RADIO TEST REPORT

Product	:	Tapo Smart Temperature & Humidity Sensor
Model Name	:	Tapo T310
FCC ID	:	2AXJ4T310
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.247)
Received Date	:	2022/6/28
Test Date	:	2022/7/4 ~ 2022/7/5
Issued Date	:	2022/9/5
Applicant	:	TP-Link Corporation Limited Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

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REVISION HISTORY

Original Test Report No.: 4790458118-US-R0-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4790458118-US-R0-V0	2022/9/5	-	Initial issue

Table of Contents

1. Attestation of Test Results

APPLICANT:	TP-Link Corporation Limited Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong
MANUFACTURER:	TP-Link Corporation Limited Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong
EUT DESCRIPTION:	Tapo Smart Temperature & Humidity Sensor
BRAND:	tp-link
MODEL:	Tapo T310
SAMPLE STAGE:	Production Unit
DATE of TESTED:	2022/7/4 ~ 2022/7/5

APPLICABLE STANDARDS

STANDARD	Test Results
FCC 47 CFR PART 15 Subpart C (Section 15.247)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu Date : 2022/9/5
Project Handler

Approved and Authorized By:

Kent Liu Date : 2022/9/5
Senior Laboratory Engineer

2. Summary of Test Results

Summary of Test Results		
FCC Clause	**Test Items**	**Result**
15.247(a)(2)	6dB Bandwidth	PASS
15.247(b)	Conducted Output Power	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Antenna Port Emission	PASS
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS
15.203	Antenna Requirement	PASS

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB558074 D01 Meas Guidance v05r02, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±2.9 dB
RF Conducted	9 kHz - 40GHz	±2.4 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.8 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.8 dB

6. Equipment under Test

6.1. Description of EUT

Product	Tapo Smart Temperature & Humidity Sensor
Brand Name	tp-link
Model Name	Tapo T310
Operating Frequency	920.9 MHz ~ 922.3 MHz
Modulation	GFSK
Transfer Rate	50 Kbps
Number of Channel	3
Maximum Output Power	10.02 dBm
Normal Voltage	3Vdc from Battery
Sample ID	Conducted Test: 5092456 Radiated Test: 5092457

Note:

1. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx,Rx Function
Sub-G	1TX,1RX

2. The EUT contains following accessory devices:

Product	Brand	Model	Description
Battery	TMMQ	CR2450	3Vdc

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

6.2. Channel List

3 channels are provided for Sub-G:

Channel	Frequency (MHz)
1	920.9
2	921.7
3	922.3

6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	24~26℃/ 66~68%RH	3Vdc	2022/07/04~ 2022/07/05	WaterNil Guan
Radiated Spurious Emission	966-2	24~26℃/ 66~68%RH	3Vdc	2022/07/04~ 2022/07/05	WaterNil Guan

FCC Test Firm Registration Number: 498077

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)	tp-link	Antenna	PCB	-2.8

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer’s specification or user’s manual.

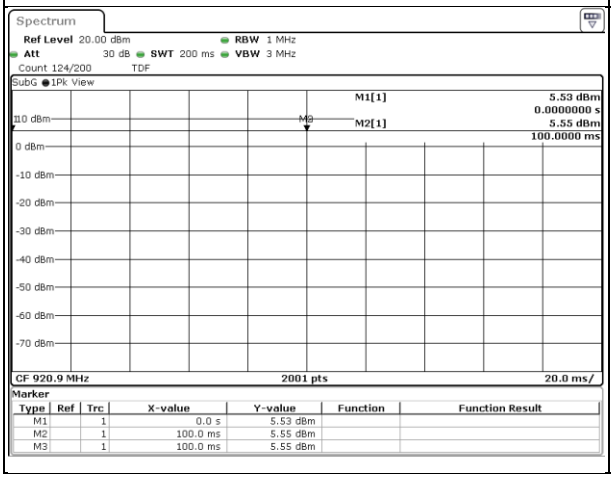
6.5. Test Mode Applicability and Tested Channel Detail

- The fundamental of the EUT was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that X-Z plane was worst-case. Therefore, all final radiated testing was performed with the EUT in X-Z plane.
- EUT powered source by 3V battery, AC power line conducted emission not to test
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Item	Modulation Type	Available Channel	Test Channel
Radiated Emissions	SubG	(920.9 / 921.7 / 922.3) MHz	(920.9 / 921.7 / 922.3) MHz
Radiated Emissions (Below 1GHz)	SubG	(920.9 / 921.7 / 922.3) MHz	(920.9 / 921.7 / 922.3) MHz
Antenna Port Conducted Measurement	SubG	(920.9 / 921.7 / 922.3) MHz	(920.9 / 921.7 / 922.3) MHz

6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
SubG	100.000	100.000	1.0000	N/A	10Hz

SubG	
	

7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2021/11/9	2022/11/8
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2021/12/10	2022/12/9
Loop Antenna	ETS lindgren	6502	00213440	2021/12/23	2022/12/22
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2022/2/8	2023/2/7
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2021/12/13	2022/12/12
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2021/12/17	2022/12/16
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2022/6/7	2023/6/6
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2022/2/16	2023/2/15
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2022/5/17	2023/5/16
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/12/3	2022/12/2
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2021/12/3	2022/12/2
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2021/10/29	2022/10/28
Pulse Power Sensor	Anritsu	MA2411B	1531202	2021/12/22	2022/12/21
Power Meter	Anritsu	ML2495A	1645002	2021/12/22	2022/12/21

UL Software		
Description	**Name**	**Version**
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF-Conducted-FCC 15247	ver 1.0
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2

8. Description of Test Setup

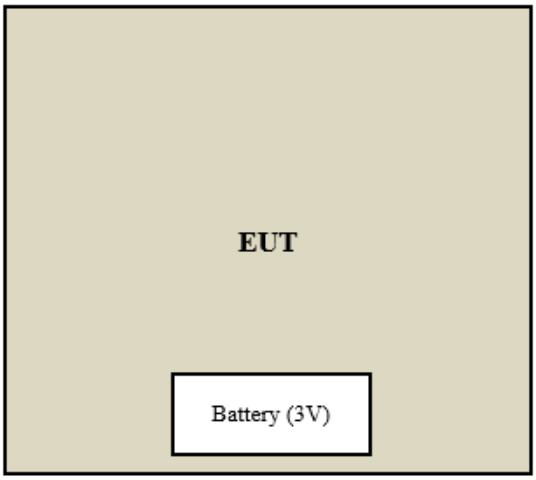
Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Battery	TMMQ	CR2450	N/A	DC: 3V Provided by Client

Test Setup

The EUT was worked in engineering mode to transmit signal.

