FCC Test Report

Report No.:	RF170421C58A
FCC ID:	UZ7TC200J
Test Model:	TC200J
Received Date:	Jun. 28, 2017
Test Date:	Jul. 05 ~ Aug. 18, 2017
Issued Date:	Aug. 24, 2017
Applicant:	Zebra Technologies Corporation
Address:	1 Zebra Plaza Holtsville New York United States 11742
Manufacturer:	Zebra Technologies Corporation
Address:	1 Zebra Plaza Holtsville New York United States 11742
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.)

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF170421C58A	Original release.	Aug. 24, 2017

1 Certificate of Conformity

Product:	Touch Computer
Brand:	ZEBRA
Test Model:	TC200J
Sample Status:	Engineering sample
Applicant:	Zebra Technologies Corporation
Test Date:	Jul. 05 ~ Aug. 18, 2017
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 EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Aug. 24, 2017

Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** Aug. 24, 2017

Ken Liu / Senior Manager

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 -14.61dB at 0.30640MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00MHz.
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	No antenna connector is used.

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	3.59 dB
	200MHz ~1000MHz	3.60 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	Touch Computer
Brand	ZEBRA
Test Model	TC200J
Status of EUT	Engineering sample
MFD	28MAR17 (For TC200J without keypad using) 26MAY17 (For TC200J with keypad using)
HW Version	EV
SW Version	90-04-03-N-00-E1
Power Supply Rating	5Vdc from adapter or host equipment 12 or 24Vdc from Vehicle Cigarette Adaptor 5Vdc from power pack 3.85Vdc from battery
Transfer Rate	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 150Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	226.464mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter, Gun Handle, Headset (1.25m non-shielded cable without core), Arm Mount, Holster, Vehicle Cigarette Adaptor, Power Pack (Refer to note 6 for more details)
Data Cable Supplied	1.5m shielded USB Type C to Type A cable without core (Refer to note 6 for more details)

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to the original report no. RF170421C58. The differences compared with the original design are adding power bank, Vehicle Cigarette Adaptor, Holster and sale type. All test data had been re-tested.
2. The EUT has four types for sale. (New sale type is marked in boldface.)

Brand	Model	Difference (sale type)
ZEBRA	TC200J	Scanner SE4710 with camera, with 2pin, without keypad
		Scanner SE4710 with camera, with 8pin (option), without keypad
		Scanner SE2100 without camera, with blank, without keypad
		Scanner SE4710 with camera, with blank, with keypad

3. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX

4. The EUT consumes power from the following adapter, Vehicle Cigarette Adaptor, power pack and battery.

Adapter	
Brand	ZEBRA
Model	SAWA-65-20005A
Input Power	100-240Vac, 0.5A, 50-60Hz
Output Power	5Vdc, 2.5A

Vehicle Cigarette Adaptor	
Brand	ZEBRA
Model	SAWA-68-25005A
Input Power	12-24V(3.5A)
Output Power	5V(2.5A)

Power Pack	
Brand	ZEBRA
Model	BT-000343
Rate capacity	2900mAh
Min capacity	2800mAh
Rate Voltage	3.85Vdc

Battery	
Brand	ZEBRA
Model	BT-000334
Rate capacity(mAh)	3000mAh
Min capacity(mAh)	2800mAh
Rate Voltage	3.85Vdc

5. The following antennas were provided to the EUT.

For TC200J without keypad using

Type	Connector	Gain (dBi)		
		2.4GHz	5GHz	BT
PIFA	NA	2.25	4.22	2.25

For TC200J with keypad using

Type	Connector	Gain (dBi)		
		WLAN (2.4GHz)	WLAN (5GHz)	BT
PIFA	NA	1.93	4.48	1.92

6. Accessory devices of EUT are list as below:

Specification of Accessory		
AC Adapter	Brand Name	ZEBRA
	Model Name	SAWA-65-20005A
USB Type C cable	Brand Name	ZEBRA
	P/N Number	CBL-MPM-USB1-01
Ear Headset	Brand Name	ZEBRA
	Model Name	HDST-35MM-PTVP-01
Headset Adapter Cable	Brand Name	ZEBRA
	Model Name	CBL-TC51-HDST35-01
Gun Handle	Brand Name	ZEBRA
	P/N Number	TRG-TC2X-SNP1-01
Vehicle Cigarette Adaptor	Brand Name	ZEBRA
	P/N Number	SAWA-68-25005A
Arm Mount for TC200J without keypad using	Brand Name	ZEBRA
	P/N Number	SG-TC2X-ARMNT-01
Holster for TC200J without keypad using	Brand Name	ZEBRA
	P/N Number	SG-TC2X-HLSTR1-01
Holster for TC200J with keypad using	Brand Name	ZEBRA
	P/N Number	SG-TC20K-HLST1-01
Power Pack	Brand Name	ZEBRA
	P/N Number	BT-000343

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

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	-	√	√	-	Scanner SE4710 (8pin), EUT with adapter+USB+Power Pack
B	-	√	√	-	Scanner SE4710 (8pin), EUT with USB+ Vehicle Cigarette Adaptor
C	√	√	√	√	Scanner SE4710 (Blank), EUT with adapter+USB
D	-	√	√	-	Scanner SE4710 (Blank), EUT with adapter+USB+Power Pack
E	-	√	√	-	Scanner SE4710 (Blank), EUT with USB+ Vehicle Cigarette Adaptor

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-plane (For Test Mode A, B), X-plane (For Test Mode C, D, E).
2. "-": Means no effect.

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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
C	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
C	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
C	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
C	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C, D, E	802.11b	1 to 11	1	DSSS	DBPSK	1.0

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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C, D, E	802.11b	1 to 11	1	DSSS	DBPSK	1.0

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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
C	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
C	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
C	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
C	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

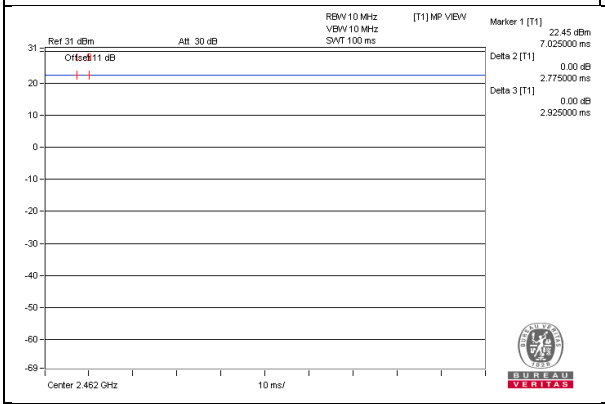
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	20deg. C, 69%RH	120Vac, 60Hz	James Yang
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Frank Liu
PLC	25deg. C, 75%RH	120Vac, 60Hz	Luis Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	Edward Lin

3.3 Duty Cycle of Test Signal

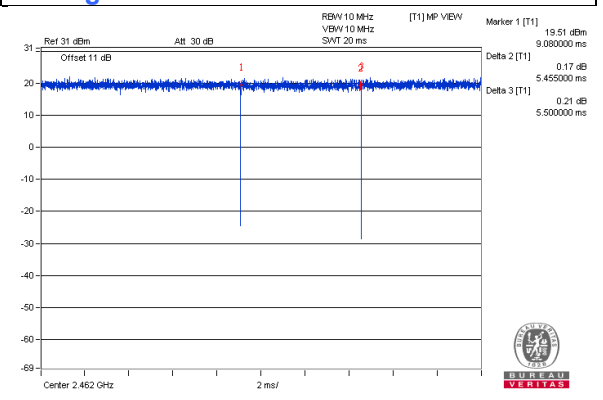
Duty cycle of test signal is < 98%, duty factor is required.

802.11b: Duty cycle = 100%
802.11g: Duty cycle = 5.455/5.5 = 0.992
802.11n (HT20): Duty cycle = 5.08/5.11 = 0.994
802.11n (HT40): Duty cycle = 2.465/2.485 = 0.992

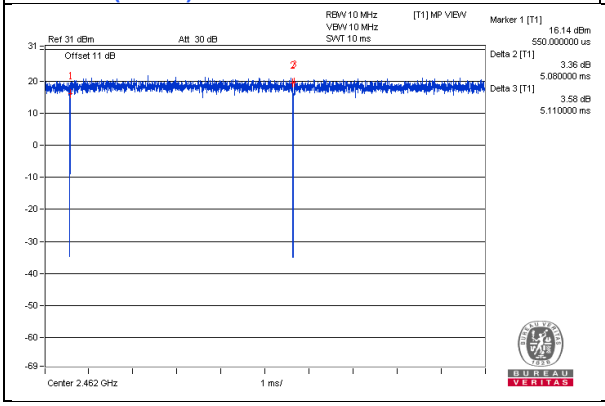
802.11b



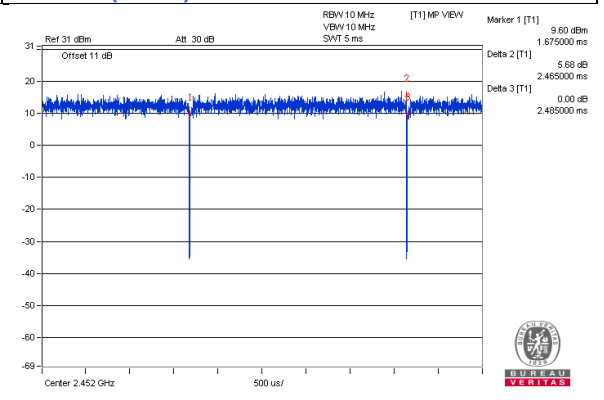
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Conducted Output Power

	802.11b Real Peak Power			
	1Mbps	2Mbps	5.5Mb	11Mbps
Ch1	21.50	-	-	-
Ch6	21.69	21.47	21.67	21.53
Ch11	20.33	-	-	-

	802.11g Real Peak Power							
	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Ch1	21.32	-	-	-	-	-	-	-
Ch6	23.51	23.43	23.38	23.28	23.44	23.29	23.32	23.43
Ch11	20.94	-	-	-	-	-	-	-

	802.11n(HT20) Real Peak Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch1	20.37	-	-	-	-	-	-	-
Ch6	23.55	23.31	23.50	23.34	23.40	23.51	23.33	23.44
Ch11	19.83	-	-	-	-	-	-	-

	802.11n(HT40) Real Peak Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch3	20.34	-	-	-	-	-	-	-
Ch6	22.08	21.88	21.93	21.94	21.99	22.01	21.95	22.07
Ch9	20.02	-	-	-	-	-	-	-

	802.11b Real Average Power			
	1Mbps	2Mbps	5.5Mb	11Mbps
Ch1	19.46	-	-	-
Ch6	19.48	19.32	19.32	19.26
Ch11	18.72	-	-	-

	802.11g Real Average Power							
	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Ch1	16.73	-	-	-	-	-	-	-
Ch6	19.86	19.84	19.77	19.82	19.84	19.73	19.62	19.80
Ch11	14.91	-	-	-	-	-	-	-

	802.11n(HT20) Real Average Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch1	15.25	-	-	-	-	-	-	-
Ch6	20.50	20.43	20.32	20.36	20.41	20.25	20.48	20.37
Ch11	14.47	-	-	-	-	-	-	-

	802.11n(HT40) Real Average Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch3	14.09	-	-	-	-	-	-	-
Ch6	15.15	14.96	15.05	14.92	14.99	14.92	15.00	15.04
Ch9	12.10	-	-	-	-	-	-	-

3.5 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.

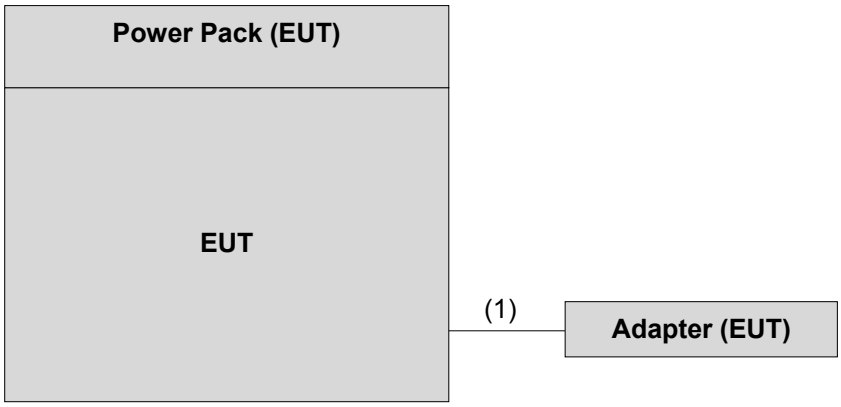
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	DC power supply	Keysight	U8002A	MY56330015	NA	-

Note: All power cords of the above support units are non-shielded (1.8m).

