FCC Test Report

(Part 95 Subpart L)

Report No.:	RF171226C09
FCC ID:	2AEIFUMPZ2-M01
Test Model:	UMPZ2-EVK2
Received Date:	Dec. 26, 2017
Tested Date:	Jan. 10 ~ Jan. 22, 2018
Issued Date:	Jan. 23, 2018
Applicant:	ALPS ELECTRIC CO., LTD.
Address:	6-3-36, Furukawanakazato, Osaki-city Miyagi-pref 989-6181, Japan
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.

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Release Control Record

Issue No.	Description	Date Issued
RF171226C09	Original release.	Jan. 23, 2018

1 Certificate of Conformity

Product:	V2X module
Brand:	ALPS
Test Model:	UMPZ2-EVK2
Sample Status:	Engineering sample
Applicant:	ALPS ELECTRIC CO., LTD.
Tested Date:	Jan. 10 ~ Jan. 22, 2018
Standards:	FCC Part 95, Subpart L FCC Part 90 FCC Part 2 ASTM E2213-03

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 : _____ , **Date:** Jan. 23, 2018

Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** Jan. 23, 2018

Bruce Chen / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 95 & Part 2 & ASTM E2213-03			
FCC Clause	Test Item	Result	Remarks
Part 2.1046; Part 95.3167; Part 95.3189; ASTM E2213-03 §8.10.1	Maximum Transmitter Power	Pass	Meet the requirement of limit.
Part 2.1046; Part 95.3167; Part 95.3189; ASTM E2213-03 §8.10.1	Effective Isotropic Radiated Power (EIRP)	Pass	Meet the requirement of limit.
Part 2.1055; ASTM E2213-03 §8.10.4	Frequency Stability	Pass	Meet the requirement of limit.
Part 2.1049; Part 95.3163	Emission Bandwidth	Pass	Meet the requirement of limit.
Part 2.1046; Part 95.3189; ASTM E2213-03 §8.10.2	Emission Mask	Pass	Meet the requirement of limit.
---	Peak To Average Ratio	Pass	Meet the requirement of limit.
Part 2.1051; ASTM E2213-03 §8.10.3	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
Part 2.1053	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -6.1dB at 47.49MHz.

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) (±)
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 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 02, 2017	May 01, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2017	Aug. 20, 2018
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 05, 2017	Apr. 04, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2017	Aug. 20, 2018
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8000	Cable-CH3-03 (309224+170907)	Sep.11, 2017	Sep. 10, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	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
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Aug. 09, 2017	Aug. 08, 2018
DC Power Supply	6303D	802236	NA	NA
Temperature & Humidity chamber TERCHY	MHU-225AU	920842	Jun. 13, 2017	Jun. 12, 2018
JFW 20dB attenuation	50HF-020-SMA	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 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 IC 7450F-3.

3 General Information

3.1 General Description of EUT

Product	V2X module
Brand	ALPS
Test Model	UMPZ2-EVK2
Status of EUT	Engineering sample
Power Supply Rating	3.3Vdc or 5Vdc from power supply
Modulation Type	BPSK, QPSK, 16QAM, 64QAM for OFDM
OBU Class	OBU Class C
Channel Bandwidth	10MHz
Data Rate	3, 4.5, 6, 9, 12, 18, 24, 27Mbps
Operating Frequency	5860 ~ 5920MHz
Number of Channel	7
Max. EIRP Power	20.2dBm (0.105W)
Antenna Type	PIFA Antenna with 2.2dBi gain
Accessory Device	NA
Data Cable Supplied	NA

Note:

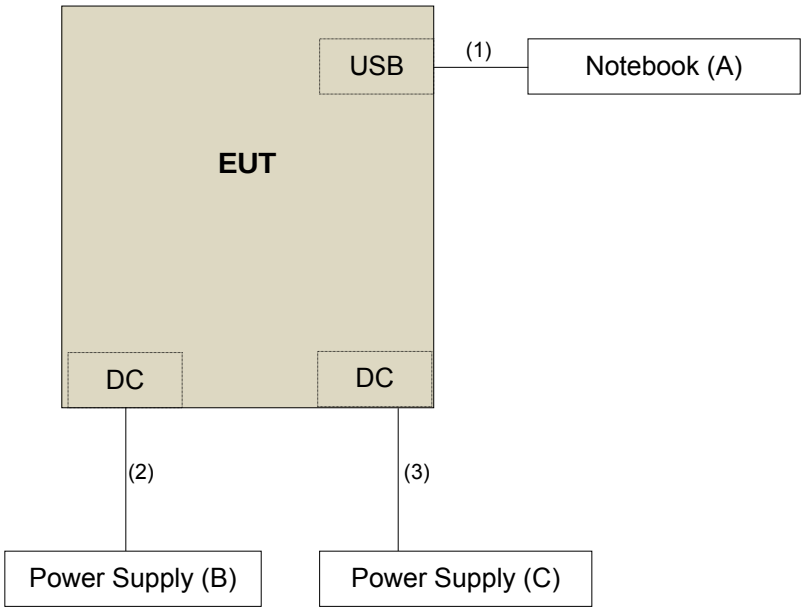
1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Description of Test Modes

7 channels are for the EUT:

Channel	Frequency (MHz)
172	5860
174	5870
176	5880
178	5890
180	5900
182	5910
184	5920

3.3 Configuration of System under Test



3.3.1 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.	Notebook	DELL	E5430	2RL3YW1	NA	-
B.	Power Supply	Keysight	U8002A	MY56330015	NA	-
C.	Power Supply	Topward	33010D	807748	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item B, C was placed under the testing table.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	1.5	Y	0	-
2.	Power cable	1	2	N	0	-
3.	Power cable	1	1	N	0	-

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.
The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

Test results are presented in the report as below.

Test Mode	TX Function
A	1TX
B	2TX

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Data Rate (Mbps)
A, B	Maximum Transmitter Power	172 to 184	172, 178, 180, 182, 184	3, 27
A, B	Effective Isotropic Radiated Power (EIRP)	172 to 184	172, 178, 180, 182, 184	3, 27
B	Frequency Stability	172 to 184	172	27
A, B	Emission Bandwidth	172 to 184	172, 178, 184	3, 27
A, B	Emission Mask	172 to 184	172, 178, 180, 182, 184	3, 27
A, B	Peak To Average Ratio	172 to 184	172, 178, 180, 182, 184	3, 27
A, B	Conducted Spurious Emissions	172 to 184	172, 178, 184	3, 27
A, B	Radiated Spurious Emissions (Frequency range below 1GHz)	172 to 184	172	3, 27
A, B	Radiated Spurious Emissions (Frequency range above 1GHz)	172 to 184	172, 178, 180, 182, 184	3, 27

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Maximum Transmitter Power	25deg. C, 66%RH	5Vdc	James Yang
Effective Isotropic Radiated Power (EIRP)	25deg. C, 66%RH	5Vdc	James Yang
Emission Mask	25deg. C, 66%RH	5Vdc	James Yang
Emission Bandwidth	25deg. C, 66%RH	5Vdc	James Yang
Conducted Spurious Emissions	25deg. C, 66%RH	5Vdc	James Yang
Frequency Stability	25deg. C, 66%RH	12Vdc	James Yang
Peak To Average Ratio	24deg. C, 64%RH	5Vdc	Match Tsui
Radiated Emission	24deg. C, 62%RH	5Vdc	Willy Cheng

3.5 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

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 47 CFR Part 2

FCC 47 CFR Part 95

ASTM E2213-03

KDB 971168 D01 Power Meas License Digital Systems v03

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

For portable DSRCS-OBUs device				
Frequency Range	Maximum Output Power			
5850–5925 MHz	1.0 mW			
For other device				
Frequency Range	Channel	Bandwidth (MHz)	Conducted Power (dBm)	EIRP (dBm)
5855-5865	172	5 /10	28.8	33
5865-5875	174	5 /10	28.8	33
5875-5885	176	5 /10	28.8	33
5885-5895	178	5 /10	28.8	33
5895-5905	180	5 /10	20	23
5905-5915	182	5 /10	20	23
5915-5925	184	5 /10	28.8	33
5855-5865	175	20	10	23
5865-5875	181	20	20	23

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. The EUT was set up for the maximum power with data modulation. The power was measured with Agilent Spectrum Analyzer. All measurements were done at 1 channel.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G

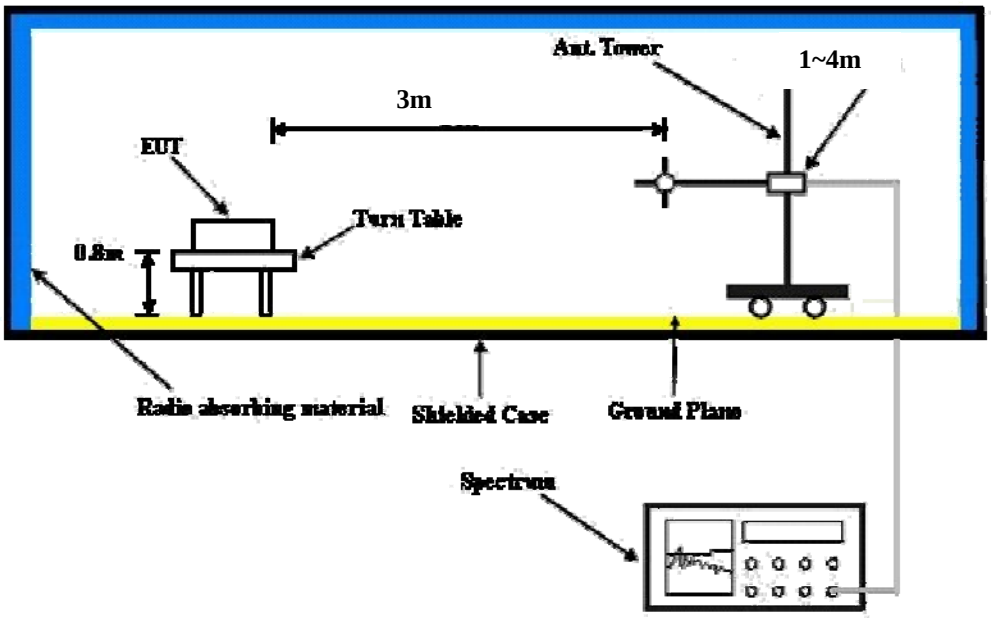
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

Conducted Power Measurement:

The EUT was set up for the maximum power with data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

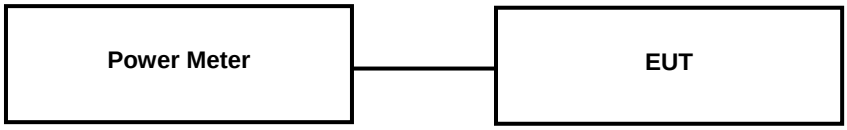
4.1.3 Test Setup

EIRP / ERP Measurement:



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

Conducted Power Measurement:



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

4.1.4 Test Results

Conducted Output Power (dBm)

Test Mode A

Data Rate	CH	Frequency (MHz)	Power (dBm)
3Mbps	CH172	5860	17.96
	CH178	5890	18.06
	CH180	5900	18.07
	CH182	5910	18.05
	CH184	5920	17.99
27Mbps	CH172	5860	18.19
	CH178	5890	18.08
	CH180	5900	18.14
	CH182	5910	18.21
	CH184	5920	18.15

Test Mode B

Data Rate	CH	Frequency (MHz)	Power (dBm)		Total Power (dBm)
			Chain 0	Chain 1	
3Mbps	CH172	5860	16.08	15.94	19.02
	CH178	5890	16.05	16.15	19.11
	CH180	5900	16.21	16.32	19.28
	CH182	5910	16.02	16.05	19.05
	CH184	5920	16.01	16.36	19.20
27Mbps	CH172	5860	16.18	16.29	19.25
	CH178	5890	16.16	16.14	19.16
	CH180	5900	16.14	16.26	19.21
	CH182	5910	15.98	16.27	19.14
	CH184	5920	16.27	16.38	19.34

EIRP Power (dBm)

Test Mode A: Data rate: 3Mbps

MODE	TX channel 172						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-36.6	14.8	0.7	15.5	33.0	-17.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-37.6	12.2	0.7	12.9	33.0	-20.1

MODE	TX channel 178						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-37.4	14.2	0.7	14.9	33.0	-18.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-35.2	14.7	0.7	15.4	33.0	-17.6

MODE	TX channel 180						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-37.9	13.8	0.7	14.5	23.0	-8.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-34.5	15.5	0.7	16.2	23.0	-6.8

MODE	TX channel 182						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-36.1	15.6	0.7	16.3	23.0	-6.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-35.2	14.7	0.7	15.4	23.0	-7.6

MODE		TX channel 184					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-35.9	15.9	0.7	16.6	33.0	-16.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-35.7	14.2	0.7	14.9	33.0	-18.1

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Test Mode A: Data rate: 27Mbps

MODE	TX channel 172						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-35.9	15.5	0.7	16.2	33.0	-16.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-35.3	14.5	0.7	15.2	33.0	-17.8

MODE	TX channel 178						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-36.2	15.4	0.7	16.1	33.0	-16.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-35.3	14.6	0.7	15.3	33.0	-17.7

MODE	TX channel 180						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-36.4	15.3	0.7	16.0	23.0	-7.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-35.7	14.3	0.7	15.0	23.0	-8.0

MODE	TX channel 182						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-36.8	14.9	0.7	15.6	23.0	-7.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-35.3	14.6	0.7	15.3	23.0	-7.7

MODE		TX channel 184					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-36.3	15.5	0.7	16.2	33.0	-16.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-36.2	13.7	0.7	14.4	33.0	-18.6

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Test Mode B: Data rate: 3Mbps

MODE		TX channel 172					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-33.9	17.5	0.7	18.2	33.0	-14.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-33.4	16.4	0.7	17.1	33.0	-15.9

MODE		TX channel 178					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-32.7	18.9	0.7	19.6	33.0	-13.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-33.0	16.9	0.7	17.6	33.0	-15.4

MODE		TX channel 180					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-32.6	19.1	0.7	19.8	23.0	-3.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-32.9	17.1	0.7	17.8	23.0	-5.2

MODE		TX channel 182					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-33.5	18.2	0.7	18.9	23.0	-4.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-32.8	17.1	0.7	17.8	23.0	-5.2

MODE		TX channel 184					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-32.4	19.4	0.7	20.1	33.0	-12.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-32.7	17.2	0.7	17.9	33.0	-15.1

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Test Mode B: Data rate: 27Mbps

MODE		TX channel 172					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**5860.00**	**-31.9**	**19.5**	**0.7**	**20.2**	**33.0**	**-12.8**
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5860.00	-31.2	18.6	0.7	19.3	33.0	-13.7

MODE		TX channel 178					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-32.6	19.0	0.7	19.7	33.0	-13.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5890.00	-32.1	17.8	0.7	18.5	33.0	-14.5

MODE		TX channel 180					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-34.0	17.7	0.7	18.4	23.0	-4.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5900.00	-33.0	17.0	0.7	17.7	23.0	-5.3

MODE		TX channel 182					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-35.0	16.7	0.7	17.4	23.0	-5.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5910.00	-33.7	16.2	0.7	16.9	23.0	-6.1

MODE	TX channel 184						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-33.1	18.7	0.7	19.4	33.0	-13.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5920.00	-32.1	17.8	0.7	18.5	33.0	-14.5

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

The transmitter center frequency stability shall be ± 10 ppm maximum for DSRC 5.9GHz band.

4.2.2 Test Procedure

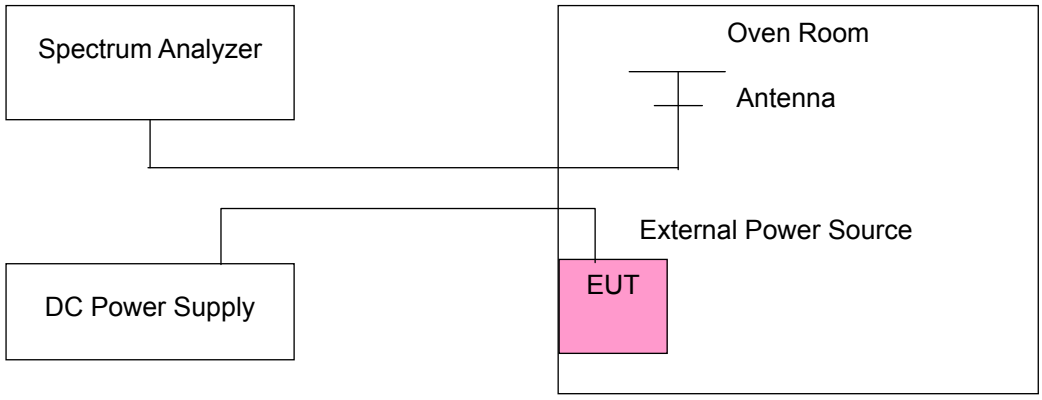
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

Test Mode A: Data rate: 3Mbps

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
13.8	-0.00023	-0.00032	-0.00028	-0.00028	10
12	-0.00024	-0.00033	-0.00026	-0.00029	10
10.2	-0.00023	-0.00032	-0.00027	-0.00031	10

NOTE: The applicant defined the normal working voltage of the platform is from 10.2Vdc to 13.8Vdc.

Frequency Error vs. Temperature.

TEMP. (℃)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
50	0.00038	0.00044	0.00038	0.00041	10
40	0.00043	0.00040	0.00047	0.00042	10
30	-0.00004	-0.00008	-0.00009	-0.00006	10
20	-0.00024	-0.00033	-0.00026	-0.00029	10
10	-0.00032	-0.00031	-0.00025	-0.00031	10
0	0.00022	0.00025	0.00027	0.00024	10
-10	-0.00013	-0.00017	-0.00011	-0.00013	10
-20	0.00015	0.00021	0.00019	0.00022	10
-30	0.00047	0.00046	0.00047	0.00043	10

Test Mode A: Data rate: 27Mbps

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
13.8	-0.00041	-0.00035	-0.00034	-0.00035	10
12	-0.00040	-0.00034	-0.00033	-0.00034	10
10.2	-0.00039	-0.00033	-0.00031	-0.00035	10

NOTE: The applicant defined the normal working voltage of the platform is from 10.2Vdc to 13.8Vdc.

Frequency Error vs. Temperature.

TEMP. (℃)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
50	0.00023	0.00020	0.00019	0.00024	10
40	-0.00037	-0.00036	-0.00034	-0.00038	10
30	0.00041	0.00040	0.00037	0.00041	10
20	-0.00040	-0.00034	-0.00033	-0.00034	10
10	0.00025	0.00026	0.00030	0.00025	10
0	-0.00024	-0.00024	-0.00016	-0.00018	10
-10	-0.00027	-0.00027	-0.00028	-0.00021	10
-20	0.00047	0.00045	0.00044	0.00051	10
-30	-0.00010	-0.00009	-0.00007	-0.00003	10

Test Mode B: Data rate: 3Mbps

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
13.8	-0.00022	-0.00022	-0.00021	-0.00027	10
12	-0.00023	-0.00022	-0.00022	-0.00028	10
10.2	-0.00023	-0.00024	-0.00021	-0.00029	10

NOTE: The applicant defined the normal working voltage of the platform is from 10.2Vdc to 13.8Vdc.

Frequency Error vs. Temperature.

TEMP. (℃)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
50	-0.00038	-0.00037	-0.00038	-0.00033	10
40	-0.00045	-0.00043	-0.00045	-0.00045	10
30	-0.00013	-0.00013	-0.00017	-0.00012	10
20	-0.00023	-0.00022	-0.00022	-0.00028	10
10	-0.00014	-0.00014	-0.00017	-0.00023	10
0	-0.00008	-0.00001	-0.00007	-0.00007	10
-10	0.00026	0.00024	0.00019	0.00025	10
-20	0.00006	0.00003	0.00003	-0.00001	10
-30	0.00021	0.00023	0.00024	0.00026	10

Test Mode B: Data rate: 27Mbps

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
13.8	0.00003	-0.00002	0.00003	-0.00001	10
12	0.00001	-0.00001	0.00002	-0.00001	10
10.2	0.00003	-0.00001	0.00004	-0.00001	10

NOTE: The applicant defined the normal working voltage of the platform is from 10.2Vdc to 13.8Vdc.

Frequency Error vs. Temperature.

