



FCC LISTED, REGISTRATION  
 NUMBER: 2764.01

ISED LISTED REGISTRATION  
 NUMBER: 23595-1

Test report No:  
 2286ERM.007

## Partial Test report

Reference Standard:  
 USA FCC Part 22 24 and 27 / IC RSS-132 133 139 and 130

Identification of item tested	Elevator Monitoring System
Trademark	KONE
Model and /or type reference	KONE Connection 220
Other identification of the product	IMEI TAC: 35870905, 35420708 FCC ID: 2ALQBKC220 (PLS8-X QIPPLS8-X) IC: 4228A-KC220 (PLS8-X 7830A-PLS8X)
Features	GSM, WCDMA, LTE, Bluetooth LE
Manufacturer	KONE CORPORATION Kartanontie 1,00330 Helsinki, Finland
Test method requested, standard	USA FCC Part 22 10-1-15 Edition USA FCC Part 24 10-1-16 Edition. USA FCC Part 27 10-1-15 Edition CANADA IC RSS-132 Issue 4, Oct. 2018. CANADA IC RSS-133 Issue 6, Jan. 2013. CANADA IC RSS-139 Issue 3, Jul. 2015. CANADA IC RSS-130 Issue 2, Feb. 2019. Measurement Guidance 971168 D01 v02r02 for certification of Licensed Digital Transmitters. ANSI/TIA-603-D (2010).
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	03-19-2019
Report template No	FDT08_21

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## Competences and guarantees

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DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

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

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

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

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## General conditions

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

## Uncertainty

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

Frequency (MHz)	U(k=2)	Units
30-180	3.82	dB
180-1000	2.61	dB
1000-18000	2.92	dB
18000-40000	2.15	dB

## Data provided by the client

The device collects data using its sensors. The data is sent to the cloud using GSM/3G/4G connection. The device communicates to wireless sensors using Bluetooth LE.

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

## Usage of samples

Samples undergoing test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
2268.32	Kone Connection 220 (US_RF)	Kone	778566345541197	2/7/2019

Following accessories elements were used with Sample S/01 to perform

Control N°	Description	Model	Serial N°	Date of reception
2268.04	Ethernet cable	-	-	2/1/2019
2268.07	USB pen drive_3.0	DTSE9 G2(16GB)	-	2/1/2019
2268.16	I/O simulator Cable	-	-	2/1/2019
2268.18	A/D simulator Cable	-	-	2/1/2019
2268.09	Antenna	2JW1124-C952B	-	2/1/2019
2268.49	Antenna	2JW1124-C952B	-	2/7/2019
2268.62	(EU)AC/DC power supply	3523-24	-	2/7/2019

1. Sample S/01 was used in the following test(s):

All radiated tests indicated in appendix A, B, and C.

## Test sample description

Ports..... :	Port name and description	Cable				
		Specified length [m]	Attached during test	Shielded		
	Analog input	1.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	Digital input	1.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	Ethernet	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	AC power	1.8	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	DC power	1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports	No data Provided					
Rated power supply:	Voltage and Frequency	Reference poles				
		L1	L2	L3	N	PE
<input type="checkbox"/>	AC: 230Vac / 50Hz. (External power supply)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	AC: 120Vac/60Hz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	DC: 36 V (Device)					
<input type="checkbox"/>	DC:					
Rated Power .....	36W					
Clock frequencies .....	500 MHz					
Other parameters.....	No data Provided					
Software version .....	1.5					
Hardware version.....	1.2					
Dimensions in cm (L x W x D) .....	130x22x132 mm					
Mounting position.....	<input type="checkbox"/>	Table top equipment				
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment				
	<input type="checkbox"/>	Floor standing equipment				
	<input type="checkbox"/>	Hand-held equipment				
	<input type="checkbox"/>	Other:				
Modules/parts .....	Module/parts of test item	Type			Manufacturer	
	PLS8-X	LTE Modem			Gemalto	
	TiWi-uB2	Bluetooth module			LSR	

Accessories (not part of the test item) .....	Description	Type	Manufacturer
	AC/DC Power Supply		Wallace Electronics
	Analog simulator	For testing	Wapice
	Digital simulator	For testing	Wapice
	Bluetooth sensor tag	For testing	Texas Instruments
	USB Flash drive	For testing	Kingston
Documents as provided by the applicant.....	Description	File name	Issue date
	<i>Equipment declaration Data</i>	FDT30_15 KC220_Declaration Equipment Data_NA	-

**Copy of marking plate:**



## Identification of the client

KONE CORPORATION  
KARTANONTIE 1,00330 HELSINKI, FINLAND

## Testing period and place

Test Location	DEKRA Certification, Inc.
Date (start)	2019-02-19
Date (finish)	2019-02-25

## Document history

Report number	Date	Description
2286ERM.007	03-19-2019	First release

## Environmental conditions

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 30 % Max. = 75 %
<b>Air pressure</b>	Min. = 860 mbar Max. = 1060 mbar

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 30 % Max. = 75 %
<b>Air pressure</b>	Min. = 860 mbar Max. = 1060 mbar

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 30 % Max. = 60 %
<b>Air pressure</b>	Min. = 860 mbar Max. = 1060 mbar

## Remarks and comments

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The tests have been performed by the technical personnel: Koji Nishimoto & Poojita Bhattu.

## Testing verdicts

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

## Summary

FCC PART 22 / RSS-132 PARAGRAPH				
Report Section	Spec Clause	Test Description	Verdict	Remark
-	§2.1046 and §22.913	RF Output power	N/M	Note 1
-	§2.1047	Modulation characteristics	N/M	Note 1
-	§2.1055 and § 22.355	Frequency stability	N/M	Note 1
-	§2.1049	Occupied Bandwidth	N/M	Note 1
-	§2.1051 and §22.917	Spurious emissions at antenna terminals	N/M	Note 1
-	§22.917	Spurious emissions at antenna terminals at Block edges	N/M	Note 1
A.1	§2.1053 and §22.917 / RSS-132 Clause 5.5	Radiated emissions	P	N/A

Supplementary information and remarks:  
Note 1: Test not performed. Only co-location radiated spurious emission test was requested.

FCC PART 24 / RSS-133 PARAGRAPH				
Report Section	Spec Clause	Test Description	Verdict	Remark
-	§ 24.232	RF Output power	N/M	Note 1
-	§ 2.1047	Modulation characteristics	N/M	Note 1
-	§ 24.235	Frequency stability	N/M	Note 1
-	§ 2.1049	Occupied Bandwidth	N/M	Note 1
-	§ 24.238	Spurious emissions at antenna terminals	N/M	Note 1
B.1	§ 24.238 / RSS-133 Clause 6.5	Radiated emissions	P	N/A

Supplementary information and remarks:  
Note 1: Test not performed. Only co-location radiated spurious emission test was requested.



FCC PART 27 / RSS-139 / RSS-130 PARAGRAPH				
Report Section	Spec Clause	Test Description	Verdict	Remark
-	§ 27.50	RF Output power	N/M	Note 1
-	§ 2.1047	Modulation characteristics	N/M	Note 1
-	§ 27.54	Frequency stability	N/M	Note 1
-	§ 2.1049	Occupied Bandwidth	N/M	Note 1
-	§ 27.53	Spurious emissions at antenna terminals	N/M	Note 1
C.1	§ 27.53 RSS-139 Clause 6.6 / RSS-130 Clause 4.7	Radiated emissions	P	N/A
<u>Supplementary information and remarks:</u>				
Note 1: Test not performed. Only co-location radiated spurious emission test was requested.				

## List of equipment used during the test

### Radiated Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1179	Semi anechoic Absorber Lined Chamber Frankonia SAC 3 plus "L"	N/A	N/A
1064	BiconicalLog antenna ETS LINDGREN 3142E	2017/03	2020/03
1057	Double-ridge Waveguide Horn antenna 1-18 GHz	2017/03	2019/03
1012	EMI Test Receiver	2018/09	2020/09
1014	Spectrum analyzer Rohde & Schwarz FSV40	2017/03	2019/03
0980	RF pre-amplifier 30 MHz-6 GHz Bonn Elektronik BLMA 0360-01N	2017/05	2019/05
0981	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-2A	2017/05	2019/05
1015, 1017, 1019, 1020	Rohde & Schwarz EMC32 software	N/A	N/A

# Appendix A:

## FCC 22 Results/ IC RSS-132

## Description of Test Conditions

The worst case was found when positioned as the table below. Following channels were selected for the final test as listed below:

TEST CONDITIONS	DESCRIPTION				
TC#01	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p>				
	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode
	824 – 849	824.7 836.5 848.3	1.4	QPSK	LTE Band 5 1 RB
TC#02	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p>				
	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode
	824 – 849	836.5	1.4	QPSK	LTE Band 5 1 RB
	2402-2480	2440	2	GFSK	BLE
<p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>					

TEST CONDITIONS	DESCRIPTION									
TC#03	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 667 1109 925"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>824 – 849</td> <td>836.5</td> <td>WCDMA Band 5</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	Mode	824 – 849	836.5	WCDMA Band 5	2402-2480	2440	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	Mode								
824 – 849	836.5	WCDMA Band 5								
2402-2480	2440	BLE								
TC#04	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 1395 1109 1653"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>824 – 849</td> <td>836.5</td> <td>GSM 850</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	Mode	824 – 849	836.5	GSM 850	2402-2480	2440	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	Mode								
824 – 849	836.5	GSM 850								
2402-2480	2440	BLE								

## Test A.1: RADIATED EMISSIONS (PART 22)

<b>LIMITS:</b>	Product standard:	FCC Part 22
	Test standard:	FCC §2.1053 and §22.917 / RSS-132 Clause 5.5

### LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB. P in watts.

At  $P_o$  (dBm) transmitting power, the specified minimum attenuation is  $43+10\log (P_o)$  and the limit level in dBm is as follows:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

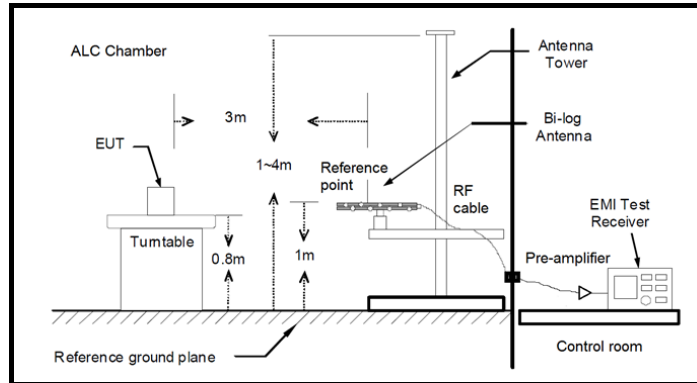
### TEST SETUP

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

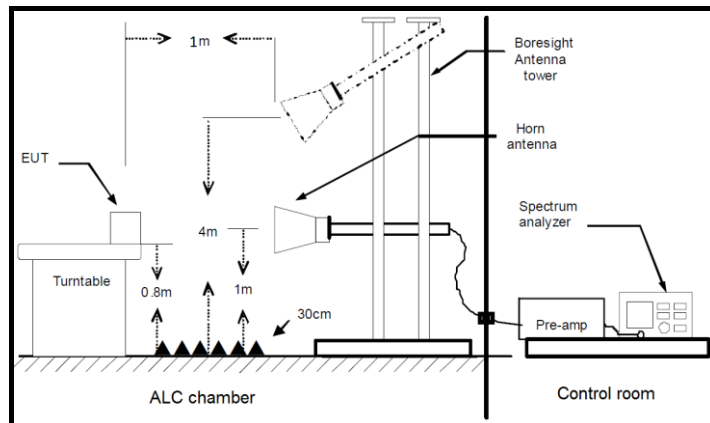
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

Radiated measurements < 1GHz



Radiated measurements > 1GHz

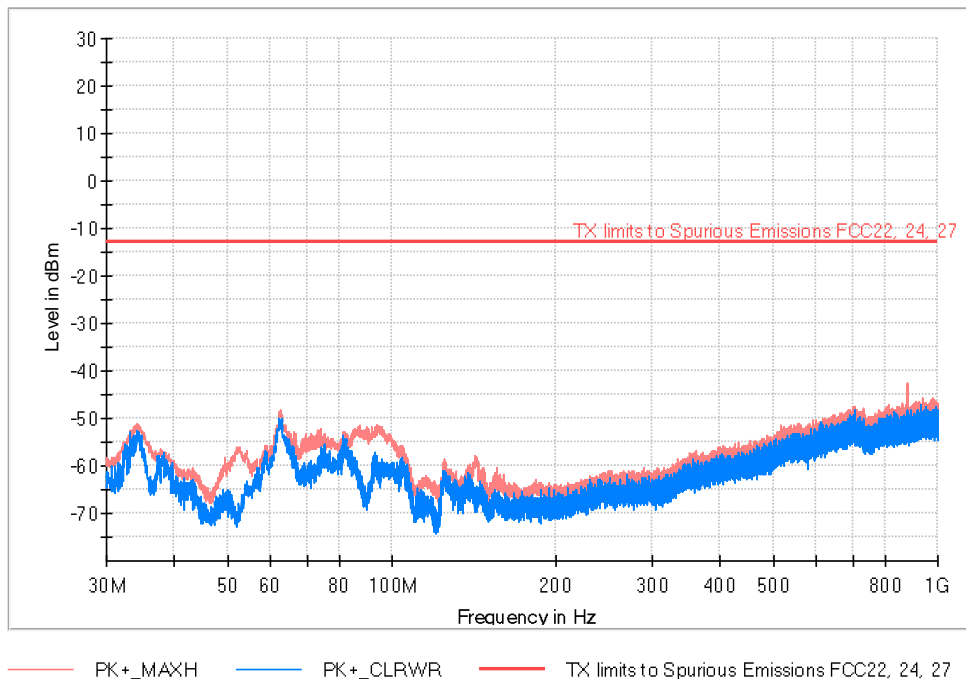


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#01
<b>TEST RESULTS:</b>	PASS

**LTE Band 5 Lowest channel 824.7 MHz**

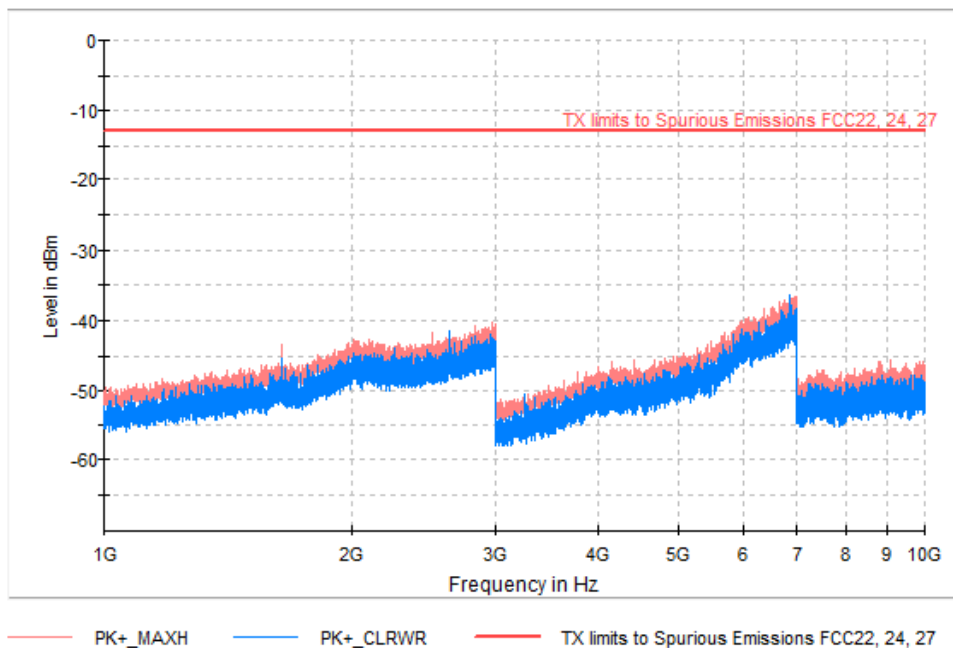
FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 30 dB below the limit.



FREQUENCY RANGE: 1-10 GHz

The radiated spurious signal was detected below 30 dB below the limit.

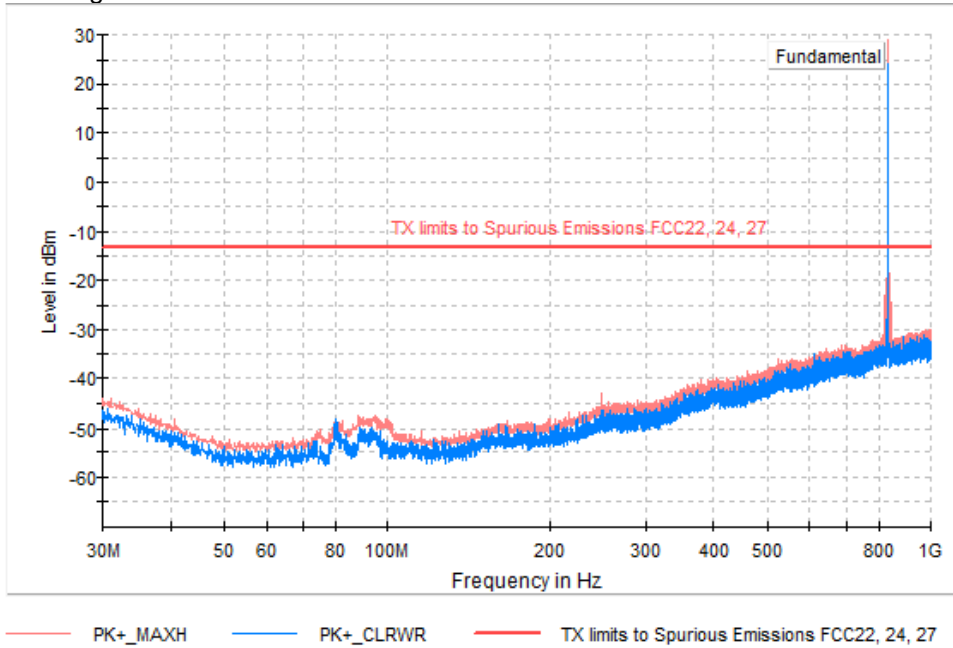


**TEST RESULTS (Cont):**

**Middle channel 836.5 MHz**

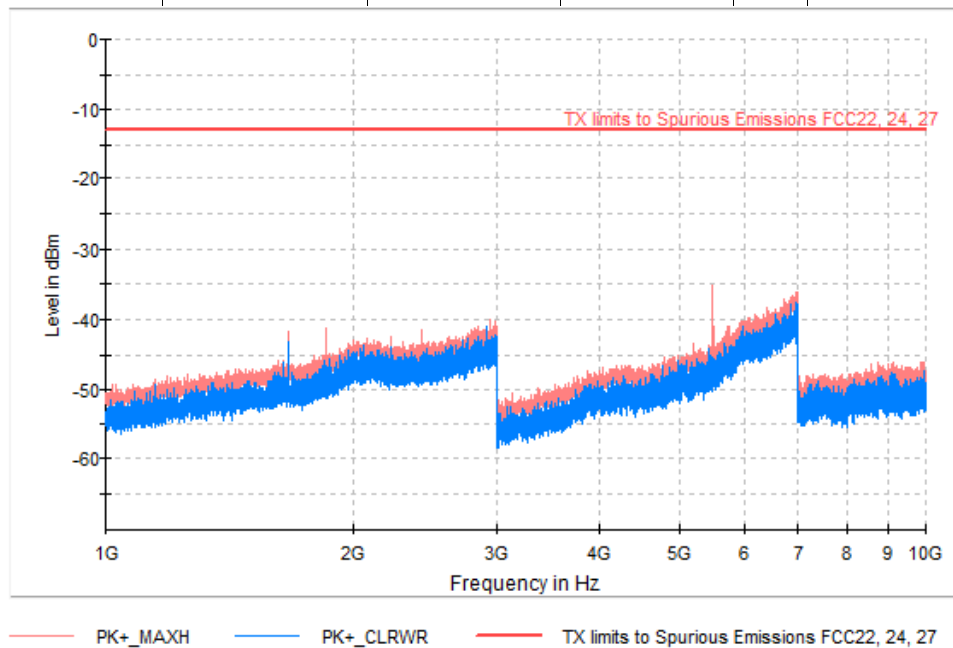
FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 30 dB below the limit.