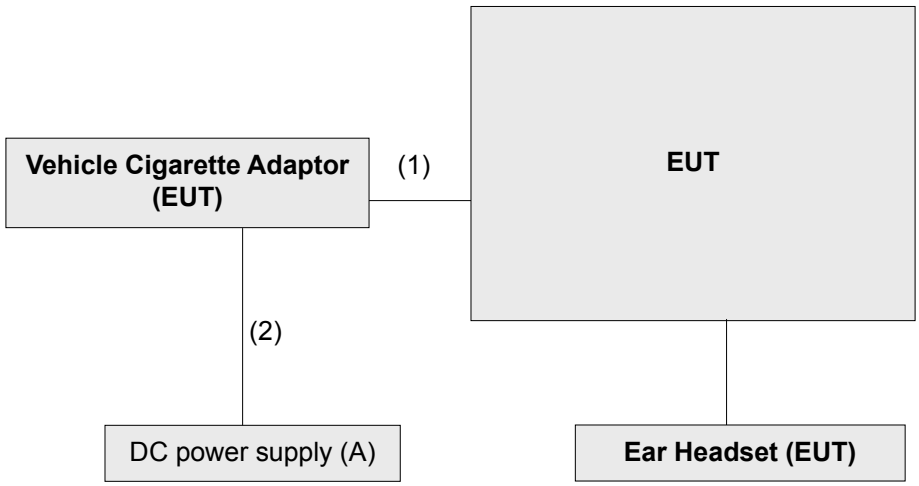
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Type C	1	1.5	Y	1	Accessory of EUT
2.	DC cable	1	1.0	N	0	-

3.5.1 Configuration of System under Test

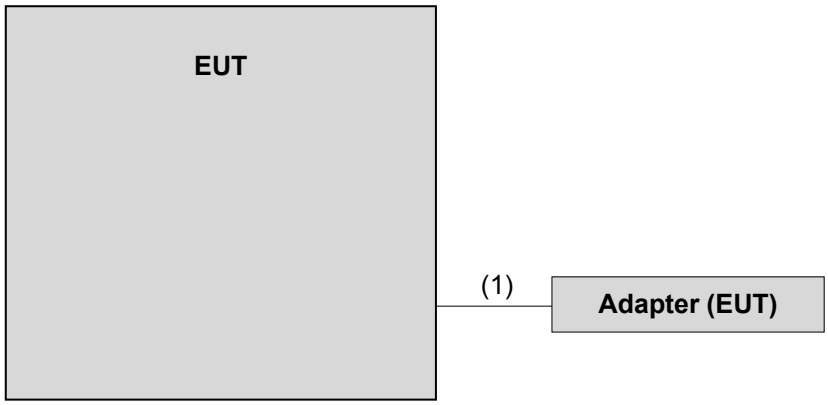
Test Mode A, D



Test Mode B, E



Test Mode C



3.6 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 DTS Meas Guidance v04
ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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 20dB 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 KEYSIGHT	N9038A	MY55420137	Mar. 27, 2017	Mar. 26, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May. 11, 2017	May. 10, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/ 4)	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 01, 2017	Jul. 31, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
High Speed Peak Power Meter	ML2495A	0842014	Apr. 24, 2017	Apr. 23, 2018
Power Sensor	MA2411B	0738404	Apr. 24, 2017	Apr. 23, 2018

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 9.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC 7450F-9.

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. Both X and Y axes 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:

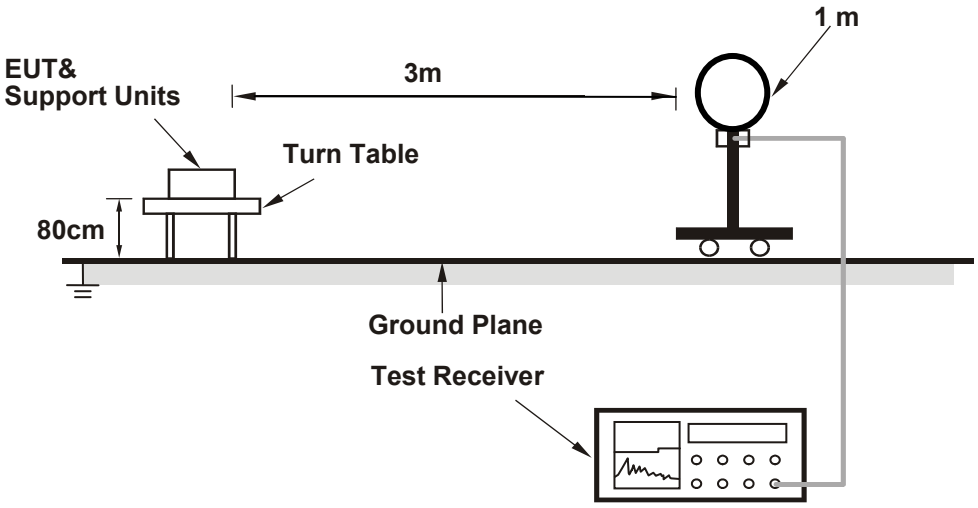
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

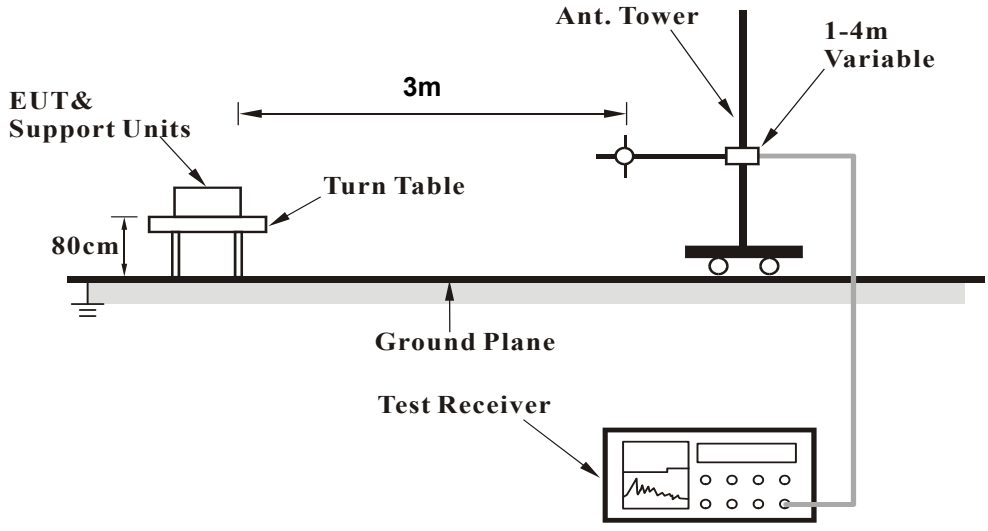
No deviation.

4.1.5 Test Set Up

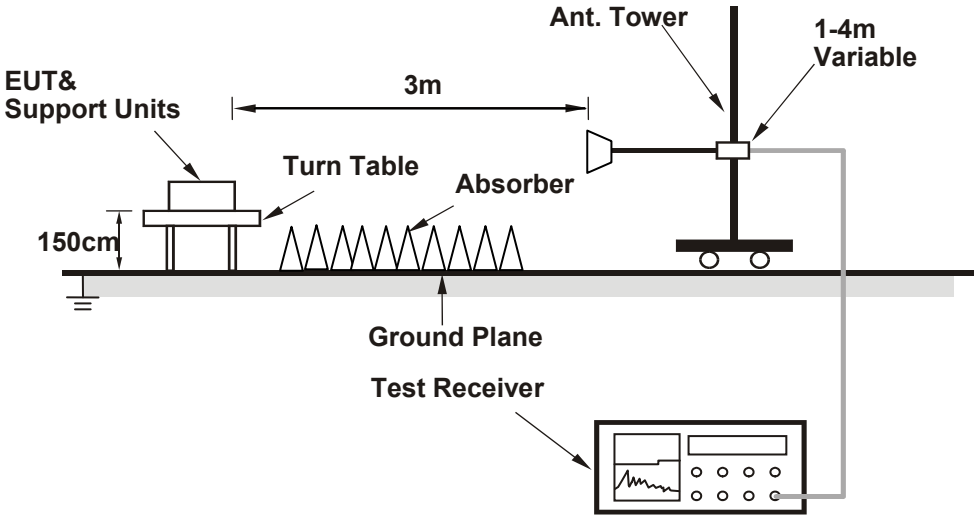
For Radiated emission below 30MHz



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

The EUT has been tested as an independent unit together with other necessary accessories or support units.

4.1.7 Test Results

Above 1GHz Data：

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	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	2390.00	62.1 PK	74.0	-11.9	1.99 H	357	29.9	32.2
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**1.99 H**	**357**	**20.8**	**32.2**
3	*2412.00	110.3 PK			1.89 H	0	78.0	32.3
4	*2412.00	106.3 AV			1.89 H	0	74.0	32.3
5	4824.00	49.6 PK	74.0	-24.4	2.37 H	136	47.6	2.0
6	4824.00	44.5 AV	54.0	-9.5	2.37 H	136	42.5	2.0
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	2390.00	57.0 PK	74.0	-17.0	1.02 V	251	24.8	32.2
2	2390.00	45.7 AV	54.0	-8.3	1.02 V	251	13.5	32.2
3	*2412.00	106.1 PK			1.00 V	244	73.8	32.3
4	*2412.00	102.3 AV			1.00 V	244	70.0	32.3
5	4824.00	48.7 PK	74.0	-25.3	1.49 V	68	46.7	2.0
6	4824.00	42.6 AV	54.0	-11.4	1.49 V	68	40.6	2.0

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	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	*2437.00	109.5 PK			1.56 H	0	77.1	32.4
2	*2437.00	105.7 AV			1.56 H	0	73.3	32.4
3	4874.00	48.6 PK	74.0	-25.4	2.73 H	125	46.4	2.2
4	4874.00	41.9 AV	54.0	-12.1	2.73 H	125	39.7	2.2
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	*2437.00	105.0 PK			3.58 V	274	72.6	32.4
2	*2437.00	101.3 AV			3.58 V	274	68.9	32.4
3	4874.00	48.6 PK	74.0	-25.4	2.75 V	78	46.4	2.2
4	4874.00	42.2 AV	54.0	-11.8	2.75 V	78	40.0	2.2

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	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	*2462.00	109.5 PK			1.87 H	3	76.9	32.6
2	*2462.00	105.8 AV			1.87 H	3	73.2	32.6
3	2483.50	60.9 PK	74.0	-13.1	1.51 H	3	28.2	32.7
4	2483.50	52.8 AV	54.0	-1.2	1.51 H	3	20.1	32.7
5	4924.00	47.1 PK	74.0	-26.9	1.07 H	130	44.9	2.2
6	4924.00	38.4 AV	54.0	-15.6	1.07 H	130	36.2	2.2
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	*2462.00	104.1 PK			3.52 V	303	71.5	32.6
2	*2462.00	100.5 AV			3.52 V	303	67.9	32.6
3	2483.50	59.4 PK	74.0	-14.6	3.51 V	298	26.7	32.7
4	2483.50	47.7 AV	54.0	-6.3	3.51 V	298	15.0	32.7
5	4924.00	48.5 PK	74.0	-25.5	1.02 V	295	46.3	2.2
6	4924.00	40.8 AV	54.0	-13.2	1.02 V	295	38.6	2.2

