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TESTING LABORATORY
CERTIFICATE # 4821.01

Bay Area Compliance Labs Corp.

FCC PART 15.247

TEST REPORT

For

SDI Technologies Inc.

1299 Main St. Rahway NJ 07065, United States

FCC ID: EMO553N

Report Type:	**Product Type:**
Class II Permissive Change	BLUETOOTH MP3 KARAOKE WITH LIGHT SHOW

Report Number: RSZ200323K52-00AA1

Report Date: 2020-04-14

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	BLUETOOTH MP3 KARAOKE WITH LIGHT SHOW
Tested Model	FR-553.EXv0MR
Multiple Model	M_1-553$M_2M_3M_4M_5M_6M_7M_8M_9M_{10}$ (M_1-M_{10}, please refer to model no. table)
Model Different	Refer to the DOS
Frequency Range	Bluetooth: 2402~2480MHz
Conducted Peak Output Power	Bluetooth: -1.8dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification	PCB Antenna: 0dBi
Voltage Range	DC 3.7 V from battery or DC 5V from USB port
Date of Test	2020-03-27 to 2020-04-01
Sample serial number	RSZ200323K52-RFA1-S1 (Assigned by BACL, Shenzhen)
Received date	2020-03-23
Sample/EUT Status	Good Condition

Objective

This test report is prepared on behalf of *SDI Technologies Inc.*in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.209 and 15.247 rules.

This is a CIIPC application of the device; the differences between the original device and the current one are as follows:

a) Add the models: FR-553.EXv0MR, M_1-553$M_2M_3M_4M_5M_6M_7M_8M_9M_{10}$ (M_1 -M_{10}, please refer to model No. table).

b) Changing the appearance of EUT.

c) Add the circuit of the recording function, the Bluetooth module is not changed.

Based on the above differences list, the radiated spurious emission was retested.

Model Table as follow:

Model No. Table

Part of model #	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Number of digit(s)	2	2	1	1	1 to 2	1	1 to 2	1 to 2	2	1 to 2
Description	2 digits alphabets by "a" – "Z" for brand	2 digits alphabets combination by "a" – "Z" special character version Or blank	"." Or blank	"U" for Europe version Or blank	"E" for English content Or "F" for English & French Or "3" for 3 language version Or "11" for Europe version with 11 languages	"X" for no sound chip * (Remark: * = configuration same as EUT)	"0"-"9" for year version Or "V0" – "V9" for year version	"M" for Movie version brand Or "R" for 553 series "Record version" Or "MR" for Movie version brand + 553 series "Record version" Or Blank (Remark : internal construction and electrically identical with EUT)	"AK" for Walmart exclusive Or "AP" for Apple exclusive Or "KS" for Kohl's exclusive Or "TG" for Target exclusive Or blank	"i" for inner carton required Or "z" for direct to consumer on-line packaging Or "OL" for Amazon packaging Or blank

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS submissions with FCC ID: EMO553N.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

For Radiated Emissions testing, please refer to DA 00-705 Released March 30, 2000, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.5dB
RF conducted test with spectrum		±1.5dB
AC Power Lines Conducted Emissions		±1.95dB
Radiated Emissions	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±3℃
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

"BT FCC TOOL V2.21" exercise software was used, and the power level is 3.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

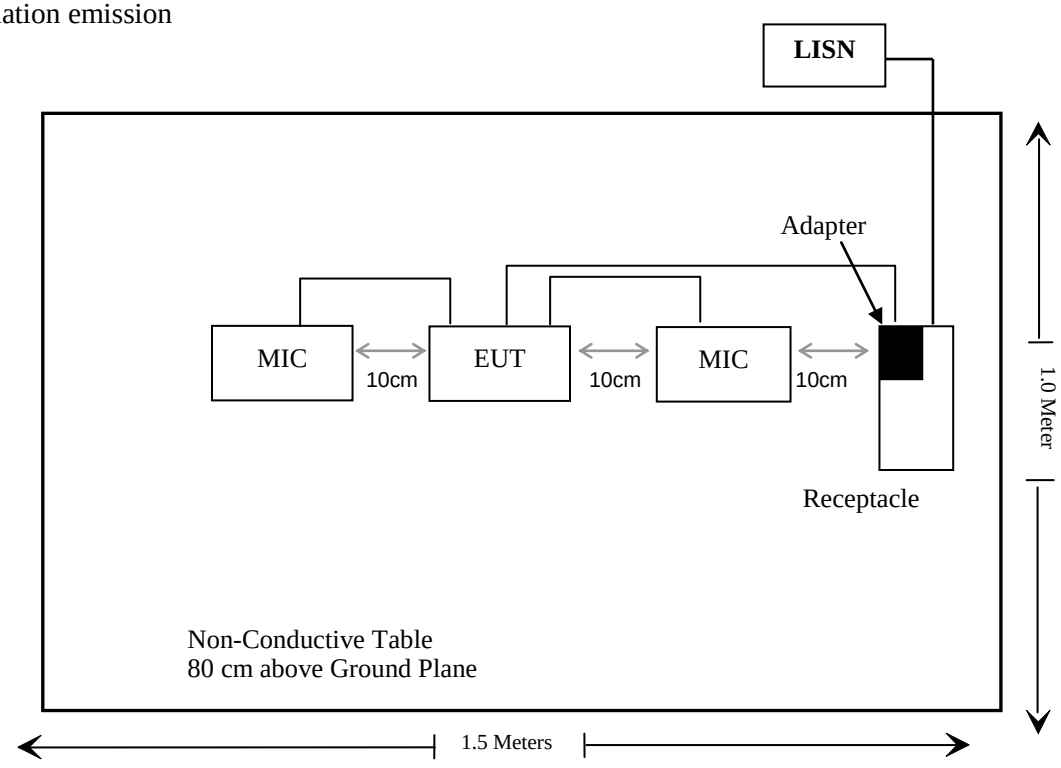
Manufacturer	Description	Model	Serial Number
TP-LINK	Adapter	A8-501000	Unknown
SDI Technologies Inc.	MIC	Unknown	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	0.5	EUT	Adapter

