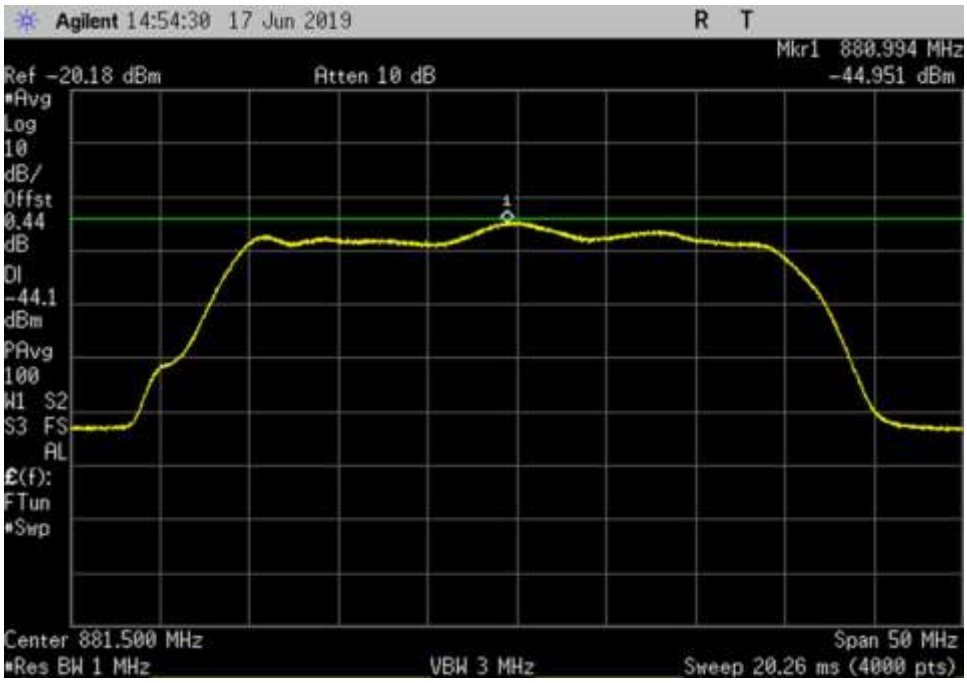
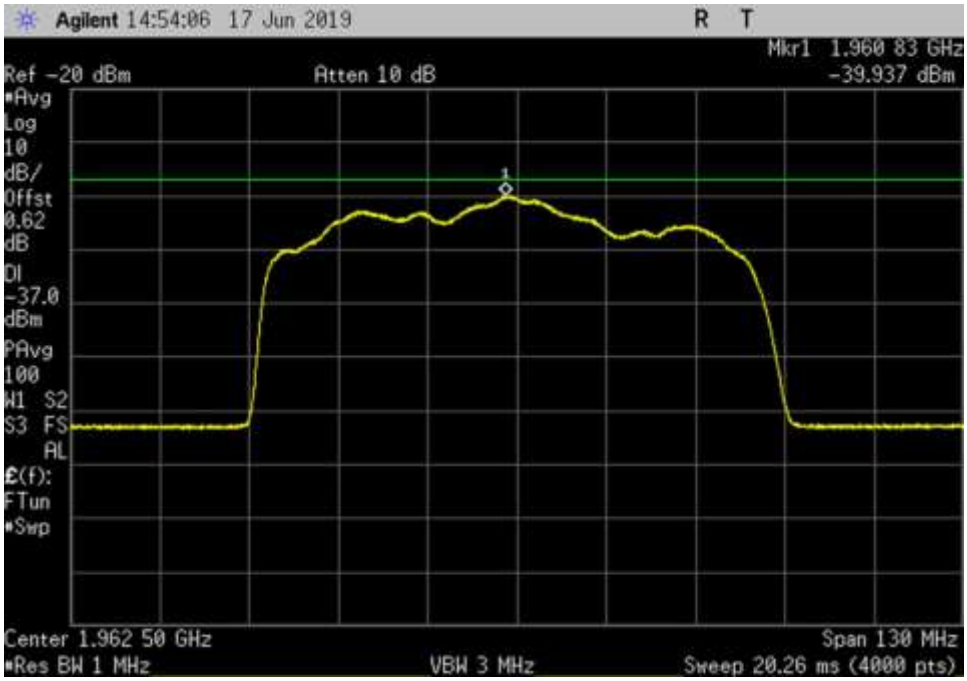
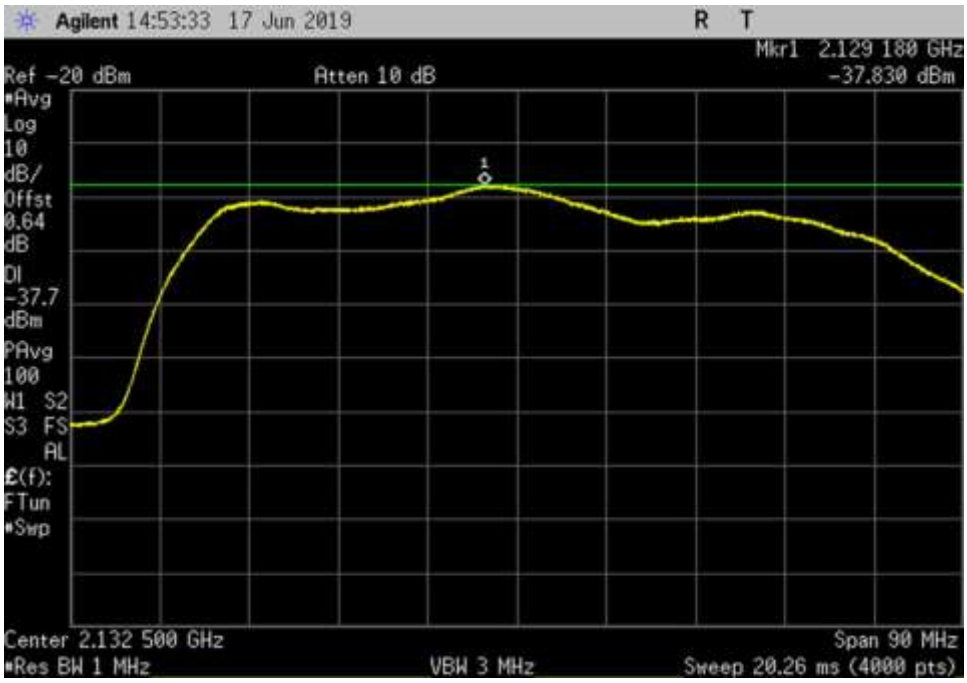


DL_869-894_ 881.5MHz

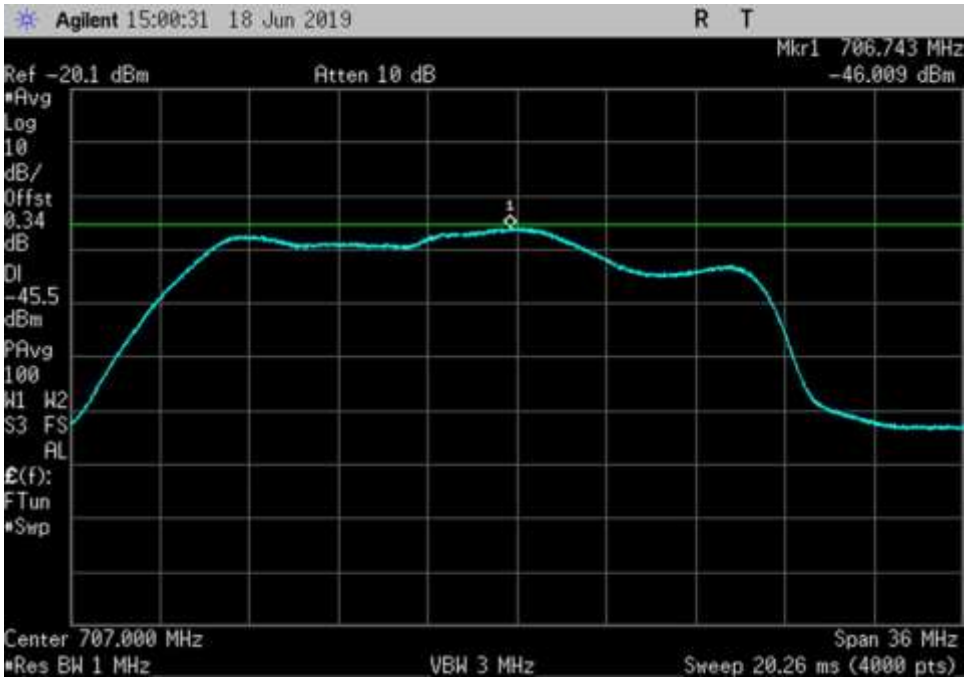


DL_1930-1995_ 1962.5MHz

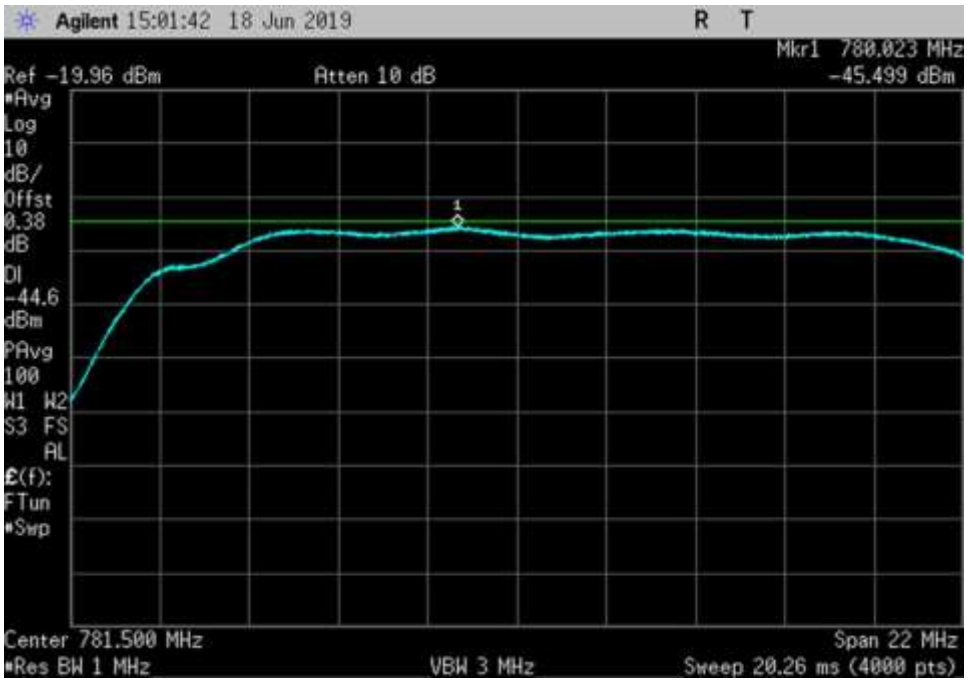


DL_2110-2155_ 2132.5MHz

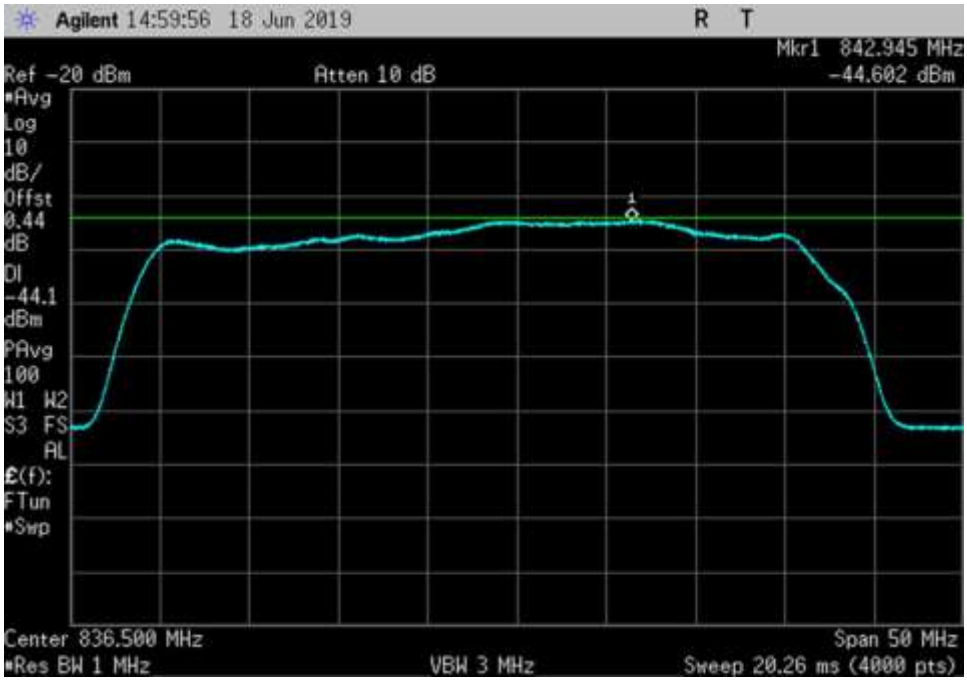
Configuration 3



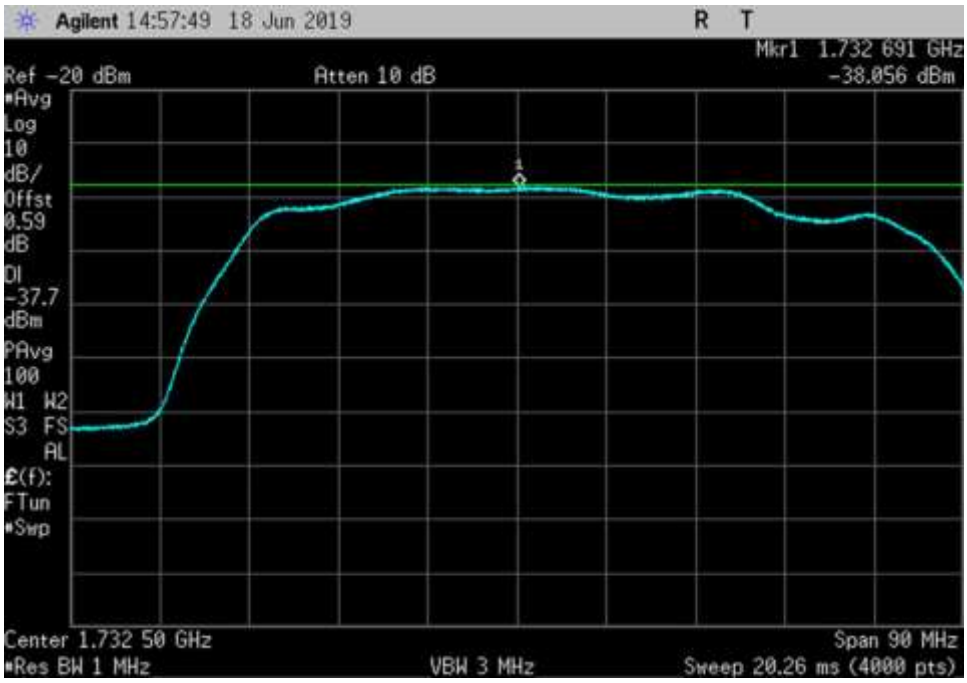
UL_698-716_ 707MHz



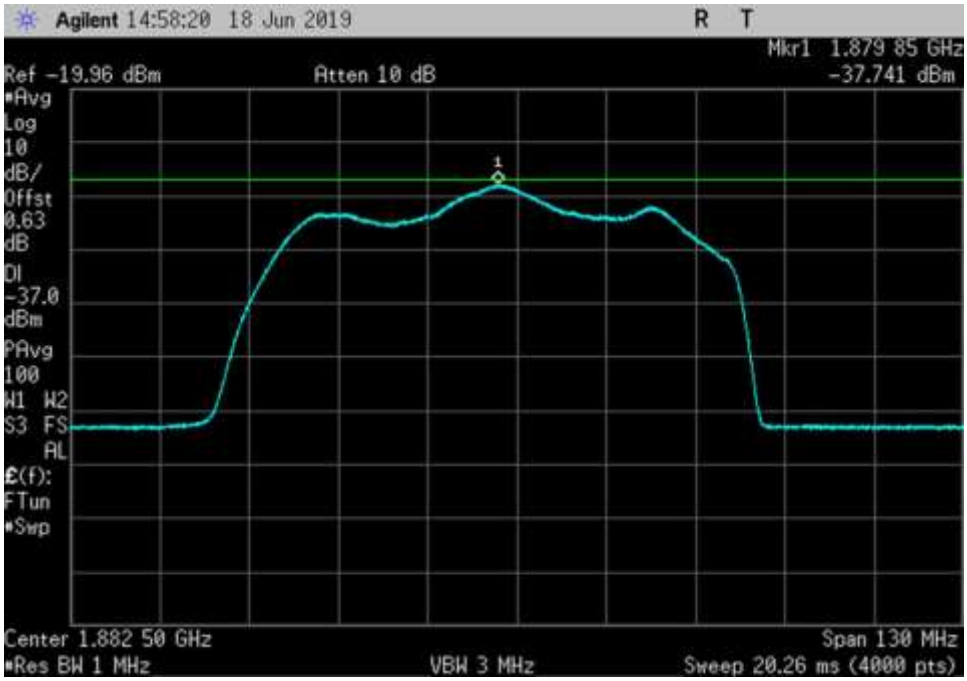
UL_776-787_ 781.5MHz



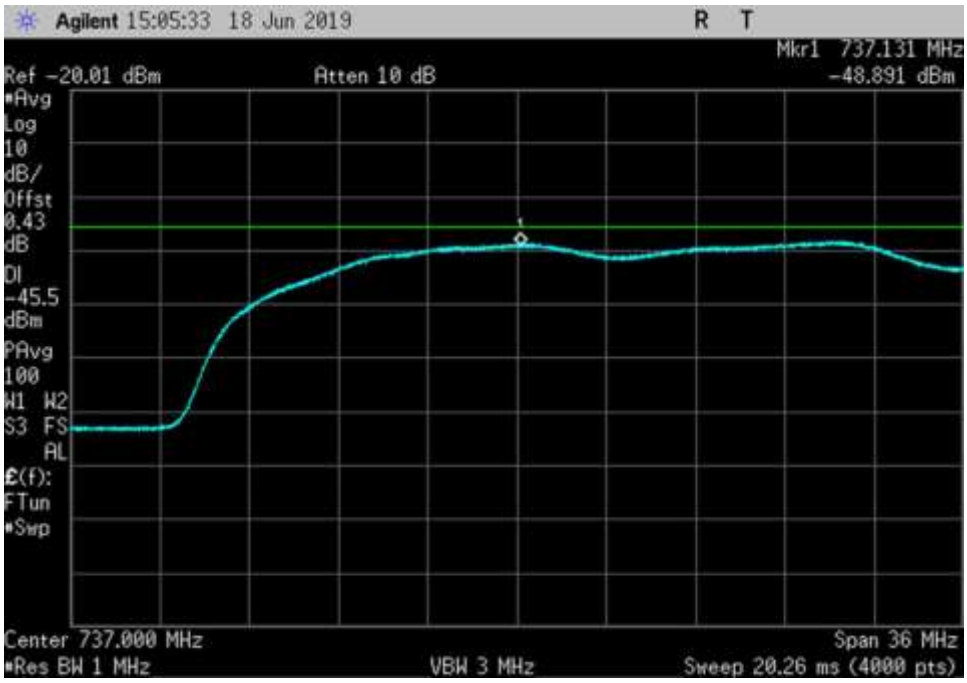
UL_824-849_ 836.5MHz



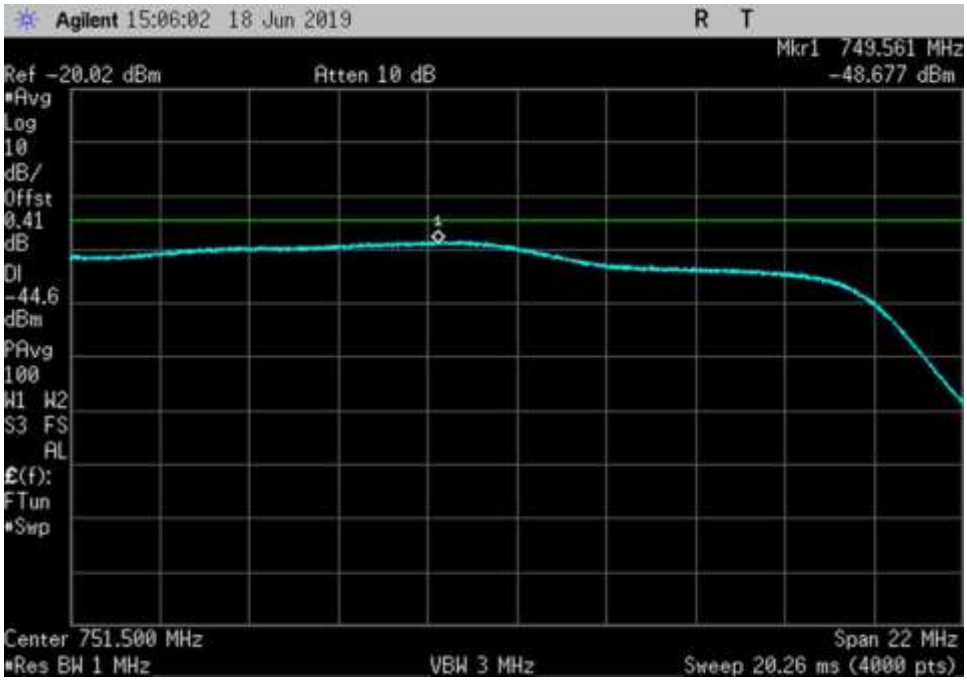
UL_1710-1755_ 1732.5MHz



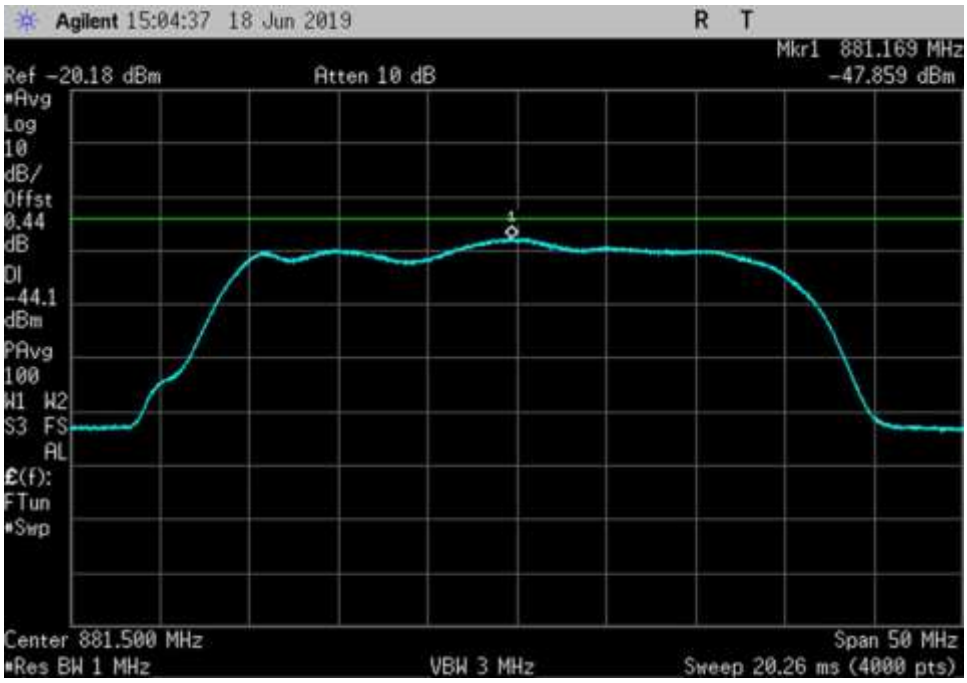
UL_1850-1915_ 1882.5MHz



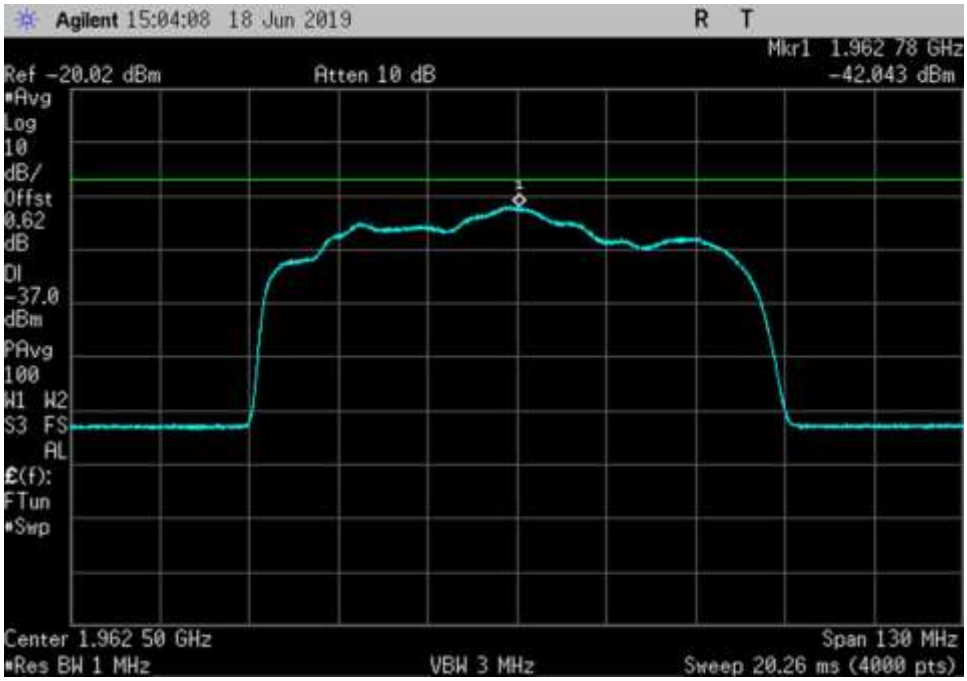
DL_728-746_ 737MHz



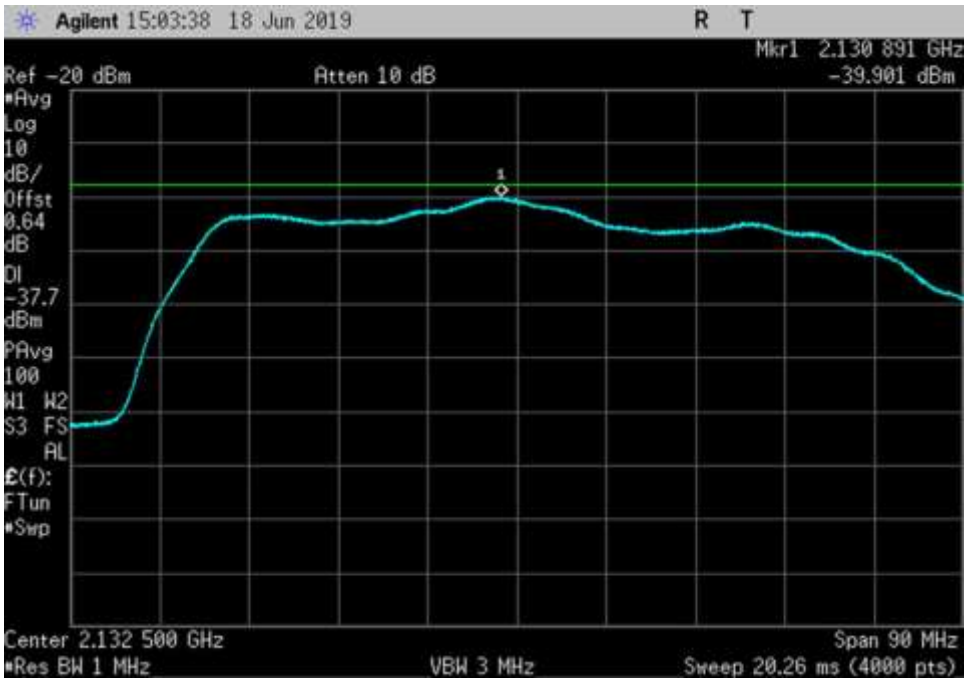
DL_746-757_ 751.5MHz



DL_869-894_ 881.5MHz



DL_1930-1995_ 1962.5MHz

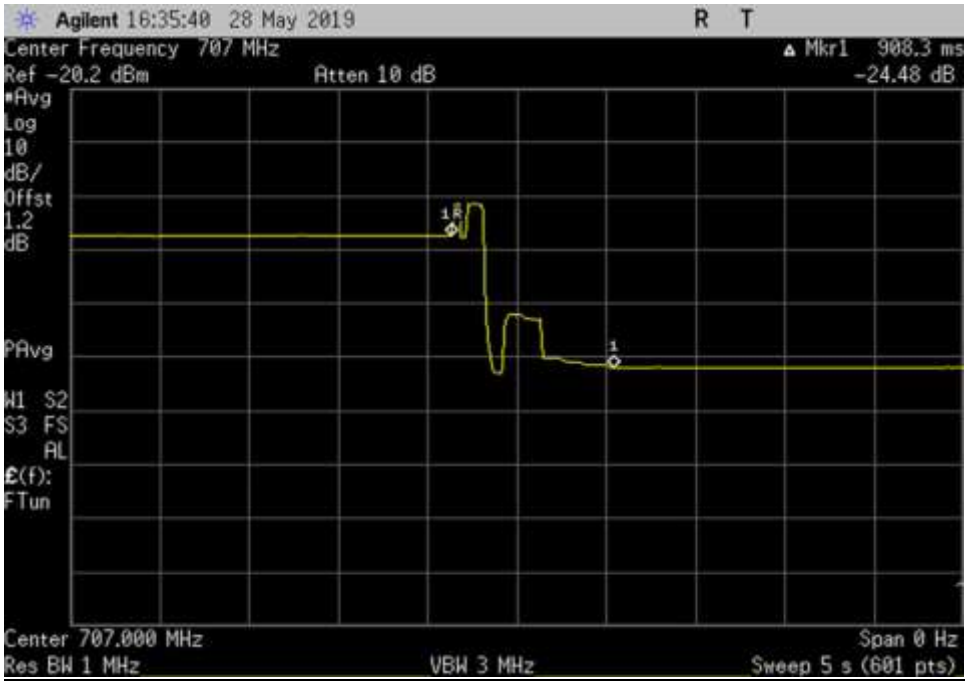


DL_2110-2155_ 2132.5MHz

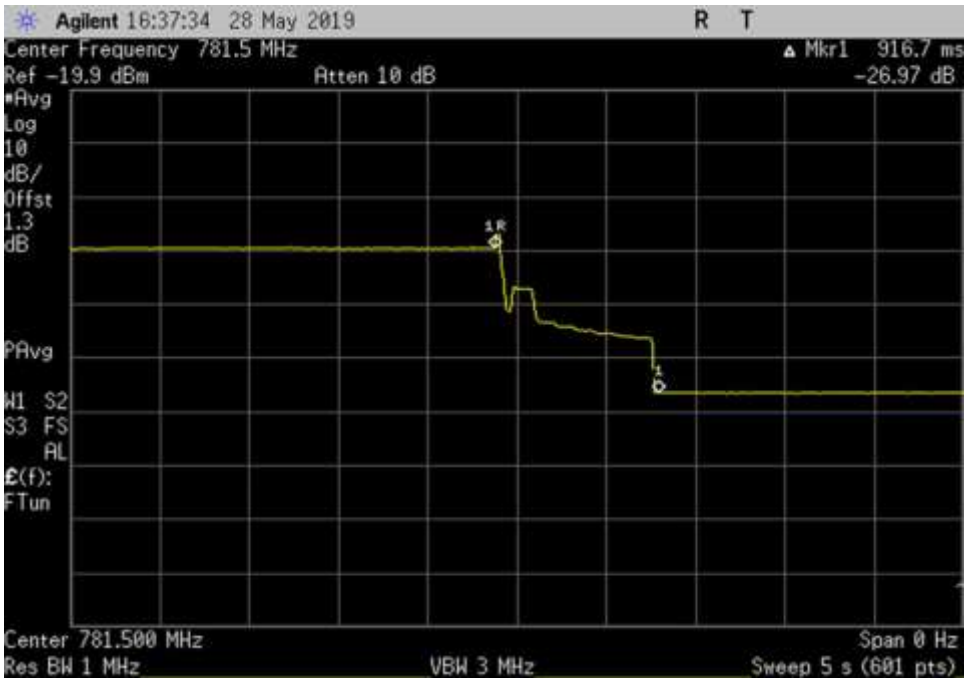
7.7.2 Variable UL Noise Timing

Plots

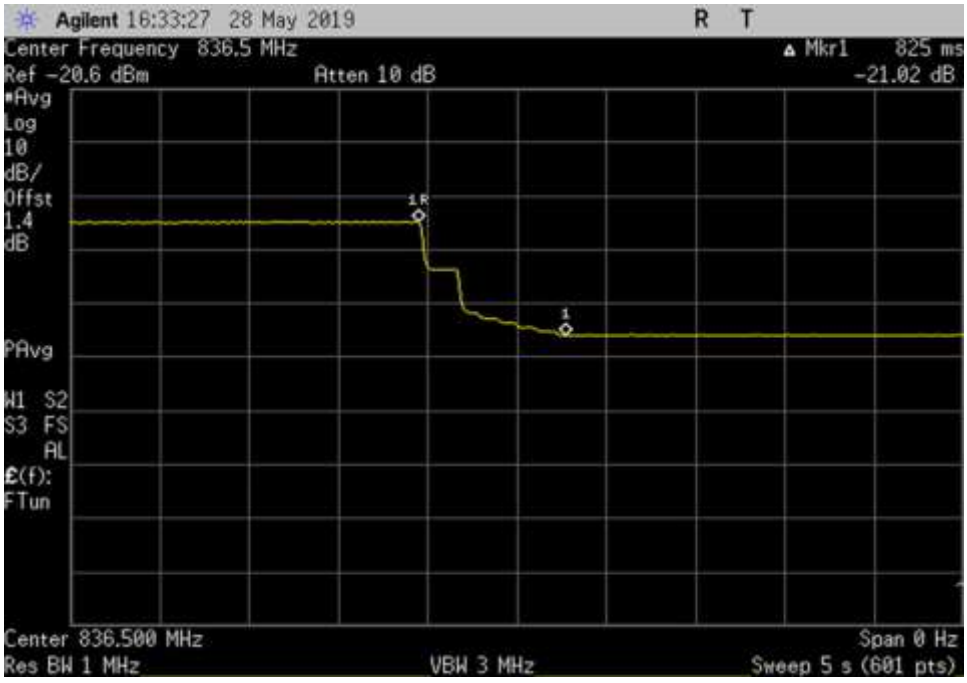
Configuration 1



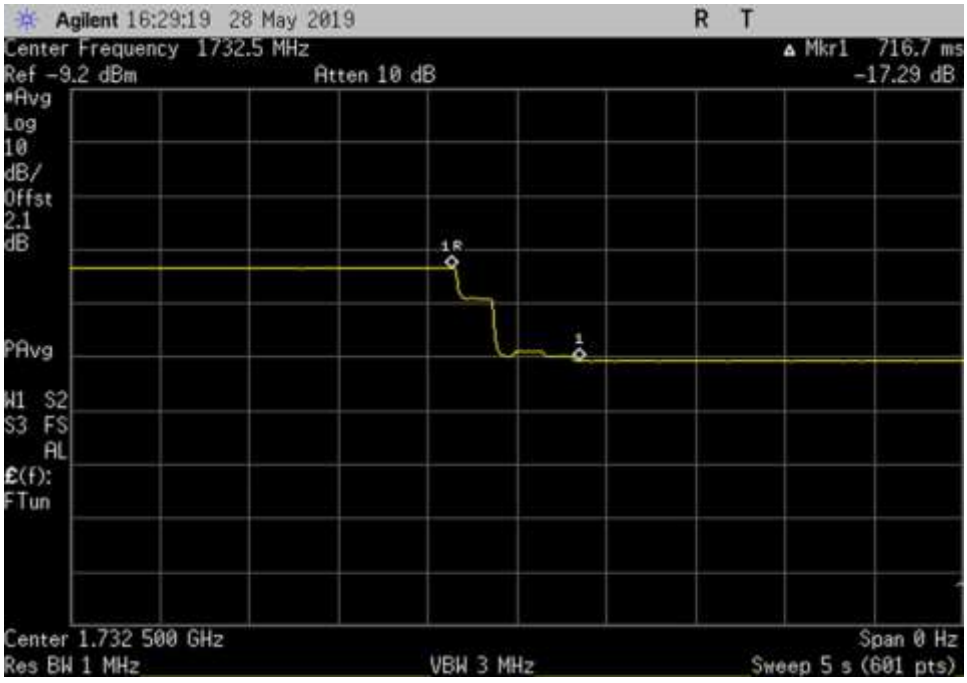
UL_698-716_ 707MHz_50ft Cable-Var



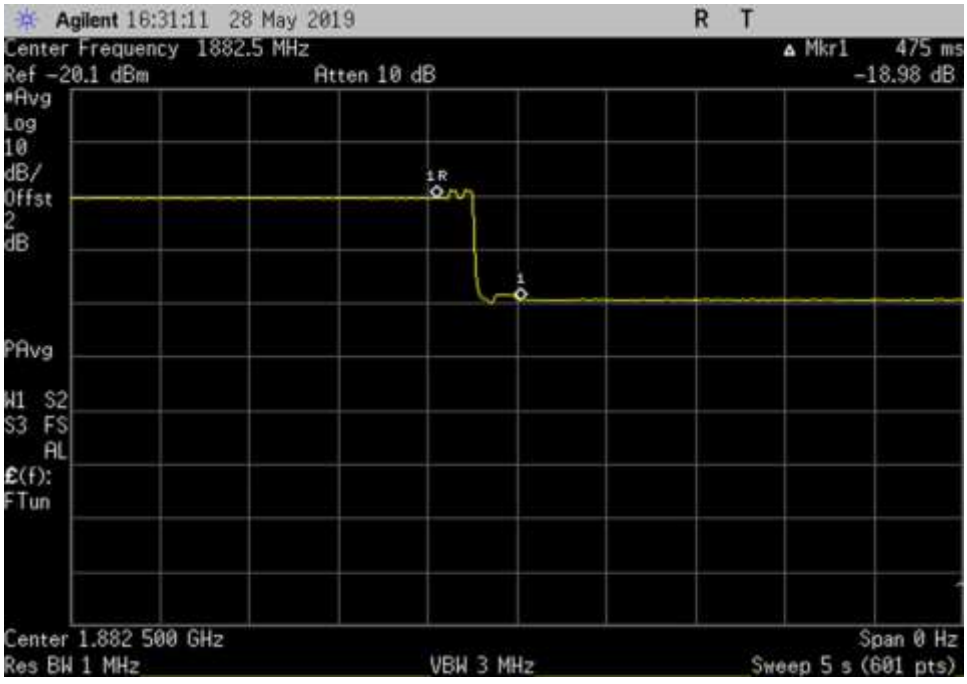
UL_776-787_ 781.5MHz_50ft Cable-Var



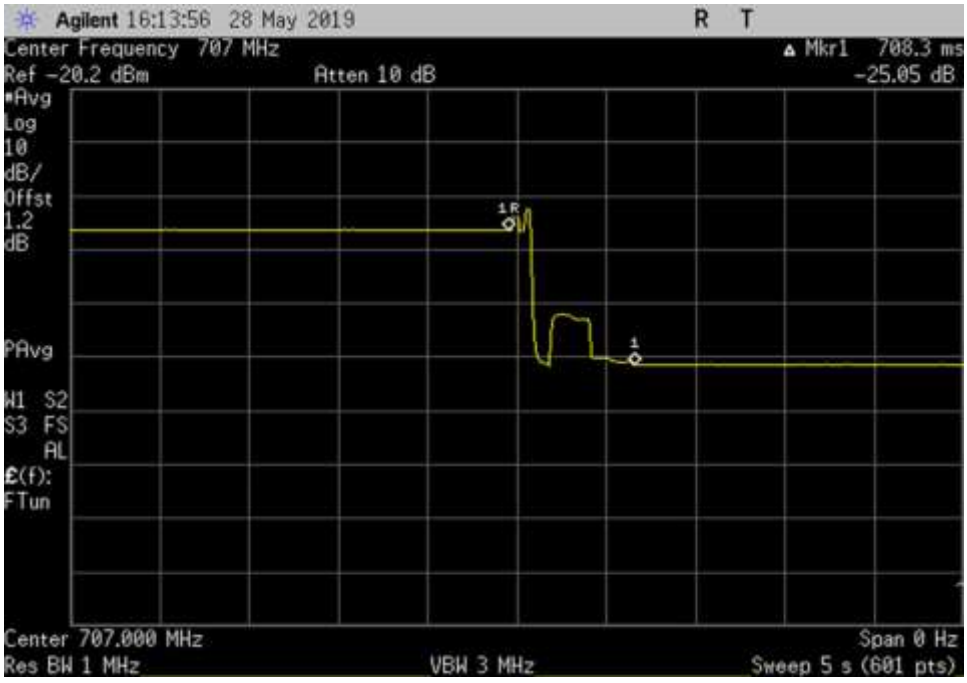
UL_824-849_ 836.5MHz_50ft Cable-Var



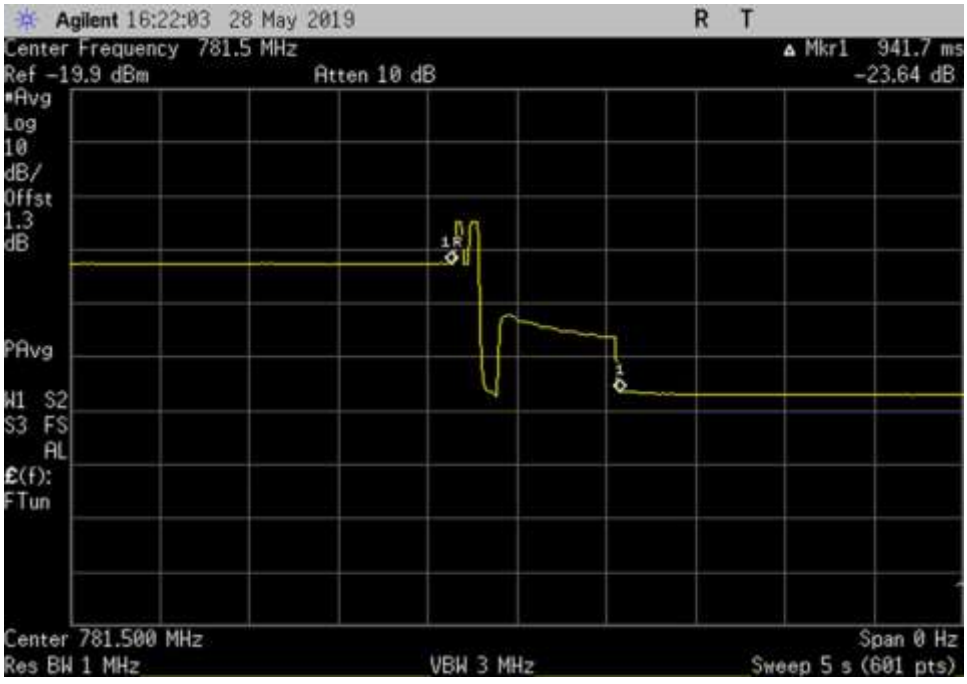
UL_1710-1755_ 1732.5MHz_50ft Cable-Var



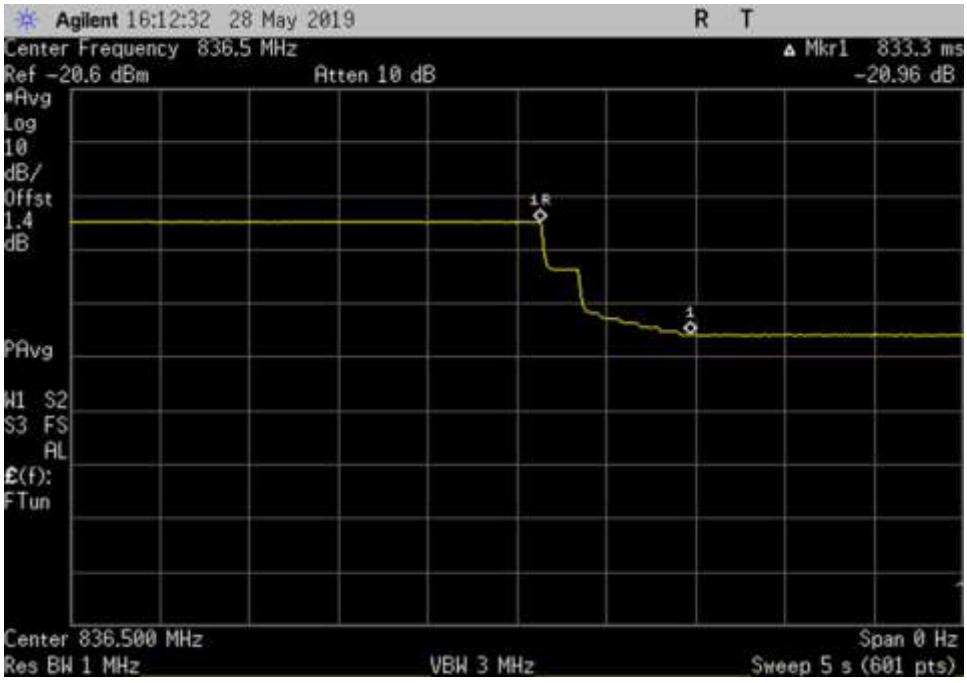
UL_1850-1915_ 1882.5MHz_50ft Cable-Var



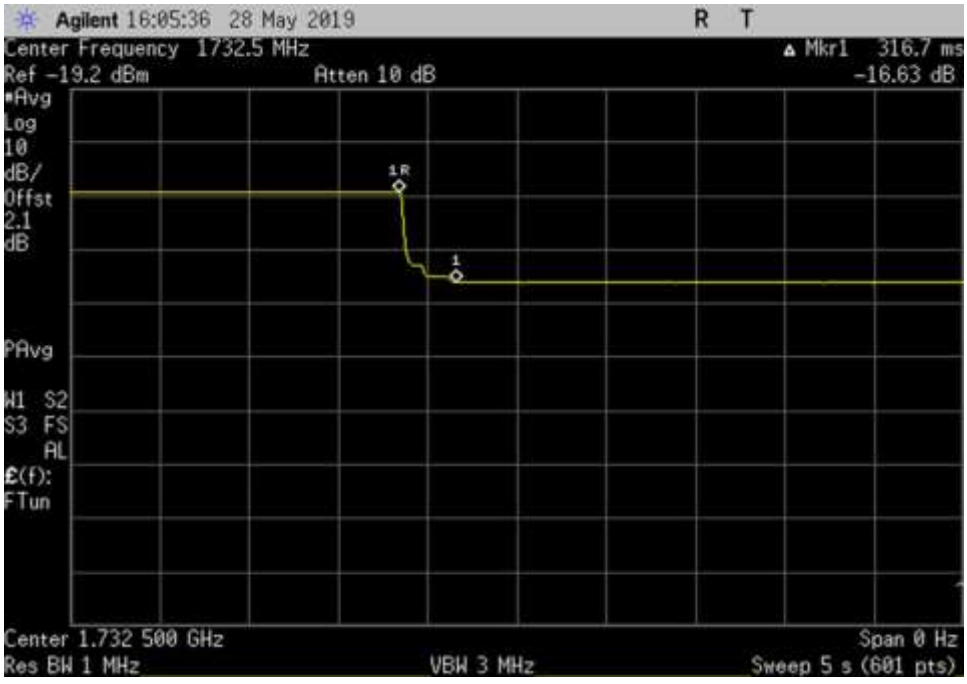
UL_698-716_ 707MHz_100ft Cable-Var



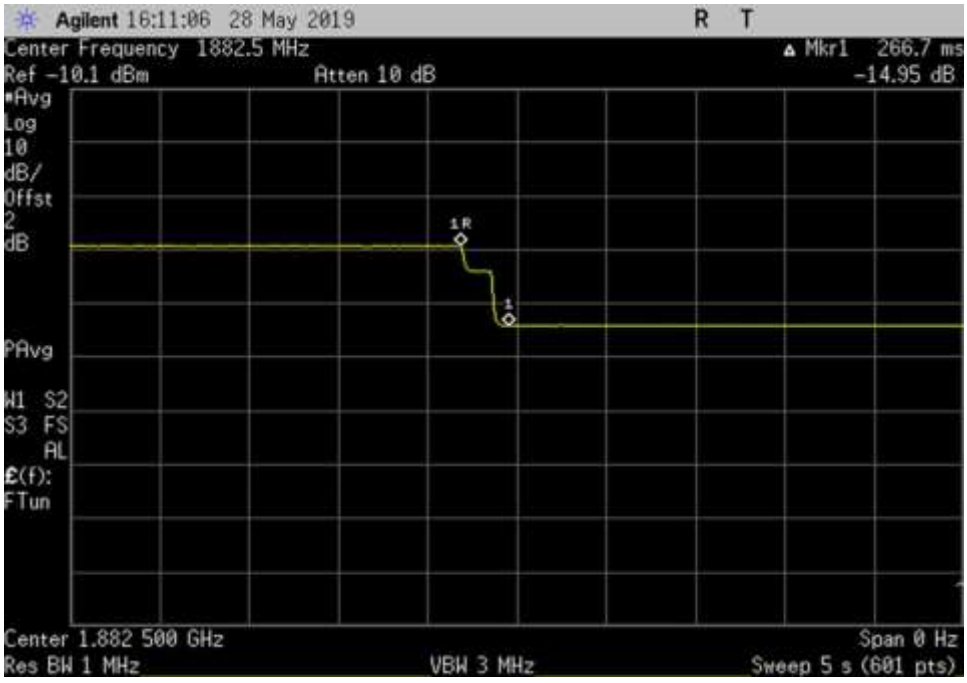
UL_776-787_ 781.5MHz_100ft Cable-Var



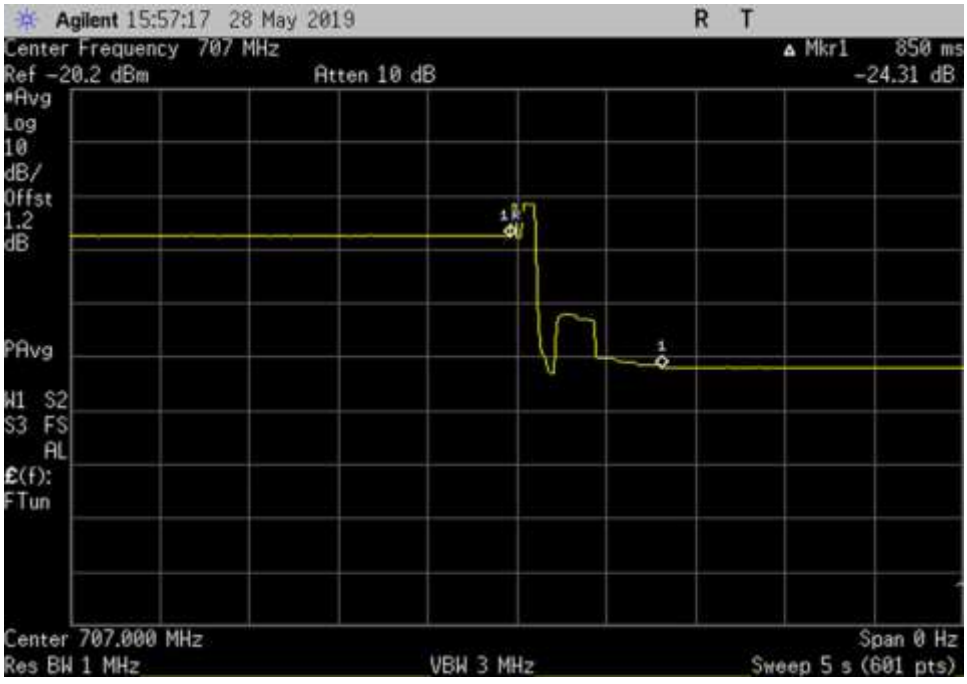
UL_824-849_ 836.5MHz_100ft Cable-Var



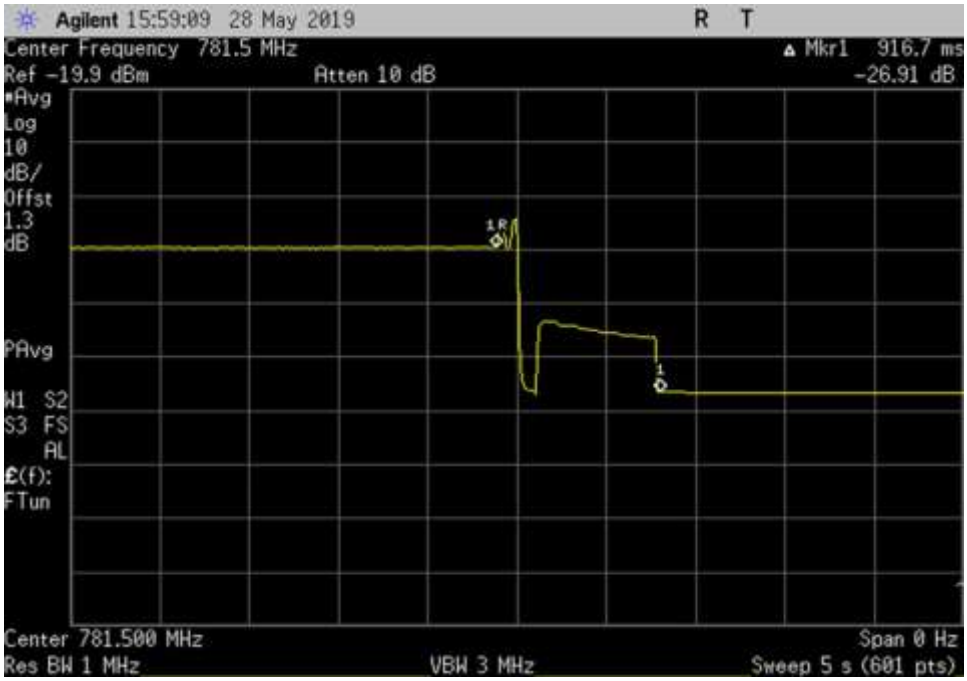
UL_1710-1755_ 1732.5MHz_100ft Cable-Var



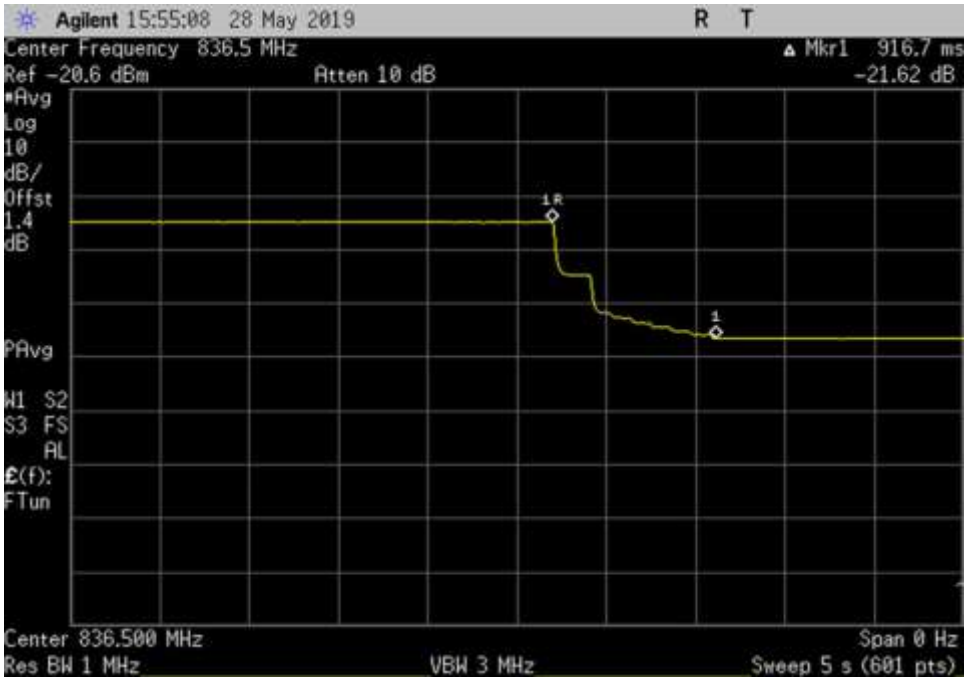
UL_1850-1915_ 1882.5MHz_100ft Cable-Var



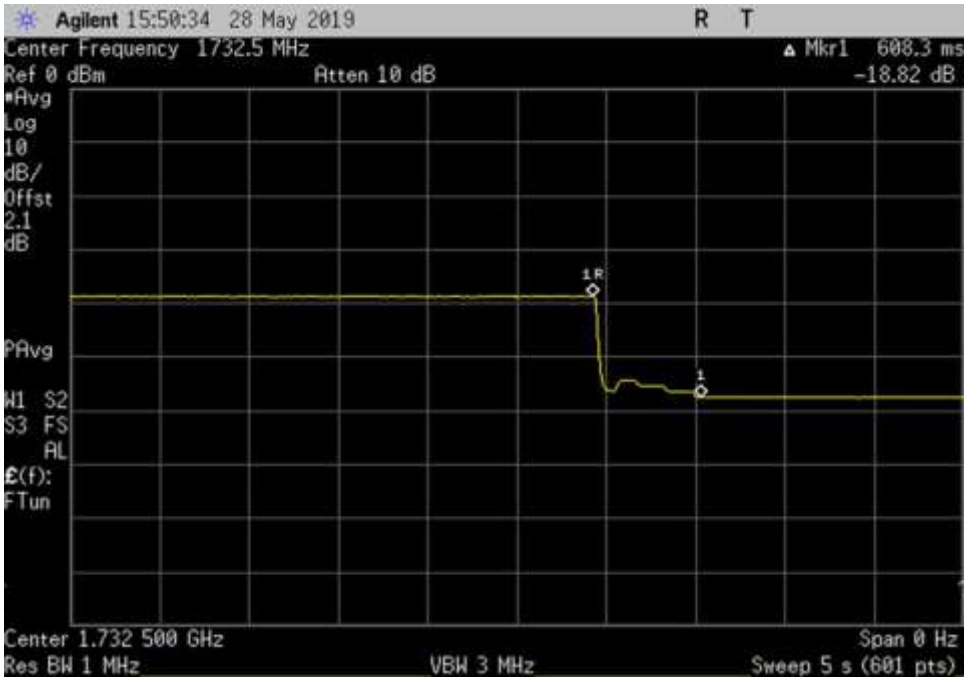
UL_698-716_ 707MHz_150ft Cable-Var



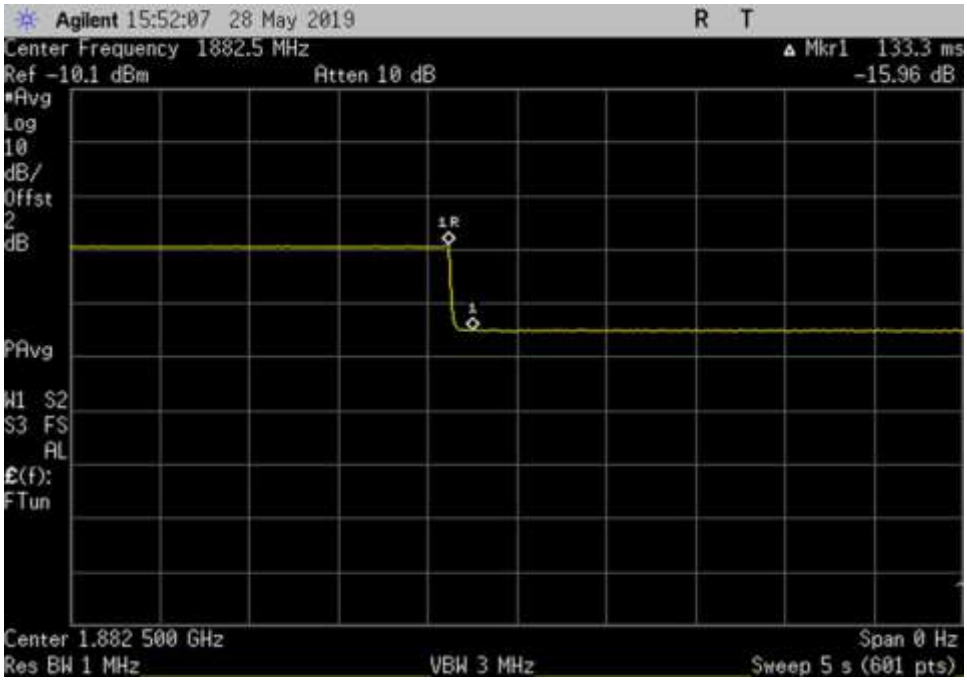
UL_776-787_ 781.5MHz_150ft Cable-Var



UL_824-849_ 836.5MHz_150ft Cable-Var



UL_1710-1755_ 1732.5MHz_150ft Cable-Var



UL_1850-1915_ 1882.5MHz_150ft Cable-Var

7.8 Uplink Inactivity

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc.
Specification:	**7.8 Uplink Inactivity**
Work Order #:	**102129** Date: 05/29/2019
Test Type:	**Conducted Emissions**
Tested By:	**Hieu Song Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Test environment conditions:
Temperature: 21.8°C
Relative Humidity: 48%
Atmospheric Pressure: 101.9kPa
Modification 1 was in place during testing.