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.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	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	**2390.00**	**73.0 PK**	**74.0**	**-1.0**	**1.98 H**	**350**	**40.8**	**32.2**
2	2390.00	51.0 AV	54.0	-3.0	1.98 H	350	18.8	32.2
3	*2412.00	106.4 PK			1.92 H	1	74.1	32.3
4	*2412.00	95.8 AV			1.92 H	1	63.5	32.3
5	4824.00	45.4 PK	74.0	-28.6	1.87 H	224	43.4	2.0
6	4824.00	32.2 AV	54.0	-21.8	1.87 H	224	30.2	2.0
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	2390.00	65.6 PK	74.0	-8.4	1.05 V	272	33.4	32.2
2	2390.00	47.6 AV	54.0	-6.4	1.05 V	272	15.4	32.2
3	*2412.00	102.7 PK			1.01 V	268	70.4	32.3
4	*2412.00	92.5 AV			1.01 V	268	60.2	32.3
5	4824.00	45.8 PK	74.0	-28.2	1.57 V	318	43.8	2.0
6	4824.00	32.5 AV	54.0	-21.5	1.57 V	318	30.5	2.0

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	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	*2437.00	113.0 PK			1.97 H	354	80.6	32.4
2	*2437.00	101.9 AV			1.97 H	354	69.5	32.4
3	4874.00	45.8 PK	74.0	-28.2	2.78 H	108	43.6	2.2
4	4874.00	34.1 AV	54.0	-19.9	2.78 H	108	31.9	2.2
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	*2437.00	105.7 PK			1.00 V	295	73.3	32.4
2	*2437.00	95.3 AV			1.00 V	295	62.9	32.4
3	4874.00	44.7 PK	74.0	-29.3	1.75 V	38	42.5	2.2
4	4874.00	32.6 AV	54.0	-21.4	1.75 V	38	30.4	2.2

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	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	*2462.00	105.9 PK			1.84 H	0	73.3	32.6
2	*2462.00	95.8 AV			1.84 H	0	63.2	32.6
3	2483.50	70.2 PK	74.0	-3.8	1.78 H	3	37.5	32.7
4	2483.50	52.5 AV	54.0	-1.5	1.78 H	3	19.8	32.7
5	4924.00	44.9 PK	74.0	-29.1	1.83 H	208	42.7	2.2
6	4924.00	31.7 AV	54.0	-22.3	1.83 H	208	29.5	2.2
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	*2462.00	101.3 PK			1.00 V	264	68.7	32.6
2	*2462.00	91.3 AV			1.00 V	264	58.7	32.6
3	2483.50	64.9 PK	74.0	-9.1	1.07 V	254	32.2	32.7
4	2483.50	48.4 AV	54.0	-5.6	1.07 V	254	15.7	32.7
5	4924.00	44.7 PK	74.0	-29.3	1.67 V	205	42.5	2.2
6	4924.00	31.9 AV	54.0	-22.1	1.67 V	205	29.7	2.2

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.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	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	2390.00	72.8 PK	74.0	-1.2	1.97 H	352	40.6	32.2
2	2390.00	50.9 AV	54.0	-3.1	1.97 H	352	18.7	32.2
3	*2412.00	105.7 PK			1.87 H	1	73.4	32.3
4	*2412.00	94.6 AV			1.87 H	1	62.3	32.3
5	4824.00	45.3 PK	74.0	-28.7	2.93 H	182	43.3	2.0
6	4824.00	32.2 AV	54.0	-21.8	2.93 H	182	30.2	2.0
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	2390.00	64.6 PK	74.0	-9.4	1.09 V	262	32.4	32.2
2	2390.00	47.7 AV	54.0	-6.3	1.09 V	262	15.5	32.2
3	*2412.00	101.5 PK			1.00 V	262	69.2	32.3
4	*2412.00	90.9 AV			1.00 V	262	58.6	32.3
5	4824.00	45.5 PK	74.0	-28.5	2.76 V	240	43.5	2.0
6	4824.00	31.9 AV	54.0	-22.1	2.76 V	240	29.9	2.0

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	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	*2437.00	110.5 PK			2.13 H	1	78.1	32.4
2	*2437.00	99.5 AV			2.13 H	1	67.1	32.4
3	4874.00	45.4 PK	74.0	-28.6	1.55 H	246	43.2	2.2
4	4874.00	32.0 AV	54.0	-22.0	1.55 H	246	29.8	2.2
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	*2437.00	106.0 PK			1.00 V	279	73.6	32.4
2	*2437.00	95.7 AV			1.00 V	279	63.3	32.4
3	4874.00	44.9 PK	74.0	-29.1	1.65 V	92	42.7	2.2
4	4874.00	32.0 AV	54.0	-22.0	1.65 V	92	29.8	2.2

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	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	*2462.00	105.1 PK			1.91 H	356	72.5	32.6
2	*2462.00	94.8 AV			1.91 H	356	62.2	32.6
3	2483.50	72.6 PK	74.0	-1.4	2.13 H	353	39.9	32.7
4	2483.50	52.3 AV	54.0	-1.7	2.13 H	353	19.6	32.7
5	4924.00	45.0 PK	74.0	-29.0	1.62 H	204	42.8	2.2
6	4924.00	31.7 AV	54.0	-22.3	1.62 H	204	29.5	2.2
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	*2462.00	100.4 PK			1.00 V	261	67.8	32.6
2	*2462.00	91.2 AV			1.00 V	261	58.6	32.6
3	2483.50	65.2 PK	74.0	-8.8	1.10 V	255	32.5	32.7
4	2483.50	49.4 AV	54.0	-4.6	1.10 V	255	16.7	32.7
5	4924.00	46.0 PK	74.0	-28.0	1.89 V	319	43.8	2.2
6	4924.00	31.9 AV	54.0	-22.1	1.89 V	319	29.7	2.2

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.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	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	2390.00	72.1 PK	74.0	-1.9	1.97 H	349	39.9	32.2
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**1.97 H**	**349**	**20.8**	**32.2**
3	*2422.00	101.8 PK			1.98 H	352	69.4	32.4
4	*2422.00	91.5 AV			1.98 H	352	59.1	32.4
5	4904.00	45.1 PK	74.0	-28.9	1.93 H	77	42.9	2.2
6	4904.00	32.3 AV	54.0	-21.7	1.93 H	77	30.1	2.2
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	2390.00	63.7 PK	74.0	-10.3	1.07 V	263	31.5	32.2
2	2390.00	47.4 AV	54.0	-6.6	1.07 V	263	15.2	32.2
3	*2422.00	96.6 PK			1.00 V	261	64.2	32.4
4	*2422.00	86.3 AV			1.00 V	261	53.9	32.4
5	4844.00	45.4 PK	74.0	-28.6	2.88 V	162	43.3	2.1
6	4844.00	32.0 AV	54.0	-22.0	2.88 V	162	29.9	2.1

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	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	2390.00	63.0 PK	74.0	-11.0	2.93 H	354	30.8	32.2
2	2390.00	48.1 AV	54.0	-5.9	2.93 H	354	15.9	32.2
3	*2437.00	105.3 PK			2.75 H	353	72.9	32.4
4	*2437.00	94.2 AV			2.75 H	353	61.8	32.4
5	2483.50	71.4 PK	74.0	-2.6	2.96 H	355	38.7	32.7
6	2483.50	52.7 AV	54.0	-1.3	2.96 H	355	20.0	32.7
7	4874.00	45.0 PK	74.0	-29.0	1.13 H	234	42.8	2.2
8	4874.00	32.1 AV	54.0	-21.9	1.13 H	234	29.9	2.2
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	2390.00	57.0 PK	74.0	-17.0	1.05 V	277	24.8	32.2
2	2390.00	45.5 AV	54.0	-8.5	1.05 V	277	13.3	32.2
3	*2437.00	98.0 PK			1.00 V	279	65.6	32.4
4	*2437.00	88.2 AV			1.00 V	279	55.8	32.4
5	2483.50	59.5 PK	74.0	-14.5	1.07 V	283	26.8	32.7
6	2483.50	46.6 AV	54.0	-7.4	1.07 V	283	13.9	32.7
7	4874.00	45.3 PK	74.0	-28.7	2.88 V	345	43.1	2.2
8	4874.00	32.0 AV	54.0	-22.0	2.88 V	345	29.8	2.2

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.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	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	*2452.00	101.1 PK			1.93 H	352	68.5	32.6
2	*2452.00	90.2 AV			1.93 H	352	57.6	32.6
3	2483.50	67.9 PK	74.0	-6.1	1.89 H	346	35.2	32.7
4	2483.50	52.9 AV	54.0	-1.1	1.89 H	346	20.2	32.7
5	4904.00	44.7 PK	74.0	-29.3	1.73 H	260	42.5	2.2
6	4904.00	31.9 AV	54.0	-22.1	1.73 H	260	29.7	2.2
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	*2452.00	94.8 PK			1.00 V	250	62.2	32.6
2	*2452.00	85.3 AV			1.00 V	250	52.7	32.6
3	2483.50	61.5 PK	74.0	-12.5	1.01 V	252	28.8	32.7
4	2483.50	48.2 AV	54.0	-5.8	1.01 V	252	15.5	32.7
5	4904.00	44.4 PK	74.0	-29.6	2.73 V	42	42.2	2.2
6	4904.00	32.1 AV	54.0	-21.9	2.73 V	42	29.9	2.2

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.

Below 1GHz Data:

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	A

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	64.11	25.5 QP	40.0	-14.5	2.00 H	219	40.7	-15.2
2	191.60	29.5 QP	43.5	-14.0	2.00 H	279	45.5	-16.0
3	193.15	32.5 QP	43.5	-11.0	1.00 H	266	48.5	-16.0
4	252.24	38.8 QP	46.0	-7.2	1.00 H	280	52.7	-13.9
5	267.79	39.9 QP	46.0	-6.1	1.00 H	248	53.0	-13.1
6	291.11	38.3 QP	46.0	-7.7	1.00 H	245	50.5	-12.2
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	48.56	30.4 QP	40.0	-9.6	1.00 V	7	44.8	-14.4
2	64.11	30.5 QP	40.0	-9.5	1.50 V	13	45.7	-15.2
3	191.60	31.2 QP	43.5	-12.3	1.00 V	7	47.2	-16.0
4	194.71	32.4 QP	43.5	-11.1	1.00 V	7	48.5	-16.1
5	255.35	36.1 QP	46.0	-9.9	1.00 V	7	49.9	-13.8
6	264.68	37.7 QP	46.0	-8.3	2.00 V	149	51.0	-13.3
7	294.22	33.2 QP	46.0	-12.8	1.50 V	173	45.4	-12.2

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	B

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	57.89	20.3 QP	40.0	-19.7	2.00 H	294	34.8	-14.5
2	121.63	23.4 QP	43.5	-20.1	2.00 H	248	39.3	-15.9
3	186.94	25.2 QP	43.5	-18.3	1.51 H	93	40.8	-15.6
4	222.70	29.3 QP	46.0	-16.7	1.51 H	104	45.3	-16.0
5	314.43	28.0 QP	46.0	-18.0	1.01 H	59	39.6	-11.6
6	729.56	39.2 QP	46.0	-6.8	1.01 H	322	42.6	-3.4
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	29.90	28.4 QP	40.0	-11.6	1.00 V	163	44.4	-16.0
2	74.99	25.5 QP	40.0	-14.5	1.00 V	273	42.3	-16.8
3	132.52	25.7 QP	43.5	-17.8	2.00 V	279	40.7	-15.0
4	314.43	28.3 QP	46.0	-17.7	1.49 V	18	39.9	-11.6
5	373.51	29.3 QP	46.0	-16.7	1.49 V	312	40.0	-10.7
6	390.62	28.6 QP	46.0	-17.4	1.00 V	91	39.0	-10.4

