Radio Equipment Directive-Radio
for
Shandong USR IOT Technology Limited

4G Router
Model No.: USR-G800, USR-G801, USR-G802, USR-G803, USR-G804, USR-G805, USR-G806, USR-G807, USR-G808, USR-G809

Prepared for	:	Shandong USR IOT Technology Limited
Address	:	Floor 11, Building 1, No. 1166 Xinluo Street, Gaoxin Qu, 250101, Jinan, Shandong, China

Prepared By	:	Shenzhen Anbotek Compliance Laboratory Limited
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Report Number	:	R011608860V-M1
Date of Test	:	Aug. 24~ Sept. 08, 2016
Date of Report	:	Sept. 09, 2016

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Test Report

TEST REPORT

Applicant	:	Shandong USR IOT Technology Limited
Manufacturer	:	Shandong USR IOT Technology Limited
EUT	:	4G Router
Model No.	:	USR-G800, USR-G801, USR-G802, USR-G803, USR-G804, USR-G805, USR-G806, USR-G807, USR-G808, USR-G809
Serial No.	:	N.A.
Trade Mark	:	
Rating	:	DC 9~16V, 600~800mA

Measurement Procedure Used:
ETSI EN 301 908-1 V7.1.1(2015-03)
ETSI EN 301 908-2 V7.1.1(2015-12)

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN 301 908-1,ETSI EN 301 908-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : Aug. 24~ Sept. 08, 2016

Prepared by : (Engineer / Baron Wen)

Reviewer : (Project Manager/Amy Ding)

Approved & Authorized Signer : (Manager/Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	4G Router
Model Number	:	USR-G800, USR-G801, USR-G802, USR-G803, USR-G804, USR-G805, USR-G806, USR-G807, USR-G808, USR-G809 (Note: All samples are the same except the model number and colour, so we prepare "USR-G800" for test only.)
Test Power Supply	:	AC 230V, 50Hz for adapter
Adapter	:	Model No.: DQS151-120100-16312C Input: AC 100-240V, 50/60Hz, 0.4A Max Output: DC 12V, 1.0A
Frequency	:	WiFi: 2412 ~ 2472MHz (13 channels) GSM: 900/1800 WCDMA: 900/2100 LTE:band 1;3
Antenna Gain	:	WiFi: 3 dBi GSM: 5 dBi WCDMA: 5 dBi LTE: 5 dBi
Applicant	:	Shandong USR IOT Technology Limited
Address	:	Floor 11, Building 1, No. 1166 Xinluo Street, Gaoxin Qu, 250101, Jinan, Shandong, China
Manufacturer	:	Shandong USR IOT Technology Limited
Address	:	Floor 11, Building 1, No. 1166 Xinluo Street, Gaoxin Qu, 250101, Jinan, Shandong, China
Factory	:	Shandong USR IOT Technology Limited
Address	:	Floor 11, Building 1, No. 1166 Xinluo Street, Gaoxin Qu, 250101, Jinan, Shandong, China
Date of receipt	:	Aug. 24, 2016
Date of Test	:	Aug. 24~ Sept. 08, 2016
Remark	:	Once the new report takes into force, the original report withdraw. This report is based on original report R011608860V. Both reports are the same except updated the product name.

1.2. Auxiliary Equipment Used during Test

N/A

1.3. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 752021
Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, July 06, 2016.

IC-Registration No.: 8058A-1
Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, Jun. 13, 2016.

Test Location
All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal) Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

1.5. Test Standards

ETSI EN 301 908-1 V7.1.1(2015-03) IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements
ETSI EN 301 908-2 V7.1.1(2015-12) IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)

2. Technical Test

2.1. Summary of Test Results

Test Standard	Description of Test	Result
ETSI EN 301 908-1 V7.1.1 § 4.2.2	Radiated emissions (UE)	Compliance
ETSI EN 301 908-1 V7.1.1 §4.2.3	Radiated emissions (BS and repeater)	N/A
ETSI EN 301 908-1 V7.1.1 §4.2.4	Control and monitoring functions (UE)	Compliance

Test Standard	Description of Test	Result
ETSI EN 301 908-2 V7.1.1 § 4.2.2	Transmitter maximum output power	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.3	Transmitter spectrum emission mask	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.4	Transmitter spurious emissions	Compliance
ETSI EN 301 908-2 V7.1.1 § 4.2.5	Transmitter minimum output power	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.6	Receiver Adjacent Channel Selectivity (ACS)	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.7	Receiver blocking characteristics	Compliance
ETSI EN 301 908-2 V7.1.1 § 4.2.8	Receiver spurious response	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.9	Receiver intermodulation characteristics	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.10	Receiver spurious emissions	Compliance
ETSI EN 301 908-2 V7.1.1 § 4.2.11	Out-of-synchronization handling of output power	Compliance
ETSI EN 301 908-2 V7.1.1 §4.2.12	Transmitter Adjacent Channel Leakage power Ratio (ACLR)	Compliance

2.2. Test Condition

Relative Humidity:	30…75%
Air Pressure:	98…102kPa
Temperature:	Normal Temperature (NT)= +25℃ Low Temperature (LT) = -10℃ High Temperature (HT)= +55℃
Voltage of the EUT:	Normal Voltage (NV) = 230V Low Voltage (LV) = 207V High Voltage (HV) =253V

3. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 16, 2016	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 16, 2016	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 16, 2016	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 19, 2016	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 19, 2016	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 16, 2016	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
8	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Jun 30, 2016	1 Year
9	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Jun 30, 2016	1 Year
10	DC Power supply	IV	IV-8080	YQSB0096	Jun 30, 2016	1 Year
11	TEMP&HUMI PROGRAMMABLE CHAMBER	Bell Group	BE-THK-150M8	SE-0137	Mar. 16, 2016	1 Year
12	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 200	114196	Jun. 30, 2016	1 Year
13	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 500	114196	Jun. 30, 2016	1 Year
14	Filter	COM-MW	ZHPF-BM1100-6000-0730	1307006523	Jun. 25, 2016	1 Year
15	Filter	COM-MW	COM-MW/ZHPF-M3.5-18G-3834	B2015094550	Jun 25, 2016	1 Year

4. Radiated Emissions (UE)

Applicable Standard

According to EN 301 908-1 V7.1.1 §4.2.2

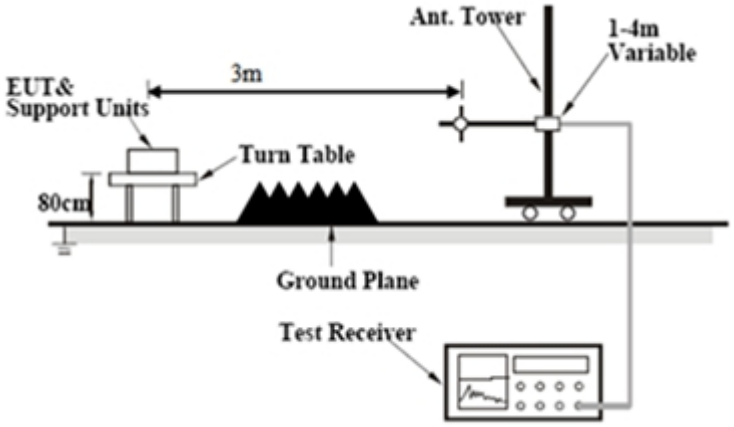
Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)

Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability
30 MHz ≤ f < 1 000 MHz	-57 dBm/100 kHz	-36 dBm/100 kHz	All
1 GHz ≤ f < 12,75 GHz	-47 dBm/1 MHz	-30 dBm/1 MHz	All
fc - 2,5 × 5 MHz < f < fc + 2,5 × 5 MHz		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3
fc - 2,5 × $BW_{Channel}$ MHz < f < fc + 2,5 × $BW_{Channel}$ MHz		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB
fc - 2,5 × 10 MHz < f < fc1 + 2,5 × 10 MHz		Not defined	UTRA TDD, 7,68 Mcps option
fc - 4 MHz < f < fc + 4 MHz		Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1
fc - 500 kHz < f < fc + 500 kHz		Not defined	UWC 136, 200 kHz option
fc - 250 kHz < f < fc + 250 kHz		Not defined	UWC 136, 30 kHz option
NOTE: fc is the UE transmit centre frequency.			

Test Procedure

Radiated Method
The EUT was switched on and allowed to warm up to its normal operating condition.
Measurement was made at a distance of 3 m.
The measuring antenna was set to 1 meter away from the ground plain.
Maximization of the emissions was carried out by rotating the EUT, and adjusting the antenna azimuth.
Note: The receiving antenna found to be worse case at 0 degrees.
The test was done in both horizontal and vertical antenna polarizations.
The measurement shall be made with the transmitter set to the lowest operating frequency and with the
Transmitter set to the highest operating frequency.
Sample Calculation: Corrected Amplitude = Raw Amplitude (dBμV/m) + ACF(dB) + Cable Loss(dB)

Test Setup



Test Data

The range of temperature is tested according to the applicant's requirement.

Idle Mode

WCDMA Band I:

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain (dB)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
315.6	-67.11	V	6.3	0.25	-61.06	-57	-4.06
495.8	-66.95	V	6.4	0.34	-60.89	-57	-3.89
362.7	-66.73	H	6.7	0.28	-60.31	-57	-3.31
620.2	-67.07	H	7.1	0.38	-60.35	-57	-3.35
1952.6	-57.64	V	7.82	0.72	-50.54	-47	-3.54
2743.5	-59.18	V	9.22	0.9	-50.86	-47	-3.86
1937.4	-56.94	H	7.82	0.72	-49.84	-47	-2.84
2695.8	-58.09	H	9.22	0.9	-49.77	-47	-2.77

WCDMA Band VIII:

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain (dB)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
315.6	-67.29	V	6.3	0.25	-61.24	-57	-4.24
497.6	-67.22	V	6.4	0.34	-61.16	-57	-4.16
369.2	-66.97	H	6.7	0.28	-60.55	-57	-3.55
628.4	-68.24	H	7.1	0.38	-61.52	-57	-4.52
1954.1	-58.41	V	7.82	0.72	-51.31	-47	-4.31
2746.5	-59.93	V	9.22	0.9	-51.61	-47	-4.61
1936.3	-57.54	H	7.82	0.72	-50.44	-47	-3.44
2695.7	-58.53	H	9.22	0.9	-50.21	-47	-3.21

Traffic Mode

WCDMA Band I:

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain (dB)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Low Channel							
295.8	-58.94	H	6.1	0.25	-53.09	-36	-17.09
745.3	-59.04	V	7.1	0.43	-52.37	-36	-16.37
3845.2	-53.82	H	10.34	1.05	-44.53	-30	-14.53
3845.2	-51.77	V	10.34	1.05	-42.48	-30	-12.48
Middle Channel							
296.2	-59.37	H	6.1	0.25	-53.52	-36	-17.52
744.4	-58.86	V	7.1	0.43	-52.19	-36	-16.19
3900	-51.49	H	10.37	1.05	-42.17	-30	-12.17
3900	-52.63	V	10.37	1.05	-43.31	-30	-13.31
High Channel							
297.1	-58.79	H	6.1	0.25	-52.94	-36	-16.94
746.2	-58.68	V	7.1	0.43	-52.01	-36	-16.01
3954.8	-52.23	H	10.4	1.05	-42.88	-30	-12.88
3954.8	-52.16	V	10.4	1.05	-42.81	-30	-12.81

WCDMA Band VIII:

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain (dB)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Low Channel							
297.2	-57.65	H	6.1	0.25	-51.80	-36	-15.80
746.5	-59.12	V	7.1	0.43	-52.45	-36	-16.45
3845.2	-54.61	H	10.34	1.05	-45.32	-30	-15.32
3845.2	-51.87	V	10.34	1.05	-42.58	-30	-12.58
Middle Channel							
296.2	-58.49	H	6.1	0.25	-52.64	-36	-16.64
748.4	-58.63	V	7.1	0.43	-51.96	-36	-15.96
3900	-52.44	H	10.37	1.05	-43.12	-30	-13.12
3900	-52.93	V	10.37	1.05	-43.61	-30	-13.61
High Channel							
298.9	-58.49	H	6.1	0.25	-52.64	-36	-16.64
748.3	-58.87	V	7.1	0.43	-52.20	-36	-16.20
3954.8	-52.19	H	10.4	1.05	-42.84	-30	-12.84
3954.8	-52.33	V	10.4	1.05	-42.98	-30	-12.98

5. Control and monitoring functions (UE)

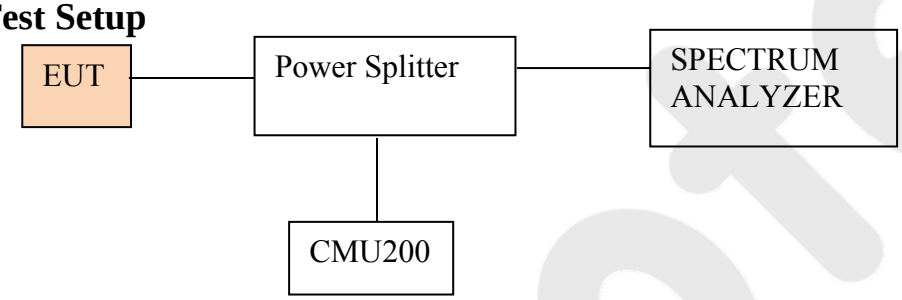
Applicable Standard

According to EN 301 908-1 V7.1.1 §4.2.4, The maximum measured power during the duration of the test shall not exceed -30 dBm

Test Procedure

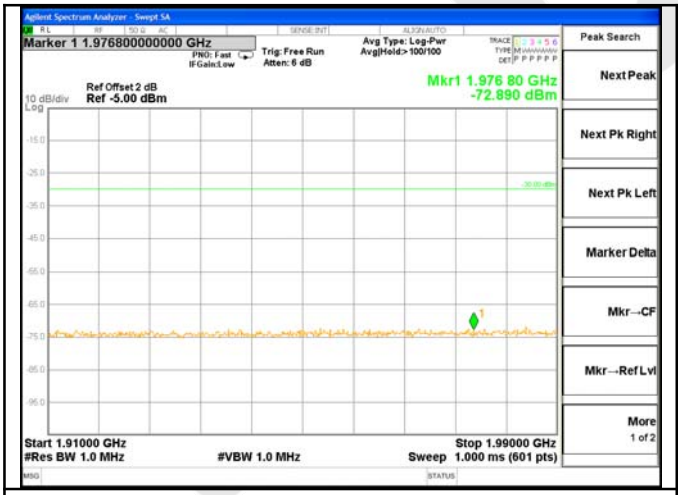
1) Set and send continuously Up power control commands to the UE until the UE output power shall be minimum level.
2) Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the power of spurious emission.

Test Setup

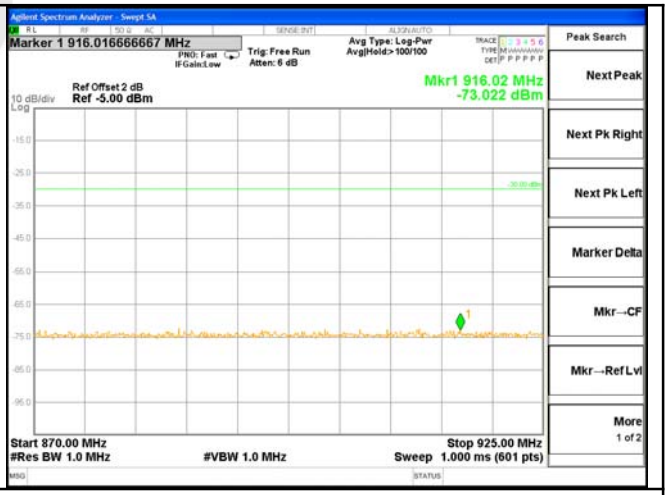


Test Data

Test Mode: Transmitting
Test Result: PASS
Test dates see the following pages



WCDMA Band I: 1.91GHz-1.99GHz



WCDMA Band VIII: 870-925MHz

6. Transmitter Maximum Output Power

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.2,

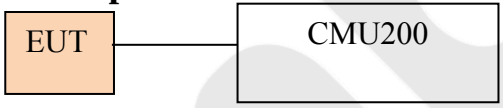
Table 4.2.2.2-1: UE power classes

Operating Band	Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+24	+1,7/-3,7			+21	+2,7/-2,7
Band III	+24	+1,7/-3,7			+21	+2,7/-2,7
Band VII	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band VIII	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XV	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-1,7
Band XVI	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-1,7
Band XX	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7

Test Procedure

1) Set and send continuously Up power control commands to the UE.
2) Measure the mean power of the UE in a bandwidth of at least (1 + α) times the chip rate of the radio access mode.
The mean power shall be averaged over at least one timeslot.

Test Setup



Test Data

Test Mode: Transmitting
Test Result: PASS
Test dates see the following pages

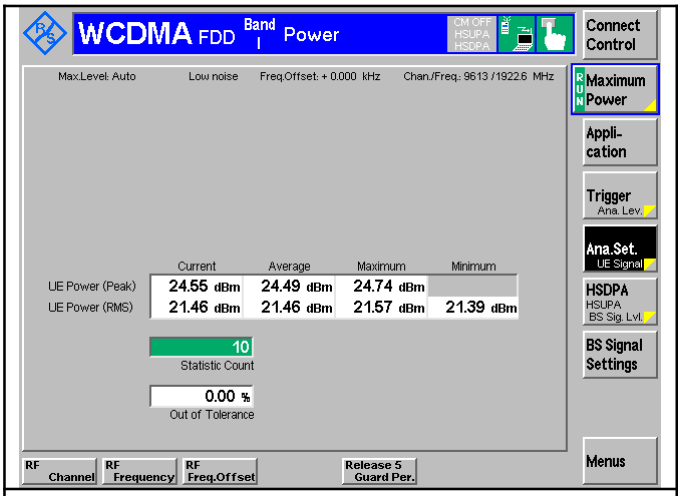
WCDMA Band I:

Test Conditions		Transmitter maximum output power (dBm)			
Temperature (℃)	**Voltage (V)**	**Low Channel**	**Middle Channel**	**High Channel**	**Result**
TN	**VN**	21.46	21.92	**22.95**	Pass
TL	**VL**	21.43	21.87	22.88	Pass
TL	**VH**	21.51	21.94	22.74	Pass
TH	**VL**	21.53	21.88	22.94	Pass
TH	**VH**	21.42	21.89	22.86	Pass

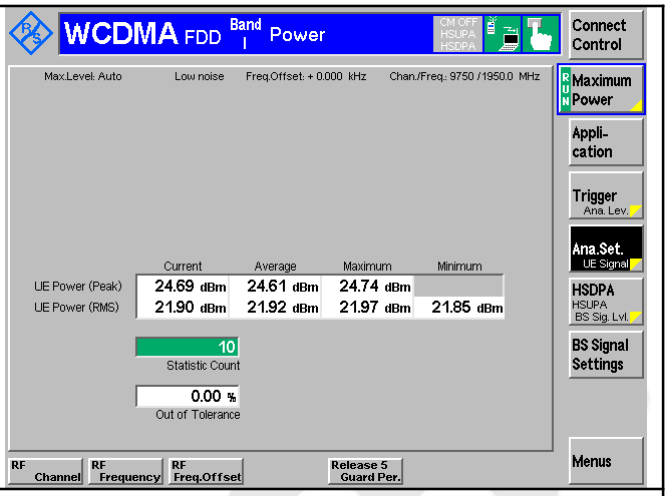
WCDMA Band VIII:

Test Conditions		Transmitter maximum output power (dBm)			
Temperature (℃)	**Voltage (V)**	**Low Channel**	**Middle Channel**	**High Channel**	**Result**
TN	**VN**	**24.33**	24.15	23.78	Pass
TL	**VL**	24.25	24.12	23.72	Pass
TL	**VH**	24.21	24.09	23.77	Pass
TH	**VL**	24.31	24.12	23.79	Pass
TH	**VH**	24.30	24.10	23.74	Pass

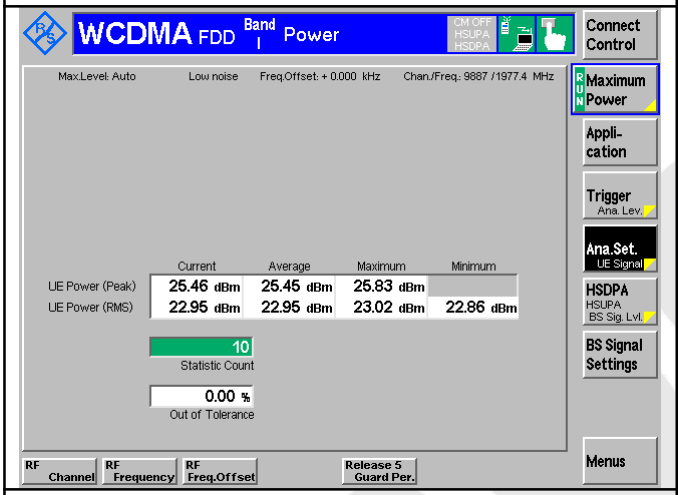
Test Plots



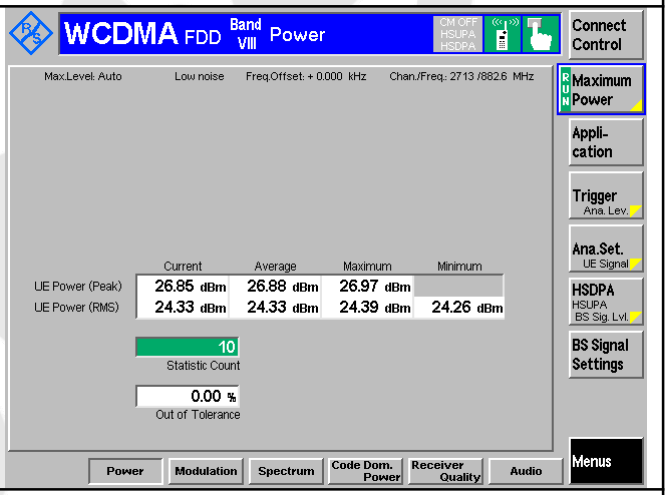
WCDMA Band I: Low Channel



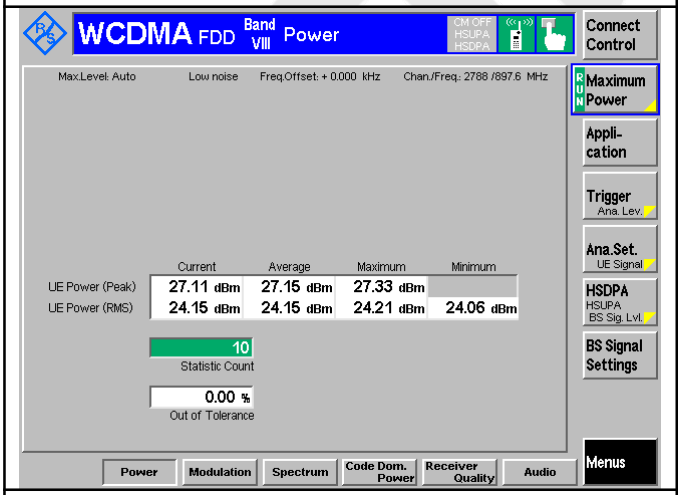
WCDMA Band I: Middle Channel



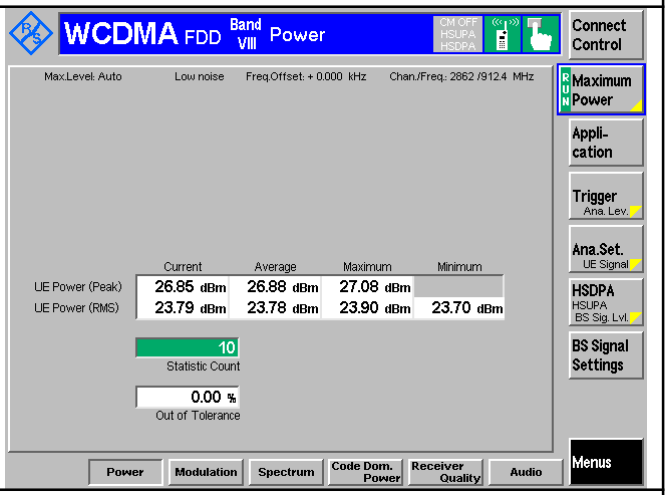
WCDMA Band I: High Channel



WCDMA Band VIII: Low Channel



WCDMA Band VIII: Middle Channel



WCDMA Band VIII: High Channel

7. Transmitter Spectrum Emission Mask

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.3,

Table 4.2.3.2-1: Spectrum emission mask requirement

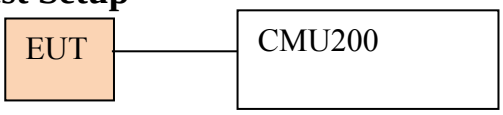
Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth (note 5)
	Relative requirement	Absolute requirement (in measurement bandwidth)	
2,5 MHz to 3,5 MHz	$\left\{-33{,}5-15\cdot\left(\frac{\Delta f}{MHz}-2{,}5\right)\right\}dBc$	-69,6 dBm	30 kHz (see note 3)
3,5 MHz to 7,5 MHz	$\left\{-33{,}5-1\cdot\left(\frac{\Delta f}{MHz}-3{,}5\right)\right\}dBc$	-54,3 dBm	1 MHz (see note 4)
7,5 MHz to 8,5 MHz	$\left\{-37{,}5-10\cdot\left(\frac{\Delta f}{MHz}-7{,}5\right)\right\}dBc$	-54,3 dBm	1 MHz (see note 4)
8,5 MHz to 12,5 MHz	-47,5 dBc	-54,3 dBm	1 MHz (see note 4)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.
NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.
NOTE 5: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

Test Procedure

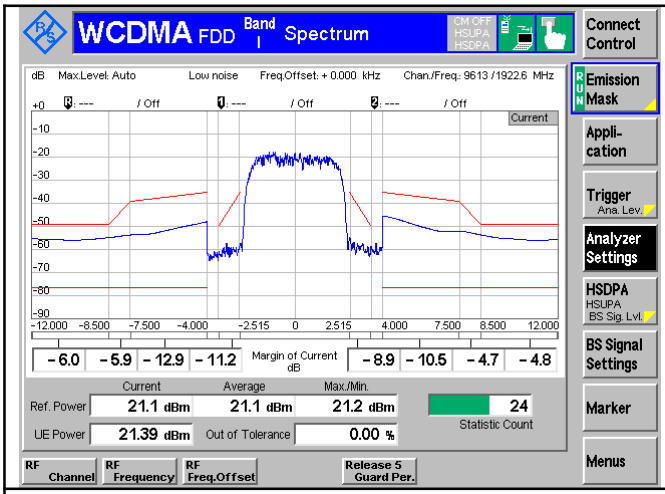
1) Set and send continuously Up power control commands to the UE until the UE output power shall be at the maximum level.
2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.2-1. Measurements with an offset from the carrier centre frequency between 2,515 MHz and 3,485 MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2-1. The measured power shall be recorded for each step.
3) Measure the RRC filtered mean power centred on the assigned channel frequency.
4) Calculate the ratio of the power 2) with respect to 3) in dBc.

Test Setup

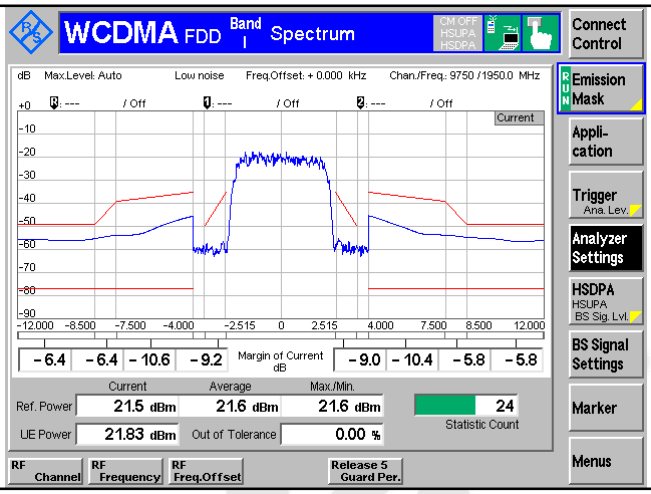


Test Data

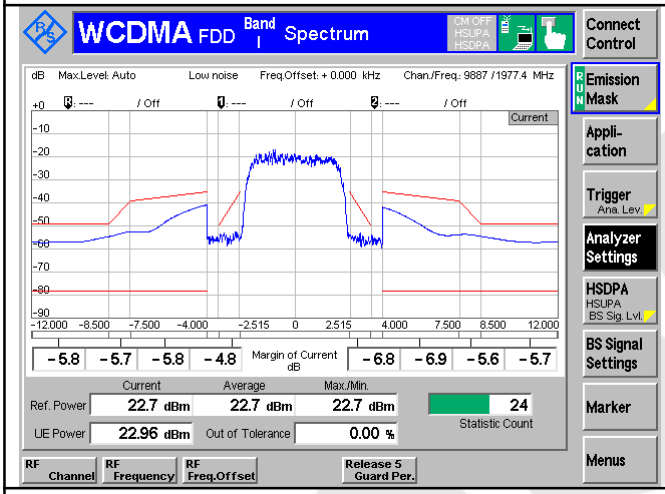
Test Mode: Transmitting
Test Result: PASS
Test dates see the following pages.



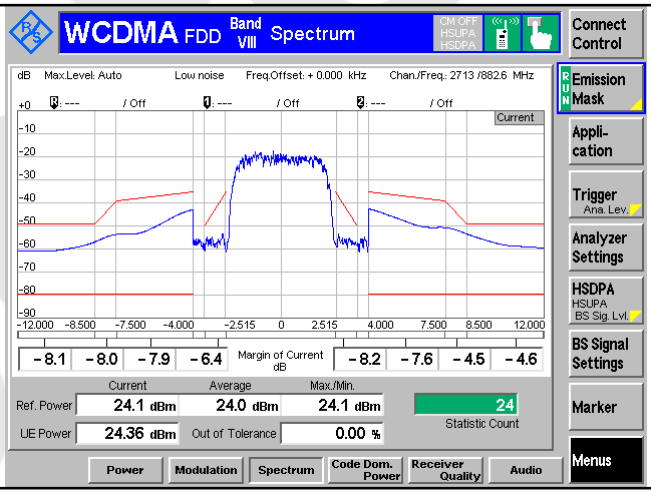
WCDMA Band I: Low Channel



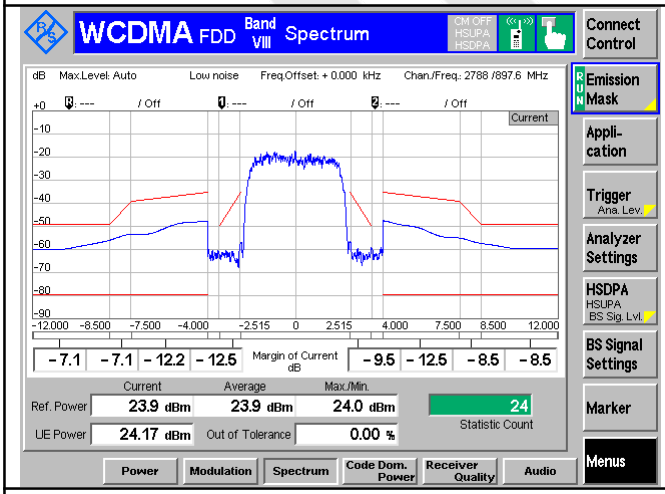
WCDMA Band I: Middle Channel



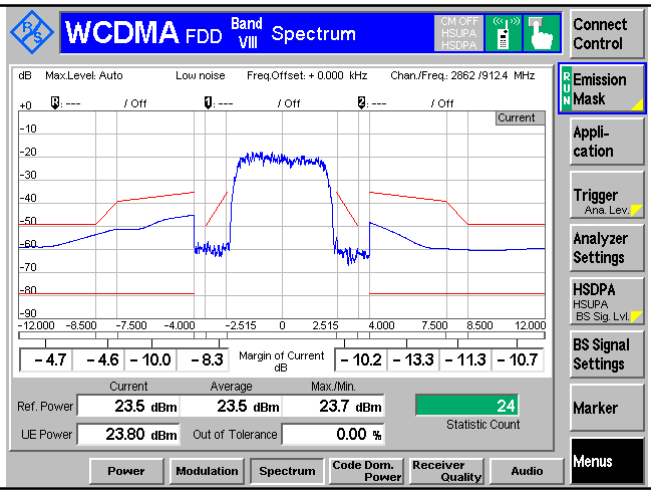
WCDMA Band I: High Channel



WCDMA Band VIII: Low Channel



WCDMA Band VIII: Middle Channel



WCDMA Band VIII: High Channel

8. Transmitter Spurious Emissions

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.4

Table 4.2.4.2-1: General spurious emissions requirements

Frequency bandwidth	Measurement bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	-30 dBm

Table 4.2.4.2-2: Additional spurious emissions requirements

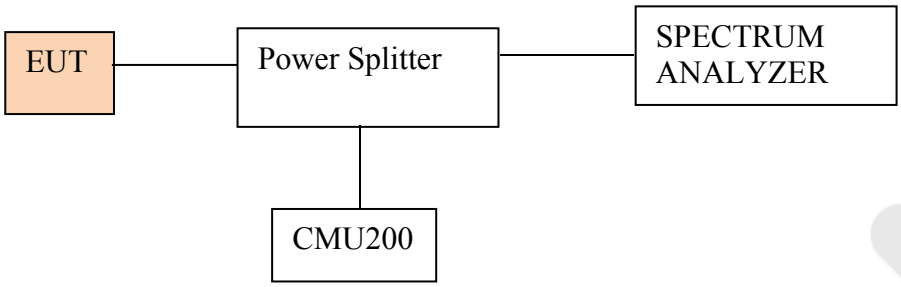
Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
III	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
VII	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	2 590 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
VIII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz < f ≤ 1 830 MHz	100 kHz 3,84 MHz	-71 dBm (notes 1 and 2) -60 dBm (note 2)
	1 830 MHz < f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 640 MHz	3,84 MHz	-60 dBm
	2 640 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm (note 2)
XV	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XVI	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	470 MHz ≤ f ≤ 790 MHz	8 MHz	-65 dBm (note 3)
	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm

Test Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

Test Setup

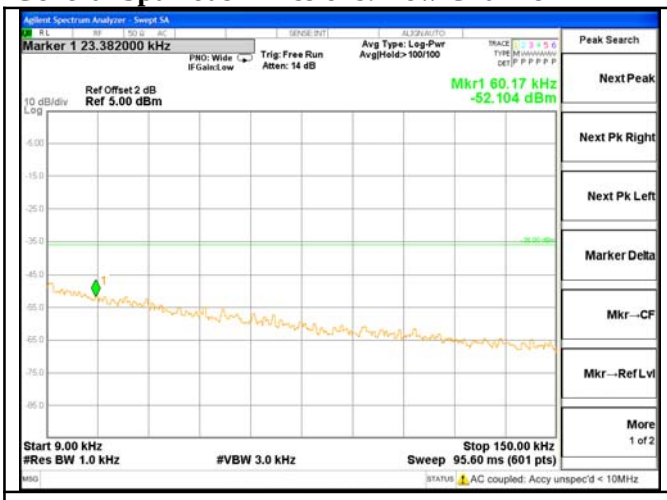
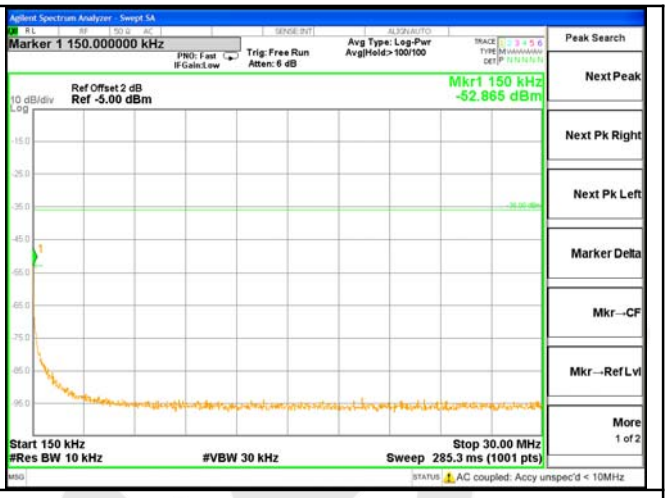
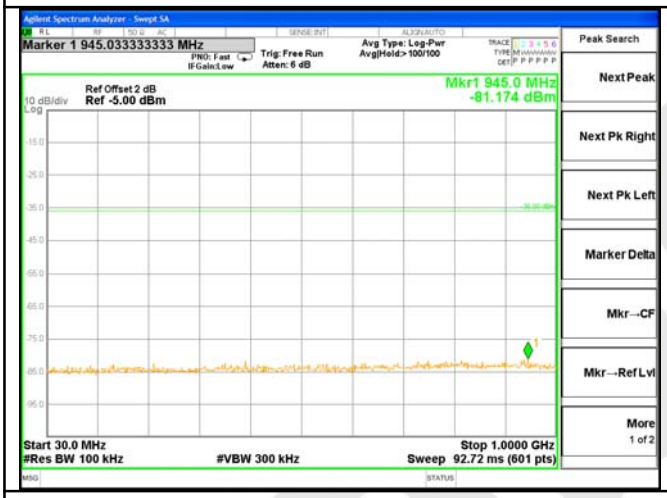
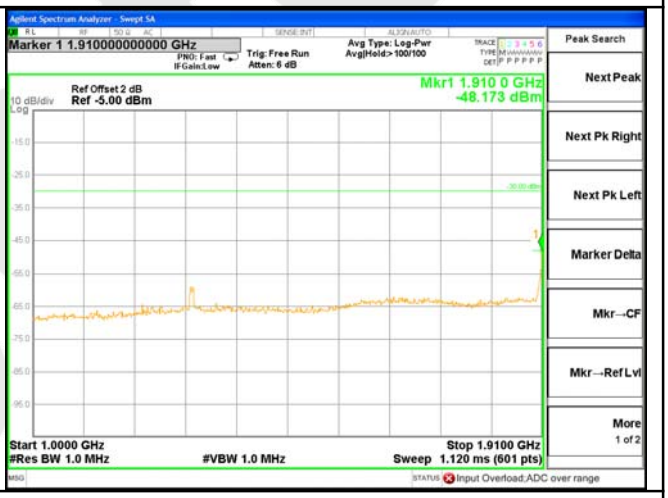
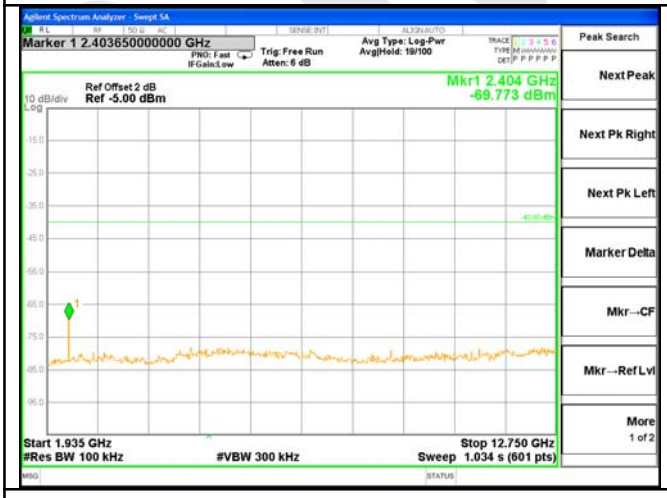


Test Data

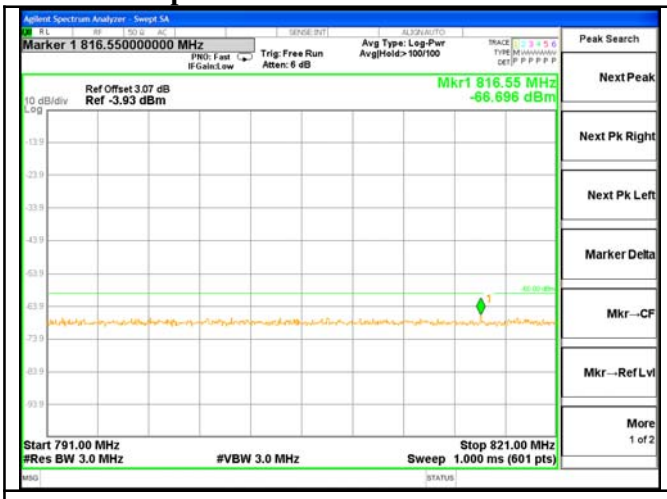
Test Mode: Transmitting
Test Result: PASS
Test dates see the following pages
Note:
If RBW is 3MHz, VBW is 3MHz,
So Offset=Cable loss (5) + 10log (3.84/3) = 6.07dBm

Test Plots

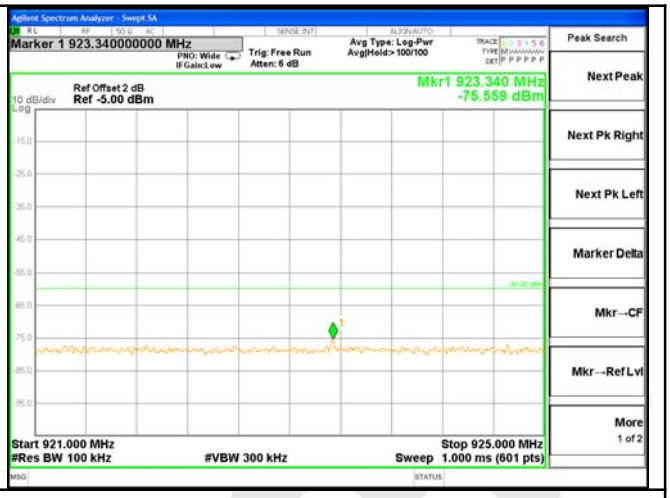
WCDMA Band I:
General Spurious Emissions: Low Channel

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>9 kHz –150 kHz</td><td>150 kHz –30 MHz</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>30 MHz –1 GHz</td><td>1 GHz –1.91 GHz</td></tr>
<tr><td> 
</td><td>/</td></tr>
<tr><td>1.935 GHz –12.75 GHz</td><td>/</td></tr>
</table>

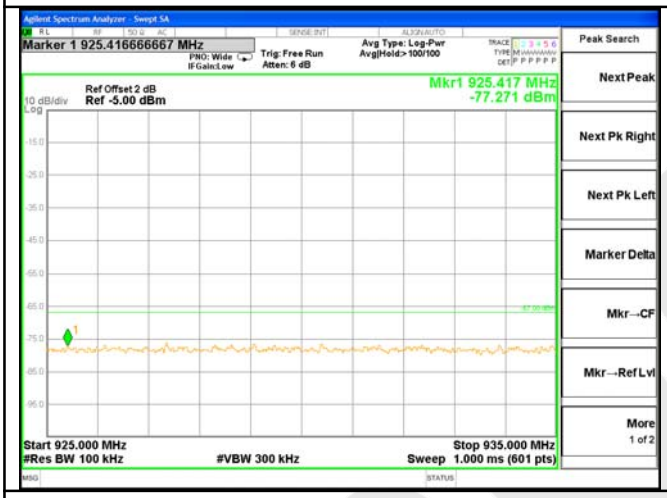
Additional Spurious Emissions:Low Channel



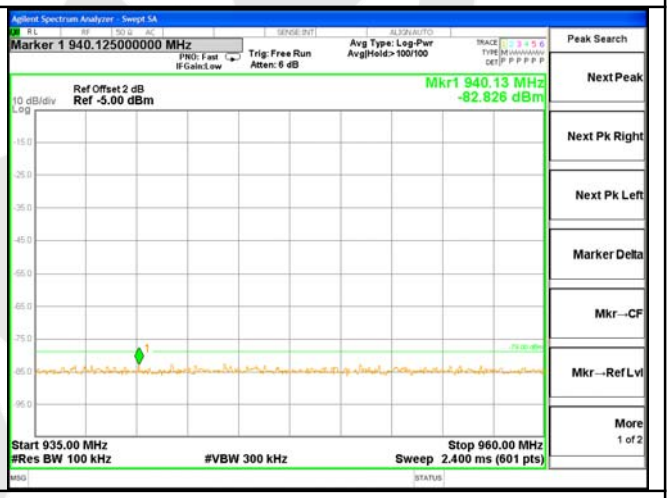
791 MHz –821 MHz



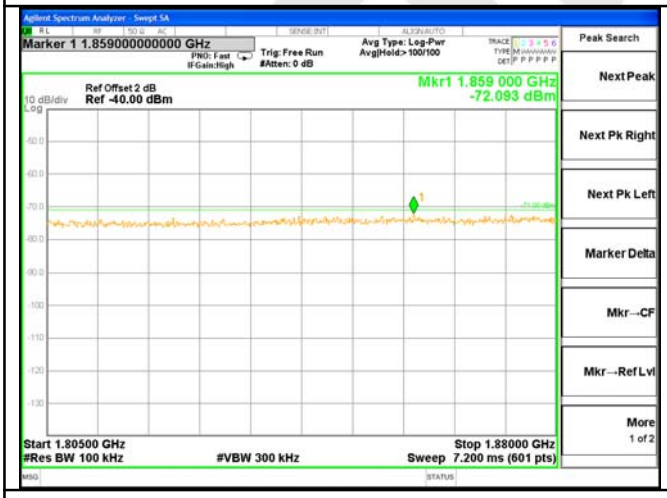
921 MHz –925 MHz



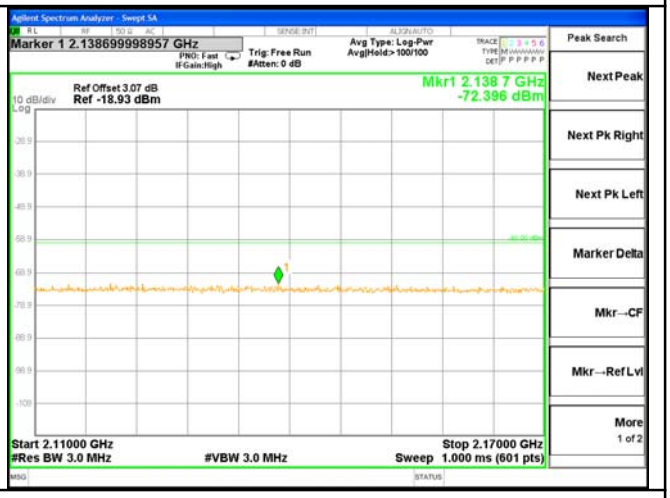
925 MHz –935 MHz



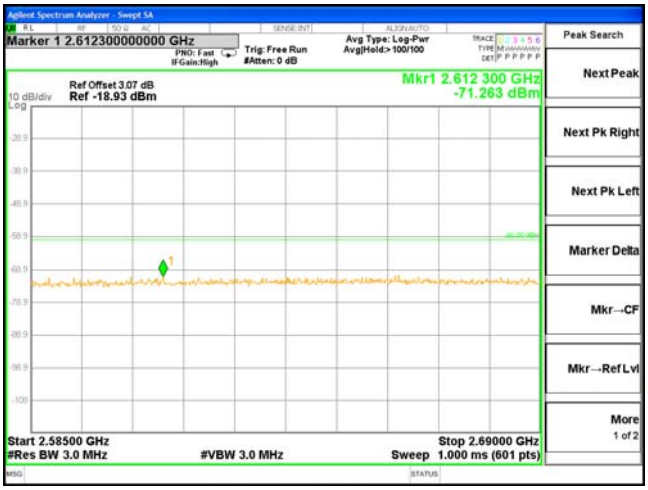
935 MHz –960 MHz



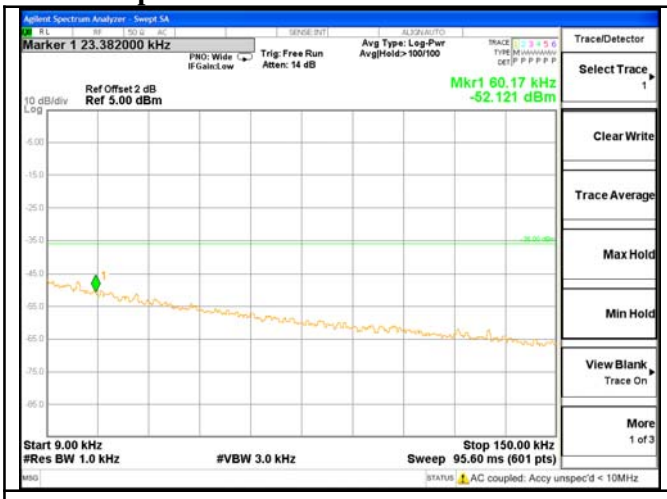
1.805 GHz –1.88 GHz



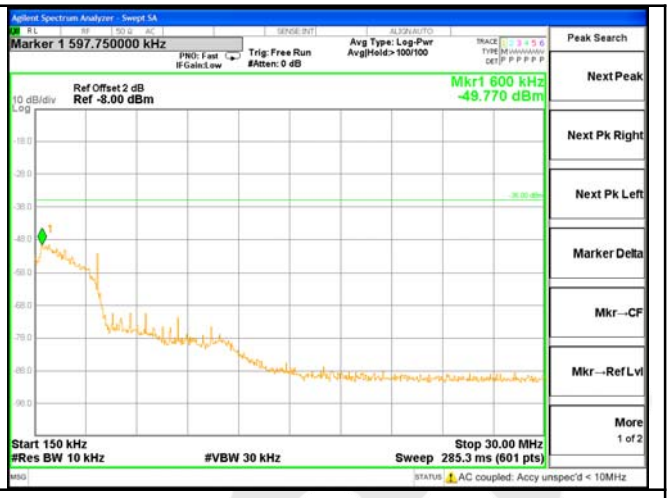
2.11 GHz –2.17 GHz

	/
2.585 GHz –2.69 GHz	/

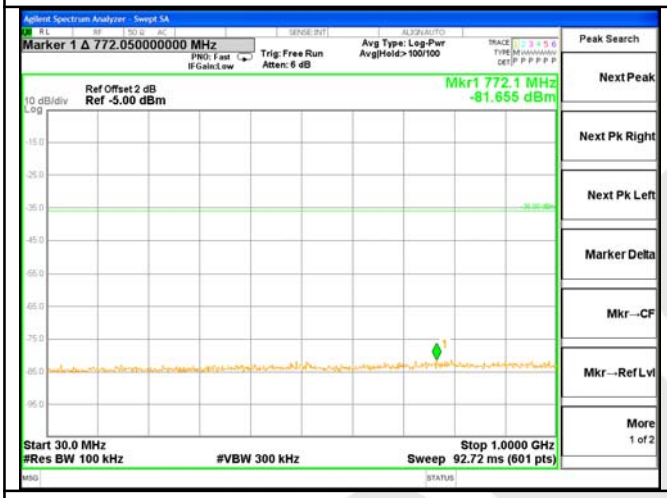
General Spurious Emissions:Middle Channel



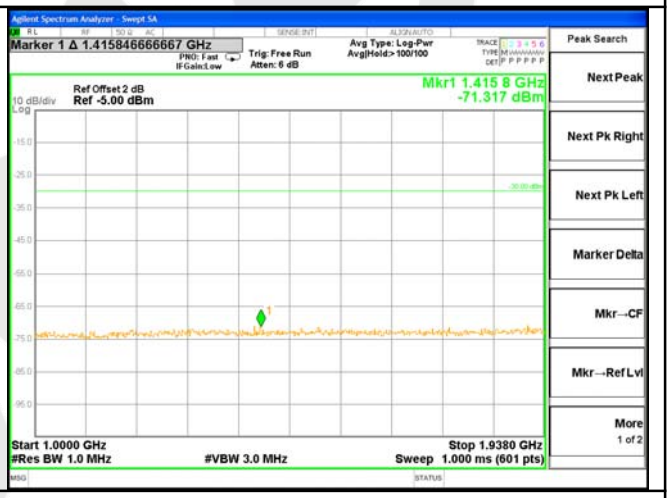
9 kHz –150 kHz



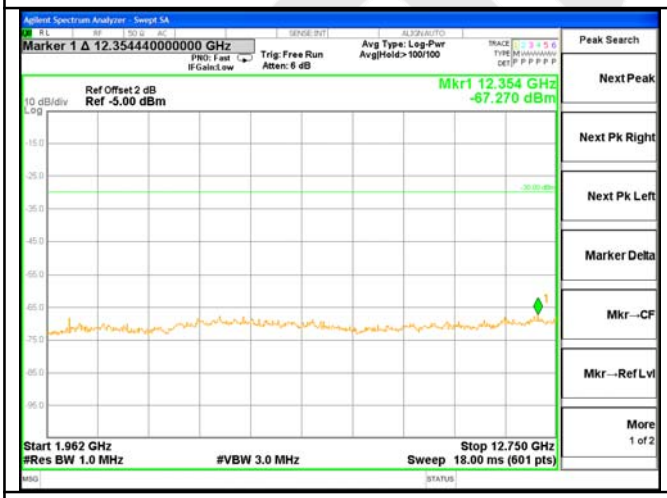
150 kHz –30 MHz



30 MHz –1 GHz

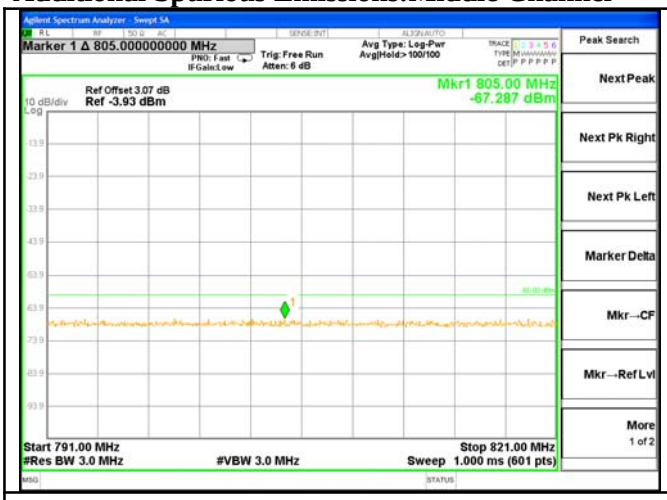


1 GHz –1.938 GHz

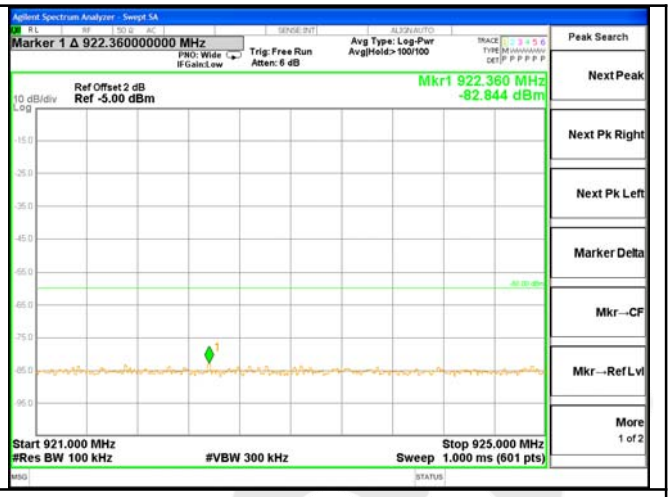


1.962 GHz –12.75 GHz

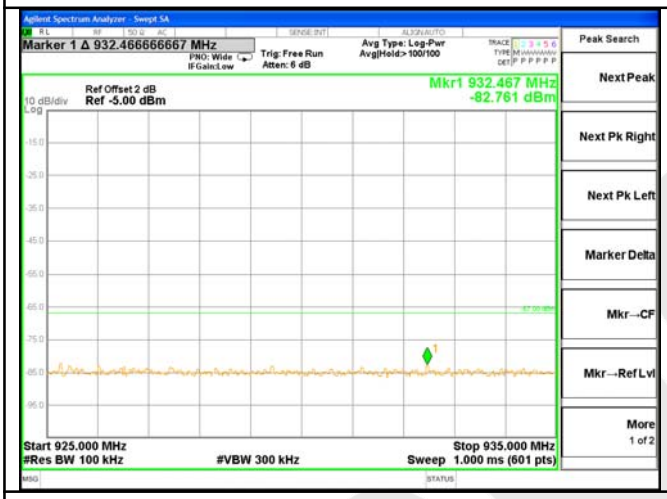
Additional Spurious Emissions:Middle Channel



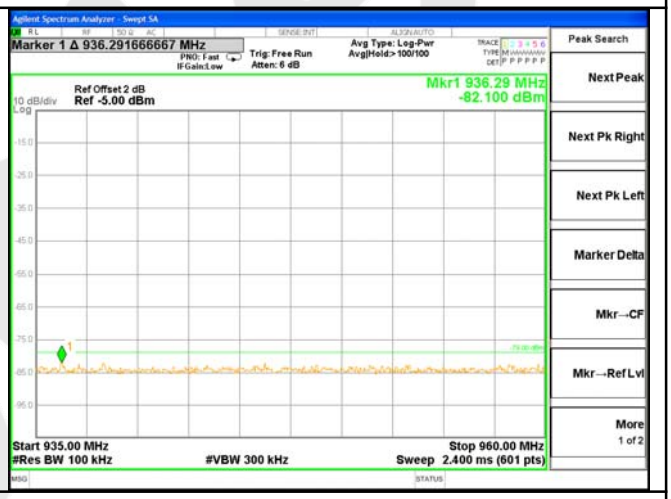
791 MHz –821 MHz



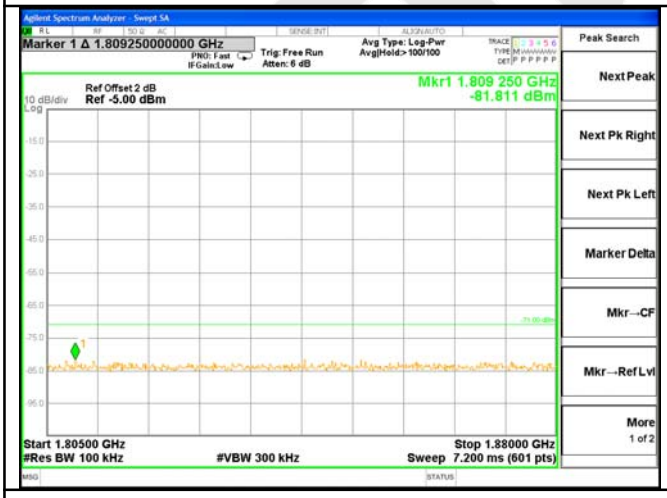
921 MHz –925 MHz



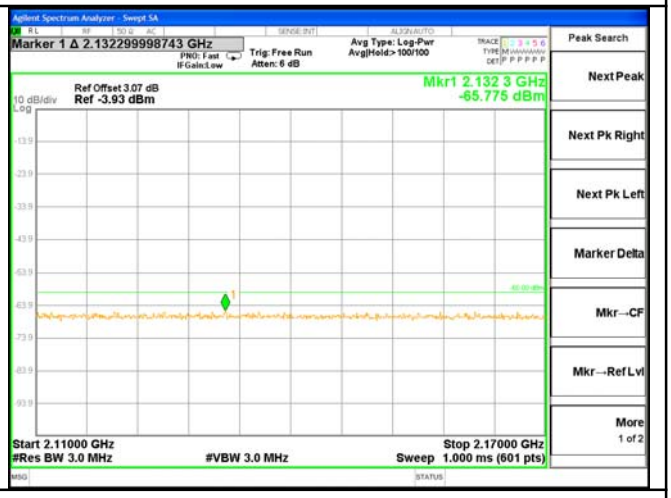
925 MHz –935 MHz



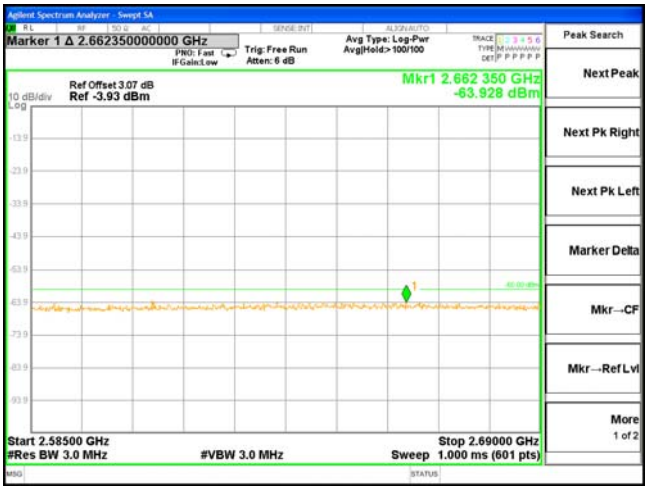
935 MHz –960 MHz



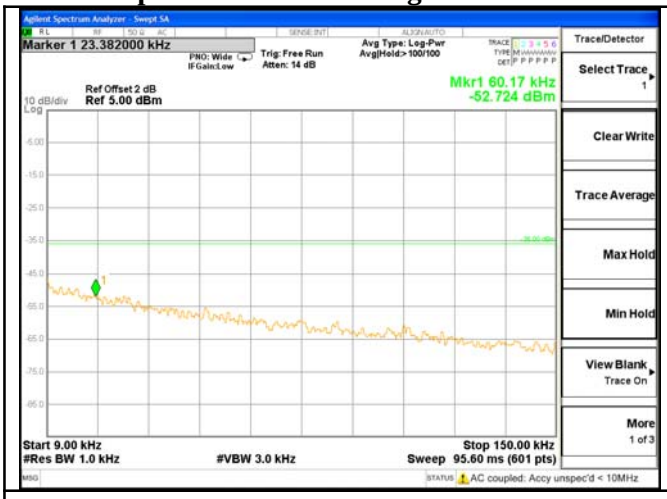
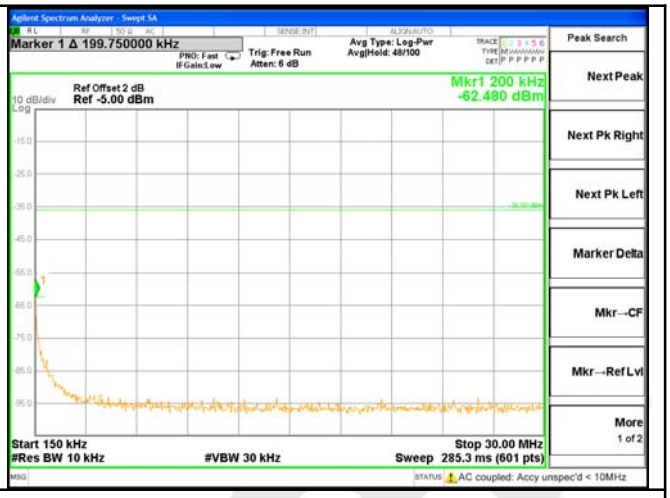
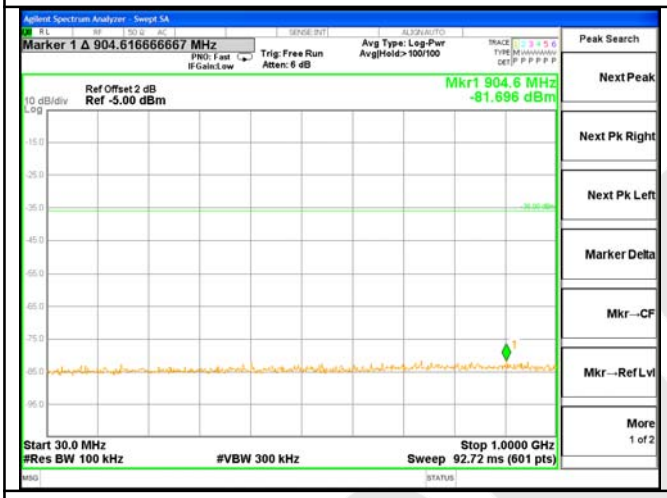
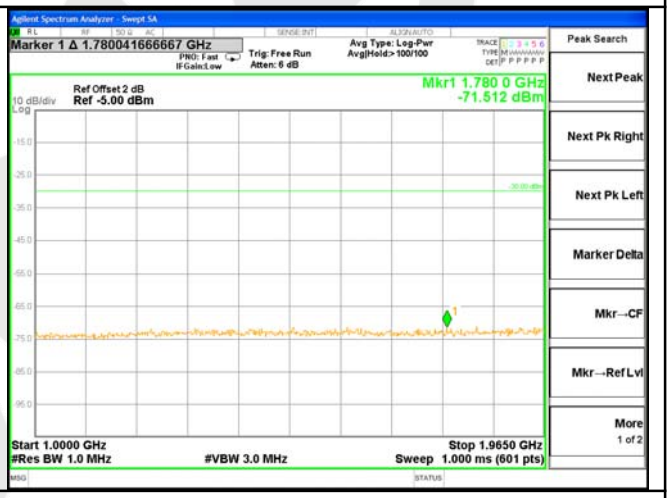
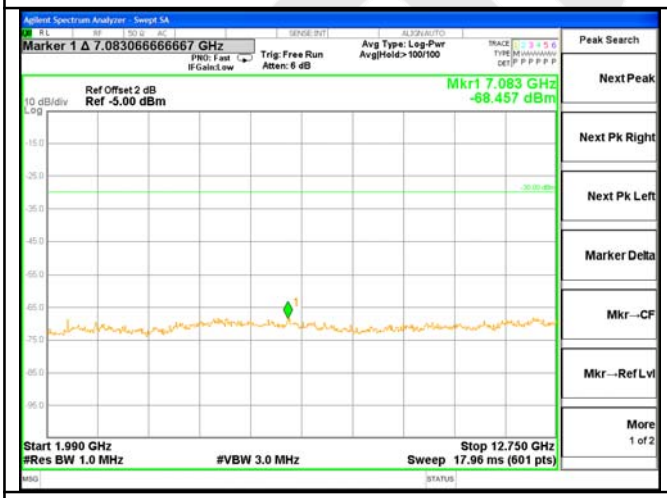
1.805 GHz –1.88 GHz



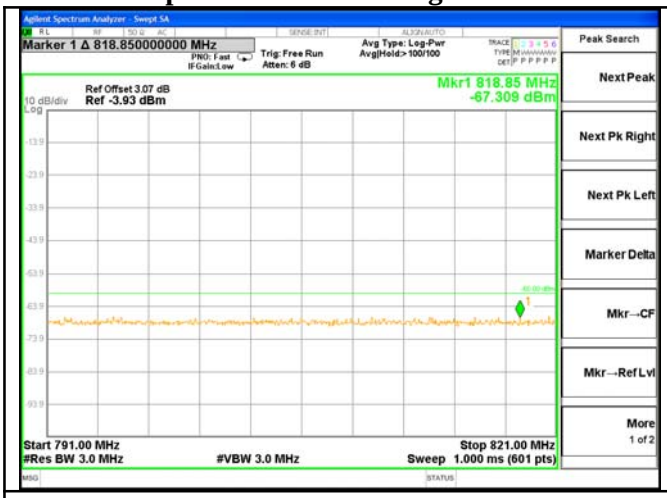
2.11 GHz –2.17 GHz

	/
2.585 GHz –2.69 GHz	/

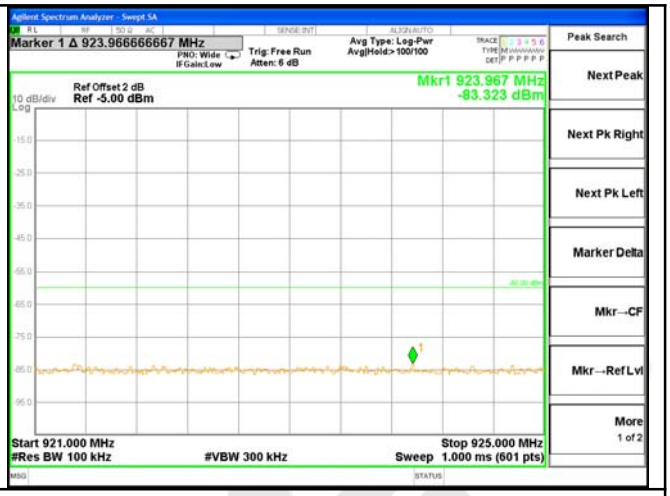
General Spurious Emissions:High Channel

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>9 kHz –150 kHz</td><td>150 kHz –30 MHz</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>30 MHz –1 GHz</td><td>1 GHz –1.965 GHz</td></tr>
<tr><td> 
</td><td>/</td></tr>
<tr><td>1.99 GHz –12.75 GHz</td><td>/</td></tr>
</table>

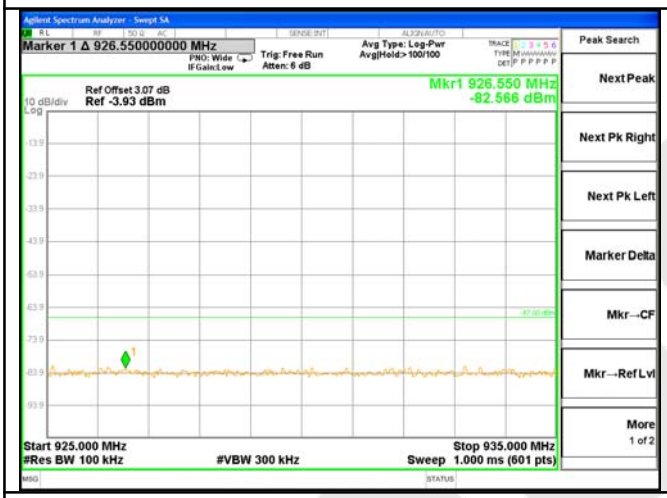
Additional spurious emissions:High Channel



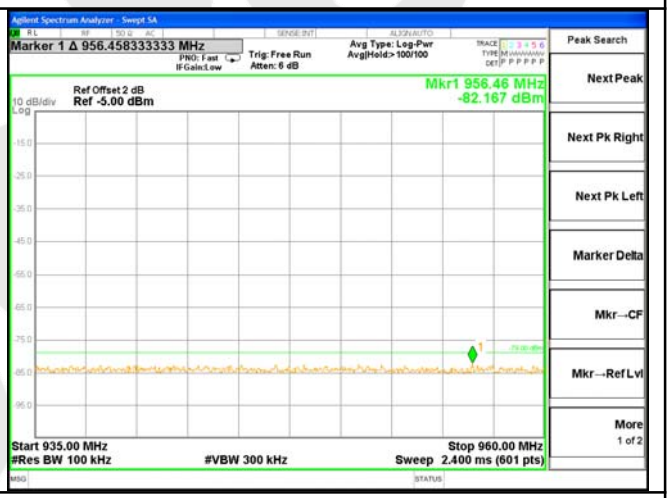
791 MHz –821 MHz



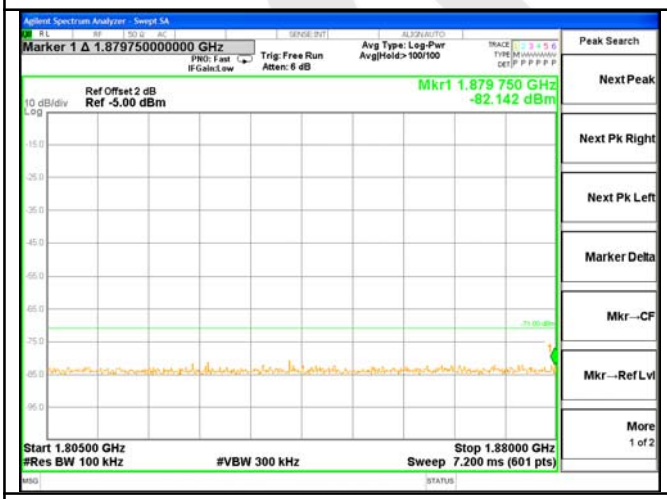
921 MHz –925 MHz



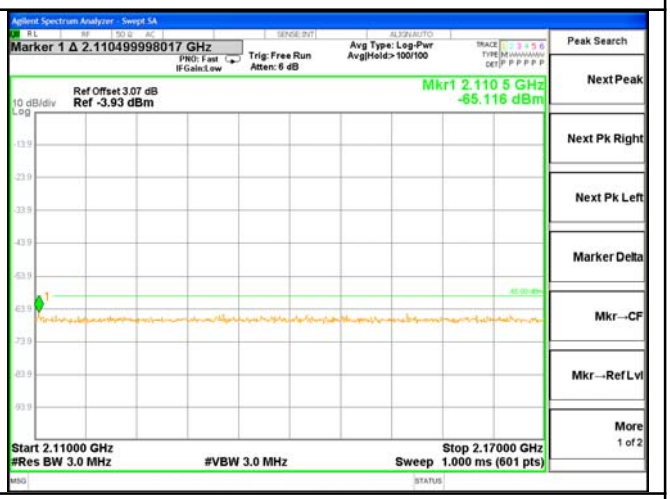
925 MHz –935 MHz



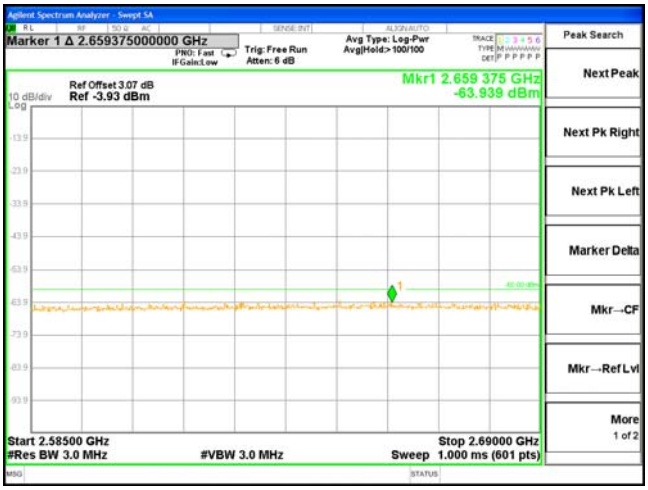
935 MHz –960 MHz



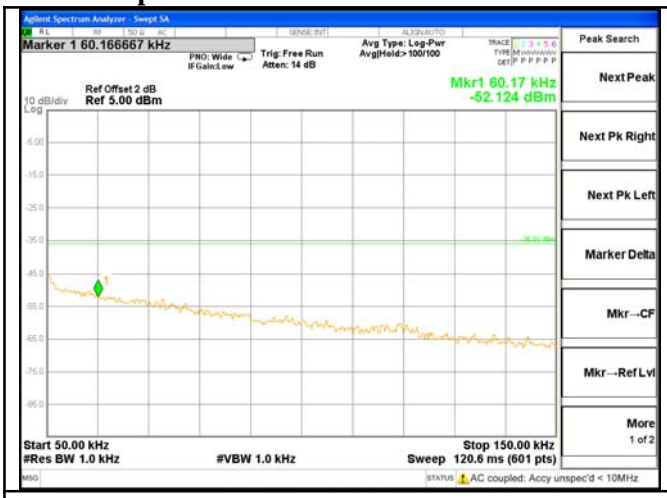
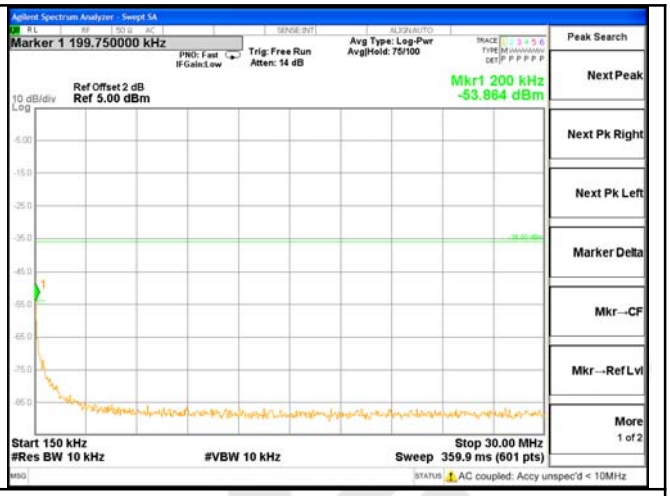
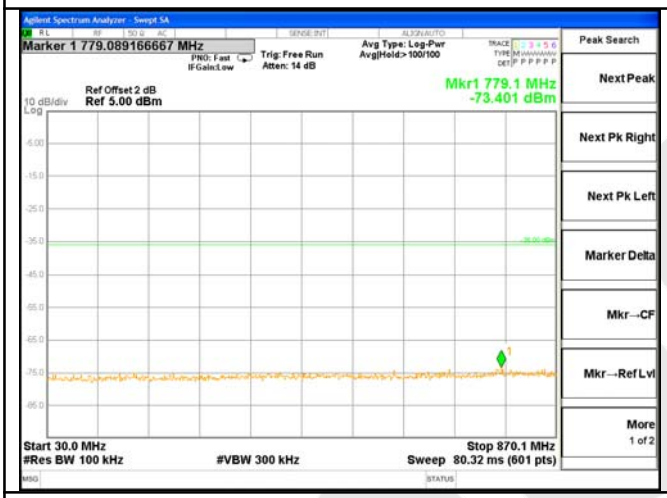
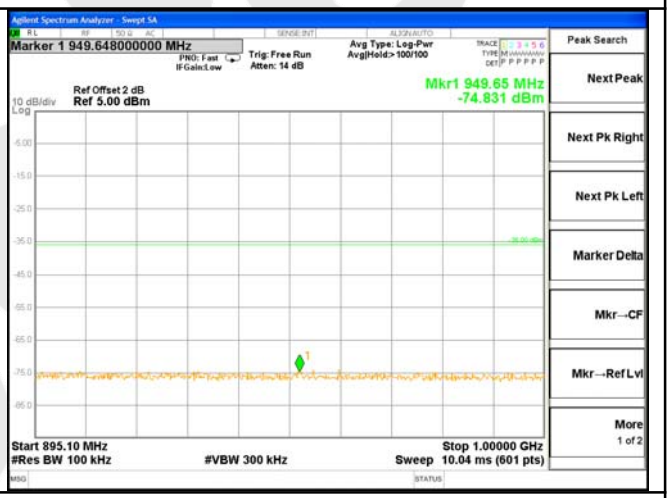
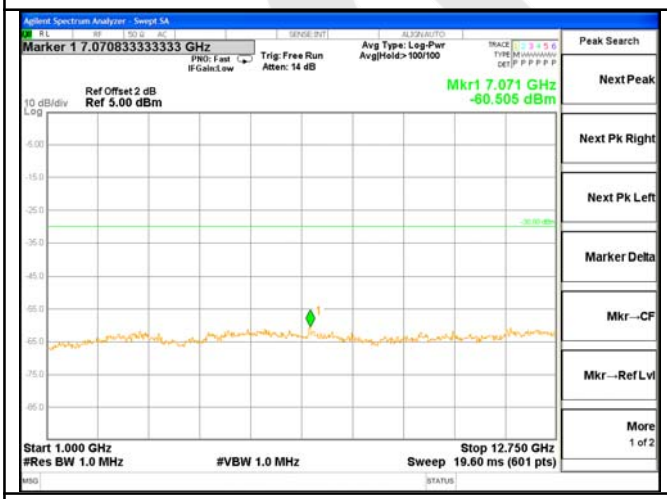
1.805 GHz –1.88 GHz



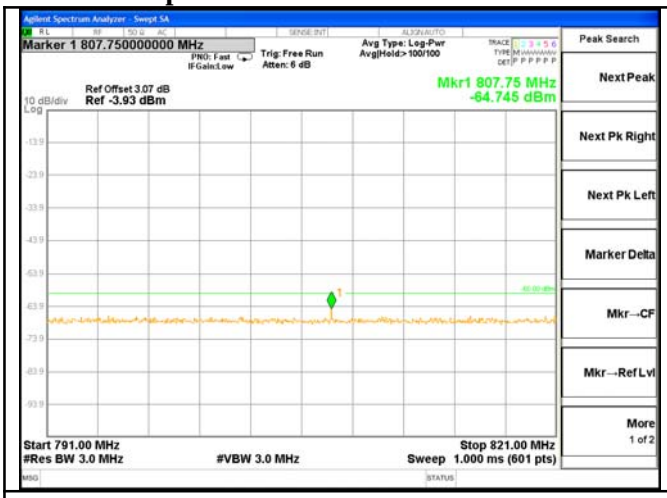
2.11 GHz –2.17 GHz

	/
2.585 GHz –2.69 GHz	/

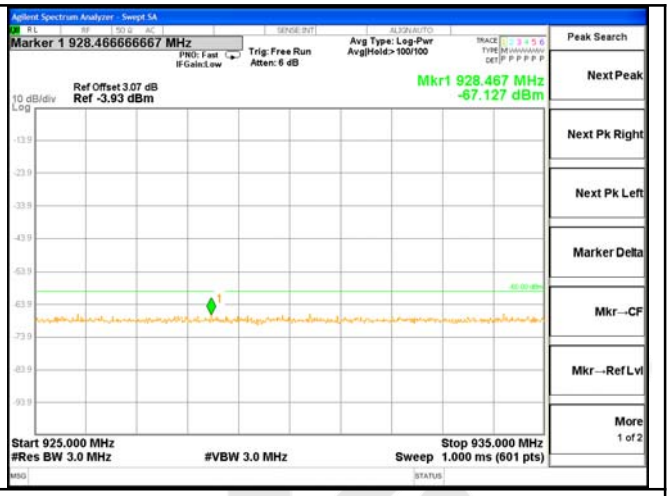
WCDMA Band VIII:
General Spurious Emissions:Low Channel

	
9 kHz –150 kHz	150 kHz –30 MHz
	
30 MHz –870.1 MHz	895.1 MHz –1 GHz
	/
1 GHz –12.75 GHz	/

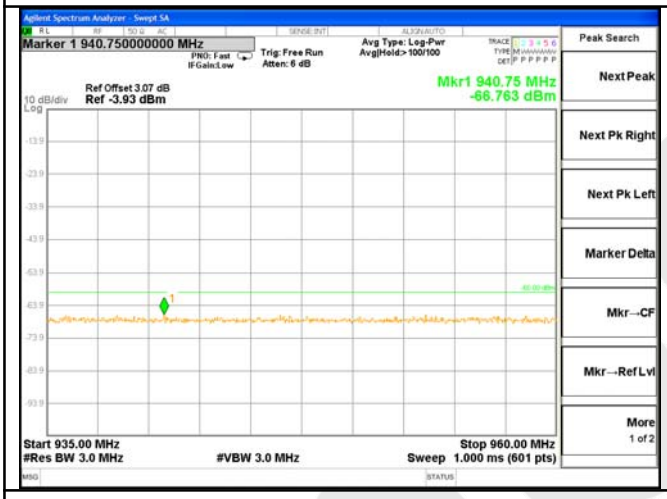
Additional spurious emissions:Low Channel



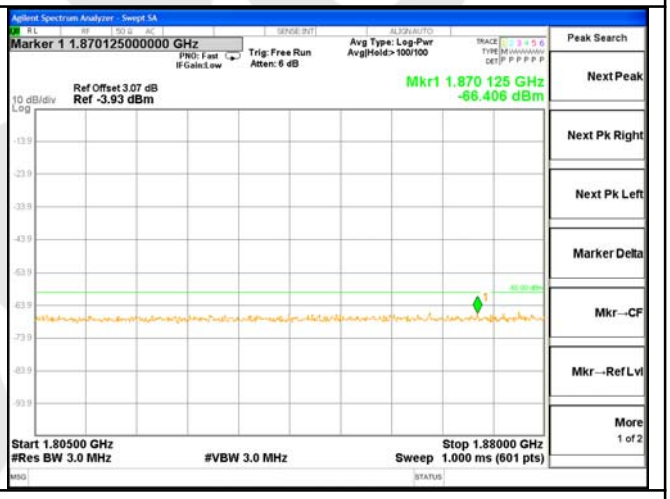
791 MHz –821 MHz



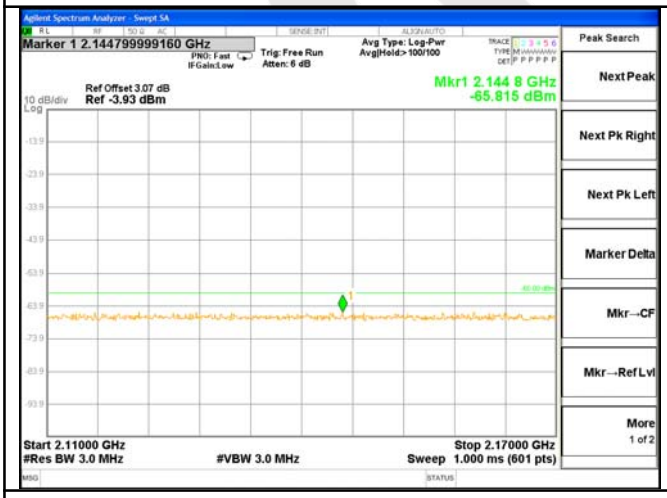
925 MHz –935 MHz



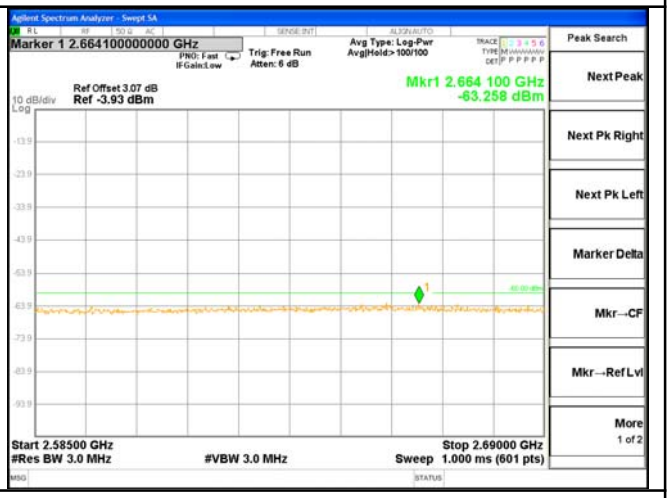
935 MHz –960 MHz



1.805 GHz –1.88 GHz

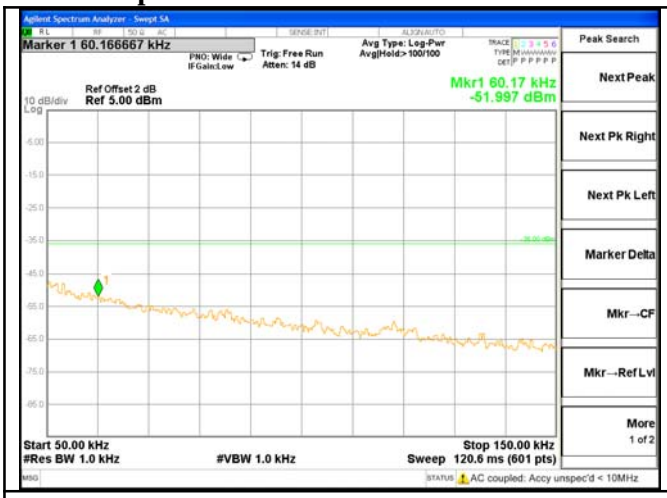


2.11 GHz –2.17 GHz

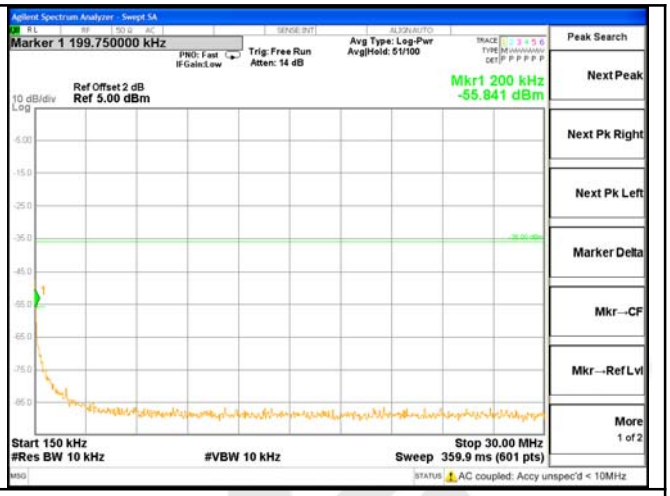


2.585 GHz –2.69 GHz

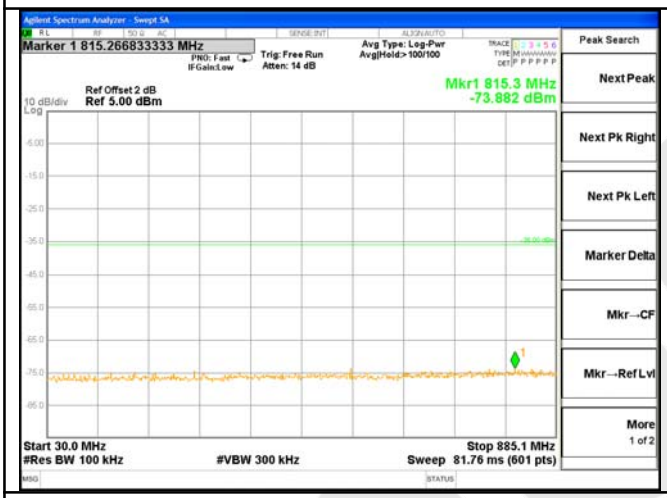
General Spurious Emissions:Middle Channel



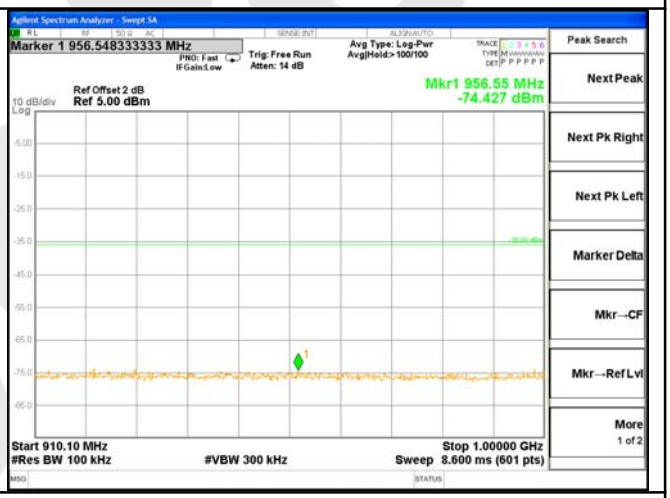
9 kHz –150 kHz



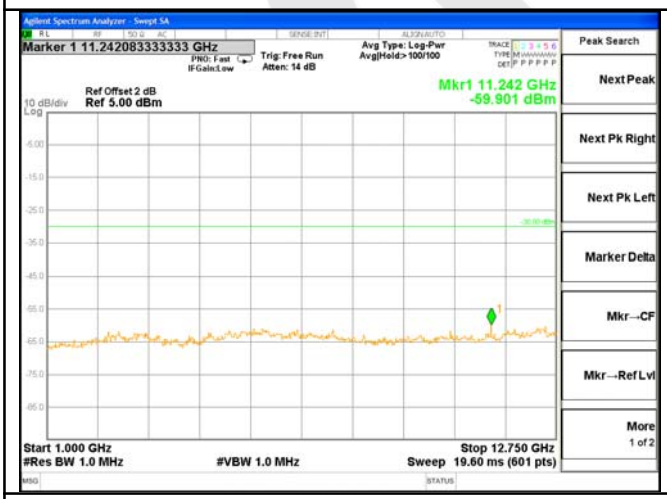
150 kHz –30 MHz



30 MHz –885.1 MHz

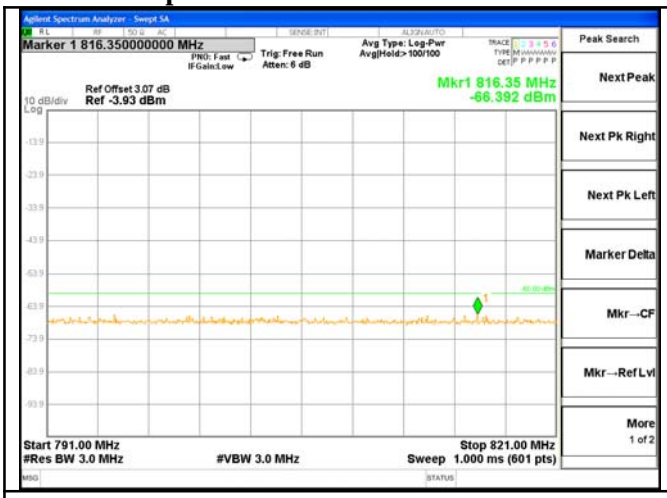


910.1MHz –1 GHz

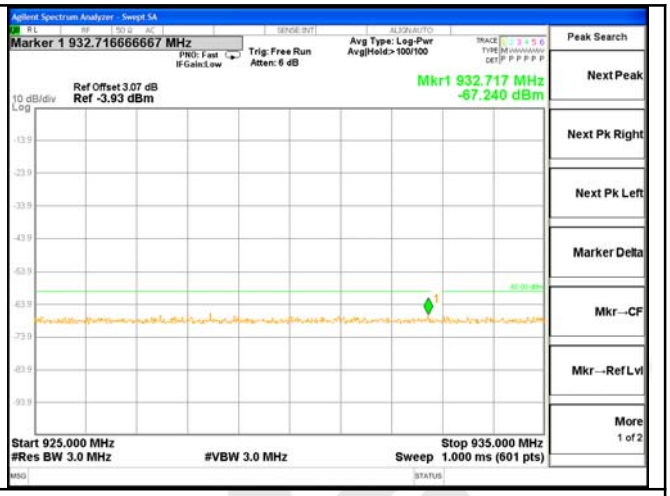


1 GHz –12.75 GHz

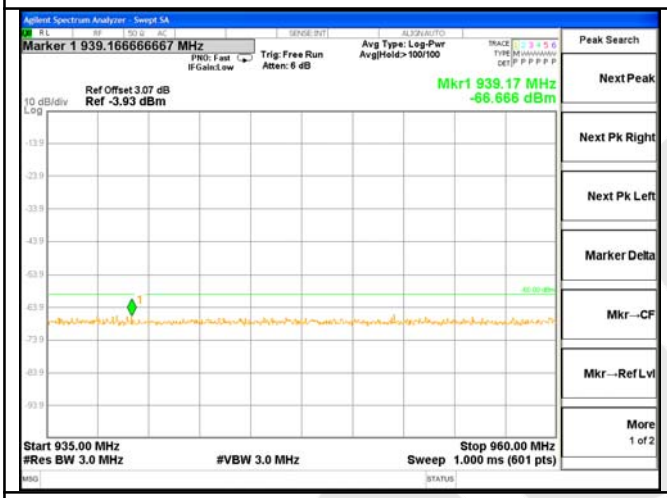
Additional spurious emissions:Middle Channel



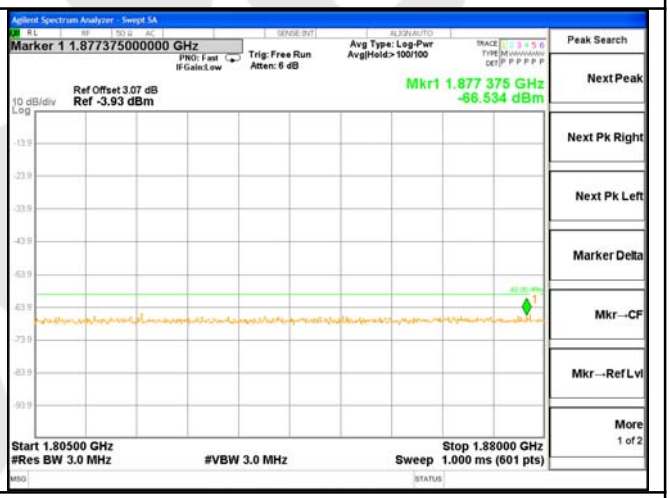
791 MHz –821 MHz



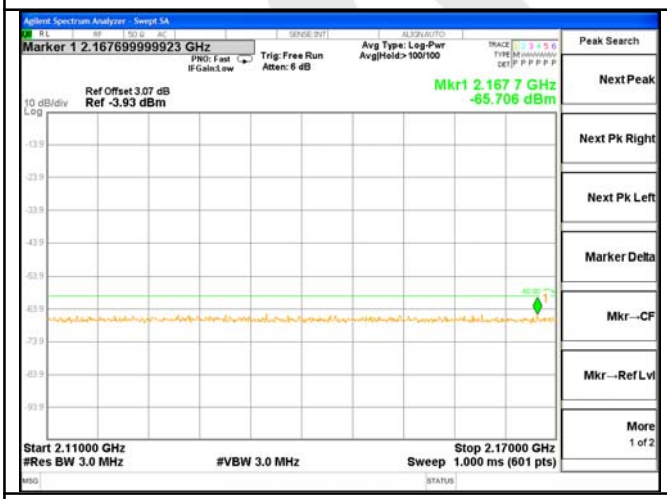
925 MHz –935 MHz



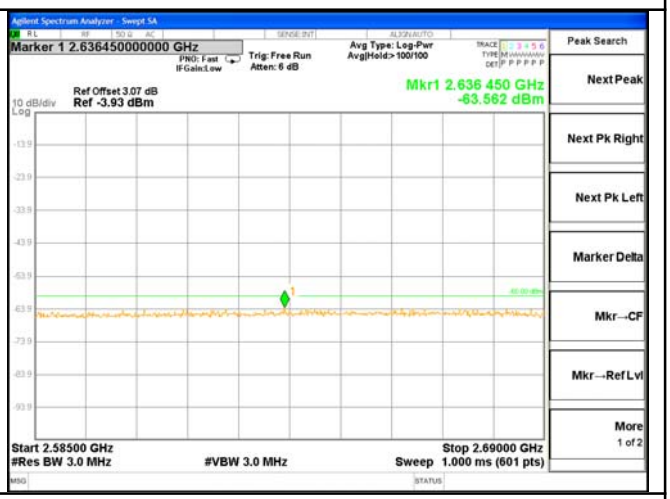
935 MHz –960 MHz



1.805 GHz –1.88 GHz

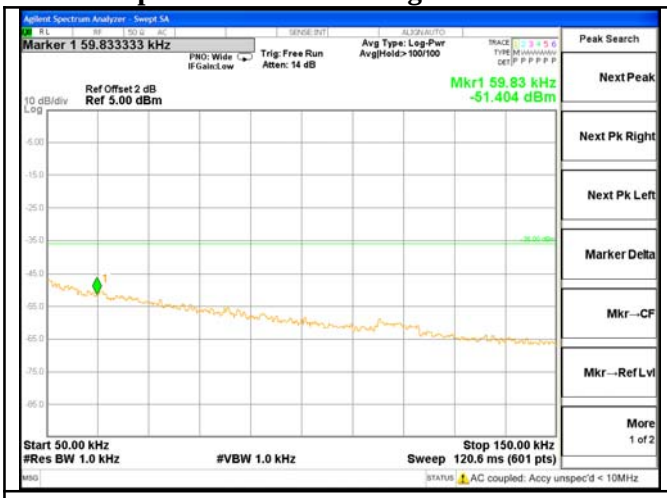


2.11 GHz –2.17 GHz

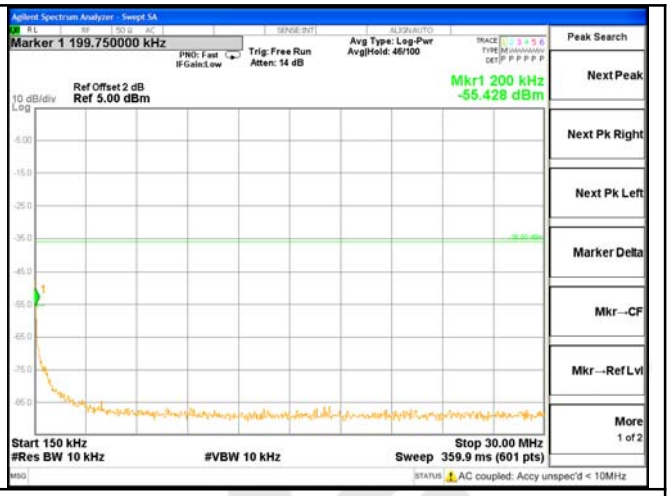


2.585 GHz –2.69 GHz

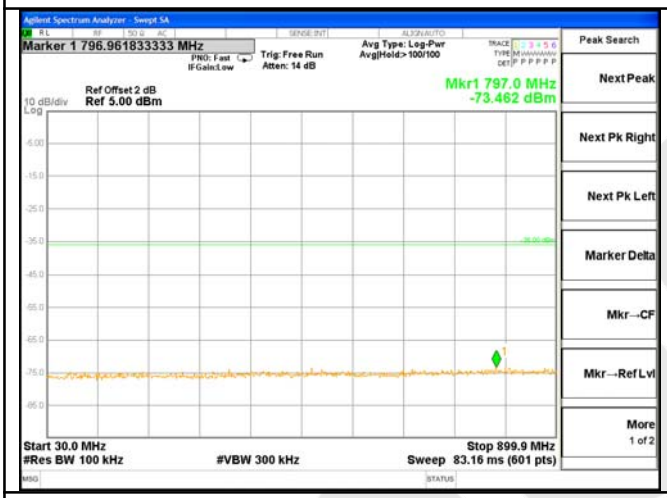
General Spurious Emissions:High Channel



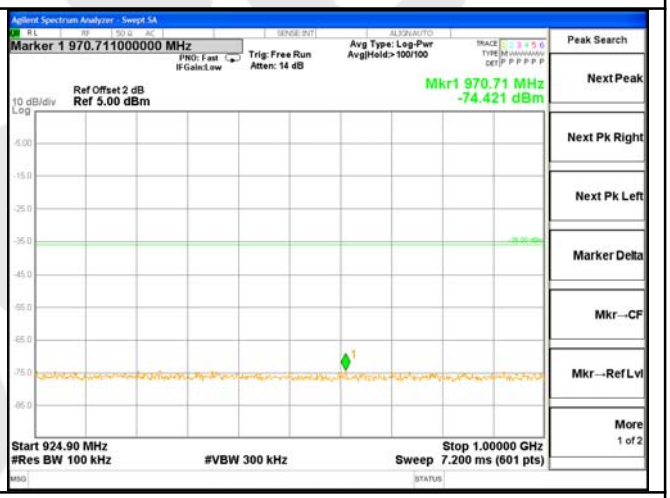
9 kHz –150 kHz



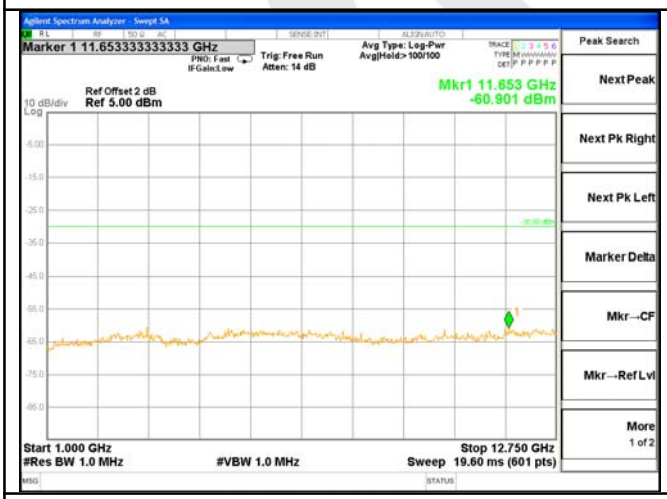
150 kHz –30 MHz



30 MHz –899.9 GHz

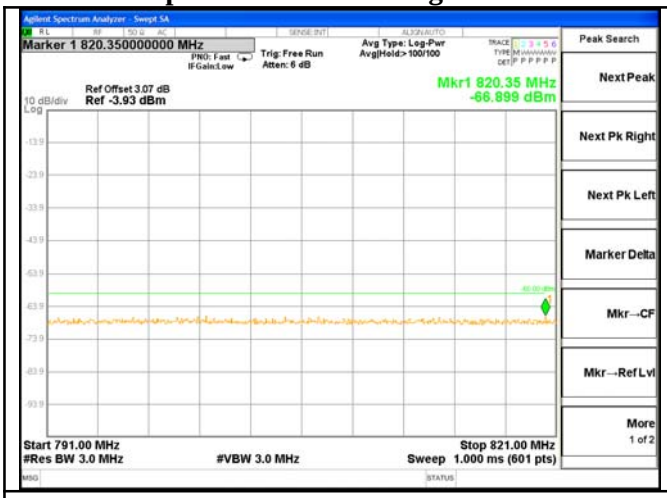


924.9 MHz –1 GHz

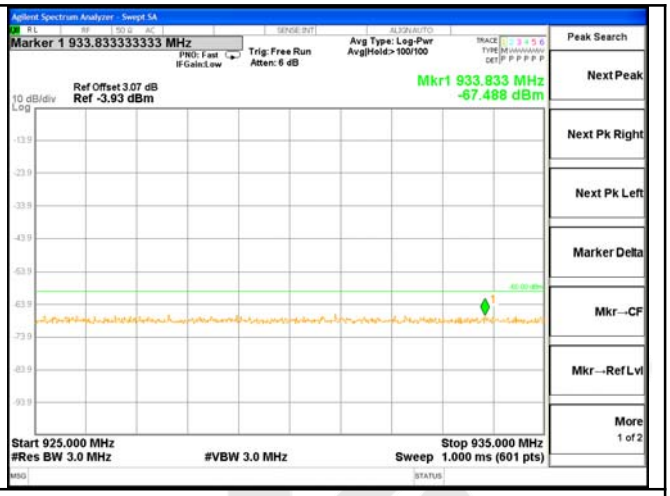


1 GHz –12.75 GHz

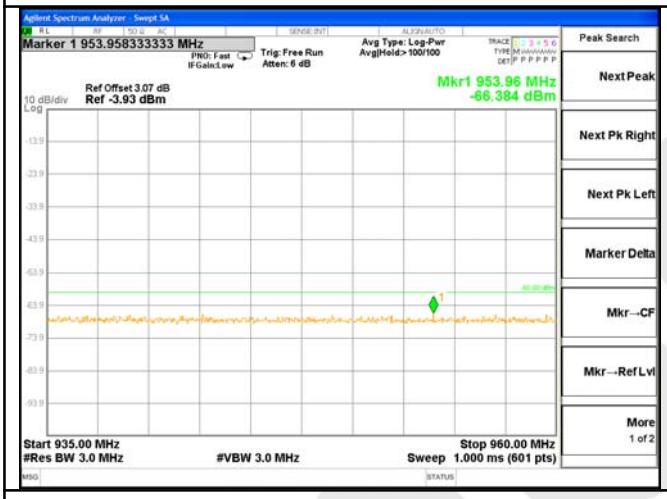
Additional spurious emissions:High Channel



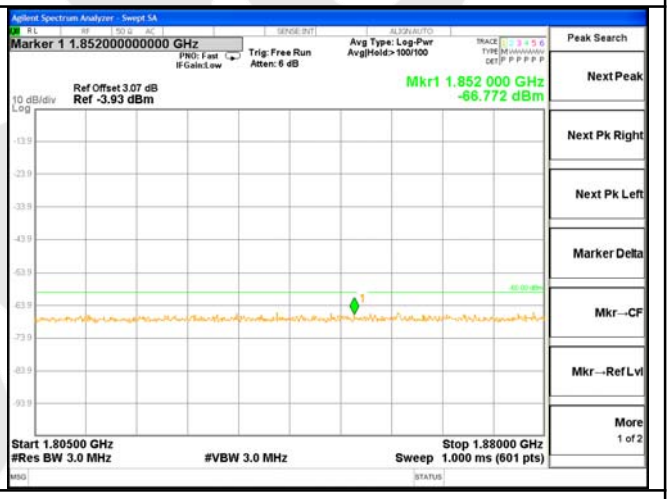
791 MHz –821 MHz



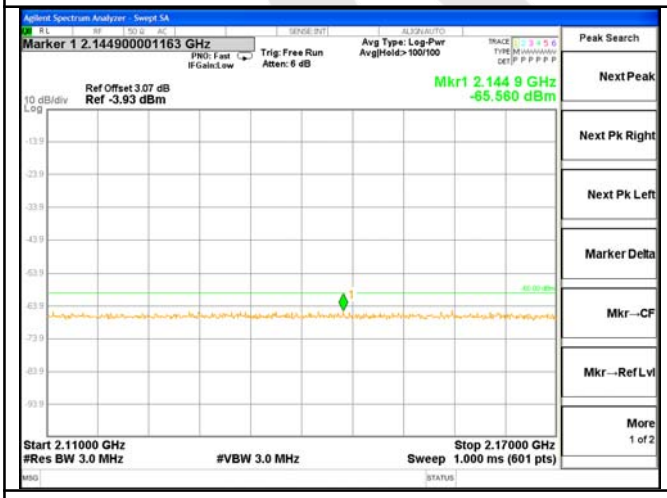
925 MHz –935 MHz



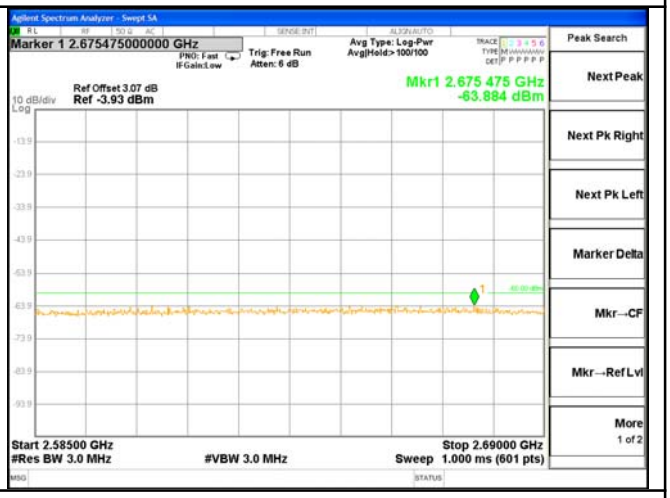
935 MHz –960 MHz



1.805 GHz –1.88 GHz



2.11 GHz –2.17 GHz



2.585 GHz –2.69 GHz

9. Transmitter Minimum Output Power

Applicable Standard

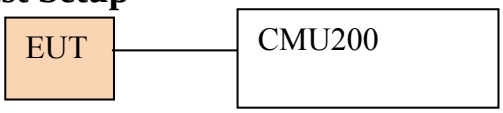
According to EN 301 908-2 V7.1.1 §4.2.5
The minimum output power shall be less than -49 dBm.

Test Procedure

1) Set and send continuously down power control commands to the UE.

2) Measure the mean power of the UE..

Test Setup



Test Data

Test Mode: Transmitting
Test Result: PASS
Test dates see the following pages

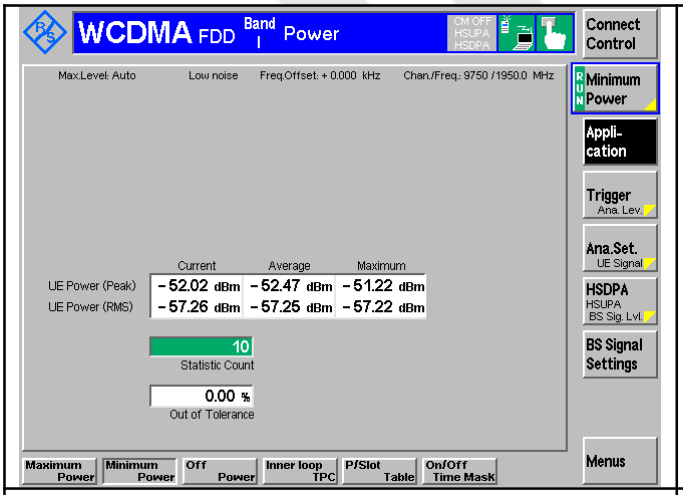
WCDMA Band I:

Test Conditions		Transmitter maximum output power (dBm) Limit:-49dBm	
Temperature (℃)	Voltage (V)	Middle Channel	Result
TN	VN	-57.25	Pass
TL	VL	-55.36	Pass
TL	VH	-54.63	Pass
TH	VL	-56.68	Pass
TH	VH	-54.39	Pass

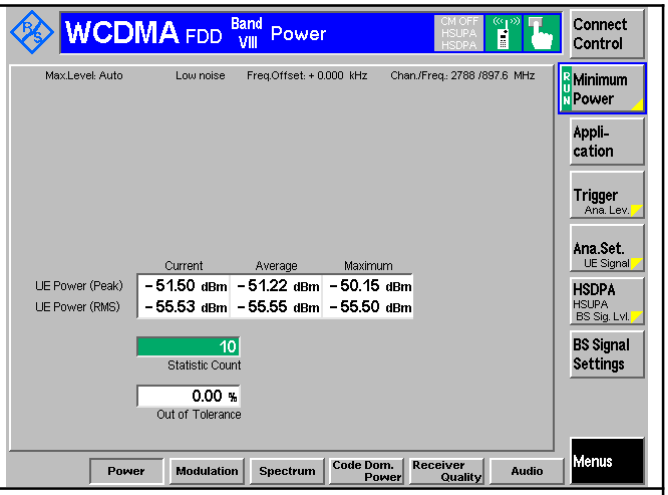
WCDMA Band I:

Test Conditions		Transmitter maximum output power (dBm) Limit:-49dBm	
Temperature (℃)	Voltage (V)	Middle Channel	Result
TN	VN	-55.55	Pass
TL	VL	-54.64	Pass
TL	VH	-53.61	Pass
TH	VL	-54.76	Pass
TH	VH	-52.19	Pass

Test Plots Normal Condition



WCDMA Band I: Middle Channel



WCDMA Band VIII: Middle Channel

10. Receiver Adjacent Channel Selectivity (ACS)

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.6

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 4.2.6.2-1. This test condition is equivalent to the ACS value 33 dB.

.

Table 4.2.6.2-1: Test parameters for adjacent channel selectivity

Parameter	Unit	Case 1	Case 2
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 14 dB	<REF$\hat{I}_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	20 (for Power class 3) 18 (for Power class 4)
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in TS 134 121-1 [2]. NOTE 2: The I_{oac} (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5].			

Test Procedure

1) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 1.
2) Set the power level of UE according to the table 4.2.6.2-1 case 1 with ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.
4) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 2.
5) Set the power level of UE according to the table 4.2.6.2-1 case 2 with ±1 dB tolerance.
6) Measure the BER of DCH received from the UE at the SS.

Test Setup

Test Data

Test Mode: Receiver

Test Result: PASS

The BER are 0.000%, in the case1 interfering signal and case 2 interfering signal conditions. No errors were detected.

11. Receiver Blocking Characteristics

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.7
For table 4.2.7.2-2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

Test Procedure

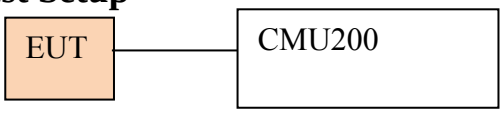
1) Set the parameters of the CW generator or the interference signal generator as shown in tables 4.2.7.2-1,4.2.7.2-2 and 4.2.7.2-3. For table 4.2.7.2-2 the frequency step size is 1 MHz.

2) Set the power level of the UE according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3 with a ±1 dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

4) For table 4.2.7.2-2, record the frequencies for which the BER exceeds the test requirements.

Test Setup



Test Data

Test Mode: Receiver
Test Result: PASS
The BER are 0.000%, for the parameters specified in table 4.2.7.2-1. No errors were detected
The preliminary test has been performed for an interfering signal at all frequencies listed in table 4.2.7.2-2. The BER are less than 0.002. So, the Blocking Characteristics test have been performed for some interfering signals at frequencies listed in table 4.2.7.2-2, the test data (only list the several worst data) are list in the following table:

WCDMA Band I:

Frequency Range	Interfering Frequency (MHz)	Interfering Level (dBm)	BER
Frequency Range 1	865	-44	0.0001
	887	-44	0.0002
	910	-44	0.0001
	975	-44	0.0000
	997	-44	0.0001
	1020	-44	0.0000
Frequency Range 2	840	-30	0.0002
	852	-30	0.0002
	865	-30	0.0001
	1020	-30	0.0001
	1032	-30	0.0001
	1045	-30	0.0002
Frequency Range 3	1	-15	0.0001
	420	-15	0.0002
	840	-15	0.0002
	1045	-15	0.0001
	2690	-15	0.0001
	12750	-15	0.0002

WCDMA Band VIII:

Frequency Range	Interfering Frequency (MHz)	Interfering Level (dBm)	BER
Frequency Range 1	865	-44	0.0002
	887	-44	0.0002
	910	-44	0.0001
	975	-44	0.0001
	997	-44	0.0001
	1020	-44	0.0000
Frequency Range 2	840	-30	0.0002
	852	-30	0.0002
	865	-30	0.0001
	1020	-30	0.0001
	1032	-30	0.0002
	1045	-30	0.0002
Frequency Range 3	1	-15	0.0001
	420	-15	0.0001
	840	-15	0.0002
	1045	-15	0.0002
	2690	-15	0.0001
	12750	-15	0.0002

12. Receiver Spurious Response

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.8
The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2-1.

Table 4.2.8.2-1: Test parameters for spurious response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> + 3 dB	dBm/3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB	dBm/3,84 MHz
$I_{blocking}$(CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm
NOTE: <REFSENS> and <REF$\hat{I}_{or}$> as specified in TS 134 121-1 [2].		

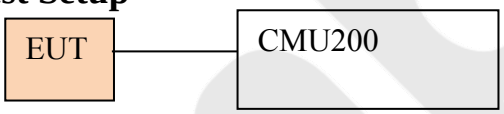
Test Procedure

1) Set the parameter of the CW generator as shown in table 4.2.8.2-1. The spurious response frequencies are determined in step 4) of clause 5.3.6.1.2.

2) Set the power level of the UE according to table 4.2.8.2-1 with a ±1 dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

Test Setup



Test Data

Test Mode: Receiver
Test Result: PASS
Note: The test only be performed on the interfering signal frequencies which is out of band blocking limit as specified in table 4.2.7.2-2 is not met.
The BER are 0.000%, for the parameters specified in table 4.2.8.2-1. No errors were detected in the presence.

13. Receiver Intermodulation Characteristics

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.9

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2-1.

Table 4.2.9.2-1: Receive intermodulation characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> + 3 dB		dBm/3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB		dBm/3,84 MHz
I_{ouw1} (CW)	-46		dBm
I_{ouw2} mean power (modulated)	-46		dBm
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)		dBm
NOTE 1: I_{ouw2} (modulated) consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5]. NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> as specified in TS 134 121-1 [2].			

Table 4.2.9.2-2: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band III, VIII	
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 10 dB	
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 10 dB	
I_{ouw1} (CW)	dBm	-43	
I_{ouw2} (GMSK)	dBm	-43	
F_{uw1} (offset)	MHz	3,6	-3,6
F_{uw2} (offset)	MHz	6,0	-6,0
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in TS 134 121-1 [2]. NOTE 2: I_{ouw2} (GMSK) is an interfering signal as defined in TS 145 004 [9]. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.			

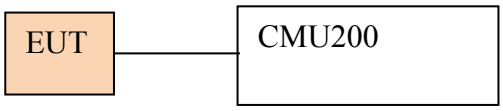
Test Procedure

1) Set the parameters of the CW generator and interference generator as shown in tables 4.2.9.2-1 and 4.2.9.2-2.

2) Set the power level of the UE according to tables 4.2.9.2-1 and 4.2.9.2-2 with a ±1 dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

Test Setup



Test Data

Test Mode: Receiver
Test Result: PASS
The BER are 0.000%, No errors were detected in the presence.

14. Receiver Spurious Emissions

Applicable Standard

According to EN 301 908-2 V7.1.1 §4.2.10

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in table 4.2.10.2-1 and 4.2.10.2-2.

Table 4.2.10.2-1: General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm

Table 4.2.10.2-2: Additional receiver spurious emission requirements

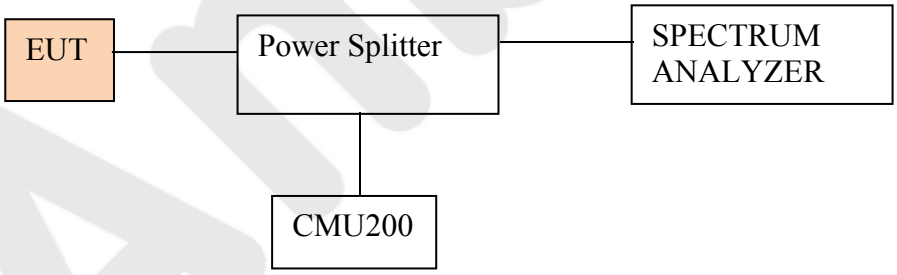
Band	Frequency Range	Measurement Bandwidth	Maximum level
I	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
III	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 710 MHz ≤ f ≤ 1 785 MHz	3,84 MHz	-60 dBm
	1 805 MHz ≤ f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
VII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 500 MHz ≤ f ≤ 2 570 MHz	3,84 MHz	-60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
VIII	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	880 MHz ≤ f ≤ 915 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz < f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm

Band	Frequency Range	Measurement Bandwidth	Maximum level
XV	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f < 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 900 MHz ≤ f ≤ 1 920 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XVI	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f < 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	2 010 MHz ≤ f ≤ 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	832 MHz ≤ f ≤ 862 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
NOTE:	The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.10.2-1 are permitted for each UARFCN used in the measurement.		

Test Procedure

Sweep the spectrum analyzer (or other suitable test equipment) over a frequency range from 30 MHz to 12.75 GHz and measure the average power of the spurious emissions.

Test Setup

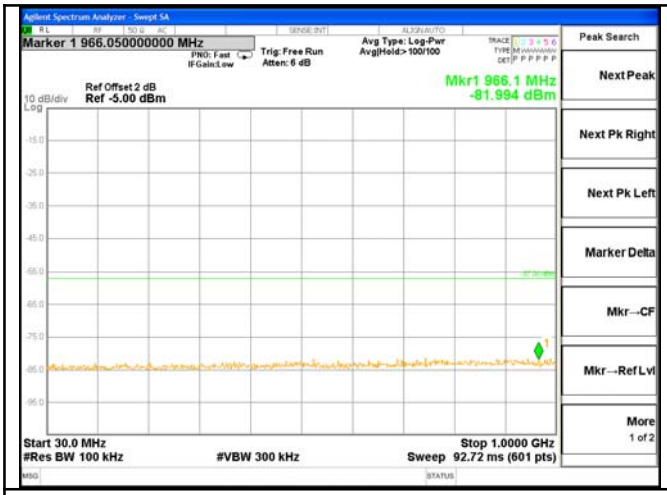
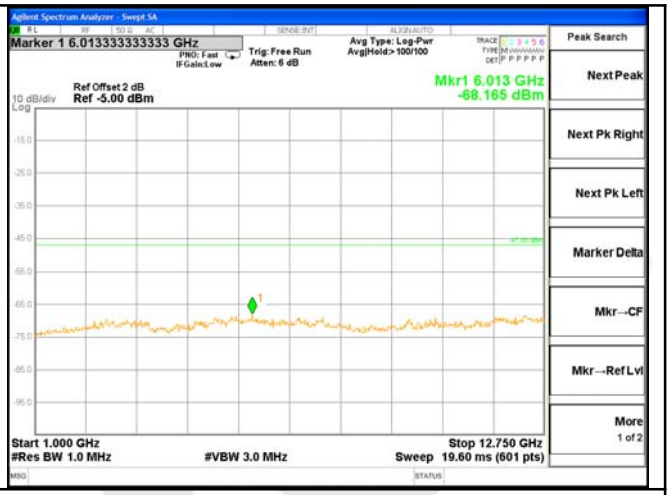


Test Data

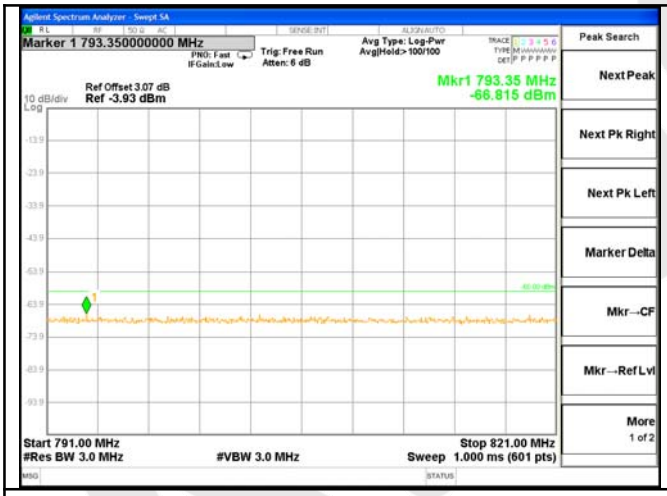
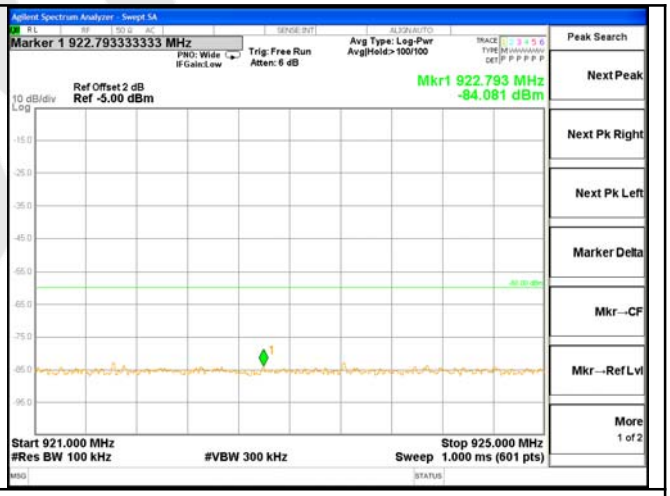
Test Mode: Receiver
Test Result: PASS

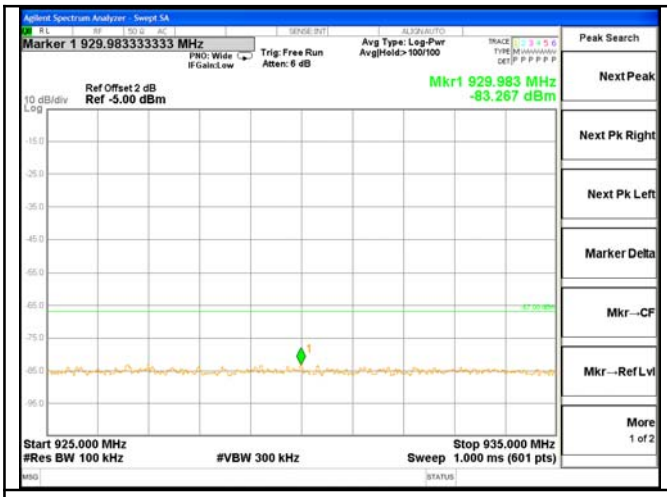
Note:
If RBW is 3MHz, VBW is 3MHz,
So Offset=Cable loss (5) + 10log (3.84/3) = 6.07dBm

Test Plots:
WCDMA Band I:
General spurious emissions:

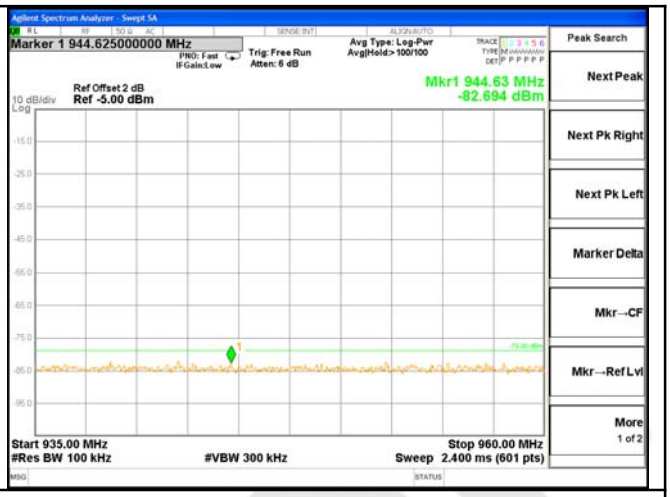
	
30 MHz – 1 GHz	1 GHz – 12.75 GHz

Additional spurious emissions:

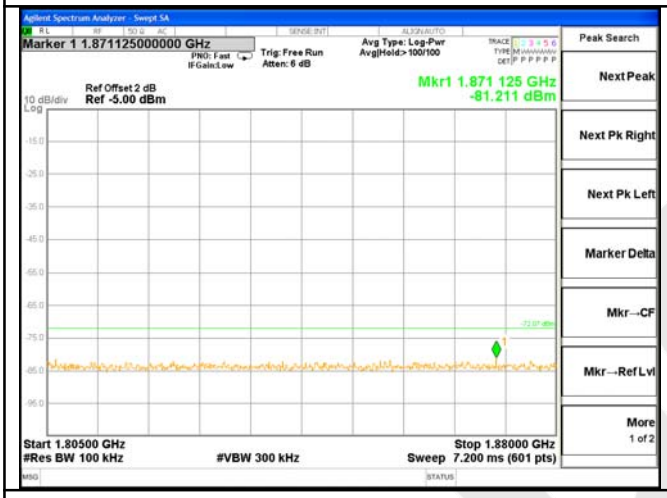
	
791 MHz – 821 MHz	921 MHz – 925 MHz



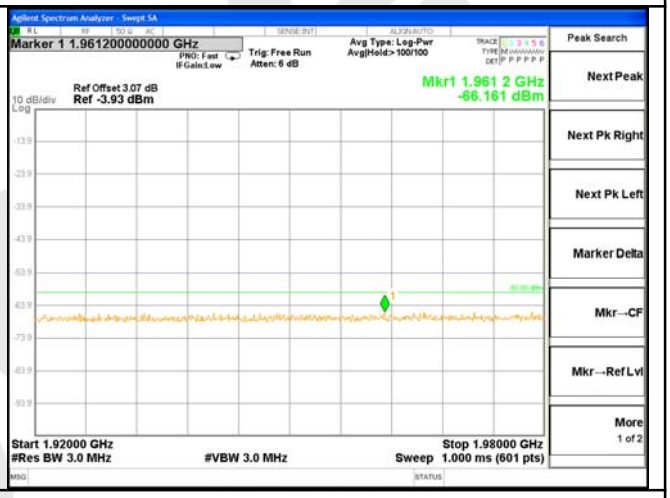
925 MHz – 935 MHz



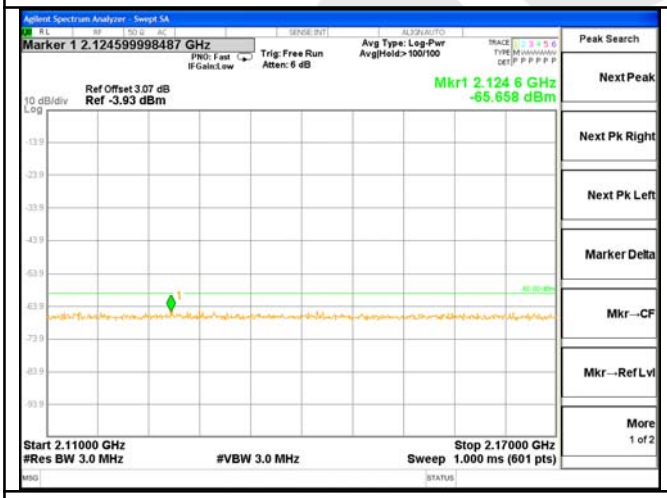
935 MHz – 960 MHz



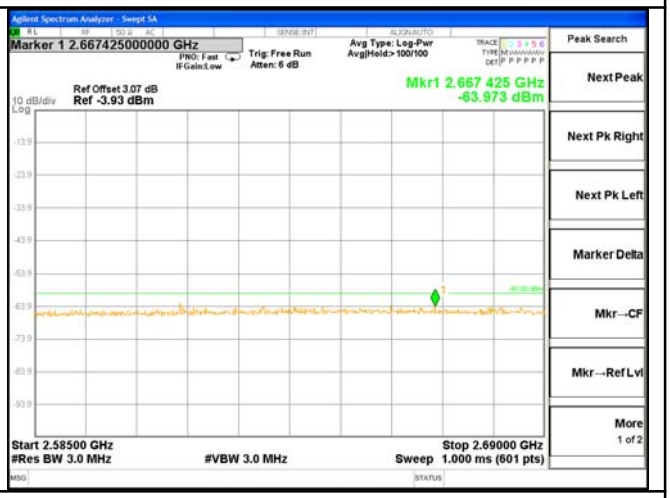
1.805 GHz – 1.88 GHz



1.92 GHz – 1.98 GHz

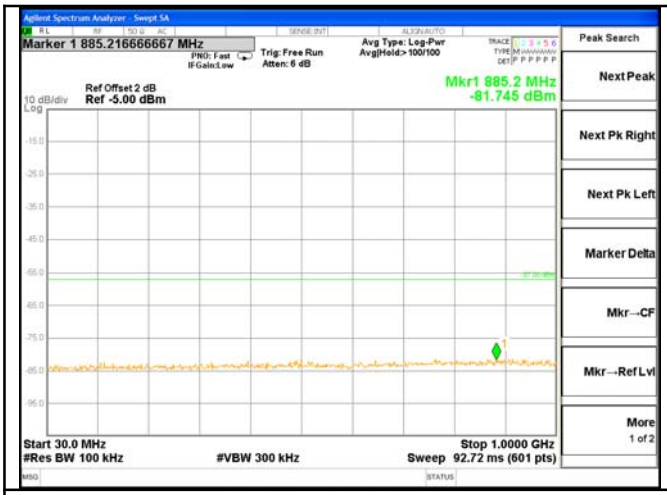
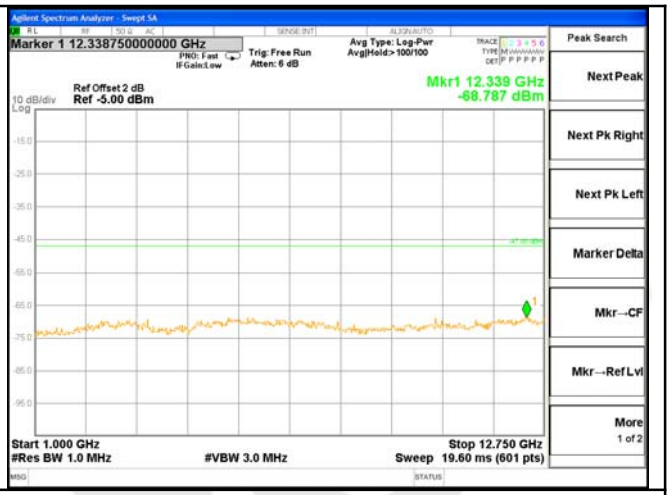


2.11 GHz – 2.17 GHz

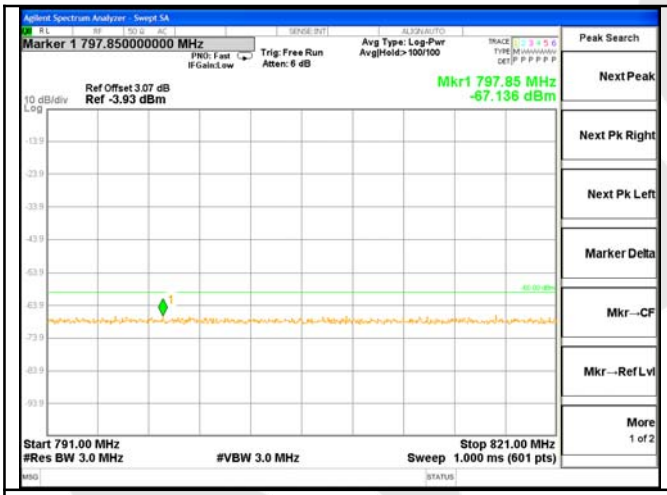
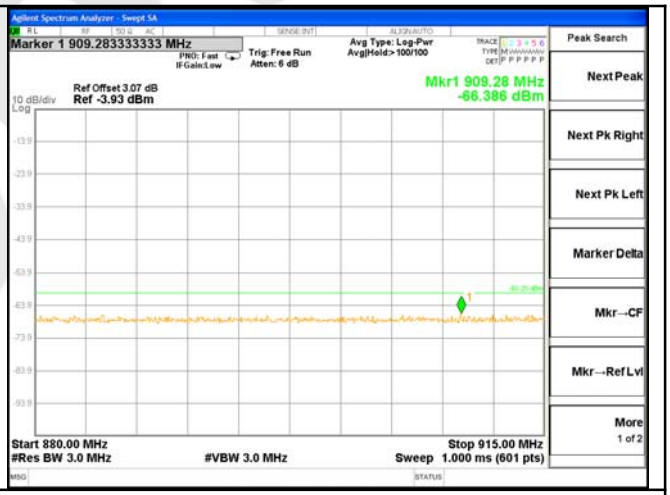


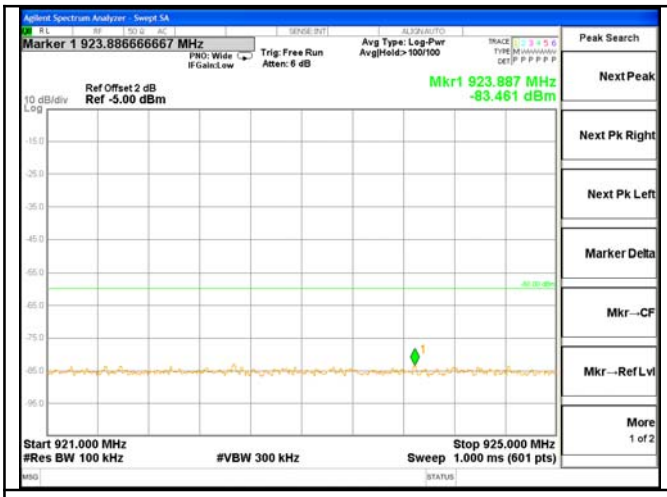
2.585 GHz – 2.69 GHz

WCDMA Band VIII:
General spurious emissions:

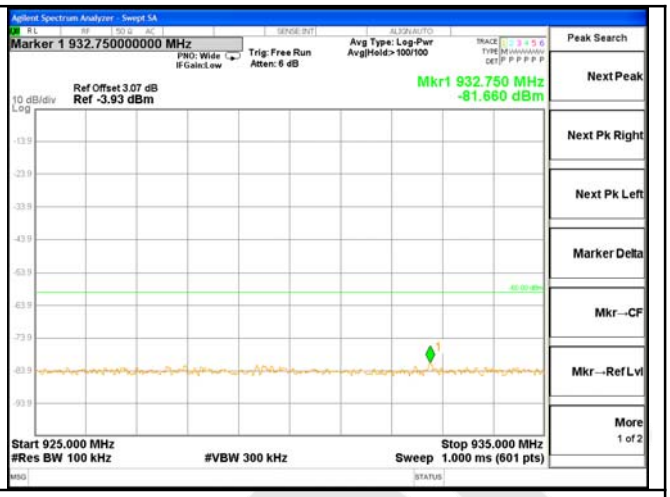
	
30 MHz – 1 GHz	1 GHz – 12.75 GHz

Additional spurious emissions:

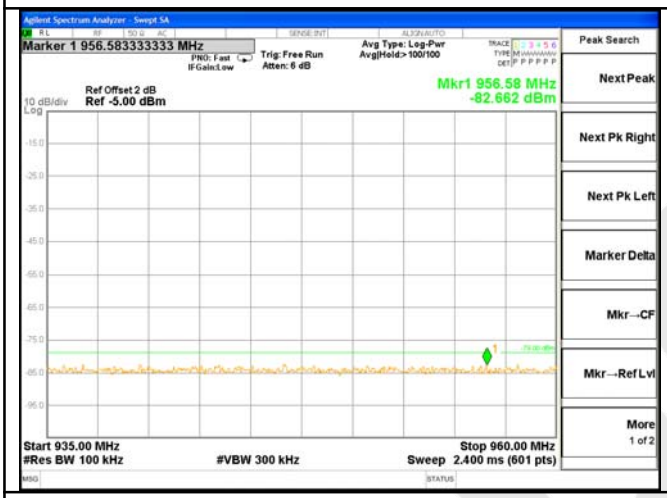
	
791 MHz – 821 MHz	880 MHz – 915 MHz



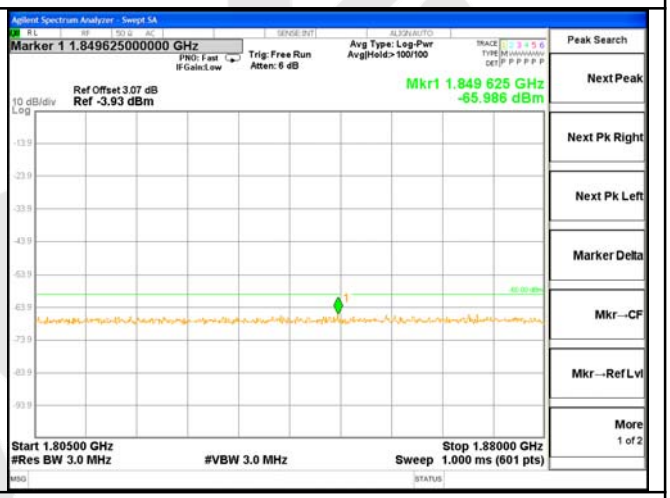
921 MHz – 925 MHz



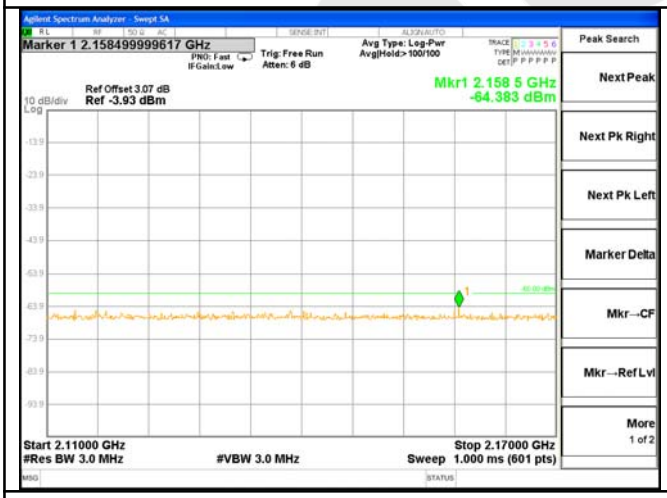
925 MHz – 935 MHz



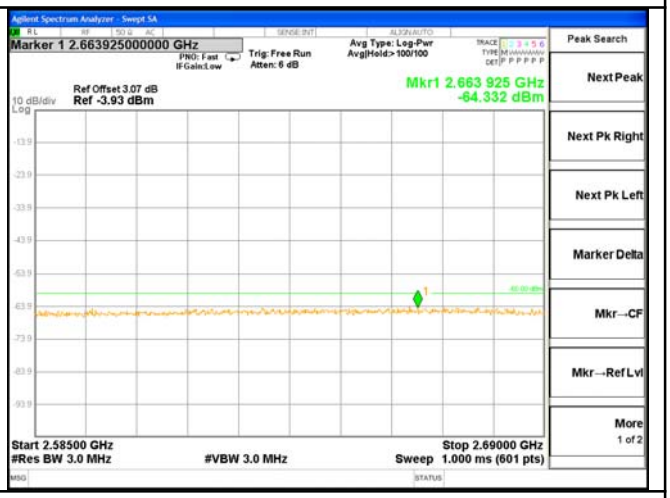
935MHz – 960MHz



1.805 GHz – 1.88 GHz



2.11 GHz – 2.17 GHz



2.585 GHz – 2.69 GHz

15. Out-of-synchronization handling of output power

Applicable Standard

According to EN 301 908-2 V7.1.1(2015-12) §4.2.11

When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold Qout , the UE shall shut its transmitter off within 40 ms. The quality level at the thresholds Qout correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2-1, a signal with the quality at the level Qout can be generated by a DPCCH_Ec/Ior ratio of -25 dB. The DL reference measurement channel 12,2 kbit/s is specified in TS 134 121-1 [2] and with static propagation conditions. The downlink physical channels, other than those specified in table 4.2.11.2-1, are as specified in TS 134 121-1 [2].

Table 4.2.11.2-1: DCH parameters for test of out-of-synchronization handling

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	-1	dB
I_{oc}	-60	dBm/3,84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See figure 4.2.11.2-1: Before point A: -16,6 for UEs not supporting enhanced performance type 1 for DCH -19,6 for UEs supporting enhanced performance type 1 for DCH After point A not defined	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See figure 4.2.11.2-1	dB
Information Data Rate	12,2	kbit/s

Figure 4.2.11.2-1 and table 4.2.11.2-2 show an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off.

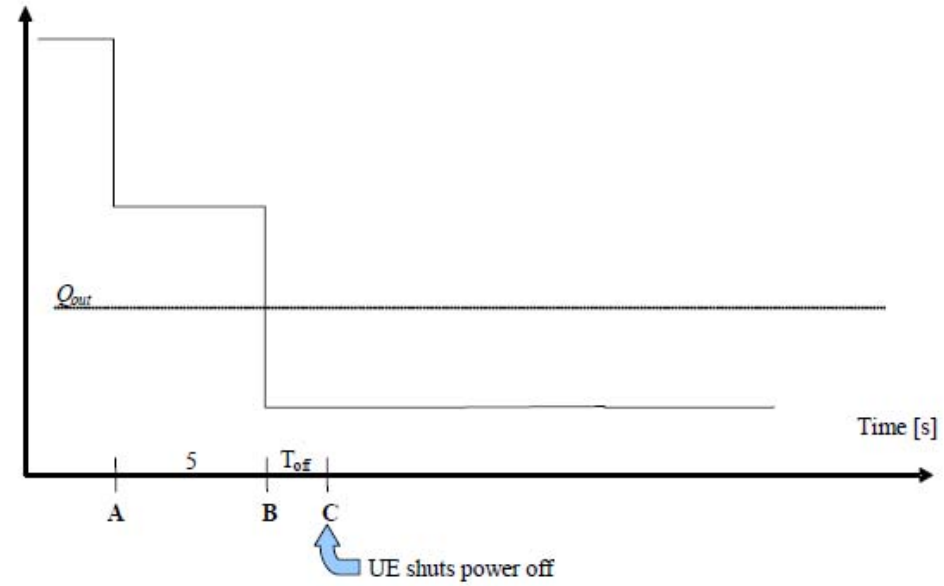


Figure 4.2.11.2-1: Conditions for out-of-synchronization handling in the UE

Table 4.2.11.2-2: Conditions for out-of-synchronization handling in the UE

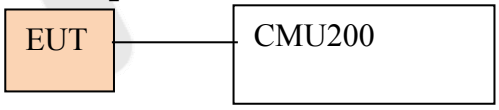
Clause from figure 4.2.11.2-1	DPCCH_Ec/Ior (UE, not supporting enhanced performance requirements type 1 for DCH)	DPCCH_Ec/Ior (UE, supporting enhanced performance requirements type 1 for DCH)	Unit
Before A	-16,6	-19,6	dB
A to B	-21,6	-24,6	dB
After B	-28,4	-31,4	dB

The requirements for the UE are that it shall shut its transmitter off before point C.
The UE transmitter is considered to be OFF if the measured RRC filtered mean power is less than -55 dBm.

Test Procedure

1) The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.
2) The SS controls the DPCCH_Ec/Ior ratio level according to table 4.2.11.2-2, 'A to B'.
3) The SS controls the DPCCH_Ec/Ior ratio level according to table 4.2.11.2-2, 'after B'. The SS waits 200 ms
and then verifies that the UE transmitter has been switched off.
4) The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

Test Setup



Test Data

Test Result: PASS.

16. Transmitter Adjacent Channel Leakage power Ratio (ACLR)

Applicable Standard

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.2-1.The requirements are applicable for all for the values of βc, βd, βhs, βec and βed defined in TS 125 214 [8].

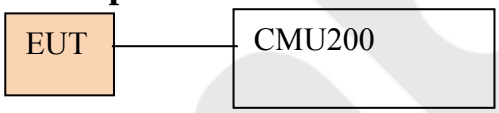
Table 4.2.12.2-1: UE ACLR

Power Class	Adjacent channel frequency relative to assigned channel frequency	ACLR limit
3	+5 MHz or -5 MHz	32,2 dB
3	+10 MHz or -10 MHz	42,2 dB
4	+5 MHz or -5 MHz	32,2 dB
4	+10 MHz or -10 MHz	42,2 dB
NOTE 1: The requirement shall still be met in the presence of switching transients. NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology. NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.		

Test Procedure

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reaches maximum level.
2) Measure the RRC filtered mean power.
3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
4) Calculate the ratio of the power between the values measured in 2) and 3) above.

Test Setup



Test Data

Test Result: PASS.

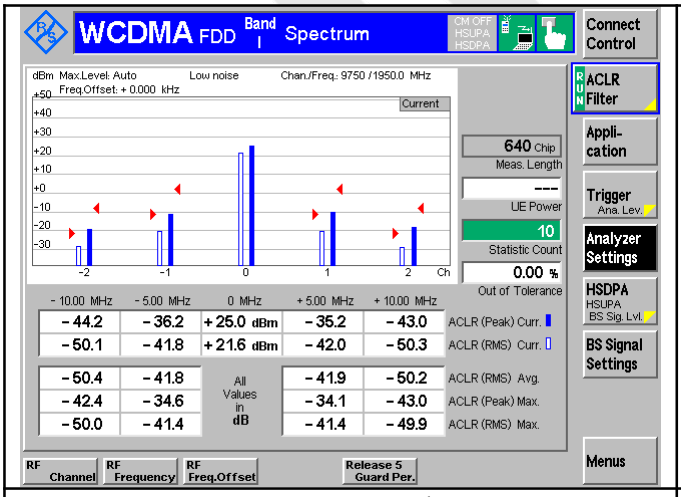
WCDMA Band I:

Test Conditions		Transmitter power			
Temperature (℃)	Voltage (V)	ACLR (-10MHz)	ACLR (-5MHz)	ACLR (+5MHz)	ACLR (+10MHz)
TN	VN	-50.4	-41.8	-41.9	-50.2
TL	VL	-50.5	-41.3	-41.7	-50.3
TL	VH	-50.1	-42.2	-42.3	-51.1
TH	VL	-50.6	-41.5	-42.7	-50.7
TH	VH	-50.7	-42.1	-41.9	-50.3

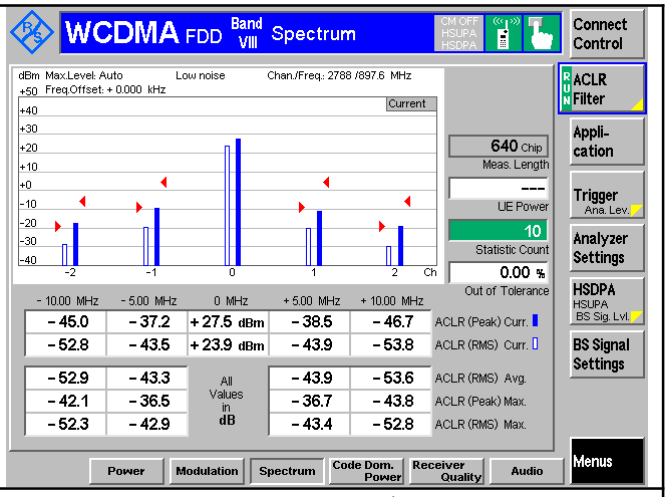
WCDMA Band VIII:

Test Conditions		Transmitter power			
Temperature (℃)	Voltage (V)	ACLR (-10MHz)	ACLR (-5MHz)	ACLR (+5MHz)	ACLR (+10MHz)
TN	VN	-52.9	-43.3	-43.9	-53.6
TL	VL	-52.7	-43.8	-44.2	-53.5
TL	VH	-53.2	-43.5	-44.3	-53.7
TH	VL	-52.9	-43.1	-43.7	-53.2
TH	VH	-53.6	-43.6	-44.1	-53.6

Test Plots Normal condition



WCDMA Band I



WCDMA Band VIII

APPENDIX I (TEST PHOTOGRAPHS)

1. Photo of Emission Test