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020

Summary of Results

7.8 Summary of Results on a 50ft Cable

Pass: As demonstrated, when the booster is not serving an active device connection after 5 minutes the uplink noise power does not exceed -70dBm/MHz

Uplink Inactivity		
Frequency	**Measured**	**Limit**
MHz	Min	Min
UL1710-1755	4.1	5.0
UL1850-1915	4.1	5.0
UL824-849	4.1	5.0
UL 698-716	4.1	5.0
UL776-787	4.1	5.0

7.8 Summary of Results on a 100ft Cable

Pass: As demonstrated, when the booster is not serving an active device connection after 5 minutes the uplink noise power does not exceed -70dBm/MHz

Uplink Inactivity		
Frequency	**Measured**	**Limit**
MHz	Min	Min
UL1710-1755	4.1	5.0
UL1850-1915	4.1	5.0
UL824-849	4.1	5.0
UL 698-716	4.1	5.0
UL776-787	4.1	5.0

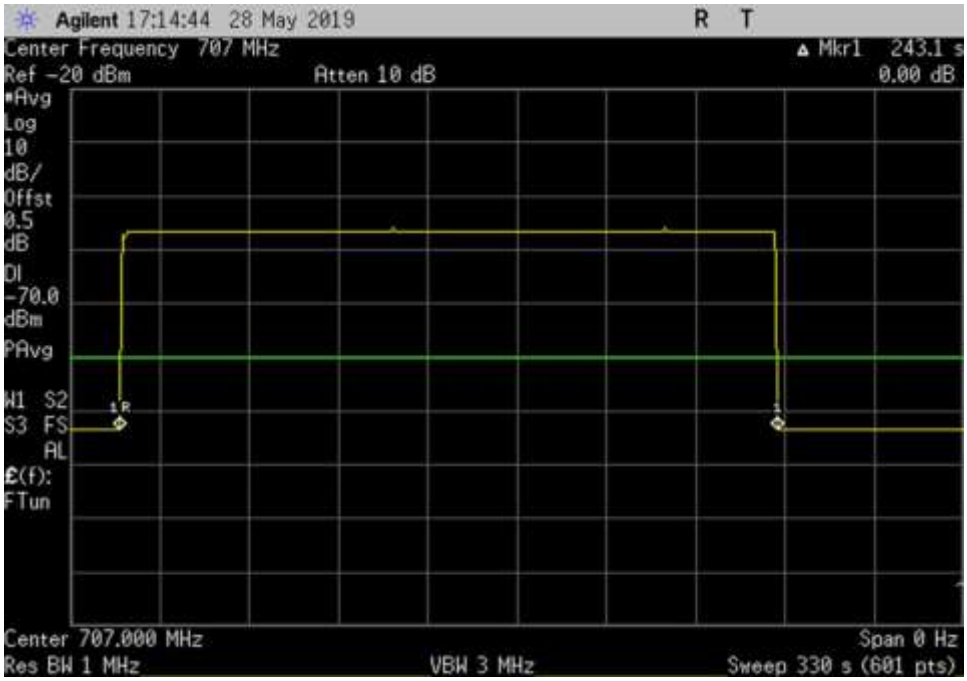
7.8 Summary of Results on a 150ft Cable

Pass: As demonstrated, when the booster is not serving an active device connection after 5 minutes the uplink noise power does not exceed -70dBm/MHz

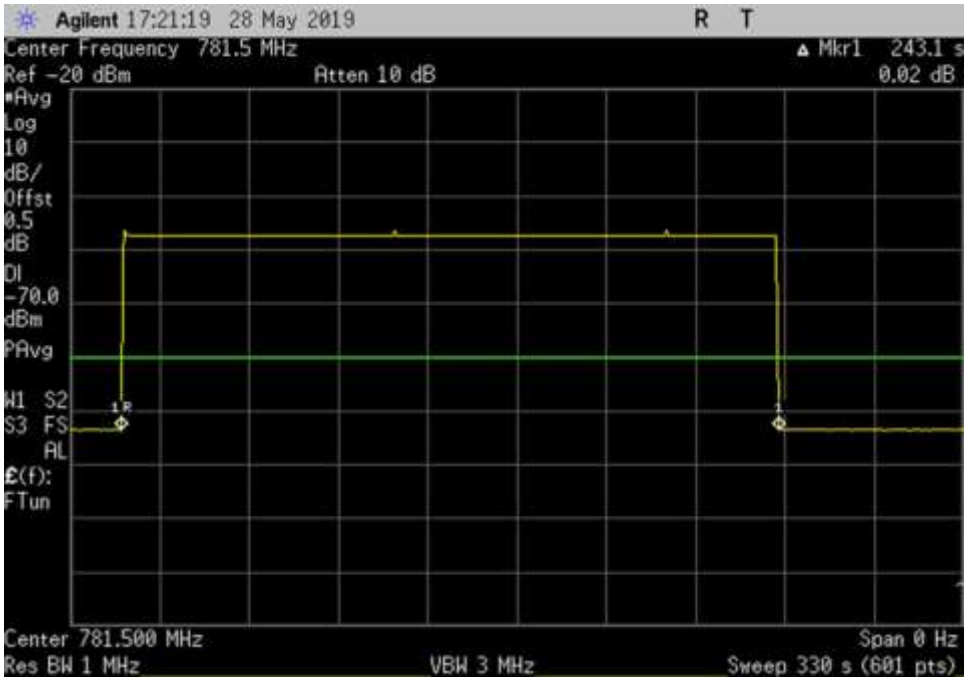
Uplink Inactivity		
Frequency	**Measured**	**Limit**
MHz	Min	Min
UL1710-1755	4.1	5.0
UL1850-1915	4.1	5.0
UL824-849	4.1	5.0
UL 698-716	4.1	5.0
UL776-787	4.1	5.0

Plots

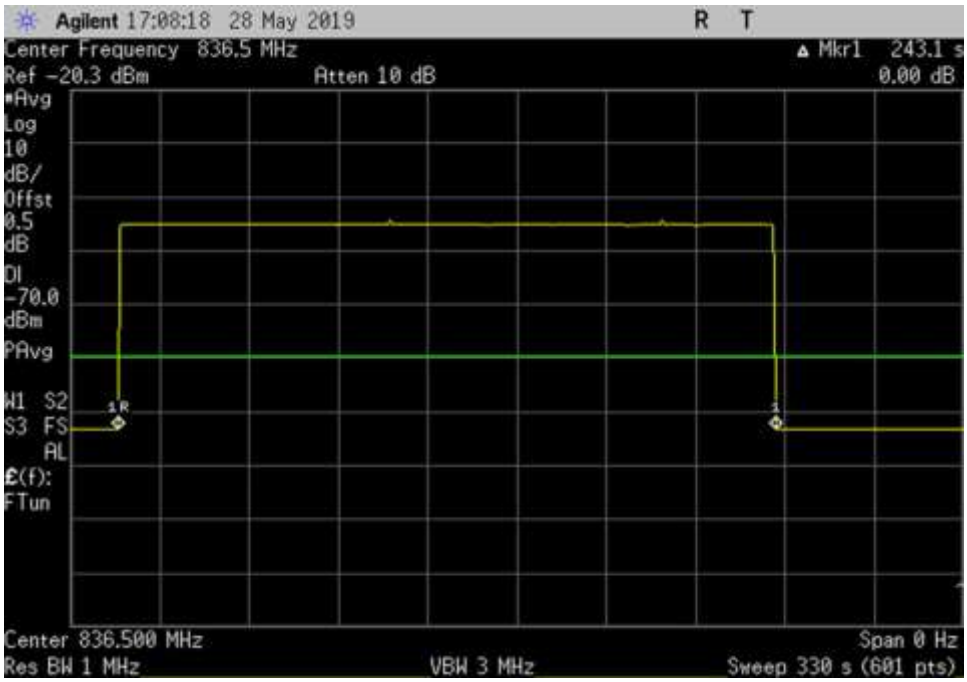
Configuration 1



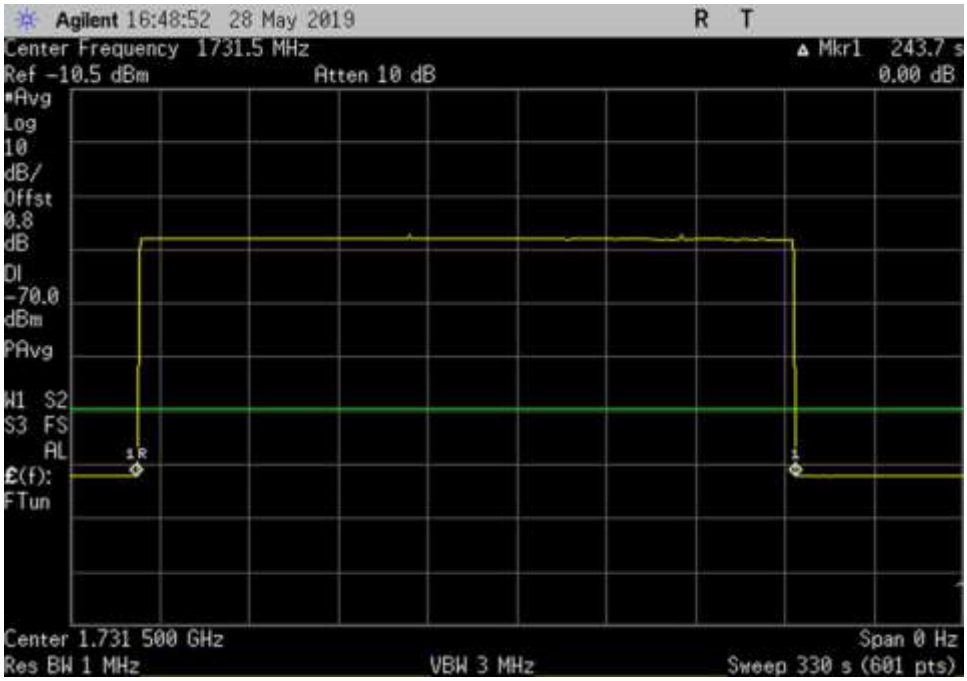
UL_698-716_ 707MHz_50ft Cable



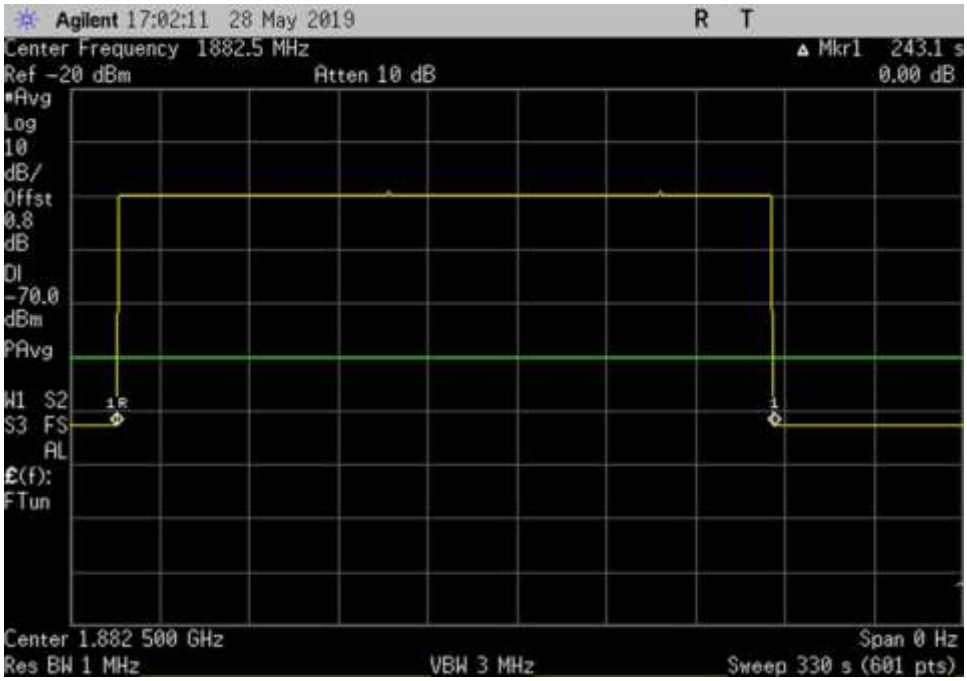
UL_776-787_ 781.5MHz_50ft Cable



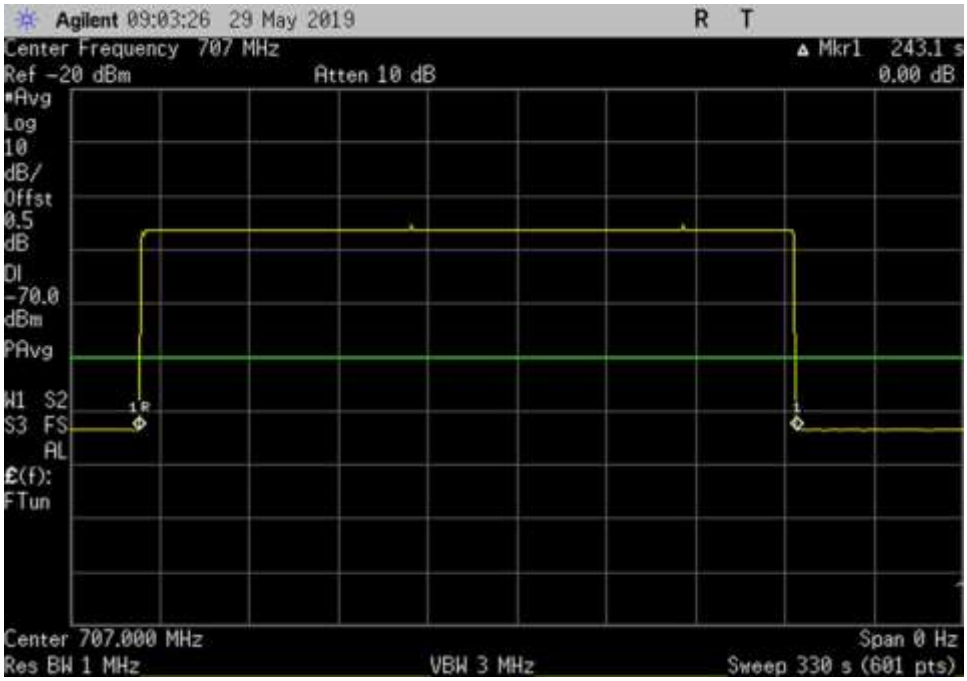
UL_824-849_ 836.5MHz_50ft Cable



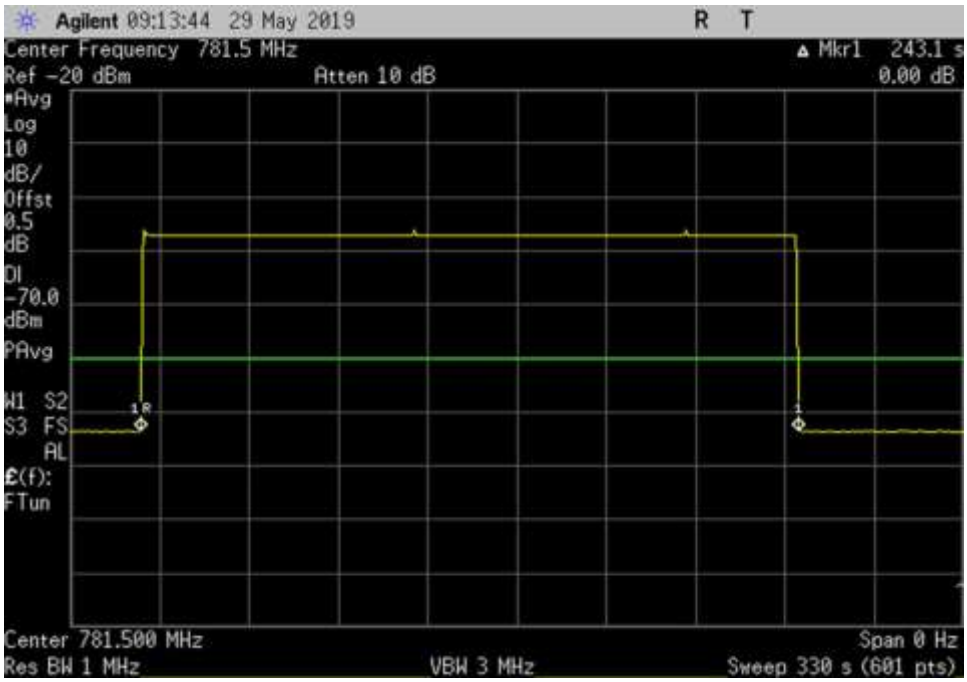
UL_1710-1755_ 1731.5MHz_50ft Cable



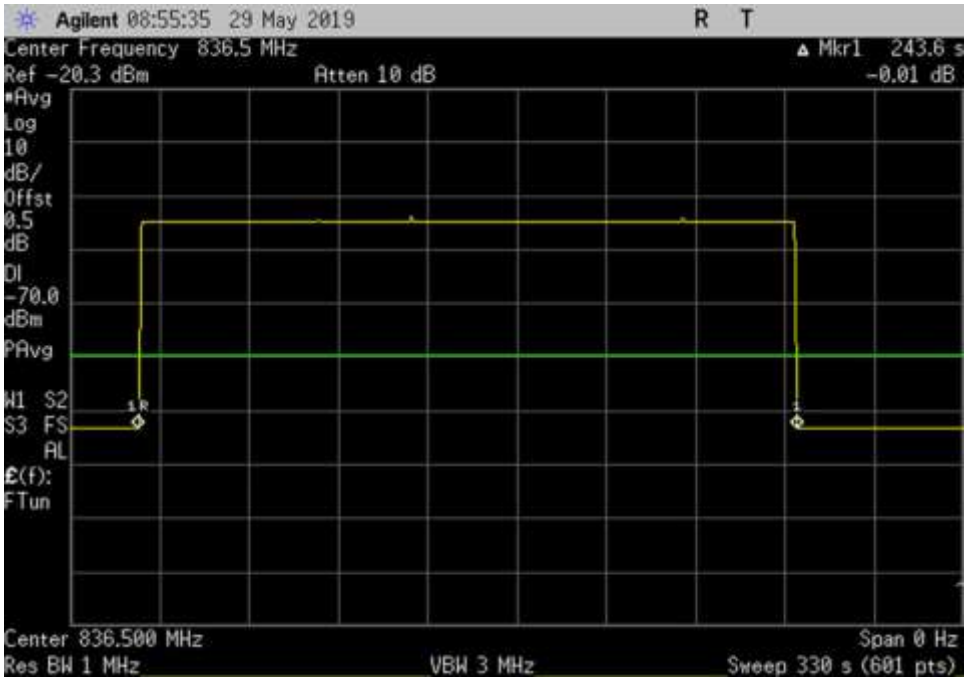
UL_1850-1915_ 1882.5MHz_50ft Cable



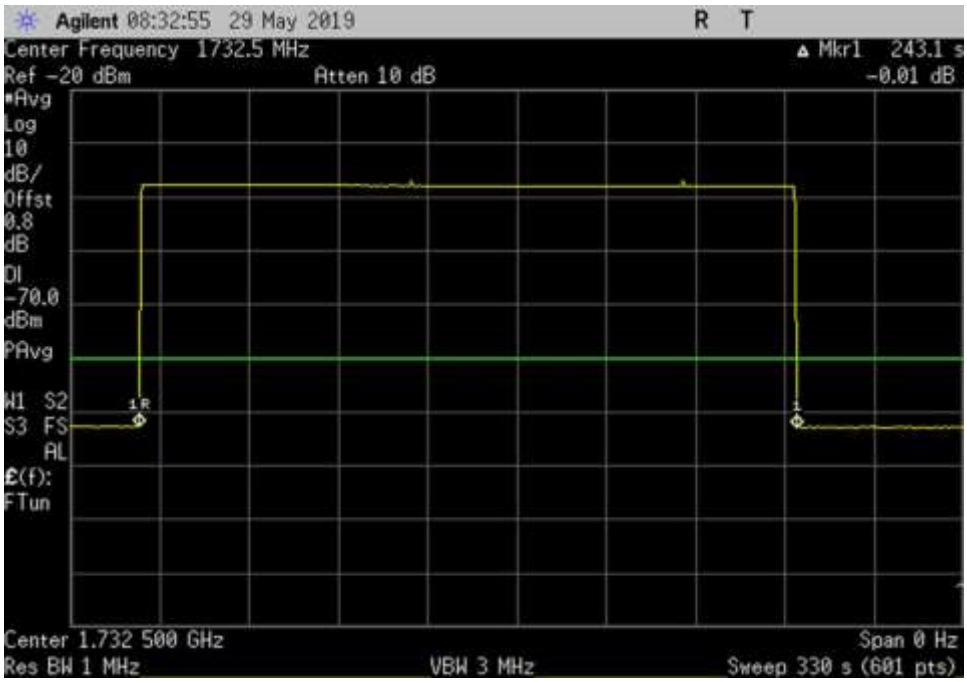
UL_698-716_ 707MHz_100ft Cable



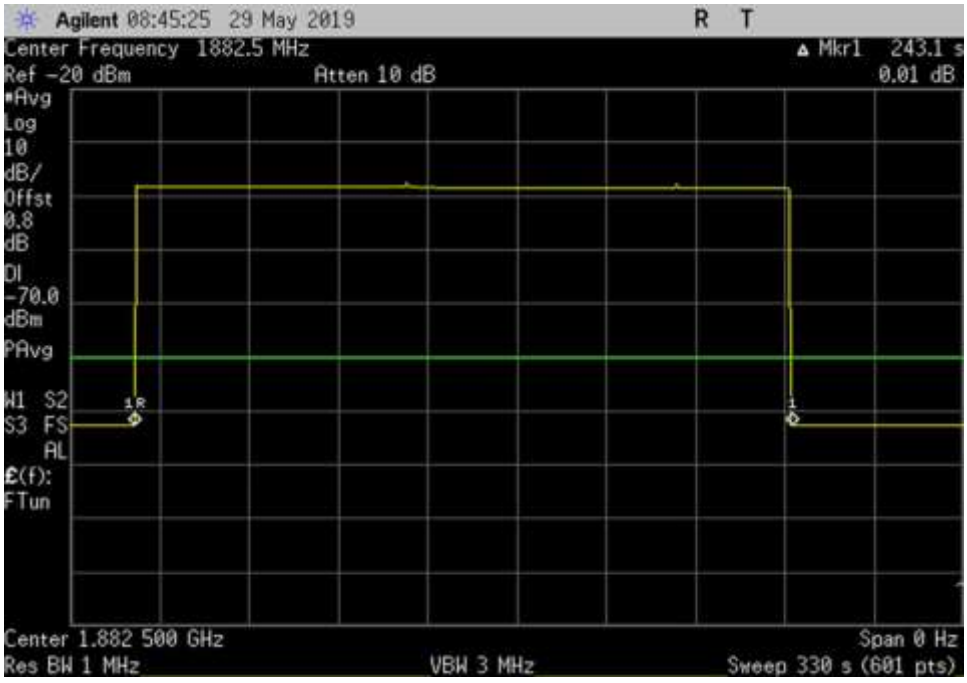
UL_776-787_ 781.5MHz_100ft Cable



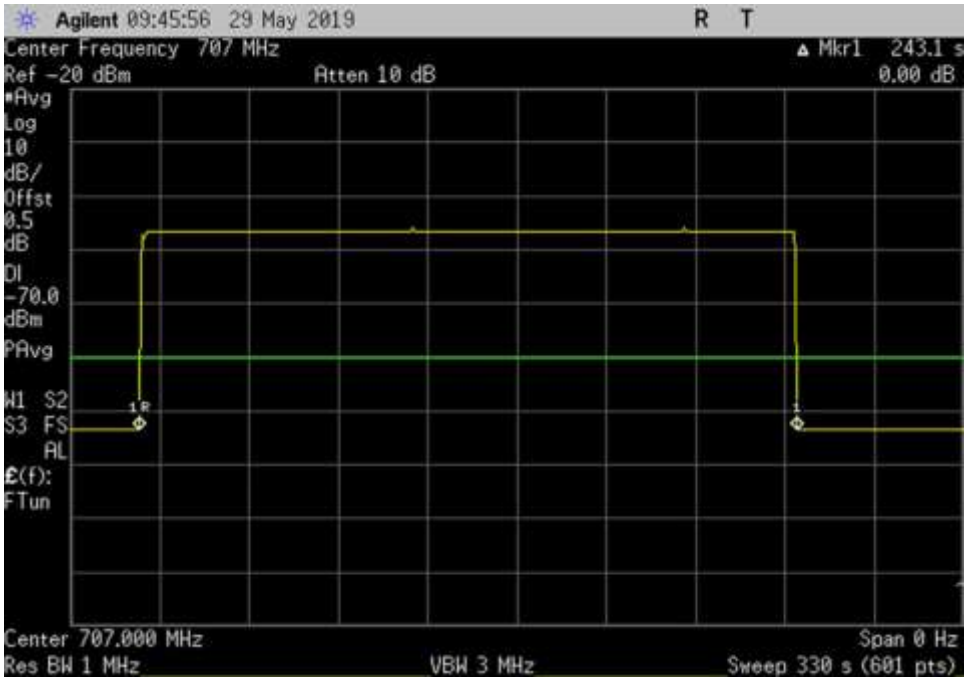
UL_824-849_ 836.5MHz_100ft Cable



UL_1710-1755_ 1732.5MHz_100ft Cable

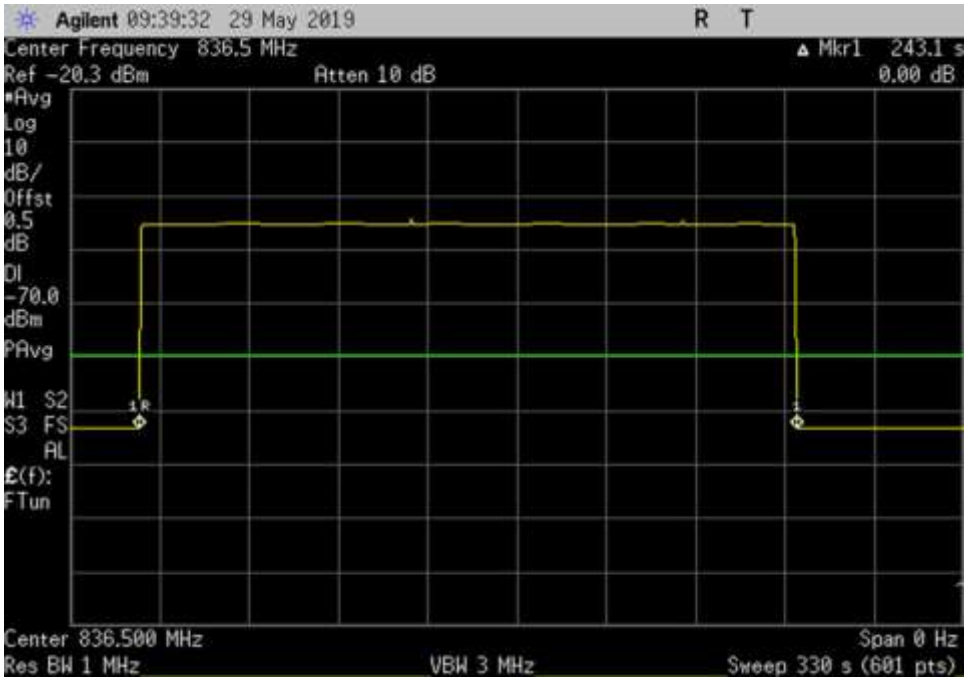


UL_1850-1915_ 1882.5MHz_100ft Cable

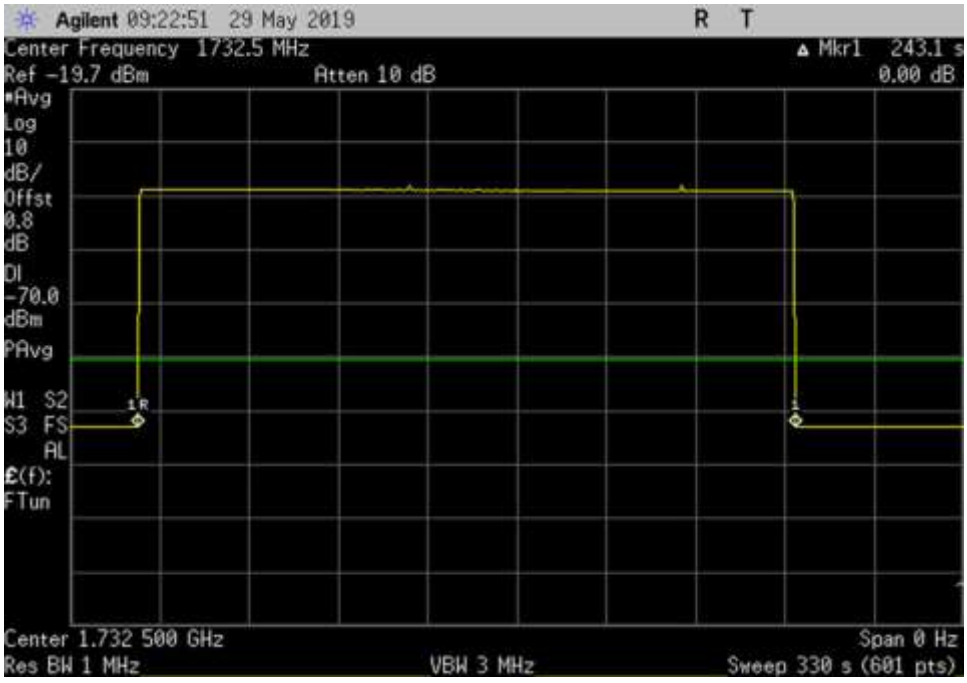


UL_698-716_ 707MHz_150ft Cable

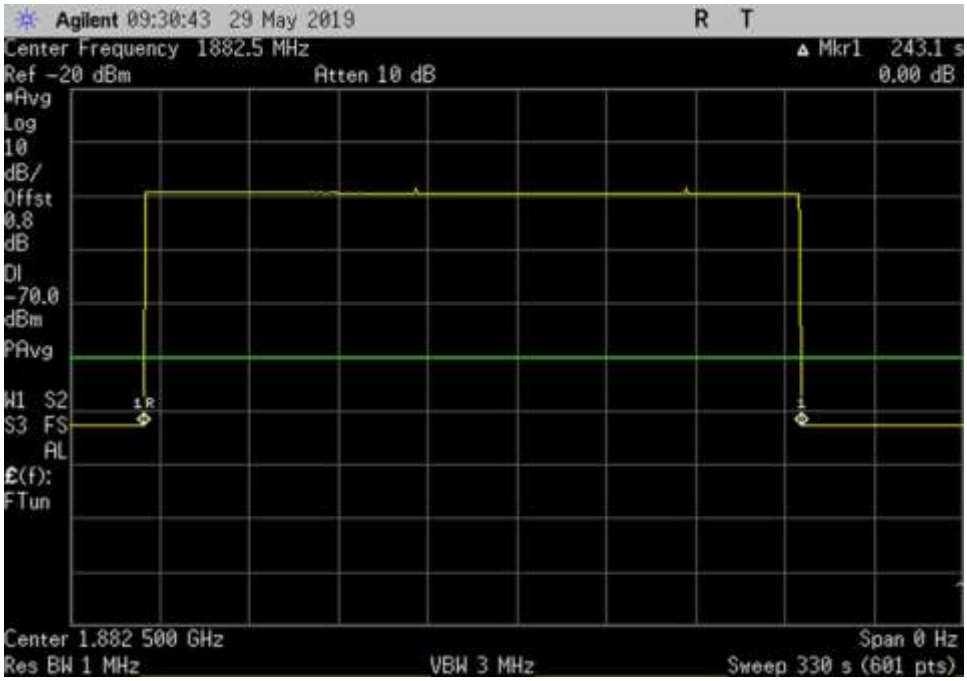
UL_776-787_ 781.5MHz_150ft Cable



UL_824-849_ 836.5MHz_150ft Cable



UL_1710-1755_ 1732.5MHz_150ft Cable



UL_1850-1915_ 1882.5MHz_150ft Cable

7.9 Booster Gain Limit

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc.
Specification:	**7.9 Variable Booster gain(Max Gain / Variable Uplink Gain Timing)**
Work Order #:	**102129**
Test Type:	**Conducted Emissions** Date 06/05/2019 and 06/07/2019
Tested By:	**Hieu Song Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

06/05/2019
Test environment conditions: Temperature: 24.5°C, Relative Humidity: 41%, Atmospheric Pressure: 102.5kPa

06/07/2019
Test environment conditions: Temperature: 23.8°C, Relative Humidity: 42%, Atmospheric Pressure: 101.4kPa

Worst Case MSCL: Fixed Booster Panel RT V1.0

Frequency (MHz)	MSCL (dB)
PCS(1850-1915)	37
Cellular(824-849)	33
LTE(698-716)	31.5
LTE(776-787)	32.5
AWS(1710-1755)	36.3

Test Equipment:

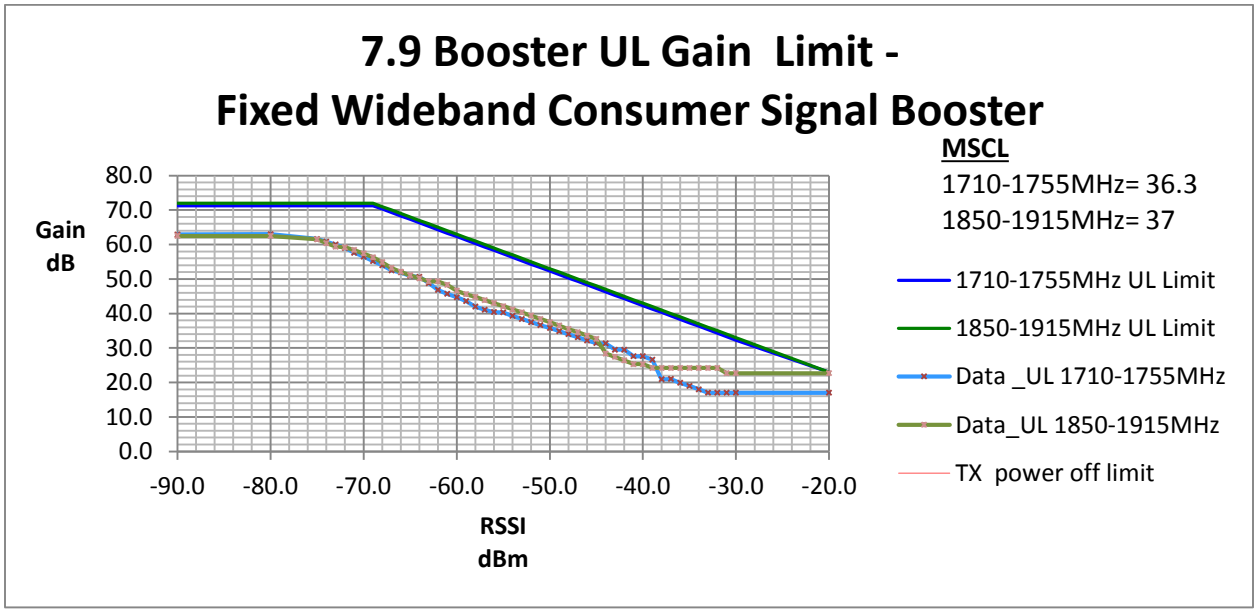
Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	05/13/2019	05/13/2021
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03360	Cable	Astrolab	32022-2-29094-36TC	6/25/2018	6/25/2020
C00082	Directional Coupler	MECA Electronics, Inc.	722-10-1.500V	9/18/2017	9/18/2019
C00032	Arbitrary Waveform Generator	Agilent	E4433B	3/19/2018	3/19/2020

Summary of Results

7.9 Summary of Results on a 50ft Cable

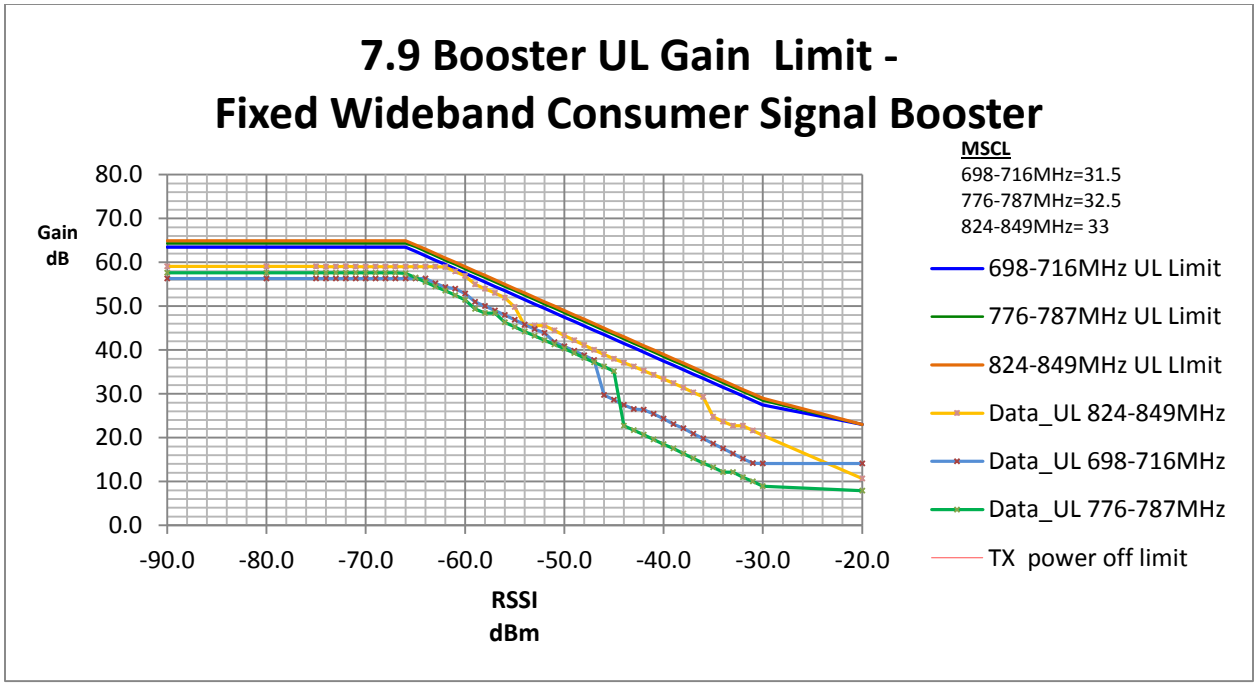
Pass: As demonstrated, computed gains are within the gain limit. All maximum variable uplink gain timings are within 3 second limit.

7.9.1 Maximum gain



1710.0			1755.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-47.4	15.5	62.9	-	71.3	-	-8.4
-80.0	-47.4	15.6	63.0	-	71.3	-	-8.3
-75.0	-47.4	14.2	61.6	-	71.3	-	-9.7
-65.0	-47.4	3.5	50.9	67.3	-	-	-16.4
-64.0	-47.4	3.2	50.6	66.3	-	-	-15.7
-20.0	-47.4	-30.4	17.0	-	-	23	-6.0

1850.0			1915.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-47.1	15.4	62.5	-	72.0	-	-9.5
-80.0	-47.1	15.4	62.5	-	72.0	-	-9.5
-75.0	-47.1	14.4	61.5	-	72.0	-	-10.5
-31.0	-47.1	-24.4	22.7	34.0	-	-	-11.3
-30.0	-47.1	-24.4	22.7	33.0	-	-	-10.3
-20.0	-47.1	-24.4	22.7	-	-	23	-0.3



824.0			849.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-43.5	15.6	59.1	-	64.9	-	-5.8
-80.0	-43.5	15.6	59.1	-	64.9	-	-5.8
-75.0	-43.5	15.6	59.1	-	64.9	-	-5.8
-62.0	-43.5	15.4	58.9	61.0	-	-	-2.1
-61.0	-43.5	14.4	57.9	60.0	-	-	-2.1
-60.0	-43.5	13.4	56.9	59.0	-	-	-2.1

698.0			716.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-38.3	18.0	56.3	-	63.5	-	-7.2
-80.0	-38.3	18.0	56.3	-	63.5	-	-7.2
-75.0	-38.3	18.0	56.3	-	63.5	-	-7.2
-62.0	-38.3	16.0	54.3	59.5	-	-	-5.2
-61.0	-38.3	15.7	54.0	58.5	-	-	-4.5
-60.0	-38.3	14.6	52.9	57.5	-	-	-4.6

776.0			787.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-38.9	18.7	57.6	-	64.4	-	-6.8
-80.0	-38.9	18.7	57.6	-	64.4	-	-6.8
-75.0	-38.9	18.7	57.6	-	64.4	-	-6.8
-64.0	-38.9	16.6	55.5	62.5	-	-	-7.0
-63.0	-38.9	15.6	54.5	61.5	-	-	-7.0
-62.0	-38.9	14.6	53.5	60.5	-	-	-7.0

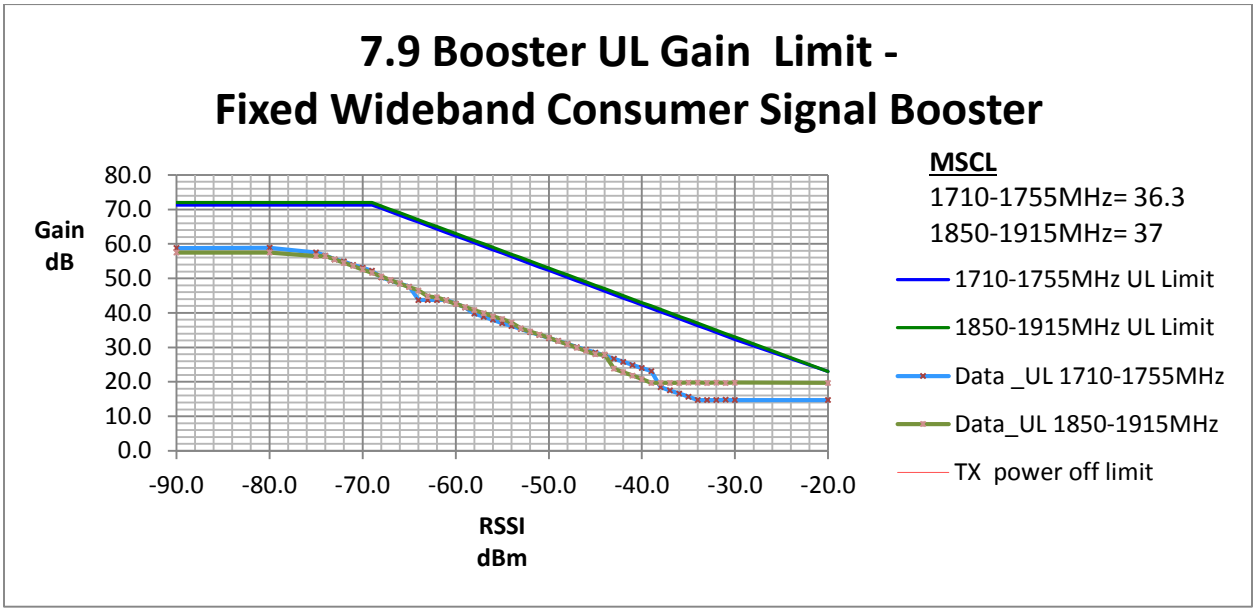
7.9.2 Variable uplink gain timing

Uplink Gain Timing		
Frequency (MHz)	**Measured (Sec)**	**Limit (Sec)**
UL 1710-1755	0.52	3.00
UL 1850-1915	0.66	3.00
UL 824-849	0.69	3.00
UL 698-716	0.80	3.00
UL 776-787	0.83	3.00

7.9 Summary of Results on a 100ft Cable

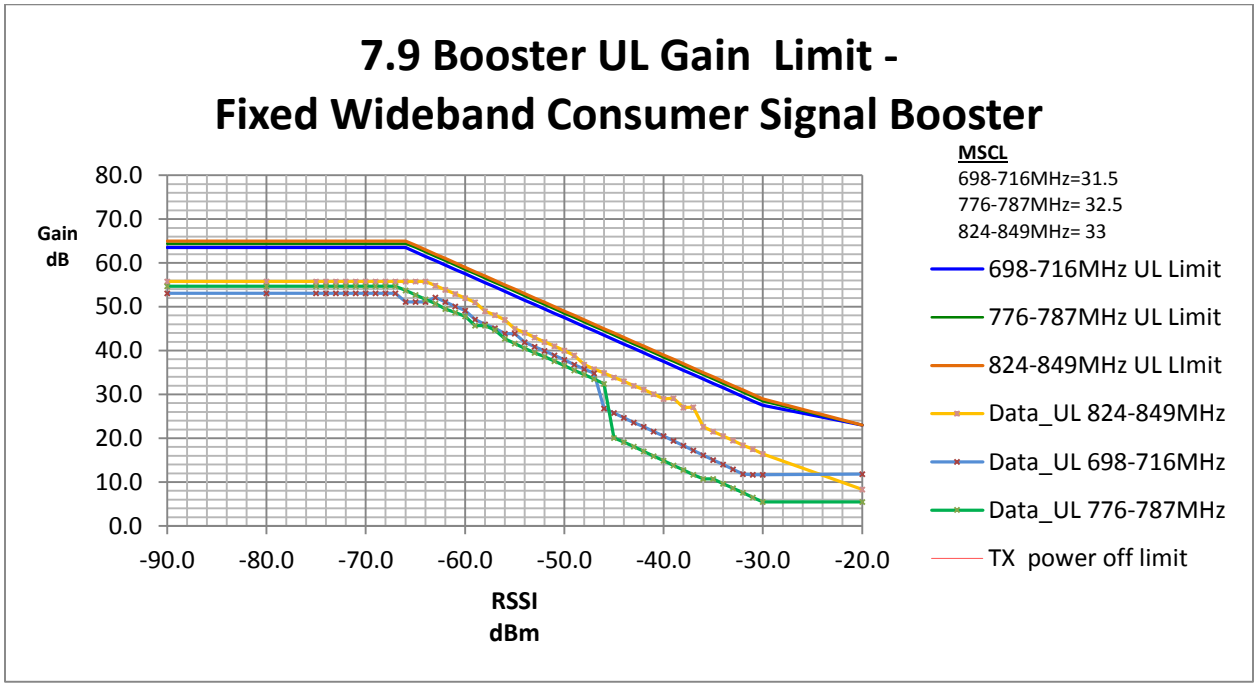
Pass: As demonstrated, computed gains are within the gain limit. All maximum variable uplink gain timings are within 3 second limit.

7.9.1 Maximum gain



1710.0			1755.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-47.4	11.4	58.8	-	71.3	-	-12.5
-80.0	-47.4	11.5	58.9	-	71.3	-	-12.4
-75.0	-47.4	10.1	57.5	-	71.3	-	-13.8
-31.0	-47.4	-32.6	14.8	33.3	-	-	-18.5
-30.0	-47.4	-32.7	14.7	32.3	-	-	-17.6
-20.0	-47.4	-32.7	14.7		-	23	-8.3

1850.0			1915.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-46.3	11.2	57.5	-	72.0	-	-14.5
-80.0	-46.3	11.2	57.5	-	72.0	-	-14.5
-75.0	-46.3	10.2	56.5	-	72.0	-	-15.5
-31.0	-46.3	-26.6	19.7	34.0	-	-	-14.3
-30.0	-46.3	-26.5	19.8	33.0	-	-	-13.2
-20.0	-46.3	-26.6	19.7	-	-	23	-3.3



824.0			849.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-43.5	12.3	55.8	-	64.9	-	-9.1
-80.0	-43.5	12.3	55.8	-	64.9	-	-9.1
-75.0	-43.5	12.3	55.8	-	64.9	-	-9.1
-61.0	-43.5	9.4	52.9	60.0	-	-	-7.1
-60.0	-43.5	8.5	52.0	59.0	-	-	-7.0
-59.0	-43.5	7.5	51.0	58.0	-	-	-7.0

698.0			716.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-38.3	14.8	53.1	-	63.5	-	-10.4
-80.0	-38.3	14.8	53.1	-	63.5	-	-10.4
-75.0	-38.3	14.8	53.1	-	63.5	-	-10.4
-63.0	-38.3	13.8	52.1	60.5	-	-	-8.4
-62.0	-38.3	12.8	51.1	59.5	-	-	-8.4
-61.0	-38.3	11.8	50.1	58.5	-	-	-8.4

776.0			787.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-38.4	16.3	54.7	-	64.4	-	-9.7
-80.0	-38.4	16.3	54.7	-	64.4	-	-9.7
-75.0	-38.4	16.3	54.7	-	64.4	-	-9.7
-64.0	-38.4	13.3	51.7	62.5	-	-	-10.8
-63.0	-38.4	12.3	50.7	61.5	-	-	-10.8
-62.0	-38.4	11.1	49.5	60.5	-	-	-11.0

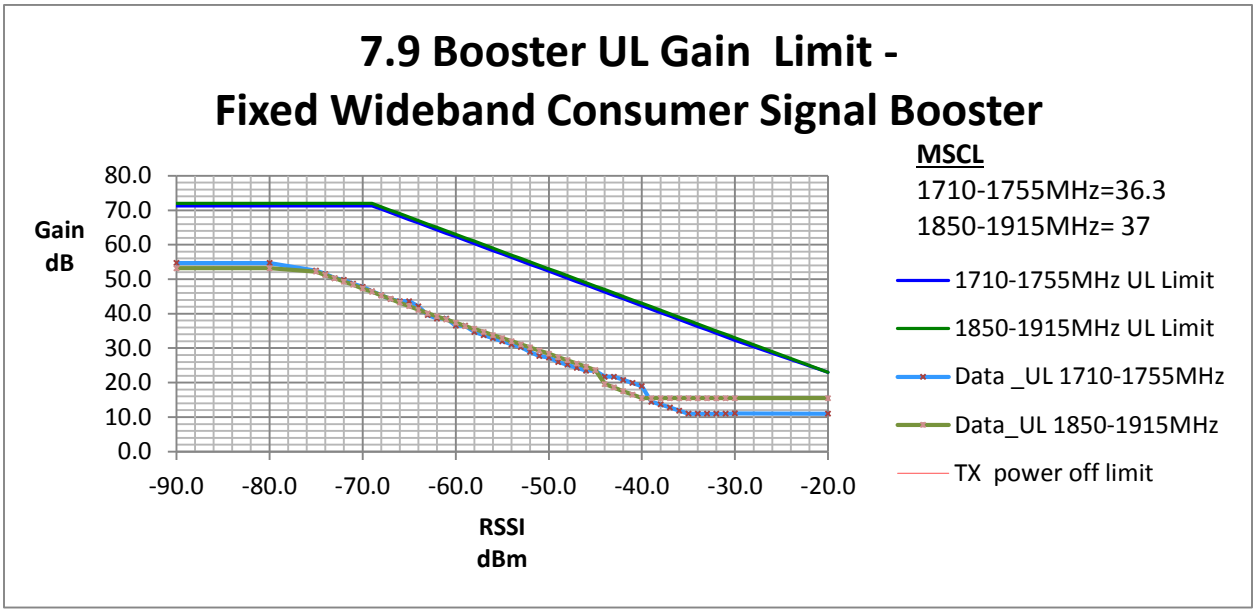
7.9.2 Variable uplink gain timing

Uplink Gain Timing		
Frequency (MHz)	**Measured (Sec)**	**Limit (Sec)**
UL 1710-1755	0.88	3.00
UL 1850-1915	0.39	3.00
UL 824-849	0.98	3.00
UL 698-716	0.90	3.00
UL 776-787	1.10	3.00

7.9 Summary of Results on a 150ft Cable

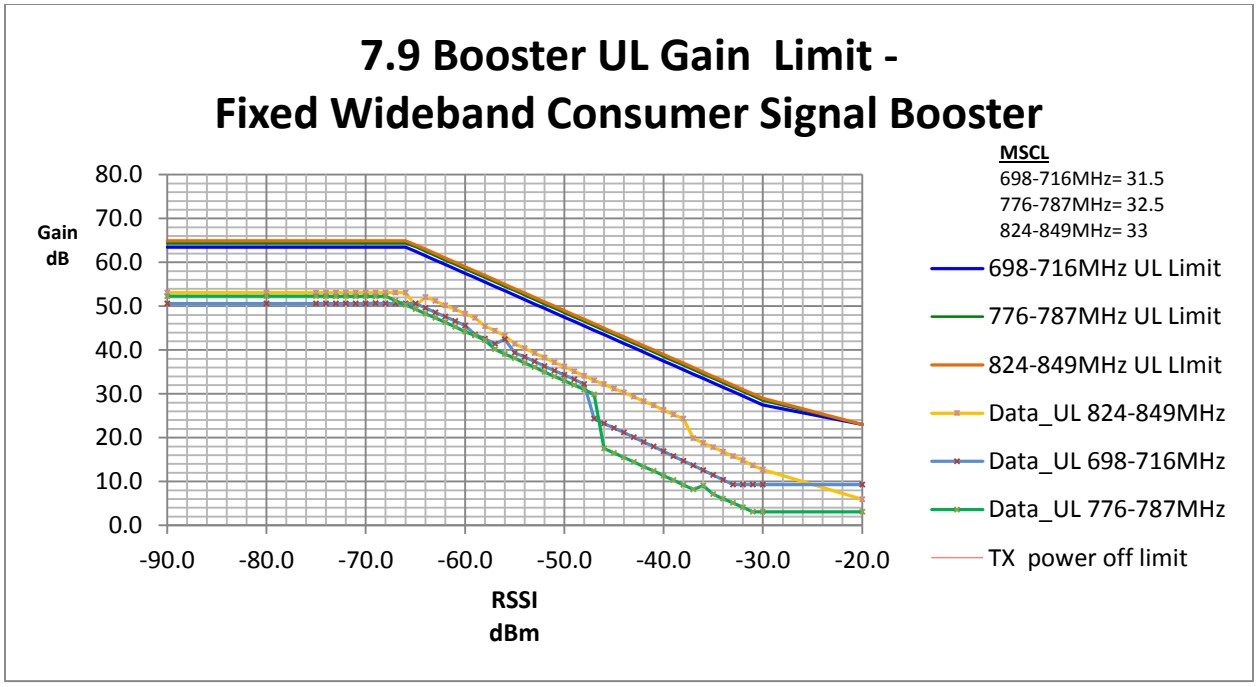
Pass: As demonstrated, computed gains are within the gain limit. All maximum variable uplink gain timings are within 3 second limit.

7.9.1 Maximum gain



1710.0			1755.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-47.4	7.3	54.7	-	71.3	-	-16.6
-80.0	-47.4	7.3	54.7	-	71.3	-	-16.6
-75.0	-47.4	5.1	52.5	-	71.3	-	-18.8
-31.0	-47.4	-36.4	11.0	33.3	-	-	-22.3
-30.0	-47.4	-36.3	11.1	32.3	-	-	-21.2
-20.0	-47.4	-36.4	11.0	-	-	23	-12.0

1850.0			1915.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-46.3	6.9	53.2	-	72.0	-	-18.8
-80.0	-46.3	6.9	53.2	-	72.0	-	-18.8
-75.0	-46.3	5.9	52.2	-	72.0	-	-19.8
-31.0	-46.3	-30.8	15.5	34.0	-	-	-18.5
-30.0	-46.3	-30.8	15.5	33.0	-	-	-17.5
-20.0	-46.3	-30.8	15.5	-	-	23	-7.5



824.0			849.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-43.5	9.6	53.1	-	64.9	-	-11.8
-80.0	-43.5	9.6	53.1	-	64.9	-	-11.8
-75.0	-43.5	9.6	53.1	-	64.9	-	-11.8
-63.0	-43.5	7.7	51.2	62.0	-	-	-10.8
-62.0	-43.5	6.7	50.2	61.0	-	-	-10.8
-61.0	-43.5	5.8	49.3	60.0	-	-	-10.7

698.0			716.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-38.3	12.3	50.6	-	63.5	-	-12.9
-80.0	-38.3	12.3	50.6	-	63.5	-	-12.9
-75.0	-38.3	12.3	50.6	-	63.5	-	-12.9
-64.0	-38.3	11.3	49.6	61.5	-	-	-11.9
-63.0	-38.3	10.3	48.6	60.5	-	-	-11.9
-62.0	-38.3	9.3	47.6	59.5	-	-	-11.9

776.0			787.0 MHz				
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-38.4	13.9	52.3	-	64.4	-	-12.1
-80.0	-38.4	13.9	52.3	-	64.4	-	-12.1
-75.0	-38.4	13.9	52.3	-	64.4	-	-12.1
-64.0	-38.4	9.9	48.3	62.5	-	-	-14.2
-63.0	-38.4	8.9	47.3	61.5	-	-	-14.2
-62.0	-38.4	7.9	46.3	60.5	-	-	-14.2

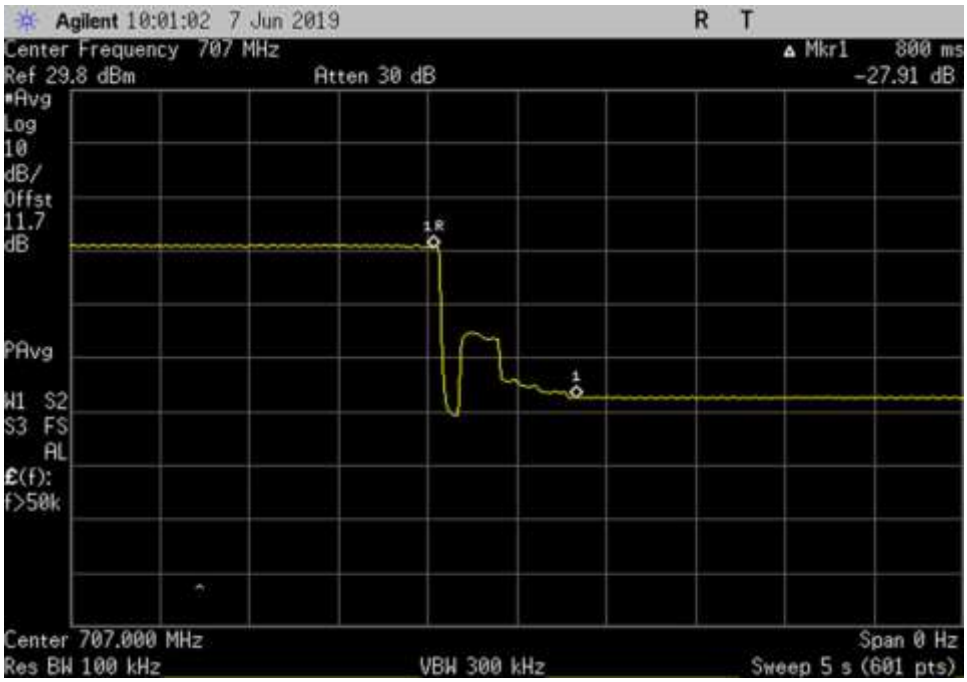
7.9.2 Variable uplink gain timing

Uplink Gain Timing		
Frequency (MHz)	Measured (Sec)	Limit (Sec)
UL 1710-1755	0.80	3.00
UL 1850-1915	0.68	3.00
UL 824-849	1.06	3.00
UL 698-716	0.86	3.00
UL 776-787	1.23	3.00

