



FCC LISTED, REGISTRATION
NUMBER: 720267

IC LISTED REGISTRATION
NUMBER IC 4621A-2

Informe de ensayo n°:
Test report No:

NIE: 52954RRF.002

Test report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

Radio Frequency Devices. Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz,
and 5725 - 5850 MHz.

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-
Exempt Local Area Network (LE-LAN) Devices.

General Requirements and Information for the Certification of Radio Apparatus.

Identificación del objeto ensayado..... Identification of item tested	Sensor Beacon
Marca Trademark	Pioneer
Modelo y/o referencia tipo Model and /or type reference	TMX-CB10
Other identification of the product	FCC ID: VIYHRM5087 ISED: 7305A- HRM5087
Final HW version	1.xx
Final SW version	1.xx
Características Features	Bluetooth Ver4.2.
Solicitante Applicant	HOSIDEN CORPORATION 4-33 Kitakyuhouji 1-chome, Yao City, Osaka 581-0071 JAPAN
Método de ensayo solicitado, norma..... Test method requested, standard	USA FCC Part 15.247 10-1-15 Edition: Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, 5725 - 5875 MHz, and 24.0 – 24.25 GHz. USA FCC Part 15.209 10-1-15 Edition: Radiated emission limits; general requirements. CANADA RSS-247 Issue 1 (May 2015). CANADA RSS-Gen Issue 4 (November 2014). Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 558074 D01 DTS Meas Guidance v04 dated 04/05/2017. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Resultado..... Summary	IN COMPLIANCE
Aprobado por (nombre / cargo y firma) Approved by (name / position & signature)	A. Llamas RF Lab. Manager

Fecha de realización	2017-04-26
Date of issue	

Formato de informe No.	FDT08_19
Report template No	

Index

Competences and guarantees.....	4
General conditions.....	4
Uncertainty	4
Usage of samples.....	4
Test sample description	5
Identification of the client	5
Testing period.....	5
Environmental conditions.....	5
Remarks and comments.....	6
Testing verdicts	7
Appendix A – Test result “Bluetooth Low Energy”	8

Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 720267.

DEKRA Testing and Certification is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: IC 4621A-2.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

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

Usage of samples

Samples undergoing test have been selected by: **the client**

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
52954B/005	Sensor Beacon	TMX-CB10	---	2017-03-21
52954B/007	Accessory for external power supply	---	---	2017-03-21

1. Sample S/01 has undergone following test(s).

All radiated tests indicated in appendix A.

Test sample description

The test sample is a sensor terminal to be used by plugging it into a car cigar lighter socket. Dangerous driving and impacts are detected by a built-in acceleration sensor. It's work with a smartphone on which applications supporting this product are installed.

Thanks to built-in lithium-ion batteries, this product can detect shock and notify smartphones even when the car's ACC power supply is not turned on. Also, you can supply power from the USB terminal to your smartphone.

Identification of the client

HOSIDEN CORPORATION

4-33 Kitakyuhouji 1-chome, Yao City, Osaka 581-0071 JAPAN

Testing period

The performed test started on 2017-03-22 and finished on 2017-03-25.

The tests have been performed at DEKRA Testing and Certification.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

Remarks and comments

1: Used instrumentation:

Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2.	BiconicalLog antenna ETS LINDGREN 3142E	2014/03	2017/03
3.	Multi Device Controller EMCO 2090	N.A.	N.A.
4.	Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2016/11	2019/11
5.	Spectrum analyser Rohde & Schwarz FSW50	2015/12	2017/12
6.	EMI Test Receiver R&S ESU 40	2016/03	2018/03
7.	RF pre-amplifier 10 MHz-6 GHz SCHWARZBECK BBV9743	2016/04	2017/04
8.	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-1M	2016/02	2018/02
9.	Broadband Horn antenna 18-40 GHz SCHWARZBECK BBHA 9170	2014/03	2017/03
10.	RF pre-amplifier 18-40 GHz BONN ELEKTRONIK BLMA 1840-1M	2015/12	2017/12

2: Test not requested.

Testing verdicts

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

1. Bluetooth Low Energy

FCC PART 15 PARAGRAPH / RSS-247		VERDICT			
		NA	P	F	NM
Section 15.247 Subclause (a) (2) / RSS-247 5.2. (1)	6 dB Bandwidth				NM ²
Section 15.247 Subclause (b) / RSS-247 5.4. (4)	Maximum output power and antenna gain				NM ²
Section 15.247 Subclause (d) / RSS-247 5.5	Emission limitations conducted (Transmitter)				NM ²
Section 15.247 Subclause (d) / RSS-247 5.5. ..	Band-edge emissions compliance (Transmitter)				NM ²
Section 15.247 Subclause (e) / RSS-247 5.2. (2)	Power spectral density				NM ²
Section 15.247 Subclause (d) / RSS-247 5.5. ...	Emission limitations radiated (Transmitter)		P		

2: See point “Remarks and comments”.

Appendix A – Test result “Bluetooth Low Energy”

INDEX

TEST CONDITIONS	10
Section 15.247 Subclause (d) / RSS-247 5.5. Emission limitations radiated (Transmitter).....	12

TEST CONDITIONS

Power supply (V):

$V_{\text{nominal}} = 14.4 \text{ Vdc}$ (worst case)

Type of power supply = External DC Power Supply and Lithium-ion batteries

Type of antenna = Integral antenna

Declared antenna gain = 0.5 dBi

TEST FREQUENCIES:

Lowest channel: 2402 MHz

Middle channel: 2440 MHz

Highest channel: 2480 MHz

RADIATED MEASUREMENTS

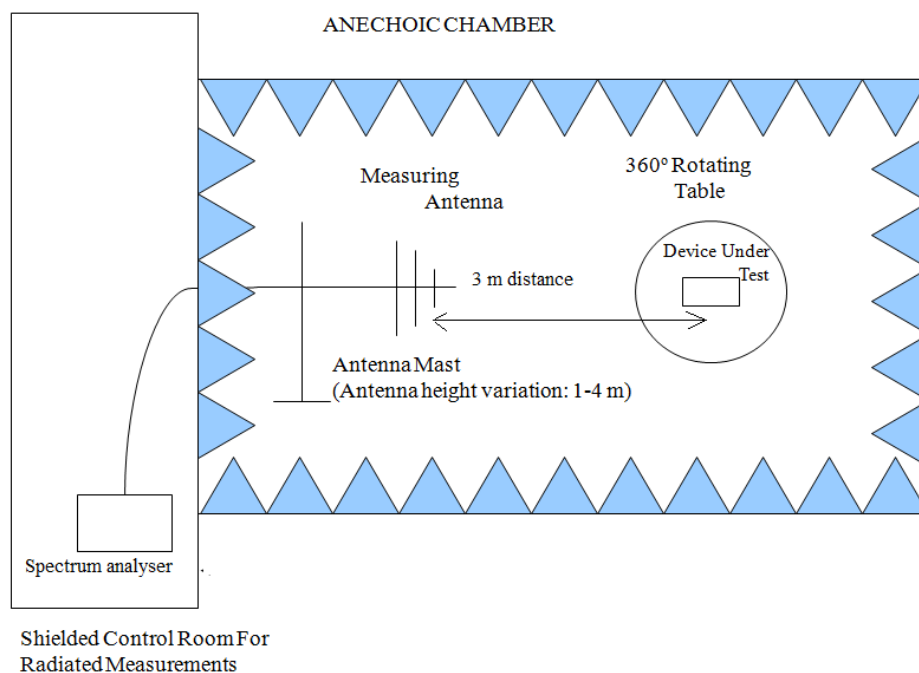
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30 MHz-1000 MHz (30 MHz-1000 MHz Bilog antenna) and at a distance of 1m for the frequency range 1 GHz-25 GHz (1 GHz-18 GHz Double ridge horn antenna and 18 GHz-40 GHz horn antenna).

