



## **FCC** Radio Test Report

FCC ID: QISCMR-AL19

This report concerns (check	one): ⊠Original Grant ⊡Class I Change ⊡Class II Chang	је	
Project No. Equipment Model Name Applicant Address	<ul> <li>: 1712C036</li> <li>: Tablet</li> <li>: CMR-AL19</li> <li>: Huawei Technologies Co., Ltd.</li> <li>: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen China</li> </ul>		
Date of Receipt Date of Test Issued Date Tested by	: Dec, 02, 2017 : Dec, 02, 2017 ~ Jan, 17, 2018 : Jan, 18, 2018 : BTL Inc.		
Testing Engineer	: Shawn Xiao)		
Technical Manage	: David Mao (David Mao)		
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## **REPORT ISSUED HISTORY**

Issued No.	Description	Issued Date
BTL-FCCP-1-1712C036	Original Issue.	Jan, 18, 2018

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#### 1. CERTIFICATION

Equipment : Tablet
Brand Name : HUAWEI
Model Name : CMR-AL19

Applicant : Huawei Technologies Co.,Ltd. Manufacturer : Huawei Technologies Co.,Ltd.

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,

Bantian, Longgang District Shenzhen China

Factory: Huawei Technologies Co.,Ltd.

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,

Bantian, Longgang District Shenzhen China

Date of Test : Dec, 02, 2017 ~ Jan, 17, 2018

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-1-1712C036) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

Test result included in this report is only for the Bluetooth EDR part.

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## 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

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#### 2.1 TEST FACILITY

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

BTL's test firm number for FCC: 854385 BTL's designation number for FCC: CN5020

#### 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 measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

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

#### A. Conducted Measurement:

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

#### B. Radiated Measurement:

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

#### C. Other Measurement:

Test Item	Uncertainty
Conducted Spurious Emission	2.67dB
Hopping Channel Separation	53.46MHz
Peak Output Power	0.95dB
Number of Hopping Frequency	53.46MHz
Temperature	0.08℃
Humidity	1.5%

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

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## 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Tablet		
Brand Name	HUAWEI		
Model Name	CMR-AL19		
Model Difference	N/A		
	Operation Frequency	2402~2480 MHz	
	Modulation Technology	GFSK(1Mbps)  π/4-DQPSK(2Mbps)	
Output Power (Max.)	Bit Rate of Transmitter	8-DPSK(3Mbps)	
	Output Power Max.	8.94 dBm(1Mbps) 9.59 dBm(3Mbps)	
Power Source	#1 Supplied from AC/DC adapter. #2 Battery Supplied.		
Power Rating	#1 Input: 100V~240V AC and 50/60 Hz,0.5A  Output: 5V = -2A OR 9V = -2A  #2 = -3.82V 7350mAh		
Hardware Version	SH1CMRONLM		
Softwarre Version	CMR-AL19 8.0.1.3(SP1C331)		

#### Note:

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

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2.

Item	Mfr/Brand	Model.
	SCUD (FUJIAN) Electronics Co., Ltd	HB2994I8ECW
Battery	Sunwoda Electronic Co., LTD.	HB2994I8ECW
	Huizhou Desay Battery Co., Ltd	HB2994I8ECW
	HONGLIN TECHNOLOGY CO.,LTD	130-26988
	Luxshare Precision Industry Co., Ltd	L99UC001-CS-H
USB Cable	FOXCONN INTERCONNECT	CUDU01B-HC288-EH
	TECHNOLOGY LIMITED	0000010110000
	foxlink cheng uei precision industry Co., Ltd	6691-10YZ-0183
	FOSTER ELECTRIC CO. (HONG KONG)	620891
LICD Turns C	LTD	020031
USB Type-C to 3.5 mm	Boluo County Quancheng Electronic	6001-7001-TC-294
10 010 111111	Co.,Ltd.	0001-7001-10-294
headset jack adapter cable	Jiangxi Lianchuang Hongsheng Electronic	HWTYPEC3R5009AW
	Co.,LTD	TIVVITECONSOUSAV
	MERRY ELECTRONICS CO., LTD.	L99UD002-CS-H
	Salcomp (Shenzhen) Co., Ltd.	11/1/ 05020011110
Adapter	HUIZHOU BYD ELECTRONIC CO.,LTD	HW-059200UHQ

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## 3. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01		28			
	2403		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		

## 4 Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	-0.5

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#### 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, 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 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

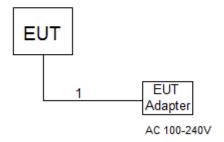
Test Software Version	Blue	etoothRfTest_APK_7.	0
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters(1Mbps)	N/A	N/A	N/A
Parameters(3Mbps)	N/A	N/A	N/A

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## 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.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	DC Cable

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#### 4. EMC EMISSION TEST

#### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

Fraguency of Emission (MHz)	Conducted Limit (dBµV)		
Frequency of Emission (MHz)	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

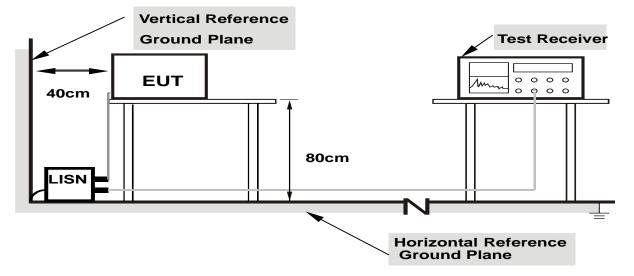
No deviation

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#### 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 Appendix 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.

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#### 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	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(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)

Fraguency (MUz)	Band edge at 3m (dBµV/m)		Harmonic at 1.5m (dBµV/m)	
Frequency (MHz)	Peak	Average	Peak	Average
Above 1000	74	54	80 (Note 5)	60(Note 5)

#### 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

$$FS_{\text{limit}} = FS_{\text{max}} - 20\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

20log d limit/d measure=20log 3/1.5=6dB.





Spectrum Parameter	Setting	
Attenuation	Auto	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RBW / VBW	4 Mile /4 Mile for Dook 4 Mile /40He for Average	
(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 or 1.5m 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

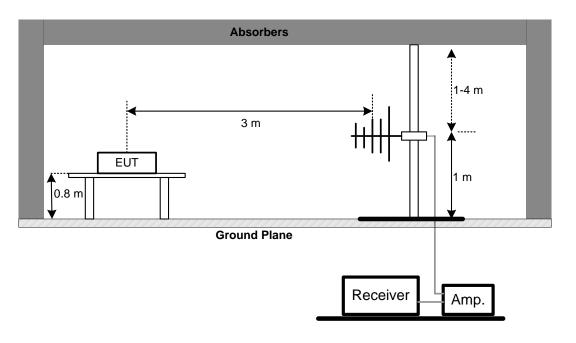
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## 4.2.4 TEST SETUP

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

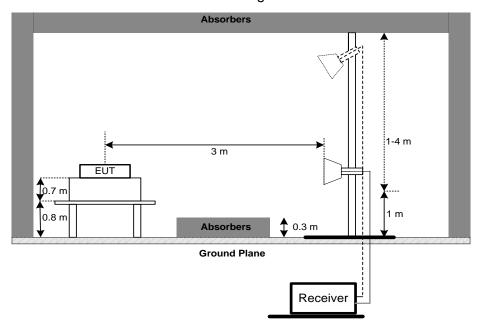


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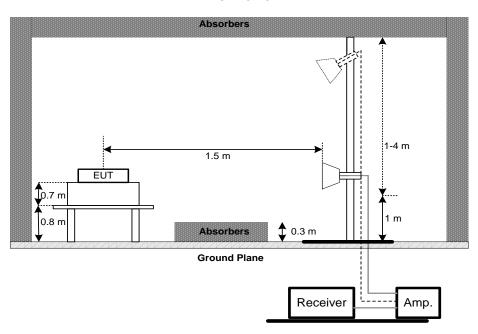




# (B) Radiated Emission Test Set-Up Frequency Above 1 GHz Band edge



## Harmonic

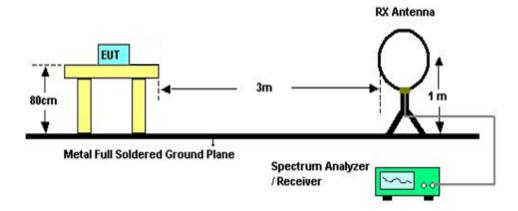


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#### (C) For Radiated Emissions Below 30MHz



#### 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 Appendix 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 (specific distance / test distance) (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### **4.2.8 TEST RESULTS (30MHZ TO 1000MHZ)**

Please refer to the Appendix C.

#### 4.2.9 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix D.

#### Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.

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#### 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

EUT	SPECTRUM
	ANALYZER

#### **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 Appendix E

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#### 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 x 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 x 31.6 = 320 within 31.6 seconds.

#### **6.1.2 DEVIATION FROM STANDARD**

No deviation.

#### 6.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

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#### **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 Appendix F

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#### 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

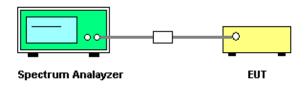
Trace = Max Hold

- 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) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ RBW Sweep = Auto Detector function = Peak

#### 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 Appendix G

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#### 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

EUT	SPECTRUM
	ANALYZER

#### **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 Appendix H

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#### 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

EUT	SPECTRUM
	ANALYZER

#### 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 Appendix I

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#### 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**

EUT	SPECTRUM
	ANALYZER

#### 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 Appendix J

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## 11. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission								
Item	Kind of Equipment	Kind of Equipment Manufacturer Type No. Serial No.		Serial No.	Calibrated until				
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 26, 2018				
2	LISN EMCO 3816/2		3816/2	52765	Mar. 26, 2018				
3	50Ω Terminator SHX		TF2-3G-A	8122901	Mar. 26, 2018				
4	TWO-LINE V-NETWORK	PX.S		101447	Mar. 26, 2018				
5	Larad L		EZ-EMC Ver.NB-03A1-01	N/A	N/A				
6			RG223	12m	Oct. 19, 2018				

	Radiated Emission Below 1GHz							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 26, 2018			
2	Amplifier HP 8447I		8447D	2944A09673	Oct. 19, 2018			
3	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018			
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	Jun. 26, 2018			
5	Controller	CT	SC100	N/A	N/A			
6	Controller	MF	MF-7802 MF780208416		N/A			
7	Measurement Farad		EZ-EMC Ver.NB-03A1-01	NI/A				
8	Antenna	EM	EM-6876-1	230	Mar. 06, 2018			

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	Radiated Emission Above 1GHz								
Item	Kind of Equipment	Manufacturer	Manufacturer Type No.		Calibrated until				
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 26, 2018				
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018				
3	Amplifier	Agilent	8449B	3008A02274	May. 16, 2018				
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 26, 2018				
5	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018				
6	Antenna	EM	EM-6876-1	230	Mar. 06, 2018				
7	Controller	СТ	SC100	N/A	N/A				
8	Controller	MF	MF-7802	MF780208416	N/A				
9	Cable	Cable emci		N/A	Jun. 26, 2018				
10	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				

Number of Hopping Channel						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	1 Spectrum Analyzer R&S		FSP40	100185	Aug. 20, 2018	

Average Time of Occupancy						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	1 Spectrum Analyzer R&S		FSP40	100185	Aug. 20, 2018	

	Hopping Channel Separation Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018		

Bandwidth						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018	

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	Peak Output Power							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018			

Antenna Conducted Spurious Emission						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	1 Spectrum Analyzer R&S		FSP40	100185	Aug. 20, 2018	

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

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	7
APPENDIX A - CONDUCTED EMISSION	

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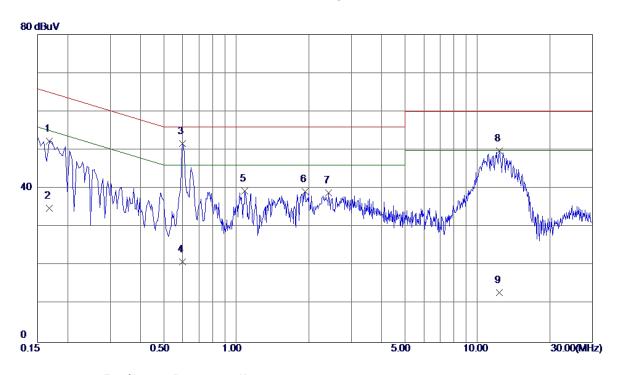




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Test Mode: TX Mode\_ Adapter: BYD

## Line



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0. 1680	42. 55	9. 78	52. 33	65.06	-12.73	Peak	
2	0.1680	25. 10	9. 78	34.88	<b>55.06</b>	-20. 18	AVG	
3 *	0.6000	41.82	9.81	51.63	56.00	-4. 37	Peak	
4	0.6000	11. 20	9.81	21.01	46.00	-24.99	AVG	
5	1.0859	29. 51	9.85	39. 36	56.00	-16.64	Peak	
6	1.9320	29. 29	9. 92	39. 21	56.00	-16. 79	Peak	
7	2.4180	28. 96	9. 96	38. 92	56.00	<b>−17. 08</b>	Peak	
8	12. 3315	39. 33	10.45	49. 78	60.00	-10. 22	Peak	
9	12. 3315	2. 50	10. 45	12. 95	50.00	-37.05	AVG	

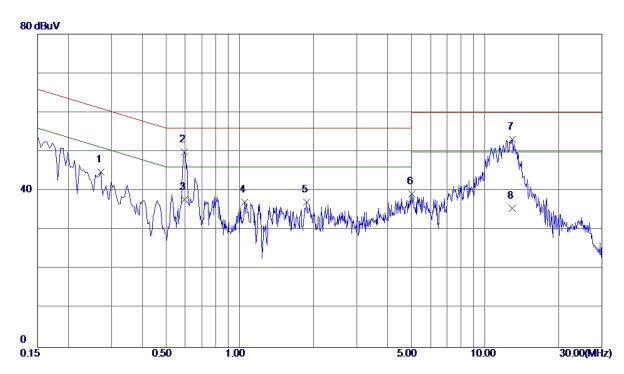
Report No.: BTL-FCCP-1-1712C036





Test Mode: TX Mode\_ Adapter: BYD

## Neutral



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.2714	35. 16	9. 67	44.83	61.07	-16. 24	Peak	
2 *	0. 5955	40. 18	9.71	49.89	56.00	-6. 11	Peak	
3	0. 5955	28.00	9.71	37.71	46.00	-8. 29	AVG	
4	1.0455	27.39	9. 75	37. 14	56.00	-18.86	Peak	
5	1.8780	27. 27	9.83	37. 10	56.00	-18. 90	Peak	
6	5.0324	29. 18	10.01	39. 19	60.00	-2 <b>0.</b> 81	Peak	
7	12.8940	42.67	10.48	53. 15	60.00	-6.85	Peak	
8	12.8940	25. 09	10.48	35. 57	50.00	-14.43	AVG	