Setup Diagram for Test



Under Table

Remote Site

9. Test Results

9.1. 6dB Bandwidth

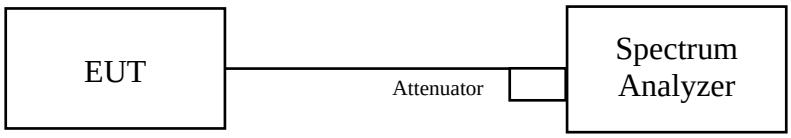
Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

a. Set resolution bandwidth (RBW) = 100kHz.
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Setup

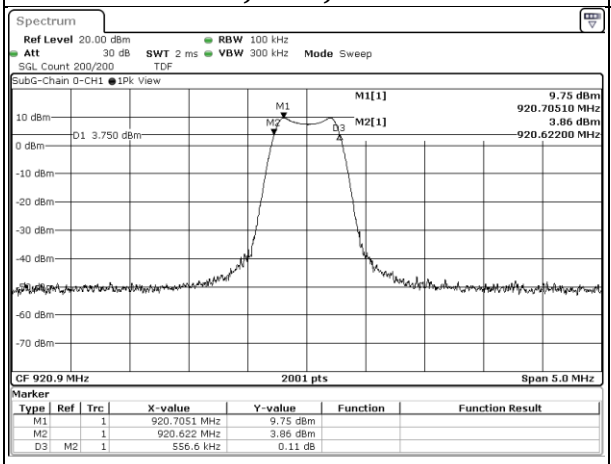


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

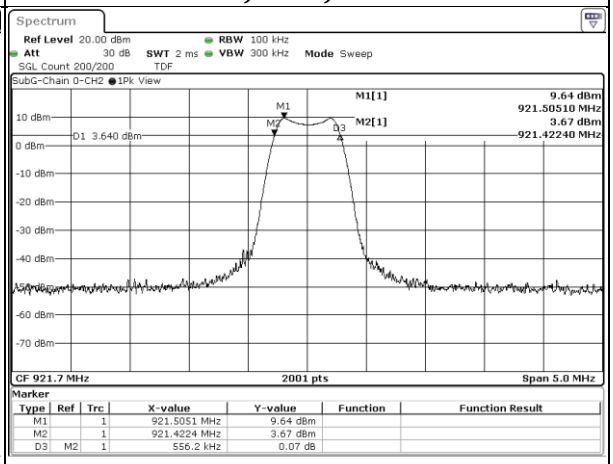
Test Data

Mode	CH	Freq (MHz)	6dB BW (MHz)	Limit (MHz)	Result
SubG	1	920.9	0.557	0.5	Pass
SubG	2	921.7	0.556	0.5	Pass
SubG	3	922.3	0.556	0.5	Pass

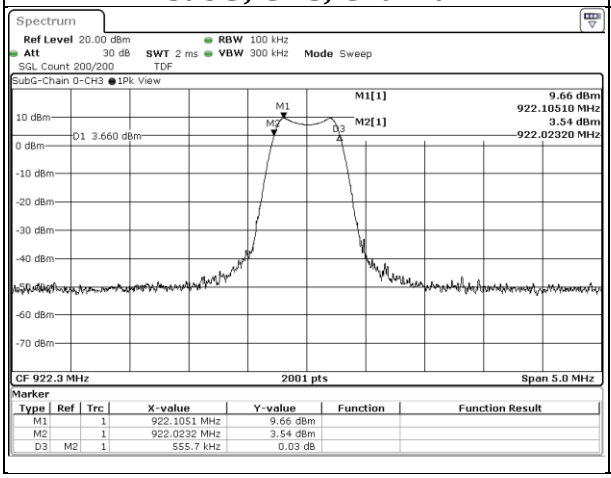
SubG, CH1, Chain 0



SubG, CH2, Chain 0



SubG, CH3, Chain 0



9.2. Conducted Output Power

Requirements

For systems using digital modulation in the 902-928 MHz bands: 1 Watt.

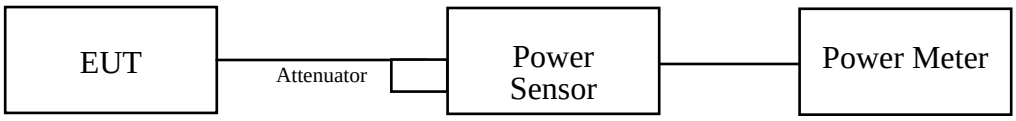
Note:
1. Directional Gain = G_{ant} + 10 log (Nant) dBi.

   N*a*nt: Number of Transmit Antennas
   G1, G2,..., Gn: Gain of Individual Antennas (Same for Each Antenna)

Test Procedure

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Test Setup



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

Average Power

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)
1	920.9	10.046	10.02	30
2	921.7	10	10.00	30
3	922.3	10.023	10.01	30

9.3. Power Spectral Density

Requirements

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz (If G_{TX} > 6 dBi, then PSD = 8 – (G_{TX} – 6)).

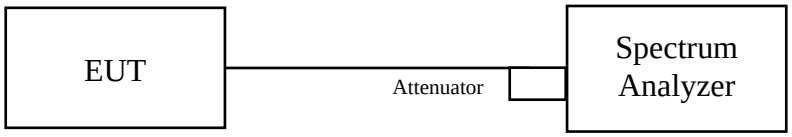
Note:
1. PSD = power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz.
2. G_{TX} = the maximum transmitting antenna directional gain in dBi.
3. Directional Gain = G_{ant} + 10 log (Nant) dBi.

