

FCC Test Report

Report No.: RF180528C02A

FCC ID: M82-WISE6610N

Test Model: WISE-6610-N500-A

Series Model: WISE-6610-N100-A, WISE-6610-N100XXXXXXXXXX,
WISE6610N100XXXXXXXXXX, WISE-6610-N500XXXXXXXXXX,
WISE6610N500XXXXXXXXXX (where "X" maybe any alphanumeric
character, blank or "-"). (refer to item 3.1 for more details)

Received Date: Sep. 19, 2018

Test Date: Oct. 05 ~ Oct. 12, 2018

Issued Date: Oct. 15, 2018

Applicant: ADVANTECH CO., LTD

Address: No.1, Alley 20, Lane 26, Rueiguang Rd, Neihu District, Taipei, Taiwan 114

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 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	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record.....	6
3 General Information	7
3.1 General Description of EUT.....	7
3.2 Description of Test Modes.....	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal.....	10
3.4 Description of Support Units.....	11
3.4.1 Configuration of System under Test.....	11
3.5 General Description of Applied Standards.....	11
4 Test Types and Results	12
4.1 Radiated Emission and Bandedge Measurement.....	12
4.1.1 Limits of Radiated Emission and Bandedge Measurement.....	12
4.1.2 Test Instruments.....	13
4.1.3 Test Procedures.....	14
4.1.4 Deviation from Test Standard.....	14
4.1.5 Test Setup.....	15
4.1.6 EUT Operating Conditions.....	16
4.1.7 Test Results.....	17
4.2 Conducted Emission Measurement.....	26
4.2.1 Limits of Conducted Emission Measurement.....	26
4.2.2 Test Instruments.....	26
4.2.3 Test Procedures.....	27
4.2.4 Deviation From Test Standard.....	27
4.2.5 Test Setup.....	27
4.2.6 EUT Operating Condition.....	27
4.2.7 Test Results.....	28
4.3 6dB Bandwidth Measurement.....	34
4.3.1 Limits of 6dB Bandwidth Measurement.....	34
4.3.2 Test Setup.....	34
4.3.3 Test Instruments.....	34
4.3.4 Test Procedure.....	34
4.3.5 Deviation from Test Standard.....	34
4.3.6 EUT Operating Conditions.....	34
4.3.7 Test Result.....	35
4.4 Conducted Output Power Measurement.....	36
4.4.1 Limits of Conducted Output Power Measurement.....	36
4.4.2 Test Setup.....	36
4.4.3 Test Instruments.....	36
4.4.4 Test Procedures.....	36
4.4.5 Deviation from Test Standard.....	36
4.4.6 EUT Operating Conditions.....	36
4.4.7 Test Results.....	36
4.5 Power Spectral Density Measurement.....	37
4.5.1 Limits of Power Spectral Density Measurement.....	37
4.5.2 Test Setup.....	37
4.5.3 Test Instruments.....	37
4.5.4 Test Procedure.....	37
4.5.5 Deviation from Test Standard.....	37
4.5.6 EUT Operating Condition.....	37

4.5.7 Test Results	38
4.6 Conducted Out of Band Emission Measurement.....	39
4.6.1 Limits of Conducted Out of Band Emission Measurement	39
4.6.2 Test Setup.....	39
4.6.3 Test Instruments	39
4.6.4 Test Procedure	39
4.6.5 Deviation from Test Standard	39
4.6.6 EUT Operating Condition	39
4.6.7 Test Results	40
5 Pictures of Test Arrangements.....	41
Appendix – Information on the Testing Laboratories	42

Release Control Record

Issue No.	Description	Date Issued
RF180528C02A	Original release	Oct. 15, 2018

1 Certificate of Conformity

Product: Industrial LoRaWAN gateway

Brand: Advantech

Test Model: WISE-6610-N500-A

Series Model: WISE-6610-N100-A, WISE-6610-N100XXXXXXXXXXXX, WISE6610N100XXXXXXXXXXXX, WISE-6610-N500XXXXXXXXXXXX, WISE6610N500XXXXXXXXXXXX (where "X" maybe any alphanumeric character, blank or "-".) (refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: ADVANTECH CO., LTD

Test Date: Oct. 05 ~ Oct. 12, 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 : Polly Chien, **Date:** Oct. 15, 2018
Polly Chien / Specialist

Approved by : Bruce Chen, **Date:** Oct. 15, 2018
Bruce Chen / 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 -24.43dB at 24.22387MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -2.1dB at 192.00MHz, 796.91 MHz & 800.24 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is SMA Male Reverse not a standard connector.

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	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Industrial LoRaWAN gateway
Brand	Advantech
Test Model	WISE-6610-N500-A
Series Model	WISE-6610-N100-A, WISE-6610-N100XXXXXXXXXXXX, WISE6610N100AXXXXXXXXXXXX, WISE-6610-N500XXXXXXXXXXXX, WISE6610N500AXXXXXXXXXXXX (where "X" maybe any alphanumeric character, blank or "-".)
Model Difference	Refer to note
Status of EUT	Engineering sample
Power Supply Rating	9~36Vdc
Modulation Type	CSS
Operating Frequency	923.3~927.5MHz
Number of Channel	8
Output Power	279.898mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	1.5m non-shielded power cable without core
Cable Supplied	NA

Note:

- The following models are provided to this EUT. The model of the WISE-6610-N500-A was chosen for final test.

Brand	Model	Description	
Advantech	WISE-6610-N100-A WISE-6610-N100XXXXXXXXXXXX; WISE6610N100AXXXXXXXXXXXX; (where "X" maybe any alphanumeric character, blank or "-".)	Version-A/ 9-36VDC	LoRaWAN Gateway support up to 100 nodes with 915MHz
	WISE-6610-N500-A; WISE-6610-N500XXXXXXXXXXXX; WISE6610N500AXXXXXXXXXXXX; (where "X" maybe any alphanumeric character, blank or "-".)	Version-A/ 9-36VDC	LoRaWAN Gateway support up to 500 nodes with 915MHz

- The following antenna was provided to the EUT.

Antenna Type	Antenna Connector	Brand	Model	Gain
Dipole	SMA Male Reverse	Advantech	AN0891-74S01BRS	0.41dBi

3.2 Description of Test Modes

8 channels are provided to this EUT:

Channel	Freq. (MHz)
0	923.3
1	923.9
2	924.5
3	925.1
4	925.7
5	926.3
6	926.9
7	927.5

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE \geq 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE \geq 1G: Radiated Emission above 1GHz & Bandedge Measurement
 RE<1G: Radiated Emission below 1GHz
 PLC: Power Line Conducted Emission
 APCM: Antenna Port Conducted Measurement

Note:

- The EUT had been pre-tested on the positioned of X-plane and Z-plane. The worst case was found when positioned on X-plane for EUT and Z-plane for antenna.