Block Diagram of Test Setup

For radiation emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1093	RF Exposure	Compliance*
§15.203	Antenna Requirement	Compliance*
§15.207(a)	AC Line Conducted Emissions	Compliance*
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliance
§15.247(a)(1)	20 dB Emission Bandwidth	Compliance*
§15.247(a)(1)	Channel Separation Test	Compliance*
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance*
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance*
§15.247(b)(1)	Peak Output Power Measurement	Compliance*
§15.247(d)	Band edges	Compliance*

Compliance*: The CIIPC application will not effected the result, test data please refer to the FCC ID: EMO553N, which was granted on 10/30/2019, Report No.: RSZ190909K52-00A, which was tested by Bay Area Compliance Laboratories Corp. (Shenzhen).

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2019/4/20	2020/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/07/21
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2019/11/29	2020/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2019/11/29	2020/11/28
SNSD	Band Reject filter	BSF2402-2480MN-0898-001	2.4G filter	2019/4/20	2020/4/20
Ducommun Technolagies	Horn antenna	ARH-4223-02	1007726-02 1304	2017/12/6	2020/12/5

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

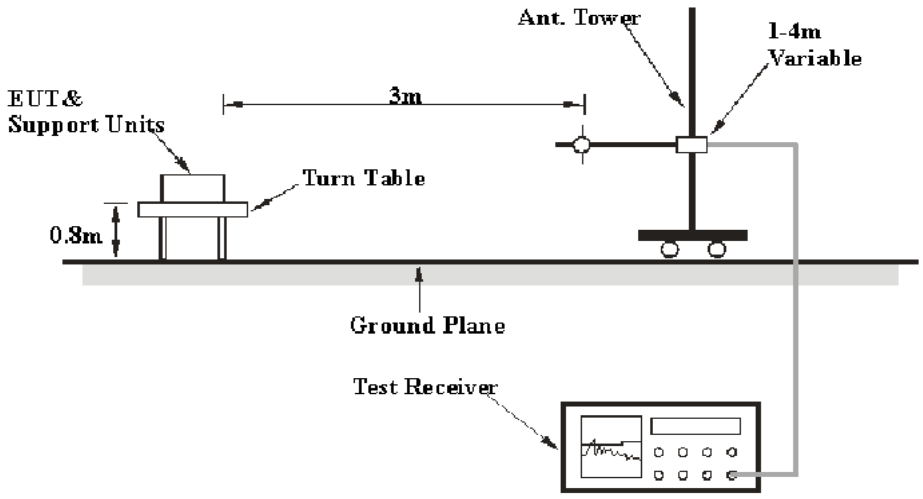
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

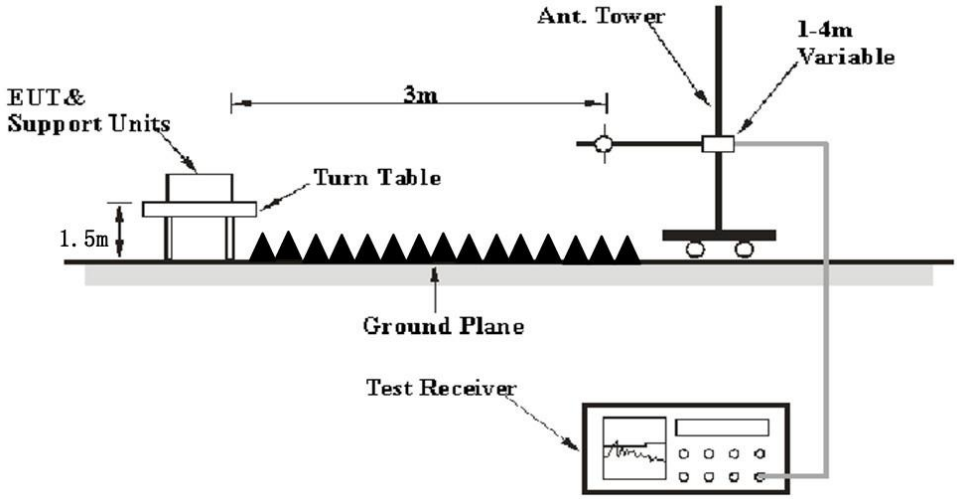
FCC §15.205; §15.209; §15.247(d)

