EQUIVALENT ISOTROPIC RADIATED POWER

XMit 2017.02.08

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	8/10/2016	8/10/2017
Block - DC	Fairview Microwave	SD3379	AMQ	6/8/2016	6/8/2017
Attenuator	S.M. Electronics	SA26B-20	AUY	6/27/2016	6/27/2017
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	6/7/2016	6/7/2017
Thermometer	Omegaette	HH311	DTY	1/21/2015	1/21/2018
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBI	NCR	NCR

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

EQUIVALENT ISOTROPIC RADIATED POWER

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	XB1301			**Work Order:**	PECK0002
Serial Number:	17			**Date:**	05/11/17
Customer:	APANA Inc			**Temperature:**	22 °C
Attendees:	None			**Humidity:**	45.7% RH
Project:	None			**Barometric Pres.:**	1018 mbar
Tested by:	Brandon Hobbs	**Power:**	5 VDC Nominal via 110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

The power level settings for the Yagi (12dBi) antenna data listed below are as follows: DAC = 4000, MXG = 8. The power level settings for the Dipole antenna data listed below are as follows: DAC = 4000, MXG = 12. All measurements were made at -20°C per client's request. Power limit for the Yagi antenna was lowered to accommodate for an antenna gain greater than 6dBi. The calculations are as follows: 24dBm + 12dBi = 36dBm (De Facto limit). A termination was placed on the unused antenna port while under test.

DEVIATIONS FROM TEST STANDARD

None

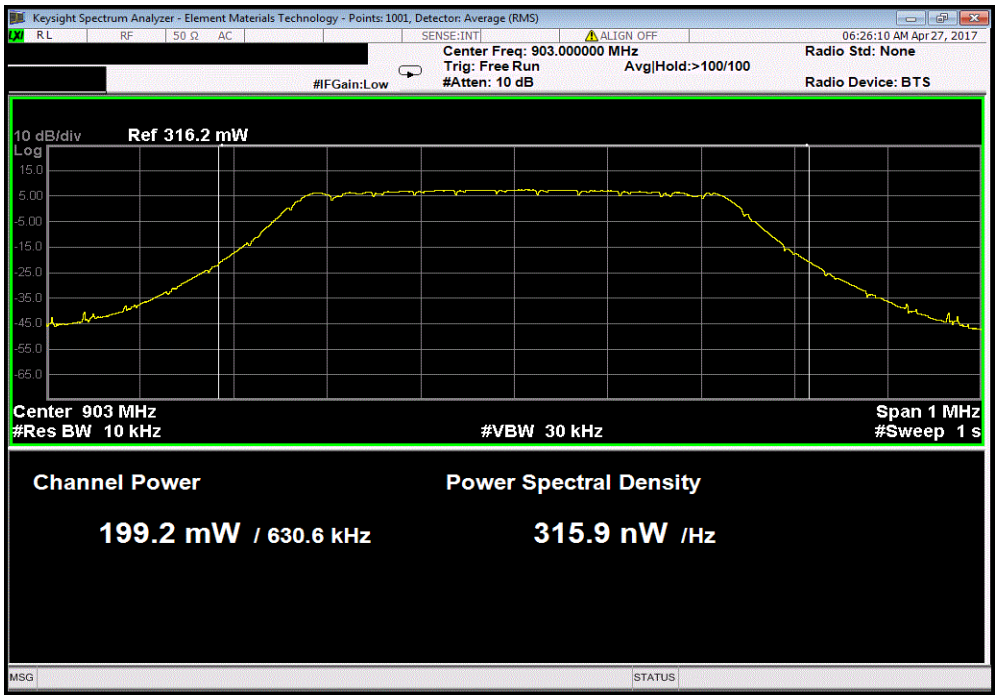
Configuration #	1	*Signature*

	Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
Yagi Antenna							
Port A							
500 kHz Bandwidth							
Spreading Factor 7							
Low Channel 903 MHz	12	199.2	22.99	0.22	35.22	36	Pass
Mid Channel 914.2 MHz	12	213.4	23.29	0.22	35.51	36	Pass
High Channel 927.5 MHz	12	187.3	22.73	0.22	34.95	36	Pass
Port B							
500 kHz Bandwidth							
Spreading Factor 7							
Low Channel 903 MHz	12	193.8	22.99	0.22	35.22	36	Pass
Mid Channel 914.2 MHz	12	198.5	22.98	0.22	35.20	36	Pass
High Channel 927.5 MHz	12	172.7	22.37	0.22	34.60	36	Pass
Dipole Antenna							
Port A							
500 kHz Bandwidth							
Spreading Factor 7							
Low Channel 903 MHz	3.5	706.5	28.49	0.22	32.21	36	Pass
Mid Channel 914.2 MHz	3.5	704.2	28.48	0.22	32.20	36	Pass
High Channel 927.5 MHz	3.5	646.9	28.11	0.22	31.83	36	Pass
Port B							
500 kHz Bandwidth							
Spreading Factor 7							
Low Channel 903 MHz	3.5	686.9	28.37	0.22	32.09	36	Pass
Mid Channel 914.2 MHz	3.5	678.0	28.31	0.22	32.04	36	Pass
High Channel 927.5 MHz	3.5	618.3	27.91	0.22	31.63	36	Pass

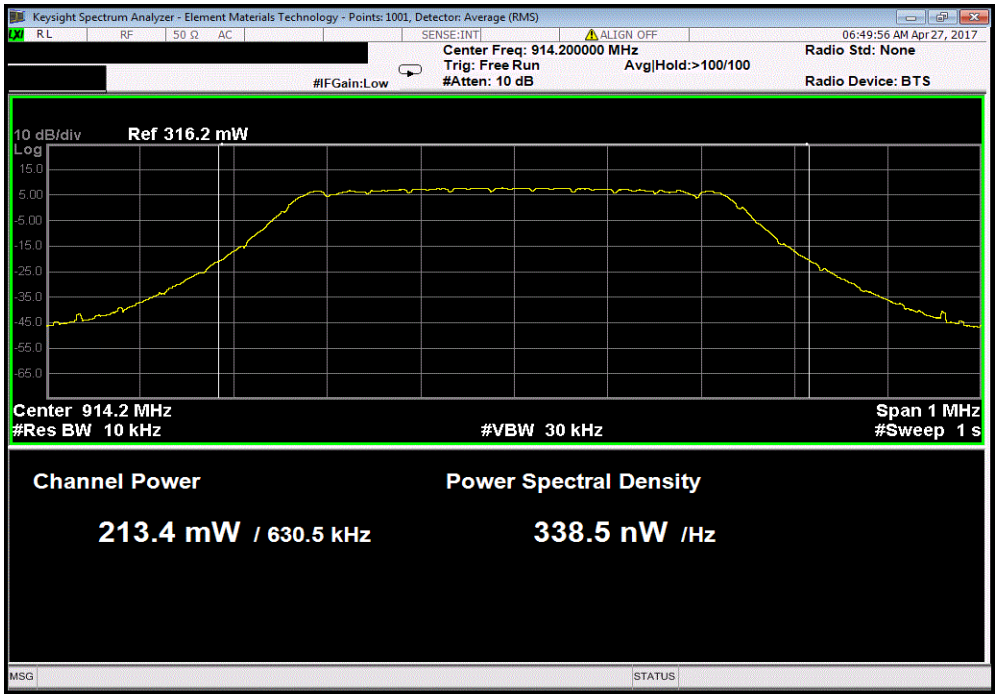
EQUIVALENT ISOTROPIC RADIATED POWER

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
12	199.2	22.99	0.22	35.22	36	Pass



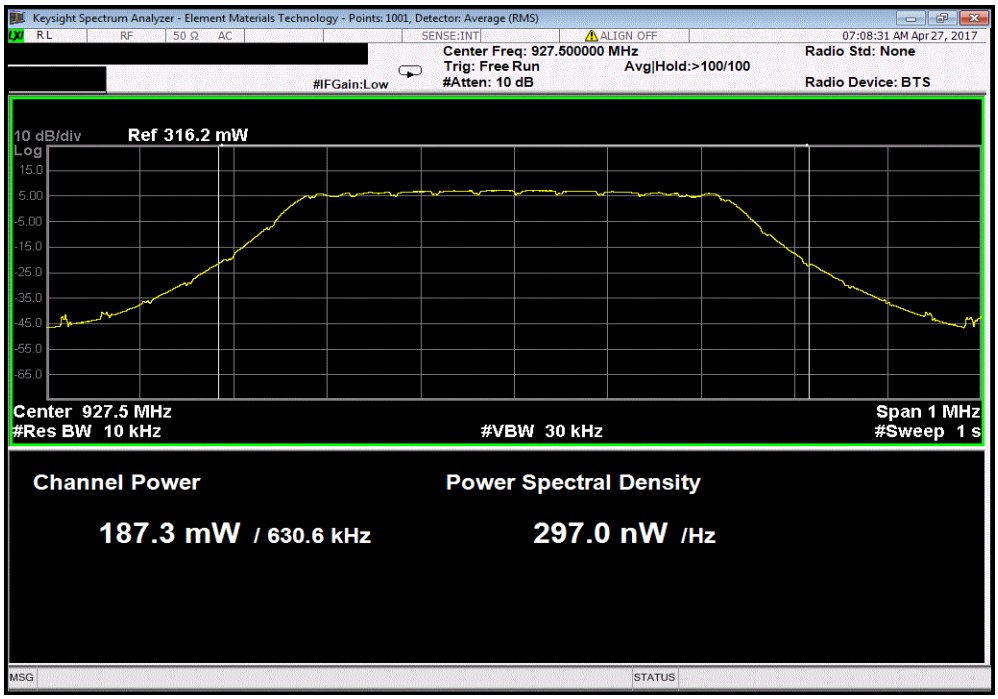
Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
12	213.4	23.29	0.22	35.51	36	Pass



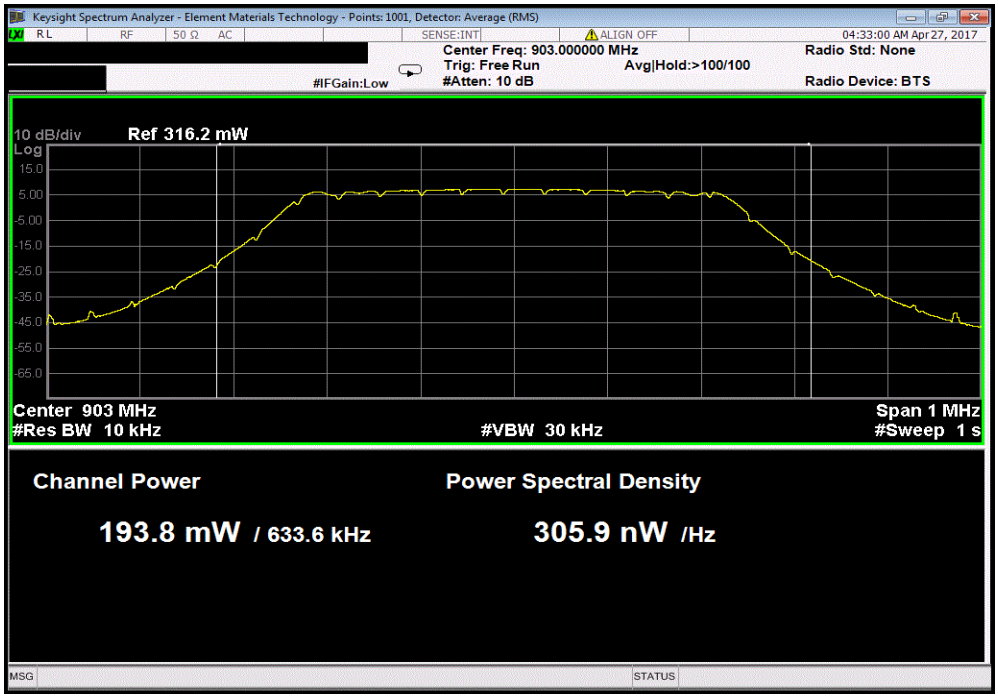
EQUIVALENT ISOTROPIC RADIATED POWER

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
12	187.3	22.73	0.22	34.95	36	Pass



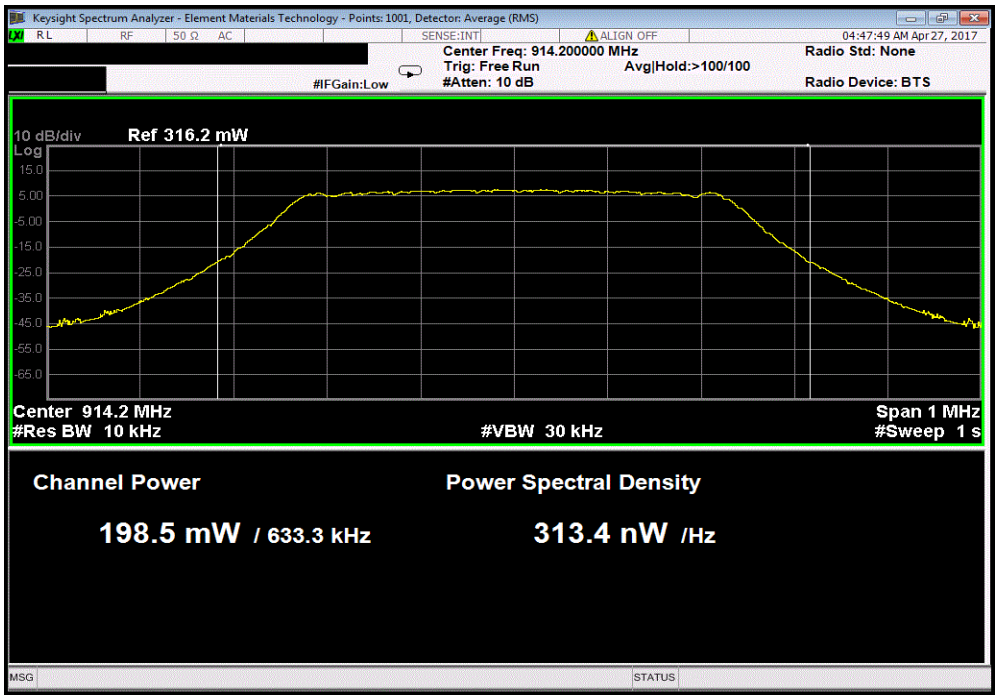
Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
12	193.8	22.99	0.22	35.22	36	Pass



