2021 ~ May 10, 2021	Feb. 28, 2022	Radiation (03CH19-HY)
Spectrum Analyzer	Keysight	N9010A	MY53470118	10Hz~44GHz	Jan. 15, 2021	May 06, 2021 ~ May 10, 2021	Jan. 14, 2022	Radiation (03CH19-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	May 06, 2021 ~ May 10, 2021	N/A	Radiation (03CH19-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	May 06, 2021 ~ May 10, 2021	N/A	Radiation (03CH19-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	May 06, 2021 ~ May 10, 2021	N/A	Radiation (03CH19-HY)
Software	Audix	E3 6.2009-8-24	RK-002157	N/A	N/A	May 06, 2021 ~ May 10, 2021	N/A	Radiation (03CH19-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY55420170	20MHz~8.4GHz	May 21, 2020	May 06, 2021 ~ May 10, 2021	May 20, 2021	Radiation (03CH19-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519226/2,804014/2,804026 /2	30MHz~40GHz	Jan. 20, 2021	May 06, 2021 ~ May 10, 2021	Jan. 19, 2022	Radiation (03CH19-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz~40GHz	Nov. 19, 2020	May 06, 2021 ~ May 10, 2021	Nov. 18, 2021	Radiation (03CH19-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101010	10Hz~44GHz	Nov. 25, 2020	May 06, 2021 ~ May 10, 2021	Nov. 24, 2021	Radiation (03CH19HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801607/2	9kHz~40GHz	Dec. 22, 2020	May 06, 2021 ~ May 10, 2021	Dec. 21, 2021	Radiation (03CH19-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	103738	9kHz to 30GHz	May 14, 2020	May 06, 2021 ~ May 10, 2021	May 13, 2021	Radiation (03CH19-HY)
Harmonic Mixer	Rohde & Schwarz	RPG FS-Z60	101033	40GHz to 60GHz	Mar. 17, 2020	May 06, 2021 ~ May 10, 2021	Mar. 16, 2023	Radiation (03CH19-HY)
Harmonic Mixer	Rohde & Schwarz	FSZ-90	101811	60GHz to 90GHz	Jul. 16, 2018	May 06, 2021 ~ May 10, 2021	Jul. 15, 2021	Radiation (03CH19-HY)
Harmonic Mixer	Rohde & Schwarz	RPG FS-Z140	101128	90GHz to 140GHz	Oct. 26, 2020	May 06, 2021 ~ May 10, 2021	Oct. 25, 2023	Radiation (03CH19-HY)
Harmonic Mixer	Rohde & Schwarz	RPG FS-Z220	101014	140GHz to 220GHz	Aug. 27, 2018	May 06, 2021 ~ May 10, 2021	Aug. 26, 2021	Radiation (03CH19-HY)
Antenna	Quinstar	QWH-UPRR00	923600007	40-60 GHz	Aug. 17, 2018	May 06, 2021 ~ May 10, 2021	Aug. 16, 2021	Radiation (03CH19-HY)
Antenna	Quinstar	QWH-EPRR00	784600034	60-90 GHz	Aug. 17, 2018	May 06, 2021 ~ May 10, 2021	Aug. 16, 2021	Radiation (03CH19-HY)
Antenna	Quinstar	QWH-FPRR00	923800009	90-140 GHz	Aug. 17, 2018	May 06, 2021 ~ May 10, 2021	Aug. 16, 2021	Radiation (03CH19-HY)
Antenna	Quinstar	QWH-GPRR00	923900001	140-220 GHz	Aug. 17, 2018	May 06, 2021 ~ May 10, 2021	Aug. 16, 2021	Radiation (03CH19-HY)

Note 1: (*) Equipment manufacturer's Calibration Certificate.



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	May 06, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	May 06, 2021	Nov. 29, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	May 06, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	May 06, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 06, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Feb. 25, 2021	May 06, 2021	Feb. 24, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	May 06, 2021	Dec. 30, 2021	Conduction (CO05-HY)



5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.80
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Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.50
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.50
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Uncertainty of Radiated Emission Measurement (40 GHz ~ 140 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8
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Appendix A. Radiated Spurious Emission

24GHz 24000~24250MHz

(Field strength of fundamental @ 3m)

24GHz	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.06GHz		23929	42.68	-31.32	74	38.44	39.09	27.99	53.3	150	0	P	H
	*	23870	28.34	-25.66	54	24.25	38.99	27.94	53.3	150	0	A	H
	*	24059.5	92.34	-35.61	127.95	87.98	39.13	28.09	53.32	150	168	P	H
		24058	90.39	-17.56	107.95	86.03	39.13	28.09	53.32	150	168	A	H
		24865	41.83	-32.17	74	37.18	39.09	28.6	53.5	150	0	P	H
		24424	28.39	-25.61	54	24.04	39.04	28.32	53.47	150	0	A	H
		23941	39.88	-34.12	74	35.61	39.11	28	53.3	150	0	P	V
	*	23849.5	27.32	-26.68	54	23.28	38.96	27.92	53.3	150	0	A	V
		24059.5	98.27	-29.68	127.95	93.91	39.13	28.09	53.32	150	165	P	V
	*	24059.5	97.82	-10.13	107.95	93.46	39.13	28.09	53.32	150	165	A	V
		24946	41.21	-32.79	74	36.43	39.16	28.66	53.5	150	0	P	V
		24418	27.35	-26.65	54	23.01	39.03	28.32	53.47	150	0	A	V
24.15GHz		23840	43.23	-30.77	74	39.21	38.94	27.92	53.3	150	0	P	H
	*	23800	28.81	-25.19	54	52.77	38.88	0	53.3	150	0	A	H
	*	24148	91.39	-36.56	127.95	87.13	39.02	28.14	53.36	150	167	P	H
		24148	86.77	-21.18	107.95	110.65	39.02	0	53.36	150	167	A	H
		25034	43.01	-30.99	74	38.13	39.2	28.71	53.49	150	0	P	H
		24416	28.7	-25.3	54	52.68	39.03	0	53.47	150	0	A	H
		23950	40.56	-33.44	74	36.27	39.12	28.01	53.3	150	0	P	V
	*	23804	27.21	-26.79	54	51.16	38.89	0	53.3	150	0	A	V
		24148	97.55	-30.4	127.95	93.29	39.02	28.14	53.36	150	169	P	V
	*	24148	97.34	-10.61	107.95	121.22	39.02	0	53.36	150	169	A	V
		25382	41.87	-32.13	74	37.03	38.94	28.86	53.42	150	0	P	V
		24408	27.28	-26.72	54	51.25	39.03	0	53.46	150	0	A	V



