Product Name:	HyperX Cloud Flight Wireless Gaming Headset USB Dongle
Model No.:	Cloud Flight, HXS-HSDG2
Applicant:	Kingston Digital, Inc. 17600 Newhope Street Fountain Valley, CA 92708, U.S.A
Date of Receipt:	Jul. 07, 2018
Finished date of Test:	Aug. 03, 2018
Applicable Standards:	47 CFR Part 15, Subpart C, 15.247 ANSI C63.10: 2013 FCC publication KDB 558074 D01 DTS Meas Guidance v04 Measurement on Digital Transmission Systems (DTS) Operating under Section 15.247 Apr 5, 2017

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Richard Lin , Date: 8/14/2018

(Richard Lin)

Approved By : , Date: 8/14/2018

(Johnson Ho, Director)

Revisions History

Report No.	Issue Date	Revisions
FCCA17060702	Jun. 19, 2017	Initial issue
FCCA17060702-01	Aug. 14, 2018	Update RF Antenna (ANT1), Class II Change

Table of Contents

1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- FCC Registered Test Site Number：TW1016

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source, DC 5.0V from PC USB Port.

1.3 EUT MODIFICATION

- No modification in SRT Lab.

2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	HyperX Cloud Flight Wireless Gaming Headset USB Dongle
MODEL NO.	Cloud Flight, HXS-HSDG2
POWER SUPPLY	DC power source, DC 5.0V from PC USB Port
CABLE	NA
FREQUENCY BAND	2.4 GHz ~ 2.4835 GHz
CARRIER FREQUENCY	2.401.35 GHz ~ 2.479.35 GHz
NUMBER OF CHANNEL	40
RATED RF OUTPUT POWER	2.44 dBm (1.75 mW)
MODULATION TYPE	Pi/4 DQPSK
MODE OF OPERATION	Duplex
ANTENNA TYPE	Chip Antenna
ANTENNA GAIN	ANT0：-1.73 dBi ANT1：1.69 dBi
OPERATING TEMPERATURE RANGE	0 ~ 40°C

NOTE:
For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID / DOC	REMARK
Micro USB Cable	N/A	N/A	N/A	1.m shielded power cable
AUXCable	N/A	N/A		1.3m shielded data cable.
Microphone	N/A	N/A	N/A	N/A
HyperX Cloud Flight Wireless Gaming Headset	Kingston	Cloud Flight	N/A	N/A

2.3 DESCRIPTION OF TEST MODE

Mode		Frequency
1	Tx-1_ANT0	2401.35 MHz
2	Tx-1_ANT1	2401.35 MHz
3	Tx-2_ANT0	2439.35 MHz
4	Tx-2_ANT1	2439.35 MHz
5	Tx-3_ANT0	2479.35 MHz
6	Tx-3_ANT1	2479.35 MHz
7	Standby	N/A
8	Link	N/A

NOTE:

1. Below 1 GHz were pre-tested in chamber and chosen the worst case for conducted and radiated emission test.
2. Above 1 GHz were tested individually.
3. The axis X,Y and Z we evaluate in chamber, the X axis is worst case.

2.4 EUT OPERATING CONDITION

Tx-1, Tx-2, Tx3, Standby：

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. We will use the following programs under Windows 10 system to test EUT.
4. Open program “VMItest-1.1.6.56”. Into mode Tx-1,. Tx-2, Tx3, Standby

Link：

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. We will use the following programs under Windows 10 system to test EUT.
4. Play music & Use the recorder to record.

2.5 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.10:2013. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DOC	CABLE
1	PC	ASUS	M32AA1	DoC	1.5m unshielded power cable.
2	LCD Monitor	ViewSonic	VS10866	DoC	1.8m unshielded power cable. 1.5m shielded data cable.
3	Keyboard	ASUS	AW211	DoC	1.8m unshielded data cable.
4	Mouse	ASUS	MOBTUO	DoC	1.5m unshielded data cable.
5	Printer	HP	C8991A	DoC	1.5m unshielded power cable. 1.5m shielded data cable.
6	USB 2.0 HDD	TERASYS	F12-U	DoC	1.5m unshielded power cable.

NOTE: For the actual test configuration, please refer to the photos of testing.

2.6 CHANNEL AND FREQUENCY TABLE

Channel	Frequency	Channel	Frequency	Channel	Frequency
CH01	2401.35 MHz	CH15	2429.35 MHz	CH29	2457.35 MHz
CH02	2403.35 MHz	CH16	2431.35 MHz	CH30	2459.35 MHz
CH03	2405.35 MHz	CH17	2433.35 MHz	CH31	2461.35 MHz
CH04	2407.35 MHz	CH18	2435.35 MHz	CH32	2463.35 MHz
CH05	2409.35 MHz	CH19	2437.35 MHz	CH33	2465.35 MHz
CH06	2411.35 MHz	CH20	2439.35 MHz	CH34	2467.35 MHz
CH07	2413.35 MHz	CH21	2441.35 MHz	CH35	2469.35 MHz
CH08	2415.35 MHz	CH22	2443.35 MHz	CH36	2471.35 MHz
CH09	2417.35 MHz	CH23	2445.35 MHz	CH37	2473.35 MHz
CH10	2419.35 MHz	CH24	2447.35 MHz	CH38	2475.35 MHz
CH11	2421.35 MHz	CH25	2449.35 MHz	CH39	2477.35 MHz
CH12	2423.35 MHz	CH26	2451.35 MHz	CH40	2479.35 MHz
CH13	2425.35 MHz	CH27	2453.35 MHz	--	--
CH14	2427.35 MHz	CH28	2455.35 MHz	--	--

2.7 DESCRIPTION OF CLASS II CHANGE DIFFERENCE

Models No.: Cloud Flight, HXS-HSDG2 are certified are identical in all aspects except for model number. In this application, one of the antennas wants to update. In the future, there will be two configurations of antenna in circulation on the market.

3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C, 15.247

ANSI C63.10: 2013

FCC publication KDB 558074 D01 DTS Meas Guidance v04 Measurement on Digital Transmission Systems (DTS) Operating under Section 15.247 Apr 5, 2017

All tests have been performed and recorded as the above standards.

3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT RESULTS	RESULTS
15.203 15.247(c)(1)(i)	Antenna requirement	PASS
15.207	AC Power Line Conducted Emission	N/A
15.247(a)(2)	6 dB Bandwidth	PASS
15.247(b)	Maximum Peak Conducted Output Power	PASS
15.247(d)	Band Edge Measurement:	PASS
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS
15.247(e)	Power Density: Limit: 8dBm/3kHz	PASS

4. TECHNICAL CHARACTERISTICS TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMIT

Frequency (MHz)	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

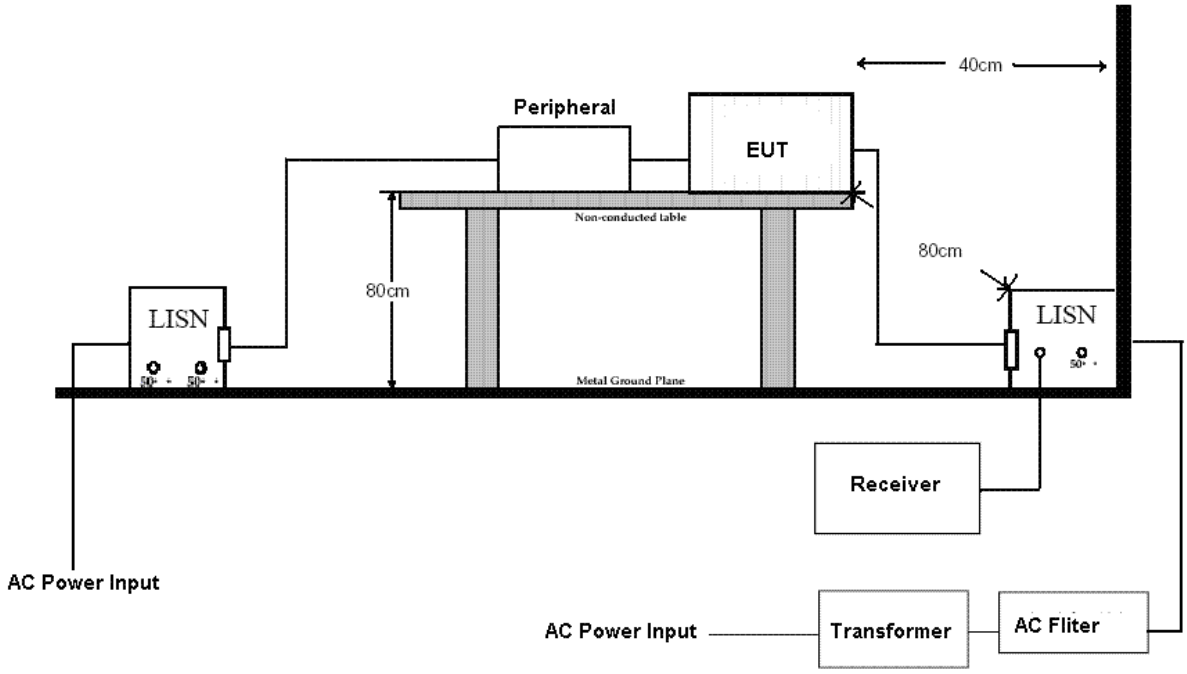
4.1.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	FINAL TEST BE USED
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	JAN. 01, 2019 ETC	■
LISN	50 μH, 50 ohm	SOLAR	9252-50-R-24-BNC /951315	OCT. 30, 2018 ETC	■
LISN	50 μH, 50 ohm	SCHWARZBECK	NSLK 8127/ 8127-808	DEC. 07, 2018 ETC	■
50Ω BNC TYPE TERMINATOR	50 ohm	N/A	11593A/ L1TEQU005	NOV. 08, 2018 ETC	■
50Ω BNC TYPE TERMINATOR	50 ohm	N/A	B00-CD-357/ L1TEQU009	MAY 17, 2019 ETC	■
COAXIAL CABLE	5 m	HUBER+SUHNER	RG214/U / #5M (L1TCAB013)	MAY 13, 2019 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 771	NCR	■
GROUND PLANE	2 m (H) x 3 m (W)	SRT	N/A	NCR	■
GROUND PLANE	2.5 m (H) x 3 m (W)	SRT	N/A	NCR	■
PULSE LIMITER	9 kHz ~ 30 MHz Insertion Loss= 10dB±0.3dB	ROHDE & SCHWARZ	ESH3Z2/ L1TTES009	MAR. 25, 2019 ETC	■
THERMO-HYGRO	15 ~ 40 °C, 0- 100% RH	TOP	20-A / 6644	SEP. 17, 2018 ETC	■
TEST SOFTWARE	---	EZ-EMC	SRT-03A1	NCR	■

NOTE:The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.3 TEST SETUP



NOTE :
1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.

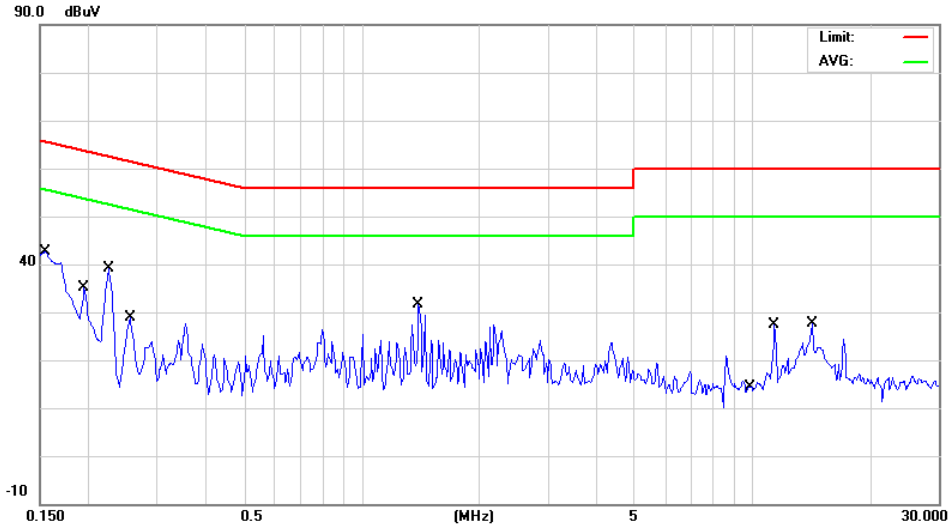
4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.10:2013 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50μH as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

4.1.5 TEST RESULT

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-1_ANT0
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line

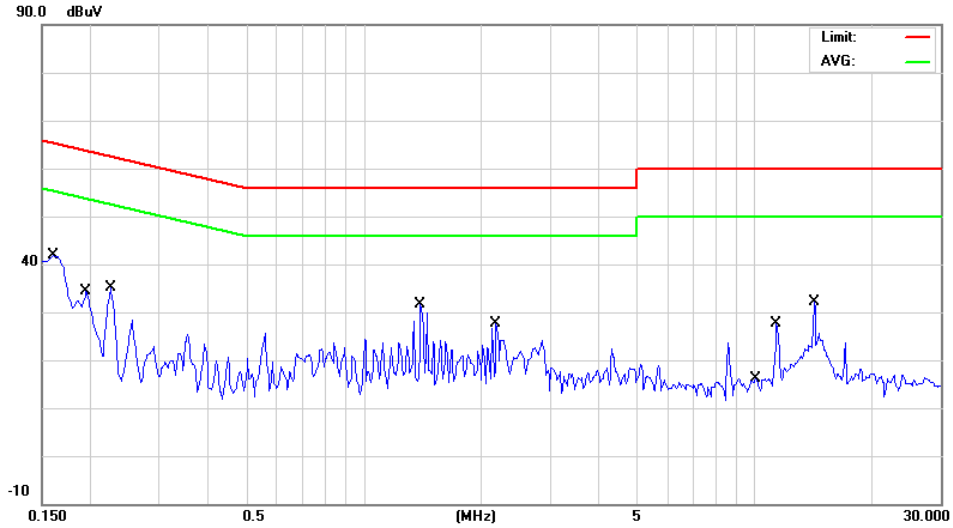


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1550	34.20	-0.09	34.11	65.73	-31.62	QP	
	2	0.1550	27.51	-0.09	27.42	55.73	-28.31	AVG	
	3	0.1950	31.18	-0.08	31.10	63.82	-32.72	QP	
	4	0.1950	27.93	-0.08	27.85	53.82	-25.97	AVG	
	5	0.2250	38.46	-0.08	38.38	62.63	-24.25	QP	
*	6	0.2250	35.84	-0.08	35.76	52.63	-16.87	AVG	
	7	0.2550	26.60	-0.09	26.51	61.59	-35.08	QP	
	8	0.2550	22.93	-0.09	22.84	51.59	-28.75	AVG	
	9	1.4000	28.46	-0.04	28.42	56.00	-27.58	QP	
	10	1.4000	14.67	-0.04	14.63	46.00	-31.37	AVG	
	11	10.0000	5.94	0.23	6.17	60.00	-53.83	QP	
	12	10.0000	1.99	0.23	2.22	50.00	-47.78	AVG	
	13	11.4100	25.24	0.27	25.51	60.00	-34.49	QP	
	14	11.4100	21.39	0.27	21.66	50.00	-28.34	AVG	
	15	14.2700	30.28	0.35	30.63	60.00	-29.37	QP	
	16	14.2700	26.71	0.35	27.06	50.00	-22.94	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-1_ANT0
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

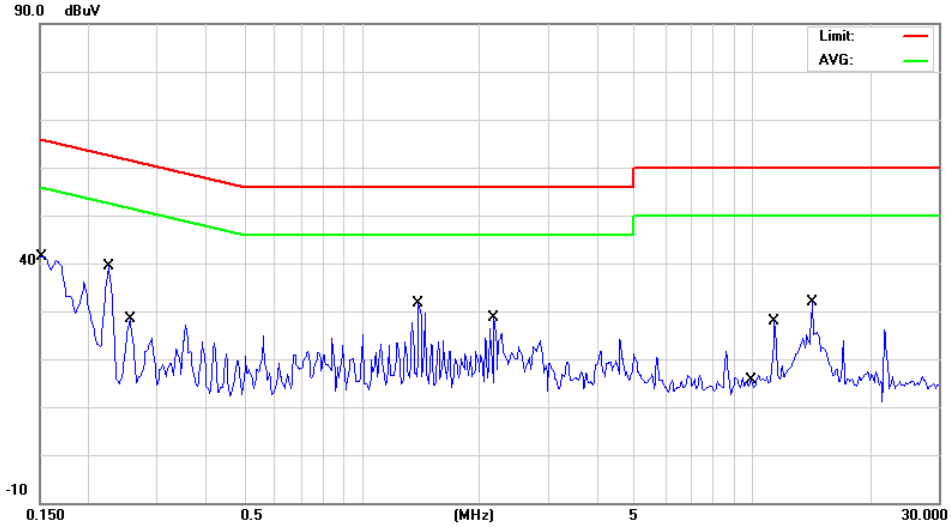


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	36.78	-0.08	36.70	65.46	-28.76	QP	
*	2	0.1600	35.90	-0.08	35.82	55.46	-19.64	AVG	
	3	0.1950	30.54	-0.07	30.47	63.82	-33.35	QP	
	4	0.1950	27.12	-0.07	27.05	53.82	-26.77	AVG	
	5	0.2250	34.26	-0.07	34.19	62.63	-28.44	QP	
	6	0.2250	31.10	-0.07	31.03	52.63	-21.60	AVG	
	7	1.4000	28.60	-0.03	28.57	56.00	-27.43	QP	
	8	1.4000	15.18	-0.03	15.15	46.00	-30.85	AVG	
	9	2.1850	24.64	0.00	24.64	56.00	-31.36	QP	
	10	2.1850	9.68	0.00	9.68	46.00	-36.32	AVG	
	11	10.0000	6.22	0.23	6.45	60.00	-53.55	QP	
	12	10.0000	2.26	0.23	2.49	50.00	-47.51	AVG	
	13	11.4150	26.32	0.27	26.59	60.00	-33.41	QP	
	14	11.4150	25.12	0.27	25.39	50.00	-24.61	AVG	
	15	14.2700	31.06	0.34	31.40	60.00	-28.60	QP	
	16	14.2700	26.97	0.34	27.31	50.00	-22.69	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-1_ANT1
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line



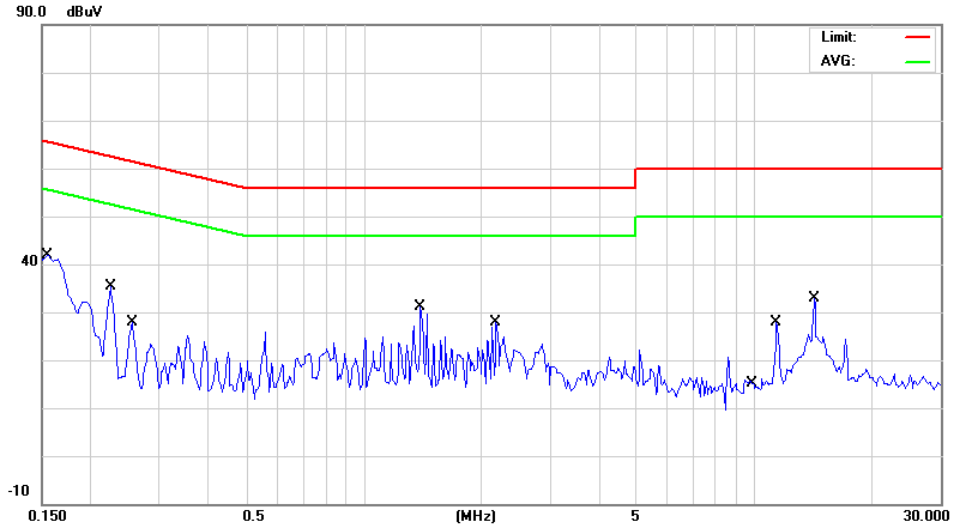
Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1500	35.44	-0.09	35.35	66.00	-30.65	QP	
	2	0.1500	13.14	-0.09	13.05	56.00	-42.95	AVG	
	3	0.2250	38.56	-0.08	38.48	62.63	-24.15	QP	
*	4	0.2250	36.45	-0.08	36.37	52.63	-16.26	AVG	
	5	0.2550	26.02	-0.09	25.93	61.59	-35.66	QP	
	6	0.2550	22.77	-0.09	22.68	51.59	-28.91	AVG	
	7	1.4000	28.56	-0.04	28.52	56.00	-27.48	QP	
	8	1.4000	14.41	-0.04	14.37	46.00	-31.63	AVG	
	9	2.1850	24.90	-0.01	24.89	56.00	-31.11	QP	
	10	2.1850	9.59	-0.01	9.58	46.00	-36.42	AVG	
	11	10.0000	6.34	0.23	6.57	60.00	-53.43	QP	
	12	10.0000	2.21	0.23	2.44	50.00	-47.56	AVG	
	13	11.4150	26.32	0.27	26.59	60.00	-33.41	QP	
	14	11.4150	24.74	0.27	25.01	50.00	-24.99	AVG	
	15	14.2700	30.04	0.35	30.39	60.00	-29.61	QP	
	16	14.2700	26.40	0.35	26.75	50.00	-23.25	AVG	

