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Test report

284168-4TRFWL

Date of issue: December 1, 2018

Applicant:

Deltanode Solutions AB

Product:

Cellular

Model:

DHR808

FCC ID: V5FDHR001 IC: 11014A-DHR001

Specifications:

FCC Part 22H, RSS-131 Issue 3, RSS-132 Issue 3

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation

FCC Part 22H, RSS-131 Issue 3, RSS-132 Issue 3; Date: November 2018

SCC Accredited LAB
LAB Accrédité CCN

Test location

Company name	Nemko Canada Inc.
Address	303 River Road
City	Ottawa
Province	Ontario
Postal code	K1V 1H2
Country	Canada
Telephone	+1 613 737 9680
Facsimile	+1 613 737 9691
Toll free	+1 800 563 6336
Website	www.nemko.com
Test Site	FCC Designation Number: CA2040, FCC Registration Number: 175281; ISED Test Site Number: 2040A-4

Tested by	Kevin Rose, Wireless/EMC Specialist
Reviewed by	Russell Grant, Senior Technical Assessor
Date	December 1, 2018
Signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Deltanode Solutions AB
Address	Hammarby Fabriksvag 61
City	Stockholm
Province/State	
Postal/Zip code	SE-120 30
Country	Sweden

1.2 Test specifications

FCC Part 22H	Public Mobile Services Subpart H – Cellular Radiotelephone Service
RSS-131 Issue 3	Zone Enhancers
RSS-132 Issue 3	Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz
KDB 935210 D05 Indus Booster Basic Meas v01r02	MEASUREMENTS GUIDANCE FOR INDUSTRIAL AND NON-CONSUMER SIGNAL BOOSTER, REPEATER, AND AMPLIFIER DEVICES

1.3 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.4 Exclusions

None

1.5 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2. Summary of test results

2.1 FCC Part 22, RSS 131, and RSS 132 test results

Part	Test description	Verdict
KDB 935210 D05 3.2	Measuring AGC threshold level	Reported
RSS-131 5.2.1, KDB 935210 D05 3.3	Out-of-band-rejection	Pass
RSS-131 5.2.2, KDB 935210 D05 3.4,	Input-versus-output signal comparison	Pass
FCC 22.913(a)(d), RSS-131 5.2.3, RSS-132 5.4, KDB 935210 D05 3.5	Mean output power and amplifier/booster gain	Pass
FCC 22.917(a), RSS-132 5.5, KDB 935210 D05 3.6.2	Out-of-band/out-of-block emissions conducted measurements	Pass
FCC 22.917(a), RSS-132 5.5, KDB 935210 D05 3.6.3	Spurious emissions conducted measurements	Pass
FCC 22.355, RSS-131 5.2.4, RSS-132 5.3, KDB 935210 D05 3.7	Frequency stability measurements	N/A[1]
FCC 22.917(a), RSS-132 5.5, KDB 935210 D05 3.8	Spurious emissions radiated measurements	Pass

Notes: [1]The signal booster does not alter the input signal in any way

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	April 29, 2015
Nemko sample ID number	13300322

3.2 EUT information

Product name	Cellular
Model	DHR808
Serial number	10199

3.3 Technical information

Operating band	824 – 849 / 869 – 894 MHz
Modulation type	GSM, CDMA, LTE
Channel Spacing	Standard
Power requirements	110 V_{AC}, ~3 A for entire system tested
Emission designator	200KGXW, 1M25F9W, 5M00F9W, 1M40D7W, 3M00D7W, 5M00D7W, and 10M0D7W
Gain	85 dB
Antenna information	External Antenna is not provided EUT used a 50 Ω termination.

3.4 Product description and theory of operation

Off air high power repeater 33 dBm of output power on DL, 25dBm of output power on UL, 85 dB gain in both DL and UL

3.5 EUT exercise details

The EUT was controlled via a Laptop interface with GUI to configure the system The EUT uses set channels Bandwidths user settable to a maximum of 15 MHz.

3.6 EUT setup diagram

Figure 3.6-1: *Setup diagram*

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Feb. 25/16
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	Jan. 7/16
Spectrum analyzer	Rohde & Schwarz	FSU	FA001877	1 year	Mar. 27/16
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	Apr. 12/16
Horn antenna (1–18 GHz)	EMCO	3115	FA000825	1 year	Apr. 01/16
Pre-amplifier (1–18 GHz)	JCA	JCA118-503	FA002091	1 year	May 05/16
50 Ω coax cable	C.C.A.	None	FA002555	1 year	May 05/16
DFS and Adaptivity system	Aeroflex	PXI 30xx	FA002628	1 year	Feb 23/16

Note: NCR - no calibration required, VOU - verify on use

Section 8. Testing data

8.1 KDB 935210 D05 3.2, Measuring AGC threshold level

8.1.1 Definitions and limits

The AGC threshold is the input power at which a 1 dB increase in the input signal power no longer causes a 1 dB increase in the output power.

8.1.2 Test summary

Test date	June 28, 2018	Temperature	21 °C
Test engineer	Kevin Rose	Air pressure	1002 mbar
Verdict	Pass	Relative humidity	44 %

8.1.3 Observations, settings and special notes

Test receiver settings:

Detector mode	RMS (for average), Peak (for peak)
Resolution bandwidth	100 kHz
Integration bandwidth	>OBW
Video bandwidth	>RBW
Trace mode	Power Average (for average), Max Hold (for peak)
Measurement time	Auto

8.1.4 Test data

Table 8.1-1: *AGC Threshold*

Modulation	Frequency, MHz	RF input power AVG, dBm
AWGN	836.5	-60.50
AWGN	881.5	-51.27
MSK	836.5	-58.15
MSK	881.5	-50.49

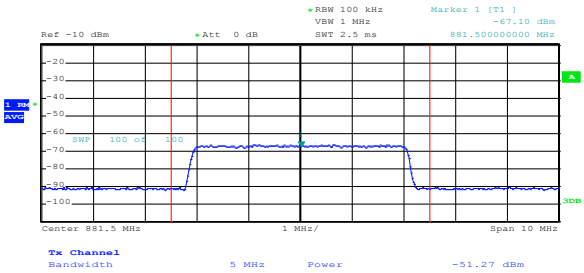

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Figure 8.1-1: *AWGN AGC +1 dB DL 881.5 MHz input power average*

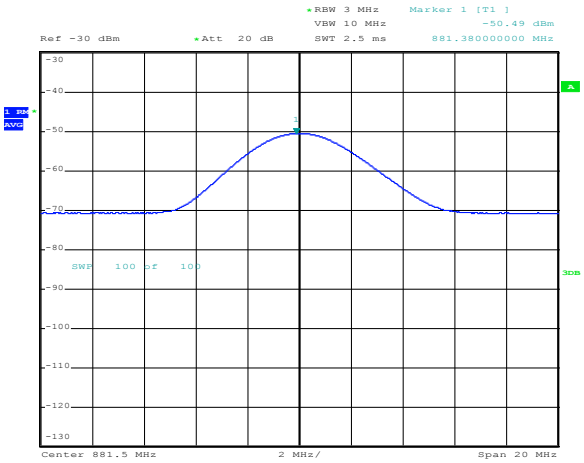

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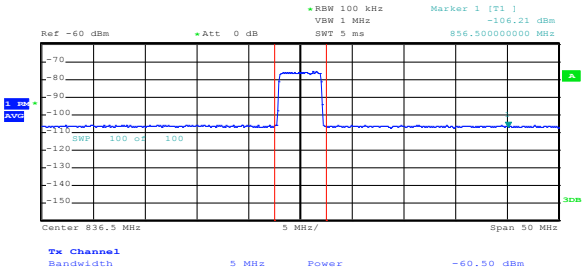
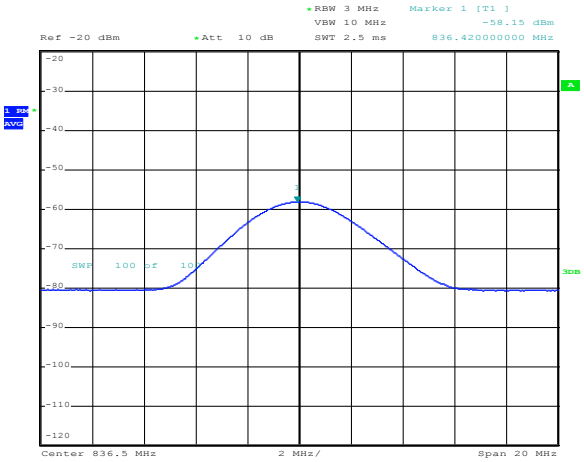
Figure 8.1-2: *MSK AGC +1 dB DL 881.5 MHz input power average*



Date: 27.JUN.2018 20:56:56

Figure 8.1-3: *AWGN AGC +1 dB UL 836.5 MHz input power average*



Date: 28.JUN.2018 18:29:09

Figure 8.1-4: *MSK AGC +1 dB UL 836.5 MHz input power average*

8.2 RSS-131 5.2.1, KDB 935210 D05 3.3, Out-of-band-rejection

8.2.1 Definitions and limits

The gain-versus-frequency response and the 20 dB bandwidth of the zone enhancer shall be reported. The zone enhancer shall reject amplification of other signals outside the passband of the zone enhancer.

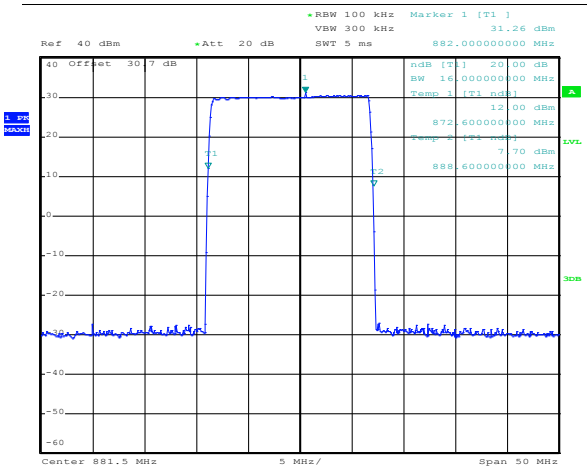
8.2.2 Test summary

Test date	June 27, 2018	Temperature	21 °C
Test engineer	Kevin Rose	Air pressure	1000 mbar
Verdict	Pass	Relative humidity	42 %

8.2.3 Observations, settings and special notes

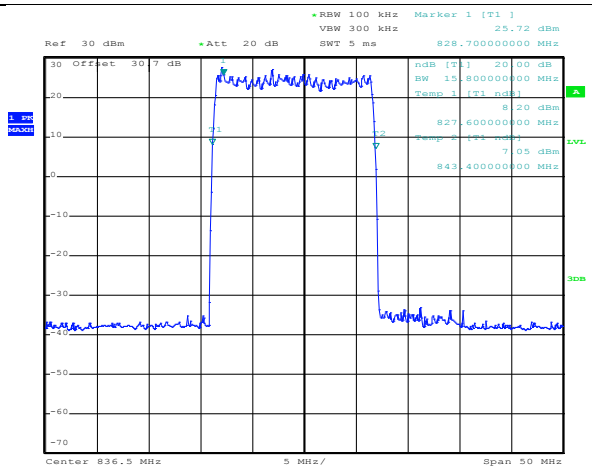
Frequency range	30 MHz to 10th harmonic
Detector mode	Peak
Resolution bandwidth sweep	100 kHz (below 1 GHz), 1000 kHz (above 1 GHz)
Video bandwidth	>RBW
Trace mode	Max Hold
Measurement time	Auto

8.2.4 Test data



Date: 27.JUN.2018 21:16:13

Figure 8.2-1: *Passband Downlink*



Date: 27.JUN.2018 21:12:50

Figure 8.2-2: *Passband Uplink*

8.3 RSS-131 5.2.2, KDB 935210 D05 3.4, Input-versus-output signal comparison

8.3.1 Definitions and limits

The spectral growth of the 26 dB bandwidth of the output signal shall be less than 5% of the input signal spectrum.

A 26 dB bandwidth measurement shall be performed on the input signal and the output signal; alternatively, the 99% OBW can be measured and used. See KDB Publication 971168 [R8] for more information on measuring OBW

8.3.2 Test summary

Test date	July 5, 2018	Temperature	23 °C
Test engineer	Kevin Rose	Air pressure	1015 mbar
Verdict	Pass	Relative humidity	39 %

8.3.3 Observations, settings and special notes

Receiver settings were:

Frequency range	250% of OBW
Detector mode	Peak
Resolution bandwidth	1 % to 5 % of the anticipated OBW
Video bandwidth	>RBW
Trace mode	Max Hold

8.3.4 Test data

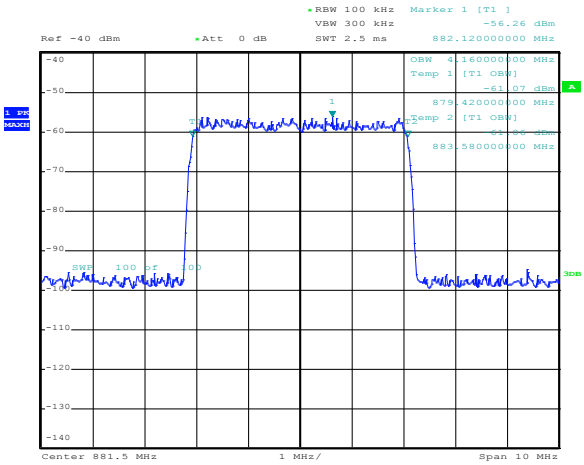


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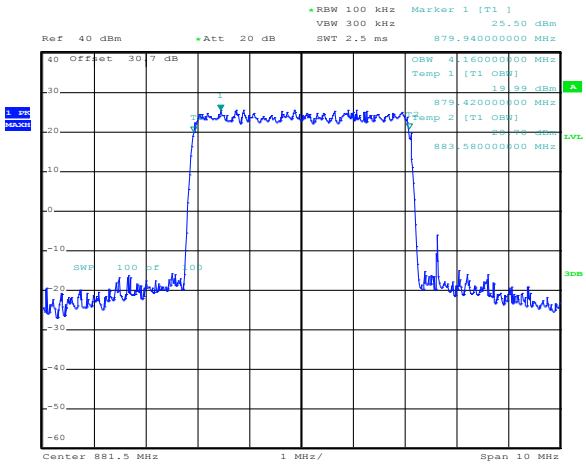
Figure 8.3-1: *AWGN AGC-0.5 dB DL 881.5 MHz input 99% BW*



Date: 28.JUN.2018 13:39:00

Figure 8.3-2: *AWGN AGC-0.5 dB DL 881.5 MHz output 99% BW*

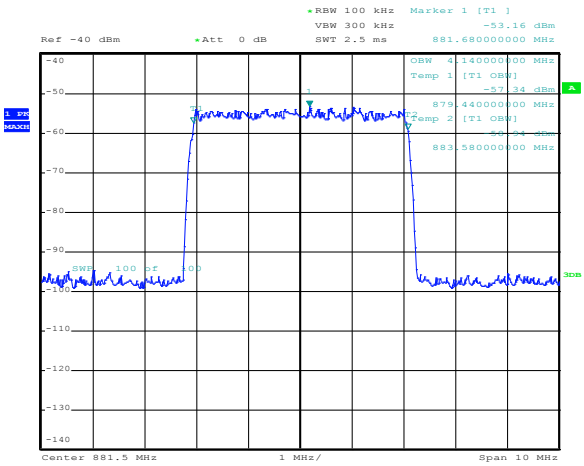


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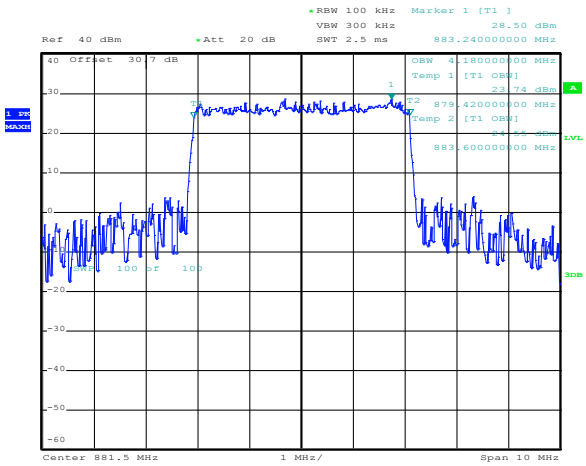
Figure 8.3-3: *AWGN AGC +3 dB DL 881.5 MHz input 99% BW*



Date: 28.JUN.2018 13:39:27

Figure 8.3-4: *AWGN AGC +3 dB DL 881.5 MHz output 99% BW*

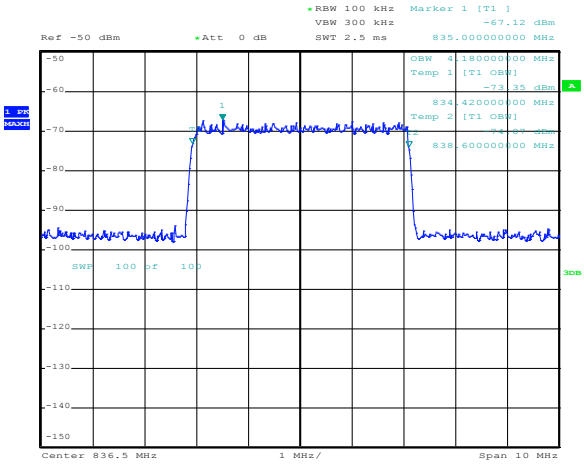


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Figure 8.3-5: *AWGN AGC-0.5 dB UL 836.5 MHz input 99% BW*

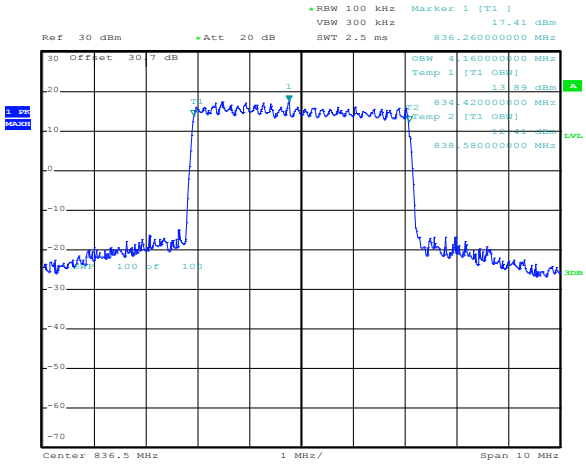

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Figure 8.3-6: *AWGN AGC-0.5 dB UL 836.5 MHz output 99% BW*

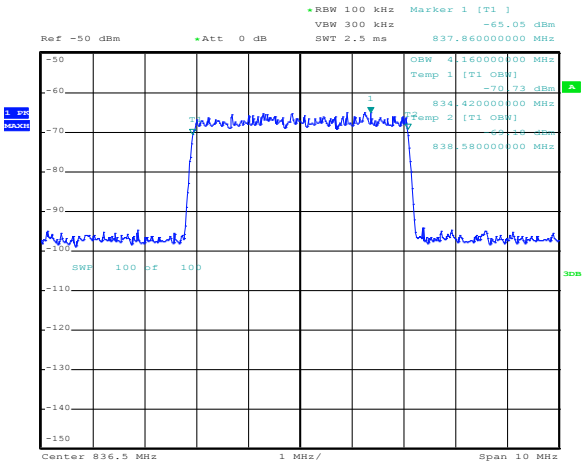

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Figure 8.3-7: *AWGN AGC +3 dB UL 836.5 MHz input 99% BW*

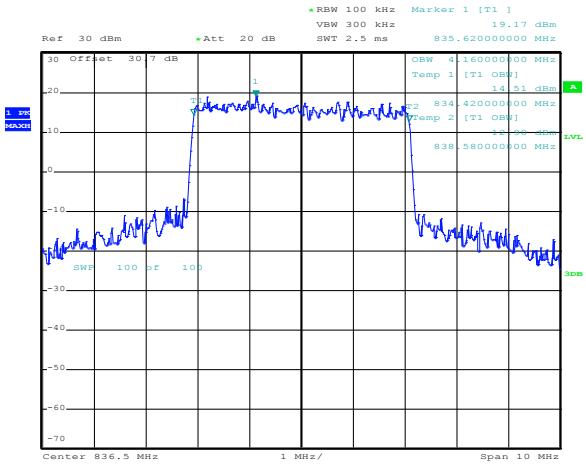

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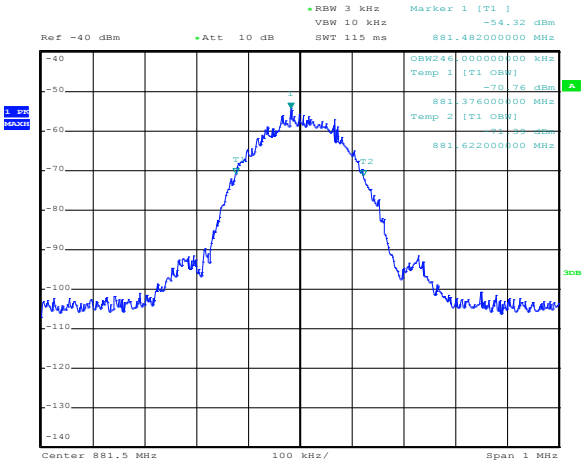
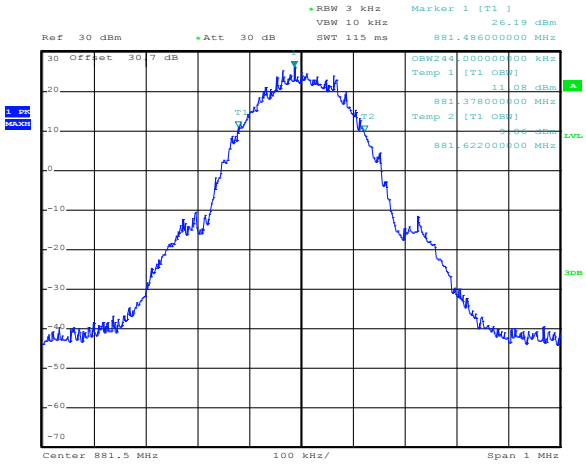
Figure 8.3-8: *AWGN AGC +3 dB UL 836.5 MHz output 99% BW*



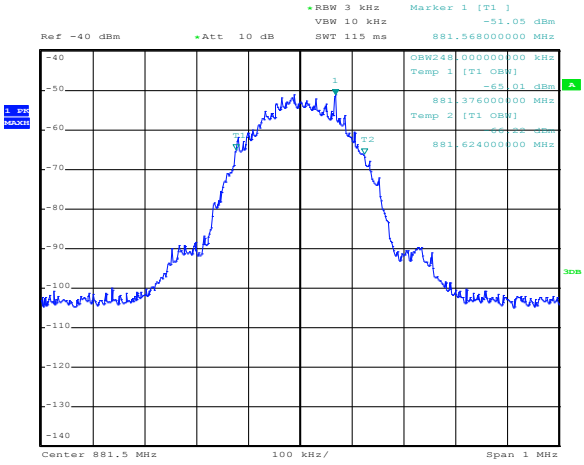
Date: 28.JUN.2018 18:43:42

Figure 8.3-9: *MSK AGC-0.5 dB DL 881.5 MHz input 99% BW*



Date: 28.JUN.2018 18:41:42

Figure 8.3-10: *MSK AGC-0.5 dB DL 881.5 MHz output 99% BW*



Date: 28.JUN.2018 18:43:19

Figure 8.3-11: *MSK AGC +3 dB DL 881.5 MHz input 99% BW*

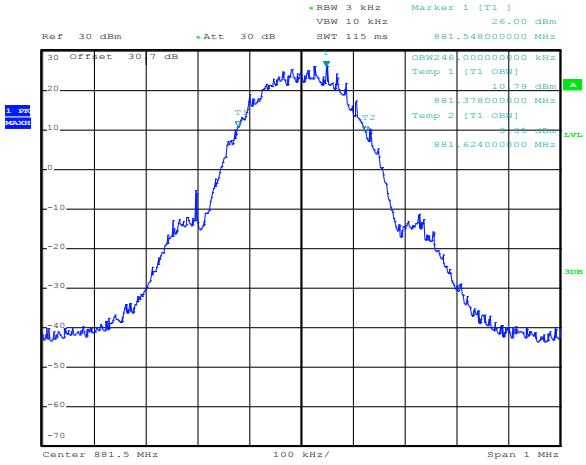


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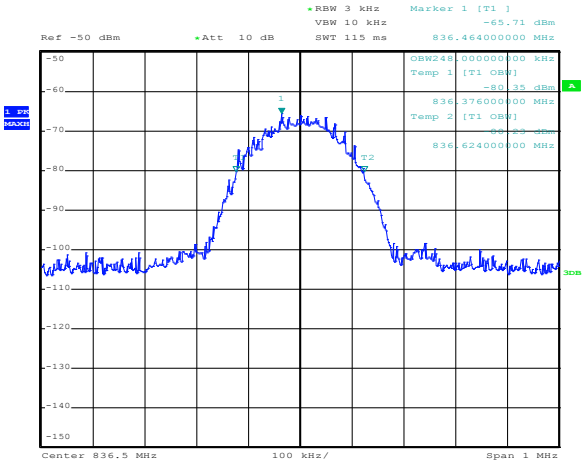
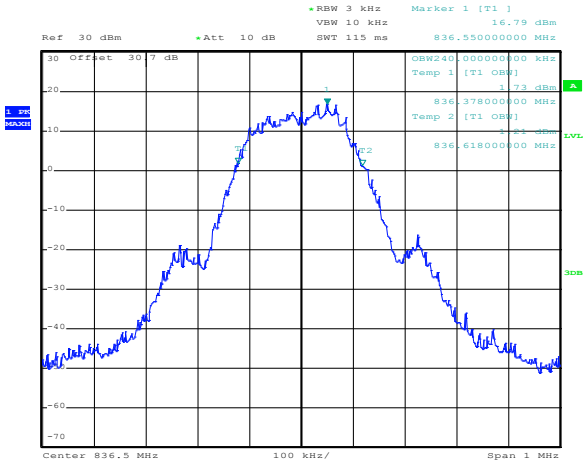
Figure 8.3-12: *MSK AGC +3 dB DL 881.5 MHz output 99% BW*



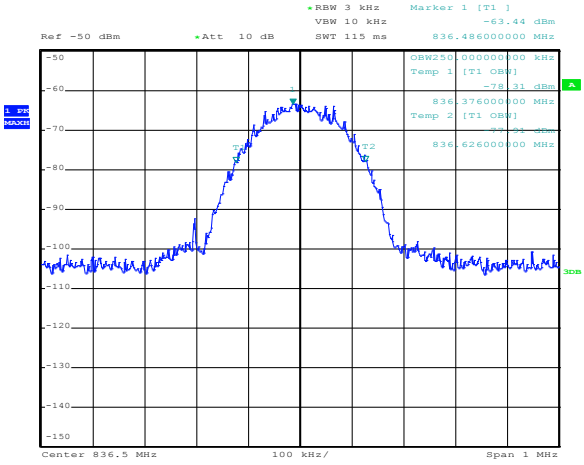
Date: 28.JUN.2018 18:35:15

Figure 8.3-13: *MSK AGC-0.5 dB UL 836.5 MHz input 99% BW*



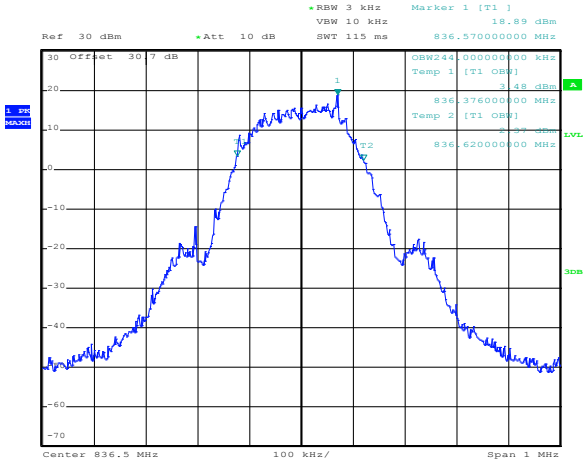
Date: 28.JUN.2018 18:39:34

Figure 8.3-14: *MSK AGC-0.5 dB UL 836.5 MHz output 99% BW*



Date: 28.JUN.2018 18:35:40

Figure 8.3-15: *MSK AGC +3 dB UL 836.5 MHz input 99% BW*



Date: 28.JUN.2018 18:39:59

Figure 8.3-16: *MSK AGC +3 dB UL 836.5 MHz output 99% BW*

8.4 FCC 22.913(a)(d), RSS-131 5.2.3, RSS-132 5.4, KDB 935210 D05 3.5, Mean output power and amplifier/booster gain

8.4.1 Definitions and limits

FCC 22.913
(a) High Density 500 W ERP, Low Density 1000 W ERP
(d) The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB

RSS-131 5.2.3 The zone enhancer gain shall not exceed the nominal gain by more than 1.0 dB. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point.

RSS-132 5.4 refer to SRSP-503. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

8.4.2 Test summary

Test date	June 28, 2018	Temperature	21 °C
Test engineer	Kevin Rose	Air pressure	1006 mbar
Verdict	Pass	Relative humidity	45 %

8.4.3 Observations, settings and special notes

The 99% occupied bandwidth was used.

Spectrum analyzer settings:

Detector mode	RMS (for average), Peak (for peak)
Resolution bandwidth	100 kHz
Integration bandwidth	>OBW
Video bandwidth	>RBW
Trace mode	Power Average (for average), Max Hold (for peak)
Measurement time	Auto

Table 8.4-1: *Peak to Average results*

Modulation	Frequency, MHz	RF output power AVG, dBm	RF output power Peak, dBm	Peak to Average Ratio, dB	Peak to Average Ratio Limit, dBm	Peak to Average Margin, dB
AWGN	836.5	24.71	35.86	11.15	13	1.85
AWGN	881.5	32.98	42.77	9.79	13	3.21
MSK	836.5	24.19	28.37	4.18	13	8.82
MSK	881.5	32.36	32.80	0.44	13	12.56

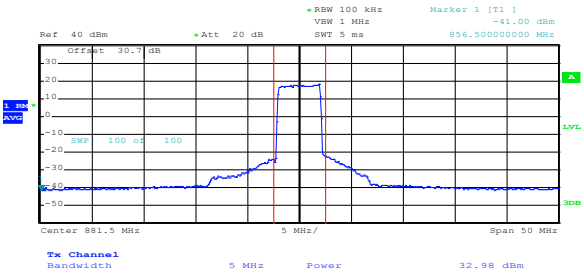
Table 8.4-2: *+3 dB Average results*

Modulation	Frequency, MHz	RF output power AVG, dBm
AWGN	836.5	25.30
AWGN	881.5	32.88
MSK	836.5	24.35
MSK	881.5	32.81

Table 8.4-3: *Amplifier Gain*

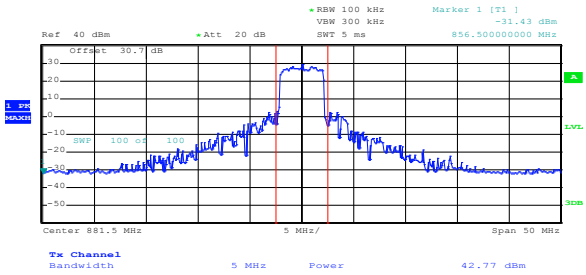
Modulation	Frequency, MHz	RF output power AVG, dBm	RF input power AVG, dBm	Gain, dB	Rated Gain, dB	Margin, dB
AWGN	836.5	24.71	-60.50	85.21	85	-0.21
AWGN	881.5	32.98	-51.01	83.99	85	1.01
MSK	836.5	24.19	-58.15	82.34	85	2.66
MSK	881.5	32.36	-50.49	82.85	85	2.15

8.4.1 Test data



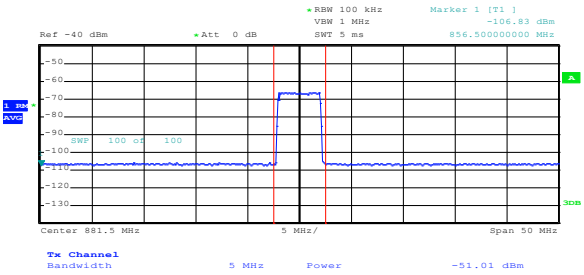
Date: 27.JUN.2018 19:59:54

Figure 8.4-1: *AWGN AGC-0.5 dB DL 881.5 MHz output power average*



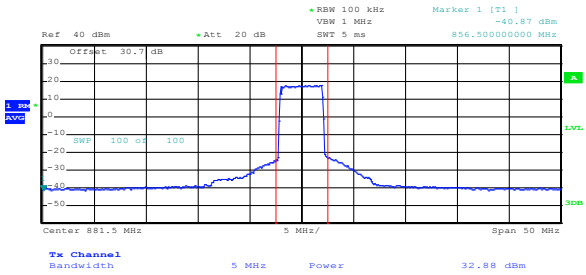
Date: 27.JUN.2018 20:01:29

Figure 8.4-2: *AWGN AGC-0.5 dB DL 881.5 MHz output power peak*



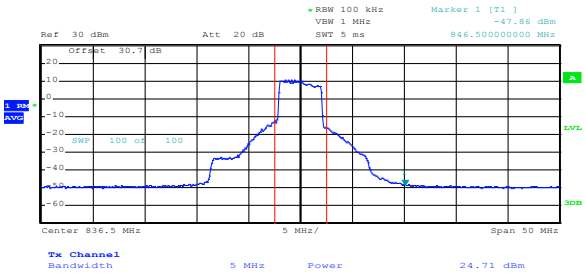
Date: 27.JUN.2018 20:04:17

Figure 8.4-3: *AWGN AGC-0.5 dB DL 881.5 MHz input power average*



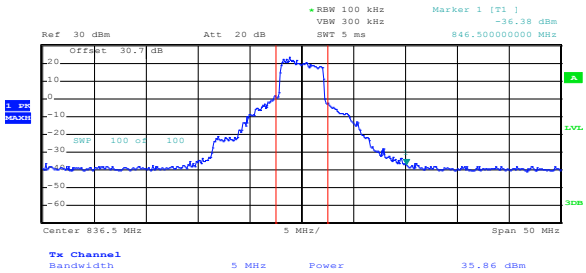
Date: 27.JUN.2018 20:00:25

Figure 8.4-4: *AWGN AGC +3 dB DL 881.5 MHz output power average*



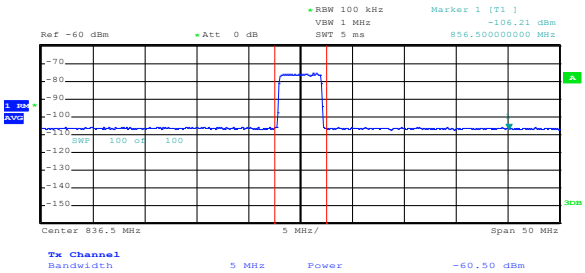
Date: 27.JUN.2018 19:34:26

Figure 8.4-5: *AWGN AGC-0.5 dB UL 836.5 MHz output power average*



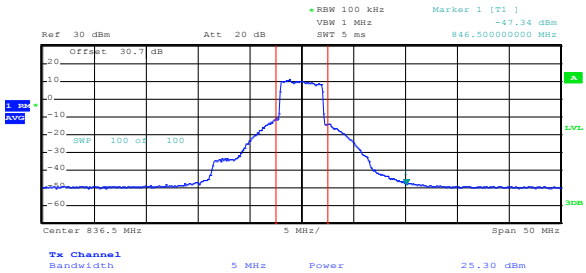
Date: 27.JUN.2018 19:35:09

Figure 8.4-6: *AWGN AGC-0.5 dB UL 836.5 MHz output power peak*



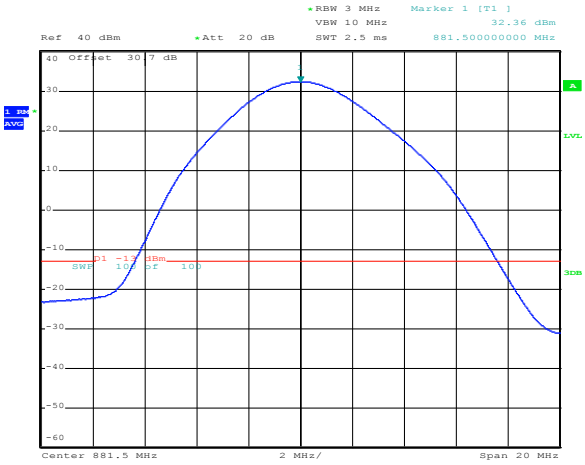
Date: 27.JUN.2018 20:56:56

Figure 8.4-7: *AWGN AGC-0.5 dB UL 836.5 MHz input power average*



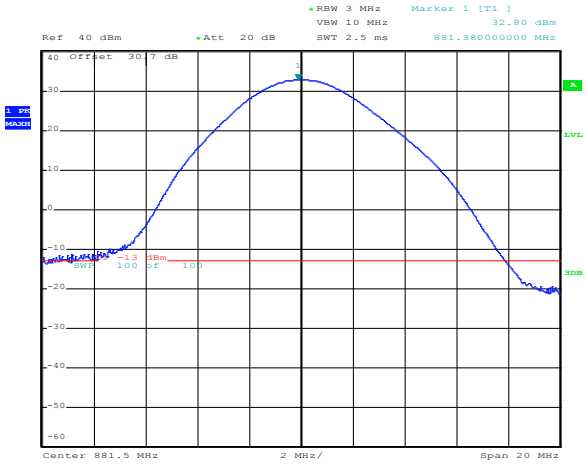
Date: 27.JUN.2018 19:36:26

Figure 8.4-8: *AWGN AGC +3 dB UL 836.5 MHz output power average*



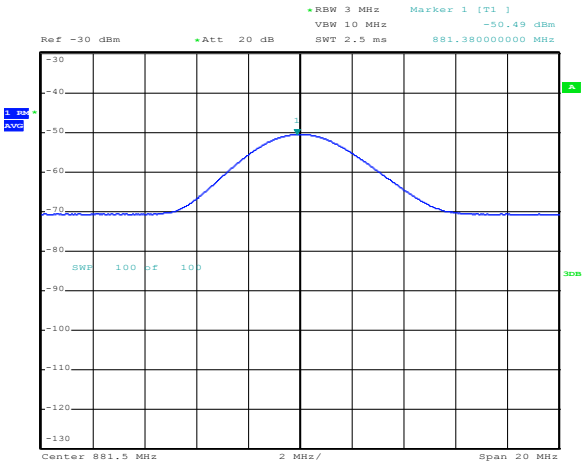
Date: 28.JUN.2018 17:19:49

Figure 8.4-9: *MSK AGC-0.5 dB DL 881.5 MHz output power average*



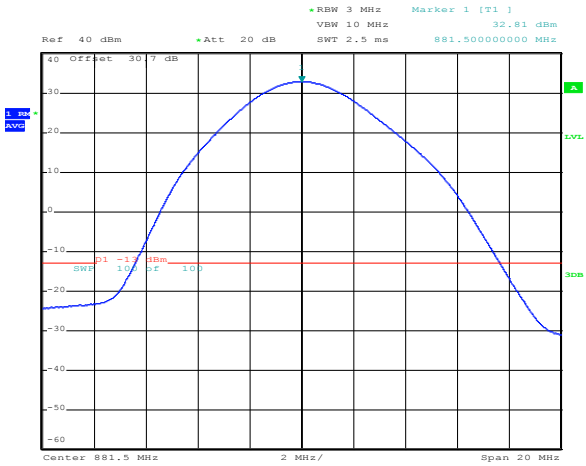
Date: 28.JUN.2018 17:20:27

Figure 8.4-10: *MSK AGC-0.5 dB DL 881.5 MHz output power peak*



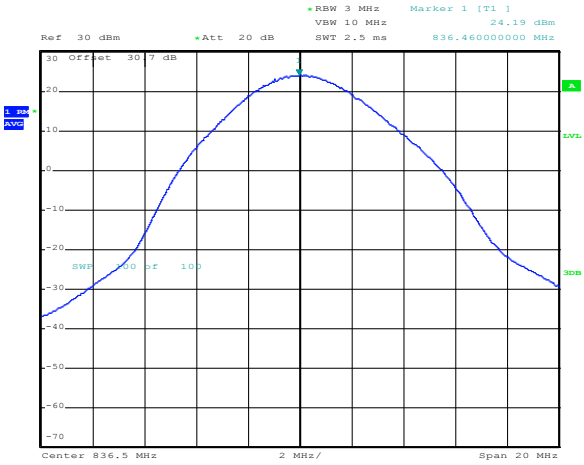
Date: 28.JUN.2018 17:24:20

Figure 8.4-11: *MSK AGC-0.5 dB DL 881.5 MHz input power average*



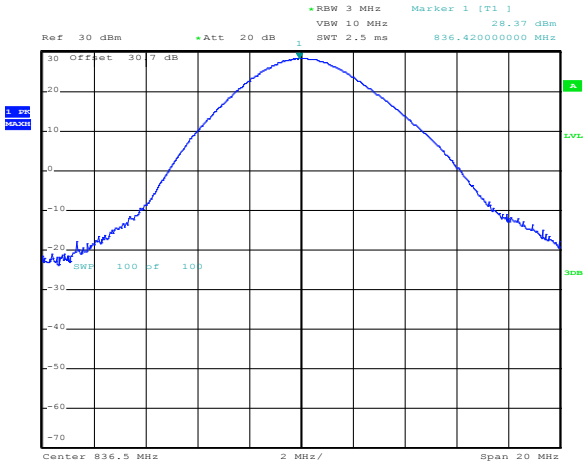
Date: 28.JUN.2018 17:21:32

Figure 8.4-12: *MSK AGC +3 dB DL 881.5 MHz output power average*



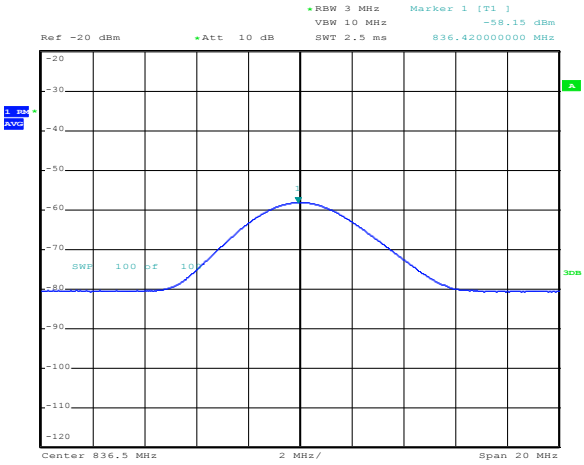
Date: 28.JUN.2018 18:25:41

Figure 8.4-13: *MSK AGC-0.5 dB UL 836.5 MHz output power average*



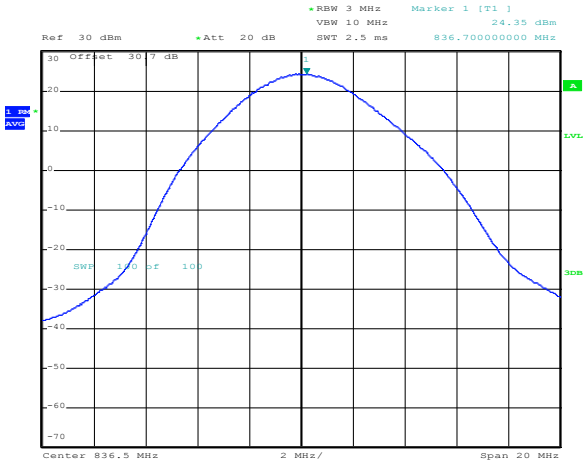
Date: 28.JUN.2018 18:26:04

Figure 8.4-14: *MSK AGC-0.5 dB UL 836.5 MHz output power peak*



Date: 28.JUN.2018 18:29:09

Figure 8.4-15: *MSK AGC-0.5 dB UL 836.5 MHz input power average*



Date: 28.JUN.2018 18:26:57

Figure 8.4-16: *MSK AGC +3 dB UL 836.5 MHz output power average*

8.5 FCC 22.917(a), RSS-132 5.5, KDB 935210 D05 3.6.2, Out-of-band/out-of-block emissions conducted measurements

8.5.1 Definitions and limits

FCC 22.917(a) / RSS-132 5.5 The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

8.5.2 Test summary

Test date	July 5, 2018	Temperature	23 °C
Test engineer	Kevin Rose	Air pressure	1015 mbar
Verdict	Pass	Relative humidity	39 %

8.5.3 Observations, settings and special notes

Test receiver settings:

Detector mode	RMS
Resolution bandwidth	100 kHz (AWGN), 3 kHz(MSK)
Integration bandwidth	>OBW
Video bandwidth	>RBW
Trace mode	Power Average (100 sweeps)
Measurement time	Auto

8.5.4 Test data

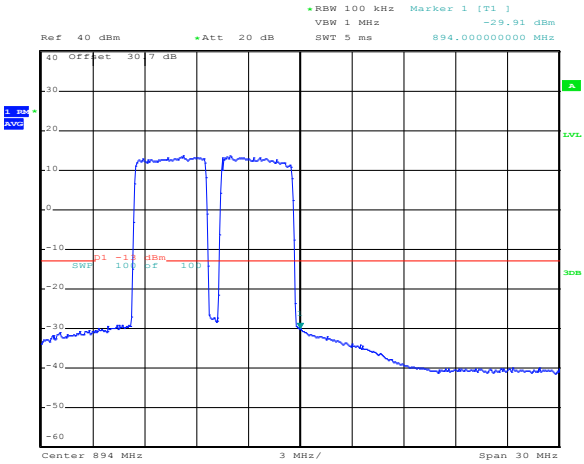


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***Figure 8.5-1: 2X** AWGN 886.5 and 891.5 MHz DL AGC Out-of-block*

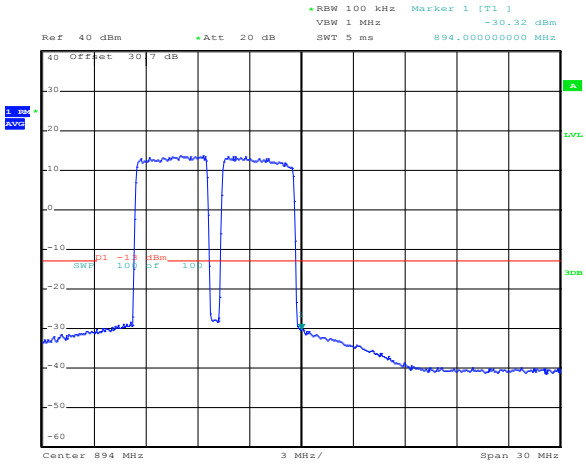

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***Figure 8.5-2: 2X** AWGN 886.5 and 891.5 MHz DL AGC + 3dB Out-of-block*

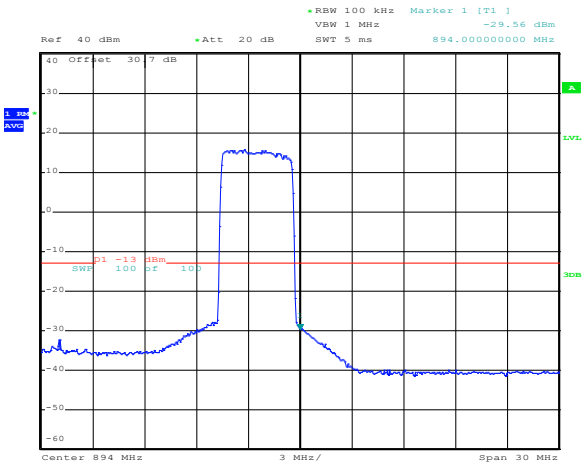

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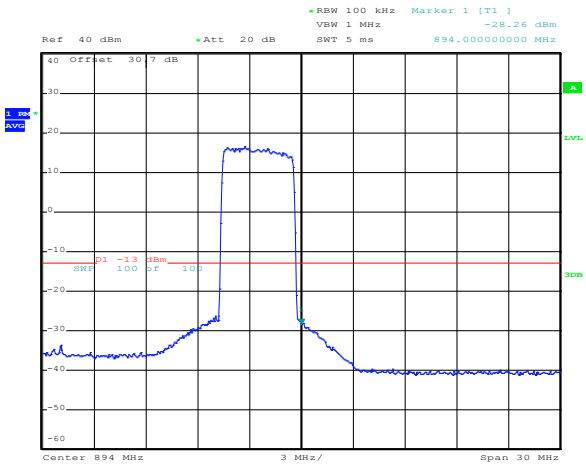
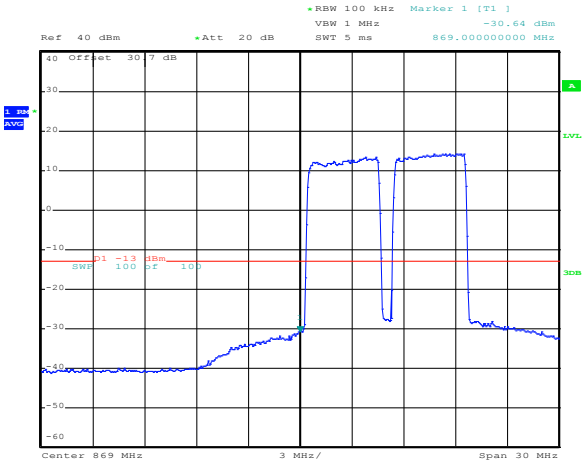
***Figure 8.5-3:** AWGN 891.5 MHz DL AGC Out-of-block*



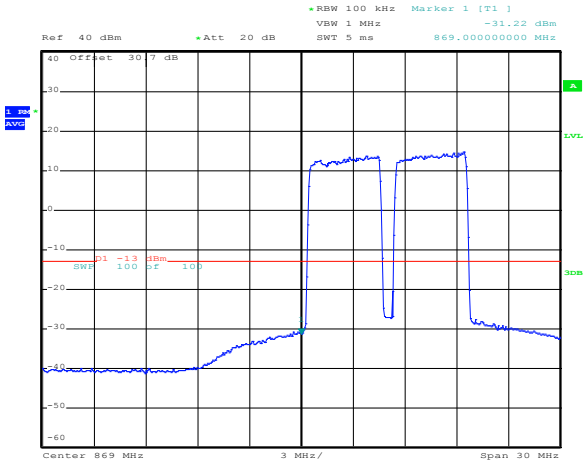
Date: 27.JUN.2018 22:42:54

***Figure 8.5-4:** AWGN 891.5 MHz DL AGC + 3dB Out-of-block*



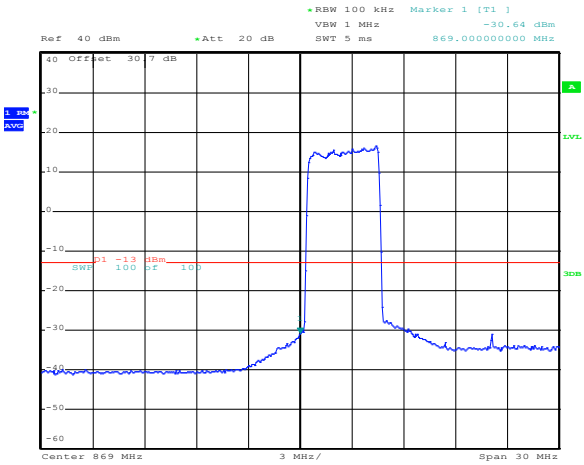
Date: 27.JUN.2018 22:48:55

***Figure 8.5-5: 2X** AWGN 871.5 and 876.5 MHz DL AGC Out-of-block*



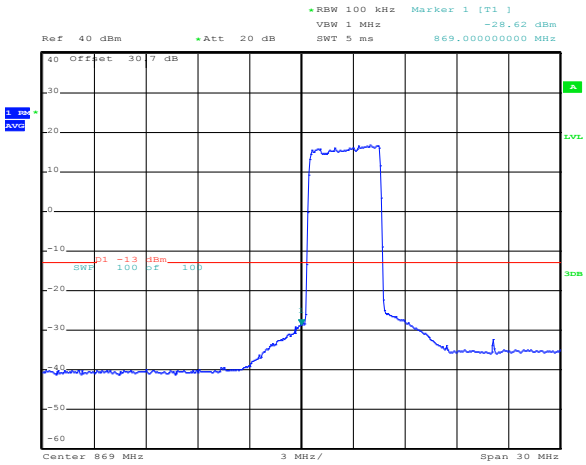
Date: 27.JUN.2018 22:49:38

***Figure 8.5-6: 2X** AWGN 871.5 and 876.5 MHz DL AGC + 3dB Out-of-block*



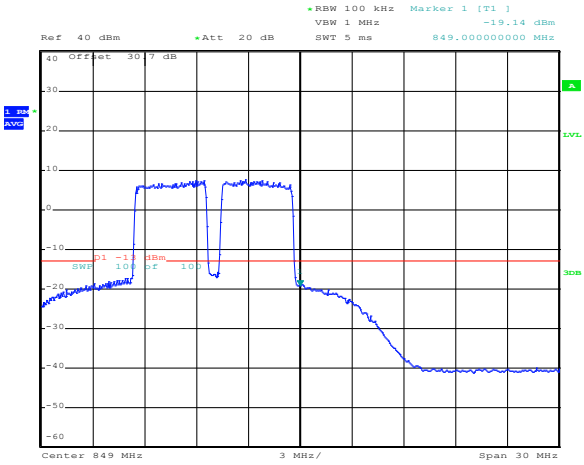
Date: 27.JUN.2018 22:50:45

***Figure 8.5-7:** AWGN 871.5 MHz DL AGC Out-of-block*



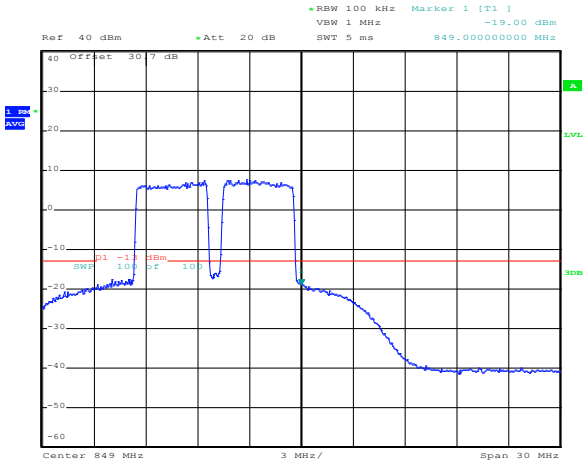
Date: 27.JUN.2018 22:50:11

***Figure 8.5-8:** AWGN 871.5 MHz DL AGC + 3dB Out-of-block*



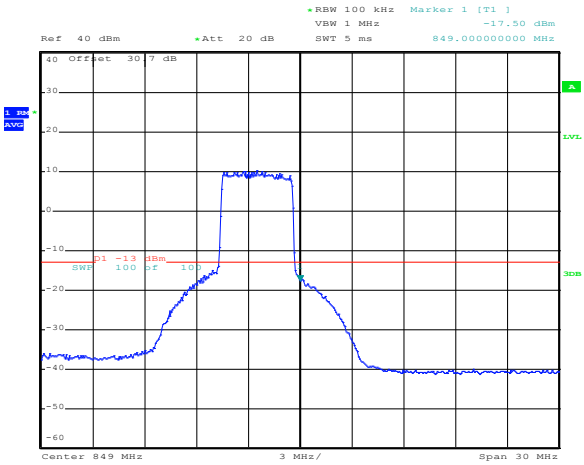
Date: 27.JUN.2018 23:12:40

***Figure 8.5-9: 2X** AWGN 841.5 and 846.5 MHz UL AGC Out-of-block*



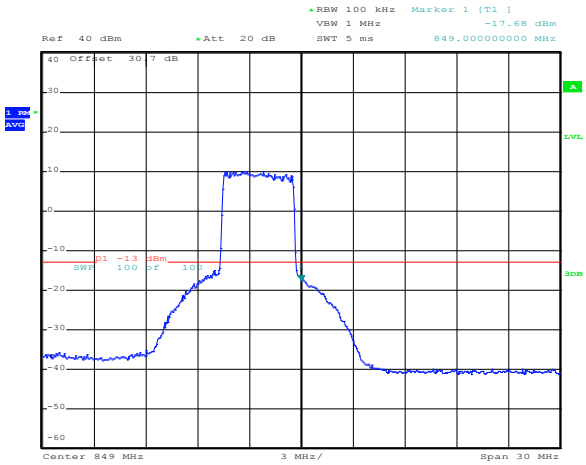
Date: 27.JUN.2018 23:13:17

***Figure 8.5-10: 2X** AWGN 841.5 and 846.5 MHz UL AGC + 3dB Out-of-block*



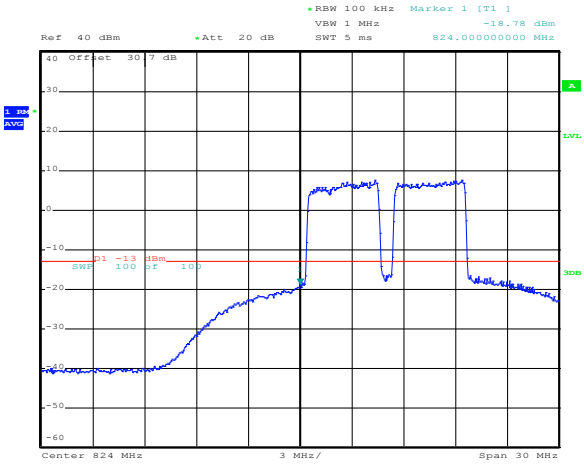
Date: 27.JUN.2018 23:14:06

***Figure 8.5-11:** AWGN 846.5 MHz UL AGC Out-of-block*



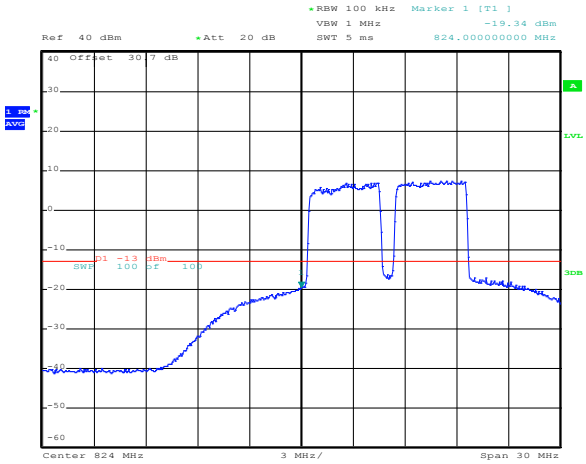
Date: 27.JUN.2018 23:13:44

***Figure 8.5-12:** AWGN 846.5 MHz UL AGC + 3dB Out-of-block*



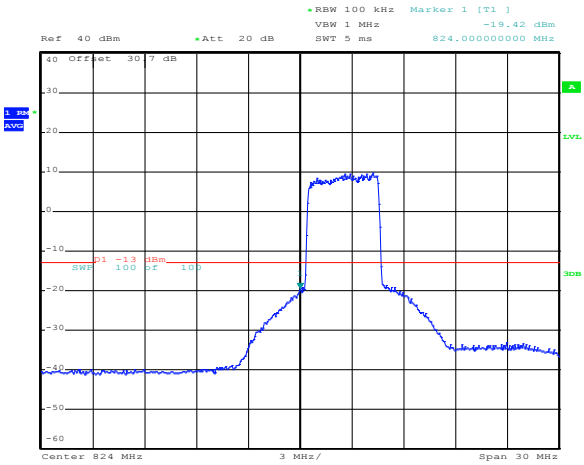
Date: 27.JUN.2018 23:05:35

***Figure 8.5-13: 2X** AWGN 826.5 and 831.5 MHz UL AGC Out-of-block*



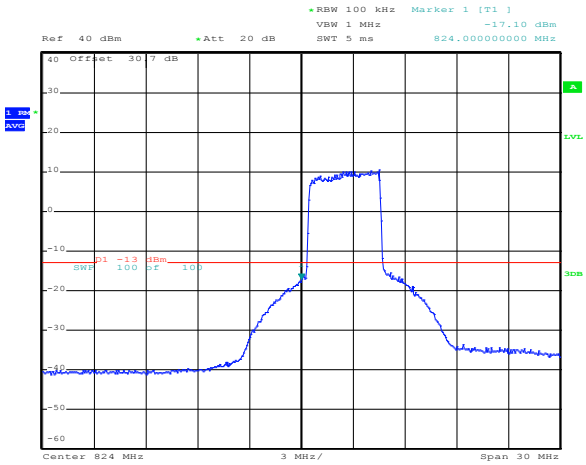
Date: 27.JUN.2018 23:07:05

***Figure 8.5-14: 2X** AWGN 826.5 and 831.5 MHz UL AGC + 3dB Out-of-block*



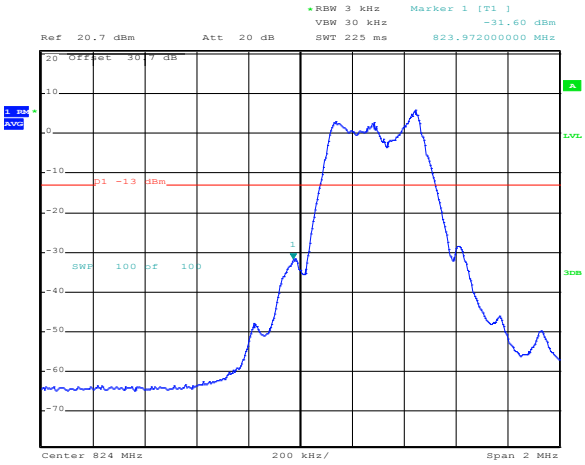
Date: 27.JUN.2018 23:09:20

***Figure 8.5-15:** AWGN 826.5 MHz UL AGC Out-of-block*



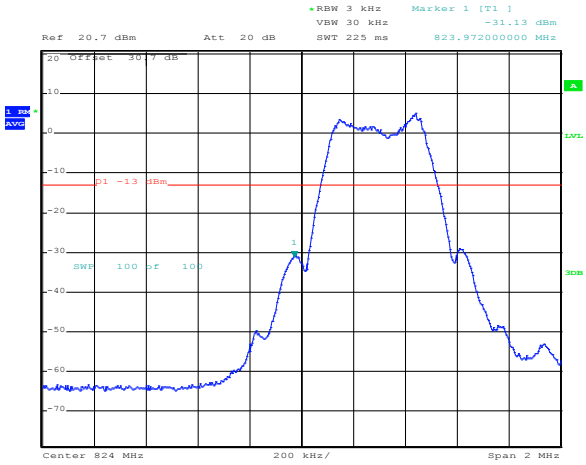
Date: 27.JUN.2018 23:07:46

***Figure 8.5-16:** AWGN 826.5 MHz UL AGC + 3dB Out-of-block*



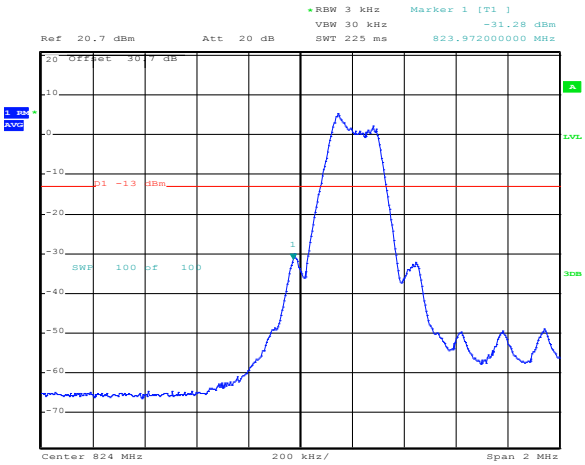
Date: 28.JUN.2018 16:43:09

***Figure 8.5-17: 2X** MSK 824.2 and 824.6 MHz UL AGC Out-of-block*



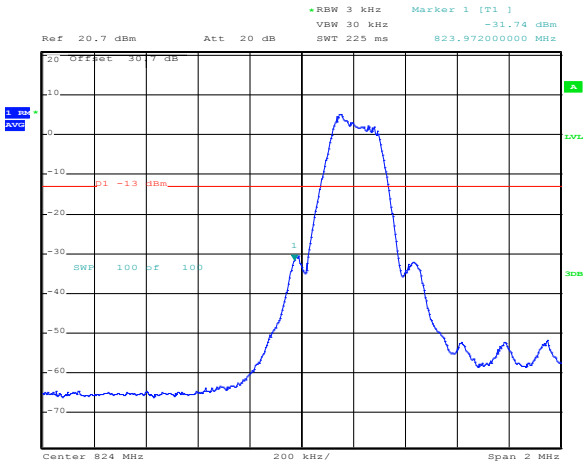
Date: 28.JUN.2018 16:44:00

***Figure 8.5-18: 2X** MSK 824.2 and 824.4 MHz UL AGC + 3dB Out-of-block*



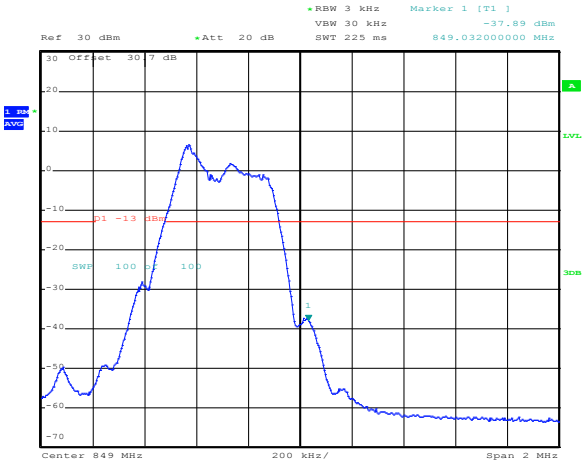
Date: 28.JUN.2018 16:45:24

***Figure 8.5-19:** MSK 824.2 MHz UL AGC Out-of-block*



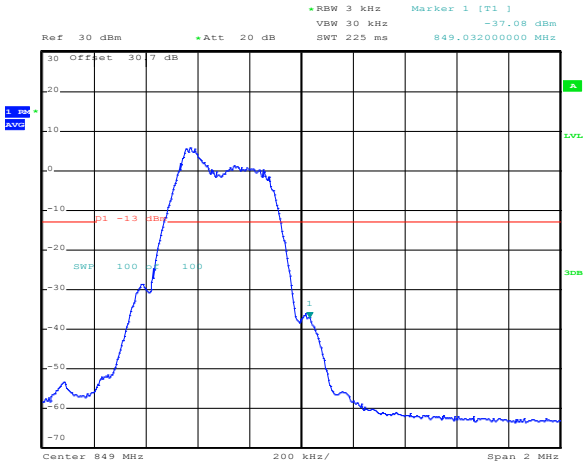
Date: 28.JUN.2018 16:44:42

***Figure 8.5-20:** MSK 824.2 MHz UL AGC + 3dB Out-of-block*



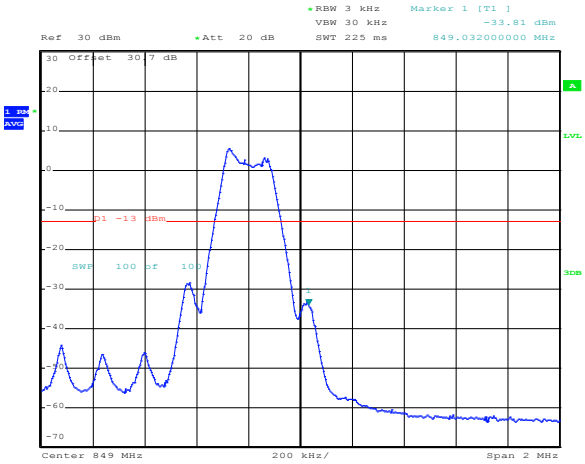
Date: 28.JUN.2018 16:28:37

***Figure 8.5-21: 2X** MSK 848.6 and 848.8 MHz UL AGC Out-of-block*



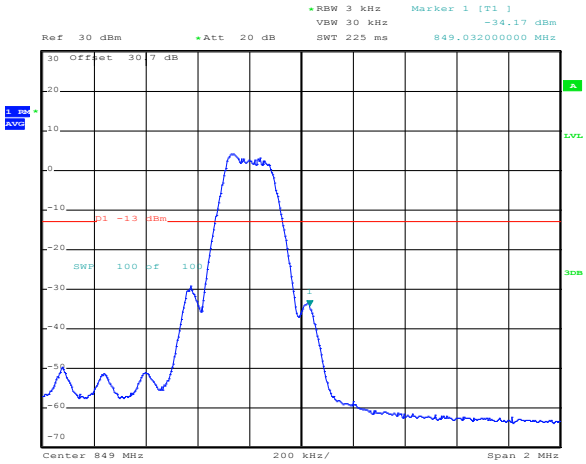
Date: 28.JUN.2018 16:20:08

***Figure 8.5-22: 2X** MSK 848.6 and 848.8 MHz UL AGC + 3dB Out-of-block*



Date: 28.JUN.2018 16:27:10

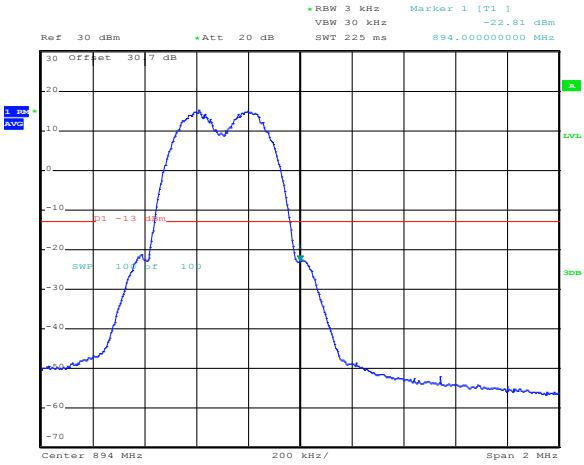
***Figure 8.5-23:** MSK 848.8 MHz UL AGC Out-of-block*



Date: 28.JUN.2018 16:21:00

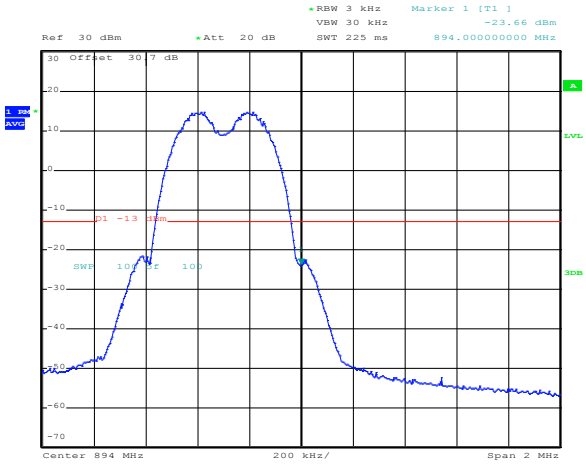
***Figure 8.5-24:** MSK 848.8 MHz UL AGC + 3dB Out-of-block*

.



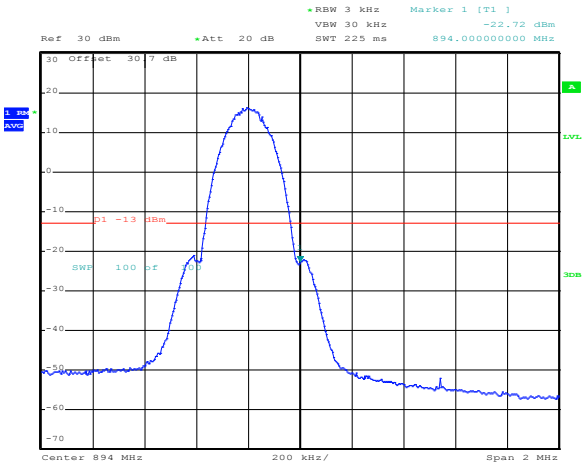
Date: 28.JUN.2018 16:08:04

***Figure 8.5-25: 2X** MSK 893.6 and 893.8 MHz DL AGC Out-of-block*



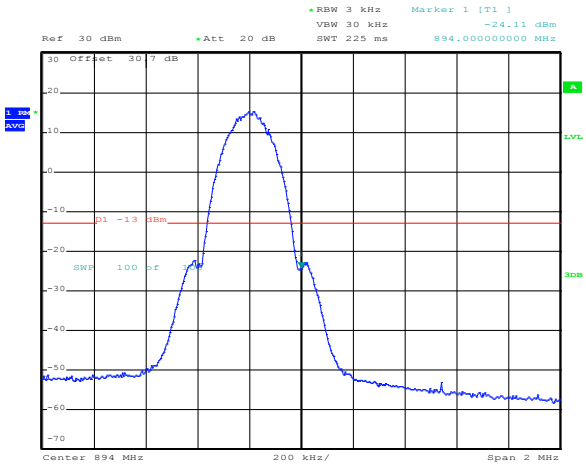
Date: 28.JUN.2018 16:08:53

***Figure 8.5-26: 2X** MSK 893.6 and 893.8 MHz DL AGC + 3dB Out-of-block*



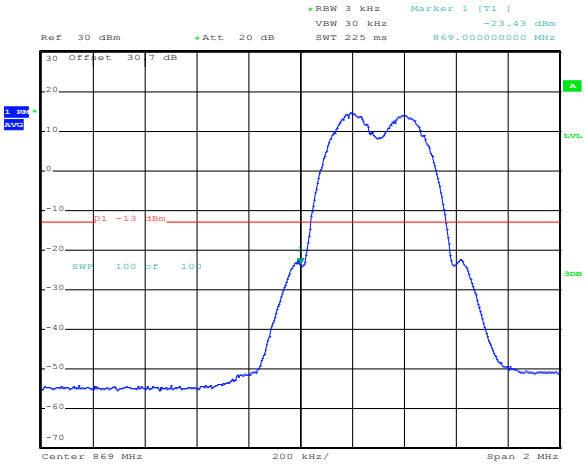
Date: 28.JUN.2018 16:10:18

***Figure 8.5-27:** MSK 893.8 MHz DL AGC Out-of-block*



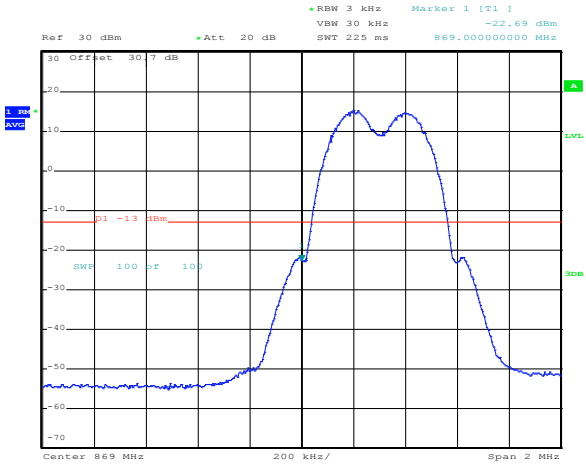
Date: 28.JUN.2018 16:09:30

***Figure 8.5-28:** MSK 893.8 MHz DL AGC + 3dB Out-of-block*



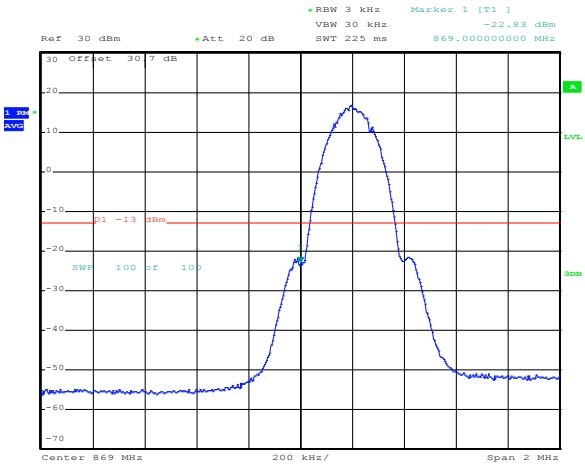
Date: 28.JUN.2018 15:58:09

***Figure 8.5-29: 2X** MSK 869.2 and 869.4 MHz DL AGC Out-of-block*



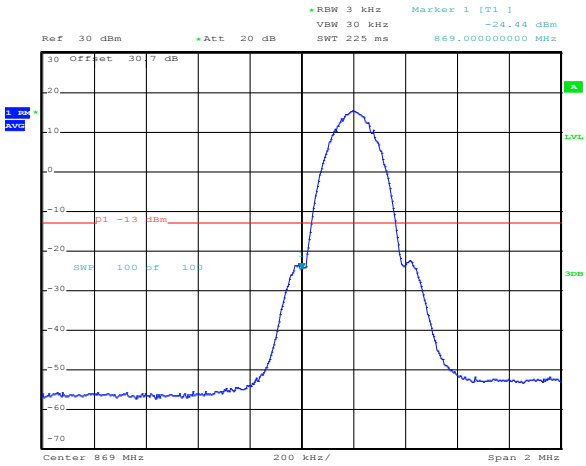
Date: 28.JUN.2018 15:59:06

***Figure 8.5-30: 2X** MSK 869.2 and 869.4 MHz MHz DL AGC + 3dB Out-of-block*



Date: 28.JUN.2018 16:00:48

***Figure 8.5-31:** MSK 869.2 MHz DL AGC Out-of-block*



Date: 28.JUN.2018 16:00:03

***Figure 8.5-32:** MSK 869.2 MHz DL AGC + 3dB Out-of-block*

8.6 FCC 22.917(a), RSS-132 5.5, KDB 935210 D05 3.6.3, Spurious emissions conducted measurements

FCC 22.917(a) / RSS-132 5.5 The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB

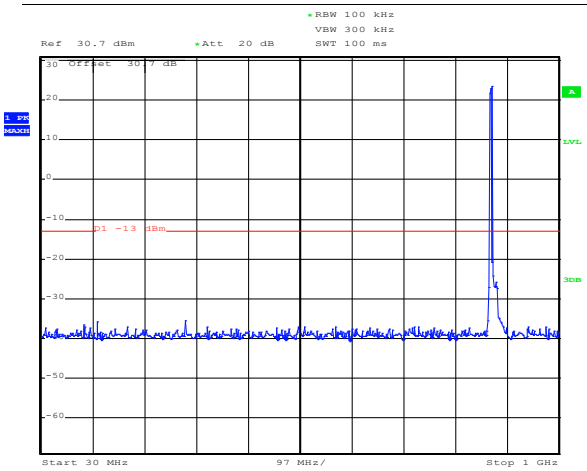
8.6.1 Test summary

Test date	June 27, 2018	Temperature	21 °C
Test engineer	Kevin Rose	Air pressure	1000 mbar
Verdict	Pass	Relative humidity	42 %

8.6.2 Observations, settings and special notes

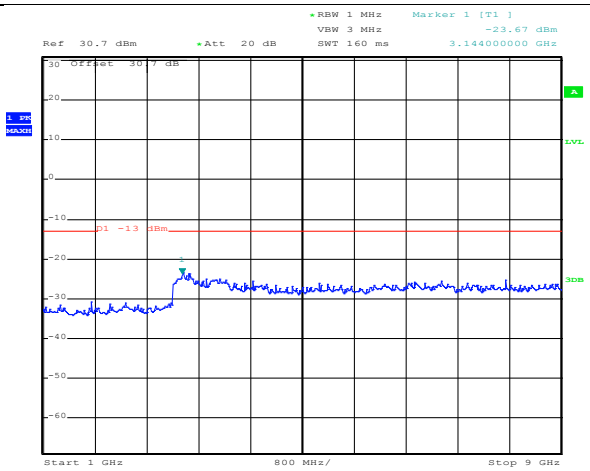
Frequency range	30 MHz to 10th harmonic
Detector mode	Peak
Resolution bandwidth sweep	100 kHz (below 1 GHz), 1000 kHz (above 1 GHz)
Video bandwidth	>RBW
Trace mode	Max Hold
Measurement time	Auto

8.6.3 Test data



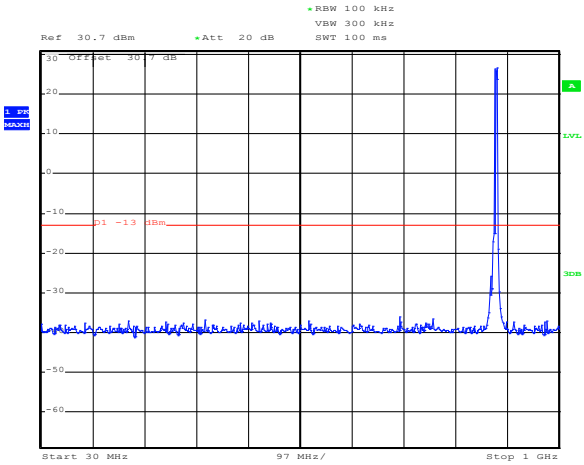
Date: 27.JUN.2018 21:56:23

Figure 8.6-1: *AWGN 871.5 MHz DL Conducted 30-1000 MHz*



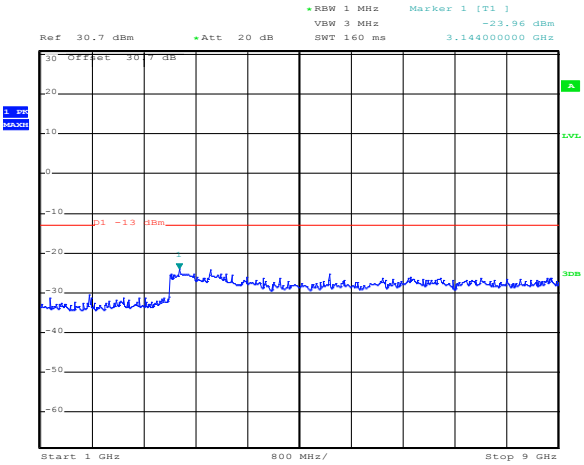
Date: 27.JUN.2018 21:57:25

Figure 8.6-2: *AWGN 871.5 MHz DL Conducted 1-9 GHz*



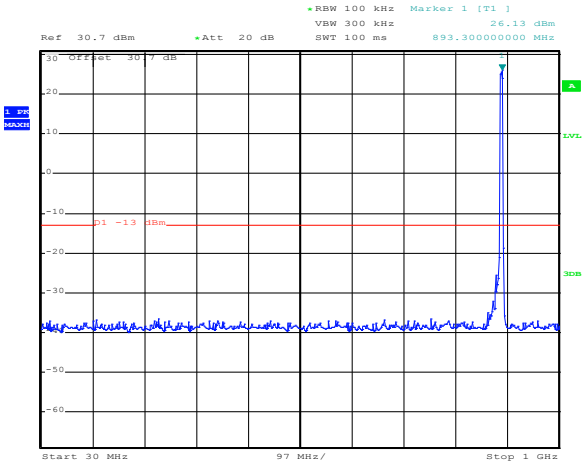
Date: 27.JUN.2018 21:55:12

Figure 8.6-3: *AWGN 881.5 MHz DL Conducted 30-1000 MHz*



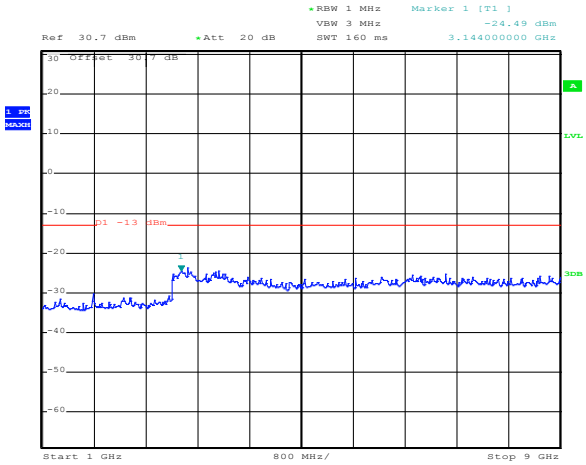
Date: 27.JUN.2018 21:57:54

Figure 8.6-4: *AWGN 881.5 MHz DL Conducted 1-9 GHz*



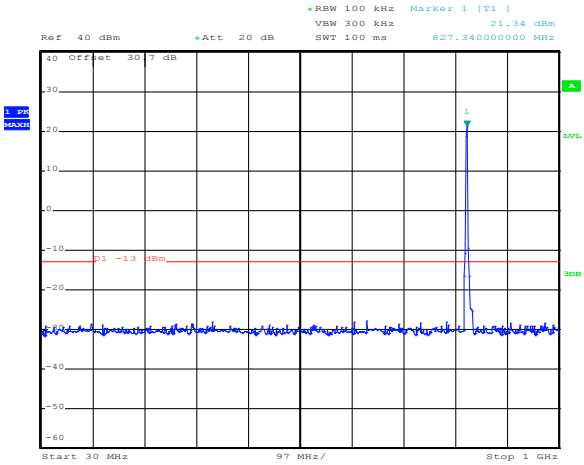
Date: 27.JUN.2018 21:59:55

Figure 8.6-5: *AWGN 891.5 MHz DL Conducted 30-1000 MHz*



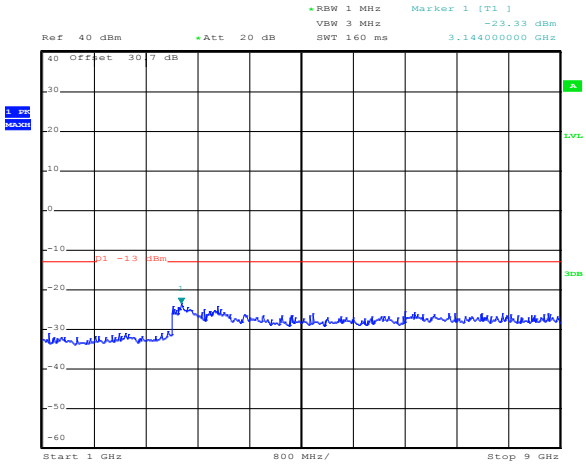
Date: 27.JUN.2018 21:59:08

Figure 8.6-6: *AWGN 891.5 MHz DL Conducted 1-9 GHz*



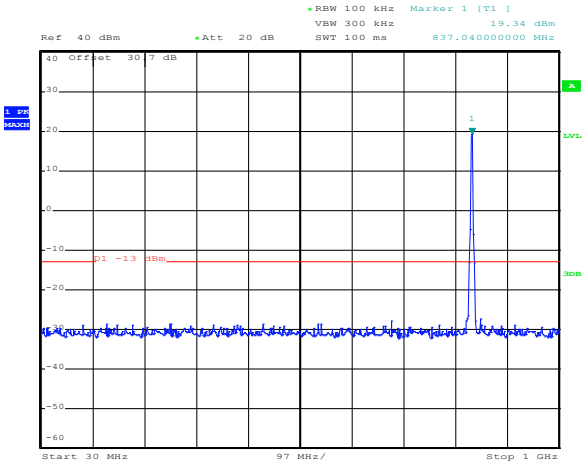
Date: 27.JUN.2018 22:09:18

Figure 8.6-7: *AWGN 826.5 MHz UL Conducted 30-1000 MHz*



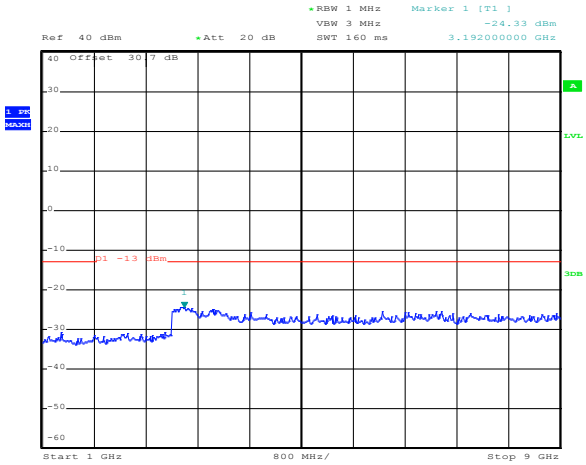
Date: 27.JUN.2018 22:08:01

Figure 8.6-8: *AWGN 826.5 MHz UL Conducted 1-9 GHz*



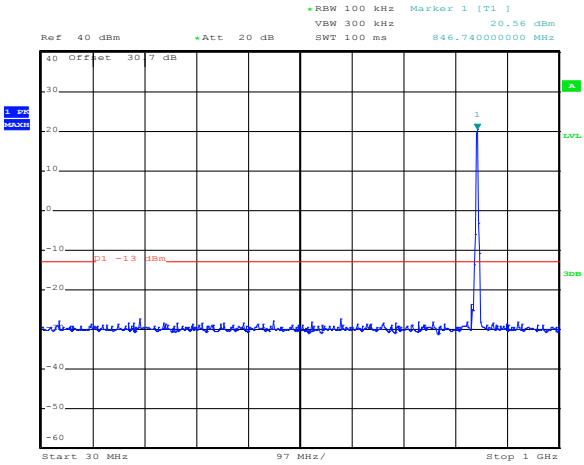
Date: 27.JUN.2018 22:09:53

Figure 8.6-9: *AWGN 836.5 MHz UL Conducted 30-1000 MHz*



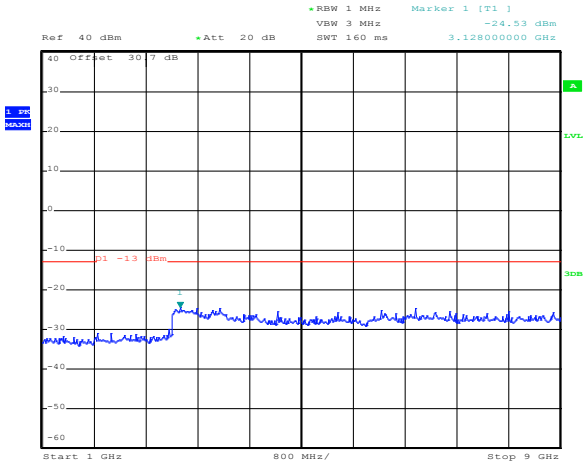
Date: 27.JUN.2018 22:07:34

Figure 8.6-10: *AWGN 836.5 MHz UL Conducted 1-9 GHz*



Date: 27.JUN.2018 22:05:13

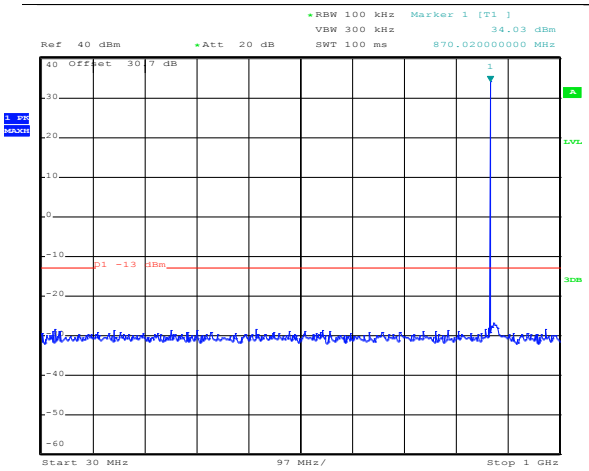
Figure 8.6-11: *AWGN 846.5 MHz UL Conducted 30-1000 MHz*



Date: 27.JUN.2018 22:05:51

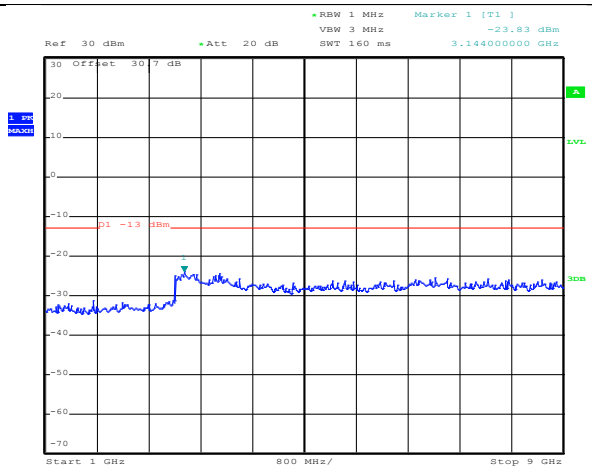
Figure 8.6-12: *AWGN 846.5 MHz UL Conducted 1-9 GHz*

8.6.1 Test data



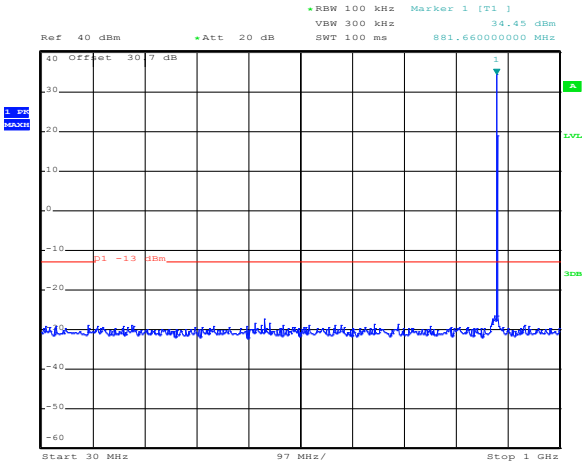
Date: 28.JUN.2018 17:02:47

Figure 8.6-13: *MSK 869.2 MHz DL Conducted 30-1000 MHz*



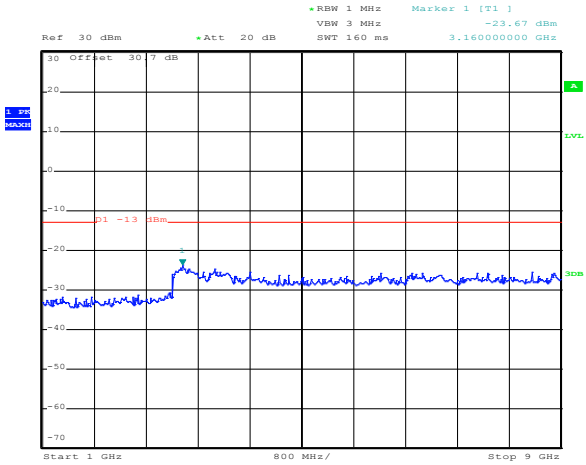
Date: 28.JUN.2018 17:01:51

Figure 8.6-14: *MSK 869.2 MHz DL Conducted 1-9 GHz*



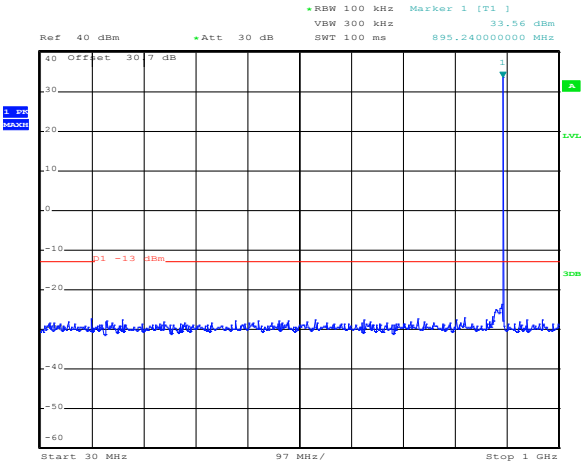
Date: 28.JUN.2018 17:03:21

Figure 8.6-15: *MSK 881.5 MHz DL Conducted 30-1000 MHz*



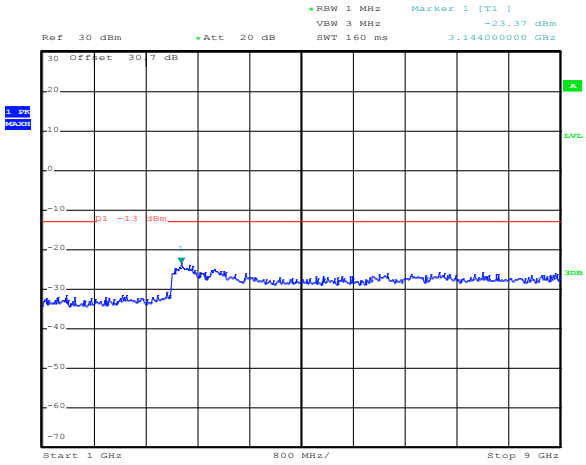
Date: 28.JUN.2018 17:01:07

Figure 8.6-16: *MSK 881.5 MHz DL Conducted 1-9 GHz*



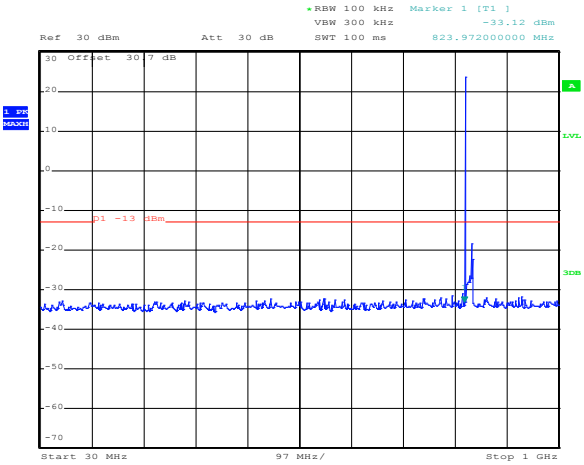
Date: 28.JUN.2018 16:56:59

Figure 8.6-17: *MSK 893.8 MHz DL Conducted 30-1000 MHz*



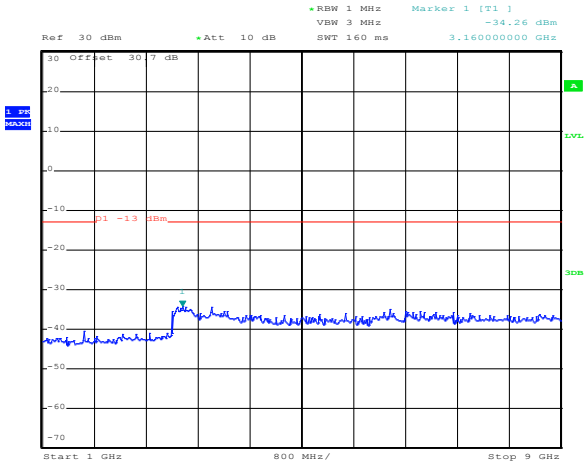
Date: 28.JUN.2018 17:00:38

Figure 8.6-18: *MSK 893.8 MHz DL Conducted 1-9 GHz*



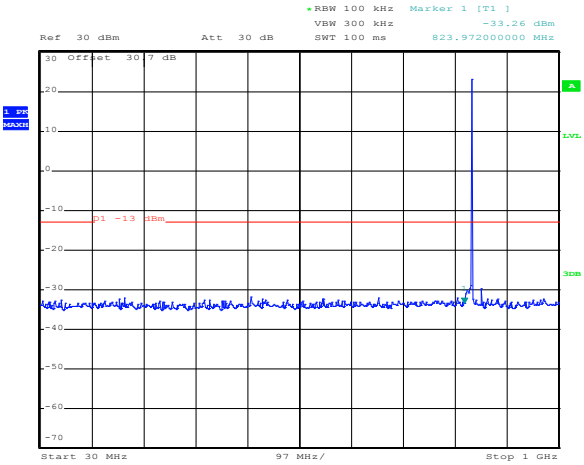
Date: 28.JUN.2018 16:49:08

Figure 8.6-19: *MSK 824.2 MHz UL Conducted 30-1000 MHz*



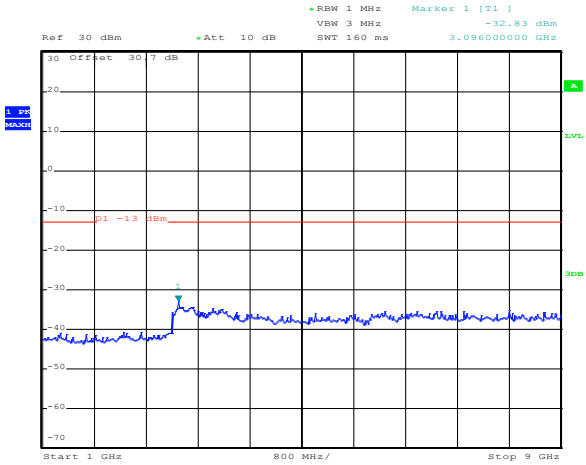
Date: 28.JUN.2018 16:51:22

Figure 8.6-20: *MSK 824.2 MHz UL Conducted 1-9 GHz*



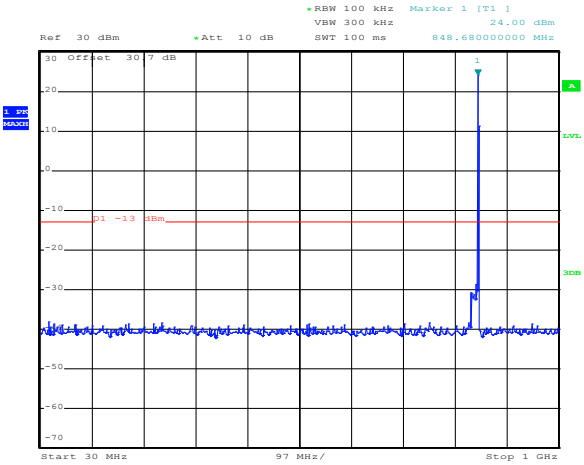
Date: 28.JUN.2018 16:49:57

Figure 8.6-21: *MSK 836.5 MHz UL Conducted 30-1000 MHz*



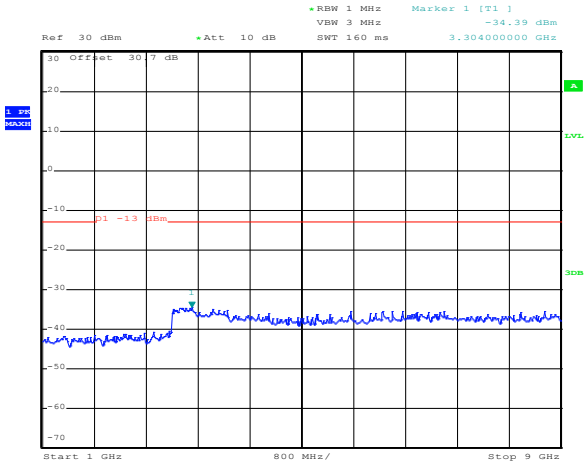
Date: 28.JUN.2018 16:50:51

Figure 8.6-22: *MSK 836.5 MHz UL Conducted 1-9 GHz*



Date: 28.JUN.2018 16:52:56

Figure 8.6-23: *MSK 848.8 MHz UL Conducted 30-1000 MHz*



Date: 28.JUN.2018 16:52:29

Figure 8.6-24: *MSK 848.8 MHz UL Conducted 1-9 GHz*

8.7 FCC 22.917(a), RSS-132 5.5, KDB 935210 D05 3.8, Spurious emissions radiated measurements

8.7.1 Definitions and limits

FCC 22.917(a) / RSS-132 5.5 The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB

8.7.2 Test summary

Test date	July 5, 2018	Temperature	23 °C
Test engineer	Kevin Rose	Air pressure	1015 mbar
Verdict	Pass	Relative humidity	39 %

8.7.3 Observations, settings and special notes

Worst case examples are provided. No emissions within 20 dB of the limit were detected.

Receiver settings were:

Frequency range	30 MHz to 10th harmonic
Detector mode	Peak
Resolution bandwidth	100 kHz (below 1 GHz), 1000 kHz (above 1 GHz)
Video bandwidth	>RBW
Trace mode	Max Hold

8.7.4 Test data

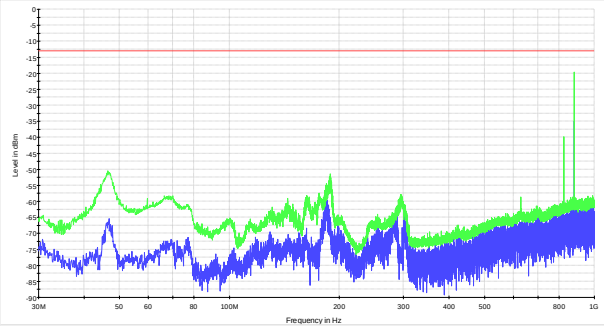


Figure 8.7-1: *30 MHz to 1 GHz Radiated*

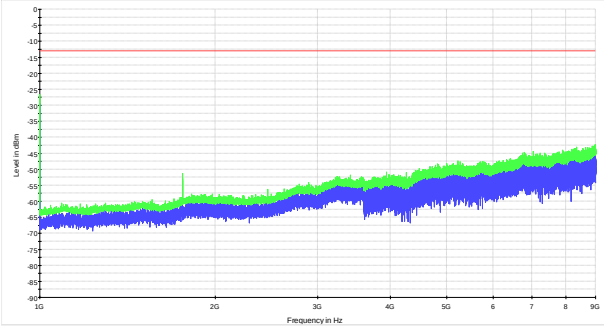


Figure 8.7-2: *1GHz to 9 GHz Radiated*

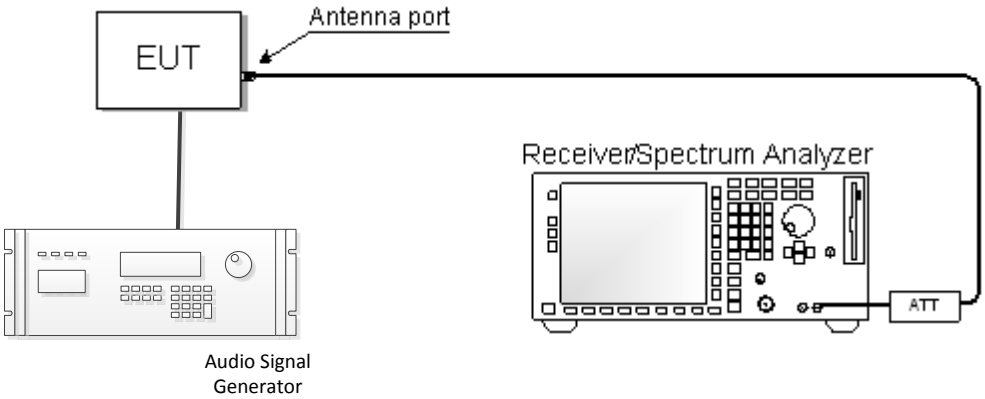
Section 9. Setup Photos

9.1 Set-up

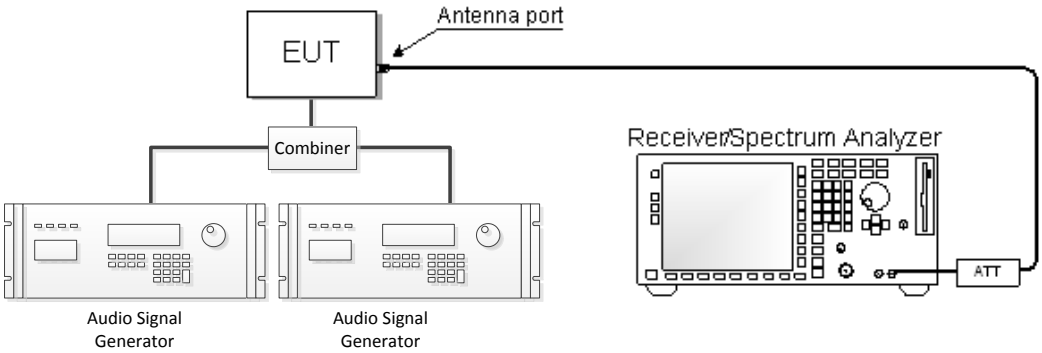
Figure 9.1-1: *Radiated setup photo*

Section 10. Block diagrams of test set-ups

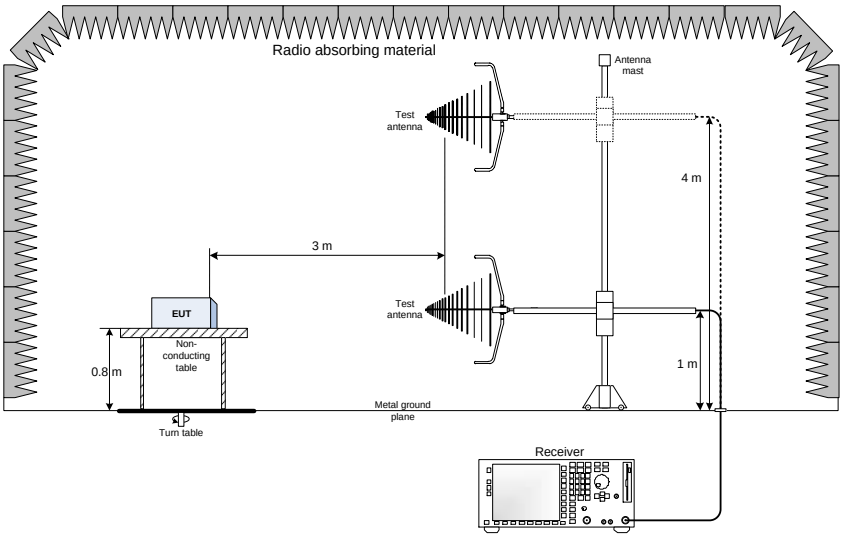
10.1 Measuring AGC threshold level, Out-of-band-rejection, Input-versus-output signal comparison, Mean output power and amplifier/booster gain, Spurious emissions conducted measurements



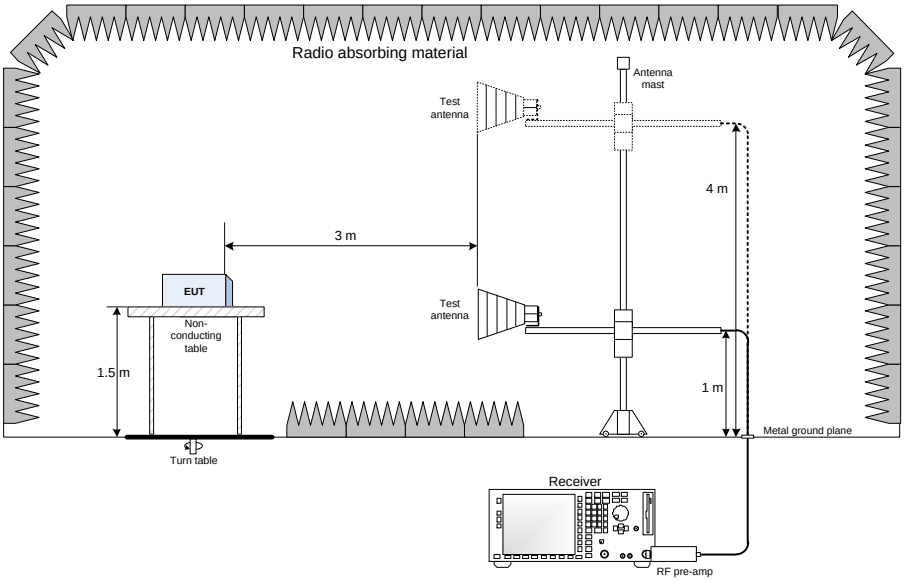
10.2 Out-of-band/out-of-block emissions conducted measurements (intermodulation test)



10.3 Spurious emissions radiated measurements



Below 1 GHz



Above 1 GHz