24GHz	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.24GHz		23850	42.18	-31.82	74	38.14	38.96	27.92	53.3	150	0	P	H
	*	23804	28.1	-25.9	54	24.16	38.89	27.89	53.3	150	0	A	H
	*	24238	93.01	-34.94	127.95	88.84	38.91	28.2	53.4	166	0	P	H
		24238	92.68	-15.27	107.95	88.51	38.91	28.2	53.4	166	0	A	H
		24250.3	61.44	-12.56	74	57.27	38.9	28.21	53.4	150	0	P	H
		24250.1	49.2	-4.8	54	45.03	38.9	28.21	53.4	150	0	A	H
		23886	40.11	-33.89	74	35.98	39.02	27.95	53.3	150	0	P	V
		23848	27.17	-26.83	54	23.13	38.96	27.92	53.3	150	0	A	V
	*	24238	97.21	-30.74	127.95	93.04	38.91	28.2	53.4	167	0	P	V
	*	24238	97.08	-10.87	107.95	92.91	38.91	28.2	53.4	167	0	A	V
		24250.1	64.76	-9.24	74	60.59	38.9	28.21	53.4	150	0	P	V
	24250.1	53.55	-0.45	54	49.38	38.9	28.21	53.4	150	0	A	V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are Pass against Peak and Average limit line. The general radiated emission limits in §15.209 is lesser attenuation as limit. The maximized peak level complies with the average limit, unnecessary to perform an average measurement 												



**24GHz 24000~24250MHz
(Radiated Spurious Emission @ 3m)**

24GHz	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.06GHz		17932	57.12	-16.88	74	38.15	41.03	24.15	46.21	100	0	P	H
		17949	43.98	-10.02	54	24.94	41.1	24.17	46.23	100	0	A	H
		39824	50.15	-23.85	74	34.94	43.23	36.1	54.58	150	0	P	H
		39978	39.27	-14.73	54	23.72	43.29	36.14	54.34	150	0	A	H
		17864	56.83	-17.17	74	38.26	40.58	24.09	46.1	100	0	P	V
		17949	45.32	-8.68	54	26.28	41.1	24.17	46.23	100	0	A	V
		39978	50.63	-23.37	74	35.08	43.29	36.14	54.34	150	0	P	V
		39978	39.03	-14.97	54	23.48	43.29	36.14	54.34	150	0	A	V
24.15GHz		17915	57.41	-16.59	74	38.49	40.96	24.14	46.18	100	0	P	H
		17932	44.18	-9.82	54	25.21	41.03	24.15	46.21	100	0	A	H
		39956	49.75	-24.25	74	34.24	43.28	36.14	54.37	150	0	P	H
		39978	39.99	-14.01	54	24.44	43.29	36.14	54.34	150	0	A	H
		17881	56.83	-17.17	74	38.12	40.73	24.11	46.13	100	0	P	V
		17932	44.06	-9.94	54	25.09	41.03	24.15	46.21	100	0	A	V
		39912	49.91	-24.09	74	34.5	43.26	36.13	54.44	150	0	P	V
		22686	40.41	-13.59	54	37.53	38.87	27.09	53.54	150	0	A	V
24.24GHz		17881	56.74	-17.26	74	38.03	40.73	24.11	46.13	100	0	P	H
		17932	44.2	-9.8	54	25.23	41.03	24.15	46.21	100	0	A	H
		39956	50.37	-23.63	74	34.86	43.28	36.14	54.37	150	0	P	H
		39956	39.33	-14.67	54	23.82	43.28	36.14	54.37	150	0	A	H
		17932	56.83	-17.17	74	37.86	41.03	24.15	46.21	100	0	P	V
		17932	44.01	-9.99	54	25.04	41.03	24.15	46.21	100	0	A	V
		39956	50.84	-23.16	74	35.33	43.28	36.14	54.37	150	0	P	V
		39978	39	-15	54	23.45	43.29	36.14	54.34	150	0	A	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are Pass against Peak and Average limit line. The general radiated emission limits in §15.209 is lesser attenuation as limit. The maximized peak level complies with the average limit, unnecessary to perform an average measurement 												



**24GHz 24000~24250MHz
(Radiated Spurious Emission & Harmonic @ 3m)**

24GHz	Note	Frequency (GHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.06GHz		48.12	50.46	-37.49	87.95	100	0	P	H
		48.12	46.29	-21.66	67.95	100	0	A	H
		46.13	53.19	-20.81	74	100	0	P	H
		46.13	45.09	-8.91	54	100	0	A	H
		72.18	52.25	-35.7	87.95	100	0	P	H
		72.18	46.25	-21.7	67.95	100	0	A	H
		74.33	54.45	-19.55	74	100	0	P	H
		74.00	49.3	-4.7	54	100	0	A	H
		86.18	53.89	-20.11	74	100	0	P	H
		85.04	47.06	-6.94	54	100	0	A	H
		96.24	46.84	-41.11	87.95	100	0	P	H
		96.24	38.10	-29.85	67.95	100	0	A	H
		92.38	59.29	-14.71	74	100	0	P	H
		91.89	48.3	-5.7	54	100	0	A	H
		48.12	55.04	-32.91	87.95	100	0	P	V
		48.12	50.15	-17.80	67.95	100	0	A	V
		49.58	53.06	-20.94	74	100	0	P	V
		49.58	48.65	-5.35	54	100	0	A	V
		72.18	51.69	-36.26	87.95	100	0	P	V
		72.18	44.56	-23.39	67.95	100	0	A	V
		74.00	57.07	-16.93	74	100	0	P	V
		74.00	50.05	-3.95	54	100	0	A	V
		88.34	53.35	-20.65	74	100	0	P	V
		85.01	46.51	-7.49	54	100	0	A	V
		96.24	47.71	-40.24	87.95	100	0	P	V
		96.24	38.09	-29.86	67.95	100	0	A	V
		91.85	59.1	-14.9	74	100	0	P	V
		91.93	48.32	-5.68	54	100	0	A	V
Remark	1. Except above, no other spurious found. 2. All results are Pass against Peak and Average limit line. 3. Test plots shown in the Annex B use closer distance and above final results are extrapolated to the distance specified by the limit, 3m, by offset with distance correction factor. 4. The maximized peak level complies with the average limit, unnecessary to perform an average measurement								



24GHz	Note	Frequency (GHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.15GHz		48.3	49.76	-38.19	87.95	100	0	P	H
		48.3	45.1	-22.85	67.95	100	0	A	H
		46.17	53.55	-20.45	74	100	0	P	H
		46.3	46.33	-7.67	54	100	0	A	H
		74.45	50.23	-37.72	87.95	100	0	P	H
		72.47	45.4	-22.55	67.95	100	0	A	H
		74.94	55.78	-18.22	74	100	0	P	H
		74.27	48.34	-5.66	54	100	0	A	H
		85.16	53.99	-20.01	74	100	0	P	H
		85.17	46.74	-7.26	54	100	0	A	H
		96.6	46.53	-41.42	87.95	100	0	P	H
		96.6	37.4	-30.55	67.95	100	0	A	H
		92.23	58.92	-15.08	74	100	0	P	H
		91.94	48.37	-5.63	54	100	0	A	H
		48.3	55.72	-32.23	87.95	100	0	P	V
		48.3	53.35	-14.60	67.95	100	0	A	V
		49.76	55.28	-18.72	74	100	0	P	V
		49.76	52.2	-1.80	54	100	0	A	V
		72.45	51.8	-36.15	87.95	100	0	P	V
		72.45	45.87	-22.08	67.95	100	0	A	V
		74.27	58.67	-15.33	74	100	0	P	V
		74.27	53.50	-0.50	54	100	0	A	V
		86.10	54.68	-19.32	74	100	0	P	V
	85.17	46.98	-7.02	54	100	0	A	V	
	96.6	47.72	-40.23	87.95	100	0	P	V	
	96.6	37.81	-30.14	67.95	100	0	A	V	
	91.95	59.11	-14.89	74	100	0	P	V	
	91.9	48.51	-5.49	54	100	0	A	V	
Remark	<ol style="list-style-type: none"> Except above, no other spurious found. All results are Pass against Peak and Average limit line. Test plots shown in the Annex B use closer distance and above final results are extrapolated to the distance specified by the limit, 3m, by offset with distance correction factor. The maximized peak level complies with the average limit, unnecessary to perform an average measurement 								



