

FCC - TEST REPORT

Report Number : **60.790.19.023.01R01** Date of Issue : July 25, 2019

Model : **SBLP 5.0 B1**

Product Type : **Bluetooth Mini Speaker**

Applicant : **Lidl US LLC.**

Address : **3500 South Clark Street, Arlington, VA 22202**

Production Facility : **Betrue Technology (ShenZhen) Company Limited**

Address : **10/F., Block 2, Jiancang Science and Technology Park,
11 Songgang Avenue, Songgang Street, Baoan, Shenzhen, China**

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 46

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product: Bluetooth Mini Speaker

Model no.: SBLP 5.0 B1

FCC ID: 2AJ9O-SBLP50B1

Rating: 1) 3.7 VDC (Internal 3.7 VDC rechargeable battery)
2) 5.0 VDC (USB charging port)

Frequency: 2402MHz-2480MHz

Antenna gain: 0 dBi

Number of operated channel: 79

Modulation: GFSK, $\pi/4$ DQPSK

Auxiliary Equipment and Software Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
Adapter	Apple	A1357	---
Computer	Lenovo	X220	0A72168

Auxiliary Software Used during Test:

DESCRIPTION	SOFTWARE NAME	VERSION	REMARK
RF Test Mode Software	FCC Assist	1.4	Provided by applicant

3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-18 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

All the tests were performed using the procedures from ANSI C63.4(2014) and ANSI C63.10 (2013).

4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
 Building 12&13 Zhiheng Wisdomland Business Park,
 Nantou Checkpoint Road 2,
 Shenzhen 518052, P.R.China
 FCC Registration Number: 502708

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	Site 1
FCC Title 47 Part 15.207(a) AC Line Conducted Emission	Site 1
FCC Title 47 Part 15.247(a)(1) 20dB & 99% Bandwidth	Site 1
FCC Title 47 Part 15.247(b) Peak Output Power	Site 1
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	Site 1
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	Site 1
FCC Title 47 Part 15.247(a)(1) Minimum Number of Hopping Frequencies	Site 1
FCC Title 47 Part 15.247(a)(1) Minimum Hopping Channel Carrier Frequency Separation	Site 1
FCC Title 47 Part 15.247(a)(1) Average Time of Occupancy	Site 1
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	Site 1

4.1 Test Equipment Site List

Radiated emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2019-7-6
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100398	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2019-6-28
Horn Antenna	Rohde & Schwarz	HF907	102294	2019-6-28
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2019-7-12
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2019-7-6
Attenuator	Agilent	8491A	MY39264334	2019-7-6
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

Conducted Emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2019-7-6
LISN	Rohde & Schwarz	ENV4200	100249	2019-7-6
LISN	Rohde & Schwarz	ENV432	101318	2019-7-6
LISN	Rohde & Schwarz	ENV216	100326	2019-7-6
ISN	Rohde & Schwarz	ENY81	100177	2019-7-6
ISN	Rohde & Schwarz	ENY81-CA6	101664	2019-7-6
High Voltage Probe	Rohde & Schwarz	TK9420(VT94 20)	9420-584	2019-6-30
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2019-6-30
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

20dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Power Spectral Density – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	2019-7-6
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2019-7-6
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2019-7-6

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.46dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
Uncertainty for Conducted Emission at AC Power Line 150kHz-30MHz	3.21dB
Uncertainty for Conducted RF Power	2.13dB
Uncertainty for frequency test	0.6×10^{-7}

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pas s	Fail	N/A
FCC Title 47 Part 15.207(a) AC Line Conducted Emission	12-13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	14-17	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(a)(2) 20dB & 99% Bandwidth	18-23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(b) Peak Output Power	24-29	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	30-35	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	36-38	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(a)(1) Min. No. of Hopping Frequencies	49-40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(a)(1) Min. of Hopping Channel Carrier Frequency Separation	41-42	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(a)(1) Average Time of Occupancy	43-44	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	45	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6 General Remarks

Remarks

EMC tests were performed on model: **SBLP 5.0 B1**.

This submittal(s) (test report) is intended for **FCC ID: 2AJ90-SBLP50B1**, complies with Section 15.203, 15.205, 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules for the DTS grant

The TX and RX range is 2402MHz-2480MHz

SUMMARY:

- All tests according to the regulations cited on page 8 were

☒ - Performed

☐ - **Not** Performed

- The Equipment Under Test

☒ - **Fulfills** the general approval requirements.

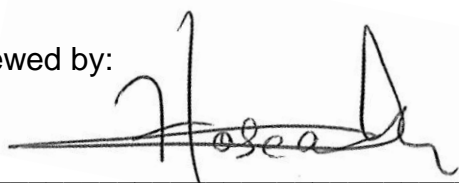
☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: June 10, 2019

Testing Start Date: June 14, 2019

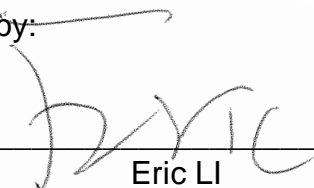
Testing End Date: June 30, 2019

Reviewed by:



Hosea CHAN
EMC Project Engineer

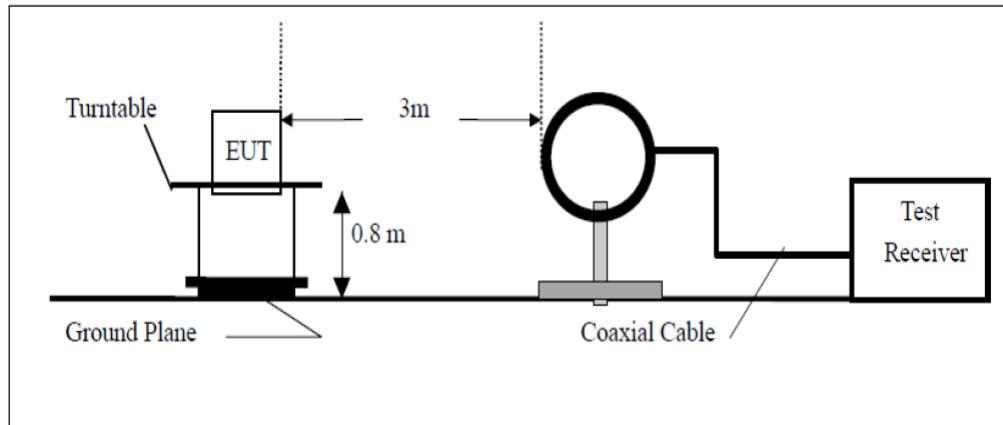
Prepared by:



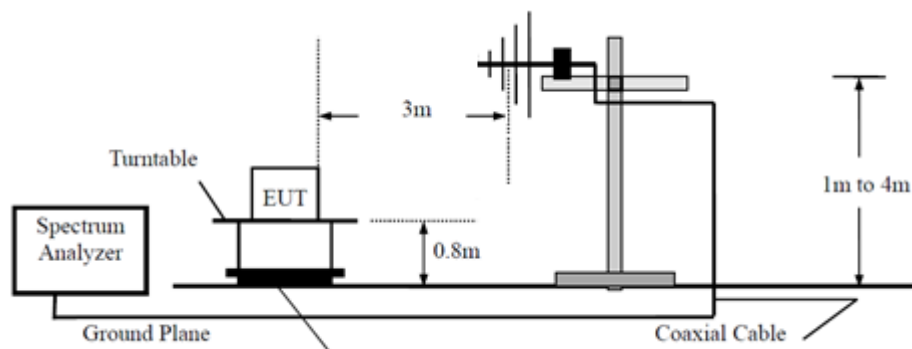
Eric LI
EMC Senior Project Engineer

7 Test Setups

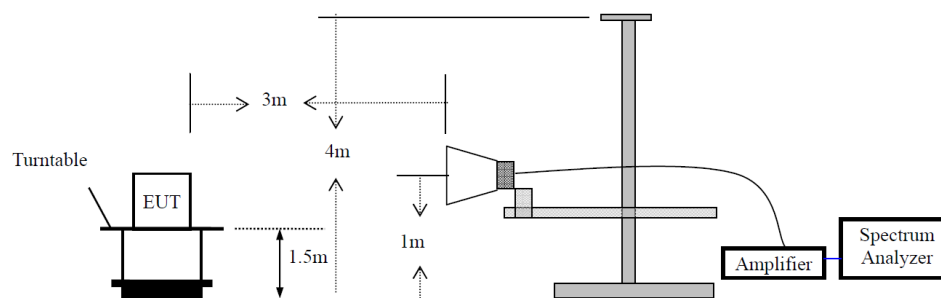
7.1 Radiated test setups 9kHz-30MHz



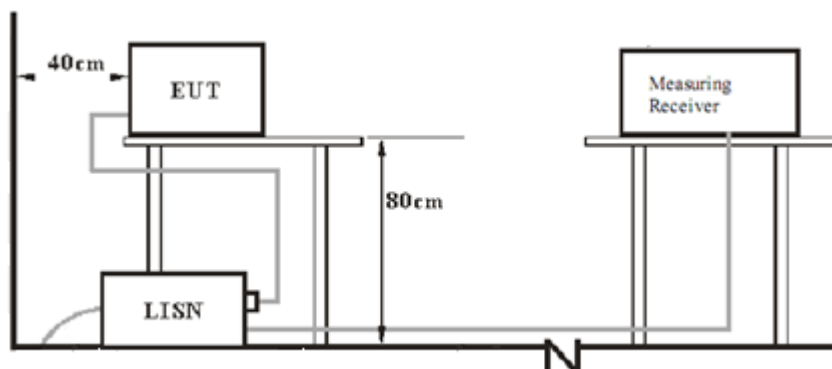
7.2 Radiated test setups Below 1GHz



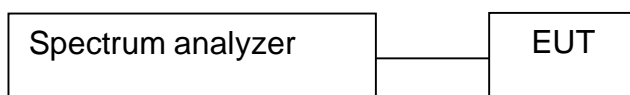
7.3 Radiated test setups Above 1GHz



7.4 AC Power Line Conducted Emission test setups



7.5 Conducted RF test setups

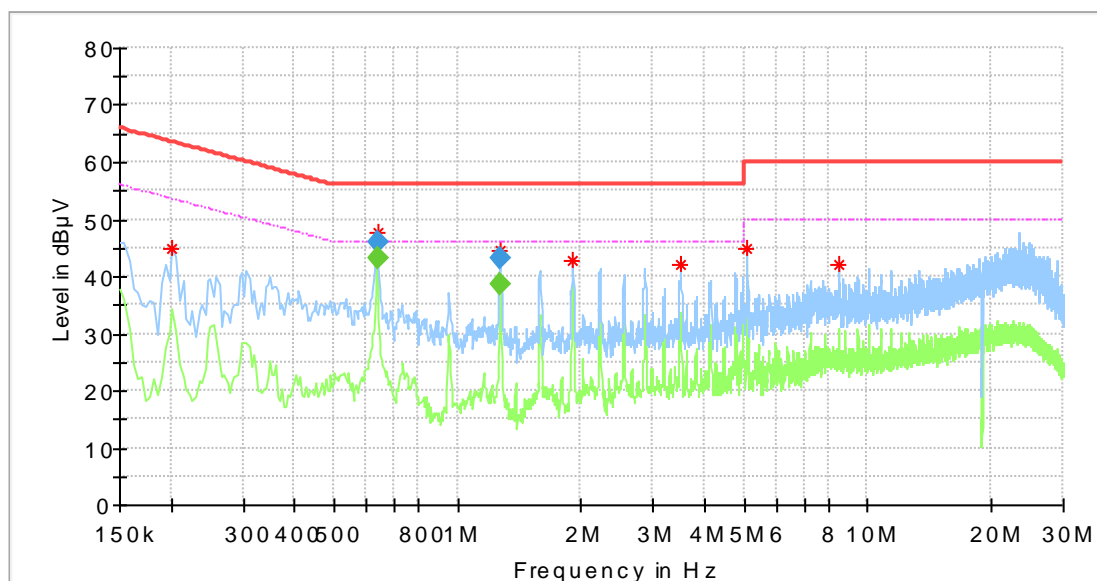


8 Emission Test Results

8.1 Conducted Emission

EUT: SBLP 5.0 B1
 Op Condition: Operated, BT link Mode
 Test Specification: FCC15.207, AC Mains, L Line
 Comment: 120VAC, 60Hz
 Test date: June 15, 2019

Test Result

☒ Passed☐ Not Passed

Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.202000	44.85	---	63.53	-18.68	10.2
0.638500	47.79	---	56.00	-8.21	10.3
1.274500	44.44	---	56.00	-11.56	10.3
1.906000	42.73	---	56.00	-13.27	10.3
3.502000	42.19	---	56.00	-13.81	10.4
5.086000	44.97	---	60.00	-15.03	10.4
8.510000	42.23	---	60.00	-17.77	10.6

Final_Result

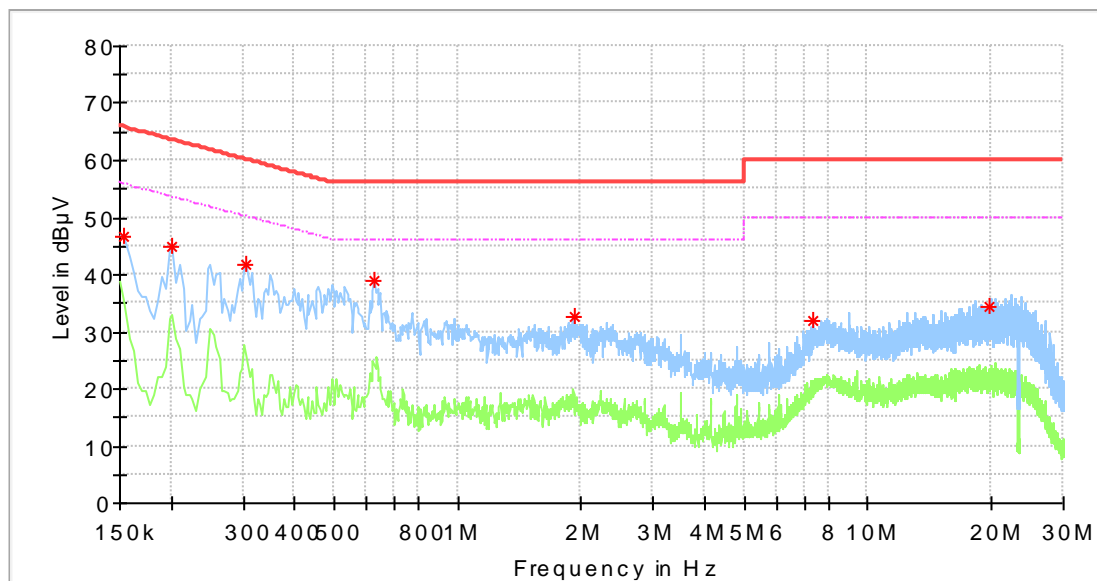
Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.638500	45.89	---	56.00	-10.11	10.3
0.638500	---	43.00	46.00	-3.00	10.3
1.274500	---	38.64	46.00	-7.36	10.3
1.274500	43.00	---	56.00	-13.00	10.3

Conducted Emission

EUT: SBLP 5.0 B1
 Op Condition: Operated, BT link Mode
 Test Specification: FCC15.207, AC Mains, N Line
 Comment: 120VAC, 60Hz
 Test date: June 15, 2019

Test Result

☒ Passed

☐ Not Passed


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.154000	46.50	---	65.78	-19.28	10.2
0.202000	45.09	---	63.53	-18.44	10.2
0.306000	41.58	---	60.08	-18.50	10.3
0.626000	38.98	---	56.00	-17.02	10.3
1.918000	32.64	---	56.00	-23.36	10.3
7.326000	32.05	---	60.00	-27.95	10.6
19.882000	34.40	---	60.00	-25.60	11.2

Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
---	---	---	---	---	---

8.2 Spurious Radiated Emission

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode(3DH5)
 (Low channel is the worst case)
 Test Specification: FCC15.205, 15.209 & 15.247(d)
 Comment: 3.7 VDC
 Test date: June 20, 2019
 Remark: 9kHz to 1GHz

Test Result
<input checked="" type="checkbox"/> Passed
<input type="checkbox"/> Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
53.825625	16.30	40.00	23.70	Peak	H	17.3
105.053750	16.19	43.50	27.31	Peak	H	15.6
216.543125	19.10	46.00	26.90	Peak	H	17.1
363.861875	22.51	46.00	23.49	Peak	H	21.5
555.436875	28.64	46.00	17.36	Peak	H	25.2
752.165000	32.04	46.00	13.96	Peak	H	27.9
34.061875	23.98	40.00	16.02	Peak	V	14.8
113.177500	16.14	43.50	27.36	Peak	V	15.3
191.201875	15.56	43.50	27.94	Peak	V	15.3
291.960625	21.74	46.00	24.26	Peak	V	19.8
552.223750	27.23	46.00	18.77	Peak	V	25.1
858.319375	31.33	46.00	14.67	Peak	V	29.4

Remark:

- As the measured peak value not exceeded the Quasi peak limit, Quasi peak value no need to be measured.

Spurious Radiated Emission

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402MHz, DH5)
 Test Specification: FCC15.205, 15.209 & 15.247(d)
 Comment: 3.7 VDC
 Test date: June 20, 2019
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
2147.000000	28.86	54.00	-25.14	Peak	H	-6.8
4804.000000	42.35	54.00	-11.65	Peak	H	3.7
7206.000000	37.17	54.00	-16.83	Peak	H	9.9
1980.875000	29.48	54.00	-24.52	Peak	V	-7.3
4804.000000	41.71	54.00	-12.29	Peak	V	3.7
7206.000000	39.52	54.00	-14.48	Peak	V	9.9

Remark:

1.As the measured peak value not exceeded the average limit, average value no need to be measured.

Spurious Radiated Emission

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, DH5)
 Test Specification: FCC15.205, 15.209 & 15.247(d)
 Comment: 3.7 VDC
 Test date: June 20, 2019
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
2076.437500	29.20	54.00	-24.80	Peak	H	-7.2
4882.000000	40.67	54.00	-13.33	Peak	H	3.8
7323.005500	36.77	54.00	-17.23	Peak	H	9.6
2261.500000	29.49	54.00	-24.51	Peak	V	-6.3
4882.000000	42.61	54.00	-11.39	Peak	V	3.8
7323.005500	35.82	54.00	-18.18	Peak	V	8.8

Remark:

1.As the measured peak value not exceeded the average limit, average value no need to be measured.

Spurious Radiated Emission

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2480MHz, DH5)
 Test Specification: FCC15.205, 15.209 & 15.247(d)
 Comment: 3.7 VDC
 Test date: June 20, 2019
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
2160.500000	29.36	54.00	-24.64	Peak	H	-6.8
4960.000000	43.25	54.00	-10.75	Peak	H	4.3
7440.000000	39.88	54.00	-14.12	Peak	H	9.8
2255.125000	28.85	54.00	-25.15	Peak	V	-6.3
4960.000000	41.45	54.00	-12.55	Peak	V	4.3
7440.000000	40.58	54.00	-13.42	Peak	V	9.8

Remark:

- 1.As the measured peak value not exceeded the average limit, average value no need to be measured.

8.3 20dB & 99% Bandwidth

EUT:

SBLP 5.0 B1

Op Condition:

Operated, TX Mode (2402MHz, DH5)

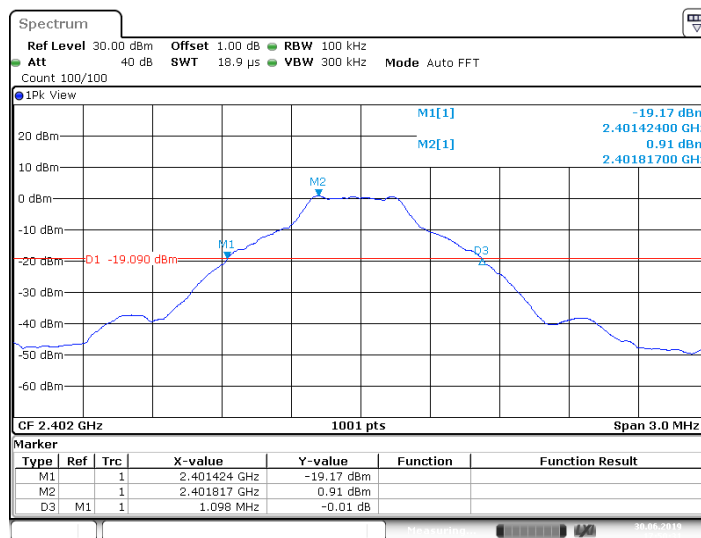
Test Specification:

FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth

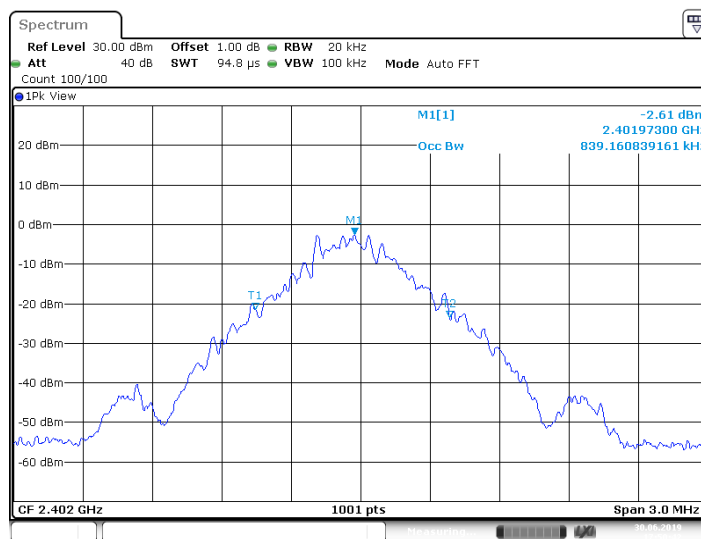
Comment:

3.7 VDC

Test Result

☒ Passed☐ Not Passed

Date: 30 JUN 2019 17:50:32



Date: 30 JUN 2019 17:50:43

20dB bandwidth	99% bandwidth
1.098 MHz	0.839 MHz

20dB & 99% Bandwidth

EUT:

Op Condition:

Test Specification:

Comment:

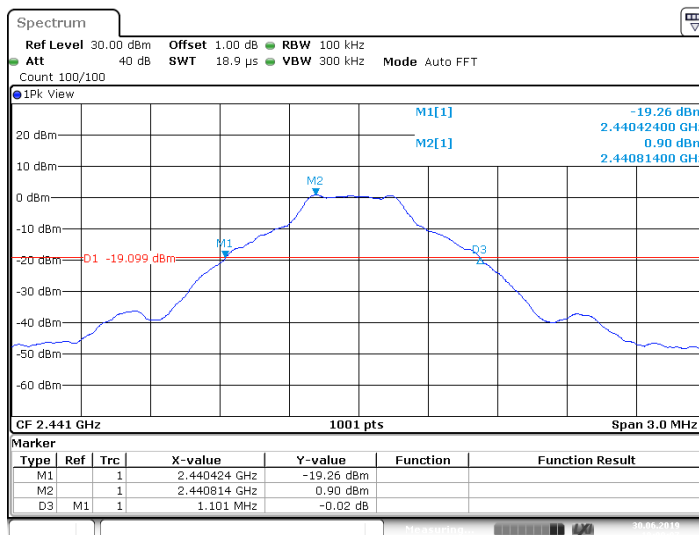
SBLP 5.0 B1

Operated, TX Mode (2441MHz, DH5)

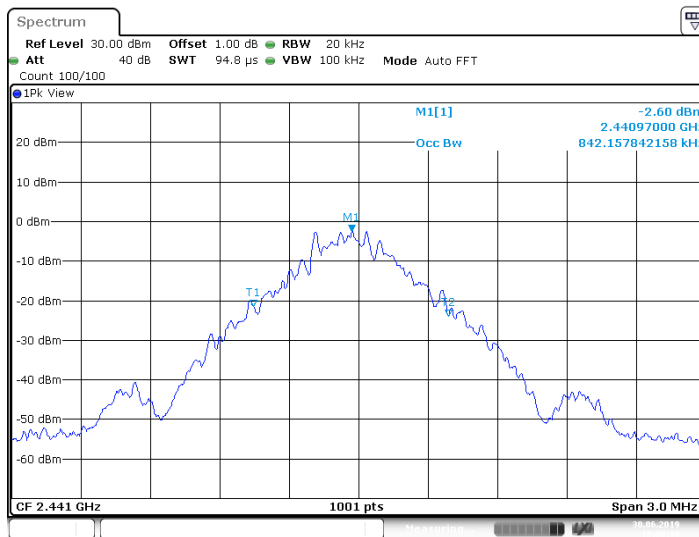
FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth

3.7 VDC

Test Result

☒ Passed☐ Not Passed

Date: 30 JUN 2019 18:00:07



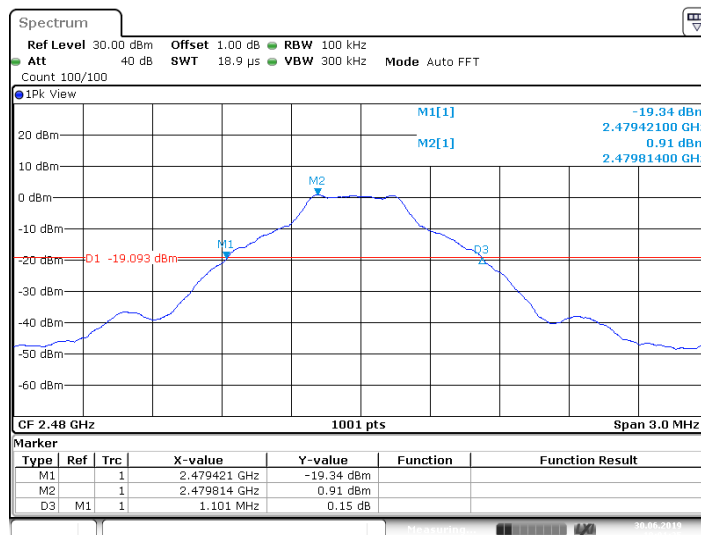
Date: 30 JUN 2019 18:00:18

20dB bandwidth	99% bandwidth
1.101 MHz	0.842 MHz

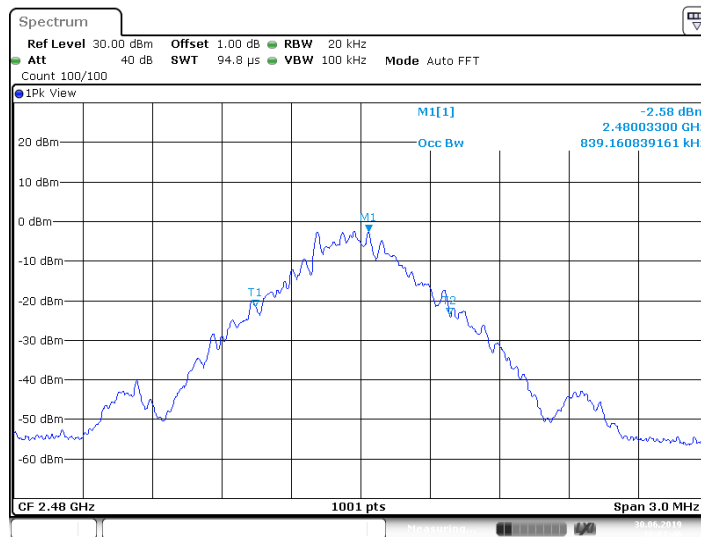
20dB & 99% Bandwidth

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2480MHz, DH5)
 Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
 Comment: 3.7 VDC

Test Result

☒ Passed☐ Not Passed

Date: 30 JUN 2019 18:01:36



Date: 30 JUN 2019 18:01:47

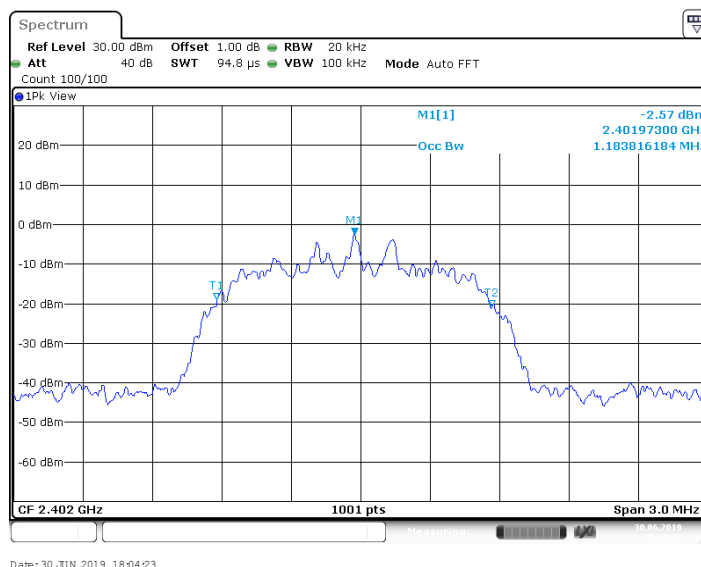
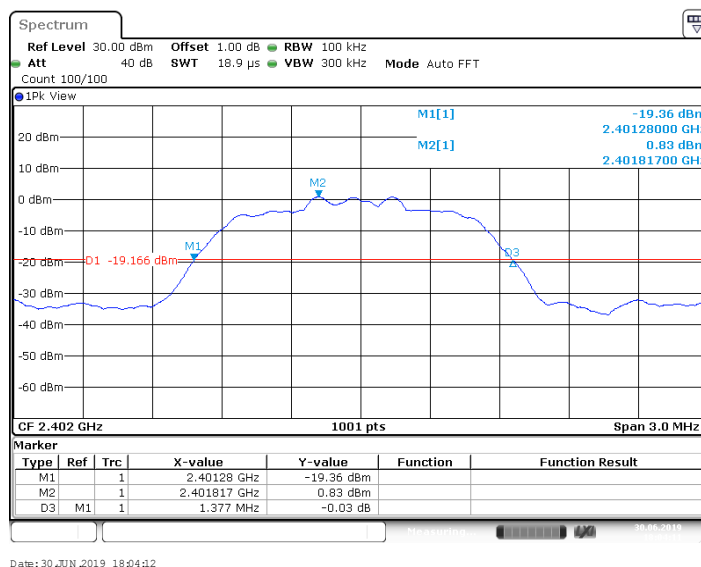
20dB bandwidth	99% bandwidth
1.101 MHz	0.839 MHz

20dB & 99% Bandwidth

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402MHz, 2DH5)
 Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
 Comment: 3.7 VDC

Test Result

☒ Passed
☐ Not Passed



20dB bandwidth	99% bandwidth
1.377 MHz	1.184 MHz

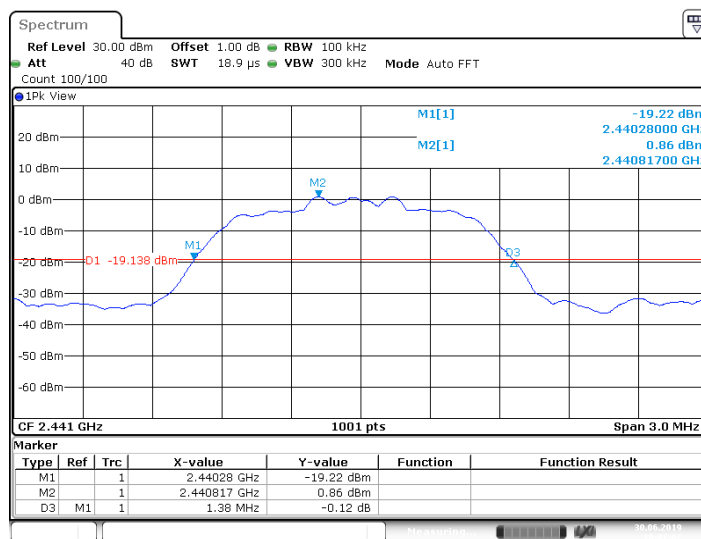
20dB & 99% Bandwidth

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, 2DH5)
 Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
 Comment: 3.7 VDC

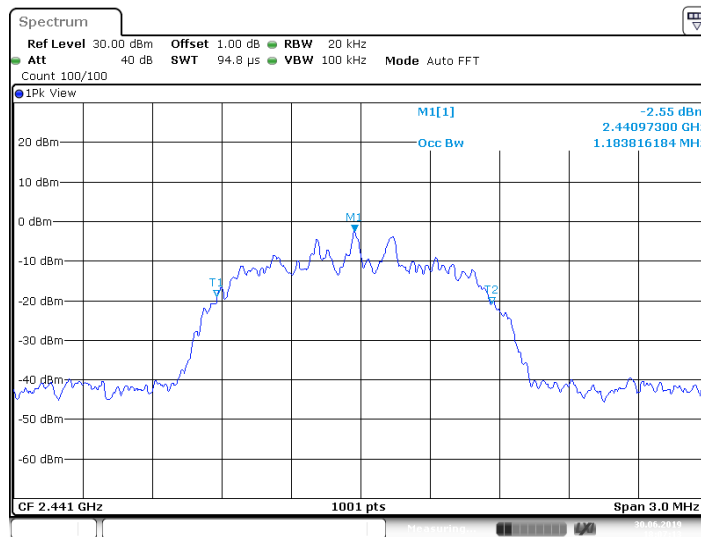
Test Result

☒ Passed

☐ Not Passed



Date: 30 JUN 2019 18:07:02



Date: 30 JUN 2019 18:07:13

20dB bandwidth	99% bandwidth
1.380 MHz	1.184 MHz

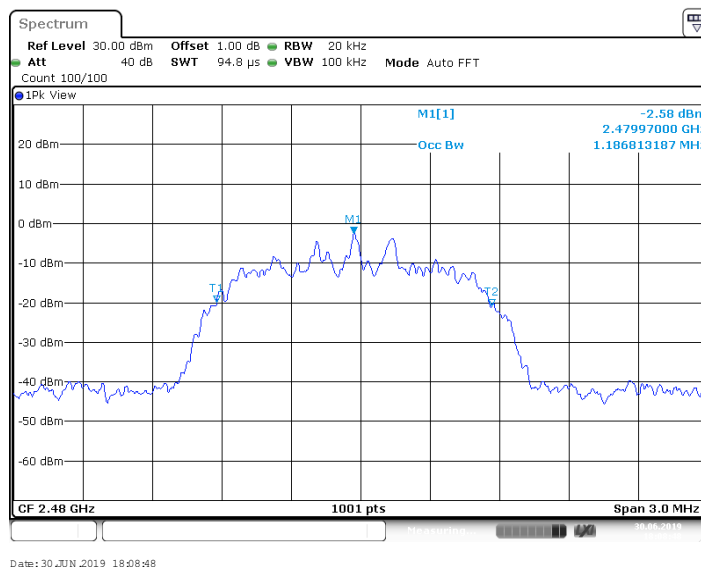
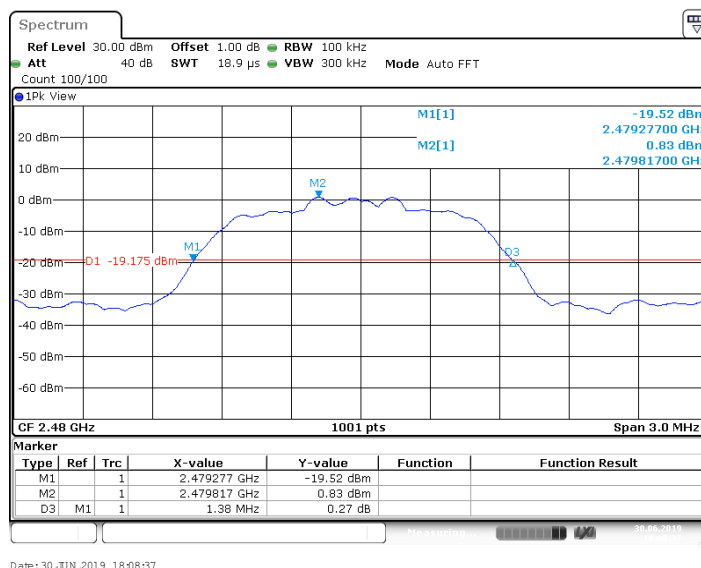
20dB & 99% Bandwidth

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2480MHz, 2DH5)
 Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



20dB bandwidth	99% bandwidth
1.380 MHz	1.187 MHz

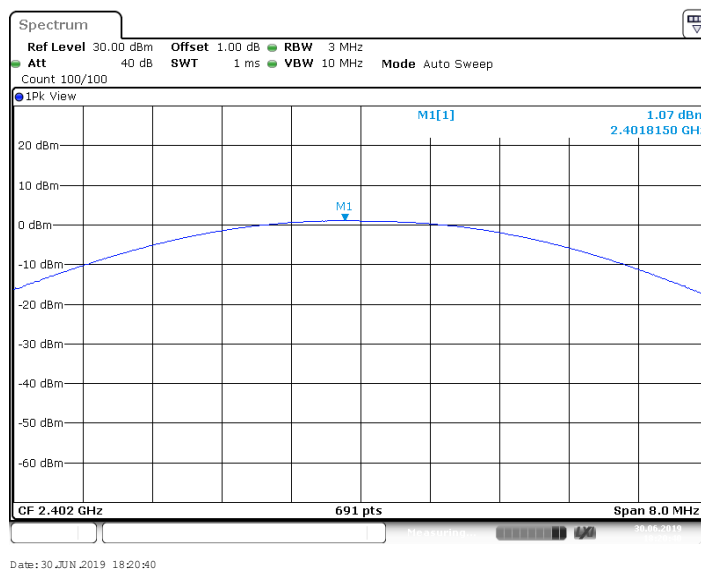
8.4 Peak Output Power

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402MHz, DH5)
 Test Specification: FCC15.247(b)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.07	1.28	1000.0

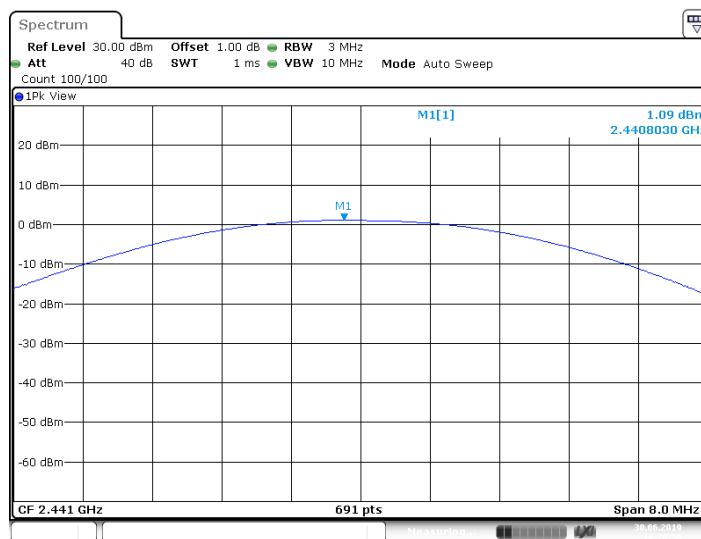
Peak Output Power

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, DH5)
 Test Specification: FCC15.247(b)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Date: 30 JUN 2019 18:20:58

Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.09	1.29	1000.0

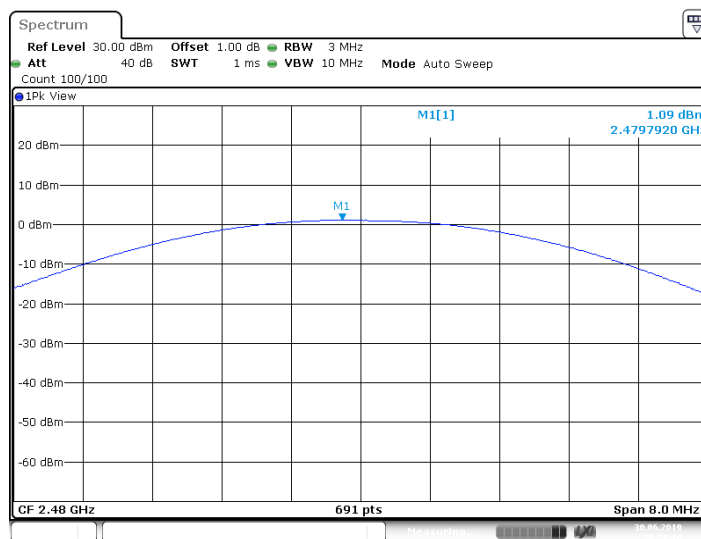
Peak Output Power

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2480MHz, DH5)
 Test Specification: FCC15.247(b)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Date: 30 JUN 2019 18:21:14

Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.09	1.29	1000.0

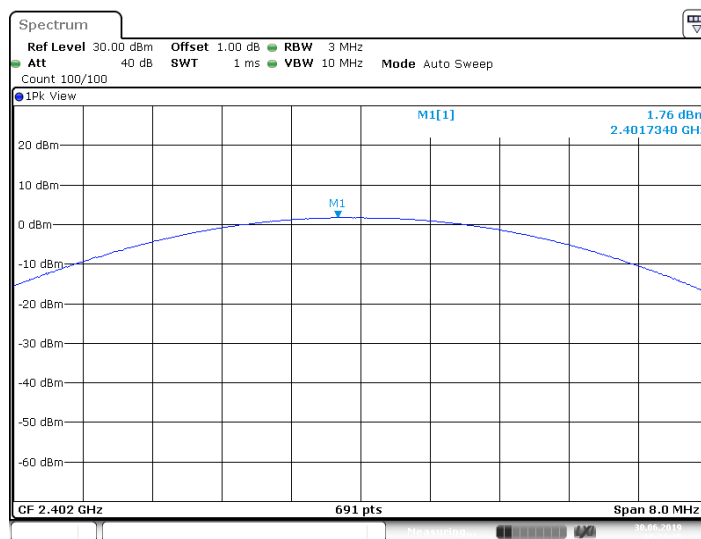
Peak Output Power

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402MHz, 2DH5)
 Test Specification: FCC15.247(b)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.76	1.50	1000.0

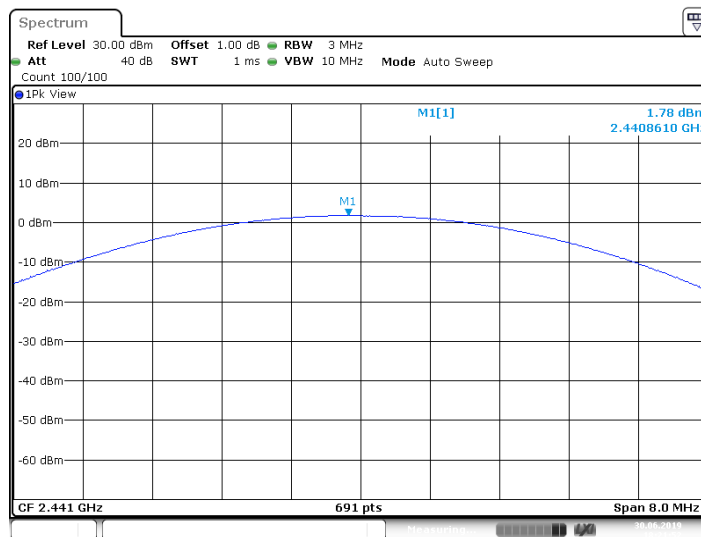
Peak Output Power

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, 2DH5)
 Test Specification: FCC15.247(b)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Date: 30 JUN 2019 18:21:52

Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.78	1.51	1000.0

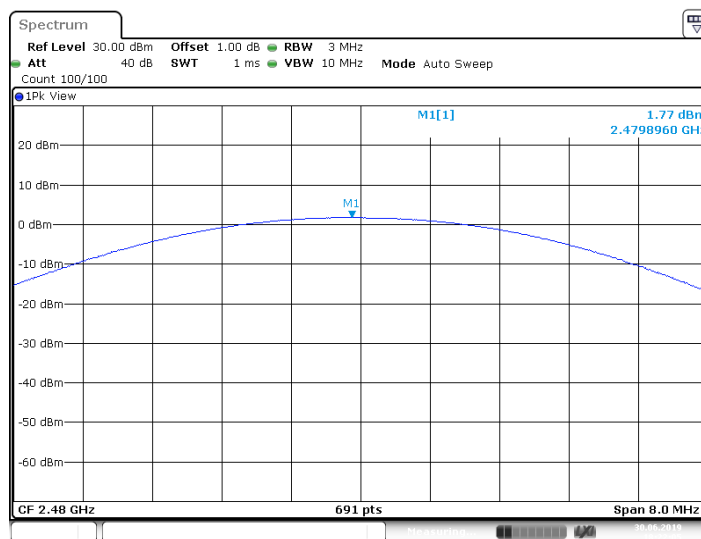
Peak Output Power

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2480MHz, 2DH5)
 Test Specification: FCC15.247(b)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Date: 30 JUN 2019 18:22:06

Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.77	1.50	1000.0

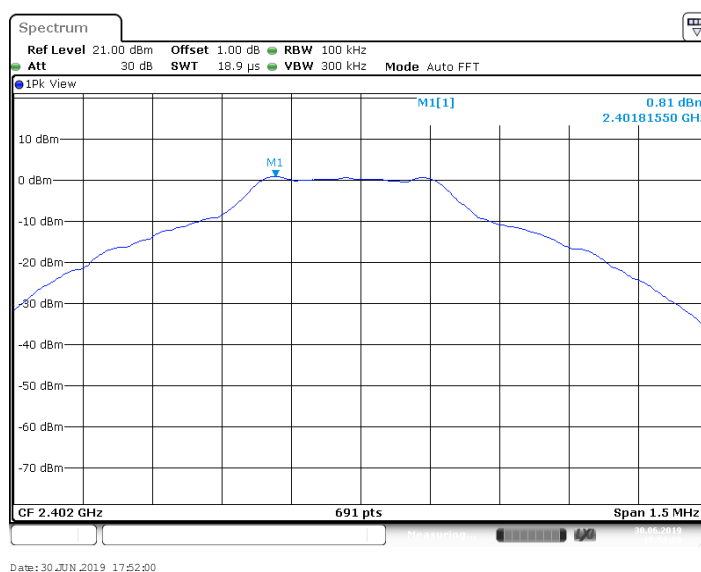
8.5 Spurious Emissions at Antenna Terminals

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402MHz, DH5)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7 VDC

Test Result

☒ Passed☐ Not Passed

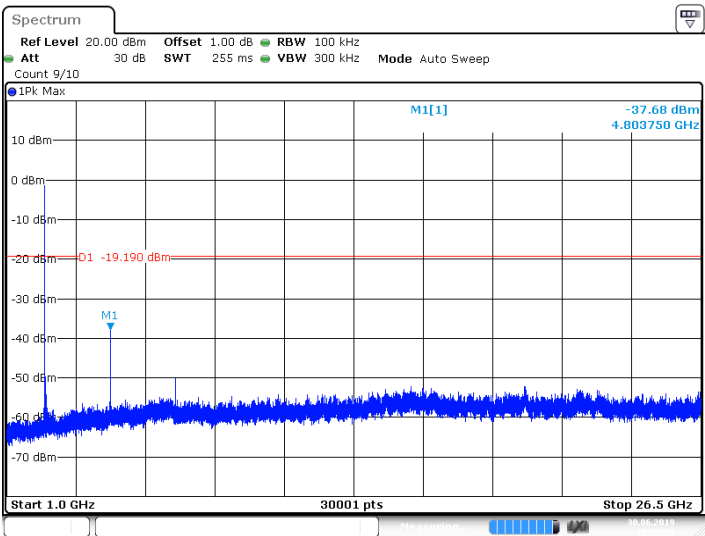
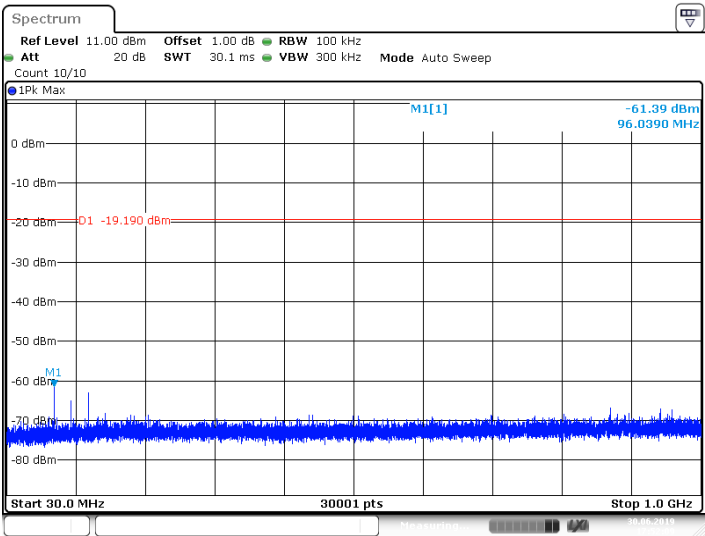
Channel	FreqRange	RefLevel	Result	Limit	Verdict
2402	Reference	0.81	---	---	PASS
2402	30~1000	0.81	-61.39	<=-19.19	PASS
2402	1000~26500	0.81	-37.68	<=-19.19	PASS



Spurious Emissions at Antenna Terminals

EUT: 165-00645
Op Condition: Operated, TX Mode (2402MHz, DH5)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.7 VDC

Test Result	
<input checked="checked" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



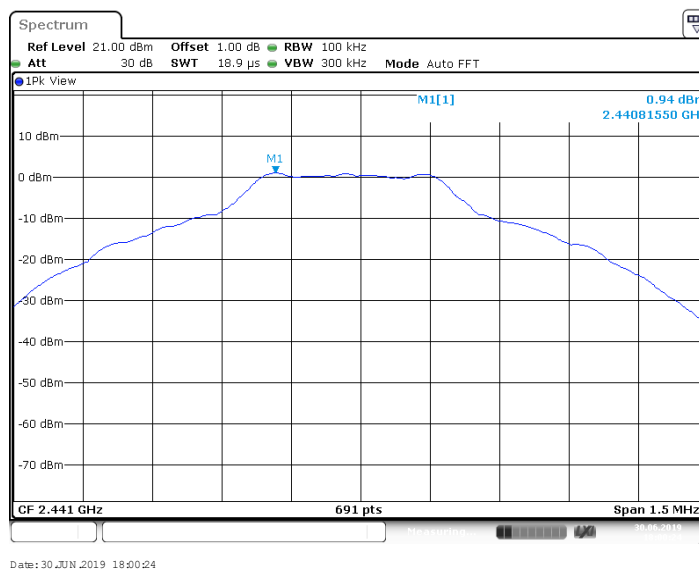
Spurious Emissions at Antenna Terminals

EUT: 165-00645
 Op Condition: Operated, TX Mode (2441MHz, DH5)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7 VDC

Test Result

☒ Passed
☐ Not Passed

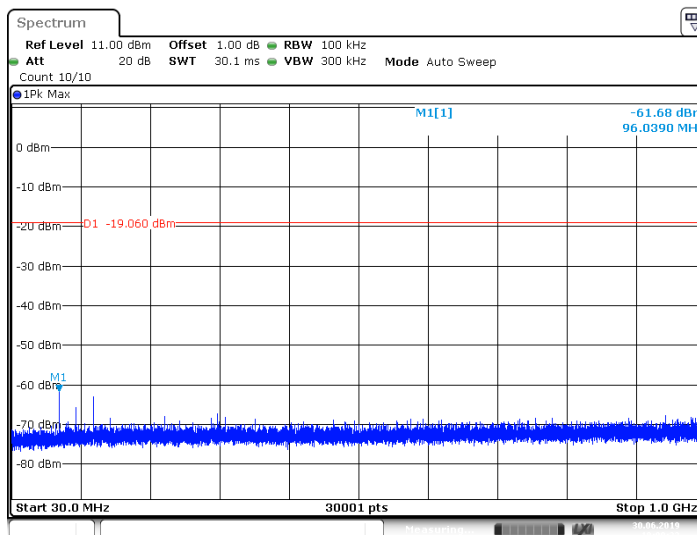
Channel	FreqRange	RefLevel	Result	Limit	Verdict
2441	Reference	0.94	---	---	PASS
2441	30~1000	0.94	-61.68	<=-19.06	PASS
2441	1000~26500	0.94	-41.11	<=-19.06	PASS



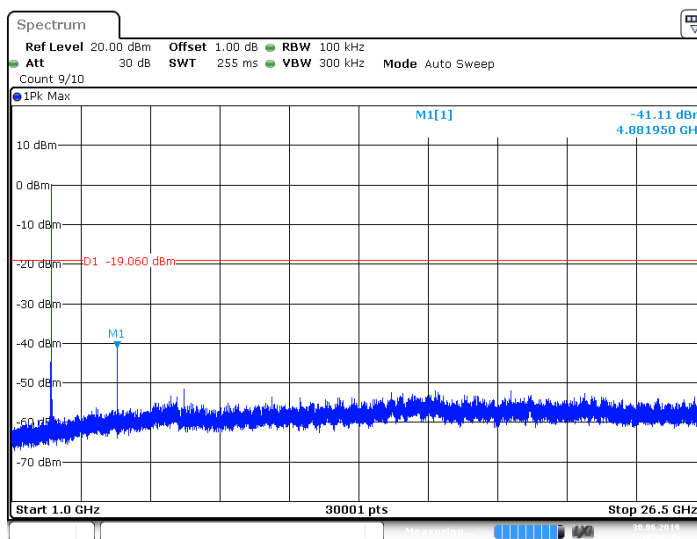
Spurious Emissions at Antenna Terminals

EUT: 165-00645
Op Condition: Operated, TX Mode (2441MHz, DH5)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.7 VDC

Test Result

☒ Passed☐ Not Passed

Date: 30 JUN 2019 18:00:34



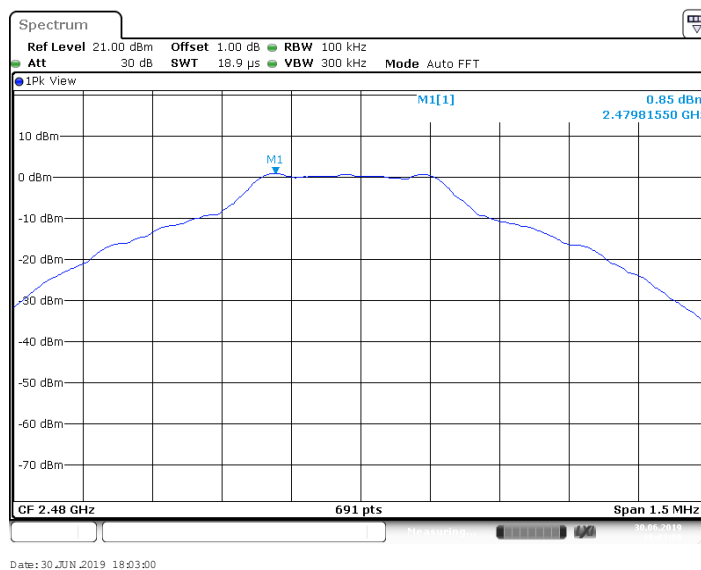
Date: 30 JUN 2019 18:00:45

Spurious Emissions at Antenna Terminals

EUT: 165-00645
 Op Condition: Operated, TX Mode (2480MHz, DH5)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7 VDC

Test Result
☒ Passed
☐ Not Passed

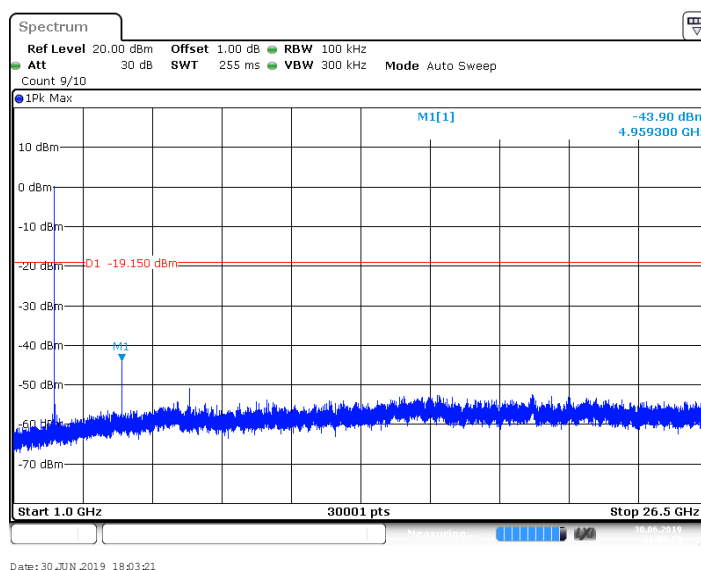
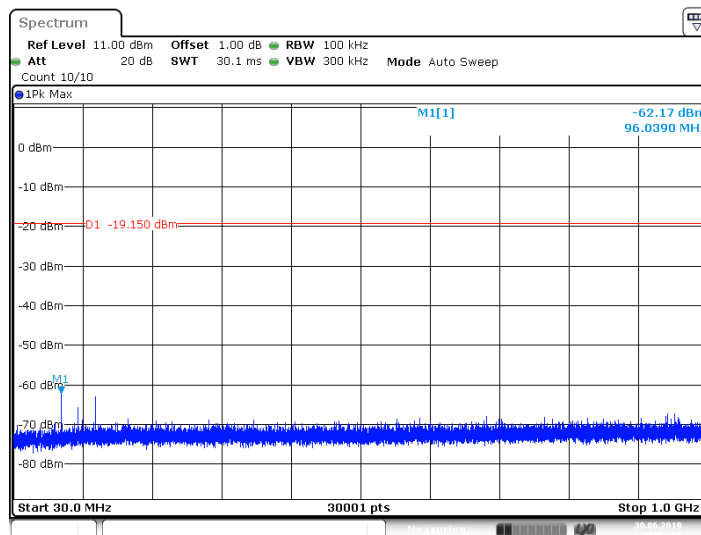
Channel	FreqRange	RefLevel	Result	Limit	Verdict
2480	Reference	0.85	---	---	PASS
2480	30~1000	0.85	-62.17	<=-19.15	PASS
2480	1000~26500	0.85	-44.05	<=-19.15	PASS