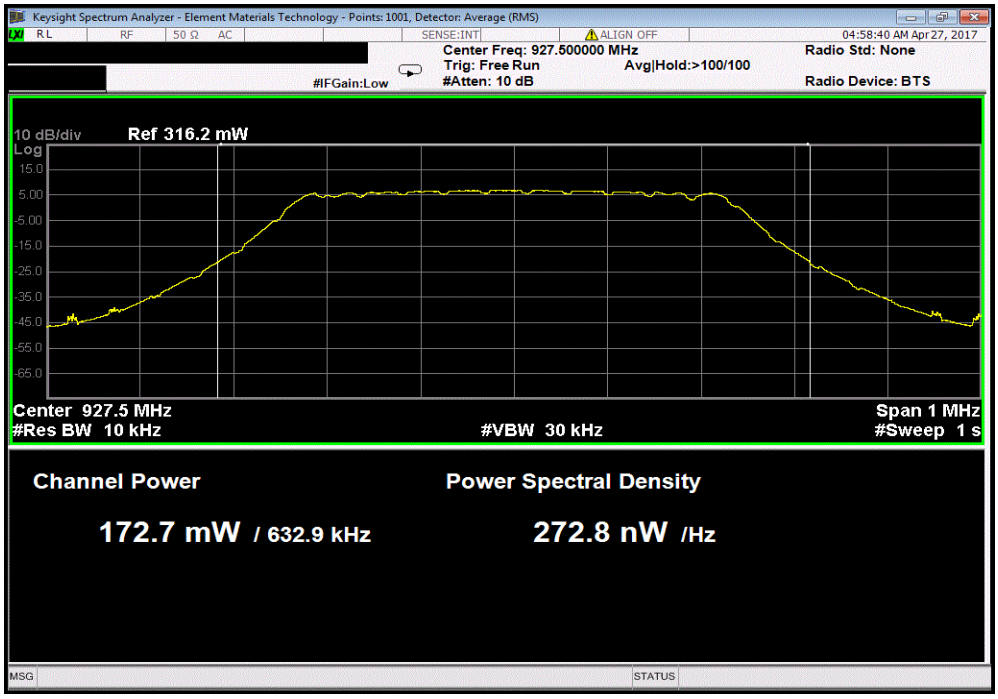
EQUIVALENT ISOTROPIC RADIATED POWER

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
12	198.5	22.98	0.22	35.20	36	Pass



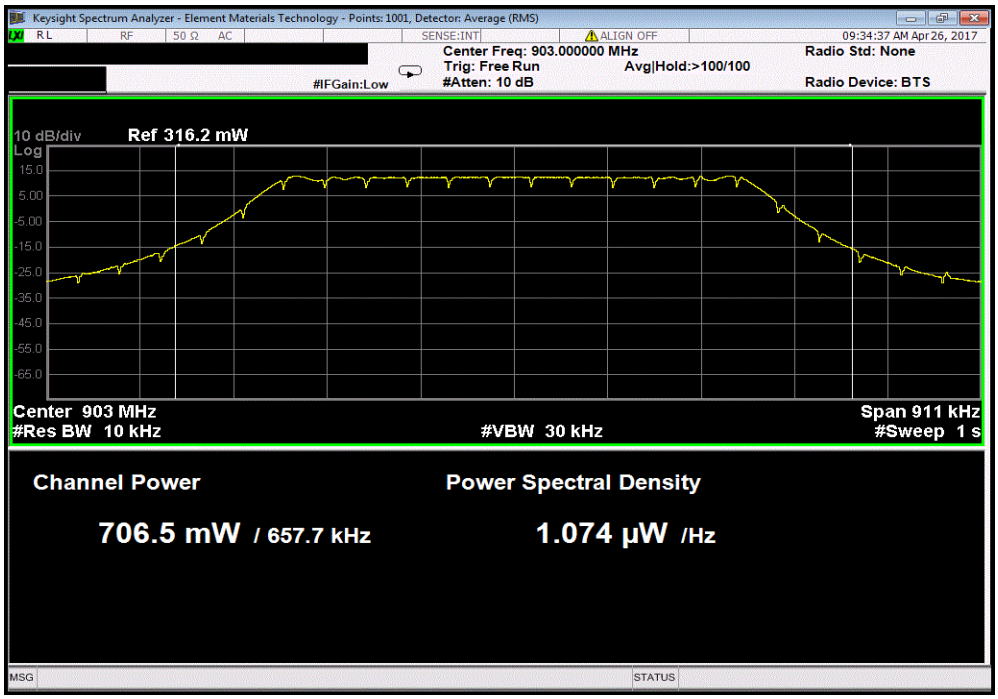
Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
12	172.7	22.37	0.22	34.60	36	Pass



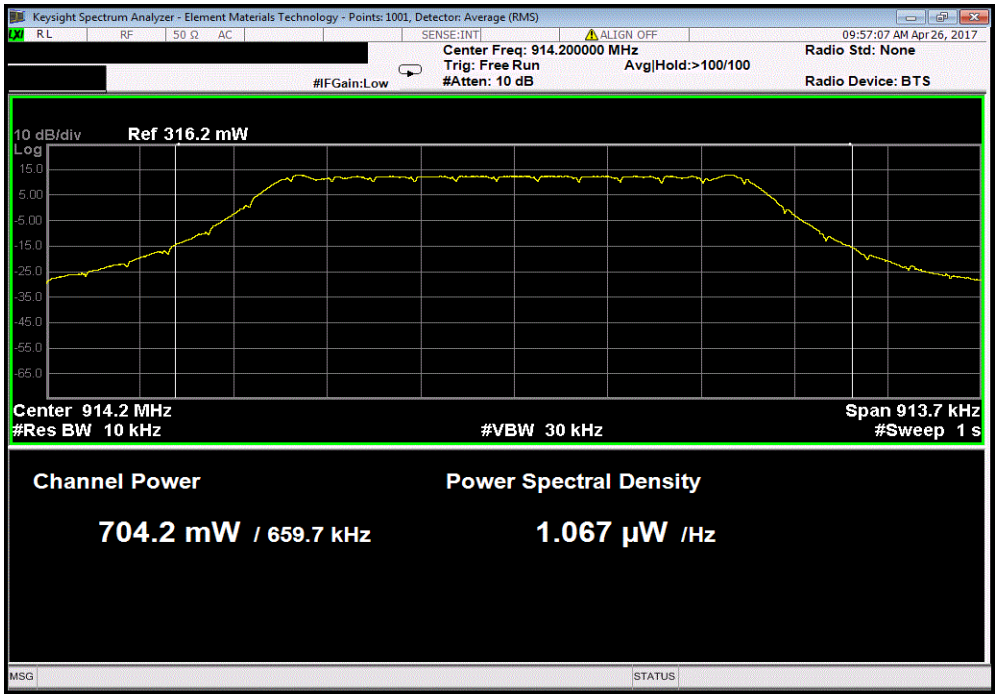
EQUIVALENT ISOTROPIC RADIATED POWER

TbtTx 2017.01.27 XMit 2017.02.08

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
3.5	706.5	28.49	0.22	32.21	36	Pass

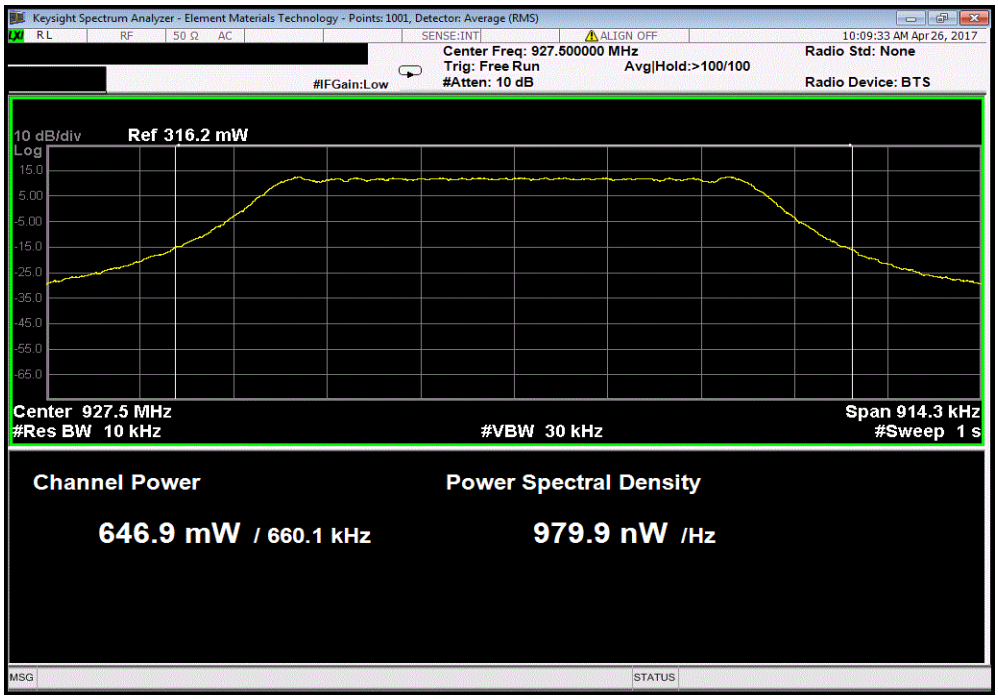


Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
3.5	704.2	28.48	0.22	32.20	36	Pass

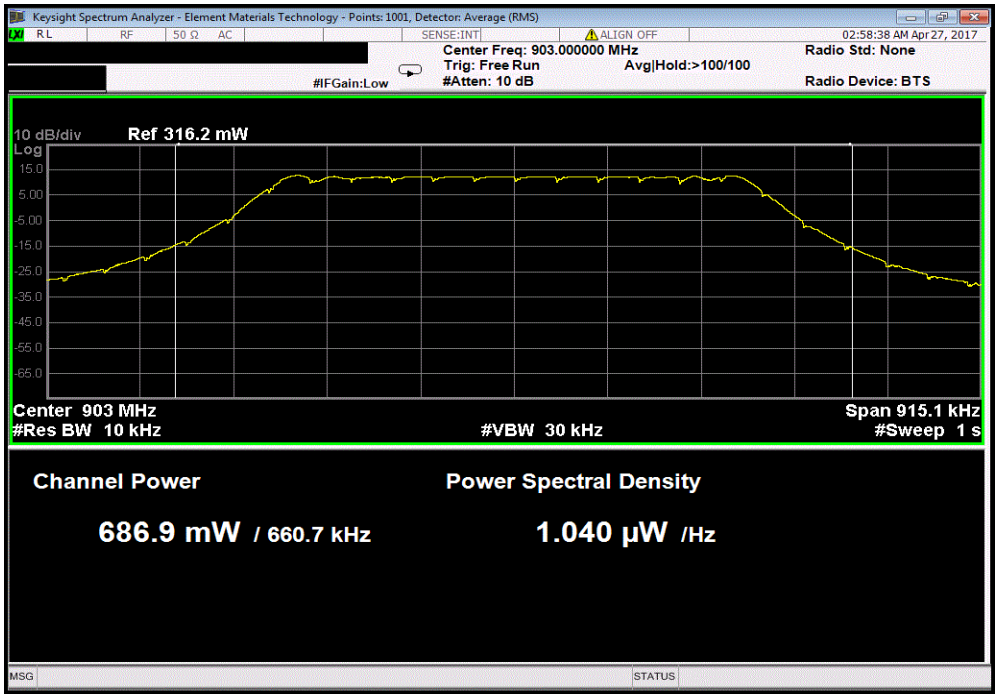


EQUIVALENT ISOTROPIC RADIATED POWER

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
3.5	646.9	28.11	0.22	31.83	36	Pass

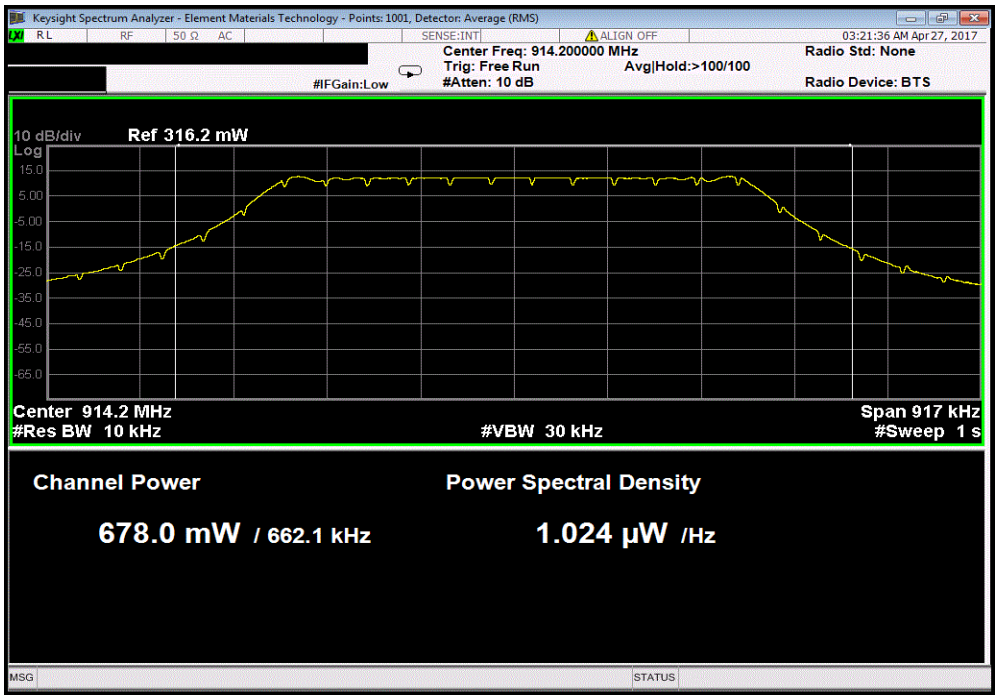


Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
3.5	686.9	28.37	0.22	32.09	36	Pass