For radiated emissions in the range 1 GHz-25 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

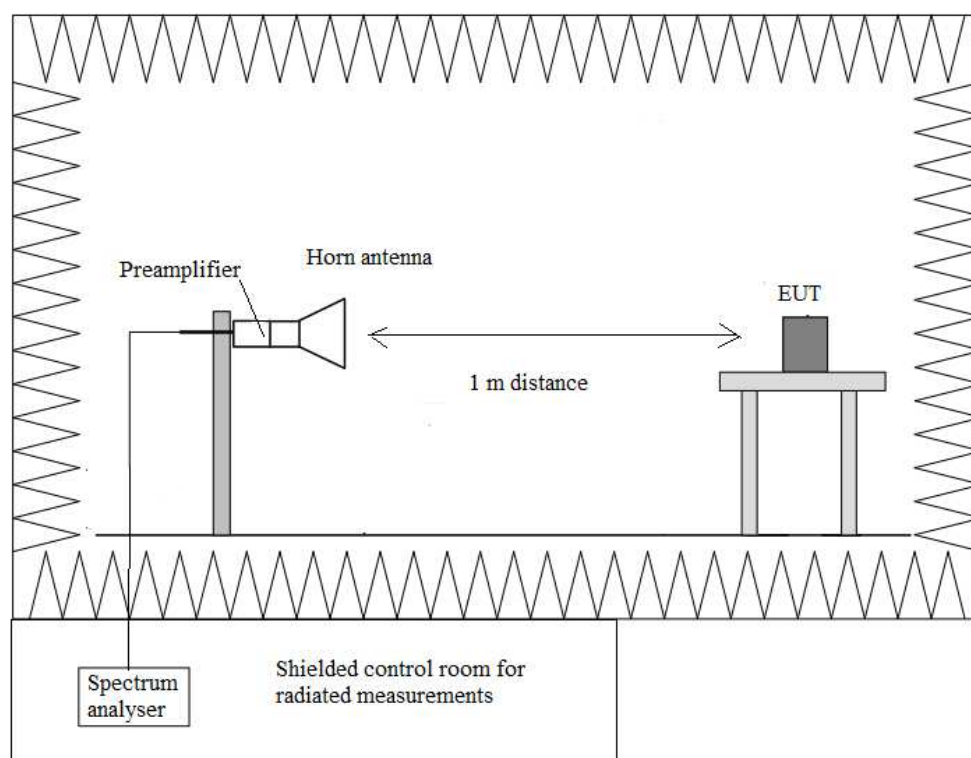
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

Radiated measurements setup $f < 1$ GHz



Radiated measurements setup $f > 1$ GHz



Section 15.247 Subclause (d) / RSS-247 5.5. Emission limitations radiated (Transmitter)

SPECIFICATION

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)) / RSS-Gen 8.9.:

Frequency Range (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
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	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247. Attenuation below the general field strength limits specified in RSS-Gen is not required.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-25 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

Frequency range 30 MHz-1000 MHz.

The spurious signals detected do not depend on the operating channel.

Spurious levels operating (radiated) closest to limit.

Spurious frequency (MHz)	Polarization	Detector	Emission Level (dBμV/m)	Measurement Uncertainty (dB)
35.7230	V	Quasi-Peak	30.59	± 3.88
254.6035	V	Quasi-Peak	28.82	± 3.88

Frequency range 1 GHz-25 GHz.

The results in the next tables show the maximum measured levels in the 1-25 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz (see next plots).

Spurious signals with peak levels above the average limit (54 dBμV/m at 3 m) are measured with average detector for checking compliance with the average limit.

1. CHANNEL: LOWEST (2402 MHz).

Spurious frequency (GHz)	Polarization	Detector	Emission Level (dBμV/m)	Measurement Uncertainty (dB)
2.27377	V	Peak	53.08	± 4.87
2.33602	H	Peak	50.98	± 4.87
2.49102	H	Peak	51.99	± 4.87
2.51097	V	Peak	52.55	± 4.87
2.53017	V	Peak	55.97	± 4.87
		Average	52.55	± 4.87
4.79975	V	Peak	45.04	± 4.87
7.20075	V	Peak	46.30	± 4.87

2. CHANNEL: MIDDLE (2440 MHz).

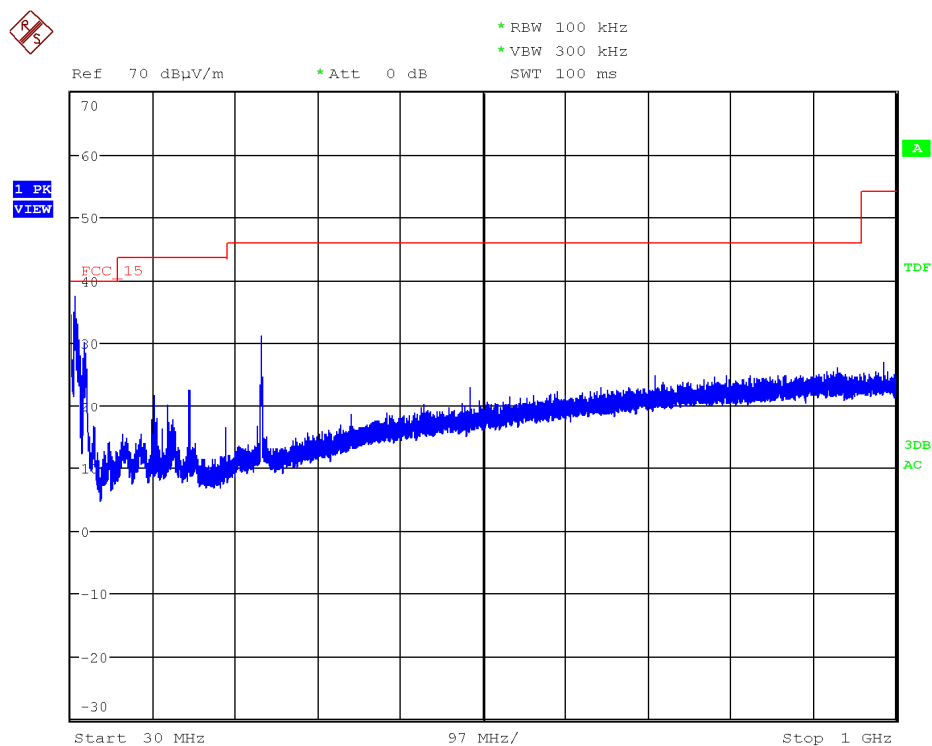
Spurious frequency (GHz)	Polarization	Detector	Emission Level (dB μ V/m)	Measurement Uncertainty (dB)
2.31205	H	Peak	54.02	± 4.87
		Average	50.30	± 4.87
2.48666	H	Peak	50.86	± 4.87
2.53043	V	Peak	50.17	± 4.87
2.56766	V	Peak	55.67	± 4.87
		Average	51.50	± 4.87
4.87975	V	Peak	41.24	± 4.87
7.31975	V	Peak	46.35	± 4.87