TEMP. (℃)	Frequency Error (%)				Limit (ppm)
	0 minutes	2 minutes	5 minutes	10 minutes	
50	0.00000	0.00003	-0.00002	0.00000	10
40	-0.00015	-0.00015	-0.00015	-0.00015	10
30	-0.00030	-0.00028	-0.00032	-0.00034	10
20	0.00001	-0.00001	0.00002	-0.00001	10
10	0.00002	0.00005	0.00004	-0.00003	10
0	0.00015	0.00013	0.00011	0.00016	10
-10	-0.00029	-0.00034	-0.00033	-0.00031	10
-20	-0.00032	-0.00029	-0.00033	-0.00037	10
-30	-0.00021	-0.00018	-0.00020	-0.00022	10

4.3 Emission Bandwidth Measurement

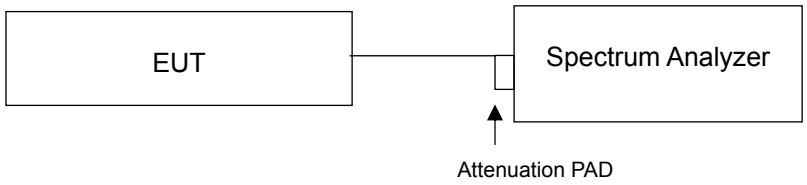
4.3.1 Limits of Emission Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW)

4.3.2 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.3 Test Setup



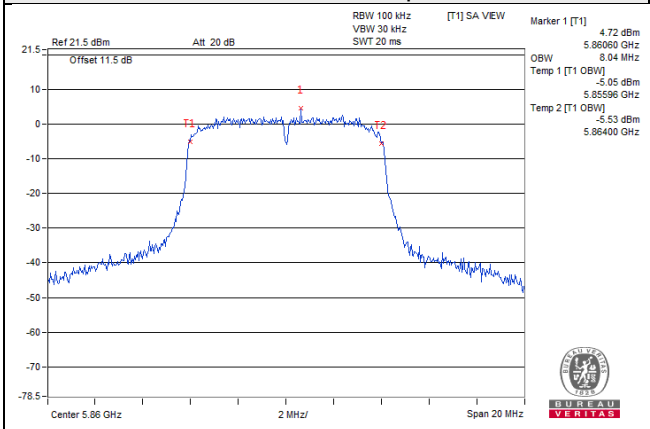
4.3.4 Test Result

Test Mode A

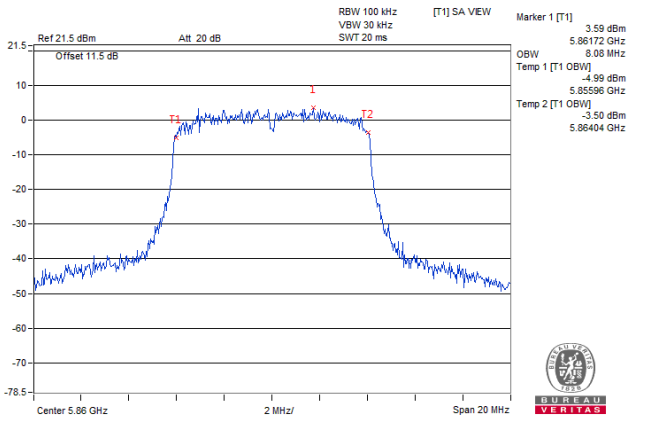
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		Data Rate: 3Mbps	Data Rate: 27Mbps
172	5860	8.04	8.08
178	5890	8.00	8.04
184	5920	8.04	8.08

Spectrum Plot of Worst Value

Data Rate: 3Mbps



Data Rate: 27Mbps

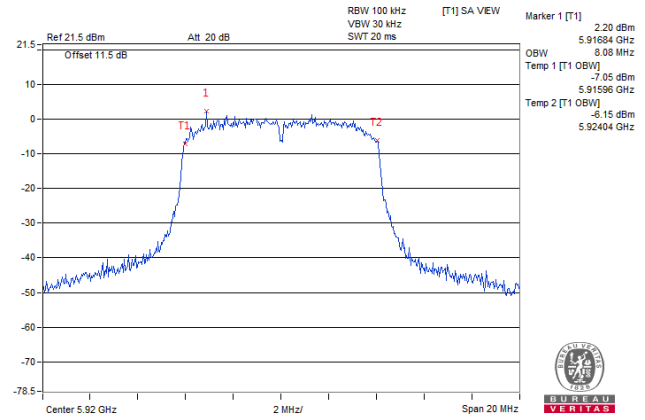


Test Mode B

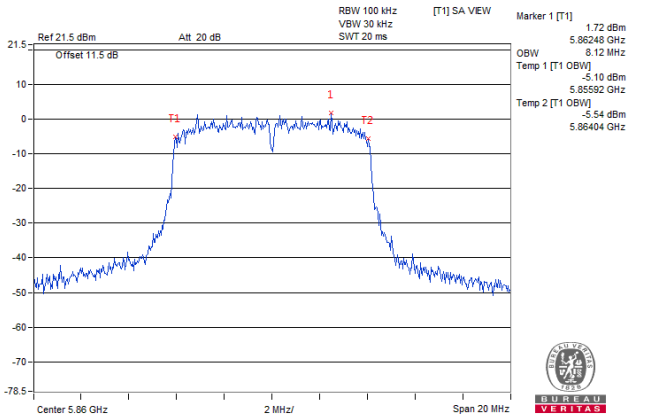
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		Data Rate: 3Mbps		Data Rate: 27Mbps	
		Chain 0	Chain 1	Chain 0	Chain 1
172	5860	8.04	8.04	8.08	8.12
178	5890	8.04	8.04	8.04	8.08
184	5920	8.08	8.04	8.04	8.08

Spectrum Plot of Worst Value

Data Rate: 3Mbps



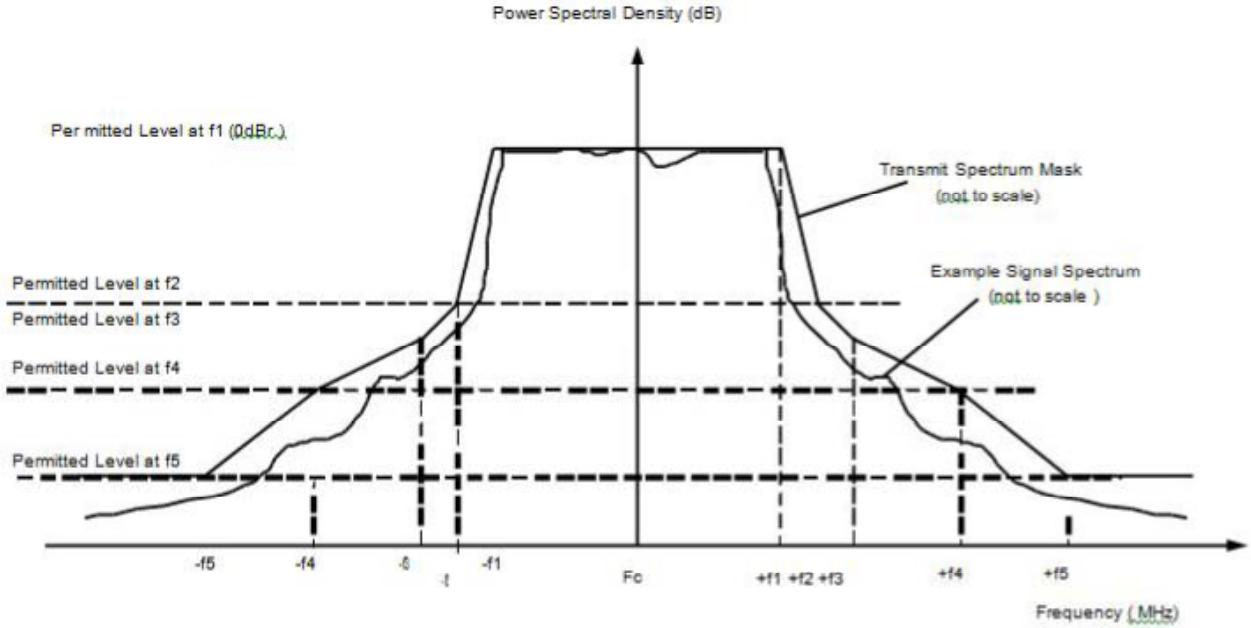
Data Rate: 27Mbps



4.4 Emission Mask Measurement

4.4.1 Limits of Emission Mask Measurement

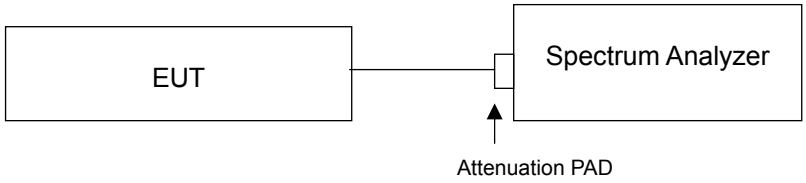
For portable DSRCS-OBUs device (5850–5925 MHz)					
Maximum Output Power	1.0 mW				
For other device (5850–5925 MHz)					
STA transmit power classification	Maximum STA transmit power (mW)		Maximum permitted EIRP (dBm)		
Class A	1		23		
Class B	10		23		
Class C	100		33		
Class D	760		33 for non-government / 44.8 for government		
STA transmit power classification	± 4.5 MHz offset (±f1)	± 5.0 MHz offset (±f2)	± 5.5 MHz offset (±f3)	± 10 MHz offset (±f4)	± 15 MHz offset (±f5)
Class A	0	-10	-20	-28	-40
Class B	0	-16	-20	-28	-40
Class C	0	-26	-32	-40	-50
Class D	0	-35	-45	-55	-65



4.4.2 Test Procedures

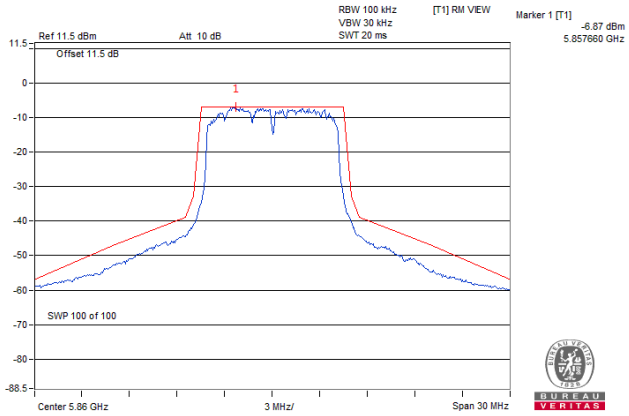
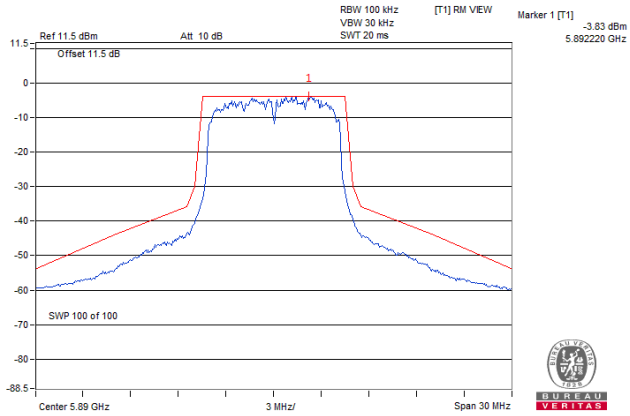
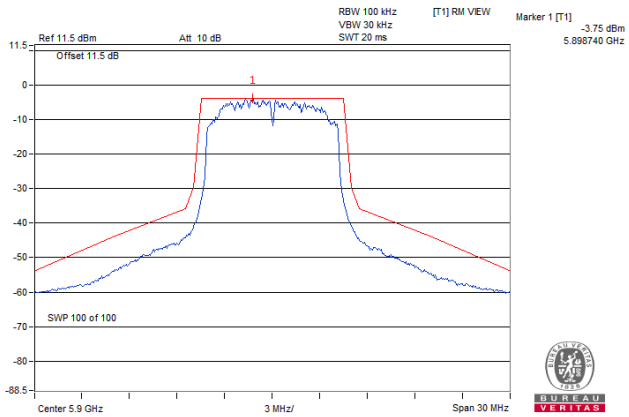
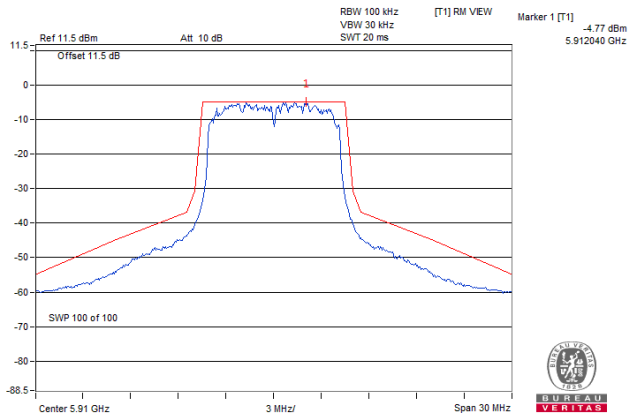
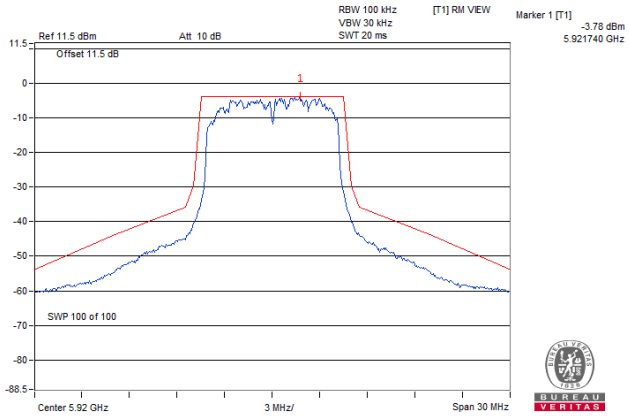
1. The power was measured with Agilent Spectrum Analyzer. All measurements were done at 1 channel.
2. The measurement used the power splitter via EUT RF power connector between signal generator and spectrum analyzer.
3. Record the test plot.

4.4.3 Test Setup



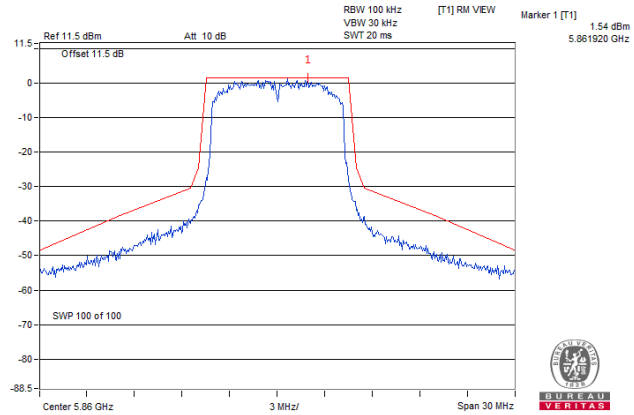
4.4.4 Test Results

Test Mode A:

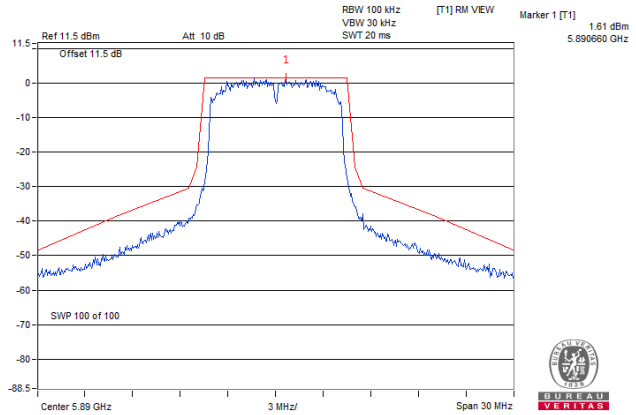
Data rate: 3Mbps	
CH172 5860MHz	CH178 5890MHz
	
CH180 5900MHz	CH182 5910MHz
	
CH184 5920MHz	
	

Data rate: 27Mbps

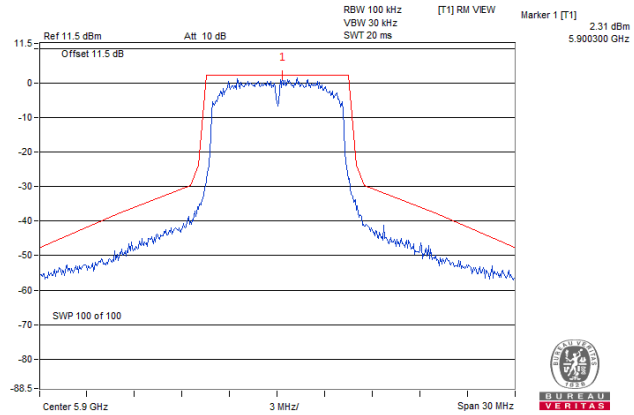
CH172 5860MHz



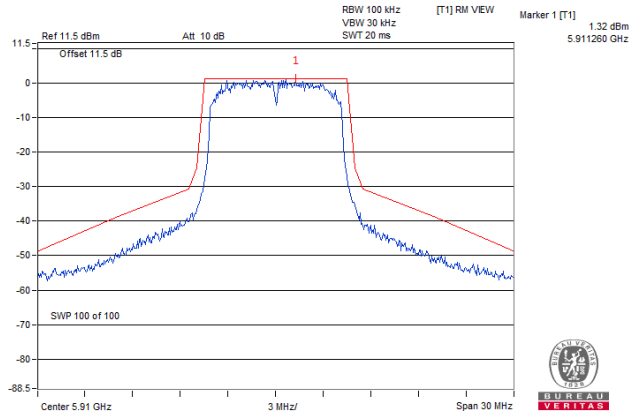
CH178 5890MHz



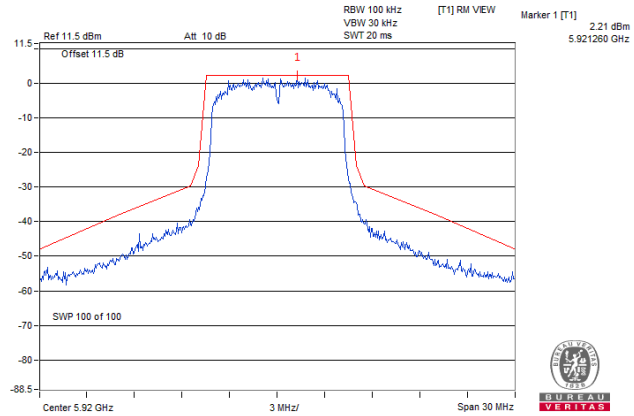
CH180 5900MHz



CH182 5910MHz



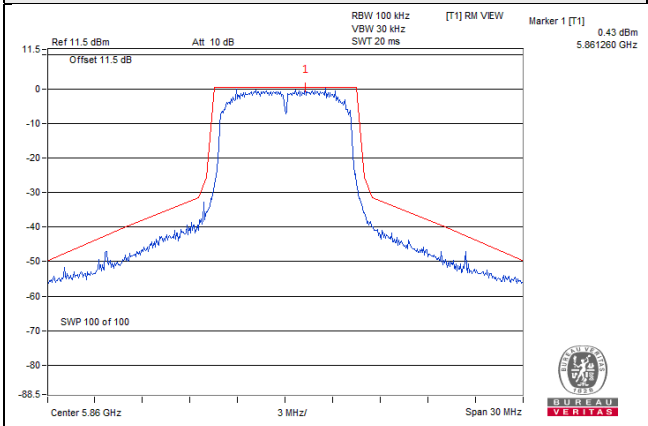
CH184 5920MHz



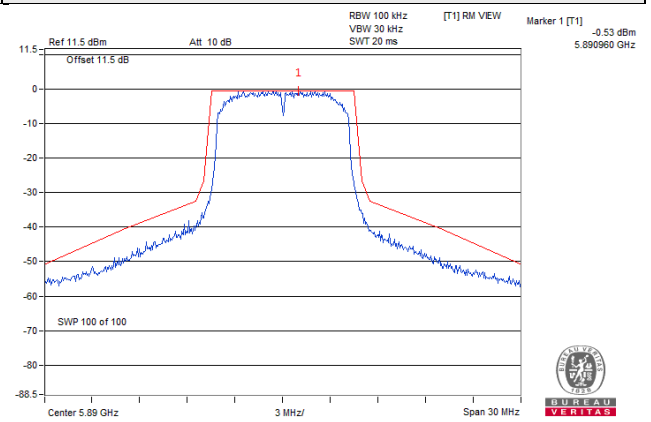
Test Mode B:

Data rate: 3Mbps, Chain 0

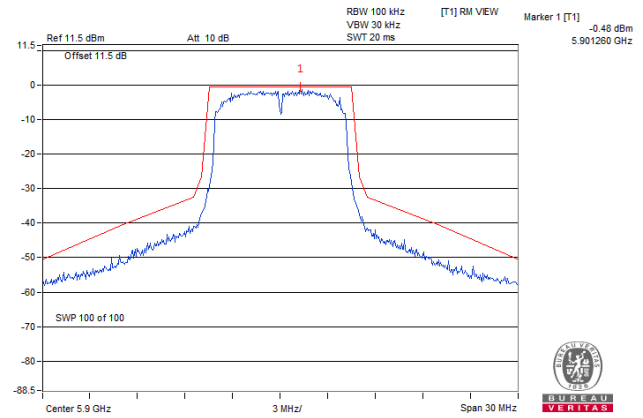
CH172 5860MHz



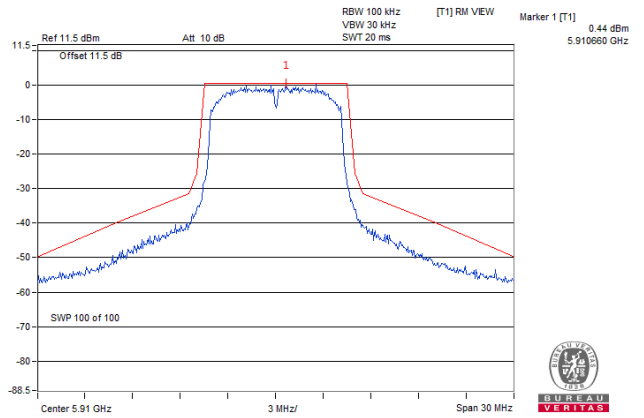
CH178 5890MHz



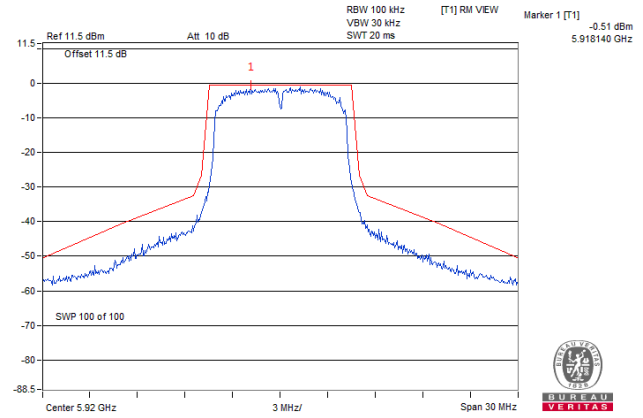
CH180 5900MHz

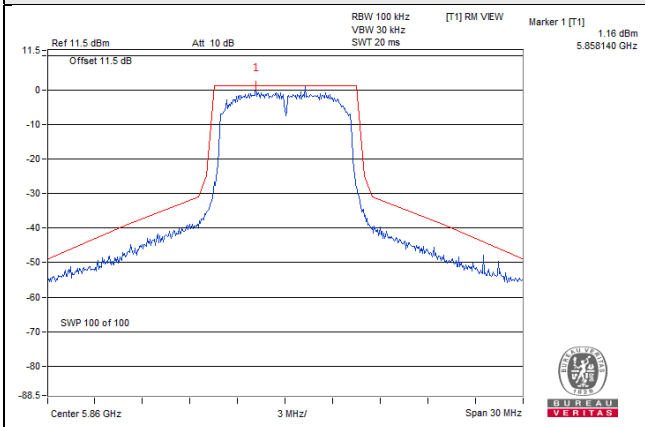
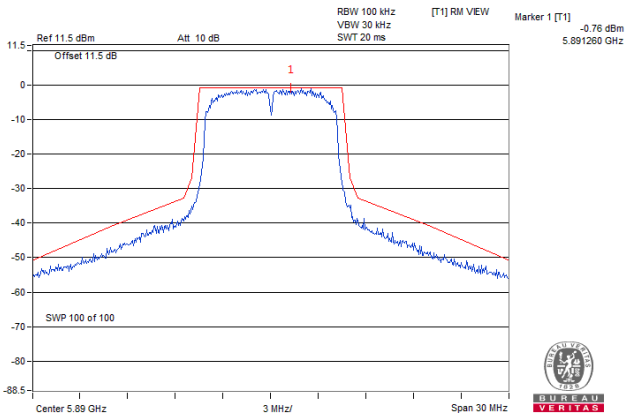
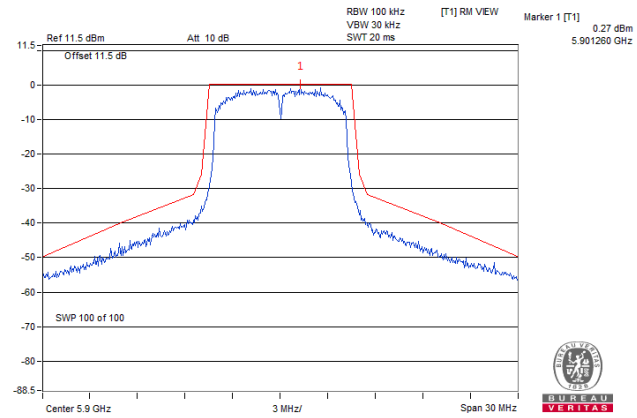
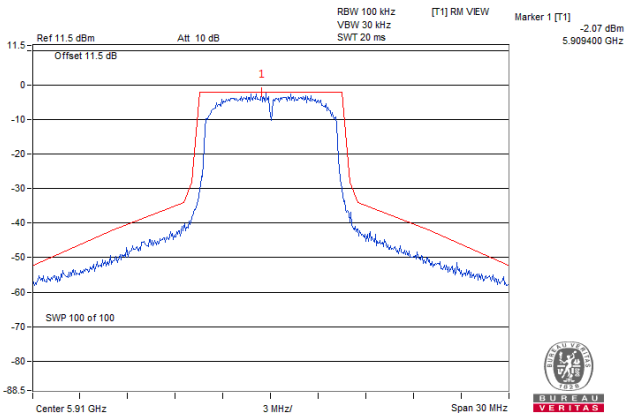
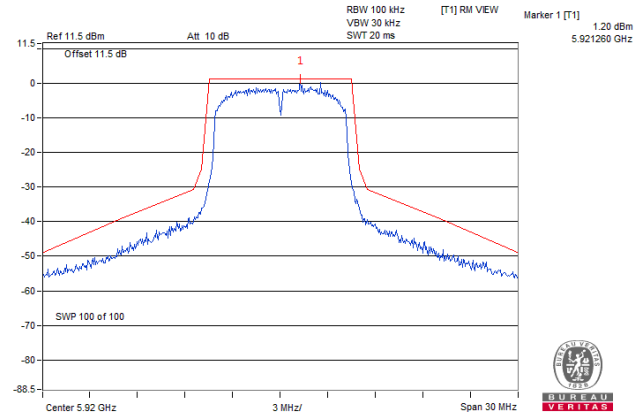


CH182 5910MHz



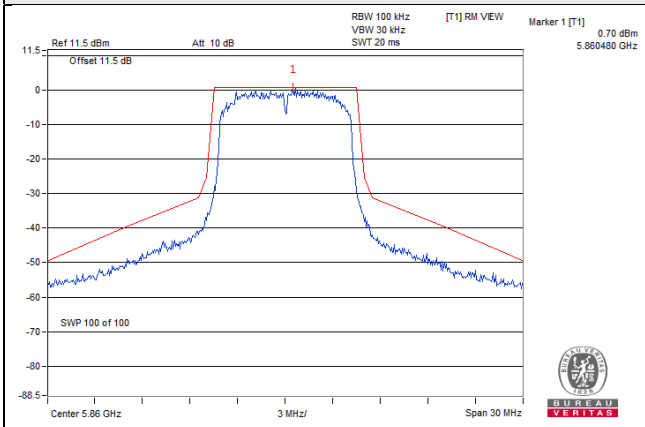
CH184 5920MHz



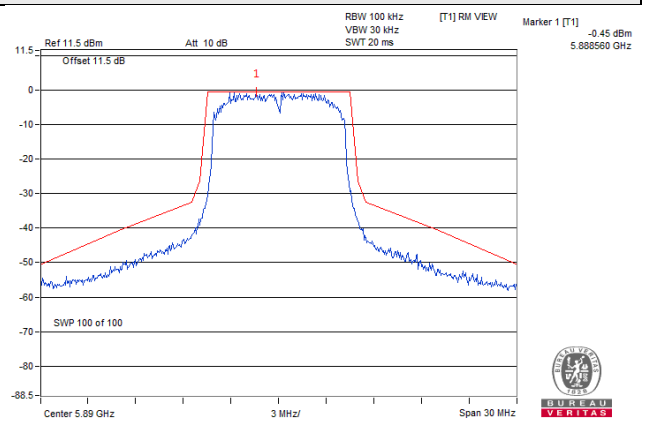
Data rate: 3Mbps, Chain 1	
CH172 5860MHz	CH178 5890MHz
	
CH180 5900MHz	CH182 5910MHz
	
CH184 5920MHz	
	

Data rate: 27Mbps, Chain 0

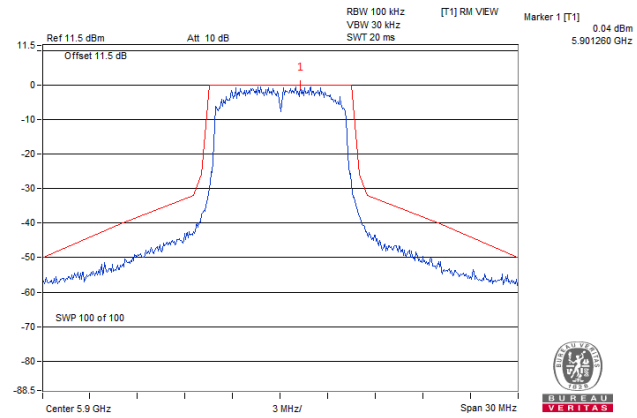
CH172 5860MHz



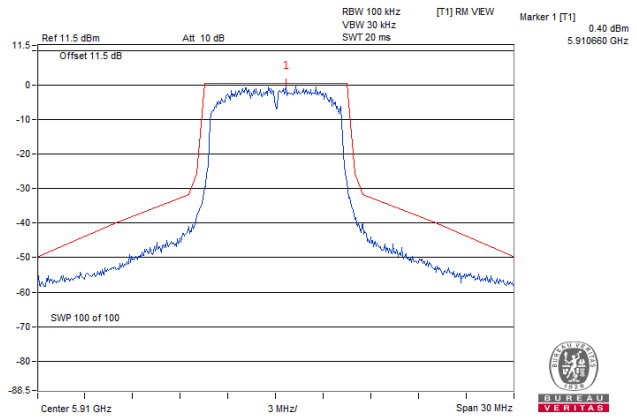
CH178 5890MHz



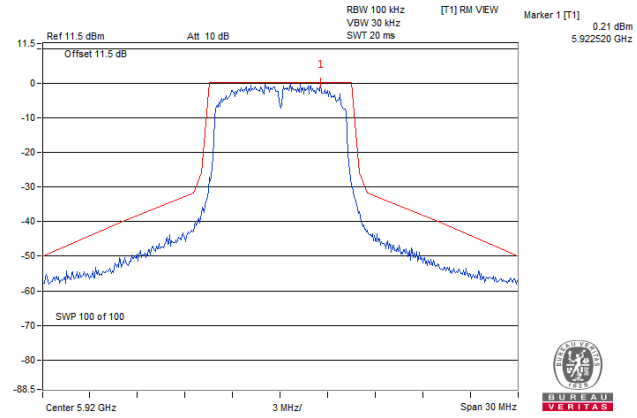
CH180 5900MHz

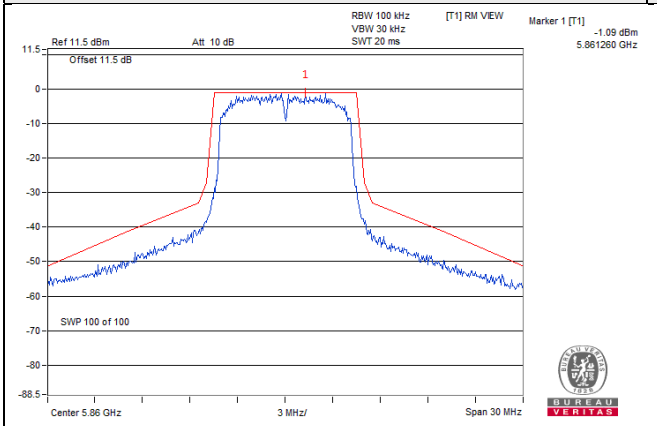
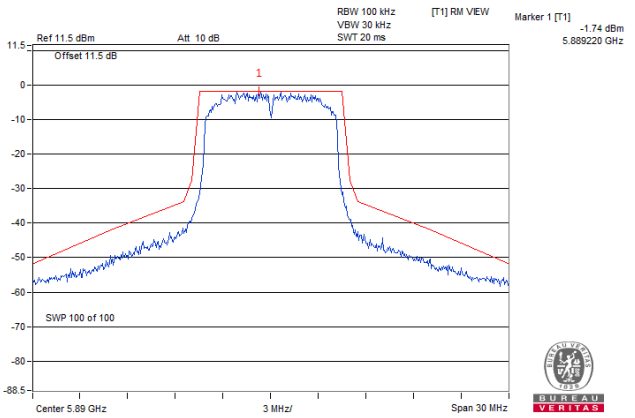
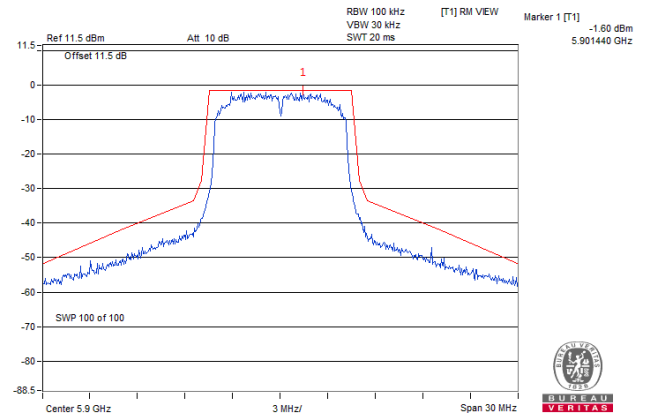
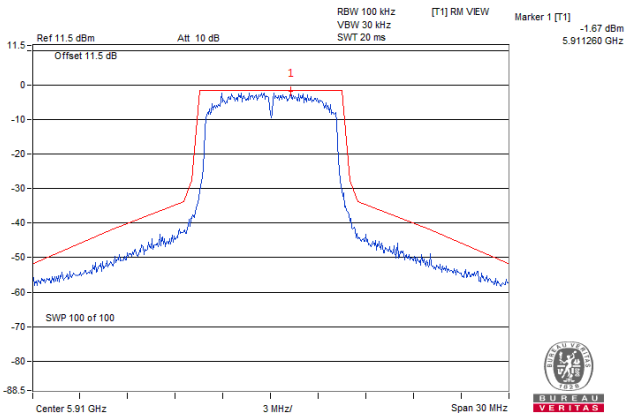
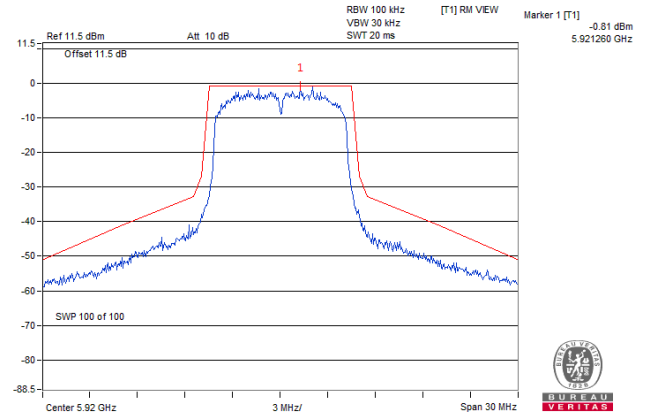


CH182 5910MHz



CH184 5920MHz



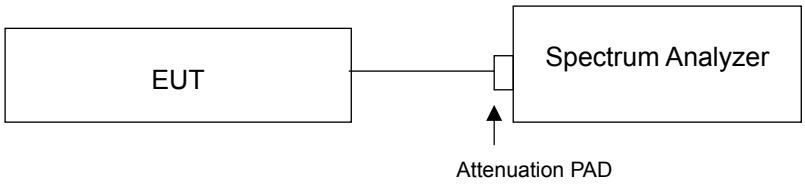
Data rate: 27Mbps, Chain 1	
CH172 5860MHz	CH178 5890MHz
	
CH180 5900MHz	CH182 5910MHz
	
CH184 5920MHz	
	

4.5 Peak to Average Ratio

4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.5.2 Test Setup



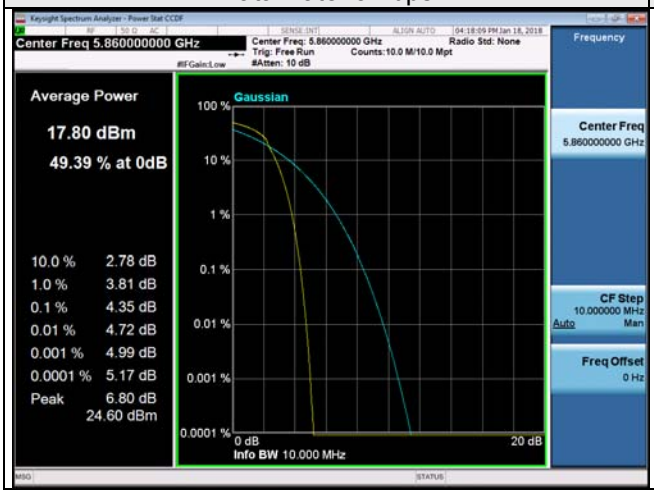
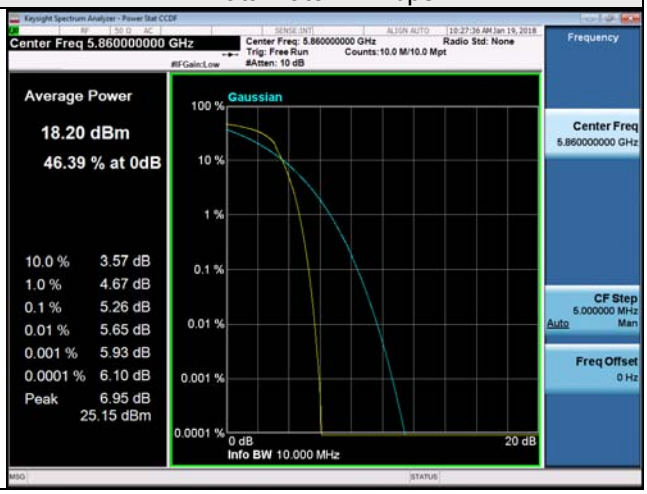
4.5.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.5.4 Test Results

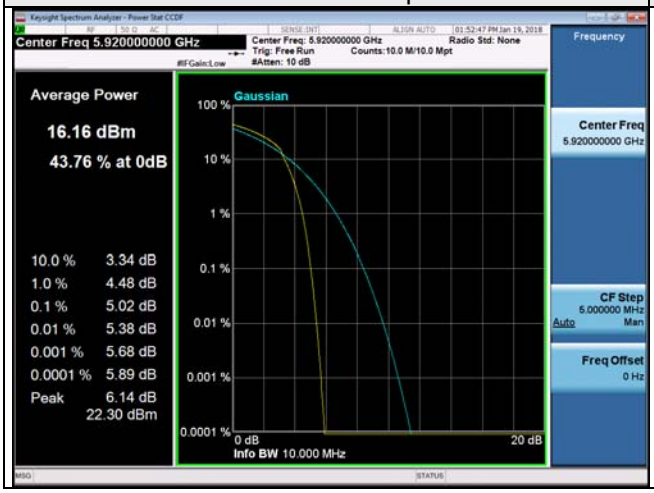
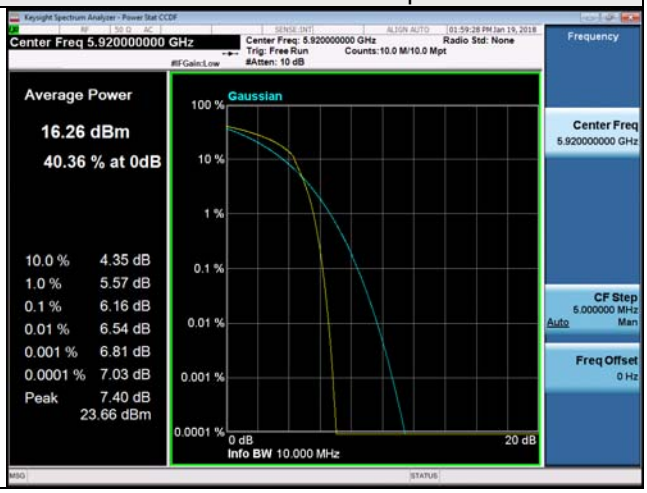
Test Mode A

Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		Data Rate: 3Mbps	Data Rate: 27Mbps
172	5860	4.35	5.26
178	5890	4.23	5.07
180	5900	4.24	5.10
182	5910	4.19	5.25
184	5920	4.20	5.09

Spectrum Plot of Worst Value	
Data Rate: 3Mbps	Data Rate: 27Mbps
	

Test Mode B

Channel	Frequency (MHz)	Peak To Average Ratio (dB)			
		Data Rate: 3Mbps		Data Rate: 27Mbps	
		Chain 0	Chain 1	Chain 0	Chain 1
172	5860	4.51	4.62	5.61	6.03
178	5890	4.28	4.72	5.49	5.95
180	5900	4.35	4.34	5.49	6.07
182	5910	4.27	4.45	5.56	6.09
184	5920	4.35	5.02	5.68	6.16

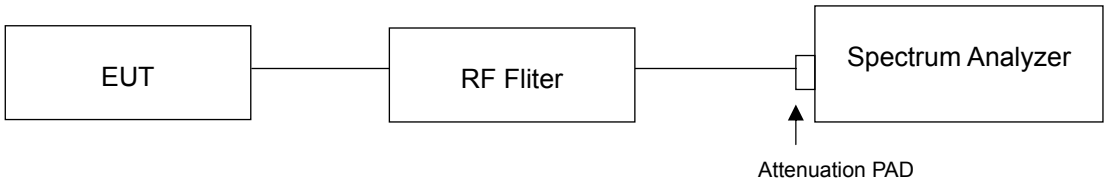
Spectrum Plot of Worst Value	
Data Rate: 3Mbps	Data Rate: 27Mbps
	

4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least [55 + 10 log(P)] (-25dBm).

