

Partial FCC Test Report

Report No.: RF180530C08

FCC ID: GKR-SHC100

Test Model: QCNFA435

Received Date: May 30, 2018

Test Date: Jul. 12, 2018 ~ Jul. 18, 2018

Issued Date: Jul. 23, 2018

Applicant: COMPAL ELECTRONICS, INC.

Address: No.581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan, R.O.C.

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
(R.O.C)

Test Location: No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, Taiwan, R.O.C.

FCC Registration /
Designation Number: 788550 / TW0003



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 Summary of Test Results.....	5
2.1 Measurement Uncertainty.....	5
2.2 Modification Record	5
3 General Information	6
3.1 General Description of EUT	6
3.2 Description of Test Modes.....	7
3.2.1 Test Mode Applicability and Tested Channel Detail.....	8
3.3 Description of Support Units	9
3.3.1 Configuration of System under Test	9
3.4 General Description of Applied Standards.....	10
4 Test Types and Results	11
4.1 Radiated Emission and Bandedge Measurement	11
4.1.1 Limits of Radiated Emission and Bandedge Measurement	11
4.1.2 Test Instruments	12
4.1.3 Test Procedures.....	13
4.1.4 Deviation from Test Standard	13
4.1.5 Test Set Up	14
4.1.6 EUT Operating Conditions.....	15
4.1.7 Test Results	16
4.2 Conducted Emission Measurement.....	32
4.2.1 Limits of Conducted Emission Measurement	32
4.2.2 Test Instruments	32
4.2.3 Test Procedures.....	33
4.2.4 Deviation from Test Standard	33
4.2.5 Test Setup.....	33
4.2.6 EUT Operating Condition	33
4.2.7 Test Results	34
4.3 Maximum Output Power	38
4.3.1 Limits of Maximum Output Power Measurement	38
4.3.2 Test Setup.....	38
4.3.3 Test Instruments	38
4.3.4 Test Procedure	38
4.3.5 Deviation from Test Standard	38
4.3.6 EUT Operating Condition	38
4.3.7 Test Results	39
5 Pictures of Test Arrangements.....	40
Appendix – Information on the Testing Laboratories	41

Release Control Record

Issue No.	Description	Date Issued
RF180530C08	Original Release	Jul. 23, 2018

1 Certificate of Conformity

Product: Single Stream 802.11a/b/g/n/ac + BT 4.1 M.2 Type Card

Brand: Qualcomm Atheros

Test Model: QCNFA435

Sample Status: Production Unit

Applicant: COMPAL ELECTRONICS, INC.

Test Date: Jul. 12, 2018 ~ Jul. 18, 2018

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Evonne Liu, **Date:** Jul. 23, 2018
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** Jul. 23, 2018
Dylan Chiou / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -11.46 dB at 0.17737 MHz.
15.247(a)(1)(iii)	Number of Hopping Frequency Used	N/A	Refer to Note
15.247(a)(1)(iii)	Dwell Time on Each Channel	N/A	Refer to Note
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	N/A	Refer to Note
15.247(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	N/A	Refer to Note
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -9.15 dB at 335.7 MHz.
15.247(d)	Band Edge Measurement	N/A	Refer to Note
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: Test items for Conducted Emission / Radiated Emissions and Conducted Power were performed for this report. For other test data, please refer to BV CPS Report No.: RF141008E03-2 R1 for module (Brand: Qualcomm Atheros, Model: QCNFA435).

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Single Stream 802.11a/b/g/n/ac + BT 4.1 M.2 Type Card
Brand	Qualcomm Atheros
Test Model	QCNFA435
Status of EUT	Production Unit
Power Supply Rating	3.3 Vdc (host equipment)
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8DPSK
Transfer Rate	1/2/3 Mbps
Operating Frequency	2402 ~ 2480 MHz
Number of Channel	79
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT is authorized for use in specific End-product. Please refer to below for more details.

Product	Brand	Model
All In One Computer	Compal	SHC-100

2. The antenna information is listed as below.

Ant. No.	Ant. Type	Vendor	Part Number	Antenna Gain (dBi)			
				BT/WLAN 2.4GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.725 GHz	WLAN 5.725~5.85 GHz
1	PCB	Nienyi	WLAN Main Antenna: NYS3283 (DC330026I0U)	0.75	-0.76	-0.47	0.13
			WLAN Aux Antenna: NYS3284 (DC330026I1U)	0.59	-0.93	-1.01	-1.96
2	Dipole	Nienyi	WLAN Main Antenna: NYS3285+ NYS3281	1.64	0.91	1.42	0.52
			WLAN Aux Antenna: NYS3285+ NYS3282	0.81	-0.78	-0.47	0.44

3. This device has 2 configurations as below.

Mode A: EUT was chosen antenna no. 1 to test.

Mode B: EUT was chosen antenna no. 2 to test.

4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or User's Manual.

3.2 Description of Test Modes

79 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE $\geq$ 1G	RE<1G	PLC	
A	√	√	√	-
B	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission

Note:

1. For Radiated emission test, pre-tested GFSK, $\pi/4$ -DQPSK, 8DPSK modulation type and found GFSK was the worse, therefore chosen for the final test and presented in the test report.

