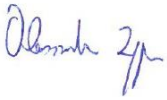
Test Report

47 CFR FCC Part 15 subpart C
Intentional Radiators

Report reference no. ..... :	28111906 009	
FCC Designation Number ..... :	IT0008	
FCC Test Firm Registration # ..... :	804595	
Tested by (name + signature)…….:	Alessandro Zappa\ Tester	
Approved by (name + signature)……:	Giovanni Molteni \ TM	
Date of issue ..... :	18-Dec-2018	
Total number of pages ..... :	67 Pages	
Testing Laboratory ..... :	TÜV Rheinland Italia S.r.l.	
Address ..... :	Via Mattei 3 - 20010 - Pogliano Milanese (MI) – Italy	
Applicant's name ..... :	Sony Mobile Communication AB	
Address ..... :	Nya Vattentornet, 223 62 Lund	
Test item description ..... :	BLE Device	
Trade Mark ..... :	Advagym/SONY	
Manufacturer ..... :	Sony Mobile Communications Inc, (NOTE AB)	
FCC ID ..... :	PY7-13006N	
Ratings ..... :	Batteries Operated – 4 x 1.5V non rechargeable batteries	
Sample ..... :		
Samples received on ..... :	24-August-2018	
TUV reference samples ..... :	---	
Samples tested n. ..... :	1	
Testing ..... :		
Start Date: ..... :	24-August-2018	
End Date: ..... :	31-August-2018	

The results in this Test Report are exclusively referred to the tested samples.
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Compliance with performed tests and recorded in this technical report does not give presumption of compliance to all requirements of the reference standard

SUMMARY

RELEASE CONTROL RECORD		
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
28111906_001	Original release	31-August-2018
28111906_005	-Section 2: updated reference standard table (used last version of KDB 558074 D01 15.247 August 24,2018). - Section 13: added information that for emission measurements below 30 MHz SAC has been characterized so that the measurements correspond to those obtained at an open-field test site - Section 15: RF output power. Retested with RBW=1MHz , VBW=3MHz , span=3MHz - Section 16 : Out of band emissions. Added graph of fundamental as reference level - Added procedure (section) of KDB 558074 D01 and ANSI C63.10 for every test item	10-Jenuary-2019
28111906_009	- Section 11: added information that EUT duty cycle is 100%	01-April-2019

1. Reference Standards

Standard	Description
FCC Part 15 (Subpart C)	§15.247 Operation within the bands 902-928 MHz, 2400-2483,5 MHz, and 5725-5850 MHz.
FCC Part 15 (Subpart C)	§15.207 Conducted Limits
FCC Part 15 (Subpart C)	§15.209 Radiated emission limits; general requirements
FCC Part 15 (Subpart C)	§15.203 Antenna Requirement
ANSI C63.10:2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074 D01 15.247 Meas Guidance v05:2018	Guidance for performing compliance measurements on digital transmission systems, frequency hopping spread spectrum system, and hybrid devices operating under §15.247

2. Summary of testing:

FCC Rule Part	Test Item	Result	Remarks
15.207	AC POWER CONDUCTED EMISSION	N/A	Batteries Operated
15.205 15.209 15.247(d)	RADIATED EMISSIONS	PASS	Meet the requirement of limit
15.247(a)(2)	6dB BANDWIDTH	PASS	Meet the requirement of limit
15.247(b)(3)	OUTPUT POWER	PASS	Meet the requirement of limit
15.247(d)	OUT OF BAND EMISSIONS	PASS	Meet the requirement of limit
15.247(d)	100 kHz Bandwidth of Frequency Band Edges	PASS	Meet the requirement of limit
15.247(e)	POWER SPECTRAL DENSITY	PASS	Meet the requirement of limit
15.203	ANTENNA REQUIREMENT	PASS	Integral Antenna

Possible test case verdicts:

- test case does not apply to the test object ....: N/A
- test object does meet the requirement .....: PASS
- test object does not meet the requirement ....: FAIL

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

3. PHOTOGRAPHIC DOCUMENTATION	
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4. General product information

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5. General Chipset information

Bluetooth Low Energy Chipset;

NORDIC Semiconductor; nRF52832

6. General Antennas information

Main unit antenna specification declared by the manufacturer

Antenna efficiency: -7.0dBi

7. **Photographic documentation**	
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8. Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Comments
EUT	BLE Device (main unit)	Sony Mobile Communications Inc	---	---
AE	PC	Dell	---	Used to set Bluetooth Channels

Note:

* Use :

EUT - Equipment Under Test,
AE - Auxiliary/Associated Equipment, or
SIM - Simulator (Not Subjected to Test)

No other Auxiliary/Associated Equipment was connected/installed on the EUT

9. Input/Output Ports:

CONNECTIONS

Port		Description	Connection	Cable lenght
1	Enclosure	Plastic	---	---
2	AC Power Port	AC	Not Present	---
3	DC Power Port	DC	Batteries Operated – 6V	---
4	LAN	TP	Not Present	---
5	USB	I/O	Not Present	---

*Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

10. Power Interface						
Mode #	**Voltage (Vdc)**	**Current (A)**	**Power (W)**	**Frequency (DC/AC-Hz)**	**Phases (#)**	**Comments**
1	6	--	--	--	--	---

11. EUT Operation Modes	
Operation mode	**Description**
#1	Continuous Bluetooth Modulation RF Transmission EUT duty cycle: 100% RF setting during tests: Frequency: 2402 MHz (low channel); 2440 MHz (mid channel); 2480 MHz (high channel);

12. EUT Configuration Modes	
Mode #	**Description**
1	EUT transmitting by means of PCB antenna (standard configuration)
2	EUT equipped with temporary SMA connector for RF conducted measurements

13. Test Conditions and Results – RADIATED EMISSION

13	TEST: Radiated Emission		PASS
Parameters required prior to the test		Laboratory Ambient Temperature (°C)	15 to 35 °C
		Relative Humidity (%)	30 to 60 %
Parameters recorded during the test		Laboratory Ambient Temperature (°C)	21°C
		Relative Humidity (%)	50%
		Air pressure (hPa)	1020
—		Power Mode	Application Point
Fully configured sample tested at the power line frequency		Batteries Operated	Enclosure
Equipment mode:		Operation mode	#1
FCC Standard		§15.205; §15.209; §15.247	

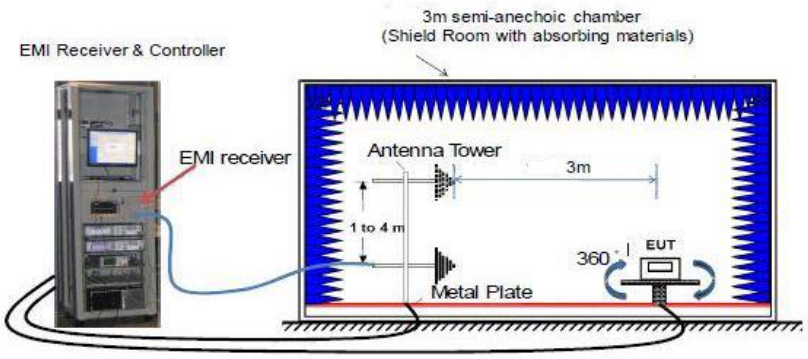
Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Remark: In accordance with part 15.31 (f) (2), where the measurement distance was specified to be 30 or 300 meters, a correction factor was applied in order to permit measurement to be performed at a separation distance. The applied formula for limits at 3 meter is:Extrapolation (dB) = 40log (300meter / 3meter) = +80db Extrapolation (dB) = 40log (30meter / 3meter) = +40dB.
According to KDB 414788 D01v01r01, for emission measurements below 30 MHz semi-anechoic chamber has been characterized so that the measurements correspond to those obtained at an open-field test site

Further information to test setup



Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
CSSA	ETS Lindgren	FACT3	87020484	06/2017	06/2019
EMI Test Receiver	R&S	ESW44	87020967	06/2018	06/2019
Loop Antenna	EMCO	6512	87020465	02/2017	02/2020
Antenna BiConiLog	ETS Lindgren	3124E	87020457	04/2017	04/2020
Antenna Horn with Preamplifier	ETS Lindgren	3117-PA	87020458	04/2017	04/2020
2xAntenna Horn with Preamplifier	ETS Lindgren	114514 120722	87020459 87020460	04/2017	04/2020
Highpass Filter	Wainwright Instr.	WHKX10-2520-2800-18000-40ss	87020799	05/2018	05/2019

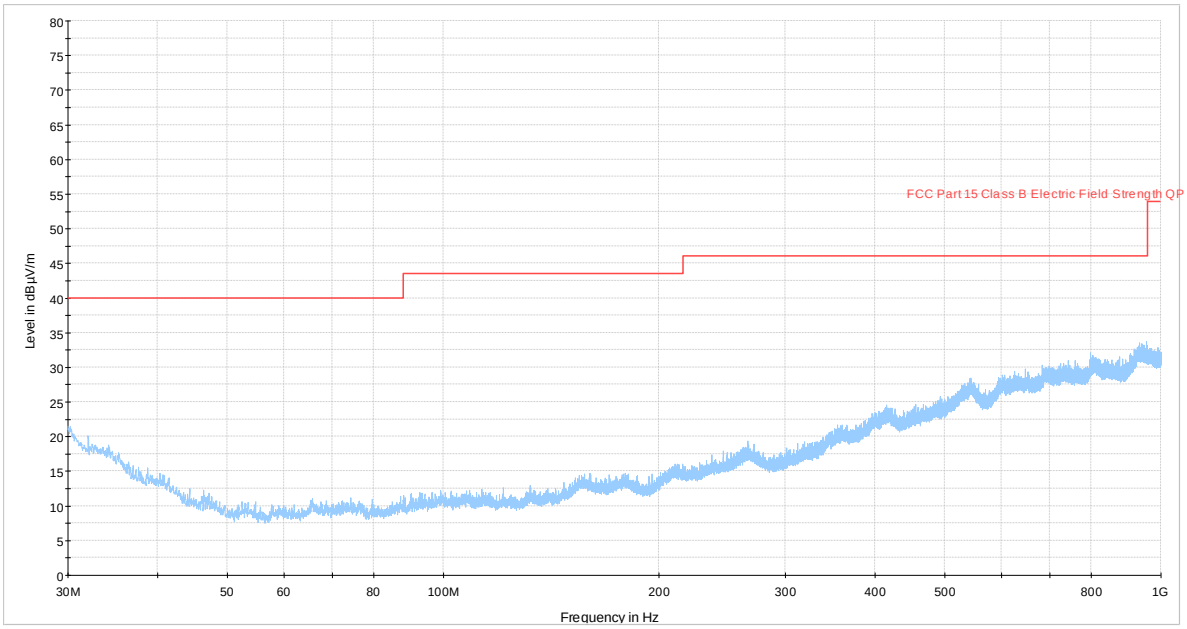
Test Procedure
In accordance to sections 6.3, 6.4, 6.5, 6.6 of ANSI C63.10

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Low Channel (2402 MHz)
Frequency: 9kHz – 30MHz

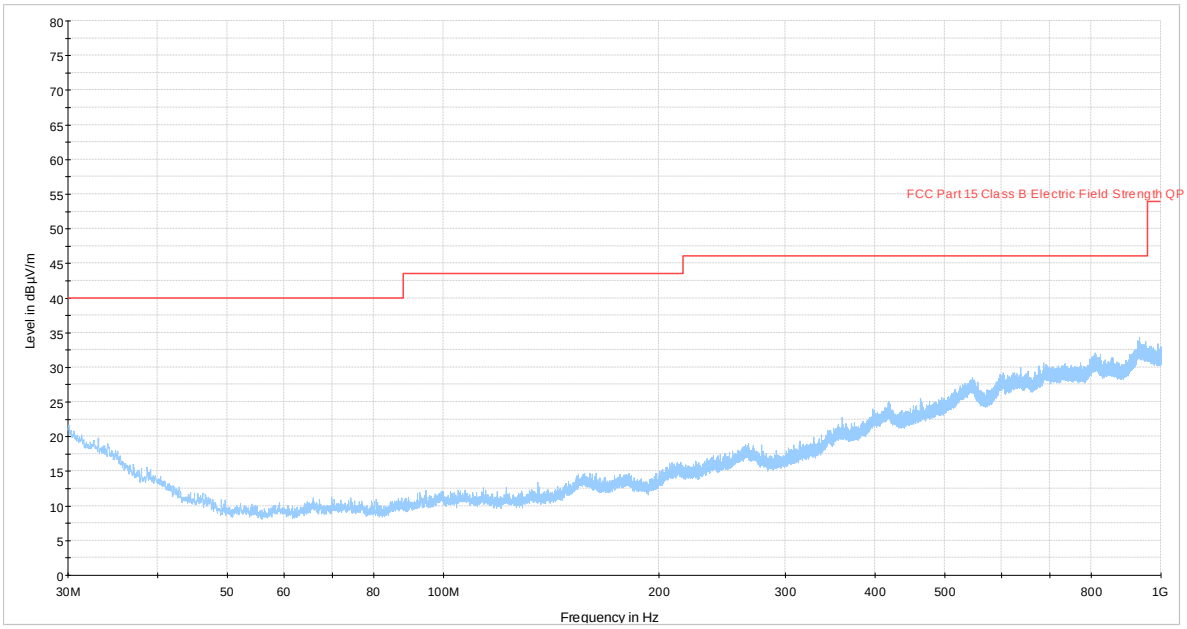
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Middle Channel (2440 MHz)
Frequency: 9kHz – 30MHz

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – High Channel (2480 MHz)
Frequency: 9kHz – 30MHz

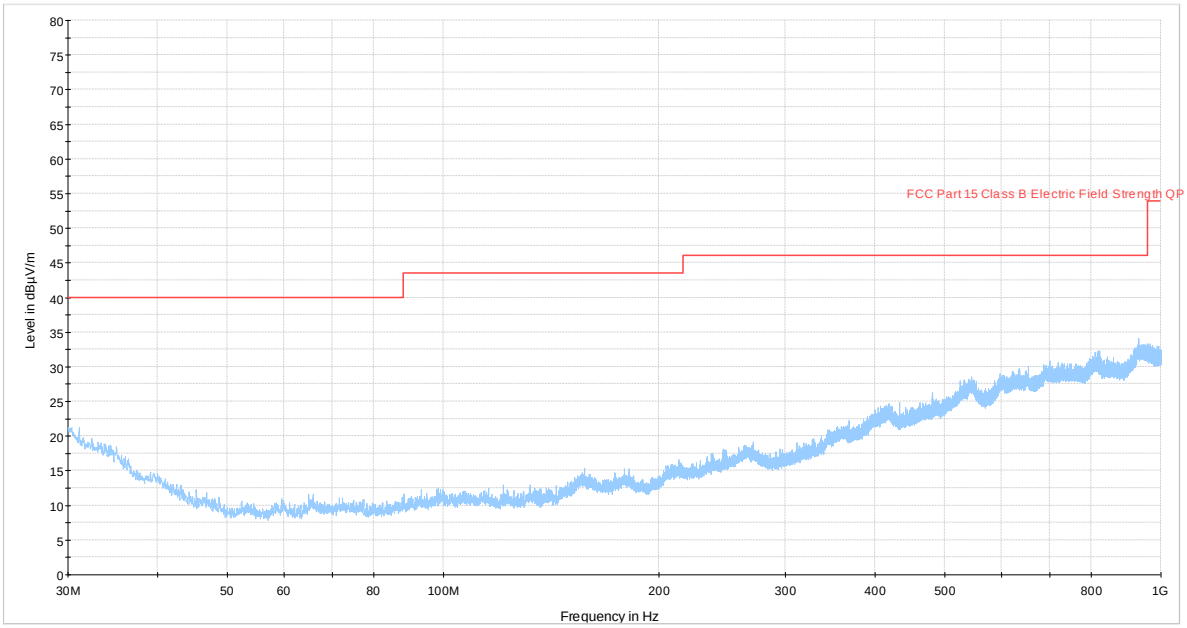
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel Low
Frequency: 30MHz – 1GHz
Antenna Polarization: Vertical



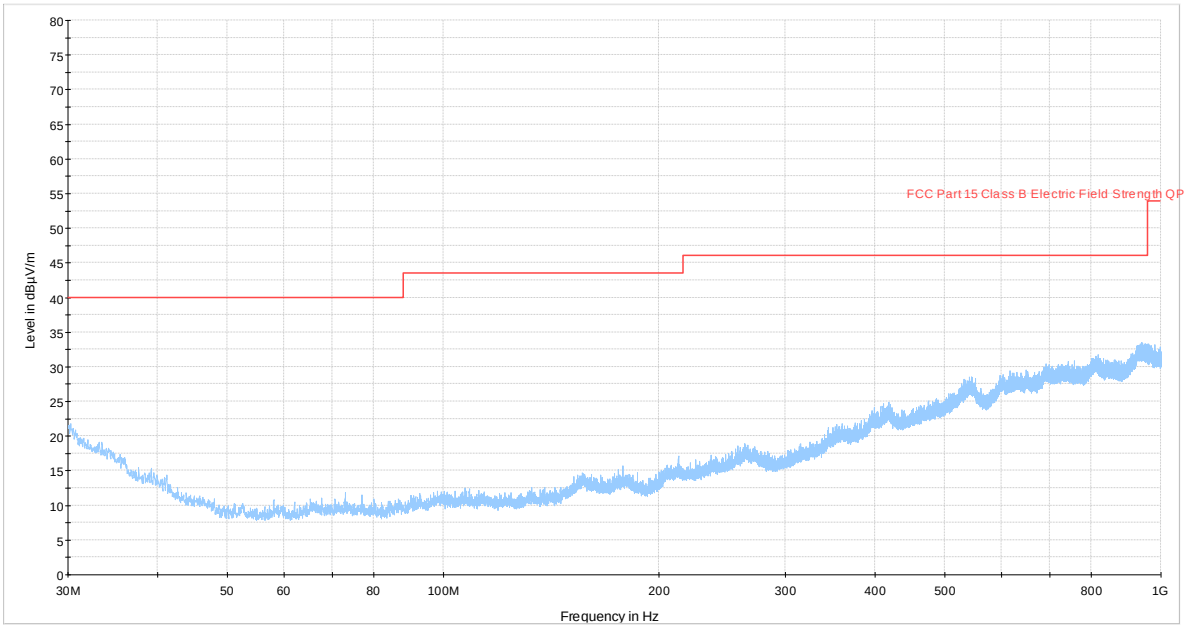
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 30MHz – 1GHz
Antenna Polarization: Horizontal