NOTE :

1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-1_ANT1
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

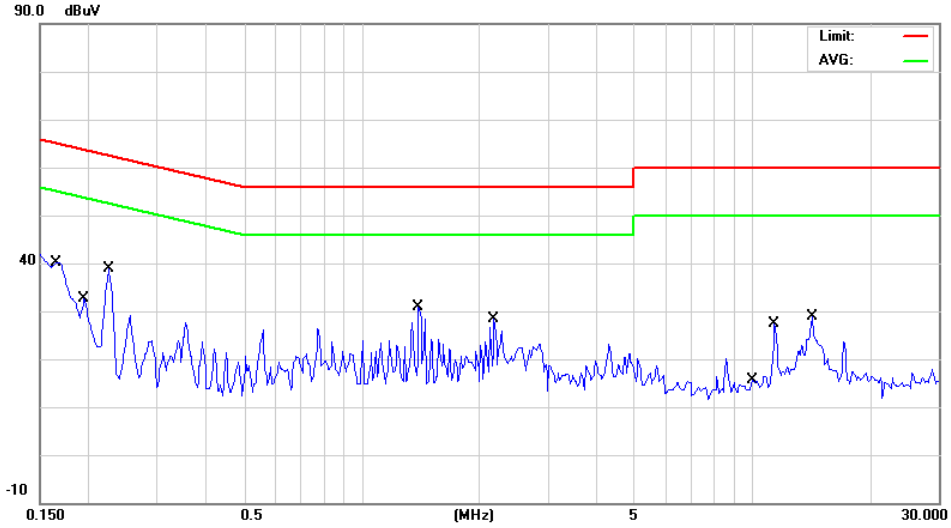


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1550	33.80	-0.08	33.72	65.73	-32.01	QP	
	2	0.1550	27.02	-0.08	26.94	55.73	-28.79	AVG	
	3	0.2250	34.08	-0.07	34.01	62.63	-28.62	QP	
*	4	0.2250	31.15	-0.07	31.08	52.63	-21.55	AVG	
	5	0.2550	25.52	-0.08	25.44	61.59	-36.15	QP	
	6	0.2550	22.04	-0.08	21.96	51.59	-29.63	AVG	
	7	1.4000	28.60	-0.03	28.57	56.00	-27.43	QP	
	8	1.4000	14.41	-0.03	14.38	46.00	-31.62	AVG	
	9	2.1850	24.78	0.00	24.78	56.00	-31.22	QP	
	10	2.1850	9.78	0.00	9.78	46.00	-36.22	AVG	
	11	10.0000	6.62	0.23	6.85	60.00	-53.15	QP	
	12	10.0000	2.32	0.23	2.55	50.00	-47.45	AVG	
	13	11.4200	24.90	0.27	25.17	60.00	-34.83	QP	
	14	11.4200	22.09	0.27	22.36	50.00	-27.64	AVG	
	15	14.2700	31.32	0.34	31.66	60.00	-28.34	QP	
	16	14.2700	27.60	0.34	27.94	50.00	-22.06	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-2_ANT0
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line



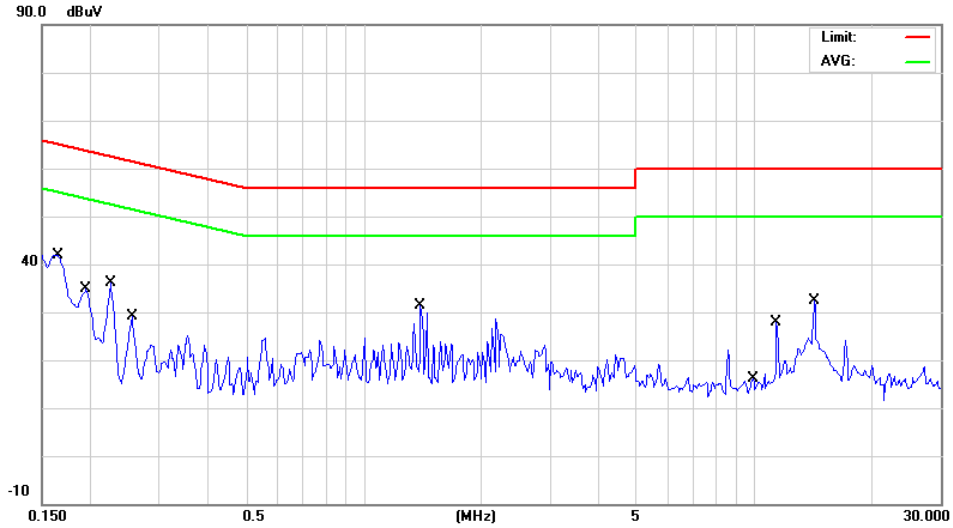
Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1650	35.96	-0.09	35.87	65.21	-29.34	QP	
	2	0.1650	32.85	-0.09	32.76	55.21	-22.45	AVG	
	3	0.1950	31.24	-0.08	31.16	63.82	-32.66	QP	
	4	0.1950	27.97	-0.08	27.89	53.82	-25.93	AVG	
	5	0.2250	38.48	-0.08	38.40	62.63	-24.23	QP	
*	6	0.2250	36.18	-0.08	36.10	52.63	-16.53	AVG	
	7	1.4000	28.48	-0.04	28.44	56.00	-27.56	QP	
	8	1.4000	14.57	-0.04	14.53	46.00	-31.47	AVG	
	9	2.1850	24.68	-0.01	24.67	56.00	-31.33	QP	
	10	2.1850	9.78	-0.01	9.77	46.00	-36.23	AVG	
	11	10.0000	6.04	0.23	6.27	60.00	-53.73	QP	
	12	10.0000	2.21	0.23	2.44	50.00	-47.56	AVG	
	13	11.4150	26.30	0.27	26.57	60.00	-33.43	QP	
	14	11.4150	24.87	0.27	25.14	50.00	-24.86	AVG	
	15	14.2700	30.46	0.35	30.81	60.00	-29.19	QP	
	16	14.2700	27.12	0.35	27.47	50.00	-22.53	AVG	

NOTE :

1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-2_ANT0
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

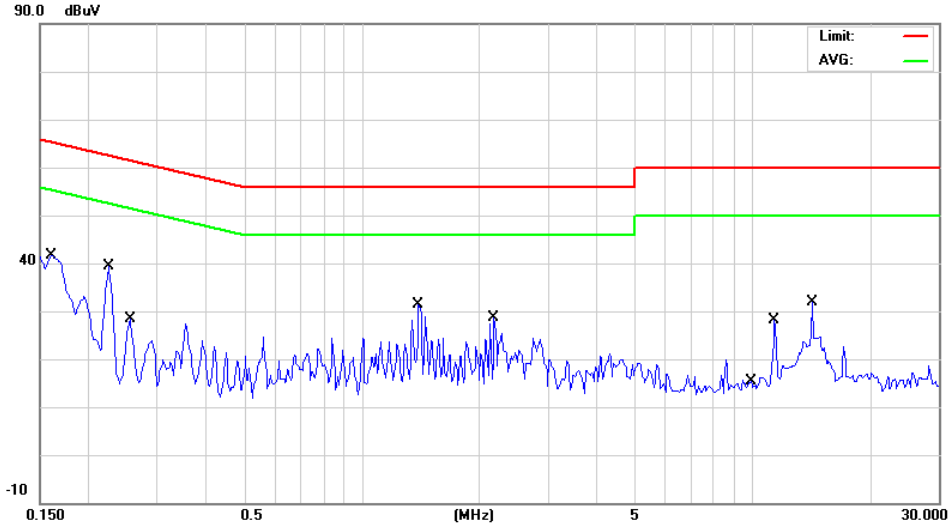


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1650	34.88	-0.08	34.80	65.21	-30.41	QP	
	2	0.1650	32.04	-0.08	31.96	55.21	-23.25	AVG	
	3	0.1950	30.58	-0.07	30.51	63.82	-33.31	QP	
	4	0.1950	27.17	-0.07	27.10	53.82	-26.72	AVG	
	5	0.2250	34.10	-0.07	34.03	62.63	-28.60	QP	
*	6	0.2250	31.15	-0.07	31.08	52.63	-21.55	AVG	
	7	0.2550	26.14	-0.08	26.06	61.59	-35.53	QP	
	8	0.2550	22.13	-0.08	22.05	51.59	-29.54	AVG	
	9	1.4000	28.44	-0.03	28.41	56.00	-27.59	QP	
	10	1.4000	14.57	-0.03	14.54	46.00	-31.46	AVG	
	11	10.0000	6.16	0.23	6.39	60.00	-53.61	QP	
	12	10.0000	2.15	0.23	2.38	50.00	-47.62	AVG	
	13	11.4200	21.18	0.27	21.45	60.00	-38.55	QP	
	14	11.4200	18.32	0.27	18.59	50.00	-31.41	AVG	
	15	14.2750	30.30	0.34	30.64	60.00	-29.36	QP	
	16	14.2750	22.04	0.34	22.38	50.00	-27.62	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-2_ANT1
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line



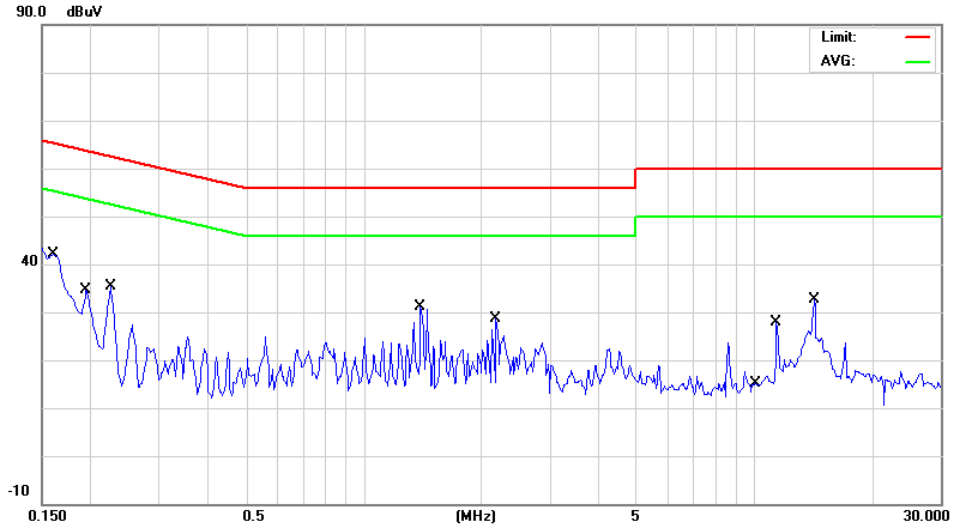
Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	37.40	-0.09	37.31	65.46	-28.15	QP	
	2	0.1600	35.95	-0.09	35.86	55.46	-19.60	AVG	
	3	0.2250	38.60	-0.08	38.52	62.63	-24.11	QP	
*	4	0.2250	36.45	-0.08	36.37	52.63	-16.26	AVG	
	5	0.2550	26.20	-0.09	26.11	61.59	-35.48	QP	
	6	0.2550	22.85	-0.09	22.76	51.59	-28.83	AVG	
	7	1.4000	28.64	-0.04	28.60	56.00	-27.40	QP	
	8	1.4000	14.25	-0.04	14.21	46.00	-31.79	AVG	
	9	2.1850	24.98	-0.01	24.97	56.00	-31.03	QP	
	10	2.1850	9.68	-0.01	9.67	46.00	-36.33	AVG	
	11	10.0000	6.52	0.23	6.75	60.00	-53.25	QP	
	12	10.0000	2.21	0.23	2.44	50.00	-47.56	AVG	
	13	11.4200	24.98	0.27	25.25	60.00	-34.75	QP	
	14	11.4200	20.95	0.27	21.22	50.00	-28.78	AVG	
	15	14.2700	30.94	0.35	31.29	60.00	-28.71	QP	
	16	14.2700	26.56	0.35	26.91	50.00	-23.09	AVG	

NOTE :

1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-2_ANT1
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

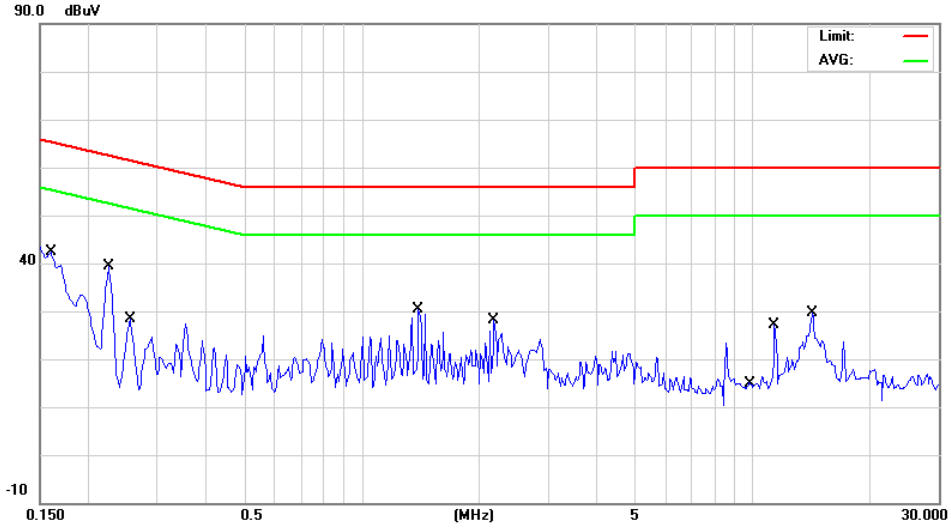


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	36.66	-0.08	36.58	65.46	-28.88	QP	
*	2	0.1600	36.18	-0.08	36.10	55.46	-19.36	AVG	
	3	0.1950	30.64	-0.07	30.57	63.82	-33.25	QP	
	4	0.1950	27.17	-0.07	27.10	53.82	-26.72	AVG	
	5	0.2250	34.08	-0.07	34.01	62.63	-28.62	QP	
	6	0.2250	31.15	-0.07	31.08	52.63	-21.55	AVG	
	7	1.4000	28.74	-0.03	28.71	56.00	-27.29	QP	
	8	1.4000	14.98	-0.03	14.95	46.00	-31.05	AVG	
	9	2.1850	24.88	0.00	24.88	56.00	-31.12	QP	
	10	2.1850	9.78	0.00	9.78	46.00	-36.22	AVG	
	11	10.0000	6.40	0.23	6.63	60.00	-53.37	QP	
	12	10.0000	2.32	0.23	2.55	50.00	-47.45	AVG	
	13	11.4150	26.54	0.27	26.81	60.00	-33.19	QP	
	14	11.4150	25.31	0.27	25.58	50.00	-24.42	AVG	
	15	14.2650	31.28	0.34	31.62	60.00	-28.38	QP	
	16	14.2650	19.65	0.34	19.99	50.00	-30.01	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-3_ANT0
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line



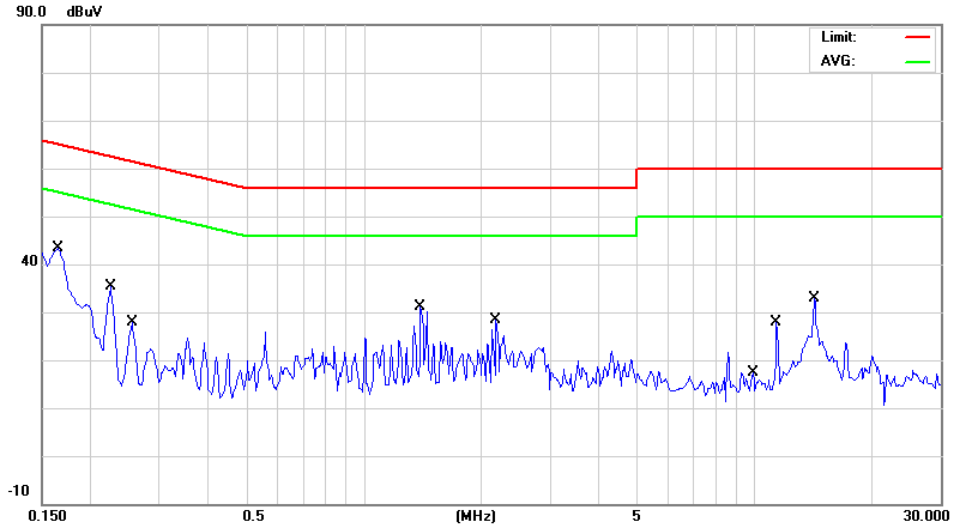
Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	37.40	-0.09	37.31	65.46	-28.15	QP	
	2	0.1600	35.78	-0.09	35.69	55.46	-19.77	AVG	
	3	0.2250	38.62	-0.08	38.54	62.63	-24.09	QP	
*	4	0.2250	36.61	-0.08	36.53	52.63	-16.10	AVG	
	5	0.2550	26.18	-0.09	26.09	61.59	-35.50	QP	
	6	0.2550	22.77	-0.09	22.68	51.59	-28.91	AVG	
	7	1.4000	28.44	-0.04	28.40	56.00	-27.60	QP	
	8	1.4000	14.88	-0.04	14.84	46.00	-31.16	AVG	
	9	2.1850	24.76	-0.01	24.75	56.00	-31.25	QP	
	10	2.1850	9.59	-0.01	9.58	46.00	-36.42	AVG	
	11	10.0000	6.60	0.23	6.83	60.00	-53.17	QP	
	12	10.0000	2.21	0.23	2.44	50.00	-47.56	AVG	
	13	11.4150	26.32	0.27	26.59	60.00	-33.41	QP	
	14	11.4150	24.74	0.27	25.01	50.00	-24.99	AVG	
	15	14.2650	29.24	0.35	29.59	60.00	-30.41	QP	
	16	14.2650	21.63	0.35	21.98	50.00	-28.02	AVG	

NOTE :

1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-3_ANT0
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