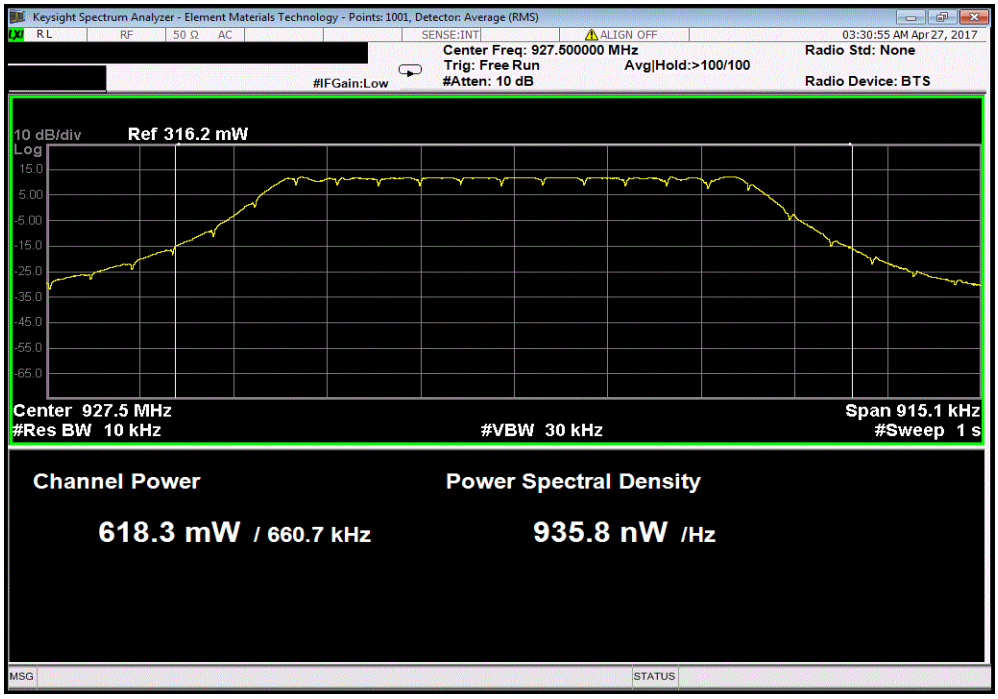


EQUIVALENT ISOTROPIC RADIATED POWER

Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
3.5	678	28.31	0.22	32.04	36	Pass



Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
3.5	618.3	27.91	0.22	31.63	36	Pass



OUTPUT POWER

XMit 2017.02.08

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	8/10/2016	8/10/2017
Block - DC	Fairview Microwave	SD3379	AMQ	6/8/2016	6/8/2017
Attenuator	S.M. Electronics	SA26B-20	AUY	6/27/2016	6/27/2017
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	6/7/2016	6/7/2017
Thermometer	Omegaette	HH311	DTY	1/21/2015	1/21/2018
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBI	NCR	NCR

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	XB1301			**Work Order:**	PECK0002
Serial Number:	17			**Date:**	05/11/17
Customer:	APANA Inc			**Temperature:**	22 °C
Attendees:	None			**Humidity:**	45.7% RH
Project:	None			**Barometric Pres.:**	1018 mbar
Tested by:	Brandon Hobbs	**Power:**	5 VDC Nominal via 110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

The power level settings for the Yagi (12dBi) antenna data listed below are as follows: DAC = 4000, MXG = 8. The power level settings for the Dipole antenna data listed below are as follows: DAC = 4000, MXG = 12. All measurements were made at -20°C per client's request. Power limit for the Yagi antenna was lowered to accommodate for an antenna gain greater than 6dBi. The calculations are as follows: 24dBm + 12dBi = 36dBm (De Facto limit). This represents the final Yagi conducted limit of 24dBm shown in the data below. A termination was placed on the unused antenna port while under test.

DEVIATIONS FROM TEST STANDARD

None

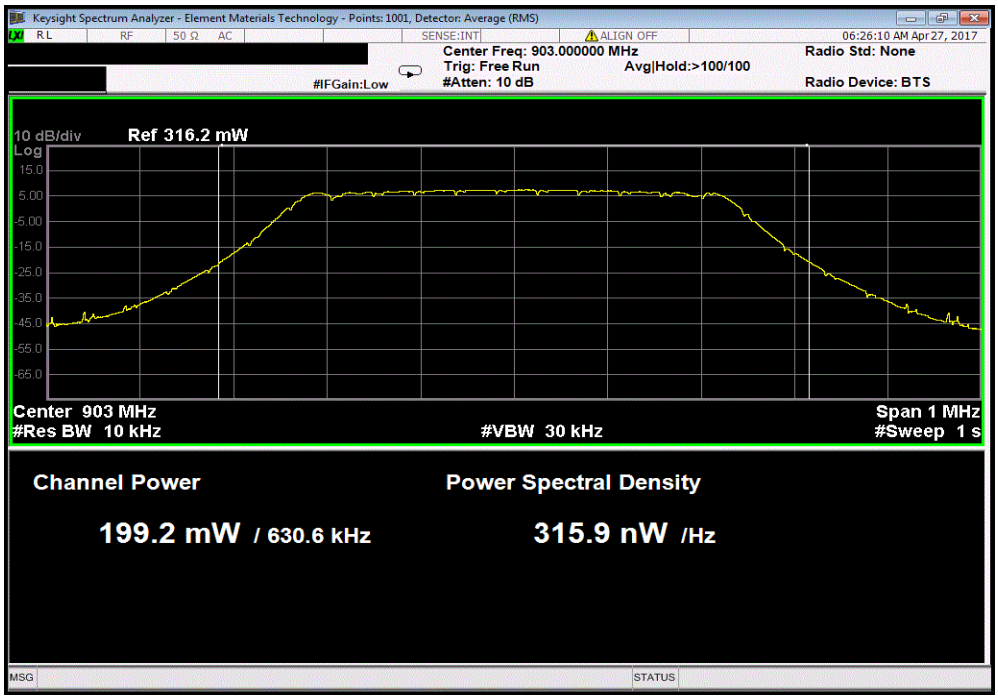
Configuration #	**1**	*Signature*

			Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
Yagi Antenna								
	Port A							
		500 kHz Bandwidth						
		Spreading Factor 7						
		Low Channel 903 MHz	199.2	22.99	0.22	23.22	24	Pass
		Mid Channel 914.2 MHz	213.4	23.29	0.22	23.51	24	Pass
		High Channel 927.5 MHz	187.3	22.73	0.22	22.95	24	Pass
	Port B							
		500 kHz Bandwidth						
		Spreading Factor 7						
		Low Channel 903 MHz	193.8	22.99	0.22	23.22	24	Pass
		Mid Channel 914.2 MHz	198.5	22.98	0.22	23.20	24	Pass
		High Channel 927.5 MHz	172.7	22.37	0.22	22.60	24	Pass
Dipole Antenna								
	Port A							
		500 kHz Bandwidth						
		Spreading Factor 7						
		Low Channel 903 MHz	706.5	28.49	0.22	28.71	30	Pass
		Mid Channel 914.2 MHz	704.2	28.48	0.22	28.70	30	Pass
		High Channel 927.5 MHz	646.9	28.11	0.22	28.33	30	Pass
	Port B							
		500 kHz Bandwidth						
		Spreading Factor 7						
		Low Channel 903 MHz	686.9	28.37	0.22	28.59	30	Pass
		Mid Channel 914.2 MHz	678.0	28.31	0.22	28.54	30	Pass
		High Channel 927.5 MHz	618.3	27.91	0.22	28.13	30	Pass

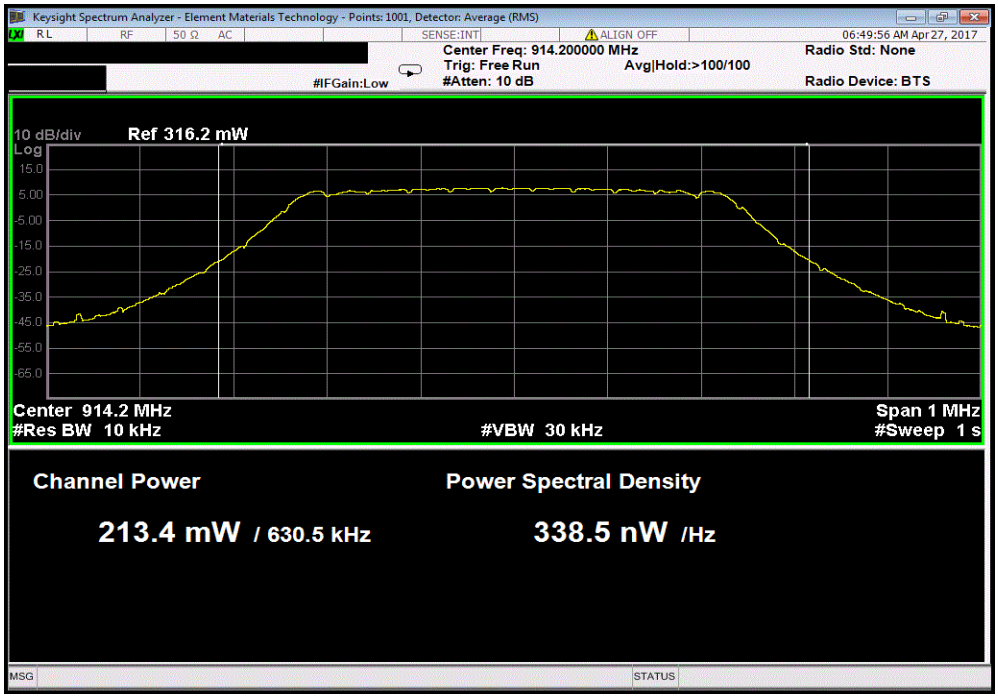
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	199.2	22.99	0.22	23.22	24	Pass



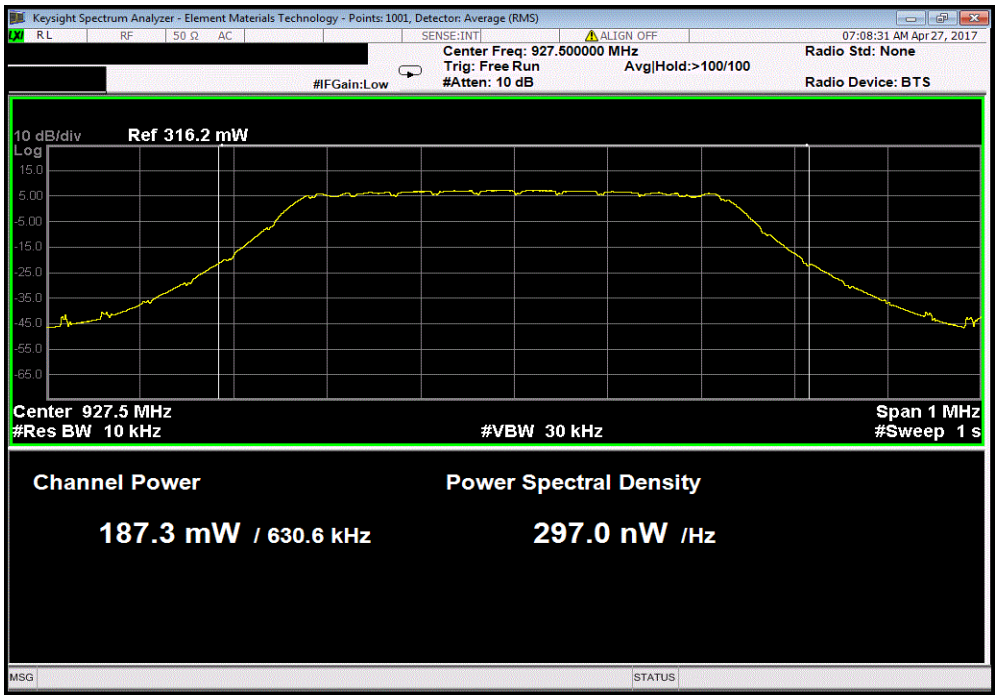
Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	213.4	23.29	0.22	23.51	24	Pass



