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DEKRA

ACCREDITED
Test Lab
Cert 2764.01

FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test report No:
2612ERM.001

Partial Test report

REFERENCE STANDARD:
USA FCC Part 22, Part 24, Part 27 & Part 90
CANADA RSS-130, RSS-132, RSS-133, RSS-139 & RSS-199

Identification of item tested	Convertible PC with Wi-Fi/BT and Cellular connectivity
Trademark	HP
Model and /or type reference	HSN-I32C
Other identification of the product	FCC ID: B94HNI32PK IC: 466X-HNI32PK
Features	Data Not Provided
Manufacturer	HP INC. 1501 Page Mill Road Palo Alto, CA 94304, USA
Test method requested, standard	USA FCC Part 22 10-1-18 Edition. USA FCC Part 24 10-1-18 Edition. USA FCC Part 27 10-1-18 Edition. USA FCC Part 90 10-1-18 Edition. CANADA RSS-130 Issue 2, Feb. 2019. CANADA RSS-132 Issue 3, Jan. 2013. CANADA IC RSS-133 Issue 6, Jan. 2013 (Amendment January 2018); CANADA RSS-139 Issue 3, Jul. 2015. CANADA RSS-199 Issue 3, Dec. 2016. ANSI C63.26-2015. ANSI/TIA-603-E: 2016. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager Digitally signed by Domingo Galvez DN: cn=Domingo Galvez, o=DEKRA Certification Inc., ou=Regulatory Lab, email=dgalvez@dekra.com, c=US Date: 2019.09.20 13:08:33 -04'00'
Date of issue	09-20-2019
Report template No	FDT08_21

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Competences and guarantees

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 item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA 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

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 sample consists of a tablet with Wi-Fi / BT and Cellular connectivity.

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 Nº	Description	Model	Serial Nº	Date of reception
2612.04	AC Adapter Cable	HPI-2918	213349-109	08/29/2019
2612.05	AC Adapter	TPN-TA002	L45962-007	08/29/2019
2612.06	Tablet HP Device	EMPIRE-1.0PCGA01ZAS8000	000919004D	08/29/2019

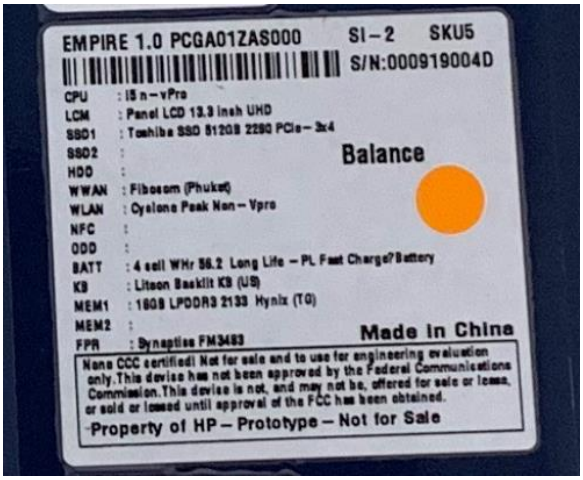
1. Sample S/01 has undergone following test(s):

   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
	USB				☐	☐
	UART0				☐	☐
	UART2				☐	☐
	UART3				☐	☐
	PWR				☐	☐
	SIM				☐	☐
Supplementary information to the ports..... :						
Rated power supply .....:	Voltage and Frequency			Reference poles		
				L1	L2	L3	N	PE
	☐	AC: 120V ac.		☐	☐	☐	☐	☐
	☐	AC:		☐	☐	☐	☐	☐
	☐	DC:						
	☐	5V from USB 2.0 port						
Rated Power .....:	No Data provided							
Clock frequencies .....:	No Data provided							
Other parameters.....:	No Data provided							
Software version .....:	No Data provided							
Hardware version.....:	No Data provided							
Dimensions in cm (L x W x D) ....:	No Data provided							
Mounting position.....:	☐	Table top equipment						
	☐	Wall/Ceiling mounted equipment						
	☐	Floor standing equipment						
	☒	Hand-held equipment						
	☐	Other:						
Modules/parts .....:	Module/parts of test item			Type		Manufacturer		
	No Data provided							
Accessories (not part of the test item) .....:	Description		Type			Manufacturer		
	No Data provided							
Documents as provided by the applicant.....:	Description		File name			Issue date		
	Equipment declaration data		FDT30_15 Declaration Equipment Data			2019/09/05		

Copy of marking plate:



Identification of the client

HP INC.
1501 Page Mill Road Palo Alto, CA 94304, USA

Testing period and place

Test Location	DEKRA Certification, Inc.
Date (start)	08-29-2019
Date (finish)	09-04-2019

Document history

Report number	Date	Description
2612ERM.001	09-20-2019	First release

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The Convertible PC supports UMTS and LTE, without UL carrier aggregation. The applicable frequency bands and operating modes are identified in the following table, where North America bands are shown in bold.

Mode	Bands	Supports TX Mode			
		WCDMA	HSDPA	HSUPA	DC-HSDPA
WCDMA / HSPA +	FDD I (1920 to 1980 MHz)	X	X	X	X
	FDD II (1850 to 1910 MHz)	X	X	X	X
	FDD IV (1710 to 1755 MHz)	X	X	X	X
	FDD V (824 to 849 MHz)	X	X	X	X
	FDD VIII (888 to 915 MHz)	X	X	X	X

Mode	Bands	Supports Channel Bandwidth (MHz)					
		1.4	3	5	10	15	20
LTE FDD	Band 1 (1920 to 1980 MHz)			X	X	X	X
	Band 2 (1850 to 1910 MHz)	X	X	X	X	X	X
	Band 3 (1710 to 1785 MHz)	X	X	X	X	X	X
	Band 4 (1710 to 1755 MHz)	X	X	X	X	X	X
	Band 5 (824 to 849 MHz)	X	X	X	X		
	Band 7 (2500 to 2570 MHz)			X	X	X	X
	Band 8 (880 to 915 MHz)	X	X	X	X		
	Band 12 (699 to 716 MHz)	X	X	X	X		
	Band 13 (777 to 787 MHz)			X	X		
	Band 14 (788 to 798 MHz)			X	X		
	Band 17 (704 to 716 MHz)			X	X		
	Band 18 (815 to 830 MHz)			X	X	X	
	Band 19 (830 to 845 MHz)			X	X	X	
	Band 20 (832 to 862 MHz)			X	X	X	X
	Band 25 (1850 to 1915 MHz)	X	X	X	X	X	X
	Band 26 (814 to 849 MHz)	X	X	X	X	X	
	Band 28 (703 to 748 MHz)		X	X	X	X	X
	Band 29 (717 to 728 MHz)		X	X	X		
	Band 30 (2305 to 2315 MHz)			X	X		
	Band 66 (1710 to 1780 MHz)	X	X	X	X	X	X
LTE TDD	**Band 38 (2570 to 2620 MHz)**			X	X	X	X
	Band 39 (1880 to 1920 MHz)			X	X	X	X
	Band 40 (2300 to 2400 MHz)			X	X	X	X
	Band 41 (2496 to 2690 MHz)			X	X	X	X
	Band 42 (3400 to 3600 MHz)			X	X	X	X

The manufacturer declared that the worst cases were 3G II, IV, V and LTE 12, 13, 25, 26, 41, 66.

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

Testing verdicts

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

Summary

FCC PART 22 / FCC Part 90 / IC RSS-132 PARAGRAPH					
Report Section	**FCC Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
A.1	§2.1053, §90.691 and §22.917	RSS-132 Clause 5.5	Radiated emissions	P	N/A
Supplementary information and remarks: None.					

FCC PART 24 /IC RSS-133 PARAGRAPH					
Report Section	**FCC Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
B.1	§2.1053 and §24.238	RSS-133 Clause 6.5	Radiated emissions	P	N/A
Supplementary information and remarks: None.					

FCC PART 27 /IC RSS-199/ IC RSS-130/IC RSS-139 PARAGRAPH					
Report Section	**FCC Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
C.1	§2.1053 and §27.53	RSS-199 Clause 4.5 RSS-130 Clause 4.7 RSS-139 Clause 6.6	Radiated emissions	P	N/A
Supplementary information and remarks: None.					

List of equipment used during the test

List of equipment used during the test					
CONTROL NUMBER	**DESCRIPTION**	**MANUFACTURER**	**MODEL**	**LAST CALIBRATION**	**NEXT CALIBRATION**
1012	EMI Test Receiver	ROHDE & SCHWARZ	ESR26	2018/09	2020/09
1039	Signal Analyzer	ROHDE & SCHWARZ	FSV40	2018/10	2020/10
1057	Double Ridged Waveguide Horn Antenna	ETS LINDGREN	3115	2017/03	2020/03
1065	Biconilog Antenna	ETS LINDGREN	3142E	2017/03	2020/03
1067	Phi Positioner	ETS LINDGREN	2111	--	--
1017	EMC measurement software	ROHDE & SCHWARZ	EMC32	---	---

Appendix A: Test Results for

FCC Part 22 & 90 / IC RSS-132

Appendix A Content

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PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	LTE: QPSK and QAM modulations 3G: QPSK and QAM modulations
Maximum RF Output Power	LTE:23 dBm 3G: 23.5 dBm
Operation mode:	Notebook Mode, Tablet Mode
- Operating Frequency Range	LTE Band 26: 824-849 MHz 3G Band V: 824-849 MHz
- Nominal Channel Bandwidth	LTE Band 26: 1.4 / 3 / 5 / 10 / 15 MHz 3G Band V: 5MHz
Extreme operating conditions	
- Temperature range	T_{nom} = +15 to + 35 T_{min} = -30 T_{max} = +50
Antenna type	Internal Antenna
Nominal Voltage	
- Supply Voltage	120 Vac
- Type of power source	120V ac/dc Power supply
Equipment type	Convertible PC

DESCRIPTION OF TEST CONDITIONS

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

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#01
LTE Band 26</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac
Test Frequencies for Conducted tests:
1.4 MHz Bandwidth:
-Lowest Channel: 26797 (824.7 MHz)
-Middle Channel: 26915 (836.5 MHz)
-Highest Channel: 27033 (848.3 MHz)
3 MHz Bandwidth:
-Lowest Channel: 26805 (825.5 MHz)
-Middle Channel: 26915 (836.5 MHz)
-Highest Channel: 27025 (847.5 MHz)
5 MHz Bandwidth:
-Lowest Channel: 26815 (826.5 MHz)
-Middle Channel: 26915 (836.5 MHz)
-Highest Channel: 27015 (846.5 MHz)
10 MHz Bandwidth:
-Lowest Channel: 26840 (829 MHz)
-Middle Channel: 26915 (836.5 MHz)
-Highest Channel: 26990 (844 MHz)
15 MHz Bandwidth:
-Lowest Channel: 26865 (831.5 MHz)
-Middle Channel: 26915 (836.5 MHz)
-Highest Channel: 26965 (841.5 MHz)
Test Frequencies for Radiated tests:
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Number of Resource blocks</th></tr>
<tr><td>824 to 849 MHz</td><td>829 MHz
836.5 MHz
846.5 MHz</td><td>10 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: The device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#02
3G Band V</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac

Test Frequencies for Radiated tests:

<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th></tr>
<tr><td>824 to 849 MHz</td><td>826.5 MHz
836.5 MHz
846.5 MHz</td><td>5 MHz</td><td>QPSK</td></tr>
</table>
Note: The device was tested under all modulations. The worst case was found in WCDMA QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

TEST A.1: RADIATED EMISSIONS

LIMITS:	Product standard:	FCC Part 22 / FCC Part 90 / IC RSS-132.
	Test standard:	FCC §2.1053 and §22.917 §90.691 /RSS-132 Clause 5.5.

LIMITS

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.

At Po transmitting power of 2 watts (33 dBm), the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative to Po becomes:

Po (dBm) – [43 + 10 log (Po in watts)] = -13 dBm

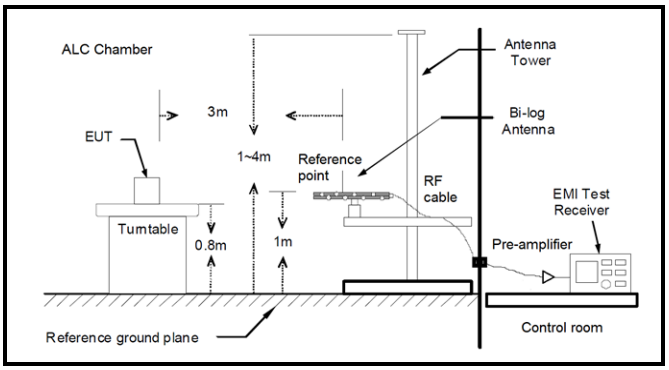
TEST SETUP	

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.

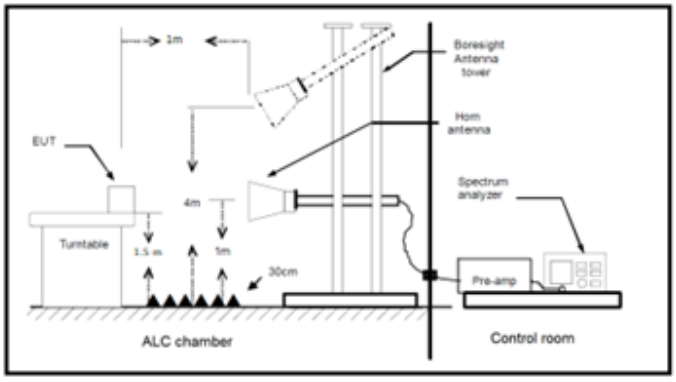
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1-meter distance for measurements above 1 GHz.