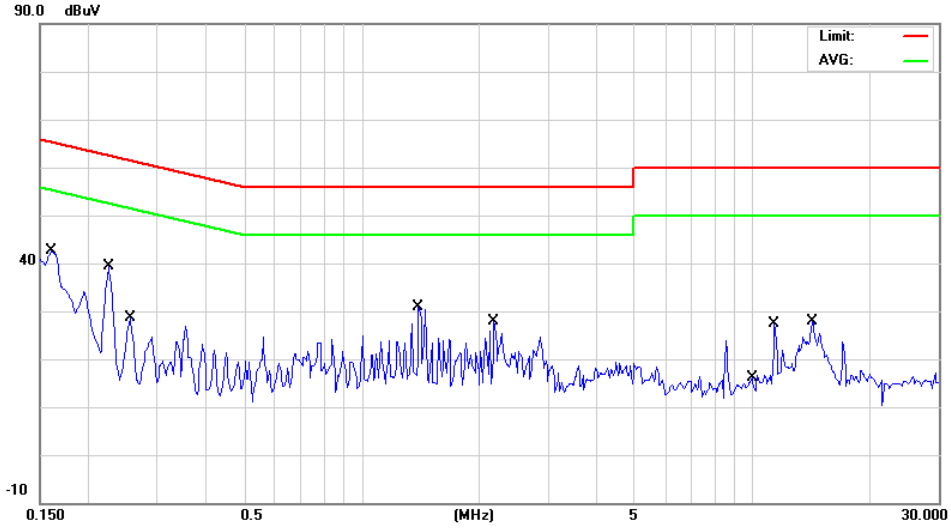


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1650	35.06	-0.08	34.98	65.21	-30.23	QP	
	2	0.1650	32.09	-0.08	32.01	55.21	-23.20	AVG	
	3	0.2250	34.06	-0.07	33.99	62.63	-28.64	QP	
*	4	0.2250	31.10	-0.07	31.03	52.63	-21.60	AVG	
	5	0.2550	25.50	-0.08	25.42	61.59	-36.17	QP	
	6	0.2550	22.04	-0.08	21.96	51.59	-29.63	AVG	
	7	1.4000	28.54	-0.03	28.51	56.00	-27.49	QP	
	8	1.4000	14.41	-0.03	14.38	46.00	-31.62	AVG	
	9	2.1850	24.68	0.00	24.68	56.00	-31.32	QP	
	10	2.1850	9.68	0.00	9.68	46.00	-36.32	AVG	
	11	10.0000	6.46	0.23	6.69	60.00	-53.31	QP	
	12	10.0000	2.21	0.23	2.44	50.00	-47.56	AVG	
	13	11.4150	26.22	0.27	26.49	60.00	-33.51	QP	
	14	11.4150	22.68	0.27	22.95	50.00	-27.05	AVG	
	15	14.2700	31.14	0.34	31.48	60.00	-28.52	QP	
	16	14.2700	26.12	0.34	26.46	50.00	-23.54	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-3_ANT1
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line



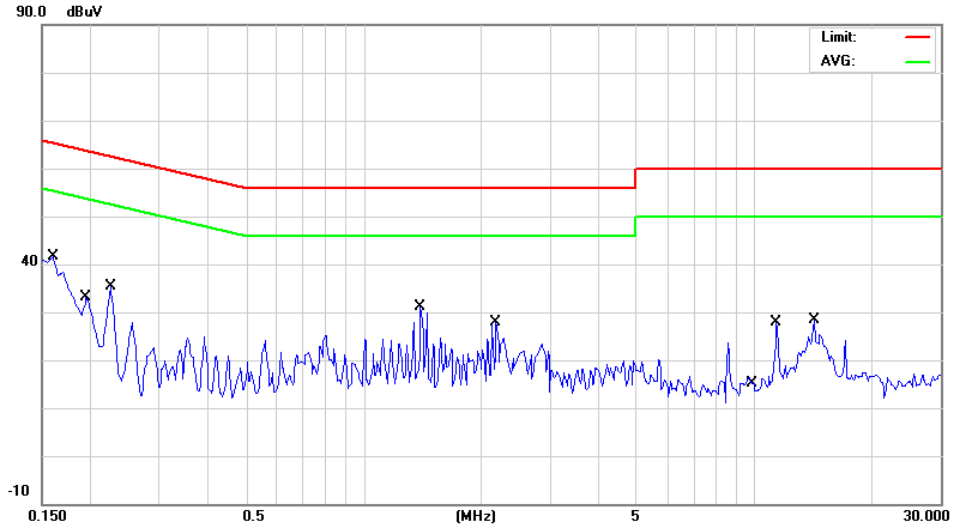
Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	37.02	-0.09	36.93	65.46	-28.53	QP	
	2	0.1600	36.01	-0.09	35.92	55.46	-19.54	AVG	
	3	0.2250	38.54	-0.08	38.46	62.63	-24.17	QP	
*	4	0.2250	36.45	-0.08	36.37	52.63	-16.26	AVG	
	5	0.2550	26.12	-0.09	26.03	61.59	-35.56	QP	
	6	0.2550	22.77	-0.09	22.68	51.59	-28.91	AVG	
	7	1.4000	28.56	-0.04	28.52	56.00	-27.48	QP	
	8	1.4000	15.52	-0.04	15.48	46.00	-30.52	AVG	
	9	2.1850	24.80	-0.01	24.79	56.00	-31.21	QP	
	10	2.1850	9.68	-0.01	9.67	46.00	-36.33	AVG	
	11	10.0000	6.46	0.23	6.69	60.00	-53.31	QP	
	12	10.0000	2.37	0.23	2.60	50.00	-47.40	AVG	
	13	11.4150	26.36	0.27	26.63	60.00	-33.37	QP	
	14	11.4150	25.18	0.27	25.45	50.00	-24.55	AVG	
	15	14.2700	30.40	0.35	30.75	60.00	-29.25	QP	
	16	14.2700	24.20	0.35	24.55	50.00	-25.45	AVG	

NOTE :

1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx-3_ANT1
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

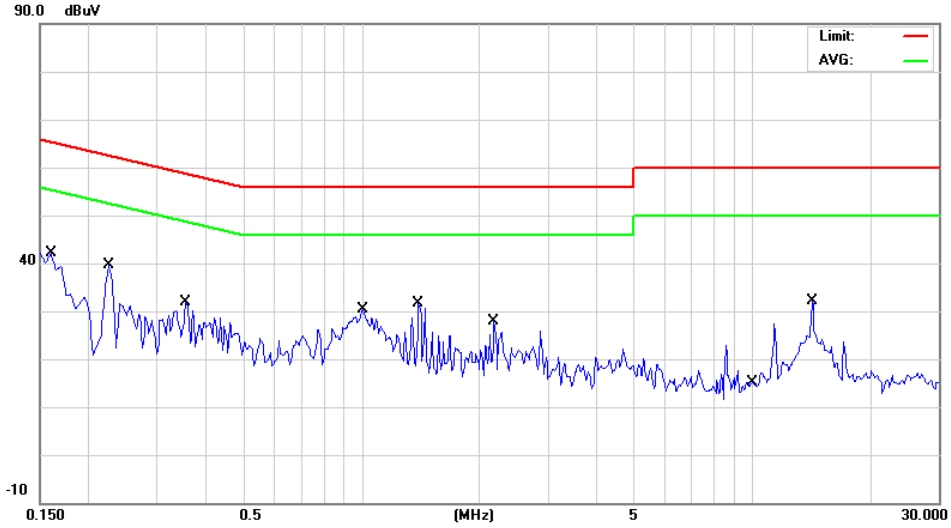


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	36.66	-0.08	36.58	65.46	-28.88	QP	
*	2	0.1600	35.84	-0.08	35.76	55.46	-19.70	AVG	
	3	0.1950	30.58	-0.07	30.51	63.82	-33.31	QP	
	4	0.1950	27.17	-0.07	27.10	53.82	-26.72	AVG	
	5	0.2250	34.08	-0.07	34.01	62.63	-28.62	QP	
	6	0.2250	31.15	-0.07	31.08	52.63	-21.55	AVG	
	7	1.4000	28.68	-0.03	28.65	56.00	-27.35	QP	
	8	1.4000	14.62	-0.03	14.59	46.00	-31.41	AVG	
	9	2.1850	24.88	0.00	24.88	56.00	-31.12	QP	
	10	2.1850	9.73	0.00	9.73	46.00	-36.27	AVG	
	11	10.0000	6.52	0.23	6.75	60.00	-53.25	QP	
	12	10.0000	2.26	0.23	2.49	50.00	-47.51	AVG	
	13	11.4150	26.56	0.27	26.83	60.00	-33.17	QP	
	14	11.4150	25.31	0.27	25.58	50.00	-24.42	AVG	
	15	14.2700	31.28	0.34	31.62	60.00	-28.38	QP	
	16	14.2700	27.37	0.34	27.71	50.00	-22.29	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Standby
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line

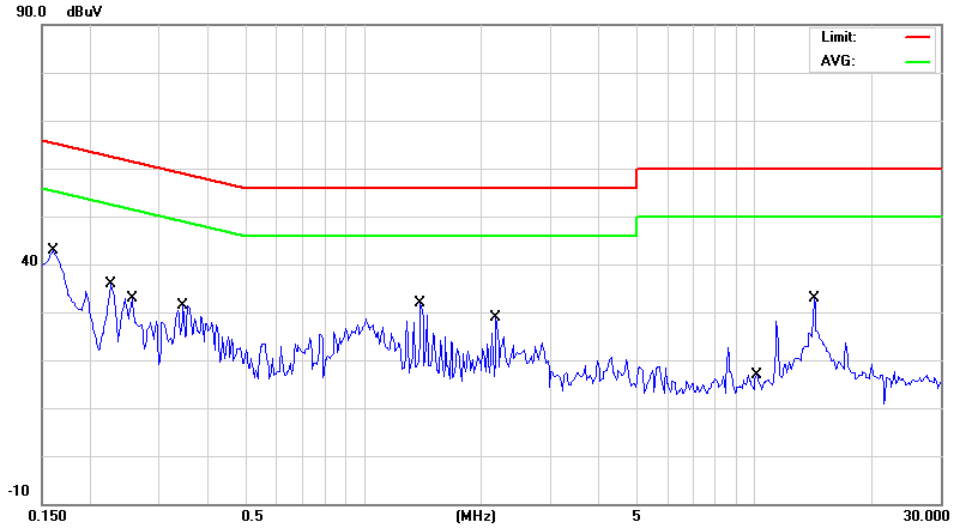


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	37.02	-0.09	36.93	65.46	-28.53	QP	
	2	0.1600	35.84	-0.09	35.75	55.46	-19.71	AVG	
	3	0.2250	38.66	-0.08	38.58	62.63	-24.05	QP	
*	4	0.2250	36.45	-0.08	36.37	52.63	-16.26	AVG	
	5	0.3550	28.60	-0.09	28.51	58.84	-30.33	QP	
	6	0.3550	25.43	-0.09	25.34	48.84	-23.50	AVG	
	7	1.0050	23.58	-0.06	23.52	56.00	-32.48	QP	
	8	1.0050	16.41	-0.06	16.35	46.00	-29.65	AVG	
	9	1.4000	29.02	-0.04	28.98	56.00	-27.02	QP	
	10	1.4000	19.35	-0.04	19.31	46.00	-26.69	AVG	
	11	2.1850	23.98	-0.01	23.97	56.00	-32.03	QP	
	12	2.1850	10.73	-0.01	10.72	46.00	-35.28	AVG	
	13	10.0000	7.52	0.23	7.75	60.00	-52.25	QP	
	14	10.0000	2.26	0.23	2.49	50.00	-47.51	AVG	
	15	14.2700	30.56	0.35	30.91	60.00	-29.09	QP	
	16	14.2700	24.34	0.35	24.69	50.00	-25.31	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Standby
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral

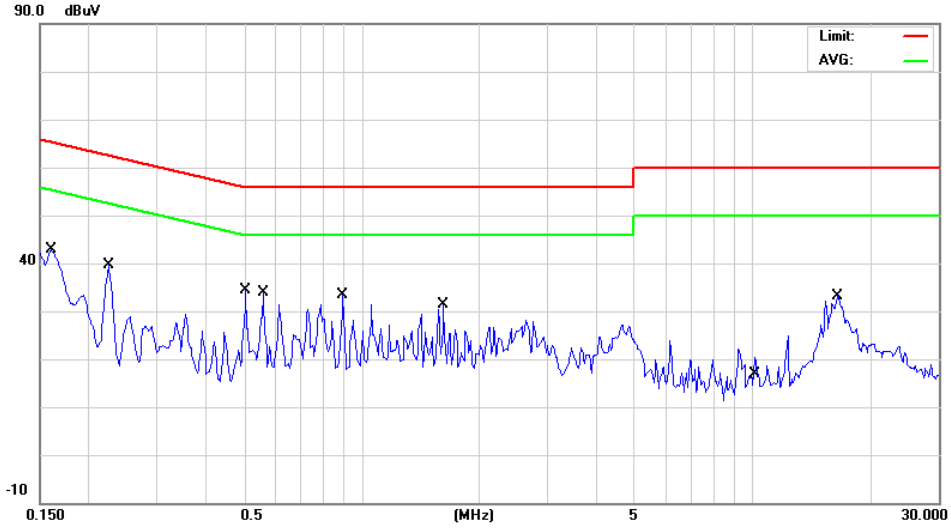


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	36.54	-0.08	36.46	65.46	-29.00	QP	
*	2	0.1600	35.78	-0.08	35.70	55.46	-19.76	AVG	
	3	0.2250	34.12	-0.07	34.05	62.63	-28.58	QP	
	4	0.2250	31.44	-0.07	31.37	52.63	-21.26	AVG	
	5	0.2550	30.56	-0.08	30.48	61.59	-31.11	QP	
	6	0.2550	24.13	-0.08	24.05	51.59	-27.54	AVG	
	7	0.3450	25.44	-0.08	25.36	59.08	-33.72	QP	
	8	0.3450	16.58	-0.08	16.50	49.08	-32.58	AVG	
	9	1.4000	29.04	-0.03	29.01	56.00	-26.99	QP	
	10	1.4000	19.16	-0.03	19.13	46.00	-26.87	AVG	
	11	2.1850	23.94	0.00	23.94	56.00	-32.06	QP	
	12	2.1850	10.81	0.00	10.81	46.00	-35.19	AVG	
	13	10.0000	7.56	0.23	7.79	60.00	-52.21	QP	
	14	10.0000	2.26	0.23	2.49	50.00	-47.51	AVG	
	15	14.2650	31.24	0.34	31.58	60.00	-28.42	QP	
	16	14.2650	26.66	0.34	27.00	50.00	-23.00	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Link
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Line

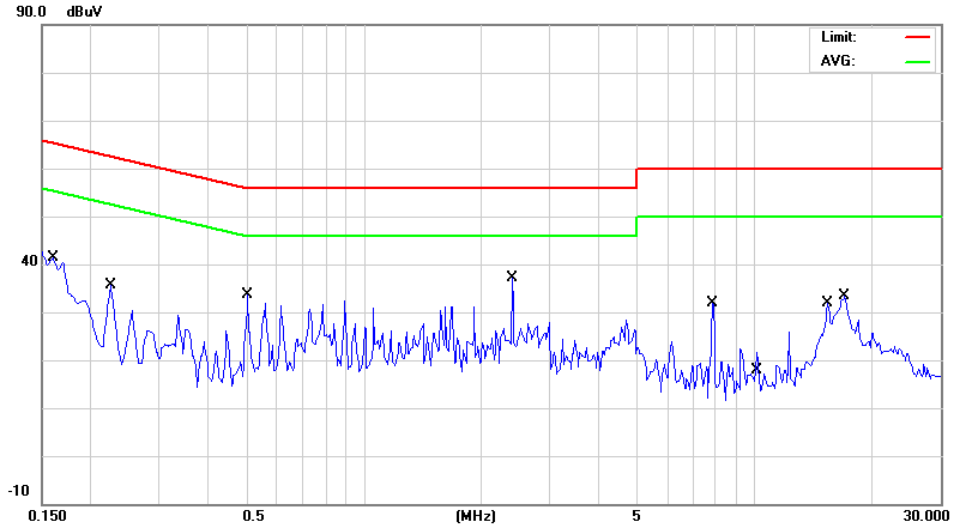


Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	37.70	-0.09	37.61	65.46	-27.85	QP	
	2	0.1600	35.95	-0.09	35.86	55.46	-19.60	AVG	
	3	0.2250	38.52	-0.08	38.44	62.63	-24.19	QP	
*	4	0.2250	36.50	-0.08	36.42	52.63	-16.21	AVG	
	5	0.5050	32.26	-0.09	32.17	56.00	-23.83	QP	
	6	0.5050	19.76	-0.09	19.67	46.00	-26.33	AVG	
	7	0.5600	31.90	-0.09	31.81	56.00	-24.19	QP	
	8	0.5600	21.20	-0.09	21.11	46.00	-24.89	AVG	
	9	0.8950	30.84	-0.06	30.78	56.00	-25.22	QP	
	10	0.8950	23.99	-0.06	23.93	46.00	-22.07	AVG	
	11	1.6250	29.28	-0.03	29.25	56.00	-26.75	QP	
	12	1.6250	17.97	-0.03	17.94	46.00	-28.06	AVG	
	13	10.0000	5.40	0.23	5.63	60.00	-54.37	QP	
	14	10.0000	1.93	0.23	2.16	50.00	-47.84	AVG	
	15	16.5700	26.74	0.41	27.15	60.00	-32.85	QP	
	16	16.5700	20.90	0.41	21.31	50.00	-28.69	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

Temperature:	25 °C	Humidity:	71 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Link
Receiver Detector:	Q.P. and AV.	Modulation Type:	Pi/4 DQPSK
Tested By:	Richard Lin	Tested Date:	Jul. 23, 2018

Power Line Measured：Neutral



Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1600	36.80	-0.08	36.72	65.46	-28.74	QP	
*	2	0.1600	35.78	-0.08	35.70	55.46	-19.76	AVG	
	3	0.2250	34.40	-0.07	34.33	62.63	-28.30	QP	
	4	0.2250	31.49	-0.07	31.42	52.63	-21.21	AVG	
	5	0.5050	31.76	-0.08	31.68	56.00	-24.32	QP	
	6	0.5050	19.22	-0.08	19.14	46.00	-26.86	AVG	
	7	2.4000	17.28	0.01	17.29	56.00	-38.71	QP	
	8	2.4000	7.84	0.01	7.85	46.00	-38.15	AVG	
	9	7.8500	9.50	0.16	9.66	60.00	-50.34	QP	
	10	7.8500	2.58	0.16	2.74	50.00	-47.26	AVG	
	11	10.0000	5.18	0.23	5.41	60.00	-54.59	QP	
	12	10.0000	1.64	0.23	1.87	50.00	-48.13	AVG	
	13	15.4050	27.74	0.36	28.10	60.00	-31.90	QP	
	14	15.4050	21.82	0.36	22.18	50.00	-27.82	AVG	
	15	17.0450	26.36	0.40	26.76	60.00	-33.24	QP	
	16	17.0450	20.59	0.40	20.99	50.00	-29.01	AVG	

NOTE :
1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN
   Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

4.2 RADIATED EMISSION TEST

4.2.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	FIELD STRENGTH (microvolts/meter)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)
0.009 - 0.490	2400/F(kHz)	300	67.6-20log(kHz)
0.490 - 1.705	24000/F(kHz)	30	87.6-20log(kHz)
1.705 - 30	30	30	30
30 - 88	100	3	40.0
88 - 216	150	3	43.5
216 - 960	200	3	46.0
Above 960	500	3	54.0

NOTE:

1. 30 dBuV (in 30m) = 70 dBuV (in 3m).
2. In the emission tables above , the tighter limit applies at the band edges.
3. Distance refers to the distance between measuring instrument, antemma, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