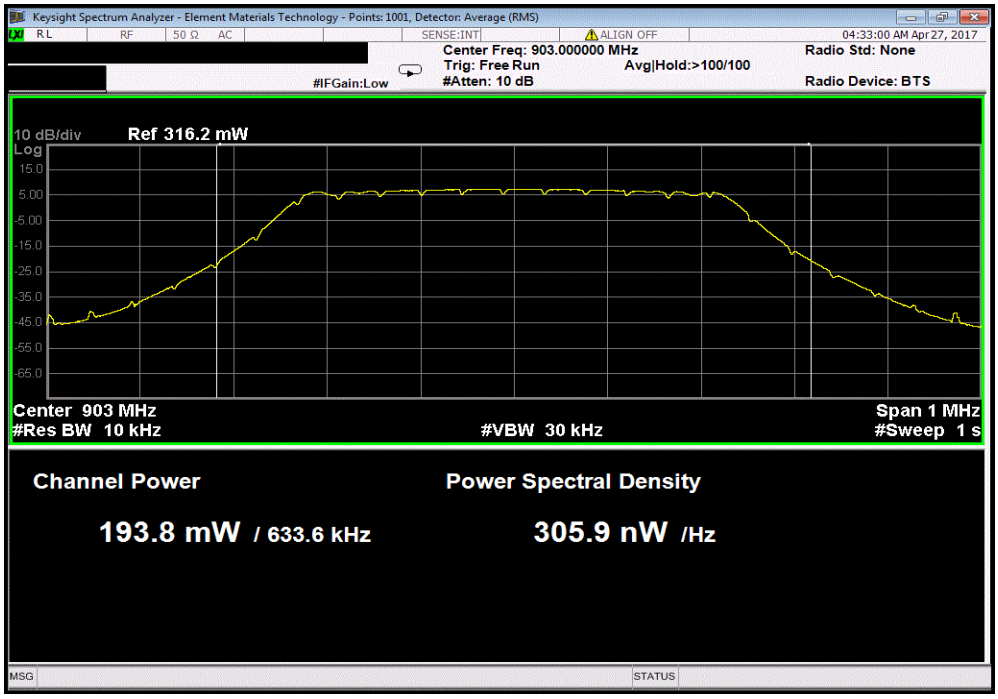
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	187.3	22.73	0.22	22.95	24	Pass



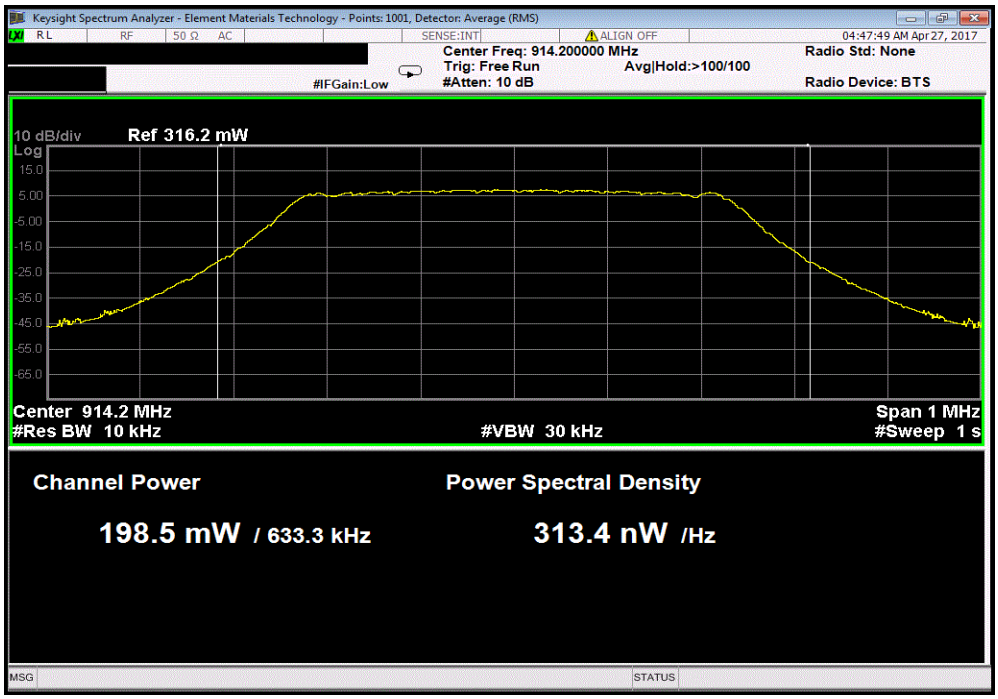
Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	193.8	22.99	0.22	23.22	24	Pass



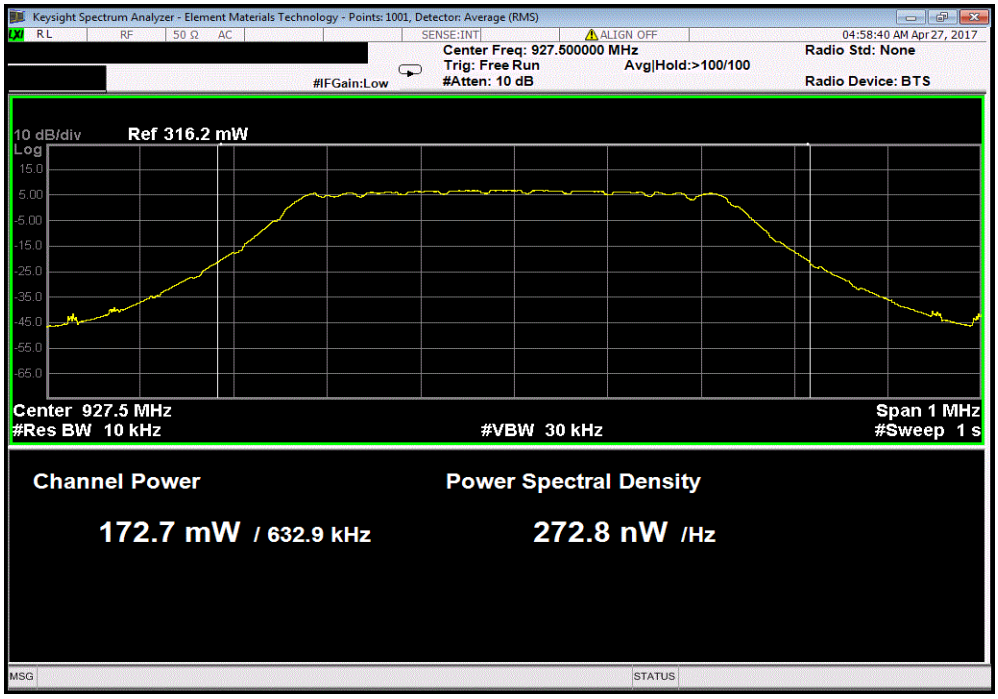
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	198.5	22.98	0.22	23.20	24	Pass



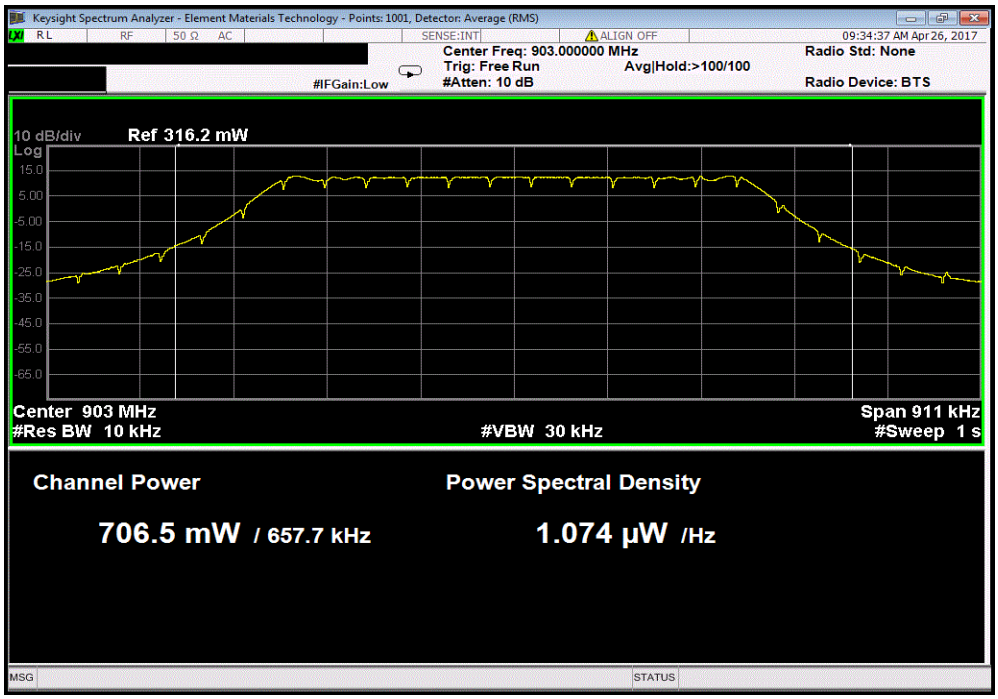
Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	172.7	22.37	0.22	22.60	24	Pass



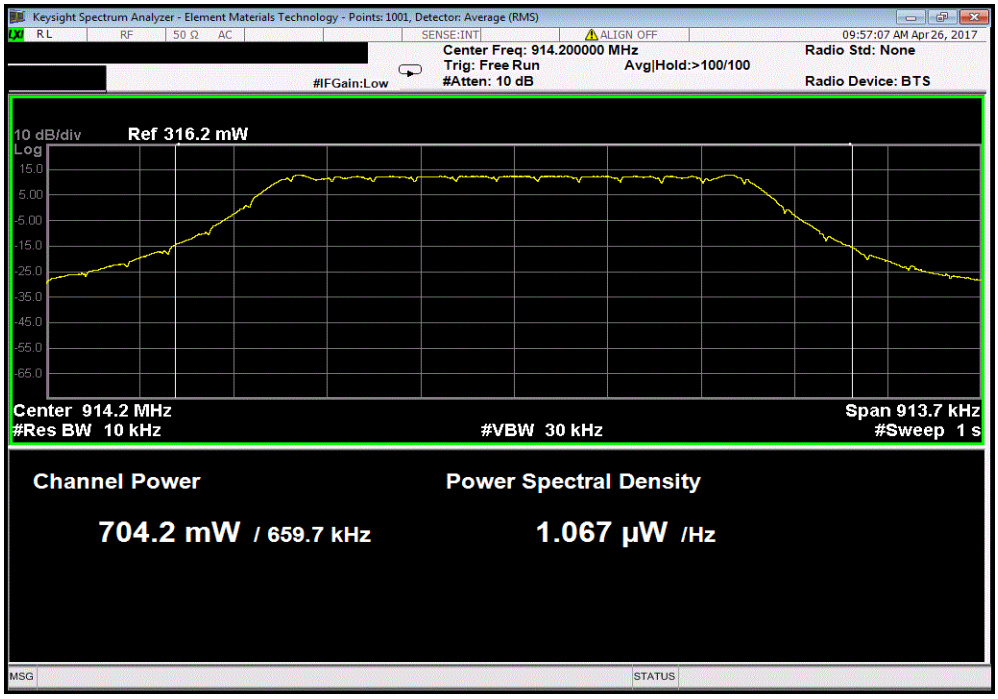
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	706.5	28.49	0.22	28.71	30	Pass



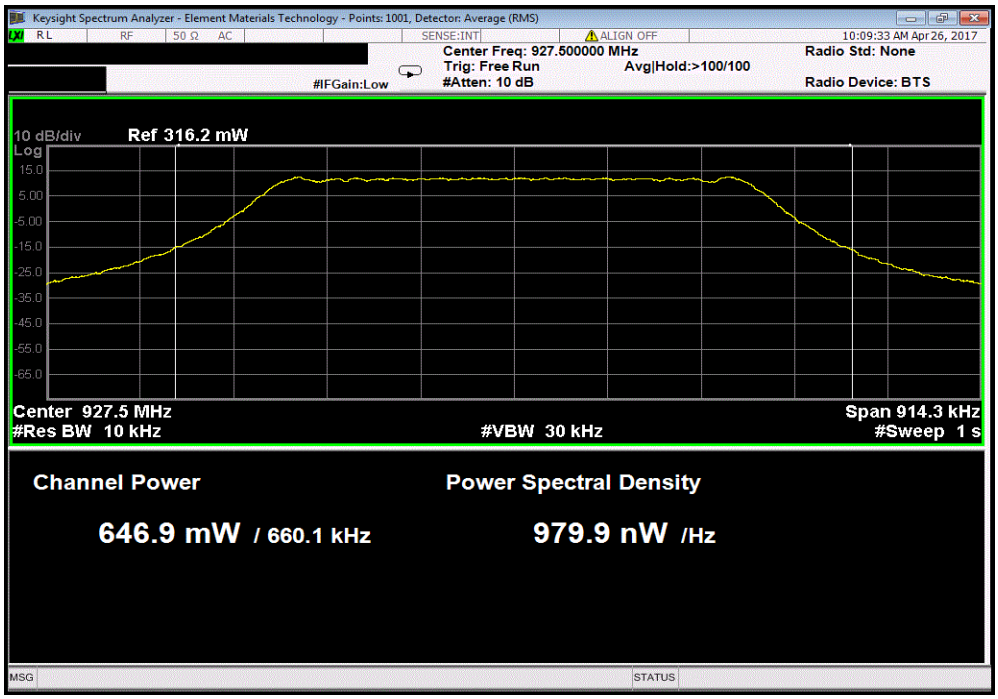
Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	704.2	28.48	0.22	28.70	30	Pass



