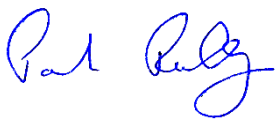
COMPLIANCE ENGINEERING IRELAND LTD

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.088T

Compliance Engineering Ireland Ltd
Clonross Lane, Derrockstown, Dunshaughlin
Co. Meath, Ireland A85 XN59
Ph +353 1 8017000 , 8256722

Confidential Report

Project Num	18E7412-1a
Quotation	Q17-2709-1a
Prepared For	Gentian Services Ltd
Address	Bay 89.1, Shannon Free Zone, Shannon, Co. Clare, Ireland. V14 E177
Ph	+353 (0)61 704 986
Contact	Mark Griffin
Email	markgriffin@gentianservices.com
Prepared By	Compliance Engineering Ireland
Test Lab Address	Clonross Lane, Derrockstown, Dunshaughlin, Co. Meath, Ireland A85XN59
FCC Test Firm Registration number	409640
Tested By	Michael Kirby
Test Report By	Michael Kirby
Date Received	3rd Jun 2018
Issue Date	5th Nov 2018
EUT Description	Fitness product with Bluetooth Low Energy radio
EUT Model	Bionic Gym
Test Standard (s)	15.247
Authorised by	**Paul Reilly**
Authorised Signature :	

TEST SUMMARY

The equipment complies with the requirements according to the following standards.

Bluetooth Low Energy

FCC Part Section(s)	TEST PARAMETERS	Test Result
15.247a 2	6dB bandwidth	Pass
15.247a	99% bandwidth	Pass
15.247e	Power Spectral Density	Pass
15.247(b)1	Output power Conducted	Pass
15.247(d)1	Conducted Spurious Emissions	Pass
15.209	Radiated Spurious Emissions	Pass

Exhibit A – Technical Report

Table of Contents

1.0 EUT Description

Device name :	Bionic Gym
Type:	Fitness product with Bluetooth Low Energy Radio
FCC ID:	2ARJQBG01
Test Standards:	47 CFR, Part 15.247
Type of radio:	Stand-alone
Operating Frequency Range(s):	2.402 GHz- 2.48GHz
Number of Channels:	40
Antenna:	Integral
Power configuration:	7.4 v Battery. (non re-chargeable)
Oper. Temp Range:	5° C to +35° C
Classification:	DTS
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2013

The EUT is a body worn fitness-related product with a BLE radio.

1.1 EUT Operation

Operating Conditions during Test:

The EUT was powered from a its internal batteries for all tests

Radiated measurements (spurious emission) and Band-edge measurements were performed on a sample with standard internal antenna.

For conducted tests a sample of EUT with the chip antenna replaced by cable and SMA and programmed to transmit on low mid and high channels were used (3 EUT).
For radiated tests a sample of EUT programmed to transmit on low mid and high channels were used (3 EUT).

All tests were carried out in modulated mode

Environmental conditions

	Temperature	**Relative Humidity**
Test	°C	%
Conducted Emissions	19	47
Radiated Emissions <1GHz	18	42
Radiated Emissions >1GHz	19	47

1.2 Modifications

No modifications were required in order to pass the test specifications.

1.3 Date of Test

The tests were carried out on 23rd Aug and 25th Sept 2018 .

2 Emissions Measurements

2.1 Conducted Emissions Measurements

Radio Conducted measurements were carried out on the EUT as per section 1.1 above.

All results were measured as conducted on the antenna except radiated spurious emissions.

2.2 Radiated Emissions Measurements

Radiated Power measurements were made at the Compliance Engineering Ireland Ltd anechoic chamber located in Dunshaughlin, Co. Meath, Ireland to determine the radio noise radiated from the EUT. A "Description of Measurement Facilities" has been submitted to the FCC and approved pursuant to Section 2.948 of CFR 47 of the FCC rules.
The EUT was centred on a motorized turntable, which allows 360 degree rotation.

Emissions below 1GHz were measured using a test antenna positioned at a distance of 3 metres from the EUT (as measured from the closest point of the EUT). The radiated emissions were maximised by configuring the EUT, by rotating the EUT, and by raising and lowering the antenna from 1 to 4 metres. In this case the resolution bandwidth was 100kHz.
Emissions in the 1GHz-3.6GHz range were measured using a horn antenna located at 3 metres distance from the EUT in a fully anechoic chamber.
The radiated emissions were maximised by configuring the EUT and by rotating the EUT, and by raising and lowering the test antenna from 1 to 4 metres.
Emissions above 3.6GHz were measured using a horn antenna located at 1 metre distance from the EUT in a fully anechoic chamber. The radiated emissions were maximised by configuring the EUT and by rotating the EUT and raising the test and antenna from 1 to 4 metres.

2.3 Antenna requirements 15.203

Antenna is internal

3.0 Results for Conducted emissions on the mains

Test not performed as the host for the EUT is battery powered only and battery cannot be recharged while in the host unit.

4. Conducted Measurements

4.1 Bandwidth

4.1.1 6dB bandwidth

As per Ansi63.10 Section 11.8.2

Limit for 6dB Bandwidth = 500KHz min

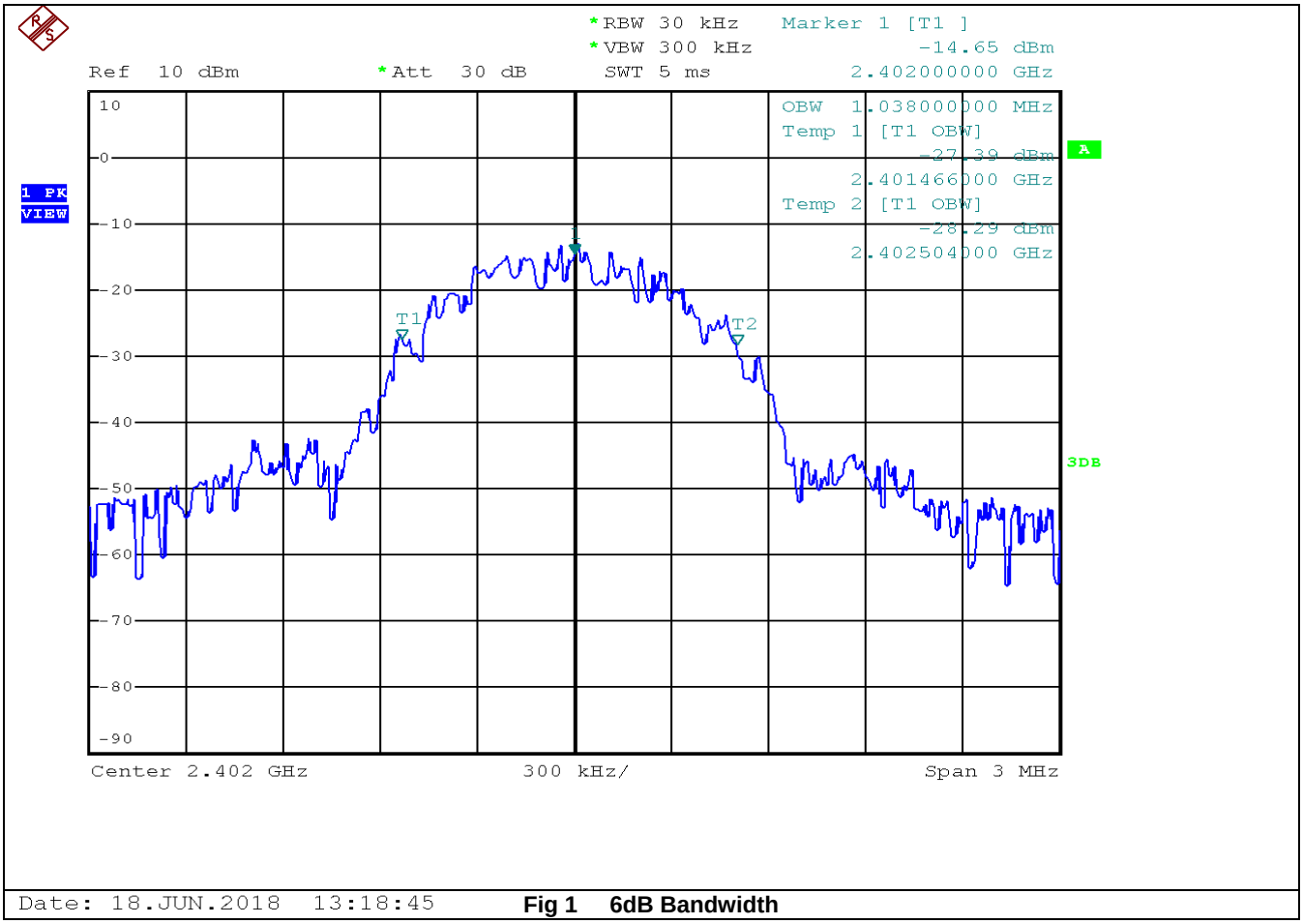


Fig 1 6dB Bandwidth

Frequency	6dB Bandwidth	99% Bandwidth
MHz	KHz	MHz
2402	708	1.038
2426	720	1.05
2480	720	1.038

4.1.2 99% bandwidth

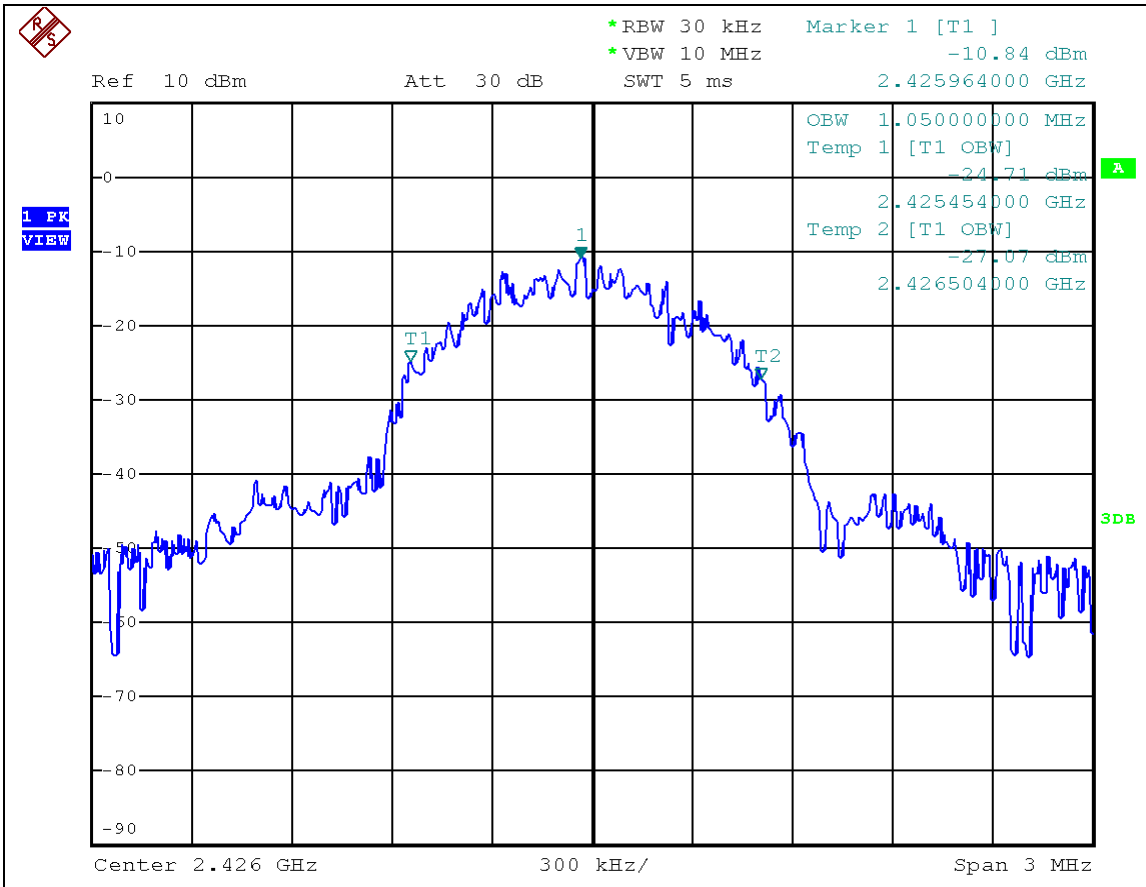


Fig 2 99% Bandwidth

Date: 18.JUN.2018 15:07:18

Frequency MHz	99% Bandwidth MHz
2402	1.038
2426	1.05
2480	1.038

Result :- Pass

4.2 Duty Cycle

As per Ansi 63.10 Section 11.6

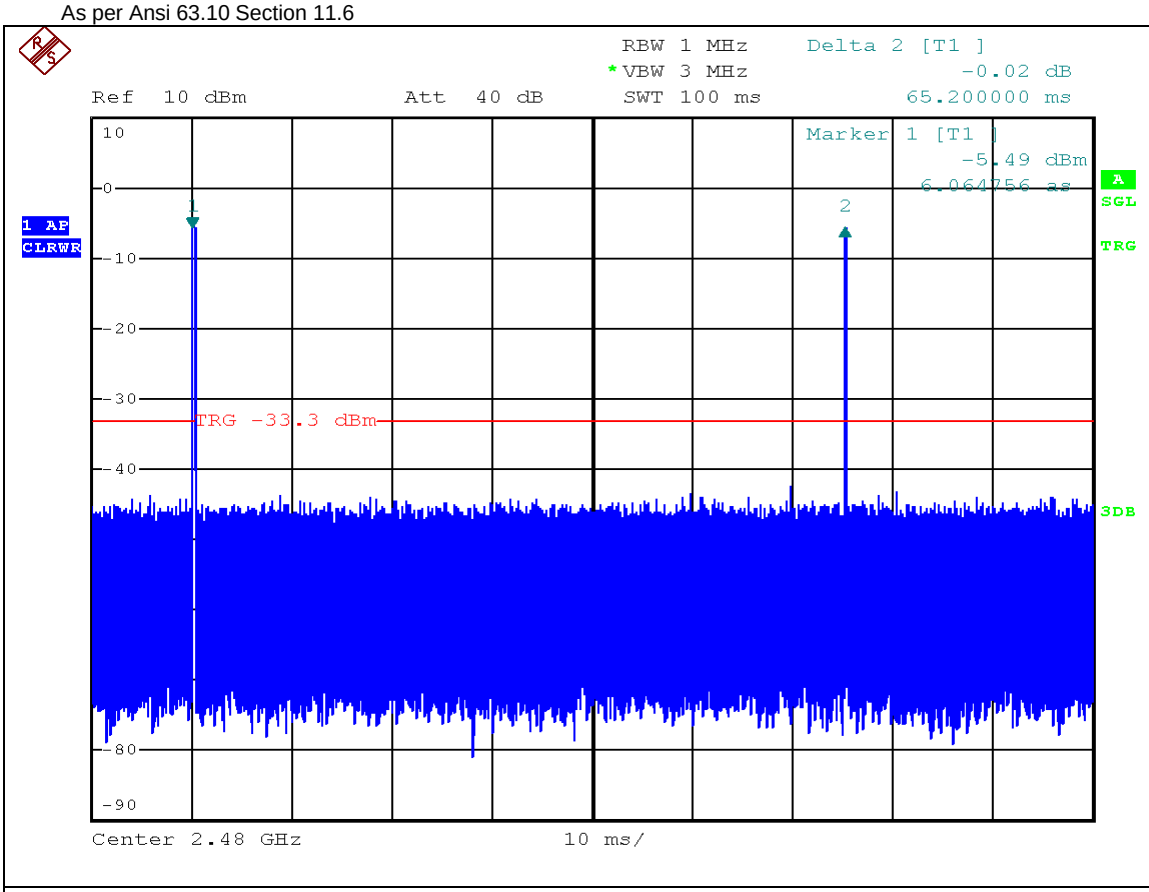


Fig 3 Duty Cycle

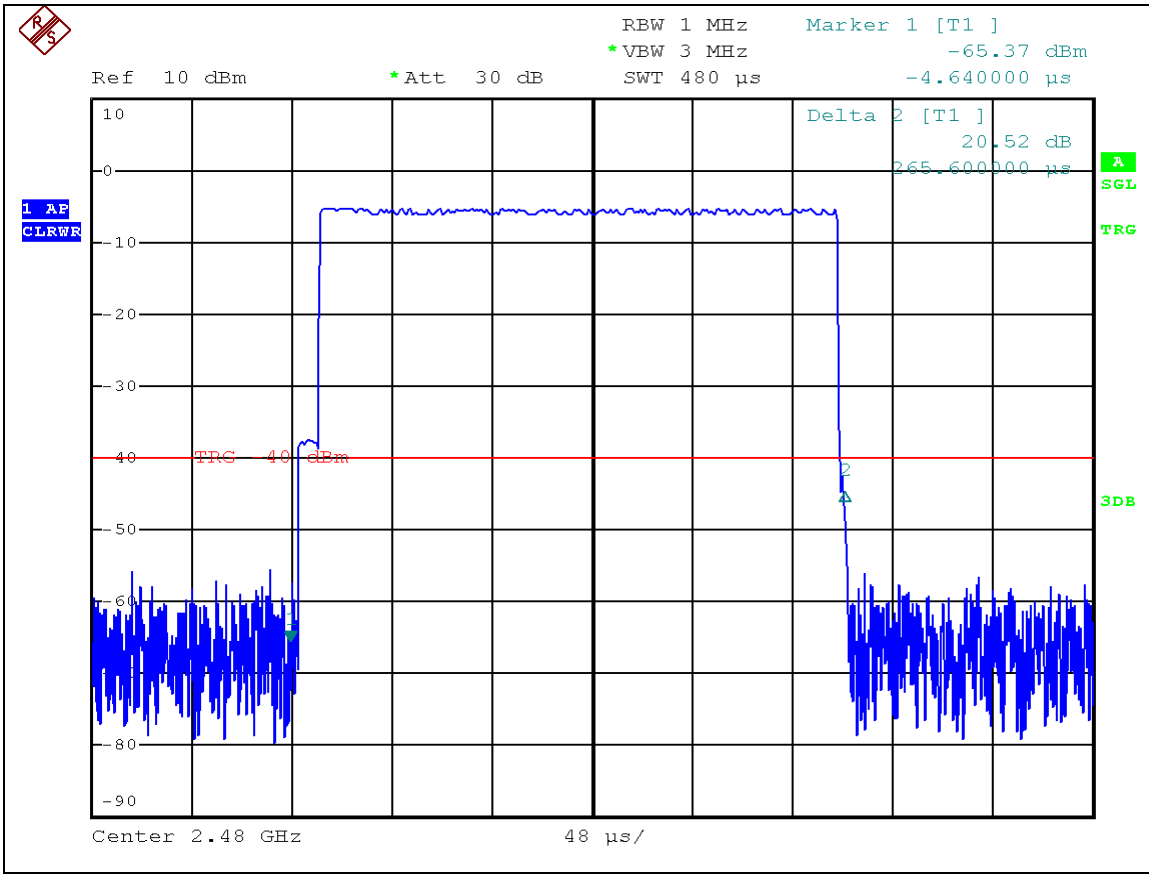


Fig 6 Duty Cycle

Duty Cycle = (265uS)/65mSS = 0.4%

Date: 18.JUN.2018 14:24:57

4.3 Power Spectral Density

As per Ansi 63.10 Section 11.10.5

Section 11.10.5 AVGPSD-2
This procedure is applicable when the EUT cannot be configured to transmit continuously (i.e., duty cycle < 98 %), and when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level, and when the transmission duty cycle is constant (i.e., duty cycle variations are less than ± 2 %):
a) Measure the duty cycle (D) of the transmitter output signal as described in Section 11.6
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 □ OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 □ RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 □ span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.
m) If resultant value exceeds the limit, then reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced)