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	C

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	30.00	29.4 QP	40.0	-10.6	1.51 H	9	45.4	-16.0
2	70.74	27.2 QP	40.0	-12.8	2.00 H	167	42.9	-15.7
3	165.80	17.6 QP	43.5	-25.9	1.51 H	14	31.0	-13.4
4	497.54	25.3 QP	46.0	-20.7	1.51 H	315	31.7	-6.4
5	747.80	37.8 QP	46.0	-8.2	1.01 H	112	38.3	-0.5
6	844.80	33.4 QP	46.0	-12.6	1.51 H	95	31.9	1.5
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	30.00	35.4 QP	40.0	-4.6	1.00 V	333	51.4	-16.0
2	61.04	18.2 QP	40.0	-21.8	1.99 V	250	32.8	-14.6
3	158.04	17.8 QP	43.5	-25.7	1.99 V	253	30.8	-13.0
4	450.98	23.7 QP	46.0	-22.3	1.00 V	289	31.2	-7.5
5	633.34	28.6 QP	46.0	-17.4	1.49 V	15	31.6	-3.0
6	924.34	34.7 QP	46.0	-11.3	1.99 V	175	31.2	3.5

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	D

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	115.41	26.7 QP	43.5	-16.8	2.00 H	282	43.3	-16.6
2	191.60	30.7 QP	43.5	-12.8	1.00 H	275	46.7	-16.0
3	214.92	32.3 QP	43.5	-11.2	1.00 H	275	48.4	-16.1
4	250.68	38.7 QP	46.0	-7.3	1.00 H	239	52.7	-14.0
5	263.12	37.7 QP	46.0	-8.3	1.00 H	243	51.1	-13.4
6	745.11	37.0 QP	46.0	-9.0	2.00 H	7	39.9	-2.9
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	45.45	29.6 QP	40.0	-10.4	1.00 V	26	44.3	-14.7
2	68.77	30.5 QP	40.0	-9.5	1.50 V	19	46.4	-15.9
3	121.63	26.2 QP	43.5	-17.3	1.00 V	197	42.1	-15.9
4	197.82	31.9 QP	43.5	-11.6	1.00 V	237	48.1	-16.2
5	263.12	33.8 QP	46.0	-12.2	1.50 V	178	47.2	-13.4
6	420.16	22.7 QP	46.0	-23.3	1.00 V	178	32.6	-9.9

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	E

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	118.52	24.4 QP	43.5	-19.1	1.50 H	85	40.5	-16.1
2	137.18	21.9 QP	43.5	-21.6	1.50 H	313	36.3	-14.4
3	222.70	25.4 QP	46.0	-20.6	1.50 H	108	41.4	-16.0
4	314.43	27.6 QP	46.0	-18.4	1.00 H	42	39.2	-11.6
5	393.73	25.5 QP	46.0	-20.5	1.00 H	136	35.9	-10.4
6	746.67	34.2 QP	46.0	-11.8	1.00 H	120	37.0	-2.8
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	29.90	27.3 QP	40.0	-12.7	1.01 V	318	43.3	-16.0
2	74.99	24.8 QP	40.0	-15.2	1.01 V	287	41.6	-16.8
3	314.43	28.6 QP	46.0	-17.4	1.01 V	13	40.2	-11.6
4	390.62	29.0 QP	46.0	-17.0	1.01 V	197	39.4	-10.4
5	415.49	29.4 QP	46.0	-16.6	1.01 V	171	39.5	-10.1
6	490.12	28.5 QP	46.0	-17.5	1.01 V	338	37.2	-8.7

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

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

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	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

a. 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

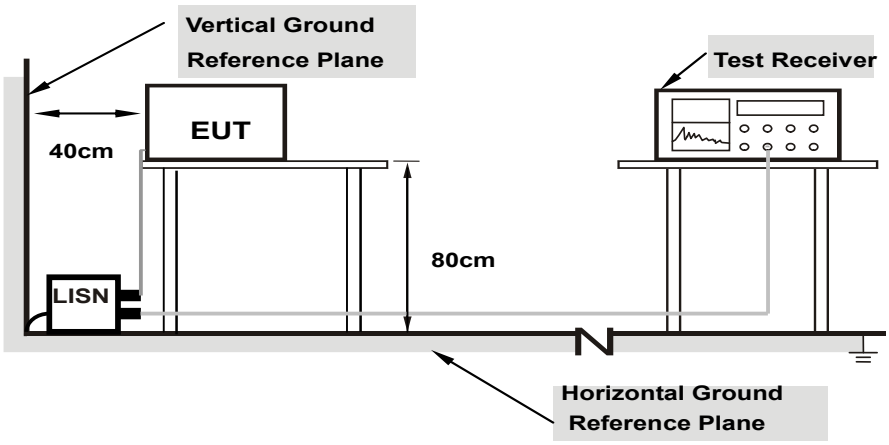
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

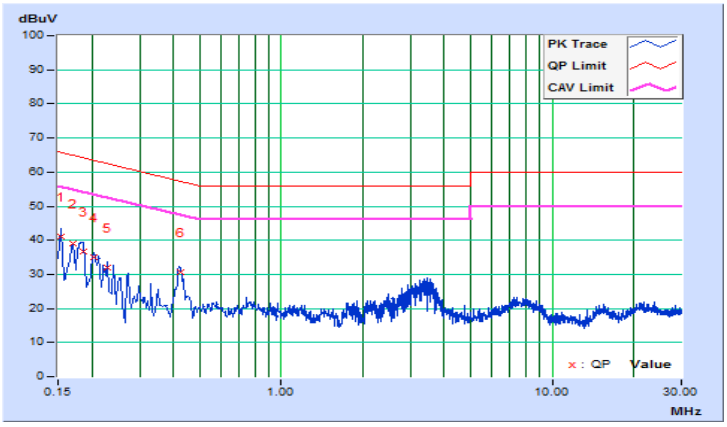
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.41	30.66	15.97	41.07	26.38	65.79	55.79	-24.72	-29.41
2	0.16967	10.41	28.74	14.56	39.15	24.97	64.98	54.98	-25.83	-30.01
3	0.18519	10.42	26.18	11.80	36.60	22.22	64.25	54.25	-27.65	-32.03
4	0.20243	10.43	24.61	11.51	35.04	21.94	63.51	53.51	-28.47	-31.57
5	0.22672	10.44	21.62	9.35	32.06	19.79	62.57	52.57	-30.51	-32.78
6	0.42370	10.51	20.18	11.65	30.69	22.16	57.38	47.38	-26.69	-25.22

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.

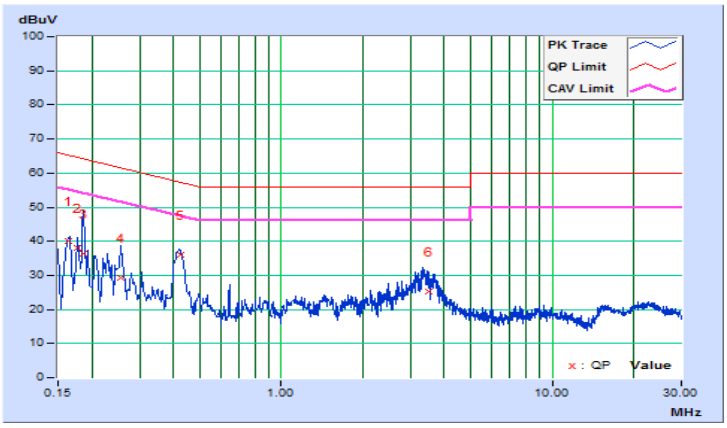


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16309	10.17	29.78	16.51	39.95	26.68	65.31	55.31	-25.36	-28.63
2	0.17605	10.18	27.76	14.80	37.94	24.98	64.67	54.67	-26.73	-29.69
3	0.18508	10.19	26.17	12.82	36.36	23.01	64.25	54.25	-27.89	-31.24
4	0.25458	10.21	18.99	9.74	29.20	19.95	61.61	51.61	-32.41	-31.66
5	0.42370	10.23	25.92	19.08	36.15	29.31	57.38	47.38	-21.23	-18.07
6	3.49696	10.39	14.86	5.14	25.25	15.53	56.00	46.00	-30.75	-30.47

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.

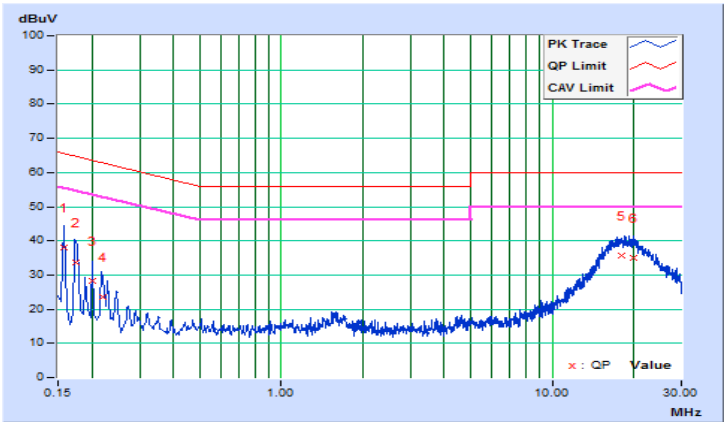


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15719	10.41	27.66	3.28	38.07	13.69	65.61	55.61	-27.54	-41.92
2	0.17374	10.42	23.09	1.91	33.51	12.33	64.78	54.78	-31.27	-42.45
3	0.19978	10.43	17.72	-0.29	28.15	10.14	63.62	53.62	-35.47	-43.48
4	0.22038	10.44	12.98	-1.90	23.42	8.54	62.80	52.80	-39.38	-44.26
5	17.95223	11.32	24.46	18.54	35.78	29.86	60.00	50.00	-24.22	-20.14
6	19.90332	11.42	23.52	17.42	34.94	28.84	60.00	50.00	-25.06	-21.16

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.

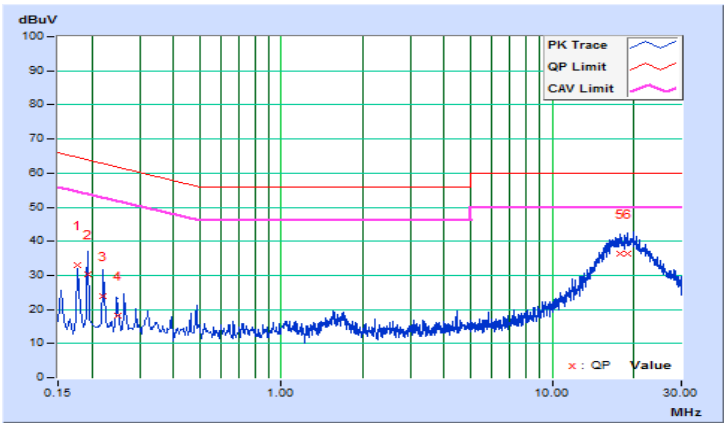


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17605	10.18	22.68	2.68	32.86	12.86	64.67	54.67	-31.81	-41.81
2	0.19255	10.19	20.21	-0.29	30.40	9.90	63.93	53.93	-33.53	-44.03
3	0.21851	10.20	13.77	-1.85	23.97	8.35	62.88	52.88	-38.91	-44.53
4	0.24796	10.21	7.81	-1.85	18.02	8.36	61.83	51.83	-43.81	-43.47
5	17.72936	10.96	25.54	19.33	36.50	30.29	60.00	50.00	-23.50	-19.71
6	18.93364	11.01	25.45	19.11	36.46	30.12	60.00	50.00	-23.54	-19.88

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.

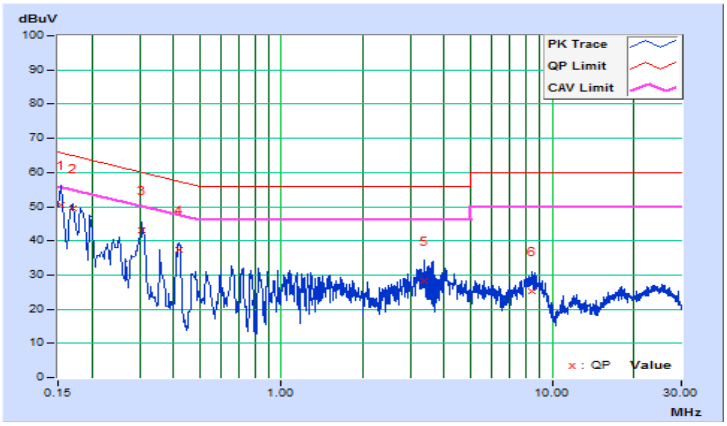


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.41	40.09	25.75	50.50	36.16	65.79	55.79	-15.29	-19.63
2	0.16967	10.41	39.25	26.31	49.66	36.72	64.98	54.98	-15.32	-18.26
3	**0.30640**	**10.47**	**32.68**	**24.99**	**43.15**	**35.46**	**60.07**	**50.07**	**-16.92**	**-14.61**
4	0.41890	10.51	26.99	21.96	37.50	32.47	57.47	47.47	-19.97	-15.00
5	3.38357	10.62	17.75	5.32	28.37	15.94	56.00	46.00	-27.63	-30.06
6	8.45484	10.84	14.37	6.74	25.21	17.58	60.00	50.00	-34.79	-32.42

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.