3. CHANNEL: HIGHEST (2480 MHz).

Spurious frequency (GHz)	Polarization	Detector	Emission Level (dB μ V/m)	Measurement Uncertainty (dB)
2.35208	H	Peak	55.85	± 4.87
		Average	51.98	± 4.87
2.48369	V	Peak	62.54	± 4.87
		Average	41.37	± 4.87
2.54390	V	Peak	49.65	± 4.87
2.58850	V	Peak	50.51	± 4.87
2.46080	V	Peak	55.08	± 4.87
		Average	51.26	± 4.87
4.95925	V	Peak	47.06	± 4.87
7.43975	V	Peak	46.91	± 4.87

Verdict: PASS

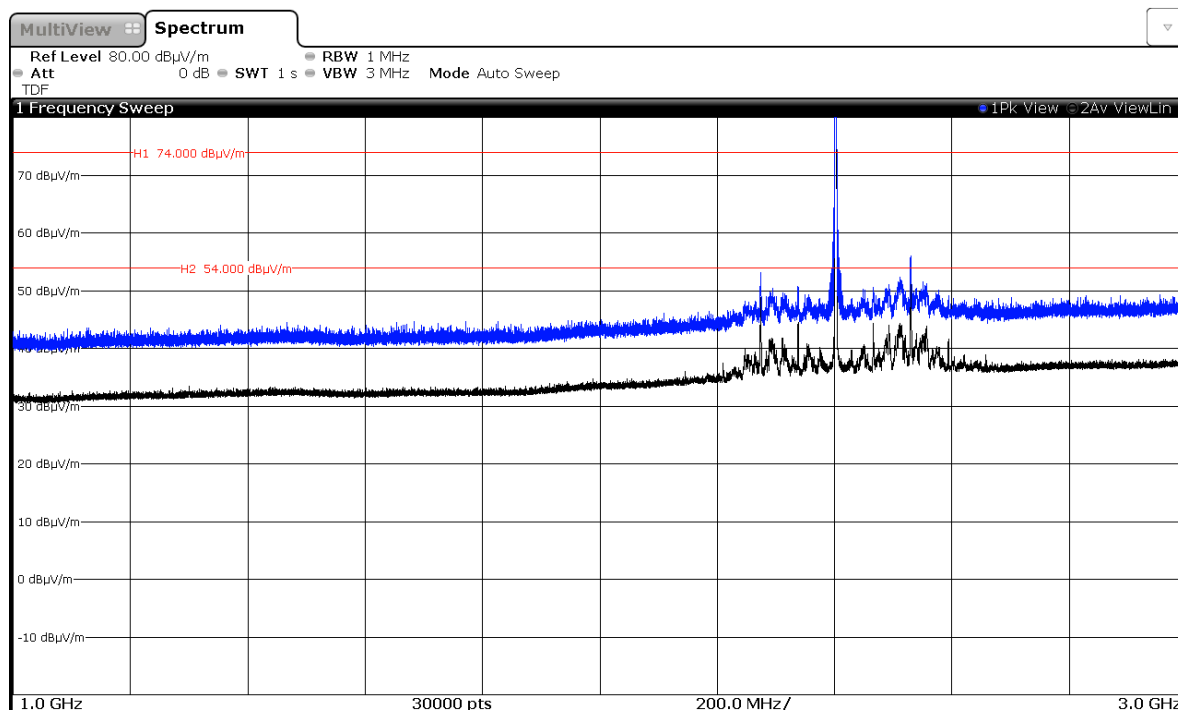
FREQUENCY RANGE 30 MHz-1000 MHz.



(This plot is valid for all three channels).

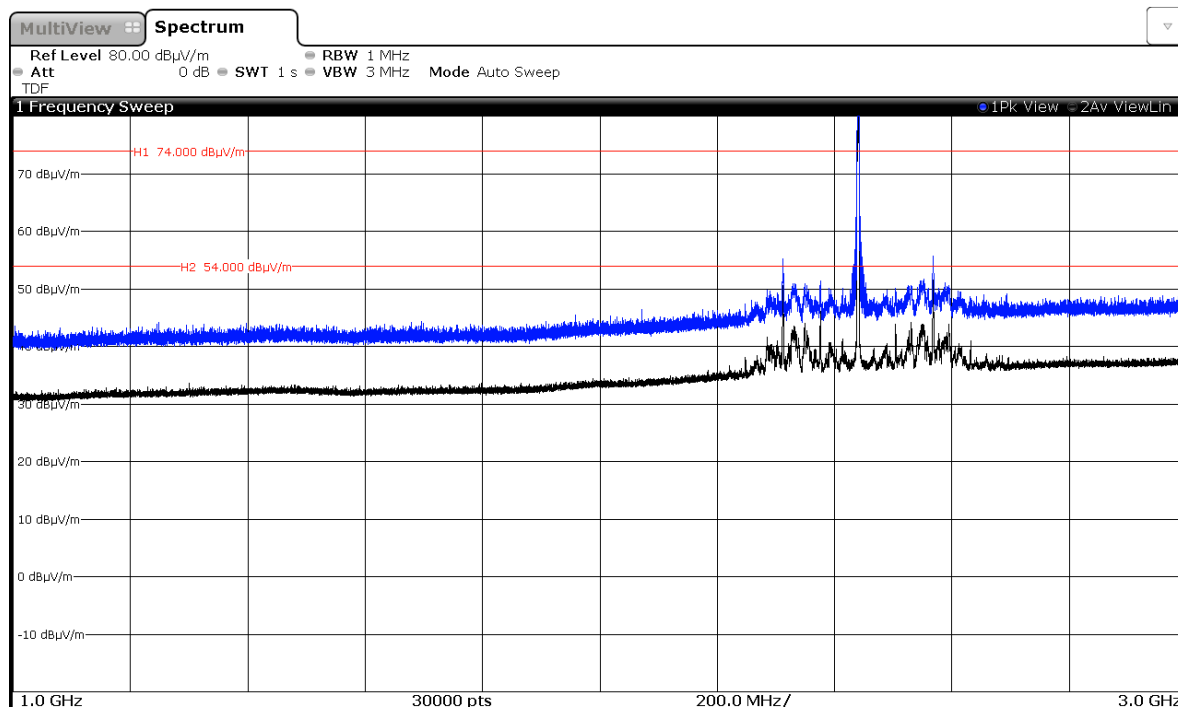
FREQUENCY RANGE 1 GHz to 3 GHz.