24GHz	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
24.24GHz		48.48	49.52	-38.43	87.95	100	0	P	H	
		48.48	42.78	-25.17	67.95	100	0	A	H	
		49.94	48.20	-25.80	74	100	0	P	H	
		46.13	42.35	-11.65	54	100	0	A	H	
		72.72	50.92	-37.03	87.95	100	0	P	H	
		72.72	48.91	-19.04	67.95	100	0	A	H	
		74.54	59.45	-14.55	74	100	0	P	H	
		74.18	50.15	-3.85	54	100	0	A	H	
		85.52	54.71	-19.29	74	100	0	P	H	
		85.05	47.07	-6.93	54	100	0	A	H	
		96.96	46.8	-41.15	87.95	100	0	P	H	
		96.96	36.78	-31.17	67.95	100	0	A	H	
		92.16	59.74	-14.26	74	100	0	P	H	
		92.18	48.32	-5.68	54	100	0	A	H	
		48.48	55.83	-32.12	87.95	100	0	P	V	
		48.48	44.2	-23.75	67.95	100	0	A	V	
		49.94	53.78	-20.22	74	100	0	P	V	
		49.94	42.25	-11.75	54	100	0	A	V	
		72.72	49.10	-38.85	87.95	100	0	P	V	
		72.72	47.64	-20.31	67.95	100	0	A	V	
		74.54	59.32	-14.68	74	100	0	P	V	
		74.54	53.48	-0.52	54	100	0	A	V	
		82.21	54.03	-19.97	74	100	0	P	V	
		85.04	46.51	-7.49	54	100	0	A	V	
		96.96	46.60	-41.35	87.95	100	0	P	V	
		96.96	36.95	-31	67.95	100	0	A	V	
		92.31	59.01	-14.99	74	100	0	P	V	
		92.27	48.36	-5.64	54	100	0	A	V	
	Remark	<ol style="list-style-type: none"> Except above, no other spurious found. All results are Pass against Peak and Average limit line. Test plots shown in the Annex B use closer distance and above final results are extrapolated to the distance specified by the limit, 3m, by offset with distance correction factor. The maximized peak level complies with the average limit, unnecessary to perform an average measurement 								



Emission below 1GHz
24GHz (LF)

24GHz	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.06GHz LF		113.42	34.21	-9.29	43.5	50.38	17.64	1.85	35.66	-	-	P	H
		161.92	36.83	-6.67	43.5	53.56	16.63	2.21	35.57	100	0	P	H
		480.08	31.72	-14.28	46	38.65	24.05	3.82	34.8	-	-	P	H
		771.08	32.95	-13.05	46	33.67	28.34	4.8	33.86	-	-	P	H
		857.41	35.43	-10.57	46	34.48	29.42	5.07	33.54	-	-	P	H
		960	37.05	-8.95	46	33.46	31.37	5.35	33.13	-	-	P	H
		32.91	33.21	-6.79	40	44.63	23.32	0.99	35.73	100	0	P	V
		87.23	27.72	-12.28	40	47.21	14.58	1.62	35.69	-	-	P	V
		163.86	34.08	-9.42	43.5	51.15	16.27	2.23	35.57	-	-	P	V
		763.32	33.49	-12.51	46	34.26	28.35	4.77	33.89	-	-	P	V
		852.56	34.82	-11.18	46	34.02	29.3	5.06	33.56	-	-	P	V
		960	37.31	-8.69	46	33.72	31.37	5.35	33.13	-	-	P	V
24.15GHz LF		114.39	35	-8.5	43.5	51.07	17.72	1.86	35.65	-	-	P	H
		157.07	35.83	-7.67	43.5	52.26	16.97	2.18	35.58	100	0	P	H
		166.77	35.19	-8.31	43.5	52.39	16.12	2.24	35.56	-	-	P	H
		855.47	34.27	-11.73	46	33.36	29.39	5.07	33.55	-	-	P	H
		924.34	35.59	-10.41	46	33.79	29.82	5.26	33.28	-	-	P	H
		947.62	36.71	-9.29	46	33.74	30.84	5.31	33.18	-	-	P	H
		31.94	33.68	-6.32	40	44.62	23.82	0.97	35.73	100	0	P	V
		114.39	29.79	-13.71	43.5	45.86	17.72	1.86	35.65	-	-	P	V
		157.07	33.67	-9.83	43.5	50.1	16.97	2.18	35.58	-	-	P	V
		850.62	34.28	-11.72	46	33.56	29.24	5.05	33.57	-	-	P	V
		916.58	35.39	-10.61	46	33.84	29.61	5.25	33.31	-	-	P	V
		959.26	36.86	-9.14	46	33.29	31.35	5.35	33.13	-	-	P	V



24GHz	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
24.24GHz LF		101.78	31.91	-11.59	43.5	49.29	16.55	1.75	35.68	-	-	P	H
		113.42	35.47	-8.03	43.5	51.64	17.64	1.85	35.66	-	-	P	H
		159.01	36.72	-6.78	43.5	53.29	16.81	2.19	35.57	100	0	P	H
		803.09	33.75	-12.25	46	34.23	28.37	4.9	33.75	-	-	P	H
		883.6	35.25	-10.75	46	34.14	29.39	5.16	33.44	-	-	P	H
		958.29	37.29	-8.71	46	33.76	31.33	5.34	33.14	-	-	P	H
		34.85	33.35	-6.65	40	45.71	22.34	1.03	35.73	100	0	P	V
		120.21	34.14	-9.36	43.5	50.02	17.86	1.9	35.64	-	-	P	V
		166.77	29.1	-14.4	43.5	46.3	16.12	2.24	35.56	-	-	P	V
		852.56	34.14	-11.86	46	33.34	29.3	5.06	33.56	-	-	P	V
		887.48	34.91	-11.09	46	33.81	29.36	5.17	33.43	-	-	P	V
		951.5	36.61	-9.39	46	33.39	31.06	5.32	33.16	-	-	P	V
Remark	<ol style="list-style-type: none"> 1. No other spurious found. 2. All results are PASS against limit line. 3. The general radiated emission limits in §15.209 is lesser attenuation as limit. 												