Radiated Emission Test (Above 1GHz):

- 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 Type	Remark
-	0 to 7	0, 3, 7	CSS	-

Radiated Emission Test (Below 1GHz):

- 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 Type	Remark
-	0 to 7	0, 3, 7	CSS	-

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 Type	Remark
-	0 to 7	0, 3, 7	CSS	-

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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.

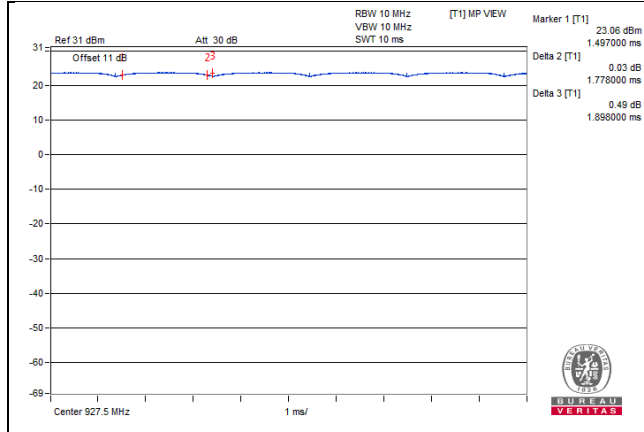
EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Remark
-	0 to 7	0, 3, 7	CSS	-

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE \geq 1G	25 deg. C, 70% RH	12Vdc	Luis Lee
RE<1G	25 deg. C, 70% RH	12Vdc	Luis Lee
PLC	24 deg. C, 65% RH	12Vdc	Jones Chang
APCM	25 deg. C, 60% RH	12Vdc	Leo Tsai

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100%, duty factor is not required.



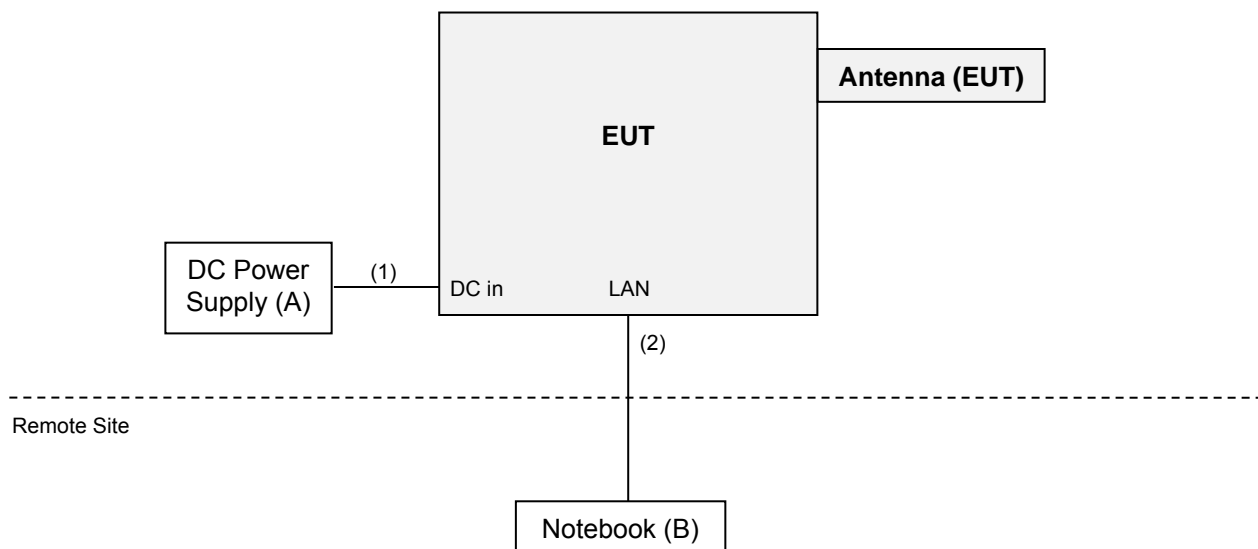
3.4 Description of Support Units

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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	DC power supply	Keysight	U8002A	MY56330015	NA	-
B.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power cable	1	1.5	N	0	Accessory of the EUT
2.	RJ45, Cat5e	1	6	N	0	-

3.4.1 Configuration of System under Test



3.5 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)
KDB 558074 D01 15.247 Meas Guidance v05
 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 30dB 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:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 29, 2018	May 28, 2019
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
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 03, 2018	Apr. 02, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM -8000	Cable-CH3-03 (309224+170907)	Aug. 21, 2018	Aug. 20, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190 004/MY55190007/MY55 210005	Jul. 17, 2018	Jul. 16, 2019

- 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 Chamber 3.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
 5. The IC Site Registration No. is 7450F-3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. 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 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. 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 detect 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:

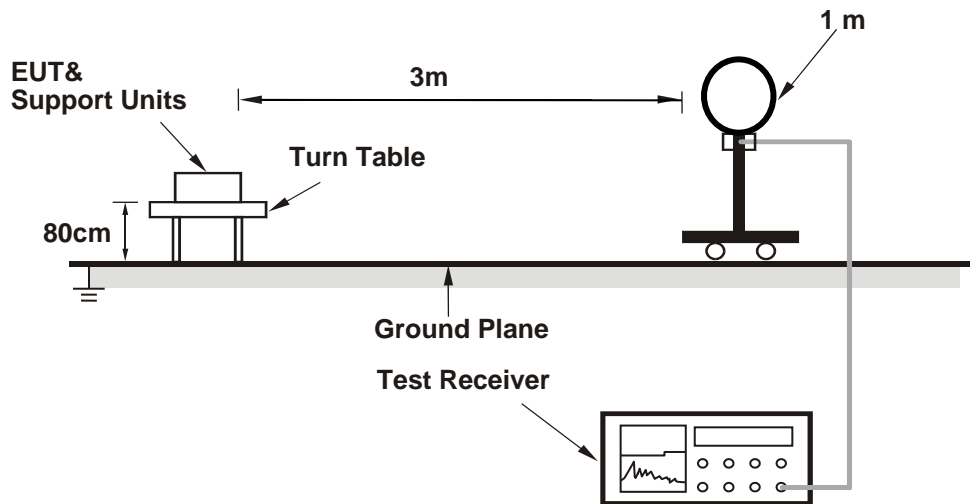
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