Spurious Emissions at Antenna Terminals

EUT: 165-00645
Op Condition: Operated, TX Mode (2480MHz, DH5)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.7 VDC

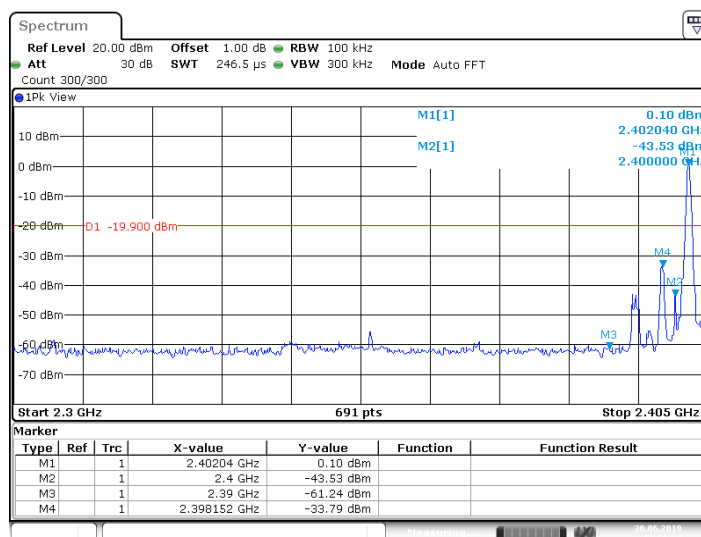
Test Result

☒ Passed☐ Not Passed

8.6 100kHz Bandwidth of band edges

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402MHz, DH5)
 (Worst case)
 Test Specification: FCC15.247(d), Conducted
 Comment: 3.7 VDC

Test Result

☒ Passed☐ Not Passed

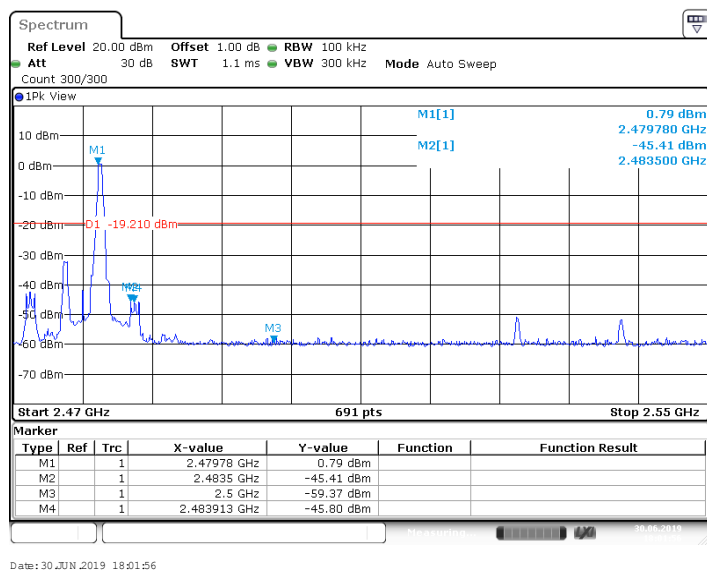
Date: 30 JUN 2019 17:50:52

Band edges	Limit
33.89 dB	> 20dB

100kHz Bandwidth of band edges

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2480MHz, DH5)
 (Worst case)
 Test Specification: FCC15.247(d), Conducted
 Comment: 3.7 VDC

Test Result

☒ Passed☐ Not Passed

Band edges	Limit
46.20 dB	> 20dB

100kHz Bandwidth of band edges

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2405MHz and 2480MHz, DH5) (Worst case)
 Test Specification: FCC15.247(d), Radiated
 Comment: 3.7 VDC

Test Result

☒ Passed

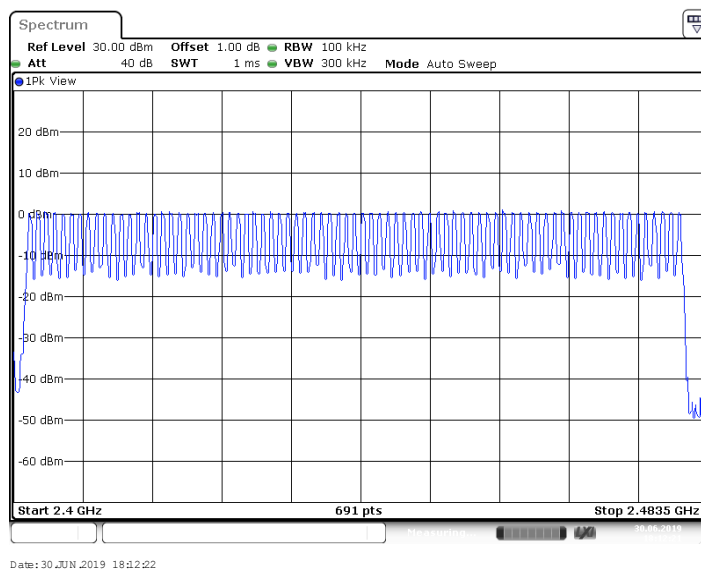
☐ Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector PK /AV	Ant. Polarity H/V
2400.00	43.26	74.00	-30.74	Peak	H
2400.00	35.16	54.00	-18.84	Average	H
2400.00	44.75	74.00	-29.25	Peak	V
2400.00	33.36	54.00	-20.64	Average	V
2483.50	40.17	74.00	-33.83	Peak	H
2483.50	34.22	54.00	-19.78	Average	H
2483.50	39.75	74.00	-34.25	Peak	V
2483.50	33.68	54.00	-20.32	Average	V

8.7 Minimum. Number of Hopping Frequencies

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402-2480MHz, DH5)
 Test Specification: FCC15.247(a)(1)
 Comment: 3.7 VDC

Test Result

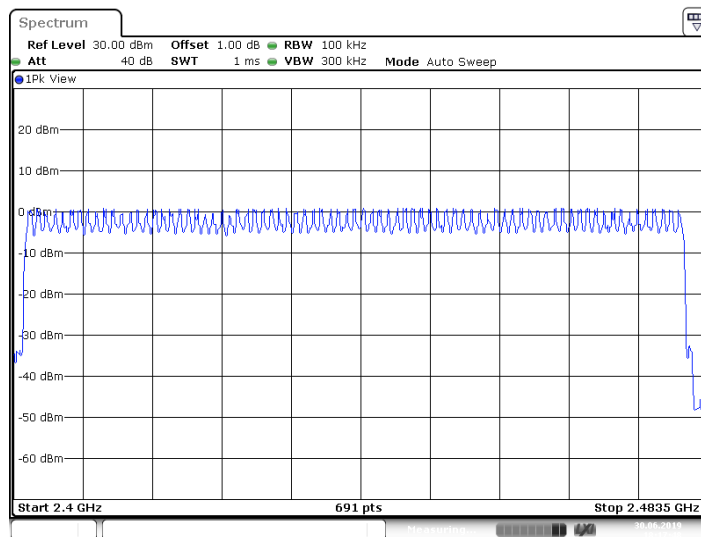
☒ Passed☐ Not Passed

Hopping Channels	Limit
79	≥ 15

Minimum. Number of Hopping Frequencies

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2402-2480MHz, 2DH5)
 Test Specification: FCC15.247(a)(1)
 Comment: 3.7 VDC

Test Result
☒ Passed
☐ Not Passed



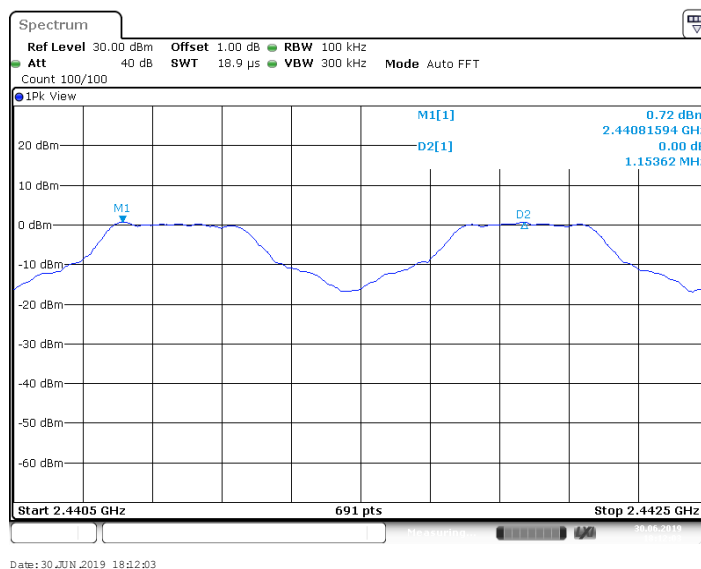
Date: 30 JUN 2019 18:17:49

Hopping Channels	Limit
79	≥ 15

8.8 Minimum Hopping Channel Carrier Frequency Separation

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, DH5)
 Test Specification: FCC15.247(a)(1)
 Comment: 3.7 VDC