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

Radiated measurements < 1GHz



Radiated measurements > 1GHz



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 26)
TEST RESULTS:	PASS

RESULTS

A preliminary scan determined the QPSK 10 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

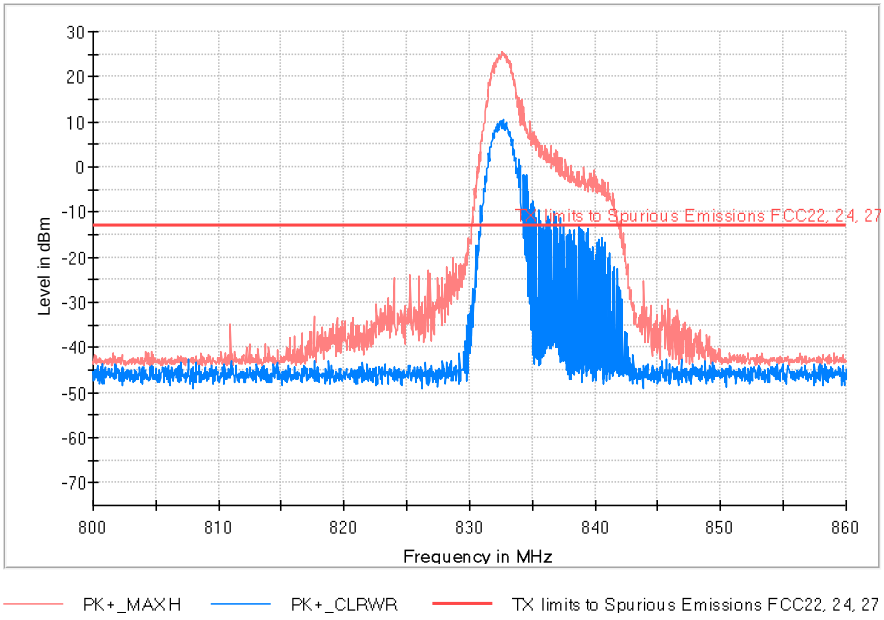
The following plots show the results for this configuration.

Spurious signal detected were more than 20dB below the reference limit.

LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 10 MHz

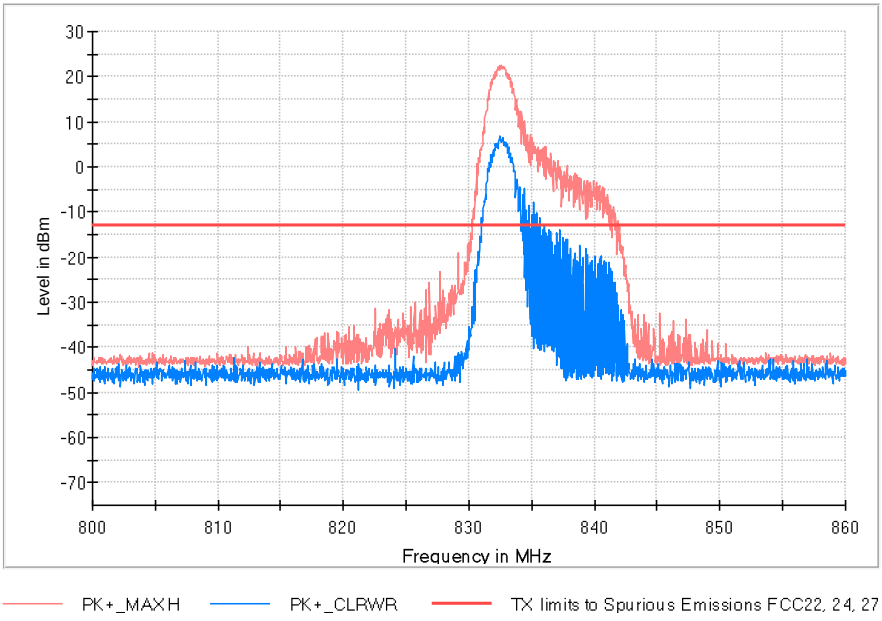
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

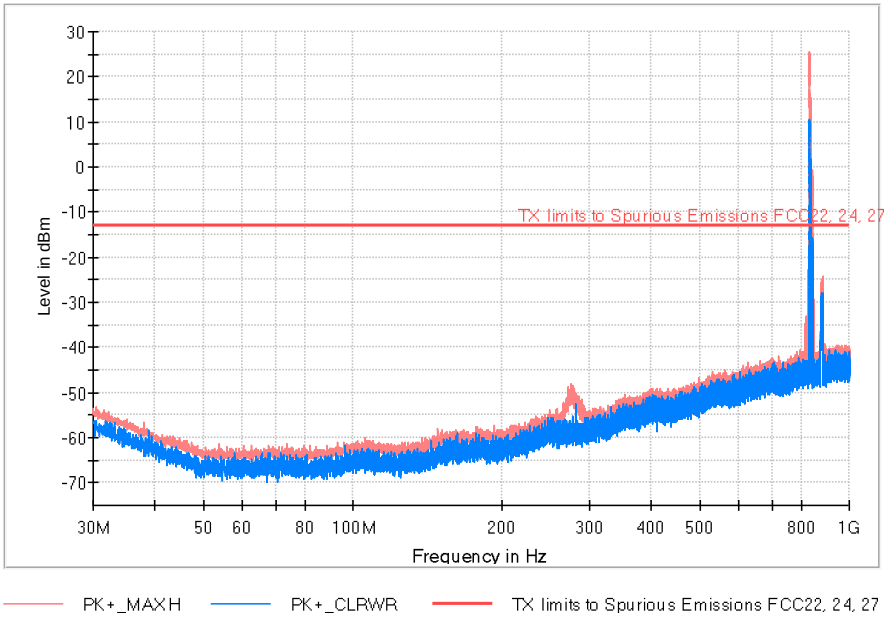
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
832.578000	Notebook	Horizontal	25.5
832.578000	Tablet	Horizontal	22.6

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Middle Channel

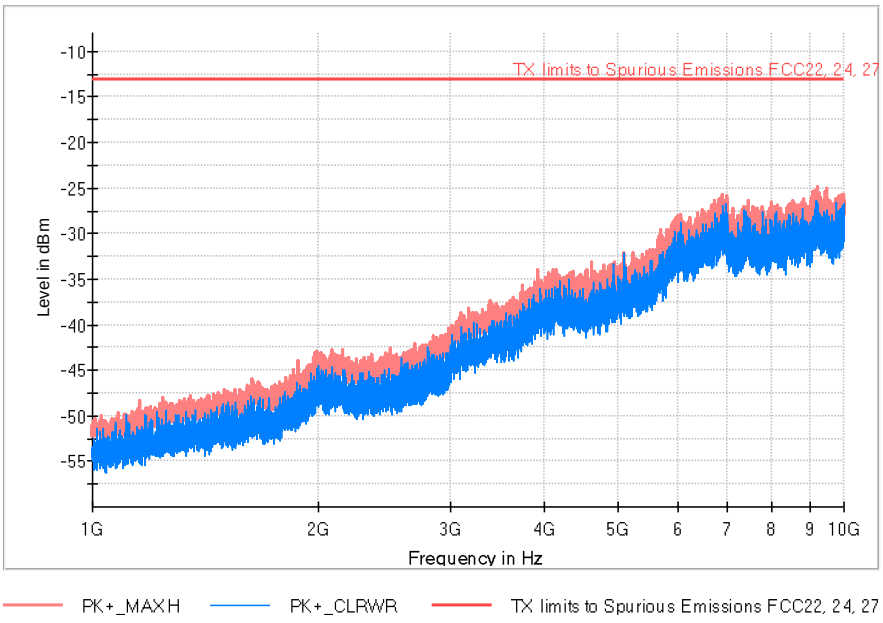
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
276.089000	-57.3	-48.1	
832.578000	9.9	25.5	Fundamental UL
885.410667	-30.4	-24.2	Fundamental DL

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 1-10 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
1876.800000	-50.4	-43.9
3919.000000	-39.5	-34.0
9225.500000	-28.3	-24.9

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (3G Band V)
TEST RESULTS:	PASS

RESULTS

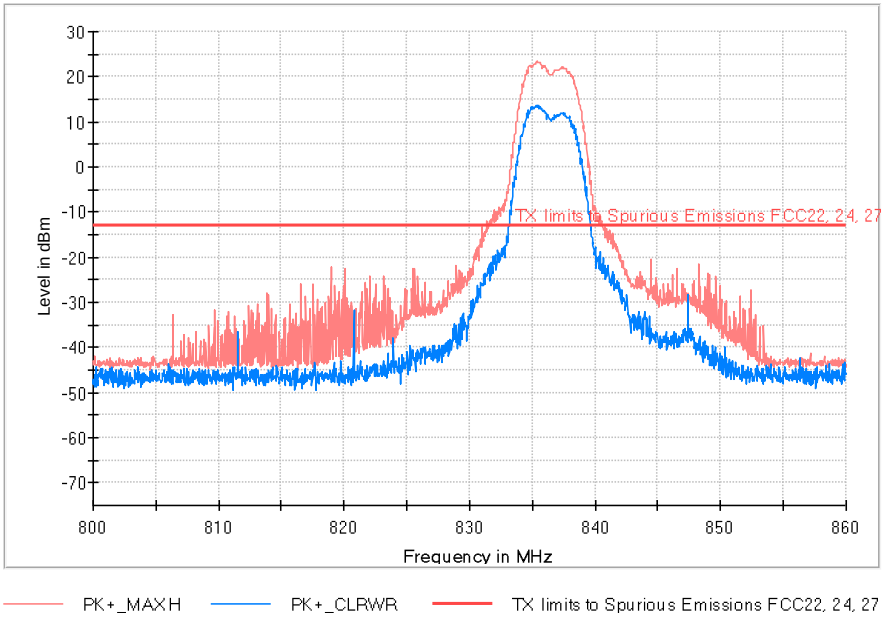
A preliminary scan determined the WCDMA QPSK modulation as the worst case. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

The following plots show the results for this configuration.

Spurious signal detected were more than 20dB below the reference limit.

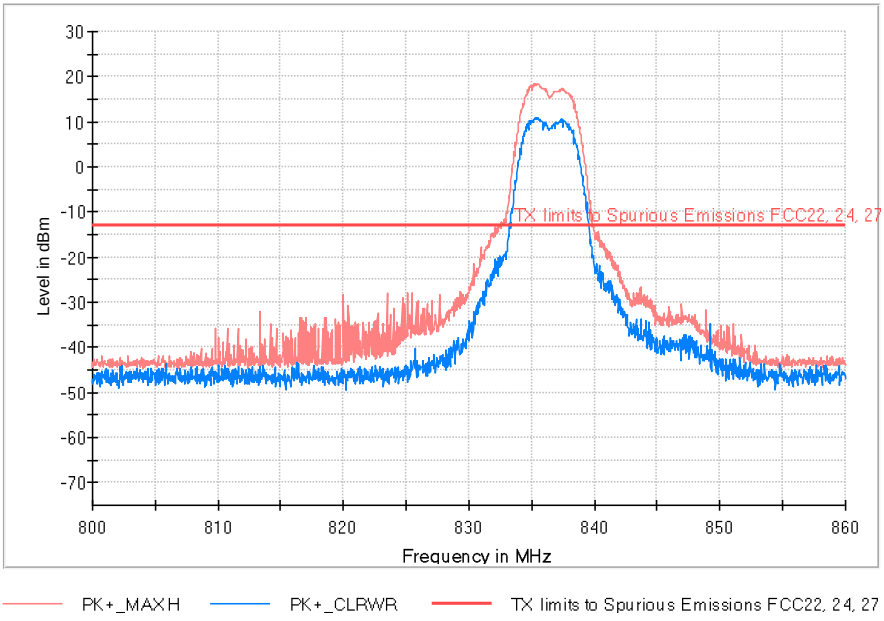
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

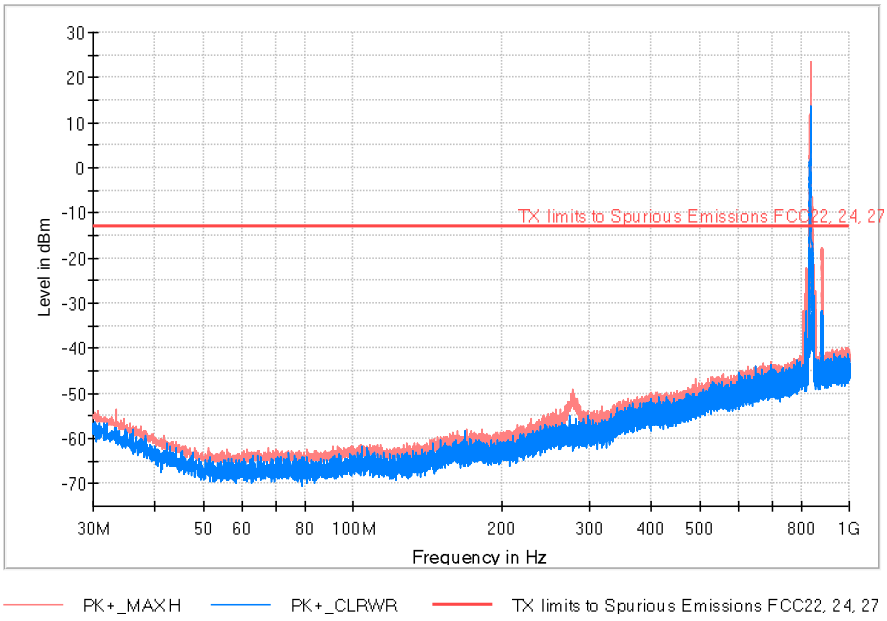
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
835.391000	Notebook	Horizontal	23.4
835.423333	Tablet	Horizontal	18.6