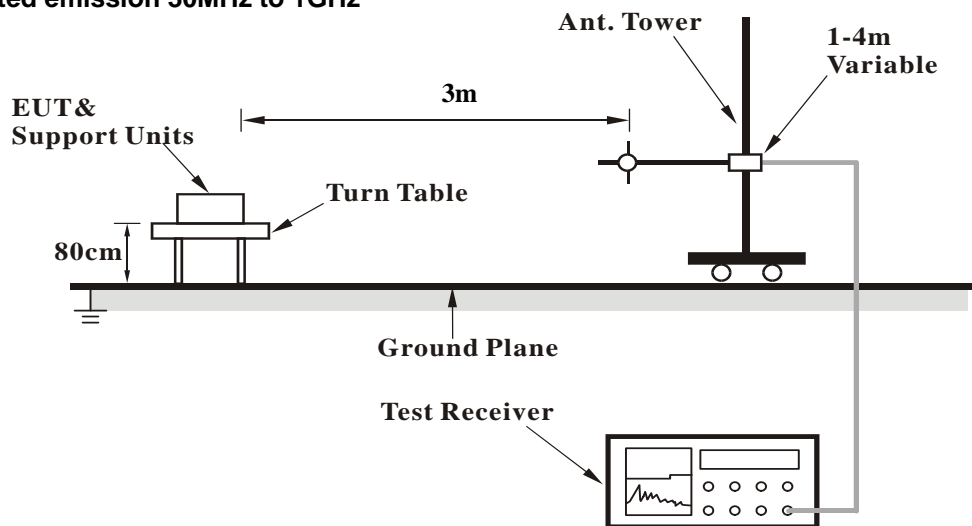
No deviation.

4.1.5 Test Setup

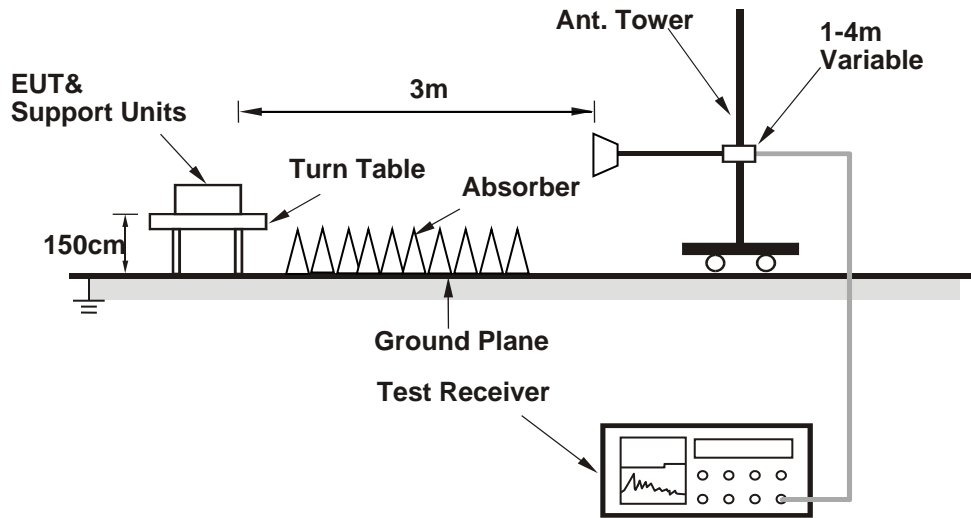
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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 1GHz Data:

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP) Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#902.00	46.2 QP	96.6	-50.4	1.62 H	315	15.10	31.10
2	*923.30	116.6 QP			1.35 H	331	85.20	31.40
3	#1846.60	49.4 PK	74.0	-24.6	1.65 H	208	53.20	-3.80
4	#1846.60	47.7 AV	54.0	-6.3	1.65 H	208	51.50	-3.80
5	2769.90	47.7 PK	74.0	-26.3	1.00 H	208	47.30	0.40
6	2769.90	42.9 AV	54.0	-11.1	1.00 H	208	42.50	0.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#902.00	47.1 QP	104.1	-57.0	1.28 V	257	16.00	31.10
2	*923.34	124.1 QP			1.00 V	314	92.70	31.40
3	#1846.60	53.2 PK	74.0	-20.8	2.28 V	112	57.00	-3.80
4	#1846.60	51.8 AV	54.0	-2.2	2.28 V	112	55.60	-3.80
5	2769.90	52.0 PK	74.0	-22.0	3.38 V	153	51.60	0.40
6	2769.90	49.5 AV	54.0	-4.5	3.38 V	153	49.10	0.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Quasi-Peak (QP) Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*925.10	115.9 QP			1.38 H	333	84.60	31.30
2	#1850.20	46.1 PK	74.0	-27.9	1.00 H	233	49.90	-3.80
3	#1850.20	42.7 AV	54.0	-11.3	1.00 H	233	46.50	-3.80
4	2775.30	48.8 PK	74.0	-25.2	1.00 H	210	48.40	0.40
5	2775.30	44.0 AV	54.0	-10.0	1.00 H	210	43.60	0.40

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*925.10	121.9 QP			1.51 V	292	90.60	31.30
2	#1850.20	51.8 PK	74.0	-22.2	1.84 V	183	55.60	-3.80
3	#1850.20	50.6 AV	54.0	-3.4	1.84 V	183	54.40	-3.80
4	2775.30	50.9 PK	74.0	-23.1	1.76 V	7	50.50	0.40
5	2775.30	48.3 AV	54.0	-5.7	1.76 V	7	47.90	0.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Quasi-Peak (QP) Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*927.50	116.6 QP			1.35 H	329	85.20	31.40
2	#928.00	87.7 QP	96.6	-8.9	1.34 H	333	56.30	31.40
3	#1855.00	44.9 PK	74.0	-29.1	1.00 H	165	48.70	-3.80
4	#1855.00	41.9 AV	54.0	-12.1	1.00 H	165	45.70	-3.80
5	2782.50	44.9 PK	74.0	-29.1	1.00 H	209	44.50	0.40
6	2782.50	39.0 AV	54.0	-15.0	1.00 H	209	38.60	0.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*927.50	121.9 QP			1.42 V	295	90.50	31.40
2	#928.00	93.1 QP	101.9	-8.8	1.48 V	297	61.70	31.40
3	#1855.00	51.5 PK	74.0	-22.5	1.86 V	170	55.30	-3.80
4	#1855.00	50.1 AV	54.0	-3.9	1.86 V	170	53.90	-3.80
5	2782.50	49.7 PK	74.0	-24.3	1.94 V	23	49.30	0.40
6	2782.50	46.6 AV	54.0	-7.4	1.94 V	23	46.20	0.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

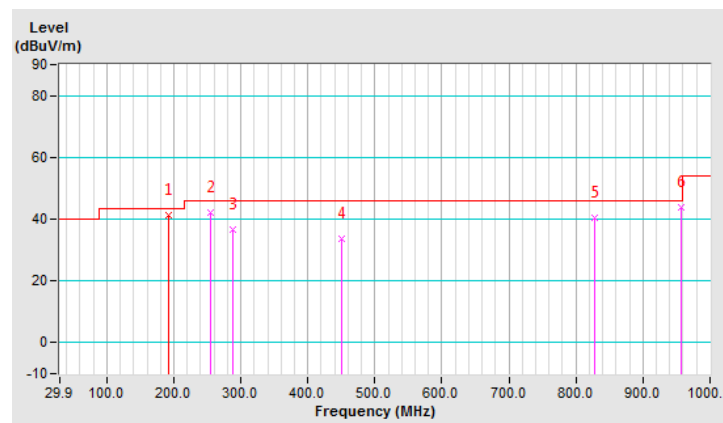
Below 1GHz data:

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	192.00	41.4 QP	43.5	-2.1	2.00 H	130	52.80	-11.40
2	254.99	42.2 QP	46.0	-3.8	1.01 H	252	51.70	-9.50
3	287.97	36.4 QP	46.0	-9.6	1.01 H	254	44.60	-8.20
4	450.97	33.5 QP	46.0	-12.5	1.01 H	303	39.00	-5.50
5	827.40	40.4 QP	46.0	-5.6	1.01 H	18	37.90	2.50
6	957.41	43.8 QP	46.0	-2.2	1.51 H	27	39.30	4.50

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

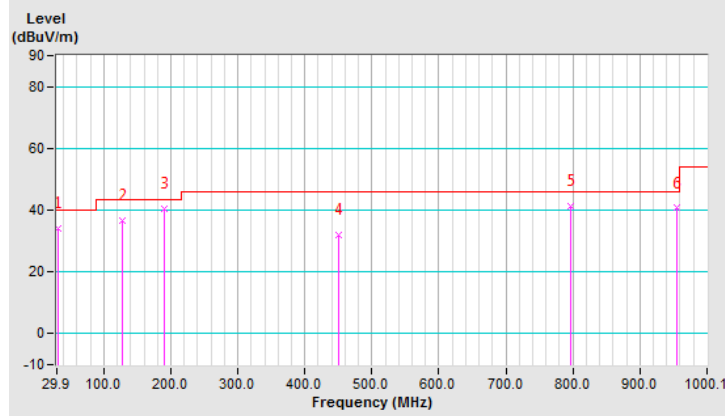


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.84	34.1 QP	40.0	-5.9	1.49 V	13	44.30	-10.20
2	126.92	36.5 QP	43.5	-7.0	1.00 V	19	47.00	-10.50
3	190.95	40.3 QP	43.5	-3.2	1.49 V	196	51.70	-11.40
4	450.97	31.8 QP	46.0	-14.2	1.00 V	146	37.30	-5.50
5	796.36	41.2 QP	46.0	-4.8	1.49 V	303	39.30	1.90
6	955.47	40.6 QP	46.0	-5.4	1.00 V	76	36.10	4.50

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

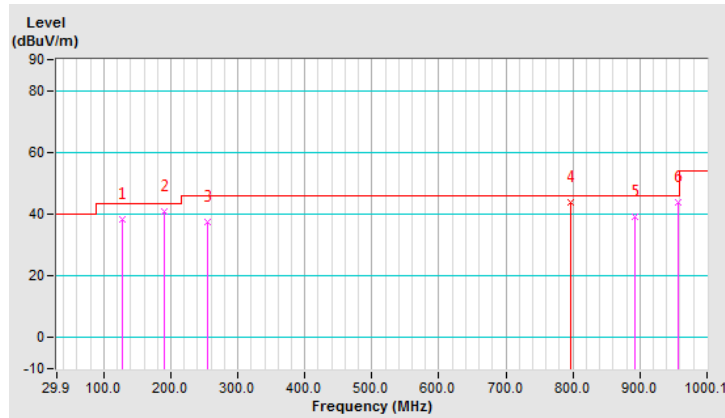


CHANNEL	TX Channel 3	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	126.92	38.4 QP	43.5	-5.1	2.00 H	288	48.90	-10.50
2	190.95	40.9 QP	43.5	-2.6	2.00 H	133	52.30	-11.40
3	254.99	37.5 QP	46.0	-8.5	1.50 H	270	47.00	-9.50
4	796.91	43.9 QP	46.0	-2.1	1.00 H	23	42.00	1.90
5	893.38	39.0 QP	46.0	-7.0	1.50 H	25	35.60	3.40
6	957.41	43.7 QP	46.0	-2.3	1.50 H	152	39.20	4.50

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

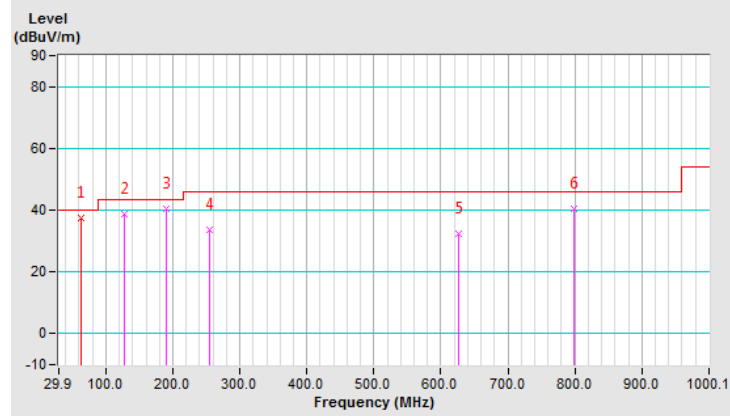


CHANNEL	TX Channel 3	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	64.00	37.6 QP	40.0	-2.4	1.47 V	12	47.20	-9.60
2	126.92	38.8 QP	43.5	-4.7	1.00 V	16	49.30	-10.50
3	190.95	40.6 QP	43.5	-2.9	1.49 V	201	52.00	-11.40
4	254.99	33.6 QP	46.0	-12.4	1.00 V	270	43.10	-9.50
5	625.60	32.4 QP	46.0	-13.6	1.49 V	158	34.10	-1.70
6	798.30	40.5 QP	46.0	-5.5	1.49 V	255	38.60	1.90

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

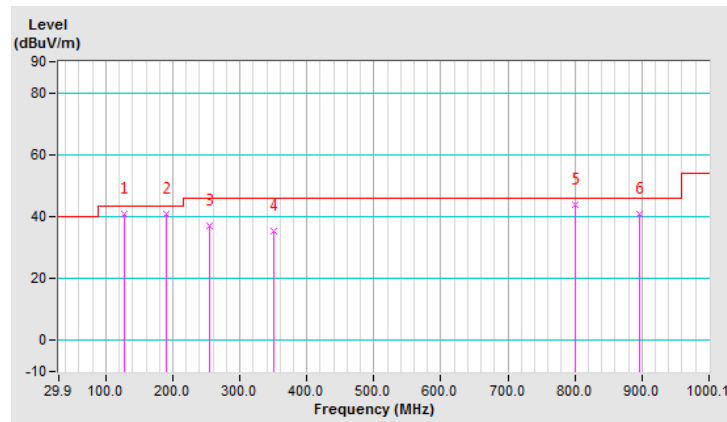


CHANNEL	TX Channel 7	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	126.92	41.0 QP	43.5	-2.5	1.99 H	295	51.50	-10.50
2	190.95	40.9 QP	43.5	-2.6	1.00 H	145	52.30	-11.40
3	254.99	37.2 QP	46.0	-8.8	1.00 H	132	46.70	-9.50
4	350.07	35.2 QP	46.0	-10.8	1.00 H	227	42.50	-7.30
5	800.24	43.9 QP	46.0	-2.1	1.49 H	12	42.00	1.90
6	897.26	40.8 QP	46.0	-5.2	1.49 H	12	37.30	3.50