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, according to the DA 00-705 Released March 30, 2000, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Average

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

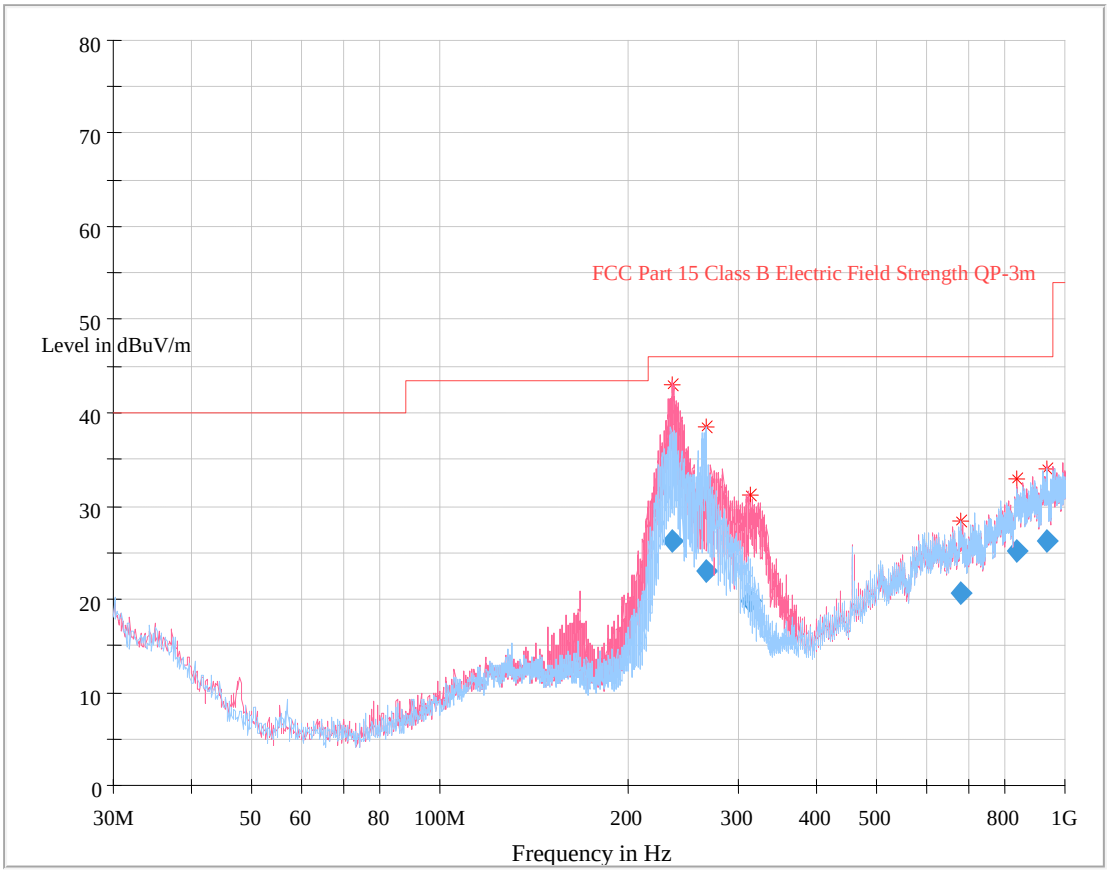
Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan on 2020-03-27 for below 1GHz and Charlie Cha on 2020-04-01 for Above 1GHz.

