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C.I.F. A29507456

ISED CABid: ES1909

Test Report No:
NIE: 64670RRF.005

Partial Test Report

USA FCC Part 15.247, 15.209
CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Smart Cooking Sensor
(*) Trademark	Safera
(*) Model and /or type reference	Sense Pro (Model code: IFU10B-PRO)
Other identification of the product	HW Version: B SW Version: 1.0.25 FCC ID: 2AT88-2000021194
(*) Features	Bluetooth LE, 802.15.4 (ZigBee-type), Wi-Fi 802.11 b/g/n (HT20)
Manufacturer	SAFERA OY Tekniikantie 4 B, FI-02150 Espoo, Finland.
Test method requested, standard	USA FCC Part 15.247 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-20 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 amendment 1 (March 2019). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager 2021.12.23 10:14:36 +01'00'
Date of issue	2021-12-23
Report template No	FDT08_23 (*) "Data provided by the client"

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Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample Safera Sense is a Smart Cooking Sensor with the following main features:
   Sensors for monitoring the stove area and detecting cooking processes, as well as estimating indoor air quality. Processor and algorithms for detecting stove overheating, which will result in an audible alarm. Support for Bluetooth communication to smartphones and iOS / Android application in order to visualize data. Support for proprietary 802.15.4 based radio protocol for controlling some Safera Accessories (for example Power Control Unit for Stove). Support for Wi-Fi for connection to Safera Cloud or other Internet of Things -services.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
64670/029	Smart Cooking Sensor	Sense Pro	1727644012	2020-11-20

Sample S/01 has undergone the following test(s): The CONDUCTED tests indicated in Appendix A.

Test sample description

Ports…… :	Port name and description		Cable				
			Specified length [m]	Attached during test		Shielded	
	N/A			☐		☐	
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: For the final product: 3 x AA Alkaline batteries as power supply. Operational voltage from 3.0 V to 5.0 V. For testing purposes, power is wired externally to some sample units. This is done to make it possible to use an external power supply. When using an external power supply, allowed voltages are 3.0 VDC to 5.0 VDC.					
Rated Power .....:	Normal operating mode: approx. 0.1 mA average Max. short term current consumption 150 mA Max. very short peak current consumption approx. 400 mA (ms level)						
Clock frequencies.....:	64 MHz main processor clock (nRF52840) 80-160 MHz auxiliary network processor clock (ESP8285) 32.768 kHz RTC auxiliary clock						
Other parameters .....:	Not provided data						
Software version .....:	1.0.25						
Hardware version .....:	B						
Dimensions in mm (W x H x D)...:	Not provided data						
Mounting position .....:	☐	Table top equipment					
	☒	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other:					
Modules/parts.....:	Module/parts of test item		Type		Manufacturer		
	Sensor Unit				Safera		
Accessories (not part of the test item) .....:	Description		Type		Manufacturer		
	Power supply						
	Batteries						
Documents as provided by the applicant.....:	Description		File name		Issue date		
	User Manual						

(3) Only for Medical Equipment

Identification of the client

SAFERA OY
Tekniikantie 4 B, FI-02150 Espoo, Finland.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-12-18
Date (finish)	2020-12-18

Document history

Report number	Date	Description
64670RRF.005	2021-12-23	First release.

Environmental conditions

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Javier Miguel Nadales.

Used instrumentation:

Conducted Measurements

		Last Calibration	Due Calibration
1.	Shielded Room ETS LINDGREN S101	N/A	N/A
2.	Signal and Spectrum Analyzer 10 Hz - 40 GHz ROHDE AND SCHWARZ FSV40	2021/02	2023/02
3.	Analog Power Supply DC 40V/40A NGPE 40/40 Rohde and Schwarz	N/A	N/A
4.	Digital multimeter FLUKE 179	2021/06	2022/06

Testing verdicts

Fail	F
Not applicable	N/A
Not measured	N/M
Pass	P

Summary

Bluetooth 5.0 (1 & 2 Mbps):

