

FCC Radio Test Report

FCC ID: Q3N-9700A

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

Project No. : 1611066
Equipment : Mobile Computer
Test Model : 9700A
Series Model : N/A
Applicant : CIPHERLAB CO., LTD.
Address : 12F, 333, Dunhua S. Rd., Sec. 2, Taipei, Taiwan

Date of Receipt : Nov. 22, 2016
Date of Test : Nov. 22, 2016 ~ Jan. 13, 2017
Issued Date : Jan. 17, 2017
Tested by : BTL Inc.

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Limitation

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Table of Contents	Page
1 . CERTIFICATION	7
2 . SUMMARY OF TEST RESULTS	8
2.1 TEST FACILITY	9
2.2 MEASUREMENT UNCERTAINTY	9
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 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	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 DEVIATION FROM TEST STANDARD	15
4.1.4 TEST SETUP	16
4.1.5 EUT OPERATING CONDITIONS	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 DEVIATION FROM TEST STANDARD	18
4.2.4 TEST SETUP	19
4.2.5 EUT OPERATING CONDITIONS	20
4.2.6 EUT TEST CONDITIONS	20
4.2.7 TEST RESULTS (9KHZ TO 30MHZ)	20
4.2.8 TEST RESULTS (30MHZ TO 1000 MHZ)	20
4.2.9 TEST RESULTS (ABOVE 1000 MHZ)	20
5 . NUMBER OF HOPPING CHANNEL	21
5.1 APPLIED PROCEDURES	21
5.1.1 TEST PROCEDURE	21
5.1.2 DEVIATION FROM STANDARD	21
5.1.3 TEST SETUP	21
5.1.4 EUT OPERATION CONDITIONS	21
5.1.5 EUT TEST CONDITIONS	21
5.1.6 TEST RESULTS	21

Table of Contents	Page
6 . AVERAGE TIME OF OCCUPANCY	22
6.1 APPLIED PROCEDURES / LIMIT	22
6.1.1 TEST PROCEDURE	22
6.1.2 DEVIATION FROM STANDARD	22
6.1.3 TEST SETUP	22
6.1.4 EUT OPERATION CONDITIONS	23
6.1.5 EUT TEST CONDITIONS	23
6.1.6 TEST RESULTS	23
7 . HOPPING CHANNEL SEPARATION MEASUREMENT	24
7.1 APPLIED PROCEDURES / LIMIT	24
7.1.1 TEST PROCEDURE	24
7.1.2 DEVIATION FROM STANDARD	24
7.1.3 TEST SETUP	24
7.1.4 EUT TEST CONDITIONS	24
7.1.5 TEST RESULTS	24
8 . BANDWIDTH TEST	25
8.1 APPLIED PROCEDURES	25
8.1.1 TEST PROCEDURE	25
8.1.2 DEVIATION FROM STANDARD	25
8.1.3 TEST SETUP	25
8.1.4 EUT OPERATION CONDITIONS	25
8.1.5 EUT TEST CONDITIONS	25
8.1.6 TEST RESULTS	25
9 . PEAK OUTPUT POWER TEST	26
9.1 APPLIED PROCEDURES / LIMIT	26
9.1.1 TEST PROCEDURE	26
9.1.2 DEVIATION FROM STANDARD	26
9.1.3 TEST SETUP	26
9.1.4 EUT OPERATION CONDITIONS	26
9.1.5 EUT TEST CONDITIONS	26
9.1.6 TEST RESULTS	26
10 . ANTENNA CONDUCTED SPURIOUS EMISSION	27
10.1 APPLIED PROCEDURES / LIMIT	27
10.1.1 TEST PROCEDURE	27
10.1.2 DEVIATION FROM STANDARD	27
10.1.3 TEST SETUP	27
10.1.4 EUT OPERATION CONDITIONS	27
10.1.5 EUT TEST CONDITIONS	27
10.1.6 TEST RESULTS	27
11 . MEASUREMENT INSTRUMENTS LIST	28

Table of Contents	Page
12 . EUT TEST PHOTO	30
ATTACHMENT A - CONDUCTED EMISSION	36
ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)	39
ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)	48
ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)	53
ATTACHMENT E - NUMBER OF HOPPING CHANNEL	78
ATTACHMENT F - AVERAGE TIME OF OCCUPANCY	80
ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT	93
ATTACHMENT H - BANDWIDTH	98
ATTACHMENT I - PEAK OUTPUT POWER	103
ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION	108

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1611066	Original Issue.	Jan. 17, 2017

1. CERTIFICATION

Equipment : Mobile Computer
Brand Name : CIPHERLAB
Test Model : 9700A
Series Model : N/A
Applicant : CIPHERLAB CO., LTD.
Manufacturer : CIPHERLAB CO., LTD.
Address : 12F, 333, Dunhua S. Rd., Sec. 2, Taipei, Taiwan
Factory : CIPHERLAB CO., LTD. 2nd
Address : 7 F., No. 198 and 7F., No. 196, Sec. 3, Da Tong Rd., Shiji Dist., New Taipei City
221, Taiwan.
Date of Test : Nov. 22, 2016 ~ Jan. 13, 2017
Test Sample : Engineering Sample
Standard(s) : FCC Part15, Subpart C (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-1-1611066) 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): FCC Part15, Subpart C (15.247)			
Standard(s) Section	Test Item	Judgment	Remark
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

The test facilities used to collect the test data in this report:

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):

CB15: (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test (Above 1 GHz):

CB15: (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

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 emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
C05	CISPR	150 kHz ~ 30MHz	3.06

B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (3m)	CISPR	9kHz ~ 150kHz	2.96
		150kHz ~ 30MHz	2.74

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	30MHz ~ 200MHz	V	4.76
		30MHz ~ 200MHz	H	4.28
		200MHz ~ 1,000MHz	V	5.08
		200MHz ~ 1,000MHz	H	4.50

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	1GHz ~ 6GHz	V	4.48
		1GHz ~ 6GHz	H	4.50
		6GHz ~ 18GHz	V	4.30
		6GHz ~ 18GHz	H	4.14

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (1m)	CISPR	18 ~ 26.5 GHz	4.72
		26.5 ~ 40 GHz	5.20

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} .

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	Mobile Computer	
Brand Name	CIPHERLAB	
Test Model	9700A	
Series Model	N/A	
Model Difference	N/A	
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.	10.16 dBm(1Mbps) 9.99 dBm(3Mbps)
Power Source	# 1 Supplied from battery. # 2 DC voltage supplied from External Power Supply.	
Power Rating	# 1 (1) Main Battery (BA-0083A6): 3.7V--- 3600 mAh 13.32Wh (2) Backup battery (US302135H5, charged by Main Battery): 3.8V--- 215 mAh # 2 I/P: 100-240V~ 50-60 Hz 0.58A O/P: 5V---4A	
Products Covered	1 * Snap-On Cable: SNP-9700-USB 1 * Main Battery Pack: Li-ion / BA-0083A6 1 * Backup Battery: CIPHERLAB / US302135H5 1 * External Power Supply: ADAPTER TECH. / ATS024T-A050 1 * Pistol (optional): PST9700	

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	Test Model	Antenna Type	Connector	Gain (dBi)	Note
1	CIPHERL AB	KZWB2ML 970072	PIFA Antenna	N/A	1.52	N/A

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base 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 Note (1)

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 1	TX Mode

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

Note:

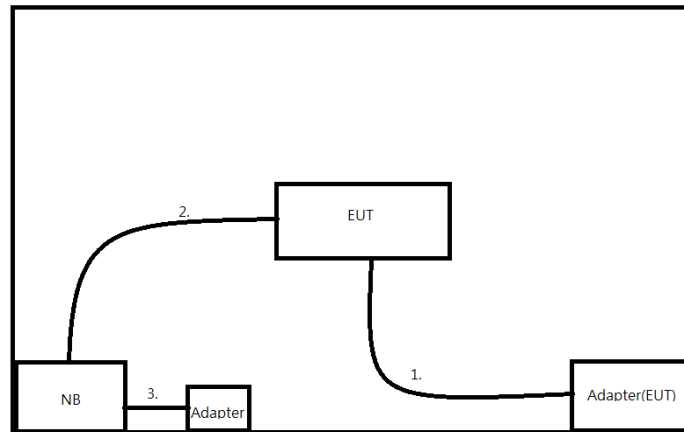
- (1) The measurements are performed at the high, middle, low available channels.
- (2) The measurements for Hopping Channel Separation, Bandwidth and Peak Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.
- (3) Orthogonal axis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

3.3 TABLE OF PARAMETERS OF TEXT 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

Test Software Version	CSR		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters(1Mbps)	7	7	7
Parameters(3Mbps)	7	7	7

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



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.
A	NB	ACER	Z8C	N/A	N/A
B	Adapter	Acer	A13-045N2A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	YES	1.5m	Power Cable
2	YES	YES	1.8m	USB Cable
3	NO	YES	1.5m	Power Cable

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 (dB μ V)	
	Quasi-peak	Average
0.15 -0.50	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

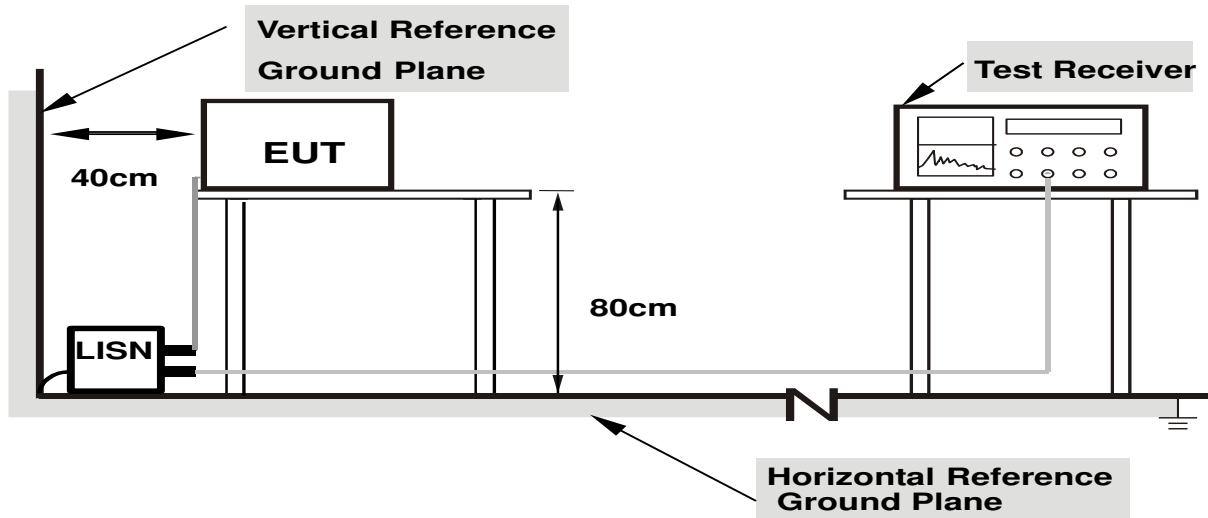
4.1.2 TEST PROCEDURE

- 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 equipment 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 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: 25°C
 Relative Humidity: 55%
 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 (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/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).
- (4) 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 (Above 1000MHz)

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

Spectrum 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

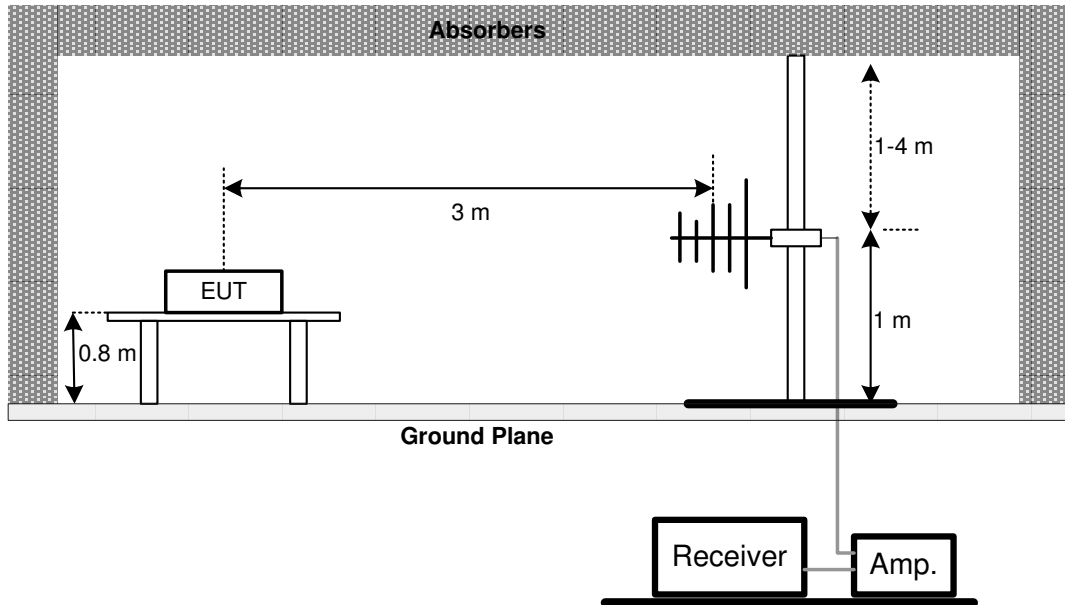
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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)
- c. The height of the equipment or of the substitution antenna shall be 0.8m 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 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.
- 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 –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

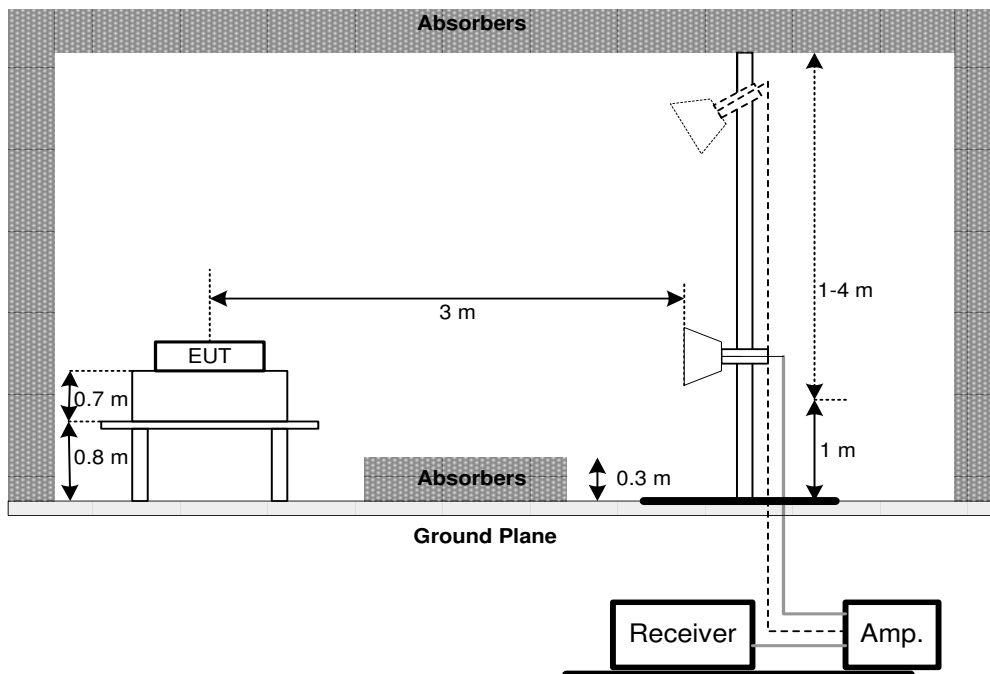
No deviation

4.2.4 TEST SETUP

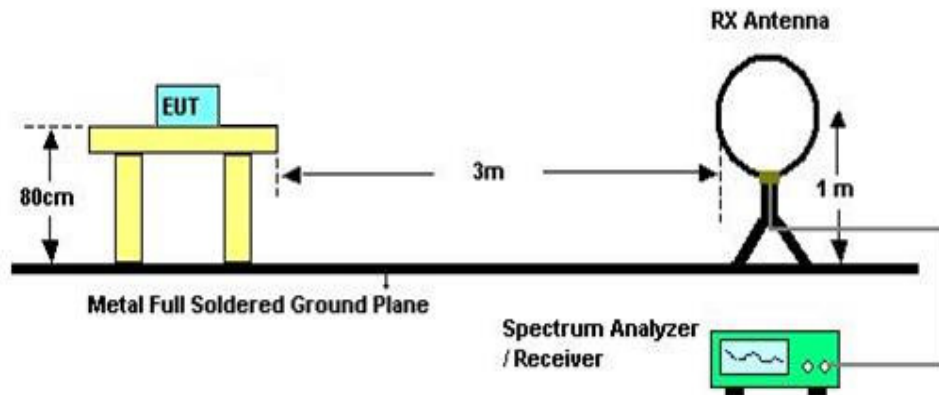
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For Radiated Emissions Below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.2.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: AC 120V/60Hz

4.2.7 TEST RESULTS (9KHZ TO 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.

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

Remark:

- (1) 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	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.1.1 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.

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: 25°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

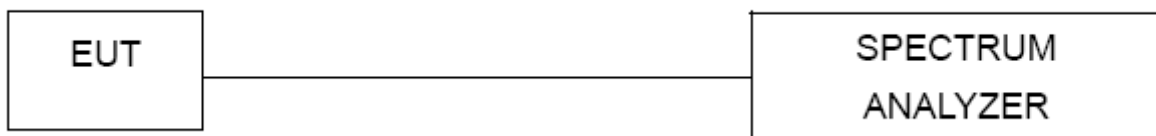
6.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. 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.
- j. 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.
- k. 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: 25°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 2400-2483.5 MHz band 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.

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

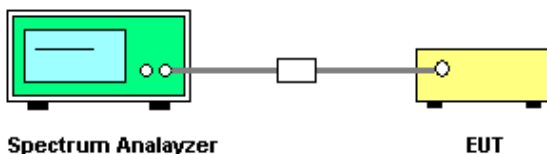
7.1.1 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels
 - Resolution (or IF) Bandwidth (RBW) \geq 1% of the span
 - Video (or Average) Bandwidth (VBW) \geq 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: 25°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	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

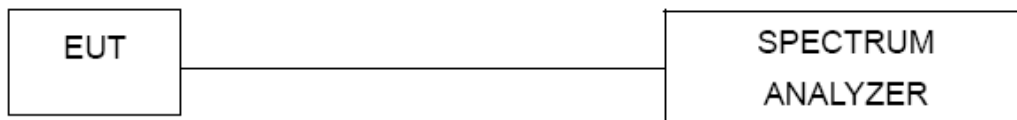
8.1.1 TEST PROCEDURE

- 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= 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: 25°C
 Relative Humidity: 55%
 Test Voltage: AC 120V/60Hz

8.1.6 TEST RESULTS

Please refer to the Attachment H

9. PEAK OUTPUT 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	1 Watt or 30dBm (hopping channel >75) 0.125Watt or 21dBm (hopping channel <75)	2400-2483.5	PASS

9.1.1 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= 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: 25°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: 25°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	EMCO	3816/2	0052765	Mar. 27, 2017
2	LISN	R&S	ENV216	101447	Mar. 27, 2017
3	Test Cable	emci	RG223(9KHz-30 MHz)	C_17	Mar. 10, 2017
4	EMI Test Receiver	R&S	ESCI	100382	Mar. 27, 2017
5	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 27, 2017
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	Preamplifier	EMCI	012645B	980267	Mar.01,2017
2	Preamplifier	EMCI	EMC02325	980217	Dec.29,2017
3	Test Cable	EMCI	EMC104-SM-S M-8000	8m	Jan.04,2018
4	Test Cable	EMCI	EMC104-SM-S M-800	150207	Jan.04,2018
5	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan.04,2018
6	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan.09,2018
7	Signal Analyzer	Agilent	N9010A	MY52220990	Feb.23,2017
8	Loop Ant	EMCO	6502	42960	Nov.24,2017
9	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Mar.01,2017
10	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan.17,2017
11	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan.17,2017

Number of Hopping Channel					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017

Average Time of Occupancy					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017

Hopping Channel Separation Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017

Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017

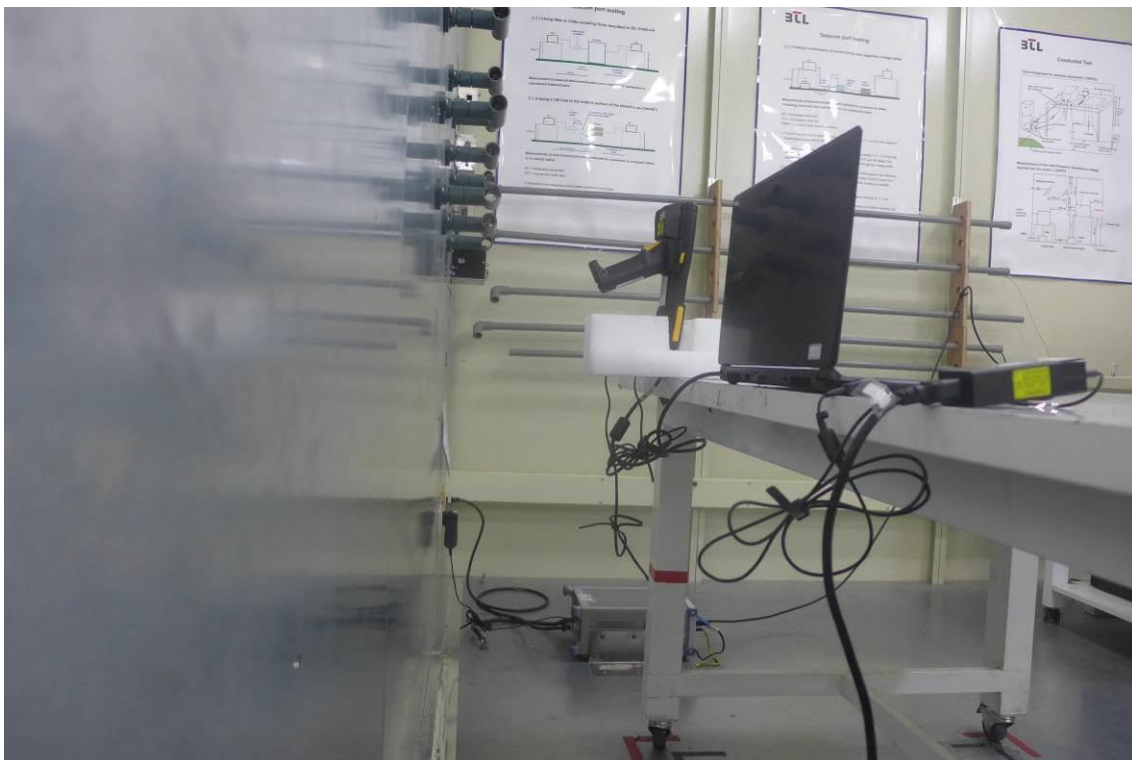
Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017

Antenna Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017

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

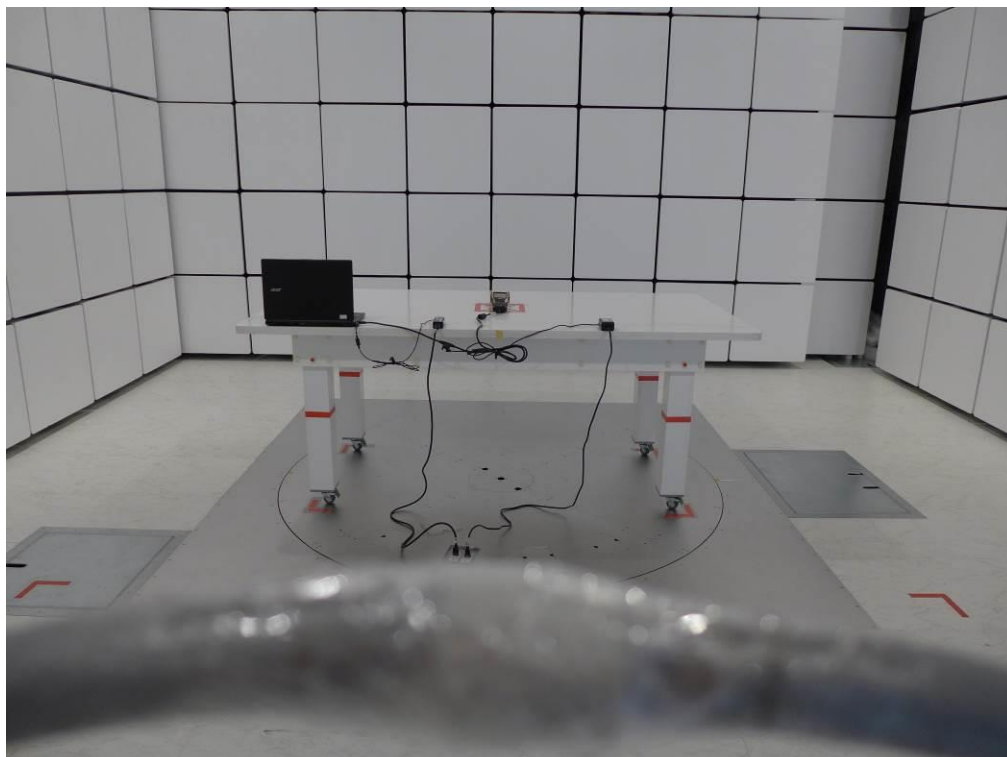
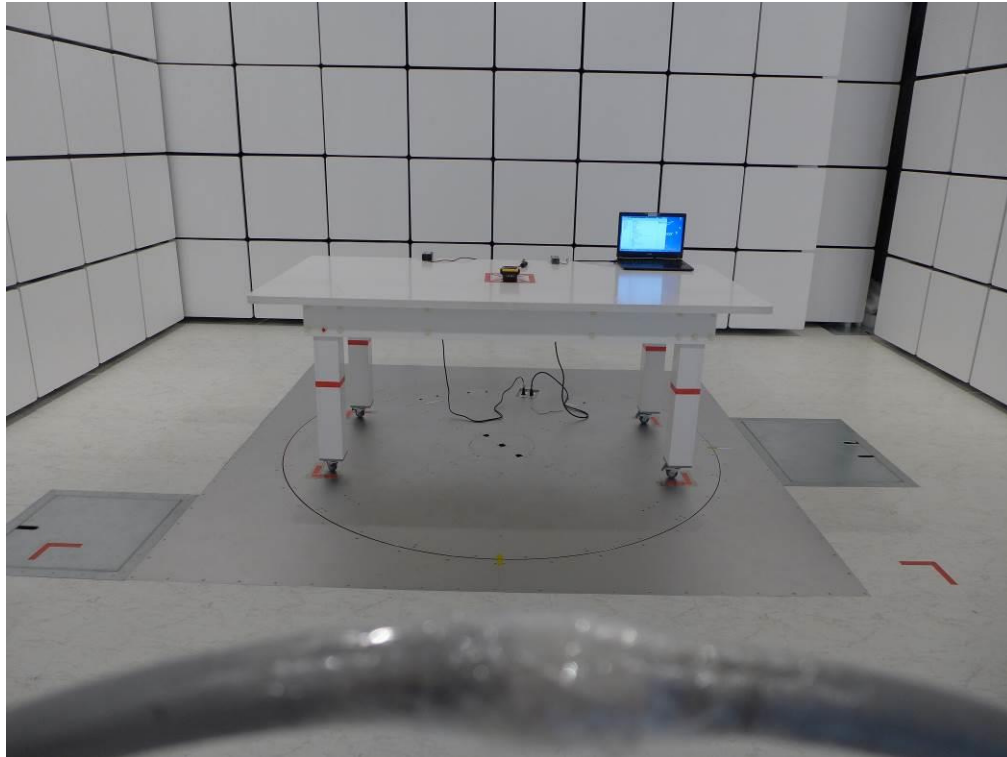
12. EUT TEST PHOTO

Conducted Measurement Photos



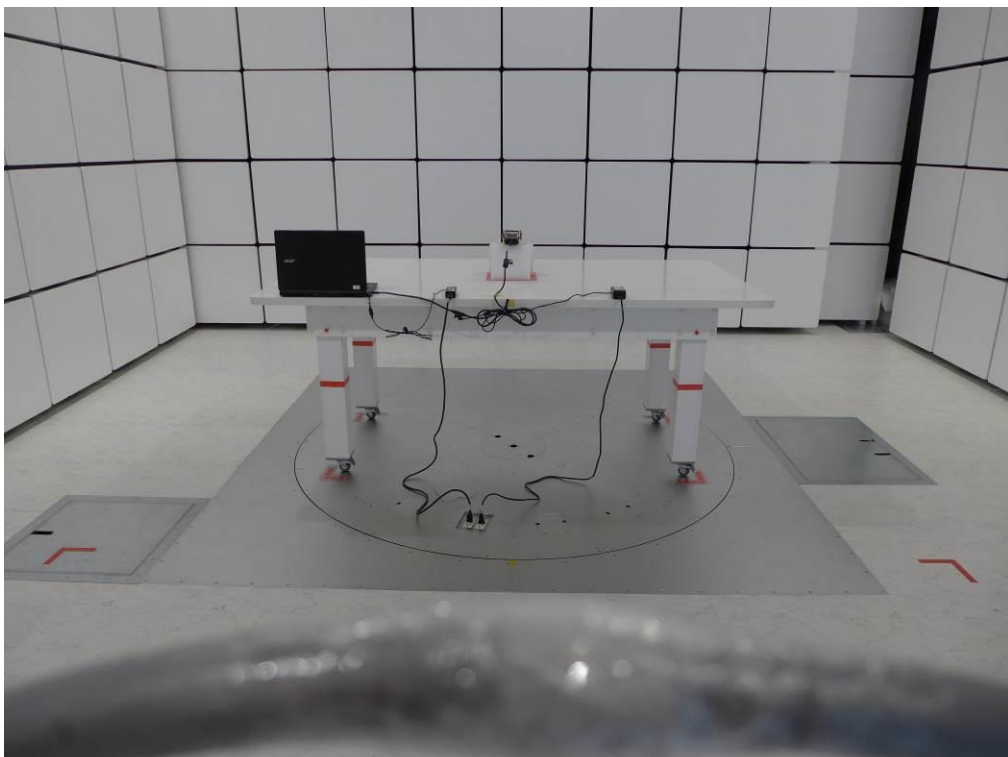
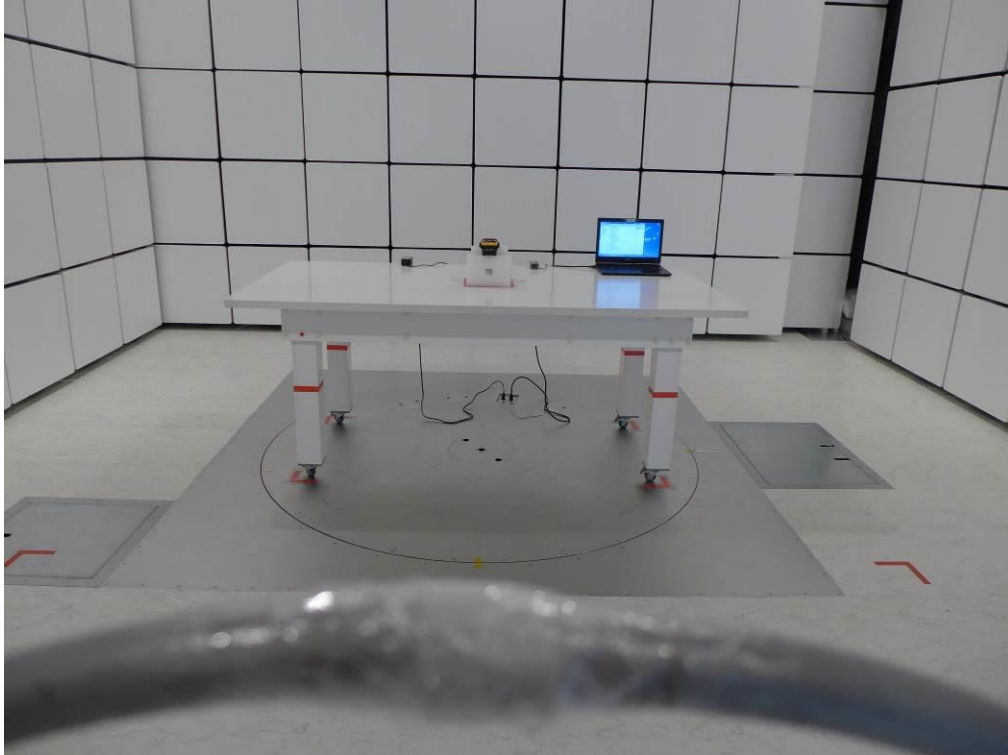
Radiated Measurement Photos

