



FCC RADIO TEST REPORT

FCC ID : P4Q-N672B
Equipment : LTE Module
Brand Name : MITAC,MIO, Magellen,Teletrac Navman
Model Name : SC600T-NA
Applicant : Mitac Digital Technology Corp.
4F., NO. 1, R&D Road 2, Hsinchu
Science Park, 30076 Hsinchu,TAIWAN,
R.O.C.
Manufacturer : Mitac Digital Technology Corp.
4F., NO. 1, R&D Road 2, Hsinchu
Science Park, 30076 Hsinchu,TAIWAN,
R.O.C.
Standard : FCC Part 15 Subpart C §15.247

The product was received on May 30, 2022 and testing was performed from Jun 15, 2022 to Jul. 09, 2022. 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 variant report apply exclusively to the tested model / sample. Without written approval from 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.)



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History of this test report

Report No.	Version	Description	Issue Date
FR000714-06C	01	Initial issue of report	Jul. 21, 2022
FR000714-06C	02	Revise section 2.2 Test Mode	Jul. 27, 2022
FR000714-06C	03	Revise section 1.1 Sample Information	Jul. 27, 2022



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.247(a)(2)	6dB Bandwidth	Not Required	-
-	2.1049	99% Occupied Bandwidth	Not Required	-
3.1	15.247(b)	Power Output Measurement	Pass	-
-	15.247(e)	Power Spectral Density	Not Required	-
-	15.247(d)	Conducted Band Edges	Not Required	-
		Conducted Spurious Emission	Not Required	-
3.2	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	0.23 dB under the limit at 2484.180 MHz
-	15.207	AC Conducted Emission	Not Required	-
3.3	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Note:

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report by adding SKU. All the test cases were performed on original report which can be referred to Sporton Report Number FR0D1806C. Based on the original report, the test cases were verified.

Declaration of Conformity:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".
Comments and Explanations:
The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Yun Huang
Report Producer: Ming Chen



1 General Description

1.1 Product Feature of Equipment Under Test

WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, and GNSS.

Product Feature	
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
Sample 3	EUT with Host 3
Sample 4	EUT with Host 4
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS / Glonass : Patch Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	0.9

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



The product was installed into Tablet (Brand Name: MITAC, MIO, Magellen, Teletrac Navman, Model Name: N672B) during test, and the host information was recorded in the following table.

Host Information	
Host 1	Host with SKU A
Host 2	Host with SKU B
Host 3	Host with SKU E
Host 4	Host with SKU F

Sample Information		
Functions	SKU A	SKU B
Screen	5" 720x1280 (HD), IPS, 350nits (w/ touch)	5" 720x1280 (HD), IPS, 350nits (w/ touch)
CPU	SD625 octa core 2.0GHz	SD625 octa core 2.0GHz
Battery	4110mAh (hard pack)	4110mAh (hard pack)
RAM	3GB	3GB
Storage	32GB	32GB
External storage	Support	Support
WWAN + WLAN Module	Support (SC600T-NA)	Support (SC600T-NA)
NFC/RFID(HF)	Support	Support
GPS	Support	Support
Barcode	Support(N6603)	Support(N3601)

Functions	SKU C	SKU D
Screen	5" 720x1280 (HD), IPS, 350nits (w/ touch)	5" 720x1280 (HD), IPS, 350nits (w/ touch)
CPU	SD625 octa core 2.0GHz	SD625 octa core 2.0GHz
Battery	4110mAh (hard pack)	4110mAh (hard pack)
RAM	2GB	2GB
Storage	16GB	16GB
External storage	Support	Support
WWAN + WLAN Module	Support (SC600T-NA)	Support (SC600T-NA)
NFC/RFID(HF)	Support	Support
GPS	Support	Support
Barcode	Support(N6603)	Support(N3601)

Functions	SKU E	SKU F
Screen	5" 720x1280 (HD), IPS, 350nits (w/ touch)	5" 720x1280 (HD), IPS, 350nits (w/ touch)
CPU	SD625 octa core 2.0GHz	SD625 octa core 2.0GHz
Battery	4110mAh (hard pack)	4110mAh (hard pack)
RAM	3GB	3GB
Storage	32GB	32GB
External storage	Support	Support
WWAN + WLAN Module	Support (SC600T-NA)	Support (SC600T-NA)
NFC/RFID(HF)	Support	Not Support
GPS	Support	Support
Barcode	Not Support	Not Support



1.2 Modification of EUT

No modifications made to the EUT during the testing.