FREQUENCY RANGE: 1-10 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol
1671.800000	-44.7	-41.8	V
1850.800000	-49.5	-41.2	H
5501.000000	-46.1	-35.1	V

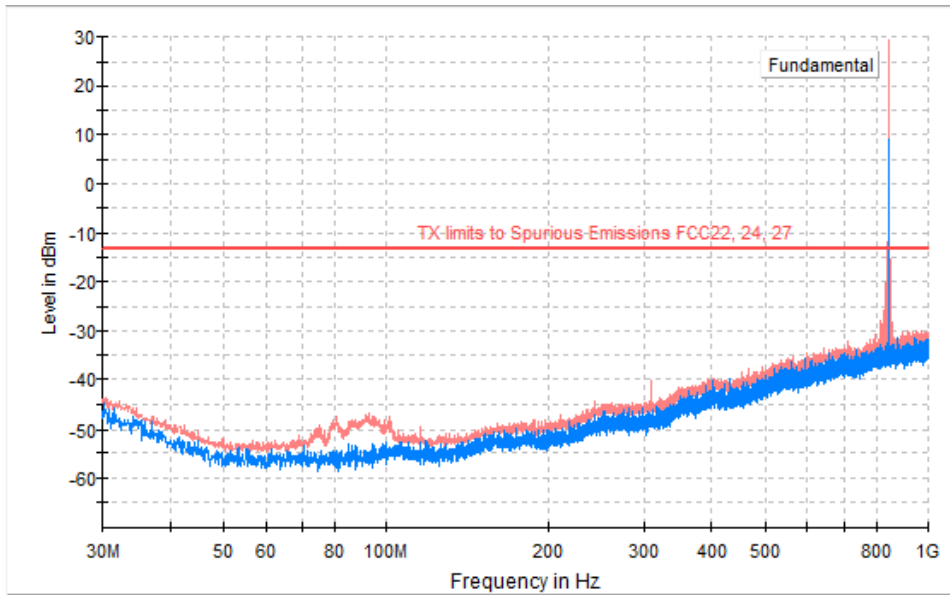


**TEST RESULTS (Cont):**

**Highest channel 848.3 MHz**

FREQUENCY RANGE: 30-1000 MHz

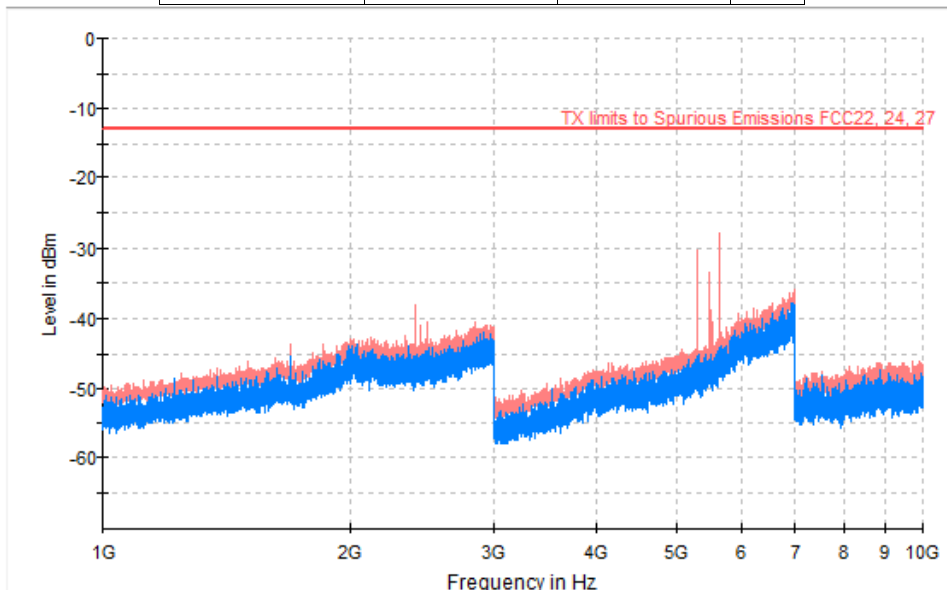
The radiated spurious signal was detected below 20 dB below the limit.



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

FREQUENCY RANGE: 1-10 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol
5302.500000	-46.7	-30.1	V
5499.000000	-47.9	-33.5	H
5667.000000	-46.8	-27.8	V



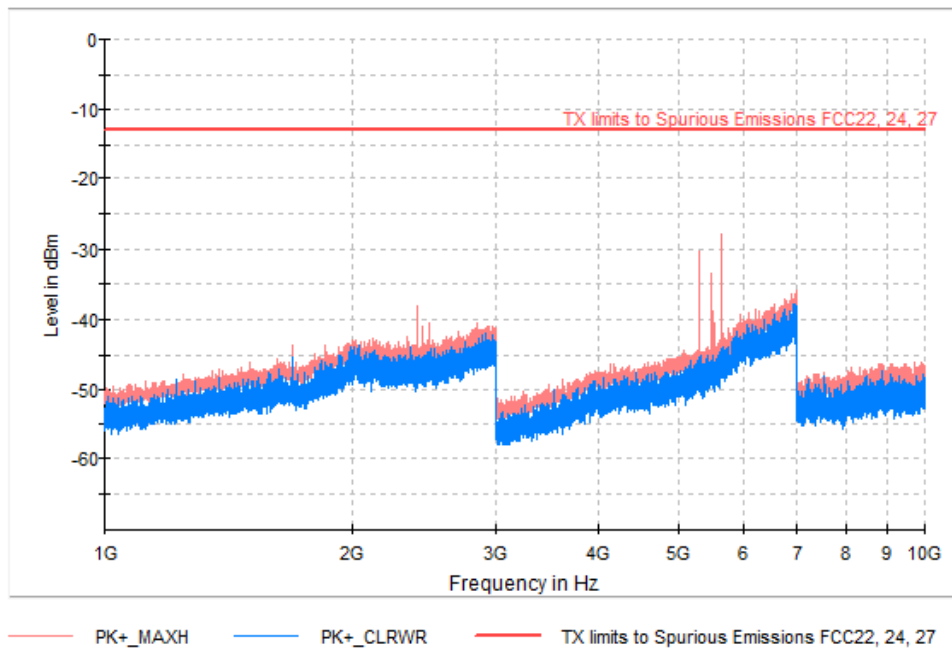
— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-10 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol
5302.500000	-46.7	-30.1	V
5499.000000	-47.9	-33.5	H
5667.000000	-46.8	-27.8	V

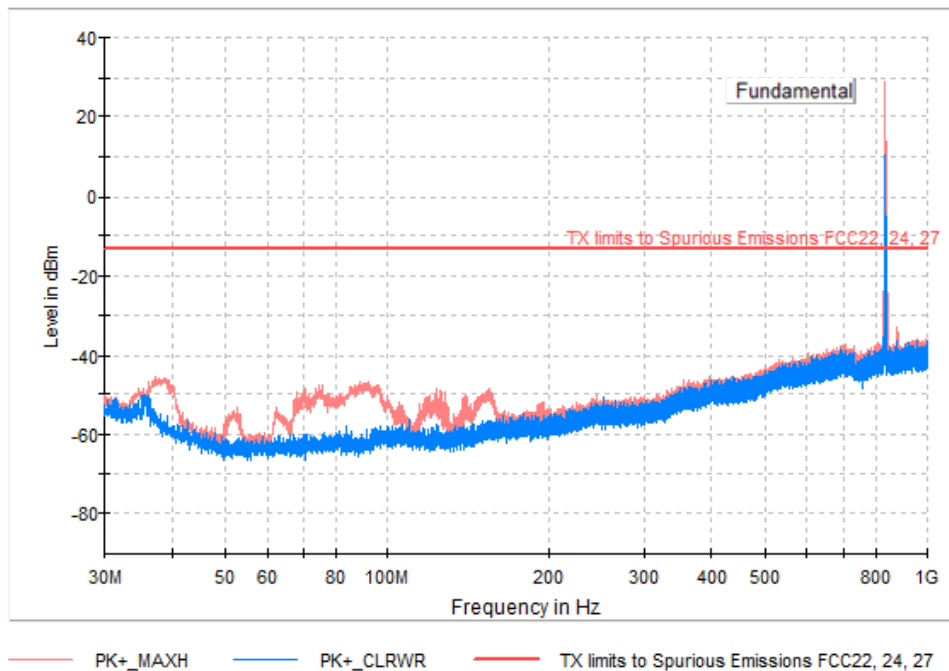


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#02
<b>TEST RESULTS:</b>	PASS

**LTE Band 5 Middle channel 836.5 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

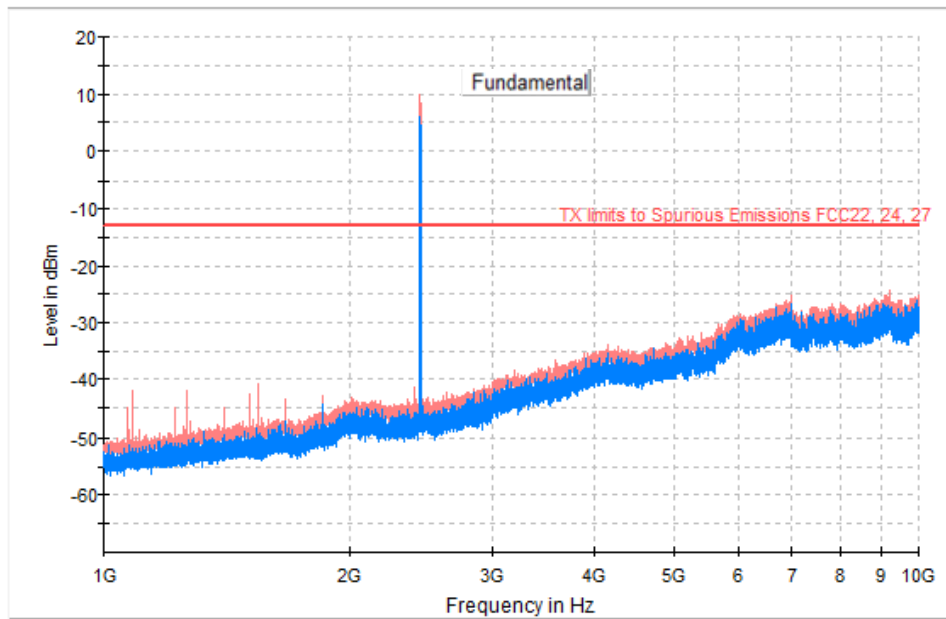
The radiated spurious signal was detected below 20 dB below the limit.



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-10 GHz

The radiated spurious signal was detected below 20 dB below the limit.

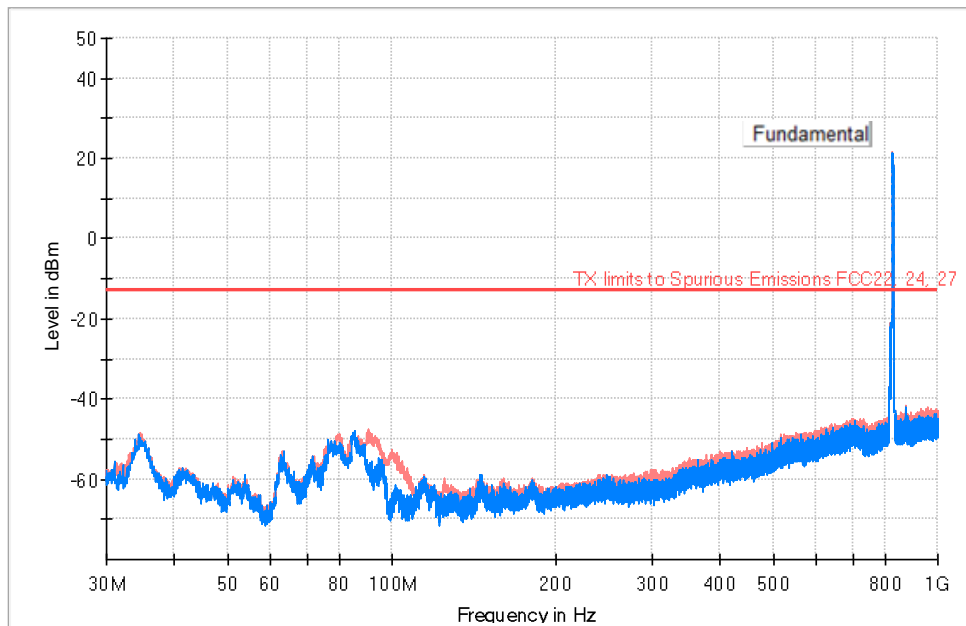


— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#03
<b>TEST RESULTS:</b>	PASS

**WCDMA Band 5 Middle channel 836.5 MHz and BLE 2440 MHz**  
**FREQUENCY RANGE: 30-1000 MHz**

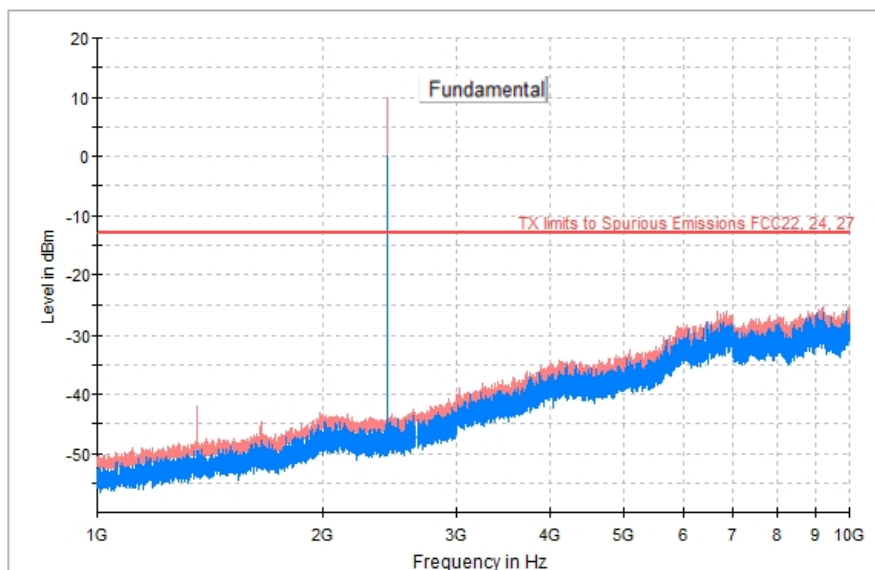
The radiated spurious signal was detected below 20 dB below the limit.



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**FREQUENCY RANGE: 1-10 GHz**

The radiated spurious signal was detected below 20 dB below the limit.

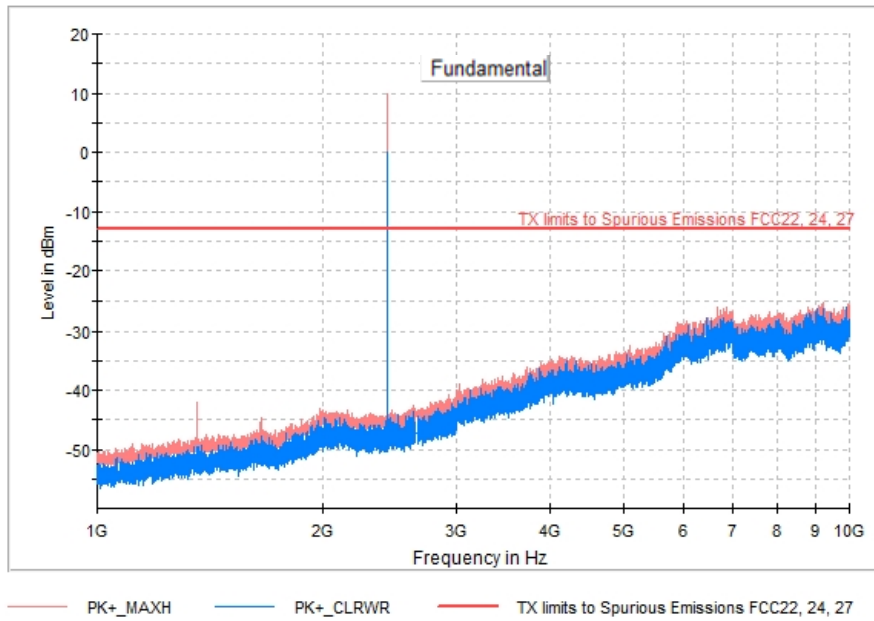


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-10 GHz**

The radiated spurious signal was detected below 20 dB below the limit.