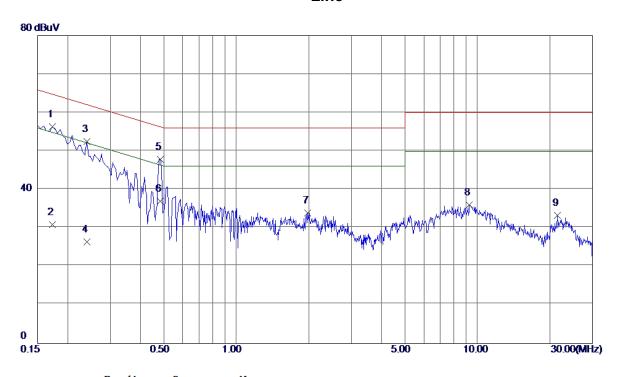
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Test Mode: TX Mode\_ Adapter: Salcomp

## Line



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0. 1725	46. 49	9. 78	56. 27	64.84	-8. 57	Peak	
2	0.1725	21. 10	9. 78	30.88	54.84	-23.96	AVG	
3	0. 2400	42.74	9. 76	<b>52. 50</b>	62. 10	-9. 60	Peak	
4	0.2400	16.60	9. 76	26. 36	52. 10	-25.74	AVG	
5 *	0.4830	38. 06	9.80	47.86	56. 29	-8.43	Peak	
6	0.4830	27. 20	9. 80	37.00	46. 29	-9. 29	AVG	
7	1. 9815	24.07	9. 92	33. 99	56.00	-22.01	Peak	
8	9. 2670	25. 76	10. 29	36. 05	60.00	-23.95	Peak	
9	21. 4845	22. 54	10.69	33. 23	60.00	-26.77	Peak	

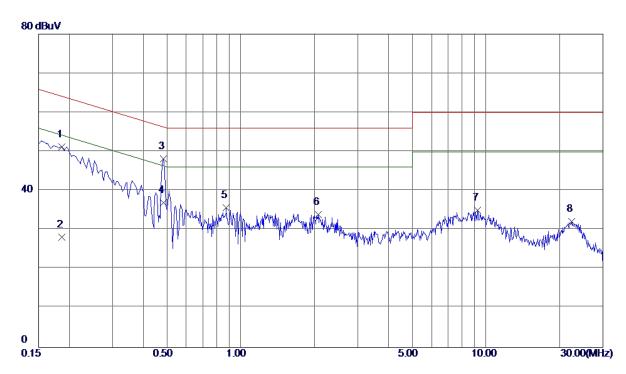
Report No.: BTL-FCCP-1-1712C036





Test Mode: TX Mode\_ Adapter: Salcomp

#### **Neutral**



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1860	41.58	9. 69	51. 27	64.21	<b>-12.94</b>	Peak	
2	0.1860	18. 50	9. 69	28. 19	54.21	<b>-26.02</b>	AVG	
3 *	0.4830	38.48	9. 70	48. 18	56. 29	-8. 11	Peak	
4	0.4830	27. 20	9. 70	36. 90	46. 29	-9. 39	AVG	
5	0.8745	25. 96	9.73	35. 69	56.00	-20. 31	Peak	
6	2.0670	24.02	9.85	33.87	56.00	-22. 13	Peak	
7	9. 2265	24.85	10. 23	35. 08	60.00	-24. 92	Peak	
8	22. 3395	21. 37	10.84	32. 21	60.00	-27.79	Peak	

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

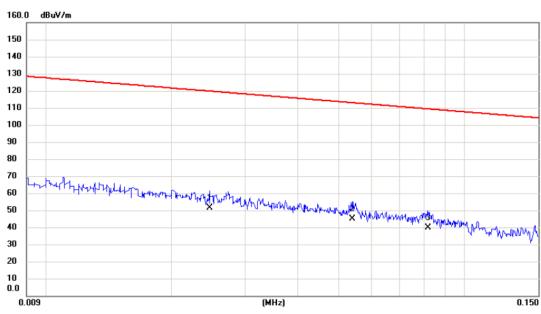
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Test Mode: TX Mode \_Adapter: BYD

Ant 0°



No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0246	31.82	19.48	51.30	119.79	-68.49	AVG	
2 *	0.0540	26.18	18.64	44.82	112.96	-68.14	AVG	
3	0.0817	21.62	18.07	39.69	109.36	-69.67	AVG	

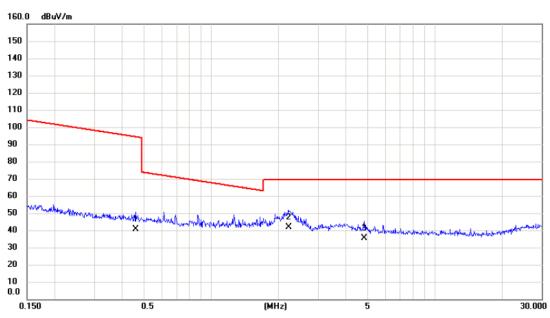
Report No.: BTL-FCCP-1-1712C036 Page 38 of 132





Test Mode: TX Mode\_ Adapter: BYD

## Ant 0°



No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.4588	24.03	16.50	40.53	94.37	-53.84	AVG	
2 *	2.2132	26.19	15.45	41.64	69.54	-27.90	QP	
3	4.8224	20.85	14.48	35.33	69.54	-34.21	QP	

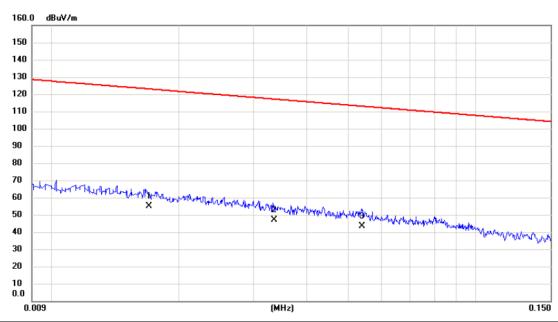
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Test Mode: TX Mode \_ Adapter: BYD

## Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0170	35.08	20.01	55.09	123.00	-67.91	AVG	
2		0.0335	27.94	19.22	47.16	117.10	-69.94	AVG	
3		0.0540	24.70	18.64	43.34	112.96	-69.62	AVG	

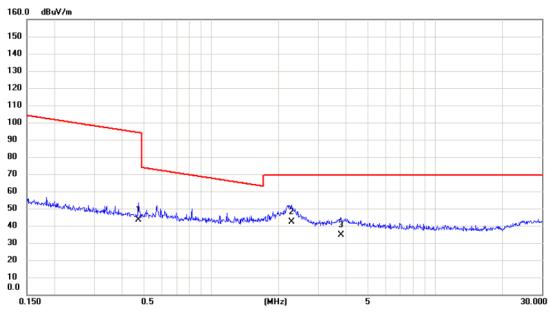
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Test Mode: TX Mode\_ Adapter: BYD

## Ant 90°



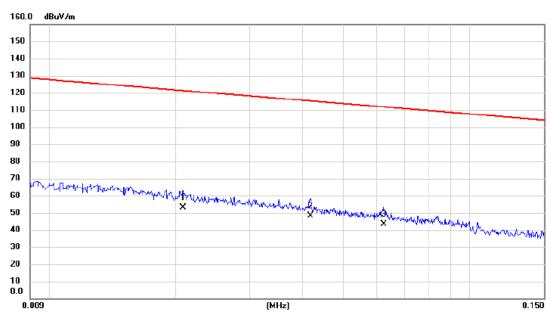
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.4736	26.77	16.49	43.26	94.10	-50.84	AVG	
2 *	2.2847	26.60	15.43	42.03	69.54	-27.51	QP	
3	3.7994	19.57	15.01	34.58	69.54	-34.96	QP	

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Ant 0°



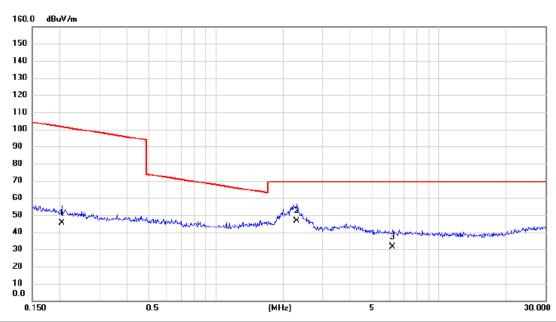
No. Mk.	Freq.	_		Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0208	33.46	19.60	53.06	121.24	-68.18	AVG	
2 *	0.0418	29.27	18.97	48.24	115.18	-66.94	AVG	
3	0.0624	24.90	18.48	43.38	111.70	-68.32	AVG	

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Ant 0°



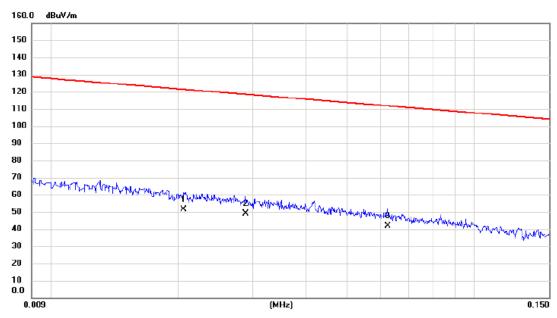
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2040	28.66	16.79	45.45	101.41	-55.96	AVG	
2 *	2.2968	30.99	15.43	46.42	69.54	-23.12	QP	
3	6.1860	17.36	14.22	31.58	69.54	-37.96	QP	

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## Ant 90°



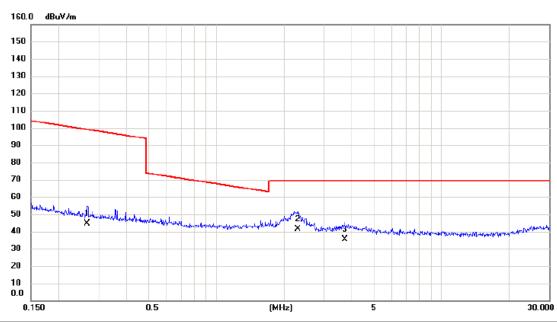
No. Mk.	Freq.			Measure ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0206	31.94	19.60	51.54	121.33	-69.79	AVG	
2 *	0.0288	29.49	19.36	48.85	118.42	-69.57	AVG	
3	0.0624	23.34	18.48	41.82	111.70	-69.88	AVG	

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## Ant 90°



No. Mk.	Freq.			Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2672	28.05	16.65	44.70	99.07	-54.37	AVG	
2 *	2.2968	25.92	15.43	41.35	69.54	-28.19	QP	
3	3.7198	20.20	15.02	35.22	69.54	-34.32	QP	

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

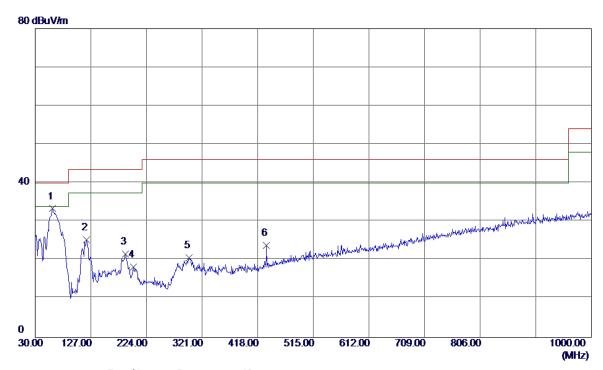
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Test Mode: TX 2402MHz \_CH00\_1Mbps\_ Adapter: BYD

# **Vertical**



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	60.0700	47.68	-14.32	33. 36	40.00	-6. 64	Peak	
2	119. 2400	40.67	-15. 46	25. 21	43.50	-18. 29	Peak	
3	187. 1400	34. 25	-12.61	21.64	43.50	-21.86	Peak	
4	201.6900	32. 02	-13.79	18. 23	43.50	-25. 27	Peak	
5	298. 6900	33. 59	-13.01	20. 58	46.00	-25.42	Peak	
6	433. 5200	34. 27	-10.41	23.86	46.00	-22. 14	Peak	

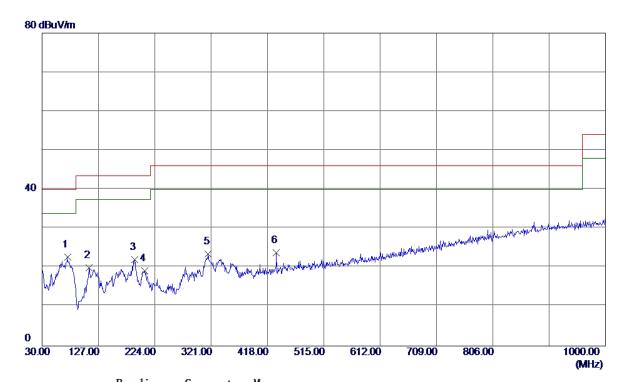
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Test Mode: TX 2402MHz \_CH00\_1Mbps\_ Adapter: BYD

# **Horizontal**



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	73.6500	39. 68	-16. 93	22. 75	40.00	-17. 25	Peak	
2	110. 5100	36. 09	-16. 15	19. 94	43.50	-23. 56	Peak	
3	189. 0800	34. 79	-12.77	22. 02	43.50	-21.48	Peak	
4	206. 5399	33. 08	-13.90	19. 18	43.50	-24.32	Peak	
5	316. 1500	36. 12	-12. 55	23. 57	46.00	-22.43	Peak	
6	433. 5200	34. 18	-10.41	23.77	46.00	-22. 23	Peak	