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. 03CH07-HY

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

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. TH05-HY (TAF Code: 3786)
Remark	The Conducted test item subcontracted to Sporton International Inc. Wensan Laboratory.

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ ANSI C63.10-2013

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.



2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find Y plane as worst plane.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Test Mode

The final test modes consider the modulation and the worst data rates as shown in the table below.

Single Antenna

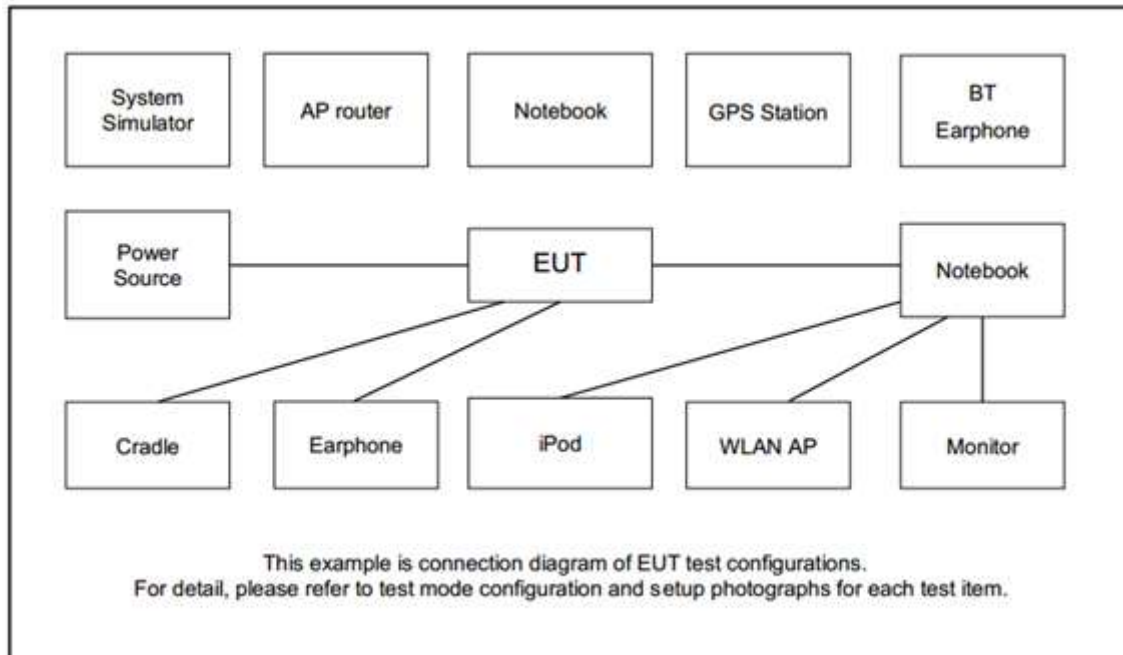
Modulation	Data Rate
802.11g	6 Mbps
802.11n HT40	MCS0

Ch. #	2400-2483.5 MHz
	802.11n HT40
Low	-
Middle	-
High	09

Remark:

1. For radiation spurious emission, the modulation and the data rate picked for testing are determined by the original worst case.
2. For Radiated Test Cases, the tests were performed with Sample 4.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “Qualcomm Radio Control Tool Ver.4” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

3 Test Result

3.1 Output Power Measurement

3.1.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna with directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

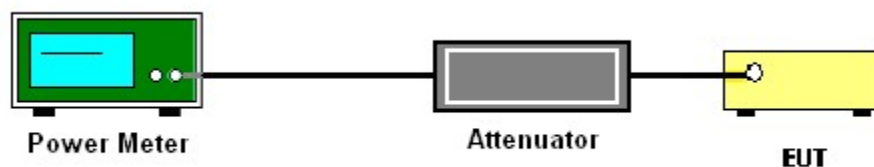
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.1.3 Test Procedures

1. For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.3 PKPM1
2. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
3. The RF output of EUT is connected to the power meter by RF cable and attenuator. The path loss is compensated to the results for each measurement.
4. Set the maximum power setting and enable the EUT to transmit continuously.
5. Measure the conducted output power and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.1.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.



