

FCC Radio Test Report

FCC ID: QISLS1015

This report concerns (check one): ☒Original Grant ☐Class II Change

Project No. : 1601C130
Equipment : Smart Home Gateway
Model Name : EchoLife LS1015
Applicant : Huawei Technologies Co.,Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen

Date of Receipt : Jan. 15, 2016
Date of Test : Jan. 15, 2016 ~ Feb. 01, 2016
Issued Date : Feb. 02, 2016
Tested by : BTL Inc.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-2-1601C130	Original Issue.	Feb. 02, 2016

1. CERTIFICATION

Equipment : Smart Home Gateway
Brand Name : Huawei
Model Name : EchoLife LS1015
Applicant : Huawei Technologies Co.,Ltd.
Manufacturer : Huawei Technologies Co.,Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen
Factory : Huawei Technologies Co.,Ltd.
Address : Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.China
Date of Test : Jan. 15, 2016 ~ Feb. 01, 2016
Test Sample : Engineering Sample
Standard(s) : FCC Part15, Subpart C(15.249)/ ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-2-1601C130) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart C (15.249)			
StandardSection	Test Item	Judgment	Remark
FCC			
15.207	Conducted Emission	PASS	
15.209 15.249	Radiated Spurious Emission	PASS	

NOTE:

(1)"N/A" denotes test is not applicable in this test report.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's test firm number for FCC: 319330

2.2 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, The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 KHz ~ 30MHz	2.32

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
DG-CB03	CISPR	9KHz~30MHz	V	3.79
		9KHz~30MHz	H	3.57
		30MHz ~ 200MHz	V	3.82
		30MHz ~ 200MHz	H	3.78
		200MHz ~ 1,000MHz	V	4.10
		200MHz ~ 1,000MHz	H	4.06
		1GHz~18GHz	V	3.12
		1GHz~18GHz	H	3.68
		18GHz~40GHz	V	4.15
		18GHz~40GHz	H	4.14

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Home Gateway	
Brand Name	Huawei	
Model Name	EchoLife LS1015	
Model Difference	NA	
Product Description	Operation Frequency	908.40-916.00MHz
	Modulation Technology	FSK(9.6Kbps, 40Kbps, 100Kbps)
	Data rate	
	Field Strength	102.06 dBuV/m(PK Max)
Power Source	DC voltage supplied from AC/DC adapter. (Support Unit)	
Power Rating	I/P: AC 100-240V O/P :DC 12V	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	amphenol / Nippon	HW7574-12-000-R / C15N15Z100EH	Internal	N/A	2

3. Channel List:

Channel	Frequency (MHz)
01	908.40
02	908.42
03	916.00

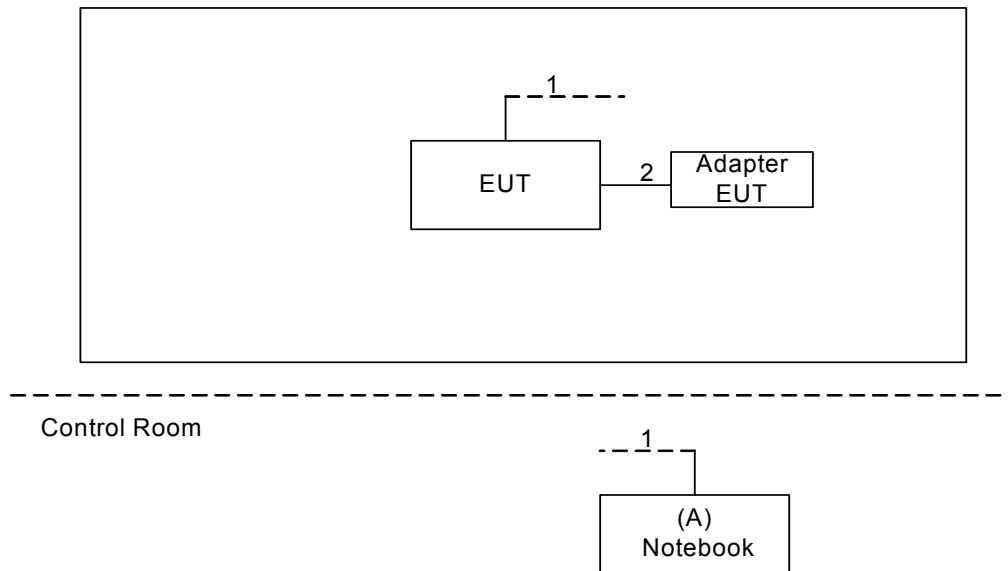
3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
A	PC	Lenovo	H2510	DOC	SS07999198

Item	Shielded Type	Ferrite Core	Length	Note
1	N/A	N/A	10m	RJ-45 Cable
2	N/A	N/A	1.5m	AC Cable

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (FREQUENCY RANGE 150KHZ-30MHZ)

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 -0.5	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

Note:

- (1) The limit of " * " decreases with the logarithm of the frequency
- (2) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

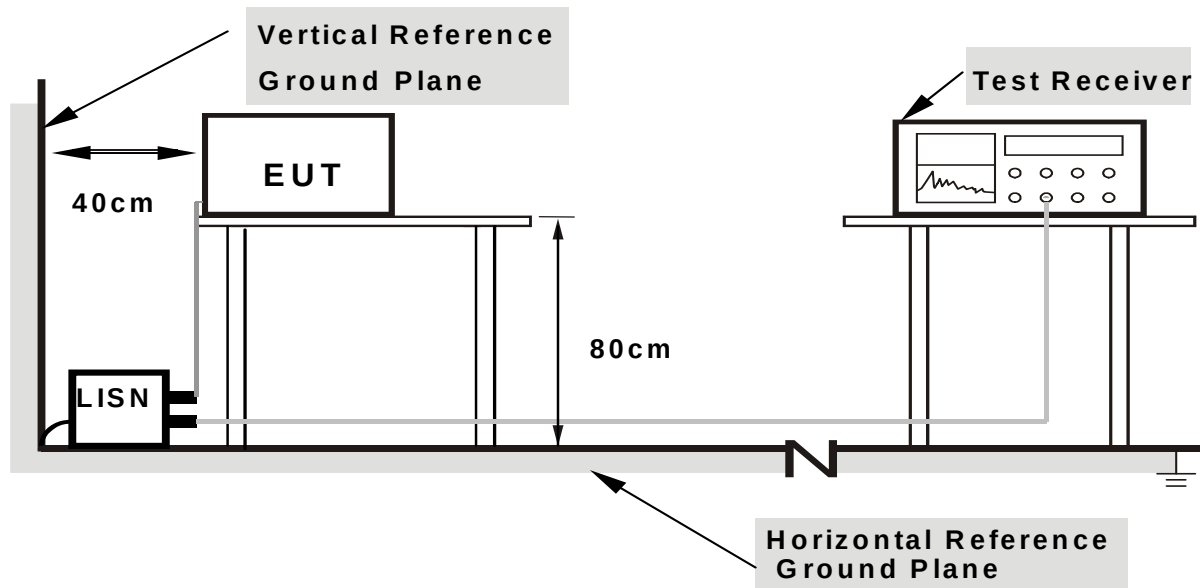
4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: 120V 60Hz

4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of 'Note'. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "*" marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
 Margin Level = Measurement Value - Limit Value

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range(MHz)
Field strength of fundamental 50000 μ V/m (94 dB μ V/m) @ 3 m	908-921
Field strength of harmonics 500 μ V/m (54 dB μ V/m) @ 3 m	908-921

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2.2 TEST PROCEDURE

- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

Duty cycle: TX908.40MHz

Duty cycle = $T_{ON} / (T_{ON} + T_{OFF})$

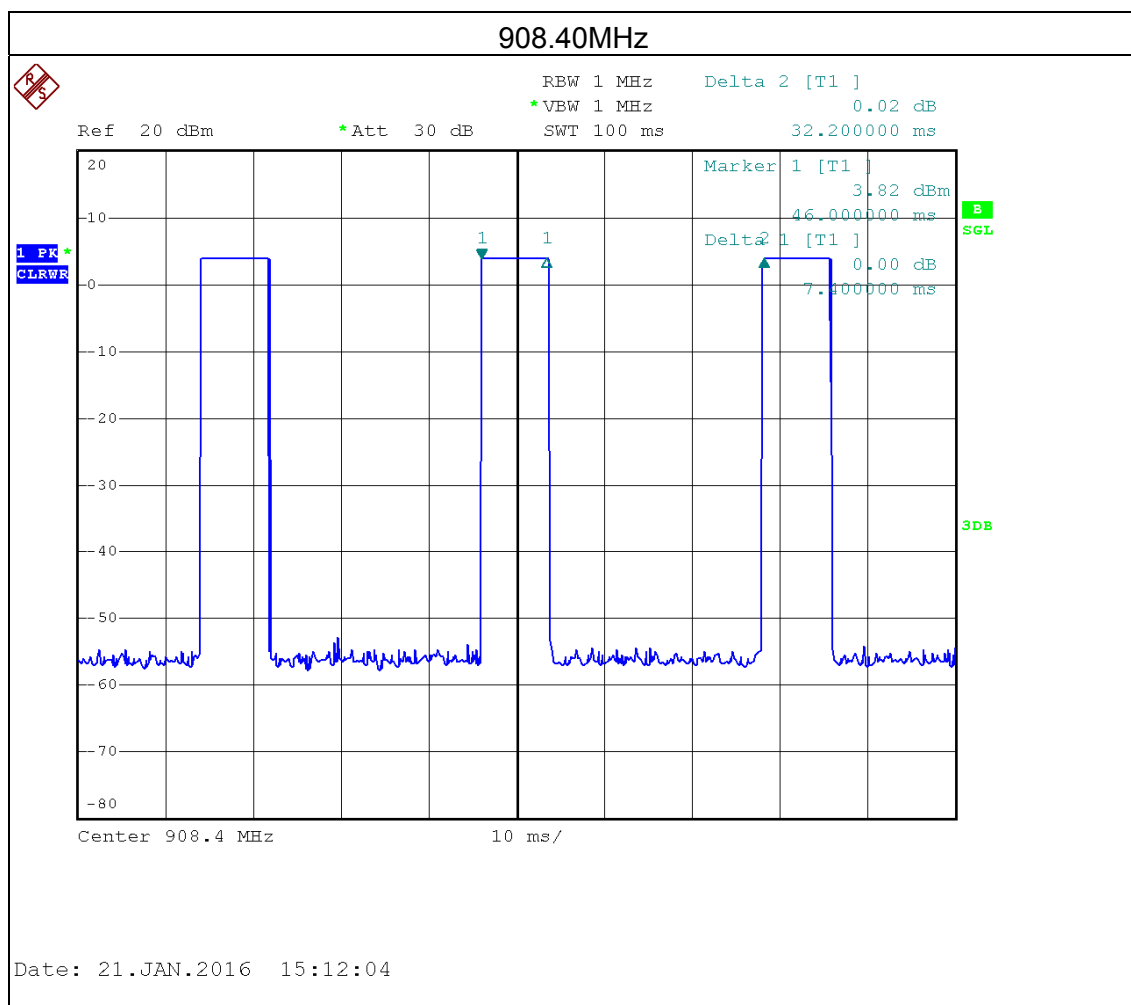
T_{ON} : 7.4/32.2ms

$T_{ON} + T_{OFF}$: (total time):32.2ms

Duty cycle: 22.98%

QP=PK+20 log(Duty cycle)

QP=PK-12.77



Duty cycle: TX908.42MHz

Duty cycle = $T_{ON} / (T_{ON} + T_{OFF})$

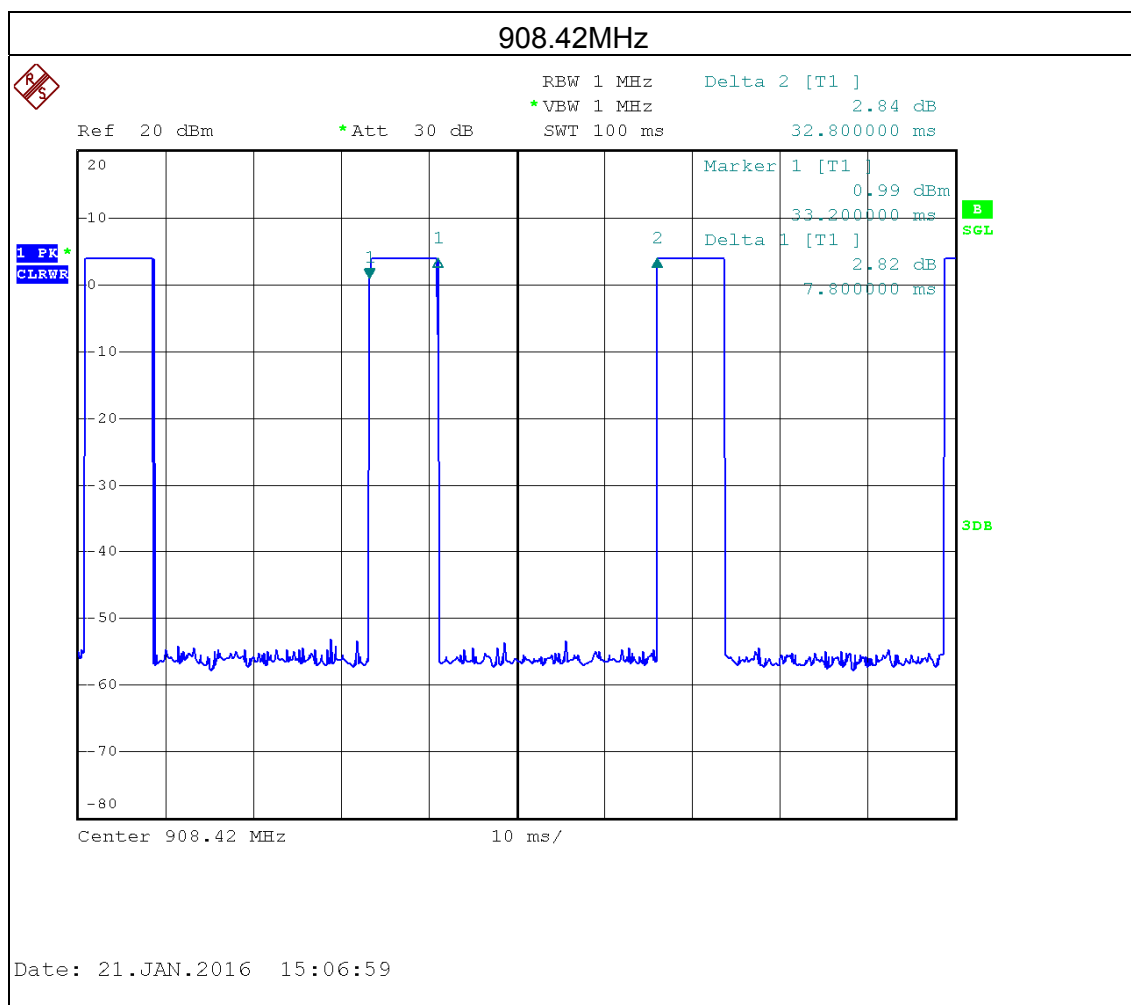
T_{ON} : 7.8/32.8ms

$T_{ON} + T_{OFF}$: (total time):32.8ms

Duty cycle: 23.78%

QP=PK+20 log(Duty cycle)

QP=PK-12.48



Duty cycle: TX916MHz

Duty cycle = $T_{ON} / (T_{ON} + T_{OFF})$

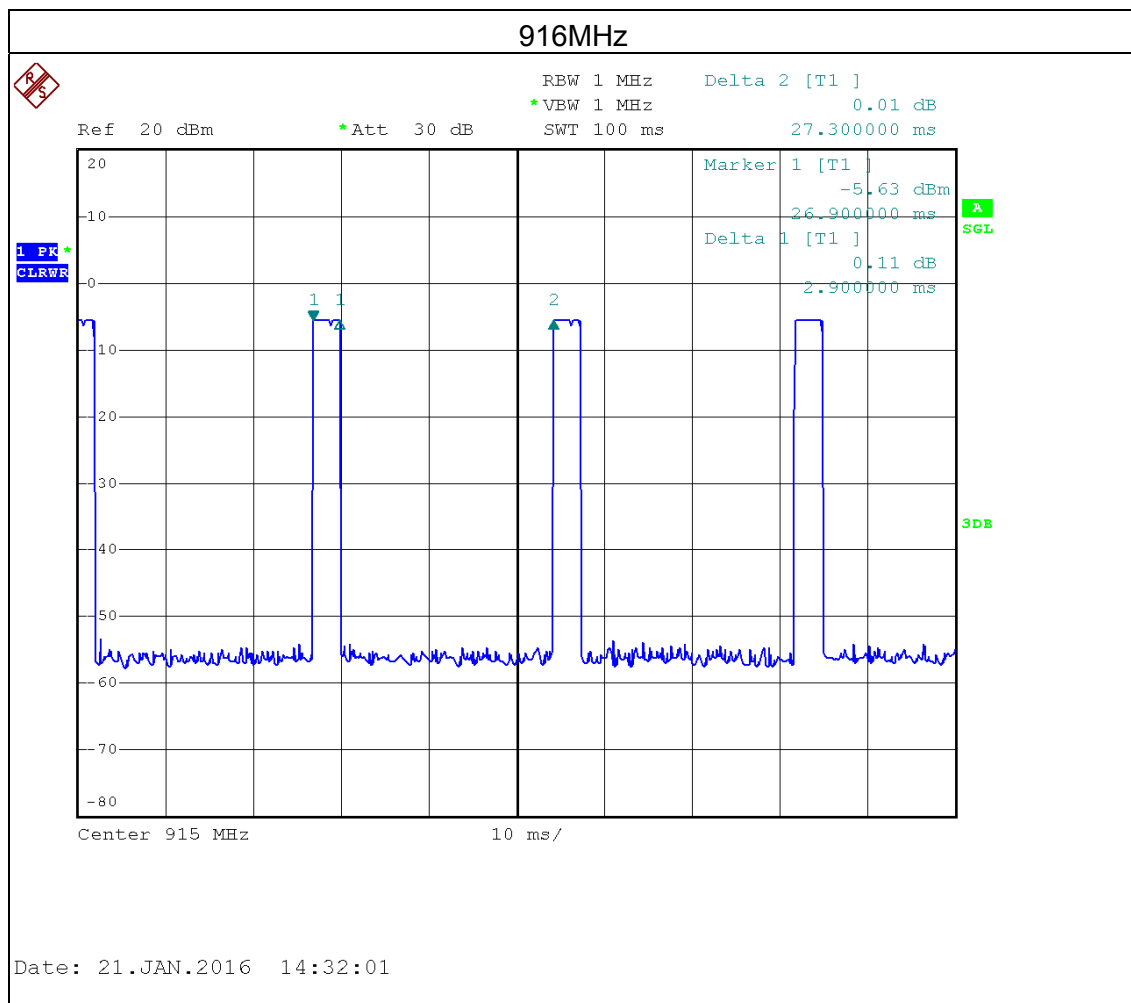
T_{ON} : 2.9/27.3ms

$T_{ON} + T_{OFF}$: (total time):27.3ms

Duty cycle: 10.62%

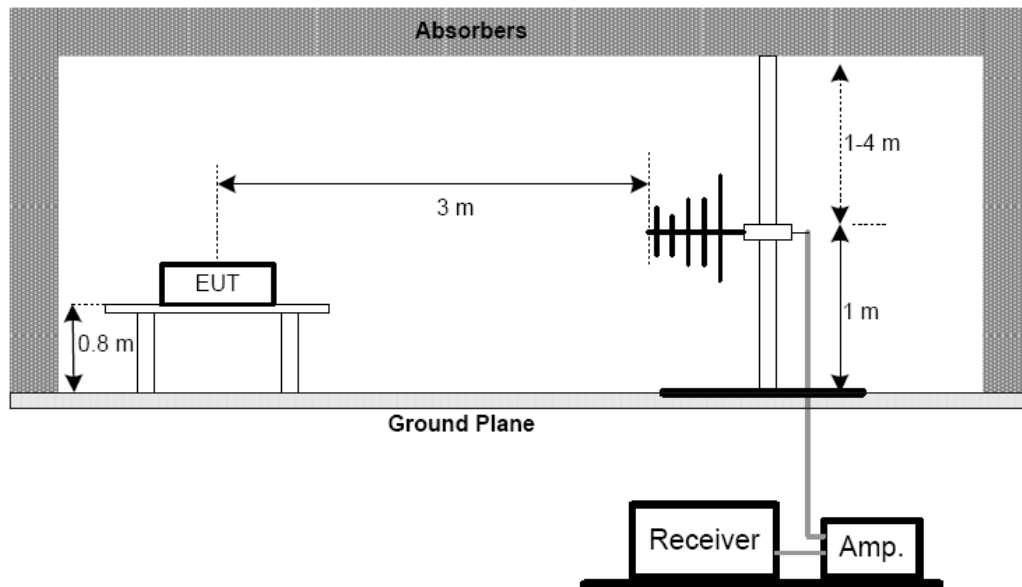
$QP = PK + 20 \log(\text{Duty cycle})$

$QP = PK - 19.48$

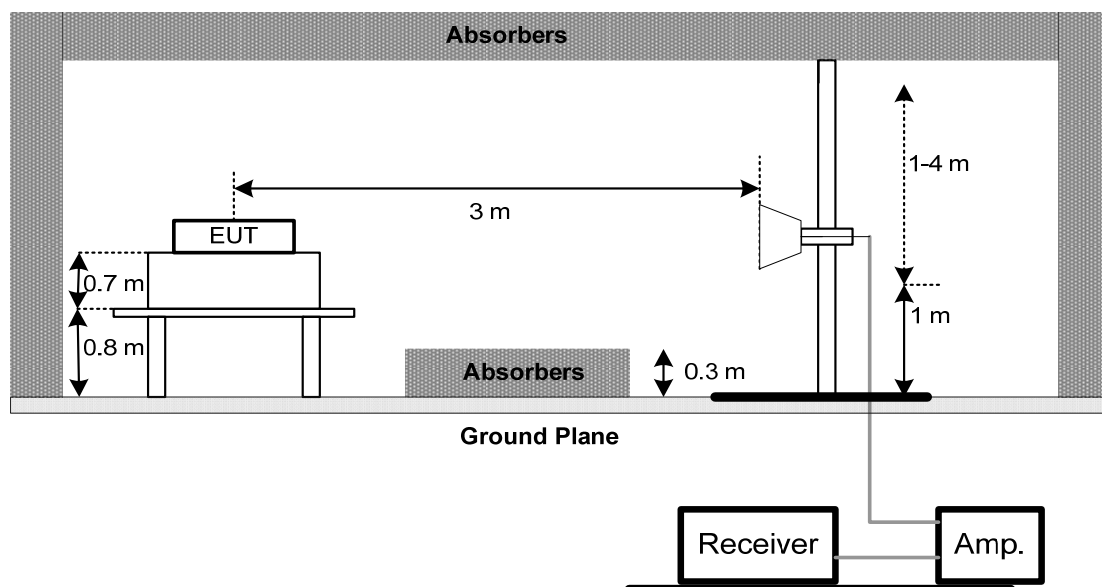


4.2.4 TEST SETUP

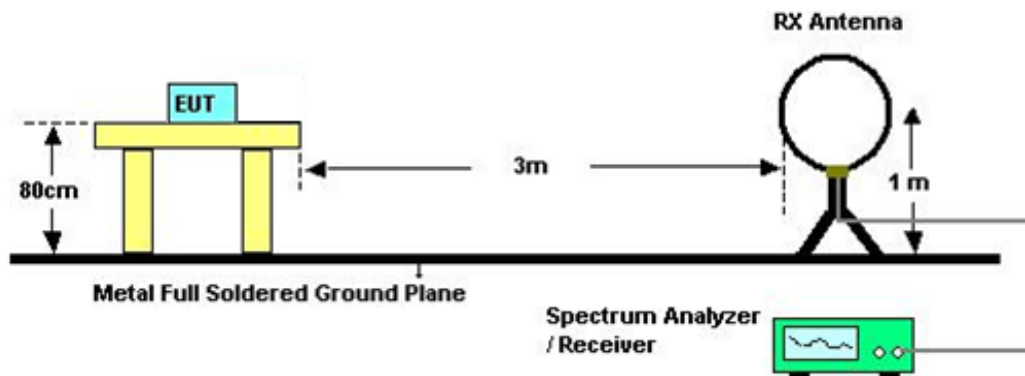
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: 120V 60Hz

4.2.7 TEST RESULTS (BELOW 30MHz)

Please refer to the Attachment B.

Remark

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);.
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor..

4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)

Please refer to the Attachment C

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) RBW 100kHz VBW 300kHz Pk detector.

4.2.9 TEST RESULTS (ABOVE 1000 MHz)

Please refer to the Attachment D

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (3) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (5) EUT Orthogonal Axis :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (6) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (7) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.
- (8) RBW1MHz VBW1MHz Peak detector for PK value , RBW 1MHz VBW 10Hz peak detector for AV value

5. BANDWIDTH TEST

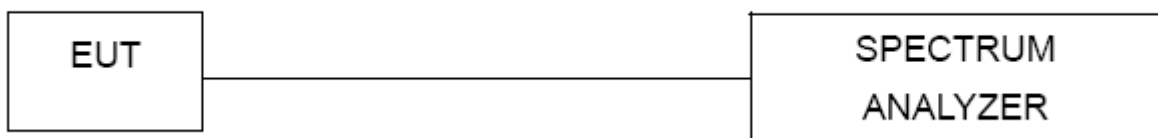
5.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 3kHz, VBW=3kHz, Sweep time = Auto.

5.2 DEVIATION FROM STANDARD

No deviation.

5.3 TEST SETUP



5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: 120V 60Hz

5.6 TEST RESULTS

Please refer to the Attachment E

6. MEASUREMENT INSTRUMENTS LIST AND SETTING

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Mar. 28, 2016
2	LISN	R&S	ENV216	101447	Mar. 28, 2016
3	Test Cable	N/A	C_17	N/A	Mar.13, 2016
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 28, 2016
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 28, 2016
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 09, 2016
3	Receiver	AGILENT	N9038A	MY52130039	Oct. 11, 2016
4	Test Cable	emci	LMR-400(30MHz-1GHz)	C-01	Jun. 28, 2016
5	Controller	CT	SC100	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Antenna	ETS	3115	00075789	Mar. 28, 2016
8	Amplifier	Agilent	8449B	3008A02274	Nov. 01, 2016
9	Test Cable	emci	EMC104-SM-S M-10000(1GHz-26.5GHz)	C-68	Jun. 28, 2016
10	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
12	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 07, 2016

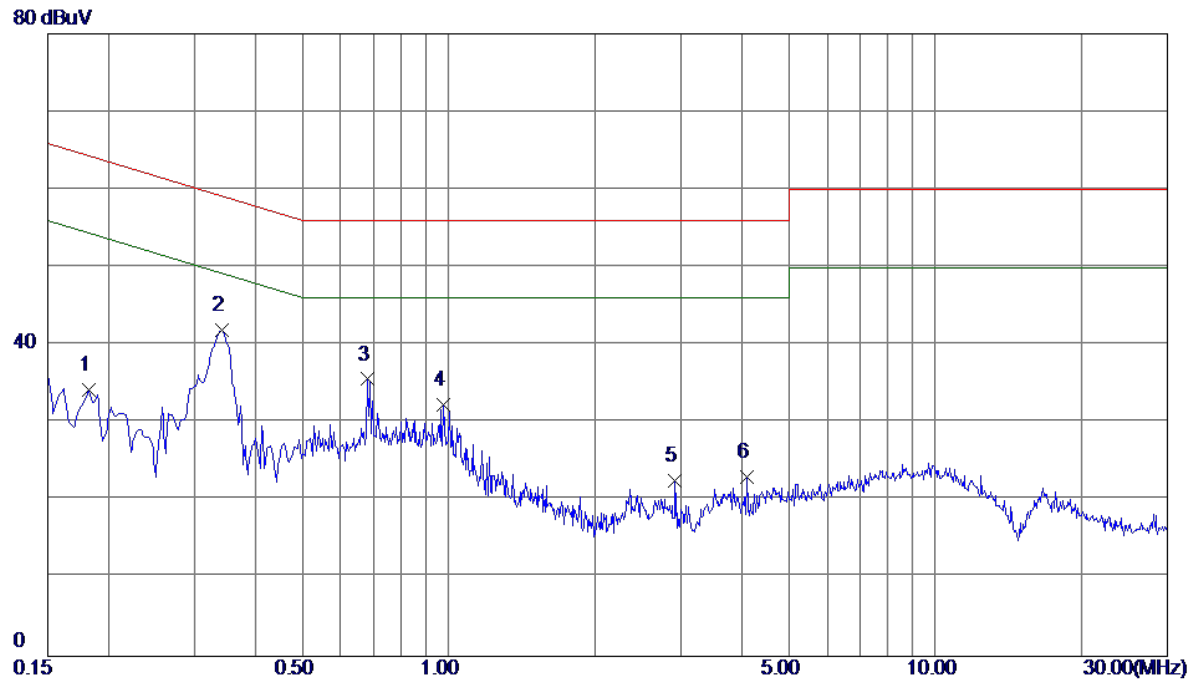
Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

ATTACHMENT A - CONDUCTED EMISSION

Test Mode : TX MODE

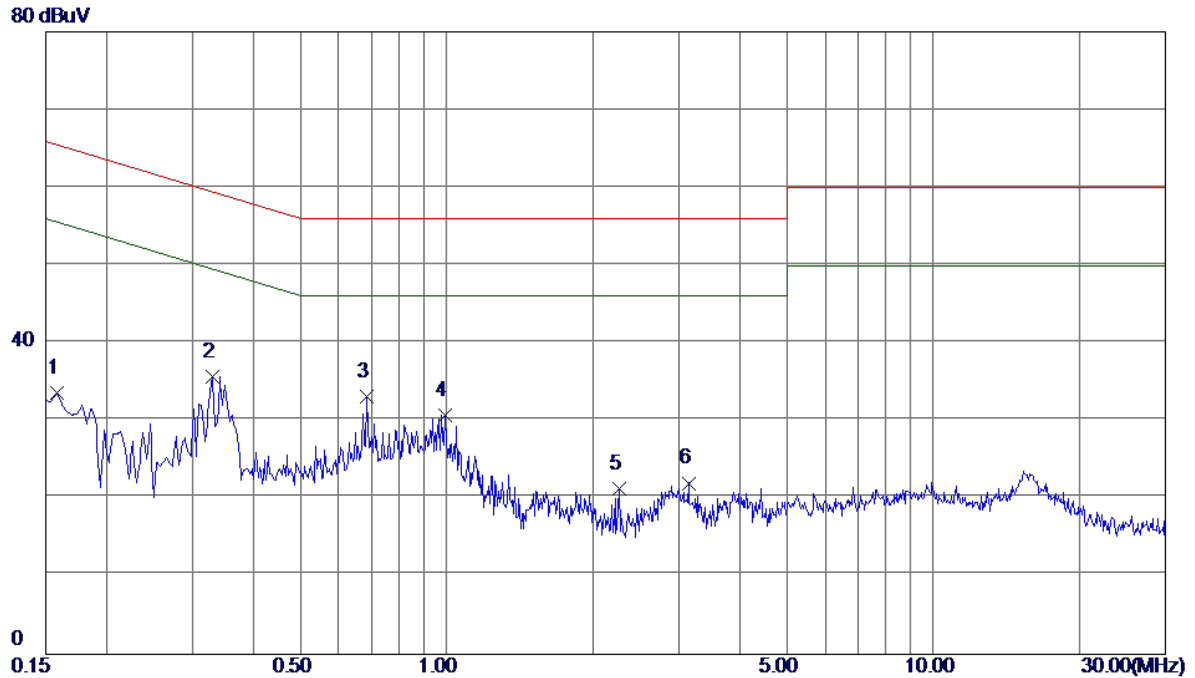
Line



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1819	24.75	9.56	34.31	64.40	-30.09	Peak	
2	0.3420	32.29	9.64	41.93	59.15	-17.22	Peak	
3	0.6820	25.86	9.74	35.60	56.00	-20.40	Peak	
4	0.9740	22.53	9.79	32.32	56.00	-23.68	Peak	
5	2.9219	12.47	10.03	22.50	56.00	-33.50	Peak	
6	4.1020	13.11	9.97	23.08	56.00	-32.92	Peak	

Test Mode : TX MODE

Neutral



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1580	24.07	9.49	33.56	65.57	-32.01	Peak	
2	0.3300	26.12	9.53	35.65	59.45	-23.80	Peak	
3	0.6860	23.53	9.54	33.07	56.00	-22.93	Peak	
4	0.9940	21.17	9.58	30.75	56.00	-25.25	Peak	
5	2.2580	11.61	9.74	21.35	56.00	-34.65	Peak	
6	3.1380	12.17	9.83	22.00	56.00	-34.00	Peak	

ATTACHMENT B - RADIATED EMISSION (9KHZ to 30MHZ)

Test Mode: TX Mode

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.00952	0°	13.53	24.9637	38.4937	128.0315	-89.5378	AVG
0.00952	0°	14.36	24.9637	39.3237	148.0315	-108.7078	PEAK
0.0237	0°	6.82	24.0657	30.8857	120.1093	-89.2236	AVG
0.0237	0°	8.43	24.0657	32.4957	140.1093	-107.6136	PEAK
0.0344	0°	3.42	23.3880	26.8080	116.8731	-90.0651	AVG
0.0344	0°	5.79	23.3880	29.1780	136.8731	-107.6951	PEAK
0.0436	0°	1.22	22.8053	24.0253	114.8145	-90.7892	AVG
0.0436	0°	2.68	22.8053	25.4853	134.8145	-109.3292	PEAK
0.4953	0°	19.58	19.8113	39.3913	73.7069	-34.3156	QP
1.7273	0°	23.94	19.5273	43.4673	69.5400	-26.0727	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.00962	90°	13.41	24.3000	37.7100	127.9407	-90.2307	AVG
0.00962	90°	15.02	24.3000	39.3200	147.9407	-108.6207	PEAK
0.0247	90°	7.39	24.0023	31.3923	119.7503	-88.3580	AVG
0.0247	90°	9.03	24.0023	33.0323	139.7503	-106.7180	PEAK
0.0335	90°	5.36	23.4450	28.8050	117.1033	-88.2983	AVG
0.0335	90°	6.21	23.4450	29.6550	137.1033	-107.4483	PEAK
0.0458	90°	1.73	22.6660	24.3960	114.3869	-89.9909	AVG
0.0458	90°	2.93	22.6660	25.5960	134.3869	-108.7909	PEAK
0.4962	90°	22.43	19.8091	42.2391	73.6911	-31.4520	QP
1.7218	90°	24.87	19.5278	44.3978	69.5400	-25.1422	QP

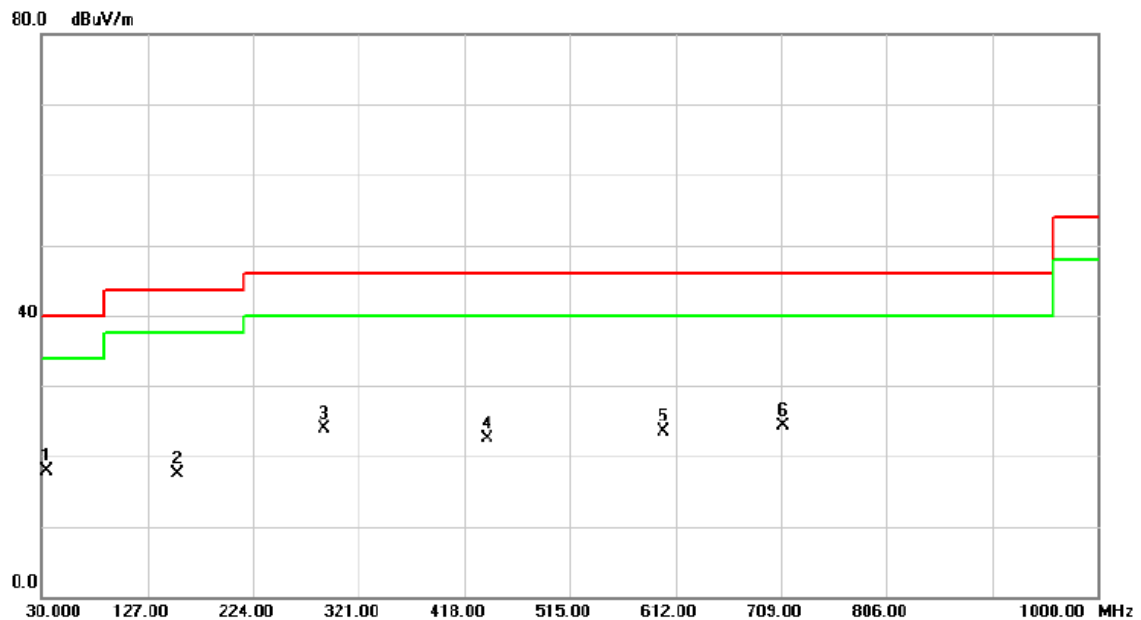
Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

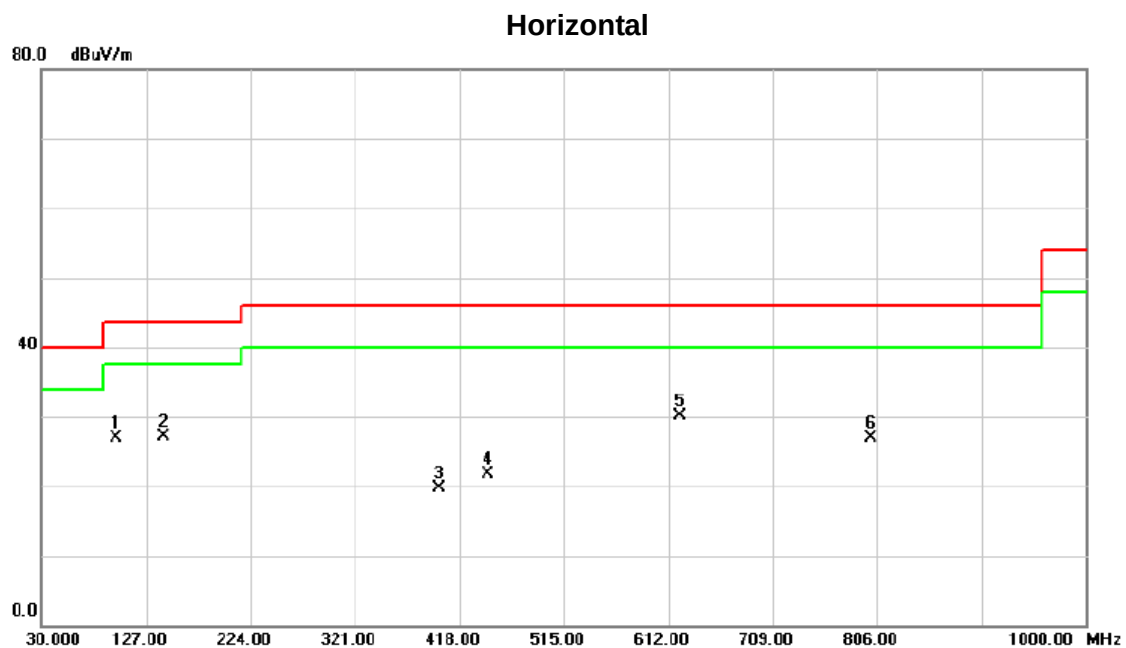
Test Mode: TX Mode_908.40MHz

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		34.8500	39.11	-21.20	17.91	40.00	-22.09	peak	
2		155.1300	35.61	-18.06	17.55	43.50	-25.95	peak	
3		288.9900	39.67	-15.76	23.91	46.00	-22.09	peak	
4		439.3400	37.55	-15.00	22.55	46.00	-23.45	peak	
5		600.3600	37.31	-13.83	23.48	46.00	-22.52	peak	
6	*	710.9400	33.89	-9.53	24.36	46.00	-21.64	peak	

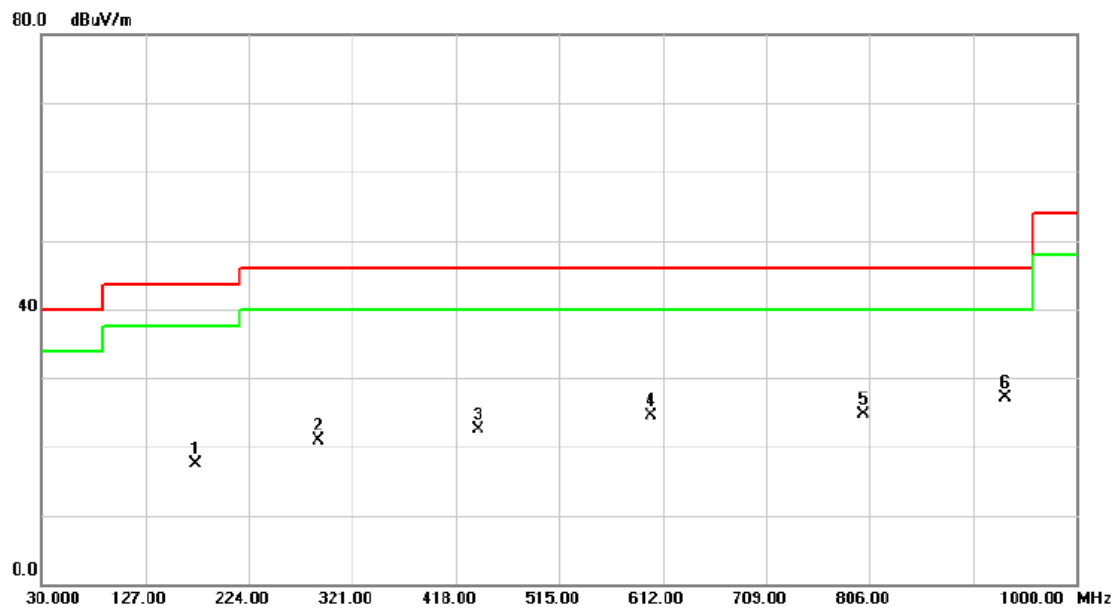
Test Mode: TX Mode_908.40MHz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		98.8700	52.13	-25.23	26.90	43.50	-16.60	peak	
2		143.4900	51.53	-24.42	27.11	43.50	-16.39	peak	
3		399.5700	34.10	-14.32	19.78	46.00	-26.22	peak	
4		444.1900	35.06	-13.39	21.67	46.00	-24.33	peak	
5	*	622.6700	41.02	-10.87	30.15	46.00	-15.85	peak	
6		800.1800	34.49	-7.54	26.95	46.00	-19.05	peak	

Test Mode: TX Mode_908.42MHz

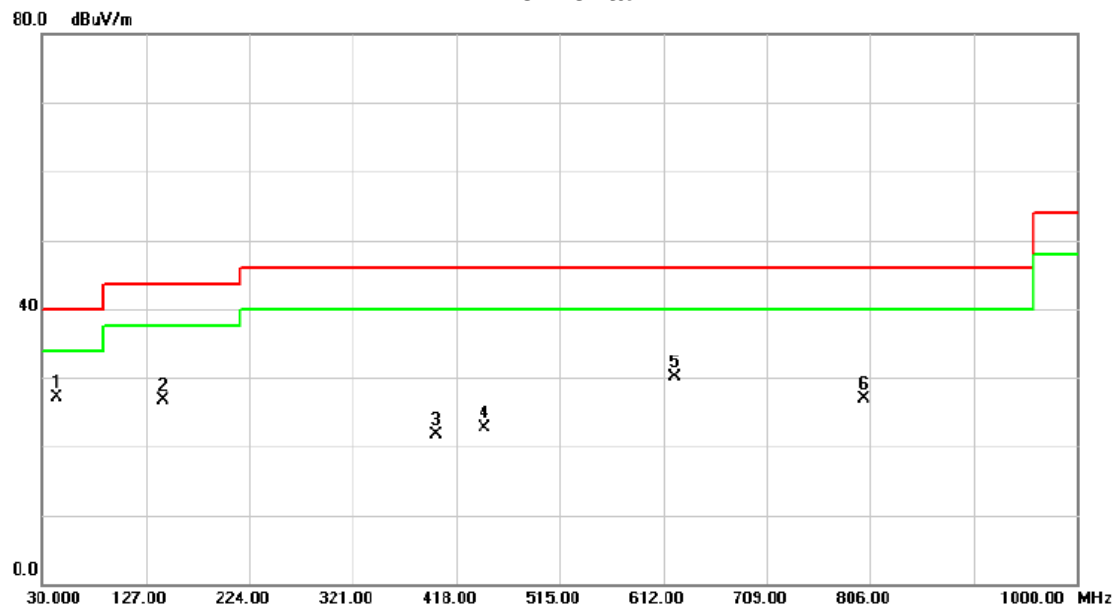
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		173.5600	35.64	-18.22	17.42	43.50	-26.08	peak	
2		288.9900	36.67	-15.76	20.91	46.00	-25.09	peak	
3		439.3400	37.55	-15.00	22.55	46.00	-23.45	peak	
4		600.3600	38.31	-13.83	24.48	46.00	-21.52	peak	
5		800.1800	31.59	-6.88	24.71	46.00	-21.29	peak	
6	*	933.0700	32.35	-5.23	27.12	46.00	-18.88	peak	

Test Mode: TX Mode_908.42MHz

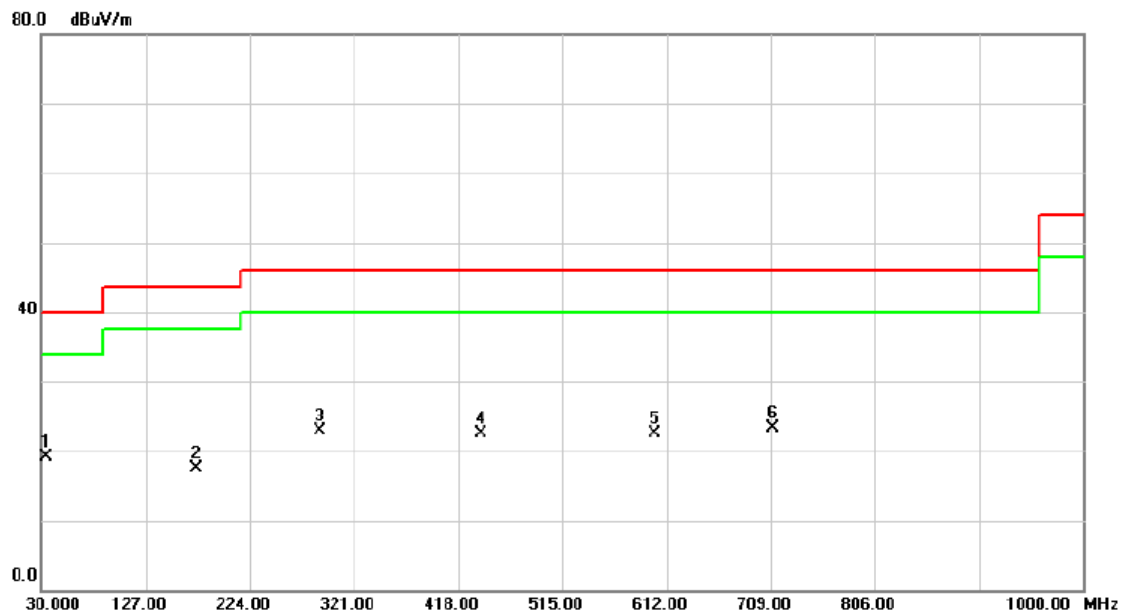
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	43.5800	47.32	-20.29	27.03	40.00	-12.97	peak	
2		143.4900	51.03	-24.42	26.61	43.50	-16.89	peak	
3		399.5700	36.10	-14.32	21.78	46.00	-24.22	peak	
4		444.1900	36.06	-13.39	22.67	46.00	-23.33	peak	
5		622.6700	41.02	-10.87	30.15	46.00	-15.85	peak	
6		800.1800	34.49	-7.54	26.95	46.00	-19.05	peak	

Test Mode: TX Mode_916MHz

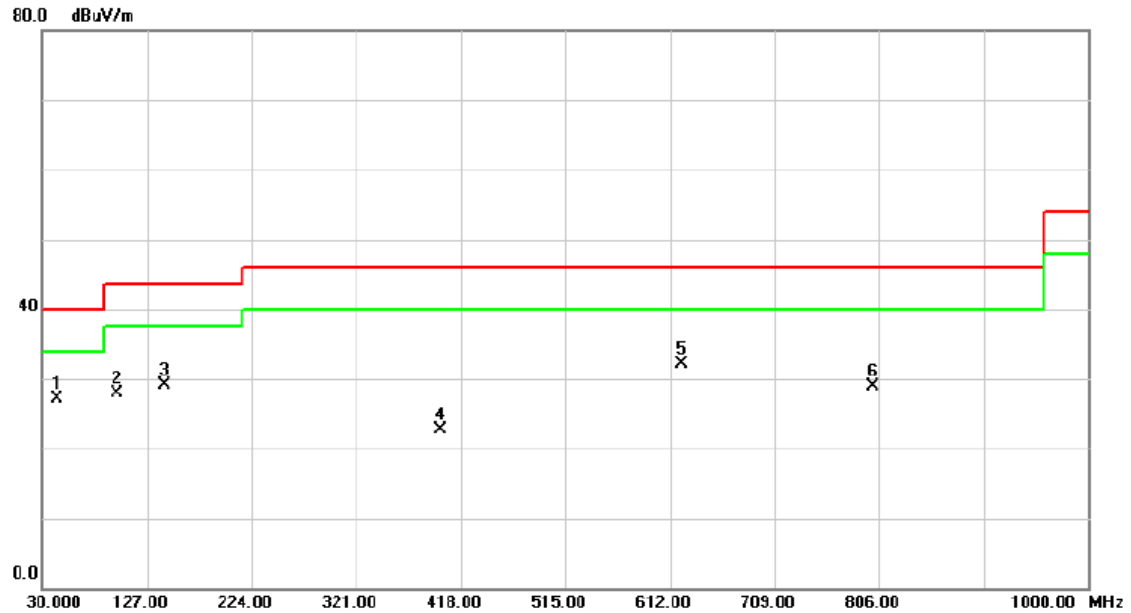
Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment				
			dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.8800	40.46	-21.30	19.16	40.00	-20.84	peak	
2		173.5600	35.64	-18.22	17.42	43.50	-26.08	peak	
3		288.9900	38.67	-15.76	22.91	46.00	-23.09	peak	
4		439.3400	37.55	-15.00	22.55	46.00	-23.45	peak	
5		600.3600	36.31	-13.83	22.48	46.00	-23.52	peak	
6		710.9400	32.89	-9.53	23.36	46.00	-22.64	peak	

Test Mode: TX Mode_916MHz

Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	43.5800	47.32	-20.29	27.03	40.00	-12.97	peak	
2		98.8700	53.13	-25.23	27.90	43.50	-15.60	peak	
3		143.4900	53.53	-24.42	29.11	43.50	-14.39	peak	
4		399.5700	37.10	-14.32	22.78	46.00	-23.22	peak	
5		622.6700	43.02	-10.87	32.15	46.00	-13.85	peak	
6		800.1800	36.49	-7.54	28.95	46.00	-17.05	peak	

**ATTACHMENT D - RADIATED EMISSION
(900MHZ to 10000MHz)**

Orthogonal Axis :	X
Test Mode :	TX Mode_908.40MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

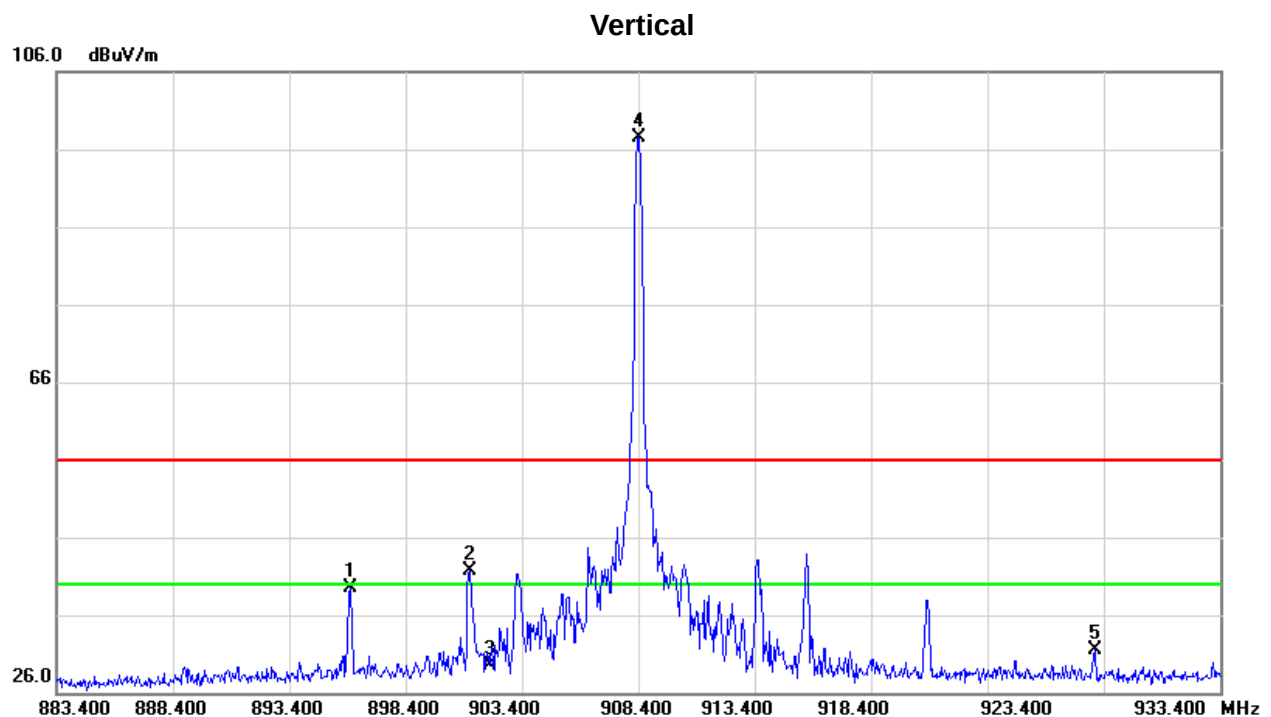
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
896.00	V	39.51	-	0.09	39.60	26.83	-	94.00	X/F
901.15	V	41.25	-	0.44	41.69	28.92	-	94.00	X/H
902.00	V	29.02	-	0.42	29.44	16.67	-	94.00	X/H
908.40	V	97.23	-	0.34	97.57	84.80	-	94.00	X/H
928.00	V	31.38	-	0.10	31.48	18.71	-	94.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:

$$QP = PK \text{ value} + 20\log(\text{Duty cycle})$$

$$\text{Final QP} = PK - 12.77$$



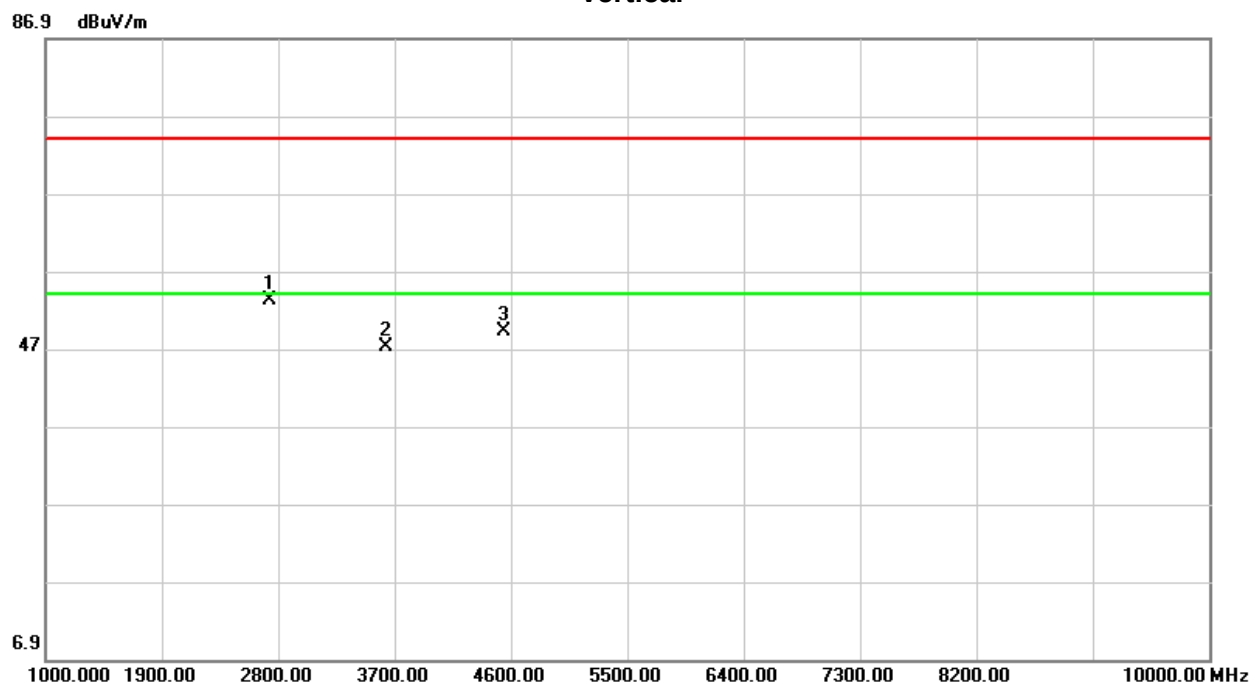
Orthogonal Axis :	X
Test Mode :	TX Mode_908.40MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
2728.00	V	53.51	-	-0.34	53.17	40.40	74.00	54.00	X/F
3637.00	V	44.91	-	2.34	47.25	34.48	74.00	54.00	X/H
4546.00	V	43.99	-	5.13	49.12	36.35	74.00	54.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-12.77

Vertical

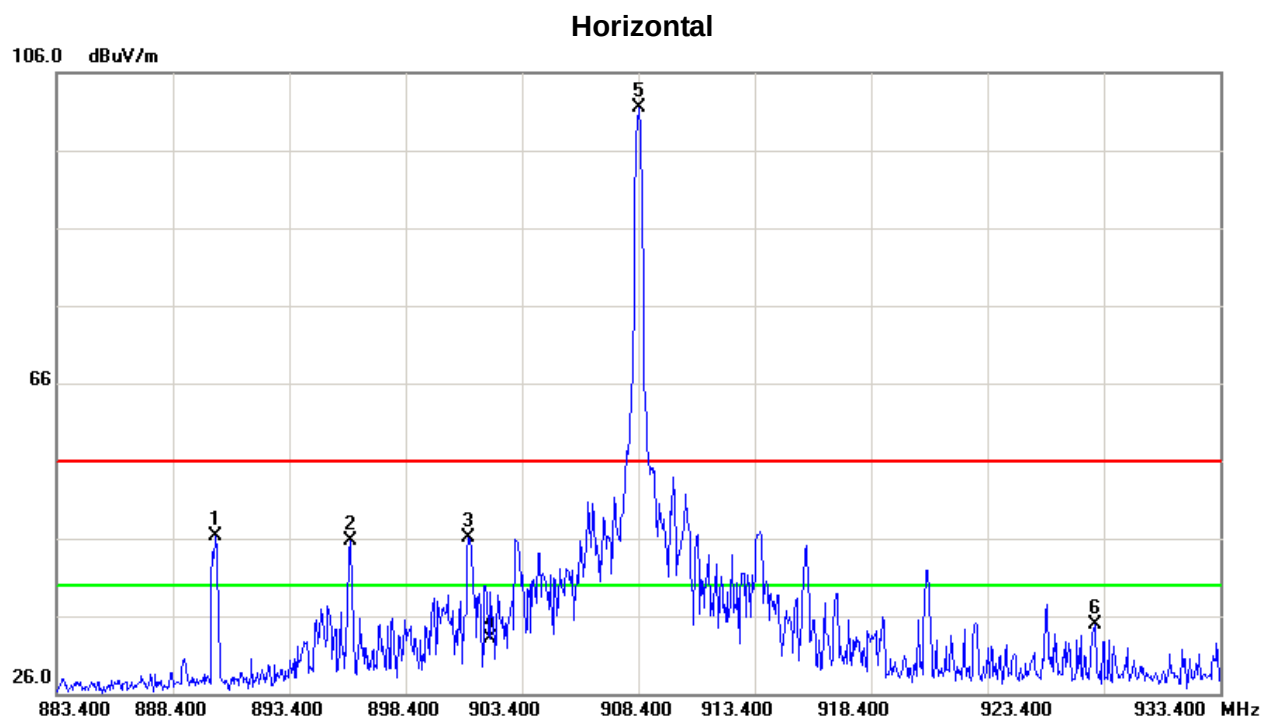


Orthogonal Axis :	X
Test Mode :	TX Mode_908.40MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
890.25	H	46.62	-	-0.42	46.20	33.43	-	94.00	X/F
896.00	H	45.68	-	0.09	45.77	33.00	-	94.00	X/H
901.10	H	45.72	-	0.44	46.16	33.39	-	94.00	X/H
901.00	H	32.64	-	0.42	33.06	20.29	-	94.00	X/H
908.45	H	101.07	-	0.34	101.41	88.64	-	94.00	X/H
928.00	H	34.80	-	0.10	34.90	22.13	-	94.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-12.77

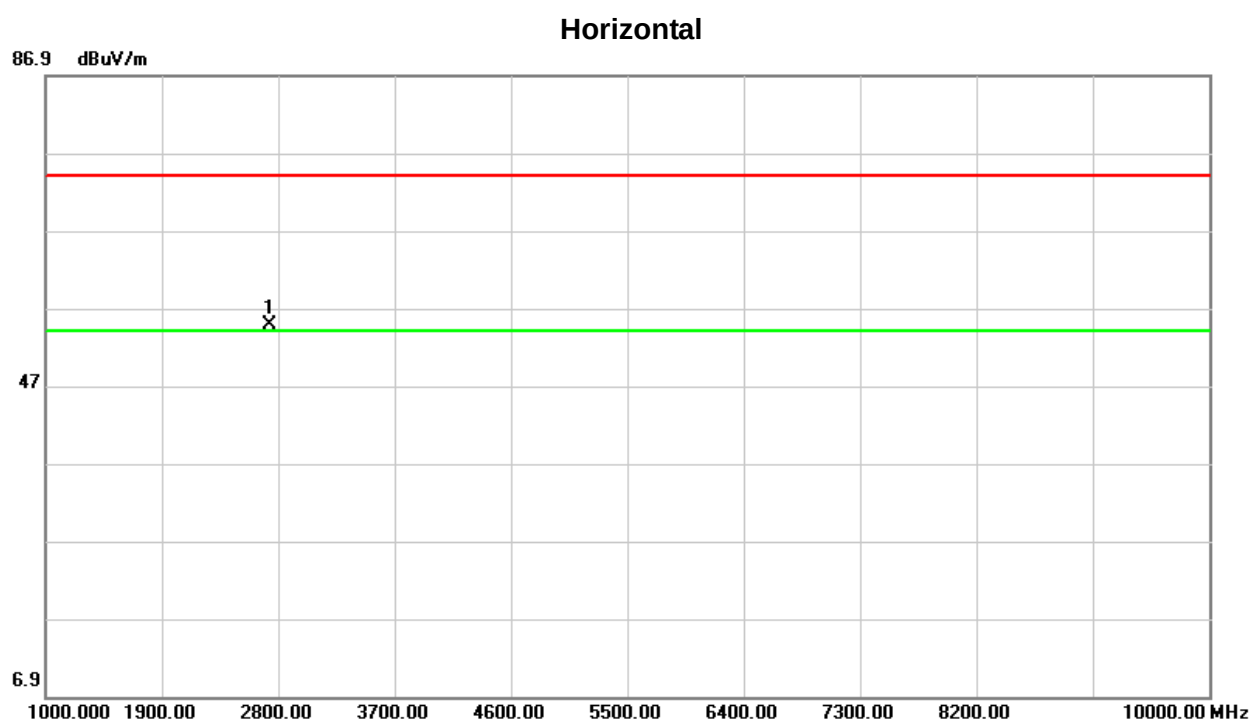


Orthogonal Axis :	X
Test Mode :	TX Mode_908.40MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
2728.00	V	55.07	-	-0.34	54.73	41.96	74.00	54.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-12.77

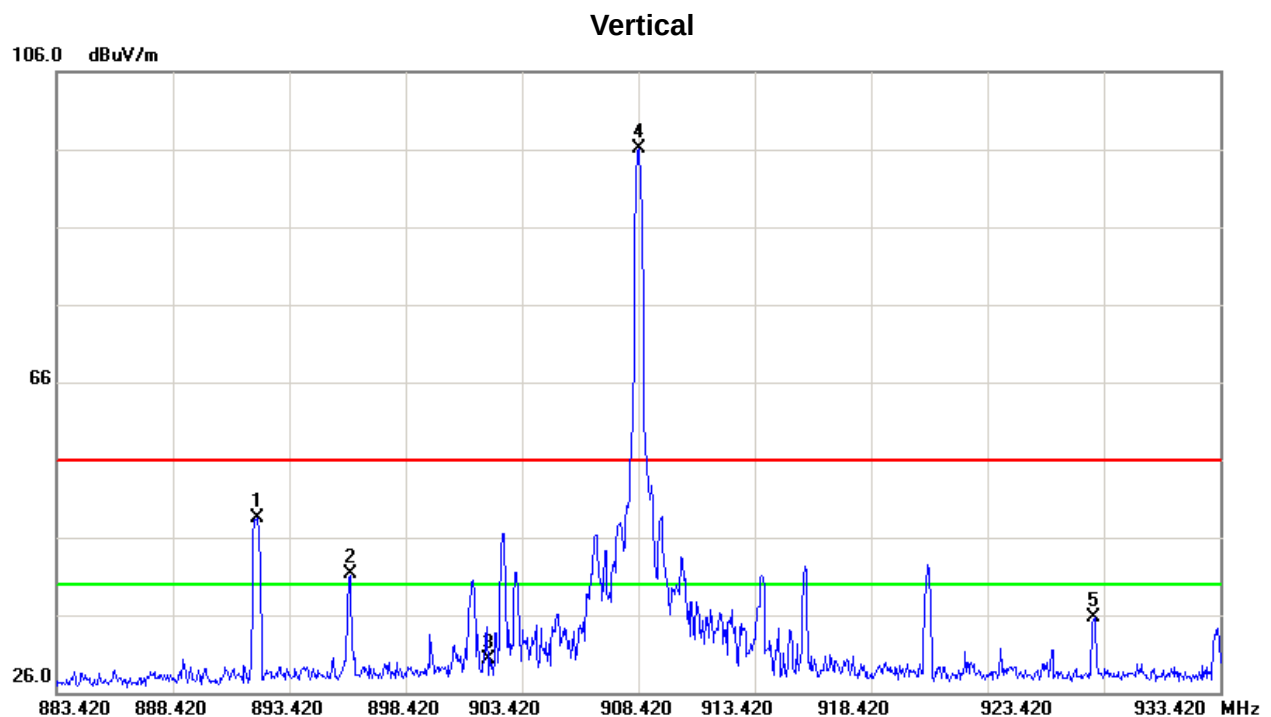


Orthogonal Axis :	X
Test Mode :	TX Mode_908.42MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
892.02	V	48.69	-	-0.26	48.43	35.95	-	94.00	X/F
896.02	V	41.10	-	0.10	41.20	28.72	-	94.00	X/H
902.00	V	29.90	-	0.42	30.32	17.84	-	94.00	X/H
908.42	V	95.72	-	0.34	96.06	83.58	-	94.00	X/H
928.00	V	35.54	-	0.10	35.64	23.16	-	94.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-12.48



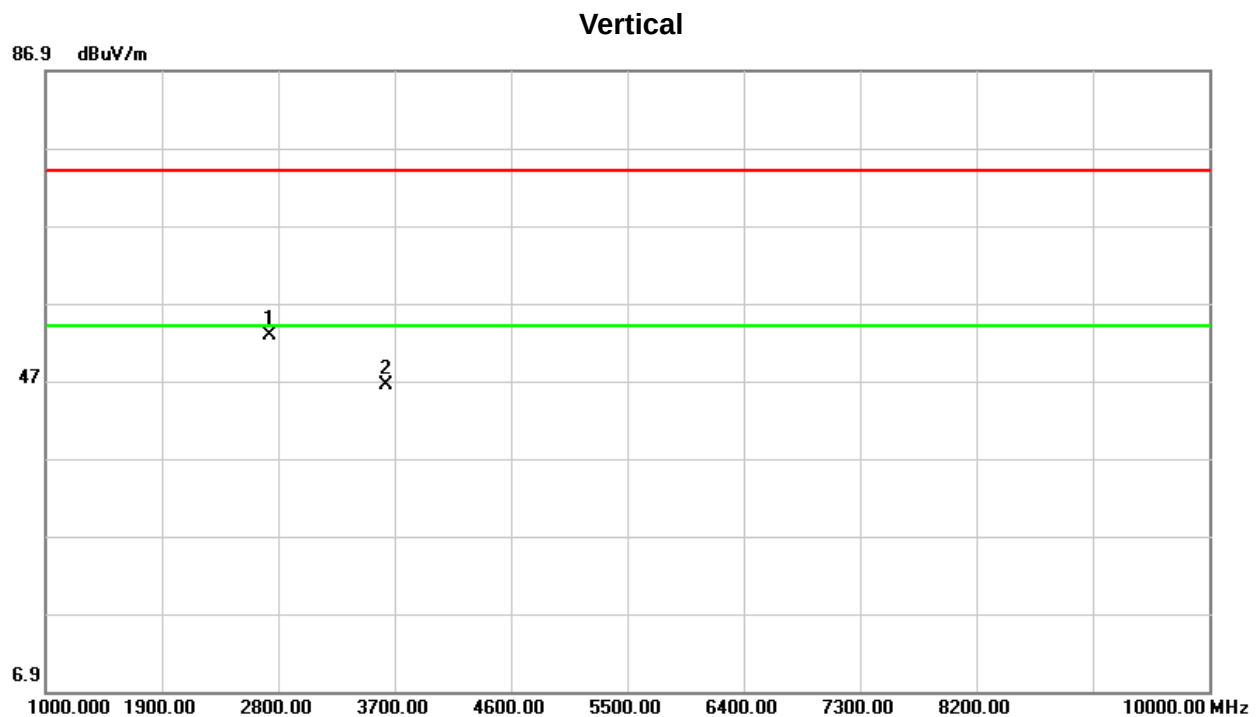
Orthogonal Axis :	X
Test Mode :	TX Mode_908.42MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
2728.00	V	53.13	-	-0.34	52.79	40.31	74.00	54.00	X/F
3637.00	V	43.98	-	2.34	46.32	33.84	74.00	54.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:

$$QP = PK \text{ value} + 20\log(\text{Duty cycle}) \text{ , Final } QP = PK - 12.48$$



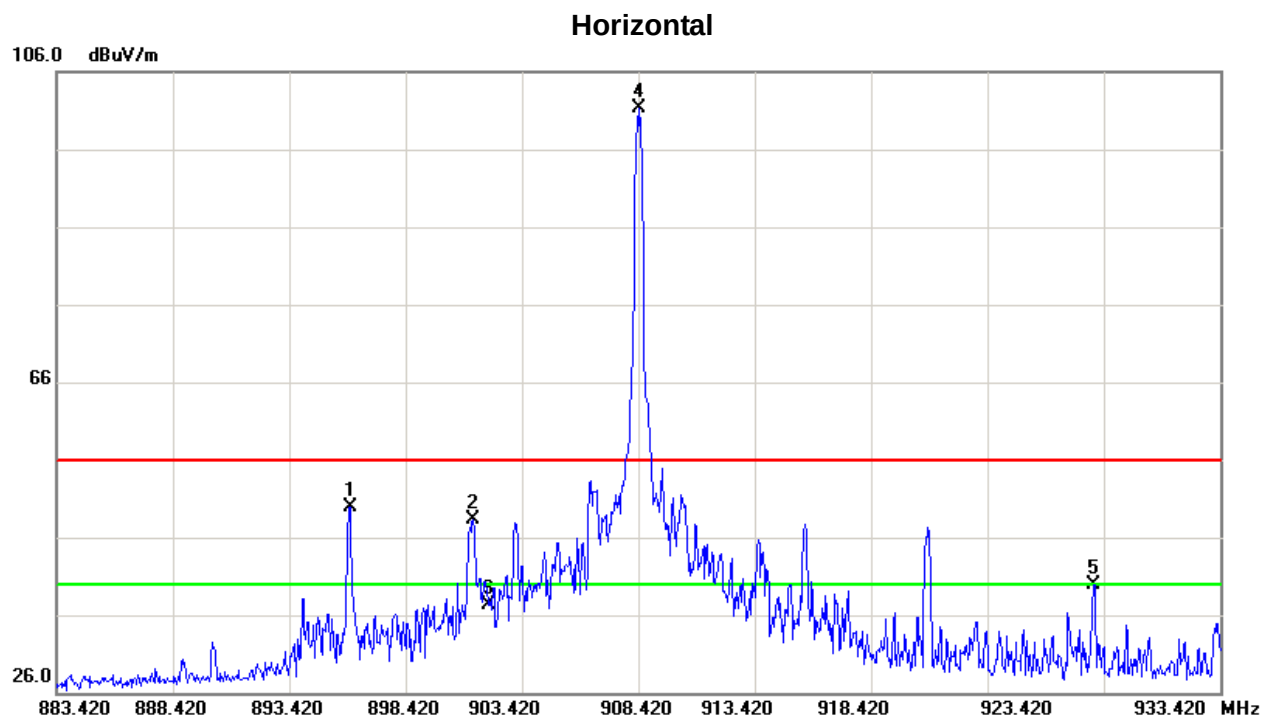
Orthogonal Axis :	X
Test Mode :	TX Mode_908.42MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
896.02	H	49.89	-	0.10	49.99	37.51	-	94.00	X/F
901.32	H	47.92	-	0.43	48.35	35.87	-	94.00	X/H
902.00	H	36.85	-	0.42	37.27	24.79	-	94.00	X/H
908.47	H	101.00	-	0.34	101.34	88.86	-	94.00	X/H
928.00	H	39.79	-	0.10	39.89	27.41	-	94.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:

$$QP = PK \text{ value} + 20\log(\text{Duty cycle}) \rightarrow \text{Final QP} = PK - 12.48$$

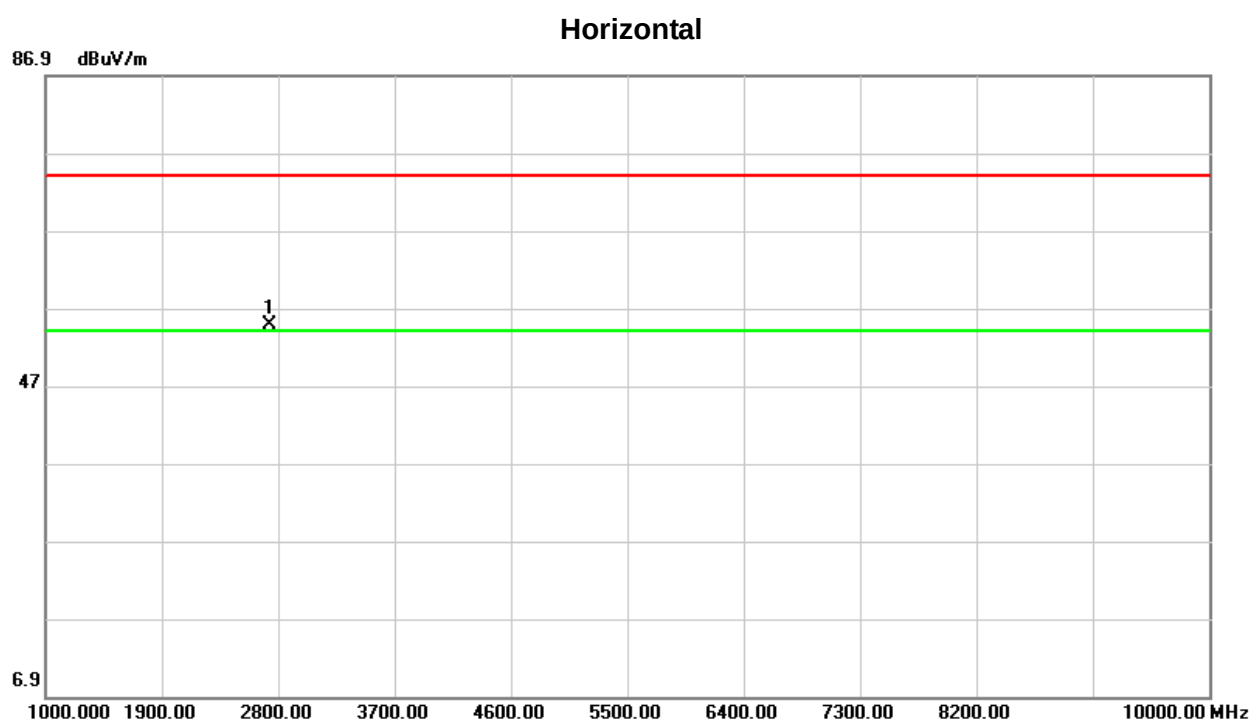


Orthogonal Axis :	X
Test Mode :	TX Mode_908.42MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
2728.00	V	55.11	-	-0.34	54.77	42.29	74.00	54.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-12.48

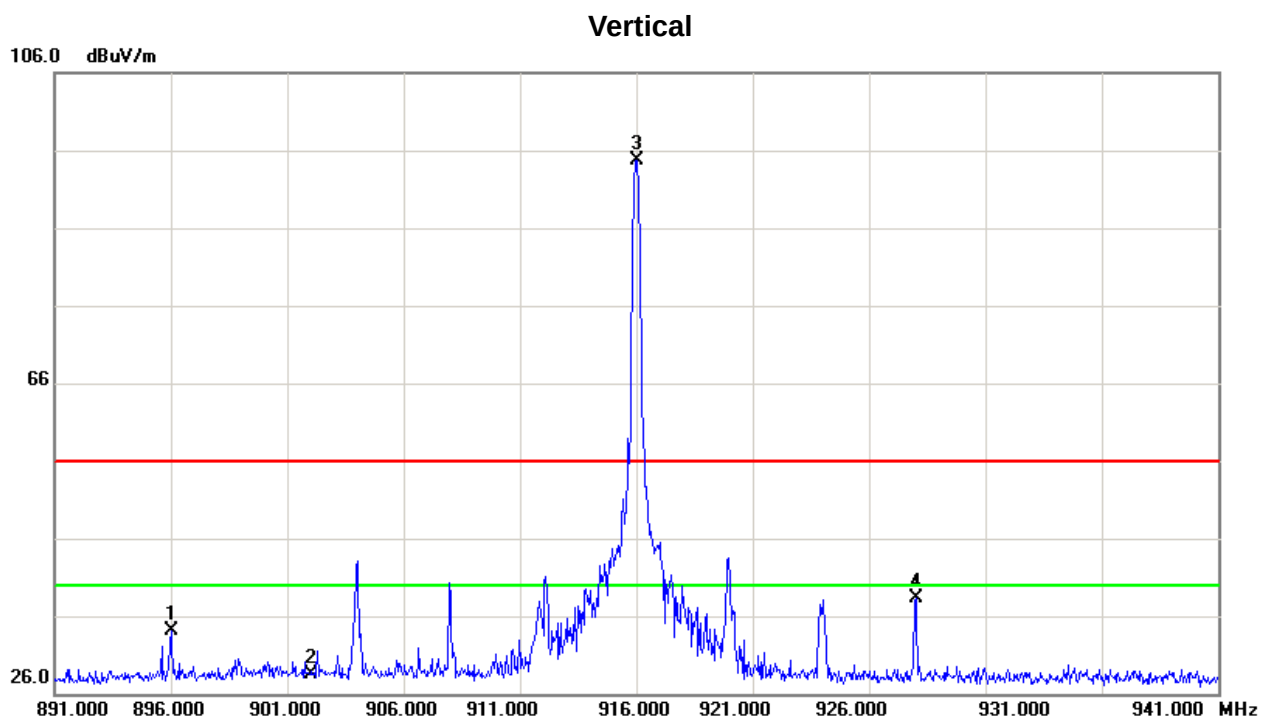


Orthogonal Axis :	X
Test Mode :	TX Mode_916MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
896.00	V	33.93	-	0.09	34.02	14.54	-	94.00	X/F
902.00	V	28.02	-	0.42	28.44	8.96	-	94.00	X/H
916.00	V	94.46	-	0.25	94.71	75.23	-	94.00	X/H
928.00	V	38.14	-	0.10	38.24	18.76	-	94.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-19.48



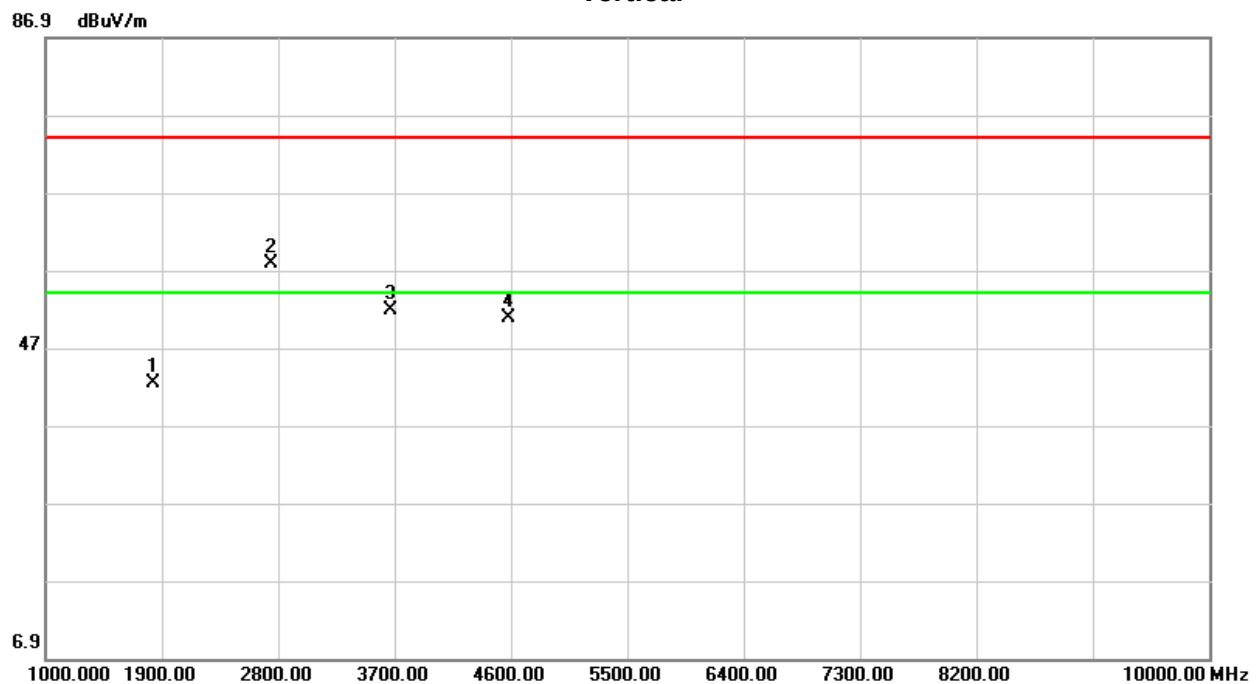
Orthogonal Axis :	X
Test Mode :	TX Mode_916MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
1828.00	V	44.95	-	-2.45	42.50	23.02	74.00	54.00	X/F
2746.00	V	58.14	-	-0.31	57.83	38.35	74.00	54.00	X/H
3664.00	V	49.28	-	2.49	51.77	32.29	74.00	54.00	X/H
4582.00	V	45.50	-	5.23	50.73	31.25	74.00	54.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-19.48

Vertical

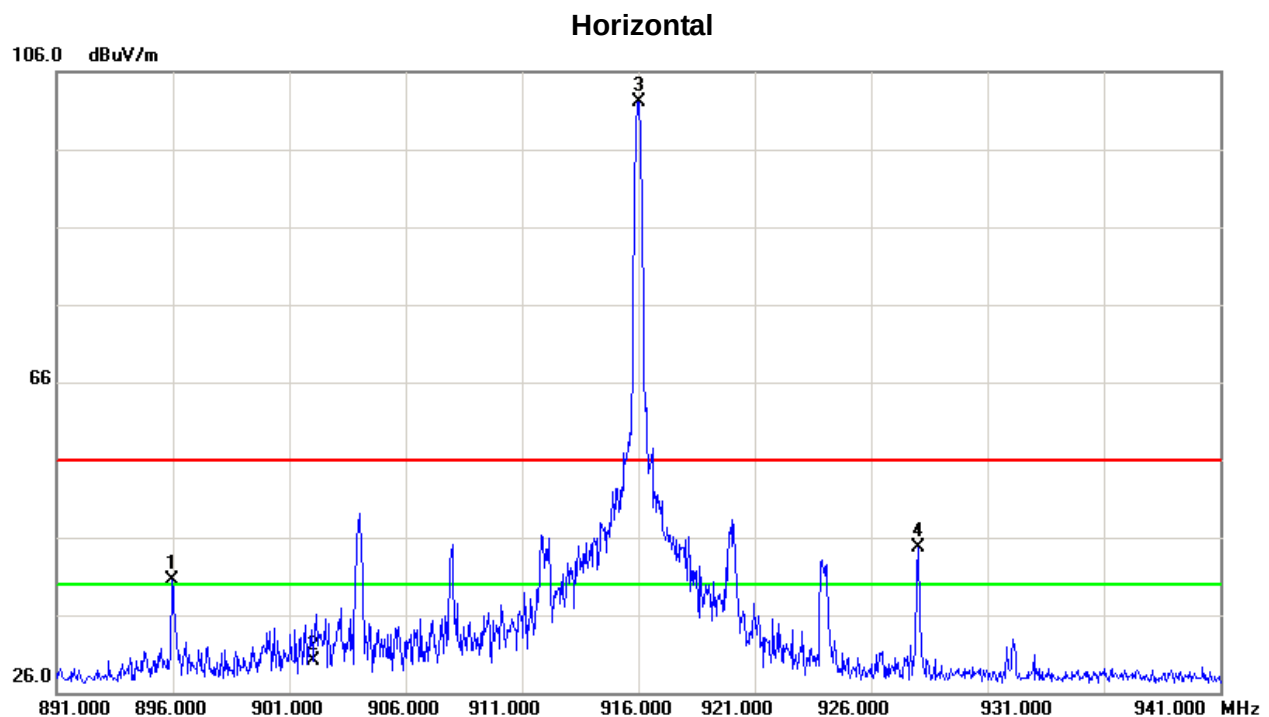


Orthogonal Axis :	X
Test Mode :	TX Mode_916MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
895.95	H	40.43	-	0.09	40.52	21.04	-	94.00	X/F
902.00	H	29.68	-	0.42	30.10	10.62	-	94.00	X/H
916.00	H	101.81	-	0.25	102.06	82.58	-	94.00	X/H
928.00	H	44.52	-	0.10	44.62	25.14	-	94.00	X/H

Remark :

- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-19.48

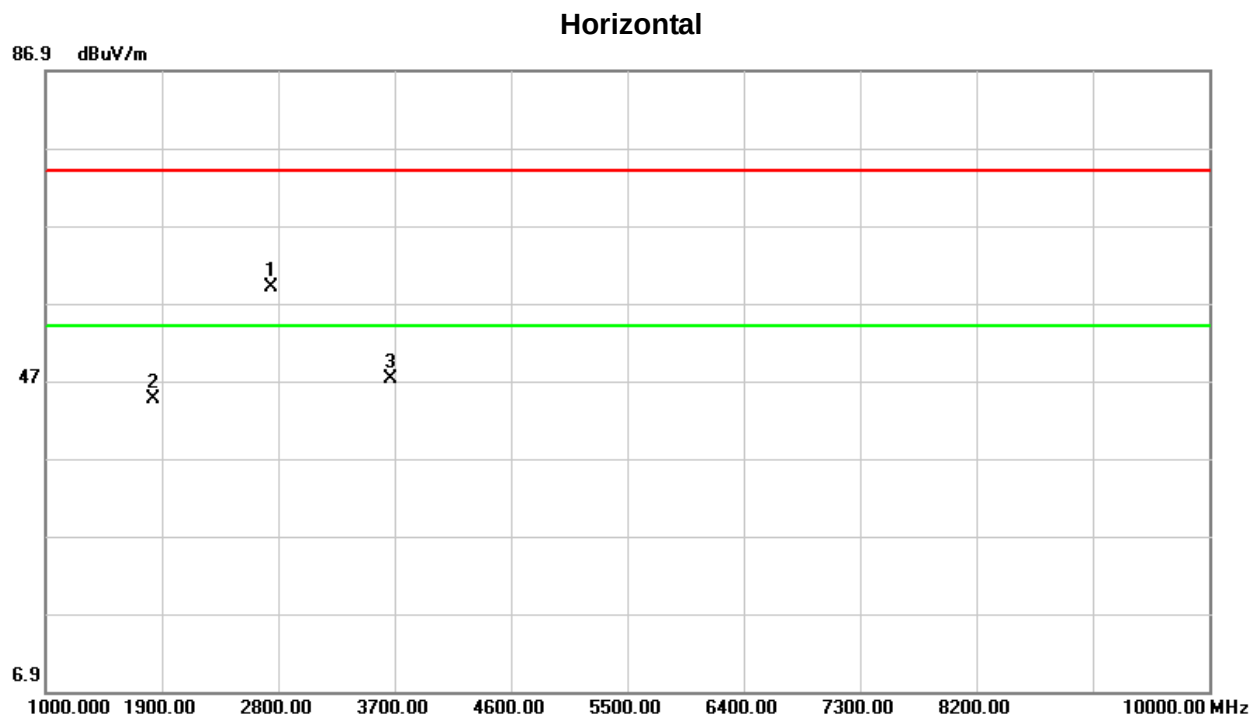


Orthogonal Axis :	X
Test Mode :	TX Mode_916MHz
About the duty cycle correction factor calculated, please refer to the page 16~18	

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Result
		Peak (dBuV)	QP (dBuV)		Peak (dBuV/m)	QP (dBuV/m)	Peak (dBuV/m)	QP (dBuV/m)	
2746.00	V	59.22	-	-0.31	58.91	39.43	74.00	54.00	X/H
1828.00	V	47.15	-	-2.45	44.70	25.22	74.00	54.00	X/H
3664.00	V	44.69	-	2.49	47.18	27.70	74.00	54.00	X/H

Remark :

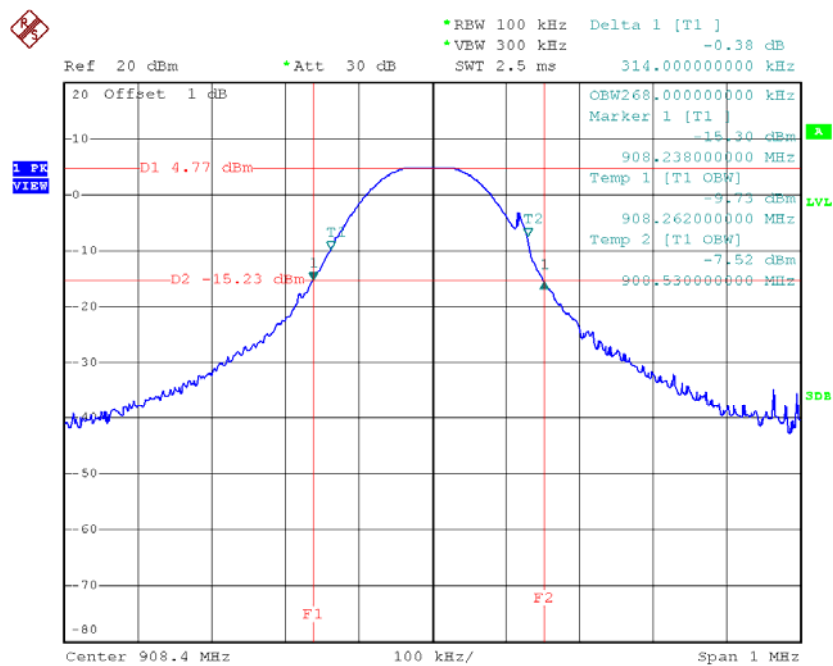
- (1) Peak value is much lower than the limit, So AV value isn't shown on this test item.
- (2) The average value of fundamental frequency is:
 $QP = PK \text{ value} + 20\log(\text{Duty cycle})$, Final QP=PK-19.48



ATTACHMENT E - BANDWIDTH

Test Mode :	TX Mode_908.40MHz
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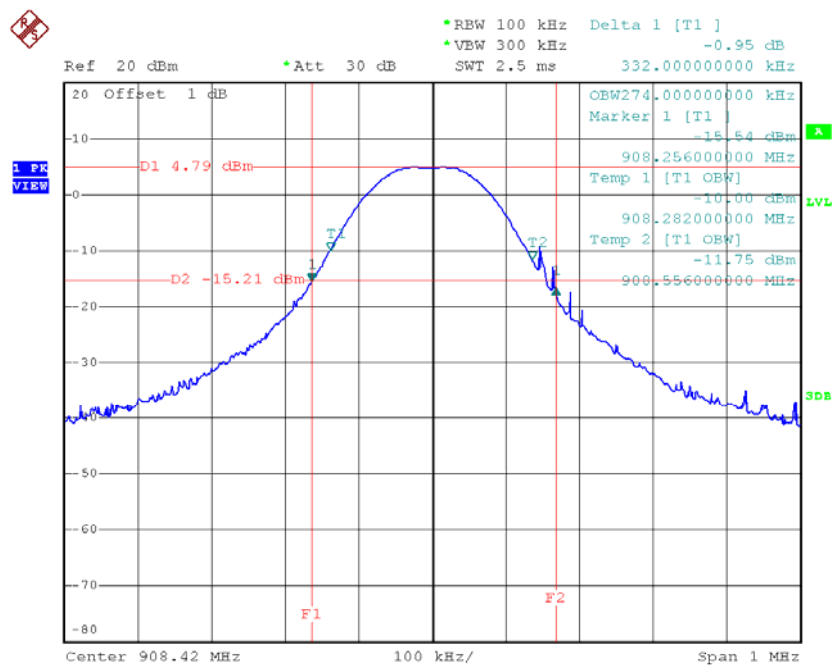
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
908.40	0.314	0.268



Date: 21.JAN.2016 15:13:45

Test Mode :	TX Mode_908.42MHz
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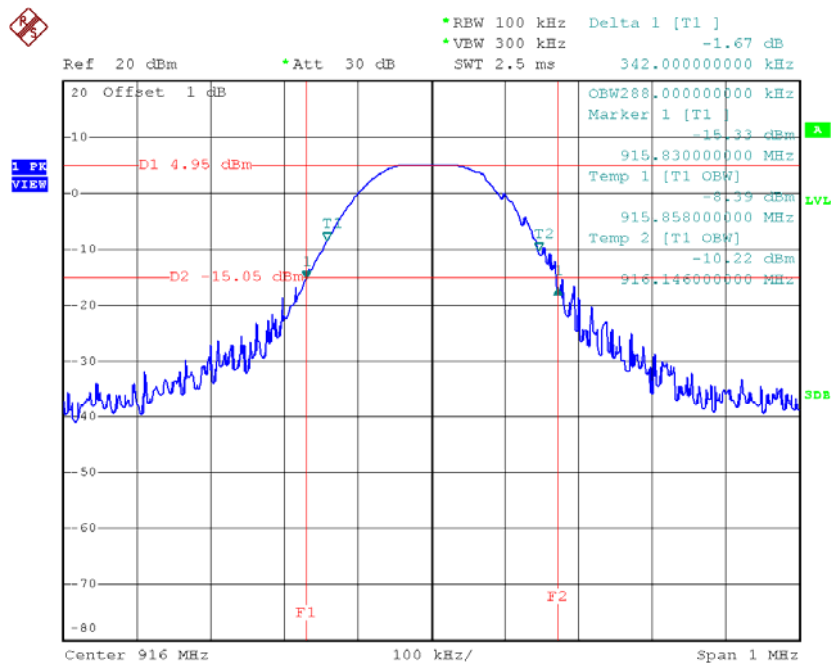
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
908.42	0.332	0.274



Date: 21.JAN.2016 15:00:32

Test Mode : TX Mode_916MHz

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
916	0.342	0.288



Date: 21.JAN.2016 14:52:45