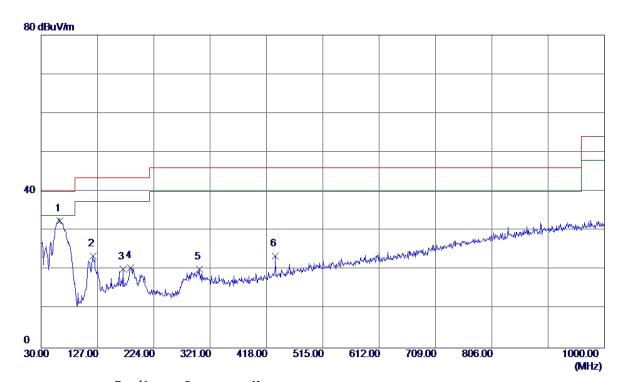
Report No.: BTL-FCCP-1-1712C036 Page 48 of 132





Test Mode: TX 2480MHz \_CH78\_1Mbps\_ Adapter: BYD

# **Vertical**



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	62.0100	47. 16	-14.65	32. 51	40.00	-7.49	Peak	
2	119. 2400	38. 99	-15. 46	23. 53	43.50	-19.97	Peak	
3	171.6200	32. 47	-12. 29	20. 18	43.50	-23. 32	Peak	
4	184. 2300	32.83	-12. 38	20.45	43.50	-23.05	Peak	
5	302. 5700	32. 92	-12.78	20. 14	46.00	-25.86	Peak	
6	433. 5200	33. 95	-10.41	23. 54	46.00	-22.46	Peak	

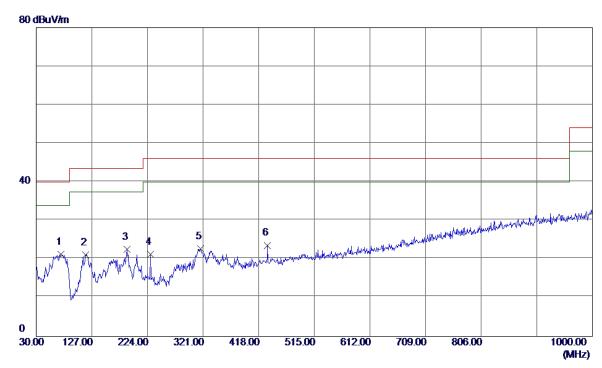
Report No.: BTL-FCCP-1-1712C036





Test Mode: TX 2480MHz \_CH78\_1Mbps\_ Adapter: BYD

# **Horizontal**



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	72.6800	38. 03	-16.82	21. 21	40.00	-18.79	Peak	
2	116. 3300	36. 86	-15. 69	21. 17	43.50	-22. 33	Peak	
3	188. 1100	35. 30	-12.69	22.61	43.50	-20.89	Peak	
4	229.8200	35. 43	-14. 13	21. 30	46.00	-24.70	Peak	
5	317. 1200	35. 32	-12. 53	22. 79	46.00	-23. 21	Peak	
6	433. 5200	34.01	-10.41	23.60	46.00	-22.40	Peak	

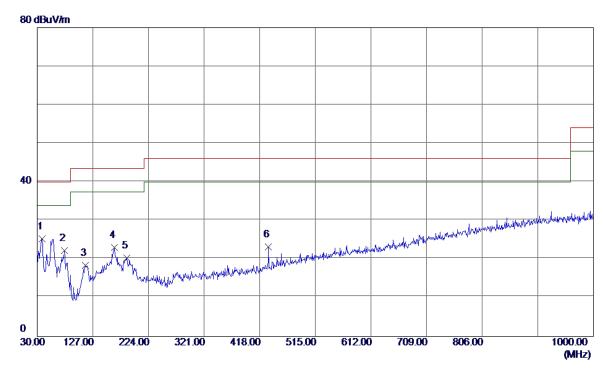
Report No.: BTL-FCCP-1-1712C036 Page 50 of 132





Test Mode: TX 2402MHz\_CH00\_1Mbps \_ Adapter: Salcomp

# **Vertical**



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	38.7300	39. 44	-14. 16	25. 28	40.00	-14.72	Peak	
2	77. 5300	39. 98	-17.67	22. 31	40.00	-17.69	Peak	
3	114. 3900	34. 28	-15.84	18. 44	43.50	<b>-25.06</b>	Peak	
4	164.8300	35. 62	-12.64	22. 98	43.50	-20. 52	Peak	
5	186. 1700	32.83	-12.54	20. 29	43.50	-23. 21	Peak	
6	433. 5200	33. 57	-10.41	23. 16	46.00	-22.84	Peak	

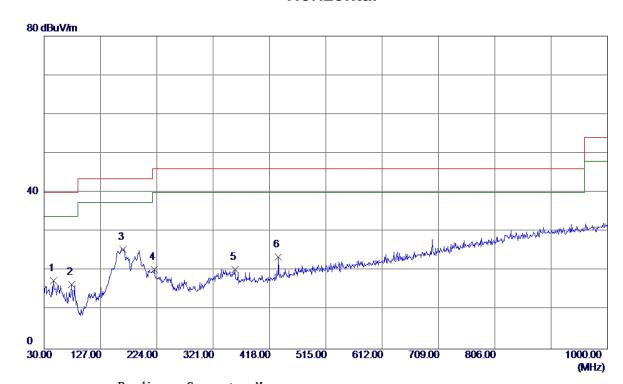
Report No.: BTL-FCCP-1-1712C036 Page 51 of 132





Test Mode: TX 2402MHz\_CH00\_1Mbps \_ Adapter: Salcomp

# **Horizontal**



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	46. 4900	30. 49	-12. 98	17. 51	40.00	-22.49	Peak	
2	77. 5300	34. 17	-17.67	16. 50	40.00	-23.50	Peak	
3 *	165.8000	38. 04	-12. 58	25. 46	43.50	-18.04	Peak	
4	220. 1200	34. 16	-13.91	20. 25	46.00	-25.75	Peak	
5	358. 8299	32. 21	-11.85	20. 36	46.00	-25.64	Peak	
6	433. 5200	33. 89	-10.41	23. 48	46.00	-22. 52	Peak	

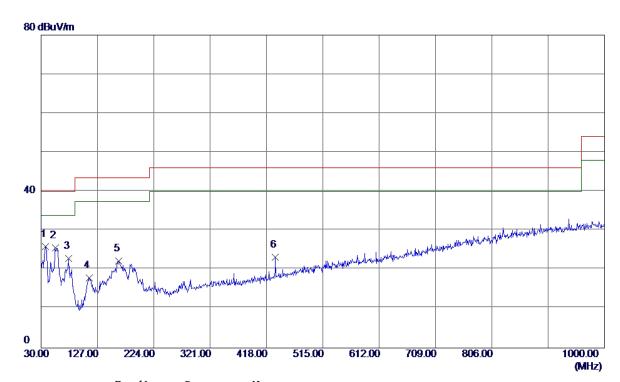
Report No.: BTL-FCCP-1-1712C036 Page 52 of 132





Test Mode: TX 2480MHz\_CH78\_1Mbps \_ Adapter: Salcomp

# **Vertical**



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	37.7599	40. 26	-14.30	25. 96	40.00	-14.04	Peak	
2	54. 2500	39. 61	-13. 95	25. 66	40.00	-14.34	Peak	
3	77. 5300	40.49	-17.67	22.82	40.00	-17. 18	Peak	
4	112.4500	33.94	-16.00	17.94	43.50	-25.56	Peak	
5	163.8600	35. 01	-12.70	22. 31	43.50	-21. 19	Peak	
6	433. 5200	33. 60	-10.41	23. 19	46.00	-22.81	Peak	

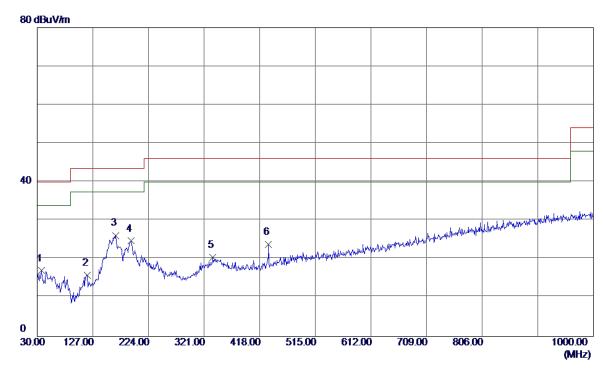
Report No.: BTL-FCCP-1-1712C036 Page 53 of 132





Test Mode: TX 2480MHz\_CH78\_1Mbps \_ Adapter: Salcomp

# **Horizontal**



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	37.7599	31. 34	-14.30	17.04	40.00	-22. 96	Peak	
2	117. 3000	31.41	-15. 61	15. 80	43. 50	-27.70	Peak	
3 *	166.7700	38. 69	-12.53	26. 16	43.50	-17.34	Peak	
4	193. 9299	37. 92	-13. 20	24.72	43.50	-18.78	Peak	
5	336. 5200	32.74	-12. 19	20. 55	46.00	-25.45	Peak	
6	433. 5200	34. 30	-10.41	23. 89	46.00	-22. 11	Peak	

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APPENDIX D - RADIATED EMISSION (ABOVE 1000MHZ)

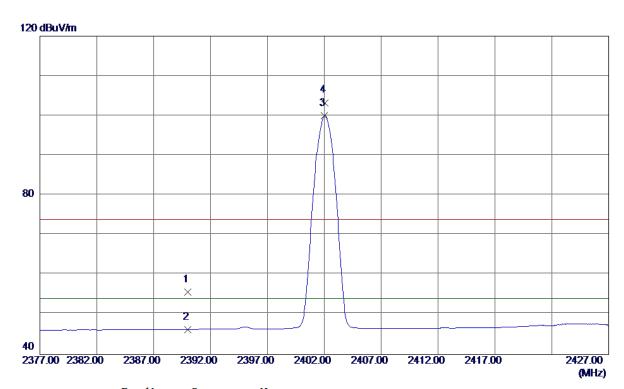
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Test Mode: TX 2402MHz \_CH00\_1Mbps

## Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	22.65	33.06	55.71	74.00	-18. 29	Peak	
2	2390.0000	13. 23	33.06	46. 29	54.00	-7.71	AVG	
3 *	2402.0000	66. 96	33. 10	100.06	54.00	46.06	AVG	No Limit
4	2402.0500	70. 18	33. 10	103. 28	74.00	29. 28	Peak	No Limit
4	2402. 0500	70. 18	33. 10	103. 28	74.00	29. 28	Peak	No Limit

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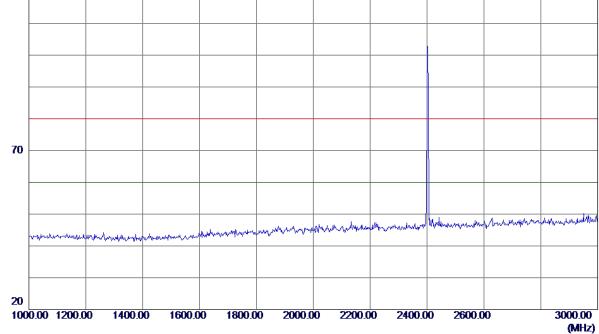




Test Mode : TX 2402MHz \_CH00\_1Mbps

Vertical

120 dBuV/m



No.	Freq.	Reading Level	Correct Factor	Measure $ment$	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment

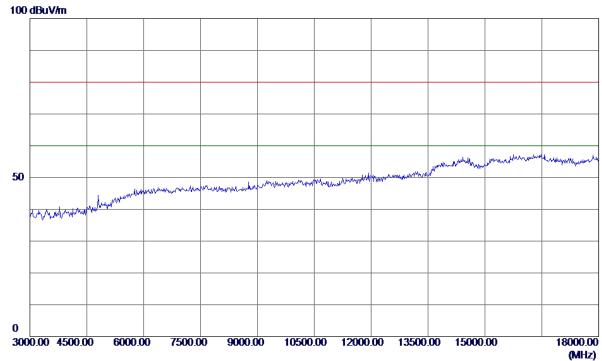
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Test Mode : TX 2402MHz \_CH00\_1Mbps

Vertical



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

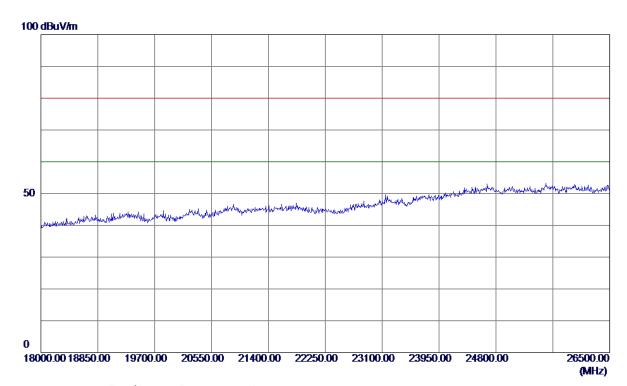
Report No.: BTL-FCCP-1-1712C036 Page 58 of 132





Test Mode: TX 2402MHz \_CH00\_1Mbps

### **Vertical**



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

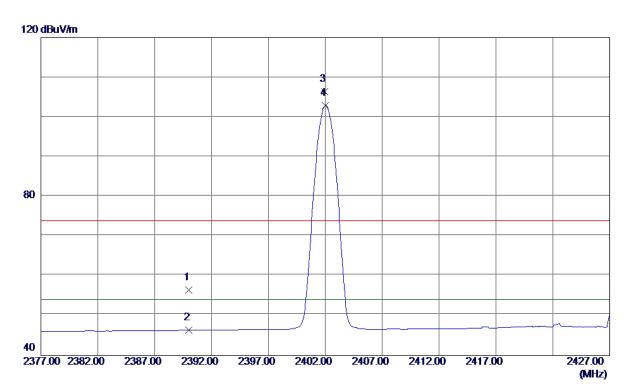
Report No.: BTL-FCCP-1-1712C036 Page 59 of 132