Requirement – Test case FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth	N/M	(1)
RSS-247 5.4 (d) / FCC 15.247 (b) (3) Maximum Peak Conducted output power	Pass	
RSS-247 5.2 (b) / FCC 15.247 (e) Power Spectral Density	N/M	(1)
RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter)	N/M	(1)
RSS-247 5.5 / FCC 15.247 (d) Emission limitations radiated (Transmitter)	N/M	(1)
99dBw Occupied Channel Bandwidth 99%	N/M	(1)
Supplementary information and remarks: 1) Test not requested		

Appendix A: Test results. Bluetooth 5.0 (1 & 2 Mbps):

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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	4.5 V DC
Type of Power Supply:	External power supply

ANTENNA (*):

Type of Antenna:	Integral
Maximum Declared Antenna Gain:	1.5 dBi

TEST FREQUENCIES (*):

Low Channel:	2402 MHz
Middle Channel:	2440 MHz
High Channel:	2480 MHz

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.

TEST CASES DETAILS

RSS-247 5.4 (d) / FCC 15.247 (b) (3) Maximum Peak Conducted output power

Limits

For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).

The e.i.r.p. shall not exceed 4 W (36 dBm) (Canada).

Results

The maximum peak conducted output power level in the fundamental emission was measured using the method according to point 11.9.1.1 ”RBW ≥ DTS bandwidth” of ANSI C.63.10-2013.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Maximum Declared Antenna Gain: 1.5 dBi

Modulation: Bluetooth 5.0 (1 & 2 Mbps):

Operation Band (MHz)	Equipment	Freq (MHz)	Max Conducted Power (dBm)	Max E.I.R.P (dBm)
[2400, 2483.5]	BLE 1Mbps	2402.00	-0.37	1.13
[2400, 2483.5]	BLE 1Mbps	2440.00	-1.12	0.38
[2400, 2483.5]	BLE 1Mbps	2480.00	-2.16	-0.66

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Operation Band (MHz)	Equipment	Freq (MHz)	Max Conducted Power (dBm)	Max E.I.R.P (dBm)
[2400, 2483.5]	BLE 2Mbps	2402.00	-0.36	1.14
[2400, 2483.5]	BLE 2Mbps	2440.00	-1.13	0.37
[2400, 2483.5]	BLE 2Mbps	2480.00	-2.15	-0.65