   Nant: Number of Transmit Antennas
   G1, G2,..., Gn: Gain of Individual Antennas (Same for Each Antenna)

Test procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

Test Setup

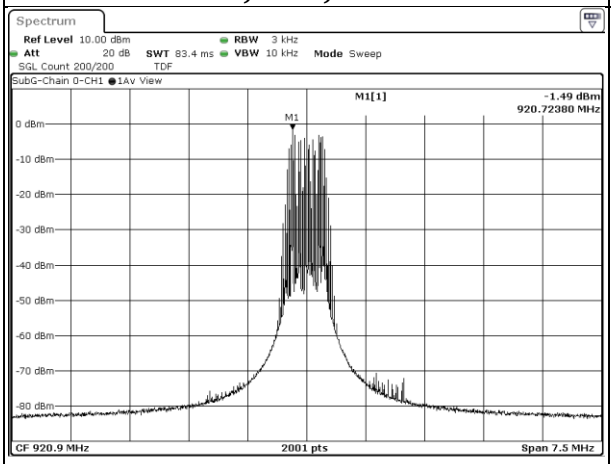


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

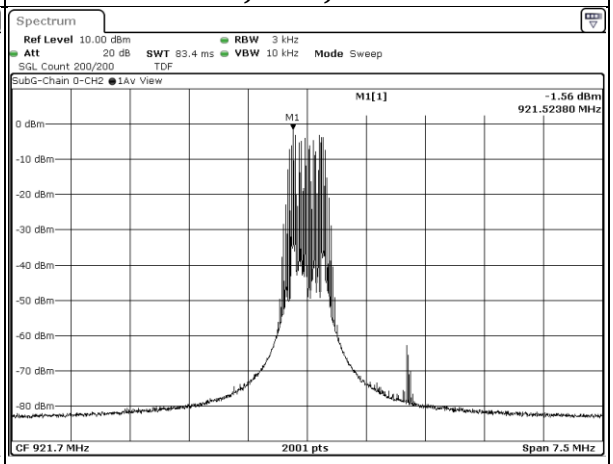
Test Data

Mode	CH	Freq (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
SubG	1	920.9	-1.49	8	Pass
SubG	2	921.7	-1.56	8	Pass
SubG	3	922.3	-1.44	8	Pass

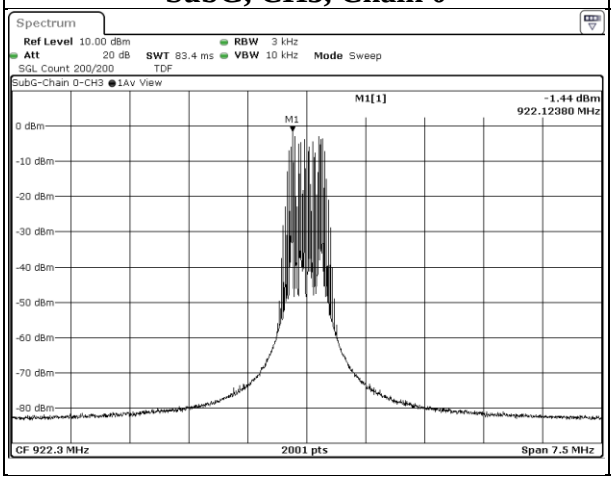
SubG, CH1, Chain 0



SubG, CH2, Chain 0



SubG, CH3, Chain 0



9.4. Conducted Out of Band Emission

Requirements

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b) (3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209 (a) is not required.

Test procedure

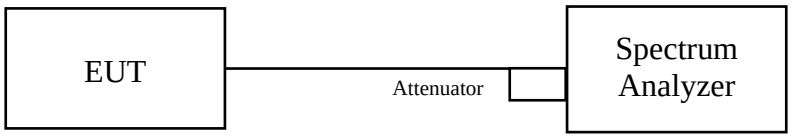
Measurement Procedure REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Measurement Procedure OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

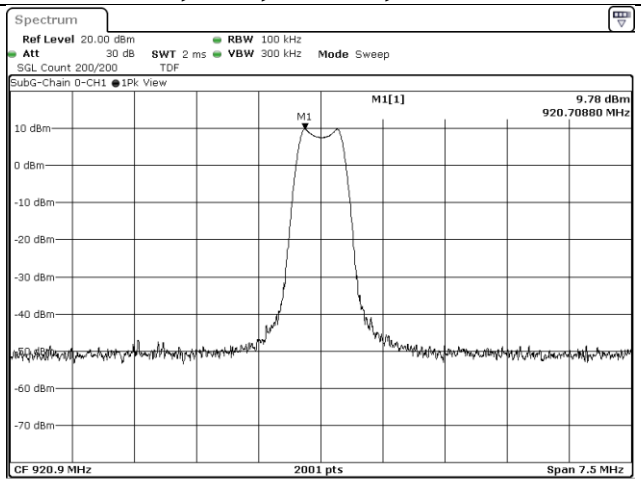
Test Setup



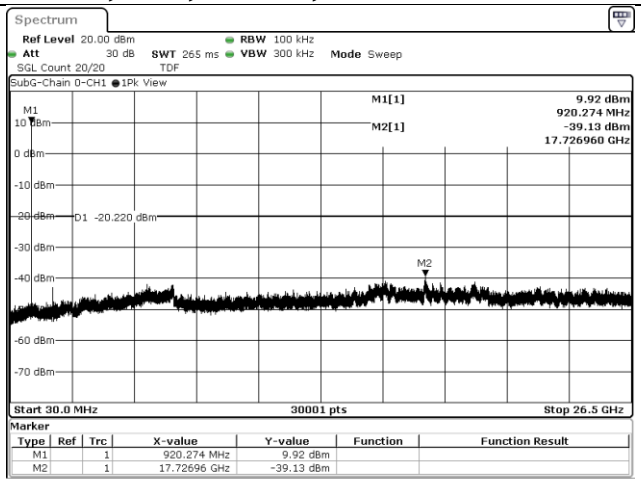
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

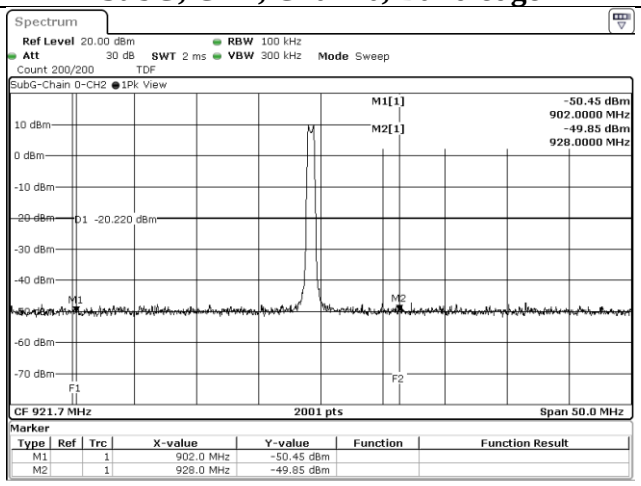
SubG, CH1, Chain 0, Reference



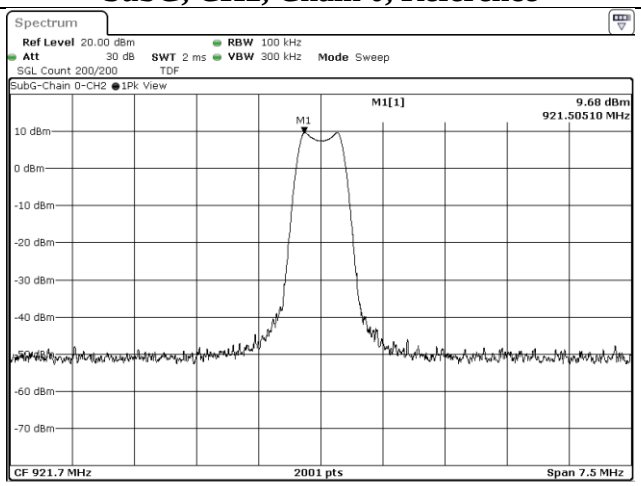
SubG, CH1, Chain 0, Conducted Emission



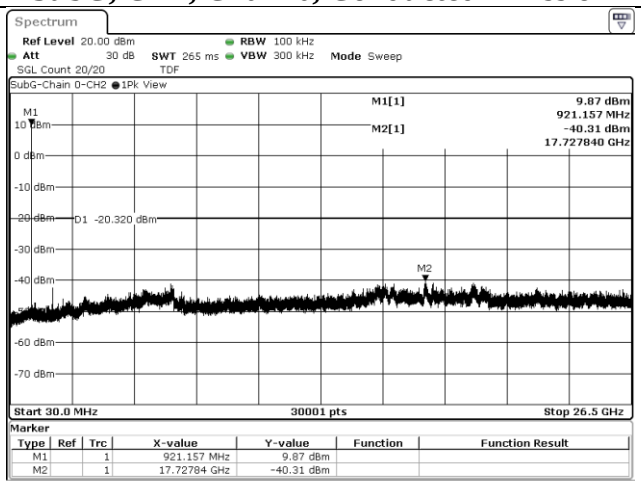
SubG, CH1, Chain 0, Band edge



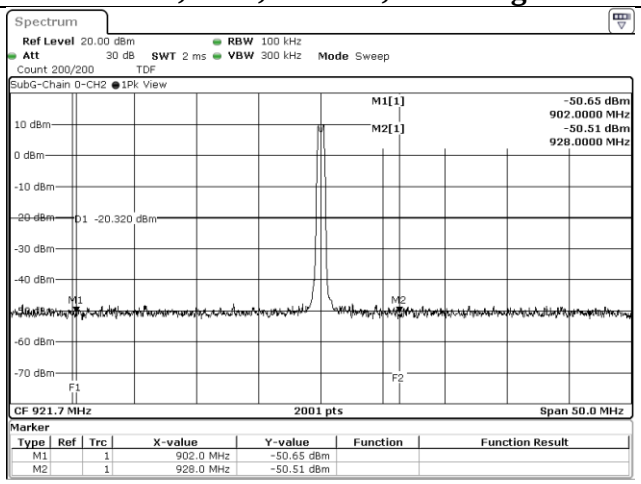
SubG, CH2, Chain 0, Reference



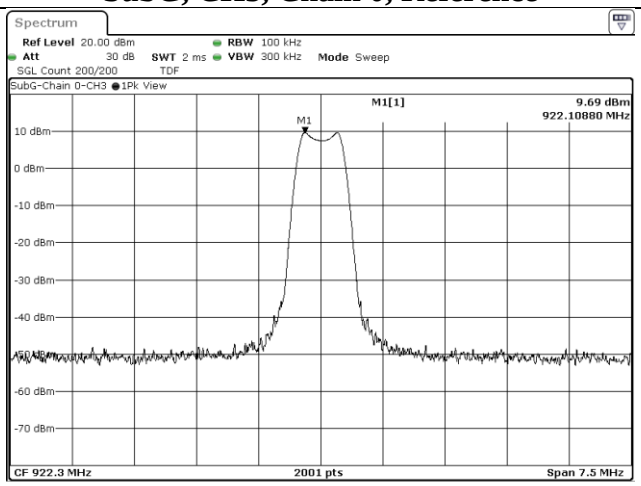
SubG, CH2, Chain 0, Conducted Emission



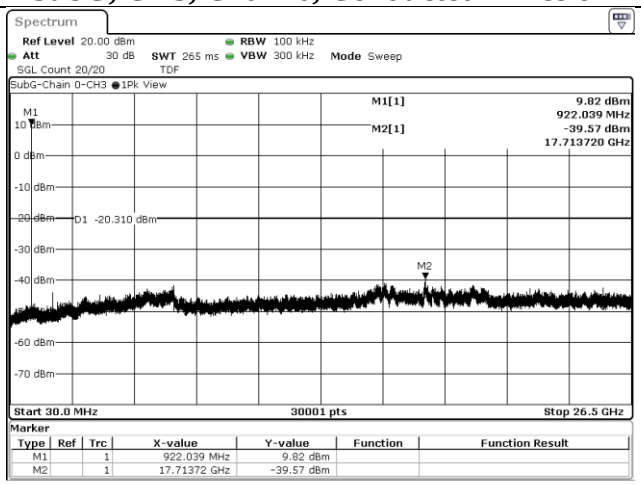
SubG, CH2, Chain 0, Band edge



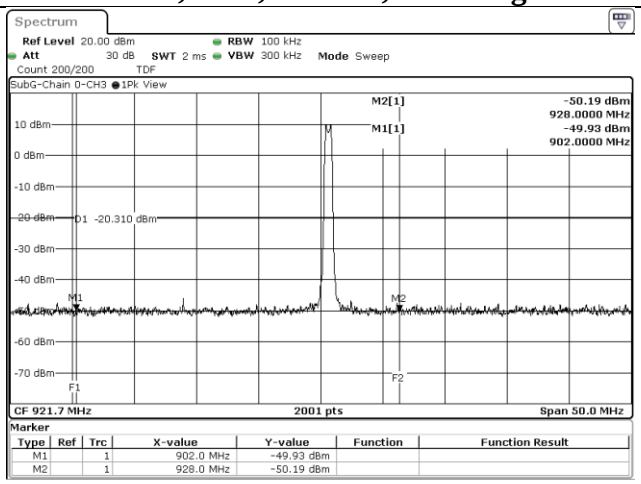
SubG, CH3, Chain 0, Reference



SubG, CH3, Chain 0, Conducted Emission



SubG, CH3, Chain 0, Band edge



9.5. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test Procedures