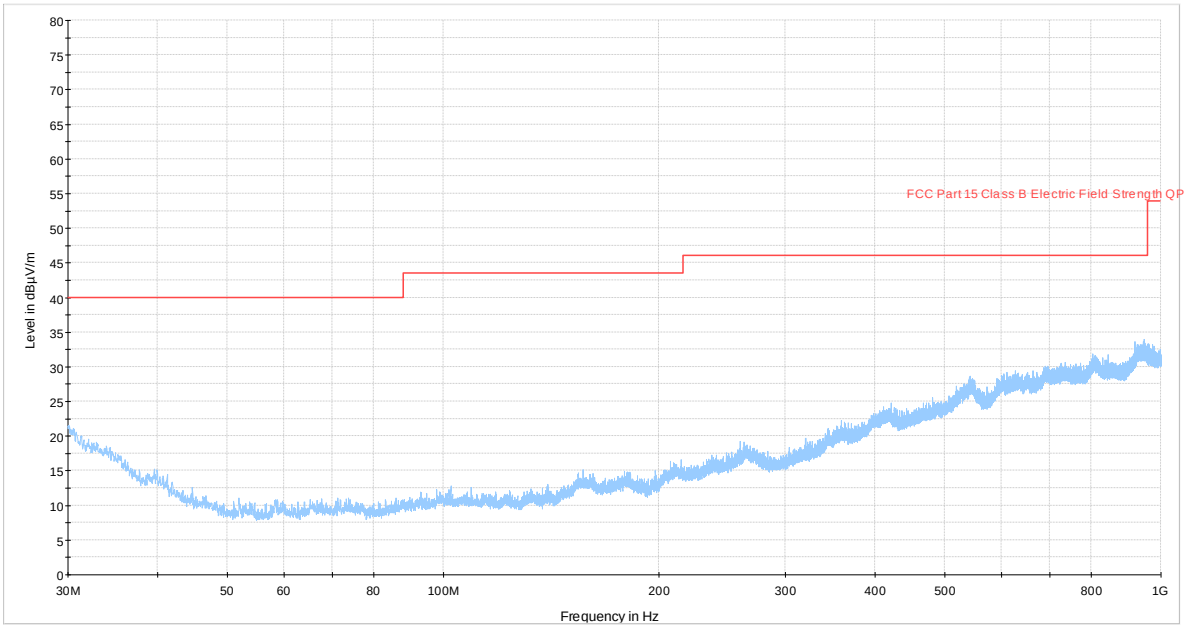
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 30MHz – 1GHz
Antenna Polarization: Vertical



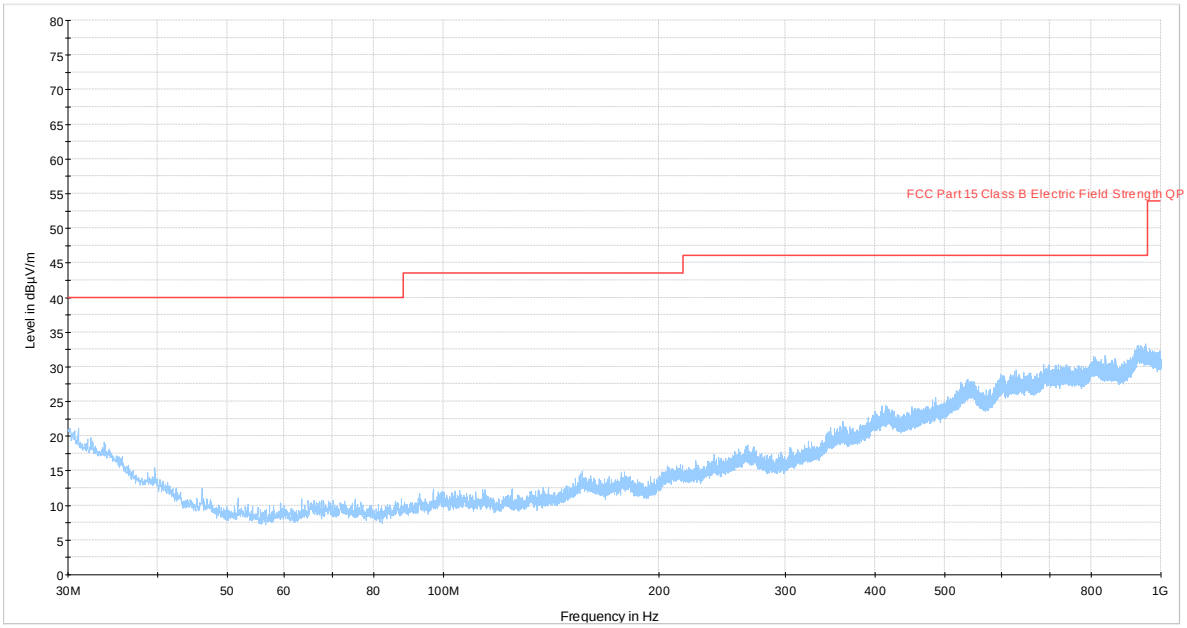
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 30MHz – 1GHz
Antenna Polarization: Horizontal



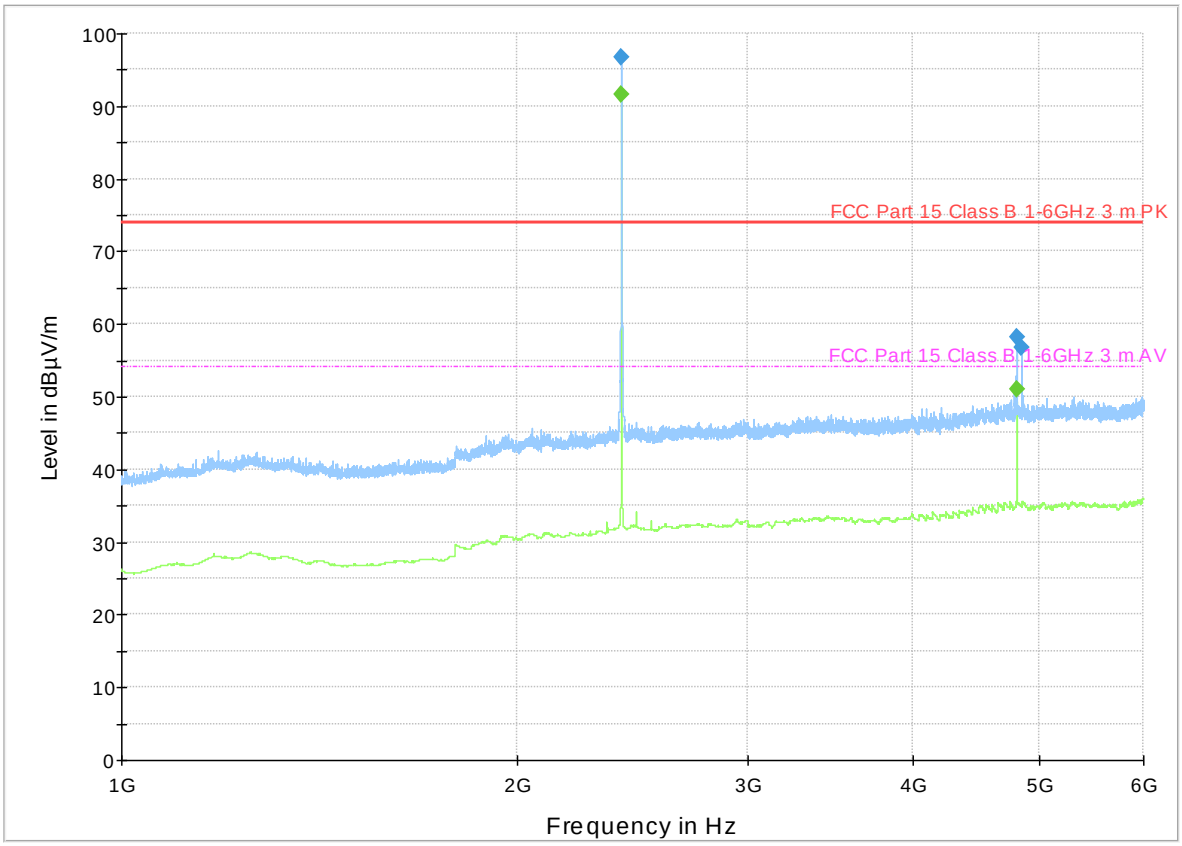
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 30MHz – 1GHz
Antenna Polarization: Vertical



Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 30MHz – 1GHz
Antenna Polarization: Horizontal



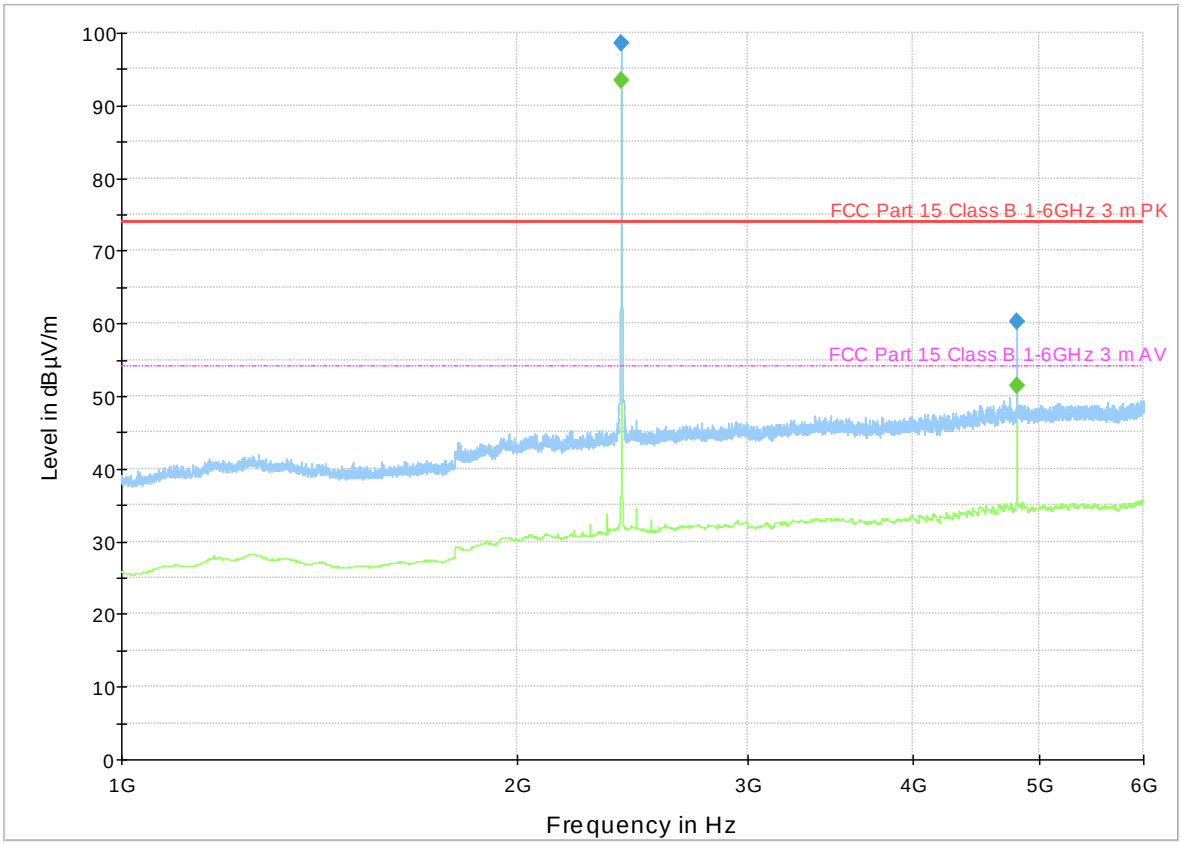
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 1GHz – 6GHz
Antenna Polarization: Vertical



Tabulated results of Radiated Emission Measurement
Operation Mode: #1 Channel Low
Frequency: 30MHz – 1GHz Vertical

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. Antenna factor + cable loss (dB)
4803.500000	58.14	---	74.00	15.86	1000.000	120.0	V	339.0	-0.7
4804.000000	---	51.11	54.00	2.89	1000.000	112.0	V	350.0	-0.7
4844.750000	56.68	---	74.00	17.32	1000.000	99.0	V	0.0	-0.7

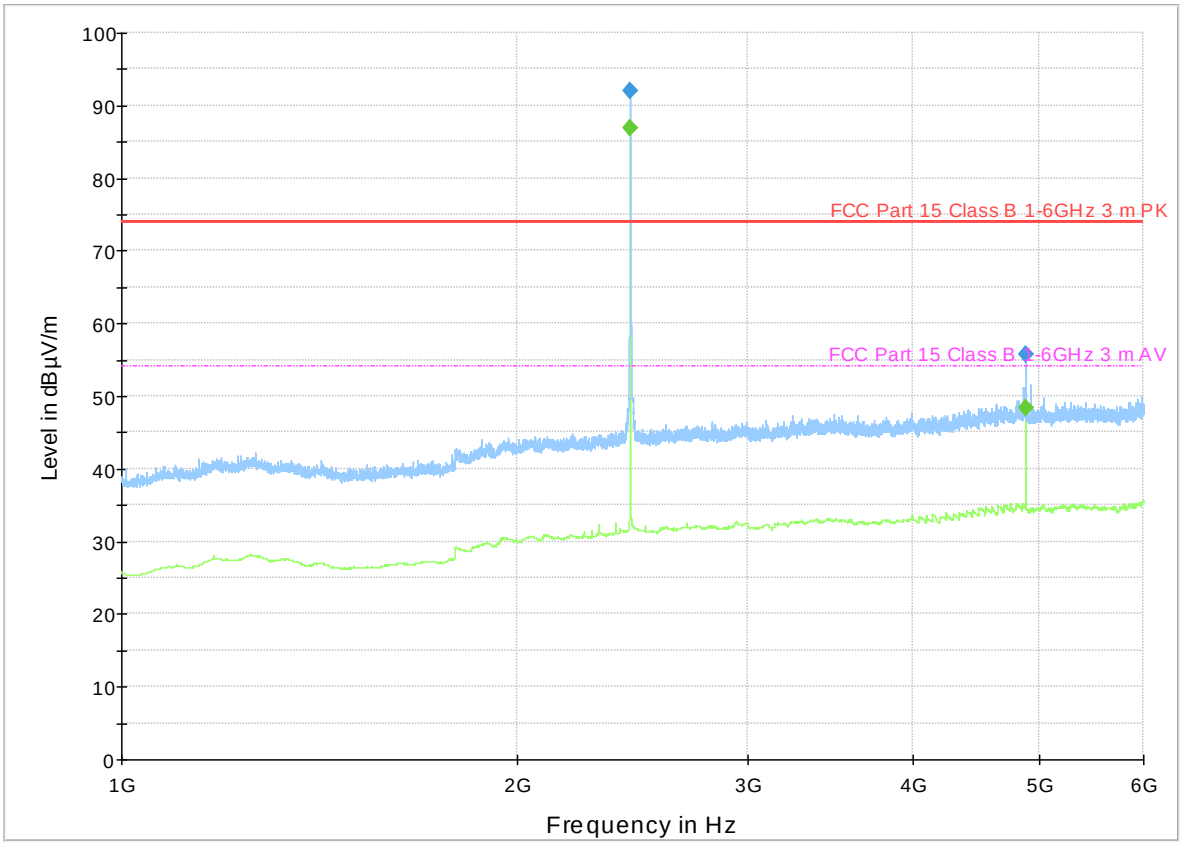
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 1GHz – 6GHz
Antenna Polarization: Horizontal



Tabulated results of Radiated Emission Measurement
Operation Mode: #1 Channel Low
Frequency: 30MHz – 1GHz Horizontal

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. Antenna factor + cable loss (dB)
4804.000000	---	51.43	54.00	2.57	1000.000	125.0	H	178.0	-0.7
4804.500000	60.35	---	74.00	13.65	1000.000	125.0	H	173.0	-0.7

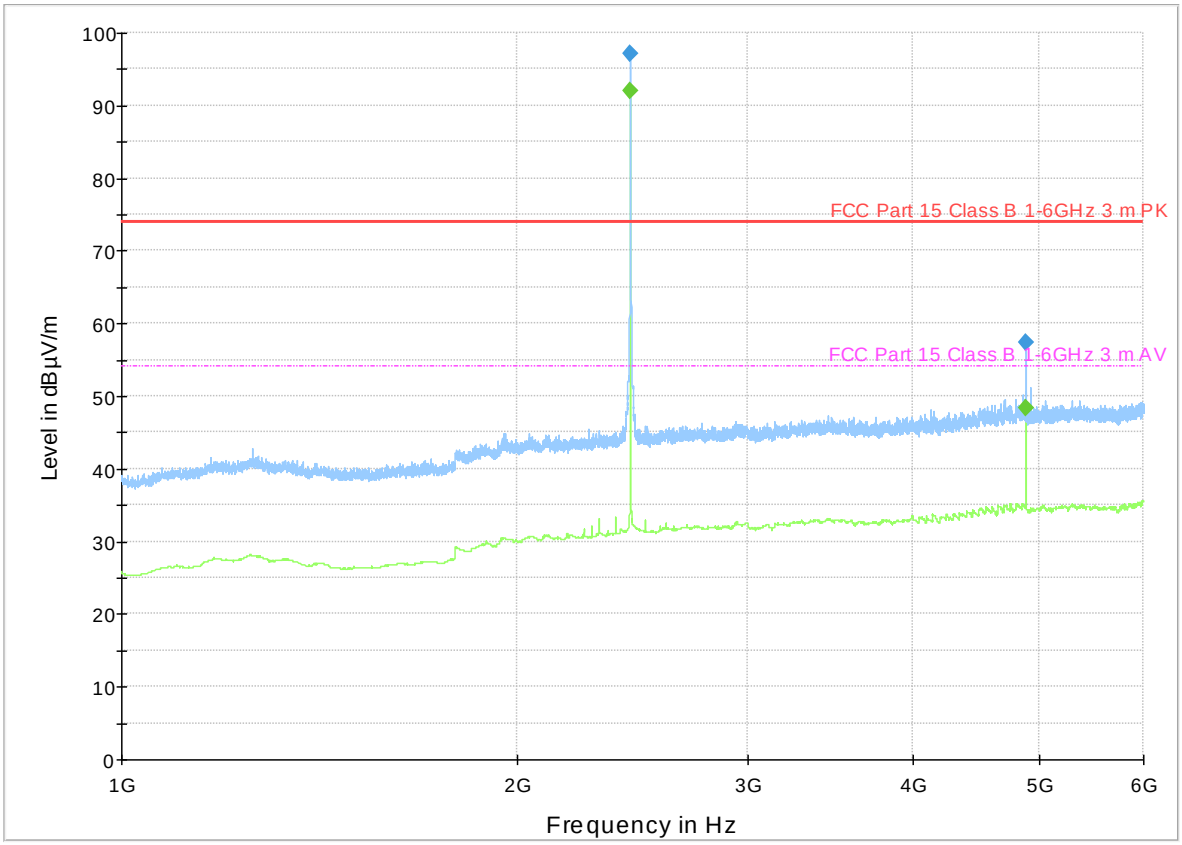
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 1GHz – 6GHz
Antenna Polarization: Vertical