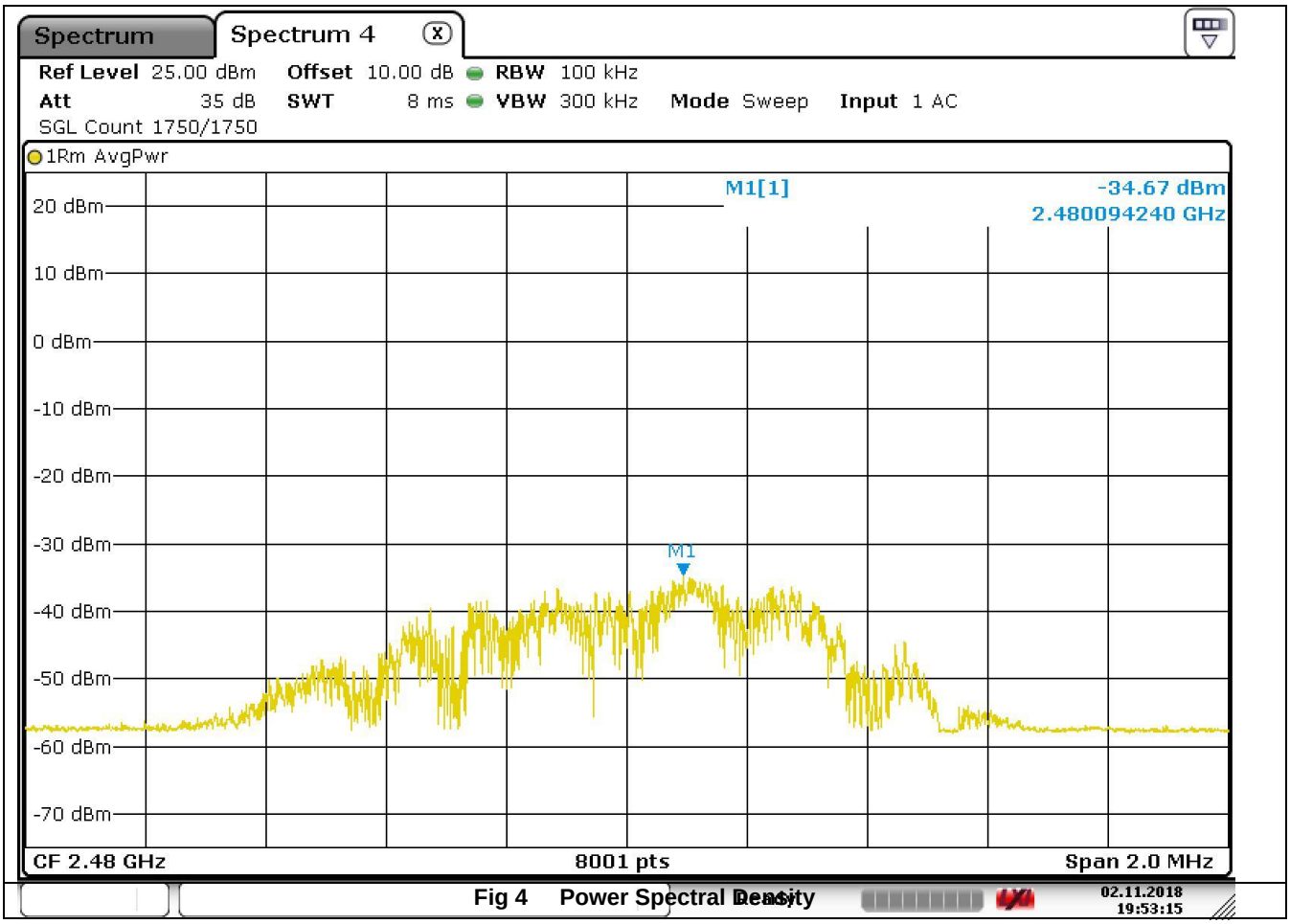


Fig 4 Power Spectral Density

Date: 2.NOV.2018 19:53:15

Frequency	Power Spectral Density Measured	Duty Cycle	Duty Cycle Factor	Power Spectral Density	Limit	Margin
GHz	dBm	%	dB	dBm	dBm	dB
2.402	-35.82	0.41	23.9	-11.92	8	19.92
2.426	-36.2	0.41	23.9	-12.3	8	20.3
2.48	-34.67	0.41	23.9	-10.77	8	18.77

Duty Cycle factor =10*Log(1/x) dB where x =duty cycle

Result :- Pass

4.4 Output power Conducted

As per Ansi 63.10 Section 11.9.2.2.4

11.9.2.2.4 Method AVGSA-2 (trace averaging across on- and off-times of the EUT transmissions, followed by duty cycle correction)

a) Measure the duty cycle, D, of the transmitter output signal as described in Section 11.6.

b) Set span to at least 1.5 □ OBW.

c) Set RBW = 1 % to 5 % of the OBW, not to exceed 1 MHz

d) Set VBW ≥ 3 □ RBW.

e) Number of points in sweep ≥ 2 □ span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time = auto.

g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

h) Do not use sweep triggering. Allow the sweep to "free run".

i) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.

j) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

k) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on- and off-times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25 %

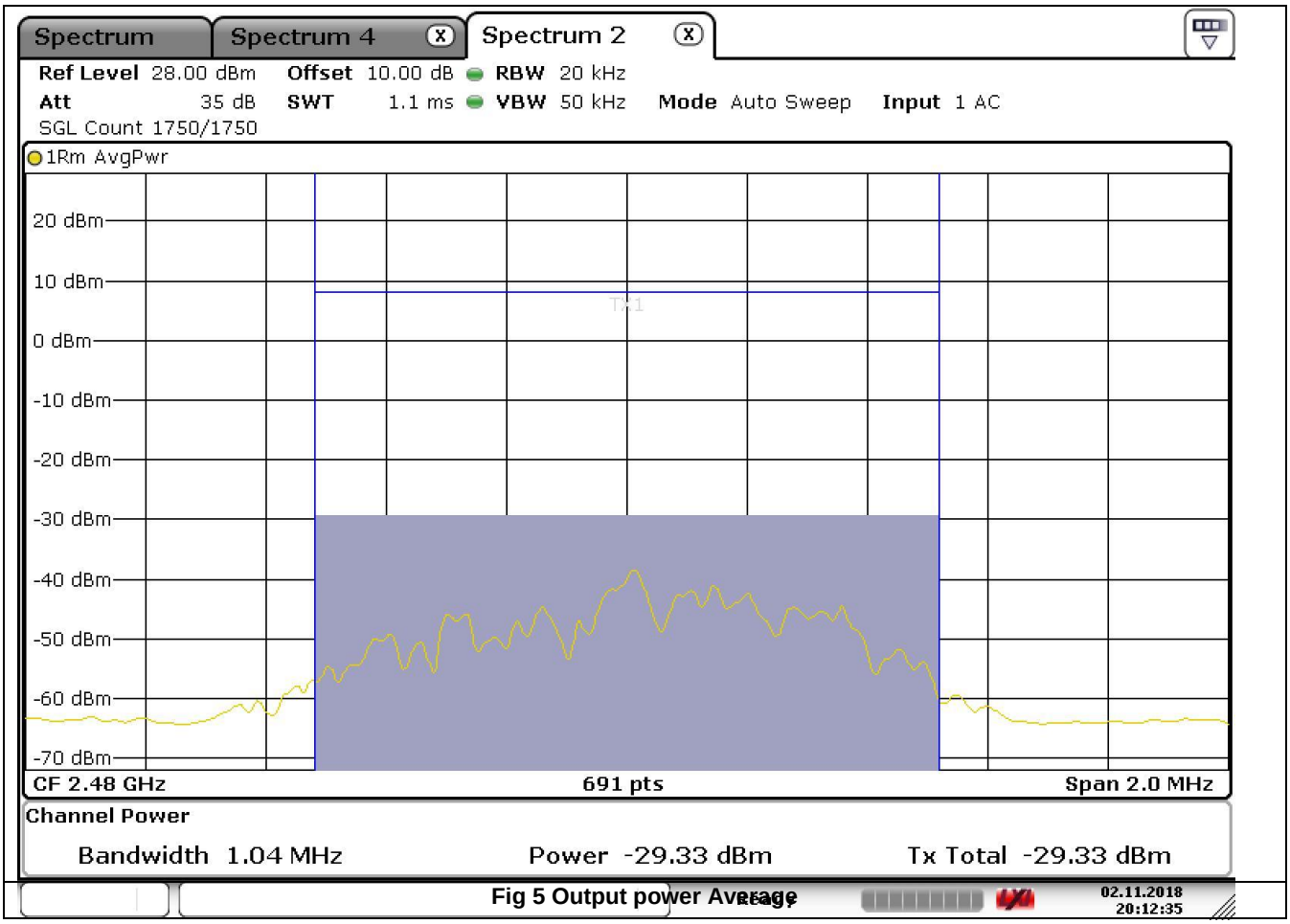


Fig 5 Output power Average

Date: 2.NOV.2018 20:12:35

Duty Cycle factor =10*Log(1/x) dB where x =duty cycle

Frequency	Measured Output Power Average	Duty Cycle	Duty Cycle Factor	Output power Average	Limit	Margin
GHz	dBm	%	dB	dBm	dBm	dB
2.402	-32.59	0.41	23.9	-8.69	30	38.69
2.426	-31.5	0.41	23.9	-7.6	30	37.6
2.48	-29.33	0.41	23.9	-5.43	30	35.43

Test Result :- Pass

5. Spurious Emissions Measurements

5.1 Spurious Emissions in Restricted bands

5.1.1 Radiated measurements

As per Ansi 63.10 Section 11.12.2.5.2

11.12.2.5.2 Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and the duty cycle is constant (duty cycle variations are less than $\pm 2\%$), then the following procedure shall be used:

a) The EUT shall be configured to operate at the maximum achievable duty cycle.

b) Measure the duty cycle D of the transmitter output signal as described in 11.6.

c) RBW = 1 MHz (unless otherwise specified).

d) VBW ≥ [3 · RBW].

e) Detector = RMS (power averaging), if span / (# of points in sweep) ≤ (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

f) Averaging type = power (i.e., rms):

1) As an alternative, the detector and averaging type may be set for linear voltage averaging.

2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.

g) Sweep time = auto.

h) Perform a trace average of at least 100 traces.

i) A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in step f), then the applicable correction factor is [10 log (1 / D)], where D is the duty cycle.

2) If linear voltage averaging mode was used in step f), then the applicable correction factor is [20 log (1 / D)], where D is the duty cycle.

3) If a specific emission is demonstrated to be continuous ($D \geq 98\%$) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Reduction of the measured emission amplitude levels to account for operational duty cycle is not permitted. Determining compliance is based on emission levels occurring during transmission; it is not based on an average across ON and OFF times of the transmitter

Result

Frequency GHz	Peak Level dBuV/m	Antenna Factor dB	Preamp Gain dB	Cable Loss	Antenna Polarity	EUT Orientation	Final Peak Level dBuV/m	Average Limit +20dB dBuV/m	Margin dB
4.804	-23.1	32.3	37.1	5.2	Vertical	O3	51.5	74.0	22.5
4.804	-22.1	32.3	37.1	5.2	Horizontal	O1	52.5	74.0	21.5
4.852	-25.1	32.3	37.1	5.2	Vertical	O3	49.5	74.0	24.5
4.852	-25.3	32.3	37.1	5.2	Horizontal	O1	49.3	74.0	24.7
4.96	-24.2	34	37.3	5.2	Vertical	O3	52.3	74.0	21.7
4.96	-25.4	34	37.3	5.2	Horizontal	O1	51.1	74.0	22.9
7.206	-38.6	37.7	36.9	6.5	Vertical	O3	42.5	74.0	31.5
7.206	-38.2	37.7	36.9	6.5	Horizontal	O1	42.9	74.0	31.1
7.278	-41.0	37.7	36.9	6.5	Vertical	O3	40.1	74.0	33.9
7.278	-41.6	37.7	36.9	6.5	Horizontal	O1	39.5	74.0	34.5
7.44	-39.9	37.7	37.5	6.3	Vertical	O3	41.6	74.0	32.4
7.44	-38.5	37.7	37.5	6.3	Horizontal	O1	43.0	74.0	31.0

5.3 Band Edge Measurements

A prescan was performed to show there were no other peaks in the vicinity
In this case the RBW was 1MHz

Final Peak measurement performed with Resolution Bandwidth set to 100KHz as per ANSI C63.10-2013 Section 11.13.3.2.Peak Detection

Average measurements as per as per ANSI C63.10-2013 Section 11.13.3.4 Trace averaging across on /off times of the EUT transmissions followed by duty cycle correction

5.3.1 Peak Measurements

Ansi 63.10 section 11.13.3.2 Peak detection

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used:

a) Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

b) Set span to 2 MHz

c) RBW = 100 kHz.

d) VBW ≥ [3 · RBW].

e) Detector = peak.

f) Sweep time = auto.

g) Trace mode = max hold.

h) Allow sweep to continue until the trace stabilizes (required measurement time may increase for low-duty-cycle applications).

i) Compute the power by integrating the spectrum over 1 MHz using the analyser's band power measurement function with band limits set equal to the emission frequency (*e*mission) ± 0.5 MHz
If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by *e*mission ± 0.5 MHz

Result

Freq	Pol	Peak	**E**	Limit	Margin	Status
GHz	V/H	dBuV	dBuV/m	dBuV/m	dB	Pass/Fail
2.4	Vertical	**36.33**	36.33	74	37.67	Pass
2.4	Horizontal	**36.35**	36.35	74	37.65	Pass
2.4835	Vertical	**37.27**	37.27	74	36.73	Pass
2.4835	Horizontal	**36.72**	36.72	74	37.28	Pass

5.3.2 Average Measurements

Ansi 63.10 section 11.13.3.4 Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and the duty cycle is constant (duty cycle variations are less ±2%), then the following procedure may be used to measure the average power of unwanted emissions within 2 MHz of the authorized band edge:

a) The EUT shall be configured to operate at the maximum achievable duty cycle.

b) Measure the duty cycle D of the transmitter output signal as described in 11.6.

c) Set instrument center frequency to the frequency of the emission to be measured.

d) Set span to 2 MHz

e) RBW = 100 kHz.

f) VBW ≥ 3 · RBW.

g) Detector = RMS (power averaging), if [span / (# of points in sweep)] ≤ (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

h) Averaging type = power (i.e., rms):

1) As an alternative, the detector and averaging type may be set for linear voltage averaging.

2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.

i) Sweep time = auto.

j) Perform a trace average of at least 100 traces.

k) Compute the power by integrating the spectrum over 1 MHz using the instrument's band power measurement function with band limits set equal to the emission frequency ($e$mission) ± 0.5 MHz

If the spectrum analyzer does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by $e$mission ± 0.5 MHz

l) A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in step f), then the applicable correction factor is [10 log (1 / D)], where D is the duty cycle.

2) If linear voltage averaging mode was used in step f), then the applicable correction factor is [20 log (1 / D)], where D is the duty cycle.