Test Mode: TX 2402MHz \_CH00\_1Mbps

### Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	23. 37	33.06	56. 43	74.00	-17. 57	Peak	
2	2390.0000	13. 28	33.06	46. 34	54.00	-7.66	AVG	
3	2401.9500	73. 23	33. 10	106. 33	74.00	32. 33	Peak	No Limit
4 *	2402.0000	69. 78	33. 10	102.88	54.00	48.88	AVG	No Limit

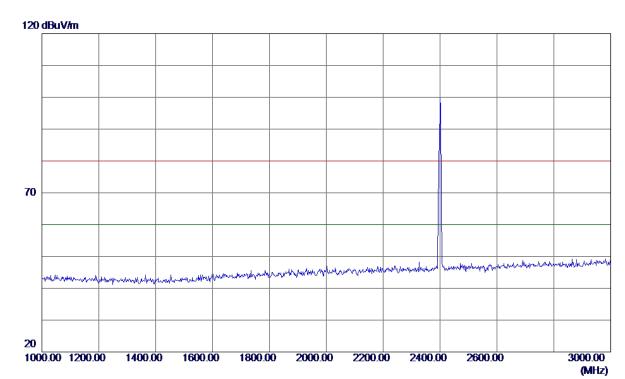
Report No.: BTL-FCCP-1-1712C036 Page 60 of 132





Test Mode : TX 2402MHz \_CH00\_1Mbps

Horizontal

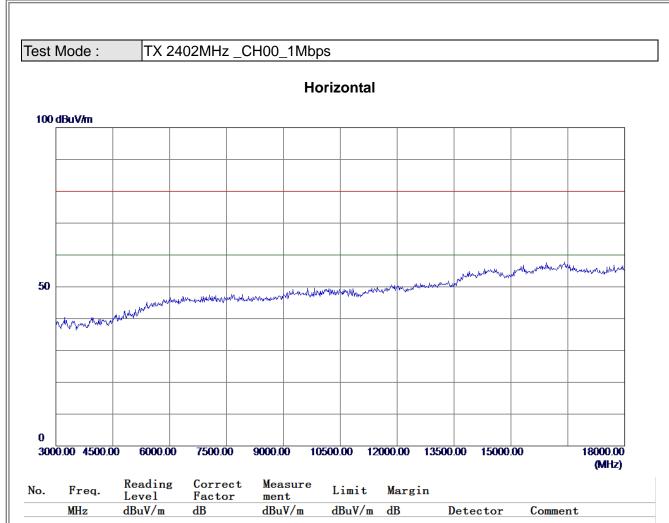


No.	Freq.	keading Level	Correct Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

Report No.: BTL-FCCP-1-1712C036 Page 61 of 132







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Test Mode: TX 2402MHz \_CH00\_1Mbps

Horizontal

100 dBuV/m

50

18000.00 18850.00 19700.00 20550.00 21400.00 22250.00 23100.00 23950.00 24800.00 (MHz)

No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

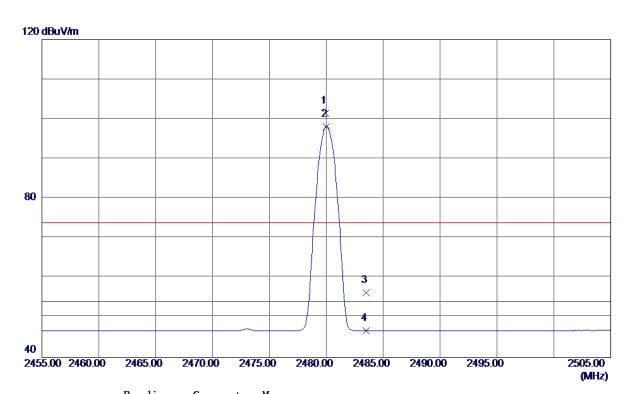
Report No.: BTL-FCCP-1-1712C036 Page 63 of 132





Test Mode: TX 2480MHz \_CH78\_1Mbps

## Vertical



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.9500	68. 07	33. 39	101.46	74.00	27.46	Peak	No Limit
2 *	2480.0000	64.77	33. 39	98. 16	54.00	44. 16	AVG	No Limit
3	2483. 5000	22. 93	33.41	56. 34	74.00	-17.66	Peak	
4	2483. 5000	13. 29	33.41	46. 70	54.00	-7. 30	AVG	

Report No.: BTL-FCCP-1-1712C036 Page 64 of 132

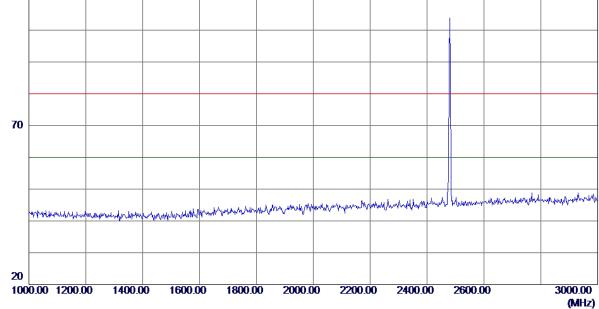




Test Mode : TX 2480MHz \_CH78\_1Mbps

Vertical

120 dBuV/m



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment

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Level

dBuV/m

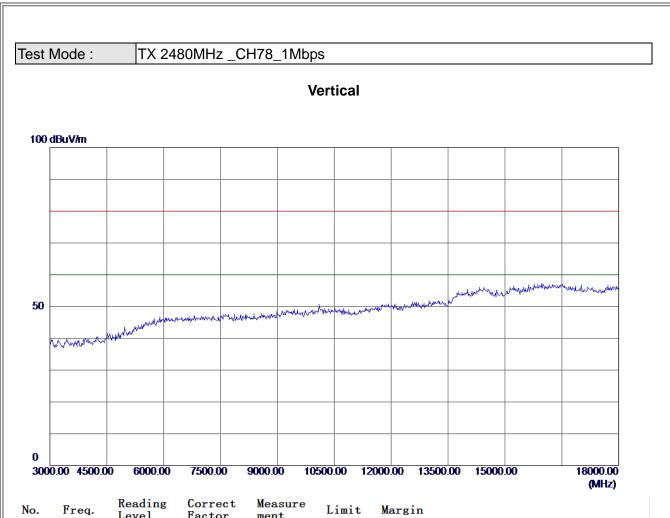
MHz

Factor

ment

dBuV/m





dBuV/m dB

Detector

Comment

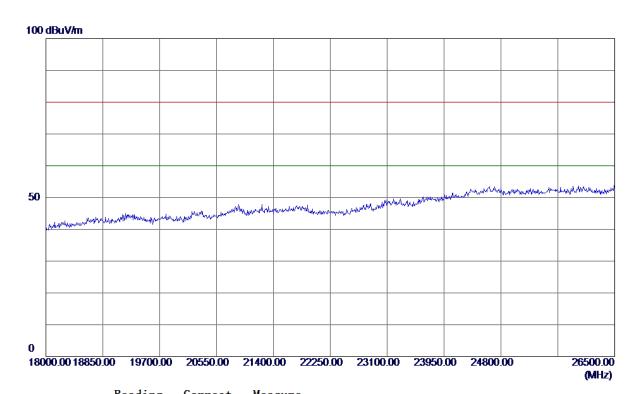
Report No.: BTL-FCCP-1-1712C036 Page 66 of 132





Test Mode: TX 2480MHz \_CH78\_1Mbps

### **Vertical**



No.	Freq.	Level	Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

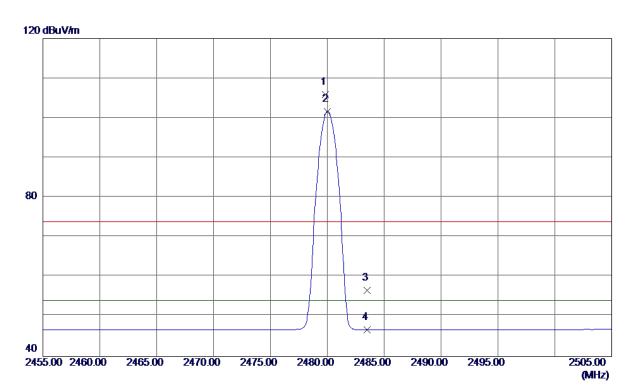
Report No.: BTL-FCCP-1-1712C036 Page 67 of 132





Test Mode: TX 2480MHz \_CH78\_1Mbps

### Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.8500	72. 56	33. 39	105. 95	74.00	31.95	Peak	No Limit
2 *	2480.0000	68. 23	33. 39	101.62	54.00	47.62	AVG	No Limit
3	2483. 5000	23. 30	33.41	56.71	74.00	-17.29	Peak	
4	2483. 5000	13. 28	33. 41	46. 69	54.00	-7. 31	AVG	

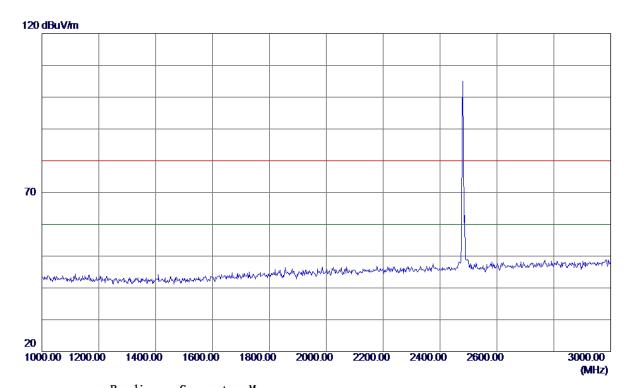
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Test Mode: TX 2480MHz \_CH78\_1Mbps

### Horizontal



No.	Freq.	keading Level	Correct Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

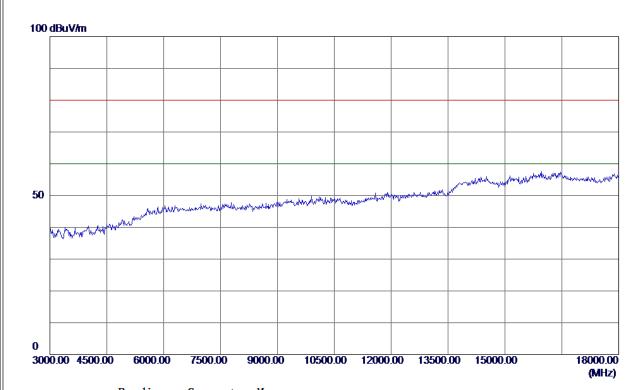
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Test Mode: TX 2480MHz \_CH78\_1Mbps

### Horizontal



No.	Freq.	Level	Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

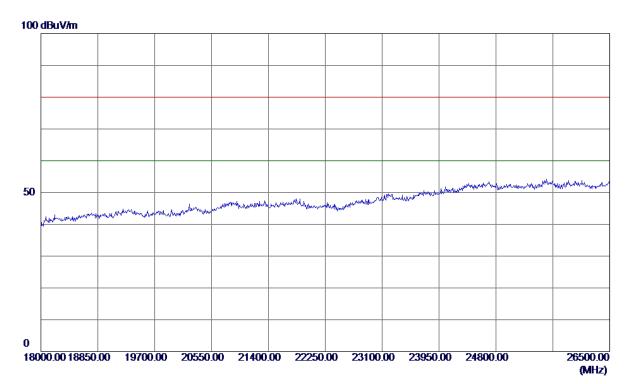
Report No.: BTL-FCCP-1-1712C036 Page 70 of 132





Test Mode: TX 2480MHz \_CH78\_1Mbps

### Horizontal



No.	Freq.		Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

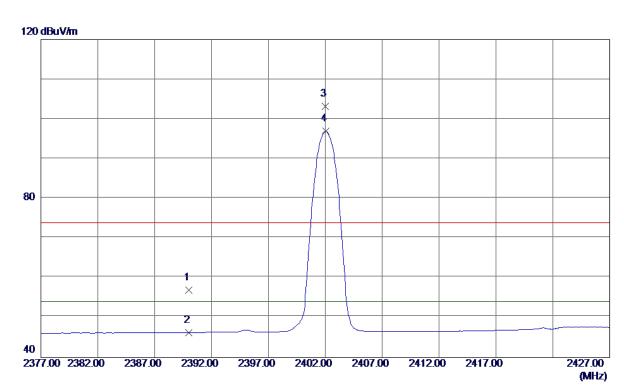
Report No.: BTL-FCCP-1-1712C036 Page 71 of 132





Test Mode: TX 2402MHz \_CH00\_3Mbps

## Vertical



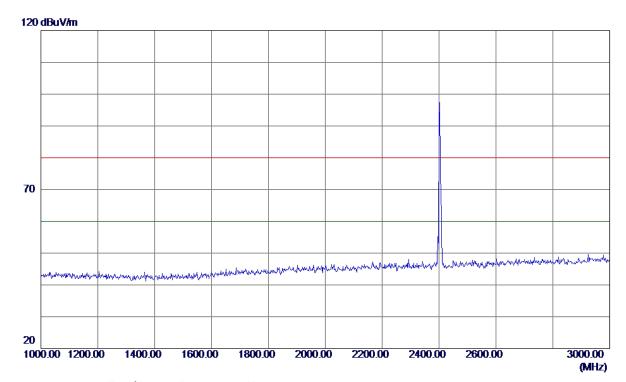
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	23.85	33. 06	56. 91	74.00	-17.09	Peak	
2	2390.0000	13. 23	33.06	46. 29	54.00	-7.71	AVG	
3	2402.0000	70. 12	33. 10	103. 22	74.00	29. 22	Peak	No Limit
4 *	2402.0500	63. 79	33. 10	96. 89	54.00	42.89	AVG	No Limit

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## **Vertical**



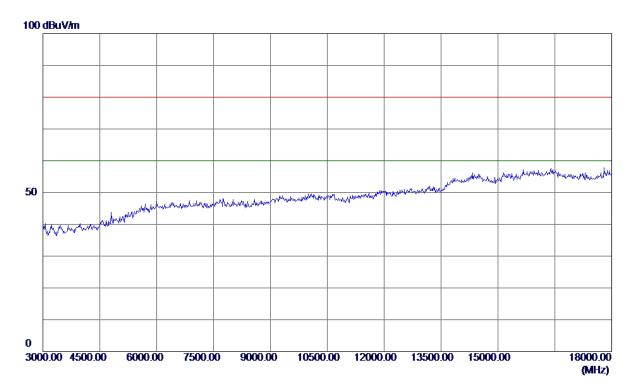
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