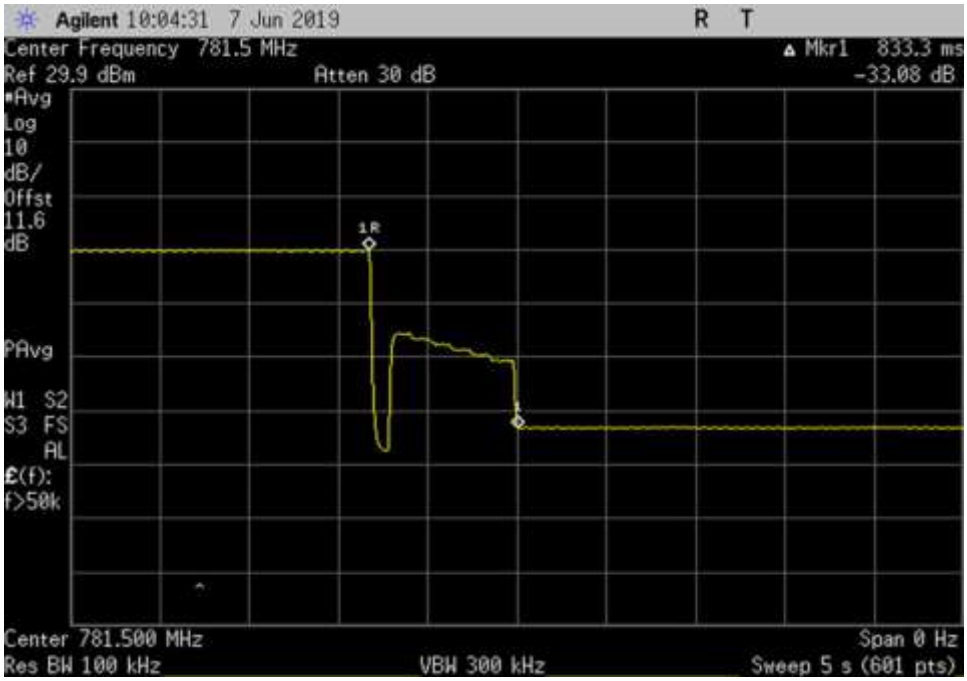
7.9.2 Variable uplink Gain Timing

Plots

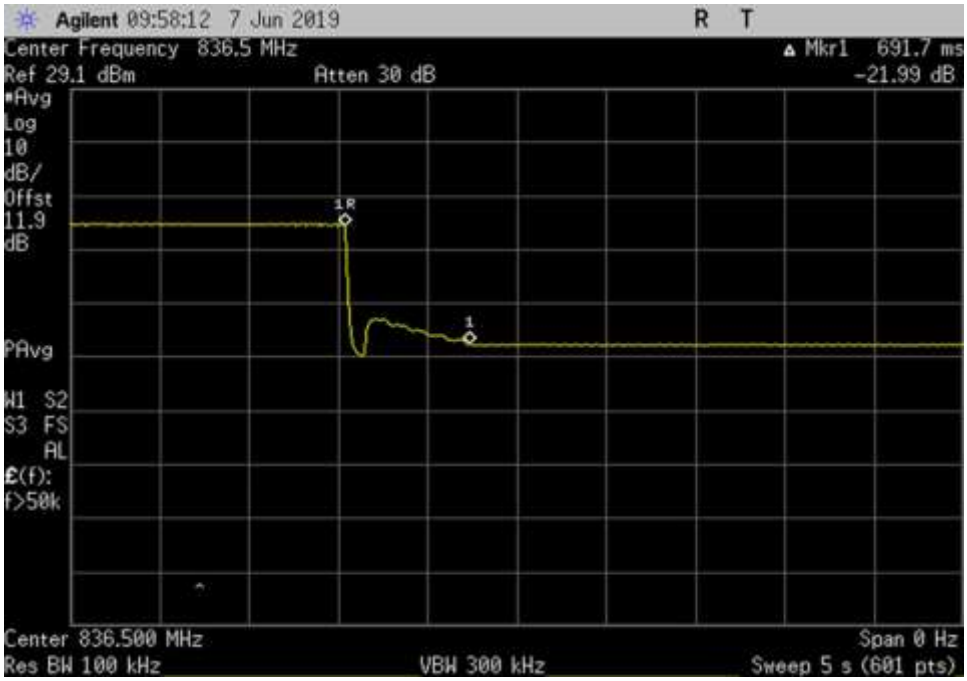
Configuration 1



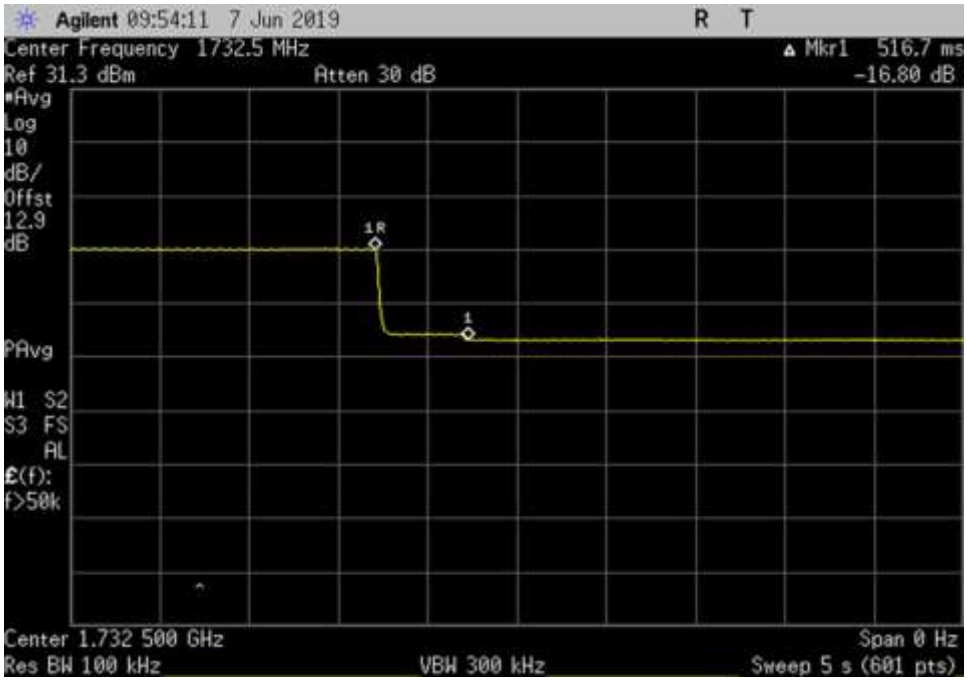
UL_698-716_ 707MHz_50ft Cable



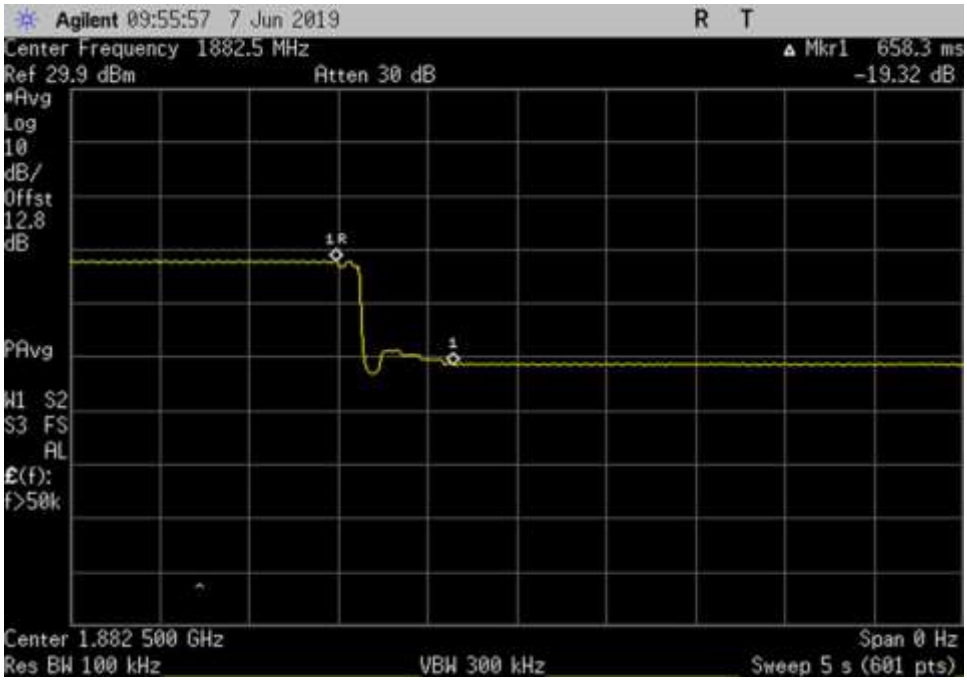
UL_776-787_ 781.5MHz_50ft Cable



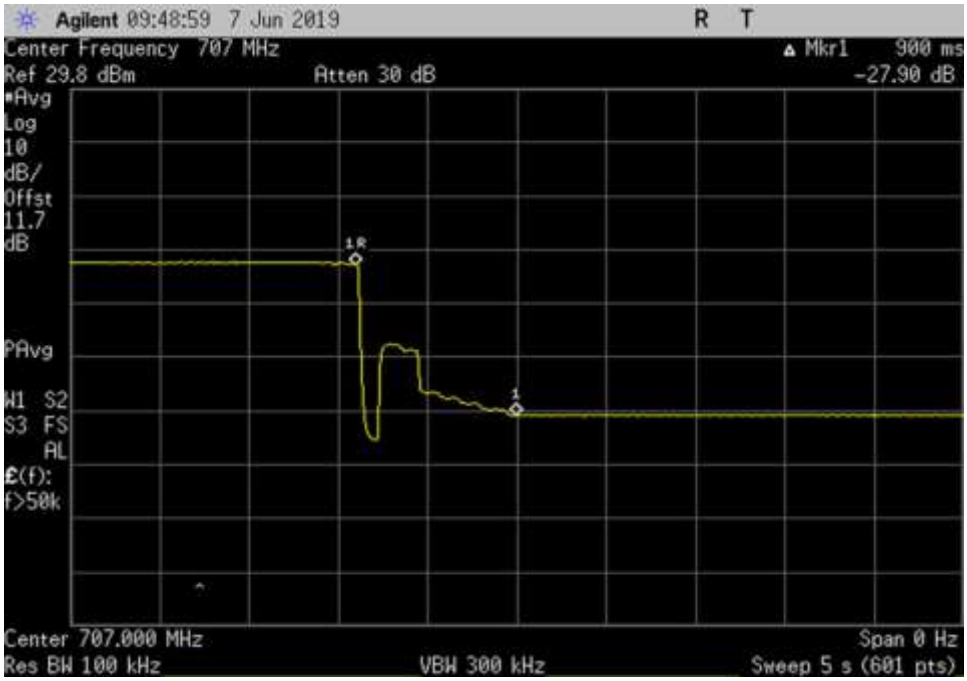
UL_824-849_ 836.5MHz_50ft Cable



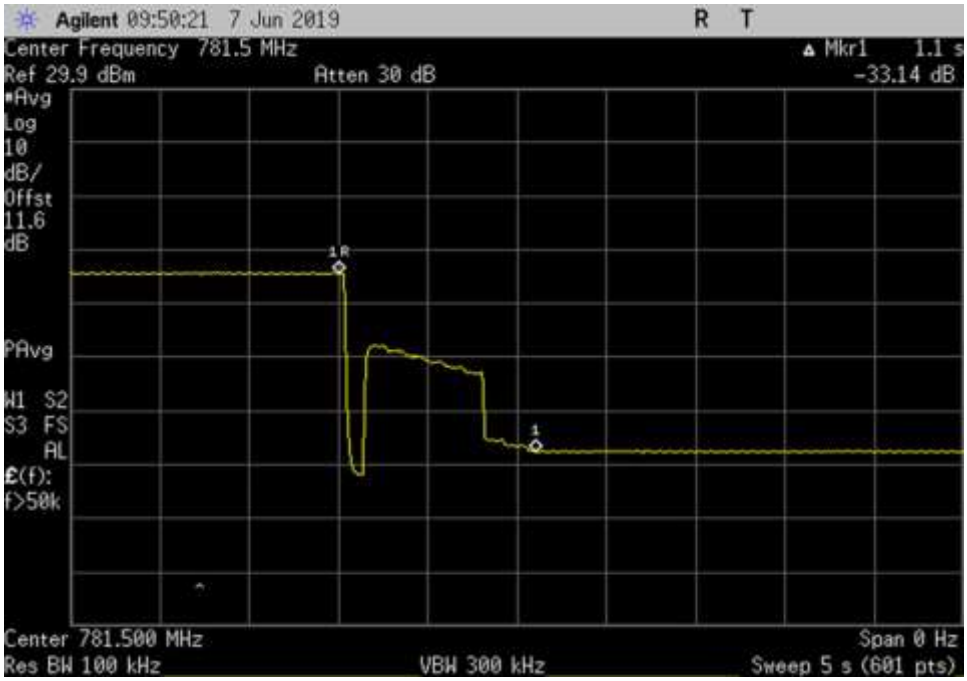
UL_1710-1755_ 1732.5MHz_50ft Cable



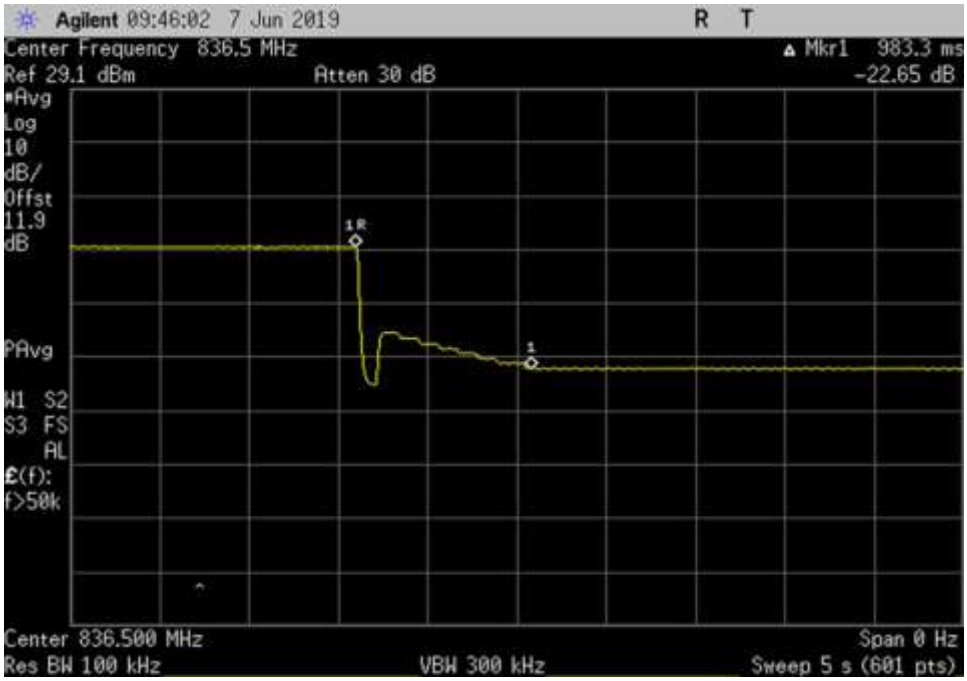
UL_1850-1915_ 1882.5MHz_50ft Cable



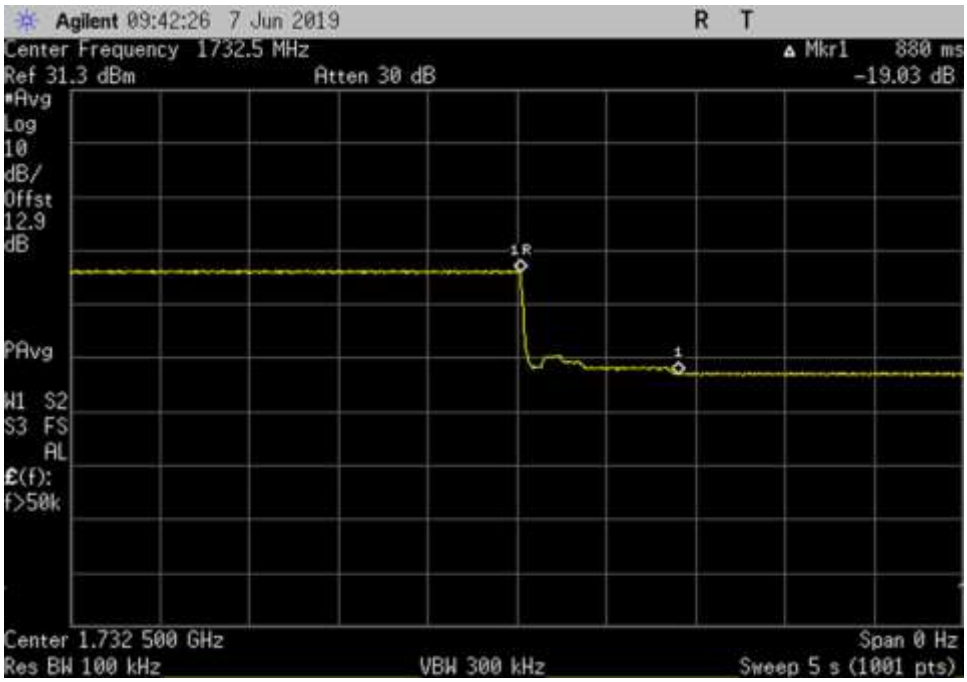
UL_698-716_ 707MHz_100ft Cable



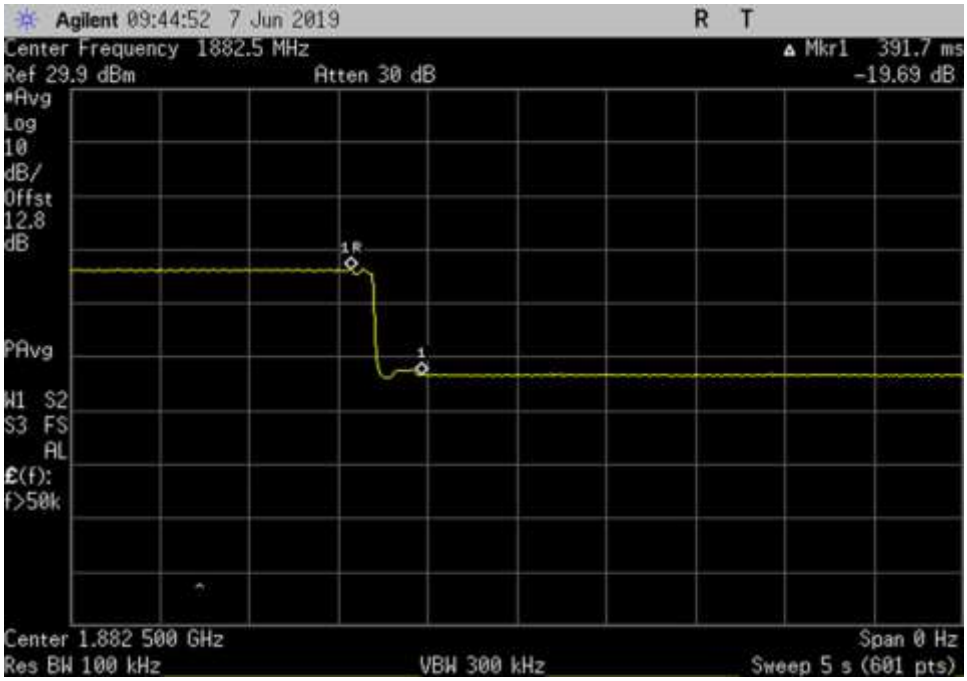
UL_776-787_ 781.5MHz_100ft Cable



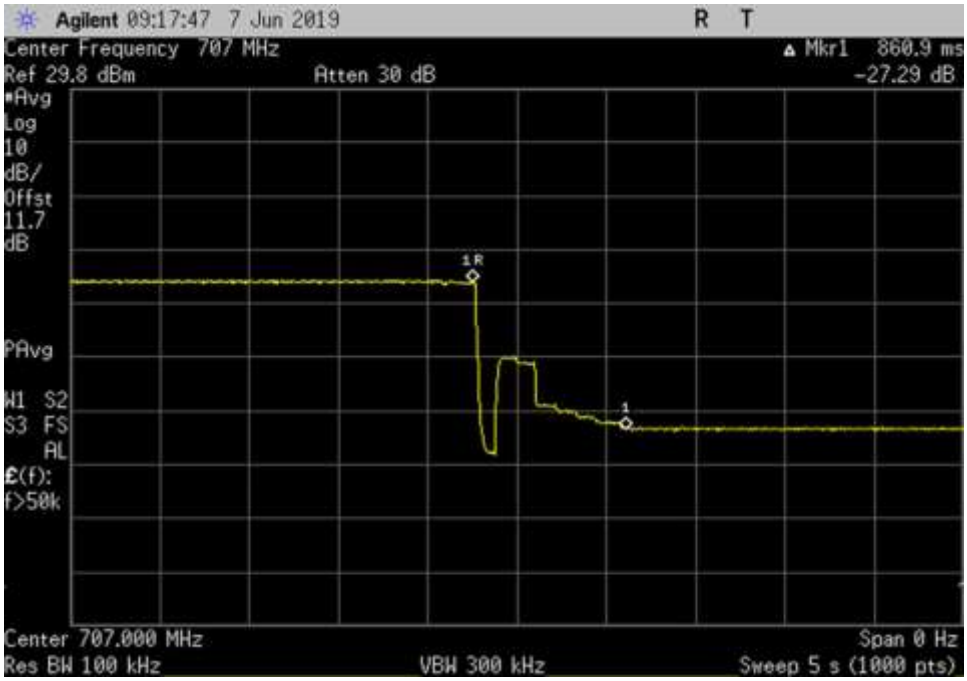
UL_824-849_ 836.5MHz_100ft Cable



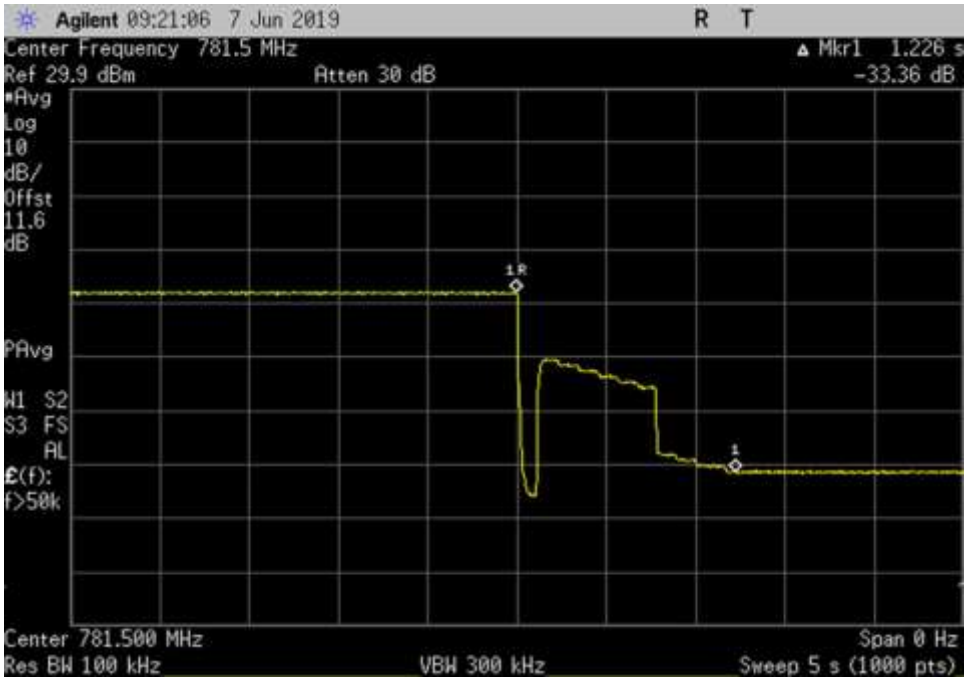
UL_1710-1755_ 1732.5MHz_100ft Cable



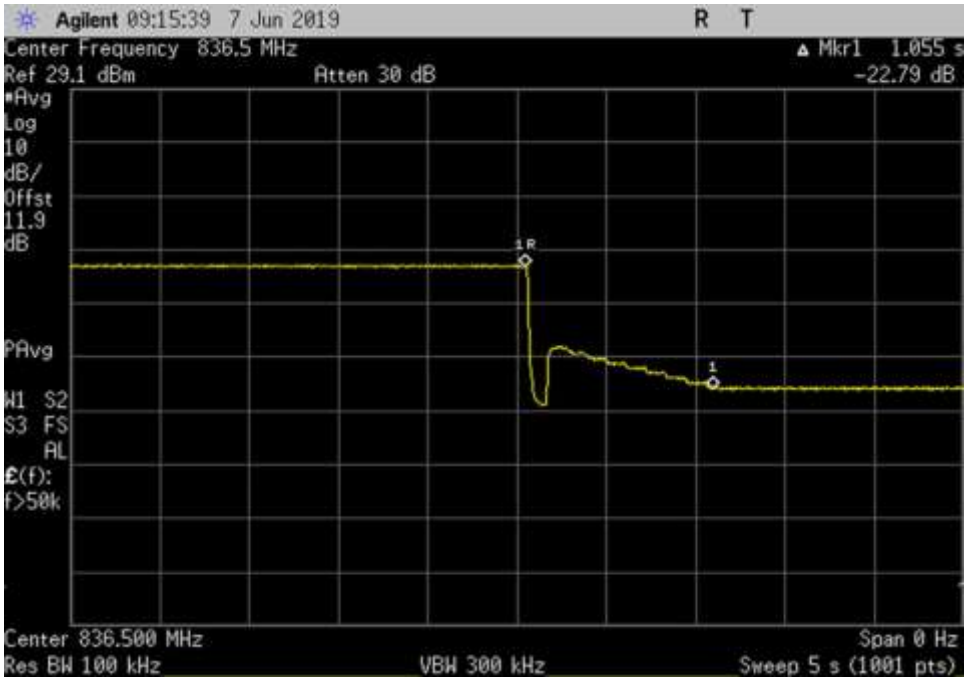
UL_1850-1915_ 1882.5MHz_100ft Cable



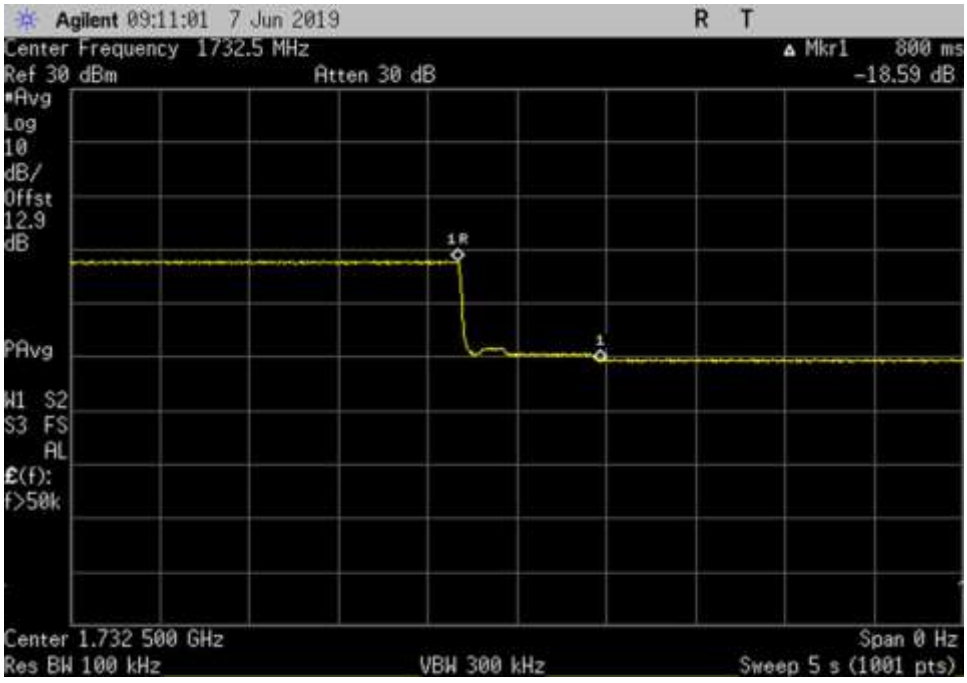
UL_698-716-Var_ 707MHz_150ft Cable



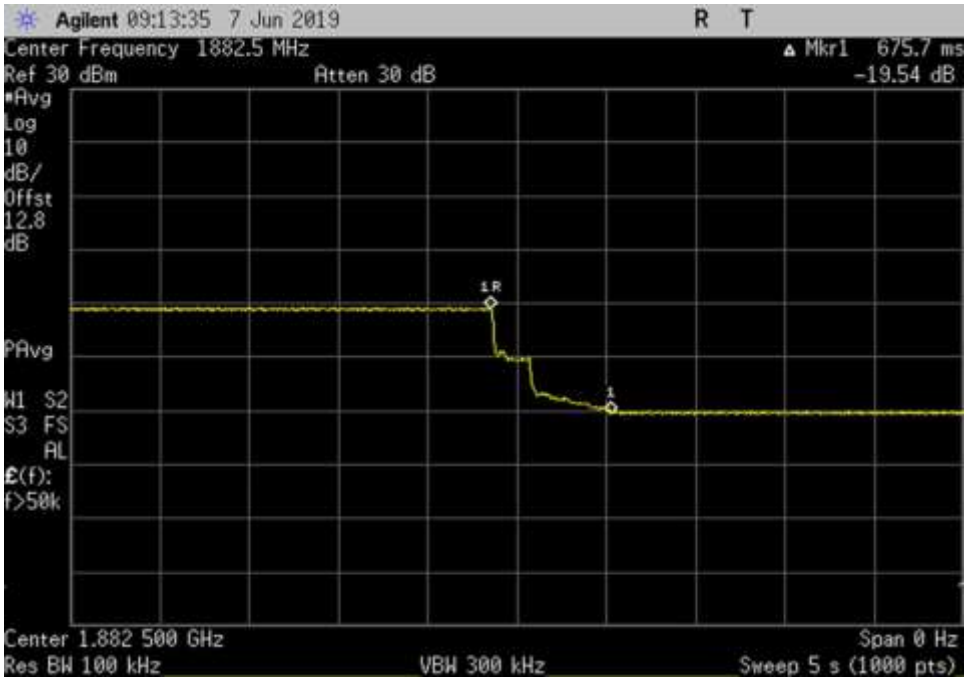
UL_776-787_Var_ 781.5MHz_150ft Cable



UL_824-849_Var_ 836.5MHz_150ft Cable



UL_1710-1755_Var_ 1732.5MHz_150ft Cable



UL_1850-1915_Var_ 1882.5MHz_150ft Cable

7.10 Occupied Band Width

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc.
Specification:	**7.10 Occupied Band Width / 47 CFR §2.1049 Occupied Band Width**
Work Order #:	**102129**
Test Type:	**Conducted Emissions** Date 06/04/2019 and 06/05/2019
Tested By:	**Hieu Song Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

06/04/2019:
Test environment conditions: Temperature: 23.1°C, Relative Humidity: 42%, Atmospheric Pressure: 101.8kPa

06/05/2019:
Test environment conditions: Temperature: 24.5°C, Relative Humidity: 41%, Atmospheric Pressure: 102.5kPa

Modification 1 was in place during testing.

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	05/13/2019	05/13/2021
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020

Summary of Results

2.1049 OBW - Summary of Results

Pass: As summarized in plots and tables below, the uniformity of the output signal relative to the input signal are practically identical. Therefore, the comparison is within limits. Only performed on a 50ft Cable

OBW-Input (Hz)				
EDGE	GSM	CDMA	AWGN	LTE
242305	247519	1252348	4138059	4461471
247685	246729	1247406	4139054	4447092
241498	244439	1254702	4119191	4453436
240327	244833	1247821	4124179	4463817
243242	240146	1253271	4133142	4448520
241935	246540	1253821	4165063	4450013
242280	242291	1266536	4140095	4451336
243661	241240	1245426	4152296	4432090
240244	246465	1261933	4143841	4446394
244469	244427	1257440	4156708	4444928

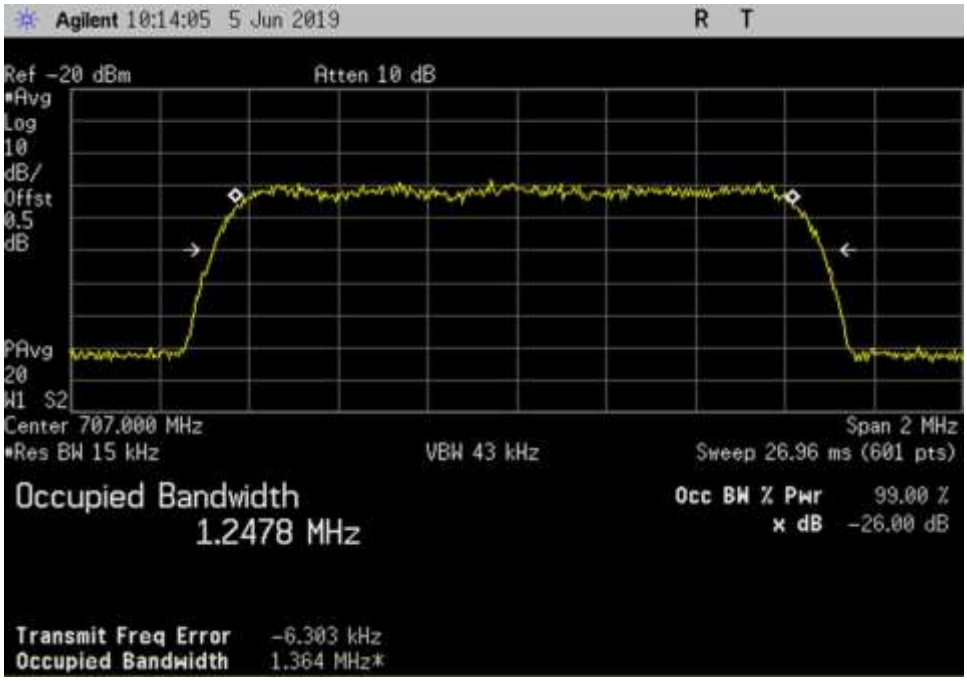
OBW-Output (Hz)				
EDGE	GSM	CDMA	AWGN	LTE
243350	245906	1263069	4147679	4435866
245323	247838	1262453	4132155	4431496
246451	245994	1259545	4148668	4455351
241911	245749	1256345	4116459	4456972
246946	244263	1255505	4141303	4462409
243002	245570	1269165	4110463	4476666
243431	244243	1255189	4136847	4476394
241277	245267	1248217	4117910	4456123
242334	244151	1255083	4102108	4433510
244366	240544	1261104	4123557	4420696

Max Difference In&Out Occ BW 99% Pwr					
Frequency Range	EDGE	GSM	CDMA	AWGN	LTE
UL_1710-1755MHz	0.43%	0.65%	0.86%	0.23%	0.57%
UL_1850-1915MHz	0.95%	0.45%	1.21%	0.17%	0.35%
UL_824-849MHz	2.05%	0.64%	0.39%	0.72%	0.04%
UL_698-716MHz	0.66%	0.37%	0.68%	0.19%	0.15%
UL_777-787MHz	1.52%	1.71%	0.18%	0.20%	0.31%
DL_2110-2155MHz	0.44%	0.39%	1.22%	1.31%	0.60%
DL_1930-1995MHz	0.48%	0.81%	0.90%	0.08%	0.56%
DL_869-894MHz	0.98%	1.67%	0.22%	0.83%	0.54%
DL_728-746MHz	0.87%	0.94%	0.54%	1.01%	0.29%
DL_746-756MHz	0.04%	1.59%	0.29%	0.80%	0.55%

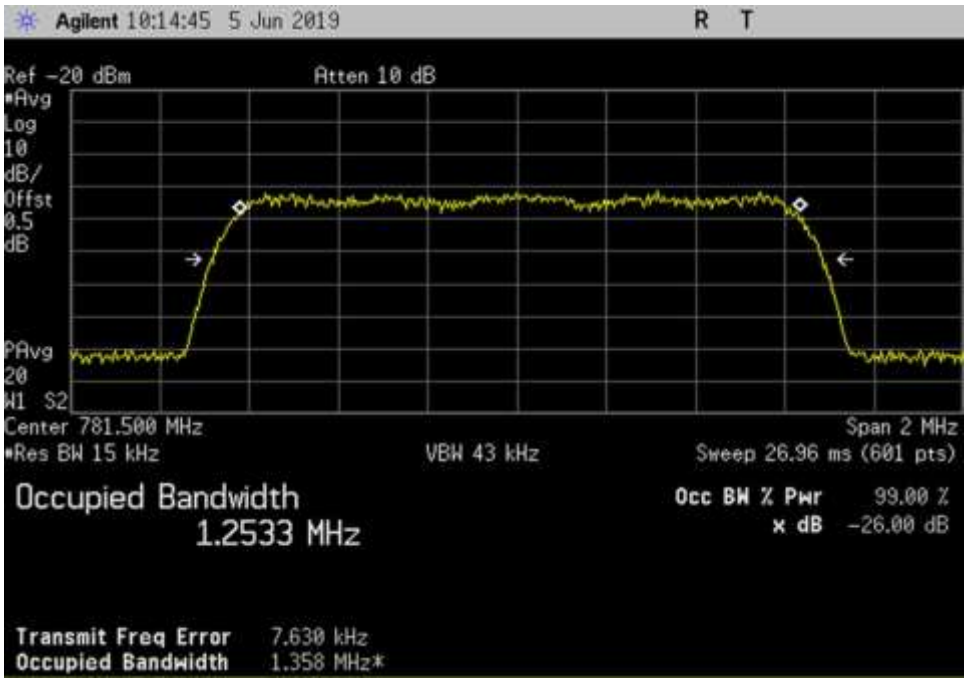
Plots

Configuration 1

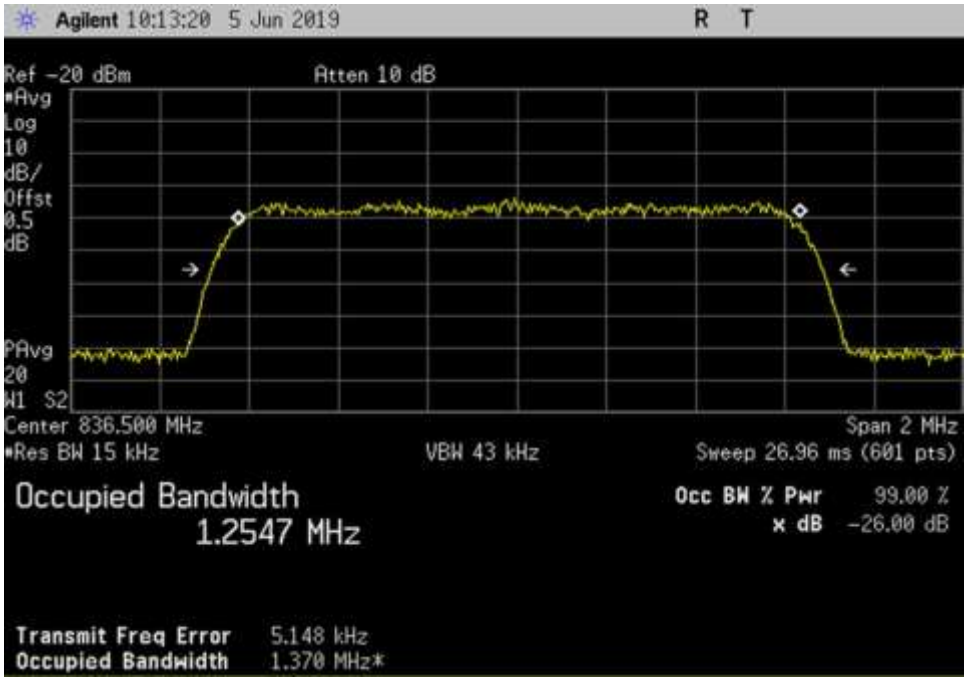
CDMA-Input



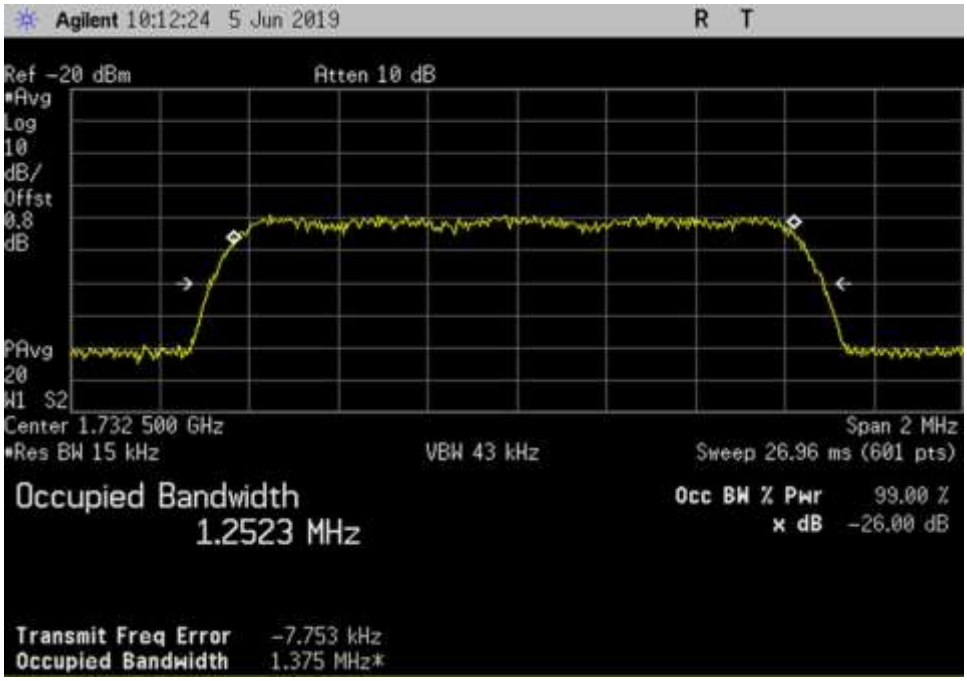
UL_698-716_CDMA_ 707MHz



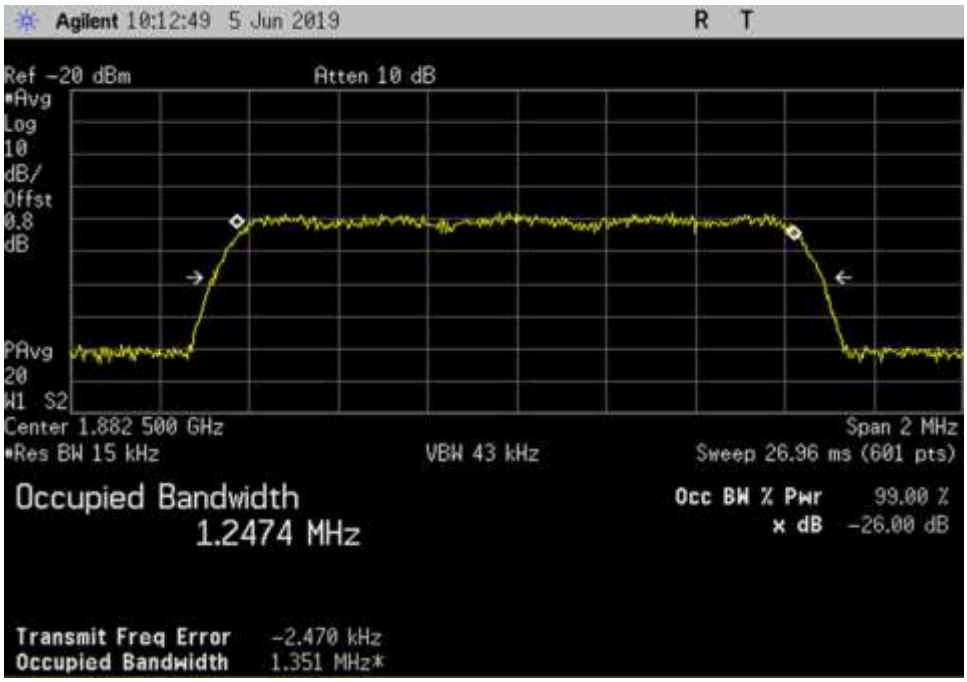
UL_776-787_CDMA_ 781.5MHz



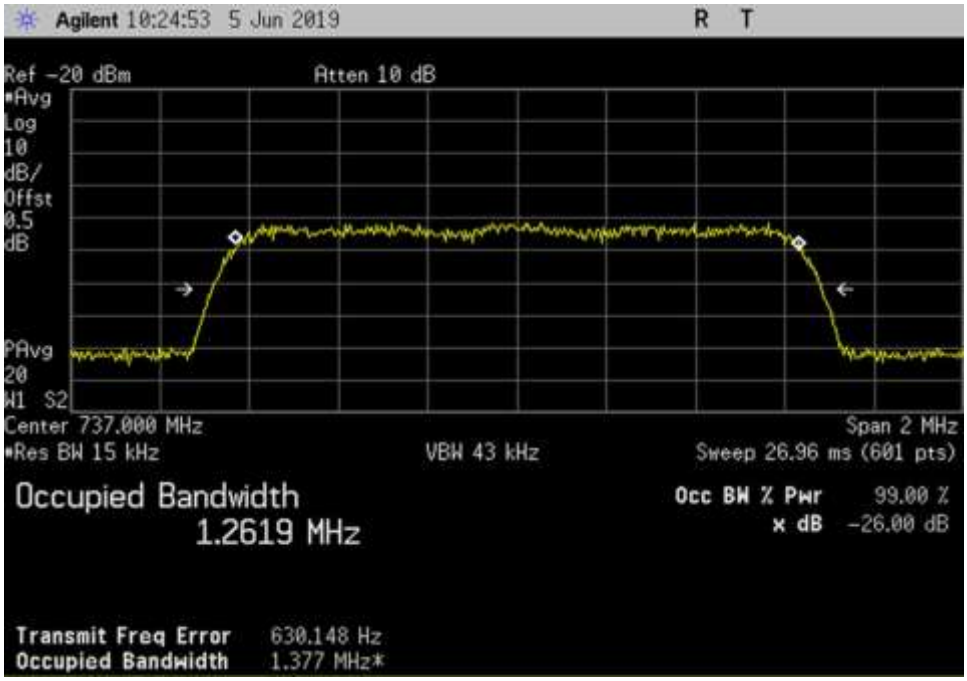
UL_824-849_CDMA_ 836.5MHz



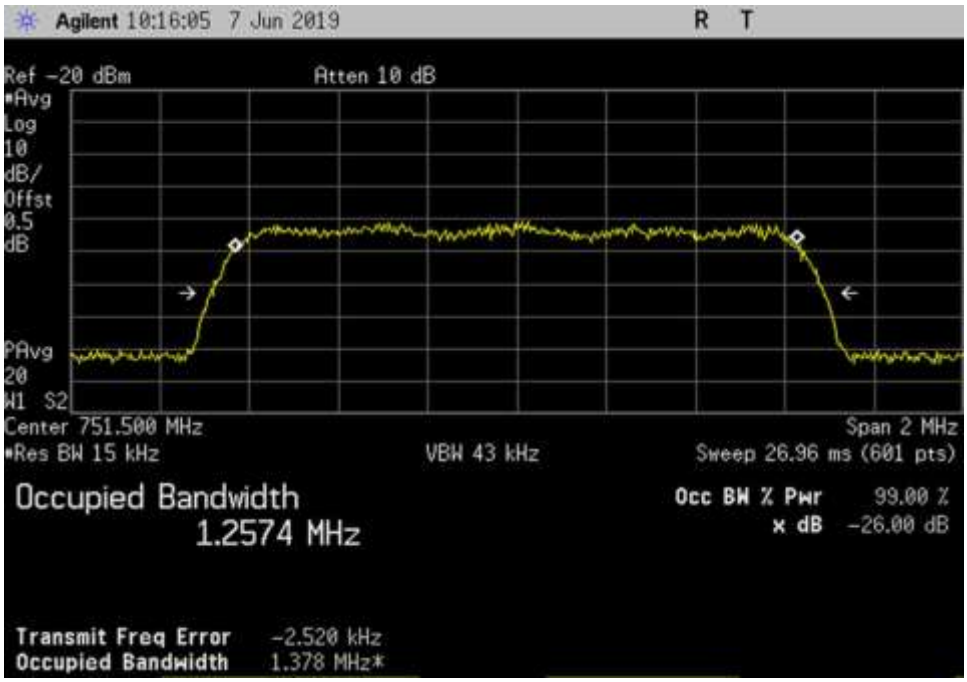
UL_1710-1755_CDMA_ 1732.5MHz



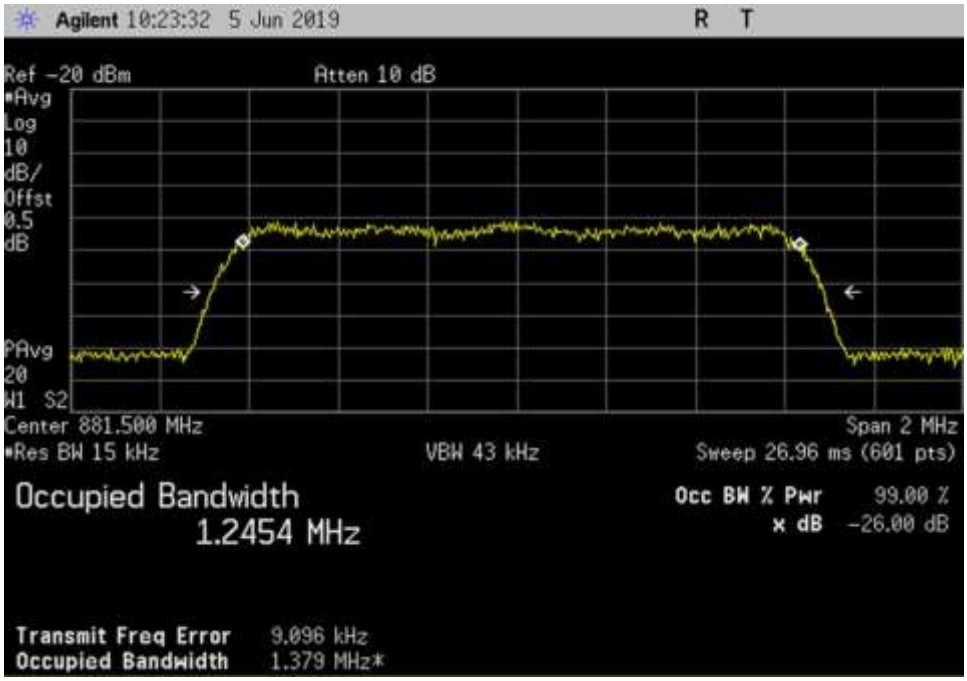
UL_1850-1915_CDMA_ 1882.5MHz



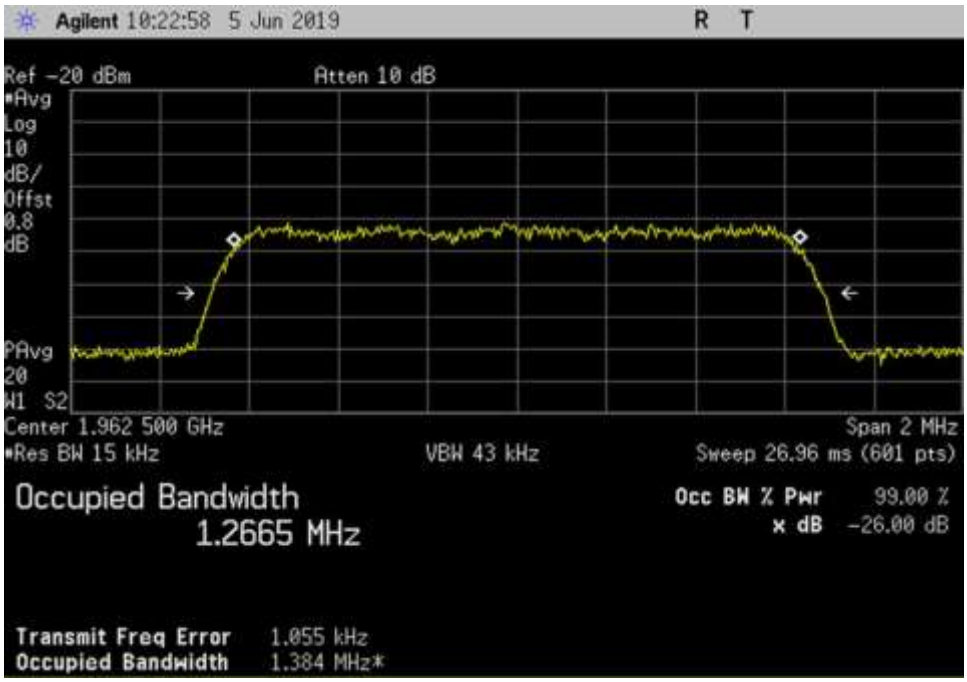
DL_728-746_CDMA_ 737MHz



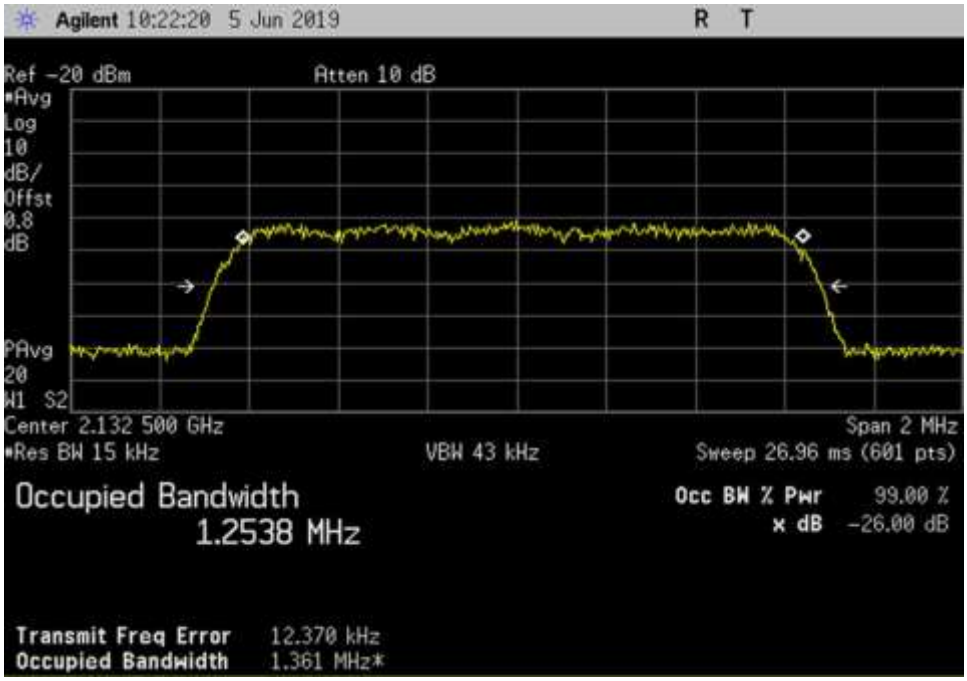
DL_746-757_CDMA_ 751.5MHz



DL_869-894_CDMA_ 881.5MHz

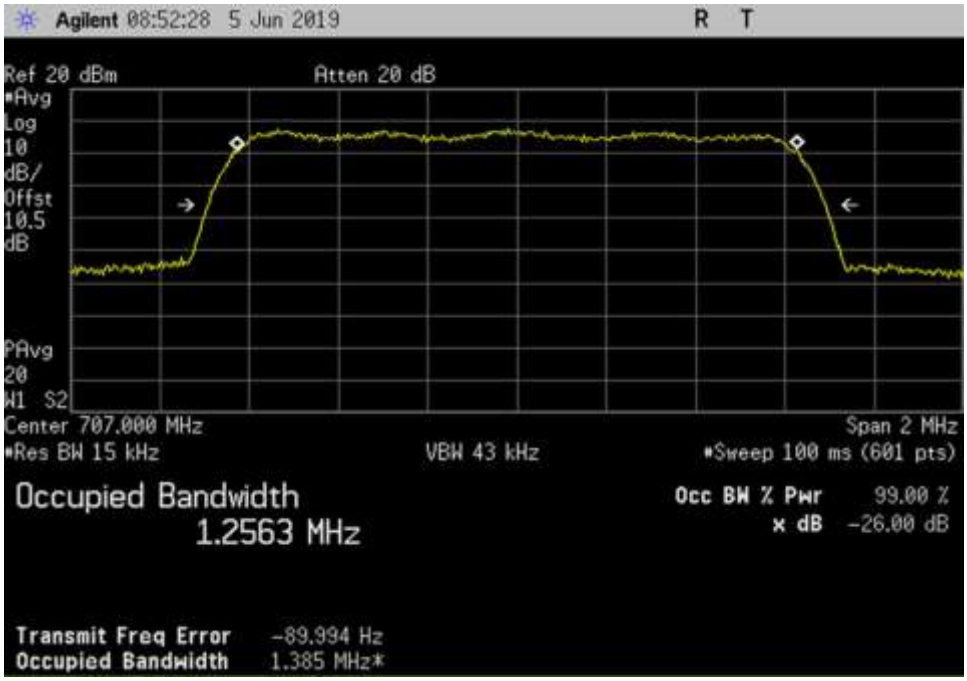


DL_1930-1995_CDMA_ 1962.5MHz

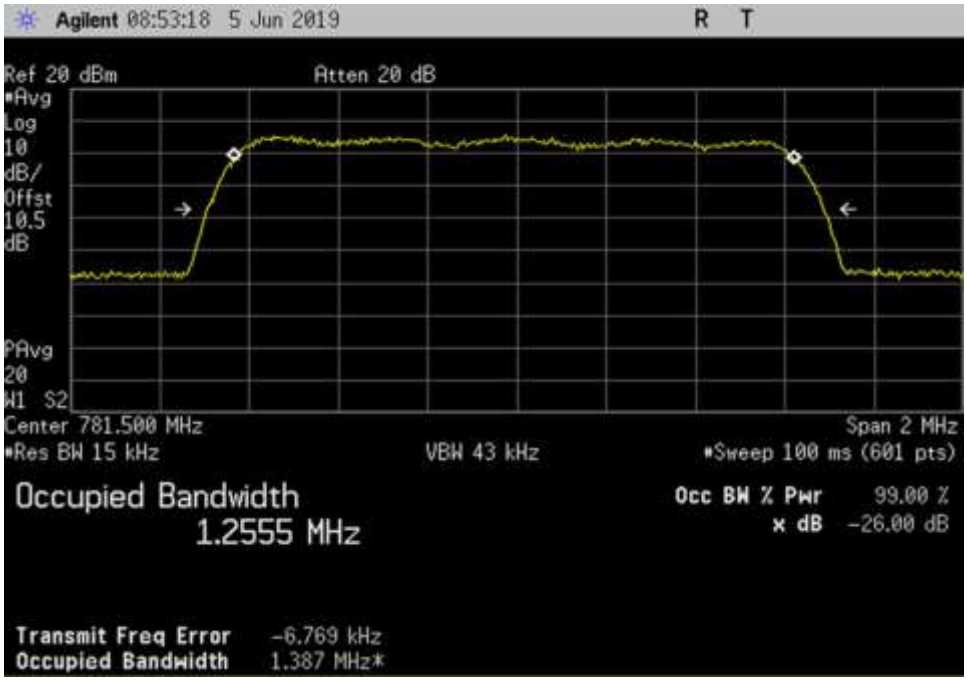


DL_2110-2155_CDMA_ 2132.5MHz

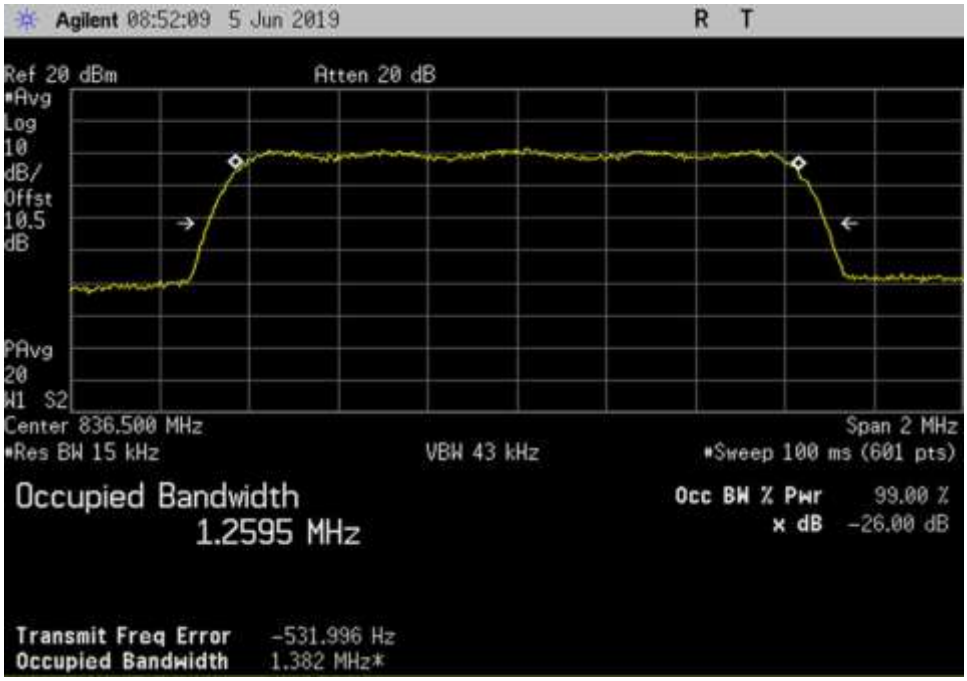
CDMA-Output



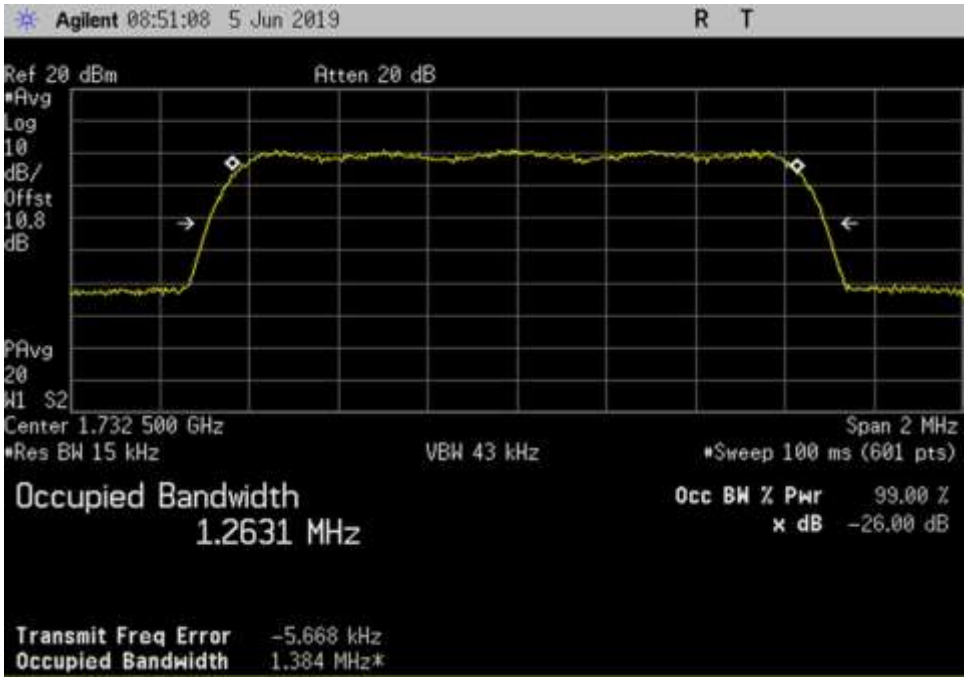
UL_698-716_CDMA_ 707MHz



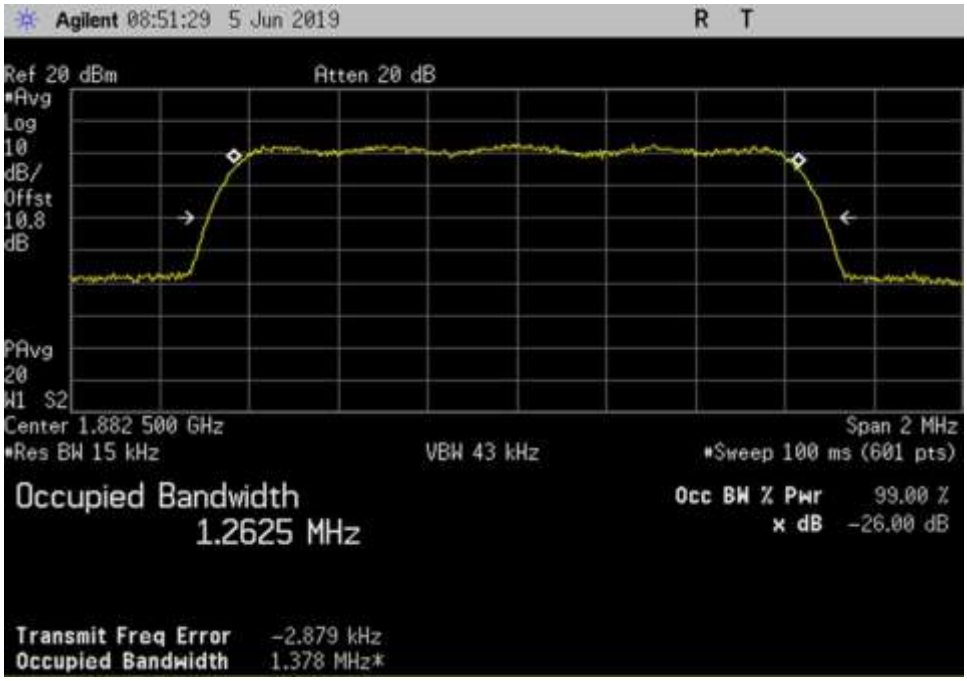
UL_776-787_CDMA_ 781.5MHz



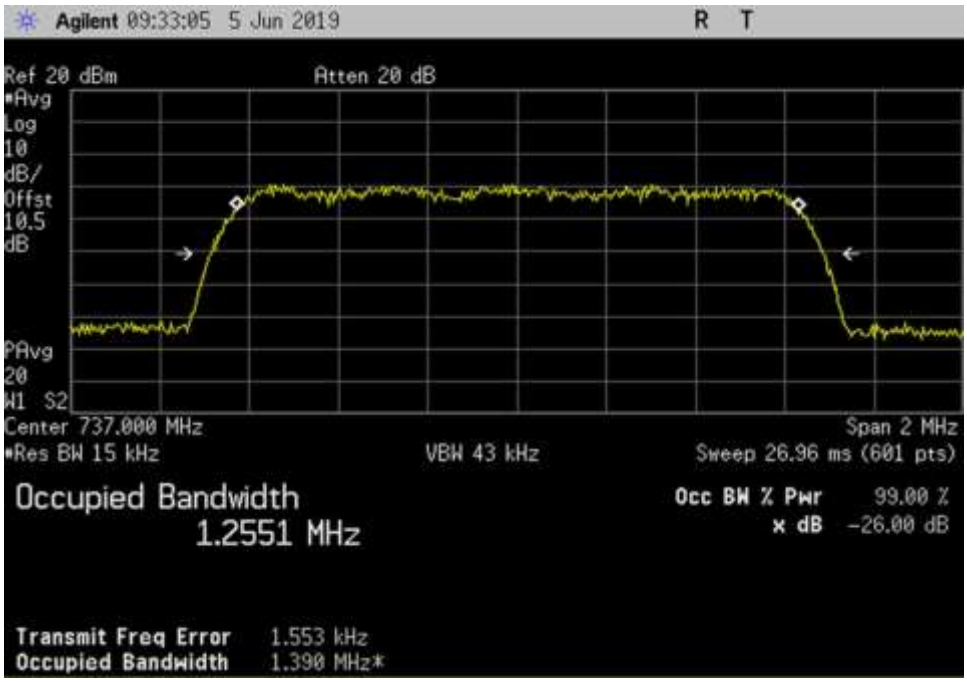
UL_824-849_CDMA_ 836.5MHz



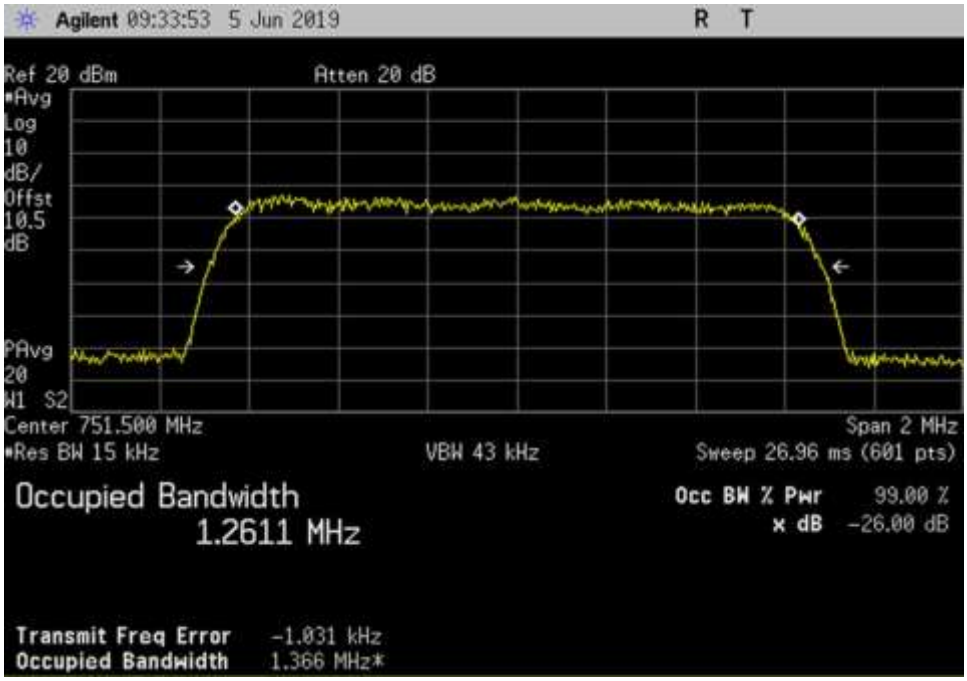
UL_1710-1755_CDMA_ 1732.5MHz



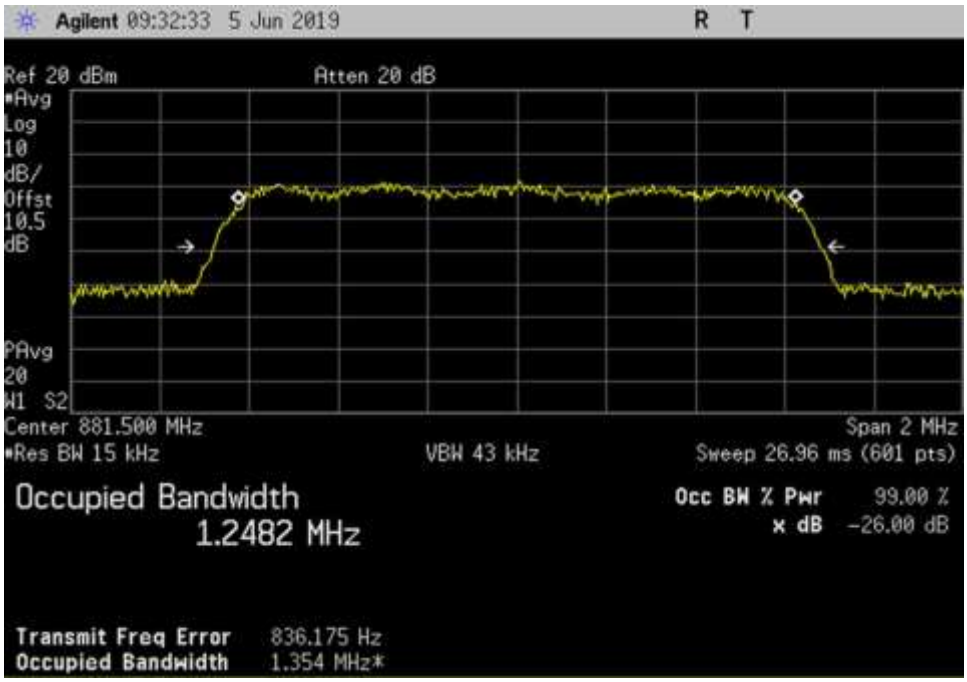
UL_1850-1915_CDMA_ 1882.5MHz



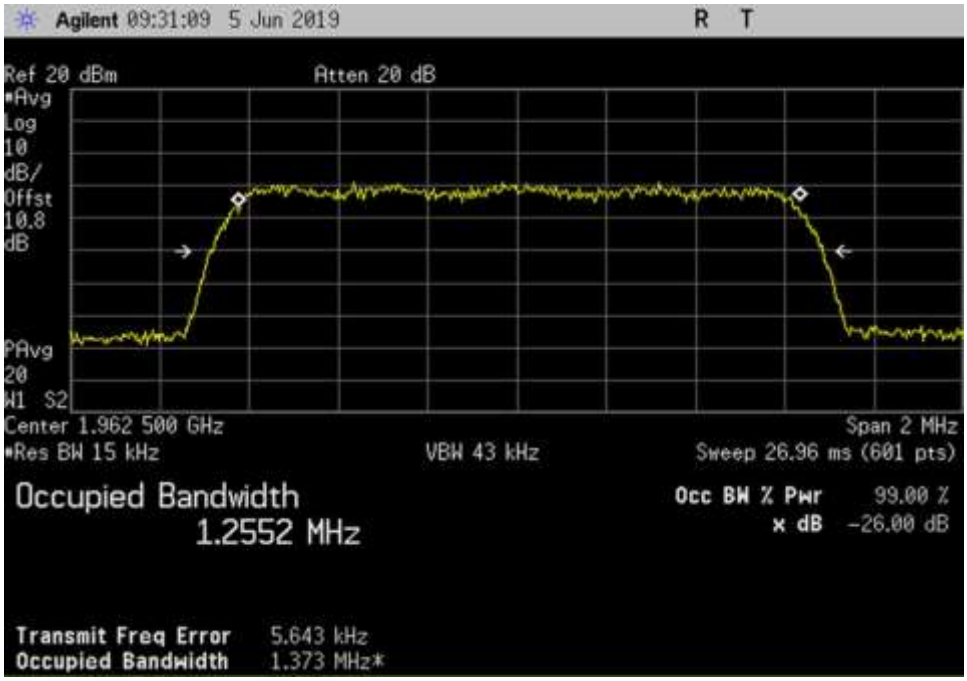
DL_728-746_CDMA_ 737MHz



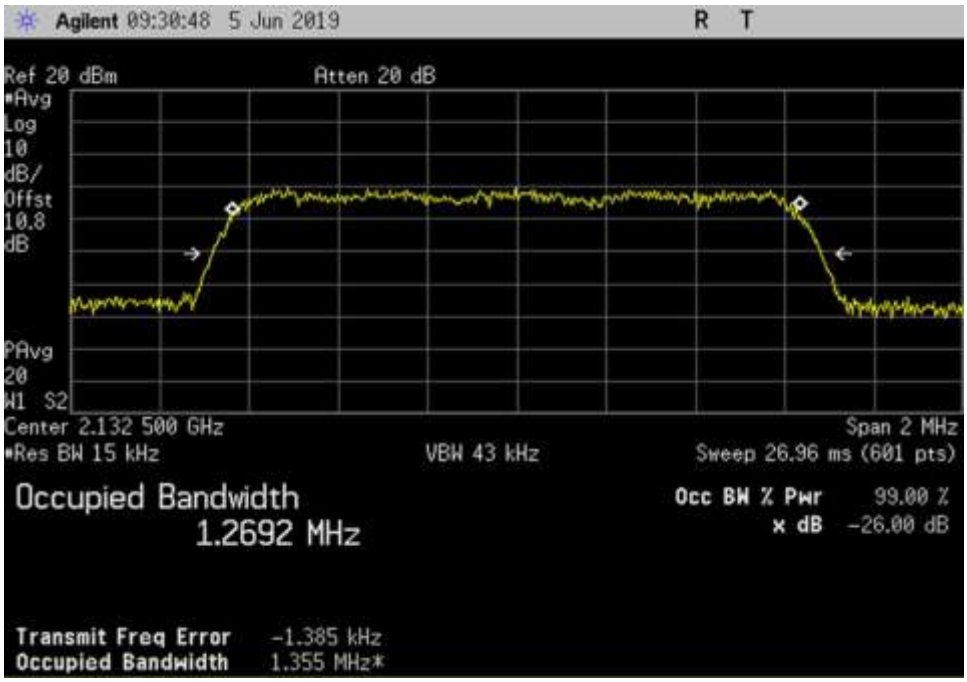
DL_746-757_CDMA_ 751.5MHz



DL_869-894_CDMA_ 881.5MHz

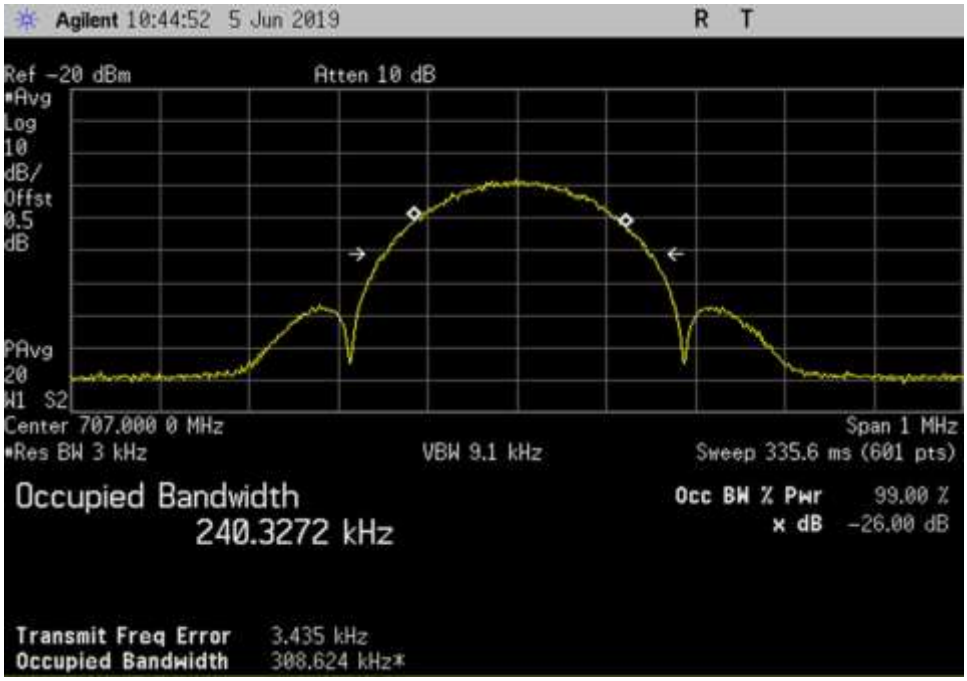


DL_1930-1995_CDMA_ 1962.5MHz

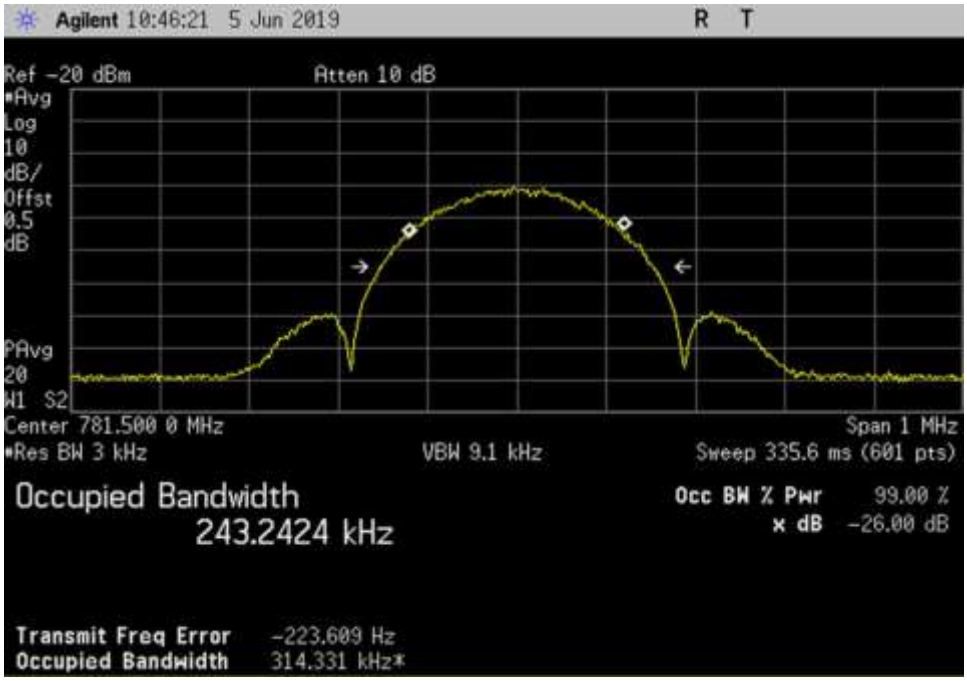


DL_2110-2155_CDMA_ 2132.5MHz

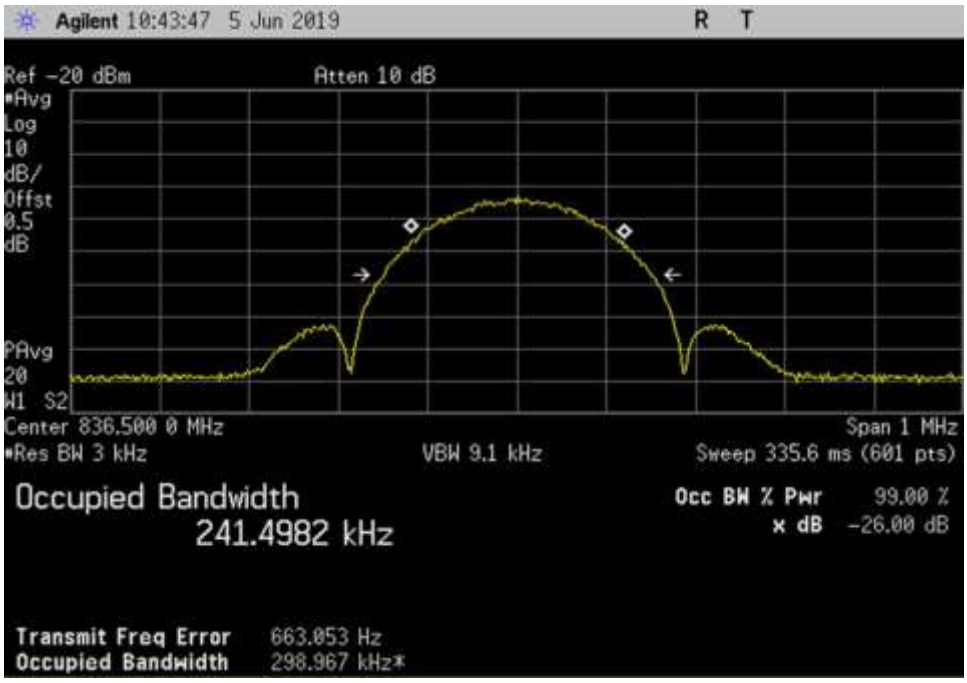
EDGE-Input



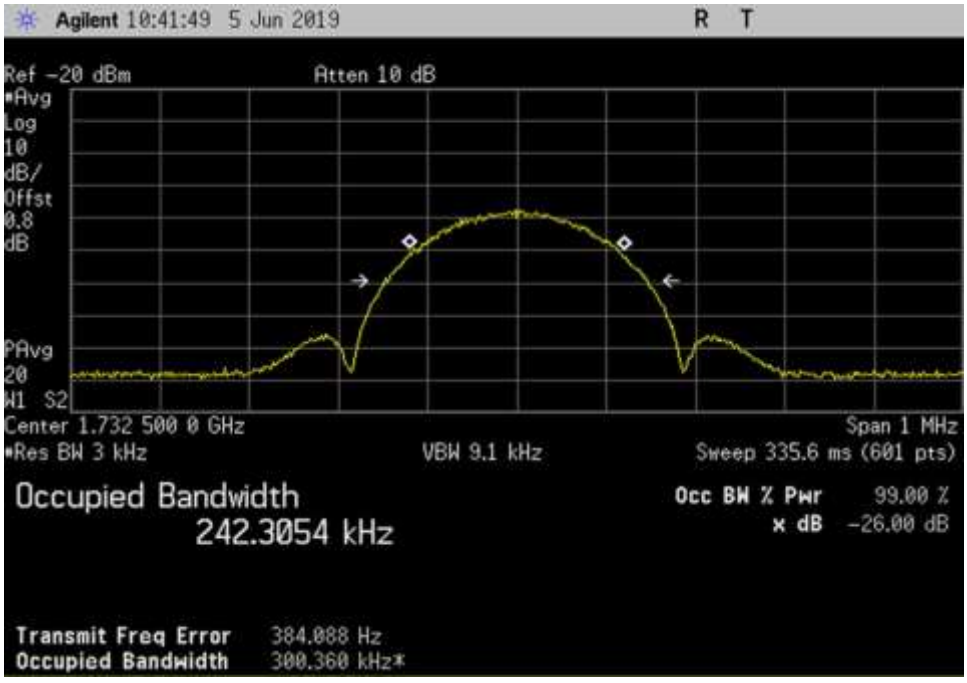
UL_698-716_EDGE_ 707MHz



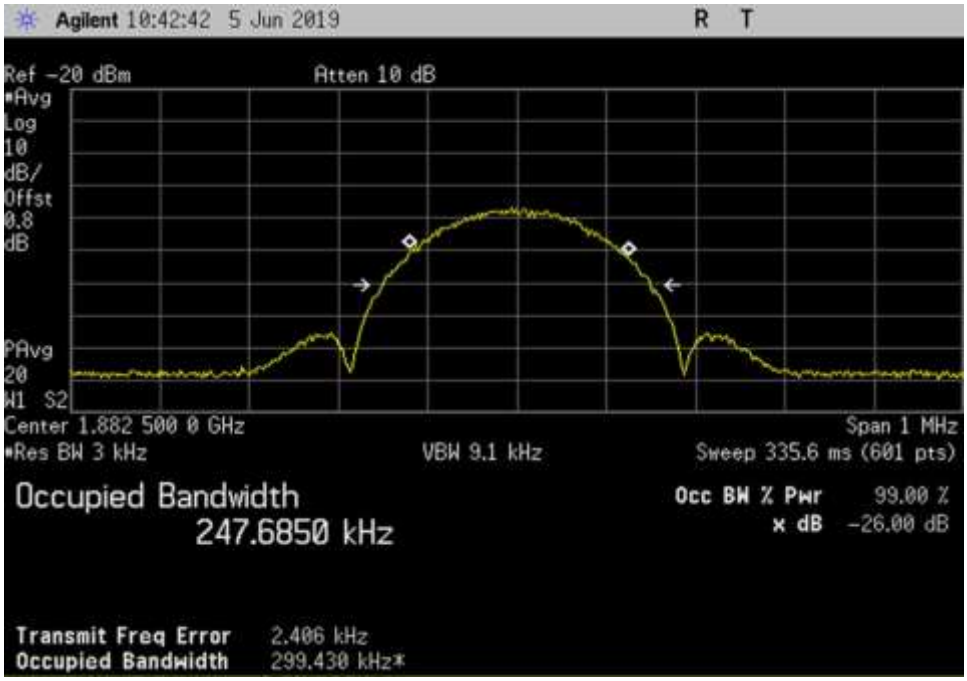
UL_776-787_EDGE_ 781.5MHz



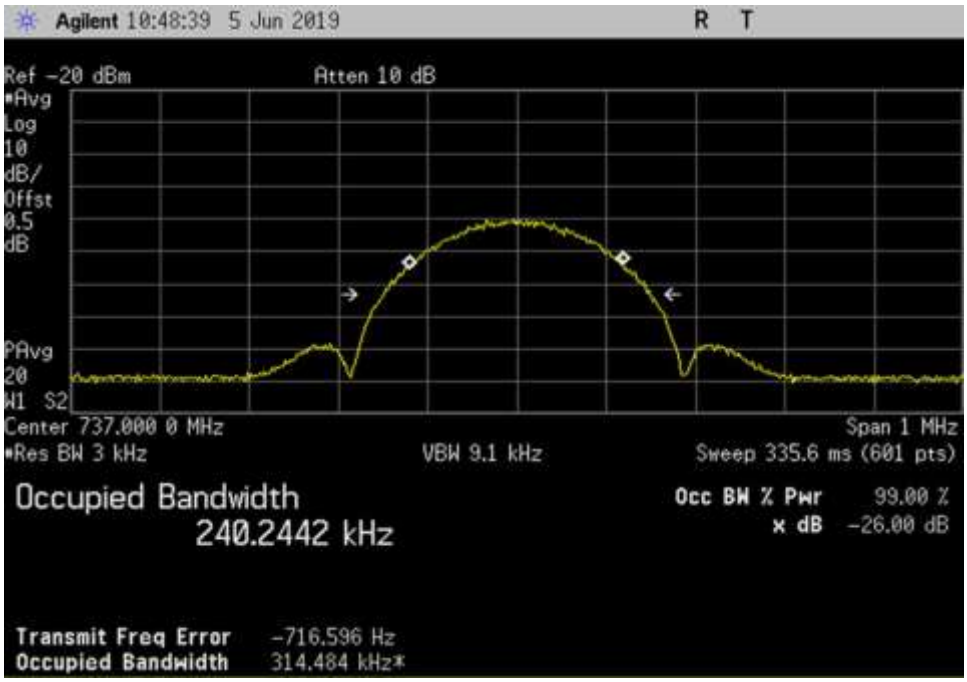
UL_824-849_EDGE_ 836.5MHz



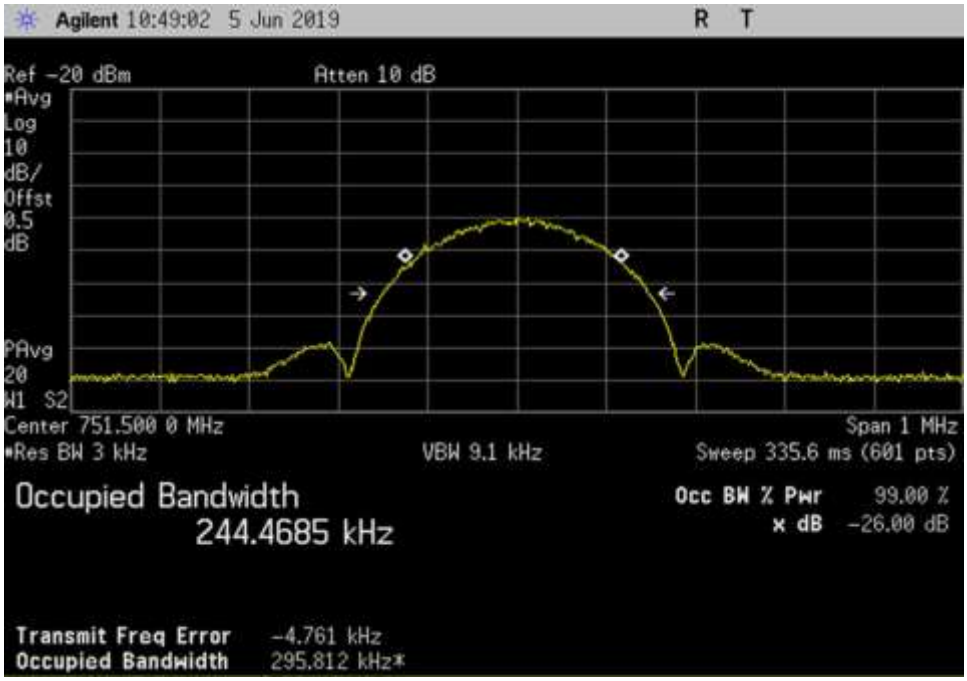
UL_1710-1755_EDGE_ 1732.5MHz



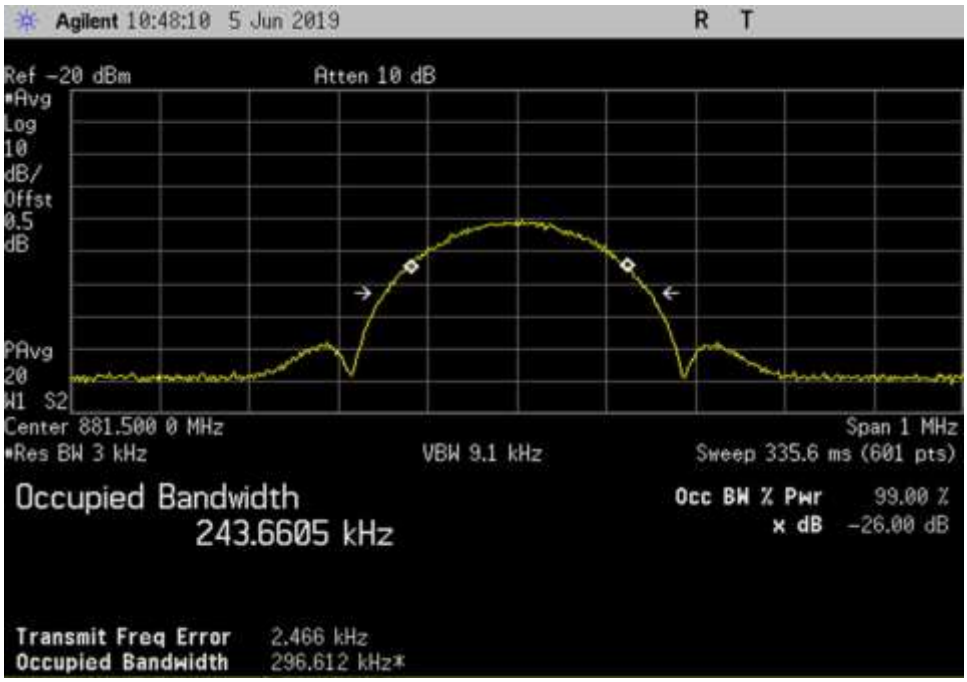
UL_1850-1915_EDGE_ 1882.5MHz



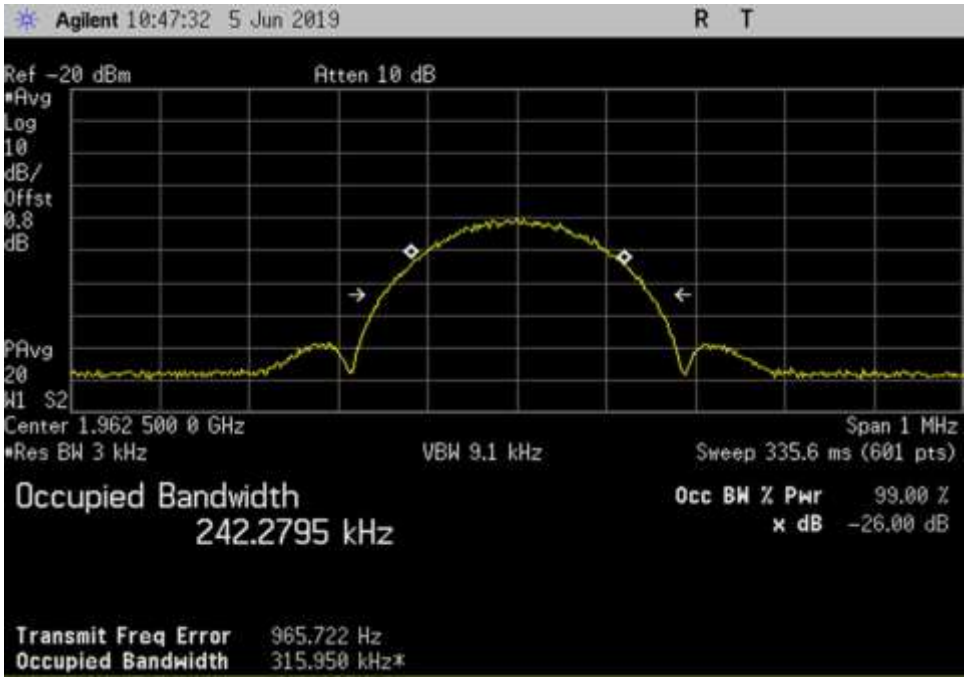
DL_728-746_EDGE_ 737MHz



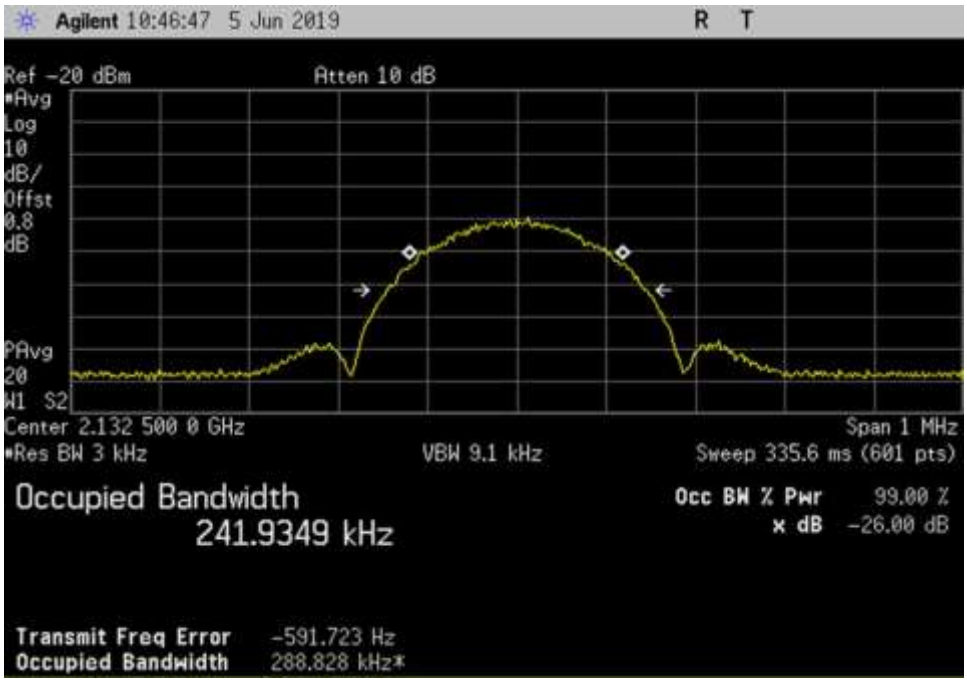
DL_746-757_EDGE_ 751.5MHz



DL_869-894_EDGE_ 881.5MHz



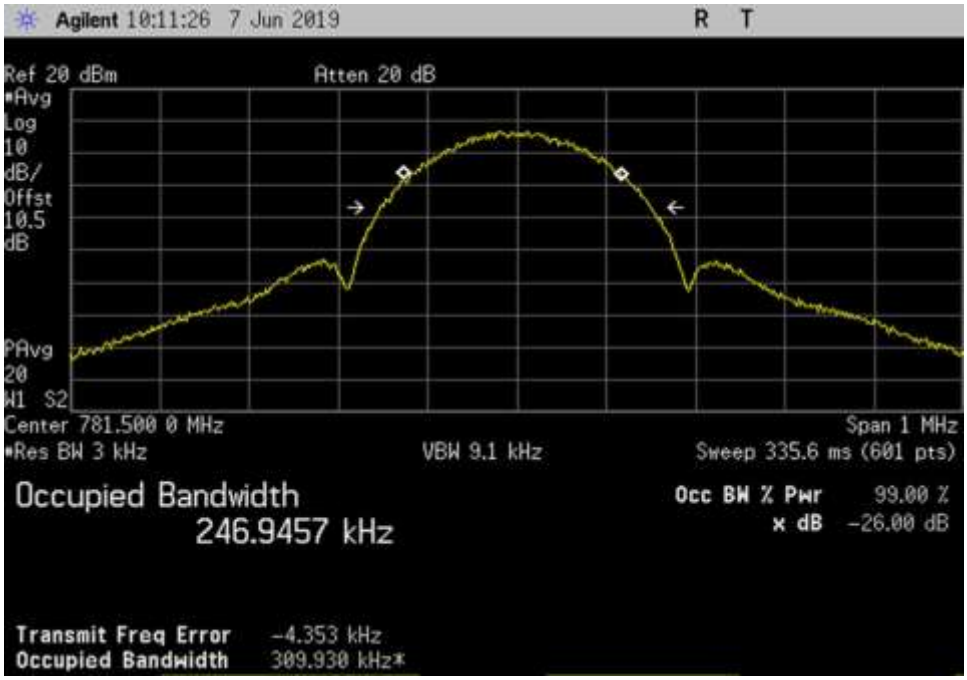
DL_1930-1995_EDGE_ 1962.5MHz



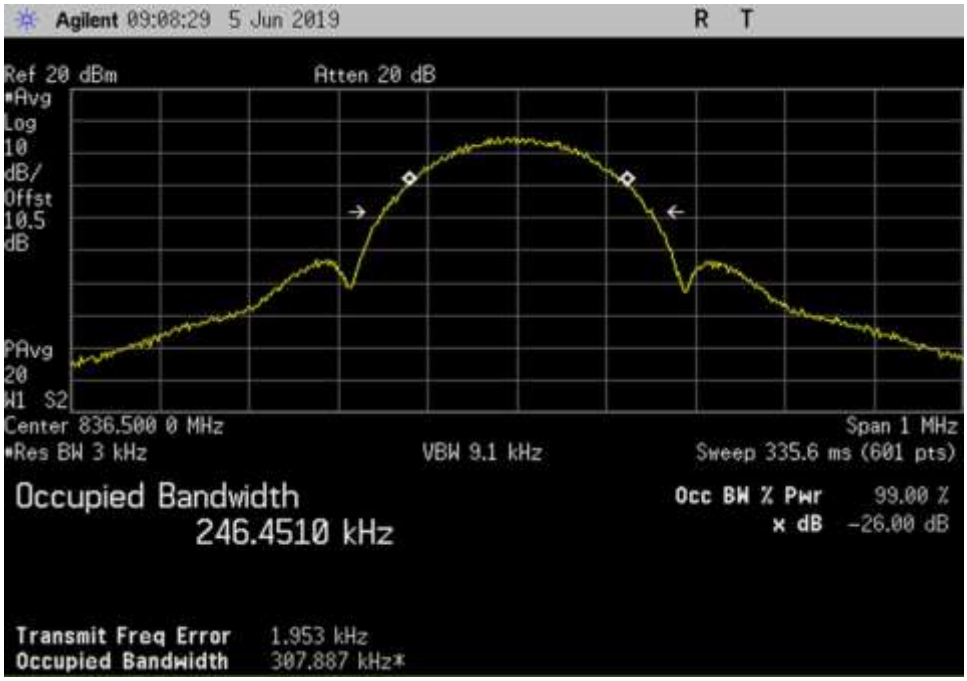
DL_2110-2155_EDGE_ 2132.5MHz

EDGE-Output

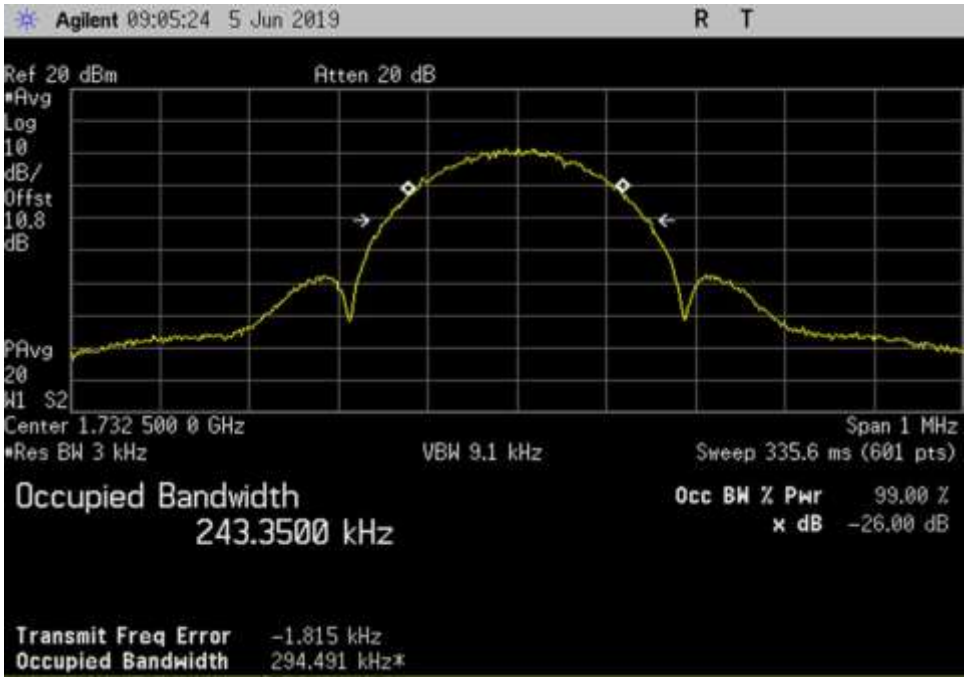
UL_698-716_EDGE_ 707MHz



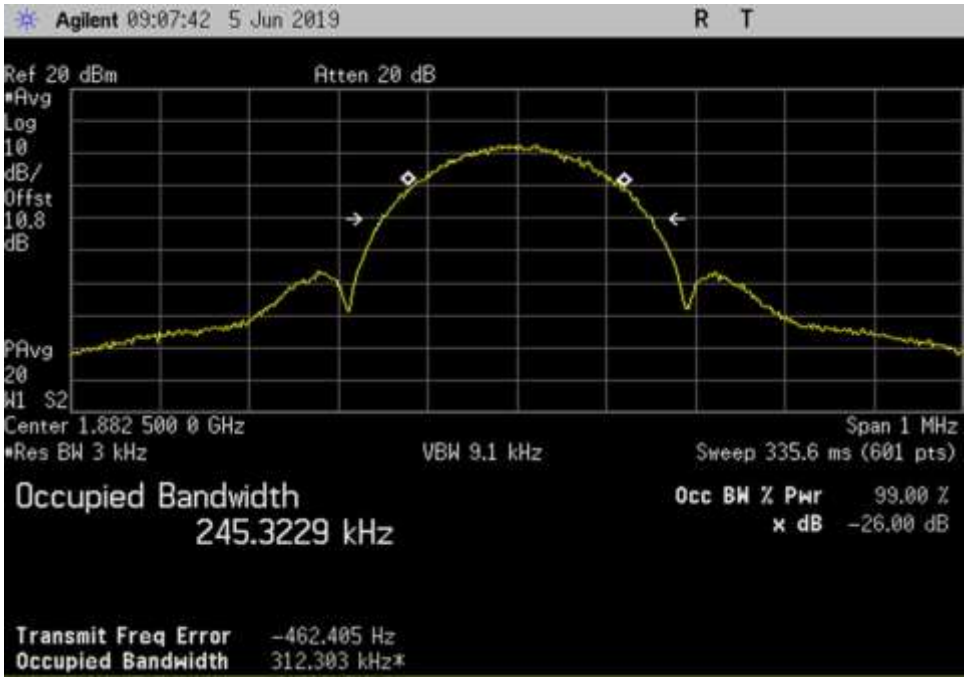
UL_776-787_EDGE_ 781.5MHz



UL_824-849_EDGE_ 836.5MHz

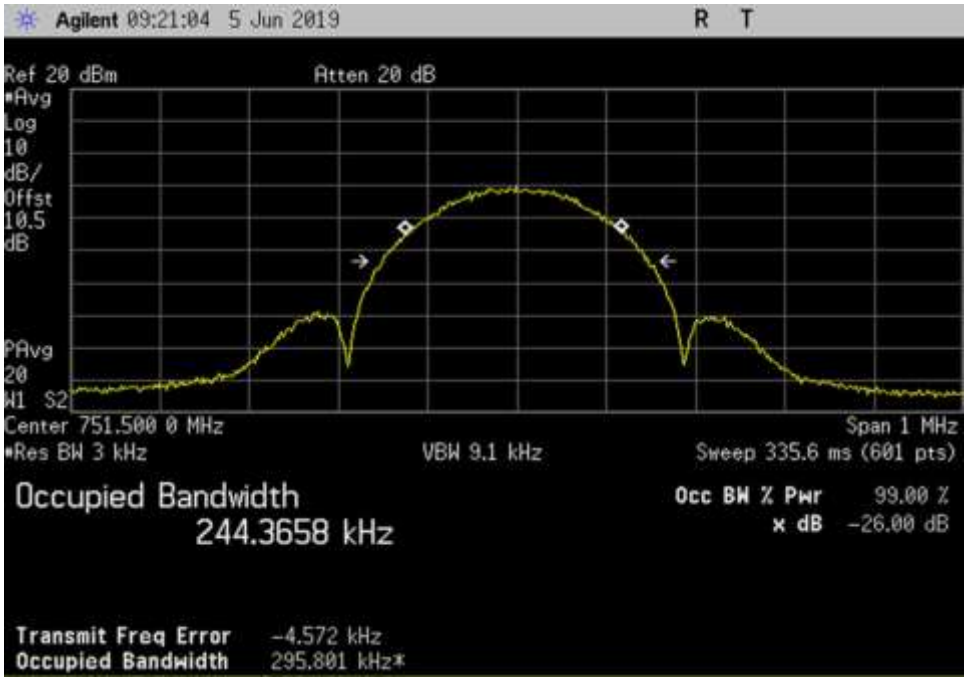


UL_1710-1755_EDGE_ 1732.5MHz



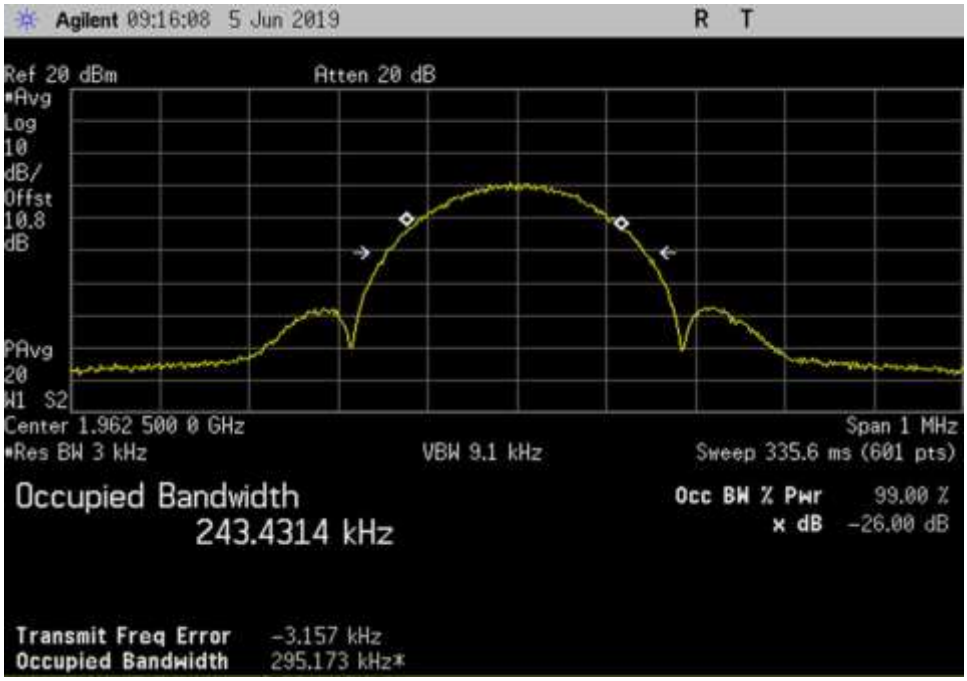
UL_1850-1915_EDGE_ 1882.5MHz

DL_728-746_EDGE_ 737MHz

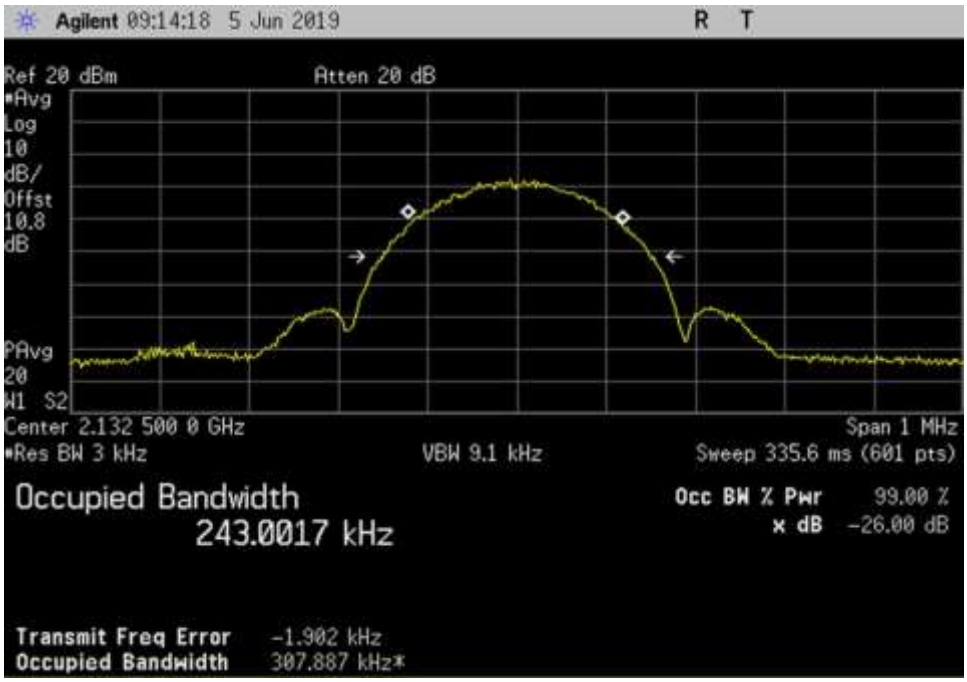


DL_746-757_EDGE_ 751.5MHz

DL_869-894_EDGE_ 881.5MHz

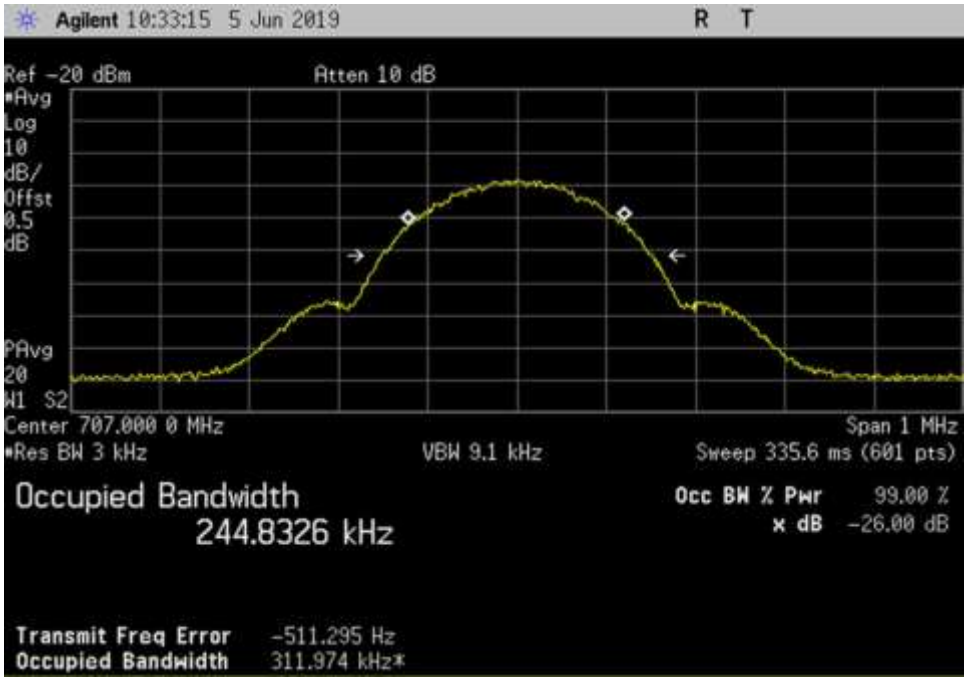


DL_1930-1995_EDGE_ 1962.5MHz



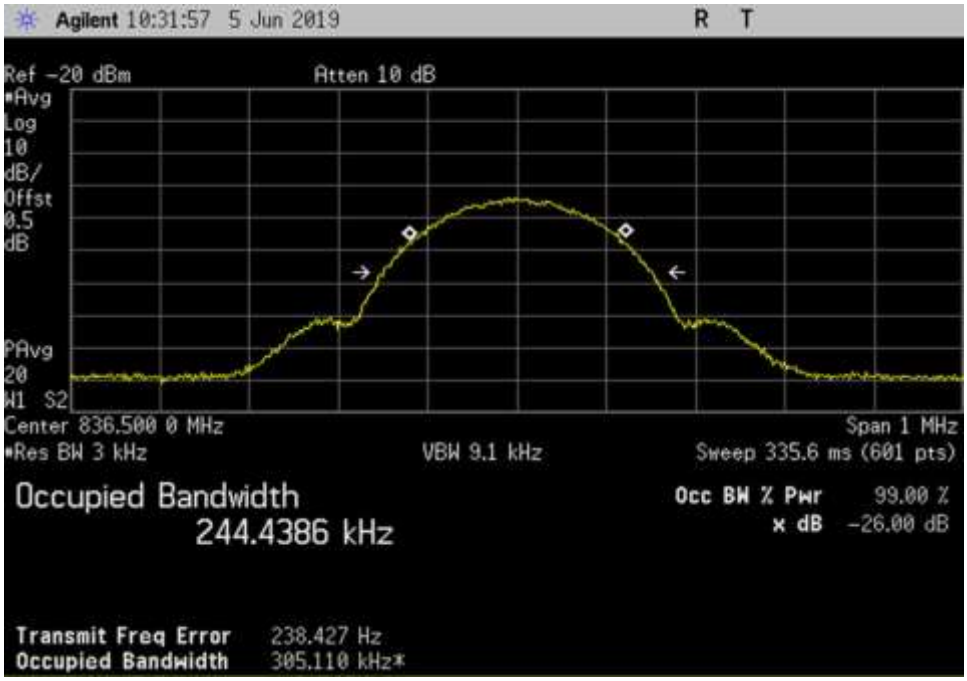
DL_2110-2155_EDGE_ 2132.5MHz

GSM-Input

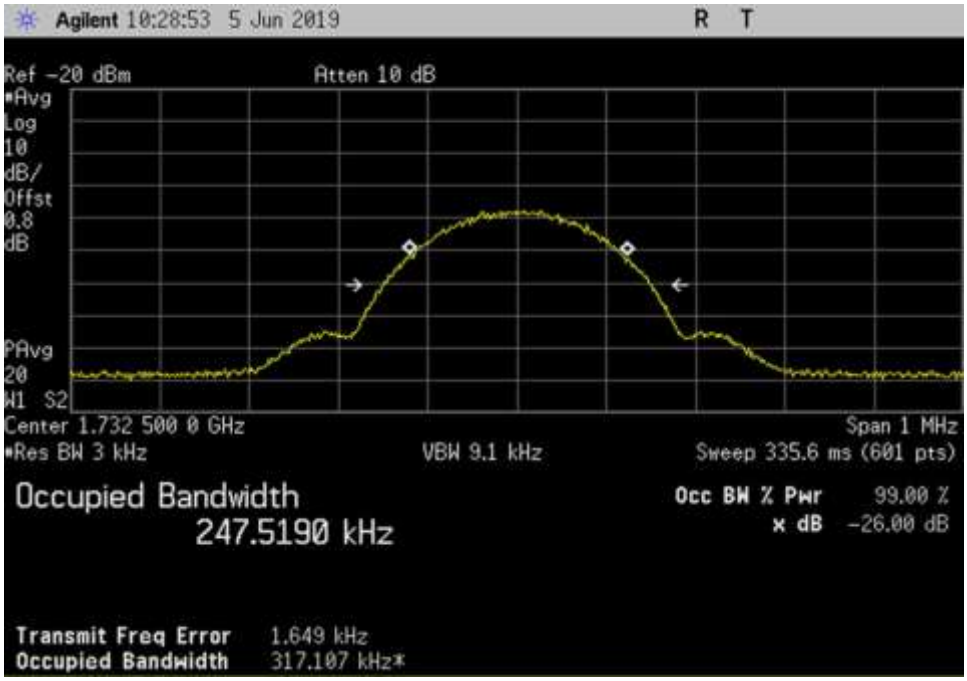


UL_698-716_GSM_ 707MHz

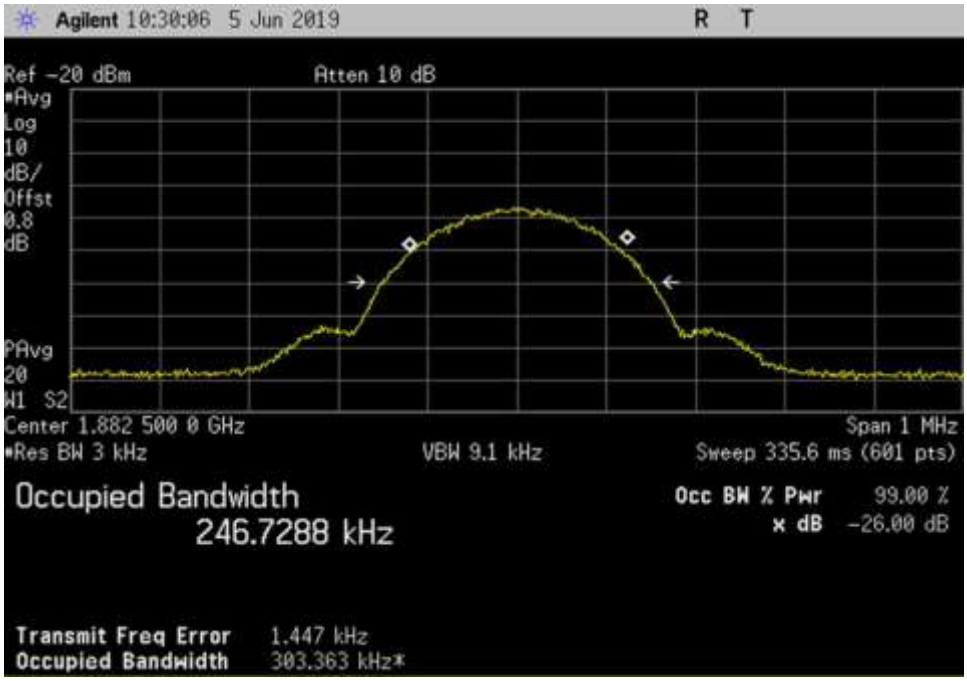
UL_776-787_GSM_ 781.5MHz



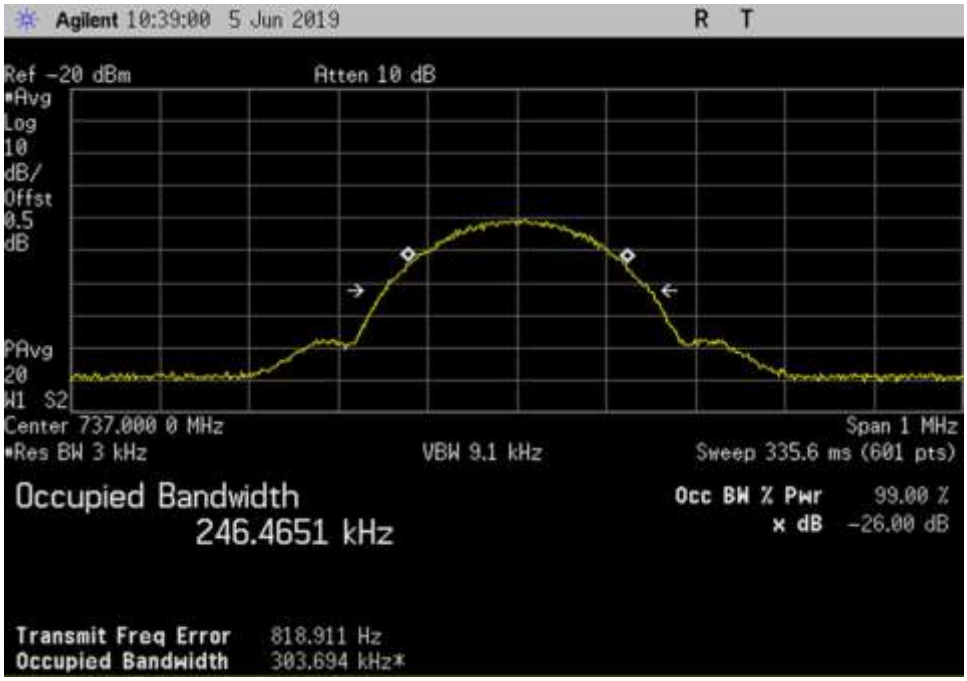
UL_824-849_GSM_ 836.5MHz



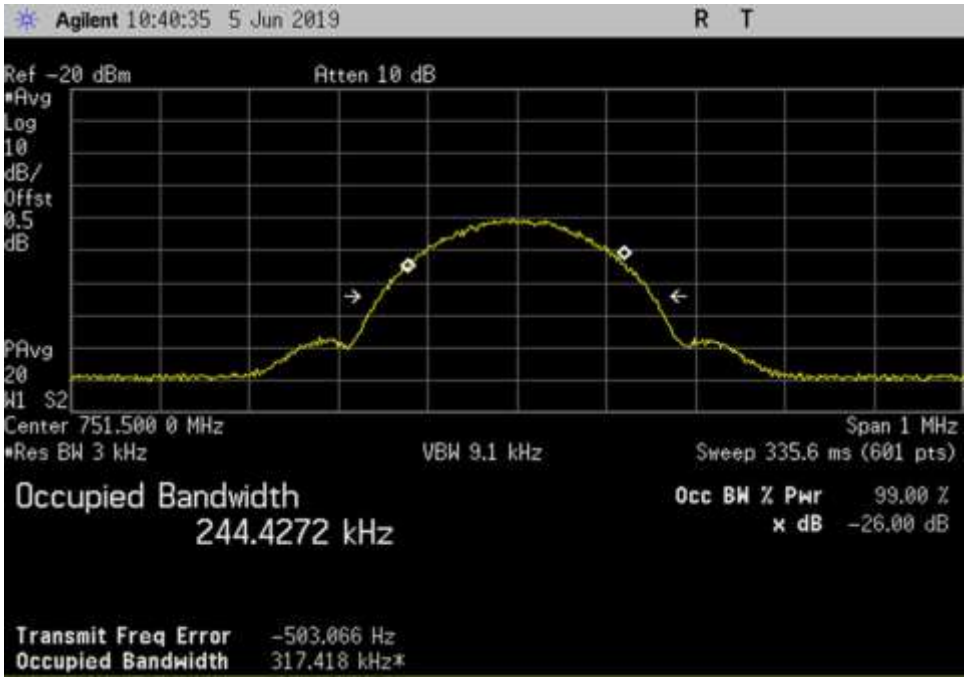
UL_1710-1755_GSM_ 1732.5MHz



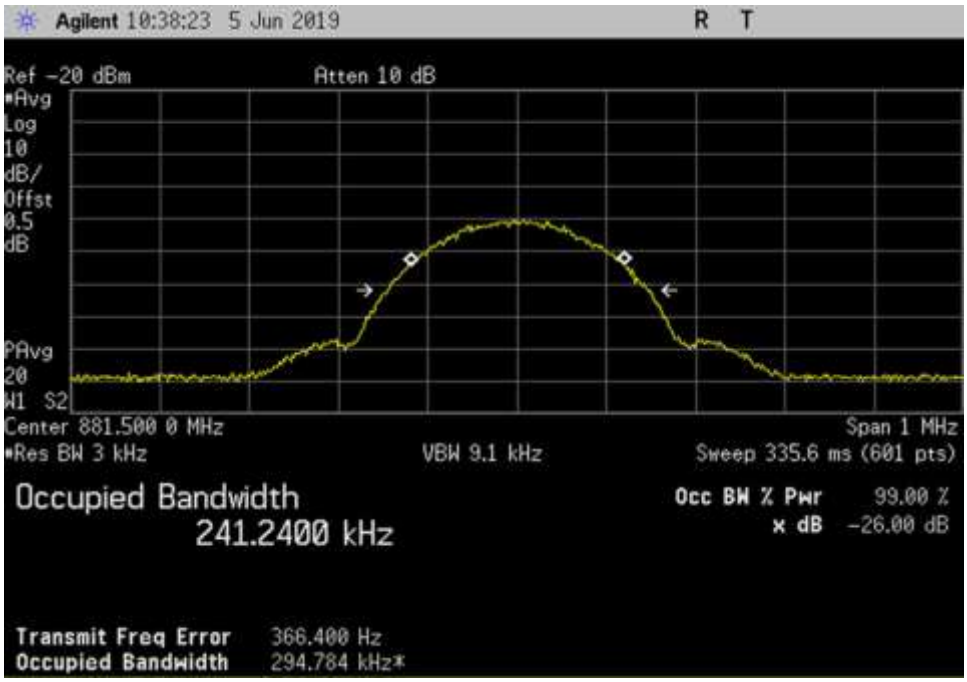
UL_1850-1915_GSM_ 1882.5MHz



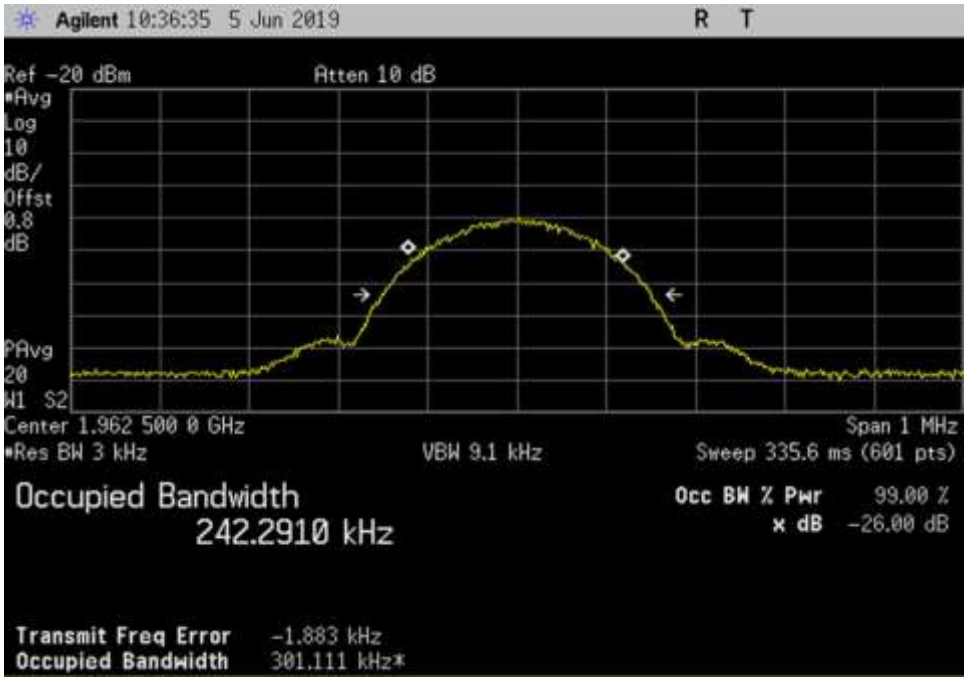
DL_728-746_GSM_ 737MHz



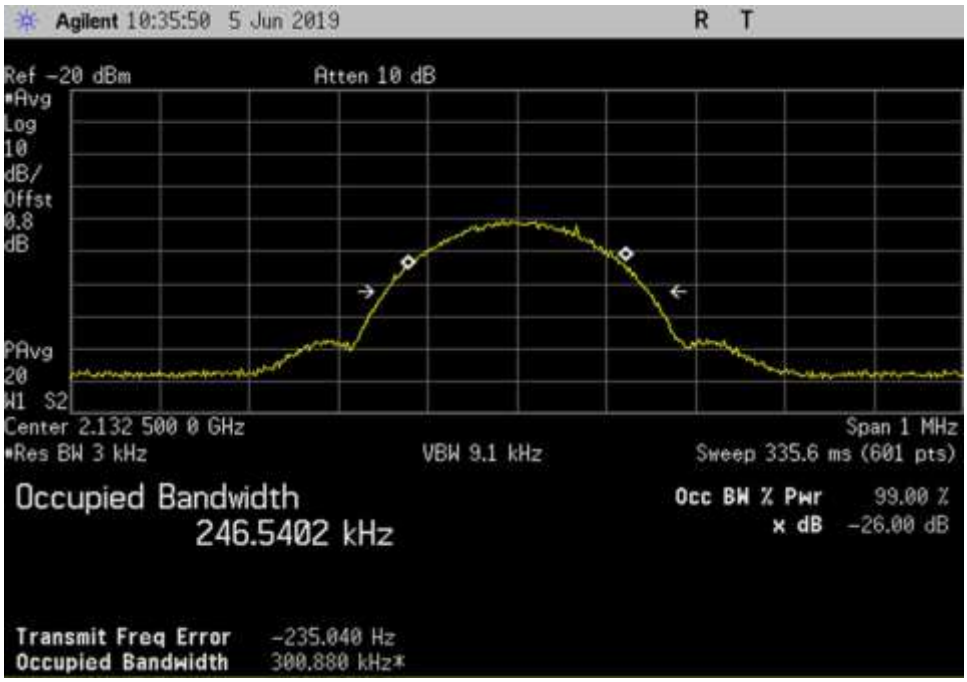
DL_746-757_GSM_ 751.5MHz



DL_869-894_GSM_ 881.5MHz

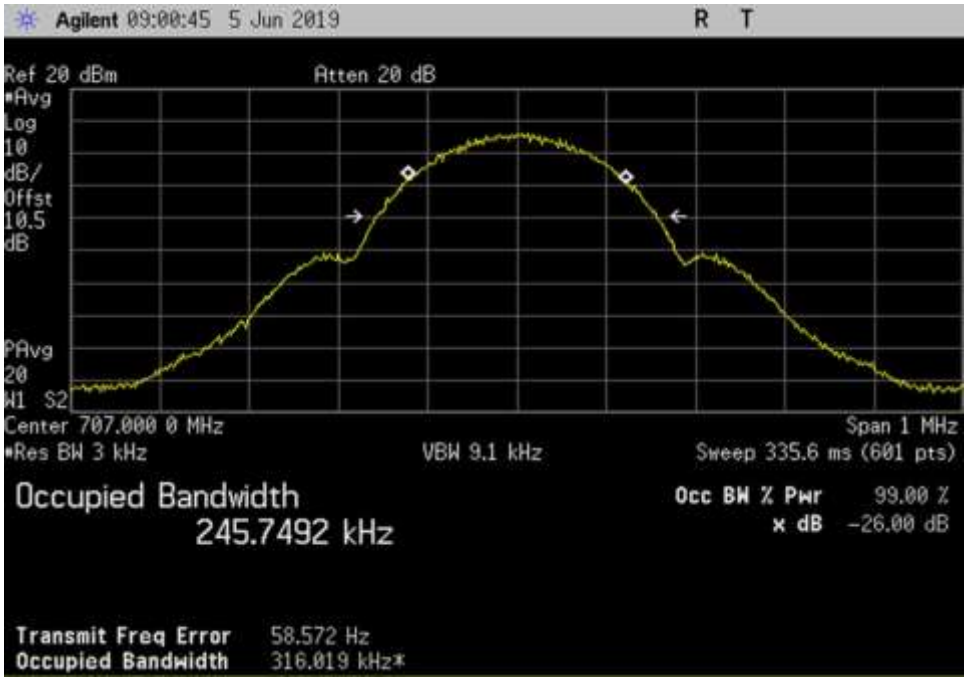


DL_1930-1995_GSM_ 1962.5MHz

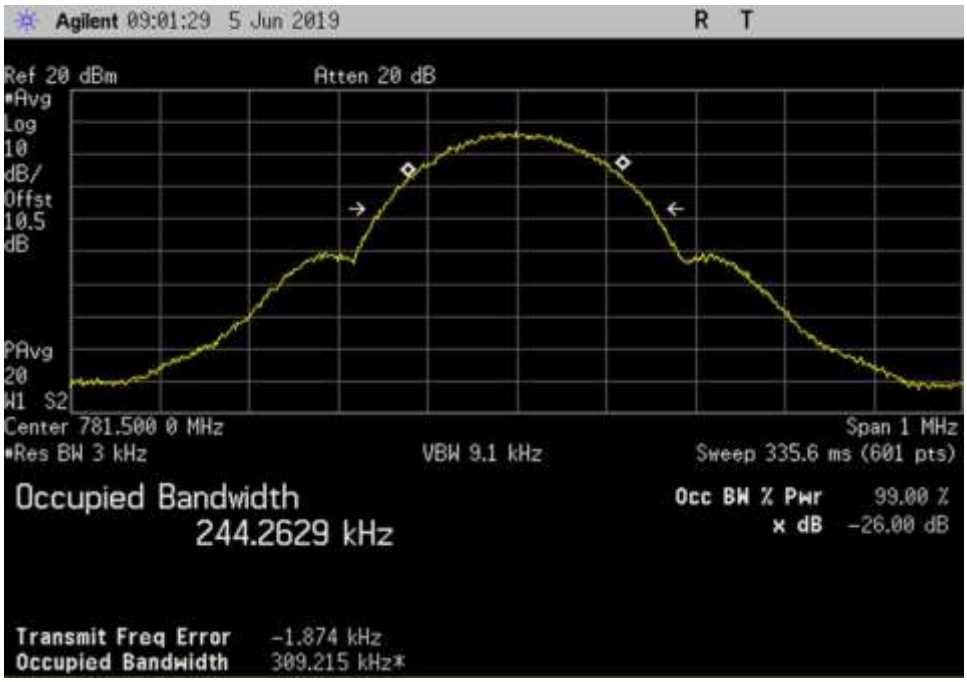


DL_2110-2155_GSM_ 2132.5MHz

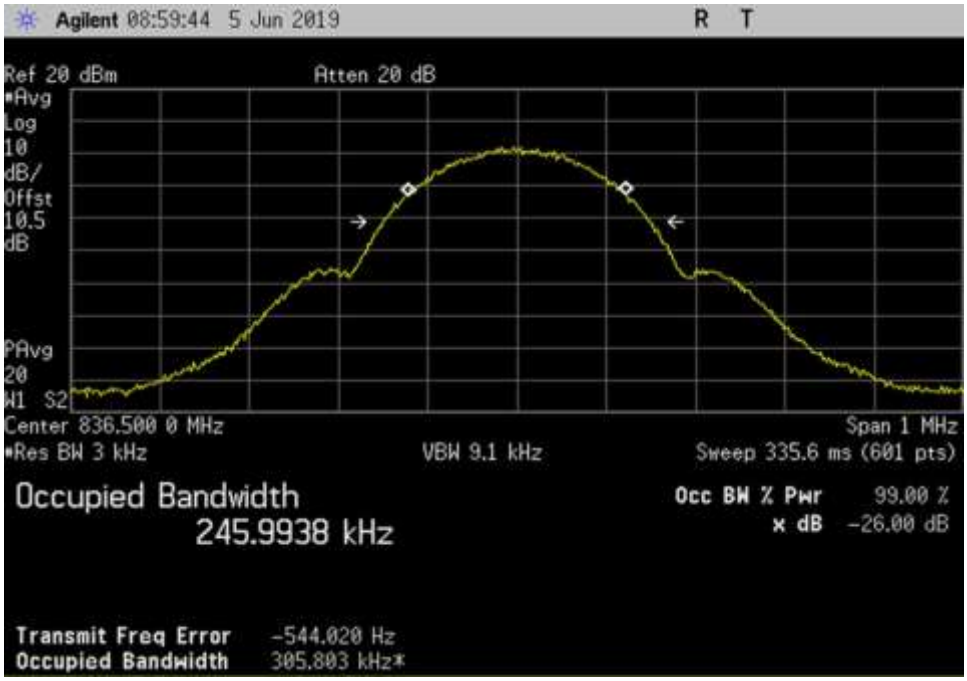
GSM-Output



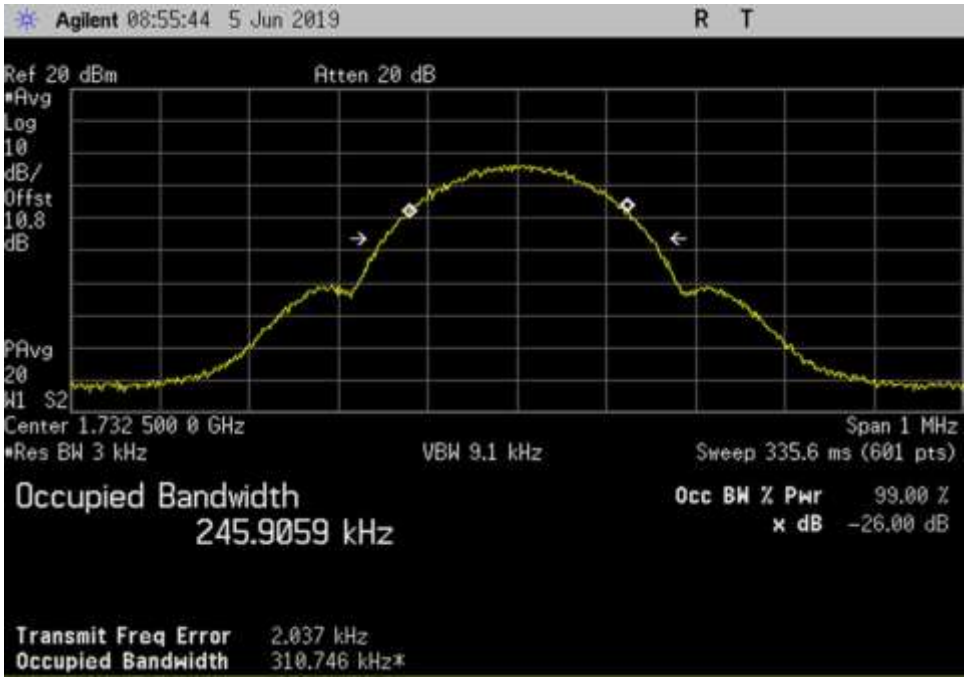
UL_698-716_GSM_ 707MHz



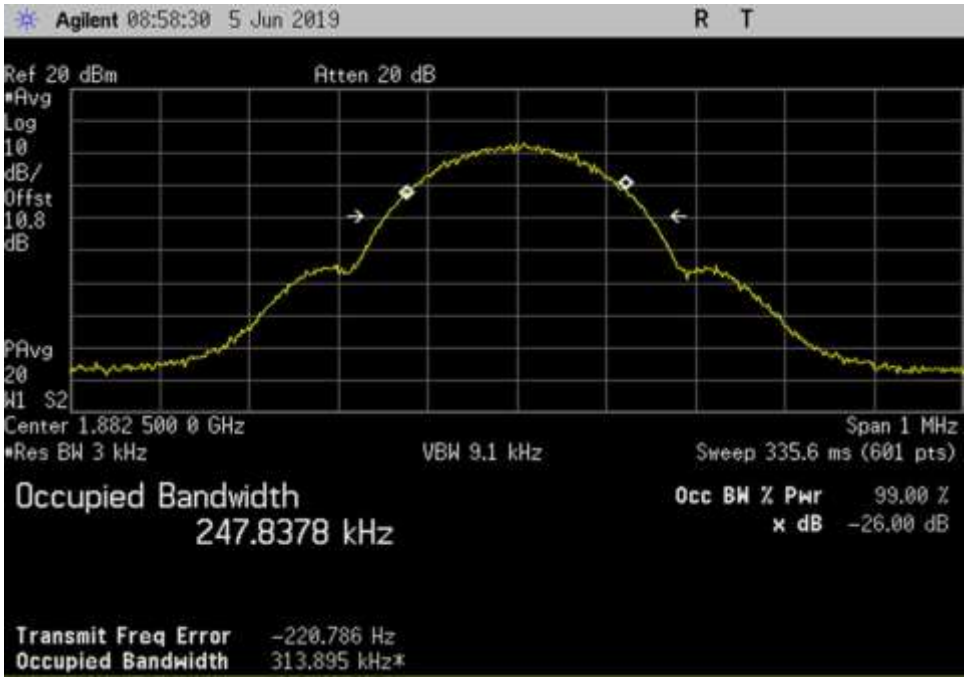
UL_776-787_GSM_ 781.5MHz



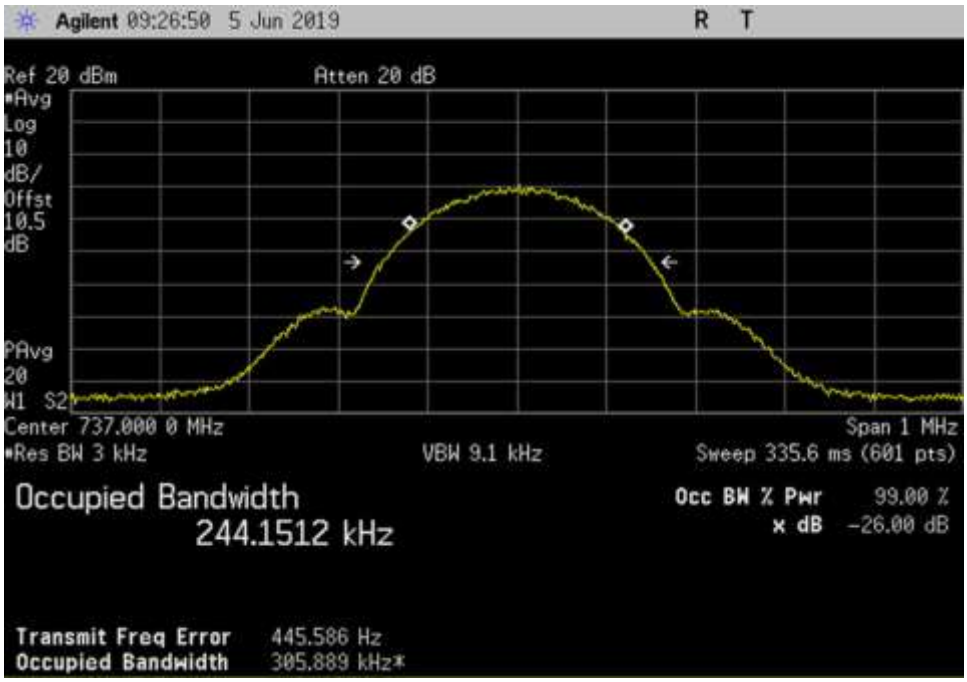
UL_824-849_GSM_ 836.5MHz



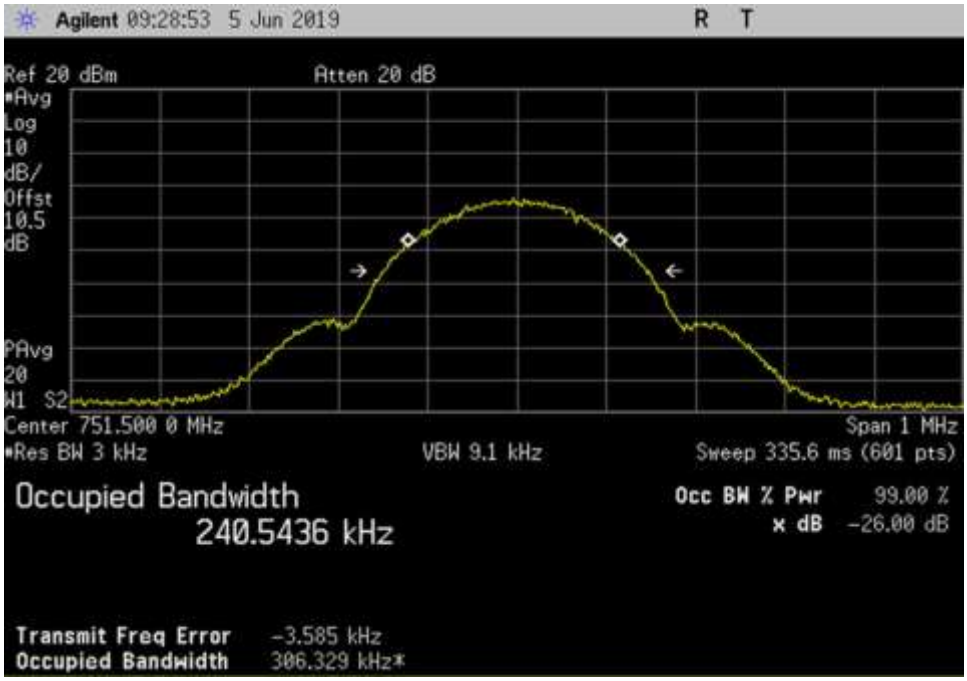
UL_1710-1755_GSM_ 1732.5MHz



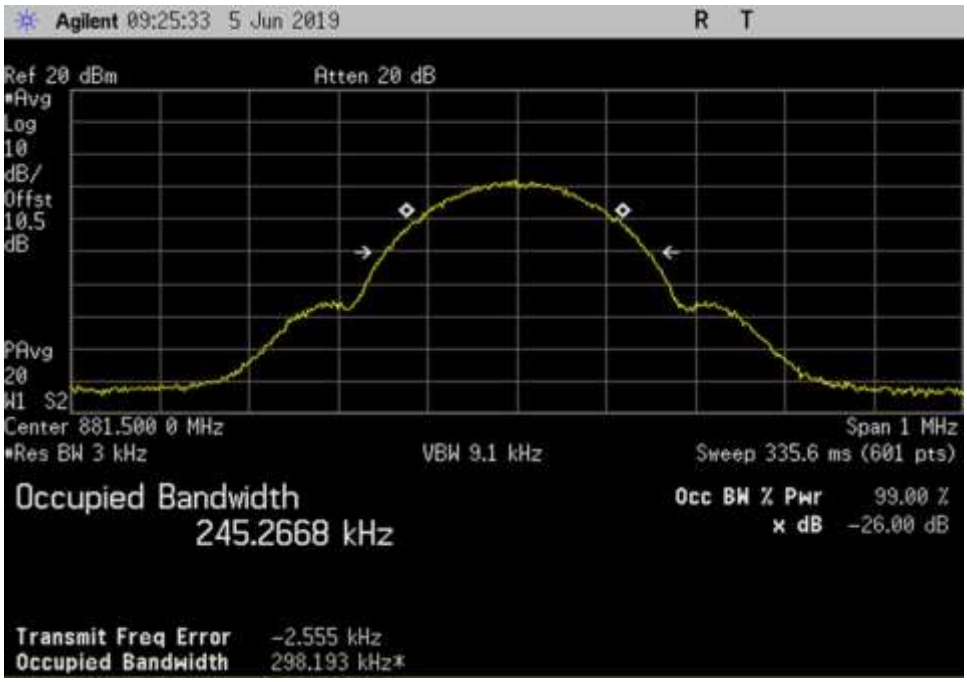
UL_1850-1915_GSM_ 1882.5MHz



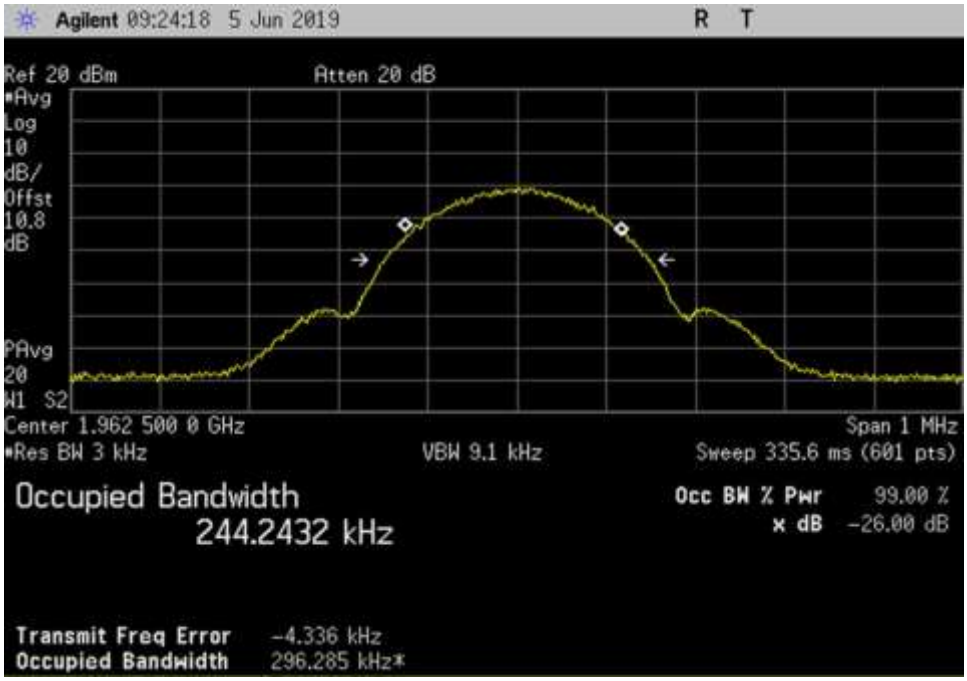
DL_728-746_GSM_ 737MHz



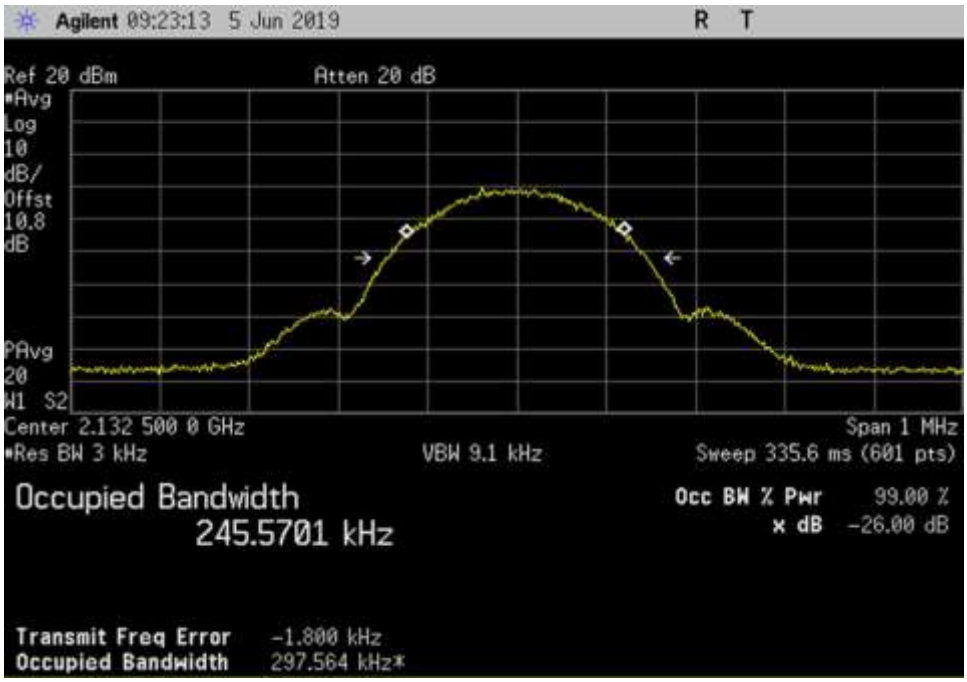
DL_746-757_GSM_ 751.5MHz



DL_869-894_GSM_ 881.5MHz

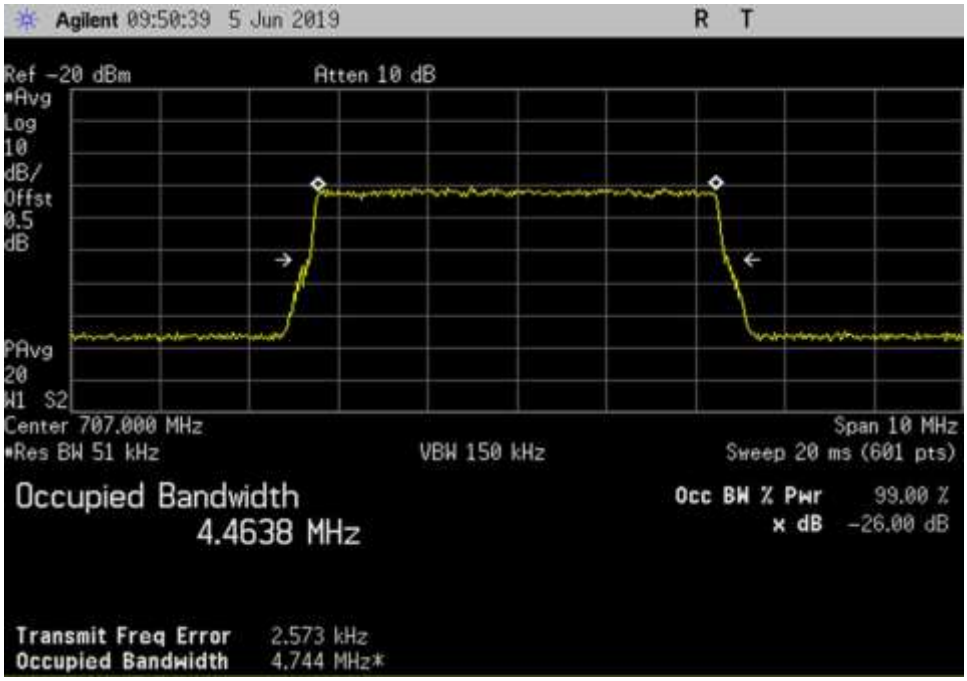


DL_1930-1995_GSM_ 1962.5MHz

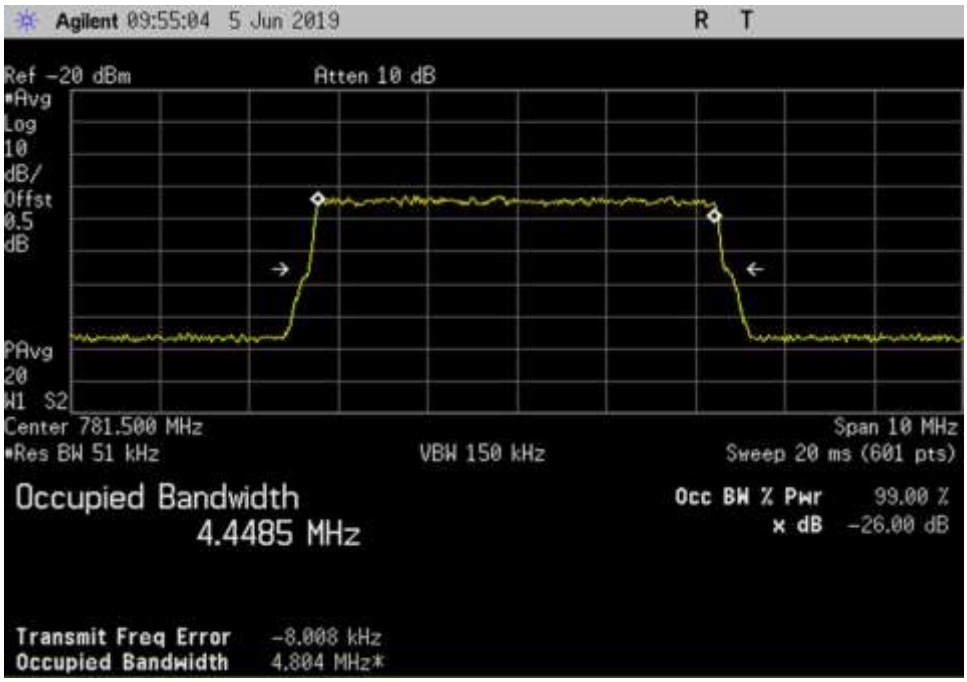


DL_2110-2155_GSM_ 2132.5MHz

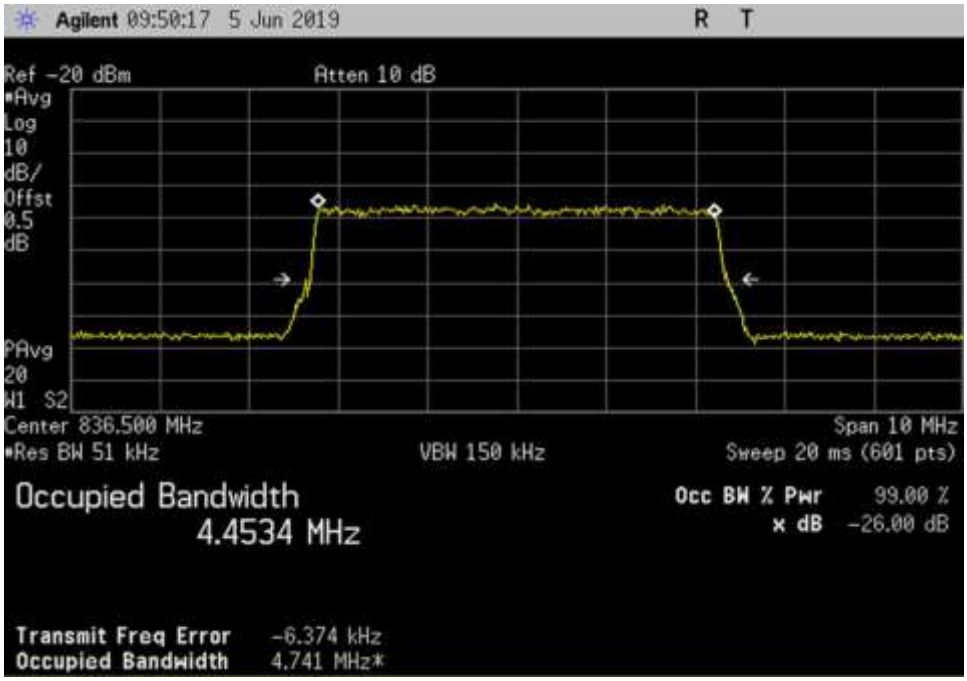
LTE-Input



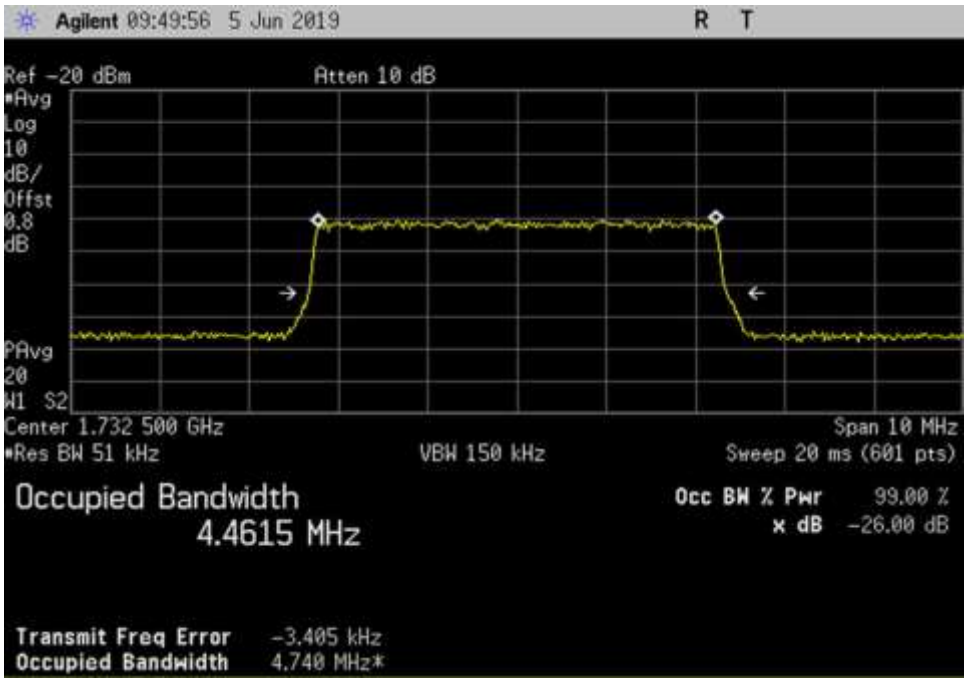
UL_698-716_LTE_ 707MHz



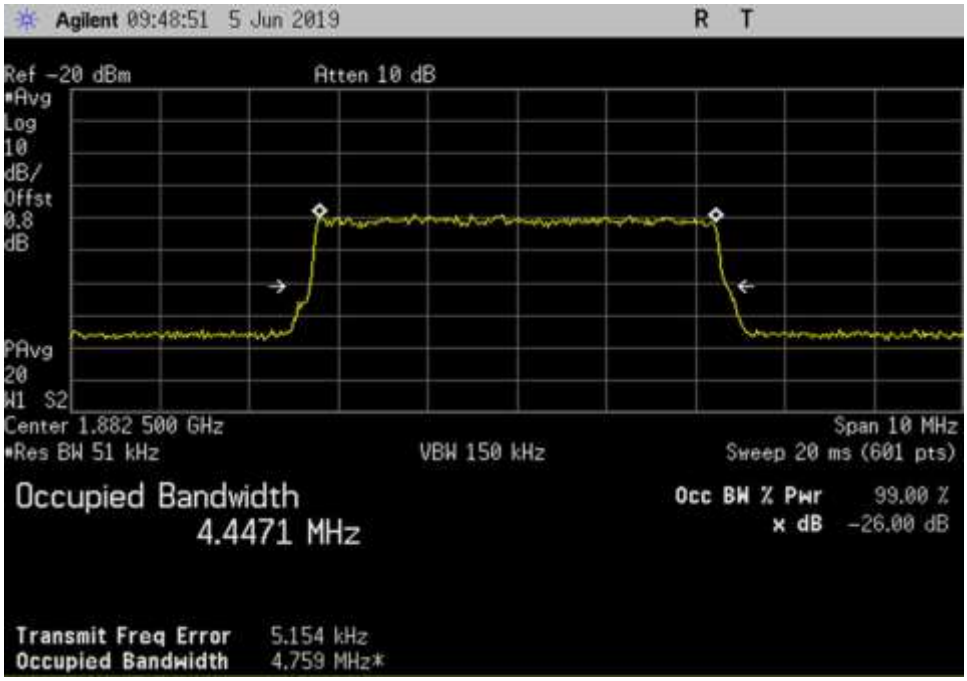
UL_776-787_LTE_ 781.5MHz



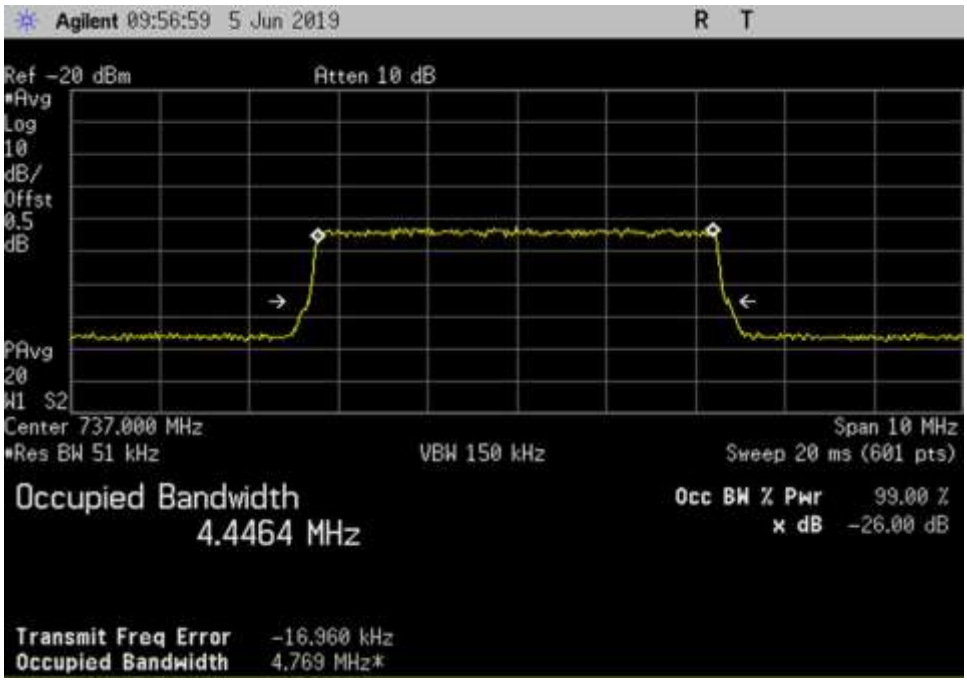
UL_824-849_LTE_ 836.5MHz



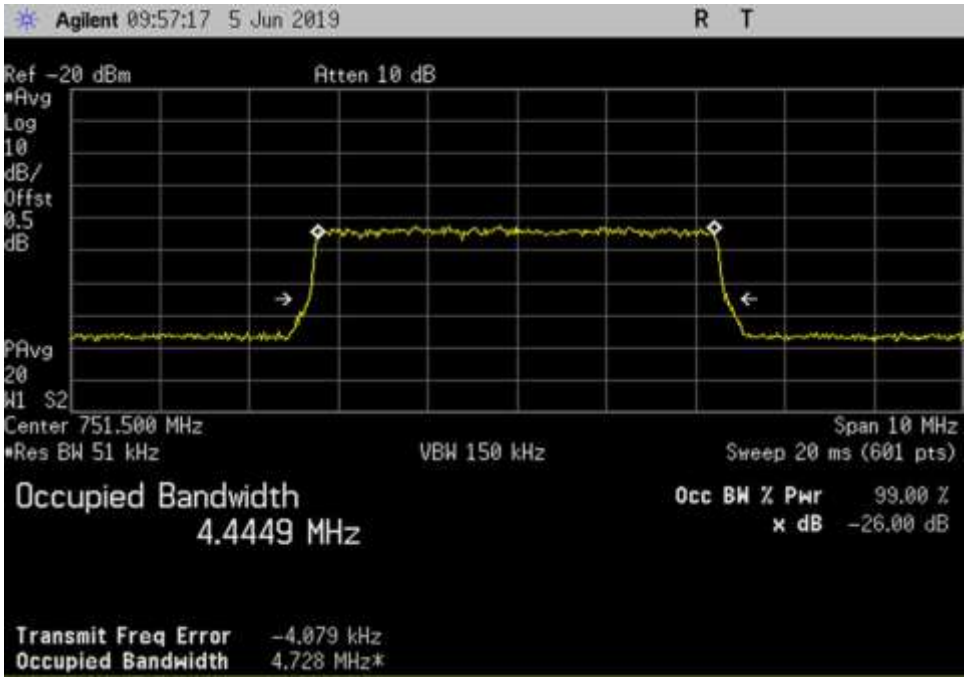
UL_1710-1755_LTE_ 1732.5MHz



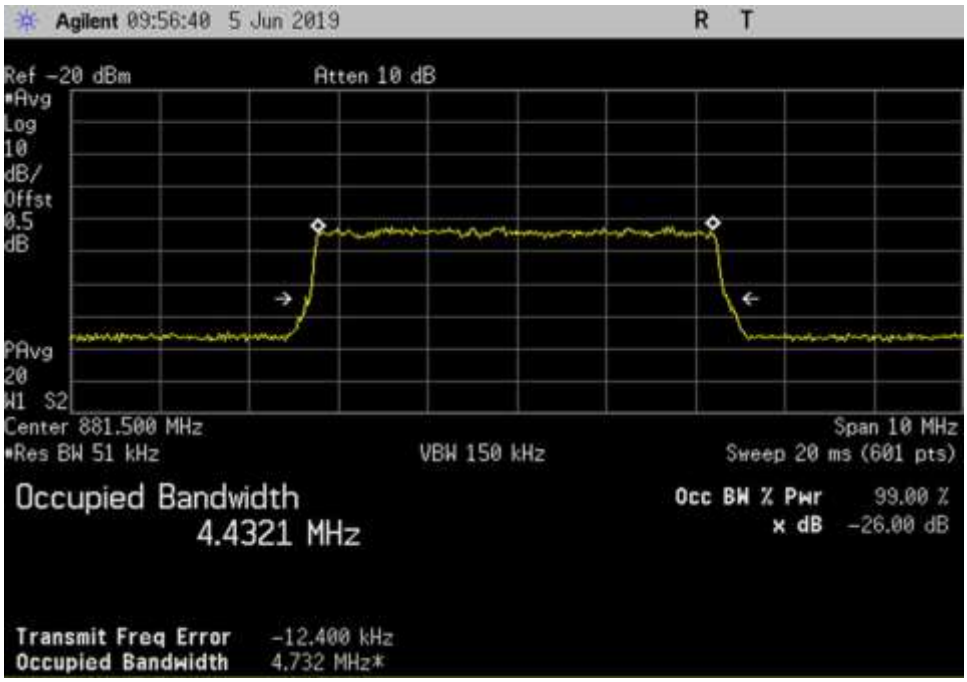
UL_1850-1915_LTE_ 1882.5MHz



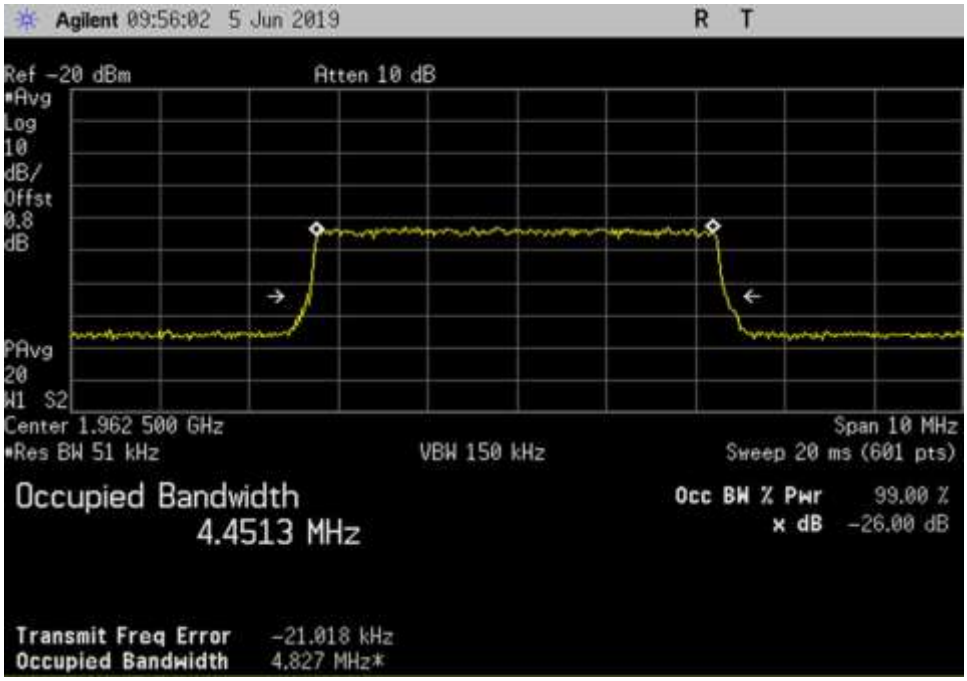
DL_728-746_LTE_ 737MHz



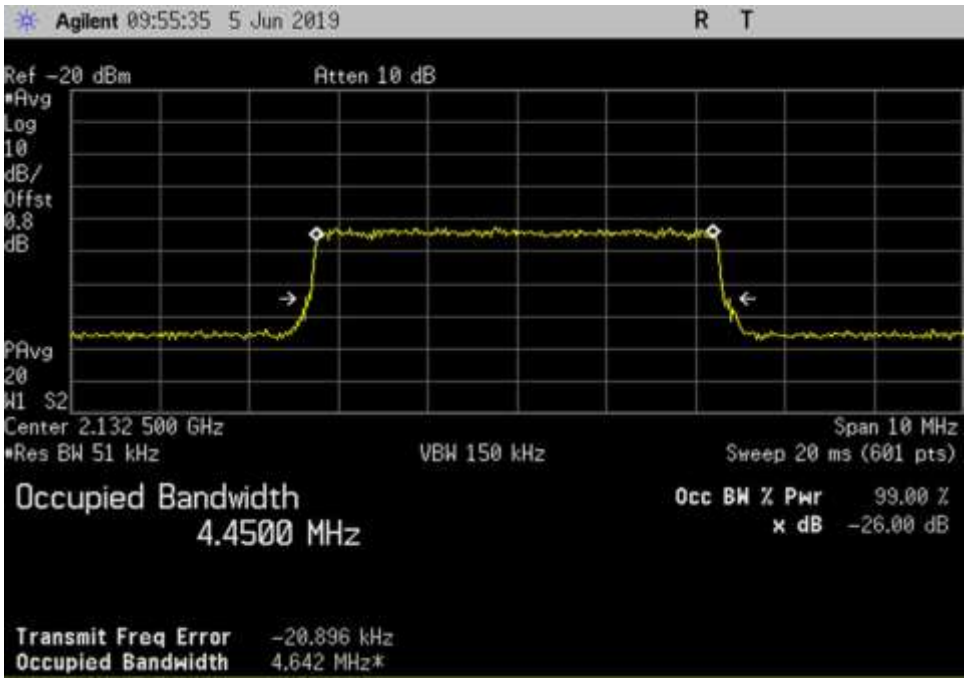
DL_746-757_LTE_ 751.5MHz



DL_869-894_LTE_ 881.5MHz

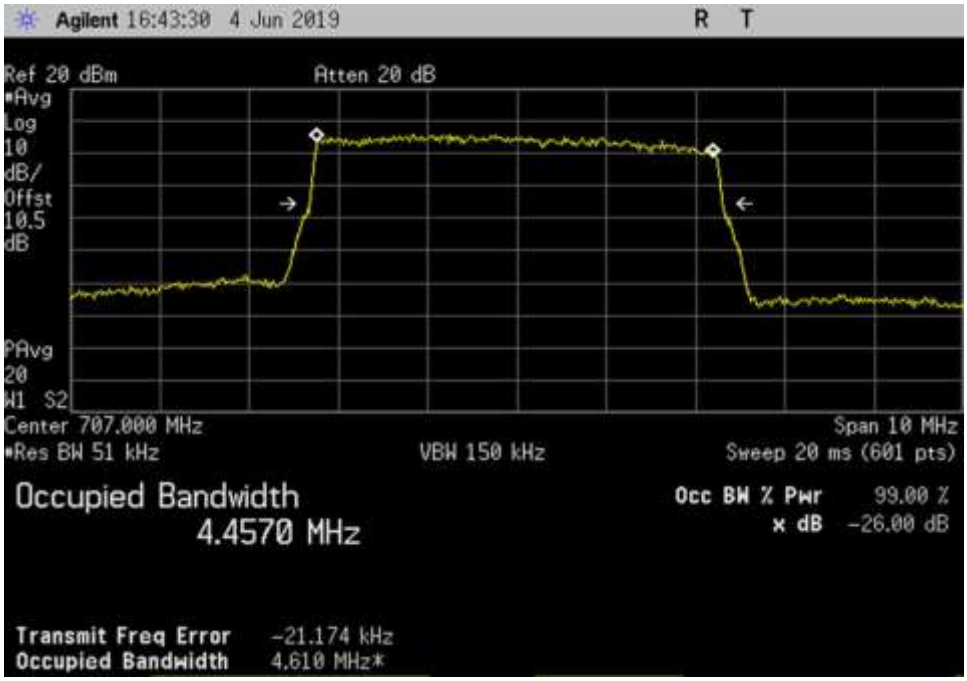


DL_1930-1995_LTE_ 1962.5MHz

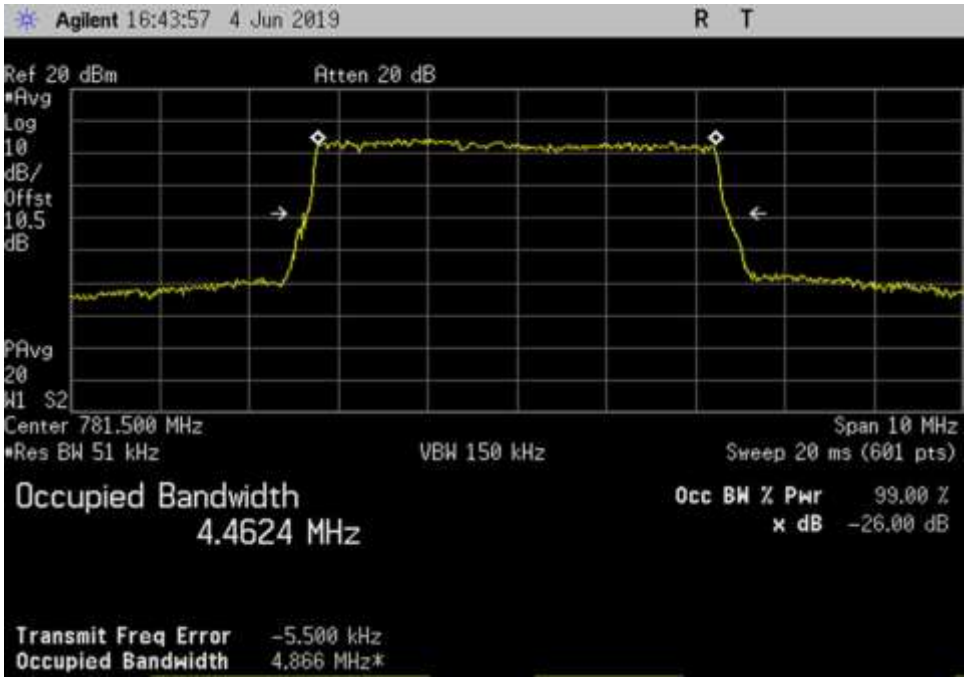


DL_2110-2155_LTE_ 2132.5MHz

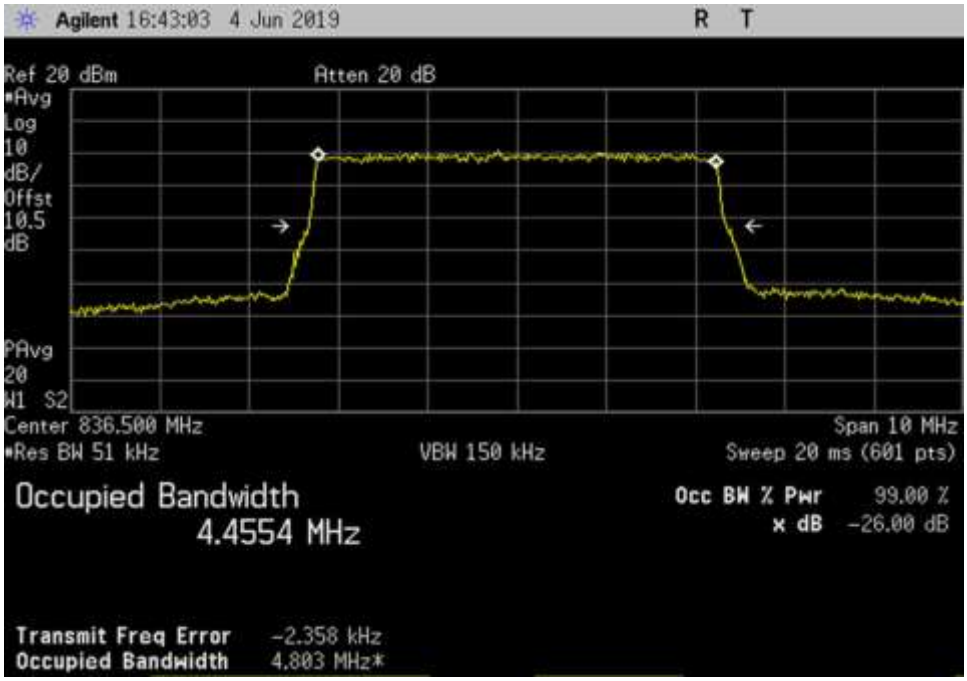
LTE-Output



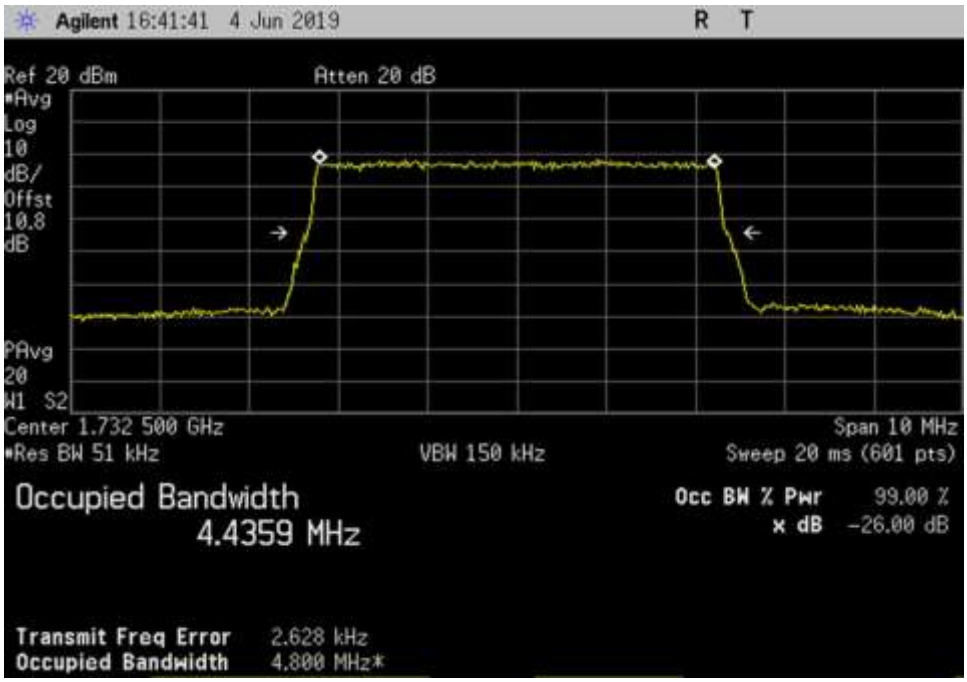
UL_698-716_LTE_ 707MHz_50ft Cable



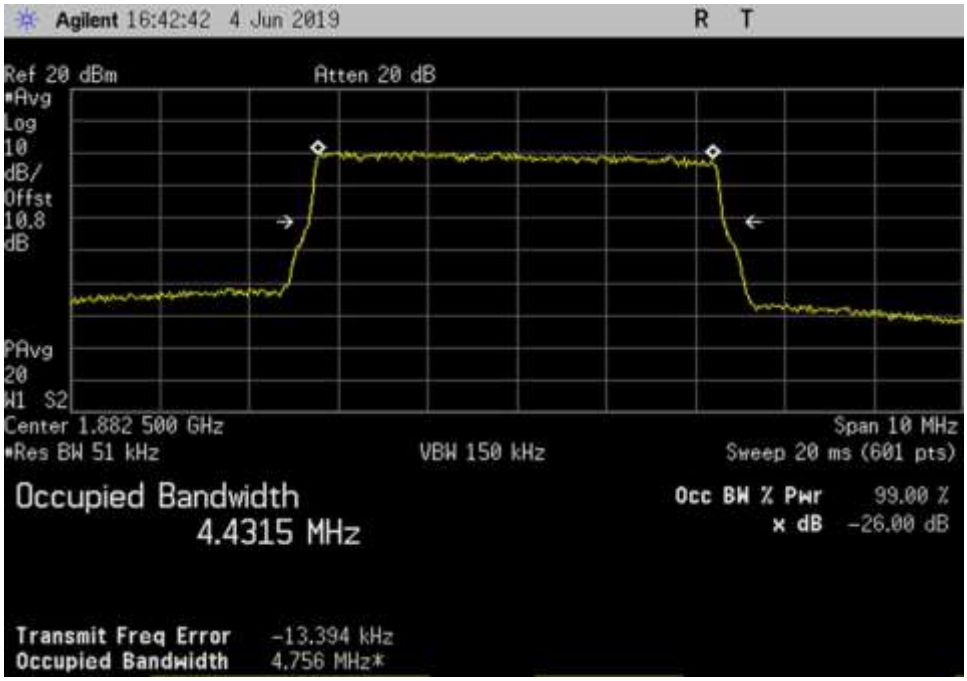
UL_776-787_LTE_ 781.5MHz_50ft Cable



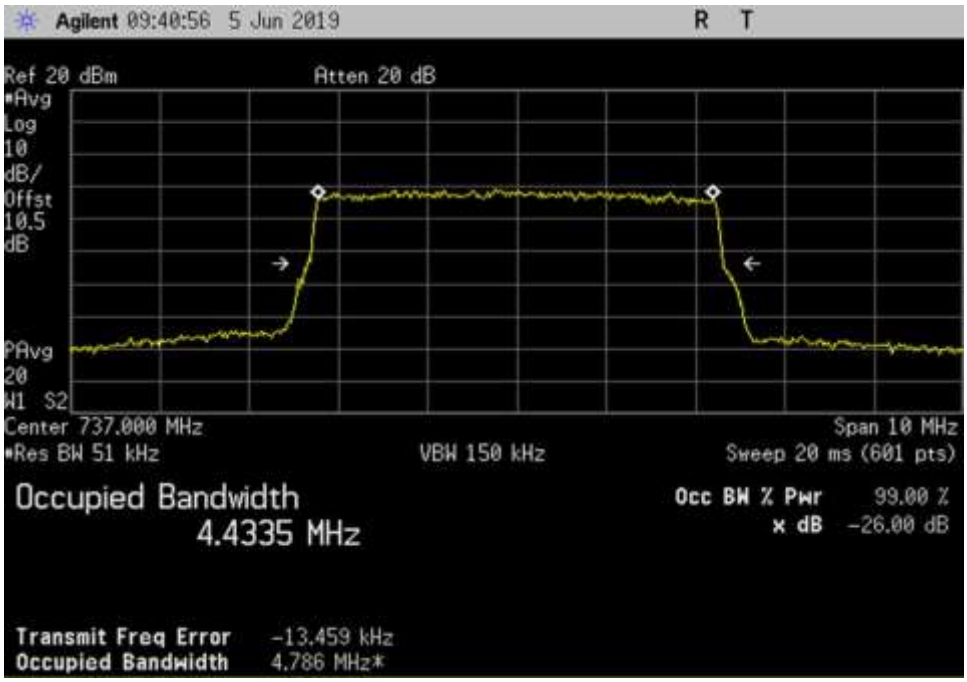
UL_824-849_LTE_ 836.5MHz_50ft Cable



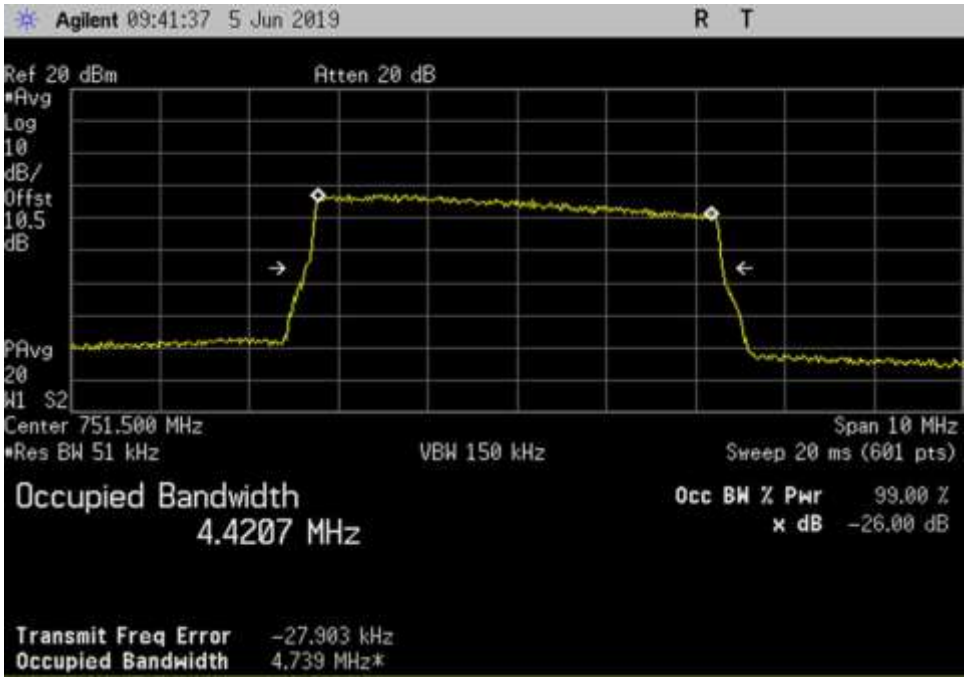
UL_1710-1755_LTE_ 1732.5MHz_50ft Cable



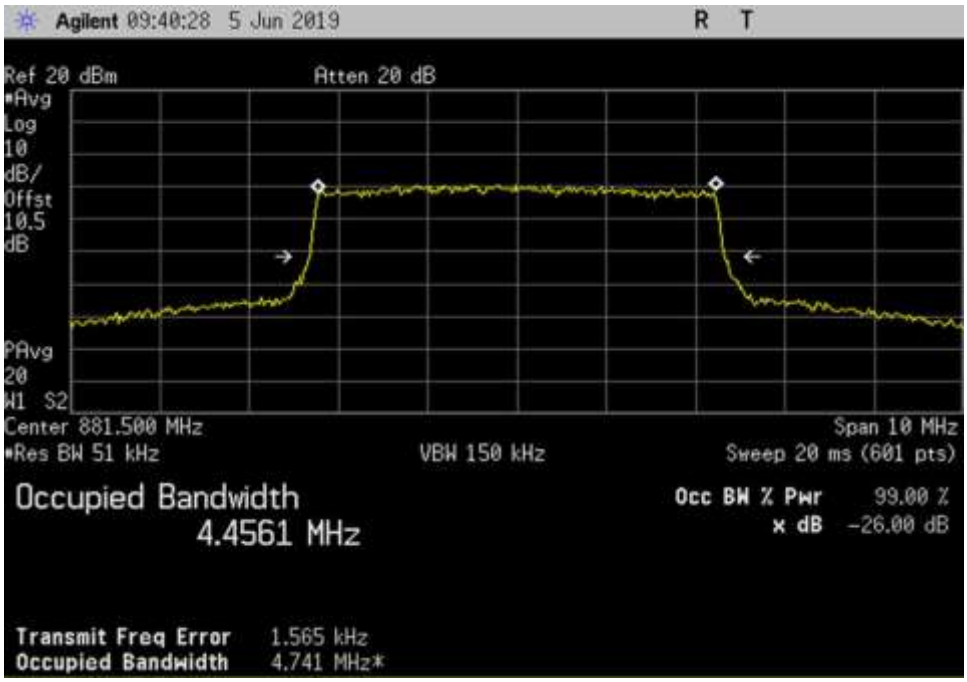
UL_1850-1915_LTE_ 1882.5MHz_50ft Cable



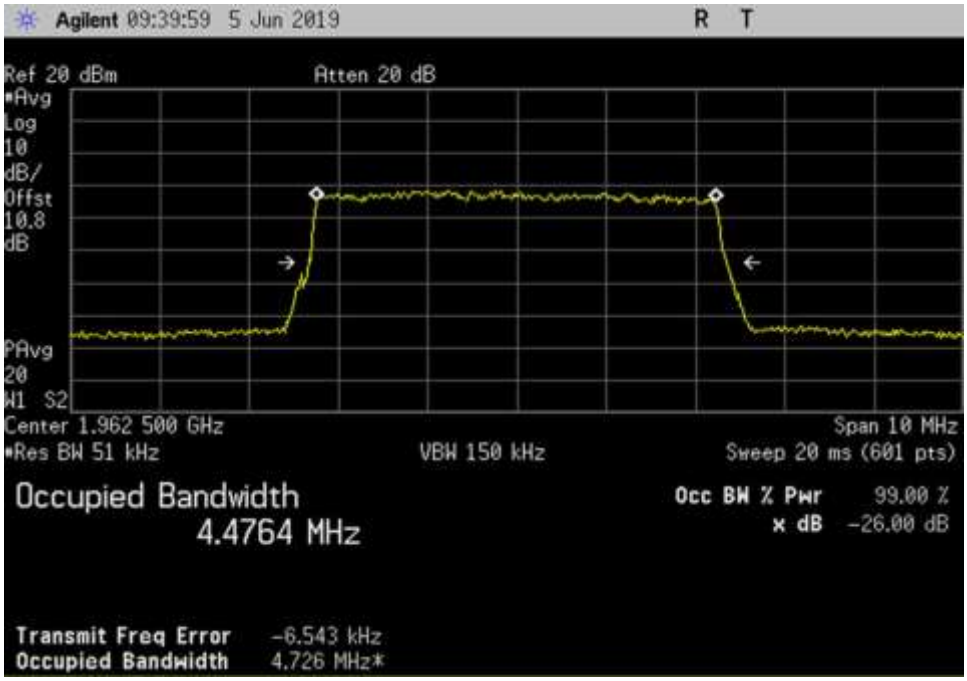
DL_728-746_LTE_ 737MHz



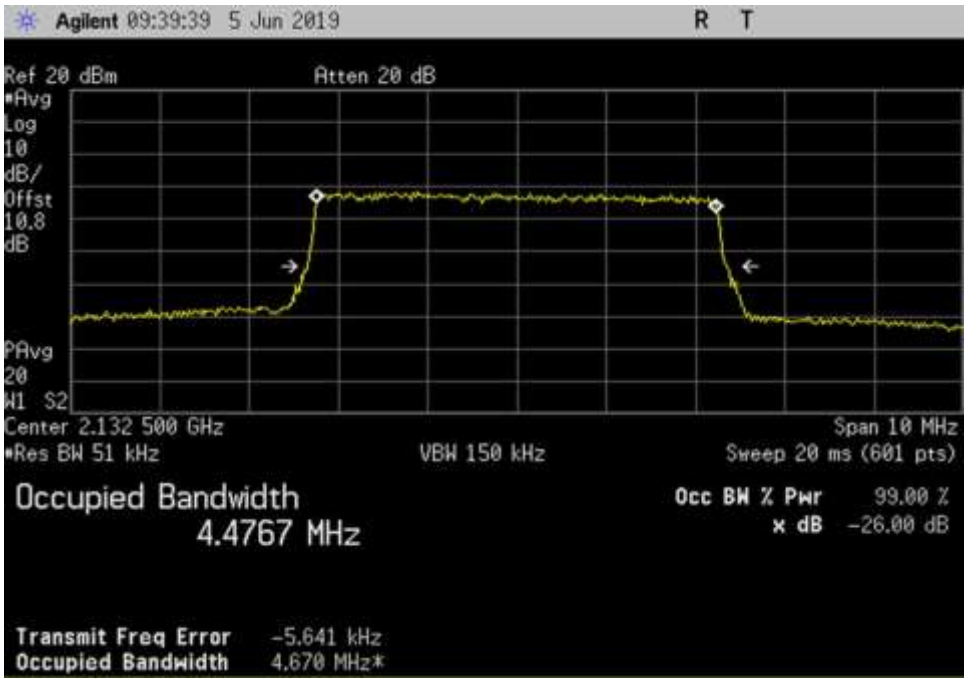
DL_746-757_LTE_ 751.5MHz



DL_869-894_LTE_ 881.5MHz

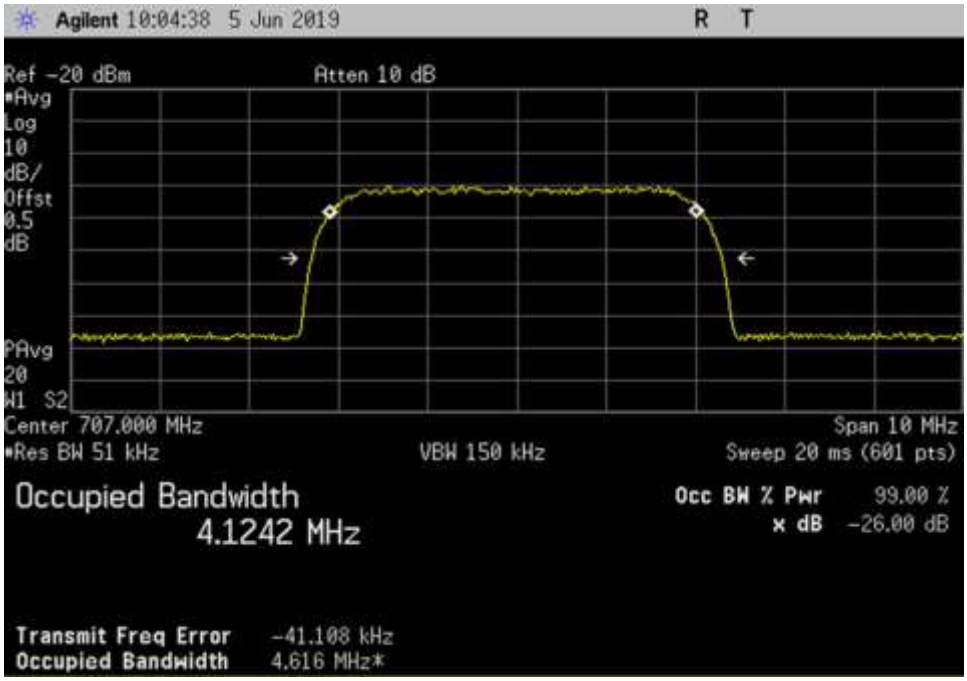


DL_1930-1995_LTE_ 1962.5MHz

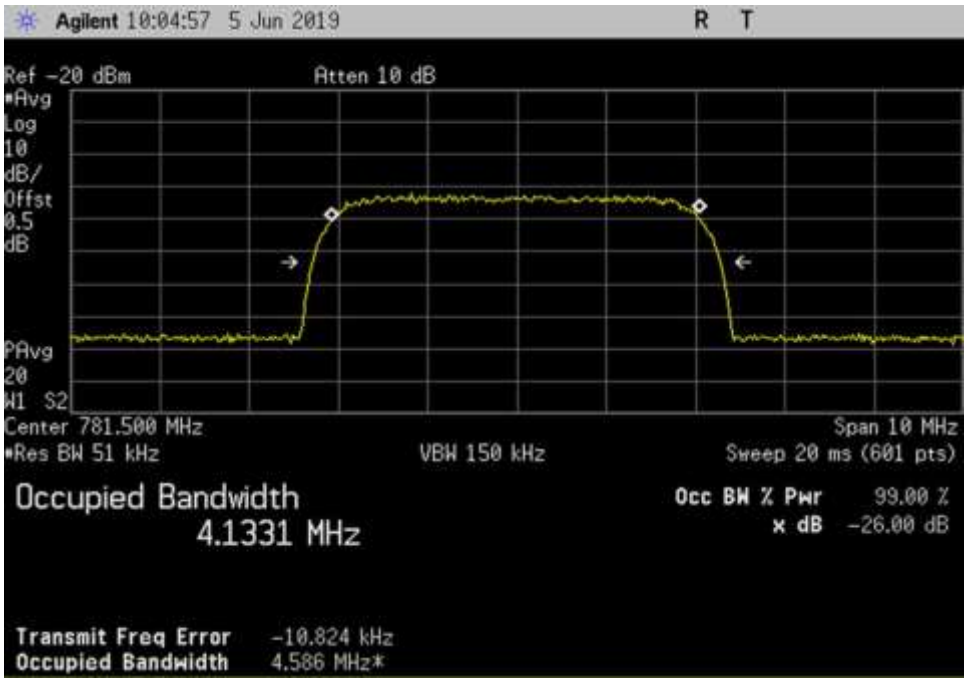


DL_2110-2155_LTE_ 2132.5MHz

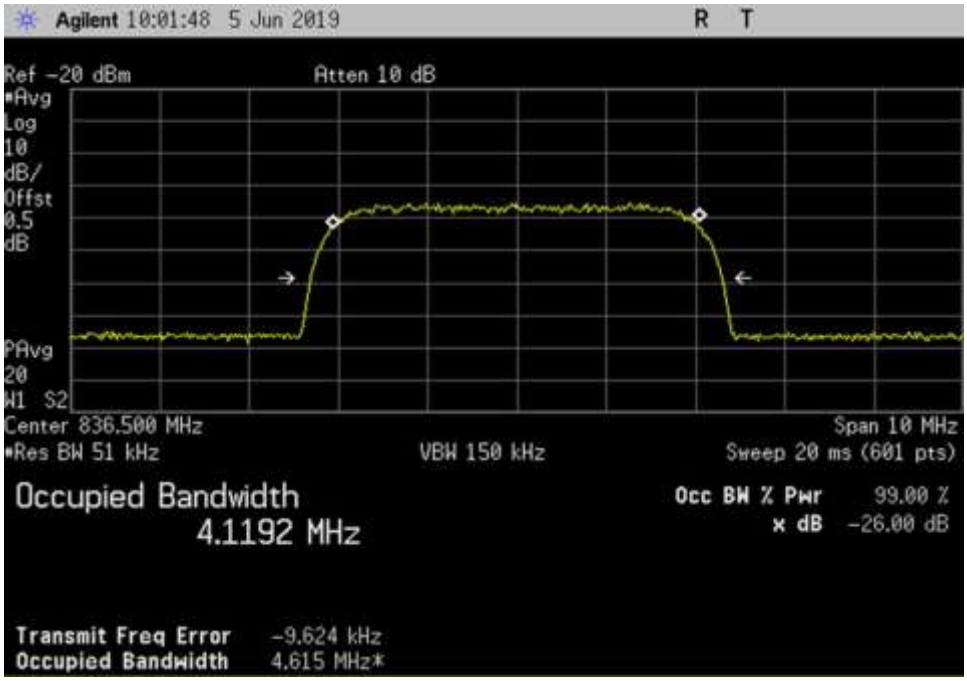
WCDMA-Input



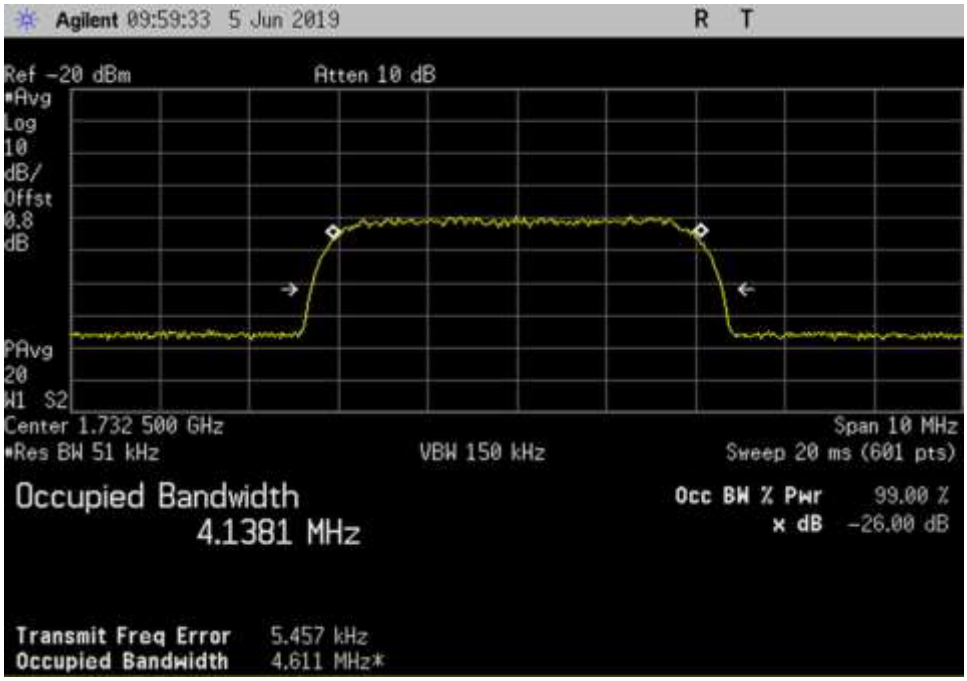
UL_698-716_WCDMA_ 707MHz



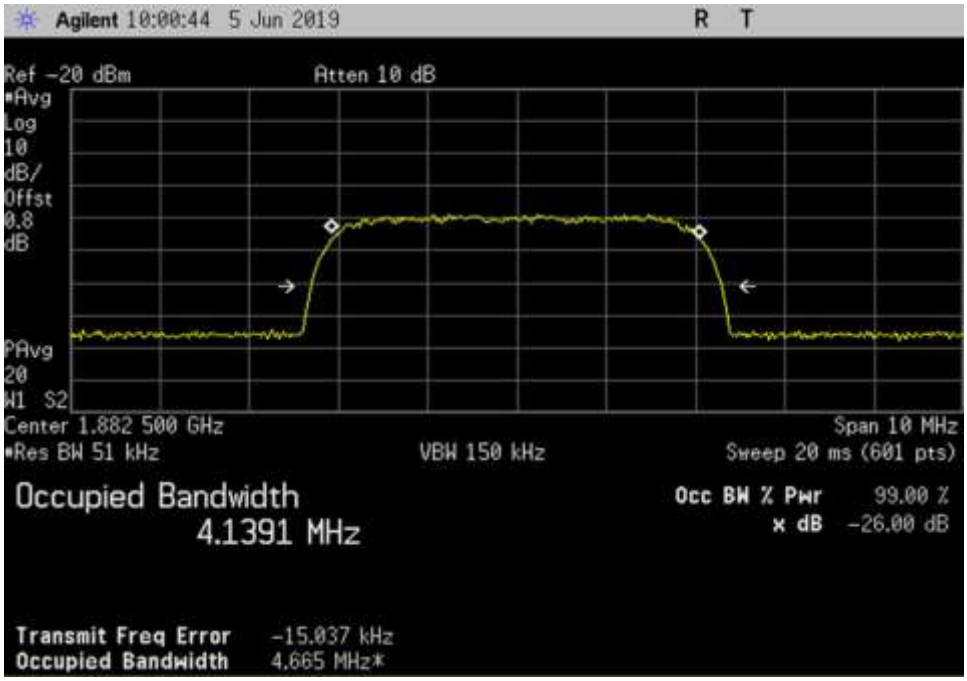
UL_776-787_WCDMA_ 781.5MHz



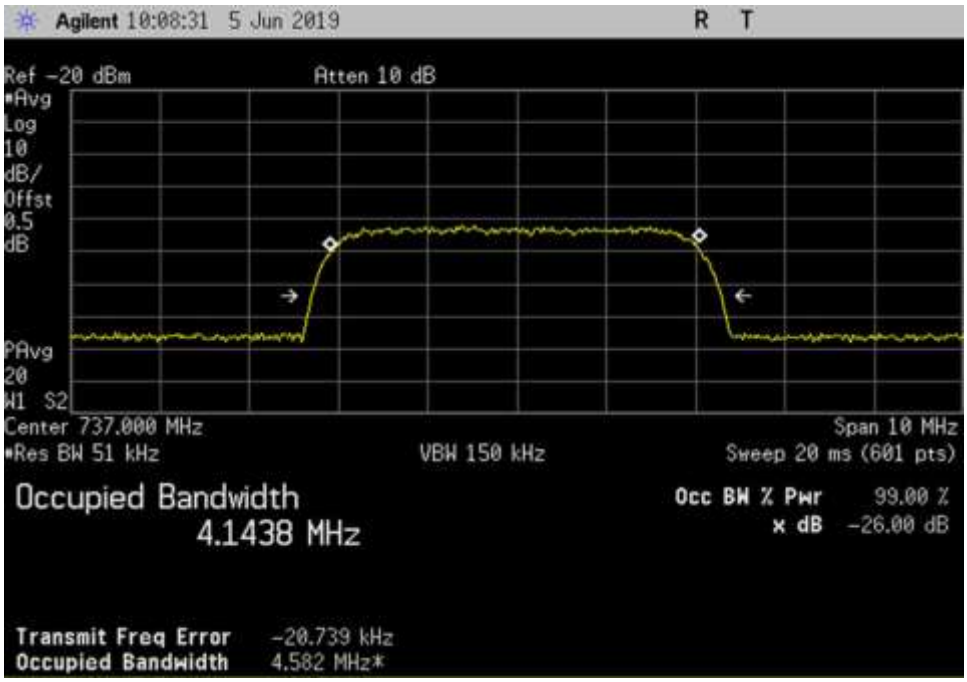
UL_824-849_WCDMA_ 836.5MHz



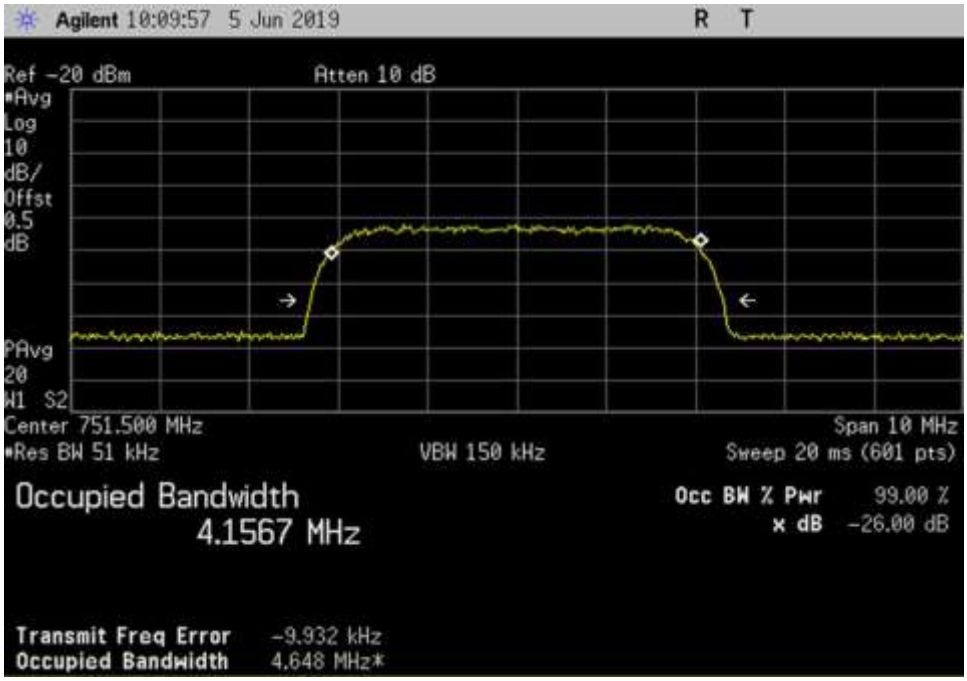
UL_1710-1755_WCDMA_ 1732.5MHz



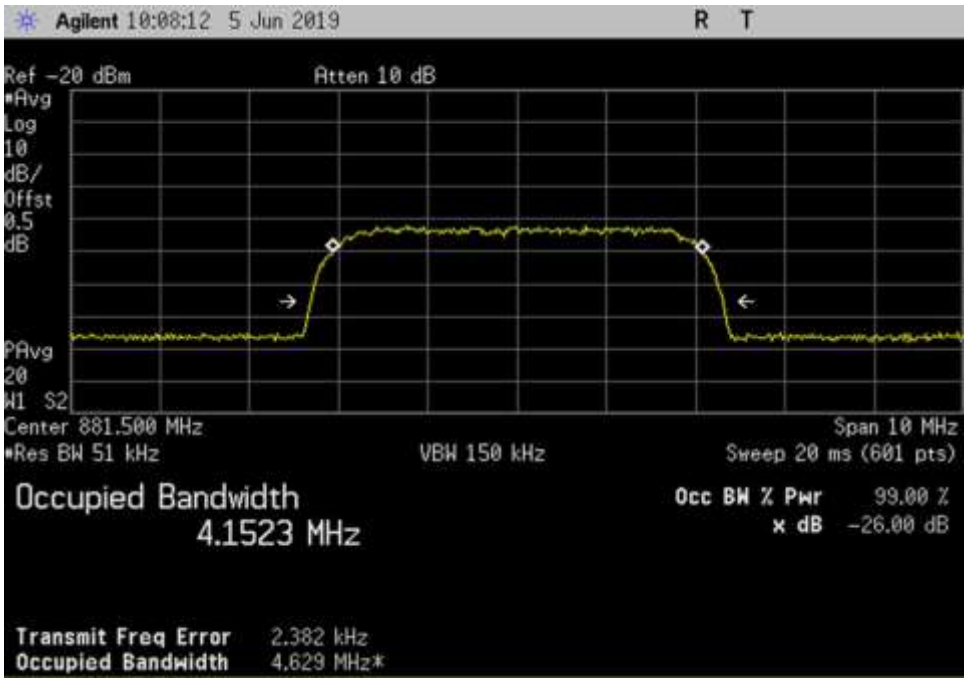
UL_1850-1915_WCDMA_ 1882.5MHz



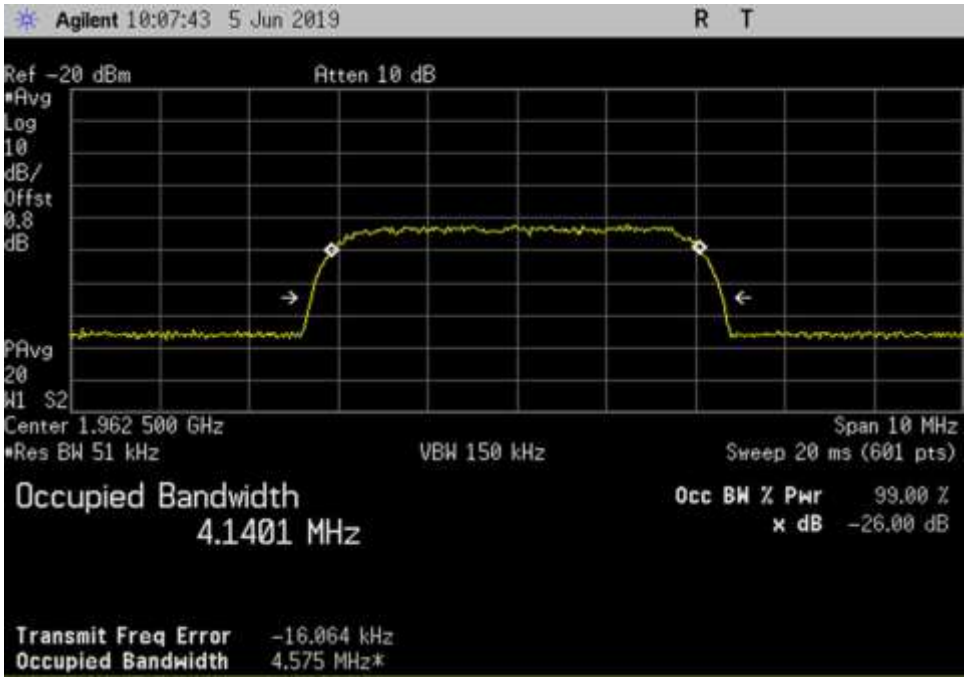
DL_728-746_WCDMA_ 737MHz



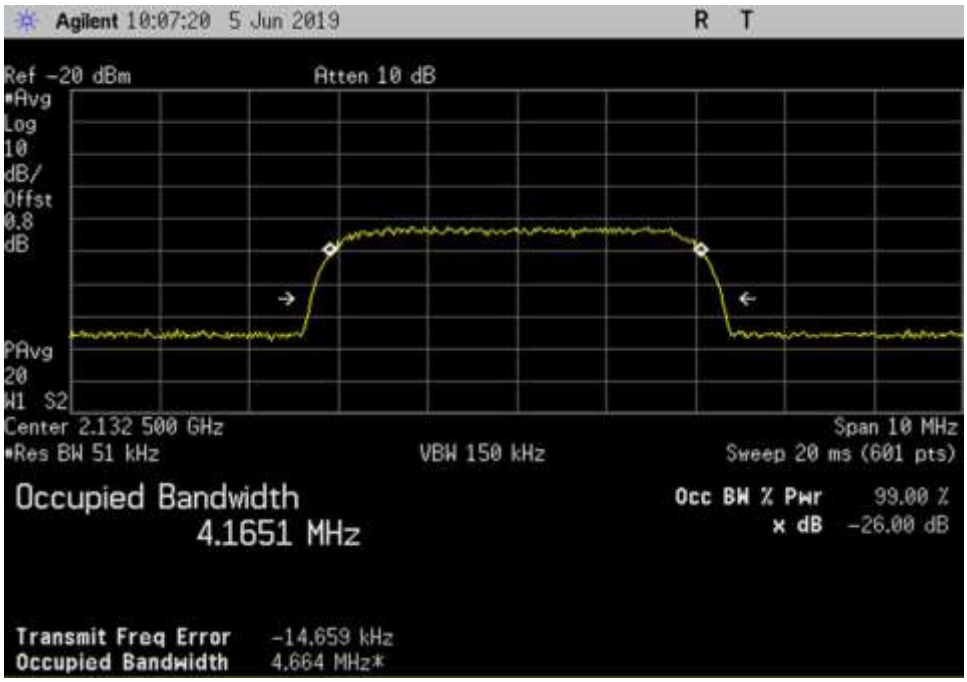
DL_746-757_WCDMA_ 751.5MHz



DL_869-894_WCDMA_ 881.5MHz

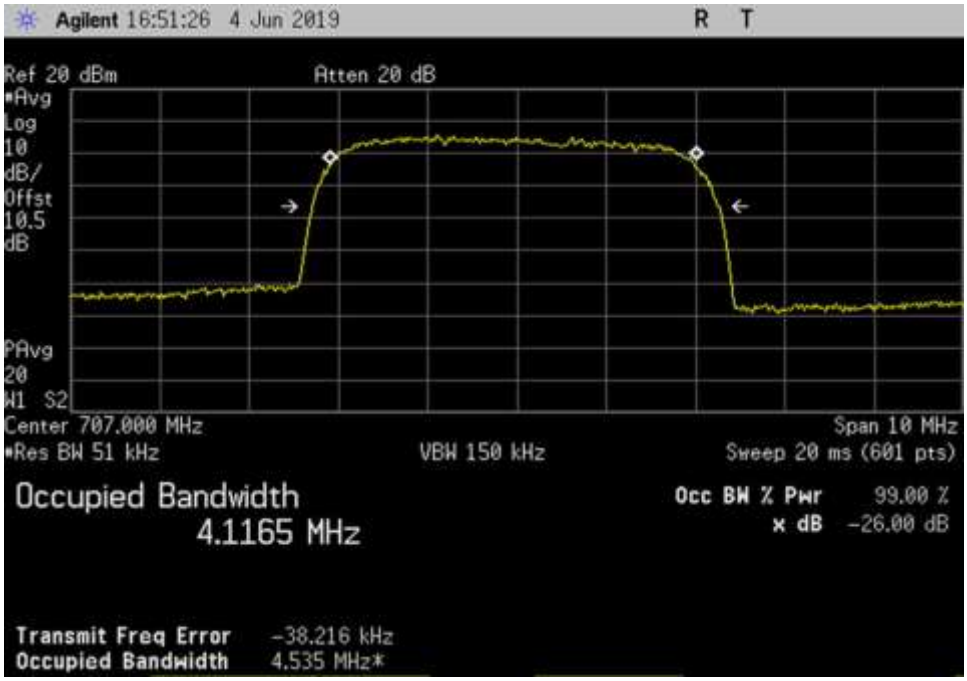


DL_1930-1995_WCDMA_ 1962.5MHz

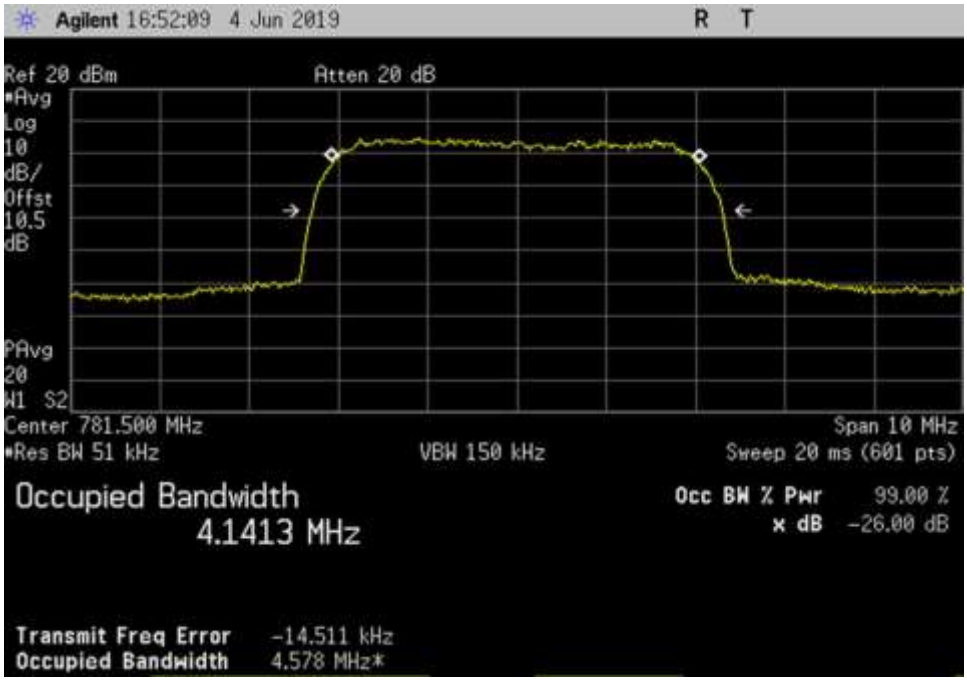


DL_2110-2155_WCDMA_ 2132.5MHz

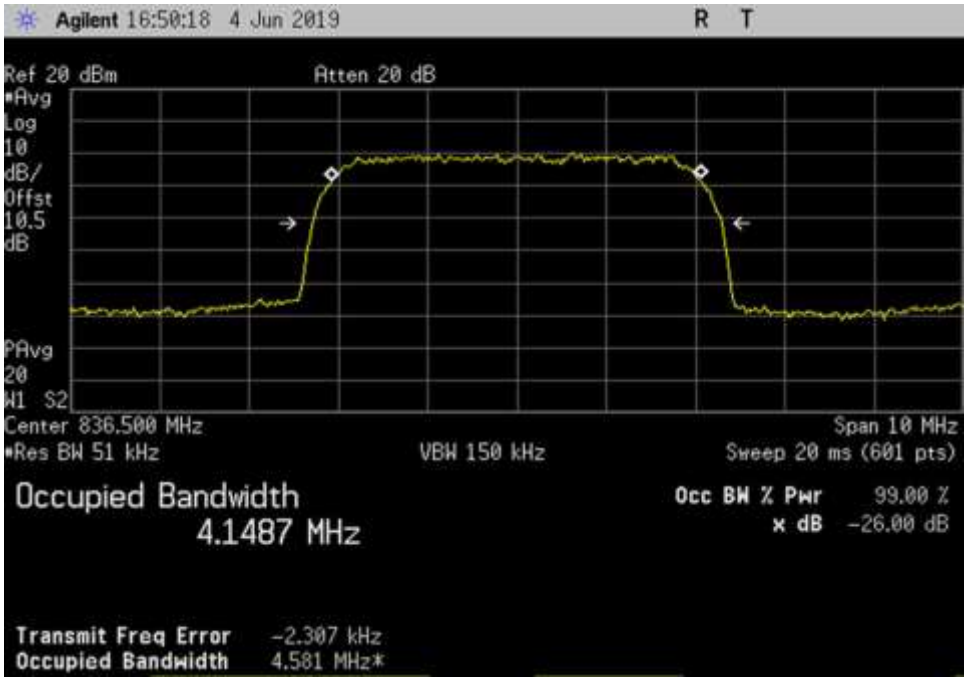
WCDMA-Output



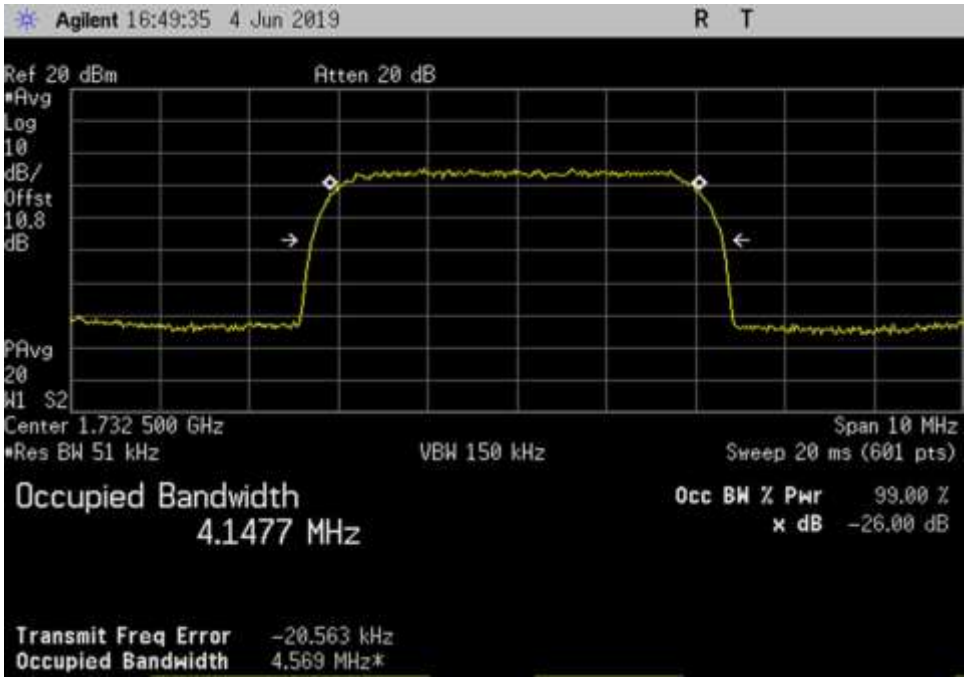
UL_698-716_WCDMA_ 707MHz_50ft Cable



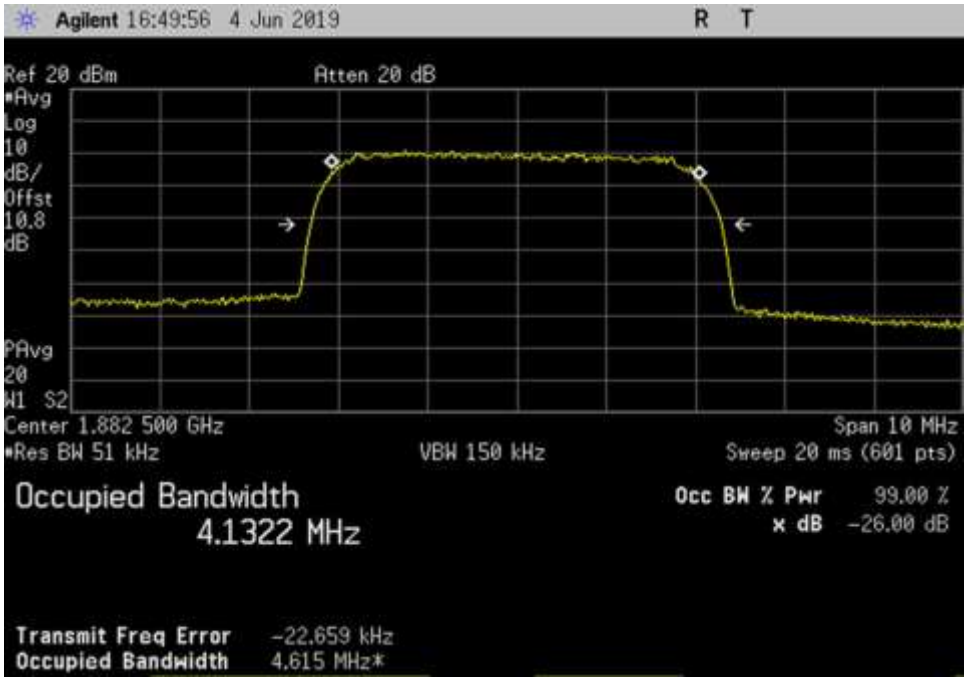
UL_776-787_WCDMA_ 781.5MHz_50ft Cable



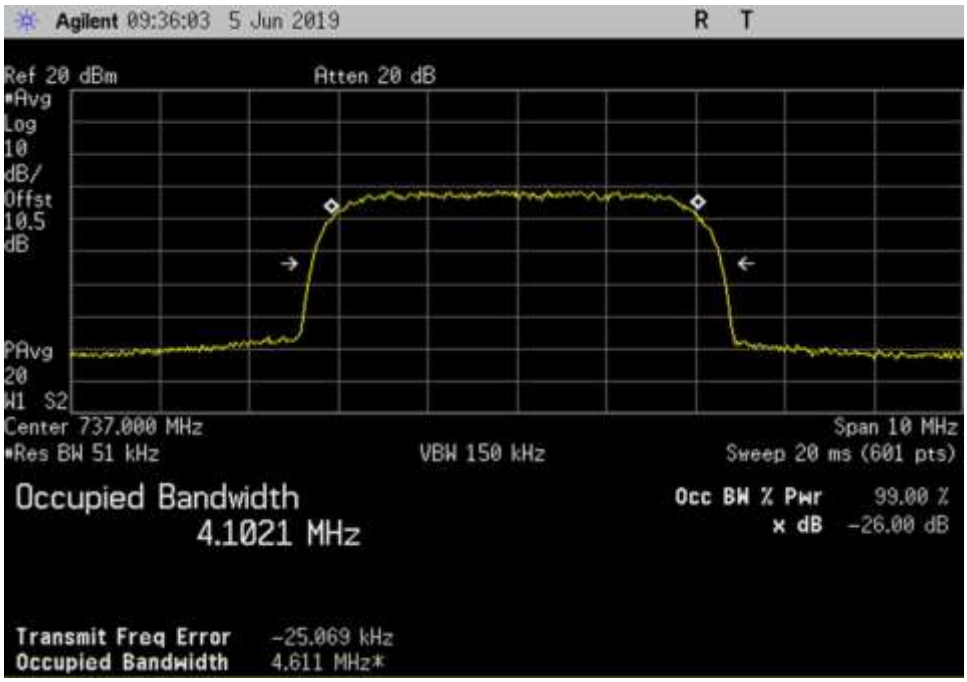
UL_824-849_WCDMA_ 836.5MHz_50ft Cable



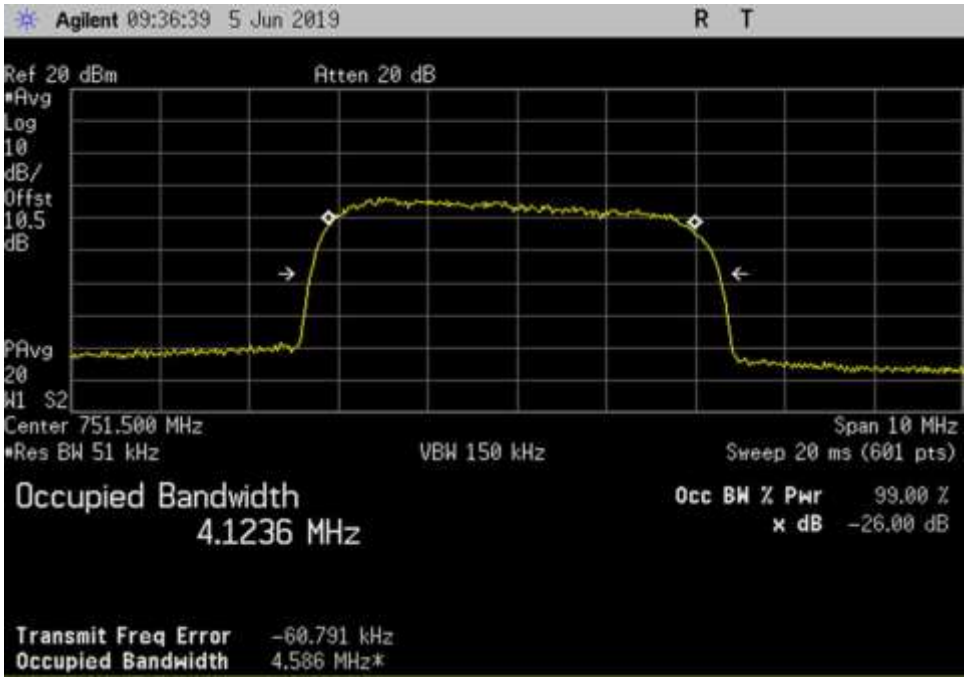
UL_1710-1755_WCDMA_ 1732.5MHz_50ft Cable



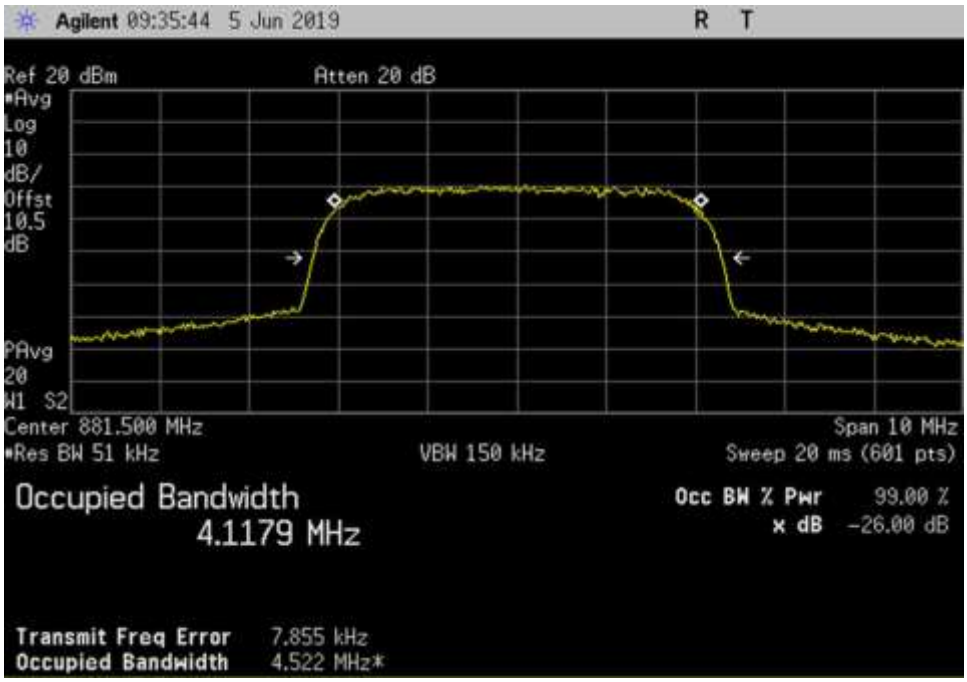
UL_1850-1915_WCDMA_ 1882.5MHz_50ft Cable



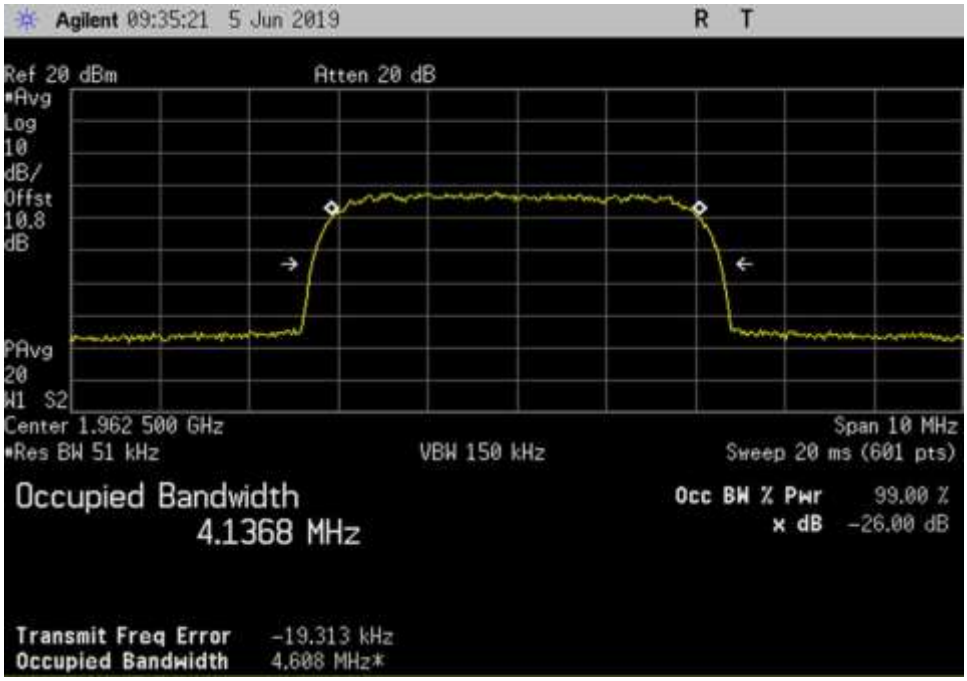
DL_728-746_WCDMA_ 737MHz



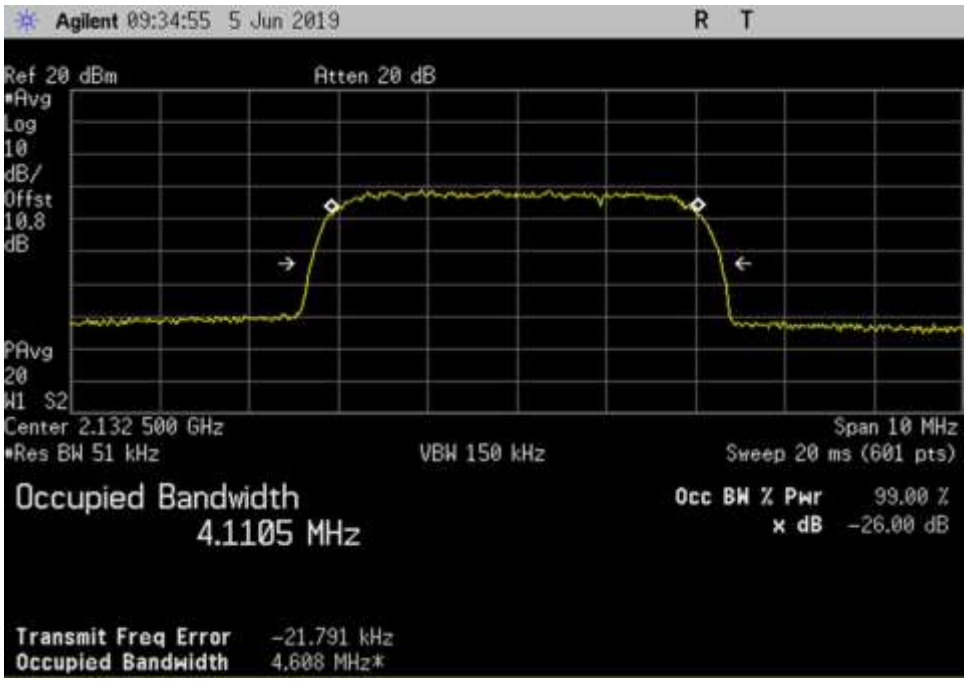
DL_746-757_WCDMA_ 751.5MHz



DL_869-894_WCDMA_ 881.5MHz



DL_1930-1995_WCDMA_ 1962.5MHz



DL_2110-2155_WCDMA_ 2132.5MHz

7.11 Oscillation Detection

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc.
Specification:	**7.11 Anti-Oscillation (Oscillation Restarts / Oscillation mitigation or shutdown)**
Work Order #:	**102129**
Test Type:	**Conducted Emissions** Date 06/07,10,11,12/2019
Tested By:	**Hieu Song Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

06/07/2019:
Test environment conditions: Temperature: 23.8°C, Relative Humidity: 42, Atmospheric Pressure: 101.4kPa

06/10/2019:
Test environment conditions: Temperature: 24.5°C, Relative Humidity: 52, Atmospheric Pressure: 102.1kPa

06/11/2019:
Test environment conditions: Temperature: 24.3°C, Relative Humidity: 47, Atmospheric Pressure: 102.5kPa

06/12/2019:
Test environment conditions: Temperature: 22.5°C, Relative Humidity: 44, Atmospheric Pressure: 102.1kPa

Note: UL1850-1915MHz -AWGNL+5:
- AWGNL denotes a 4.1MHz AWGN signal (99% occupied bandwidth) tuned to the frequency of 2.5 MHz above the lower edge of the operating band 1850-1915MHz.
- +5 denotes a variable attenuator adjusted such that the insertion loss for center of band under test (isolation) between the booster's donor and server ports is 5 dB greater than the maximum gain, as recorded in the maximum gain test procedure, for the band under test.

Modification 1 was in place during testing.

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	05/13/2019	05/13/2021
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020
P06904	Cable	Astrolab	32022-29094K-29094K-36TC	1/4/2018	1/4/2020
C00082	Directional Coupler	MECA Electronics, Inc.	722-10-1.500V	9/18/2017	9/18/2019
03412	Band Pass Filter	Pasternack	PE8705	8/16/2017	8/16/2019
03413	Band Pass Filter	Pasternack	PE8706	8/16/2017	8/16/2019
03414	Band Pass Filter	Pasternack	PE8707	8/16/2017	8/16/2019
03415	Band Pass Filter	Pasternack	PE8708	8/16/2017	8/16/2019
03447	Band Pass Filter	Pasternack	PE8710	8/16/2017	8/16/2019
03448	Band Pass Filter	Pasternack	PE8711	8/16/2017	8/16/2019
03446	Band Pass Filter	K & L	4FV50-707/H18-O/O	8/16/2017	8/16/2019
03467	High Pass Filter	K & L	4FV50-731/H30-O/O	8/16/2017	8/16/2019
03468	High Pass Filter	K & L	4CS10-781.5/E12.2-O/O	8/16/2017	8/16/2019
03469	High Pass Filter	K & L	4CS10-751.5/E12-O/O	8/16/2017	8/16/2019
02475	Attenuator	HP	8494B	6/8/2017	6/8/2019*
03429	Attenuator	HP	8496B	11/8/2017	11/8/2019

* Used for 6/7/2019 testing only.

Summary of Results

7.11 Summary of Results on a 50ft Cable

Pass: All oscillations detections and mitigations occur within 0.3 seconds in uplink bands, within 1 second in the downlink bands and the noise level is below the -70dBm/MHz limit.

7.11.2 Oscillation restart tests

Oscillation detection				Time Between restart		Number of restart	
Frequency	Measured	Limit	Peak Level	Measured	Limit	Measured	Limit
MHz	Sec	Sec	dBm	Sec	At least sec		
UL1710-1755	0.250	0.3	28.9	68	60	1	5
UL1850-1915	0.250	0.3	26.3	68	60	1	5
UL824-894	0.250	0.3	28.6	70	60	1	5
UL 698-716	0.275	0.3	30.7	68	60	1	5
UL776-787	0.250	0.3	29.8	70	60	1	5
DL2110-2155	0.275	1.0	11.2	70	60	1	5
DL1930-1995	0.275	1.0	16.9	69	60	1	5
DL869-894	0.250	1.0	13.8	67	60	1	5
DL:728-746	0.258	1.0	17.2	67	60	1	5
DL 746-757	0.250	1.0	15.4	69	60	1	5

The booster continues to mitigate at least 1 minute before restarting. The plots demonstrate after 1 restart (the limit is 5 restart), the booster does not resume operation until manually reset.

7.11.3 Test procedure for measuring oscillation mitigation or shutdown

	UL 1710-1755	UL1850-1915	UL 824-894	UL 698-716	UL 776-787	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	(12.6) *	10.8	11.5	11.3	11.5	12.0
+4dB	(14.7) *	(12.8) *	(12.2) *	(12.6) *	(13.1) *	12.0
+3dB	(17.3) *	(15.5) *	(14.8) *	(15.4) *	(15.2) *	12.0