4.2.2 TEST EQUIPMENT

Below 1 GHz The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	FINAL TEST BE USED
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	JAN. 01, 2019 ETC	■
LOOP ANTENNA	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	HFH2-Z2 / 860605/002	FEB. 24, 2019 ETC	■
BICONICAL ANTENNA	30 MHz ~ 200 MHz	EMCO	3110/ 11966C	JUN. 12, 2019 ETC	■
LOG PERIODIC ANTENNA	200 MHz ~ 1 GHz	EMCO	3146/ 9002-2686	DEC. 24, 2018 ETC	■
PRE-AMPLIFIER	0.1 MHz ~ 1.3 GHz	HP	8447D / 2944A06746	DEC. 14, 2018 ETC	■
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 08, 2019 SRT	■
ANECHOIC CHAMBER	3 M MEASUREMENT	SRT	A01 / SRT001	SEP. 13, 2018 SRT	■
COAXIAL CABLE	30 M	TIMES	LMR-400 / #30M(L1TCAB014)	JUN. 03, 2019 ETC	■
COAXIAL CABLE	9k - 1GHz	Suncity	CABLE14/ EQM-0158, #14-1M	DEC. 17, 2018 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943/ 869	NCR	■
CDN	0.15 MHz ~ 300 MHz	LUTHI	CDN L-801 M2/M3 / 2790	MAY 28, 2019 ETC	■
THERMO-HYGRO	15 – 40 ℃, 0- 100% RH	TOP	20-A / 7685	SEP. 17, 2018 ETC	■
TEST SOFTWARE	---	EZ-EMC	SRT-03A1	NCR	■

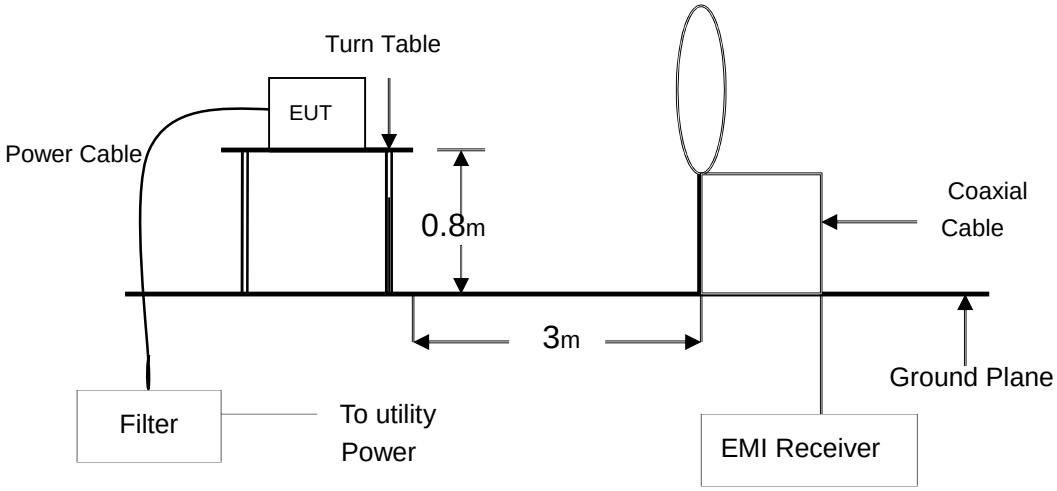
NOTE: The Open Area Test Site (SRT-1) is registered by FCC with No. 90957

Above 1 GHz The following test equipment was used during the radiated emission test:

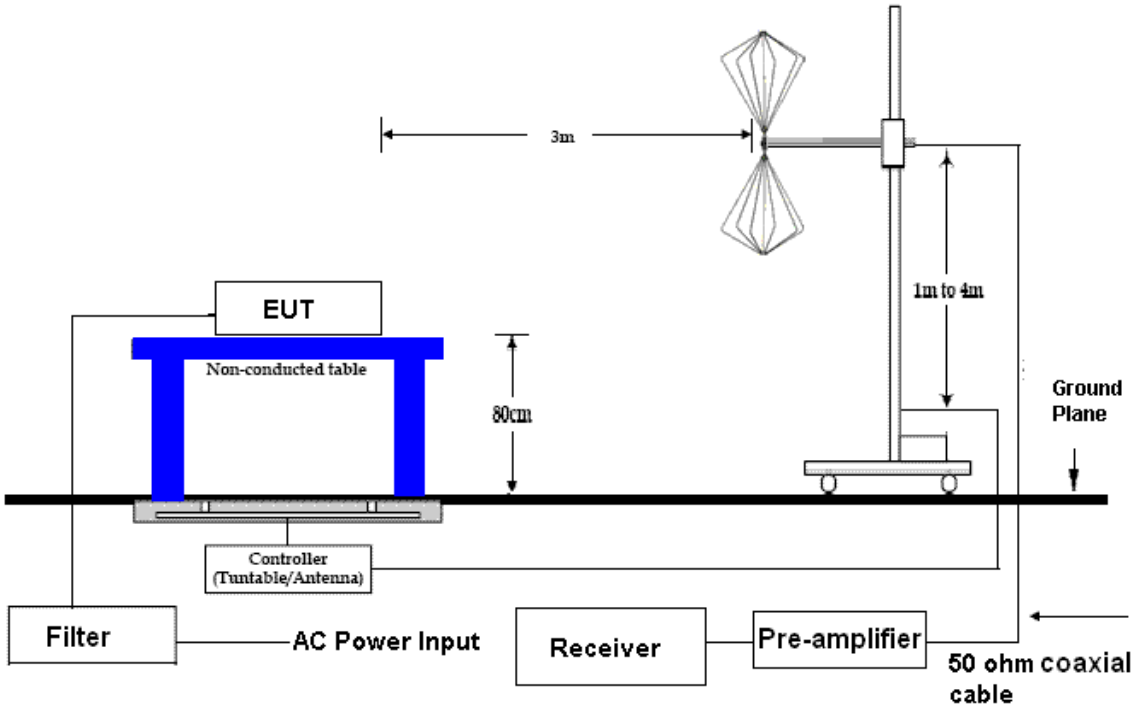
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	FINAL TEST BE USED
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	JAN. 01, 2019 ETC	■
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	NOV. 28, 2018 ETC	■
HORN ANTENNA	18 ~ 40 GHZ	ETS-LINDGREN	3116 /00032255	JAN. 15, 2019 ETC	■
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 27, 2018 ETC	■
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 08, 2019 SRT	■
K-TYPE CABLE	UP TO 40 GHz 3 m	HUBER+SUHNER	SF102-46/2*11SK252 /MY2611/2	MAR. 05, 2019 ETC	■
K-TYPE CABLE	UP TO 40 GHz, 1 m	HUBER+SUHNER	SF102/2*11SK252 /MY3331/2	SEP. 28, 2018 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943/ 869	NCR	■
THERMO-HYGRO	15 – 40 ℃, 0- 100% RH	TOP	20-A / 7685	SEP. 17, 2018 ETC	■

4.2.3 TEST SET-UP

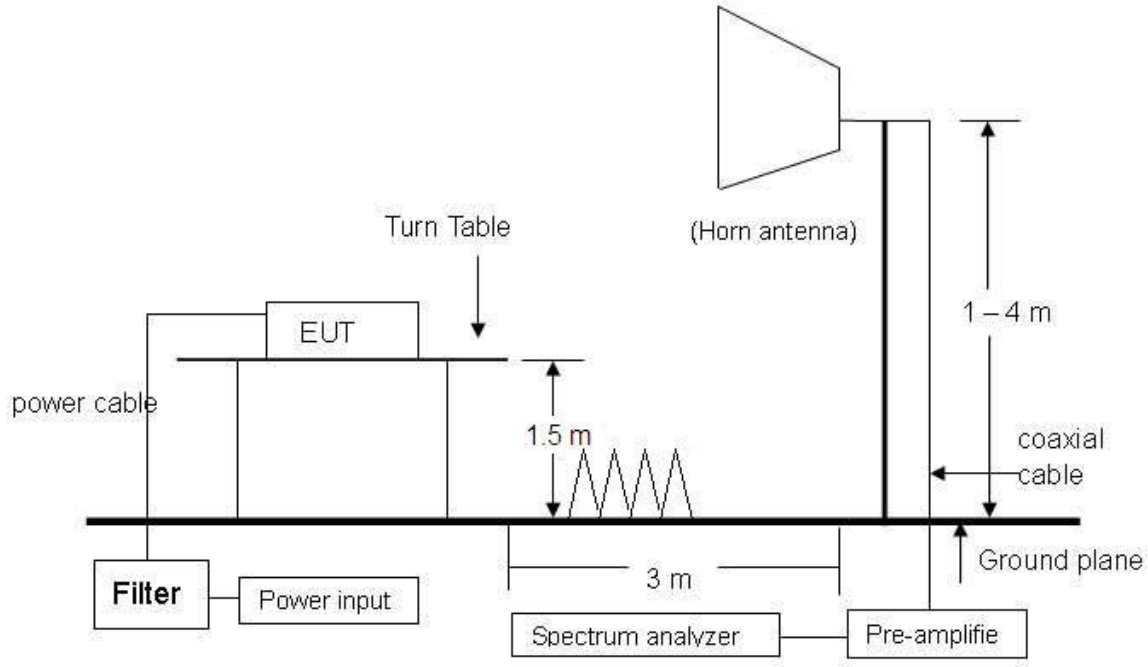
9KHz ~ 30MHz



30 MHz ~ 1 GHz



Above 1 GHz



NOTE: The EUT system was put on a wooden table with 1.5m heights above a ground plane. For the actual test configuration, please refer to the photos of testing.

4.2.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.10:2013 and CISPR 22:2003. When the frequency spectrum measured started from 9 kHz to 30 MHz, then use antenna is a loop antenna. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 9kHz to 30MHz and 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

4.2.5 TEST RESULT

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Tx-1_ANT0
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10.82	0.80	20.51	7.38	28.70	70.00	-41.30
15.37	0.99	21.15	6.30	28.44	70.00	-41.56
17.44	1.05	21.43	5.67	28.16	70.00	-41.84
19.07	1.10	21.66	6.22	28.98	70.00	-41.02
20.51	1.15	21.82	6.91	29.88	70.00	-40.12
27.39	1.39	22.10	5.93	29.42	70.00	-40.58

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Tx-1_ANT1
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
12.43	0.87	20.74	6.13	27.74	70.00	-42.26
15.81	1.00	21.21	5.94	28.15	70.00	-41.85
18.89	1.10	21.64	6.23	28.96	70.00	-41.04
21.54	1.18	21.86	5.71	28.75	70.00	-41.25
25.33	1.30	22.01	5.48	28.79	70.00	-41.21
27.95	1.42	22.12	6.02	29.55	70.00	-40.45

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Tx-2_ANT0
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBµV)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
7.88	0.68	20.23	7.03	27.94	70.00	-42.06
13.45	0.91	20.88	6.28	28.08	70.00	-41.92
16.27	1.02	21.27	5.67	27.96	70.00	-42.04
18.35	1.08	21.56	6.17	28.81	70.00	-41.19
23.39	1.23	21.94	6.08	29.25	70.00	-40.75
26.15	1.33	22.05	5.71	29.09	70.00	-40.91

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Tx-2_ANT1
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBµV)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.52	0.83	20.61	5.96	27.41	70.00	-42.59
16.91	1.04	21.36	6.39	28.79	70.00	-41.21
19.35	1.11	21.70	5.88	28.69	70.00	-41.31
20.74	1.15	21.83	6.71	29.69	70.00	-40.31
24.38	1.26	21.98	5.64	28.88	70.00	-41.12
28.11	1.42	22.12	6.83	30.38	70.00	-39.62

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Tx-3_ANT0
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10.27	0.78	20.44	6.71	27.93	70.00	-42.07
16.46	1.02	21.30	6.58	28.90	70.00	-41.10
19.51	1.12	21.72	5.92	28.76	70.00	-41.24
21.39	1.17	21.86	5.84	28.87	70.00	-41.13
24.53	1.27	21.98	6.16	29.41	70.00	-40.59
28.32	1.43	22.13	6.37	29.94	70.00	-40.06

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Tx-3_ANT1
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBμV)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11.26	0.82	20.58	6.07	27.47	70.00	-42.53
15.34	0.99	21.14	5.84	27.97	70.00	-42.03
17.28	1.05	21.41	6.35	28.81	70.00	-41.19
20.21	1.14	21.81	5.99	28.93	70.00	-41.07
25.87	1.32	22.03	6.12	29.47	70.00	-40.53
28.33	1.43	22.13	6.57	30.14	70.00	-39.86

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Standby
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBµV)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
12.60	0.88	20.76	6.25	27.89	70.00	-42.11
16.59	1.03	21.32	5.73	28.08	70.00	-41.92
22.38	1.20	21.90	6.01	29.11	70.00	-40.89
24.22	1.26	21.97	5.97	29.20	70.00	-40.80
26.75	1.36	22.07	6.89	30.32	70.00	-39.68
28.01	1.42	22.12	5.42	28.96	70.00	-41.04

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Link
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB/m)	Reading (dBµV)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.81	0.80	20.51	6.40	27.72	70.00	-42.28
16.55	1.03	21.31	5.38	27.72	70.00	-42.28
18.62	1.09	21.60	5.91	28.60	70.00	-41.40
20.23	1.14	21.81	6.13	29.08	70.00	-40.92
25.77	1.32	22.03	6.84	30.19	70.00	-39.81
27.69	1.40	22.11	5.97	29.48	70.00	-40.52

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Tx-1_ANT0
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
42.62	1.68	15.14	28.28	28.63	17.17	40	-22.83	230	3.58
56.80	1.69	10.28	28.24	40.93	24.66	40	-15.34	146	3.44
297.94	3.70	14.83	27.30	29.79	21.02	46	-24.98	79	3.15
513.15	5.30	18.66	28.48	30.17	25.65	46	-20.35	181	2.53
660.03	6.23	21.08	28.45	26.27	25.12	46	-20.88	324	2.06
724.51	6.61	21.90	28.32	27.75	27.94	46	-18.06	205	1.83

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
55.22	1.69	10.60	28.24	31.32	15.36	40	-24.64	77	1.06
185.70	2.74	16.75	27.67	27.88	19.70	44	-23.80	126	1.45
491.05	5.15	18.43	28.42	33.42	28.58	46	-17.42	93	2.23
499.13	5.20	19.03	28.46	27.11	22.87	46	-23.13	157	2.48
517.98	5.33	18.70	28.48	29.60	25.15	46	-20.85	304	2.56
859.67	7.44	23.54	27.84	26.90	30.04	46	-15.96	88	3.39

NOTE :
1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Tx-1_ANT1
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.48	1.68	10.92	28.25	28.69	13.05	40	-26.95	255	3.61
352.17	4.21	15.31	27.63	26.49	18.37	46	-27.63	307	3.04
499.29	5.20	19.03	28.46	28.84	24.60	46	-21.40	142	2.57
709.55	6.52	21.82	28.36	27.31	27.28	46	-18.72	61	1.94
824.84	7.21	22.93	27.99	26.86	29.01	46	-16.99	188	1.53
994.03	8.26	25.20	27.28	27.79	33.97	54	-20.03	329	1.04

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
55.38	1.69	10.60	28.24	32.36	16.40	40	-23.60	43	1.09
131.93	2.34	14.42	27.94	27.97	16.79	44	-26.71	133	1.33
183.12	2.72	16.61	27.68	27.20	18.85	44	-24.65	291	1.57
491.08	5.15	18.43	28.42	30.81	25.97	46	-20.03	254	2.39
514.72	5.31	18.67	28.48	29.16	24.66	46	-21.34	39	2.52
709.66	6.52	21.82	28.36	28.17	28.14	46	-17.86	164	3.11

NOTE :
1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Tx-2_ANT0
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.66	1.69	10.28	28.24	41.13	24.86	40	-15.14	106	3.55
70.02	1.76	6.80	28.20	36.71	17.07	40	-22.93	258	3.41
97.37	2.03	9.81	28.11	34.38	18.11	44	-25.39	74	3.29
499.50	5.20	19.03	28.46	27.73	23.49	46	-22.51	112	2.57
743.19	6.73	22.00	28.26	26.67	27.14	46	-18.86	320	1.78
997.62	8.28	25.15	27.26	27.87	34.04	54	-19.96	139	1.04

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.34	1.68	10.92	28.25	32.40	16.76	40	-23.24	58	1.02
73.16	1.79	6.65	28.19	32.95	13.20	40	-26.80	177	1.25
187.99	2.75	16.89	27.66	29.31	21.29	44	-22.21	263	1.53
520.70	5.35	18.74	28.49	28.94	24.55	46	-21.45	81	2.39
715.51	6.55	21.86	28.35	27.44	27.51	46	-18.49	192	3.11
781.38	6.94	22.25	28.15	28.40	29.44	46	-16.56	301	3.34

NOTE :

1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Tx-2_ANT1
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
49.31	1.68	12.94	28.26	35.30	21.66	40	-18.34	140	3.64
56.76	1.69	10.28	28.24	43.39	27.12	40	-12.88	259	3.51
81.82	1.86	6.49	28.16	36.60	16.79	40	-23.21	341	3.32
131.18	2.34	14.42	27.94	29.31	18.13	44	-25.37	193	3.01
498.96	5.20	18.95	28.46	29.50	25.19	46	-20.81	277	2.56
798.55	7.04	22.30	28.10	27.92	29.17	46	-16.83	128	1.67

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
55.16	1.69	10.60	28.24	31.31	15.35	40	-24.65	40	1.14
184.94	2.73	16.68	27.67	26.75	18.49	44	-25.01	59	1.45
499.78	5.20	19.03	28.46	28.25	24.01	46	-21.99	299	2.39
513.23	5.30	18.66	28.48	30.60	26.08	46	-19.92	34	2.67
744.50	6.73	22.02	28.26	27.77	28.26	46	-17.74	301	3.11
991.62	8.25	25.24	27.29	28.27	34.47	54	-19.53	72	3.54

NOTE :
1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Tx-3_ANT0
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.40	1.69	10.28	28.24	40.10	23.83	40	-16.17	226	3.59
94.56	2.00	9.12	28.12	34.06	17.06	44	-26.44	281	3.38
297.77	3.70	14.83	27.30	28.19	19.42	46	-26.58	302	3.16
499.02	5.20	19.03	28.46	27.93	23.69	46	-22.31	57	2.57
513.86	5.30	18.66	28.48	28.58	24.06	46	-21.94	183	2.19
796.91	7.03	22.31	28.10	29.02	30.25	46	-15.75	319	1.65

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.40	1.69	10.28	28.24	40.11	23.84	40	-16.16	46	1.12
94.56	2.00	9.12	28.12	34.02	17.02	44	-26.48	99	1.25
297.77	3.70	14.83	27.30	28.17	19.40	46	-26.60	168	1.84
499.02	5.20	19.03	28.46	27.91	23.67	46	-22.33	254	2.33
513.86	5.30	18.66	28.48	28.55	24.03	46	-21.97	70	2.67
796.91	7.03	22.31	28.10	29.04	30.27	46	-15.73	335	3.38

NOTE :

1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Tx-3_ANT1
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
55.24	1.69	10.60	28.24	38.34	22.38	40	-17.62	154	3.61
298.96	3.71	14.92	27.30	27.87	19.21	46	-26.79	250	3.25
425.75	4.73	17.30	28.08	29.72	23.67	46	-22.33	277	2.91
488.81	5.13	18.33	28.41	28.78	23.84	46	-22.16	132	2.56
499.30	5.20	19.03	28.46	27.02	22.78	46	-23.22	65	2.43
515.66	5.32	18.68	28.48	28.45	23.97	46	-22.03	194	2.01

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.53	1.68	10.92	28.25	31.68	16.04	40	-23.96	83	1.13
183.06	2.72	16.61	27.68	26.63	18.28	44	-25.22	129	1.48
415.86	4.67	17.10	28.03	27.25	20.99	46	-25.01	66	2.05
499.42	5.20	19.03	28.46	28.07	23.83	46	-22.17	315	2.44
520.99	5.35	18.74	28.49	32.14	27.75	46	-18.25	304	2.57
809.46	7.11	22.59	28.05	26.64	28.29	46	-17.71	90	3.42

