PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.
Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.
The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.
The PAPR was measured using the CCDF function of the spectrum analyzer.

RF conducted emissions testing was performed only on one port. The AHLBA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBA			Work Order:	NOKI0046
Serial Number:	K9180844519			Date:	17-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	21.1 °C
Attendees:	David Le			Humidity:	54.1% RH
Project:	None			Barometric Pres.:	1016 mbar
Tested by:	Marty Martin	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015

COMMENTS

All measurement path losses accounted for the reference level offset including and attenuators, filters, and DC blocks. Carriers enabled at maximum power.

DEVIATIONS FROM TEST STANDARD

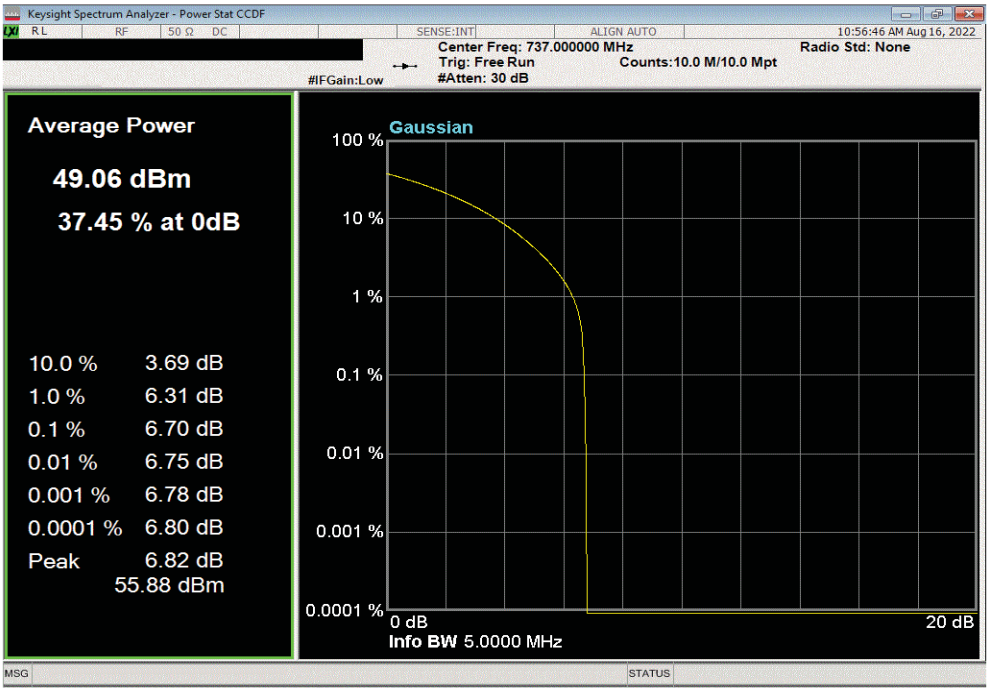
None

Configuration #	2	Signature

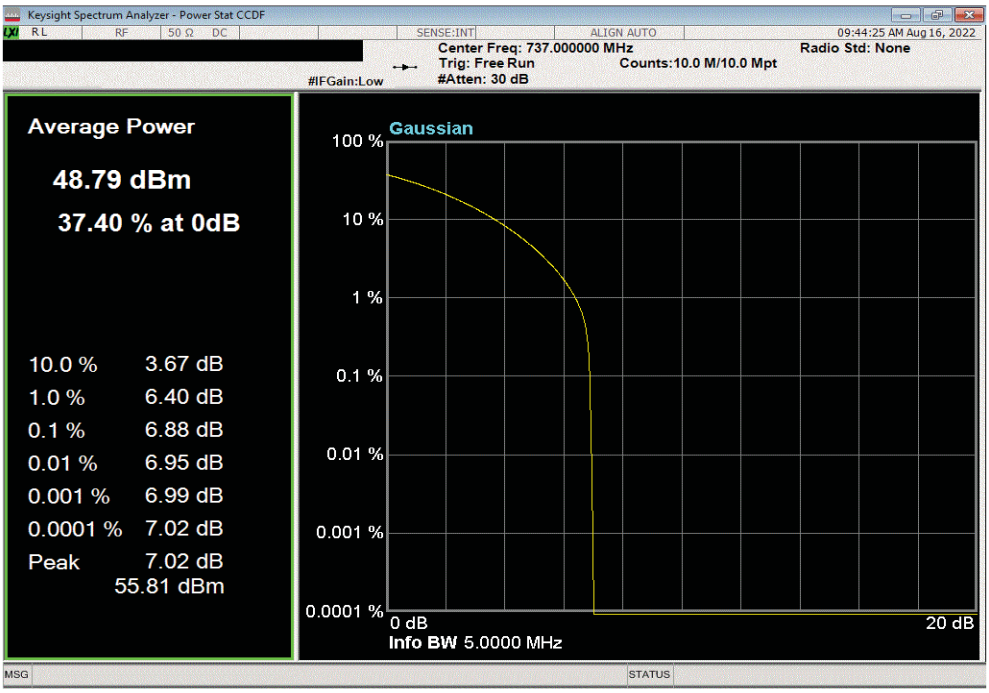
	PAPR Value (dB)	PAPR Limit (dB)	Results
Port 1			
Band n12, 729 - 745 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
Mid Channel, 737.0 MHz	6.7	13	Pass
16QAM Modulation			
Mid Channel, 737.0 MHz	6.88	13	Pass
64QAM Modulation			
Mid Channel, 737.0 MHz	6.69	13	Pass
256QAM Modulation			
Low Channel, 731.5 MHz	6.78	13	Pass
Mid Channel, 737.0 MHz	6.71	13	Pass
High Channel, 742.5 MHz	6.71	13	Pass
10 MHz Bandwidth			
256QAM Modulation			
Low Channel, 734 MHz	6.8	13	Pass
Mid Channel, 737.0 MHz	6.92	13	Pass
High Channel, 740 MHz	6.75	13	Pass
15 MHz Bandwidth			
256QAM Modulation			
Low Channel, 736.5 MHz	7.07	13	Pass
Mid Channel, 737.0 MHz	7.02	13	Pass
High Channel, 737.5 MHz	6.98	13	Pass

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.7	13	Pass

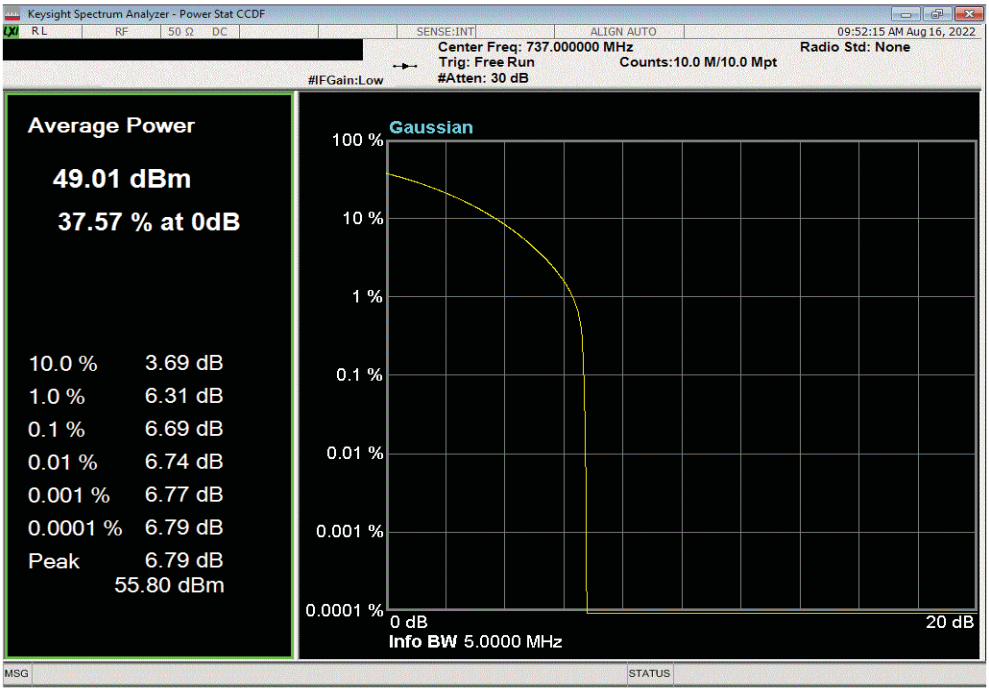


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.88	13	Pass

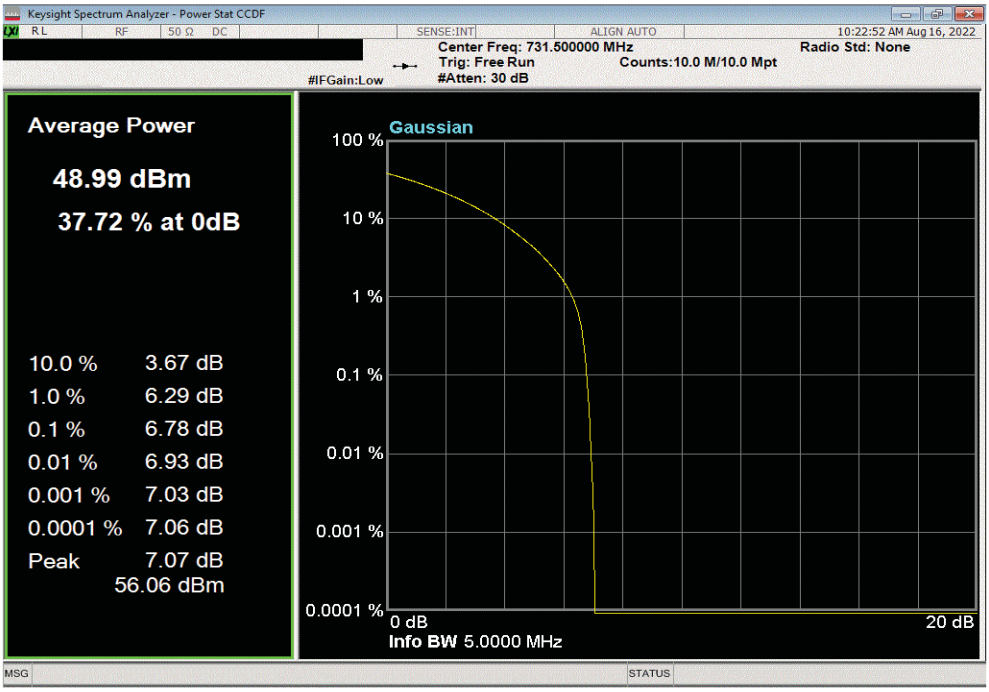


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.69	13	Pass

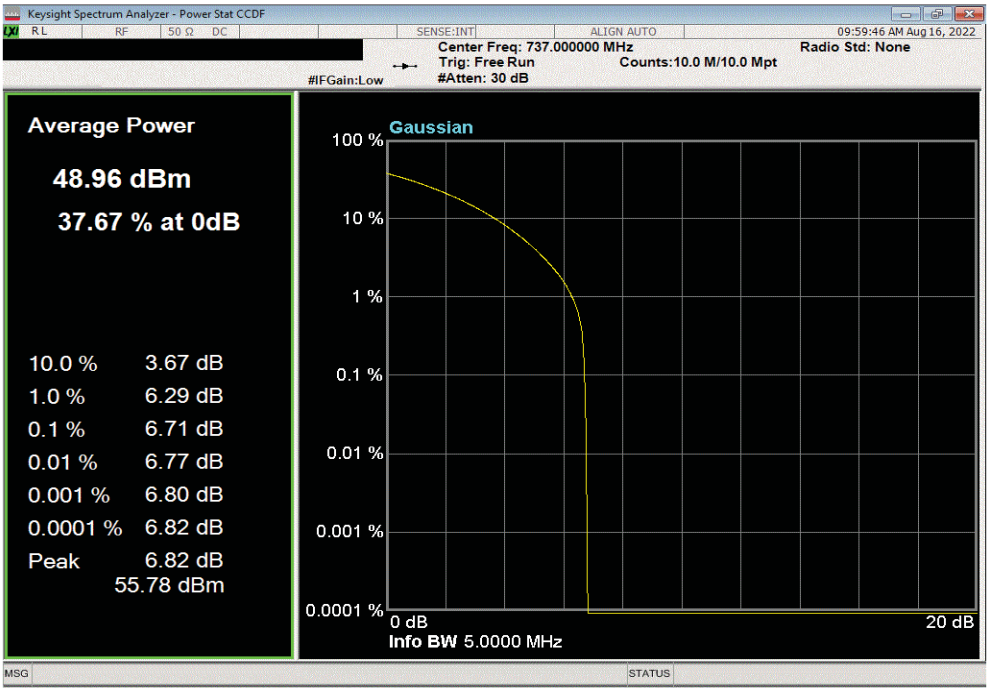


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.78	13	Pass

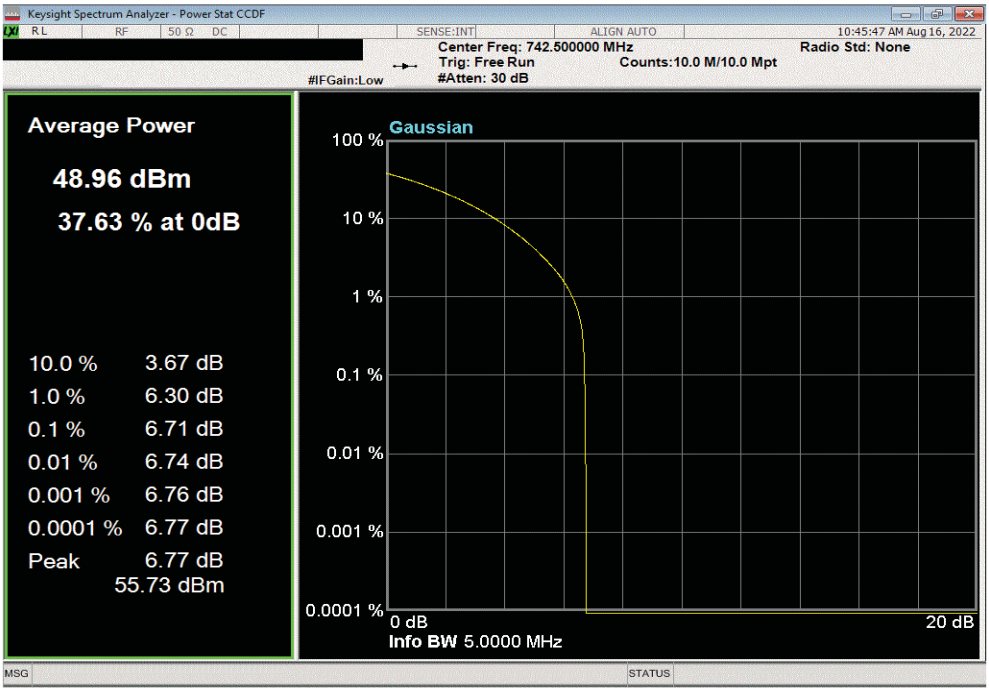


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.71	13	Pass

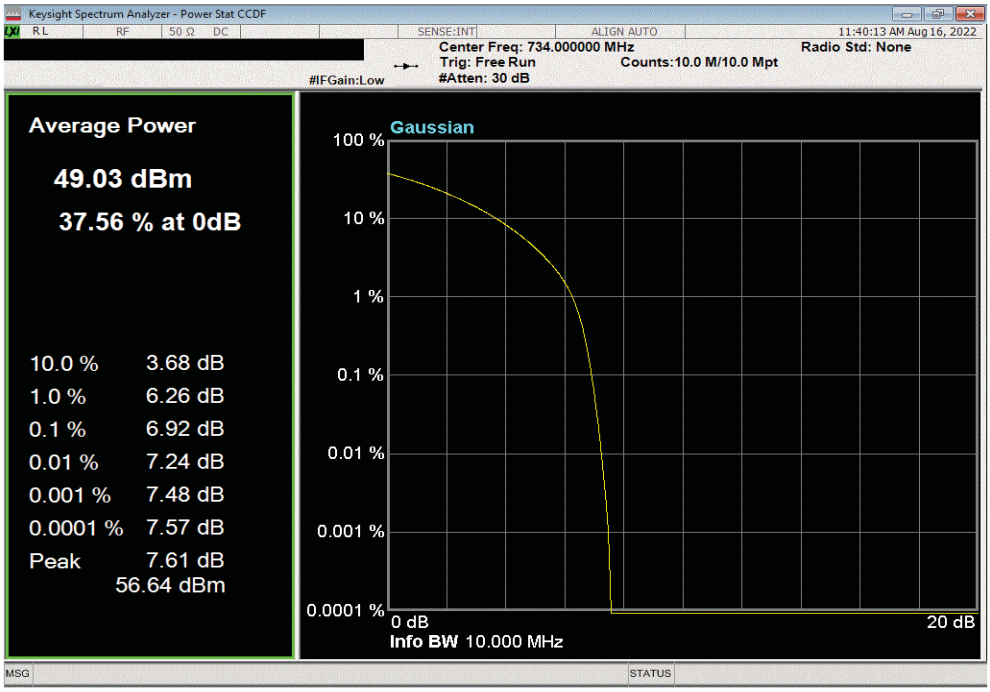


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.71	13	Pass

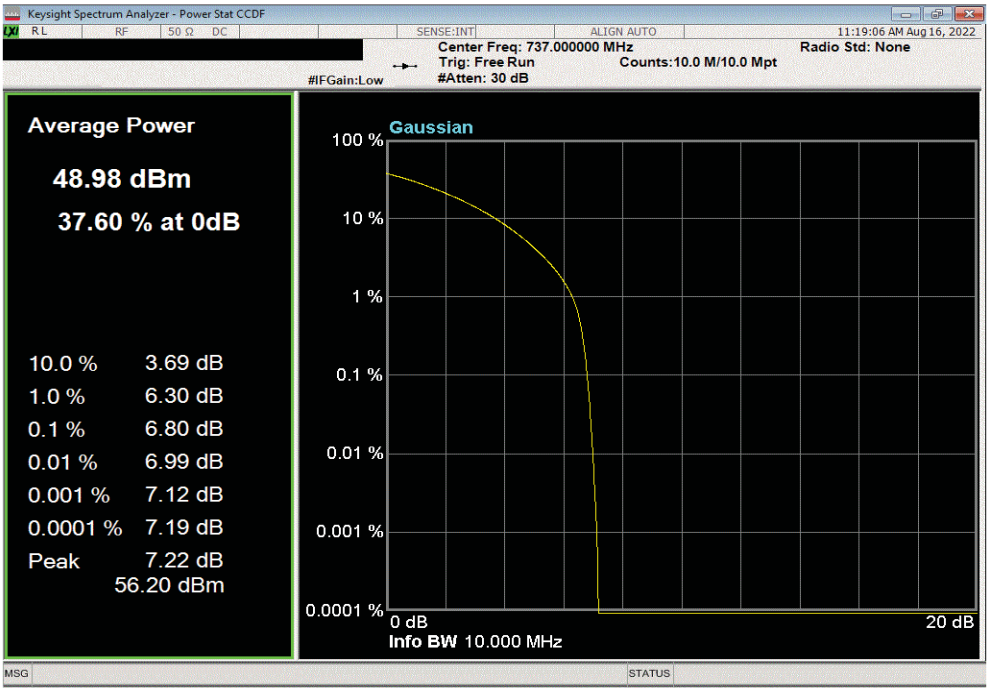


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.92	13	Pass

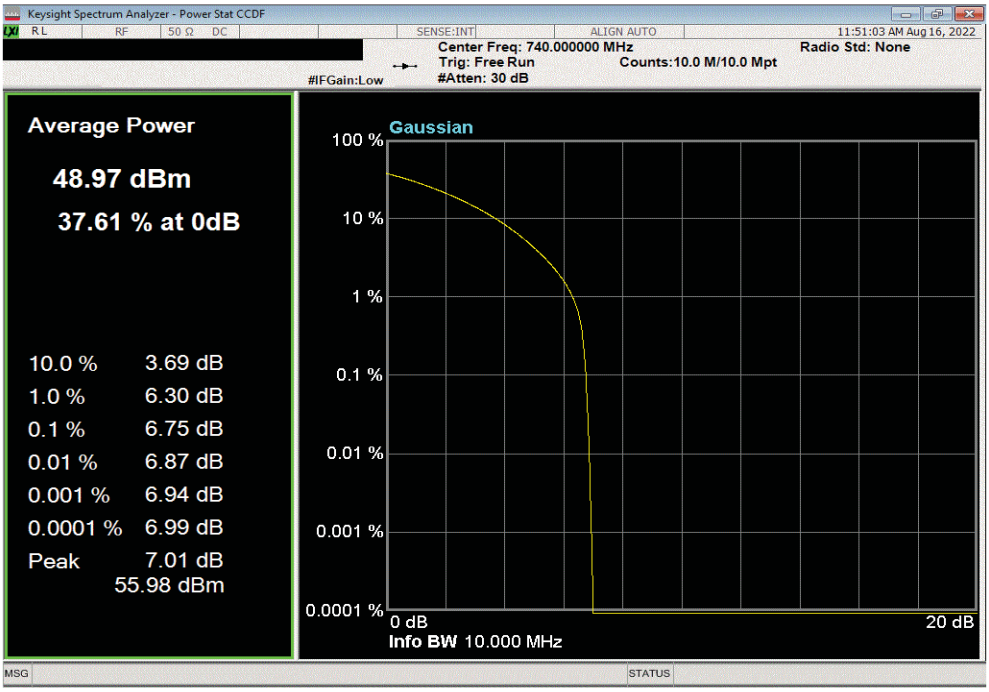


Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.8	13	Pass

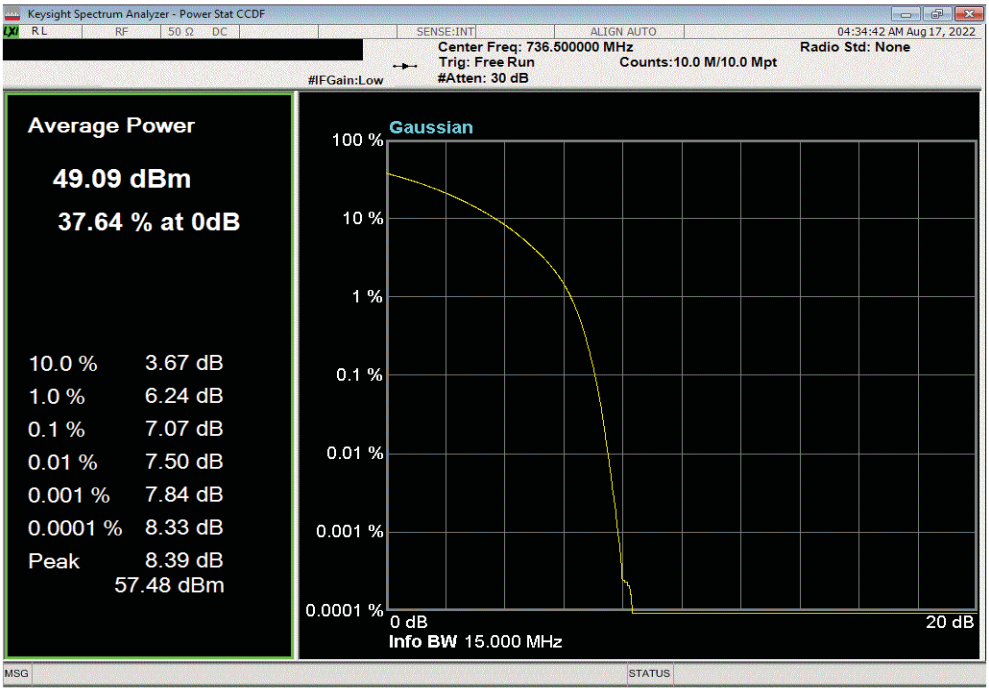


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.75	13	Pass

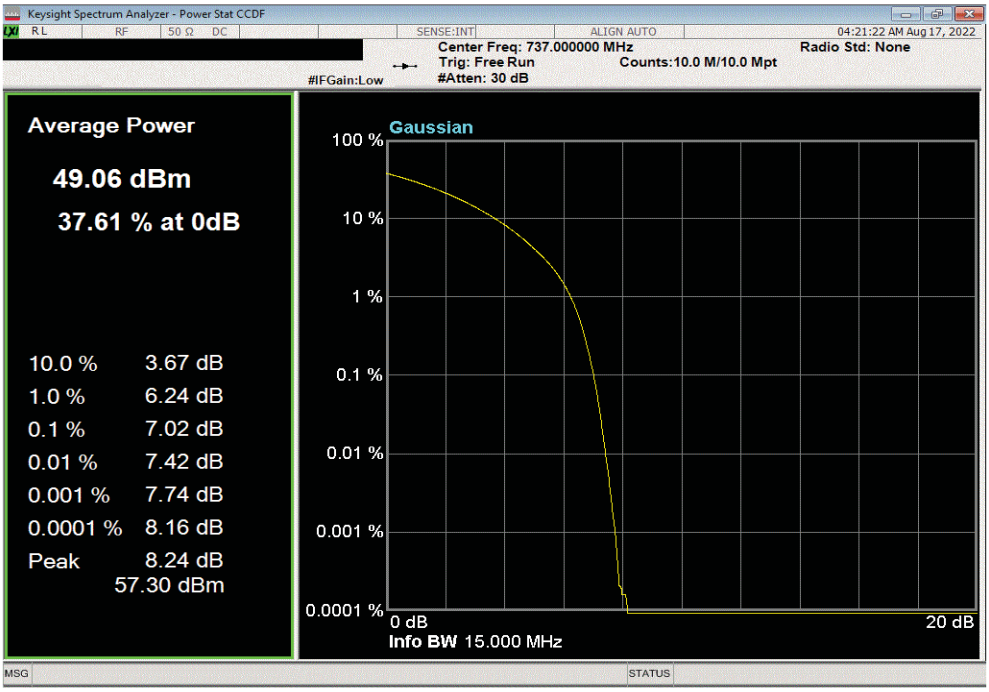


Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.07	13	Pass

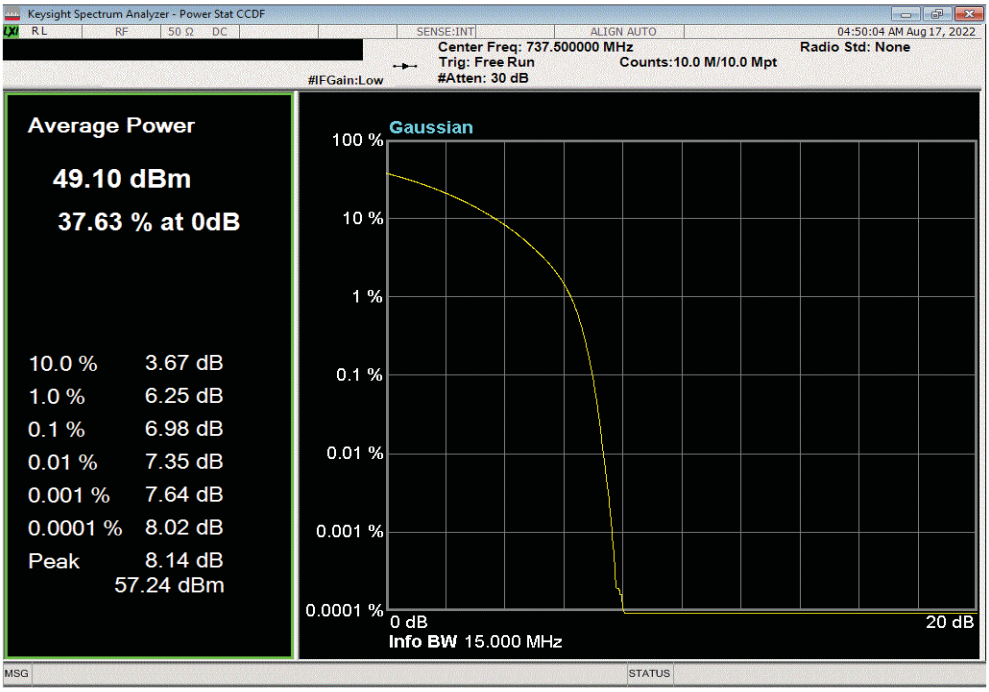


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.02	13	Pass



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.98	13	Pass



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n14

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.
The PAPR was measured using the CCDF function of the spectrum analyzer.

RF conducted emissions testing was performed only on one port. The AHLBA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n14

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBA			Work Order:	NOKI0046
Serial Number:	K9180844519			Date:	19-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	21.5 °C
Attendees:	David Le			Humidity:	54.8% RH
Project:	None			Barometric Pres.:	1018 mbar
Tested by:	Marty Martin	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015

COMMENTS

All measurement path loses accounted for in the reference level offest including any attenuators, filters, and DC blocks. Carriers enabled at maximum power.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	2	Signature

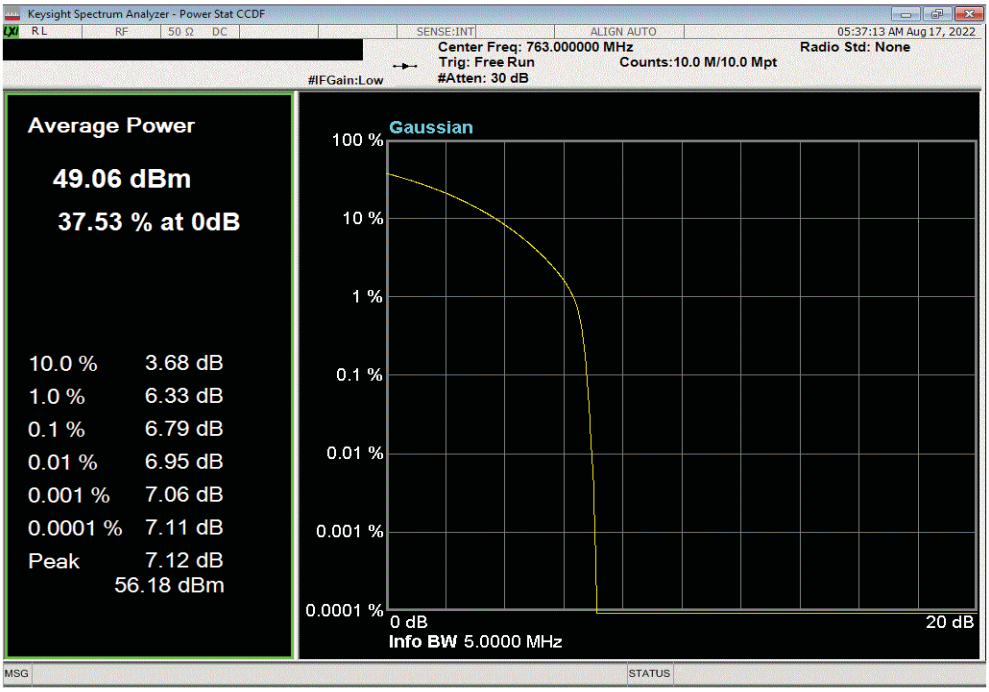
	PAPR Value (dB)	PAPR Limit (dB)	Results
Port 1			
5G NR, Band n14, 758 - 768 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
Mid Channel, 763 MHz	6.79	13	Pass
16QAM Modulation			
Mid Channel, 763 MHz	6.95	13	Pass
64QAM Modulation			
Mid Channel, 763 MHz	6.76	13	Pass
256QAM Modulation			
Low Channel, 760.5 MHz	6.72	13	Pass
Mid Channel, 763 MHz	6.77	13	Pass
High Channel, 765.5 MHz	7.06	13	Pass
10 MHz Bandwidth			
256QAM Modulation			
Mid Channel, 763 MHz	7.38	13	2

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n14

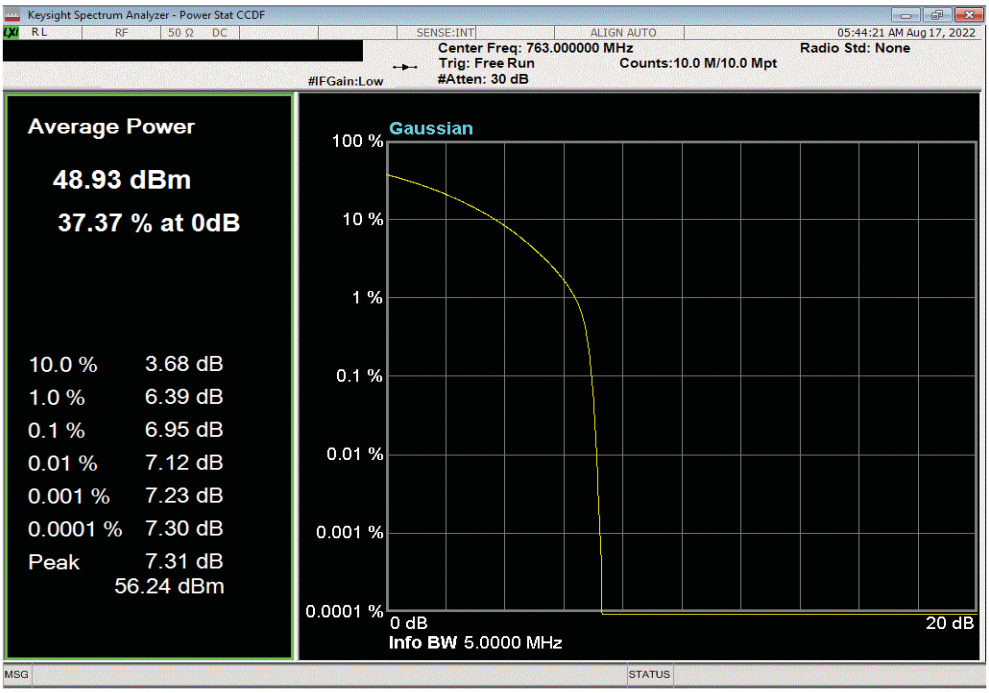
element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.79	13	Pass

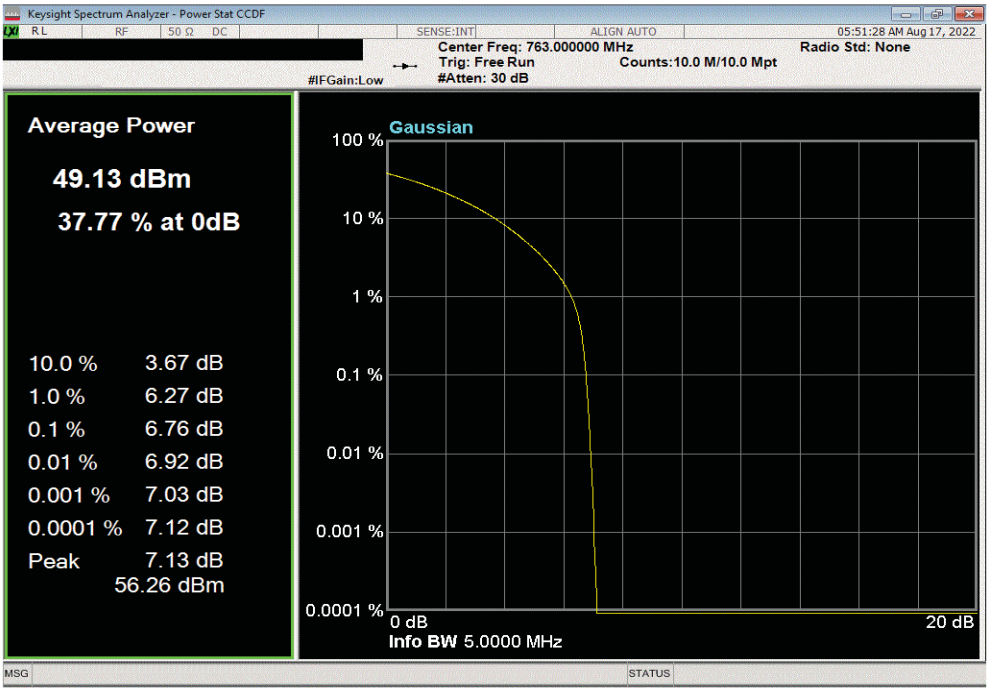


Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.95	13	Pass

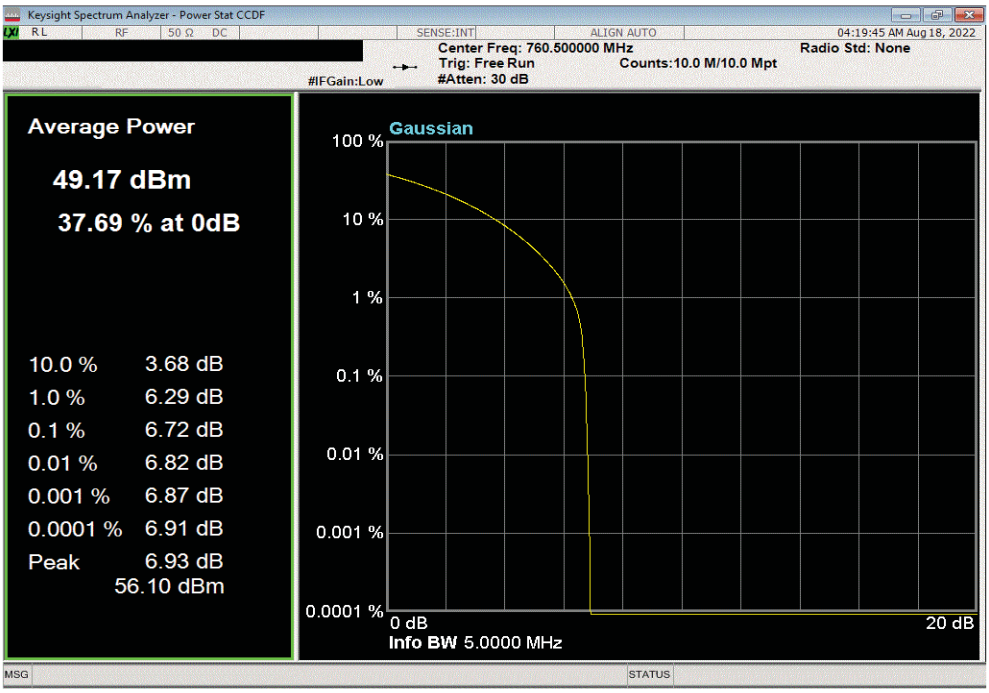


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n14

Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.76	13	Pass

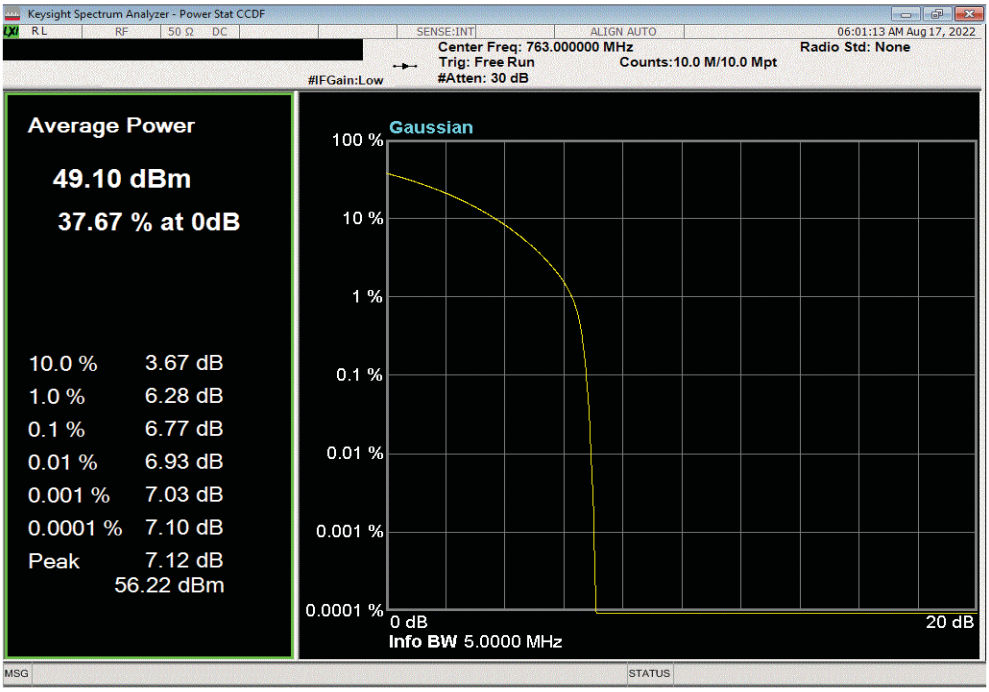


Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.72	13	Pass

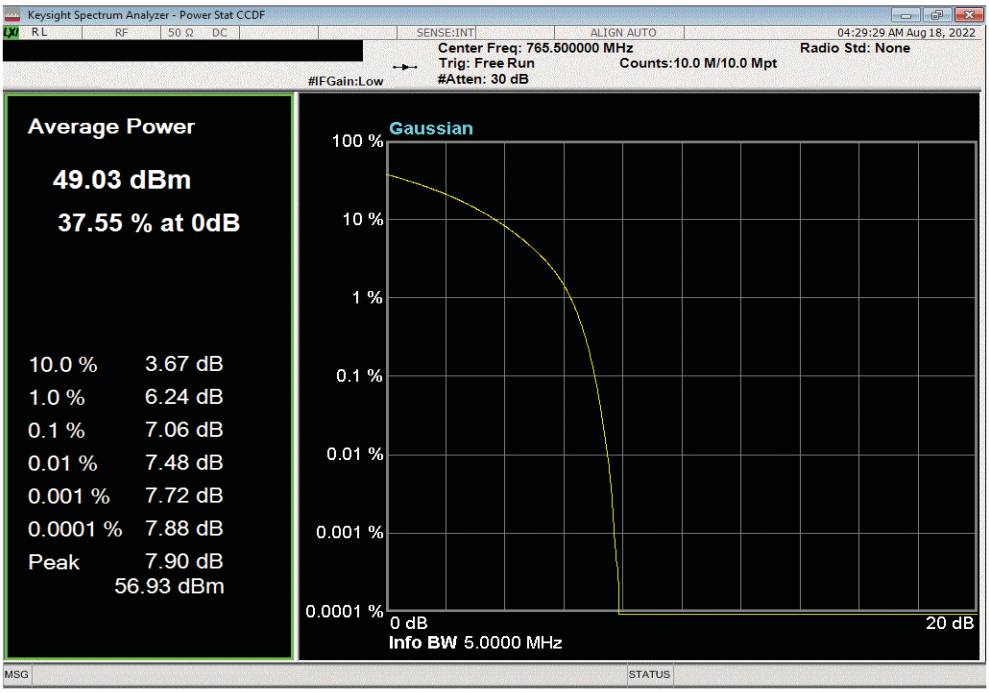


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n14

Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				6.77	13	Pass

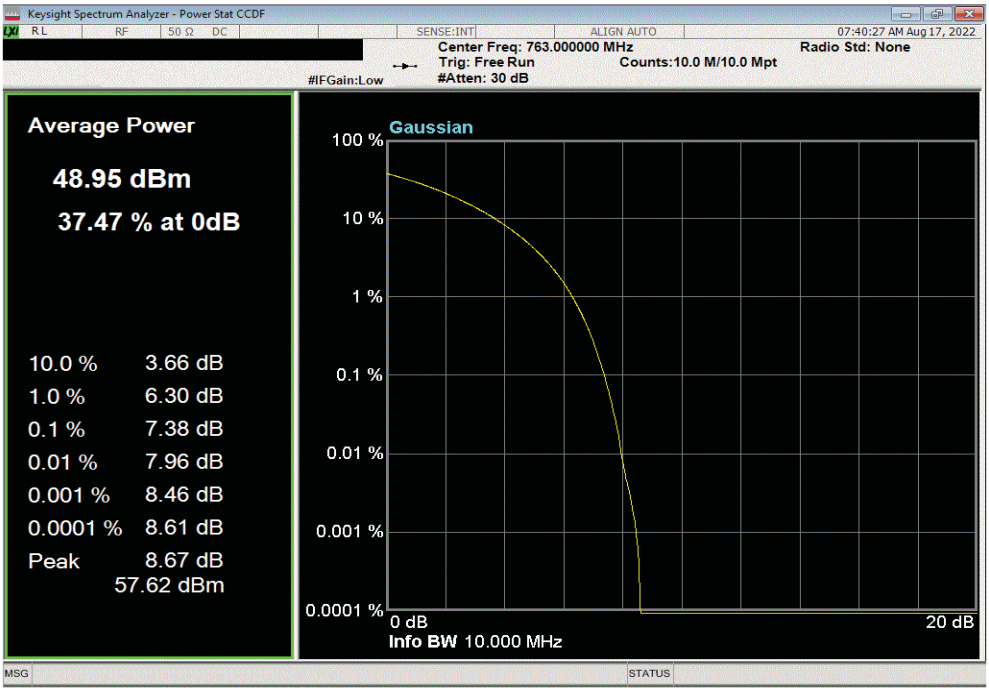


Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.06	13	Pass



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n14

Port 1, 5G NR, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.38	13	Pass



SPURIOUS CONDUCTED EMISSIONS - MULTIBAND MULTICARRIER

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 3 different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth called out by the client's test plan were made for each modulation type from 9 KHz to 8 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than the limits also called out by the client's test plan shown below.

The measurement methods are detailed in KDB 971168 D01v03 section 6 and ANSI C63.26-2015. Per FCC 2.1057(a)(1), the upper level of measurement is the 10th harmonic of the highest fundamental frequency. These measurements are for the frequency band after the first 100kHz bands immediately outside and adjacent to the frequency block.

Per FCC sections 27.53(g) and 90.543(e)(3), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

FCC 27.53(g), and FCC 90.543(e)(5) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

Per section 90.543(f), for the frequency range 1559-1610 MHz the EIRP limit is -70dBW/MHz for wideband signals and -80dBW for discrete emissions of bandwidths less than 700Hz. This equates to an EIRP of -40dBm/MHz for wideband emissions and -50dBm/MHz for discrete emissions. The limit is adjusted to -46 dBm [-40 dBm -10 log (4)] for wideband signals and -56dBm [-50 dBm -10 log (4)] for discrete emissions per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

The limit for the 9kHz to 150kHz frequency range was adjusted to –39dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 100kHz [i.e.: -39dBm = -19dBm -10log(100kHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to –29dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 100kHz [i.e.: -29dBm = -19dBm -10log(100kHz/10kHz)]. The required limit of -19dBm with a RBW of > 100kHz was used for all other frequency ranges. (See ANSI C63.26-2015 paragraph 5.7.2a for details on the Limit/RBW scaling method)

Multicarrier Test Cases
Multi-Carrier Test Case 1 (3GPP Band n12 Multicarrier): Three NR5 carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band (731.5MHz & 736.5MHz) and a third carrier with maximum spacing between the other two carrier frequencies (742.5MHz) at the upper band edge. The NR 5MHz channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12 carriers).

Multi-Carrier Test Case 2 (3GPP Band n12 and Band n14 Multicarrier/Multiband): In the Band n12 _ Two NR5 carriers at the lower band edge (731.5 & 736.5MHz). In Band n14 one NR5 carrier at the upper band edge (765.5MHz). The NR 5MHz channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12/n14 carriers).

RF conducted emissions testing was performed only on one port. The AHLBA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

SPURIOUS CONDUCTED EMISSIONS - MULTIBAND MULTICARRIER

element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	**AHLBA**			**Work Order:**	**NOKI0046**
Serial Number:	**K9180844519**			**Date:**	**19-Aug-22**
Customer:	**Nokia Solutions and Networks**			**Temperature:**	**21 °C**
Attendees:	**David Le**			**Humidity:**	**53.8% RH**
Project:	**None**			**Barometric Pres.:**	**1017 mbar**
Tested by:	**Marty Martin**	**Power:**	**54 VDC**	**Job Site:**	**TX07**

TEST SPECIFICATIONS	**Test Method**
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. Band n12 and Band n14 carriers were operating at maximum power in each applicable test case to achieve a total port power of 80 watts.

DEVIATIONS FROM TEST STANDARD

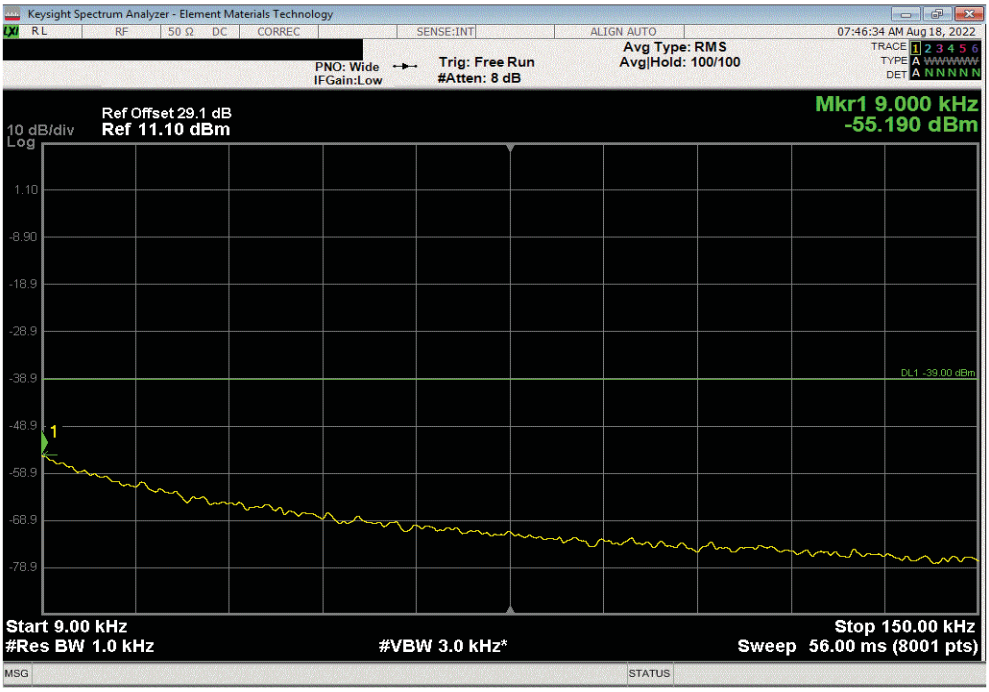
None

Configuration #	**1, 2, 3**	*Signature* Marty Martin

		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
Port 1, Multi-Carrier Test Case 1						
5G NR, Band n12, 729 - 745 MHz						
5 MHz Bandwidth						
QPSK Modulation						
	731.5, 736.5 and 742.5 MHz	9 kHz - 150 kHz	0.01	-55.19	-39	Pass
	731.5, 736.5 and 742.5 MHz	150 kHz - 20 MHz	0.15	-52.01	-29	Pass
	731.5, 736.5 and 742.5 MHz	20 MHz - 1.2 GHz	909.41	-40.78	-19	Pass
	731.5, 736.5 and 742.5 MHz	1.2 GHz - 8 GHz	4022	-37.65	-19	Pass
Port 1, Multi-Carrier Test Case 2						
5G NR, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz						
5 MHz Bandwidth						
QPSK Modulation						
	731.5, 736.5 and 765.5 MHz	9 kHz - 150 kHz	0.01	-55.09	-39	Pass
	731.5, 736.5 and 765.5 MHz	150 kHz - 20 MHz	0.15	-51.59	-29	Pass
	731.5, 736.5 and 765.5 MHz	20 MHz - 1.2 GHz	910.19	-40.45	-19	Pass
	731.5, 736.5 and 765.5 MHz	1.2 GHz - 8 GHz	4021.55	-38.14	-19	Pass
Port 1, Multi-Carrier Test Case 1						
5G NR, Band n12, 729 - 745 MHz, 1559 - 1610 MHz						
5 MHz Bandwidth						
QPSK Modulation						
	731.5, 736.5 and 742.5 MHz	1.559 GHz - 1.61 GHz	1607.56	-61.95	-46	Pass
Port 1, Multi-Carrier Test Case 2						
5G NR, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz, 1559 - 1610 MHz						
5 MHz Bandwidth						
QPSK Modulation						
	731.5, 736.5 and 765.5 MHz	1.559 GHz - 1.61 GHz	1591.93	-61.87	-46	Pass

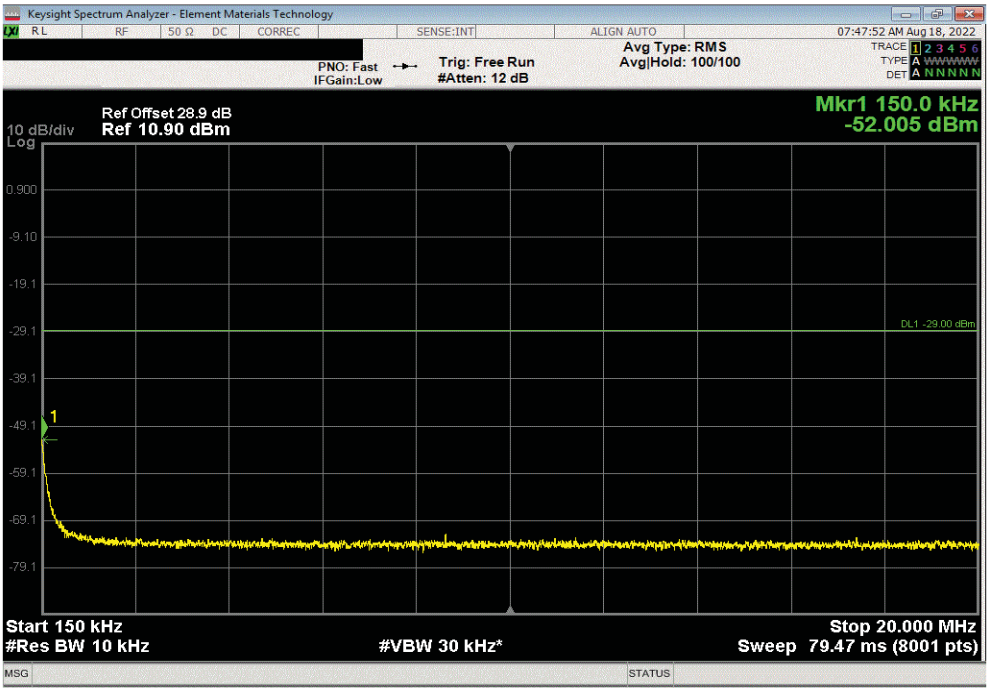
Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 742.5 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz	0.01	-55.19	-39	Pass

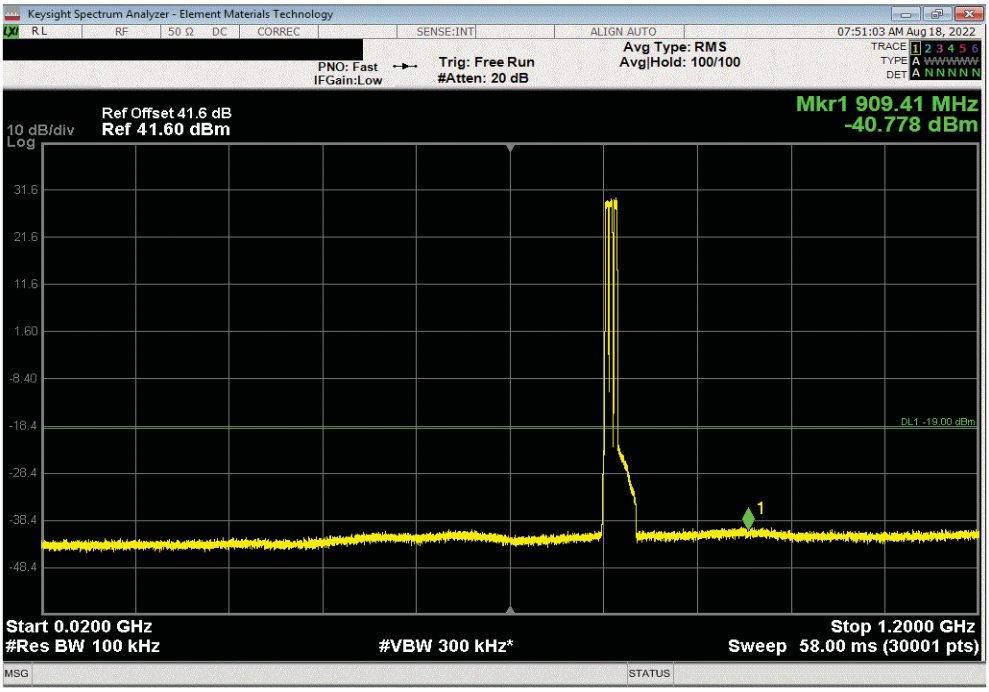


Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 742.5 MHz

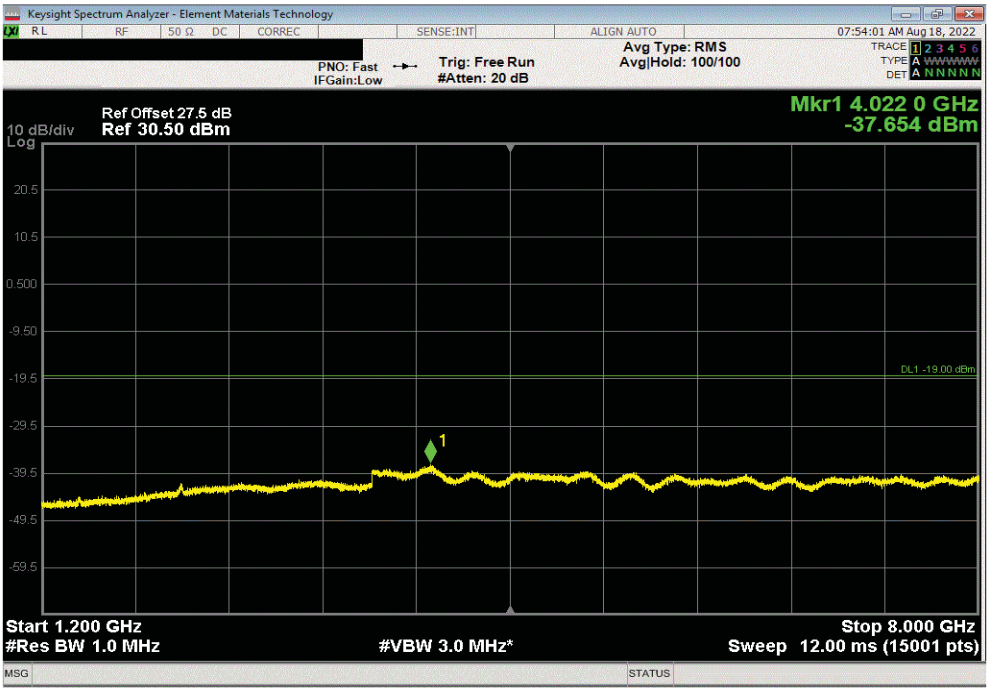
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-52.01	-29	Pass



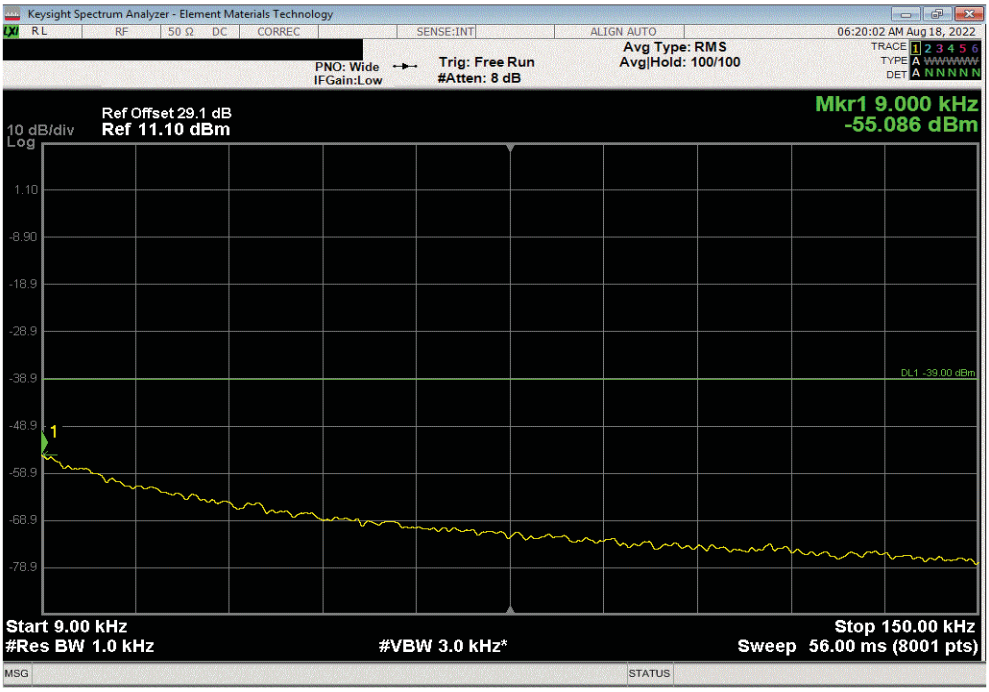
Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 742.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.41	-40.78	-19	Pass



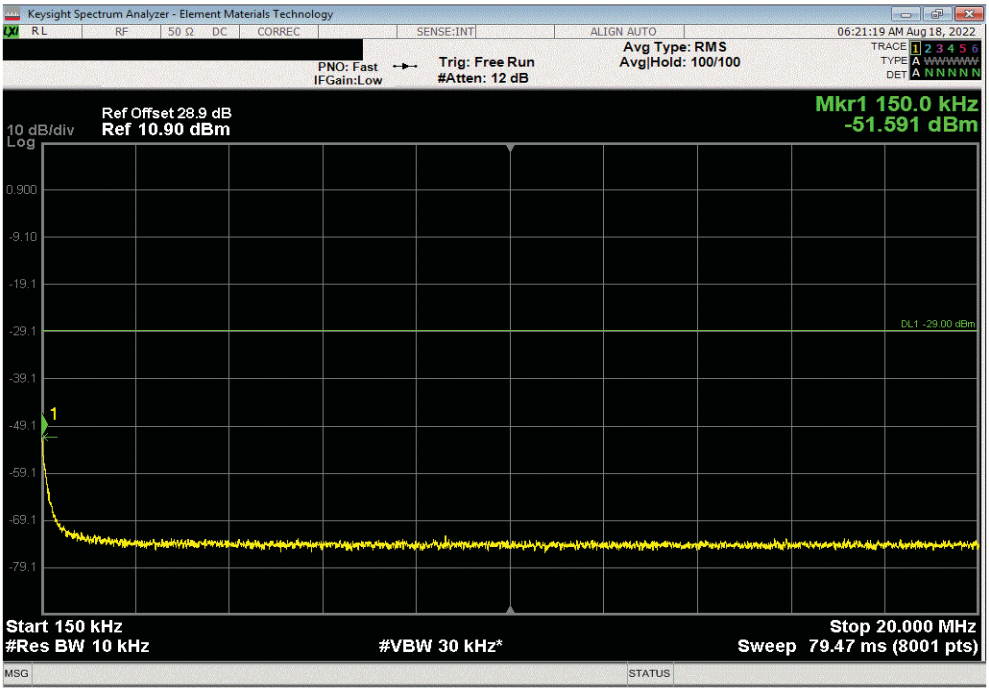
Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 742.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4022	-37.65	-19	Pass



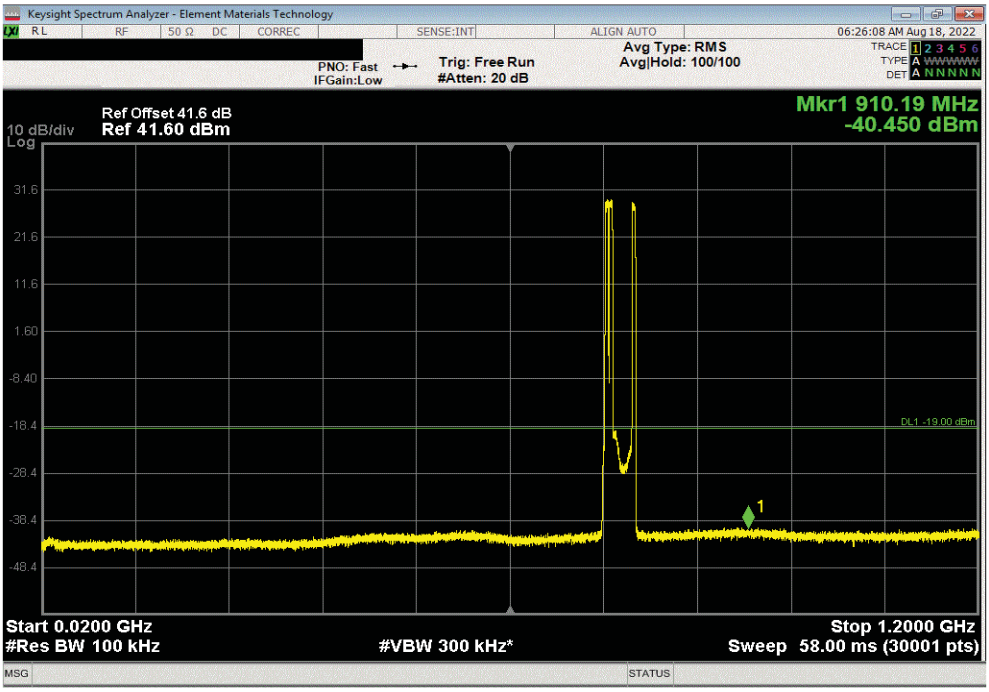
Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 765.5 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-55.09	-39	Pass	



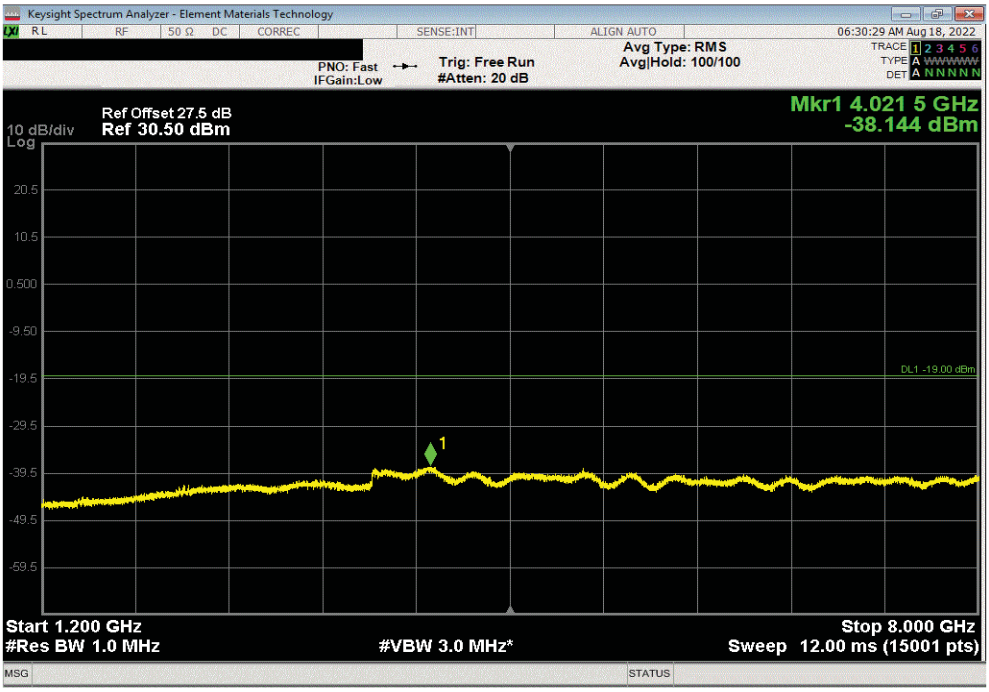
Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 765.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.59	-29	Pass



Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 765.5 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	20 MHz - 1.2 GHz	910.19	-40.45	-19	Pass

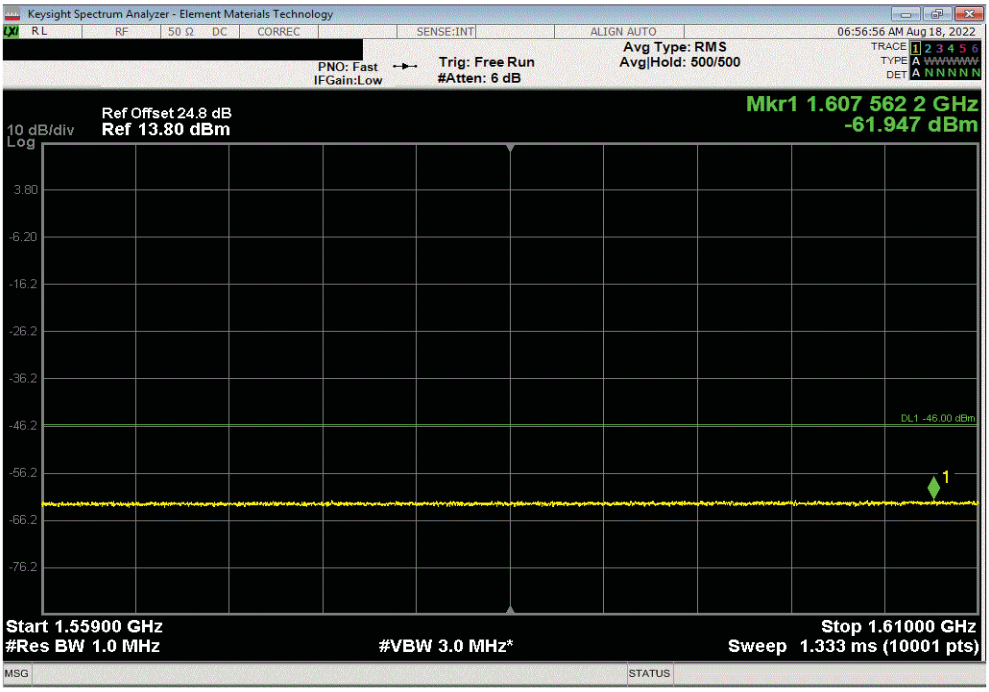


Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 765.5 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1.2 GHz - 8 GHz	4021.55	-38.14	-19	Pass



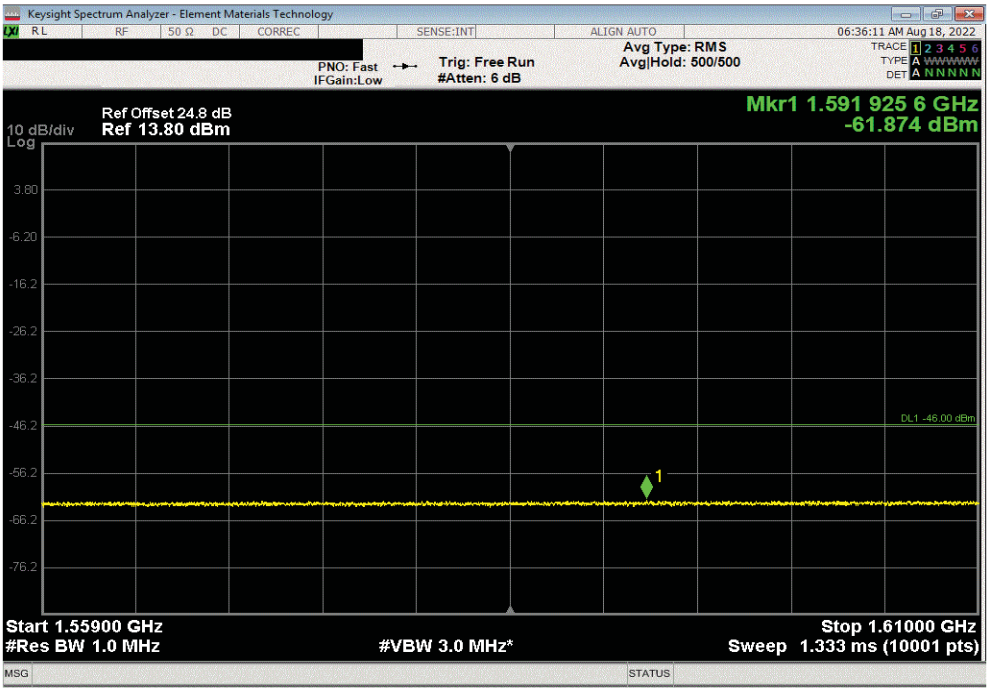
Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 MHz, 5 MHz Bandwidth, QPSK Modulation, 731.5, 736.5 and 742.5 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.559 GHz - 1.61 GHz	1607.56	-61.95	-46	Pass



Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 MHz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.559 GHz - 1.61 GHz	1591.93	-61.87	-46	Pass



SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND n12

element

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 3 different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth called out by the client's test plan were made for each modulation type from 9 KHz to 8 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than the limits also called out by the client's test plan shown below.

The measurement methods are detailed in KDB 971168 D01v03 section 6 and ANSI C63.26-2015. Per FCC 2.1057(a)(1), the upper level of measurement is the 10th harmonic of the highest fundamental frequency. These measurements are for the frequency band after the first 100 kHz bands immediately outside and adjacent to the frequency block.

Per FCC sections 27.53(g), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

FCC 27.53(g) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

The limit for the 9kHz to 150kHz frequency range was adjusted to –39dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 100kHz [i.e.: -39dBm = -19dBm -10log(100kHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to -29dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 100kHz [i.e.: -29dBm = -19dBm -10log(100kHz/10kHz)]. The required limit of -19dBm with a RBW of > 100kHz was used for all other frequency ranges. (See ANSI C63.26-2015 paragraph 5.7.2a for details on the Limit/RBW scaling method)

RF conducted emissions testing was performed only on one port. The AHLBA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND n12

element

TbiTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBA			Work Order:	NOKI0046
Serial Number:	K9180844519			Date:	19-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	22.1 °C
Attendees:	David Le			Humidity:	53.7% RH
Project:	None			Barometric Pres.:	1018 mbar
Tested by:	Marty Martin	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offest including any attenuators, filters and DC blocks. The carrier was enabled at maximum power (80 watts/carrier).

DEVIATIONS FROM TEST STANDARD

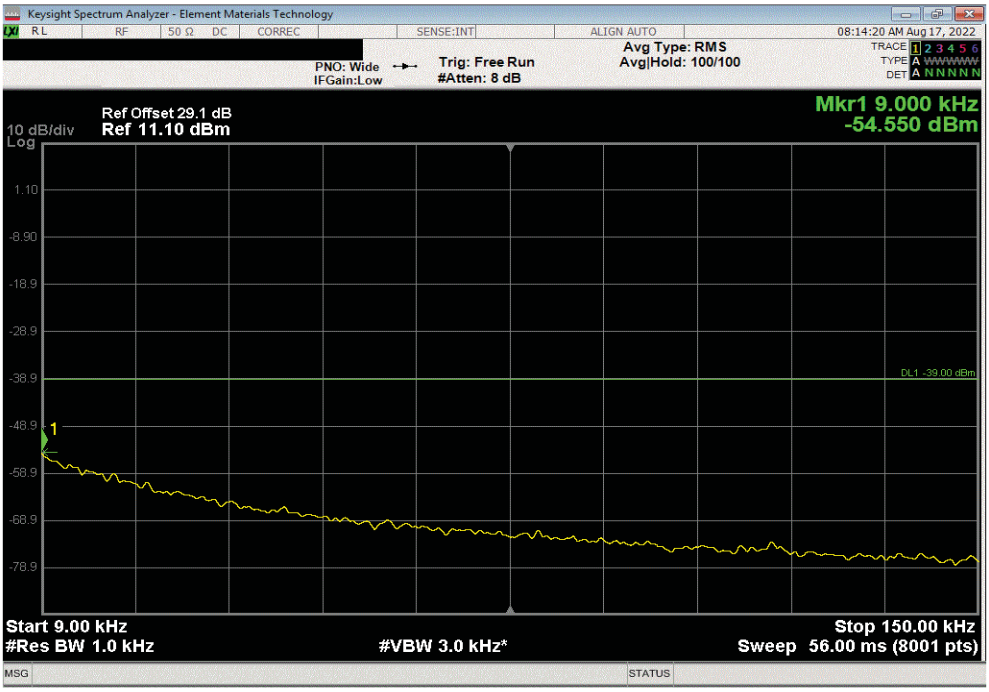
None

Configuration #	1, 2, 3	Signature

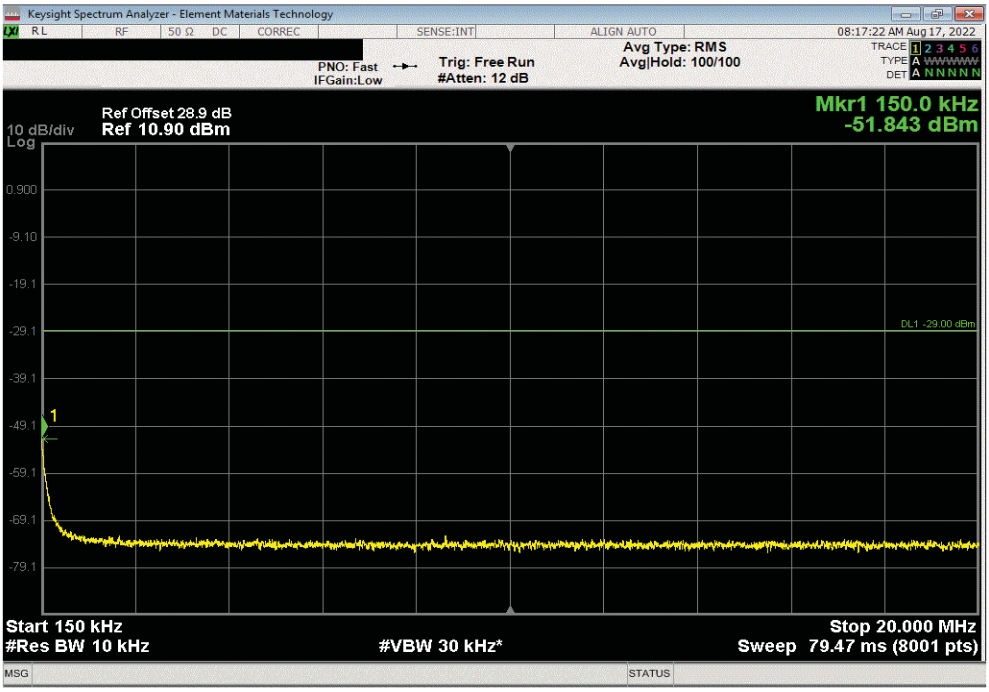
		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
Port 1						
5G NR, Band n12, 729 - 745 Mhz						
5 MHz Bandwidth						
QPSK Modulation						
	Mid Channel, 737.0 MHz	9 kHz - 150 kHz	0.01	-54.55	-39	Pass
	Mid Channel, 737.0 MHz	150 kHz - 20 MHz	0.15	-51.84	-29	Pass
	Mid Channel, 737.0 MHz	20 MHz - 1.2 GHz	909.6	-40.56	-19	Pass
	Mid Channel, 737.0 MHz	1.2 GHz - 8 GHz	3956.72	-37.83	-19	Pass
16QAM Modulation						
	Mid Channel, 737.0 MHz	9 kHz - 150 kHz	0.01	-55.34	-39	Pass
	Mid Channel, 737.0 MHz	150 kHz - 20 MHz	0.15	-51.1	-29	Pass
	Mid Channel, 737.0 MHz	20 MHz - 1.2 GHz	909.21	-40.5	-19	Pass
	Mid Channel, 737.0 MHz	1.2 GHz - 8 GHz	3992.99	-37.54	-19	Pass
64QAM Modulation						
	Mid Channel, 737.0 MHz	9 kHz - 150 kHz	0.01	-54.49	-39	Pass
	Mid Channel, 737.0 MHz	150 kHz - 20 MHz	0.15	-51.82	-29	Pass
	Mid Channel, 737.0 MHz	20 MHz - 1.2 GHz	909.25	-40.09	-19	Pass
	Mid Channel, 737.0 MHz	1.2 GHz - 8 GHz	4000.69	-37.84	-19	Pass
256QAM Modulation						
	Mid Channel, 737.0 MHz	9 kHz - 150 kHz	0.01	-54.79	-39	Pass
	Mid Channel, 737.0 MHz	150 kHz - 20 MHz	0.15	-51.53	-29	Pass
	Mid Channel, 737.0 MHz	20 MHz - 1.2 GHz	910.03	-40.69	-19	Pass
	Mid Channel, 737.0 MHz	1.2 GHz - 8 GHz	4018.83	-37.78	-19	Pass
10 MHz Bandwidth						
256QAM Modulation						
	Mid Channel, 737.0 MHz	9 kHz - 150 kHz	0.01	-55.01	-39	Pass
	Mid Channel, 737.0 MHz	150 kHz - 20 MHz	0.15	-51.54	-29	Pass
	Mid Channel, 737.0 MHz	20 MHz - 1.2 GHz	909.6	-40.13	-19	Pass
	Mid Channel, 737.0 MHz	1.2 GHz - 8 GHz	4000.69	-37.85	-19	Pass
15 MHz Bandwidth						
256QAM Modulation						
	Mid Channel, 737.0 MHz	9 kHz - 150 kHz	0.01	-54.7	-39	Pass
	Mid Channel, 737.0 MHz	150 kHz - 20 MHz	0.15	-51.34	-29	Pass
	Mid Channel, 737.0 MHz	20 MHz - 1.2 GHz	910.35	-39.99	-19	Pass
	Mid Channel, 737.0 MHz	1.2 GHz - 8 GHz	4019.73	-37.87	-19	Pass
Band n12, 729 - 745 Mhz, 1559 - 1610 MHz						
5 MHz Bandwidth						
256QAM Modulation						
	Low Channel, 731.5 MHz	1.559 GHz - 1.61 GHz	1609.43	-61.86	-46	Pass
	Mid Channel, 737.0 MHz	1.559 GHz - 1.61 GHz	1600.17	-61.86	-46	Pass
	High Channel, 742.5 MHz	1.559 GHz - 1.61 GHz	1594.93	-61.94	-46	Pass
10 MHz Bandwidth						
256QAM Modulation						
	Mid Channel, 737.0 MHz	1.559 GHz - 1.61 GHz	1596.22	-61.9	-46	Pass

SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n12

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-54.55	-39	Pass	

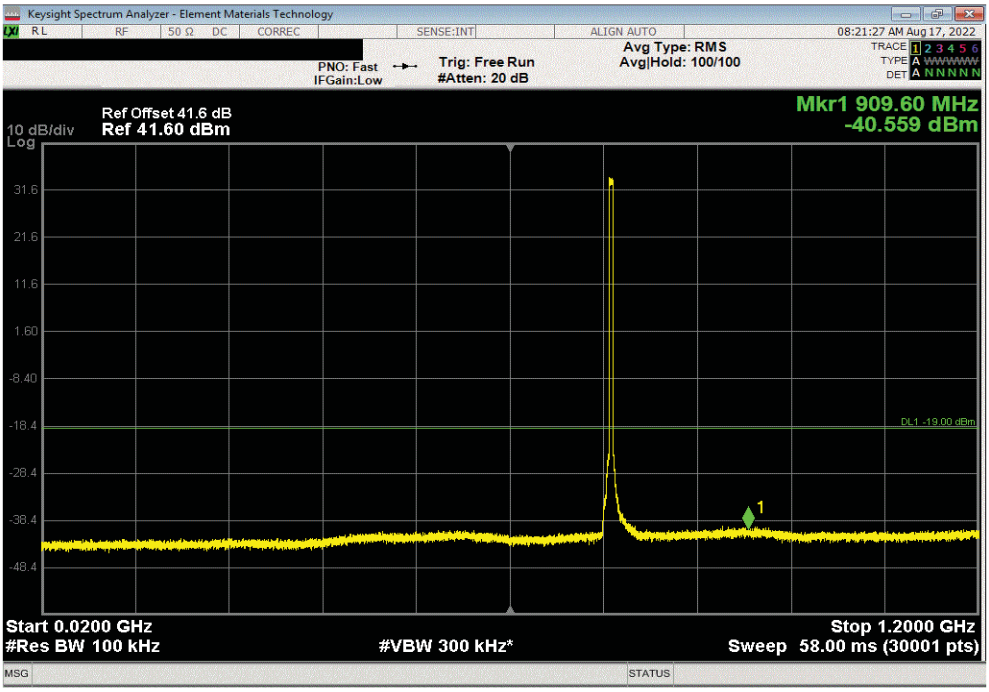


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.84	-29	Pass

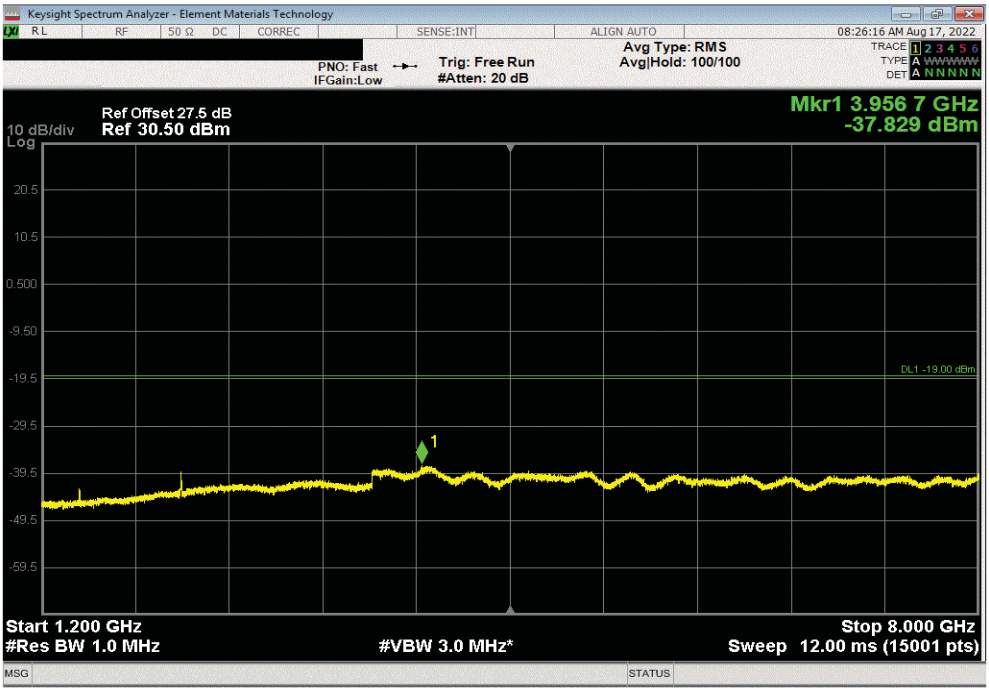


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n12

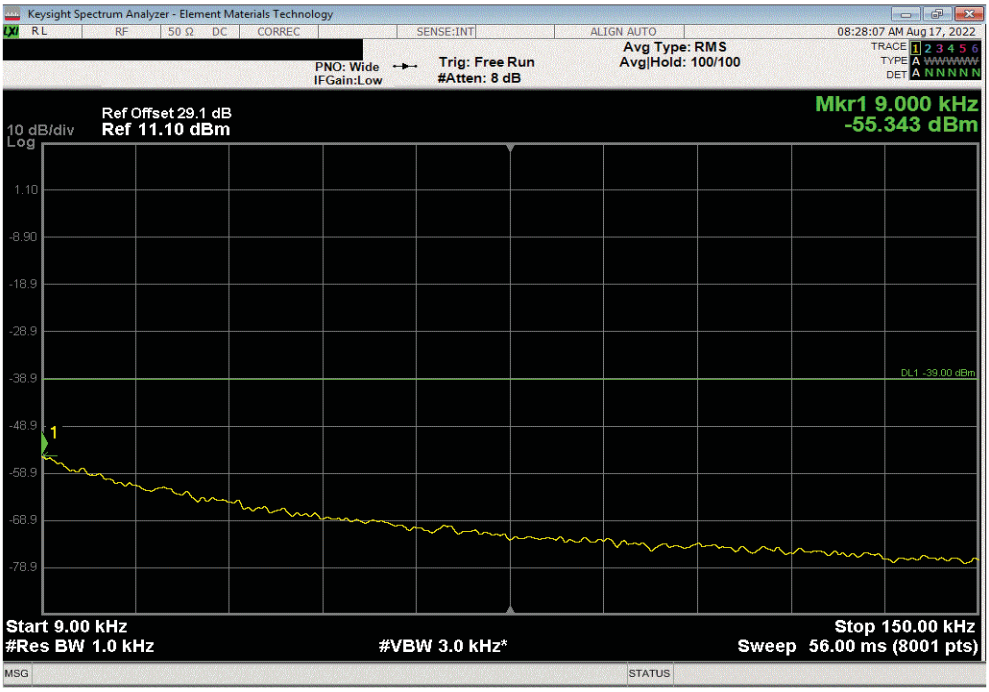
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.6	-40.56	-19	Pass



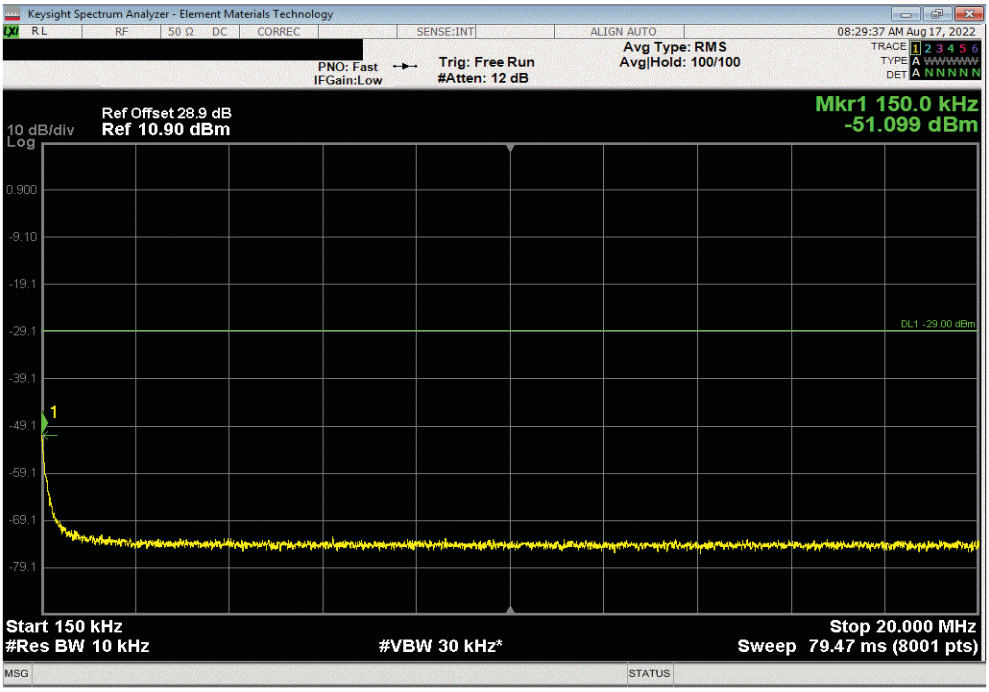
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3956.72	-37.83	-19	Pass



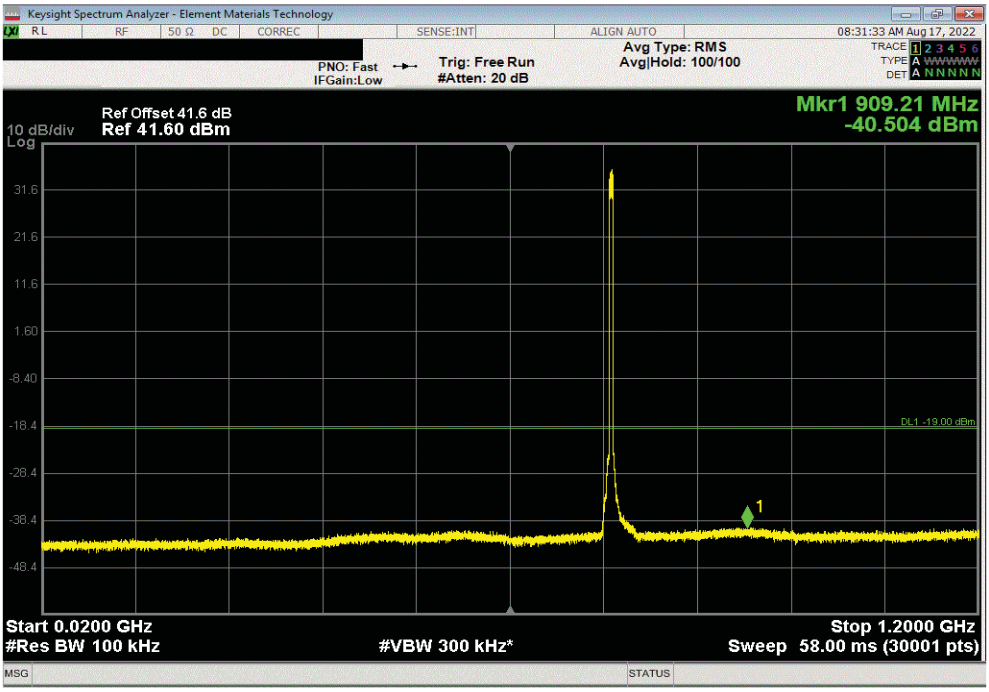
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	9 kHz - 150 kHz	0.01	-55.34	-39	Pass



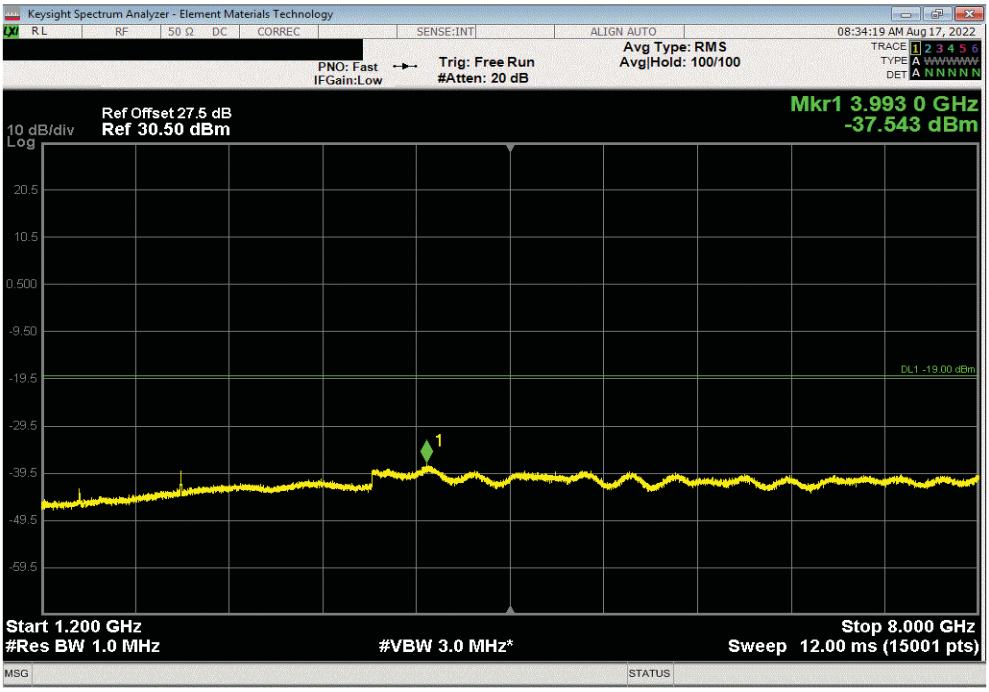
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	150 kHz - 20 MHz	0.15	-51.1	-29	Pass



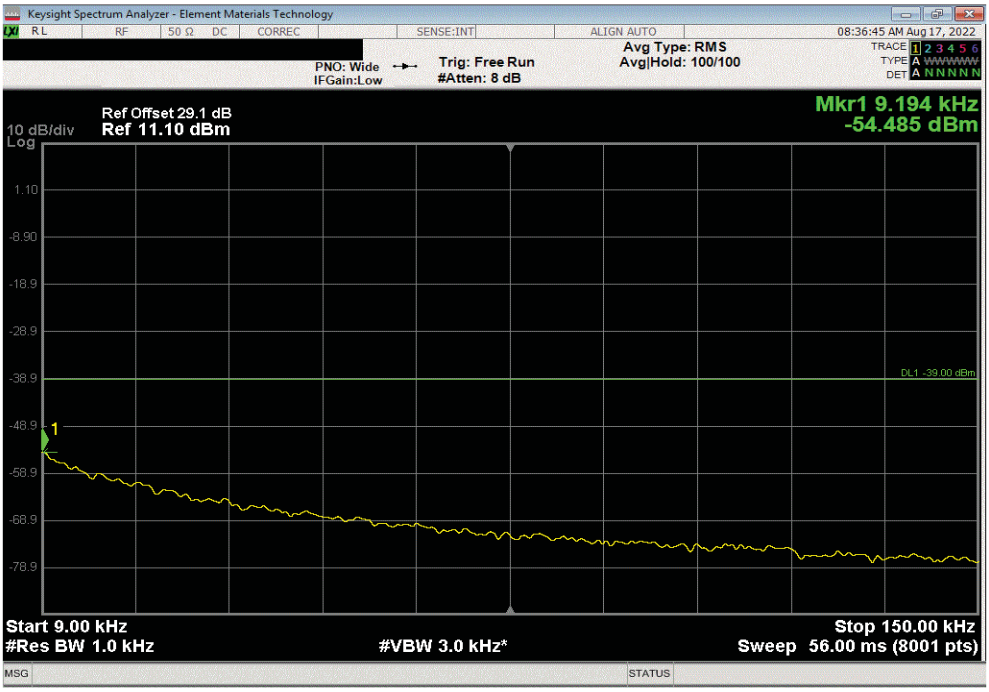
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.21	-40.5	-19	Pass



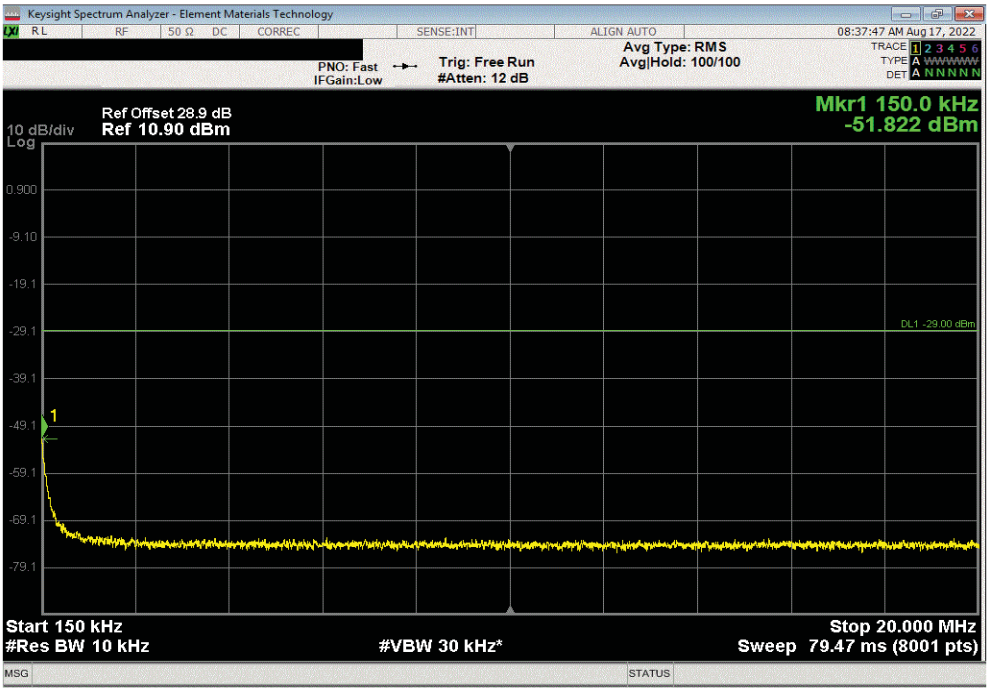
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3992.99	-37.54	-19	Pass



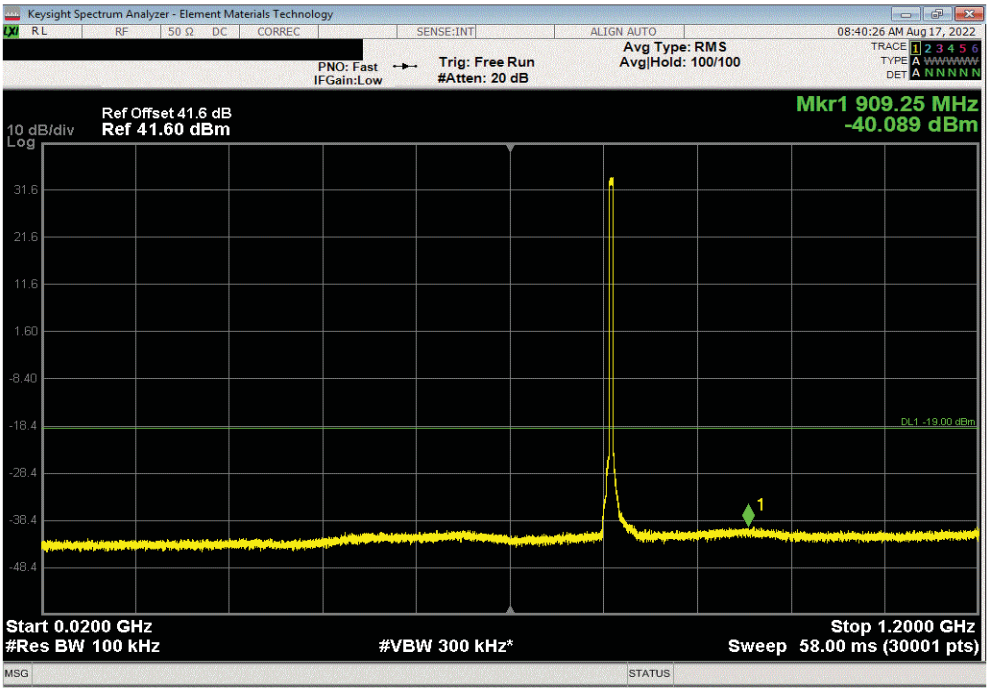
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-54.49	-39	Pass	



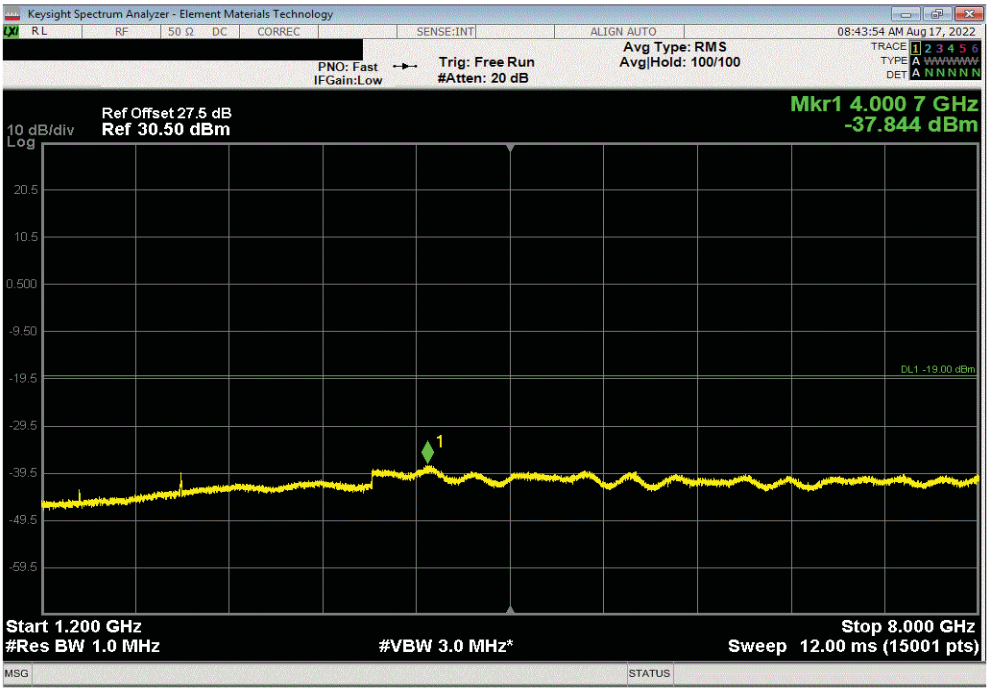
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.82	-29	Pass



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.25	-40.09	-19	Pass

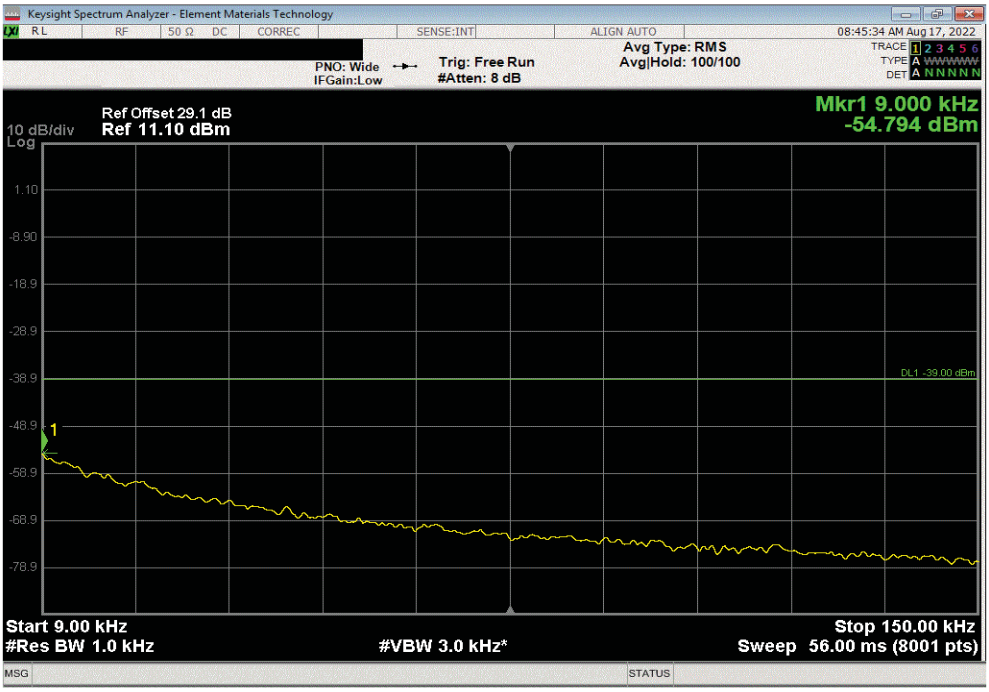


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4000.69	-37.84	-19	Pass

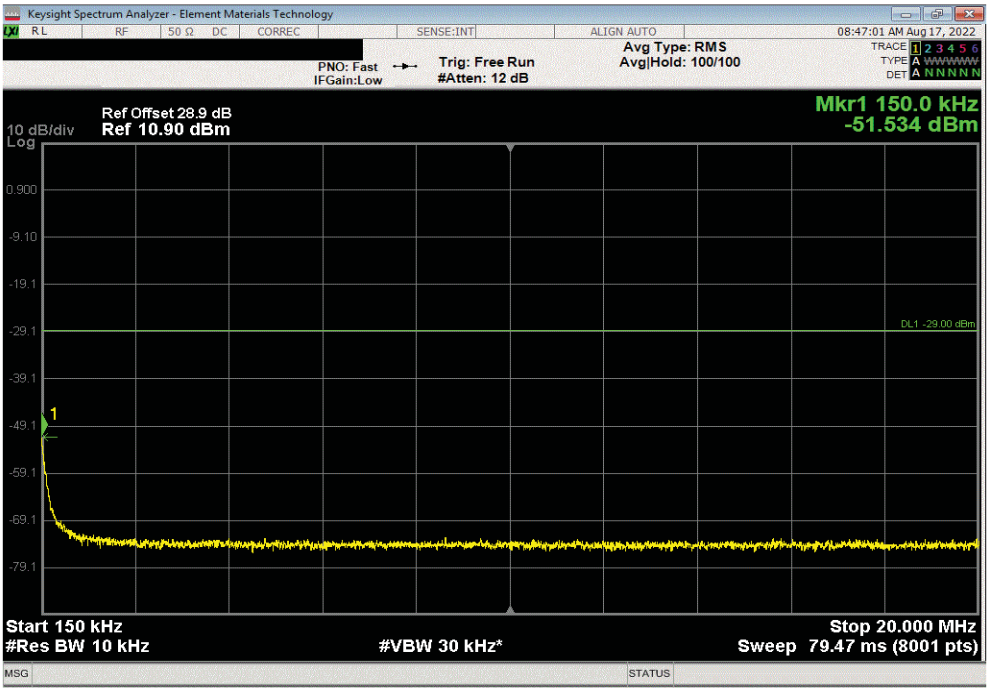


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n12

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-54.79	-39	Pass	

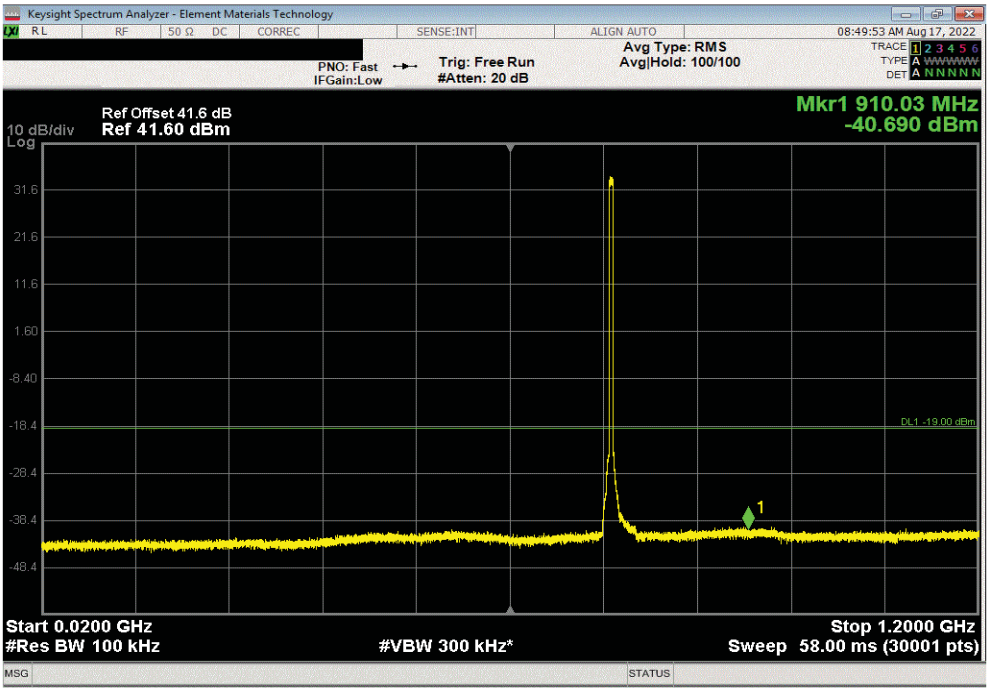


Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.53	-29	Pass

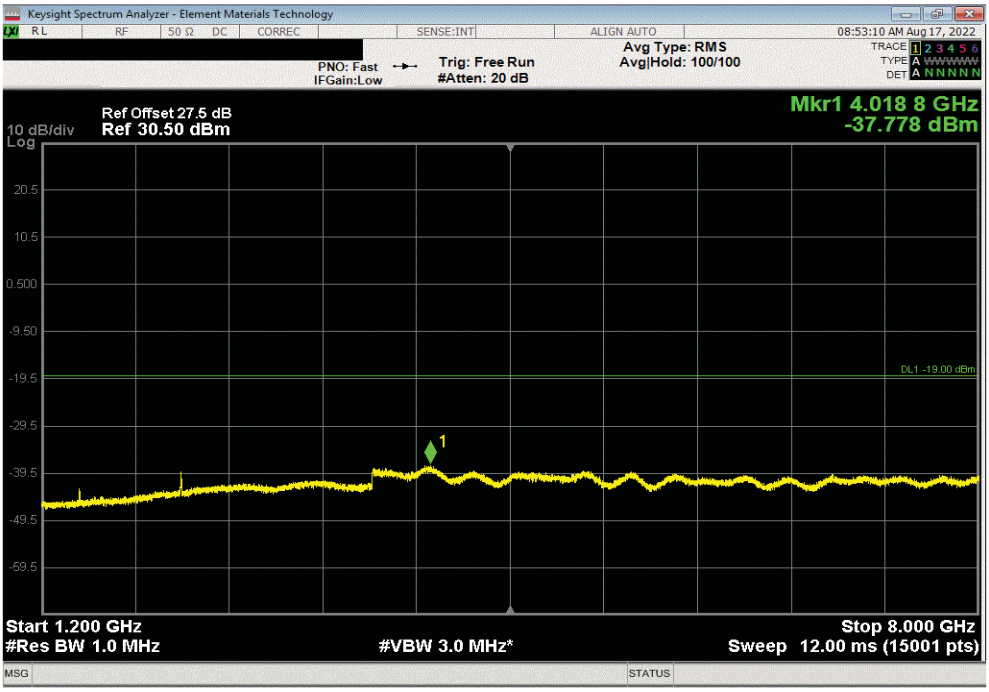


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n12

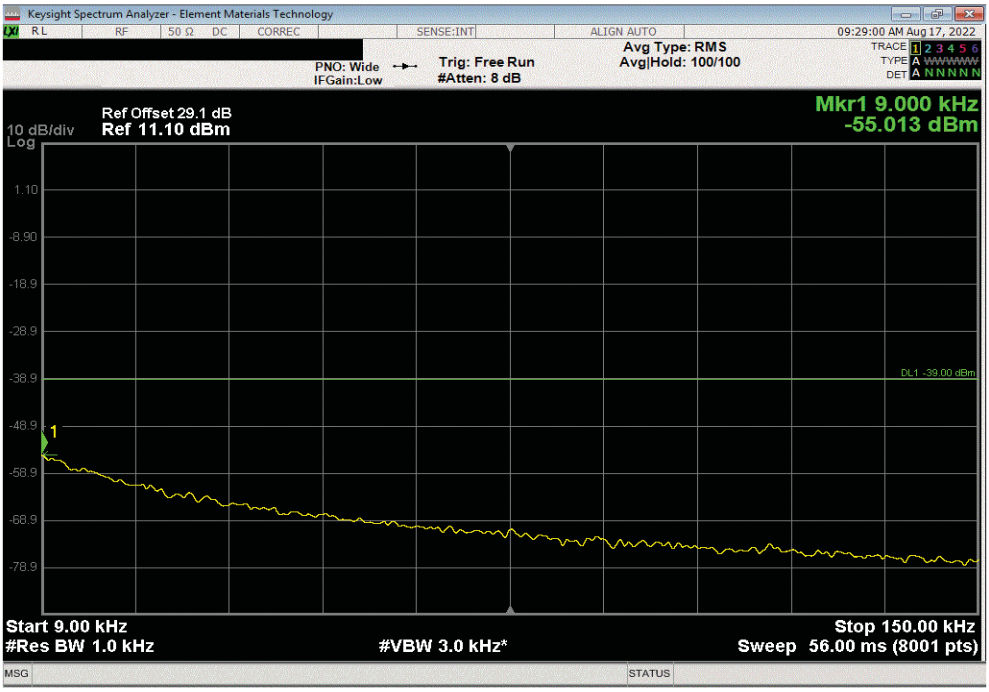
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	910.03	-40.69	-19	Pass



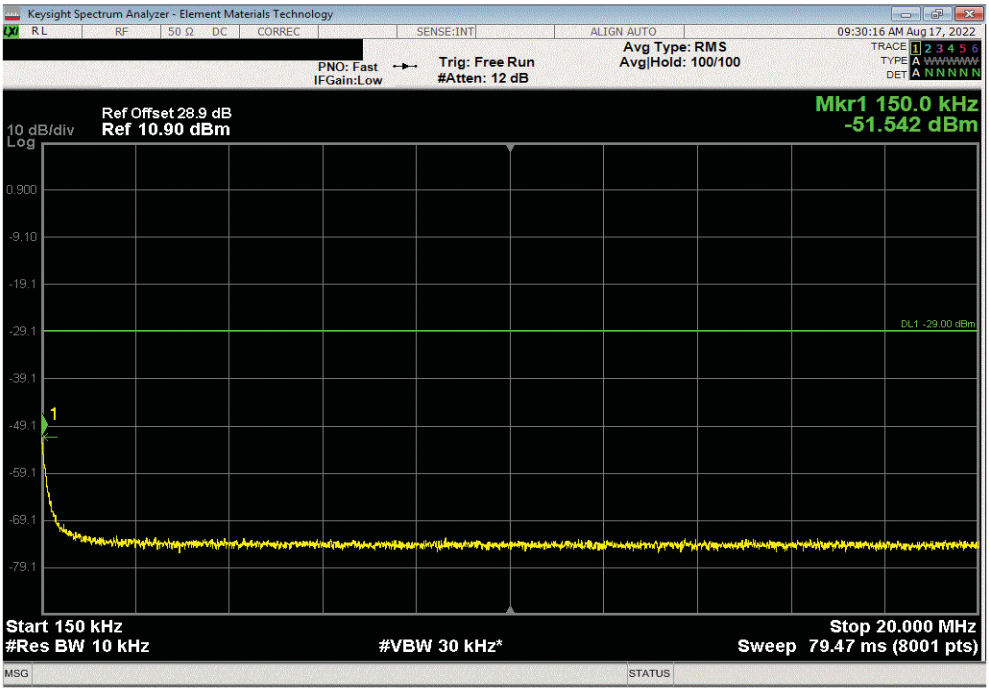
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4018.83	-37.78	-19	Pass



Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-55.01	-39	Pass

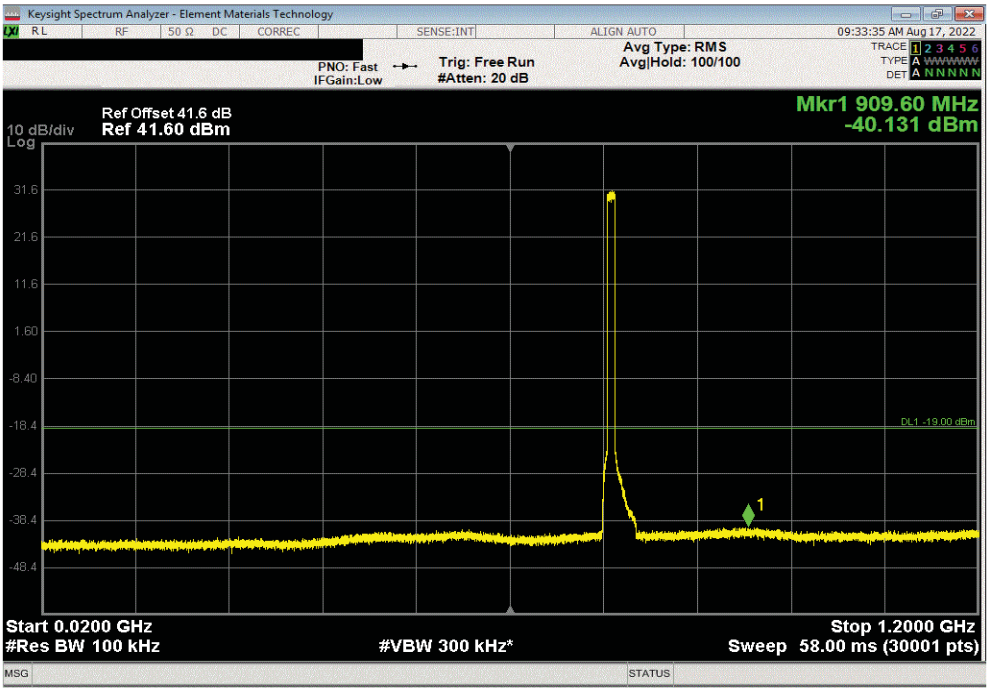


Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.54	-29	Pass

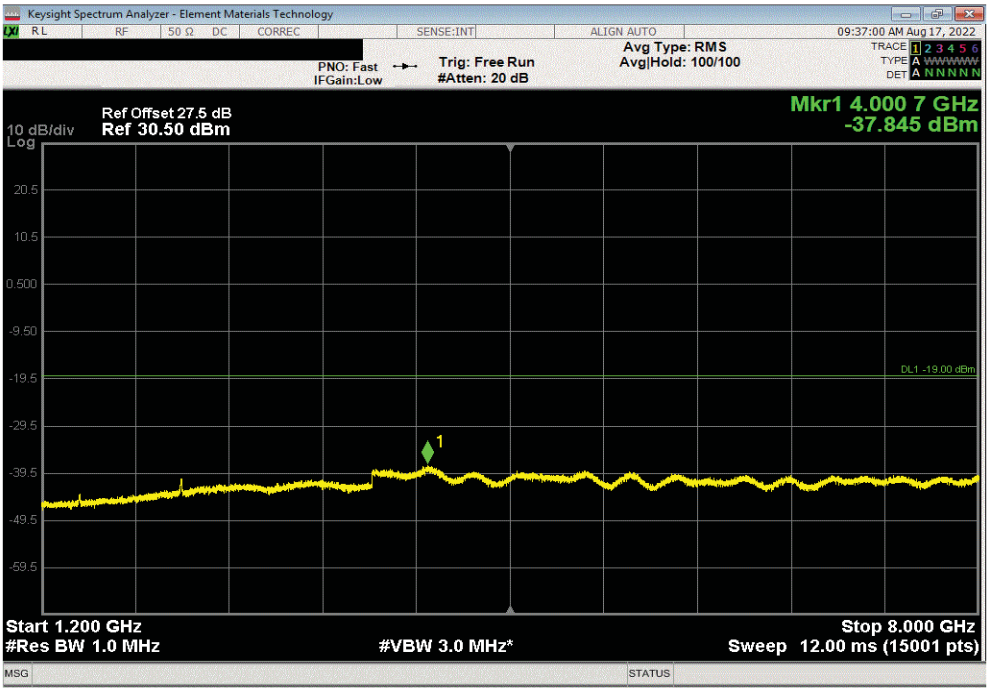


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n12

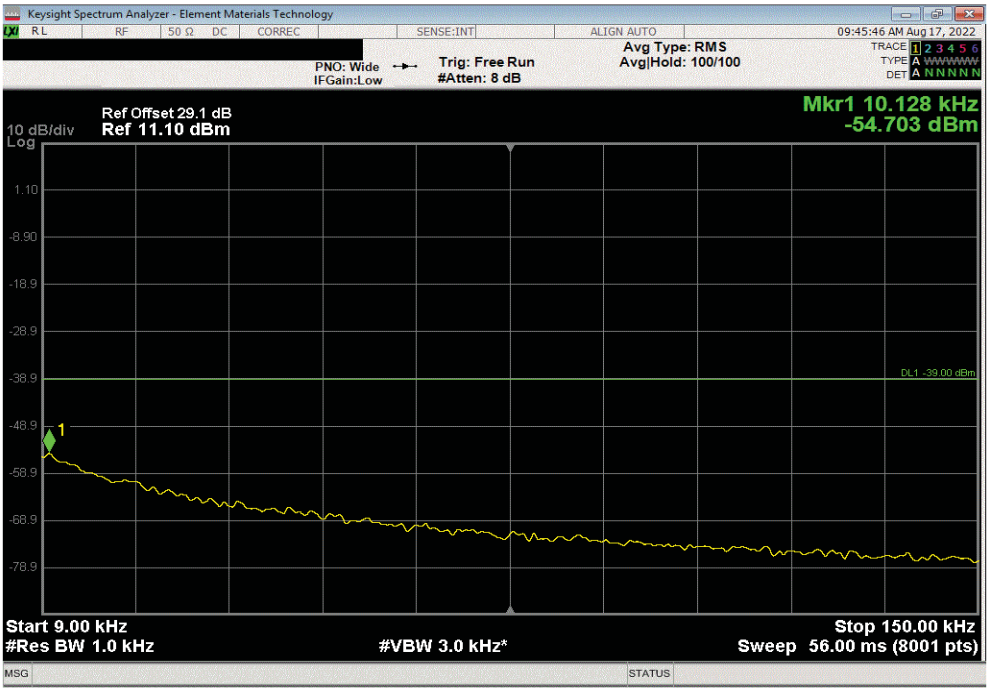
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.6	-40.13	-19	Pass



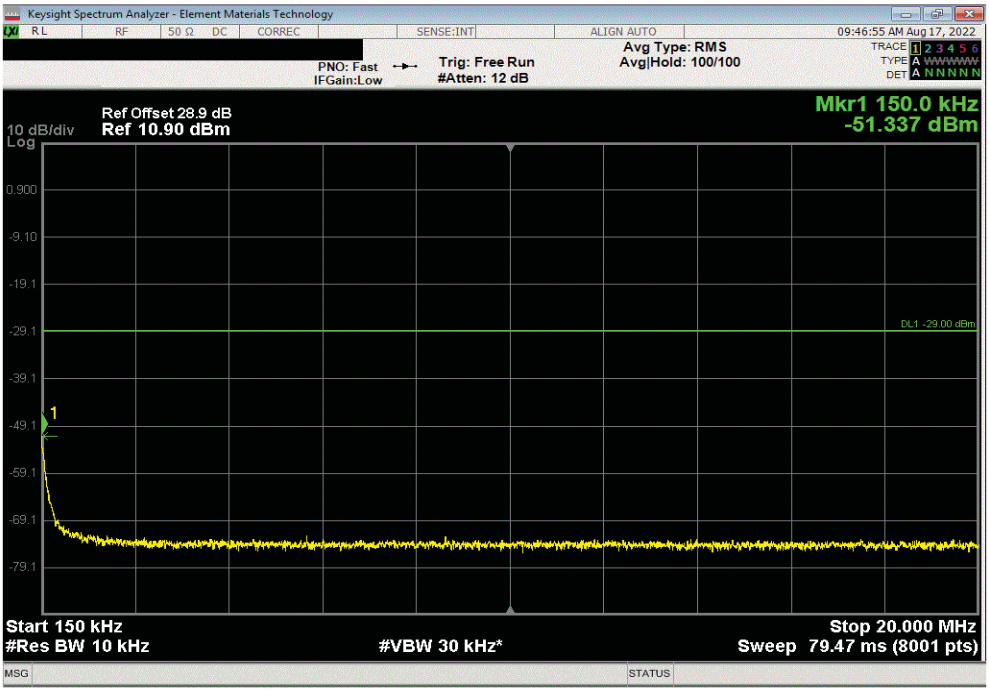
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4000.69	-37.85	-19	Pass



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	9 kHz - 150 kHz	0.01	-54.7	-39	Pass

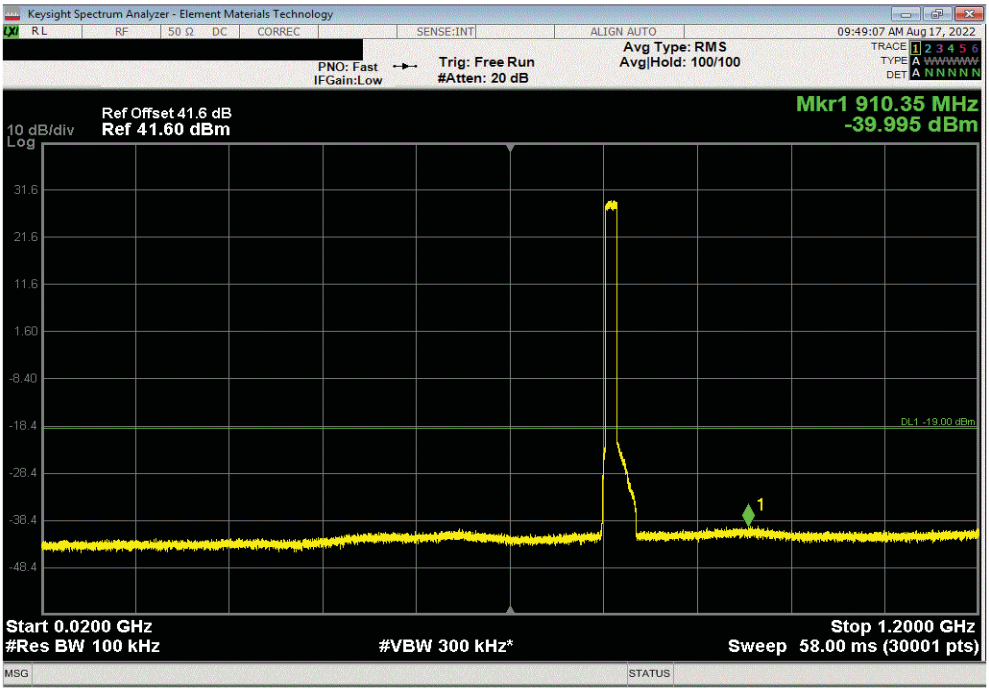


Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	150 kHz - 20 MHz	0.15	-51.34	-29	Pass

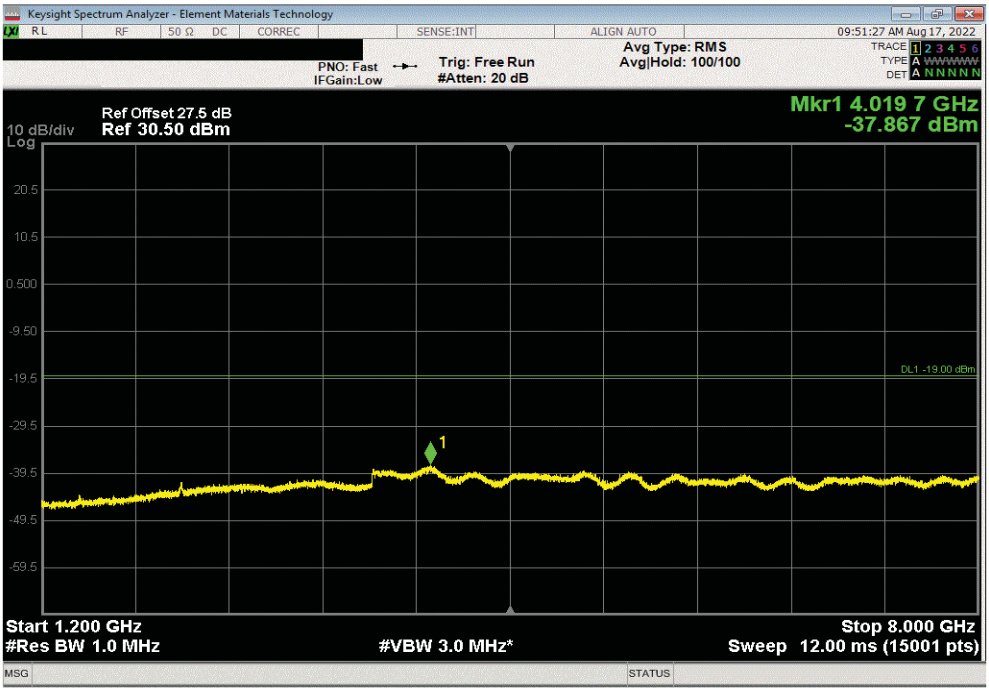


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n12

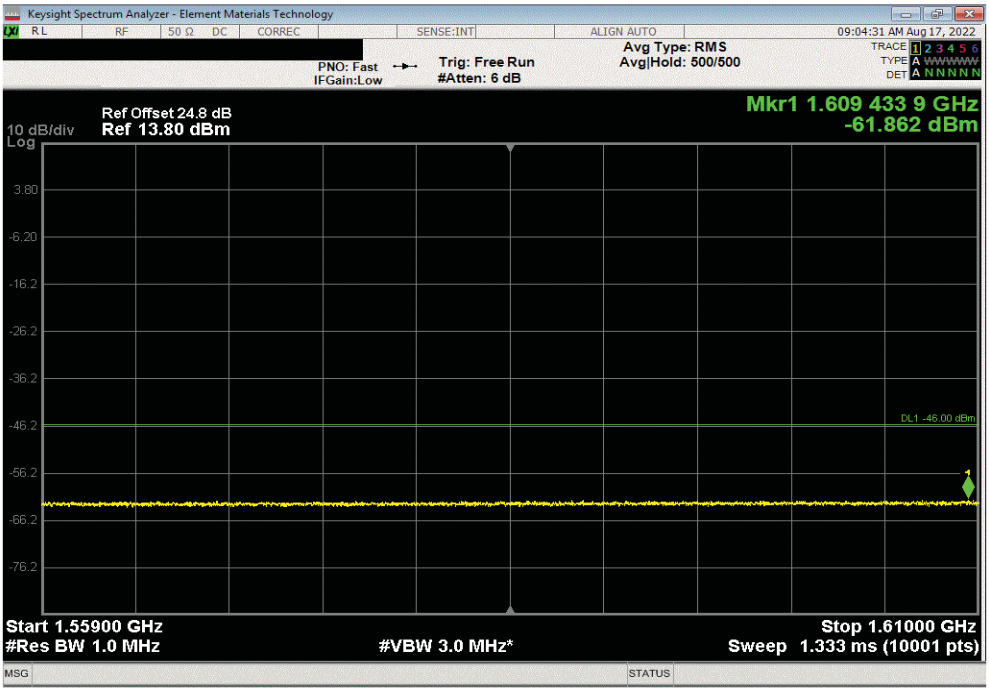
Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	910.35	-39.99	-19	Pass



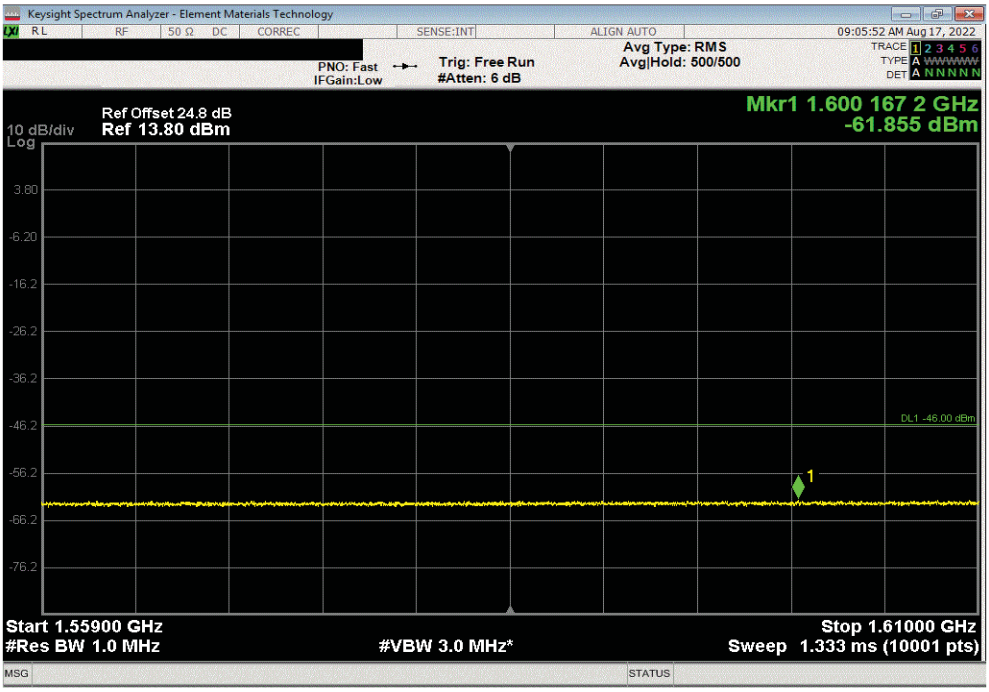
Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4019.73	-37.87	-19	Pass



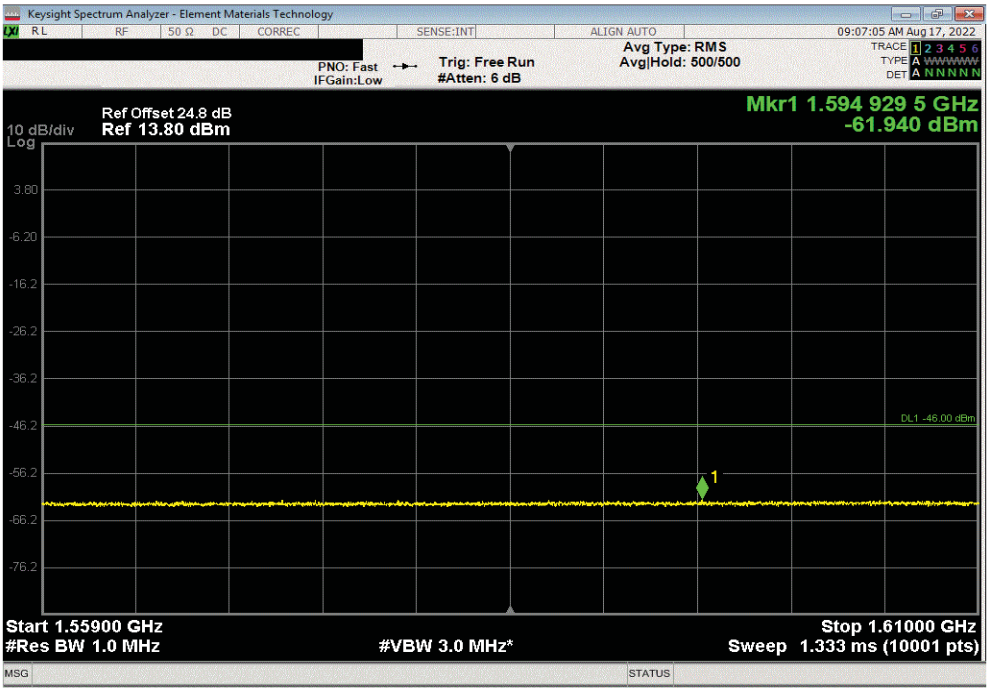
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.559 GHz - 1.61 GHz	1609.43	-61.86	-46	Pass



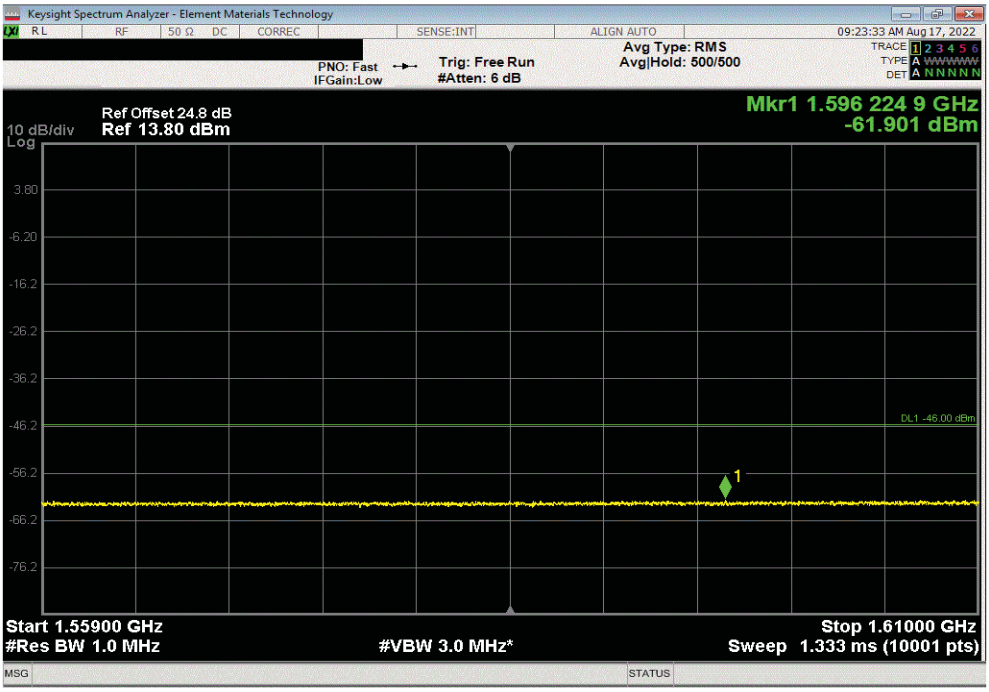
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.559 GHz - 1.61 GHz	1600.17	-61.86	-46	Pass



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
1.559 GHz - 1.61 GHz	1594.93	-61.94	-46	Pass



Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
1.559 GHz - 1.61 GHz	1596.22	-61.9	-46	Pass



SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND n14

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 3 different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth called out by the client's test plan were made for each modulation type from 9 KHz to 8 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than the limits also called out by the client's test plan shown below.

The measurement methods are detailed in KDB 971168 D01v03 section 6 and ANSI C63.26-2015. Per FCC 2.1057(a)(1), the upper level of measurement is the 10th harmonic of the highest fundamental frequency. These measurements are for the frequency band after the first 100 kHz bands immediately outside and adjacent to the frequency block.

Per FCC section 90.543(e)(3), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

FCC 90.543(e)(5) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

Per section 90.543(f), for the frequency range 1559-1610 MHz the EIRP limit is -70dBW/MHz for wideband signals and -80dBW for discrete emissions of bandwidths less than 700Hz. This equates to an EIRP of -40dBm/MHz for wideband emissions and -50dBm/MHz for discrete emissions. The limit is adjusted to -46 dBm [-40 dBm -10 log (4)] for wideband signals and -56dBm [-50 dBm -10 log (4)] for discrete emissions per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

The limit for the 9kHz to 150kHz frequency range was adjusted to –39dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 100kHz [i.e.: -39dBm = -19dBm -10log(100kHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to -29dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 100kHz [i.e.: -29dBm = -19dBm -10log(100kHz/10kHz)]. The required limit of -19dBm with a RBW of > 100kHz was used for all other frequency ranges. (See ANSI C63.26-2015 paragraph 5.7.2a for details on the Limit/RBW scaling method)

RF conducted emissions testing was performed only on one port. The AHLBA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND n14

TbiTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBA			Work Order:	NOKI0046
Serial Number:	K9180844519			Date:	19-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	21.5 °C
Attendees:	David Le			Humidity:	54.9% RH
Project:	None			Barometric Pres.:	1017 mbar
Tested by:	Marty Martin	Power:	54 VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offest including any attenuators, filters and DC blocks. The carrier was enabled at maximum power (80 watts/carrier).

DEVIATIONS FROM TEST STANDARD

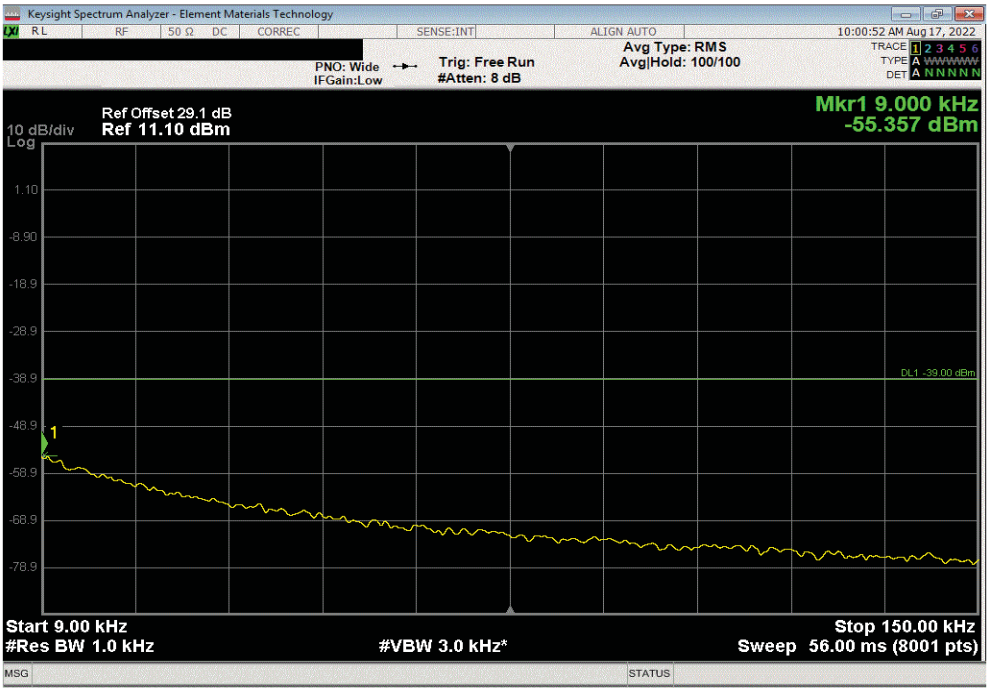
None

Configuration #	1, 2, 3	Signature

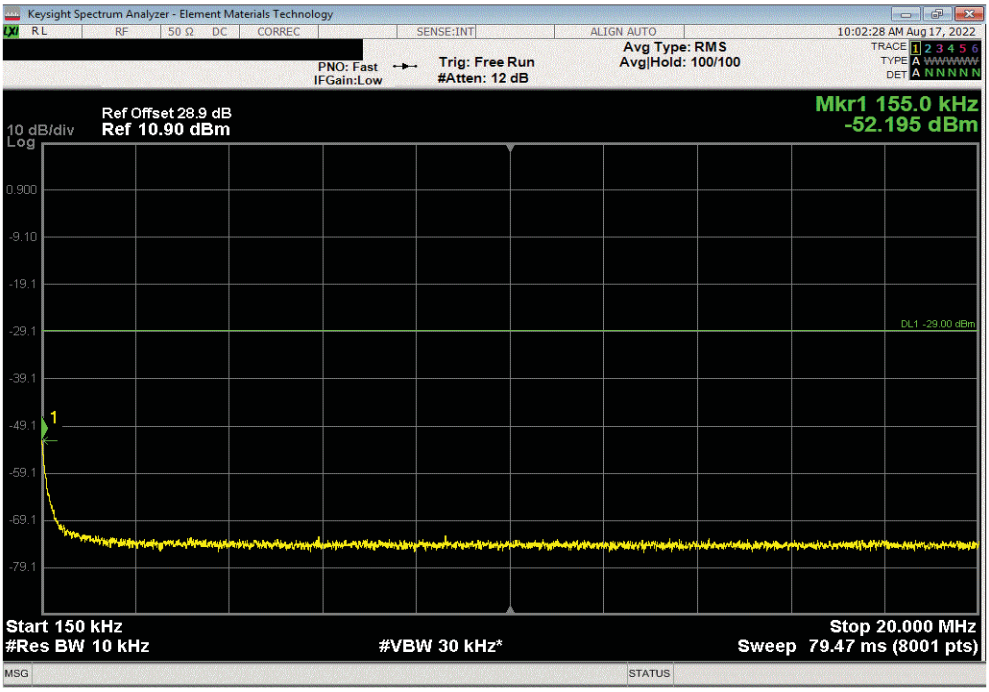
		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
Port 1						
5G NR, Band n14, 758 - 768 Mhz						
5 MHz Bandwidth						
QPSK Modulation						
	Mid Channel, 763.0 MHz	9 kHz - 150 kHz	0.01	-55.36	-39	Pass
	Mid Channel, 763.0 MHz	150 kHz - 20 MHz	0.15	-52.2	-29	Pass
	Mid Channel, 763.0 MHz	20 MHz - 1.2 GHz	909.44	-40.29	-19	Pass
	Mid Channel, 763.0 MHz	1.2 GHz - 8 GHz	3631.68	-37.72	-19	Pass
16QAM Modulation						
	Mid Channel, 763.0 MHz	9 kHz - 150 kHz	0.01	-54.66	-39	Pass
	Mid Channel, 763.0 MHz	150 kHz - 20 MHz	0.15	-52.55	-29	Pass
	Mid Channel, 763.0 MHz	20 MHz - 1.2 GHz	909.52	-40.55	-19	Pass
	Mid Channel, 763.0 MHz	1.2 GHz - 8 GHz	4026.53	-37.89	-19	Pass
64QAM Modulation						
	Mid Channel, 763.0 MHz	9 kHz - 150 kHz	0.01	-54.58	-39	Pass
	Mid Channel, 763.0 MHz	150 kHz - 20 MHz	0.15	-51.39	-29	Pass
	Mid Channel, 763.0 MHz	20 MHz - 1.2 GHz	909.64	-40.44	-19	Pass
	Mid Channel, 763.0 MHz	1.2 GHz - 8 GHz	4025.63	-37.81	-19	Pass
256QAM Modulation						
	Mid Channel, 763.0 MHz	9 kHz - 150 kHz	0.01	-54.77	-39	Pass
	Mid Channel, 763.0 MHz	150 kHz - 20 MHz	0.15	-51.81	-29	Pass
	Mid Channel, 763.0 MHz	20 MHz - 1.2 GHz	908.97	-40.68	-19	Pass
	Mid Channel, 763.0 MHz	1.2 GHz - 8 GHz	4028.8	-37.74	-19	Pass
10 MHz Bandwidth						
256QAM Modulation						
	Mid Channel, 763.0 MHz	9 kHz - 150 kHz	0.01	-55.11	-39	Pass
	Mid Channel, 763.0 MHz	150 kHz - 20 MHz	0.15	-51.66	-29	Pass
	Mid Channel, 763.0 MHz	20 MHz - 1.2 GHz	910.03	-40.67	-19	Pass
	Mid Channel, 763.0 MHz	1.2 GHz - 8 GHz	4029.71	-37.9	-19	Pass
5G NR, Band n14, 758 - 768 Mhz, 1559 - 1610 MHz						
5 MHz Bandwidth						
256QAM Modulation						
	Low Channel, 760.5 MHz	1.559 GHz - 1.61 GHz	1609.43	-61.95	-46	Pass
	Mid Channel, 763.0 MHz	1.559 GHz - 1.61 GHz	1597.15	-61.99	-46	Pass
	High Channel, 765.5 MHz	1.559 GHz - 1.61 GHz	1590.25	-61.94	-46	Pass
10 MHz Bandwidth						
256QAM Modulation						
	Mid Channel, 763.0 MHz	1.559 GHz - 1.61 GHz	1605.76	-61.94	-46	Pass

SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n14

Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763.0 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-55.36	-39	Pass	

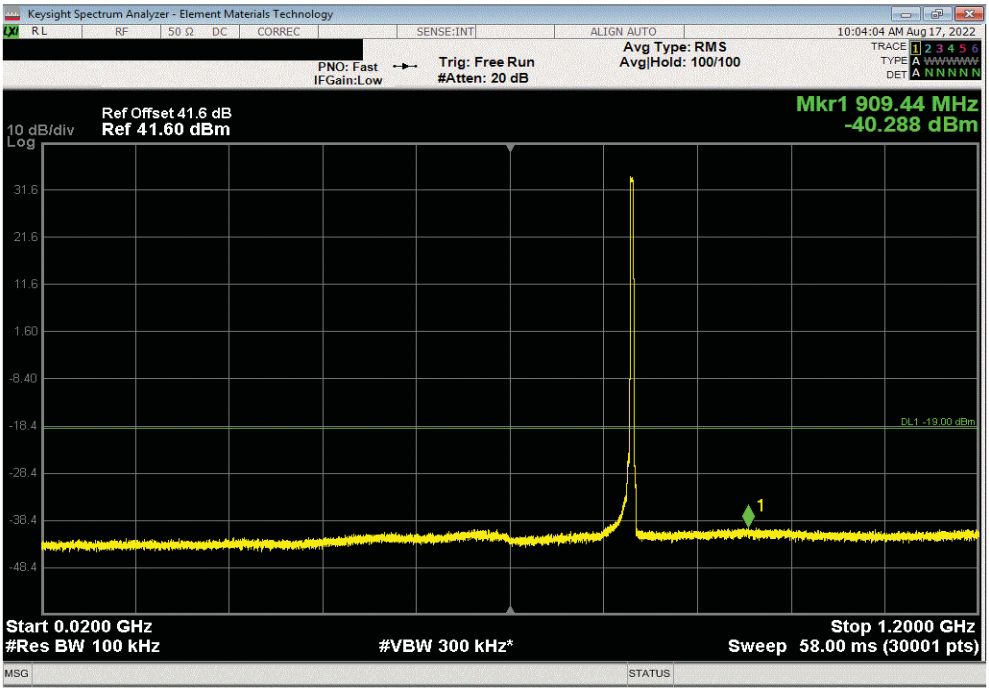


Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-52.2	-29	Pass

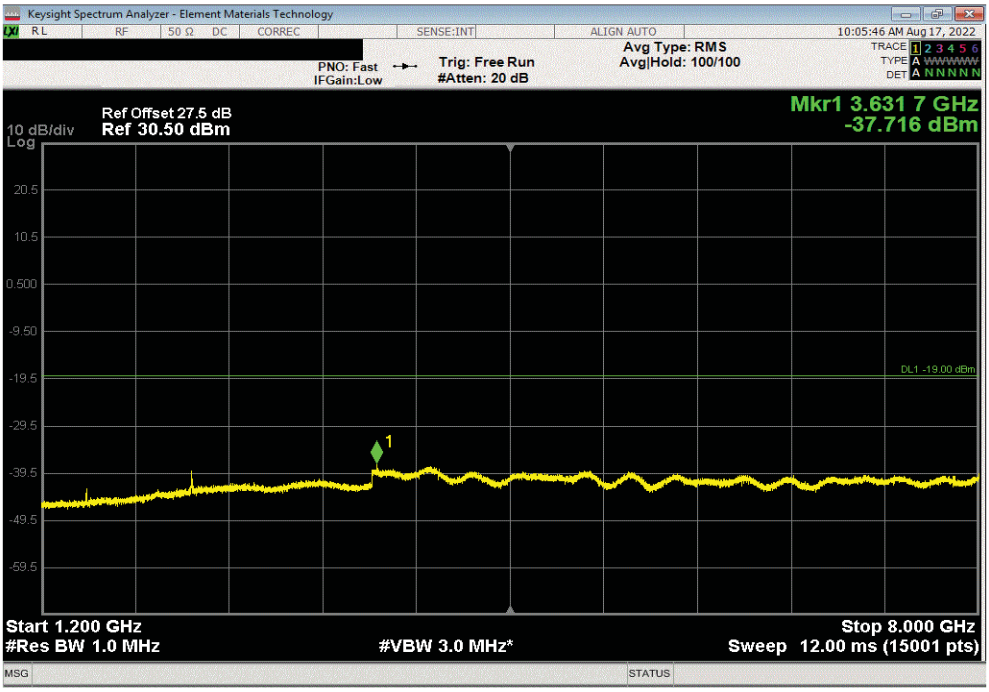


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n14

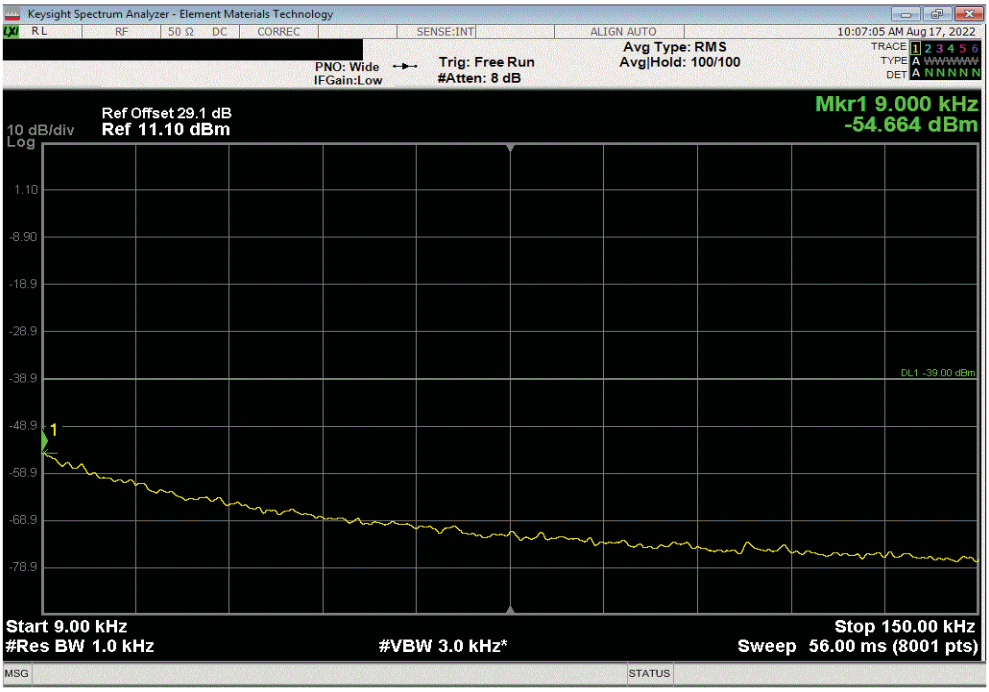
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.44	-40.29	-19	Pass



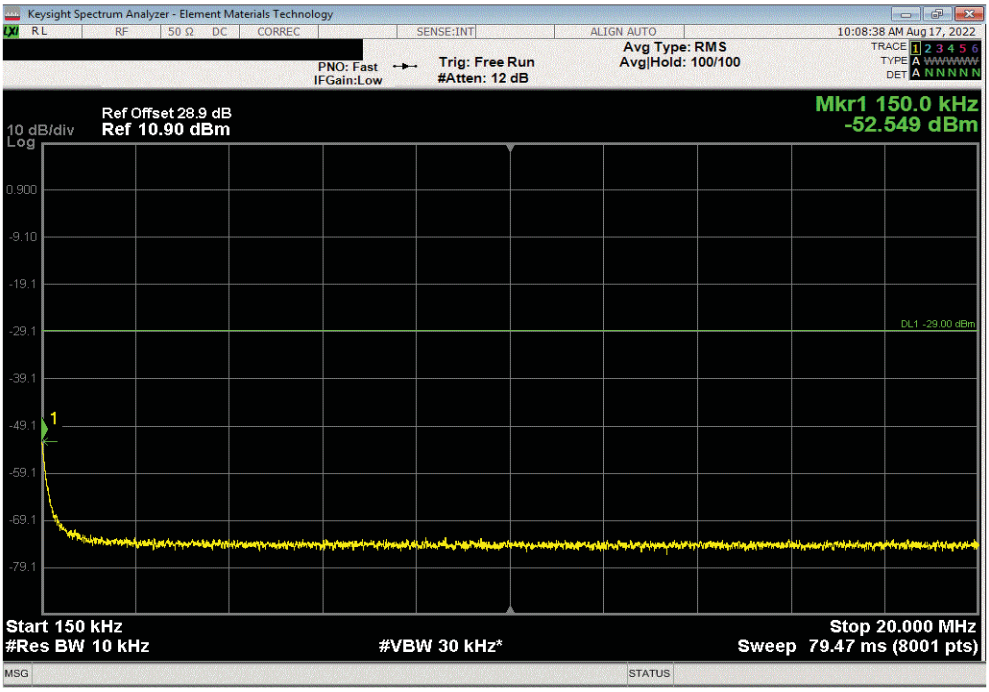
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3631.68	-37.72	-19	Pass



Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763.0 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-54.66	-39	Pass

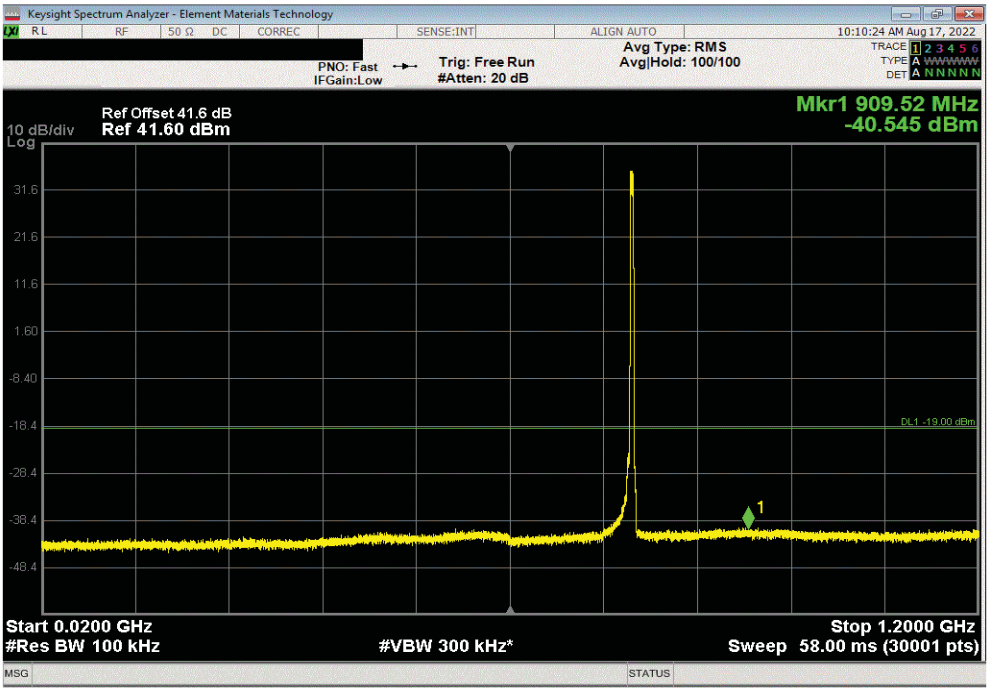


Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-52.55	-29	Pass

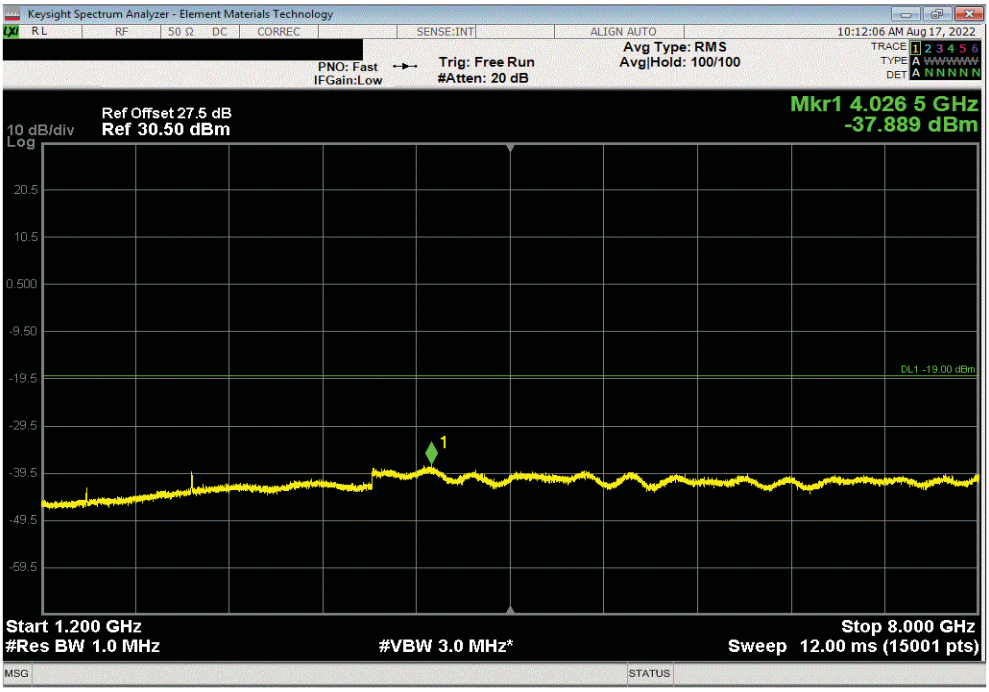


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n14

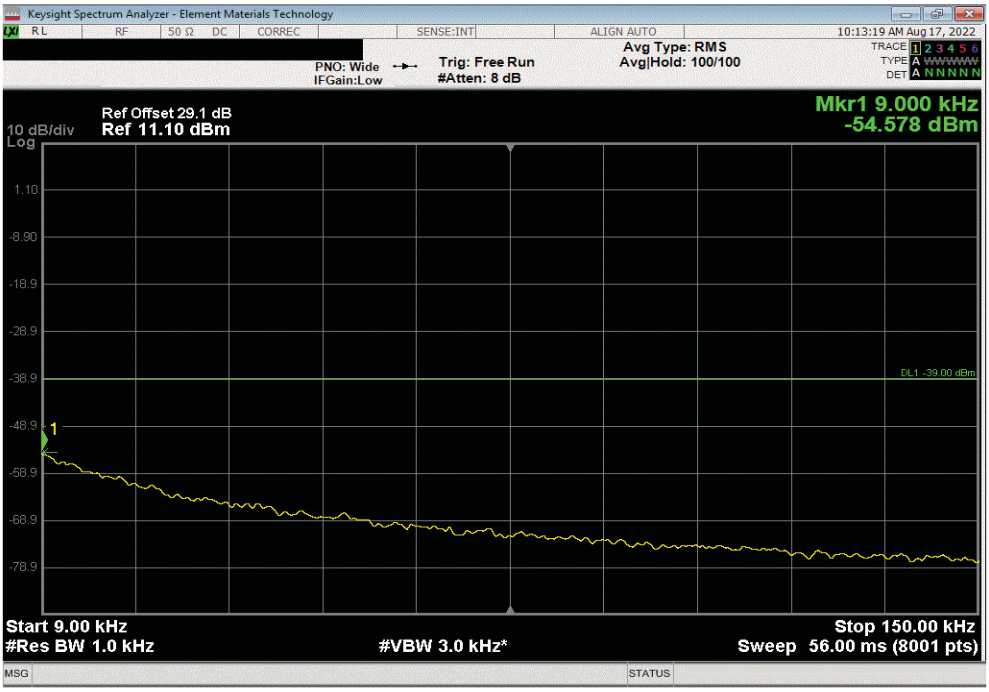
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.52	-40.55	-19	Pass



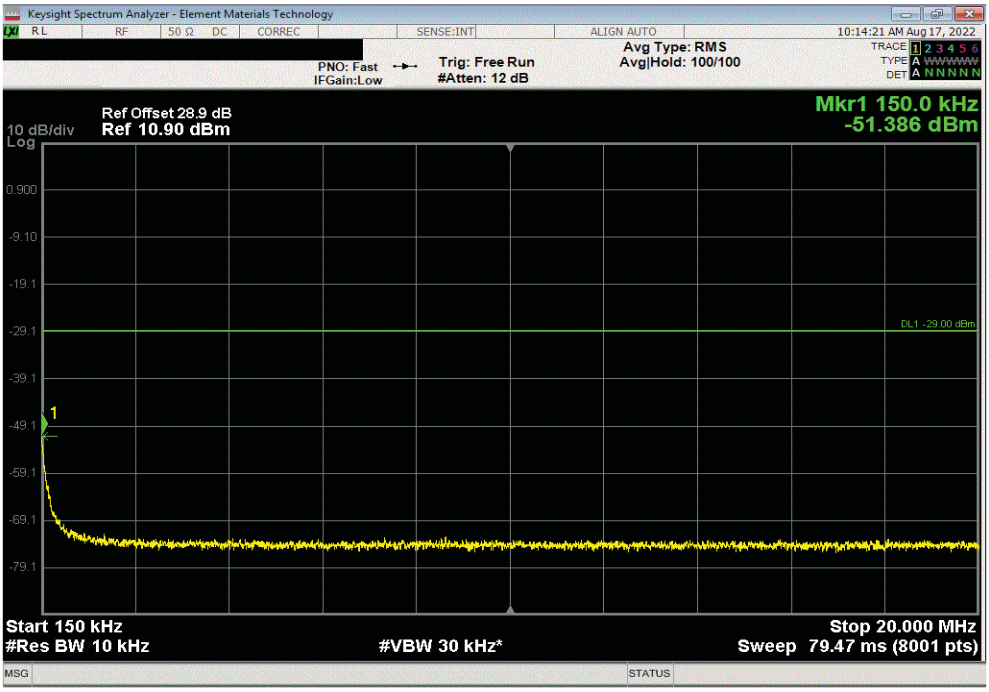
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4026.53	-37.89	-19	Pass



Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763.0 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-54.58	-39	Pass

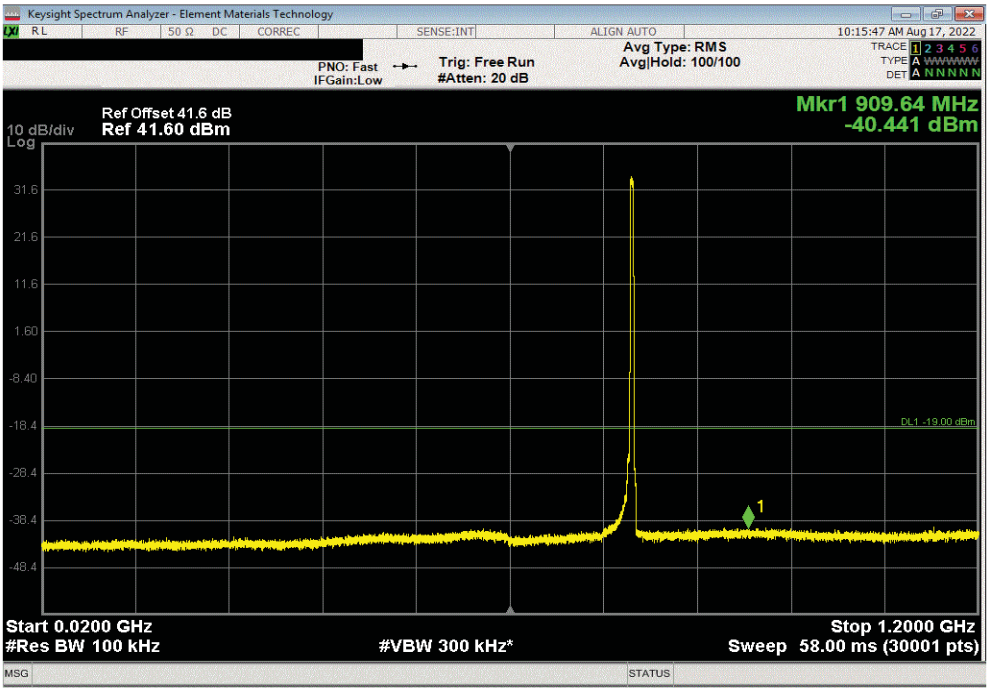


Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.39	-29	Pass



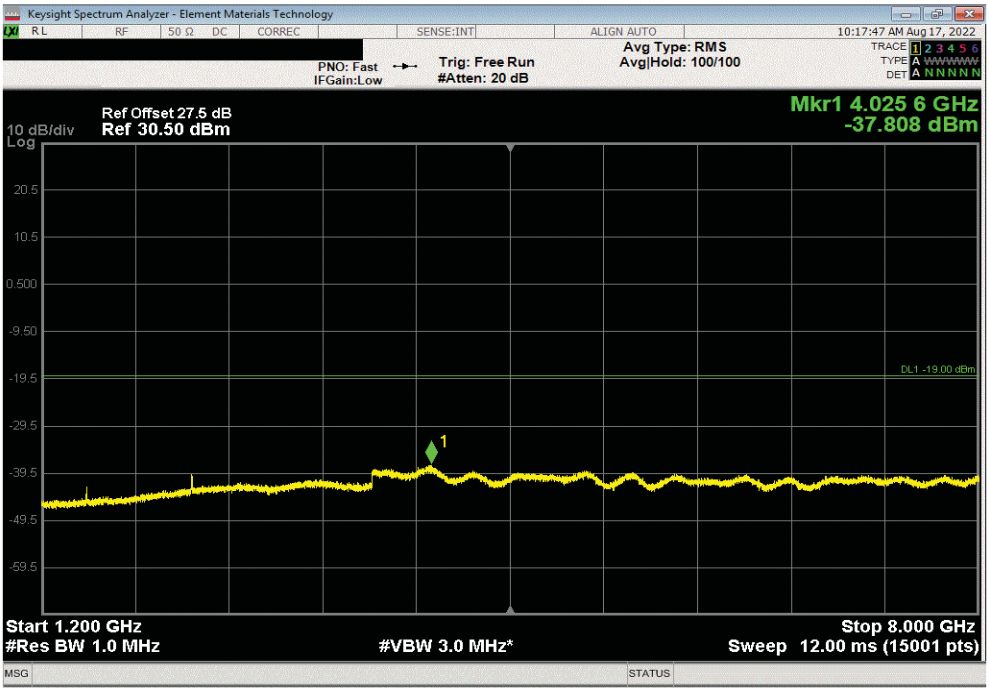
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763.0 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	909.64	-40.44	-19	Pass



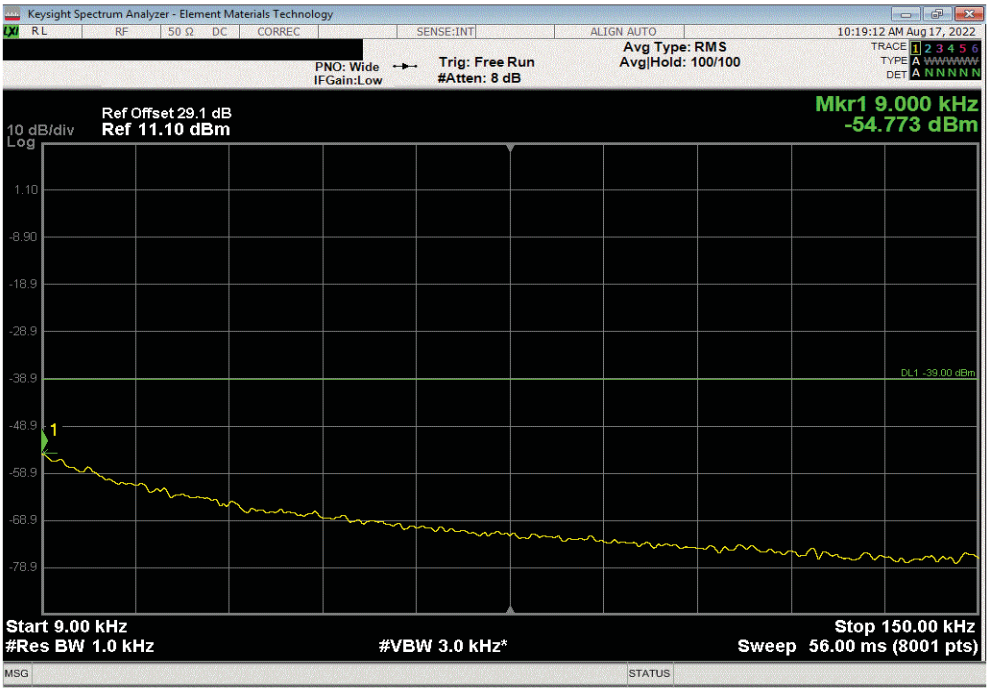
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763.0 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4025.63	-37.81	-19	Pass



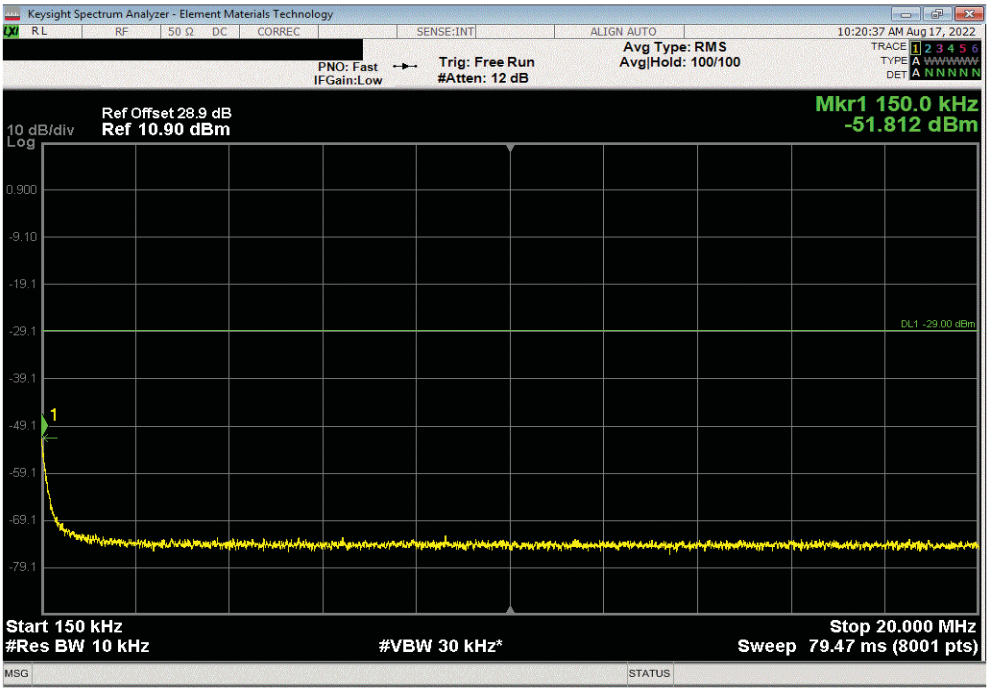
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz	0.01	-54.77	-39	Pass



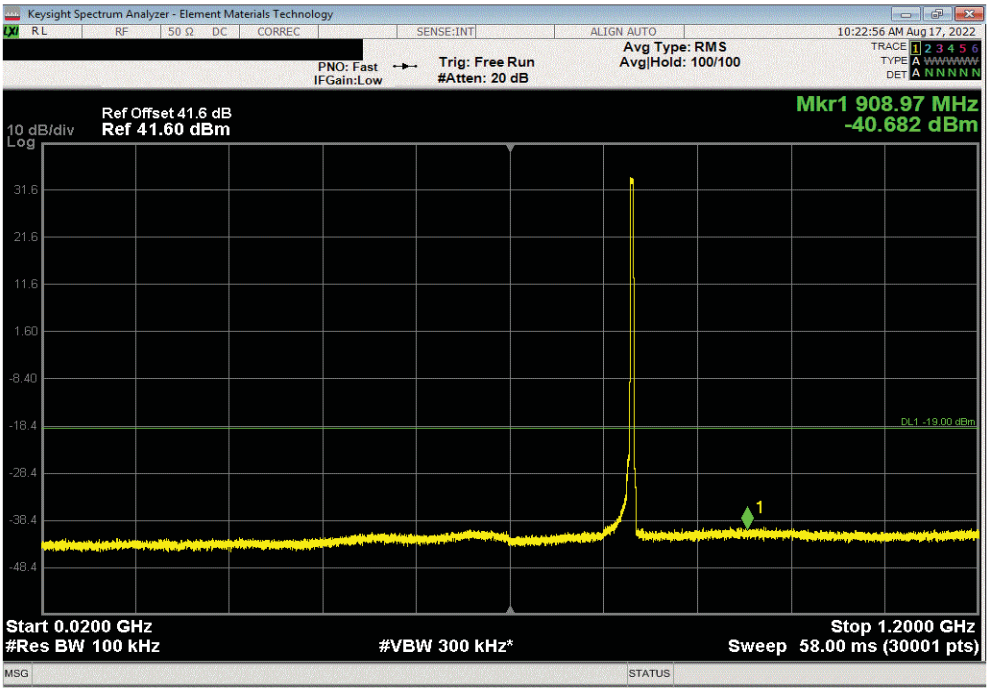
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz

Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	0.15	-51.81	-29	Pass

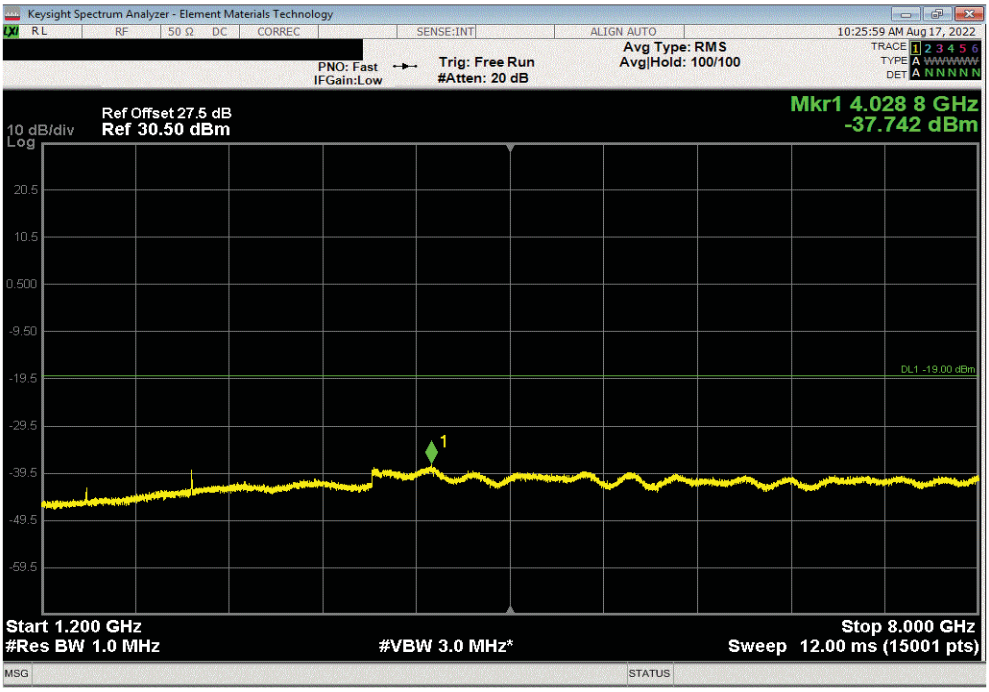


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND n14

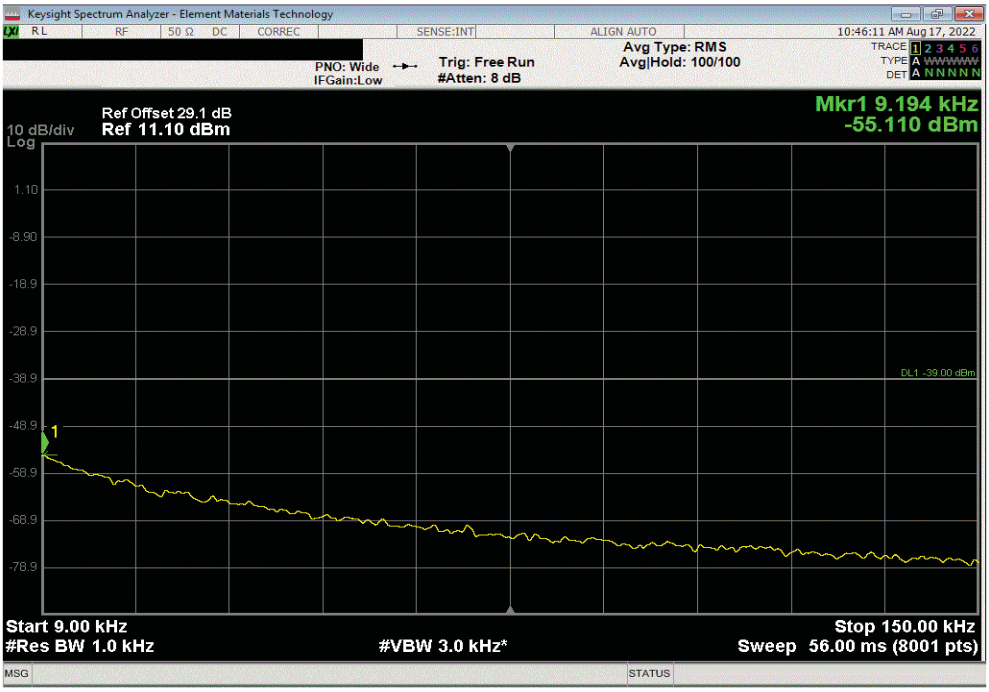
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	908.97	-40.68	-19	Pass



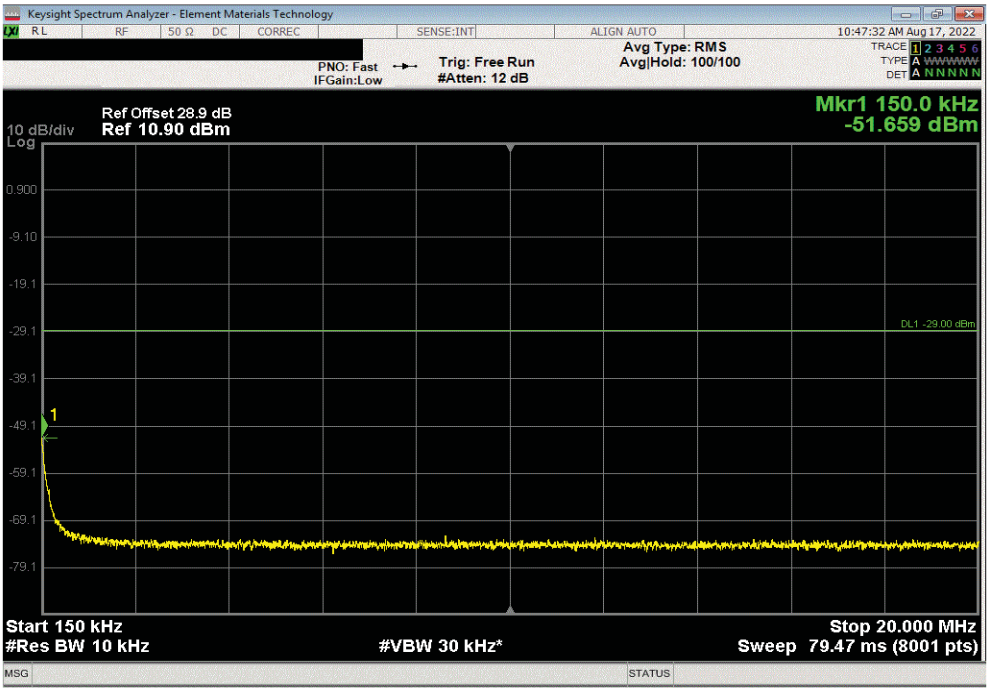
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4028.8	-37.74	-19	Pass



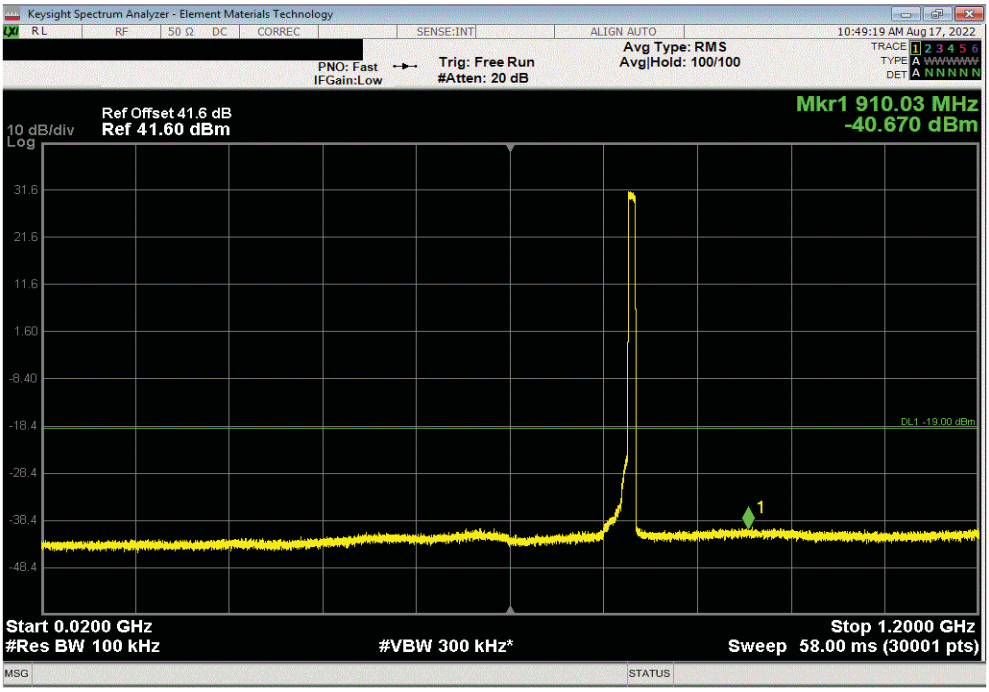
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	9 kHz - 150 kHz	0.01	-55.11	-39	Pass



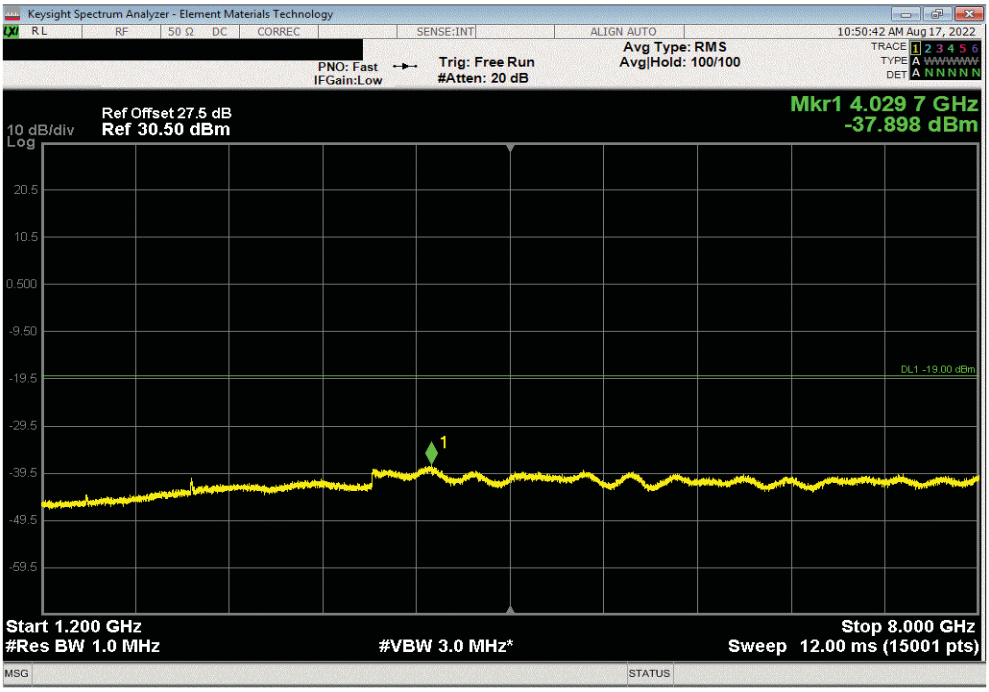
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	150 kHz - 20 MHz	0.15	-51.66	-29	Pass



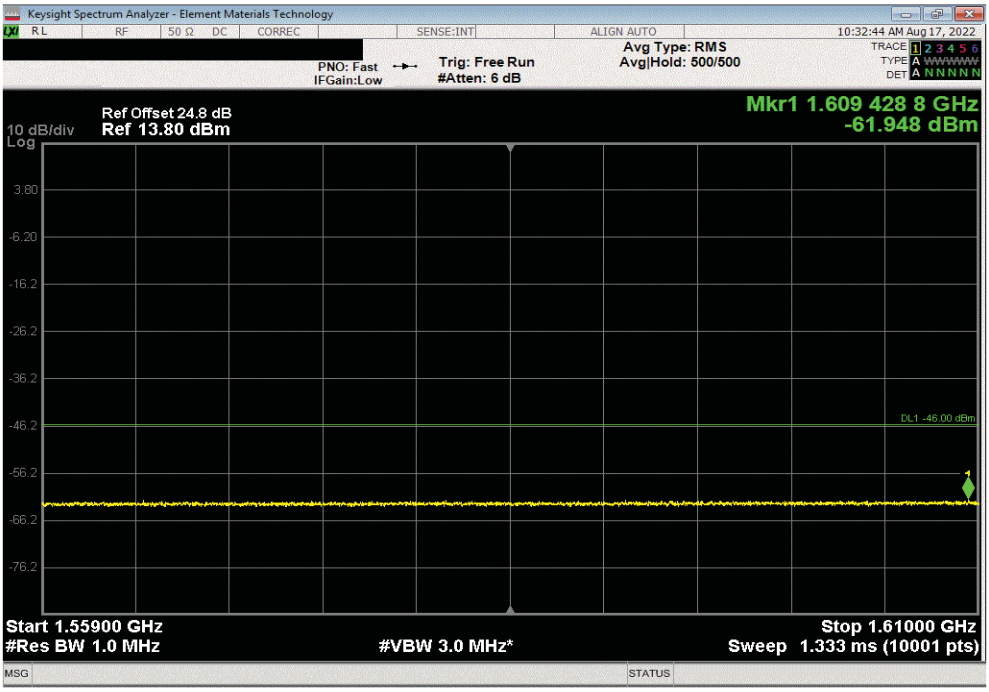
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 1.2 GHz	910.03	-40.67	-19	Pass



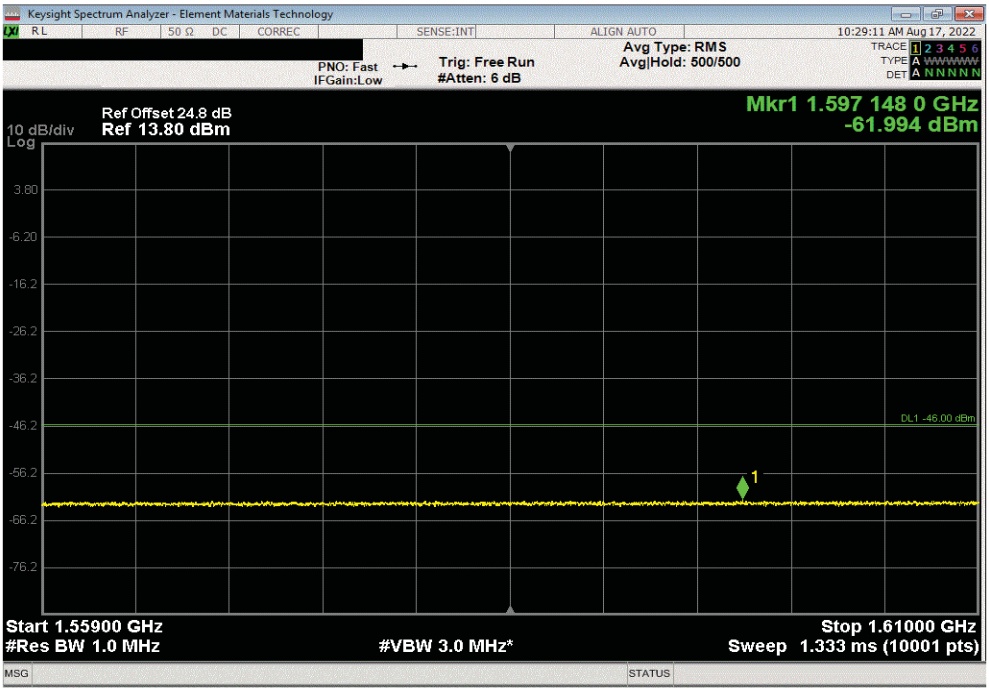
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	4029.71	-37.9	-19	Pass



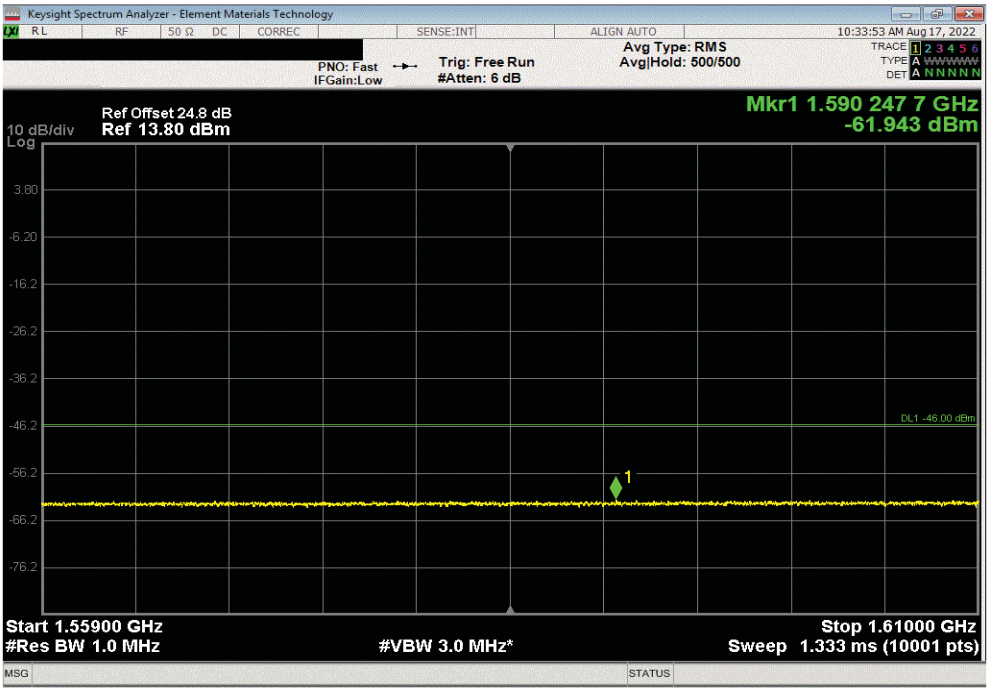
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
1.559 GHz - 1.61 GHz	1609.43	-61.95	-46	Pass



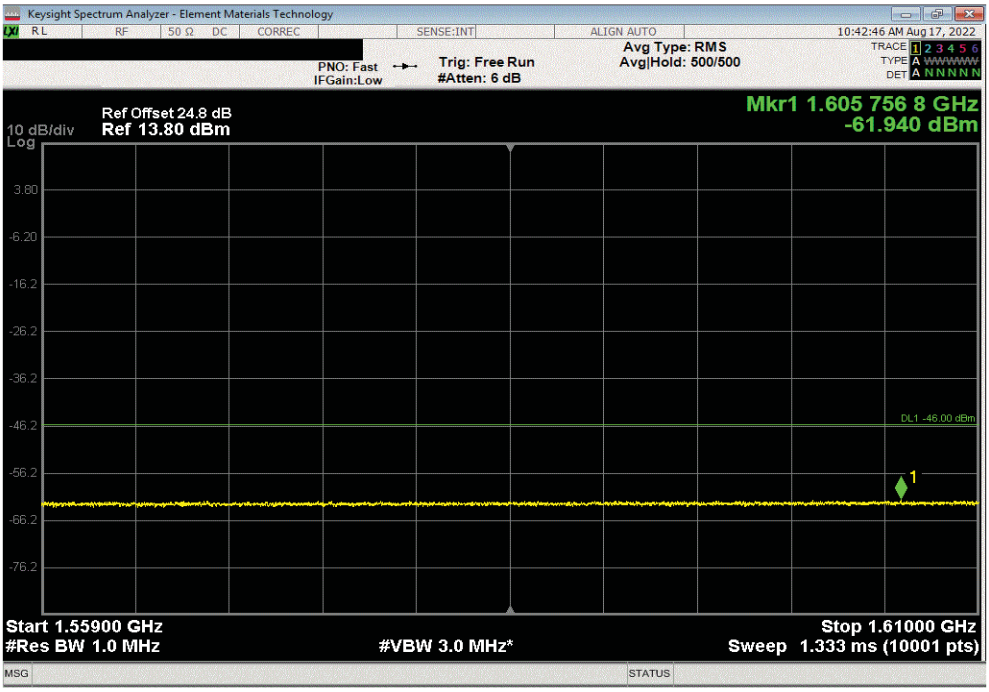
Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
1.559 GHz - 1.61 GHz	1597.15	-61.99	-46	N/A



Port 1, 5G NR, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.559 GHz - 1.61 GHz	1590.25	-61.94	-46	Pass



Port 1, 5G NR, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763.0 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.559 GHz - 1.61 GHz	1605.76	-61.94	-46	Pass



End of Test Report