[For 9 kHz ~ 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

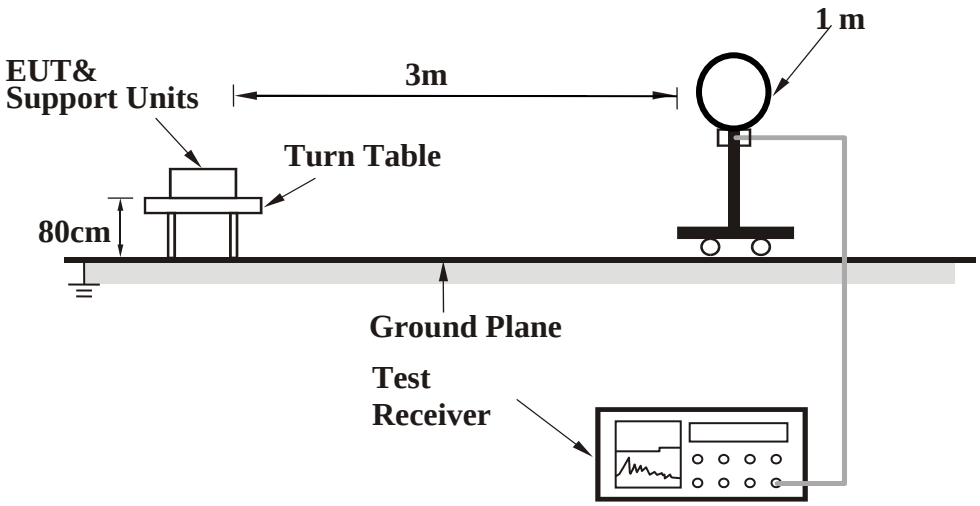
a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
Sub-G	1MHz	Refer to section 6.6 for duty cycle.

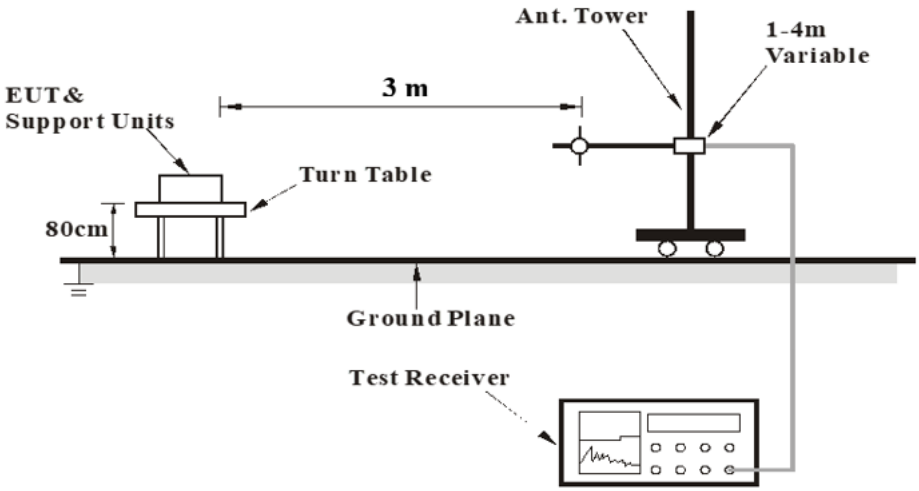
d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
e. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
f. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
g. Test data of Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
h. Test data of Notation "@" = Fundamental Frequency
i. Test data of Notation " * " = The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