NOTE :
1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Standby
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.43	1.69	10.28	28.24	43.76	27.49	40	-12.51	126	3.59
94.60	2.00	9.12	28.12	31.82	14.82	44	-28.68	335	3.36
298.82	3.71	14.92	27.30	26.41	17.75	46	-28.25	76	3.18
471.15	5.02	18.09	28.32	27.22	22.02	46	-23.98	182	2.65
499.77	5.20	19.03	28.46	28.53	24.29	46	-21.71	34	2.17
772.94	6.89	22.18	28.17	27.26	28.16	46	-17.84	155	1.72

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.73	1.69	10.28	28.24	30.94	14.67	40	-25.33	240	1.09
74.01	1.80	6.60	28.18	32.45	12.66	40	-27.34	350	1.15
183.69	2.72	16.61	27.68	28.19	19.84	44	-23.66	302	1.53
355.53	4.23	15.48	27.65	27.43	19.49	46	-26.52	271	2.02
499.21	5.20	19.03	28.46	26.21	21.97	46	-24.03	44	2.43
516.84	5.33	18.69	28.48	29.38	24.91	46	-21.09	183	2.54

NOTE :

1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	21 °C	Humidity:	66 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Link
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.02	1.68	10.92	28.25	47.30	31.66	40	-8.34	193	3.61
72.64	1.78	6.70	28.19	41.16	21.45	40	-18.55	63	3.52
131.83	2.34	14.42	27.94	35.87	24.69	44	-18.81	331	3.34
192.15	2.79	16.16	27.63	33.22	24.54	44	-18.96	158	3.19
212.97	2.97	11.98	27.55	38.44	25.83	44	-17.67	42	3.04
513.18	5.30	18.66	28.48	31.48	26.96	46	-19.04	253	2.38

Antenna Polarization：Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Pre-Amp (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
44.63	1.69	14.38	28.28	29.75	17.54	40	-22.46	266	1.06
77.88	1.82	6.45	28.17	39.27	19.37	40	-20.63	217	1.18
454.14	4.92	17.62	28.23	30.93	25.23	46	-20.77	84	2.30
489.02	5.14	18.35	28.41	34.53	29.60	46	-16.40	99	2.44
723.25	6.60	21.89	28.32	27.67	27.84	46	-18.16	100	2.99
915.98	7.78	23.95	27.61	27.62	31.75	46	-14.25	239	3.47

NOTE :
1. Measurement uncertainty is 4.20 dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-1_ANT0
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1827.39	-31.84	27.31	44.17	33.68	39.64	29.15	74	54	-34.36	-24.85	135	2.29
2279.64	-31.37	28.23	43.99	33.45	40.85	30.31	74	54	-33.15	-23.69	229	2.13
3086.15	-30.70	30.50	43.89	33.32	43.69	33.12	74	54	-30.31	-20.88	63	1.85
4421.08	-29.21	32.60	42.22	31.79	45.61	35.18	74	54	-28.39	-18.82	184	1.46
4628.42	-28.94	32.93	42.03	31.56	46.02	35.55	74	54	-27.98	-18.45	71	1.40
5592.85	-28.40	34.30	41.26	30.74	47.16	36.64	74	54	-26.84	-17.36	50	1.13

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1832.28	-31.84	27.33	43.99	33.43	39.48	28.92	74	54	-34.52	-25.08	124	1.26
2304.54	-31.36	28.26	44.21	33.78	41.12	30.69	74	54	-32.88	-23.31	307	1.38
3031.02	-30.78	30.44	43.94	33.49	43.59	33.14	74	54	-30.41	-20.86	88	1.64
4255.06	-29.38	32.60	43.11	32.62	46.33	35.84	74	54	-27.67	-18.16	209	1.95
4613.96	-28.97	32.89	42.57	32.07	46.50	36.00	74	54	-27.50	-18.00	174	2.06
5538.71	-28.41	34.30	40.88	30.35	46.77	36.24	74	54	-27.23	-17.76	281	2.37

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-1_ANT0 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2401.35 (F)	-31.29	28.38	88.23	74.89	85.32	71.98	--	--	--	--	117	1.61
4802.70	-28.69	33.39	39.67	29.13	44.37	33.83	74	54	-29.63	-20.17	312	1.58
7204.05	-27.71	35.79	39.38	28.80	47.46	36.88	74	54	-26.54	-17.12	28	1.64
9605.40	-27.16	37.76	40.51	30.05	51.11	40.65	74	54	-22.89	-13.35	316	1.68
12006.75	-26.01	39.30	36.43	25.90	49.72	39.19	74	54	-24.28	-14.81	298	1.59
14408.10	-23.60	42.29	30.48	19.93	49.17	38.62	74	54	-24.83	-15.38	58	1.64

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2401.35 (F)	-31.29	28.38	83.76	71.24	80.85	68.33	--	--	--	--	343	1.64
4802.70	-28.69	33.39	39.99	29.45	44.69	34.15	74	54	-29.31	-19.85	354	1.49
7204.05	-27.71	35.79	39.11	28.69	47.19	36.77	74	54	-26.81	-17.23	161	1.50
9605.40	-27.16	37.76	40.24	29.81	50.84	40.41	74	54	-23.16	-13.59	296	1.51
12006.75	-26.01	39.30	33.87	23.31	47.16	36.60	74	54	-26.84	-17.40	40	1.62
14408.10	-23.60	42.29	30.52	20.09	49.21	38.78	74	54	-24.79	-15.22	358	1.66

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-1_ANT1
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1829.59	-31.84	27.32	44.20	33.71	39.68	29.19	74	54	-34.32	-24.81	270	2.27
1953.12	-31.64	27.74	45.93	35.42	42.03	31.52	74	54	-31.97	-22.48	152	2.22
3077.23	-30.71	30.49	43.41	32.97	43.19	32.75	74	54	-30.81	-21.25	210	1.89
3688.89	-29.91	31.60	42.73	32.28	44.42	33.97	74	54	-29.58	-20.03	134	1.65
4124.75	-29.51	32.60	42.57	32.01	45.66	35.10	74	54	-28.34	-18.90	81	1.53
5396.40	-28.42	34.22	41.09	30.55	46.89	36.35	74	54	-27.11	-17.65	299	1.14

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1748.35	-31.97	27.04	44.25	33.78	39.33	28.86	74	54	-34.67	-25.14	305	1.23
2186.43	-31.44	28.12	43.63	33.14	40.31	29.82	74	54	-33.69	-24.18	34	1.39
3102.79	-30.67	30.52	43.93	33.62	43.78	33.47	74	54	-30.22	-20.53	129	1.65
3665.08	-29.93	31.53	42.86	32.37	44.46	33.97	74	54	-29.54	-20.03	251	1.82
4277.02	-29.36	32.60	41.96	31.40	45.20	34.64	74	54	-28.80	-19.36	69	1.99
5483.91	-28.42	34.29	41.10	30.68	46.97	36.55	74	54	-27.03	-17.45	244	2.34

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-1_ANT1 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2401.35 (F)	-31.29	28.38	87.60	75.02	84.69	72.11	--	--	--	--	317	1.58
4802.70	-28.69	33.39	40.96	30.44	45.66	35.14	74	54	-28.34	-18.86	307	1.47
7204.05	-27.71	35.79	39.24	28.71	47.32	36.79	74	54	-26.68	-17.21	97	1.60
9605.40	-27.16	37.76	39.71	29.25	50.31	39.85	74	54	-23.69	-14.15	77	1.61
12006.75	-26.01	39.30	34.99	24.51	48.28	37.80	74	54	-25.72	-16.20	90	1.65
14408.10	-23.60	42.29	30.15	19.68	48.84	38.37	74	54	-25.16	-15.63	26	1.54

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2401.35 (F)	-31.29	28.38	84.73	71.91	81.82	69.00	--	--	--	--	231	1.43
4802.70	-28.69	33.39	39.93	29.48	44.63	34.18	74	54	-29.37	-19.82	169	1.52
7204.05	-27.71	35.79	39.07	28.54	47.15	36.62	74	54	-26.85	-17.38	267	1.49
9605.40	-27.16	37.76	39.78	29.23	50.38	39.83	74	54	-23.62	-14.17	26	1.51
12006.75	-26.01	39.30	34.52	24.04	47.81	37.33	74	54	-26.19	-16.67	201	1.53
14408.10	-23.60	42.29	30.02	19.53	48.71	38.22	74	54	-25.29	-15.78	62	1.43

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-2_ANT0
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1592.42	-32.21	26.51	45.37	34.88	39.67	29.18	74	54	-34.33	-24.82	230	2.33
2276.96	-31.38	28.23	44.75	34.25	41.60	31.10	74	54	-32.40	-22.90	279	2.15
2961.30	-30.86	30.25	43.83	33.37	43.22	32.76	74	54	-30.78	-21.24	54	1.94
3288.85	-30.39	30.75	43.96	33.41	44.31	33.76	74	54	-29.69	-20.24	167	1.82
4649.78	-28.91	32.99	42.05	31.55	46.12	35.62	74	54	-27.88	-18.38	86	1.43
5617.21	-28.40	34.30	41.37	30.82	47.27	36.72	74	54	-26.73	-17.28	50	1.15

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1826.60	-31.84	27.31	44.18	33.64	39.64	29.10	74	54	-34.36	-24.90	299	1.26
2288.83	-31.37	28.25	44.21	33.79	41.09	30.67	74	54	-32.91	-23.33	302	1.38
2957.19	-30.86	30.24	43.76	33.25	43.13	32.62	74	54	-30.87	-21.38	115	1.55
3761.25	-29.85	31.84	43.41	32.93	45.40	34.92	74	54	-28.60	-19.08	298	1.84
4279.41	-29.36	32.60	42.79	32.25	46.03	35.49	74	54	-27.97	-18.51	40	1.96
5282.33	-28.41	34.13	41.98	31.47	47.69	37.18	74	54	-26.31	-16.82	123	2.27

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-2_ANT0 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2439.35 (F)	-31.26	28.43	86.35	73.12	83.51	70.28	--	--	--	--	100	1.65
4878.70	-28.58	33.58	41.49	30.99	46.49	35.99	74	54	-27.51	-18.01	33	1.64
7318.05	-27.64	36.06	39.43	28.94	47.86	37.37	74	54	-26.14	-16.63	156	1.60
9757.40	-27.09	37.85	39.81	29.33	50.57	40.09	74	54	-23.43	-13.91	209	1.60
12196.75	-25.55	39.26	33.50	23.07	47.21	36.78	74	54	-26.79	-17.22	70	1.65
14636.10	-23.64	41.80	29.54	19.04	47.70	37.20	74	54	-26.30	-16.80	66	1.44

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2439.35 (F)	-31.26	28.43	84.19	71.39	81.35	68.55	--	--	--	--	244	1.49
4878.70	-28.58	33.58	40.08	29.52	45.08	34.52	74	54	-28.92	-19.48	316	1.59
7318.05	-27.64	36.06	39.56	28.90	47.99	37.33	74	54	-26.01	-16.67	161	1.49
9757.40	-27.09	37.85	39.84	29.30	50.60	40.06	74	54	-23.40	-13.94	120	1.53
12196.75	-25.55	39.26	33.46	22.94	47.17	36.65	74	54	-26.83	-17.35	38	1.46
14636.10	-23.64	41.80	29.69	19.12	47.85	37.28	74	54	-26.15	-16.72	194	1.56

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-2_ANT1
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1729.67	-32.00	26.98	44.04	33.51	39.02	28.49	74	54	-34.98	-25.51	165	2.31
2276.35	-31.38	28.23	43.53	33.06	40.38	29.91	74	54	-33.62	-24.09	224	2.18
2762.44	-31.02	29.50	43.63	33.19	42.11	31.67	74	54	-31.89	-22.33	219	1.95
4093.98	-29.55	32.60	42.70	32.24	45.75	35.29	74	54	-28.25	-18.71	107	1.58
4718.03	-28.81	33.17	42.73	32.29	47.09	36.65	74	54	-26.91	-17.35	58	1.34
5481.16	-28.42	34.28	42.50	32.01	48.37	37.88	74	54	-25.63	-16.12	276	1.17

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1838.46	-31.83	27.35	44.03	33.58	39.55	29.10	74	54	-34.45	-24.90	133	1.26
2164.79	-31.46	28.10	43.42	32.94	40.06	29.58	74	54	-33.94	-24.42	323	1.39
2757.27	-31.02	29.48	43.27	32.78	41.73	31.24	74	54	-32.27	-22.76	197	1.54
3751.61	-29.85	31.80	42.85	32.35	44.80	34.30	74	54	-29.20	-19.70	55	1.86
3986.98	-29.65	32.56	42.50	32.04	45.40	34.94	74	54	-28.60	-19.06	201	1.97
5032.58	-28.40	33.93	41.81	31.33	47.33	36.85	74	54	-26.67	-17.15	349	2.24

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-2_ANT1 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2439.35 (F)	-31.26	28.43	83.37	70.08	80.53	67.24	--	--	--	--	266	1.43
4878.70	-28.58	33.58	40.38	29.81	45.38	34.81	74	54	-28.62	-19.19	167	1.63
7318.05	-27.64	36.06	39.44	28.92	47.87	37.35	74	54	-26.13	-16.65	344	1.50
9757.40	-27.09	37.85	39.25	28.88	50.01	39.64	74	54	-23.99	-14.36	75	1.58
12196.75	-25.55	39.26	33.34	22.89	47.05	36.60	74	54	-26.95	-17.40	36	1.50
14636.10	-23.64	41.80	29.42	18.81	47.58	36.97	74	54	-26.42	-17.03	183	1.65

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2439.35 (F)	-31.26	28.43	84.01	71.28	81.17	68.44	--	--	--	--	179	1.47
4878.70	-28.58	33.58	40.37	29.84	45.37	34.84	74	54	-28.63	-19.16	148	1.44
7318.05	-27.64	36.06	39.37	28.85	47.80	37.28	74	54	-26.20	-16.72	52	1.64
9757.40	-27.09	37.85	39.23	28.73	49.99	39.49	74	54	-24.01	-14.51	106	1.69
12196.75	-25.55	39.26	33.15	22.60	46.86	36.31	74	54	-27.14	-17.69	119	1.54
14636.10	-23.64	41.80	29.19	18.62	47.35	36.78	74	54	-26.65	-17.22	237	1.44

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-3_ANT0
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1591.71	-32.22	26.51	44.29	33.77	38.58	28.06	74	54	-35.42	-25.94	220	2.36
2294.82	-31.36	28.25	42.90	32.42	39.79	29.31	74	54	-34.21	-24.69	257	2.13
2763.35	-31.01	29.50	43.94	33.56	42.42	32.04	74	54	-31.58	-21.96	148	1.98
3758.52	-29.85	31.83	42.65	32.13	44.63	34.11	74	54	-29.37	-19.89	193	1.65
4244.34	-29.39	32.60	42.99	32.40	46.20	35.61	74	54	-27.80	-18.39	300	1.52
5579.60	-28.41	34.30	41.42	30.98	47.31	36.87	74	54	-26.69	-17.13	325	1.18

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1827.92	-31.84	27.31	44.17	33.63	39.64	29.10	74	54	-34.36	-24.90	86	1.26
2271.64	-31.38	28.23	44.00	33.54	40.84	30.38	74	54	-33.16	-23.62	132	1.39
2853.78	-30.94	29.84	43.98	33.48	42.88	32.38	74	54	-31.12	-21.62	115	1.58
3254.51	-30.44	30.70	43.77	33.29	44.03	33.55	74	54	-29.97	-20.45	71	1.64
3723.03	-29.88	31.71	42.82	32.34	44.66	34.18	74	54	-29.34	-19.82	206	1.89
4102.44	-29.54	32.60	42.69	32.18	45.75	35.24	74	54	-28.25	-18.76	284	1.99

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-3_ANT0 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2479.35 (F)	-31.23	28.47	82.28	69.54	79.52	66.78	--	--	--	--	190	1.56
4958.70	-28.46	33.79	39.76	29.24	45.09	34.57	74	54	-28.91	-19.43	313	1.45
7438.05	-27.56	36.35	39.15	28.69	47.94	37.48	74	54	-26.06	-16.52	254	1.61
9917.40	-27.02	37.95	39.66	29.17	50.59	40.10	74	54	-23.41	-13.90	327	1.69
12396.75	-25.07	39.22	34.79	24.21	48.94	38.36	74	54	-25.06	-15.64	141	1.48
14876.10	-23.70	40.75	30.21	19.75	47.26	36.80	74	54	-26.74	-17.20	326	1.49

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2479.35 (F)	-31.23	28.47	81.19	68.93	78.43	66.17	--	--	--	--	351	1.63
4958.70	-28.46	33.79	39.87	29.38	45.20	34.71	74	54	-28.80	-19.29	205	1.49
7438.05	-27.56	36.35	39.45	28.90	48.24	37.69	74	54	-25.76	-16.31	278	1.42
9917.40	-27.02	37.95	39.32	28.85	50.25	39.78	74	54	-23.75	-14.22	44	1.67
12396.75	-25.07	39.22	34.88	24.36	49.03	38.51	74	54	-24.97	-15.49	279	1.43
14876.10	-23.70	40.75	30.14	19.68	47.19	36.73	74	54	-26.81	-17.27	17	1.60

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-3_ANT1
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1792.27	-31.90	27.19	43.89	33.35	39.18	28.64	74	54	-34.82	-25.36	329	2.28
2177.36	-31.45	28.11	44.68	34.17	41.35	30.84	74	54	-32.65	-23.16	204	2.14
3208.48	-30.51	30.65	42.59	32.01	42.73	32.15	74	54	-31.27	-21.85	218	1.88
3802.92	-29.81	31.97	42.51	32.09	44.67	34.25	74	54	-29.33	-19.75	107	1.63
4279.08	-29.36	32.60	42.40	31.97	45.64	35.21	74	54	-28.36	-18.79	50	1.51
5591.53	-28.40	34.30	41.51	31.04	47.41	36.94	74	54	-26.59	-17.06	144	1.14

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1998.58	-31.57	27.89	42.05	31.53	38.37	27.85	74	54	-35.63	-26.15	338	1.32
2401.93	-31.29	28.38	42.94	32.47	40.03	29.56	74	54	-33.97	-24.44	172	1.45
2947.44	-30.87	30.20	43.79	33.29	43.12	32.62	74	54	-30.88	-21.38	256	1.63
3752.12	-29.85	31.81	42.82	32.35	44.77	34.30	74	54	-29.23	-19.70	85	1.88
4733.37	-28.79	33.21	41.92	31.38	46.34	35.80	74	54	-27.66	-18.20	192	2.14
5564.08	-28.41	34.30	40.82	30.30	46.71	36.19	74	54	-27.29	-17.81	230	2.39

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Tx-3_ANT1 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2479.35 (F)	-31.23	28.47	81.60	68.37	78.84	65.61	--	--	--	--	305	1.67
4958.70	-28.46	33.79	39.75	29.24	45.08	34.57	74	54	-28.92	-19.43	226	1.61
7438.05	-27.56	36.35	39.16	28.68	47.95	37.47	74	54	-26.05	-16.53	27	1.47
9917.40	-27.02	37.95	39.74	29.28	50.67	40.21	74	54	-23.33	-13.79	262	1.64
12396.75	-25.07	39.22	35.21	24.74	49.36	38.89	74	54	-24.64	-15.11	299	1.69
14876.10	-23.70	40.75	30.53	20.00	47.58	37.05	74	54	-26.42	-16.95	133	1.57

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2479.35 (F)	-31.23	28.47	81.03	68.01	78.27	65.25	--	--	--	--	336	1.68
4958.70	-28.46	33.79	39.33	28.83	44.66	34.16	74	54	-29.34	-19.84	112	1.49
7438.05	-27.56	36.35	39.22	28.71	48.01	37.50	74	54	-25.99	-16.50	157	1.57
9917.40	-27.02	37.95	39.14	28.69	50.07	39.62	74	54	-23.93	-14.38	48	1.67
12396.75	-25.07	39.22	34.63	24.15	48.78	38.30	74	54	-25.22	-15.70	293	1.52
14876.10	-23.70	40.75	30.38	19.83	47.43	36.88	74	54	-26.57	-17.12	329	1.47