Tabulated results of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 1GHz - 6GHz Vertical

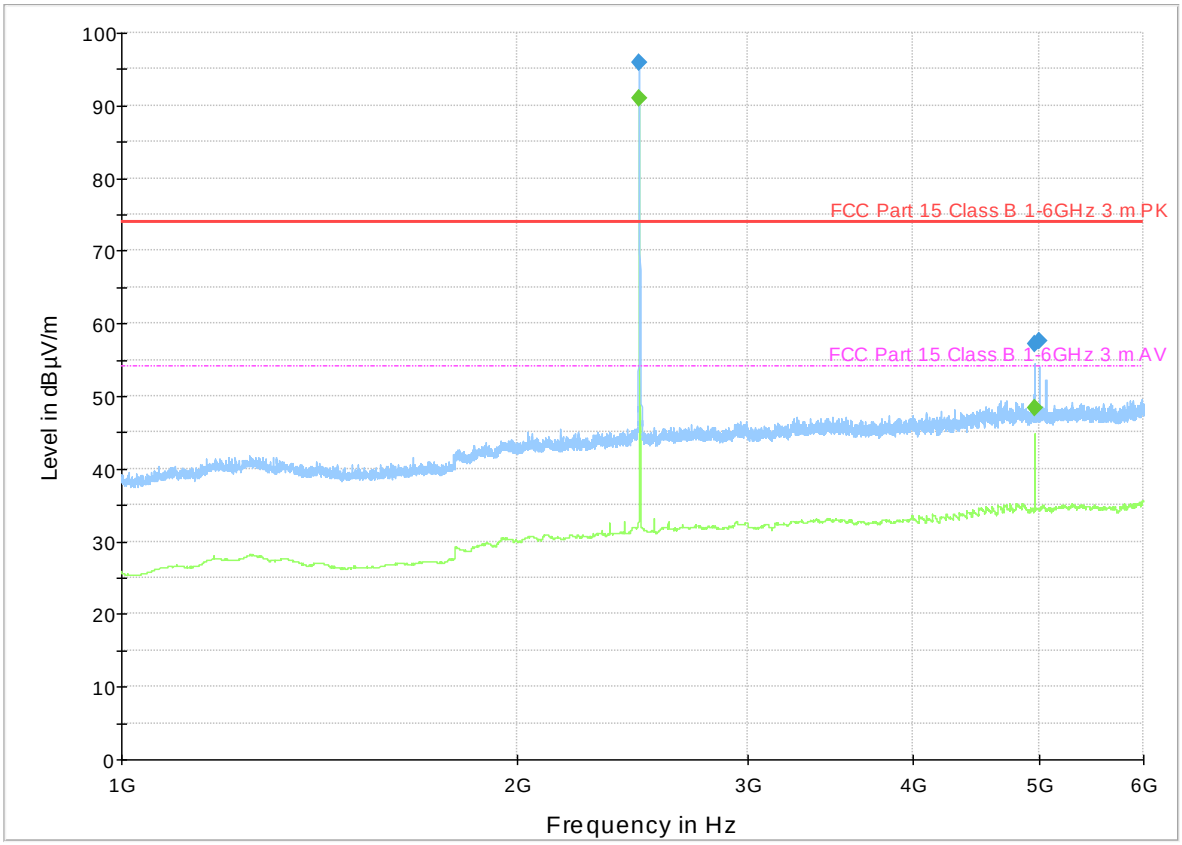
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. Antenna factor + cable loss (dB)
4880.000000	---	48.27	54.00	5.73	1000.000	125.0	V	189.0	-0.6
4880.500000	55.72	---	74.00	18.28	1000.000	125.0	V	193.0	-0.6

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 1GHz – 6GHz
Antenna Polarization: Horizontal



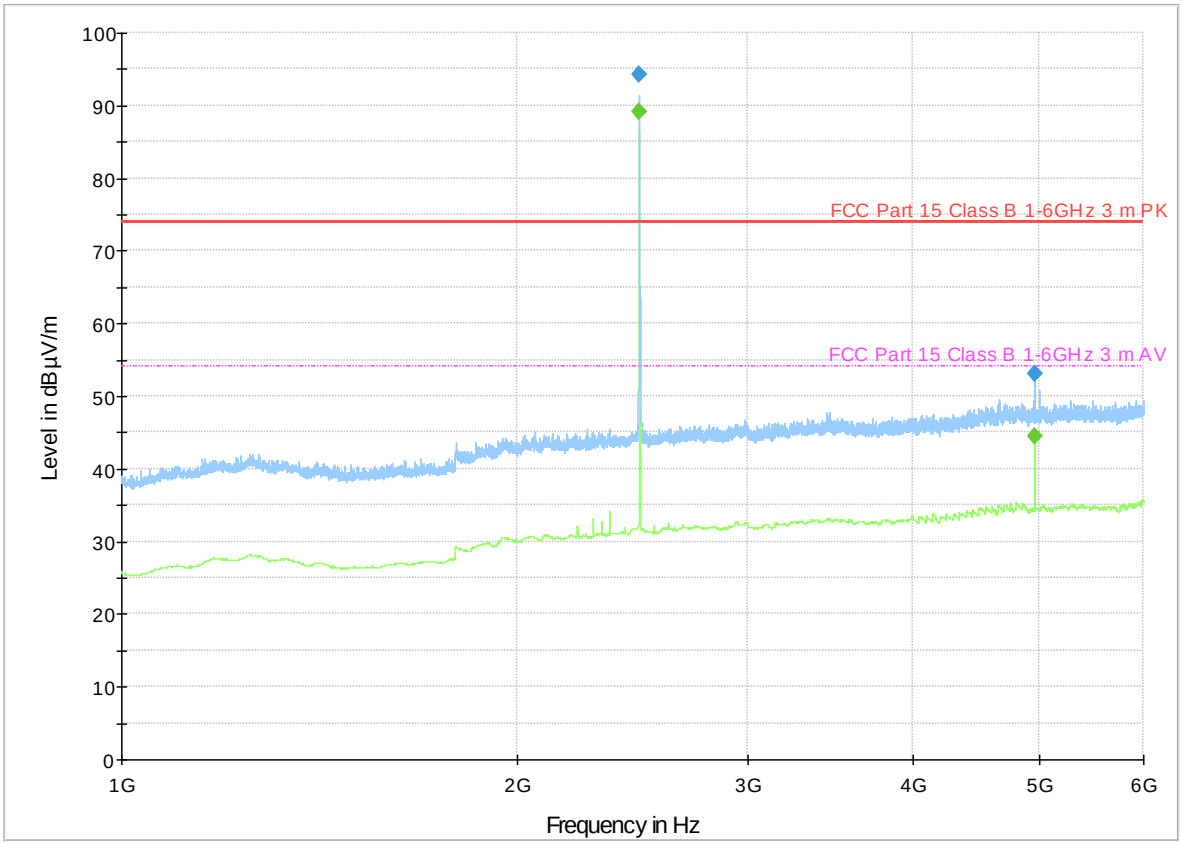
Tabulated results of Radiated Emission Measurement									
Operation Mode: #1 Channel middle									
Frequency: 1GHz - 6GHz Horizontal									
Frequency (MHz)	**MaxPeak (dBµV/m)**	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. Antenna factor + cable loss (dB)**
4880.000000	**---**	**48.37**	**54.00**	**5.63**	**1000.000**	**121.0**	**H**	**187.0**	**-0.6**
4880.500000	**57.43**	**---**	**74.00**	**16.57**	**1000.000**	**125.0**	**H**	**184.0**	**-0.6**

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 1GHz – 6GHz
Antenna Polarization: Vertical



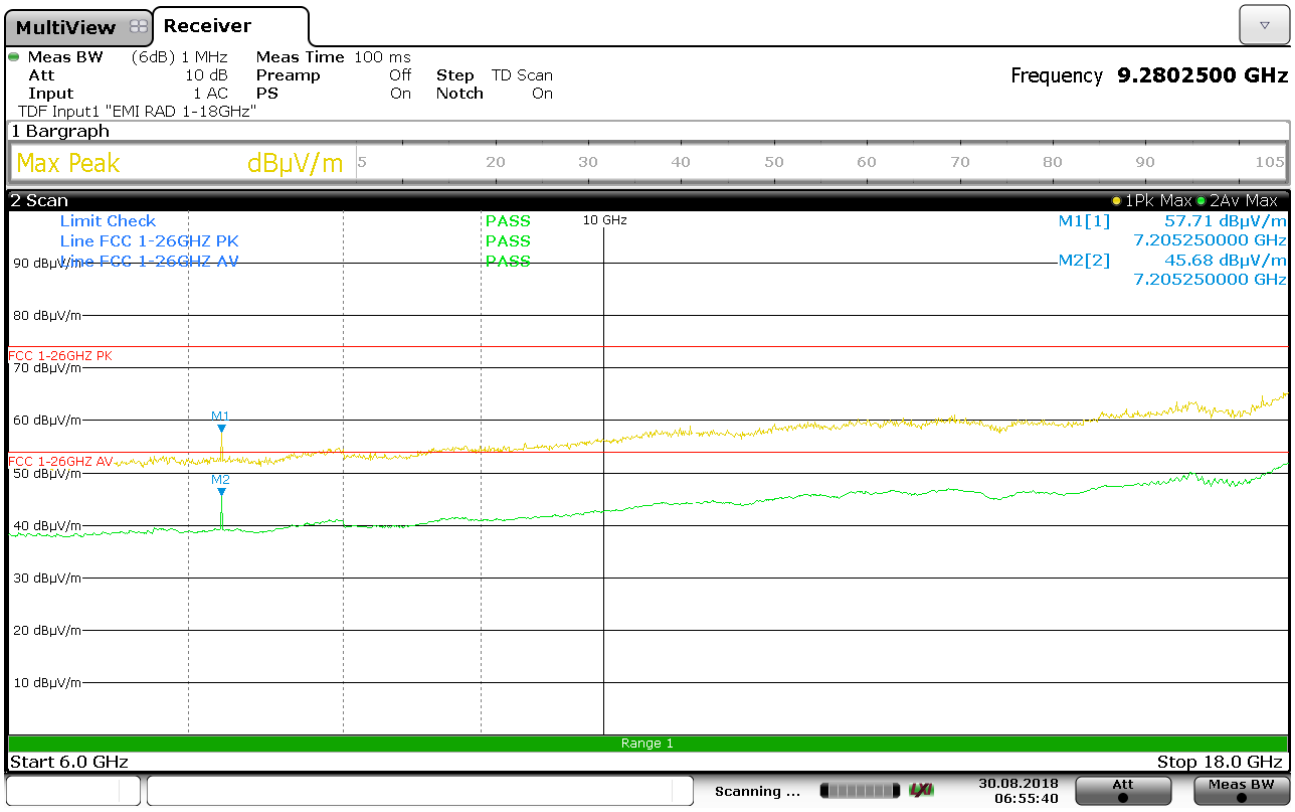
Tabulated results of Radiated Emission Measurement									
Operation Mode: #1 Channel high									
Frequency: 1GHz - 6GHz Vertical									
Frequency (MHz)	**MaxPeak (dBµV/m)**	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Antenna factor + cable loss (dB)**
4959.500000	**57.16**	**---**	**74.00**	**16.84**	**1000.000**	**125.0**	**V**	**111.0**	**-0.6**
4960.000000	**---**	**48.35**	**54.00**	**5.65**	**1000.000**	**125.0**	**V**	**111.0**	**-0.6**
4997.500000	**57.66**	**---**	**74.00**	**16.34**	**1000.000**	**104.0**	**V**	**33.0**	**-0.5**

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 1GHz – 6GHz
Antenna Polarization: Horizontal



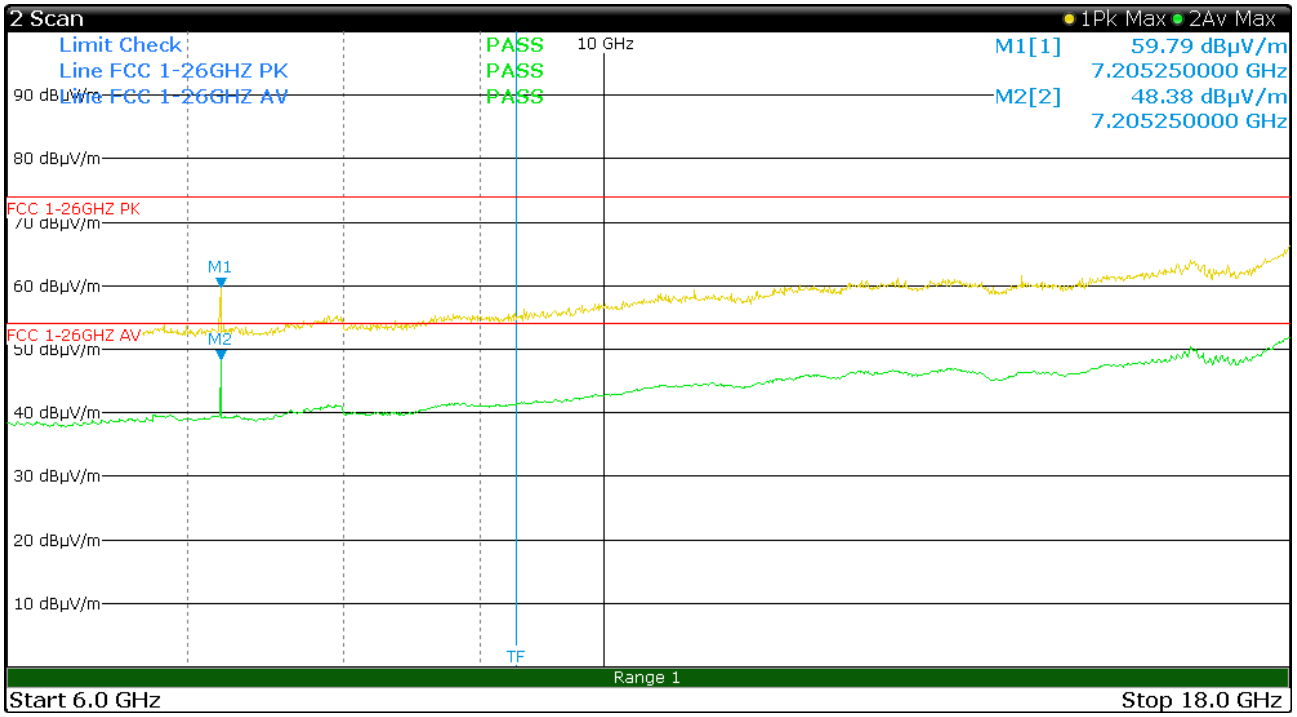
Tabulated results of Radiated Emission Measurement									
Operation Mode: #1 Channel high									
Frequency: 1GHz - 6GHz Horizontal									
Frequency (MHz)	**MaxPeak (dBµV/m)**	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Antenna factor + cable loss (dB)**
4959.500000	**53.11**	**---**	**74.00**	**20.89**	**1000.000**	**100.0**	**H**	**110.0**	**-0.6**
4960.000000	**---**	**44.41**	**54.00**	**9.59**	**1000.000**	**100.0**	**H**	**110.0**	**-0.6**

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 6GHz – 18GHz
Antenna Polarization: Vertical