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# Vertical



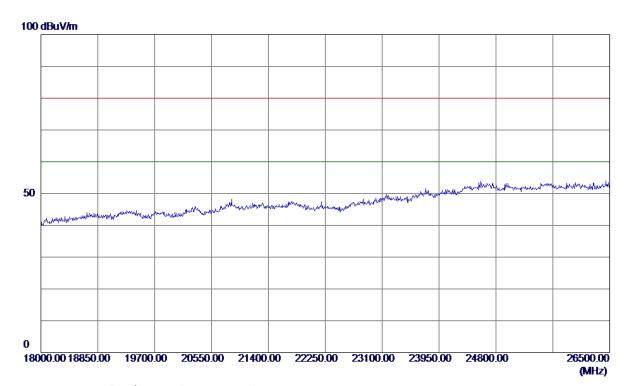
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

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## **Vertical**



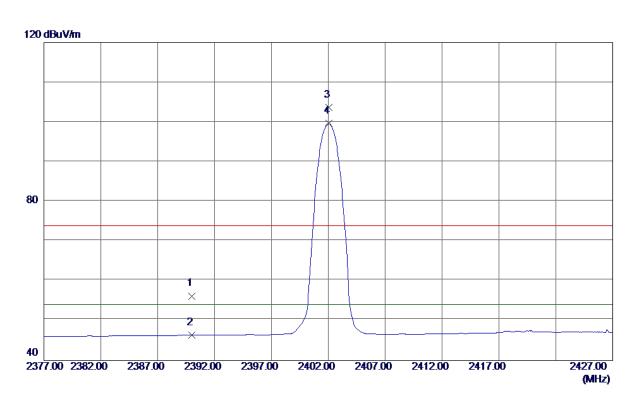
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

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## Horizontal



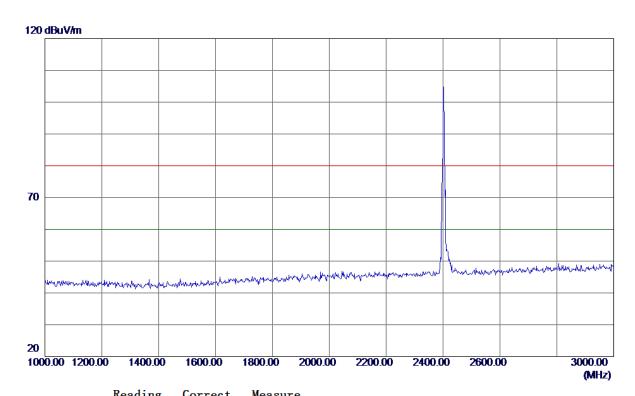
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	23. 18	33.06	56. 24	74.00	-17.76	Peak	
2	2390.0000	13. 27	33.06	46. 33	54.00	-7.67	AVG	
3	2402.0500	70. 58	33. 10	103.68	74.00	29.68	Peak	No Limit
4 *	2402.0500	66. 52	33. 10	99. 62	54.00	45.62	AVG	No Limit

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## Horizontal



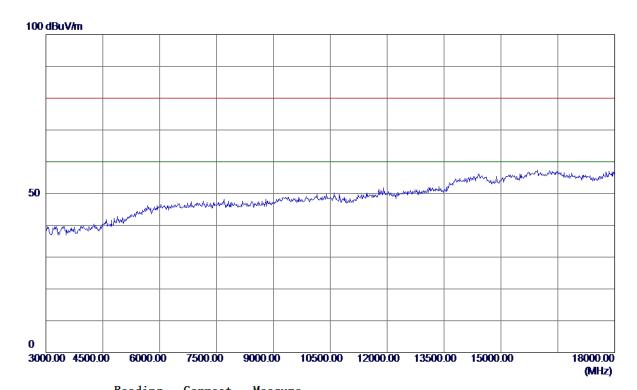
No.	Freq.	Level	Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

Report No.: BTL-FCCP-1-1712C036 Page 77 of 132





## Horizontal



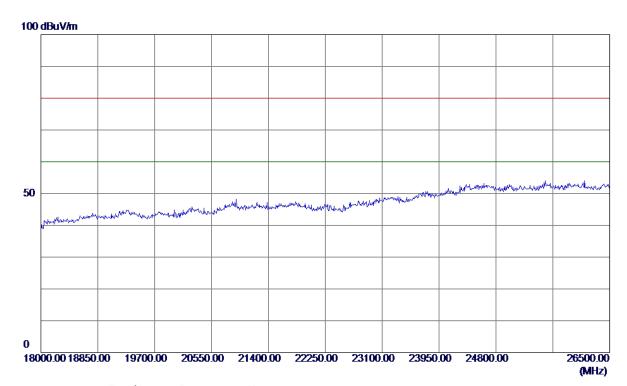
No.	Freq.	Level	Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

Report No.: BTL-FCCP-1-1712C036 Page 78 of 132





## Horizontal



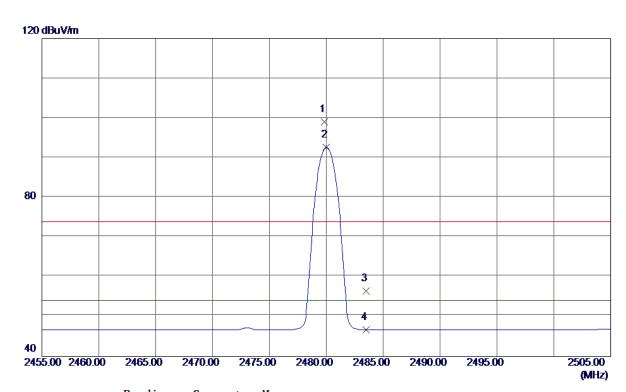
N	o.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

Report No.: BTL-FCCP-1-1712C036 Page 79 of 132





# Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.8500	65. 67	33. 39	99.06	74.00	25.06	Peak	No Limit
2 *	2480.0000	59. 21	33. 39	92. 60	54.00	38. 60	AVG	No Limit
3	2483. 5000	23. 09	33.41	56. 50	74.00	-17. 50	Peak	
4	2483. 5000	13. 29	33. 41	46. 70	54.00	-7. 30	AVG	

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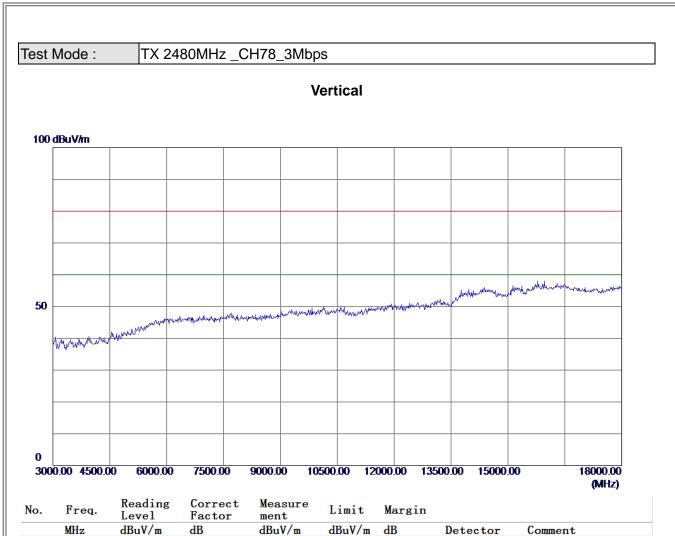
Test Mode: TX 2480MHz \_CH78\_3Mbps **Vertical** 120 dBuV/m 70 20 3000.00 1000.00 1200.00 1400.00 1600.00 1800.00 2000.00 2200.00 2400.00 2600.00 (MHz)

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment

Report No.: BTL-FCCP-1-1712C036







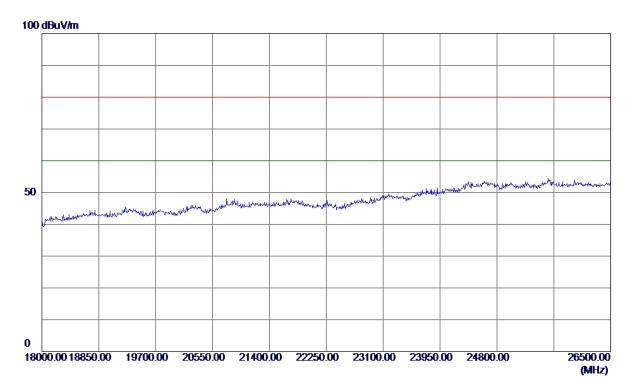
Report No.: BTL-FCCP-1-1712C036 Page 82 of 132





Test Mode: TX 2480MHz \_CH78\_3Mbps

# **Vertical**



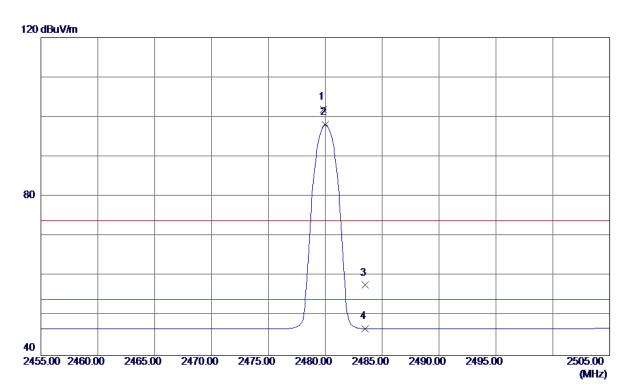
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

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## Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.8500	68. 56	33. 39	101. 95	74.00	27.95	Peak	No Limit
2 *	2480.0000	64.66	33. 39	98. 05	54.00	44.05	AVG	No Limit
3	2483. 5000	24. 27	33. 41	57. 68	74.00	-16. 32	Peak	
4	2483. 5000	13. 29	33. 41	46. 70	54.00	-7.30	AVG	

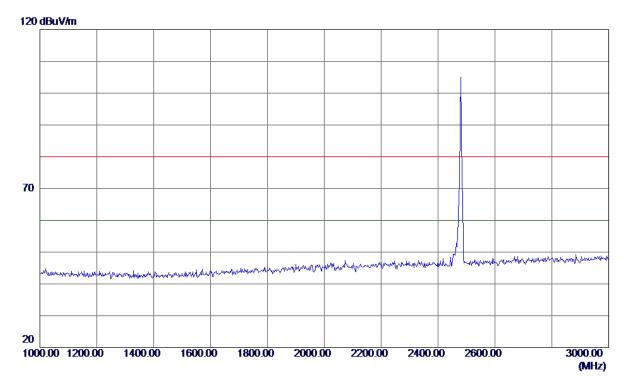
Report No.: BTL-FCCP-1-1712C036 Page 84 of 132





Test Mode: TX 2480MHz \_CH78\_3Mbps

## Horizontal



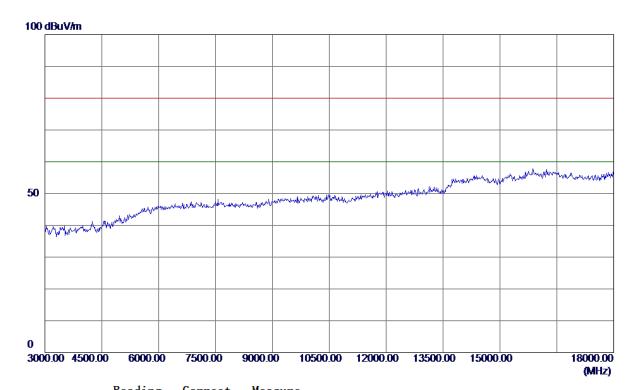
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

Report No.: BTL-FCCP-1-1712C036





## Horizontal



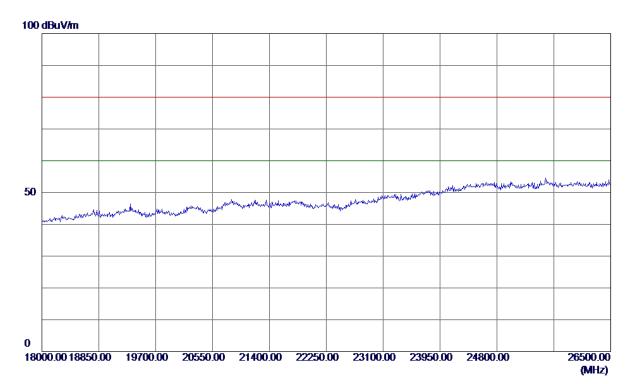
No.	Freq.	Level	Factor	measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

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## Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment	

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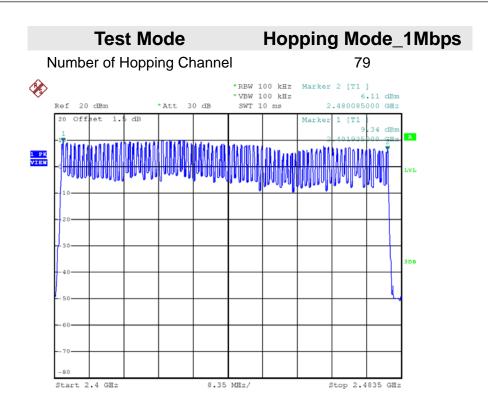


APPENDIX E - NUMBER OF HOPPING CHANNEL	_

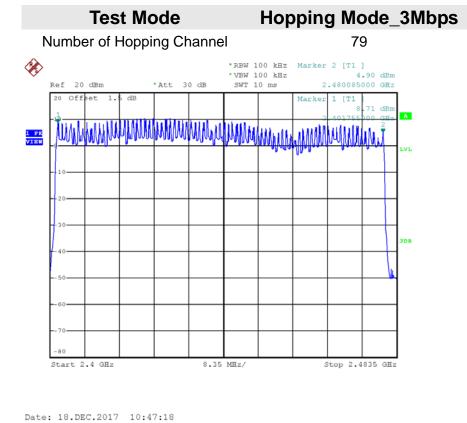
Report No.: BTL-FCCP-1-1712C036 Page 88 of 132