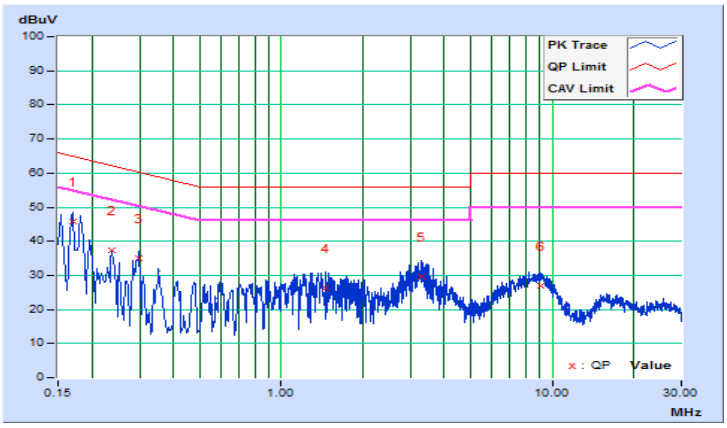


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	10.17	35.74	22.02	45.91	32.19	64.98	54.98	-19.07	-22.79
2	0.23602	10.21	27.00	17.01	37.21	27.22	62.24	52.24	-25.03	-25.02
3	0.29858	10.21	24.86	15.09	35.07	25.30	60.28	50.28	-25.21	-24.98
4	1.45203	10.27	16.04	4.36	26.31	14.63	56.00	46.00	-29.69	-31.37
5	3.29364	10.38	19.19	5.03	29.57	15.41	56.00	46.00	-26.43	-30.59
6	9.08044	10.61	16.21	8.77	26.82	19.38	60.00	50.00	-33.18	-30.62

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.

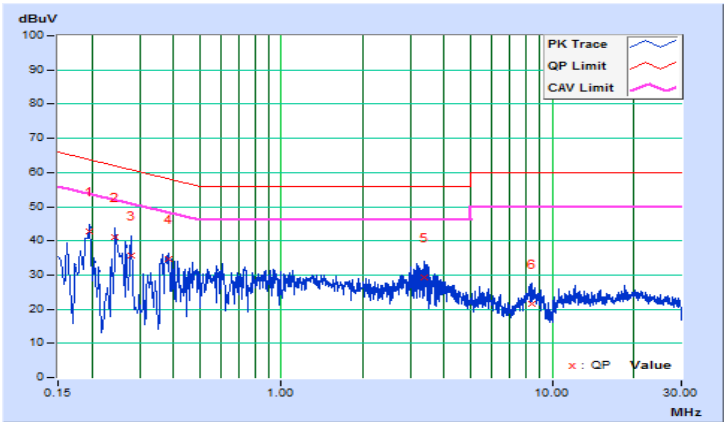


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19692	10.43	32.20	17.63	42.63	28.06	63.74	53.74	-21.11	-25.68
2	0.24384	10.45	30.68	19.39	41.13	29.84	61.96	51.96	-20.83	-22.12
3	0.27903	10.46	25.20	6.37	35.66	16.83	60.84	50.84	-25.18	-34.01
4	0.38401	10.50	24.02	9.28	34.52	19.78	58.19	48.19	-23.67	-28.41
5	3.38748	10.62	18.59	6.77	29.21	17.39	56.00	46.00	-26.79	-28.61
6	8.41183	10.84	10.69	4.31	21.53	15.15	60.00	50.00	-38.47	-34.85

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.

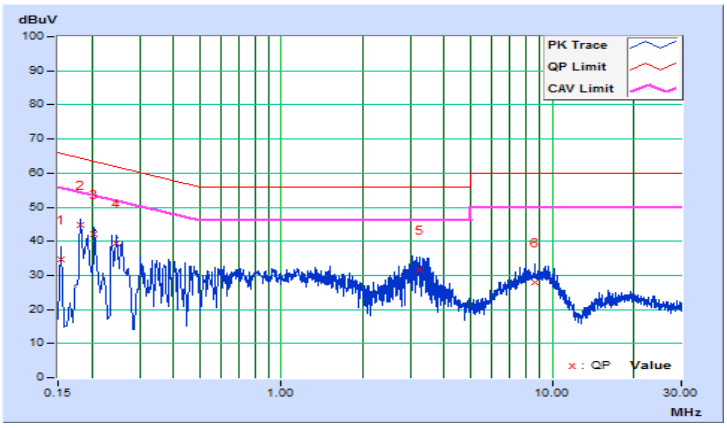


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.16	24.46	3.62	34.62	13.78	65.79	55.79	-31.17	-42.01
2	0.18128	10.18	34.47	21.25	44.65	31.43	64.43	54.43	-19.78	-23.00
3	0.20474	10.20	31.89	14.99	42.09	25.19	63.42	53.42	-21.33	-28.23
4	0.24775	10.21	29.25	17.13	39.46	27.34	61.83	51.83	-22.37	-24.49
5	3.25063	10.38	21.40	8.87	31.78	19.25	56.00	46.00	-24.22	-26.75
6	8.66207	10.59	17.45	11.93	28.04	22.52	60.00	50.00	-31.96	-27.48

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.

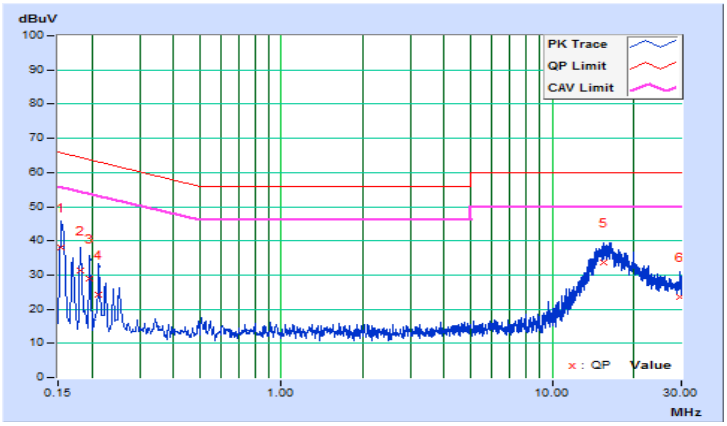


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	E		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.41	27.78	2.70	38.19	13.11	65.79	55.79	-27.60	-42.68
2	0.18128	10.42	20.80	0.46	31.22	10.88	64.43	54.43	-33.21	-43.55
3	0.19692	10.43	18.55	1.39	28.98	11.82	63.74	53.74	-34.76	-41.92
4	0.21256	10.44	13.80	2.35	24.24	12.79	63.10	53.10	-38.86	-40.31
5	15.48893	11.18	22.37	12.88	33.55	24.06	60.00	50.00	-26.45	-25.94
6	29.76043	11.77	11.84	1.70	23.61	13.47	60.00	50.00	-36.39	-36.53

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.

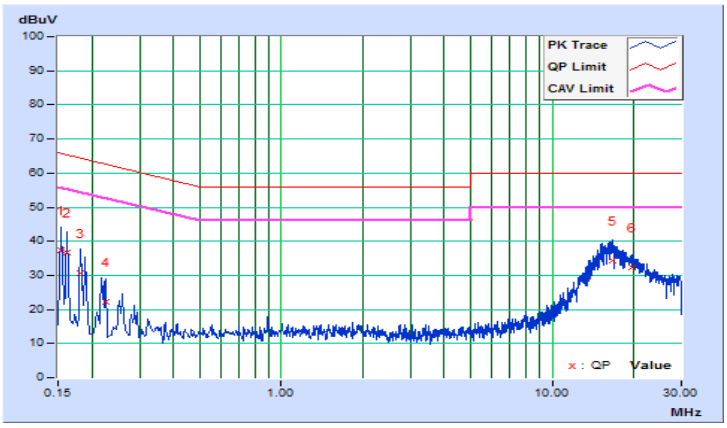


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	E		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.16	27.16	2.36	37.32	12.52	65.79	55.79	-28.47	-43.27
2	0.16173	10.17	26.61	2.14	36.78	12.31	65.37	55.37	-28.59	-43.06
3	0.18128	10.18	20.38	0.50	30.56	10.68	64.43	54.43	-33.87	-43.75
4	0.22434	10.20	12.12	2.66	22.32	12.86	62.66	52.66	-40.34	-39.80
5	16.67366	10.91	23.59	15.15	34.50	26.06	60.00	50.00	-25.50	-23.94
6	19.75865	11.05	21.23	12.67	32.28	23.72	60.00	50.00	-27.72	-26.28

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.

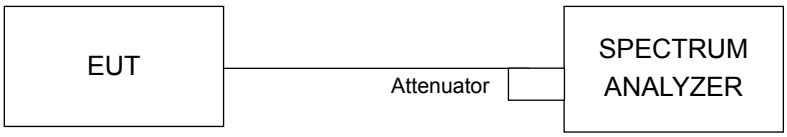


4.3 6dB Bandwidth Measurement

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

4.3.5 Deviation fromTest 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

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	9.08	0.5	Pass
6	2437	9.08	0.5	Pass
11	2462	9.57	0.5	Pass

802.11g

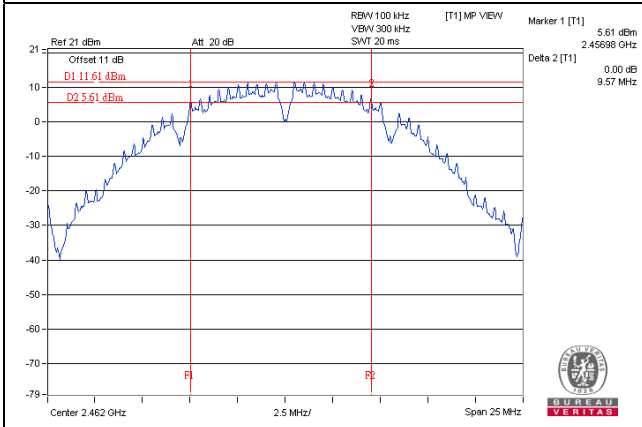
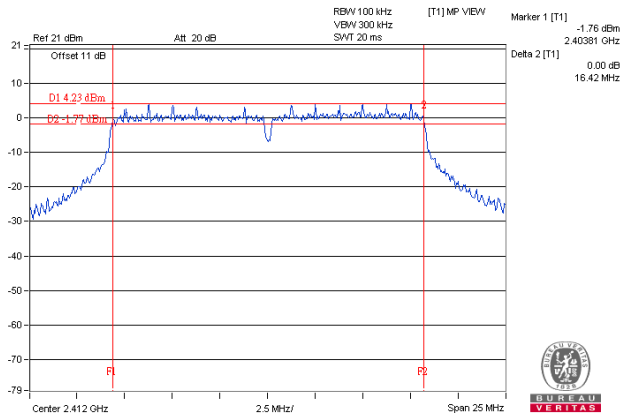
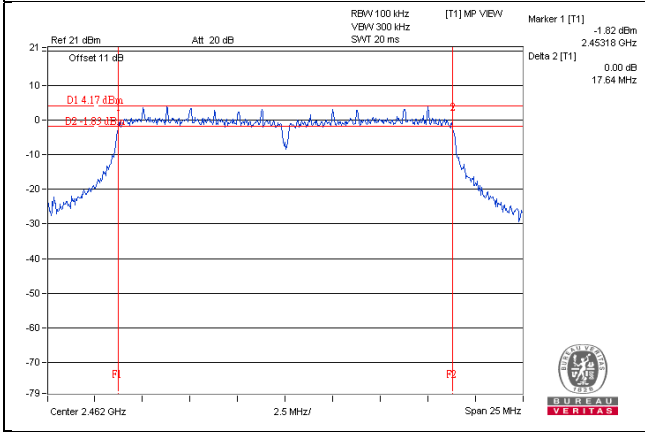
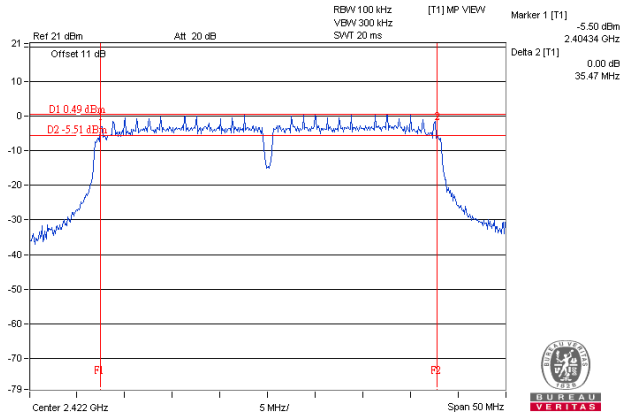
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.42	0.5	Pass
6	2437	16.39	0.5	Pass
11	2462	16.41	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.63	0.5	Pass
6	2437	17.64	0.5	Pass
11	2462	17.64	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.47	0.5	Pass
6	2437	35.12	0.5	Pass
9	2452	35.27	0.5	Pass

Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (HT20)	**802.11n (HT40)**
	

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

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

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

Peak Power

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	141.254	21.50	30	Pass
6	2437	147.571	21.69	30	Pass
11	2462	107.895	20.33	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	135.519	21.32	30	Pass
6	2437	224.388	23.51	30	Pass
11	2462	124.165	20.94	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	108.893	20.37	30	Pass
6	2437	**226.464**	23.55	30	Pass
11	2462	96.161	19.83	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	108.143	20.34	30	Pass
6	2437	161.436	22.08	30	Pass
9	2452	100.462	20.02	30	Pass

Average Power

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	88.308	19.46
6	2437	88.716	19.48
11	2462	74.473	18.72

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	47.098	16.73
6	2437	96.828	19.86
11	2462	30.974	14.91

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	33.497	15.25
6	2437	112.720	20.52
11	2462	29.309	14.67

802.11n (HT40)

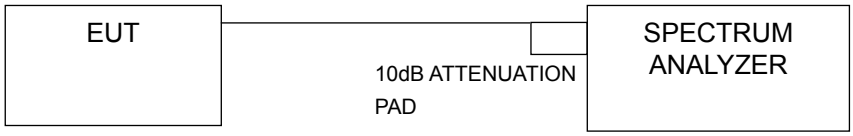
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	25.645	14.09
6	2437	32.734	15.15
9	2452	16.218	12.10

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

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

802.11b

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-3.26	8.00	Pass
6	2437	-3.80	8.00	Pass
11	2462	-2.41	8.00	Pass

802.11g

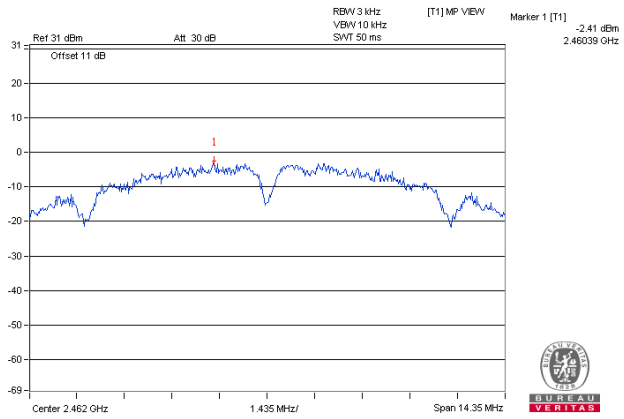
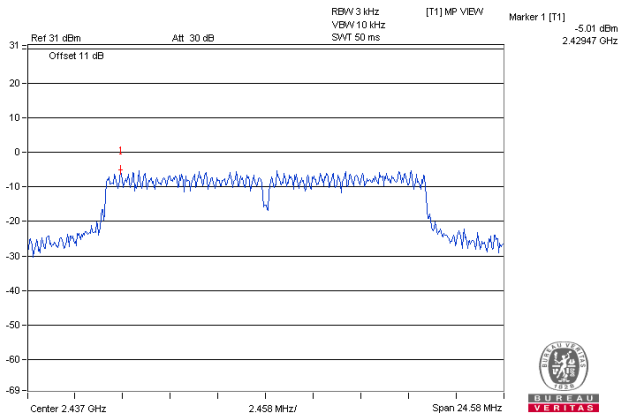
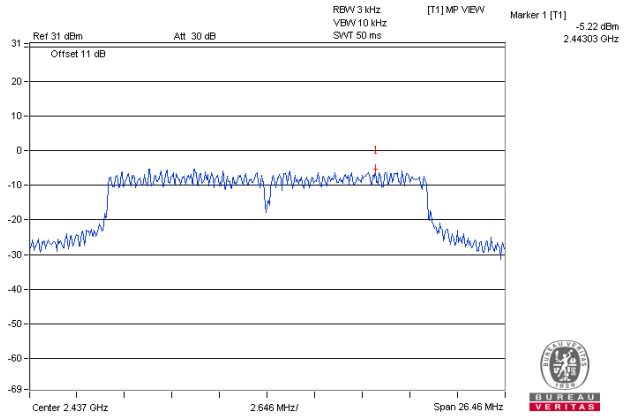
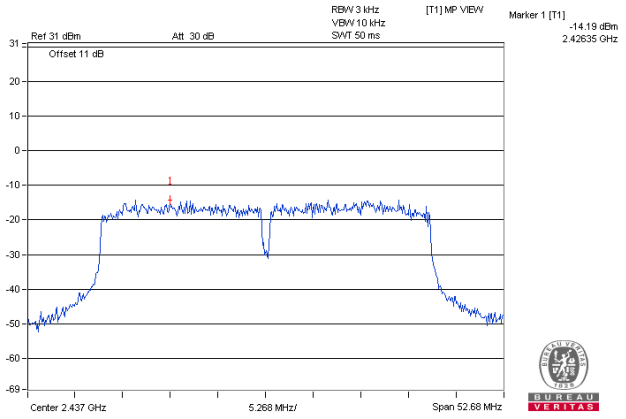
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-9.71	8.00	Pass
6	2437	-5.01	8.00	Pass
11	2462	-10.47	8.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-10.61	8.00	Pass
6	2437	-5.22	8.00	Pass
11	2462	-9.63	8.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
3	2422	-14.36	8.00	Pass
6	2437	-14.19	8.00	Pass
9	2452	-16.42	8.00	Pass

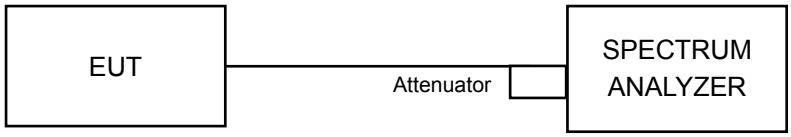
Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (HT20)	**802.11n (HT40)**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB 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

a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = average.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Ensure that the number of measurement points ≥ span/RBW
d. According to measurement points to set differ measurement span.
e. Detector = average.
f. Trace Mode = max hold.
g. Sweep = auto couple.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

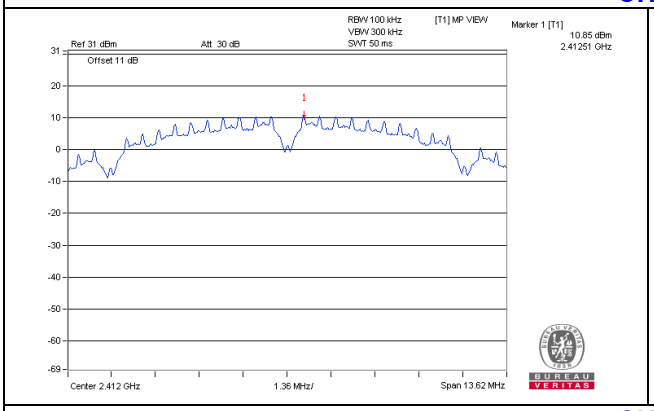
Same as Item 4.3.6

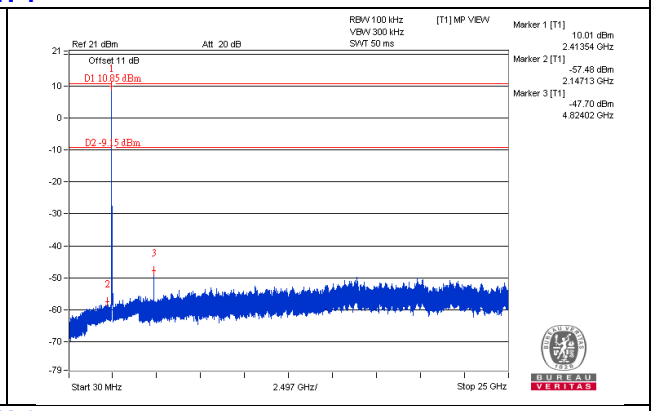
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