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Middle Channel

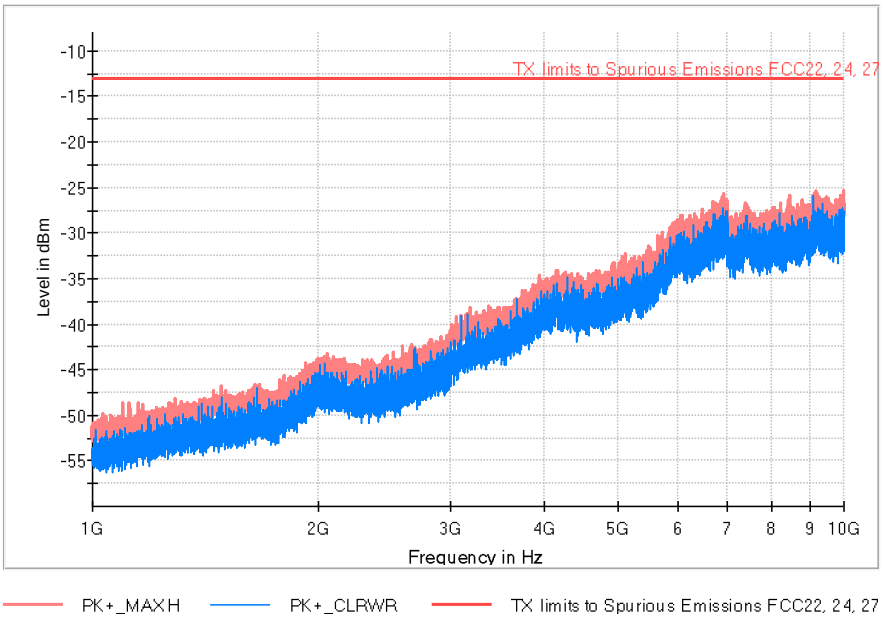
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
277.382333	-59.8	-49.2	
835.391000	13.3	23.4	Fundamental UL
882.565333	-33.7	-17.7	Fundamental DL

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 1-10 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
1099.800000	-54.5	-48.6
8474.500000	-30.5	-26.0
9166.000000	-28.1	-25.4

Appendix B: Test Results for

FCC Part 24/ IC RSS-133

Appendix B Content

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PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	LTE: QPSK and QAM modulations 3G: QPSK and QAM modulations
Maximum RF Output Power	LTE:23 dBm 3G: 23.5 dBm
Operation mode:	Notebook Mode, Tablet Mode
- Operating Frequency Range	LTE Band 25: 1850-1915 MHz 3G Band II: 1850-1910 MHz
- Nominal Channel Bandwidth	LTE Band 25: 1.4 / 3 / 5 / 10 / 15 / 20 MHz 3G Band II: 5MHz
Extreme operating conditions	
- Temperature range	T_{nom} = +15 to + 35 T_{min} = -30 T_{max} = +50
Antenna type	Internal Antenna
Nominal Voltage	
- Supply Voltage	120 Vac
- Type of power source	120V ac/dc Power supply
Equipment type	Convertible PC

DESCRIPTION OF TEST CONDITIONS

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

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#01
LTE Band 25</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac
Test Frequencies for Conducted tests:
1.4 MHz Bandwidth:
-Lowest Channel: 26047 (1850.7 MHz)
-Middle Channel: 26365 (1882.5 MHz)
-Highest Channel: 26683 (1914.3 MHz)
3 MHz Bandwidth:
-Lowest Channel: 26055 (1851.5 MHz)
-Middle Channel: 26365 (1882.5 MHz)
-Highest Channel: 26675 (1913.5 MHz)
5 MHz Bandwidth:
-Lowest Channel: 26065 (1852.5 MHz)
-Middle Channel: 26365 (1882.5 MHz)
-Highest Channel: 26665 (1912.5 MHz)
10 MHz Bandwidth:
-Lowest Channel: 26090 (1855 MHz)
-Middle Channel: 26365 (1882.5 MHz)
-Highest Channel: 26640 (1910 MHz)
15 MHz Bandwidth:
-Lowest Channel: 26115 (1857.5 MHz)
-Middle Channel: 26365 (1882.5 MHz)
-Highest Channel: 26615 (1907.5 MHz)
20 MHz Bandwidth:
-Lowest Channel: 26140 (1860 MHz)
-Middle Channel: 26365 (1882.5 MHz)
-Highest Channel: 26590 (1905 MHz)
Test Frequencies for Radiated tests:
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Number of Resource blocks</th></tr>
<tr><td>1850 to 1915 MHz</td><td>1860 MHz
1882.5 MHz
1905 MHz</td><td>20 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#02
3G Band II</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 120 Vac

<u>Test Frequencies for Conducted tests:</u>

-Lowest Channel: 9262 (1852.4 MHz)
-Middle Channel: 9400 (1880 MHz)
-Highest Channel: 9537 (1907.4 MHz)

<u>Test Frequencies for Radiated tests:</u>
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th></tr>
<tr><td>1850 to 1910 MHz</td><td>1852.4 MHz
1880 MHz
1907.4 MHz</td><td>5 MHz</td><td>QPSK</td></tr>
</table>
Note: The device was tested under all modulations. The worst case was found in WCDMA QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

TEST B.1: RADIATED EMISSIONS

LIMITS:	Product standard:	FCC Part 24 / IC RSS-133
	Test standard:	FCC §2.1053 and §24.238 /RSS-133 Clause 6.6

LIMITS

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.

At Po transmitting power of 2 watts (33 dBm), the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative to Po becomes:

Po (dBm) – [43 + 10 log (Po in watts)] = -13 dBm

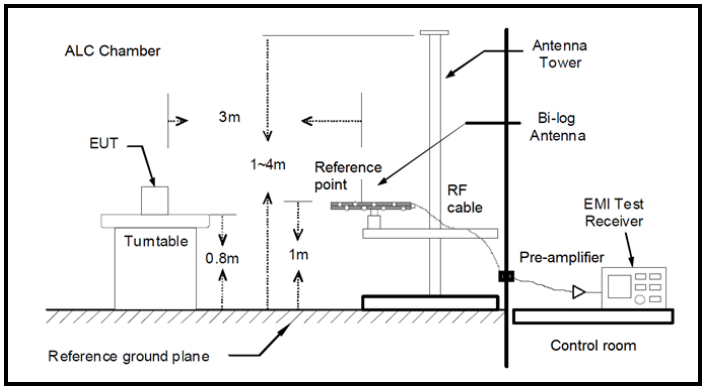
TEST SETUP

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.

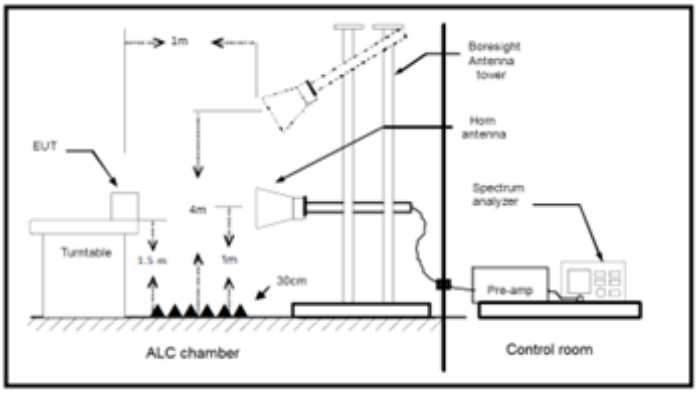
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1-meter distance for measurements above 1 GHz.

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

Radiated measurements < 1GHz



Radiated measurements > 1GHz



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 25)
TEST RESULTS:	PASS

RESULTS

A preliminary scan determined the QPSK 20 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used. The device was tested in both Tablet mode and Notebook mode to determine the worst-case mode.

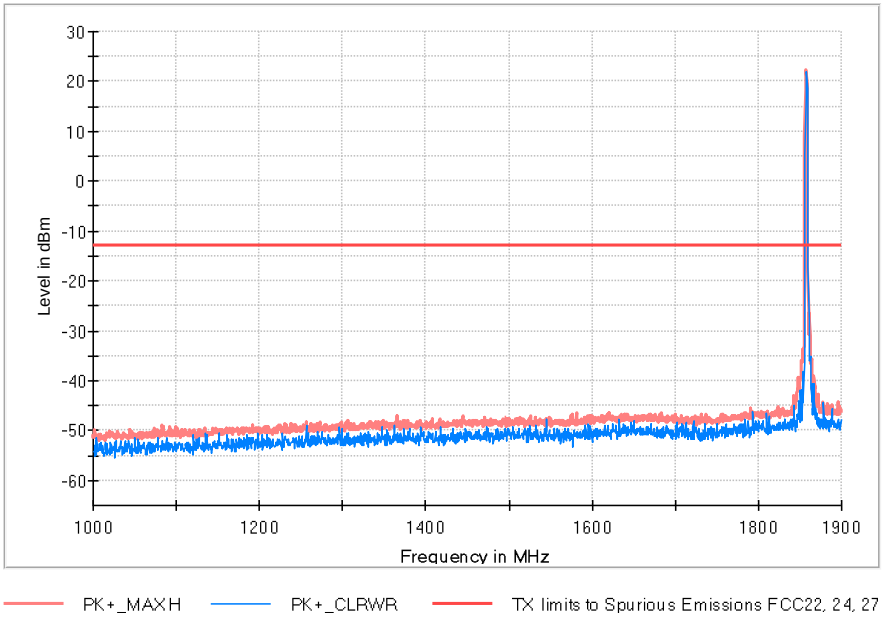
The following plots show the results for the following configuration.

LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 20 MHz

Spurious signal detected were more than 20dB below the reference limit.

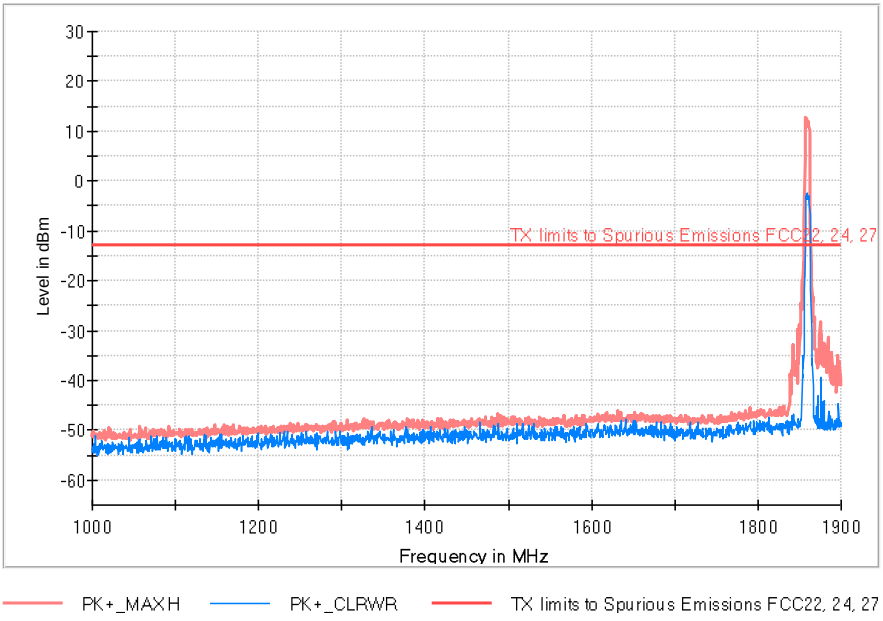
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

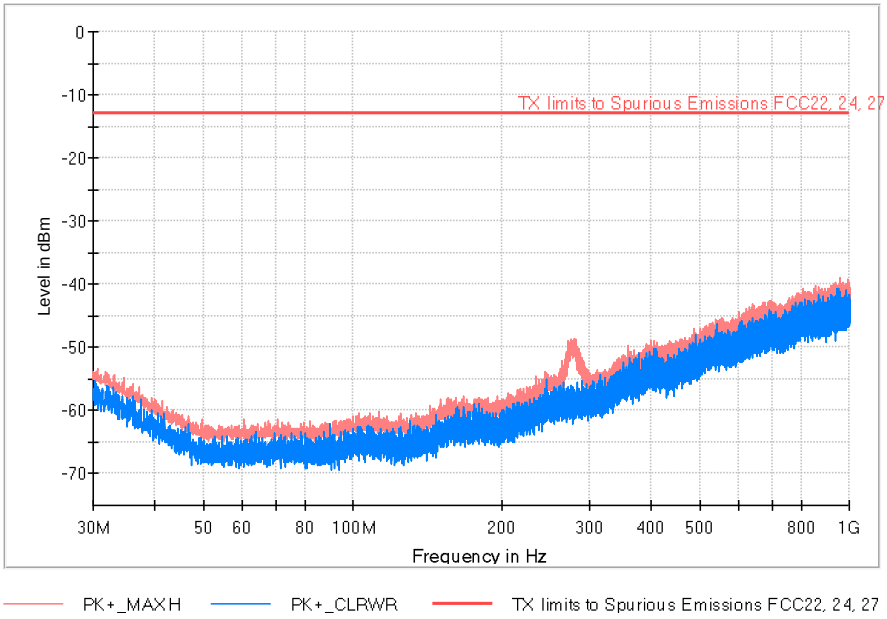
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
1858.000000	Notebook	Horizontal	22.3
1860.500000	Tablet	Vertical	11.0