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

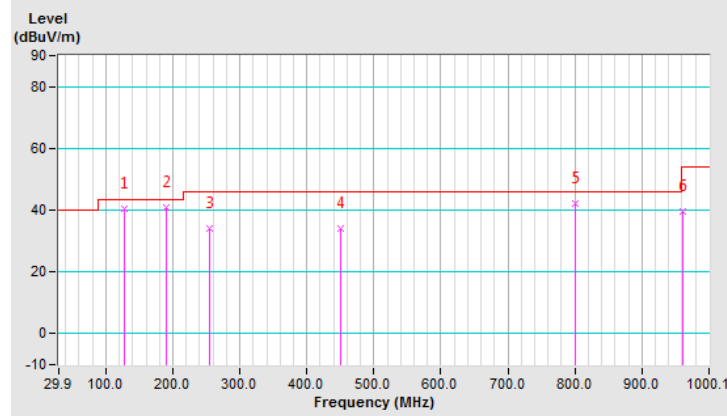


CHANNEL	TX Channel 7	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	126.92	40.6 QP	43.5	-2.9	2.00 V	297	51.10	-10.50
2	190.95	40.9 QP	43.5	-2.6	1.51 V	192	52.30	-11.40
3	254.99	34.2 QP	46.0	-11.8	1.00 V	277	43.70	-9.50
4	450.97	34.2 QP	46.0	-11.8	1.00 V	159	39.70	-5.50
5	800.24	42.2 QP	46.0	-3.8	2.00 V	359	40.30	1.90
6	961.29	39.7 QP	54.0	-14.3	1.00 V	75	35.00	4.70

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



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 0.50MHz.

4.2.2 Test Instruments

Tested date: Oct. 12, 2018

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
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

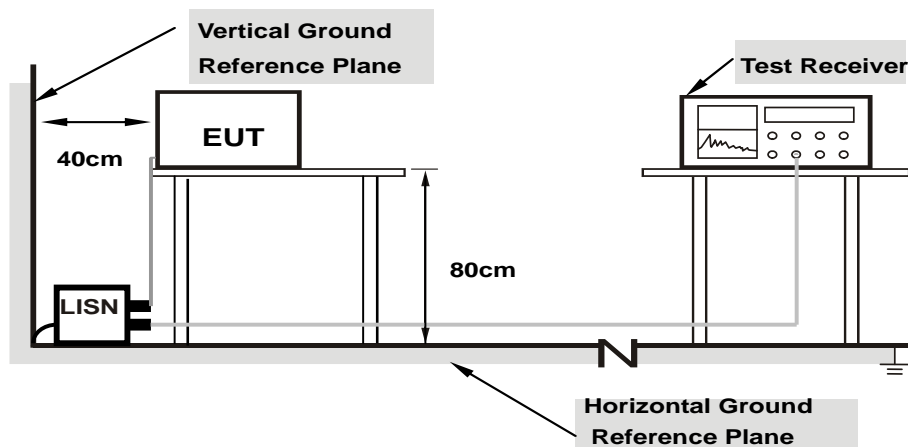
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation From Test Standard

No deviation.

4.2.5 Test Setup



- Note:**
- Support units were connected to second LISN.
 - 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

Same as item 4.1.6.

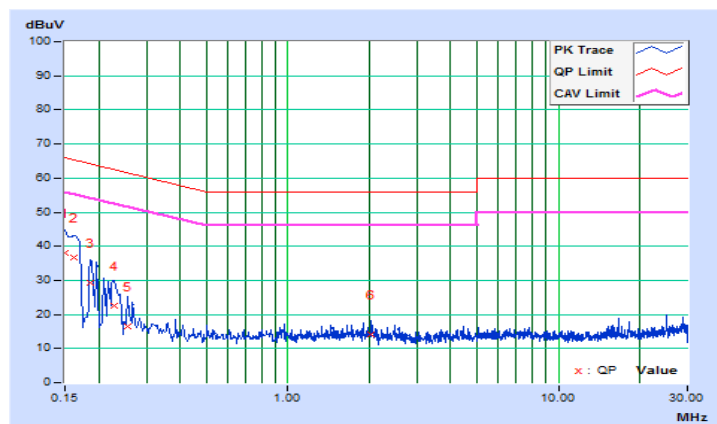
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 0		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15000	9.67	28.52	10.92	38.19	20.59	66.00
2	0.16096	9.67	26.94	10.70	36.61	20.37	65.41	55.41	-28.80	-35.04
3	0.18557	9.67	19.51	5.17	29.18	14.84	64.23	54.23	-35.05	-39.39
4	0.22672	9.67	12.76	7.70	22.43	17.37	62.57	52.57	-40.14	-35.20
5	0.25557	9.67	6.78	0.28	16.45	9.95	61.57	51.57	-45.12	-41.62
6	2.03462	9.68	4.37	0.12	14.05	9.80	56.00	46.00	-41.95	-36.20

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.

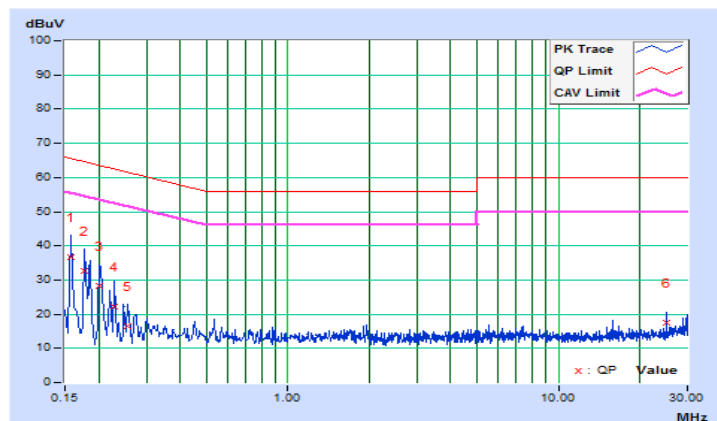


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 0		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15782	9.68	26.86	10.13	36.54	19.81	65.58
2	0.17737	9.67	22.85	11.27	32.52	20.94	64.61	54.61	-32.09	-33.67
3	0.20084	9.67	18.74	4.86	28.41	14.53	63.58	53.58	-35.17	-39.05
4	0.22820	9.67	12.66	7.50	22.33	17.17	62.51	52.51	-40.18	-35.34
5	0.25557	9.67	6.80	0.13	16.47	9.80	61.57	51.57	-45.10	-41.77
6	25.16618	10.03	7.44	4.43	17.47	14.46	60.00	50.00	-42.53	-35.54

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.