3) If a specific emission is demonstrated to be continuous ($D \geq 98\%$) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Reduction of the measured emission amplitude levels to account for operational duty cycle is not permitted.

Determining compliance is based on emission levels occurring during transmission—it is not based on an average across ON and OFF times of the transmitter.

Result

Freq	Pol	Average	Duty Cycle correction	**E**	Limit	Margin	Status
GHz	V/H	dBuV	dB	dBuV/m	dBuV/m	dB	Pass/Fail
2.4	Vertical	**26.19**	**23.9**	50.3	54	3.7	Pass
2.4	Horizontal	**26.15**	**23.9**	45.97	54	8.03	Pass
2.4835	Vertical	**26.49**	**23.9**	47.56	54	6.44	Pass
2.4835	Horizontal	**26.35**	**23.9**	46.96	54	7.04	Pass

Test Result Pass

6 List of Test Equipment

Instrument	Manufacturer	Model	Serial Num	CEI Ref	Cal Due Date	Cal Interval Months
Microwave Preamplifier	Hewlett Packard	83017A	3123A00175	805	29-Sept -19	12
Spectrum Analyser 30Hz-40GHz	Rohde& Schwarz	FSP40	100053	850	09-Nov-18	36
Test Receiver 3.6GHz	Rohde& Schwarz	ESR	1316.3003k03-101625-s	869	07-Jun-20	36
Anechoic Chamber	CEI	SAR 10M	845	845	16-Mar-19	36
Antenna Horn	EMCO	3115	9905-5809	655	06-Nov-19	24
Antenna Horn	AH Systems	SAS-200/571	373	839	14-Mar-21	36
Fully Anechoic Chamber	CEI	FAR 3M	906	906	22-Mar-21	36
Antenna Bilog	Schaffner	CBL6111C	2549	690	06-Nov-19	24
Antenna Horn Standard Gain 18-26.5GHz	A-info	LB-42-25-C-KF	J2021091103028	877	29-Nov-18	12
Antenna Biconical	Schwarzbeck	VHBB 9124	9124 667	871	21-Aug-20	36
Antenna Log Periodic	Electro-Metrics	EM-6950	838	957	15-Mar-20	24

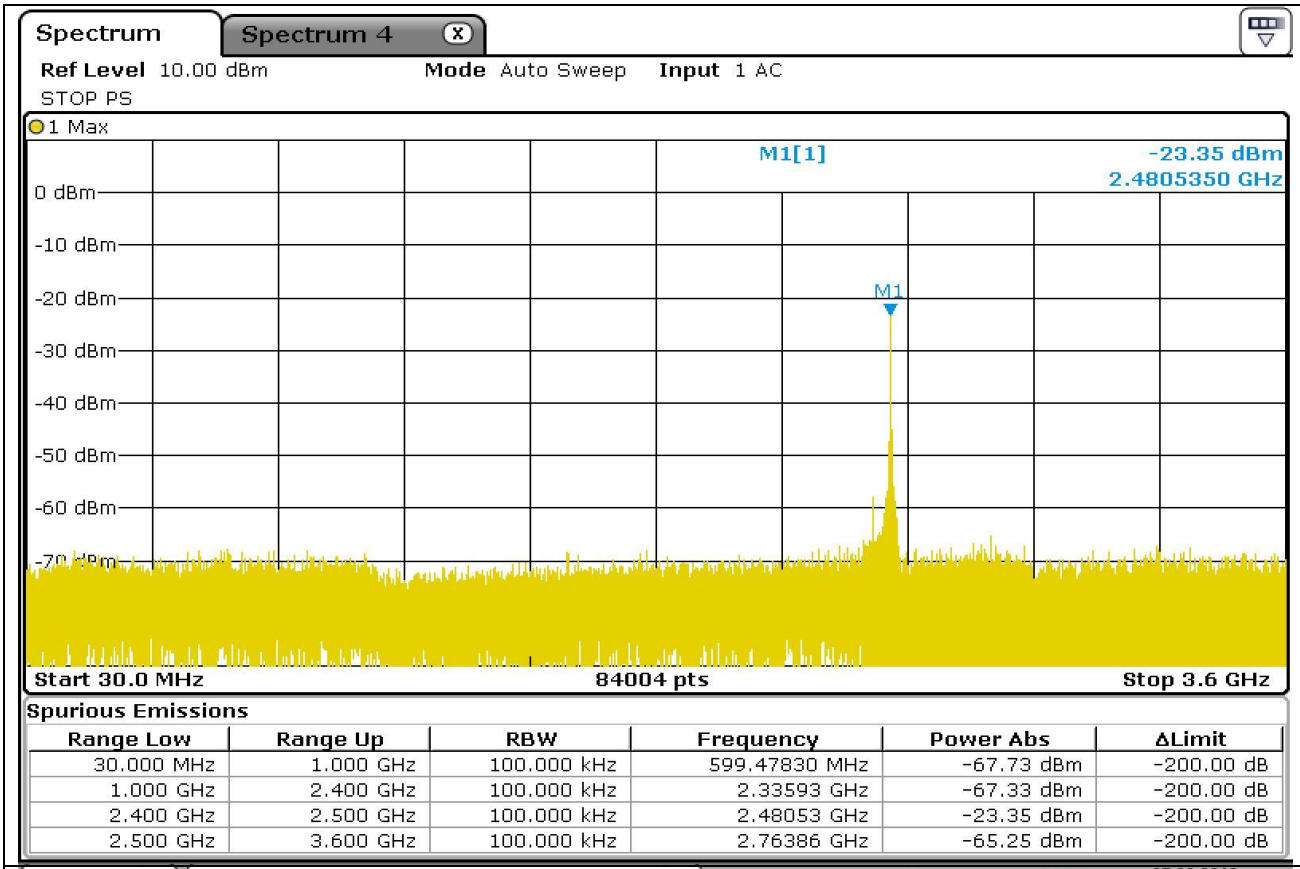
7 Measurement Uncertainties

Measurement	Uncertainty
Radio Frequency	+/- $5x10^{-7}$
Maximum Frequency Deviation	+/- 1.7 %
Conducted Emissions	+/- 1 dB
Radiated Emission 30MHz-100MHz	+/- 5.3 dB
Radiated Emission 100MHz-300MHz	+/- 4.7 dB
Radiated Emission 300MHz-1GHz	+/- 3.9 dB
Radiated Emission 1GHz-40GHz	+/- 3.8 dB

The measurement uncertainties stated were calculated with a k=2 for a confidence level of over 95% as per ETS TR100 028.

Appendix A

Additional Test Results
For
Conducted Measurements on the Antenna Port

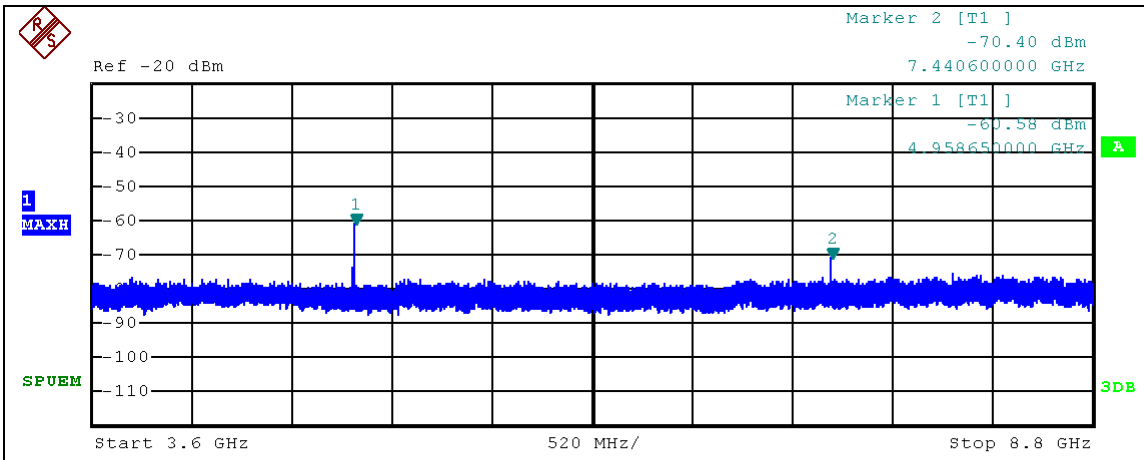


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	100.000 kHz	599.47830 MHz	-67.73 dBm	-200.00 dB
1.000 GHz	2.400 GHz	100.000 kHz	2.33593 GHz	-67.33 dBm	-200.00 dB
2.400 GHz	2.500 GHz	100.000 kHz	2.48053 GHz	-23.35 dBm	-200.00 dB
2.500 GHz	3.600 GHz	100.000 kHz	2.76386 GHz	-65.25 dBm	-200.00 dB

25.09.2018
16:41:18

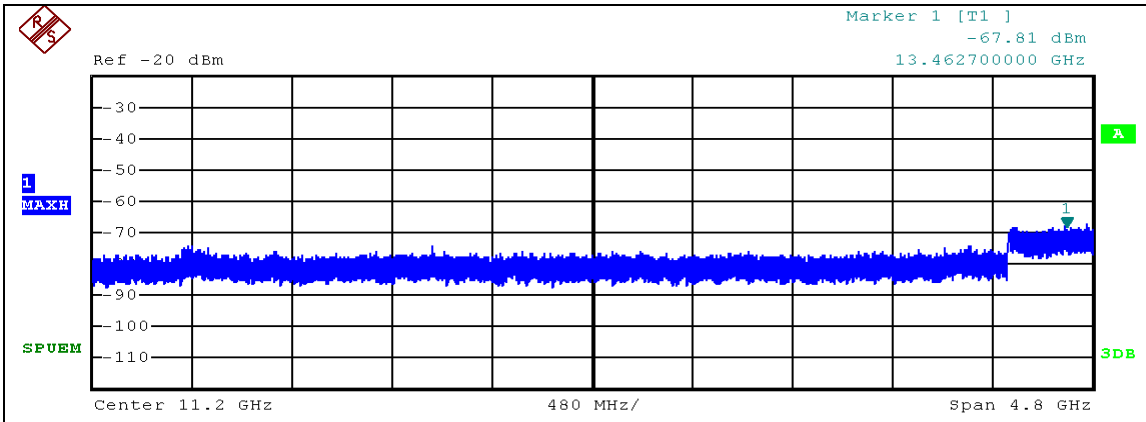
Fig A1 High Channel Conducted Spurious Emissions 30 MHz -3.6 GHz



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
3.600 G	4.000 G	100.00 k	3.805150 G	-76.42	-200.00
4.000 G	4.800 G	100.00 k	4.424700 G	-76.93	-200.00
4.800 G	5.200 G	100.00 k	4.958650 G	-60.58	-200.00
5.200 G	5.600 G	100.00 k	5.301450 G	-76.81	-200.00
5.600 G	6.000 G	100.00 k	5.634650 G	-76.95	-200.00
6.000 G	6.400 G	100.00 k	6.027900 G	-77.71	-200.00
6.400 G	6.800 G	100.00 k	6.468250 G	-78.10	-200.00
6.800 G	7.200 G	100.00 k	7.019750 G	-76.76	-200.00
7.200 G	7.600 G	100.00 k	7.440600 G	-70.40	-200.00
7.600 G	8.000 G	100.00 k	7.982050 G	-76.24	-200.00
8.000 G	8.400 G	100.00 k	8.076550 G	-75.49	-200.00
8.400 G	8.800 G	100.00 k	8.630850 G	-76.14	-200.00

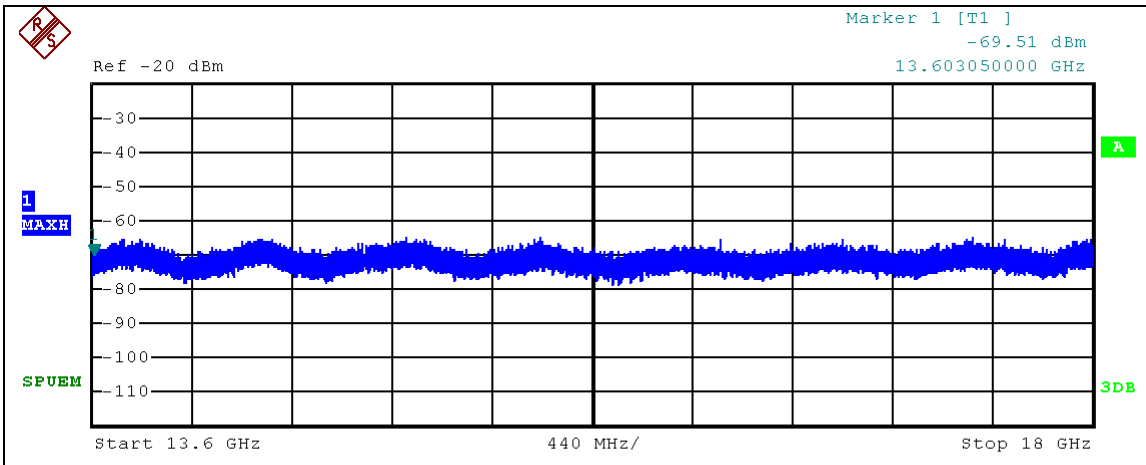
Fig A2 High Channel Conducted Spurious Emissions 3.6 GHz -8.8GHz

Date: 25.SEP.2018 16:30:43



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
8.800 G	9.200 G	100.00 k	9.017400 G	-76.80	-200.00
9.200 G	9.600 G	100.00 k	9.275900 G	-74.04	-200.00
9.600 G	10.000 G	100.00 k	9.670900 G	-75.77	-200.00
10.000 G	10.400 G	100.00 k	10.165600 G	-75.85	-200.00
10.400 G	10.800 G	100.00 k	10.436500 G	-74.21	-200.00
10.800 G	11.200 G	100.00 k	10.864400 G	-76.08	-200.00
11.200 G	11.600 G	100.00 k	11.293150 G	-75.64	-200.00
11.600 G	12.000 G	100.00 k	11.948450 G	-75.83	-200.00
12.000 G	12.400 G	100.00 k	12.186850 G	-76.94	-200.00
12.400 G	12.800 G	100.00 k	12.764600 G	-74.99	-200.00
12.800 G	13.200 G	100.00 k	13.005350 G	-74.18	-200.00
13.200 G	13.600 G	100.00 k	13.567600 G	-67.11	-200.00

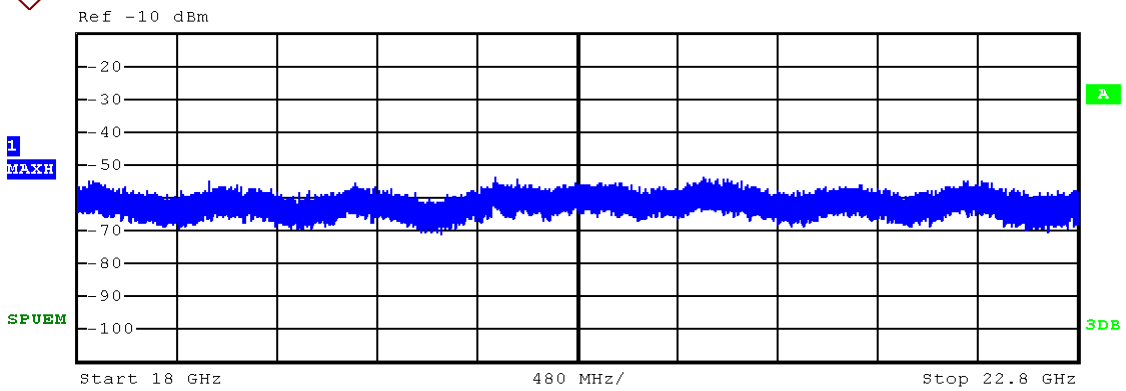
Fig A3 High Channel Conducted Spurious Emissions 8.8GHz-13.6GHz



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
13.600 G	14.000 G	100.00 k	13.733550 G	-65.03	-200.00
14.000 G	14.400 G	100.00 k	14.335050 G	-65.08	-200.00
14.400 G	14.800 G	100.00 k	14.797100 G	-66.34	-200.00
14.800 G	15.200 G	100.00 k	14.978900 G	-64.71	-200.00
15.200 G	15.600 G	100.00 k	15.571600 G	-64.75	-200.00
15.600 G	16.000 G	100.00 k	15.652450 G	-66.73	-200.00
16.000 G	16.400 G	100.00 k	16.366000 G	-65.38	-200.00
16.400 G	16.800 G	100.00 k	16.780450 G	-66.56	-200.00
16.800 G	17.200 G	100.00 k	16.900400 G	-65.52	-200.00
17.200 G	17.600 G	100.00 k	17.470350 G	-65.02	-200.00
17.600 G	18.000 G	100.00 k	17.976800 G	-65.12	-200.00