Test Setup

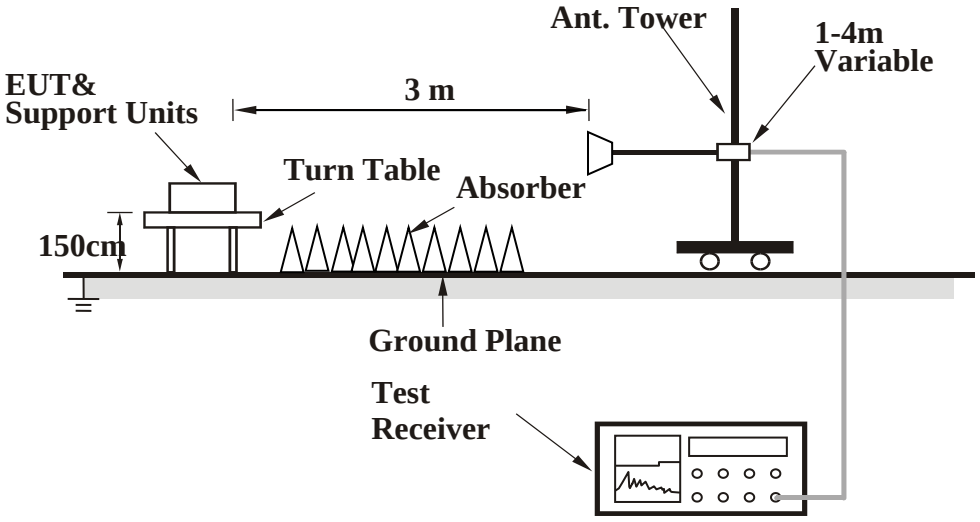
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



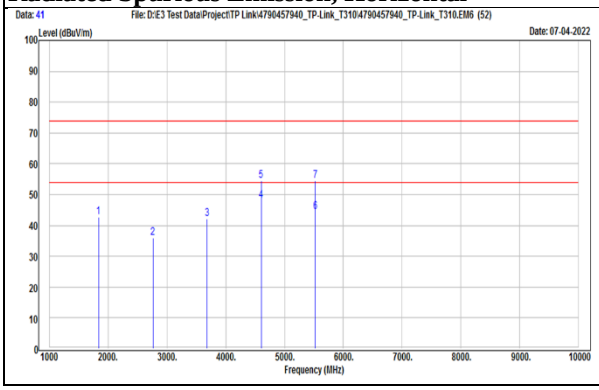
For the actual test configuration, please refer to the Setup Configurations.

Test Data

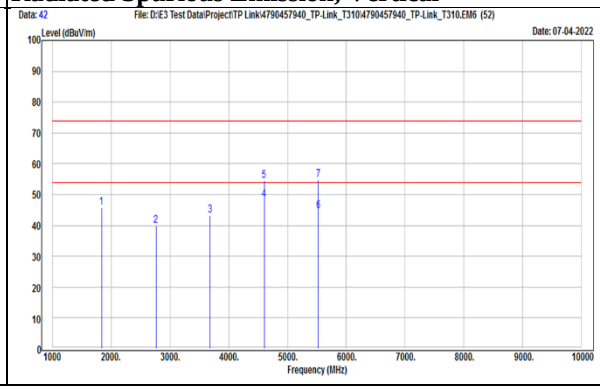
Mode	SubG	Channel	1

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	1841.8	49.85	-7.14	42.71	74	-31.29	PK
	*	2762.7	39.28	-3.33	35.95	74	-38.05	PK
	*	3683.6	43.12	-0.86	42.26	74	-31.74	PK
		4604.5	52.55	1.82	54.37	74	-19.63	PK
		4604.5	46.23	1.82	48.05	54	-5.95	AVG
		5525.4	50.58	3.81	54.39	74	-19.61	PK
		5525.4	40.43	3.81	44.24	54	-9.76	AVG
Vertical	*	1841.8	52.92	-7.14	45.78	74	-28.22	PK
	*	2762.7	43.1	-3.33	39.77	74	-34.23	PK
	*	3683.6	44.04	-0.86	43.18	74	-30.82	PK
		4604.5	52.77	1.82	54.59	74	-19.41	PK
		4604.5	46.62	1.82	48.44	54	-5.56	AVG
		5525.4	50.96	3.81	54.77	74	-19.23	PK
		5525.4	40.74	3.81	44.55	54	-9.45	AVG

TX, SubG (Ch 1)
Radiated Spurious Emission, Horizontal



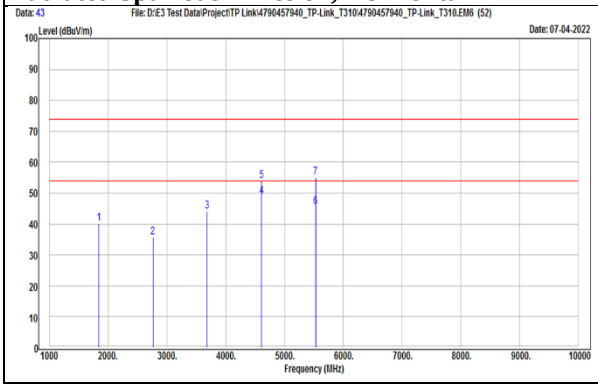
TX, SubG (Ch 1)
Radiated Spurious Emission, Vertical



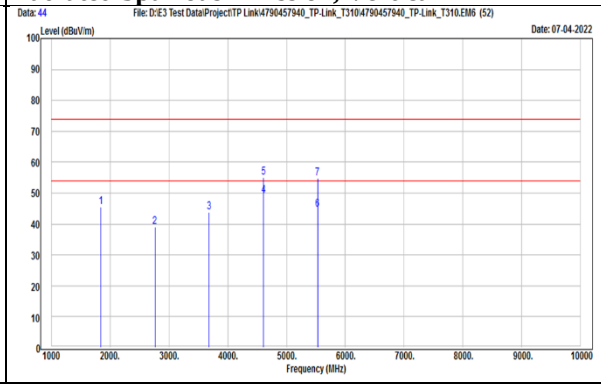
Mode	SubG	Channel	2

Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	*	1843.4	47.25	-7.14	40.11	74	-33.89	PK
		2765.1	38.9	-3.32	35.58	74	-38.42	PK
	*	3686.8	45.02	-0.86	44.16	74	-29.84	PK
		4608.5	52.11	1.82	53.93	74	-20.07	PK
		4608.5	47.14	1.82	48.96	54	-5.04	AVG
		5530.2	51.29	3.81	55.1	74	-18.9	PK
		5530.2	41.79	3.81	45.6	54	-8.4	AVG
Vertical	*	1843.4	52.62	-7.14	45.48	74	-28.52	PK
		2765.1	42.35	-3.32	39.03	74	-34.97	PK
	*	3686.8	44.61	-0.86	43.75	74	-30.25	PK
		4608.5	53.36	1.82	55.18	74	-18.82	PK
		4608.5	47.38	1.82	49.2	54	-4.8	AVG
		5530.2	50.93	3.81	54.74	74	-19.26	PK
		5530.2	40.88	3.81	44.69	54	-9.31	AVG

