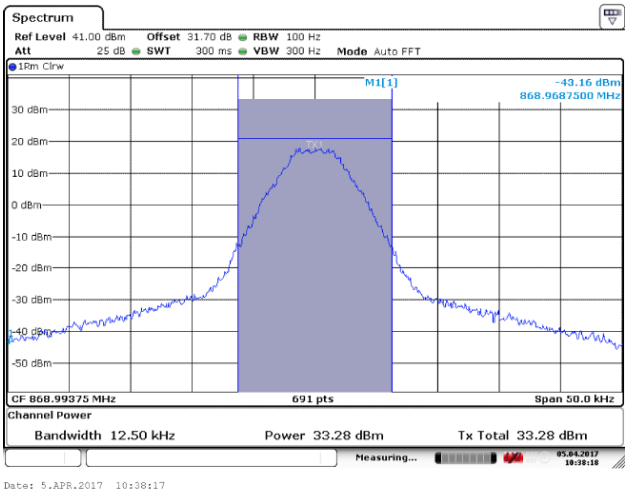
Low Frequency: 851.00625MHz

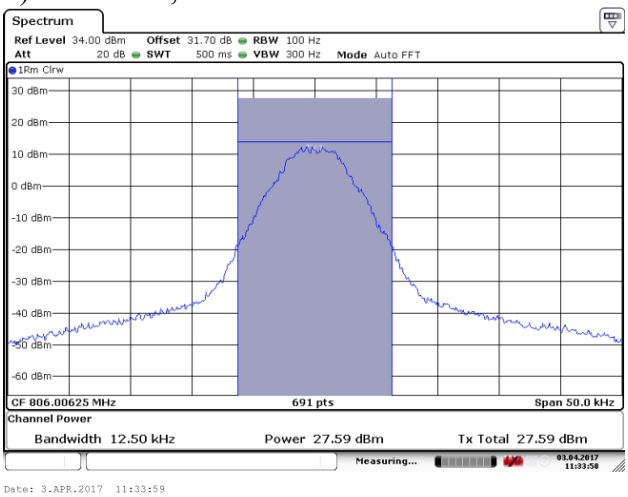


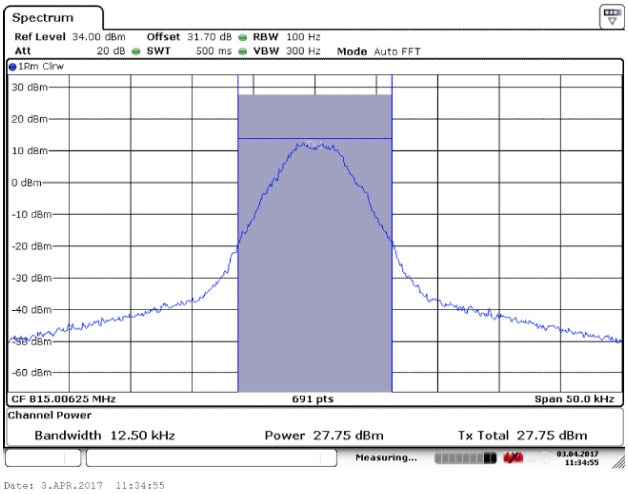
Mid Frequency: 860.00625MHz

High Frequency: 868.99375MHz

(2) Uplink

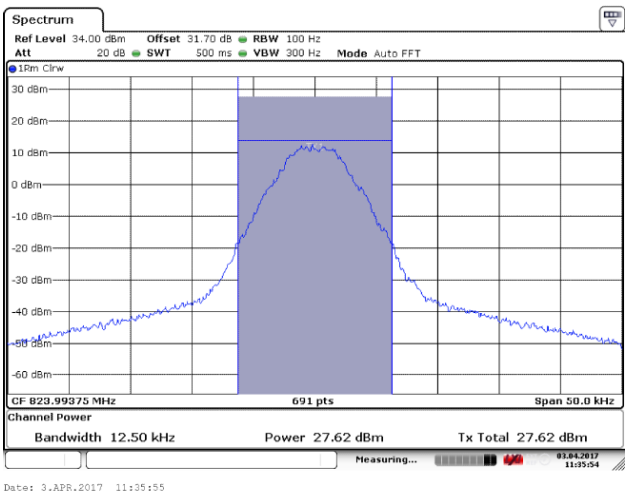
1). AC 120V, 50/60Hz





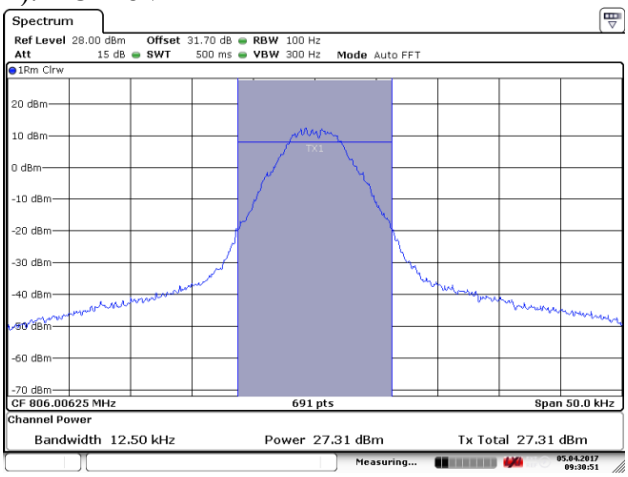
Low Frequency: 806.00625MHz

Mid Frequency: 815.00625MHz

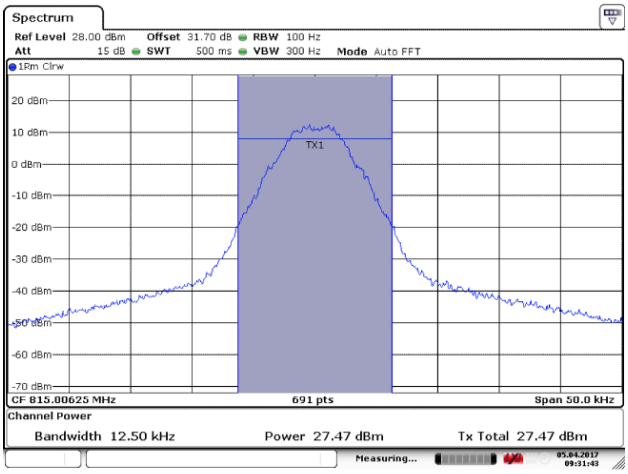


High Frequency: 823.99375MHz

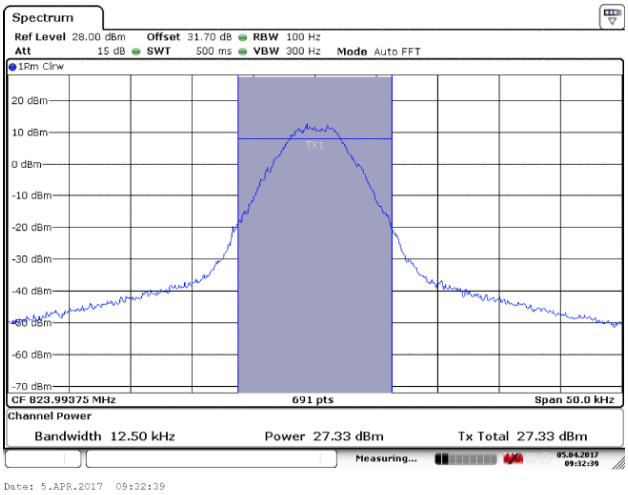
2). DC -48V



Low Frequency: 806.00625MHz



Mid Frequency: 815.00625MHz

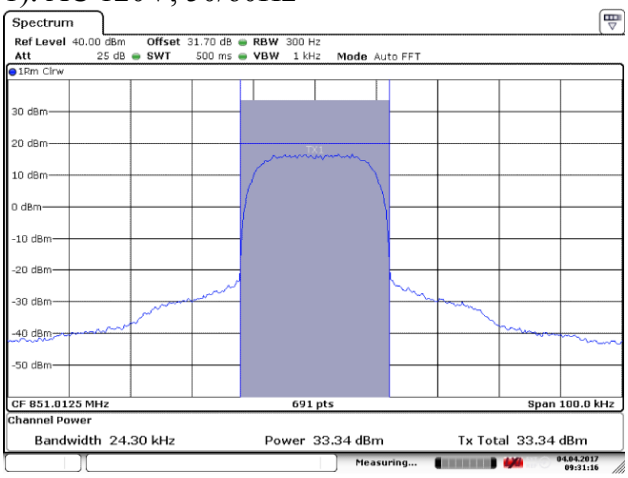


High Frequency: 823.99375MHz

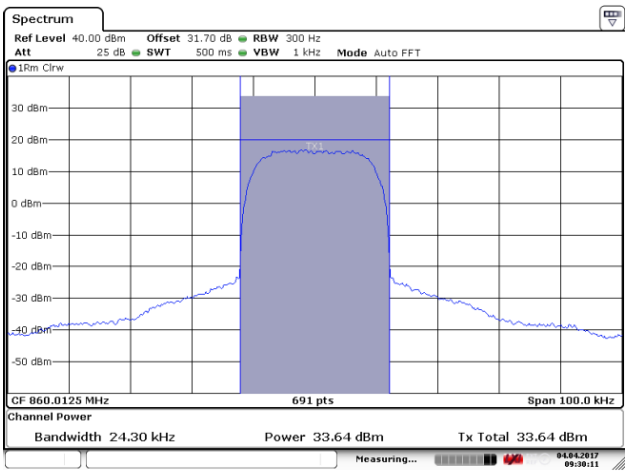
6.1.5.2.2 Modulation signal: Tetra

(1) Downlink

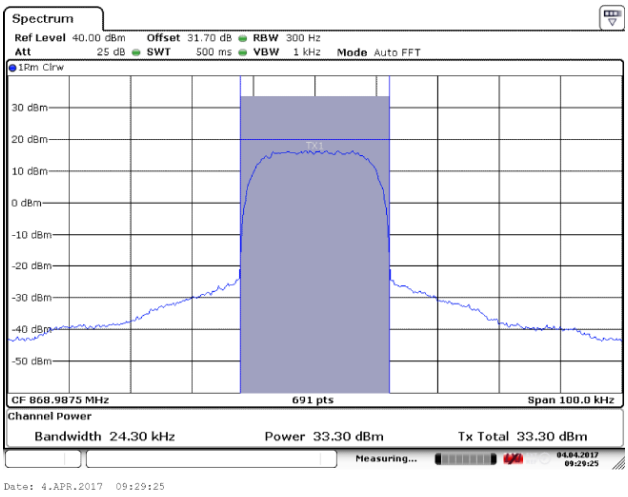
1). AC 120V, 50/60Hz



Low Frequency: 851.0125MHz

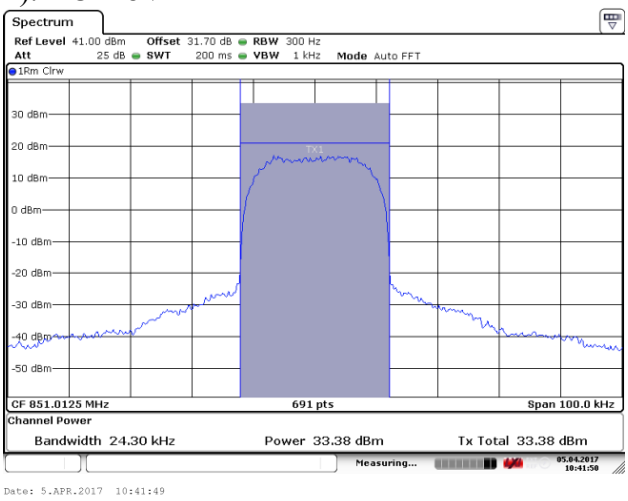


Mid Frequency: 860.0125MHz

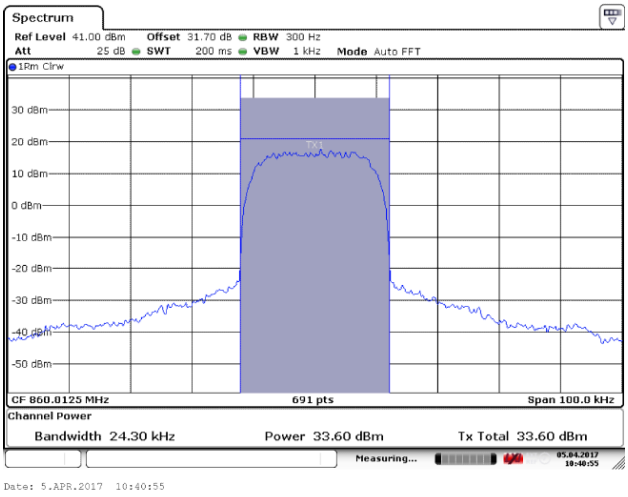


High Frequency: 868.9875MHz

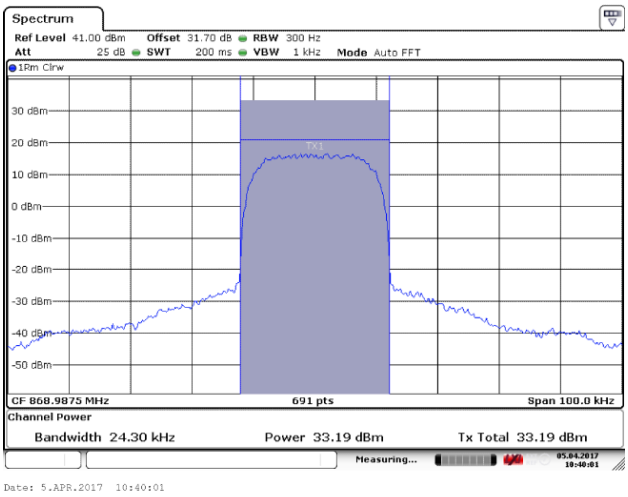
2). DC -48V



Low Frequency: 851.0125MHz



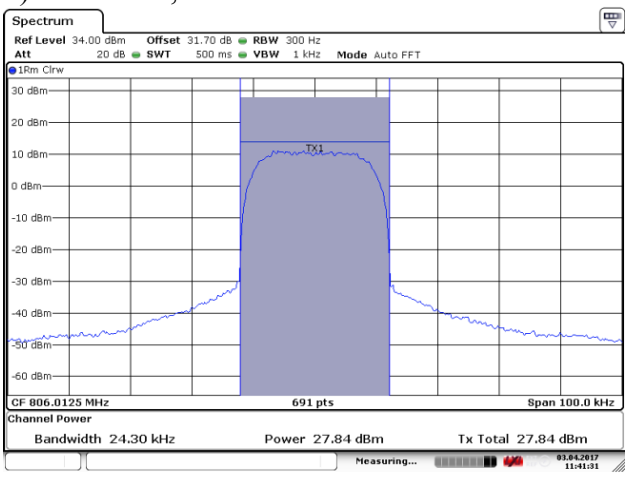
Mid Frequency: 860.0125MHz



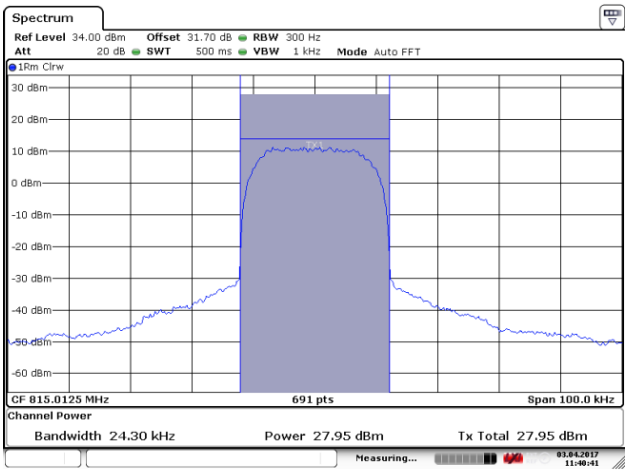
High Frequency: 868.9875MHz

(2) Uplink

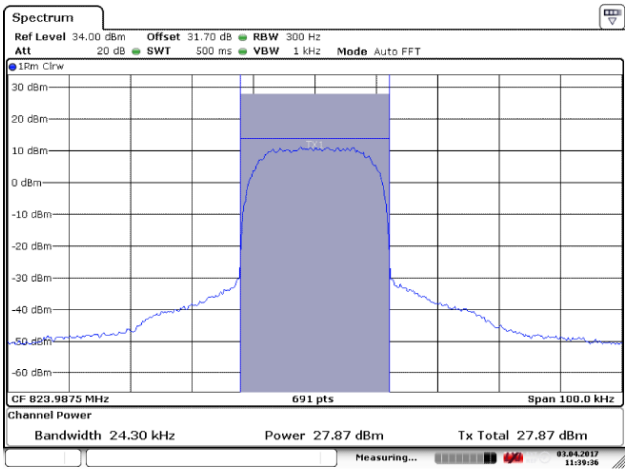
1). AC 120V, 50/60Hz



Low Frequency: 806.0125MHz

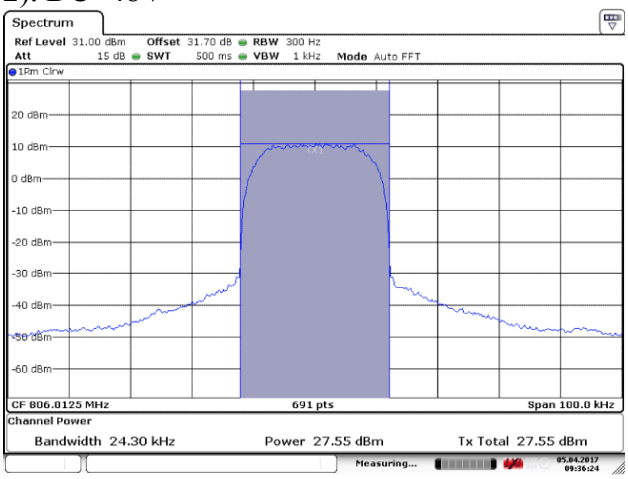


Mid Frequency: 815.0125MHz

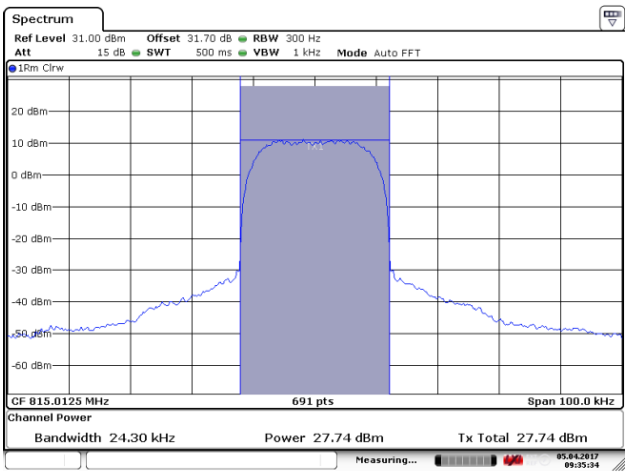


High Frequency: 823.9875MHz

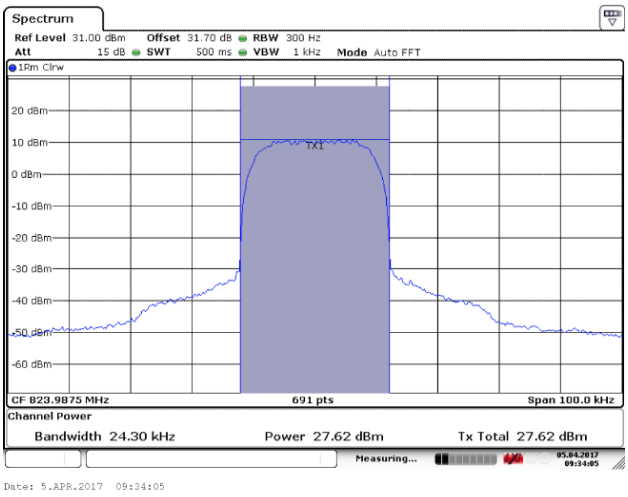
2). DC -48V



Low Frequency: 806.0125MHz



Mid Frequency: 815.0125MHz

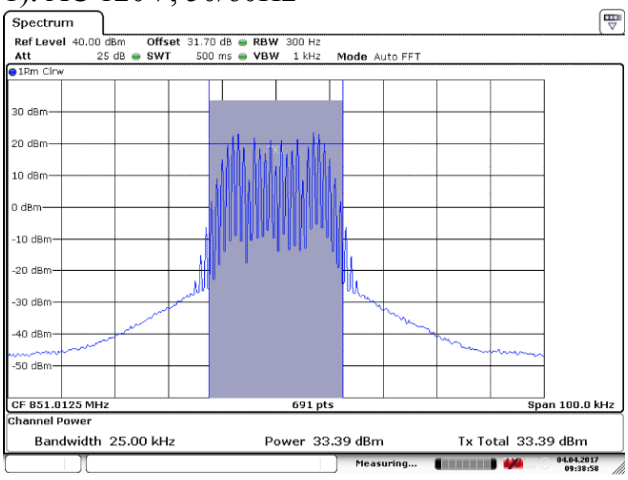


High Frequency: 823.9875MHz

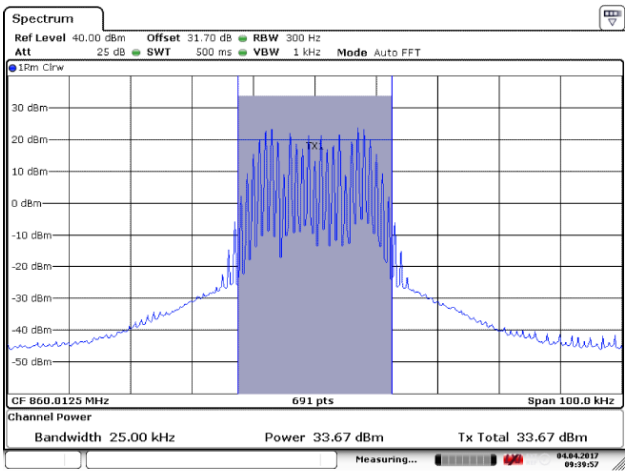
6.1.5.2.3 Modulation signal: Analog FM(10kHz/1kHz)

(1) Downlink

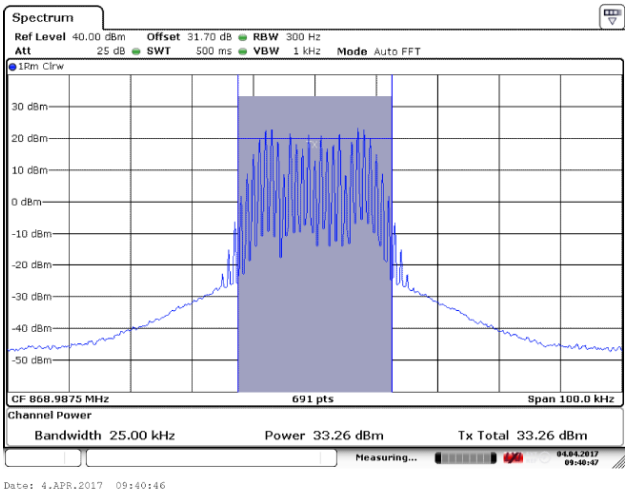
1). AC 120V, 50/60Hz



Low Frequency: 851.0125MHz

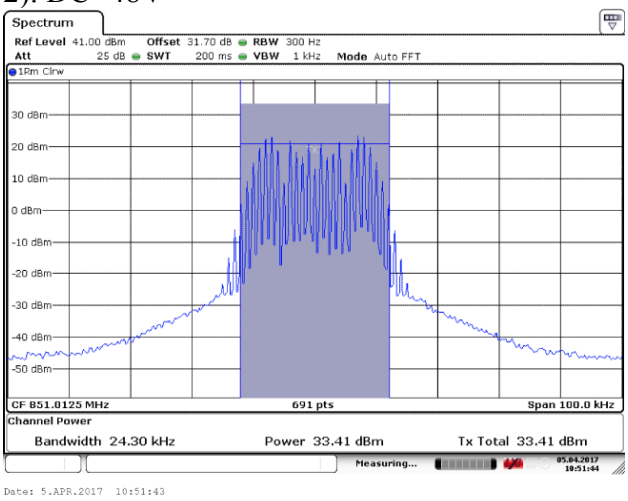


Mid Frequency: 860.0125MHz

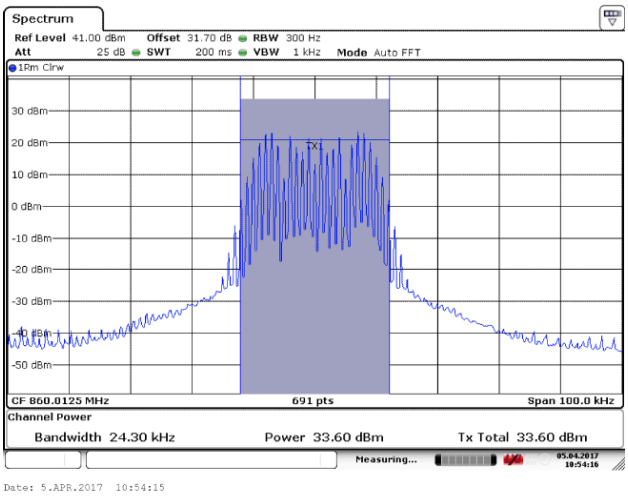


High Frequency: 868.9875MHz

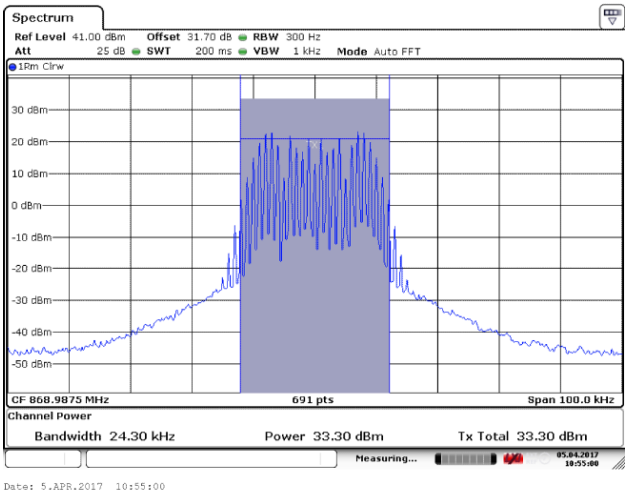
2). DC -48V



Low Frequency: 851.0125MHz



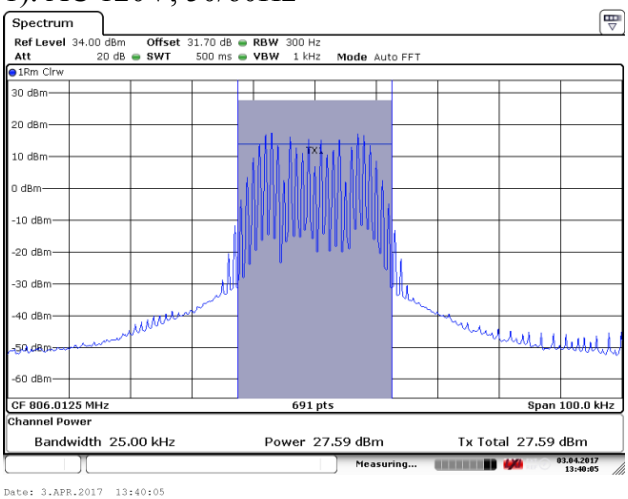
Mid Frequency: 860.0125MHz



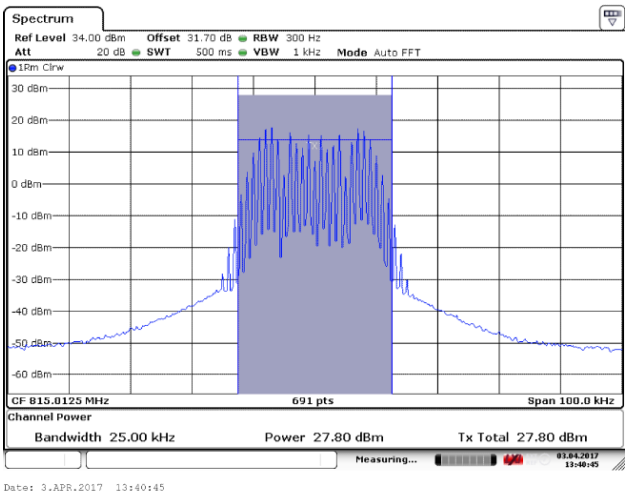
High Frequency: 868.9875MHz

(2) Uplink

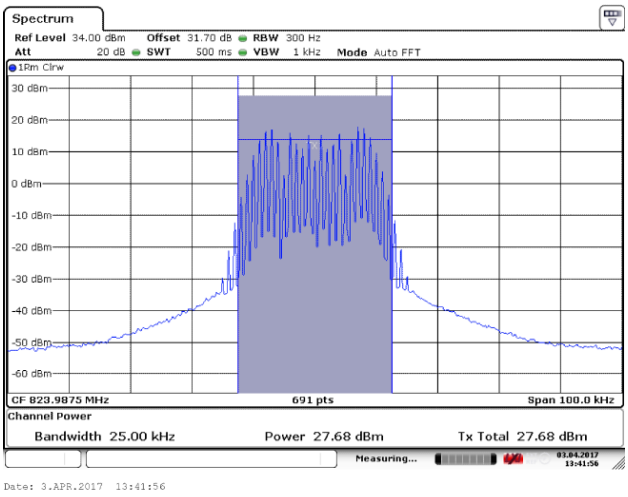
1). AC 120V, 50/60Hz



Low Frequency: 806.0125MHz

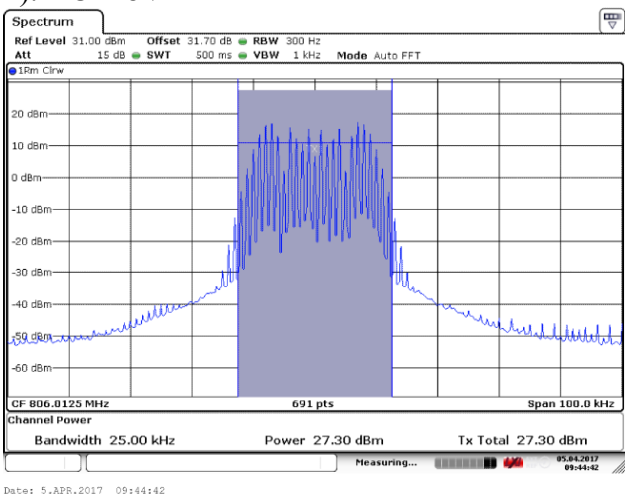


Mid Frequency: 815.0125MHz

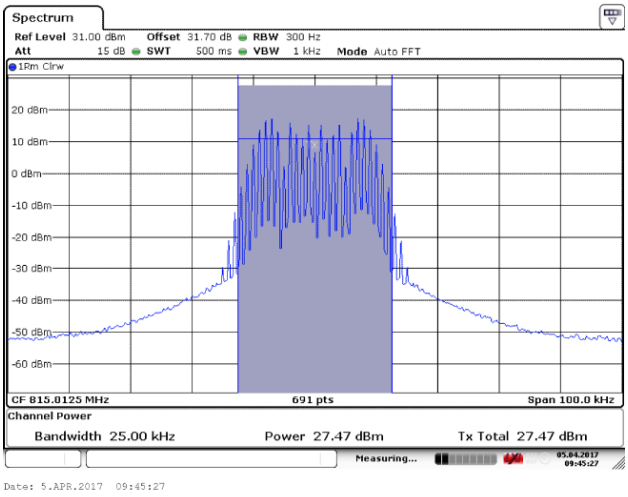


High Frequency: 823.9875MHz

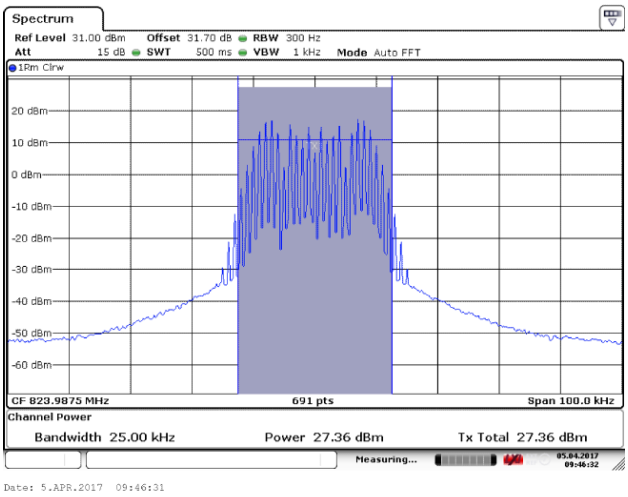
2). DC -48V



Low Frequency: 806.0125MHz



Mid Frequency: 815.0125MHz



High Frequency: 823.9875MHz

6.2 Occupied bandwidth

Test Date (yy-mm-dd):	2017-04-12 to 2017-04-15
Test environment:	Normal
	Ambient Temp 23.8℃~28.1℃, Humid 44%~59%, Atmospheric Pressure 101kpa
Power supply:	AC 120V 50/60Hz
Test Method:	FCC part 2. 1049& KDB 935210 D05 Indus Booster Basic Meas v01r01
Test Requirement:	FCC part 90.219(a)

6.2.1 Limit

A signal booster designed to retransmit signals on one or more specific channels. A signal booster is deemed to be a Class A signal booster if none of its passbands exceed 75 kHz

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in table 2.

Table 2 Occupied bandwidth limits

Assigned frequency (MHz)	Modulation envelope reference points(Occupied BW X% power)	Maximum allowed bandwidth
700MHz Band(LTE) Downlink: 758~768 Uplink:788~798	99	10MHz
700MHz Band Downlink: 769~775 Uplink:799~805	99	75kHz
800MHz Band Downlink: 851~869 Uplink:806~824	99	75kHz

NOTE:

1. RF channels to be tested for single-carrier: Low, Mid and High frequency;
2. Modulation types are C4FM, Tetra , Analog FM(10kHz/1kHz) and LTE;
3. Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

6.2.2 Test configuration

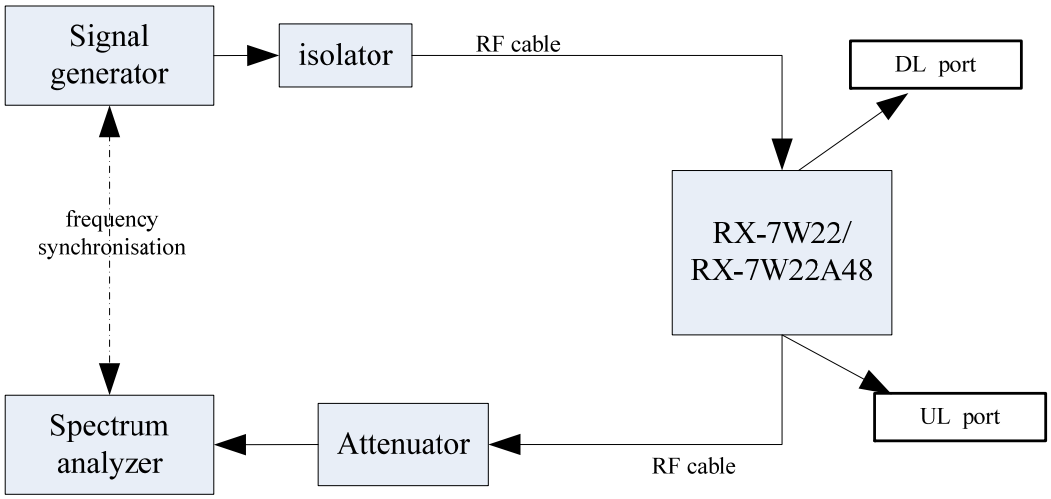


Figure 3: Occupied bandwidth arrangement for Downlink

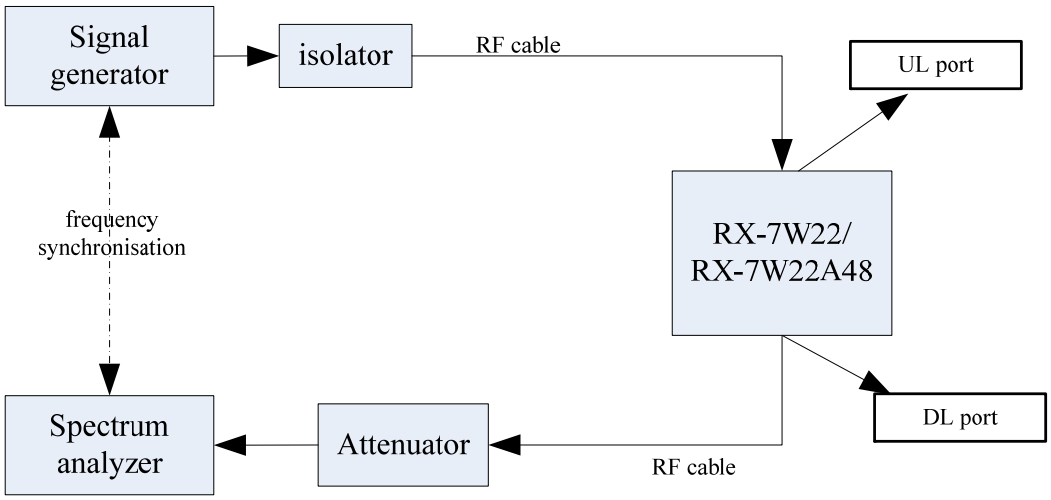


Figure 4: Occupied bandwidth arrangement for Uplink

6.2.3 Test procedures

(1) Connect the equipment as illustrated Figure 3 and Figure 4, when the output power is over the maximum value of the Spectrum Analyzer, add the attenuator to avoid destroying.

(2) Configure the signal generator to transmit the appropriate test signal associated with the public safety emission designation.

(3) Configure the signal level to be just below the ALC threshold and maximum gain.

(4) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation as necessary.

(5) Set the spectrum analyzer center frequency to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between 2 times to 5 times the OBW.

(6) The nominal RBW shall be 100 Hz for 12.5kHz channel and 300 Hz for 25kHz channel and 100kHz for LTE(10MHz channel).

(7) Set the reference level of the spectrum analyzer to accommodate the maximum input amplitude level.

(8) Set spectrum analyzer detection mode to peak, and trace mode to max hold.

(9) Allow the trace to fully stabilize.

(10) Confirm that the signal is contained within the appropriate emissions mask.

(11) Use the marker function to determine the maximum emission level and record the associated frequency as f0.

(12) Capture the emissions mask plot for inclusion in the test report (output signal spectra).

(13) Measure the EUT input signal power (signal generator output signal) directly from the signal generator using power measurement guidance provided in KDB Publication 971168 [R8] (input signal spectra).

(14) Compare the spectral plot of the output signal (determined in step 11), to the input signal (determined in step l) to affirm they are similar (in passband and roll off characteristic features and relative spectral locations).

(15) Repeat steps (4) to (16) with the input signal amplitude set 3 dB above the AGC threshold;

(16) Repeat steps (2 to (17) for all authorized operational bands and emissions types.

(17) Include all accumulated spectral plots depicting EUT input signal and EUT output signal in the test report, and note any observed dissimilarities.

(18) Repeat RF channels to be tested for single-carrier: Low and High frequency.

6.2.4 Test Results

6.2.4.1 700MHz Band

6.2.4.1.1 Modulation signal: LTE

Resolution Bandwidth:	100 kHz
Video Bandwidth:	1MHz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Operating frequency range:	Downlink: 758MHz~768MHz Uplink:788MHz~798MHz

Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(MHz)	Output Occupied BW (MHz)	Max.Limit (MHz)	Result
Downlink transmit mode					
763.00	-57.40	8.931	8.894	10.00	pass
	-54.40	8.931	8.894	10.00	pass
Uplink transmit mode					
793.00	-63.20	8.947	8.920	10.00	pass
	-60.20	8.947	8.920	10.00	pass

6.2.4.1.2 Modulation signal: C4FM

Resolution Bandwidth:	100 Hz
Video Bandwidth:	300 Hz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Symbol Rate:	4.8ksps
Operating frequency range:	Downlink: 769MHz~775MHz Uplink:799MHz~805MHz

Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(kHz)	Output Occupied BW (kHz)	Max.Limit (kHz)	Result
Downlink transmit mode					
769.00625	-55.70	7.959479016	8.031837916	75.00	pass

	-52.70	7.959479016	8.031837916	75.00	pass
772.00625	-56.60	8.104196816	8.031837916	75.00	pass
	-53.60	8.104196816	8.031837916	75.00	pass
774.99375	-56.00	8.104196816	8.104196816	75.00	pass
	-53.00	8.104196816	8.104196816	75.00	pass
Uplink transmit mode					
799.00625	-63.00	7.959479016	8.031837916	75.00	pass
	-60.00	7.959479016	8.031837916	75.00	pass
802.00625	-63.30	8.031837916	8.104196816	75.00	pass
	-60.30	8.031837916	8.104196816	75.00	pass
804.99375	-63.20	7.959479016	8.104196816	75.00	pass
	-60.20	7.959479016	7.959479016	75.00	pass

6.2.4.1.3 Modulation signal: Tetra

Resolution Bandwidth:	300 Hz
Video Bandwidth:	1 kHz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Symbol Rate:	18ksps
Operating frequency range:	Downlink: 769MHz~775MHz Uplink:799MHz~805MHz

Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(kHz)	Output Occupied BW (kHz)	Max.Limit (kHz)	Result
Downlink transmit mode					
769.0125	-56.60	20.984081042	20.839363242	75.00	pass
	-53.60	20.984081042	20.984081042	75.00	pass
772.0125	-57.40	20.984081042	20.839363242	75.00	pass
	-54.40	20.984081042	20.839363242	75.00	pass

774.9875	-56.80	21.128798842	20.839363242	75.00	pass
	-53.80	21.128798842	20.984081042	75.00	pass
Uplink transmit mode					
799.0125	-62.60	21.128798842	20.947901592	75.00	pass
	-59.60	21.128798842	20.947901592	75.00	pass
802.0125	-62.80	21.128798842	20.947901592	75.00	pass
	-59.80	21.128798842	20.947901592	75.00	pass
804.9875	-62.70	20.984081042	20.947901592	75.00	pass
	-59.70	20.984081042	20.947901592	75.00	pass

6.2.4.1.4 Modulation signal: Analog FM(10kHz/1kHz)

Resolution Bandwidth:	300 Hz
Video Bandwidth:	1 kHz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Symbol Rate:	1ksps
Frequency Dev:	10kHz
Operating frequency range:	Downlink: 769MHz~775MHz Uplink:799MHz~805MHz

Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(kHz)	Output Occupied BW (kHz)	Max.Limit (kHz)	Result
Downlink transmit mode					
769.0125	-56.30	20.549927641	20.549927641	75.00	pass
	-53.30	20.549927641	20.549927641	75.00	pass
772.0125	-57.30	20.549927641	20.549927641	75.00	pass
	-54.30	20.549927641	20.549927641	75.00	pass
774.9875	-56.80	20.549927641	20.549927641	75.00	pass
	-53.80	20.549927641	20.549927641	75.00	pass

Uplink transmit mode					
799.0125	-62.60	20.549927641	20.622286541	75.00	pass
	-59.60	20.549927641	20.947901592	75.00	pass
802.0125	-62.90	20.549927641	21.056439942	75.00	pass
	-59.90	20.549927641	20.947901592	75.00	pass
804.9875	-62.90	20.549927641	20.947901592	75.00	pass
	-59.90	20.549927641	20.947901592	75.00	pass

6.2.4.2 800MHz Band

6.2.4.2.1 Modulation signal: C4FM

Resolution Bandwidth:	100 Hz
Video Bandwidth:	300 Hz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Symbol Rate:	4.8ksps
Operating frequency range:	Downlink: 851MHz~869MHz Uplink:806MHz~824MHz

Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(kHz)	Output Occupied BW (kHz)	Max.Limit (kHz)	Result
Downlink transmit mode					
851.00625	-57.00	8.104196816	7.959479016	75.00	pass
	-54.00	8.104196816	8.104196816	75.00	pass
860.00625	-57.10	7.959479016	8.031837916	75.00	pass
	-54.10	7.959479016	8.104196816	75.00	pass
868.99375	-56.90	7.959479016	8.031837916	75.00	pass
	-53.90	7.959479016	7.959479016	75.00	pass
Uplink transmit mode					
806.00625	-63.50	8.031837916	8.031837916	75.00	pass

	-60.50	8.031837916	8.031837916	75.00	pass
815.00625	-64.00	7.959479016	8.031837916	75.00	pass
	-61.00	7.959479016	8.031837916	75.00	pass
823.99375	-61.90	8.104196816	7.959479016	75.00	pass
	-58.90	8.104196816	8.104196816	75.00	pass

6.2.4.2.2 Modulation signal: Tetra

Resolution Bandwidth:	300 Hz
Video Bandwidth:	1 kHz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Symbol Rate:	18ksps
Operating frequency range:	Downlink: 851MHz~869MHz Uplink:806MHz~824MHz

Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(kHz)	Output Occupied BW (kHz)	Max.Limit (kHz)	Result
Downlink transmit mode					
851.0125	-54.90	21.128798842	20.839363242	75.00	pass
	-51.90	21.128798842	20.839363242	75.00	pass
860.0125	-56.90	20.984081042	20.839363242	75.00	pass
	-53.90	20.984081042	20.839363242	75.00	pass
868.9875	-56.80	21.128798842	20.984081042	75.00	pass
	-53.80	21.128798842	20.839363242	75.00	pass
Uplink transmit mode					
806.0125	-63.00	21.128798842	20.984081042	75.00	pass
	-60.00	21.128798842	20.984081042	75.00	pass
815.0125	-63.50	21.128798842	20.984081042	75.00	pass
	-60.50	21.128798842	20.984081042	75.00	pass

823.9875	-61.50	20.984081042	20.984081042	75.00	pass
	-58.50	20.984081042	20.984081042	75.00	pass

6.2.4.2.3 Modulation signal: Analog FM(10kHz/1kHz)

Resolution Bandwidth:	300 Hz
Video Bandwidth:	1 kHz
Detector mode:	Peak hold
Trace mode:	Maximum hold
Modulation envelope reference points	Occupied BW 99% power
Configuration:	Single Band
Symbol Rate:	1ksps
Frequency Dev:	10kHz
Operating frequency range:	Downlink: 851MHz~869MHz Uplink:806MHz~824MHz

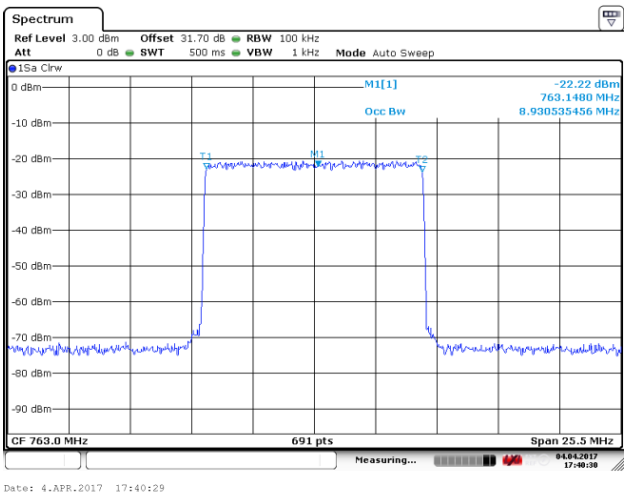
Carrier frequency (MHz)	Input power (dBm)	Input Occupied BW(kHz)	Output Occupied BW (kHz)	Max.Limit (kHz)	Result
Downlink transmit mode					
851.0125	-54.70	20.549927641	20.549927641	75.00	pass
	-51.70	20.549927641	20.549927641	75.00	pass
860.0125	-56.70	20.549927641	20.549927641	75.00	pass
	-53.70	20.549927641	20.549927641	75.00	pass
868.9875	-56.70	20.549927641	20.549927641	75.00	pass
	-53.70	20.549927641	20.549927641	75.00	pass
Uplink transmit mode					
806.0125	-63.20	20.549927641	20.947901592	75.00	pass
	-60.20	20.549927641	20.947901592	75.00	pass
815.0125	-63.60	20.549927641	21.056439942	75.00	pass
	-60.60	20.549927641	21.056439942	75.00	pass
823.9875	-61.60	20.549927641	20.947901592	75.00	pass
	-58.60	20.549927641	20.947901592	75.00	pass

6.2.5 Test screenshot

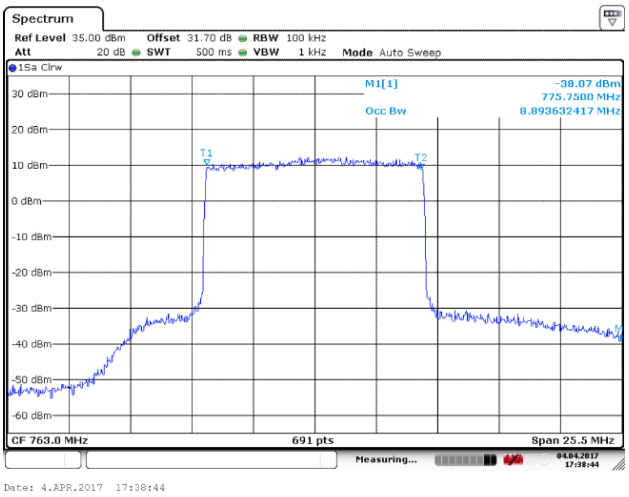
6.2.5.1 700MHz Band

6.2.5.1.1 Modulation signal: LTE

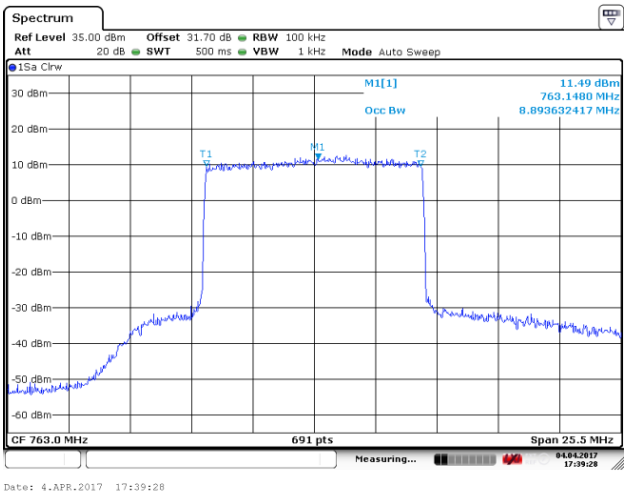
(1) Downlink



Frequency: 763.0MHz, Input occupied BW

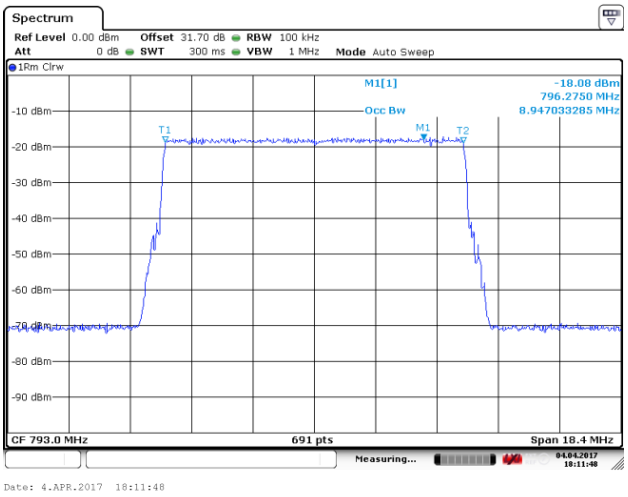


Frequency: 763.0MHz,, Output occupied BW(ALC)

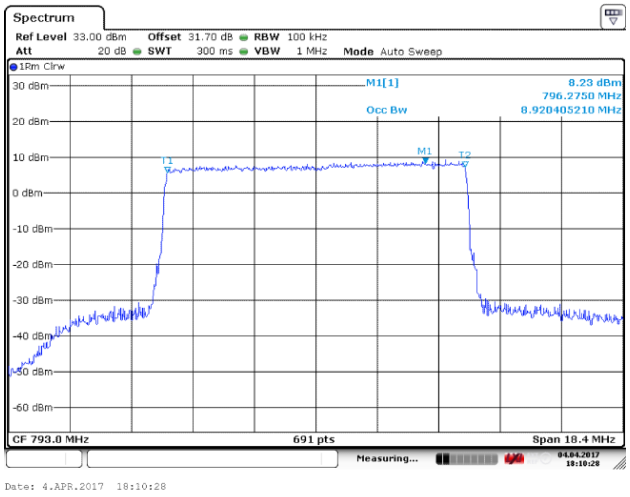


Frequency: 763.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)

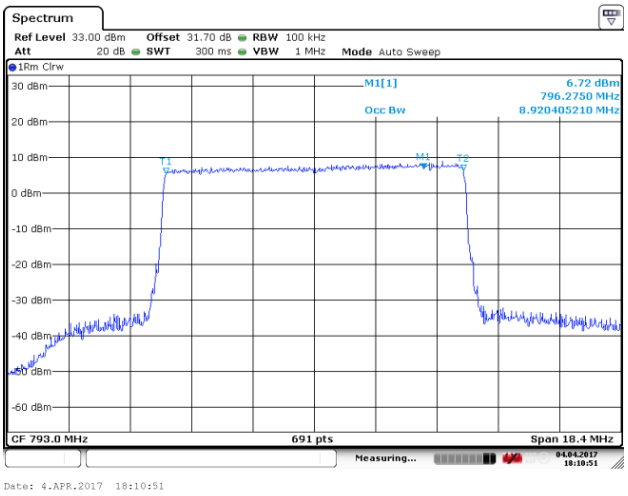
(2) Uplink



Frequency: 793.0MHz, Input occupied BW



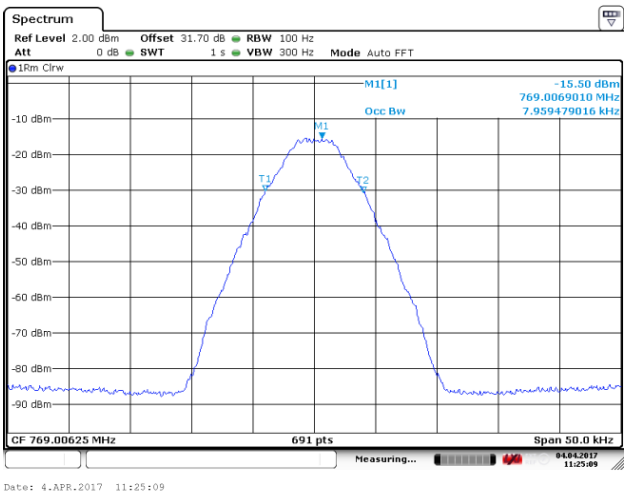
Frequency: 793.0MHz,, Output occupied BW(ALC)



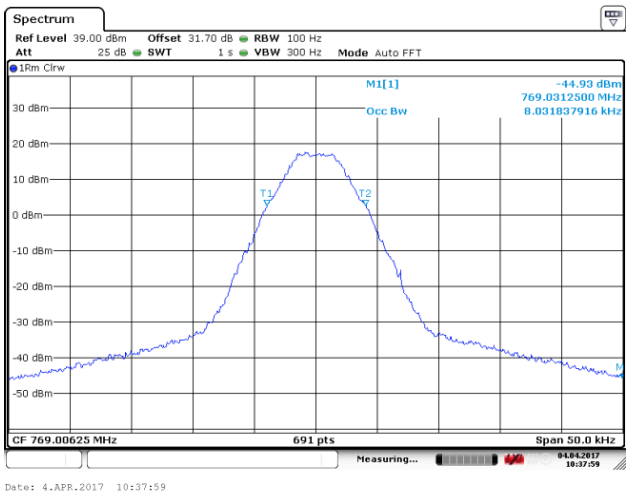
Frequency: 793.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)

6.2.5.1.2 Modulation signal: C4FM

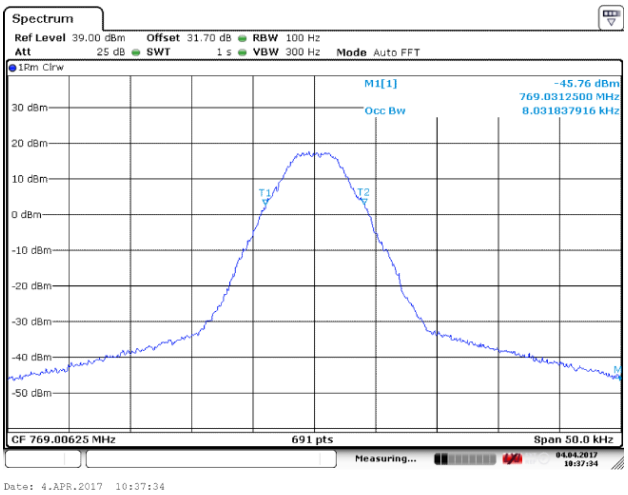
(1) Downlink



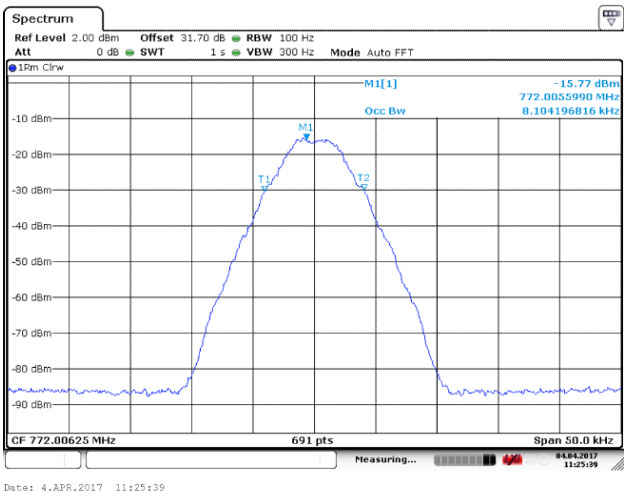
Low Frequency: 769.00625MHz, Input occupied BW



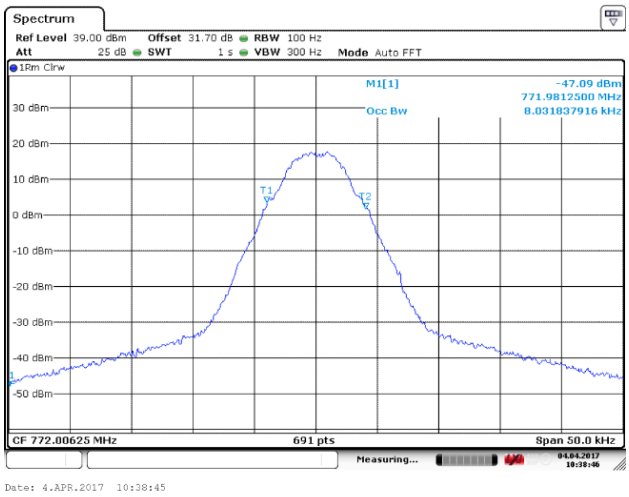
Low Frequency: 769.00625MHz, Output occupied BW(ALC)



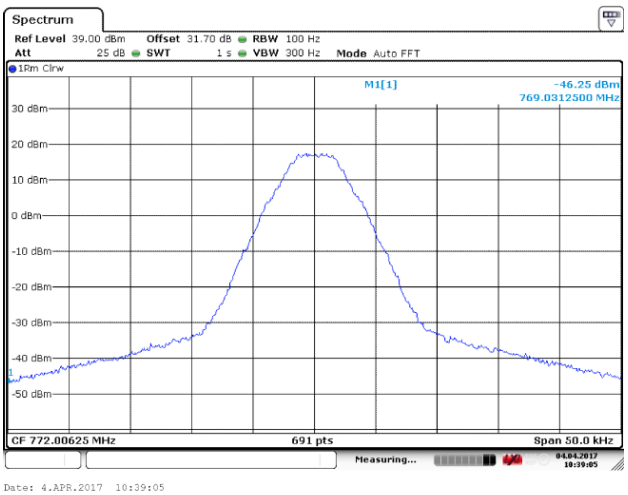
Low Frequency: 769.00625MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



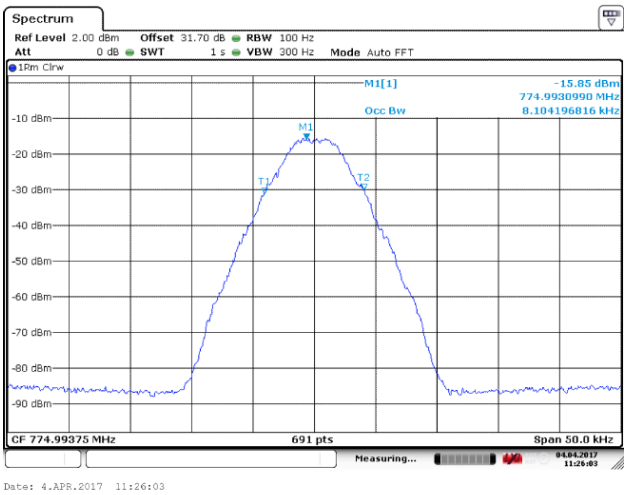
Mid Frequency: 772.00625MHz, Input occupied BW



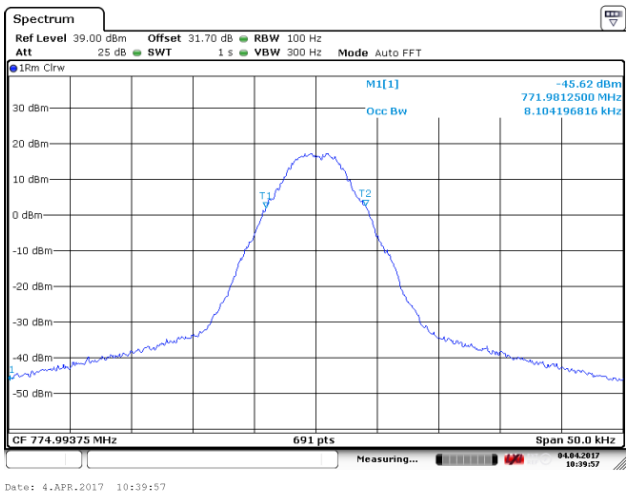
Mid Frequency: 772.00625MHz, Output occupied BW(ALC)



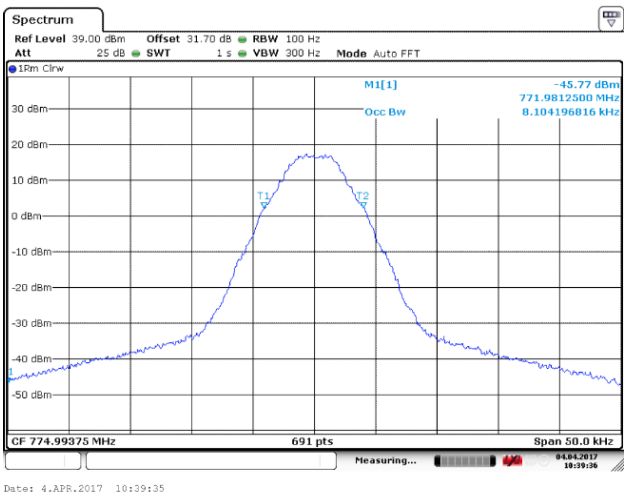
Mid Frequency: 772.00625MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



High Frequency: 774.99375MHz, Input occupied BW

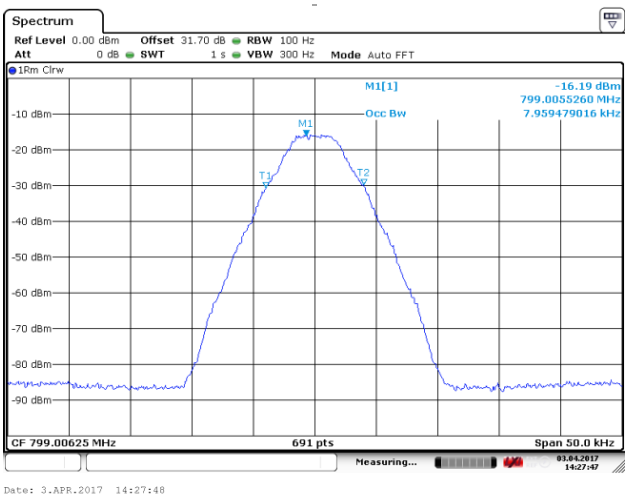


High Frequency: 774.99375MHz, Output occupied BW(ALC)

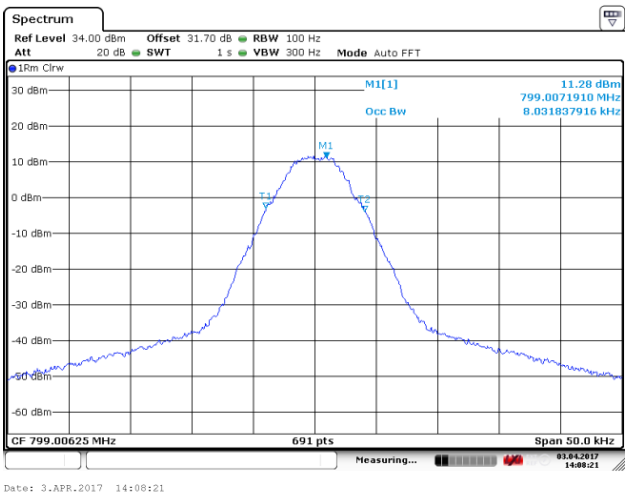


High Frequency: 774.99375MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)

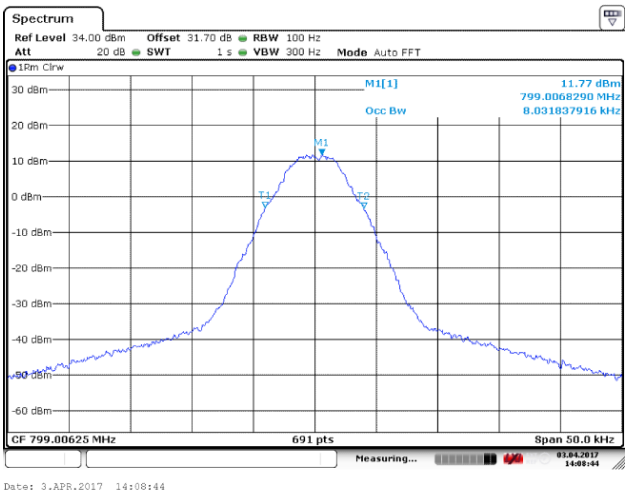
(2) Uplink



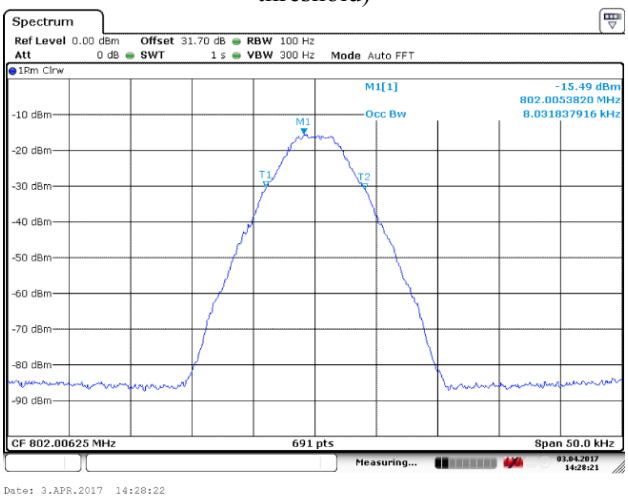
Low Frequency: 799.00625MHz, Input occupied BW



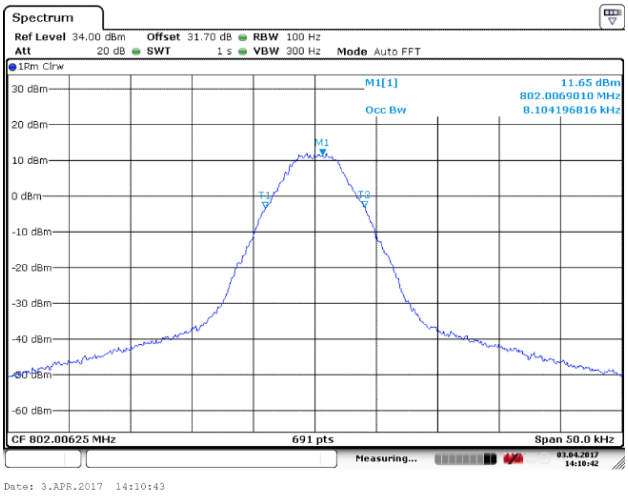
Low Frequency: 799.00625MHz, Output occupied BW(ALC)



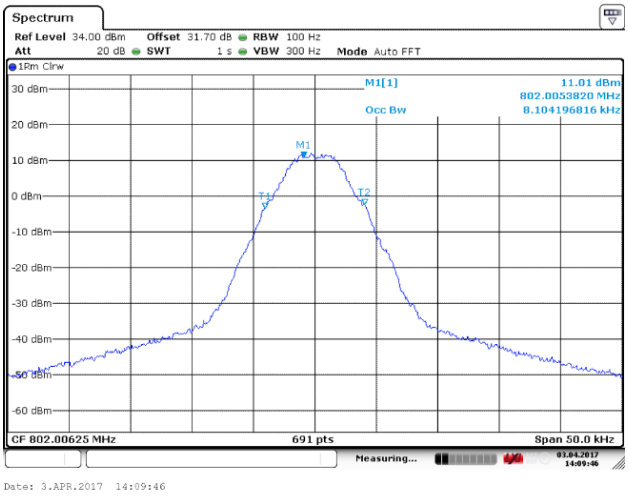
Low Frequency: 799.00625MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



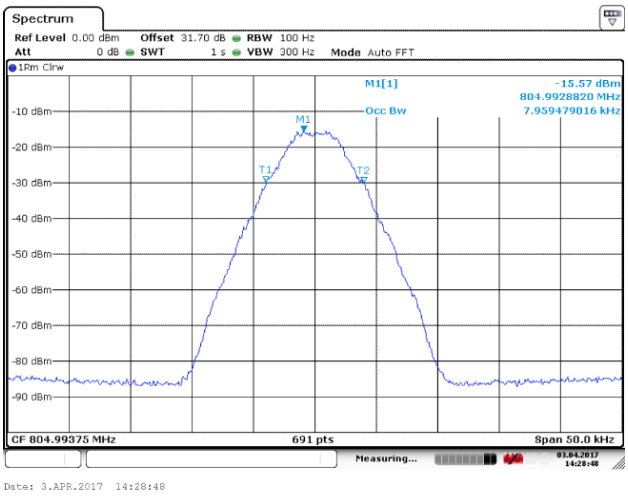
Mid Frequency: 802.00625MHz, Input occupied BW



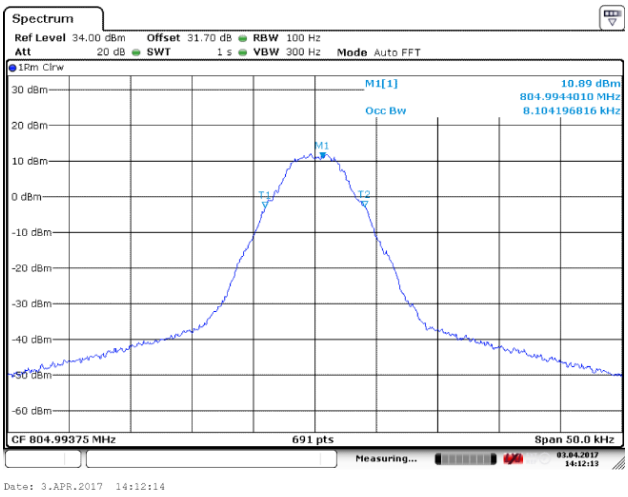
Mid Frequency: 802.00625MHz, Output occupied BW(ALC)



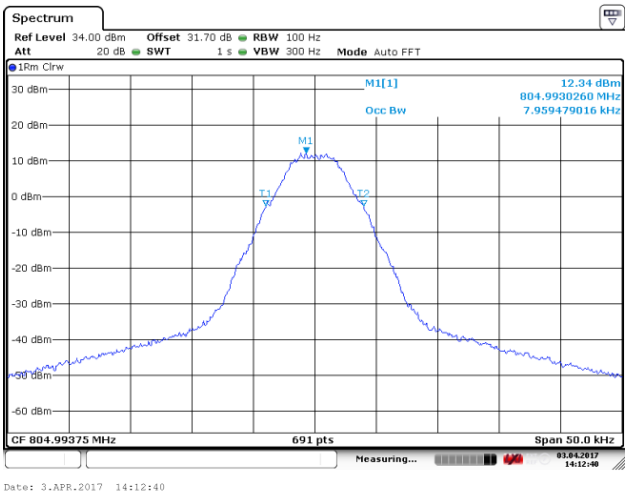
Mid Frequency: 802.00625MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



High Frequency: 804.99375MHz, Input occupied BW



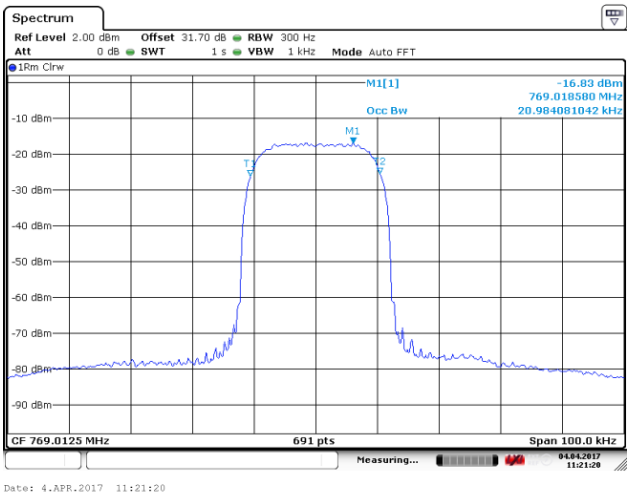
High Frequency: 804.99375MHz, Output occupied BW(ALC)



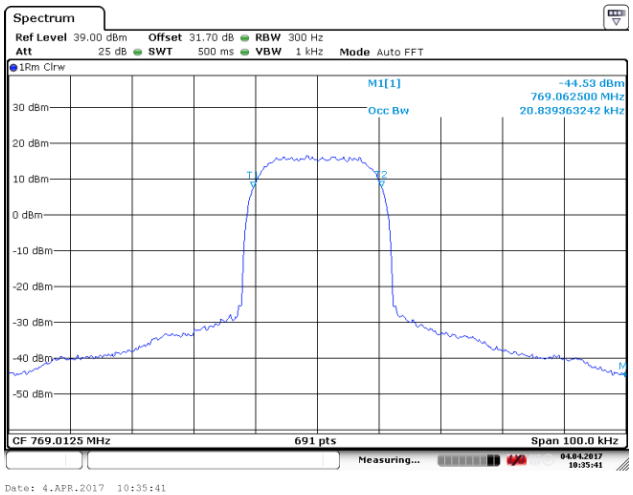
High Frequency: 804.99375MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)

6.2.5.1.3 Modulation signal: Tetra

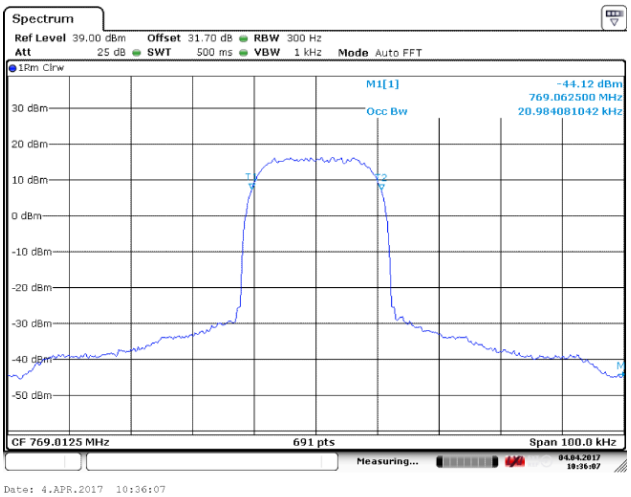
(1) Downlink



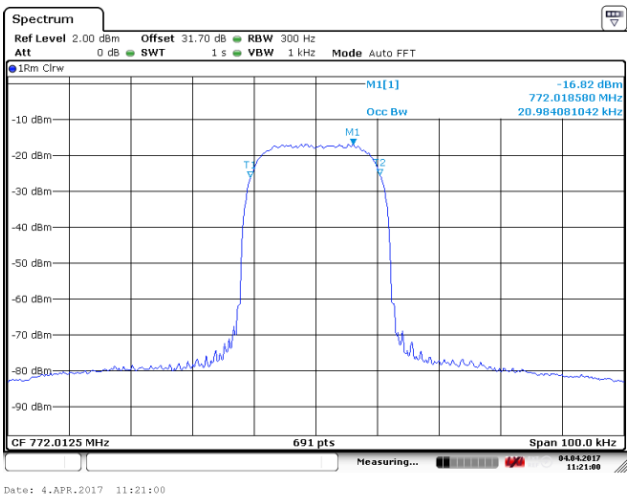
Low Frequency: 769.0125MHz, Input occupied BW



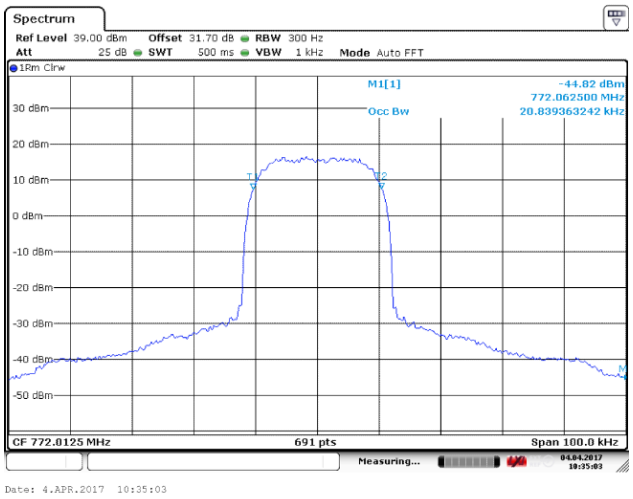
Low Frequency: 769.0125MHz, Output occupied BW(ALC)



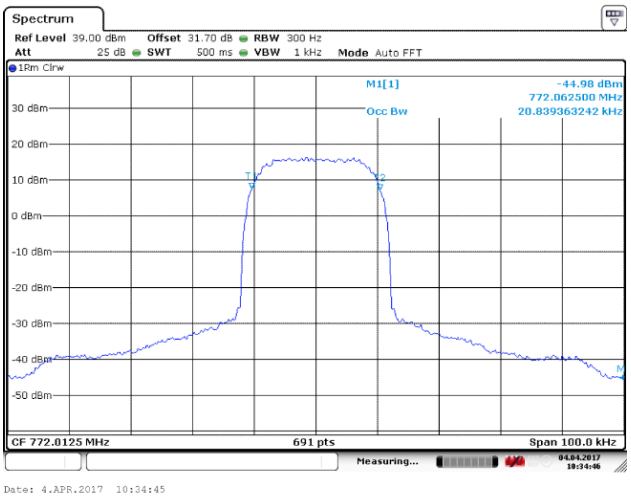
Low Frequency: 769.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



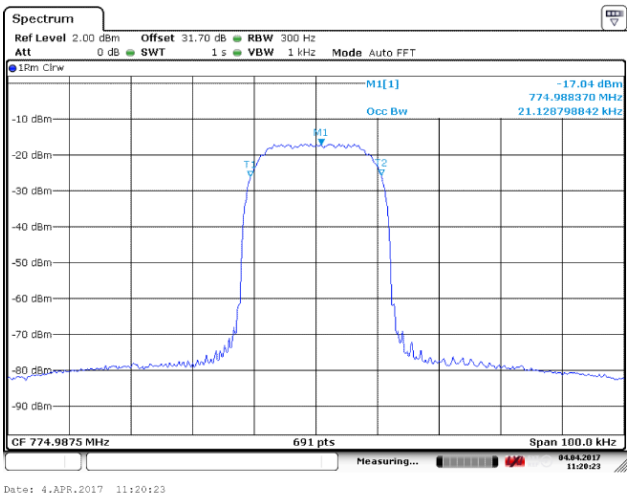
Mid Frequency: 772.0125MHz, Input occupied BW



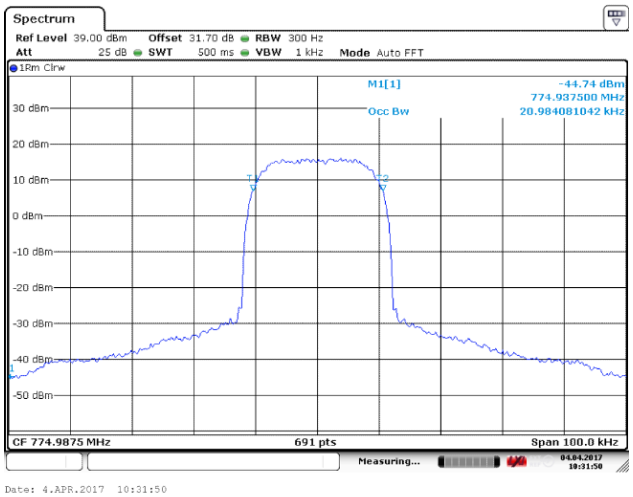
Mid Frequency: 772.0125MHz, Output occupied BW(ALC)



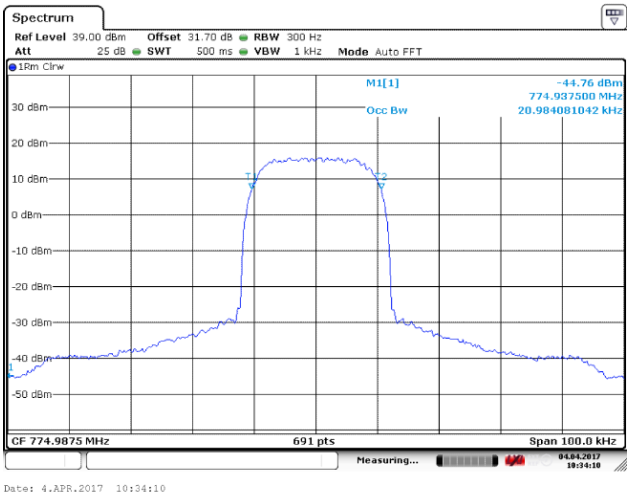
Mid Frequency: 772.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



High Frequency: 774.9875MHz, Input occupied BW

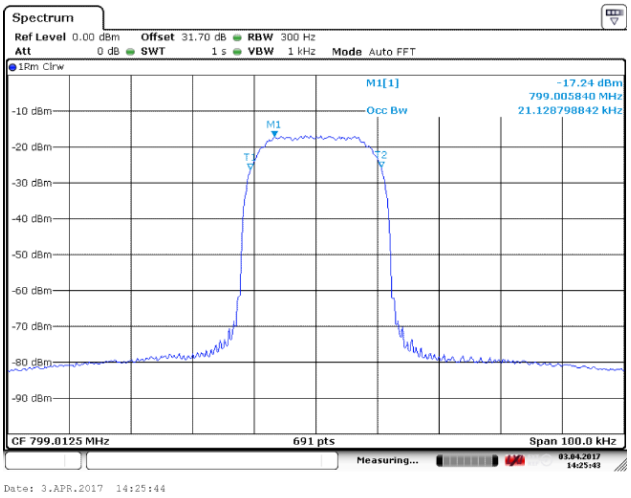


High Frequency: 774.9875MHz, Output occupied BW(ALC)

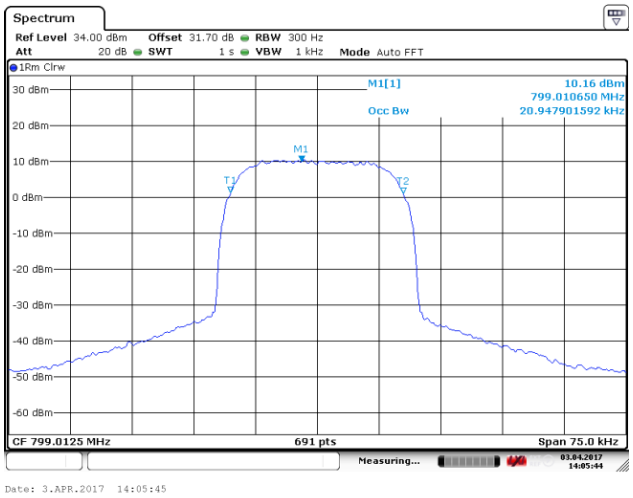


High Frequency: 774.9875MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)

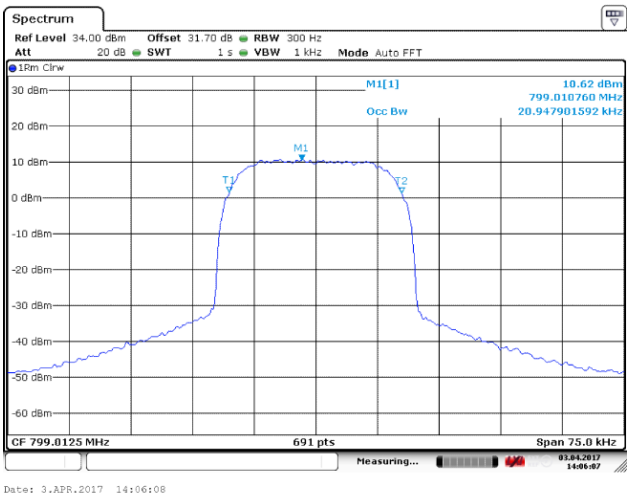
(2) Uplink



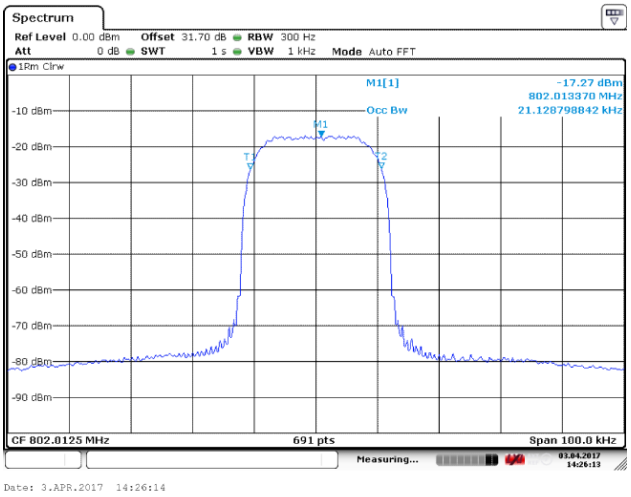
Low Frequency: 799.0125MHz, Input occupied BW



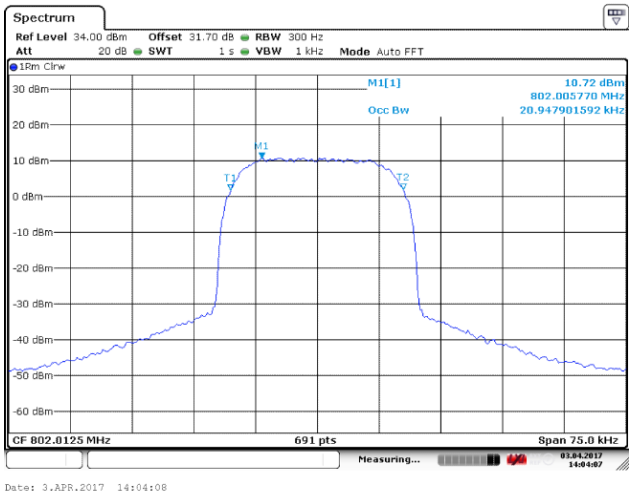
Low Frequency: 799.0125MHz, Output occupied BW(ALC)



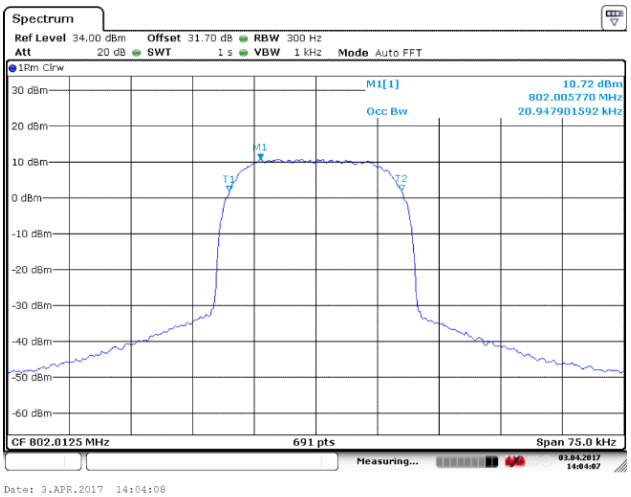
Low Frequency: 799.0125MHz, Input occupied BW(with the input signal amplitude set 3 dB above the ALC threshold)



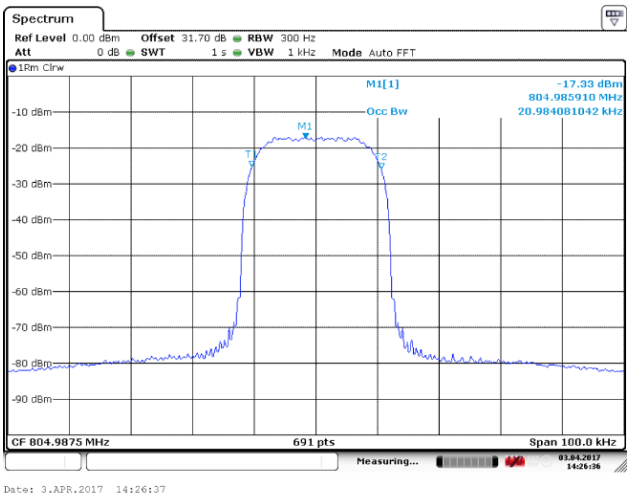
Mid Frequency: 802.0125MHz, Input occupied BW



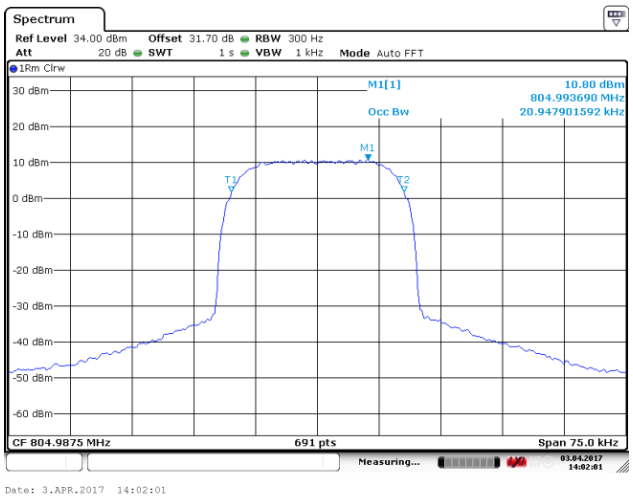
Mid Frequency: 802.0125MHz, Output occupied BW(ALC)



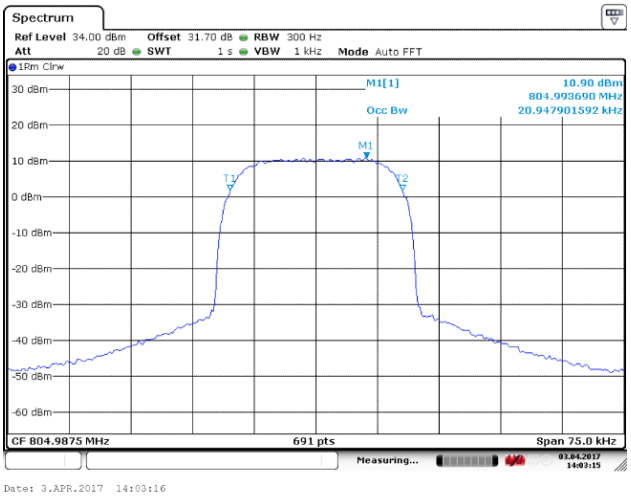
Mid Frequency: 802.0125MHz, Input occupied BW(with the input signal amplitude set 3 dB above the ALC threshold)



High Frequency: 804.9875MHz, Input occupied BW



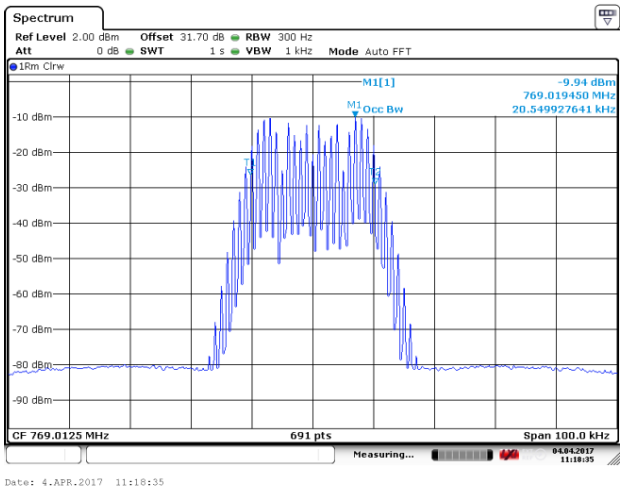
High Frequency: 804.9875MHz, Output occupied BW(ALC)



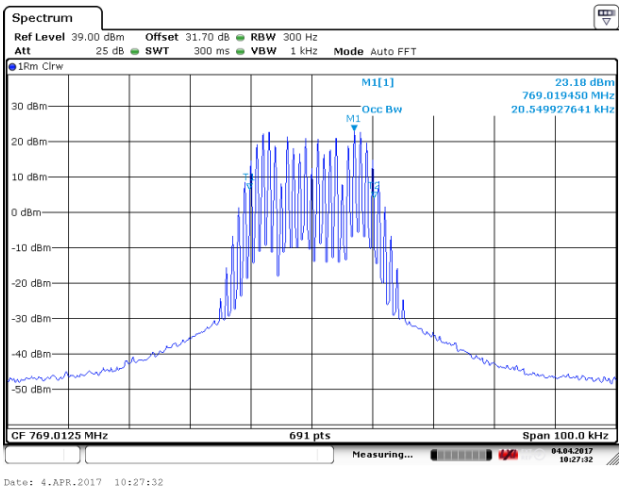
High Frequency: 804.9875MHz, Input occupied BW(with the input signal amplitude set 3 dB above the ALC threshold)

6.2.5.1.4 Modulation signal: Analog FM(10kHz/1kHz)

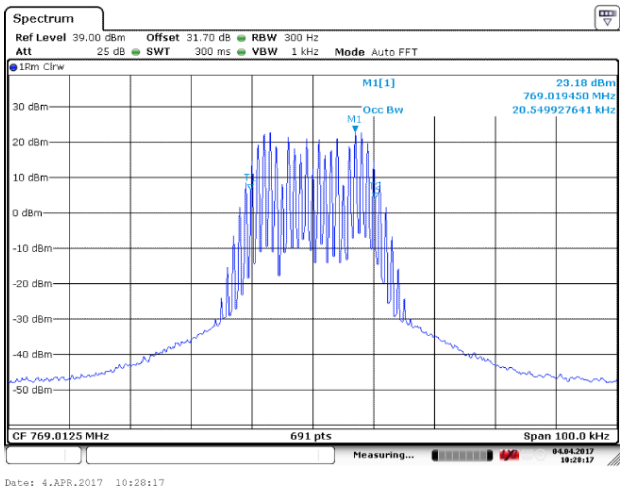
(1) Downlink



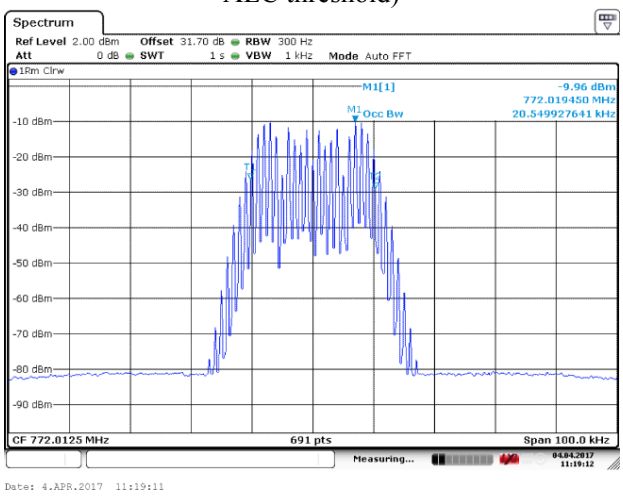
Low Frequency: 769.0125MHz, Input occupied BW



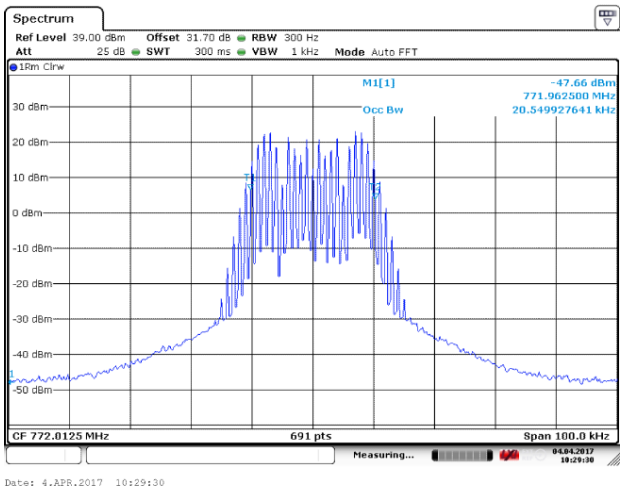
Low Frequency: 769.0125MHz, Output occupied BW(ALC)



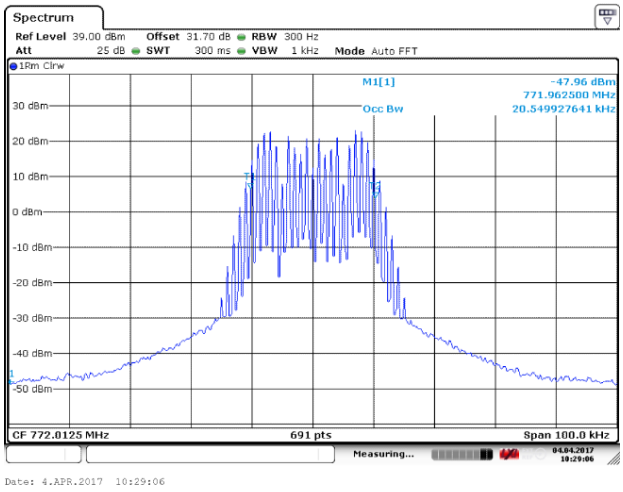
Low Frequency: 769.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



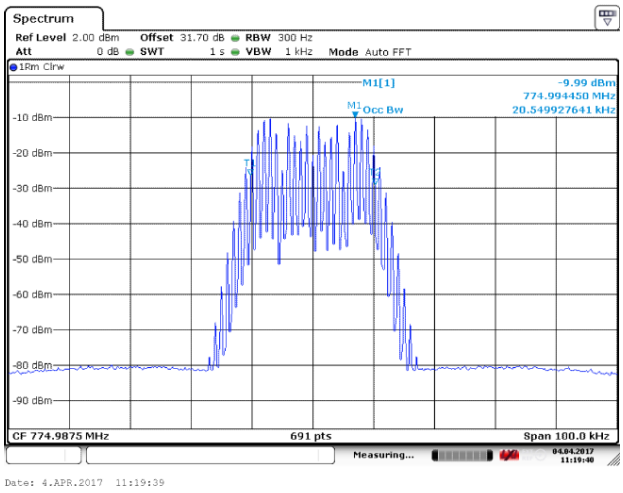
Mid Frequency: 772.0125MHz, Input occupied BW



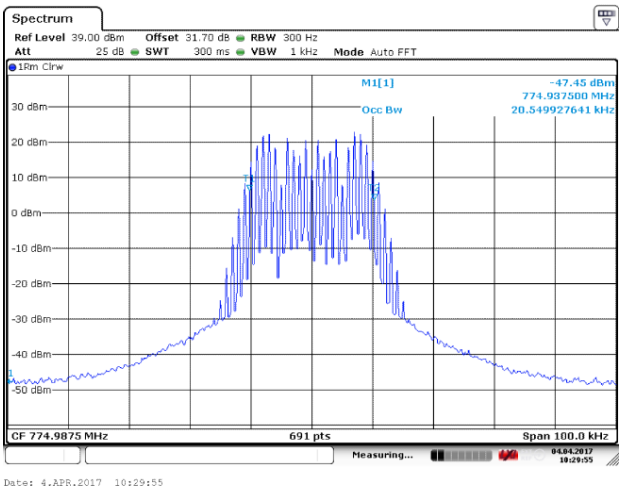
Mid Frequency: 772.0125MHz, Output occupied BW(ALC)



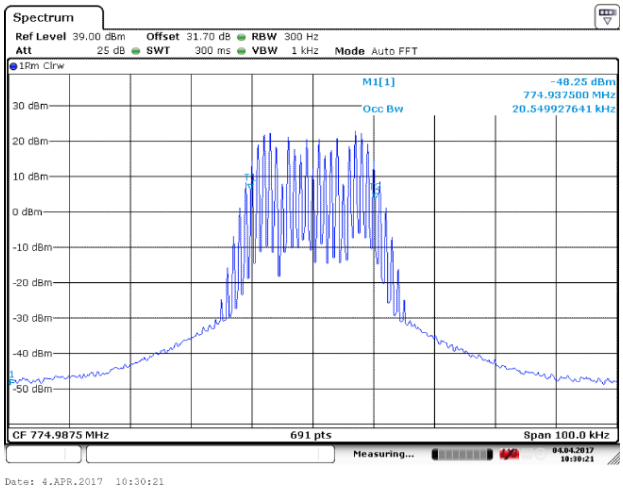
Mid Frequency: 772.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)



High Frequency: 774.9875MHz, Input occupied BW

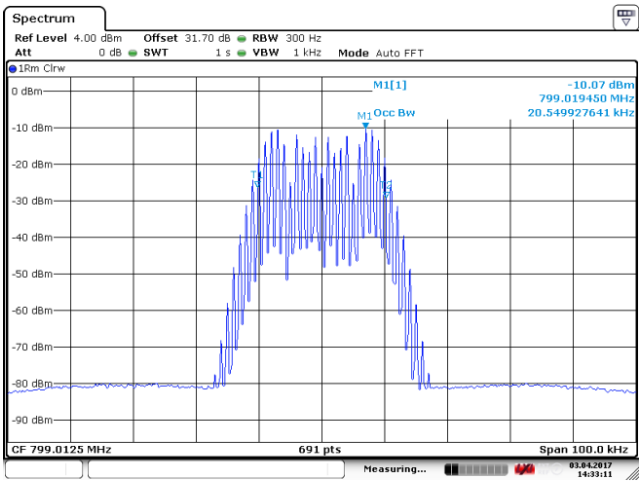


High Frequency: 774.9875MHz, Output occupied BW(ALC)

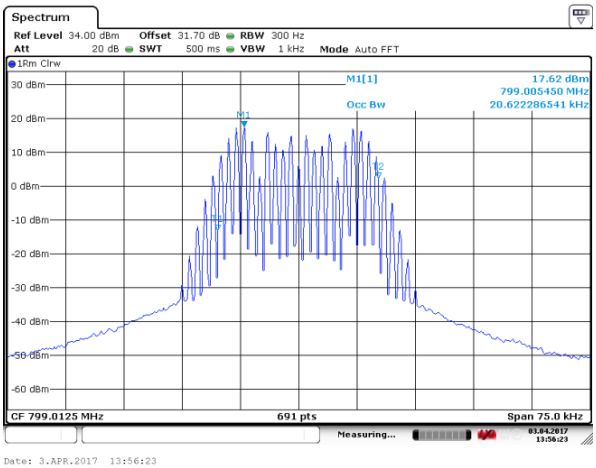


High Frequency: 774.9875MHz, Output occupied BW (with the input signal amplitude set 3 dB above the ALC threshold)

(2) Uplink



Low Frequency: 799.0125MHz, Input occupied BW



Low Frequency: 799.0125MHz, Output occupied BW(ALC)