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Standby
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2748.38	-31.03	29.44	42.24	31.77	40.66	30.19	74	54	-33.34	-23.81	218	2.04
3529.59	-30.05	31.09	42.34	31.83	43.39	32.88	74	54	-30.61	-21.12	102	1.83
3706.33	-29.89	31.66	42.43	31.96	44.20	33.73	74	54	-29.80	-20.27	55	1.67
4266.98	-29.37	32.60	41.92	31.45	45.15	34.68	74	54	-28.85	-19.32	147	1.51
5013.41	-28.40	33.91	40.37	29.82	45.88	35.33	74	54	-28.12	-18.67	90	1.33
5598.62	-28.40	34.30	40.43	29.98	46.33	35.88	74	54	-27.67	-18.12	175	1.14

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2509.33	-31.21	28.53	43.14	32.61	40.46	29.93	74	54	-33.54	-24.07	236	1.46
3077.82	-30.71	30.49	42.26	31.75	42.04	31.53	74	54	-31.96	-22.47	312	1.68
3768.09	-29.84	31.86	41.80	31.27	43.82	33.29	74	54	-30.18	-20.71	202	1.88
4061.14	-29.58	32.60	41.42	30.84	44.44	33.86	74	54	-29.56	-20.14	71	1.97
4768.55	-28.74	33.30	40.98	30.37	45.54	34.93	74	54	-28.46	-19.07	183	2.15
5142.28	-28.41	34.01	41.06	30.55	46.67	36.16	74	54	-27.33	-17.84	269	2.33

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Link
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Aug. 03, 2018

Antenna Polarization：Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2297.53	-31.36	28.26	43.42	32.97	40.31	29.86	74	54	-33.69	-24.14	171	2.16
2948.21	-30.87	30.20	43.36	32.84	42.69	32.17	74	54	-31.31	-21.83	215	1.93
3681.64	-29.91	31.58	42.30	31.80	43.96	33.46	74	54	-30.04	-20.54	109	1.73
4132.88	-29.51	32.60	42.51	32.03	45.60	35.12	74	54	-28.40	-18.88	314	1.55
5069.03	-28.40	33.96	41.27	30.78	46.82	36.33	74	54	-27.18	-17.67	296	1.29
5554.29	-28.41	34.30	41.02	30.56	46.91	36.45	74	54	-27.09	-17.55	74	1.12

Antenna Polarization：Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2297.30	-31.36	28.26	43.76	33.29	40.65	30.18	74	54	-33.35	-23.82	131	1.37
2941.72	-30.88	30.18	43.06	32.55	42.36	31.85	74	54	-31.64	-22.15	255	1.56
3648.98	-29.94	31.47	42.81	32.34	44.34	33.87	74	54	-29.66	-20.13	294	1.78
4129.45	-29.51	32.60	41.71	31.28	44.80	34.37	74	54	-29.20	-19.63	80	1.95
5024.12	-28.40	33.92	40.86	30.35	46.38	35.87	74	54	-27.62	-18.13	190	2.20
5467.03	-28.42	34.27	40.57	30.16	46.42	36.01	74	54	-27.58	-17.99	221	2.39

NOTE:

1. Measurement uncertainty is 4.04 dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

4.3 6dB Bandwidth

4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247 (a)(2). The minimum 6dB bandwidth shall be at least 500 kHz.

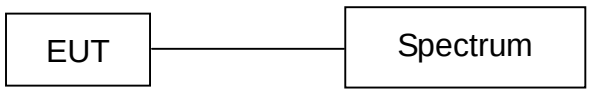
4.3.2 TEST EQUIPMENT

The following test equipment was used during the test：

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAY 20, 2019 ETC

NOTE： The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.3.4 TEST PROCEDURE

The EUT was operated in hopping mode or any specific channel.

Printed out the test result from the spectrum by hard copy function.

4.3.5 EUT OPERATING CONDITION

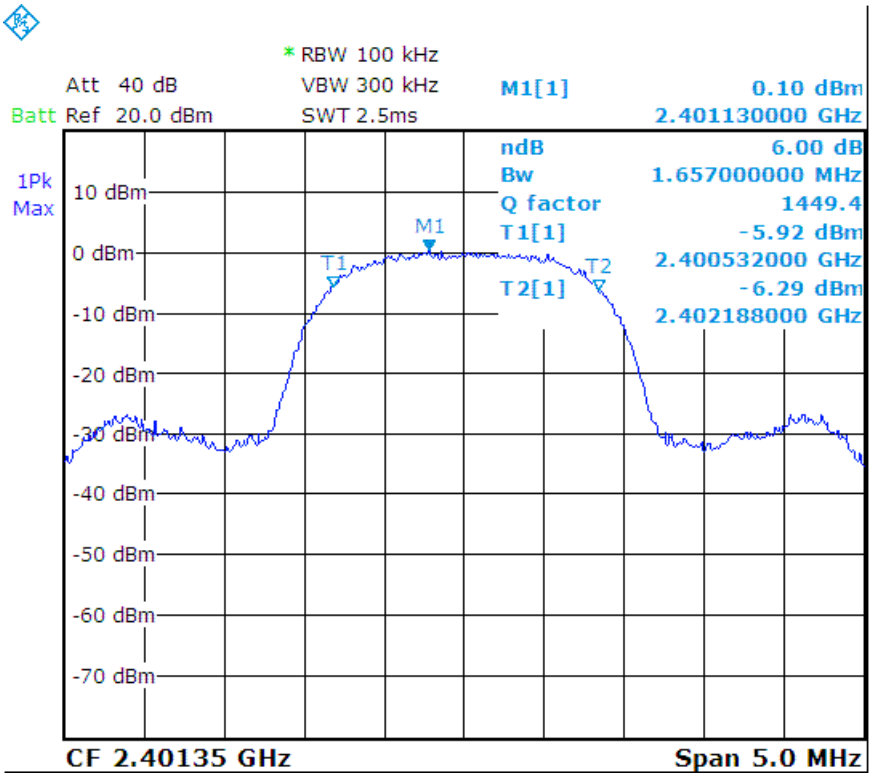
1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

4.3.6 TEST RESULT

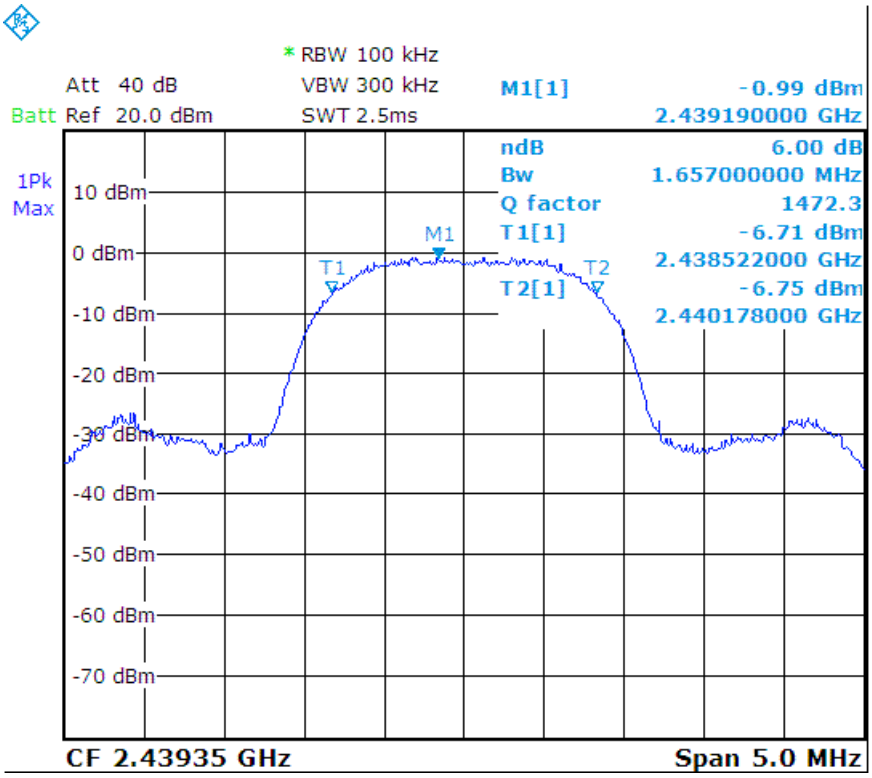
Temperature:	25 °C	Humidity:	64 %RH
Detector:	Peak	Tesr Mode:	Tx-1, Tx-2, Tx-3
RBW:	100 kHz	VBW:	300 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Channel Number	Channel Frequency (MHz)	6dB Down Bandwidth (MHz)	Limit (kHz)	Pass/Fail
CH01	2401.35	1.657	> 500	Pass
CH20	2439.35	1.657	> 500	Pass
CH40	2479.35	1.667	> 500	Pass

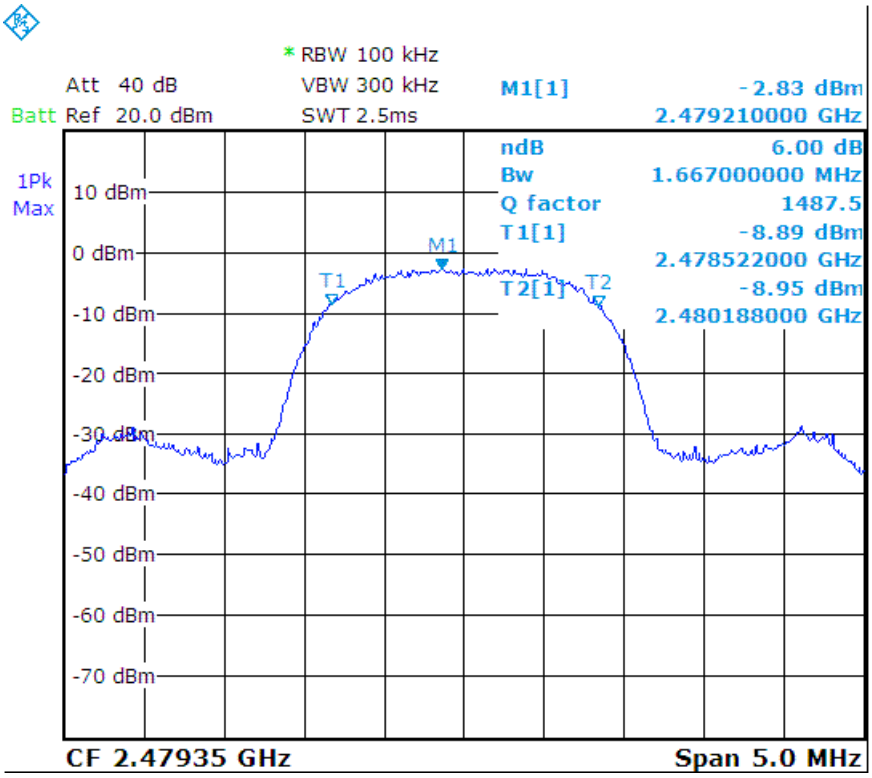
CH01：



CH20：


* RBW 100 kHz
Att 40 dB
VBW 300 kHz
M1[1]
-0.99 dBm
Batt Ref 20.0 dBm
SWT 2.5ms
2.439190000 GHz
ndB
6.00 dB
1Pk
Max
Bw
1.657000000 MHz
Q factor
1472.3
10 dBm
T1[1]
-6.71 dBm
M1
0 dBm
T1
T2
2.438522000 GHz
T2[1]
-6.75 dBm
-10 dBm
2.440178000 GHz
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.43935 GHz
Span 5.0 MHz

CH40：


* RBW 100 kHz
Att 40 dB
VBW 300 kHz
M1[1]
-2.83 dBm
Batt Ref 20.0 dBm
SWT 2.5ms
2.479210000 GHz
ndB
6.00 dB
1Pk
Max
Bw
1.667000000 MHz
Q factor
1487.5
10 dBm
T1[1]
-8.89 dBm
M1
0 dBm
T1
T2
2.478522000 GHz
T2[1]
-8.95 dBm
-10 dBm
2.480188000 GHz
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.47935 GHz
Span 5.0 MHz

4.4 PEAK POWER TEST

4.4.1 LIMIT

FCC Part15, Subpart C Section 15.247(b).

Frequency Range (MHz)	Limit(W)				
	Quantity of Hopping Channel	50	25	15	75
902-928		1(30 dBm)	0.125(21 dBm)	NA	NA
2400-2483.5		NA	NA	0.125(21dBm)	1(30 dBm)
5725-5850		NA	NA	NA	1(30 dBm)

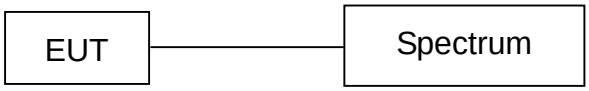
4.4.2 TEST EQUIPMENT

The following test equipment was used during the test：

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAY 20, 2019 ETC

NOTE： The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.4.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel.

Printed out the test result from the spectrum by hard copy function.

4.4.5 EUT OPERATING CONDITION

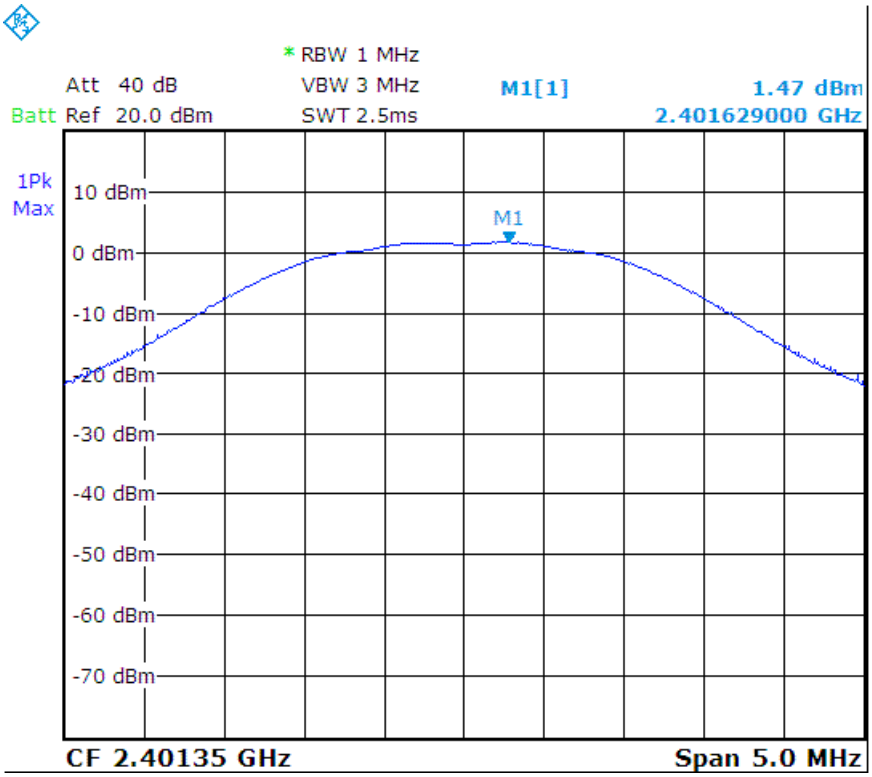
1. Set the EUT under frequency hopping transmission condition.
2. The EUT was set to the highest available power level.

4.4.6 TEST RESULT

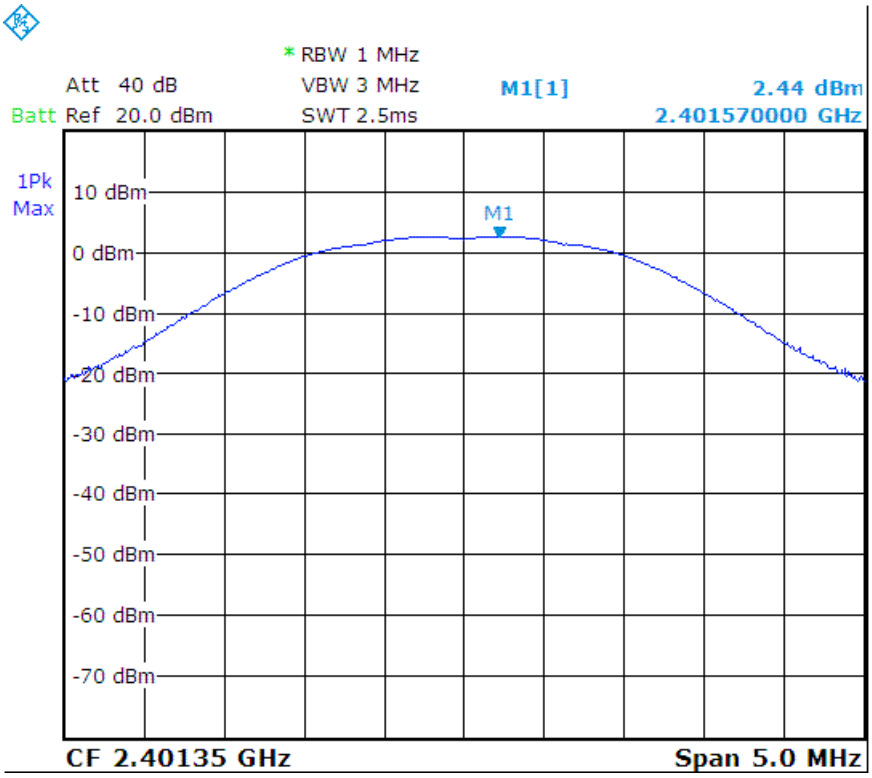
Temperature:	25 °C	Humidity:	64 %RH
Spectrum Detector:	PK.	Tesr Mode:	Tx-1, Tx-2, Tx-3
RBW:	1 MHz	VBW:	3 MHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Channel Number	Channel Frequency (MHz)	Peak Output Power		Limit (dBm)
		(dBm)	(mW)	
CH01_ANT0	2401.35	1.47	1.40	21
CH01_ANT1	2401.35	2.44	1.75	21
CH20_ANT0	2439.35	0.75	1.19	21
CH20_ANT1	2439.35	1.50	1.41	21
CH40_ANT0	2479.35	0.06	1.01	21
CH40_ANT1	2479.35	-0.06	0.99	21

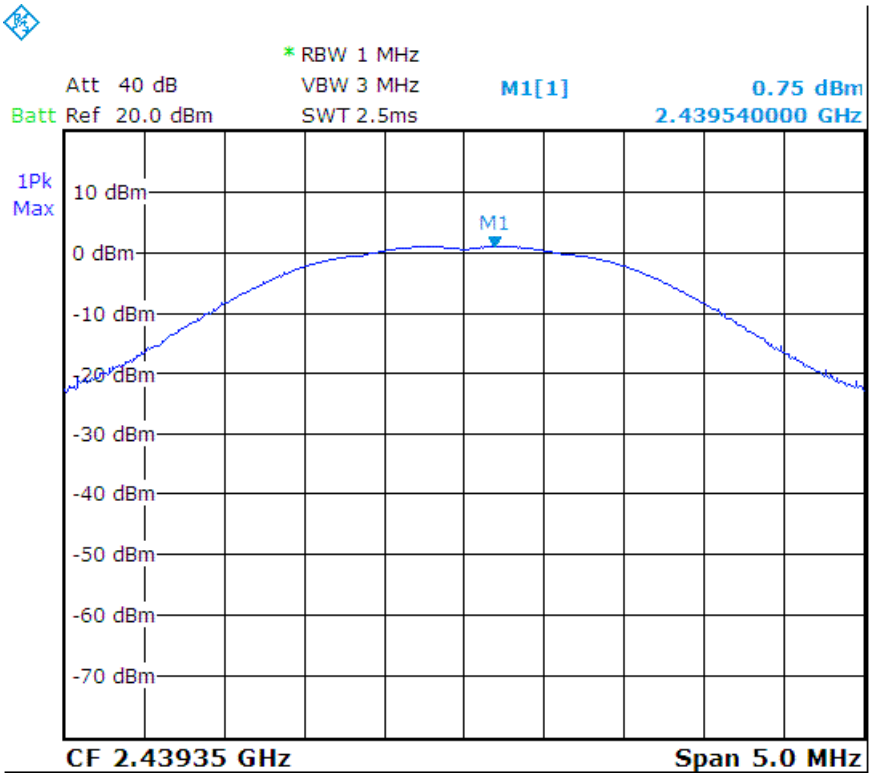
CH01_ANT0：



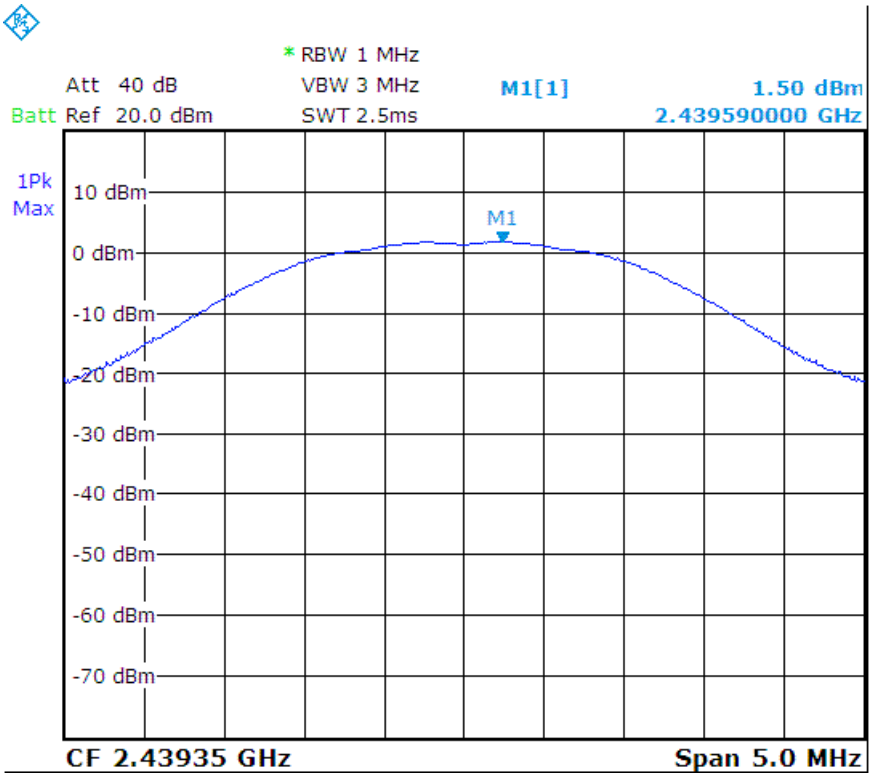
CH01_ANT1：



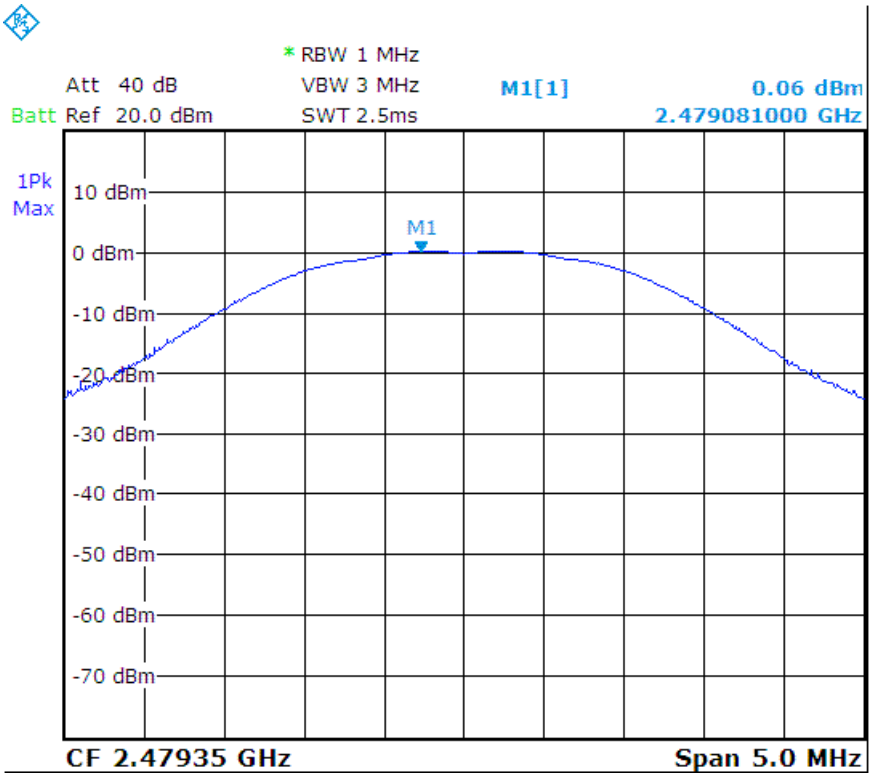
CH20_ANT0：



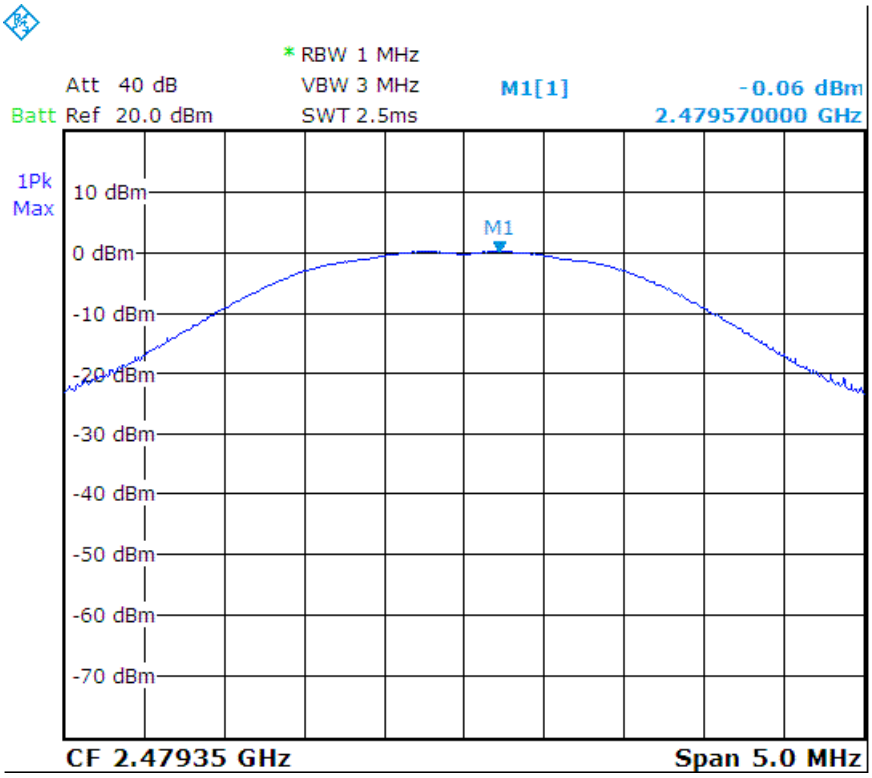
CH20_ANT1：



CH40_ANT0：



CH40_ANT1：


* RBW 1 MHz
Att 40 dB
VBW 3 MHz
M1[1]
-0.06 dBm
Batt Ref 20.0 dBm
SWT 2.5ms
2.479570000 GHz
1Pk
Max
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.47935 GHz
Span 5.0 MHz

4.5 BAND EDGE TEST

4.5.1 LIMIT

FCC Part15, Subpart C Section 15.247(d).

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

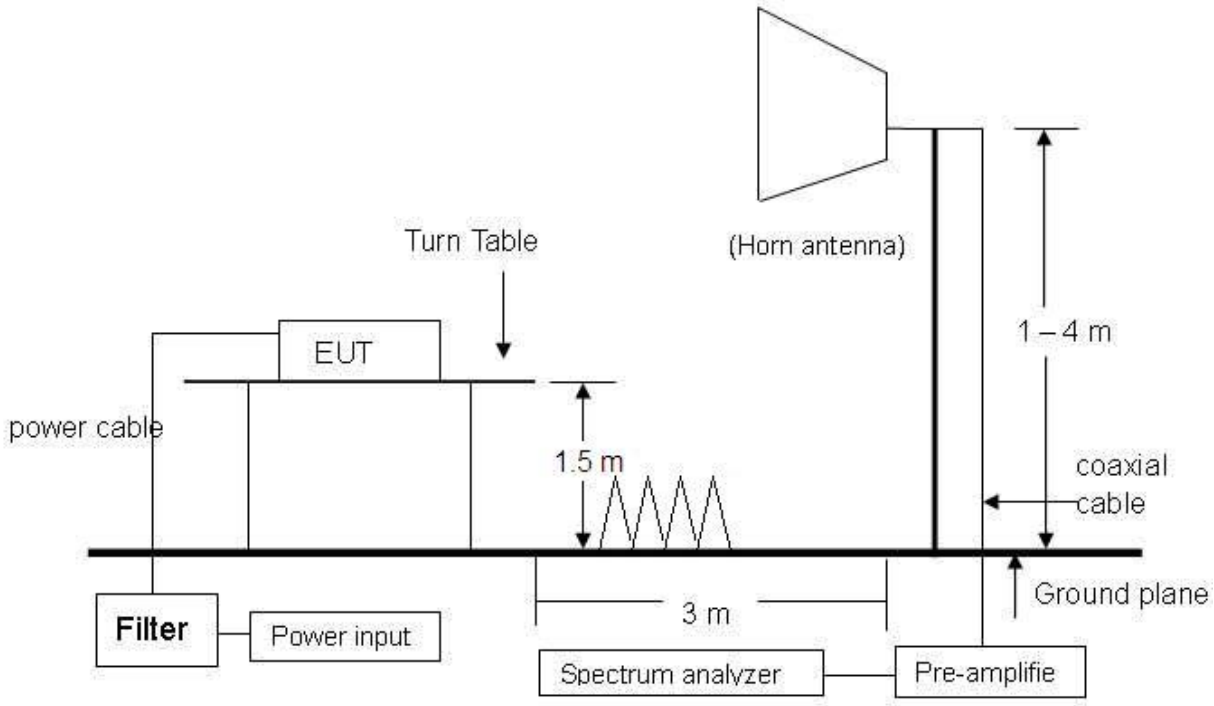
OPERATING FREQUENCY RANGE (MHz)	SPURIOUS EMISSION FREQUENCY (MHz)	LIMIT	
		Peak power ration to emission(dBc)	Emission level(dBuV/m)
2400 - 2483.5	< 2400	> 20	N/A
	> 2483.5-2500	N/A	54

4.5.2 TEST EQUIPMENT

Above 1 GHz The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	FINAL TEST BE USED
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	JAN. 01, 2019 ETC	■
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	NOV. 28, 2018 ETC	■
HORN ANTENNA	18 ~ 40 GHZ	ETS-LINDGREN	3116 /00032255	JAN. 15, 2019 ETC	■
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 27, 2018 ETC	■
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 08, 2019 SRT	■
K-TYPE CABLE	UP TO 40 GHz 3 m	HUBER+SUHNER	SF102-46/2*11SK252 /MY2611/2	MAR. 05, 2019 ETC	■
K-TYPE CABLE	UP TO 40 GHz, 1 m	HUBER+SUHNER	SF102/2*11SK252 /MY3331/2	SEP. 28, 2018 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943/ 869	NCR	■
THERMO-HYGRO	15 ﹣ 40 ℃, 0- 100% RH	TOP	20-A / 7685	SEP. 17, 2018 ETC	■

4.5.3 TEST SETUP



NOTE: The EUT system was put on a wooden table with 1.5m heights above a ground plane. For the actual test configuration, please refer to the photos of testing.

4.5.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.10:2013 and CISPR 22:2003. When the frequency spectrum measured Above 1 GHz, then use antenna is a HORN ANTENNA. The measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver.

4.5.5 TEST RESULT

Below 2400MHz (CH01)

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	2.3 GHz – 2.41 GHz	Tested Mode:	Tx-1
Receiver Detector:	PK. and AV.	IF Bandwidth:	1 MHz
Tested By:	Richard Lin	Tested Date:	Aug. 03, 2018

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2399.34	-31.29	28.38	H	50.74	40.26	47.83	37.35	74.00	54.00	-26.17	-16.65
2399.18	-31.29	28.38	V	52.19	41.68	49.28	38.77	74.00	54.00	-24.72	-15.23
2400.00	-31.29	28.38	H	46.03	35.54	43.12	32.63	74.00	54.00	-30.88	-21.37
2400.00	-31.29	28.38	V	46.85	36.39	43.94	33.48	74.00	54.00	-30.06	-20.52

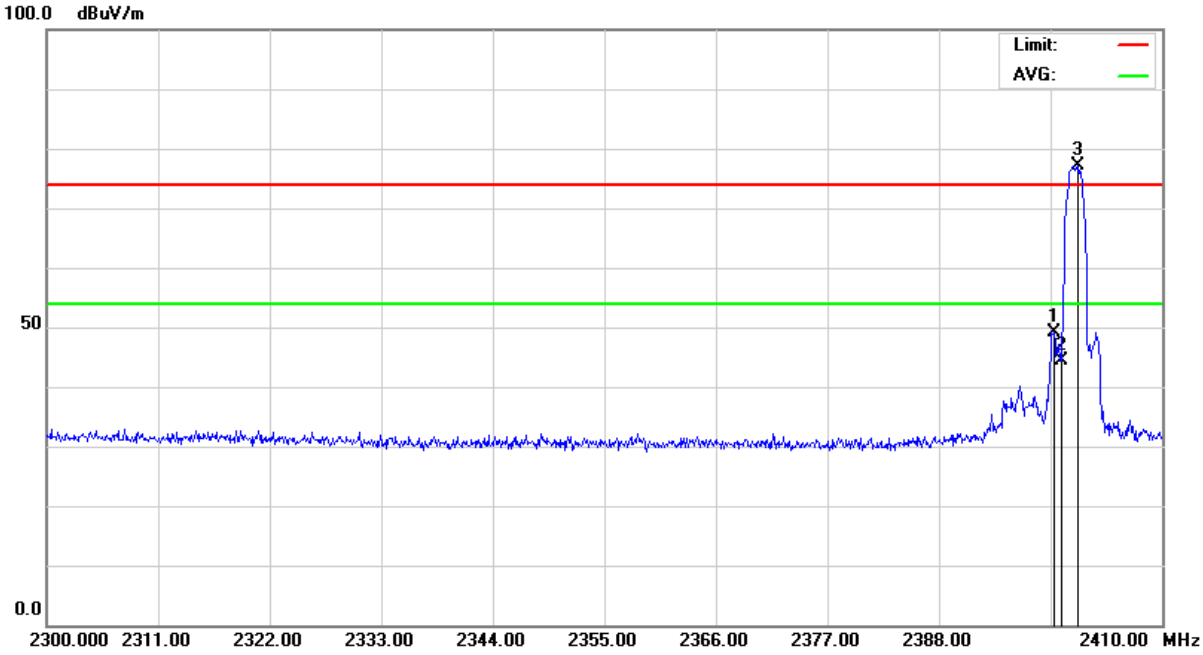
Above 2483.5MHz (CH40)

Temperature:	23 °C	Humidity:	69 %RH
Frequency Range:	2.47 GHz – 2.6 GHz	Tested Mode:	Tx-3
Receiver Detector:	PK. and AV.	IF Bandwidth:	1 MHz
Tested By:	Richard Lin	Tested Date:	Aug. 03, 2018

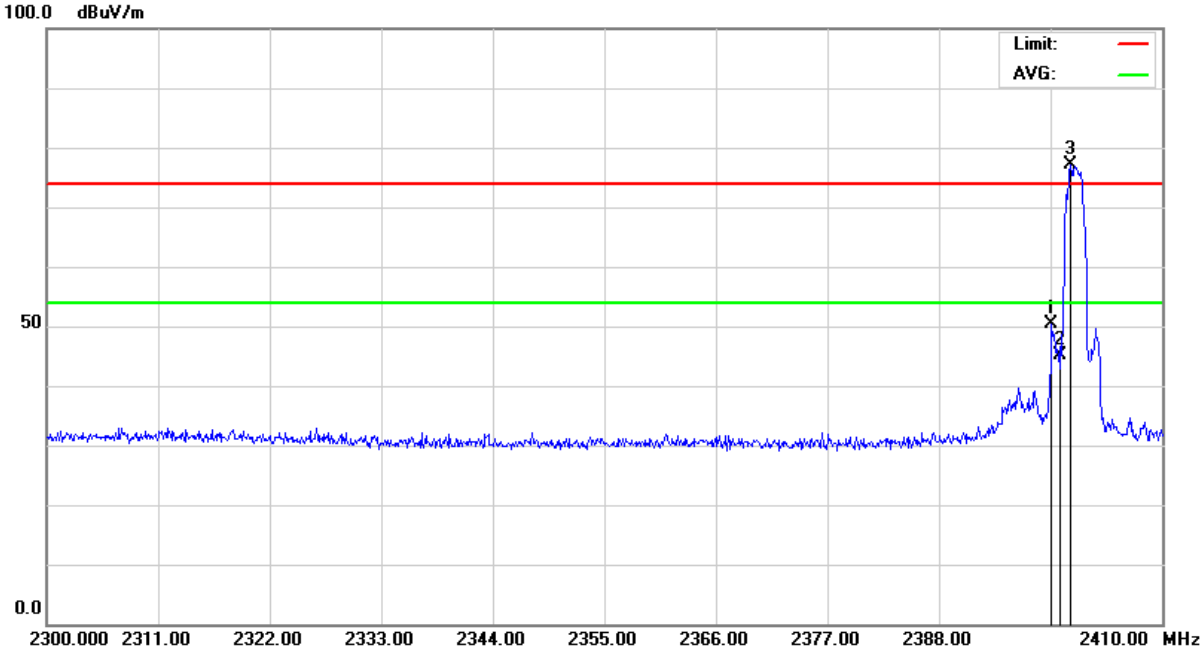
Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2483.50	-31.23	28.48	H	33.39	22.81	30.64	20.06	74.00	54.00	-43.36	-33.94
2483.50	-31.23	28.48	V	33.31	22.87	30.56	20.12	74.00	54.00	-43.44	-33.88
2516.11	-31.21	28.56	H	35.16	24.69	32.51	22.04	74.00	54.00	-41.49	-31.96
2514.73	-31.21	28.55	V	35.07	24.53	32.41	21.87	74.00	54.00	-41.59	-32.13

Below 2400MHz (CH01)