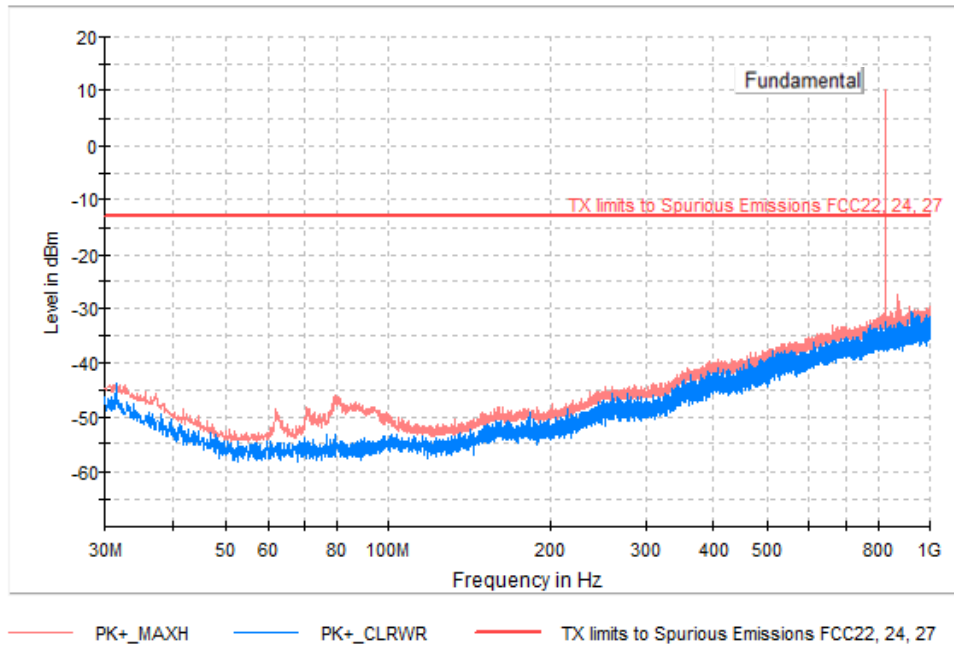


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#04
<b>TEST RESULTS:</b>	PASS

**GSM 850 Middle channel 836.5 MHz and BLE 2440 MHz**

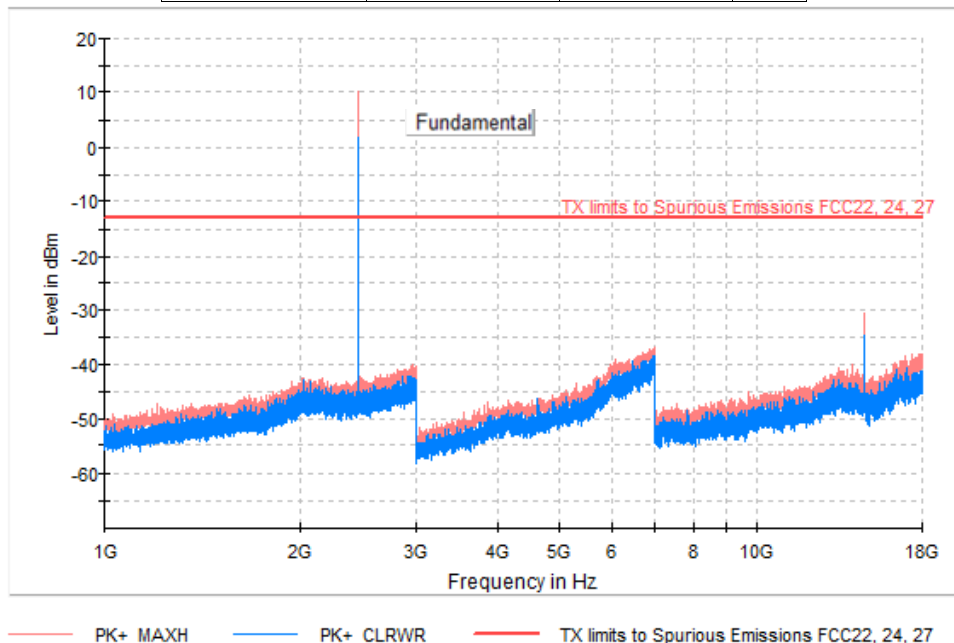
FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 20 dB below the limit.



FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol
14642.142857	-34.7	-30.4	V



# Appendix B:

## FCC 24 Results / IC RSS-133

## Description of Test Conditions

The worst case was found when positioned as the table below. Following channels were selected for the final test as listed below:

TEST CONDITIONS	DESCRIPTION				
TC#01	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p>				
	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode
	1850 – 1910	1860 1880 1900	20	QPSK	LTE Band 2 1 RB
TC#02	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p>				
	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode
	1850 – 1910	1880	20	QPSK	LTE Band 2 1 RB
	2402-2480	2440	2	GFSK	BLE
<p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>					



TEST CONDITIONS	DESCRIPTION									
TC#03	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 667 1109 925"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>1850 – 1910</td> <td>1880</td> <td>WCDMA Band 2</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	Mode	1850 – 1910	1880	WCDMA Band 2	2402-2480	2440	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	Mode								
1850 – 1910	1880	WCDMA Band 2								
2402-2480	2440	BLE								
TC#04	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 1368 1109 1626"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>1850 – 1910</td> <td>1880</td> <td>GSM 1900</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	Mode	1850 – 1910	1880	GSM 1900	2402-2480	2440	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	Mode								
1850 – 1910	1880	GSM 1900								
2402-2480	2440	BLE								

## Test A.1: RADIATED EMISSIONS (PART 24)

<b>LIMITS:</b>	Product standard:	FCC Part 24
	Test standard:	FCC §2.1053 and §24.238 / RSS-133 Clause 6.5

### LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. P in watts.

At  $P_o$  (dBm) transmitting power, the specified minimum attenuation is  $43 + 10 \log(P_o)$  and the limit level in dBm is as follows:

$$P_o \text{ (dBm)} - [43 + 10 \log(P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

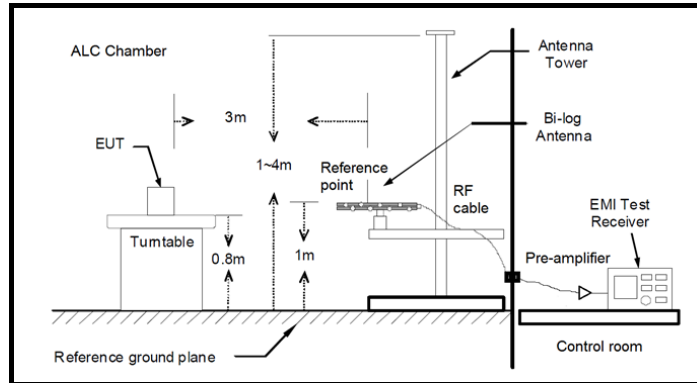
### TEST SETUP

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

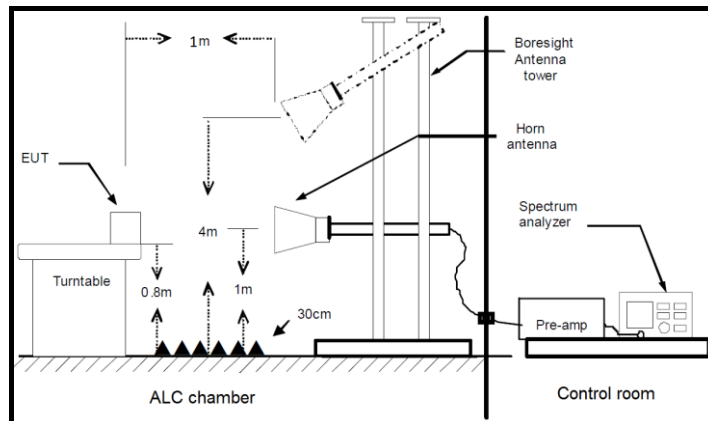
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

Radiated measurements < 1GHz



Radiated measurements > 1GHz

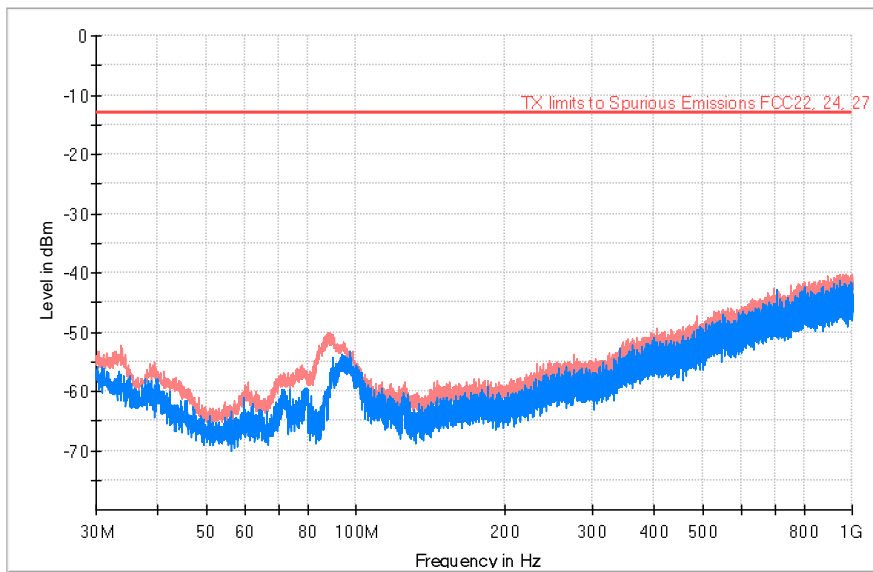


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#01
<b>TEST RESULTS:</b>	PASS

**LTE Band 2 Lowest channel 1860 MHz**

FREQUENCY RANGE: 30-1000 MHz

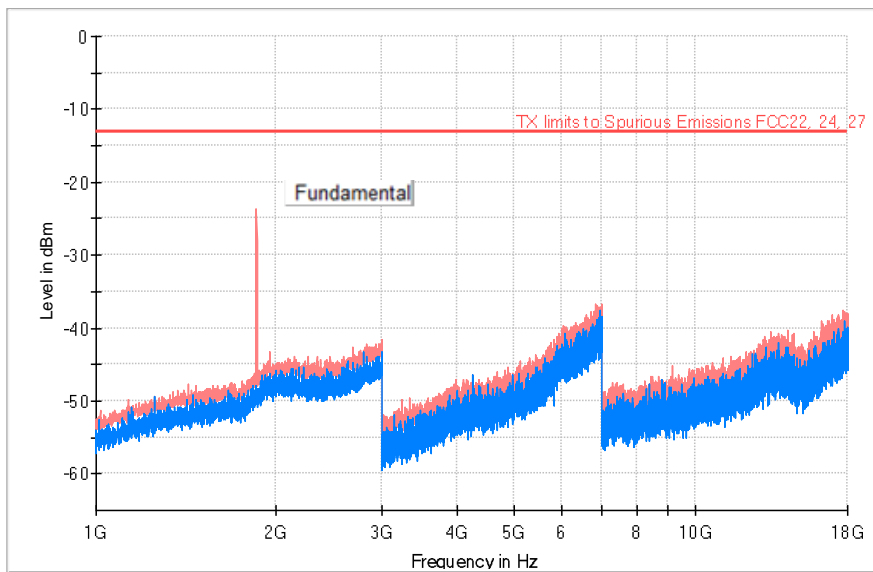
The radiated spurious signal was detected below 30 dB below the limit.



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

FREQUENCY RANGE: 1-18 GHz

The radiated spurious signal was detected below 30 dB below the limit.

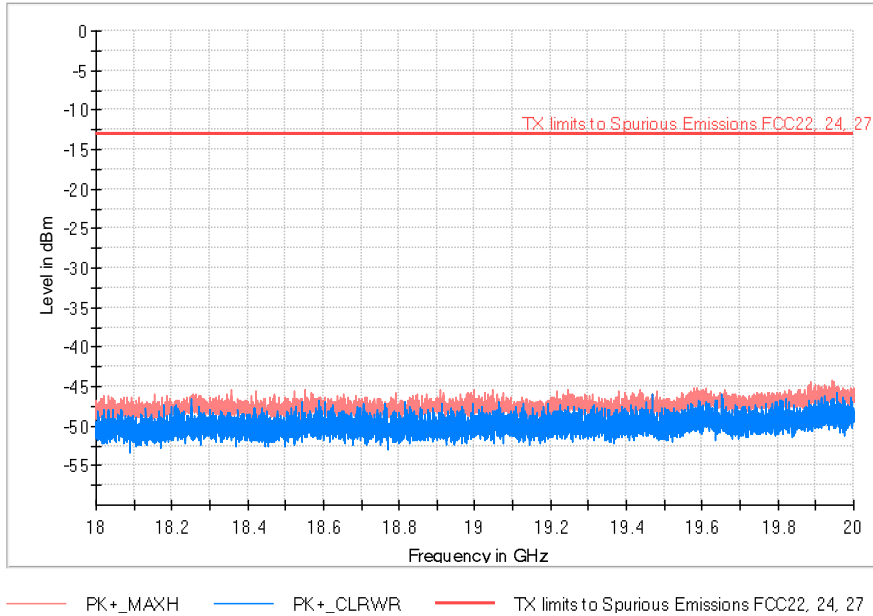


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 18-20 GHz**

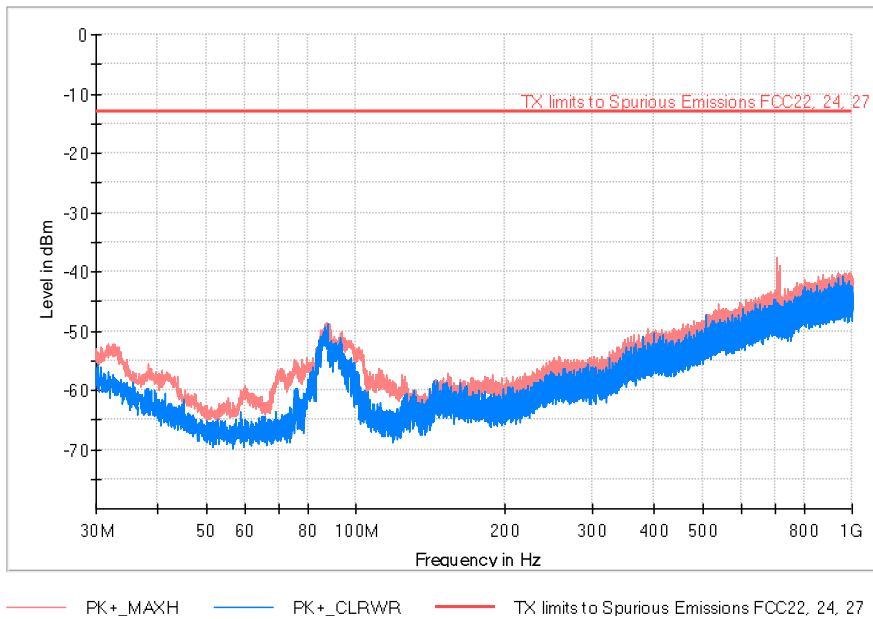
The radiated spurious signal was detected below 30 dB below the limit.



**Middle channel 1880 MHz**

**FREQUENCY RANGE: 30-1000 MHz**

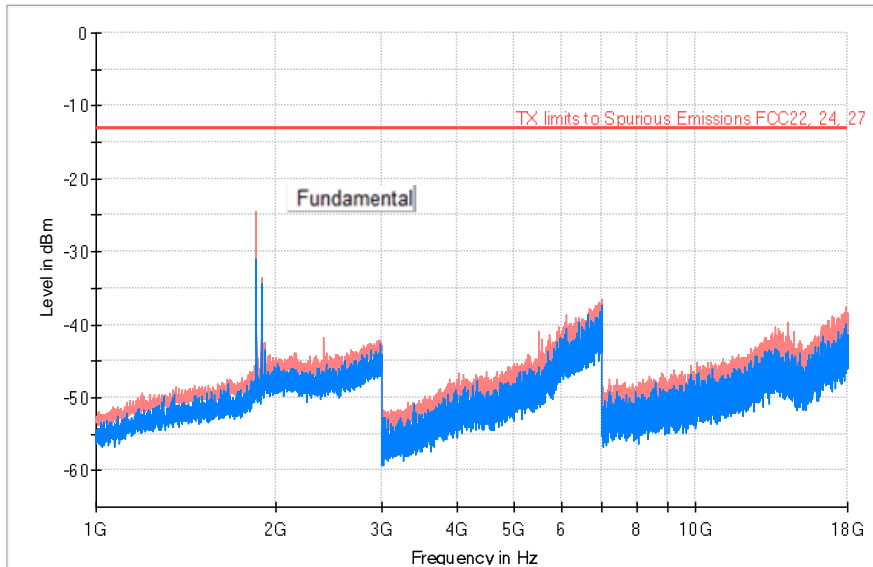
The radiated spurious signal was detected below 30 dB below the limit.



**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-18 GHz**

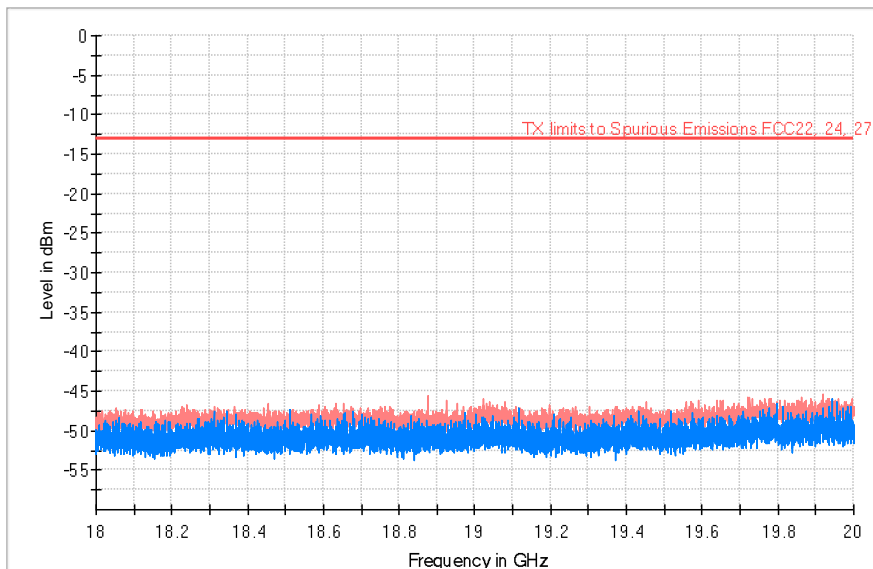
The radiated spurious signal was detected below 30 dB below the limit.



PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27

**FREQUENCY RANGE: 18-20 GHz**

The radiated spurious signal was detected below 30 dB below the limit.



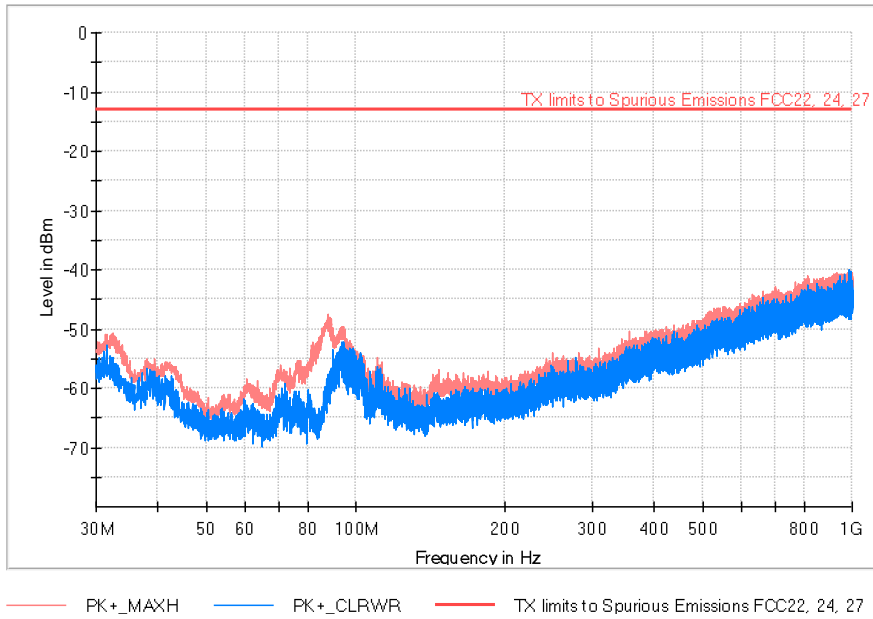
PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**Highest channel 1900 MHz**

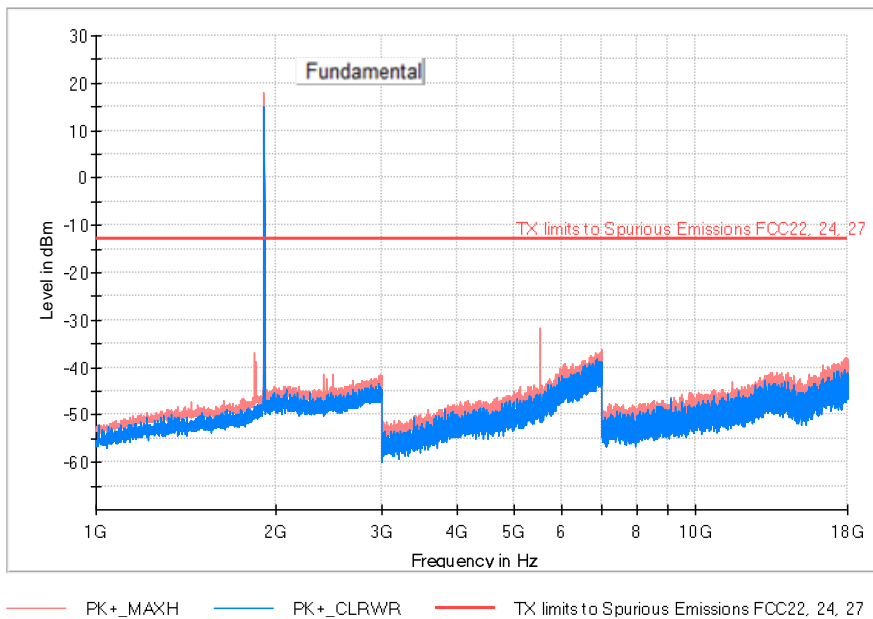
FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 20 dB below the limit.



FREQUENCY RANGE: 1-18 GHz

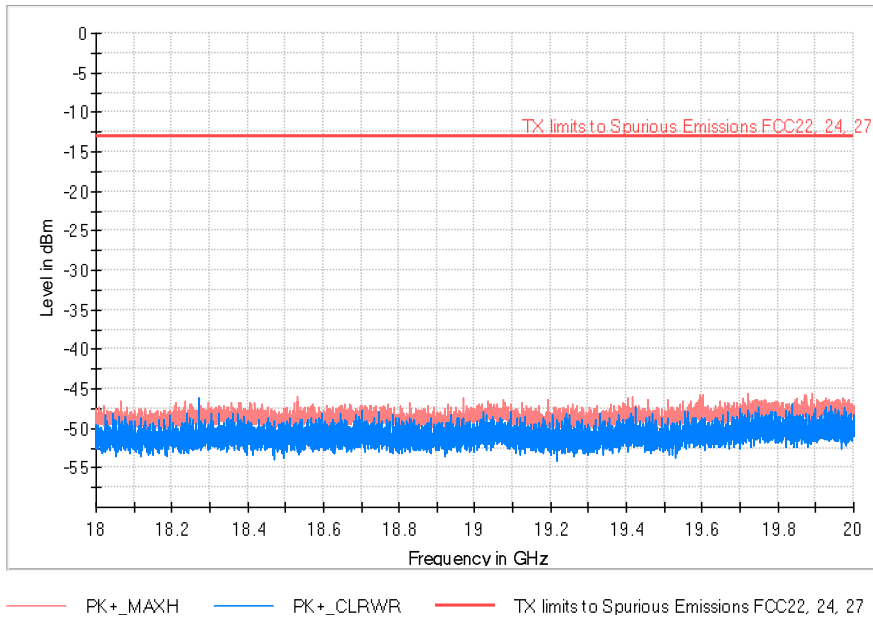
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	PoI
5504.000000	-48.8	-31.6	V



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 18-20 GHz

The radiated spurious signal was detected below 30 dB below the limit.

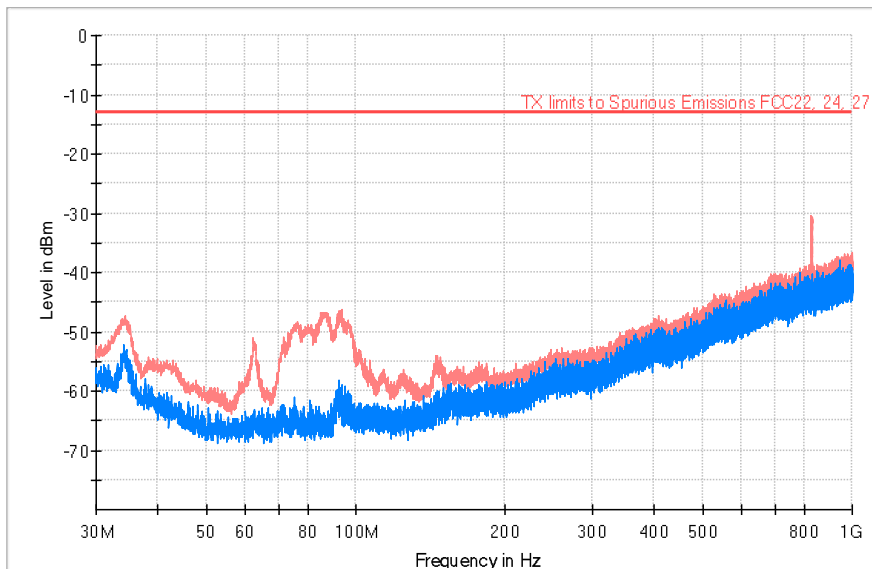


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#02
<b>TEST RESULTS:</b>	PASS

**LTE Band 2 Middle channel 1880 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol
827.728000	-45.0	-30.3	V



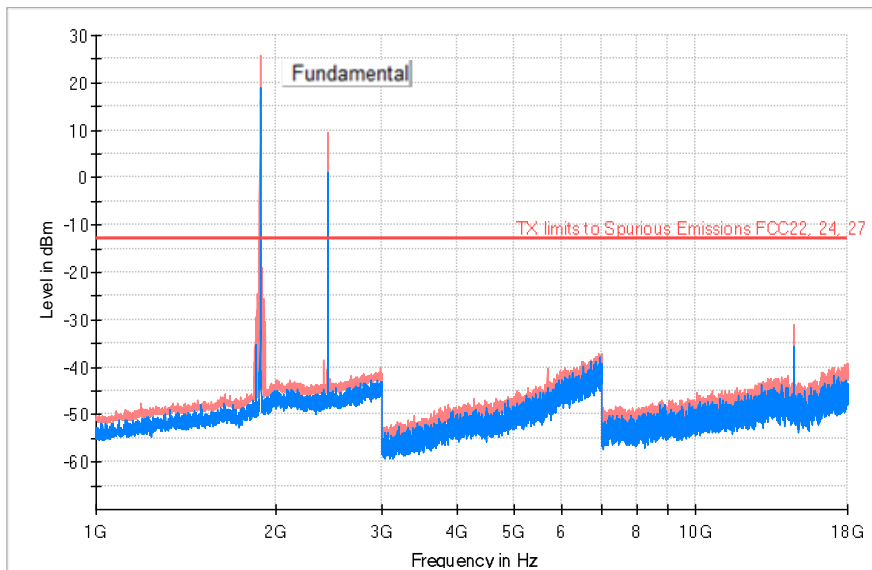
— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-18 GHz

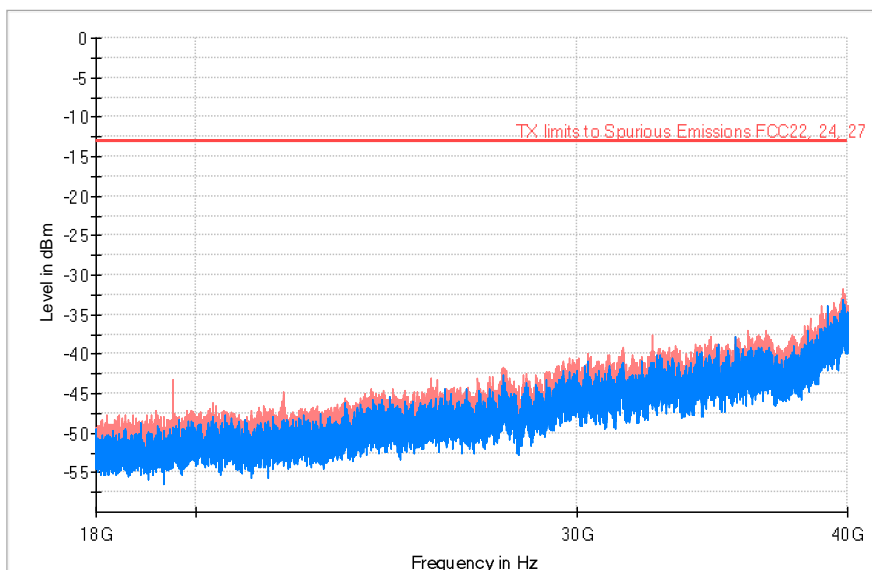
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol
14641.500000	-35.6	-31.1	V



PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27

FREQUENCY RANGE: 18-40 GHz

The radiated spurious signal was detected below 30 dB below the limit.



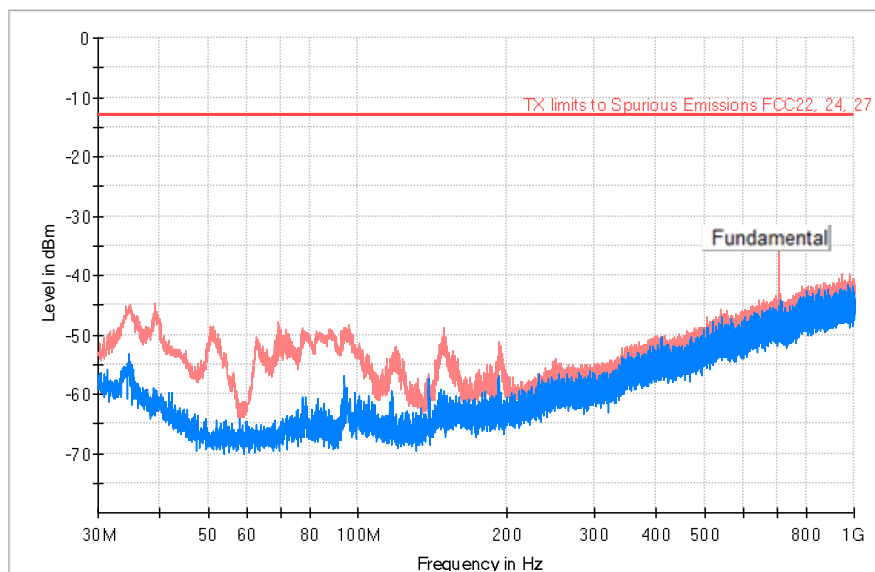
PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#03
<b>TEST RESULTS:</b>	PASS

**GSM 850 Middle channel 836.5 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 30 dB below the limit.

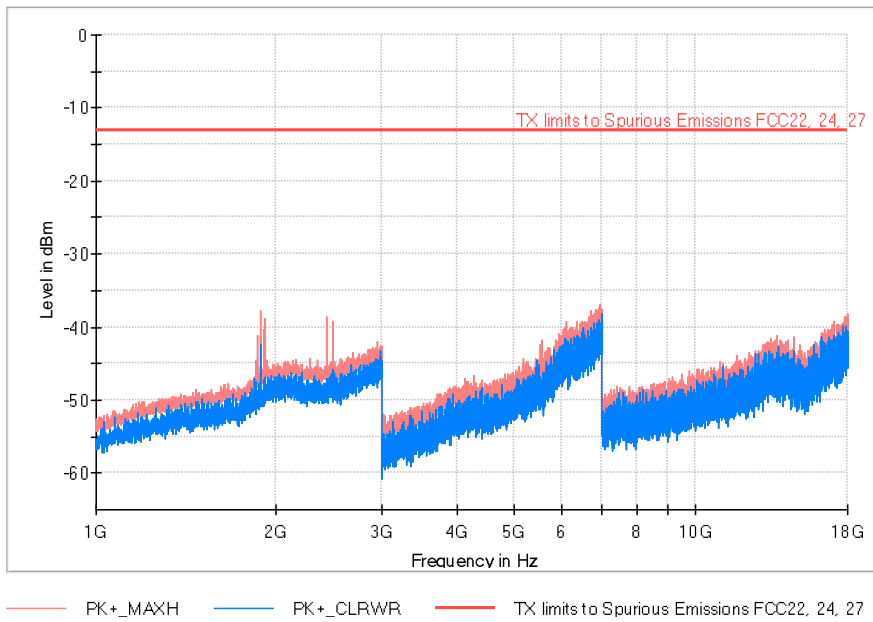


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

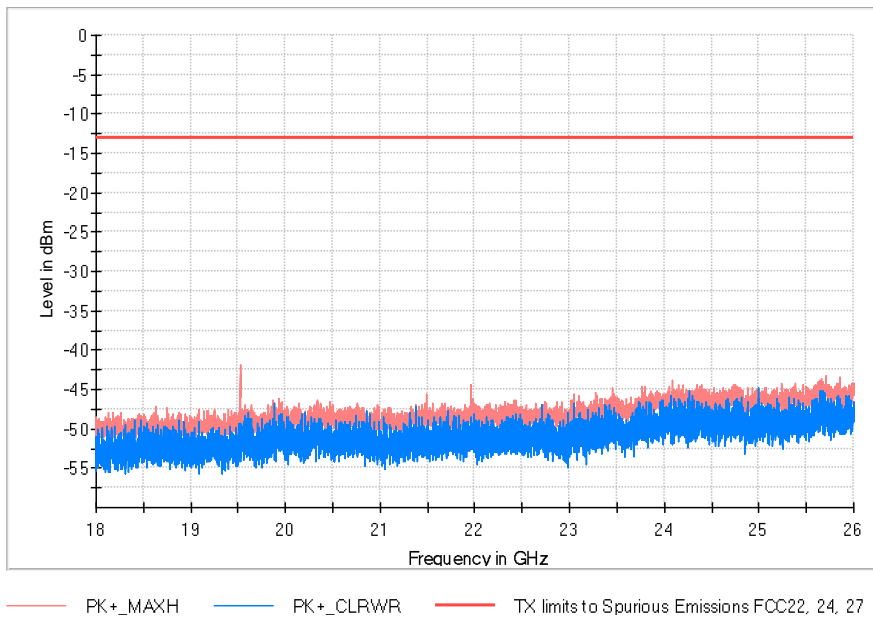
FREQUENCY RANGE: 1-18 GHz

The radiated spurious signal was detected below 30 dB below the limit.



FREQUENCY RANGE: 18-26 GHz

The radiated spurious signal was detected below 30 dB below the limit.