Radiated Emission Test (Above 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
A, B	0 to 78	0, 39, 78	FHSS	GFSK	DH5
	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

Radiated Emission Test (Below 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
A	0 to 78	39	FHSS	GFSK	DH5
B	0 to 78	78	FHSS	GFSK	DH5

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
A	0 to 78	39	FHSS	GFSK	DH5
B	0 to 78	78	FHSS	GFSK	DH5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Harry Hsueh
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

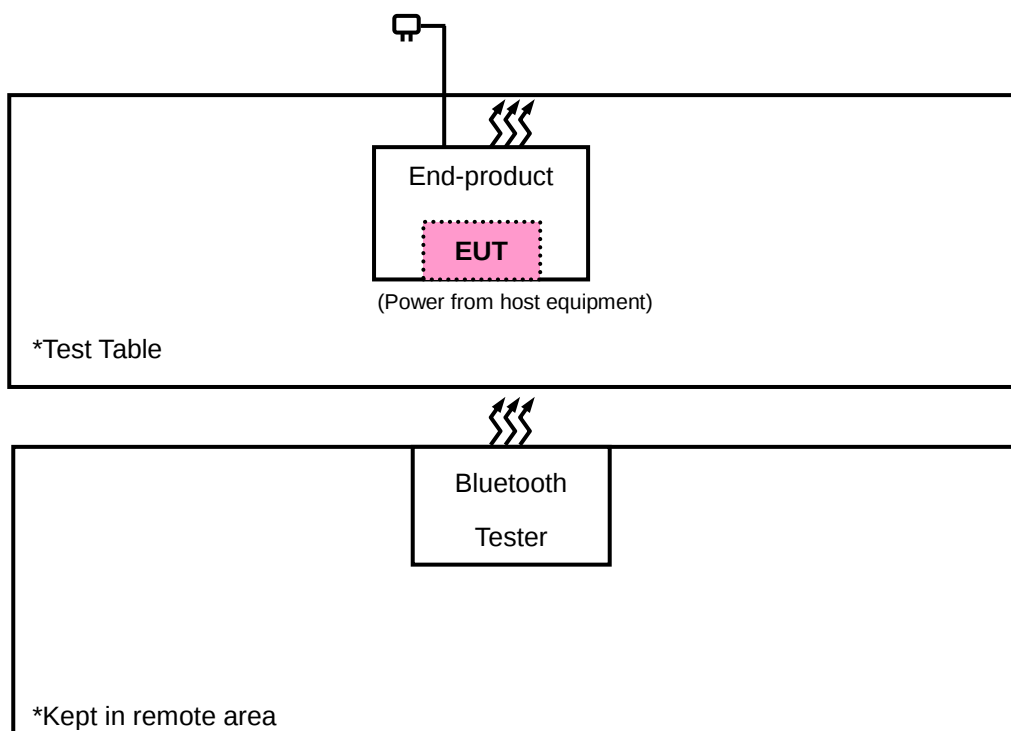
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Bluetooth Tester	R&S	CBT	100980	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1 acted as communication partners to transfer data.

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

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

Note:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220207	Dec. 07, 2017	Dec. 06, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	BW-N4W5+	PAD-ATT4-01	Jan. 29, 2018	Jan. 28, 2019
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 31, 2018
Bluetooth Tester	CBT	100946	Jul. 29, 2016	Jul. 28, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 20, 2017	Oct. 19, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF Coaxial Cable	8D-FB	Cable-RF3-04	Oct. 19, 2017	Oct. 18, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	230129/4	Oct. 19, 2017	Oct. 18, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	250723/4	Oct. 19, 2017	Oct. 18, 2018
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450F-10.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

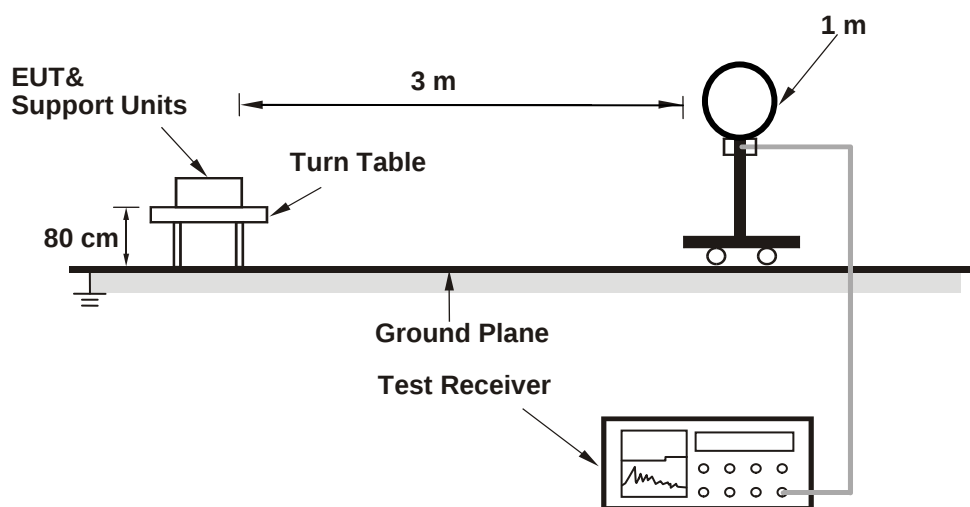
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz. (RBW = 1 MHz, VBW = 3 MHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

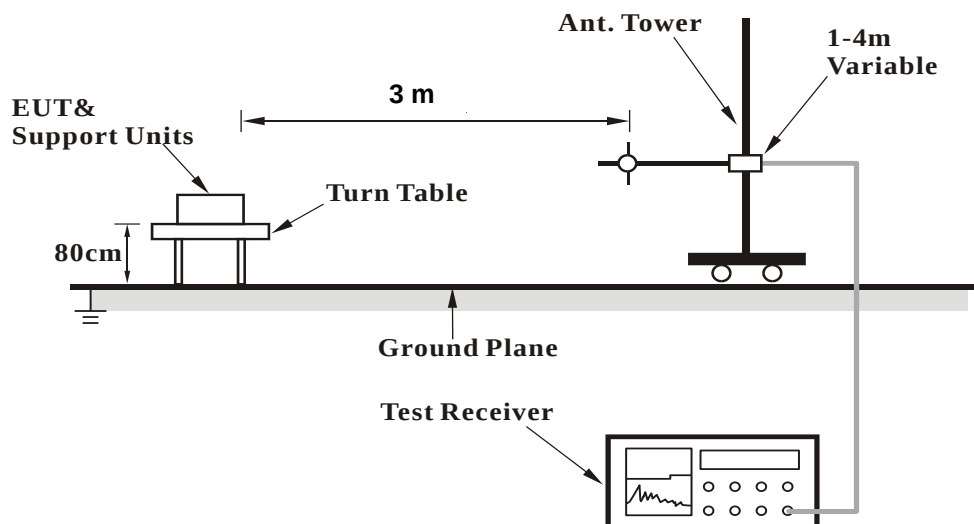
No deviation.