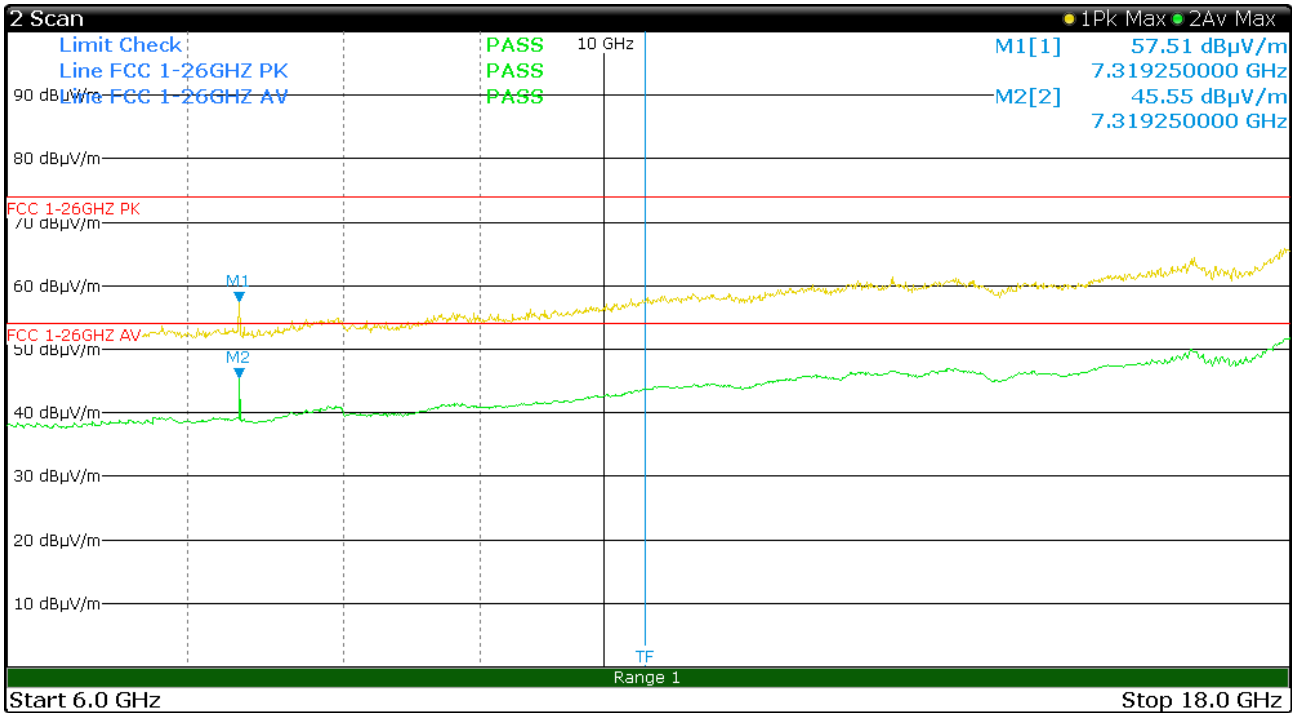
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Antenna factor + cable loss (dB)
7205.250000	57.71	---	74.00	16.29	1000.000	100.0	V	110.0	+3.8
7205.250000	---	45.68	54.00	8.32	1000.000	100.0	V	110.0	+3.8

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 6GHz – 18GHz
Antenna Polarization: Horizontal



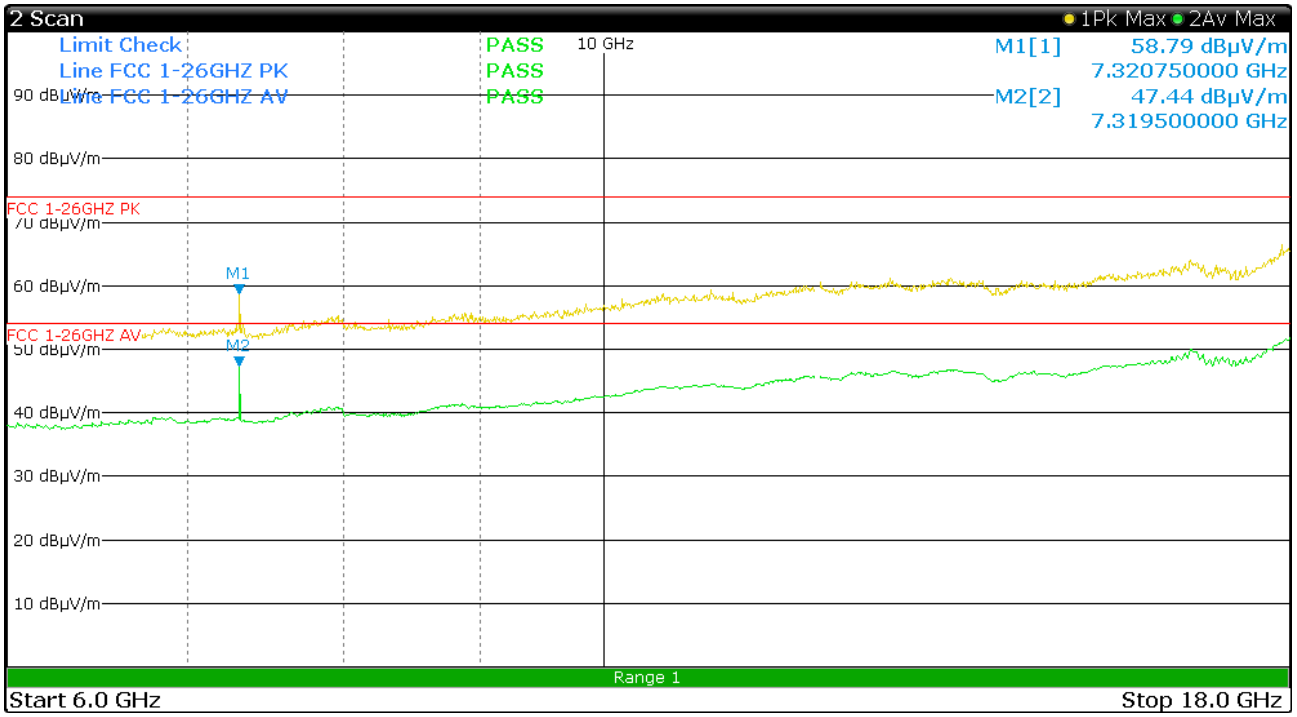
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Antenna factor + cable loss (dB)
7205.250000	59.79	---	74.00	14.21	1000.000	100.0	H	110.0	+3.8
7205.250000	---	48.38	54.00	5.62	1000.000	100.0	H	110.0	+3.8

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 6GHz – 18GHz
Antenna Polarization: Vertical



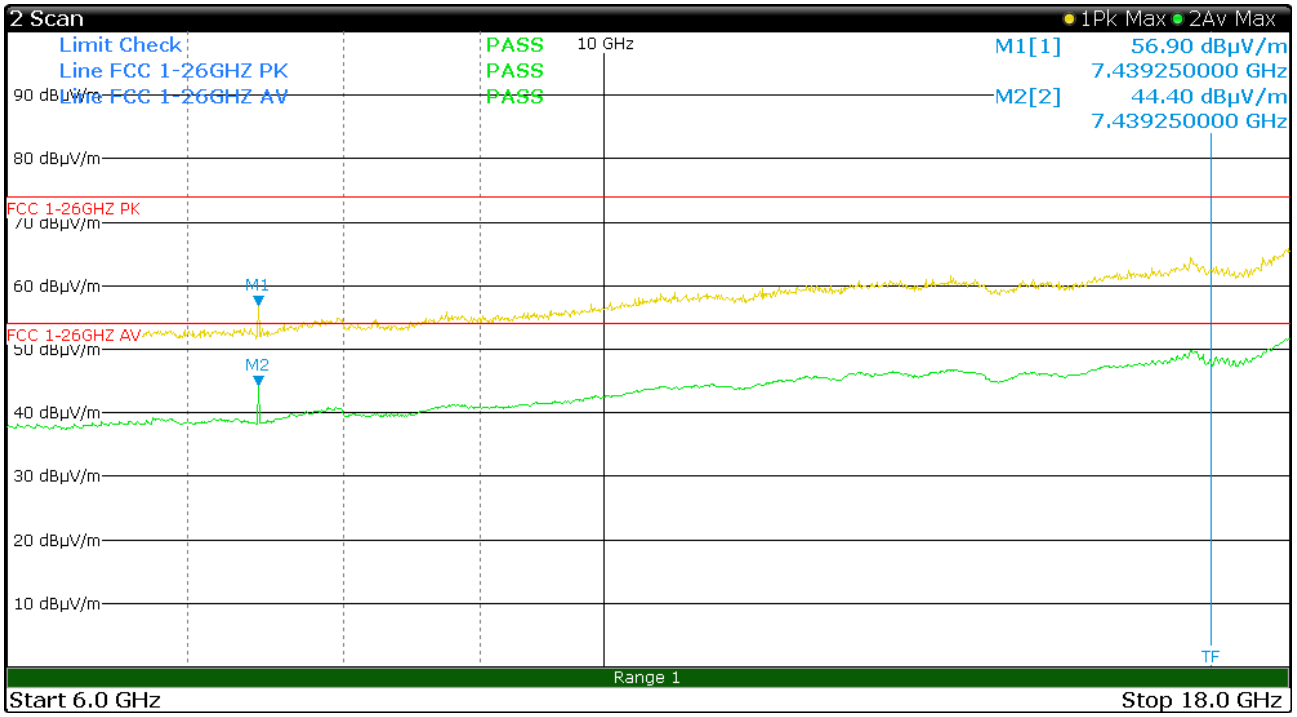
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Antenna factor + cable loss (dB)
7319.250000	57.51	---	74.00	16.49	1000.000	100.0	V	110.0	+3.8
7319.250000	---	45.55	54.00	8.45	1000.000	100.0	V	110.0	+3.8

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 6GHz – 18GHz
Antenna Polarization: Horizontal



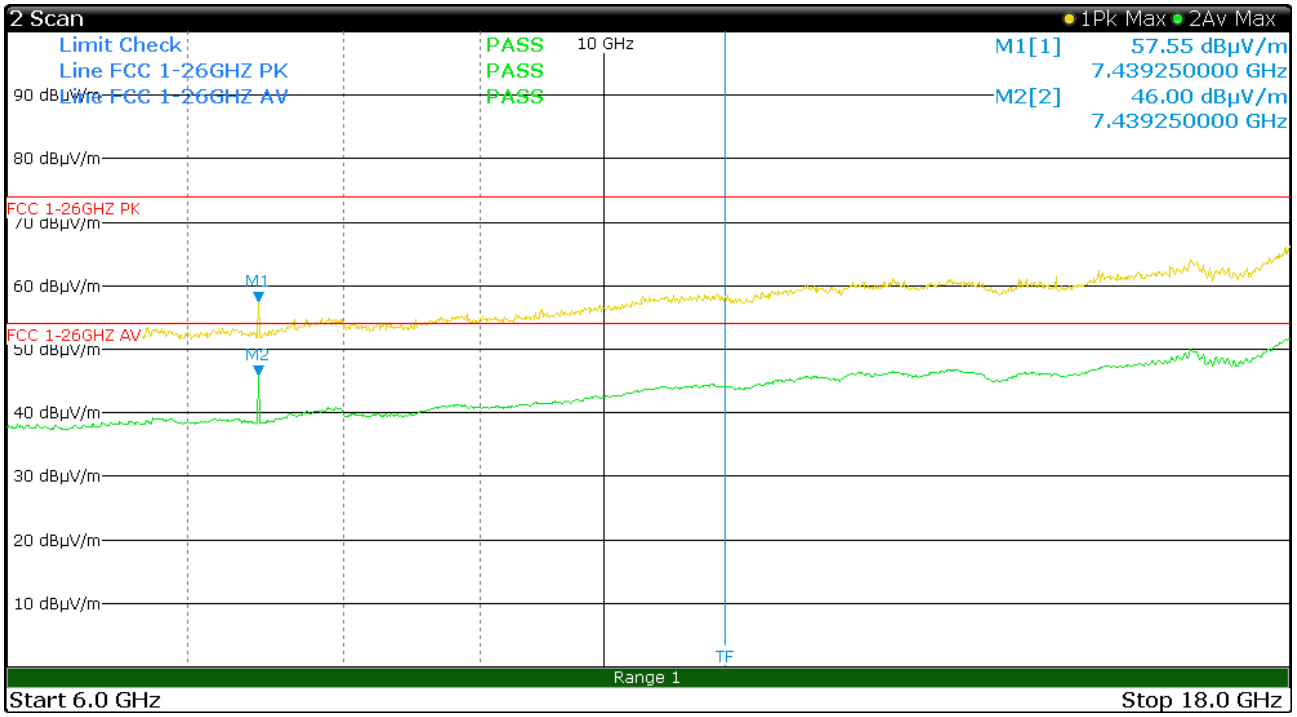
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Antenna factor + cable loss (dB)
7320.750000	58.79	---	74.00	15.21	1000.000	100.0	H	110.0	+3.8
7319.500000	---	47.44	54.00	6.56	1000.000	100.0	H	110.0	+3.8

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 6GHz – 18GHz
Antenna Polarization: Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Antenna factor + cable loss (dB)
7439.250000	56.90	---	74.00	17.01	1000.000	100.0	V	110.0	+3.9
7439.250000	---	44.40	54.00	9.60	1000.000	100.0	V	110.0	+3.9

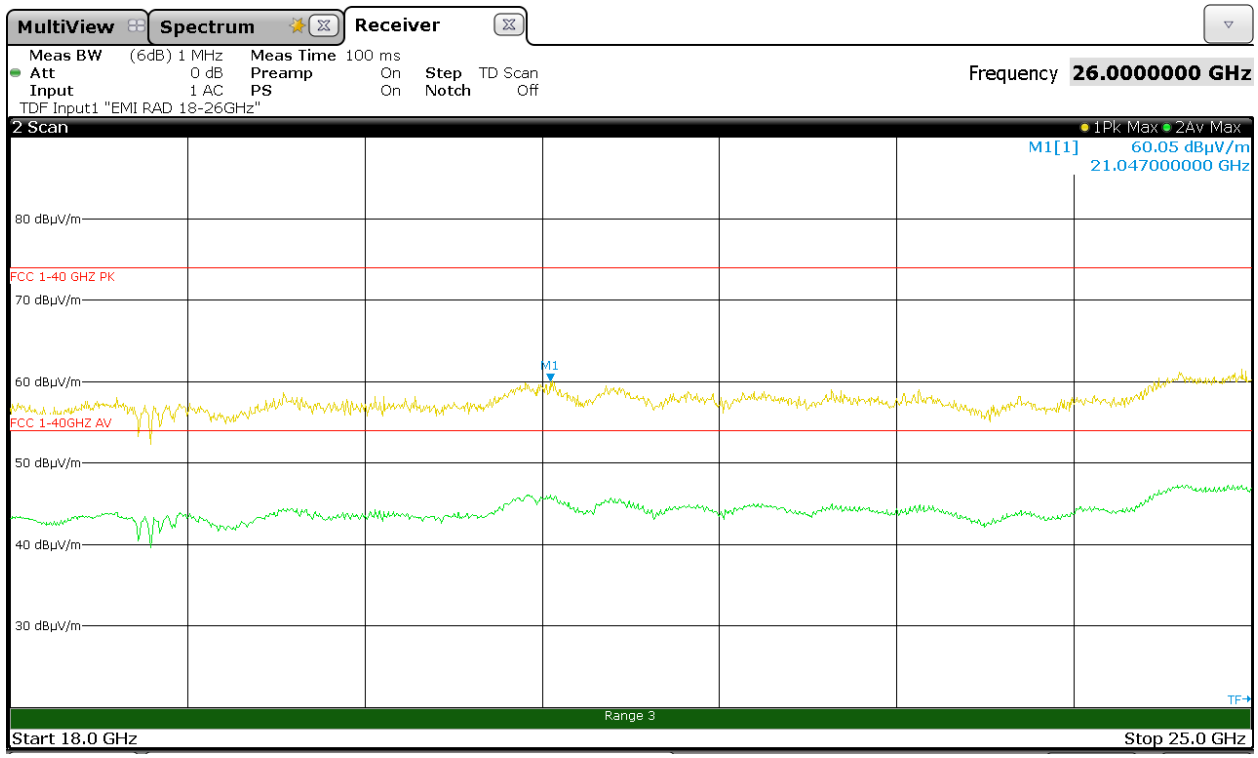
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 6GHz – 18GHz
Antenna Polarization: Horizontal



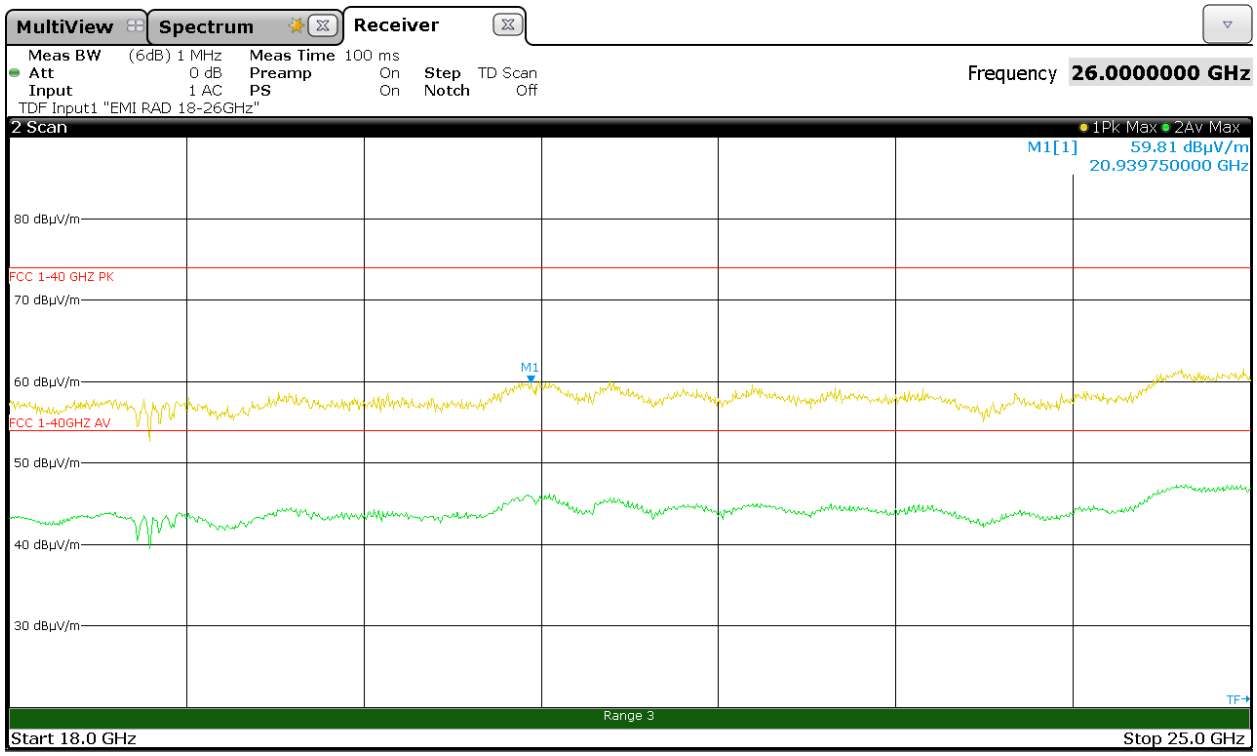
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Antenna factor + cable loss (dB)
7439.250000	57.55	---	74.00	16.45	1000.000	100.0	V	110.0	+3.9
7439.250000	---	46.00	54.00	8.00	1000.000	100.0	V	110.0	+3.9