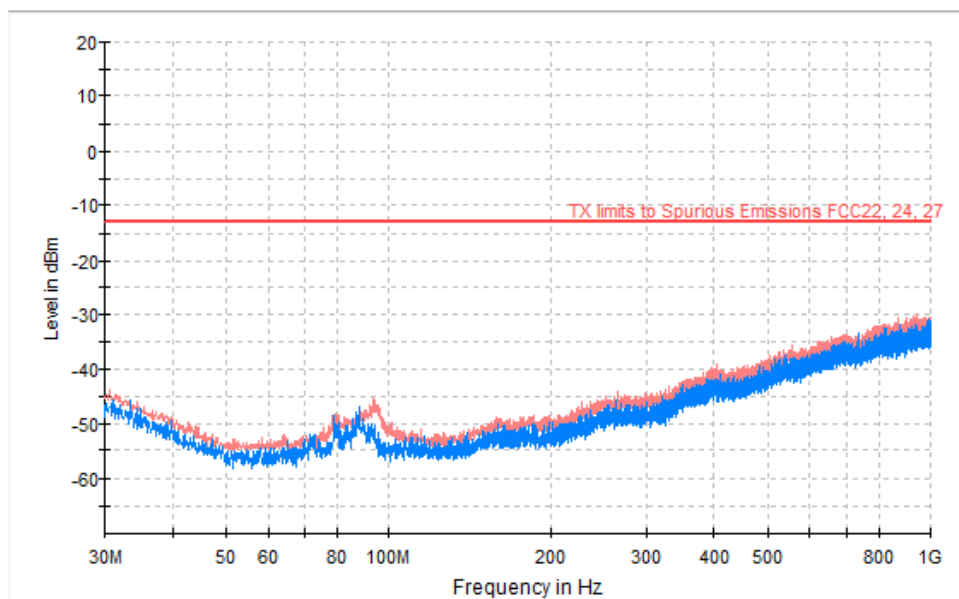


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#04
<b>TEST RESULTS:</b>	PASS

**GSM 1900 Middle channel 1880 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 30 dB below the limit.

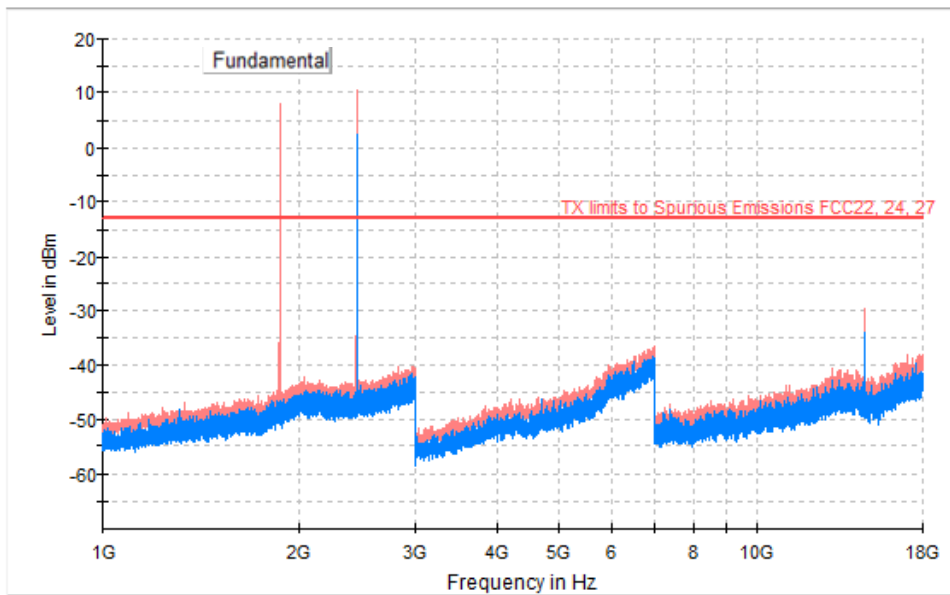


— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-18 GHz**

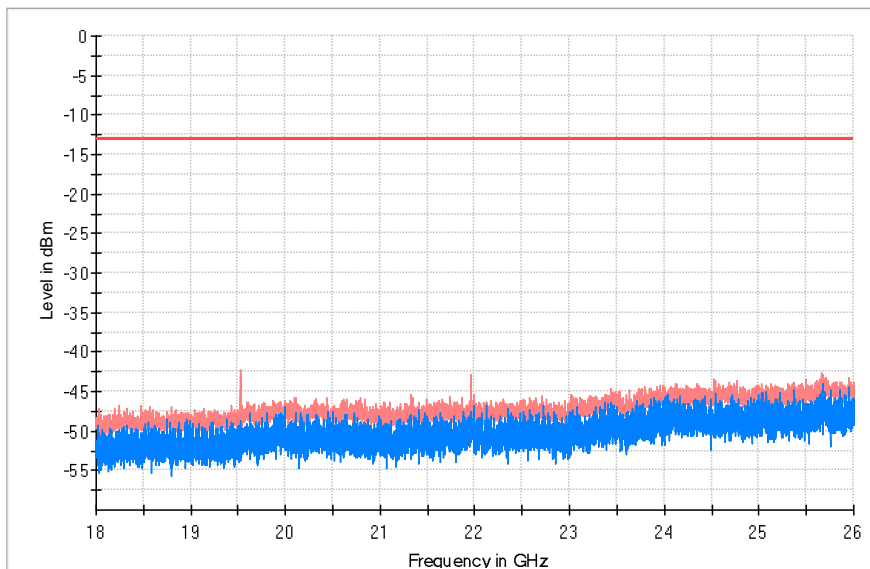
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	PoI	Comment
1877.800000	-50.0	7.9	V	Fundamental
2439.800000	2.4	10.5	H	Fundamental
14642.142857	-34.0	-29.5	V	



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**FREQUENCY RANGE: 18-26 GHz**

The radiated spurious signal was detected below 30 dB below the limit.



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

# Appendix C:

## FCC 27 Results/ IC RSS-139 / RSS-130

## Description of Test Conditions

The worst case was found when positioned as the table below. Following channels were selected for the final test as listed below:

TEST CONDITIONS	DESCRIPTION														
TC#01	<p><u>Power supply (V):</u> <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u> DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 739 1407 981"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>BW (MHz)</th> <th>Modulation</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>1710 – 1755</td> <td>1712.5 1732.5 1752.5</td> <td>5</td> <td>QPSK</td> <td>LTE Band 4 1 RB</td> </tr> </tbody> </table>					Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode	1710 – 1755	1712.5 1732.5 1752.5	5	QPSK	LTE Band 4 1 RB
Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode											
1710 – 1755	1712.5 1732.5 1752.5	5	QPSK	LTE Band 4 1 RB											
TC#02	<p><u>Power supply (V):</u> <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u> DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 1265 1407 1507"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>BW (MHz)</th> <th>Modulation</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>777 – 787</td> <td>779.5 782.0 784.5</td> <td>5</td> <td>QPSK</td> <td>LTE Band 13 1 RB</td> </tr> </tbody> </table>					Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode	777 – 787	779.5 782.0 784.5	5	QPSK	LTE Band 13 1 RB
Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode											
777 – 787	779.5 782.0 784.5	5	QPSK	LTE Band 13 1 RB											
TC#03	<p><u>Power supply (V):</u> <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u> DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 1765 1407 2007"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>BW (MHz)</th> <th>Modulation</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>704 – 716</td> <td>706.5 710.0 713.5</td> <td>5</td> <td>QPSK</td> <td>LTE Band 17 1 RB</td> </tr> </tbody> </table>					Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode	704 – 716	706.5 710.0 713.5	5	QPSK	LTE Band 17 1 RB
Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode											
704 – 716	706.5 710.0 713.5	5	QPSK	LTE Band 17 1 RB											

TEST CONDITIONS	DESCRIPTION															
TC#04	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 667 1407 909"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>BW (MHz)</th> <th>Modulation</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>1710 – 1755</td> <td>1732.5</td> <td>5</td> <td>QPSK</td> <td>LTE Band 4 1 RB</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>2</td> <td>GFSK</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode	1710 – 1755	1732.5	5	QPSK	LTE Band 4 1 RB	2402-2480	2440	2	GFSK	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode												
1710 – 1755	1732.5	5	QPSK	LTE Band 4 1 RB												
2402-2480	2440	2	GFSK	BLE												
TC#05	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 1469 1407 1789"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>BW (MHz)</th> <th>Modulation</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>777 – 787</td> <td>782.0</td> <td>5</td> <td>QPSK</td> <td>LTE Band 13 1 RB</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>2</td> <td>GFSK</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode	777 – 787	782.0	5	QPSK	LTE Band 13 1 RB	2402-2480	2440	2	GFSK	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode												
777 – 787	782.0	5	QPSK	LTE Band 13 1 RB												
2402-2480	2440	2	GFSK	BLE												



TEST CONDITIONS	DESCRIPTION															
TC#06	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 667 1406 987"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>BW (MHz)</th> <th>Modulation</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>704 – 716</td> <td>710.0</td> <td>5</td> <td>QPSK</td> <td>LTE Band 17 1 RB</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>2</td> <td>GFSK</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular and BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode	704 – 716	710.0	5	QPSK	LTE Band 17 1 RB	2402-2480	2440	2	GFSK	BLE
Available Frequencies (MHz)	Tested Frequency (MHz)	BW (MHz)	Modulation	Mode												
704 – 716	710.0	5	QPSK	LTE Band 17 1 RB												
2402-2480	2440	2	GFSK	BLE												
TC#07	<p><u>Power supply (V):</u>  <math>V_{\text{nominal}} = 120 \text{ V AC}</math></p> <p><u>Type of power supply:</u>            DC voltage from DP Pulse Power inverter with AC adapter.</p> <p><u>Test Frequencies for Radiated tests:</u></p> <table border="1" data-bbox="400 1480 1109 1742"> <thead> <tr> <th>Available Frequencies (MHz)</th> <th>Tested Frequency (MHz)</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>1710 – 1755</td> <td>1732.5</td> <td>WCDMA Band 4</td> </tr> <tr> <td>2402-2480</td> <td>2440</td> <td>BLE</td> </tr> </tbody> </table> <p>The test was performed with the equipment transmitting with cellular BLE radios simultaneously. These measurements have been performed in order to check the impact of the co-location of all radio interfaces that can be transmitting simultaneously.</p>	Available Frequencies (MHz)	Tested Frequency (MHz)	Mode	1710 – 1755	1732.5	WCDMA Band 4	2402-2480	2440	BLE						
Available Frequencies (MHz)	Tested Frequency (MHz)	Mode														
1710 – 1755	1732.5	WCDMA Band 4														
2402-2480	2440	BLE														

## Test C.1: RADIATED EMISSIONS (PART 27)

<b>LIMITS:</b>	Product standard:	FCC Part 27
	Test standard:	FCC §2.1053 and §27.53 (h) / RSS-139 Clause 6.6 / RSS-130 Clause 4.7

### LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. P in watts.

At  $P_o$  (dBm) transmitting power, the specified minimum attenuation is  $43+10\log(P_o)$  and the limit level in dBm is as follows:

$$P_o \text{ (dBm)} - [43 + 10 \log(P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

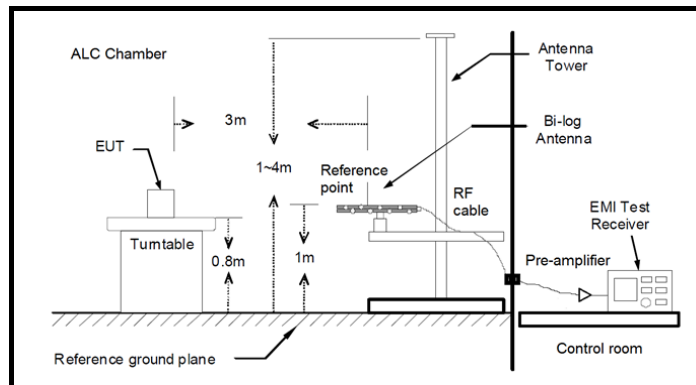
### TEST SETUP

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

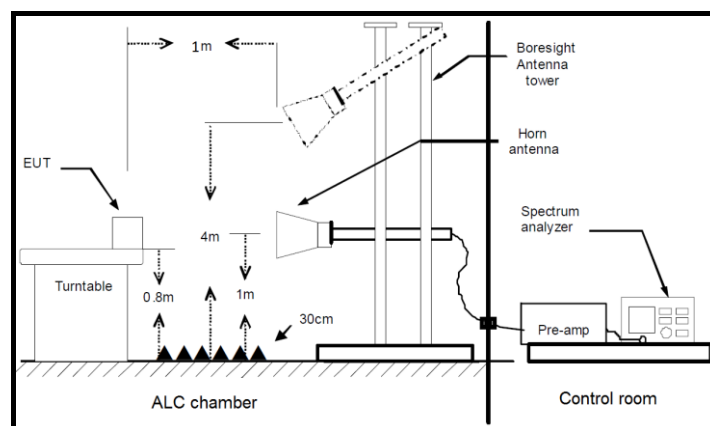
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

Radiated measurements < 1GHz



Radiated measurements > 1GHz

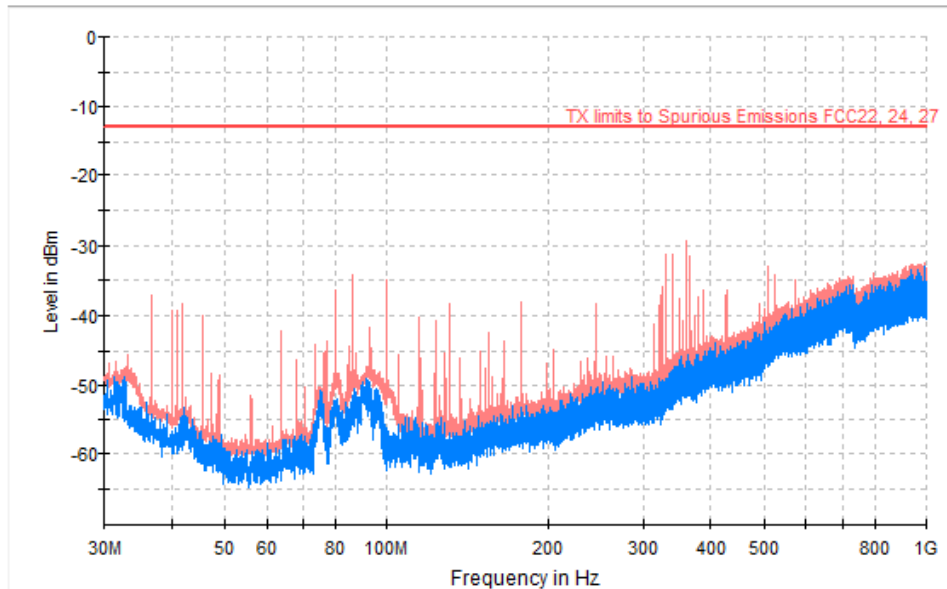


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#01
<b>TEST RESULTS:</b>	PASS

**LTE Band 4 Lowest channel 1712.5 MHz**

FREQUENCY RANGE: 30-1000 MHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
36.693000	-54.2	-37.3
41.834000	-55.4	-38.4
45.681667	-59.7	-40.0
80.246000	-52.7	-36.4
86.292333	-51.6	-34.3
100.034000	-59.0	-35.0
177.310667	-55.3	-38.0
244.240667	-54.6	-38.4
329.924000	-51.2	-31.0
357.213333	-50.7	-29.2
130.847667	-58.7	-38.4

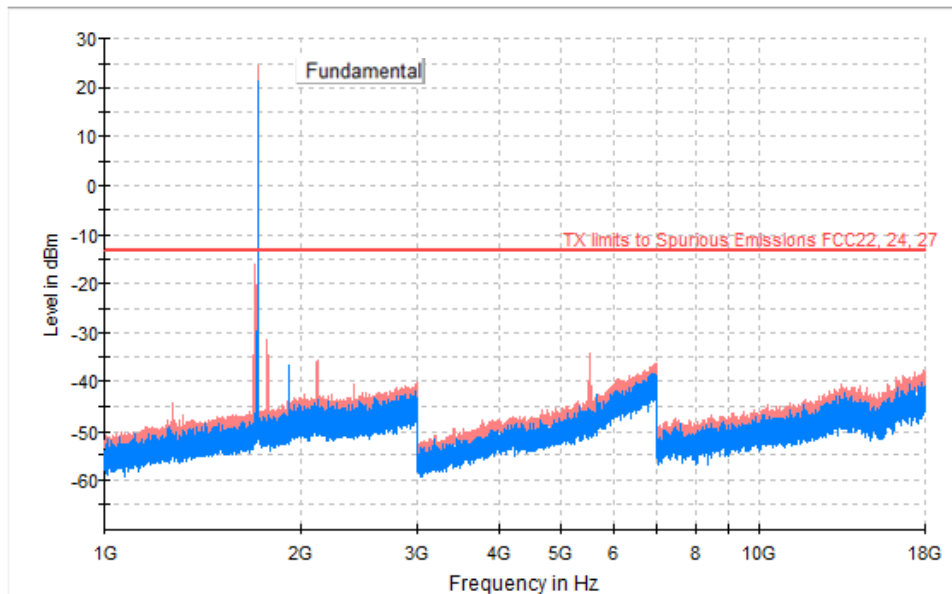


— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol	Comment
1710.133333	19.8	24.7	V	Fundamental
1762.333333	-52.1	-31.2	V	
2111.533333	-46.5	-36.0	H	
5526.000000	-49.7	-34.2	H	



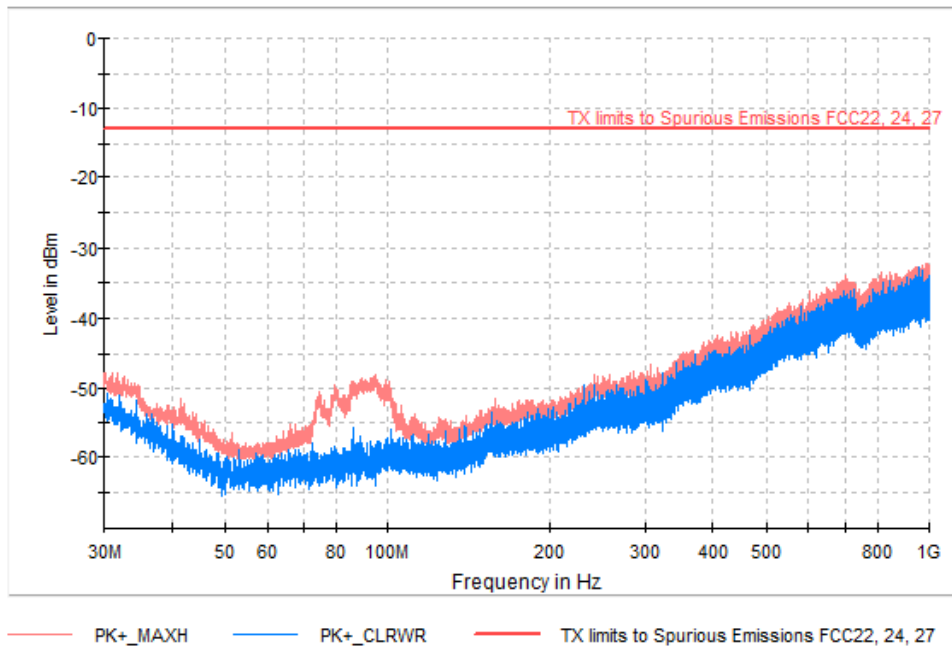
— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**Middle channel 1732.5 MHz**

FREQUENCY RANGE: 30-1000 MHz

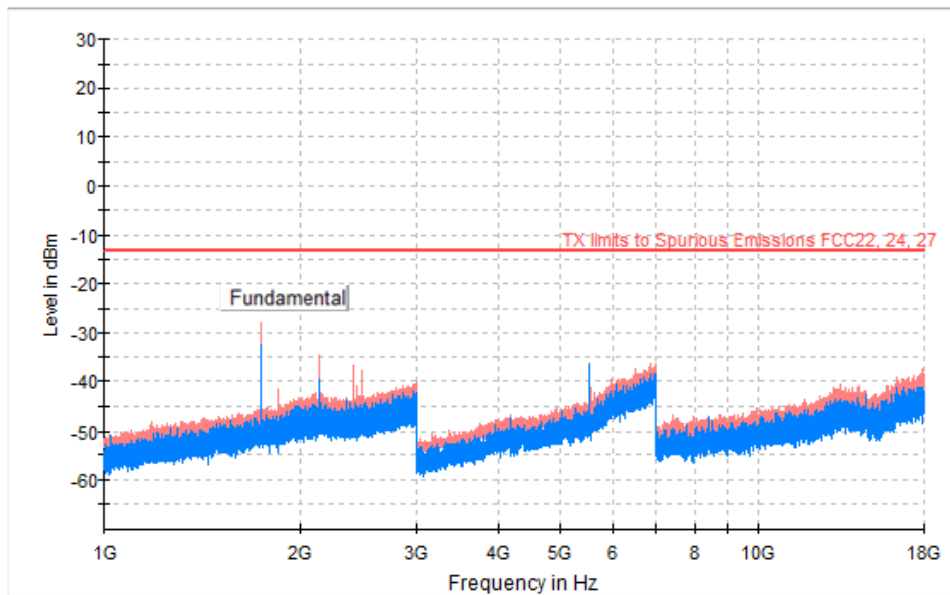
The radiated spurious signal was detected below 30 dB below the limit.



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol	Comment
1730.333333	-33.4	-27.8	V	Fundamental
2132.066667	-40.6	-34.3	H	Fundamental
2401.600000	-47.2	-36.7	V	
5511.000000	-36.3	-36.3	H	



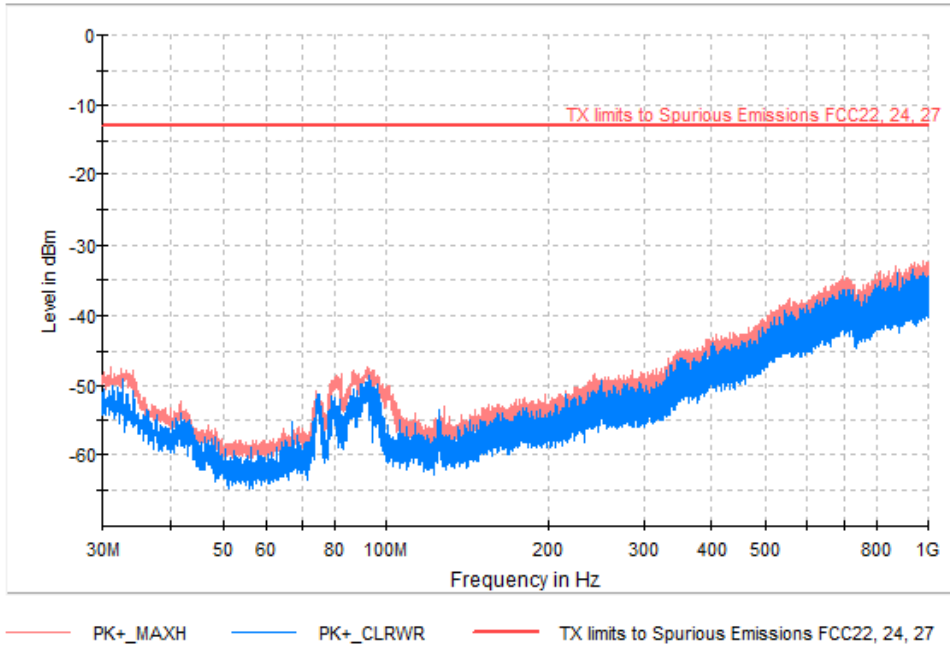
— PK+\_MAXH    — PK+\_CLRWR    TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**Highest channel 1752.5 MHz**

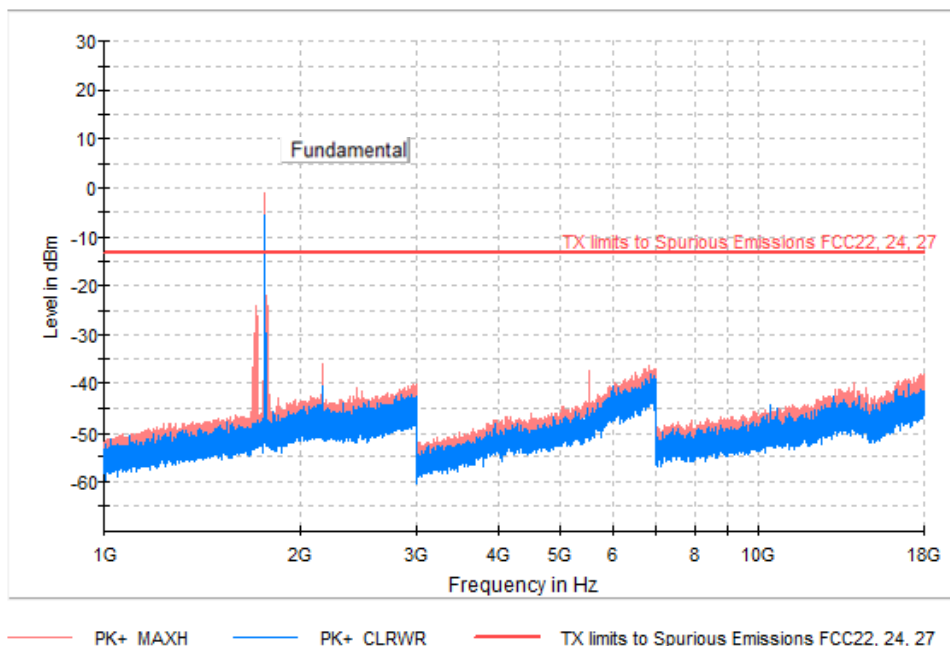
FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 20 dB below the limit.



FREQUENCY RANGE: 1-18 GHz

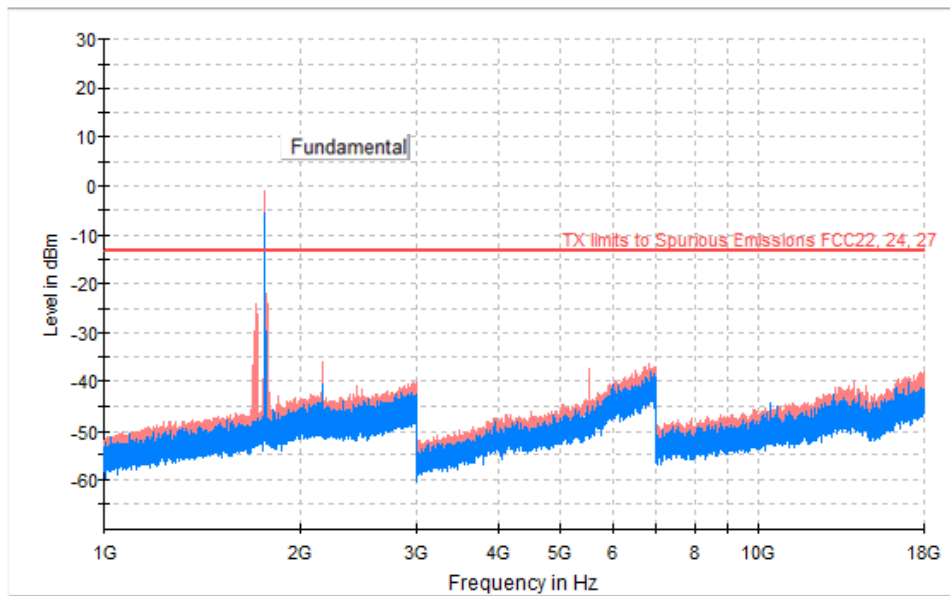
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol	Comment
1697.800000	-50.0	-24.2	V	
1750.400000	-5.9	-1.2	V	Fundamental
2150.733333	-40.8	-36.2	V	
5532.000000	-48.4	-37.4	V	
5532.000000	-48.4	-37.4	V	



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol	Comment
1697.800000	-50.0	-24.2	V	
1750.400000	-5.9	-1.2	V	Fundamental
2150.733333	-40.8	-36.2	V	
5532.000000	-48.4	-37.4	V	
5532.000000	-48.4	-37.4	V	



— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

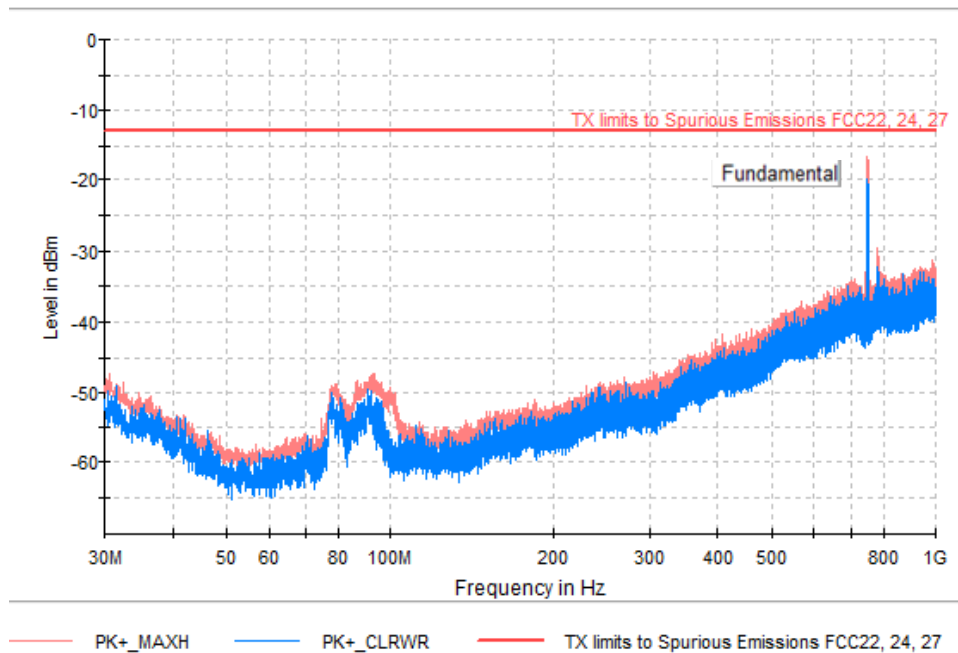


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#02
<b>TEST RESULTS:</b>	PASS

**LTE Band 2 Lowest channel 779.5 MHz**

FREQUENCY RANGE: 30-1000 MHz

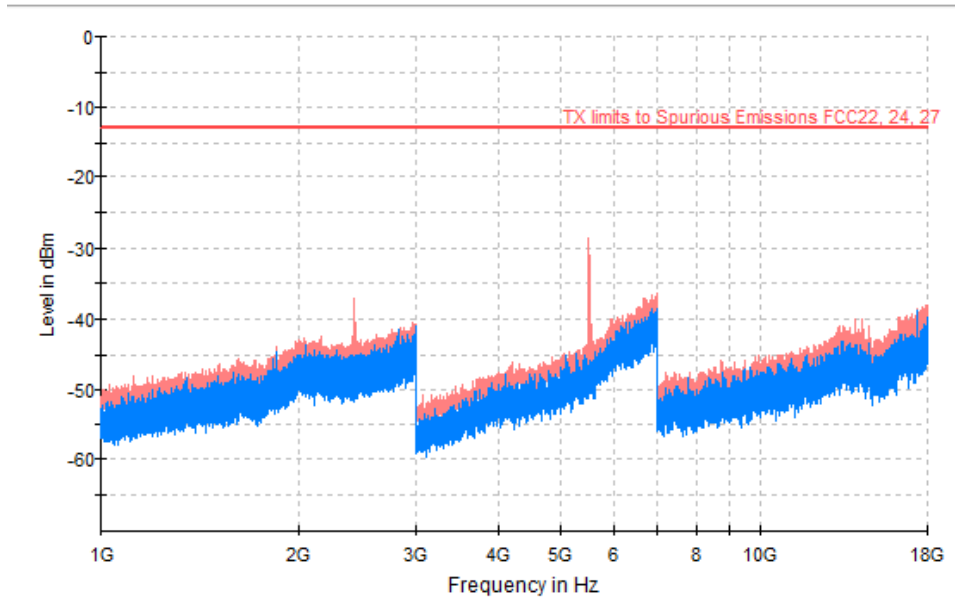
The radiated spurious signal was detected below 20 dB below the limit.



**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
2409.600000	-49.6	-37.1
5498.000000	-51.2	-28.6

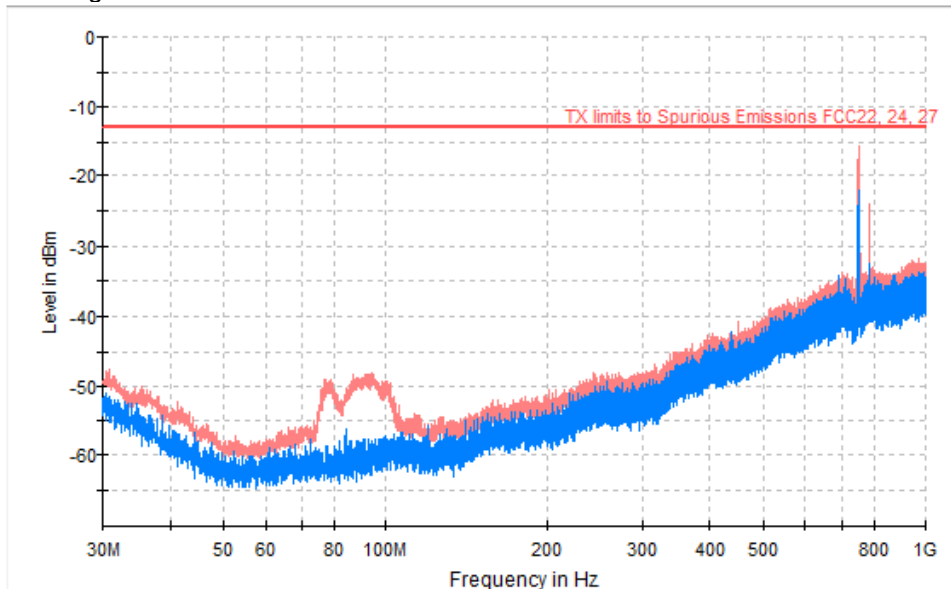


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**Middle channel 782 MHz**

FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 20 dB below the limit.

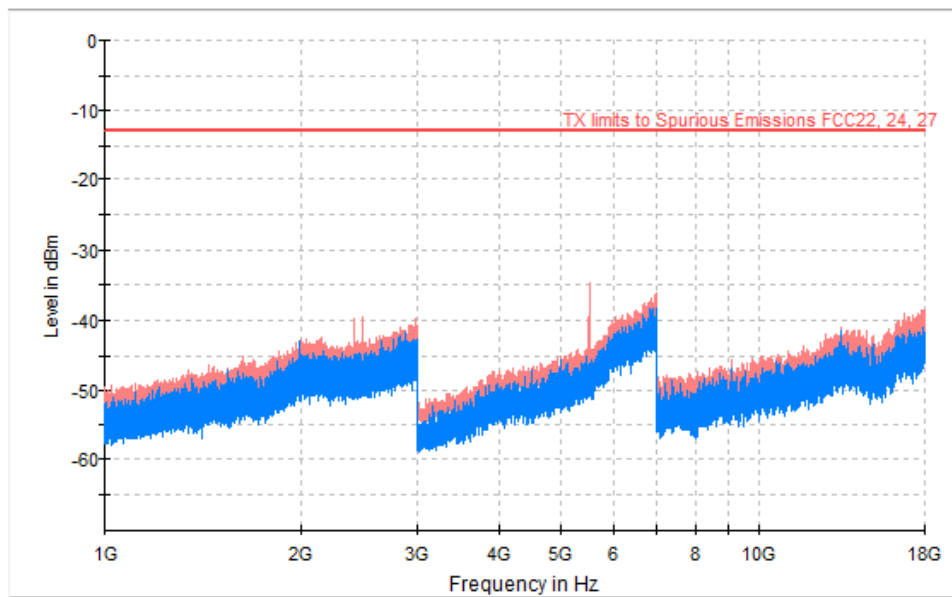


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
2480.266667	-49.4	-39.4
5505.500000	-49.7	-34.7



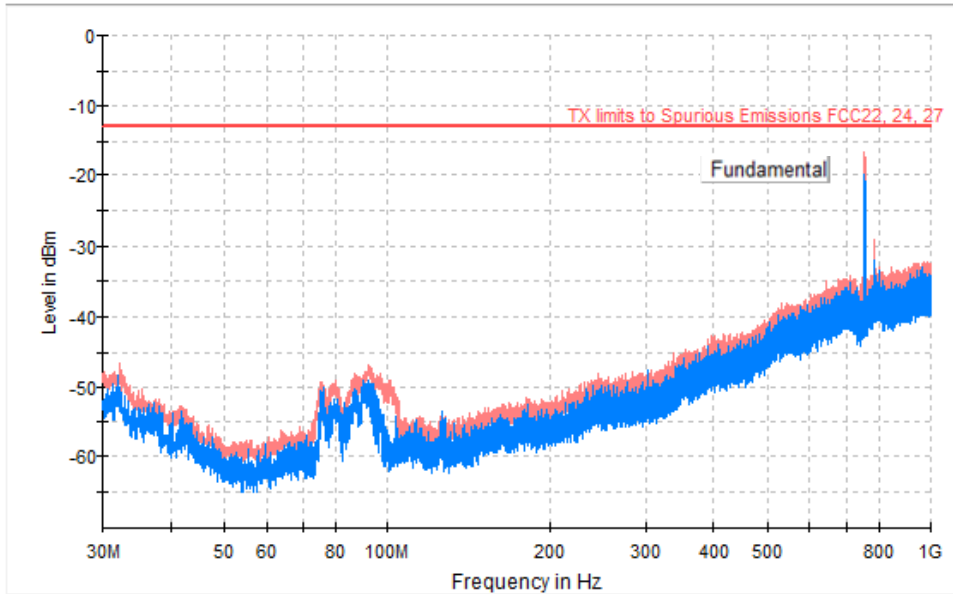
— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**Highest channel 784.5 MHz**

FREQUENCY RANGE: 30-1000 MHz

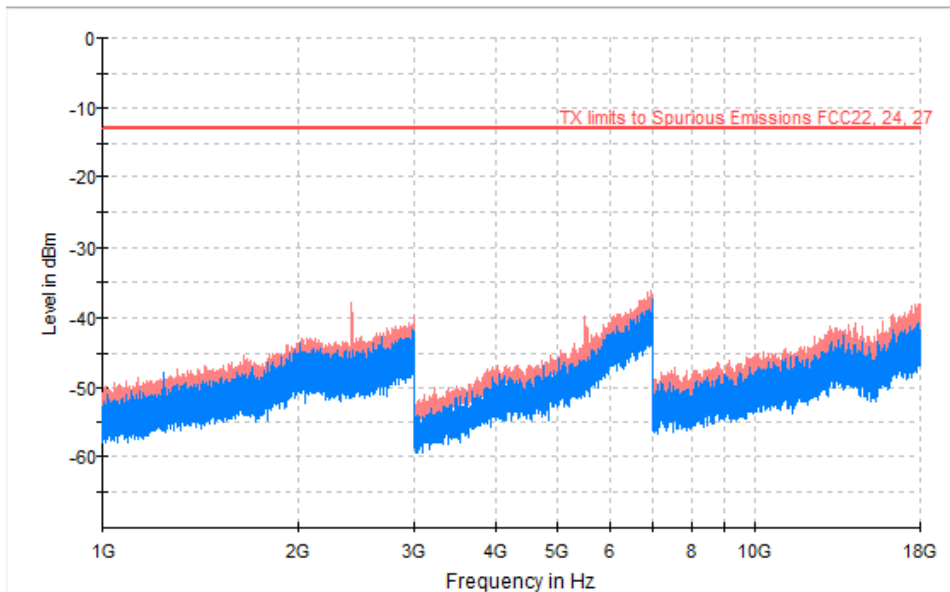
The radiated spurious signal was detected below 25 dB below the limit.