4.1.5 Test Set Up

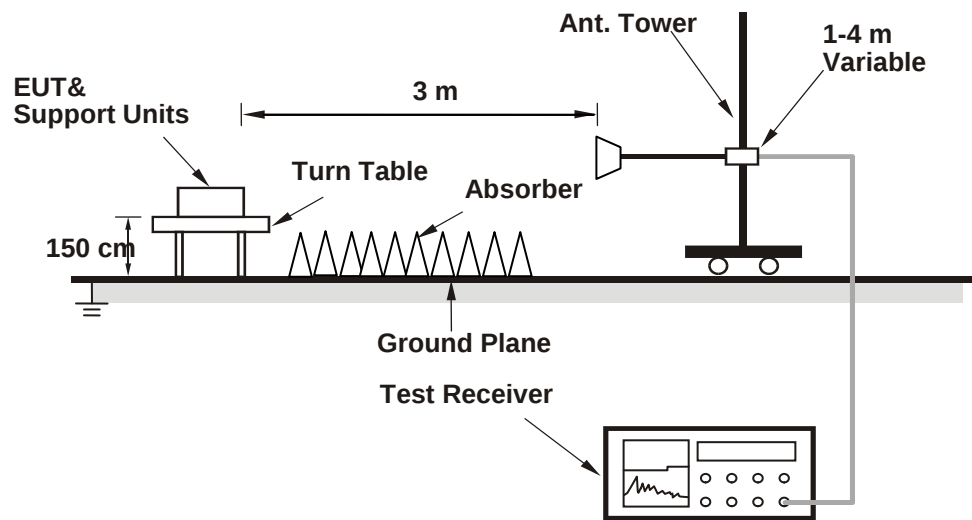
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data:

Mode A

GFSK

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.14	40.29	38.58	54	-13.71	31.8	5.4	35.49	100	320	Average
2386.14	51.96	50.25	74	-22.04	31.8	5.4	35.49	100	320	Peak
2402	96.7	94.97			31.8	5.4	35.47	100	320	Average
2402	99.2	97.47			31.8	5.4	35.47	100	320	Peak
4804	40.66	32.57	54	-13.34	33.96	8.25	34.12	149	5	Average
4804	46.56	38.47	74	-27.44	33.96	8.25	34.12	149	5	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388.3	40.26	38.55	54	-13.74	31.8	5.4	35.49	200	274	Average
2388.3	52	50.29	74	-22	31.8	5.4	35.49	200	274	Peak
2402	95.35	93.62			31.8	5.4	35.47	200	274	Average
2402	98.21	96.48			31.8	5.4	35.47	200	274	Peak
4804	40.43	32.34	54	-13.57	33.96	8.25	34.12	149	324	Average
4804	46.76	38.67	74	-27.24	33.96	8.25	34.12	149	324	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2402 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2387.31	40.31	38.6	54	-13.69	31.8	5.4	35.49	100	320	Average
2387.31	51.42	49.71	74	-22.58	31.8	5.4	35.49	100	320	Peak
2441	96.36	94.49			31.85	5.46	35.44	100	320	Average
2441	99	97.13			31.85	5.46	35.44	100	320	Peak
2499.28	40.98	38.96	54	-13.02	31.9	5.53	35.41	100	320	Average
2499.28	52.25	50.23	74	-21.75	31.9	5.53	35.41	100	320	Peak
4882	40.63	32.44	54	-13.37	33.98	8.27	34.06	198	198	Average
4882	46.37	38.18	74	-27.63	33.98	8.27	34.06	198	198	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2385.33	40.41	38.72	54	-13.59	31.78	5.4	35.49	200	274	Average
2385.33	52.05	50.36	74	-21.95	31.78	5.4	35.49	200	274	Peak
2441	95.66	93.79			31.85	5.46	35.44	200	274	Average
2441	98.66	96.79			31.85	5.46	35.44	200	274	Peak
2494.6	41.06	39.04	54	-12.94	31.9	5.53	35.41	200	274	Average
2494.6	51.95	49.93	74	-22.05	31.9	5.53	35.41	200	274	Peak
4882	40.75	32.56	54	-13.25	33.98	8.27	34.06	147	156	Average
4882	46.95	38.76	74	-27.05	33.98	8.27	34.06	147	156	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2441 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	96.15	94.19			31.88	5.5	35.42	100	320	Average
2480	99.53	97.57			31.88	5.5	35.42	100	320	Peak
2486.4	41.03	39.04	54	-12.97	31.88	5.53	35.42	100	320	Average
2486.4	52.27	50.28	74	-21.73	31.88	5.53	35.42	100	320	Peak
4960	40.75	32.48	54	-13.25	33.99	8.29	34.01	149	245	Average
4960	47.11	38.84	74	-26.89	33.99	8.29	34.01	149	245	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	95.1	93.14			31.88	5.5	35.42	200	274	Average
2480	98.44	96.48			31.88	5.5	35.42	200	274	Peak
2488.4	40.92	38.91	54	-13.08	31.9	5.53	35.42	200	274	Average
2488.4	52.2	50.19	74	-21.8	31.9	5.53	35.42	200	274	Peak
4960	40.5	32.23	54	-13.5	33.99	8.29	34.01	159	310	Average
4960	46.69	38.42	74	-27.31	33.99	8.29	34.01	159	310	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2480 MHz: Fundamental frequency.