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Report No.: BTL-FCCP-1-1712C036





APPENDIX F - AVERAGE TIME OF OCCUPANCY

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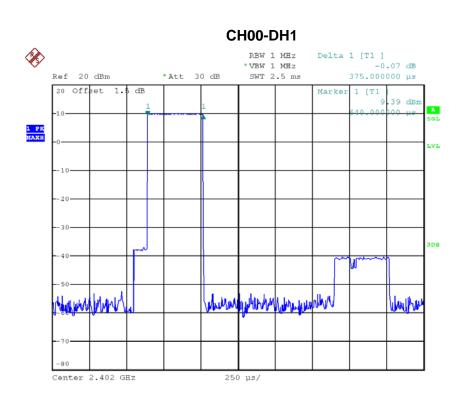
Test Mode : TX Mode\_1Mbps

Data Packet	Frequency	Pulse Duration	Dwell Time	Limits	Test Result
Dala Packel	(MHz)	(ms)	(s)	(s)	rest 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	0.3750	0.1200	0.4000	Pass
DH5	2480	2.8800	0.3072	0.4000	Pass
DH3	2480	1.6200	0.2592	0.4000	Pass
DH1	2480	0.3750	0.1200	0.4000	Pass

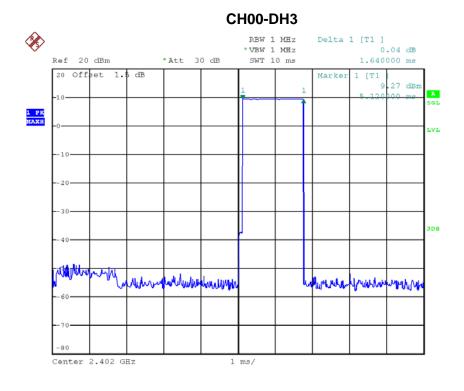
Report No.: BTL-FCCP-1-1712C036 Page 91 of 132







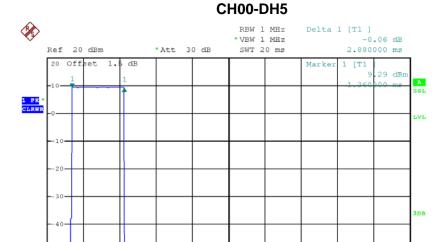
Date: 18.DEC.2017 10:05:06



Date: 18.DEC.2017 10:20:27







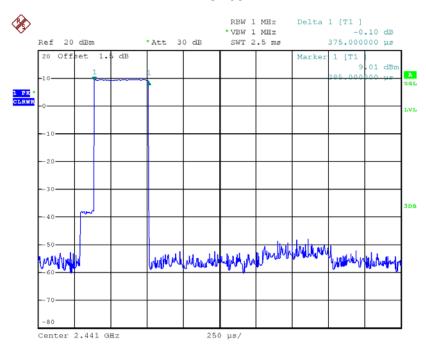
Date: 18.DEC.2017 10:21:20

Center 2.402 GHz

#### CH39-DH1

2 ms/

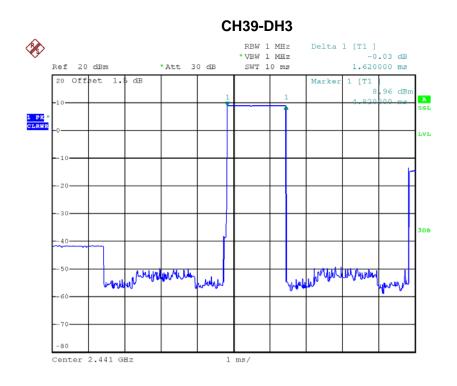
rather and a higher development below harden by



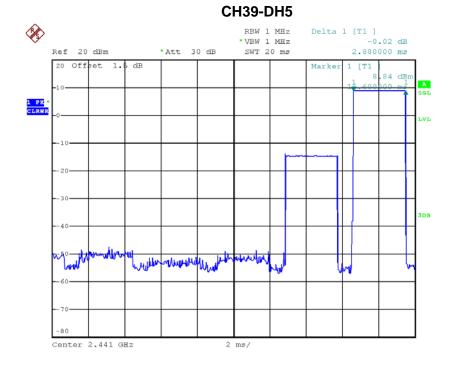
Date: 18.DEC.2017 10:05:11







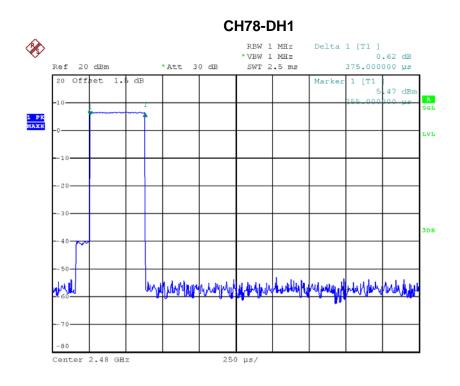
Date: 18.DEC.2017 10:20:45



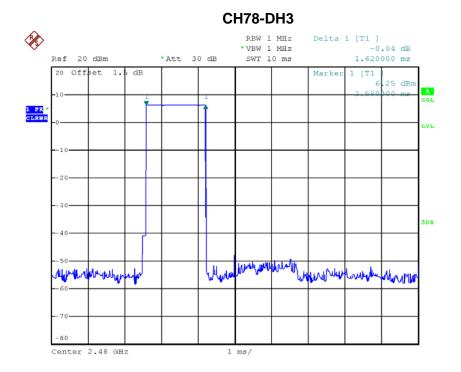
Date: 18.DEC.2017 10:21:25







Date: 18.DEC.2017 10:11:19

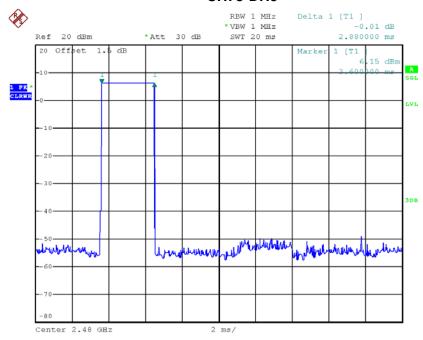


Date: 18.DEC.2017 10:21:04









Date: 18.DEC.2017 10:21:30





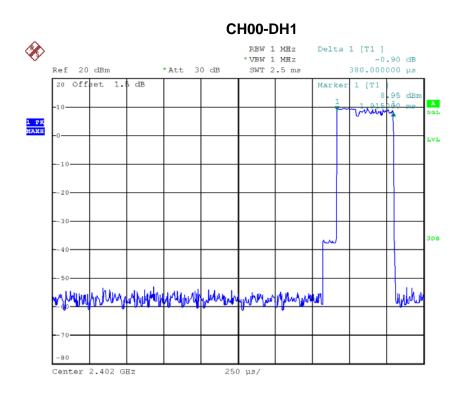
Test Mode : TX Mode\_3Mbps

Data Packet	Fraguenay	Pulse	Dwell	Limito(a)	Test Result	
Dala Packel	Frequency	Duration(ms)	Time(s)	Limits(s)		
DH5	2402	2.8800	0.3072	0.4000	Pass	
DH3	2402	1.6200	0.2592	0.4000	Pass	
DH1	2402	0.3800	0.1216	0.4000	Pass	
DH5	2441	2.8800	0.3072	0.4000	Pass	
DH3	2441	1.6400	0.2624	0.4000	Pass	
DH1	2441	0.3800	0.1216	0.4000	Pass	
DH5	2480	2.8800	0.3072	0.4000	Pass	
DH3	2480	1.6400	0.2624	0.4000	Pass	
DH1	2480	0.3800	0.1216	0.4000	Pass	

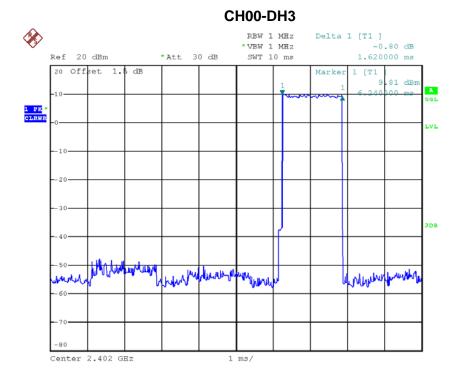
Report No.: BTL-FCCP-1-1712C036 Page 97 of 132







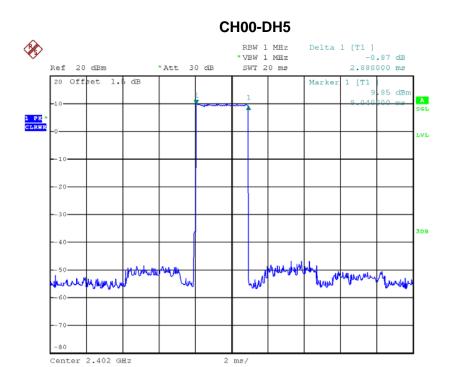
Date: 18.DEC.2017 10:28:17



Date: 18.DEC.2017 10:49:15

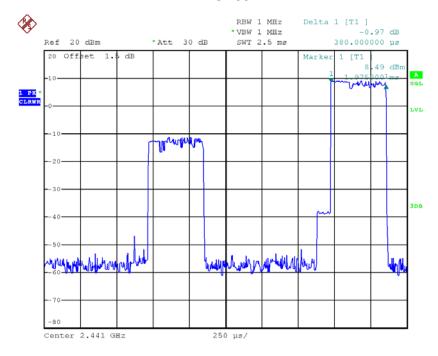






Date: 18.DEC.2017 10:51:32

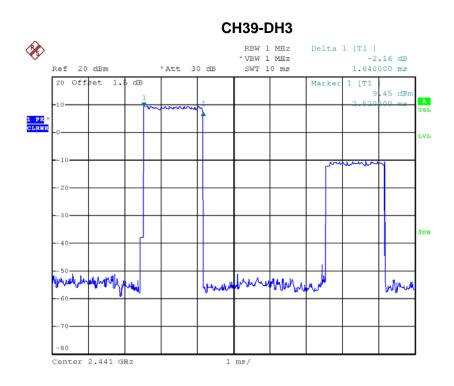
#### CH39-DH1



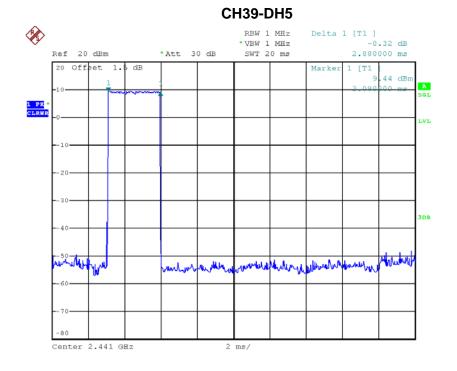
Date: 18.DEC.2017 10:29:49







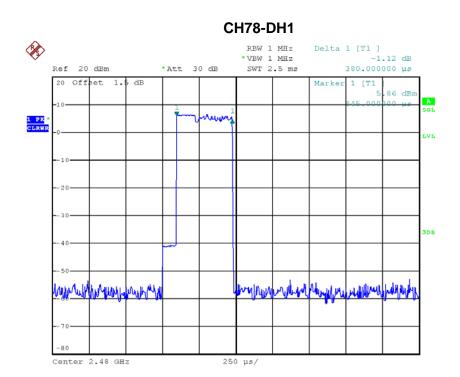
Date: 18.DEC.2017 10:49:22



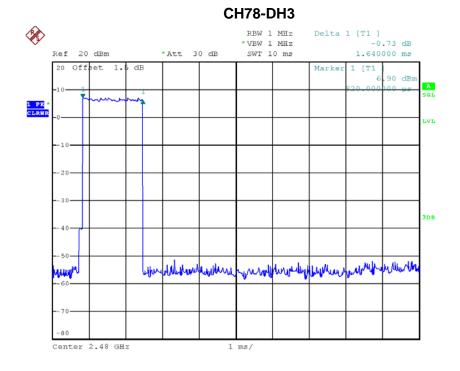
Date: 18.DEC.2017 10:50:48







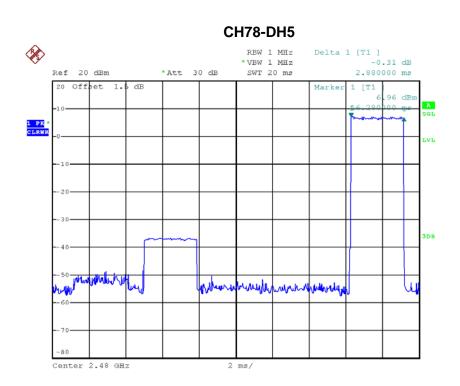
Date: 18.DEC.2017 10:30:03



Date: 18.DEC.2017 10:50:32







Date: 18.DEC.2017 10:51:11





# APPENDIX G - HOPPING CHANNEL SEPARATION MEASUREMENT

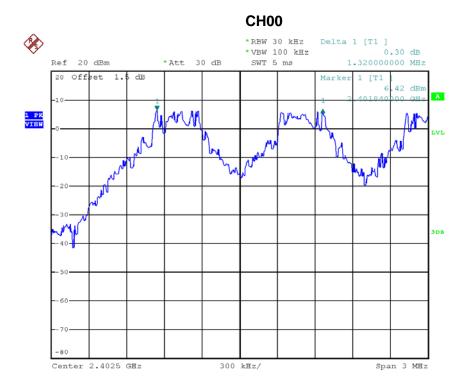
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Test Mode: Hopping on \_1Mbps

Frequency	Channel Separation	2/3 of 20dB Bandwidth	Toot Dooult
(MHz)	(MHz)	(MHz)	Test Result
2402	1.320	0.639	Pass
2441	1.204	0.639	Pass
2480	1.185	0.644	Pass