CHANNEL: Lowest (2402 MHz).



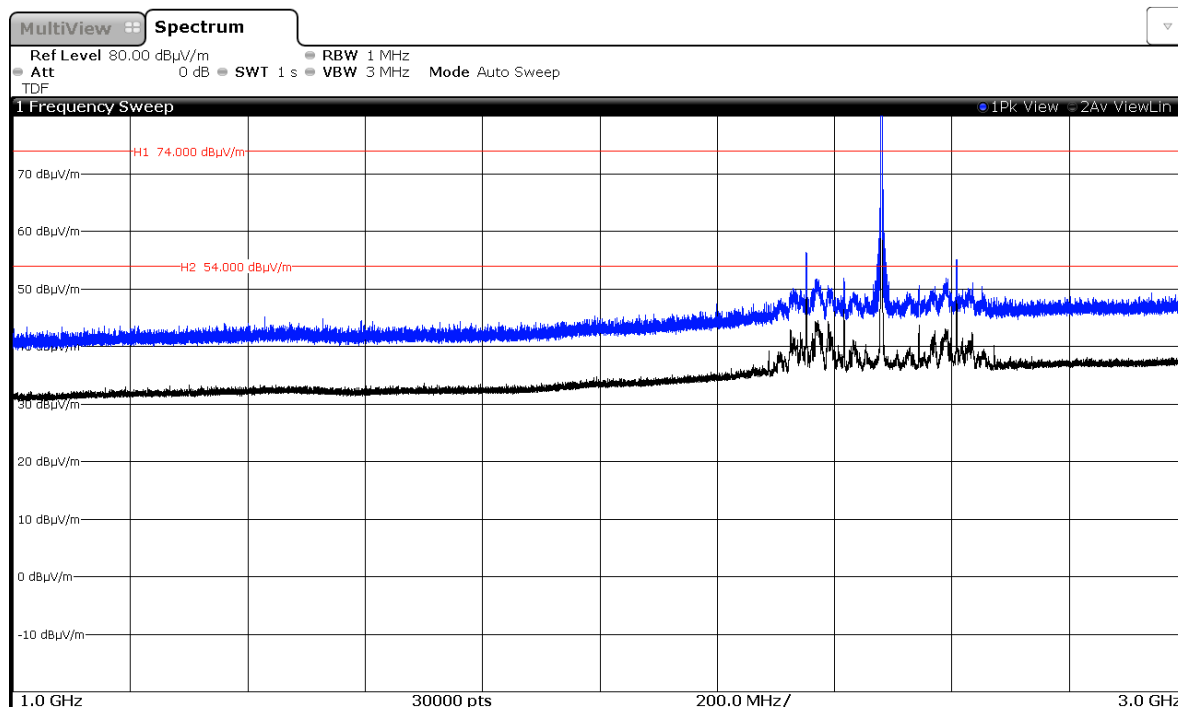
Note: The peak shown in the plot above the limit is the carrier frequency.

CHANNEL: Middle (2440 MHz).



Note: The peak shown in the plot above the limit is the carrier frequency.

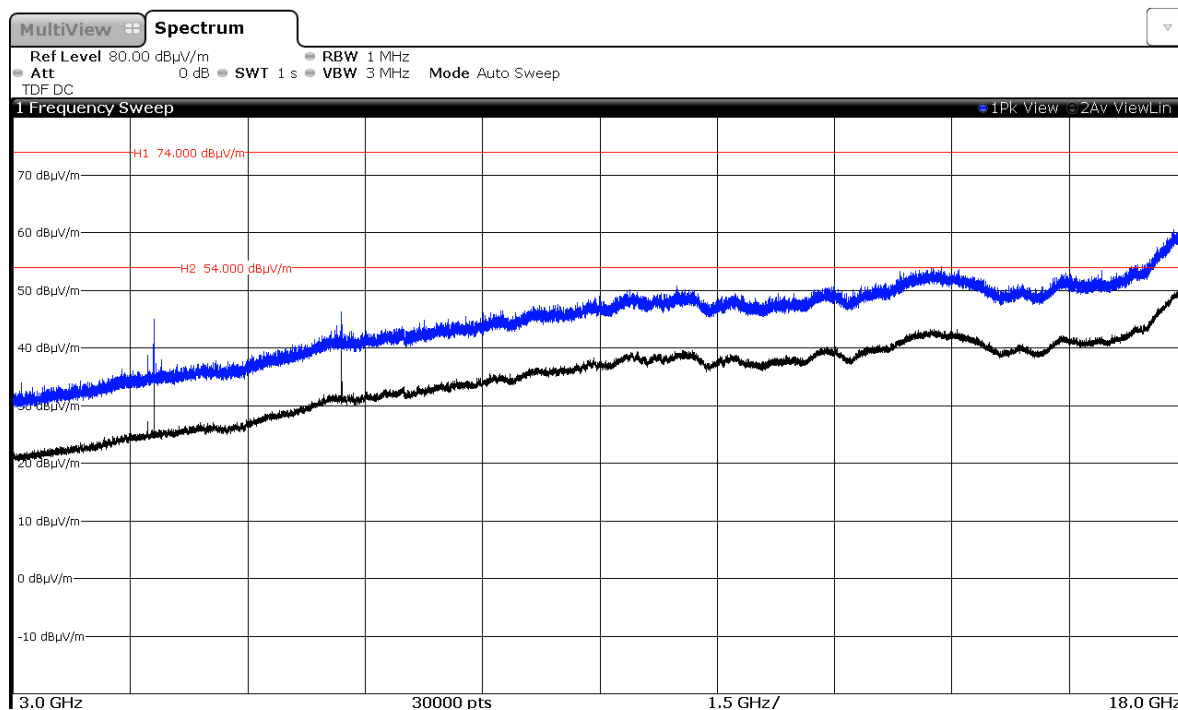
CHANNEL: Highest (2480 MHz).



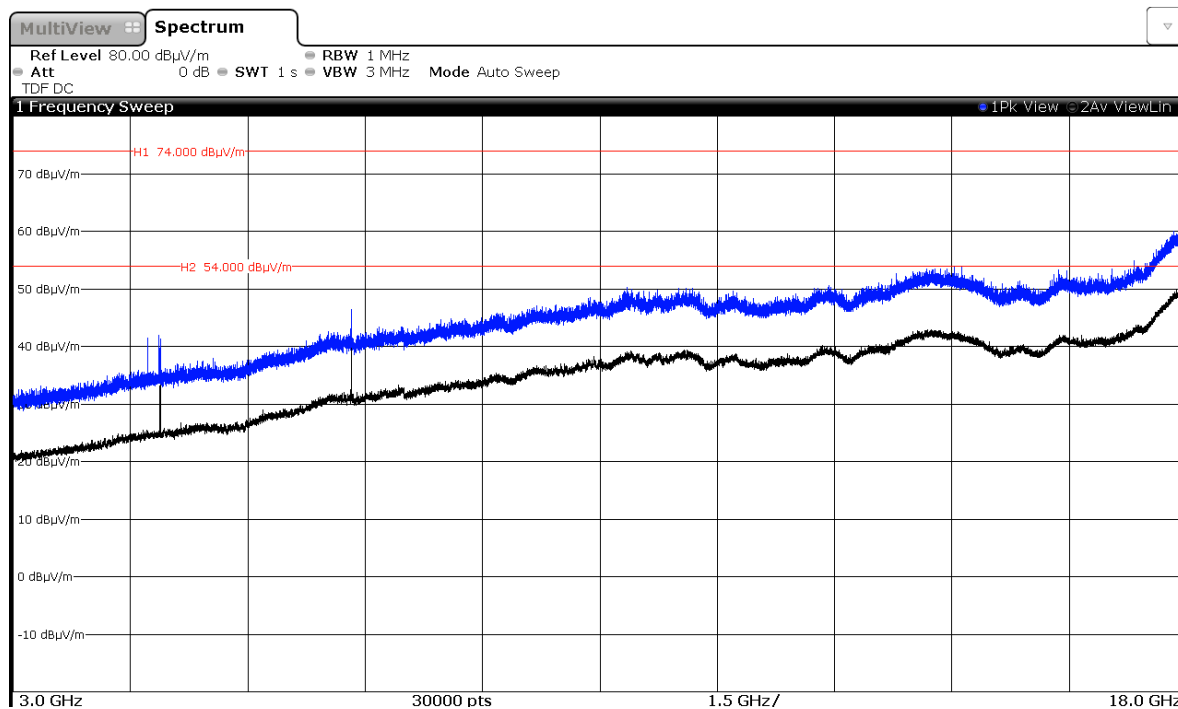
Note: The peak shown in the plot above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 18 GHz.

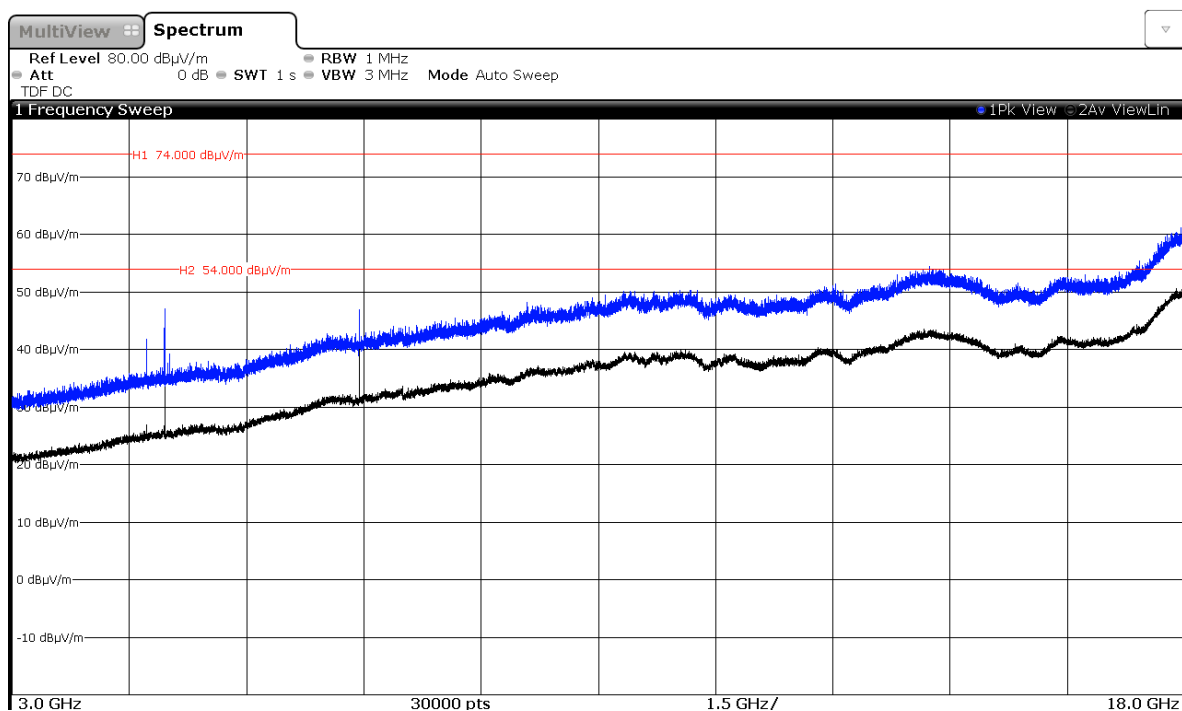
CHANNEL: Lowest (2402 MHz).



CHANNEL: Middle (2440 MHz).

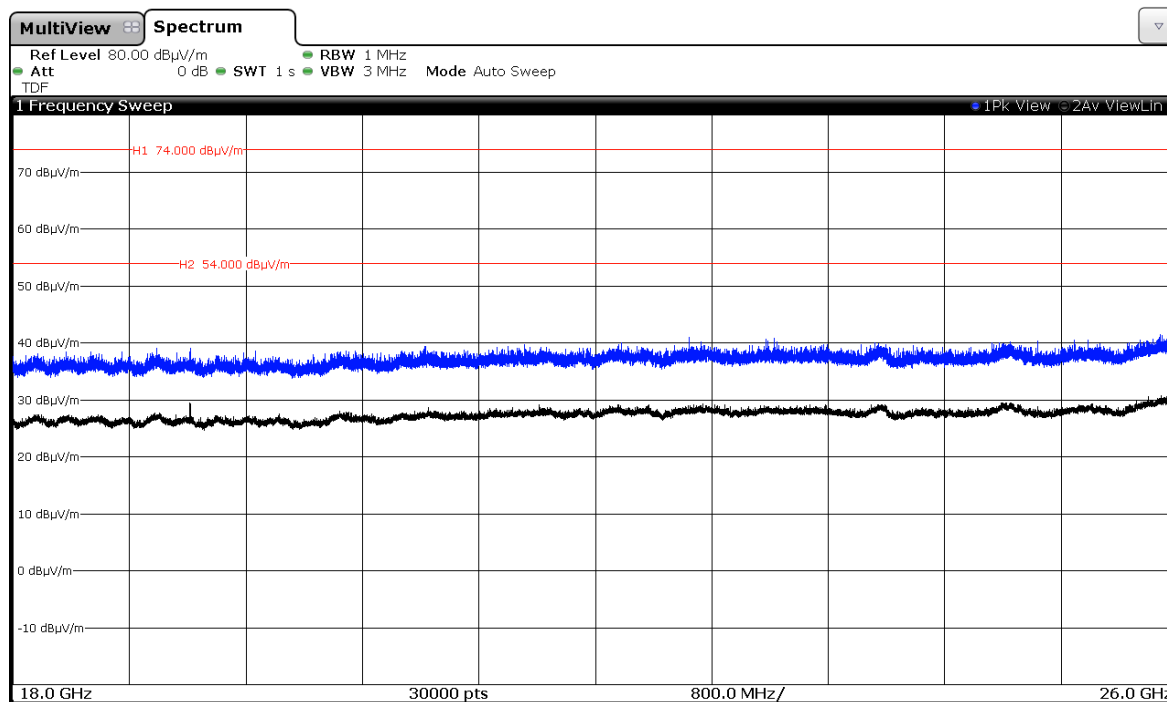


CHANNEL: Highest (2480 MHz).

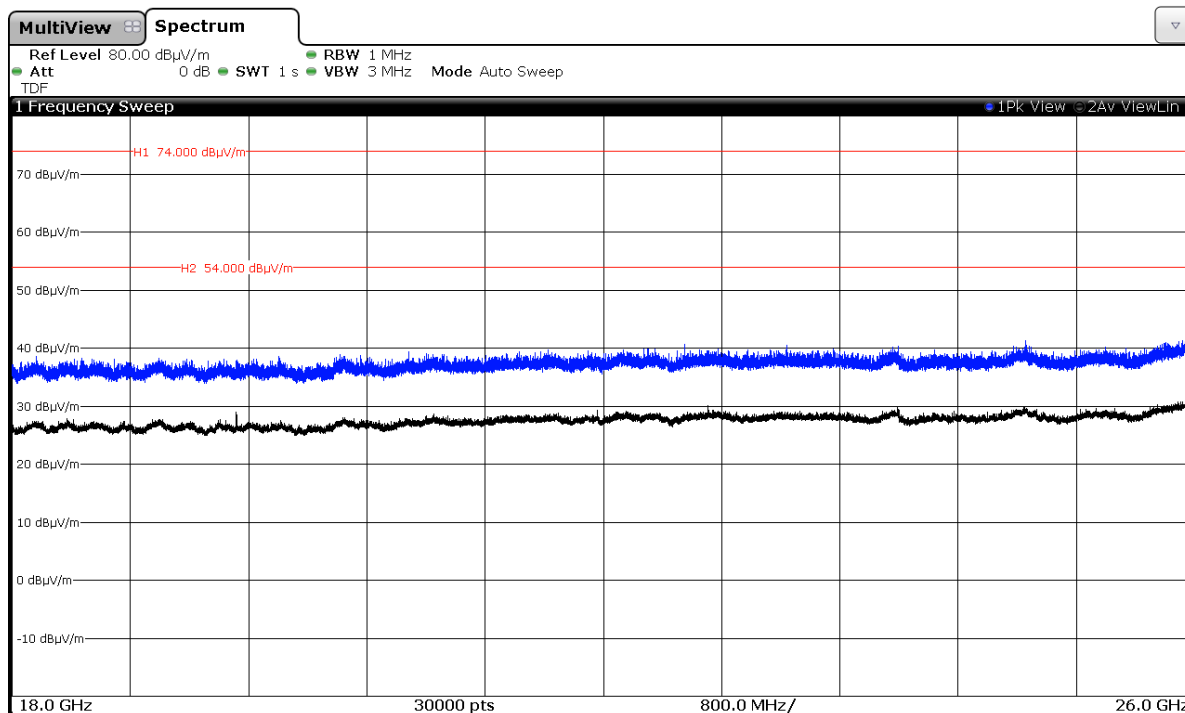


FREQUENCY RANGE 18 GHz to 26 GHz.

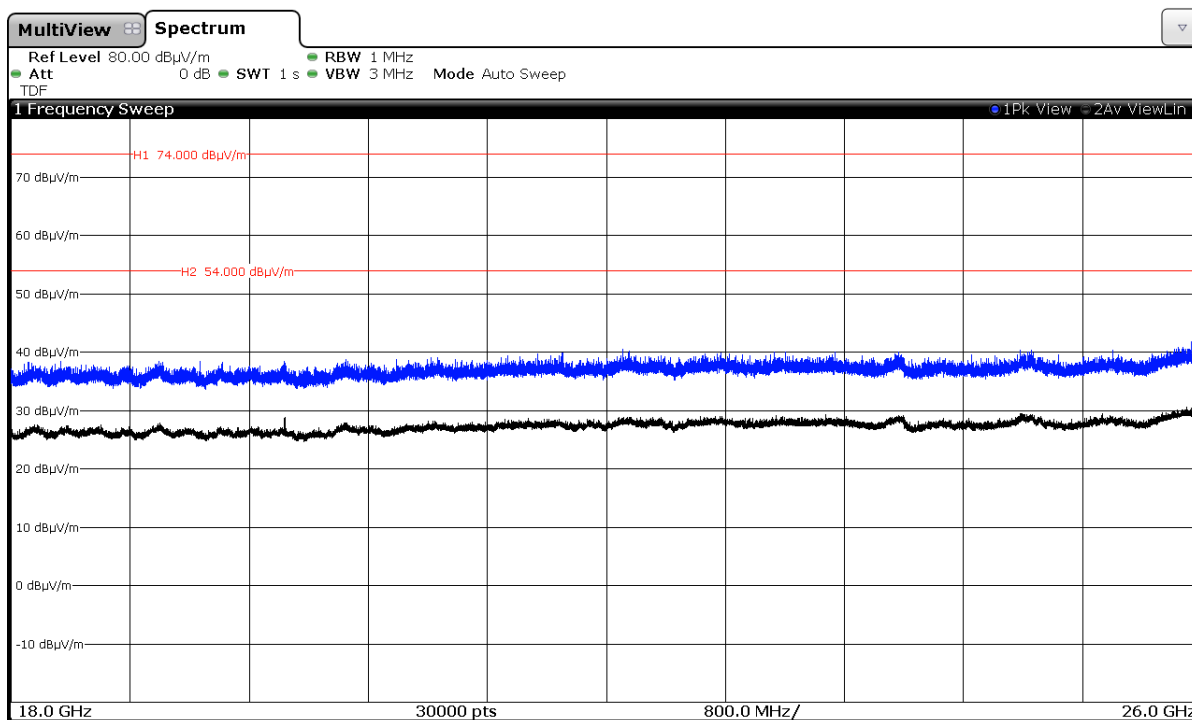
CHANNEL: Lowest (2402 MHz).



CHANNEL: Middle (2440 MHz).

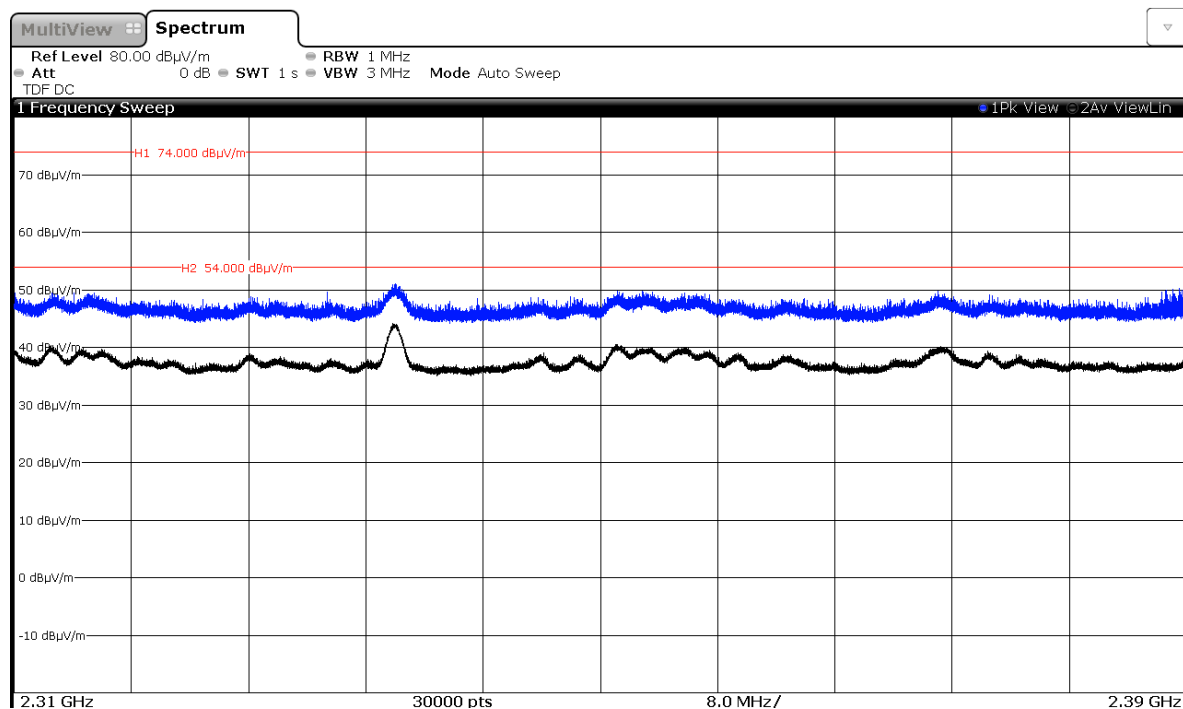


CHANNEL: Highest (2480 MHz).

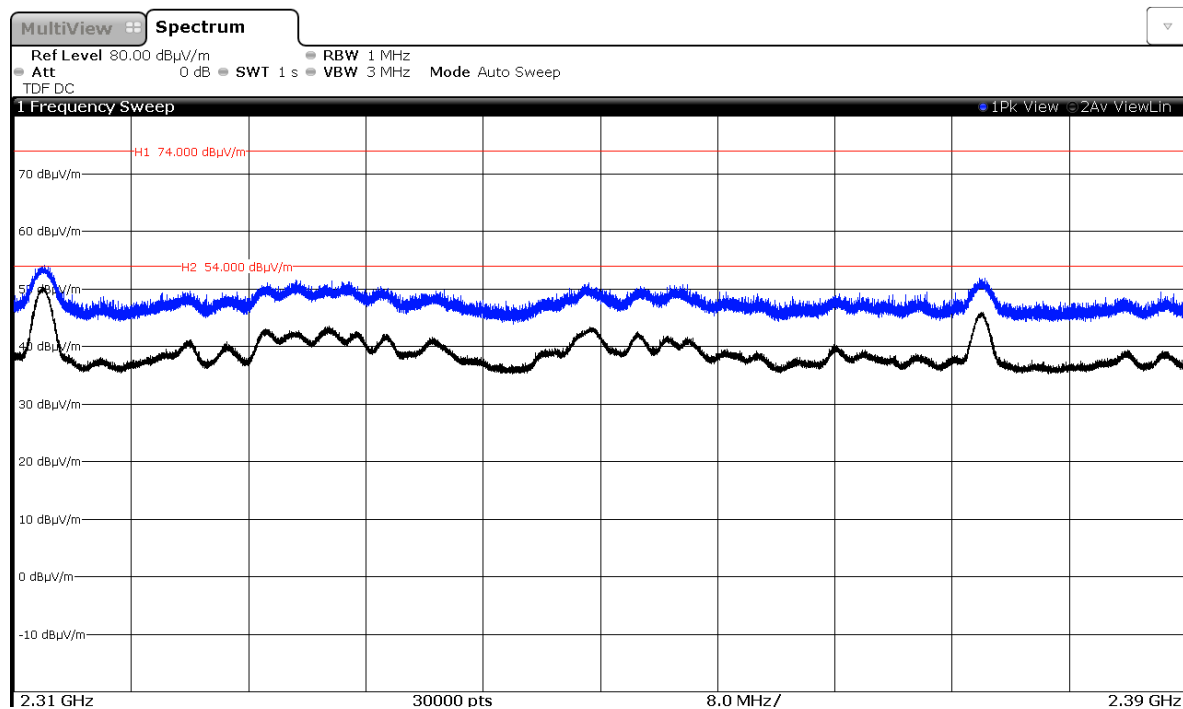


FREQUENCY RANGE 2.31 GHz to 2.39 GHz. (RESTRICTED BAND).

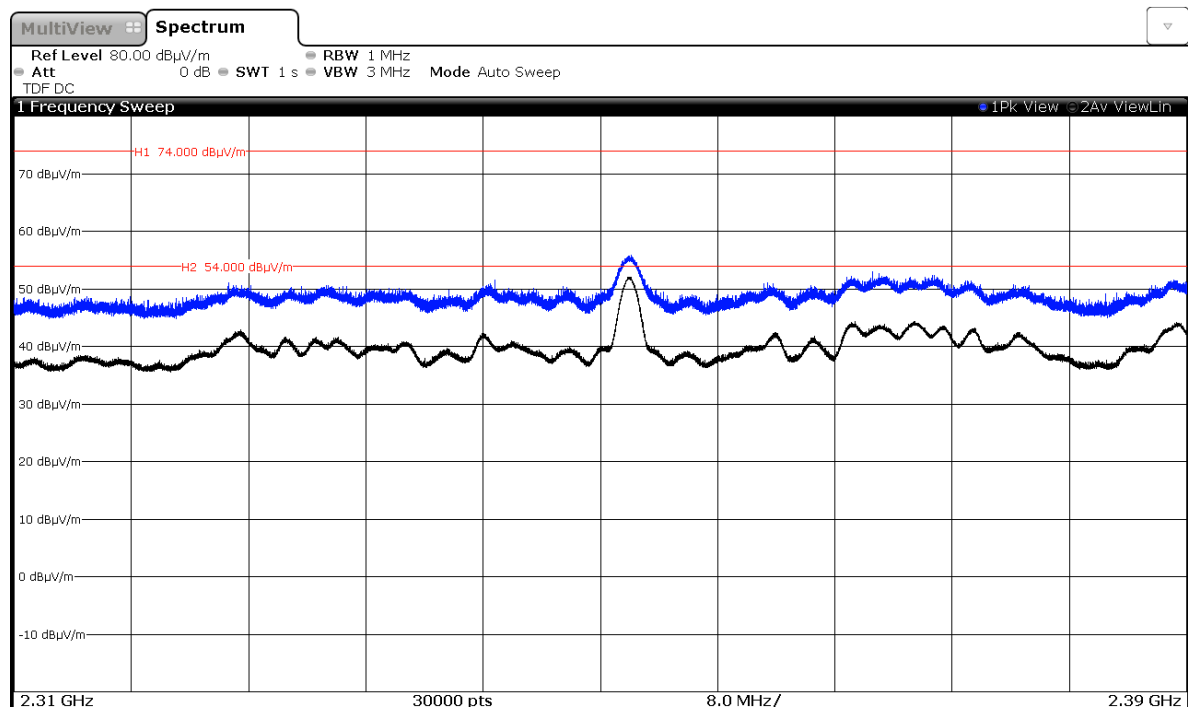
CHANNEL: Lowest (2402 MHz).