TX, SubG (Ch 2)
Radiated Spurious Emission, Horizontal



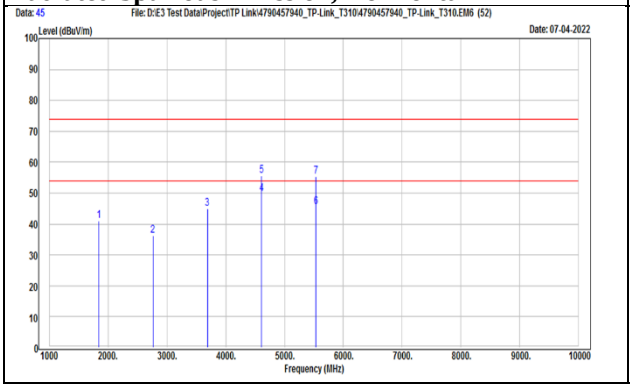
TX, SubG (Ch 2)
Radiated Spurious Emission, Vertical



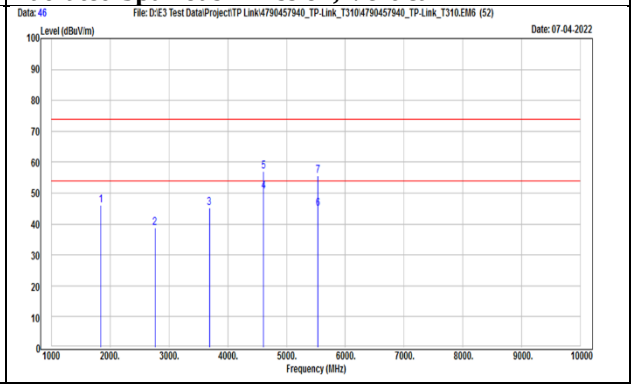
Mode	SubG	Channel	3

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	1844.6	48.2	-7.13	41.07	74	-32.93	PK
		2766.9	39.44	-3.32	36.12	74	-37.88	PK
	*	3689.2	45.79	-0.85	44.94	74	-29.06	PK
		4611.5	53.88	1.82	55.7	74	-18.3	PK
		4611.5	47.88	1.82	49.7	54	-4.3	AVG
		5533.8	51.4	3.82	55.22	74	-18.78	PK
		5533.8	41.79	3.82	45.61	54	-8.39	AVG
Vertical	*	1844.6	53.15	-7.13	46.02	74	-27.98	PK
		2766.9	41.95	-3.32	38.63	74	-35.37	PK
	*	3689.2	46.16	-0.85	45.31	74	-28.69	PK
		4611.5	55.12	1.82	56.94	74	-17.06	PK
		4611.5	48.68	1.82	50.5	54	-3.5	AVG
		5533.8	51.66	3.82	55.48	74	-18.52	PK
		5533.8	41.23	3.82	45.05	54	-8.95	AVG

TX, SubG (Ch 3)
Radiated Spurious Emission, Horizontal



TX, SubG (Ch 3)
Radiated Spurious Emission, Vertical

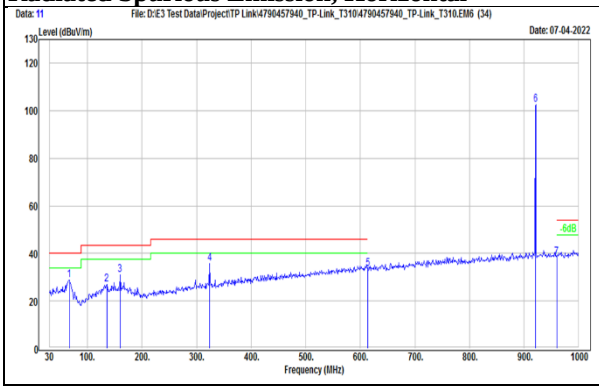


Below 1 GHz

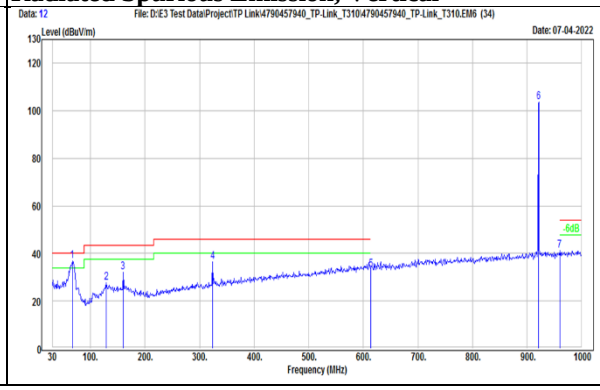
Mode	SubG	Channel	1

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		66.86	36.41	-7.42	28.99	40	-11.01	PK
		135.73	33.75	-6.6	27.15	43.5	-16.35	PK
		159.98	36.16	-5.11	31.05	43.5	-12.45	PK
		323.91	38.96	-3.23	35.73	46	-10.27	PK
		614	29.7	4.05	33.75	46	-12.25	PK
	@	920.9	93.1	9.33	102.43	N/A	N/A	PK
		960	28.59	9.83	38.42	54	-15.58	PK
Vertical		66.86	44.32	-7.42	36.9	40	-3.1	PK
		128.94	35.15	-7.38	27.77	43.5	-15.73	PK
		159.98	37.38	-5.11	32.27	43.5	-11.23	PK
		323.91	39.69	-3.23	36.46	46	-9.54	PK
		614	29.23	4.05	33.28	46	-12.72	PK
	@	920.9	94.36	9.33	103.69	N/A	N/A	PK
		960	31.29	9.83	41.12	54	-12.88	PK