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. $Level(dB\mu V/m) =$

$Antenna\ Factor(dB/m) + Cable\ Loss(dB) + Read\ Level(dB\mu V) - Preamp\ Factor(dB)$

2. $Over\ Limit(dB) = Level(dB\mu V/m) - Limit\ Line(dB\mu V/m)$

For Peak Limit @ 2390MHz:

1. $Level(dB\mu V/m)$

$= Antenna\ Factor(dB/m) + Cable\ Loss(dB) + Read\ Level(dB\mu V) - Preamp\ Factor(dB)$

$= 32.22(dB/m) + 4.58(dB) + 54.51(dB\mu V) - 35.86(dB)$

$= 55.45(dB\mu V/m)$

2. $Over\ Limit(dB)$

$= Level(dB\mu V/m) - Limit\ Line(dB\mu V/m)$

$= 55.45(dB\mu V/m) - 74(dB\mu V/m)$

$= -18.55(dB)$

For Average Limit @ 2390MHz:

1. $Level(dB\mu V/m)$

$= Antenna\ Factor(dB/m) + Cable\ Loss(dB) + Read\ Level(dB\mu V) - Preamp\ Factor(dB)$

$= 32.22(dB/m) + 4.58(dB) + 42.6(dB\mu V) - 35.86(dB)$

$= 43.54(dB\mu V/m)$

2. $Over\ Limit(dB)$

$= Level(dB\mu V/m) - Limit\ Line(dB\mu V/m)$

$= 43.54(dB\mu V/m) - 54(dB\mu V/m)$

$= -10.46(dB)$

Both peak and average measured complies with the limit line, so test result is "PASS".



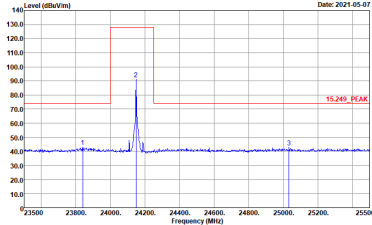
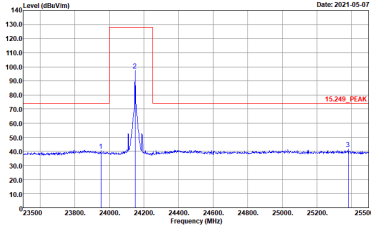
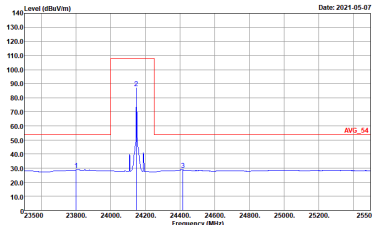
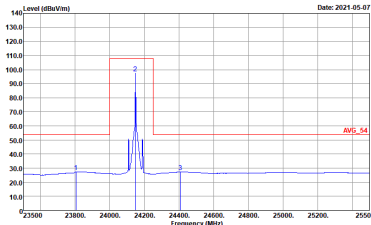
Appendix B. Radiated Spurious Emission Plots

24GHz 24000~24250MHz

Field strength of fundamental @ 3m

24GHz	Field strength of fundamental	
	Test frequency:24.06GHz	
	Horizontal	Vertical
Peak	<p>Site : 03CH13-HY Condition : 15.249_PEAk Im 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	<p>Site : 03CH13-HY Condition : 15.249_PEAk Im 9170_00993 VERTICAL Project : 120337-01 : Z</p>
Avg.	<p>Site : 03CH13-HY Condition : AVG_54 Im 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	<p>Site : 03CH13-HY Condition : AVG_54 Im 9170_00993 VERTICAL Project : 120337-01 : Z</p>



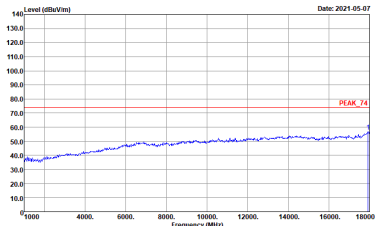
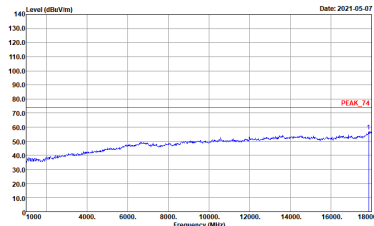
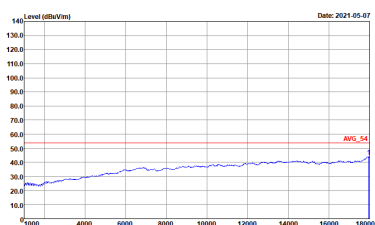
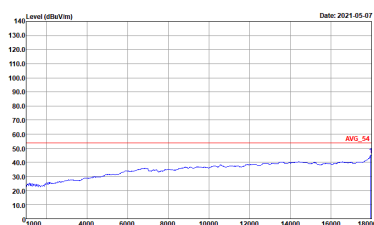
24GHz	Field strength of fundamental	
	Test frequency :24.15GHz	
	Horizontal	Vertical
Peak	 <p>Site : 03CH19-HY Condition : 15249_PEAK_1m 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : 15249_PEAK_1m 9170_00993 VERTICAL Project : 120337-01 : Z</p>
Avg.	 <p>Site : 03CH19-HY Condition : AVG_54_1m 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : AVG_54_1m 9170_00993 VERTICAL Project : 120337-01 : Z</p>



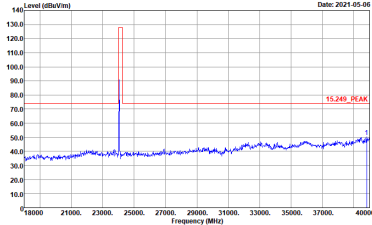
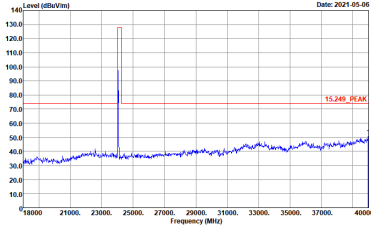
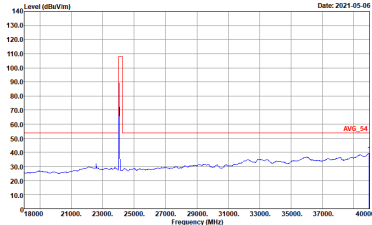
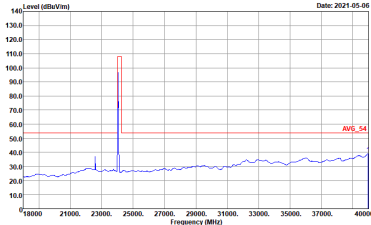
24GHz	Field strength of fundamental	
	Test frequency :24.24GHz	
	Horizontal	Vertical
Peak	<p>Site : 03CH19-HY Condition : 15249_PEAK Im 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	<p>Site : 03CH19-HY Condition : 15249_PEAK Im 9170_00993 VERTICAL Project : 120337-01 : Z</p>
Avg.	<p>Site : 03CH19-HY Condition : AV6_54 Im 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	<p>Site : 03CH19-HY Condition : AV6_54 Im 9170_00993 VERTICAL Project : 120337-01 : Z</p>