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 18GHz – 25GHz
Antenna Polarization: Vertical

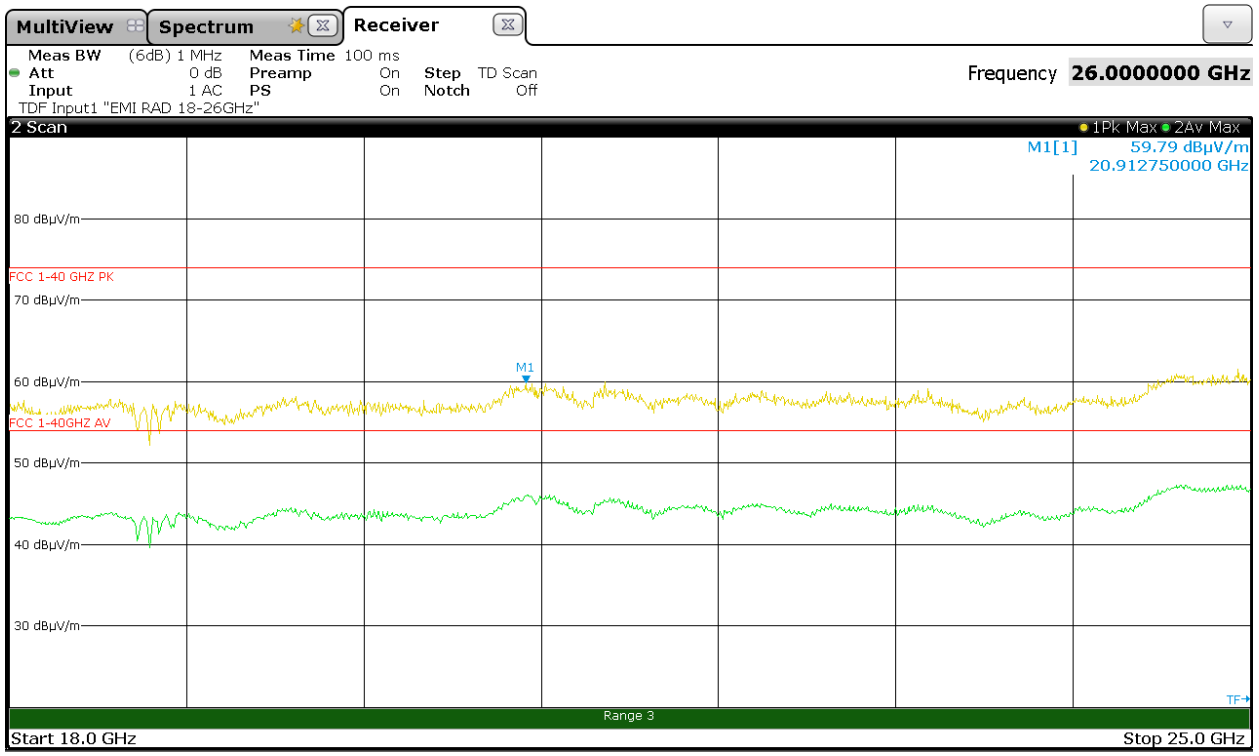
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel low
Frequency: 18GHz – 25GHz
Antenna Polarization: Horizontal



Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 18GHz – 25GHz
Antenna Polarization: Vertical



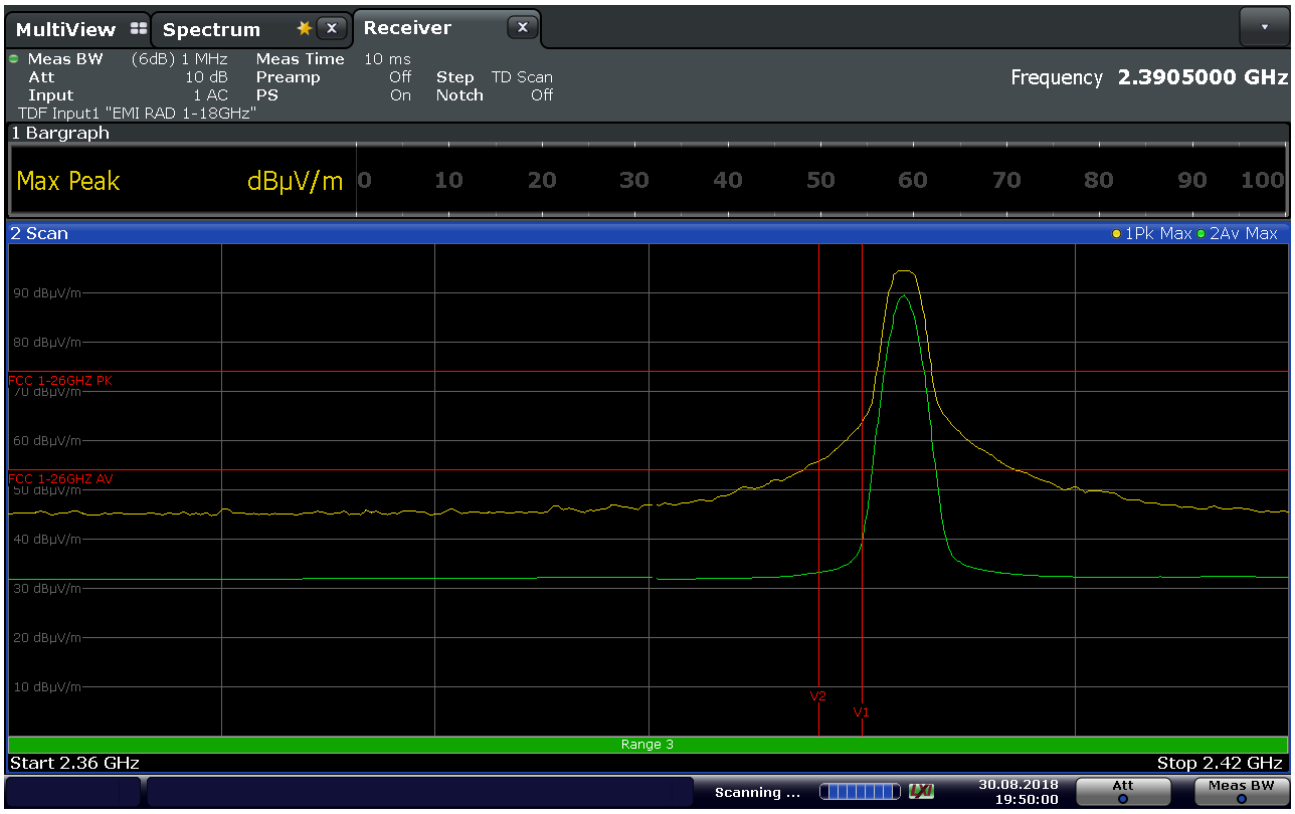
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel middle
Frequency: 18GHz – 25GHz
Antenna Polarization: Horizontal



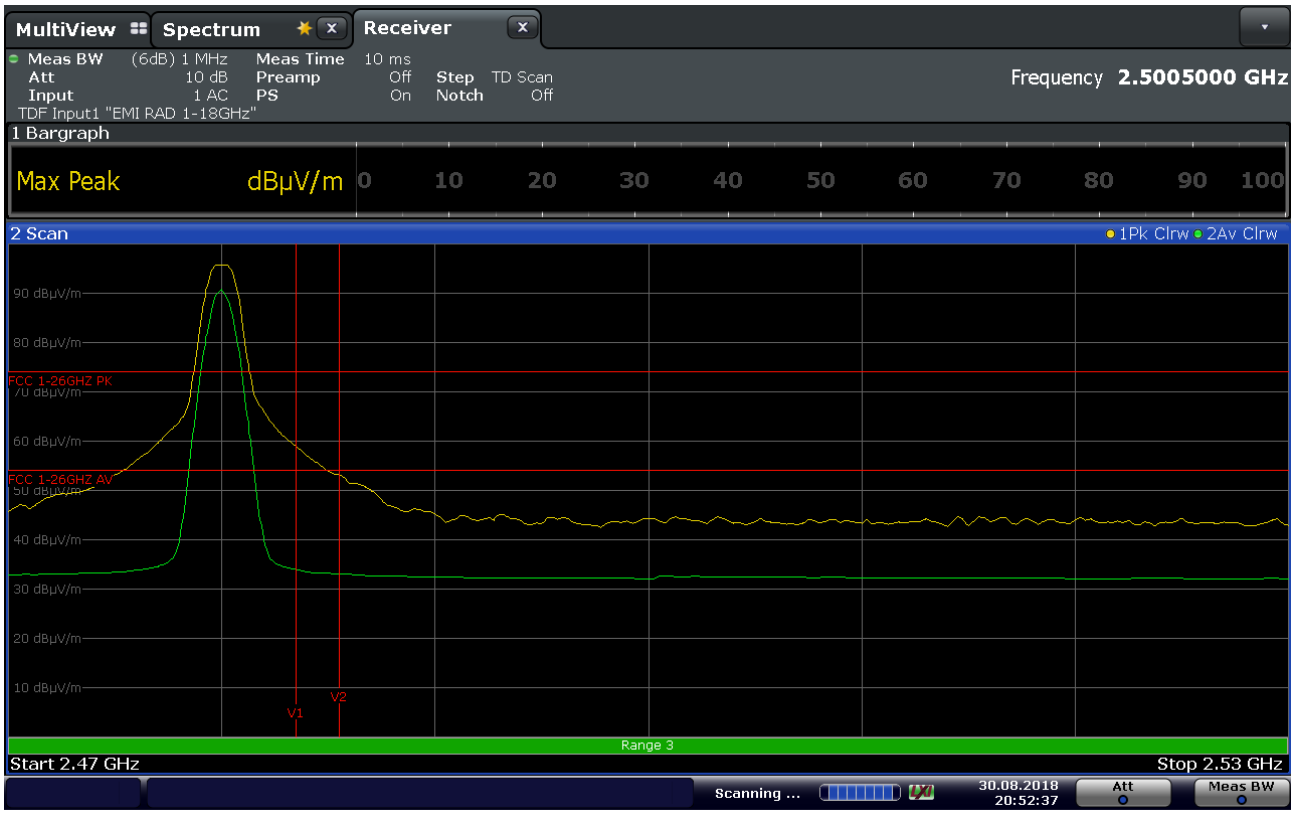
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 18GHz – 25GHz
Antenna Polarization: Vertical

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 Channel high
Frequency: 18GHz – 25GHz
Antenna Polarization: Horizontal

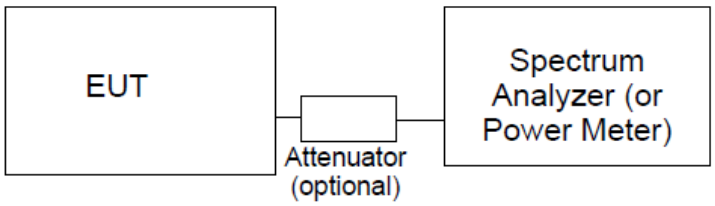
Graphical representation of Radiated Emission Measurement
BAND ENDGE LOW



Graphical representation of Radiated Emission Measurement
BAND ENDGE HIGH



14. Test Conditions and Results – 6dB BANDWIDTH

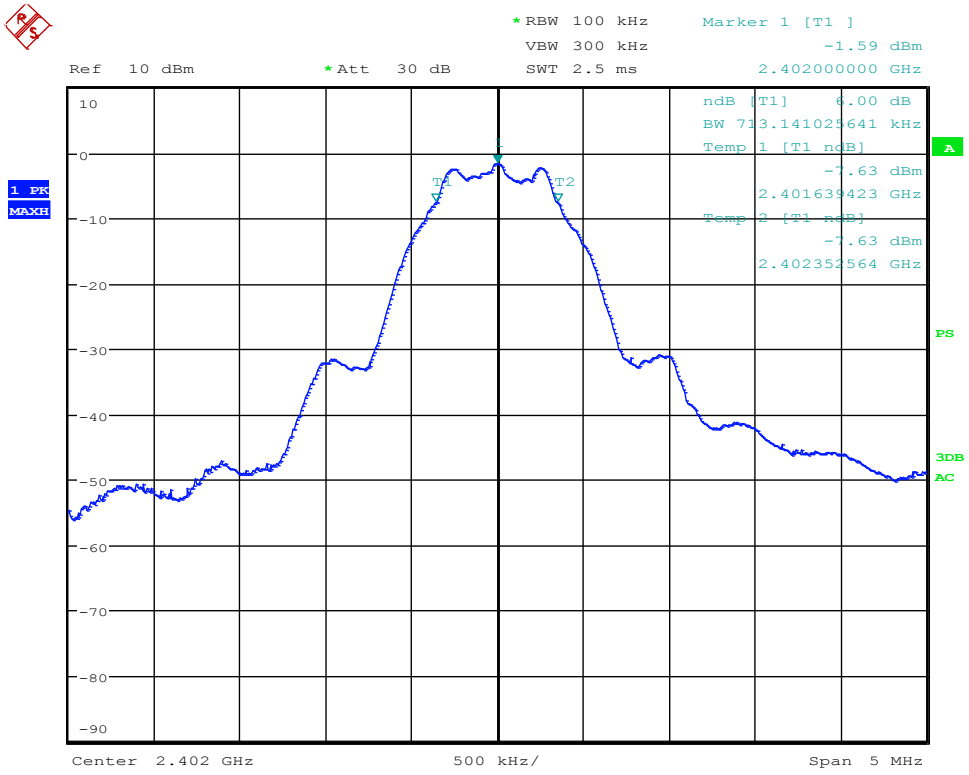
14	TEST: 6dB Bandwidth		PASS
Parameters required prior to the test		Laboratory Ambient Temperature (°C)	15 to 35 °C
		Relative Humidity (%)	30 to 60 %
Parameters recorded during the test		Laboratory Ambient Temperature (°C)	22°C
		Relative Humidity (%)	49%
		Air pressure (hPa)	1020
—		Power Mode	Application Point
Fully configured sample tested at the power line frequency		Batteries Operated	SMA connector
Equipment mode:		Operation mode	#1
FCC Standard		§15.247	
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.			
Further information to test setup			

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	87020455	05/2018	05/2019

Test Procedure
Section 2.1 of KDB 558074 Subclause 11.8.1 Option 2 of ANSI C63.10 is applied DTS Bandwidth

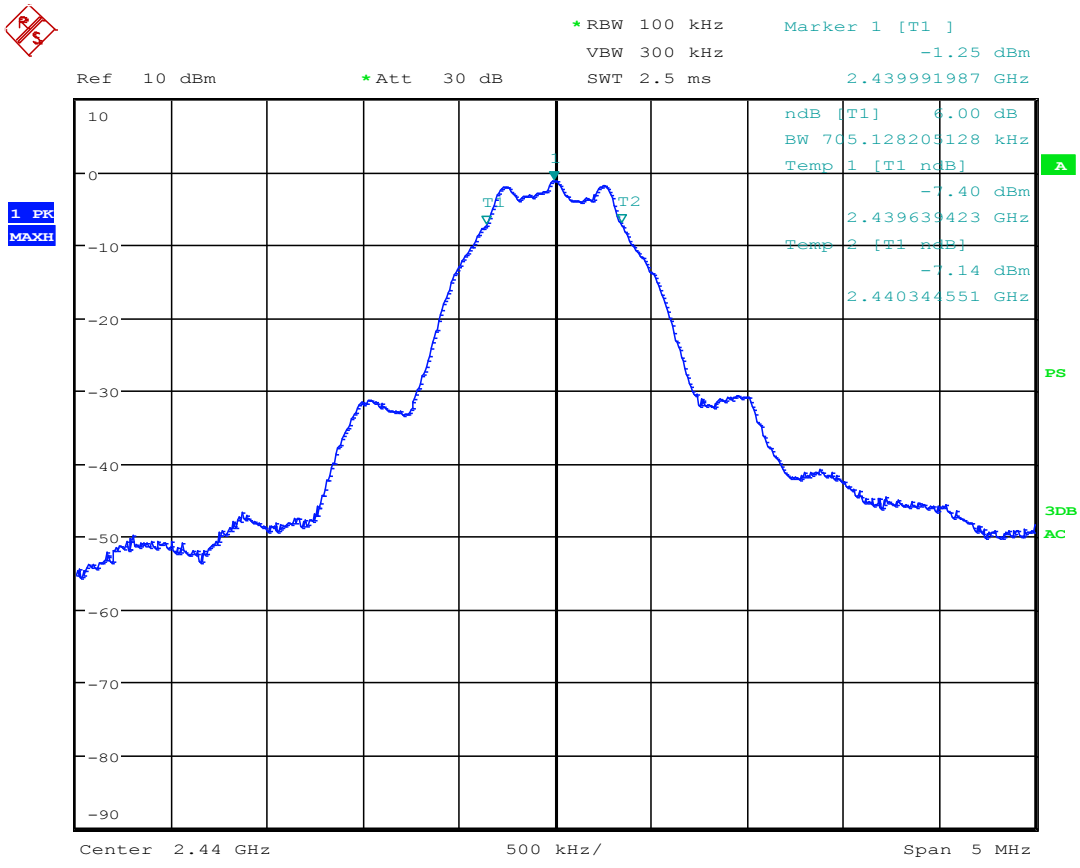
Graphical representation of 6dB Bandwidth
Operation Mode: #1
Channel: Low