30 MHz~1 GHz: *(the worst case is GFSK Mode, High channel)*



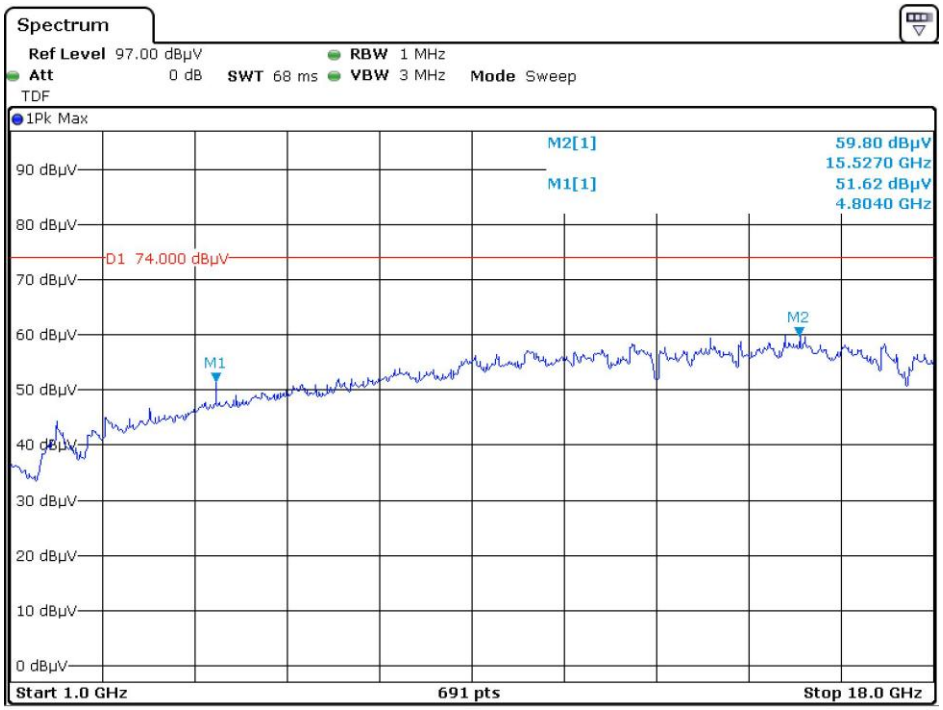
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
235.510250	26.13	371.0	V	305.0	-14.0	46.00	19.87
266.172125	22.97	115.0	H	33.0	-13.0	46.00	23.03
312.813375	19.73	102.0	V	357.0	-10.7	46.00	26.27
682.196250	20.64	394.0	H	18.0	-1.4	46.00	25.36
836.382875	25.19	124.0	V	73.0	2.7	46.00	20.81
935.190500	26.32	254.0	V	325.0	4.8	46.00	19.68

1 GHz - 25 GHz (*Scan with GFSK, π/4-DQPSK, the worst case is π/4-DQPSK Mode*)**:**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2402 MHz)									
2333.86	28.74	PK	233	1.4	H	31.64	60.38	74	13.62
2333.86	13.61	Ave.	233	1.4	H	31.64	45.25	54	8.75
2491.81	28.54	PK	319	2.4	V	32.13	60.67	74	13.33
2491.81	13.46	Ave.	319	2.4	V	32.13	45.59	54	8.41
4804.00	50.31	PK	303	1.1	H	5.40	55.70	74	18.30
4804.00	42.77	Ave.	303	1.1	H	5.40	48.17	54	5.83
Middle Channel (2441 MHz)									
4882.00	48.65	PK	172	2.3	H	6.43	55.08	74	18.92
4882.00	39.59	Ave.	172	2.3	H	6.43	46.02	54	7.98
High Channel (2480 MHz)									
2385.64	28.79	PK	113	1.9	H	31.87	60.66	74	13.34
2385.64	13.61	Ave.	113	1.9	H	31.87	45.48	54	8.52
2495.77	29.15	PK	90	1.5	V	32.13	61.28	74	12.72
2495.77	13.89	Ave.	90	1.5	V	32.13	46.02	54	7.98
4960.00	47.65	PK	13	2.2	H	6.95	54.60	74	19.40
4960.00	35.62	Ave.	13	2.2	H	6.95	42.57	54	11.43

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude
The other spurious emission which is 20dB to the limit was not recorded.
And for the harmonic test, it is performed with the 2400-2483.5MHz band filter.

Pre-scan with low channel Peak
Horizontal



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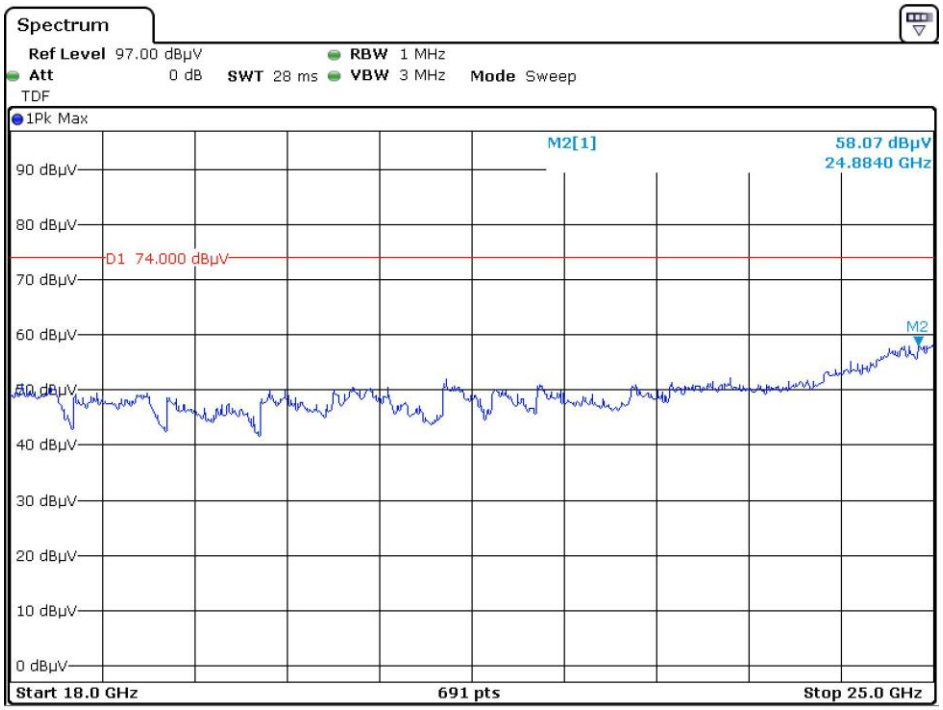

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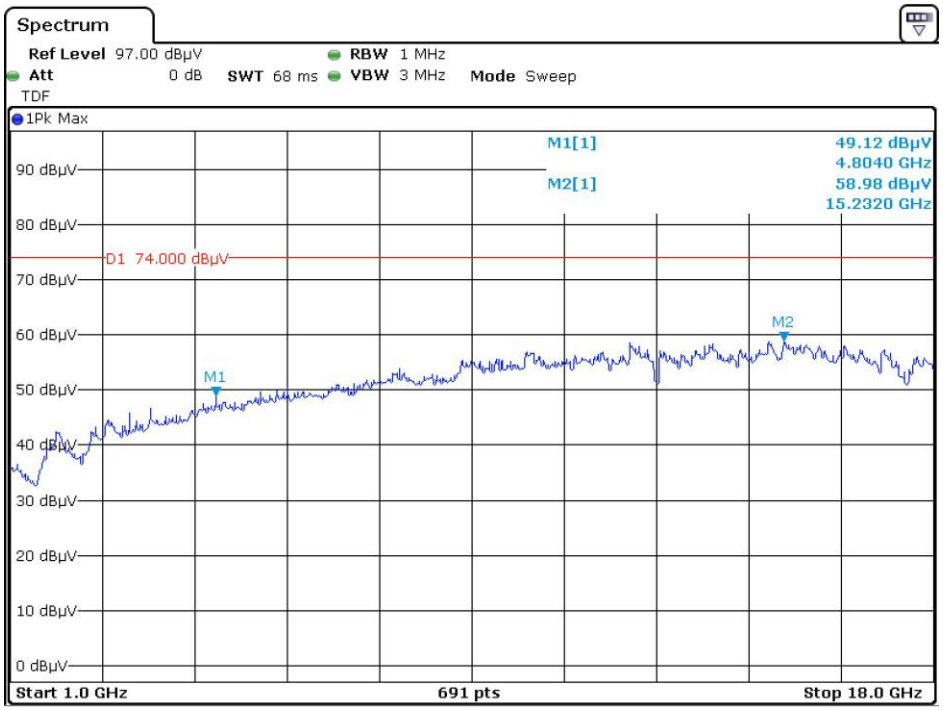
Vertical



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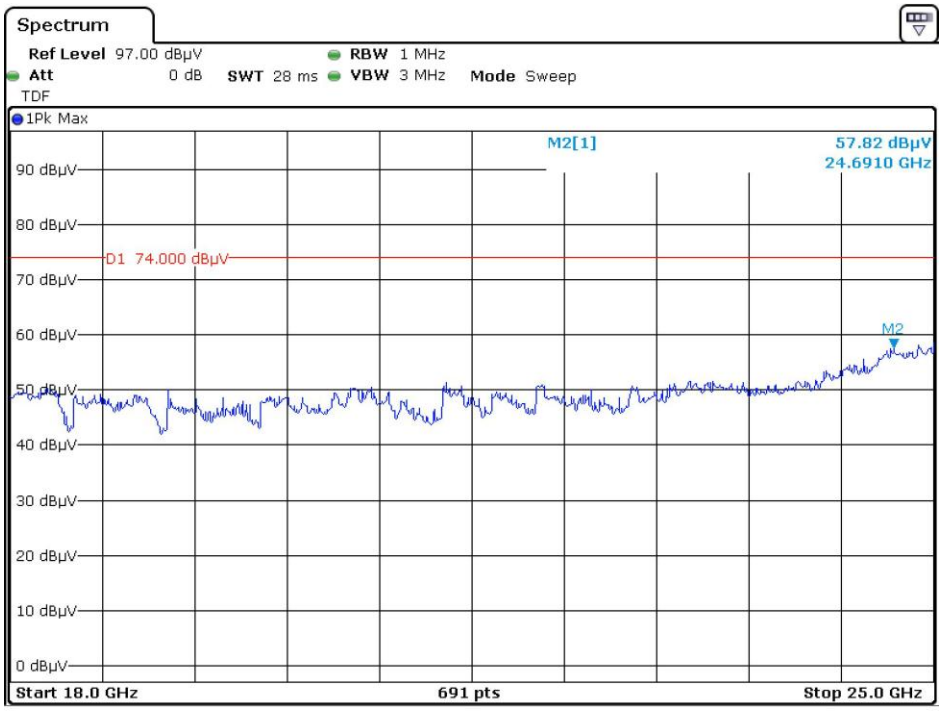