9KHz to 30MHz
Without Pistol



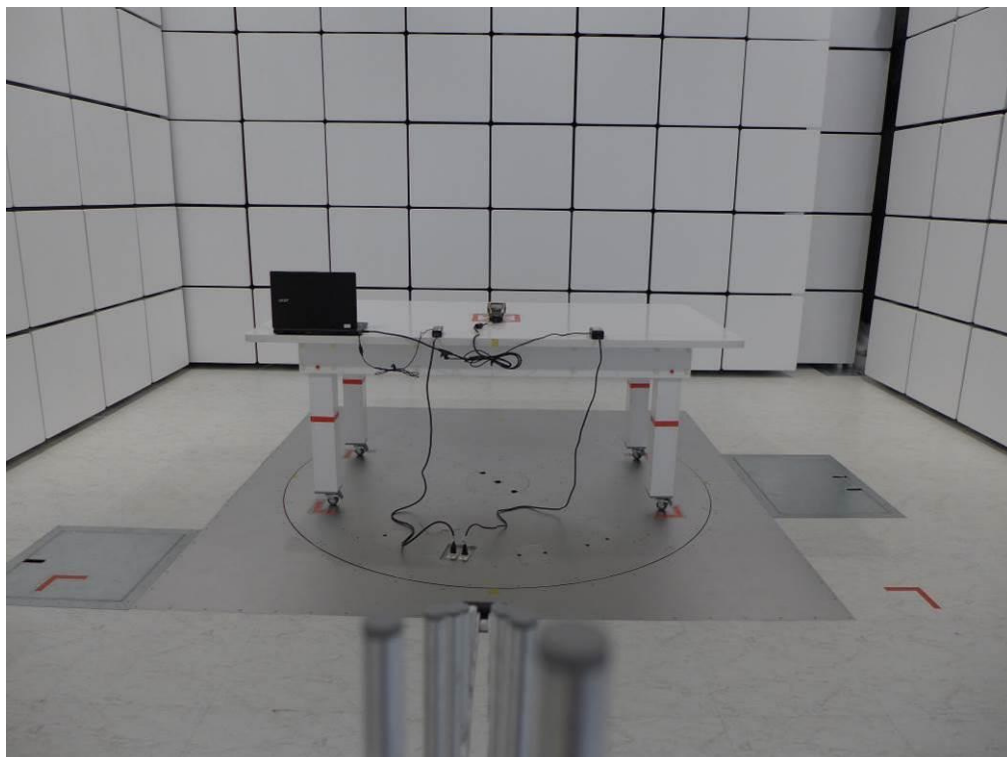
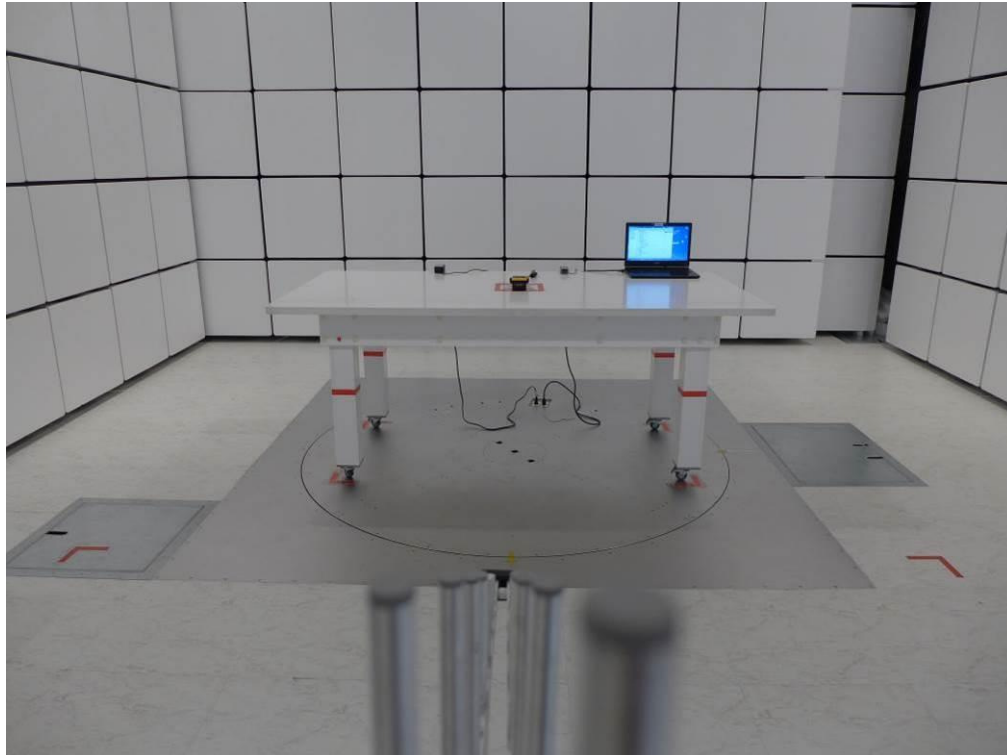
Radiated Measurement Photos

9KHz to 30MHz
With Pistol



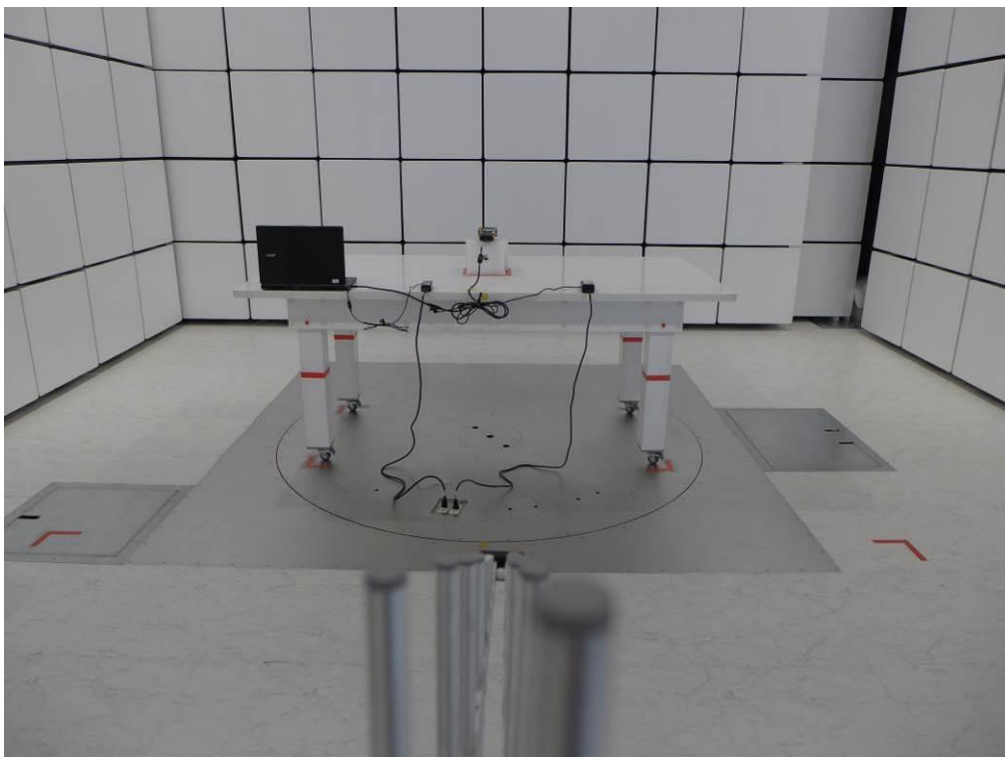
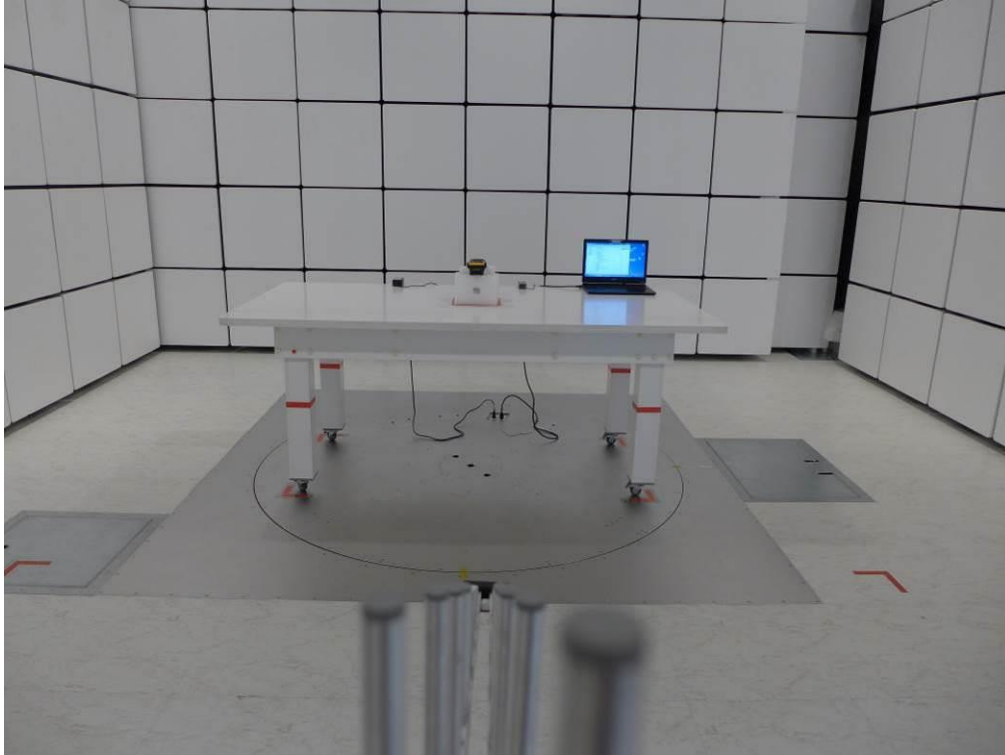
Radiated Measurement Photos

Below 1GHz
Without Pistol



Radiated Measurement Photos

Below 1GHz
With Pistol



Radiated Measurement Photos

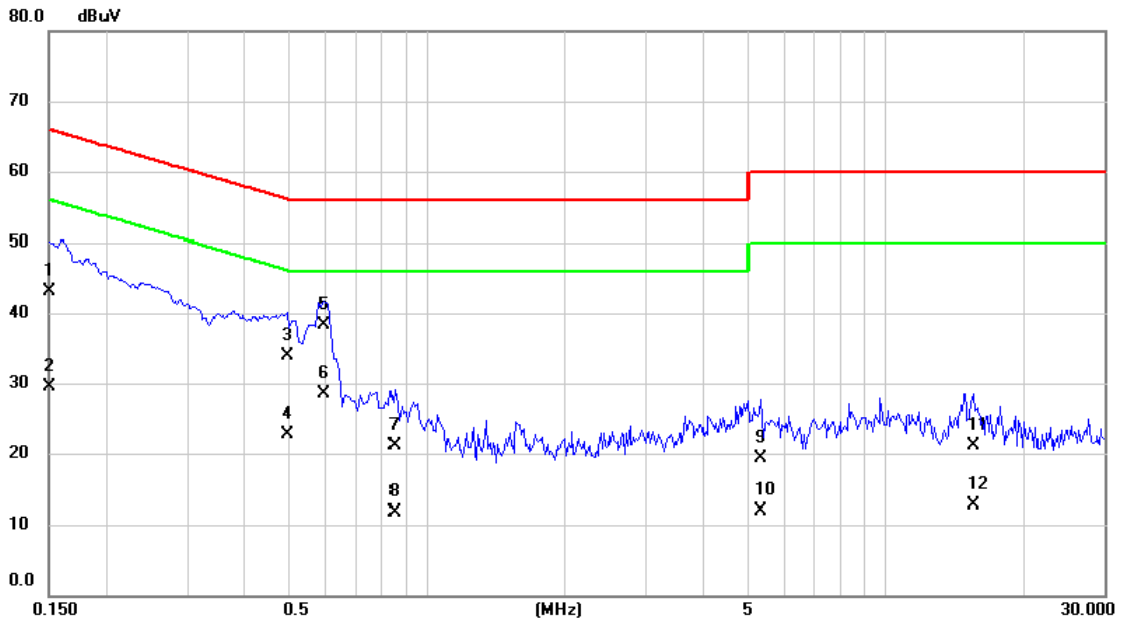
Above 1GHz
Without Pistol



ATTACHMENT A - CONDUCTED EMISSION

Test Mode: TX Mode

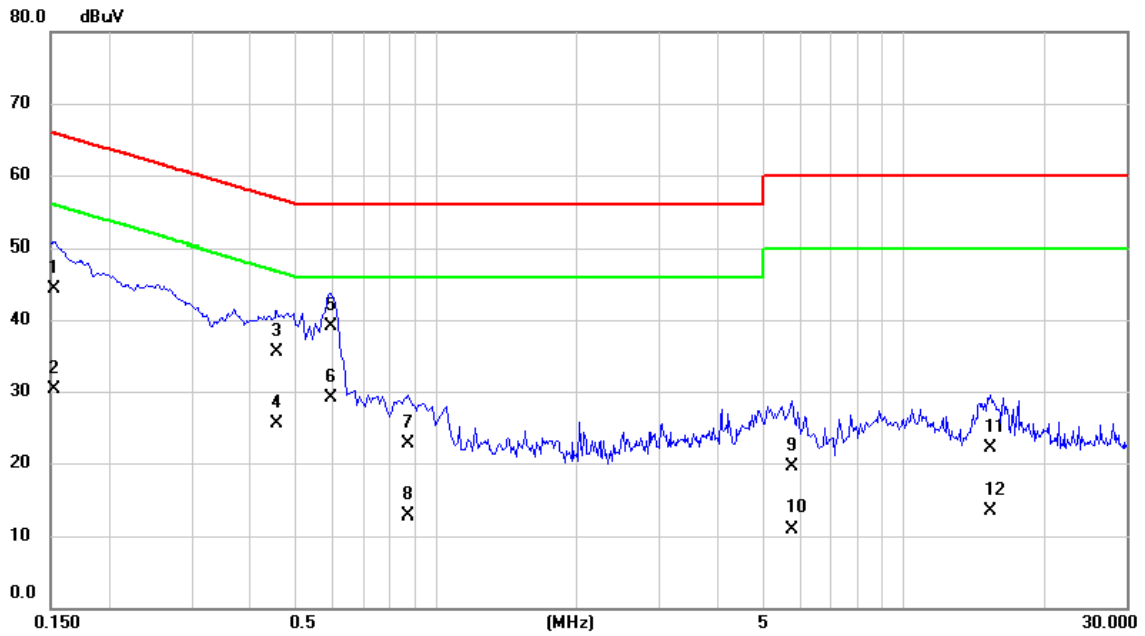
Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	33.50	9.66	43.16	66.00	-22.84	QP	
2		0.1500	19.80	9.66	29.46	56.00	-26.54	AVG	
3		0.4951	24.30	9.67	33.97	56.08	-22.11	QP	
4		0.4951	13.10	9.67	22.77	46.08	-23.31	AVG	
5		0.5990	28.70	9.67	38.37	56.00	-17.63	QP	
6	*	0.5990	18.80	9.67	28.47	46.00	-17.53	AVG	
7		0.8510	11.50	9.67	21.17	56.00	-34.83	QP	
8		0.8510	2.10	9.67	11.77	46.00	-34.23	AVG	
9		5.3500	9.40	9.82	19.22	60.00	-40.78	QP	
10		5.3500	2.10	9.82	11.92	50.00	-38.08	AVG	
11		15.5500	11.20	9.94	21.14	60.00	-38.86	QP	
12		15.5500	2.70	9.94	12.64	50.00	-37.36	AVG	

Test Mode: TX Mode

Neutral



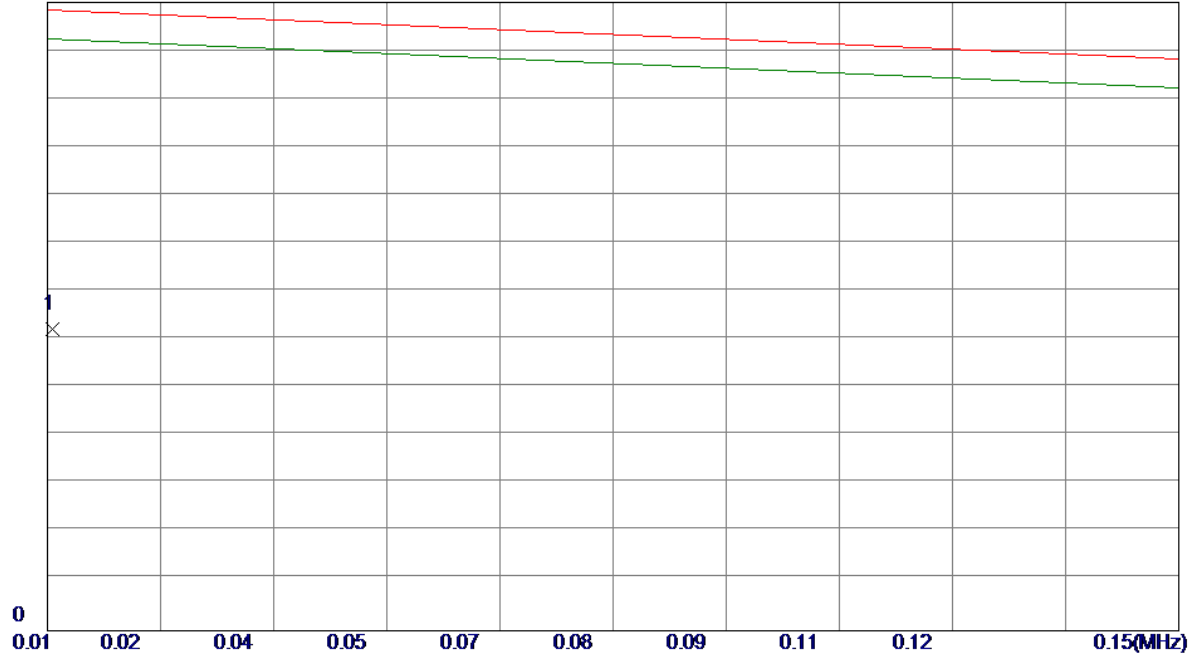
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1528	34.70	9.67	44.37	65.85	-21.48	QP	
2		0.1528	20.70	9.67	30.37	55.85	-25.48	AVG	
3		0.4552	25.80	9.67	35.47	56.78	-21.31	QP	
4		0.4552	15.90	9.67	25.57	46.78	-21.21	AVG	
5	*	0.5990	29.50	9.67	39.17	56.00	-16.83	QP	
6		0.5990	19.50	9.67	29.17	46.00	-16.83	AVG	
7		0.8690	13.10	9.68	22.78	56.00	-33.22	QP	
8		0.8690	3.00	9.68	12.68	46.00	-33.32	AVG	
9		5.7500	9.70	9.82	19.52	60.00	-40.48	QP	
10		5.7500	1.10	9.82	10.92	50.00	-39.08	AVG	
11		15.2500	12.20	9.94	22.14	60.00	-37.86	QP	
12		15.2500	3.30	9.94	13.24	50.00	-36.76	AVG	

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

Test Mode: TX Mode_Without Pistol

Ant 0°

130 dBuV/m

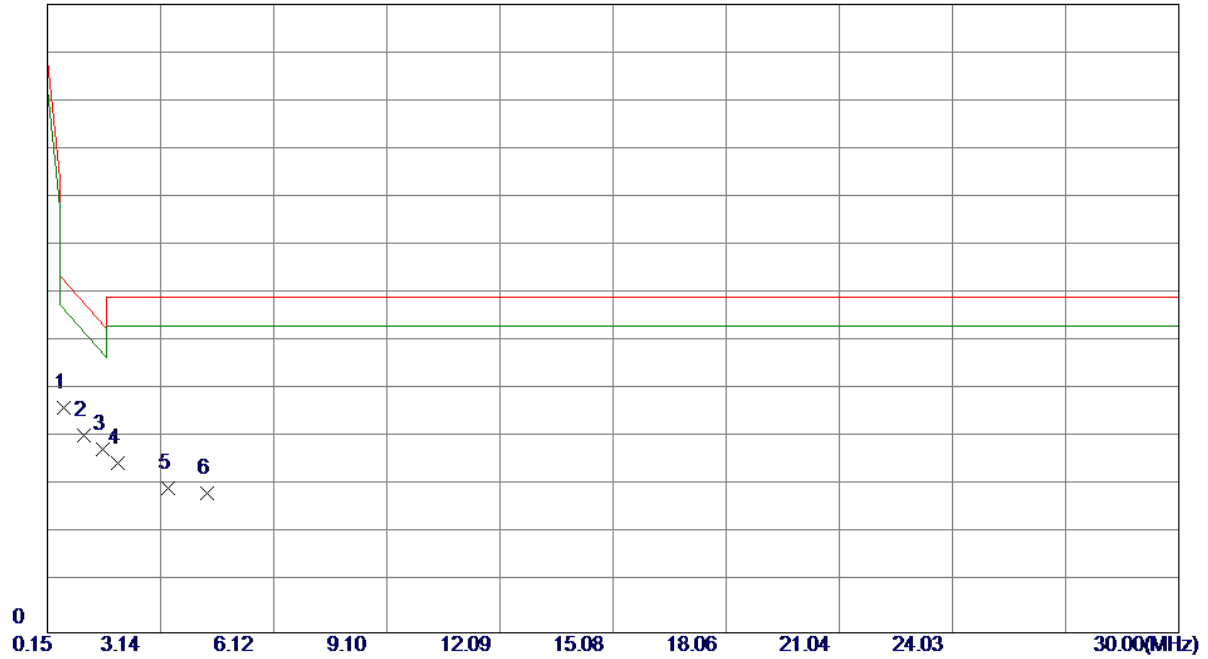


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	0.0097	41.92	20.50	62.42	128.46	-66.04	Peak	

Test Mode: TX Mode_Without Pistol

Ant 0°

130 dBuV/m

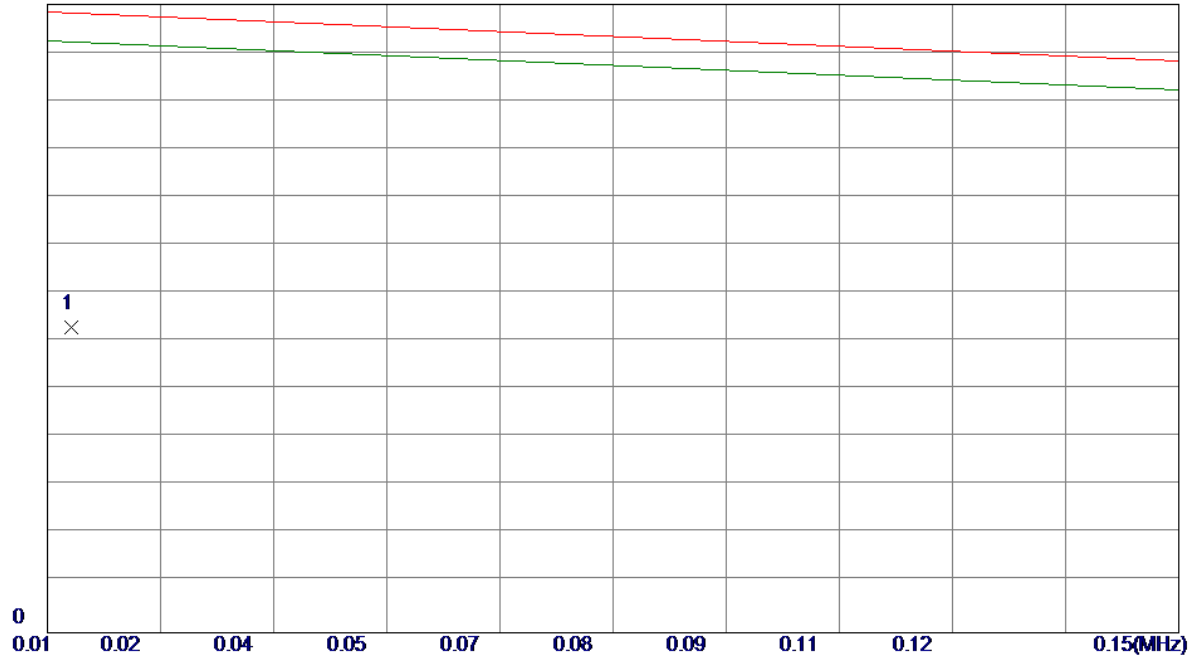


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	0.5680	34.76	11.83	46.59	73.10	-26.51	Peak	
2	1.1052	28.88	11.95	40.83	68.32	-27.49	Peak	
3 *	1.6126	26.30	11.72	38.02	63.79	-25.77	Peak	
4	2.0007	23.67	11.55	35.22	69.54	-34.32	Peak	
5	3.3440	18.78	11.15	29.93	69.54	-39.61	Peak	
6	4.3590	17.58	11.30	28.88	69.54	-40.66	Peak	

Test Mode: TX Mode_Without Pistol

Ant 90°

130 dBuV/m

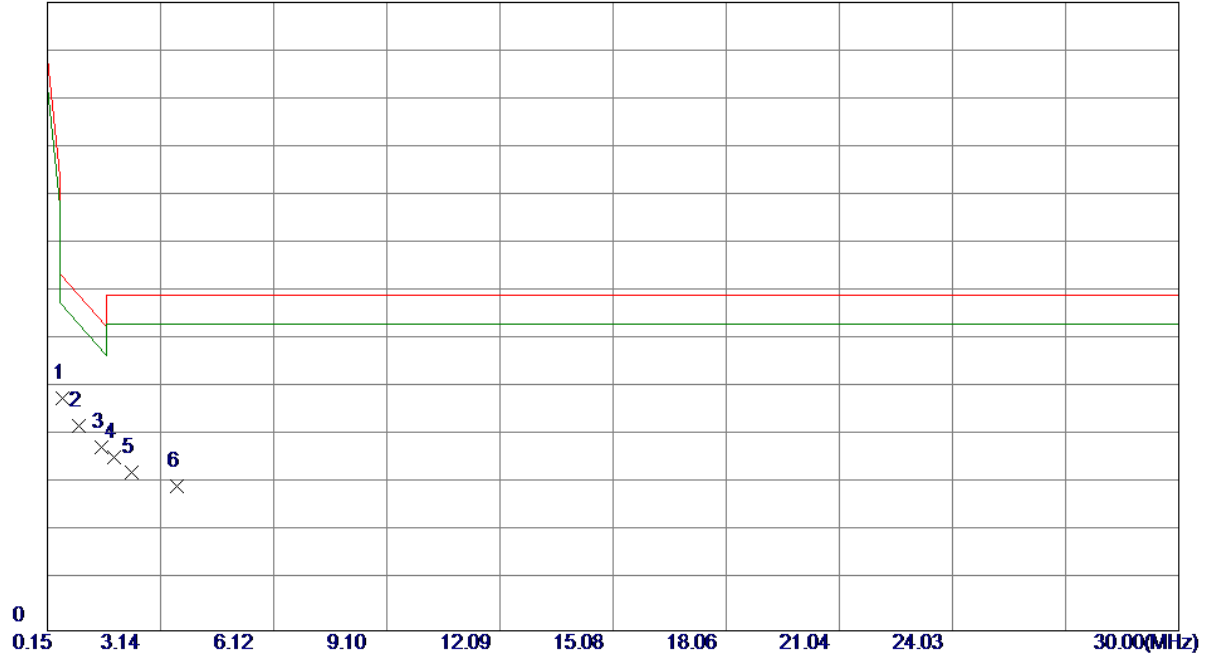


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	0.0120	43.10	19.95	63.05	128.30	-65.25	Peak	

Test Mode: TX Mode_Without Pistol

Ant 90°

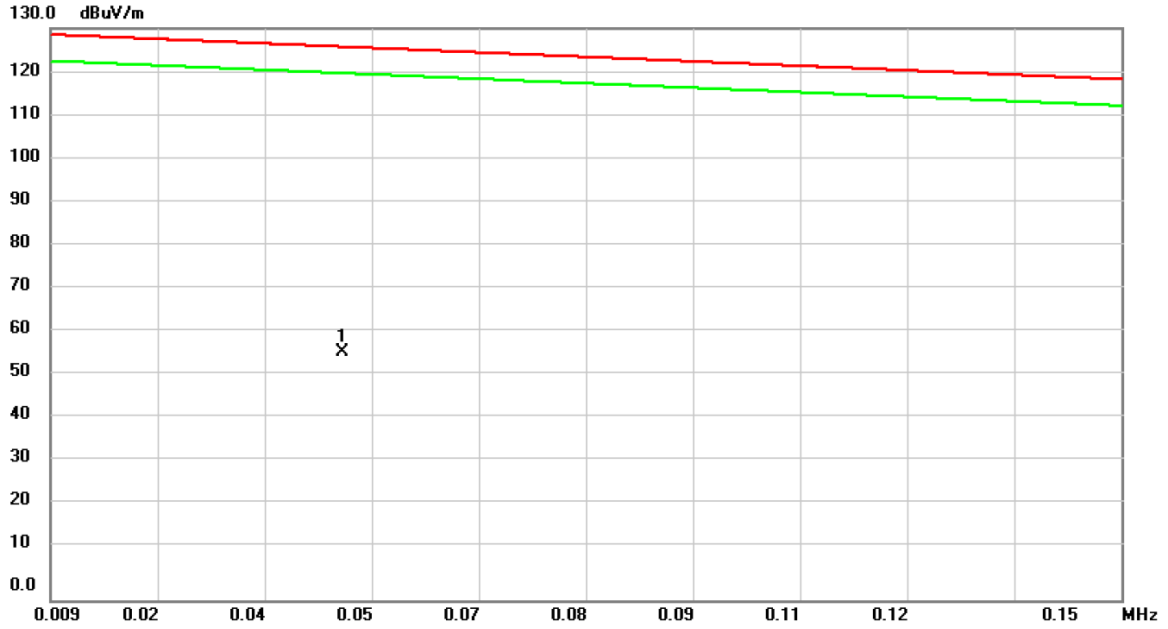
130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	0.5381	36.16	11.82	47.98	73.37	-25.39	Peak	
2	0.9858	30.44	11.99	42.43	69.38	-26.95	Peak	
3	1.5828	26.10	11.74	37.84	64.06	-26.22	Peak	
4	1.9111	24.24	11.59	35.83	69.54	-33.71	Peak	
5	2.3887	21.40	11.38	32.78	69.54	-36.76	Peak	
6	3.5530	18.81	11.18	29.99	69.54	-39.55	Peak	

Test Mode: TX Mode_With Pistol

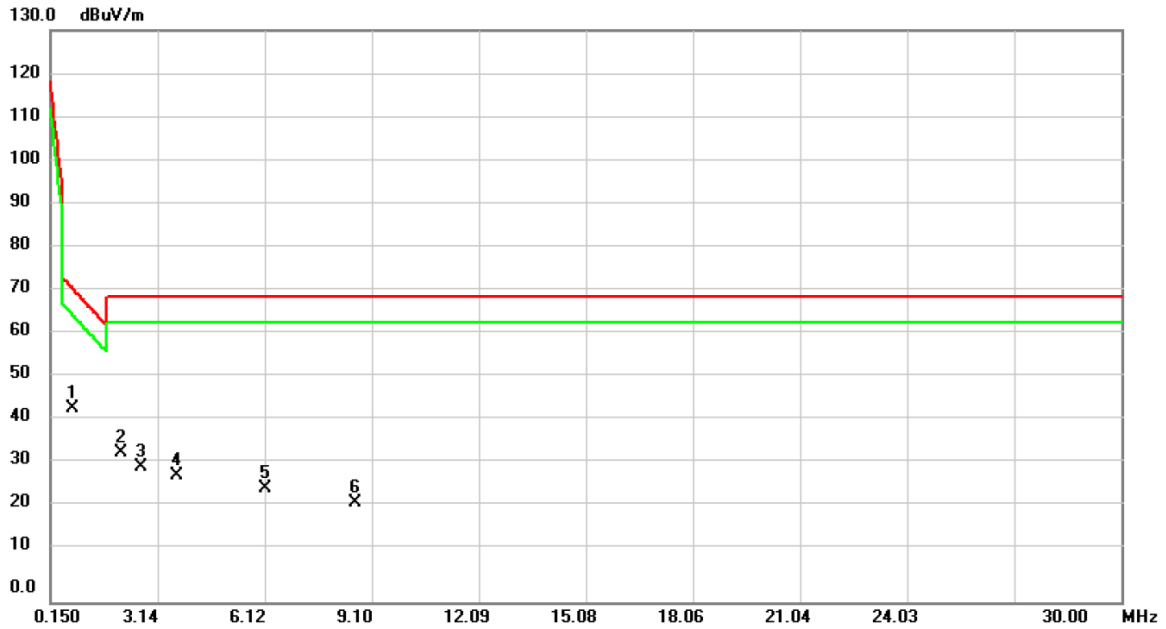
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0475	43.22	13.25	56.47	125.74	-69.27	peak	

Test Mode: TX Mode_With Pistol

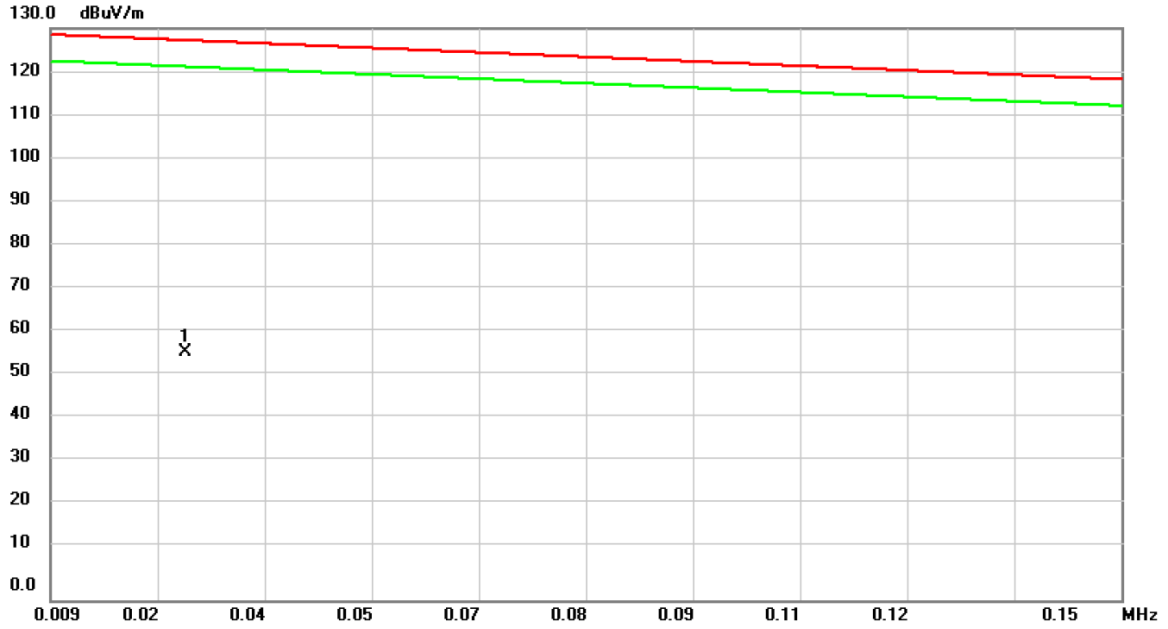
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.7470	32.26	11.90	44.16	71.51	-27.35	peak	
2		2.1200	22.49	11.50	33.99	69.54	-35.55	peak	
3		2.6872	19.40	11.24	30.64	69.54	-38.90	peak	
4		3.6722	17.57	11.20	28.77	69.54	-40.77	peak	
5		6.1200	14.55	11.38	25.93	69.54	-43.61	peak	
6		8.6570	11.12	11.33	22.45	69.54	-47.09	peak	

