

TEST REPORT

of

ARIB STD-T66

Equipment Under Test : GPS Golf Rangefinder
Model Name : GOLFBUDDY aim W11 Premium
Variant Model Name(s) : GOLFBUDDY aim W11
Applicant : GolfzonDeca Inc
Manufacturer : Shenzhen huaxin communication co., ltd
Date of Receipt : 2021.01.04
Date of Test(s) : 2021.01.04 ~ 2021.01.11
Date of Issue : 2021.01.13

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
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Tested by:



James Bae

Technical
Manager:



Hyunchae You

SGS Korea Co., Ltd. Gunpo Laboratory

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1. General information

1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

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Phone No. : +82 31 688 0901

Fax No. : +82 31 688 0921

1.2. Details of applicant

Applicant : GolfzonDeca Inc

Address : 253, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Contact Person : Kim, Yoo-ha

Phone No. : +82 70 8890 6207

1.3. Details of manufacturer

Company : Shenzhen huaxin communication co., Ltd

Address : 5F, Building B5, Xujingchang Industrial Park, No.39, Haoye Road, Xin he Community,
 Fu hai Street, Baoan District, Shenzhen

1.4. Description of EUT

Kind of Product	GPS Golf Rangefinder
Model Name	GOLFBUDDY aim W11 Premium
Variant Model Name	GOLFBUDDY aim W11
Power Supply	DC 3.7 V
Frequency Range	2 402 MHz ~ 2 480 MHz (Bluetooth Low Energy)
Modulation Technique	GFSK
Number of Channels	40 channels (Bluetooth Low Energy)
Rated Output Power	Bluetooth Low Energy : 4.5 mW
Antenna Type	FPC Antenna
Antenna Gain	2.15 dB i

1.5. Test Equipment List

Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Authority	Cal. Method
Spectrum Analyzer	R&S	FSV30	103102	Jun. 01, 2020	SICT	c)
Signal Generator	R&S	SMR40	100272	Jun. 18, 2020	SICT	c)
Signal Generator	R&S	SMBV100A	255834	Jun. 03, 2020	SICT	c)
Attenuator	AEROFLEX / INMET	26A-10 dB	3	Feb. 18, 2020	SICT	c)
DC Power Supply	R&S	HMP2020	019922876	Apr. 27, 2020	SICT	c)
DIGITAL MULTIMETER	HIOKI	DT4211	N0301231	Sep. 17, 2020	SICT	c)

Note;

- a):** Calibration conducted by the National Institute of Information and Communications Technology or a designated calibration agency under Article 102-18 paragraph (1).
- b):** Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law. (Law No. 51 of 1992)
- c):** Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- d):** Calibration conducted by using other equipment that listed above from a) to c).

1.6. Test method

Measurement was conducted by the following test method:

The test method of Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and Communication notification in Annex 43 of Article 88, Paragraph 1 or the test method more than equivalent.

1.7. Information of Variant model

Model name		Description
Basic model	GOLFBUDDY aim W11 Premium	- Basic model
Variant model	GOLFBUDDY aim W11	- Same to basic model except below - Changed appearance color - Changed boot screen design

1.8. Summary of test results

The EUT has been tested according to the following specifications:

Applied Standard : Radio equipment regulations and ARIB STD-T66		
Article Reference	Test item	Result
STD-T66 3.2	Frequency Tolerance	Complied
STD-T66 3.2	Occupied Bandwidth (99 %)	Complied
STD-T66 3.2	Spurious Emission Intensity	Complied
STD-T66 3.2	Antenna Power	Complied
STD-T66 3.3	Secondary Radiated Emissions	Complied
STD-T66 3.4	Interference Prevention Function	Complied

1.9. Test report revision

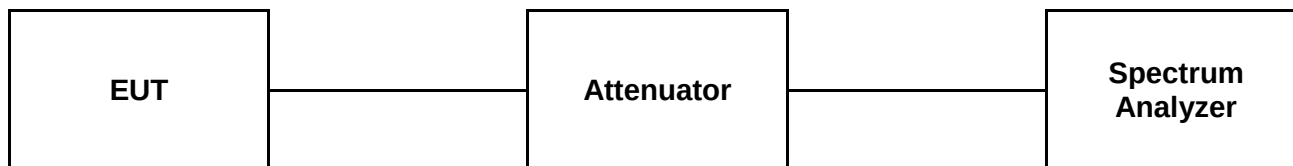
Revision	Report number	Date of Issue	Description
0	F690501-RF-RTL001572	2021.01.13	Initial

1.10. Abbreviations

V_{min} : Minimum Voltage
V_{nom} : Nominal Voltage
V_{max} : Maximum Voltage

2. Frequency Tolerance

2.1. Test Setup



2.2. Limit

Tolerance of frequency: $\pm 50 \times 10^{-6}$ or less.

2.3. Test procedure

1. Connect transmitter output to the spectrum analyzer input port.
2. The EUT should be transmitting at low, middle and high channels.
3. Set the spectrum analyzer as below;

Center frequency:	2 402 MHz, 2 442 MHz, 2 480 MHz (Bluetooth Low Energy)
Span:	5 MHz
RBW:	30 kHz
VBW:	100 kHz
Sweep time:	Auto
Sweep data points:	1 001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold

4. Find the peak carrier signal and measure its frequency.

2.4. Test result

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

- Test mode: Modulated

Low voltage

Test voltage(V _{d.c.})	Measured frequency (MHz)	Reading frequency (MHz)	Frequency tolerance [ppm]
V _{min} = 3.33	Low Ch. (2 402)	2 401.920 100	-33.26
	Middle Ch. (2 442)	2 441.925 100	-30.67
	High Ch. (2 480)	2 479.920 100	-32.22

Normal voltage

Test voltage(V _{d.c.})	Measured frequency (MHz)	Reading frequency (MHz)	Frequency tolerance [ppm]
V _{nom} = 3.70	Low Ch. (2 402)	2 401.920 100	-33.26
	Middle Ch. (2 442)	2 441.925 100	-30.67
	High Ch. (2 480)	2 479.920 100	-32.22

High voltage

Test voltage(V _{d.c.})	Measured frequency (MHz)	Reading frequency (MHz)	Frequency tolerance [ppm]
V _{max} = 4.07	Low Ch. (2 402)	2 401.920 100	-33.26
	Middle Ch. (2 442)	2 441.925 100	-30.67
	High Ch. (2 480)	2 479.920 100	-32.22

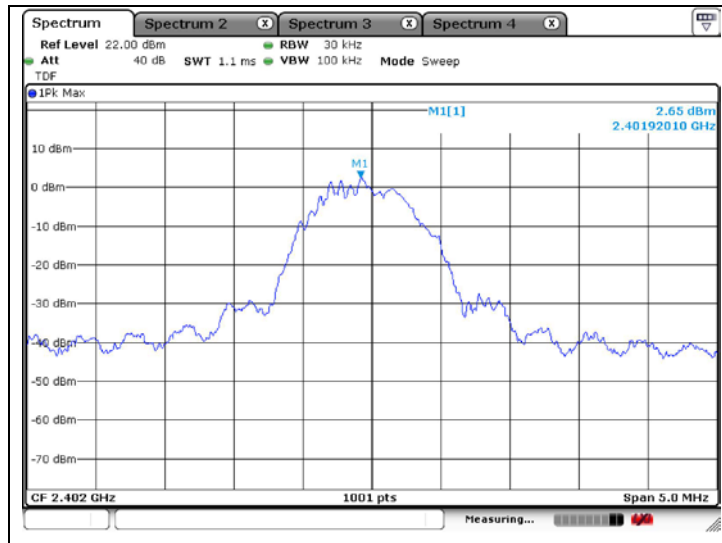
Note;

1. FT (ppm) = [(RF-MF)/MF] × 10⁶

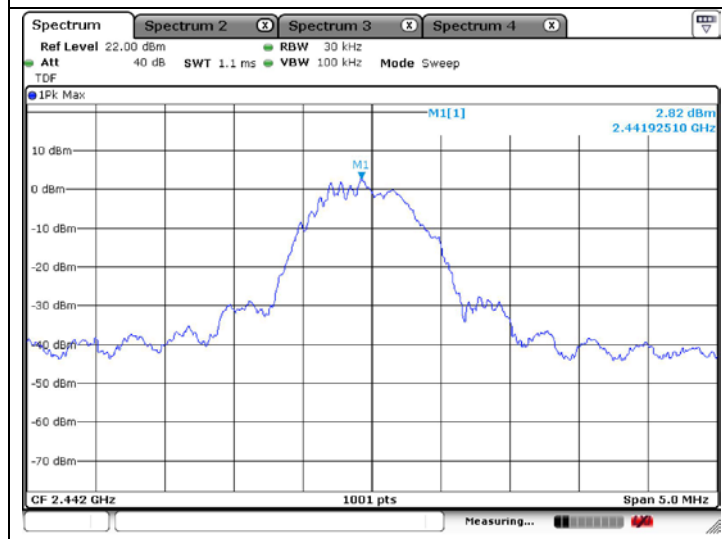
- FT: Frequency Tolerance, RF: Reading Frequency and MF: Measurement Frequency

Low voltage

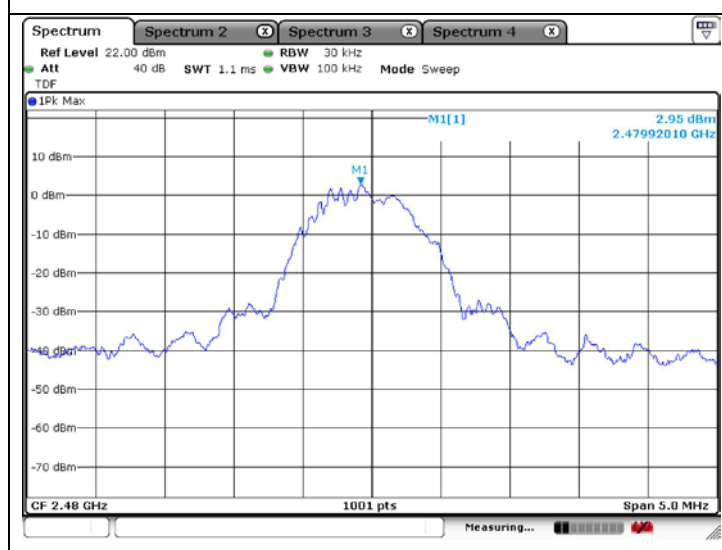
Low Channel



Middle Channel

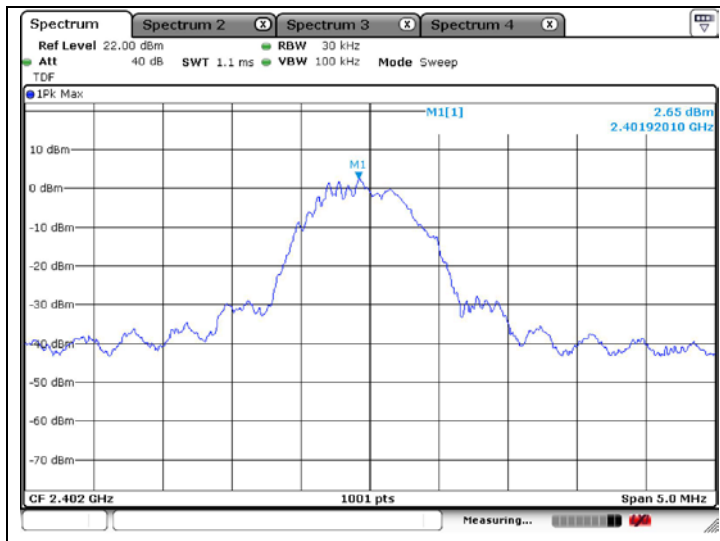


High Channel

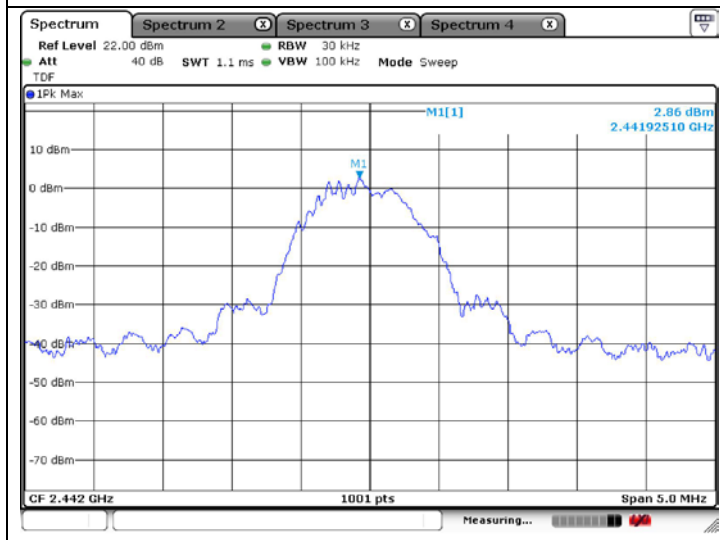


Normal voltage

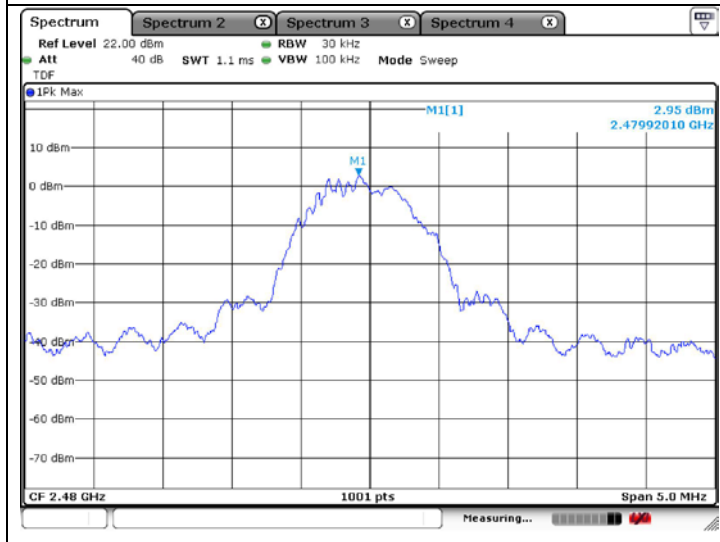
Low Channel



Middle Channel

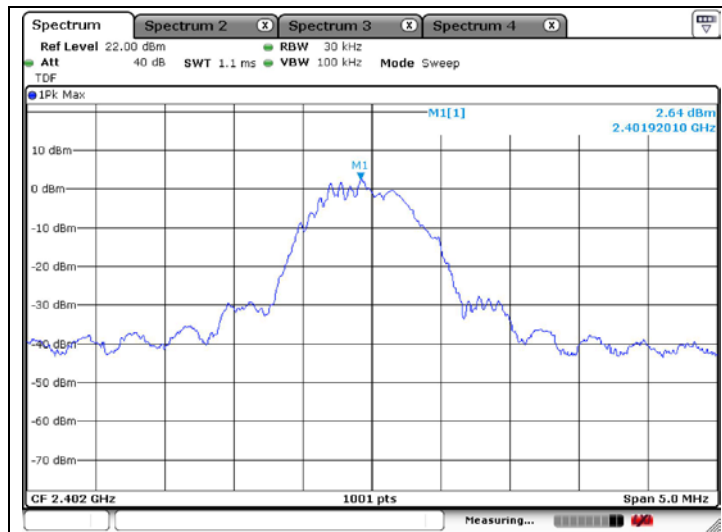


High Channel

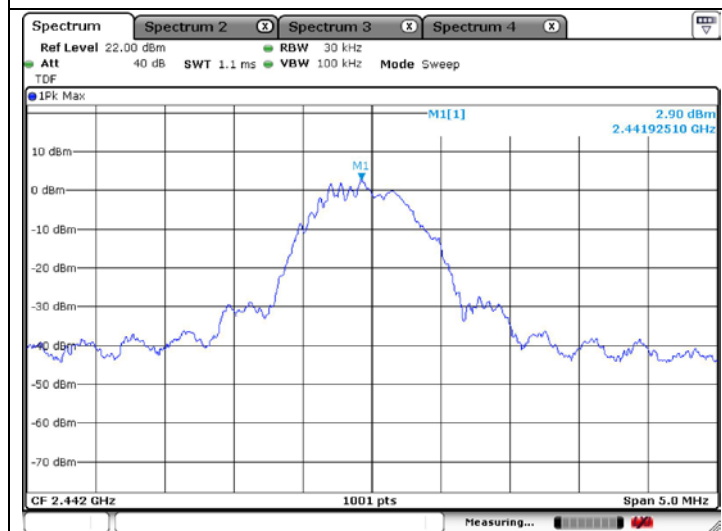


High voltage

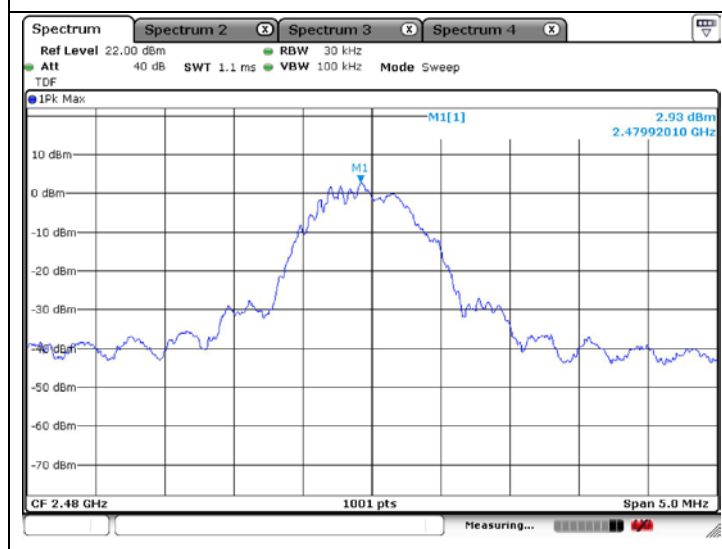
Low Channel



Middle Channel



High Channel



3. Occupied Bandwidth (99 %)

3.1. Test Setup



3.2. Limit

26 MHz or less

3.3. Test Procedure

1. Connect transmitter output to the spectrum analyzer input port.
2. Measure the signal bandwidth using a spectrum analyzer.
3. Set the spectrum analyzer as below;

Center frequency:	2 402 MHz, 2 442 MHz, 2 480 MHz
Span:	10 MHz
RBW:	300 kHz
VBW:	300 kHz
Sweep time:	Auto
Sweep data points:	1 001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold
BW setting:	99 %

3.4. Test result

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

Low voltage

Test voltage (V _{d.c.})	Measured frequency (MHz)	Occupied bandwidth (MHz)
V _{min} = 3.33	Low Ch. (2 402)	1.349
	Middle Ch. (2 442)	1.349
	High Ch. (2 480)	1.349

Normal voltage

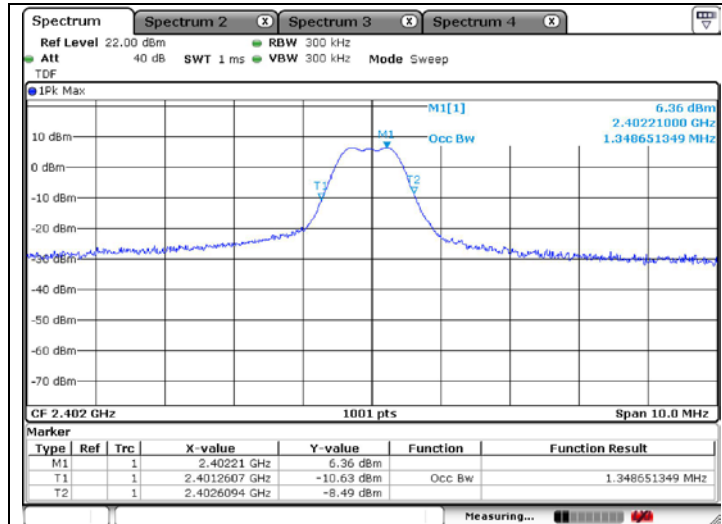
Test voltage (V _{d.c.})	Measured frequency (MHz)	Occupied bandwidth (MHz)
V _{nom} = 3.70	Low Ch. (2 402)	1.379
	Middle Ch. (2 442)	1.349
	High Ch. (2 480)	1.359

High voltage

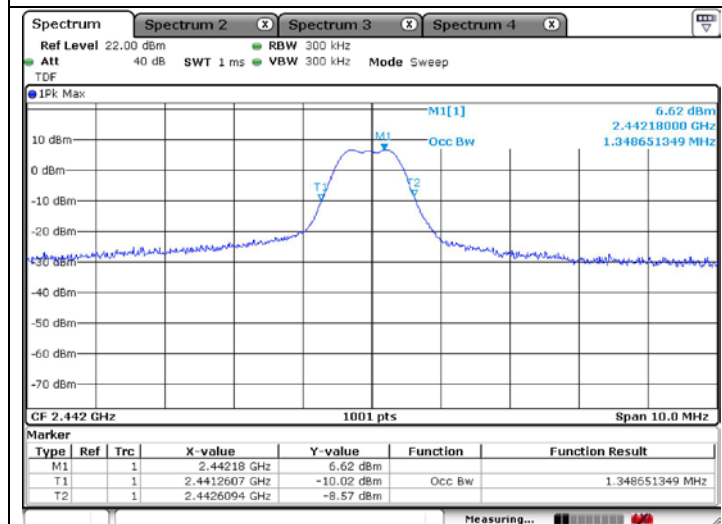
Test voltage (V _{d.c.})	Measured frequency (MHz)	Occupied bandwidth (MHz)
V _{max} = 4.07	Low Ch. (2 402)	1.349
	Middle Ch. (2 442)	1.349
	High Ch. (2 480)	1.359

Low voltage

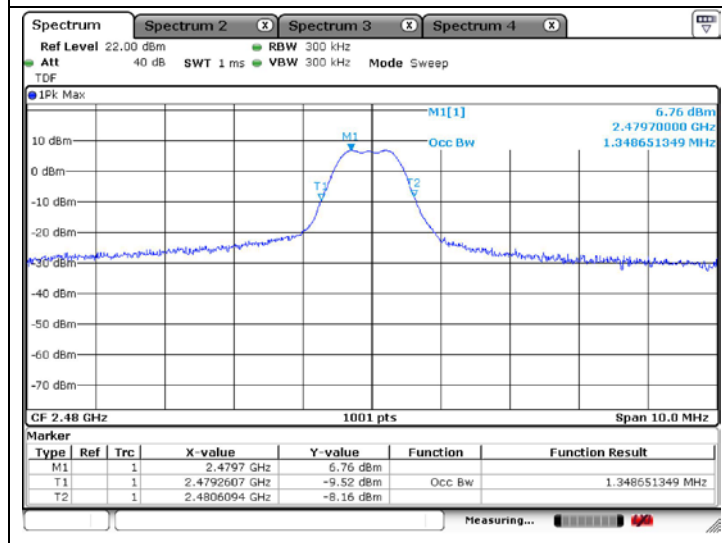
Low Channel



Middle Channel

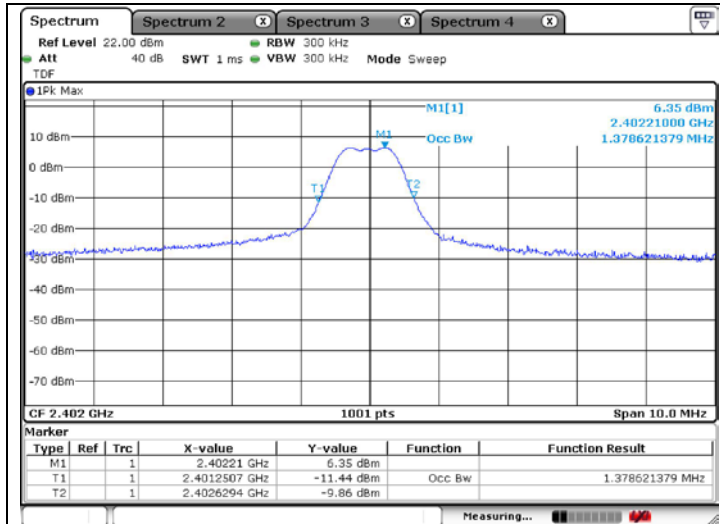


High Channel

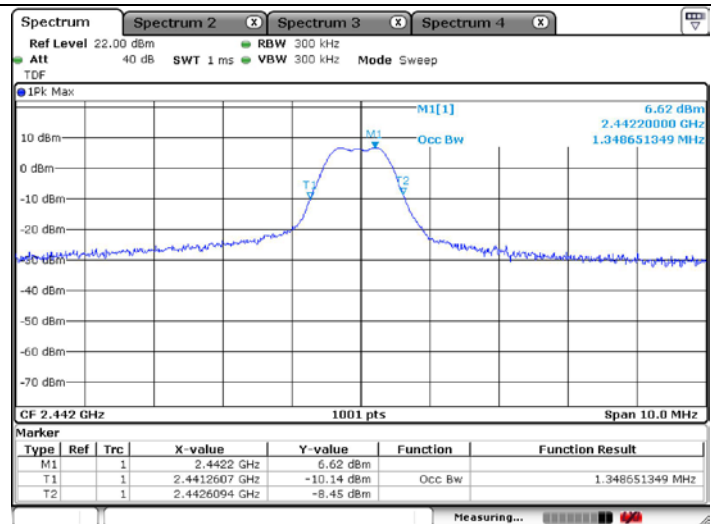


Normal voltage

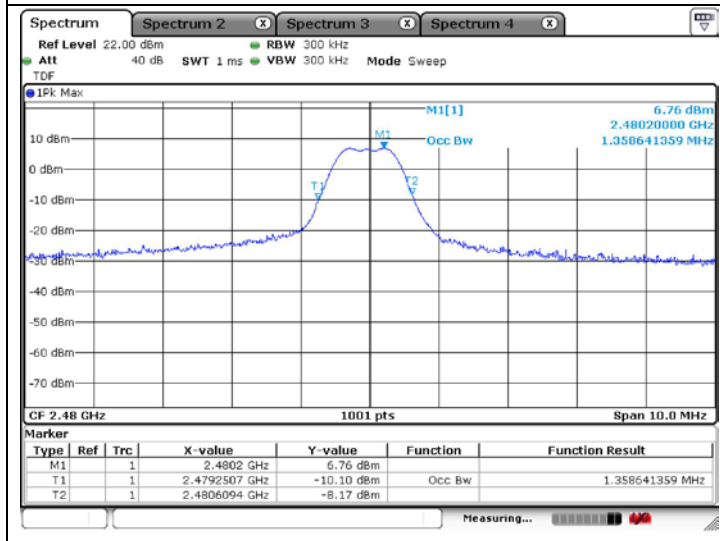
Low Channel



Middle Channel

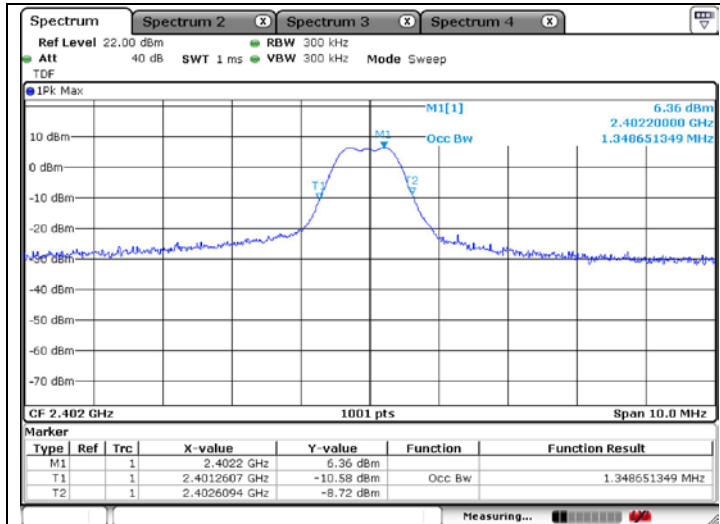


High Channel

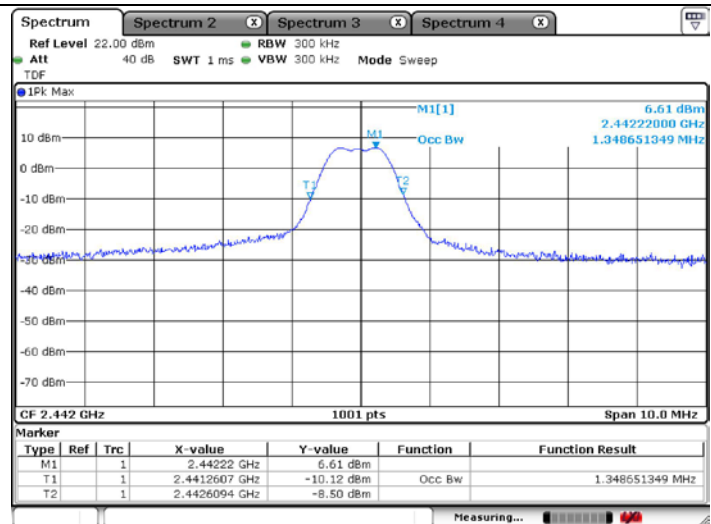


High voltage

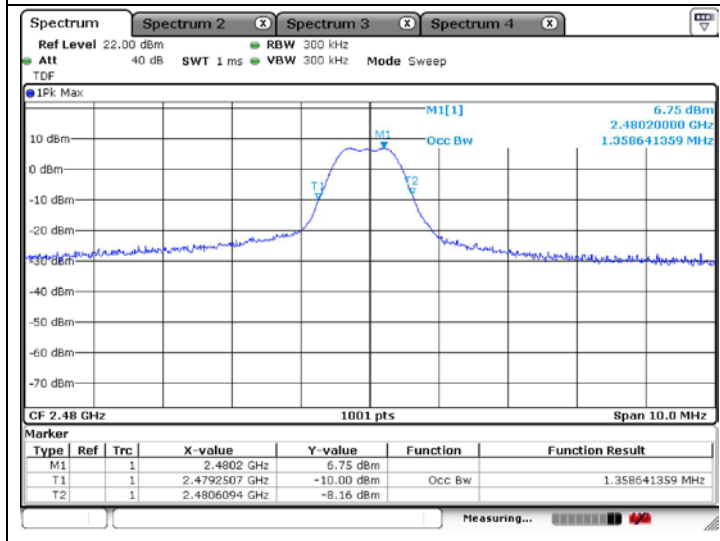
Low Channel



Middle Channel



High Channel



4. Spurious Emission Intensity

4.1. Test Setup



4.2. Limit

Below 2 387 MHz:	2.5 μ W (-26 dB m)/MHz or less
2 387 to 2 400 MHz:	25.0 μ W (-16 dB m)/MHz or less
2 483.5 to 2 496.5 MHz:	25.0 μ W (-16 dB m)/MHz or less
Over 2 496.5 MHz:	2.5 μ W (-26 dB m)/MHz or less

4.3. Test Procedure

[Setting 1]

1. Connect transmitter output to the spectrum analyzer input port.
2. Configure the EUT
 - Test channels: low, middle, high

Frequency range:	30 MHz to 12.5 GHz, except for 2 400 MHz to 2 483.5 MHz
RBW:	1 MHz
VBW:	1 MHz
Sweep time:	Minimum time required to make an accurate measurement
Sweep data points:	1 001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold

Note: sweep shall be repeated until the max hold waveform is stable.

3. Search for spurious emissions from 30 MHz to 12.5 GHz

[Setting 2]

Center frequency:	Frequency of spurious emission found using [Setting 1]
Span:	0 Hz
RBW:	1 MHz
VBW:	1 MHz
Sweep:	Minimum time required to make an accurate measurement. For burst type (intermittent) spurious, sweep time shall be greater than one burst interval
Sweep data points:	1 001 or greater
Detector mode:	Sample

4.4. Test result

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

Low voltage

Test voltage (V _{d.c.})	Frequency range (MHz)	Measured	Low Ch. (2 402 MHz)	Middle Ch. (2 442 MHz)	High Ch. (2 480 MHz)	Limit
V min = 3.33	Below 2 387	Frequency (GHz)	2.382	2.298	2.201	-
		Level (dB m/MHz)	-39.32	-46.18	-45.69	-26
		Level (μW/MHz)	0.116 950	0.024 099	0.026 977	2.5
	2 387 to 2 400	Frequency (GHz)	2.399	2.398	2.389	-
		Level (dB m/MHz)	-28.35 ^{‘*’}	-44.47	-47.01	-16
		Level (μW/MHz)	1.462 177	0.035 727	0.019 907	25
	2 483.5 to 2 496.5	Frequency (GHz)	2.490	2.484	2.484	-
		Level (dB m/MHz)	-45.24	-45.10	-22.01	-16
		Level (μW/MHz)	0.029 923	0.030 903	6.295 062	25
	Above 2 496.5	Frequency (GHz)	4.804	4.884	4.960	-
		Level (dB m/MHz)	-35.70	-37.24	-38.03	-26
		Level (μW/MHz)	0.269 153	0.188 799	0.157 398	2.5

- ‘*’ means [Setting 2] test result

Normal voltage

Test voltage (V _{d.c.})	Frequency range (MHz)	Measured	Low Ch. (2 402 MHz)	Middle Ch. (2 442 MHz)	High Ch. (2 480 MHz)	Limit
V nom = 3.70	Below 2 387	Frequency (GHz)	2.384	1.999	2.334	-
		Level (dB m/MHz)	-41.00	-46.74	-45.34	-26
		Level (μW/MHz)	0.079 433	0.021 184	0.029 242	2.5
	2 387 to 2 400	Frequency (GHz)	2.400	2.398	2.393	-
		Level (dB m/MHz)	-28.08 ^{‘*’}	-46.34	-45.95	-16
		Level (μW/MHz)	1.555 966	0.023 227	0.025 410	25
	2 483.5 to 2 496.5	Frequency (GHz)	2.493	2.484	2.484	-
		Level (dB m/MHz)	-47.07	-45.00	-21.93	-16
		Level (μW/MHz)	0.019 634	0.031 623	6.412 096	25
	Above 2 496.5	Frequency (GHz)	4.804	4.884	4.960	-
		Level (dB m/MHz)	-36.19	-37.22	-37.38	-26
		Level (μW/MHz)	0.240 436	0.189 671	0.182 810	2.5

- ‘*’ means [Setting 2] test result

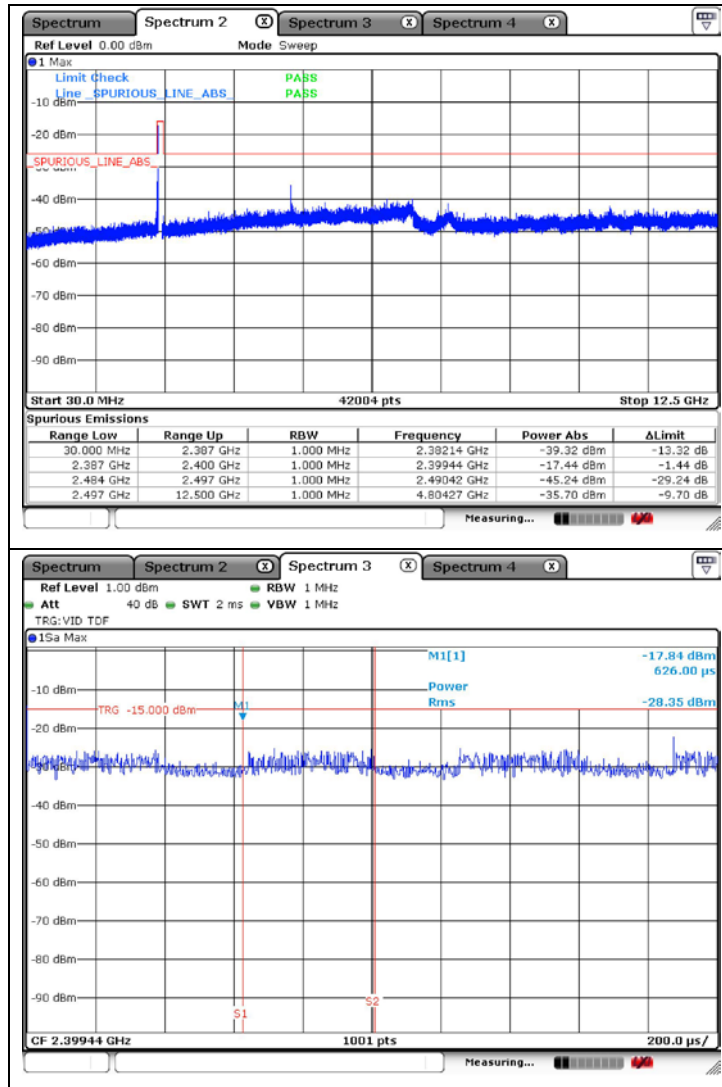
High voltage

Test voltage (V _{d.c.})	Frequency range (MHz)	Measured	Low Ch. (2 402 MHz)	Middle Ch. (2 442 MHz)	High Ch. (2 480 MHz)	Limit
V max = 4.07	Below 2 387	Frequency (GHz)	2.386	2.274	2.244	-
		Level (dB m/MHz)	-38.81	-45.71	-46.74	-26
		Level (μW/MHz)	0.131 522	0.026 853	0.021 184	2.5
	2 387 to 2 400	Frequency (GHz)	2.400	2.396	2.397	-
		Level (dB m/MHz)	-27.02 ^{†*}	-44.81	-46.67	-16
		Level (μW/MHz)	1.986 095	0.033 037	0.021 528	25
	2 483.5 to 2 496.5	Frequency (GHz)	2.488	2.484	2.484	-
		Level (dB m/MHz)	-46.20	-45.79	-22.13	-16
		Level (μW/MHz)	0.023 988	0.026 363	6.123.504	25
	Above 2 496.5	Frequency (GHz)	4.804	4.884	4.960	-
		Level (dB m/MHz)	-35.73	-39.96	-38.00	-26
		Level (μW/MHz)	0.267 301	0.201 372	0.158 489	2.5

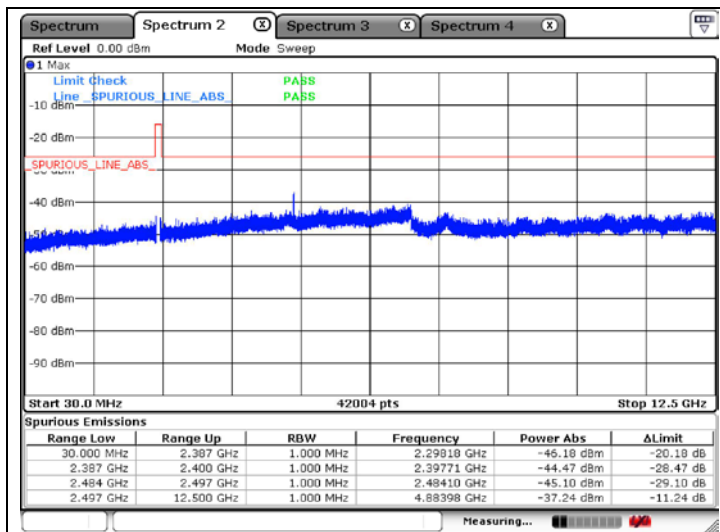
- '†*' means [Setting 2] test result

Low voltage

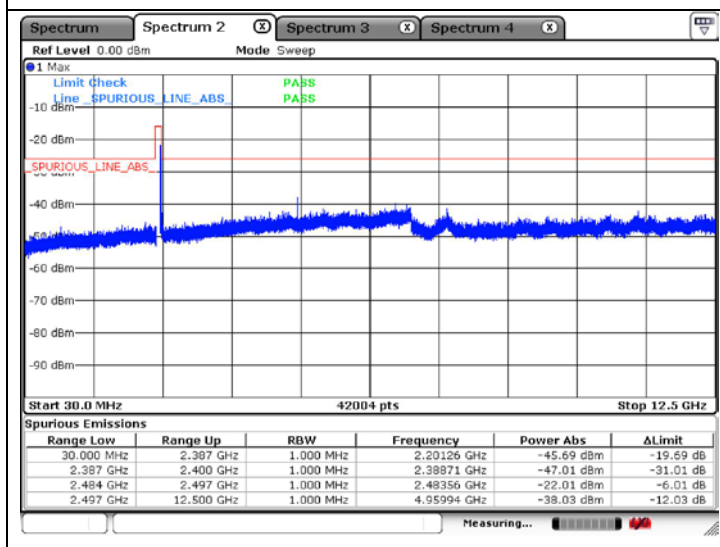
Low Channel



Middle Channel

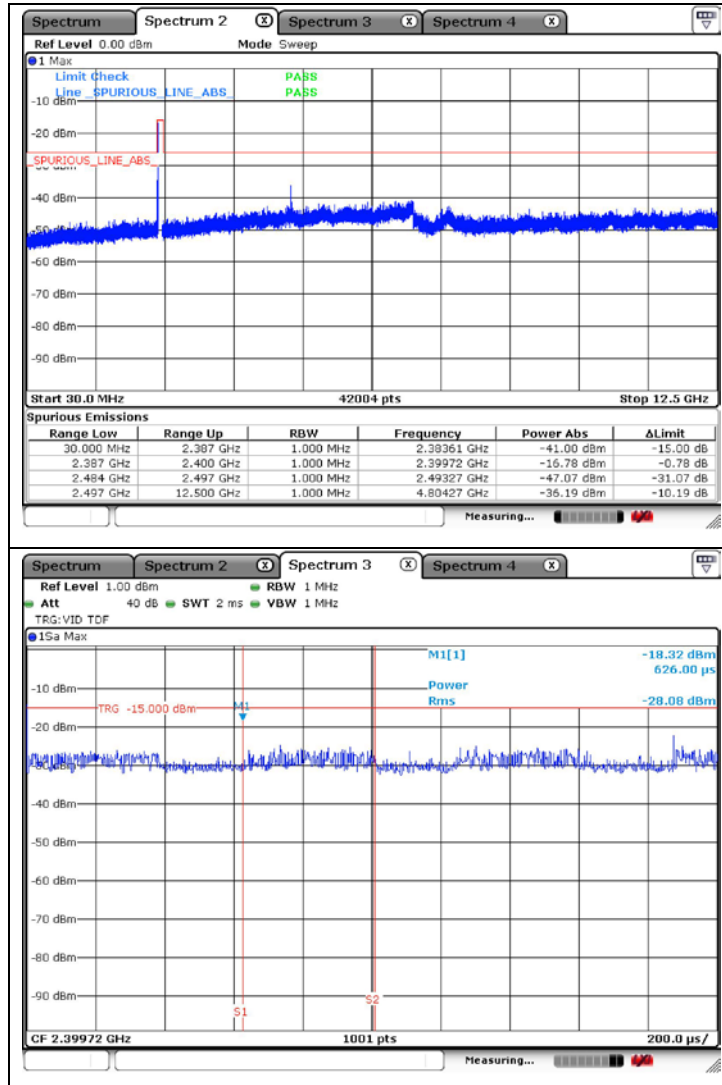


High Channel

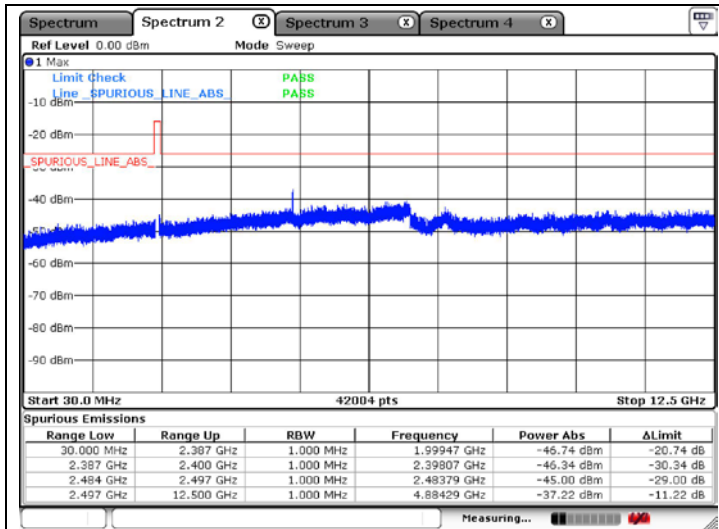


Normal voltage

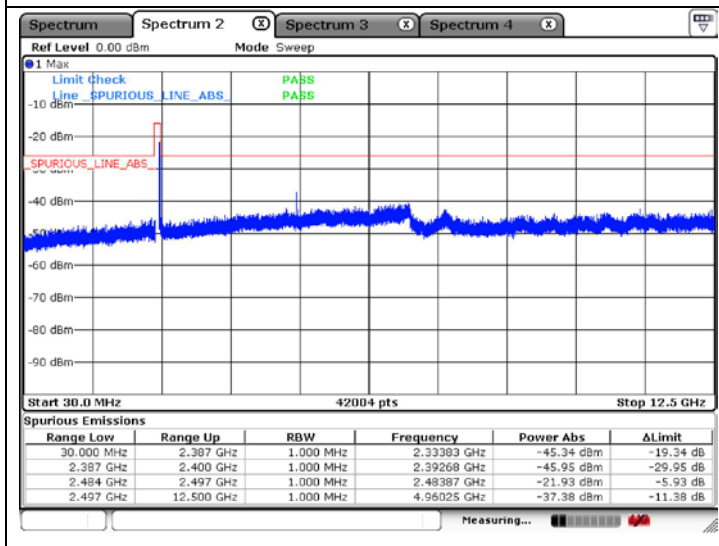
Low Channel



Middle Channel

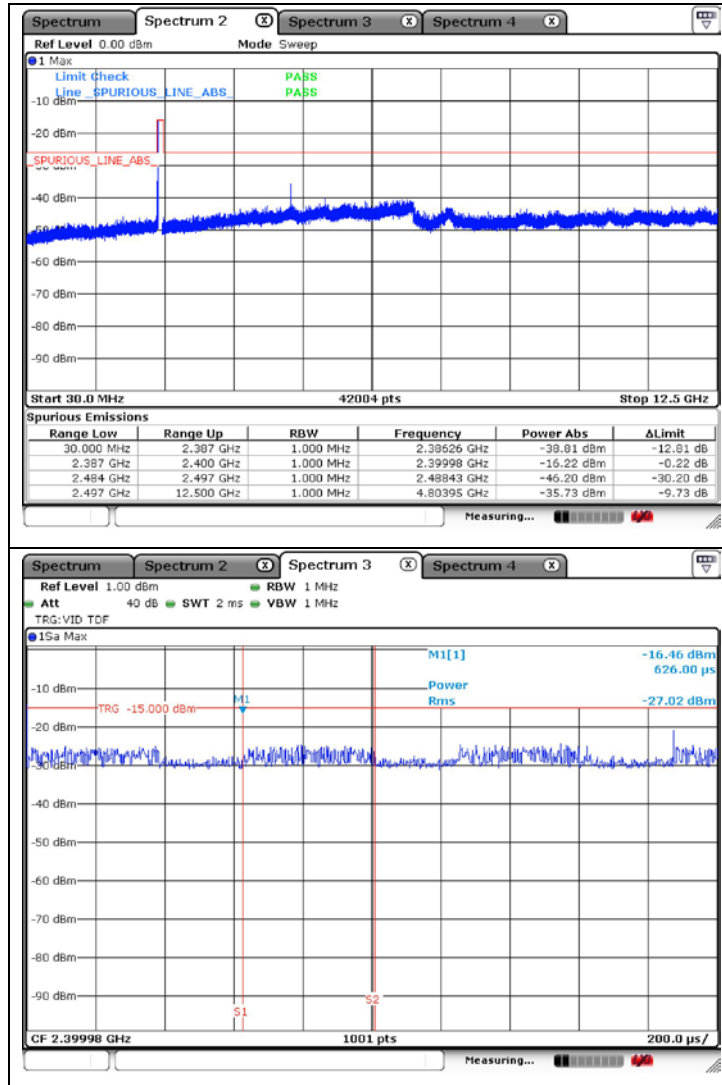


High Channel

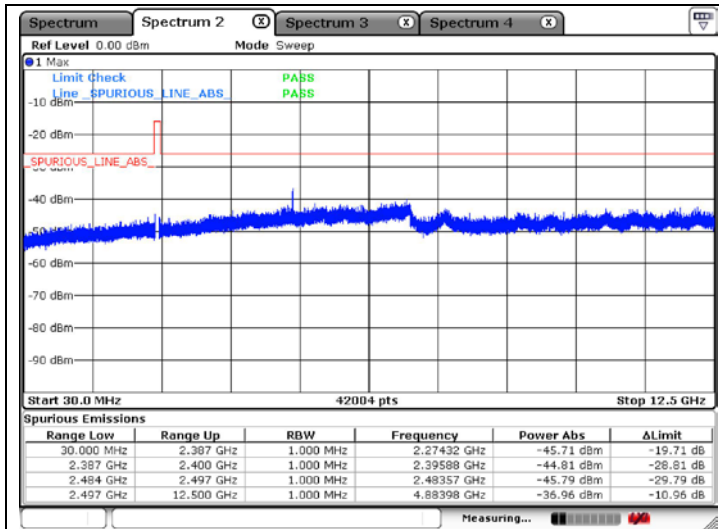


High voltage

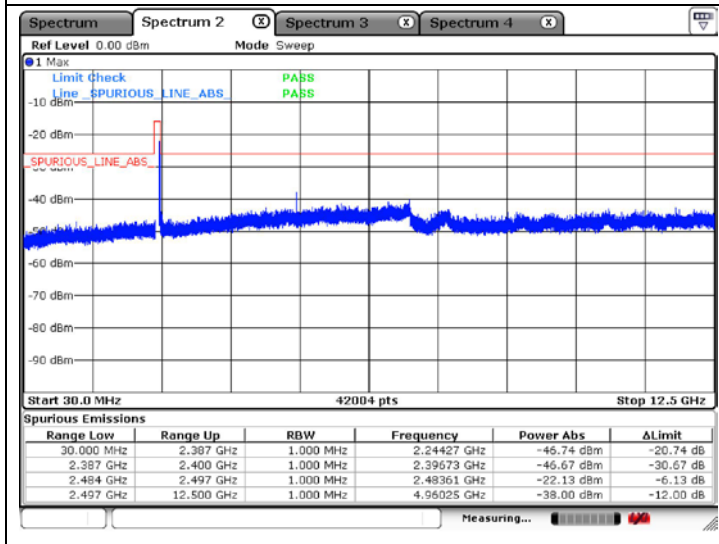
Low Channel



Middle Channel



High Channel



5. Antenna Power

5.1. Test setup



5.2. Limit

The difference between measured output power and the rated output power shall be within a tolerance of +20 % to -80 %. In addition, the rated output power shall not be over the limits shown below.

Limit (rated output power, upper limit)

- 10 mW or less

5.3. Test procedure

1. Connect transmitter output to the spectrum analyzer input port.

2. Configure the spectrum analyzer as below;

–Search for peak power frequency according to below settings

Center frequency: 2 402 MHz, 2 442 MHz, 2 480 MHz

Span: 10 MHz

RBW: 1 MHz

VBW: 3 MHz

Sweep time: Auto

Sweep data points: 1 001 or greater

Detector mode: Positive peak

Indication mode: Max hold

Find the frequency of maximum transmitted power

–Measurement of average antenna power according to below settings

Center frequency: Frequency of peak power

Span: 0 Hz

RBW: 3 MHz

VBW: 3 MHz

Sweep: Minimum time required to make an accurate measurement.

For burst type (intermittent) transmission, sweep time shall be greater than one burst Interval.

Sweep data points: 1 001 or greater

Detector mode: Sample

Measure the Average Burst Power of the frequency

5.4. Test result

Ambient temperature : (23 ± 1) °C
Relative humidity : 47 % R.H.

Low voltage

Test voltage (V _{d.c.})	Channel	Antenna gain (dB i)	Rated Output Power		E.I.R.P. (dB m)	Average Burst Power		Power Tolerance (%)
V _{min} = 3.33	Low Ch. (2 402 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.05 mW	6.07 dB m	-10.00
	Middle Ch. (2 442 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.30 mW	6.33 dB m	-4.44
	High Ch. (2 480 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.45 mW	6.48 dB m	-1.11

Normal voltage

Test voltage (V _{d.c.})	Channel	Antenna gain (dB i)	Rated Output Power		E.I.R.P. (dB m)	Average Burst Power		Power Tolerance (%)
V _{nom} = 3.70	Low Ch. (2 402 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.04 mW	6.06 dB m	-10.22
	Middle Ch. (2 442 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.29 mW	6.32 dB m	-4.67
	High Ch. (2 480 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.41 mW	6.44 dB m	-2.00

High voltage

Test voltage (V _{d.c.})	Channel	Antenna gain (dB i)	Rated Output Power		E.I.R.P. (dB m)	Average Burst Power		Power Tolerance (%)
V _{max} = 4.07	Low Ch. (2 402 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.06 mW	6.09 dB m	-9.78
	Middle Ch. (2 442 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.35 mW	6.38 dB m	-3.33
	High Ch. (2 480 MHz)	2.15	4.50 mW	6.53 dB m	8.68	4.46 mW	6.49 dB m	-0.89

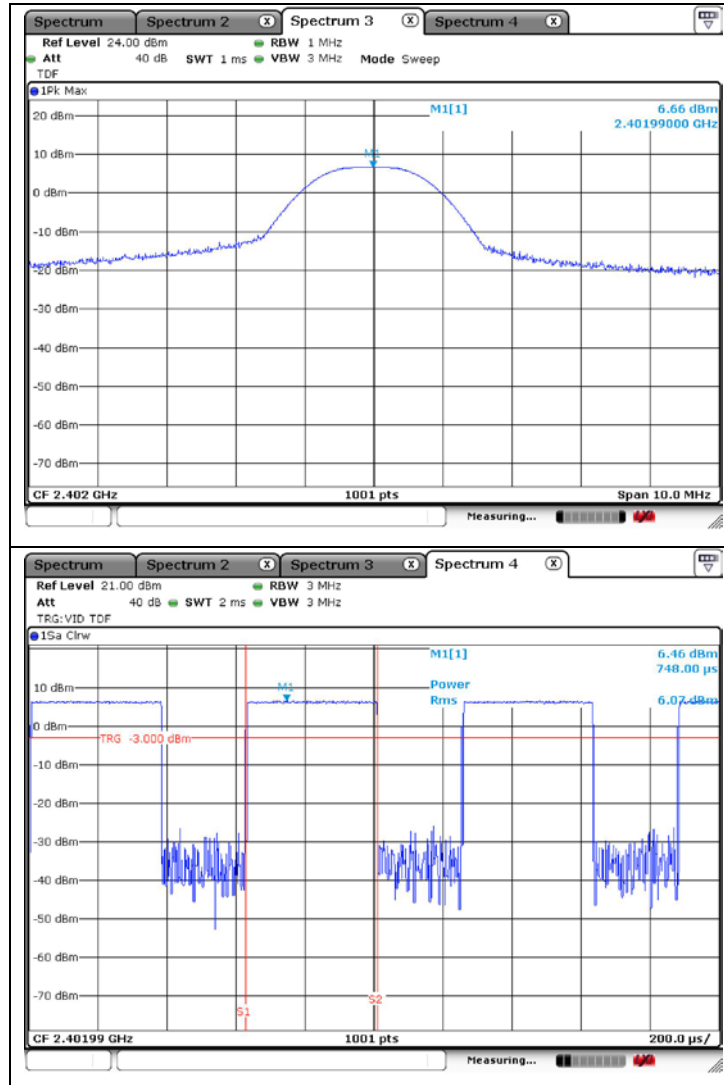
Note;

Antenna Power (mW) = Average Burst Power (mW)

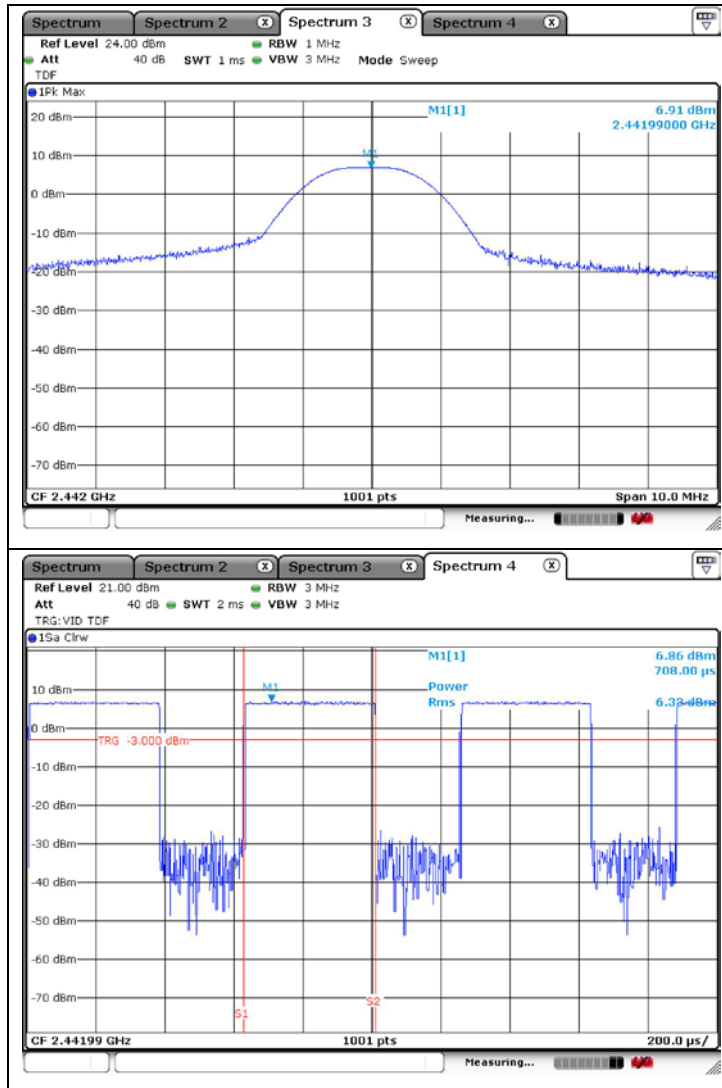
Power Tolerance (%) = {[Antenna Power (mW) - Rated Output Power (mW)] ÷ Rated Output Power (mW)} × 100

Low voltage

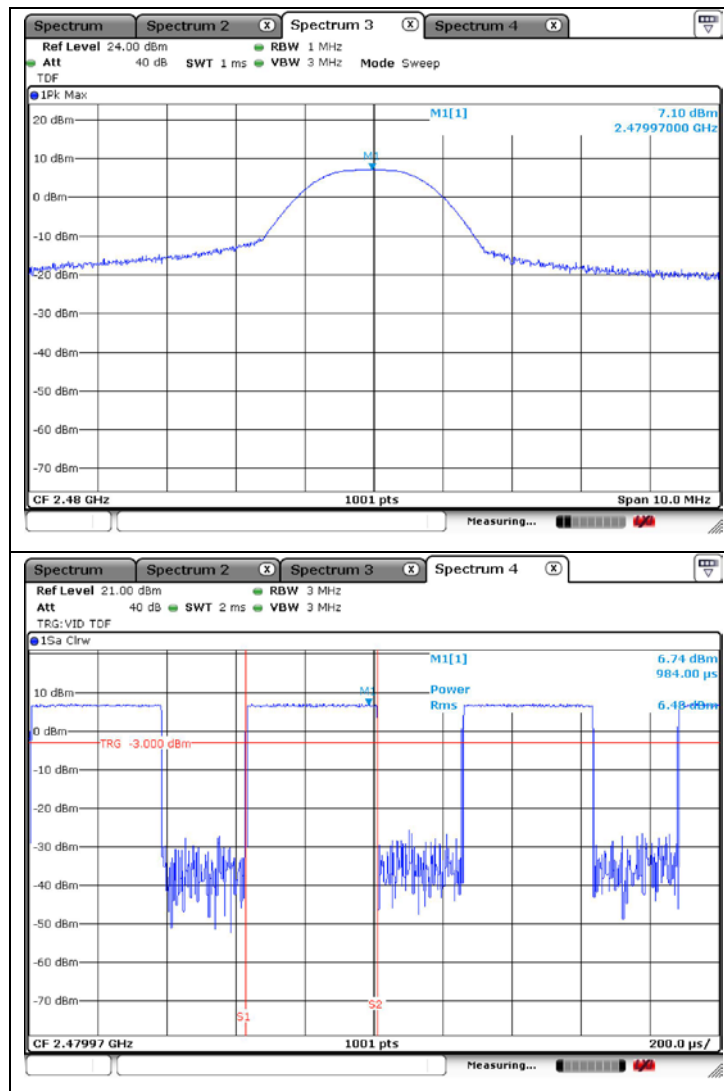
Low channel



Middle channel



High channel



Normal voltage

Low channel