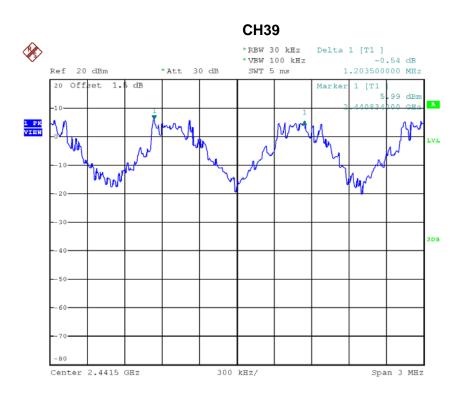


Date: 18.DEC.2017 10:12:25

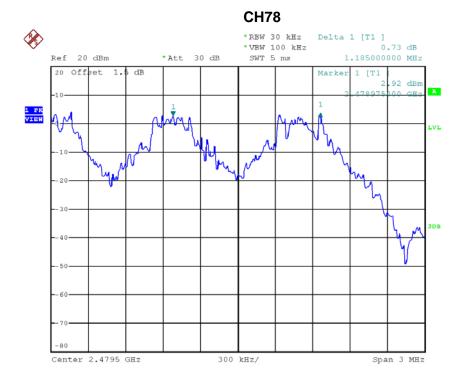
Report No.: BTL-FCCP-1-1712C036 Page 104 of 132







Date: 18.DEC.2017 10:16:01



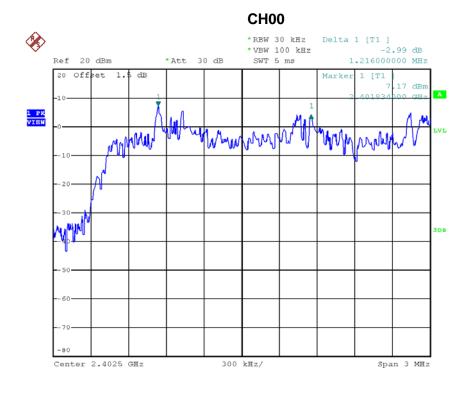
Date: 18.DEC.2017 10:17:07





Test Mode: Hopping on \_3Mbps

Frequency	Channel Separation	2/3 of 20dB Bandwidth	Toot Dooult
(MHz)	(MHz)	(MHz)	Test Result
2402	1.216	0.857	Pass
2441	0.994	0.871	Pass
2480	1.204	0.877	Pass

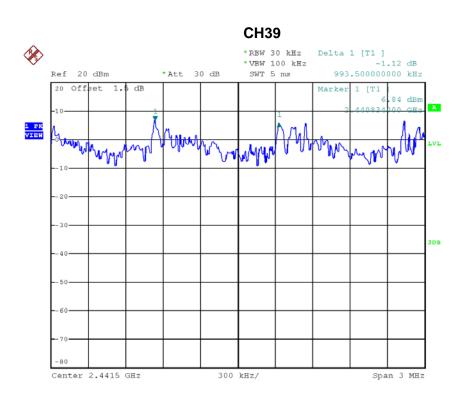


Date: 18.DEC.2017 10:37:56

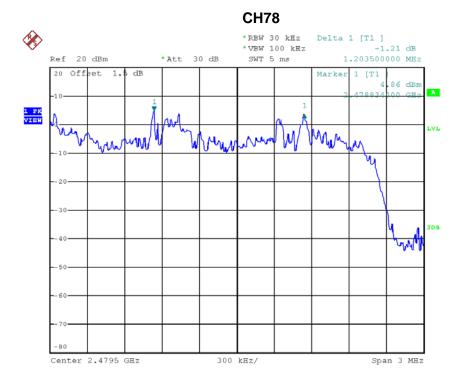
Report No.: BTL-FCCP-1-1712C036 Page 106 of 132







Date: 18.DEC.2017 10:42:28



Date: 18.DEC.2017 10:45:31





APPENDIX H - BANDWIDTH

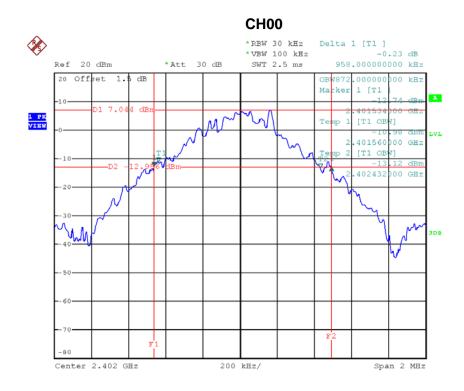
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Test Mode : TX Mode \_1Mbps

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	0.958	0.872	Pass
2441	0.958	0.876	Pass
2480	0.966	0.876	Pass

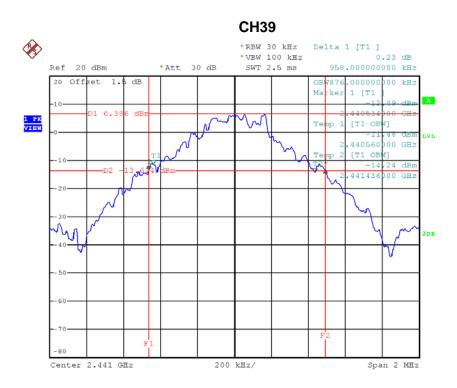


Date: 18.DEC.2017 09:58:06

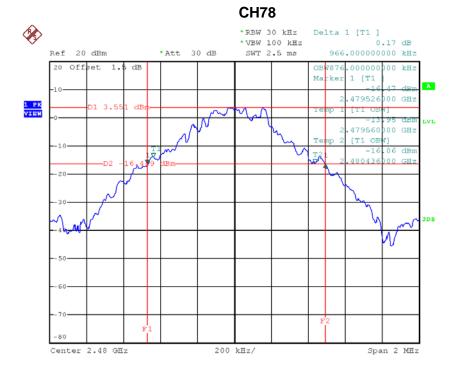
Report No.: BTL-FCCP-1-1712C036 Page 109 of 132







Date: 18.DEC.2017 09:59:56



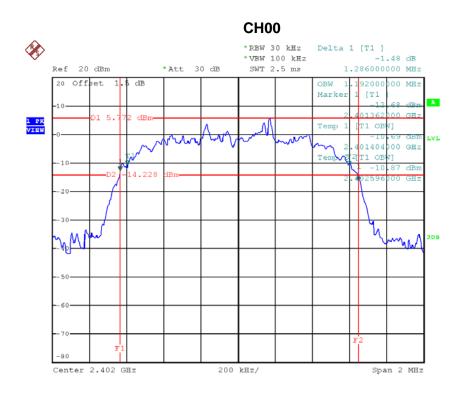
Date: 18.DEC.2017 10:02:05





Test Mode: TX Mode \_3Mbps

Frequency	20dB Bandwidth	99% Occupied BW	Test Result	
(MHz)	(MHz)	(MHz)		
2402	1.286	1.192	Pass	
2441	1.306	1.192	Pass	
2480	1.316	1.192	Pass	

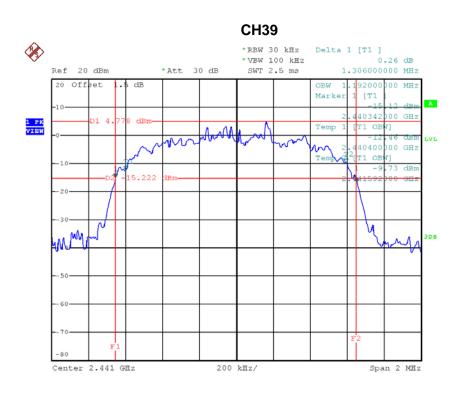


Date: 18.DEC.2017 10:24:18

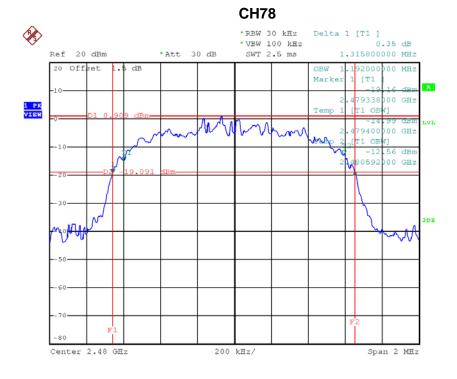
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Date: 18.DEC.2017 10:26:00



Date: 18.DEC.2017 10:26:41





APPENDIX I - PEAK OUTPUT POWER				

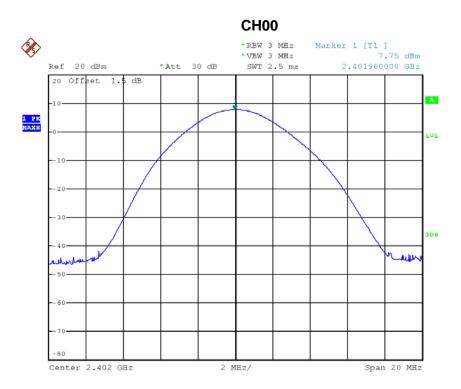
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Test Mode : TX Mode \_1Mbps

Frequency	Conducted Power	Conducted Power	Max. Limit	Max. Limit	Test Result
(MHz)	(dBm)	(W)	(dBm)	(W)	
2402	7.75	0.0060	30.00	1.00	Pass
2441	8.94	0.0078	30.00	1.00	Pass
2480	7.54	0.0057	30.00	1.00	Pass

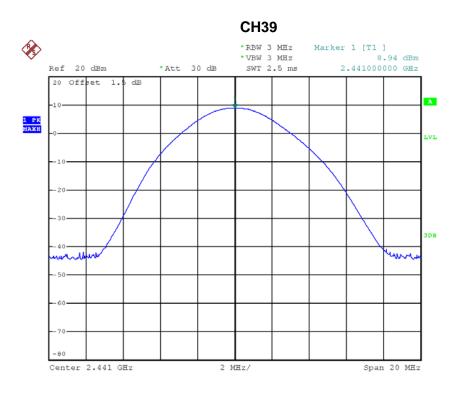


Date: 18.DEC.2017 15:14:32

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Date: 18.DEC.2017 15:14:46



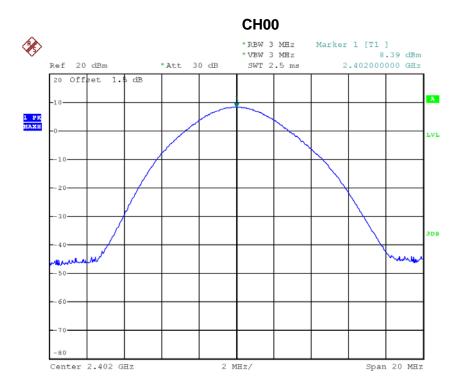
Date: 18.DEC.2017 15:15:05





Test Mode : TX Mode \_3Mbps

Frequency	Conducted Power	Conducted Power	Max. Limit	Max. Limit	Test Result
(MHz)	(dBm)	(W)	(dBm)	(W)	
2402	8.39	0.0069	21.00	0.125	Pass
2441	9.59	0.0091	21.00	0.125	Pass
2480	8.54	0.0071	21.00	0.125	Pass

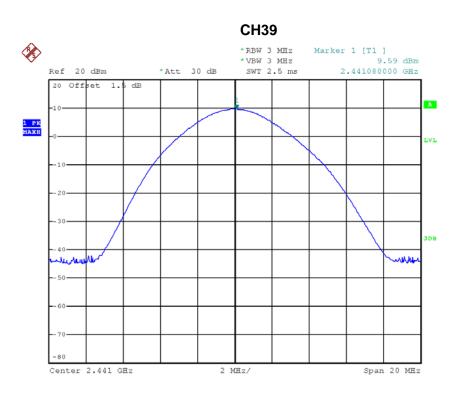


Date: 18.DEC.2017 15:15:33

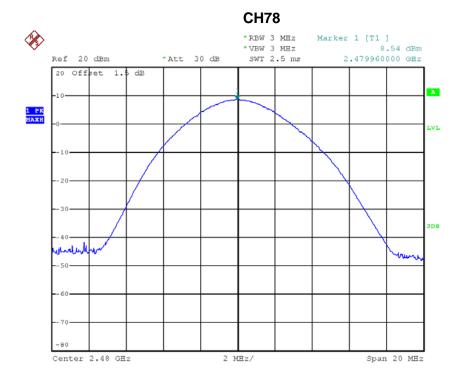
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Date: 18.DEC.2017 15:15:50



Date: 18.DEC.2017 15:16:18



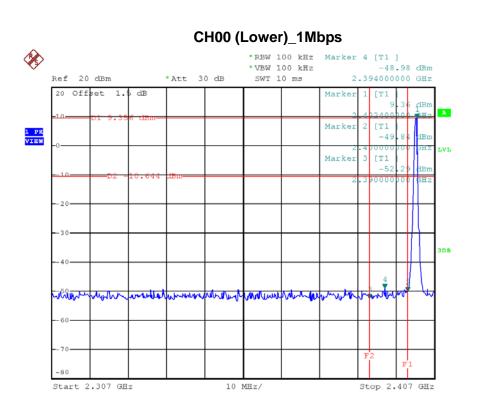


APPENDIX J - ANTENNA CONDUCTED SPURIOUS EMISSION

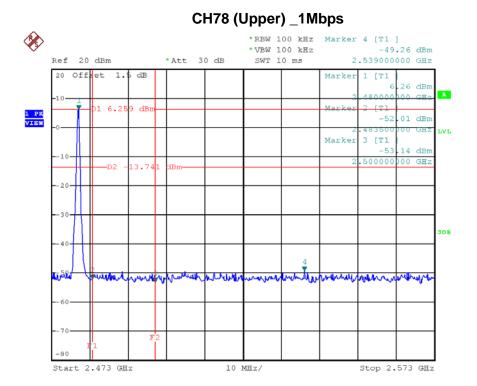
Report No.: BTL-FCCP-1-1712C036 Page 118 of 132