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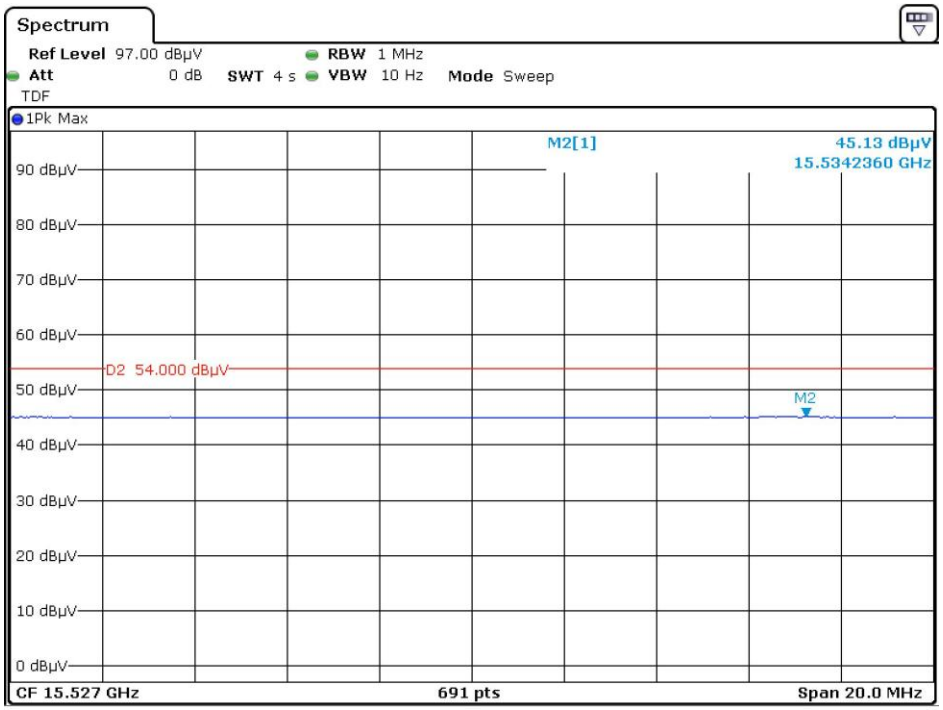
Pre-scan for Average
Horizontal



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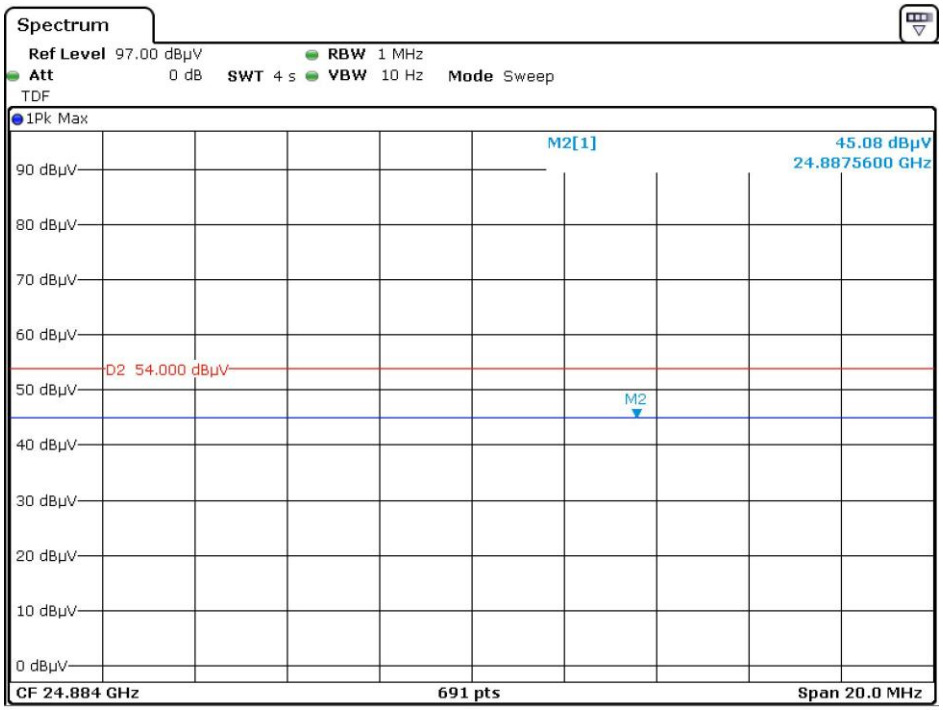

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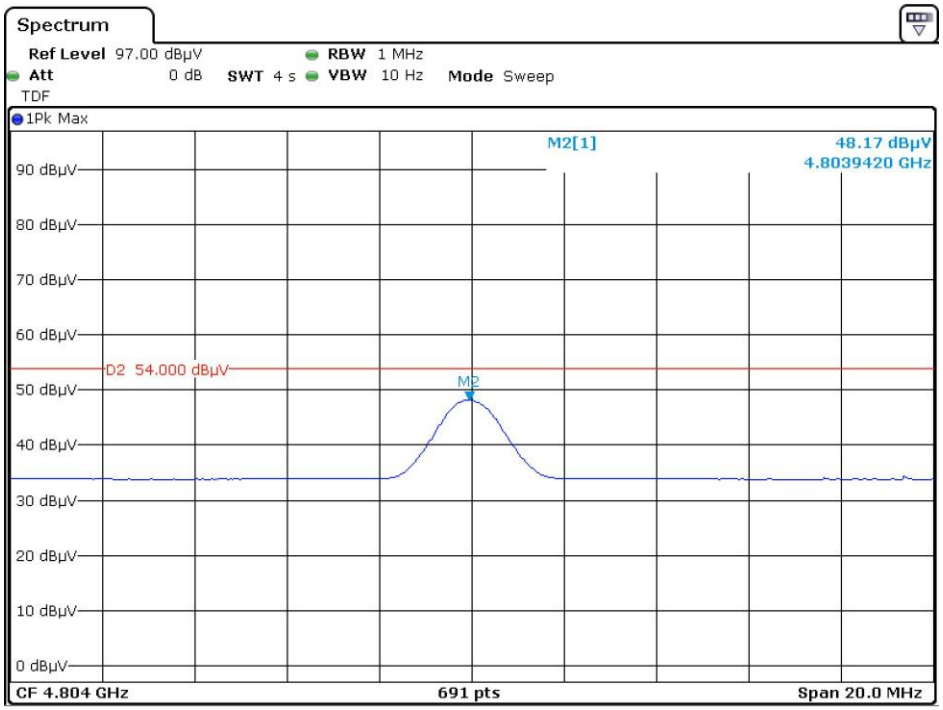

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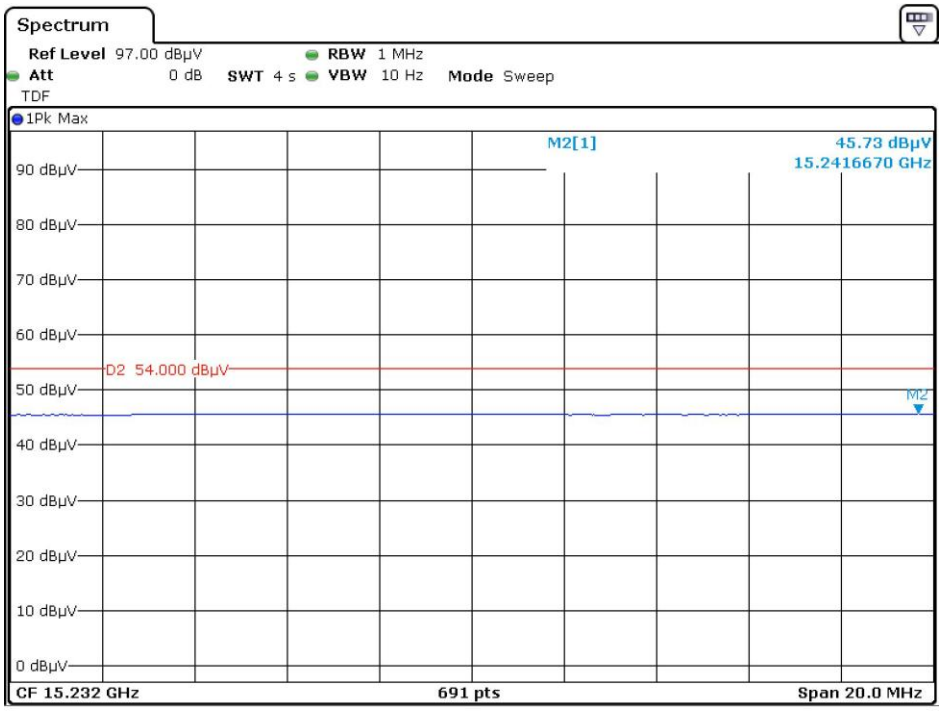
Vertical