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

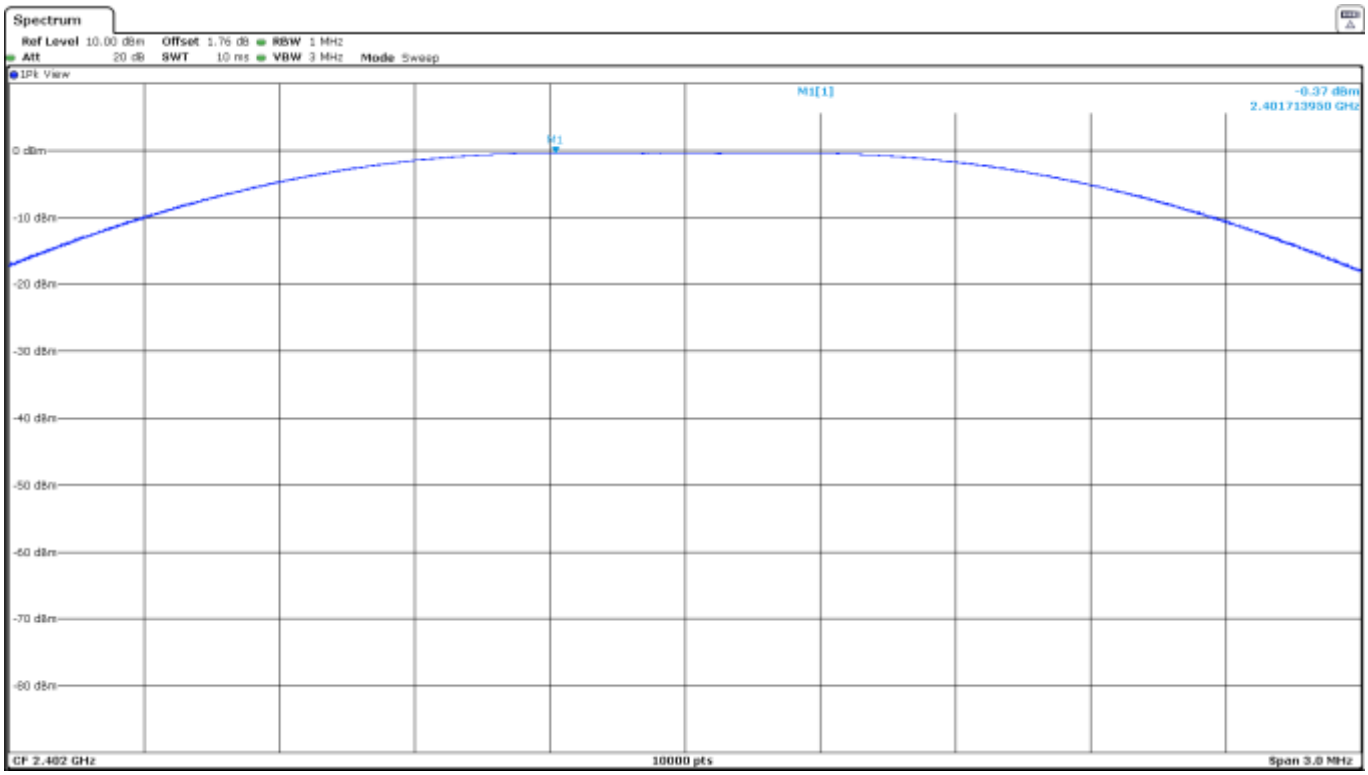
Verdict

Pass