Test Mode: TX Mode_With Pistol

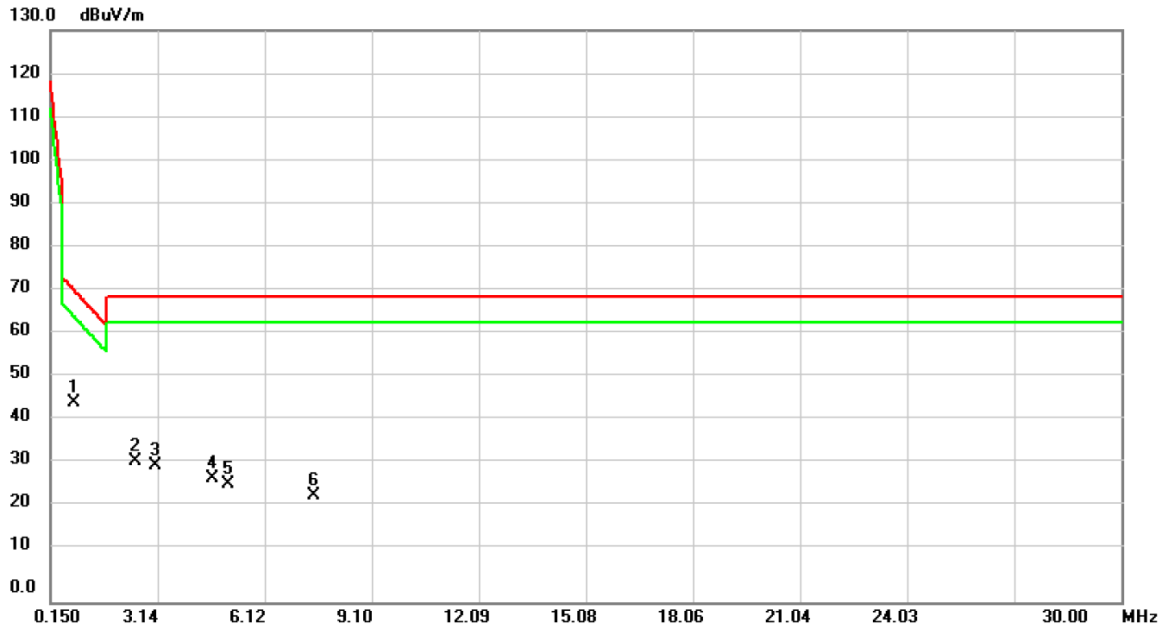
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0268	40.45	15.88	56.33	127.24	-70.91	peak	

Test Mode: TX Mode_With Pistol

Ant 90°

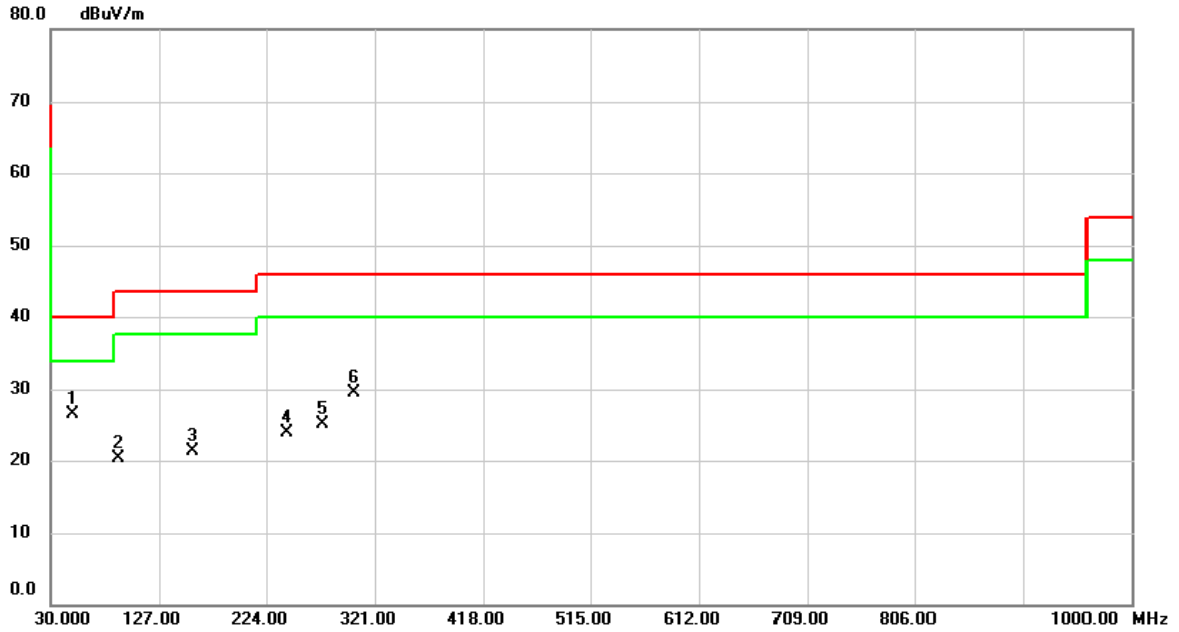


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	0.8064	33.51	11.92	45.43	70.98	-25.55	peak	
2		2.5081	20.80	11.32	32.12	69.54	-37.42	peak	
3		3.0752	20.02	11.11	31.13	69.54	-38.41	peak	
4		4.6870	16.62	11.35	27.97	69.54	-41.57	peak	
5		5.1051	15.52	11.40	26.92	69.54	-42.62	peak	
6		7.4931	12.83	11.35	24.18	69.54	-45.36	peak	

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

Test Mode: TX 2480MHz_CH78_3 Mbps_Without Pistol

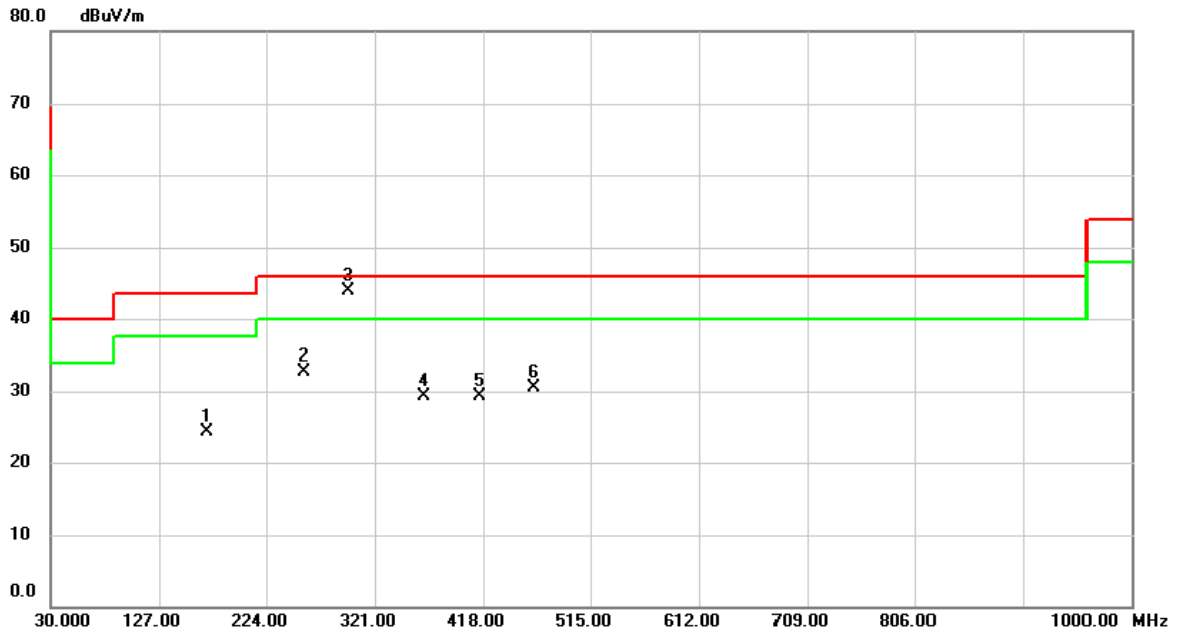
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	49.4000	34.94	-8.39	26.55	40.00	-13.45	peak	
2		91.1100	33.86	-13.63	20.23	43.50	-23.27	peak	
3		157.0700	30.21	-8.84	21.37	43.50	-22.13	peak	
4		242.4300	33.57	-9.64	23.93	46.00	-22.07	peak	
5		273.4700	33.53	-8.49	25.04	46.00	-20.96	peak	
6		301.6000	37.21	-7.74	29.47	46.00	-16.53	peak	

Test Mode: TX 2480MHz_CH78_3 Mbps_Without Pistol

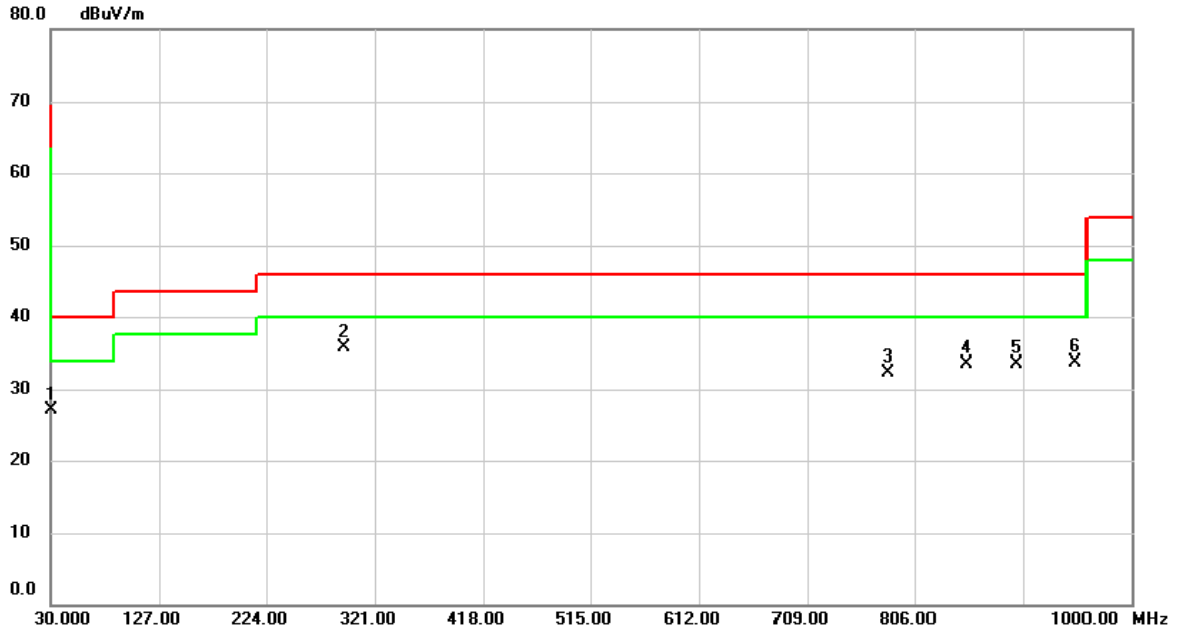
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		170.6500	33.49	-9.16	24.33	43.50	-19.17	peak	
2		257.9500	41.83	-9.15	32.68	46.00	-13.32	peak	
3	*	296.7500	51.78	-7.83	43.95	46.00	-2.05	peak	
4		365.6200	35.31	-6.00	29.31	46.00	-16.69	peak	
5		414.1200	34.09	-4.85	29.24	46.00	-16.76	peak	
6		463.5900	34.06	-3.63	30.43	46.00	-15.57	peak	

Test Mode: TX 2480MHz_CH78_3 Mbps_With Pistol

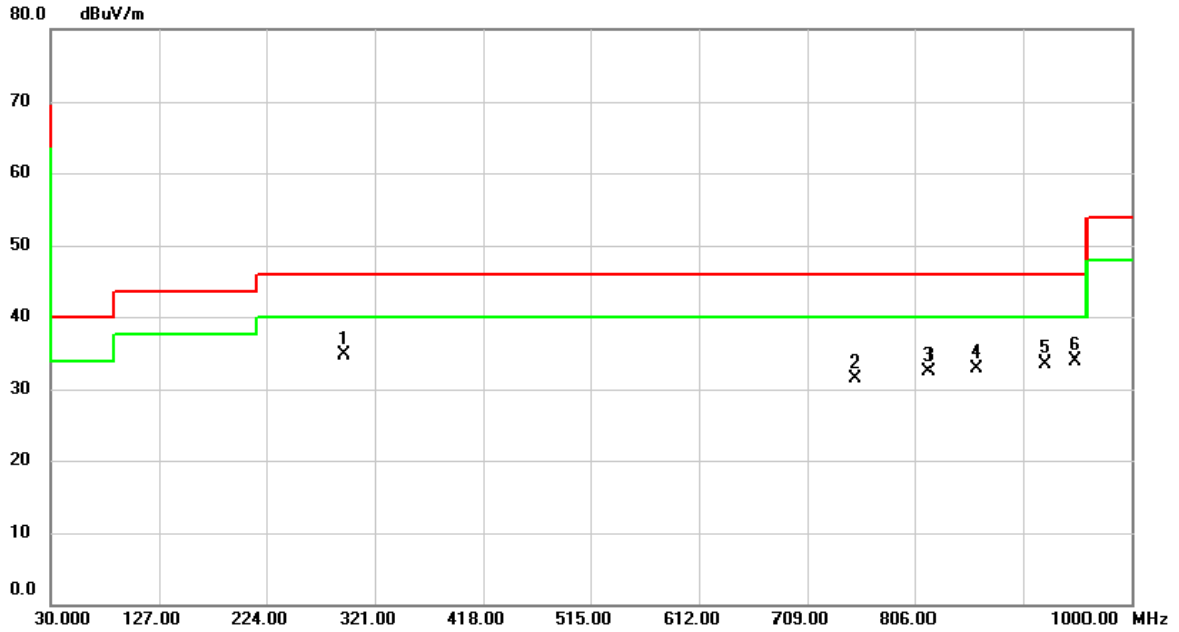
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		30.9700	36.14	-9.00	27.14	40.00	-12.86	peak	
2	*	293.8400	43.19	-7.46	35.73	46.00	-10.27	peak	
3		781.7500	29.64	2.63	32.27	46.00	-13.73	peak	
4		851.5900	29.89	3.55	33.44	46.00	-12.56	peak	
5		897.1800	28.96	4.46	33.42	46.00	-12.58	peak	
6		949.5600	28.73	5.04	33.77	46.00	-12.23	peak	

Test Mode: TX 2480MHz_CH78_3 Mbps_With Pistol

Horizontal



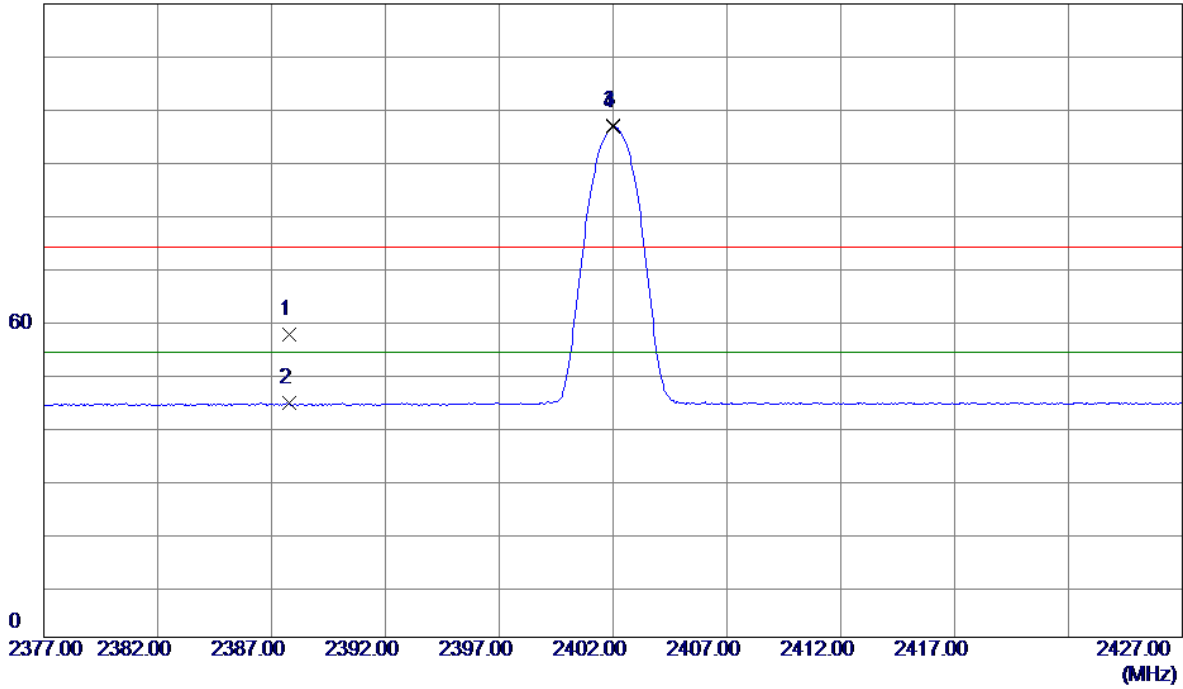
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	293.8400	42.26	-7.46	34.80	46.00	-11.20	peak	
2		752.6500	29.21	2.32	31.53	46.00	-14.47	peak	
3		817.6400	29.45	3.07	32.52	46.00	-13.48	peak	
4		860.3200	29.27	3.73	33.00	46.00	-13.00	peak	
5		922.4000	28.83	4.75	33.58	46.00	-12.42	peak	
6		949.5600	28.96	5.04	34.00	46.00	-12.00	peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

Test Mode : TX 2402MHz_CH00_1 Mbps_Without Pistol

Vertical

120 dBuV/m

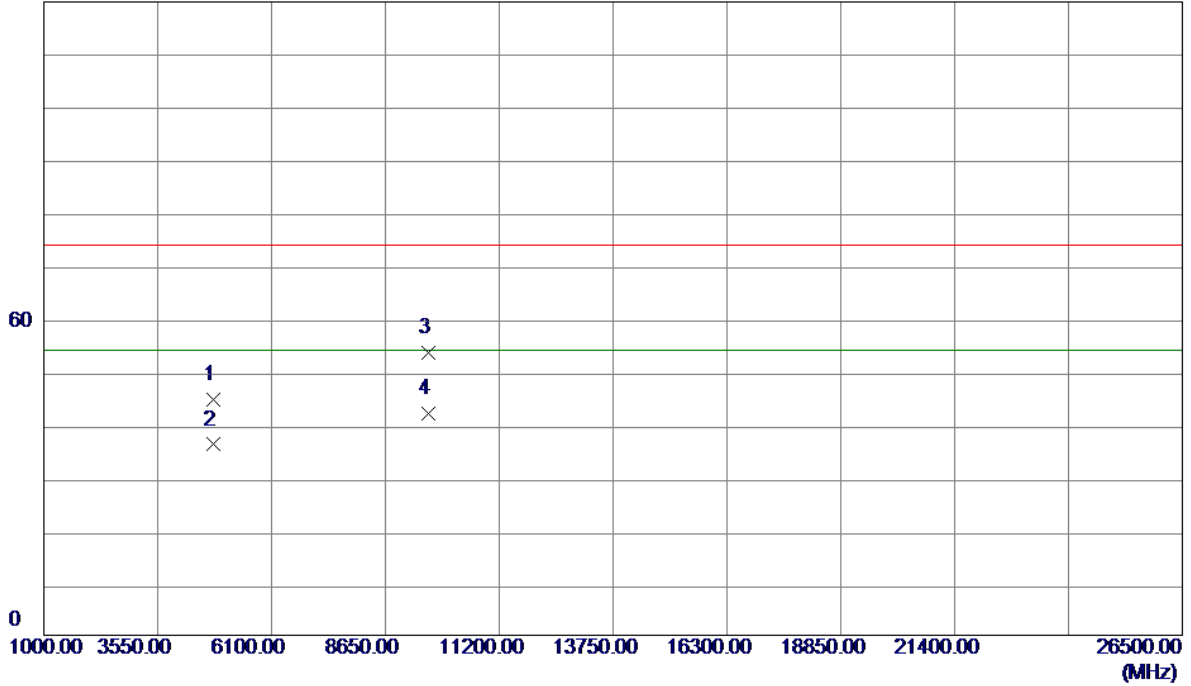


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2387.7900	26.35	30.96	57.31	74.00	-16.69	Peak	
2	2387.7900	13.36	30.96	44.32	54.00	-9.68	AVG	
3	2402.0000	65.93	31.01	96.94	74.00	22.94	Peak	No Limit
4 *	2402.0000	65.67	31.01	96.68	54.00	42.68	AVG	No Limit

Test Mode : TX 2402MHz _CH00_1 Mbps_Without Pistol

Vertical

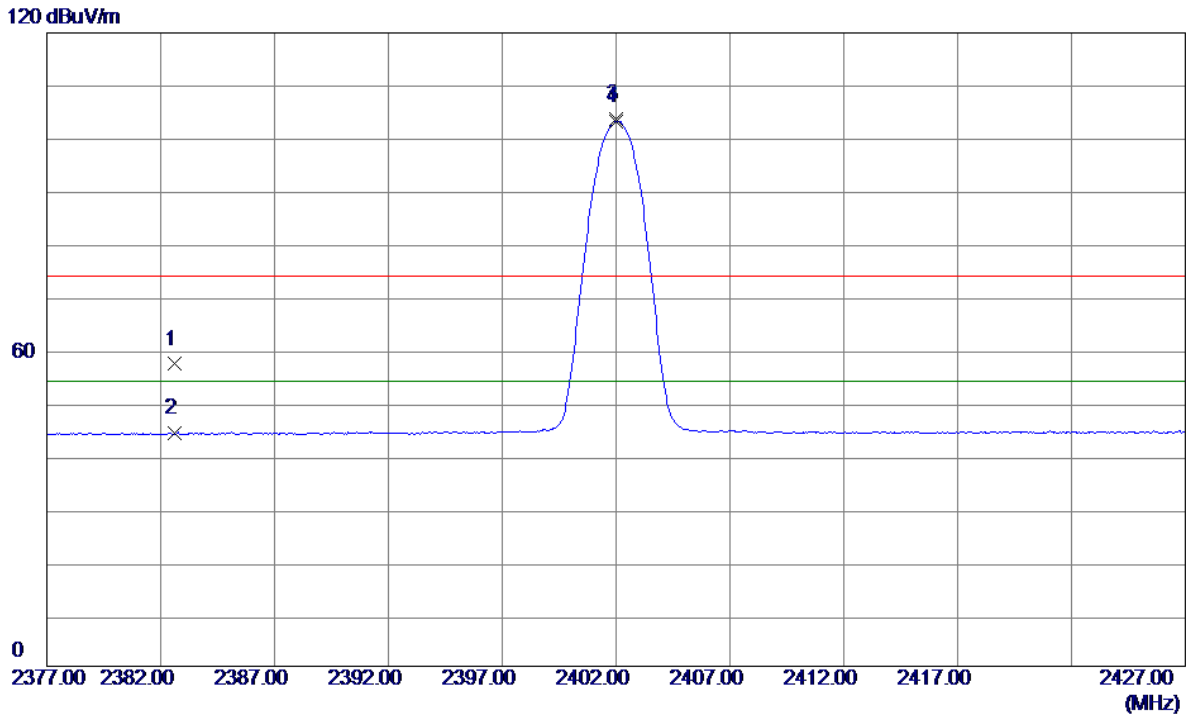
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4804.0000	56.10	-11.50	44.60	74.00	-29.40	Peak	
2	4804.0000	47.62	-11.50	36.12	54.00	-17.88	AVG	
3	9608.0000	52.90	0.69	53.59	74.00	-20.41	Peak	
4 *	9608.0000	41.34	0.69	42.03	54.00	-11.97	AVG	

Test Mode : TX 2402MHz _CH00_1 Mbps_Without Pistol

Horizontal

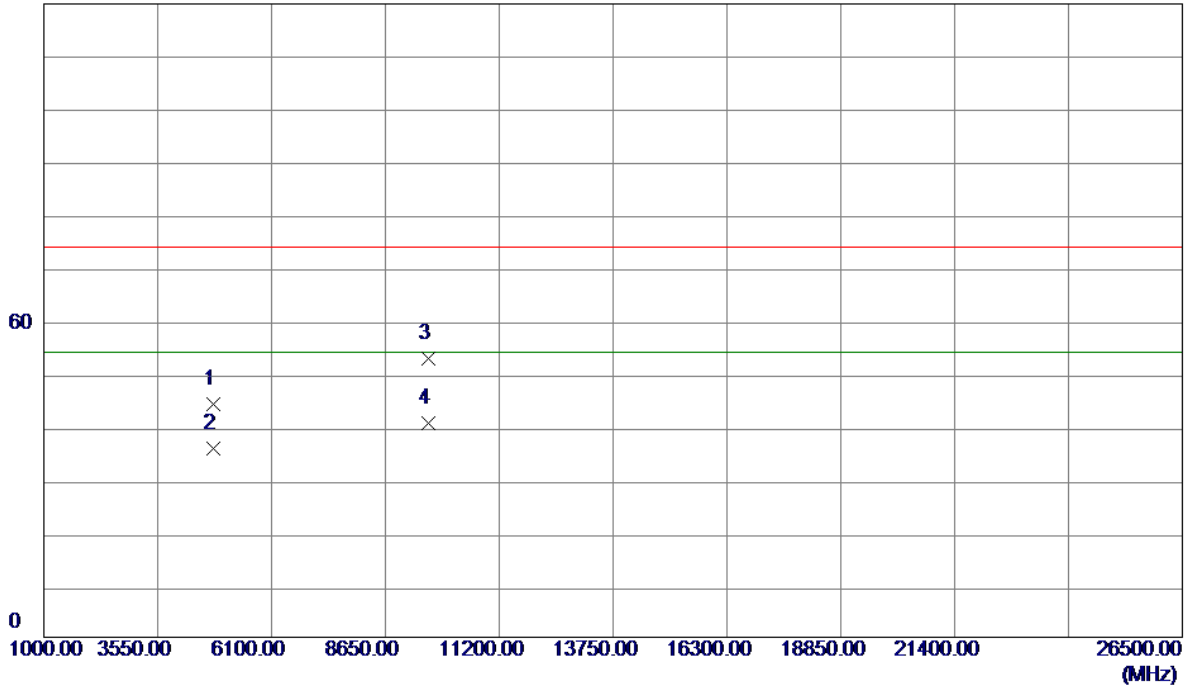


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2382.5900	26.30	30.94	57.24	74.00	-16.76	Peak	
2	2382.5900	13.29	30.94	44.23	54.00	-9.77	AVG	
3	2402.0000	72.64	31.01	103.65	74.00	29.65	Peak	No Limit
4 *	2402.0000	72.30	31.01	103.31	54.00	49.31	AVG	No Limit

Test Mode : TX 2402MHz _CH00_1 Mbps_Without Pistol

Horizontal

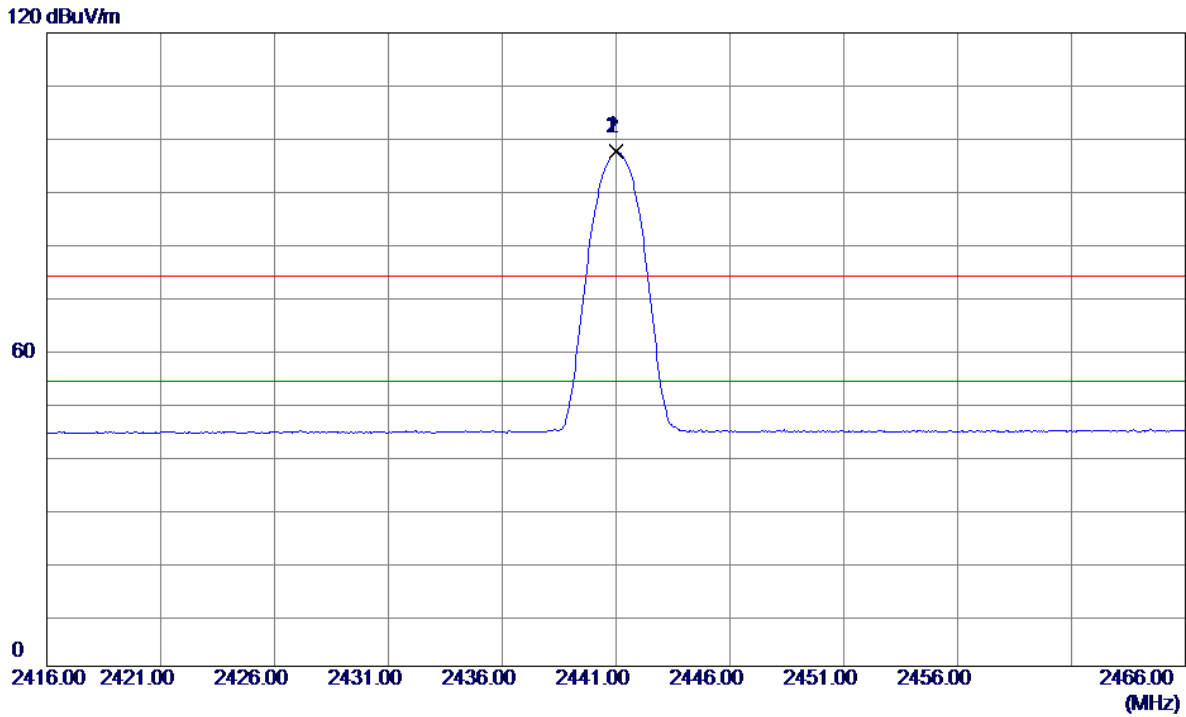
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4804.0000	55.57	-11.50	44.07	74.00	-29.93	Peak	
2	4804.0000	47.27	-11.50	35.77	54.00	-18.23	AVG	
3	9608.0000	52.18	0.69	52.87	74.00	-21.13	Peak	
4 *	9608.0000	39.76	0.69	40.45	54.00	-13.55	AVG	

Test Mode : TX 2441MHz _CH39_ 1 Mbps_ Without Pistol

Vertical

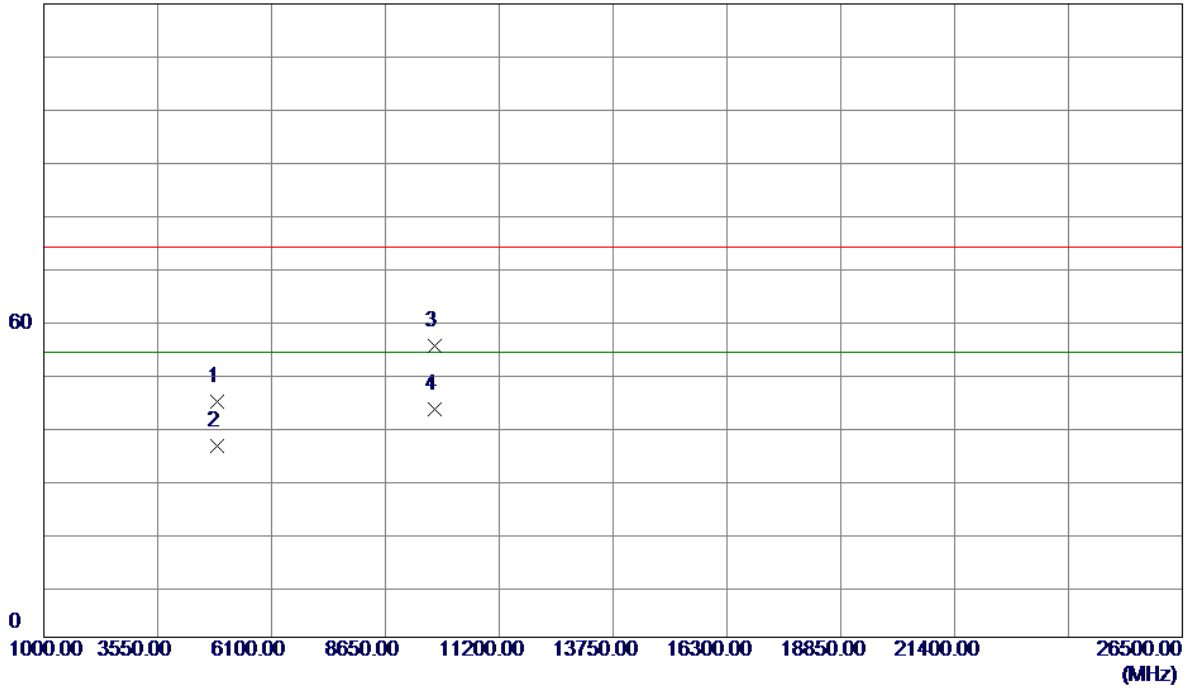


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2441.0000	66.48	31.15	97.63	74.00	23.63	Peak	No Limit
2 *	2441.0000	66.18	31.15	97.33	54.00	43.33	AVG	No Limit

Test Mode : TX 2441MHz _CH39_1 Mbps_Without Pistol

Vertical

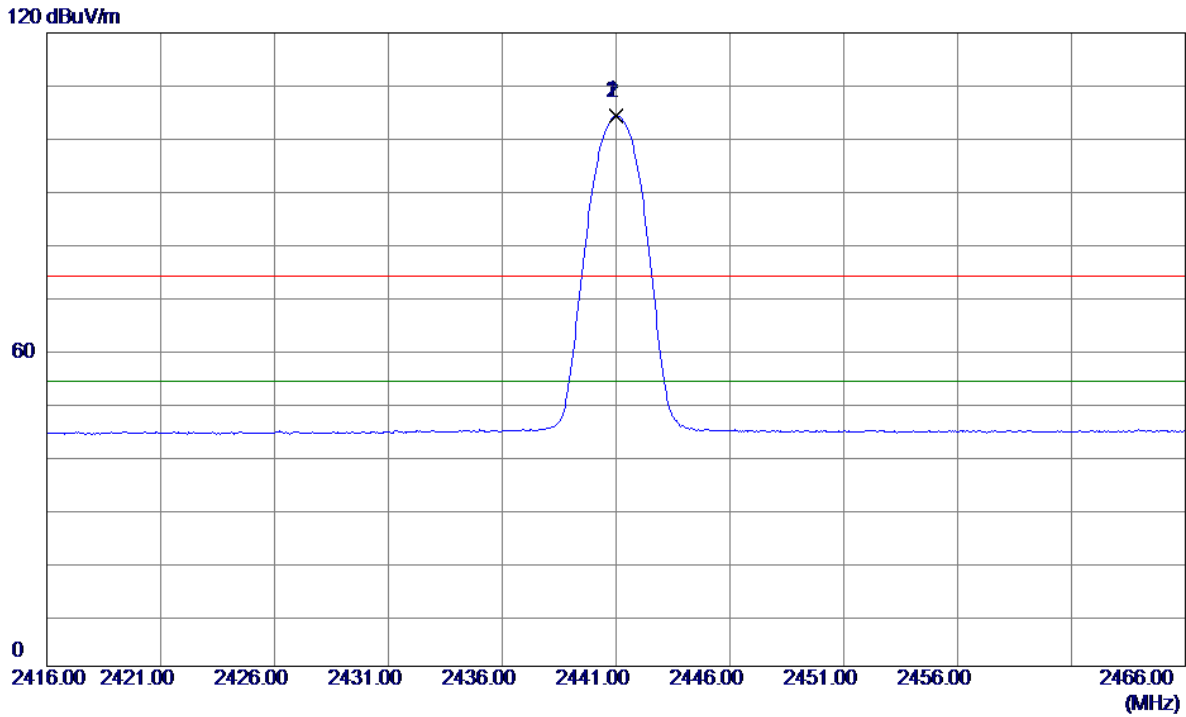
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4882.0000	55.92	-11.38	44.54	74.00	-29.46	Peak	
2	4882.0000	47.52	-11.38	36.14	54.00	-17.86	AVG	
3	9764.0000	54.05	1.15	55.20	74.00	-18.80	Peak	
4 *	9764.0000	42.07	1.15	43.22	54.00	-10.78	AVG	

Test Mode : TX 2441MHz _CH39_1 Mbps_Without Pistol

Horizontal

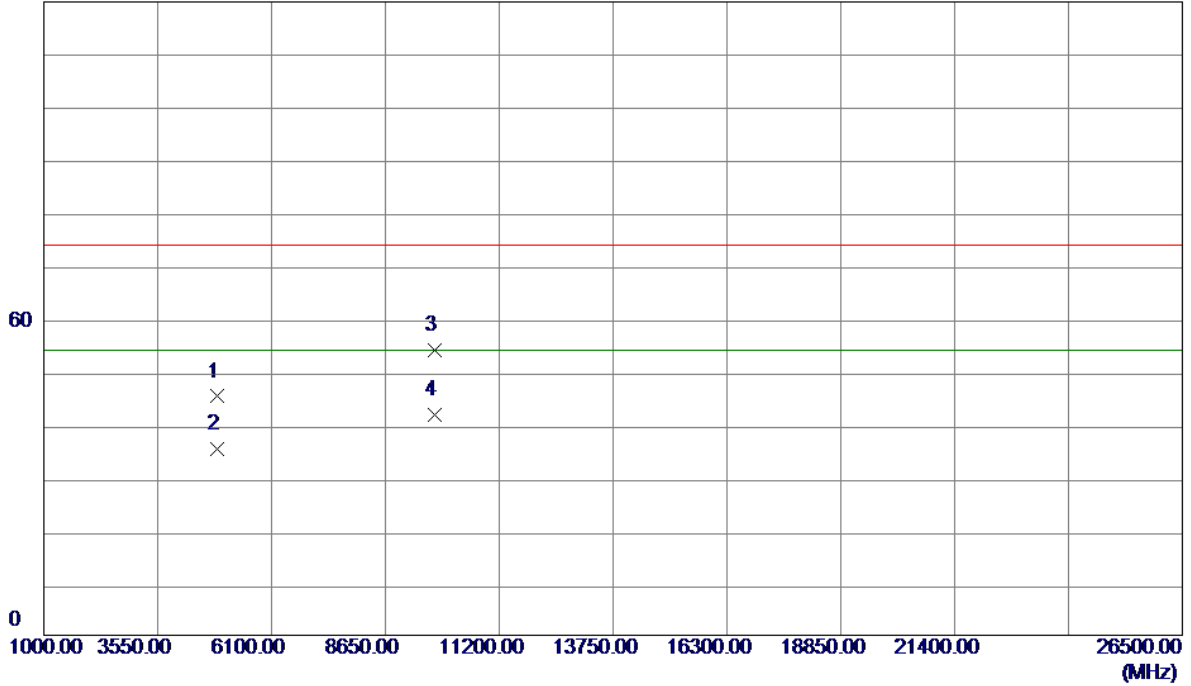


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2441.0000	73.32	31.15	104.47	74.00	30.47	Peak	No Limit
2 *	2441.0000	73.07	31.15	104.22	54.00	50.22	AVG	No Limit

Test Mode : TX 2441MHz _CH39_1 Mbps_Without Pistol

Horizontal

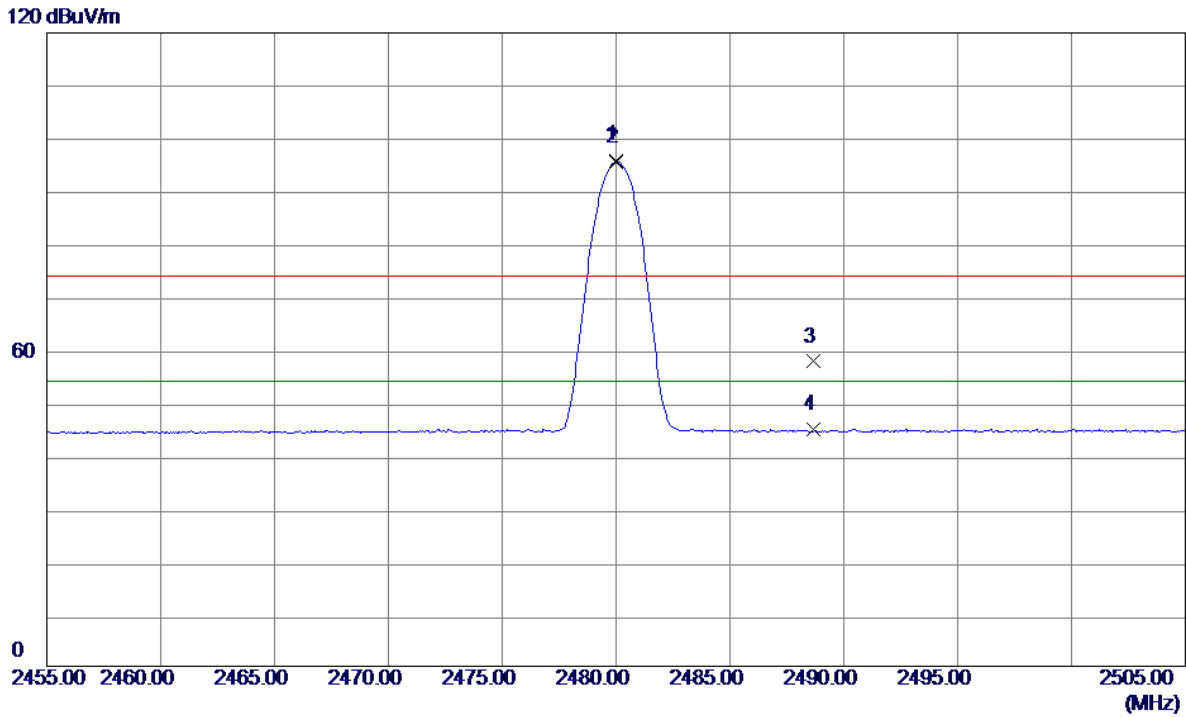
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4882.0000	56.62	-11.38	45.24	74.00	-28.76	Peak	
2	4882.0000	46.55	-11.38	35.17	54.00	-18.83	AVG	
3	9764.0000	52.89	1.15	54.04	74.00	-19.96	Peak	
4 *	9764.0000	40.61	1.15	41.76	54.00	-12.24	AVG	

Test Mode : TX 2480MHz _CH78_ 1 Mbps_ Without Pistol

Vertical

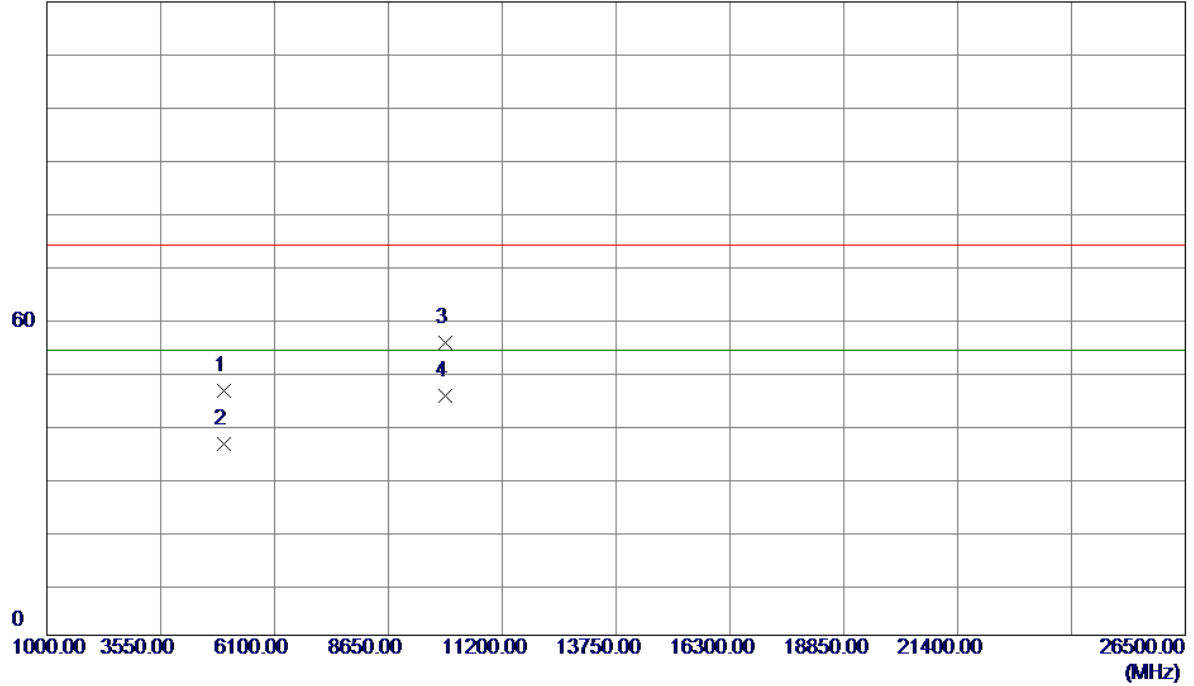


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2480.0000	64.58	31.30	95.88	74.00	21.88	Peak	No Limit
2 *	2480.0000	64.27	31.30	95.57	54.00	41.57	AVG	No Limit
3	2488.6480	26.39	31.33	57.72	74.00	-16.28	Peak	
4	2488.6480	13.55	31.33	44.88	54.00	-9.12	AVG	

Test Mode : TX 2480MHz _CH78_1 Mbps_Without Pistol

Vertical

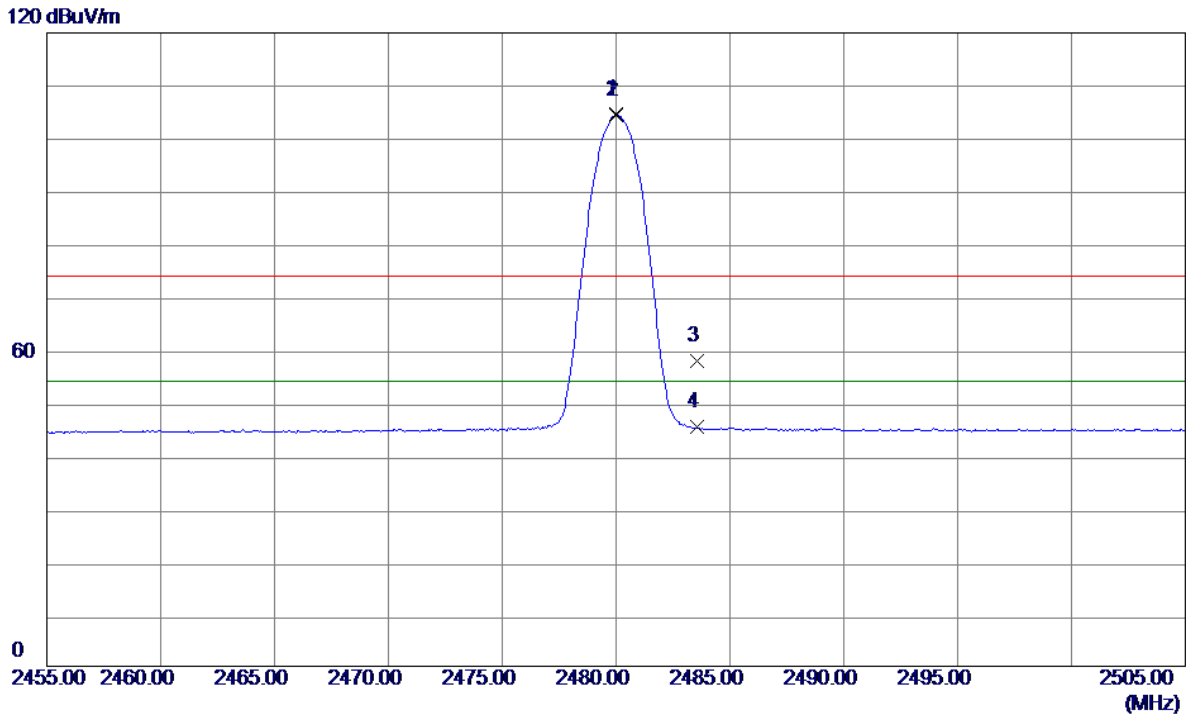
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4960.0000	57.52	-11.26	46.26	74.00	-27.74	Peak	
2	4960.0000	47.50	-11.26	36.24	54.00	-17.76	AVG	
3	9920.0000	53.81	1.60	55.41	74.00	-18.59	Peak	
4 *	9920.0000	43.80	1.60	45.40	54.00	-8.60	AVG	

Test Mode : TX 2480MHz _CH78_1 Mbps_Without Pistol

Horizontal

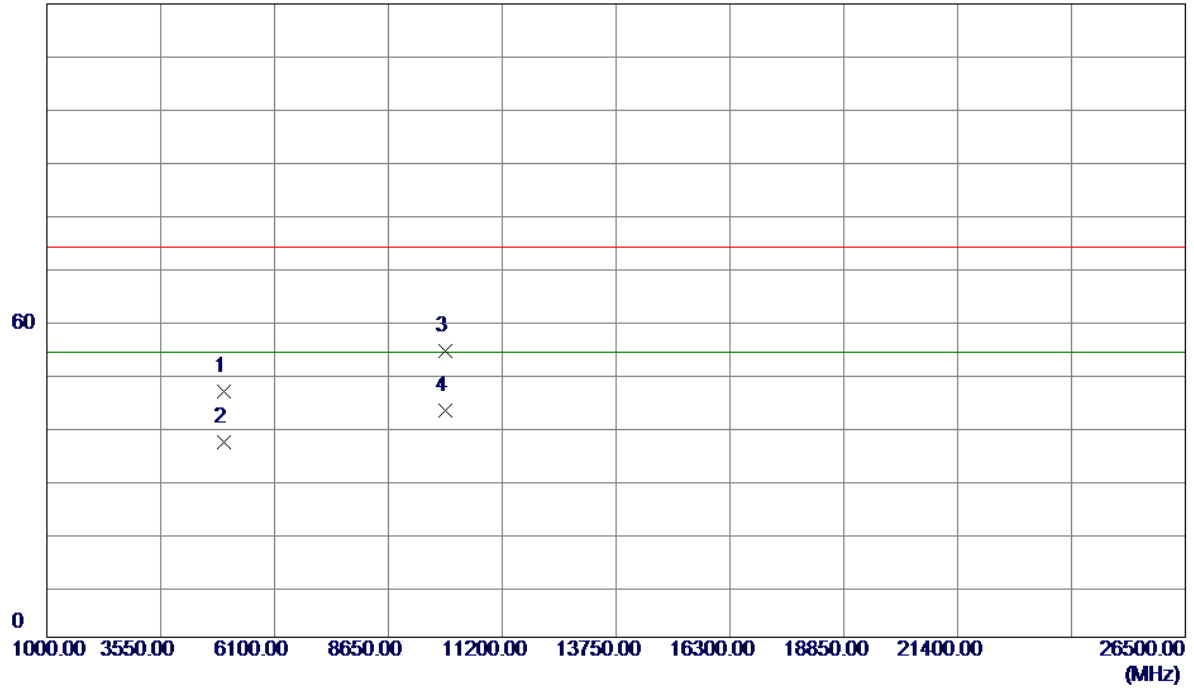


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2480.0000	73.31	31.30	104.61	74.00	30.61	Peak	No Limit
2 *	2480.0000	73.07	31.30	104.37	54.00	50.37	AVG	No Limit
3	2483.5330	26.43	31.31	57.74	74.00	-16.26	Peak	
4	2483.5330	14.03	31.31	45.34	54.00	-8.66	AVG	

Test Mode : TX 2480MHz _CH78_1 Mbps_Without Pistol

Horizontal

120 dBuV/m

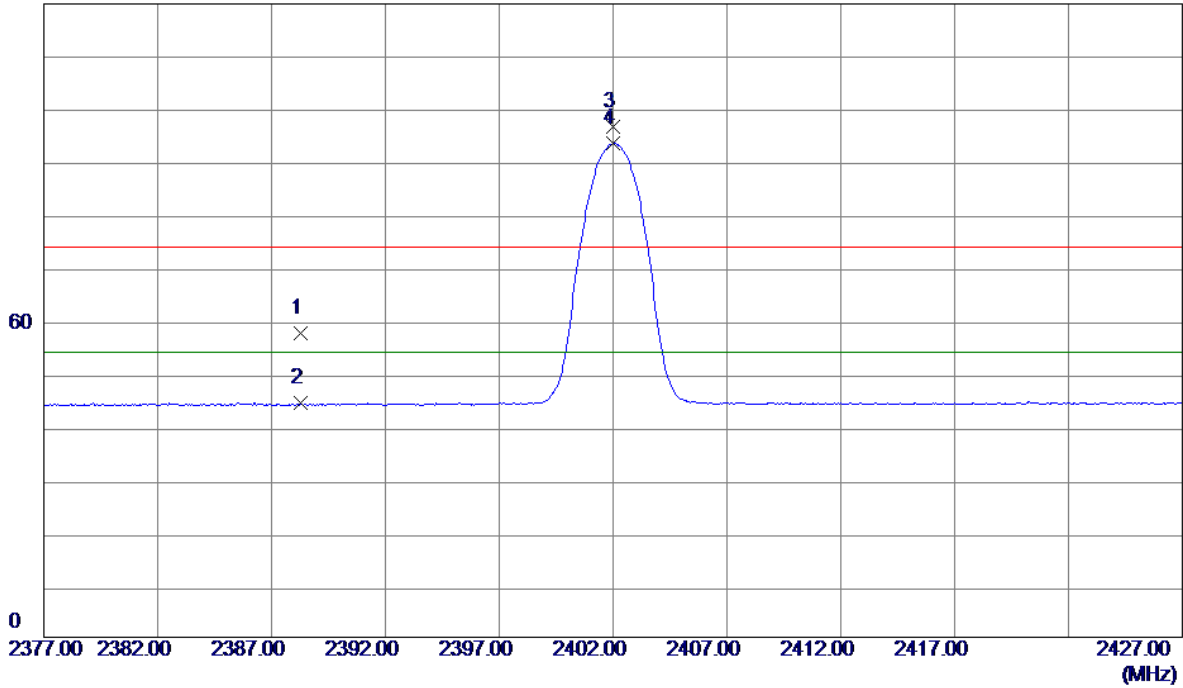


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4960.0000	57.71	-11.26	46.45	74.00	-27.55	Peak	
2	4960.0000	48.20	-11.26	36.94	54.00	-17.06	AVG	
3	9920.0000	52.70	1.60	54.30	74.00	-19.70	Peak	
4 *	9920.0000	41.39	1.60	42.99	54.00	-11.01	AVG	

Test Mode : TX 2402MHz _CH00_3 Mbps_Without Pistol

Vertical

120 dBuV/m

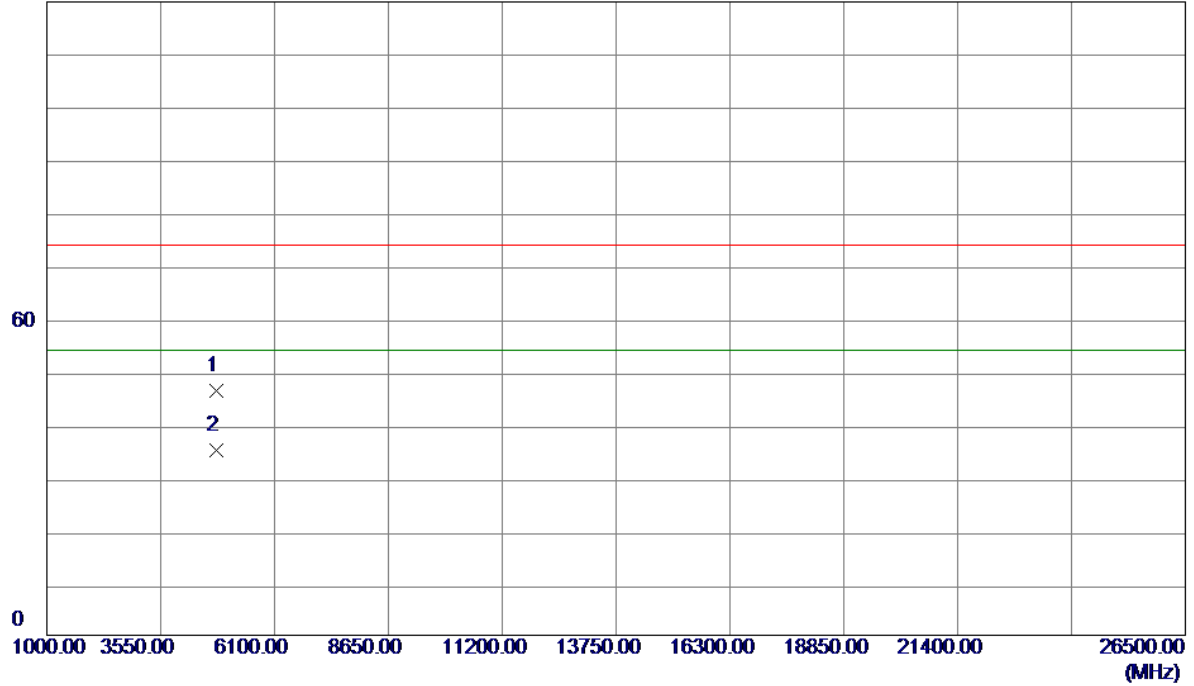


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2388.2970	26.54	30.96	57.50	74.00	-16.50	Peak	
2	2388.2970	13.41	30.96	44.37	54.00	-9.63	AVG	
3	2402.0000	65.68	31.01	96.69	74.00	22.69	Peak	No Limit
4 *	2402.0000	62.52	31.01	93.53	54.00	39.53	AVG	No Limit

Test Mode : TX 2402MHz _CH00_ 3 Mbps_ Without Pistol

Vertical

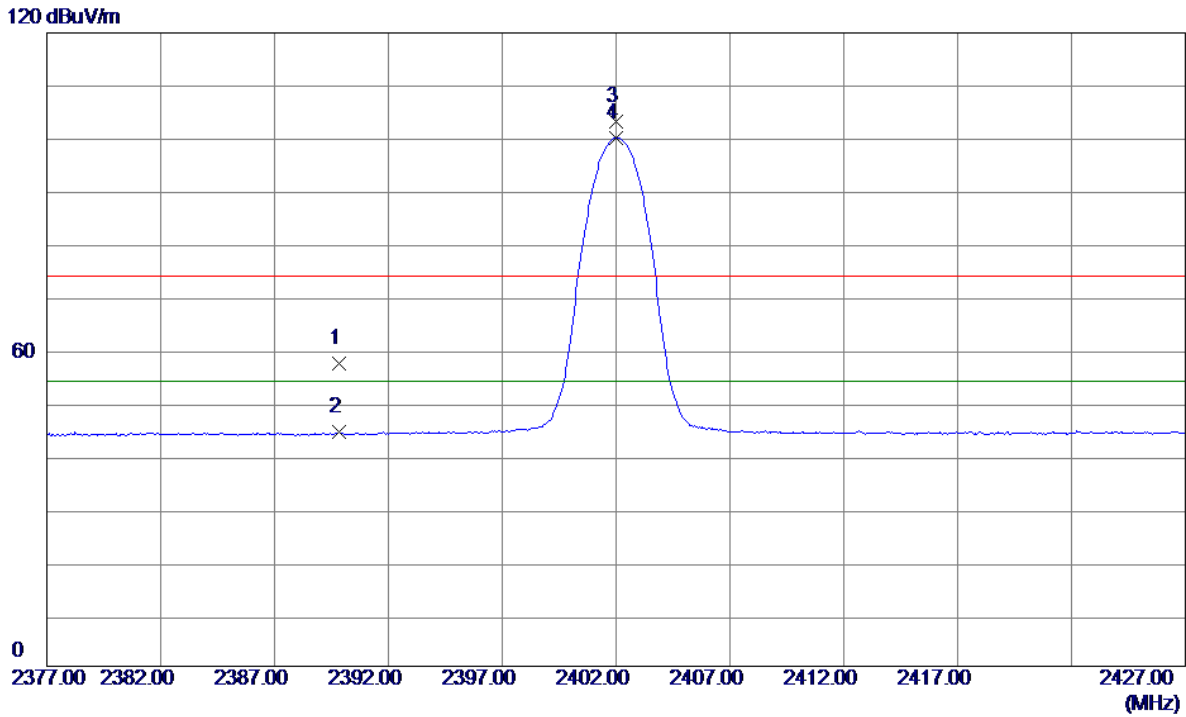
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4804.0000	57.86	-11.50	46.36	74.00	-27.64	Peak	
2 *	4804.0000	46.60	-11.50	35.10	54.00	-18.90	AVG	

Test Mode : TX 2402MHz _CH00_ 3 Mbps_ Without Pistol

Horizontal

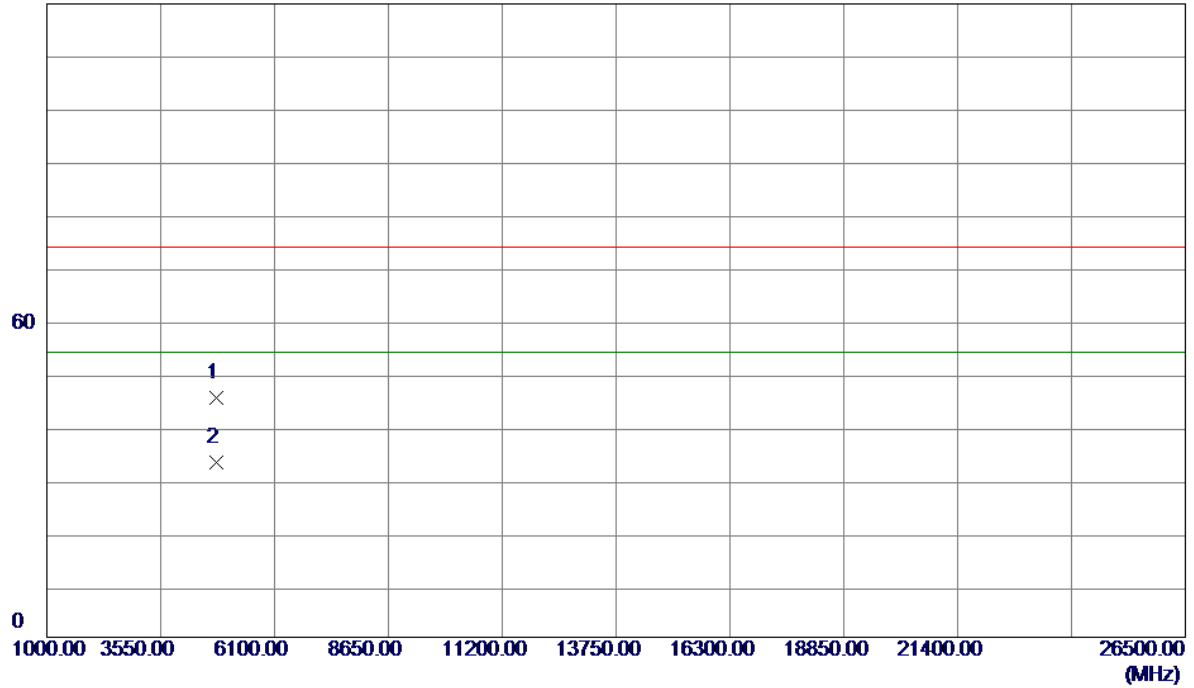


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2389.8500	26.36	30.96	57.32	74.00	-16.68	Peak	
2	2389.8500	13.34	30.96	44.30	54.00	-9.70	AVG	
3	2402.0000	72.25	31.01	103.26	74.00	29.26	Peak	No Limit
4 *	2402.0000	69.09	31.01	100.10	54.00	46.10	AVG	No Limit

Test Mode : TX 2402MHz _CH00_3 Mbps_Without Pistol

Horizontal

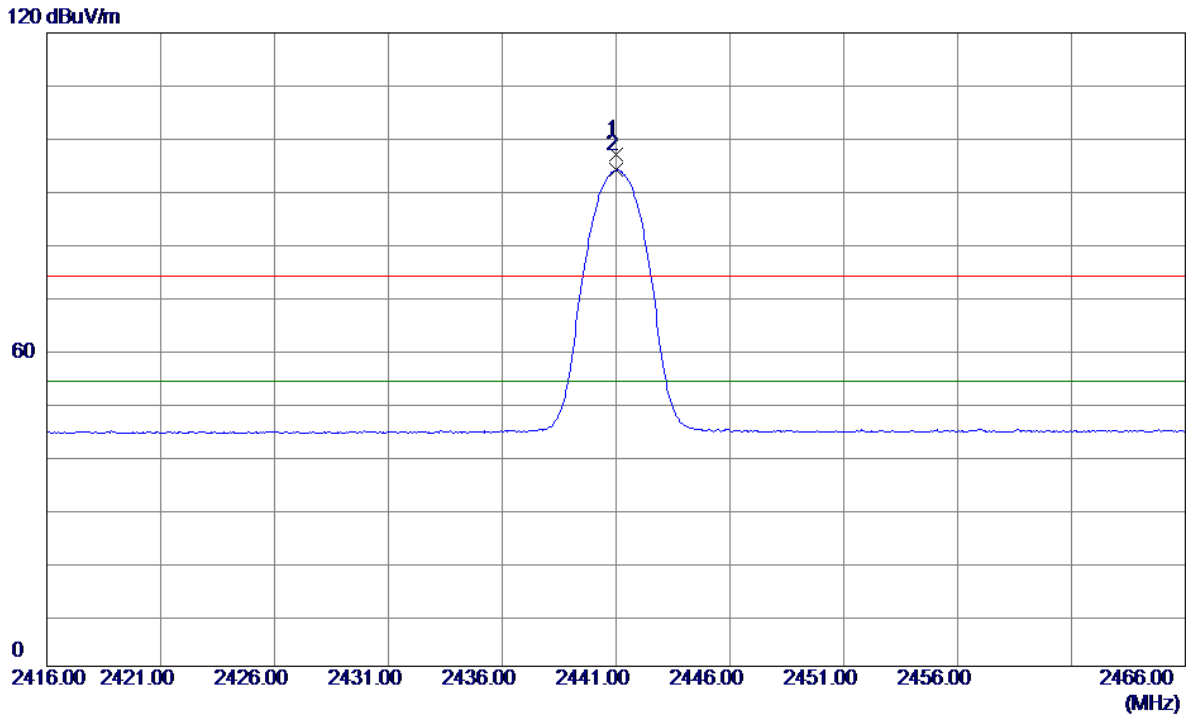
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4804.0000	56.89	-11.50	45.39	74.00	-28.61	Peak	
2 *	4804.0000	44.63	-11.50	33.13	54.00	-20.87	AVG	

Test Mode : TX 2441MHz _CH39_3 Mbps_Without Pistol

Vertical

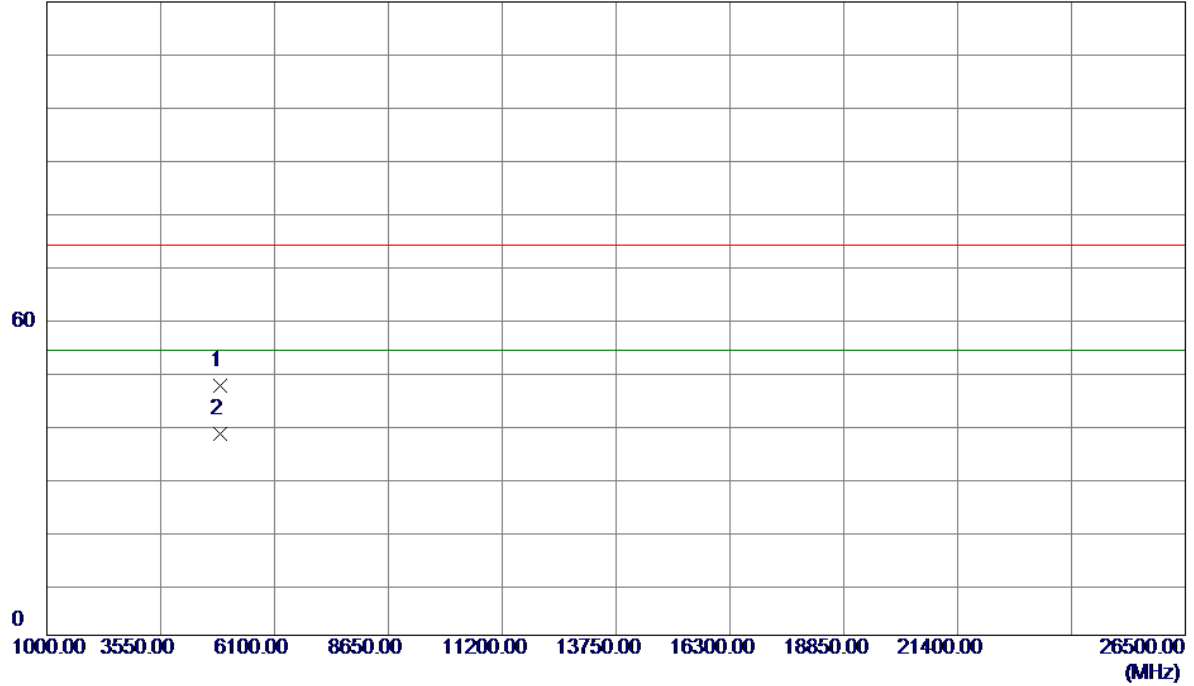


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2441.0000	65.83	31.15	96.98	74.00	22.98	Peak	No Limit
2 *	2441.0000	62.82	31.15	93.97	54.00	39.97	AVG	No Limit

Test Mode : TX 2441MHz _CH39_ 3 Mbps_ Without Pistol

Vertical

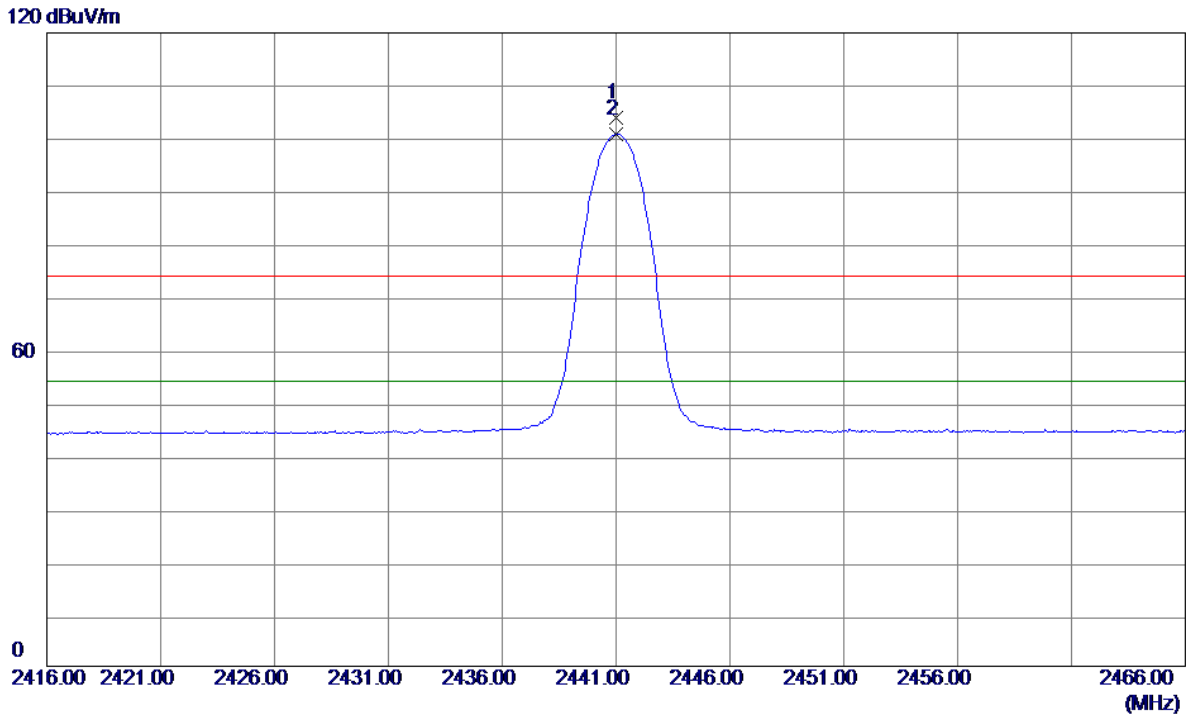
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4882.0000	58.66	-11.38	47.28	74.00	-26.72	Peak	
2 *	4882.0000	49.47	-11.38	38.09	54.00	-15.91	AVG	

Test Mode : TX 2441MHz _CH39_ 3 Mbps_ Without Pistol

Horizontal

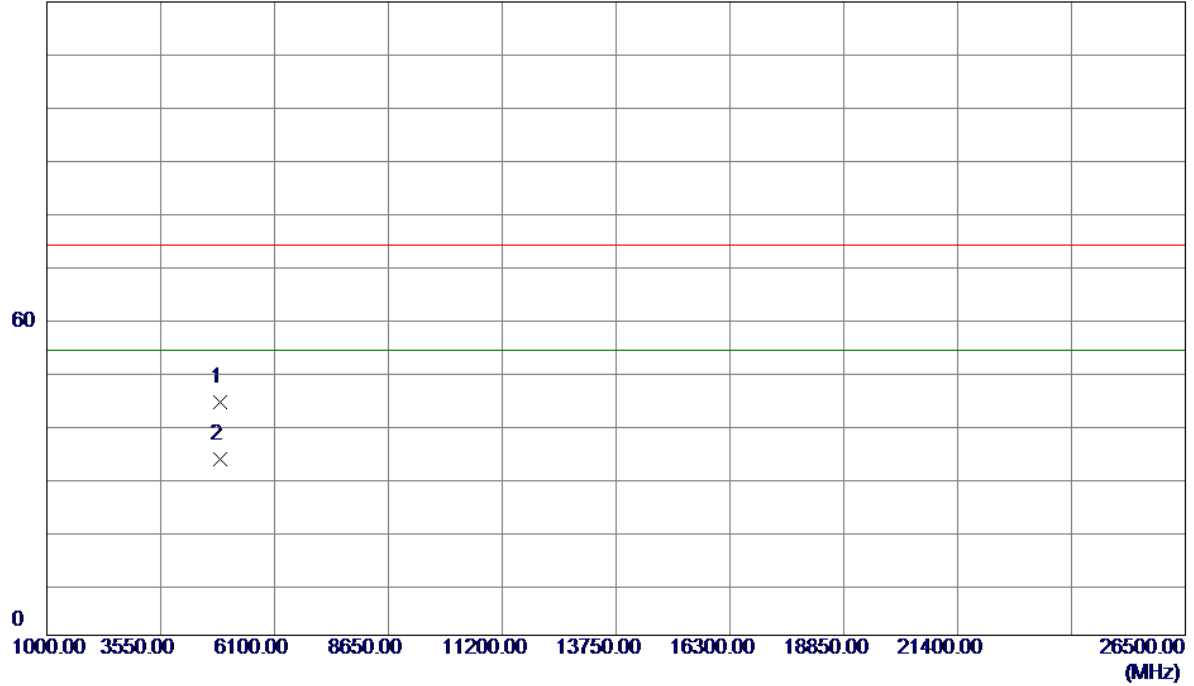


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2441.0000	72.66	31.15	103.81	74.00	29.81	Peak	No Limit
2 *	2441.0000	69.69	31.15	100.84	54.00	46.84	AVG	No Limit

Test Mode : TX 2441MHz _CH39_ 3 Mbps_ Without Pistol

Horizontal

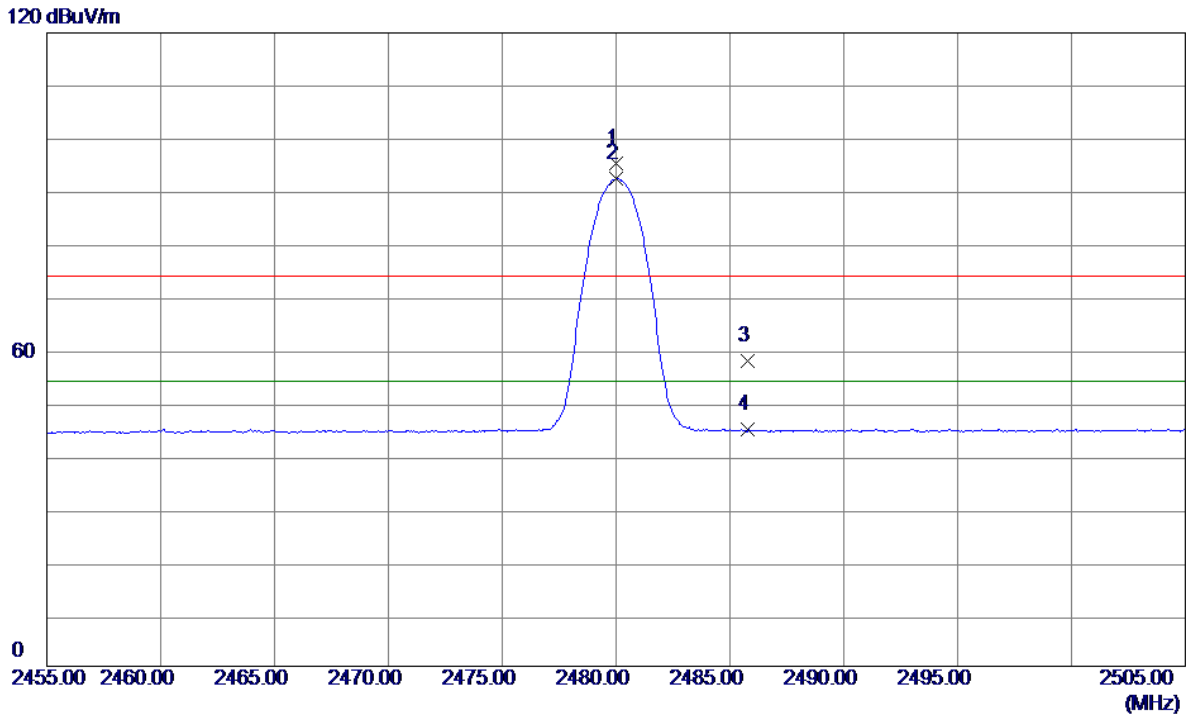
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4882.0000	55.43	-11.38	44.05	74.00	-29.95	Peak	
2 *	4882.0000	44.70	-11.38	33.32	54.00	-20.68	AVG	

Test Mode : TX 2480MHz _CH78_3 Mbps_Without Pistol

Vertical

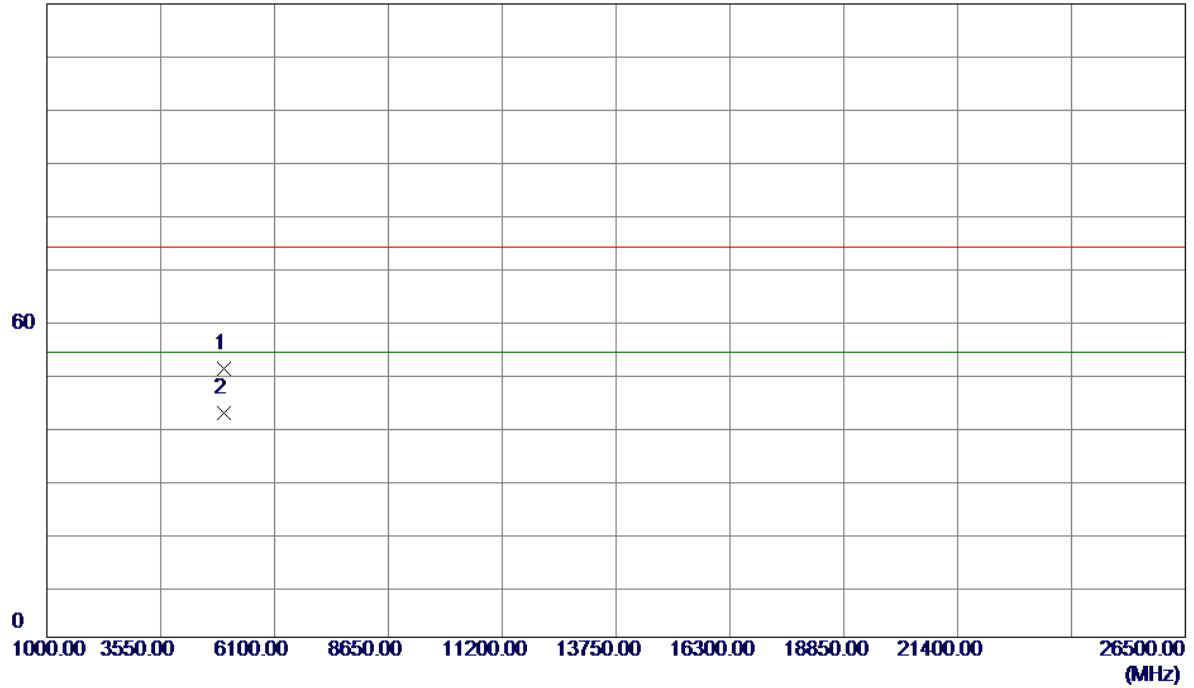


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2480.0000	64.00	31.30	95.30	74.00	21.30	Peak	No Limit
2 *	2480.0000	61.02	31.30	92.32	54.00	38.32	AVG	No Limit
3	2485.7790	26.58	31.32	57.90	74.00	-16.10	Peak	
4	2485.7790	13.65	31.32	44.97	54.00	-9.03	AVG	

Test Mode : TX 2480MHz _CH78_3 Mbps_Without Pistol

Vertical

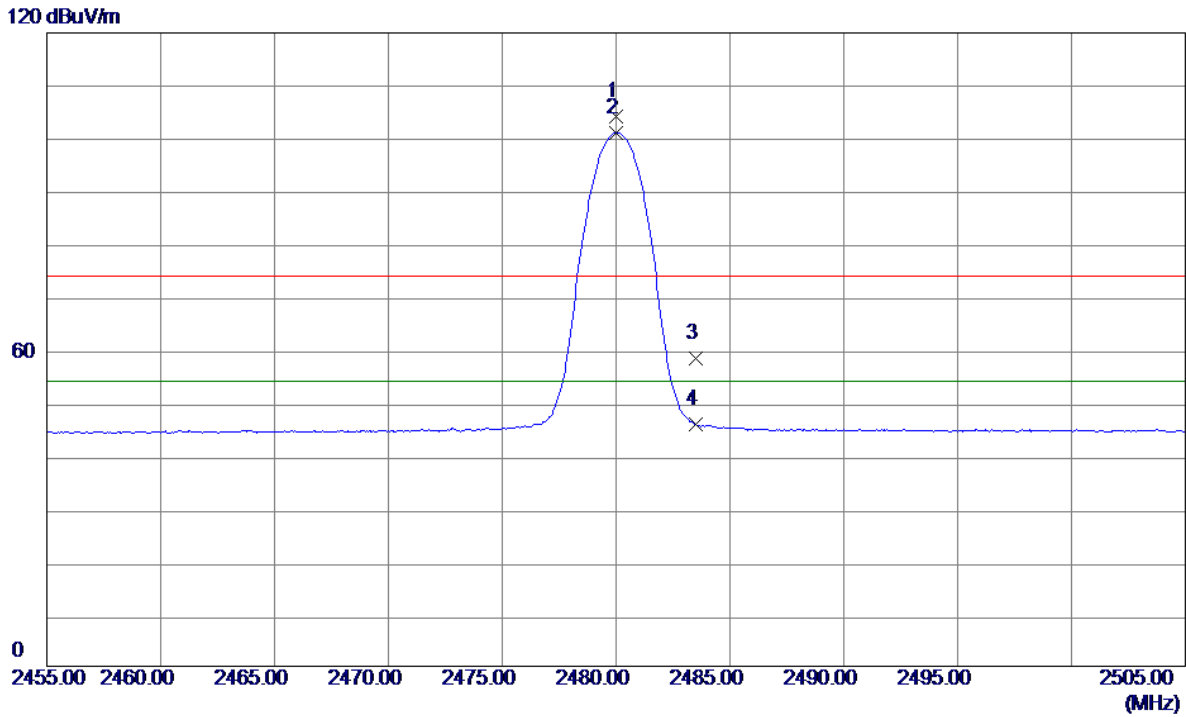
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4960.0000	62.12	-11.26	50.86	74.00	-23.14	Peak	
2 *	4960.0000	53.71	-11.26	42.45	54.00	-11.55	AVG	

Test Mode : TX 2480MHz _CH78_3 Mbps_Without Pistol

Horizontal

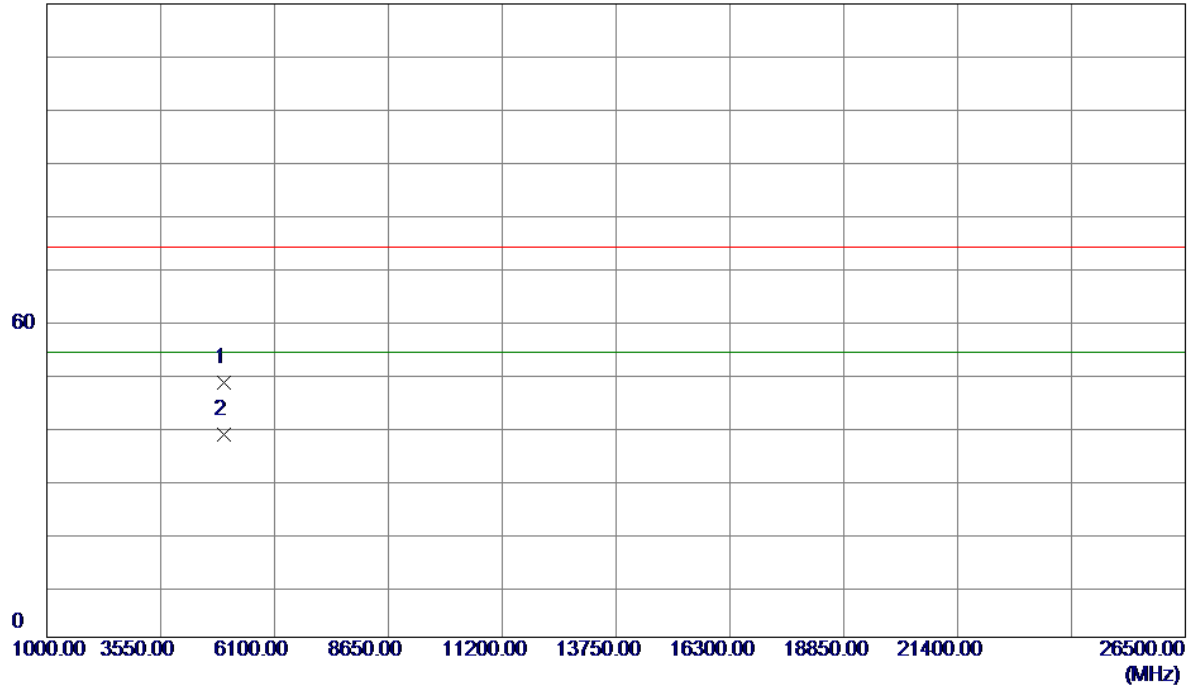


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2480.0000	72.85	31.30	104.15	74.00	30.15	Peak	No Limit
2 *	2480.0000	69.80	31.30	101.10	54.00	47.10	AVG	No Limit
3	2483.5000	27.11	31.31	58.42	74.00	-15.58	Peak	
4	2483.5000	14.53	31.31	45.84	54.00	-8.16	AVG	

Test Mode : TX 2480MHz _CH78_3 Mbps_Without Pistol

Horizontal

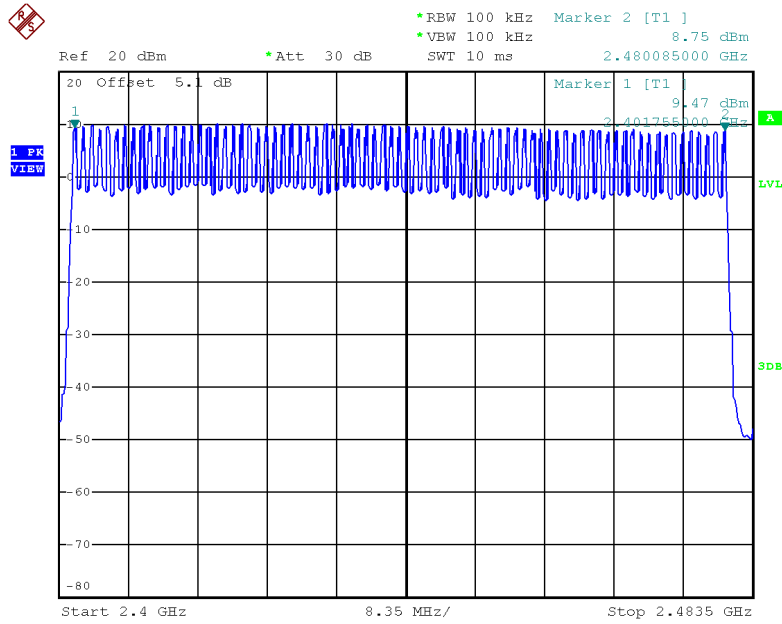
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4960.0000	59.52	-11.26	48.26	74.00	-25.74	Peak	
2 *	4960.0000	49.55	-11.26	38.29	54.00	-15.71	AVG	

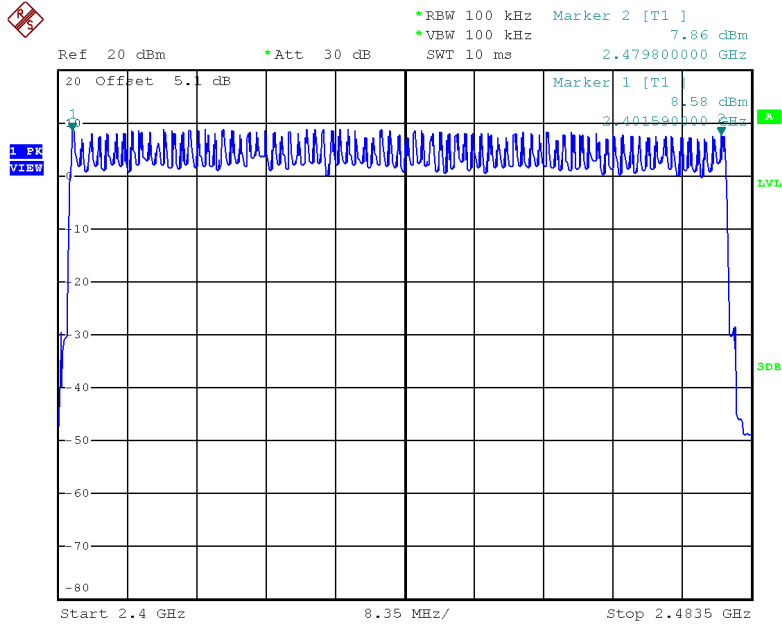
ATTACHMENT E - NUMBER OF HOPPING CHANNEL

Test Mode Hopping Mode_1 Mbps
 Number of Hopping Channel 79



Date: 30.NOV.2016 12:10:49

Test Mode Hopping Mode_3 Mbps
 Number of Hopping Channel 79



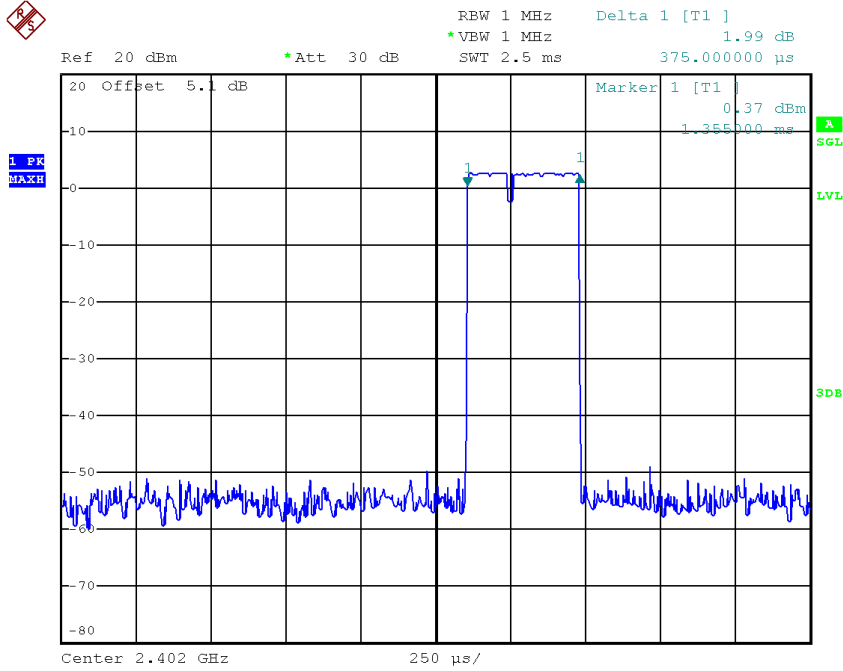
Date: 30.NOV.2016 12:40:56

ATTACHMENT F - AVERAGE TIME OF OCCUPANCY

Test Mode :	TX Mode_1 Mbps
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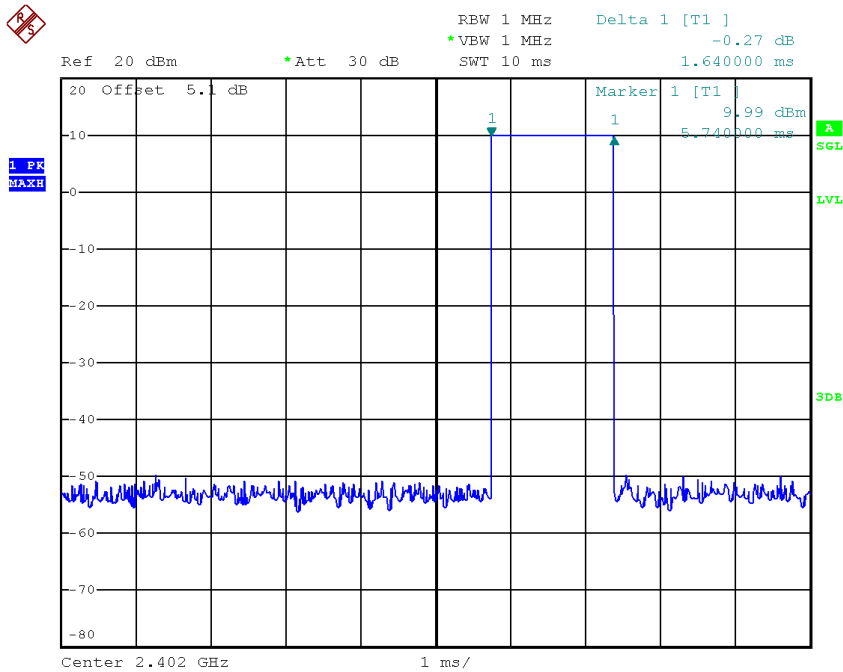
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	2.8800	0.3072	0.4000	Pass
DH3	2402	1.6400	0.2624	0.4000	Pass
DH1	2402	0.3750	0.1200	0.4000	Pass
DH5	2441	2.8800	0.3072	0.4000	Pass
DH3	2441	1.6200	0.2592	0.4000	Pass
DH1	2441	0.3700	0.1184	0.4000	Pass
DH5	2480	2.8800	0.3072	0.4000	Pass
DH3	2480	1.6400	0.2624	0.4000	Pass
DH1	2480	0.3700	0.1184	0.4000	Pass

CH00-DH1



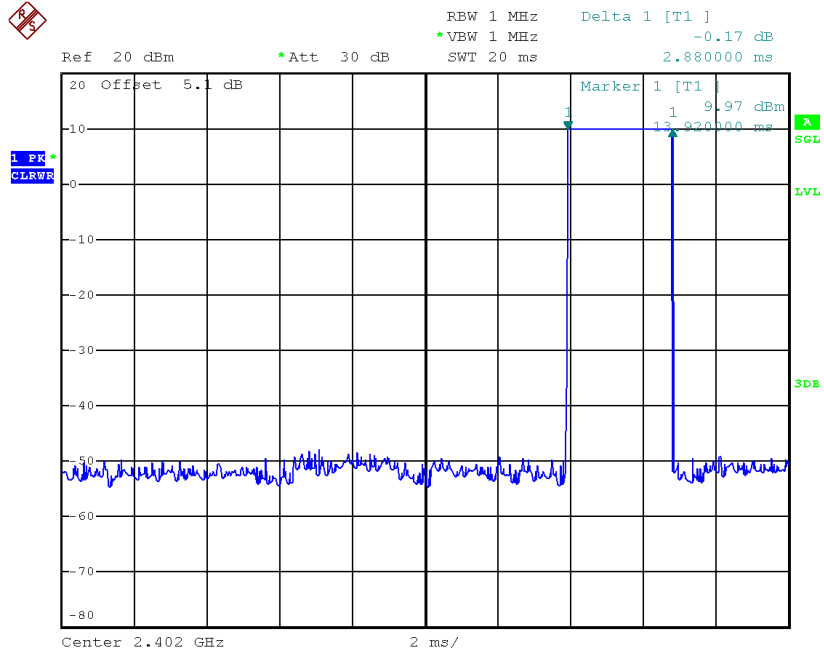
Date: 30.NOV.2016 11:59:31

CH00-DH3



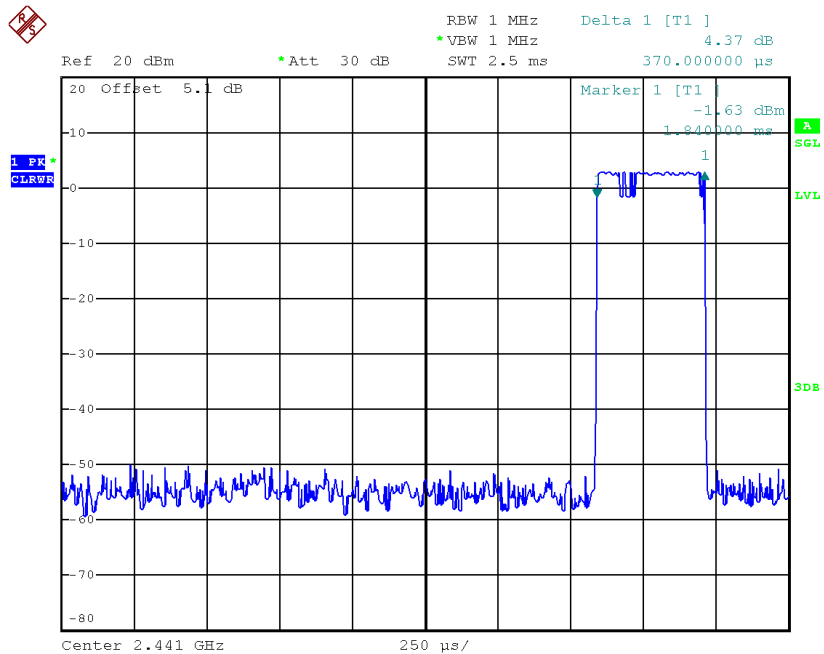
Date: 30.NOV.2016 12:03:42

CH00-DH5



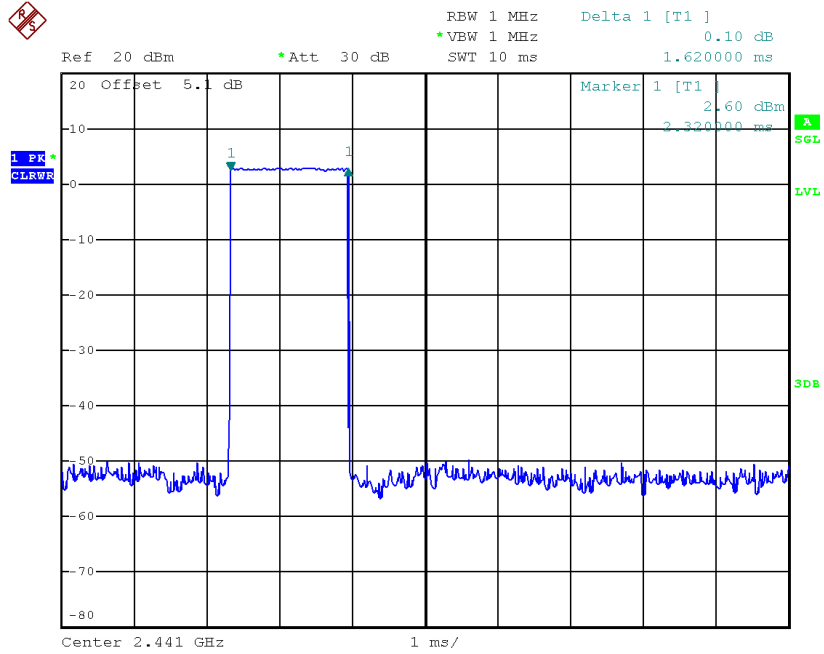
Date: 30.NOV.2016 12:04:21

CH39-DH1



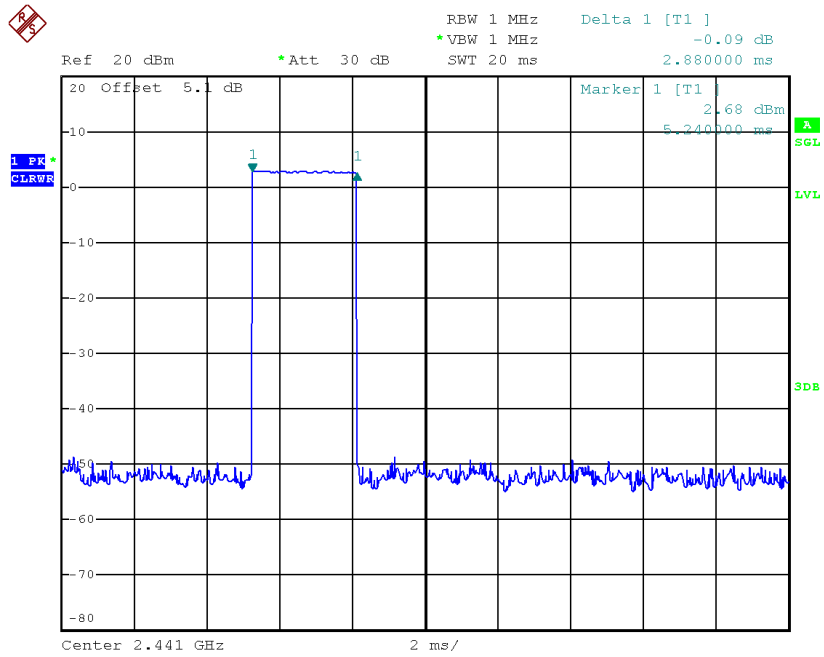
Date: 30.NOV.2016 11:59:53

CH39-DH3



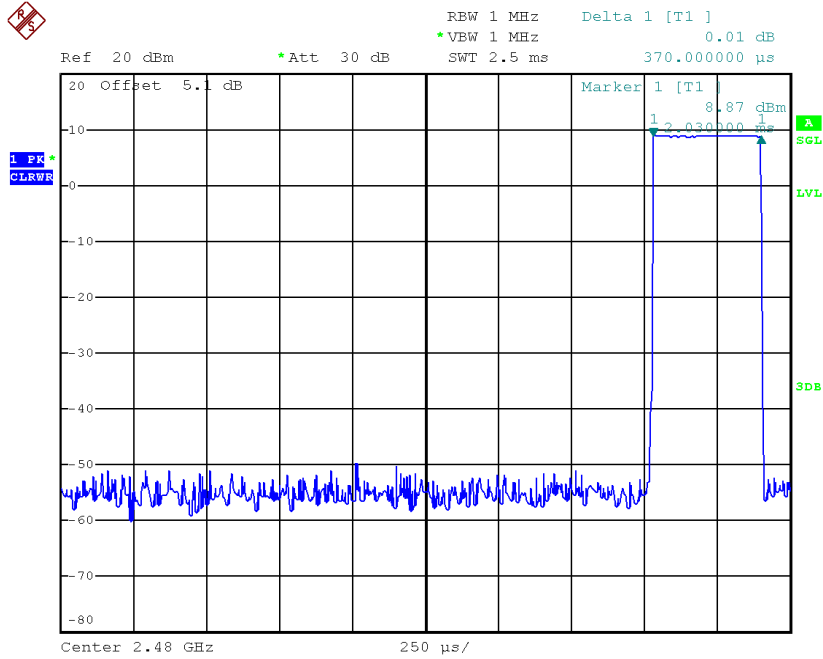
Date: 30.NOV.2016 12:04:02

CH39-DH5



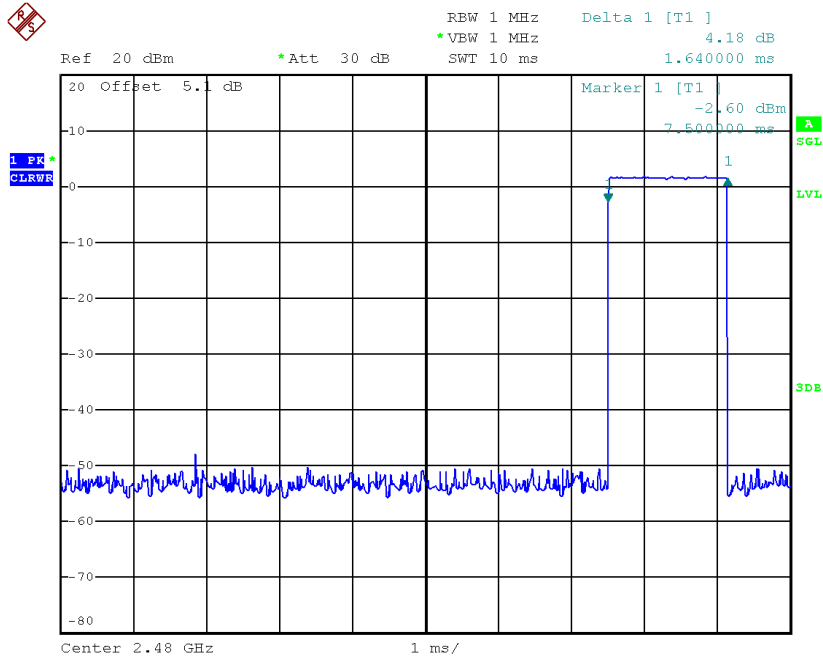
Date: 30.NOV.2016 12:04:25

CH78-DH1



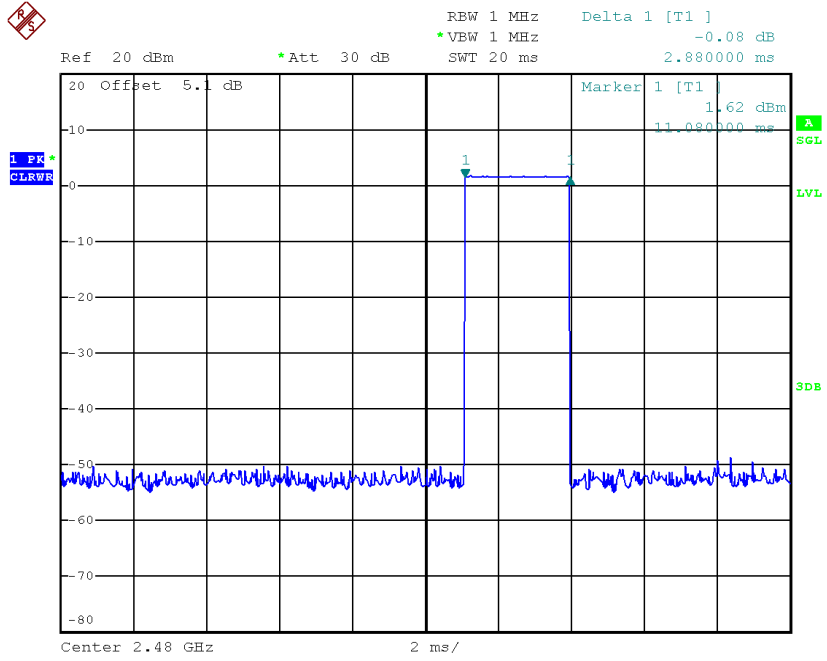
Date: 30.NOV.2016 11:59:56

CH78-DH3



Date: 30.NOV.2016 12:04:07

CH78-DH5

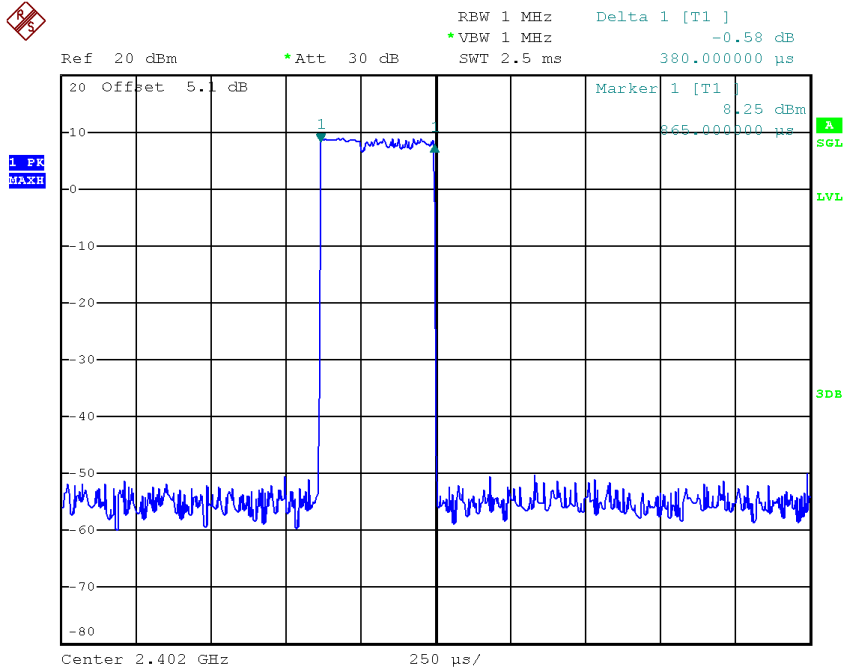


Date: 30.NOV.2016 12:04:29

Test Mode :	TX Mode_3 Mbps
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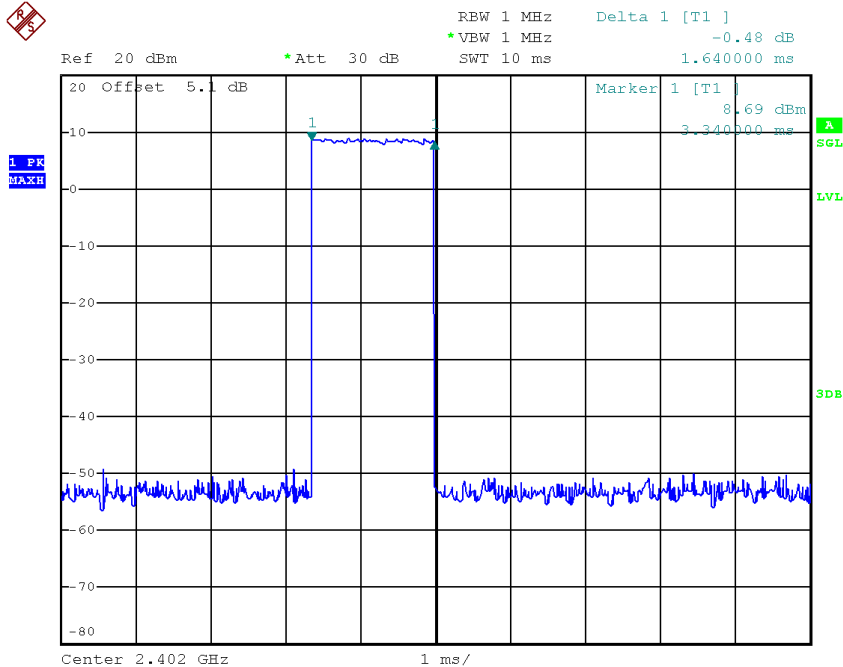
Data Packet	Frequency	Pulse Duration(ms)	Dwell Time(s)	Limits(s)	Test Result
DH5	2402	2.8800	0.3072	0.4000	Pass
DH3	2402	1.6400	0.2624	0.4000	Pass
DH1	2402	0.3800	0.1216	0.4000	Pass
DH5	2441	2.9200	0.3115	0.4000	Pass
DH3	2441	1.6400	0.2624	0.4000	Pass
DH1	2441	0.3750	0.1200	0.4000	Pass
DH5	2480	2.8800	0.3072	0.4000	Pass
DH3	2480	1.6400	0.2624	0.4000	Pass
DH1	2480	0.3750	0.1200	0.4000	Pass

CH00-DH1



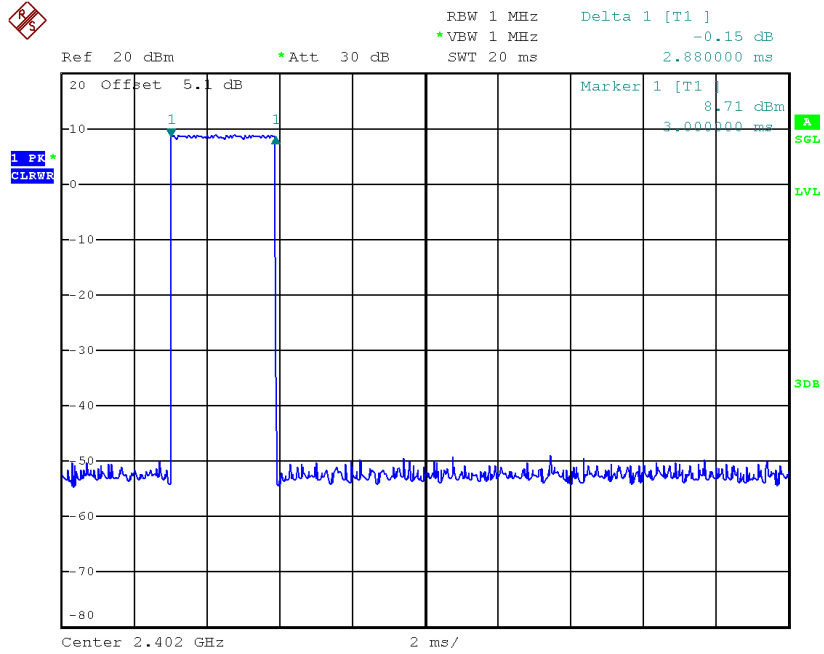
Date: 30.NOV.2016 12:31:15

CH00-DH3



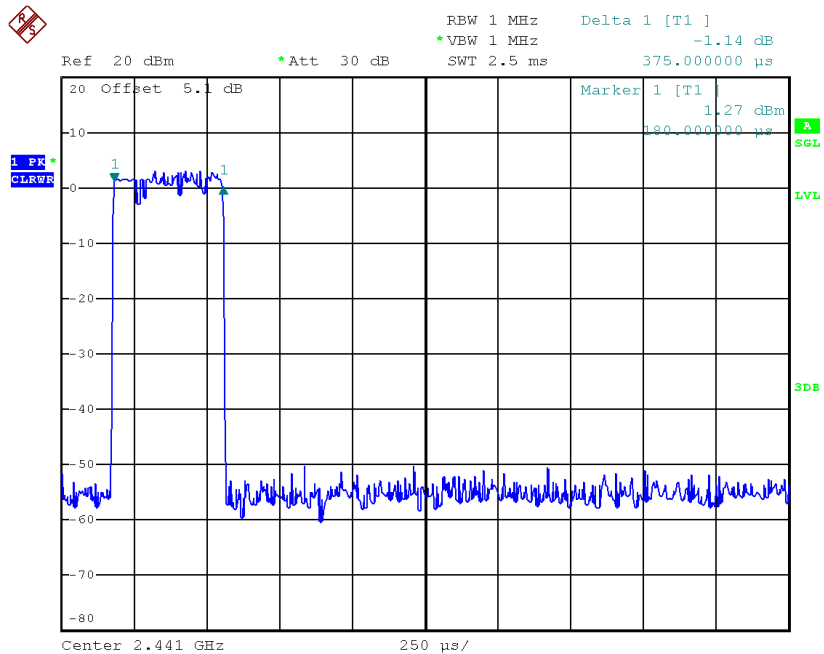
Date: 30.NOV.2016 12:36:14

CH00-DH5



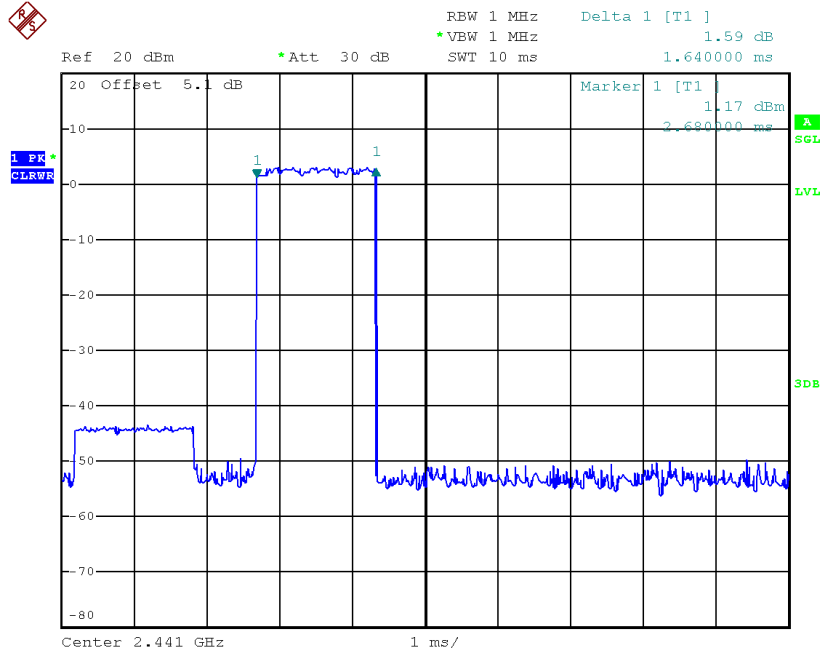
Date: 30.NOV.2016 12:37:22

CH39-DH1



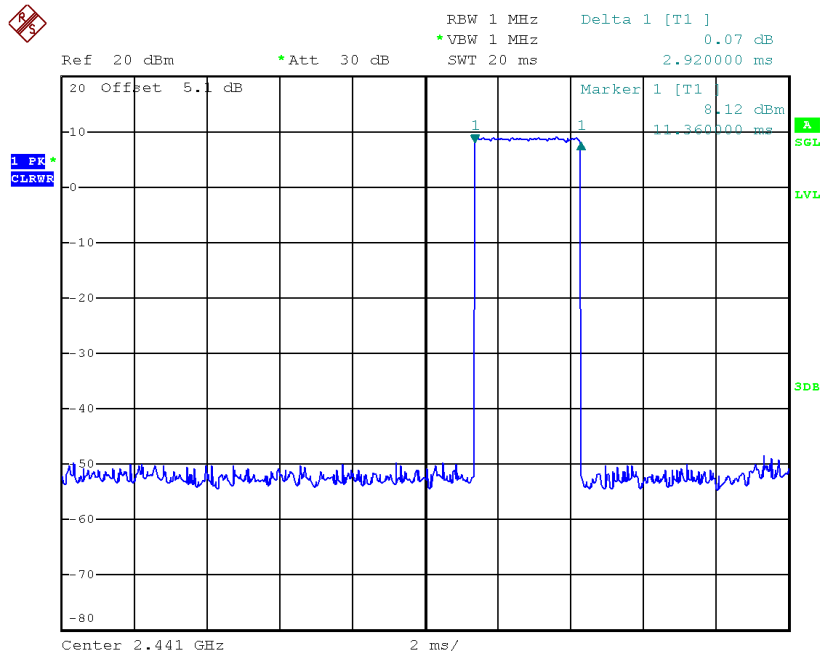
Date: 30.NOV.2016 12:31:36

CH39-DH3



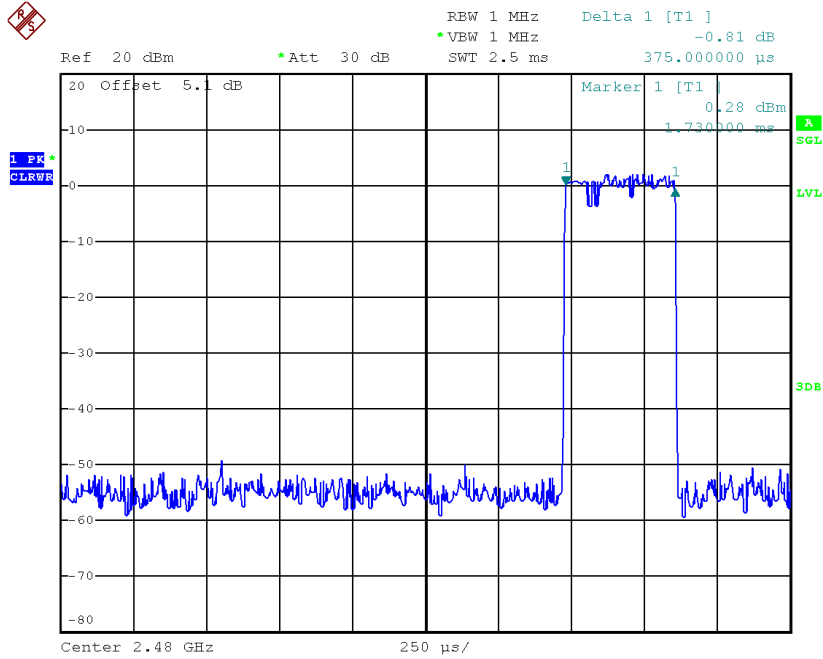
Date: 30.NOV.2016 12:36:35

CH39-DH5



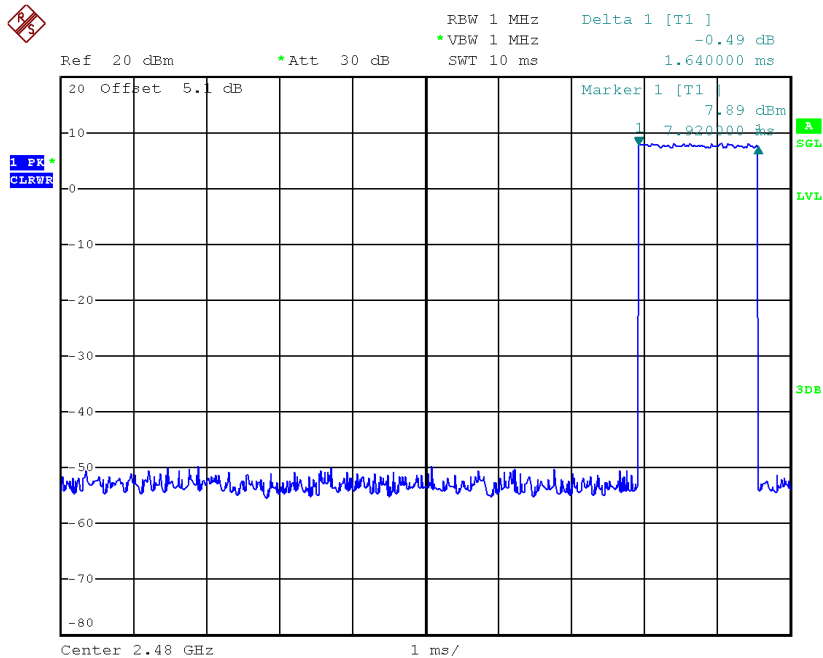
Date: 30.NOV.2016 12:37:26

CH78-DH1



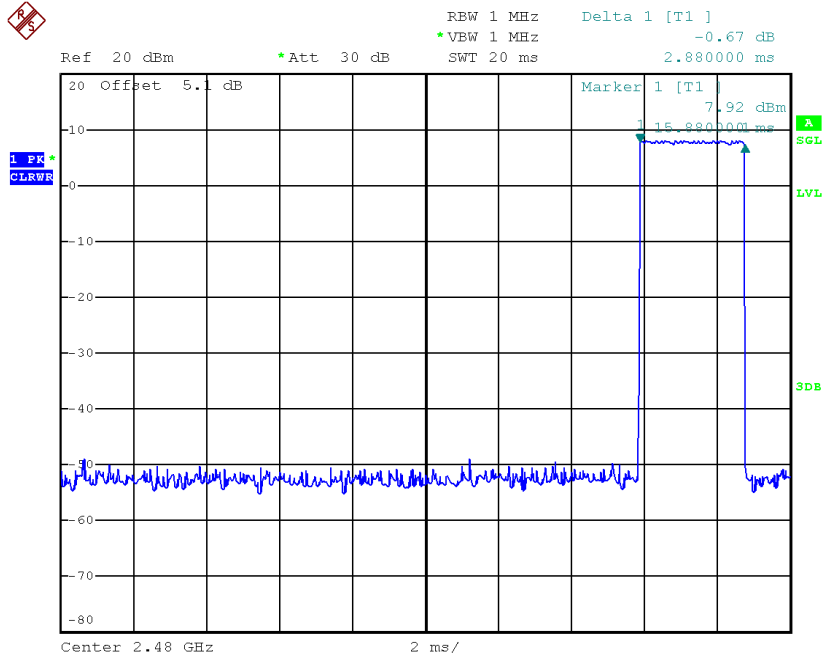
Date: 30.NOV.2016 12:31:41

CH78-DH3



Date: 30.NOV.2016 12:36:38

CH78-DH5

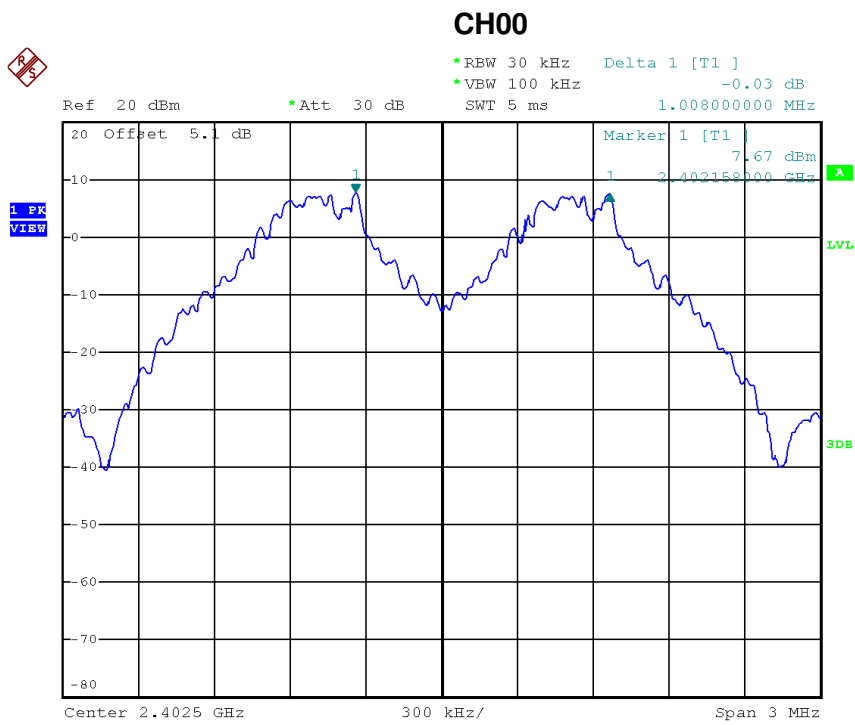


Date: 30.NOV.2016 12:37:29

ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT

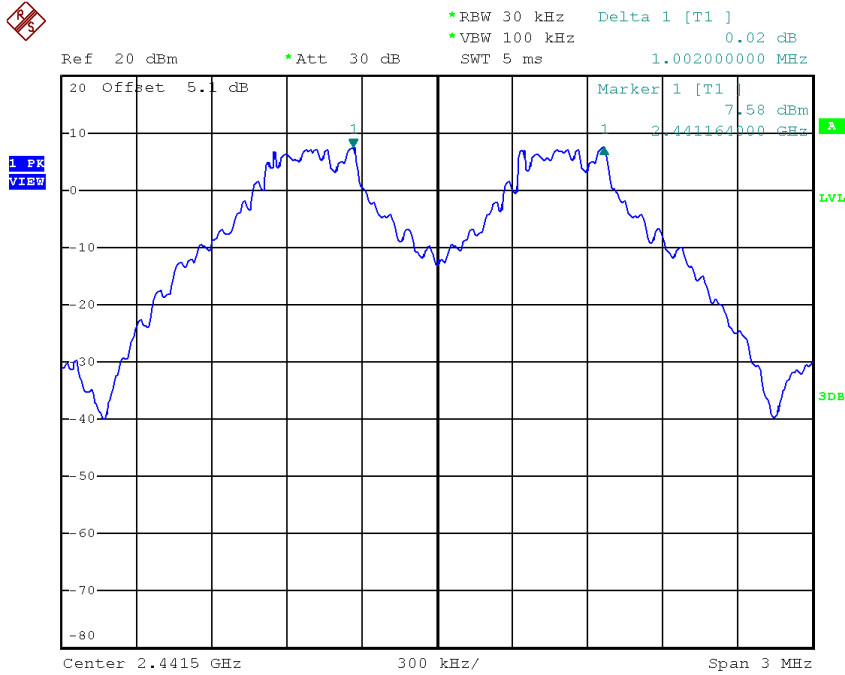
Test Mode : Hopping on _1 Mbps

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	1.008	0.633	Pass
2441	1.002	0.687	Pass
2480	0.996	0.648	Pass



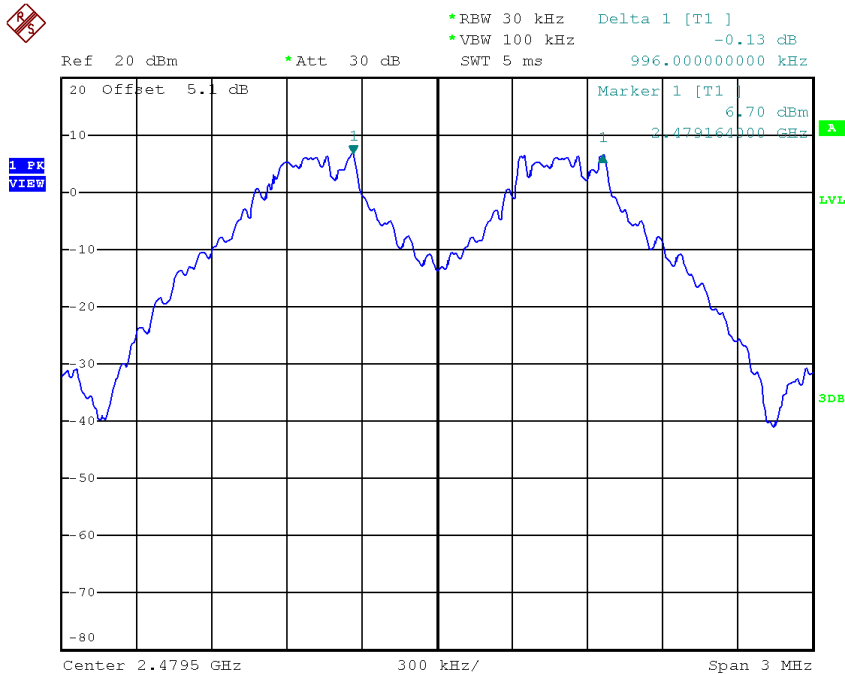
Date: 30.NOV.2016 12:14:24

CH39



Date: 30.NOV.2016 12:15:38

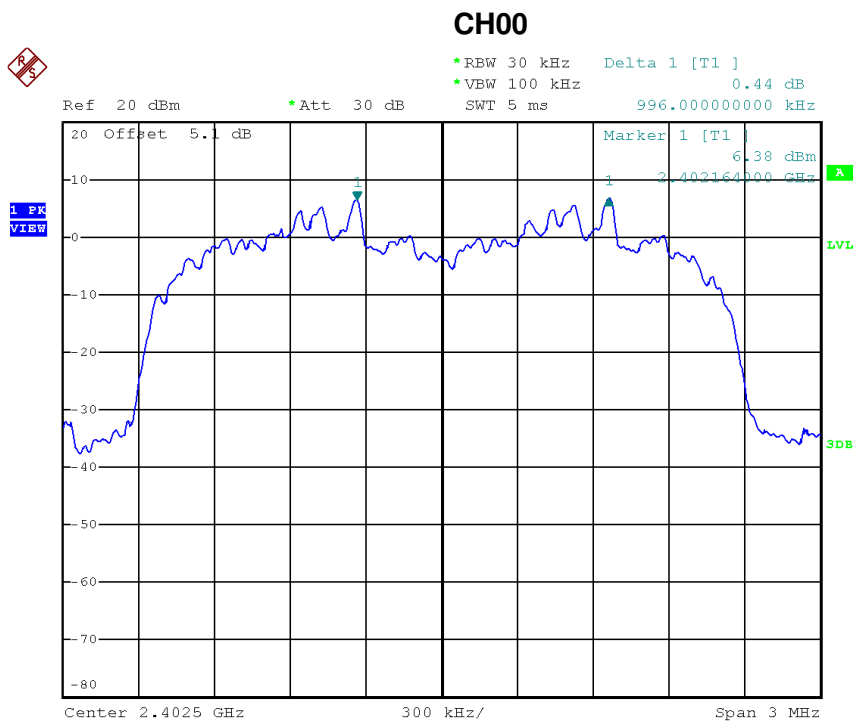
CH78



Date: 30.NOV.2016 12:08:05

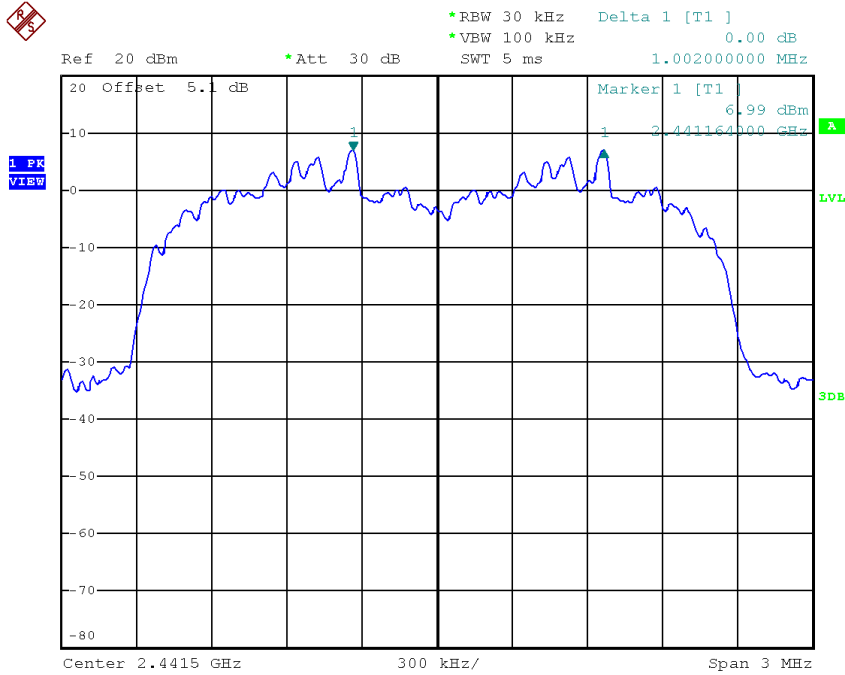
Test Mode : Hopping on _3 Mbps

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.996	0.856	Pass
2441	1.002	0.865	Pass
2480	0.996	0.859	Pass



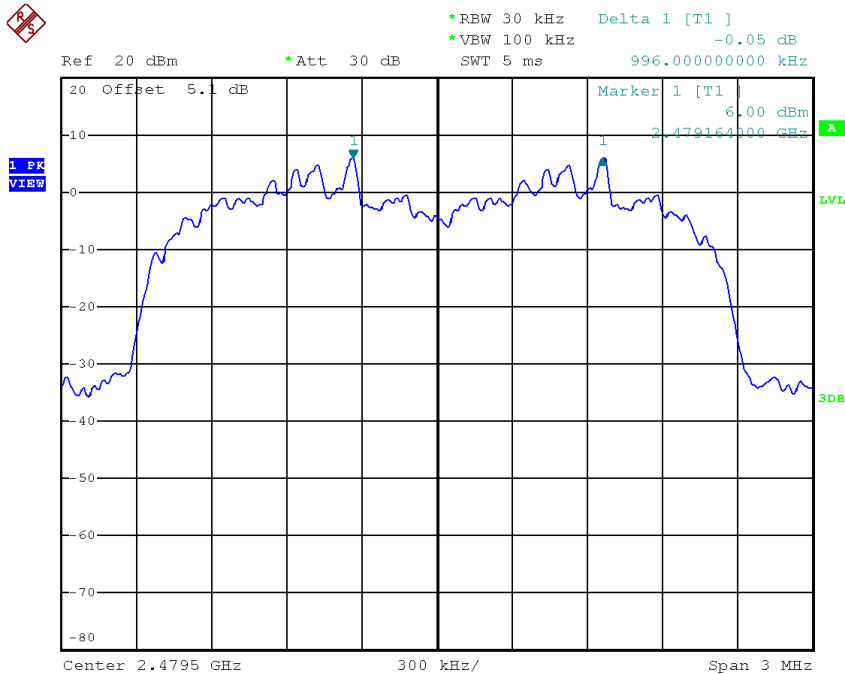
Date: 30.NOV.2016 12:47:35

CH39



Date: 30.NOV.2016 12:49:36

CH78

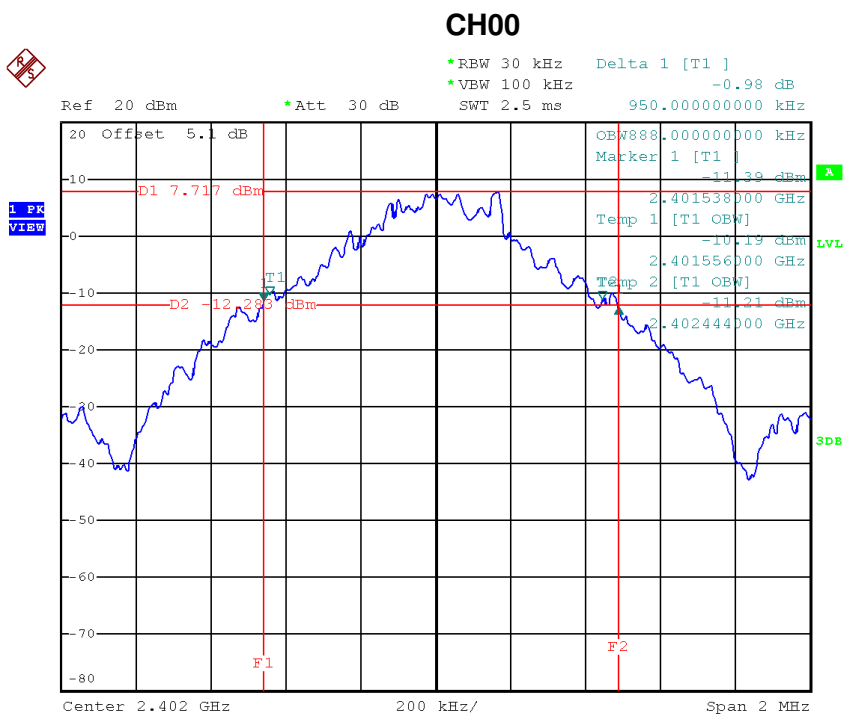


Date: 30.NOV.2016 12:51:31

ATTACHMENT H - BANDWIDTH

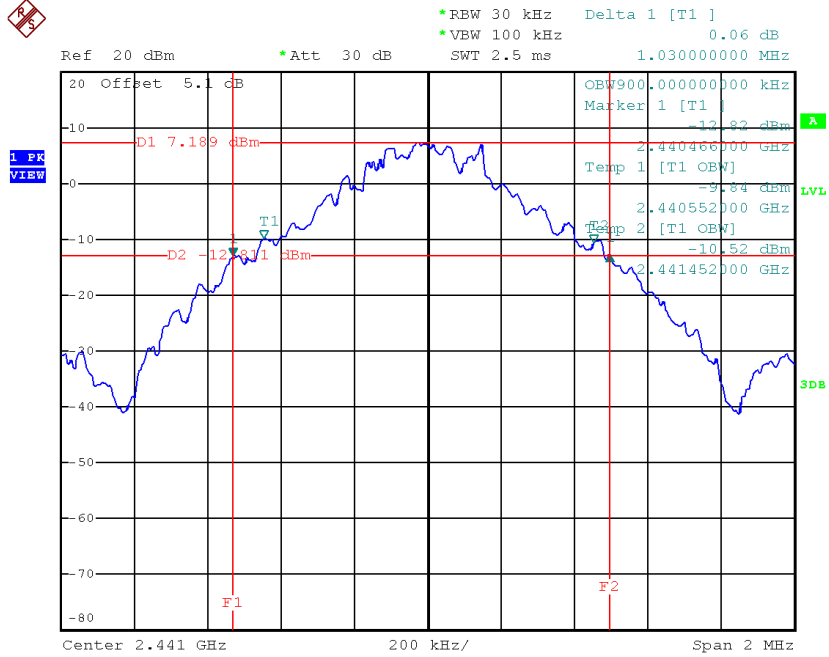
Test Mode : TX Mode_1 Mbps

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	0.950	0.888	Pass
2441	1.030	0.900	Pass
2480	0.972	0.896	Pass



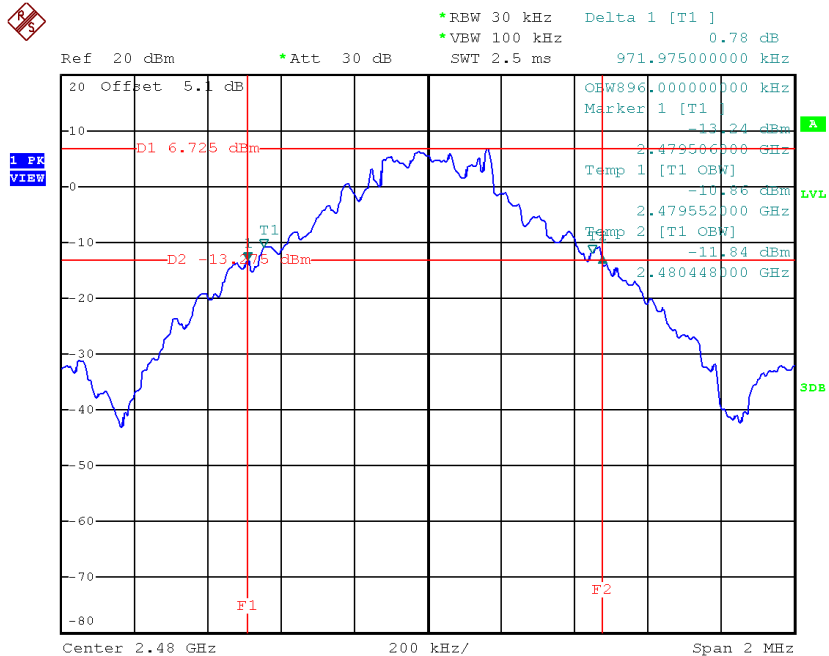
Date: 30.NOV.2016 11:55:37

CH39



Date: 30.NOV.2016 11:57:32

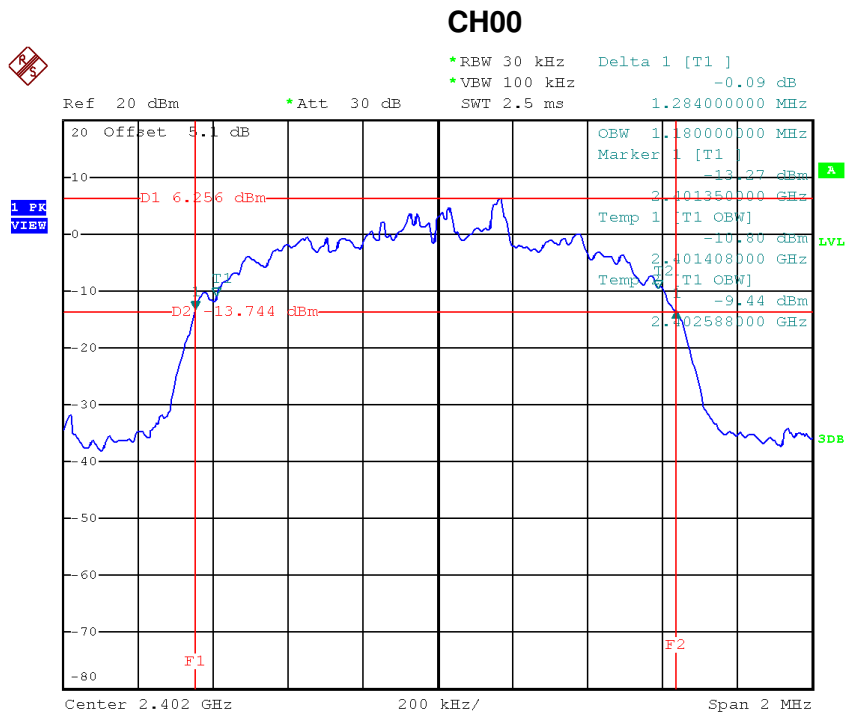
CH78



Date: 30.NOV.2016 11:58:33

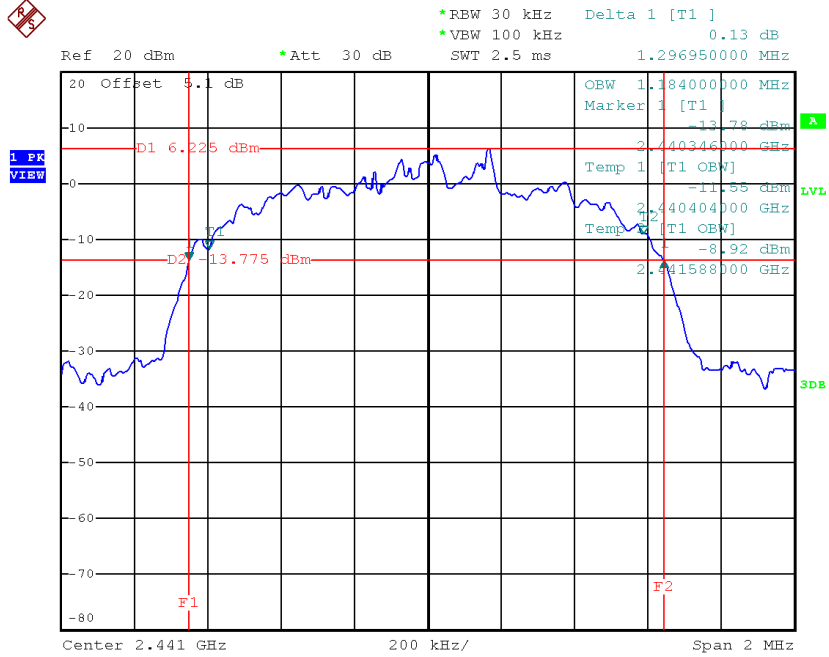
Test Mode : TX Mode_3 Mbps

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.284	1.180	Pass
2441	1.297	1.184	Pass
2480	1.288	1.180	Pass



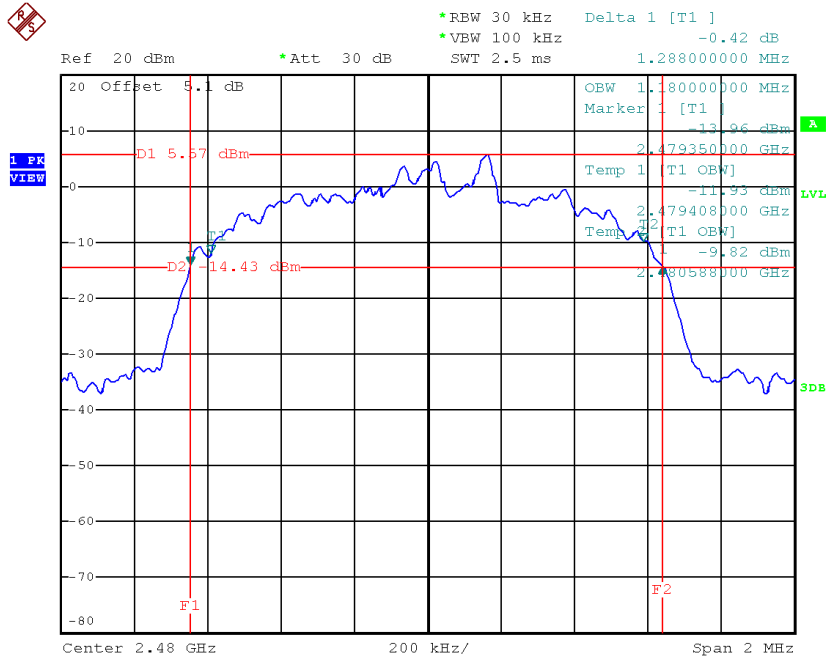
Date: 30.NOV.2016 12:21:16

CH39



Date: 30.NOV.2016 12:28:47

CH78

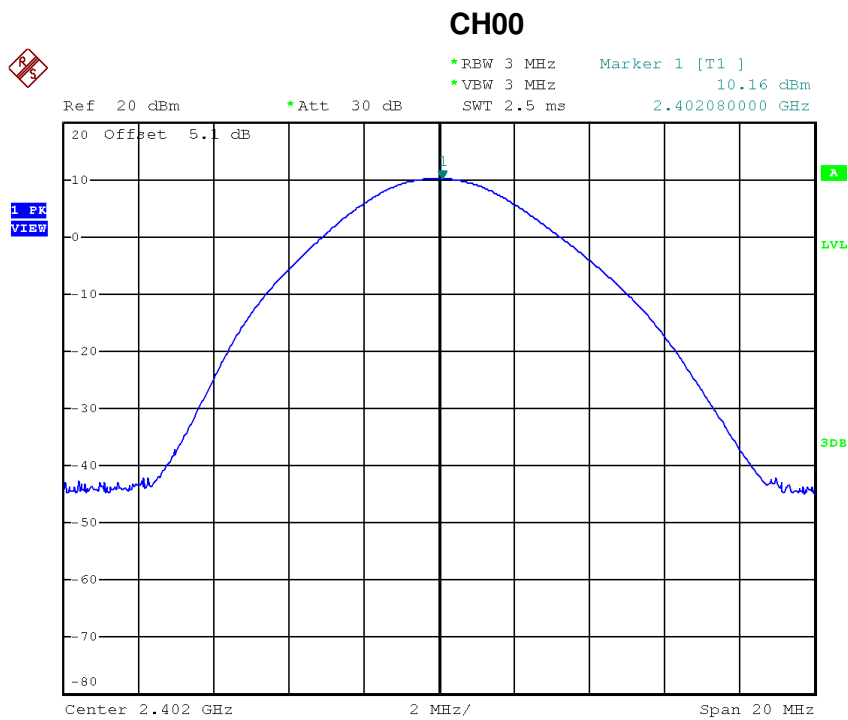


Date: 30.NOV.2016 12:30:09

ATTACHMENT I - PEAK OUTPUT POWER

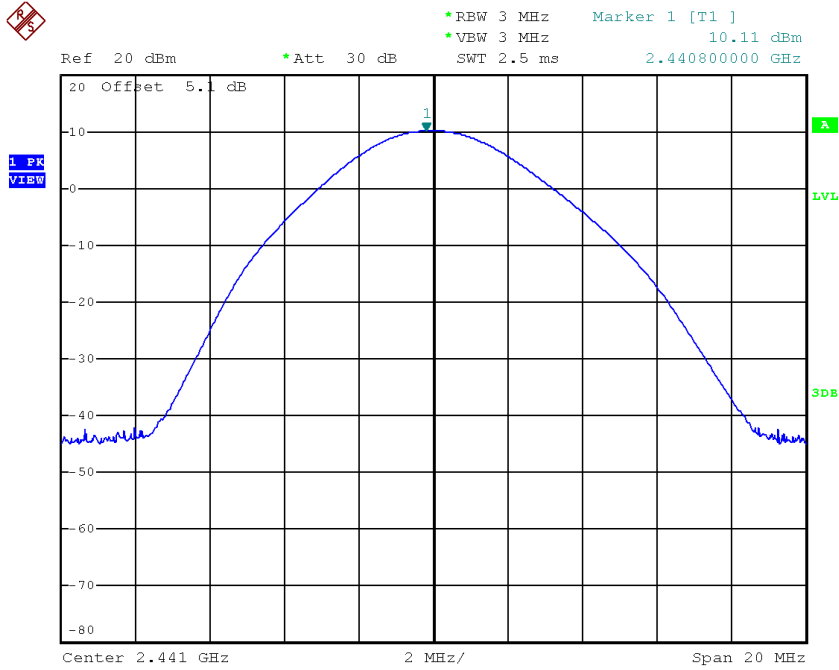
Test Mode : TX Mode_1 Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	10.16	0.0104	30.00	1.00	Pass
2441	10.11	0.0103	30.00	1.00	Pass
2480	9.07	0.0081	30.00	1.00	Pass



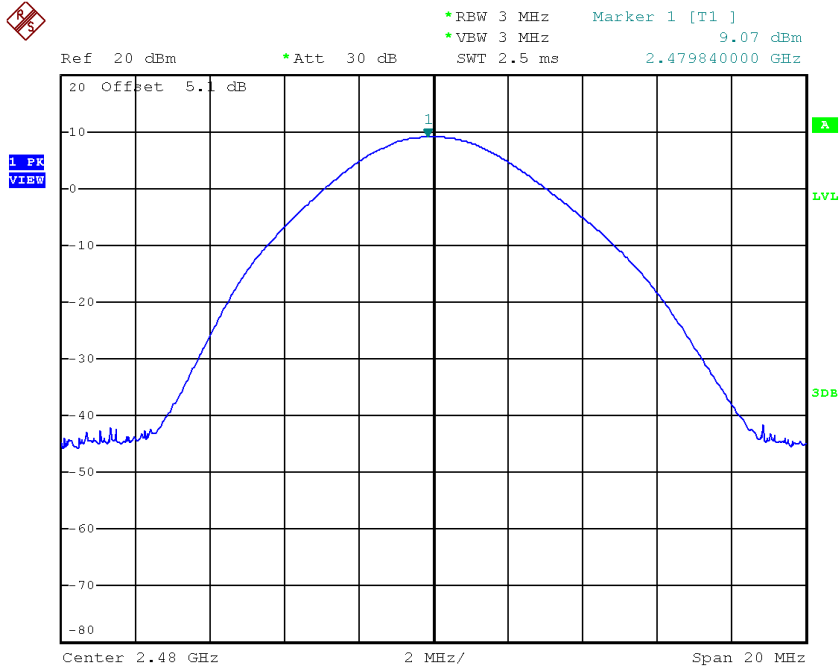
Date: 30.NOV.2016 11:56:09

CH39



Date: 30.NOV.2016 11:57:38

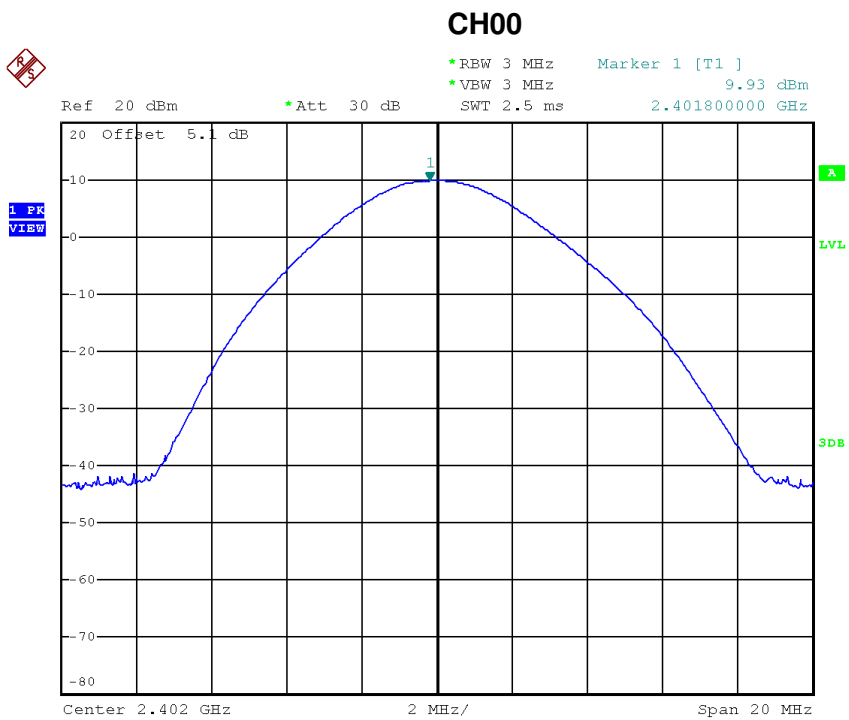
CH78



Date: 30.NOV.2016 11:59:04

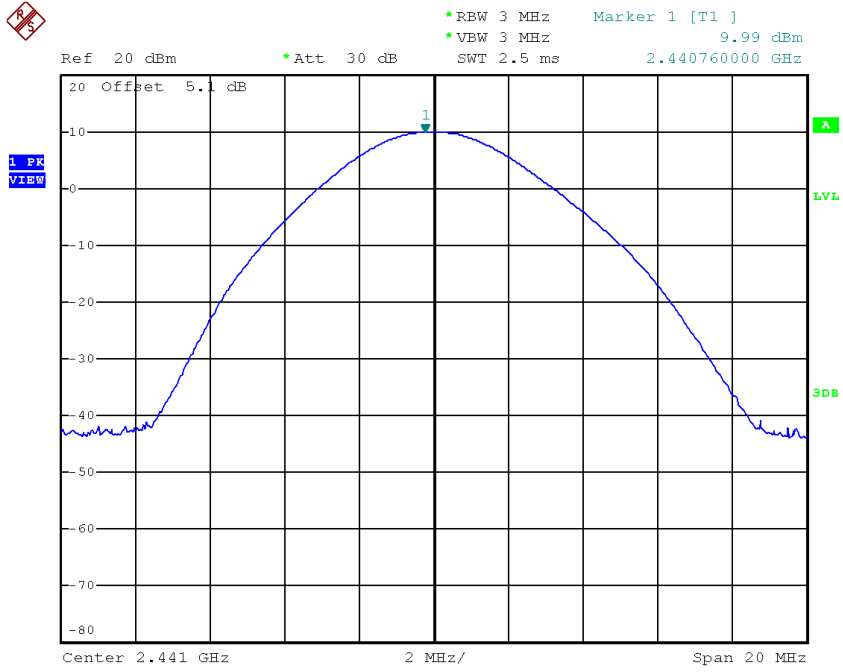
Test Mode : TX Mode_3 Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.93	0.0091	30.00	1.00	Pass
2441	9.99	0.0091	30.00	1.00	Pass
2480	8.93	0.0074	30.00	1.00	Pass



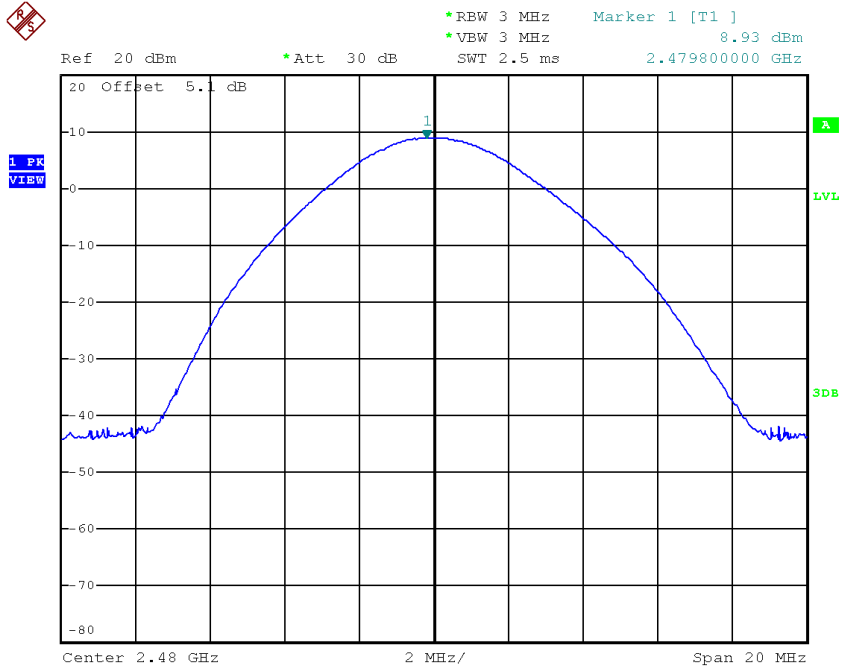
Date: 30.NOV.2016 14:18:33

CH39



Date: 30.NOV.2016 14:19:10

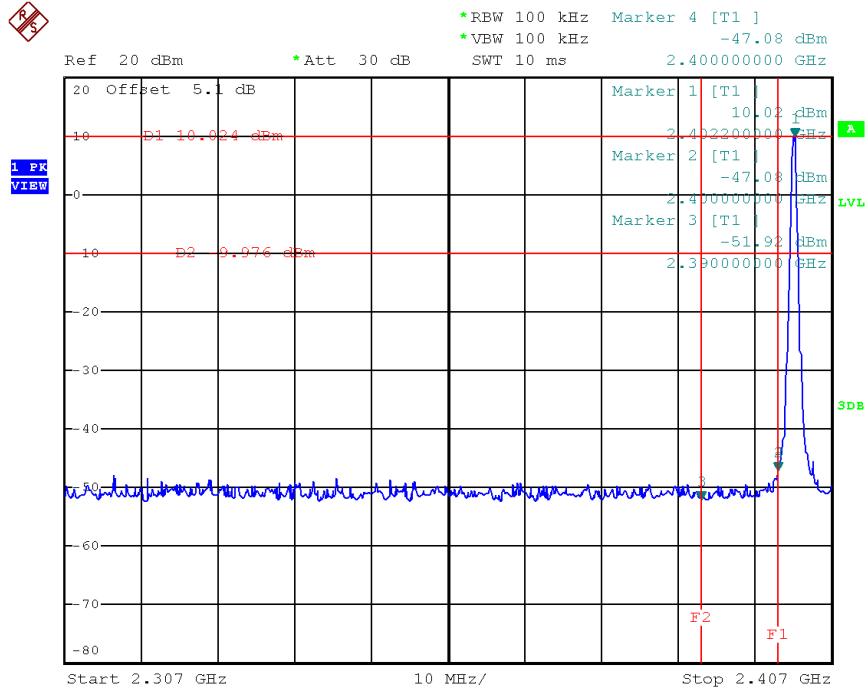
CH78



Date: 30.NOV.2016 14:19:39

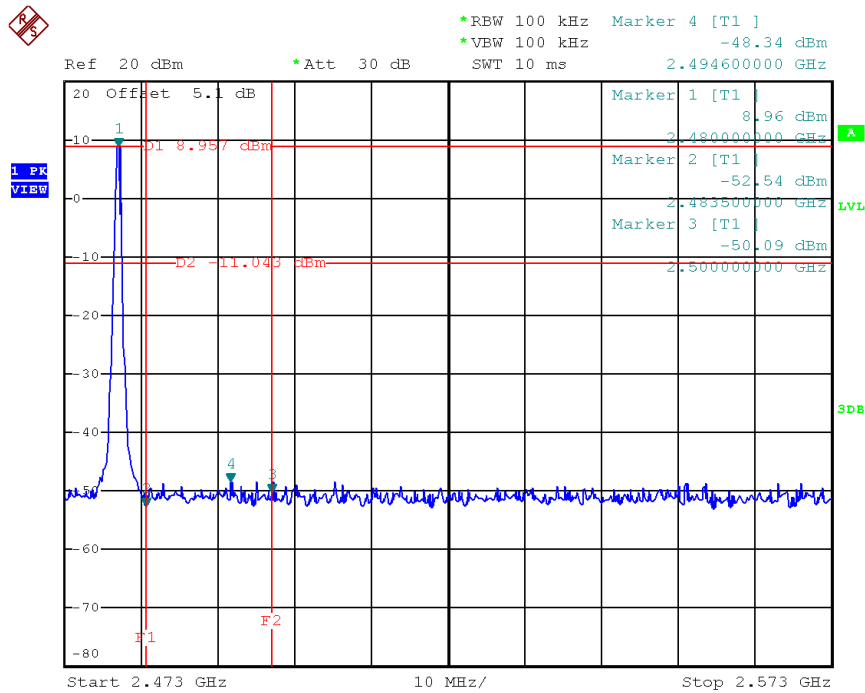
ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION

CH00 (Lower)_1 Mbps



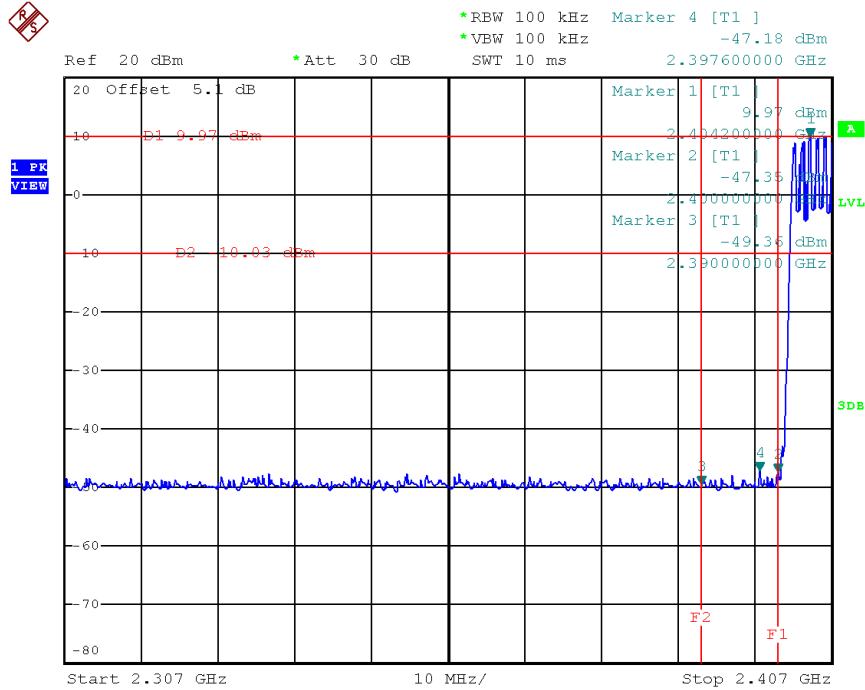
Date: 30.NOV.2016 11:55:03

CH78 (Upper)_1 Mbps



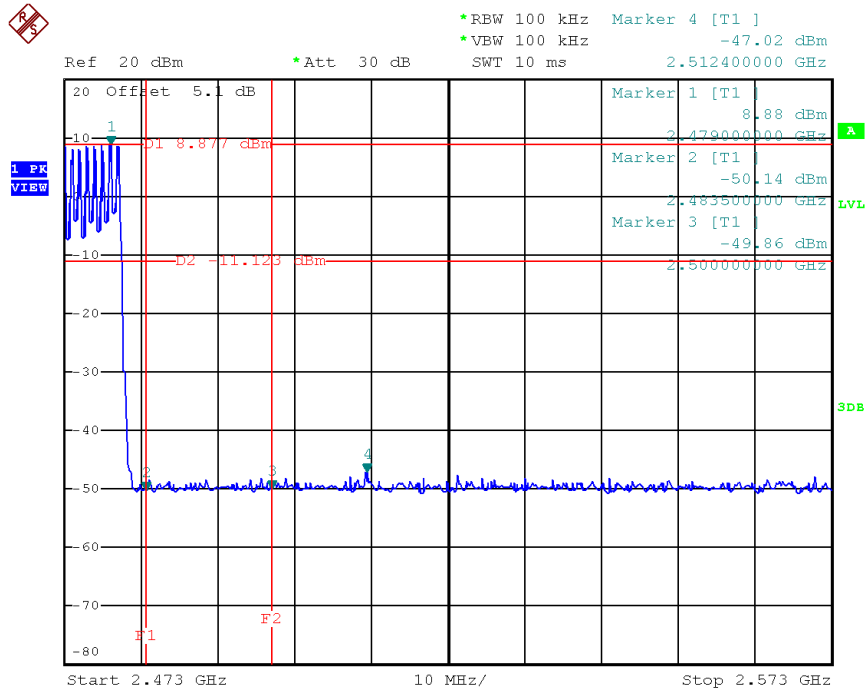
Date: 30.NOV.2016 11:58:00

CH00 Hopping on mode (Lower)_1 Mbps



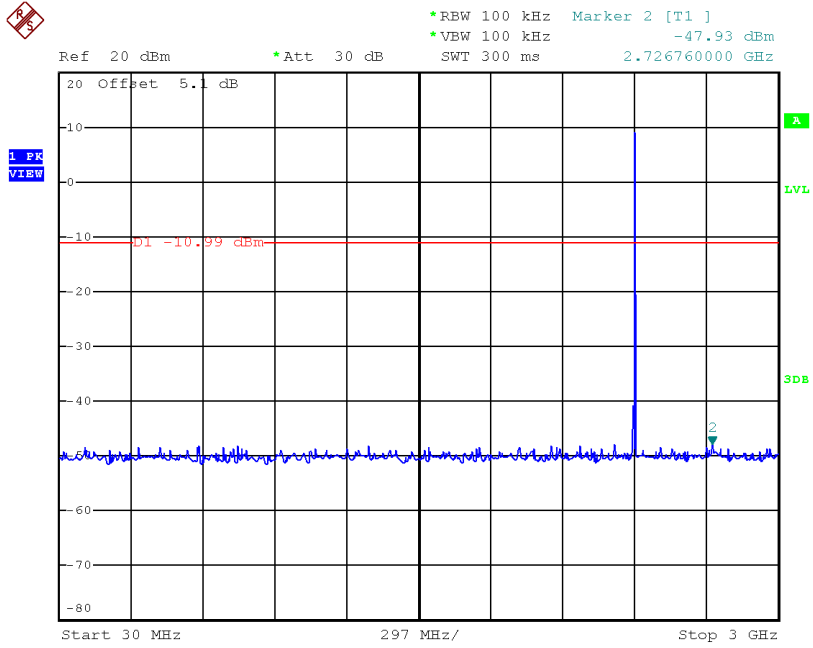
Date: 30.NOV.2016 12:11:33

CH78 Hopping on mode (Upper)_1 Mbps

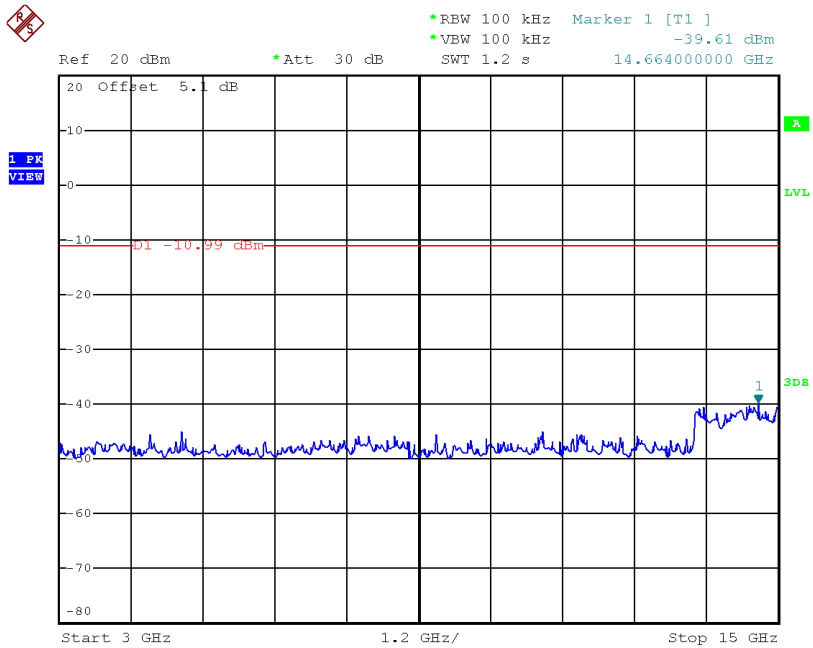


Date: 30.NOV.2016 12:12:34

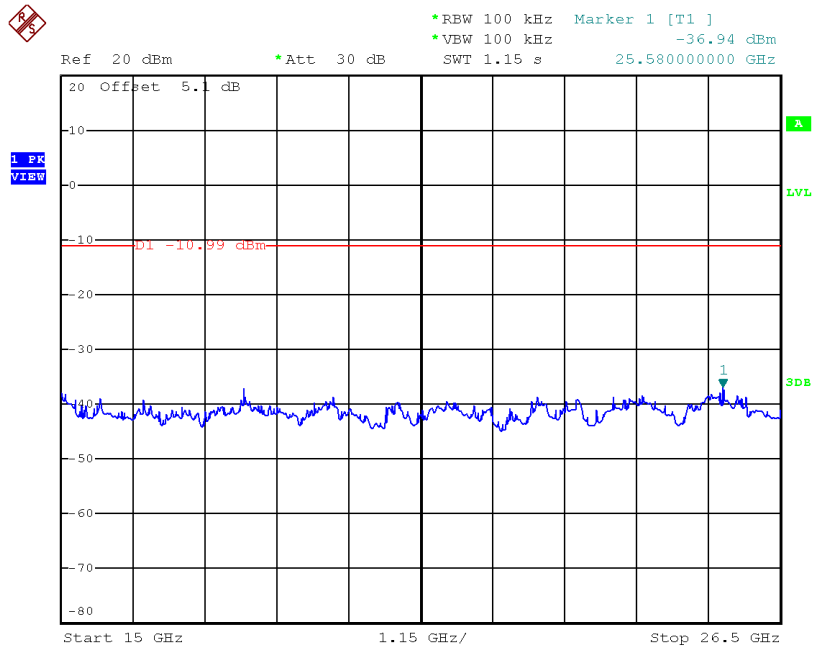
CH00 (10 Harmonic of the frequency) _1 Mbps



Date: 30.NOV.2016 11:55:50

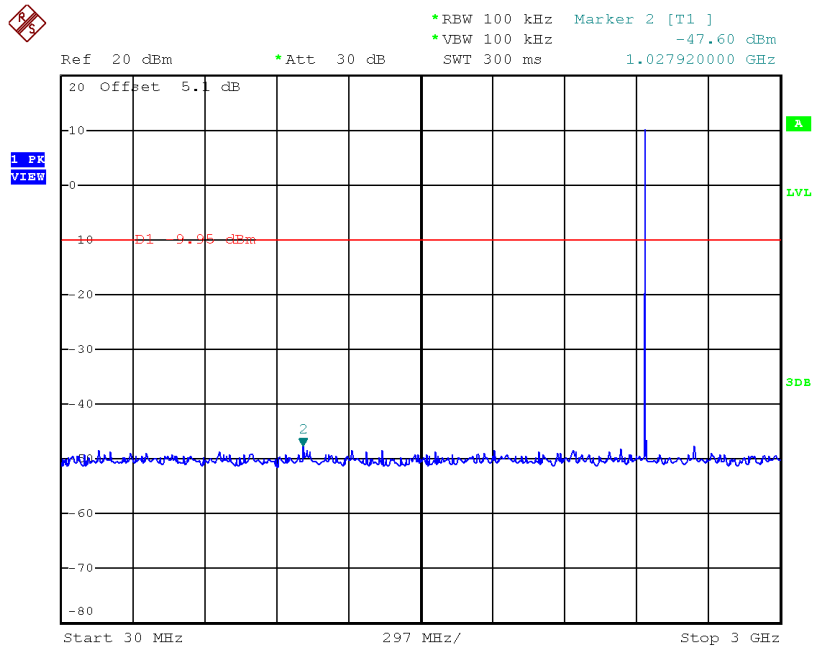


Date: 30.NOV.2016 11:55:57

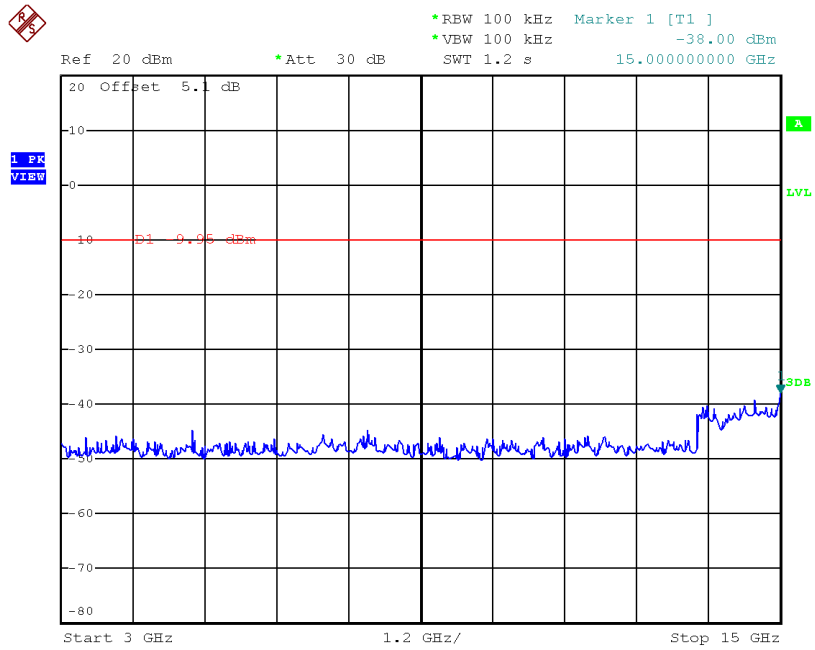


Date: 30.NOV.2016 11:56:04

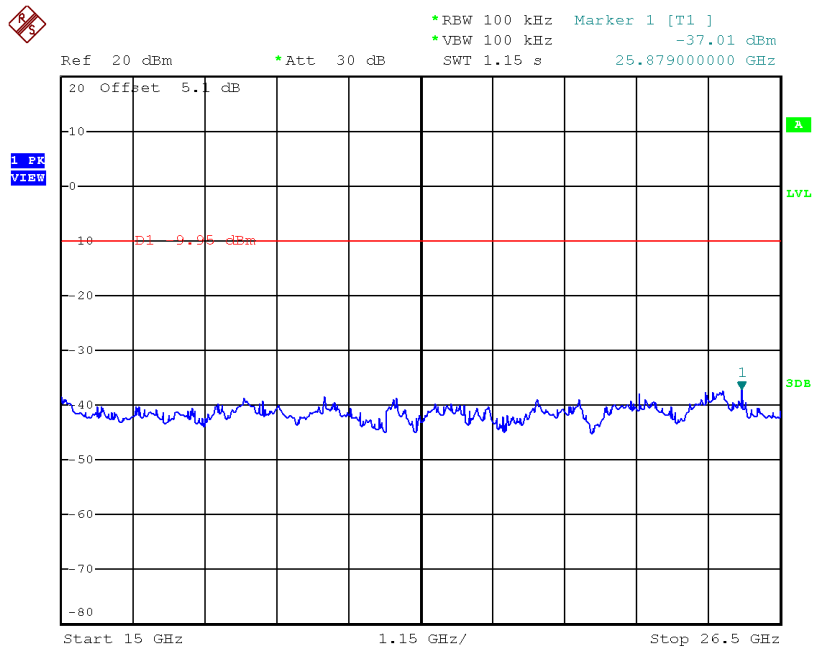
CH39 (10 Harmonic of the frequency) _1 Mbps



Date: 30.NOV.2016 11:56:45

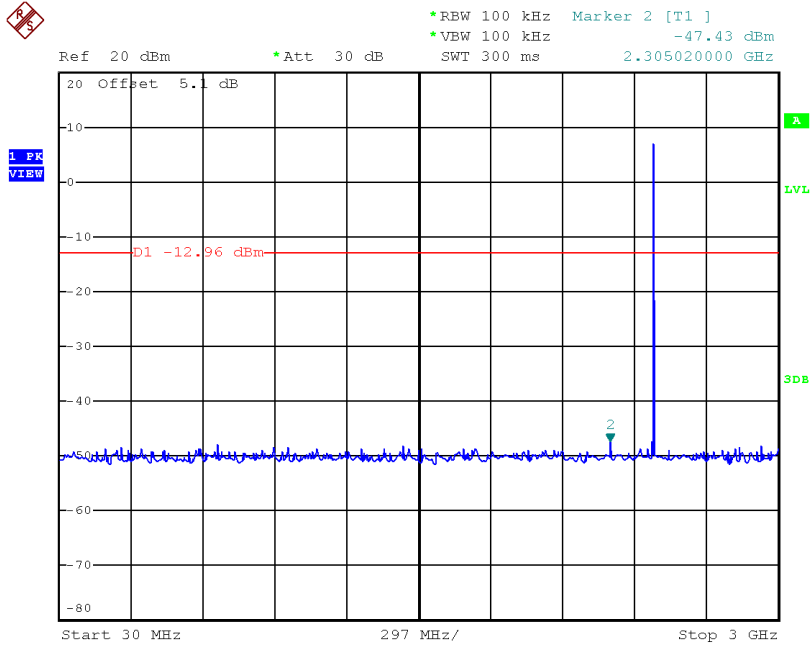


Date: 30.NOV.2016 11:56:52

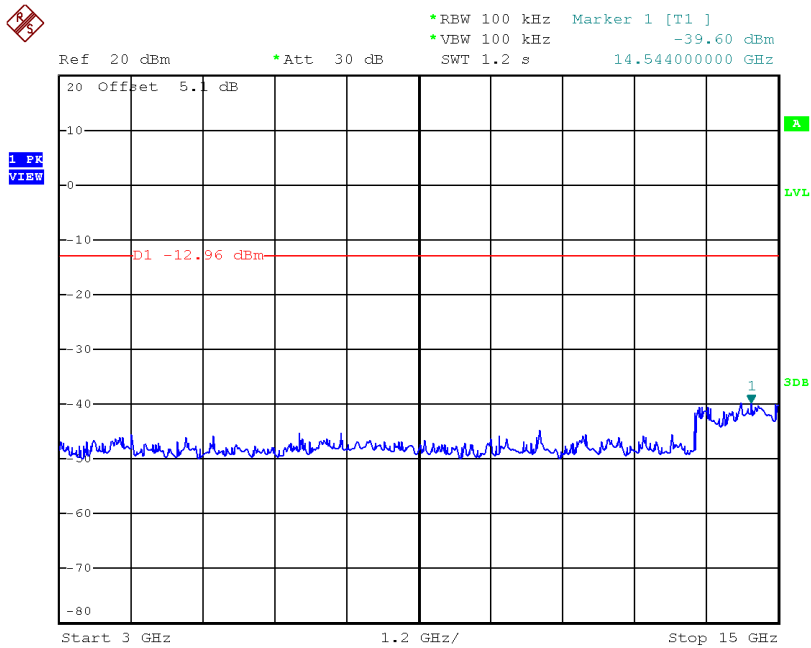


Date: 30.NOV.2016 11:56:59

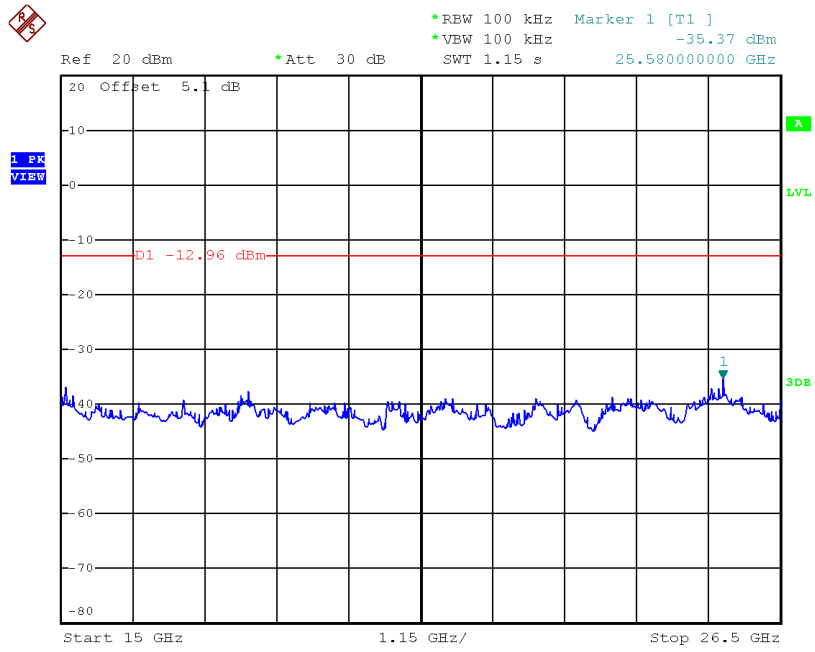
CH78 (10 Harmonic of the frequency) _1 Mbps



Date: 30.NOV.2016 11:58:45

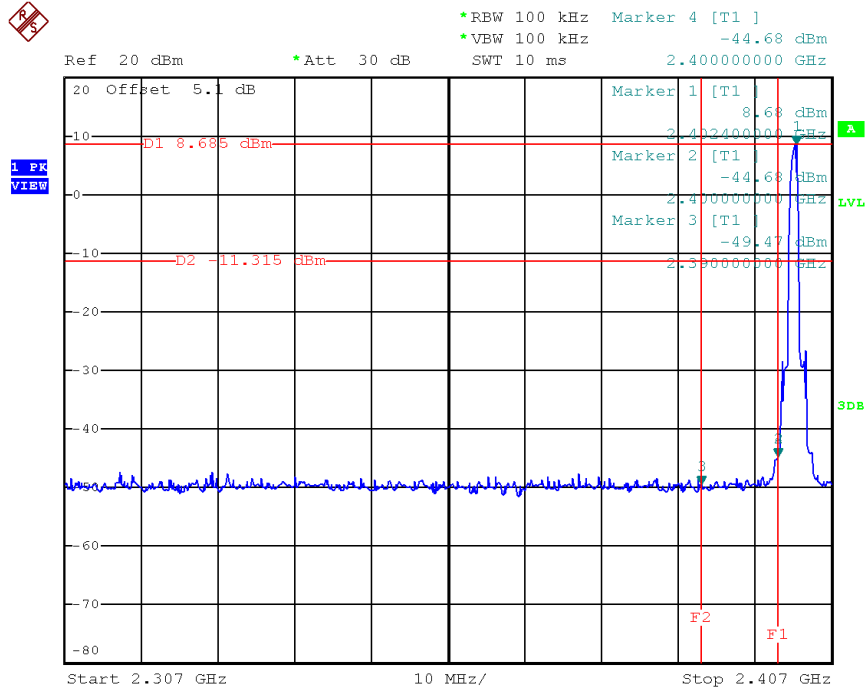


Date: 30.NOV.2016 11:58:52



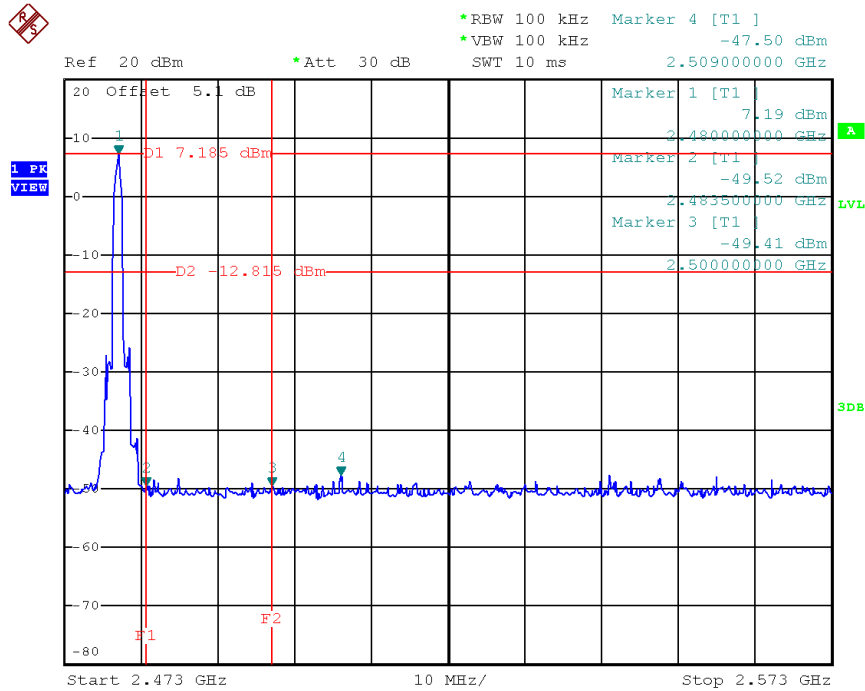
Date: 30.NOV.2016 11:58:59

CH00 (Lower) _3 Mbps



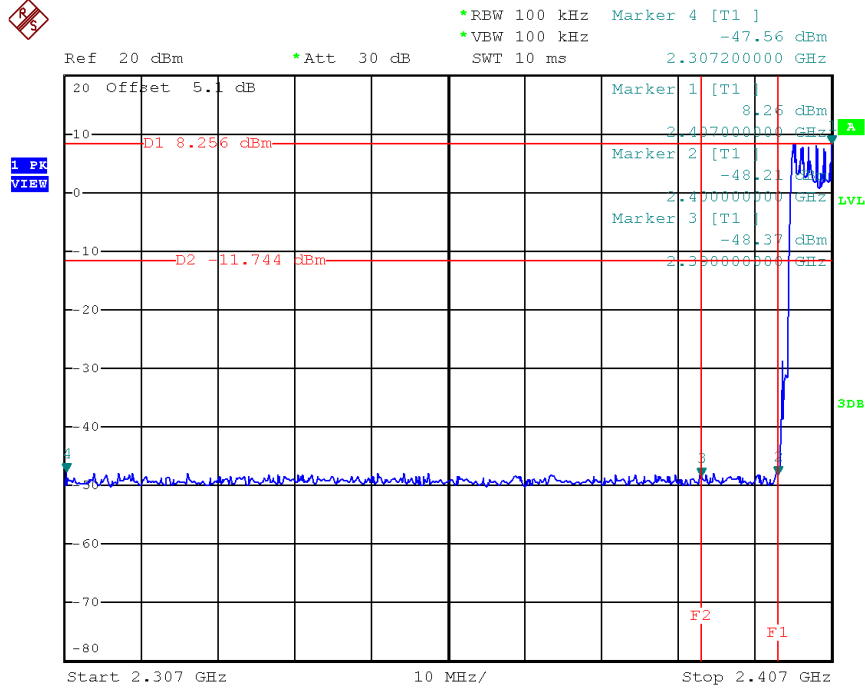
Date: 30.NOV.2016 12:20:46

CH78 (Upper) _3 Mbps



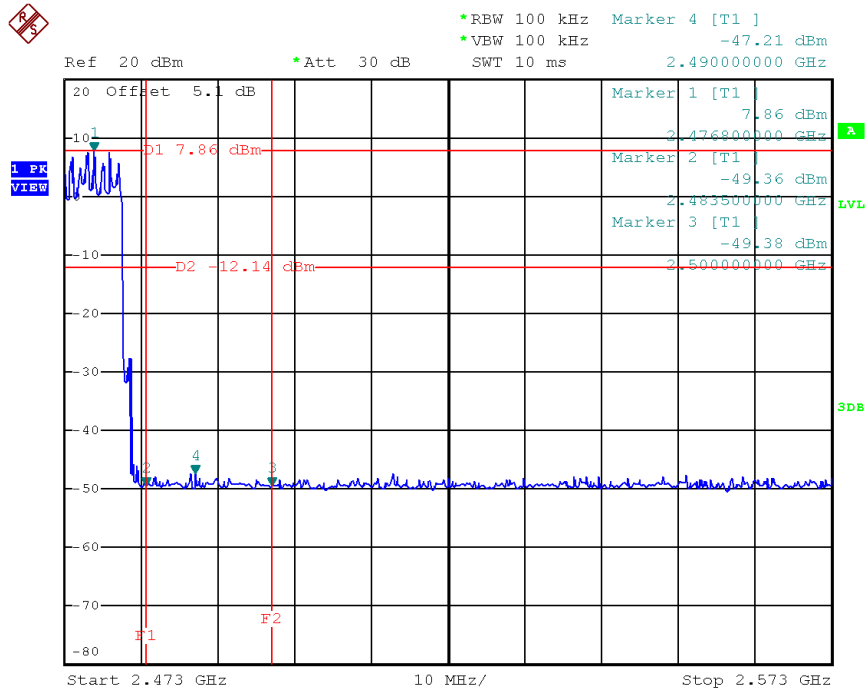
Date: 30.NOV.2016 12:29:41

CH00 Hopping on mode (Lower)_3 Mbps



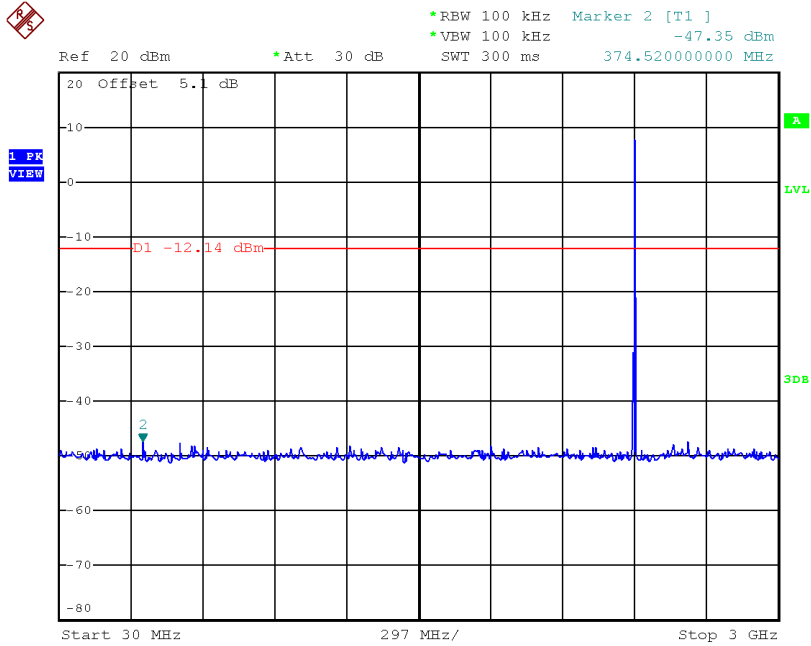
Date: 30.NOV.2016 12:42:20

CH78 Hopping on mode (Upper)_3 Mbps

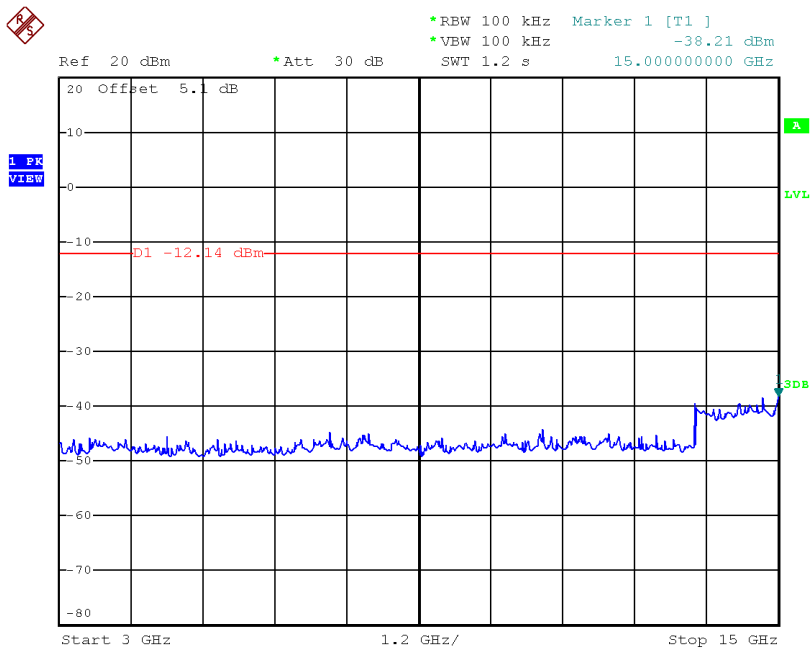


Date: 30.NOV.2016 12:43:44

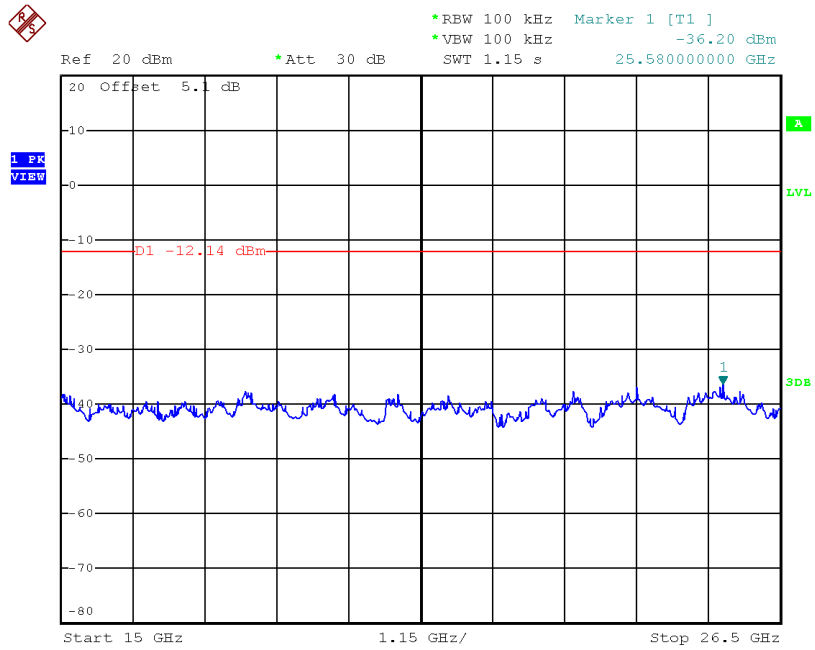
CH00 (10 Harmonic of the frequency) _3 Mbps



Date: 30.NOV.2016 12:21:34

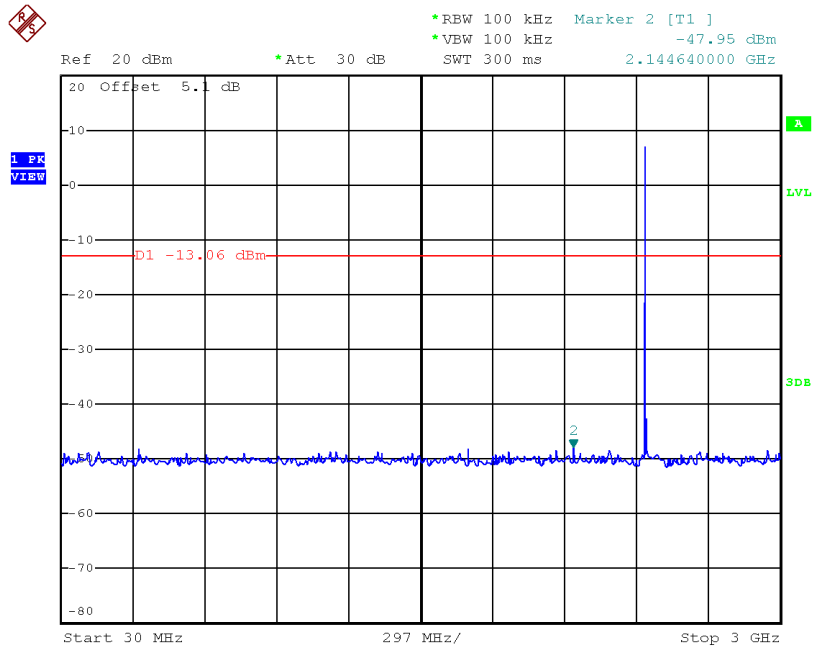


Date: 30.NOV.2016 12:21:46

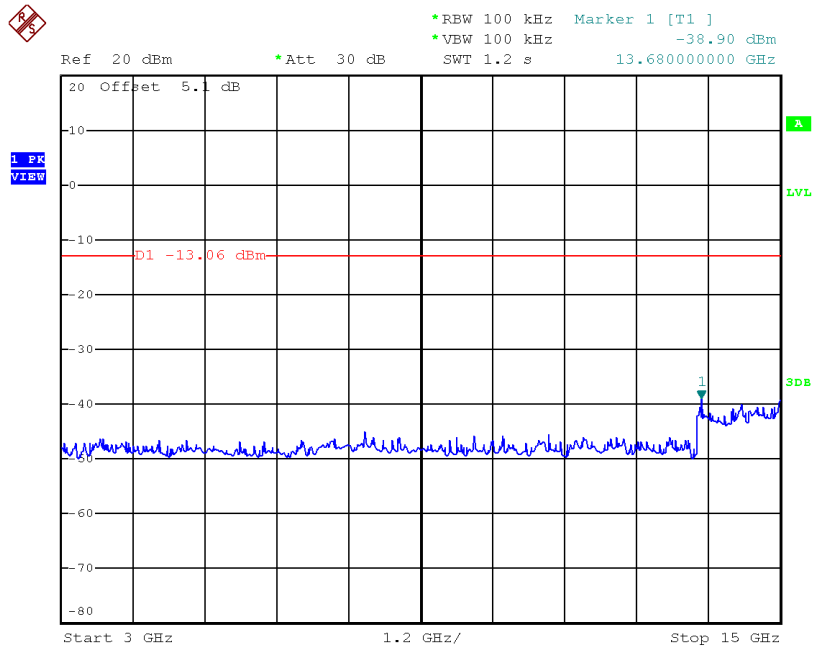


Date: 30.NOV.2016 12:21:58

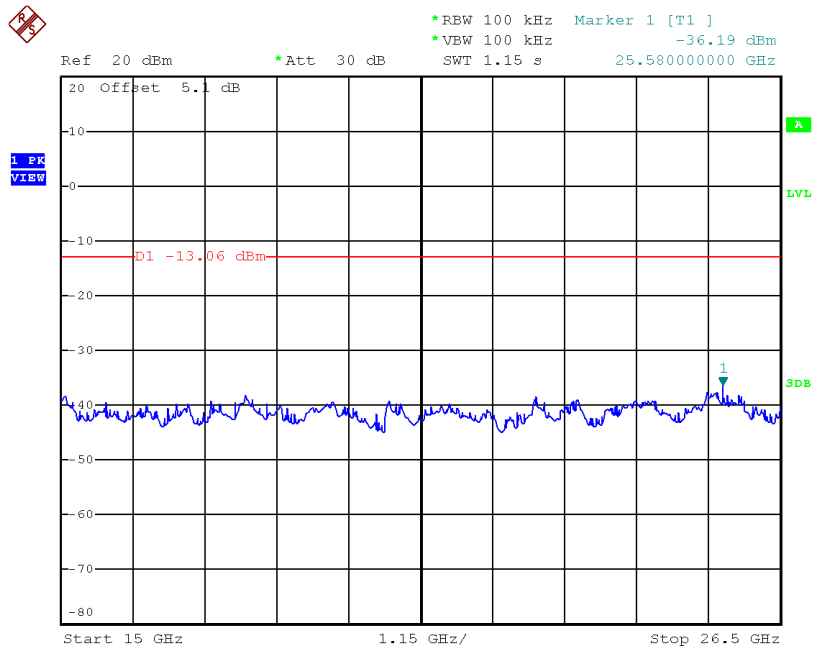
CH39 (10 Harmonic of the frequency) _3 Mbps



Date: 30.NOV.2016 12:28:03

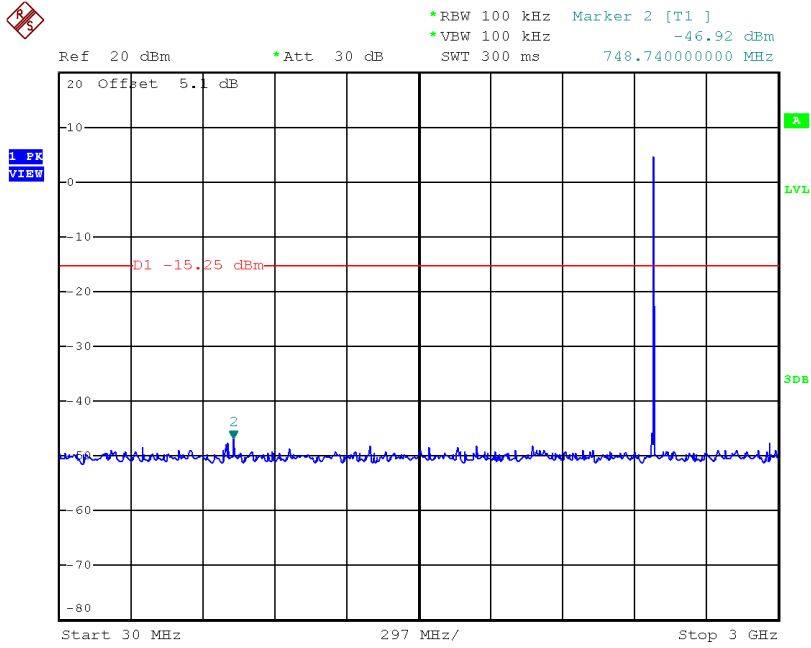


Date: 30.NOV.2016 12:28:10

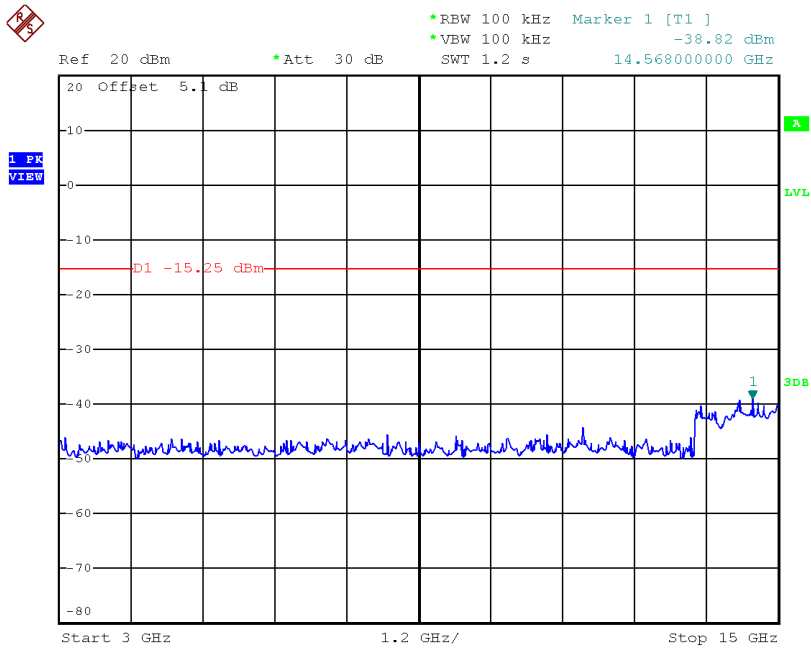


Date: 30.NOV.2016 12:28:17

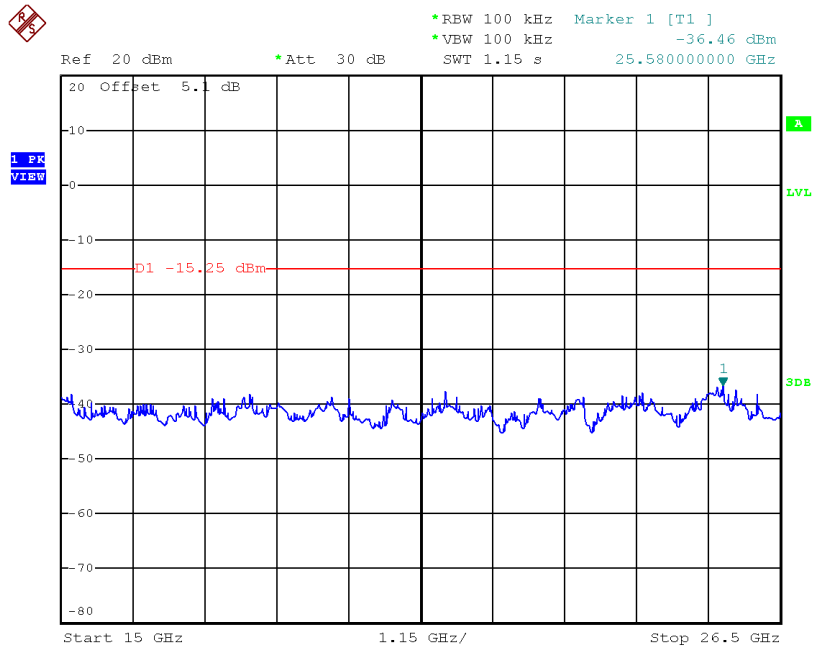
CH78 (10 Harmonic of the frequency) _3 Mbps



Date: 30.NOV.2016 12:30:22



Date: 30.NOV.2016 12:30:29



Date: 30.NOV.2016 12:30:36