

FCC Radio Test Report

FCC ID: YDB-SNOMD375

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

Project No. : 1508017
Equipment : VoIP Phone
Model Name : D375, snom D375, snom 375, 375
Applicant : Snom technology AG
Address : Wittestr. 30 G, Berlin, Germany 13509.

Date of Receipt : Aug. 03, 2015
Date of Test : Aug. 03, 2015 ~ Sep. 02, 2015
Issued Date : Sep. 07, 2015
Tested by : BTL Inc.

Testing Engineer :

Rush Kao

(Rush Kao)

Technical Manager :

Jeff Yang

(Jeff Yang)

Authorized Signatory :

Andy Chiu

(Andy Chiu)

B T L I N C .

B1, No.37, Lane 365, Yang Guang St.,
Nei-Hu District, Taipei City 114, Taiwan.
TEL:+886-2-2657-3299 FAX: +886-2- 2657-3331

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 **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

BTL's report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **BTL-self**, extracts from the test report shall not be reproduced except in full with **BTL's** authorized written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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.

Table of Contents	Page
1 . CERTIFICATION	7
2 . SUMMARY OF TEST RESULTS	8
2.1 TEST FACILITY	9
2.2 MEASUREMENT UNCERTAINTY	10
3 . GENERAL INFORMATION	11
3.1 GENERAL DESCRIPTION OF EUT	11
3.2 DESCRIPTION OF TEST MODES	13
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	13
3.4 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED	14
3.5 DESCRIPTION OF SUPPORT UNITS	14
4 . EMC EMISSION TEST	15
4.1 CONDUCTED EMISSION MEASUREMENT	15
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	15
4.1.2 TEST PROCEDURE	15
4.1.3 DEVIATIONFROMTESTSTANDARD	15
4.1.4 TESTSETUP	16
4.1.5 EUT OPERATINGCONDITIONS	16
4.1.6 EUT TEST CONDITIONS	16
4.1.7 TEST RESULTS	16
4.2 RADIATED EMISSION MEASUREMENT	17
4.2.1 RADIATED EMISSION LIMITS	17
4.2.2 TEST PROCEDURE	18
4.2.3 DEVIATIONFROMTESTSTANDARD	18
4.2.4 TESTSETUP	19
4.2.5 EUT OPERATING CONDITIONS	20
4.2.6 EUT TEST CONDITIONS	20
4.2.7 TEST RESULTS (9KHZTO 30MHZ)	20
4.2.8 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ)	21
4.2.9 TEST RESULTS (ABOVE 1000 MHZ)	21
5 . NUMBER OF HOPPING CHANNEL	22
5.1 APPLIED PROCEDURES	22
5.1.1 TEST PROCEDURE	22
5.1.2 DEVIATION FROM STANDARD	22
5.1.3 TEST SETUP	22
5.1.4 EUT OPERATION CONDITIONS	22
5.1.5 EUT TEST CONDITIONS	22
5.1.6 TEST RESULTS	22

Table of Contents	Page
6 . AVERAGE TIME OF OCCUPANCY	23
6.1 APPLIED PROCEDURES / LIMIT	23
6.1.1 TEST PROCEDURE	23
6.1.2 DEVIATION FROM STANDARD	23
6.1.3 TEST SETUP	23
6.1.4 EUT OPERATION CONDITIONS	24
6.1.5 EUT TEST CONDITIONS	24
6.1.6 TEST RESULTS	24
7 . HOPPING CHANNEL SEPARATION MEASUREMENT	25
7.1 APPLIED PROCEDURES /LIMIT	25
7.1.1 TEST PROCEDURE	25
7.1.2 DEVIATION FROM STANDARD	25
7.1.3 TEST SETUP	25
7.1.4 EUT TEST CONDITIONS	25
7.1.5 TEST RESULTS	25
8 . BANDWIDTH TEST	26
8.1 APPLIED PROCEDURES	26
8.1.1 TEST PROCEDURE	26
8.1.2 DEVIATION FROM STANDARD	26
8.1.3 TEST SETUP	26
8.1.4 EUT OPERATION CONDITIONS	26
8.1.5 EUT TEST CONDITIONS	26
8.1.6 TEST RESULTS	26
9 . PEAKOUTPUT POWER TEST	27
9.1 APPLIED PROCEDURES / LIMIT	27
9.1.1 TEST PROCEDURE	27
9.1.2 DEVIATION FROM STANDARD	27
9.1.3 TEST SETUP	27
9.1.4 EUT OPERATION CONDITIONS	27
9.1.5 EUT TEST CONDITIONS	27
9.1.6 TEST RESULTS	27
10 . ANTENNA CONDUCTED SPURIOUS EMISSION	28
10.1 APPLIED PROCEDURES / LIMIT	28
10.1.1 TEST PROCEDURE	28
10.1.2 DEVIATION FROM STANDARD	28
10.1.3 TEST SETUP	28
10.1.4 EUT OPERATION CONDITIONS	28
10.1.5 EUT TEST CONDITIONS	28
10.1.6 TEST RESULTS	28
11 . MEASUREMENT INSTRUMENTS LIST	29

Table of Contents	Page
12 . EUT TEST PHOTO	31
ATTACHMENT A - CONDUCTED EMISSION	35
ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)	38
ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)	40
ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)	43
ATTACHMENT E - NUMBER OF HOPPING CHANNEL	68
ATTACHMENT F - AVERAGE TIME OF OCCUPANCY	70
ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT	83
ATTACHMENT H - BANDWIDTH	88
ATTACHMENT I - PEAK OUTPUT POWER	93
ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION	98

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1508017	Original Issue.	Sep. 07, 2015

1. CERTIFICATION

Equipment : VoIP Phone
Brand Name : Snom
Model Name : D375, snom D375, snom 375, 375
Applicant : Snom technology AG
Manufacturer : SERCOMM CORP
Address : 3F 81 YUYI RD CHU-NAN MIAO-LI, 350 TAIWAN
Factory : SERCOMM CORP
Address : 3F 81 YUYI RD CHU-NAN MIAO-LI, 350 TAIWAN
Date of Test : Aug. 03, 2015 ~ Sep. 02, 2015
Test Sample : ENGINEERING SAMPLE
Standard(s) : FCC Part15, Subpart C : 2014 (15.247) / 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-1-1508017) 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):

Applied Standard(s): 47 CFR Part 15, Subpart C: 2014			
Standard(s) Section	Test Item	Judgment	Remark
FCC			
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(d)15.209	Radiated Spurious Emission	PASS	
15.247(a)(1)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(1)(iii)	Dwell Time	PASS	
15.205	Restricted Bands	PASS	
15.203	Antenna Requirement	PASS	

Note:

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

2.1 TEST FACILITY

Conducted emission Test:

C05: (VCCI RN: C-4742; FCC RN:965108; FCC DN:TW1082)
No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules and Canada Industry for reference only.

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%**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

A. Conducted emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)	Note
C05	CISPR	150 kHz ~ 30MHz	2.04	

B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)	Note
CB08 (3m)	CISPR	9kHz ~ 150kHz	4.00	
		150kHz ~ 30MHz	4.00	

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)	Note
CB08 (3m)	CISPR	30MHz ~ 200MHz	V	3.06	
		30MHz ~ 200MHz	H	2.58	
		200MHz ~ 1,000MHz	V	3.50	
		200MHz ~ 1,000MHz	H	3.10	

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)	Note
CB08 (3m)	CISPR	1GHz ~ 6GHz	V	4.14	
		1GHz ~ 6GHz	H	4.14	
		6GHz ~ 18GHz	V	5.34	
		6GHz ~ 18GHz	H	5.34	

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
CB08 (3m)	CISPR	18 ~ 26.5 GHz	4.66	
		26.5 ~ 40 GHz	4.74	

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

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	VoIP Phone	
Brand Name	Snom	
Model Name	D375, snom D375, snom 375, 375	
Model Difference	Only differ in model name due to marketing purpose.	
Output Power (Max.)	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps) π /4-DQPSK(2Mbps)
	Bit Rate of Transmitter	8-DPSK(3Mbps)
	Output Power Max.	2.30 dBm (1Mbps) 5.62 dBm (3Mbps)
PowerSource	#1 DC Voltage supplied from AC/DC adapter (support unit). #2 Supplied from PoE.	
Power Rating	#1 I/P: AC 100-240V 0.3A 50-60Hz 23-32VA O/P: DC 5V 2.0A #2 DC 48V	

Note:

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

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1		AT8010 -E2R9HAA	Chip	N/A	2.50	

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 possibly 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 Note (1)
Mode 2	Bluetooth

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Emission	
Final Test Mode	Description
Mode 2	Bluetooth

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode Note (1)

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) The measurements for Hopping Channel Separation, Bandwidth and Peak Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.

3.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

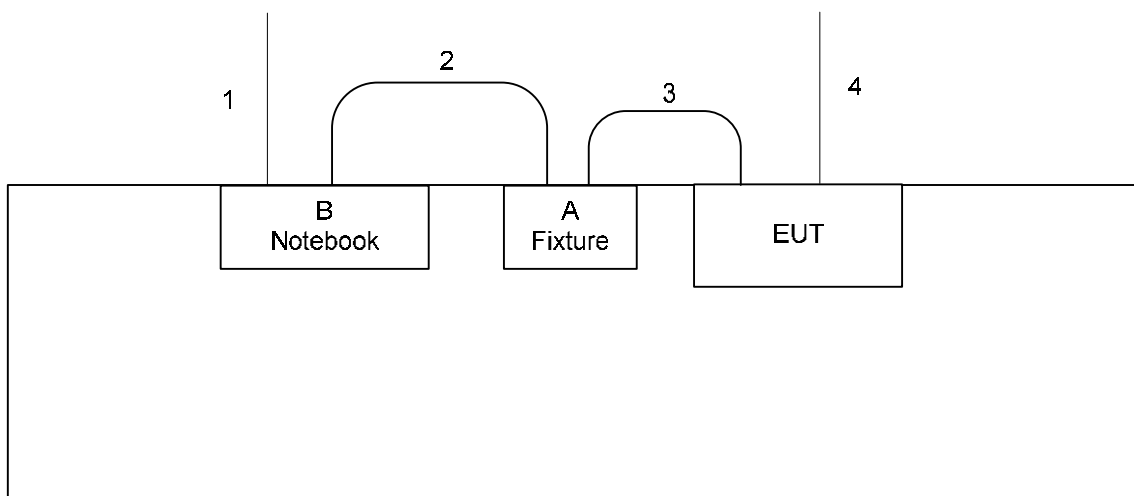
1Mbps

Test Software Version	Terminal		
Frequency (MHz)	2402	2441	2480
Parameters	1	1	1

3Mbps

Test Software Version	Terminal		
Frequency (MHz)	2402	2441	2480
Parameters	1	1	1

3.4 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED



3.5 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
A	Fixture	N/A	N/A	N/A	N/A	N/A
B	Notebook	ASUS	X450J	DOC	E8N0WU31377235F	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	YES	YES	1.5m	Power Line
2	YES	NO	1.8m	USB To RS-232 Cable
3	NO	NO	0.3m	Control Cable
4	NO	NO	1.3m	Power Line

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION Limits (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 = Antenna Factor + Cable Loss - Amplifier Gain(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

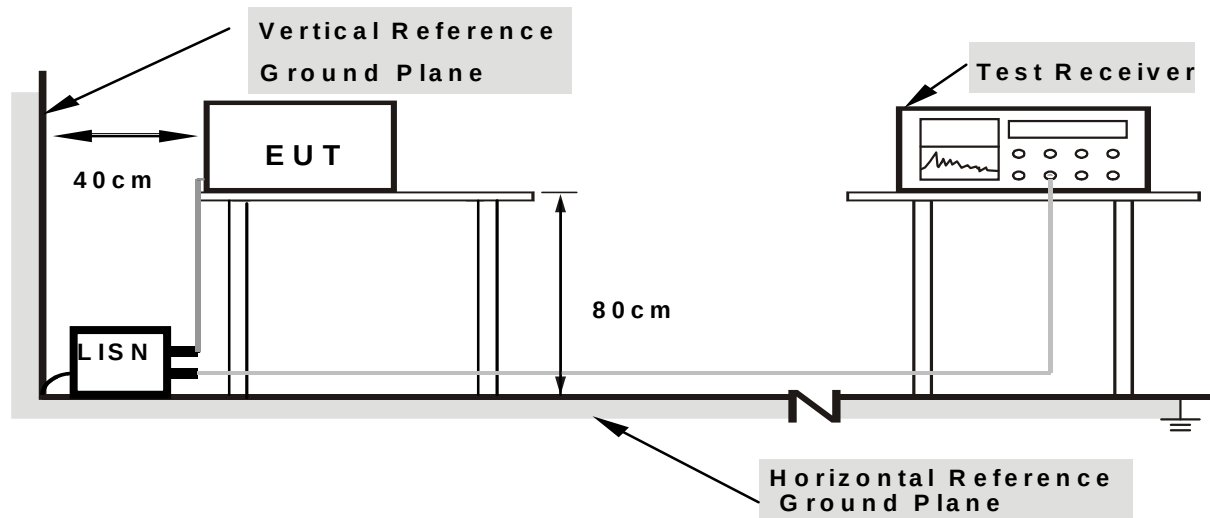
4.1.2 TEST PROCEDURE

- 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 DEVIATIONFROMTESTSTANDARD

No deviation

4.1.4 TESTSETUP



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 OPERATINGCONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 26°C
Relative Humidity: 59%
Test Voltage: AC 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 (Frequency Range 9KHz -1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency (MHz)	Field Strength (micro volts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	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).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

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

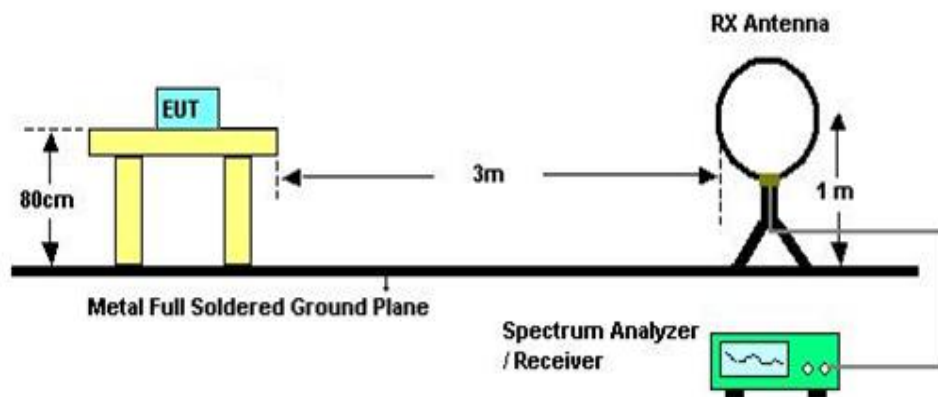
4.2.2 TEST PROCEDURE

- a. The measuring distance of at 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)
- b. The measuring distance of at 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)
- c. 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting conducted 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.
- g. 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)
- h. 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)
- i. For the actual test configuration, please refer to the related Item - Block Diagram of system tested (please refer to 3.3).

4.2.3 DEVIATIONFROMTESTSTANDARD

No deviation

(C) For radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing

4.2.6 EUT TEST CONDITIONS

Temperature: 27°C

Relative Humidity: 60%

Test Voltage: AC 120V/60Hz

4.2.7 TEST RESULTS (9KHZTO 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 (30MHZ TO 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.
- (3) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

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) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (4) EUT Orthogonal Axis:
"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand
- (5) 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
- (6) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100KHz
VBW	100KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW=100KHz, VBW=100KHz, Sweep time = Auto.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 EUT TEST CONDITIONS

Temperature: 27° C
 Relative Humidity: 55%
 Test Voltage: AC 120V/60Hz

5.1.6 TEST RESULTS

Please refer to the Attachment E

6. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

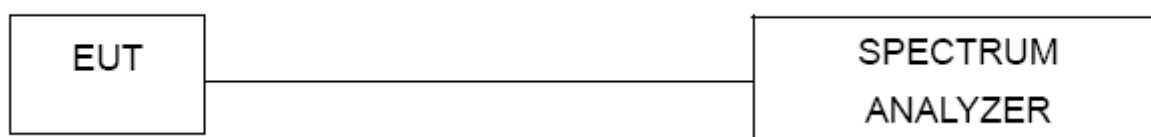
6.1.1 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.
- DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 EUT TEST CONDITIONS

Temperature: 27° C

Relative Humidity: 55%

Test Voltage: AC 120V/60Hz

6.1.6 TEST RESULTS

Please refer to the Attachment F

7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES /LIMIT

Frequency hopping systems operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two thirds of the -20 dB bandwidth of the hopping channel, whichever is greater, provided that the systems operate with an output power no greater than 0.125 W.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

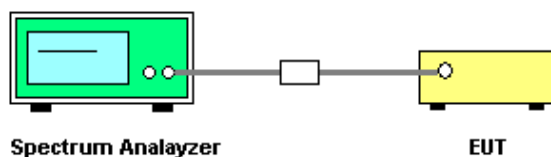
7.1.1 TEST PROCEDURE

- The EUT must have its hopping function enabled
- Span = wide enough to capture the peaks of two adjacent channels
 Resolution (or IF) Bandwidth (RBW) ³ 1% of the span
 Video (or Average) Bandwidth (VBW) ³ RBW
 Sweep = Auto
 Detector function = Peak
 Trace = Max Hold

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT TEST CONDITIONS

Temperature: 27° C
 Relative Humidity: 55%
 Test Voltage: AC 120V/60Hz

7.1.5 TEST RESULTS

Please refer to the Attachment G

8. BANDWIDTH TEST

8.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Frequency Range (MHz)
15.247(a)(2)	Bandwidth	2400-2483.5

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30KHz (20dB Bandwidth) / 30KHz (Channel Separation)
VBW	100KHz (20dB Bandwidth) / 100KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep Time = Auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 EUT TEST CONDITIONS

Temperature: 27° C
 Relative Humidity: 55%
 Test Voltage: AC 120V/60Hz

8.1.6 TEST RESULTS

Please refer to the Attachment H

9. PEAKOUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	1Watt or 30dBm	2400-2483.5	PASS

9.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 1MHz/3MHz, VBW= 1MHz/3MHz, Sweep time = Auto.

9.1.2 DEVIATION FROM STANDARD

No deviation.

9.1.3 TEST SETUP



9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

9.1.5 EUT TEST CONDITIONS

Temperature: 27° C
 Relative Humidity: 55%
 Test Voltage: AC 120V/60Hz

9.1.6 TEST RESULTS

Please refer to the Attachment I

10. ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

10.1.1 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= 100KHz, VBW=100KHz, Sweep time = Auto.
- c. Offset=antenna gain+ cable loss

10.1.2 DEVIATION FROM STANDARD

No deviation.

10.1.3 TEST SETUP



10.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

10.1.5 EUT TEST CONDITIONS

Temperature: 27° C

Relative Humidity: 55%

Test Voltage: AC 120V/60Hz

10.1.6 TEST RESULTS

Please refer to the Attachment J

11. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101050	Nov. 24, 2015
2	Test Cable	TIMES	CFD300-NL	C01	Jun. 16, 2016
3	EMI Test Receiver	R&S	ESCI	100082	Apr. 14, 2016
4	Measurement Software	EZ	EZ EMC (Version NB-02A)	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Jun. 15, 2016
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2016
4	Microflex Cable	Harbour industries	27478LL142	1m	May 13, 2016
5	Microflex Cable	EMC	S104-SMA	8m	May 15, 2016
6	Microflex Cable	Harbour industries	27478LL142	3m	May 13, 2016
7	Test Cable	LMR	LMR-400	12m	May 14, 2016
8	Test Cable	LMR	LMR-400	3m	May 14, 2016
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2016
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	July. 11, 2016
11	Loop Antenna	EMCO	6502	00042960	Nov. 07, 2016

Number of Hopping Channel					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

Average Time of Occupancy					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

Hopping Channel Separation Measurement

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

Bandwidth

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

Peak Output Power

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

Antenna Conducted Spurious Emission

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

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

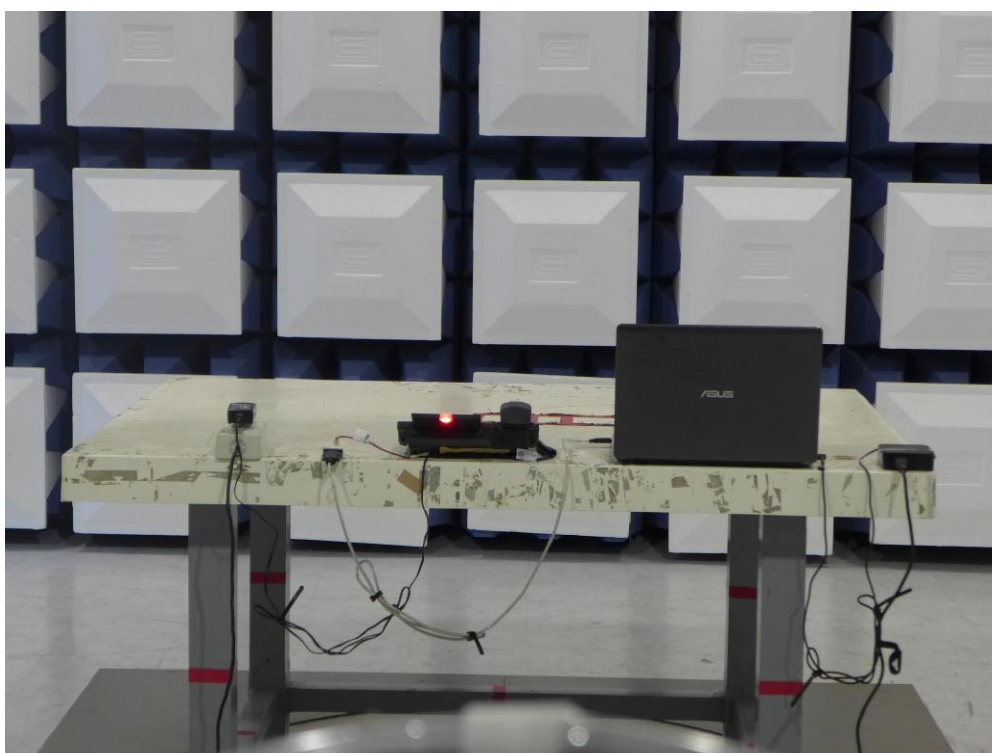
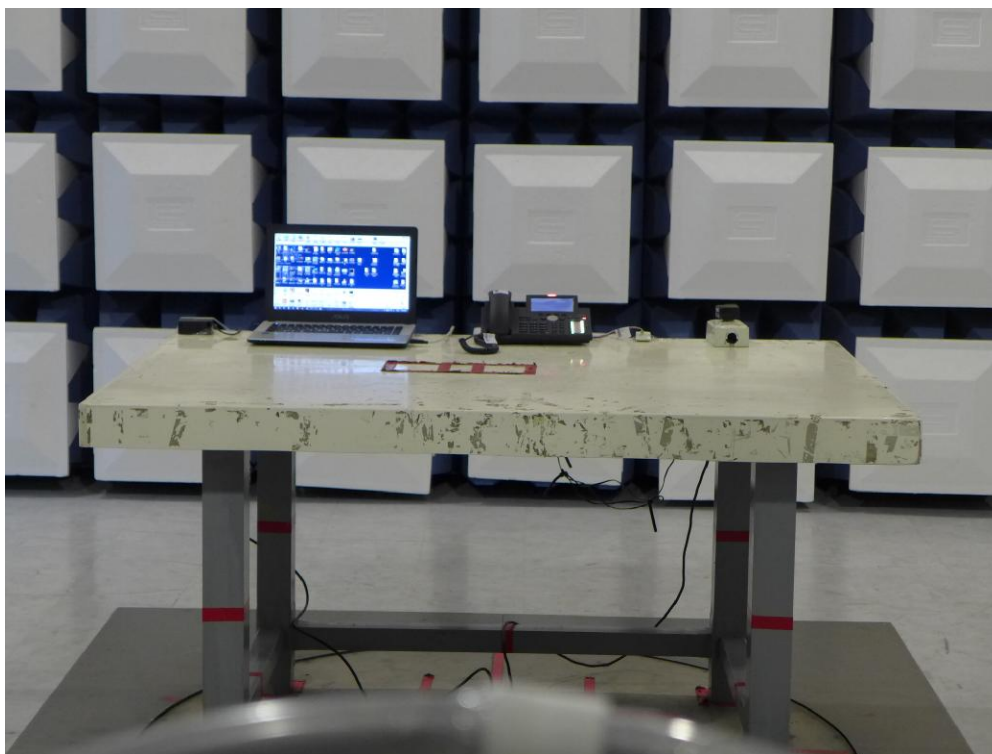
12. EUT TEST PHOTO

Conducted Measurement Photos



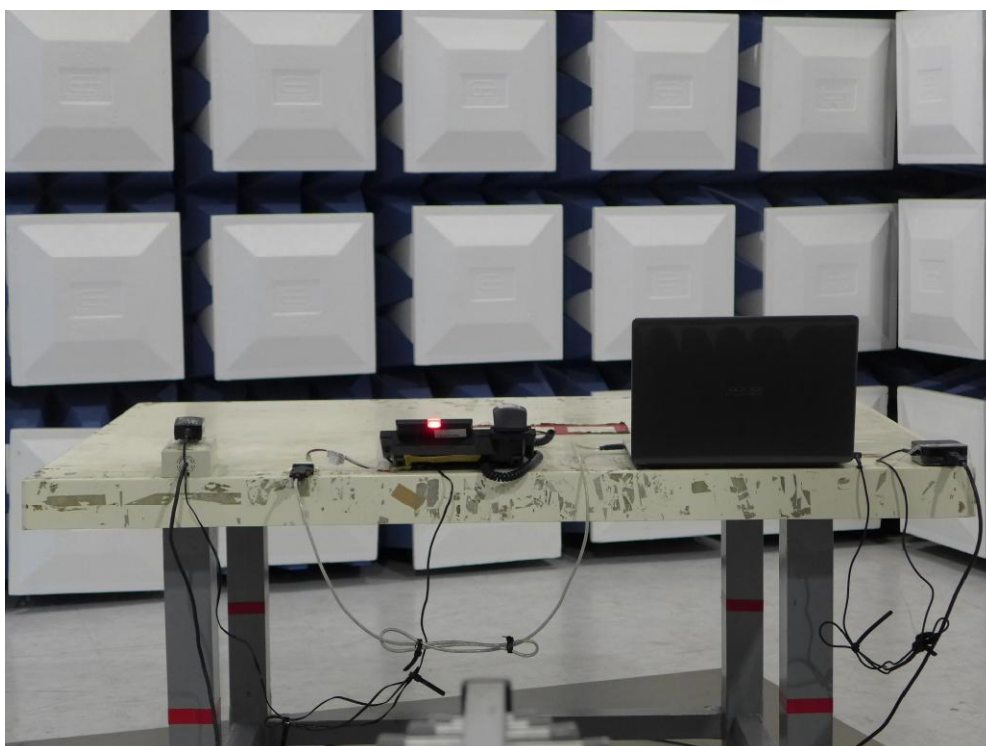
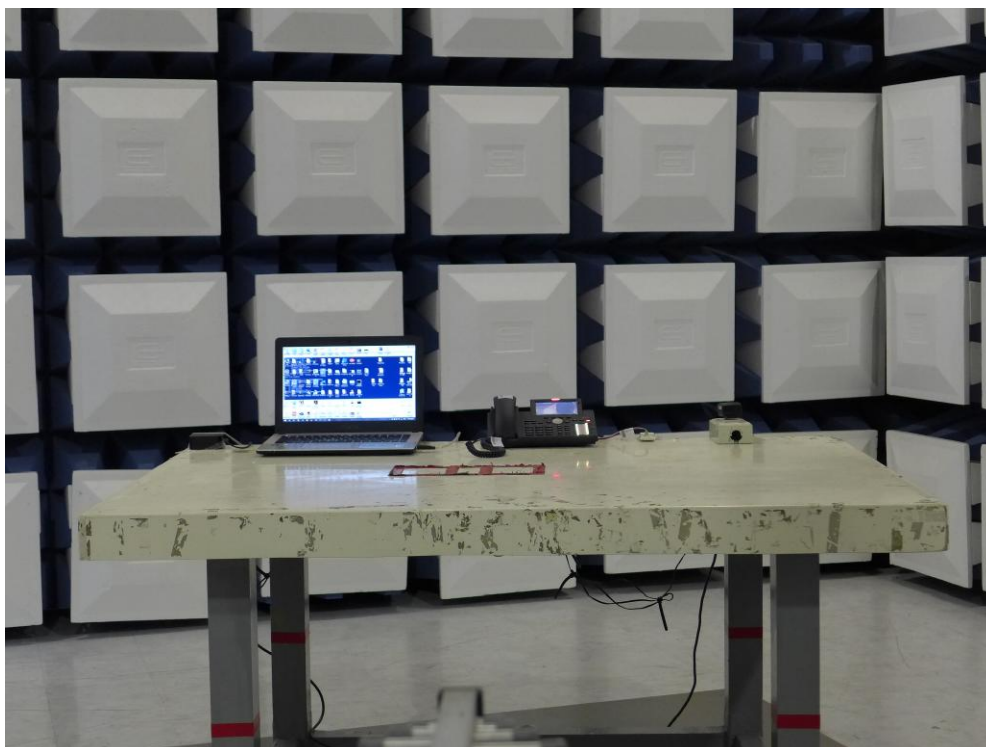
Radiated Measurement Photos

9K-30MHz



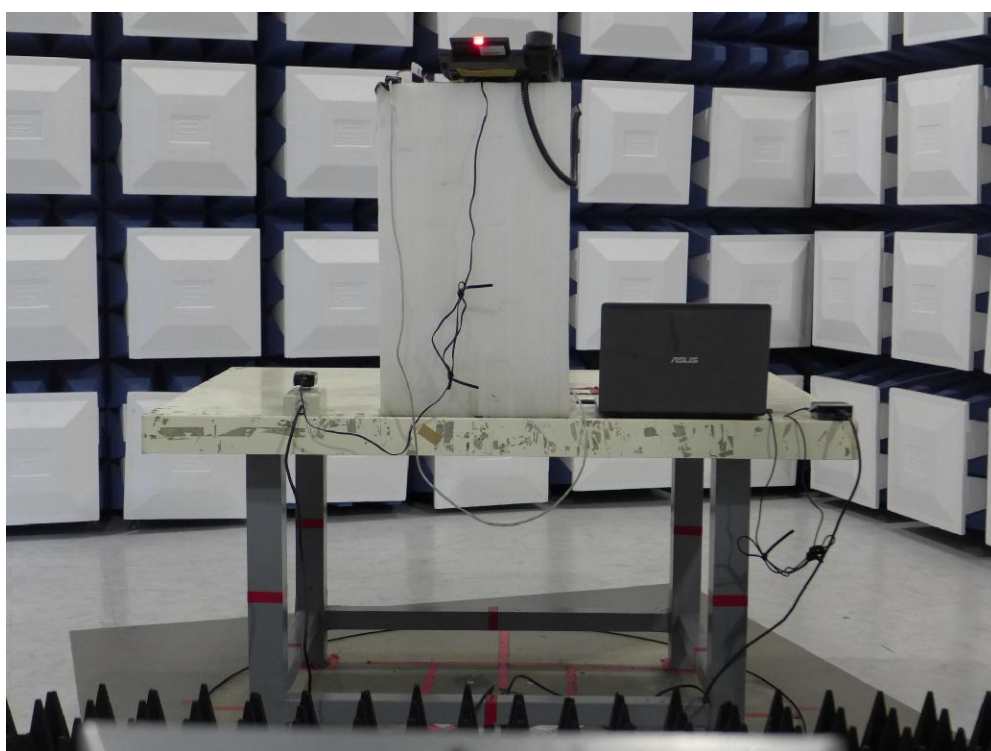
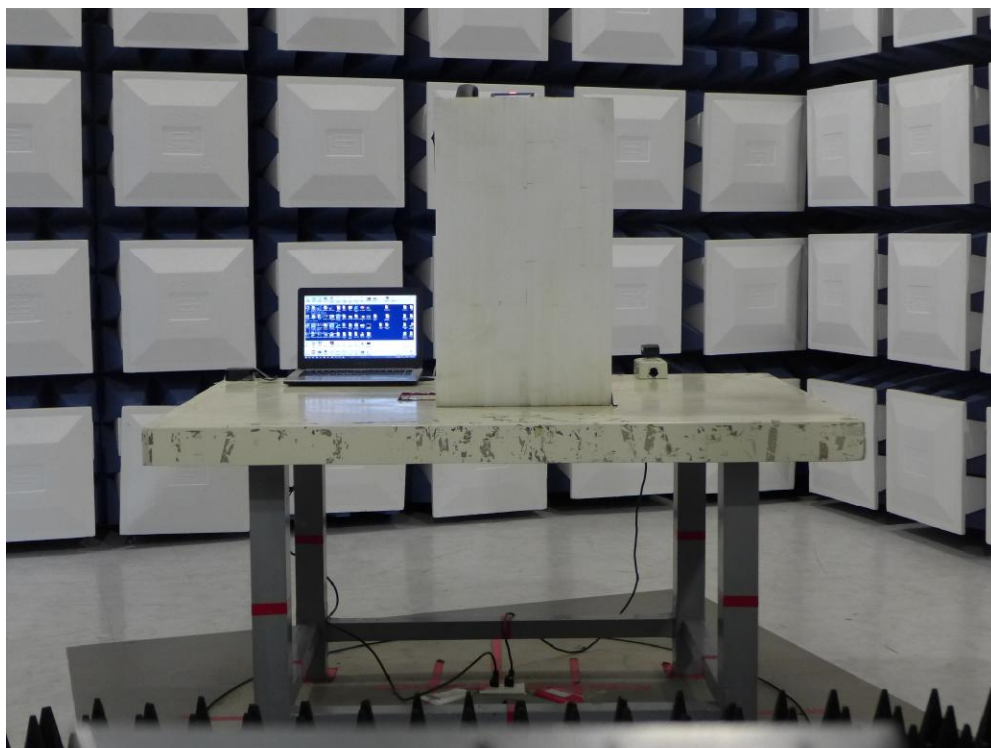
Radiated Measurement Photos

30MHz-1G



Radiated Measurement Photos

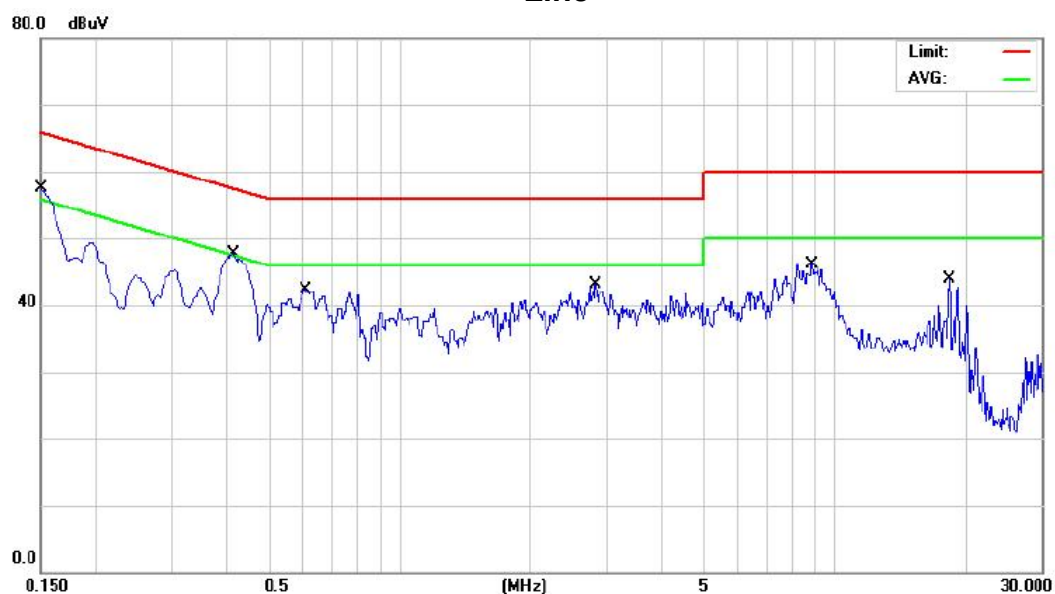
Above 1G



ATTACHMENT A - CONDUCTED EMISSION

Test Mode: Bluetooth

Line



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1500	45.60	9.64	55.24	65.99	-10.75	QP	
2 *	0.1500	38.10	9.64	47.74	55.99	-8.25	AVG	
3	0.4139	32.60	9.63	42.23	57.57	-15.34	QP	
4	0.4139	28.00	9.63	37.63	47.57	-9.94	AVG	
5	0.6080	28.80	9.64	38.44	56.00	-17.56	QP	
6	0.6080	23.90	9.64	33.54	46.00	-12.46	AVG	
7	2.8130	26.10	9.77	35.87	56.00	-20.13	QP	
8	2.8130	19.50	9.77	29.27	46.00	-16.73	AVG	
9	8.8500	30.70	9.90	40.60	60.00	-19.40	QP	
10	8.8500	24.10	9.90	34.00	50.00	-16.00	AVG	
11	18.3000	29.40	9.84	39.24	60.00	-20.76	QP	
12	18.3000	24.20	9.84	34.04	50.00	-15.96	AVG	

Test Mode: Bluetooth

Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	47.50	9.63	57.13	65.99	-8.86	QP	
2	*	0.1500	39.50	9.63	49.13	55.99	-6.86	AVG	
3		0.4069	33.00	9.64	42.64	57.71	-15.07	QP	
4		0.4069	28.10	9.64	37.74	47.71	-9.97	AVG	
5		0.7700	29.10	9.66	38.76	56.00	-17.24	QP	
6		0.7700	24.10	9.66	33.76	46.00	-12.24	AVG	
7		2.8580	27.80	9.76	37.56	56.00	-18.44	QP	
8		2.8580	21.40	9.76	31.16	46.00	-14.84	AVG	
9		9.3000	30.80	9.91	40.71	60.00	-19.29	QP	
10		9.3000	24.50	9.91	34.41	50.00	-15.59	AVG	
11		19.2000	31.40	9.87	41.27	60.00	-18.73	QP	
12		19.2000	26.80	9.87	36.67	50.00	-13.33	AVG	

ATTACHMENT B - RADIATED EMISSION (9KHZ-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
0.0153	0°	32.53	22.27	54.80	103.91	-49.11	AVG
0.0153	0°	42.54	22.27	64.81	123.91	-59.10	PK
0.0266	0°	29.45	21.99	51.44	99.11	-47.67	AVG
0.0266	0°	35.35	21.99	57.34	119.11	-61.77	PK
0.0427	0°	26.43	21.58	48.01	95.00	-46.98	AVG
0.0427	0°	31.35	21.58	52.93	115.00	-62.06	PK
0.0620	0°	35.35	21.21	56.56	111.76	-55.20	PK
1.2490	0°	33.59	20.35	53.94	65.67	-11.73	QP
1.5300	0°	35.64	20.07	55.71	63.91	-8.20	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0174	90°	32.57	22.22	54.79	102.79	-48.01	AVG
0.0174	90°	43.41	22.22	65.63	122.79	-57.17	PK
0.0250	90°	28.50	22.03	50.53	99.65	-49.12	AVG
0.0250	90°	34.65	22.03	56.68	119.65	-62.97	PK
0.0463	90°	27.69	21.49	49.18	94.29	-45.11	AVG
0.0463	90°	32.41	21.49	53.90	114.29	-60.39	PK
0.0750	90°	35.63	21.00	56.63	110.10	-53.47	PK
1.4250	90°	32.51	20.18	52.69	64.53	-11.84	QP
1.7490	90°	34.92	19.85	54.77	69.54	-14.77	QP

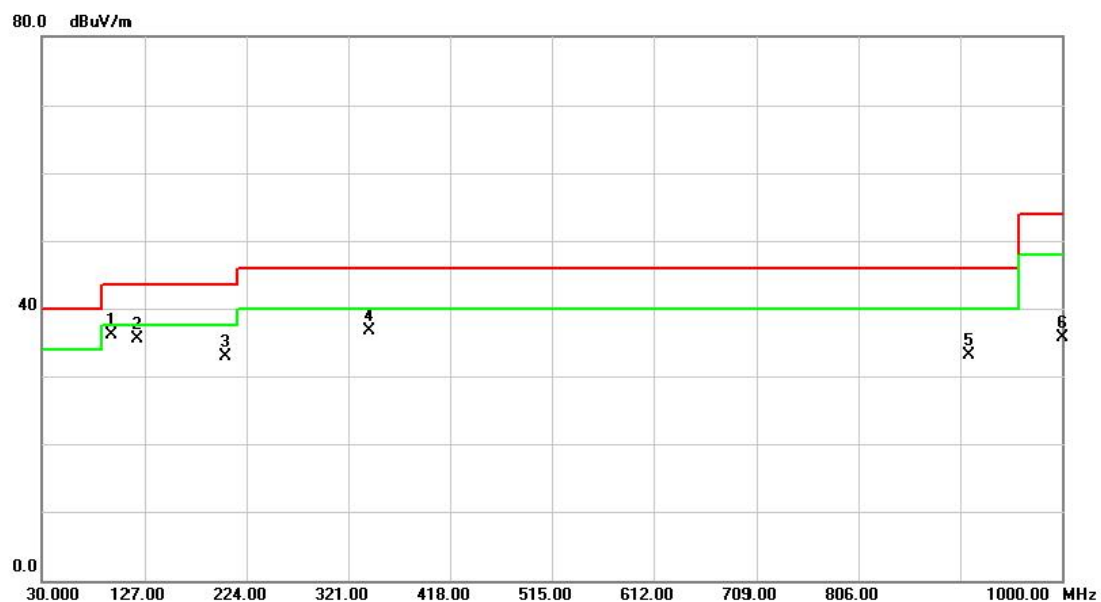
Remark:

- (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 = $40 \log (\text{specific distance} / \text{test distance})$ (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

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

Test Mode: TX 2441MHz_CH39_1Mbps

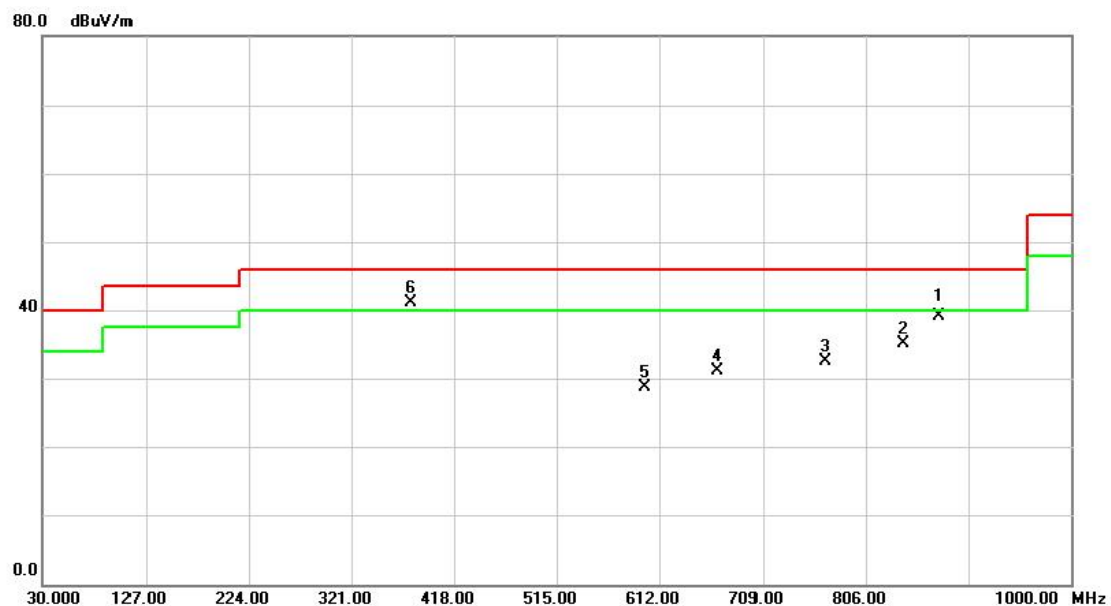
Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	95.9600	53.64	-17.61	36.03	43.50	-7.47	peak	
2		120.2100	49.68	-14.11	35.57	43.50	-7.93	peak	
3		203.6300	48.03	-15.09	32.94	43.50	-10.56	peak	
4		340.4000	47.22	-10.57	36.65	46.00	-9.35	peak	
5		911.7300	34.51	-1.32	33.19	46.00	-12.81	peak	
6		1000.0000	36.13	-0.33	35.80	54.00	-18.20	peak	

Test Mode: TX 2441MHz_CH39_1Mbps

Horizontal

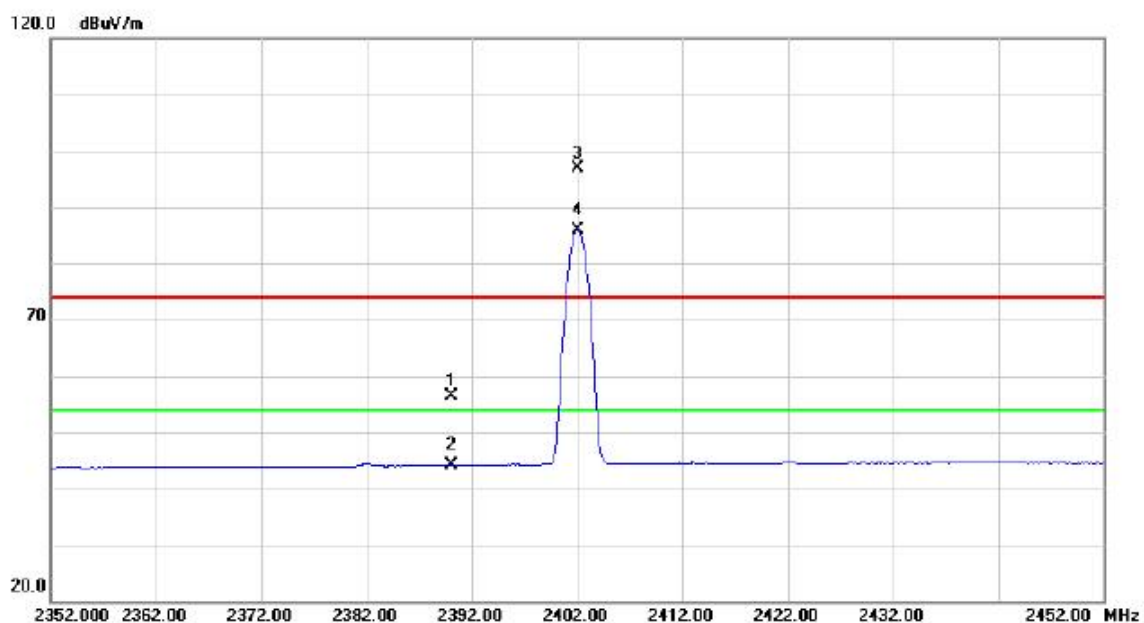


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		874.8700	41.09	-2.01	39.08	46.00	-6.92	peak	
2		841.8900	37.74	-2.67	35.07	46.00	-10.93	peak	
3		768.1700	36.05	-3.46	32.59	46.00	-13.41	peak	
4		666.3200	36.31	-5.21	31.10	46.00	-14.90	peak	
5		598.4200	35.44	-6.68	28.76	46.00	-17.24	peak	
6	*	377.2600	51.10	-10.04	41.06	46.00	-4.94	peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

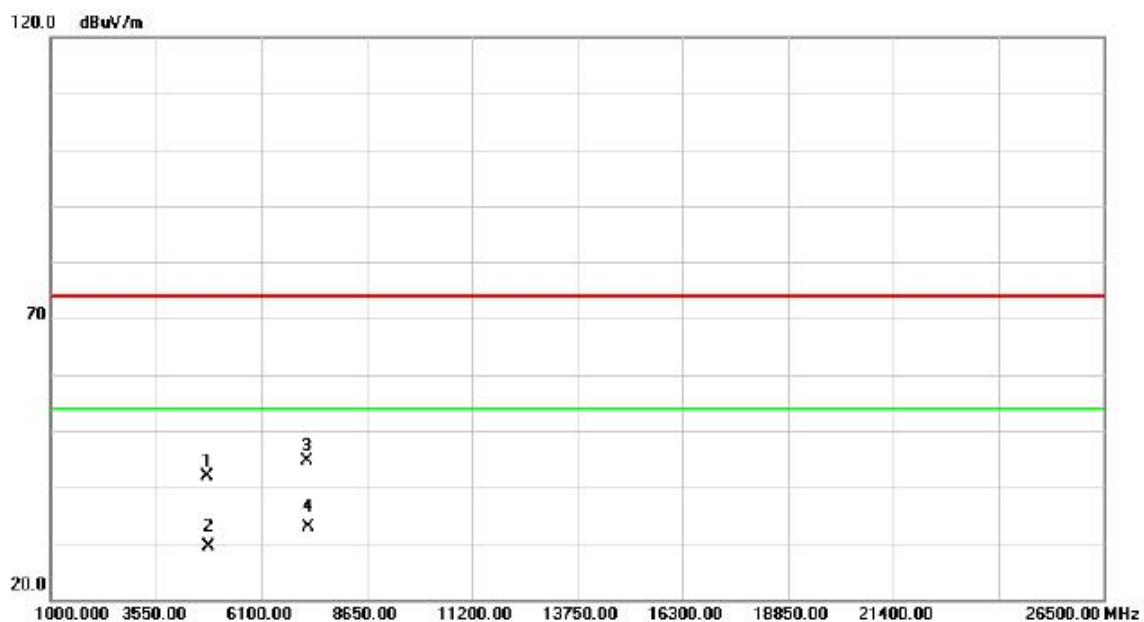
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	25.80	30.56	56.36	74.00	-17.64	peak	
2		2390.000	13.57	30.56	44.13	54.00	-9.87	AVG	
3	X	2402.100	66.17	30.61	96.78	74.00	22.78	peak	NO LIMIT
4	*	2402.100	55.28	30.61	85.89	54.00	31.89	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

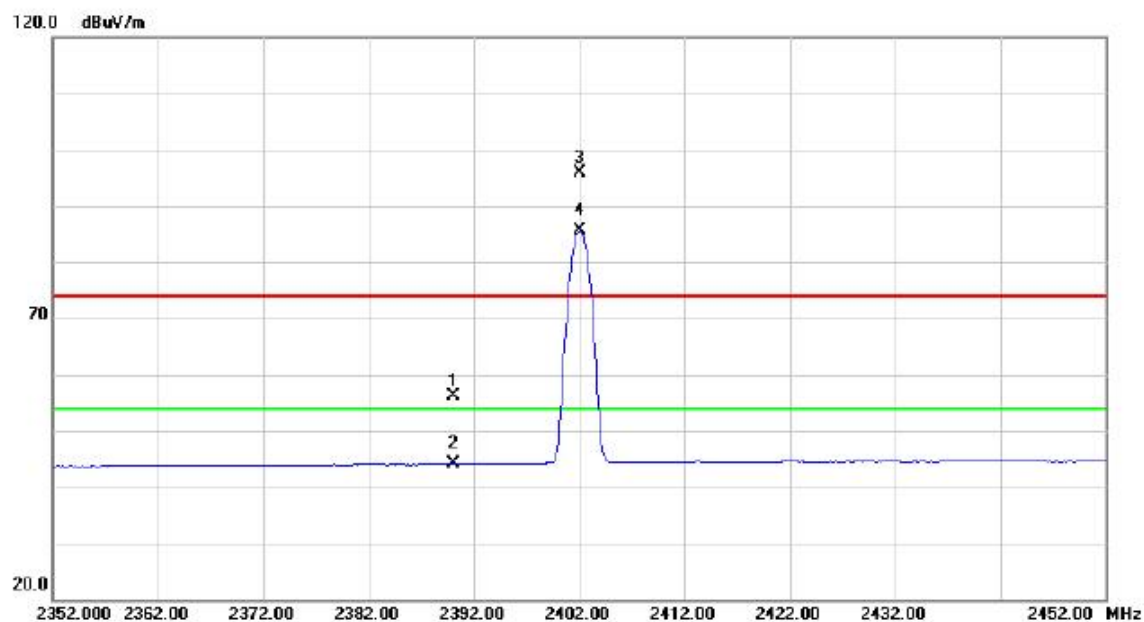
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4804.165	38.60	3.24	41.84	74.00	-32.16	peak	
2		4804.167	26.10	3.24	29.34	54.00	-24.66	AVG	
3		7201.300	36.33	8.38	44.71	74.00	-29.29	peak	
4	*	7201.300	24.61	8.38	32.99	54.00	-21.01	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