4.6.2 Test Setup



4.6.3 Test Procedure

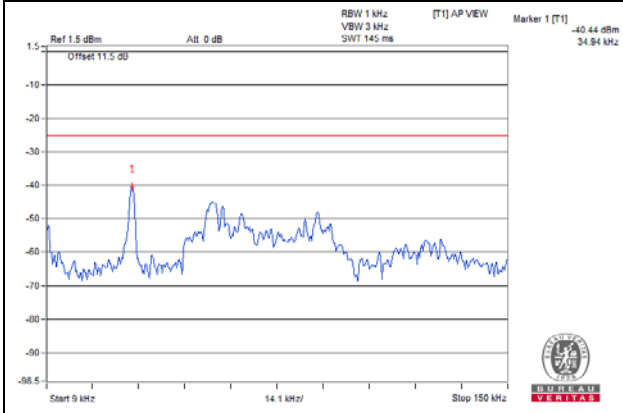
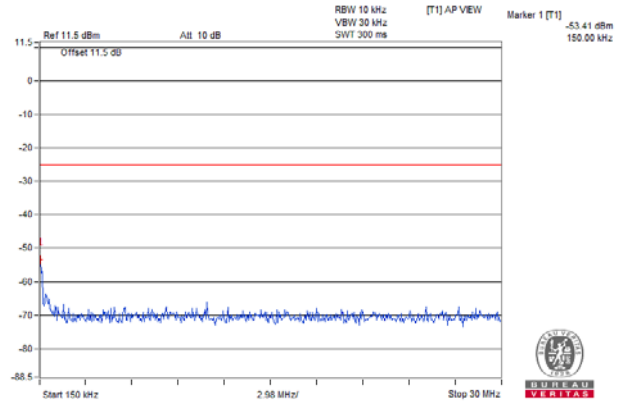
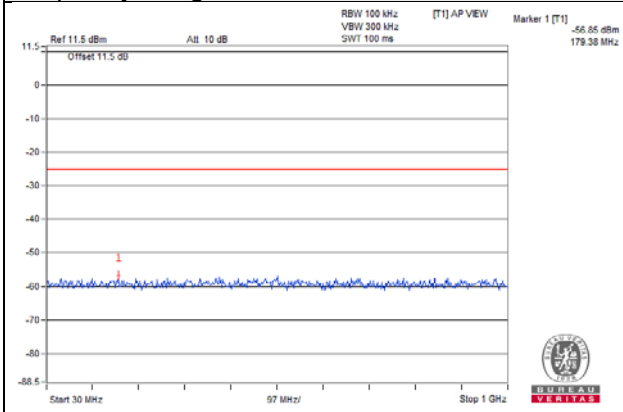
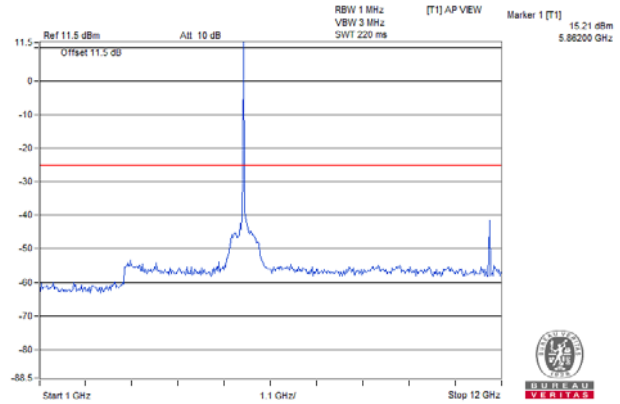
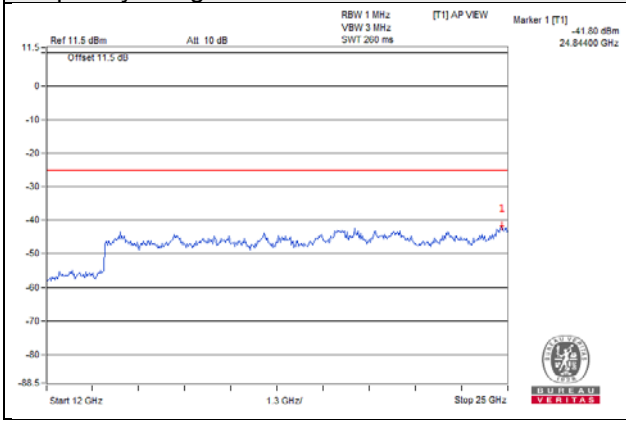
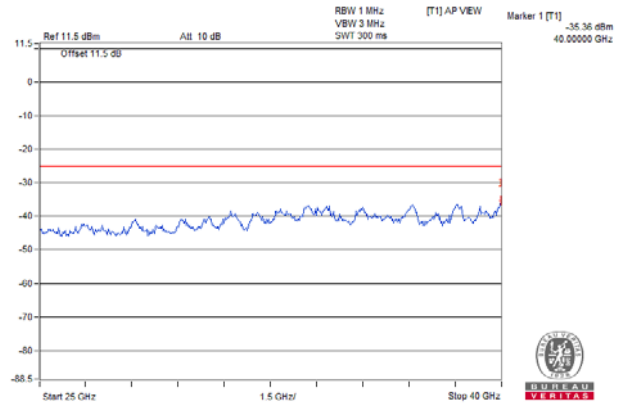
a. The EUT was set up for the maximum peak power with worst data modulation. The power was measured with Spectrum Analyzer.

b. The conducted spurious emission used the RF cable via EUT RF power connector between spectrum analyzer.

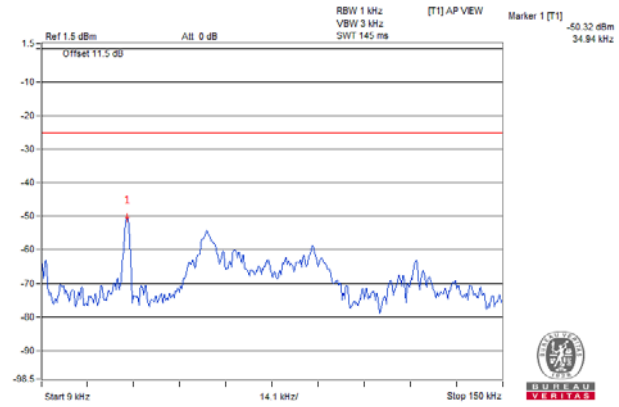
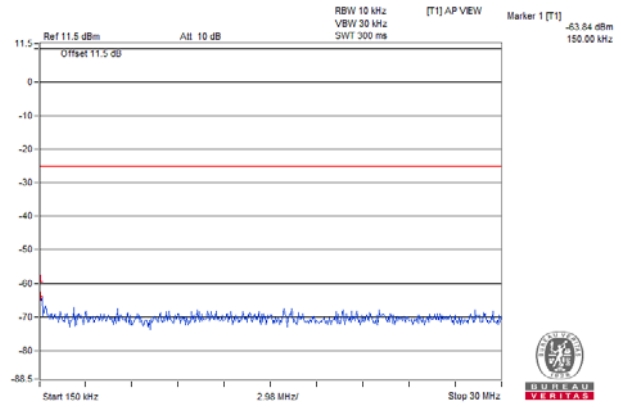
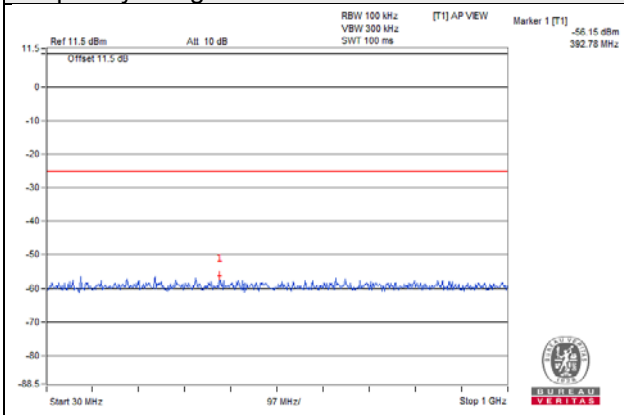
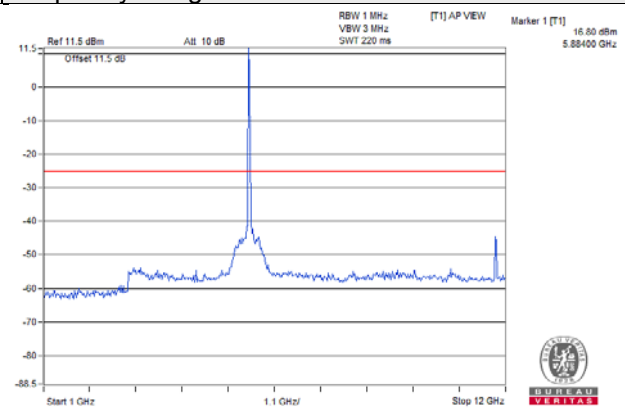
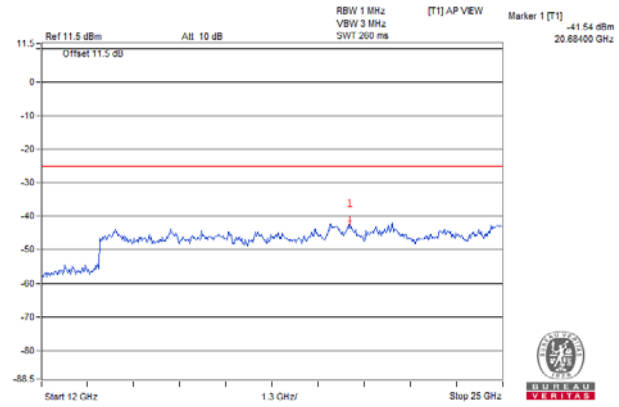
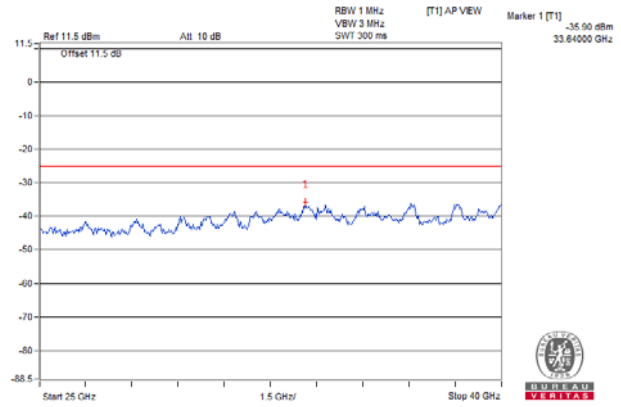
c. When the spectrum scanned from 9kHz to 40GHz, it shall be connected to the band reject filter attenuated the carried frequency.

4.6.4 Test Results

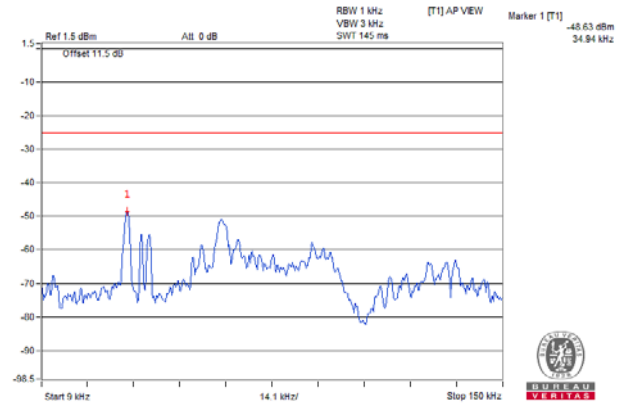
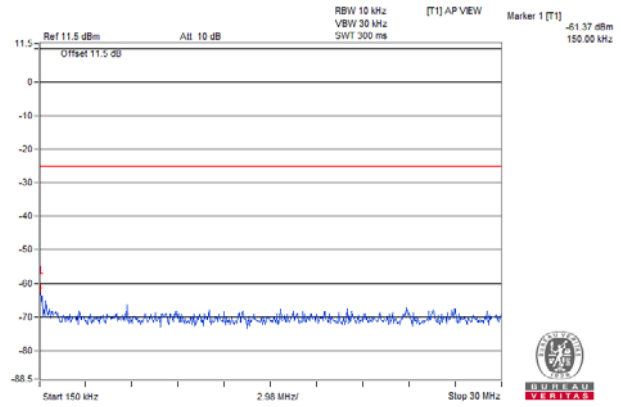
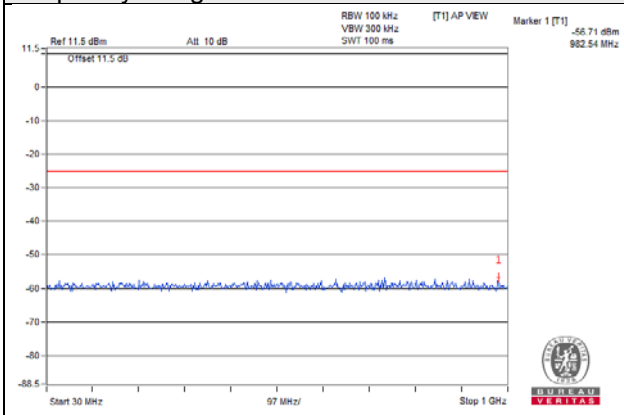
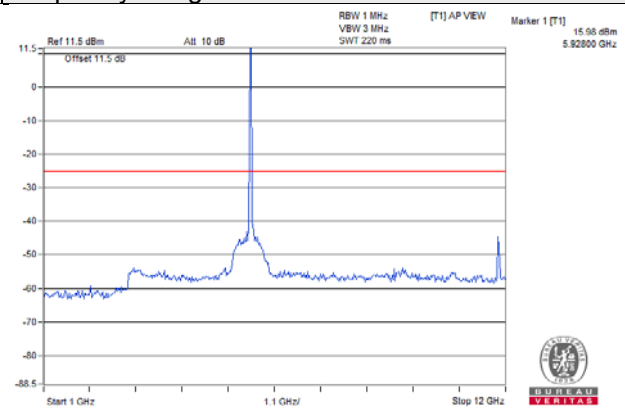
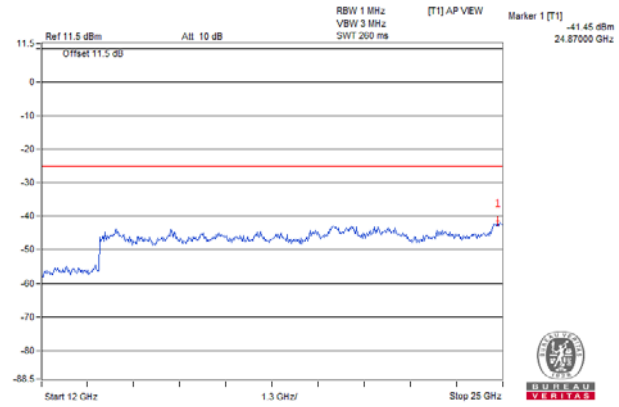
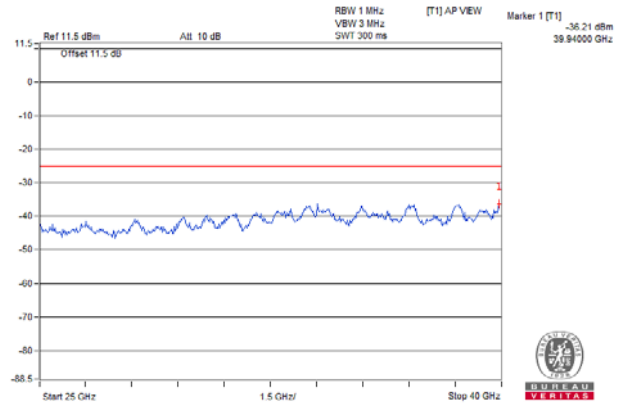
Test Mode A

Data Rate: 3Mbps	
Channel 172	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

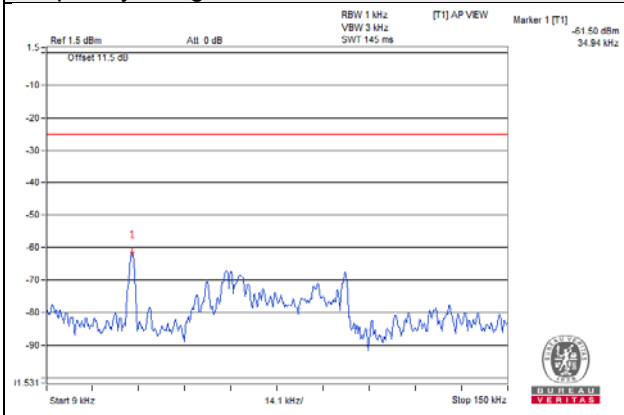
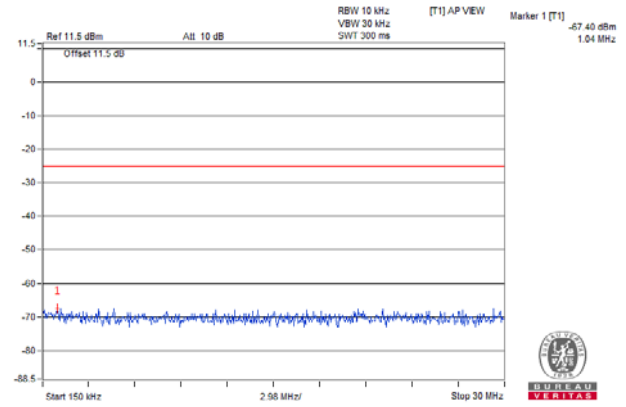
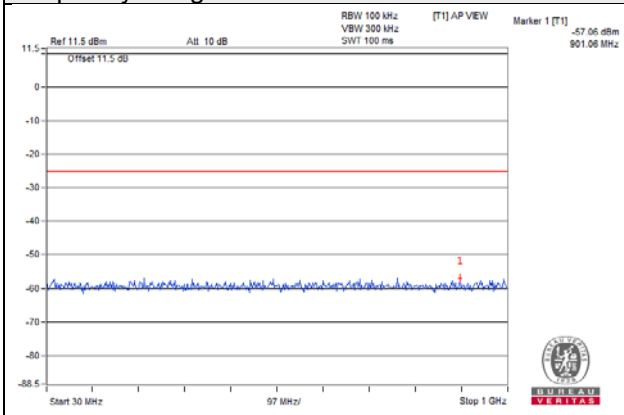
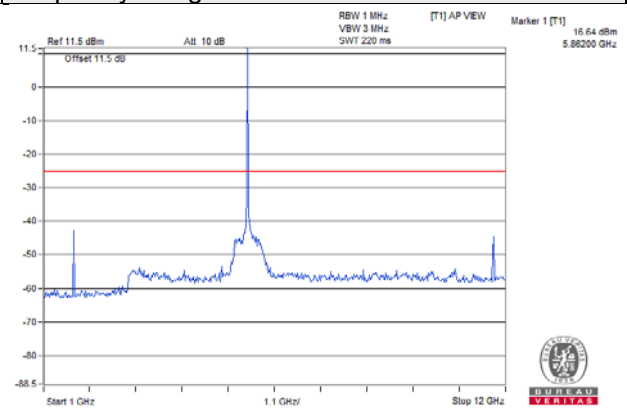
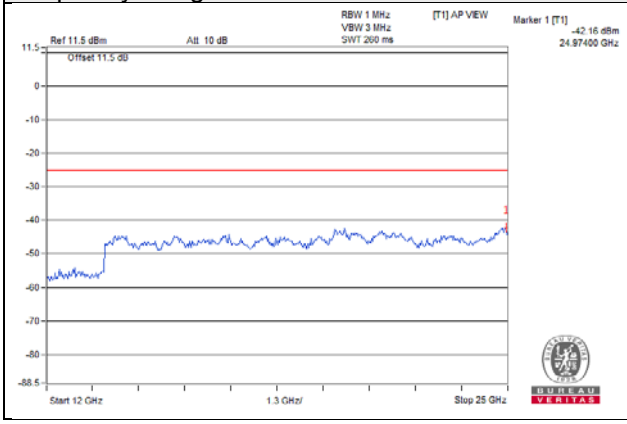
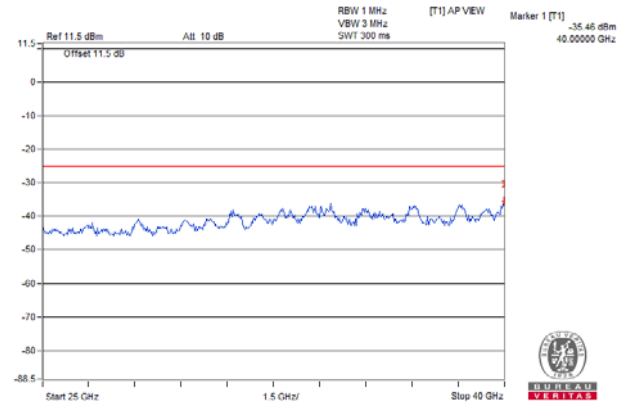
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps	
Channel 178	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

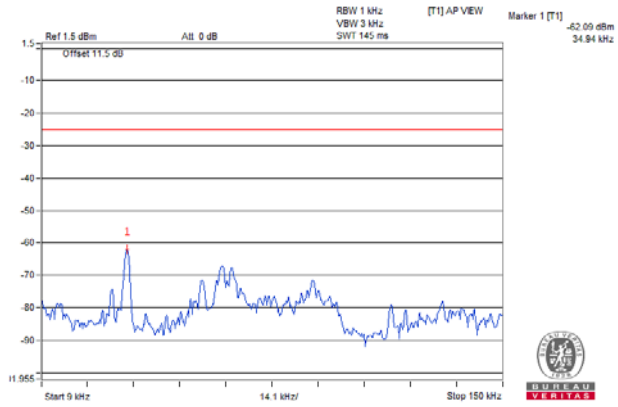
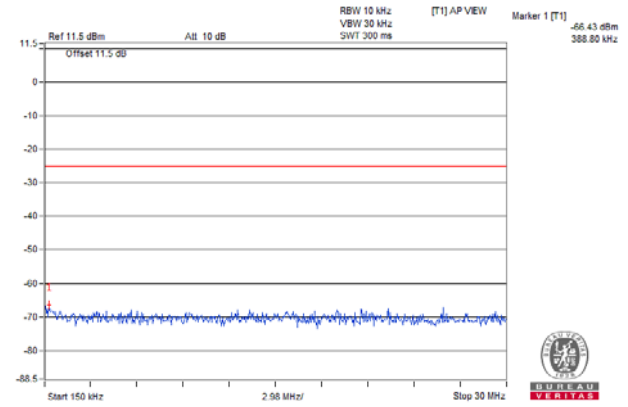
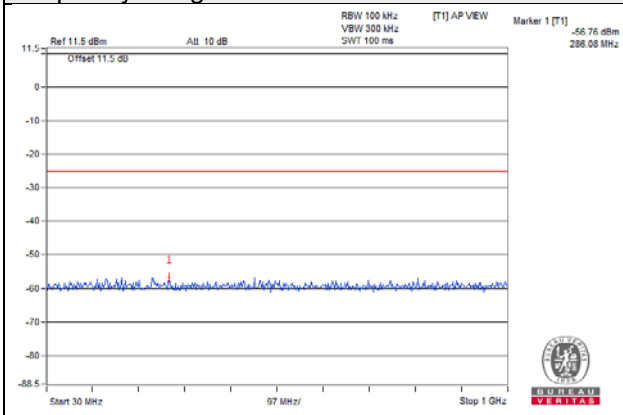
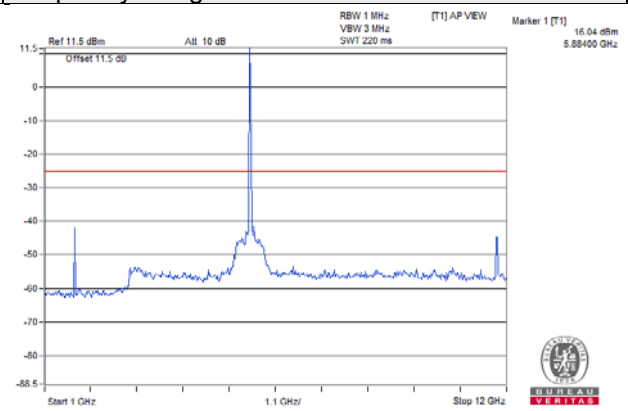
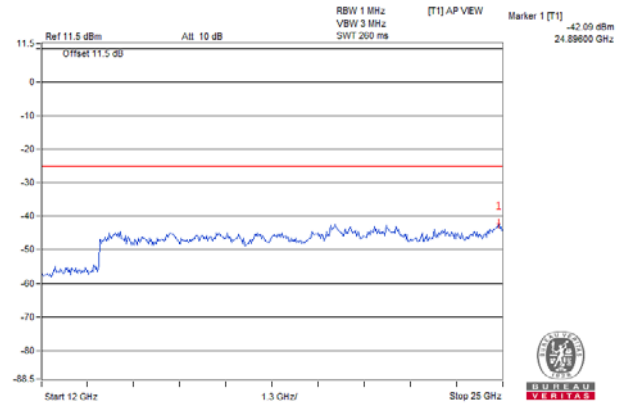
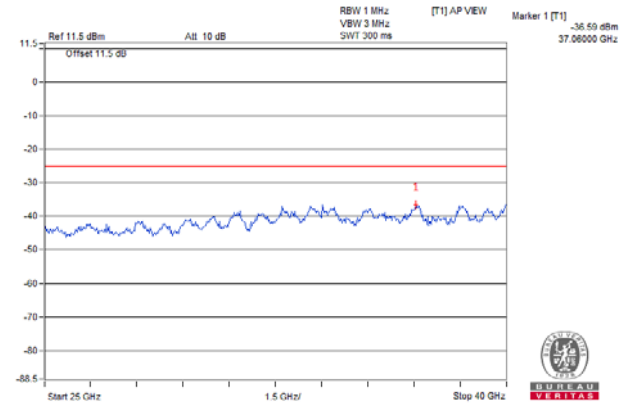
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps	
Channel 184	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

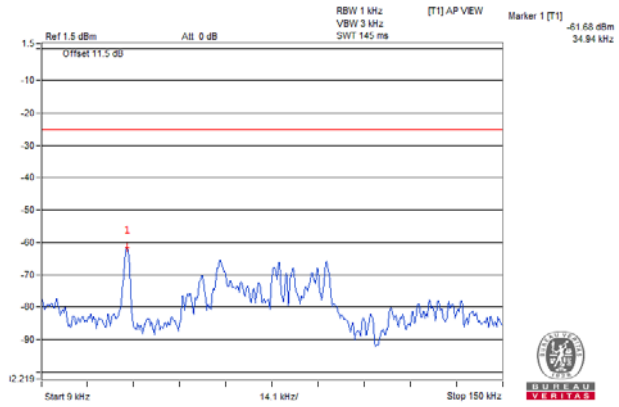
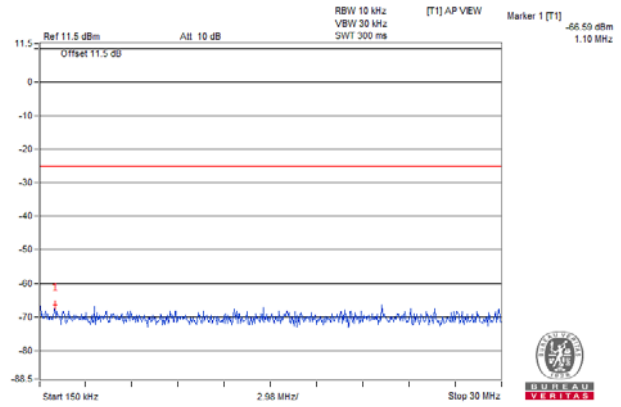
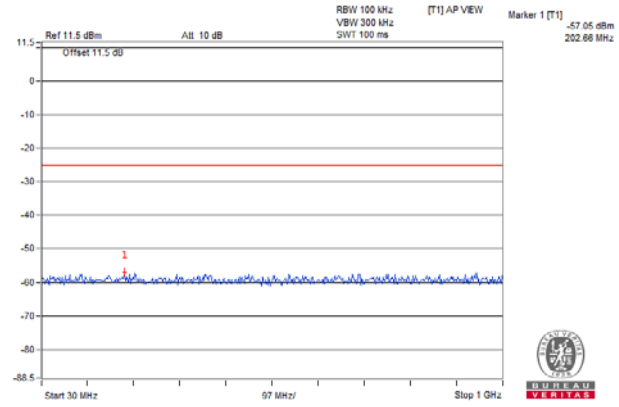
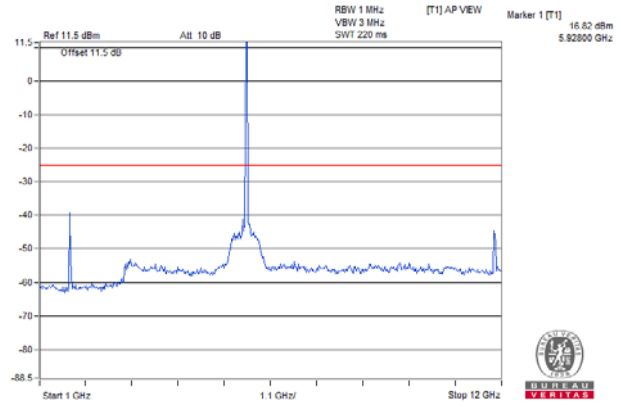
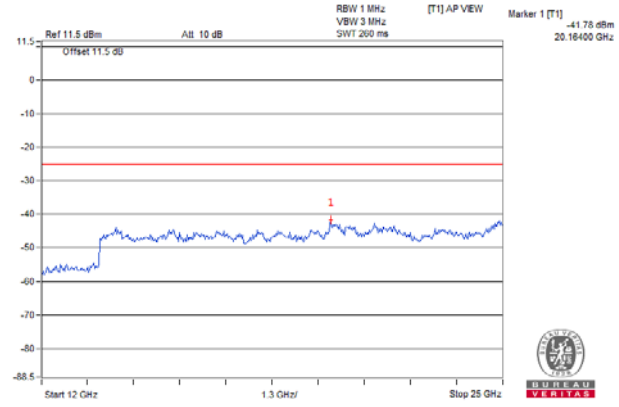
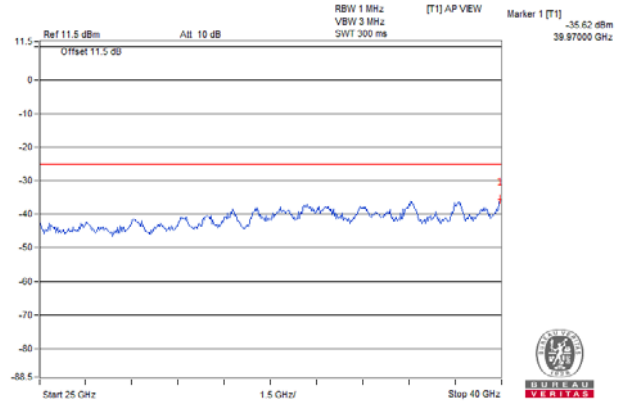
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps	
Channel 172	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

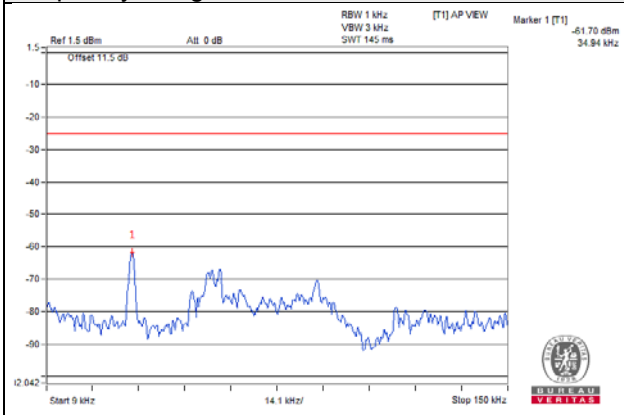
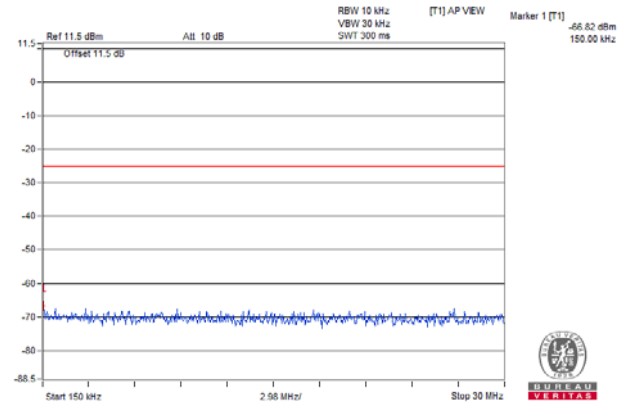
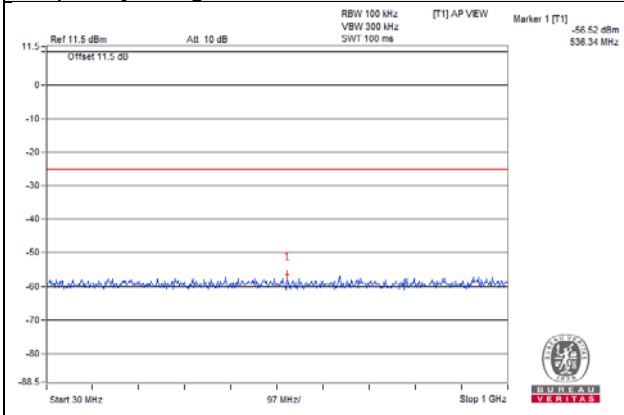
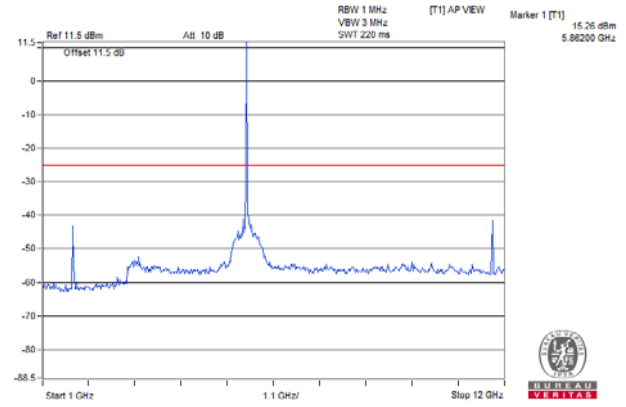
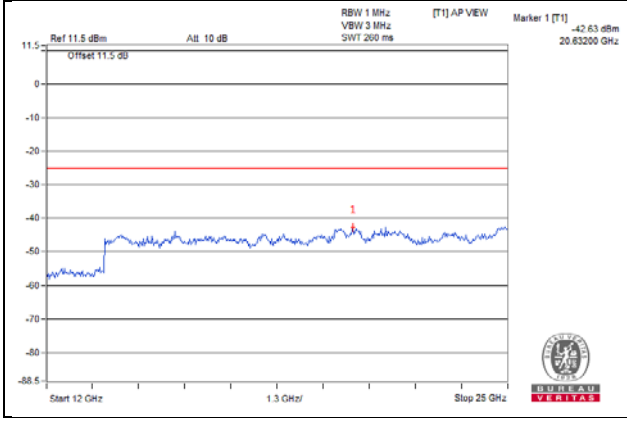
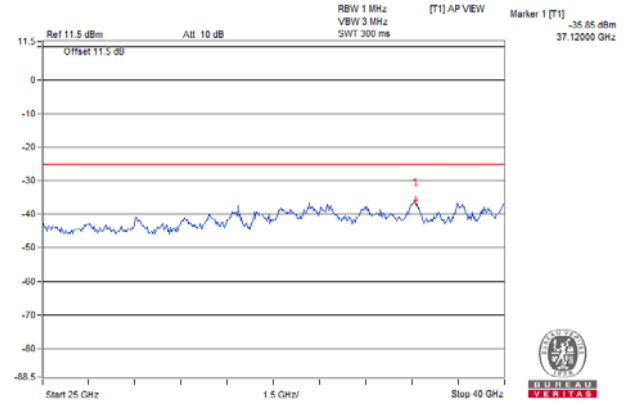
Data Rate: 27Mbps	
Channel 178	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

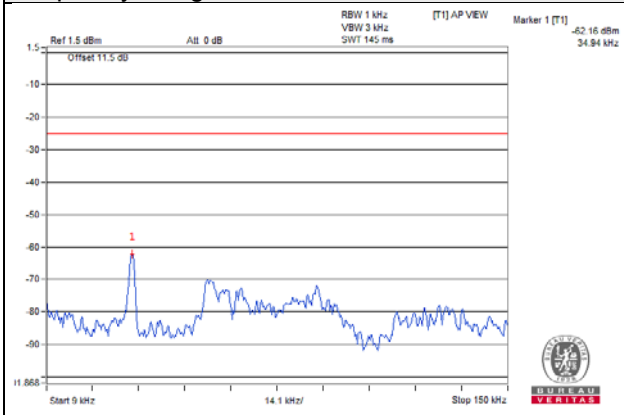
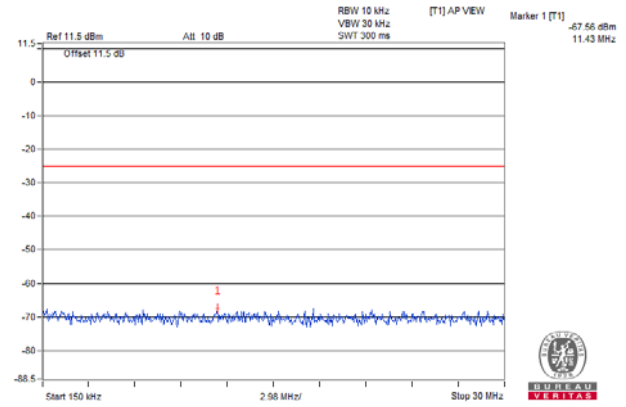
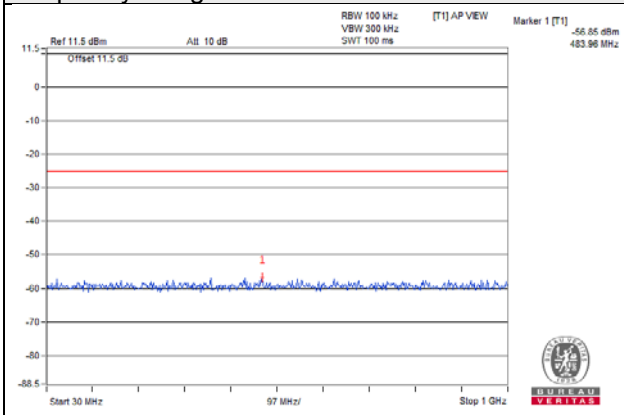
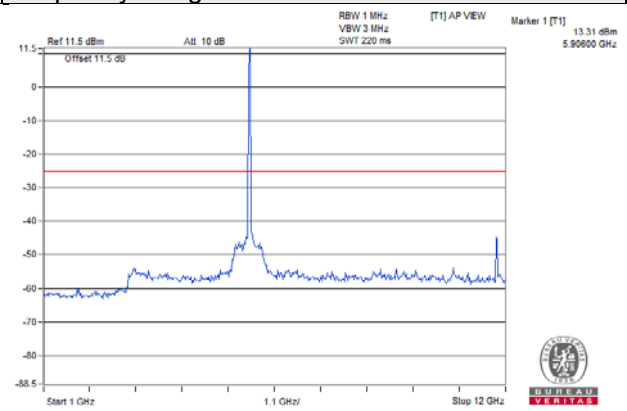
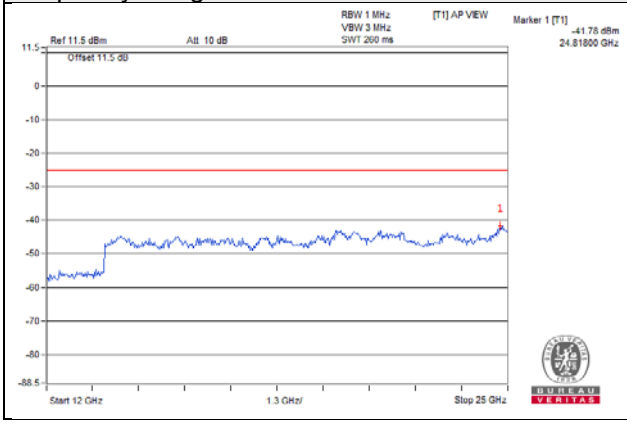
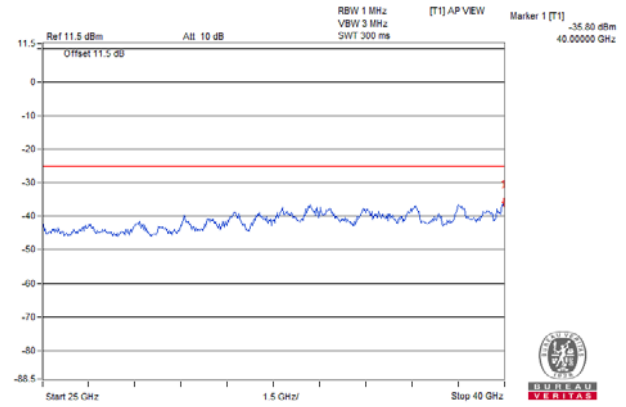
Data Rate: 27Mbps	
Channel 184	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

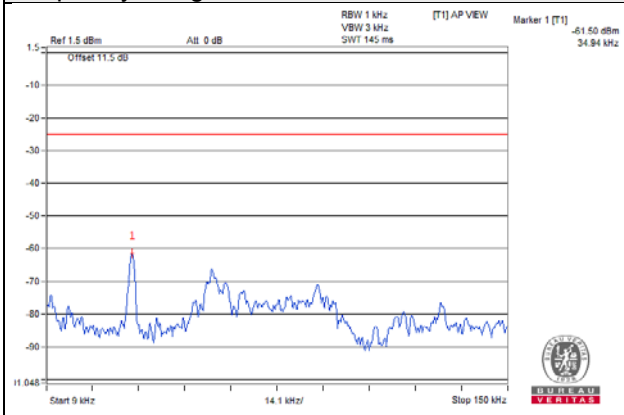
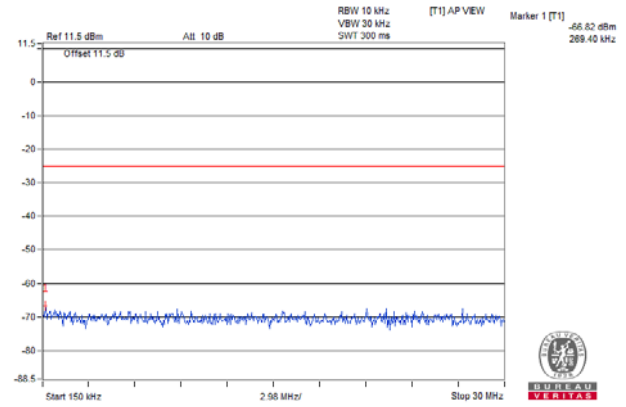
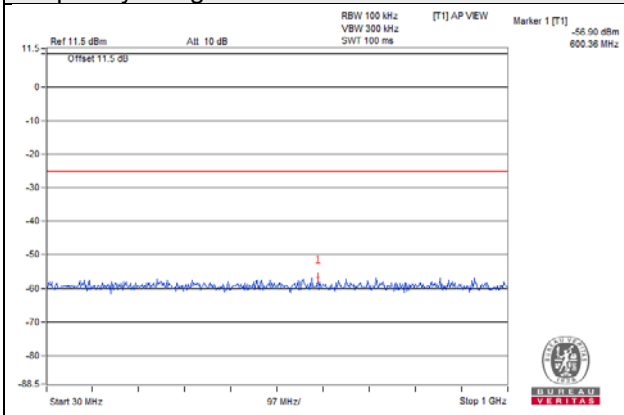
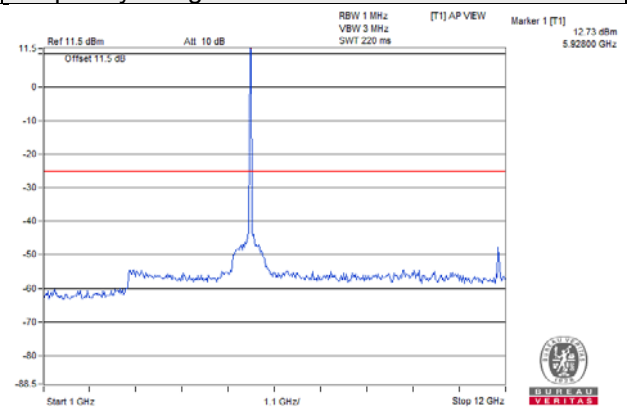
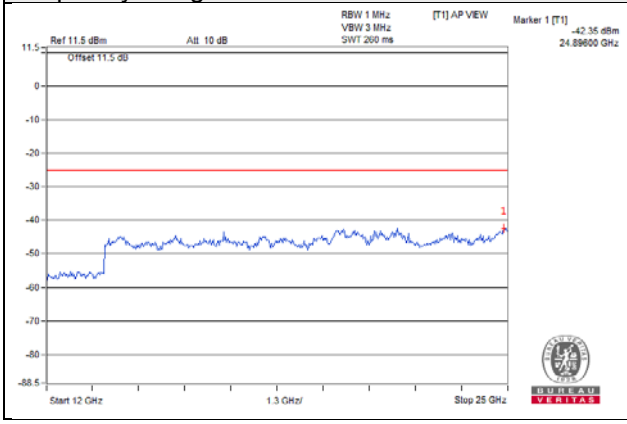
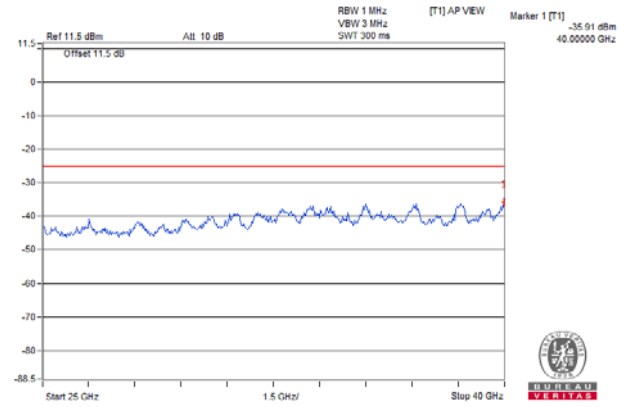
Test Mode B

Data Rate: 3Mbps, Chain 0	
Channel 172	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

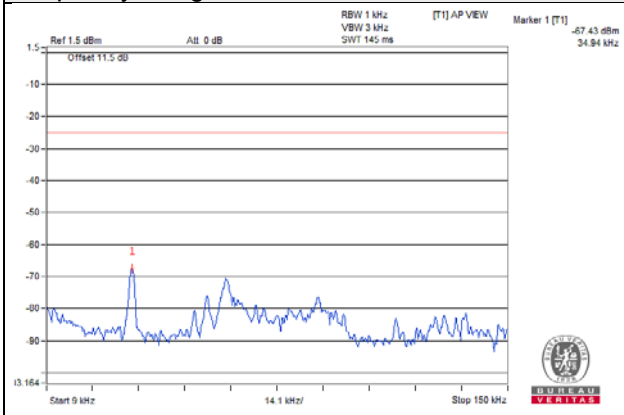
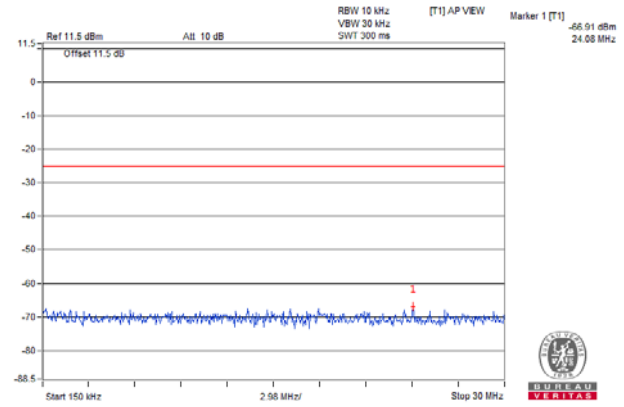
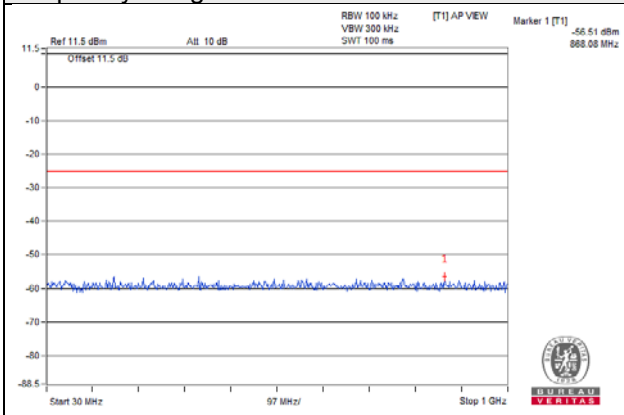
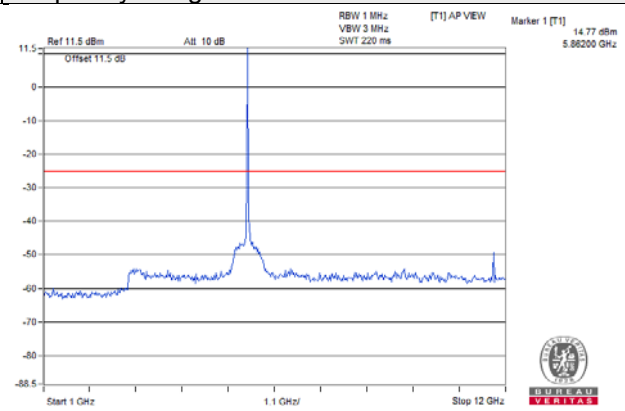
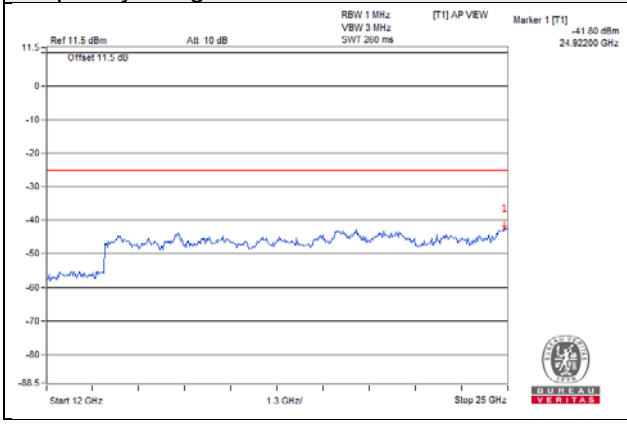
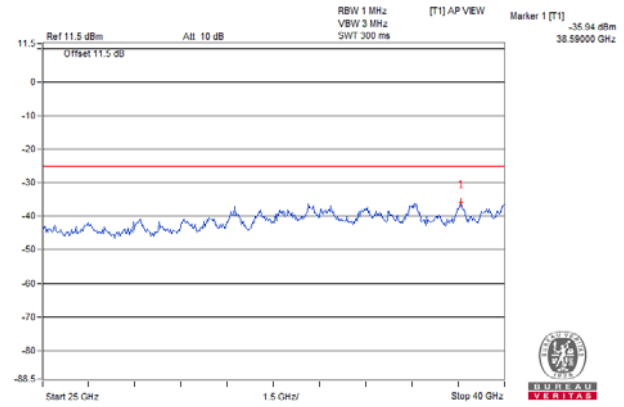
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps, Chain 0	
Channel 178	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

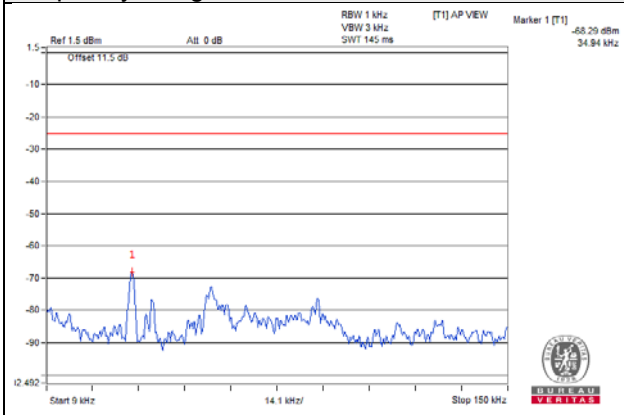
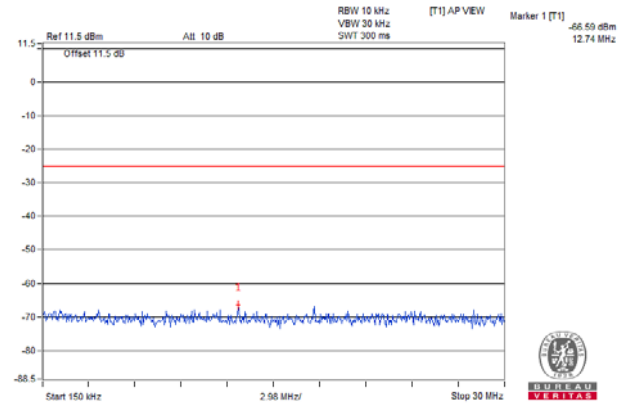
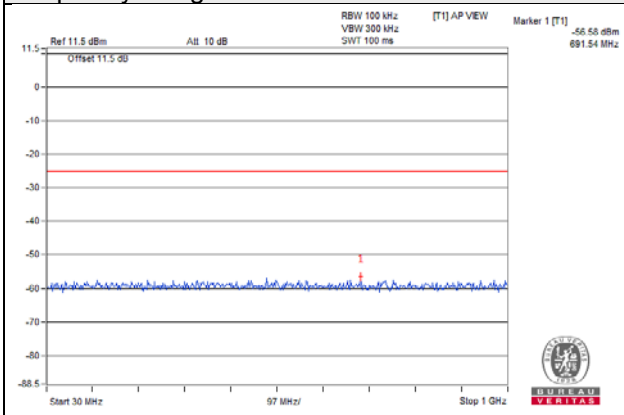
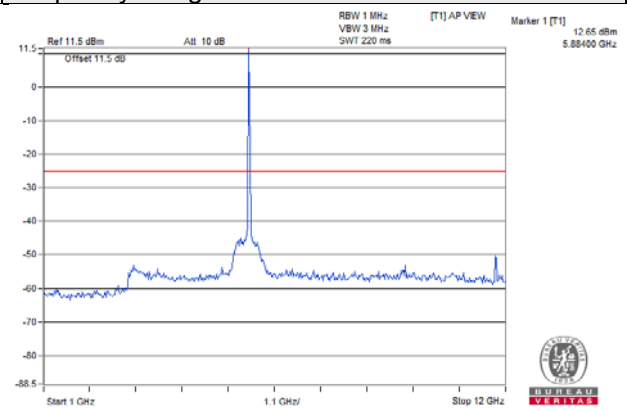
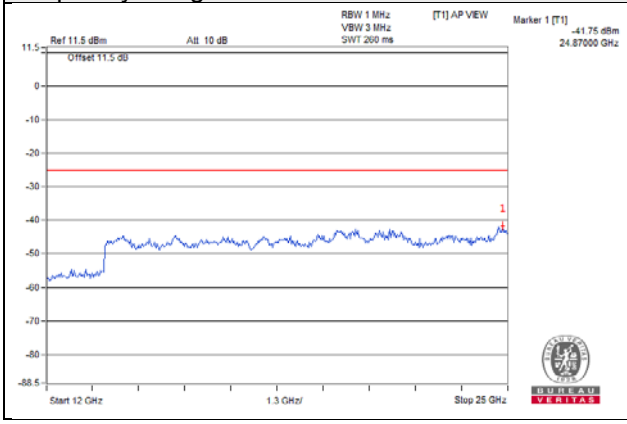
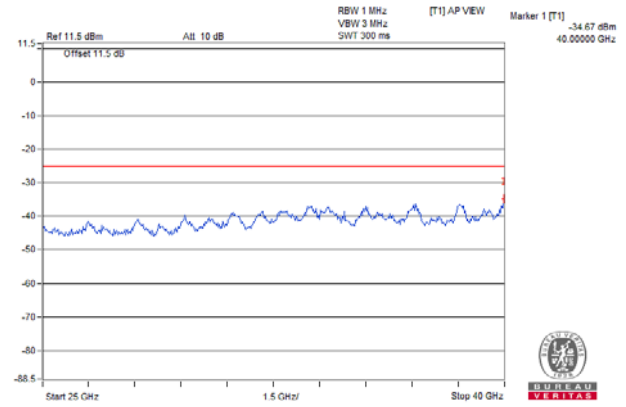
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps, Chain 0	
Channel 184	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

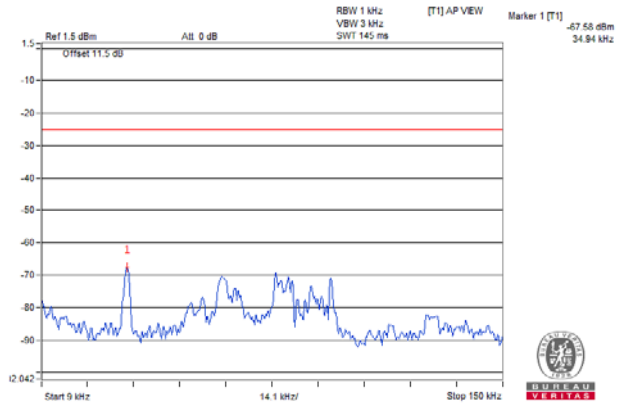
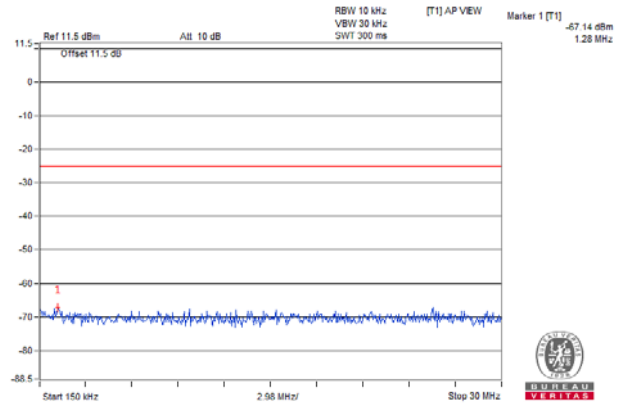
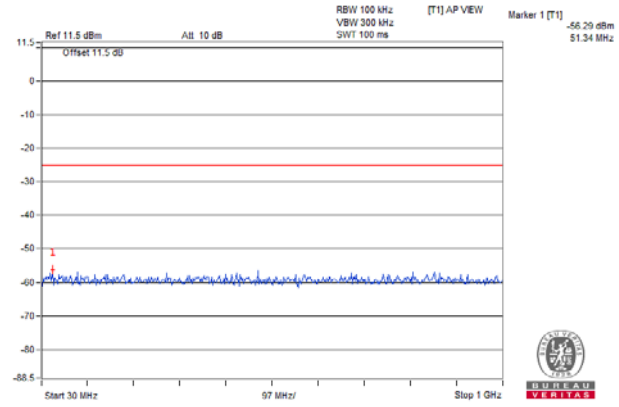
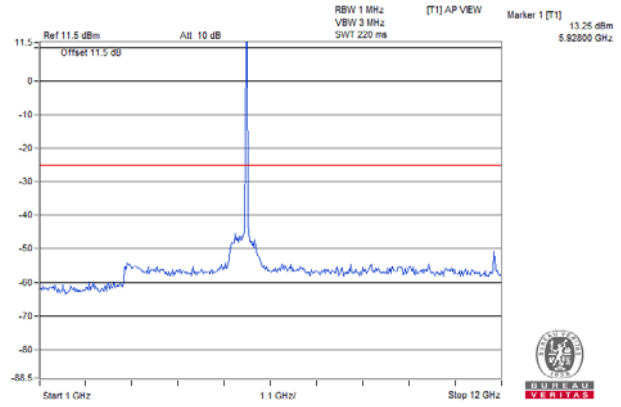
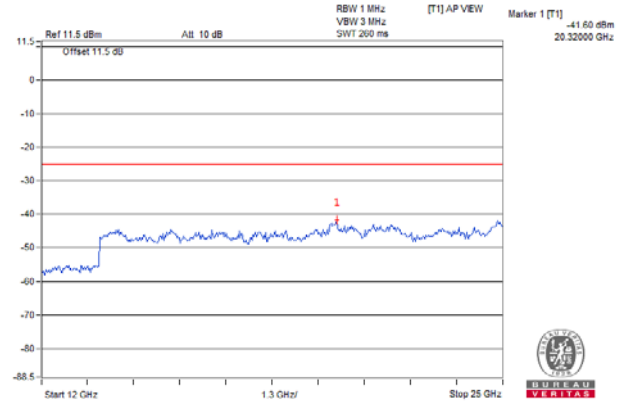
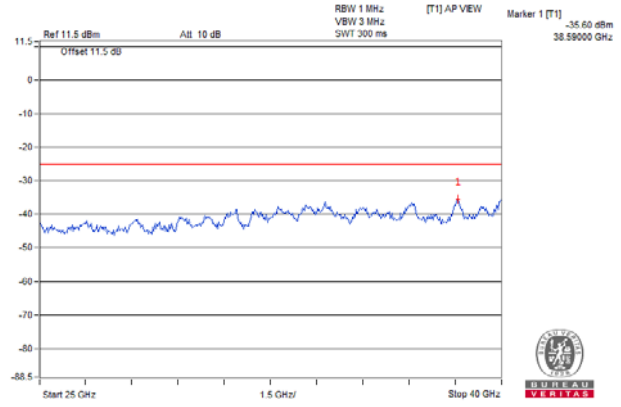
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps, Chain 1	
Channel 172	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

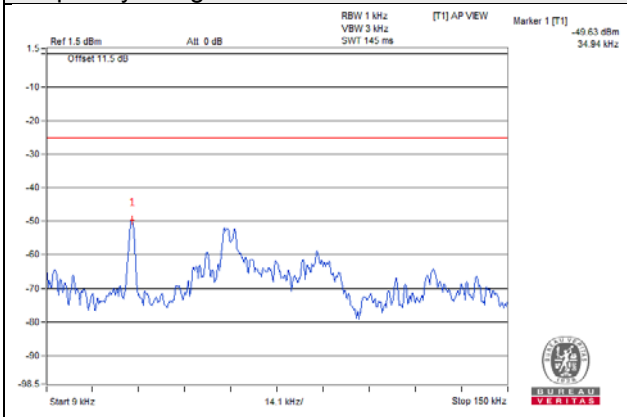
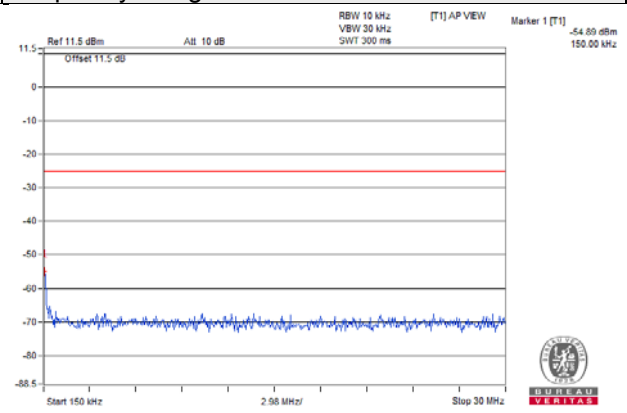
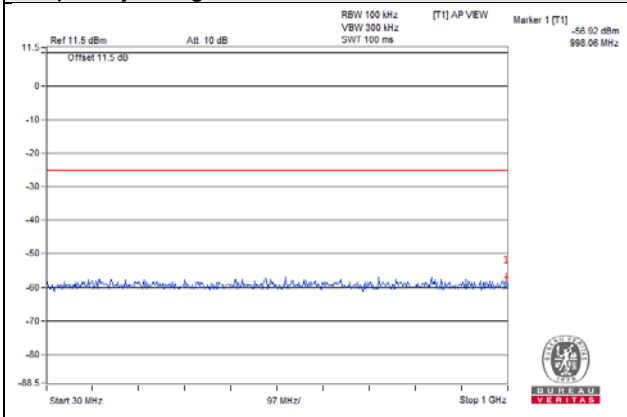
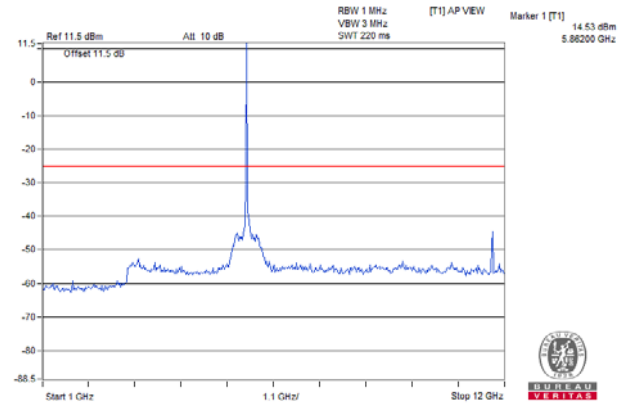
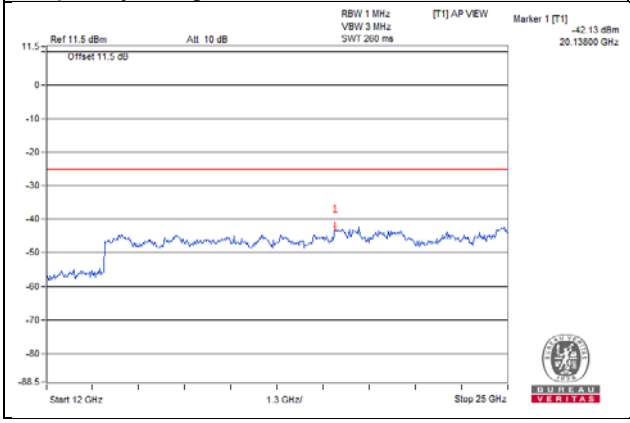
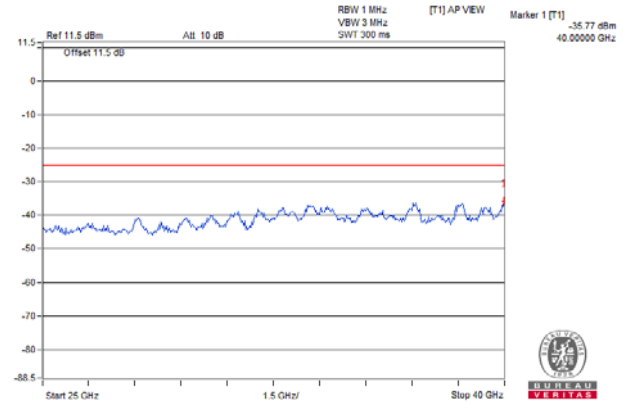
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps, Chain 1	
Channel 178	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

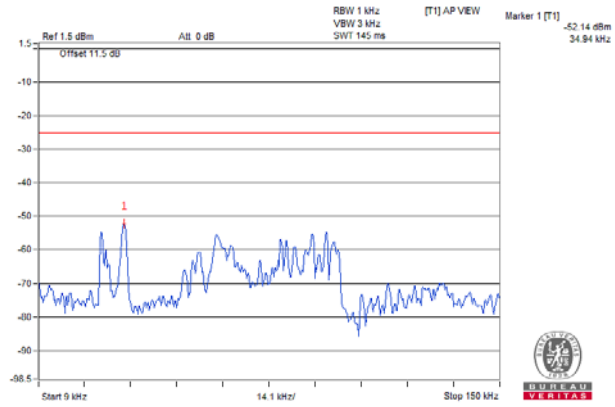
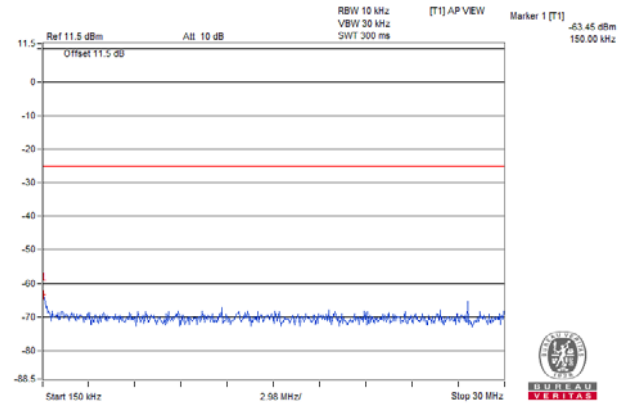
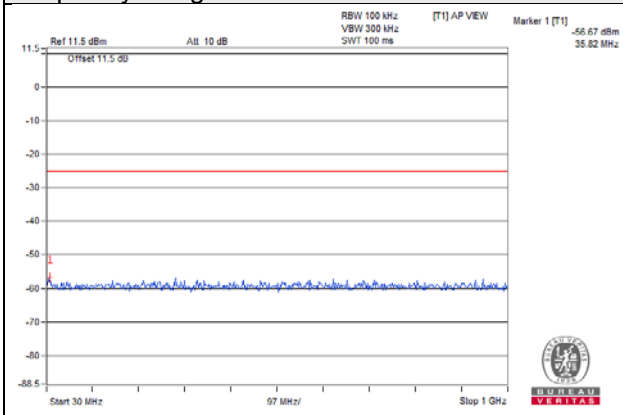
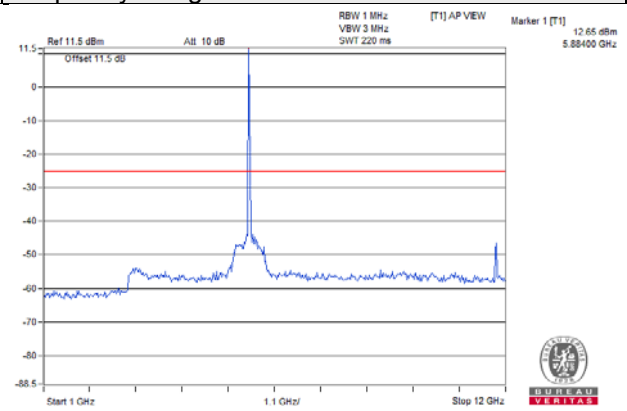
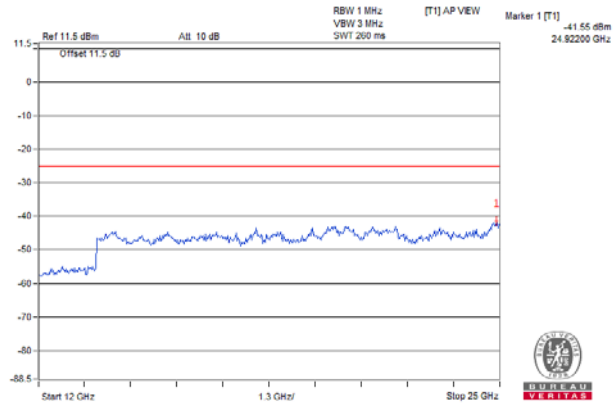
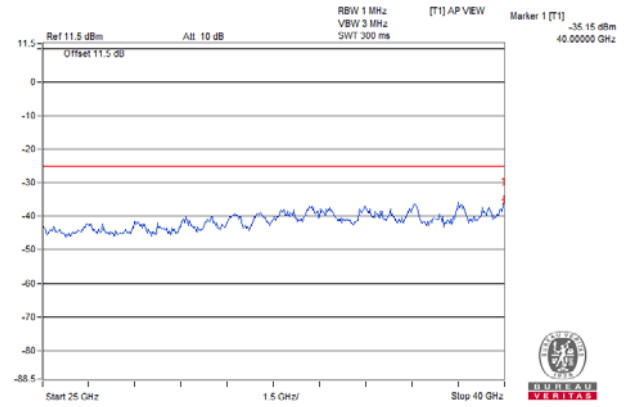
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 3Mbps, Chain 1	
Channel 184	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

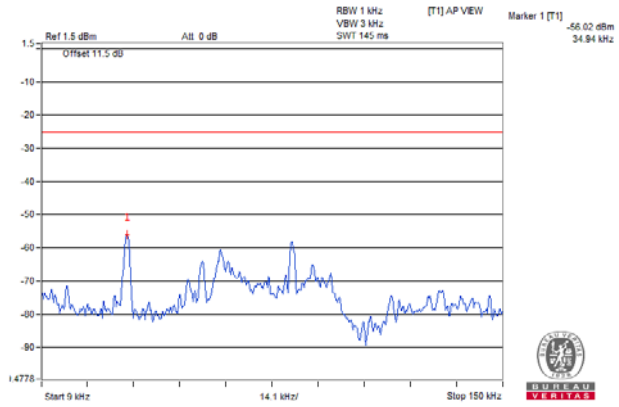
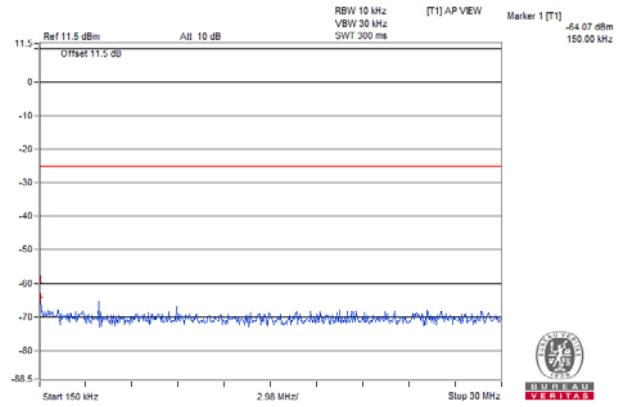
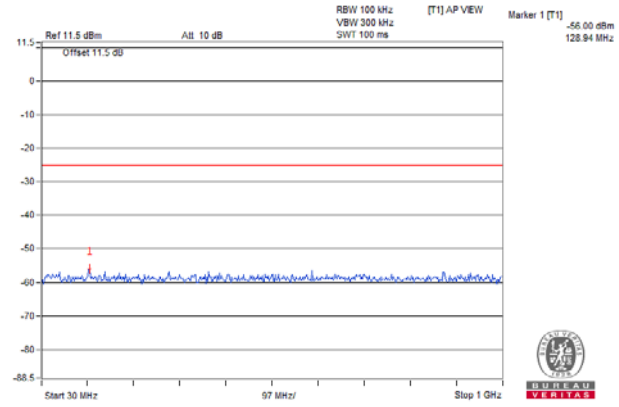
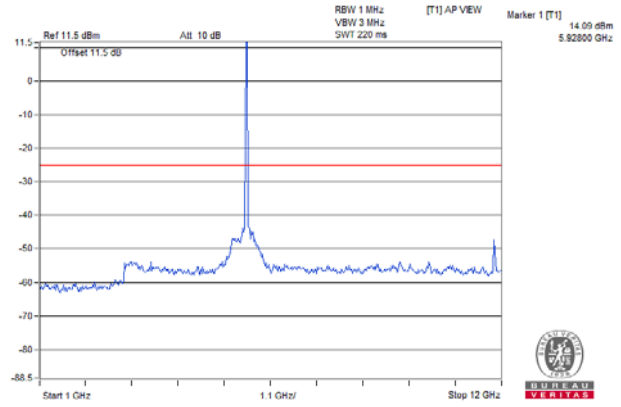
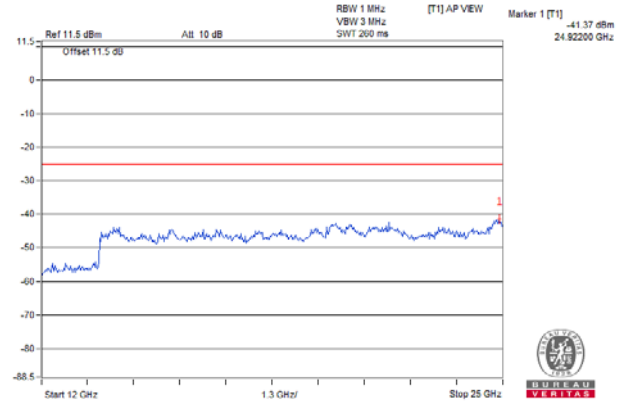
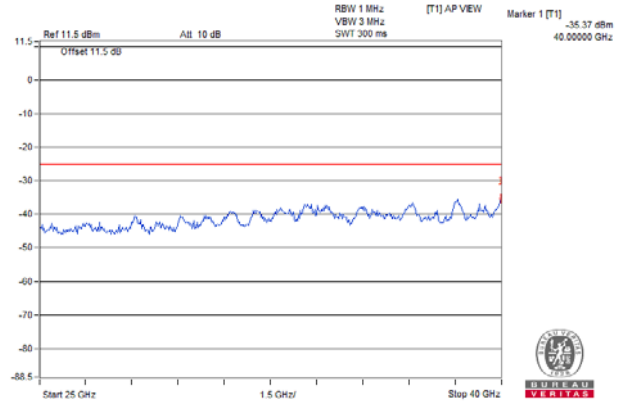
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps, Chain 0	
Channel 172	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

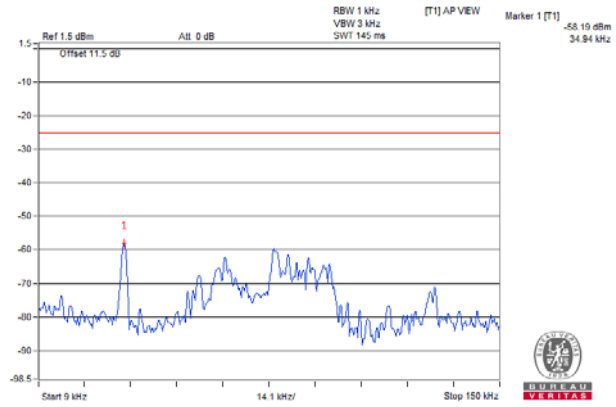
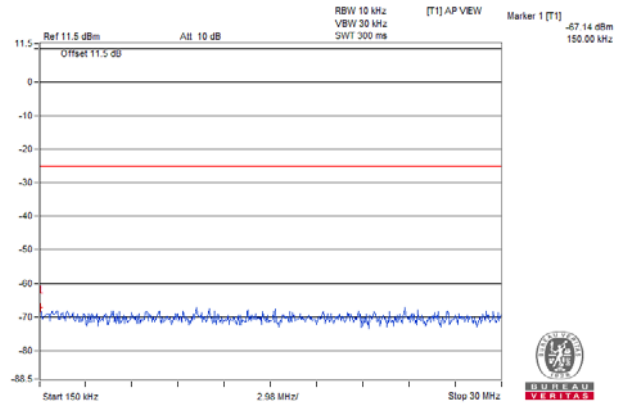
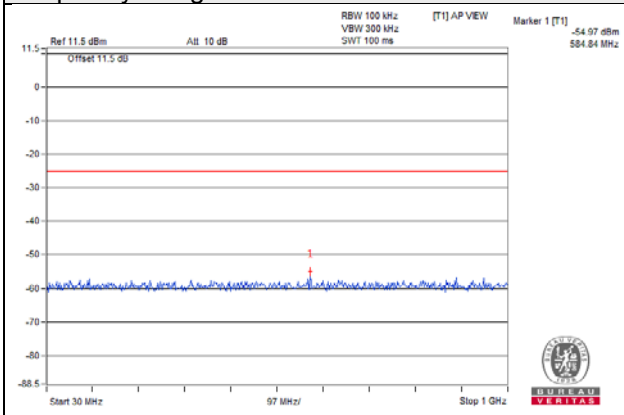
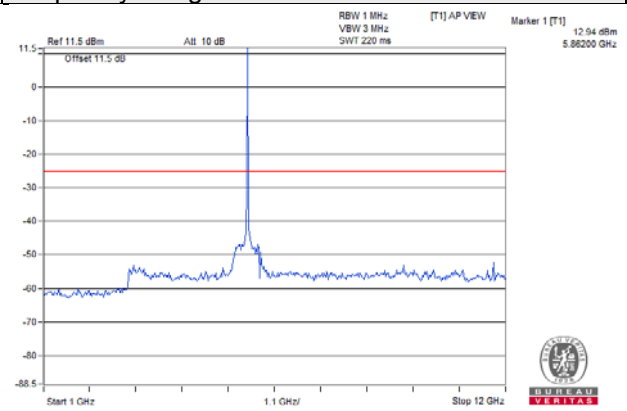
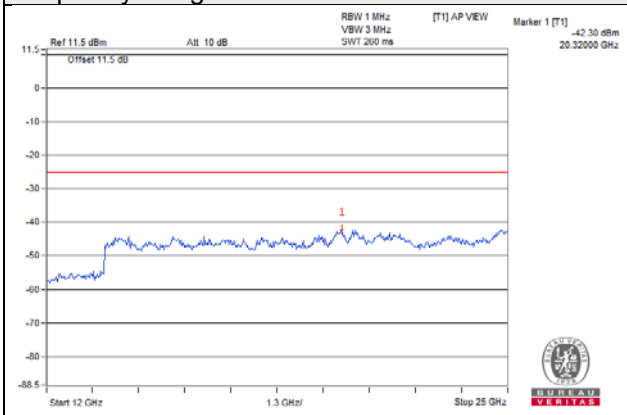
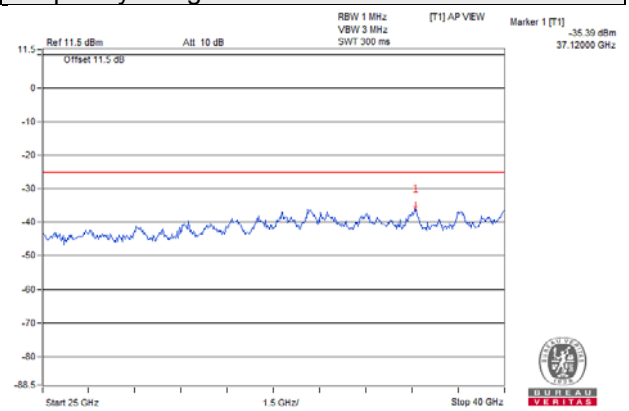
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps, Chain 0	
Channel 178	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

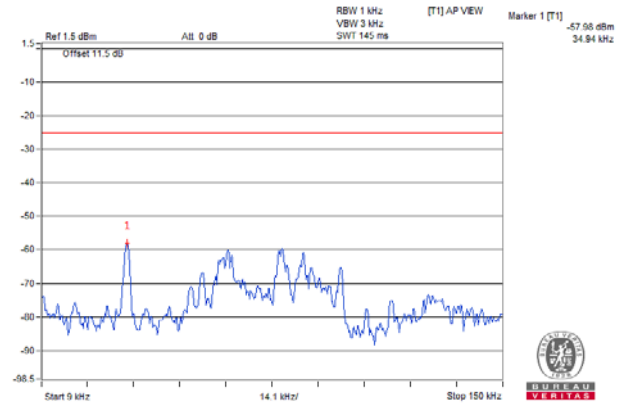
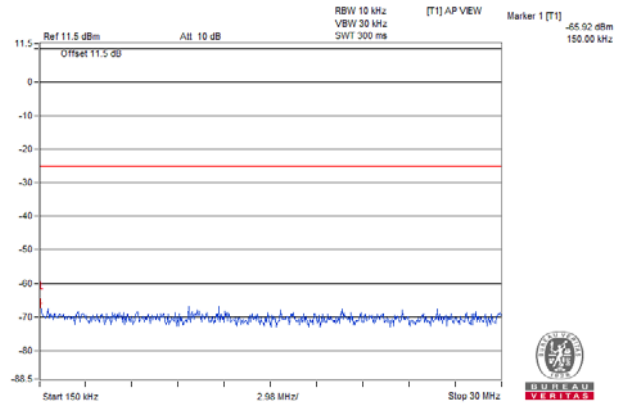
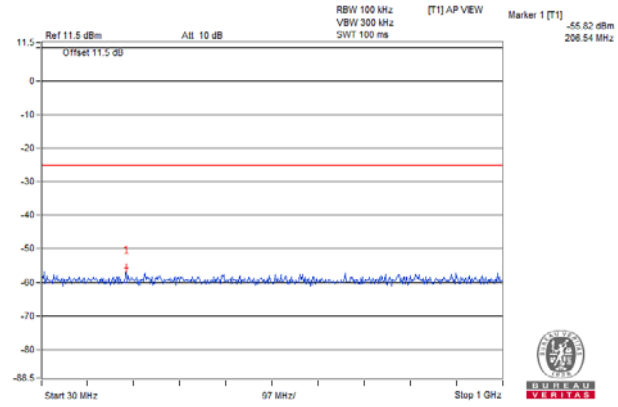
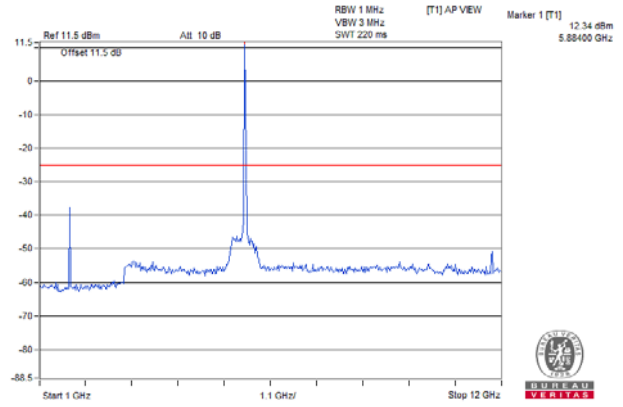
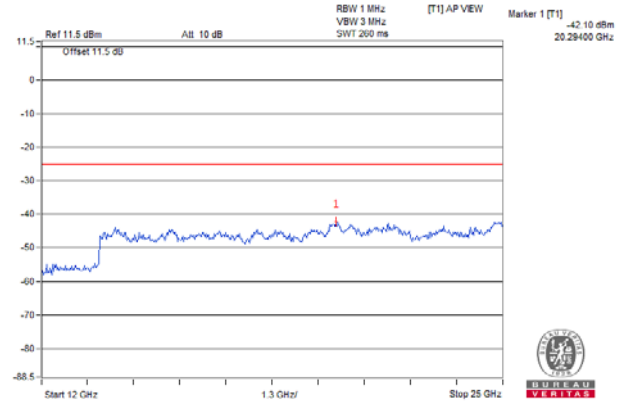
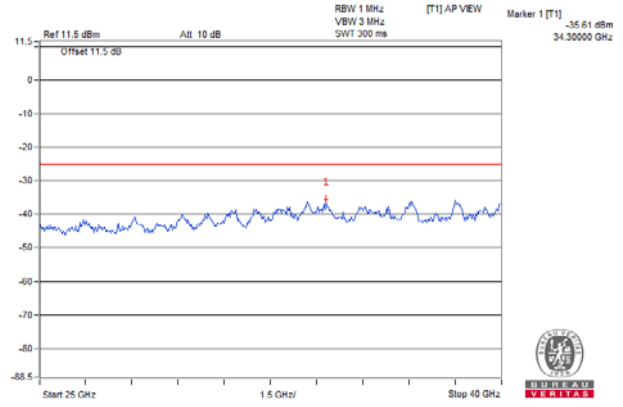
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps, Chain 0	
Channel 184	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

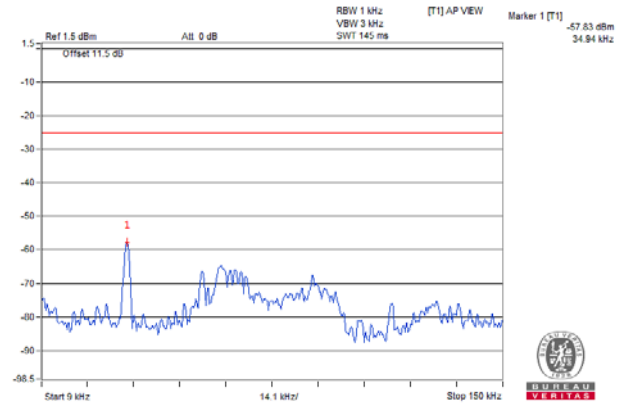
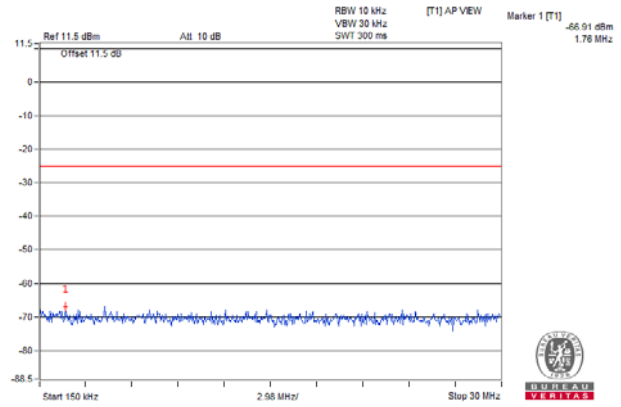
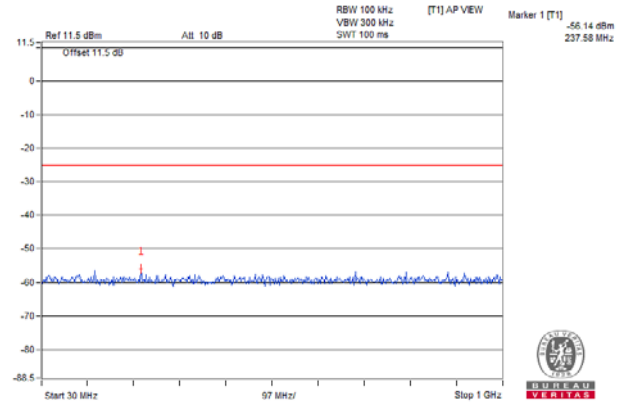
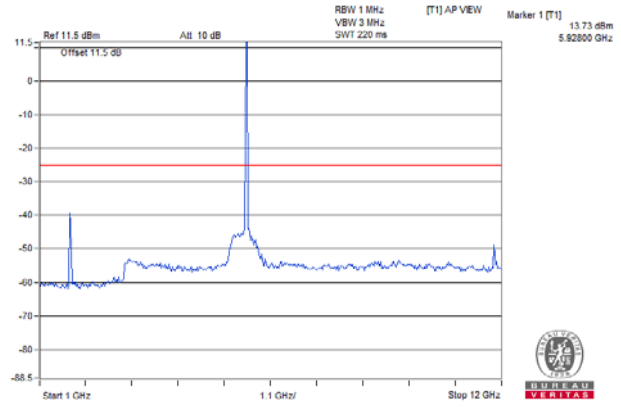
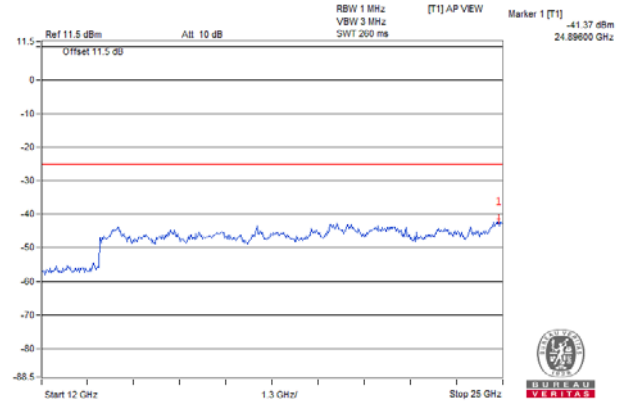
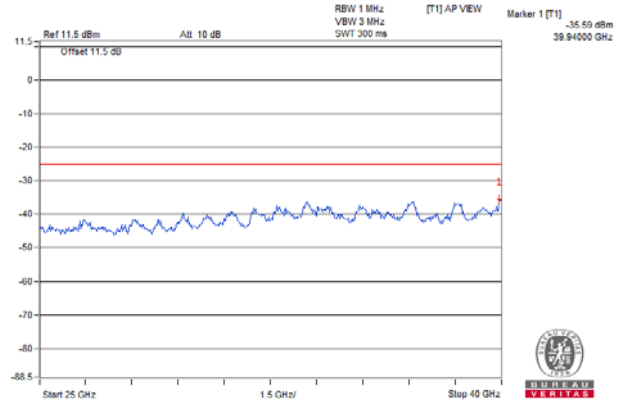
Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps, Chain 1	
Channel 172	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps, Chain 1	
Channel 178	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

Data Rate: 27Mbps, Chain 1	
Channel 184	
Frequency Range : 9kHz~150kHz	Frequency Range : 150kHz~30MHz
	
Frequency Range : 30MHz~1GHz	Frequency Range : 1GHz~12GHz
	
Frequency Range : 12GHz~25GHz	Frequency Range : 25GHz~40GHz
	

Note: The test figure (frequency range 1GHz ~ 12GHz) which measurement point over the limit was fundamental frequency.

4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least [55 + 10 log(P)] (e.i.r.p. -25dBm [70.2 dBuV/m at 3m]).

4.7.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

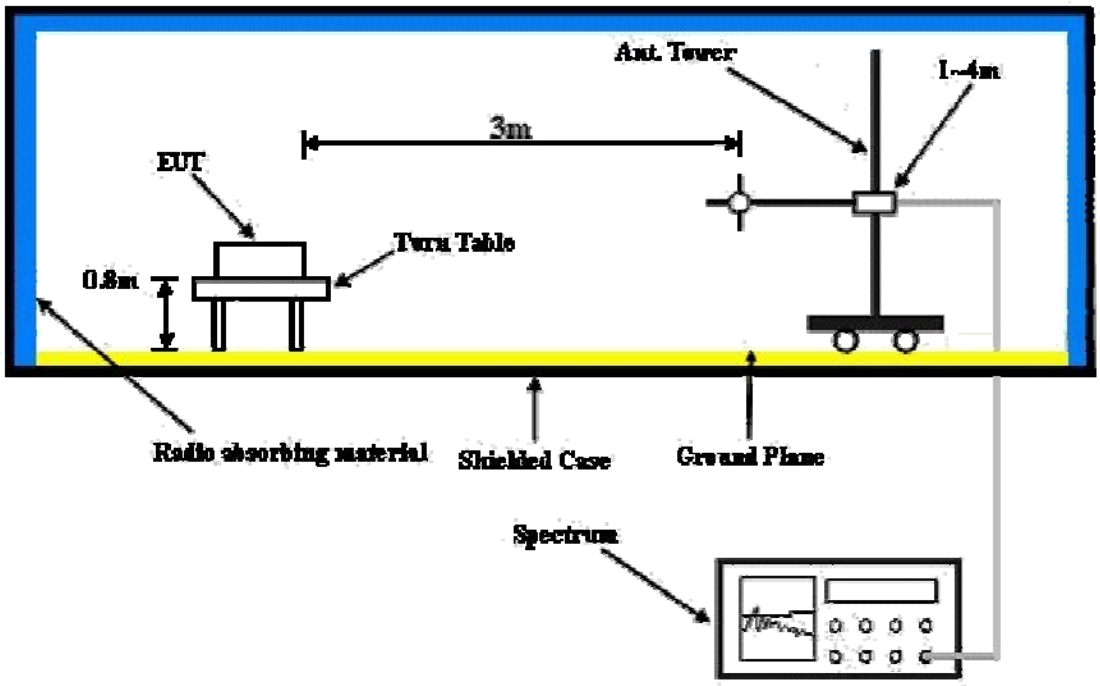
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.7.3 Deviation from Test Standard

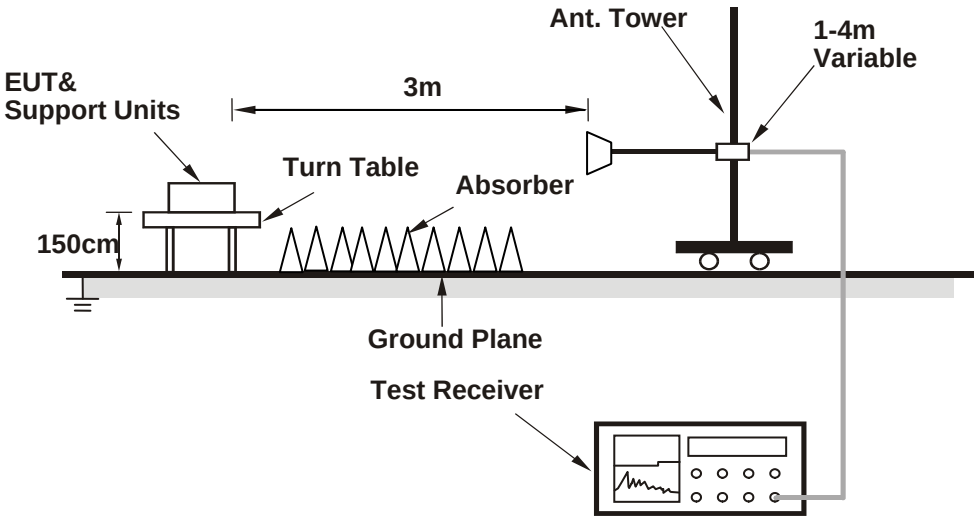
No deviation.

4.7.4 Test Setup

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).

4.7.5 Test Results

Below 1GHz

Test Mode A: Data rate: 3Mbps

Mode	TX channel 172	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 62%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	80.54	-40.0	-37.4	-1.5	-38.9	-25.0	-13.9
2	134.97	-47.3	-45.9	-0.3	-46.2	-25.0	-21.2
3	195.23	-45.6	-49.4	4.9	-44.5	-25.0	-19.5
4	243.83	-47.8	-52.2	5.5	-46.7	-25.0	-21.7
5	323.53	-51.0	-55.1	5.2	-49.9	-25.0	-24.9
6	480.98	-56.5	-60.4	5.0	-55.4	-25.0	-30.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	47.49	-40.7	-30.8	-9.6	-40.4	-25.0	-15.4
2	133.03	-43.6	-43.2	-0.1	-43.3	-25.0	-18.3
3	166.07	-37.8	-38.7	1.2	-37.5	-25.0	-12.5
4	751.18	-53.7	-58.0	4.6	-53.4	-25.0	-28.4
5	939.74	-55.2	-58.8	3.9	-54.9	-25.0	-29.9
6	966.95	-57.6	-61.2	3.9	-57.3	-25.0	-32.3

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Mode A: Data rate: 27Mbps

Mode	TX channel 172	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 62%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	80.54	-42.0	-39.4	-1.5	-40.9	-25.0	-15.9
2	134.97	-47.4	-46.0	-0.3	-46.3	-25.0	-21.3
3	166.07	-51.1	-51.2	1.2	-50.0	-25.0	-25.0
4	239.94	-46.8	-51.1	5.4	-45.7	-25.0	-20.7
5	366.29	-57.8	-61.9	5.2	-56.7	-25.0	-31.7
6	679.26	-59.8	-63.8	5.1	-58.7	-25.0	-33.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	47.49	-33.3	-23.4	-9.6	-33.0	-25.0	-8.0
2	70.82	-38.5	-33.5	-4.7	-38.2	-25.0	-13.2
3	86.37	-38.9	-38.7	0.1	-38.6	-25.0	-13.6
4	166.07	-49.7	-50.6	1.2	-49.4	-25.0	-24.4
5	239.94	-44.4	-49.5	5.4	-44.1	-25.0	-19.1
6	580.12	-59.1	-63.3	4.5	-58.8	-25.0	-33.8

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Mode B: Data rate: 3Mbps

Mode	TX channel 172	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 62%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	55.27	-46.1	-36.3	-8.7	-45.0	-25.0	-20.0
2	80.54	-39.4	-36.8	-1.5	-38.3	-25.0	-13.3
3	134.97	-47.3	-45.9	-0.3	-46.2	-25.0	-21.2
4	166.07	-51.8	-51.9	1.2	-50.7	-25.0	-25.7
5	255.49	-50.0	-54.2	5.3	-48.9	-25.0	-23.9
6	484.87	-55.7	-59.6	5.0	-54.6	-25.0	-29.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	47.49	-32.6	-22.7	-9.6	-32.3	-25.0	-7.3
2	70.82	-38.0	-33.0	-4.7	-37.7	-25.0	-12.7
3	119.42	-46.7	-46.5	0.1	-46.4	-25.0	-21.4
4	166.07	-50.1	-51.0	1.2	-49.8	-25.0	-24.8
5	239.94	-45.4	-50.5	5.4	-45.1	-25.0	-20.1
6	319.64	-49.7	-54.6	5.2	-49.4	-25.0	-24.4

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Mode B: Data rate: 27Mbps

Mode	TX channel 172	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 62%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	47.49	-46.5	-35.8	-9.6	-45.4	-25.0	-20.4
2	80.54	-40.0	-37.4	-1.5	-38.9	-25.0	-13.9
3	134.97	-45.7	-44.3	-0.3	-44.6	-25.0	-19.6
4	166.07	-51.6	-51.7	1.2	-50.5	-25.0	-25.5
5	255.49	-47.3	-51.5	5.3	-46.2	-25.0	-21.2
6	480.98	-58.5	-62.4	5.0	-57.4	-25.0	-32.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**47.49**	**-31.4**	**-21.5**	**-9.6**	**-31.1**	**-25.0**	**-6.1**
2	86.37	-37.9	-37.7	0.1	-37.6	-25.0	-12.6
3	134.97	-47.7	-47.1	-0.3	-47.4	-25.0	-22.4
4	166.07	-49.6	-50.5	1.2	-49.3	-25.0	-24.3
5	239.94	-46.4	-51.5	5.4	-46.1	-25.0	-21.1
6	459.60	-57.9	-62.6	5.0	-57.6	-25.0	-32.6

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Above 1GHz

Test Mode A: Data rate: 3Mbps

Mode	TX channel 172	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-64.5	-37.5	2.9	-34.6	-25.0	-9.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-65.2	-39.5	2.9	-36.6	-25.0	-11.6

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 178	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-64.6	-37.6	3.0	-34.6	-25.0	-9.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-65.3	-39.0	3.0	-36.0	-25.0	-11.0

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 180	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-64.8	-37.8	3.1	-34.7	-25.0	-9.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-65.5	-39.1	3.1	-36.0	-25.0	-11.0

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 182	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-64.4	-37.5	3.1	-34.4	-25.0	-9.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-64.7	-38.1	3.1	-35.0	-25.0	-10.0

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 184	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-64.4	-37.6	3.2	-34.4	-25.0	-9.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-65.5	-38.8	3.2	-35.6	-25.0	-10.6

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Mode A: Data rate: 27Mbps

Mode	TX channel 172	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-65.7	-38.7	2.9	-35.8	-25.0	-10.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-65.3	-39.6	2.9	-36.7	-25.0	-11.7

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 178	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-65.2	-38.2	3.0	-35.2	-25.0	-10.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-64.9	-38.6	3.0	-35.6	-25.0	-10.6

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 180	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-65.2	-38.2	3.1	-35.1	-25.0	-10.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-65.1	-38.7	3.1	-35.6	-25.0	-10.6

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 182	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-65.4	-38.5	3.1	-35.4	-25.0	-10.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-65.1	-38.5	3.1	-35.4	-25.0	-10.4

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 184	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-65.5	-38.7	3.2	-35.5	-25.0	-10.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-65.6	-38.9	3.2	-35.7	-25.0	-10.7

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Mode B: Data rate: 3Mbps

Mode	TX channel 172	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-62.3	-35.3	2.9	-32.4	-25.0	-7.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-63.1	-37.4	2.9	-34.5	-25.0	-9.5

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 178	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-62.9	-35.9	3.0	-32.9	-25.0	-7.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-63.5	-37.2	3.0	-34.2	-25.0	-9.2

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 180	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-64.2	-37.2	3.1	-34.1	-25.0	-9.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-62.8	-36.4	3.1	-33.3	-25.0	-8.3

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 182	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-63.8	-36.9	3.1	-33.8	-25.0	-8.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-62.7	-36.1	3.1	-33.0	-25.0	-8.0

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 184	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-63.5	-36.7	3.2	-33.5	-25.0	-8.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-63.0	-36.3	3.2	-33.1	-25.0	-8.1

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Mode B: Data rate: 27Mbps

Mode	TX channel 172	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-63.8	-36.8	2.9	-33.9	-25.0	-8.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11720.00	-63.3	-37.6	2.9	-34.7	-25.0	-9.7

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 178	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-63.9	-36.9	3.0	-33.9	-25.0	-8.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11780.00	-62.8	-36.5	3.0	-33.5	-25.0	-8.5

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 180	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-64.5	-37.5	3.1	-34.4	-25.0	-9.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11800.00	-63.4	-37.0	3.1	-33.9	-25.0	-8.9

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 182	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-63.6	-36.7	3.1	-33.6	-25.0	-8.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11820.00	-63.5	-36.9	3.1	-33.8	-25.0	-8.8

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 184	Frequency Range	Above 1000MHz
Environmental Conditions	20deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Willy Cheng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-63.5	-36.7	3.2	-33.5	-25.0	-8.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	11840.00	-63.3	-36.6	3.2	-33.4	-25.0	-8.4

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

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.

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

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