TX, SubG (Ch 1)
Radiated Spurious Emission, Horizontal



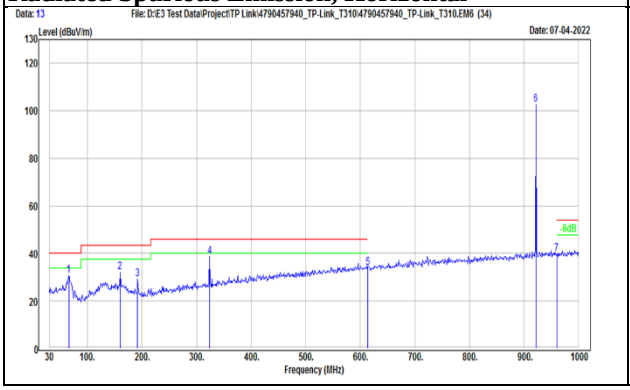
TX, SubG (Ch 1)
Radiated Spurious Emission, Vertical



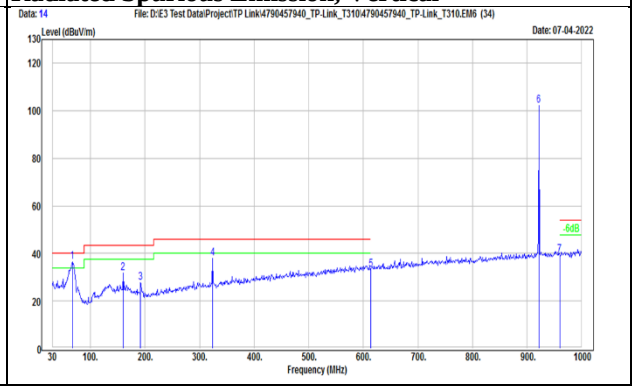
Mode	SubG	Channel	2

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		65.89	37.75	-7.14	30.61	40	-9.39	PK
		159.98	37.29	-5.11	32.18	43.5	-11.32	PK
		191.99	36.56	-7.29	29.27	43.5	-14.23	PK
		323.91	41.88	-3.23	38.65	46	-7.35	PK
		614	29.92	4.05	33.97	46	-12.03	PK
	@	921.7	93.13	9.34	102.47	N/A	N/A	PK
		960	29.86	9.83	39.69	54	-14.31	PK
Vertical		66.86	43.9	-7.42	36.48	40	-3.52	PK
		159.98	36.88	-5.11	31.77	43.5	-11.73	PK
		191.99	35.01	-7.29	27.72	43.5	-15.78	PK
		323.91	41.16	-3.23	37.93	46	-8.07	PK
		614	29.05	4.05	33.1	46	-12.9	PK
	@	921.7	93.02	9.34	102.36	N/A	N/A	PK
		960	29.53	9.83	39.36	54	-14.64	PK

TX, SubG (Ch 2)
Radiated Spurious Emission, Horizontal



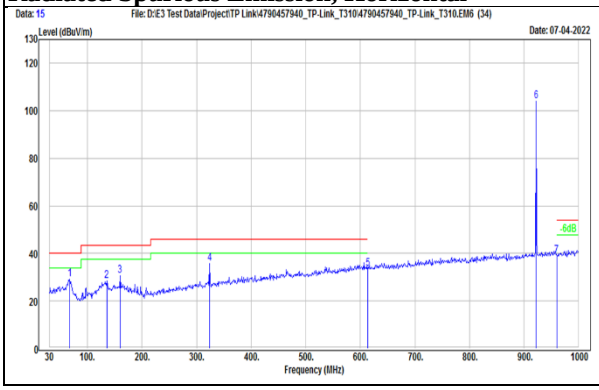
TX, SubG (Ch 2)
Radiated Spurious Emission, Vertical



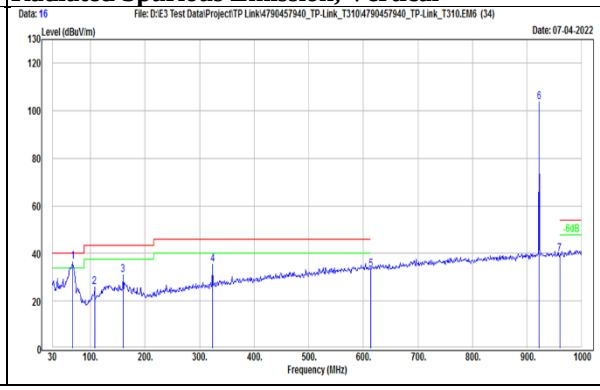
Mode	SubG	Channel	3

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		67.83	36.77	-7.53	29.24	40	-10.76	PK
		135.73	34.95	-6.6	28.35	43.5	-15.15	PK
		159.98	35.87	-5.11	30.76	43.5	-12.74	PK
		323.91	39.18	-3.23	35.95	46	-10.05	PK
		614	29.38	4.05	33.43	46	-12.57	PK
	@	922.3	94.64	9.36	104	N/A	N/A	PK
		960	29.26	9.83	39.09	54	-14.91	PK
Vertical		67.83	43.88	-7.53	36.35	40	-3.65	PK
		107.6	35.05	-9.26	25.79	43.5	-17.71	PK
		159.98	36.09	-5.11	30.98	43.5	-12.52	PK
		323.91	38.74	-3.23	35.51	46	-10.49	PK
		614	29.33	4.05	33.38	46	-12.62	PK
	@	922.3	94.22	9.36	103.58	N/A	N/A	PK
		960	29.98	9.83	39.81	54	-14.19	PK

TX, SubG (Ch 3)
Radiated Spurious Emission, Horizontal



TX, SubG (Ch 3)
Radiated Spurious Emission, Vertical



9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

KDB 414788 D01 OATS and Chamber Correlation Justification

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

END OF REPORT