6dB Bandwidth



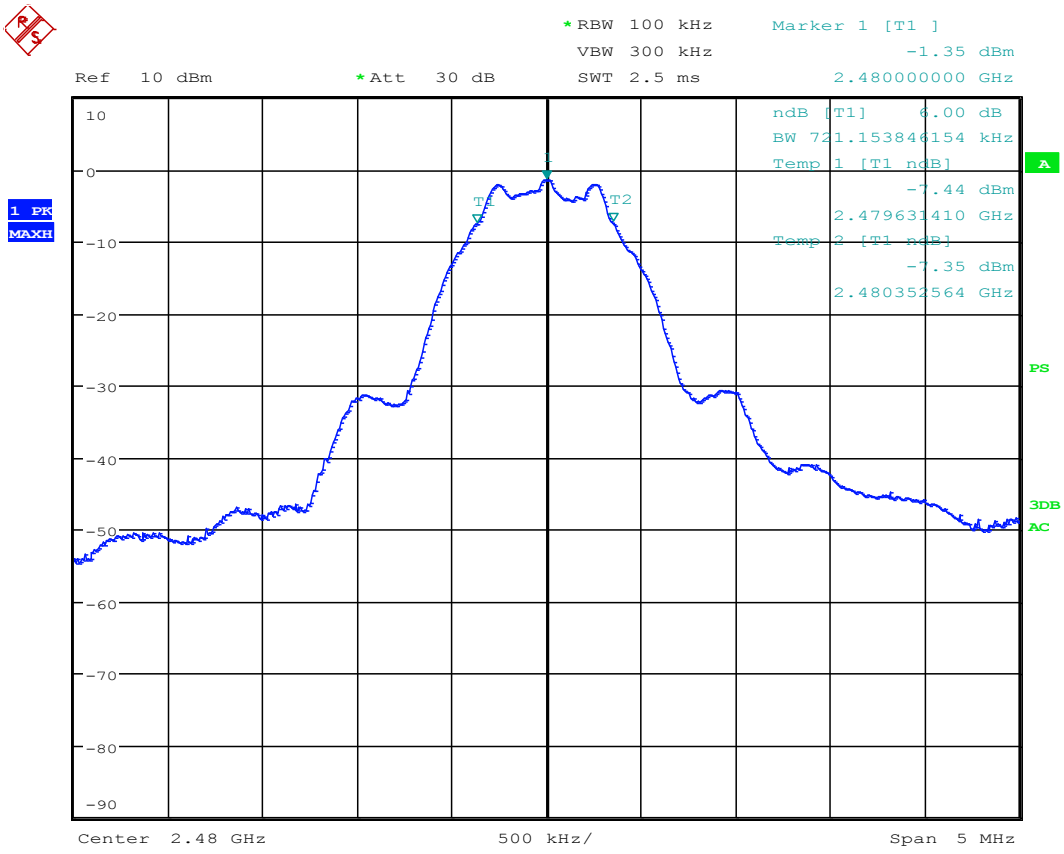
Graphical representation of 6dB Bandwidth
Operation Mode: #1
Channel: Medium

6dB Bandwidth



Graphical representation of 6dB Bandwidth
Operation Mode: #1
Channel: High

6dB Bandwidth



Frequency (MHz)	Channel	6dB BW (MHz)
2402	Low	0.713
2440	Middle	0.705
2480	High	0.721

15. Test Conditions and Results – RF OUTPUT POWER

15	TEST: Output Power		PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	22,5°C	
	Relative Humidity (%)	51%	
	Air pressure (hPa)	1020	
—	Power Mode	Application Point	
Fully configured sample tested at the power line frequency	Batteries Operated	SMA	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247		

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

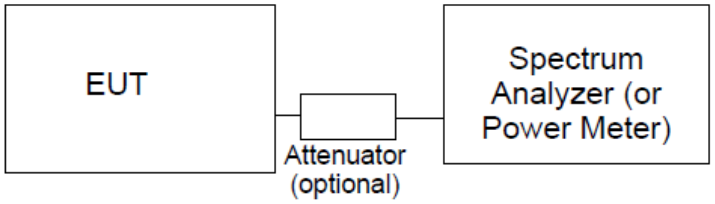
(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Further information to test setup:



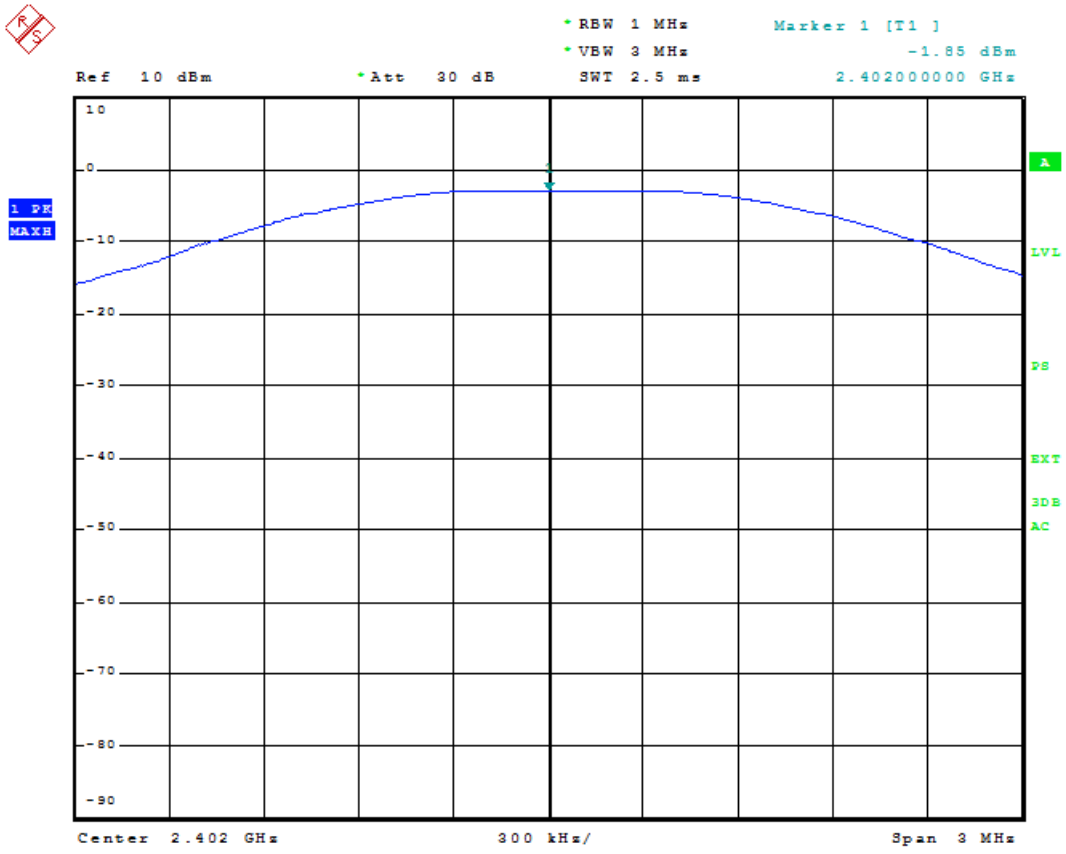
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	87020455	05/2018	05/2019

Test Procedure
Section 8.3.1 of KDB 558074 Subclause 11.9.1.1 of ANSI C63.10 is applied Maximum peak conducted power RBW =1MHz, VBW=3MHz, Detector = Peak Sweep time = auto, Trace mode= max hold, Allow trace to fully stabilize.

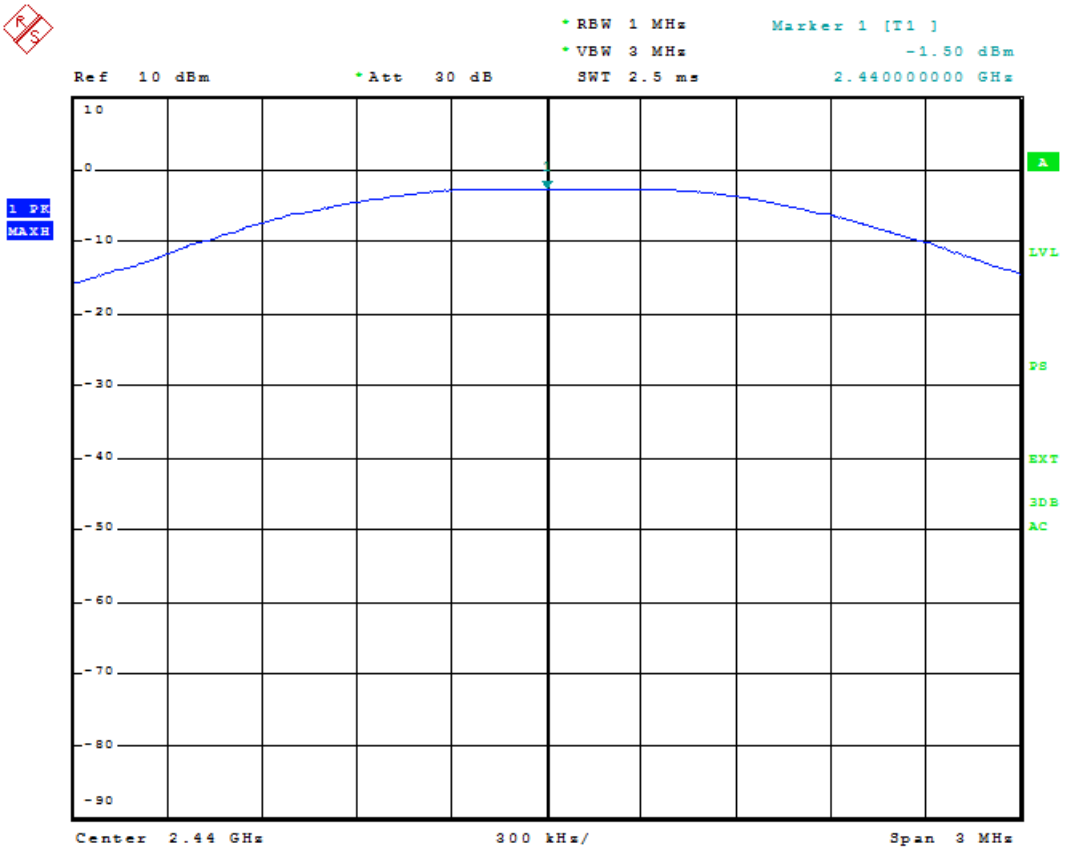
Test result of Maximum Output Power

Channel	Channel Frequency (MHz)	Output power (conducted) (dBm)	Limit (dBm)	Output power (conducted) (W)	Limit (W)
Low Channel	2402	-1,85	30	0.000653131	1
Middle Channel	2440	-1,50	30	0.000707946	1
High Channel	2480	-1,49	30	0.000709578	1

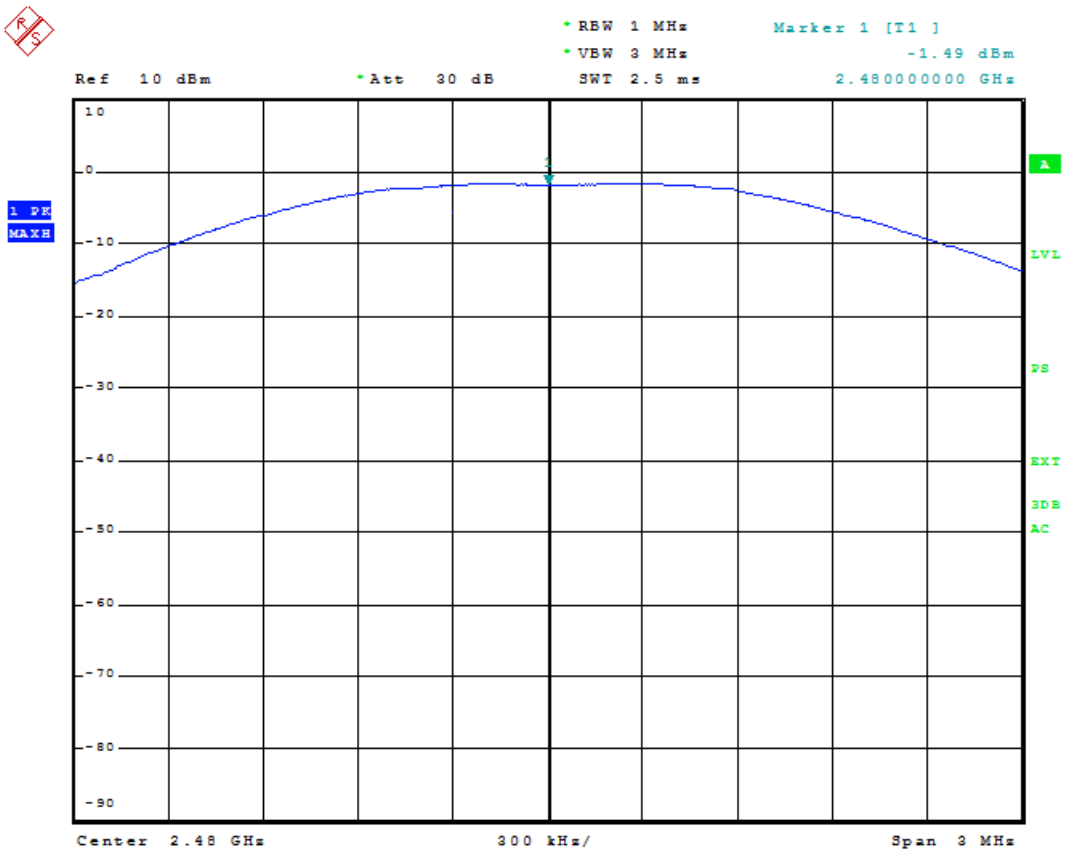
Graphical representation of RF Output Power
Operation Mode: #1
Channel: Low



Graphical representation of RF Output Power
Operation Mode: #1
Channel: Middle



Graphical representation of RF Output Power
Operation Mode: #1
Channel: High

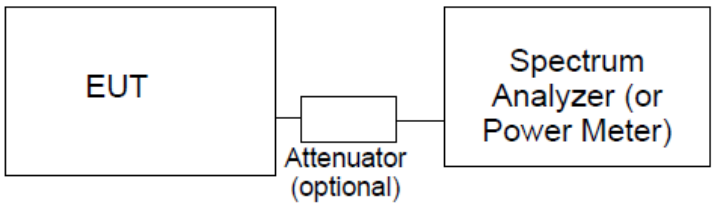


16. Test Conditions and Results – Out of Band Emissions

16	TEST: Out of Band Emissions		PASS
Parameters required prior to the test		Laboratory Ambient Temperature (°C)	15 to 35 °C
		Relative Humidity (%)	30 to 60 %
Parameters recorded during the test		Laboratory Ambient Temperature (°C)	21°C
		Relative Humidity (%)	49%
		Air pressure (hPa)	1020
—		Power Mode	Application Point
Fully configured sample tested at the power line frequency		Batteries Operated	SMA Connector
Equipment mode:		Operation mode	#1
FCC Standard		§15.247(D)	

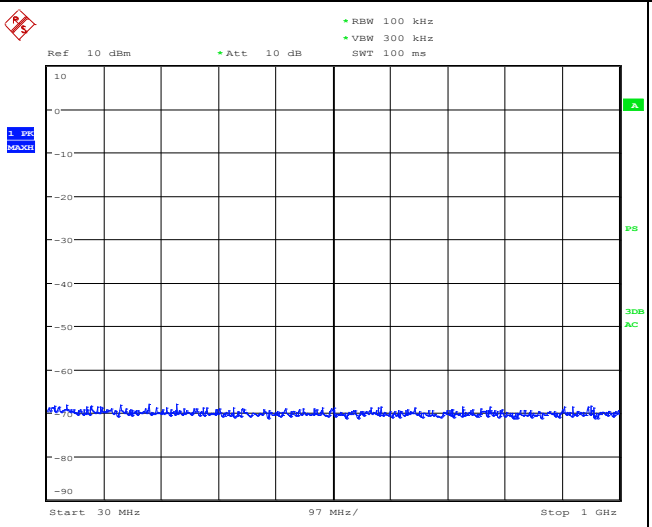
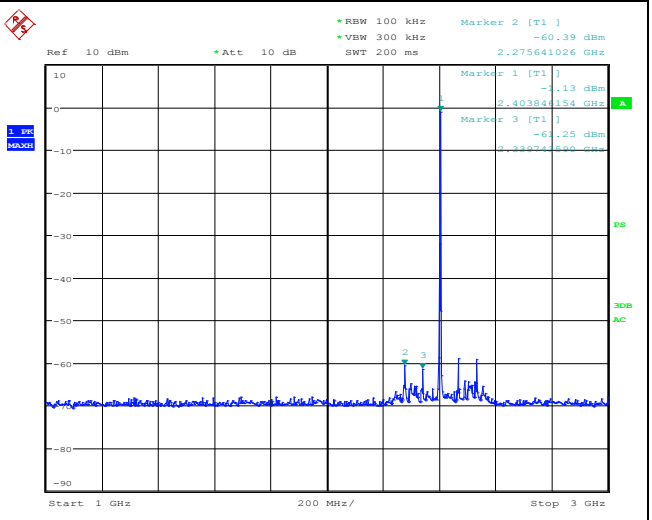
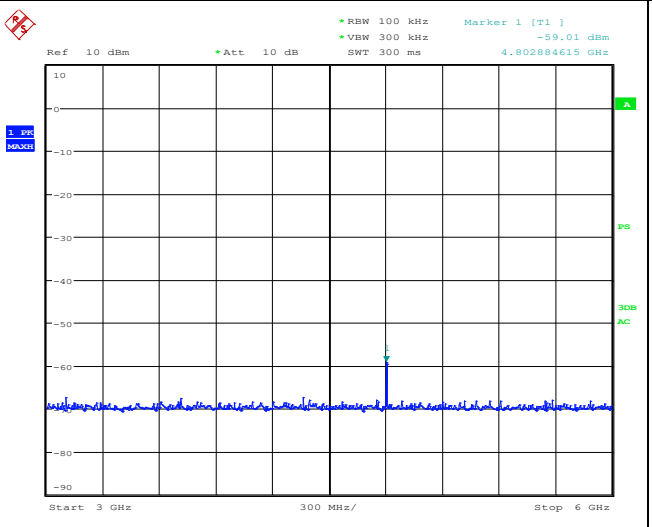
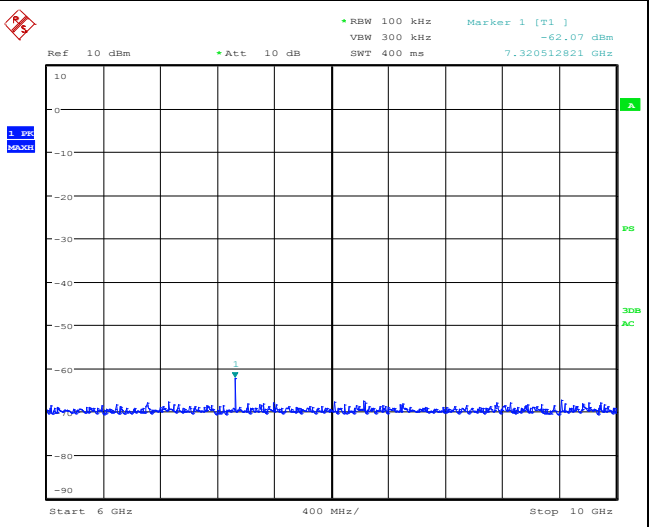
(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)).