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Lowest Channel

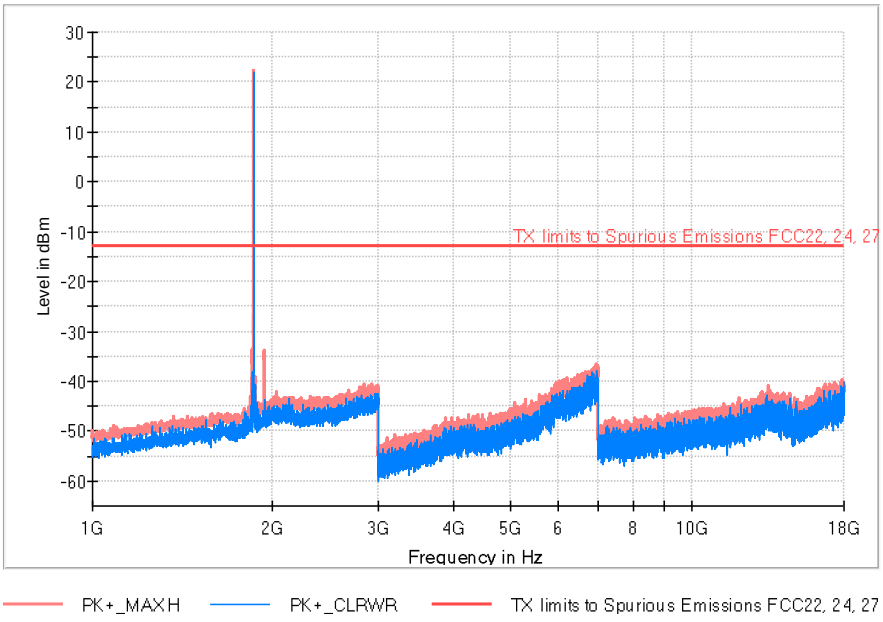
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
280.098333	-61.4	-48.6
357.730667	-54.0	-49.8
960.230000	-45.3	-38.9

TEST RESULTS (Cont.):	

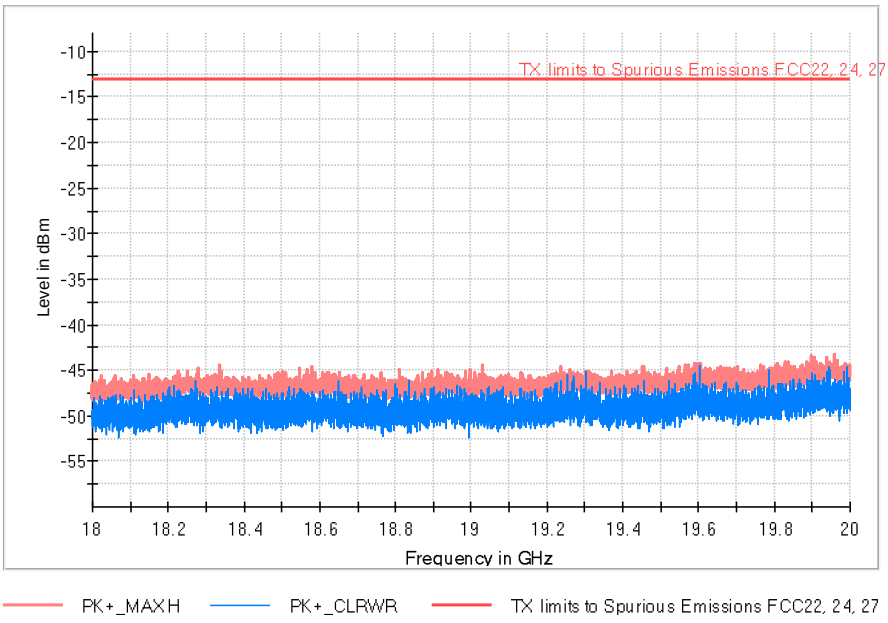
FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1858.000000	22.1	22.3	Fundamental UL
1941.500000	-44.7	-33.9	Fundamental DL
13457.000000	-47.9	-40.8	

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 18-20 GHz



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (3G Band II)
TEST RESULTS:	PASS

RESULTS

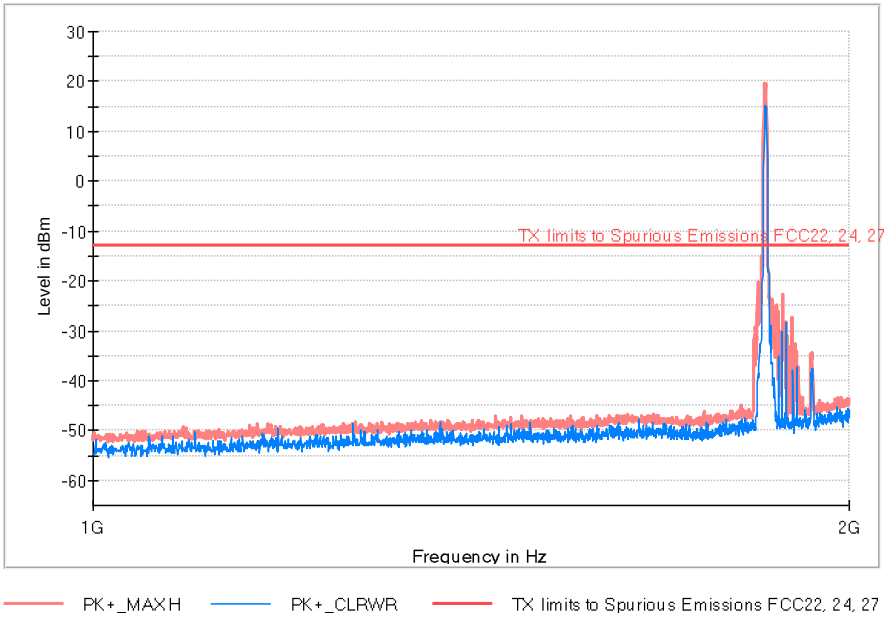
A preliminary scan determined the WCDMA QPSK modulation as the worst case. The device was tested in both Tablet mode and Notebook mode to determine the worst-case mode.

The following plots show the results for this configuration.

Spurious signal detected were more than 20dB below the reference limit.

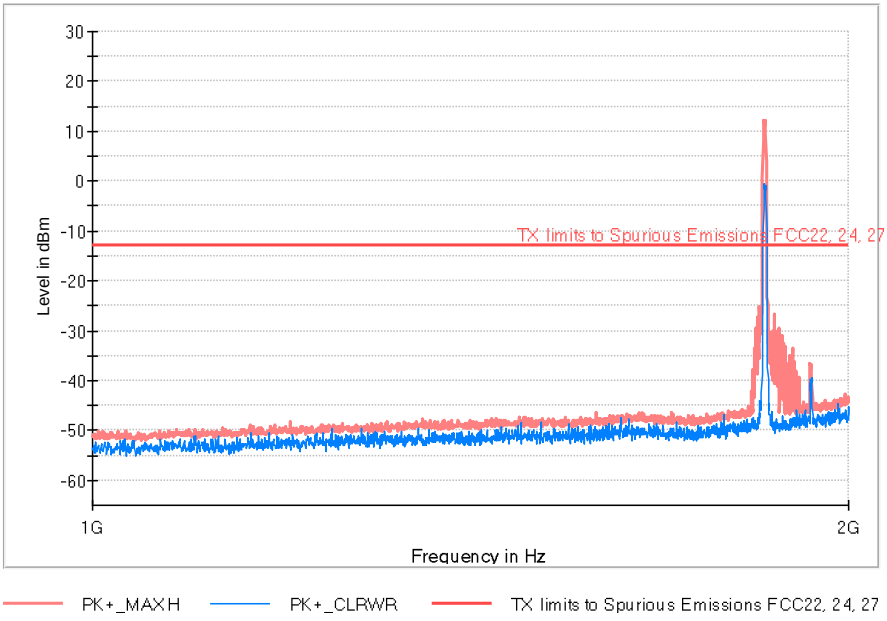
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental Signal level:

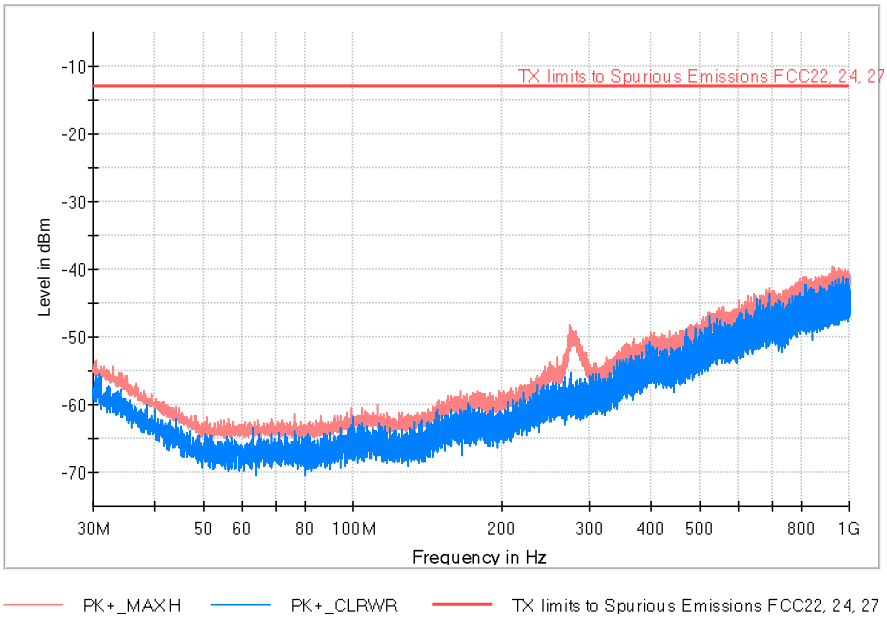
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
1851.500000	Notebook	Horizontal	19.7
1851.000000	Tablet	Horizontal	12.2

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Lowest Channel

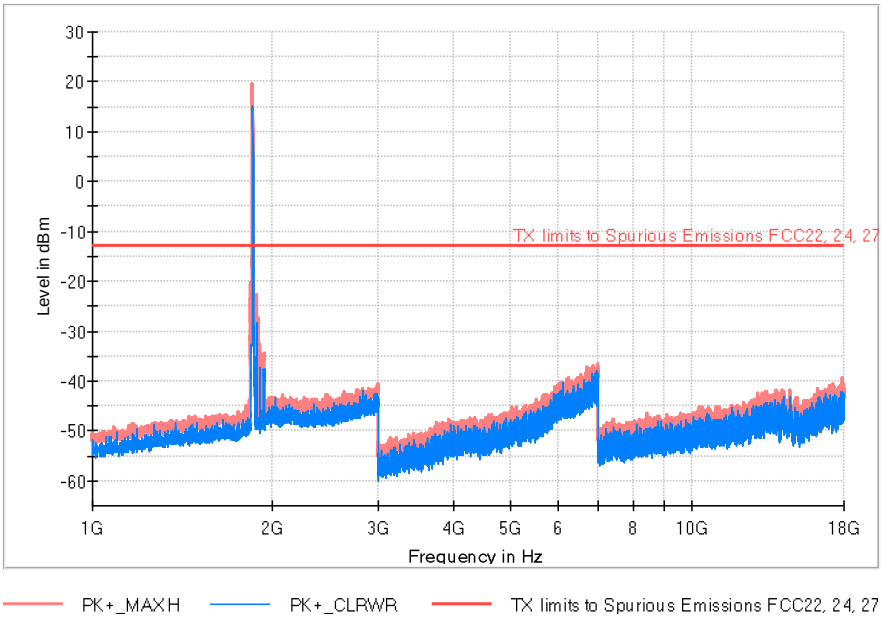
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
76.463000	-66.0	-61.4
273.890333	-60.8	-48.3
556.063333	-50.8	-45.4

TEST RESULTS (Cont.):	

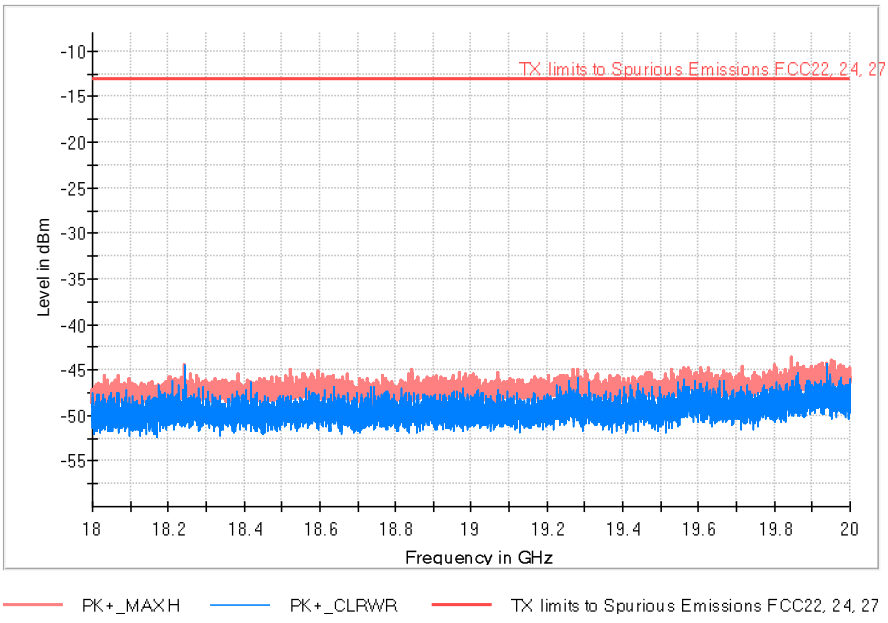
FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1851.500000	15.2	19.7	Fundamental UL
1933.500000	-40.1	-34.6	Fundamental DL