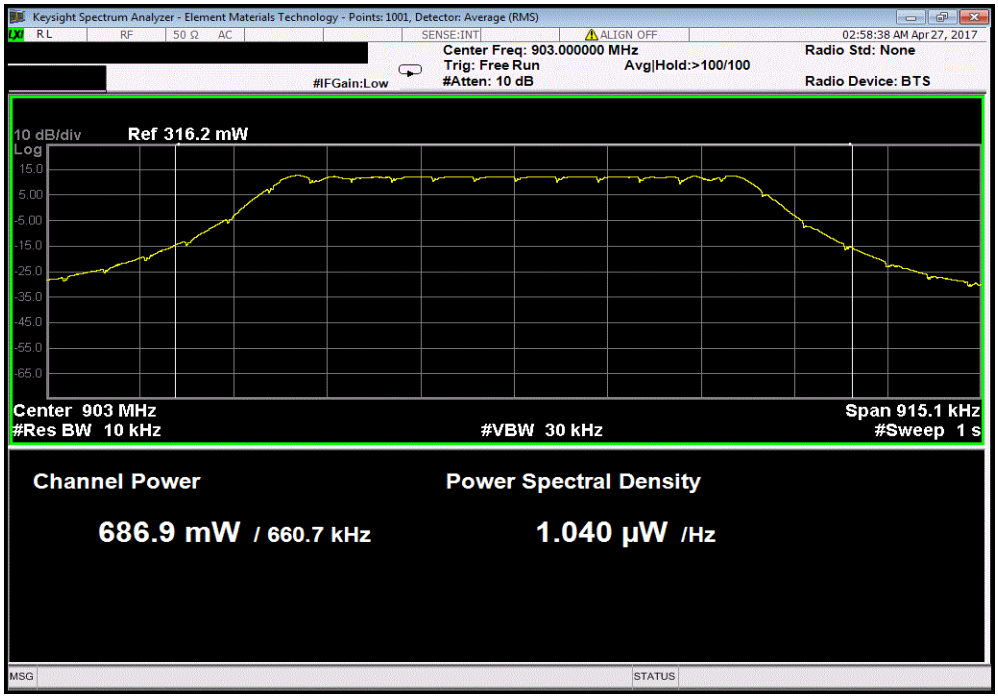
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	646.9	28.11	0.22	28.33	30	Pass



Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	686.9	28.37	0.22	28.59	30	Pass



OUTPUT POWER

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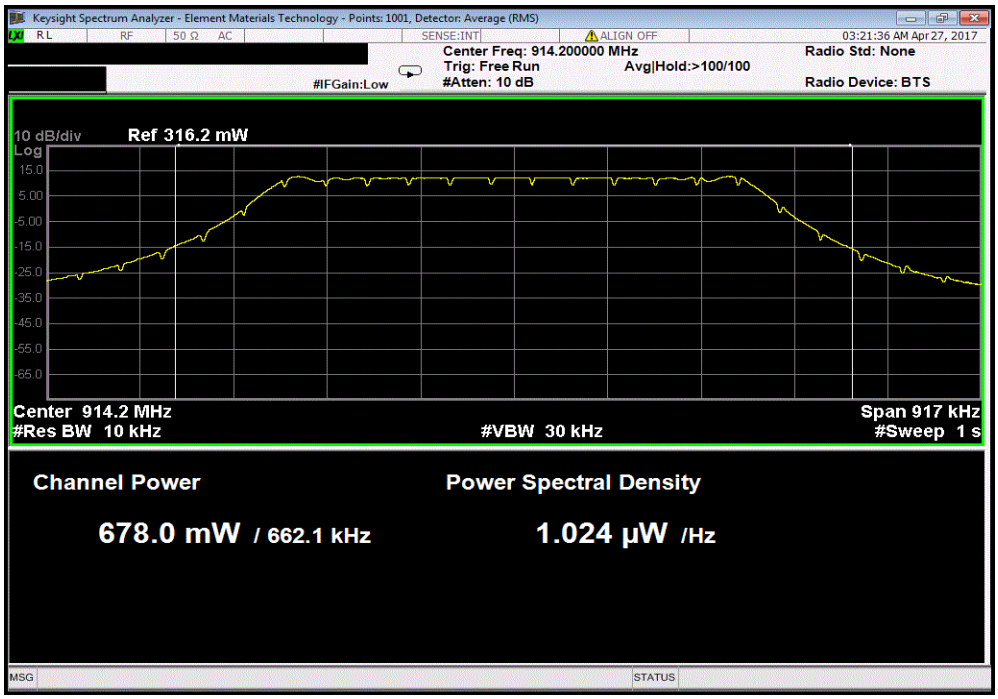
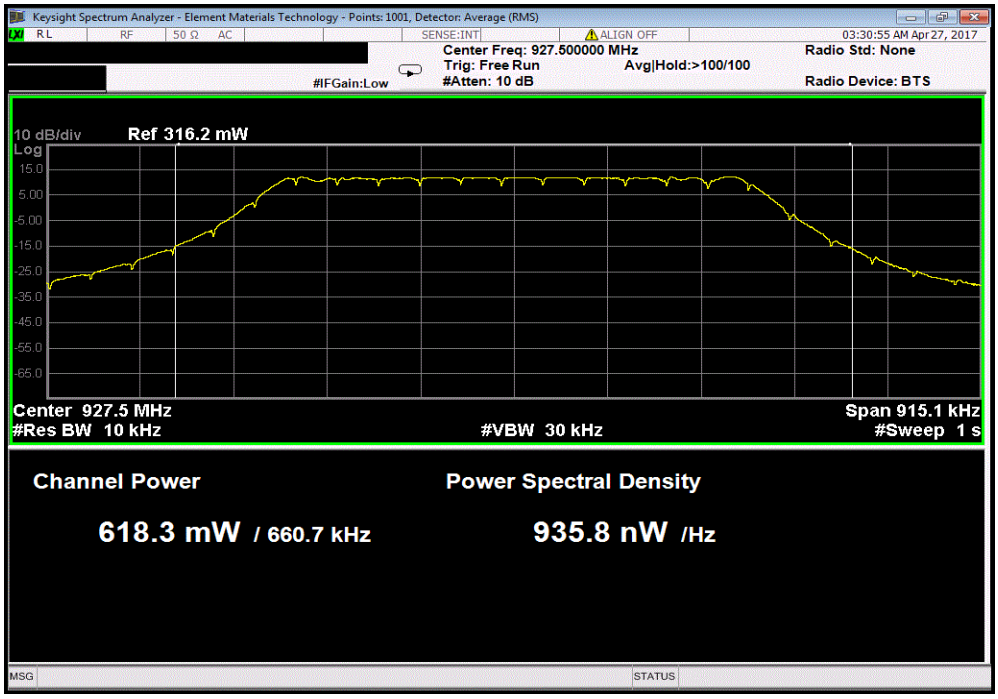
Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	678	28.31	0.22	28.54	30	Pass



Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Final Conducted Value (dBm)	Conducted Limit (dBm)	Result
	618.3	27.91	0.22	28.13	30	Pass



POWER SPECTRAL DENSITY

XMit 2017.02.08

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	10/27/2015	10/27/2018
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBI	NCR	NCR
Thermometer	Omegaette	HH311	DTY	1/21/2015	1/21/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	6/7/2016	6/7/2017
Attenuator	S.M. Electronics	SA26B-20	AUY	6/27/2016	6/27/2017
Block - DC	Fairview Microwave	SD3379	AMQ	6/8/2016	6/8/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	8/10/2016	8/10/2017

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-2 in section 11.10.5 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging and RMS detection across the on and off times of the EUT transmission. This method is allowed as the same method has been used to determine the conducted output power. Following the measurement a duty cycle correction was applied by adding [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times

In accordance with power settings stated herein, the power applied to each antenna is different. The approximate output power for each antenna is listed below.

- Yagi antenna: ≈ 24 dBm
- Dipole antenna: ≈ 30 dBm

POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	XB1301			**Work Order:**	PECK0002
Serial Number:	17			**Date:**	04/26/17
Customer:	APANA Inc			**Temperature:**	22.9 °C
Attendees:	None			**Humidity:**	41.7% RH
Project:	None			**Barometric Pres.:**	1017 mbar
Tested by:	Brandon Hobbs	**Power:**	5 VDC Nominal via 110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

The power level settings for the Yagi (12dBi) antenna data listed below are as follows: DAC = 4000, MXG = 8. The power level settings for the Dipole antenna data listed below are as follows: DAC = 4000, MXG = 12. All measurements were made at -20°C per client's request. Power limit for the Yagi antenna was lowered to accommodate for an antenna gain greater than 6dBi. A termination was placed on the unused antenna port while under test.

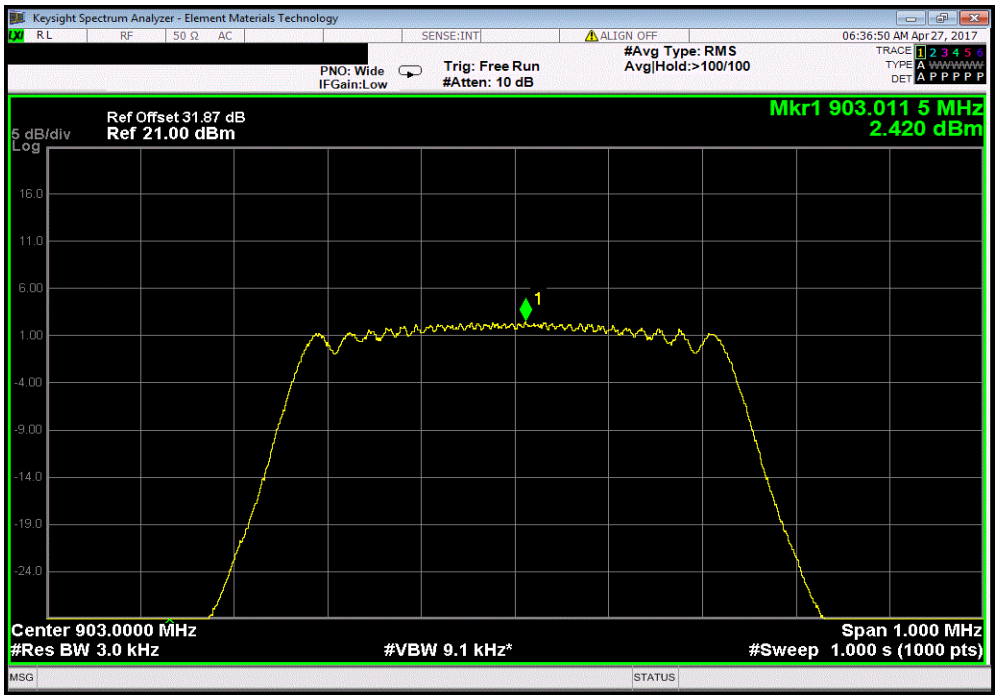
DEVIATIONS FROM TEST STANDARD

None

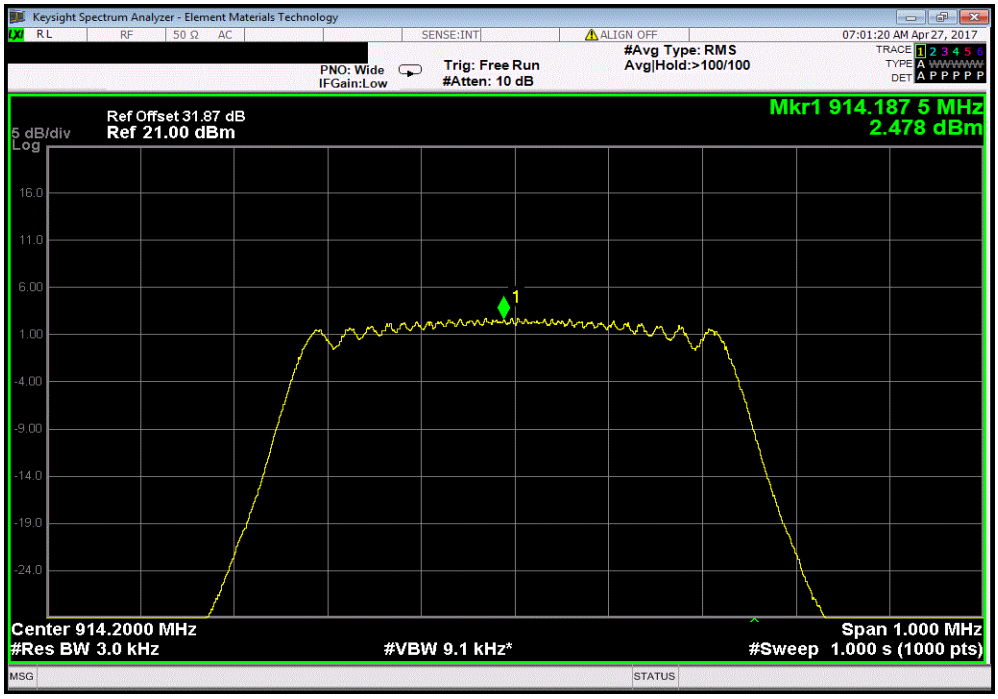
Configuration #	1	Signature

	Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
Yagi Antenna					
Port A					
500 kHz Bandwidth					
Spreading Factor 7					
Low Channel 903 MHz	2.409	0.021	2.4	8	Pass
Mid Channel 914.2 MHz	2.478	0.021	2.5	8	Pass
High Channel 927.5 MHz	1.687	0.021	1.7	8	Pass
Port B					
500 kHz Bandwidth					
Spreading Factor 7					
Low Channel 903 MHz	2.248	0.021	2.3	8	Pass
Mid Channel 914.2 MHz	2.452	0.021	2.5	8	Pass
High Channel 927.5 MHz	2.025	0.021	2.0	8	Pass
Dipole Antenna					
Port A					
500 kHz Bandwidth					
Spreading Factor 7					
Low Channel 903 MHz	0.021	0.021	7.7	8	Pass
Mid Channel 914.2 MHz	7.581	0.021	7.6	8	Pass
High Channel 927.5 MHz	7.380	0.021	7.4	8	Pass
Port B					
500 kHz Bandwidth					
Spreading Factor 7					
Low Channel 903 MHz	7.721	0.021	7.7	8	Pass
Mid Channel 914.2 MHz	7.725	0.021	7.7	8	Pass
High Channel 927.5 MHz	7.169	0.021	7.1	8	Pass

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		2.4090	0.0209	2.4299	8	Pass



Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		2.4780	0.0209	2.4989	8	Pass



POWER SPECTRAL DENSITY

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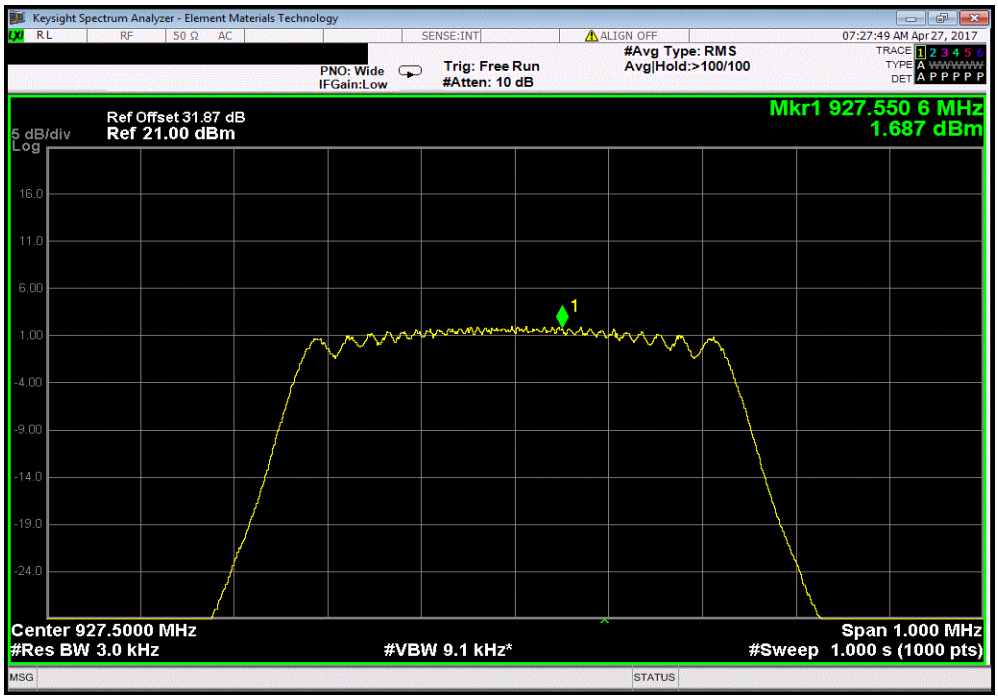
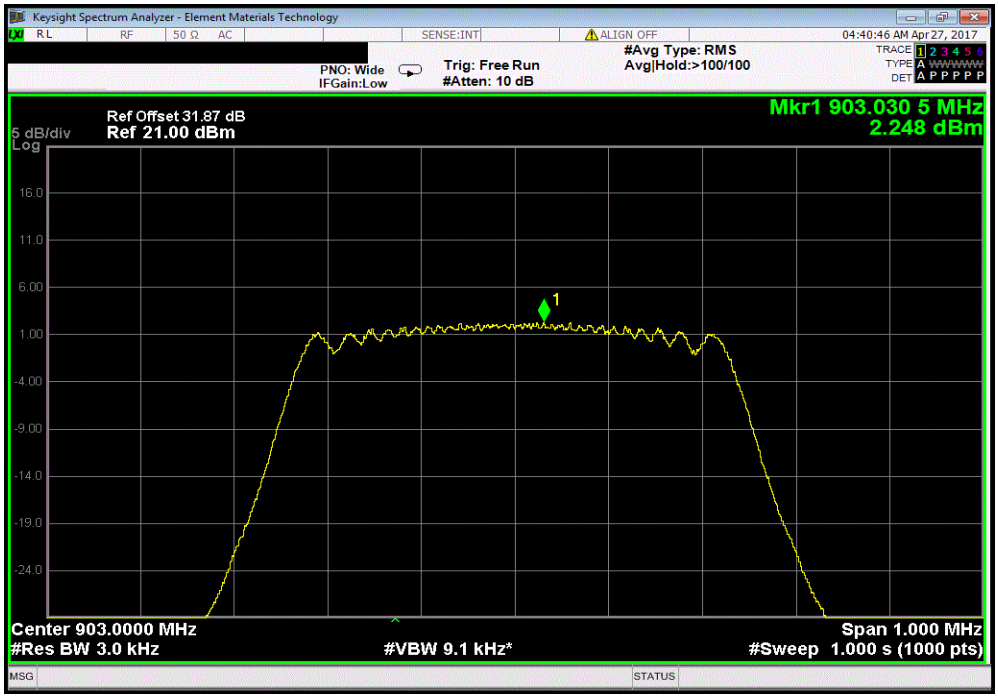
Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		1.687	0.0209	1.7079	8	Pass



Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		2.2480	0.0209	2.2689	8	Pass



POWER SPECTRAL DENSITY

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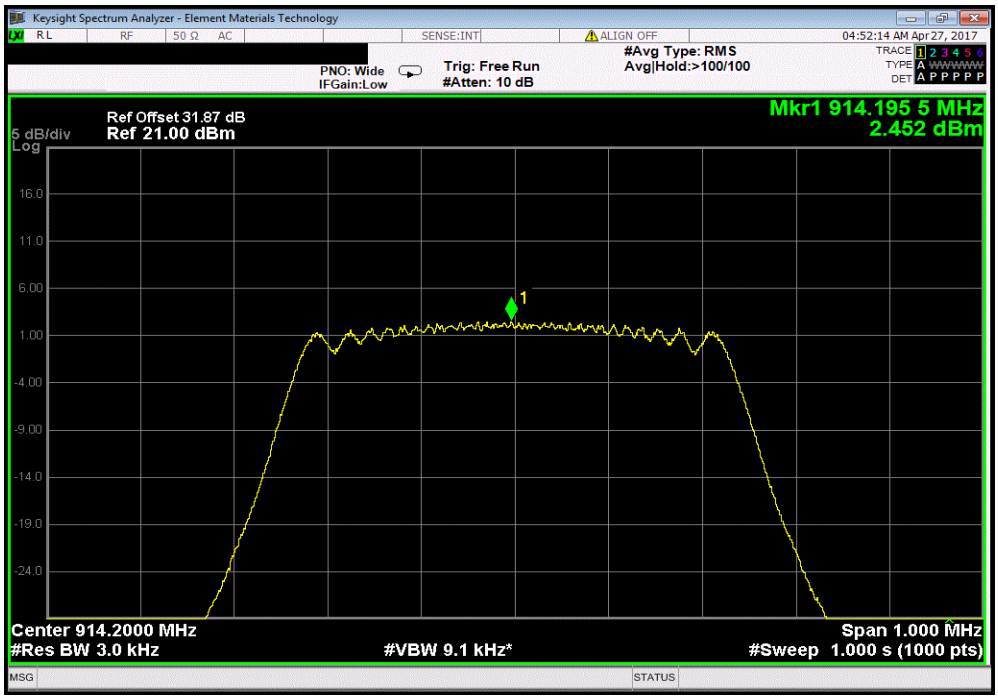
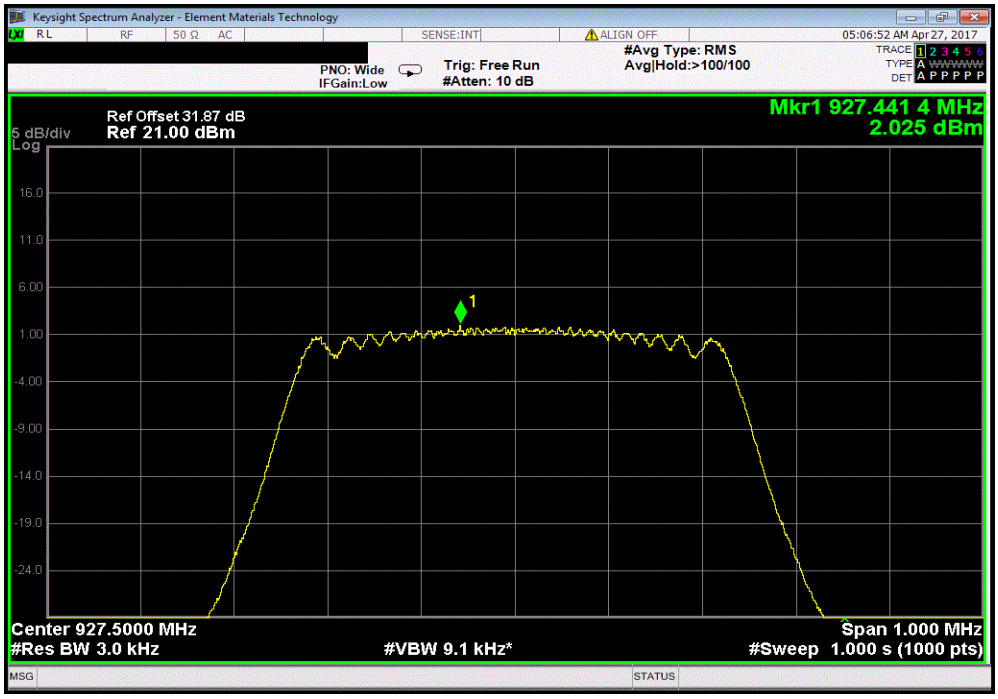
Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		2.4520	0.0209	2.4729	8	Pass



Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		2.025	0.0209	2.0459	8	Pass



POWER SPECTRAL DENSITY

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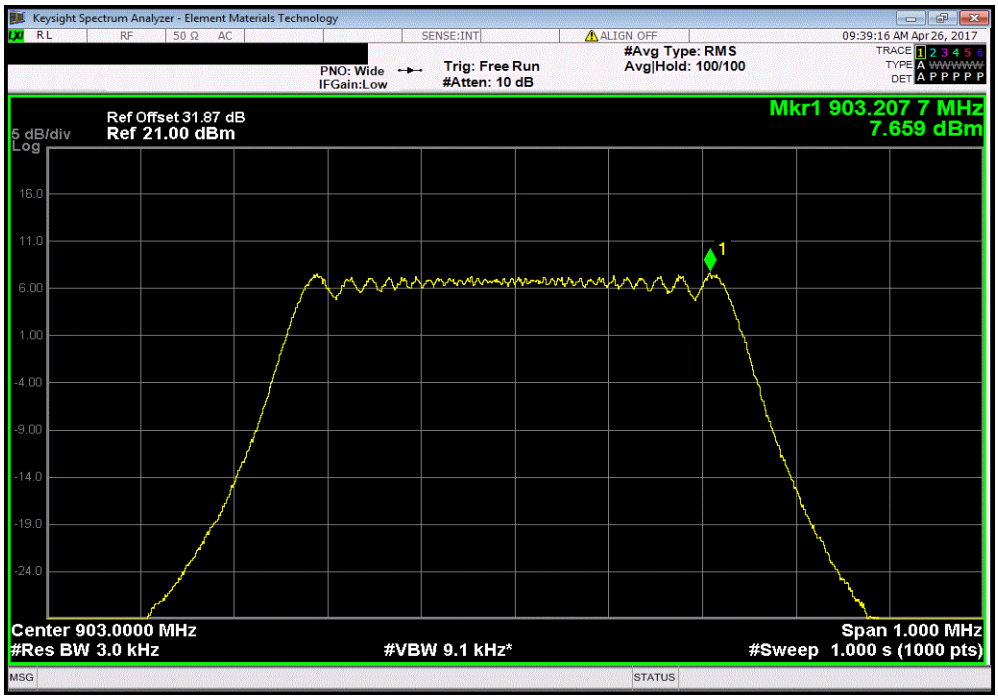
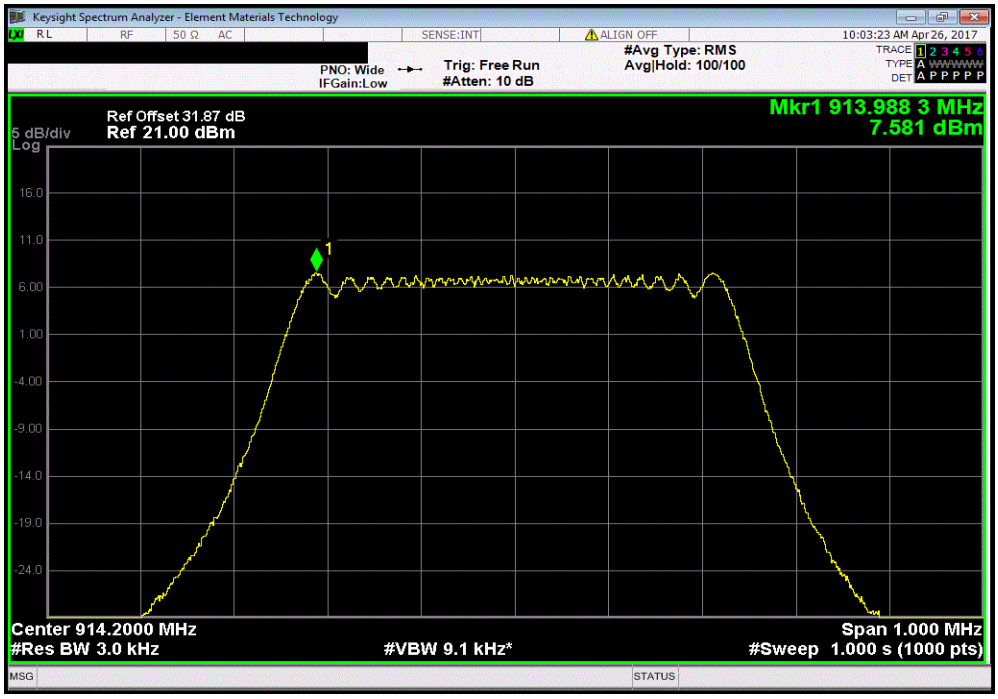
Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		0.0209	0.0209	7.659	8	Pass



Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		7.581	0.0209	7.6019	8	Pass



POWER SPECTRAL DENSITY

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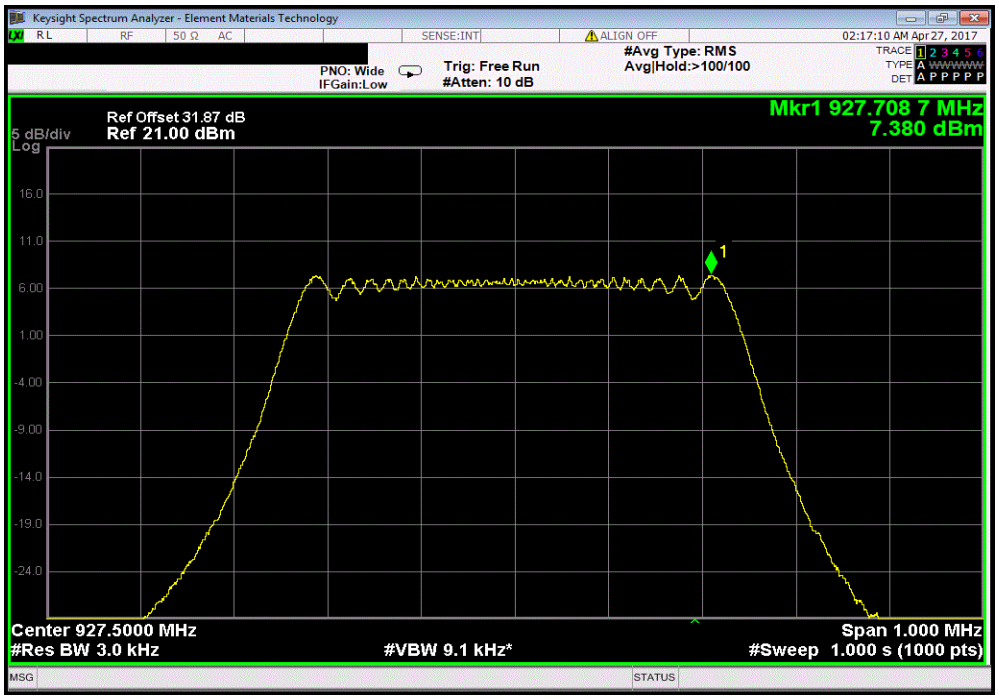
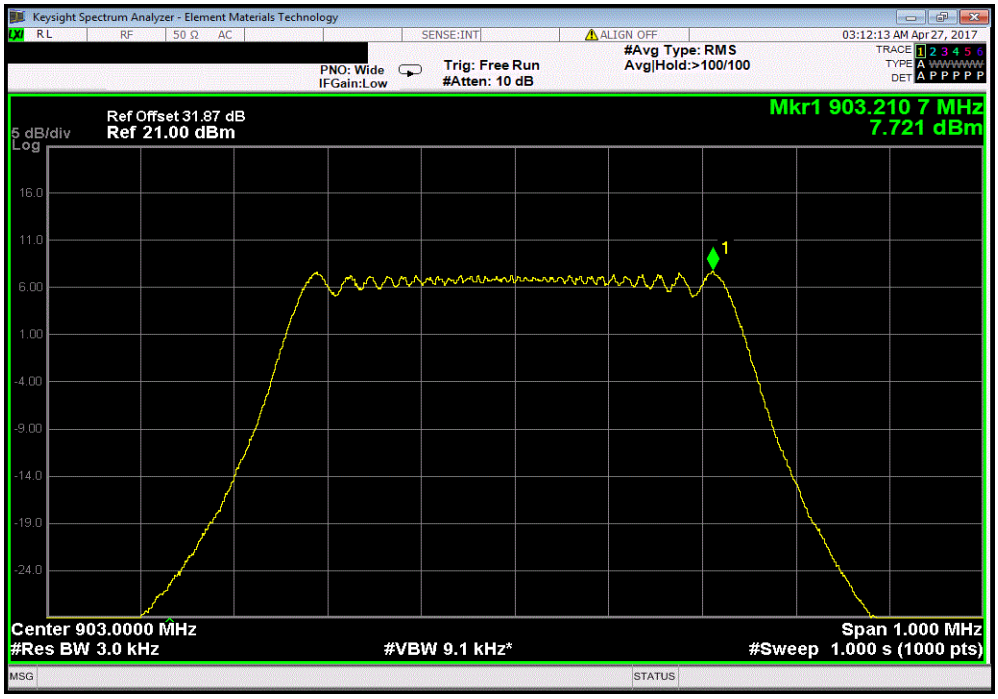
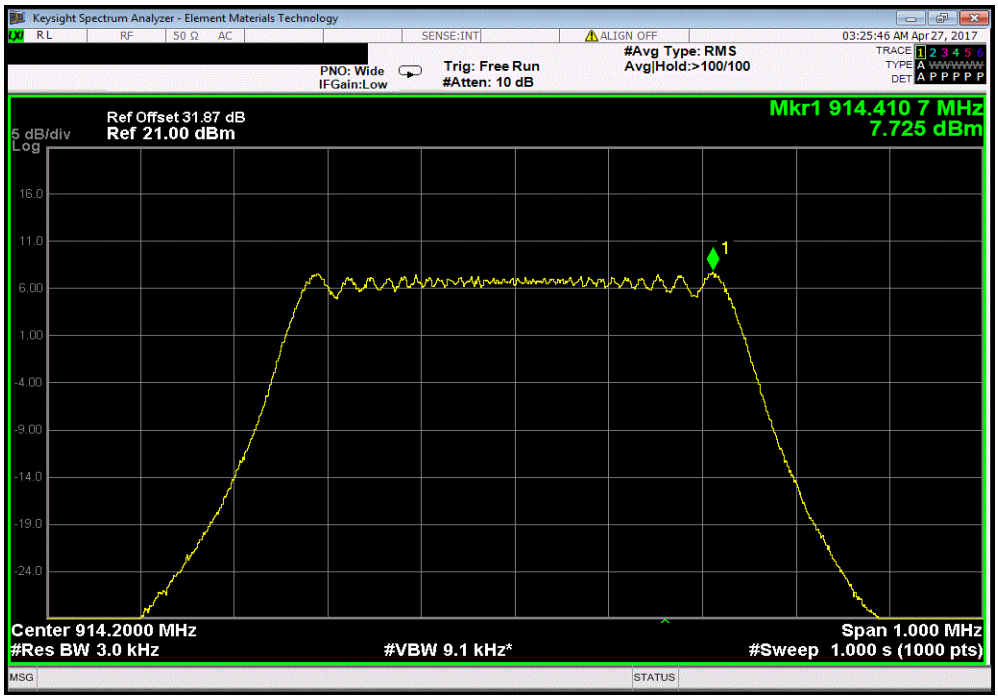
Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		7.38	0.0209	7.4009	8	Pass



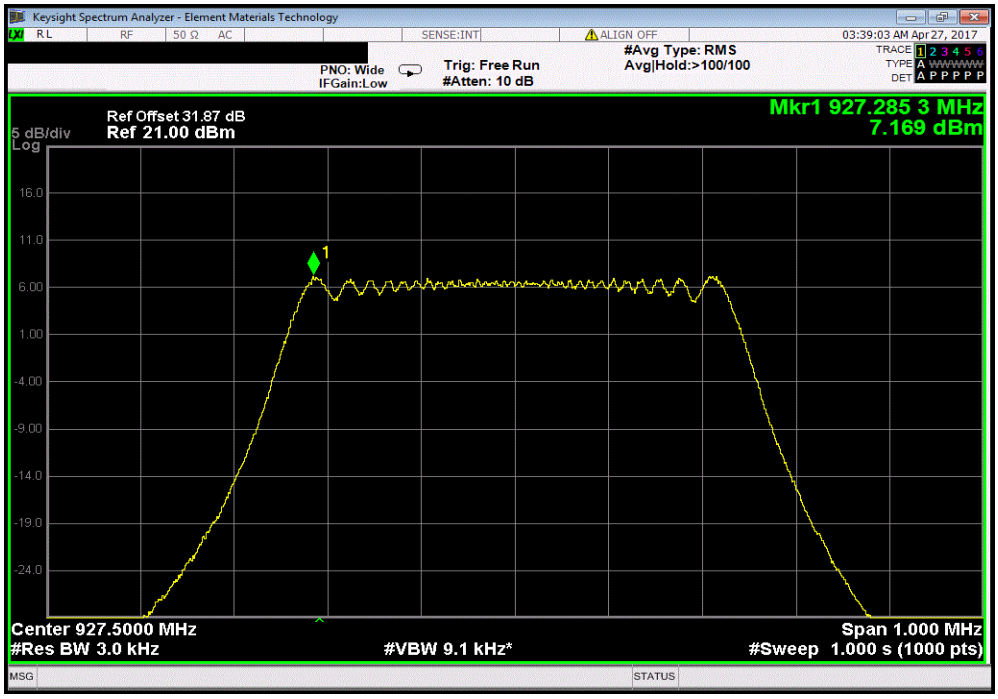
Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		7.721	0.0209	7.7419	8	Pass



Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		7.725	0.0209	7.7459	8	Pass



Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
		Initial Value dBm/3kHz	Duty Cycle Correction (dB)	Final Value dBm/3kHz	Limit < dBm/3kHz	Results
		7.169	0.0209	7.138	8	Pass



BAND EDGE COMPLIANCE

XMit 2017.02.08

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	10/27/2015	10/27/2018
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBI	NCR	NCR
Thermometer	Omegaette	HH311	DTY	1/21/2015	1/21/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	6/7/2016	6/7/2017
Attenuator	S.M. Electronics	SA26B-20	AUY	6/27/2016	6/27/2017
Block - DC	Fairview Microwave	SD3379	AMQ	6/8/2016	6/8/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	8/10/2016	8/10/2017

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 at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

An RMS detector was used to match the method called out for Output Power. Because the reference level was taken with an RMS detector, the attenuation requirement is -30 dBc.

In accordance with power settings stated herein, the power applied to each antenna is different. The approximate output power for each antenna is listed below.
- Yagi antenna: ≈ 24 dBm
- Dipole antenna: ≈ 30 dBm

BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	**XB1301**			**Work Order:**	**PECK0002**
Serial Number:	**17**			**Date:**	**04/26/17**
Customer:	**APANA Inc**			**Temperature:**	**23.4 °C**
Attendees:	**None**			**Humidity:**	**40.7% RH**
Project:	**None**			**Barometric Pres.:**	**1016 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**5 VDC Nominal via 110VAC/60Hz**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

The power level settings for the Yagi (12dBi) antenna data listed below are as follows: DAC = 4000, MXG = 8. The power level settings for the Dipole antenna data listed below are as follows: DAC = 4000, MXG = 12. All measurements were made at -20°C per client's request. A termination was placed on the unused antenna port while under test.

DEVIATIONS FROM TEST STANDARD

None

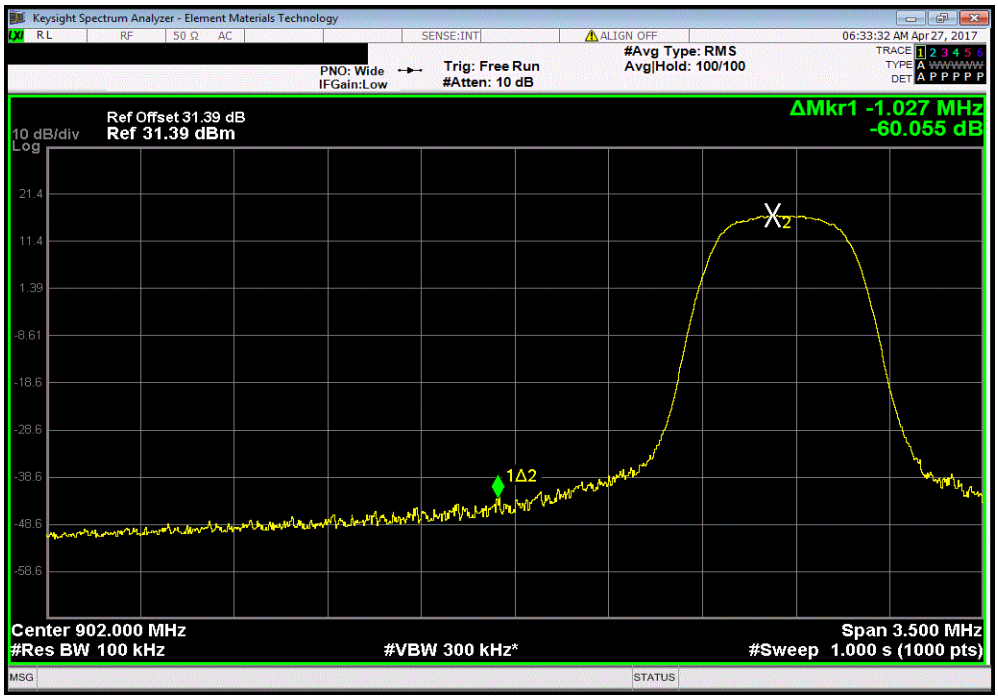
Configuration #	**1**	*Signature*

				Final Value (dBc)	**Limit ≤ (dBc)**	**Result**
Yagi Antenna						
	Port A					
		500 kHz Bandwidth				
			Spreading Factor 7			
			Low Channel 903 MHz	-60.06	-30	Pass
			High Channel 927.5 MHz	-51.56	-30	Pass
	Port B					
		500 kHz Bandwidth				
			Spreading Factor 7			
			Low Channel 903 MHz	-59.66	-30	Pass
			High Channel 927.5 MHz	-50.86	-30	Pass
Dipole Antenna						
	Port A					
		500 kHz Bandwidth				
			Spreading Factor 7			
			Low Channel 903 MHz	-60.04	-30	Pass
			High Channel 927.5 MHz	-42.16	-30	Pass
	Port B					
		500 kHz Bandwidth				
			Spreading Factor 7			
			Low Channel 903 MHz	-60.48	-30	Pass
			High Channel 927.5 MHz	-43.39	-30	Pass