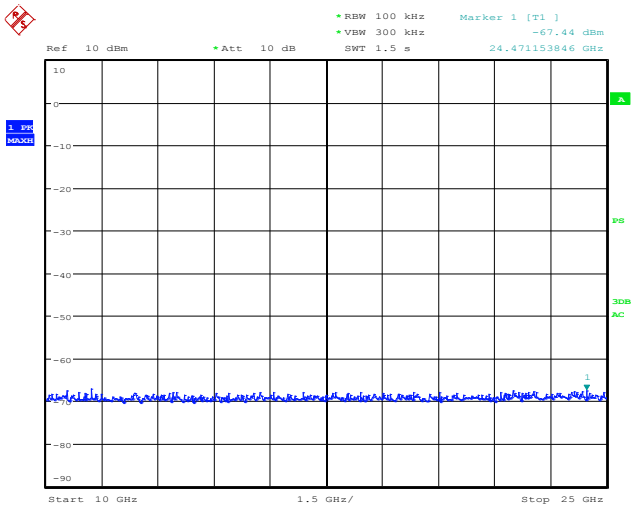
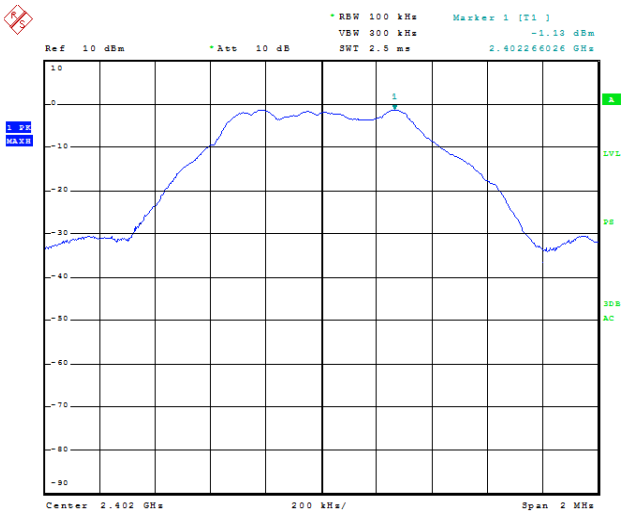
Further information to test setup



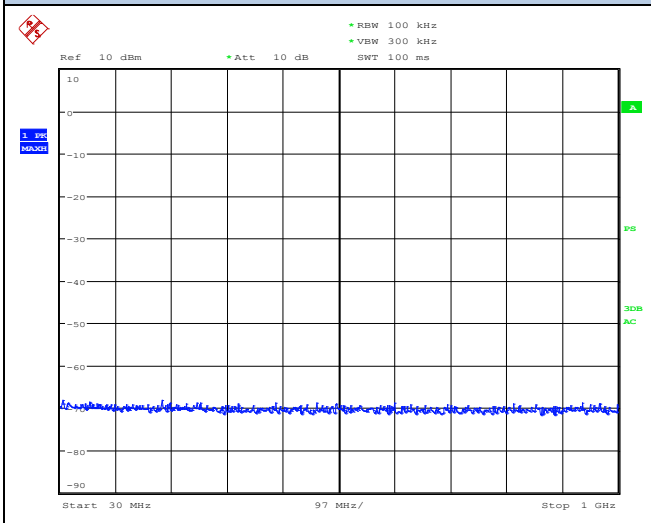
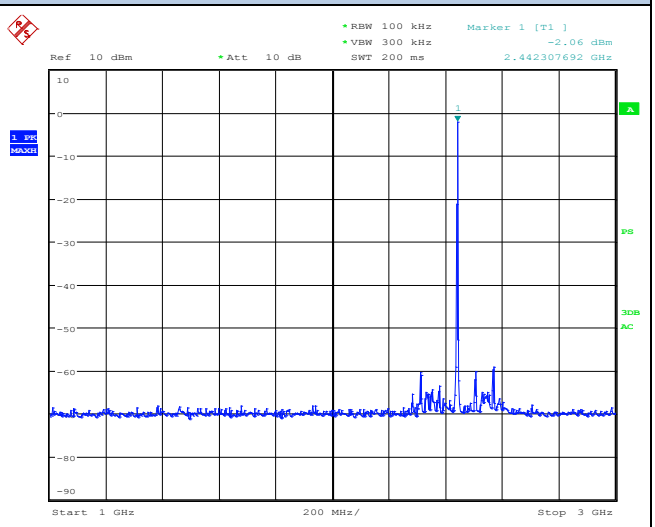
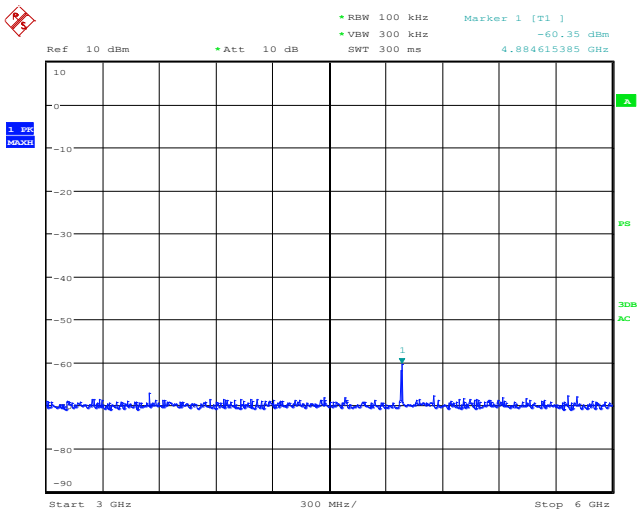
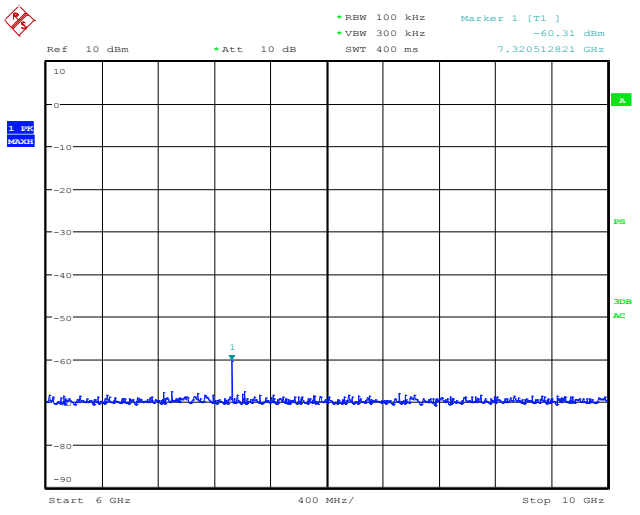
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	87020455	05/2018	05/2019

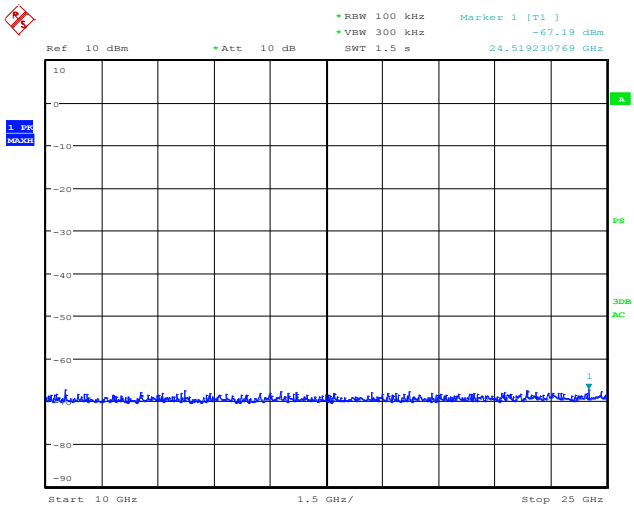
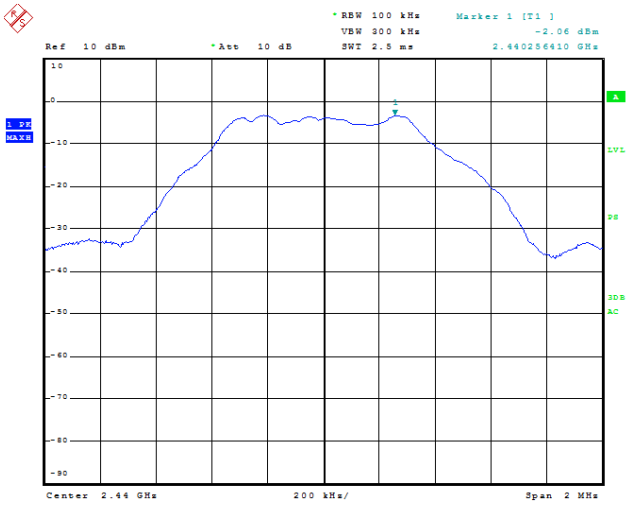
Test Procedure
Section 8.5 of DTS *KDB 558074* Subclause 11.11 of ANSI C63.10 is applied

Graphical representation of Antenna Port Spurious Emission - Conducted	
Operation Mode: #1 – Low Channel (2402 MHz)	
Frequency: 30MHz – 1000MHz	Frequency: 1GHz – 3GHz
	
Frequency: 3GHz – 6GHz	Frequency: 6GHz – 10GHz
	

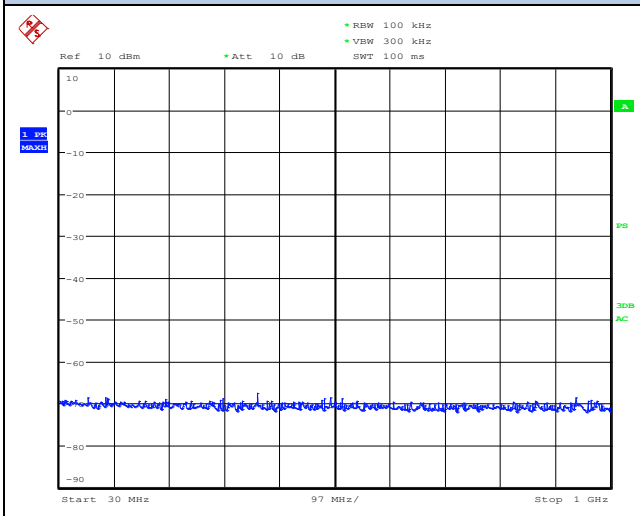
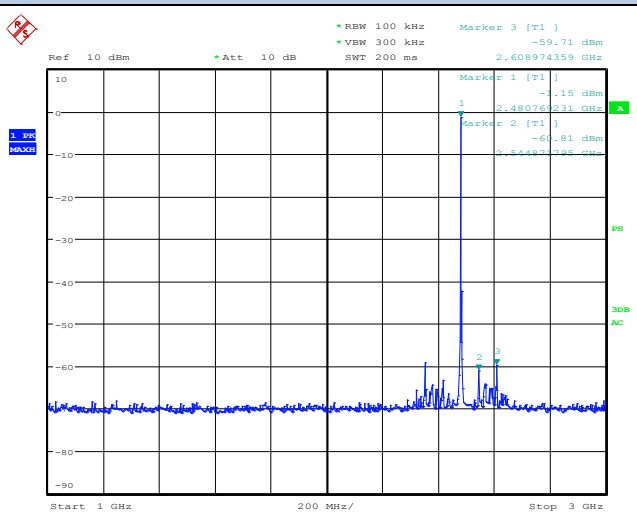
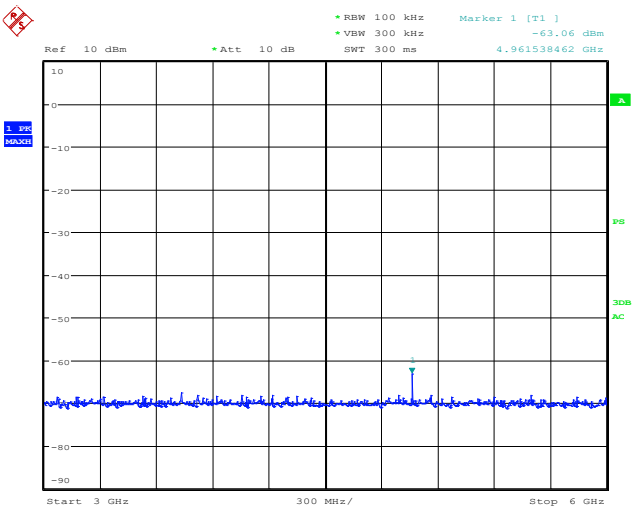
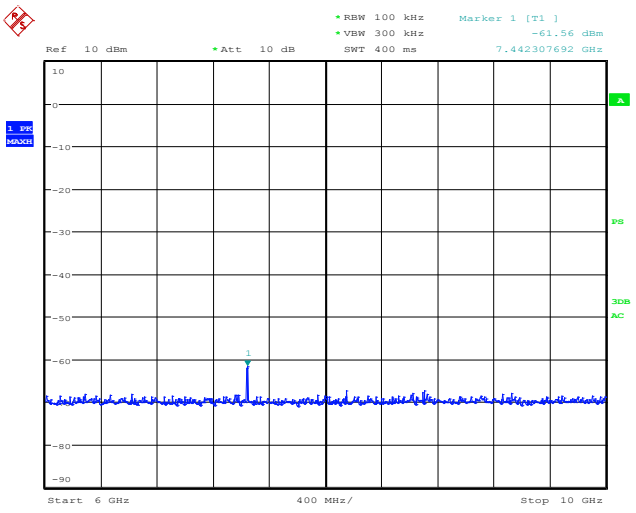
Frequency: 10GHz – 25GHz	Fundamental level
	

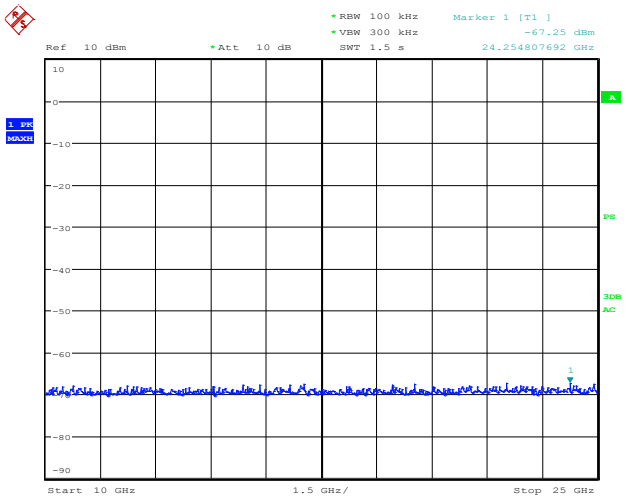
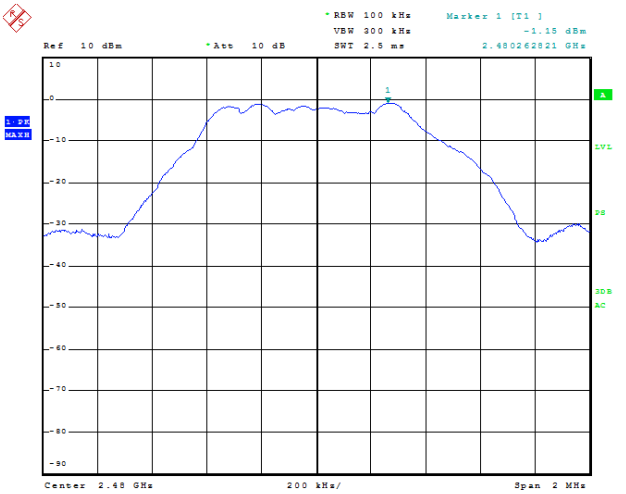
Frequency (MHz)	Level (dBm)	Fundamental Level (dBm)	Difference (dB)	Limit (at least) (dB)	Rusult
2275,64	-60,39	-1,13	59,26	20	compliant
2339,74	-61,25		60,12		compliant
4802,88	-59,01		57,88		compliant
7320,51	-62,07		60,94		compliant
24471,15	-67,44		66,31		compliant

Graphical representation of Antenna Port Spurious Emission - Conducted	
Operation Mode: #1 – Middle Channel (2440 MHz)	
Frequency: 30MHz – 1000MHz	Frequency: 1GHz – 3GHz
	
Frequency: 3GHz – 6GHz	Frequency: 6GHz – 10GHz
	

Frequency: 10GHz – 25GHz	Fundamental level
	

Frequency (MHz)	Level (dBm)	Fundamental Level (dBm)	Difference (dB)	Limit (at least) (dB)	Rusult
4884,61	-60,35	-2,06	58,29	20	compliant
7320,51	-60,31		58,25		compliant
24519,23	-67,19		65,13		compliant

Graphical representation of Antenna Port Spurious Emission - Conducted	
Operation Mode: #1 – high Channel (2480 MHz)	
Frequency: 30MHz – 1000MHz	Frequency: 1GHz – 3GHz
	
Frequency: 3GHz – 6GHz	Frequency: 6GHz – 10GHz
	

Frequency: 10GHz – 25GHz	Fundamental level
	

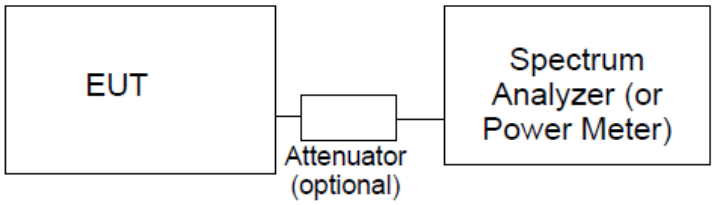
Frequency (MHz)	Level (dBm)	Fundamental Level (dBm)	Difference (dB)	Limit (at least) (dB)	Rusult
2544,87	-60,81	-1,15	59,66	20	compliant
2608,97	-59,71		58,56		compliant
4961,53	-63,06		61,91		compliant
7442,30	-61,56		60,41		compliant
24254,80	-67,25		66,10		compliant

17. Test Conditions and Results – 100 kHz Bandwidth of Frequency Band Edges

17	TEST: 100 kHz Bandwidth of Frequency Band Edges		PASS
Parameters required prior to the test		Laboratory Ambient Temperature (°C)	15 to 35 °C
		Relative Humidity (%)	30 to 60 %
Parameters recorded during the test		Laboratory Ambient Temperature (°C)	21°C
		Relative Humidity (%)	49%
		Air pressure (hPa)	1020
—		Power Mode	Application Point
Fully configured sample tested at the power line frequency		Batteries Operated	SMA Connector
Equipment mode:		Operation mode	#1
FCC Standard		§15.247(D)	

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)).

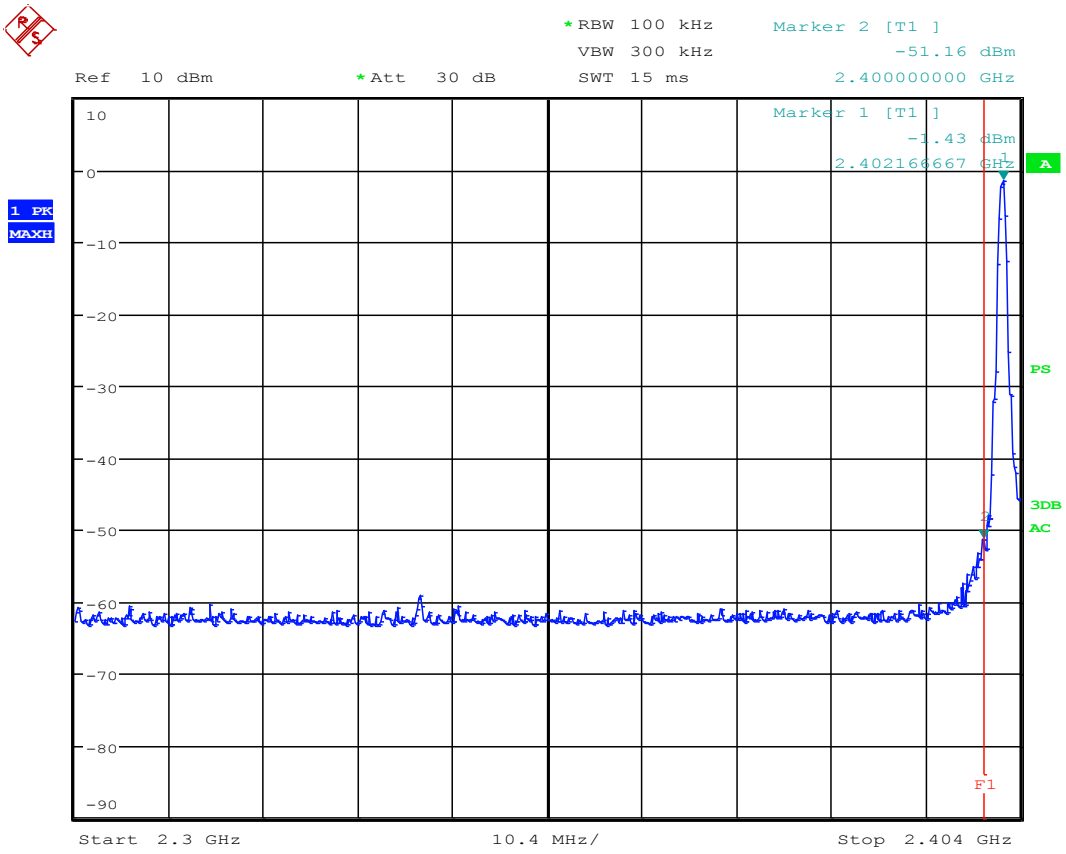
Further information to test setup



Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	87020455	05/2018	05/2019

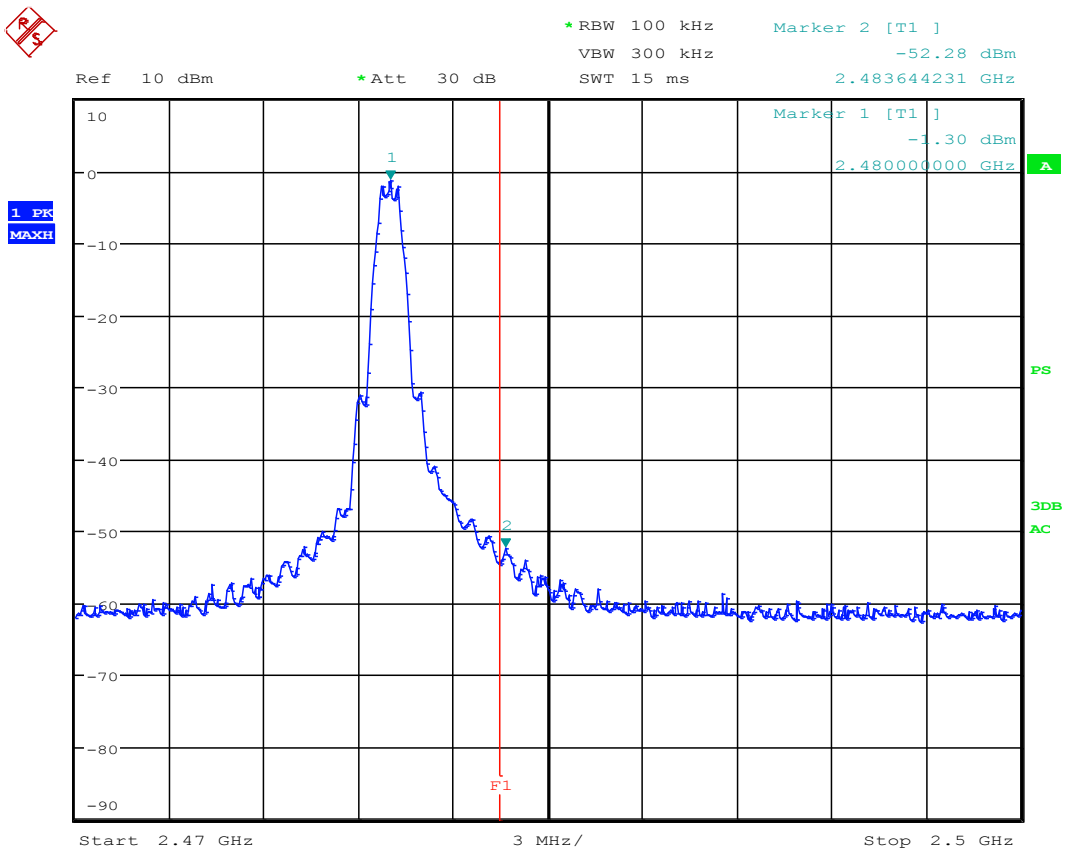
Test Procedure
Section 8.5 of DTS *KDB 558074* Subclause 11.11 of ANSI C63.10 is applied

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Conducted
Operation Mode: #1 – Low Channel (2402 MHz)



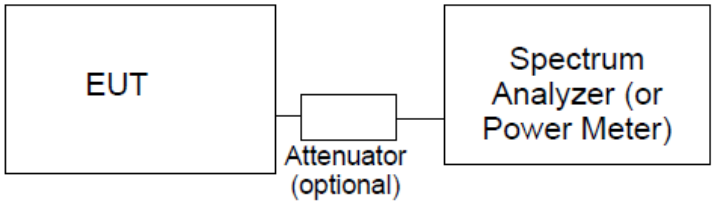
Frequency (MHz	Measured power at the band edge (dBm)	Measured peak power at fundamental frequency (dBm)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBm)	Margin (dB)
2400	**-51,16**	**-1,43**	**49,73**	**-21,43**	**29,73**

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Conducted
Operation Mode: #1 – High Channel (2480 MHz)



Frequency (MHz	Measured power at the band edge (dBm)	Measured peak power at fundamental frequency (dBm)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBm)	Margin (dB)
2483,5	**-52,28**	**-1,30**	**50,98**	**-21,30**	**30,98**

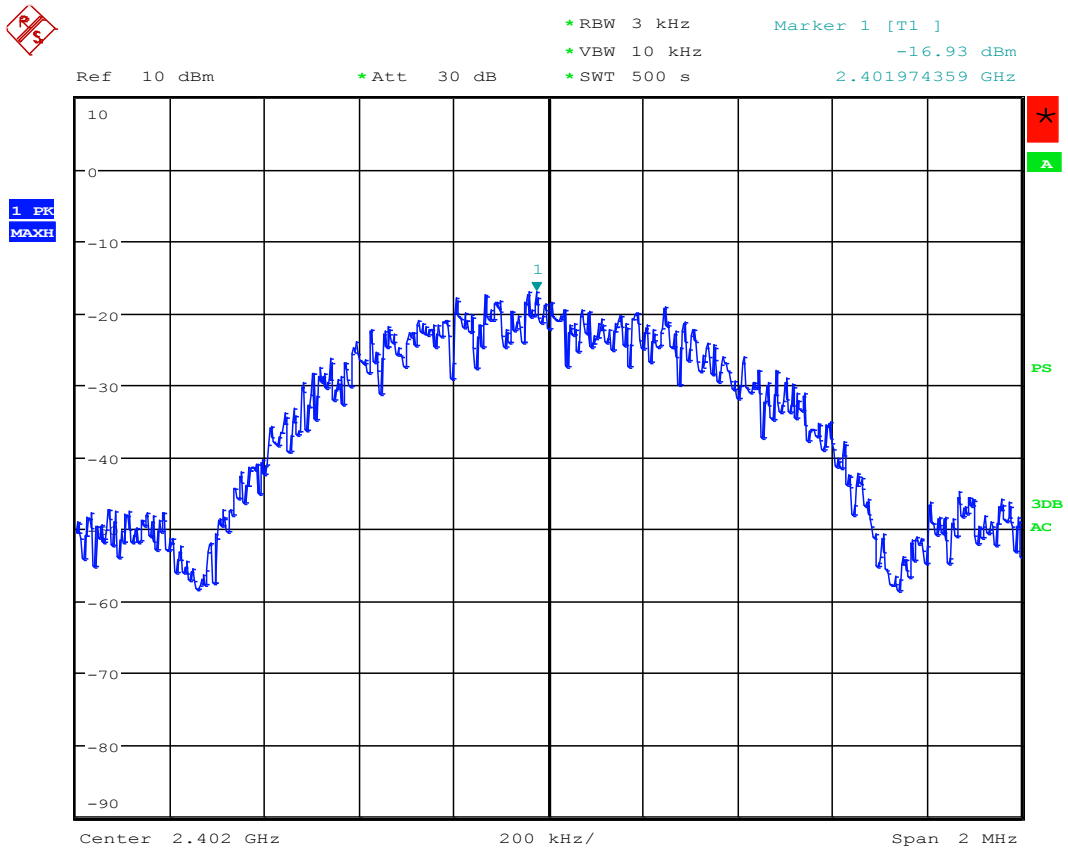
18. Test Conditions and Results – POWER SPECTRAL DENSITY

18	TEST: Power Spectral Density		PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	24°C	
	Relative Humidity (%)	37%	
	Air pressure (hPa)	1020	
—	Power Mode	Application Point	
Fully configured sample tested at the power line frequency	Batteries Operated	Enclosure	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247		
(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.			
Further information to test setup			

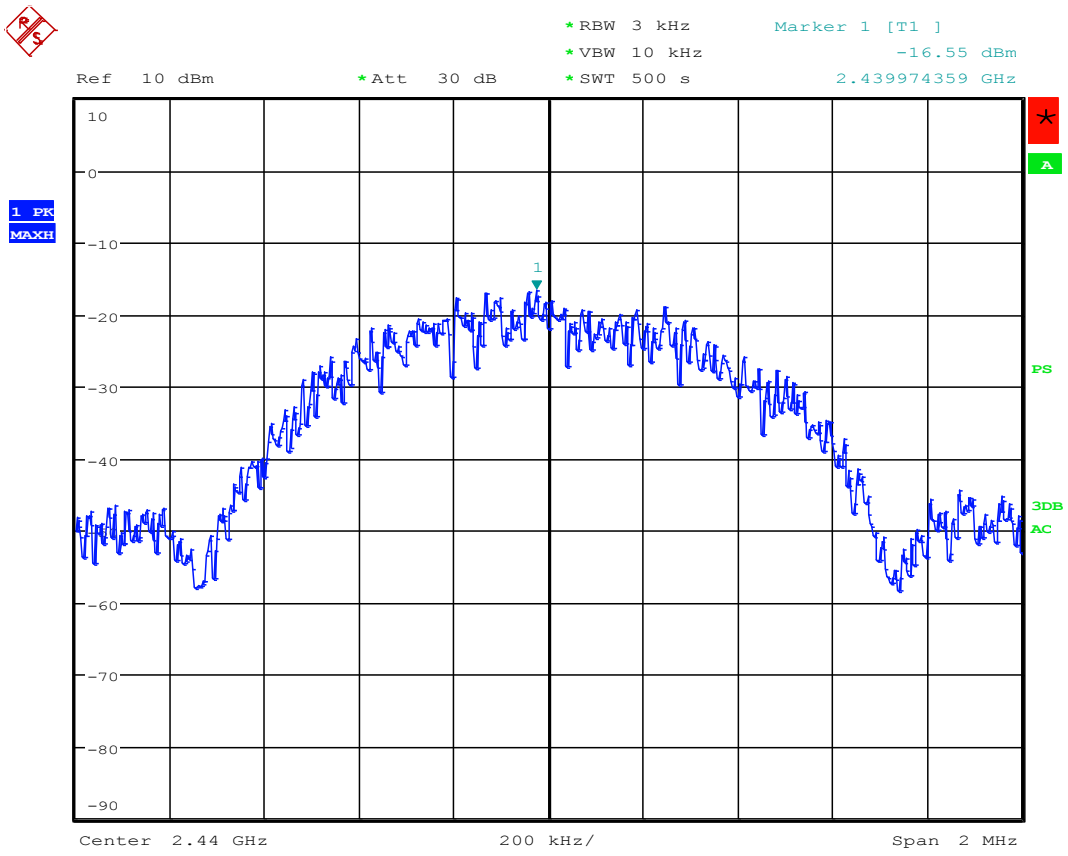
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	87020455	05/2018	05/2019

Test Procedure
Section 8.4 of DTS KDB 558074 Subclause 11.10 of ANSI C63.10 is applicable.

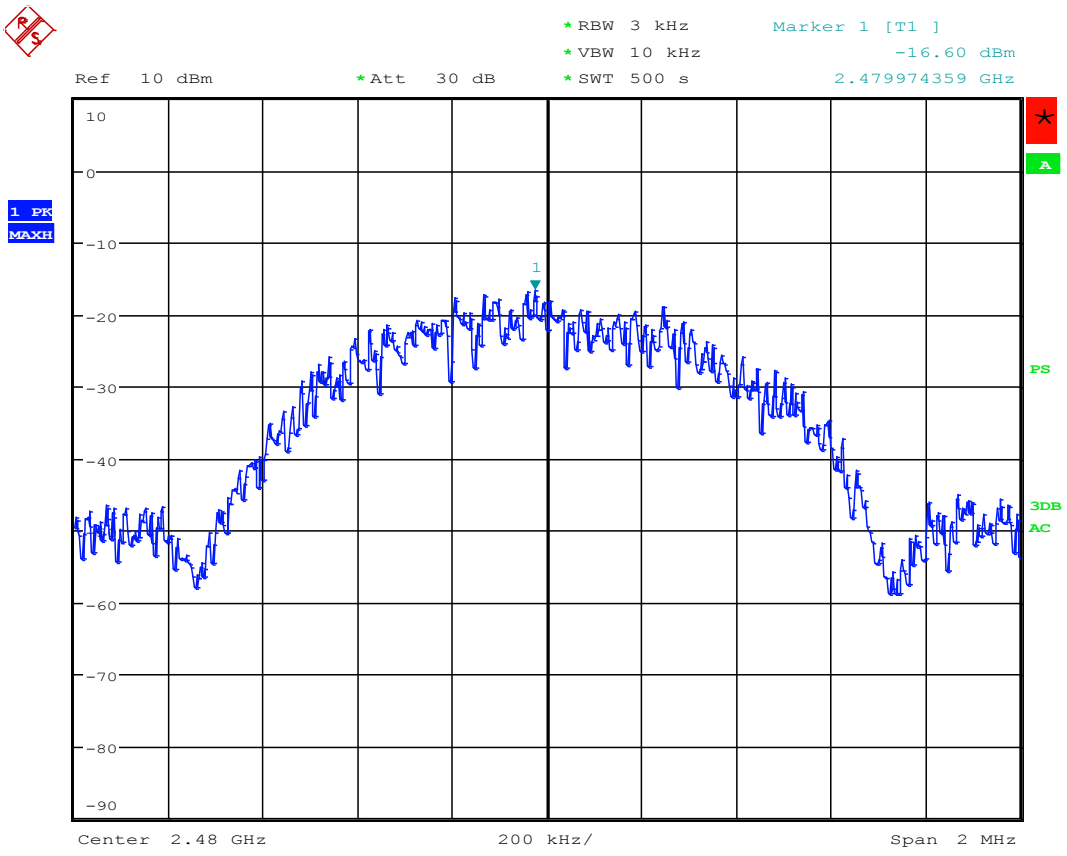
Graphical representation of Power Spectral Density
Operation Mode: #1
Channel: Low



Graphical representation of Power Spectral Density
Operation Mode: #1
Channel: Middle



Graphical representation of Power Spectral Density
Operation Mode: #1
Channel: High



Frequency (MHz)	Channel	PSD (dBm)
2402	Low	-16.93
2440	Middle	-16.55
2480	High	-16.60

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