

Annex 1: Measurement diagrams
To
TEST REPORT
No.: 6-0754/15-1-3c

According to:
FCC Regulations
Part 22, Part 24, Part 27

IC-Regulations
RSS-132 Issue 3, RSS-133 Issue 6,
RSS-139 Issue 3, RSS-Gen Issue 4

for

peiker acoustic GmbH & Co. KG

ATM-01 T1-US-4GW
Advanced Telecommunication Module

FCC-ID: QWY-ATM-T-522
IC: 6588A-ATMT522
PMN: ATM trunk version
HVIN ATM-01 T1-US-4GW

Laboratory Accreditation and Listings			
 DAkkS Deutsche Akkreditierungsstelle D-PL-12047-01-01	 MRA US-EU 0003	 Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3	 Voluntary Controls for Electromagnetic Emissions Reg. No.: R-2666 C-2914, T-1967, G-301
 WiFi ALLIANCE AUTHORIZED RF LABORATORY	 CTIA Authorized Test Lab LAB CODE 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
CETECOM GmbH Laboratory Radio Communications & Electromagnetic Compatibility Im Teelbruch 116 • 45219 Essen • Germany Registered in Essen, Germany, Reg. No.: HRB Essen 8984 Tel.: + 49 (0) 20 54 / 95 19-954 • Fax: + 49 (0) 20 54 / 95 19-964 E-mail: info@cetecom.com • Internet: www.cetecom.com			

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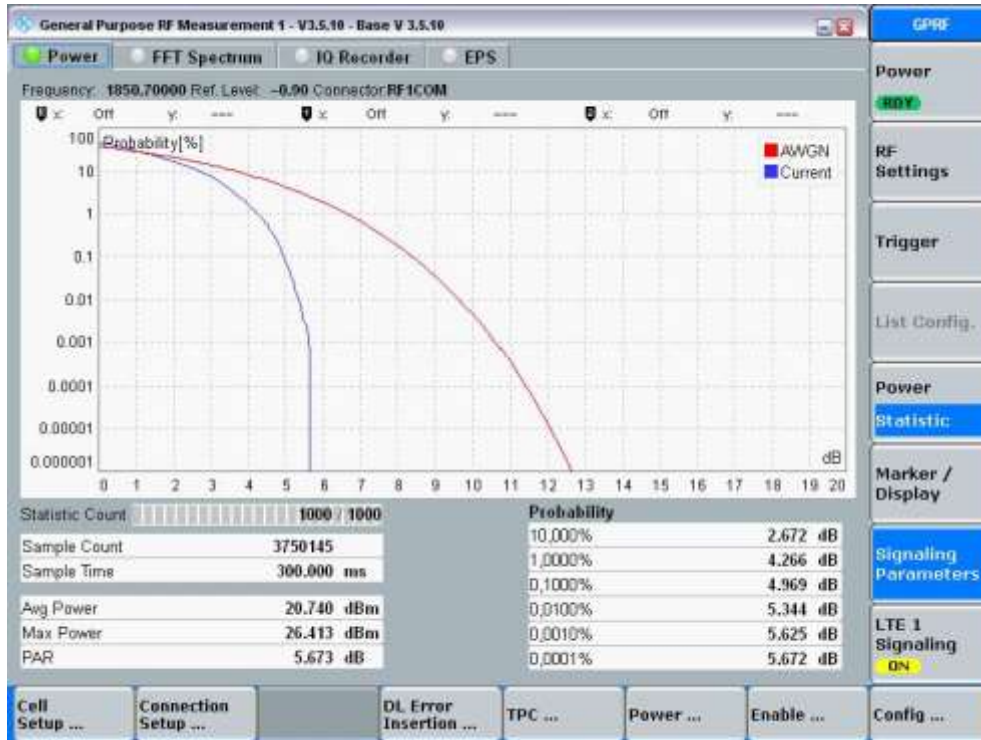
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1. PAPR value main RF-connector (CCDF-plots)

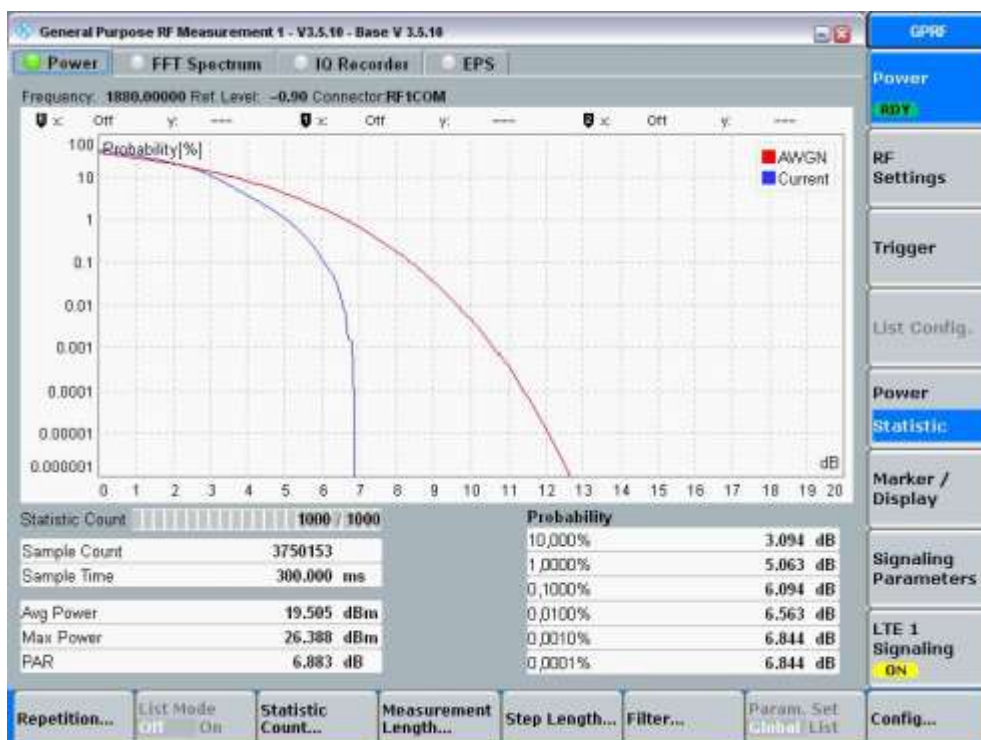
1.1. LTE Band 2

Worst-Case of each maximum Peak to Average power value was tested with the CCDF method

1.1.1. 1.4MHz signal bandwidth

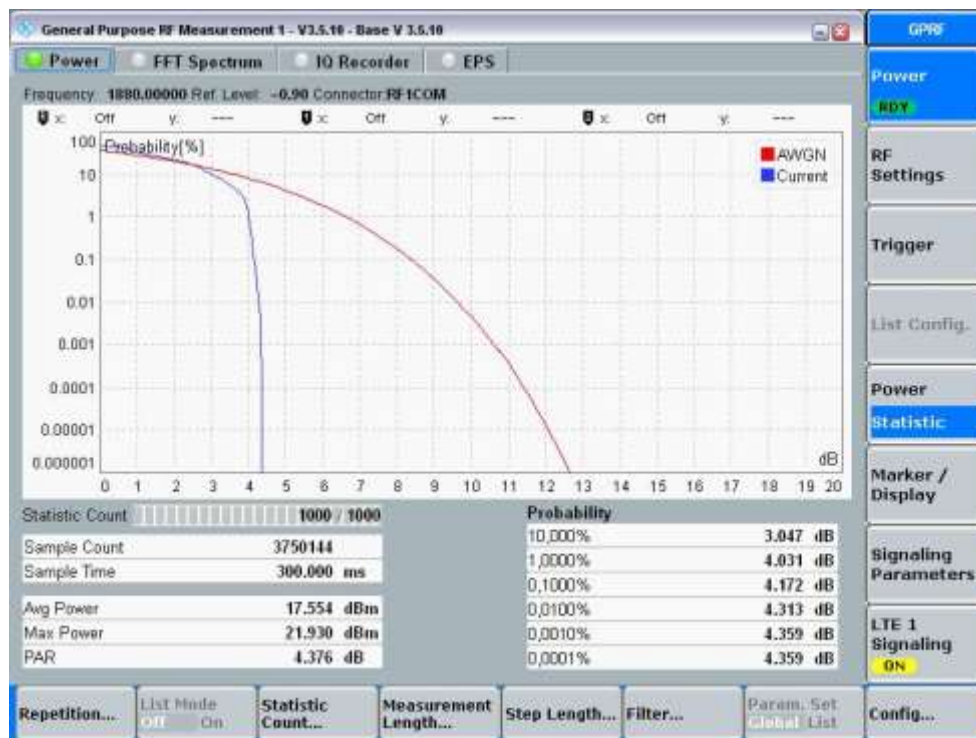


QPSK, Ch18607, 100% RB (6RBs)

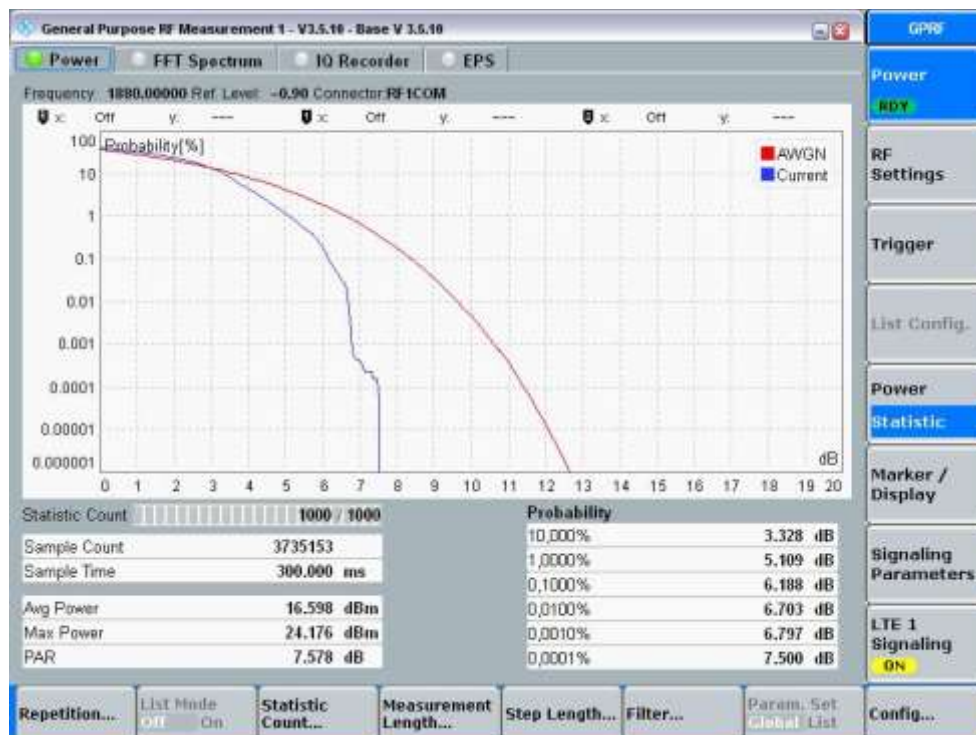


16-QAM, Ch18607, 100% RB (6RBs)

1.1.2. 3MHz signal bandwidth

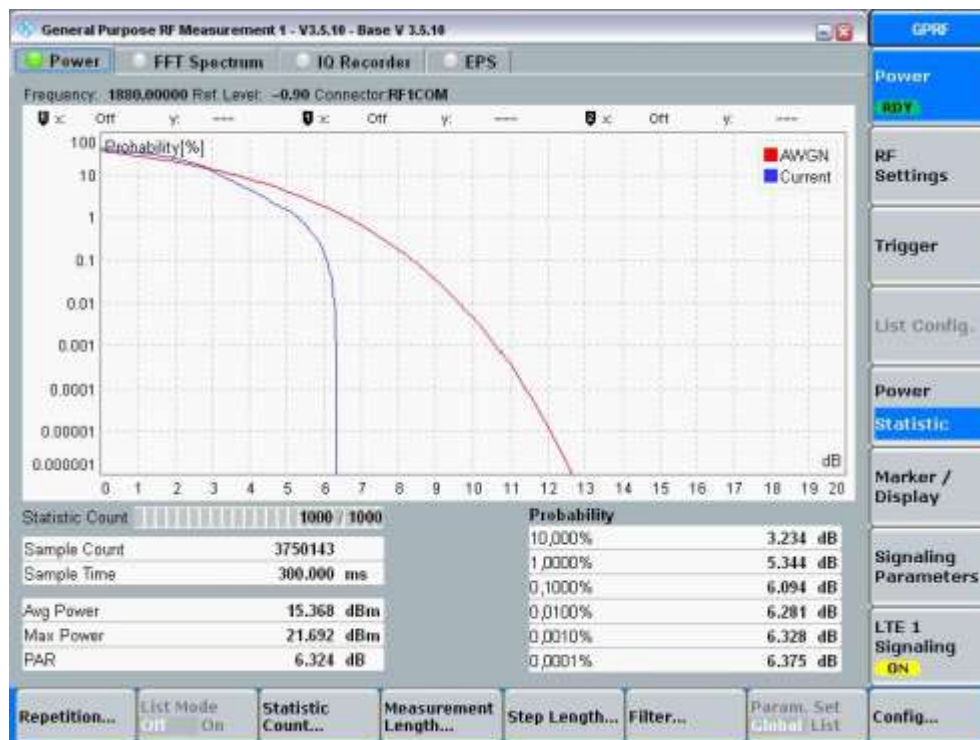


QPSK, Ch18900, 100% RB (15RBs)

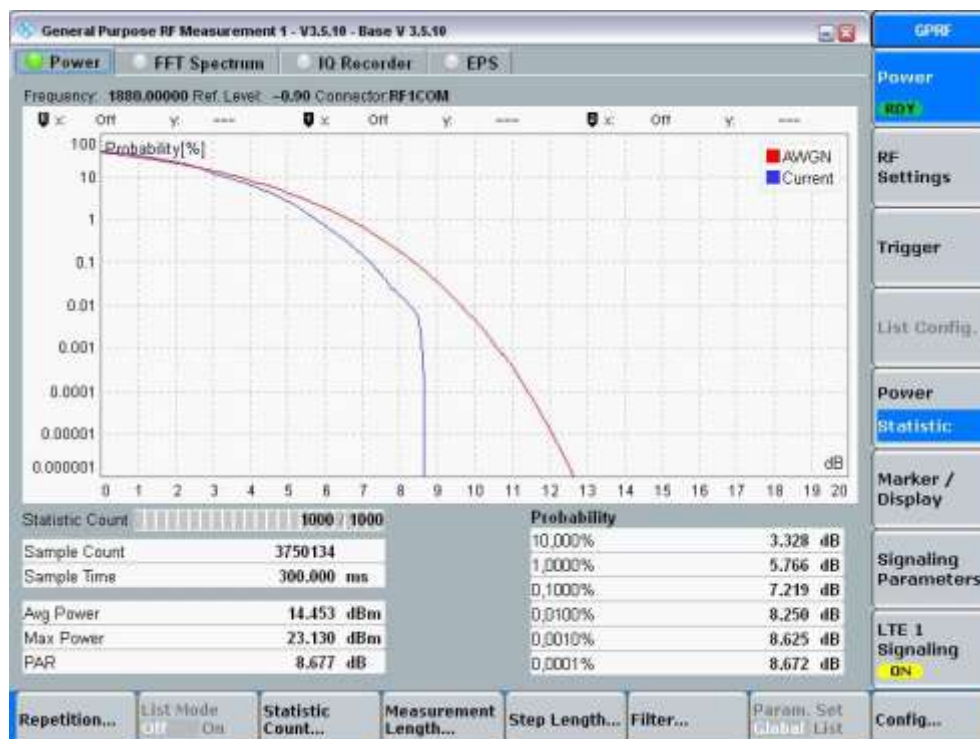


16-QAM, Ch18900, 100% RB (15RBs)

1.1.3. 5MHz signal bandwidth

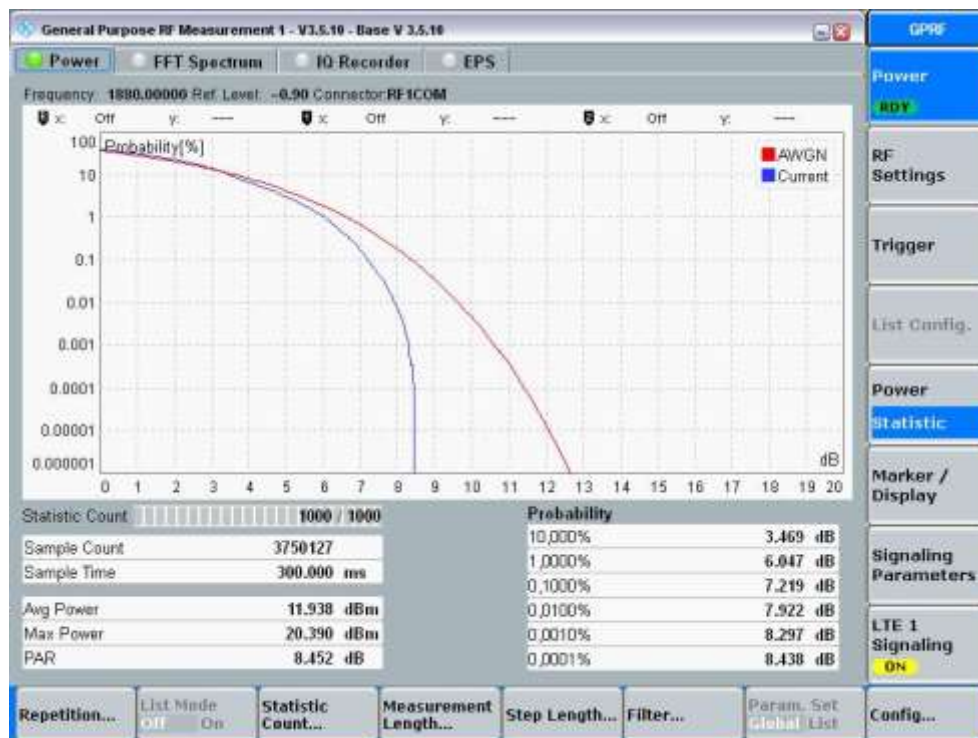


QPSK, Ch18900, 100% RB (6RBs)

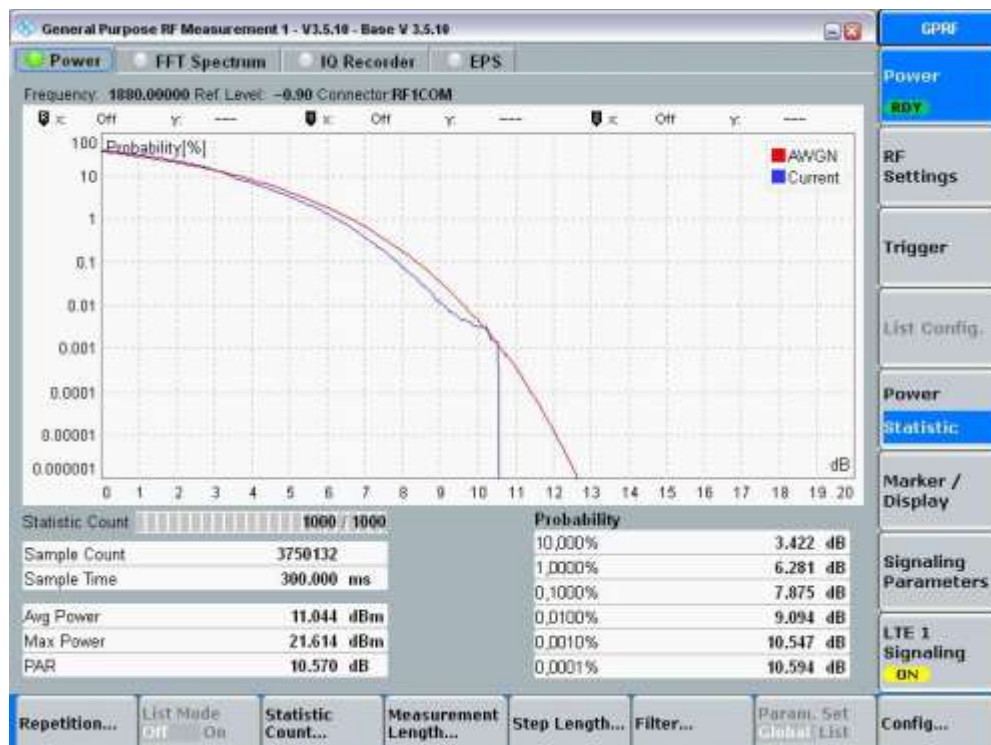


16-QAM, Ch18900, 100% RB (6RBs)

1.1.4. 10MHz signal bandwidth

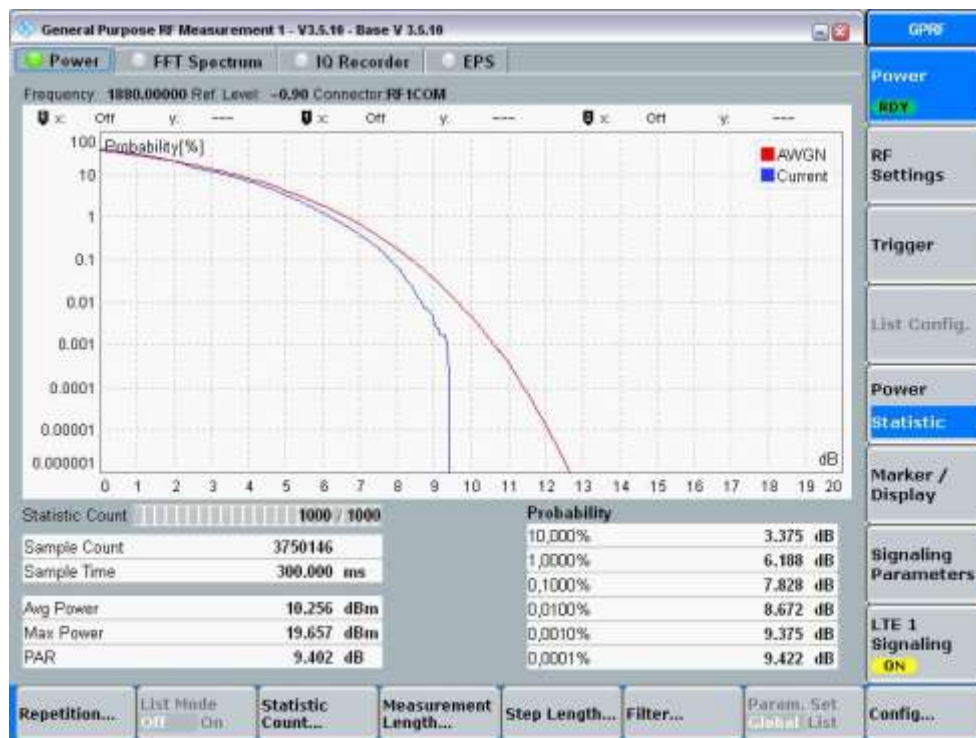


QPSK, Ch18900, 100% RB (50RBs)

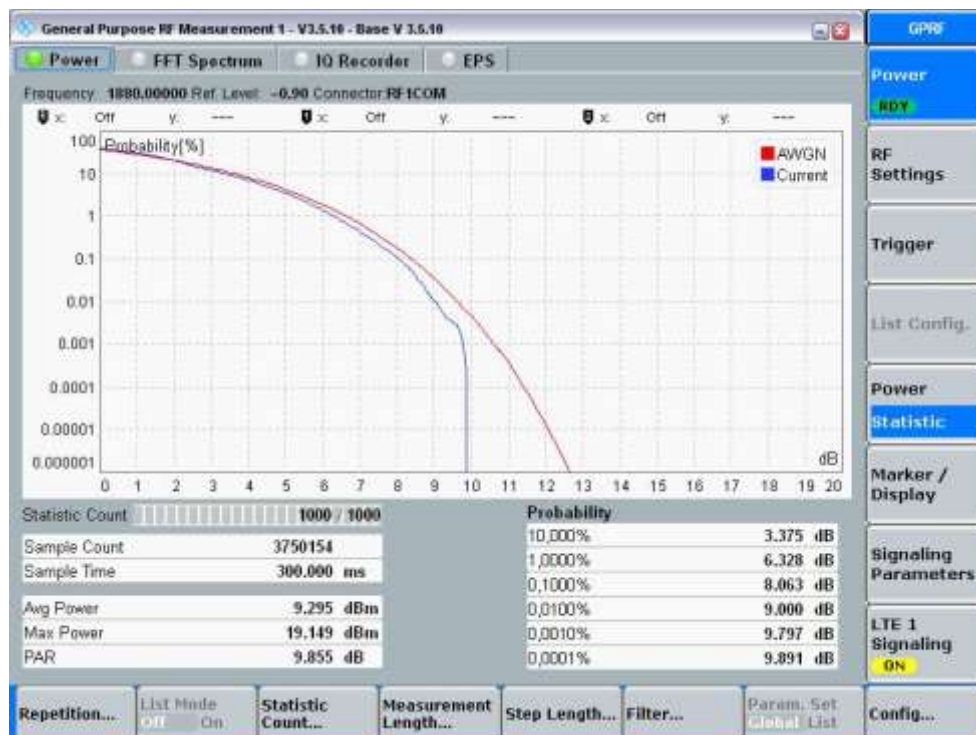


16-QAM, Ch18900, 100% RB (50RBs)

1.1.5. 15MHz signal bandwidth

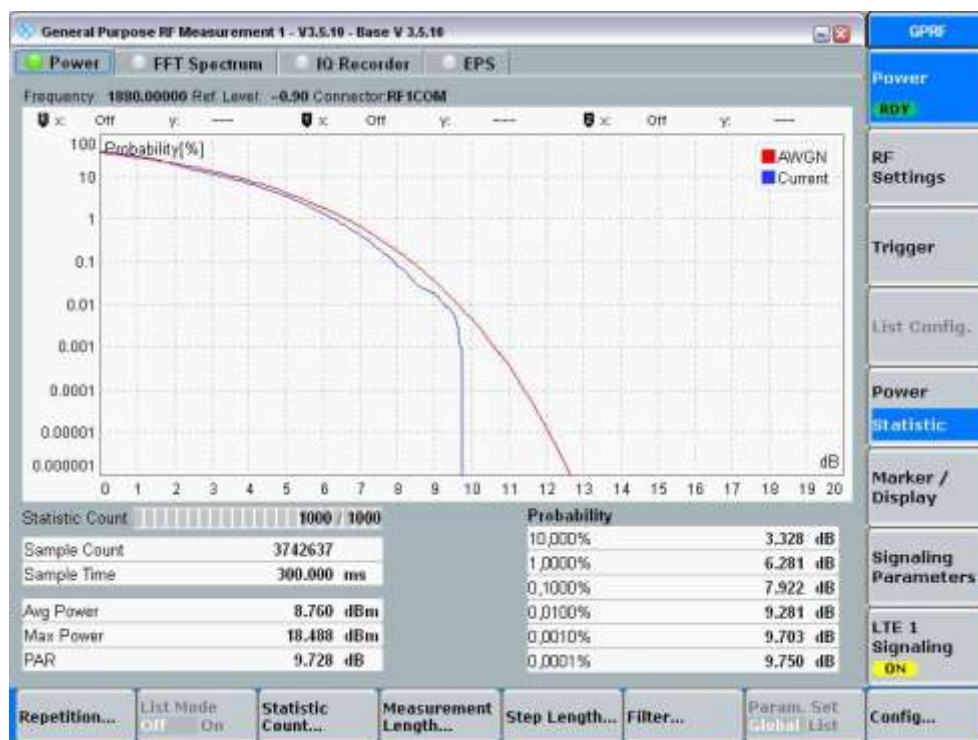


QPSK, Ch18900, 100% RB (75RBs)

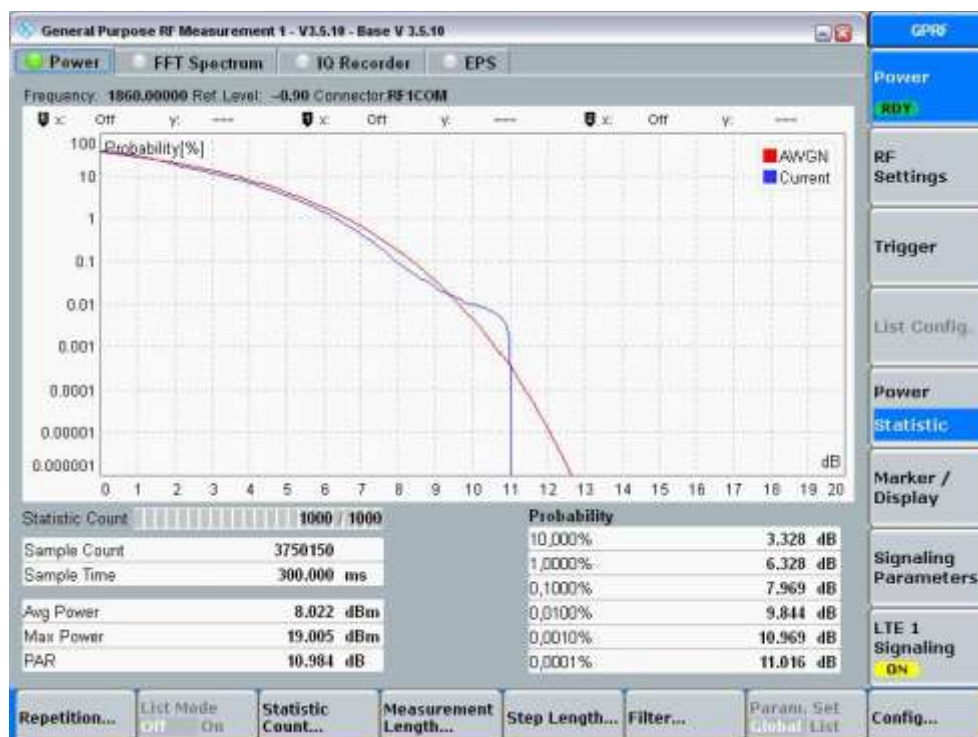


16-QAM, Ch18900, 100% RB (75RBs)

1.1.6. 20MHz signal bandwidth



QPSK, Ch18900, 100% RB (100RBs)

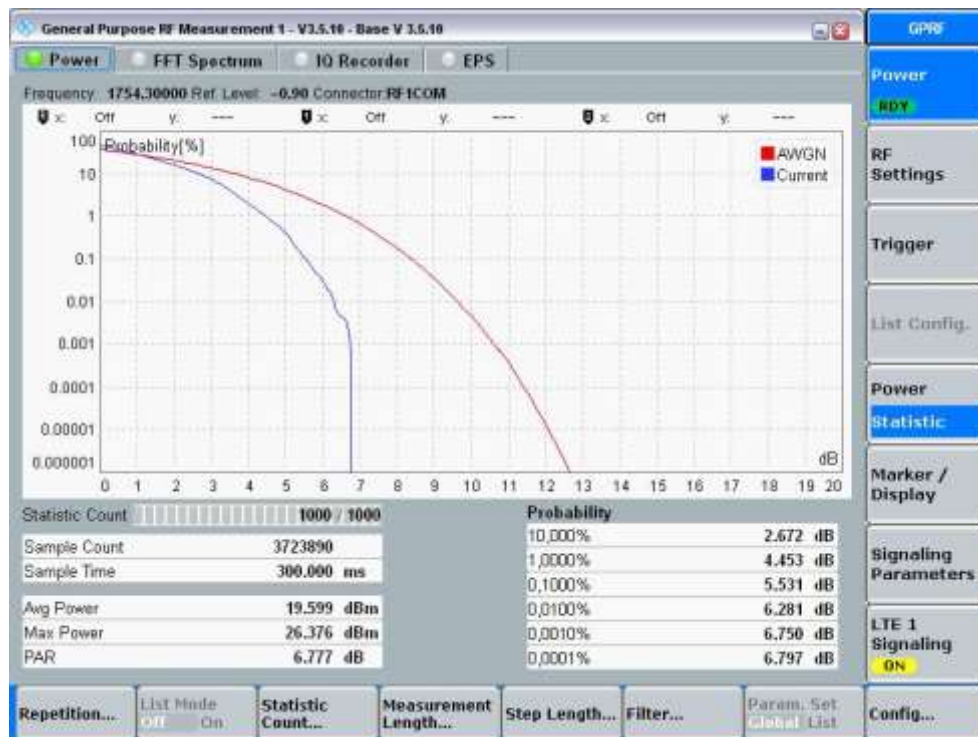


16-QAM, Ch18900, 100% RB (100RBs)

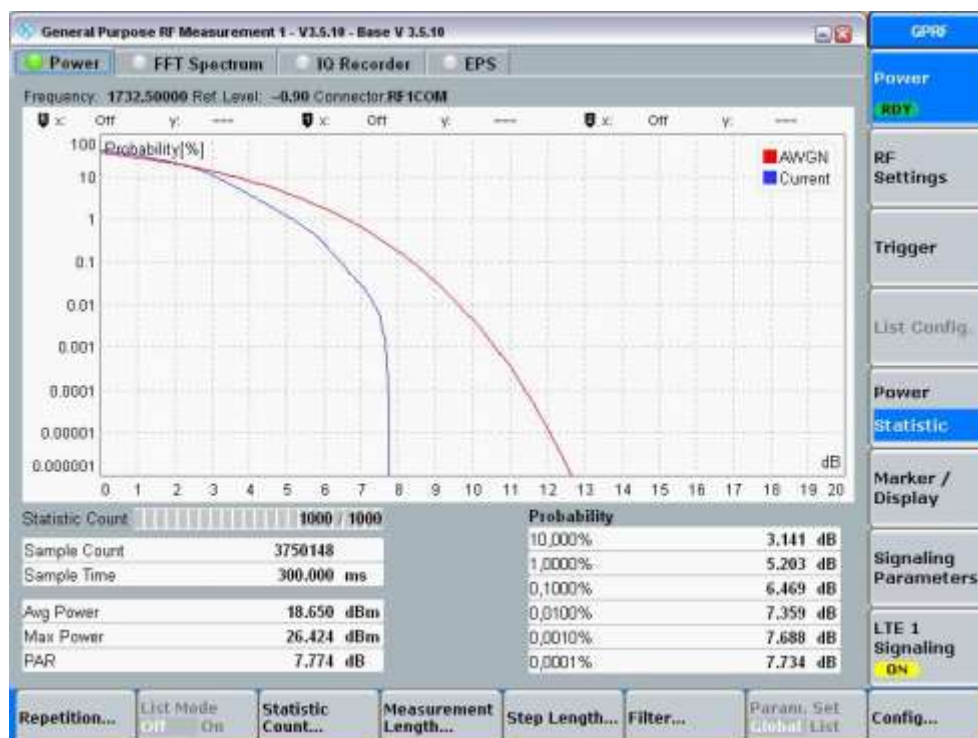
1.2. LTE Band 4

Worst-Case of each maximum Peak to Average power value was tested with the CCDF method

1.2.1. 1.4MHz signal bandwidth

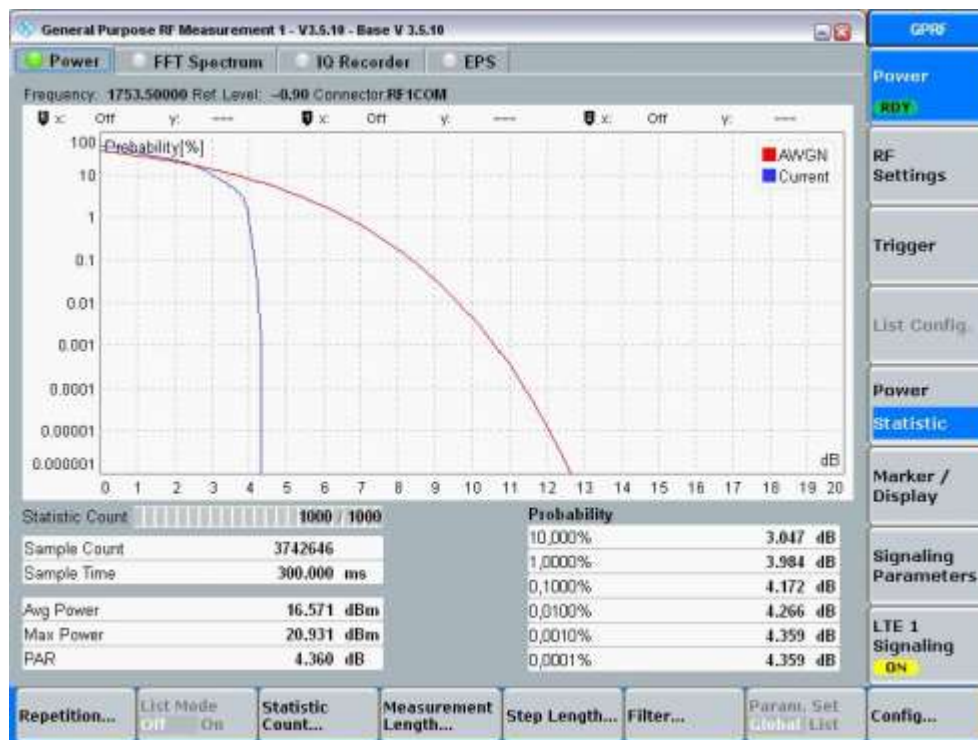


QPSK, Ch21393, 100% RB (6RBs)

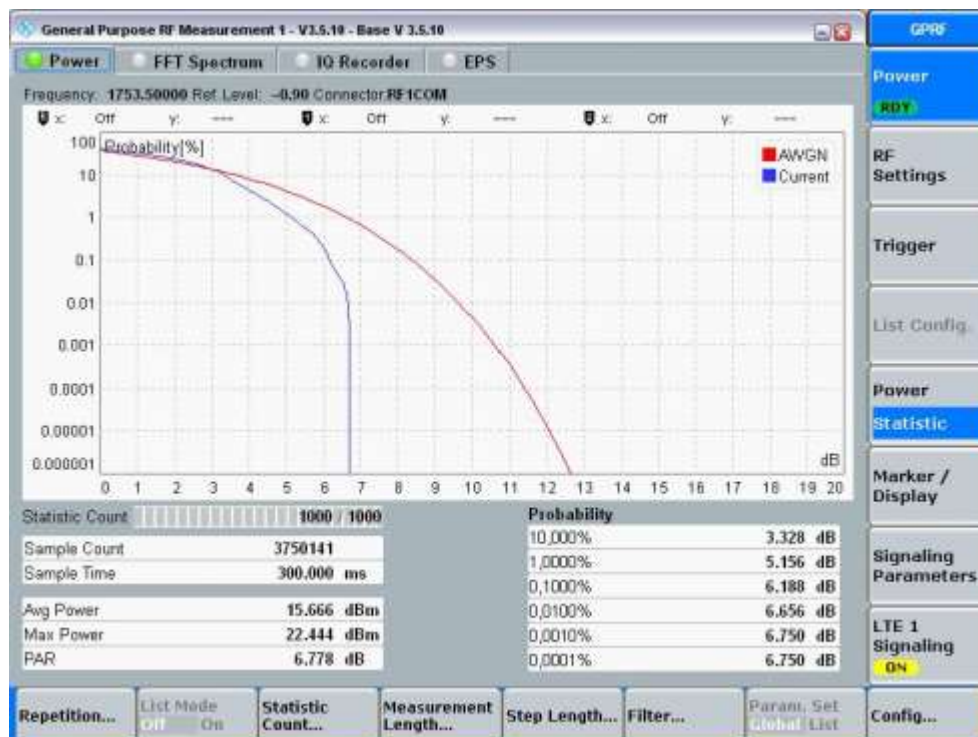


16-QAM, Ch20175, 100% RB (6RBs)

1.2.2. 3MHz signal bandwidth

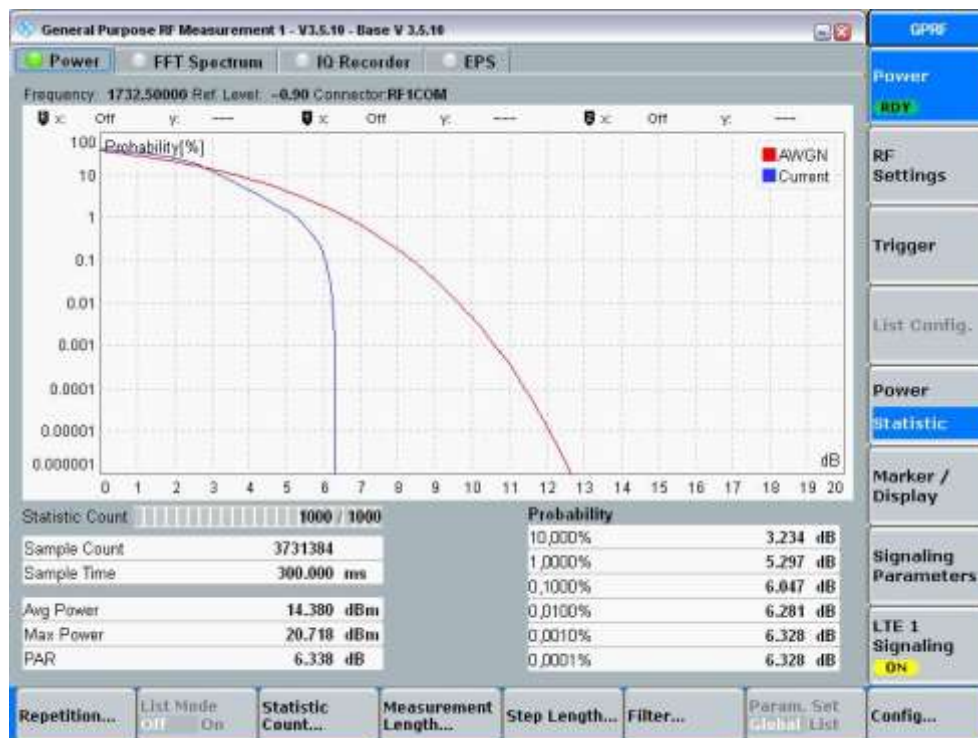


QPSK, Ch20385, 100% RB (15RBs)

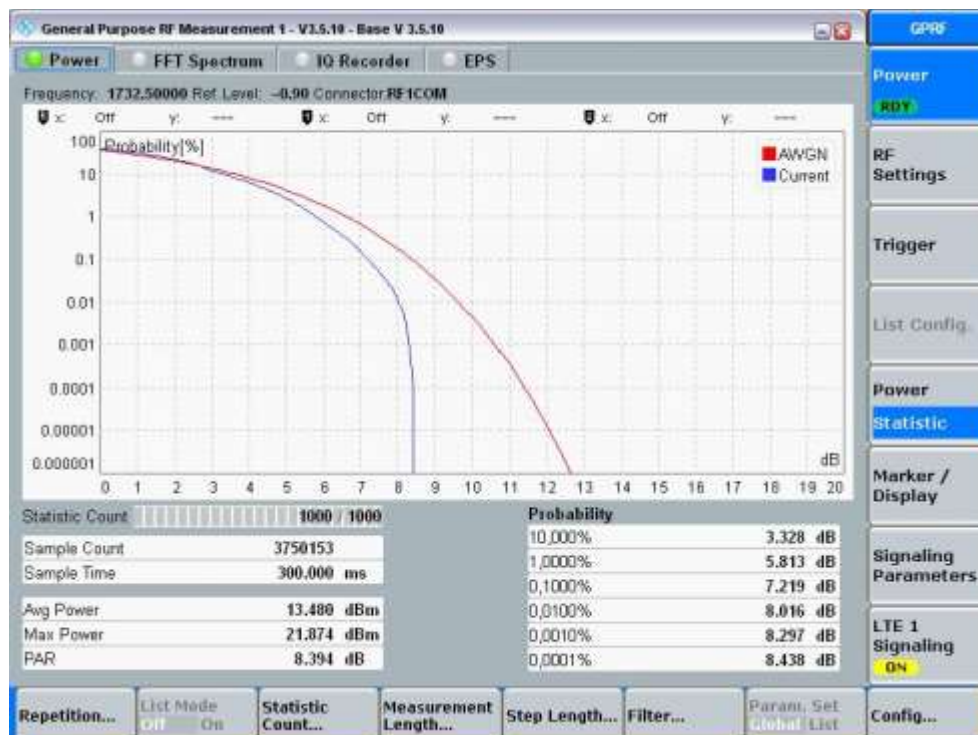


16-QAM, Ch20385, 100% RB (15RBs)

1.2.3. 5MHz signal bandwidth

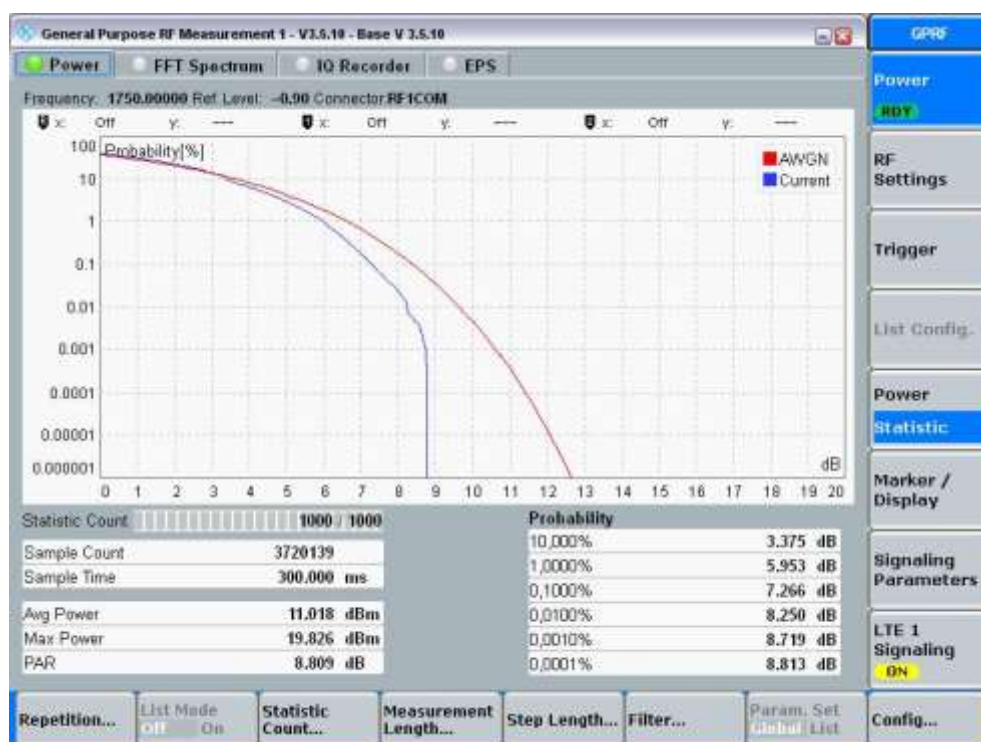


QPSK, Ch18900, 100% RB (25RBs)

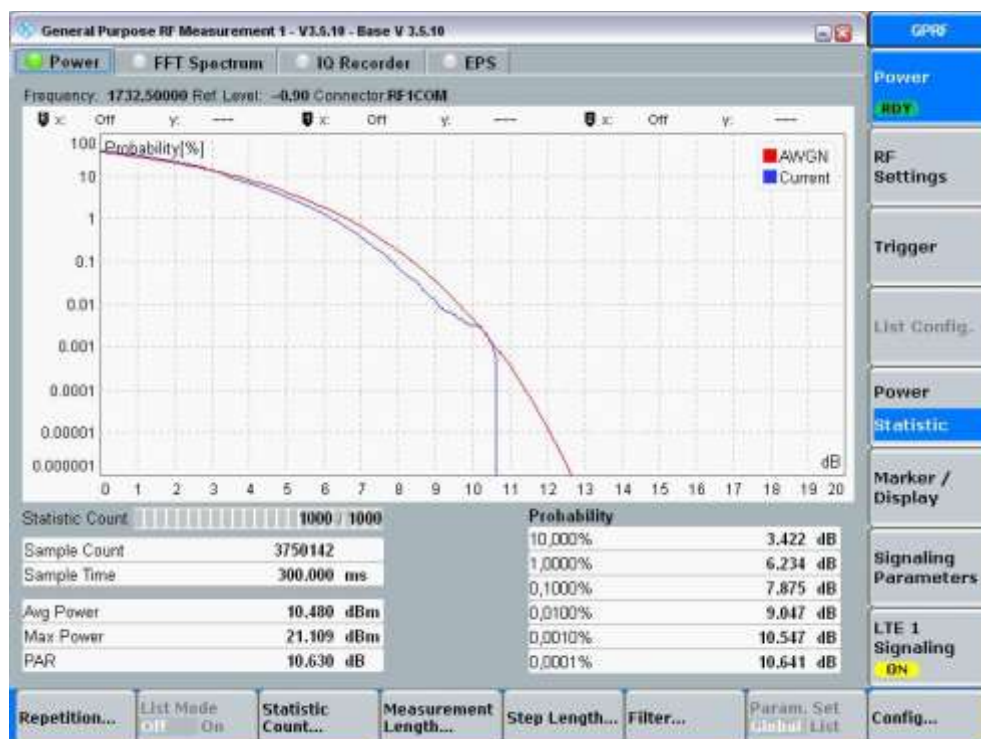


16-QAM, Ch18900, 100% RB (25RBs)

1.2.4. 10MHz signal bandwidth

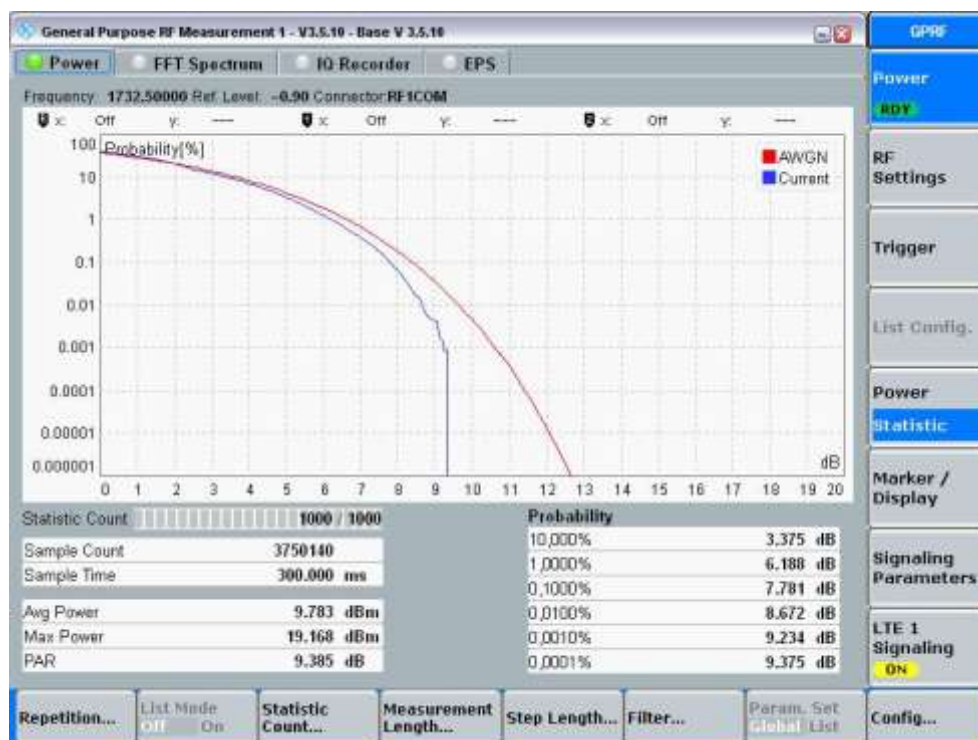


QPSK, Ch18900, 100% RB (50RBs)

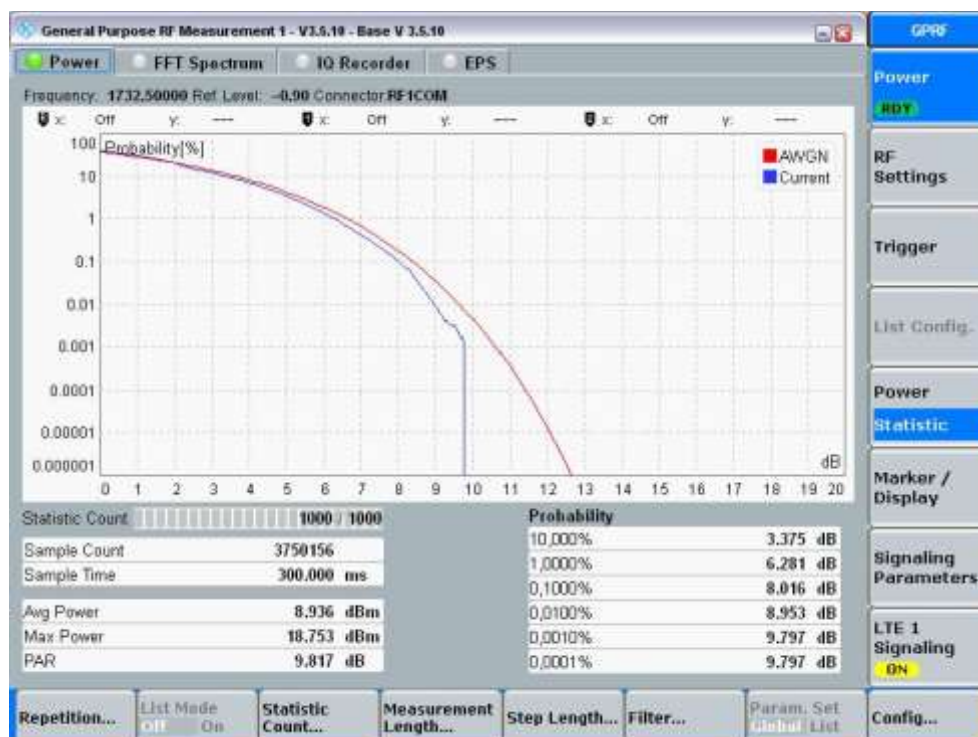


16-QAM, Ch18900, 100% RB (50RBs)

1.2.5. 15MHz signal bandwidth

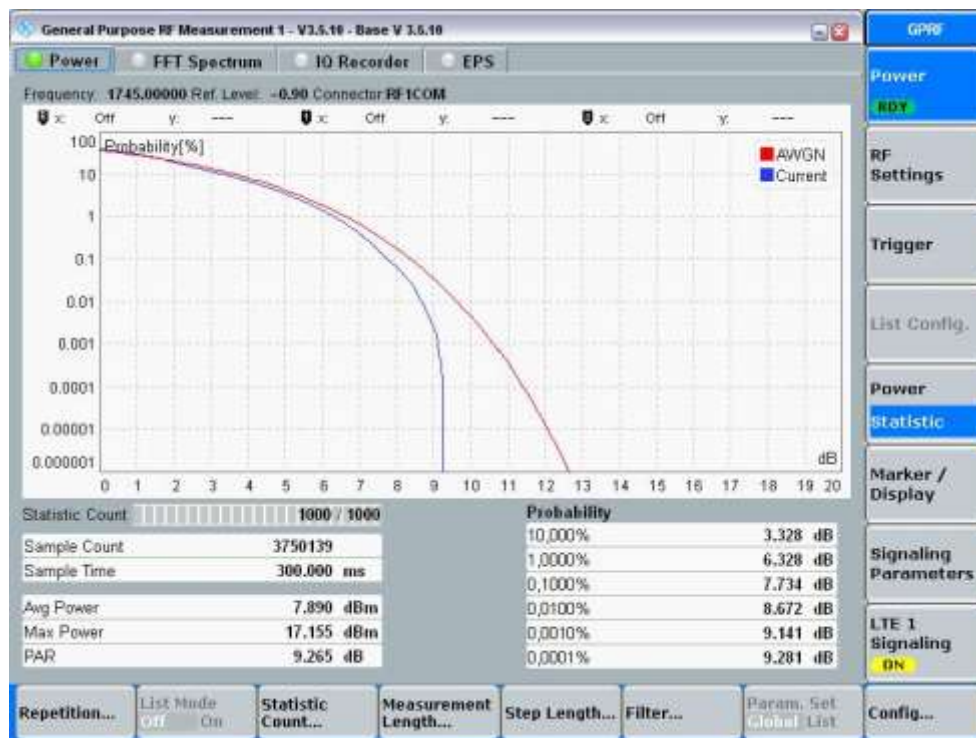


QPSK, Ch18900, 100% RB (75RBs)

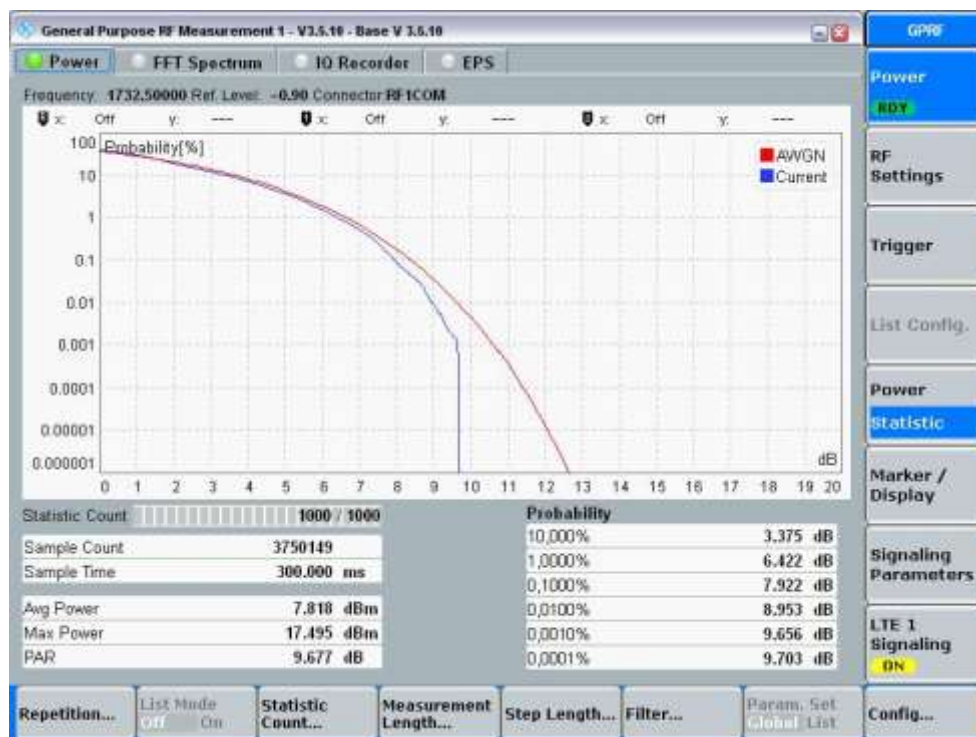


16-QAM, Ch18900, 100% RB (75RBs)

1.2.6. 20MHz signal bandwidth



QPSK, Ch18900, 100% RB (100RBs)

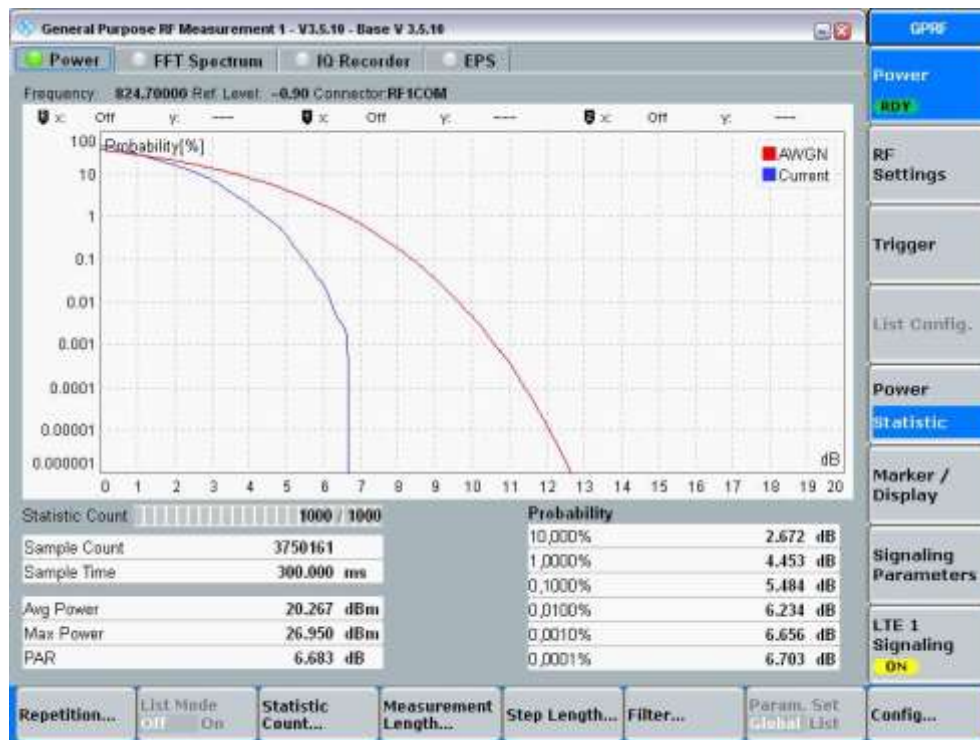


16-QAM, Ch18900, 100% RB (100RBs)

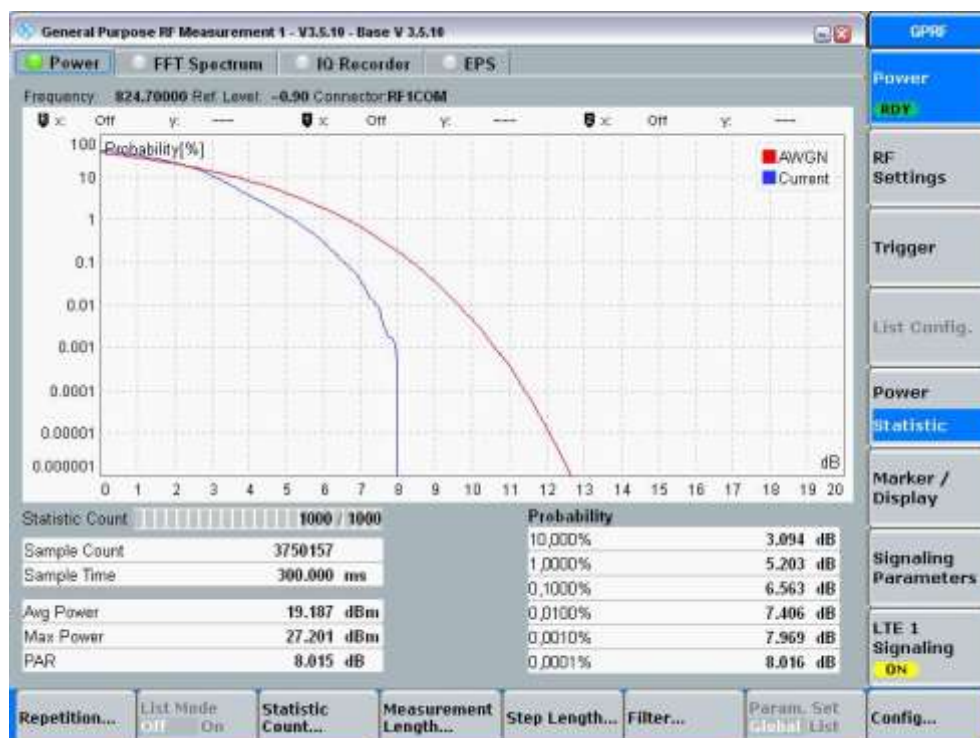
1.3. LTE Band 5

Worst-Case of each maximum Peak to Average power value was tested with the CCDF method

1.3.1. 1.4MHz signal bandwidth

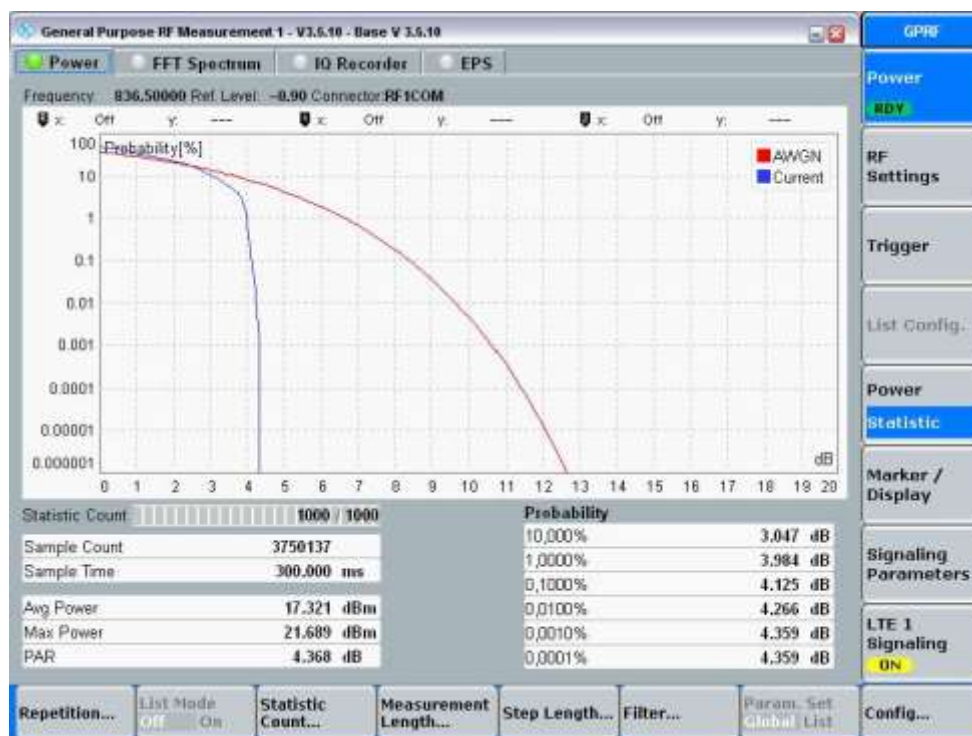


QPSK, Ch20407, 100% RB (6RBs)

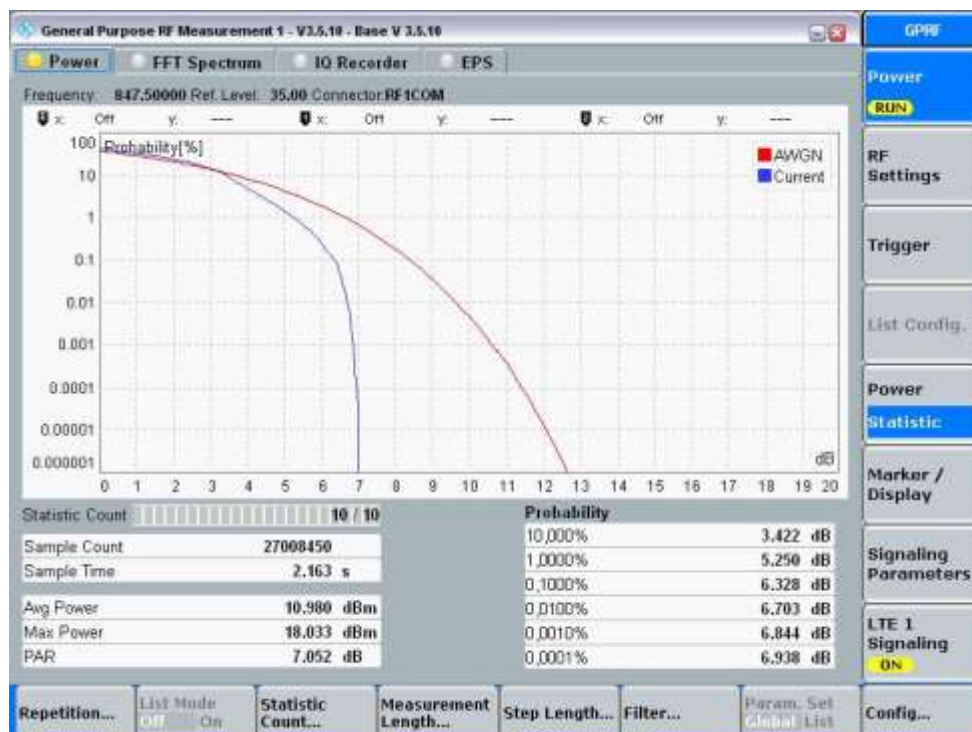


16-QAM, Ch20407, 100% RB (6RBs)

1.3.2. 3MHz signal bandwidth

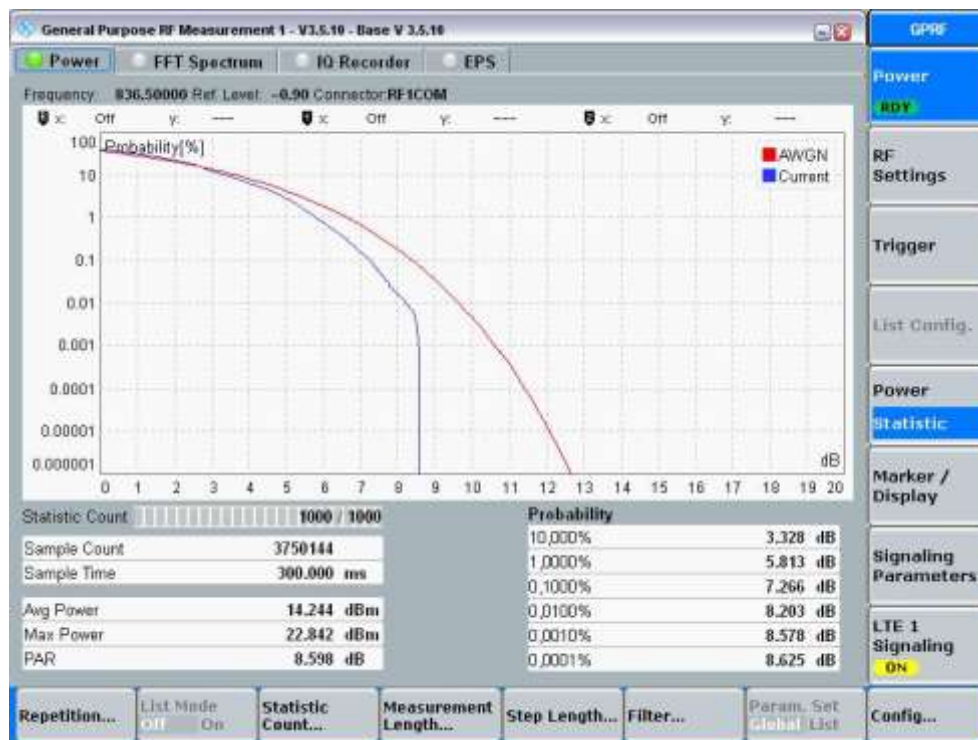


QPSK, Ch20525, 100% RB (15RBs)

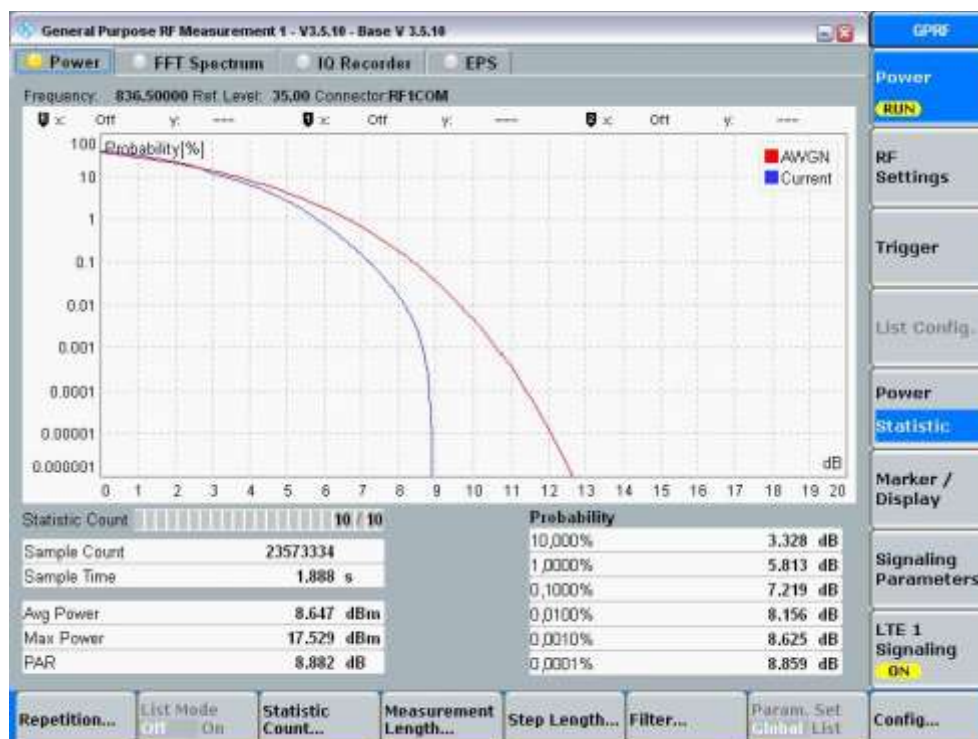


16-QAM, Ch20635, 100% RB (15RBs)

1.3.3. 5MHz signal bandwidth

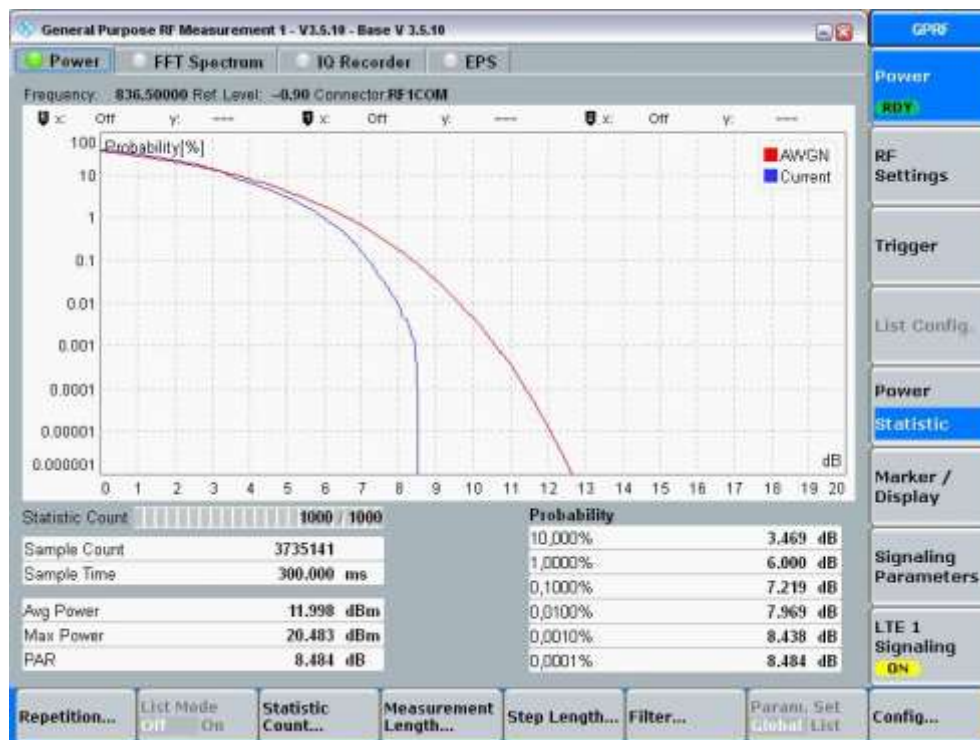


QPSK, Ch20525, 100% RB (25RBs)

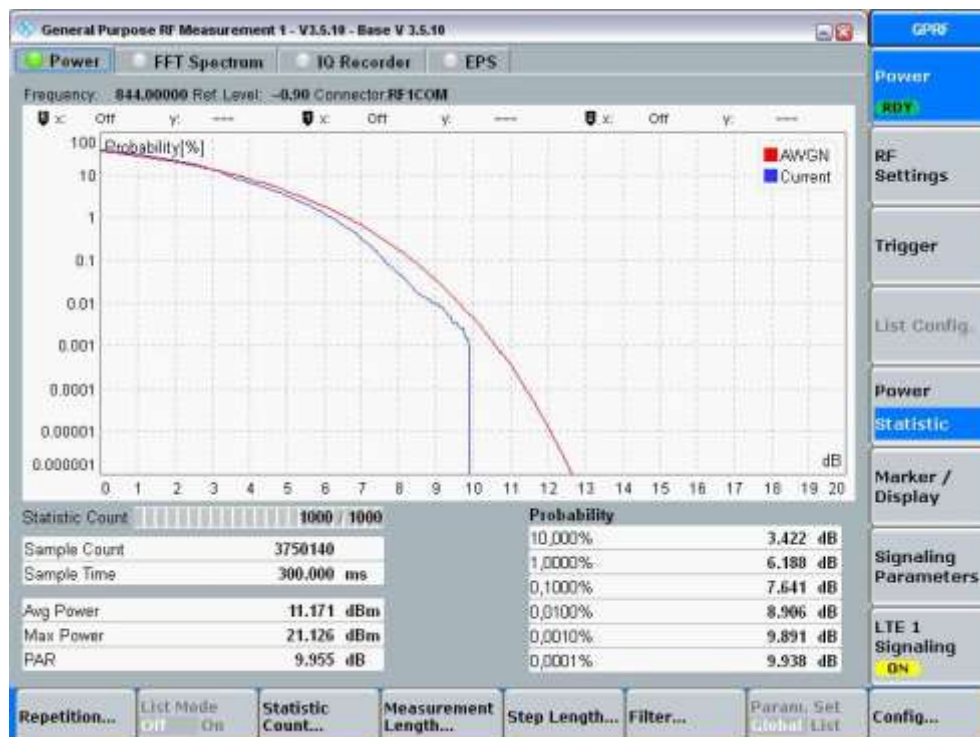


16-QAM, Ch20525, 100% RB (25RBs)

1.3.4. 10MHz signal bandwidth



QPSK, Ch20525, 100% RB (50RBs)

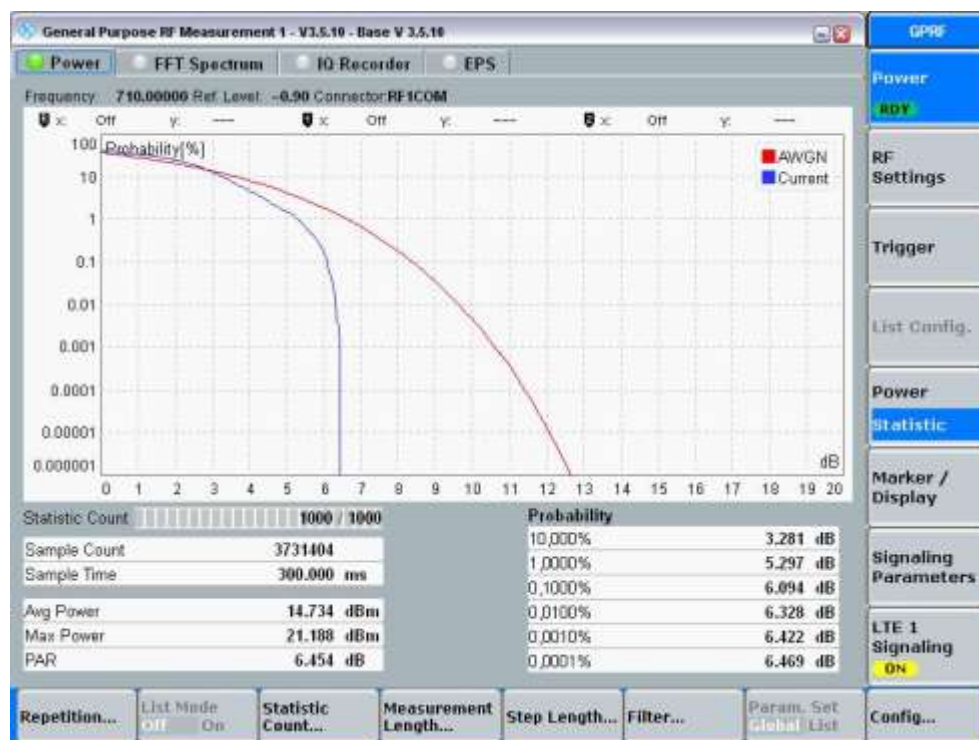


16-QAM, Ch20600, 100% RB (50RBs)

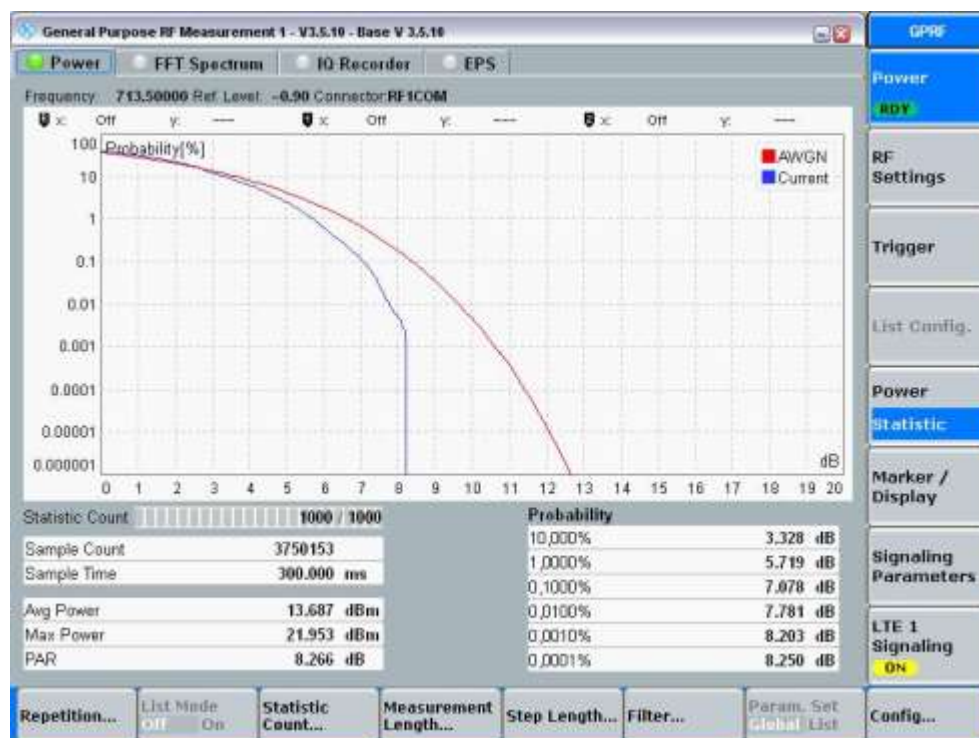
1.4. LTE Band 17

Worst-Case of each maximum Peak to Average power value was tested with the CCDF method

1.4.1. 5MHz signal bandwidth

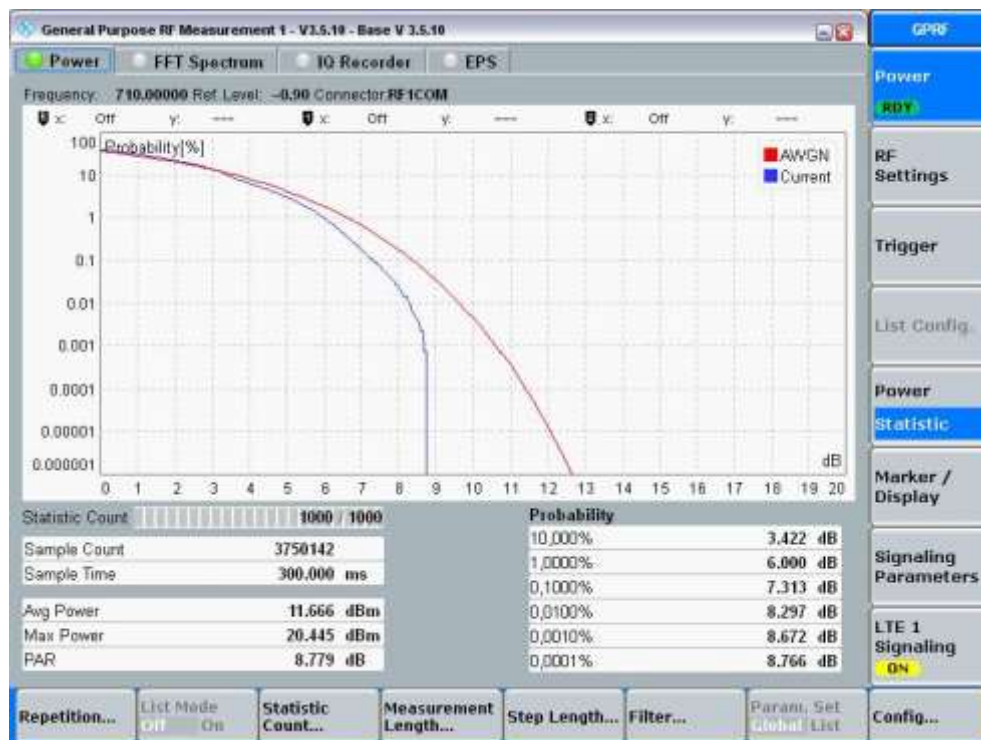


QPSK, Ch23790, 100% RB (25RBs)

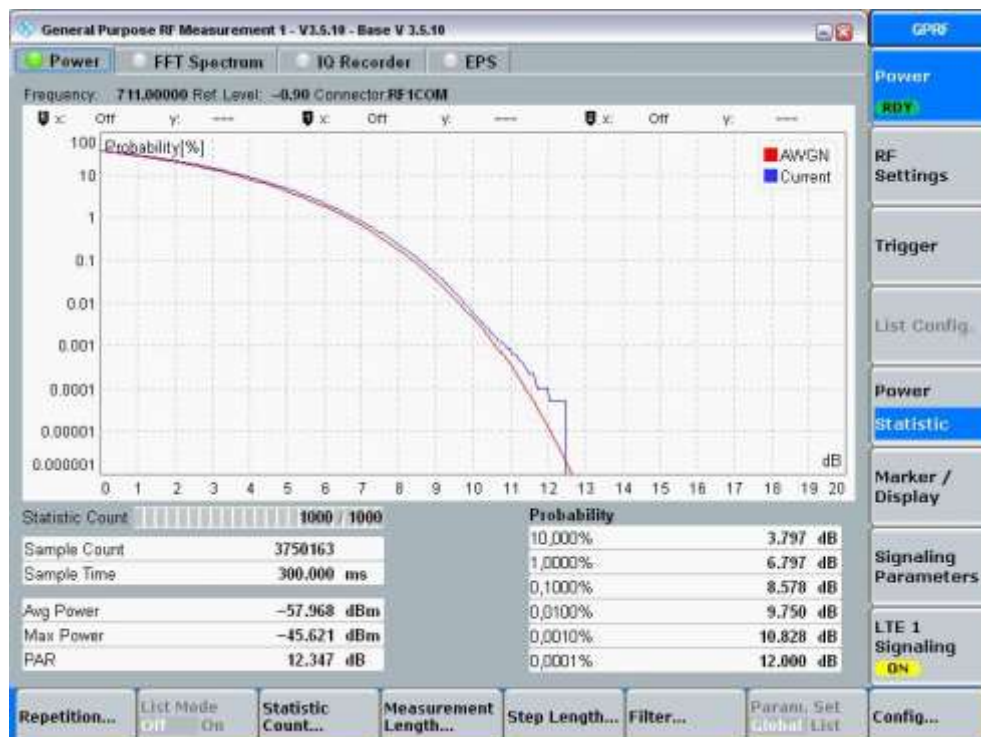


16-QAM, Ch23825, 100% RB (25RBs)

1.4.2. 10MHz signal bandwidth



QPSK, Ch23790, 100% RB (50RBs)



16-QAM, Ch23800, 100% RB (50RBs)

2. Radiated spurious emissions main RF-connector

2.1. Spurious emissions radiated (LTE Band 2)

8.20_RSE_R_CH18607_BW_1_4

Common Information

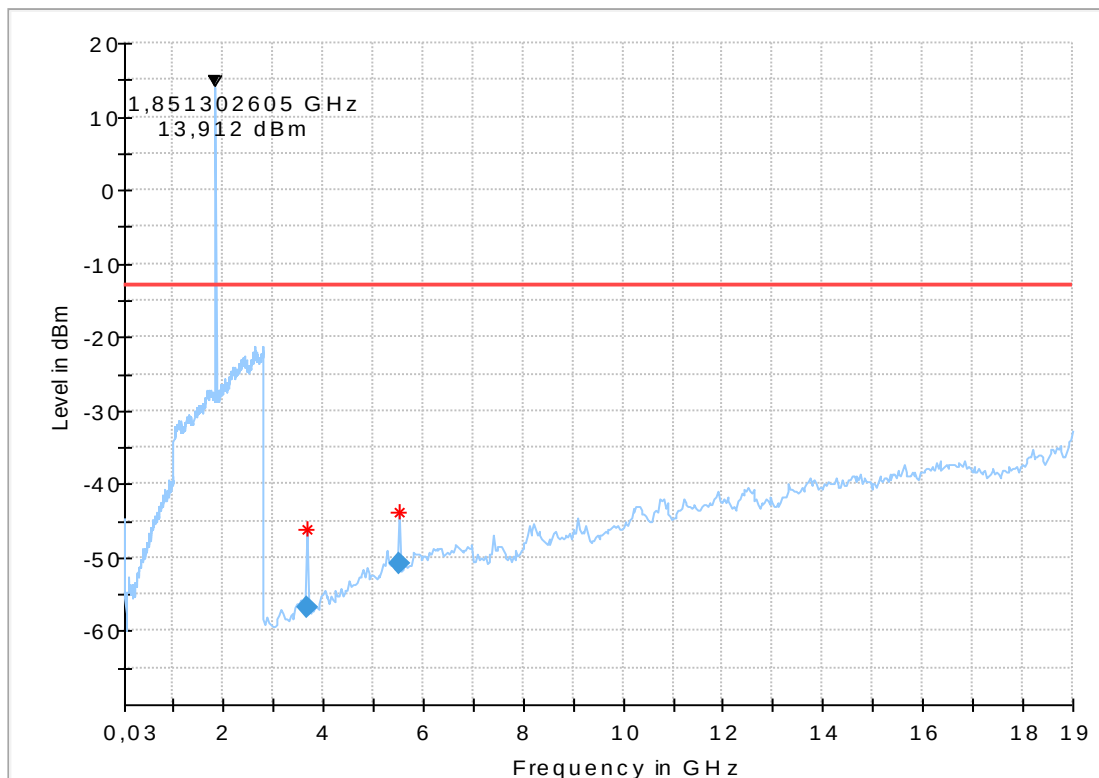
Test Description:	Radiated Spurious Emissions UMTS FDDII
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24/RSS-133
Operating Mode:	UE allocated channel 18607; bw 1.4MHz; 1RB Low, QPSK
Environmental Conditions:	Humidity: 53%rH; Temperature: 22:3°C
Operator:	MFr

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW

HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3679.534068	-56.70	-	43.70	10000.0	1000.000	H	90.0	90.0	-94.9
5517.560120	-50.86	-	37.86	10000.0	1000.000	V	45.0	45.0	-89.9

2.2. Spurious emissions radiated (LTE Band 4)

Diagram No.: 8.40_RSE_R_CH19957_BW_1_4

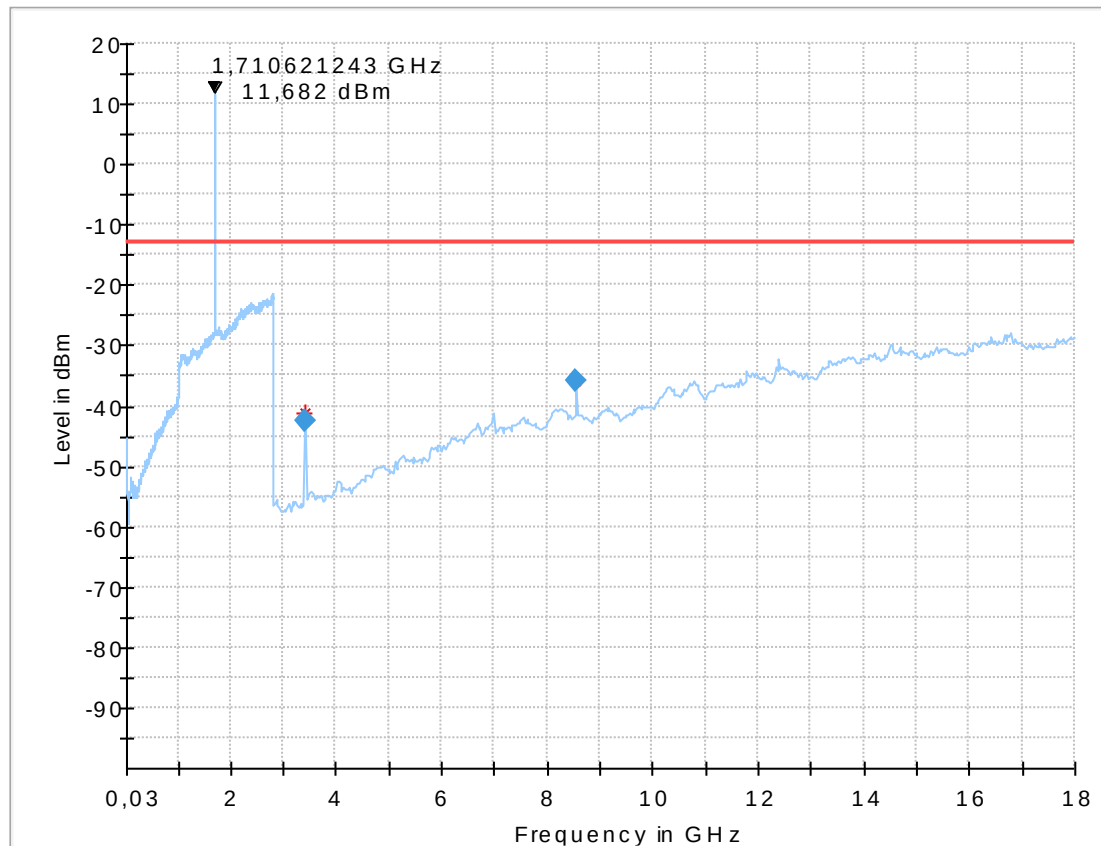
Common Information

Test Description:	Radiated Spurious Emissions LTE Band 4
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test specification:	FCC Part 27.917/RSS-139
Operating Mode:	MS allocated channel 19957: bw:1.4MHz 1RB Low, QPSK
Environmental Conditions:	Humidity: 53%rH; Temperature: 22:3°C
Operator Name:	MFr

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW

HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3420.370742	-42.58	-13.00	44.24	155.0	H	25.0	90.0	-95.0
8554.619239	-35.73	-13.00	22.73	155.0	V	9.0	90.0	-82.8

2.3. Spurious emissions radiated (LTE Band 5)

8.50_RSE_Ch20407_1_4MHz_QPSK_1RB_low

Common Information

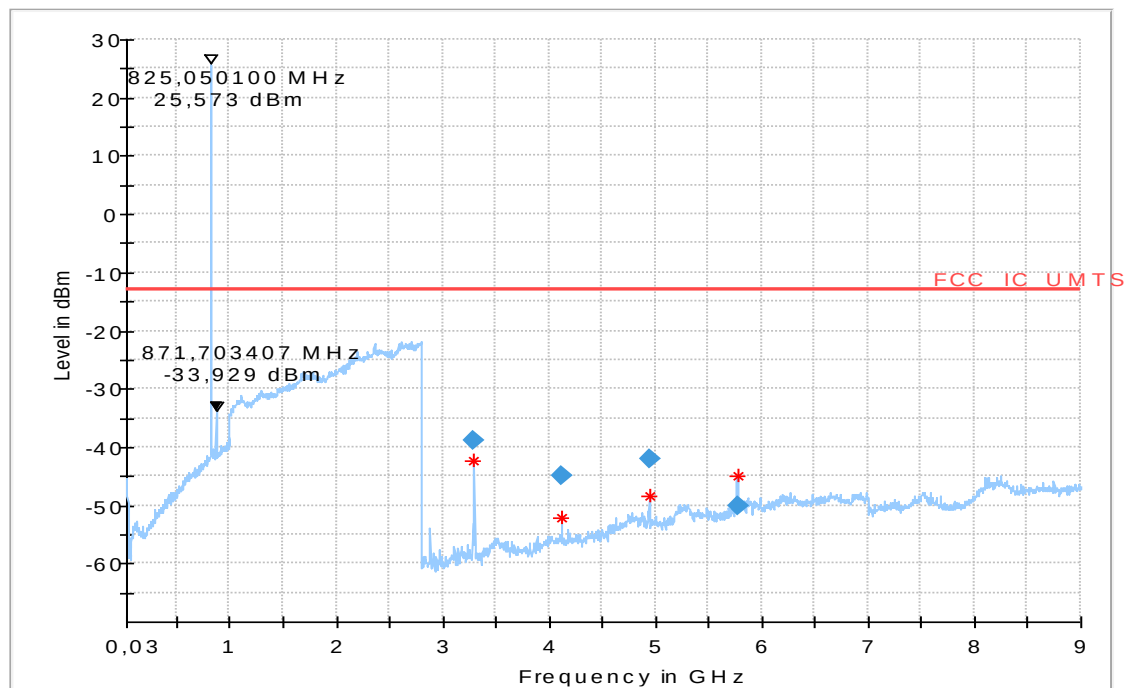
Test Description:	Radiated Spurious Emissions LTE FDD Band 5
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917(a) / RSS-132: Issue 3
Operating Mode:	UE allocated channel 20407, BW=1.4MHz, QPSK, 1 RB Low
Environmental Conditions:	Humidity: 53%rH; Temperature: 22:3°C
Operator:	Mra

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW

HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3297.124248	-38.88	-13.00	25.88	10000.0	1000.000	V	103.0	90.0	-95.7
4121.212425	-45.04	-13.00	32.04	10000.0	1000.000	V	177.0	90.0	-93.3
4944.759519	-42.18	-13.00	29.18	10000.0	1000.000	V	179.0	90.0	-90.9
5769.889780	-50.10	-13.00	37.10	10000.0	1000.000	V	311.0	90.0	-88.7

2.4. Spurious emissions radiated (LTE Band 17)

8.172_RSE_R_CH23790_BW5

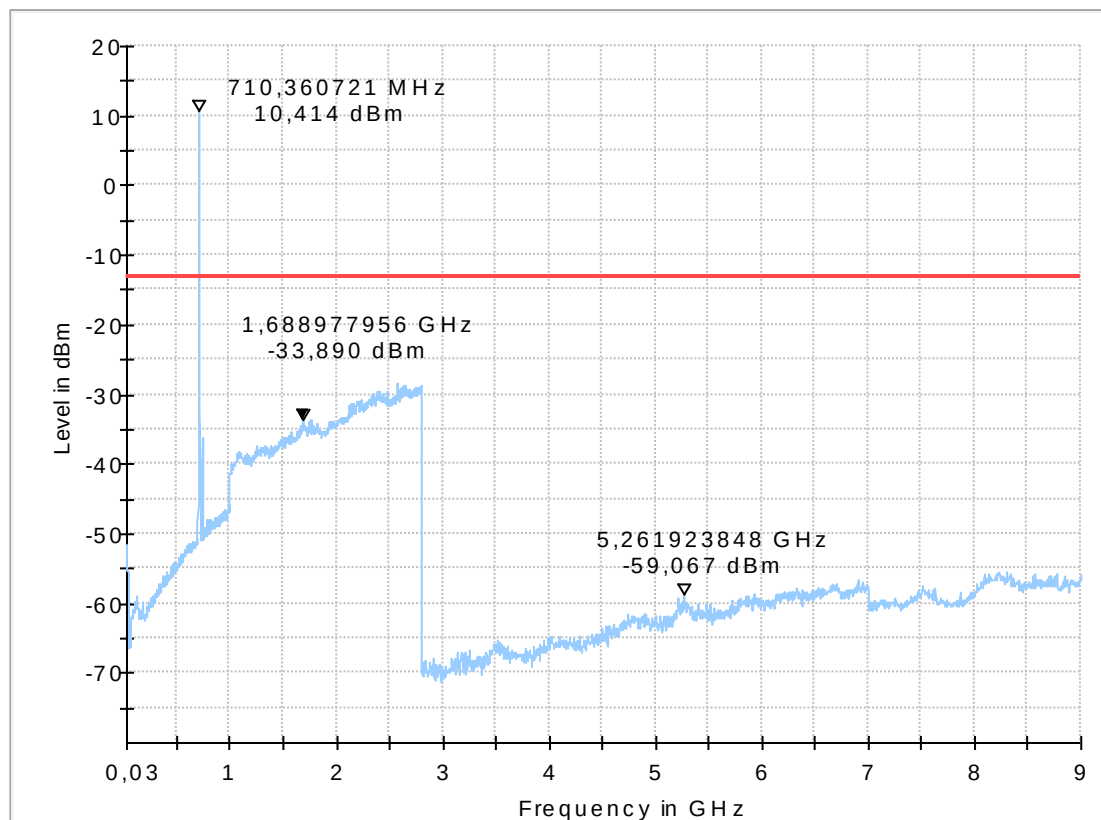
Common Information

Test Description:	Radiated Spurious Emissions LTE Band 17
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 27.917(a)
Operating Mode:	MS allocated channel 23790 : bw:5MHz Full RB , QPSK
Environmental Conditions:	Humidity: 53%rH; Temperature: 22:3°C
Operator:	

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



2.5. Radiated emissions – band-edge (LTE Band 2)

2.5.1. Band-edge low

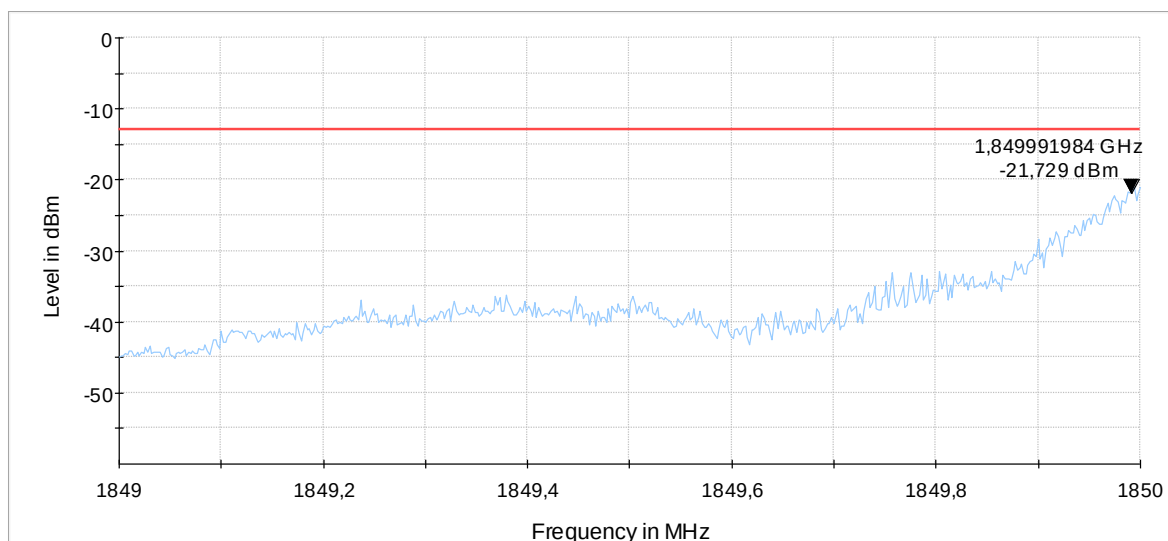


Diagram 9.20a_Ch18607BW_1.4MHz_1RBlow_QPSK

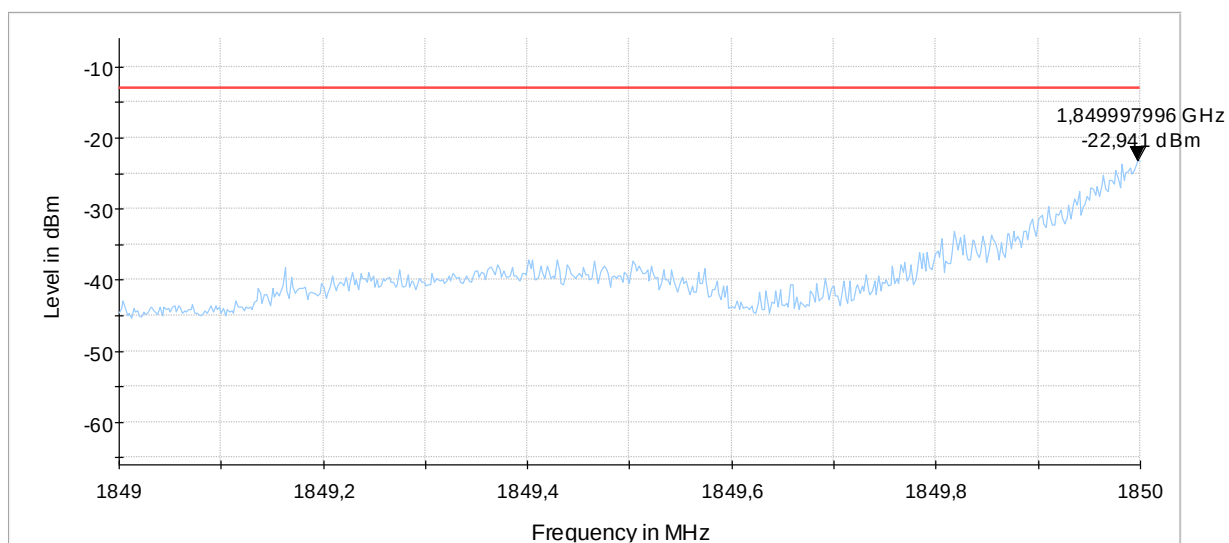


Diagram 9.20b_Ch18607BW_1.4MHz_1RBlow_16QAM

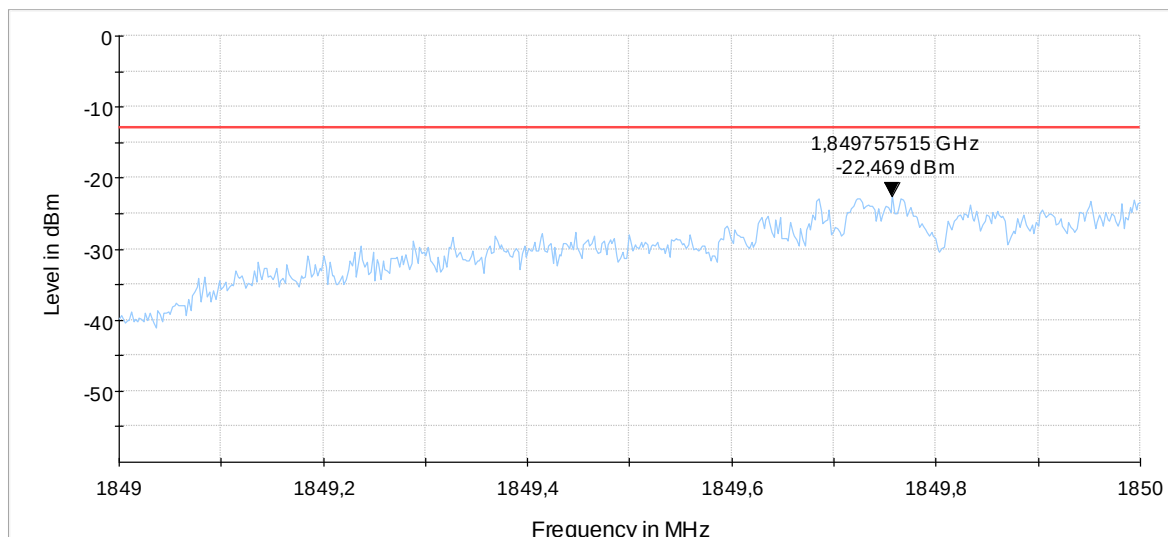


Diagram 9.21a_Ch18607BW_1.4MHz_6RBs_QPSK

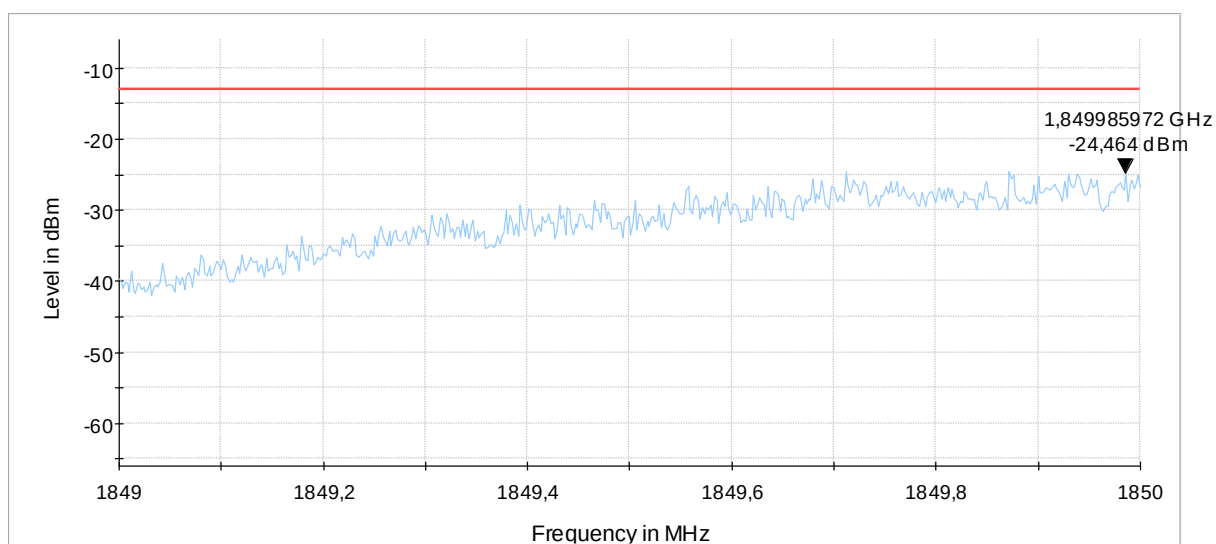


Diagram 9.21b_Ch18607BW_1.4MHz_6RBs_16QAM

2.5.2. Band-edge high

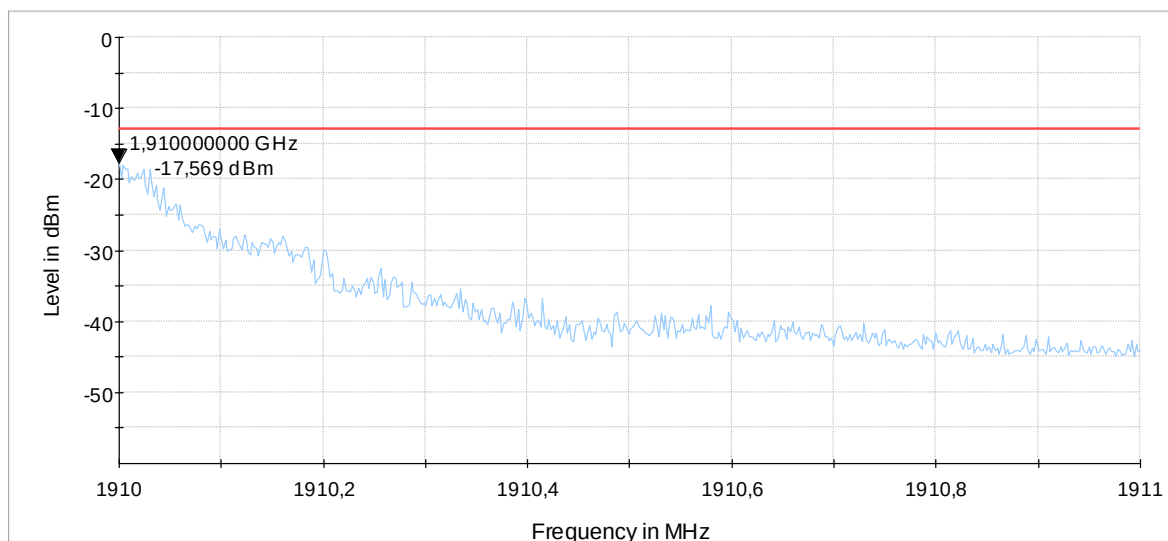


Diagram 9.22a_Ch19193_BW_1.4MHz_1RBhigh_QPSK

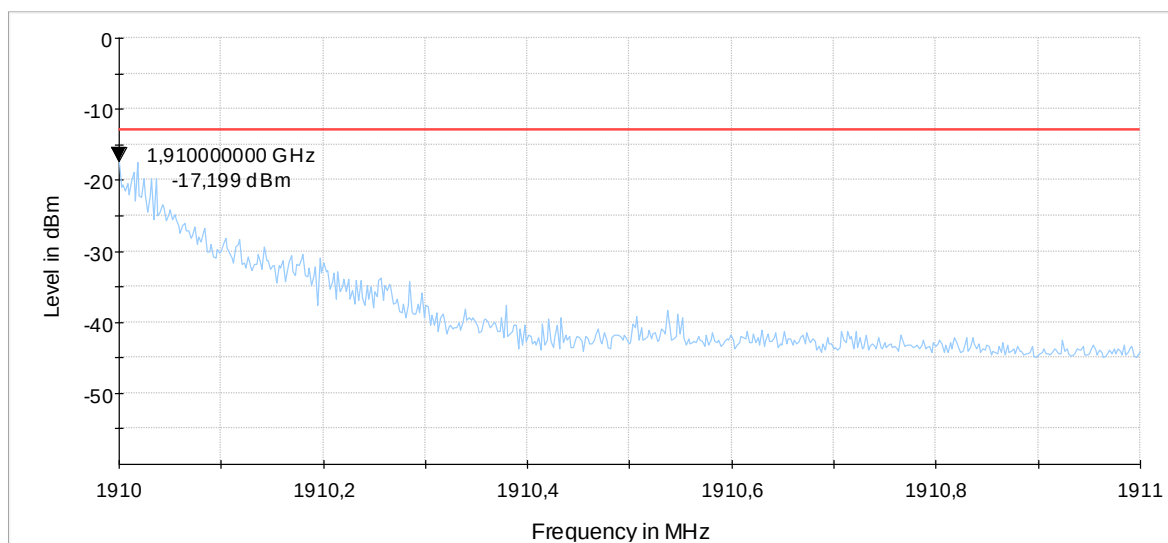


Diagram 9.22b_Ch19193_BW_1.4MHz_1RBhigh_16QAM

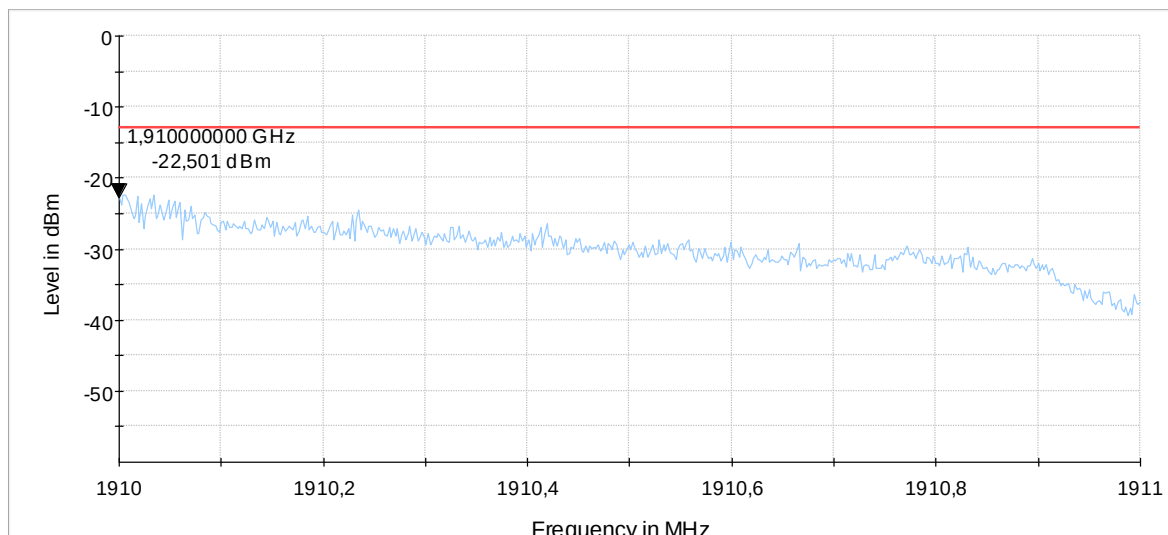


Diagram 9.23a_Ch19193_BW_1.4MHz_6RBs_QPSK

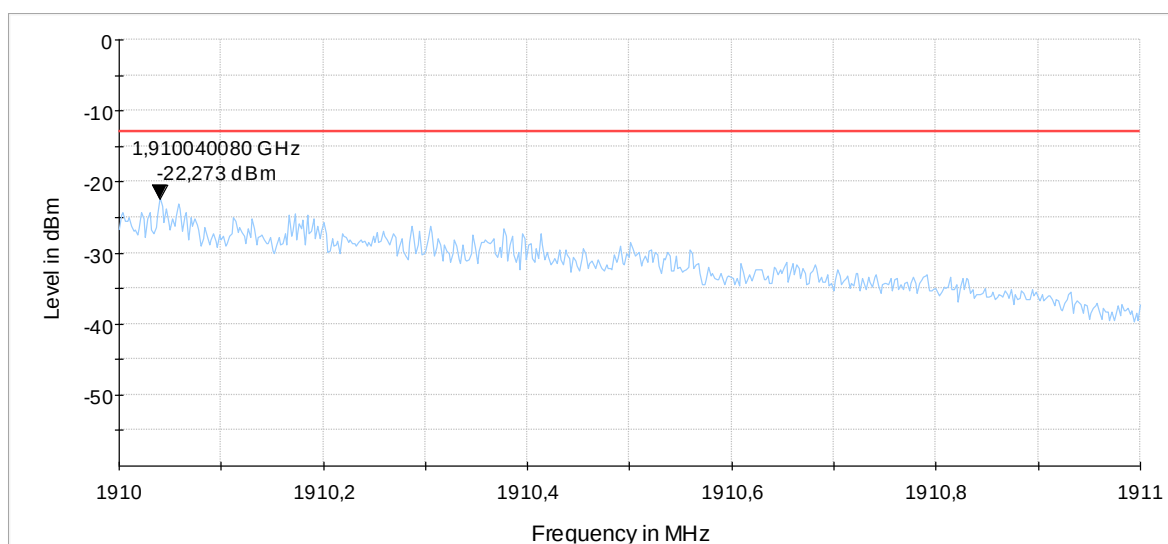


Diagram 9.23b_Ch19193_BW_1.4MHz_6RBs_16QAM

2.6. Radiated emissions – band-edge (LTE Band 4)

2.6.1. Band-edge low

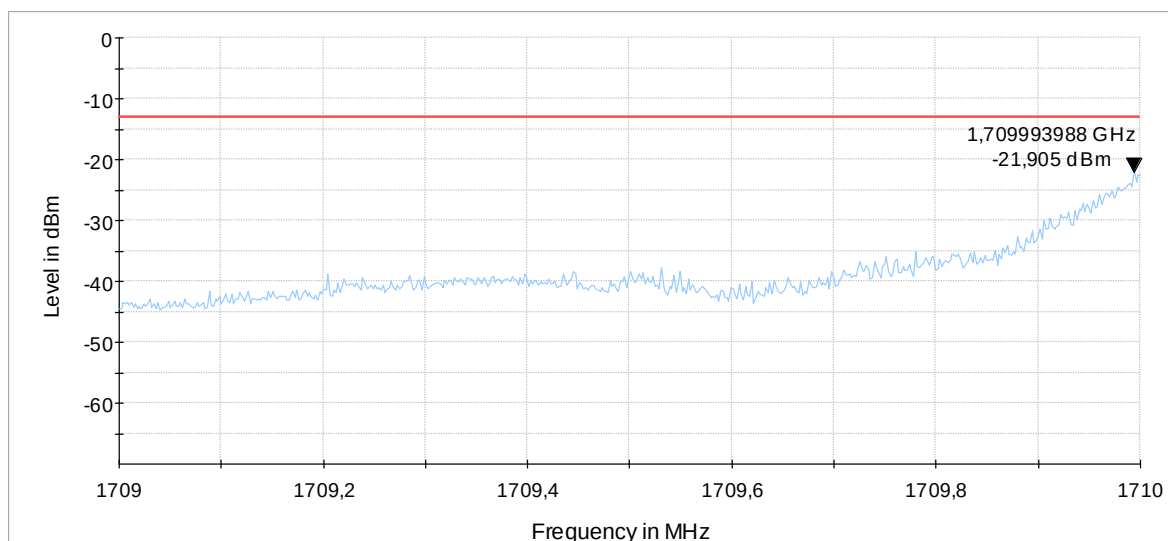


Diagram 9.40a_Ch19957_BW_1.4MHz_1RBlow_QPSK

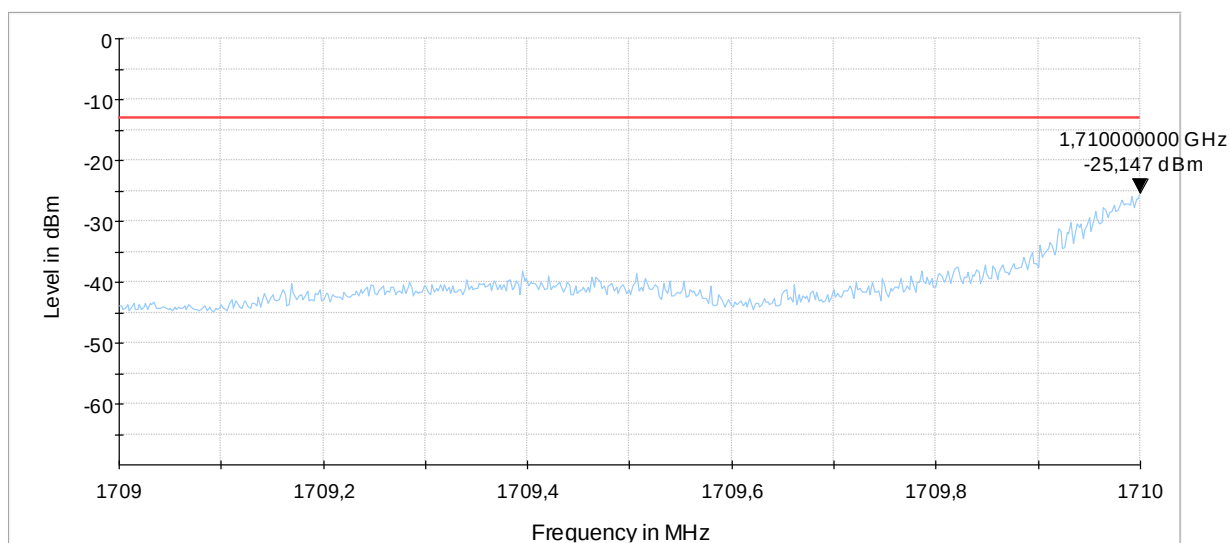


Diagram 9.40b_Ch19957_BW_1.4MHz_1RBlow_16QAM

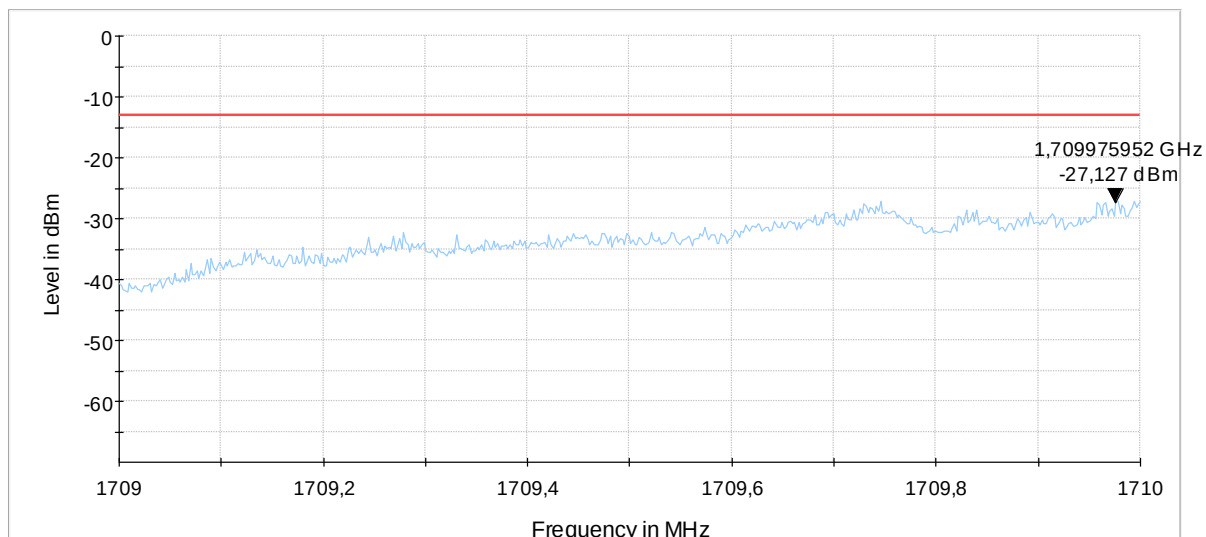


Diagram 9.41a_Ch19957_BW_1.4MHz_6RBs_QPSK

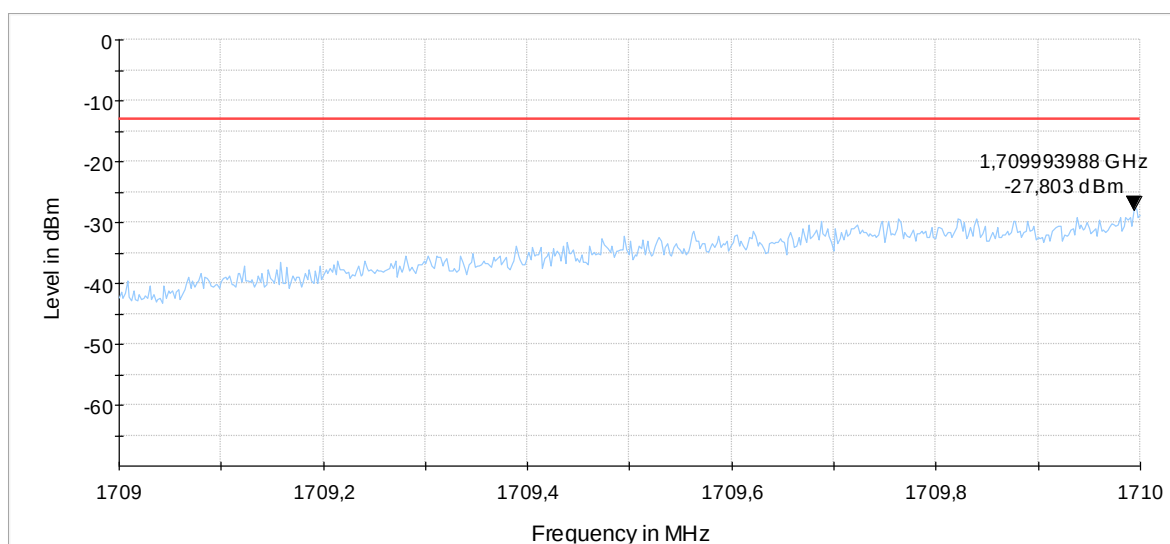


Diagram 9.41b_Ch19957_BW_1.4MHz_6RBs_16QAM

2.6.2. Band-edge high

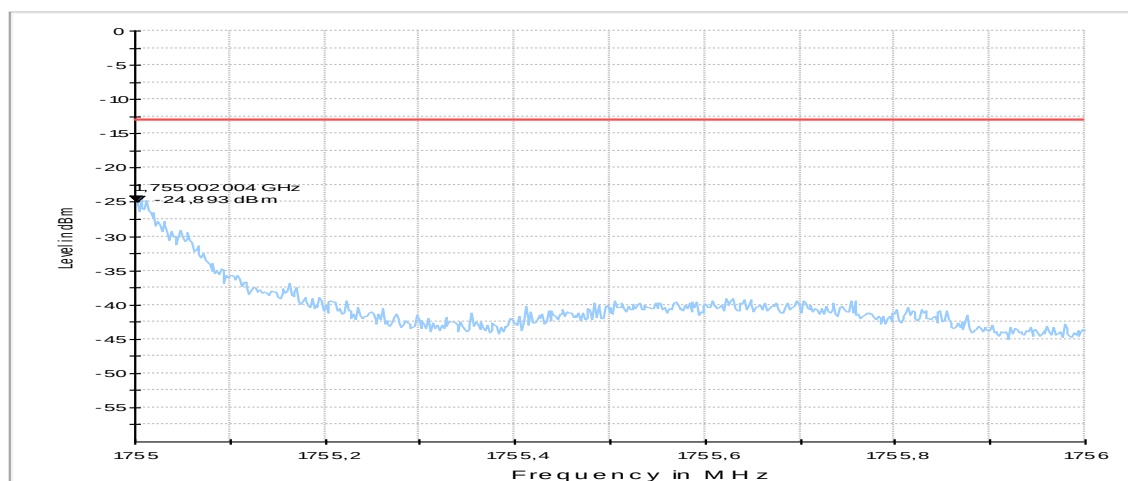


Diagram 9.42a_Ch20393_BW_1.4MHz_1RBhigh_QPSK

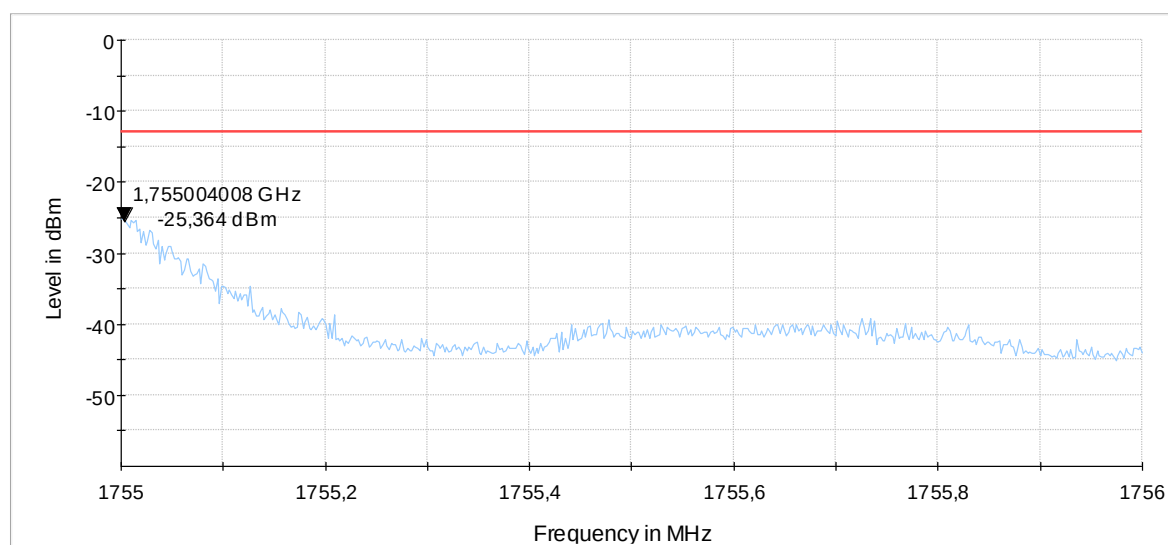


Diagram 9.42b_Ch20393_BW_1.4MHz_1RBhigh_16QAM

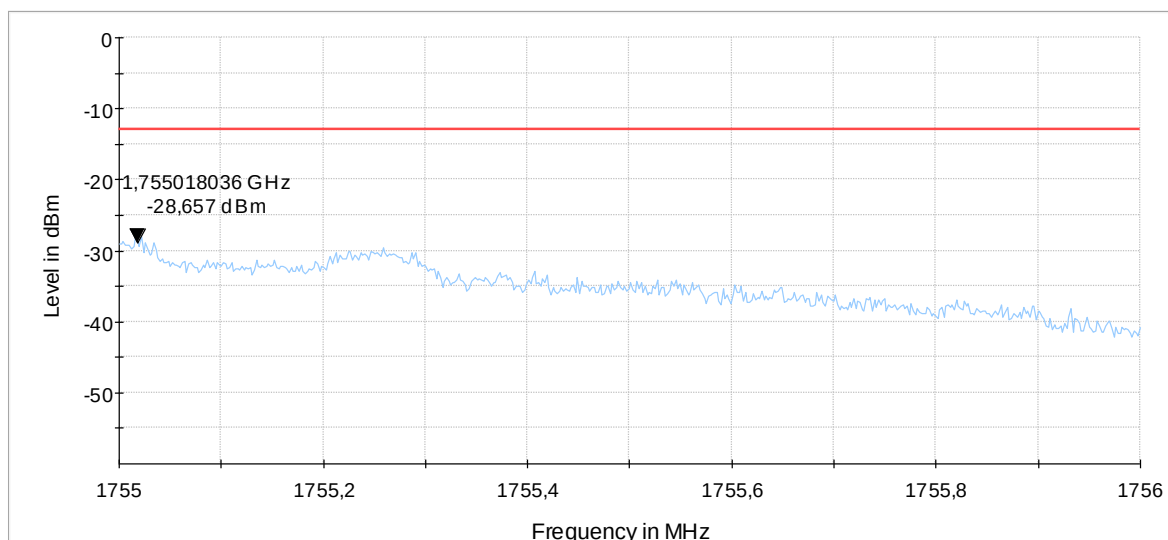


Diagram 9.43a_Ch20393_BW_1.4MHz_6RBs_QPSK

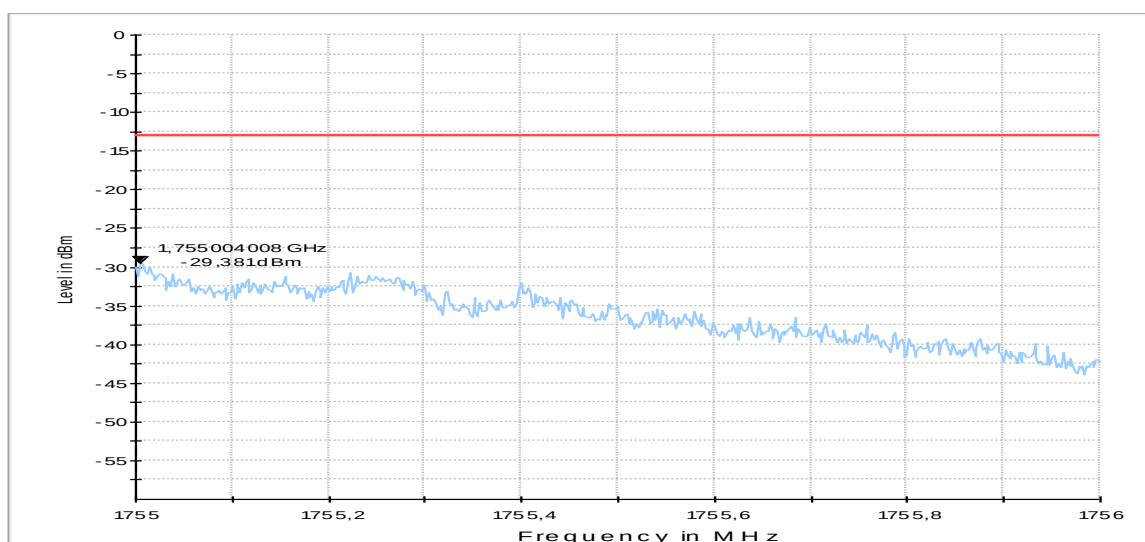


Diagram 9.43b_Ch20393_BW_1.4MHz_6RBs_16QAM

2.7. Radiated emissions – band-edge (LTE Band 5)

2.7.1. Band-edge low

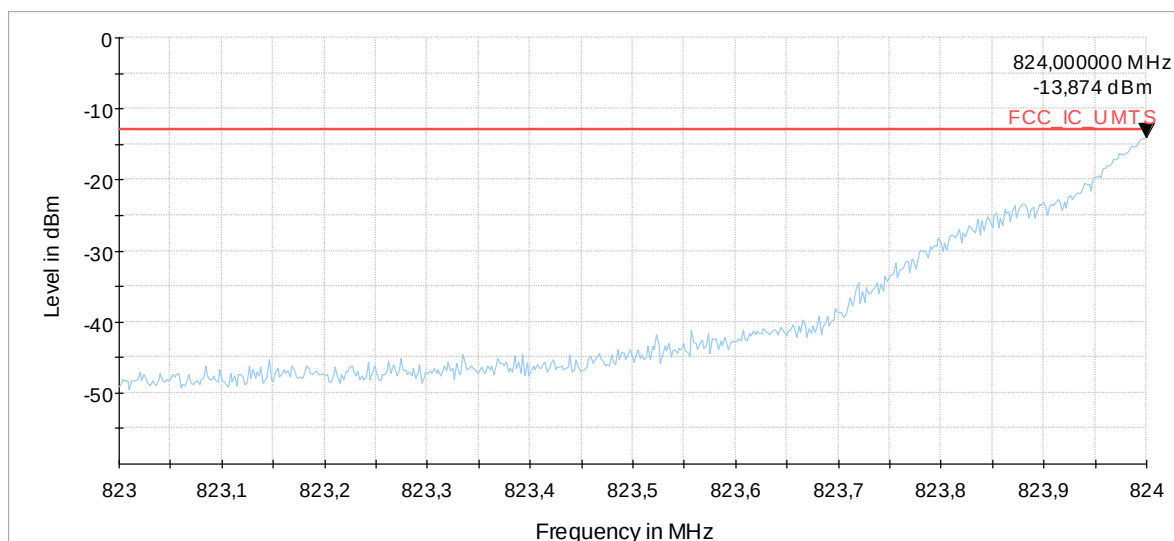


Diagram 9.500a_Ch20407_BW_1.4MHz_1RBlow_QPSK

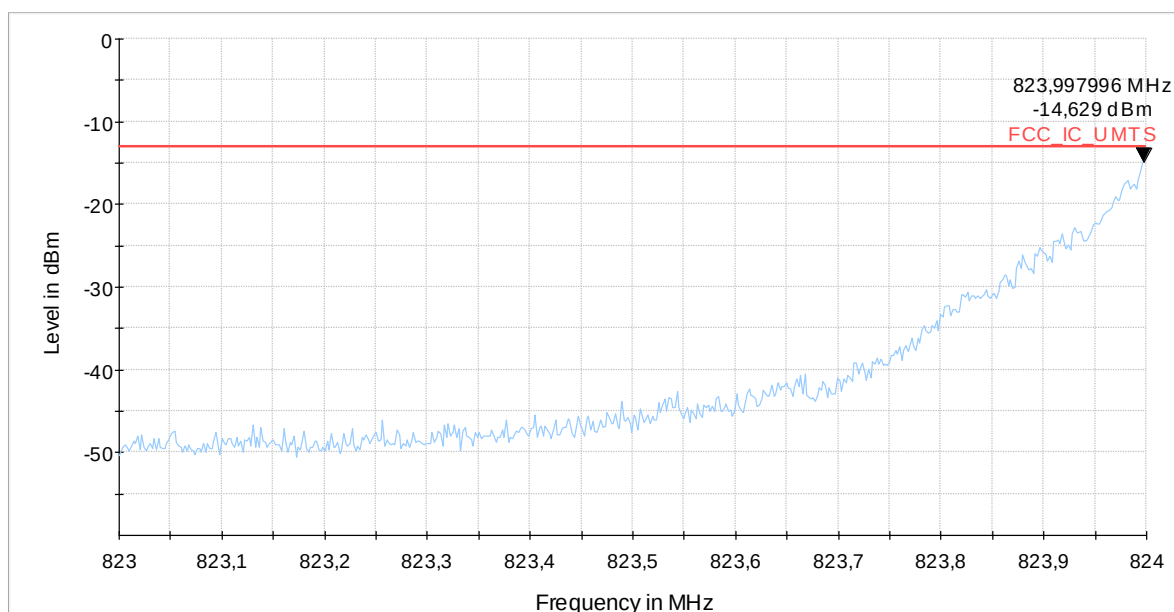


Diagram 9.500b_Ch20407_BW_1.4MHz_1RBlow_16QAM

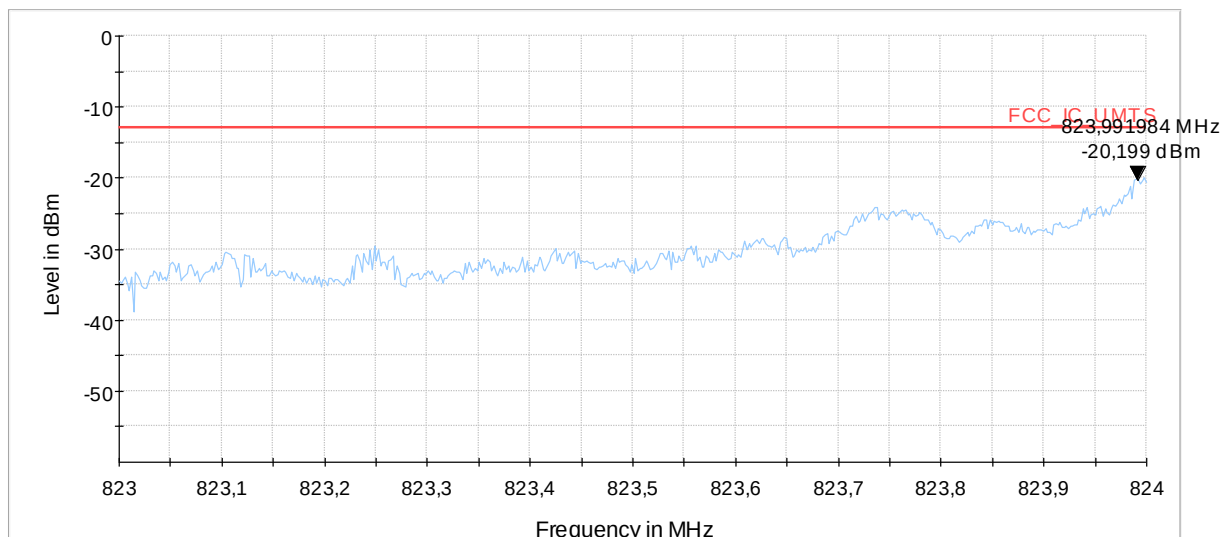


Diagram 9.501a_Ch20407_BW_1.4MHz_6RBs_QPSK

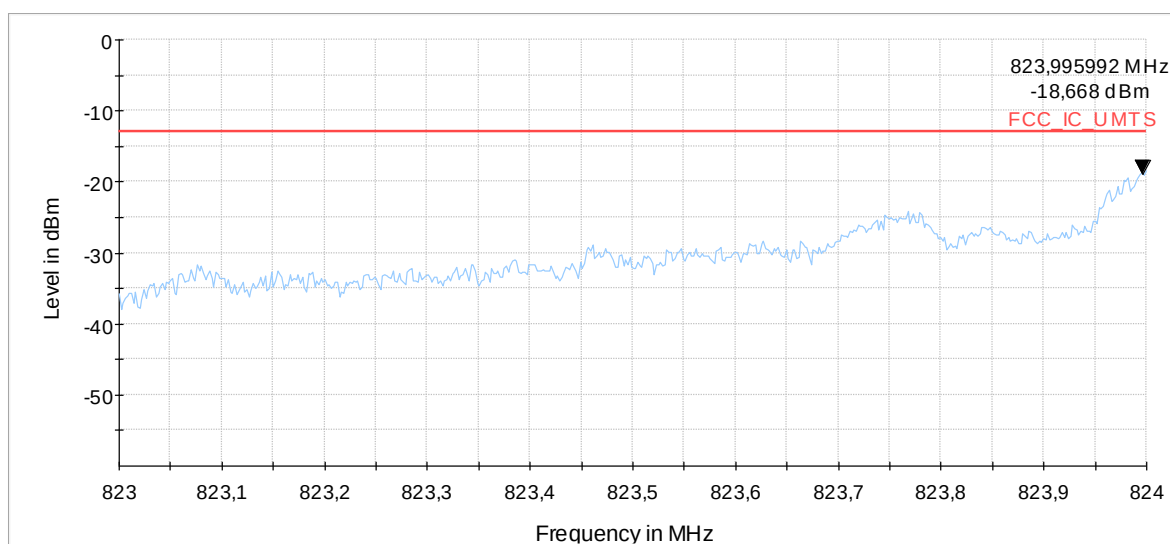


Diagram 9.501b_Ch20407_BW_1.4MHz_6RBs_16QAM

2.7.2. Band-edge high

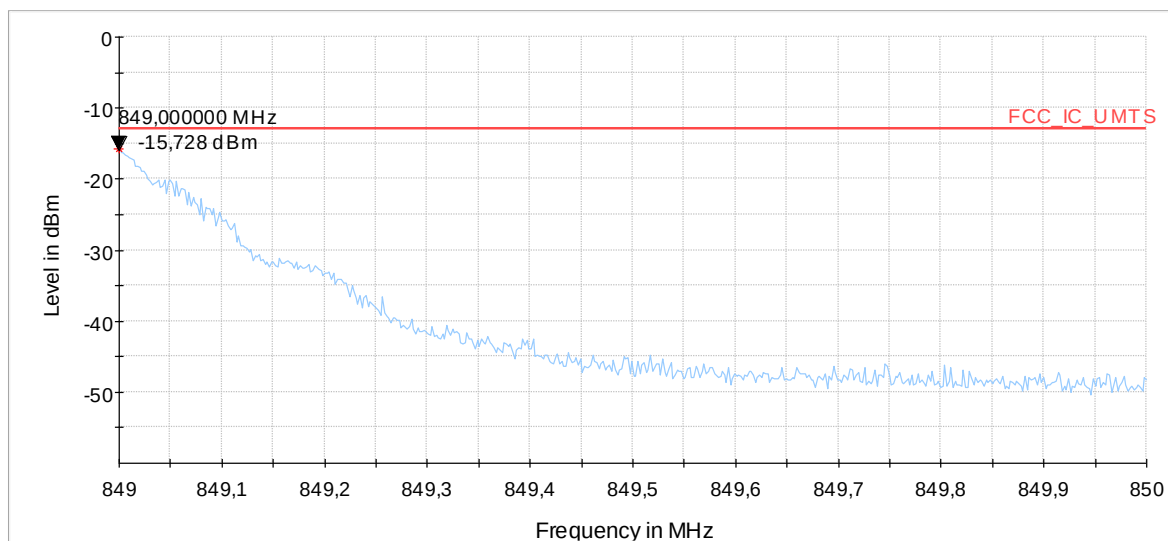


Diagram 9.502a_Ch20643_BW_1.4MHz_1RBhigh_QPSK

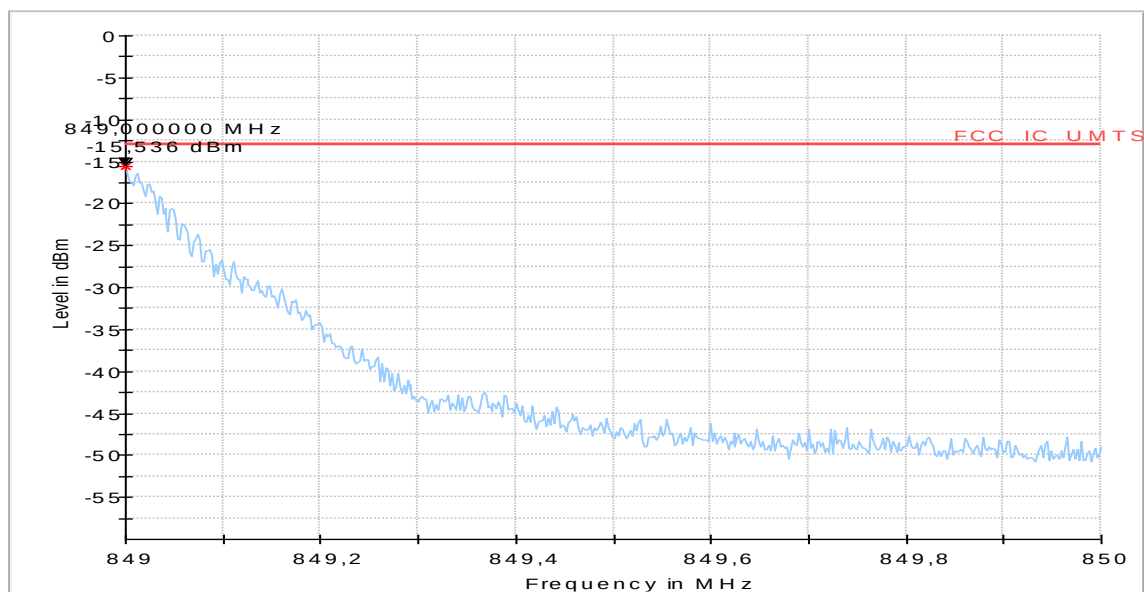


Diagram 9.502b_Ch20643_BW_1.4MHz_1RBhigh_16QAM

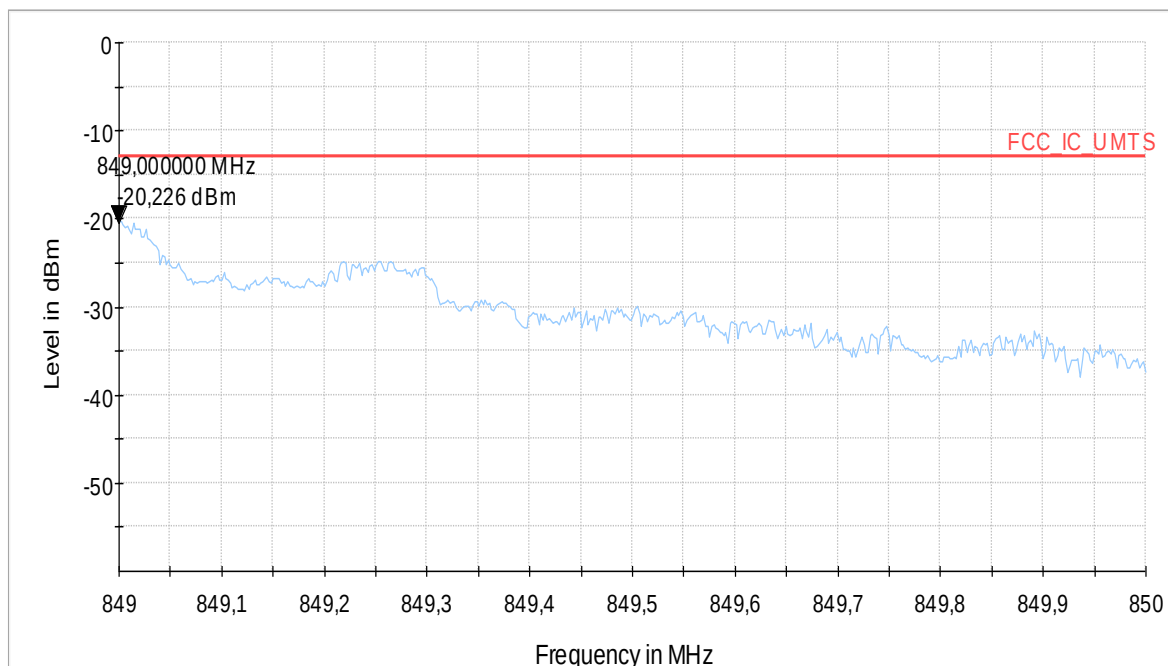


Diagram 9.503a_Ch20643_BW_1.4MHz_6RBs_QPSK

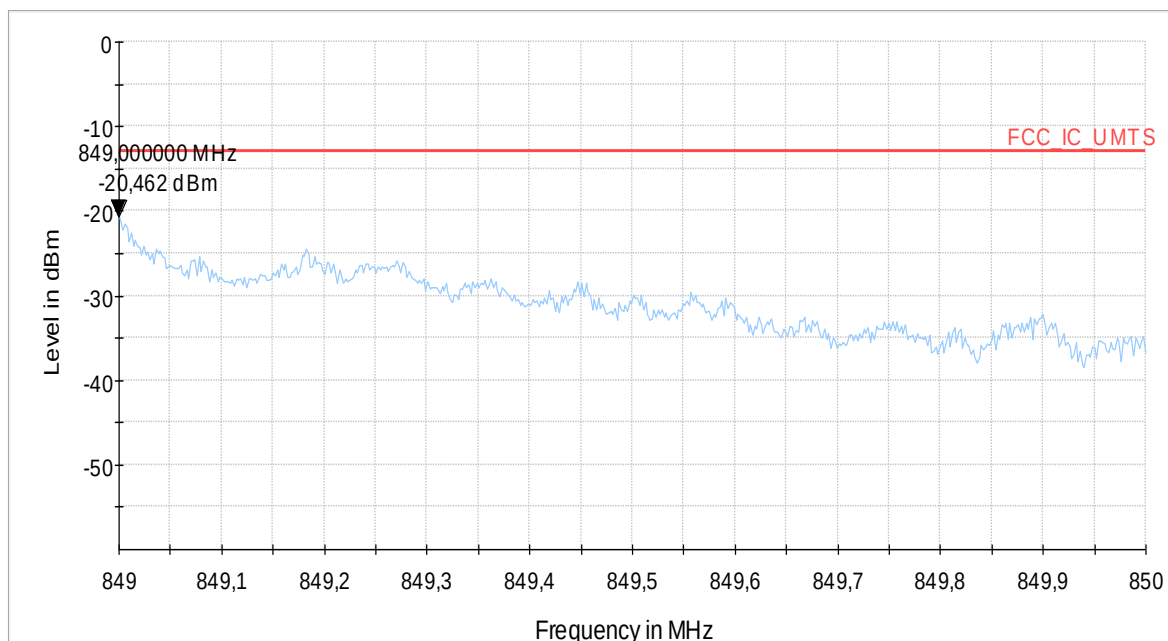


Diagram 9.503b_Ch20643_BW_1.4MHz_6RBs_16QAM

2.8. Radiated emissions – band-edge (LTE Band 17)

2.8.1. Band-edge low

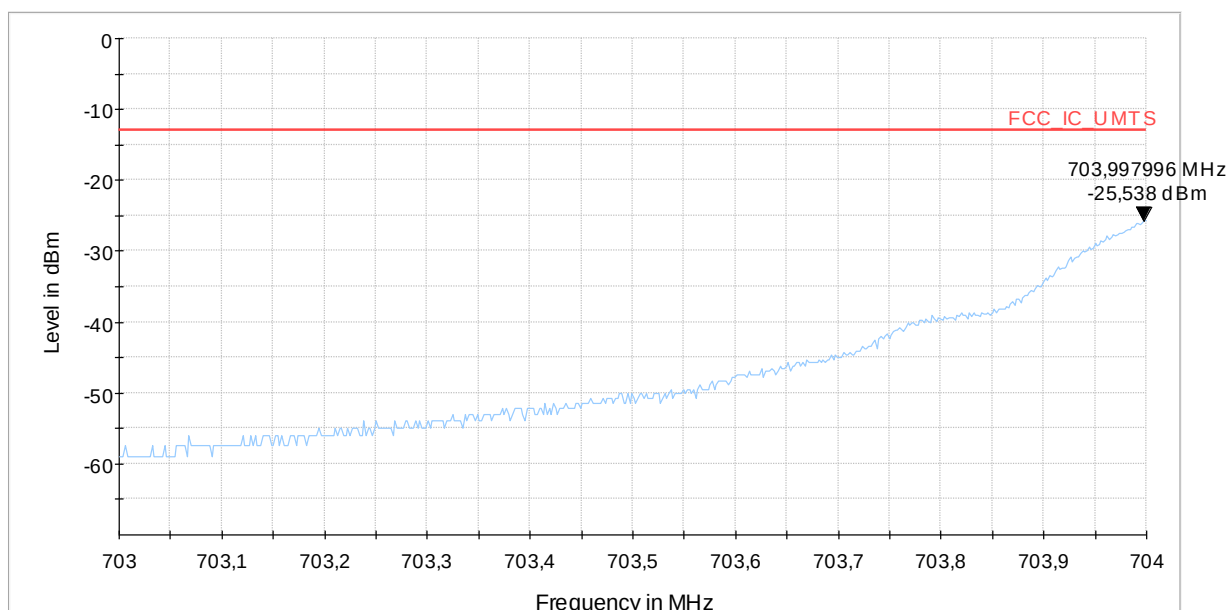


Diagram 9.1701a_Ch23755_BW_5MHz_1RBlow_QPSK

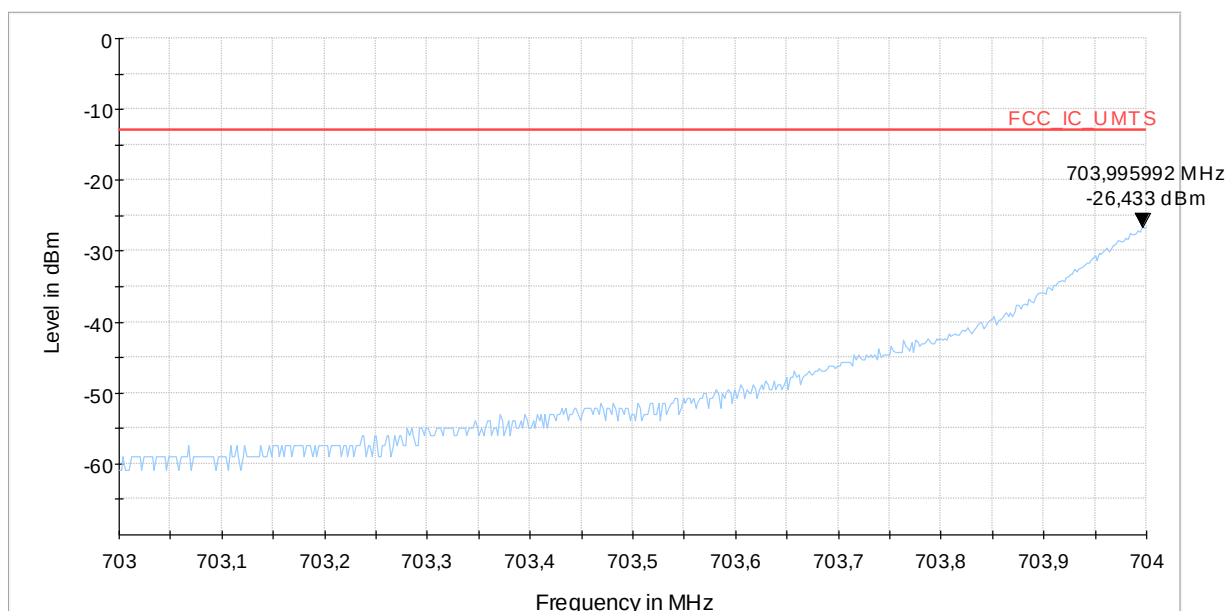


Diagram 9.1701b_Ch23755_BW_5MHz_1RBlow_16QAM

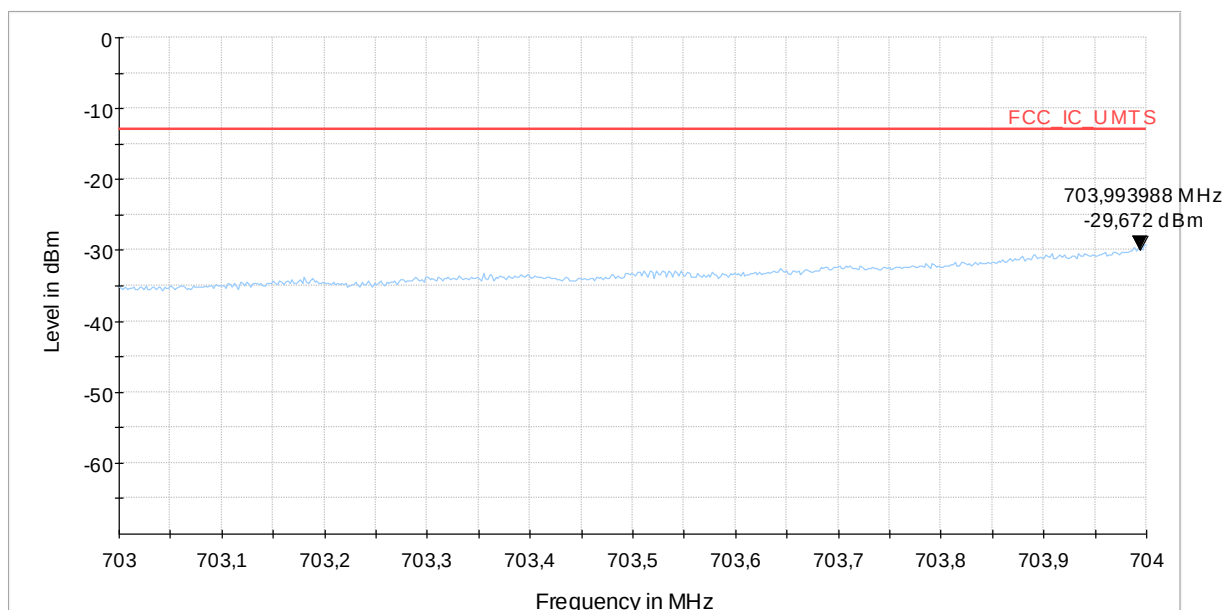


Diagram 9.1702a_Ch23755_BW_5MHz_25RBS_QPSK

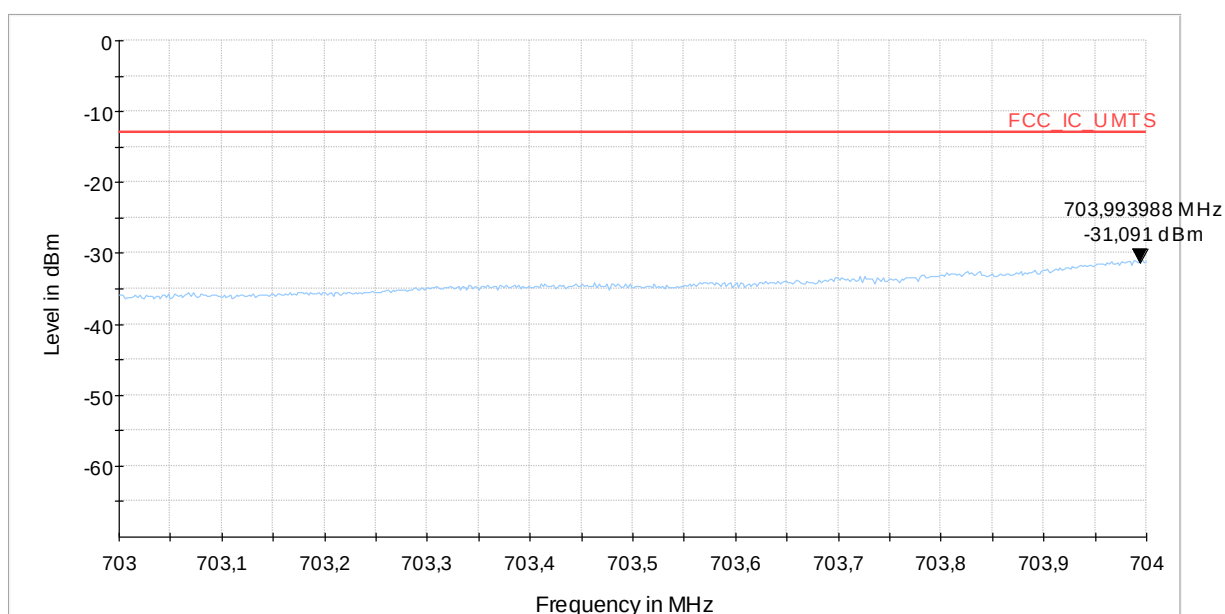


Diagram 9.1702b_Ch23755_BW_5MHz_25RBs_16QAM

2.8.2. Band-edge high

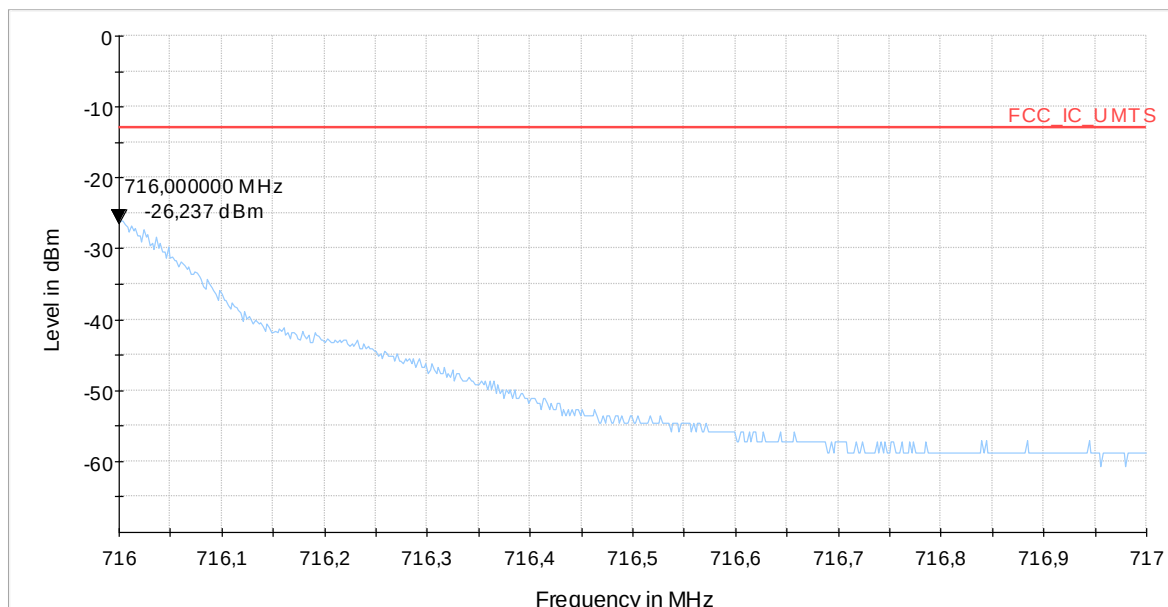


Diagram 9.1703a_Ch23825_BW_5MHz_1RBhigh_QPSK

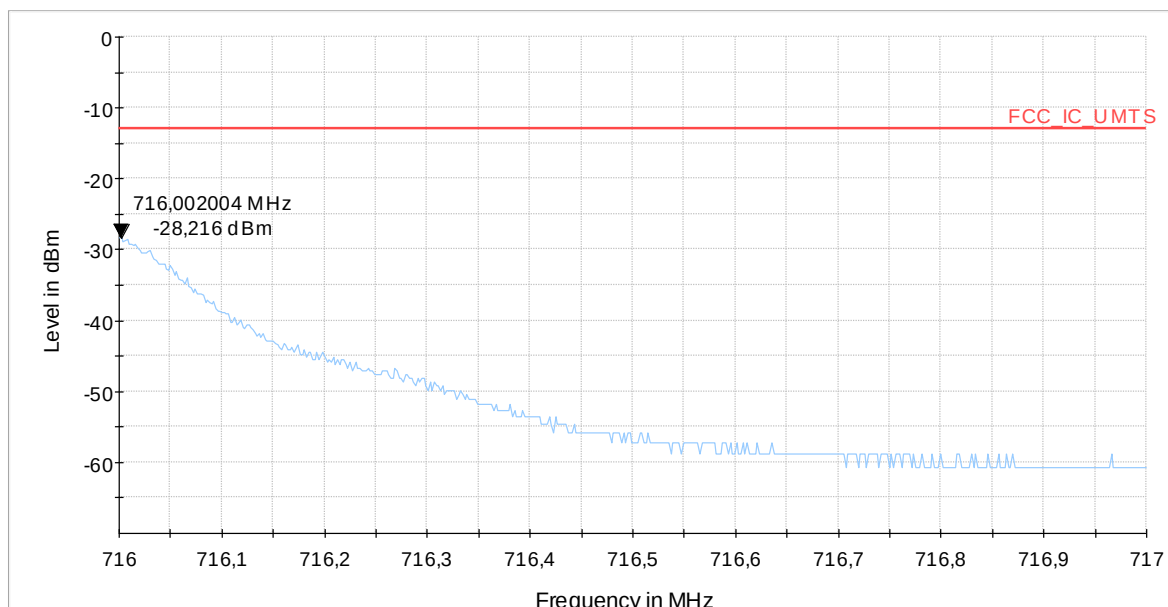


Diagram 9.1703b_Ch23825_BW_5MHz_1RBhigh_16QAM

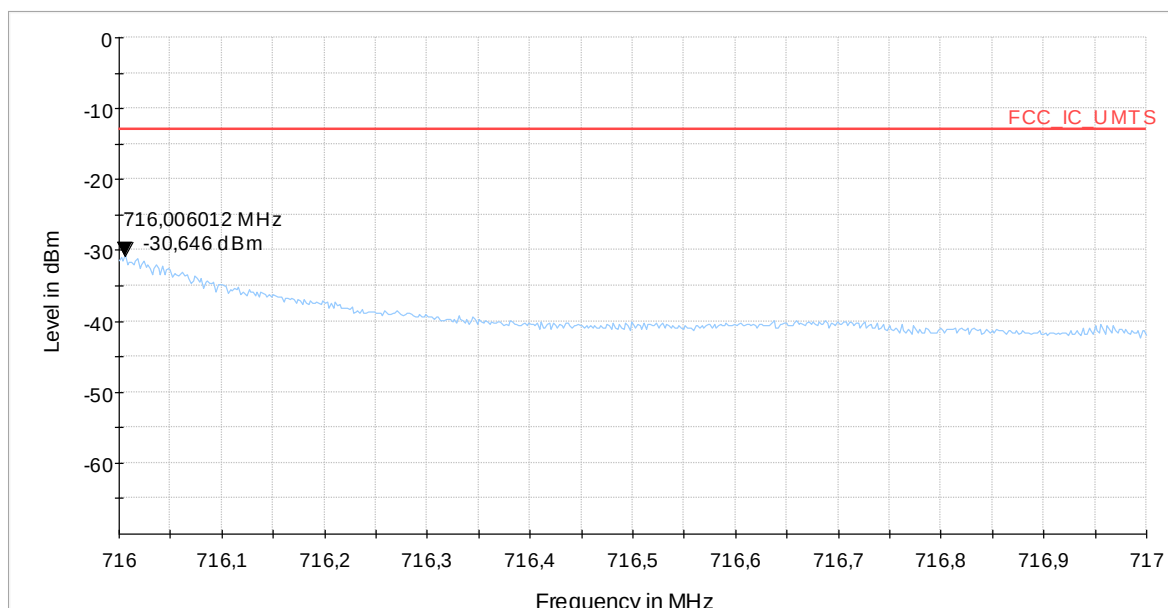


Diagram 9.1704a_Ch23825_BW_5MHz_25RBS_QPSK

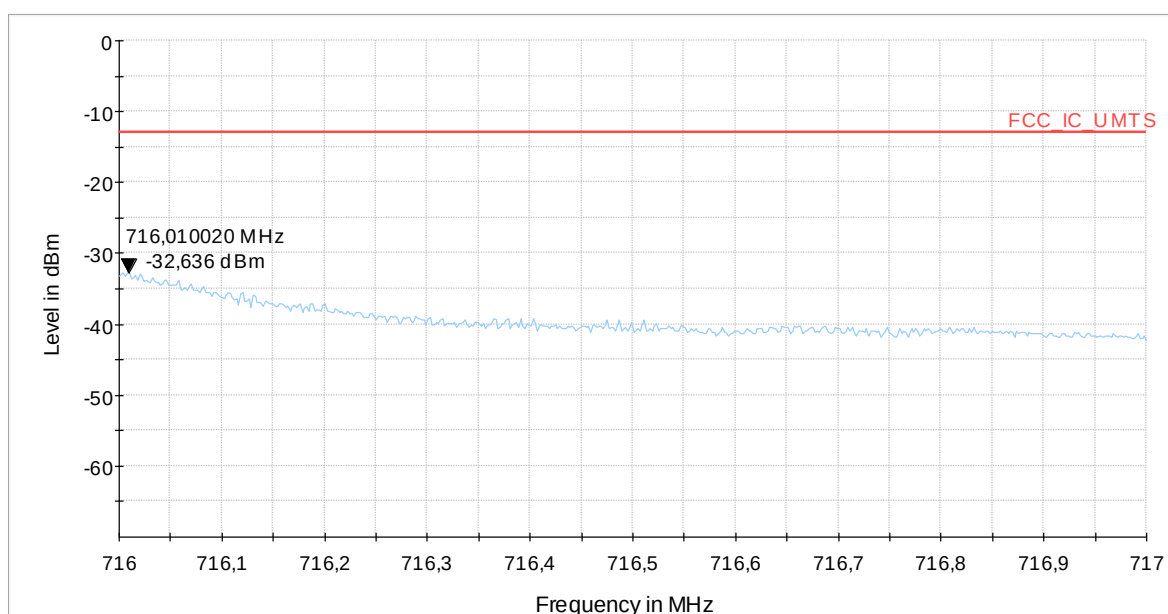


Diagram 9.1704b_Ch23825_BW_5MHz_25RBs_16QAM