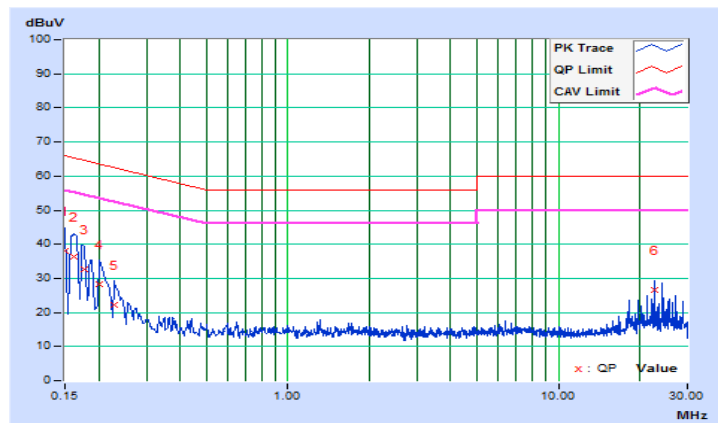


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 3		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15000	9.67	28.50	10.88	38.17	20.55	66.00
2	0.16139	9.67	26.75	10.79	36.42	20.46	65.39	55.39	-28.97	-34.93
3	0.17737	9.67	22.88	11.32	32.55	20.99	64.61	54.61	-32.06	-33.62
4	0.20084	9.67	18.72	4.94	28.39	14.61	63.58	53.58	-35.19	-38.97
5	0.22851	9.67	12.66	6.90	22.33	16.57	62.50	52.50	-40.17	-35.93
6	22.70679	9.91	16.61	12.38	26.52	22.29	60.00	50.00	-33.48	-27.71

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.

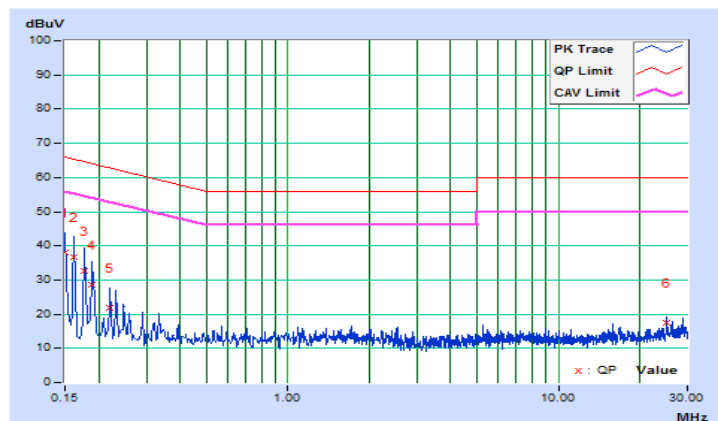


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 3		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15000	9.68	28.42	10.77	38.10	20.45	66.00
2	0.16173	9.68	26.89	10.74	36.57	20.42	65.37	55.37	-28.80	-34.95
3	0.17737	9.67	22.84	11.27	32.51	20.94	64.61	54.61	-32.10	-33.67
4	0.18910	9.67	19.05	4.92	28.72	14.59	64.08	54.08	-35.36	-39.49
5	0.22038	9.67	12.31	8.63	21.98	18.30	62.80	52.80	-40.82	-34.50
6	25.16618	10.03	7.47	4.47	17.50	14.50	60.00	50.00	-42.50	-35.50

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.

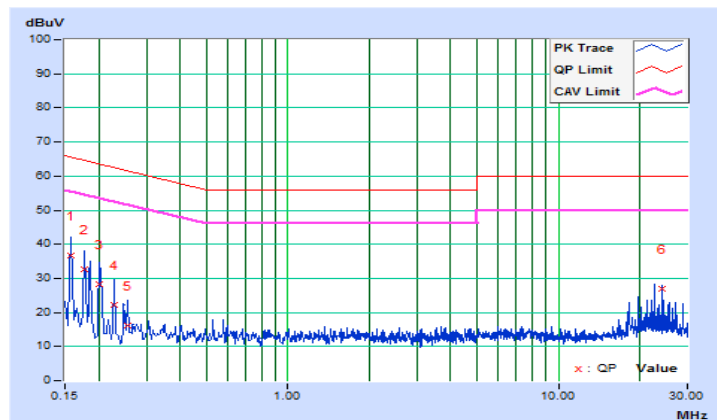


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 7		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15782	9.67	27.05	10.09	36.72	19.76	65.58
2	0.17737	9.67	22.92	11.38	32.59	21.05	64.61	54.61	-32.02	-33.56
3	0.20084	9.67	18.70	5.00	28.37	14.67	63.58	53.58	-35.21	-38.91
4	0.22820	9.67	12.60	7.65	22.27	17.32	62.51	52.51	-40.24	-35.19
5	0.25557	9.67	6.63	0.36	16.30	10.03	61.57	51.57	-45.27	-41.54
6	24.22387	9.91	17.04	15.66	26.95	25.57	60.00	50.00	-33.05	-24.43

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.

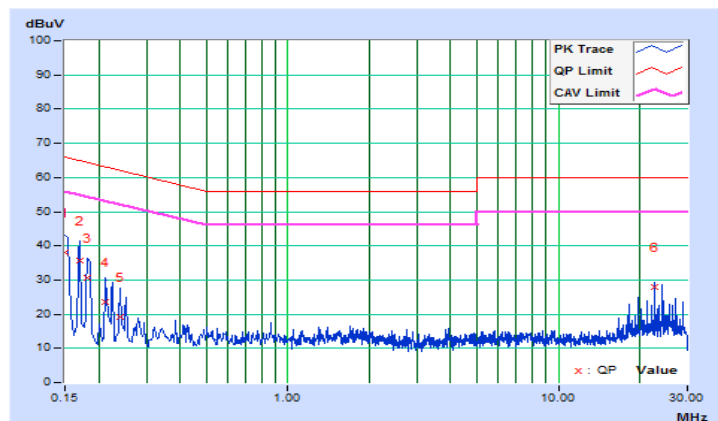


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 7		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15000	9.68	28.48	11.37	38.16	21.05	66.00
2	0.16955	9.68	26.09	11.20	35.77	20.88	64.98	54.98	-29.21	-34.10
3	0.18170	9.67	20.83	13.88	30.50	23.55	64.41	54.41	-33.91	-30.86
4	0.21256	9.67	13.87	7.60	23.54	17.27	63.10	53.10	-39.56	-35.83
5	0.23993	9.67	9.44	0.41	19.11	10.08	62.10	52.10	-42.99	-42.02
6	22.70679	10.02	18.09	14.54	28.11	24.56	60.00	50.00	-31.89	-25.44

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.