3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device is measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

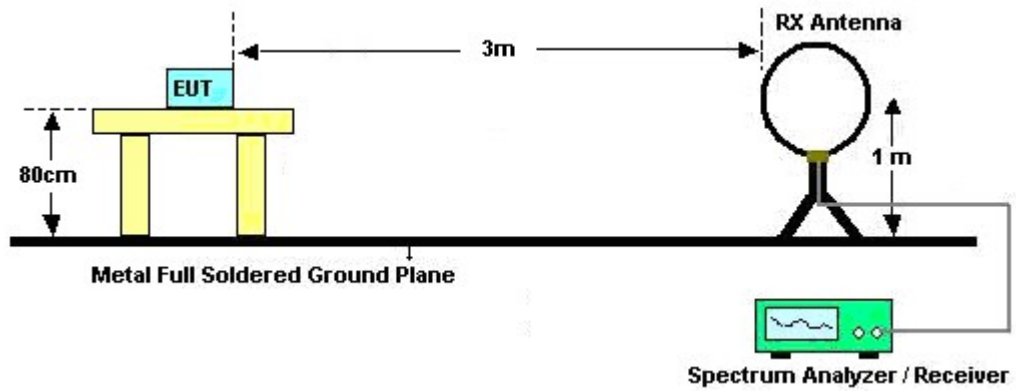
Please refer to the measuring equipment list in this test report.

**3.2.3 Test Procedures**

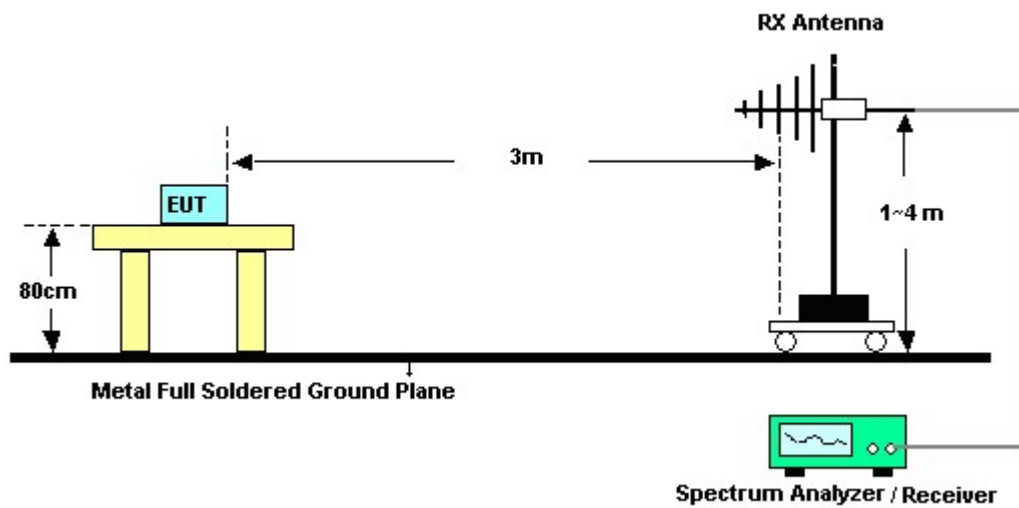
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-“.
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-“.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW = 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3 MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.2.4 Test Setup

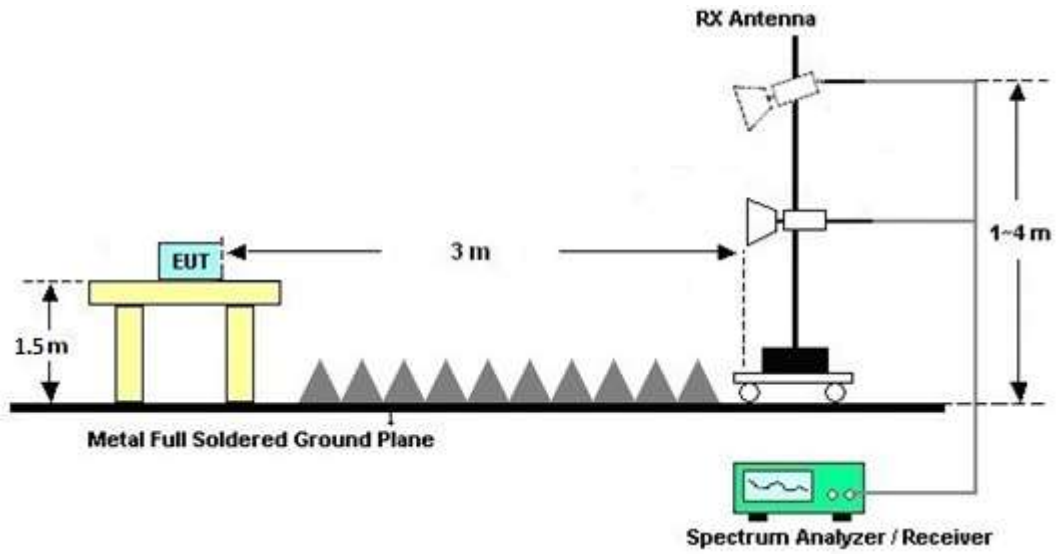
For radiated emissions below 30MHz



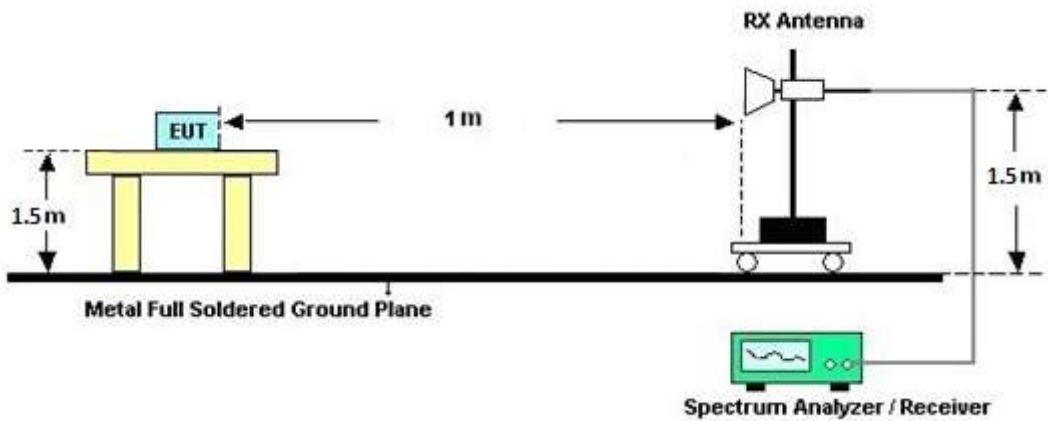
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz





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

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.2.7 Duty Cycle

Please refer to Appendix D.

3.2.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.



3.3 Antenna Requirements

3.3.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. 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 rule.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECEPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Jun. 15, 2022~ Jun. 16, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 10 (NO:131))	10MHz~6GHz	Dec. 16, 2021	Jun 15, 2022~ Jun 16, 2022	Dec. 15, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Jun. 15, 2022~ Jun. 16, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Mainframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Jun. 15, 2022~ Jun. 16, 2022	Aug. 11, 2022	Conducted (TH05-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	35419 & 03	30MHz~1GHz	Apr. 24, 2022	Jun. 23, 2022~ Jul. 09, 2022	Apr. 23, 2023	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Feb. 09, 2022	Jun. 23, 2022~ Jul. 09, 2022	Feb. 08, 2023	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 03, 2021	Jun. 23, 2022~ Jul. 09, 2022	Dec. 02, 2022	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 07, 2022	Jun. 23, 2022~ Jul. 09, 2022	Jan. 06, 2023	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 21, 2022	Jun. 23, 2022~ Jul. 09, 2022	Apr. 20, 2023	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 04, 2021	Jun. 23, 2022~ Jul. 09, 2022	Oct. 03, 2022	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Oct. 04, 2021	Jun. 23, 2022~ Jul. 09, 2022	Oct. 03, 2022	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 23, 2021	Jun. 23, 2022~ Jul. 09, 2022	Jul. 22, 2022	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Jul. 22, 2021	Jun. 23, 2022~ Jul. 09, 2022	Jul. 21, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 23, 2022	Jun. 23, 2022~ Jul. 09, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 23, 2022	Jun. 23, 2022~ Jul. 09, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 23, 2022	Jun. 23, 2022~ Jul. 09, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	Sep. 17, 2021	Jun. 23, 2022~ Jul. 09, 2022	Sep. 16, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 23, 2022	Jun. 23, 2022~ Jul. 09, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801606/2	9KHz ~ 40GHz	Apr. 14, 2022	Jun. 23, 2022~ Jul. 09, 2022	Apr. 13, 2023	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Jun. 23, 2022~ Jul. 09, 2022	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Jun. 23, 2022~ Jul. 09, 2022	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Jun. 23, 2022~ Jul. 09, 2022	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Jun. 23, 2022~ Jul. 09, 2022	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Jun. 23, 2022~ Jul. 09, 2022	N/A	Radiation (03CH07-HY)
USB Data Logger	TECEPEL	TR-32	HE17XB2495	N/A	Mar. 07, 2022	Jun. 23, 2022~ Jul. 09, 2022	Mar. 06, 2023	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	18GHz~40GHz	Nov. 30, 2021	Jun. 23, 2022~ Jul. 09, 2022	Nov. 29, 2022	Radiation (03CH07-HY)



5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
-------------------------------------------------------------------------	--------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
-------------------------------------------------------------------------	--------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.0 dB
-------------------------------------------------------------------------	--------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Howard Hu	Temperature:	21~25	°C
Test Date:	2022/6/15~2022/6/16	Relative Humidity:	51~54	%

TEST RESULTS DATA
Peak Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	N _{Tx}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11g	6Mbps	1	1	2412	19.45	-	-	30.00	-	0.90	-	20.35	-	36.00	-	Pass
HT40	MCS0	1	9	2452	18.25	-	-	30.00	-	0.90	-	19.15	-	36.00	-	Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Output Power
(Reporting Only)

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11g	6Mbps	1	1	2412	12.15	-	-	30.00	-	0.90	-	13.05	-	36.00	-	Pass
HT40	MCS0	1	9	2452	10.35	-	-	30.00	-	0.90	-	11.25	-	36.00	-	Pass

Note: Measured power (dBm) has offset with cable loss.



Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	23.1~25.3°C
		Relative Humidity :	58.9~62.8%

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 09 2452MHz		2365.3	54.18	-19.82	74	39.81	31.4	18.38	35.41	225	43	P	H
		2382.1	45.34	-8.66	54	30.92	31.4	18.43	35.41	225	43	A	H
	*	2452	98.17	-	-	83.24	31.82	18.55	35.44	206	24	P	H
	*	2452	91.11	-	-	76.18	31.82	18.55	35.44	206	24	A	H
		2484.67	61.2	-12.8	74	45.96	32.08	18.61	35.45	225	43	P	H
		2484.18	53.77	-0.23	54	38.54	32.07	18.61	35.45	225	43	A	H
		2378.04	54.12	-19.88	74	39.72	31.4	18.41	35.41	292	356	P	V
		2346.54	45.47	-8.53	54	31.15	31.41	18.31	35.4	292	356	A	V
	*	2452	97.39	-	-	82.46	31.82	18.55	35.44	292	356	P	V
	*	2452	89.31	-	-	74.38	31.82	18.55	35.44	292	356	A	V
		2492.02	55.96	-18.04	74	40.67	32.14	18.61	35.46	292	356	P	V
	2484.53	47.98	-6.02	54	32.74	32.08	18.61	35.45	292	356	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT40 CH 09 2452MHz		4904	41.09	-32.91	74	53.11	34.01	12.78	58.81	-	-	P	H	
		7356	40.65	-33.35	74	47.36	35.81	15.01	57.53	-	-	P	H	
													H	
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													H	
			4904	40.98	-33.02	74	53	34.01	12.78	58.81	-	-	P	V
			7356	40.57	-33.43	74	47.28	35.81	15.01	57.53	-	-	P	V
													V	
													V	
													V	
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													V	
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													V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. 													



Emission above 18GHz

2.4GHz WIFI 802.11n HT40 (SHF)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT40 SHF		24986	37.35	-36.65	74	46.47	39	9.29	57.41	-	-	P	H
													H
													H
													H
													H
													H
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													H
			24965	37.5	-36.5	74	46.68	38.97	9.28	57.43	-	-	P
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												



Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (LF)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz 802.11n HT40 LF		30	30.35	-9.65	40	34.88	24.57	1.01	30.11	-	-	P	H	
		56.73	27.74	-12.26	40	44.27	12.24	1.26	30.03	-	-	P	H	
		139.08	27.44	-16.06	43.5	37.79	17.52	2.02	29.89	-	-	P	H	
		633.9	27.83	-18.17	46	27.21	25.97	4.33	29.68	-	-	P	H	
		802.6	30.66	-15.34	46	27.15	27.72	5.03	29.24	-	-	P	H	
		959.4	33.95	-12.05	46	26.19	30.8	5.58	28.62	-	-	P	H	
														H
														H
														H
														H
														H
														H
			30	33.68	-6.32	40	38.21	24.57	1.01	30.11	-	-	P	V
			42.96	26.56	-13.44	40	37.8	17.75	1.06	30.05	-	-	P	V
			52.68	25.78	-14.22	40	41.53	13.09	1.19	30.03	-	-	P	V
			734.7	30.96	-15.04	46	28.48	27.21	4.74	29.47	-	-	P	V
			847.4	31.74	-14.26	46	27.07	28.62	5.12	29.07	-	-	P	V
			948.2	34.55	-11.45	46	27.49	30.17	5.55	28.66	-	-	P	V
														V
														V
													V	
													V	
													V	
													V	
													V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. The emission position marked as "-" means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only. 													



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:

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
2412MHz													

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Margin(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Margin(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Margin(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

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



Appendix C. Radiated Spurious Emission Plots

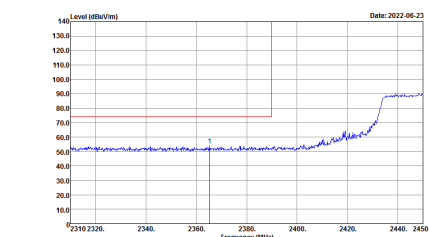
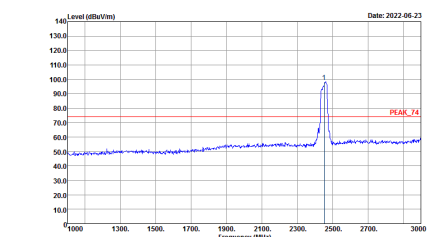
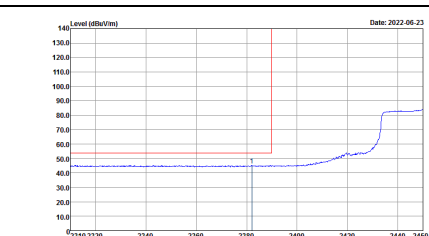
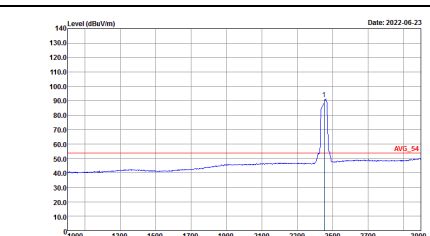
Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	23.1~25.3°C
		Relative Humidity :	58.9~62.8%