+2dB	(21.2) *	(17.8) *	(17.4) *	(18.2) *	(19.4) *	12.0
+1dB	(30.1) *	(21.9) *	(23.7) *	(24.2) *	(24.4) *	12.0
0dB	**	(66.4) *	(61.5) *	(39.4) *	(47.4) *	12.0
-1dB	**	**	**		**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**		**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

	DL 2110-2155	DL 1930-1995	DL 869-894	DL 728-746	DL 746-775	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	(14.1) *	(12.1) *	(12.1) *	(12.1) *	10.9	12.0
+4dB	(16.6) *	(14.1) *	(14.3) *	(14.1) *	(12.4) *	12.0
+3dB	(19.2) *	(16.5) *	(17.6) *	(16.5) *	(15.4) *	12.0
+2dB	(23.9) *	(19.4) *	(20.7) *	(19.4) *	(17.7) *	12.0
+1dB	(36.5) *	(28.7) *	(28.9) *	(28.7) *	(22.3) *	12.0
0dB	**	**	**	**	(32.1) *	12.0
-1dB	**	**	**	**	**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

Note:
* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 97 seconds for the Uplink bands and 96 seconds for the Downlink bands.

** The device shuts down immediately.

7.11 Summary of Results on a 100ft Cable

Pass: All oscillations detections and mitigations occur within 0.3 seconds in uplink bands, within 1 second in the downlink bands and the noise level is below the -70dBm/MHz limit.

7.11.2 Oscillation restart tests

Oscillation detection				Time Between restart		Number of restart	
Frequency	Measured	Limit	Peak Level	Measured	Limit	Measured	Limit
MHz	Sec	Sec	dBm	Sec	At least sec		
UL1710-1755	0.242	0.3	27.4	69	60	1	5
UL1850-1915	0.233	0.3	26.3	70	60	1	5
UL824-894	0.250	0.3	28.0	68	60	1	5
UL 698-716	0.242	0.3	30.7	67	60	1	5
UL776-787	0.242	0.3	29.1	69	60	1	5
DL2110-2155	0.275	1.0	6.9	68	60	1	5
DL1930-1995	0.233	1.0	12.9	67	60	1	5
DL869-894	0.275	1.0	7.0	68	60	1	5
DL:728-746	0.250	1.0	11.3	71	60	1	5
DL 746-757	0.250	1.0	13.8	69	60	1	5

The booster continues to mitigate at least 1 minute before restarting. The plots demonstrate after 1 restart (the limit is 5 restart), the booster does not resume operation until manually reset.

7.11.3 Test procedure for measuring oscillation mitigation or shutdown

	UL 1710-1755	UL1850-1915	UL 824-894	UL 698-716	UL 776-787	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	11.5	9.1	9.1	10.1	9.2	12.0
+4dB	(13.5) *	10.6	11.5	(12.5) *	11.2	12.0
+3dB	(14.5) *	11.6	(13.7) *	(14.3) *	(12.8) *	12.0
+2dB	(18.4) *	(14.2) *	(15.8) *	(17.1) *	(15.3) *	12.0
+1dB	(23.1) *	(15.7) *	(19.8) *	(21.4) *	(23.8) *	12.0
0dB	(34.7) *	(20.7) *	(26.5) *	(31.1) *	(38.4) *	12.0
-1dB	**	(24.6) *	(70.4) *		**	12.0
-2dB	**	(54.7) *	**	**	**	12.0
-3dB	**		**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

	DL 2110-2155	DL 1930-1995	DL 869-894	DL 728-746	DL 746-775	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	(14.9) *	(13.1) *	(12.2) *	(12.4) *	11.6	12.0
+4dB	(16.4) *	(15.2) *	(14.6) *	(14.7) *	(13.5) *	12.0
+3dB	(20.3) *	(18.3) *	(18.8) *	(17.4) *	(16.5) *	12.0
+2dB	(24.7) *	(20.1) *	(24.2) *	(24.5) *	(17.6) *	12.0
+1dB	(34.7) *	(23.9) *	(39.5) *	(34.1) *	(19.5) *	12.0
0dB	**	**	**	**	(21.5) *	12.0
-1dB	**	**	**	**	(28.2) *	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

Note:
* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 96 seconds for the Uplink bands and 95 seconds for the Downlink bands.

** The device shuts down immediately.

7.11 Summary of Results on a 150ft Cable

Pass: All oscillations detections and mitigations occur within 0.3 seconds in uplink bands, within 1 second in the downlink bands and the noise level is below the -70dBm/MHz limit.

7.11.2 Oscillation restart tests

Oscillation detection				Time Between restart		Number of restart	
Frequency	Measured	Limit	Peak Level	Measured	Limit	Measured	Limit
MHz	Sec	Sec	dBm	Sec	At least sec		
UL1710-1755	0.233	0.3	27.1	70	60	1	5
UL1850-1915	0.242	0.3	24.1	67	60	1	5
UL824-894	0.233	0.3	27.9	68	60	1	5
UL 698-716	0.250	0.3	29.3	69	60	1	5
UL776-787	0.258	0.3	28.5	68	60	1	5
DL2110-2155	0.250	1.0	1.8	67	60	1	5
DL1930-1995	0.250	1.0	7.4	67	60	1	5
DL869-894	0.242	1.0	8.2	69	60	1	5
DL:728-746	0.242	1.0	10.2	67	60	1	5
DL 746-757	0.242	1.0	11.7	68	60	1	5

The booster continues to mitigate at least 1 minute before restarting. The plots demonstrate after 1 restart (the limit is 5 restart), the booster does not resume operation until manually reset.

7.11.3 Test procedure for measuring oscillation mitigation or shutdown

	UL 1710-1755	UL1850-1915	UL 824-894	UL 698-716	UL 776-787	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	(13.7) *	(12.2) *	(12.1) *	10.0	(12.6) *	12.0
+4dB	(17.2) *	(13.3) *	(14.5) *	(13.1) *	(13.6) *	12.0
+3dB	(22.6) *	(16.2) *	(16.5) *	(14.5) *	(16.5) *	12.0
+2dB	(31.9) *	(18.2) *	(20.1) *	(18.4) *	(18.4) *	12.0
+1dB	**	(24.1) *	(27.4) *	(23.1) *	(22.4) *	12.0
0dB	**	(39.1) *	(76.4) *	(40.4) *	(30.8) *	12.0
-1dB	**	(68.6) *	**		**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**		**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

	DL 2110-2155	DL 1930-1995	DL 869-894	DL 728-746	DL 746-775	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	(15.1) *	(15.3) *	(12.6) *	11.8	10.3	12.0
+4dB	(16.7) *	(16.7) *	(13.8) *	(13.5) *	11.4	12.0
+3dB	(21.3) *	(21.3) *	(15.2) *	(16.6) *	(14.5) *	12.0
+2dB	(30.4) *	(30.4) *	(18.6) *	(20.9) *	(19.1) *	12.0
+1dB	**	**	(39.5) *	(30.7) *	(23.6) *	12.0
0dB	**	**	**	**	(30.6) *	12.0
-1dB	**	**	**	**	**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

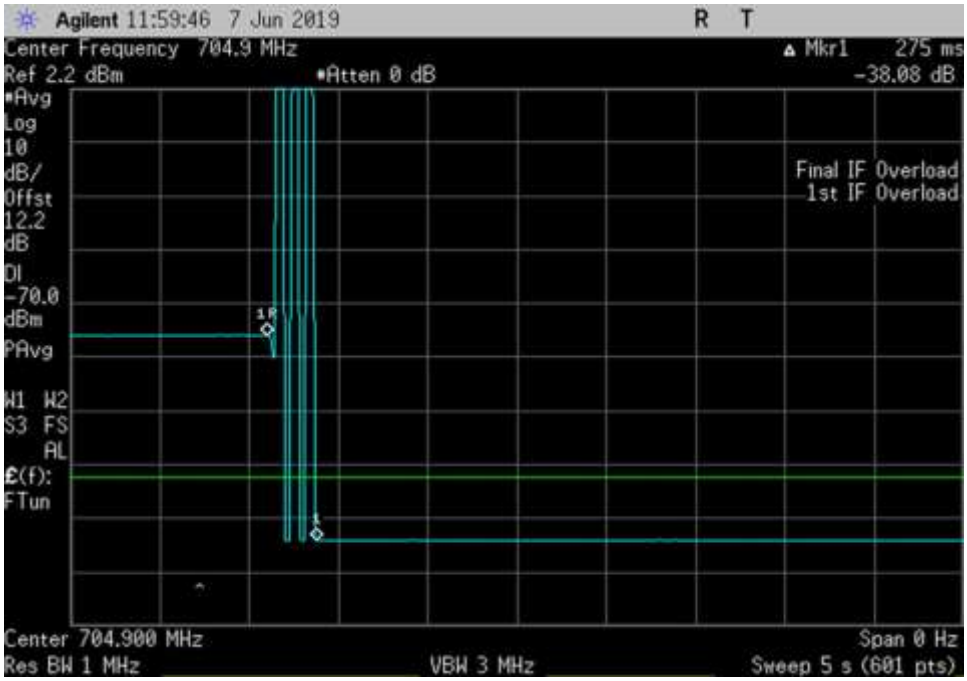
Note:
* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 95 seconds for the Uplink bands and 96 seconds for the Downlink bands.

** The device shuts down immediately.

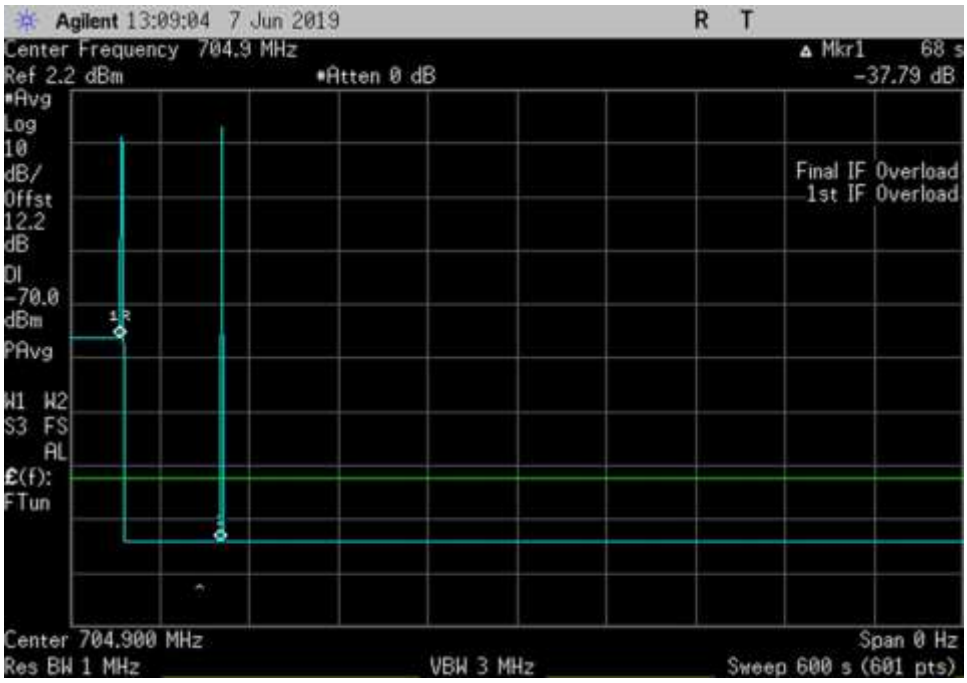
7.11.2 Oscillation Restart Tests

Plots

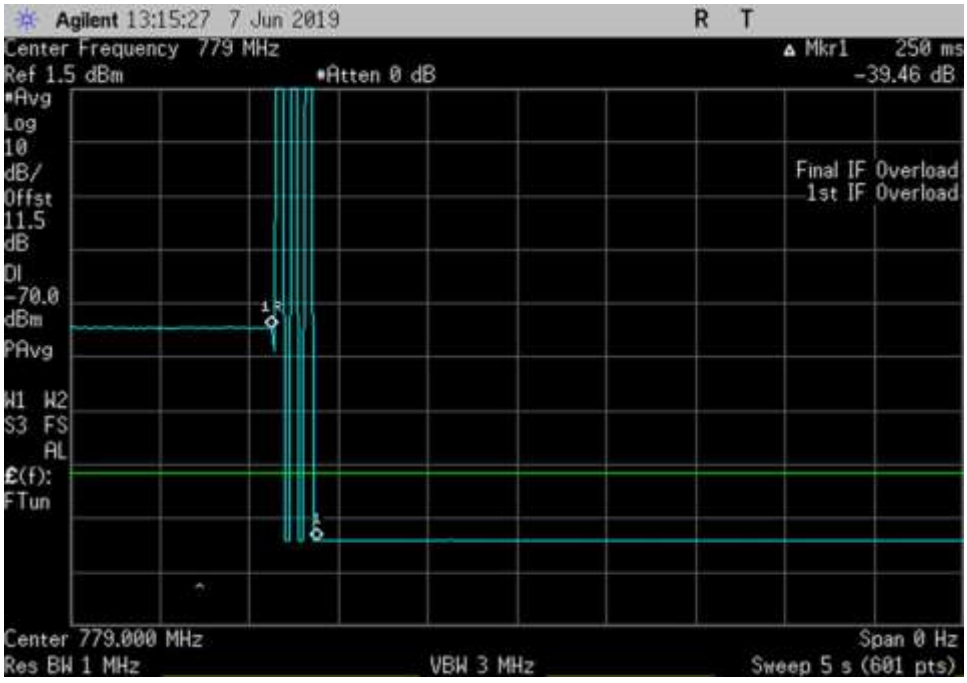
Configuration 1



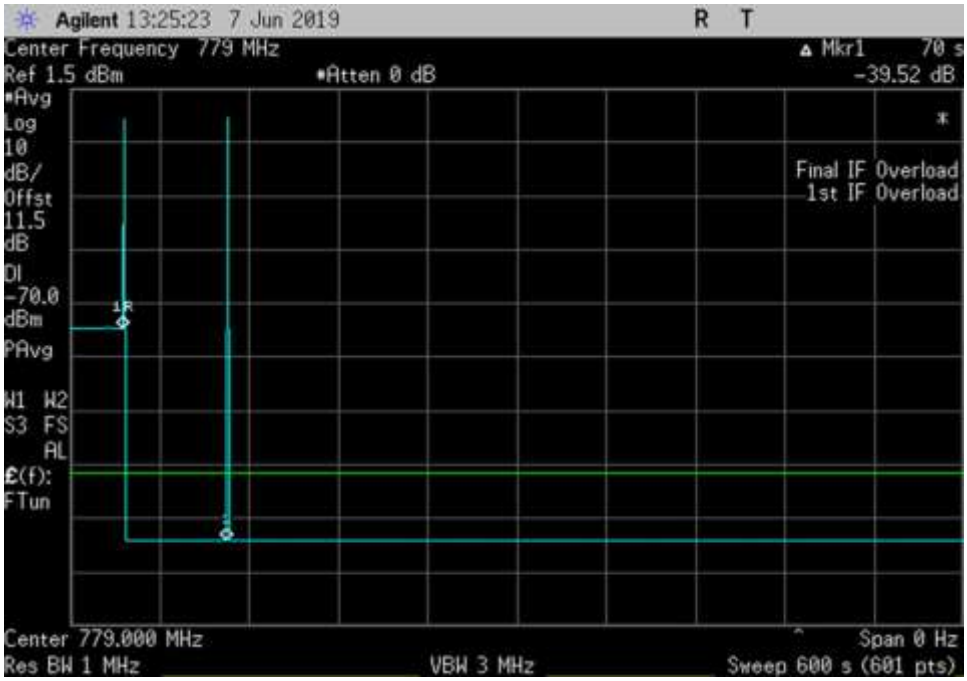
UL_698-716_ 704.9MHz_50ft Cable



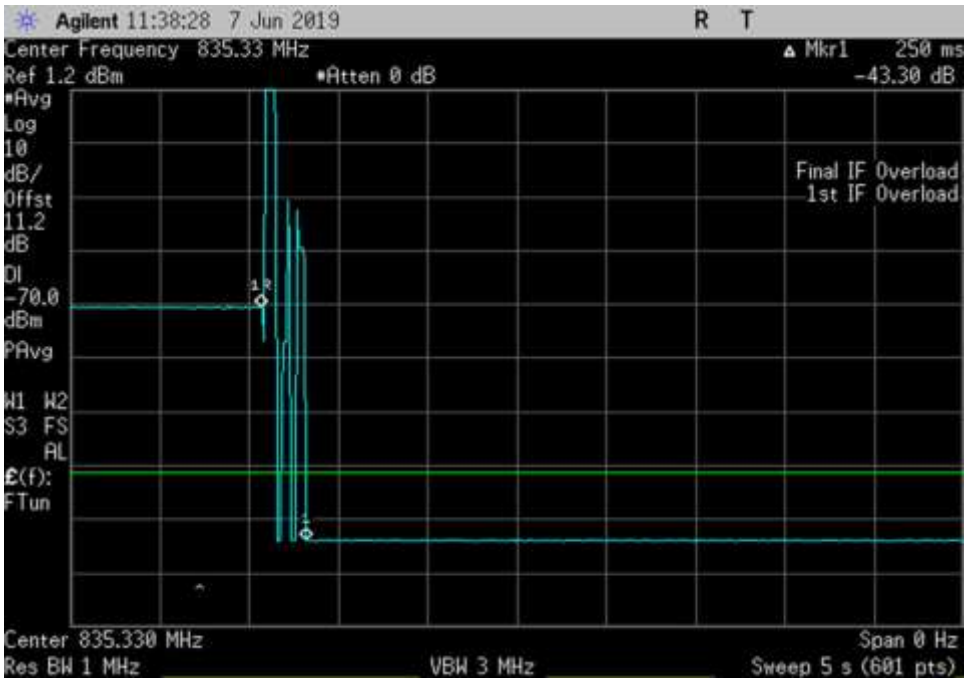
UL_698-716_ 704.9MHz_600s_50ft Cable



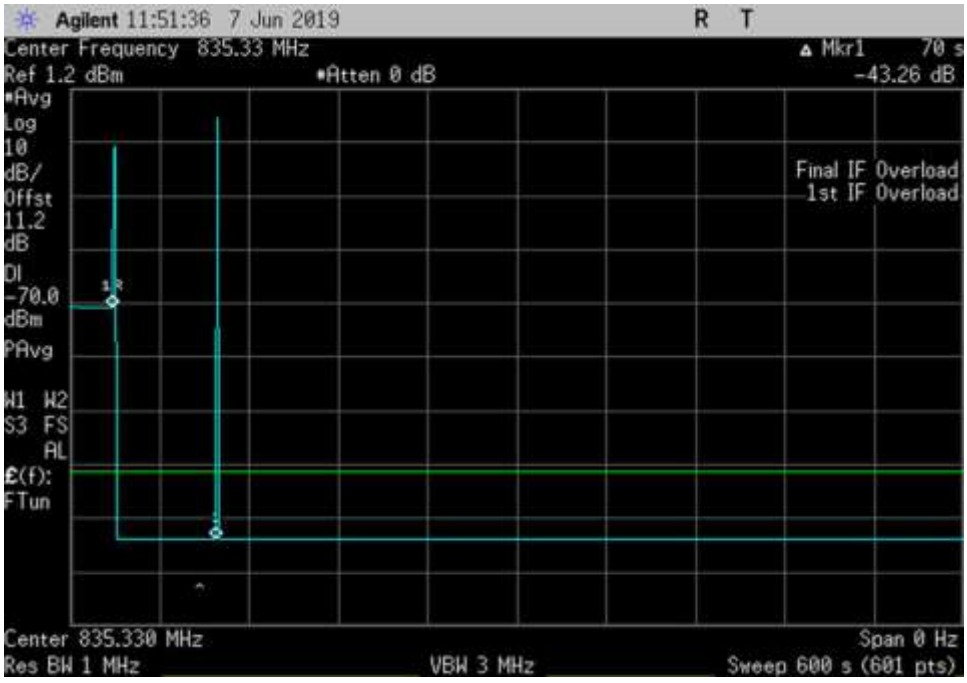
UL_776-787_ 779MHz_50ft Cable



UL_776-787_ 779MHz_600s_50ft Cable



UL_824-849_ 835.33MHz_50ft Cable



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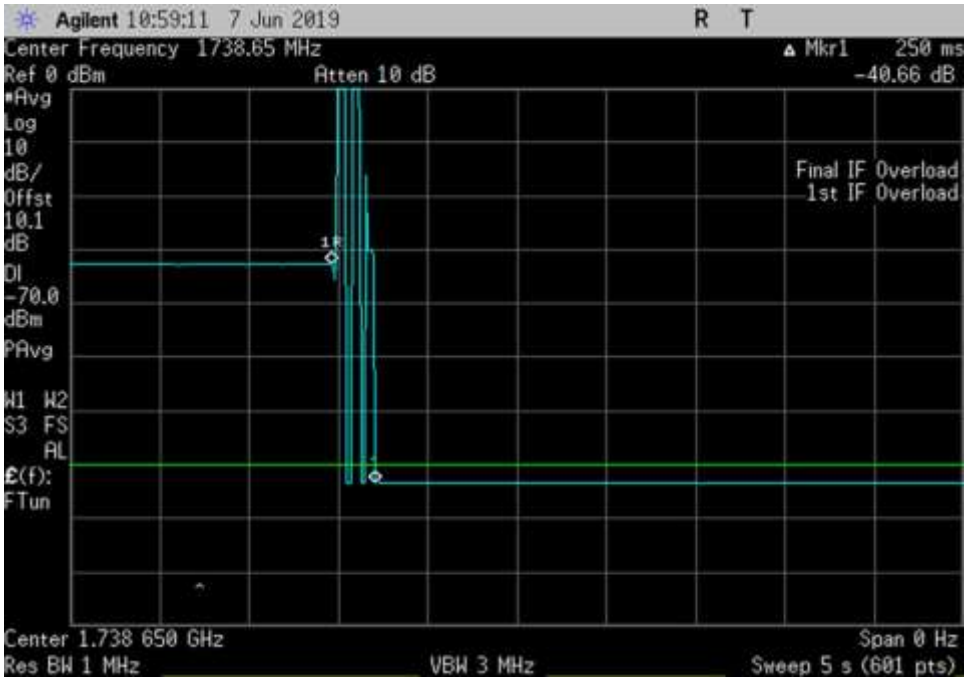
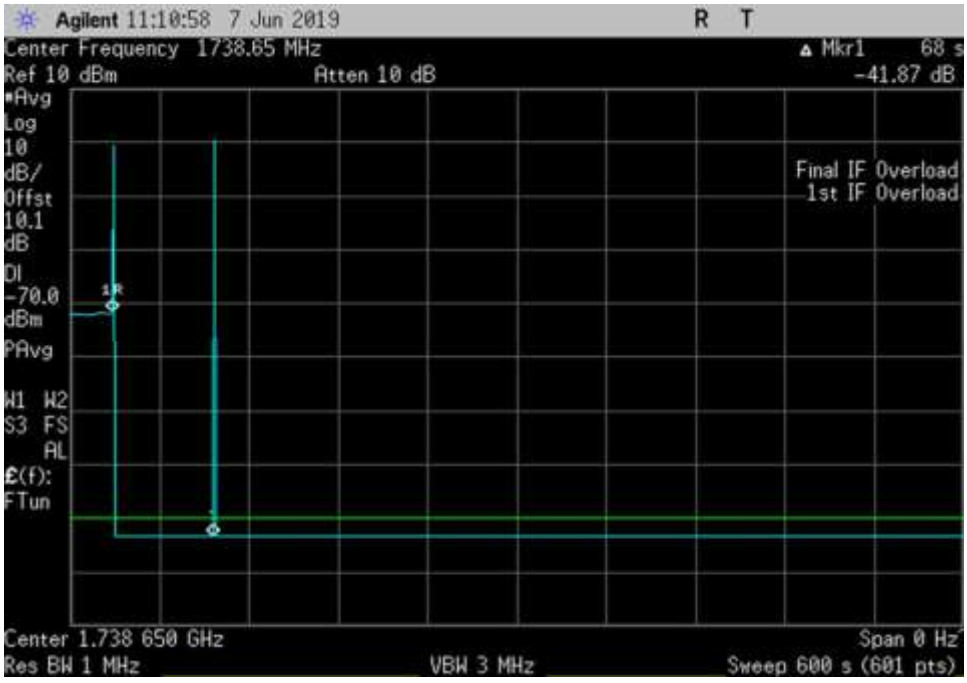


UL_1710-1755_ 1738.65MHz_50ft Cable



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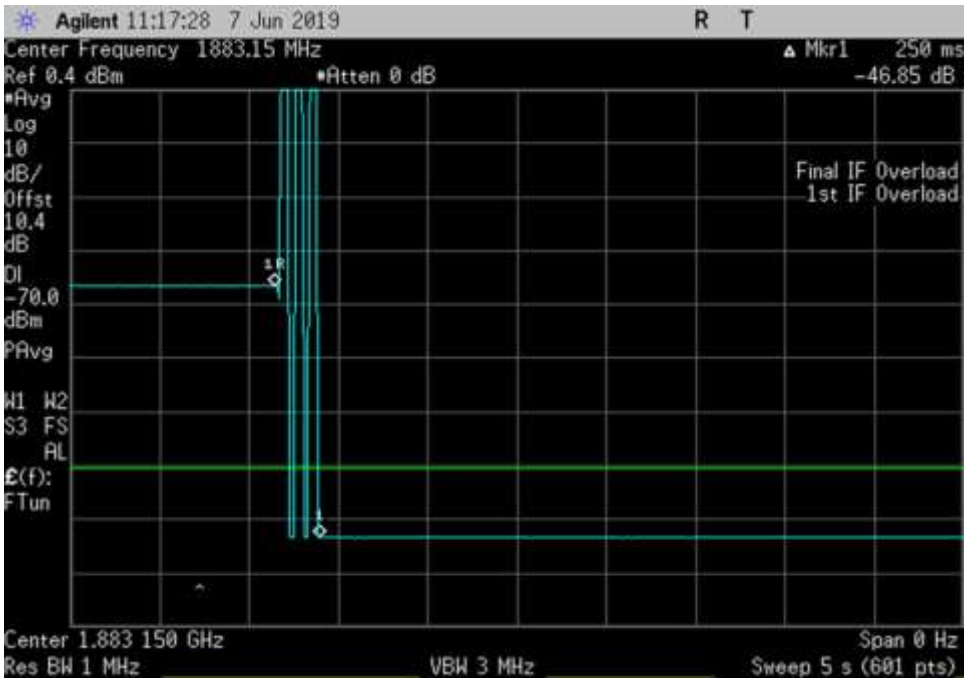
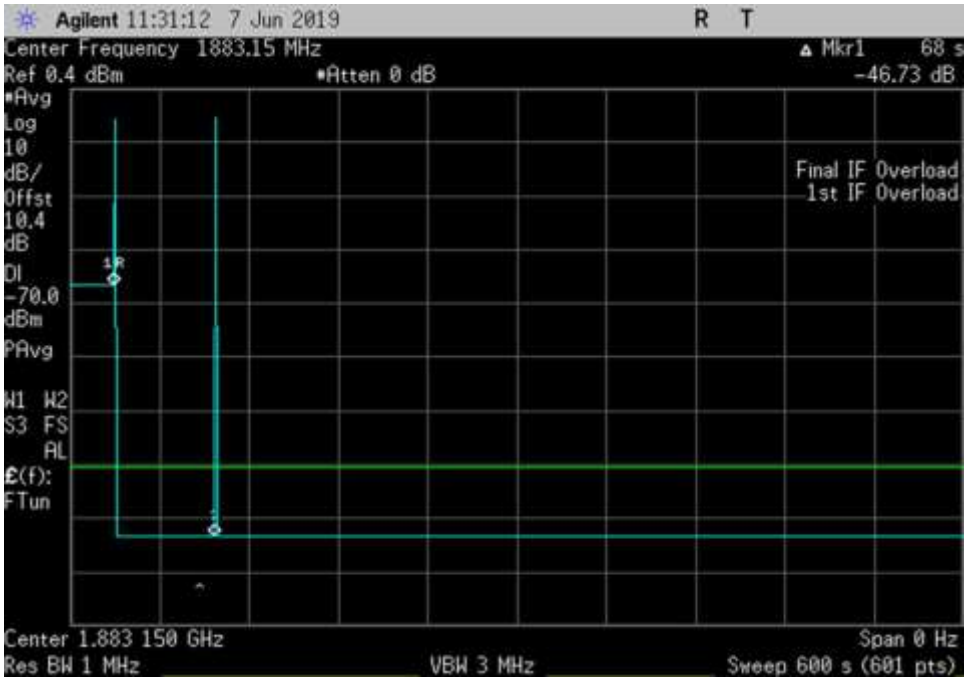
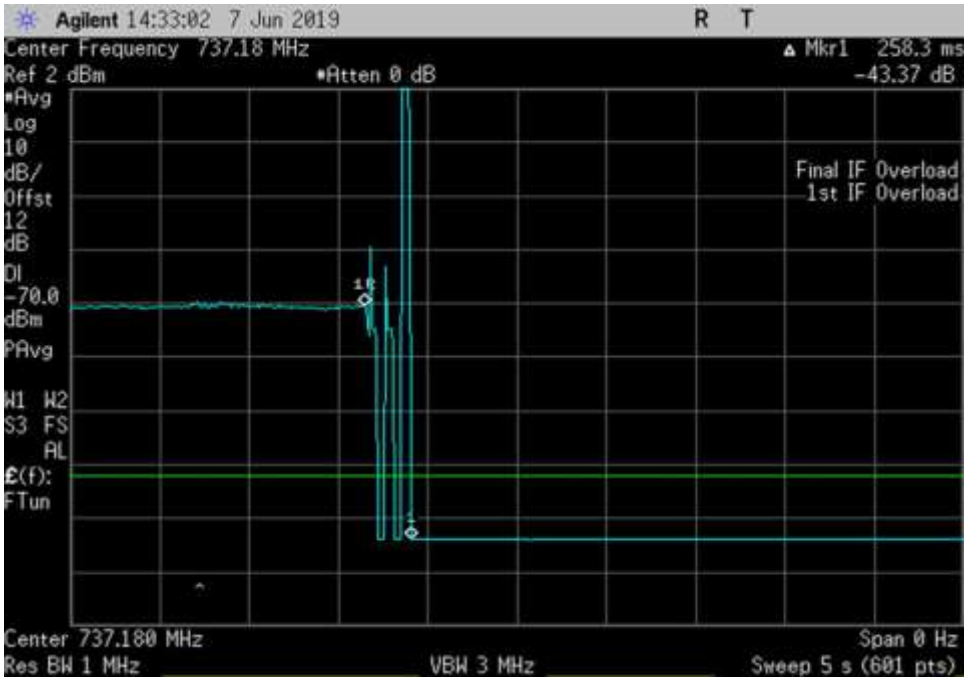


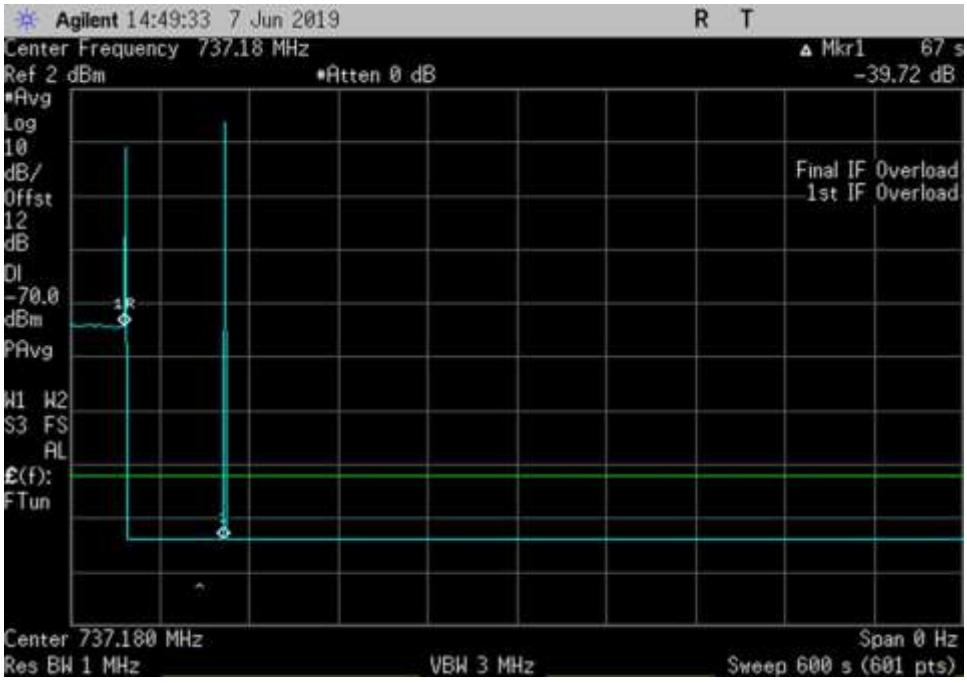
UL_1850-1915_ 1883.15MHz_50ft Cable



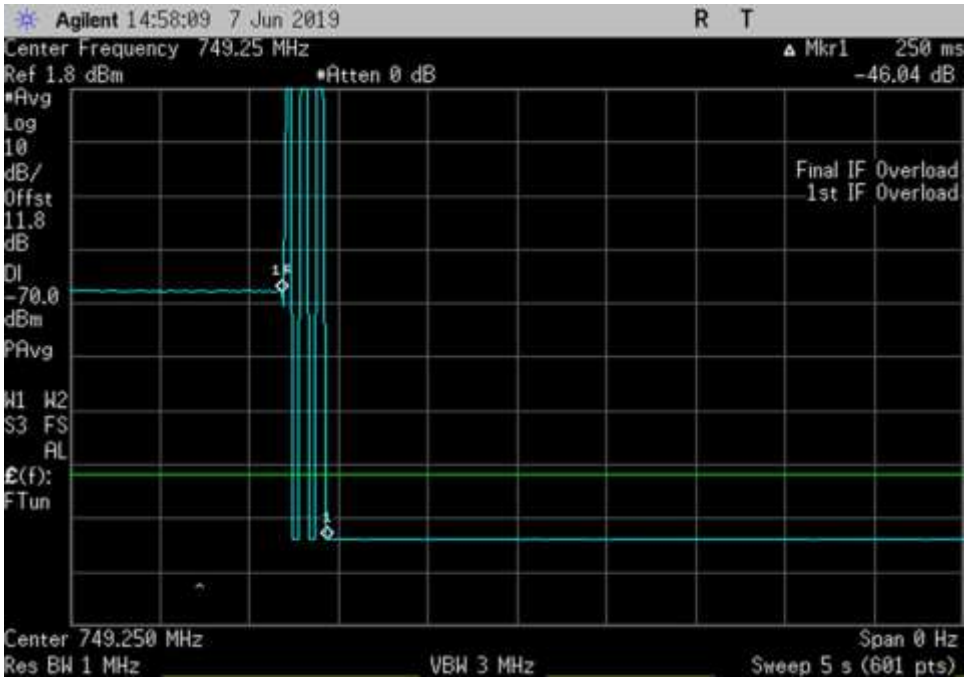
UL_1850-1915_ 1883.15MHz_600s_50ft Cable



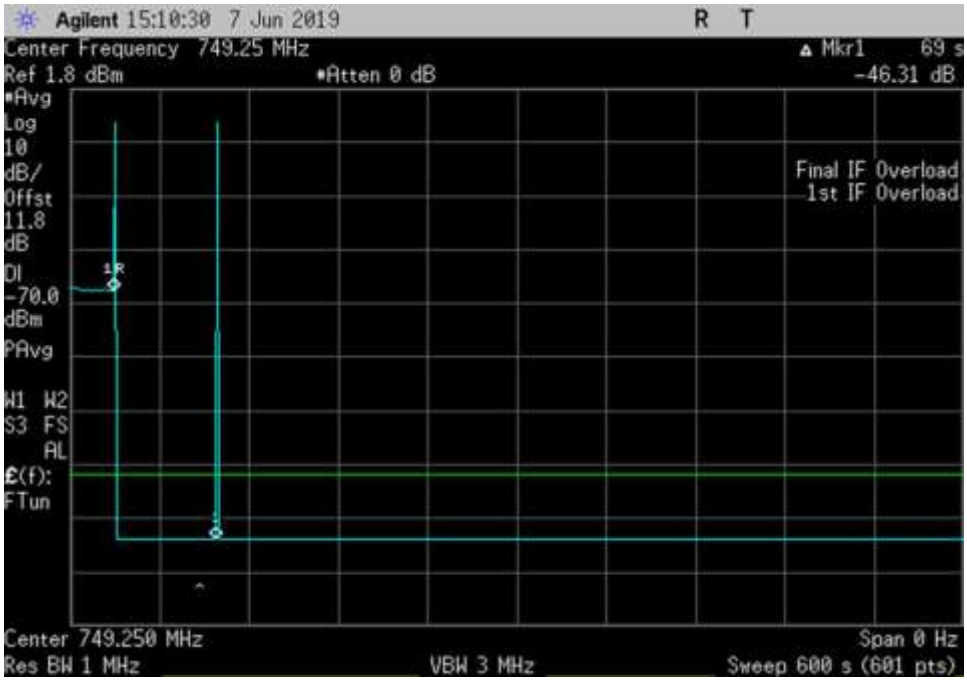
DL_728-746_ 737.18MHz_50ft Cable



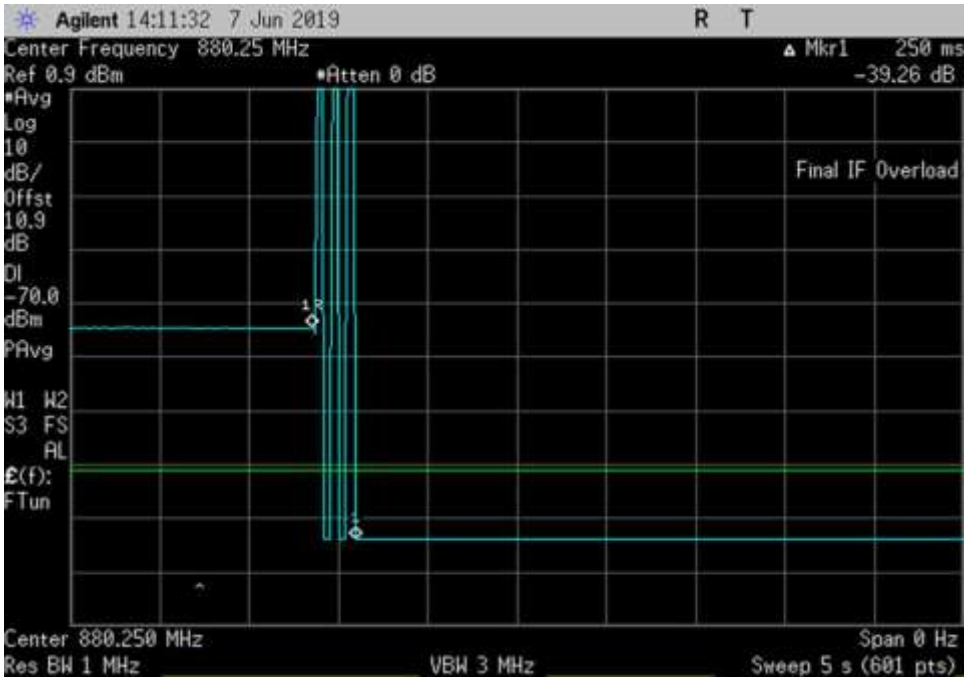
DL_728-746_ 737.18MHz_600s_50ft Cable



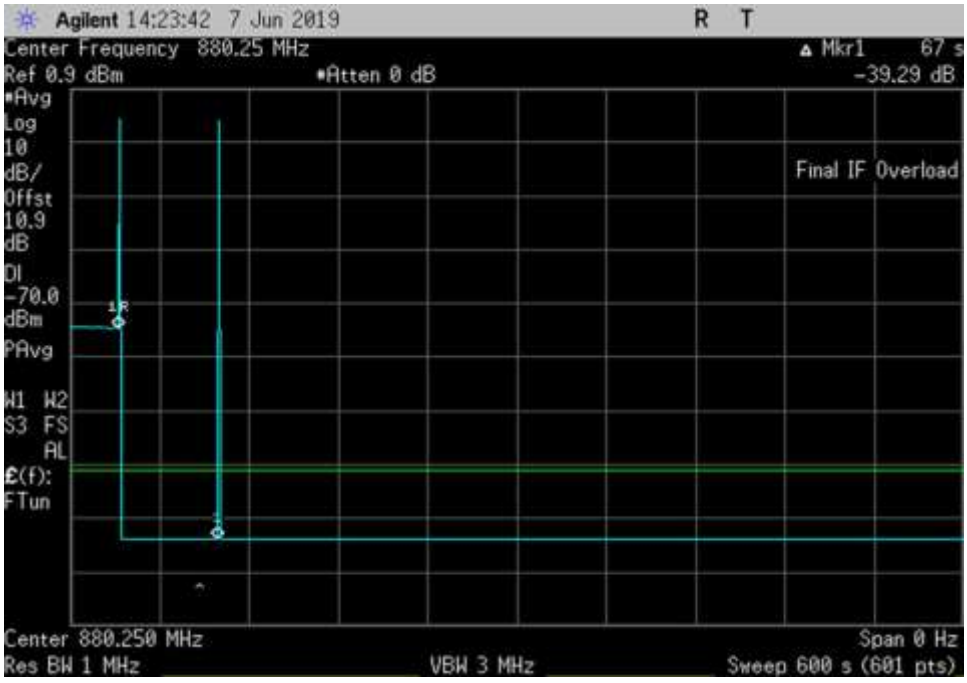
DL_746-757_ 749.25MHz_50ft Cable



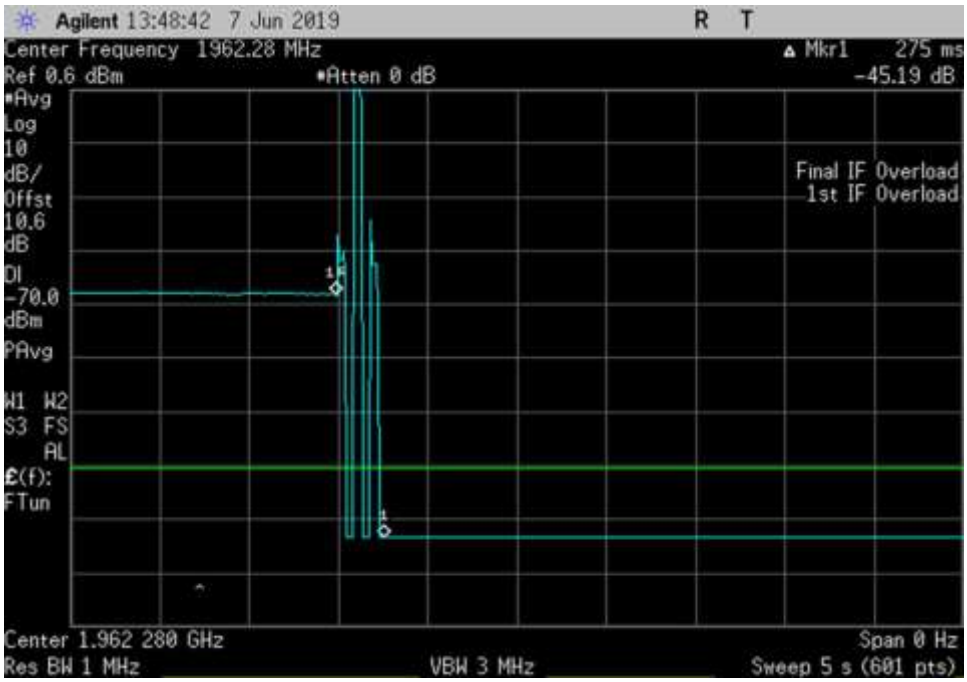
DL_746-757_ 749.25MHz_600s_50ft Cable



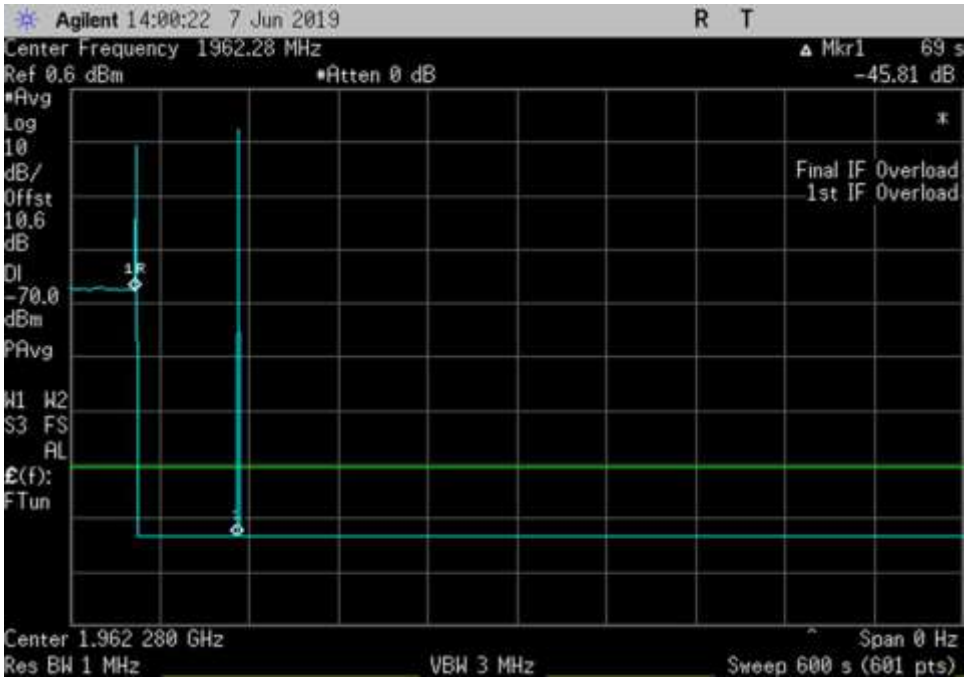
DL_869-894_ 880.25MHz_50ft Cable



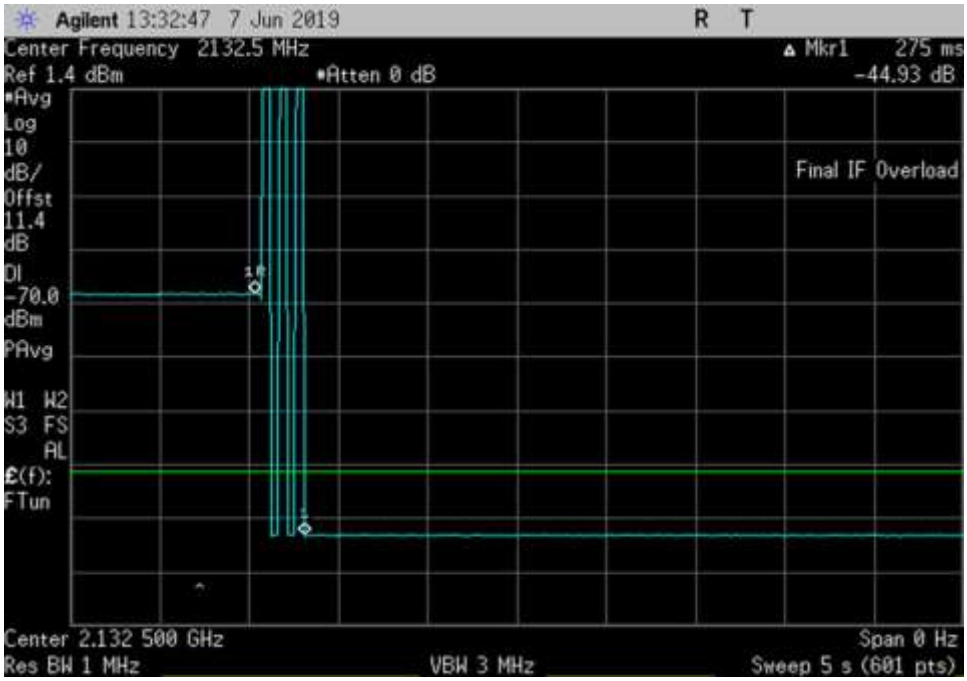
DL_869-894_ 880.25MHz_600s_50ft Cable



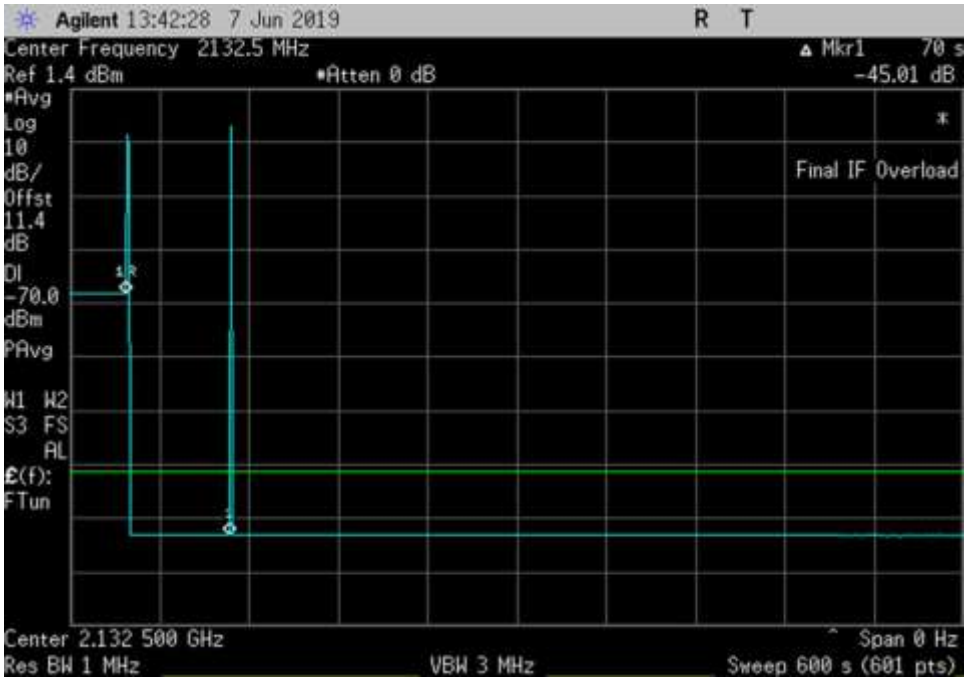
DL_1930-1995_ 1962.28MHz_50ft Cable



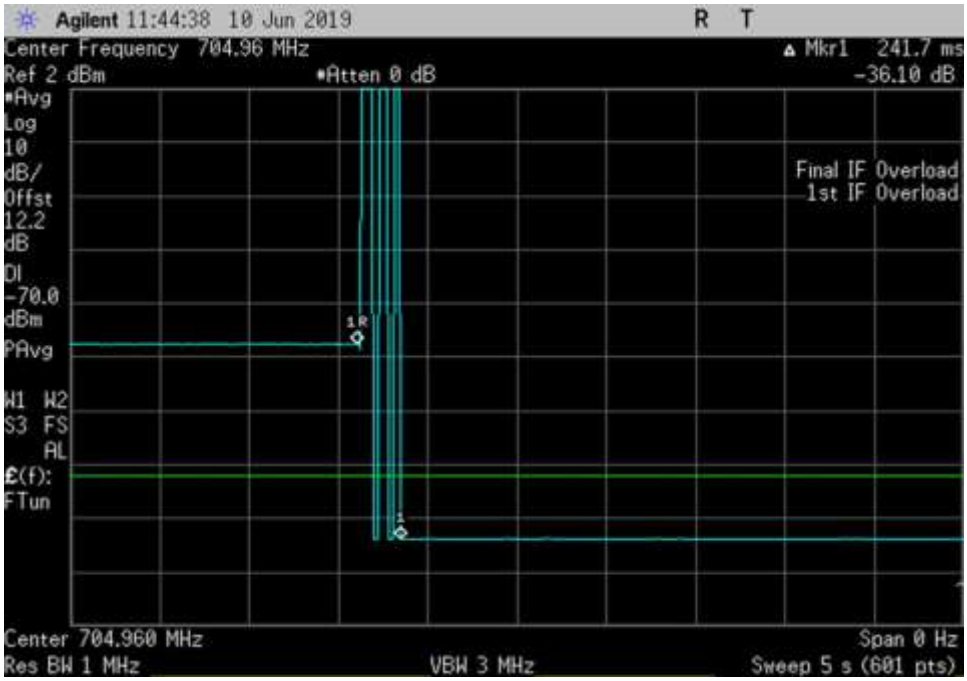
DL_1930-1995_ 1962.28MHz_600s_50ft Cable



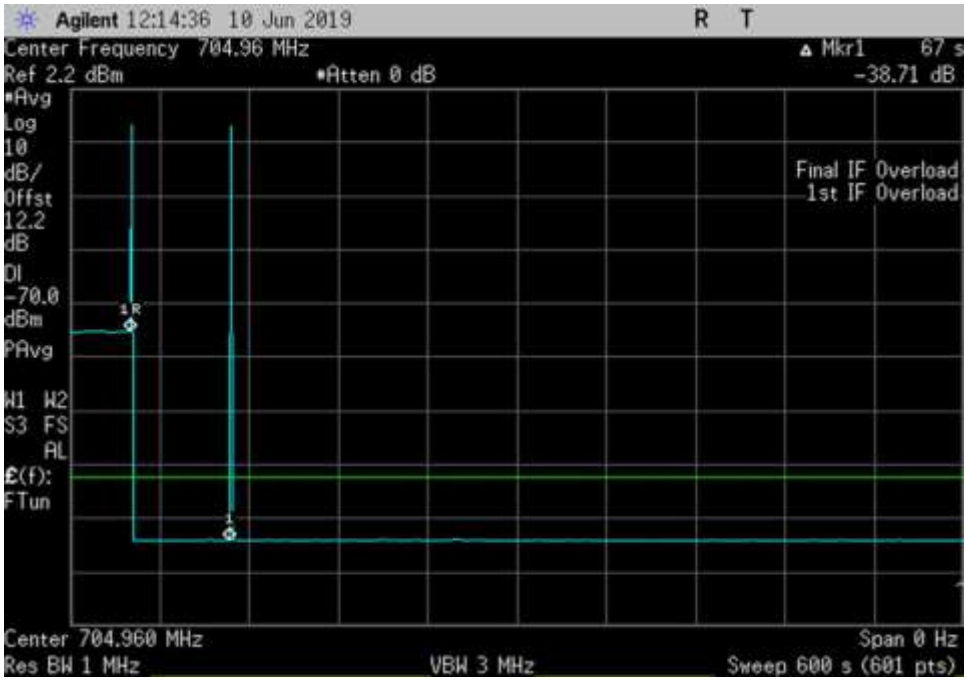
DL_2110-2155_ 2132.5MHz_50ft Cable



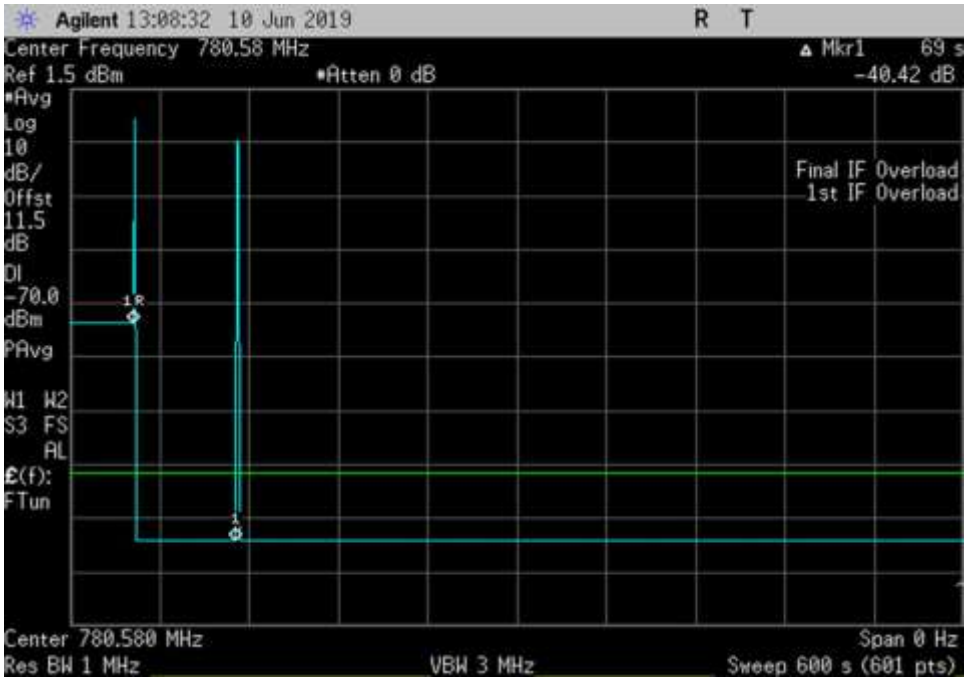
DL_2110-2155_ 2132.5MHz_600s_50ft Cable



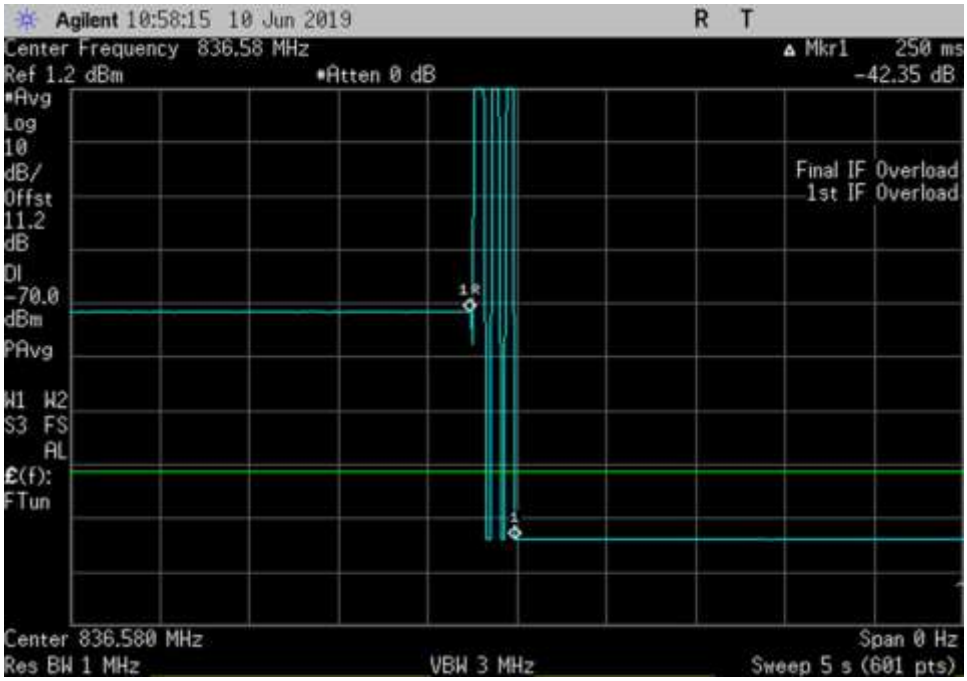
UL_698-716_ 704.96MHz_100ft Cable



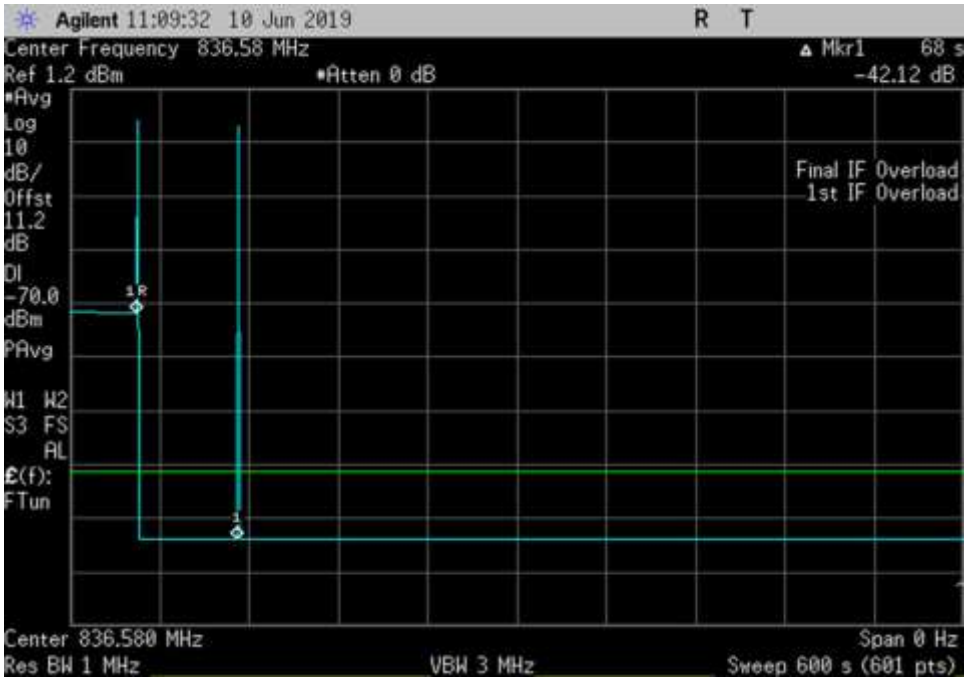
UL_698-716_ 704.96MHz_600s_100ft Cable



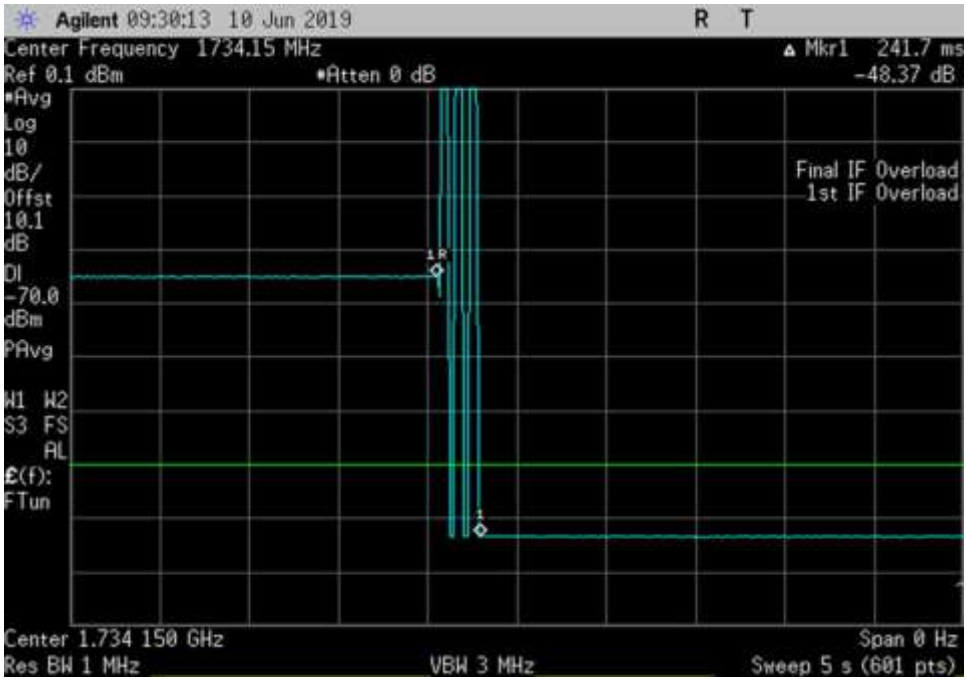
UL_776-787_ 780.58MHz_600s_100ft Cable



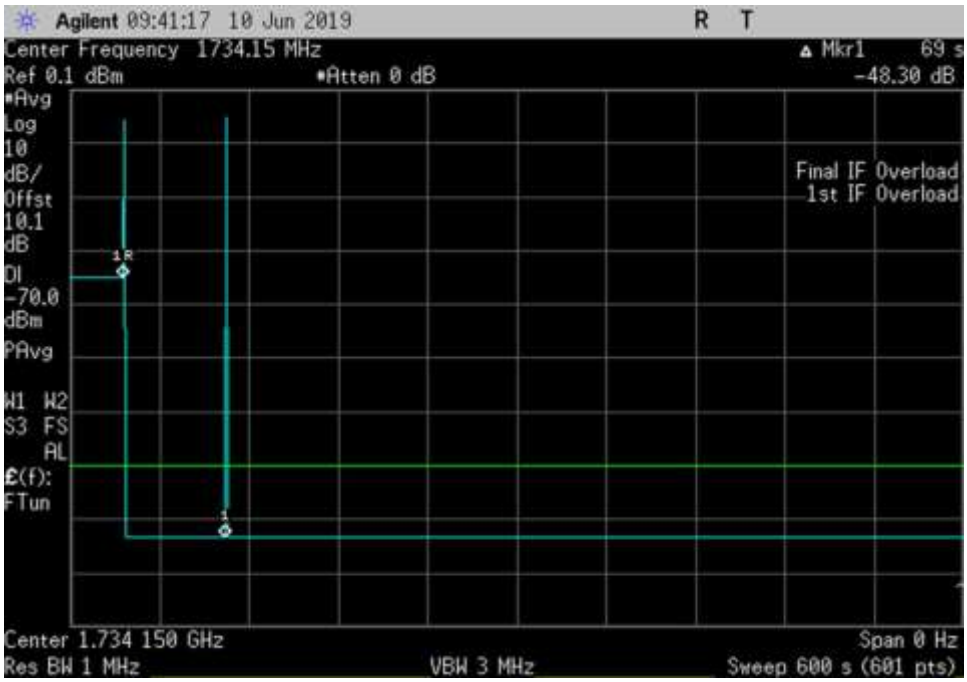
UL_824-849_ 836.58MHz_100ft Cable



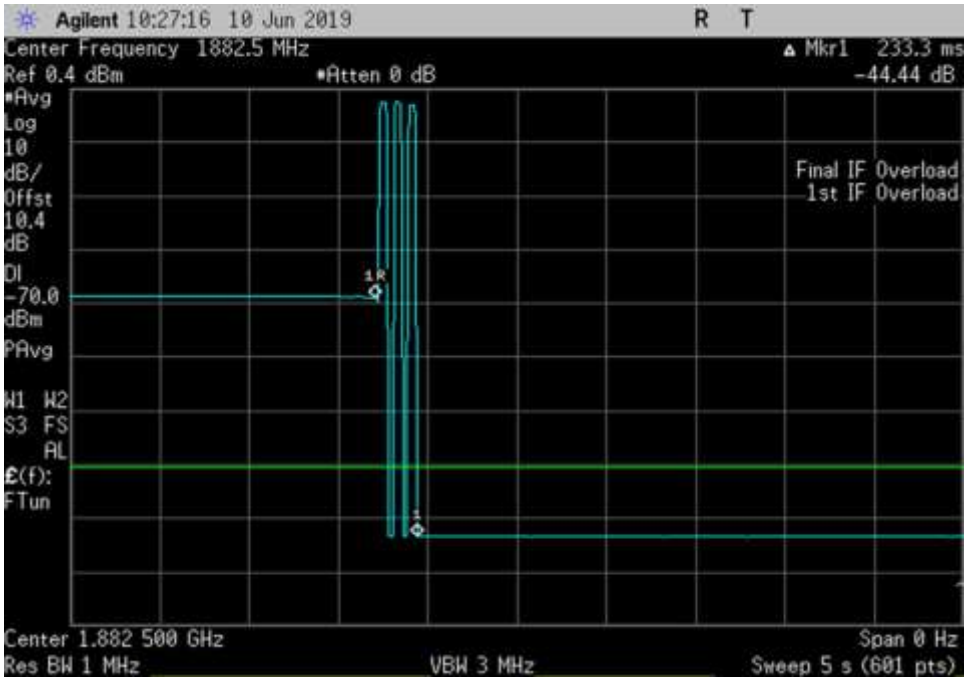
UL_824-849_ 836.58MHz_600s_100ft Cable



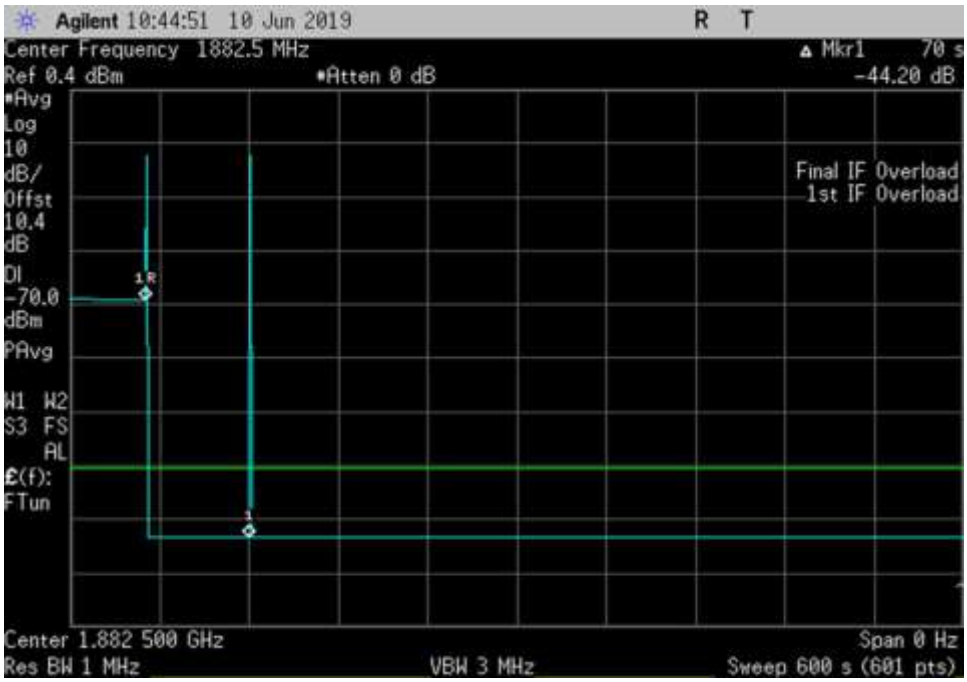
UL_1710-1755_ 1734.15MHz_100ft Cable



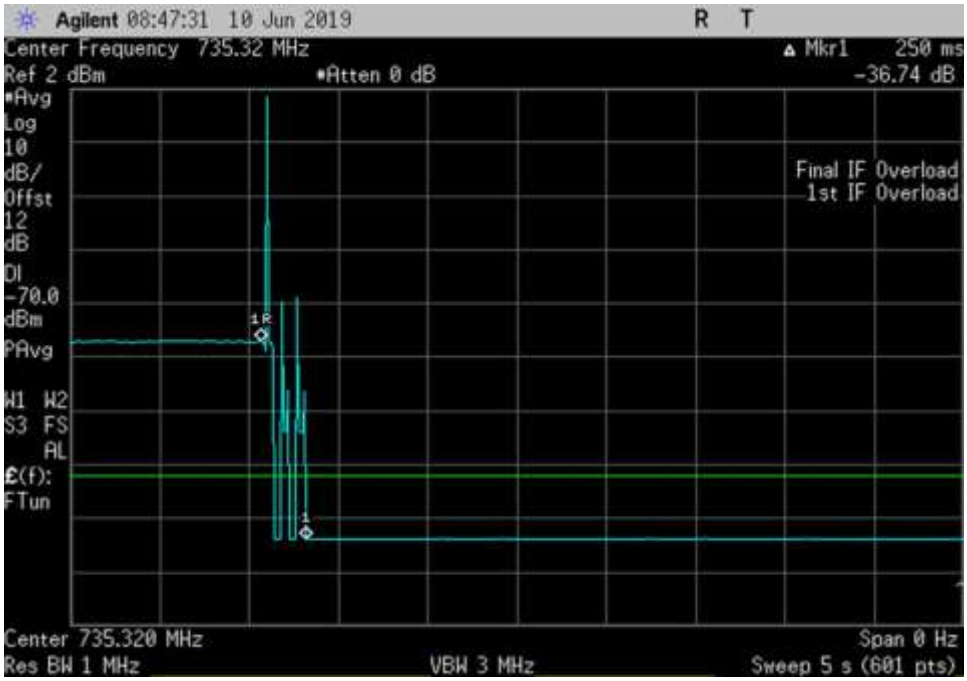
UL_1710-1755_ 1734.15MHz_600s_100ft Cable



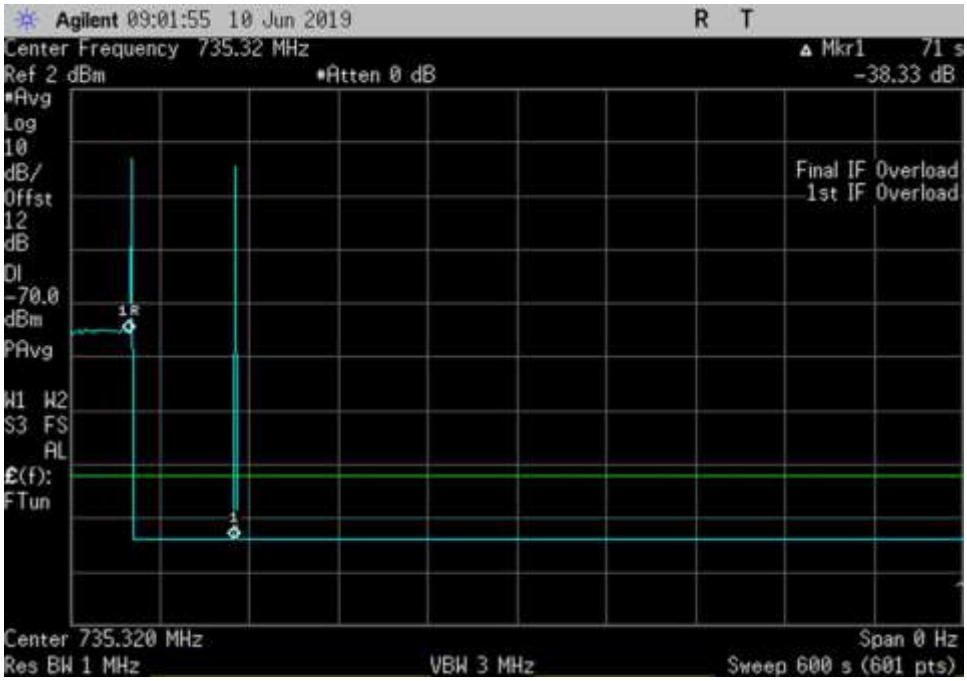
UL_1850-1915_ 1882.5MHz_100ft Cable



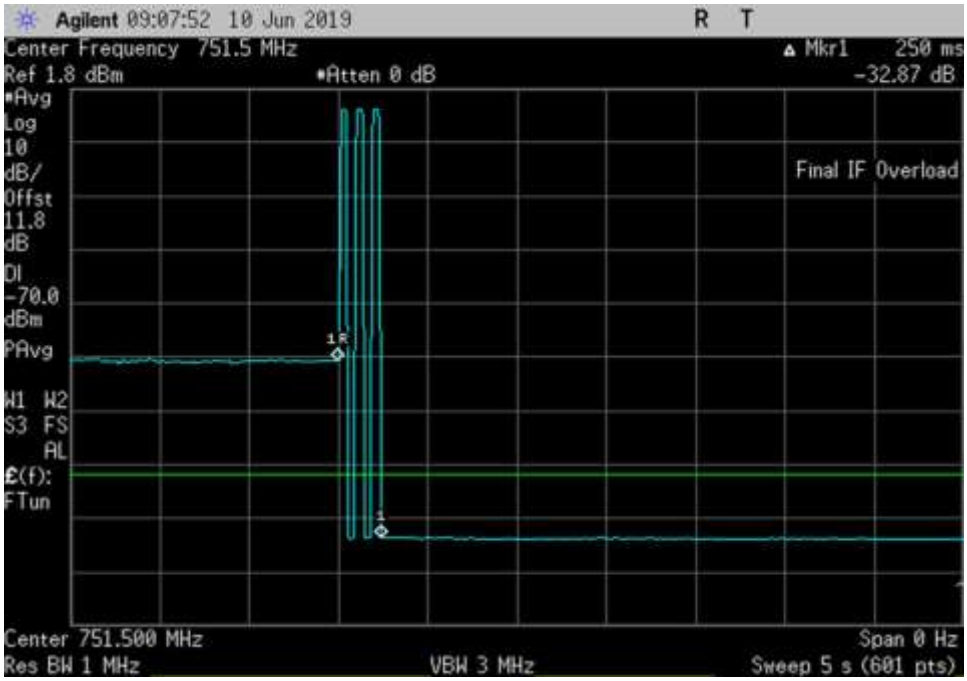
UL_1850-1915_ 1882.5MHz_600s_100ft Cable



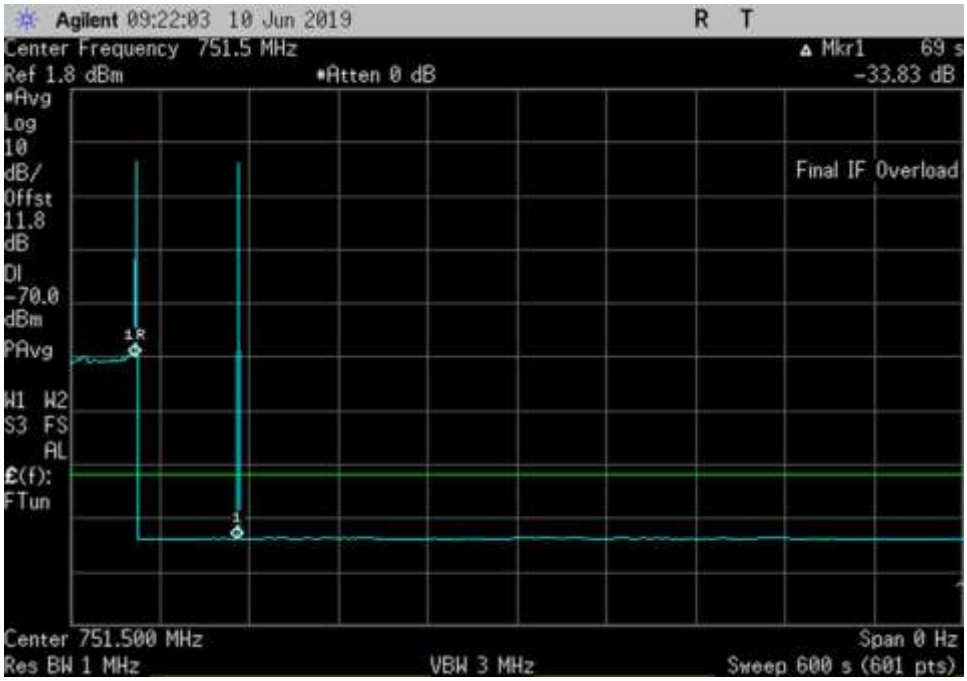
DL_728-746_ 735.32MHz_100ft Cable



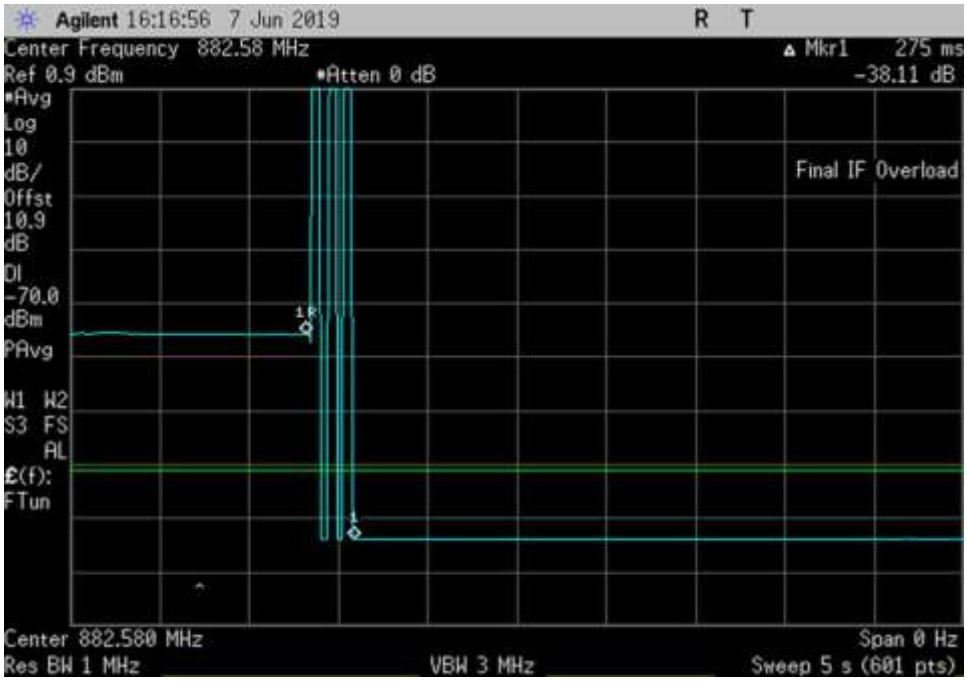
DL_728-746_ 735.32MHz_600s_100ft Cable



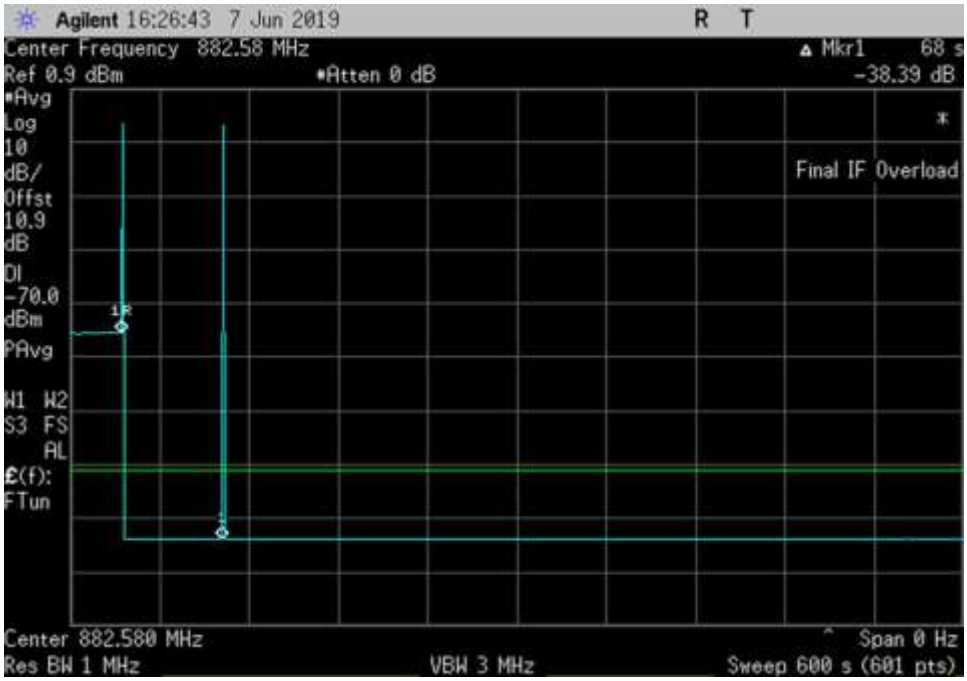
DL_746-757_ 751.5MHz_100ft Cable



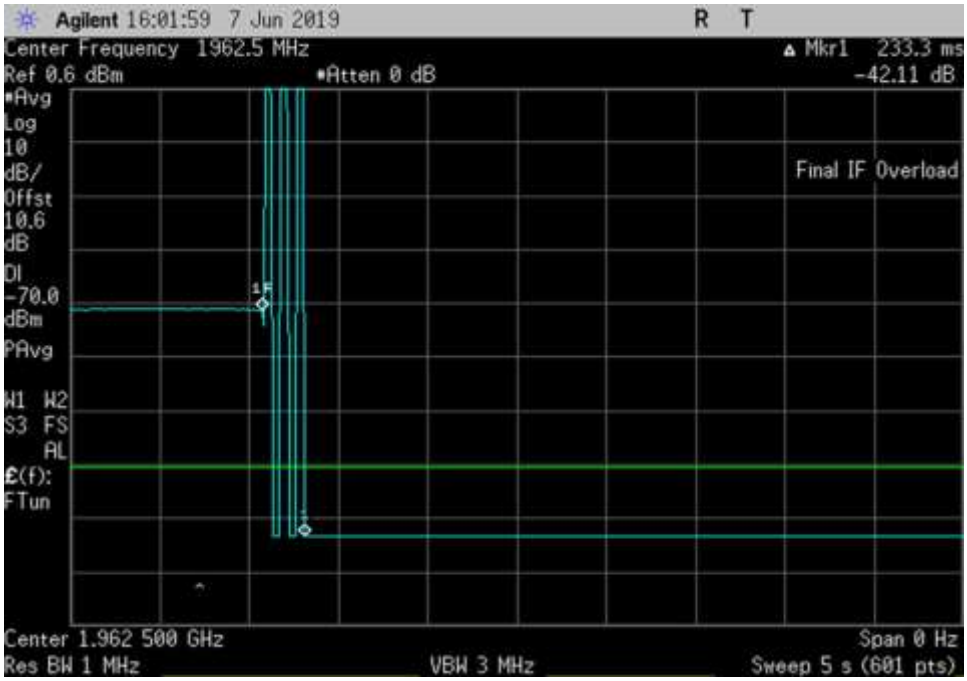
DL_746-757_ 751.5MHz_600s_100ft Cable



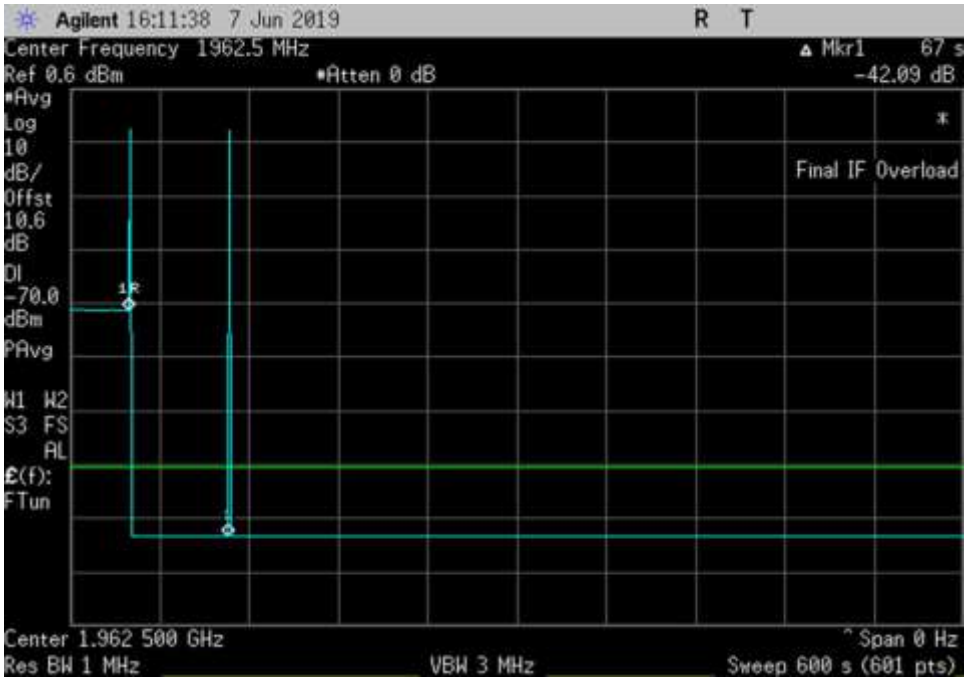
DL_869-894_ 882.58MHz_100ft Cable



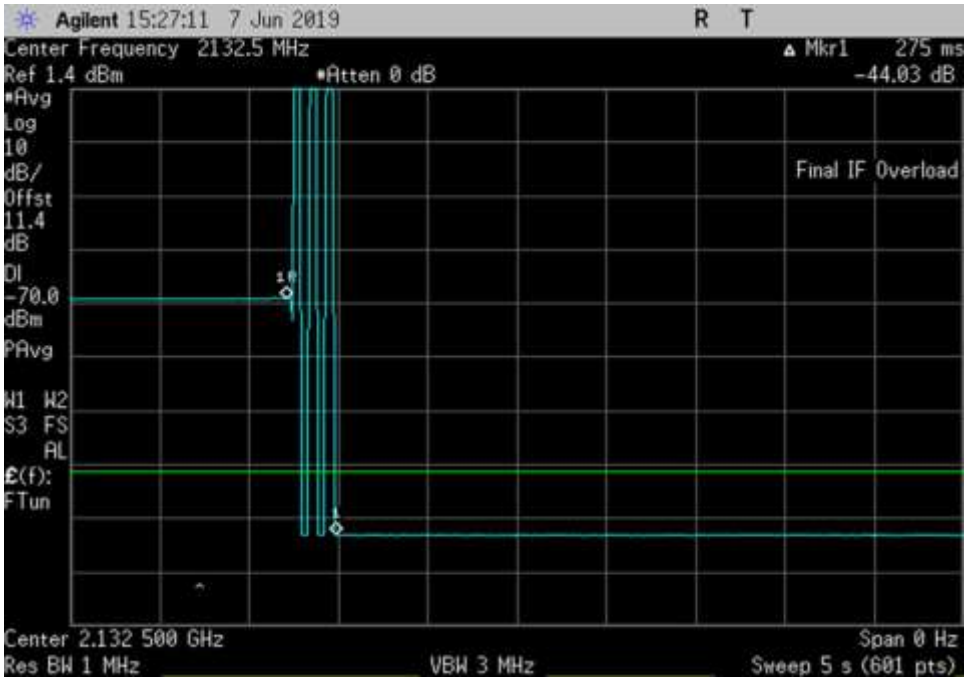
DL_869-894_ 882.58MHz_600s_100ft Cable



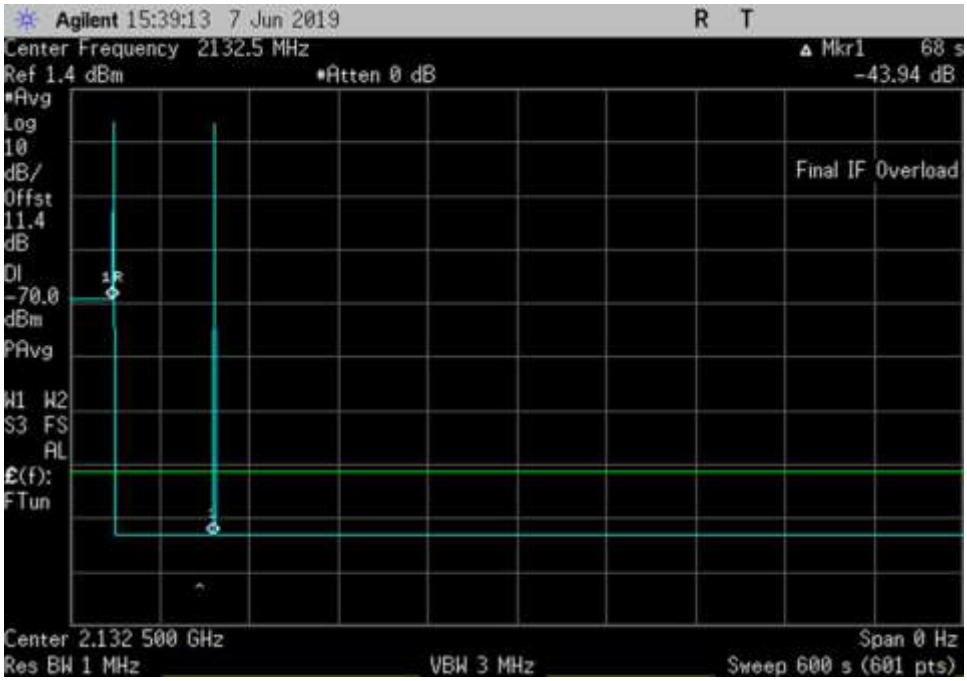
DL_1930-1995_ 1962.5MHz_100ft Cable



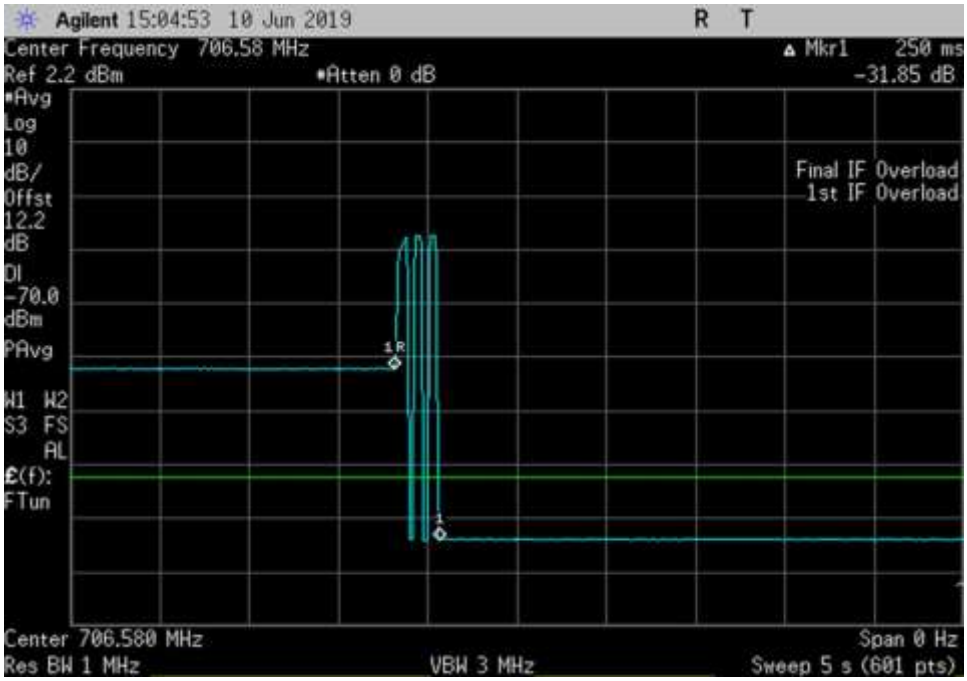
DL_1930-1995_ 1962.5MHz_600s_100ft Cable



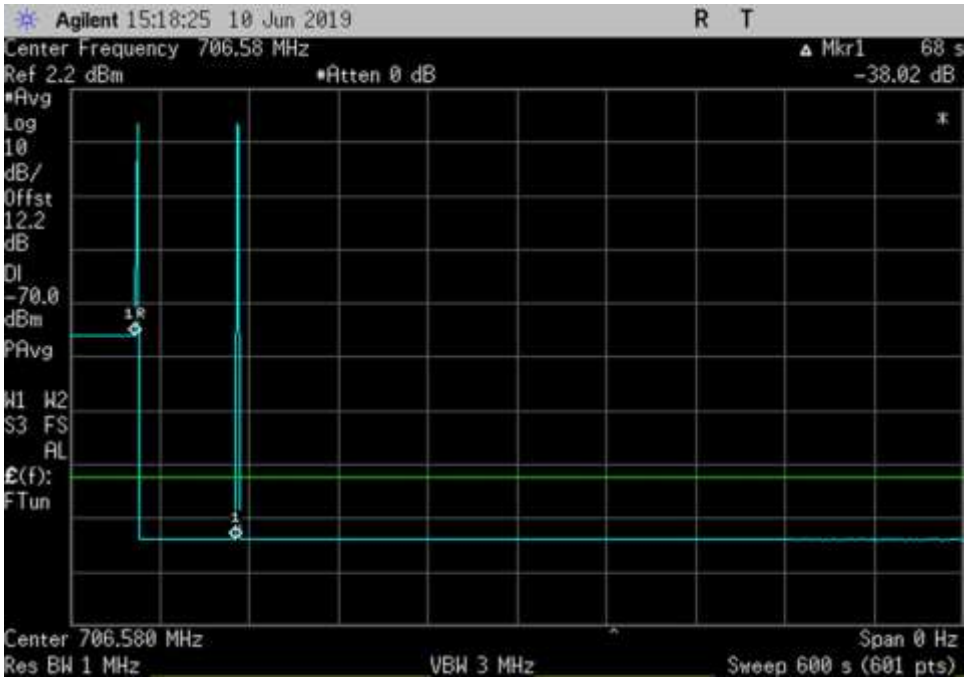
DL_2110-2155_ 2132.5MHz_100ft Cable



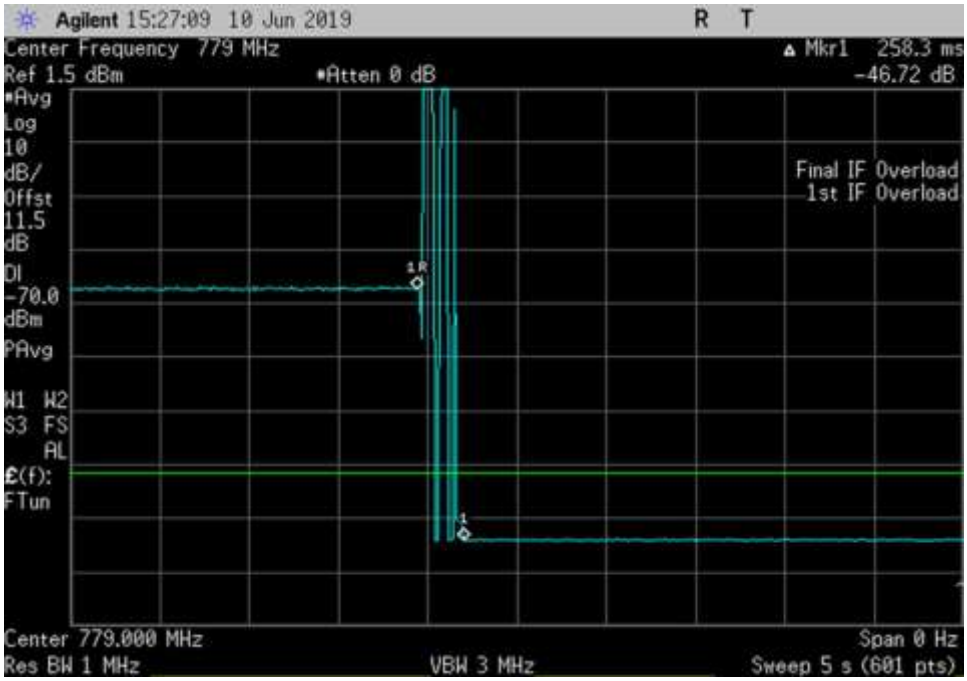
DL_2110-2155_ 2132.5MHz_600s_100ft Cable



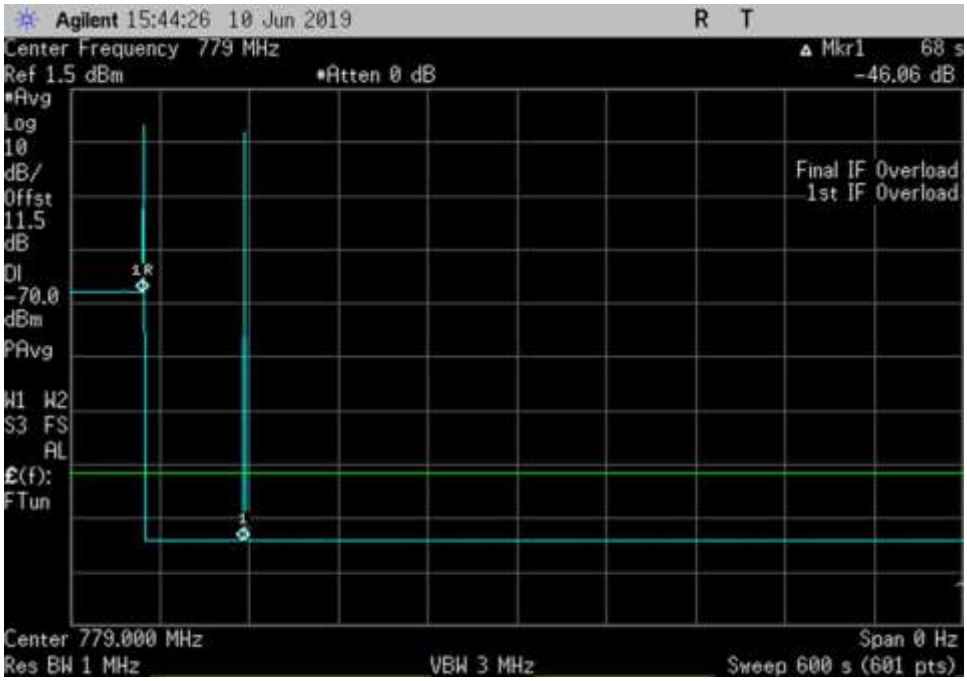
UL_698-716_ 706.58MHz_150ft Cable



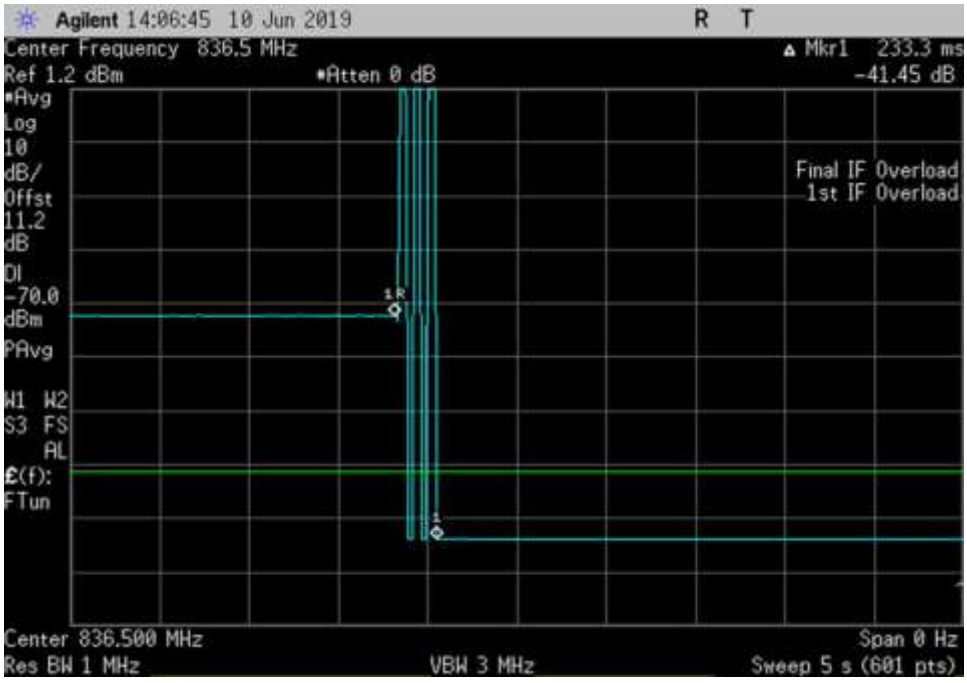
UL_698-716_ 706.58MHz_600s_150ft Cable



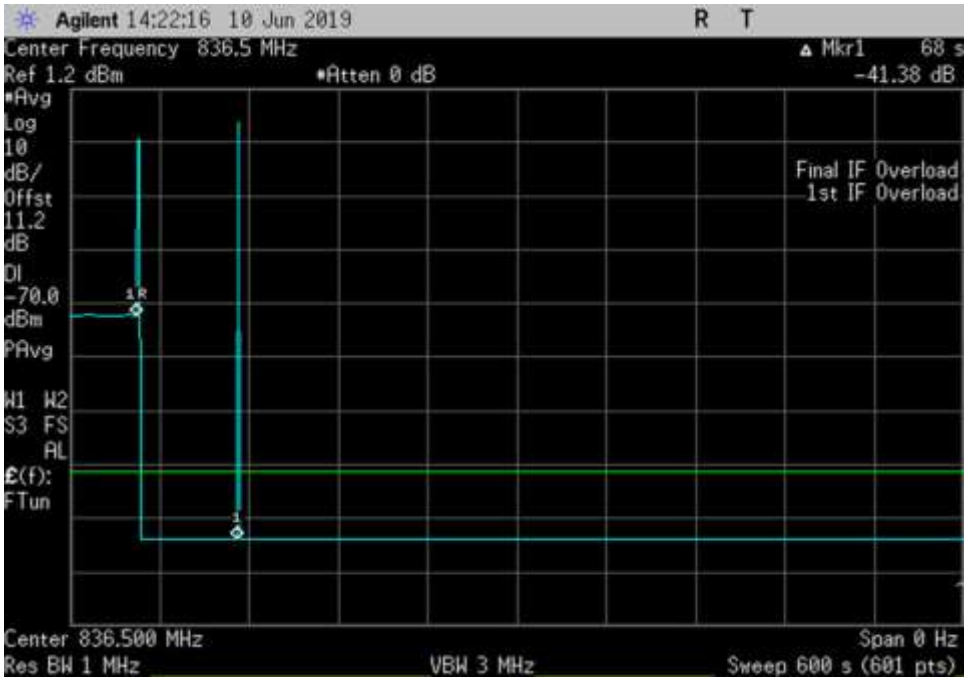
UL_776-787_ 779MHz_150ft Cable



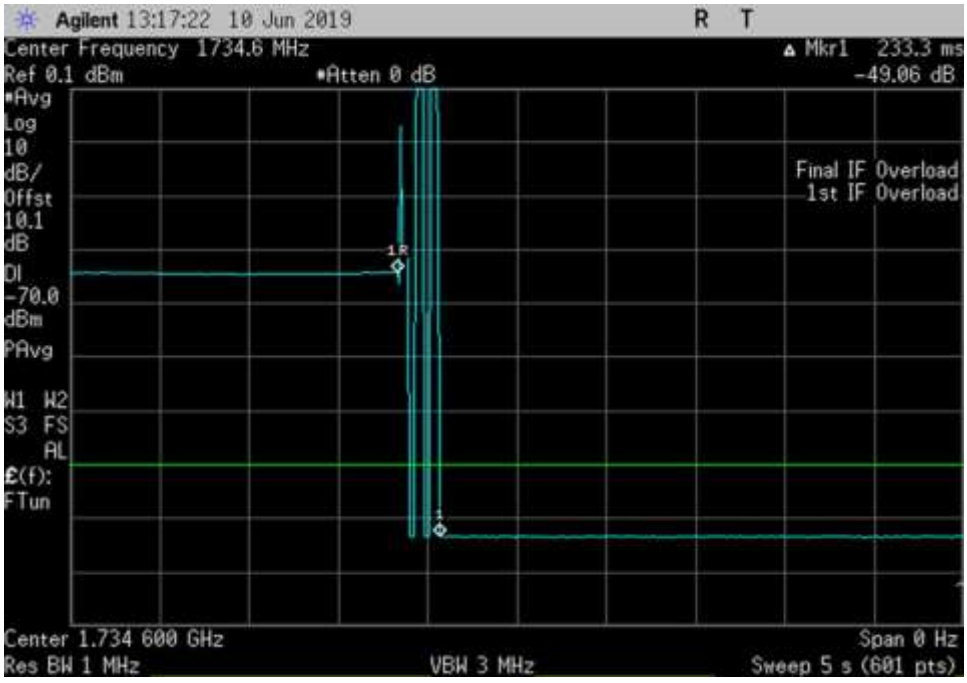
UL_776-787_ 779MHz_600s_150ft Cable



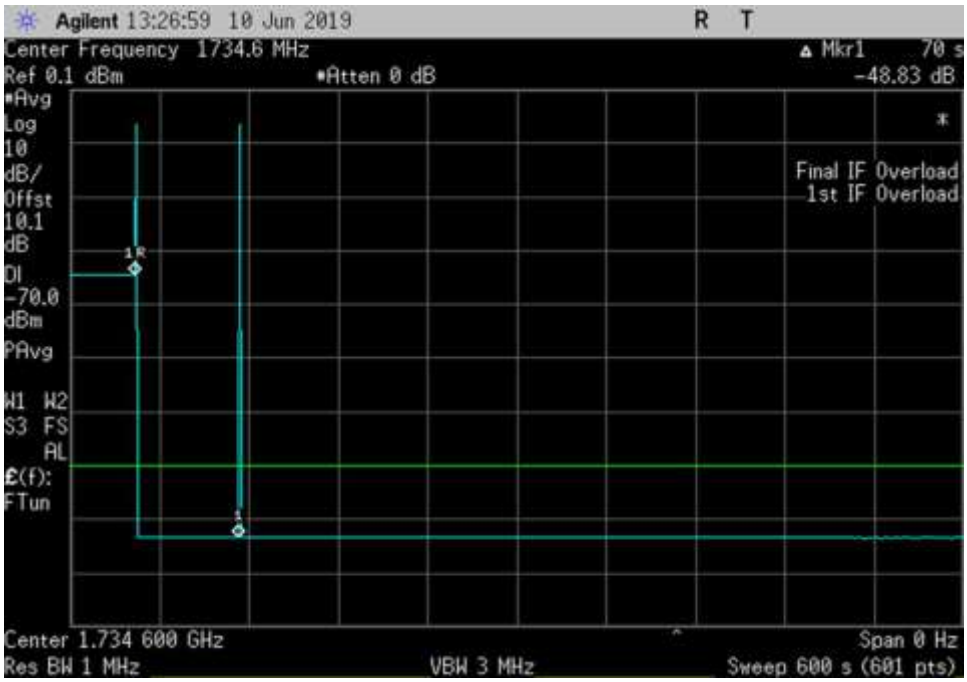
UL_824-849_ 836.5MHz_150ft Cable



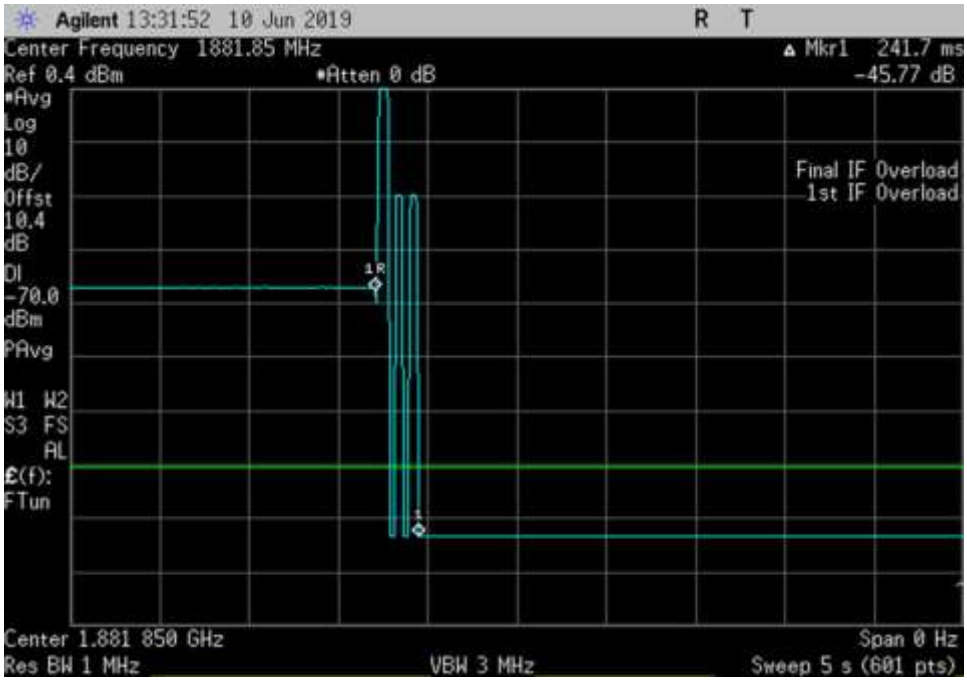
UL_824-849_ 836.5MHz_600s_150ft Cable



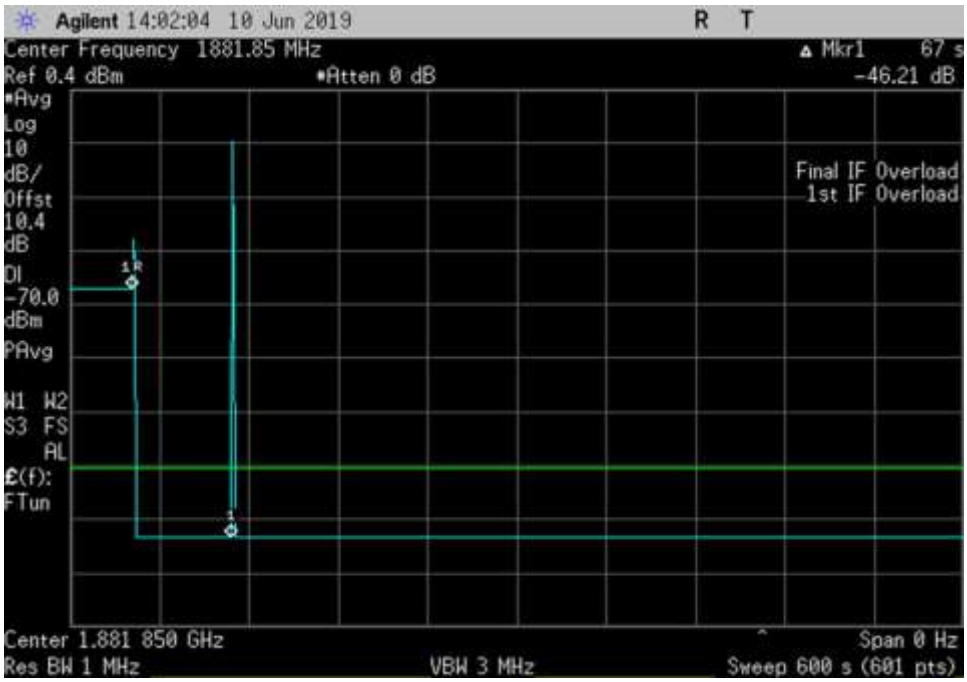
UL_1710-1755_ 1734.6MHz_150ft Cable



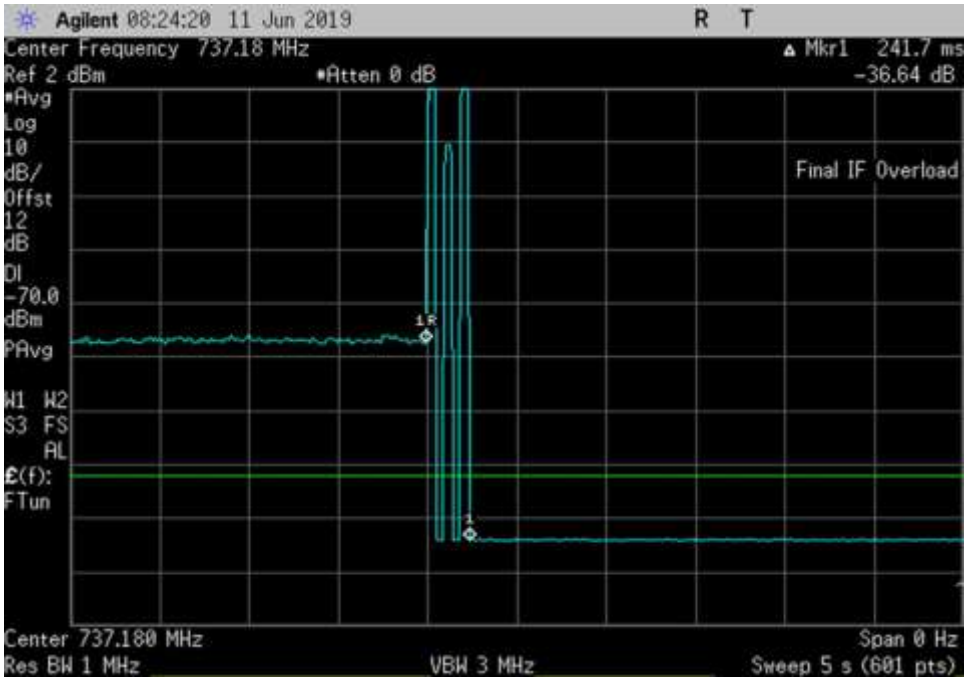
UL_1710-1755_ 1734.6MHz_600s_150ft Cable



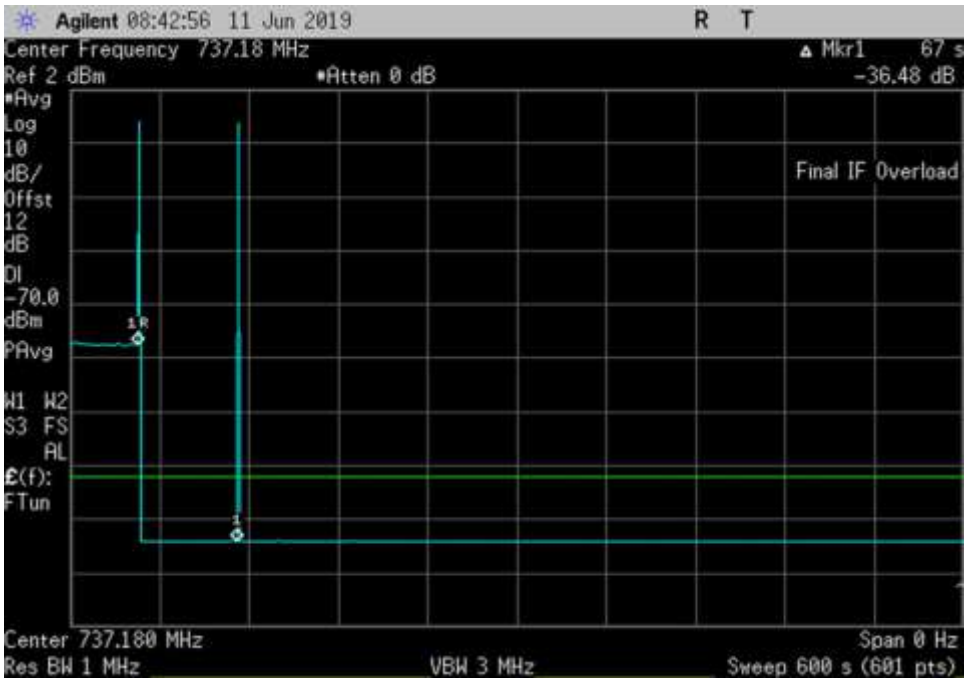
UL_1850-1915_ 1881.85MHz_150ft Cable



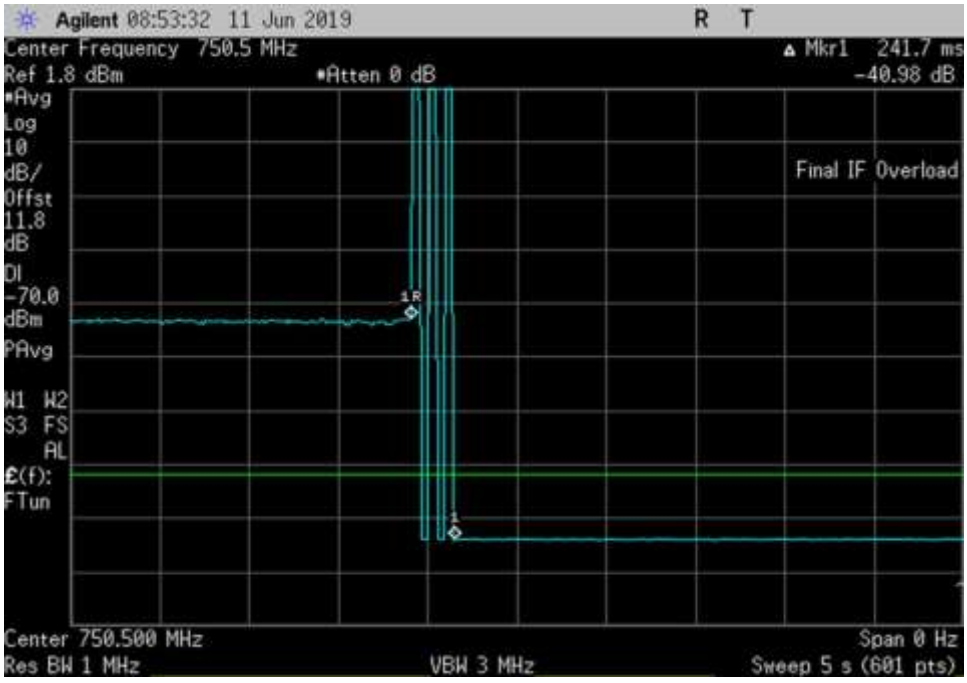
UL_1850-1915_ 1881.85MHz_600s_150ft Cable



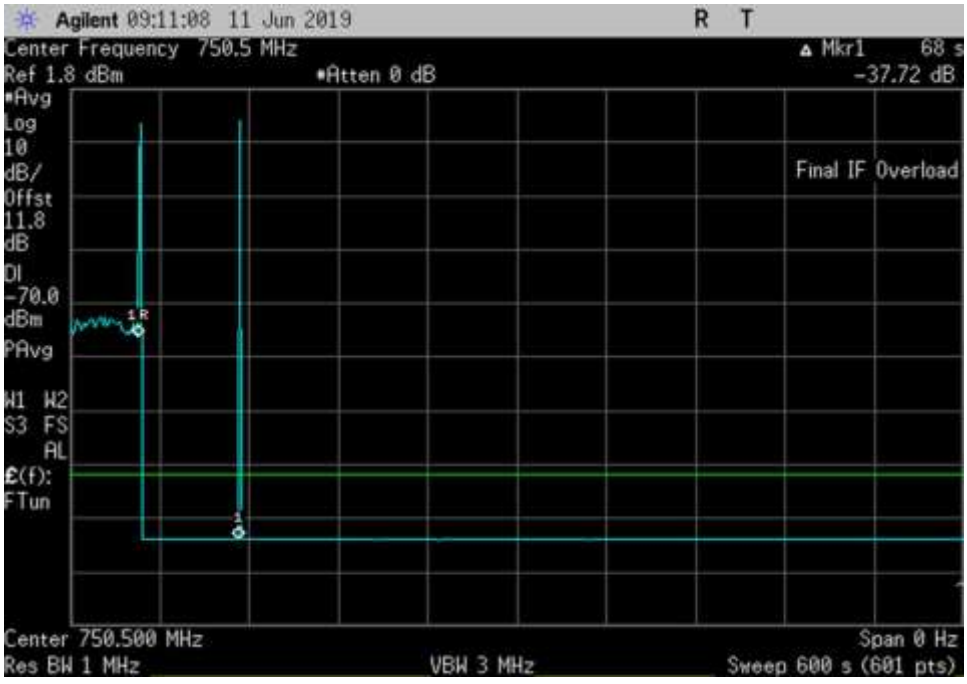
DL_728-746_ 737.18MHz_150ft Cable



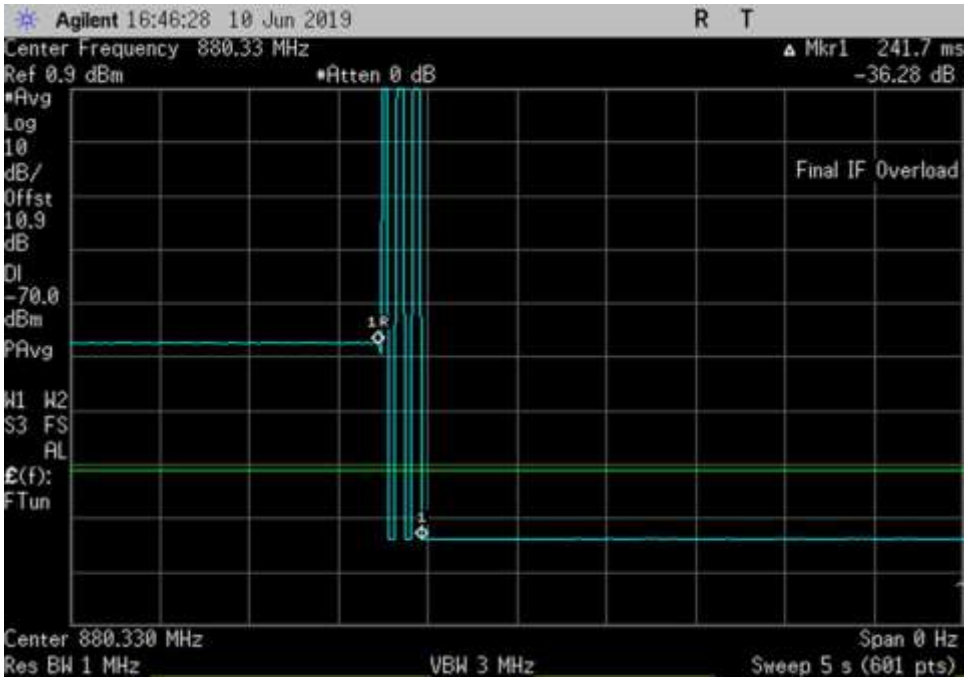
DL_728-746_ 737.18MHz_600s_150ft Cable



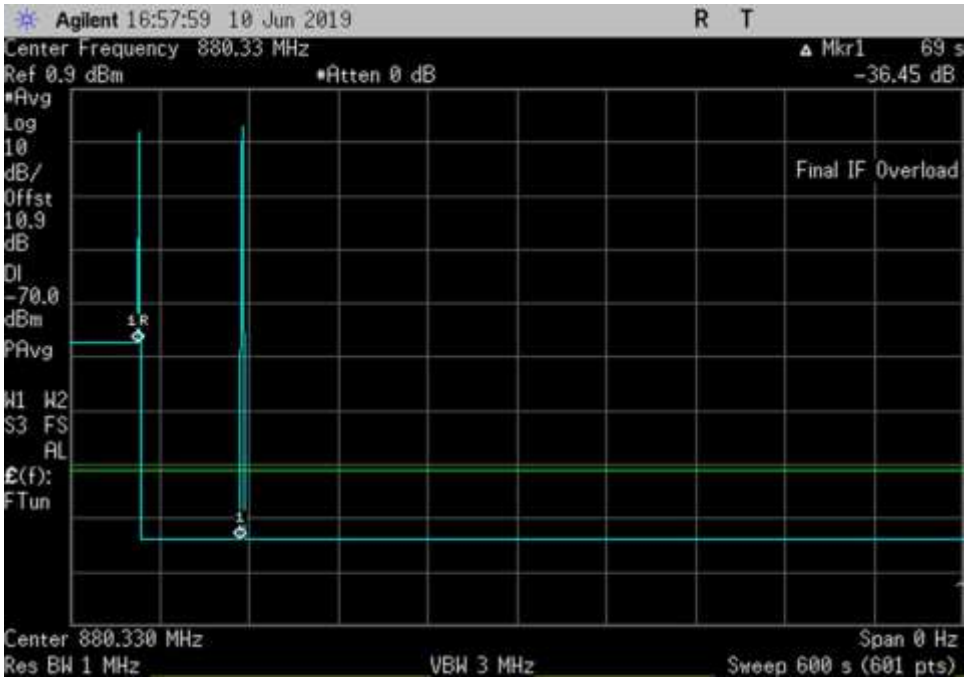
DL_746-757_ 750.5MHz_150ft Cable



DL_746-757_ 750.5MHz_600s_150ft Cable

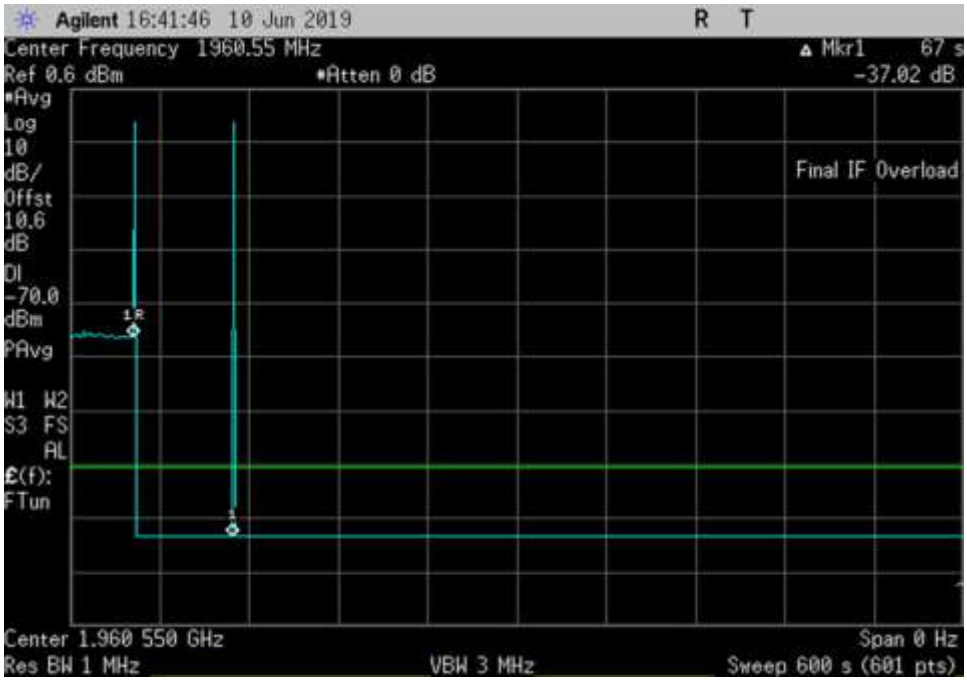


DL_869-894_ 880.33MHz_150ft Cable

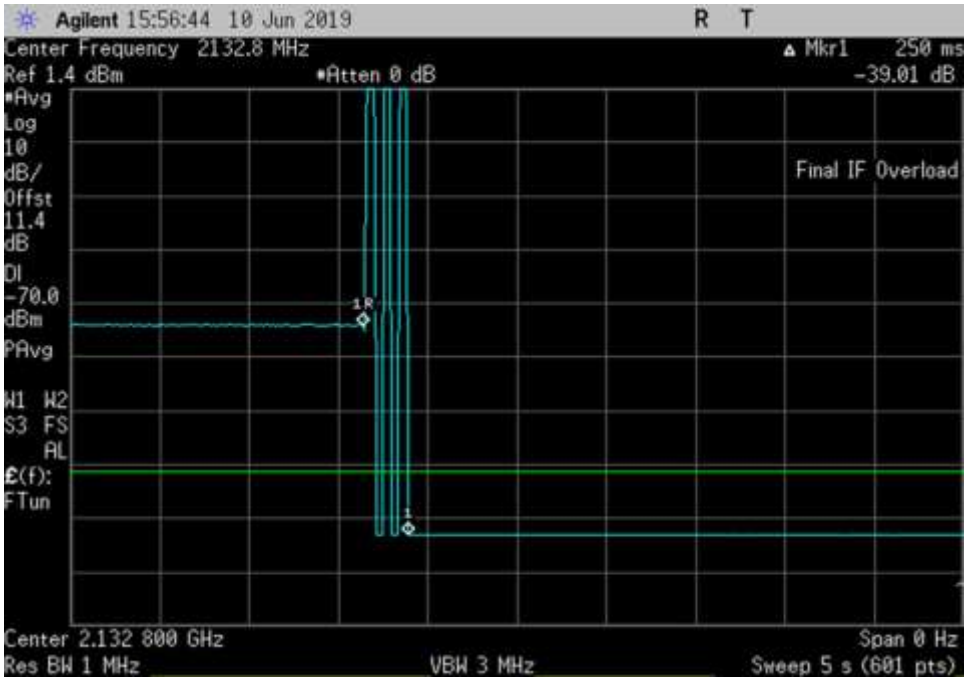


DL_869-894_ 880.33MHz_600s_150ft Cable

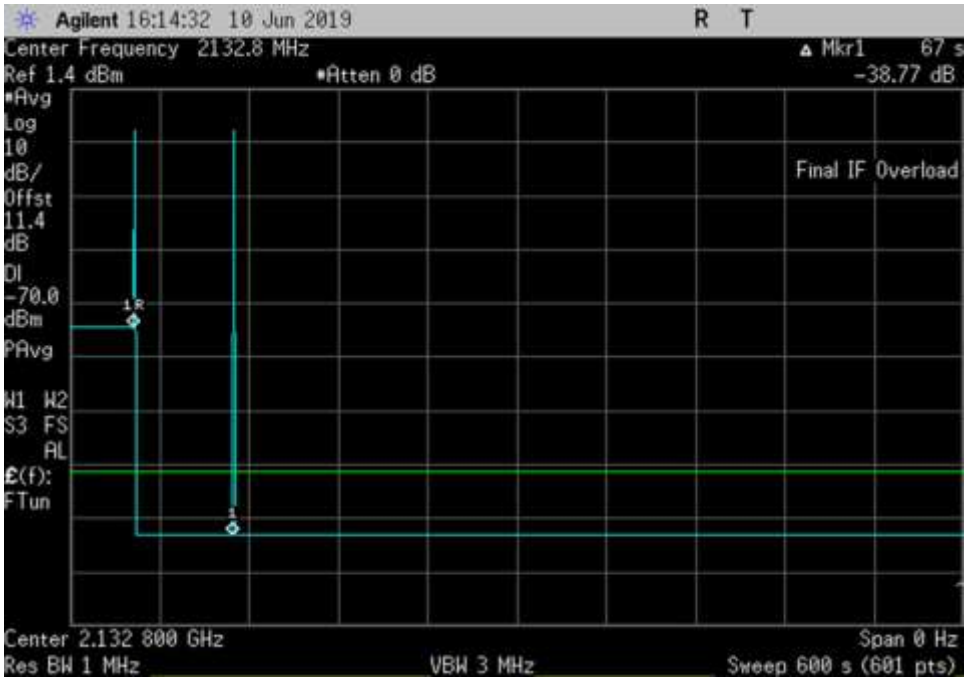
DL_1930-1995_ 1960.55MHz_150ft Cable



DL_1930-1995_ 1960.55MHz_600s_150ft Cable



DL_2110-2155_ 2132.8MHz_150ft Cable



DL_2110-2155_ 2132.8MHz_600s_150ft Cable

7.12 Radiated Spurious Emissions

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc.
Specification:	**7.12 Radiated Spurious Emissions**
Work Order #:	**102129** Date: 06/21/2019
Test Type:	**Radiated Emissions**
Tested By:	**Hieu Song Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Test environment conditions:
Temperature: 22.6°C,
Relative Humidity: 44%
Atmospheric Pressure: 101.3kPa

Frequency range of measurement = 9 kHz- 22 GHz.
9 kHz - 150 kHz -> RBW=200 Hz VBW=1 kHz
150 kHz - 30 MHz -> RBW=9 kHz VBW=30 kHz
30 MHz - 1000MHz -> RBW=120 kHz VBW=1MHz
1000 MHz-22000MHz -> RBW=1 MHz VBW=3MHz

Note:
No spurious emissions were found within 20dB of the limit line.
Emissions in the band 1559-1610 MHz were investigated and these were not found within 20dB of the limit line.

27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

Modification 1 was in place during testing.

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN03471	Spectrum Analyzer	E4440A	1/18/2018	1/18/2020
00852	Biconilog Antenna	Schaffner	5/1/2018	5/1/2020
ANP06049	Attenuator	PE7002-6	5/14/2018	5/14/2020
ANP06691	Cable	PE3062-180	5/14/2018	5/14/2020
ANP00880	Cable	RG214U	5/14/2018	5/14/2020
P07508	Preamp	Sonoma	10/15/2018	10/15/2020
ANP01187	Cable	CNT-195	8/20/2018	8/20/2020
AN02157	Horn Antenna-ANSI C63.5	3115	1/15/2019	1/15/2021
AN03302	Cable	32026-29094K-29094K-72TC	1/15/2018	1/15/2020
ANP01210	Cable	FSJ1P-50A-4A	12/18/2018	12/18/2020
ANP06900	Cable	32022-29094K-29094K-36TC	1/4/2018	1/4/2020
AN03366	Active Horn Antenna-ANSI C63.5 3m	GH-62-25	6/20/2018	6/20/2020
P02810	Preamp	83051A	03/06/2018	03/03/2020
AN00266	Loop Antenna	6502	6/1/2018	6/1/2020
P06126	Cable	32022-29094K-29094K-168TC	5/3/2019	5/3/2021
P06899	Cable	32022-29094K-29094K-72TC	1/4/2018	1/4/2020
P00928	Cable	various	1/15/2018	1/15/2020
P00929	Cable	various	1/15/2018	1/15/2020
02112	Horn Antenna	84125-80008	7/7/2017	07/07/2019
01414	Horn Antenna	84125-80008 RA28-K-F-4B-C	7/7/2017	07/07/2019

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170		
Customer:	Cellphone-Mate, Inc.		
Specification:	**7.12 Radiated Spurious Emissions**		
Work Order #:	**102129**	Date:	06/21/2019
Test Type:	**Radiated Emissions**		
Tested By:	**Hieu Song Nguyenpham**		
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

Test environment conditions:
Temperature: 22.6°C
Relative Humidity: 44%
Atmospheric Pressure: 101.3kPa

Frequency range of measurement = 9 kHz- 22 GHz.
9 kHz - 150 kHz -> RBW=200 Hz VBW=1 kHz
150 kHz - 30 MHz -> RBW=9 kHz VBW=30 kHz
30 MHz - 1000MHz -> RBW=120 kHz VBW=1MHz
1000 MHz-22000MHz -> RBW=1 MHz VBW=3MHz

Note:
No spurious emissions were found within 20dB of the limit line.
Emissions in the band 1559-1610 MHz were investigated and these were not found within 20dB of the limit line.

27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN03471	Spectrum Analyzer	E4440A	1/18/2018	1/18/2020
00852	Biconilog Antenna	Schaffner	5/1/2018	5/1/2020
ANP06049	Attenuator	PE7002-6	5/14/2018	5/14/2020
ANP06691	Cable	PE3062-180	5/14/2018	5/14/2020
ANP00880	Cable	RG214U	5/14/2018	5/14/2020
P07508	Preamp	Sonoma	10/15/2018	10/15/2020
ANP01187	Cable	CNT-195	8/20/2018	8/20/2020
AN02157	Horn Antenna-ANSI C63.5	3115	1/15/2019	1/15/2021
AN03302	Cable	32026-29094K-29094K-72TC	1/15/2018	1/15/2020
ANP01210	Cable	FSJ1P-50A-4A	12/18/2018	12/18/2020
ANP06900	Cable	32022-29094K-29094K-36TC	1/4/2018	1/4/2020
AN03366	Active Horn Antenna-ANSI C63.5 3m	GH-62-25	6/20/2018	6/20/2020
P02810	Preamp	83051A	03/06/2018	03/03/2020
AN00266	Loop Antenna	6502	6/1/2018	6/1/2020
P06126	Cable	32022-29094K-29094K-168TC	5/3/2019	5/3/2021
P06899	Cable	32022-29094K-29094K-72TC	1/4/2018	1/4/2020
P00928	Cable	various	1/15/2018	1/15/2020
P00929	Cable	various	1/15/2018	1/15/2020
02112	Horn Antenna	84125-80008	7/7/2017	07/07/2019
01414	Horn Antenna	84125-80008 RA28-K-F-4B-C	7/7/2017	07/07/2019

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer: Cellphone-Mate, Inc.
Specification: **7.12 Radiated Spurious Emissions**

Work Order #: **102129** Date: 06/21/2019
Test Type: **Radiated Emissions**
Tested By: **Hieu Song Nguyenpham**
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 5			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 5			

Test Conditions / Notes:

Test environment conditions:
Temperature: 22.6°C
Relative Humidity: 44%
Atmospheric Pressure: 101.3kPa

Frequency range of measurement = 9 kHz- 22 GHz.
9 kHz - 150 kHz -> RBW=200 Hz VBW=1 kHz
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ANP06691	Cable	PE3062-180	5/14/2018	5/14/2020
ANP00880	Cable	RG214U	5/14/2018	5/14/2020
P07508	Preamp	Sonoma	10/15/2018	10/15/2020
ANP01187	Cable	CNT-195	8/20/2018	8/20/2020
AN02157	Horn Antenna-ANSI C63.5	3115	1/15/2019	1/15/2021
AN03302	Cable	32026-29094K-29094K-72TC	1/15/2018	1/15/2020
ANP01210	Cable	FSJ1P-50A-4A	12/18/2018	12/18/2020
ANP06900	Cable	32022-29094K-29094K-36TC	1/4/2018	1/4/2020
AN03366	Active Horn Antenna-ANSI C63.5 3m	GH-62-25	6/20/2018	6/20/2020
P02810	Preamp	83051A	03/06/2018	03/03/2020
AN00266	Loop Antenna	6502	6/1/2018	6/1/2020
P06126	Cable	32022-29094K-29094K-168TC	5/3/2019	5/3/2021
P06899	Cable	32022-29094K-29094K-72TC	1/4/2018	1/4/2020
P00928	Cable	various	1/15/2018	1/15/2020
P00929	Cable	various	1/15/2018	1/15/2020
02112	Horn Antenna	84125-80008	7/7/2017	07/07/2019
01414	Horn Antenna	84125-80008 RA28-K-F-4B-C	7/7/2017	07/07/2019