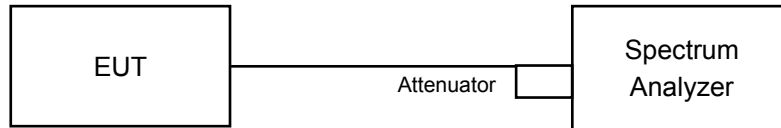


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

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

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

4.3.5 Deviation from Test Standard

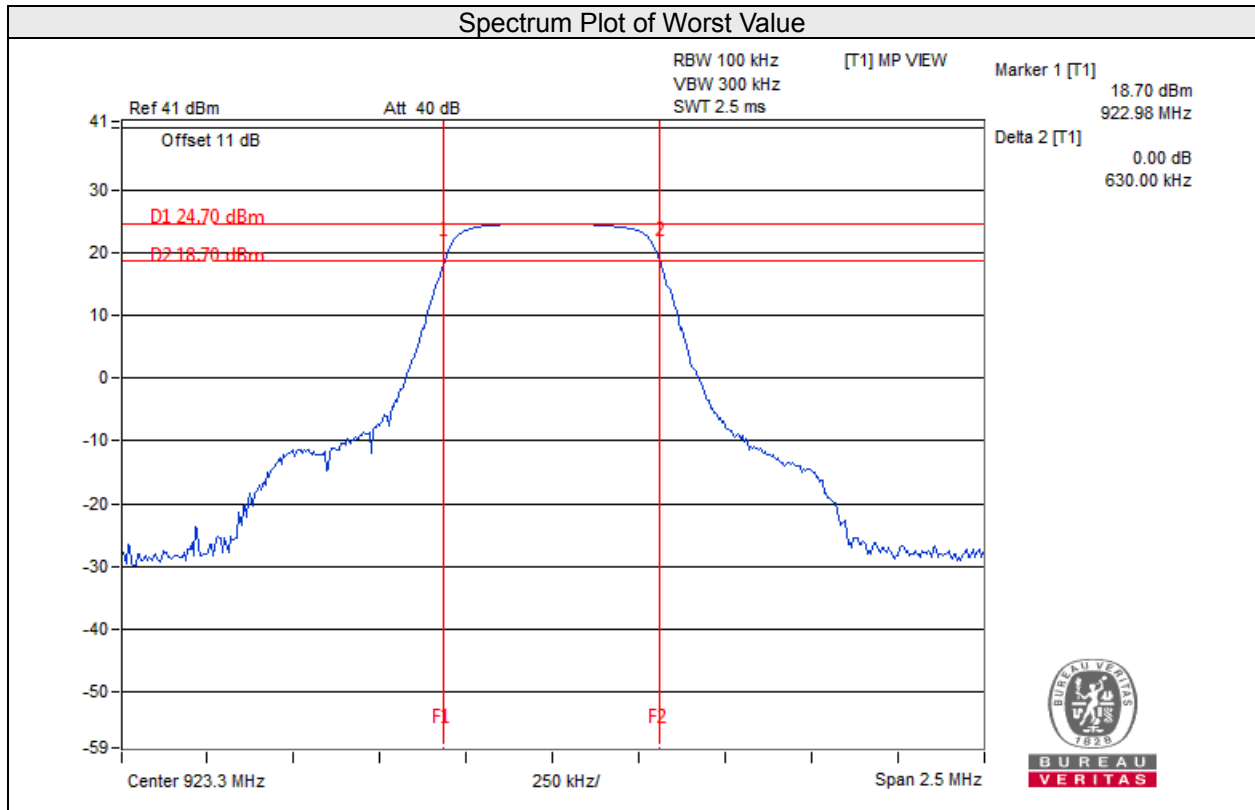
No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	923.3	0.63	0.5	Pass
3	925.1	0.63	0.5	Pass
7	927.5	0.59	0.5	Pass

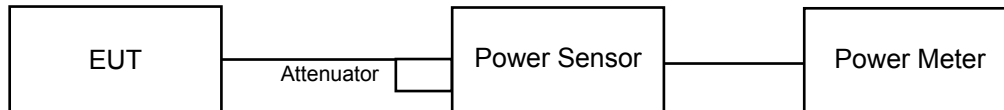


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as item 4.3.6.

4.4.7 Test Results

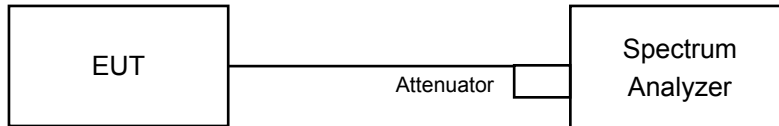
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
0	923.3	279.898	24.47	30.00	Pass
3	925.1	257.632	24.11	30.00	Pass
7	927.5	111.944	20.49	30.00	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- a. Set instrument center frequency to DTS channel center frequency.
- b. Set span to at least 1.5 times the OBW.
- c. Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set VBW $\geq 3 \times \text{RBW}$.
- e. Detector = power averaging (RMS) or sample detector (when RMS not available).
- f. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- g. Sweep time = auto couple.
- h. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- i. Use the peak marker function to determine the maximum amplitude level.

4.5.5 Deviation from Test Standard

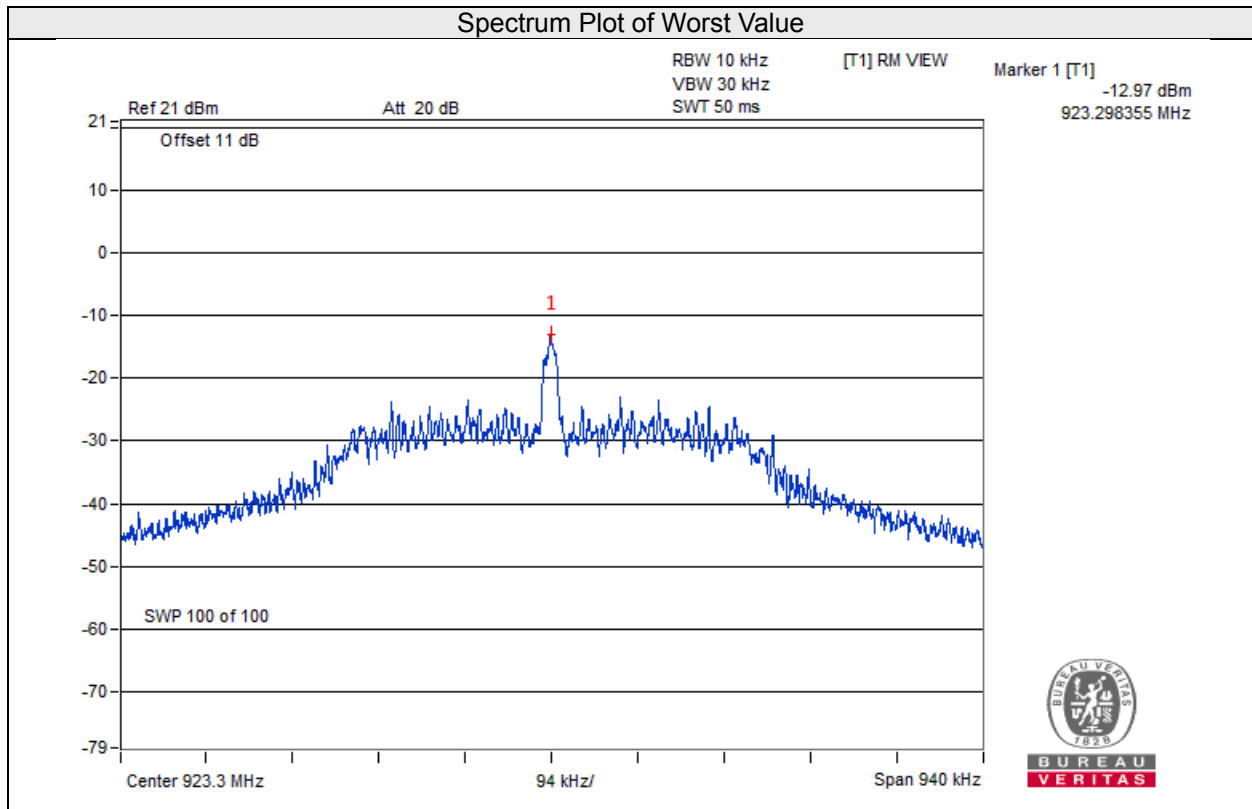
No deviation.

4.5.6 EUT Operating Condition

Same as item 4.3.6

4.5.7 Test Results

Channel	Frequency (MHz)	PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	923.3	-12.97	8.00	Pass
3	925.1	-18.02	8.00	Pass
7	927.5	-18.77	8.00	Pass

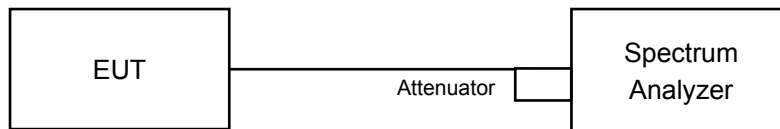


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set the RBW = 100 kHz.
- Set the VBW \geq 300 kHz.
- Detector = average.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW \geq 300 kHz.
- Detector = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

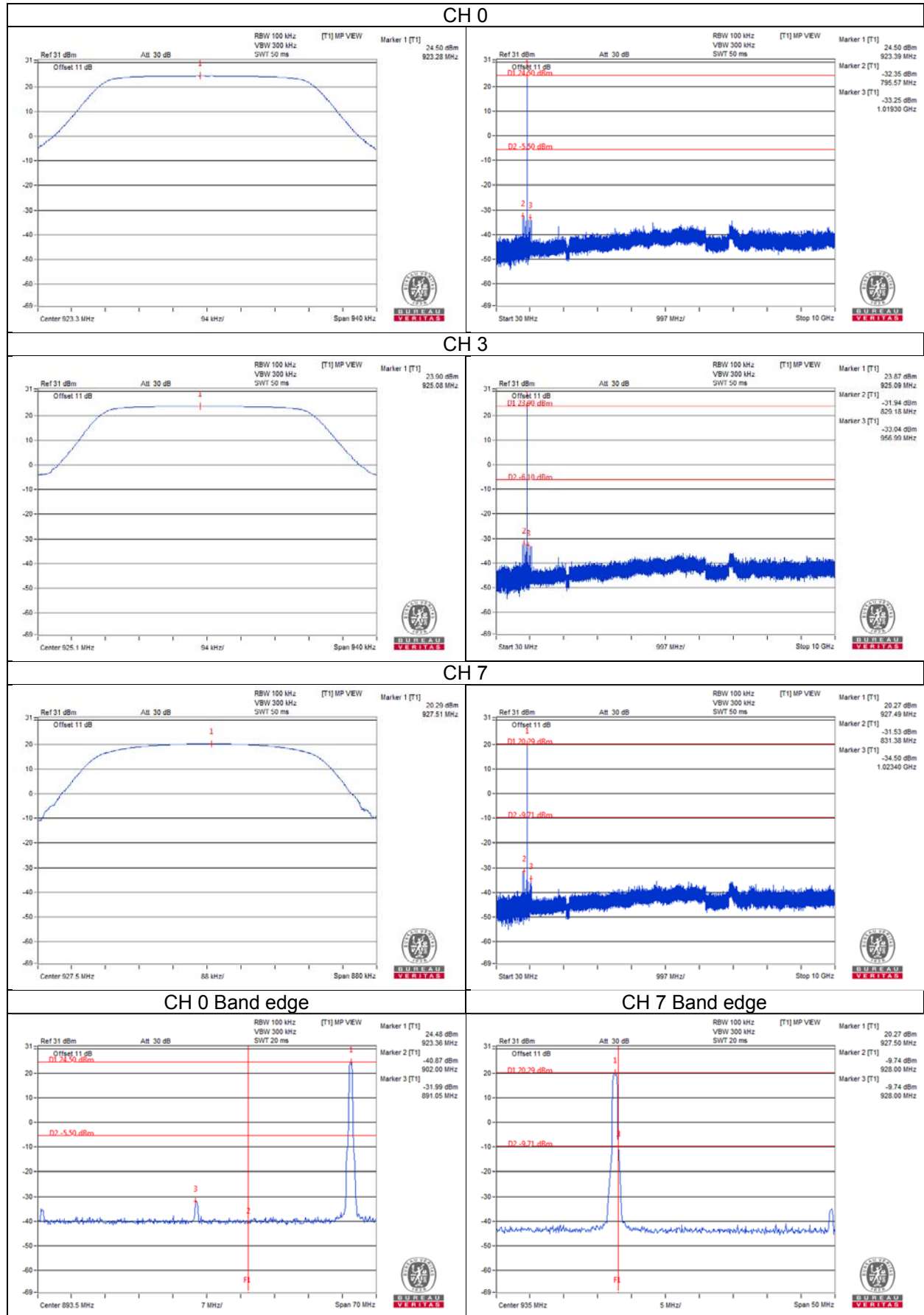
4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as item 4.3.6

4.6.7 Test Results



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 and approved 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 Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

--- END ---