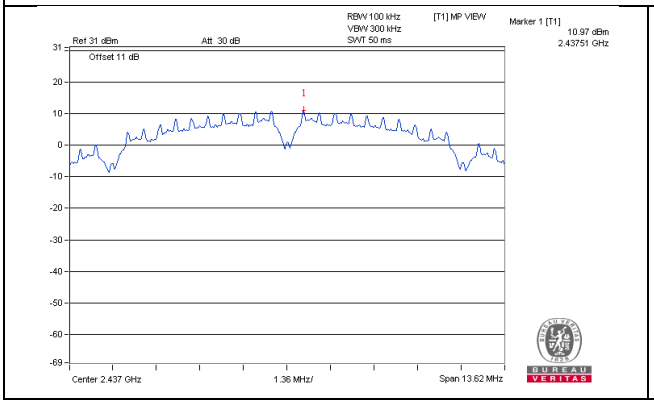
802.11b

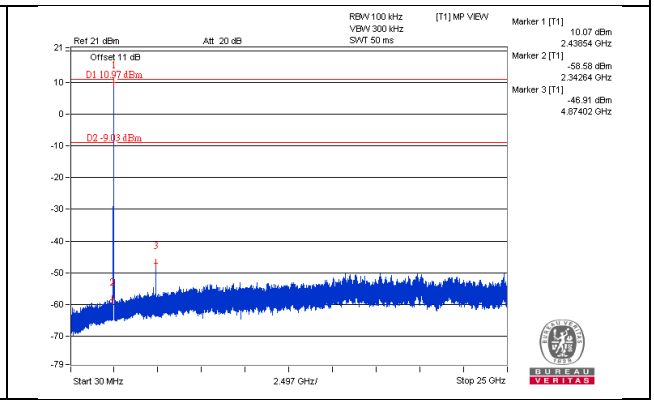
CH 1



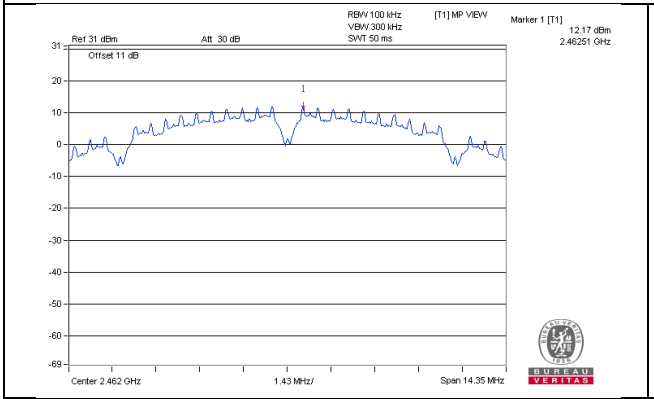


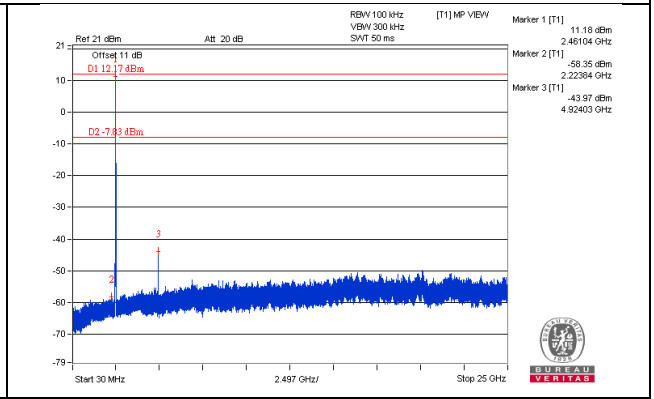
CH 6



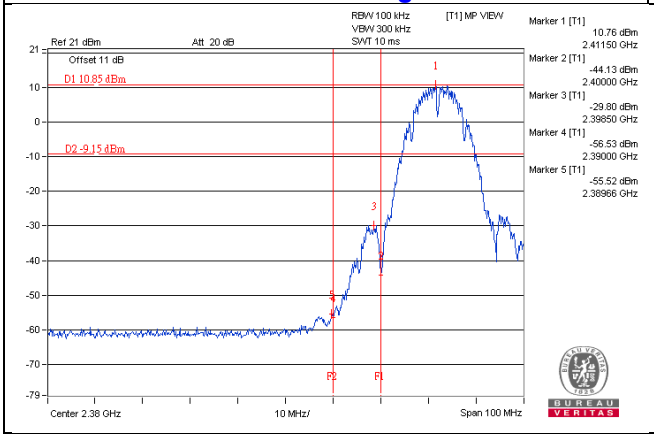


CH 11

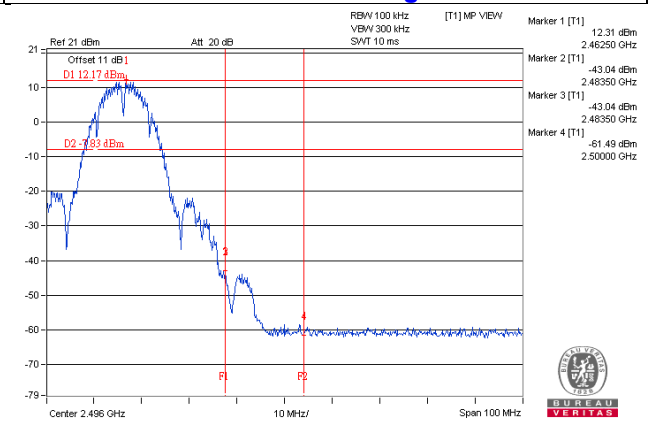




CH 1 Band edge

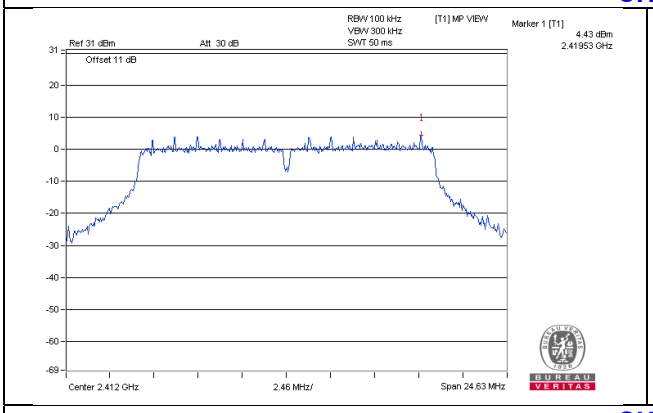


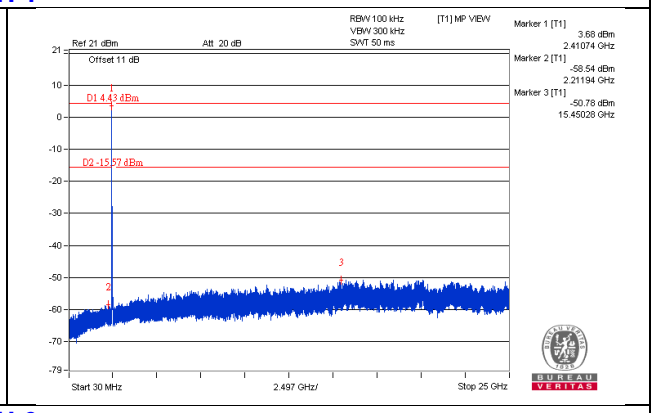
CH 11 Band edge



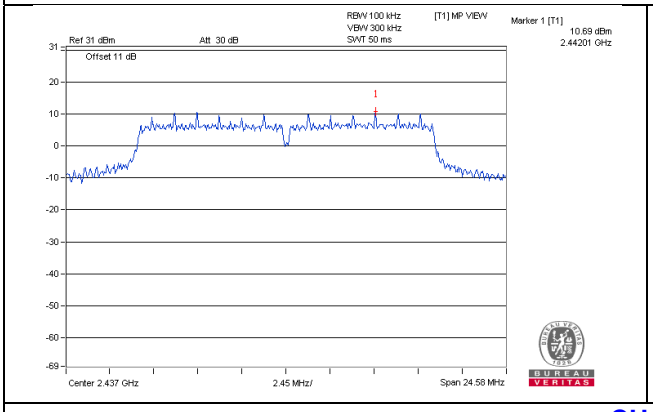
802.11g

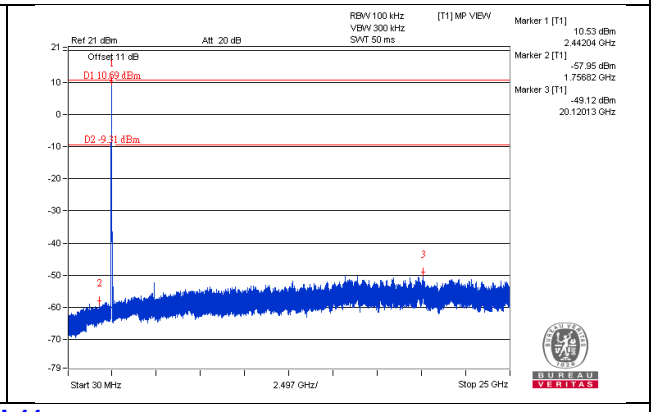
CH 1



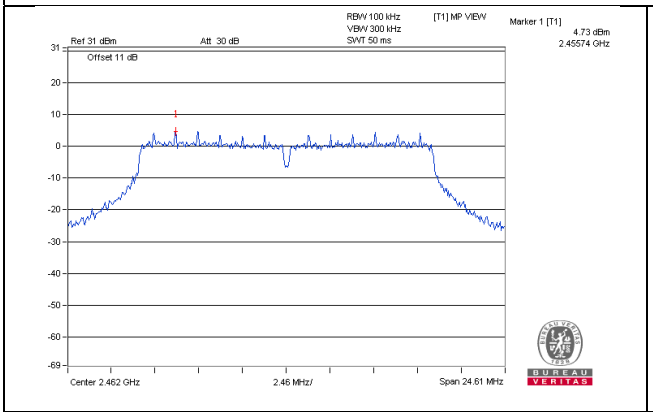


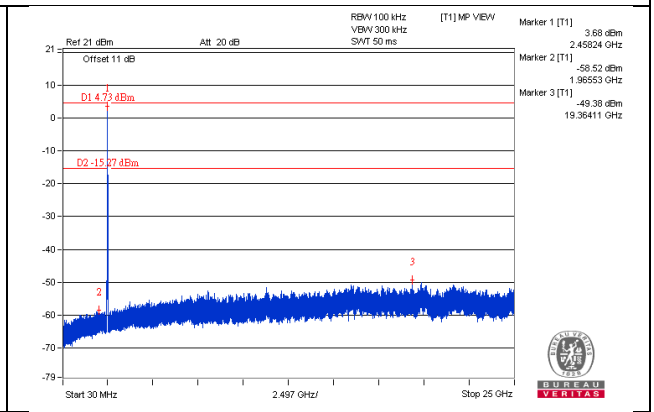
CH 6



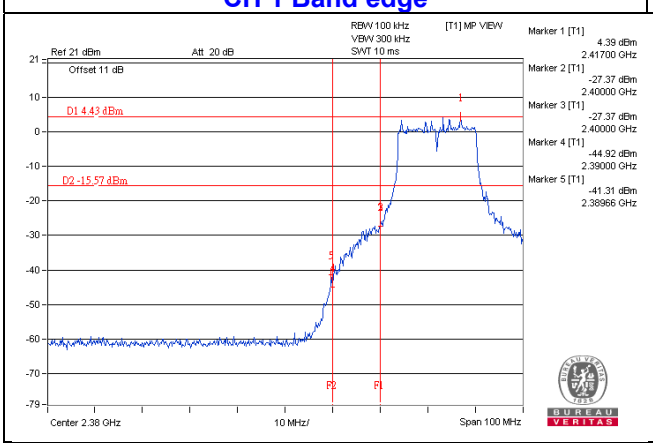


CH 11

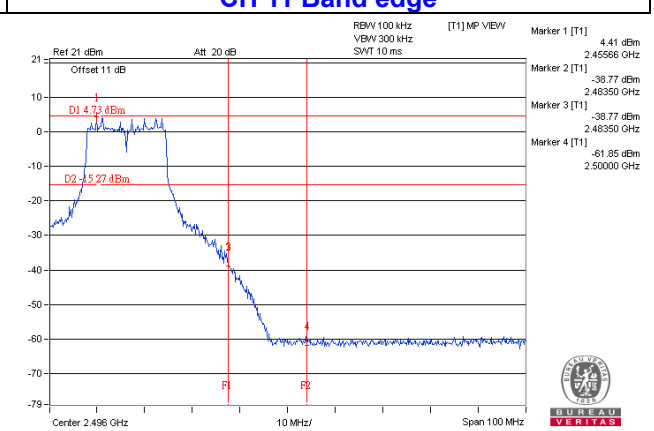




CH 1 Band edge

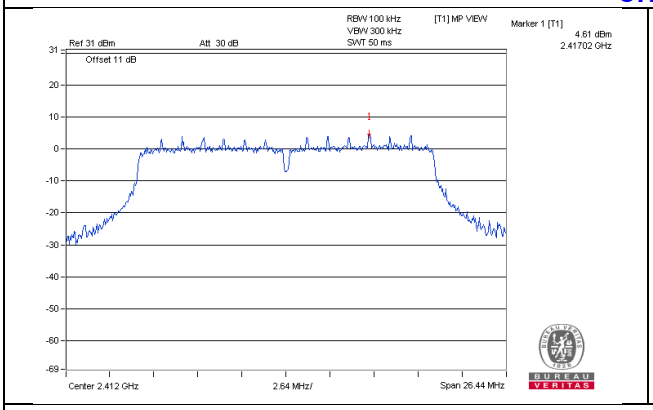


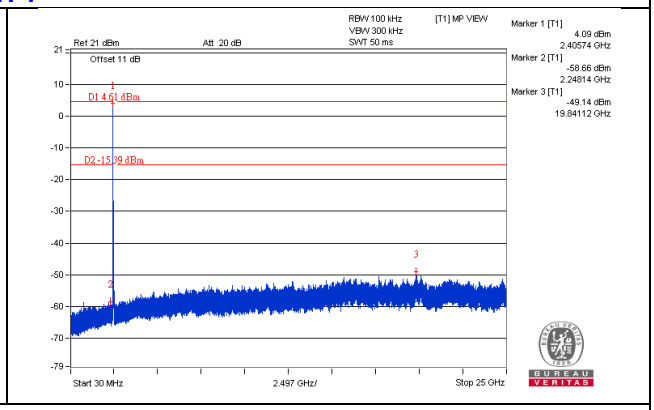
CH 11 Band edge



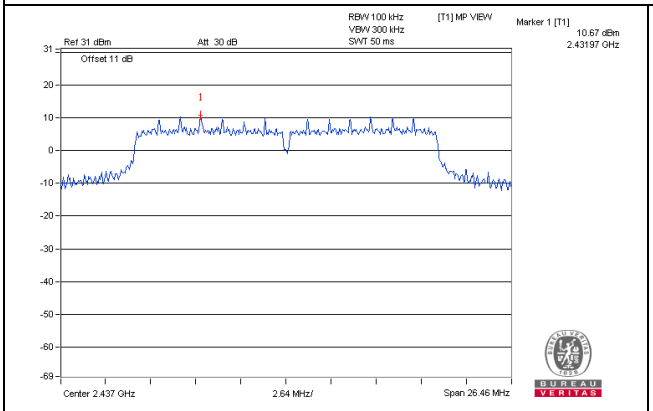
802.11n (HT20)

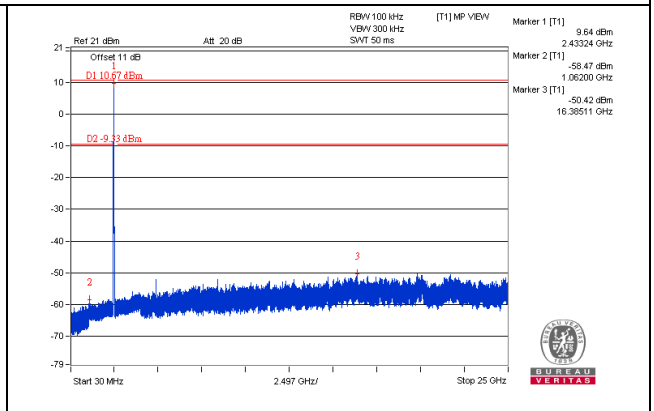
CH 1



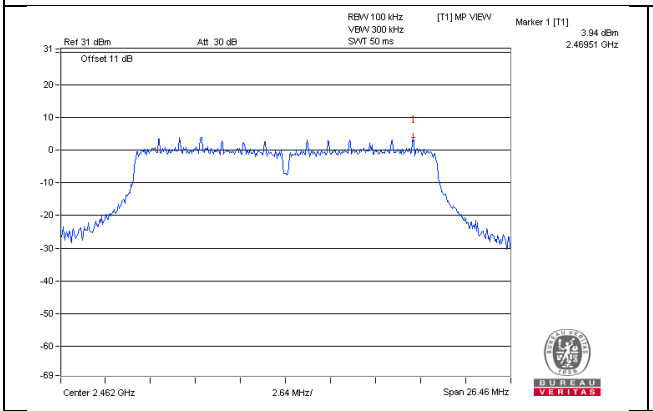


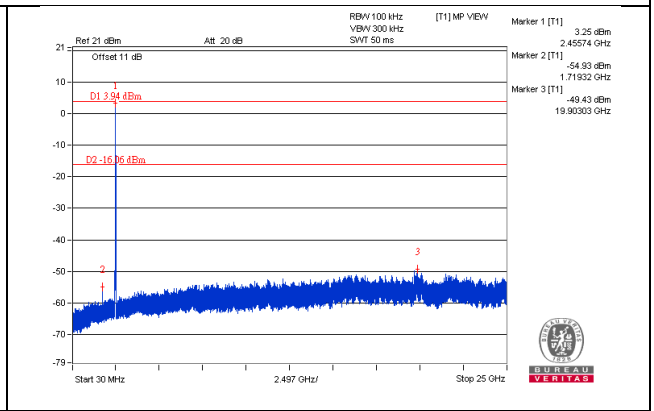
CH 6



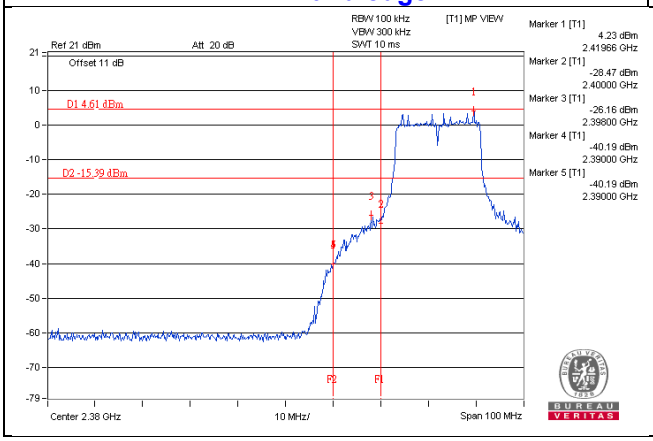


CH 11

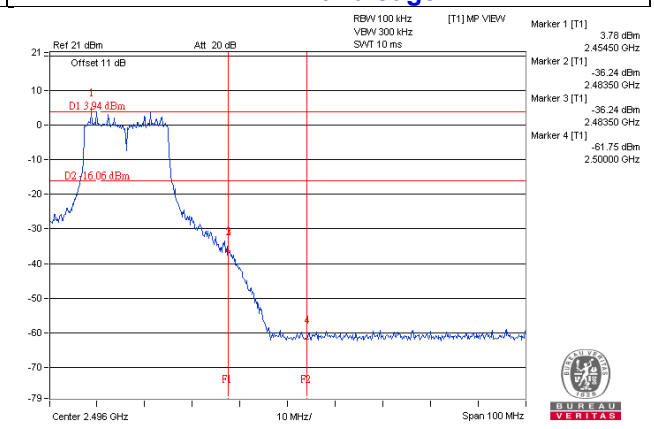




CH 1 Band edge

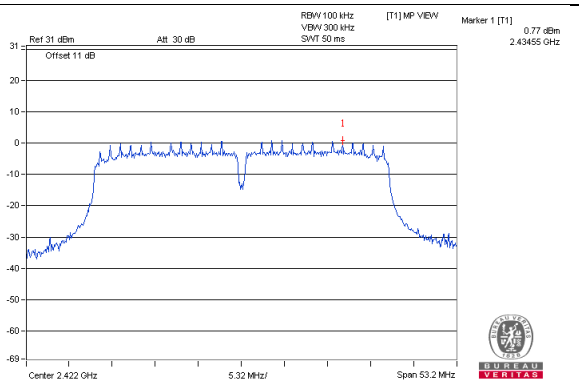


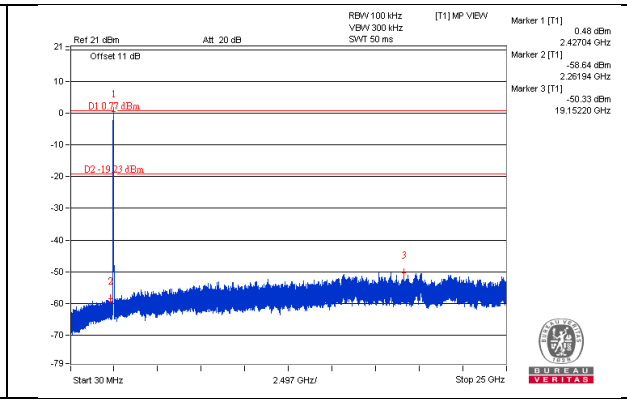
CH 11 Band edge



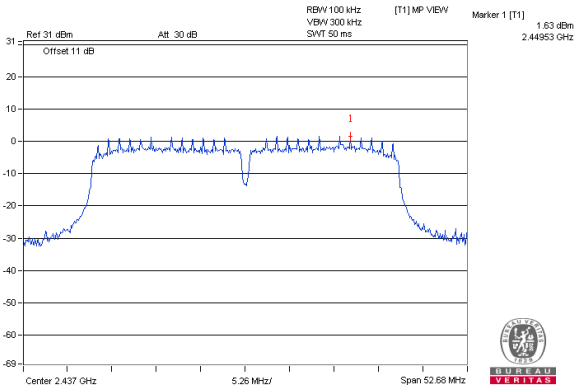
802.11n (HT40)

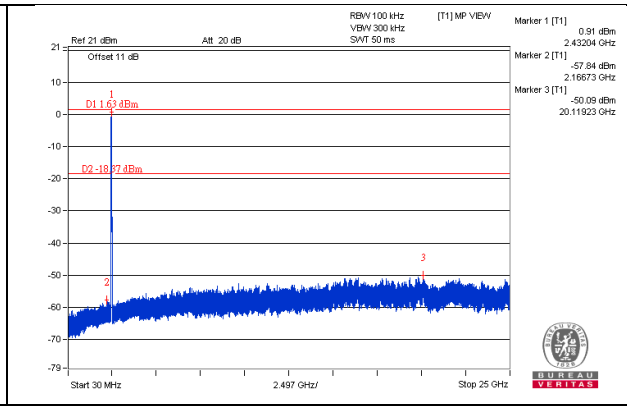
CH 3



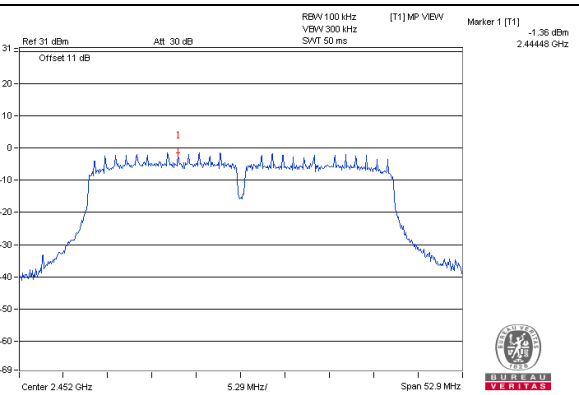


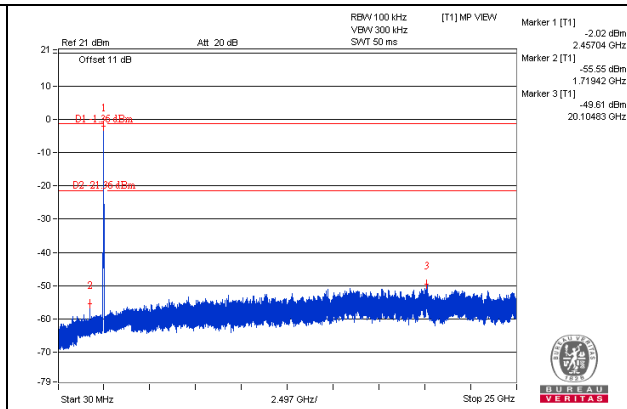
CH 6



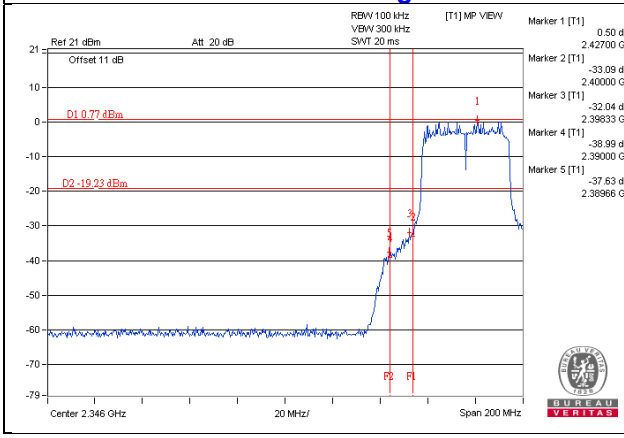


CH 9

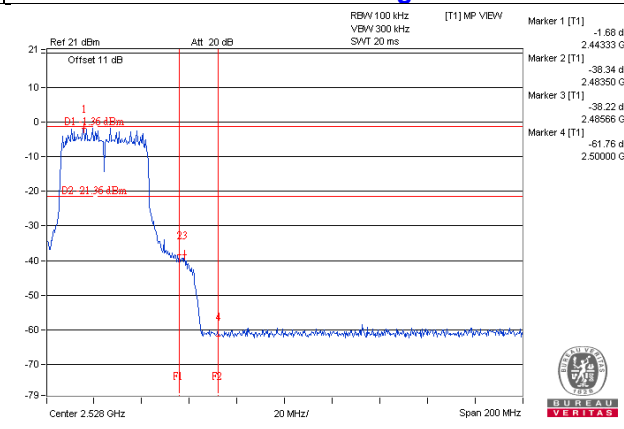




CH 3 Band edge



CH 9 Band edge



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 accredited and approved according to ISO/IEC 17025.

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

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Fax: 886-2-26051924

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Hwa Ya EMC/RF/Safety Lab
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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.

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