Antenna Polarization：Horizontal

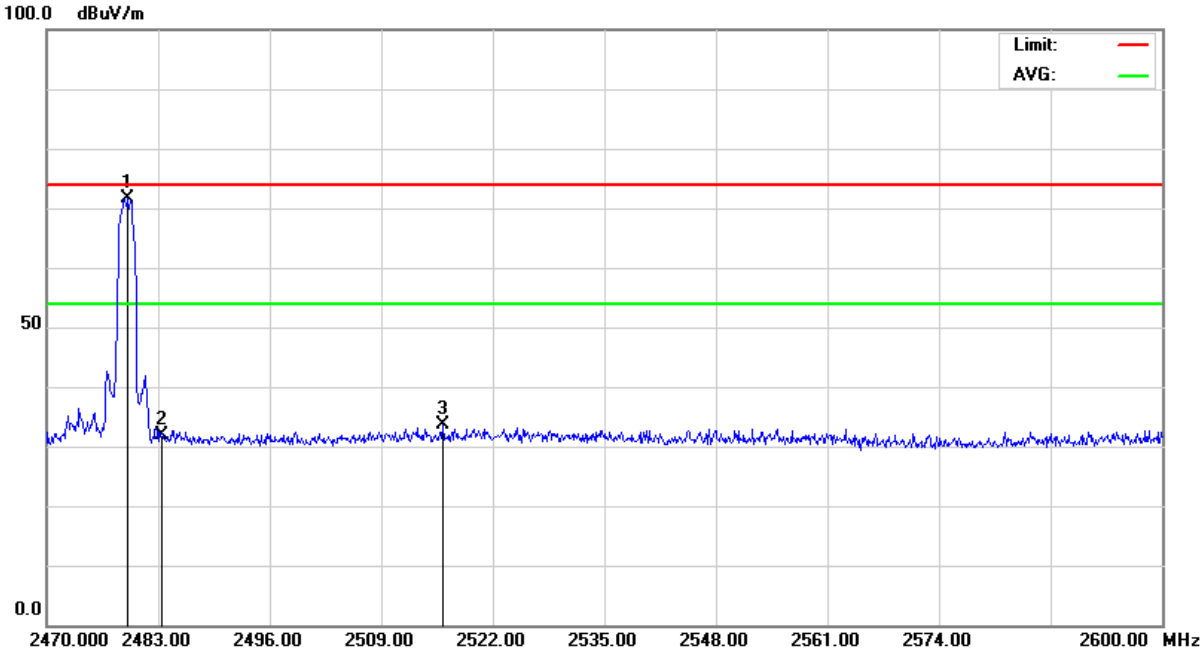


Antenna Polarization：Vertical

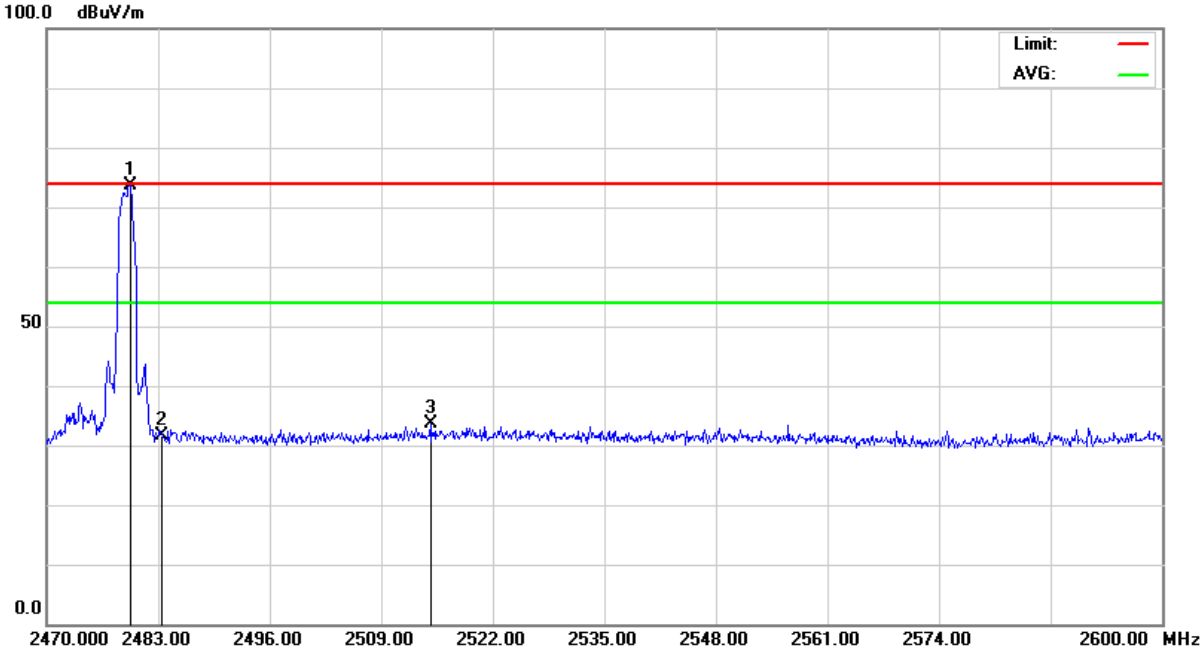


Above 2483.5MHz (CH40)

Antenna Polarization：Horizontal



Antenna Polarization：Vertical



4.6 POWER DENSITY TEST

4.6.1 LIMIT

FCC Part15, Subpart C Section 15.247(e).

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

FREQUENCY RANGE	Limit
2.40 - 2.4835 GHz	8 dBm / 3 kHz

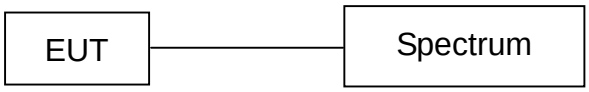
4.6.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAY 20, 2019 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.6.4 TEST PROCEDURE

The EUT was operating in transmitter mode and could be controlled its channel.

Printed out the test result from the spectrum by hard copy function.

4.6.5 EUT OPERATING CONDITION

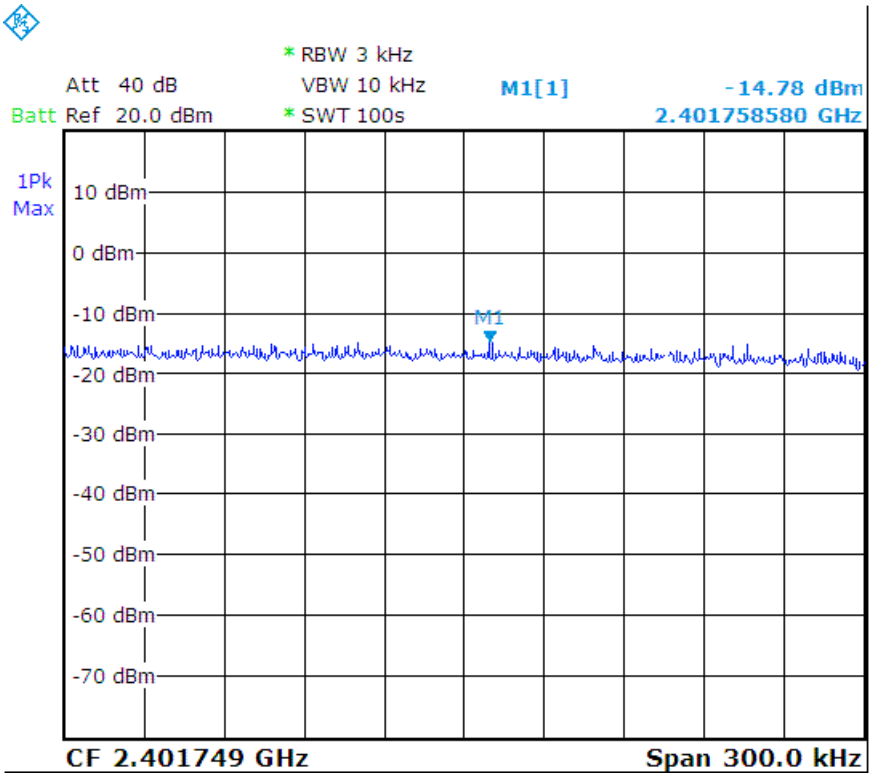
1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

4.6.6 TEST RESULT

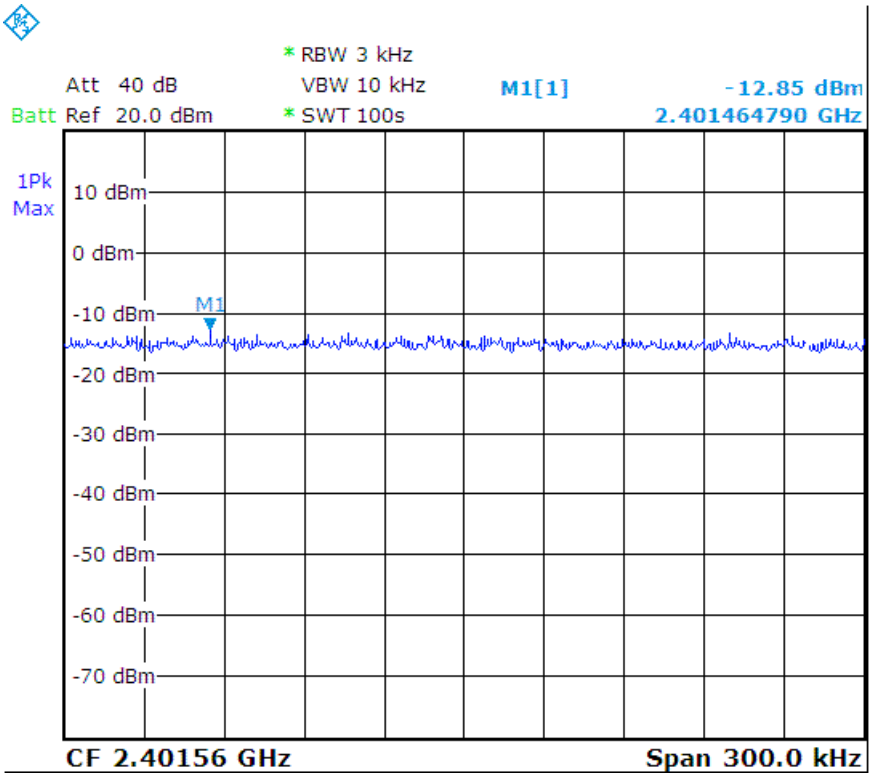
Temperature:	25 °C	Humidity:	64 %RH
Spectrum Detector:	PK.	Tesr Mode:	Tx-1, Tx-2, Tx-3
RBW:	3 kHz	VBW:	10 kHz
Tested By:	Richard Lin	Tested Date:	Aug. 02, 2018

Channel Number	Channel Frequency (MHz)	RF Power Level in 3 KHz BW (dBm/3kHz)	Maximum Limit (dBm/3kHz)
CH01_ANT0	2401.35	-14.78	8
CH01_ANT1	2401.35	-12.85	8
CH20_ANT0	2439.35	-16.24	8
CH20_ANT1	2439.35	-14.06	8
CH40_ANT0	2479.35	-16.51	8
CH40_ANT1	2479.35	-15.65	8

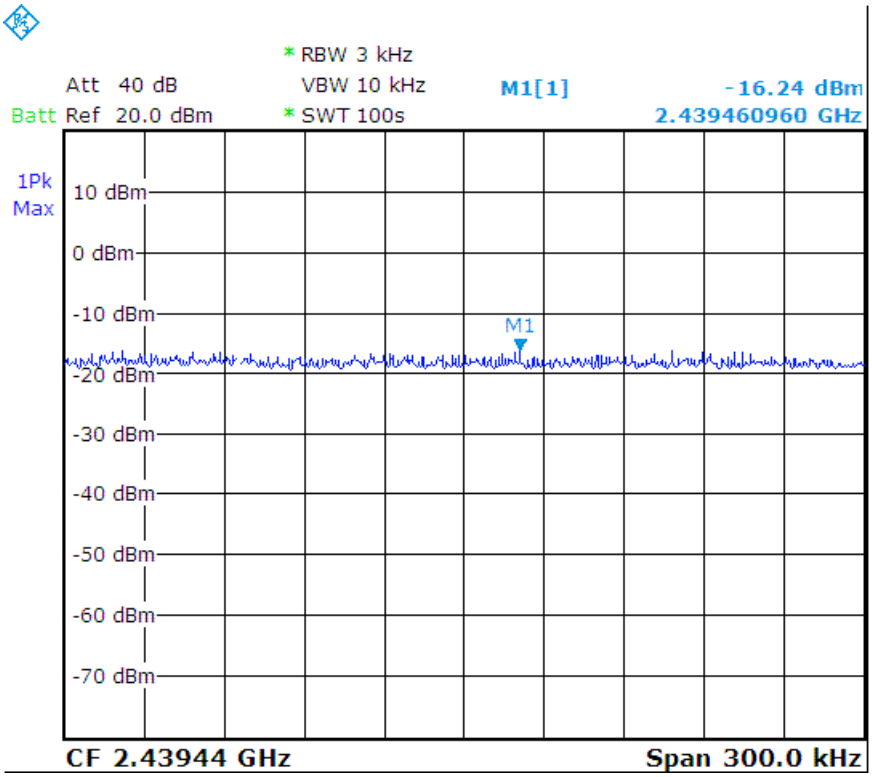
CH01_ANT0：



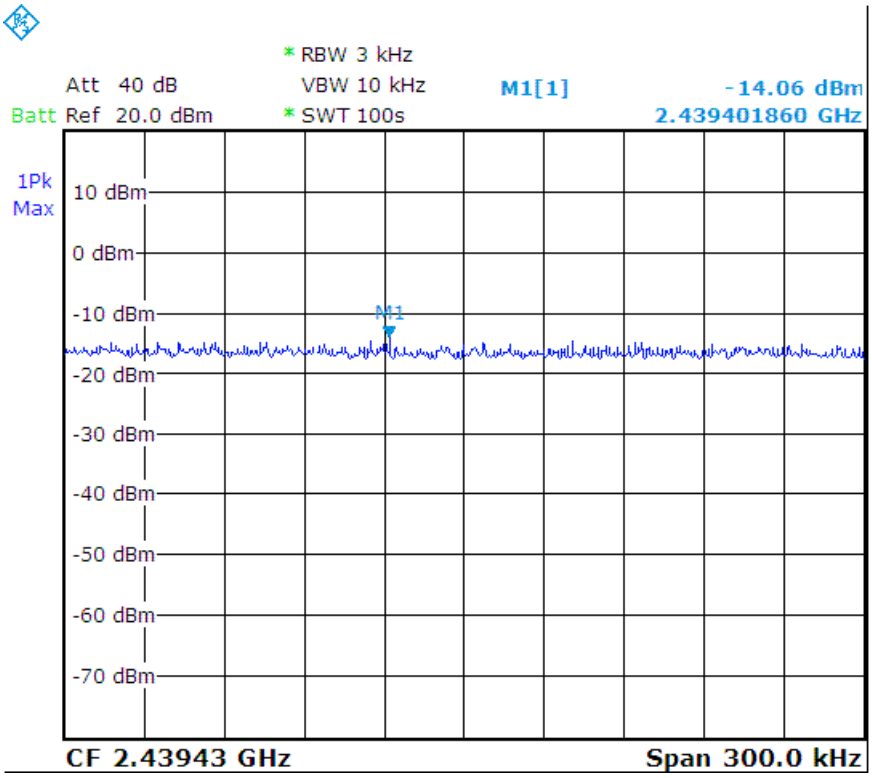
CH01_ANT1：



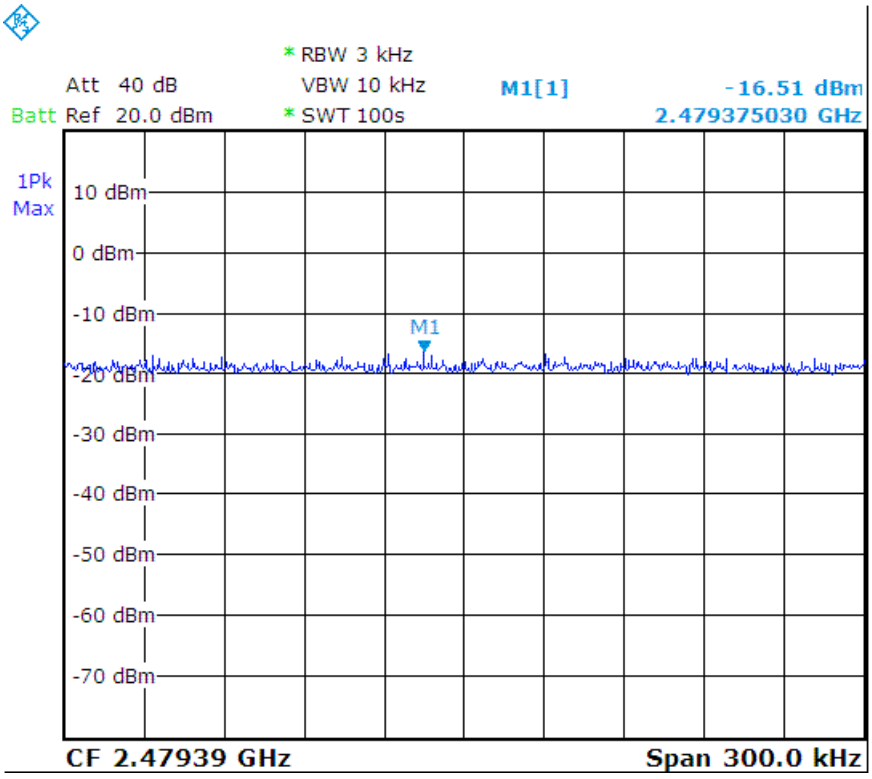
CH20_ANT0：



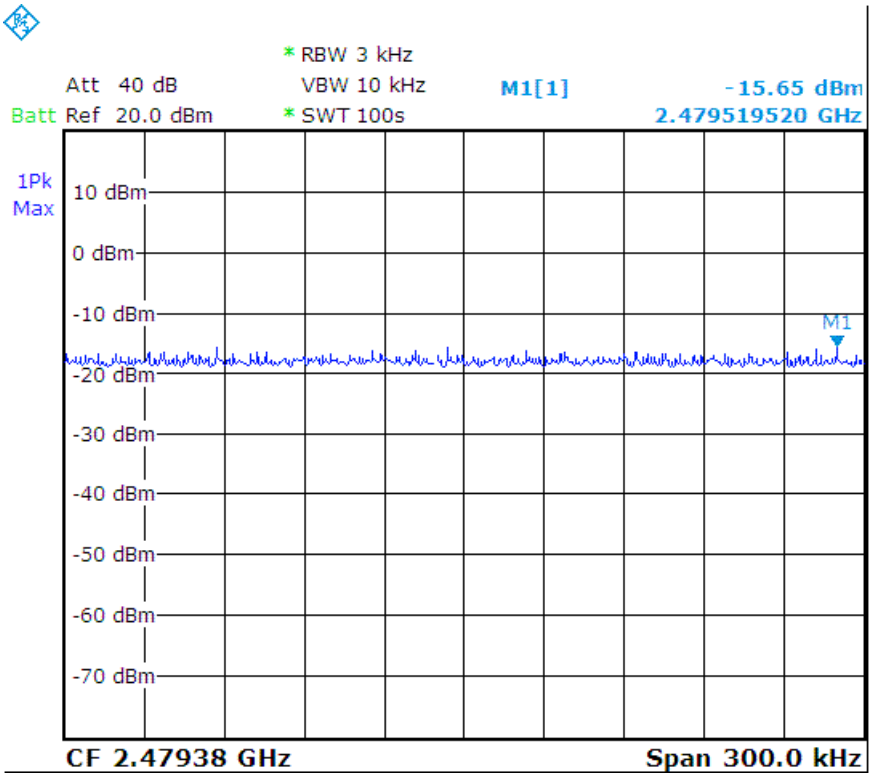
CH20_ANT1：



CH40_ANT0：



CH40_ANT1：


* RBW 3 kHz
Att 40 dB
VBW 10 kHz
M1[1]
-15.65 dBm
Batt Ref 20.0 dBm
* SWT 100s
2.479519520 GHz
1Pk
Max
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.47938 GHz
Span 300.0 kHz

5. Antenna application

5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC Part 15C section 15.203.

FCC part15C section15.247 requirement:
Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Result

The EUT's antenna used a Chip Antenna. Gain of antenna types is ANT0：-1.73 dBi & ANT1：1.69 dBi that meet the requirement.

6. TERMS OF ABBREVIATION

AV.	Average detection
AZ(º)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction