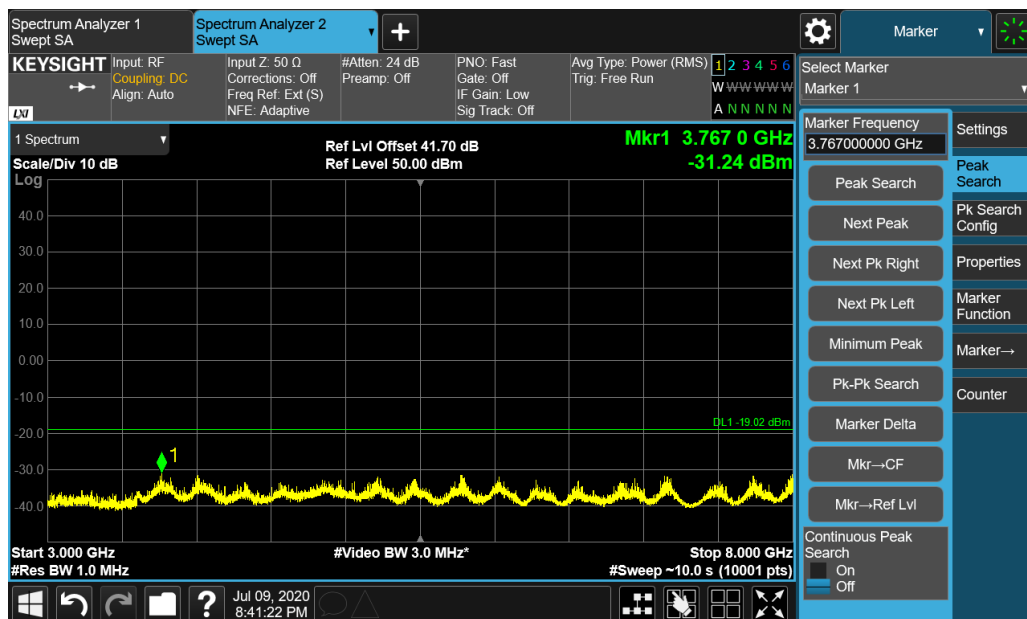
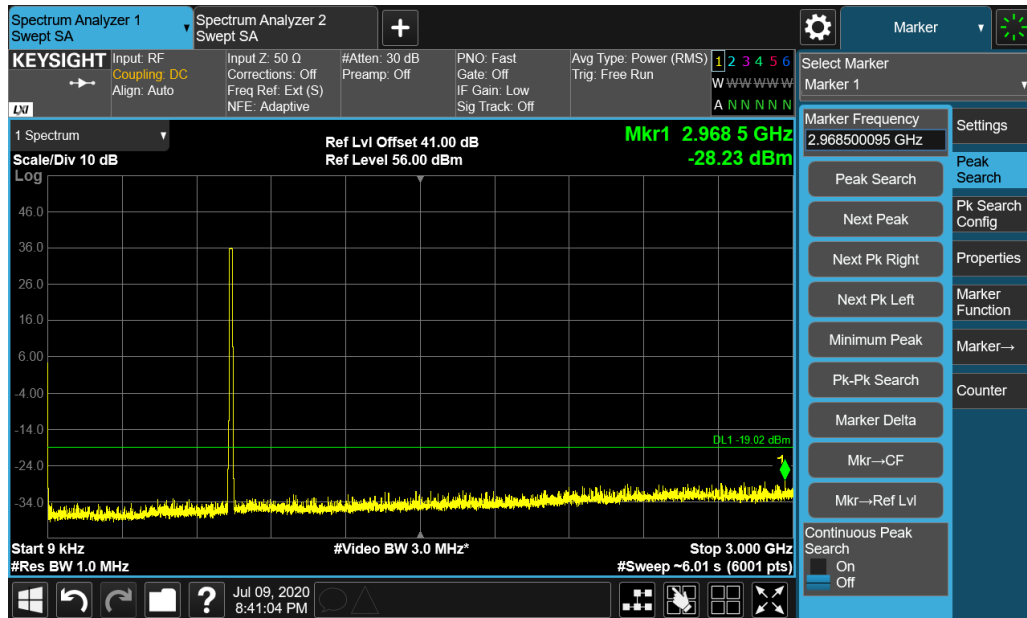


Channel Position T

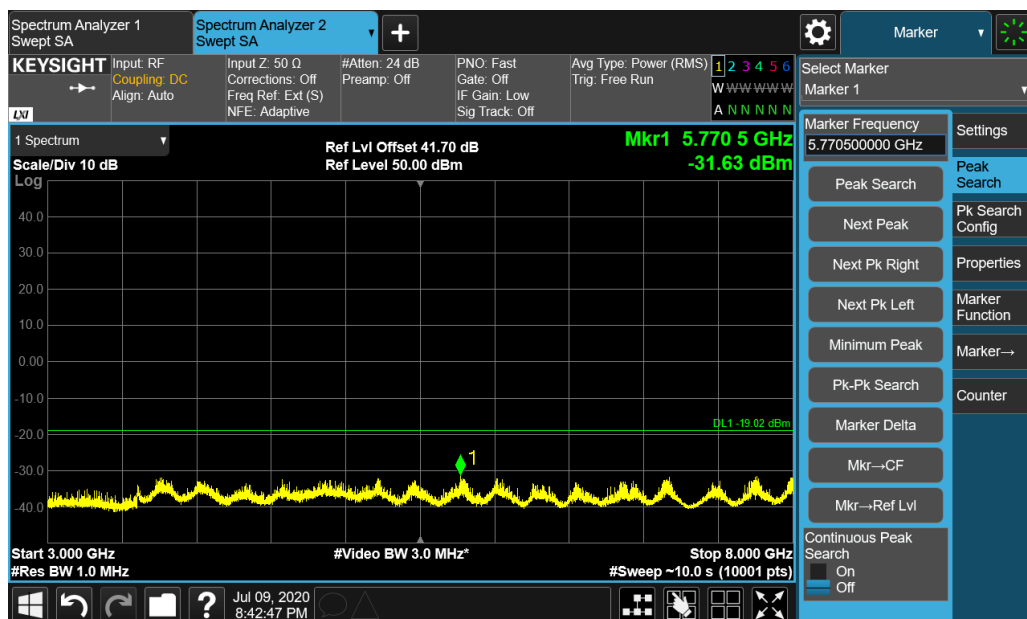
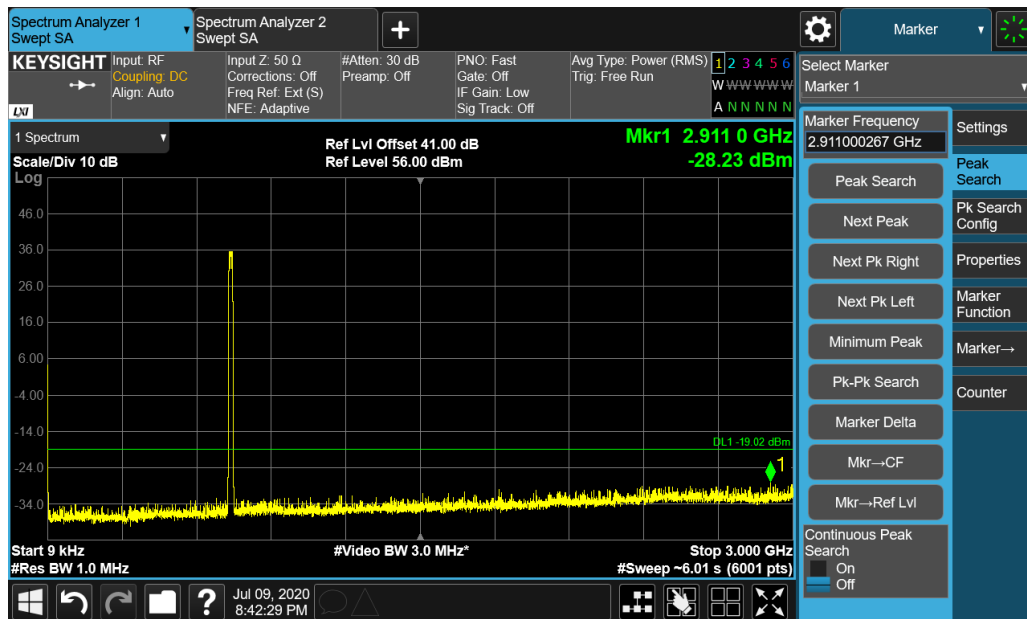


TEST REPORT

Configuration LTE-MIMO-3C

Antenna Port	Channel Position	LTE Modulation	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	1000	-19
D	M	QPSK	5	1000	-19
D	T	QPSK	5	1000	-19

Channel Position M

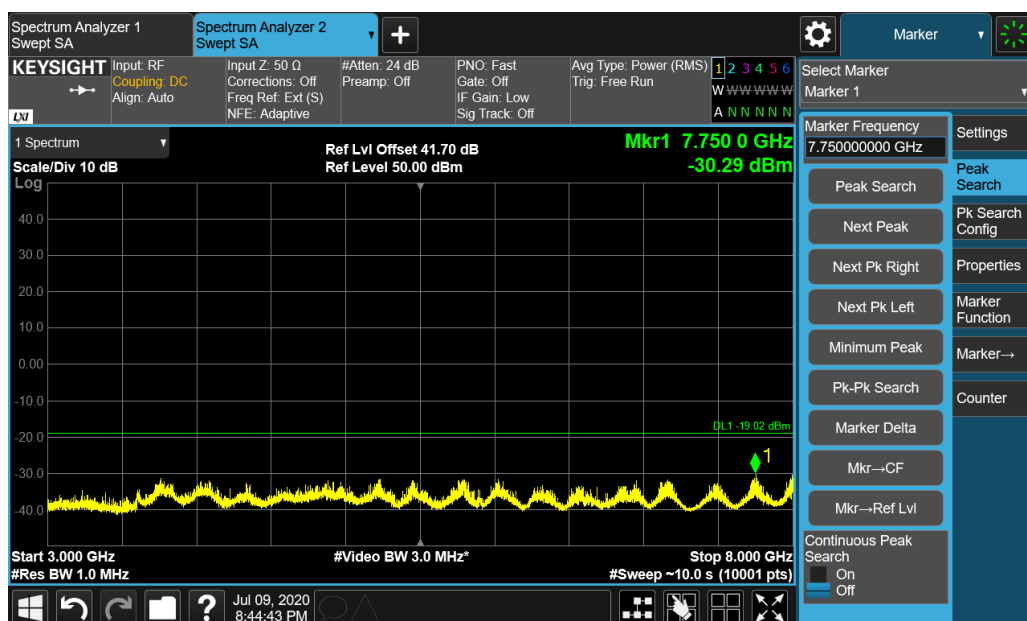
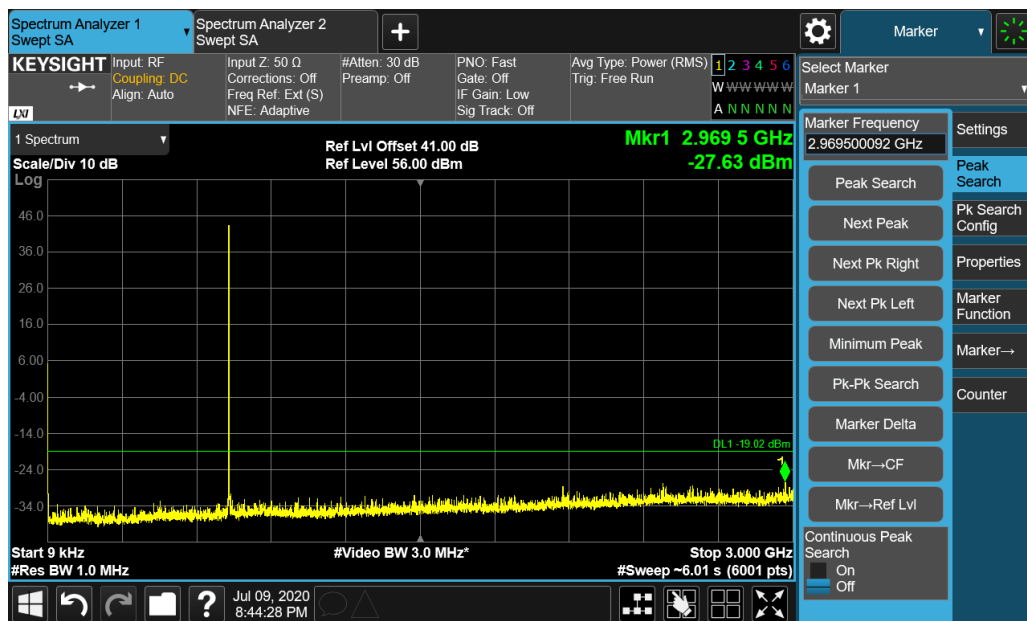


TEST REPORT

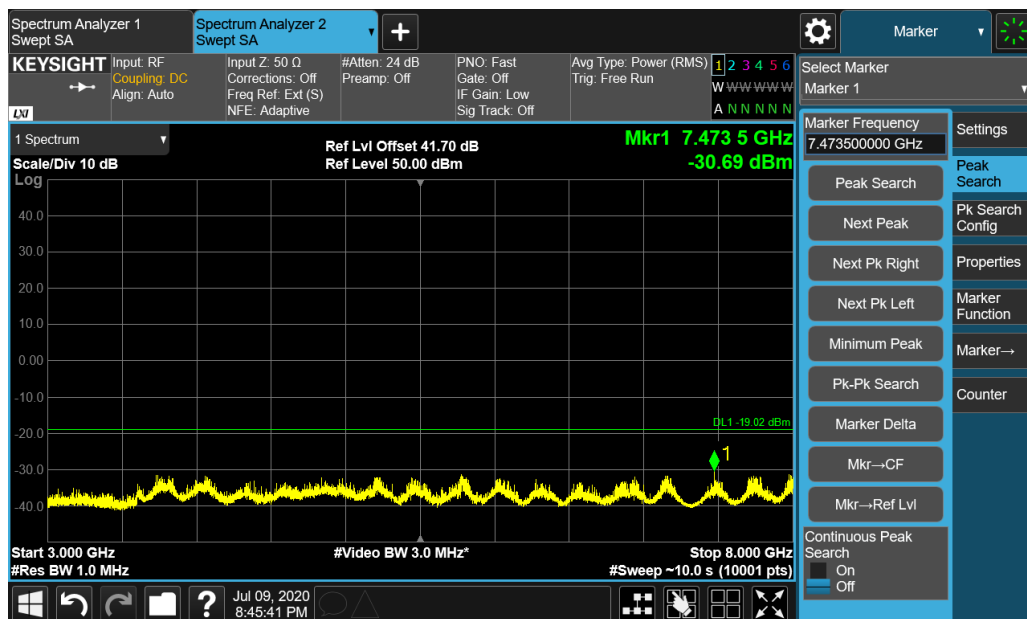
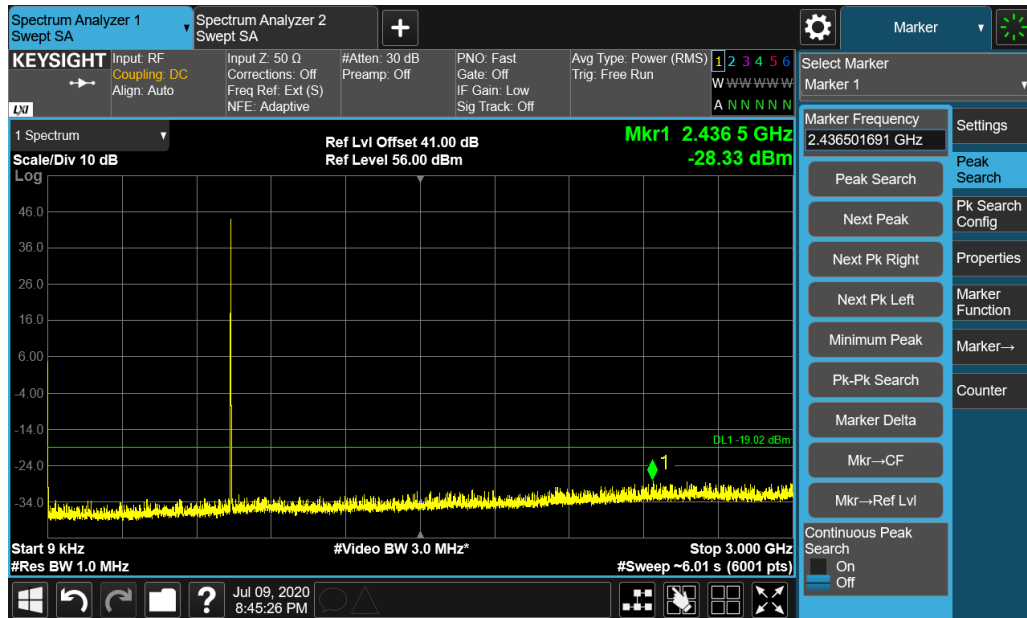
Configuration NB-IoT-Standalone-1C

Antenna Port	Channel Position	Modulation	NB Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	0.2	1000	-16
D	M	QPSK	0.2	1000	-16
D	T	QPSK	0.2	1000	-16

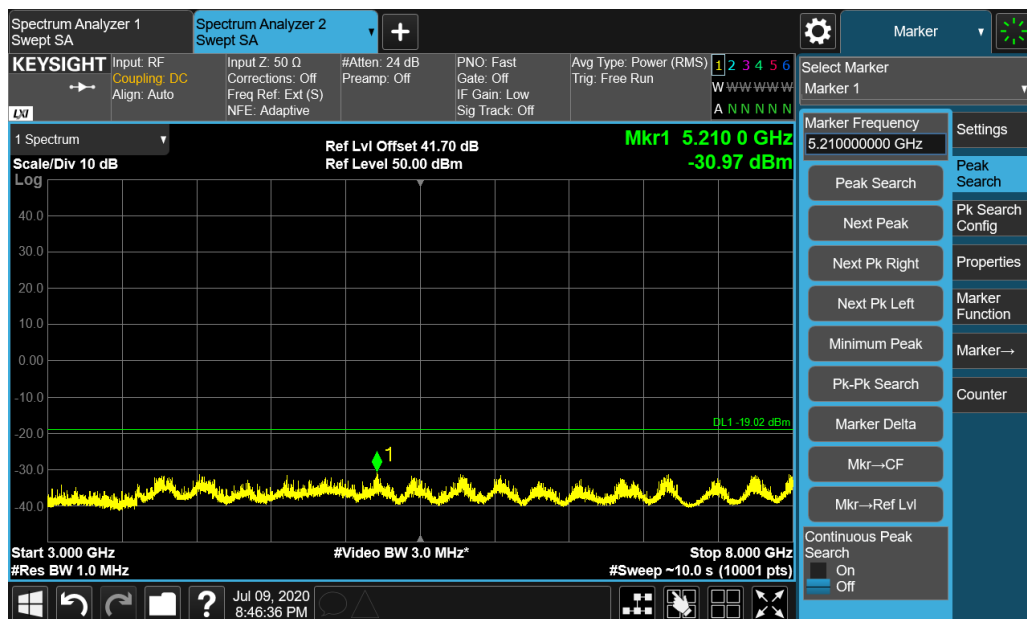
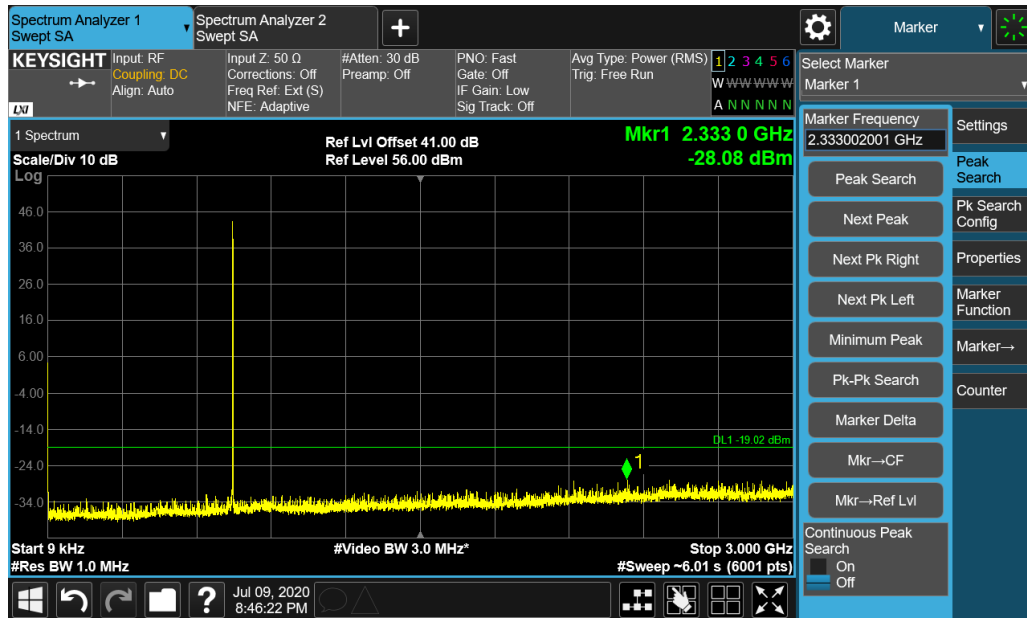
Channel Position B



Channel Position M



Channel Position T

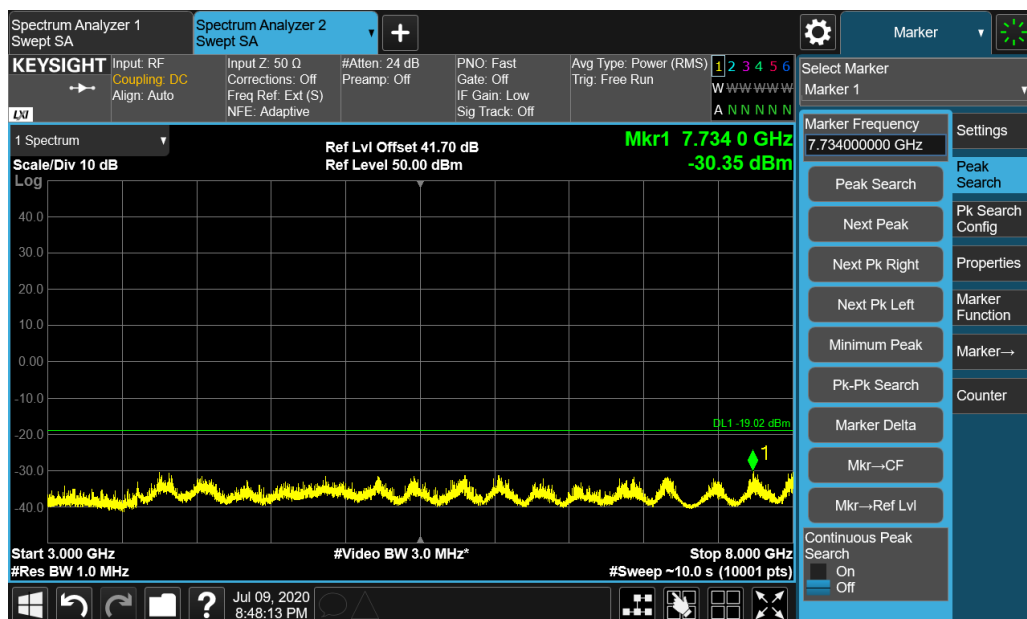
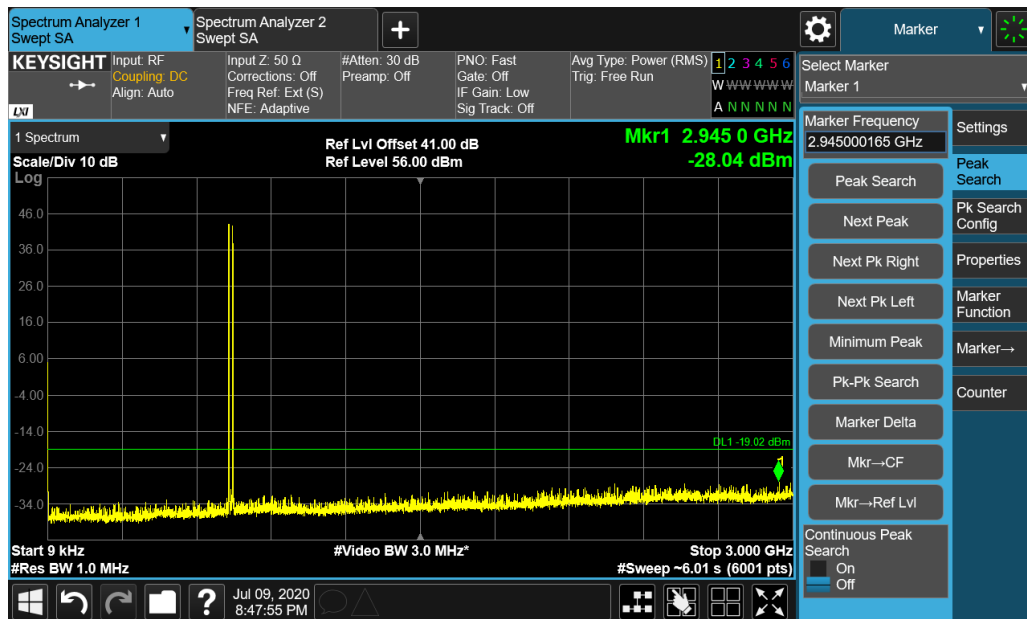


TEST REPORT

Configuration NB-IoT-Standalone-2C

Antenna Port	Channel Position	Modulation	NB Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	0.2	1000	-16
D	M	QPSK	0.2	1000	-16
D	T	QPSK	0.2	1000	-16

Channel Position M

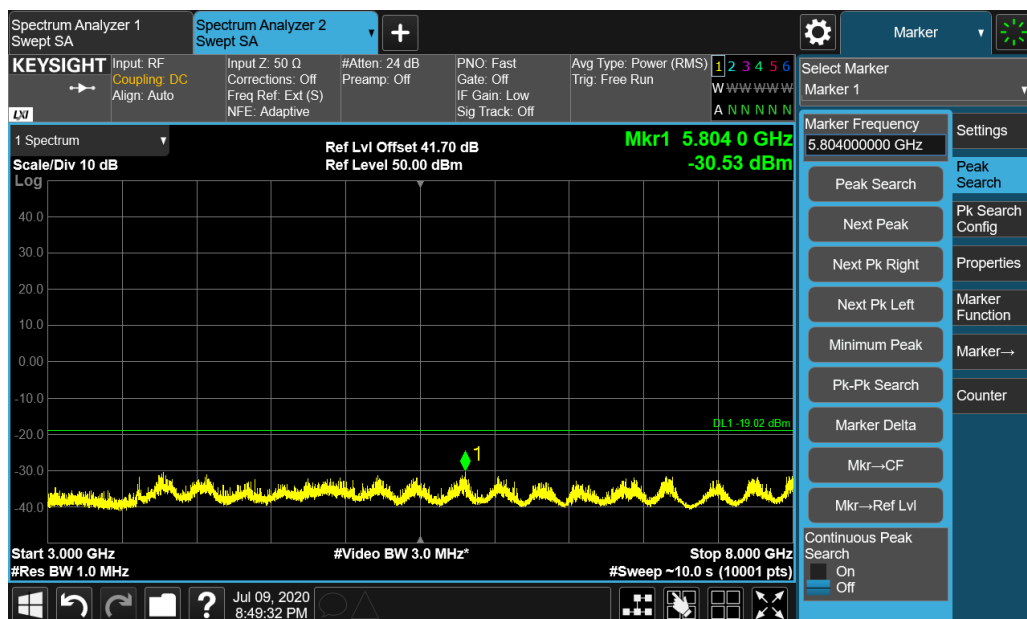
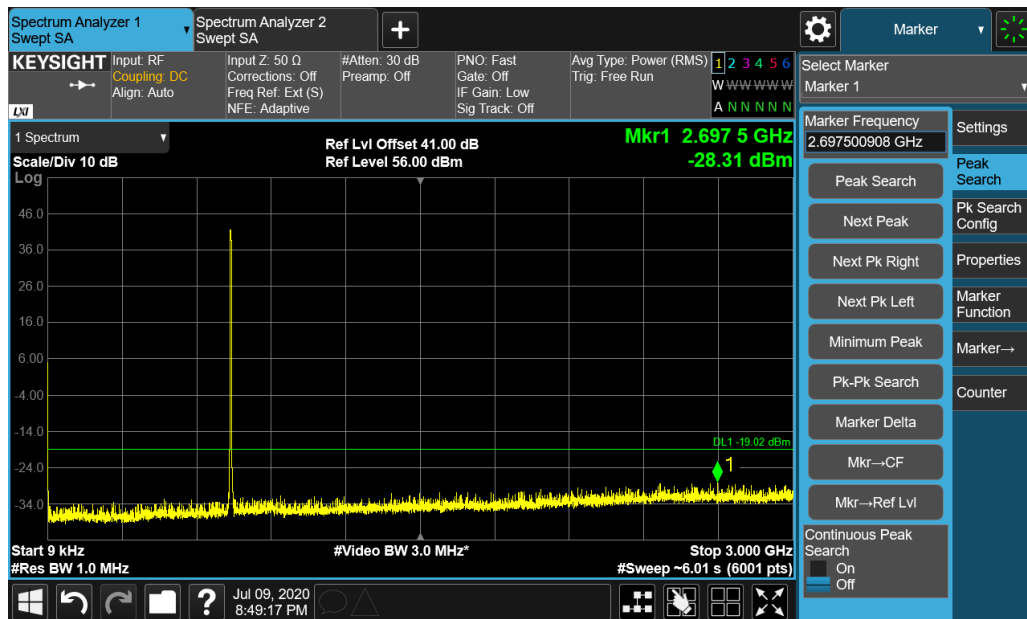


TEST REPORT

Configuration NB-IoT-InBand-1C

Antenna Port	Channel Position	Modulation	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	1000	-19
D	M	QPSK	5	1000	-19
D	T	QPSK	5	1000	-19

Channel Position M

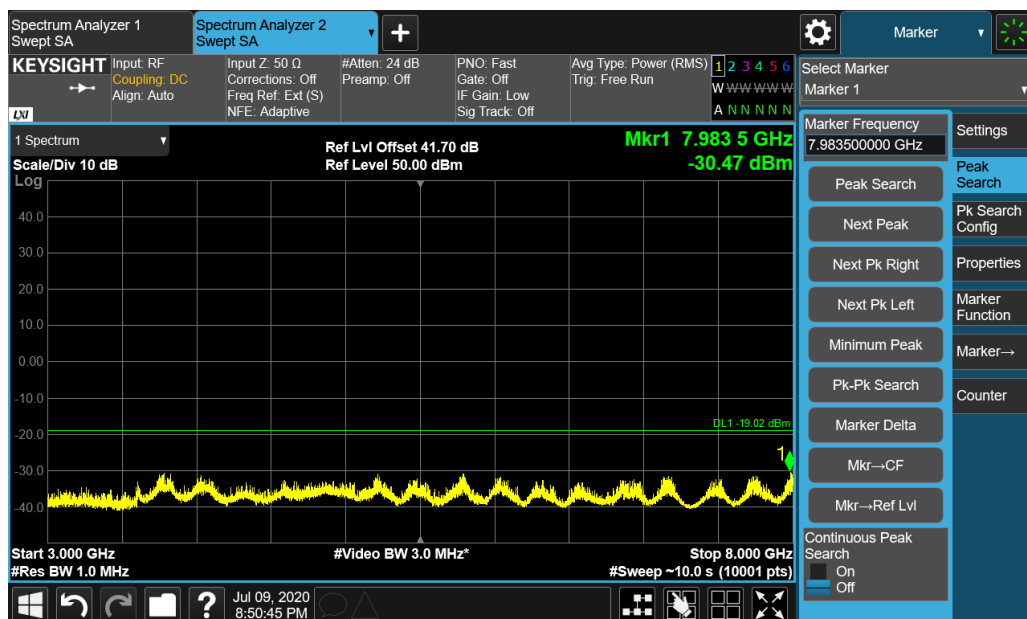
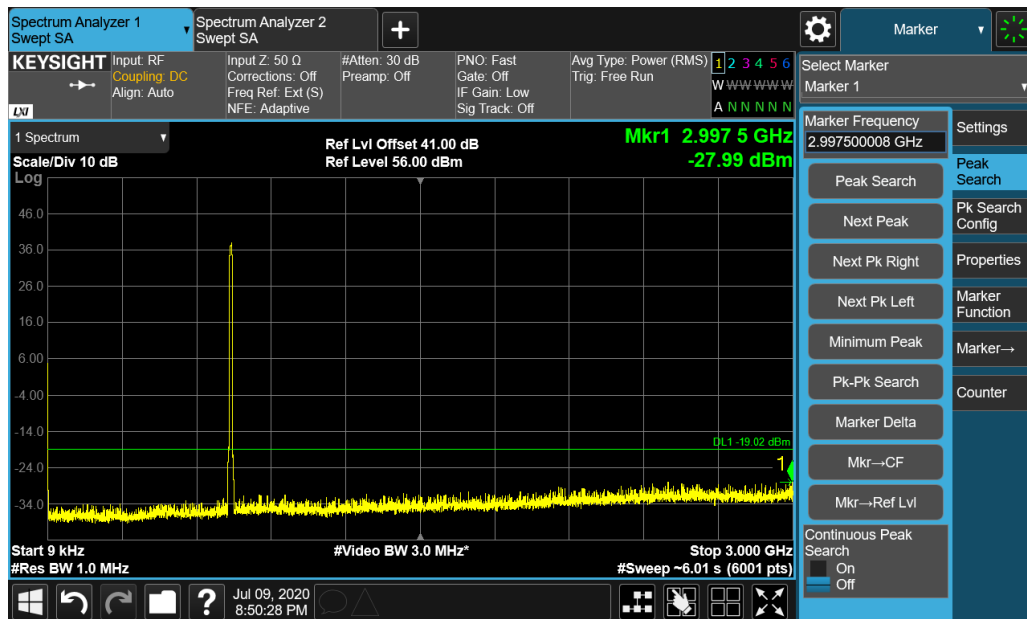


TEST REPORT

Configuration NB-IoT-GuardBand-1C

Antenna Port	Channel Position	Modulation	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	10	1000	-19
D	M	QPSK	10	1000	-19
D	T	QPSK	10	1000	-19

Channel Position M

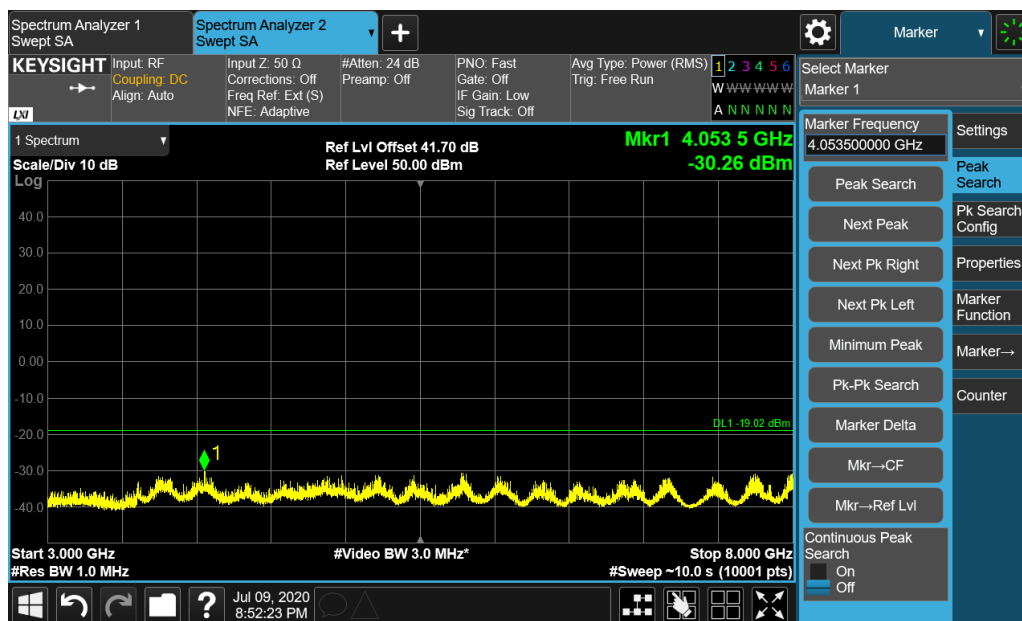
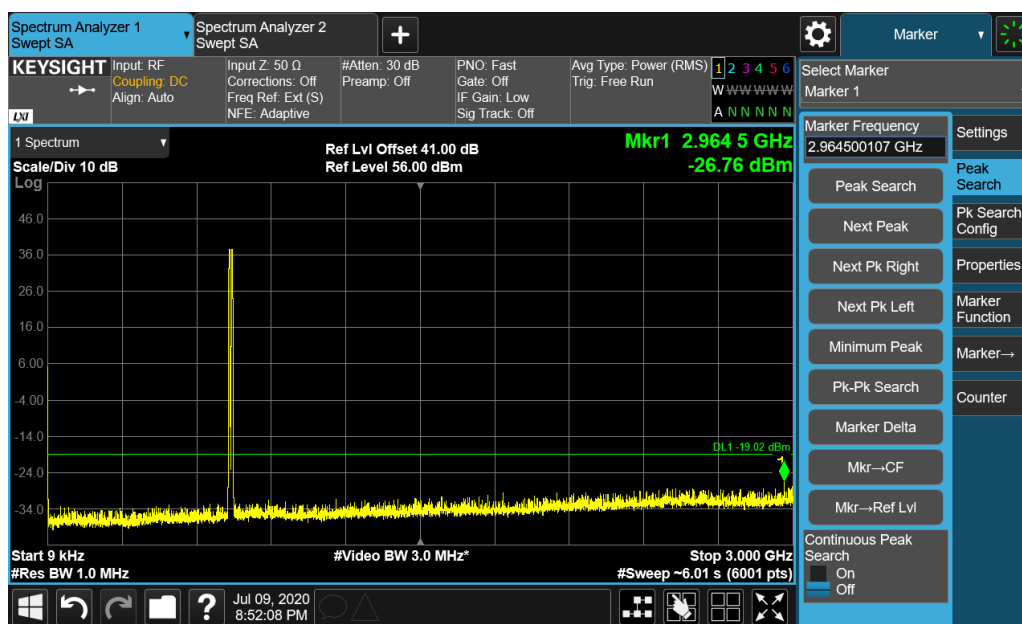


TEST REPORT

Configuration NR+LTE-MC-1

Antenna Port	Channel Position	Modulation	NR Channel Bandwidth (MHz)	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	5	1000	-19
D	M	QPSK	5	5	1000	-19
D	T	QPSK	5	5	1000	-19

Channel Position M

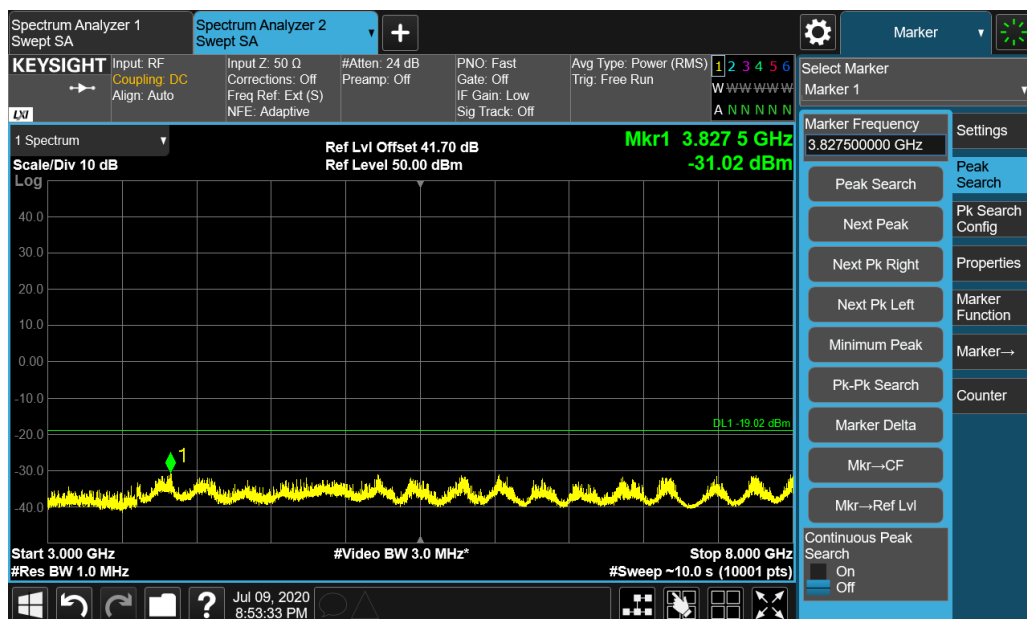
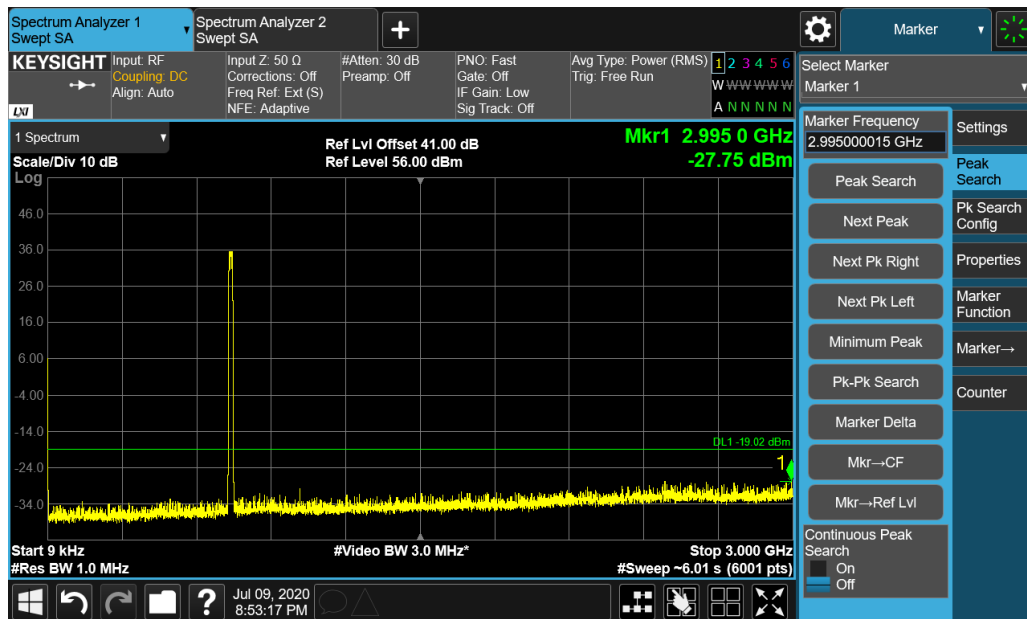


TEST REPORT

Configuration NR+LTE-MC-2

Antenna Port	Channel Position	Modulation	NR Channel Bandwidth (MHz)	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	5	1000	-19
D	M	QPSK	5	5	1000	-19
D	T	QPSK	5	5	1000	-19

Channel Position M

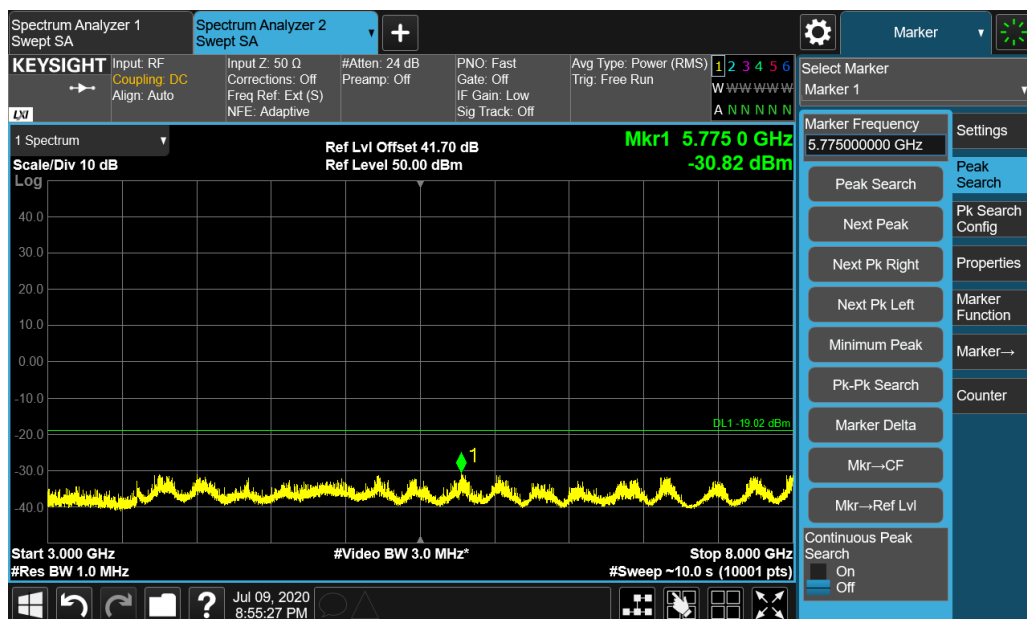
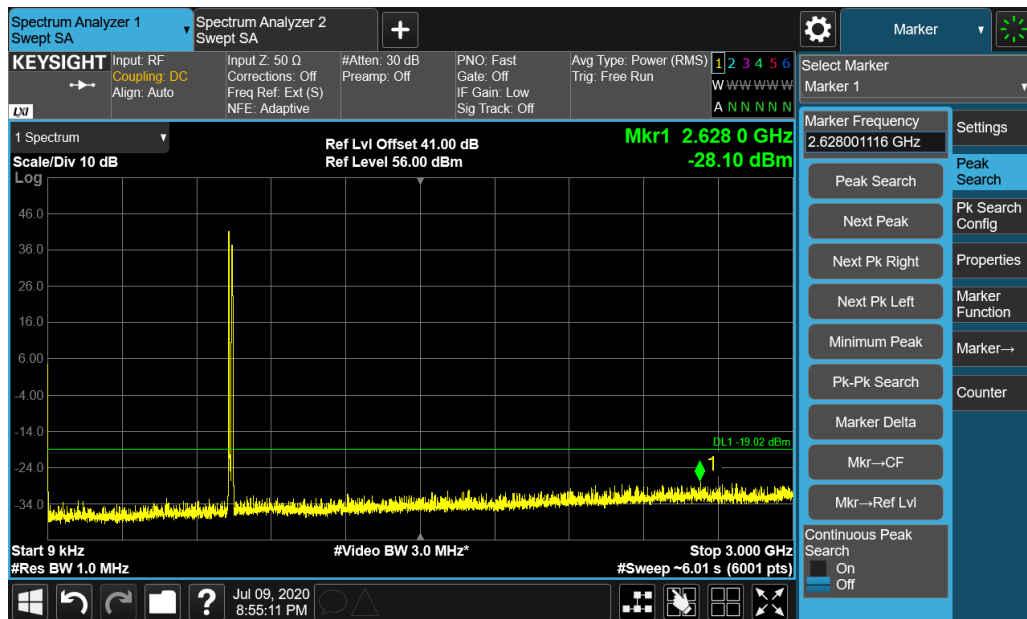


TEST REPORT

Configuration NR+NB-IoT-MC-1

Antenna Port	Channel Position	Modulation	NR Channel Bandwidth (MHz)	NB Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	0.2	1000	-19
D	M	QPSK	5	0.2	1000	-19
D	T	QPSK	5	0.2	1000	-19

Channel Position M

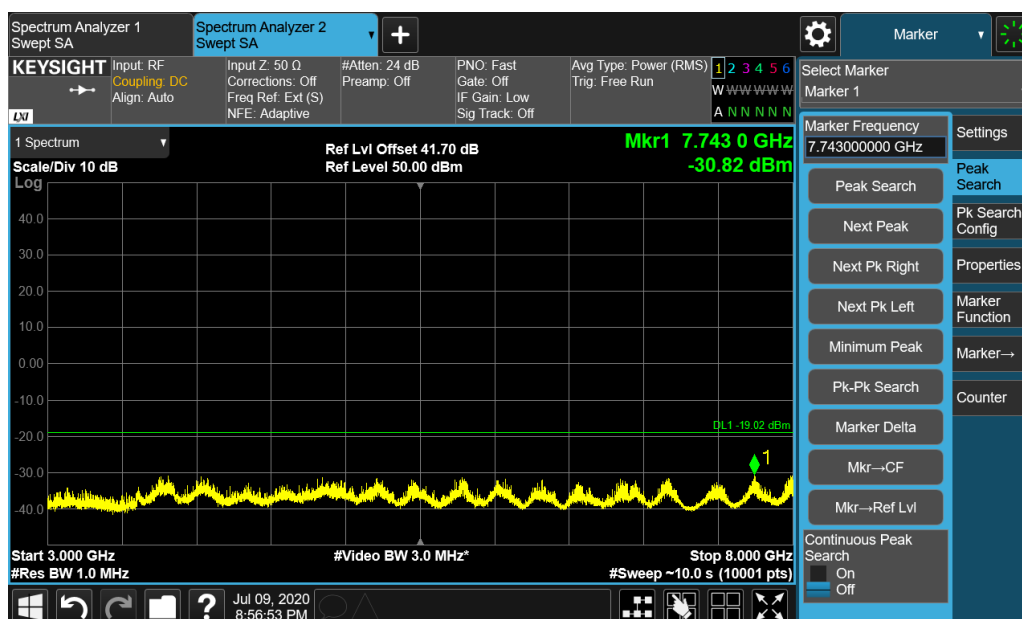
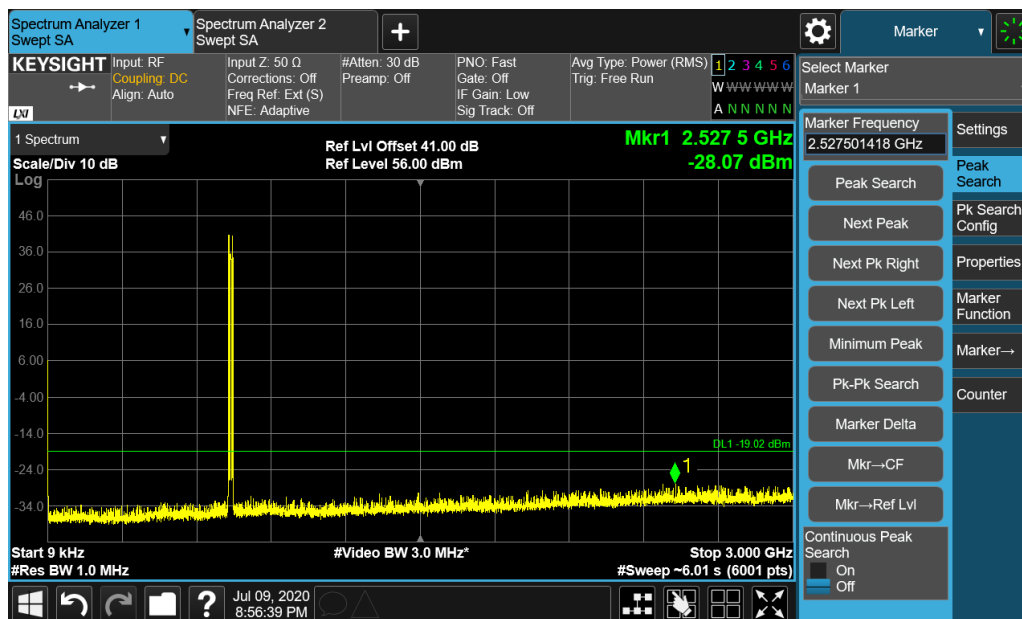


TEST REPORT

Configuration NR+NB-IoT-MC-2

Antenna Port	Channel Position	Modulation	NR Channel Bandwidth (MHz)	NB Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	0.2	1000	-19
D	M	QPSK	5	0.2	1000	-19
D	T	QPSK	5	0.2	1000	-19

Channel Position M

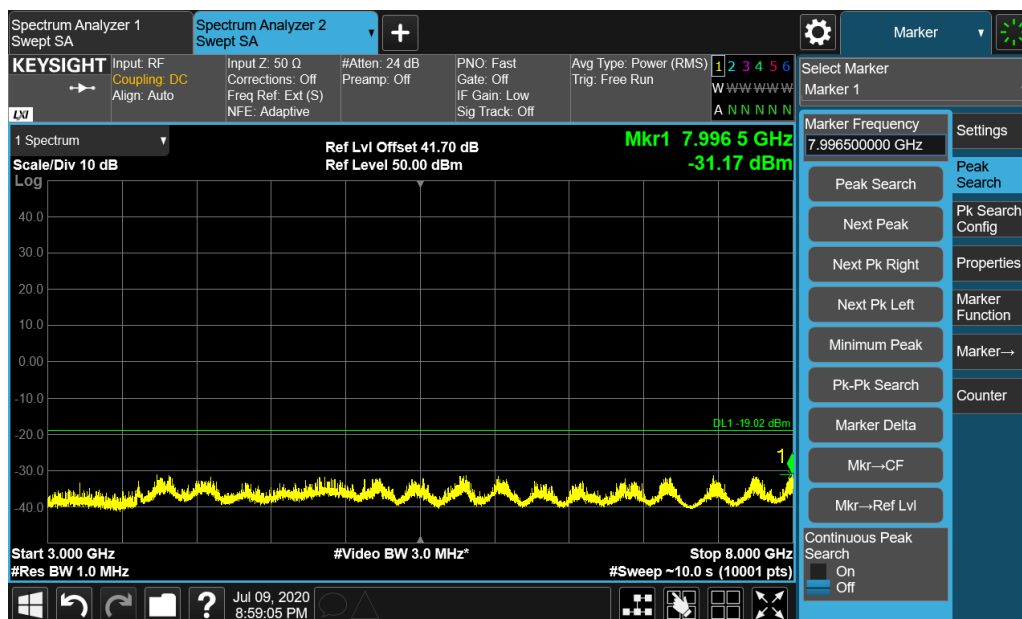
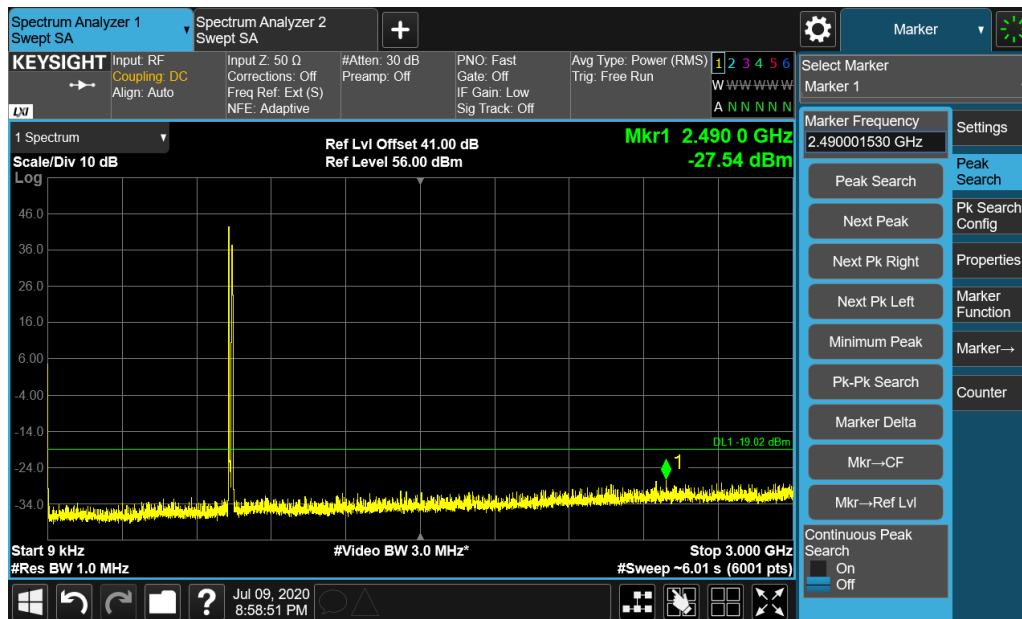


TEST REPORT

Configuration LTE+NB-IoT-MC-1

Antenna Port	Channel Position	Modulation	LTE Channel Bandwidth (MHz)	NB Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	0.2	1000	-19
D	M	QPSK	5	0.2	1000	-19
D	T	QPSK	5	0.2	1000	-19

Channel Position M

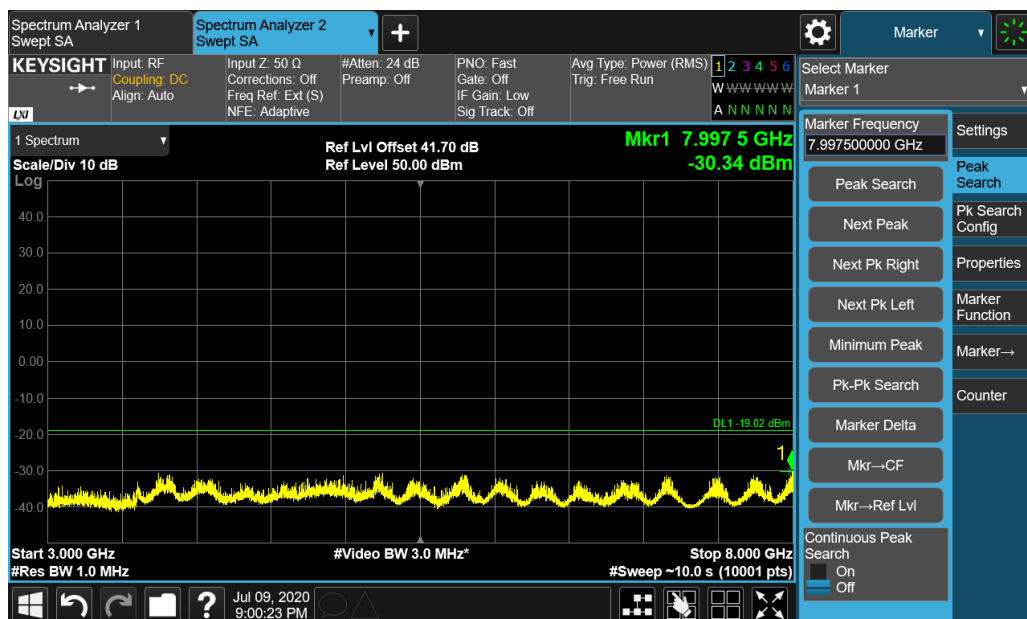
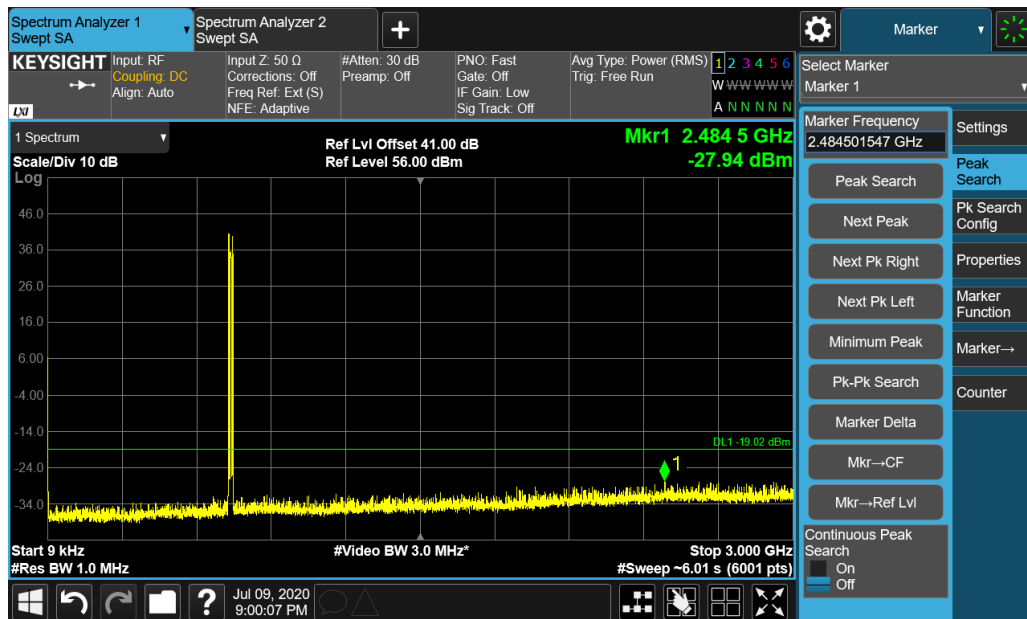


TEST REPORT

Configuration LTE+NB-IoT-MC-2

Antenna Port	Channel Position	Modulation	LTE Channel Bandwidth (MHz)	NB Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	0.2	1000	-19
D	M	QPSK	5	0.2	1000	-19
D	T	QPSK	5	0.2	1000	-19

Channel Position M

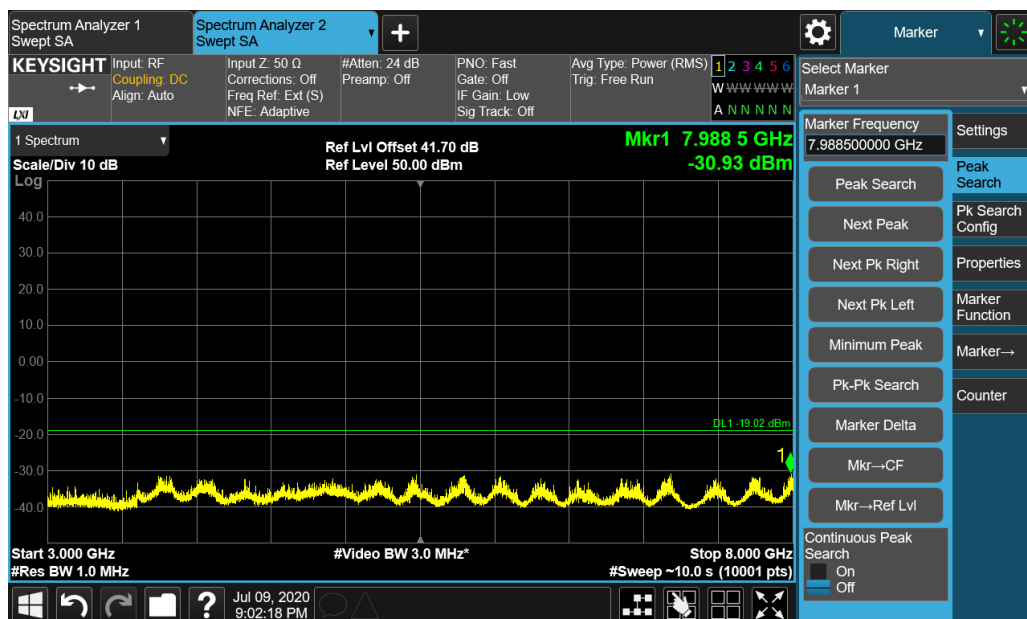
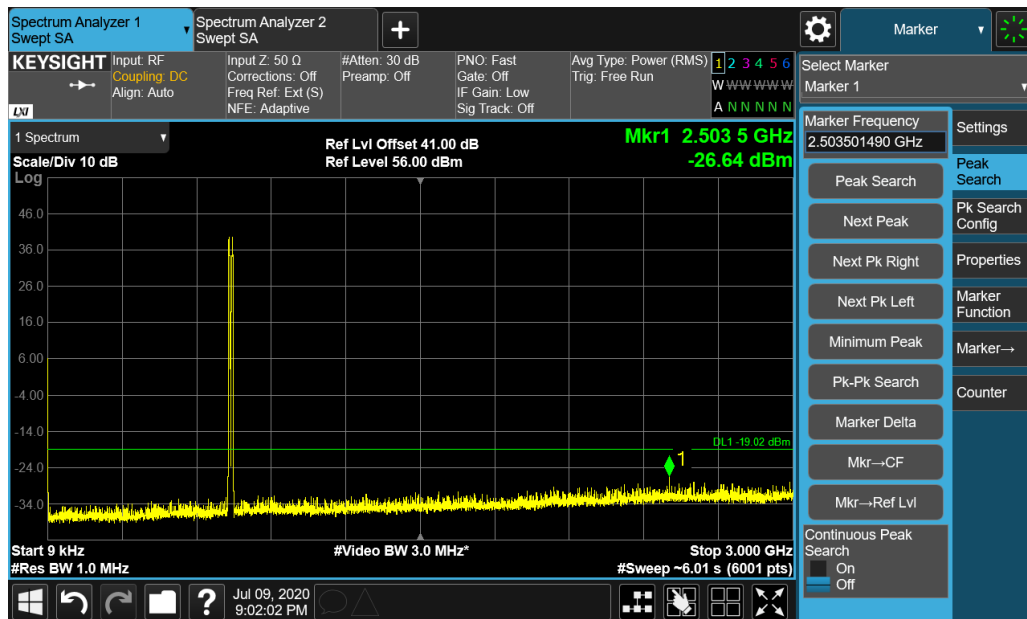


TEST REPORT

Configuration NR+LTE+NB-IoT-MC-1

Antenna Port	Channel Position	Modulation	NR Channel Bandwidth (MHz)	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	5	1000	-19
D	M	QPSK	5	5	1000	-19
D	T	QPSK	5	5	1000	-19

Channel Position M

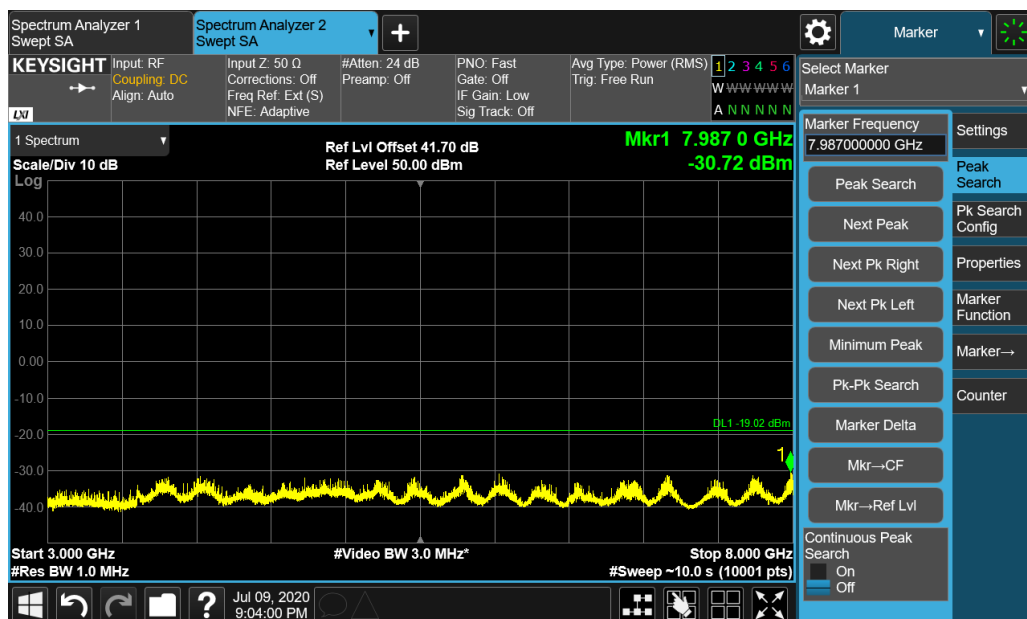
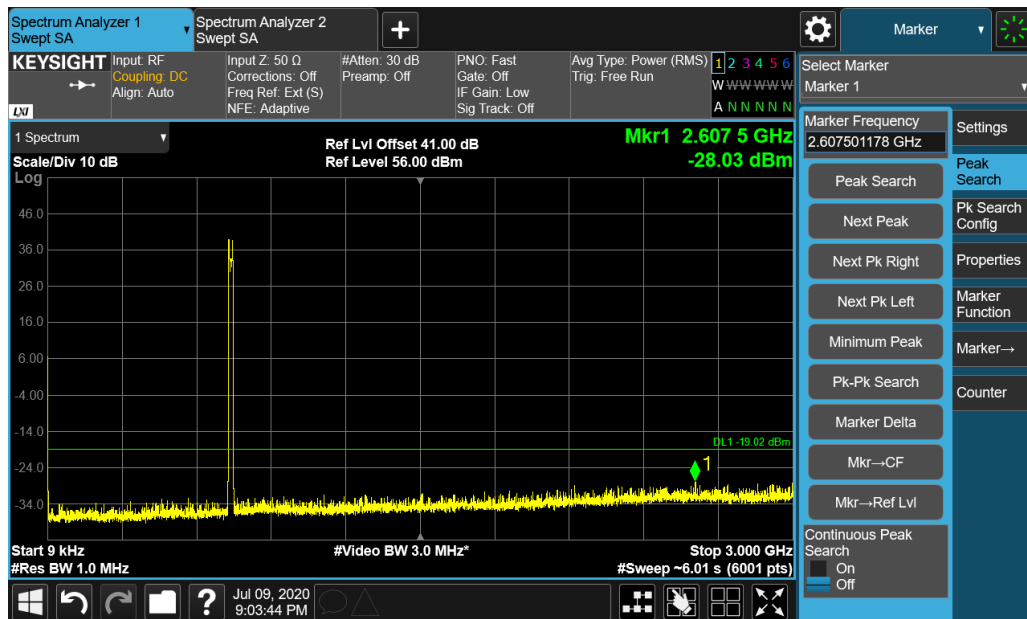


TEST REPORT

Configuration NR+LTE+NB-IoT-MC-2

Antenna Port	Channel Position	Modulation	NR Channel Bandwidth (MHz)	LTE Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	5	1000	-19
D	M	QPSK	5	5	1000	-19
D	T	QPSK	5	5	1000	-19

Channel Position M



7 Radiated Unwanted Emission

Test result: Pass

7.1 Limit

The field strength of the carrier has been calculated assuming that the power is to be fed to a half-wave tuned dipoles as per 2.1053 (a).

$$E(V/m) = (30 \times G_i \times P_o)^{0.5} / d$$

Where

G_i is the antenna gain of ideal half-wave dipoles,

P_o is the power out of the transceiver in W,

d is the measurement distance in meter.

As per FCC Part 27, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

Therefore, the limit at 3m measurement distance is:

$$E(V/m) = 84.4 \text{ dB}\mu\text{V/m}$$

These limits have been used to determine Pass or Fail for the harmonics measured and detailed in the following results.

7.2 Measurement Procedure

This measurement is carried out in semi-anechoic chamber.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the measurement antenna in both horizontal and vertical polarizations.

Emissions identified within the range 30MHz to 8GHz were then formally measured using a peak detector as the worst case.

The limits for outside a licensee's frequency band(s) of operation the power of the spurious emissions have been calculated, as shown below using the following formula:

$$\text{Field Strength of Carrier} - (43 + 10\log(P)) \text{ dB}$$

Where:

Field Strength is measured in dB μ V/m

P is measured Transmitter Power in Watts

The EUT was measured with the antenna height varied between 1 and 4 m with the turntable rotated between 0 and 360 degrees. The emission of any outside a licensee's frequencies within 20dB of the limit were measured according to the standard.

The measurements were performed at a 3m distance unless otherwise stated.

7.3 Measurement result

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
LTE-MIMO-1C	B	1 Carrier	15MHz	QPSK

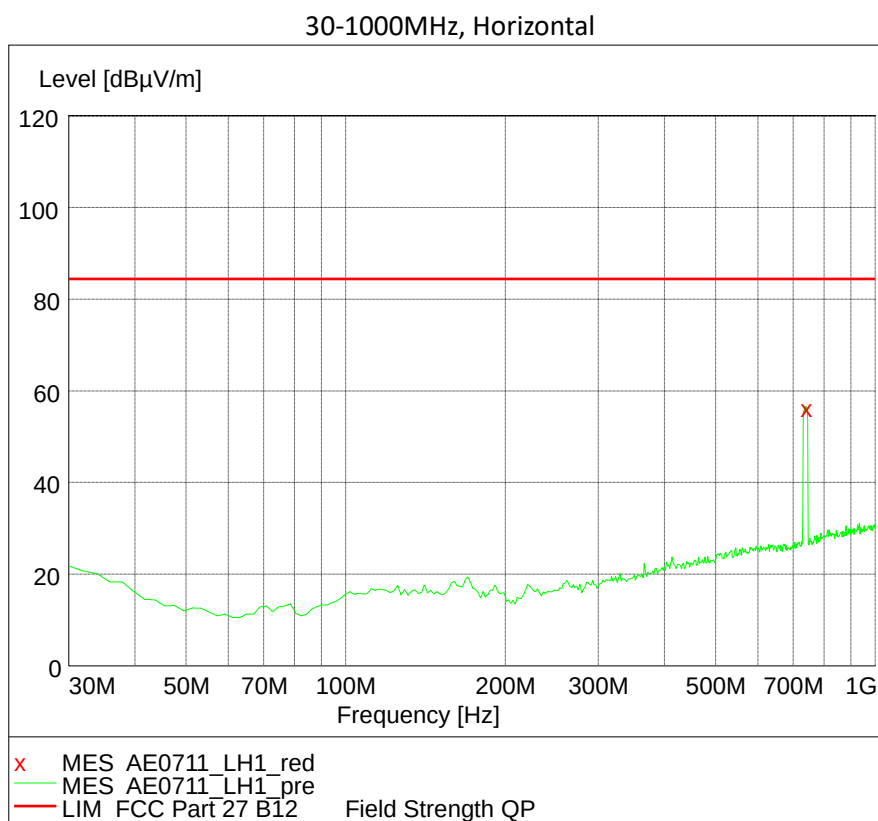
No emissions were detected within 20dB of the limit.

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
LTE-MIMO-1C	M	1 Carrier	15MHz	QPSK

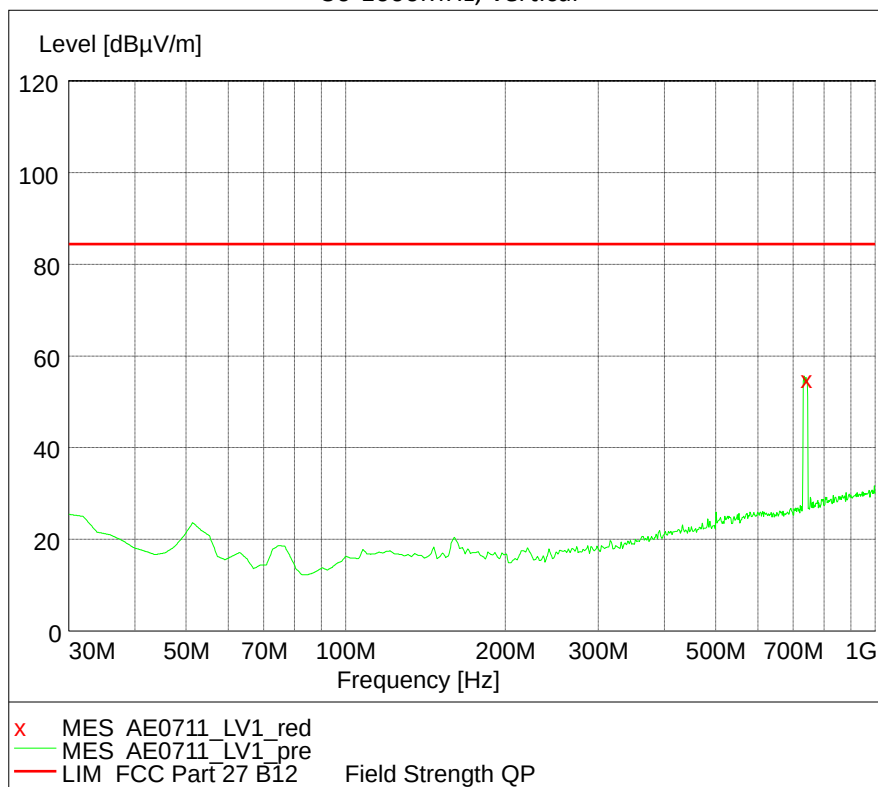
No emissions were detected within 20dB of the limit.

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
LTE-MIMO-1C	T	1 Carrier	15MHz	QPSK

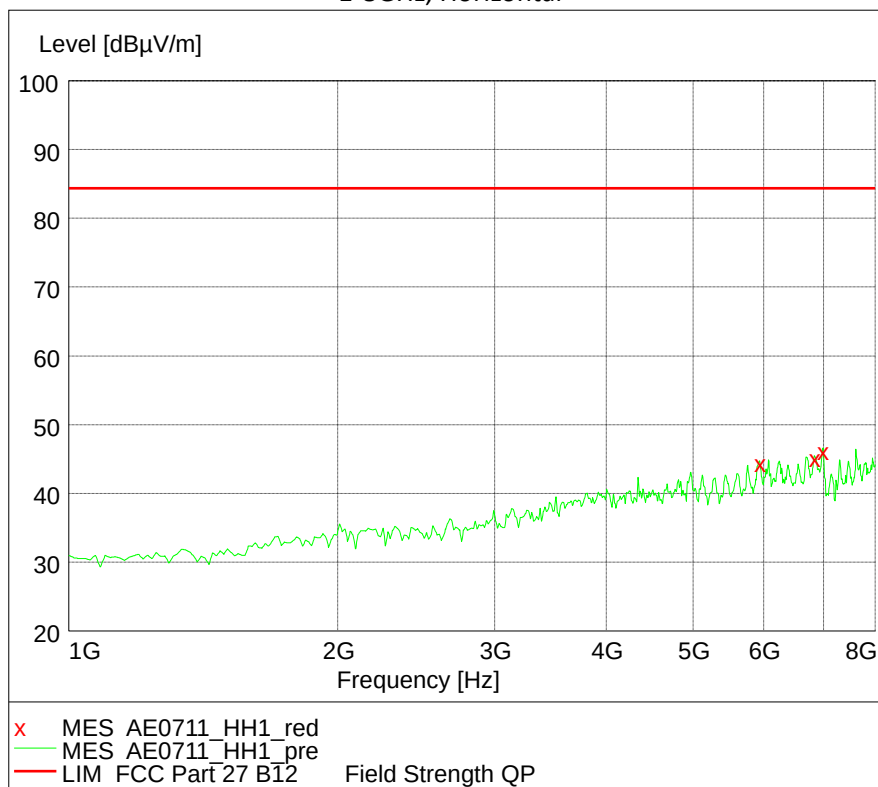
No emissions were detected within 20dB of the limit.

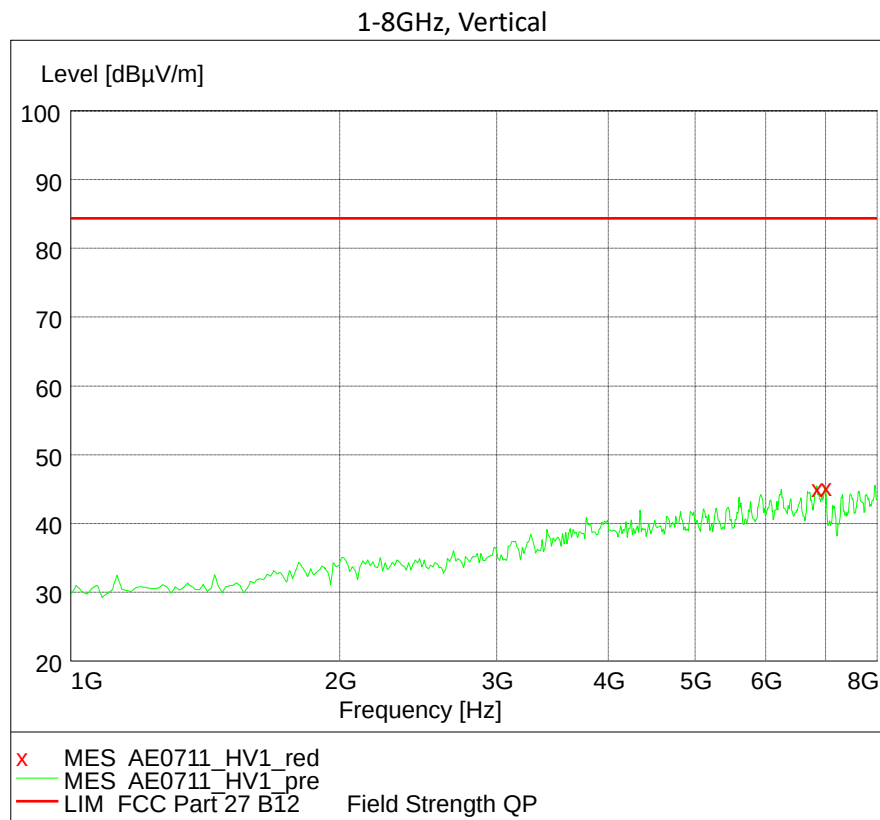


30-1000MHz, Vertical



1-8GHz, Horizontal

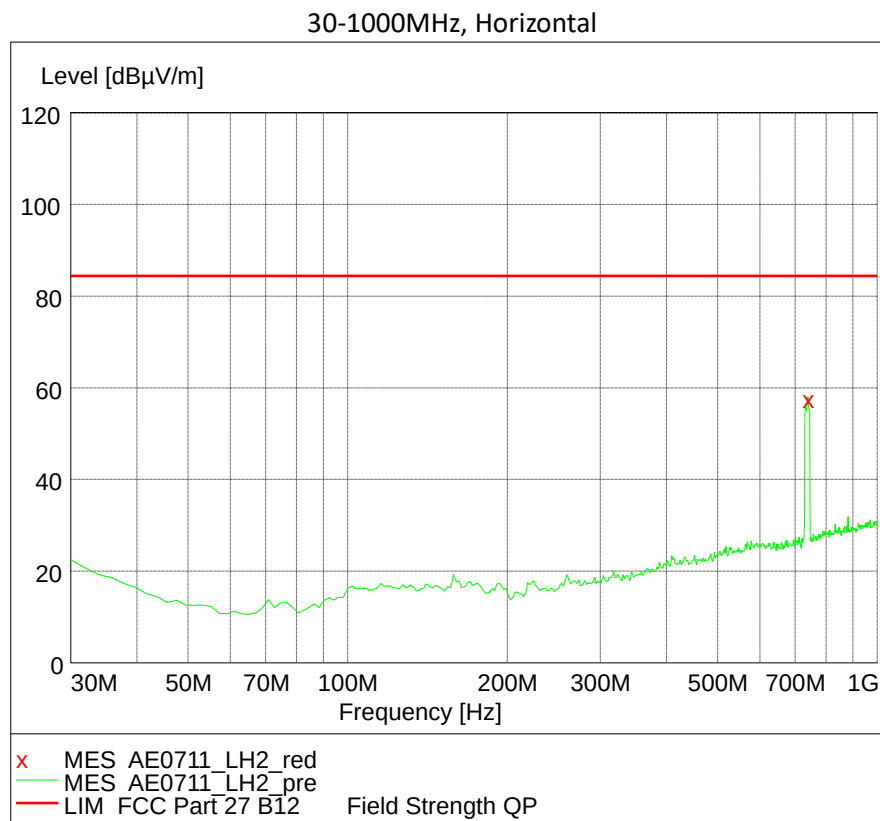




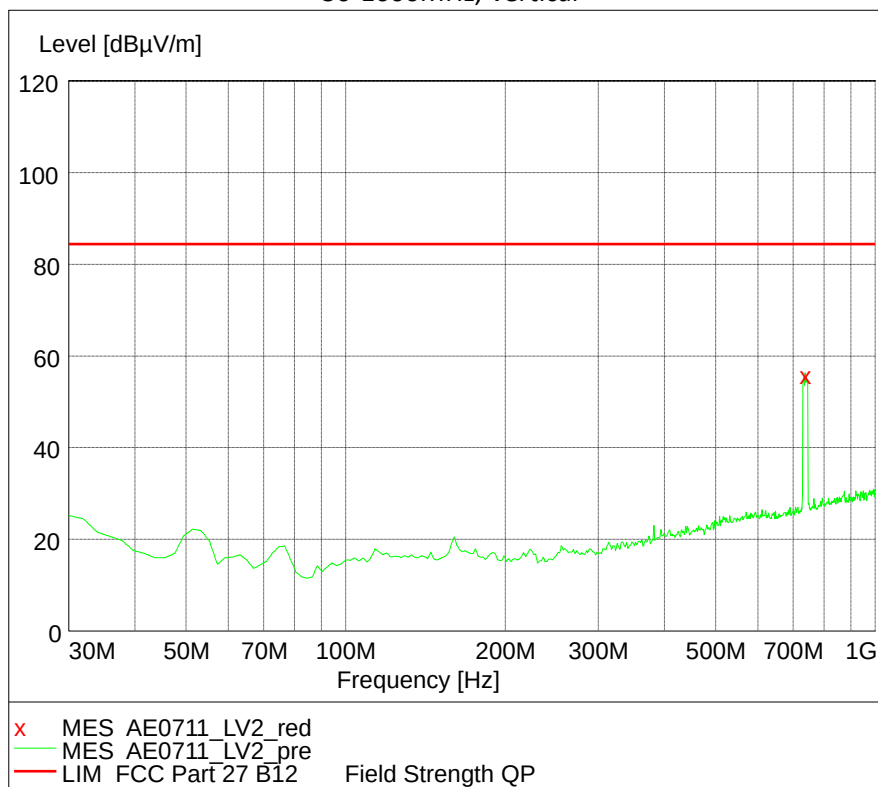
TEST REPORT

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
LTE-MIMO-3C	M	3 Carriers	5MHz	QPSK

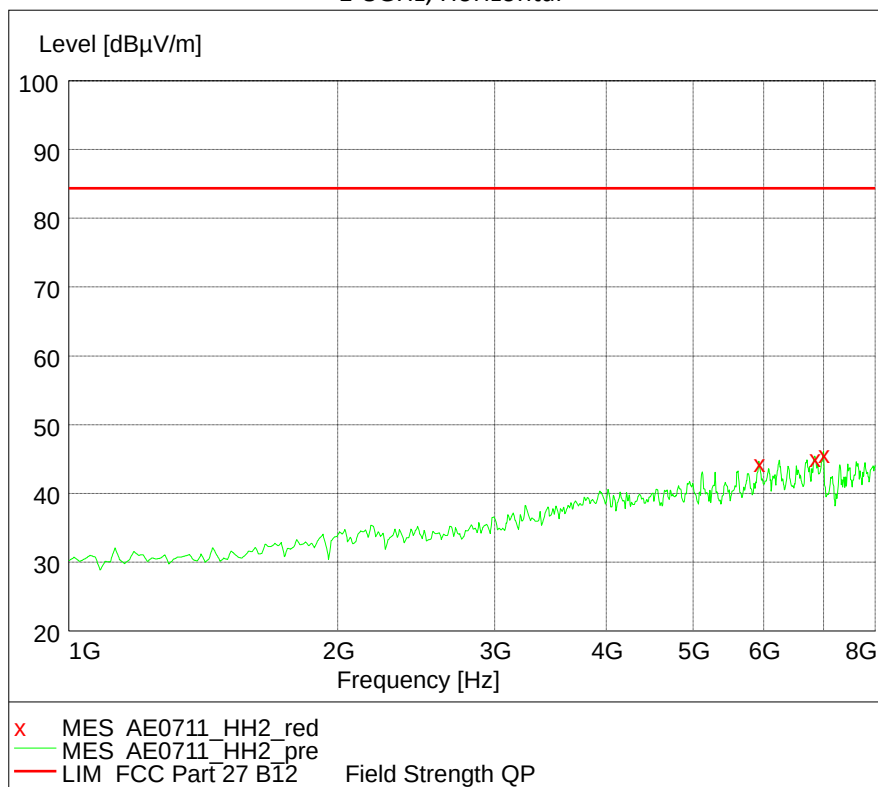
No emissions were detected within 20dB of the limit.

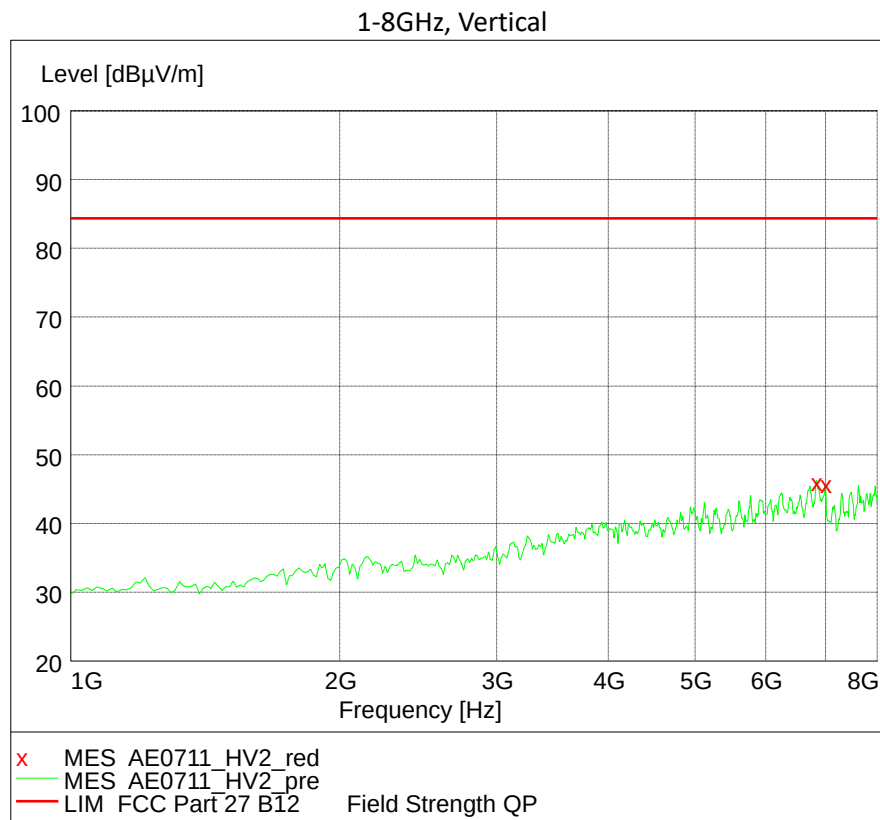


30-1000MHz, Vertical



1-8GHz, Horizontal





TEST REPORT

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
NR-MIMO-1C	B	1 Carrier	15MHz	QPSK

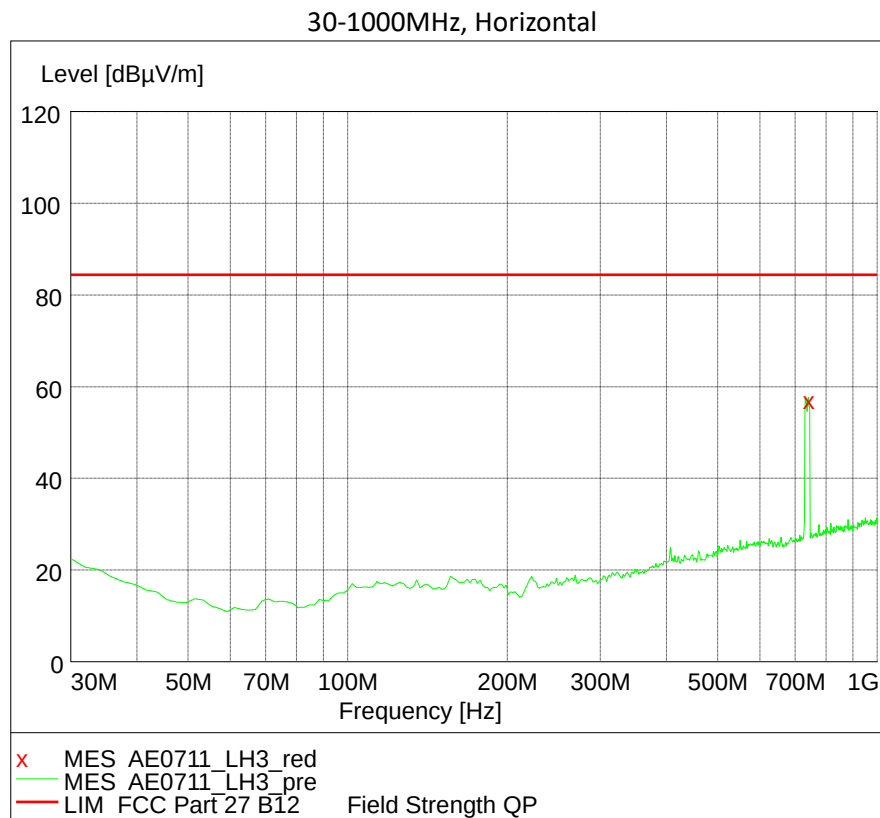
No emissions were detected within 20dB of the limit.

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
NR-MIMO-1C	M	1 Carrier	15MHz	QPSK

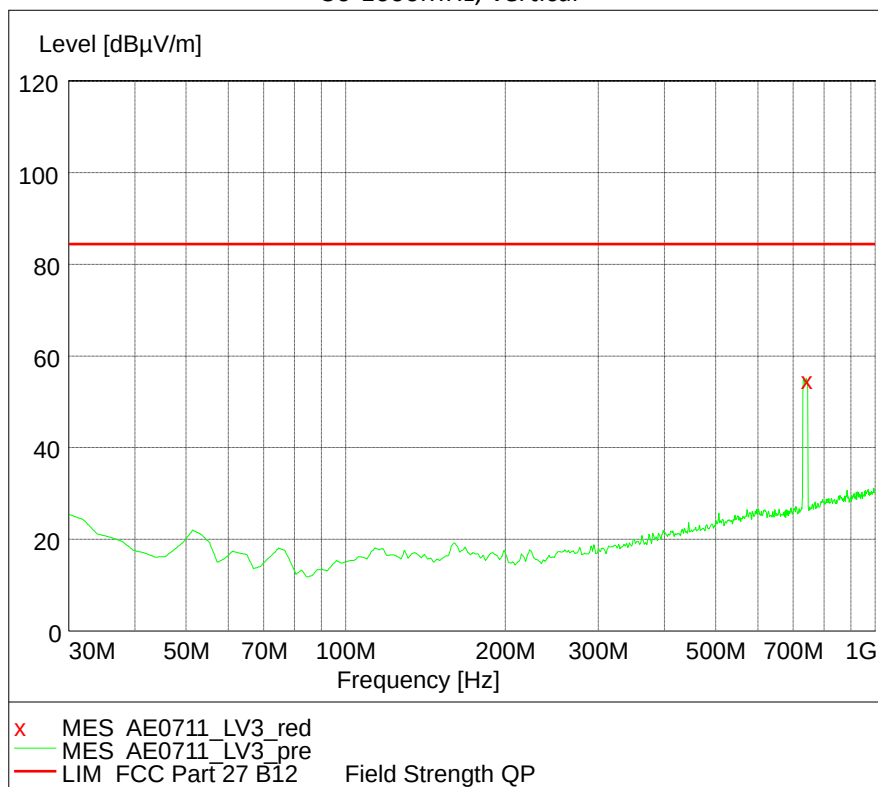
No emissions were detected within 20dB of the limit.

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
NR-MIMO-1C	T	1 Carrier	15MHz	QPSK

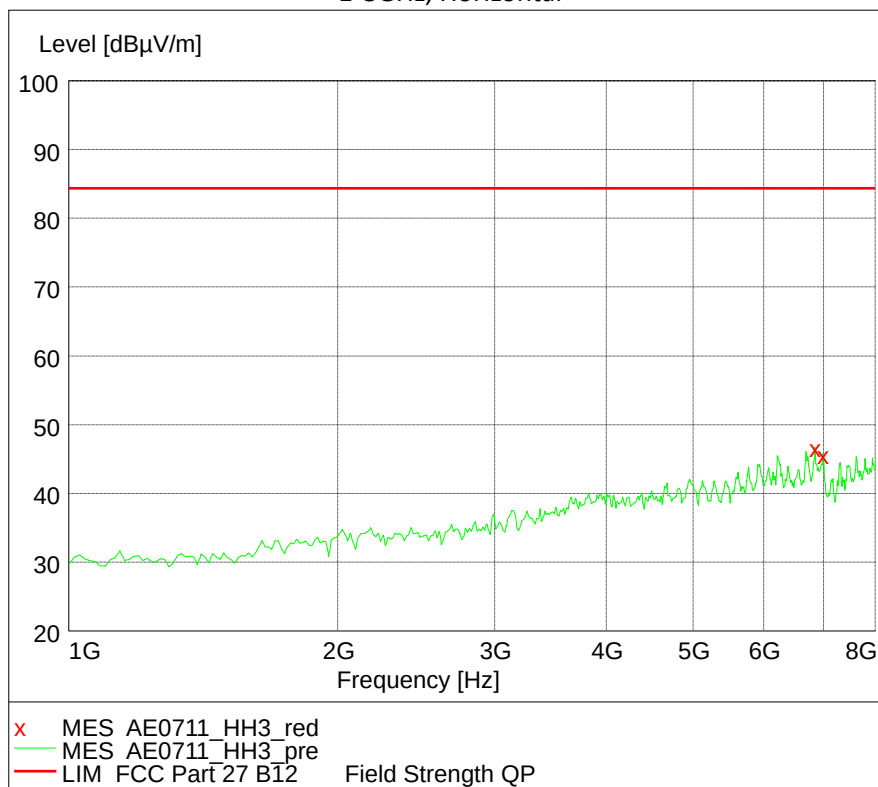
No emissions were detected within 20dB of the limit.

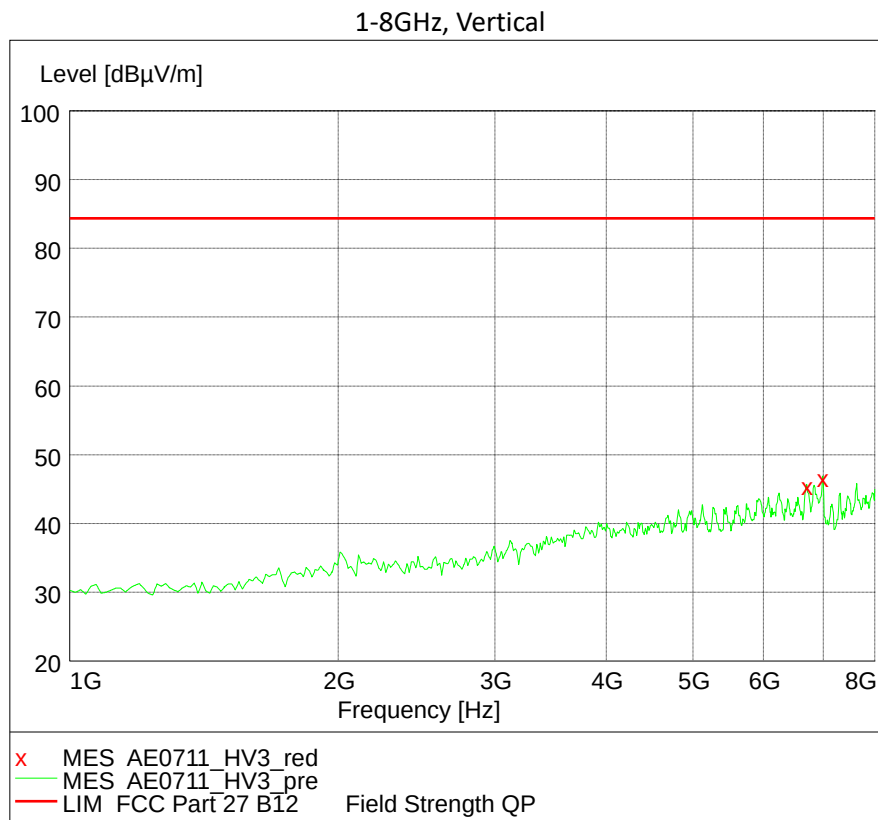


30-1000MHz, Vertical



1-8GHz, Horizontal

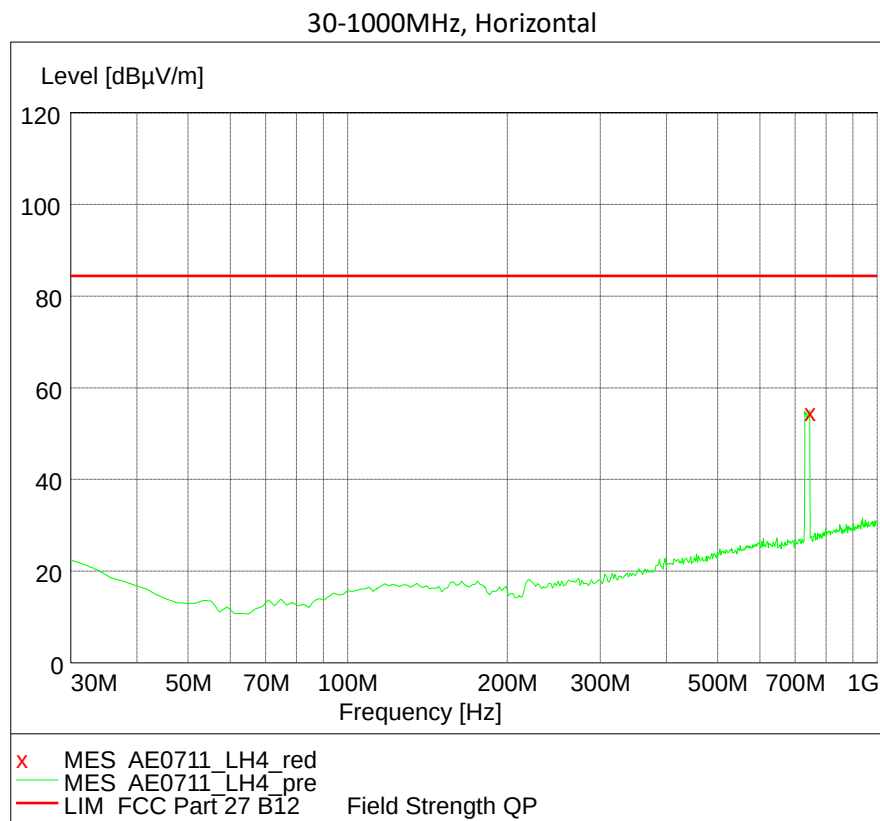




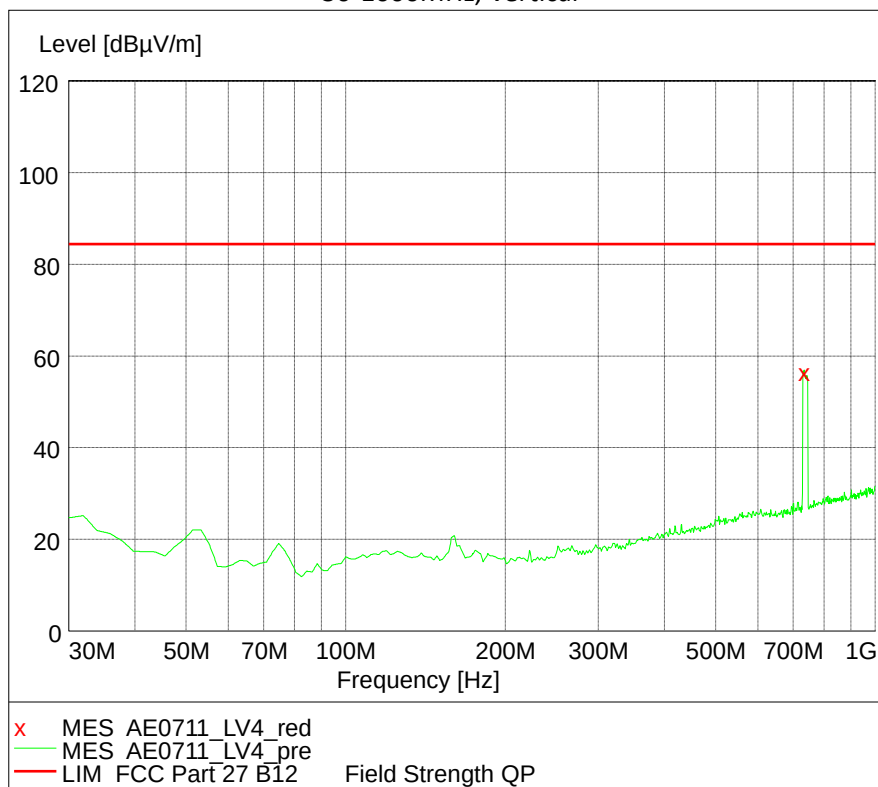
TEST REPORT

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
NR-MIMO-3C	M	3 Carriers	5MHz	QPSK

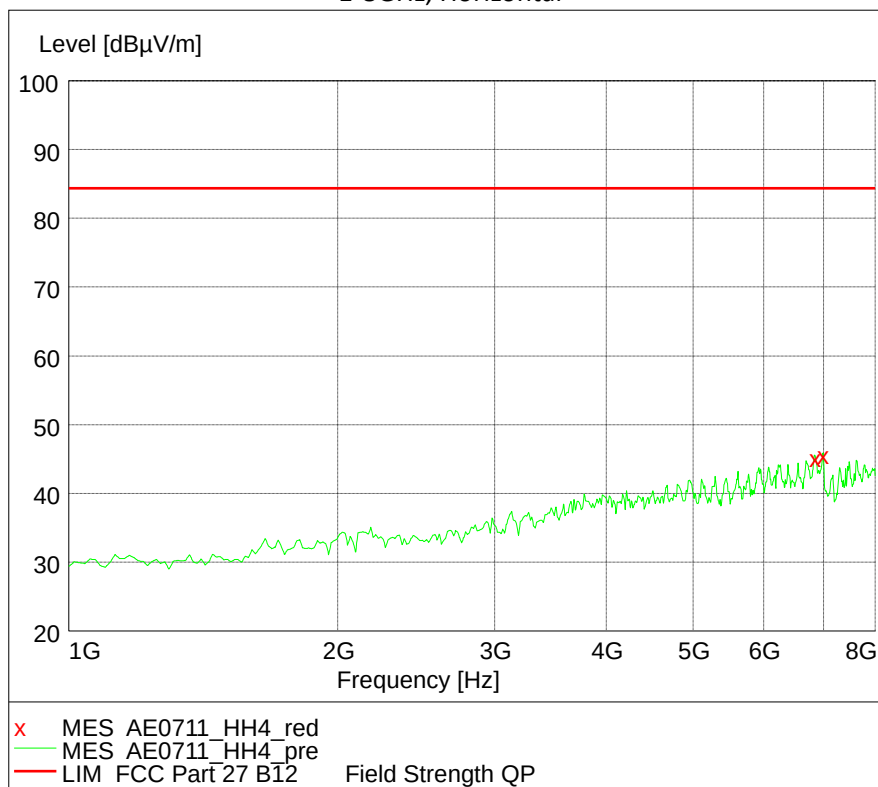
No emissions were detected within 20dB of the limit.

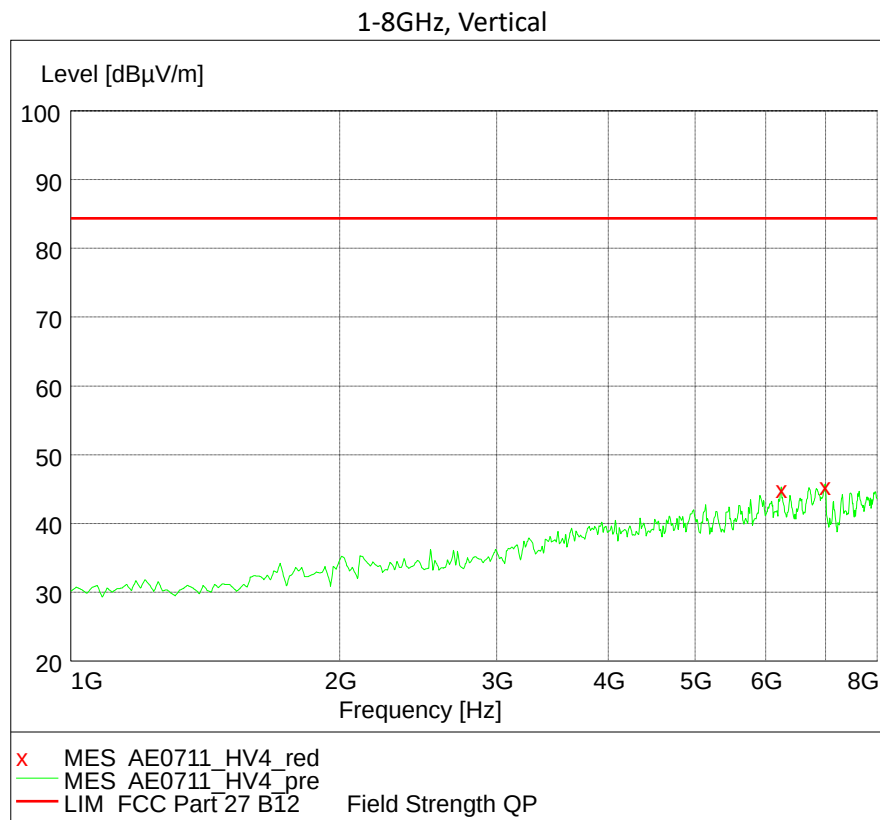


30-1000MHz, Vertical



1-8GHz, Horizontal

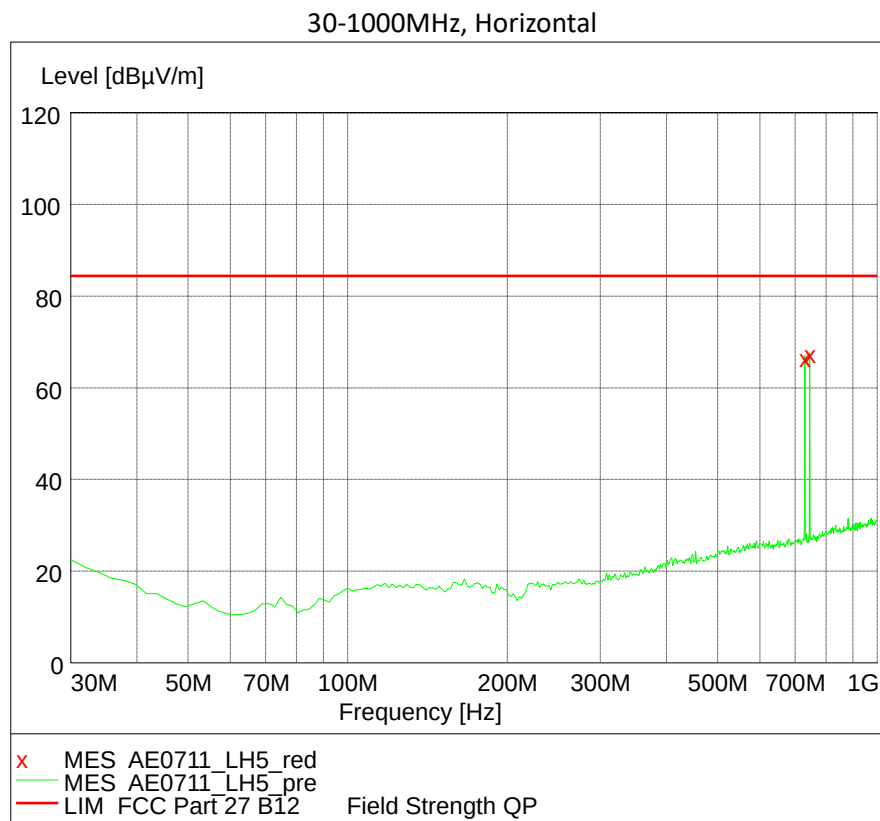




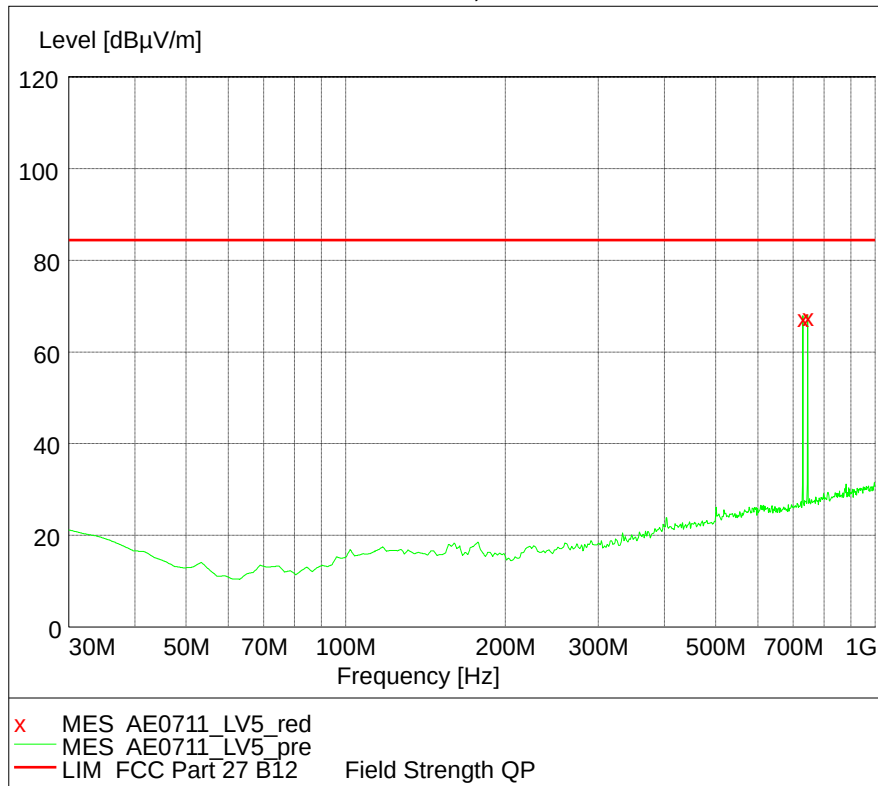
TEST REPORT

Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
NB-IoT-Standalone-2C	M	2 Carriers	0.2MHz	QPSK

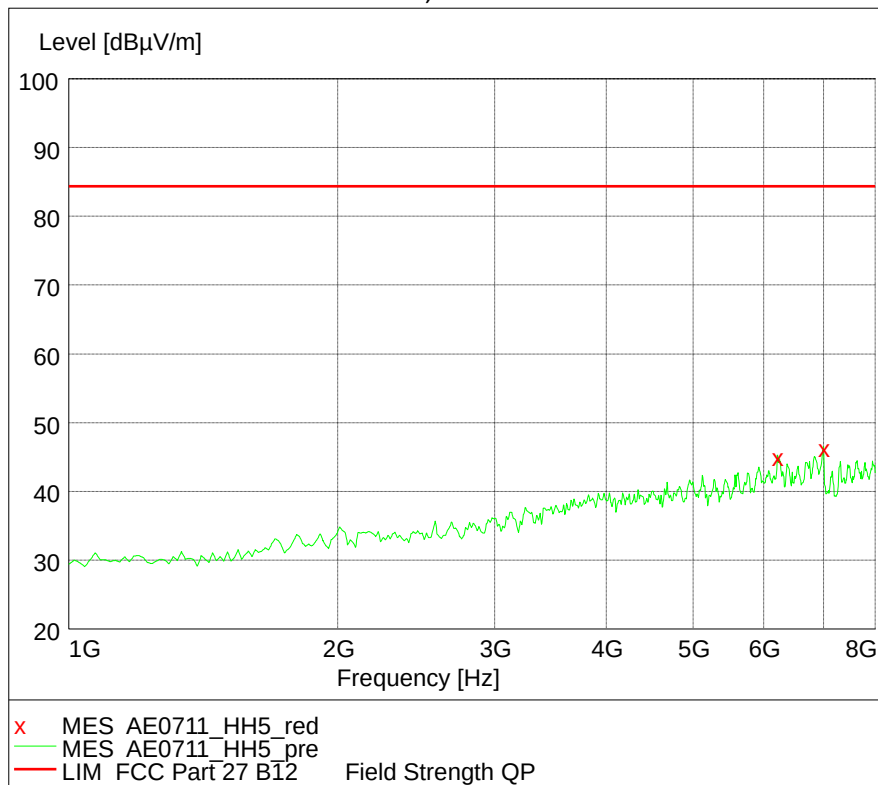
No emissions were detected within 20dB of the limit.

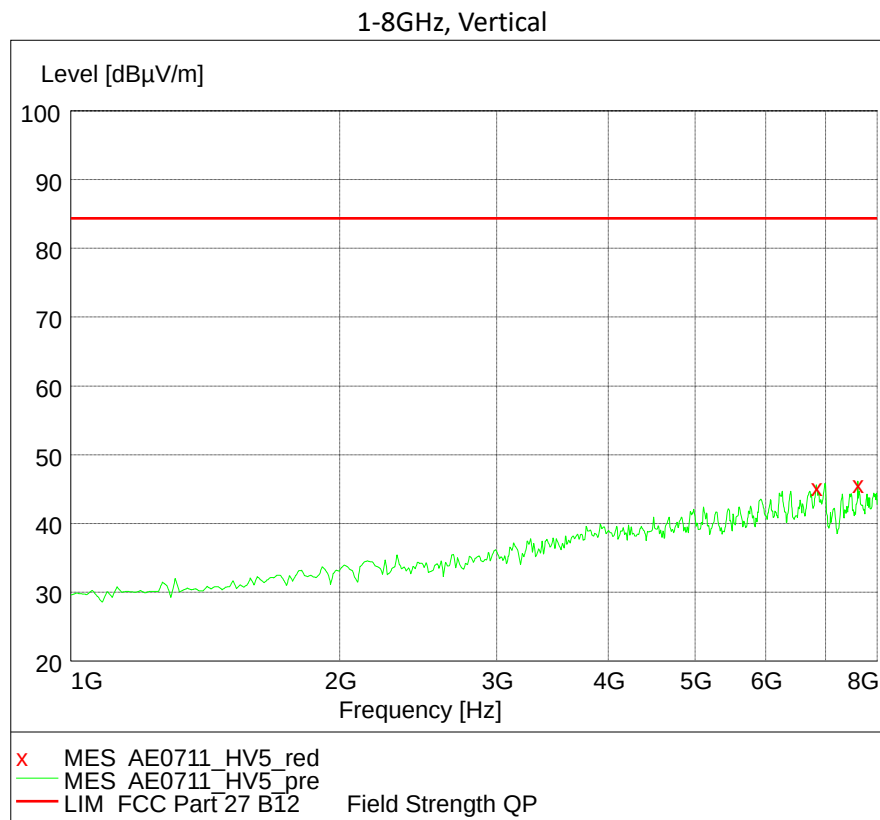


30-1000MHz, Vertical



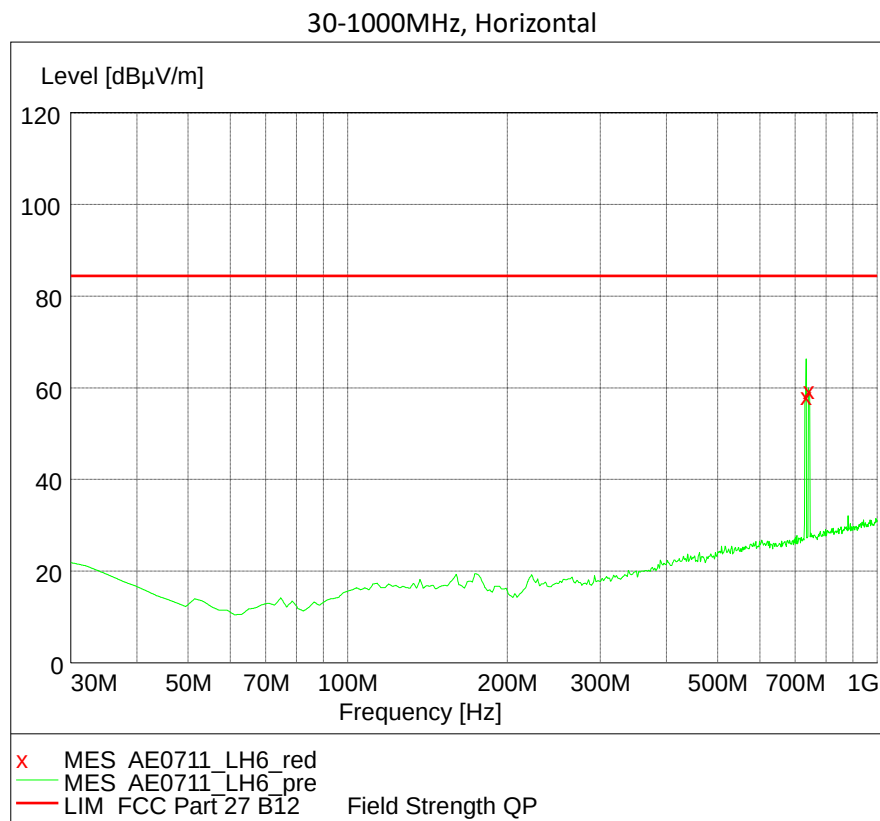
1-8GHz, Horizontal



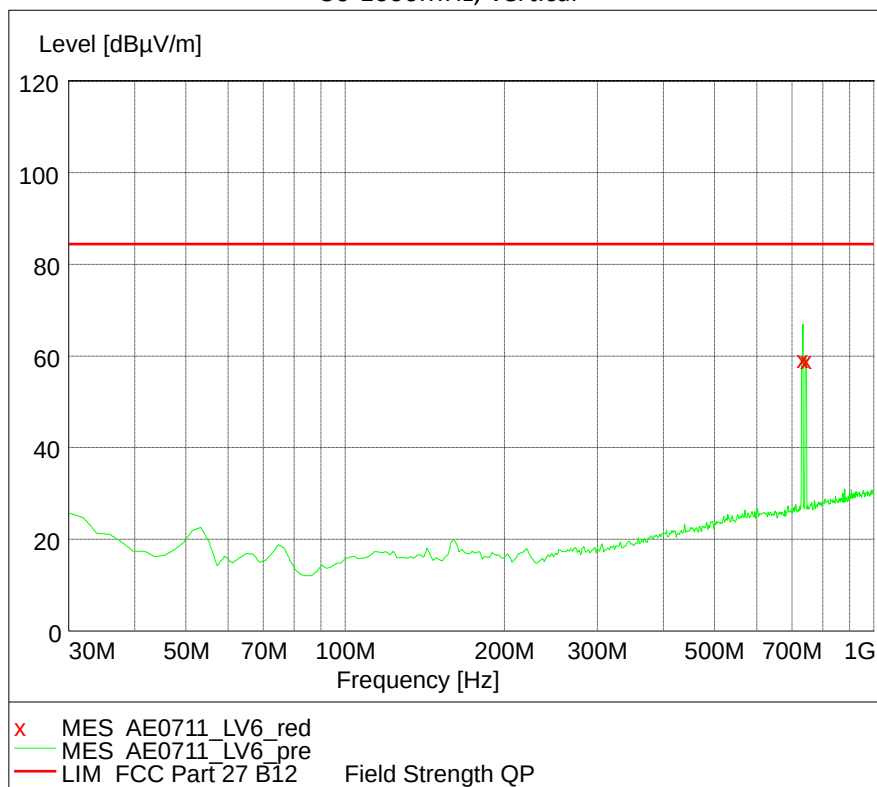


Configuration	Channel Position	Carrier	Carrier Bandwidth	Modulation
NR+LTE-MC-1	M	2 Carriers	5MHz	QPSK

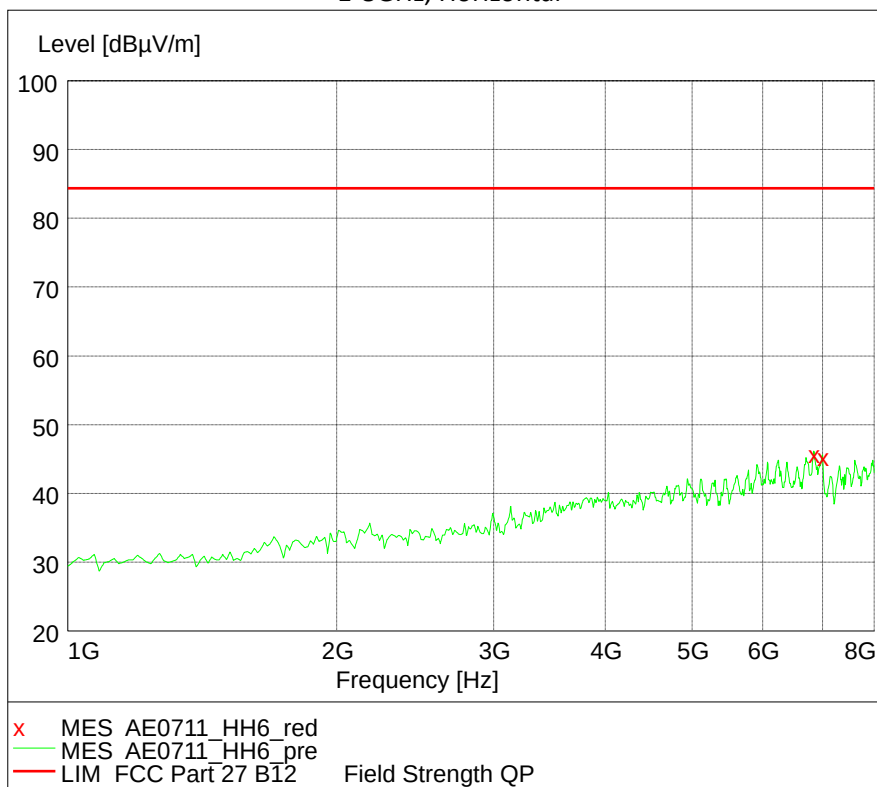
No emissions were detected within 20dB of the limit.

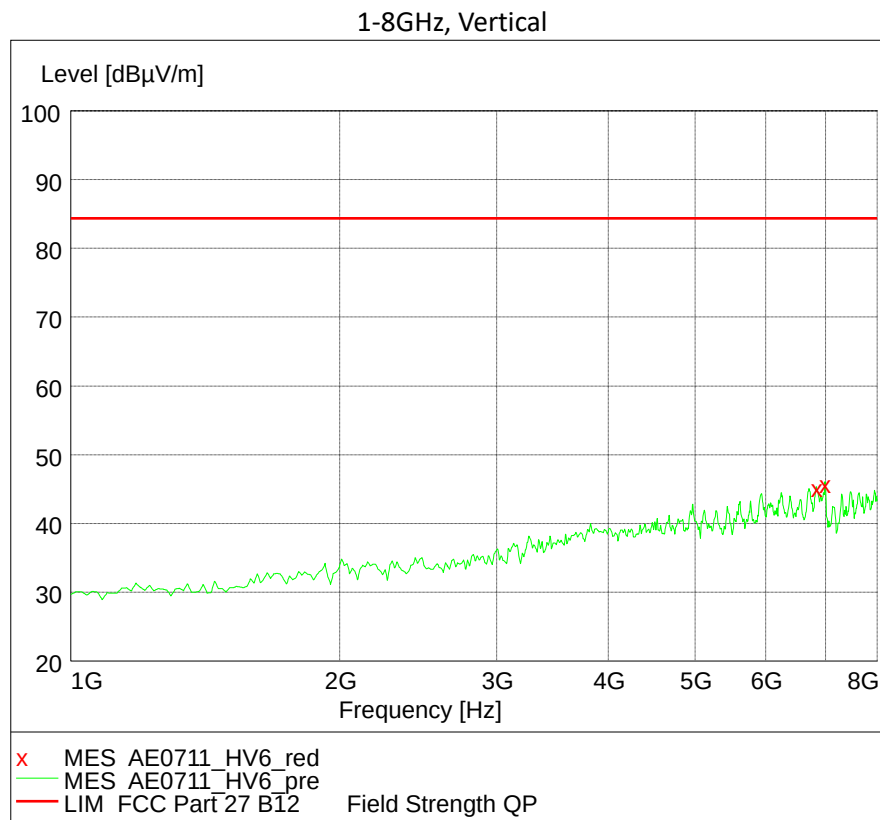


30-1000MHz, Vertical



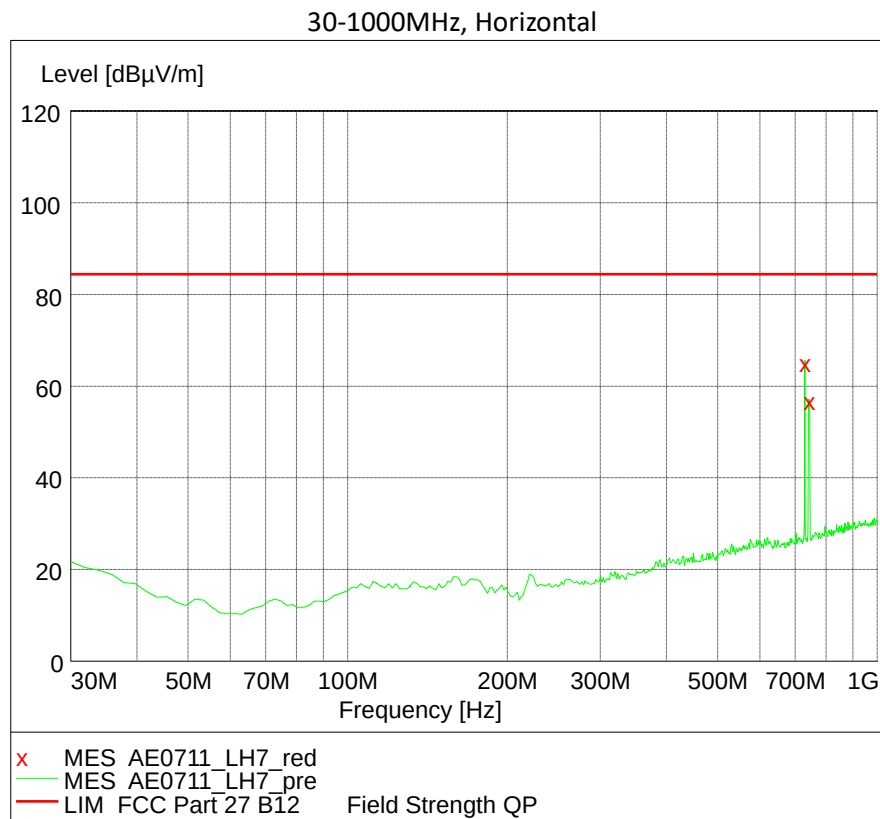
1-8GHz, Horizontal



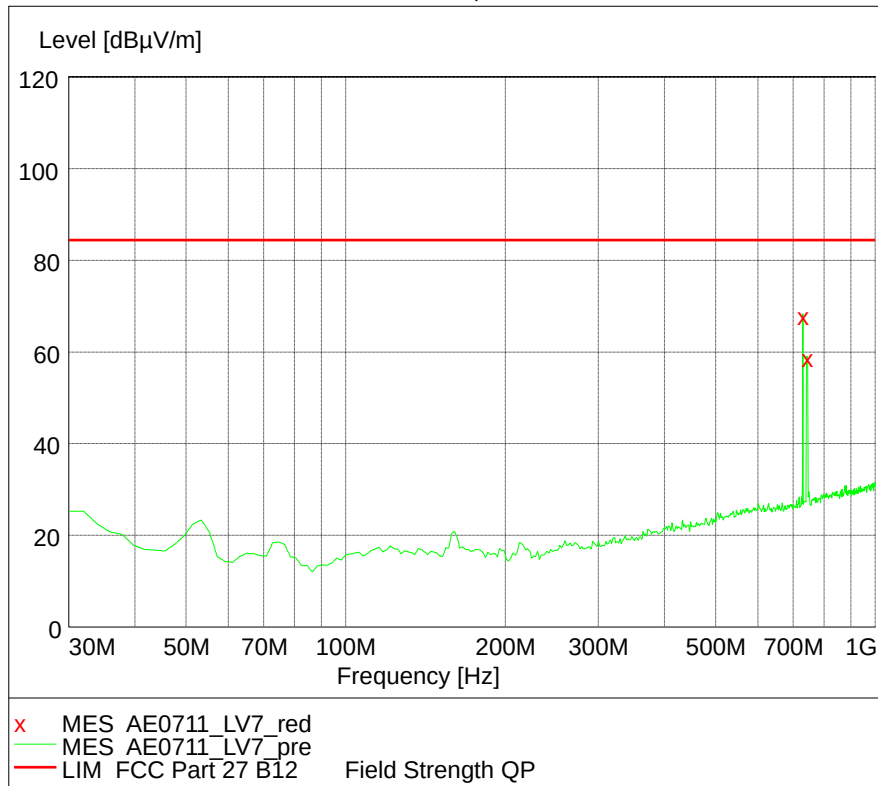


Configuration	Channel Position	Carrier	NR Carrier Bandwidth	Modulation
NR+NB-IoT-MC-1	M	2 Carriers	5MHz	QPSK

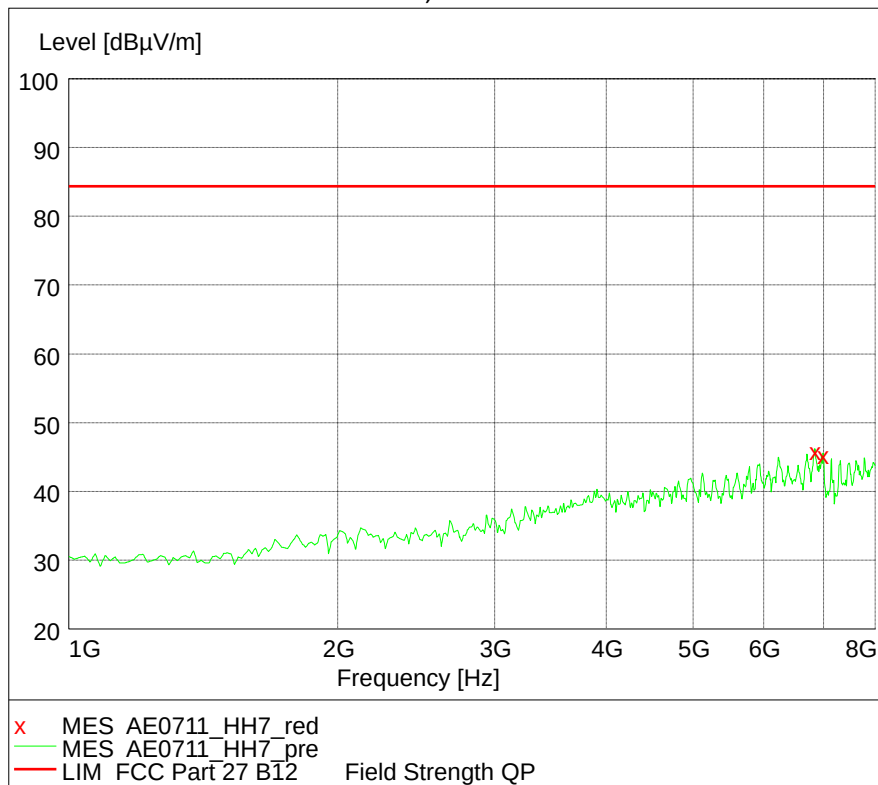
No emissions were detected within 20dB of the limit.

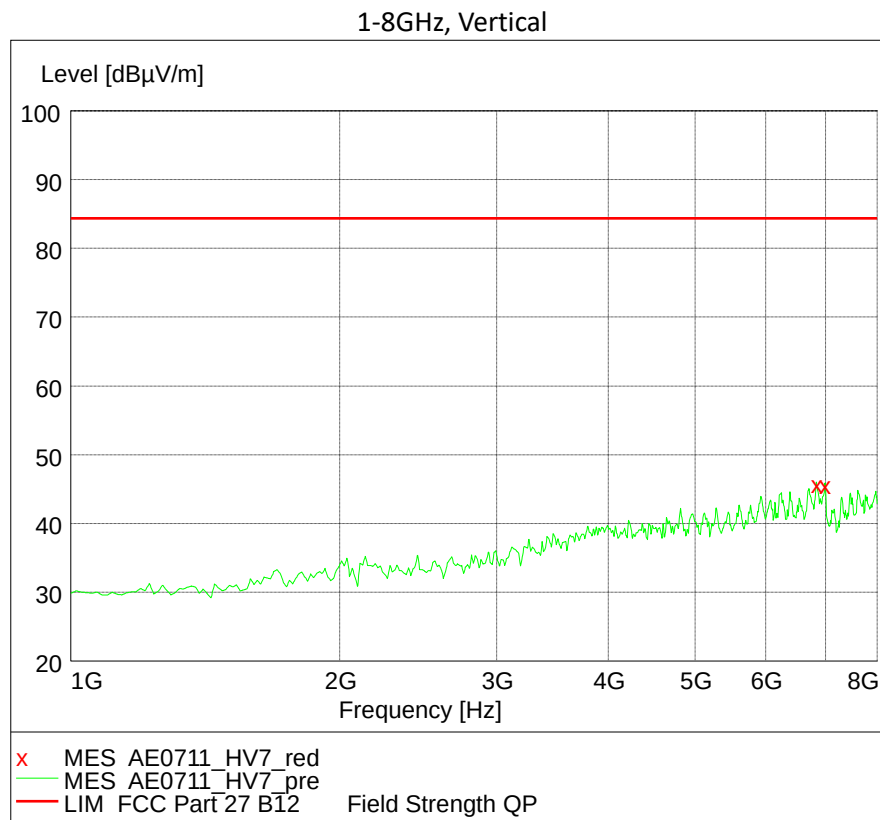


30-1000MHz, Vertical



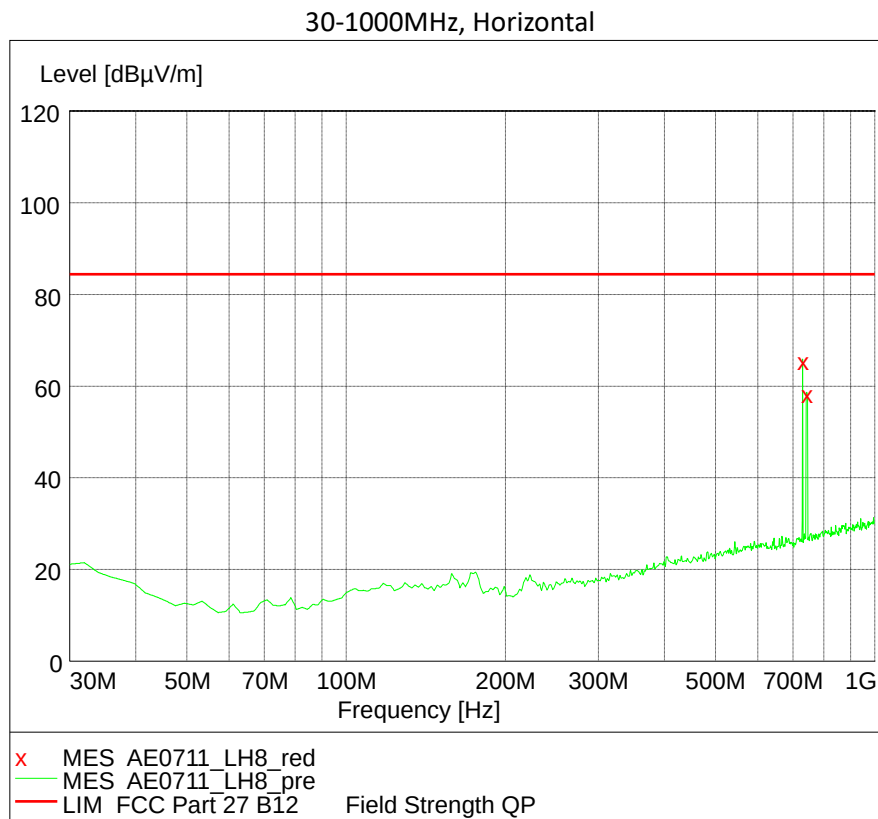
1-8GHz, Horizontal



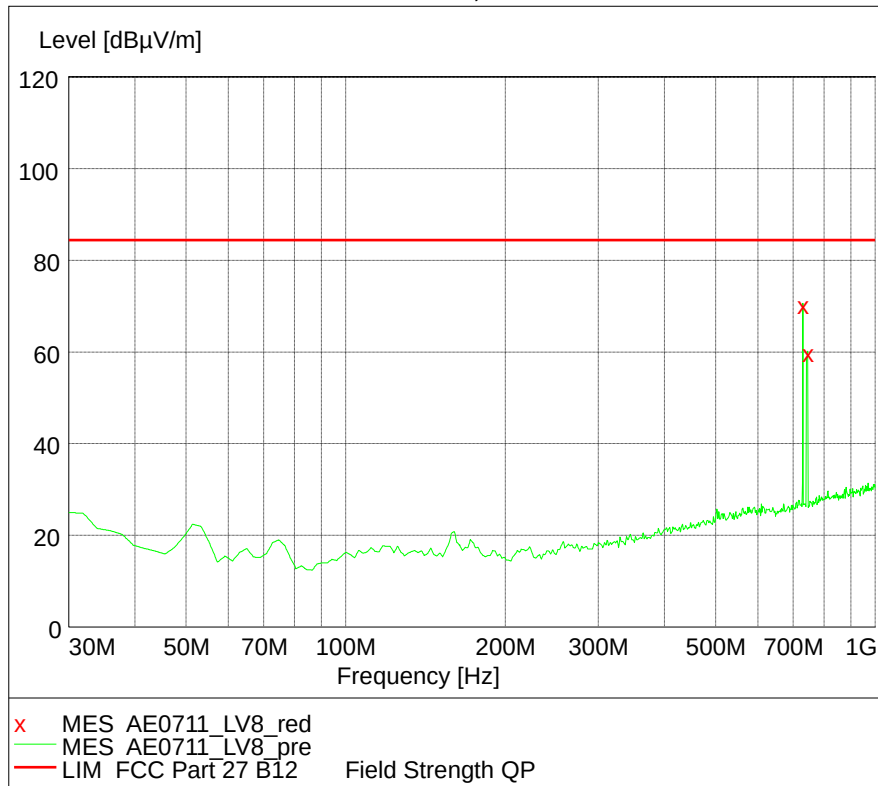


Configuration	Channel Position	Carrier	LTE Carrier Bandwidth	Modulation
LTE+NB-IoT-MC-1	M	2 Carriers	5MHz	QPSK

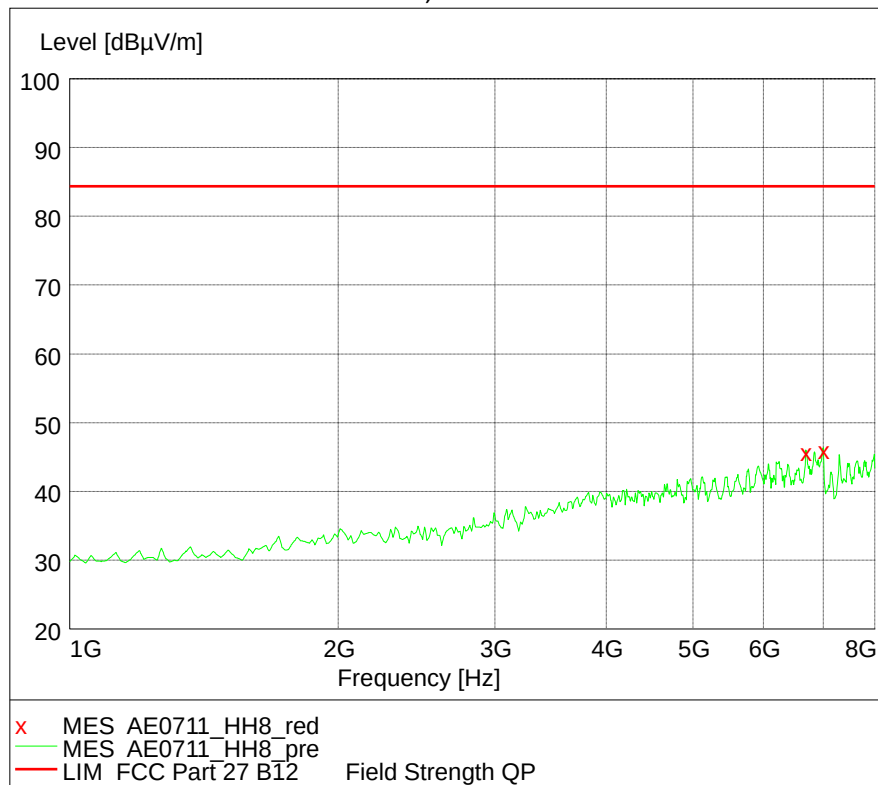
No emissions were detected within 20dB of the limit.

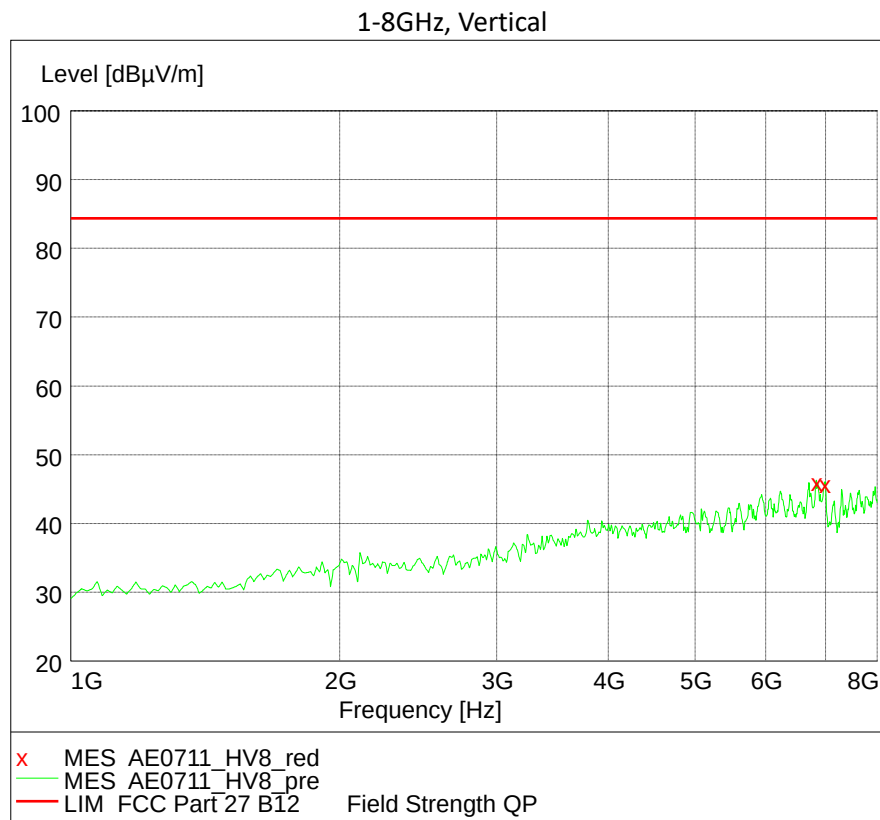


30-1000MHz, Vertical



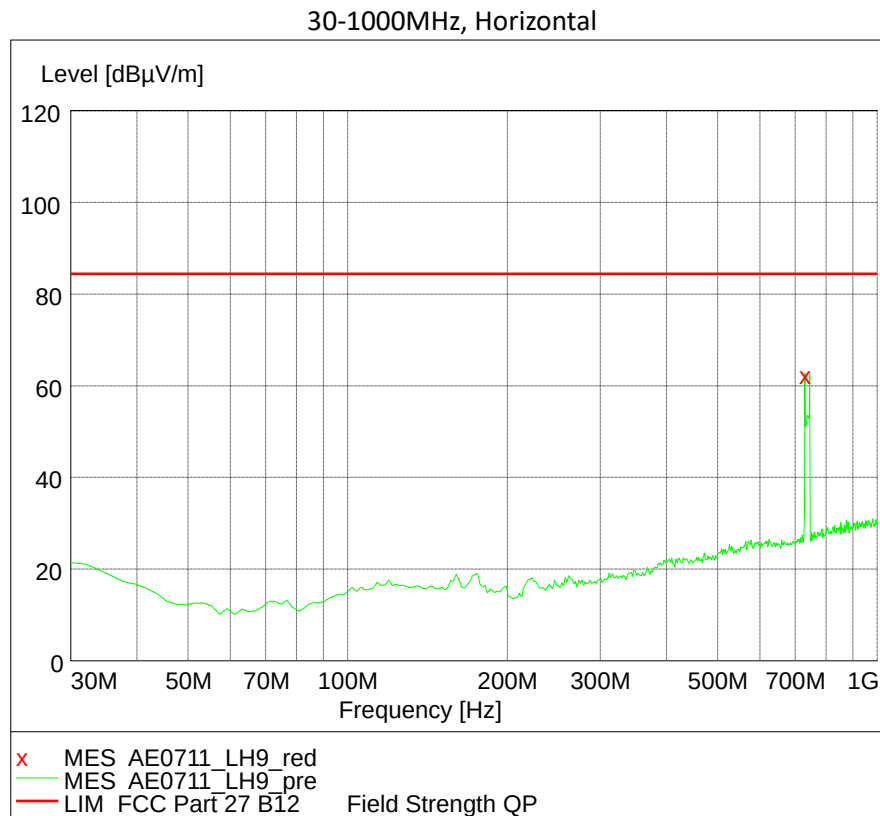
1-8GHz, Horizontal



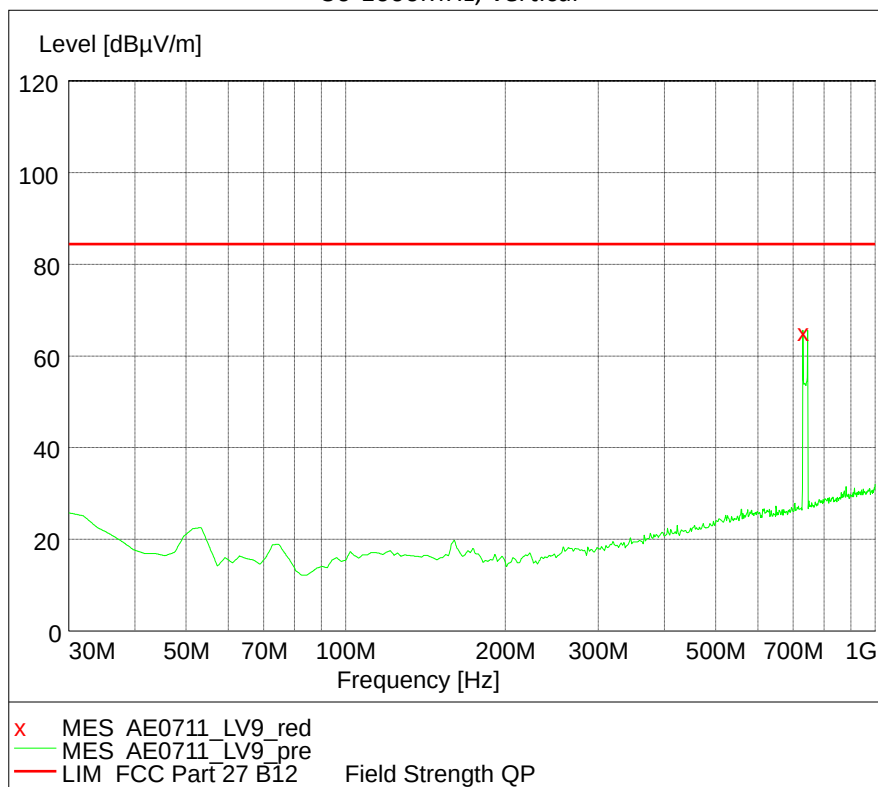


Configuration	Channel Position	Carrier	NR Carrier Bandwidth	LTE Carrier Bandwidth	Modulation
NR+LTE+NB-IoT-MC-2	M	5 Carriers	5MHz	5MHz	QPSK

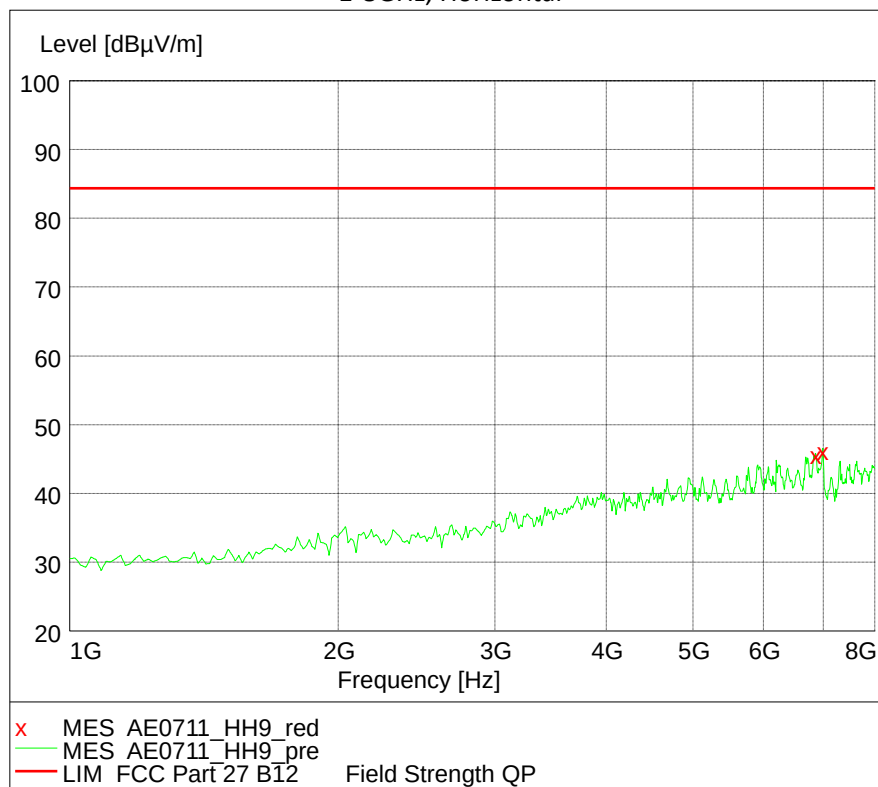
No emissions were detected within 20dB of the limit.

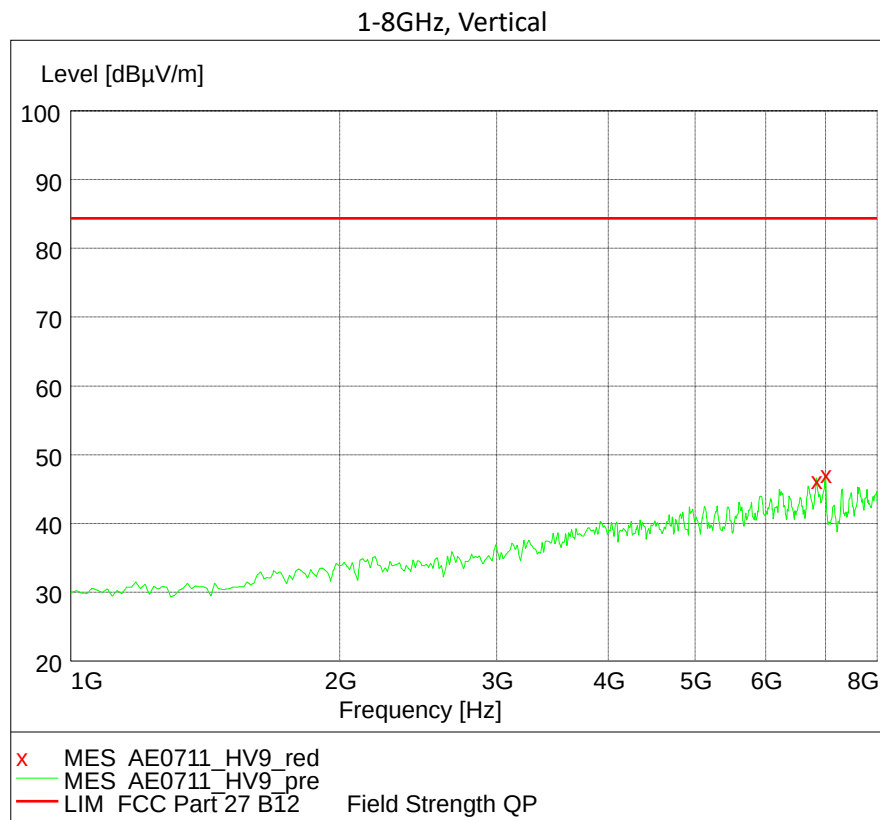


30-1000MHz, Vertical



1-8GHz, Horizontal





8 Frequency Stability

Test result: Tested

8.1 Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

8.2 Measurement Procedure

Temperature Variation

The EUT was tested over the temperature range -30°C to +50°C in 10°C steps with -48 VDC Power Supply. At each temperature step, the Base Station was configured to transmit at maximum power on the middle channel of the operating band.

Voltage Variation

The EUT was tested at the supplied voltages varied from 85 to 115 percent of the nominal values of -48 VDC. At +20°C, the Base Station was configured to transmit at maximum power on the middle channel of the frequency block.

8.3 Measurement result

Frequency Error – Temperature Variation

Configuration NR-MIMO-1C:

Antenna Port	Modulation	Temperature (°C)	Frequency Stability (Hz) Channel Position M		
			Channel Bandwidth 5MHz	Channel Bandwidth 10MHz	Channel Bandwidth 15MHz
D	QPSK	-30	0.98	0.82	0.91
		-20	-0.96	-0.78	0.81
		-10	-1.03	-1.03	-1.02
		0	-1.05	-1.02	-1.03
		10	-0.82	-0.87	-1.07
		20	0.97	-0.82	-0.95
		30	1.06	-0.80	0.98
		40	1.26	-0.95	-0.99
		50	-0.91	0.82	-0.81

Configuration LTE-MIMO-1C

Antenna Port	Modulation	Temperature (°C)	Frequency Stability (Hz) Channel Position M		
			Channel Bandwidth 5MHz	Channel Bandwidth 10MHz	Channel Bandwidth 15MHz
D	QPSK	-30	-1.08	-0.99	-1.05
		-20	-1.06	-1.08	-1.24
		-10	-1.34	-0.77	-0.95
		0	0.95	0.87	0.78
		10	1.48	-1.06	-1.21
		20	0.95	-1.43	-0.97
		30	-0.84	0.98	-1.40
		40	-1.13	1.38	-1.21
		50	-1.20	-1.11	-1.14

Configuration NB-IoT-Standalone-1C

Antenna Port	Modulation	Temperature (°C)	Frequency Stability (Hz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	-30	-	-1.31	-
		-20	-	-1.22	-
		-10	-	-1.31	-
		0	-	0.90	-
		10	-	1.16	-
		20	-	1.49	-
		30	-	1.24	-
		40	-	-1.31	-
		50	-	-1.42	-

Frequency Error – Voltage Variation
Configuration NR-MIMO-1C

Antenna Port	Modulation	Temperature (°C)	Supply Voltage (V)	Frequency Stability (Hz)		
				Channel Position M		
				Channel Bandwidth 5MHz	Channel Bandwidth 10MHz	Channel Bandwidth 15MHz
D	QPSK	20	-40.8	-0.93	0.96	0.79
			-48.0	0.97	-0.82	-0.95
			-55.2	-0.96	0.88	0.98

Configuration LTE-MIMO-1C

Antenna Port	Modulation	Temperature (°C)	Supply Voltage (V)	Frequency Stability (Hz)		
				Channel Position M		
				Channel Bandwidth 5MHz	Channel Bandwidth 10MHz	Channel Bandwidth 15MHz
D	QPSK	20	-40.8	-1.02	-1.13	-0.94
			-48.0	0.95	-1.43	-0.97
			-55.2	0.99	-1.16	-1.02

Configuration NB-IoT-Standalone-1

Antenna Port	Modulation	Temperature (°C)	Supply Voltage (V)	Frequency Stability (Hz)		
				Channel Position B	Channel Position M	Channel Position T
D	QPSK	20	-40.8	-	1.07	-
			-48.0	-	1.49	-
			-55.2	-	1.32	-

***** END *****