CHANNEL: Middle (2440 MHz).

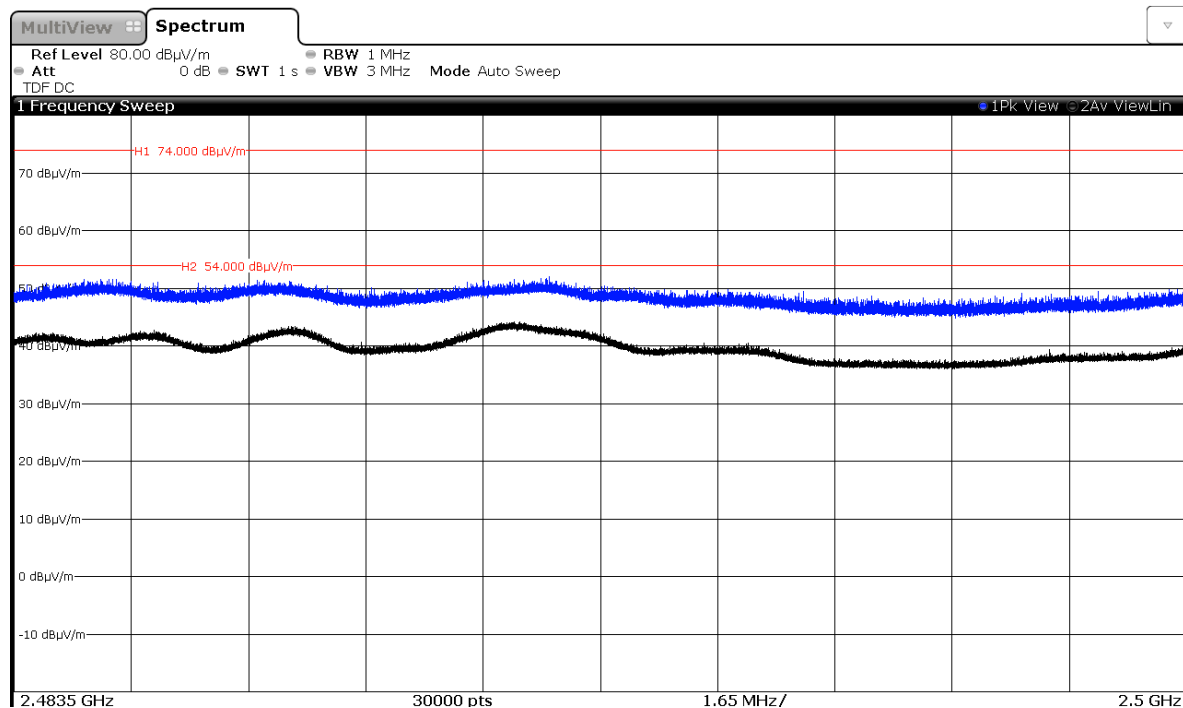


CHANNEL: Highest (2480 MHz).

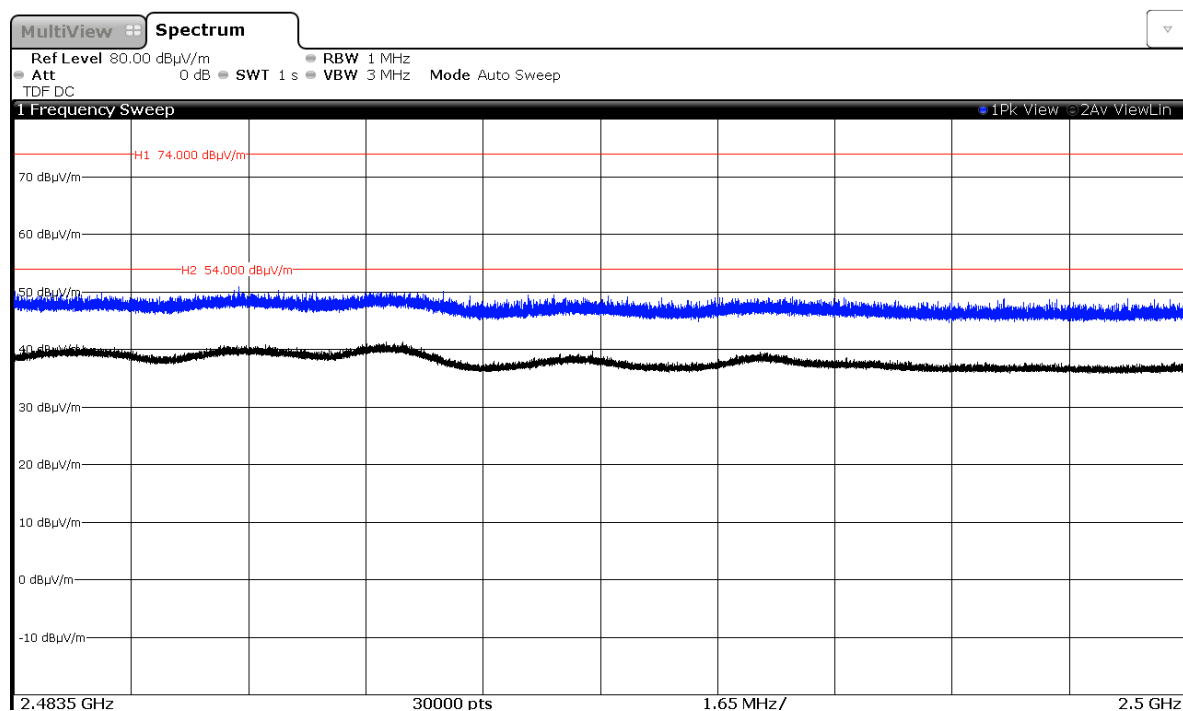


FREQUENCY RANGE 2.4835 GHz to 2.5 GHz. (RESTRICTED BAND).

CHANNEL: Lowest (2402 MHz).



CHANNEL: Middle (2440 MHz).



CHANNEL: Highest (2480 MHz).