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 18-20 GHz



Appendix C: Test Results for

FCC Part 27/ IC RSS-130/ IC RSS-199/ IC RSS-139

Appendix C Content

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TEST C.1: RADIATED EMISSIONS.....49

PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	LTE: QPSK and QAM modulations 3G: QPSK and QAM modulations
Maximum RF Output Power	LTE:23 dBm 3G: 23.5 dBm
Operation mode:	Notebook Mode, Tablet Mode
- Operating Frequency Range	LTE Band 12: 699 MHz – 716 MHz LTE Band 13: 777-787 MHz LTE Band 41: 2496-2690 MHz LTE Band 66: 1710-1780 MHz 3G Band IV: 1710-1755 MHz
- Nominal Channel Bandwidth	LTE Band 12: 1.4 / 3 / 5 / 10 MHz LTE Band 13: 5 / 10 MHz LTE Band 41: 5 / 10 / 15 / 20 MHz LTE Band 66: 1.4 / 3 / 5 / 10 / 15 / 20 MHz 3G Band IV: 5 MHz
Extreme operating conditions	
- Temperature range	T_{nom} = +15 to + 35 T_{min} = -30 T_{max} = +50
Antenna type	Internal Antenna
Nominal Voltage	
- Supply Voltage	120 Vac
- Type of power source	120V ac/dc Power Supply
Equipment type	Convertible PC

DESCRIPTION OF TEST CONDITIONS

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

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#01
LTE Band 12</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac

Test Frequencies for Conducted tests:
1.4 MHz Bandwidth:
-Lowest Channel: 23017 (699.7 MHz)
-Middle Channel: 23095 (707.5 MHz)
-Highest Channel: 23173 (715.3 MHz)
3 MHz Bandwidth:
-Lowest Channel: 23025 (700.5 MHz)
-Middle Channel: 23095 (707.5 MHz)
-Highest Channel: 23165 (714.5 MHz)
5 MHz Bandwidth:
-Lowest Channel: 23035 (701.5 MHz)
-Middle Channel: 23095 (707.5 MHz)
-Highest Channel: 23155 (713.5 MHz)
10 MHz Bandwidth:
-Lowest Channel: 23060 (704 MHz)
-Middle Channel: 23095 (707.5 MHz)
-Highest Channel: 23130 (711 MHz)

Test Frequencies for Radiated tests:

<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Number of Resource blocks</th></tr>
<tr><td>699 to 716 MHz</td><td>701.5 MHz
707.5 MHz
713.5 MHz</td><td>5 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#02
LTE Band 13</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac

Test Frequencies for Conducted tests:

5 MHz Bandwidth:
-Lowest Channel: 23205 (779.5 MHz)
-Middle Channel: 23230 (782.0 MHz)
-Highest Channel: 23255 (784.5 MHz)

10 MHz Bandwidth:
-Middle Channel: 23230 (782.0 MHz)

Test Frequencies for Radiated tests:
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Number of Resource blocks</th></tr>
<tr><td>777 to 787 MHz</td><td>779.5 MHz
782.0 MHz
784.5 MHz</td><td>5 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#03
LTE Band 41</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac
Test Frequencies for Conducted tests:

5 MHz Bandwidth:
-Lowest Channel: 39675 (2498.5 MHz)
-Middle Channel: 40620 (2593 MHz)
-Highest Channel: 41565 (2687.5 MHz)

10 MHz Bandwidth:
-Lowest Channel: 39700 (2501 MHz)
-Middle Channel: 40620 (2593 MHz)
-Highest Channel: 41540 (2685 MHz)

15 MHz Bandwidth:
-Lowest Channel: 39725 (2503.5 MHz)
-Middle Channel: 40620 (2593 MHz)
-Highest Channel: 41515 (2682.5 MHz)

20 MHz Bandwidth:
-Lowest Channel: 39750 (2506 MHz)
-Middle Channel: 40620 (2593 MHz)
-Highest Channel: 41490 (2680 MHz)
Test Frequencies for Radiated tests:

<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Number of Resource blocks</th></tr>
<tr><td>2496 to 2690 MHz</td><td>2506 MHz
2593 MHz
2680 MHz</td><td>20 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#04
LTE Band 66</td><td>
Power supply (V):
$V_{nominal}$ = 120 Vac
Test Frequencies for Conducted tests:
1.4 MHz Bandwidth:
-Lowest Channel: 131979 (1710.7 MHz)
-Middle Channel: 132422 (1755 MHz)
-Highest Channel: 132665 (1779.3 MHz)
3 MHz Bandwidth:
-Lowest Channel: 131987 (1711.5 MHz)
-Middle Channel: 132422 (1755 MHz)
-Highest Channel: 132657 (1778.5 MHz)
5 MHz Bandwidth:
-Lowest Channel: 131997 (1712.5 MHz)
-Middle Channel: 132422 (1755 MHz)
-Highest Channel: 132647 (1777.5 MHz)
10 MHz Bandwidth:
-Lowest Channel: 132022 (1715 MHz)
-Middle Channel: 132422 (1755 MHz)
-Highest Channel: 132622 (1775 MHz)
15 MHz Bandwidth:
-Lowest Channel: 132047 (1717.5 MHz)
-Middle Channel: 132422 (1755 MHz)
-Highest Channel: 132597 (1772.5 MHz)
20 MHz Bandwidth:
-Lowest Channel: 132072 (1720 MHz)
-Middle Channel: 132422 (1755 MHz)
-Highest Channel: 132572 (1770 MHz)
Test Frequencies for Radiated tests:
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Number of Resource blocks</th></tr>
<tr><td>1710 to 1780 MHz</td><td>1720 MHz
1755 MHz
1770 MHz</td><td>20 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#05
3G Band IV</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 120 Vac

<u>Test Frequencies for Conducted tests:</u>

-Lowest Channel: 1313 (1712.6 MHz)
-Middle Channel: 1413 (1732.6 MHz)
-Highest Channel: 1512 (1752.4 MHz)

<u>Test Frequencies for Radiated tests:</u>

<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th></tr>
<tr><td>1710 to 1755 MHz</td><td>1712.6 MHz
1732.6 MHz
1752.4 MHz</td><td>5 MHz</td><td>QPSK</td></tr>
</table>
Note: The device was tested under all modulations. The worst case was found in WCDMA QPSK modulation. The device was tested in both Tablet mode and Notebook mode to detect the worst-case scenario.
</td></tr>
</table>

TEST C.1: RADIATED EMISSIONS

LIMITS:	Product standard:	FCC Part 27 / IC RSS-130, 199 and 139
	Test standard:	FCC §2.1053 and §27.53 / RSS-130 Clause 4.7 and RSS-139 Clause 6.6 / RSS-199 Clause 4.5

LIMITS

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.

At Po transmitting power of 2 watts (33 dBm), the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative to Po becomes:

Po (dBm) – [43 + 10 log (Po in watts)] = -13 dBm

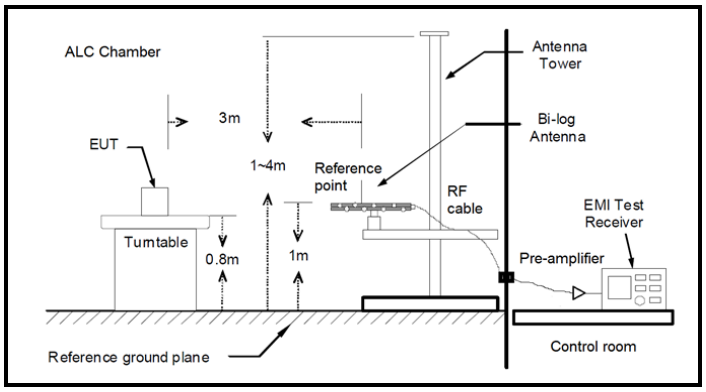
TEST SETUP

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.

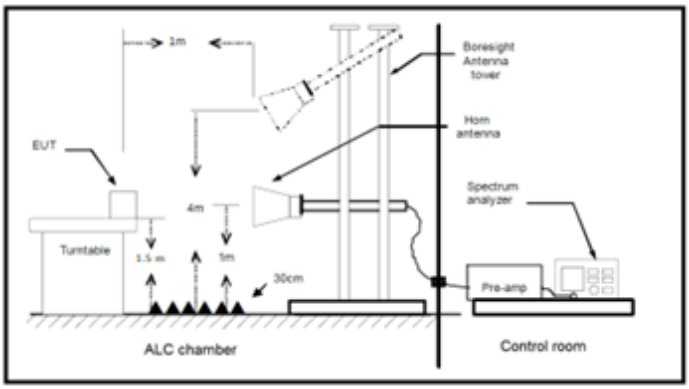
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1-meter distance for measurements above 1 GHz.

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

Radiated measurements < 1GHz



Radiated measurements > 1GHz



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 12)
TEST RESULTS:	PASS

RESULTS

A preliminary scan determined the QPSK 5 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

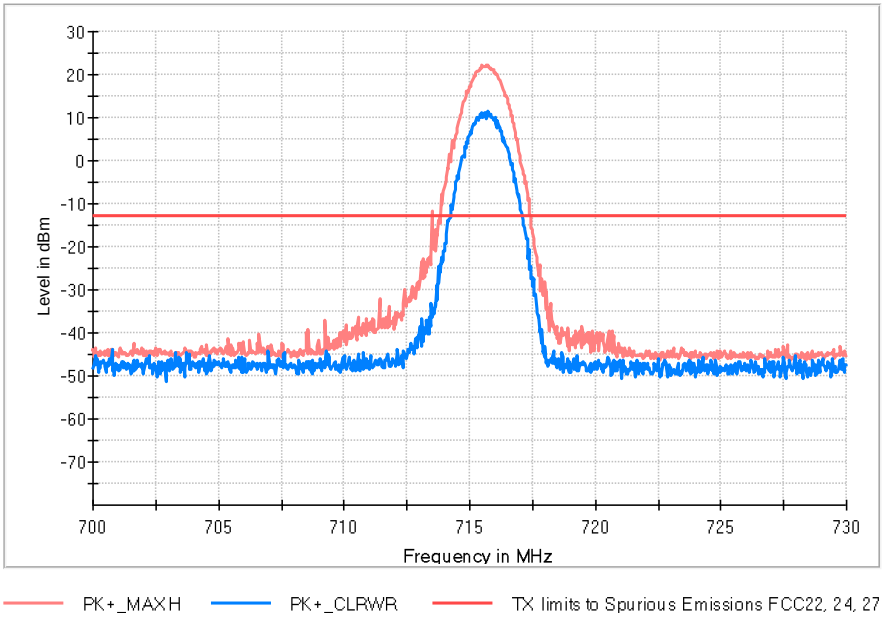
The following plots show the results for the following configuration.

LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 5 MHz

Spurious signal detected were more than 20dB below the reference limit.

