SPURIOUS CONDUCTED EMISSIONS

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2021-12-05	2022-12-05
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2022-09-08	2023-09-08

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = “Internal” cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

SPURIOUS CONDUCTED EMISSIONS

element

TbtTx 2022.06.03.0 XMit 2022.02.07.0

EUT:	**Passport**			**Work Order:**	**ONIT0091**
Serial Number:	**44594524**			**Date:**	**30-Sep-22**
Customer:	**Onity Inc.**			**Temperature:**	**21.9 °C**
Attendees:	**Ali Elmi**			**Humidity:**	**48.3% RH**
Project:	**None**			**Barometric Pres.:**	**1020 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**Battery**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

Reference level offest includes: DC Block, 20 dB attenuator, measurement cable and manufacturers provided SMA patch cable.

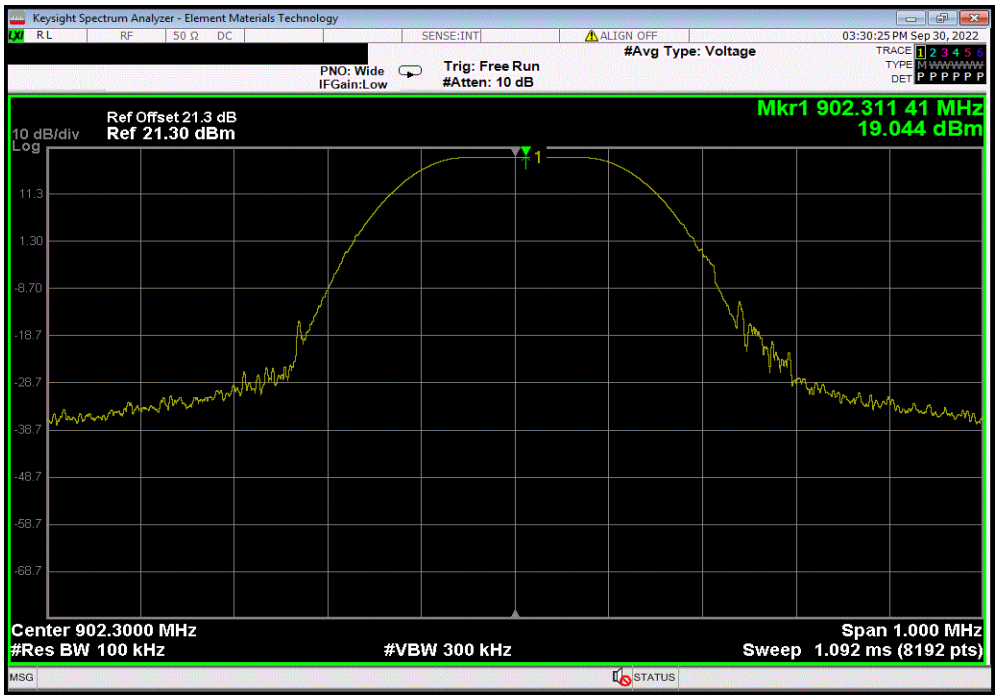
DEVIATIONS FROM TEST STANDARD

None

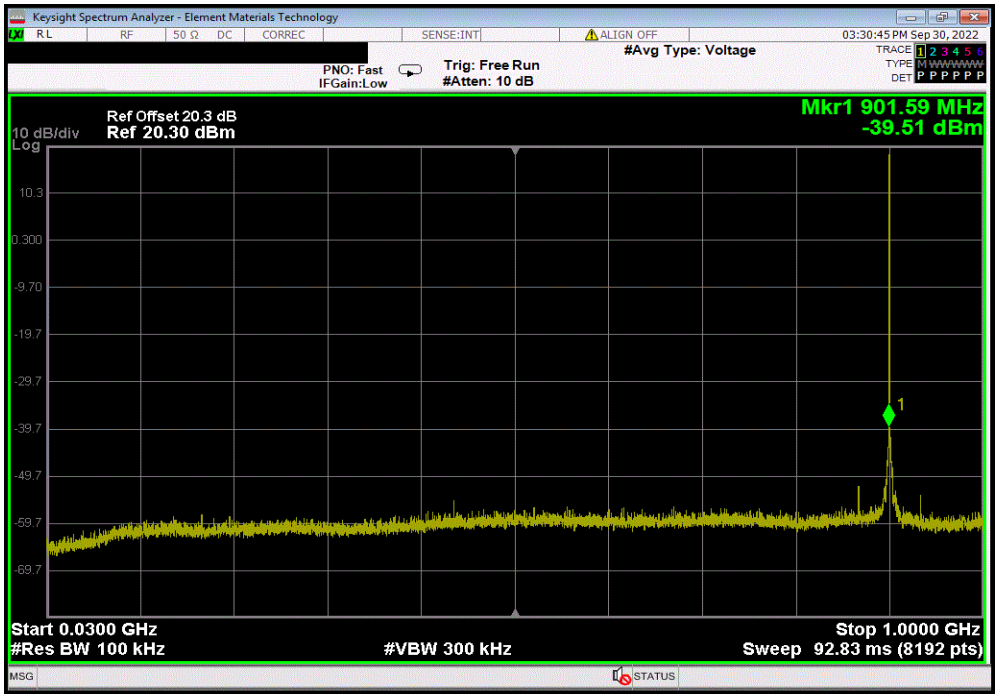
Configuration #	**3**	*Signature*

			Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Single Channel Mode							
LoRa, 125 kHz BW							
SF 10							
	Ch. 0, 902.3 MHz		Fundamental	902.31	N/A	N/A	N/A
	Ch. 0, 902.3 MHz		30 MHz - 1 GHz	901.59	-58.55	-30	Pass
	Ch. 0, 902.3 MHz		1 GHz - 10 GHz	1804.3	-51.01	-30	Pass
	Ch. 32, 908.7 MHz		Fundamental	908.65	N/A	N/A	N/A
	Ch. 32, 908.7 MHz		30 MHz - 1 GHz	876.72	-70.78	-30	Pass
	Ch. 32, 908.7 MHz		1 GHz - 10 GHz	1817.48	-49.96	-30	Pass
	Ch. 63, 914.9 MHz		Fundamental	914.85	N/A	N/A	N/A
	Ch. 63, 914.9 MHz		30 MHz - 1 GHz	883	-71.03	-30	Pass
	Ch. 63, 914.9 MHz		1 GHz - 10 GHz	1829.57	-49.1	-30	Pass
SF 7							
	Ch. 0, 902.3 MHz		Fundamental	902.26	N/A	N/A	N/A
	Ch. 0, 902.3 MHz		30 MHz - 1 GHz	901.59	-57.98	-30	Pass
	Ch. 0, 902.3 MHz		1 GHz - 10 GHz	1804.3	-50.86	-30	Pass
	Ch. 32, 908.7 MHz		Fundamental	908.65	N/A	N/A	N/A
	Ch. 32, 908.7 MHz		30 MHz - 1 GHz	876.72	-71.07	-30	Pass
	Ch. 32, 908.7 MHz		1 GHz - 10 GHz	1817.48	-49.9	-30	Pass
	Ch. 63, 914.9 MHz		Fundamental	914.86	N/A	N/A	N/A
	Ch. 63, 914.9 MHz		30 MHz - 1 GHz	883	-70.8	-30	Pass
	Ch. 63, 914.9 MHz		1 GHz - 10 GHz	1829.57	-49.02	-30	Pass

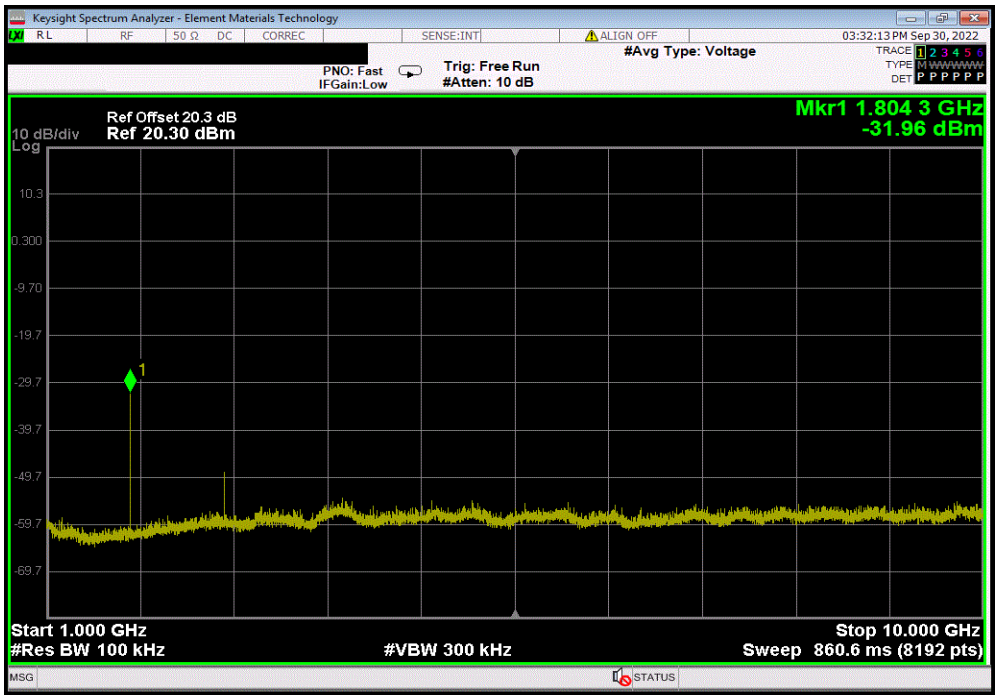
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		902.31	N/A	N/A	N/A



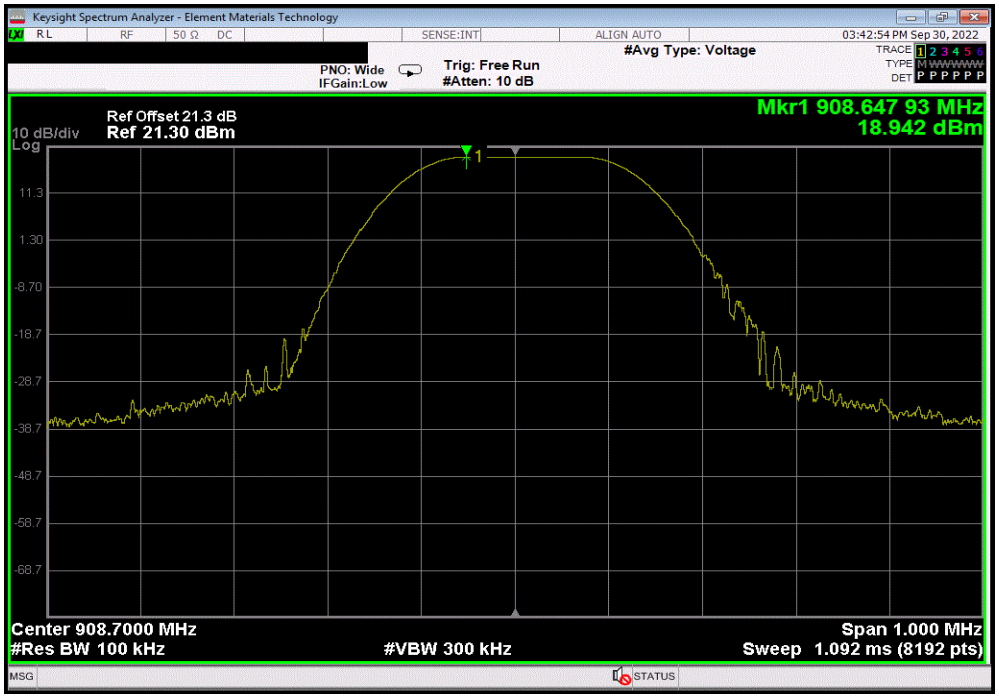
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	30 MHz - 1 GHz		901.59	-58.55	-30	Pass



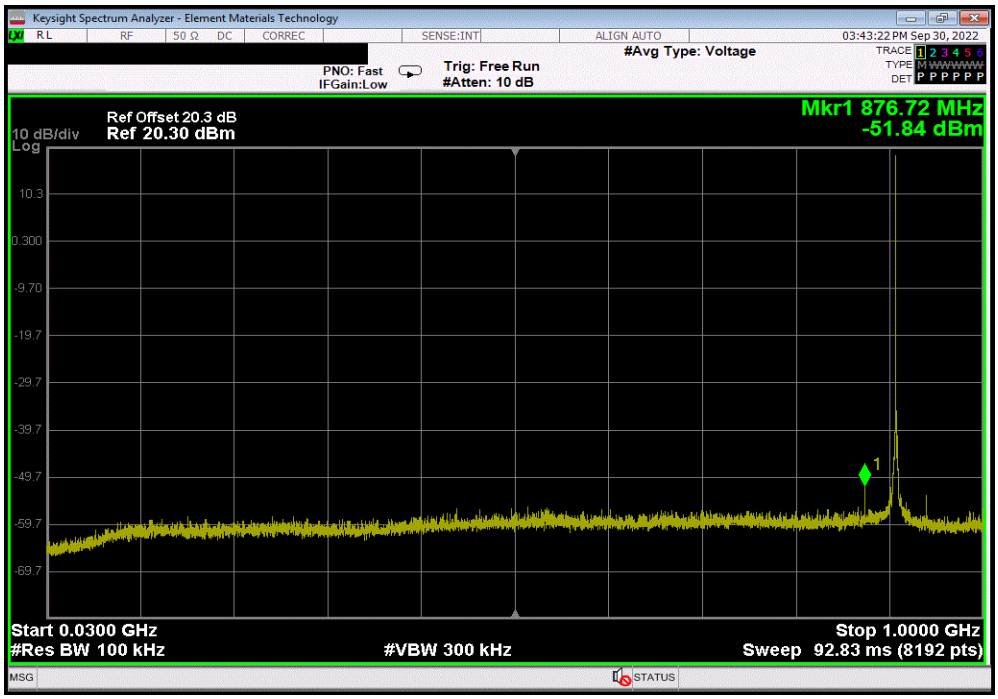
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	1 GHz - 10 GHz		1804.3	-51.01	-30	Pass



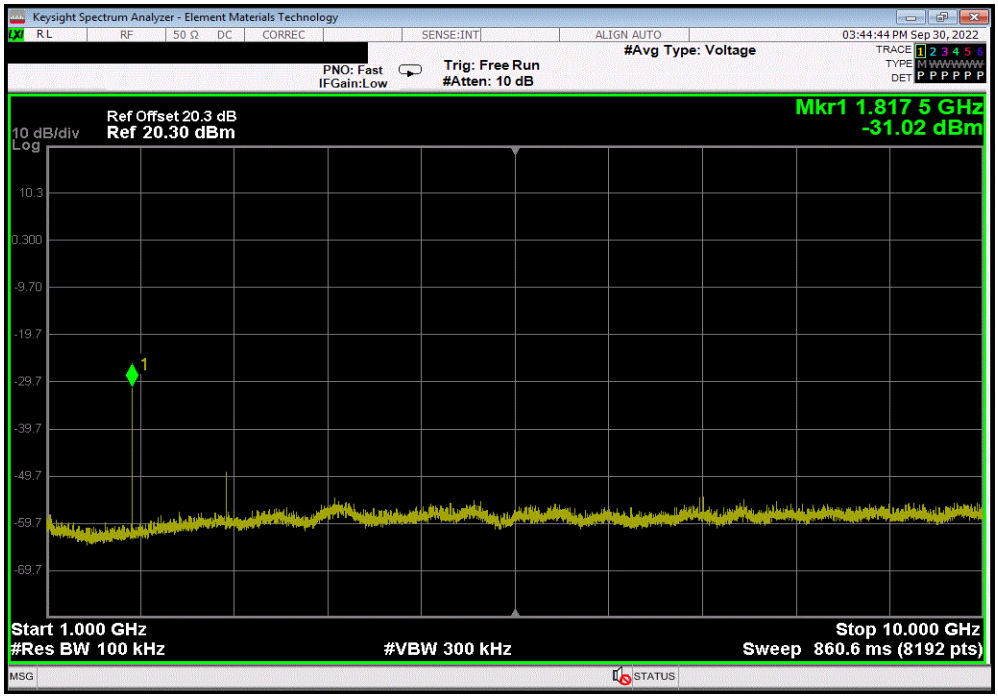
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		908.65	N/A	N/A	N/A



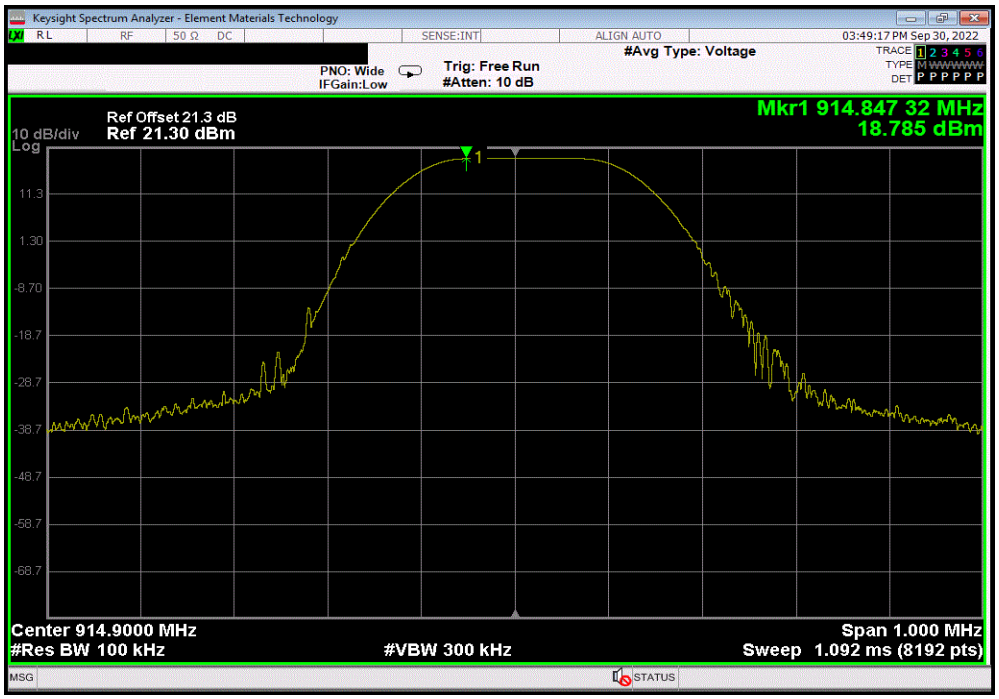
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 1 GHz	876.72	-70.78	-30	Pass	



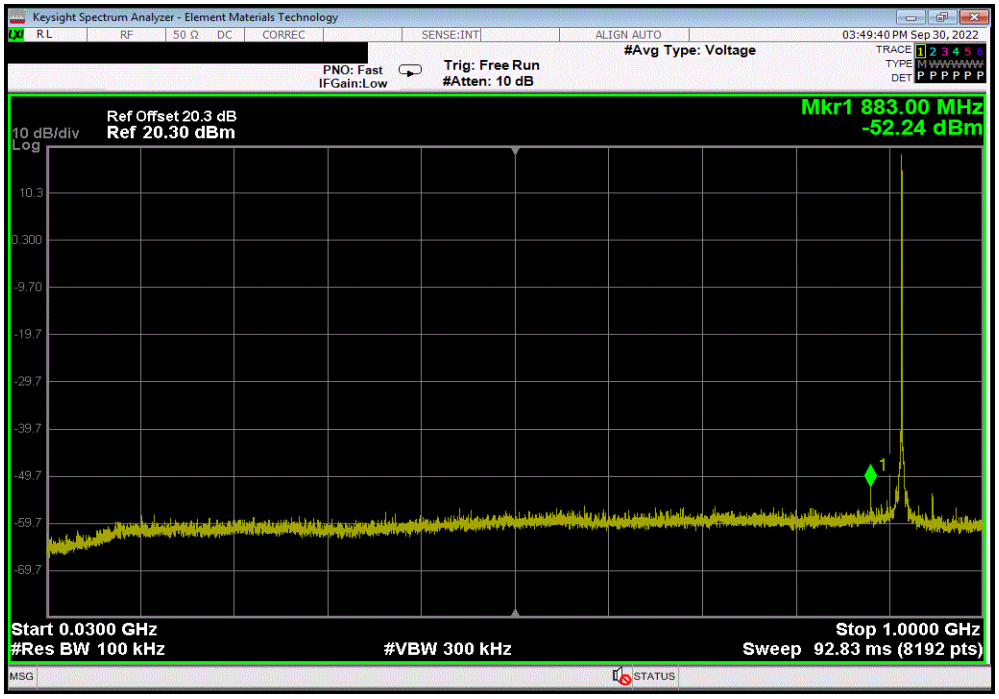
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
1 GHz - 10 GHz	1817.48	-49.96	-30	Pass	



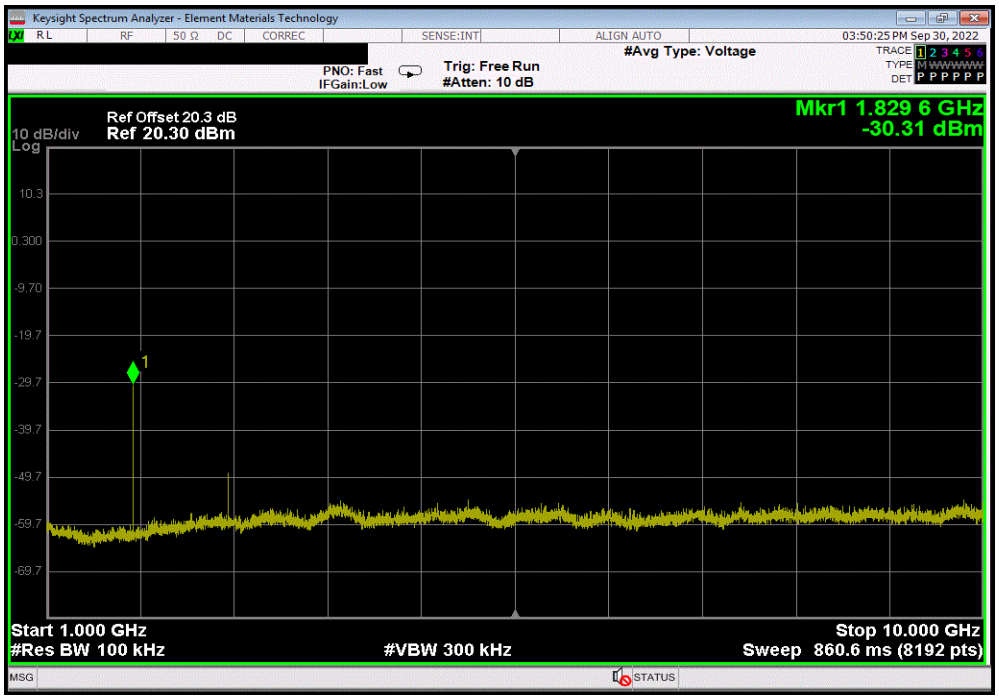
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		914.85	N/A	N/A	N/A



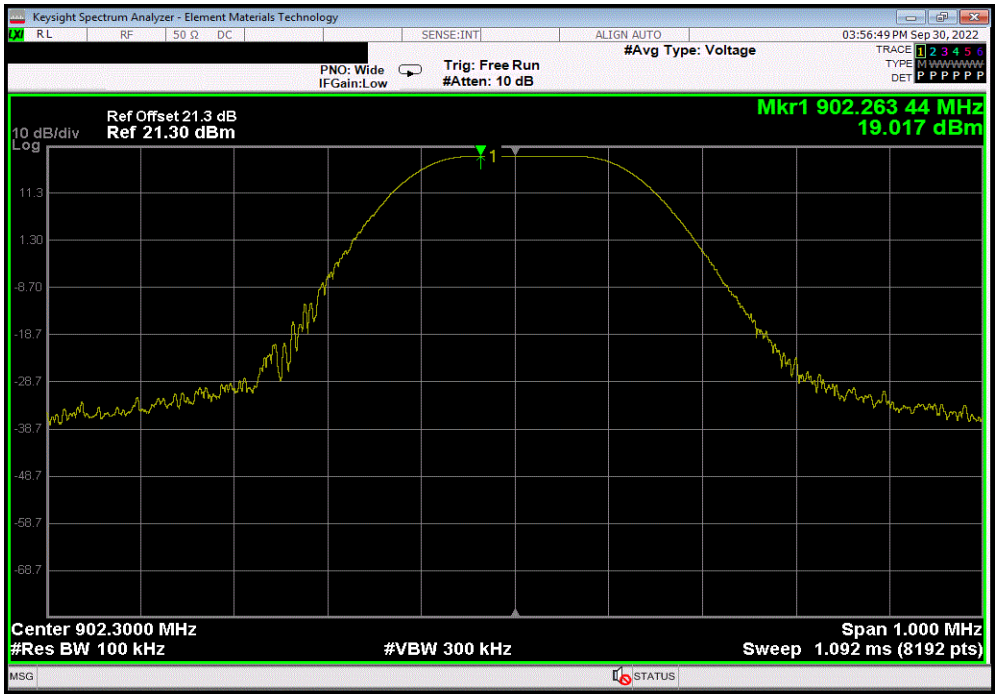
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	30 MHz - 1 GHz		883	-71.03	-30	Pass



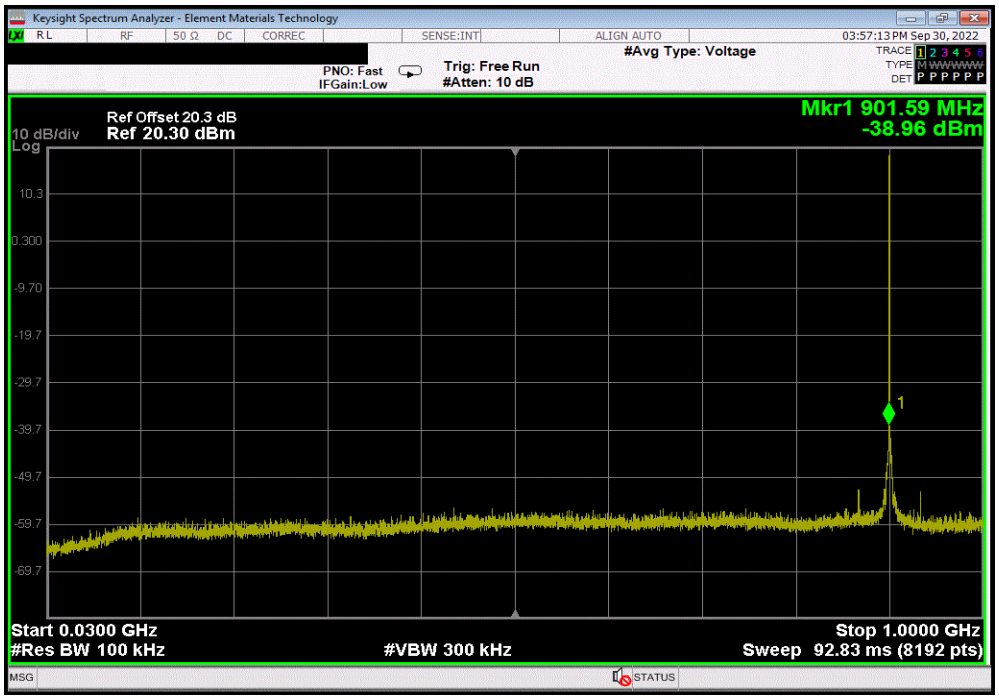
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	1 GHz - 10 GHz		1829.57	-49.1	-30	Pass



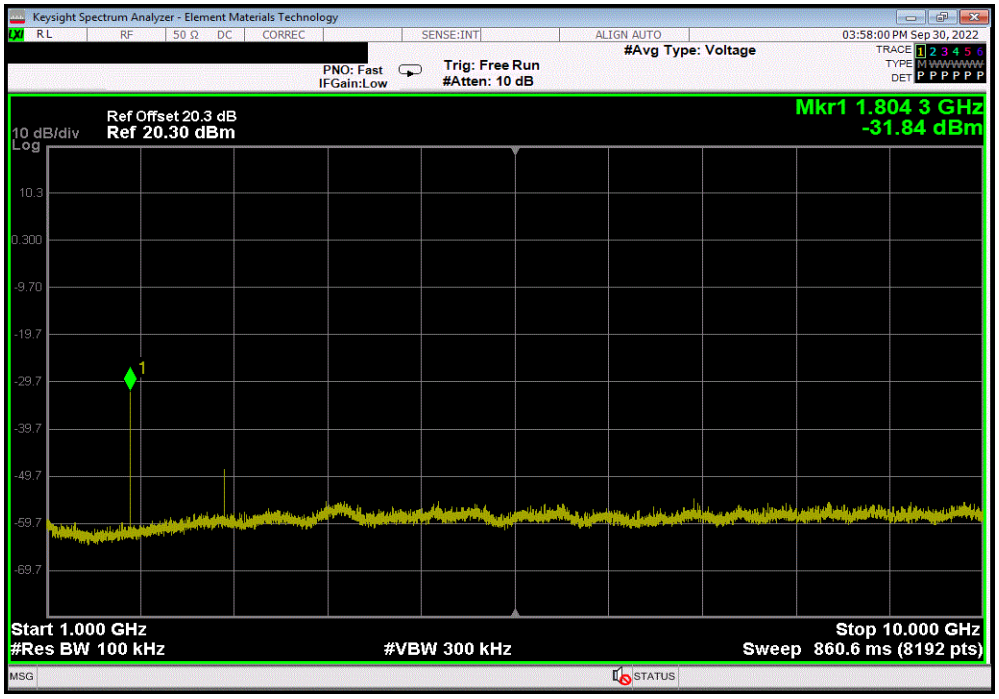
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		902.26	N/A	N/A	N/A



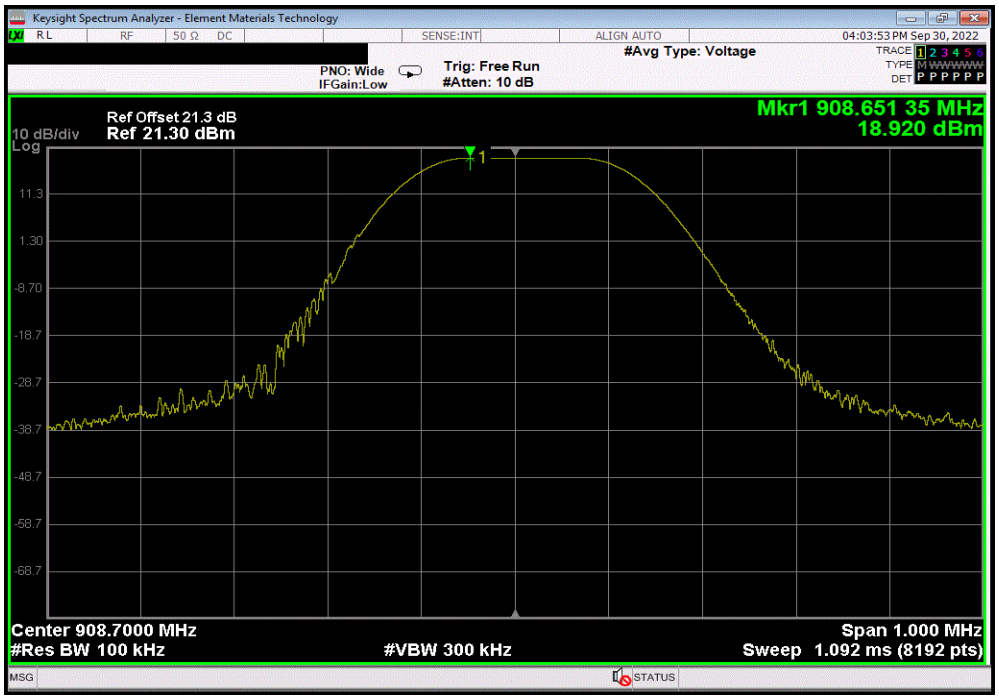
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 1 GHz	901.59	-57.98	-30	Pass	



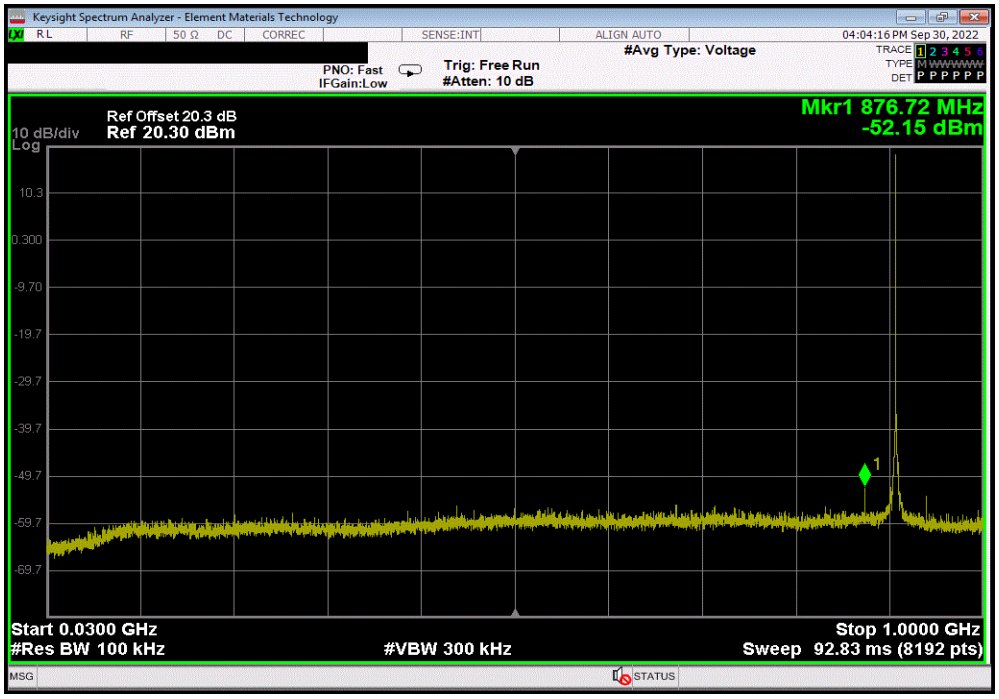
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
1 GHz - 10 GHz	1804.3	-50.86	-30	Pass	



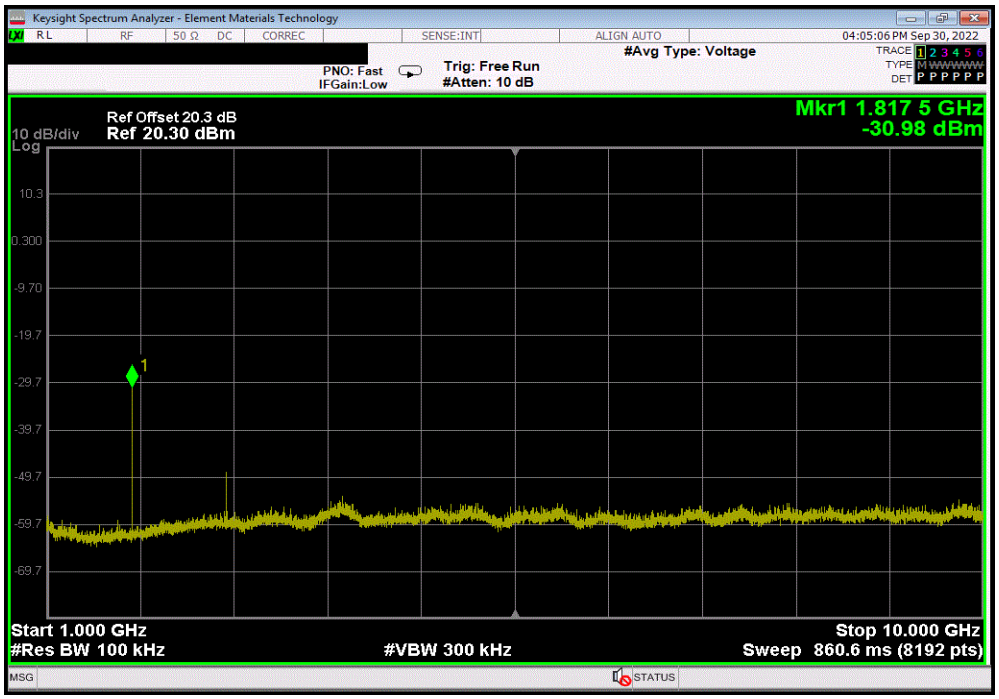
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		908.65	N/A	N/A	N/A



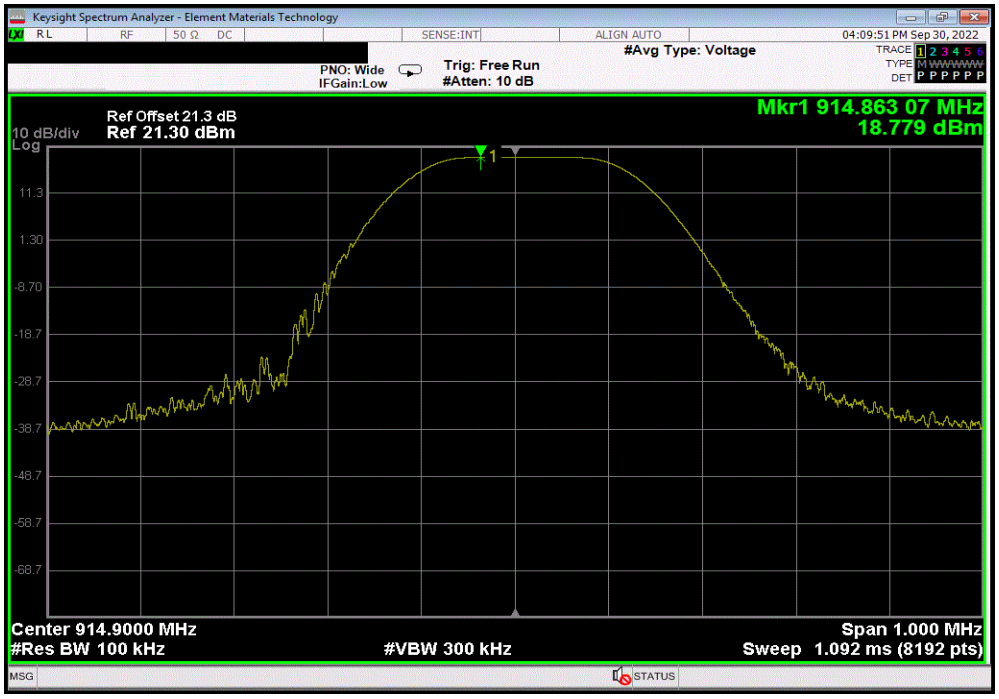
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	30 MHz - 1 GHz		876.72	-71.07	-30	Pass



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	1 GHz - 10 GHz		1817.48	-49.9	-30	Pass



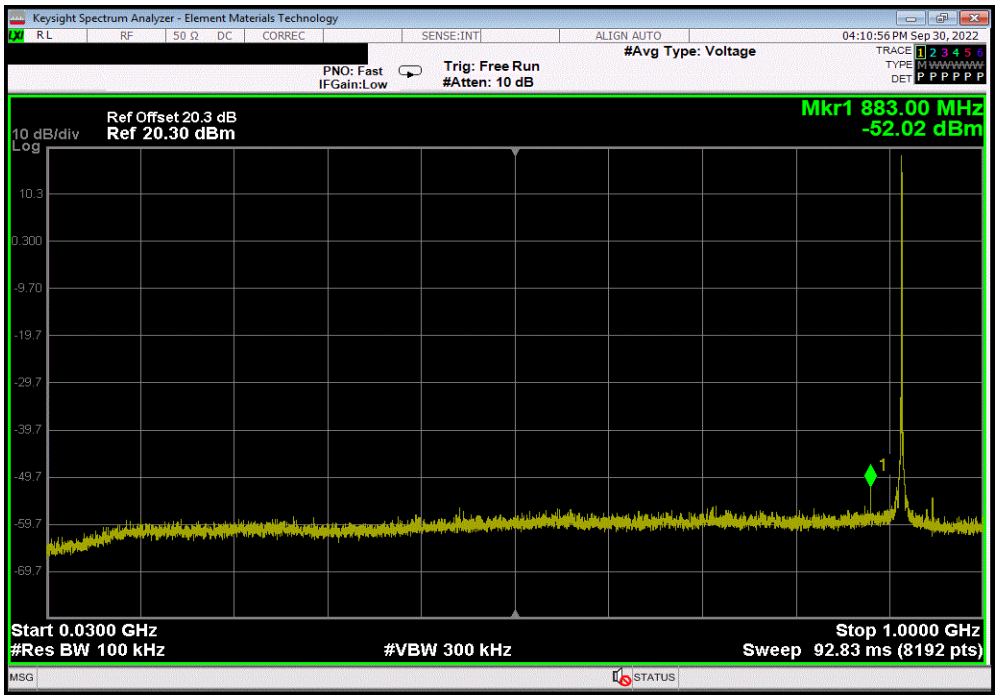
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		914.86	N/A	N/A	N/A



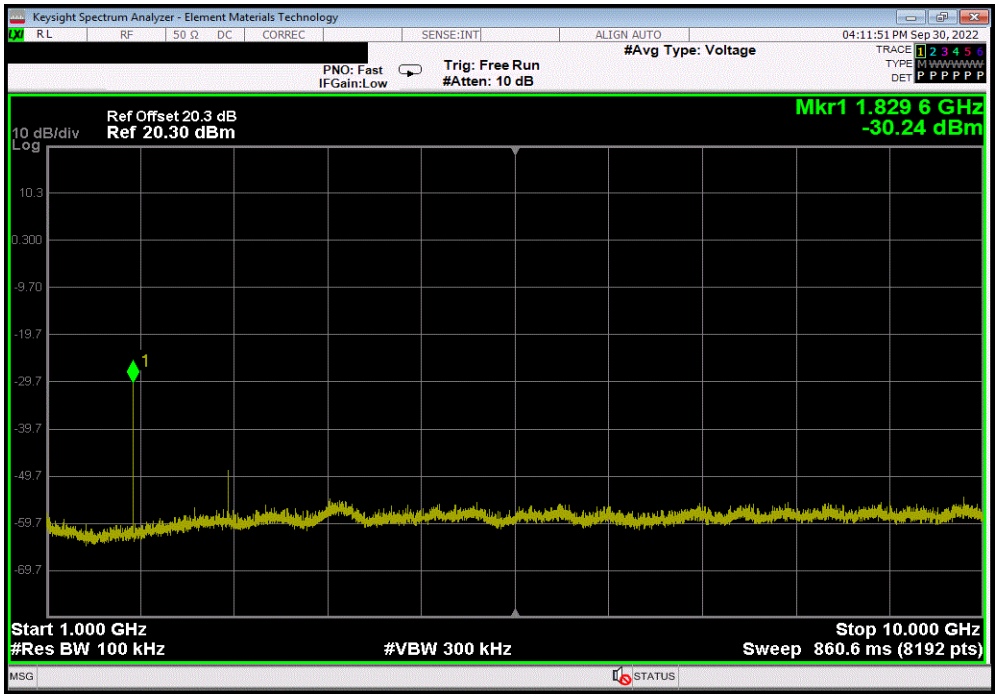
SPURIOUS CONDUCTED EMISSIONS

TbtTx 2022.06.03.0 XMit 2022.02.07.0

Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 1 GHz	883	-70.8	-30	Pass	



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
1 GHz - 10 GHz	1829.57	-49.02	-30	Pass	



POWER SPECTRAL DENSITY

XMit 2023.02.14.0

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	None	10m Test Distance Cable	EVL	2021-11-30	2022-11-30
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2022-09-08	2023-09-08

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The power spectral density was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

The method AVGPSD-1 in section 11.10.3 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging and RMS detection across the full power of the burst.

POWER SPECTRAL DENSITY

TbtTx 2022.06.03.0 XMit 2023.02.14.0

EUT:	Passport	Work Order:	ONIT0091
Serial Number:	44594524	Date:	30-Sep-22
Customer:	Onity Inc.	Temperature:	22.7°C
Attendees:	Ali Elmi	Humidity:	47.2%
Project:	None	Barometric Pres.:	1017 mbar
Tested by:	Jeff Alcoke	Power: Battery	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2023	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable.

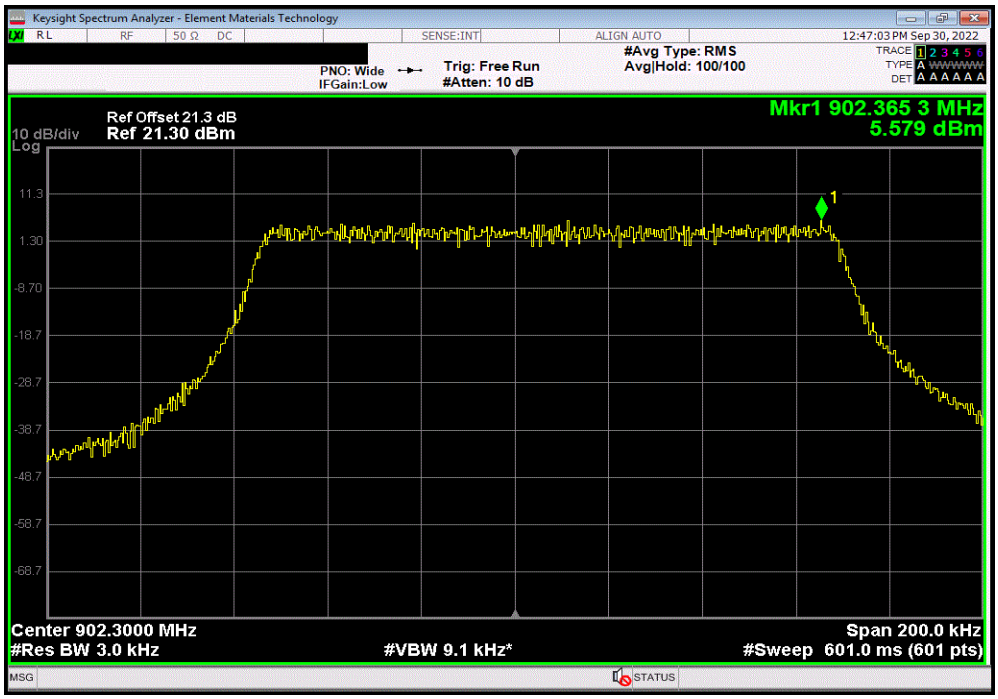
DEVIATIONS FROM TEST STANDARD

None

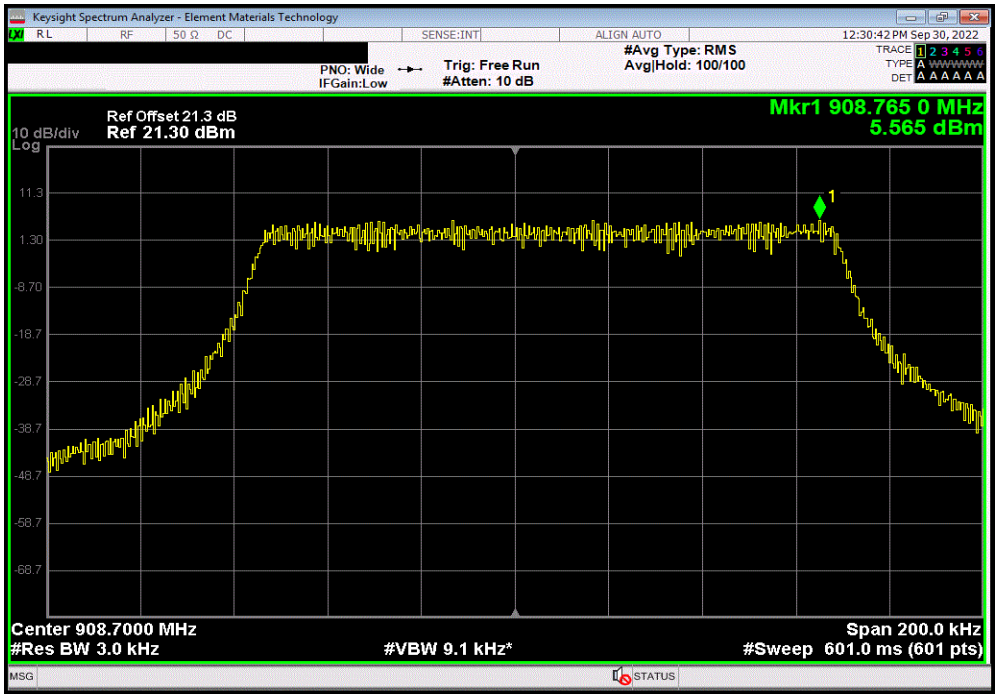
Configuration #	ONIT0091-3	Signature

	Value dBm/3kHz	Limit < dBm/3kHz	Results
Single Channel Mode			
LoRa, 125 kHz BW			
SF 10			
Ch. 0, 902.3 MHz	5.579	8	Pass
Ch. 32, 908.7 MHz	5.565	8	Pass
Ch. 63, 914.9 MHz	2.439	8	Pass
SF 7			
Ch. 0, 902.3 MHz	4.584	8	Pass
Ch. 32, 908.7 MHz	4.778	8	Pass
Ch. 63, 914.9 MHz	4.158	8	Pass

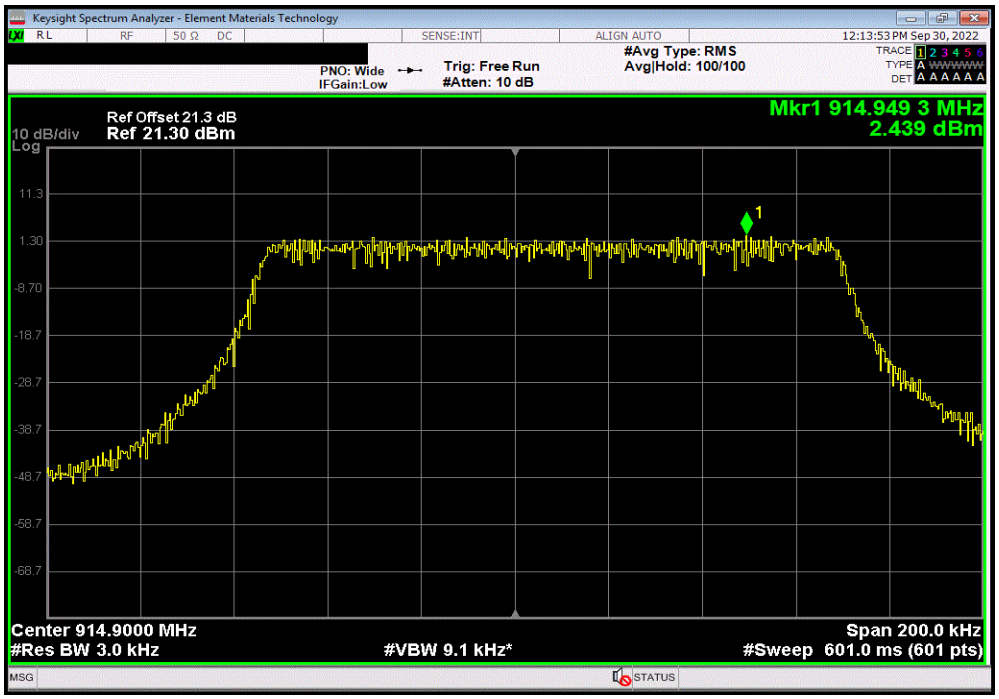
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				5.579	8	Pass



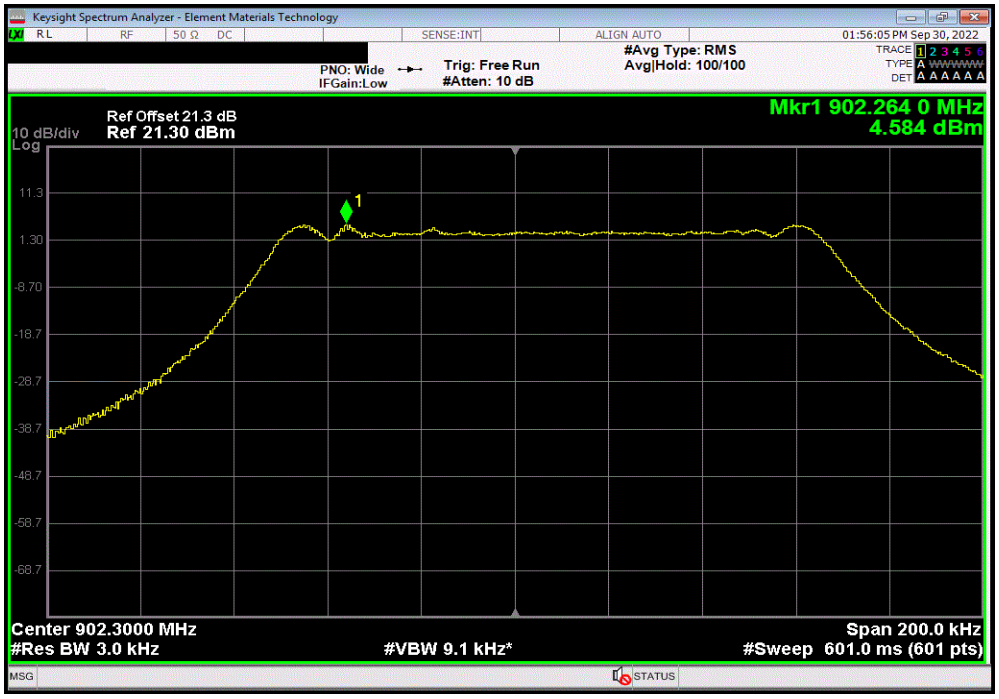
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				5.565	8	Pass



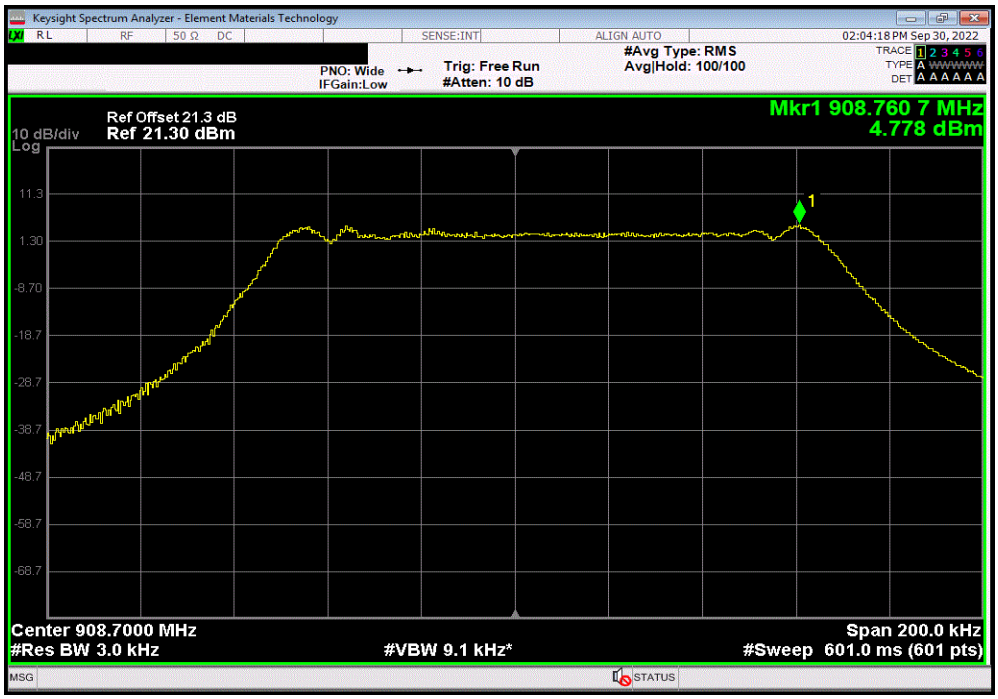
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				2.439	8	Pass



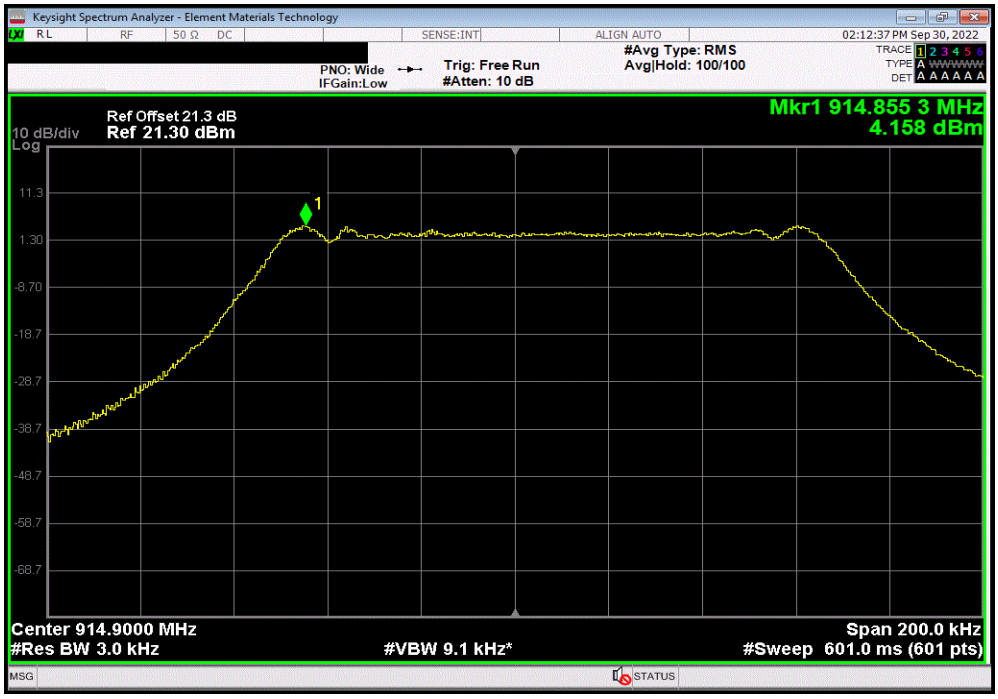
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				4.584	8	Pass



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				4.778	8	Pass



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				4.158	8	Pass



End of Test Report