24GHz 24000~24250MHz
(Radiated Spurious Emission& Harmonic @ 3m)

24GHz	Test frequency :24.06GHz	
	1-18GHz	
	Horizontal	Vertical
<p align="center">Peak</p>	 <p>Date: 2021-05-07</p> <p>Site : 03CH19-HY Condition : PEAK_74 3m 91200-02294_1090609 HORIZONTAL Project : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : 120337-01 : Z</p>	 <p>Date: 2021-05-07</p> <p>Site : 03CH19-HY Condition : PEAK_74 3m 91200-02294_1090609 VERTICAL Project : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : 120337-01 : Z</p>
<p align="center">Avg.</p>	 <p>Date: 2021-05-07</p> <p>Site : 03CH19-HY Condition : AVG_54 3m 91200-02294_1090609 HORIZONTAL Project : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : 120337-01 : Z</p>	 <p>Date: 2021-05-07</p> <p>Site : 03CH19-HY Condition : AVG_54 3m 91200-02294_1090609 VERTICAL Project : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : 120337-01 : Z</p>



24GHz	Test frequency :24.06GHz	
18-40GHz		
Horizontal		Vertical
Peak	 <p>Site : 03CH19-HY Condition : 15249_PEAK Im 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : 15249_PEAK Im 9170_00993 VERTICAL Project : 120337-01 : Z</p>
Avg.	 <p>Site : 03CH19-HY Condition : AVG_54 Im 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : AVG_54 Im 9170_00993 VERTICAL Project : 120337-01 : Z</p>



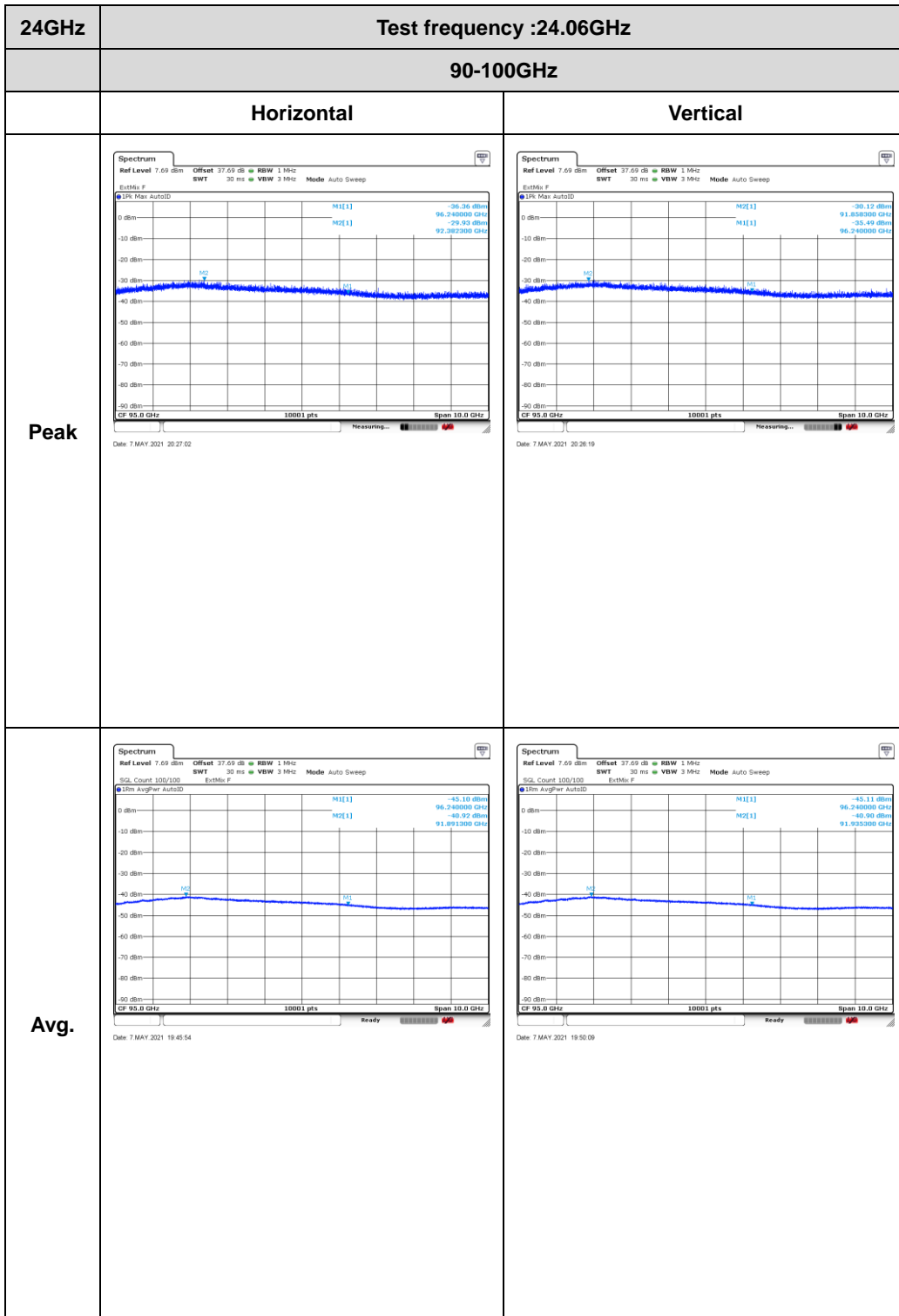
24GHz	Test frequency :24.06GHz	
	40-60GHz	
	Horizontal	Vertical
Peak.	<p>Ref Level -11.86 dBm Offset 13.14 dB RBW 1 MHz SWT 60 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 L1M Max AutoID M2[1] -42.05 dBm 46.131973 GHz M1[1] -41.79 dBm 46.118180 GHz CF 50.0 GHz 32001 pts Span 20.0 GHz Date 7 MAY 2021 15:47:00</p>	<p>Ref Level -11.86 dBm Offset 13.14 dB RBW 1 MHz SWT 60 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 L1M Max AutoID M2[1] -42.18 dBm 49.578158 GHz M1[1] -40.20 dBm 48.118180 GHz CF 50.0 GHz 32001 pts Span 20.0 GHz Date 7 MAY 2021 15:45:55</p>
Avg	<p>Ref Level -11.86 dBm Offset 13.14 dB RBW 1 MHz SWT 60 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 L1M AvgPer AutoID M2[1] -45.13 dBm 46.131973 GHz M1[1] -45.93 dBm 46.118180 GHz CF 50.0 GHz 32001 pts Span 20.0 GHz Date 7 MAY 2021 15:47:54</p>	<p>Ref Level -11.86 dBm Offset 13.14 dB RBW 1 MHz SWT 60 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 L1M AvgPer AutoID M2[1] -45.39 dBm 49.578158 GHz M1[1] -45.09 dBm 48.118180 GHz CF 50.0 GHz 32001 pts Span 20.0 GHz Date 7 MAY 2021 15:42:49</p>