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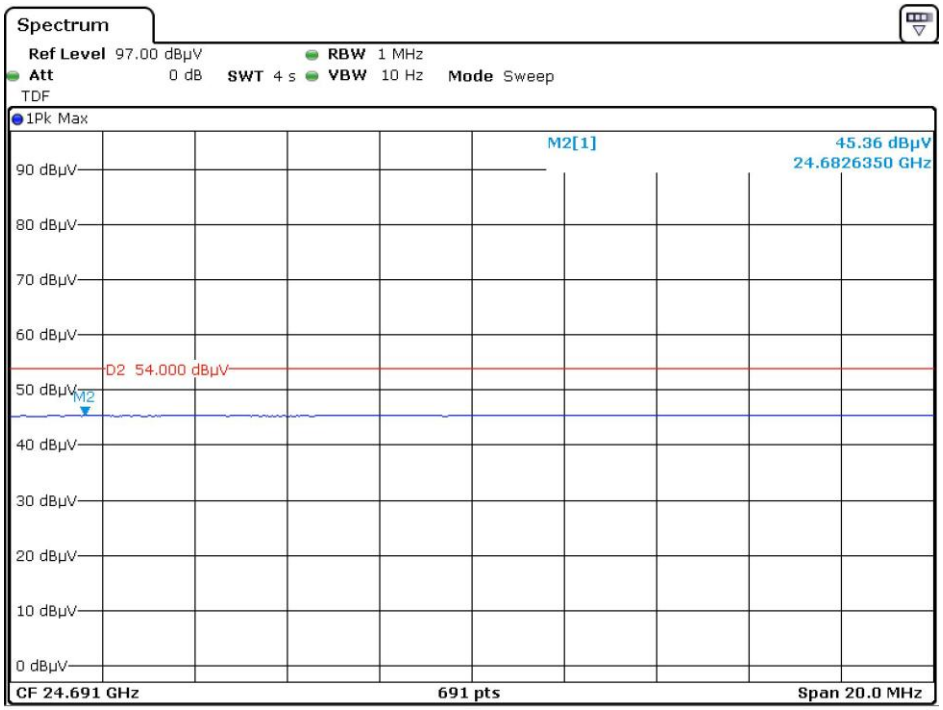

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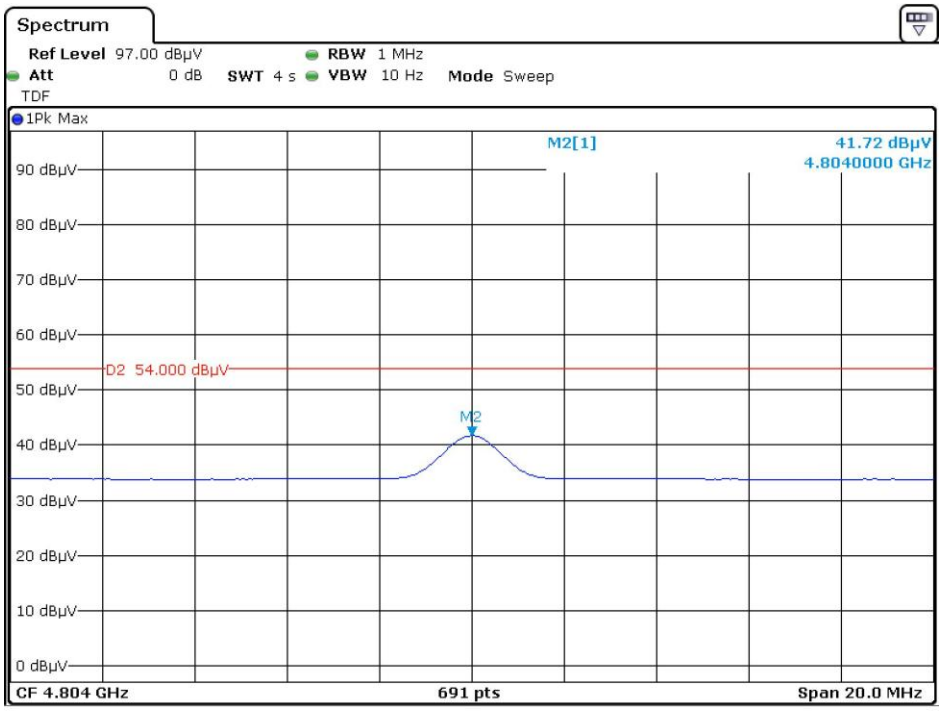

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