Test Result

☒ Passed☐ Not Passed

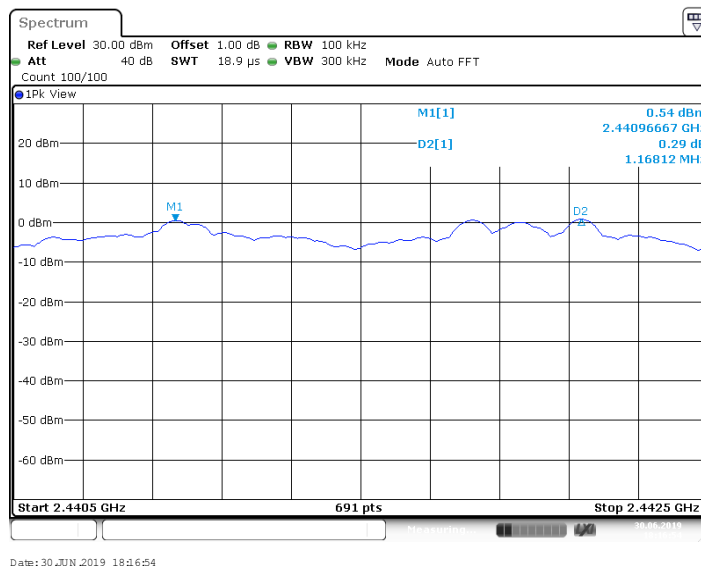
Chanel Separation	Limit
1154 kHz	734 kHz

Limit: 2/3 of 20dB bandwidth of hopping channel

Minimum Hopping Channel Carrier Frequency Separation

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, 2DH5)
 Test Specification: FCC15.247(a)(1)
 Comment: 3.7 VDC

Test Result
☒ Passed
☐ Not Passed



Chanel Separation	Limit
1168 kHz	920 kHz

Limit: 2/3 of 20dB bandwidth of hopping channel

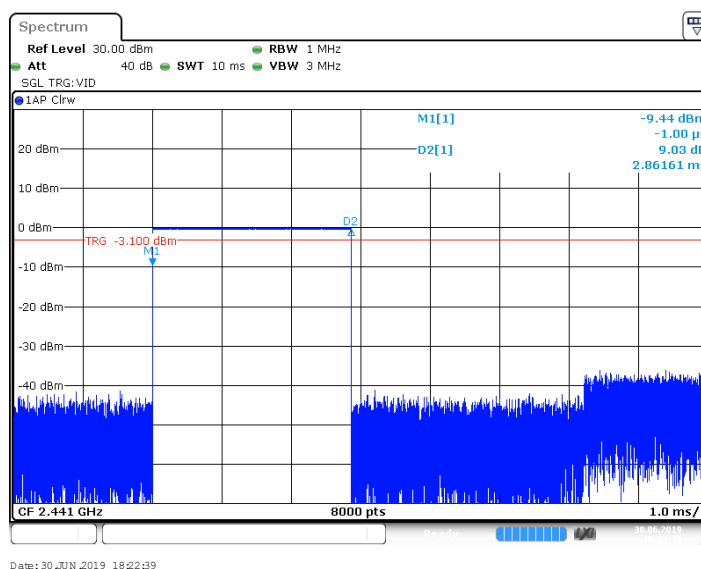
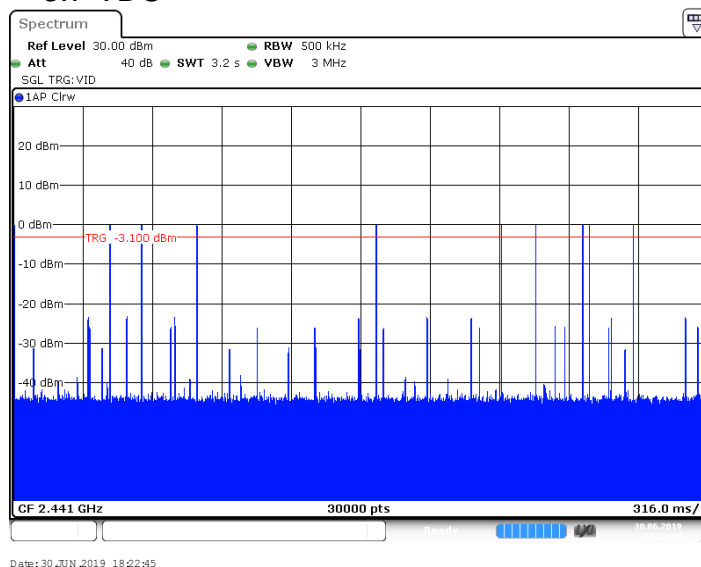
8.9 Average Channel Occupancy Time

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, DH5)
 Test Specification: FCC15.247(a)(1)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Average time of occupancy	Limit
Number of hops in 3.16 sec.: 9 Period: $0.4 \times 79 \text{ Ch.} = 31.6 \text{ sec.}$ Total number of hops in 31.6 sec.: $9 \times 31.6 / 3.16 = 90$ Time of single pulse: 2.86ms Average time of occupancy: $2.903 \text{ ms} \times 90 = 0.2574 \text{ sec.}$	0.4 Seconds

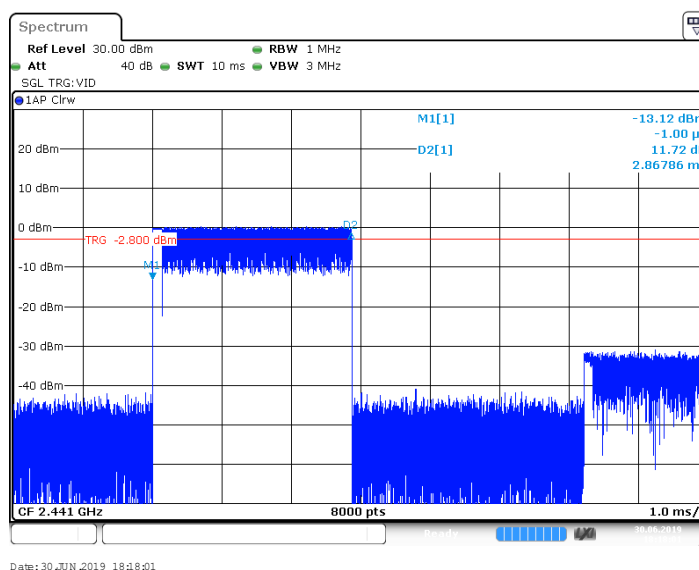
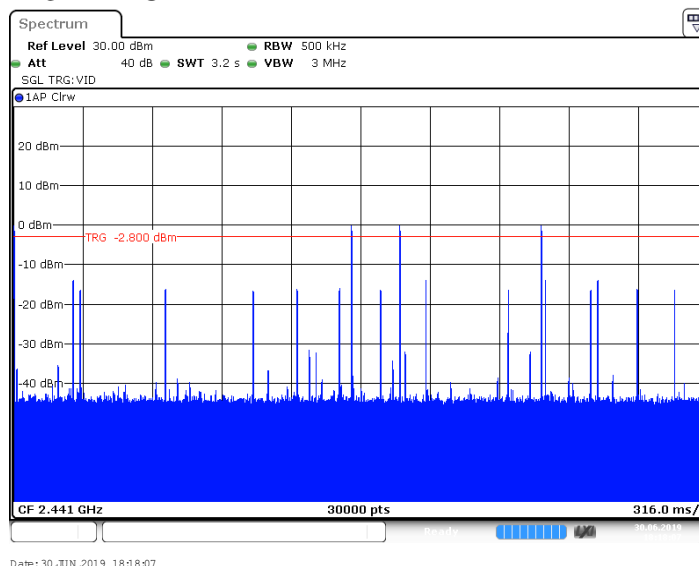
Average Channel Occupancy Time

EUT: SBLP 5.0 B1
 Op Condition: Operated, TX Mode (2441MHz, 2DH5)
 Test Specification: FCC15.247(a)(1)
 Comment: 3.7 VDC

Test Result

☒ Passed

☐ Not Passed



Average time of occupancy	Limit
Number of hops in 3.16 sec.: 3 Period: 0.4 x 79 Ch. = 31.6 sec. Total number of hops in 31.6 sec.: $10 \times 31.6 / 3.16 = 30$ Time of single pulse: 2.87ms Average time of occupancy: $2.920 \text{ ms} \times 30 = 0.0861 \text{ sec.}$	0.4 Seconds

8.10 Antenna Requirement

EUT: SBLP 5.0 B1
Op Condition: Operated, TX Mode
Test Specification: FCC15.203 & 15.247(b)
Comment: 3.7 VDC

Test Result	
<input checked="checked" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Limit

For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC Title 47 Part 15.247(b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The antenna used in this product is PCB antenna, and the maximum gain of this antenna is 0 dBi.

9 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as

Step a)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

>> The fundamental frequency of the EUT is 2402-2480MHz,
the test separation distance is ≤ 50 mm.
(Manufacturer specified the separation distance is: 5 mm)

Step a)

>> Numeric threshold (2402MHz), $\text{mW} / 5\text{mm} \cdot \sqrt{2.402\text{GHz}} \leq 3.0$
Numeric threshold (2402MHz) $\leq 9.678\text{mW}$

>> Numeric threshold (2440MHz), $\text{mW} / 5\text{mm} \cdot \sqrt{2.441\text{GHz}} \leq 3.0$
Numeric threshold (2440MHz) $\leq 9.601\text{mW}$

>> Numeric threshold (2480MHz), $\text{mW} / 5\text{mm} \cdot \sqrt{2.480\text{GHz}} \leq 3.0$
Numeric threshold (2480MHz) $\leq 9.525\text{mW}$

>> The power of EUT measured (2402MHz) is: 1.76dBm = 1.50mW
The power of EUT measured (2440MHz) is: 1.78dBm = 1.51mW
The power of EUT measured (2480MHz) is: 1.77dBm = 1.50mW
Which is smaller than the Numeric threshold.
Therefore, the device is exempt from stand-alone SAR test requirements.