Note symbol

-L	Low channel location
-R	High channel location



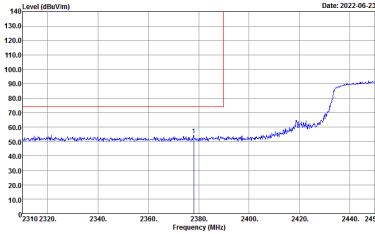
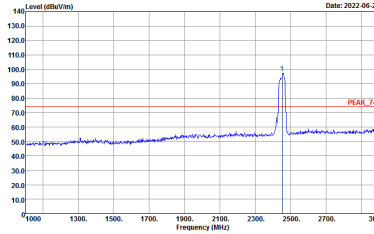
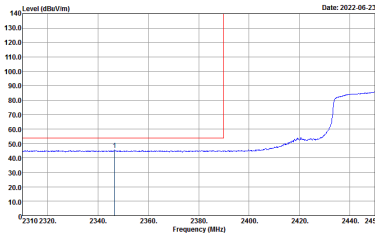
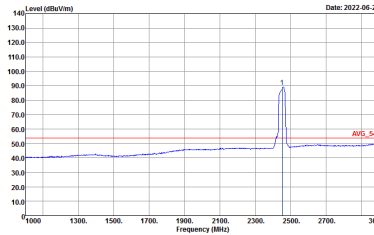
2.4GHz 2400~2483.5MHz
 WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH07-HY Condition : PEAK_BE_3m HF ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH07-HY Condition : PEAK_3m HF ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH07-HY Condition : AVG_BE_3m HF ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	 <p>Site : 03CH07-HY Condition : AVG_3m HF ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>

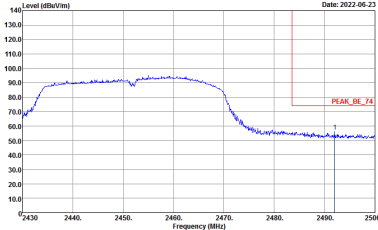
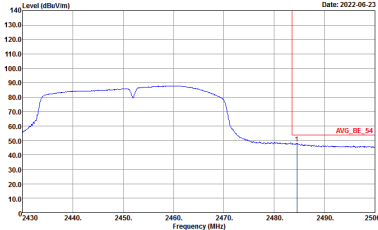


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1	Horizontal	Fundamental
Peak	<p>Site : 03CHK7-HY Condition : PEAK_BE_74 3m HF ANT_00070962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	Left blank
Avg.	<p>Site : 03CHK7-HY Condition : AVG_BE_54 3m HF ANT_00070962 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH07-HY Condition : AVG_BE_34 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	 <p>Site : 03CH07-HY Condition : AVG_34 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1	Vertical	Fundamental
Peak	 <p>Site Condition : 03CH07-HY : PEAK_BE_74 3m HF ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	Left blank
Avg.	 <p>Site Condition : 03CH07-HY : AVG_BE_54 3m HF ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	Left blank



2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH09 2452MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH07-HY Condition : PEAK_74 3m HF ANT_00075962 HORIZONTAL</p>	<p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p>

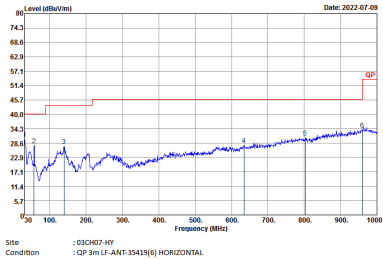
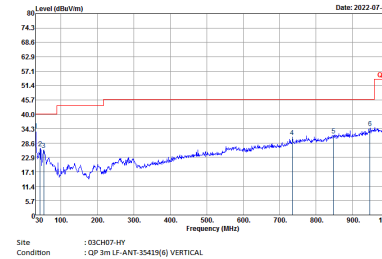


Emission above 18GHz
2.4GHz WIFI 802.11n HT40 (SHF @ 1m)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT40 SHF	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH07-HY Condition : PEAK_74 1m SHF-EHF_5170251 HORIZONTAL</p>	<p>Site : 03CH07-HY Condition : PEAK_74 1m SHF-EHF_5170251 VERTICAL</p>



Emission below 1GHz
2.4GHz WIFI 802.11n HT40 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT40 LF	
1	Horizontal	Vertical
QP / Peak	 <p>Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(g) HORIZONTAL</p>	 <p>Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(g) VERTICAL</p>



Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
2.4GHz 802.11n HT40	97.73	926.1	1.08	3kHz