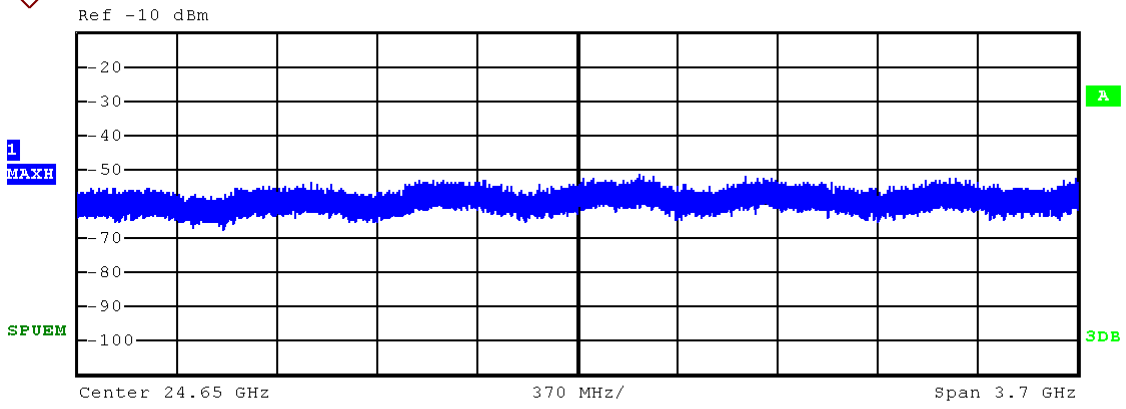
Fig A4 High Channel Conducted Spurious Emissions 13.6GHz -18GHz

Date: 25.SEP.2018 16:48:34



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
18.000 G	18.400 G	100.00 k	18.074700 G	-54.53	-200.00
18.400 G	18.800 G	100.00 k	18.629050 G	-55.01	-200.00
18.800 G	19.200 G	100.00 k	18.846950 G	-56.82	-200.00
19.200 G	19.600 G	100.00 k	19.336500 G	-55.04	-200.00
19.600 G	20.000 G	100.00 k	19.968800 G	-56.47	-200.00
20.000 G	20.400 G	100.00 k	20.007200 G	-53.82	-200.00
20.400 G	20.800 G	100.00 k	20.601350 G	-55.09	-200.00
20.800 G	21.200 G	100.00 k	21.003050 G	-53.65	-200.00
21.200 G	21.600 G	100.00 k	21.211900 G	-55.79	-200.00
21.600 G	22.000 G	100.00 k	21.767200 G	-55.77	-200.00
22.000 G	22.400 G	100.00 k	22.250350 G	-54.79	-200.00
22.400 G	22.800 G	100.00 k	22.430800 G	-57.10	-200.00

Fig A5 High Channel Conducted Spurious Emissions 18GHz – 22.8GHz



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
22.800 G	23.200 G	100.00 k	22.911400 G	-55.10	-200.00
23.200 G	23.600 G	100.00 k	23.507450 G	-54.76	-200.00
23.600 G	24.000 G	100.00 k	23.663550 G	-53.51	-200.00
24.000 G	24.400 G	100.00 k	24.116750 G	-52.72	-200.00
24.400 G	24.800 G	100.00 k	24.706200 G	-52.35	-200.00
24.800 G	25.200 G	100.00 k	24.881400 G	-51.38	-200.00
25.200 G	25.600 G	100.00 k	25.271050 G	-52.05	-200.00
25.600 G	26.000 G	100.00 k	25.991150 G	-53.20	-200.00
26.000 G	26.400 G	100.00 k	26.045300 G	-52.34	-200.00
26.400 G	26.500 G	100.00 k	26.495288 G	-52.68	-200.00