8DPSK

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.92	40.32	38.59	54	-13.68	31.8	5.4	35.47	100	320	Average
2389.92	51.61	49.88	74	-22.39	31.8	5.4	35.47	100	320	Peak
2402	93.4	91.67			31.8	5.4	35.47	100	320	Average
2402	98.03	96.3			31.8	5.4	35.47	100	320	Peak
4804	40.56	32.47	54	-13.44	33.96	8.25	34.12	125	9	Average
4804	46.27	38.18	74	-27.73	33.96	8.25	34.12	125	9	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2370.48	40.36	38.7	54	-13.64	31.78	5.37	35.49	200	274	Average
2370.48	51.66	50	74	-22.34	31.78	5.37	35.49	200	274	Peak
2402	92.35	90.62			31.8	5.4	35.47	200	274	Average
2402	97.22	95.49			31.8	5.4	35.47	200	274	Peak
4804	40.49	32.4	54	-13.51	33.96	8.25	34.12	135	210	Average
4804	45.87	37.78	74	-28.13	33.96	8.25	34.12	135	210	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2402 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2385.24	40.36	38.67	54	-13.64	31.78	5.4	35.49	100	320	Average
2385.24	51.7	50.01	74	-22.3	31.78	5.4	35.49	100	320	Peak
2441	93.85	91.98			31.85	5.46	35.44	100	320	Average
2441	98.99	97.12			31.85	5.46	35.44	100	320	Peak
2499.96	40.94	38.92	54	-13.06	31.9	5.53	35.41	100	320	Average
2499.96	51.98	49.96	74	-22.02	31.9	5.53	35.41	100	320	Peak
4882	40.59	32.4	54	-13.41	33.98	8.27	34.06	177	149	Average
4882	47.19	39	74	-26.81	33.98	8.27	34.06	177	149	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.56	40.54	38.83	54	-13.46	31.8	5.4	35.49	200	274	Average
2389.56	52.05	50.34	74	-21.95	31.8	5.4	35.49	200	274	Peak
2441	92.22	90.35			31.85	5.46	35.44	200	274	Average
2441	97.67	95.8			31.85	5.46	35.44	200	274	Peak
2484.16	40.92	38.96	54	-13.08	31.88	5.5	35.42	200	274	Average
2484.16	52.54	50.58	74	-21.46	31.88	5.5	35.42	200	274	Peak
4882	40.79	32.6	54	-13.21	33.98	8.27	34.06	135	26	Average
4882	47.84	39.65	74	-26.16	33.98	8.27	34.06	135	26	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2441 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	93.54	91.58			31.88	5.5	35.42	100	320	Average
2480	98.66	96.7			31.88	5.5	35.42	100	320	Peak
2483.72	40.92	38.96	54	-13.08	31.88	5.5	35.42	100	320	Average
2483.72	52.17	50.21	74	-21.83	31.88	5.5	35.42	100	320	Peak
4960	40.86	32.59	54	-13.14	33.99	8.29	34.01	147	1	Average
4960	47	38.73	74	-27	33.99	8.29	34.01	147	1	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	92.35	90.39			31.88	5.5	35.42	200	274	Average
2480	97.02	95.06			31.88	5.5	35.42	200	274	Peak
2485.12	41.02	39.03	54	-12.98	31.88	5.53	35.42	200	274	Average
2485.12	52.55	50.56	74	-21.45	31.88	5.53	35.42	200	274	Peak
4960	40.53	32.26	54	-13.47	33.99	8.29	34.01	134	333	Average
4960	46.8	38.53	74	-27.2	33.99	8.29	34.01	134	333	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2480 MHz: Fundamental frequency.

Mode B

GFSK

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.95	40.28	38.57	54	-13.72	31.8	5.4	35.49	221	111	Average
2386.95	51.59	49.88	74	-22.41	31.8	5.4	35.49	221	111	Peak
2402	94.55	92.82			31.8	5.4	35.47	221	111	Average
2402	97.72	95.99			31.8	5.4	35.47	221	111	Peak
4804	40.46	32.37	54	-13.54	33.96	8.25	34.12	124	210	Average
4804	46.85	38.76	74	-27.15	33.96	8.25	34.12	124	210	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.77	40.58	38.87	54	-13.42	31.8	5.4	35.49	248	176	Average
2386.77	51.69	49.98	74	-22.31	31.8	5.4	35.49	248	176	Peak
2402	99.5	97.77			31.8	5.4	35.47	248	176	Average
2402	102.19	100.46			31.8	5.4	35.47	248	176	Peak
4804	40.68	32.59	54	-13.32	33.96	8.25	34.12	115	207	Average
4804	47.54	39.45	74	-26.46	33.96	8.25	34.12	115	207	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2402 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2384.25	40.32	38.63	54	-13.68	31.78	5.4	35.49	221	111	Average
2384.25	51.76	50.07	74	-22.24	31.78	5.4	35.49	221	111	Peak
2441	94.46	92.59			31.85	5.46	35.44	221	111	Average
2441	97.36	95.49			31.85	5.46	35.44	221	111	Peak
2494	40.94	38.92	54	-13.06	31.9	5.53	35.41	221	111	Average
2494	52.16	50.14	74	-21.84	31.9	5.53	35.41	221	111	Peak
4882	40.6	32.41	54	-13.4	33.98	8.27	34.06	154	340	Average
4882	46.59	38.4	74	-27.41	33.98	8.27	34.06	154	340	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2378.13	40.32	38.66	54	-13.68	31.78	5.37	35.49	248	176	Average
2378.13	51.61	49.95	74	-22.39	31.78	5.37	35.49	248	176	Peak
2441	99.62	97.75			31.85	5.46	35.44	248	176	Average
2441	102.04	100.17			31.85	5.46	35.44	248	176	Peak
2496.04	40.95	38.93	54	-13.05	31.9	5.53	35.41	248	176	Average
2496.04	52.85	50.83	74	-21.15	31.9	5.53	35.41	248	176	Peak
4882	40.68	32.49	54	-13.32	33.98	8.27	34.06	124	26	Average
4882	46.78	38.59	74	-27.22	33.98	8.27	34.06	124	26	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2441 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	94.47	92.51			31.88	5.5	35.42	221	111	Average
2480	97.67	95.71			31.88	5.5	35.42	221	111	Peak
2496.84	40.98	38.96	54	-13.02	31.9	5.53	35.41	221	111	Average
2496.84	52.86	50.84	74	-21.14	31.9	5.53	35.41	221	111	Peak
4960	40.64	32.37	54	-13.36	33.99	8.29	34.01	157	8	Average
4960	47.06	38.79	74	-26.94	33.99	8.29	34.01	157	8	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	99.7	97.74			31.88	5.5	35.42	248	176	Average
2480	102.29	100.33			31.88	5.5	35.42	248	176	Peak
2483.8	41.29	39.33	54	-12.71	31.88	5.5	35.42	248	176	Average
2483.8	52.61	50.65	74	-21.39	31.88	5.5	35.42	248	176	Peak
4960	40.86	32.59	54	-13.14	33.99	8.29	34.01	147	45	Average
4960	46.84	38.57	74	-27.16	33.99	8.29	34.01	147	45	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2480 MHz: Fundamental frequency.