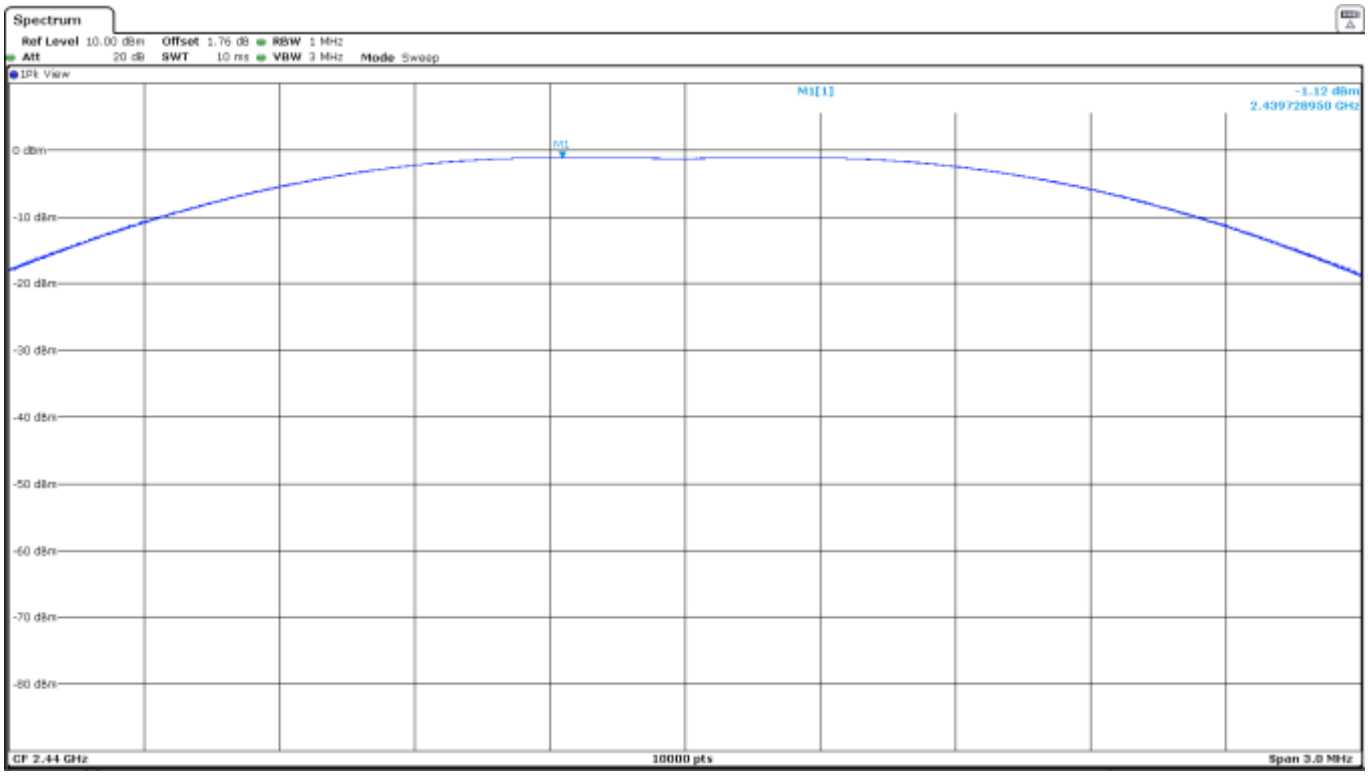
Uncertainty 0.99dB

BLE 1Mbps:

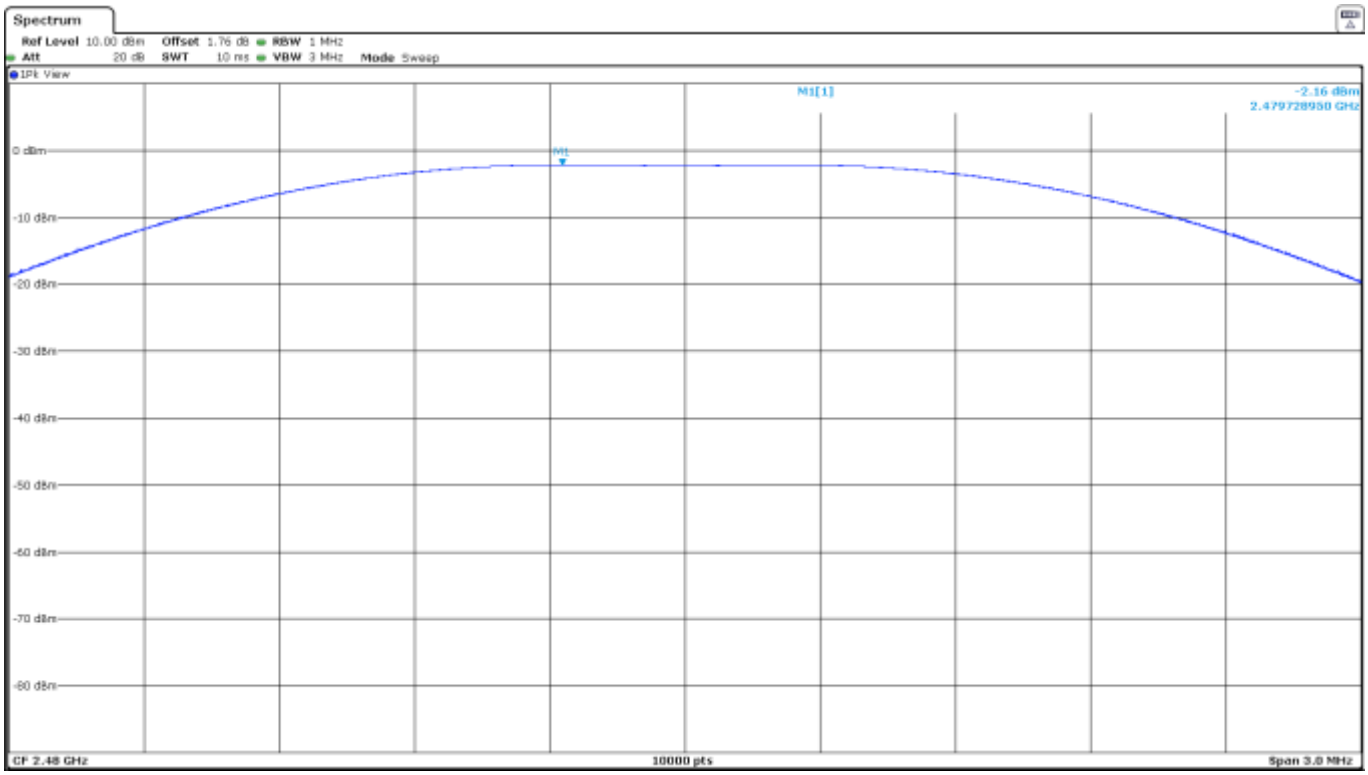
-Low Channel:



-Middle Channel:

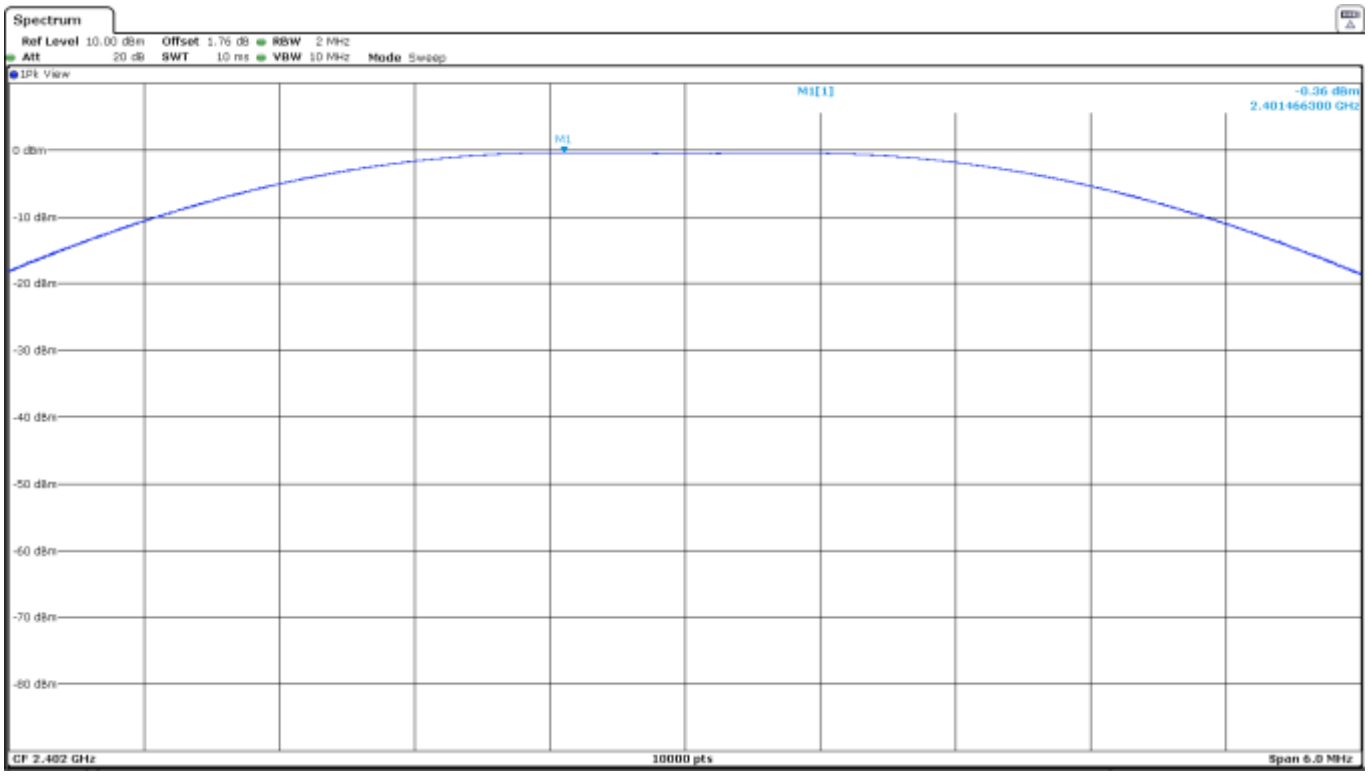


-High Channel:

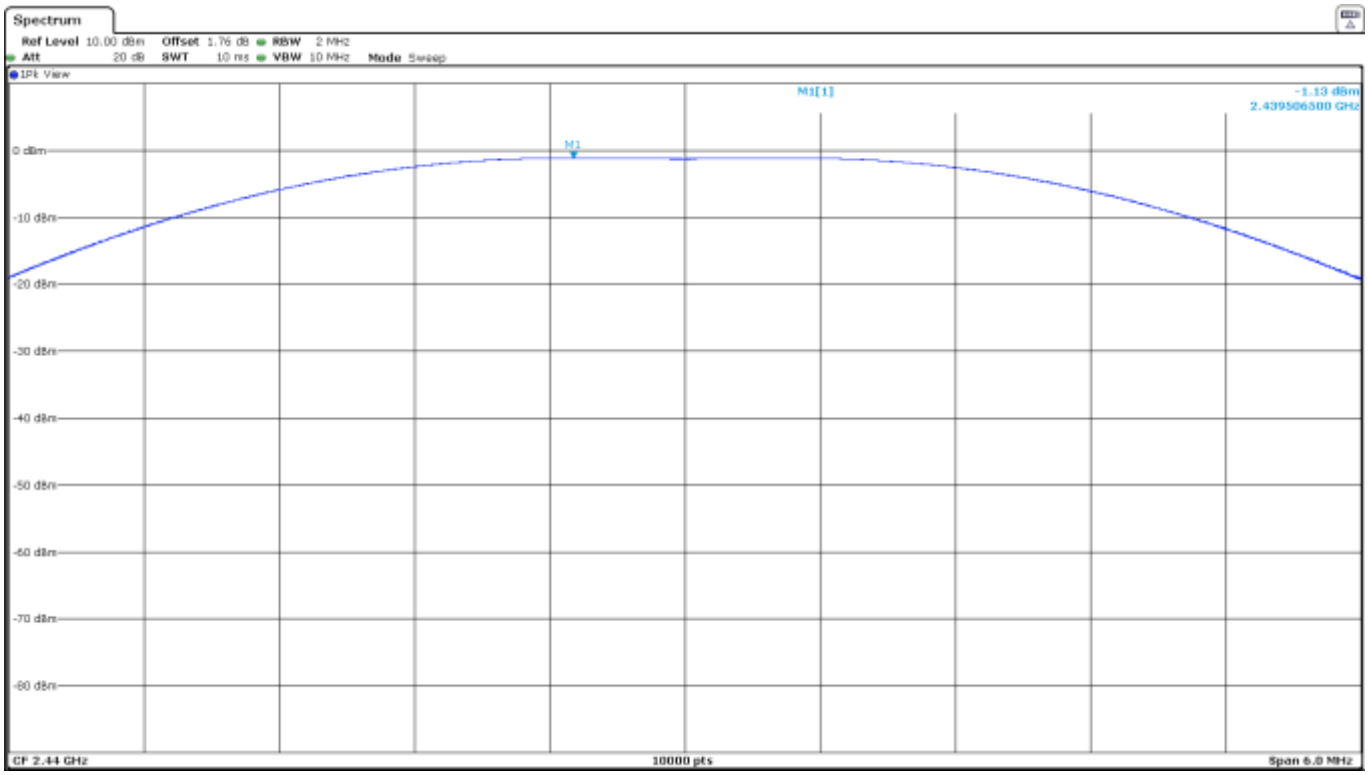
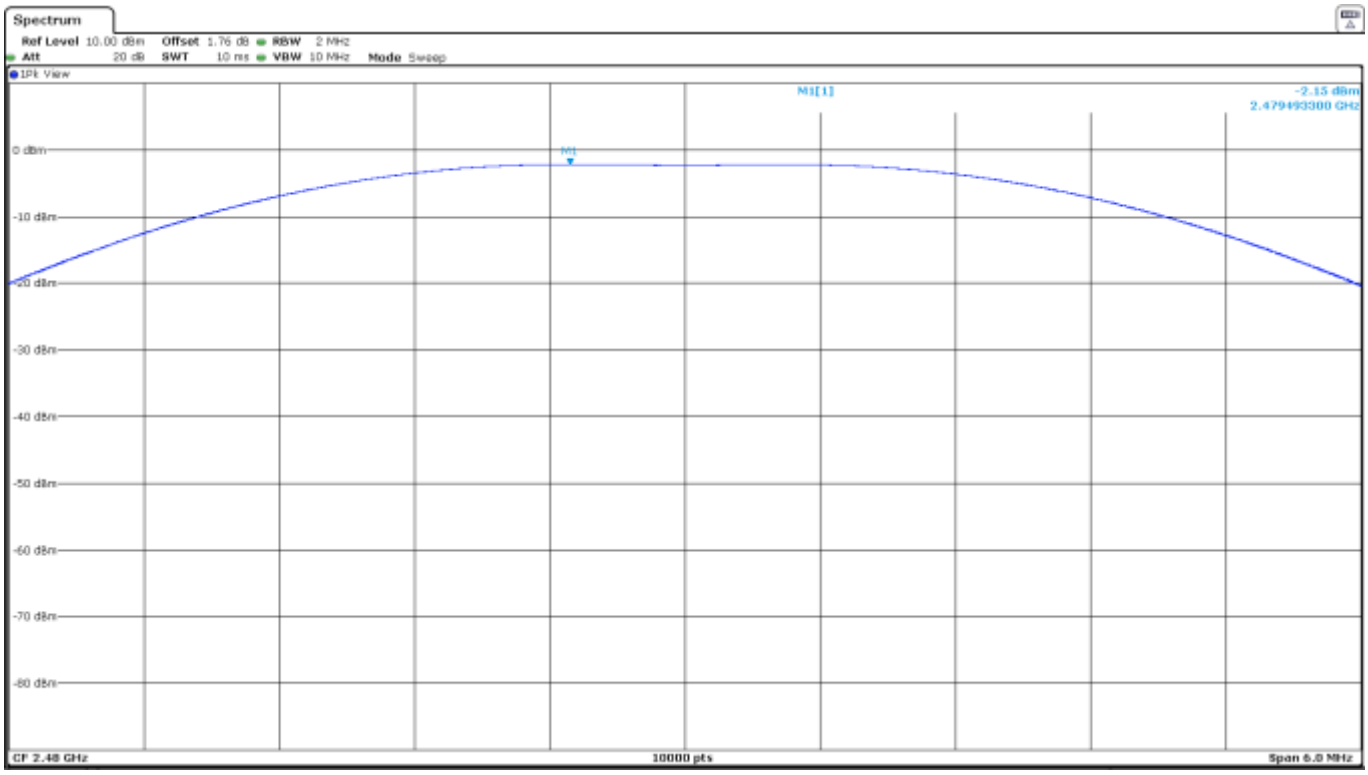


BLE 2Mbps:

-Low Channel:



-Middle Channel:



-High Channel: