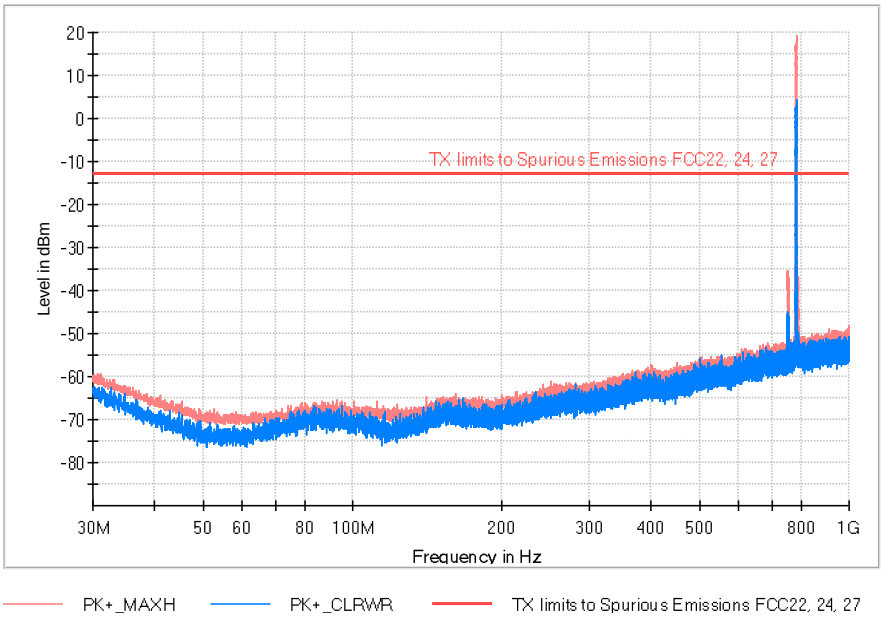
TEST RESULTS(Cont.):	High Channel

FREQUENCY RANGE: 30-1000 MHz

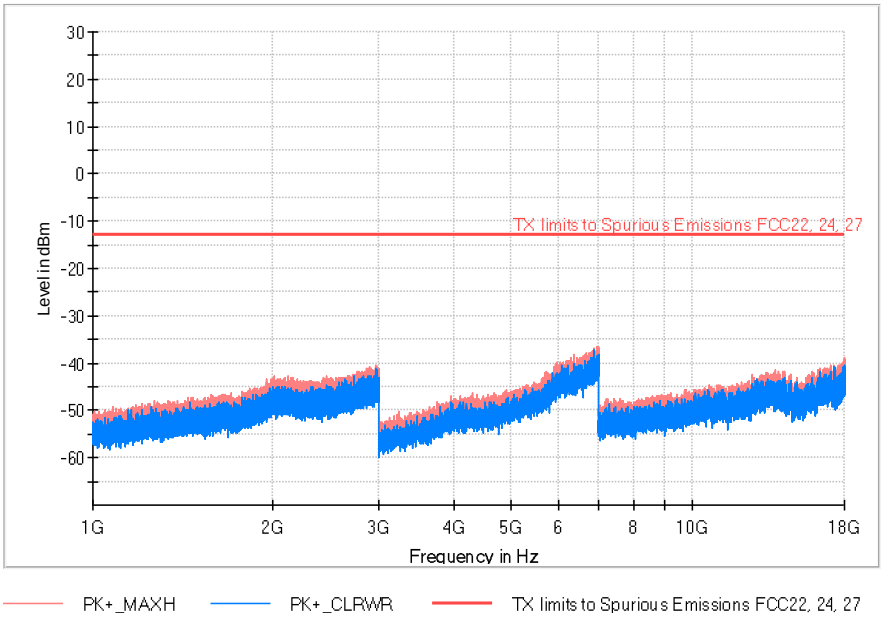
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
30.646667	-63.28	-59.36	
752.714667	-57.45	-35.51	
782.396667	4.29	19.23	Fundamental
997.413333	-54.32	-48.14	



TEST RESULTS (Cont):	High Channel

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
2960.200000	-46.22	-40.44
6986.000000	-39.04	-36.46
13809.500000	-47.36	-41.42
17948.000000	-42.94	-38.67



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#05 (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 following plots show the results for this configuration.

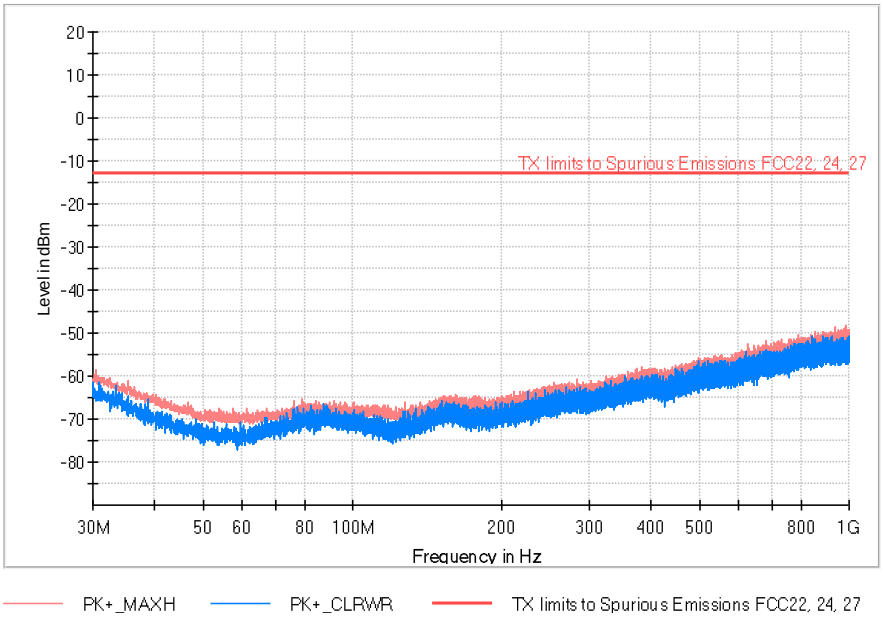
No spurious signal was found at less than 20dB respect to the limit in all the frequency ranges.

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

TEST RESULTS (Cont):	Low Channel

FREQUENCY RANGE: 30-1000 MHz

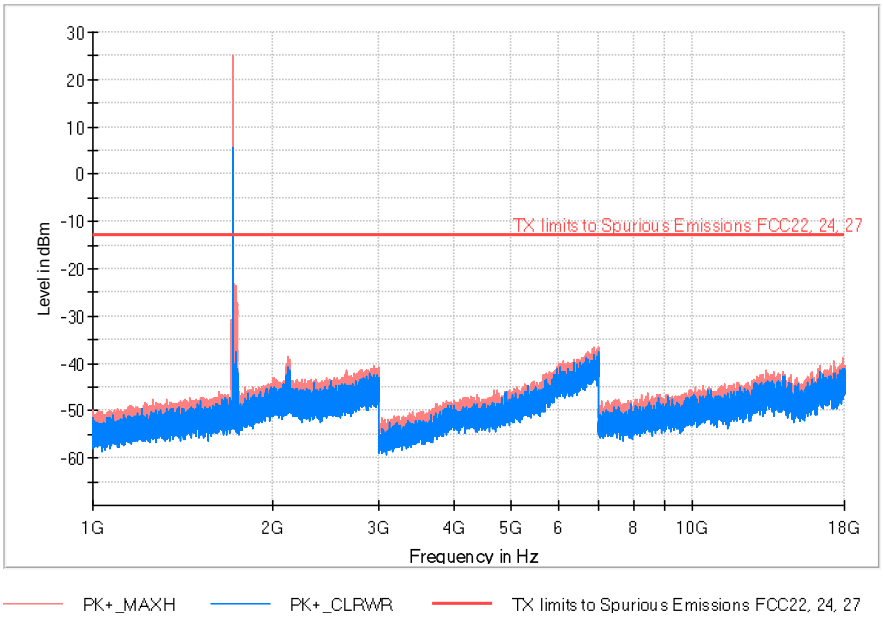
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
30.420333	-64.54	-58.67	
986.808000	-53.14	-48.23	



TEST RESULTS (Cont):	Low Channel

FREQUENCY RANGE: 1-18 GHz

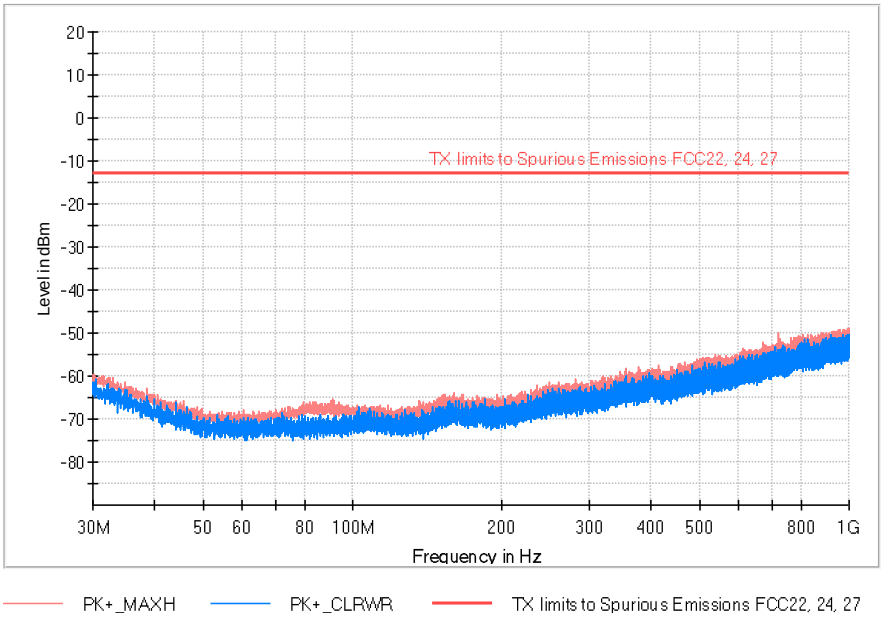
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1711.133333	5.30	25.16	
2116.733333	-44.57	-38.42	Fundamental
2956.200000	-47.42	-40.61	
6991.500000	-41.50	-36.57	
13348.000000	-46.45	-41.36	
17909.000000	-45.84	-38.88	



TEST RESULTS(Cont.):	Middle Channel

FREQUENCY RANGE: 30-1000 MHz

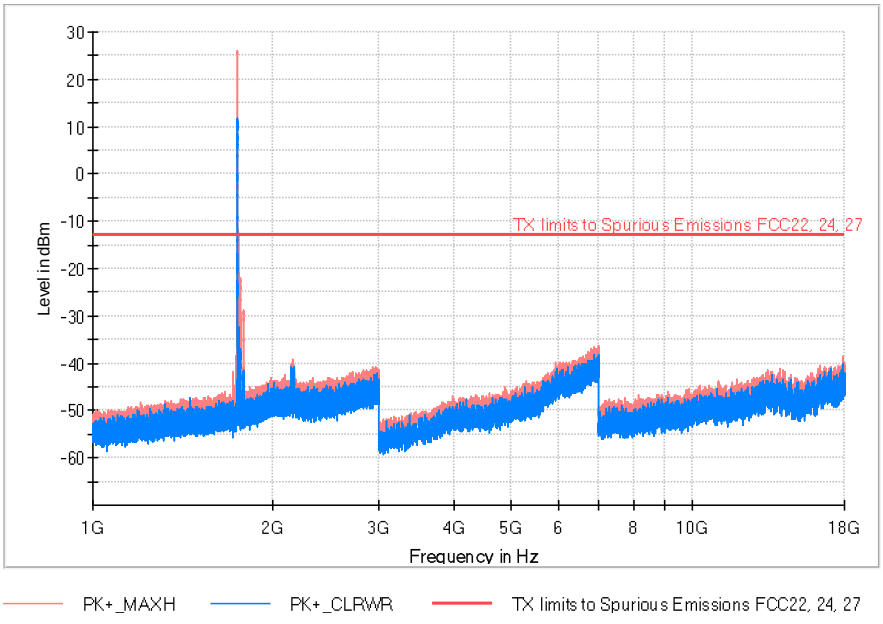
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
30.129333	-61.55	-59.76	
718.312000	-58.38	-49.97	
990.397000	-54.41	-48.81	



TEST RESULTS (Cont):	Middle Channel

FREQUENCY RANGE: 1-18 GHz

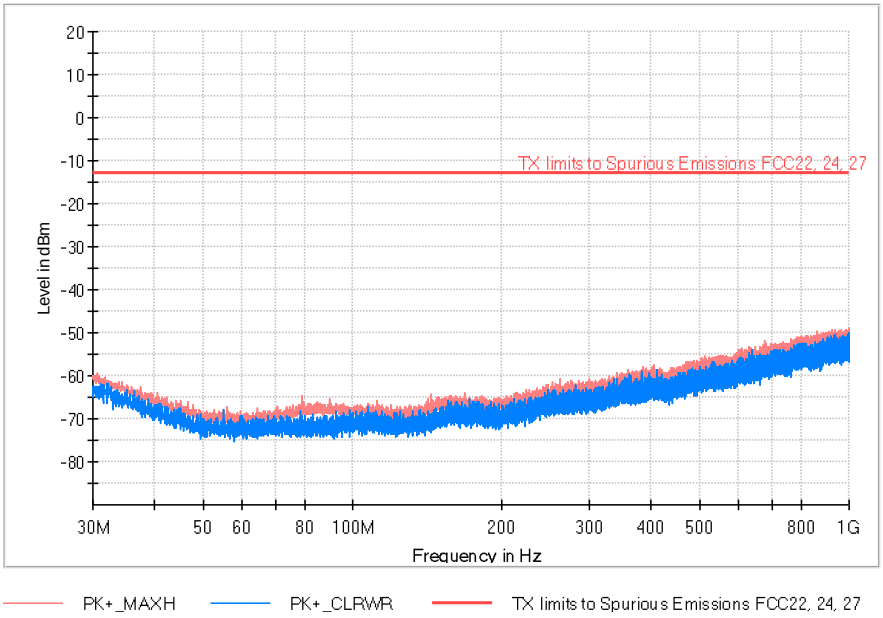
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1746.000000	11.67	25.96	
2151.600000	-45.52	-39.27	Fundamental
2932.933333	-48.19	-40.78	
6977.500000	-40.68	-36.12	
14015.500000	-46.49	-41.22	
17919.000000	-44.07	-38.62	



TEST RESULTS(Cont.):	High Channel

FREQUENCY RANGE: 30-1000 MHz

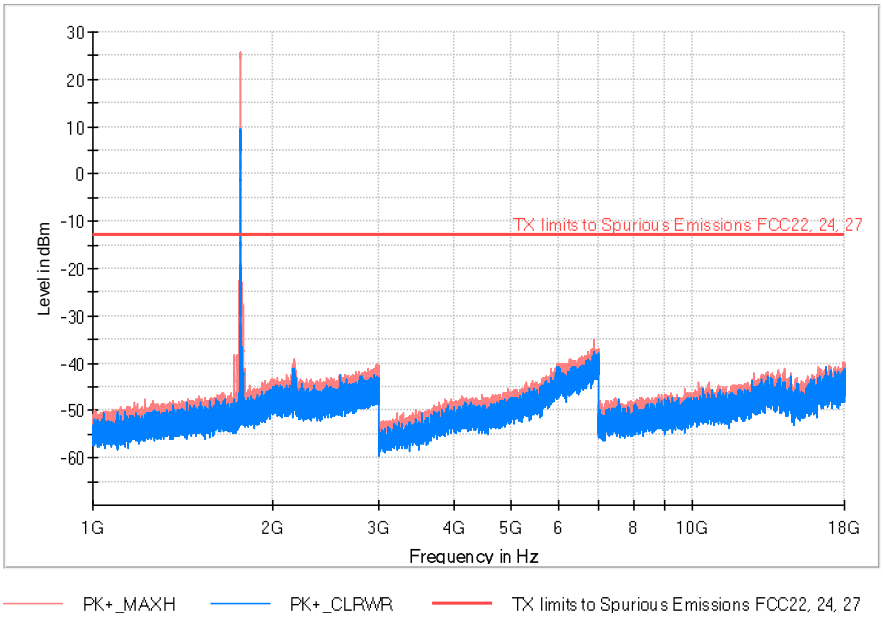
Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
30.549667	-64.41	-59.27	
999.967667	-53.61	-48.90	



TEST RESULTS (Cont):	High Channel

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1761.000000	8.84	25.65	
2167.800000	-42.30	-39.25	Fundamental
2981.600000	-46.05	-40.29	
6857.500000	-41.86	-34.98	
14297.000000	-47.47	-41.22	
17936.000000	-43.37	-39.72	



Appendix B: Test Results for 3G – RSS 139

Appendix B Content

PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	WCDMA, HSPA
Maximum RF Output Power	24 dBm
Operation mode:	
- Operating Frequency Range	Band 4: 1710-1755 MHz
- Nominal Channel Bandwidth	Band 4: 5 MHz
Extreme operating conditions	
- Temperature range	T_{nom} = +15 to + 35 T_{min} = -30 T_{max} = +50
Antenna type	External attachable Antenna.
Antenna gain	4 dBi
Nominal Voltage	
- Supply Voltage	3.8 Vdc
- Type of power source	DC voltage from power supply.

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
Band 4</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 3.8 Vdc

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

-Lowest Channel: 1313 (1712.6 MHZ)
-Middle Channel: 1450 (1740 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
1740 MHz
1752.4 MHz</td><td>5 MHz</td><td>WCDMA</td></tr>
</table>
Note: This device was tested under all channels and modulations. The worst case found in WCDMA modulation.
</td></tr>
</table>

TEST B.1: RF OUTPUT POWER

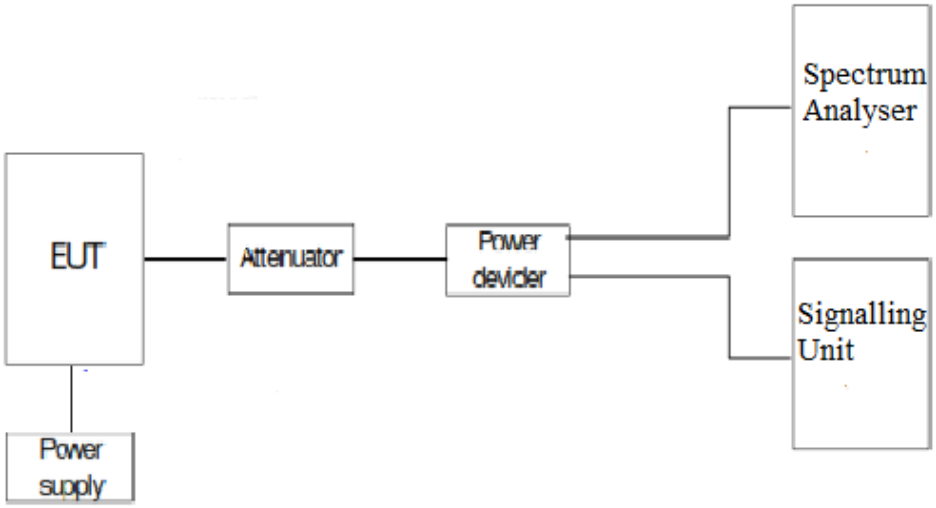
LIMITS:	Product standard:	FCC Part 27 / IC RSS-139
	Test standard:	FCC §2.1046 and §27.50 / RSS-139 Clause 6.5

LIMITS

Fixed. mobile. and portable (hand-held) stations operating in the band are limited to 1-watt EIRP (30 dBm). Fixed stations operating in the band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.
The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB.

RSS-139 Clause 6.5
The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

TEST SETUP



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

WCDMA Modulation:

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	24.35	4.0	28.35	2.99
Middle	24.29	4.0	28.29	3.33
Highest	24.22	4.0	28.22	3.25
Measurement uncertainty (dB)			<±0.95	

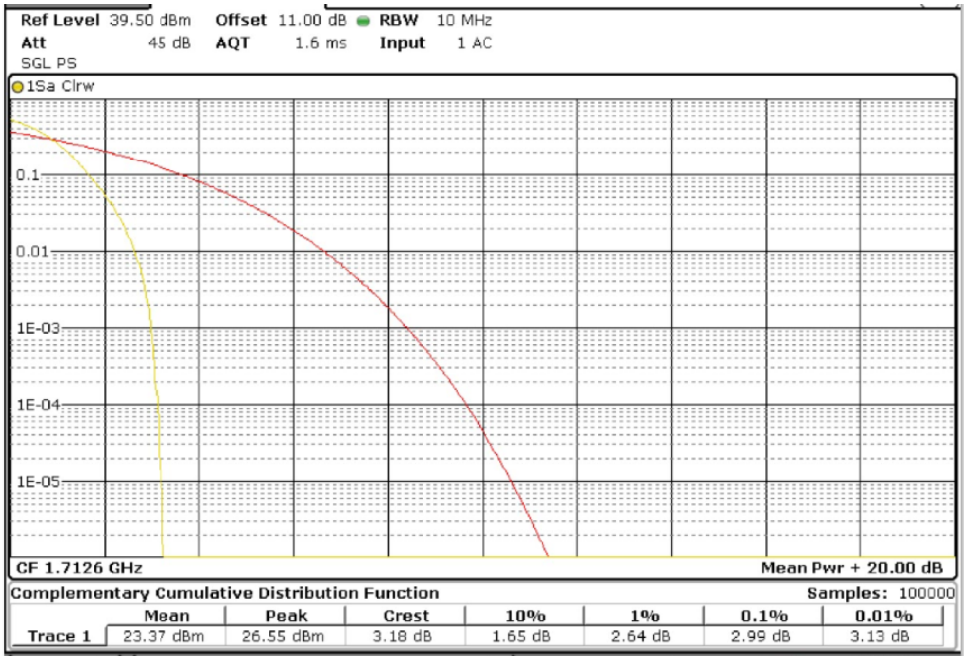
HSPA Modulation:

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	21.6	4.0	25.6
Middle	22.5	4.0	26.5
Highest	22.29	4.0	26.29
Measurement uncertainty (dB)			<±0.95

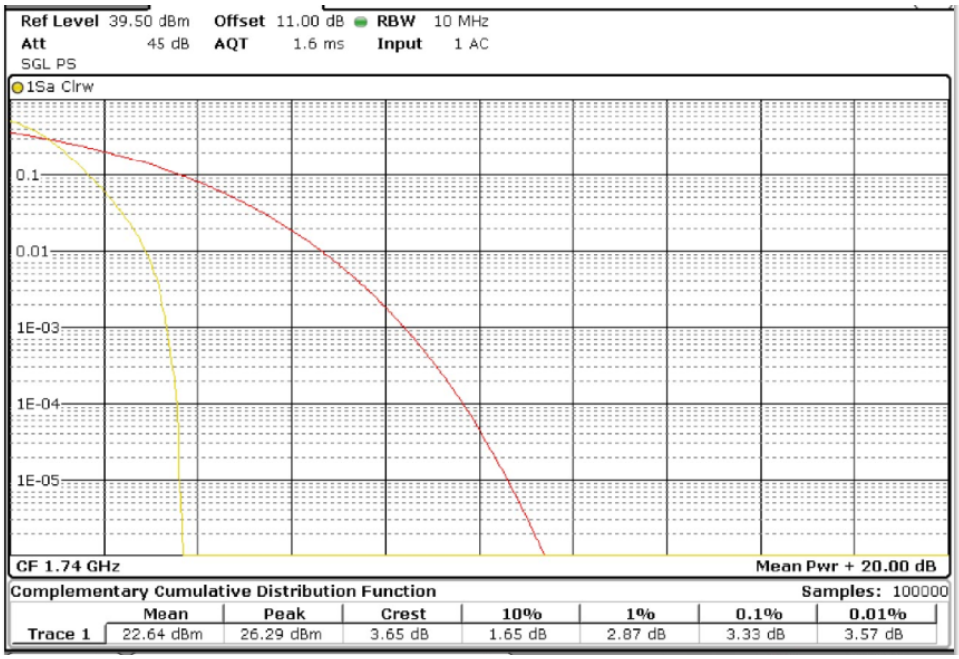
TEST RESULTS (Cont):	

WCDMA:

Lowest channel

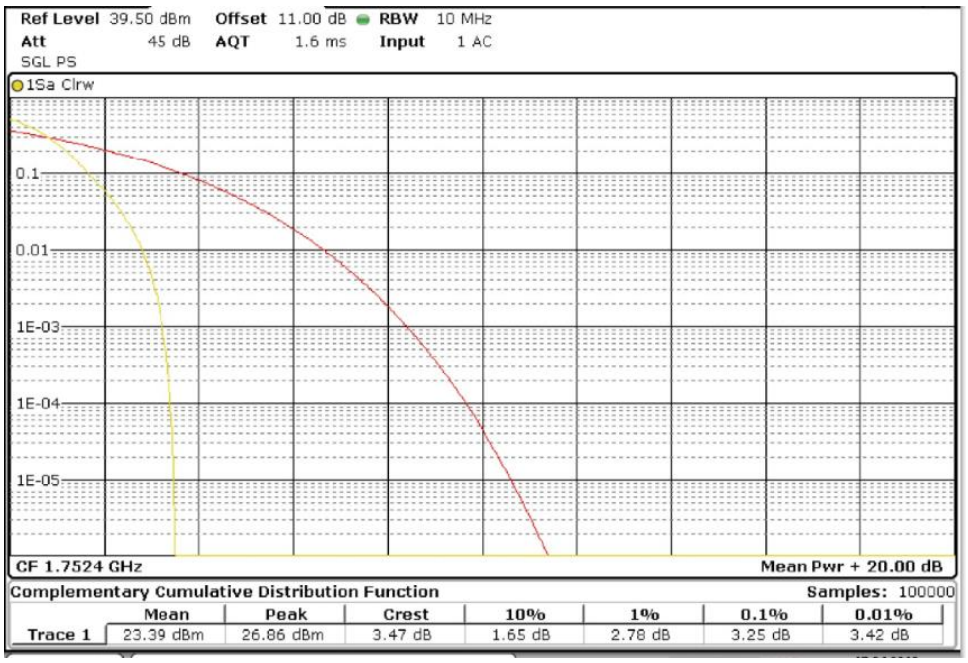


Middle channel



TEST RESULTS (Cont):	

Highest channel



TEST B.2: MODULATION CHARACTERISTICS

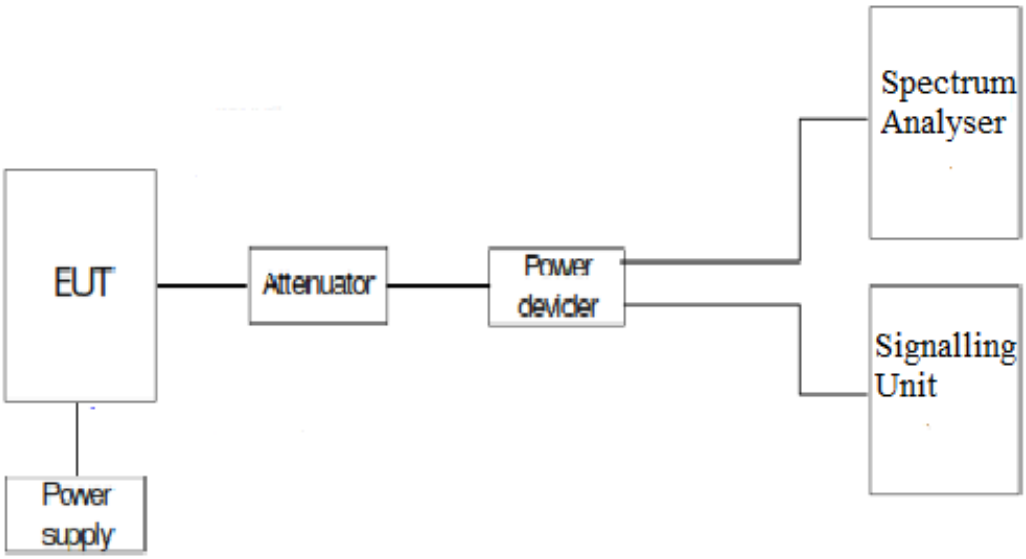
LIMITS:	Product standard:	FCC Part 27 / IC RSS-139
	Test standard:	FCC §2.1047 and §27.50 / RSS-139 Clause 6.4

LIMITS

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

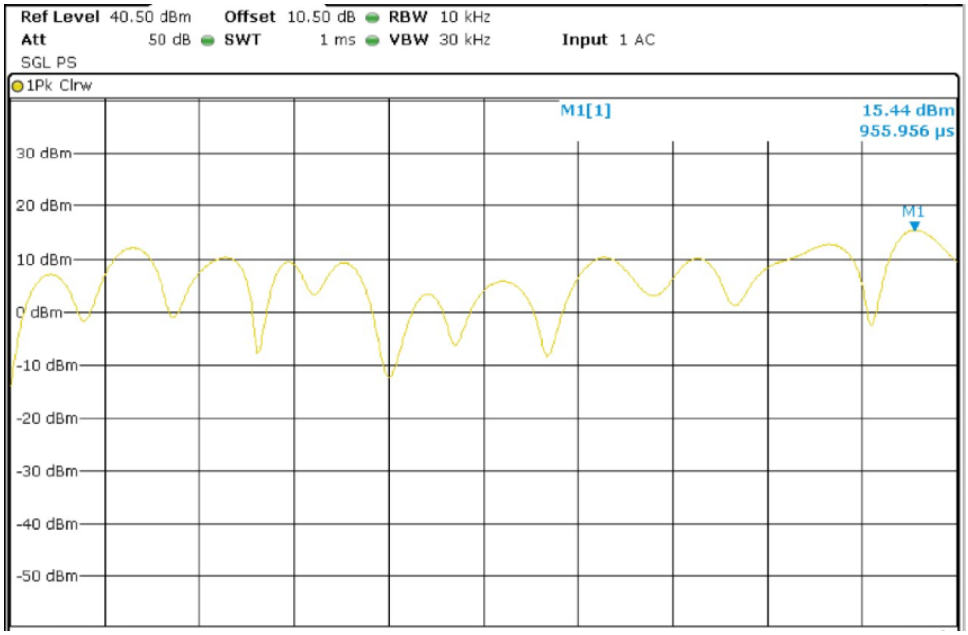
The devices shall employ digital modulation techniques.

TEST SETUP	

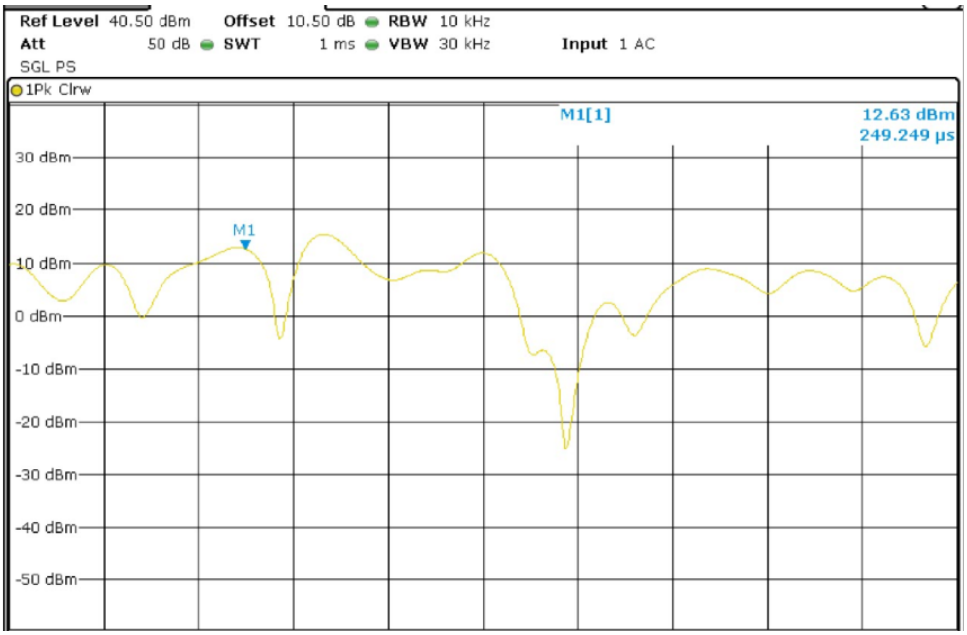


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

WCDMA Modulation



HSPA Modulation



TEST B.3: FREQUENCY STABILITY

LIMITS:	Product standard:	FCC Part 27 / IC RSS-199
	Test standard:	FCC §2.1055 and § 27.54 / RSS-199 Clause 4.3

LIMITS

The frequency stability shall be enough to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST SETUP	

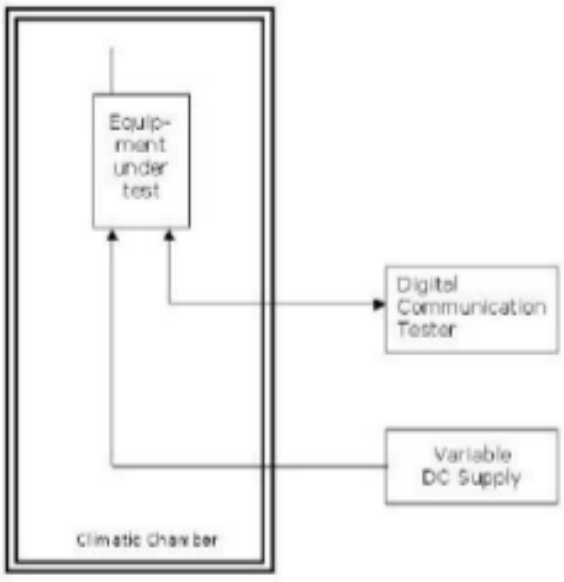
The frequency tolerance measurements over temperature variations were made over the temperature range of

–30ºC to +50ºC. The EUT was placed inside a climatic chamber and the temperature was raised hourly in 10ºC steps from –30ºC up to +50ºC.

The supply voltage was varied between 85% and 115% of nominal voltage.

The EUT was set in “call mode” in the middle channel using the Universal Radio Communication tester R&S CMW500 and the maximum frequency error was measured using the built-in calibrated frequency meter.

For LTE mode the QPSK modulation was used for the test as it is the worst case for conducted power.



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

GPRS MODULATION.

Frequency stability over temperature variations

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
50	-2.52	-0.0014	-0.00000014
40	3.45	0.0020	0.00000020
30	1.22	0.0007	0.00000007
20	8.61	0.0049	0.00000049
10	10.9	0.0063	0.00000063
0	12.22	0.0070	0.00000070
-10	14.44	0.0083	0.00000083
-20	13.72	0.0079	0.00000079
-30	13.79	0.0079	0.00000079

Frequency stability over voltage variations

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.37	11.49	0.0066	0.00000066
Vmin	3.23	7.73	0.0044	0.00000044

TEST B.4: OCCUPIED BANDWIDTH

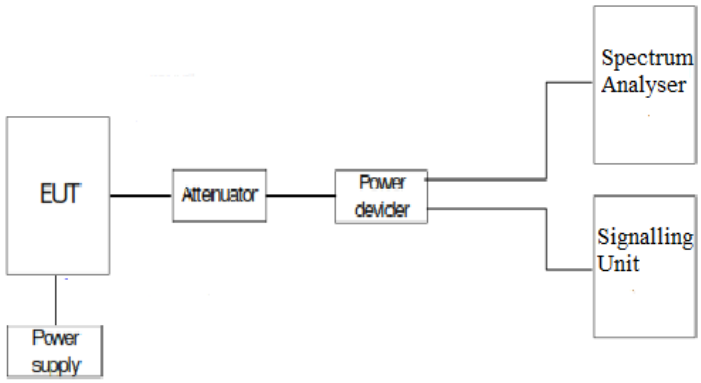
LIMITS:	Product standard:	FCC Part 27
	Test standard:	FCC § 2.1049

LIMITS

Reference only.

TEST SETUP	

The occupied bandwidth measurement was performed at the output terminals of the EUT using an attenuator, power splitter and spectrum analyzer. The EUT was controlled via the Universal Radio Communication Tester R&S CMW500 selecting maximum transmission power of the EUT and different modes of modulation. The 99% occupied bandwidth and the -26 dBc bandwidth were measured directly using the built-in bandwidth measuring option of spectrum analyzer.



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

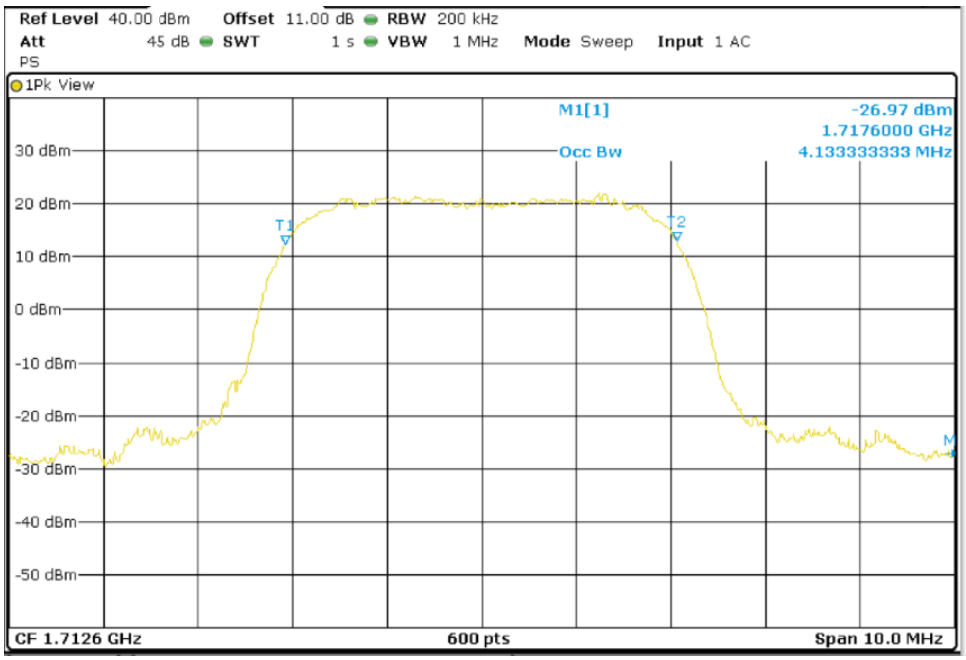
WCDMA MODULATION.

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4.13	4.15	4.15
-26 dBc bandwidth (kHz)	4.72	4.69	4.70

TEST RESULTS (Cont):	

WCDMA MODULATION.

Lowest Channel 99% Occupied Bandwidth



Lowest Channel -26dBc Bandwidth kHz