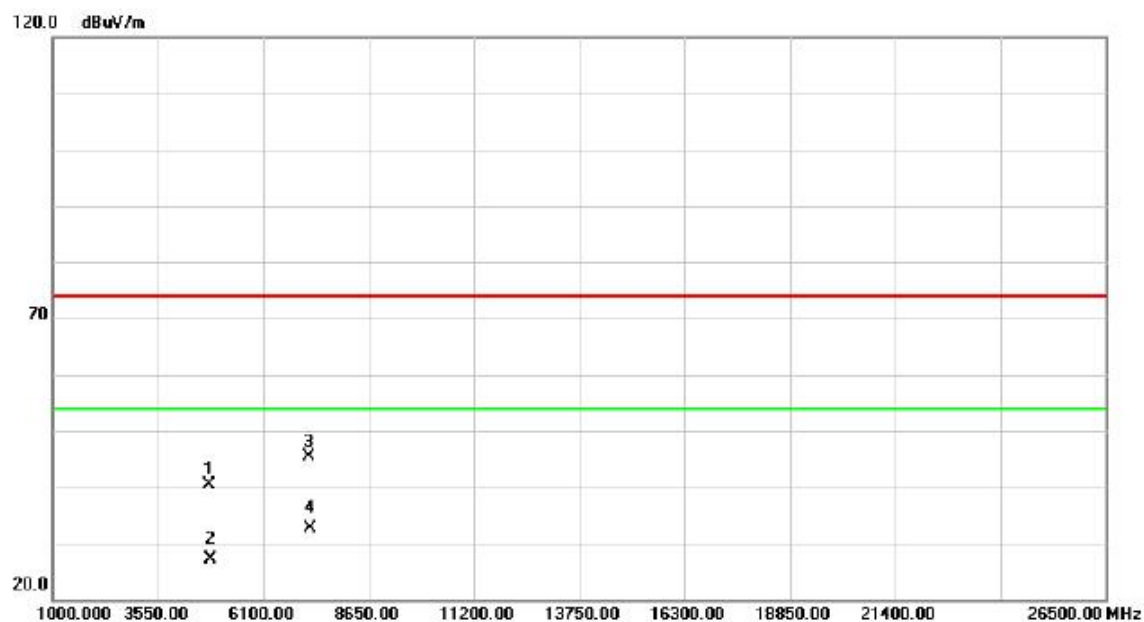
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	25.58	30.56	56.14	74.00	-17.86	peak	
2		2390.000	13.51	30.56	44.07	54.00	-9.93	AVG	
3	X	2402.000	65.21	30.61	95.82	74.00	21.82	peak	NO LIMIT
4	*	2402.000	54.98	30.61	85.59	54.00	31.59	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

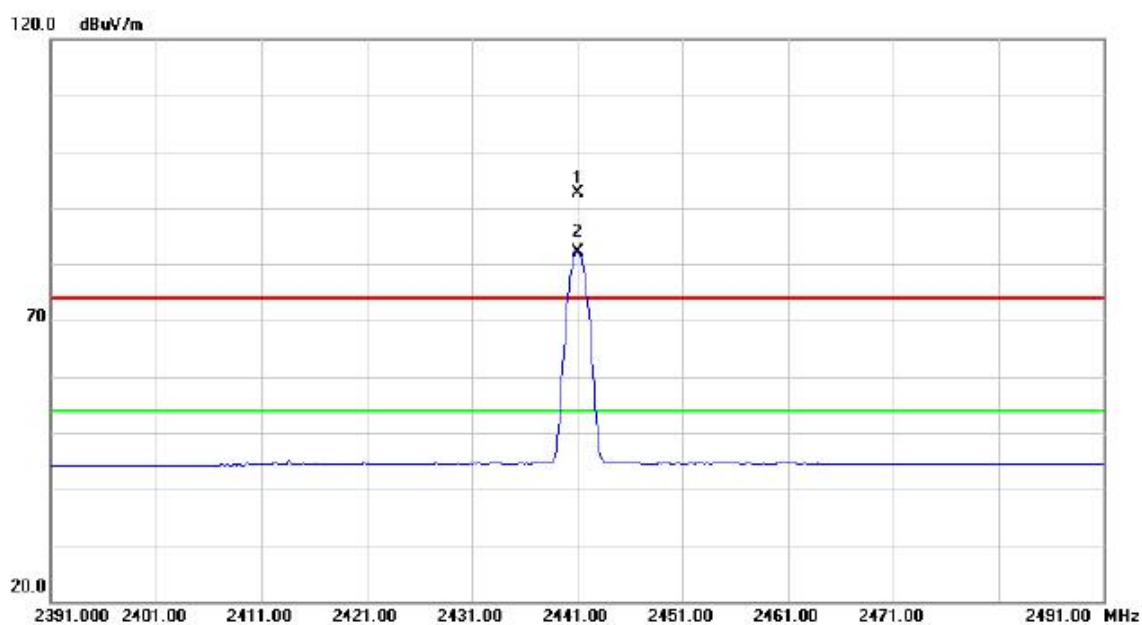
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4804.090	37.15	3.24	40.39	74.00	-33.61	peak	
2		4804.090	23.77	3.24	27.01	54.00	-26.99	AVG	
3		7206.345	37.07	8.41	45.48	74.00	-28.52	peak	
4	*	7206.345	24.12	8.41	32.53	54.00	-21.47	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

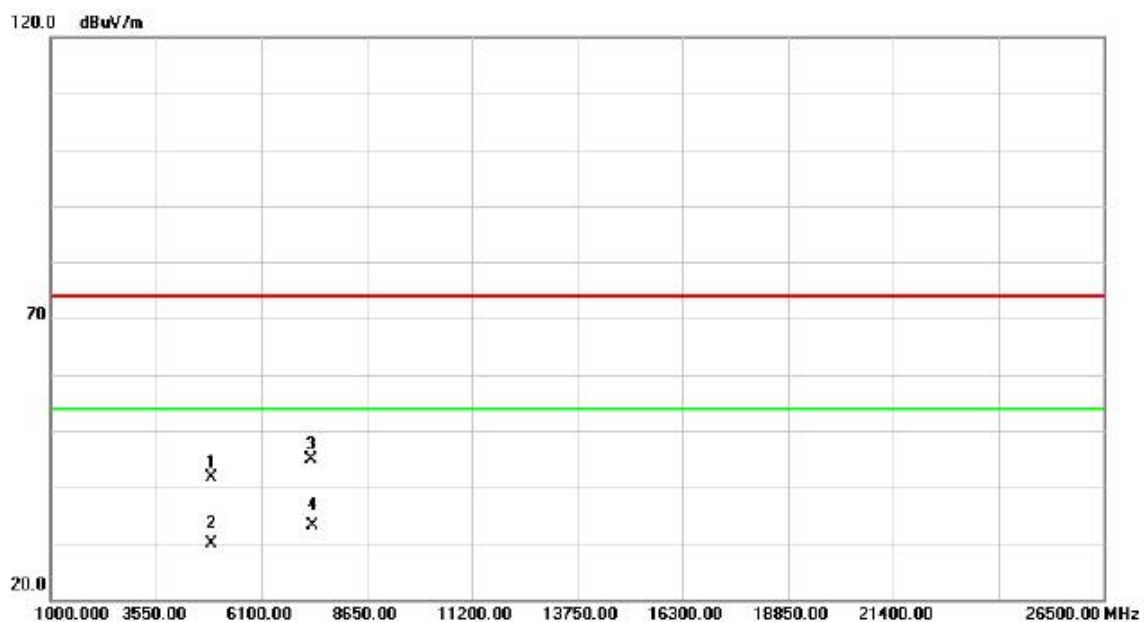
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.100	61.95	30.73	92.68	74.00	18.68	peak	NO LIMIT
2	*	2441.100	51.43	30.73	82.16	54.00	28.16	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

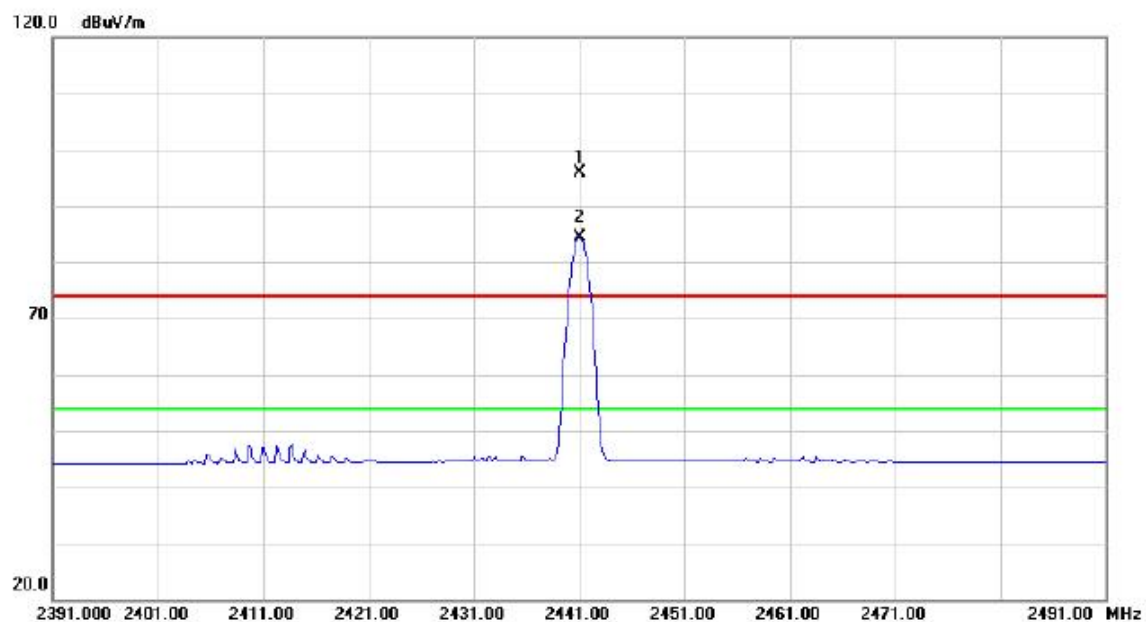
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4882.140	38.08	3.52	41.60	74.00	-32.40	peak	
2		4882.140	26.34	3.52	29.86	54.00	-24.14	AVG	
3		7323.110	36.30	8.62	44.92	74.00	-29.08	peak	
4	*	7323.110	24.59	8.62	33.21	54.00	-20.79	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

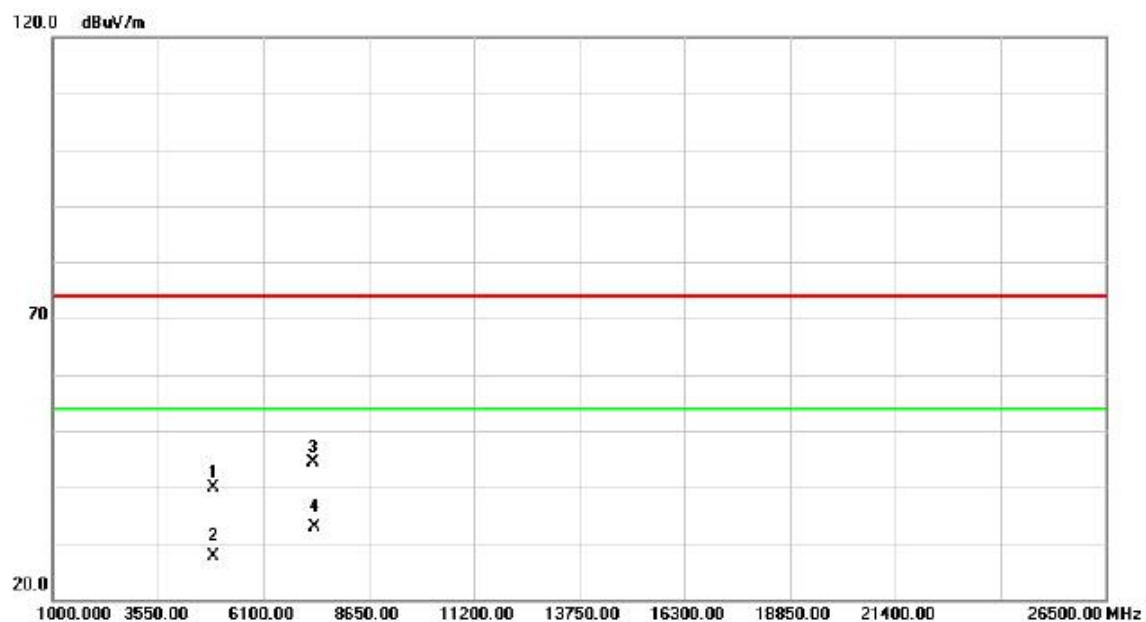
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2441.000	65.26	30.73	95.99	74.00	21.99	peak	NO LIMIT
2	*	2441.000	53.70	30.73	84.43	54.00	30.43	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

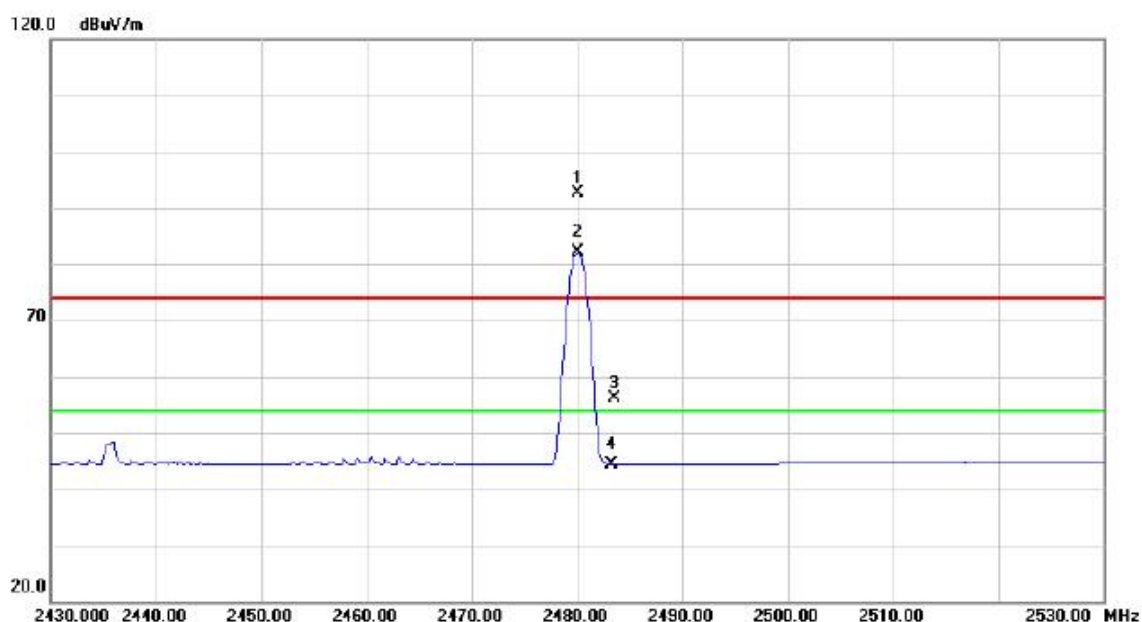
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4884.155	36.33	3.53	39.86	74.00	-34.14	peak	
2		4884.155	24.22	3.53	27.75	54.00	-26.25	AVG	
3		7322.665	35.75	8.62	44.37	74.00	-29.63	peak	
4	*	7322.665	24.15	8.62	32.77	54.00	-21.23	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_1Mbps

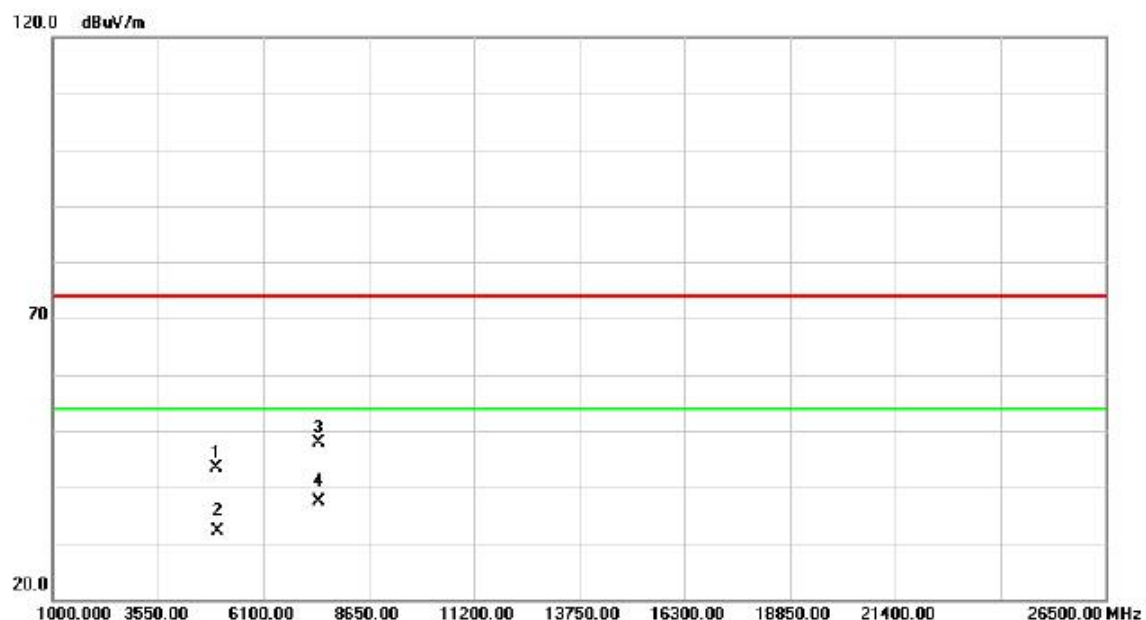
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2480.000	61.67	30.86	92.53	74.00	18.53	peak	NO LIMIT
2	*	2480.000	51.16	30.86	82.02	54.00	28.02	AVG	NO LIMIT
3		2483.500	25.29	30.87	56.16	74.00	-17.84	peak	
4		2483.500	13.51	30.87	44.38	54.00	-9.62	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_1Mbps

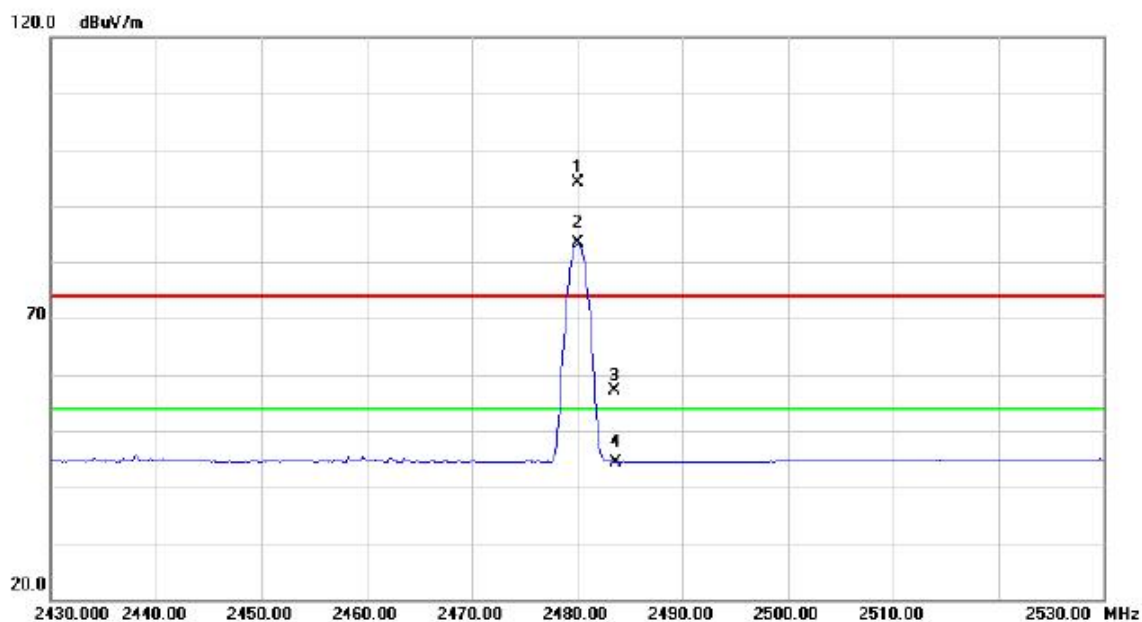
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4959.810	39.52	3.82	43.34	74.00	-30.66	peak	
2		4959.810	28.35	3.82	32.17	54.00	-21.83	AVG	
3		7439.640	39.13	8.86	47.99	74.00	-26.01	peak	
4	*	7439.640	28.57	8.86	37.43	54.00	-16.57	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_1Mbps

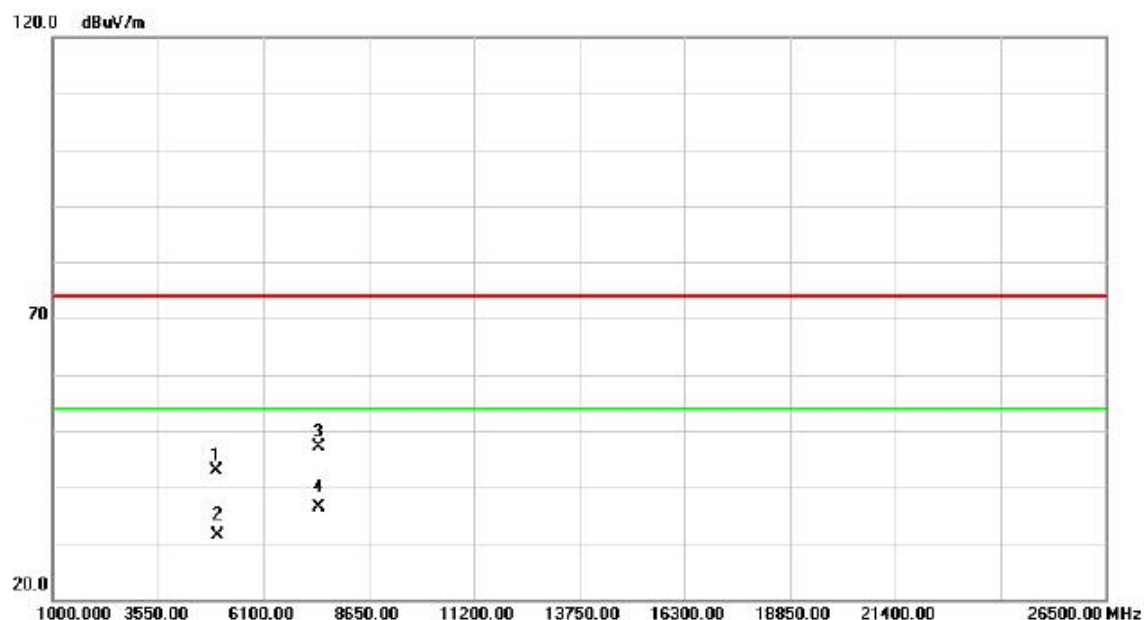
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2480.100	63.22	30.86	94.08	74.00	20.08	peak	NO LIMIT
2	*	2480.100	52.47	30.86	83.33	54.00	29.33	AVG	NO LIMIT
3		2483.500	26.35	30.87	57.22	74.00	-16.78	peak	
4		2483.500	13.58	30.87	44.45	54.00	-9.55	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_1Mbps

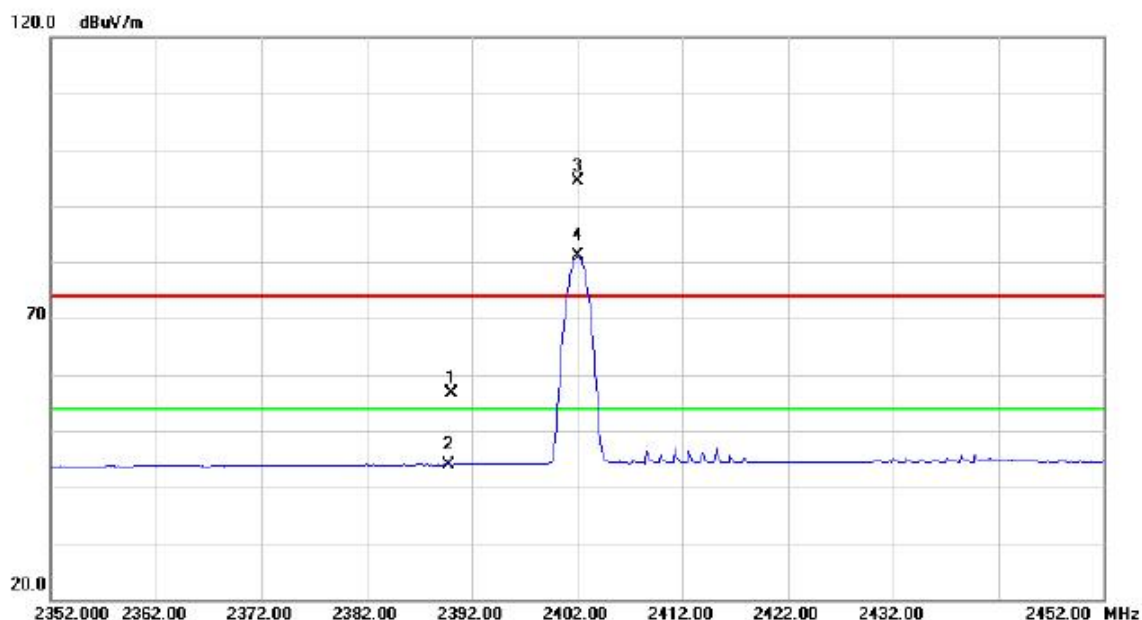
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.050	39.03	3.82	42.85	74.00	-31.15	peak	
2		4960.050	27.53	3.82	31.35	54.00	-22.65	AVG	
3		7440.180	38.36	8.85	47.21	74.00	-26.79	peak	
4	*	7440.180	27.53	8.85	36.38	54.00	-17.62	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_3Mbps

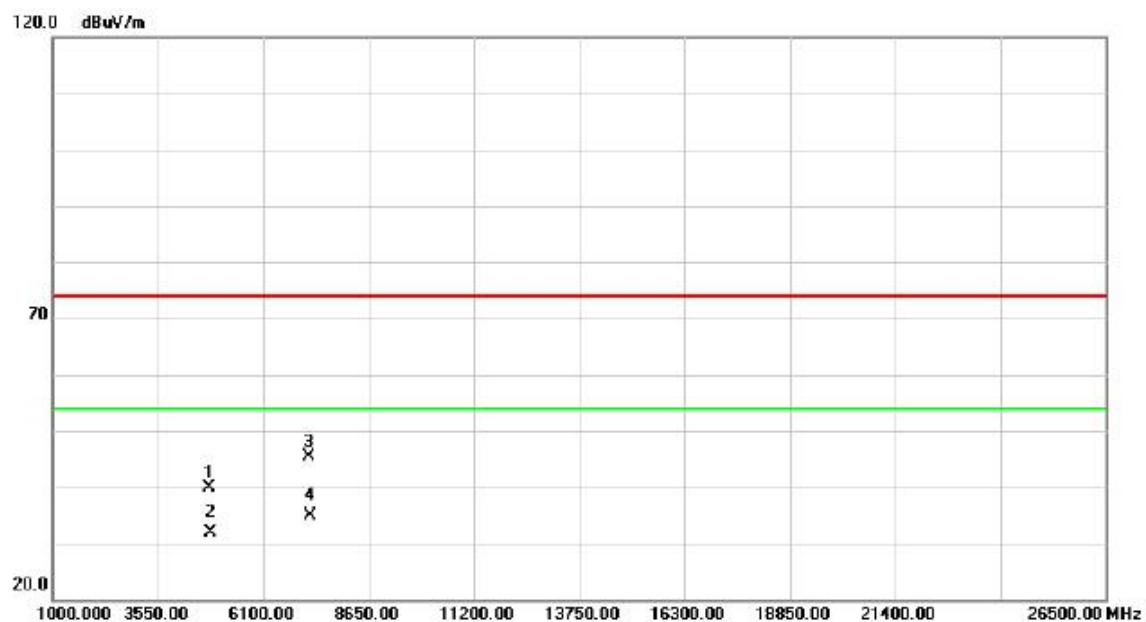
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	26.09	30.56	56.65	74.00	-17.35	peak	
2		2390.000	13.43	30.56	43.99	54.00	-10.01	AVG	
3	X	2402.000	63.87	30.61	94.48	74.00	20.48	peak	NO LIMIT
4	*	2402.000	50.47	30.61	81.08	54.00	27.08	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_3Mbps

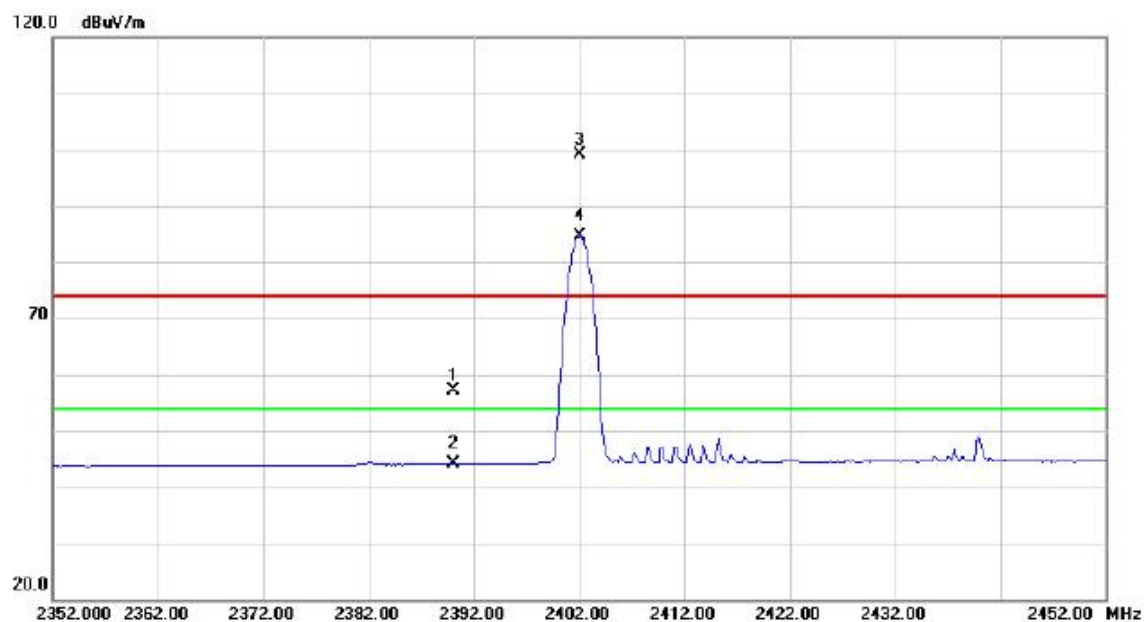
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4804.080	36.70	3.24	39.94	74.00	-34.06	peak	
2		4804.080	28.53	3.24	31.77	54.00	-22.23	AVG	
3		7206.690	36.91	8.41	45.32	74.00	-28.68	peak	
4	*	7206.690	26.53	8.41	34.94	54.00	-19.06	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_3Mbps

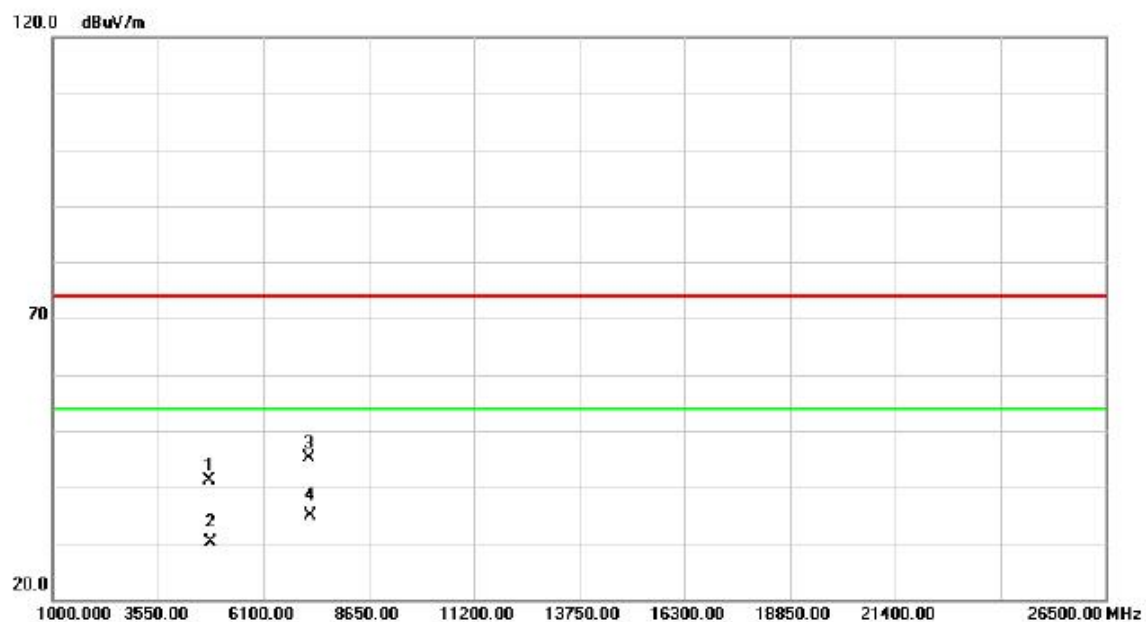
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	26.56	30.56	57.12	74.00	-16.88	peak	
2		2390.000	13.54	30.56	44.10	54.00	-9.90	AVG	
3	X	2402.100	68.50	30.61	99.11	74.00	25.11	peak	NO LIMIT
4	*	2402.100	53.98	30.61	84.59	54.00	30.59	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_3Mbps

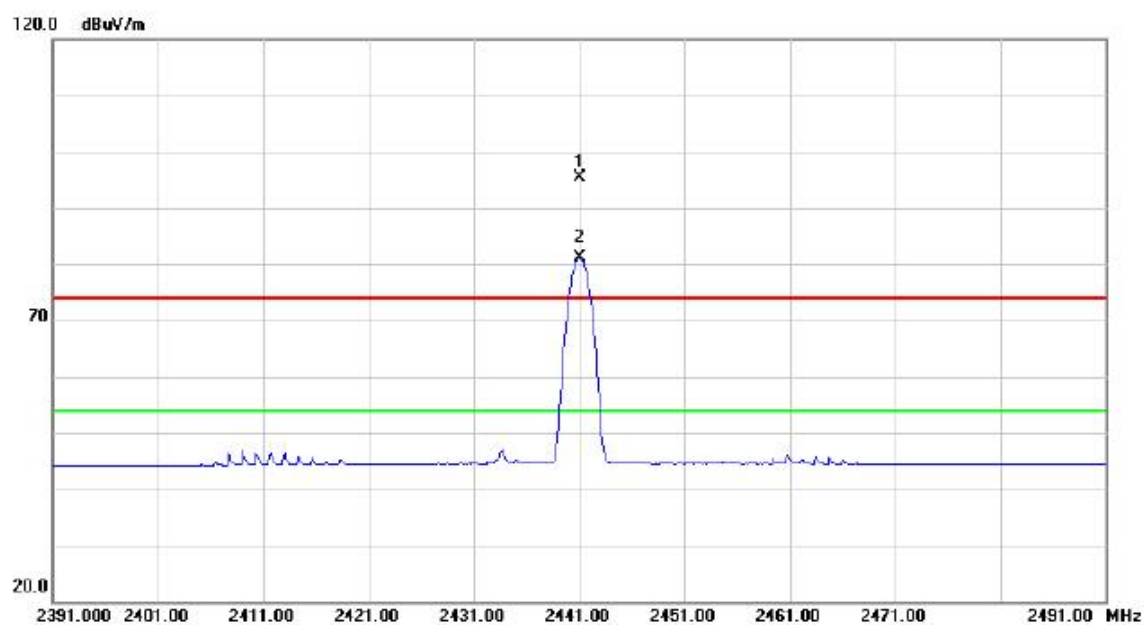
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4803.970	37.95	3.24	41.19	74.00	-32.81	peak	
2		4803.970	26.89	3.24	30.13	54.00	-23.87	AVG	
3		7206.270	36.71	8.41	45.12	74.00	-28.88	peak	
4	*	7206.270	26.44	8.41	34.85	54.00	-19.15	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

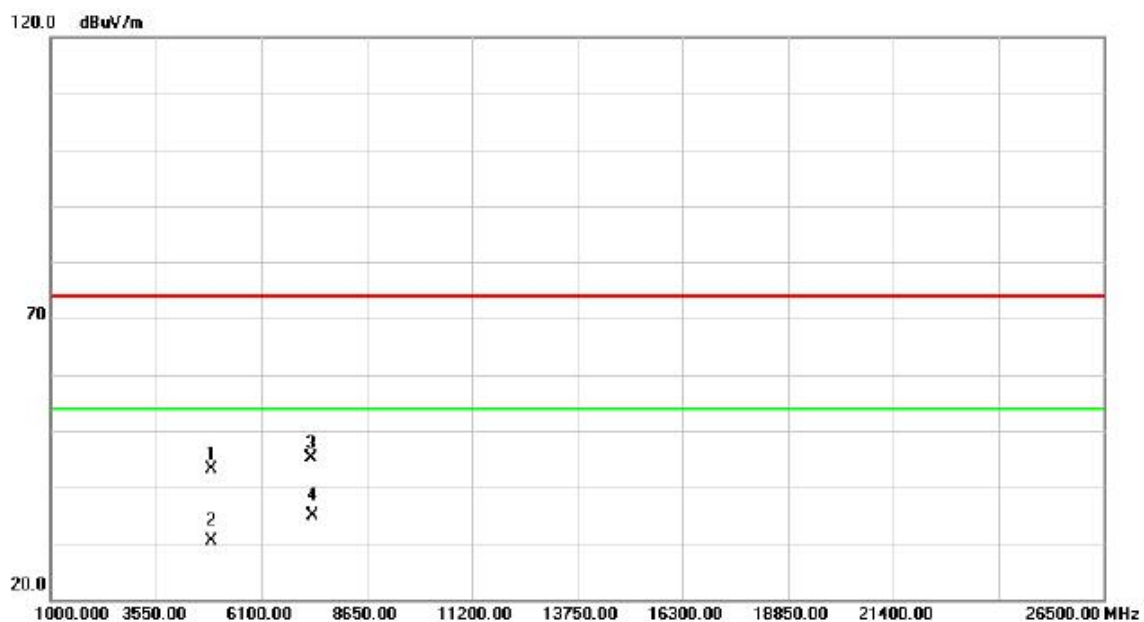
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.000	64.58	30.73	95.31	74.00	21.31	peak	NO LIMIT
2	*	2441.000	50.35	30.73	81.08	54.00	27.08	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

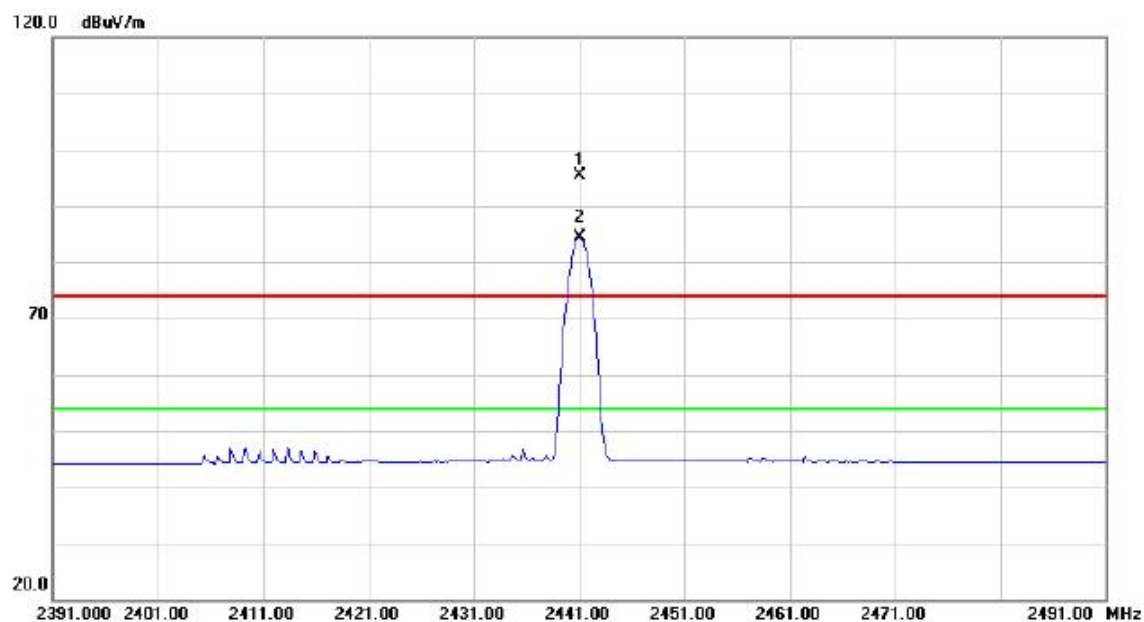
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4882.375	39.50	3.52	43.02	74.00	-30.98	peak	
2		4882.375	26.75	3.52	30.27	54.00	-23.73	AVG	
3		7323.670	36.43	8.63	45.06	74.00	-28.94	peak	
4	*	7323.670	26.35	8.63	34.98	54.00	-19.02	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

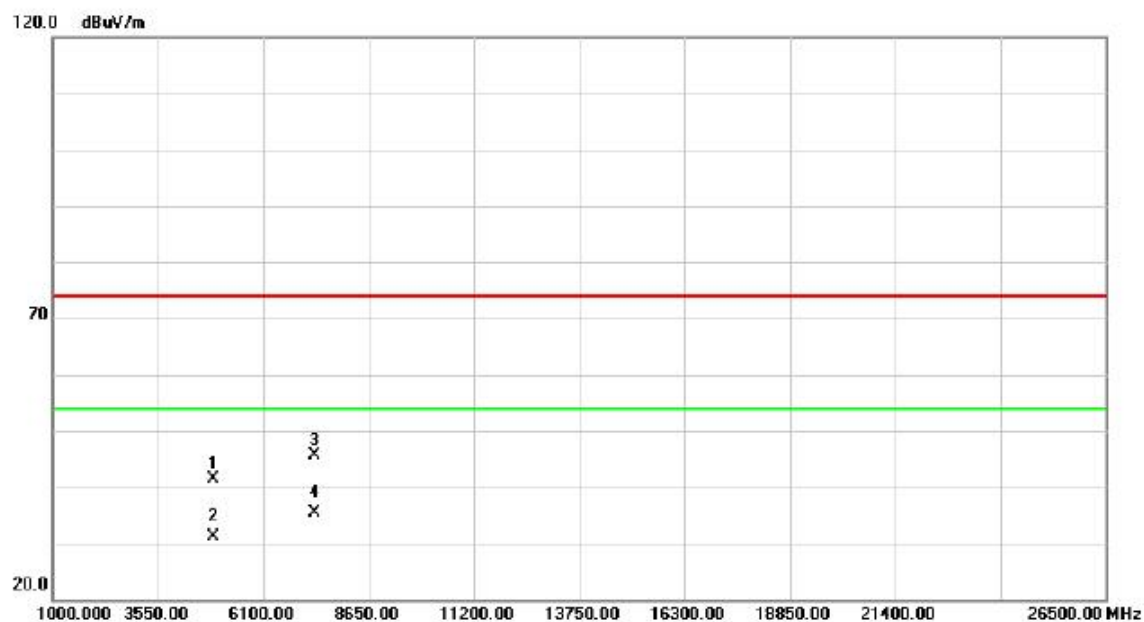
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2441.000	64.75	30.73	95.48	74.00	21.48	peak	NO LIMIT
2	*	2441.000	53.69	30.73	84.42	54.00	30.42	AVG	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

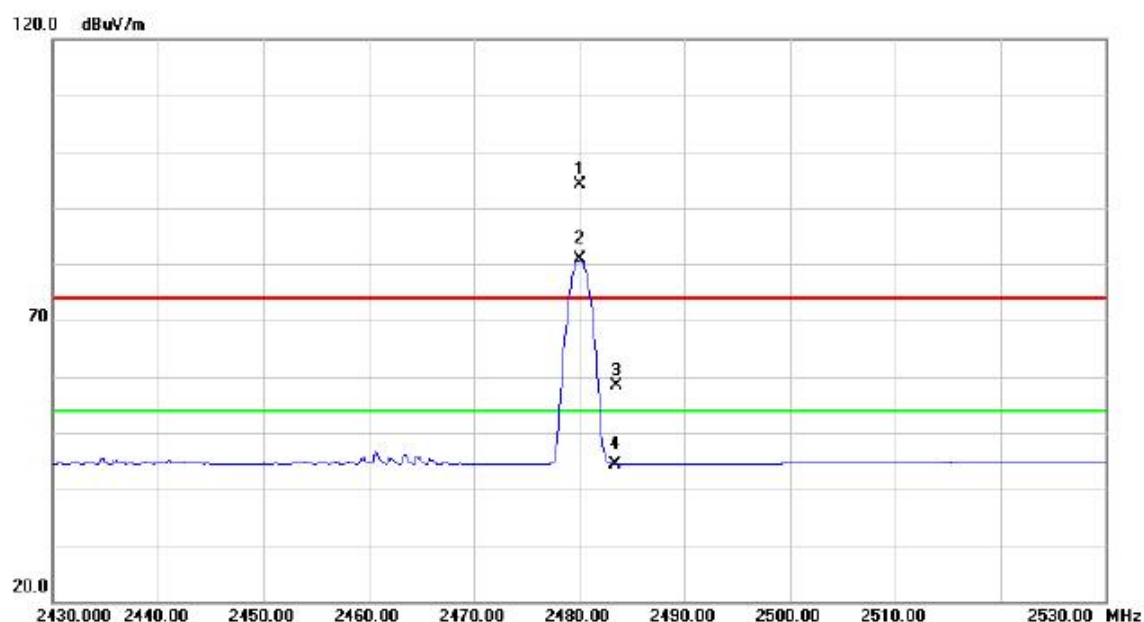
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4882.070	37.83	3.52	41.35	74.00	-32.65	peak	
2		4882.070	27.56	3.52	31.08	54.00	-22.92	AVG	
3		7324.020	36.91	8.63	45.54	74.00	-28.46	peak	
4	*	7324.020	26.74	8.63	35.37	54.00	-18.63	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

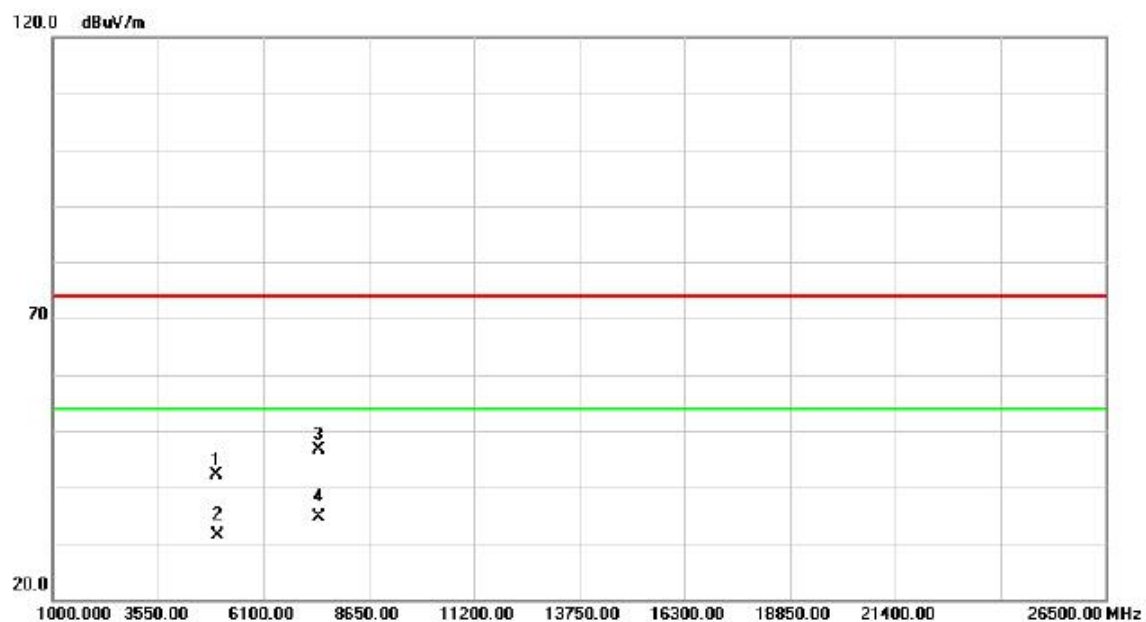
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2480.000	63.26	30.86	94.12	74.00	20.12	peak	NO LIMIT
2	*	2480.000	49.94	30.86	80.80	54.00	26.80	AVG	NO LIMIT
3		2483.500	27.53	30.87	58.40	74.00	-15.60	peak	
4		2483.500	13.57	30.87	44.44	54.00	-9.56	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

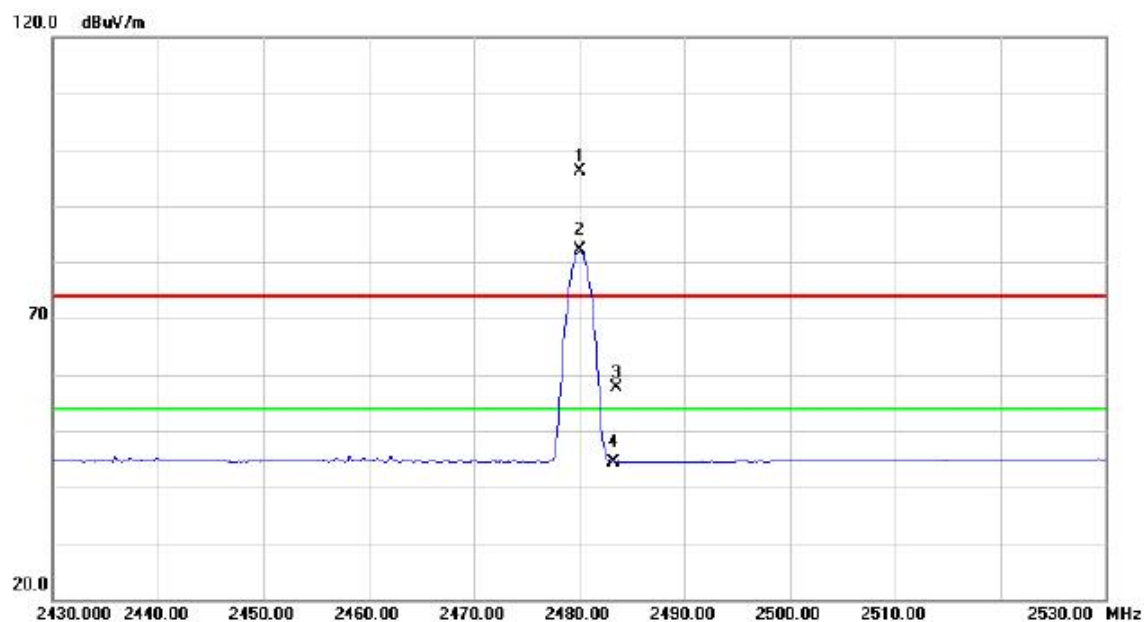
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4960.095	38.41	3.82	42.23	74.00	-31.77	peak	
2		4960.095	27.48	3.82	31.30	54.00	-22.70	AVG	
3		7439.900	37.85	8.85	46.70	74.00	-27.30	peak	
4	*	7439.900	25.69	8.85	34.54	54.00	-19.46	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

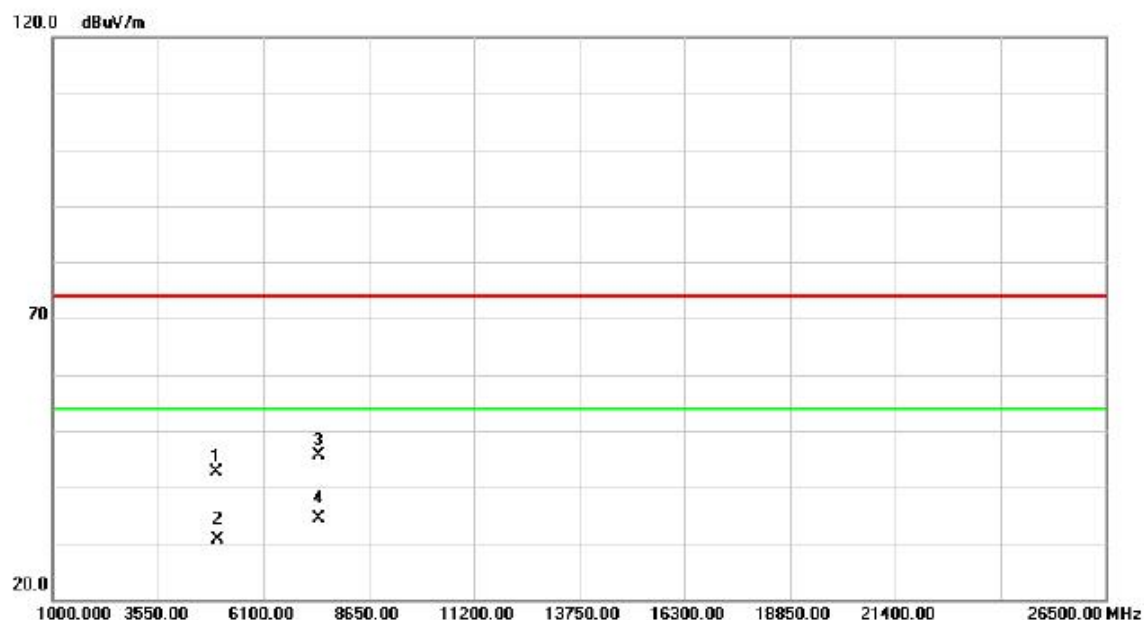
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2480.000	65.36	30.86	96.22	74.00	22.22	peak	NO LIMIT
2	*	2480.000	51.20	30.86	82.06	54.00	28.06	AVG	NO LIMIT
3		2483.500	26.68	30.87	57.55	74.00	-16.45	peak	
4		2483.500	13.63	30.87	44.50	54.00	-9.50	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4960.290	38.89	3.82	42.71	74.00	-31.29	peak	
2		4960.290	26.75	3.82	30.57	54.00	-23.43	AVG	
3		7440.135	36.68	8.85	45.53	74.00	-28.47	peak	
4	*	7440.135	25.44	8.85	34.29	54.00	-19.71	AVG	

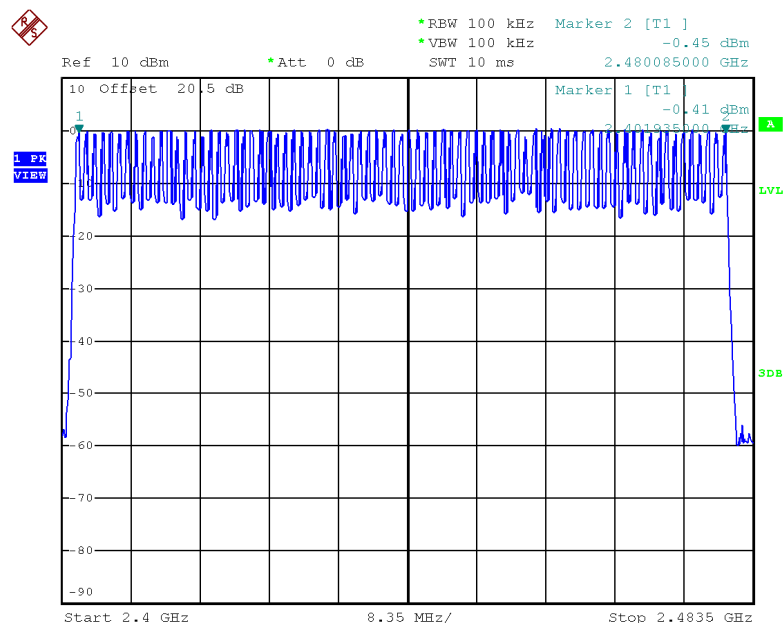
ATTACHMENT E - NUMBER OF HOPPING CHANNEL

Test Mode

Hopping Mode_1Mbps

Number of Hopping Channel

79



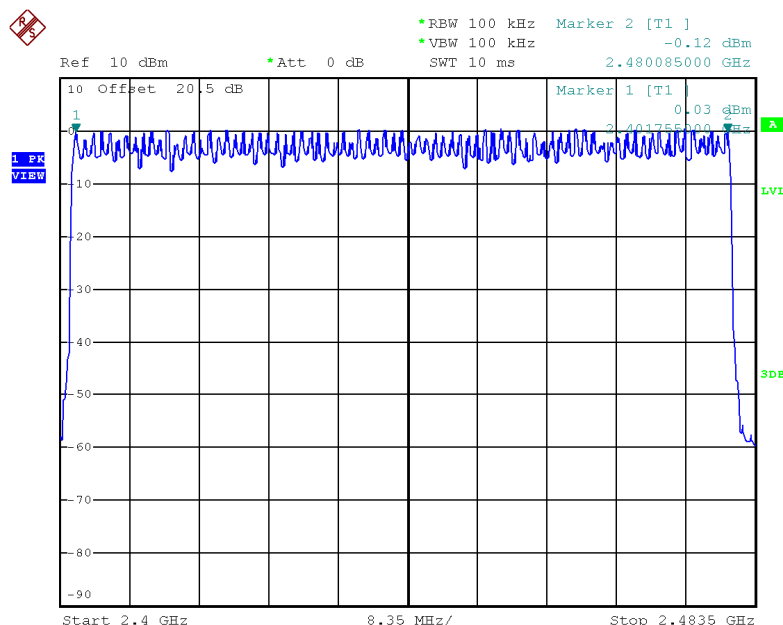
Date: 24.AUG.2015 14:05:14

Test Mode

Hopping Mode_3Mbps

Number of Hopping Channel

79



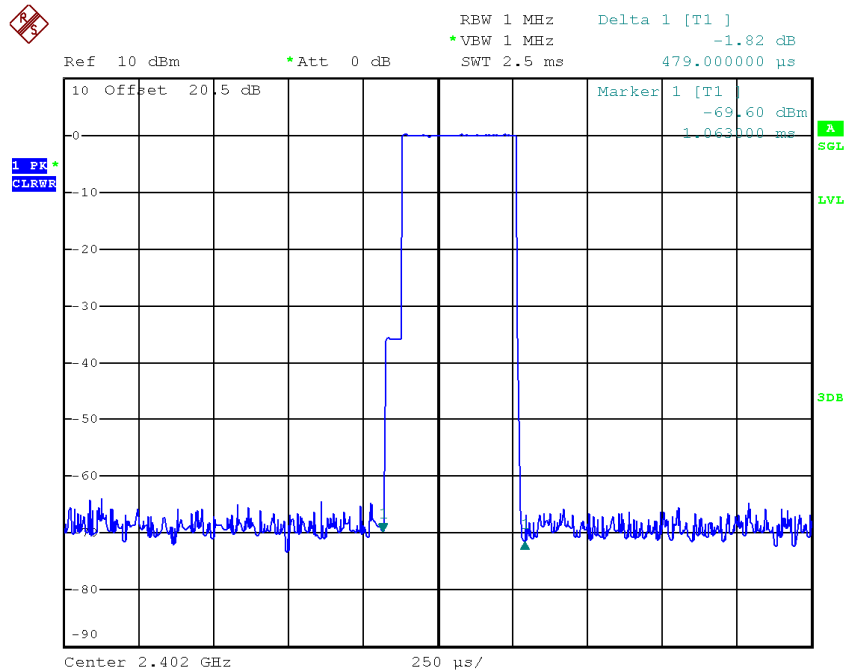
Date: 24.AUG.2015 14:56:02

ATTACHMENT F - AVERAGE TIME OF OCCUPANCY

Test Mode :	TX Mode_1Mbps
-------------	---------------

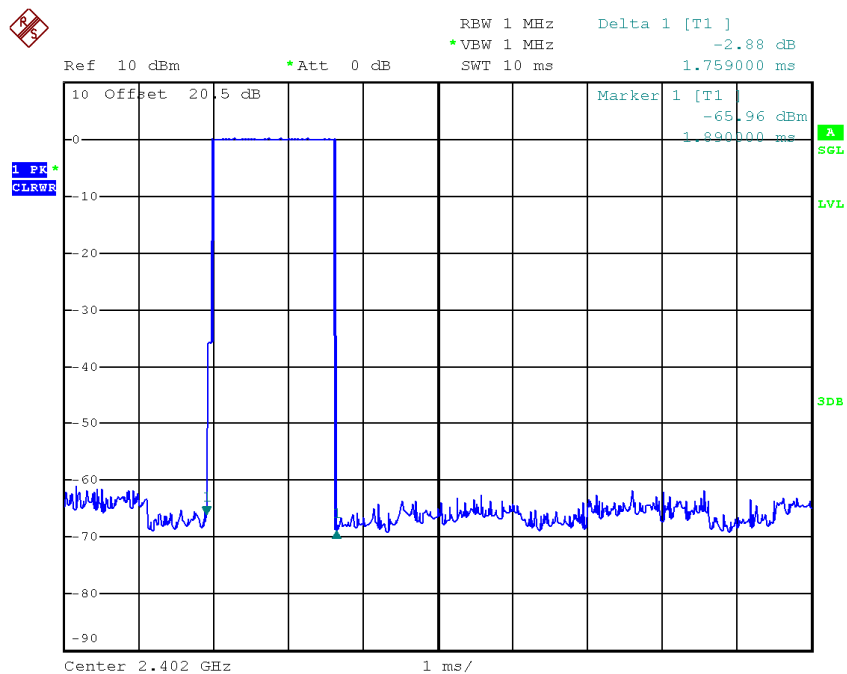
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.1590	0.3370	0.4000	Complies
DH3	2402	1.7590	0.2814	0.4000	Complies
DH1	2402	0.4790	0.1533	0.4000	Complies
DH5	2441	3.2790	0.3498	0.4000	Complies
DH3	2441	1.7980	0.2877	0.4000	Complies
DH1	2441	0.4840	0.1549	0.4000	Complies
DH5	2480	3.0790	0.3284	0.4000	Complies
DH3	2480	1.7990	0.2878	0.4000	Complies
DH1	2480	0.4840	0.1549	0.4000	Complies

CH00-DH1



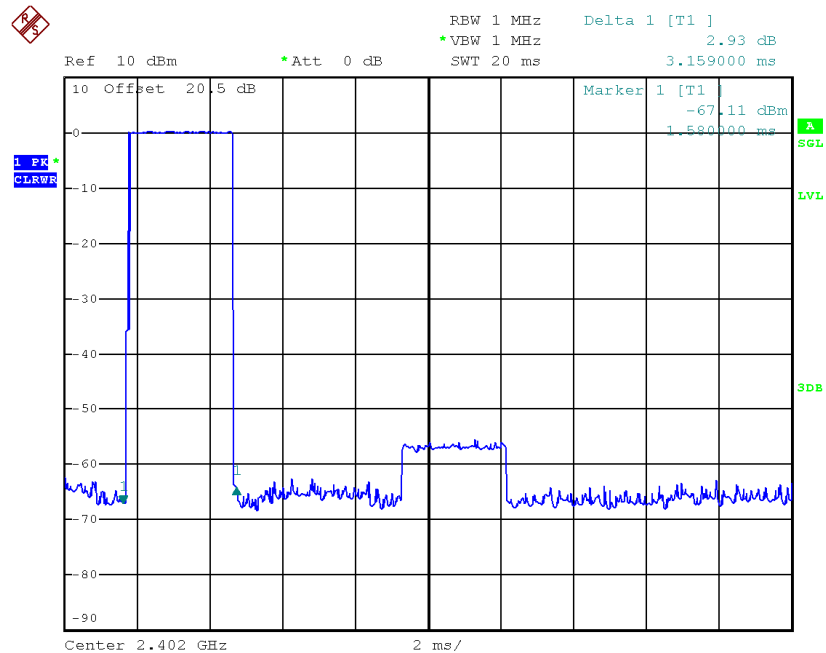
Date: 24.AUG.2015 13:59:58

CH00-DH3



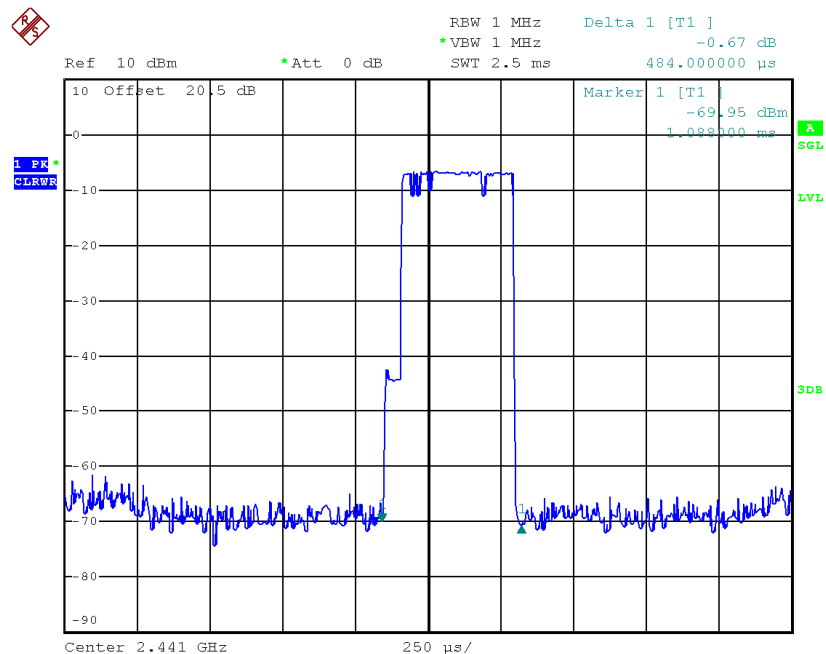
Date: 24.AUG.2015 14:09:31

CH00-DH5



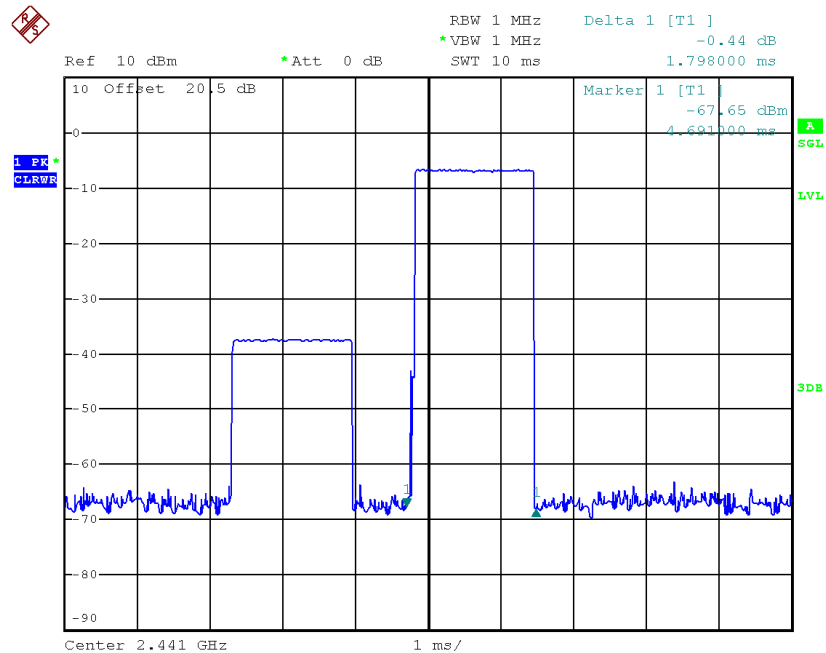
Date: 24.AUG.2015 14:11:34

CH39-DH1



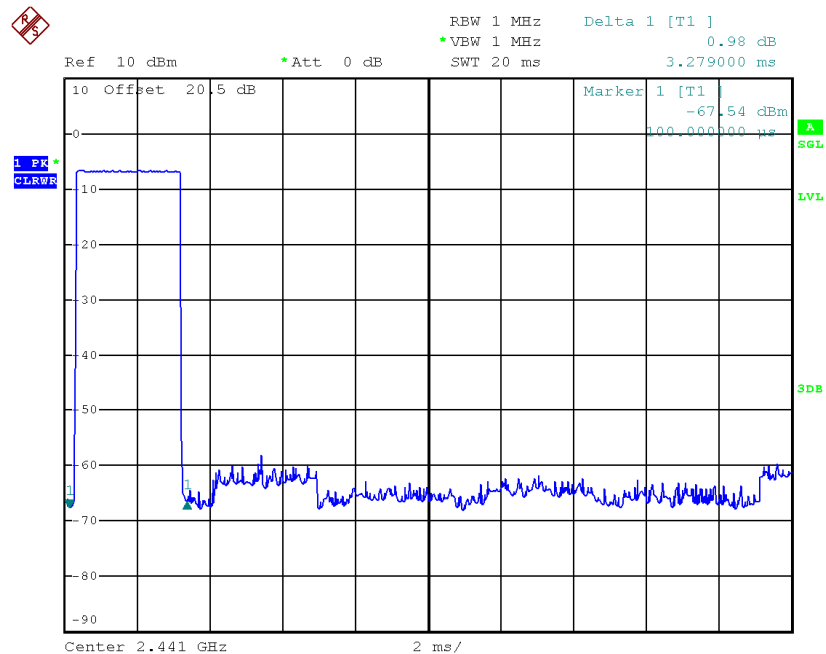
Date: 24.AUG.2015 14:00:05

CH39-DH3



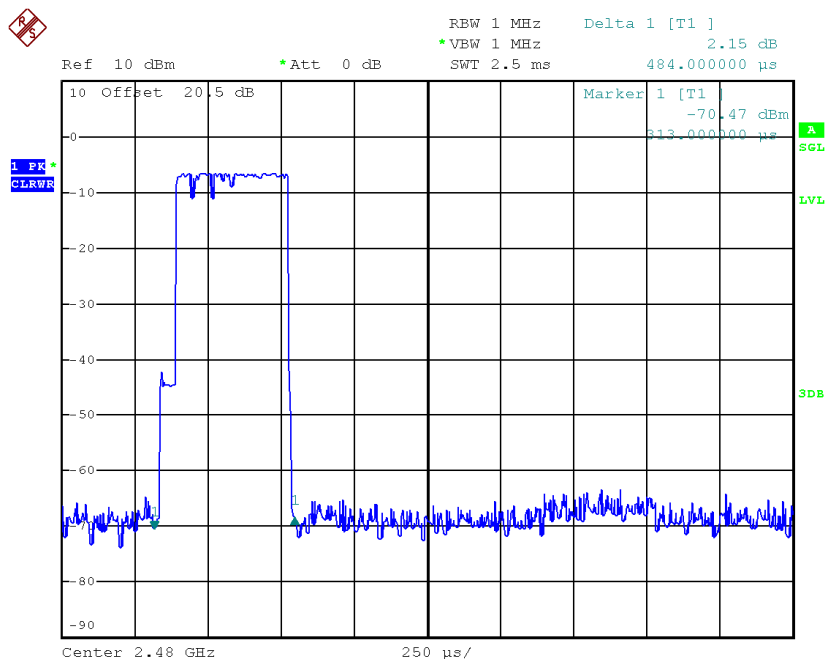
Date: 24.AUG.2015 14:09:40

CH39-DH5



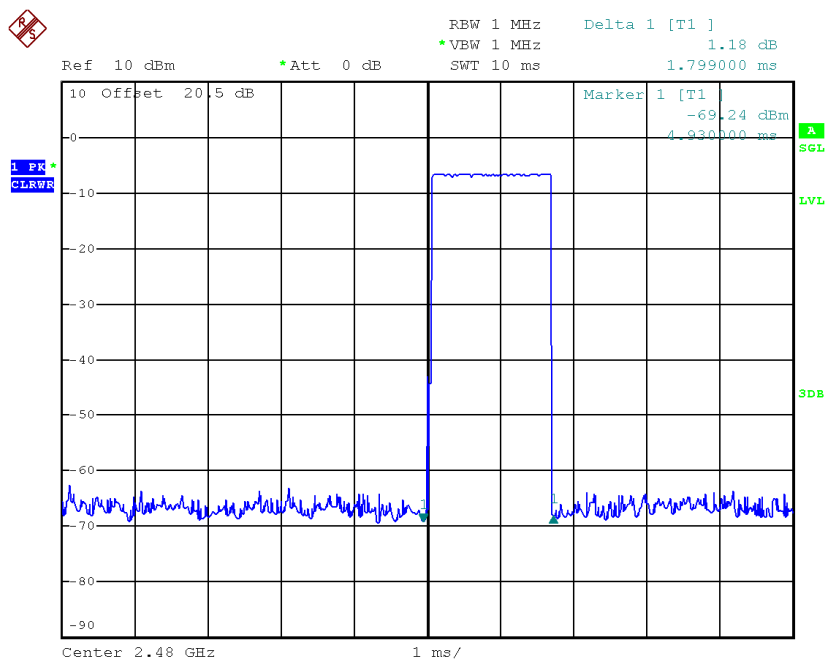
Date: 24.AUG.2015 14:11:48

CH78-DH1



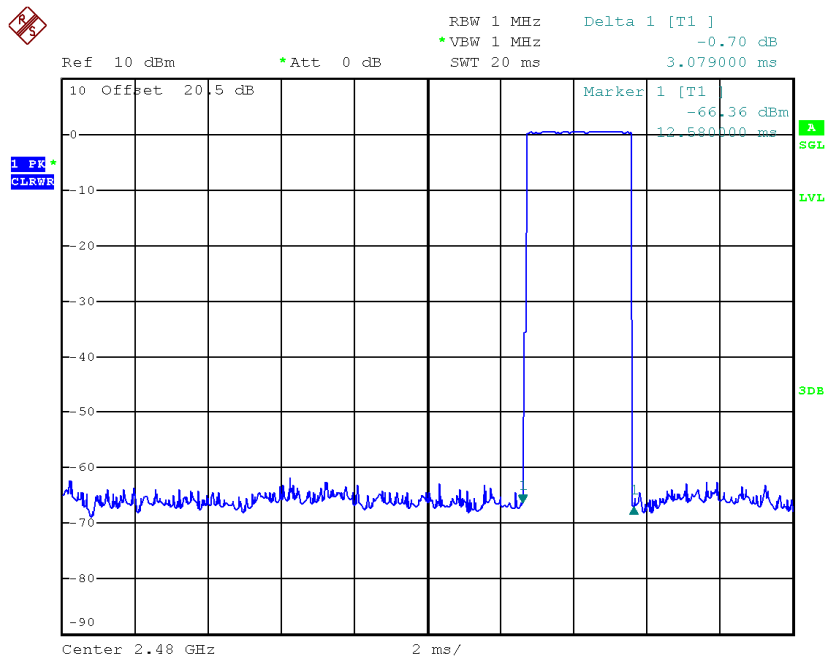
Date: 24.AUG.2015 14:00:11

CH78-DH3



Date: 24.AUG.2015 14:09:48

CH78-DH5

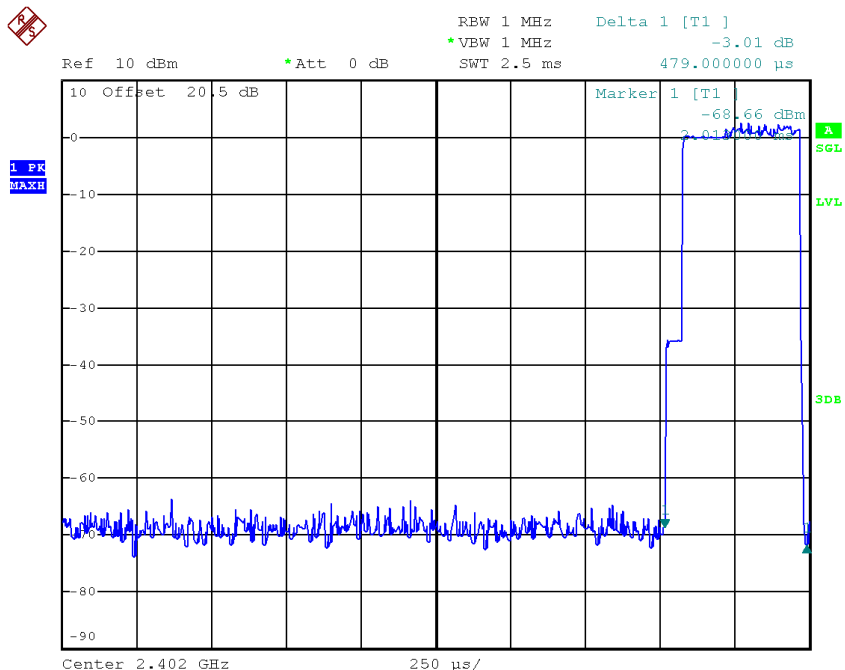


Date: 24.AUG.2015 14:11:57

Test Mode :	TX Mode_3Mbps
-------------	---------------

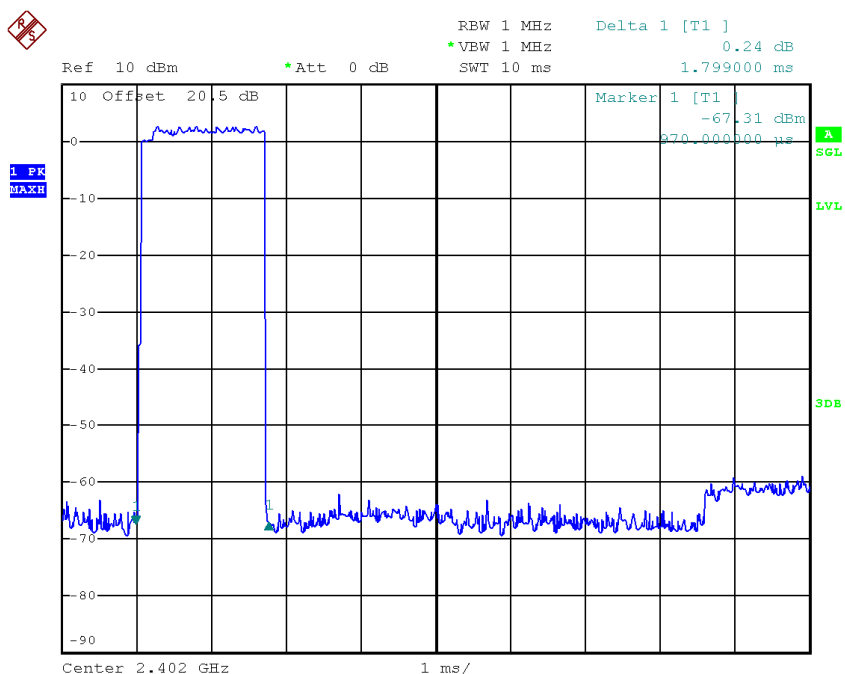
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.1200	0.3328	0.4000	Complies
DH3	2402	1.7990	0.2878	0.4000	Complies
DH1	2402	0.4790	0.1533	0.4000	Complies
DH5	2441	3.1180	0.3326	0.4000	Complies
DH3	2441	1.8790	0.3006	0.4000	Complies
DH1	2441	0.4790	0.1533	0.4000	Complies
DH5	2480	3.1190	0.3327	0.4000	Complies
DH3	2480	1.7600	0.2816	0.4000	Complies
DH1	2480	0.4840	0.1549	0.4000	Complies

CH00-DH1



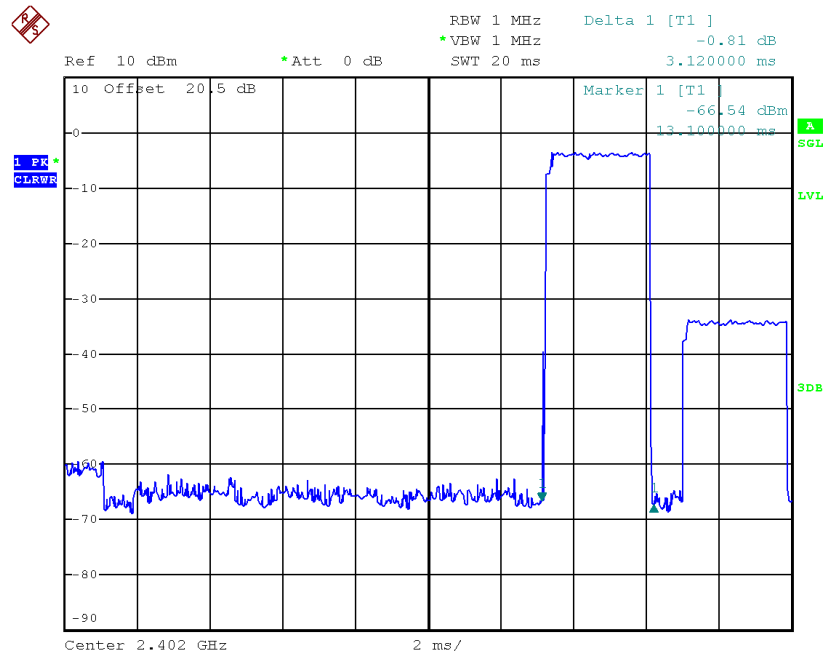
Date: 24.AUG.2015 14:50:23

CH00-DH3



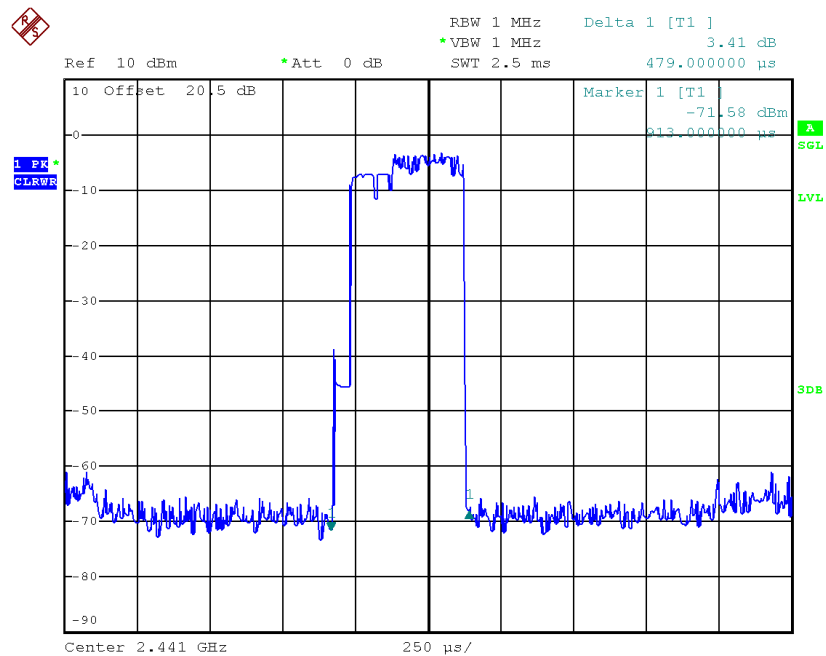
Date: 24.AUG.2015 14:59:48

CH00-DH5



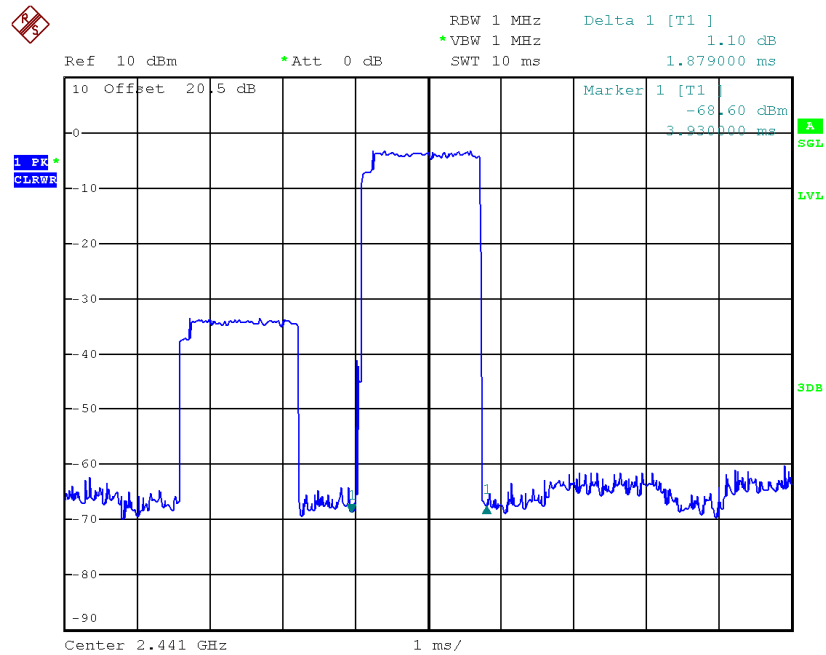
Date: 24.AUG.2015 15:01:31

CH39-DH1



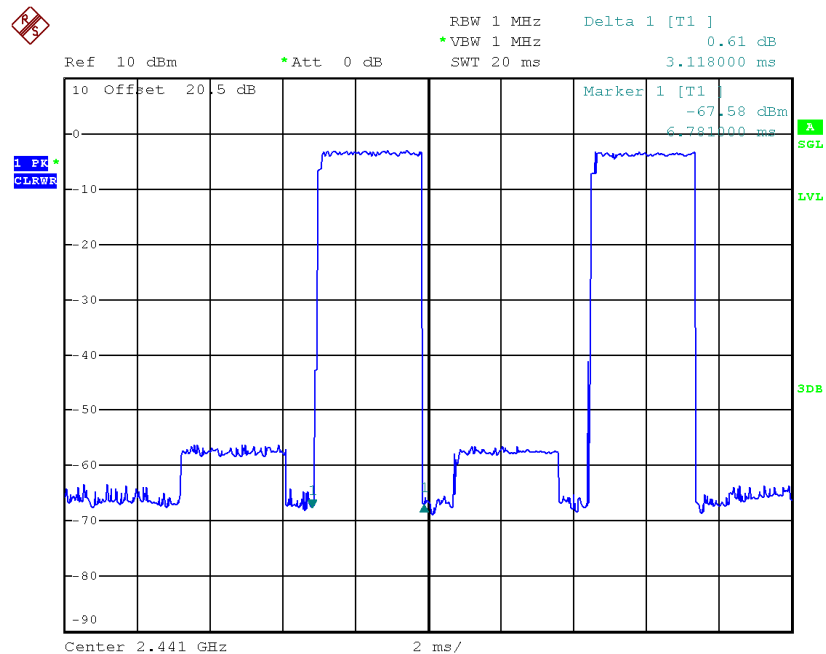
Date: 24.AUG.2015 14:50:46

CH39-DH3



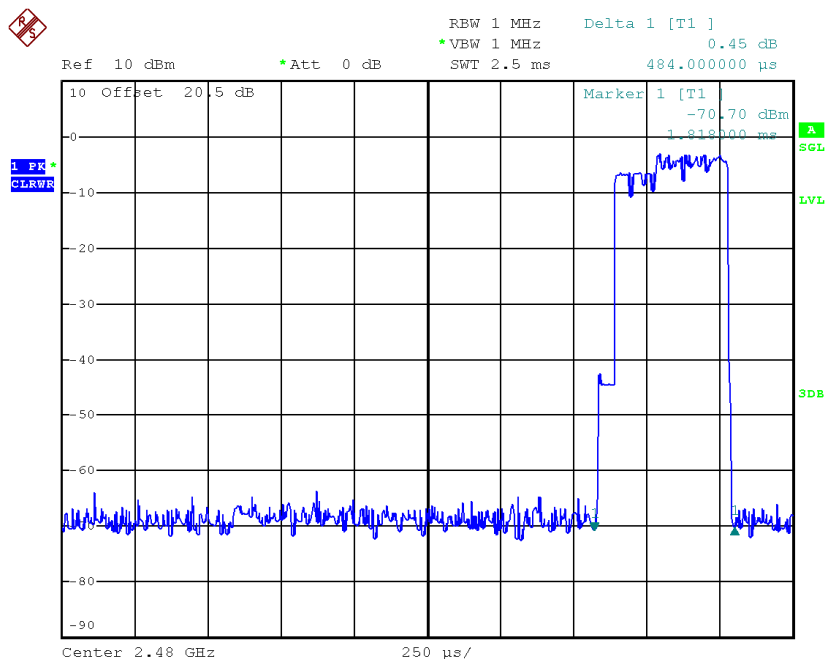
Date: 24.AUG.2015 15:00:15

CH39-DH5



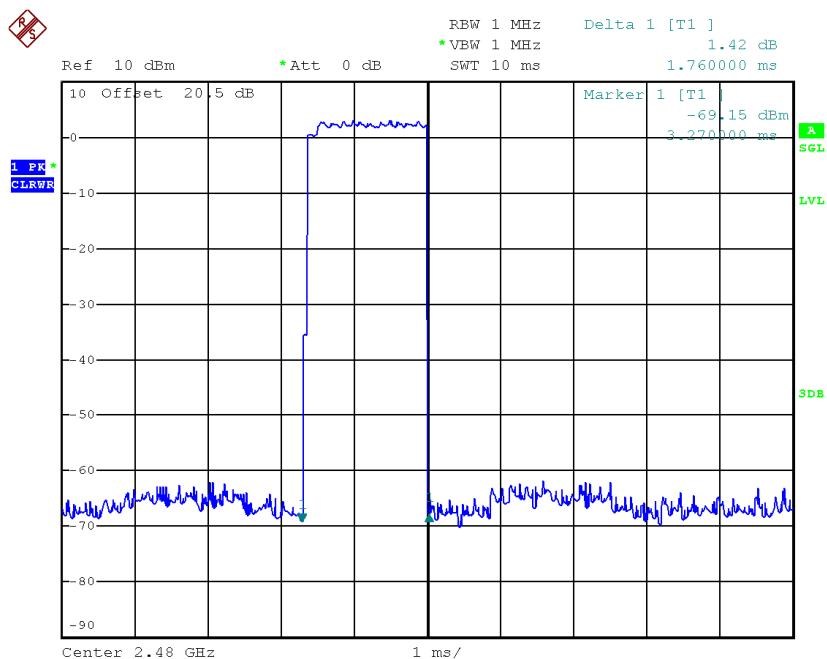
Date: 24.AUG.2015 15:01:41

CH78-DH1



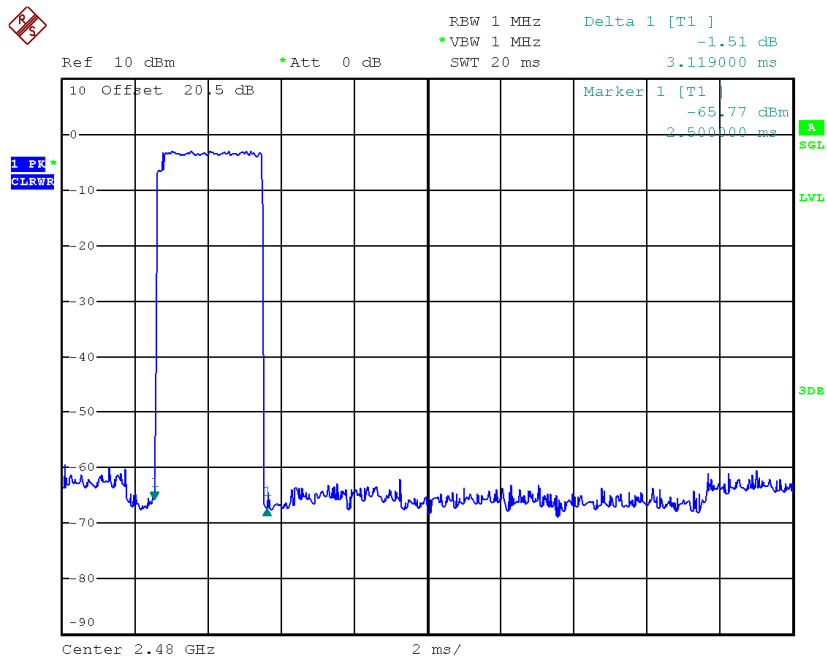
Date: 24.AUG.2015 14:50:53

CH78-DH3



Date: 24.AUG.2015 15:00:24

CH78-DH5

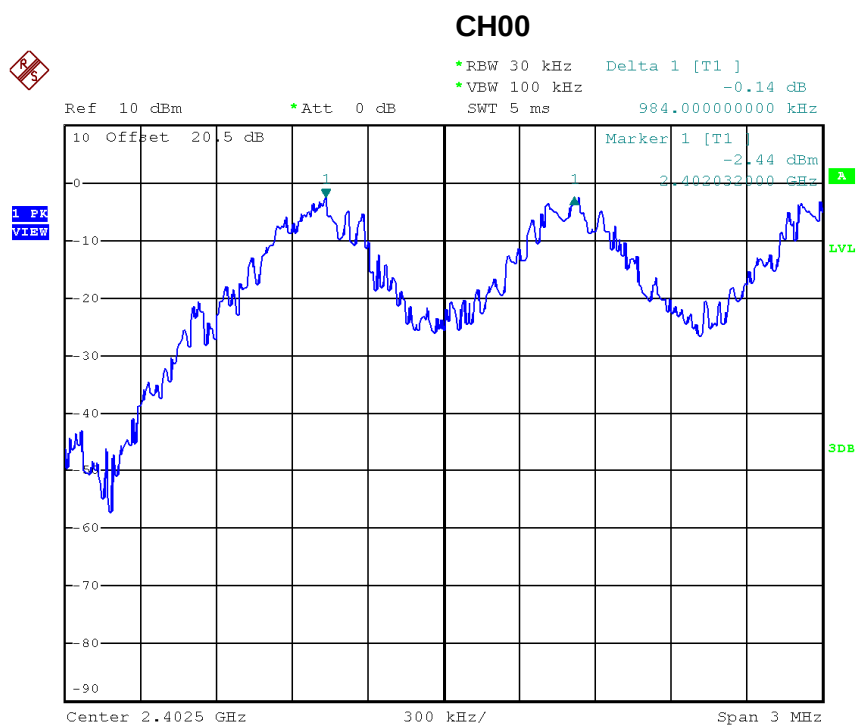


Date: 24.AUG.2015 15:01:50

ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT

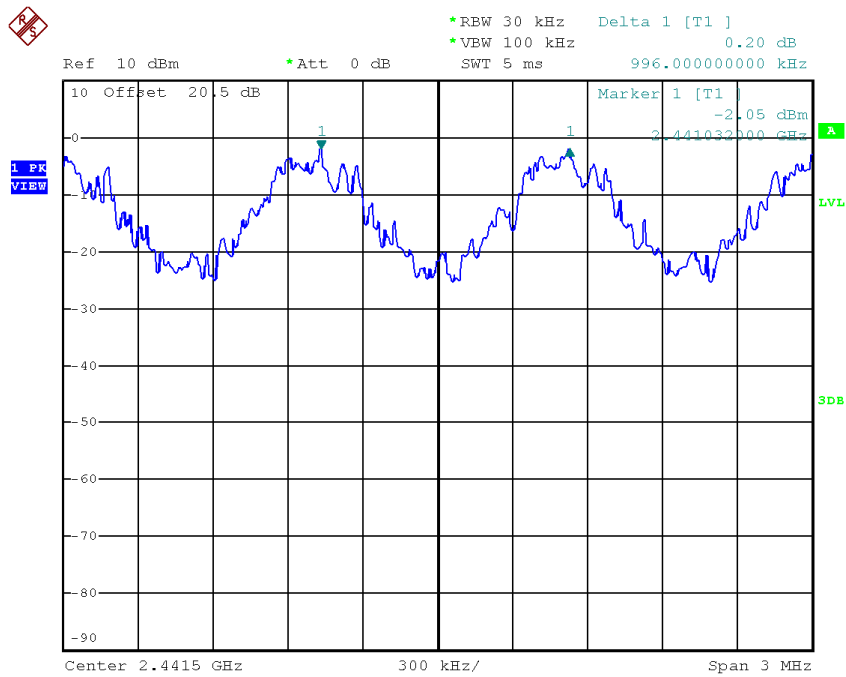
Test Mode :	Hopping on _1Mbps
-------------	-------------------

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.984	0.689	Complies
2441	0.996	0.687	Complies
2480	1.035	0.671	Complies



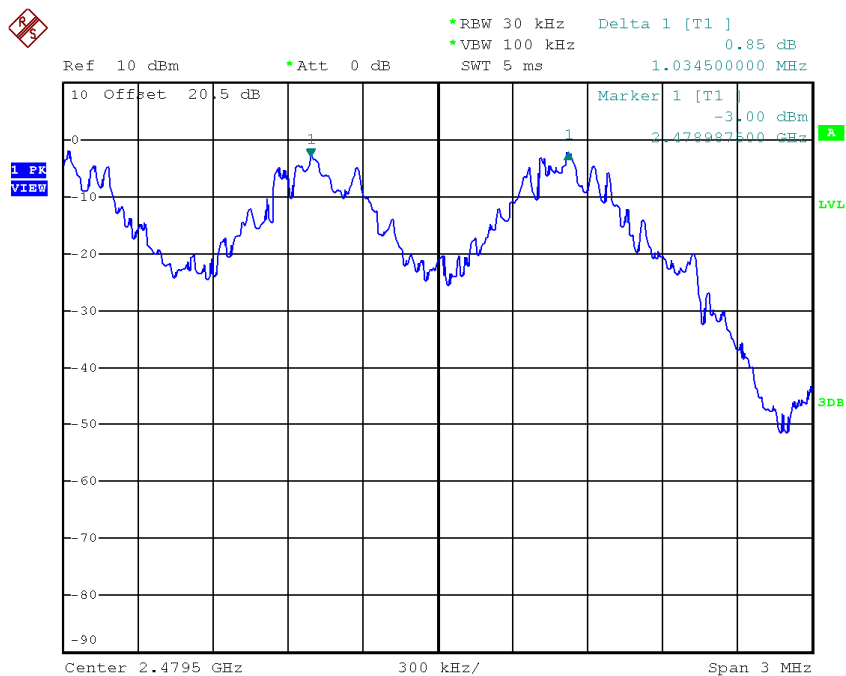
Date: 24.AUG.2015 14:01:15

CH39



Date: 24.AUG.2015 14:02:19

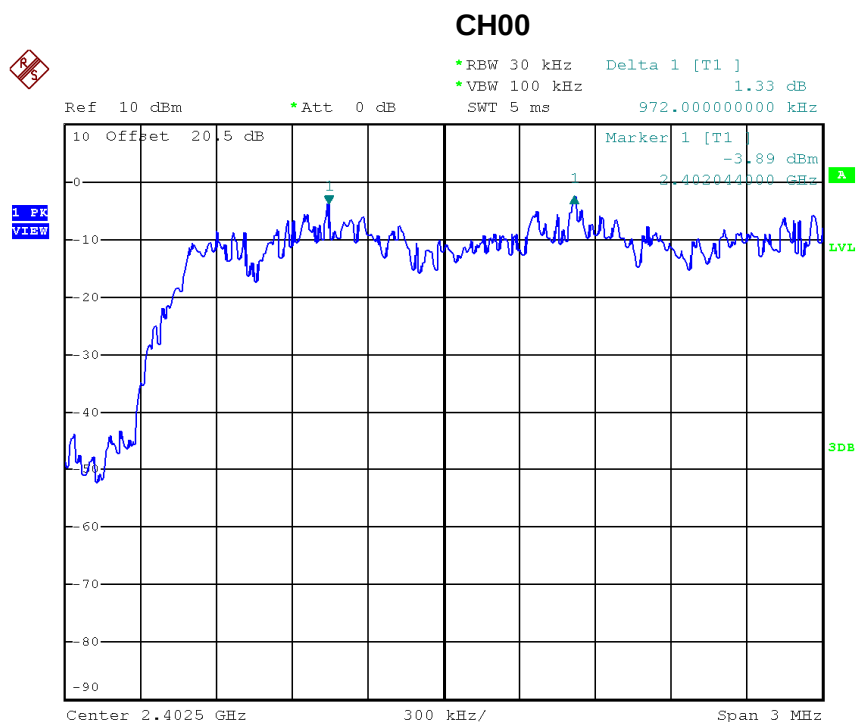
CH78



Date: 24.AUG.2015 14:03:26

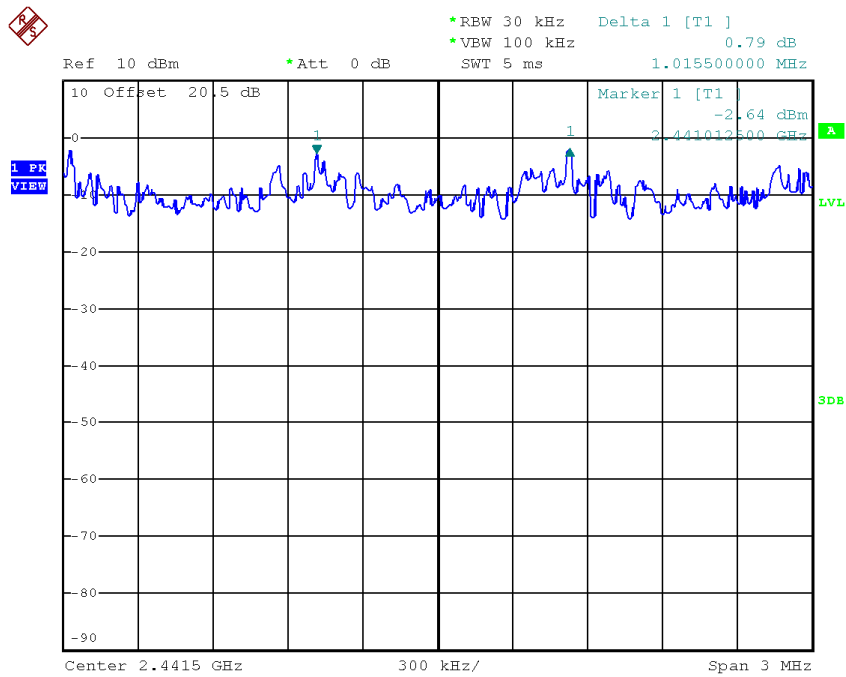
Test Mode :	Hopping on _3Mbps
-------------	-------------------

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.972	0.835	Complies
2441	1.016	0.837	Complies
2480	0.941	0.841	Complies



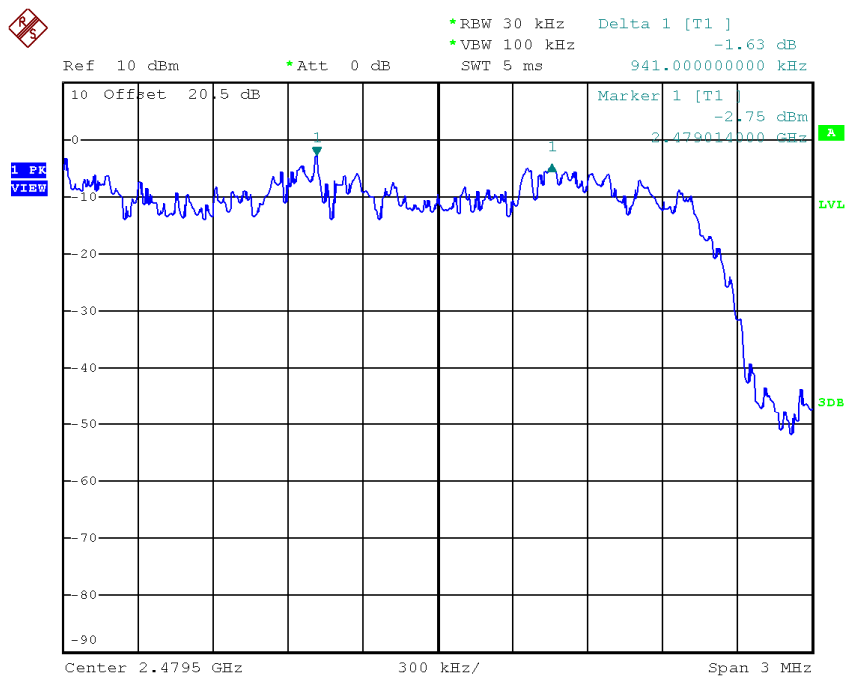
Date: 24.AUG.2015 14:51:57

CH39



Date: 24.AUG.2015 14:53:05

CH78

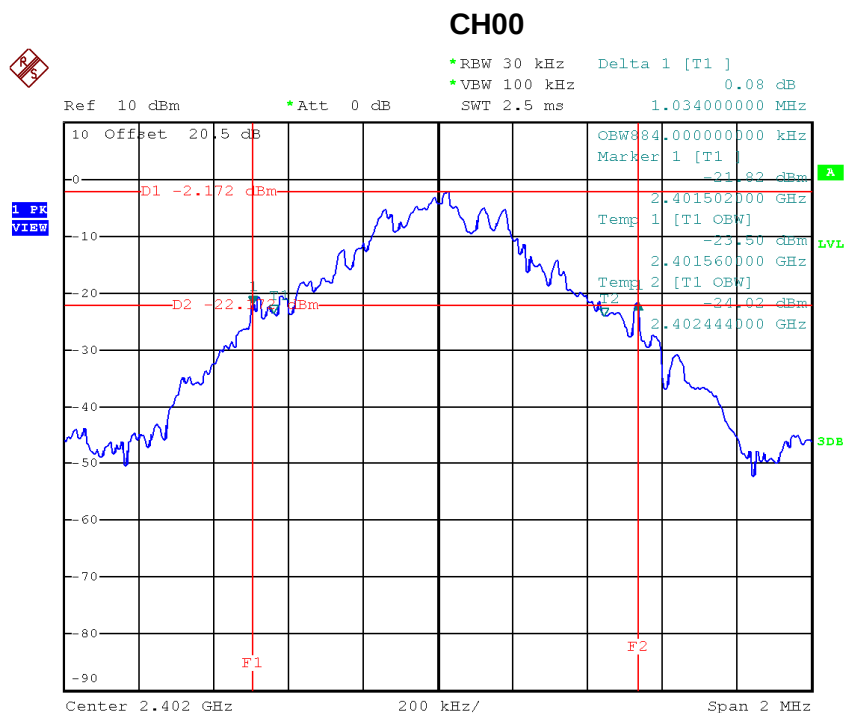


Date: 24.AUG.2015 14:54:13

ATTACHMENT H - BANDWIDTH

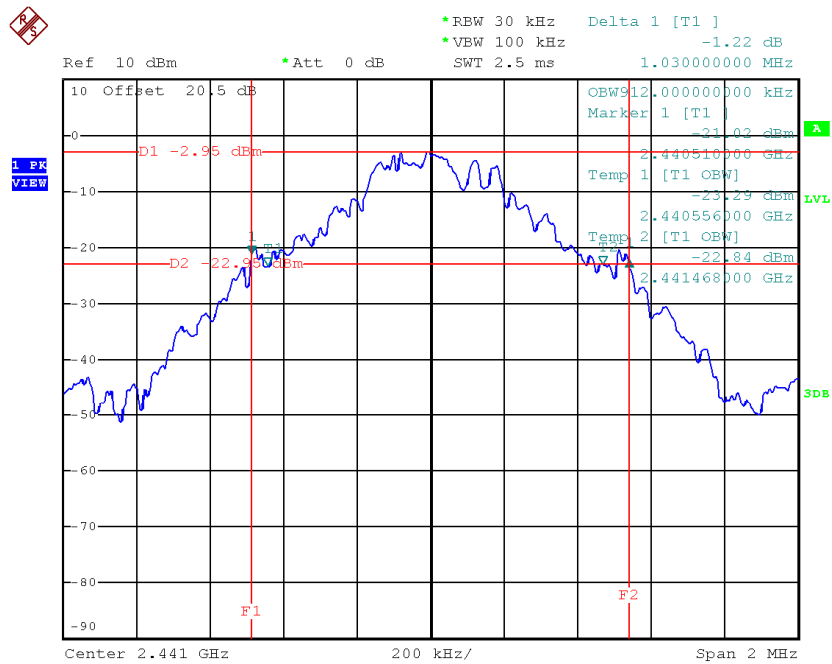
Test Mode :	TX Mode _1Mbps
-------------	----------------

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.034	0.884	Complies
2441	1.030	0.912	Complies
2480	1.006	0.896	Complies



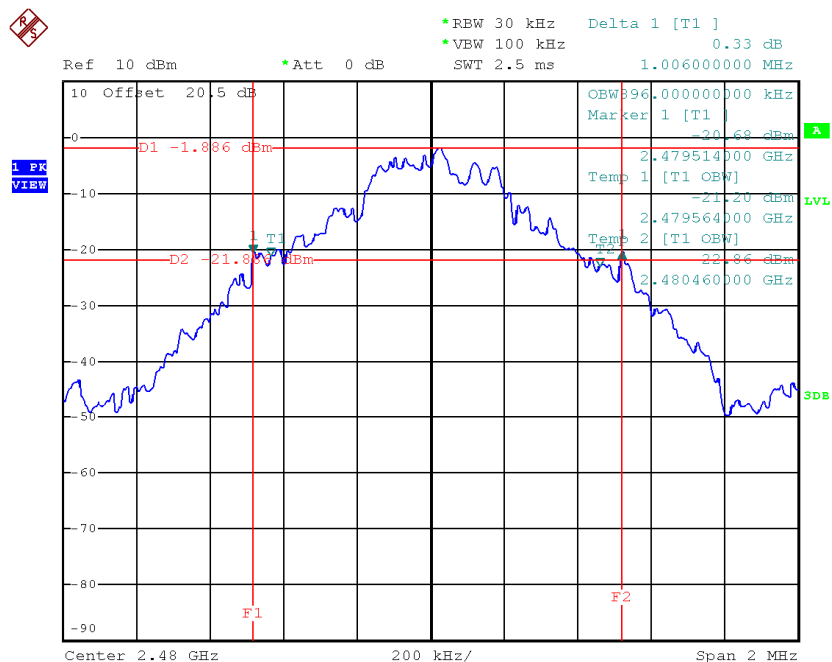
Date: 24.AUG.2015 12:47:59

CH39



Date: 24.AUG.2015 12:50:14

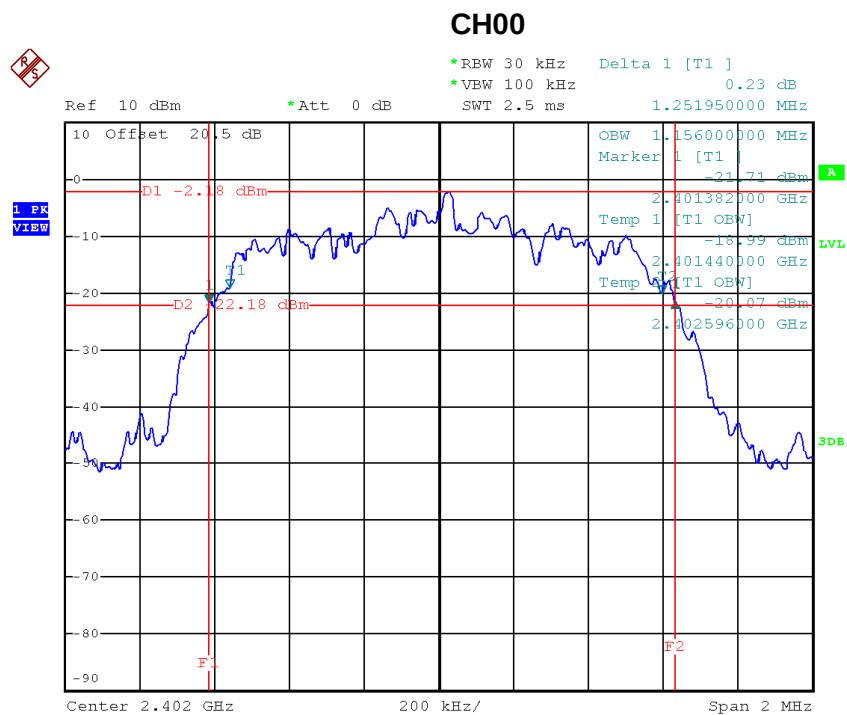
CH78



Date: 24.AUG.2015 12:51:48

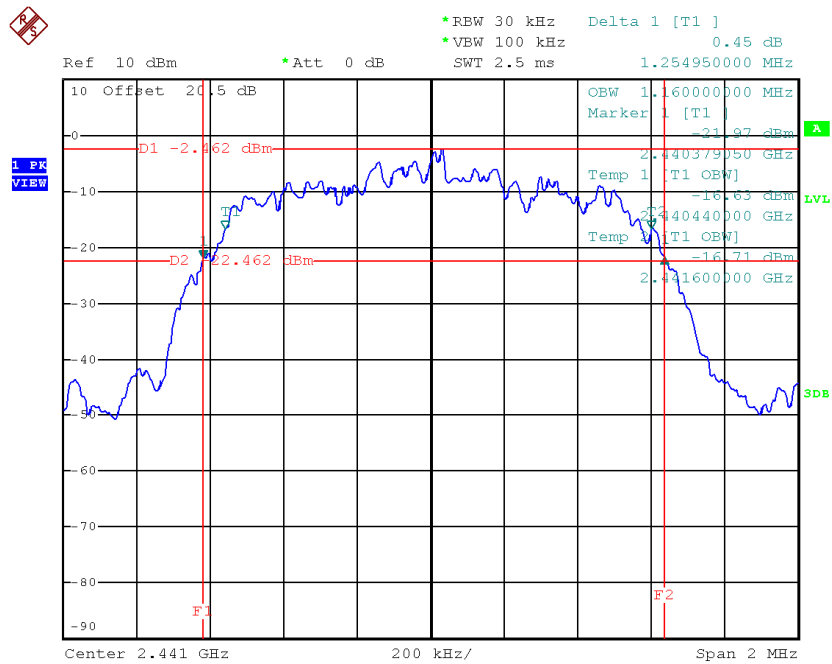
Test Mode :	TX Mode _3Mbps
-------------	----------------

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.252	1.156	Complies
2441	1.255	1.160	Complies
2480	1.262	1.160	Complies



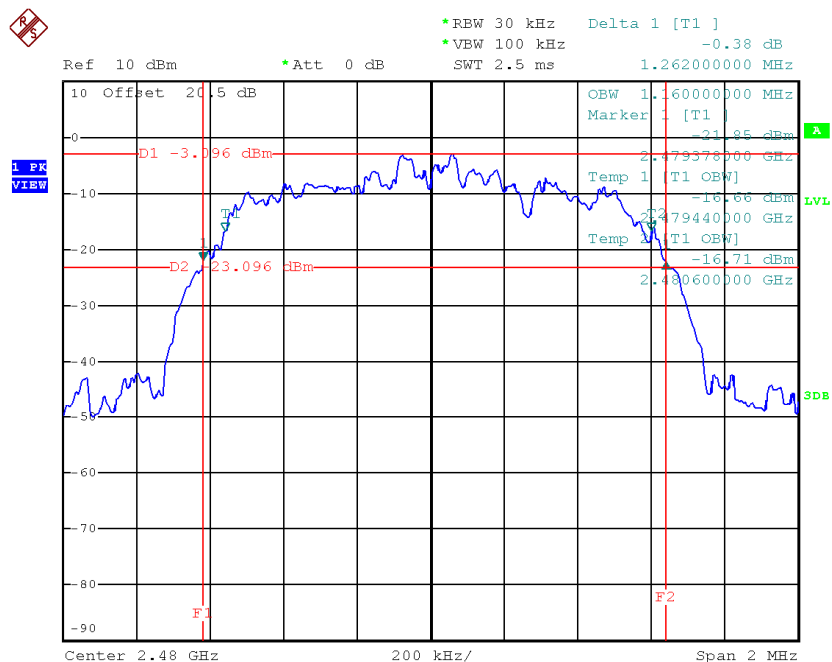
Date: 24.AUG.2015 14:16:36

CH39



Date: 24.AUG.2015 14:18:39

CH78

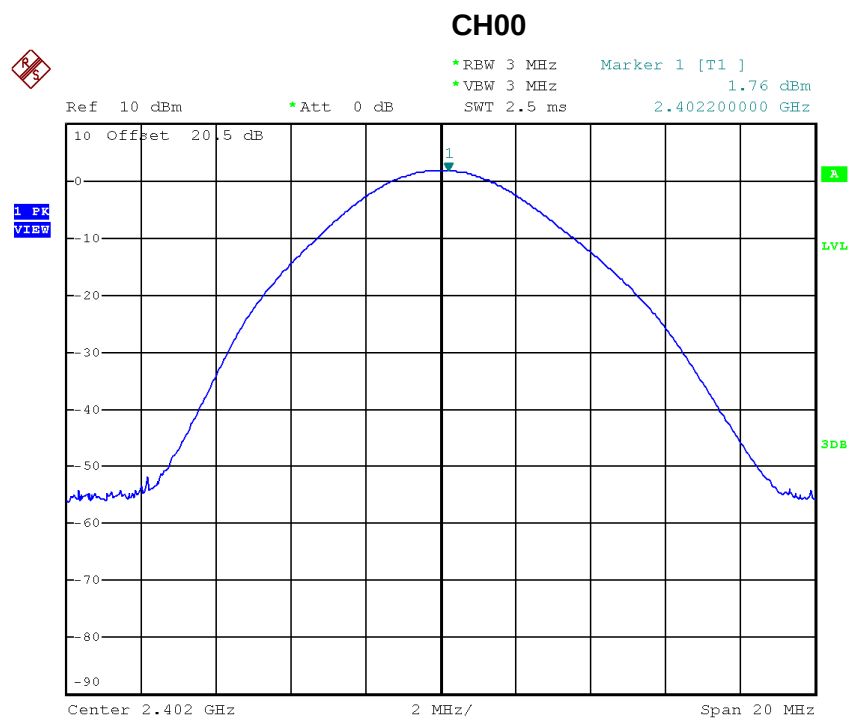


Date: 24.AUG.2015 14:44:34

ATTACHMENT I - PEAK OUTPUT POWER

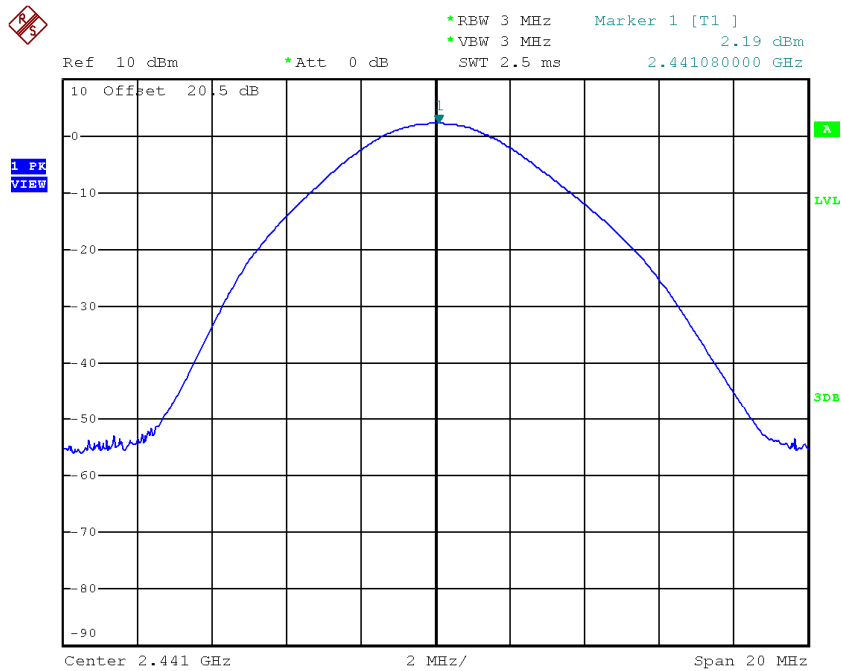
Test Mode :	TX Mode _1Mbps
-------------	----------------

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	1.76	0.0015	30.00	1.0000	Complies
2441	2.19	0.0017	30.00	1.0000	Complies
2480	2.30	0.0017	30.00	1.0000	Complies



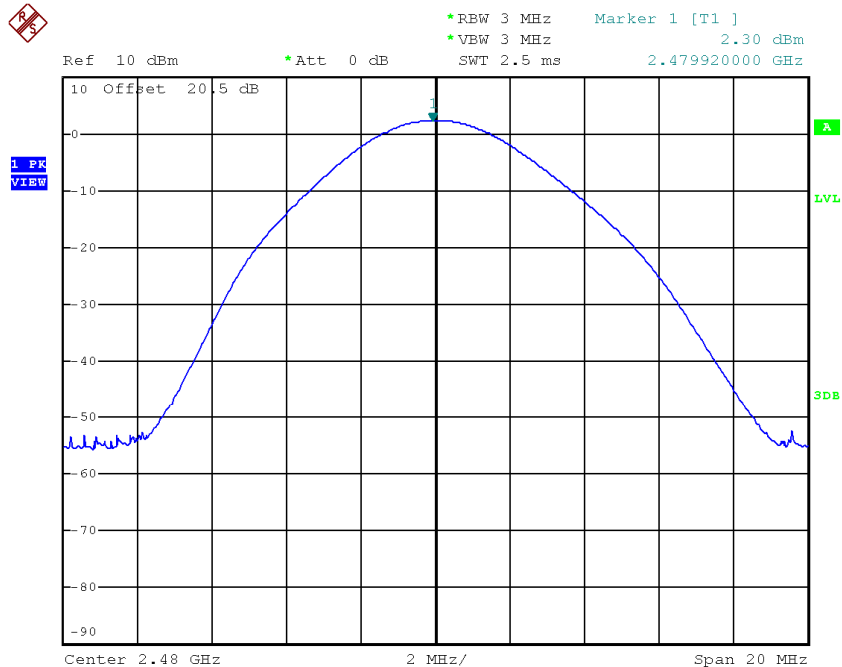
Date: 27.AUG.2015 16:00:58

CH39



Date: 27.AUG.2015 16:01:43

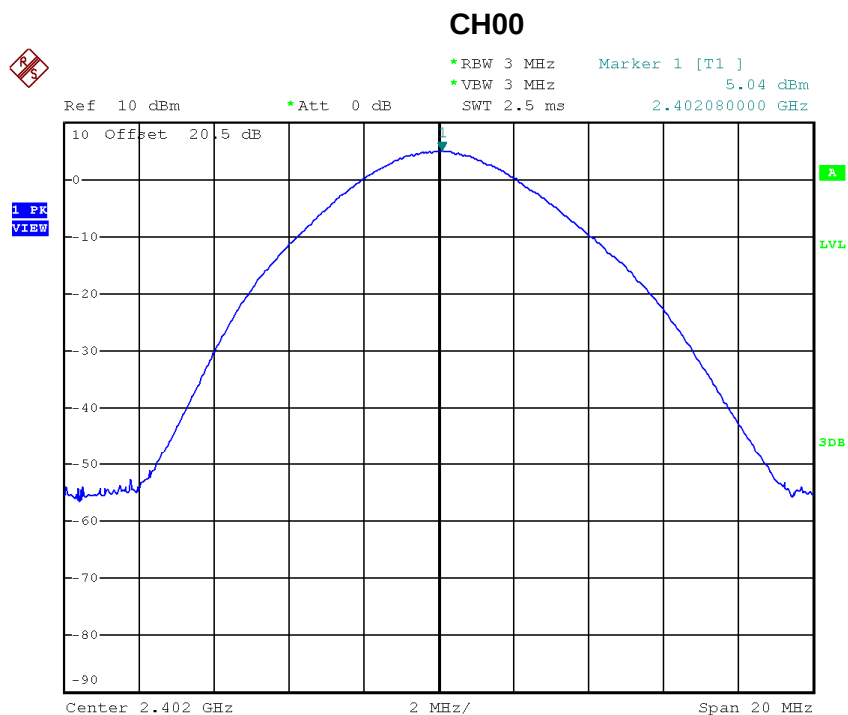
CH78



Date: 27.AUG.2015 16:02:37

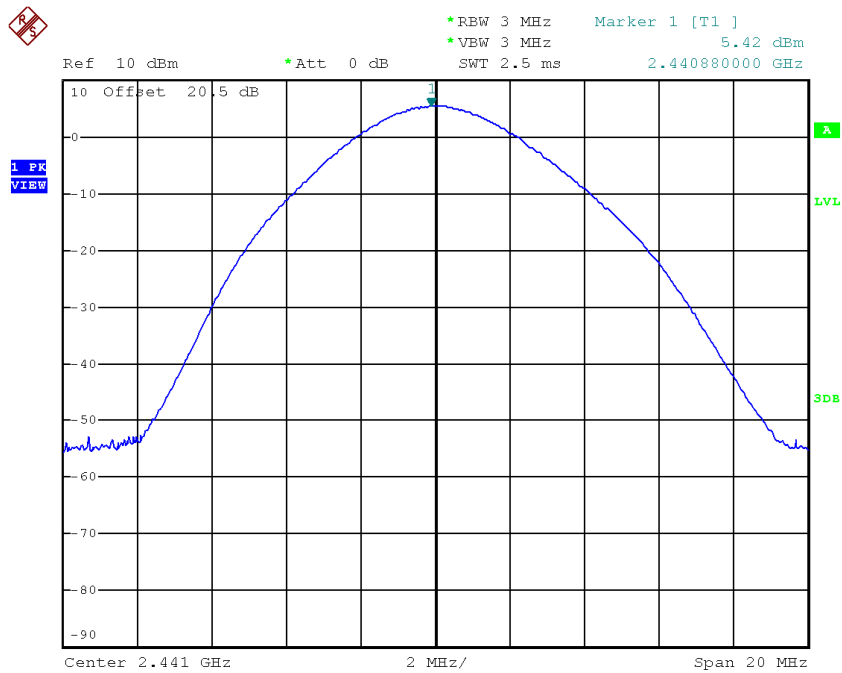
Test Mode : TX Mode _3Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	5.04	0.0032	30.00	1.0000	Complies
2441	5.42	0.0035	30.00	1.0000	Complies
2480	5.62	0.0036	30.00	1.0000	Complies



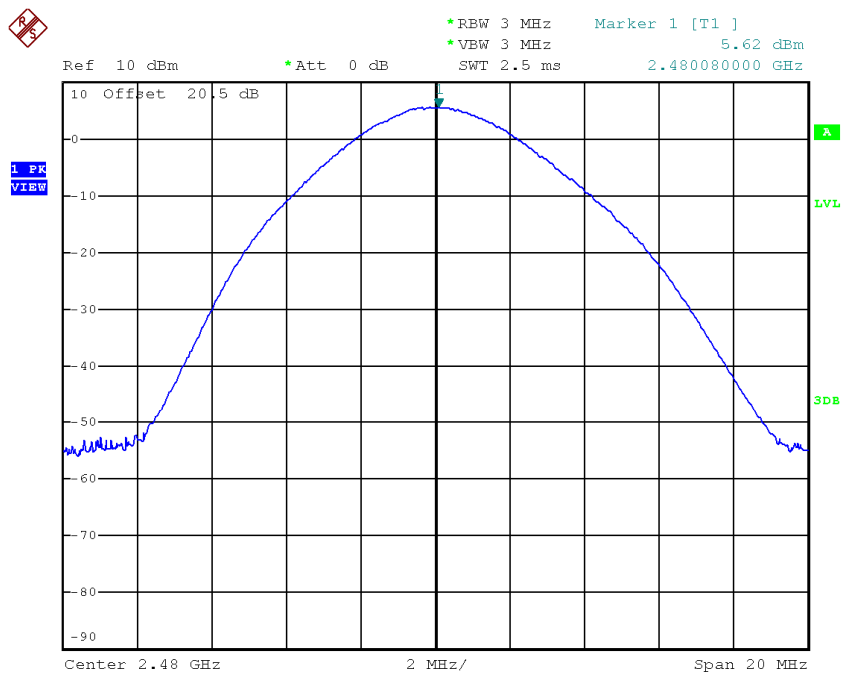
Date: 27.AUG.2015 16:04:25

CH39



Date: 27.AUG.2015 16:05:44

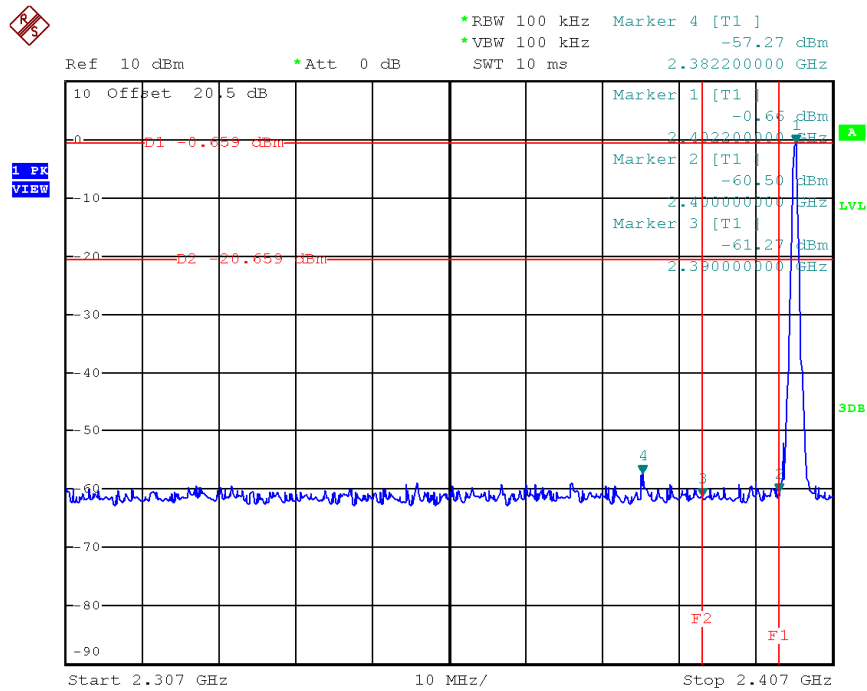
CH78



Date: 27.AUG.2015 16:06:44

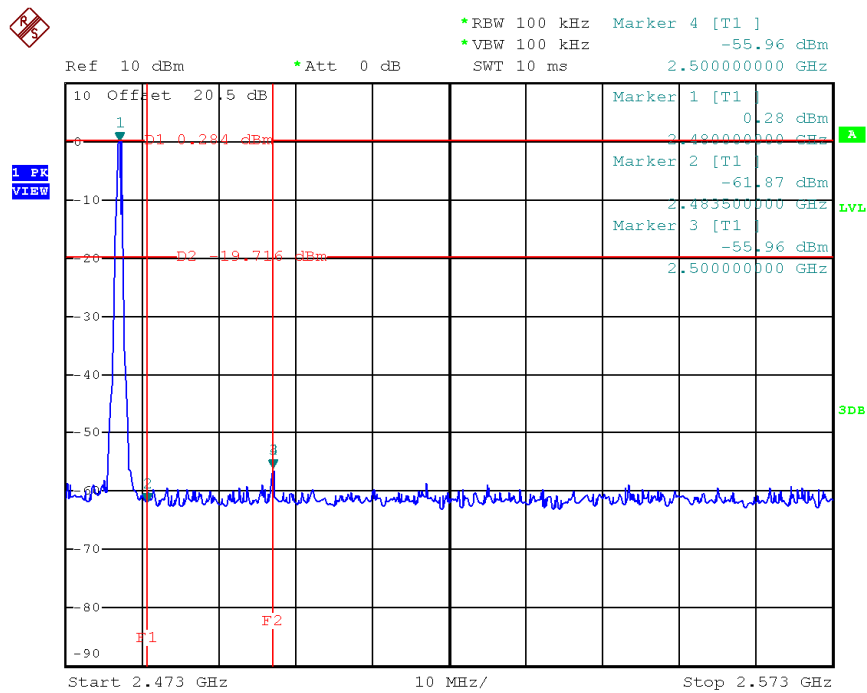
ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION

CH00 (Lower)_1Mbps



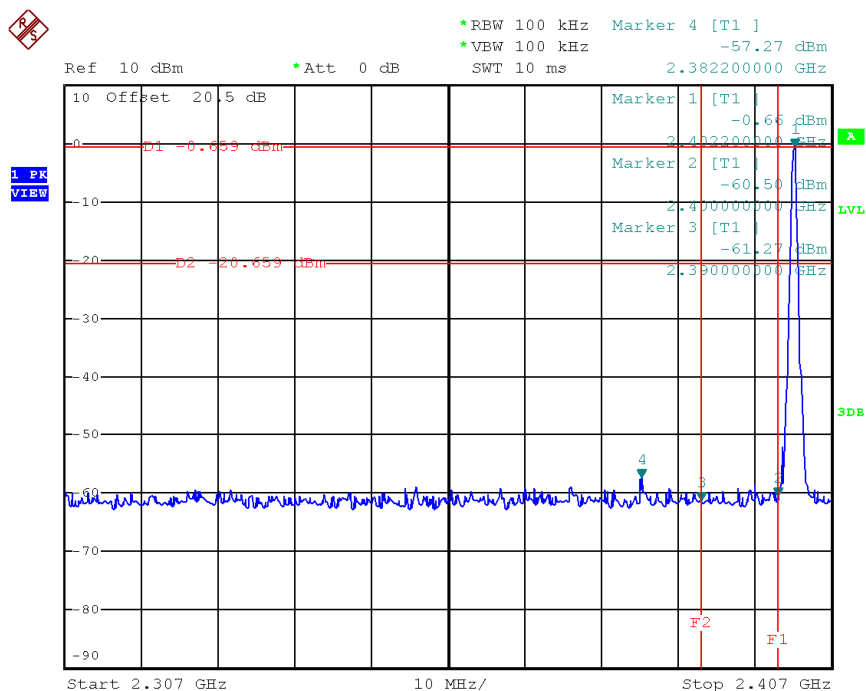
Date: 24.AUG.2015 12:47:28

CH78 (Upper)_1Mbps



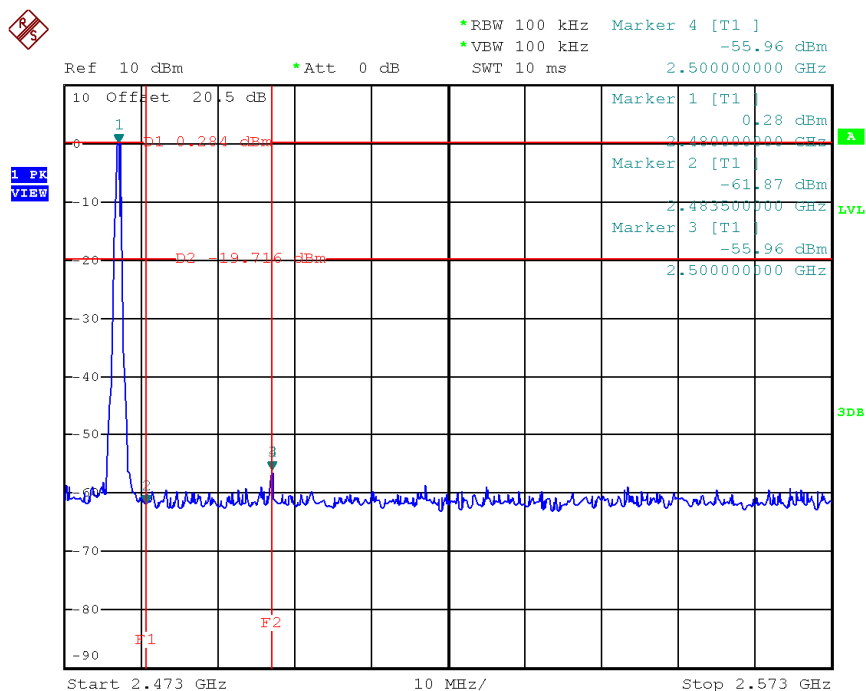
Date: 24.AUG.2015 12:51:18

CH00 Hopping on mode (Lower)_1Mbps



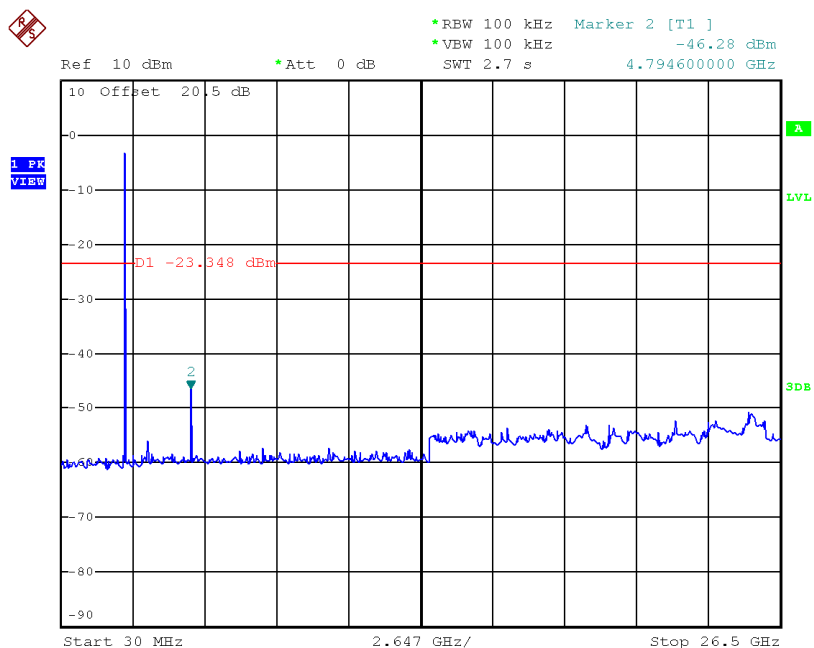
Date: 24.AUG.2015 12:47:28

CH78 Hopping on mode (Upper)_1Mbps



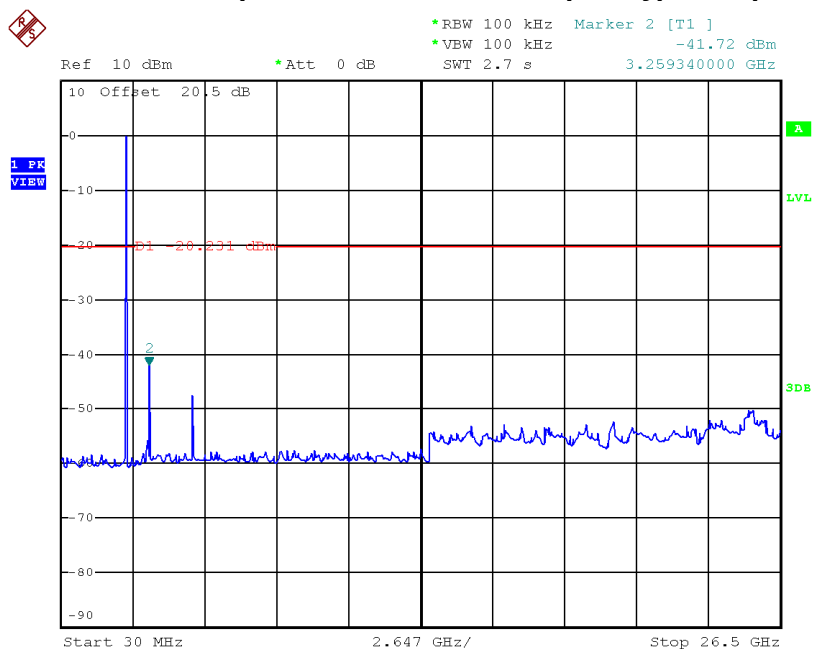
Date: 24.AUG.2015 12:51:18

CH00 (10 Harmonic of the frequency) _1Mbps



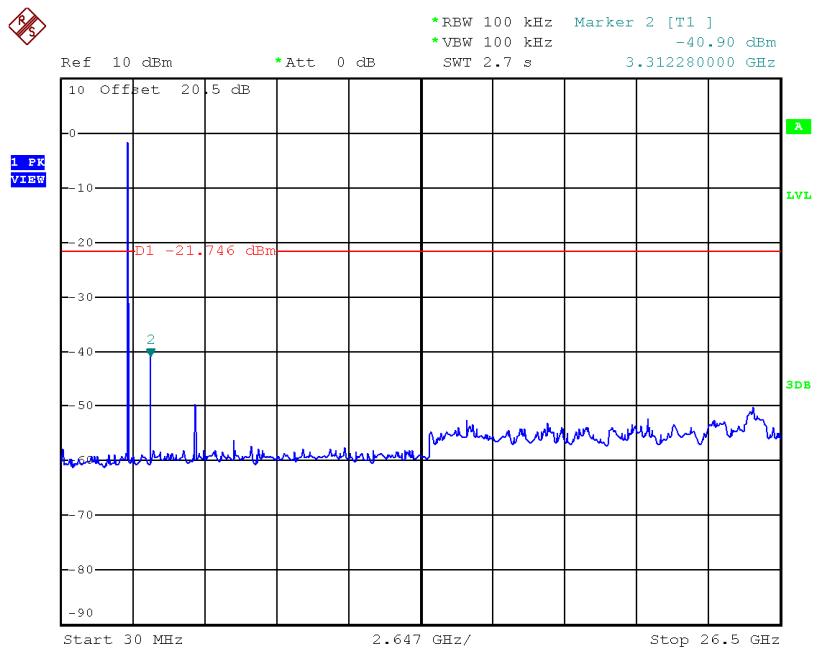
Date: 24.AUG.2015 12:48:14

CH39 (10 Harmonic of the frequency) _1Mbps



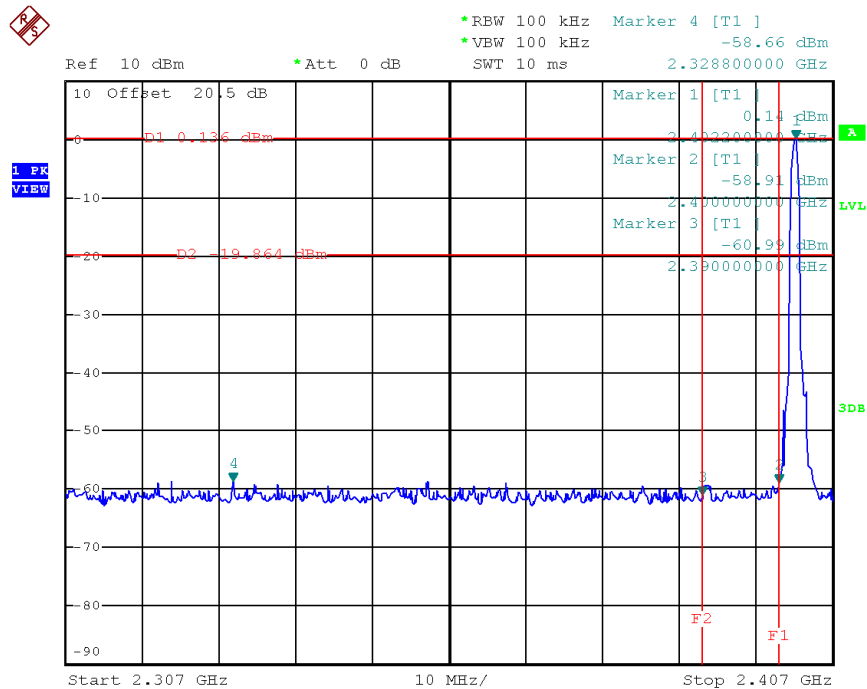
Date: 24.AUG.2015 12:49:41

CH78 (10 Harmonic of the frequency) _1Mbps



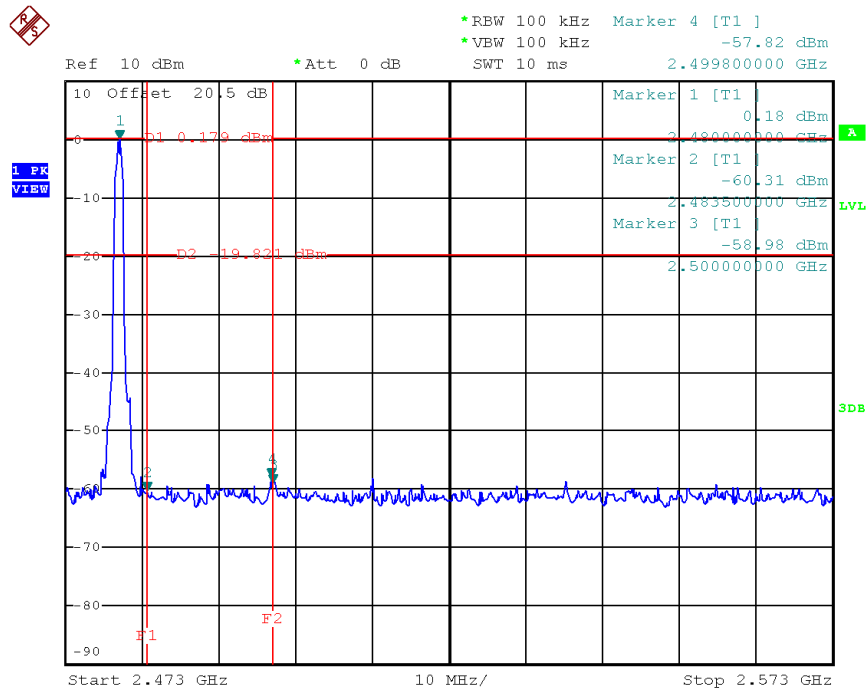
Date: 24.AUG.2015 12:52:04

CH00 (Lower) _3Mbps



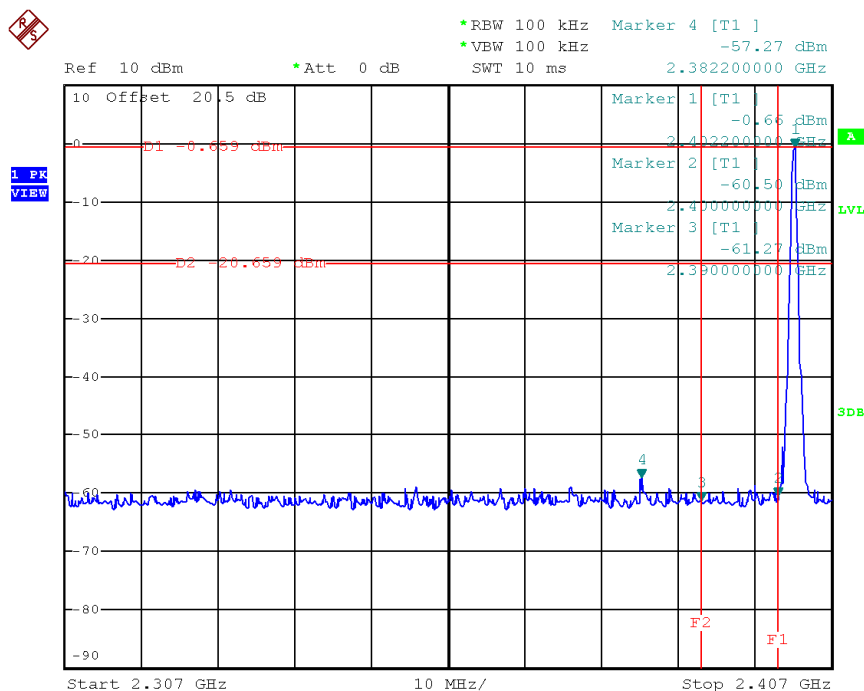
Date: 24.AUG.2015 14:16:12

CH78 (Upper) _3Mbps



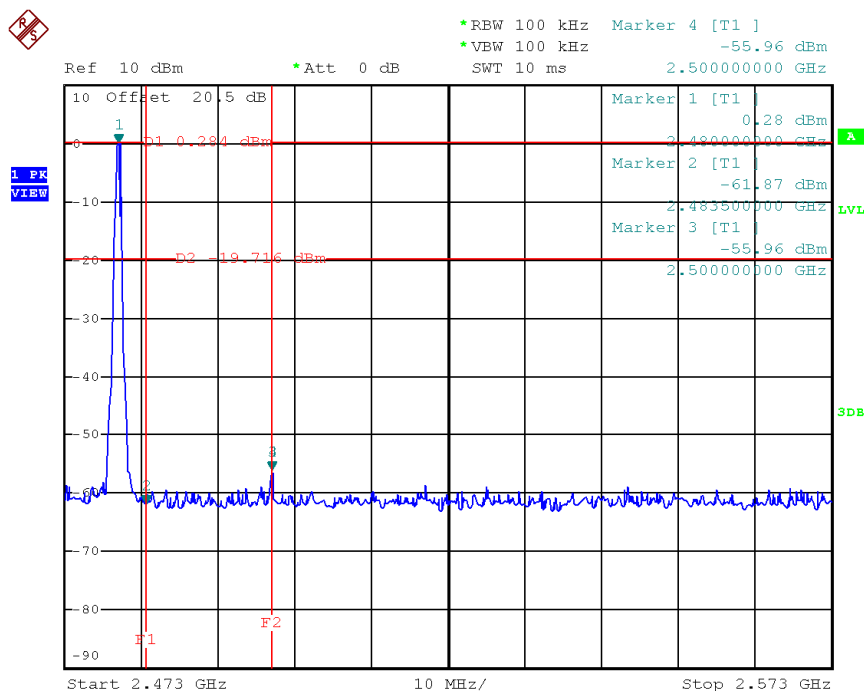
Date: 24.AUG.2015 14:44:08

CH00 Hopping on mode (Lower) _3Mbps



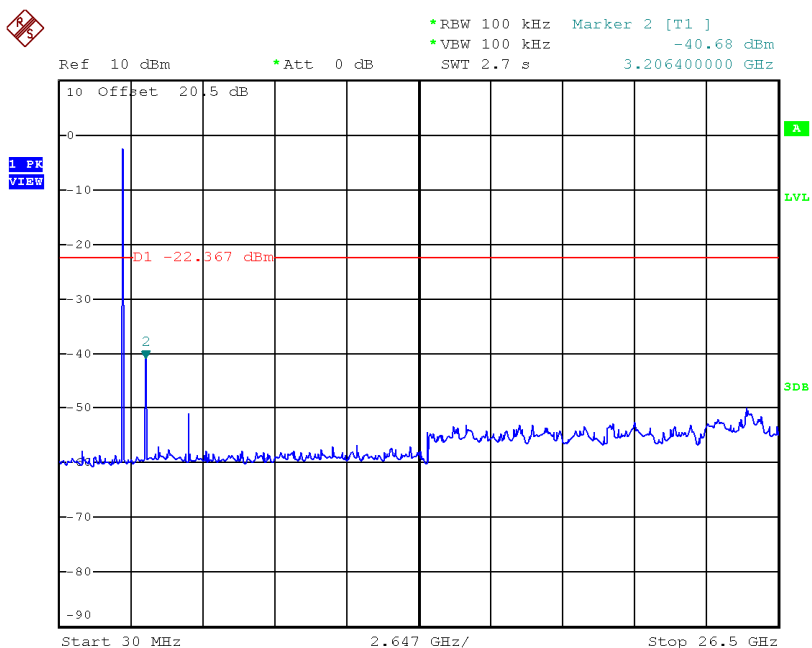
Date: 24.AUG.2015 12:47:28

CH78 Hopping on mode (Upper) _3Mbps



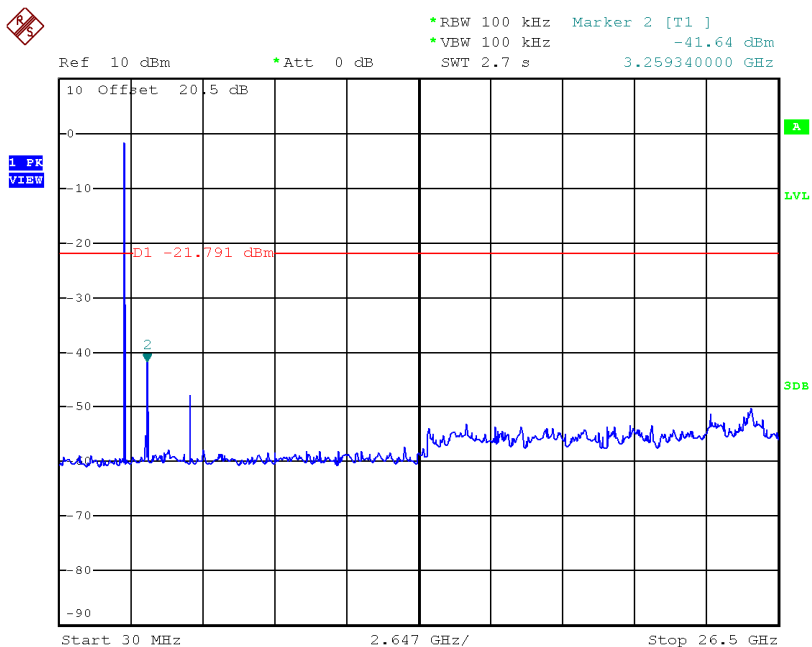
Date: 24.AUG.2015 12:51:18

CH00 (10 Harmonic of the frequency) _3Mbps



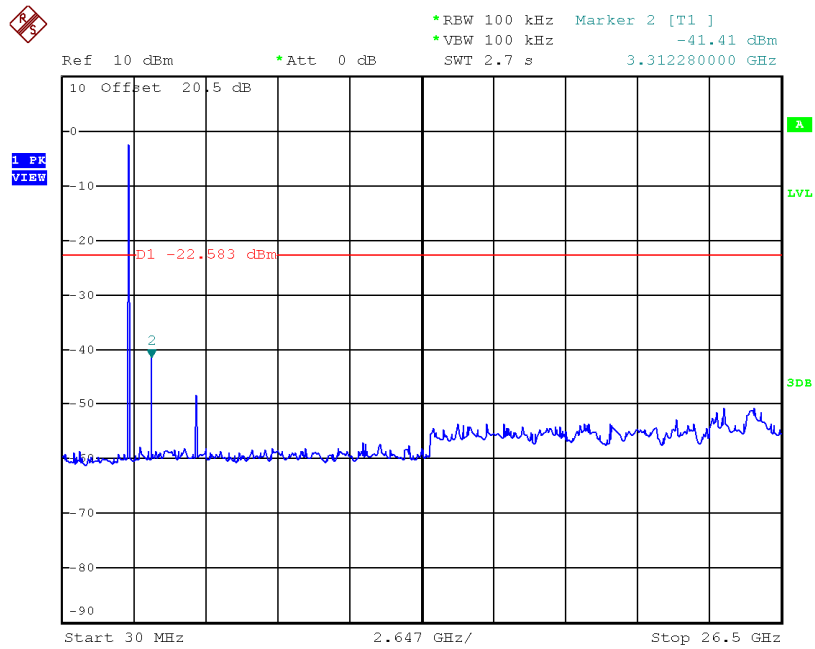
Date: 24.AUG.2015 14:17:03

CH39 (10 Harmonic of the frequency) _3Mbps



Date: 24.AUG.2015 14:18:15

CH78 (10 Harmonic of the frequency) _3Mbps



Date: 24.AUG.2015 14:44:47