Date: 18.DEC.2017 09:57:42

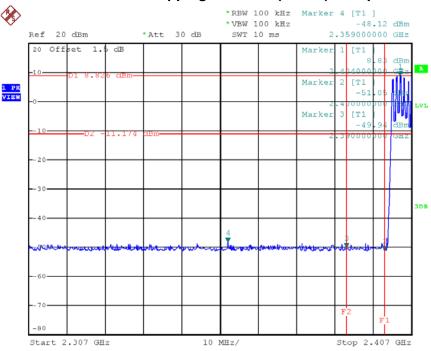


Date: 18.DEC.2017 10:01:42



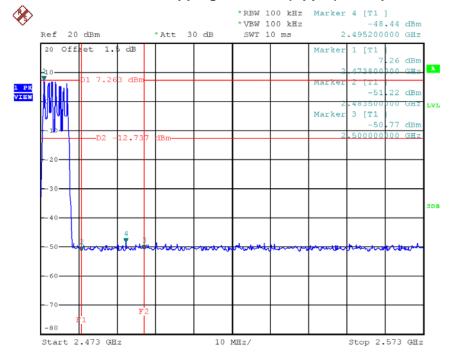






Date: 18.DEC.2017 10:19:29

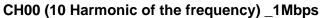
## CH78 Hopping on mode (Upper) \_1Mbps

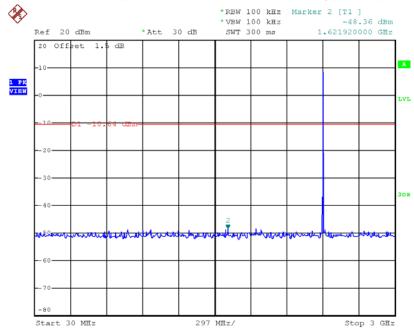


Date: 18.DEC.2017 10:20:04

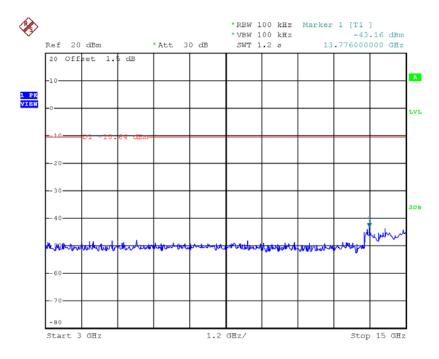








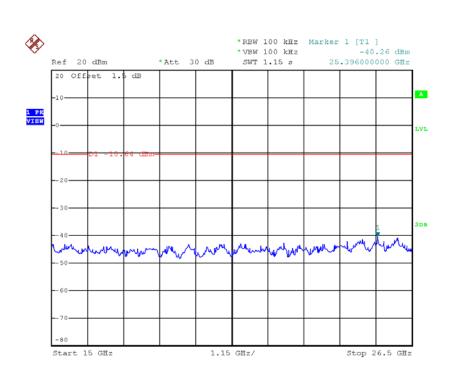
Date: 18.DEC.2017 09:58:19



Date: 18.DEC.2017 09:58:27

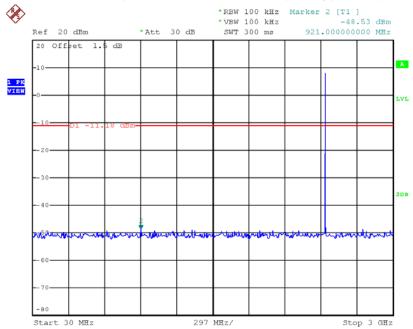






Date: 18.DEC.2017 09:58:35

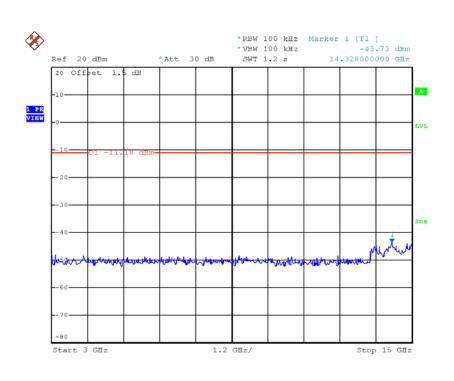
## CH39 (10 Harmonic of the frequency) \_1Mbps



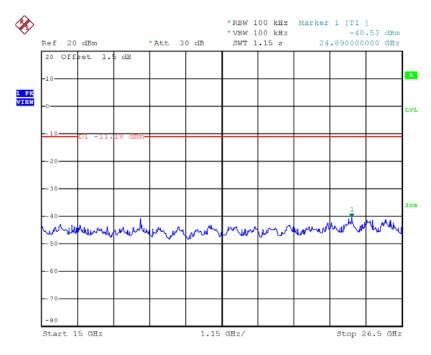
Date: 18.DEC.2017 09:59:18







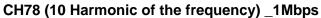
Date: 18.DEC.2017 09:59:26

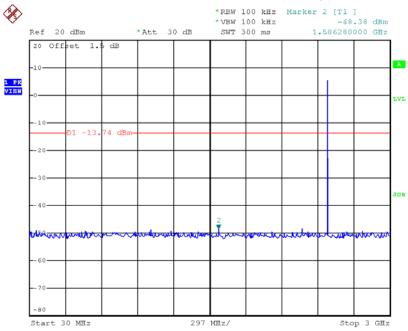


Date: 18.DEC.2017 09:59:34

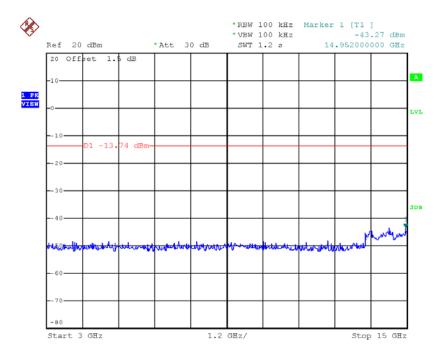








Date: 18.DEC.2017 10:02:19

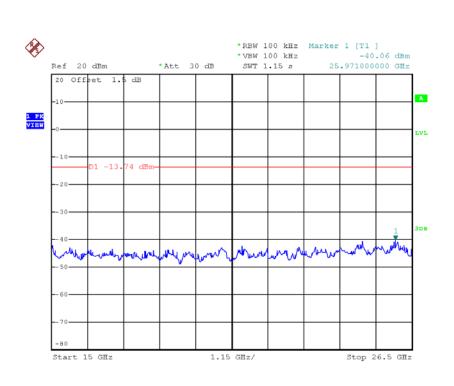


Date: 18.DEC.2017 10:02:27

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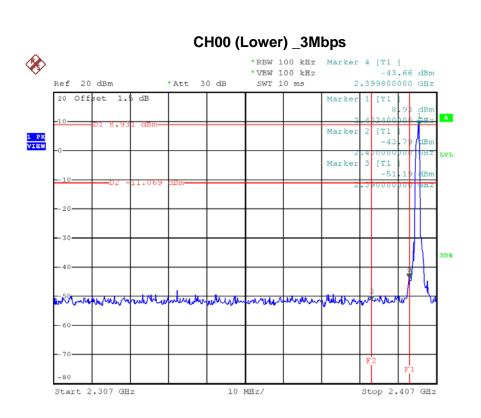




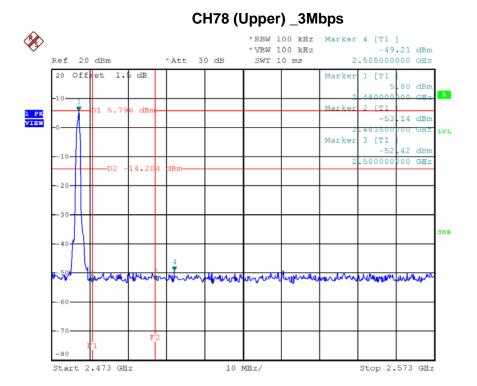
Date: 18.DEC.2017 10:02:34







Date: 18.DEC.2017 10:24:00

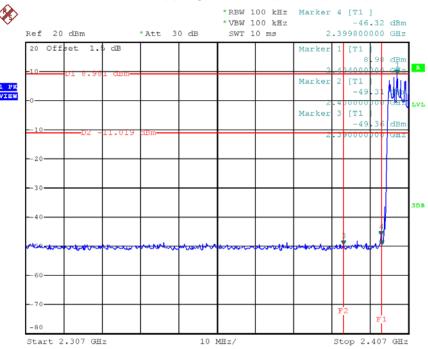


Date: 18.DEC.2017 10:26:23



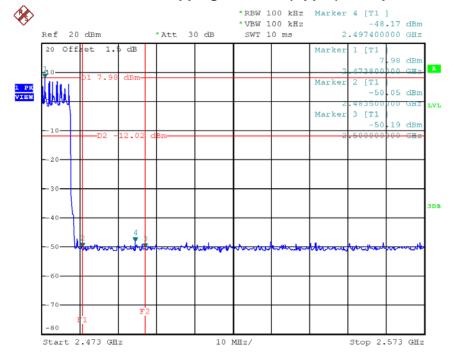






Date: 18.DEC.2017 10:47:52

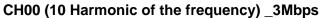
## CH78 Hopping on mode (Upper) \_3Mbps

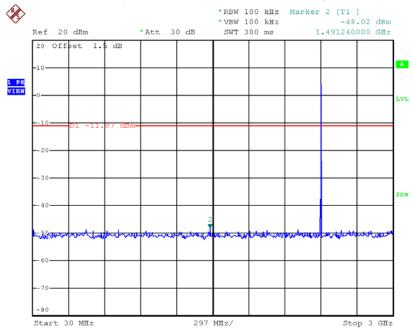


Date: 18.DEC.2017 10:48:27

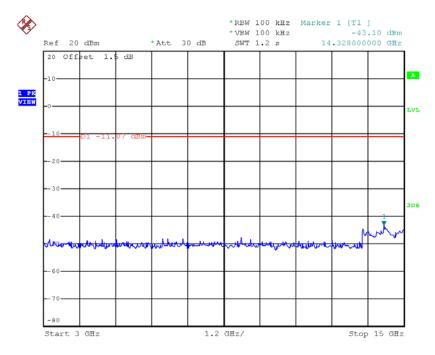








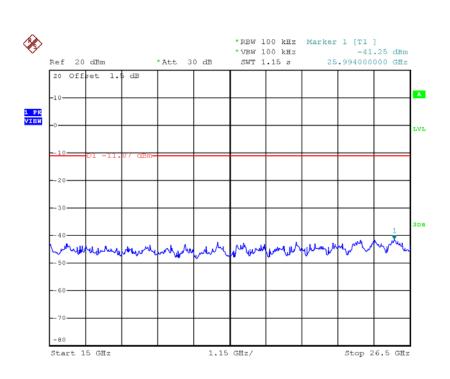
Date: 18.DEC.2017 10:24:32



Date: 18.DEC.2017 10:24:40

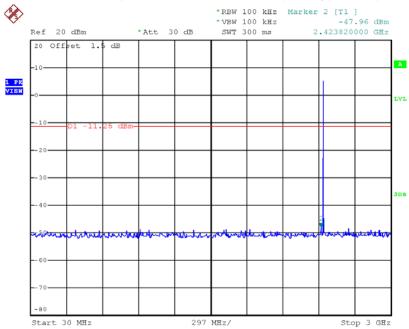






Date: 18.DEC.2017 10:24:47

## CH39 (10 Harmonic of the frequency) \_3Mbps

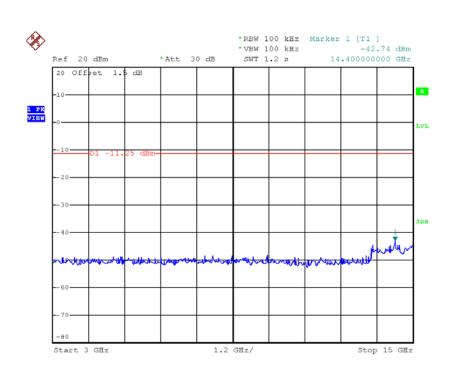


Date: 18.DEC.2017 10:25:26

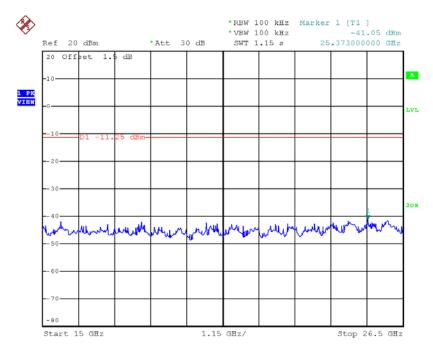
Report No.: BTL-FCCP-1-1712C036 Page 129 of 132







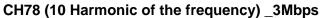
Date: 18.DEC.2017 10:25:33

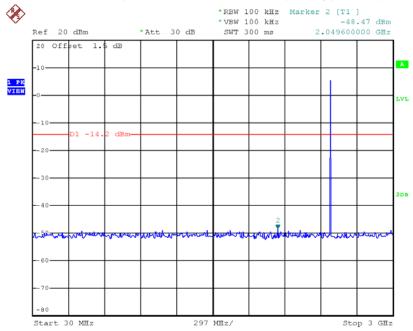


Date: 18.DEC.2017 10:25:41

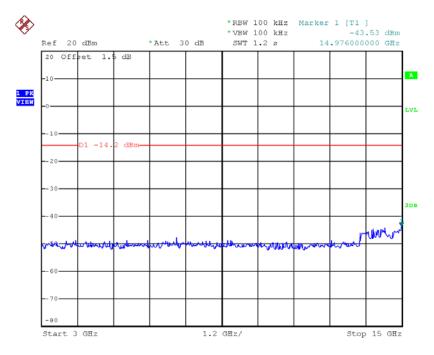








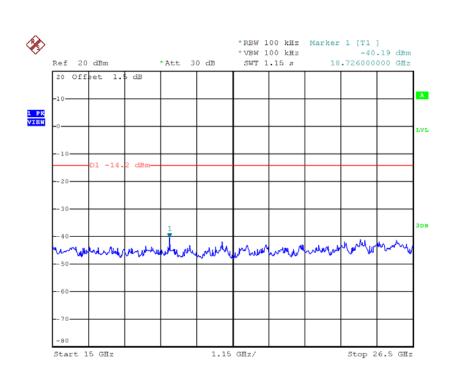
Date: 18.DEC.2017 10:26:54



Date: 18.DEC.2017 10:27:02







Date: 18.DEC.2017 10:27:09