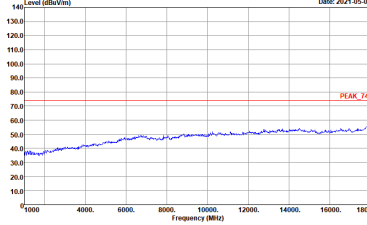
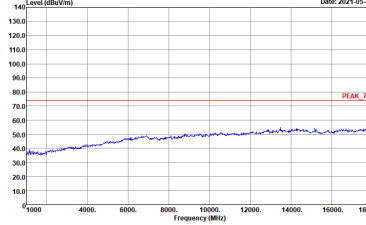
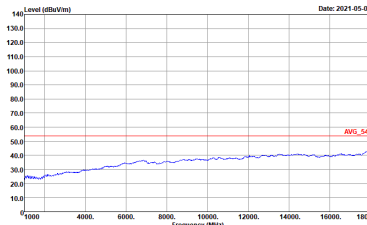
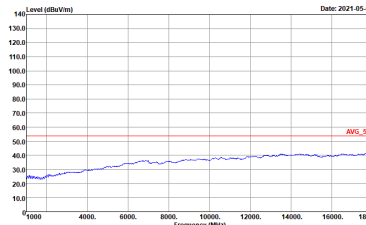
24GHz	Test frequency :24.06GHz	
	60-75GHz	
	Horizontal	Vertical
Peak	<p>Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep L1M Max AutoID M2[1] -48.79 dBm 74.001858 GHz M1[1] -52.99 dBm 72.177660 GHz Start 60.0 GHz 32001 pts Stop 75.0 GHz Date 7 MAY 2021 16:56:54</p>	<p>Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep L1M Max AutoID M2[1] -50.17 dBm 74.001858 GHz M1[1] -53.55 dBm 72.177660 GHz Start 60.0 GHz 32001 pts Stop 75.0 GHz Date 7 MAY 2021 16:56:16</p>
Avg	<p>Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 L1M AvgPwr AutoID M2[1] -45.84 dBm 74.001858 GHz M1[1] -49.99 dBm 72.177660 GHz Start 60.0 GHz 32001 pts Stop 75.0 GHz Date 7 MAY 2021 16:54:27</p>	<p>Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 L1M AvgPwr AutoID M2[1] -45.19 dBm 74.001858 GHz M1[1] -50.66 dBm 72.177660 GHz Start 60.0 GHz 32001 pts Stop 75.0 GHz Date 7 MAY 2021 16:55:12</p>



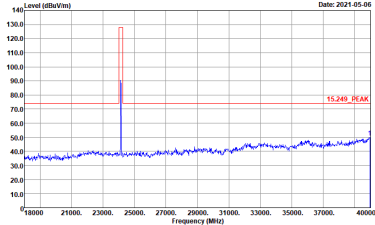
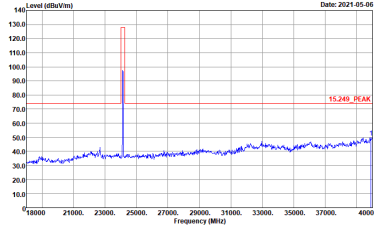
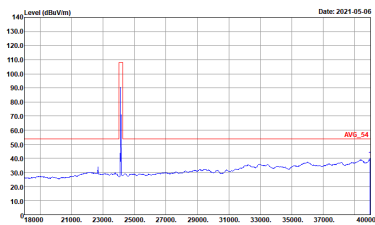
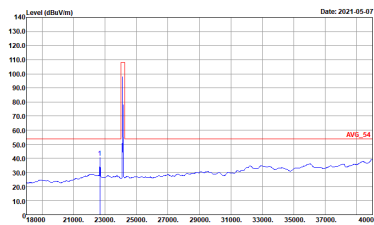
24GHz	Test frequency :24.06GHz	
	75-90GHz	
	Horizontal	Vertical
Peak	<p>Spectrum Ref Level -10.50 dBm Offset 22.44 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtMz E • LRM Max AutoID -41.35 dBm 86.176760 GHz Start 75.0 GHz 32001 pts Stop 90.0 GHz Date 7 MAY 2021 17:41:33</p>	<p>Spectrum Ref Level -10.50 dBm Offset 22.44 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtMz E • LRM Max AutoID -41.09 dBm 88.344660 GHz Start 75.0 GHz 32001 pts Stop 90.0 GHz Date 7 MAY 2021 17:41:08</p>
Avg.	<p>Spectrum Ref Level -10.50 dBm Offset 22.44 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtMz E • LRM AvgPwr AutoID -48.18 dBm 85.041950 GHz Start 75.0 GHz 32001 pts Stop 90.0 GHz Date 7 MAY 2021 17:42:23</p>	<p>Spectrum Ref Level -10.50 dBm Offset 22.44 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtMz E • LRM AvgPwr AutoID -48.72 dBm 85.041950 GHz Start 75.0 GHz 32001 pts Stop 90.0 GHz Date 7 MAY 2021 17:48:24</p>





24GHz	Test frequency :24.15GHz	
	1-18GHz	
	Horizontal	Vertical
Peak	 <p>Date: 2021-05-08</p> <p>Site : 03CH19-HY Condition : PEAK_74 3m 91200-02294_1090609 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Date: 2021-05-08</p> <p>Site : 03CH19-HY Condition : PEAK_74 3m 91200-02294_1090609 VERTICAL Project : 120337-01 : Z</p>
Avg.	 <p>Date: 2021-05-08</p> <p>Site : 03CH19-HY Condition : AVG_54 3m 91200-02294_1090609 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Date: 2021-05-08</p> <p>Site : 03CH19-HY Condition : AVG_54 3m 91200-02294_1090609 VERTICAL Project : 120337-01 : Z</p>



24GHz	Test frequency :24.15GHz	
	18-40GHz	
	Horizontal	Vertical
Peak	 <p>Date: 2021-05-06</p> <p>Site : 03CH19-HY Condition : 15249_Peak_1m 9170_00993 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 120337-01 : Z</p>	 <p>Date: 2021-05-06</p> <p>Site : 03CH19-HY Condition : 15249_Peak_1m 9170_00993 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 120337-01 : Z</p>
Avg	 <p>Date: 2021-05-06</p> <p>Site : 03CH19-HY Condition : AV6_54 1m 9170_00993 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Project : 120337-01 : Z</p>	 <p>Date: 2021-05-07</p> <p>Site : 03CH19-HY Condition : AV6_54 1m 9170_00993 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Project : 120337-01 : Z</p>