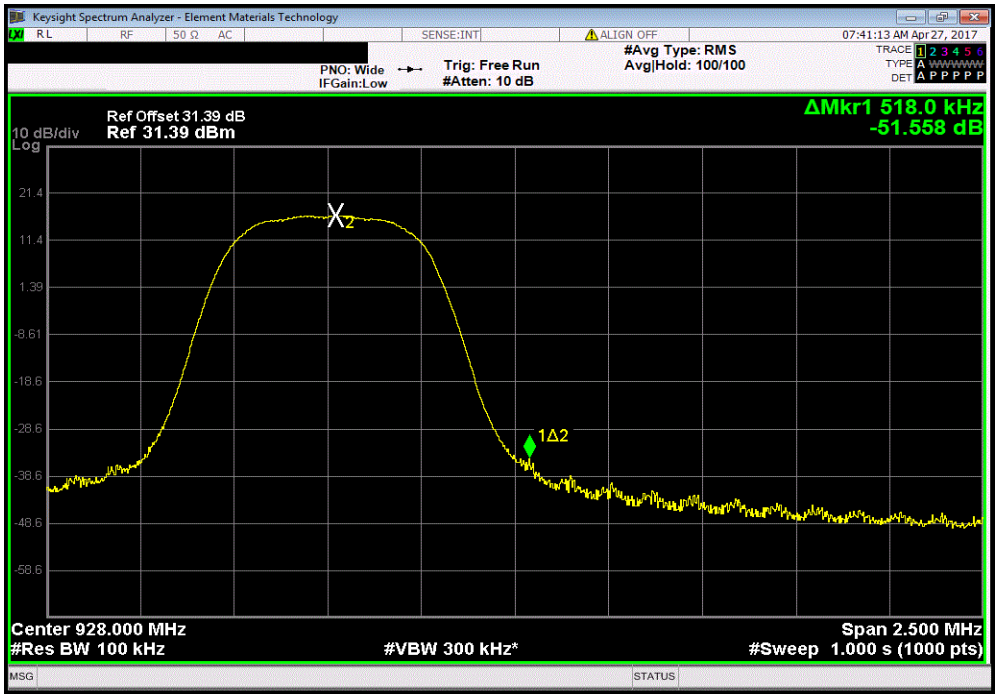
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-60.06	-30	Pass



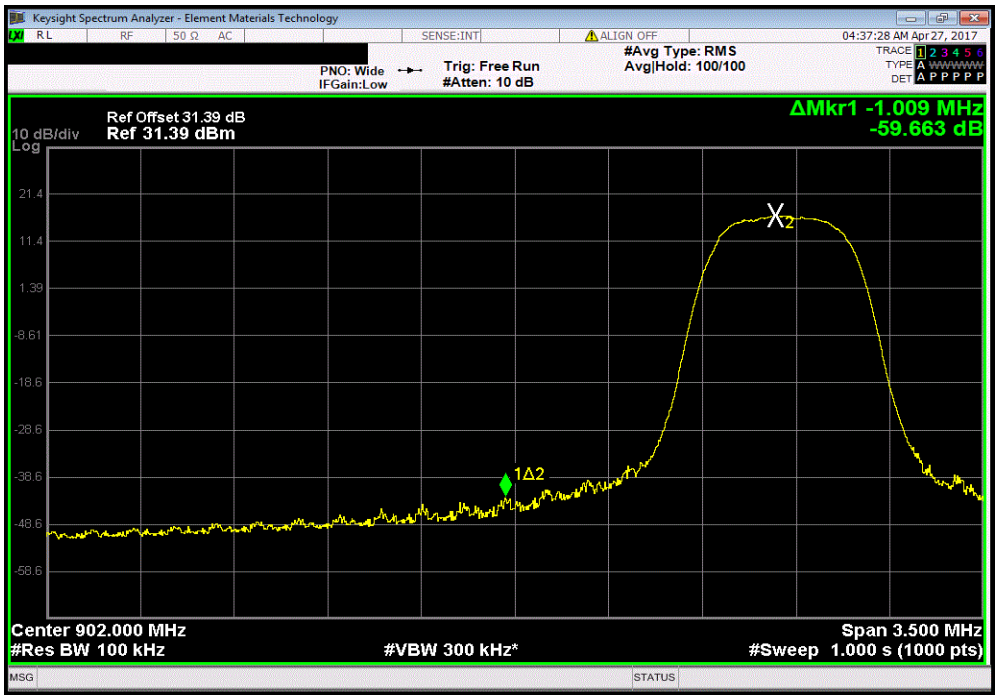
Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-51.56	-30	Pass



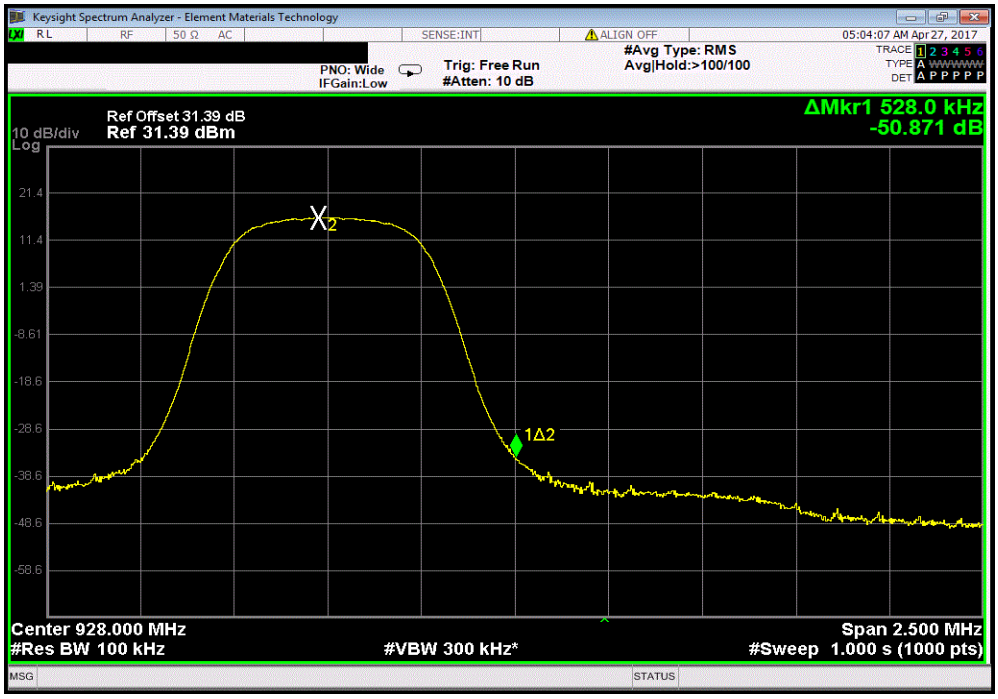
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-59.66	-30	Pass



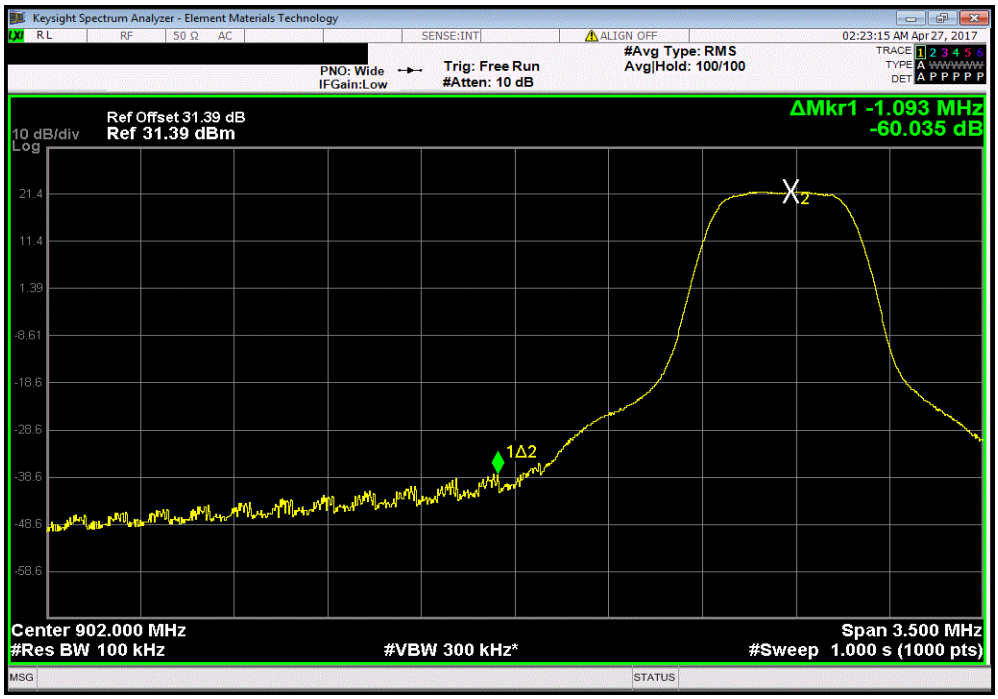
Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-50.86	-30	Pass



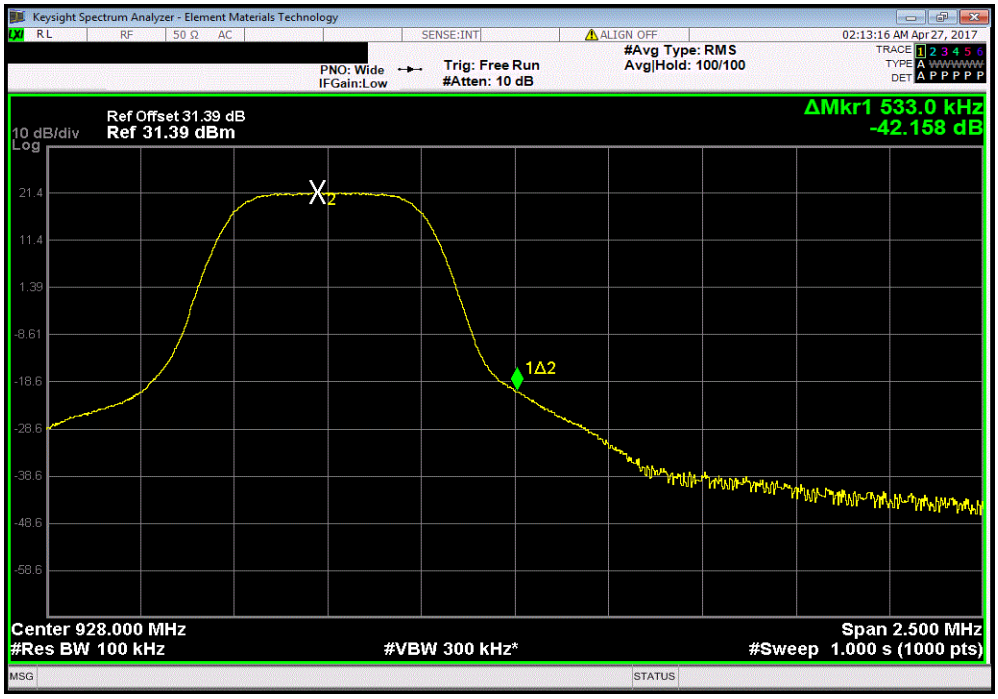
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-60.04	-30	Pass



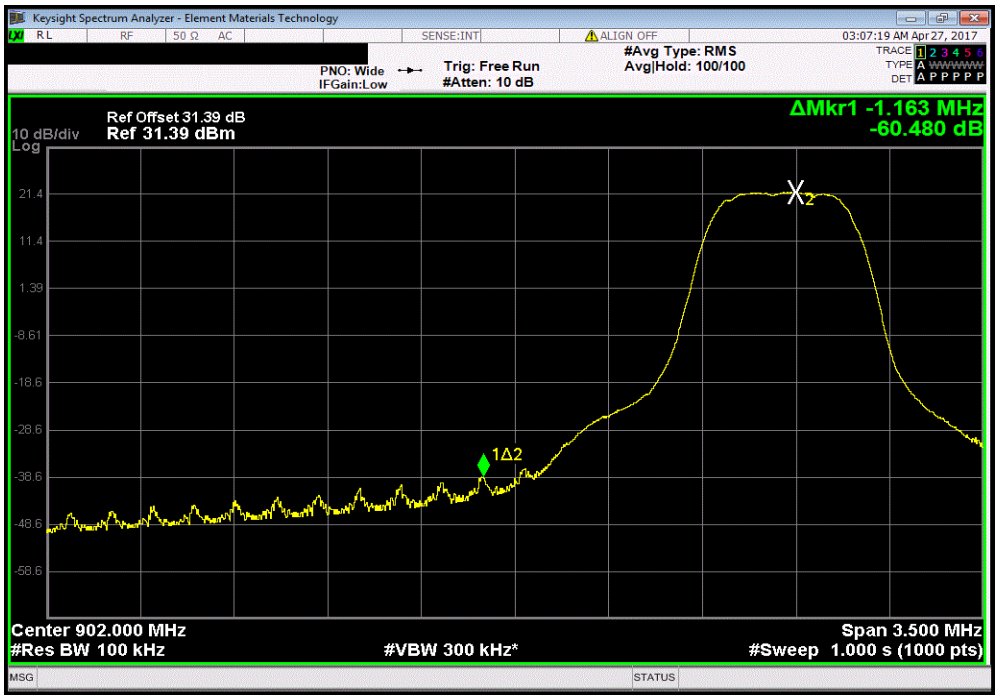
Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-42.16	-30	Pass



BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-60.48	-30	Pass



Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz						
				Final Value (dBc)	Limit ≤ (dBc)	Result
				-43.39	-30	Pass