Fig A6 High Channel Conducted Spurious Emissions 22.8GHz – 26.5GHz

Date: 18.JUN.2018 12:26:57

Appendix B

Radiated tests for Band Edges /Restricted band

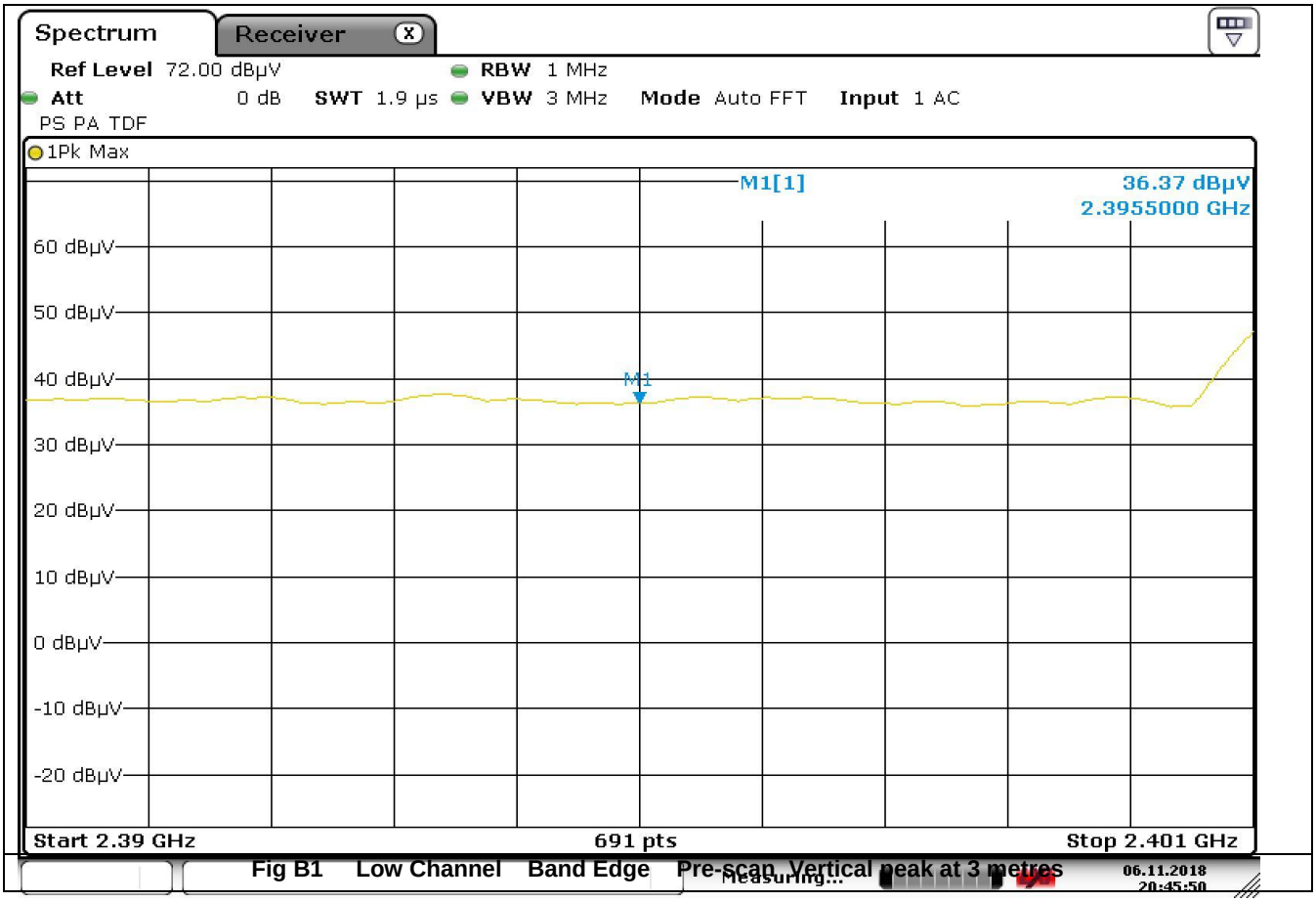


Fig B1 Low Channel Band Edge Pre-scan Vertical peak at 3 metres

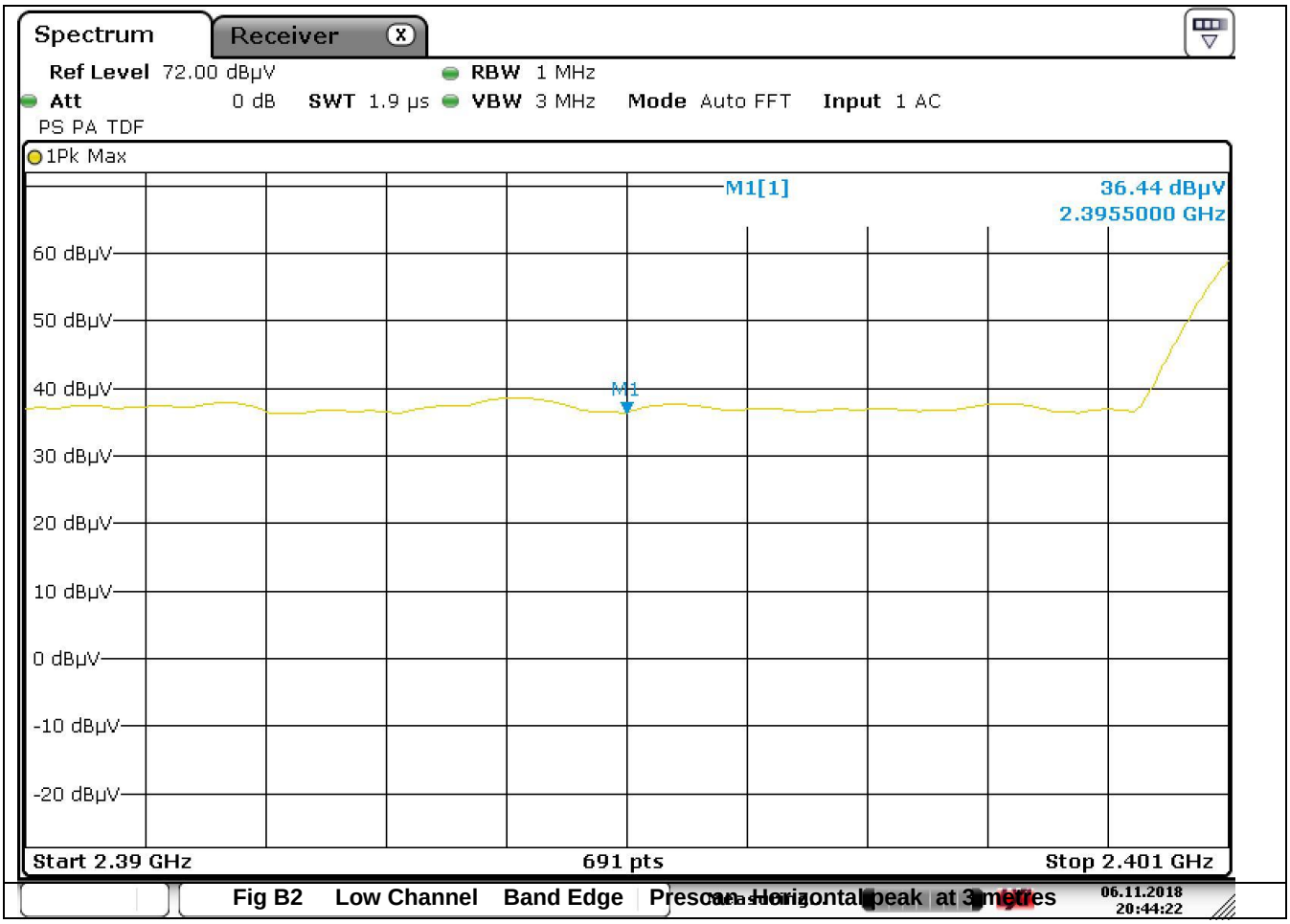


Fig B2 Low Channel Band Edge Pre-scan Horizontal peak at 3 metres

Date: 6.NOV.2018 20:44:22

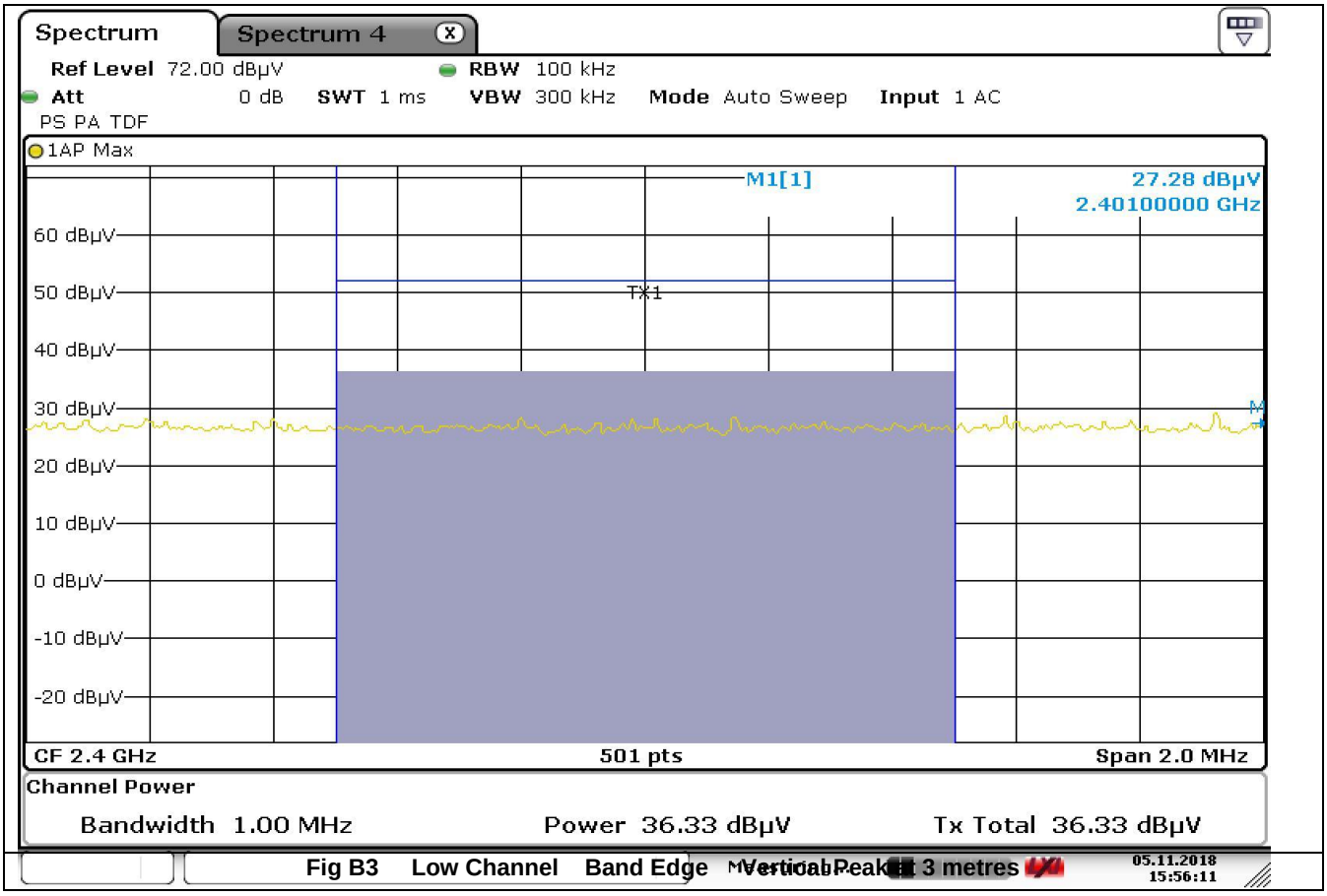


Fig B3 Low Channel Band Edge Vertical Peak at 3 metres

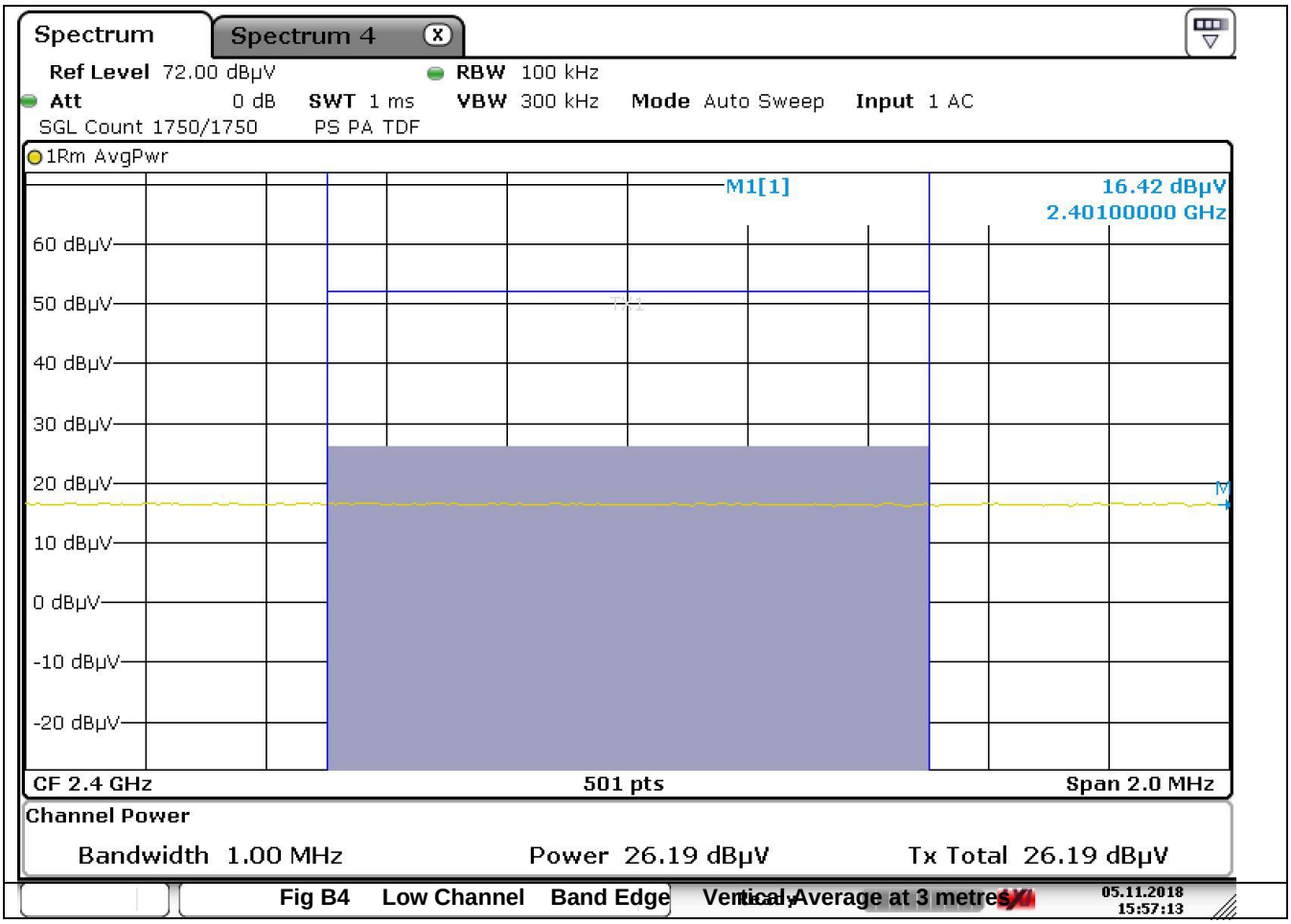


Fig B4 Low Channel Band Edge Vertical Average at 3 metres

Date: 5.NOV.2018 15:57:13

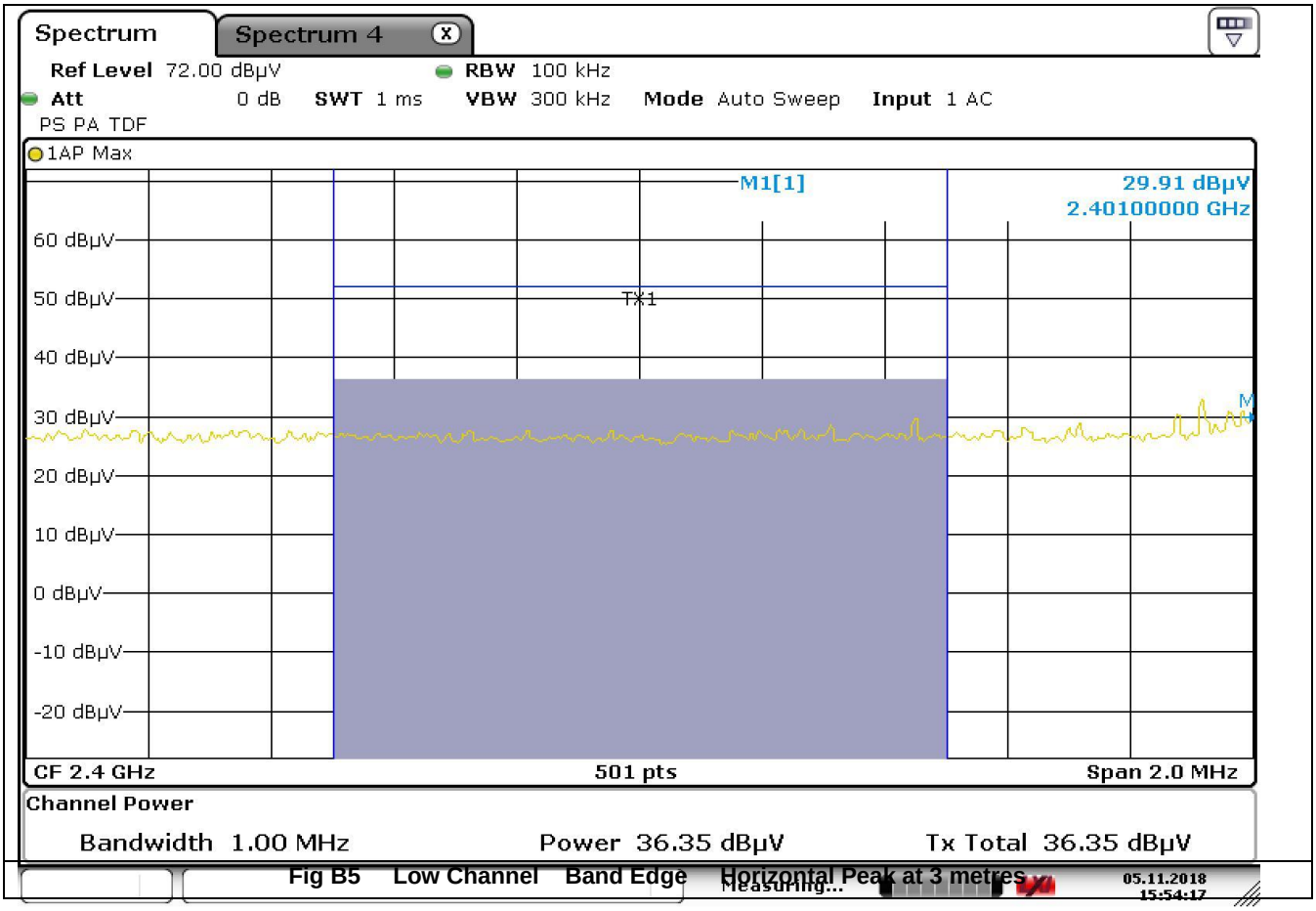


Fig B5 Low Channel Band Edge Horizontal Peak at 3 metres

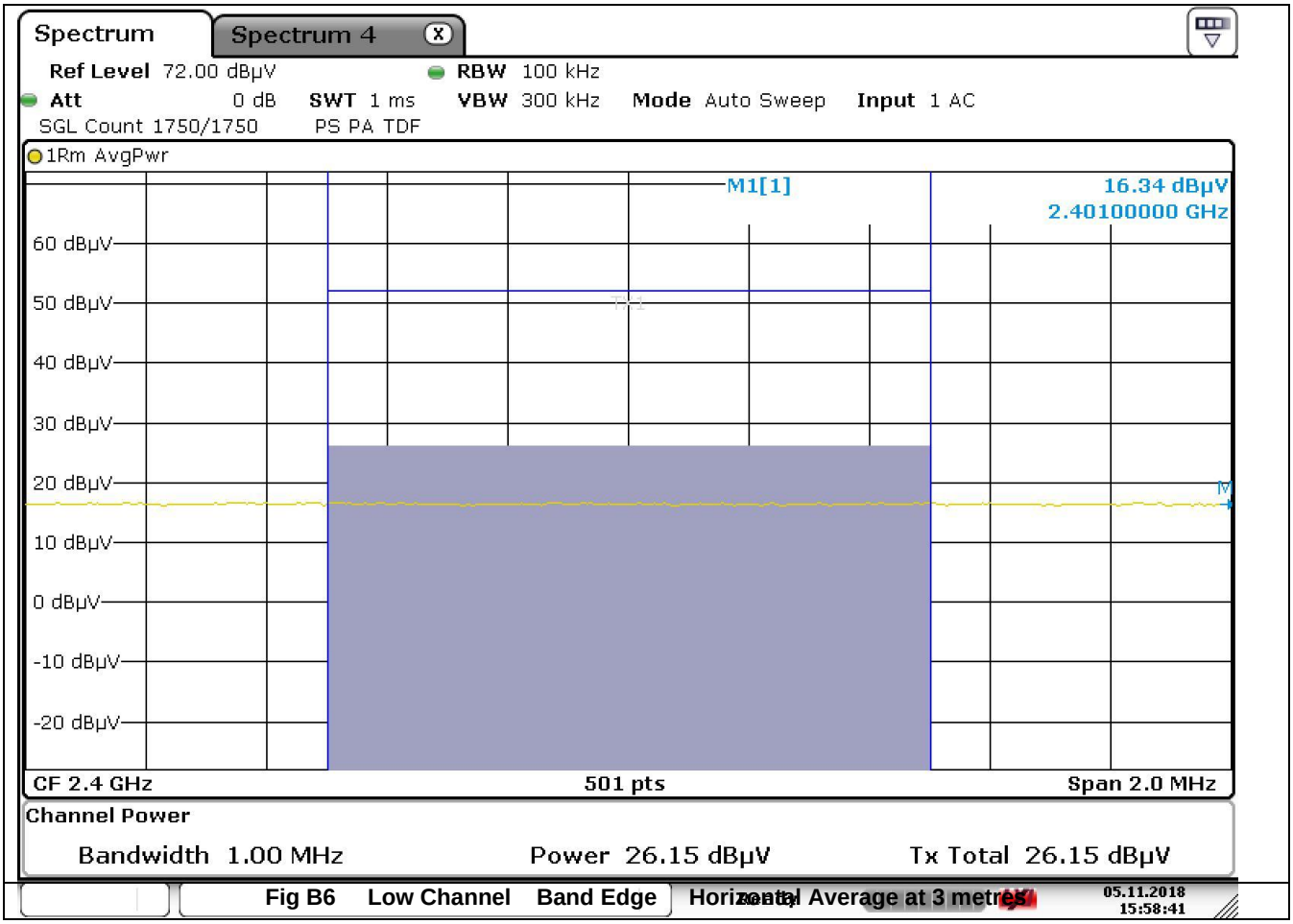


Fig B6 Low Channel Band Edge Horizontal Average at 3 metres

Date: 5.NOV.2018 15:58:40

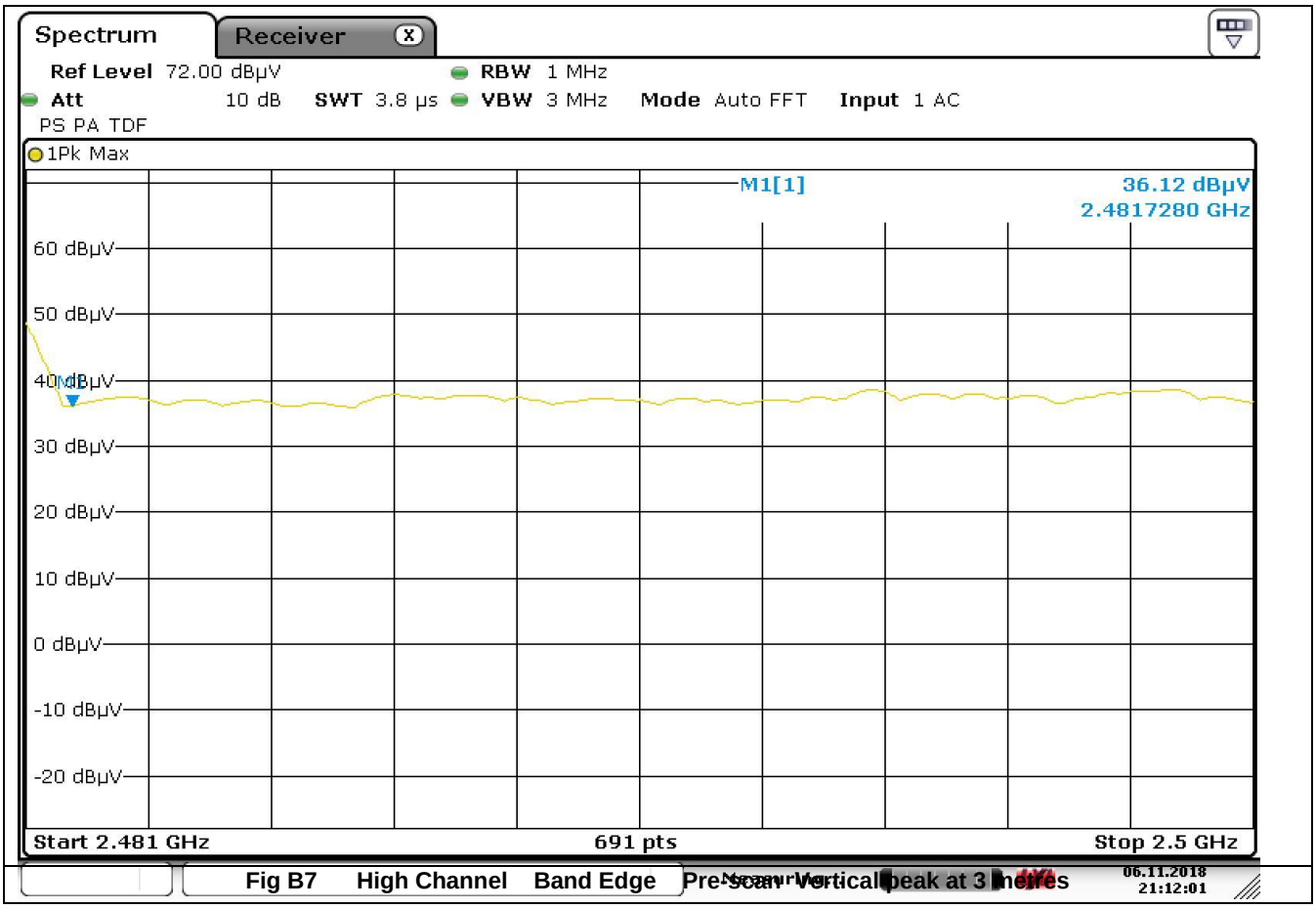


Fig B7 High Channel Band Edge Pre-scan Vertical peak at 3 metres

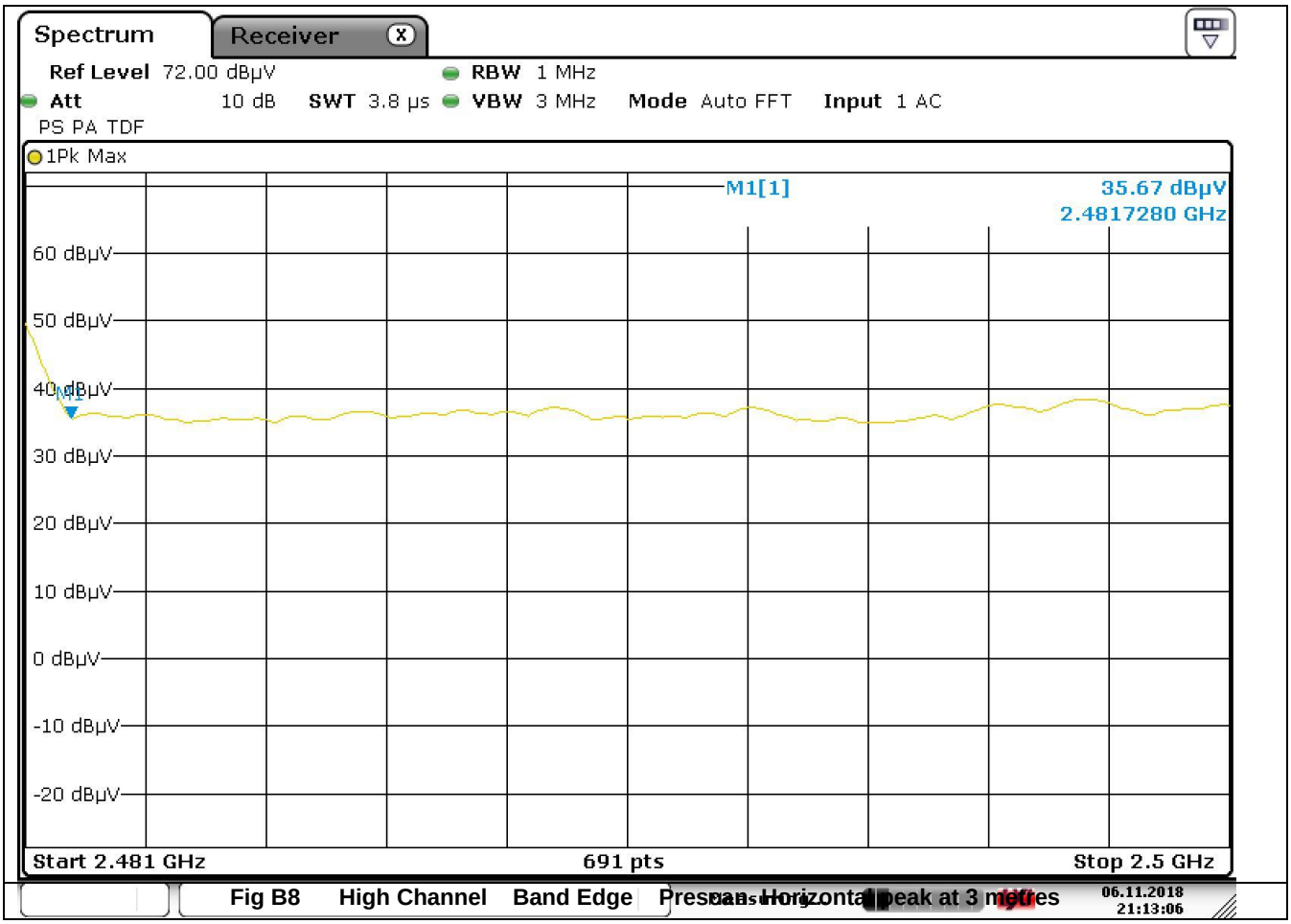


Fig B8 High Channel Band Edge Pre-scan Horizontal peak at 3 metres

Date: 6.NOV.2018 21:13:05

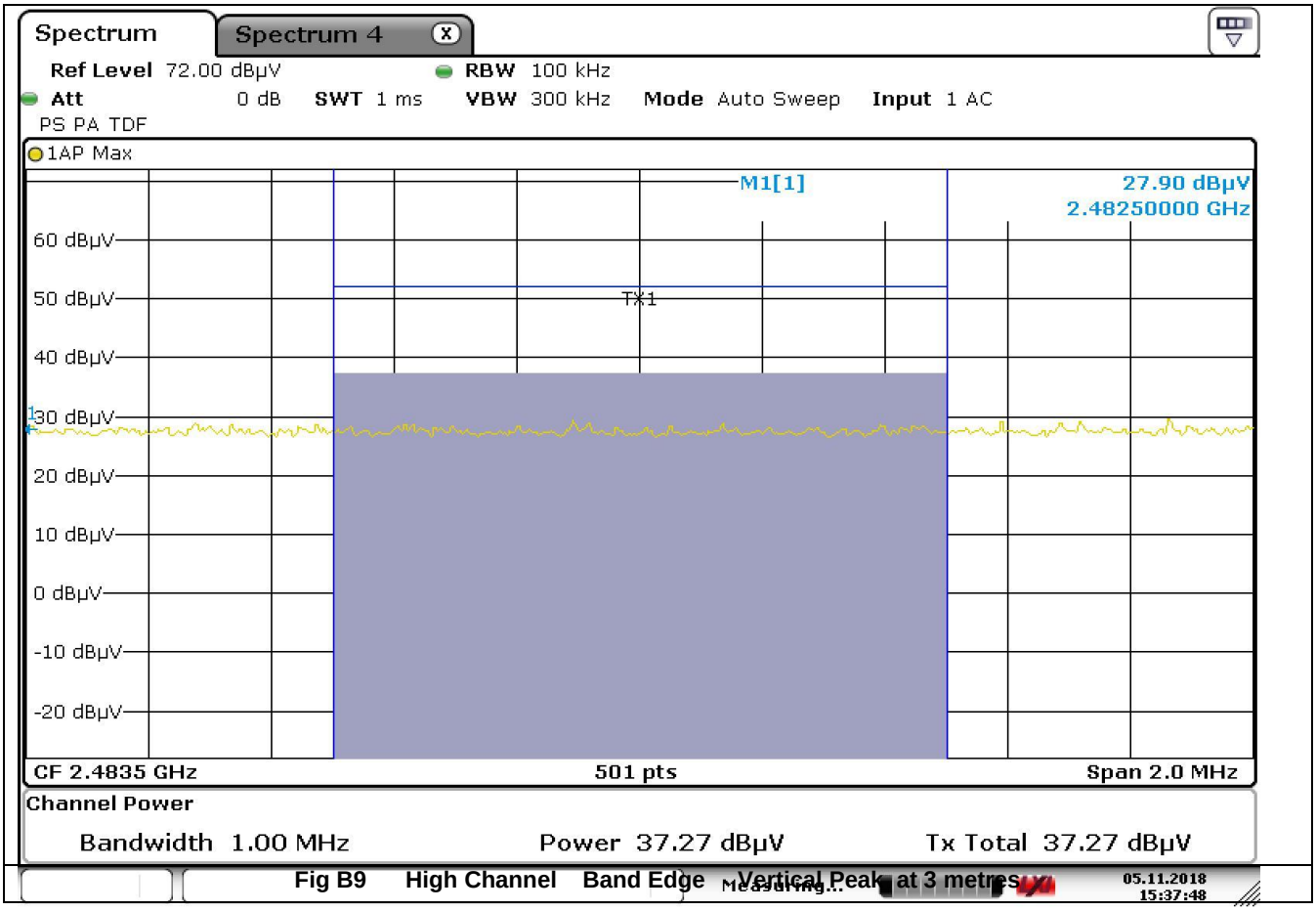


Fig B9 High Channel Band Edge Vertical Peak at 3 metres

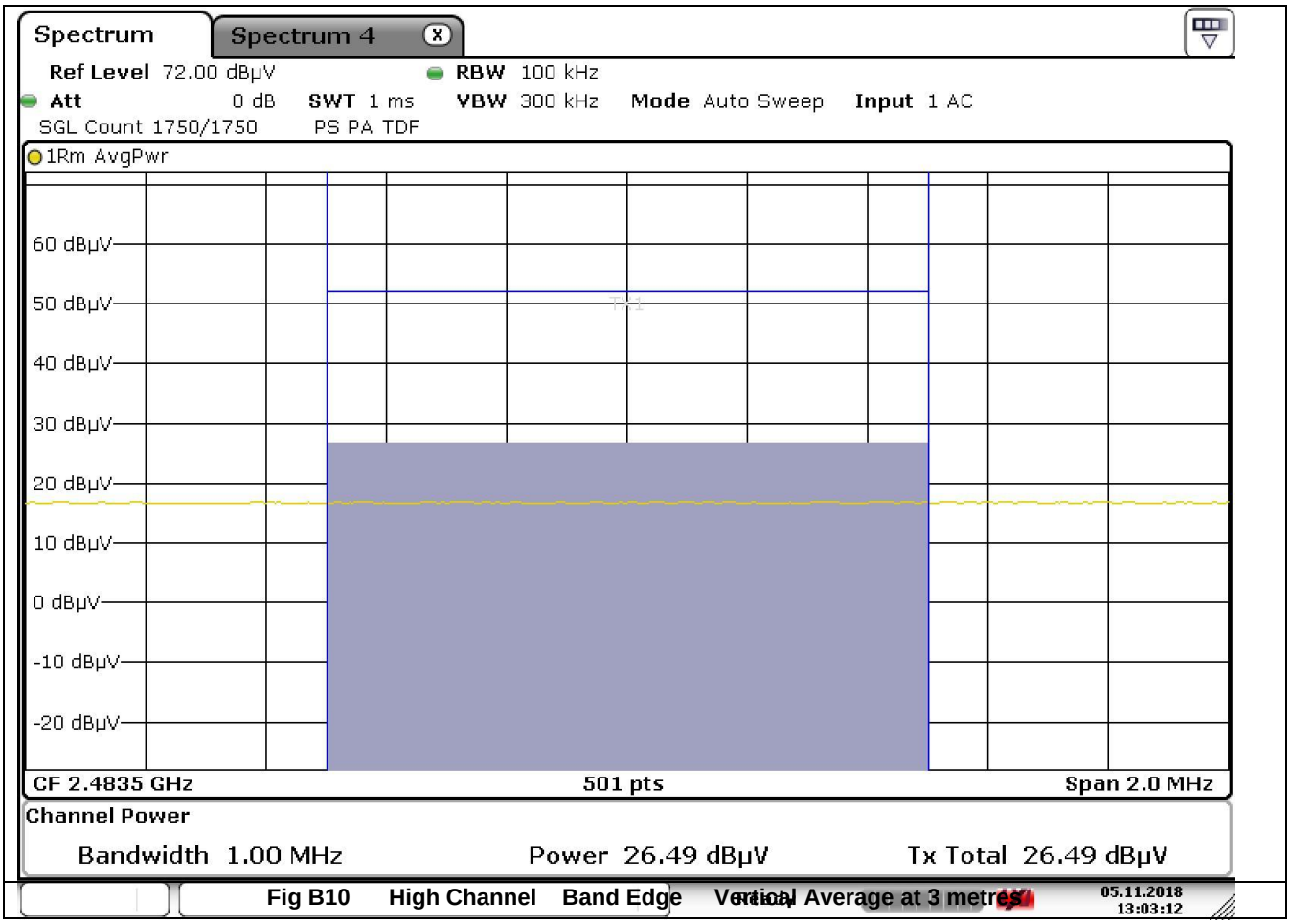


Fig B10 High Channel Band Edge Vertical Average at 3 metres

Date: 5.NOV.2018 13:03:12

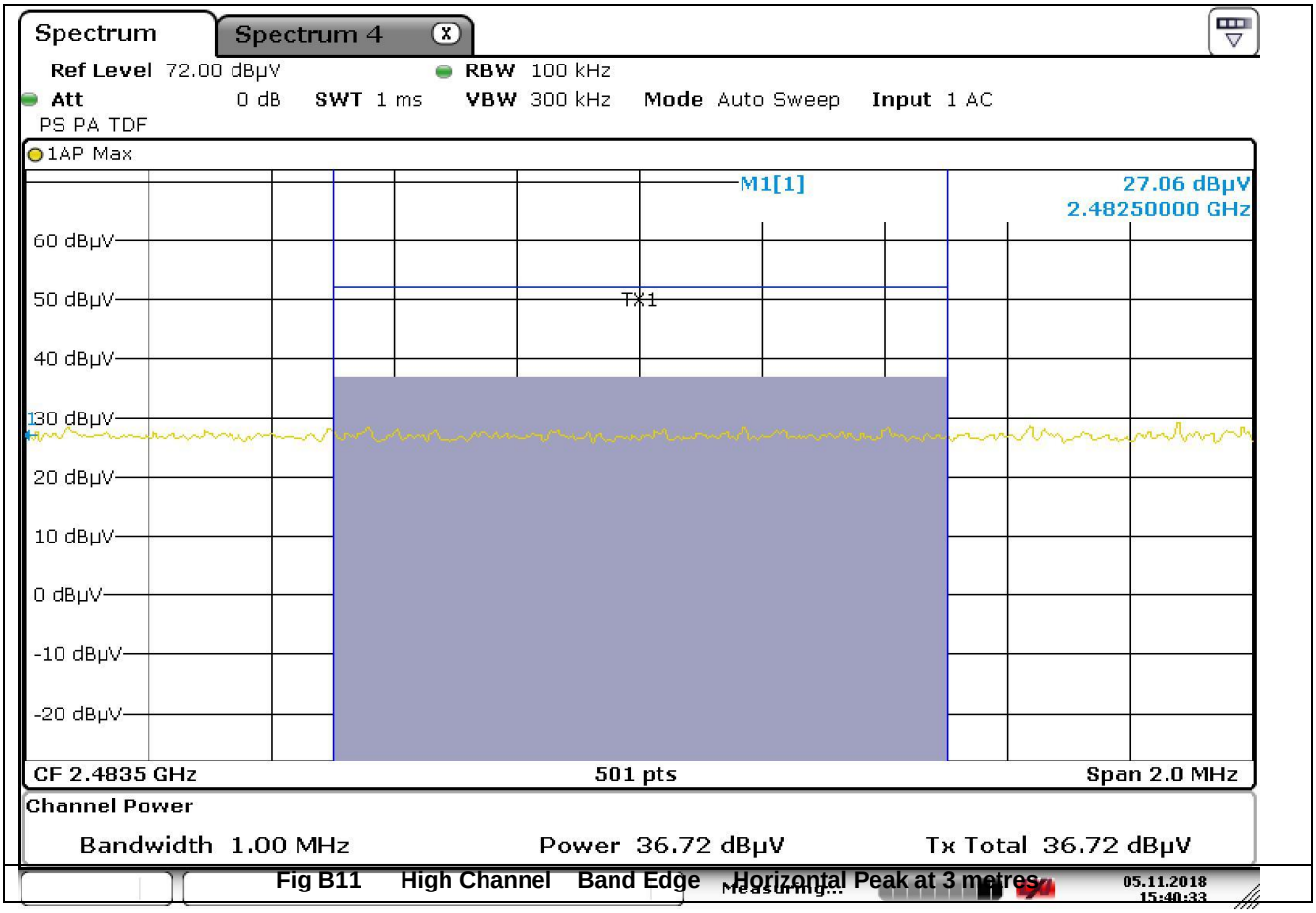


Fig B11 High Channel Band Edge Horizontal Peak at 3 metres

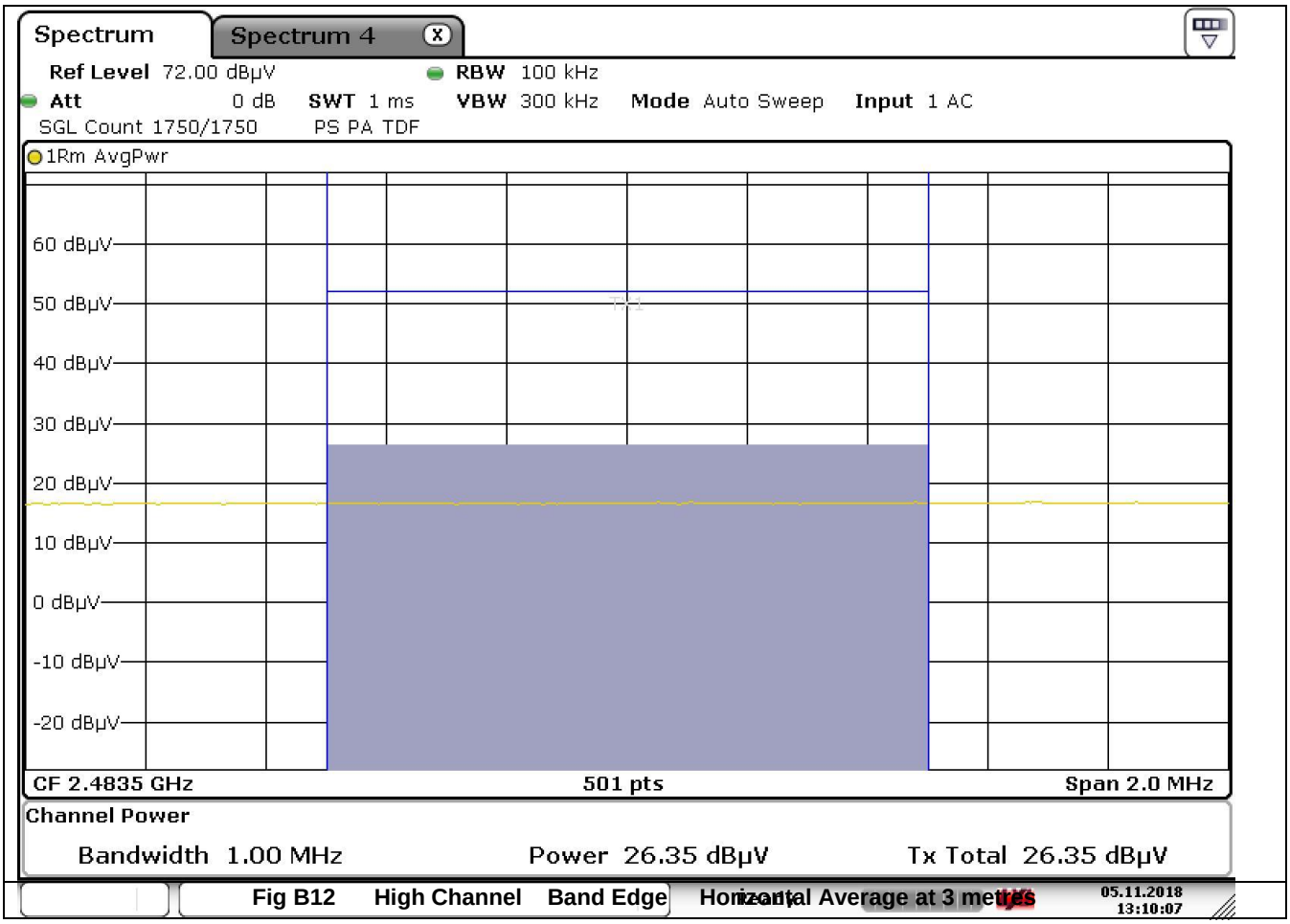


Fig B12 High Channel Band Edge Horizontal Average at 3 metres

Date: 5.NOV.2018 13:10:07

Appendix C

Radiated Spurious Emissions
Radiated sample

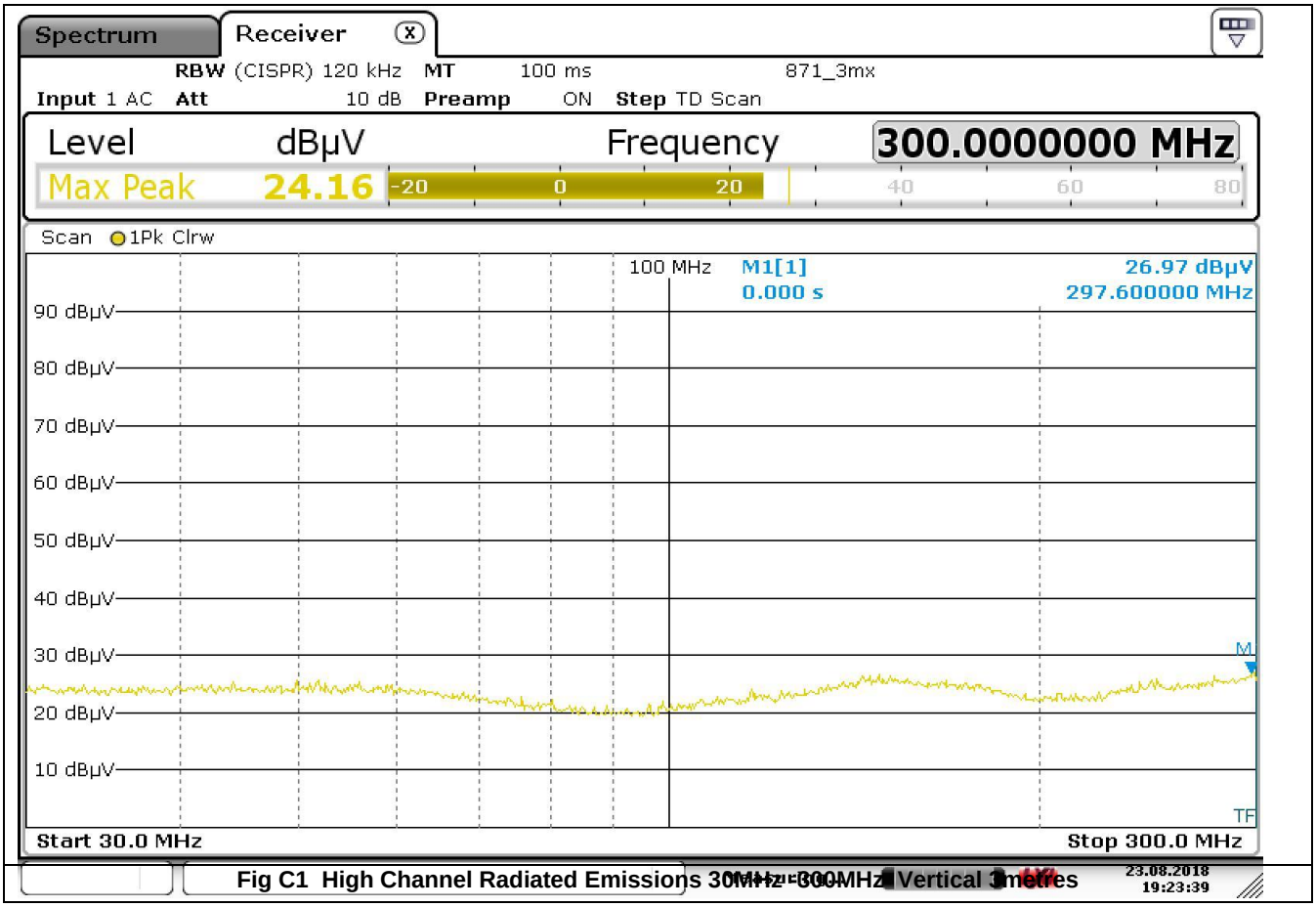


Fig C1 High Channel Radiated Emissions 30MHz-300MHz Vertical 3metres

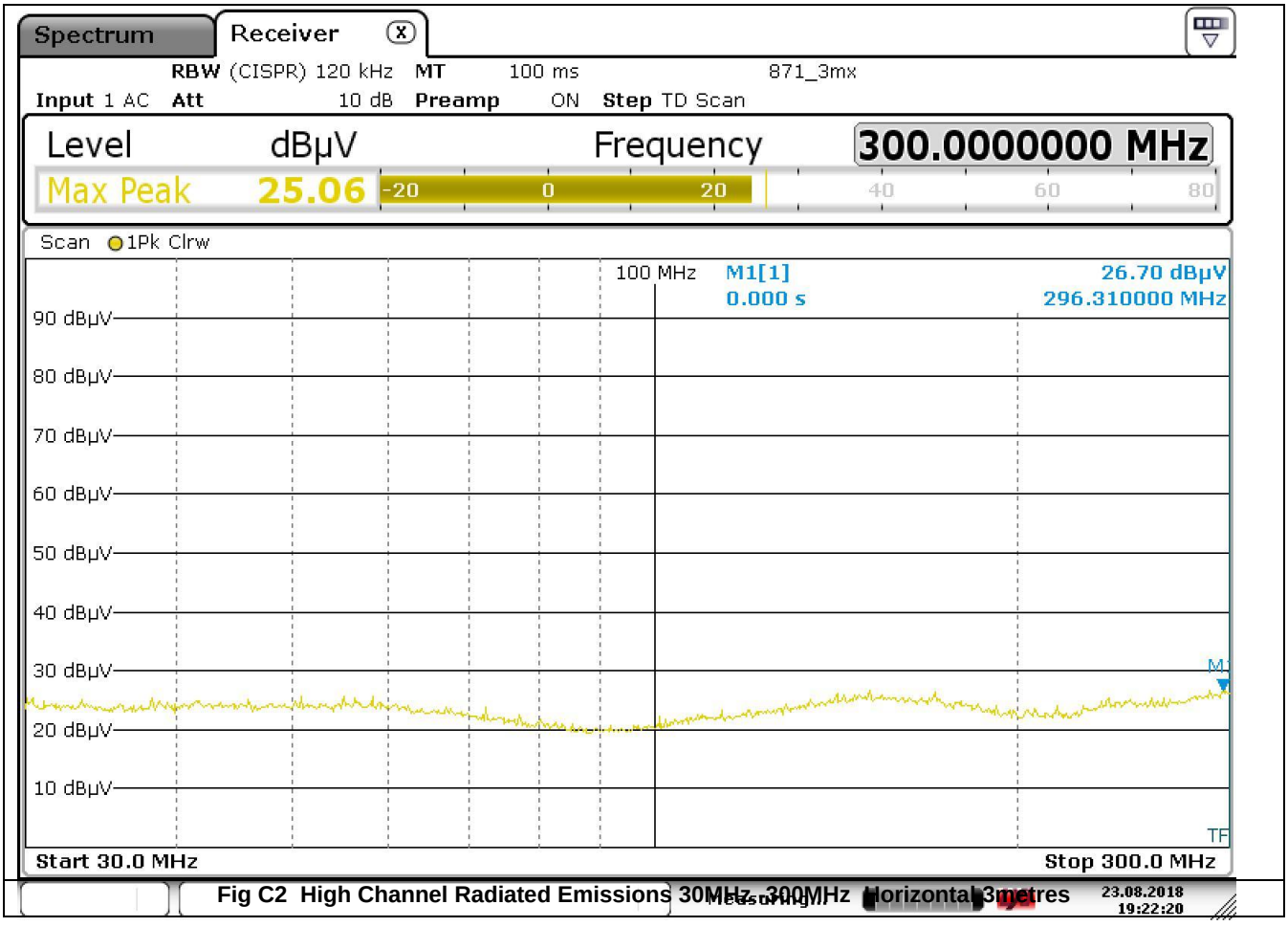


Fig C2 High Channel Radiated Emissions 30MHz-300MHz Horizontal 3metres

Date: 23.AUG.2018 19:22:20

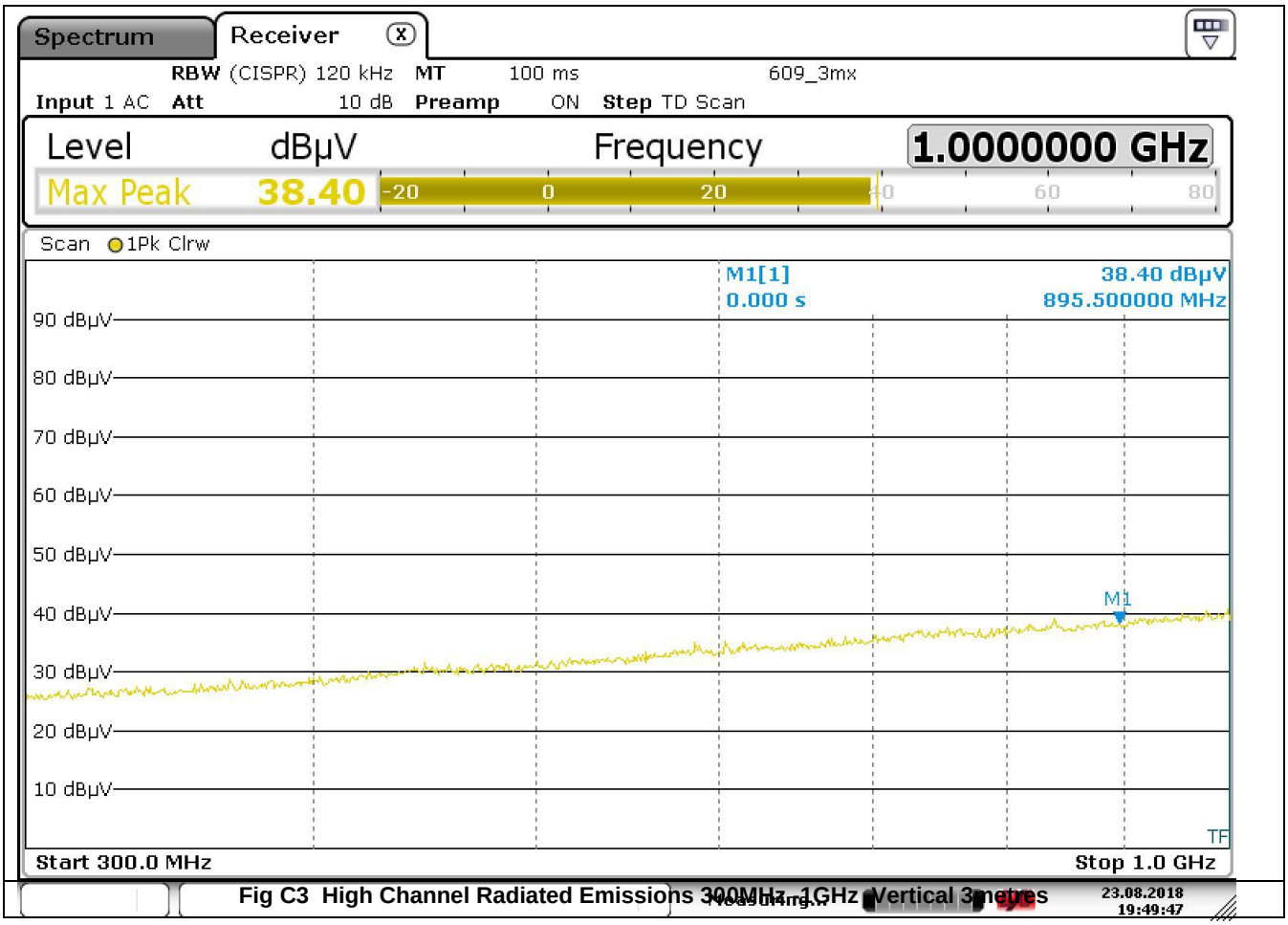


Fig C3 High Channel Radiated Emissions 300MHz-1GHz Vertical 3metres

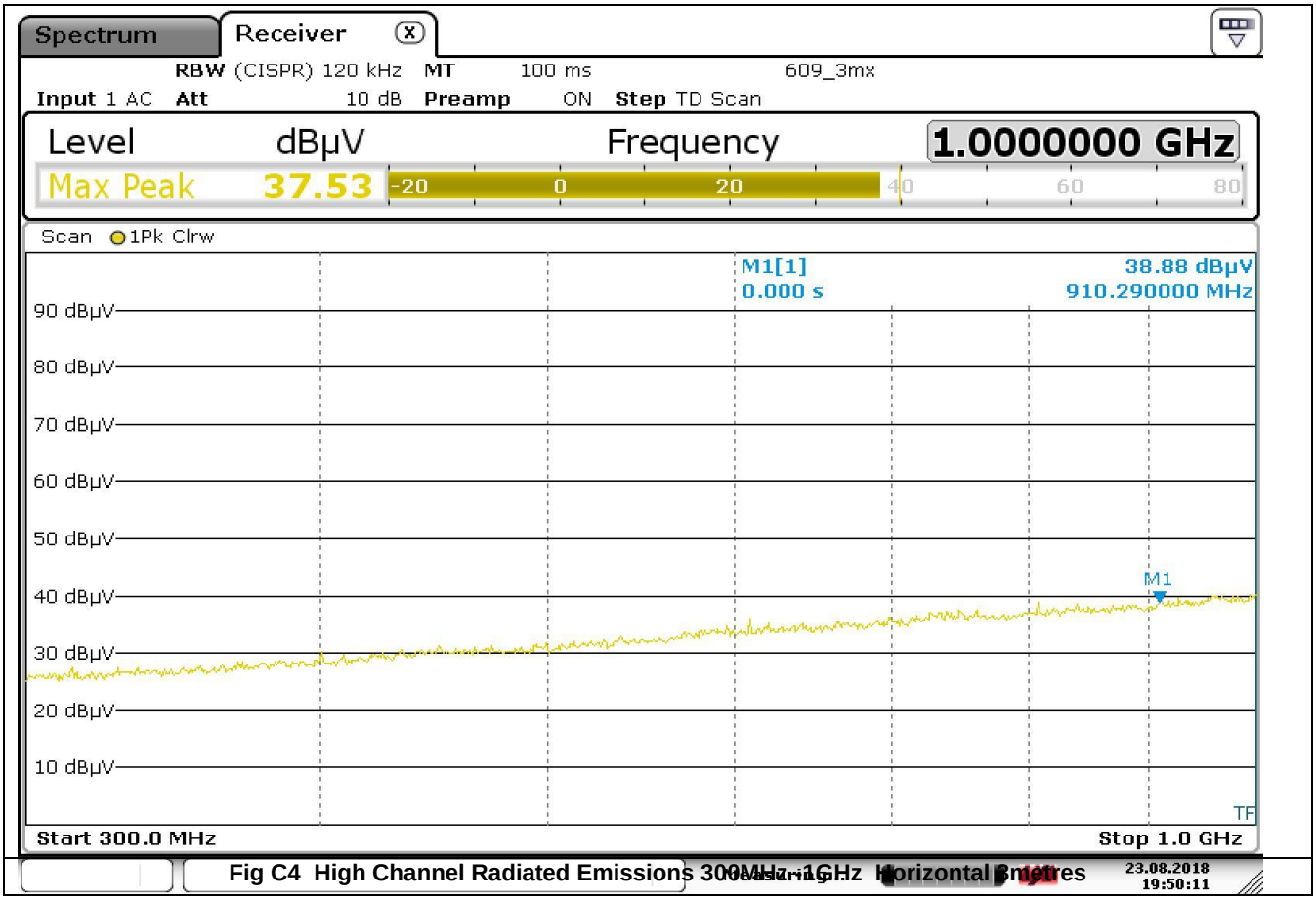


Fig C4 High Channel Radiated Emissions 300MHz-1GHz Horizontal 3metres

Date: 23.AUG.2018 19:50:11

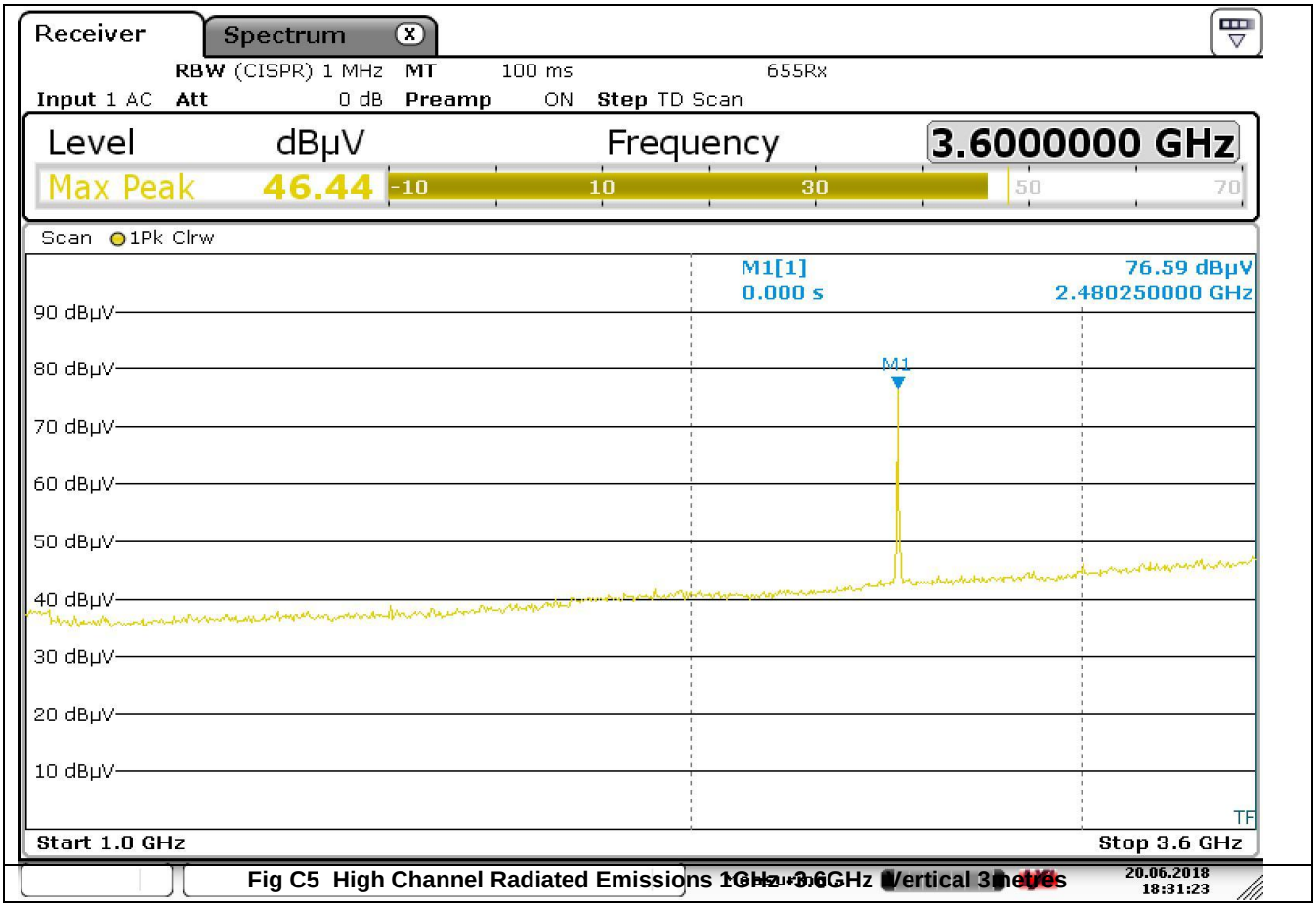


Fig C5 High Channel Radiated Emissions 1GHz-3.6GHz Vertical 3metres

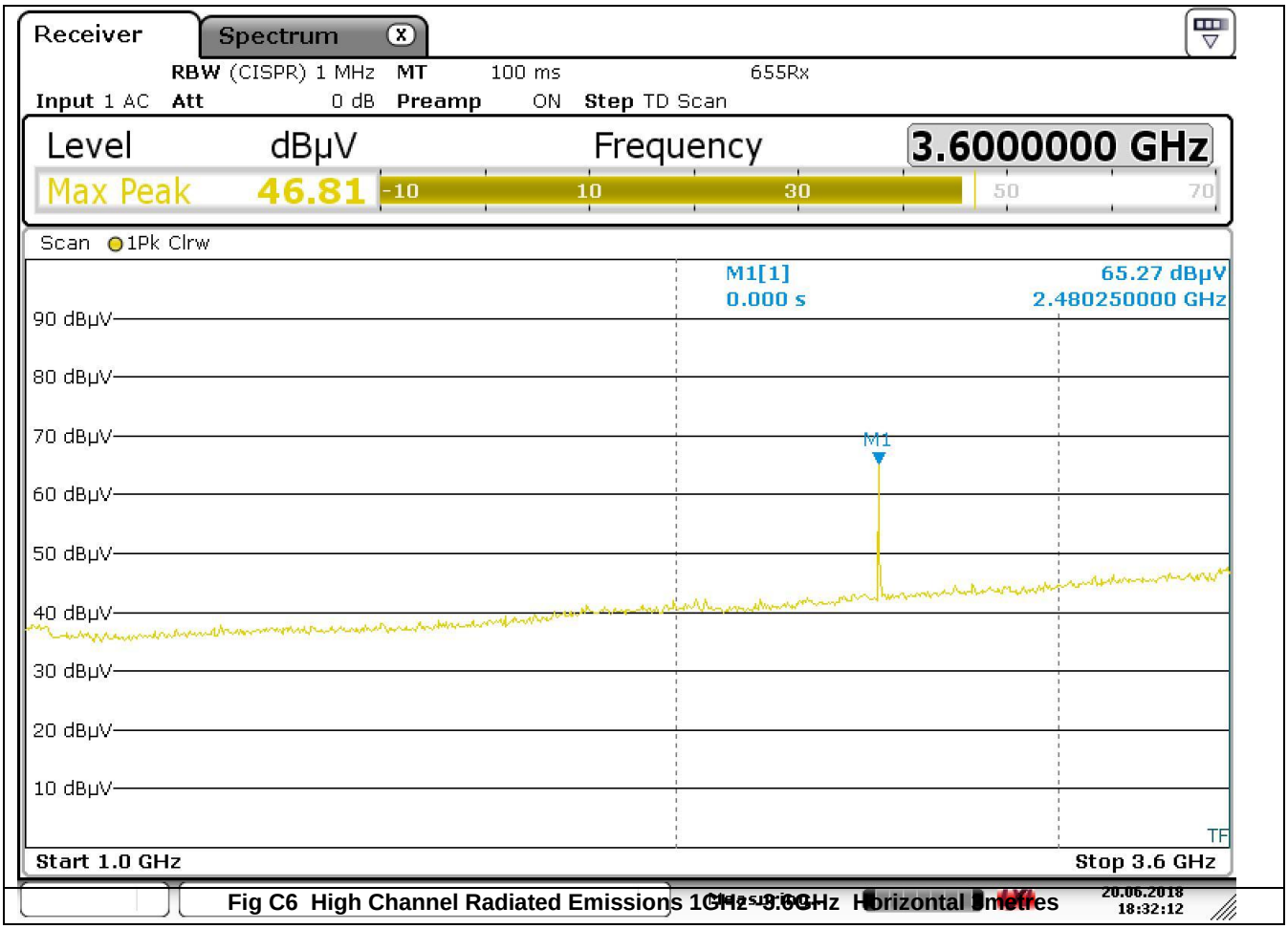
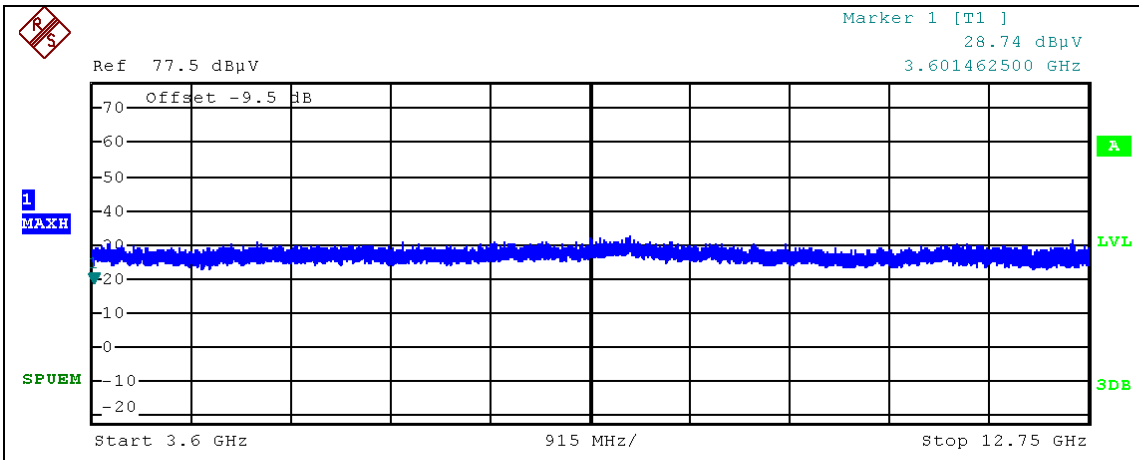


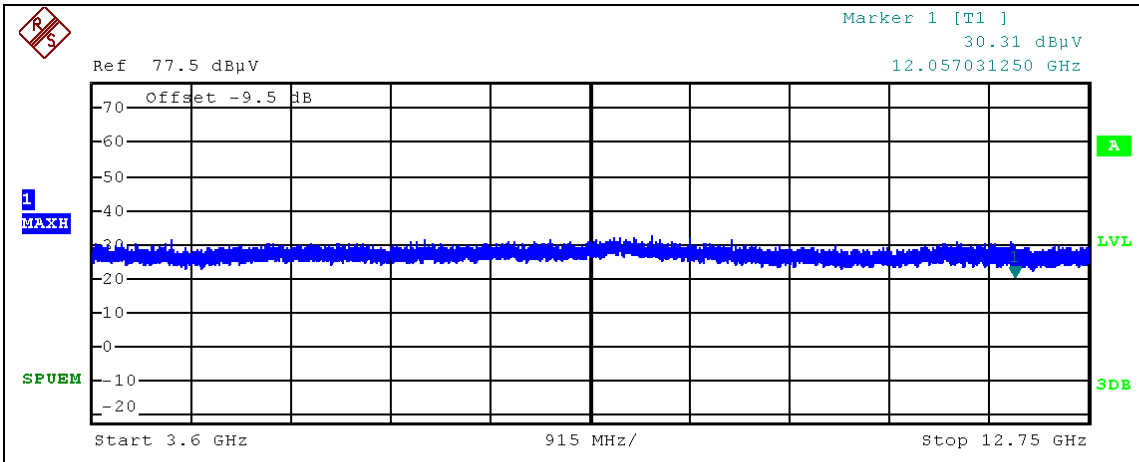
Fig C6 High Channel Radiated Emissions 1GHz-3.6GHz Horizontal 3metres

Date: 20.JUN.2018 18:32:12



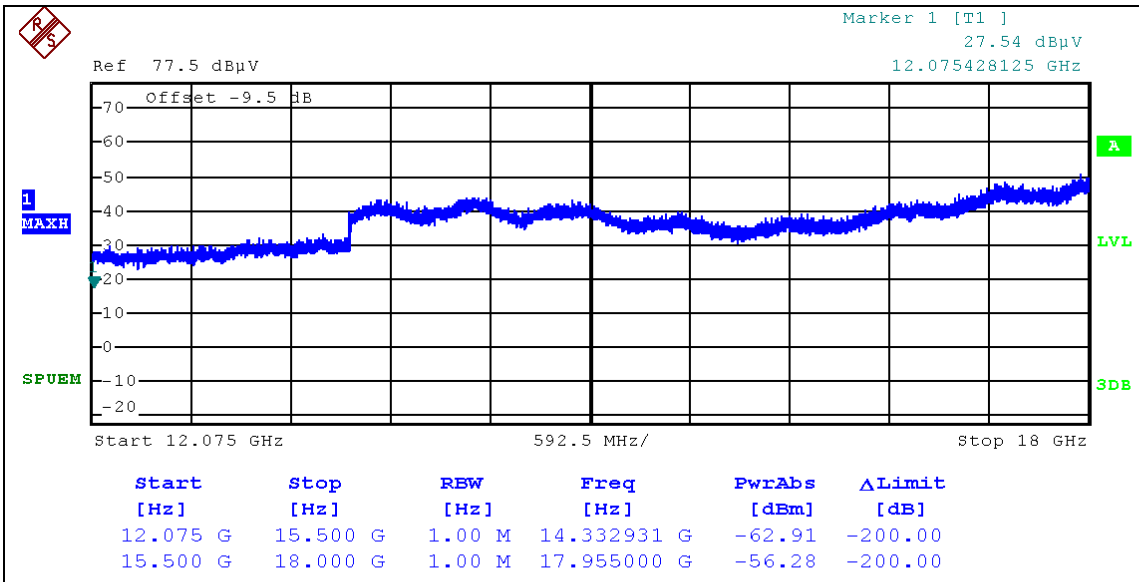
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
3.600 G	7.500 G	1.00 M	6.458213 G	-75.79	-200.00
7.500 G	11.500 G	1.00 M	8.545000 G	-74.49	-200.00
11.500 G	12.750 G	1.00 M	12.595000 G	-75.49	-200.00

Fig C7 High Channel Radiated Emissions 3.6GHz -12.75GHz Vertical 1metre



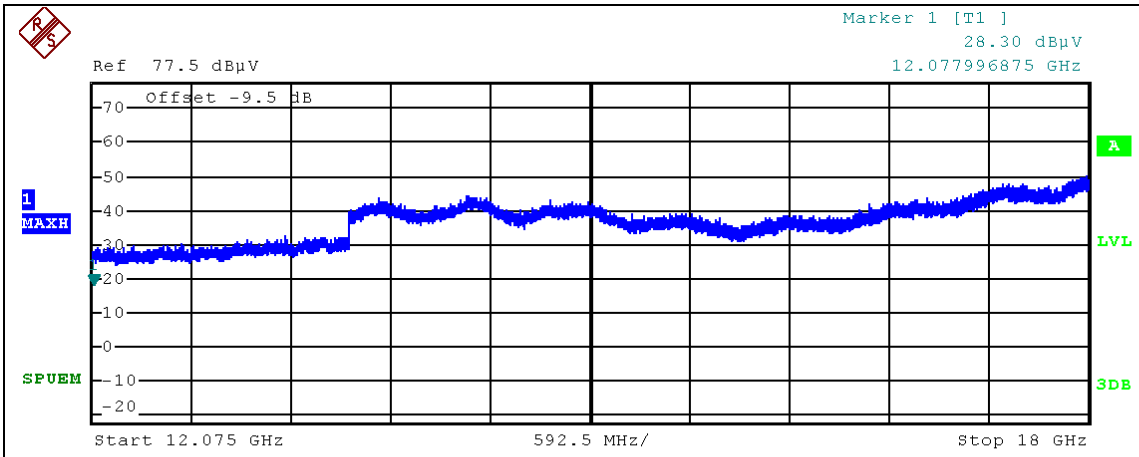
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
3.600 G	7.500 G	1.00 M	6.661988 G	-75.62	-200.00
7.500 G	11.500 G	1.00 M	8.742000 G	-74.14	-200.00
11.500 G	12.750 G	1.00 M	12.038750 G	-75.78	-200.00

Fig C8 High Channel Radiated Emissions 3.6GHz -12.75GHz Horizontal 1metre



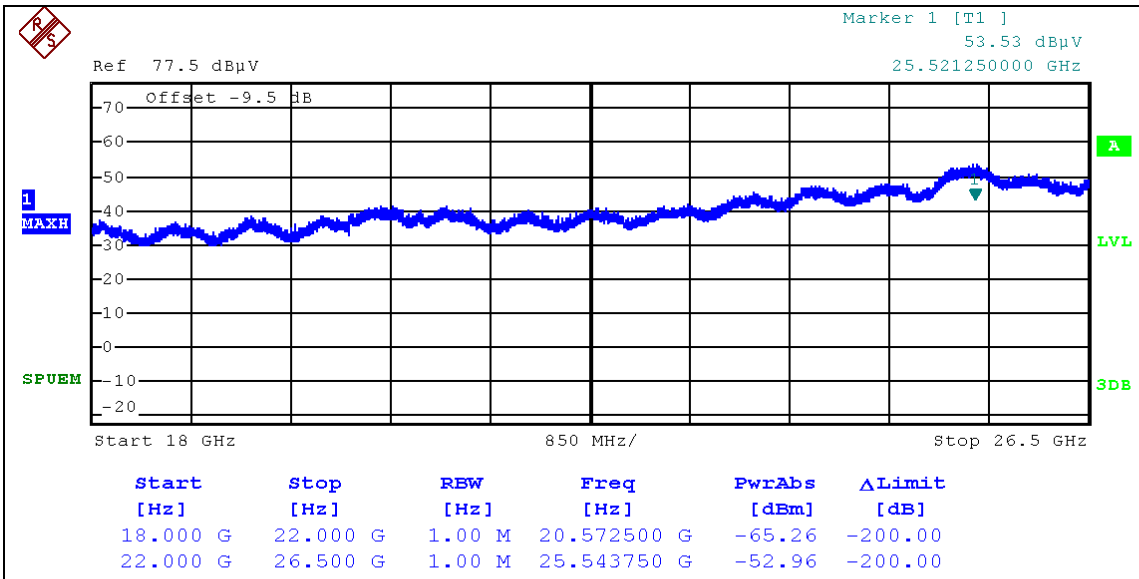
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
12.075 G	15.500 G	1.00 M	14.332931 G	-62.91	-200.00
15.500 G	18.000 G	1.00 M	17.955000 G	-56.28	-200.00

Fig C9 High Channel Radiated Emissions 13GHz -18GHz Vertical 1metre



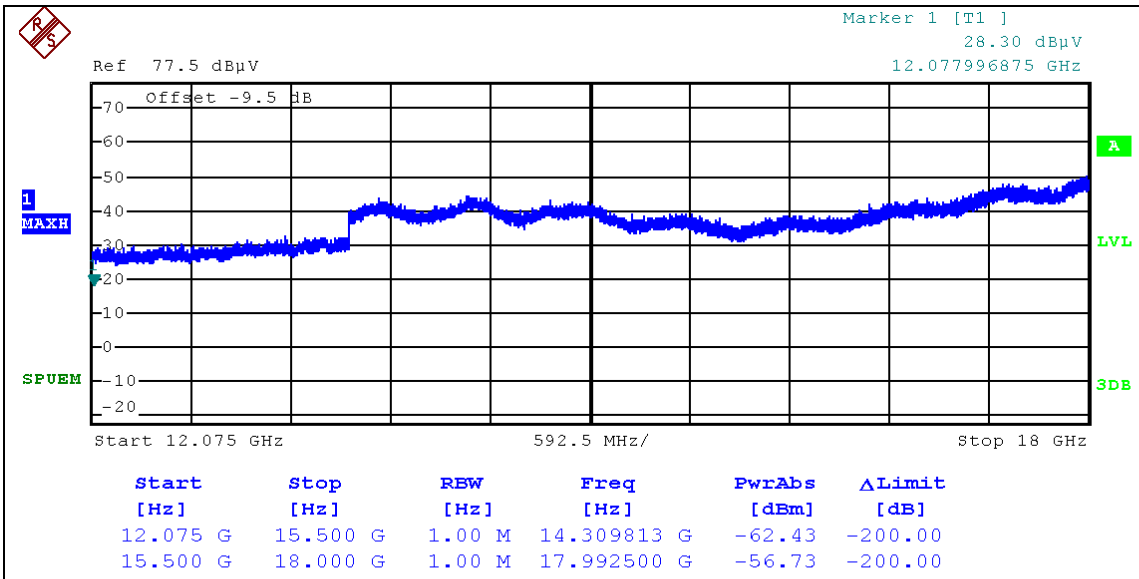
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
12.075 G	15.500 G	1.00 M	14.309813 G	-62.43	-200.00
15.500 G	18.000 G	1.00 M	17.992500 G	-56.73	-200.00

Fig C10 High Channel Radiated Emissions 13GHz -18GHz Horizontal 1metre



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
18.000 G	22.000 G	1.00 M	20.572500 G	-65.26	-200.00
22.000 G	26.500 G	1.00 M	25.543750 G	-52.96	-200.00

Fig C11 High Channel Radiated Emissions 18GHz -26GHz Vertical 1 metre



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
12.075 G	15.500 G	1.00 M	14.309813 G	-62.43	-200.00
15.500 G	18.000 G	1.00 M	17.992500 G	-56.73	-200.00

Fig C12 High Channel Radiated Emissions 18GHz -26GHz Horizontal 1metre

Date: 20.JUN.2018 19:02:32

End of Report