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
2402.600000	-48.4	-37.8
5493.000000	-49.0	-39.9



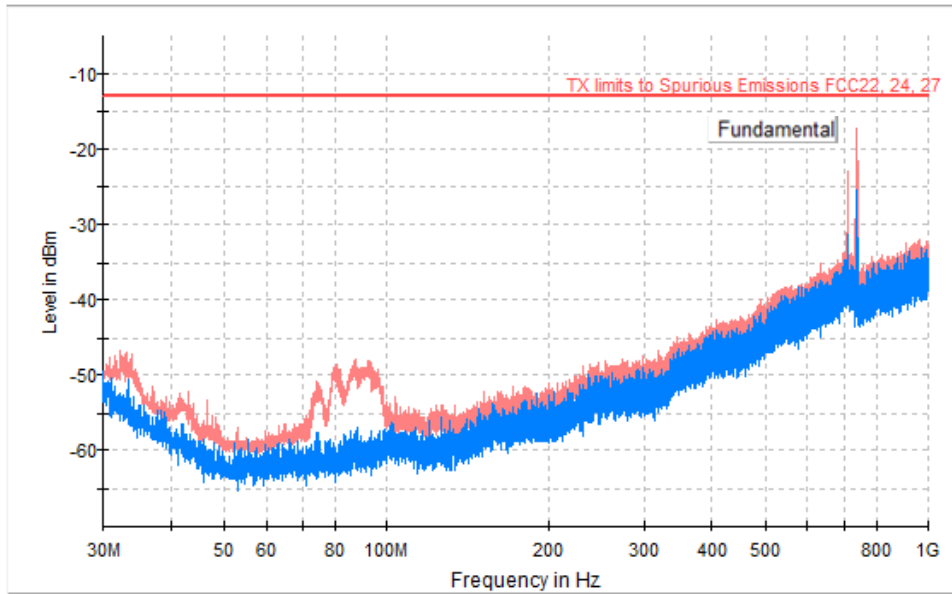
— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#03
<b>TEST RESULTS:</b>	PASS

**LTE Band 2 Lowest channel 706.5 MHz**

FREQUENCY RANGE: 30-1000 MHz

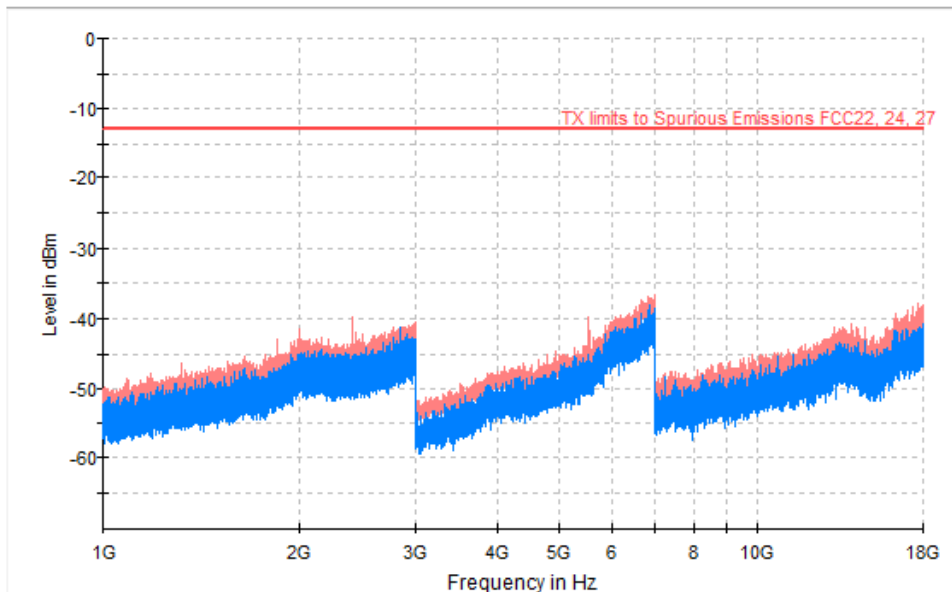
The radiated spurious signal was detected below 20 dB below the limit.



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

FREQUENCY RANGE: 1-18 GHz

The radiated spurious signal was detected below 20 dB below the limit.



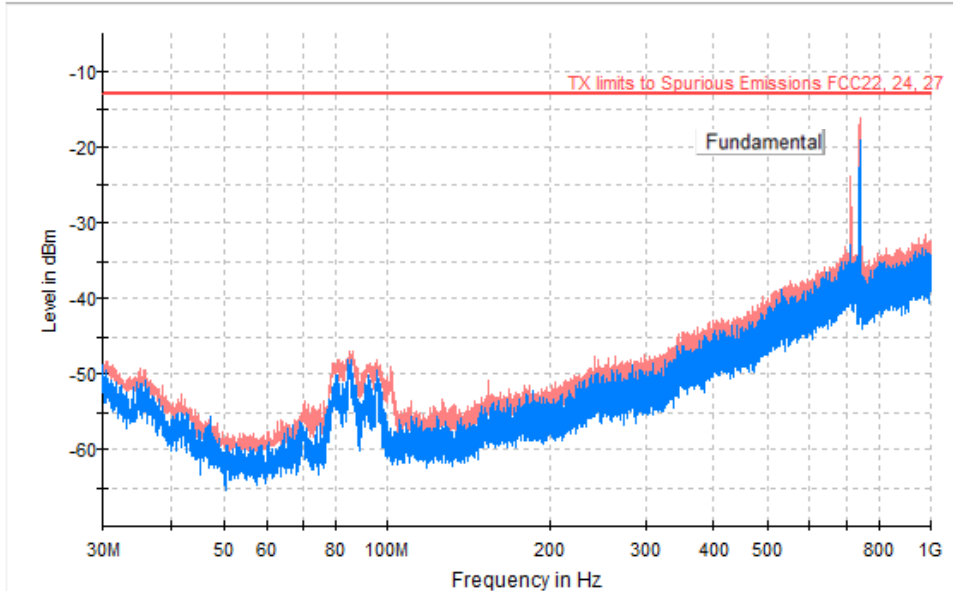
— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**Middle channel 710.0 MHz**

FREQUENCY RANGE: 30-1000 MHz

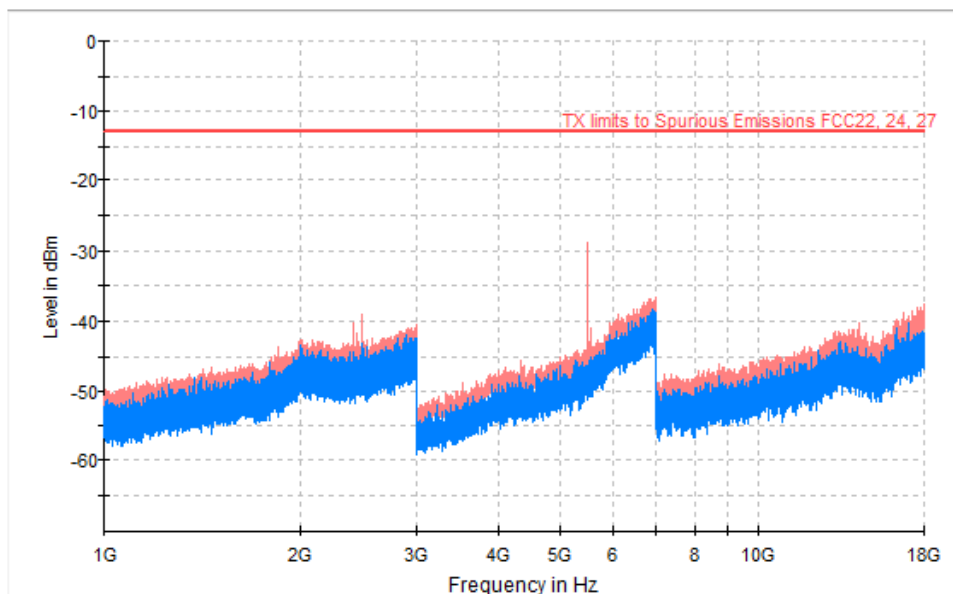
The radiated spurious signal was detected below 20 dB below the limit.



PK+\_MAXH    PK+\_CLRWR    TX limits to Spurious Emissions FCC22, 24, 27

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
2480.266667	-48.7	-39.1
5499.000000	-48.0	-28.9



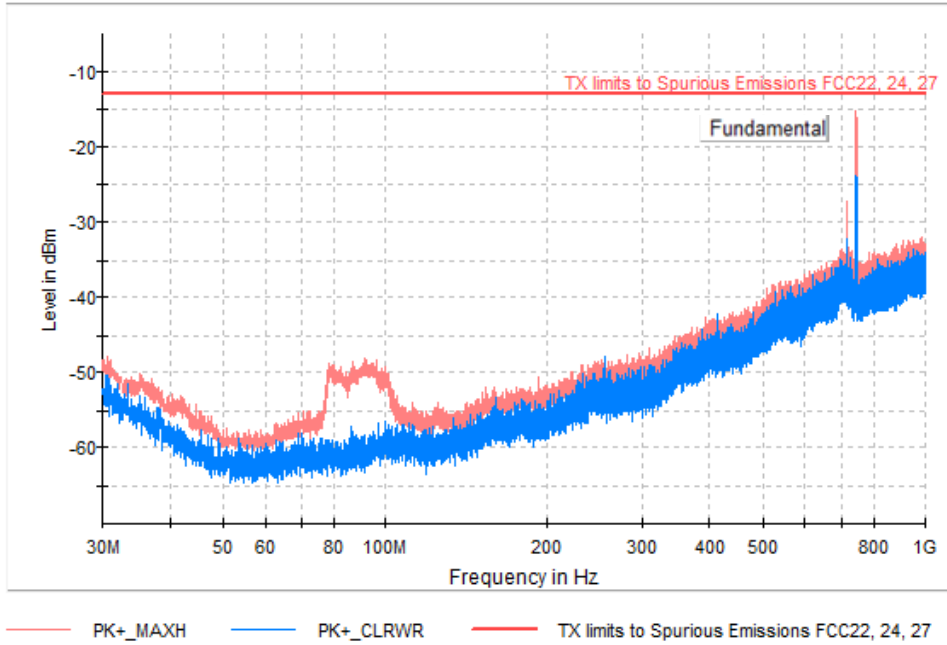
PK+\_MAXH    PK+\_CLRWR    TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**Highest channel 713.5 MHz**

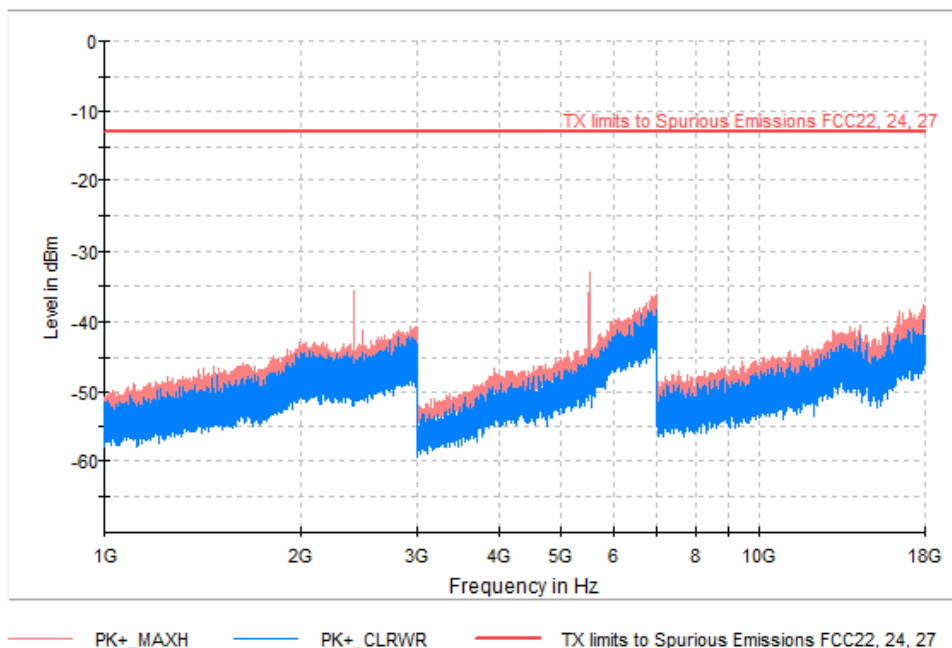
FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 20 dB below the limit.



FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	PoI
2439.866667	-49.4	-35.8	H
5504.000000	-50.1	-33.1	V

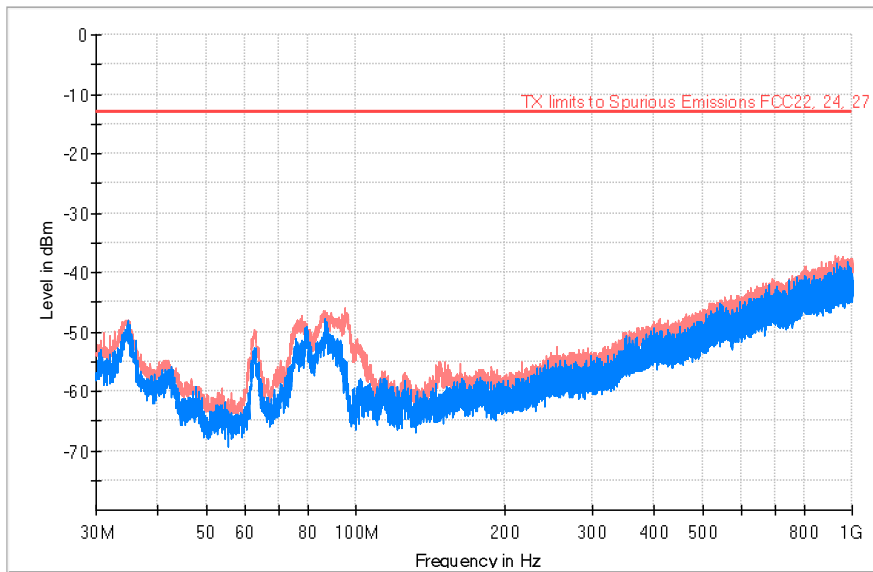


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#04
<b>TEST RESULTS:</b>	PASS

**LTE Band 4 Middle channel 1732.5 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 25 dB below the limit.



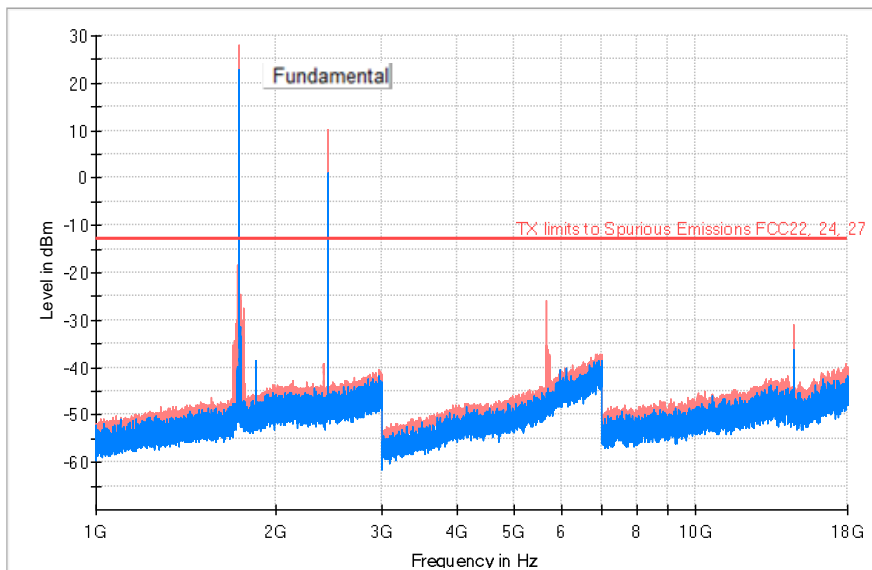
PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27



**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-18 GHz**

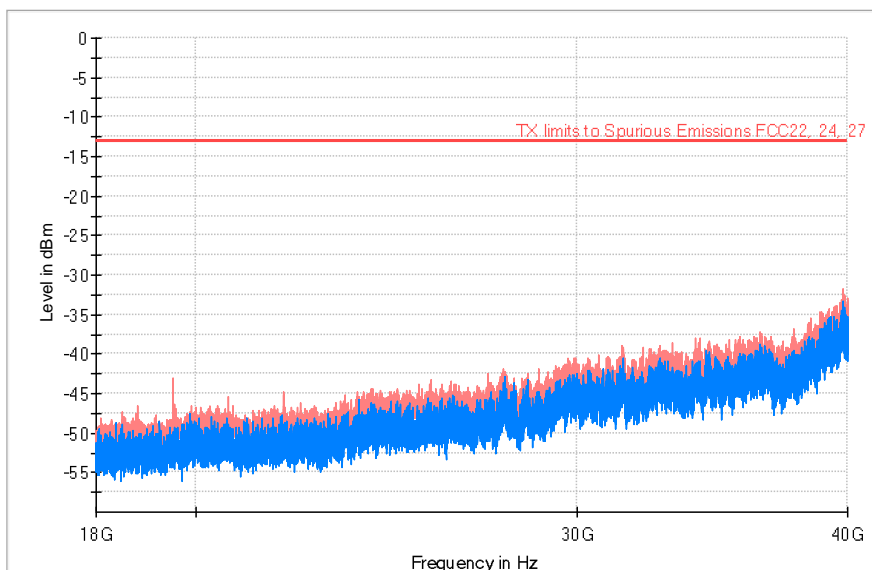
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Pol	Comment
1734.800000	21.5	27.9	V	Fundamental
2439.733333	1.3	10.1	H	Fundamental
5655.000000	-48.8	-26.0	V	
14638.500000	-37.6	-31.2	V	



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**FREQUENCY RANGE: 18-40 GHz**

The radiated spurious signal was detected below 20 dB below the limit.



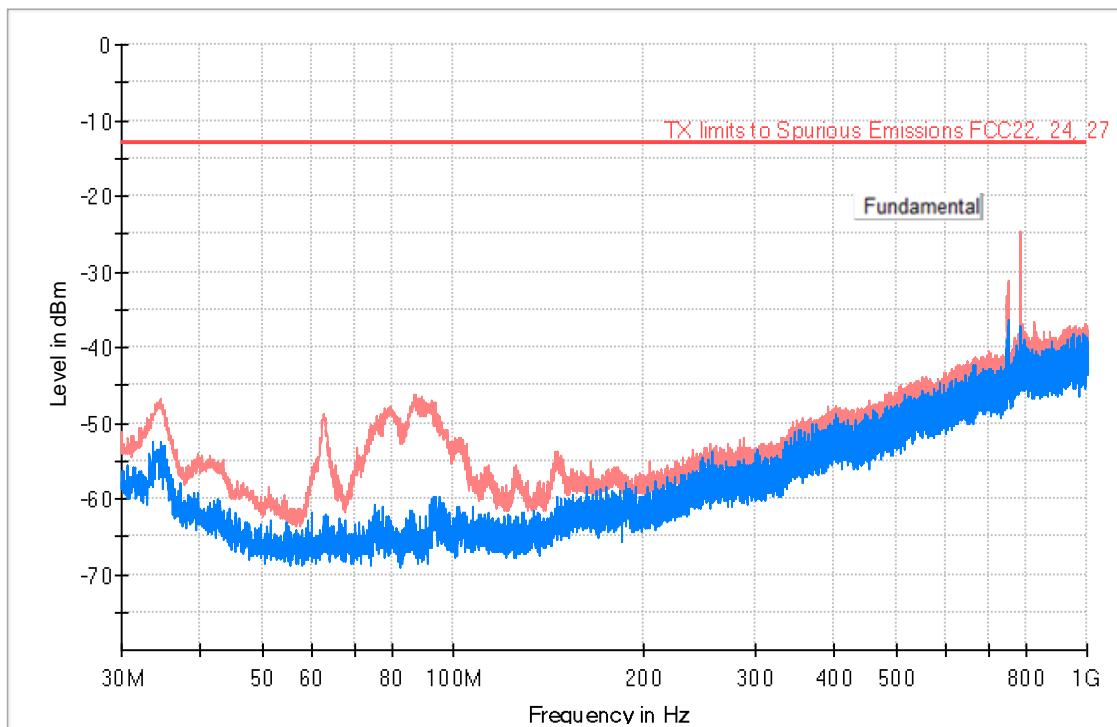
— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#05
<b>TEST RESULTS:</b>	PASS

**LTE Band 13 Middle channel 782 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
34.494333	-55.4	-46.8	
62.559667	-63.4	-48.9	
87.424000	-66.4	-46.3	
750.871667	-40.6	-31.0	Fundamental
784.110333	-38.3	-24.6	Fundamental

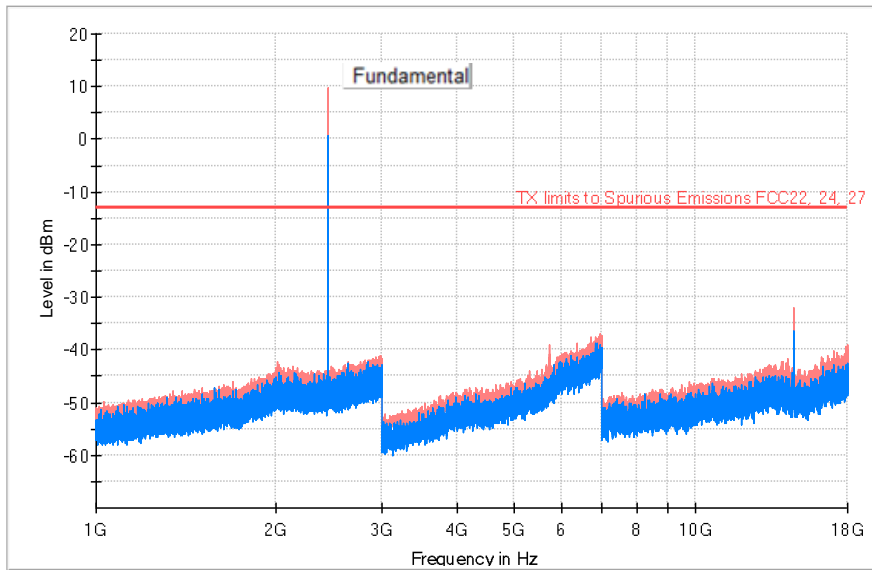


— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-18 GHz**

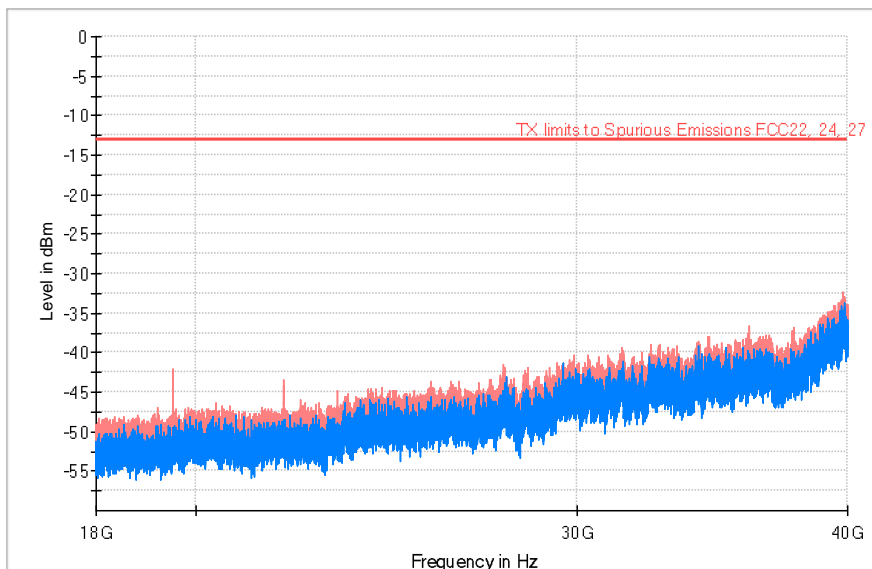
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
2439.800000	0.8	9.9	Fundamental
14639.000000	-38.0	-32.0	



PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27

**FREQUENCY RANGE: 18-40 GHz**

The radiated spurious signal was detected below 20 dB below the limit.



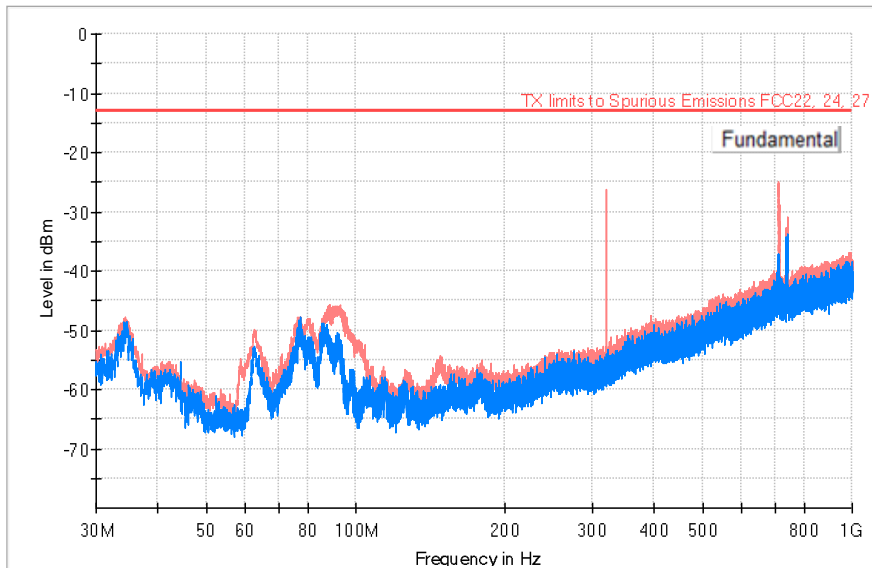
PK+\_MAXH PK+\_CLRWR TX limits to Spurious Emissions FCC22, 24, 27

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#06
<b>TEST RESULTS:</b>	PASS

**LTE Band 17 Middle channel 710.0 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
34.332667	-48.9	-48.2	
62.559667	-53.6	-49.9	
88.879000	-52.4	-45.7	
319.157000	-57.9	-26.2	
712.071667	-37.2	-24.8	Fundamental
739.522667	-35.8	-31.0	Fundamental

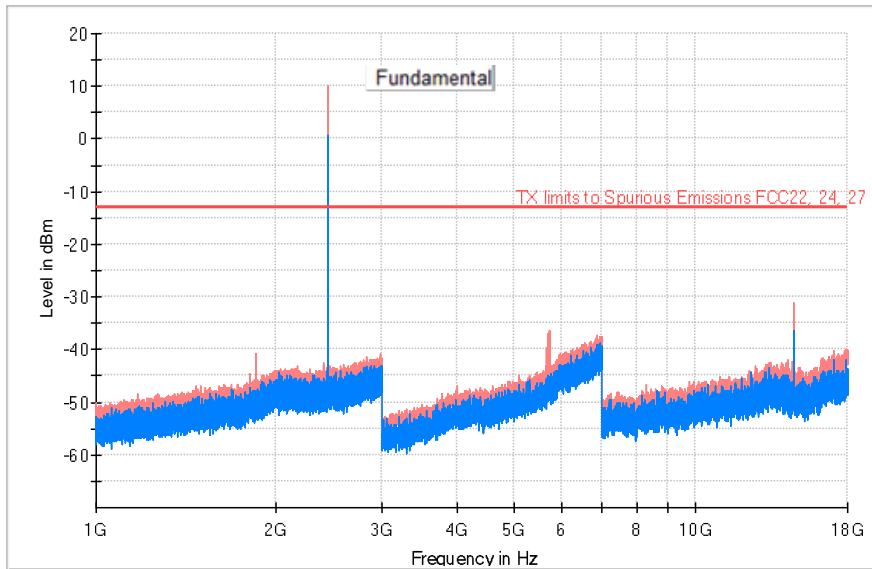


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-18 GHz**

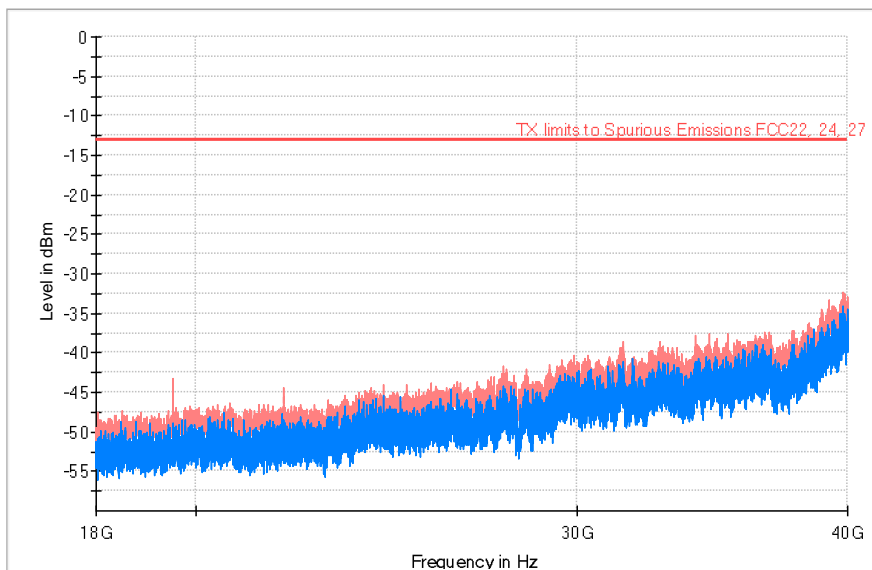
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
2439.800000	0.8	10.0	Fundamental
5718.500000	-48.8	-36.5	
14641.500000	-36.3	-31.1	



— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

**FREQUENCY RANGE: 18-40 GHz**

The radiated spurious signal was detected below 20 dB below the limit.



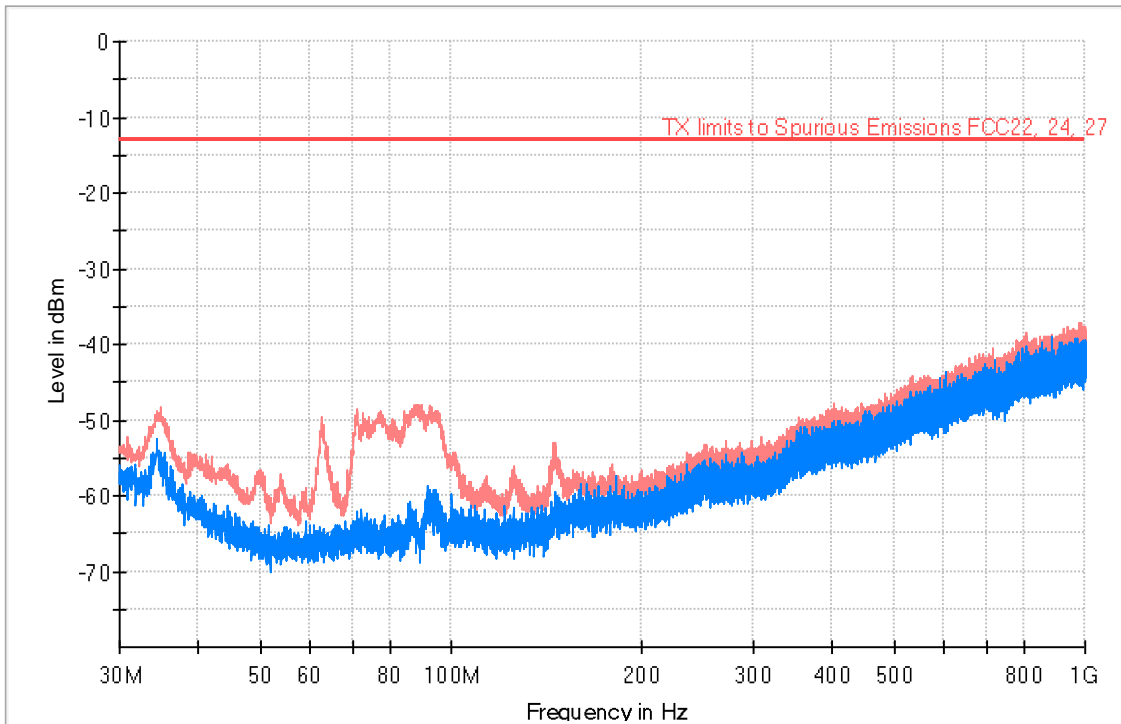
— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#07
<b>TEST RESULTS:</b>	PASS

**WCDMA Band 4 Middle channel 1732.5 MHz and BLE 2440 MHz**

FREQUENCY RANGE: 30-1000 MHz

The radiated spurious signal was detected below 25 dB below the limit.

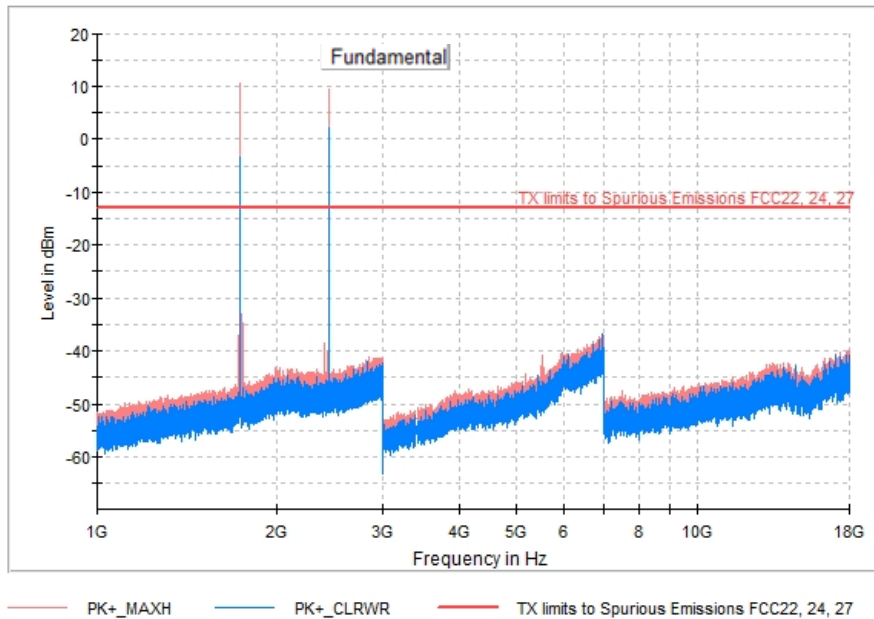


— PK+\_MAXH    — PK+\_CLRWR    — TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

**FREQUENCY RANGE: 1-18 GHz**

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1731.533333	-3.8	10.6	Fundamental
2439.866667	2.3	9.5	Fundamental



**FREQUENCY RANGE: 18-40 GHz**

The radiated spurious signal was detected below 20 dB below the limit.