24GHz	Test frequency :24.15GHz	
	40-60GHz	
	Horizontal	Vertical
Peak.		
Avg		



24GHz	Test frequency :24.15GHz	
	60-75GHz	
	Horizontal	Vertical
Peak	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtIn: V LRM Max AutoOff M1[1] 74.935980 GHz -45.01 dBm M2[1] 72.458000 GHz -39.46 dBm Start 60.0 GHz Span 15.0 GHz Stop 75.0 GHz Date 7 MAY 2021 17:05:27 </p>	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtIn: V LRM Max AutoOff M1[1] 74.272290 GHz -43.44 dBm M2[1] 72.478590 GHz -36.57 dBm Start 60.0 GHz Span 15.0 GHz Stop 75.0 GHz Date 7 MAY 2021 17:08:35 </p>
Avg	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtIn: V LRM AvgPwr AutoOff M1[1] 72.465940 GHz -46.90 dBm M2[1] 74.272290 GHz -41.74 dBm Start 60.0 GHz Span 15.0 GHz Stop 75.0 GHz Date 7 MAY 2021 17:08:09 </p>	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep ExtIn: V LRM AvgPwr AutoOff M1[1] 72.465940 GHz -46.90 dBm M2[1] 74.272290 GHz -41.74 dBm Start 60.0 GHz Span 15.0 GHz Stop 75.0 GHz Date 7 MAY 2021 17:07:23 </p>

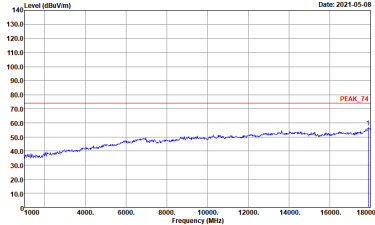
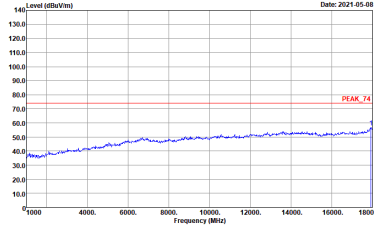
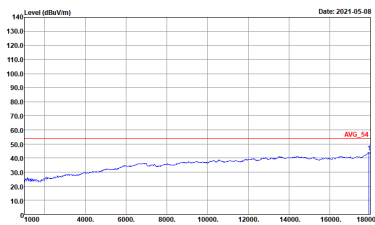
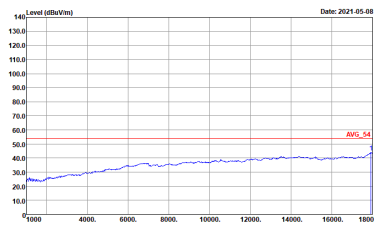


24GHz	Test frequency :24.15GHz	
	75-90GHz	
	Horizontal	Vertical
Peak		
Avg.		

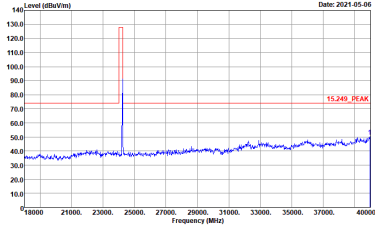
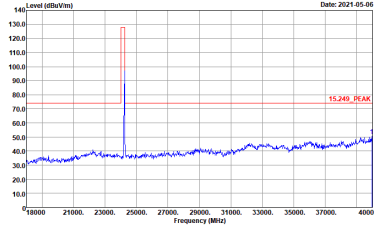
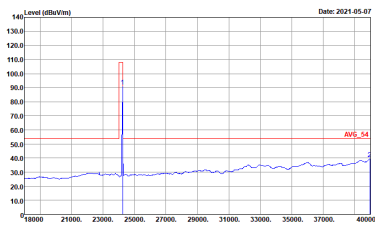
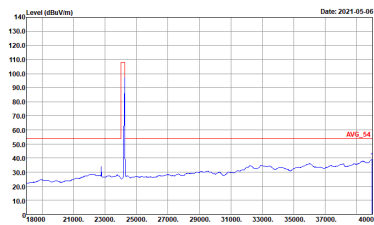


24GHz	Test frequency :24.15GHz	
	90-100GHz	
	Horizontal	Vertical
Peak	<p>Ref Level 7.69 dBm Offset 37.69 dB RBW 1 MHz SWT 30 ms VBW 3 MHz Mode Auto Sweep</p> <p>ExtMtx F</p> <p>0 dBm -39.30 dBm 92.236300 GHz -38.67 dBm 96.608000 GHz</p> <p>CF 95.0 GHz 10001 pts Span 10.0 GHz</p> <p>Date 7 MAY 2021 20:29:36</p>	<p>Ref Level 7.69 dBm Offset 37.69 dB RBW 1 MHz SWT 30 ms VBW 3 MHz Mode Auto Sweep</p> <p>ExtMtx F</p> <p>0 dBm -35.48 dBm 96.608000 GHz -39.11 dBm 91.954300 GHz</p> <p>CF 95.0 GHz 10001 pts Span 10.0 GHz</p> <p>Date 7 MAY 2021 20:30:24</p>
Avg.	<p>Ref Level 7.69 dBm Offset 37.69 dB RBW 1 MHz SWT 30 ms VBW 3 MHz Mode Auto Sweep</p> <p>SGL Count 100/100 ExtMtx F</p> <p>0 dBm -45.80 dBm 96.608000 GHz -49.85 dBm 91.954300 GHz</p> <p>CF 95.0 GHz 10001 pts Span 10.0 GHz</p> <p>Date 7 MAY 2021 19:55:13</p>	<p>Ref Level 7.69 dBm Offset 37.69 dB RBW 1 MHz SWT 30 ms VBW 3 MHz Mode Auto Sweep</p> <p>SGL Count 100/100 ExtMtx F</p> <p>0 dBm -40.71 dBm 91.980300 GHz -45.59 dBm 96.608000 GHz</p> <p>CF 95.0 GHz 10001 pts Span 10.0 GHz</p> <p>Date 7 MAY 2021 19:52:24</p>



24GHz	Test frequency :24.24GHz	
	1-18GHz	
	Horizontal	Vertical
<p>Peak</p>	 <p>Site : 03CH19-HY Condition : PEAK_74 3m 91200-02294_1090609 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : PEAK_74 3m 91200-02294_1090609 VERTICAL Project : 120337-01 : Z</p>
<p>Avg.</p>	 <p>Site : 03CH19-HY Condition : AVG_54 3m 91200-02294_1090609 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : AVG_54 3m 91200-02294_1090609 VERTICAL Project : 120337-01 : Z</p>



24GHz	Test frequency :24.24GHz	
	18-40GHz	
	Horizontal	Vertical
Peak	 <p>Site : 03CH19-HY Condition : 15.249_Peak_1m 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : 15.249_Peak_1m 9170_00993 VERTICAL Project : 120337-01 : Z</p>
Avg	 <p>Site : 03CH19-HY Condition : AVG_54 1m 9170_00993 HORIZONTAL Project : 120337-01 : Z</p>	 <p>Site : 03CH19-HY Condition : AVG_54 1m 9170_00993 VERTICAL Project : 120337-01 : Z</p>