8DPSK

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2387.67	40.34	38.63	54	-13.66	31.8	5.4	35.49	221	111	Average
2387.67	51.35	49.64	74	-22.65	31.8	5.4	35.49	221	111	Peak
2402	91.36	89.63			31.8	5.4	35.47	221	111	Average
2402	96.61	94.88			31.8	5.4	35.47	221	111	Peak
4804	40.4	32.31	54	-13.6	33.96	8.25	34.12	154	336	Average
4804	46.53	38.44	74	-27.47	33.96	8.25	34.12	154	336	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.14	40.43	38.72	54	-13.57	31.8	5.4	35.49	248	176	Average
2386.14	51.25	49.54	74	-22.75	31.8	5.4	35.49	248	176	Peak
2402	96.49	94.76			31.8	5.4	35.47	248	176	Average
2402	101.14	99.41			31.8	5.4	35.47	248	176	Peak
4804	40.3	32.21	54	-13.7	33.96	8.25	34.12	124	118	Average
4804	47.5	39.41	74	-26.5	33.96	8.25	34.12	124	118	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2402 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2383.35	40.28	38.59	54	-13.72	31.78	5.4	35.49	221	111	Average
2383.35	51.85	50.16	74	-22.15	31.78	5.4	35.49	221	111	Peak
2441	91.55	89.68			31.85	5.46	35.44	221	111	Average
2441	96.29	94.42			31.85	5.46	35.44	221	111	Peak
2491.6	40.96	38.95	54	-13.04	31.9	5.53	35.42	221	111	Average
2491.6	52.82	50.81	74	-21.18	31.9	5.53	35.42	221	111	Peak
4882	40.59	32.4	54	-13.41	33.98	8.27	34.06	147	5	Average
4882	46.47	38.28	74	-27.53	33.98	8.27	34.06	147	5	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2381.73	40.42	38.73	54	-13.58	31.78	5.4	35.49	248	176	Average
2381.73	51.52	49.83	74	-22.48	31.78	5.4	35.49	248	176	Peak
2441	96.59	94.72			31.85	5.46	35.44	248	176	Average
2441	101.11	99.24			31.85	5.46	35.44	248	176	Peak
2488.2	40.93	38.92	54	-13.07	31.9	5.53	35.42	248	176	Average
2488.2	51.69	49.68	74	-22.31	31.9	5.53	35.42	248	176	Peak
4882	40.88	32.69	54	-13.12	33.98	8.27	34.06	165	175	Average
4882	46.78	38.59	74	-27.22	33.98	8.27	34.06	165	175	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2441 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	91.47	89.51			31.88	5.5	35.42	221	111	Average
2480	96.06	94.1			31.88	5.5	35.42	221	111	Peak
2496.12	41.01	38.99	54	-12.99	31.9	5.53	35.41	221	111	Average
2496.12	52.28	50.26	74	-21.72	31.9	5.53	35.41	221	111	Peak
4960	40.68	32.41	54	-13.32	33.99	8.29	34.01	147	159	Average
4960	47	38.73	74	-27	33.99	8.29	34.01	147	159	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	96.63	94.67			31.88	5.5	35.42	248	176	Average
2480	101.49	99.53			31.88	5.5	35.42	248	176	Peak
2483.92	41.23	39.27	54	-12.77	31.88	5.5	35.42	248	176	Average
2483.92	53	51.04	74	-21	31.88	5.5	35.42	248	176	Peak
4960	40.68	32.41	54	-13.32	33.99	8.29	34.01	159	333	Average
4960	46.33	38.06	74	-27.67	33.99	8.29	34.01	159	333	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2480 MHz: Fundamental frequency.

9 kHz ~ 30 MHz Data:

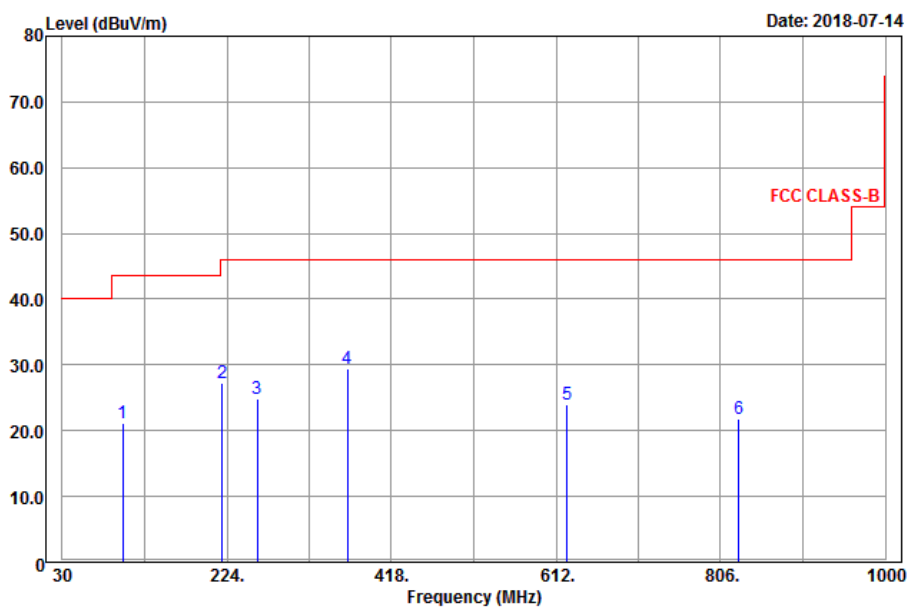
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

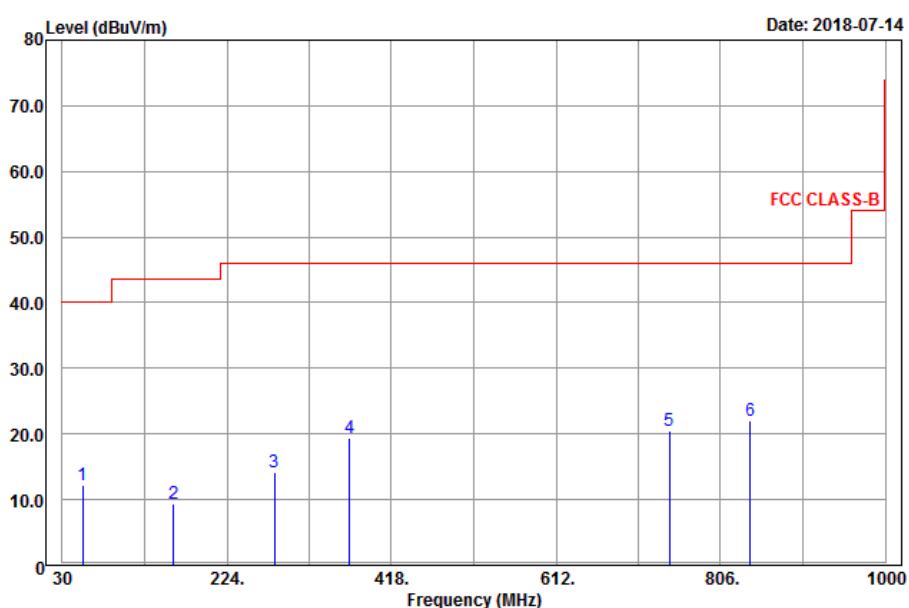
Mode A

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Harry Hsueh

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
101.55	21.12	39.76	43.5	-22.38	12.34	1.28	32.26	187	101	Peak
218.19	27.16	46.43	46	-18.84	11.3	1.65	32.22	104	147	Peak
259.77	24.86	42.53	46	-21.14	12.49	1.94	32.1	143	89	Peak
366.5	29.4	44.83	46	-16.6	14.43	2.26	32.12	153	265	Peak
624.8	23.94	35.01	46	-22.06	18.17	2.93	32.17	154	155	Peak
827.1	21.7	29.49	46	-24.3	20.74	3.38	31.91	180	1	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
54.03	12.16	29.27	40	-27.84	14.22	0.9	32.23	190	206	Peak
161.49	9.46	31.38	43.5	-34.04	8.82	1.52	32.26	164	118	Peak
280.02	14.2	31.55	46	-31.8	12.74	2.03	32.12	187	188	Peak
368.6	19.45	34.87	46	-26.55	14.45	2.26	32.13	145	286	Peak
745.9	20.56	29.71	46	-25.44	19.77	3.22	32.14	195	16	Peak
841.1	21.98	29.54	46	-24.02	20.9	3.38	31.84	180	214	Peak

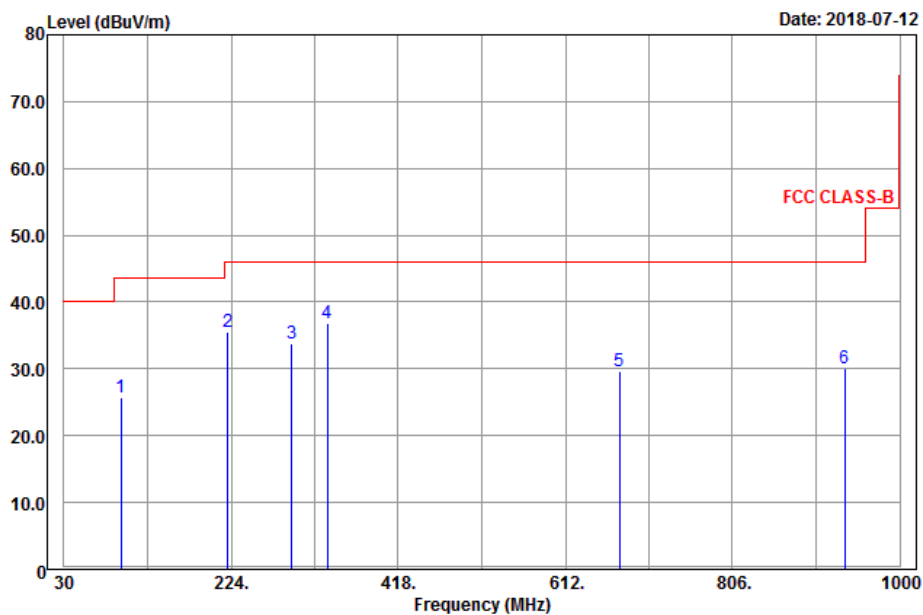
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

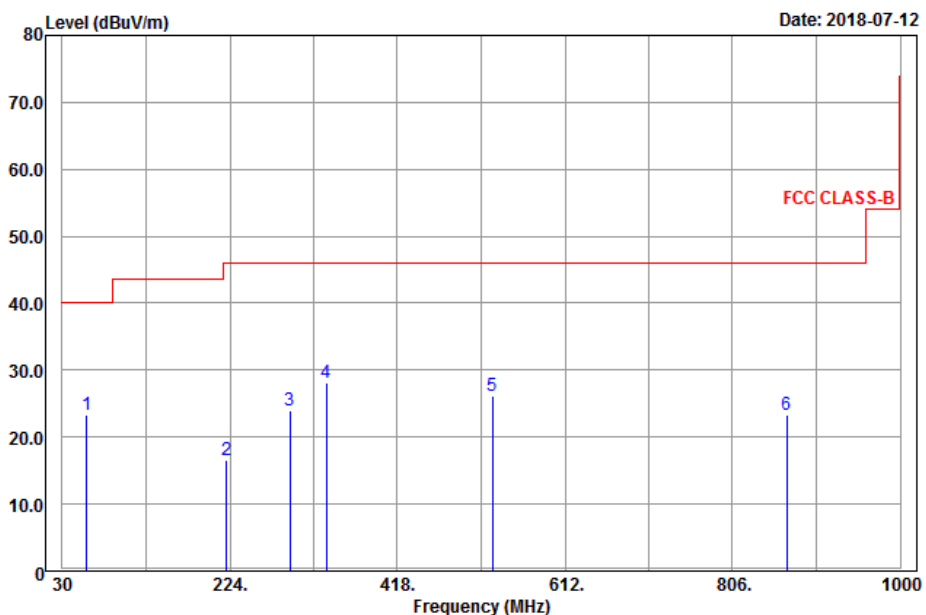
Mode B

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Harry Hsueh

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
95.88	25.73	44.74	43.5	-17.77	11.75	1.28	32.04	195	288	Peak
219.81	35.57	54.8	46	-10.43	11.34	1.65	32.22	100	104	Peak
294.33	33.73	50.87	46	-12.27	12.96	2.03	32.13	154	149	Peak
335.7	36.85	52.81	46	-9.15	13.94	2.19	32.09	165	360	Peak
675.2	29.73	39.95	46	-16.27	18.85	3.05	32.12	175	164	Peak
936.3	30.05	35.99	46	-15.95	21.65	3.62	31.21	190	246	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
58.35	23.27	40.92	40	-16.73	13.68	0.9	32.23	158	326	Peak
220.35	16.54	35.77	46	-29.46	11.34	1.65	32.22	114	321	Peak
293.52	23.94	41.1	46	-22.06	12.94	2.03	32.13	120	95	Peak
335.7	28.03	43.99	46	-17.97	13.94	2.19	32.09	124	280	Peak
528.2	26.25	38.99	46	-19.75	16.72	2.7	32.16	154	165	Peak
869.1	23.24	30.23	46	-22.76	21.24	3.44	31.67	195	344	Peak

Remarks:

2. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

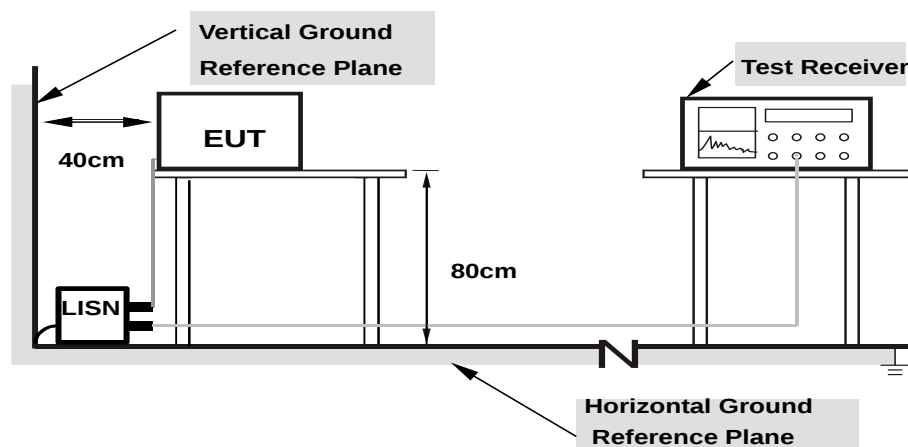
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz - 30 MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Condition

Set the EUT under transmission condition continuously at specific channel frequency.

4.2.7 Test Results

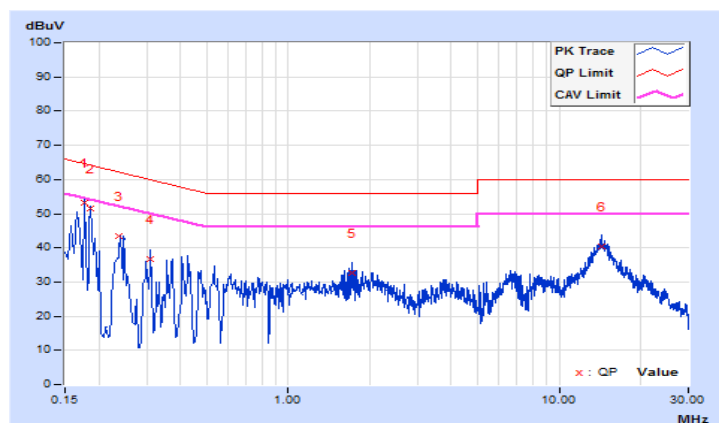
Mode A

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17737	9.67	43.48	29.21	53.15	38.88	64.61	54.61	-11.46	-15.73
2	0.18508	9.67	41.99	25.91	51.66	35.58	64.25	54.25	-12.59	-18.67
3	0.23836	9.67	33.91	20.36	43.58	30.03	62.15	52.15	-18.57	-22.12
4	0.31031	9.67	27.07	10.26	36.74	19.93	59.96	49.96	-23.22	-30.03
5	1.71009	9.71	23.10	6.02	32.81	15.73	56.00	46.00	-23.19	-30.27
6	14.27292	9.91	30.49	17.21	40.40	27.12	60.00	50.00	-19.60	-22.88

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

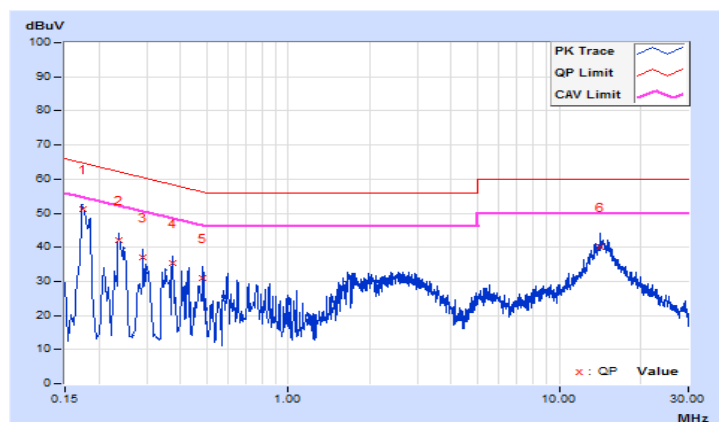


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17374	9.68	41.45	28.15	51.13	37.83	64.78	54.78	-13.65	-16.95
2	0.23586	9.68	32.30	19.01	41.98	28.69	62.24	52.24	-20.26	-23.55
3	0.29076	9.68	27.29	13.08	36.97	22.76	60.50	50.50	-23.53	-27.74
4	0.37287	9.68	25.84	13.03	35.52	22.71	58.44	48.44	-22.92	-25.73
5	0.48235	9.68	21.39	7.35	31.07	17.03	56.30	46.30	-25.23	-29.27
6	14.17517	9.95	30.28	15.01	40.23	24.96	60.00	50.00	-19.77	-25.04

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



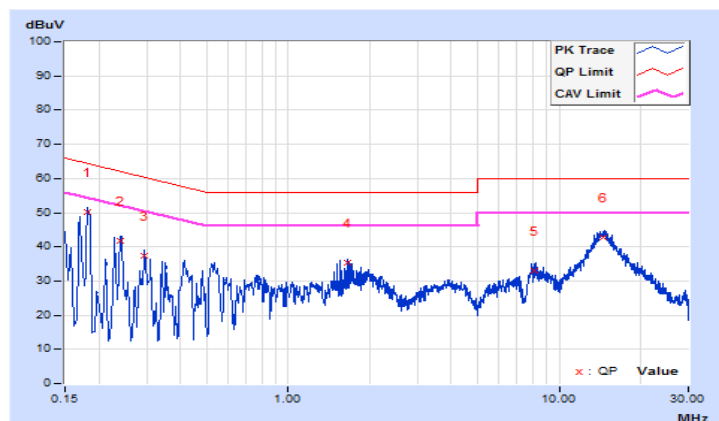
Mode B

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18122	9.67	40.36	26.21	50.03	35.88	64.43	54.43	-14.40	-18.55
2	0.23961	9.67	32.20	19.27	41.87	28.94	62.11	52.11	-20.24	-23.17
3	0.29506	9.67	27.75	14.47	37.42	24.14	60.38	50.38	-22.96	-26.24
4	1.65144	9.70	25.78	4.91	35.48	14.61	56.00	46.00	-20.52	-31.39
5	8.15377	9.84	23.15	8.88	32.99	18.72	60.00	50.00	-27.01	-31.28
6	14.49497	9.91	32.99	18.69	42.90	28.60	60.00	50.00	-17.10	-21.40

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

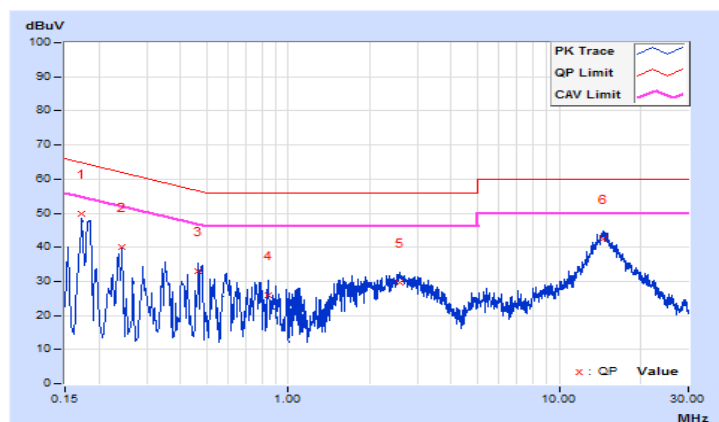


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17328	9.68	40.11	26.38	49.79	36.06	64.80	54.80	-15.01	-18.74
2	0.24384	9.68	30.52	16.36	40.20	26.04	61.96	51.96	-21.76	-25.92
3	0.46301	9.68	23.29	9.22	32.97	18.90	56.64	46.64	-23.67	-27.74
4	0.84208	9.68	16.35	1.45	26.03	11.13	56.00	46.00	-29.97	-34.87
5	2.59404	9.73	19.90	4.55	29.63	14.28	56.00	46.00	-26.37	-31.72
6	14.54271	9.96	32.32	17.07	42.28	27.03	60.00	50.00	-17.72	-22.97

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

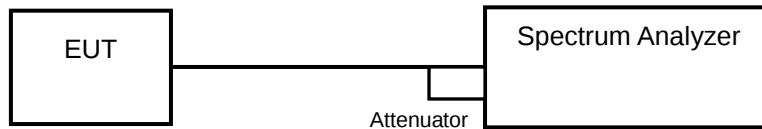


4.3 Maximum Output Power

4.3.1 Limits of Maximum Output Power Measurement

The Maximum Output Power Measurement is 125 mW.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 10 MHz VBW.
- Measure the captured power within the band and recording the plot.
- Repeat above procedures until all frequencies required were complete.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

<GFSK>

Channel	Freq. (MHz)	Output Power (dBm)	Power Limit (mW)	Pass / Fail
0	2402	5.77	125	Pass
39	2441	6.16	125	Pass
78	2480	6.04	125	Pass

<8DPSK>

Channel	Freq. (MHz)	Output Power (dBm)	Power Limit (mW)	Pass / Fail
0	2402	5.01	125	Pass
39	2441	5.45	125	Pass
78	2480	5.34	125	Pass

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---