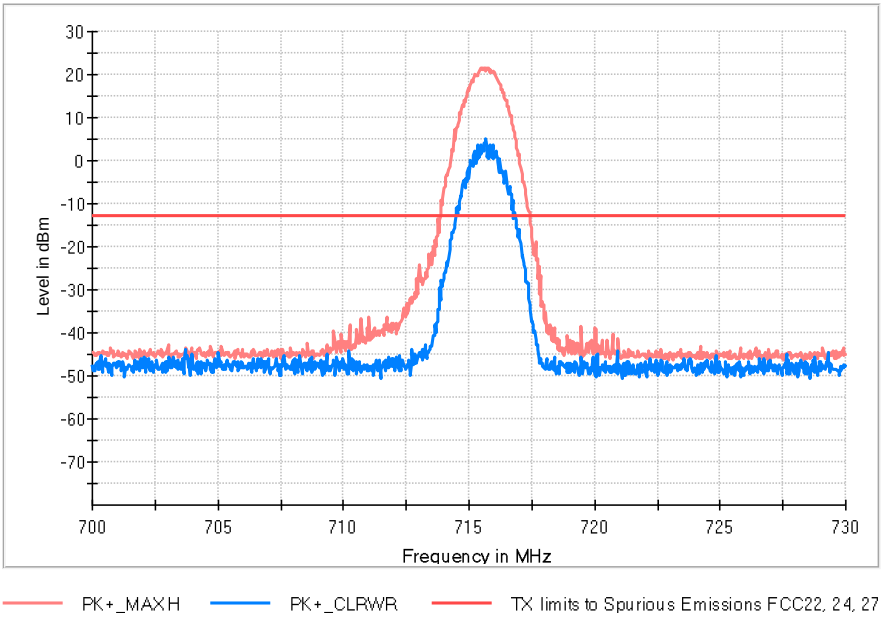
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

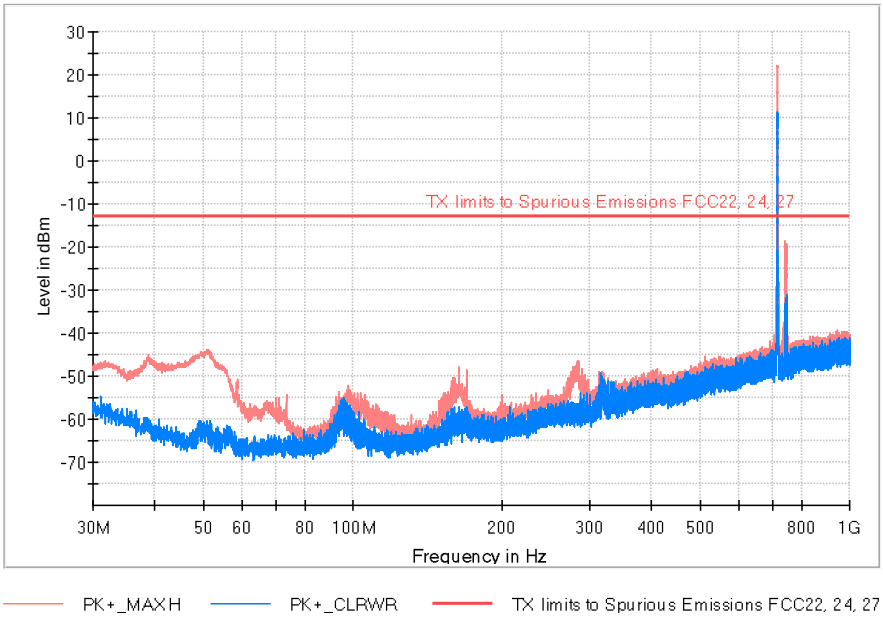
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
715.693000	Notebook	Vertical	22.1
715.628333	Tablet	Horizontal	21.6

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Highest Channel

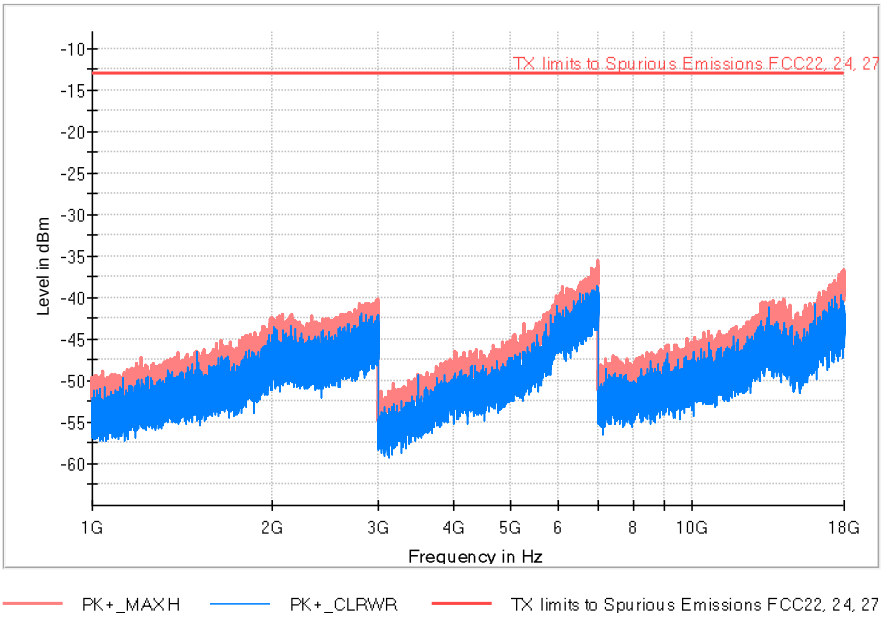
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
51.340000	-65.6	-43.9	
97.770667	-62.0	-52.1	
163.795333	-62.4	-47.9	
284.075333	-58.3	-46.3	
715.693000	9.6	22.1	Fundamental UL
741.786000	-35.7	-18.7	Fundamental DL

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
1392.733333	-50.3	-46.7
2860.200000	-45.3	-40.7

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (Band 13)
TEST RESULTS:	PASS

RESULTS

A preliminary scan determined the QPSK 5 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

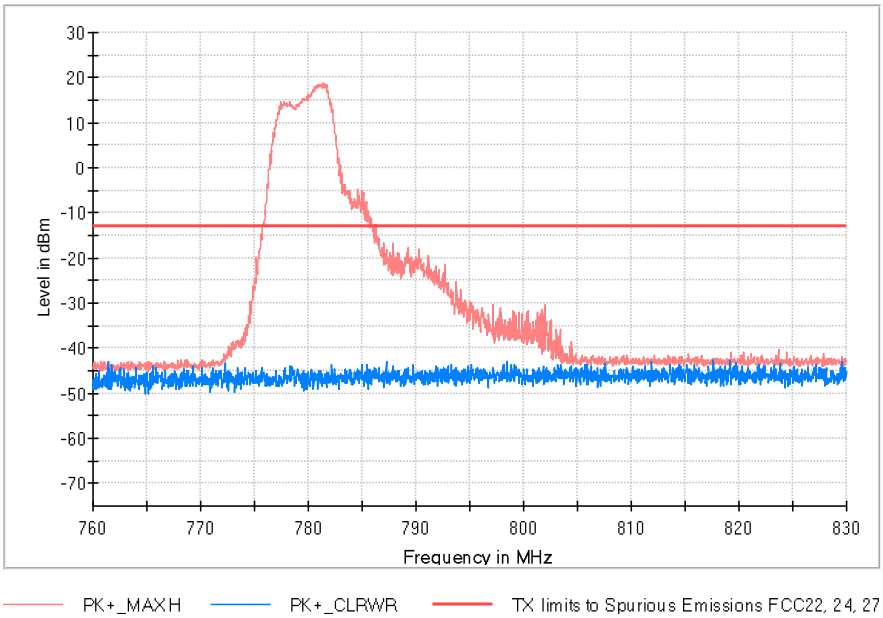
The following plots show the results for the following configuration.

LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 5 MHz

Spurious signal detected were more than 20dB below the reference limit.

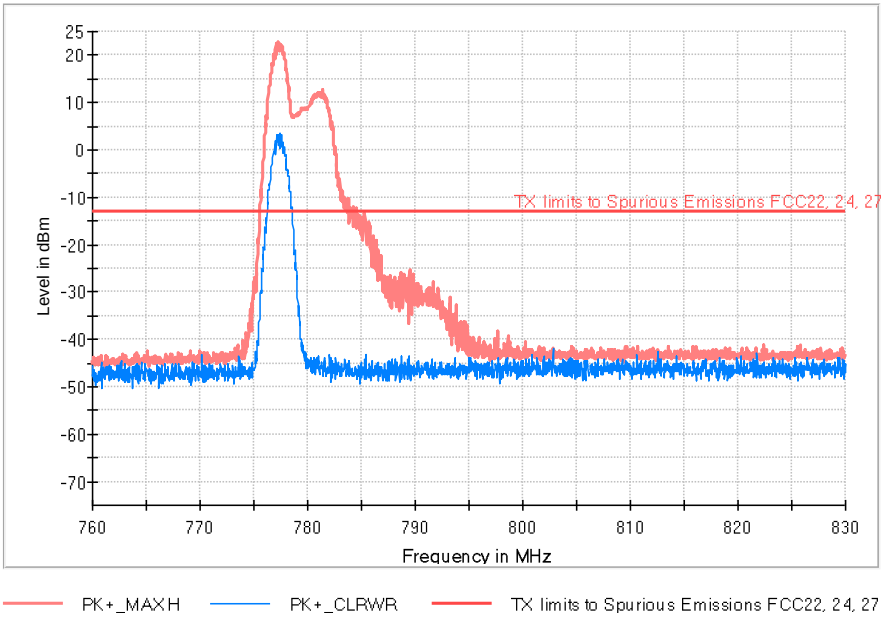
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

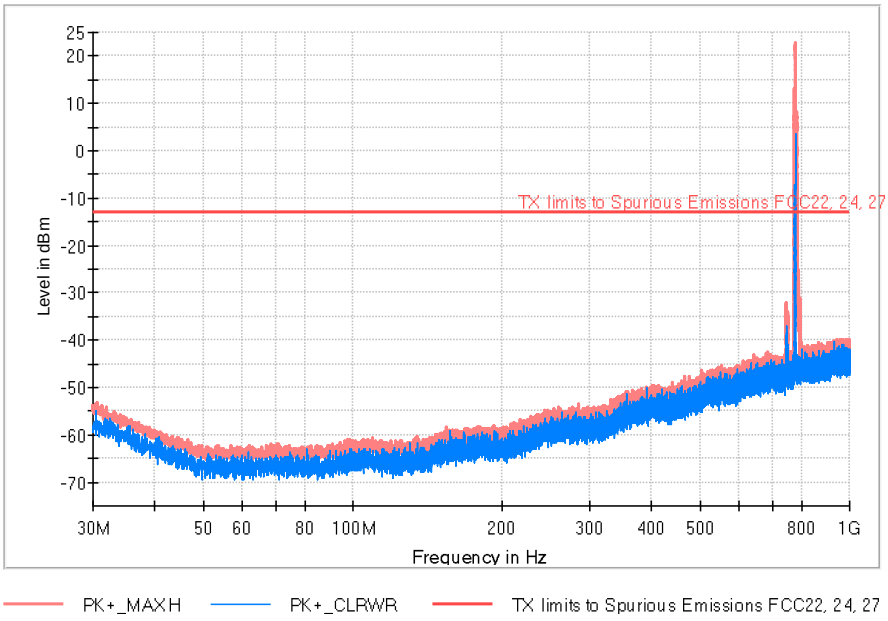
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
781.394333	Notebook	Vertical	18.9
777.288000	Tablet	Horizontal	22.8

Worst Case: Tablet Mode

TEST RESULTS(Cont.):	Tablet Mode

Lowest Channel

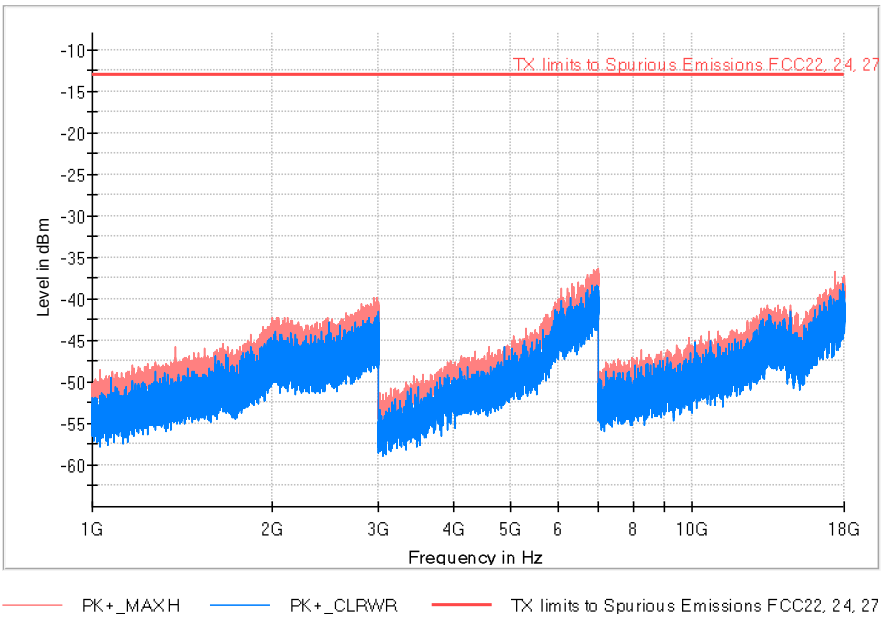
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
747.735333	-41.3	-32.0	Fundamental DL
777.288000	1.0	22.8	Fundamental UL

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
1557.933333	-52.7	-46.9
2333.066667	-48.6	-43.1

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (Band 41)
TEST RESULTS:	PASS

RESULTS

A preliminary scan determined the QPSK 20 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

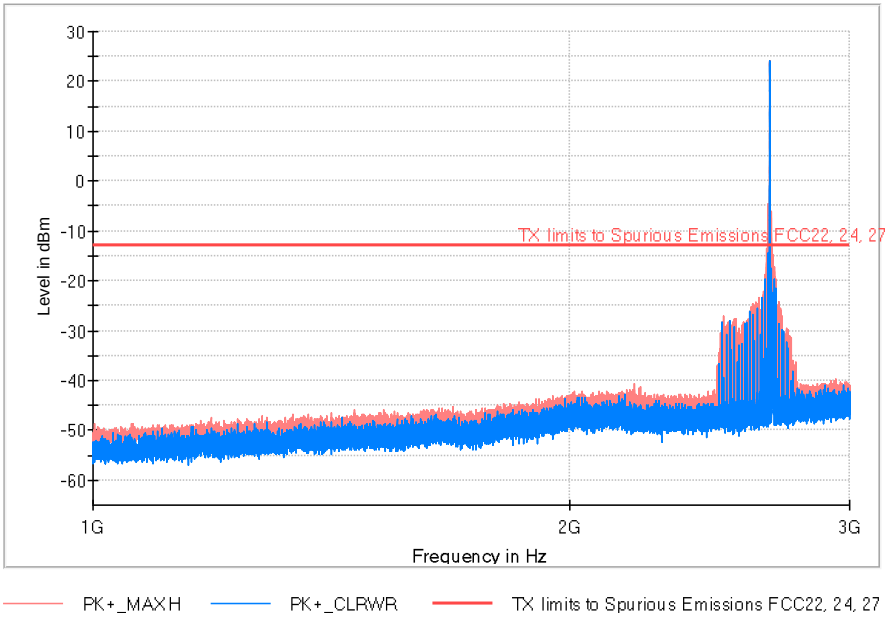
The following plots show the results for the following configuration.

LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 20 MHz

Spurious signal detected were more than 20dB below the reference limit.

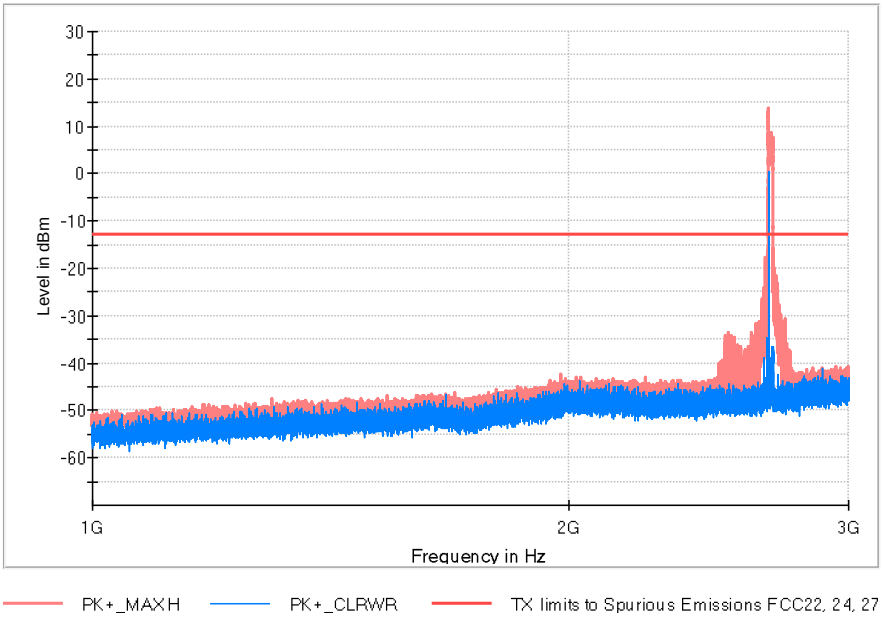
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

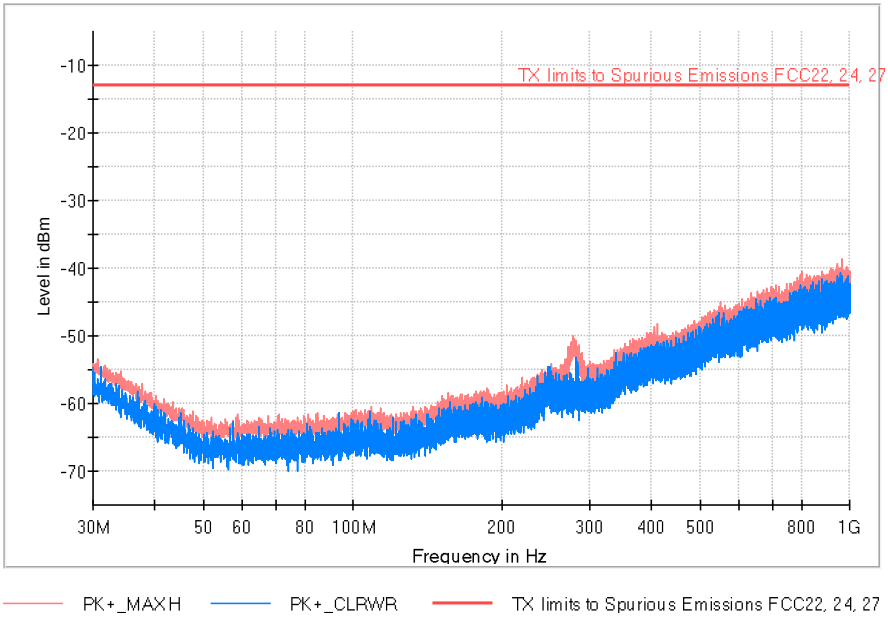
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
2671.200000	Notebook	Horizontal	24.2
2671.200000	Tablet	Vertical	13.7

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Highest Channel

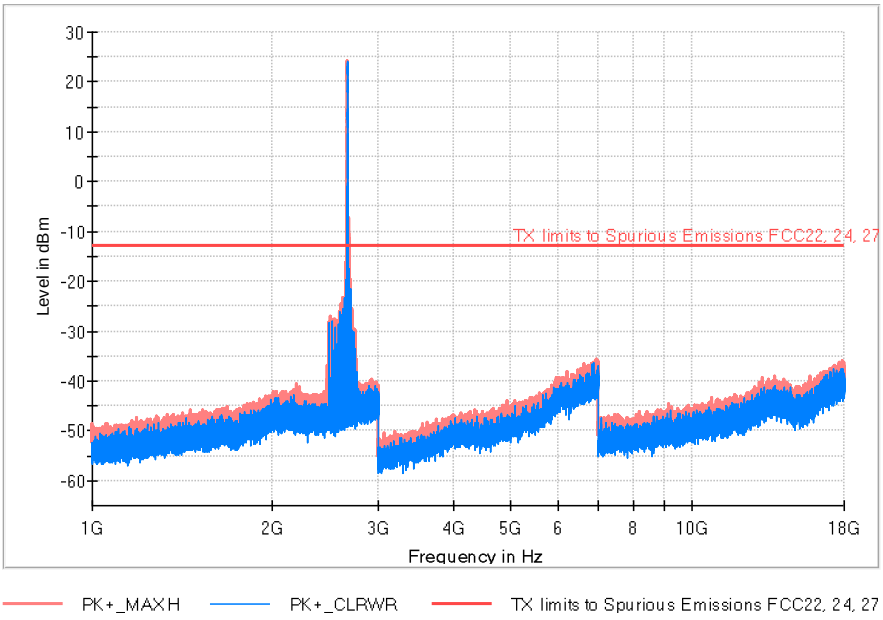
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
277.091333	-60.3	-50.0
410.046000	-53.4	-48.1
548.044667	-49.9	-45.0
967.569667	-45.0	-38.7

TEST RESULTS (Cont.):	

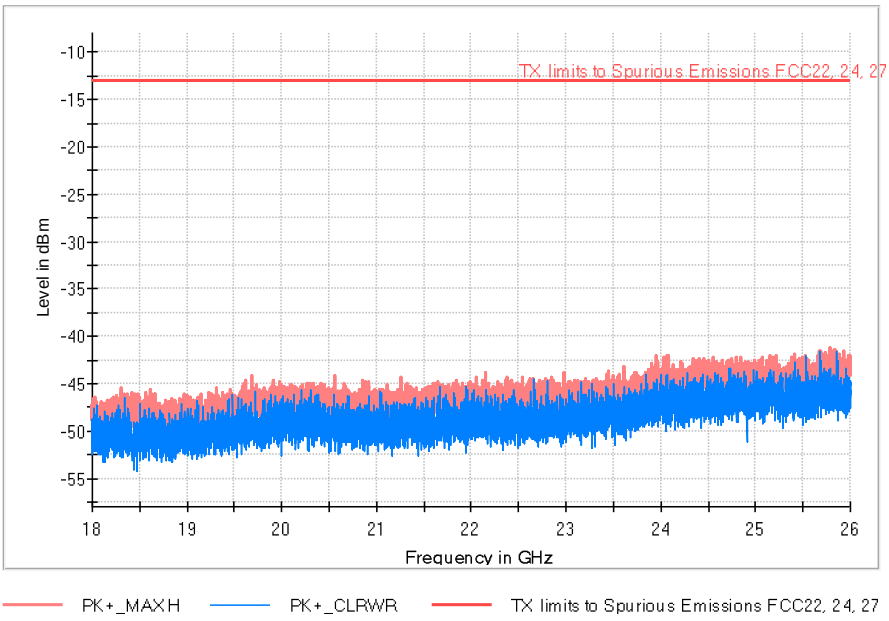
FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
2671.200000	23.3	24.2	Fundamental
4934.500000	-50.0	-44.2	
9174.000000	-49.3	-44.7	

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 18-26 GHz



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#04 (Band 66)
TEST RESULTS:	PASS

RESULTS

A preliminary scan determined the QPSK 20 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

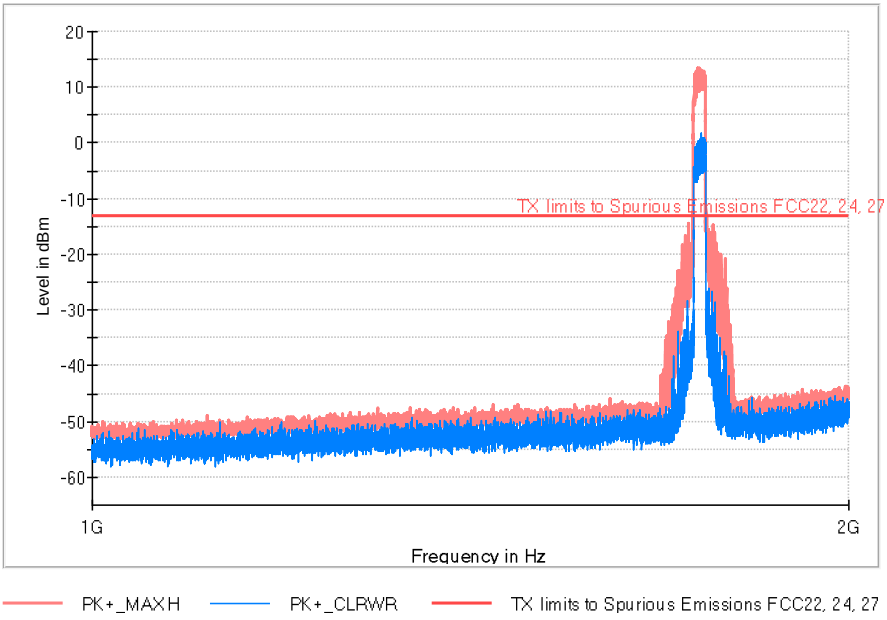
The following plots show the results for the following configuration.

LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 20 MHz

Spurious signal detected were more than 20dB below the reference limit.

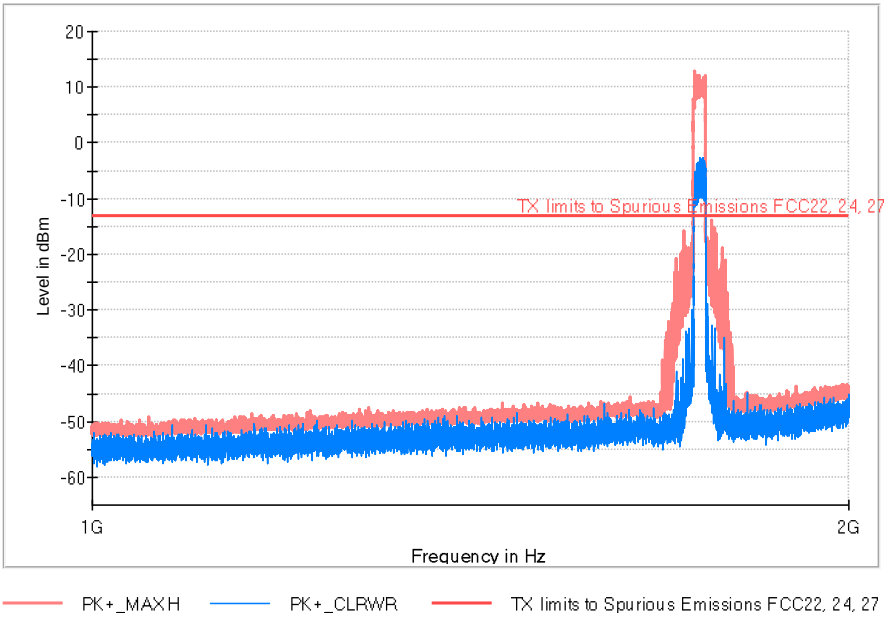
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

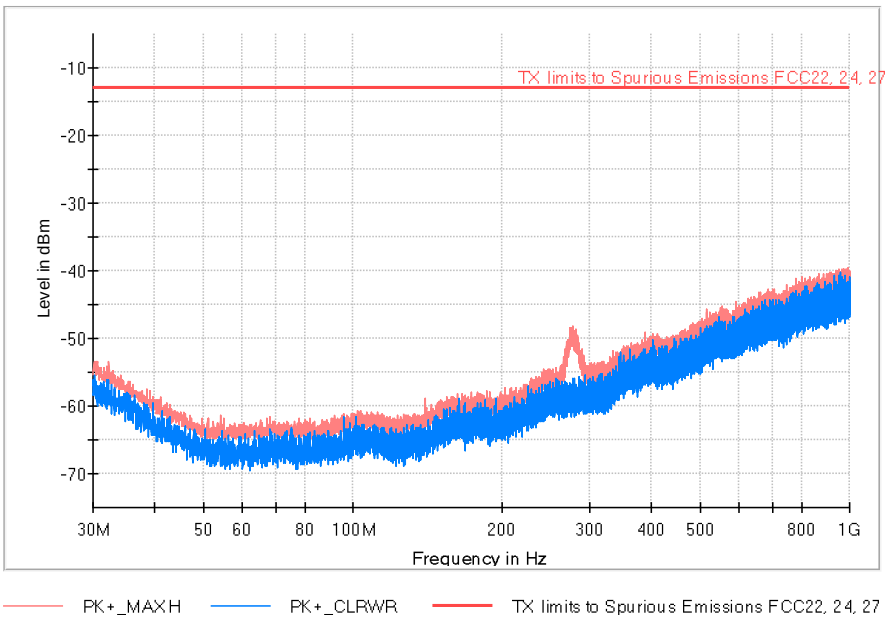
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
1741.733333	Notebook	Horizontal	13.4
1737.000000	Tablet	Horizontal	12.8

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Middle Channel

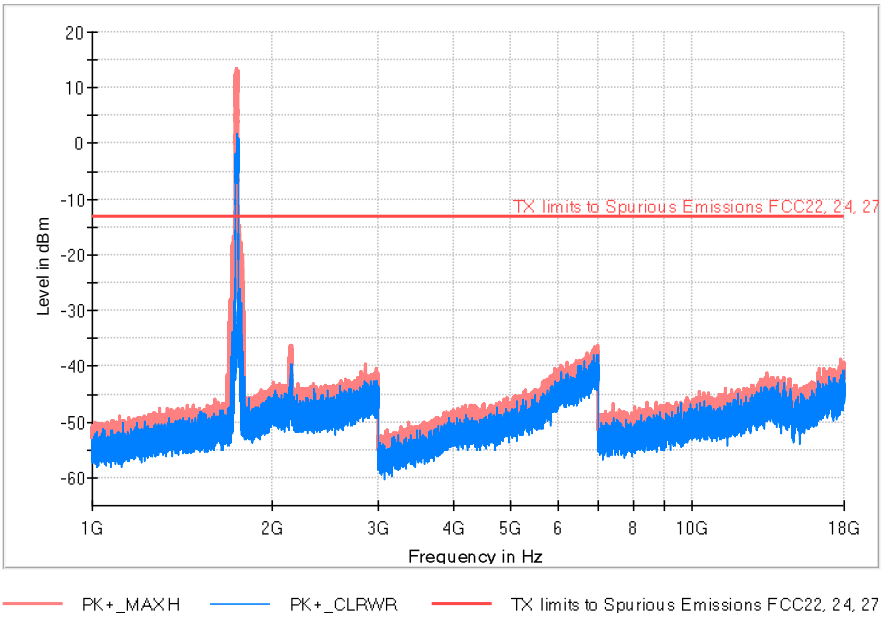
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
277.285333	-59.8	-48.1
588.138000	-50.9	-44.6

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1741.733333	-2.1	13.4	Fundamental UL
2149.466667	-44.3	-36.3	Fundamental DL
2855.266667	-45.9	-39.7	
7422.500000	-52.3	-46.7	

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#05 (3G Band IV)
TEST RESULTS:	PASS

RESULTS

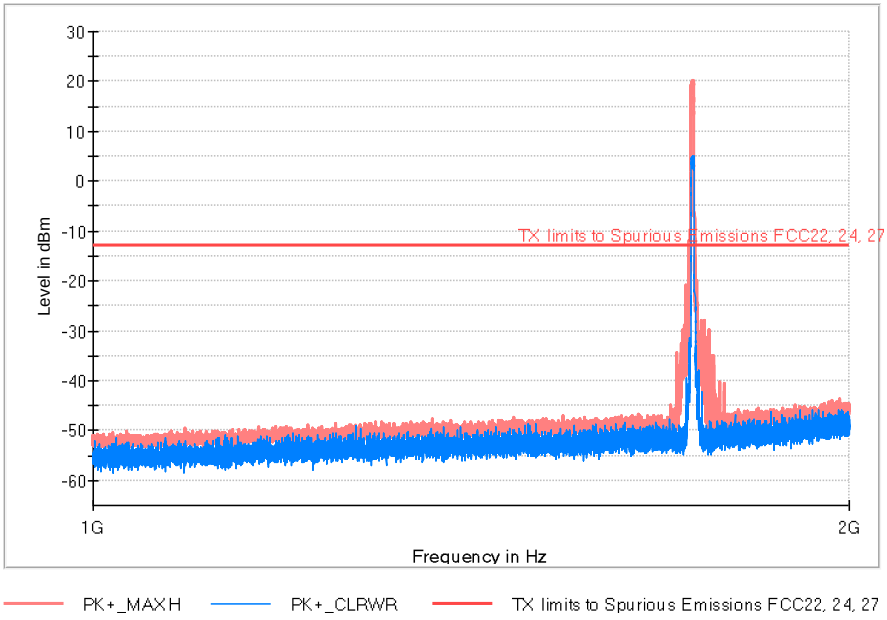
A preliminary scan determined the WCDMA QPSK modulation as the worst case. The device is tested in both Tablet mode and Notebook mode to determine the worst-case mode.

The following plots show the results for this configuration.

Spurious signal detected were more than 20dB below the reference limit.

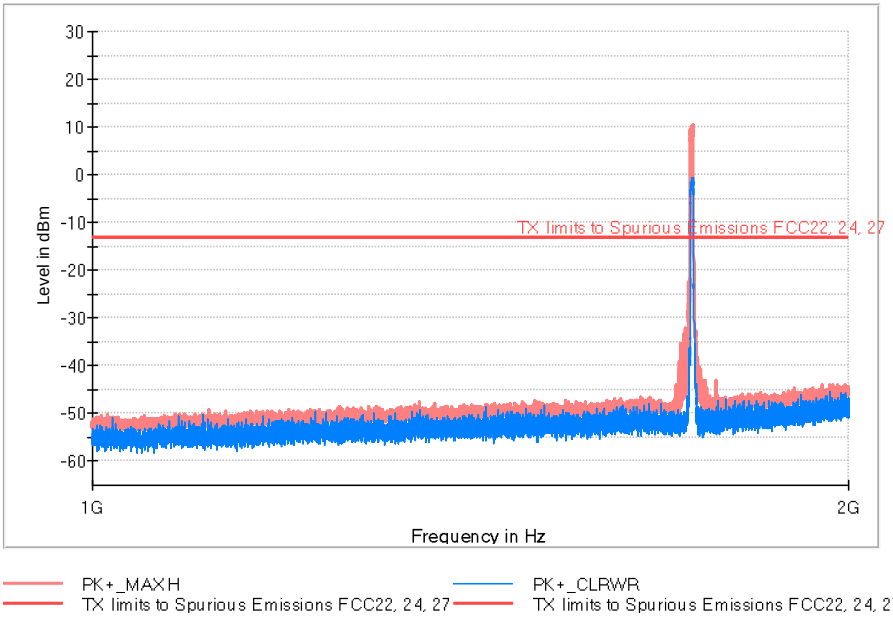
TEST RESULTS (Cont.):	**Preliminary scan to detect worst-case mode**

Notebook Mode:



TEST RESULTS (Cont.):	

Tablet Mode:



Fundamental signal level:

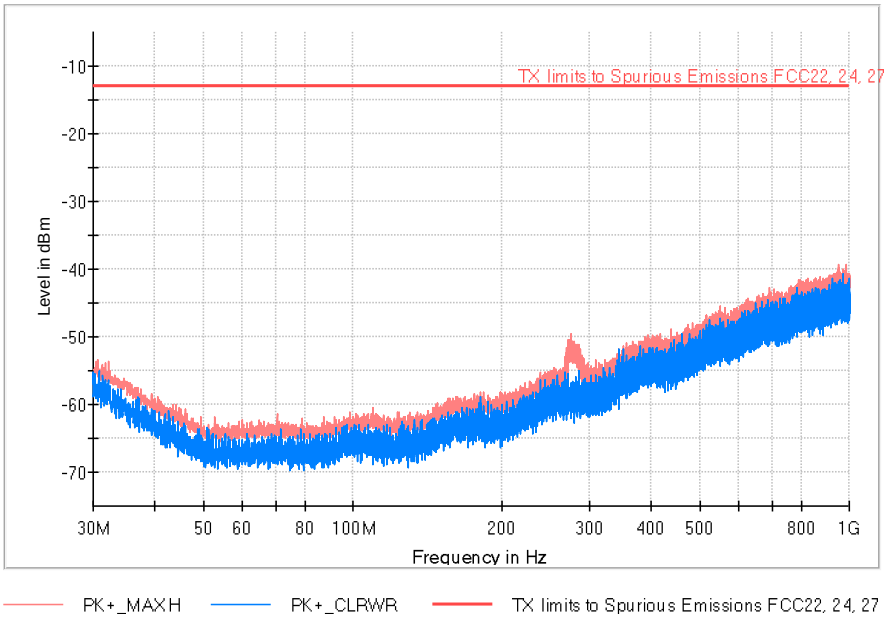
Frequency (MHz)	Mode	Polarization	E.I.R.P (dBm)
1733.600000	Notebook	Horizontal	20.2
1733.533333	Tablet	Vertical	10.3

Worst Case: Notebook Mode

TEST RESULTS(Cont.):	Notebook Mode

Middle Channel

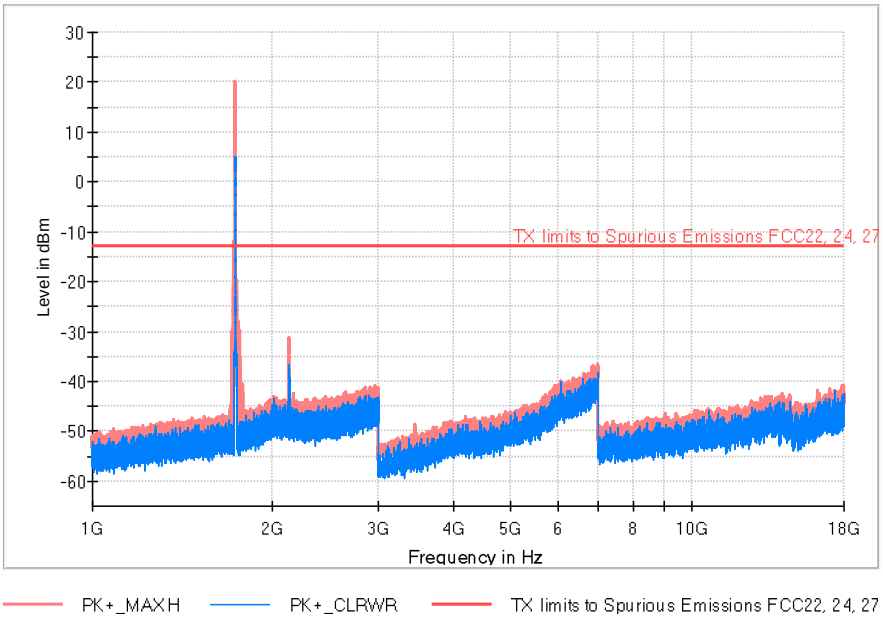
FREQUENCY RANGE: 30-1000 MHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
275.604000	-59.2	-49.5
436.106667	-54.9	-48.8
951.532333	-44.3	-39.3

TEST RESULTS (Cont.):	

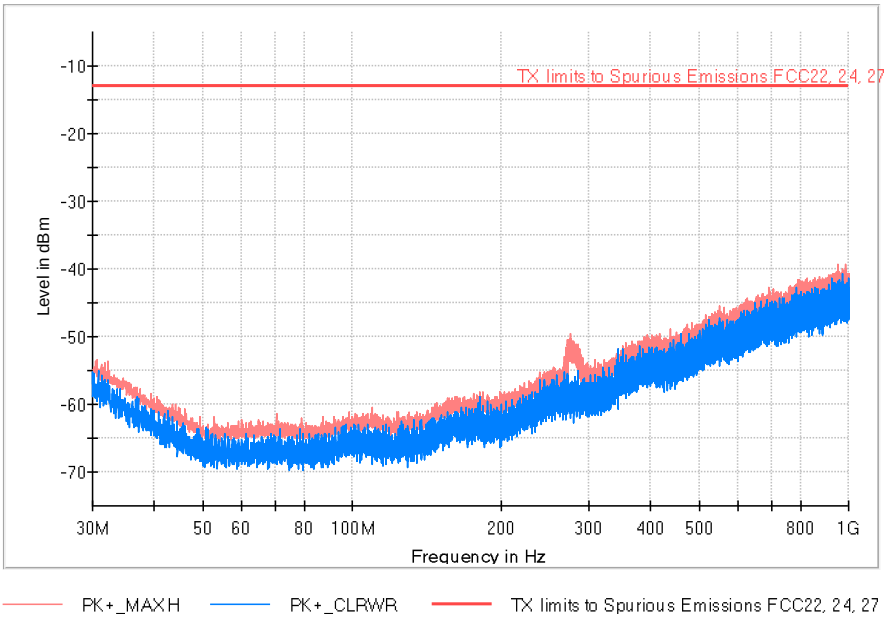
FREQUENCY RANGE: 1-18 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1733.600000	5.1	20.2	Fundamental UL
2131.666667	-44.7	-31.3	Fundamental DL
3468.000000	-54.7	-48.7	

TEST RESULTS (Cont.):	

FREQUENCY RANGE: 18-26 GHz



Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
275.604000	-59.2	-49.5
436.106667	-54.9	-48.8
951.532333	-44.3	-39.3