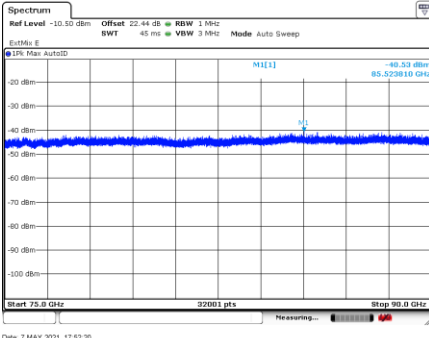
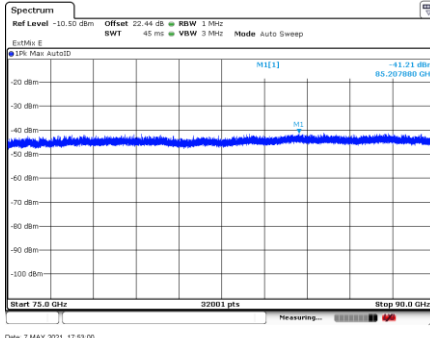
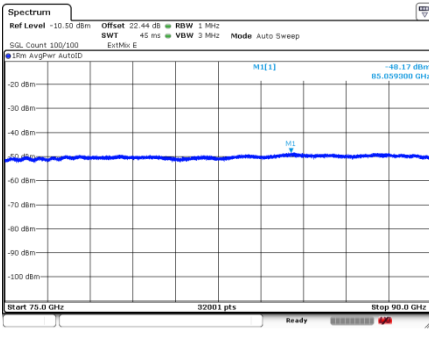
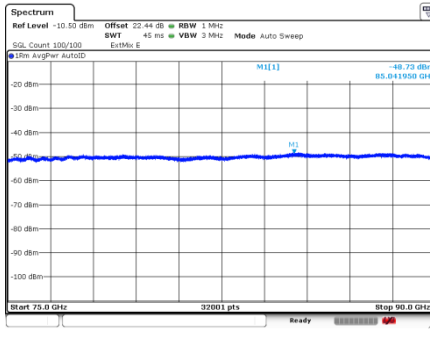


24GHz	Test frequency :24.24GHz	
	40-60GHz	
	Horizontal	Vertical
Peak.		
Avg		



24GHz	Test frequency :24.24GHz	
	60-75GHz	
	Horizontal	Vertical
Peak	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep EstImz V LRM Max AutoOff M2[1] -35.79 dBm 74.542280 GHz M1[1] -43.92 dBm 72.720000 GHz CF 67.5 GHz 32001 pts Span 15.0 GHz Date 7 MAY 2021 17:20:09 </p>	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep EstImz V LRM Max AutoOff M1[1] -46.14 dBm 72.720000 GHz M2[1] -35.92 dBm 74.542280 GHz CF 67.5 GHz 32001 pts Span 15.0 GHz Date 7 MAY 2021 17:21:54 </p>
Avg	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 EstImz V LRM AvgPwr AutoOff M2[1] -45.09 dBm 74.172195 GHz M1[1] -46.35 dBm 72.717660 GHz CF 67.5 GHz 32001 pts Span 15.0 GHz Date 7 MAY 2021 17:18:15 </p>	<p> Spectrum Ref Level -13.41 dBm Offset 16.43 dB RBW 1 MHz SWT 45 ms VBW 3 MHz Mode Auto Sweep SQL Count 100/100 EstImz V LRM AvgPwr AutoOff M2[1] -41.76 dBm 74.542750 GHz M1[1] -47.60 dBm 72.717660 GHz CF 67.5 GHz 32001 pts Span 15.0 GHz Date 7 MAY 2021 17:19:00 </p>



24GHz	Test frequency :24.24GHz	
	75-90GHz	
	Horizontal	Vertical
Peak		
Avg.		



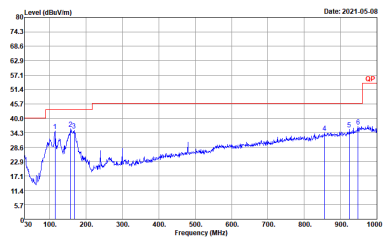
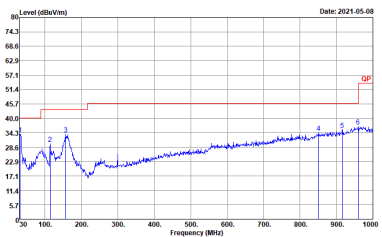
24GHz	Test frequency :24.24GHz	
	90-100GHz	
	Horizontal	Vertical
Peak	<p>Spectrum Ref Level 7.69 dBm Offset 37.69 dB BW 1 MHz Mode Auto Sweep SWT 30 ms VBW 3 MHz EstMz F • 10% Max AutoID N1[1] -36.40 dBm 96.969000 GHz N2[1] -29.40 dBm 92.169300 GHz CF 95.0 GHz 10001 pts Span 10.0 GHz Date 7 MAY 2021 20:19:16</p>	<p>Spectrum Ref Level 7.69 dBm Offset 37.69 dB BW 1 MHz Mode Auto Sweep SWT 30 ms VBW 3 MHz EstMz F • 10% Max AutoID N1[1] -36.60 dBm 96.969000 GHz N2[1] -29.21 dBm 92.312300 GHz CF 95.0 GHz 10001 pts Span 10.0 GHz Date 7 MAY 2021 20:23:48</p>
Avg.	<p>Spectrum Ref Level 7.69 dBm Offset 37.69 dB BW 1 MHz Mode Auto Sweep SQL Count 100/100 EstMz F • 10% AvgPer AutoID N2[1] -40.90 dBm 92.187300 GHz N1[1] -46.42 dBm 96.969000 GHz CF 95.0 GHz 10001 pts Span 10.0 GHz Date 7 MAY 2021 20:18:20</p>	<p>Spectrum Ref Level 7.69 dBm Offset 37.69 dB BW 1 MHz Mode Auto Sweep SQL Count 100/100 EstMz F • 10% AvgPer AutoID N2[1] -40.88 dBm 92.278300 GHz N1[1] -46.25 dBm 96.969000 GHz CF 95.0 GHz 10001 pts Span 10.0 GHz Date 7 MAY 2021 20:24:44</p>



Emission below 1GHz
24GHz

24GHz	24GHz	
	Test frequency :24.06GHz_LF	
	Horizontal	Vertical
QP / Peak	<p>Site : 03C-119-14Y Condition : QP 3m LF_55608 409_1091022 HORIZONTAL Project : 120337-01 : Z</p>	<p>Site : 03C-119-14Y Condition : QP 3m LF_55608 409_1091022 VERTICAL Project : 120337-01 : Z</p>



24GHz	24GHz	
	Test frequency :24.15GHz_LF	
	Horizontal	Vertical
QP / Peak	 <p data-bbox="430 728 813 772">Site : 03C119-11Y Condition : QP_3m_LF_55608 409_1091022 HORIZONTAL Project : 120337-01 : Z</p>	 <p data-bbox="909 728 1292 772">Site : 03C119-11Y Condition : QP_3m_LF_55608 409_1091022 VERTICAL Project : 120337-01 : Z</p>



24GHz	24GHz	
	Test frequency :24.24GHz_LF	
	Horizontal	Vertical
QP / Peak	<p>Site : 03C119-14Y Condition : QP_3m_LF_55608 409_1091022 HORIZONTAL Project : 120337-01 : Z</p>	<p>Site : 03C119-14Y Condition : QP_3m_LF_55608 409_1091022 VERTICAL Project : 120337-01 : Z</p>