

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.



	: XB1301							Work Order:	TbtTx 2017.01.27	XMit 20
Serial Number									05/11/17	
	: APANA Ir	IC						Temperature:		
Attendees								Humidity:		
Project					_			Barometric Pres.:		
	: Brandon	Hobbs		Power	r: 5 VDC Nominal via	110VAC/60Hz		Job Site:	EV06	
EST SPECIFICAT	TONS				Test Method					
CC 15.247:2017					ANSI C63.10:2013					
OMMENTS										
he power level se	ettings for 1	he Yagi (12dBi) antenn	a data listed below are as follow	s: DAC = 4000,	MXG = 8. The power I	evel settings for	the Dipole antenna	data listed below a	re as follows: DAC	= 4000, MXC
			's request. Power limit for the Ya							
2dBi = 36dBm (D	e Facto lim	it). A termination was p	placed on the unused antenna p							
EVIATIONS FRO	M TEST ST	ANDARD								
one										
			1	2	1 1					
onfiguration #		1		7	Sal					
			Signature							
				Antenna Gain (dBi)	Initial Conducted Value (mW)	Conducted Value (dBm)	Duty Cycle Correction (dB)	Conducted EIRP Value (dBm)	De Facto Limit (dBm)	Result
gi Antenna				Gain (ubi)	value (IIIvv)	Value (ubili)	Correction (uB)	Value (UBIII)	сппп (автт)	Result
gi Antenna	Port A									
	POILA	500 kl la Dendwidth								
		500 kHz Bandwidth	ing Factor 7							
		Spreadi		40	400.0	00.00	0.00	05.00	00	D
			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								
		Spreadi	ing 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
ipole Antenna										
	Port A									
		500 kHz Bandwidth								
		Spreadi	ing 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		<b>3</b> • • • • • • • • • • • • • • • • • • •							
		500 kHz Bandwidth								
			ing Easter 7							
		Spreadi								
		Spreadi		3.5	686.9	28 37	0.22	32.09	36	Pass
		Spread	Low Channel 903 MHz	3.5	686.9 678.0	28.37	0.22	32.09	36 36	Pass
		Spread.		3.5 3.5 3.5	686.9 678.0 618.3	28.37 28.31 27.91	0.22 0.22 0.22	32.09 32.04 31.63	36 36 36	Pass Pass Pass



TbtTx 2017.01.27



**Channel Power Power Spectral Density** 213.4 mW / 630.5 kHz 338.5 nW /Hz STATUS



TbtTx 2017.01.27 XMit 2017.02.08



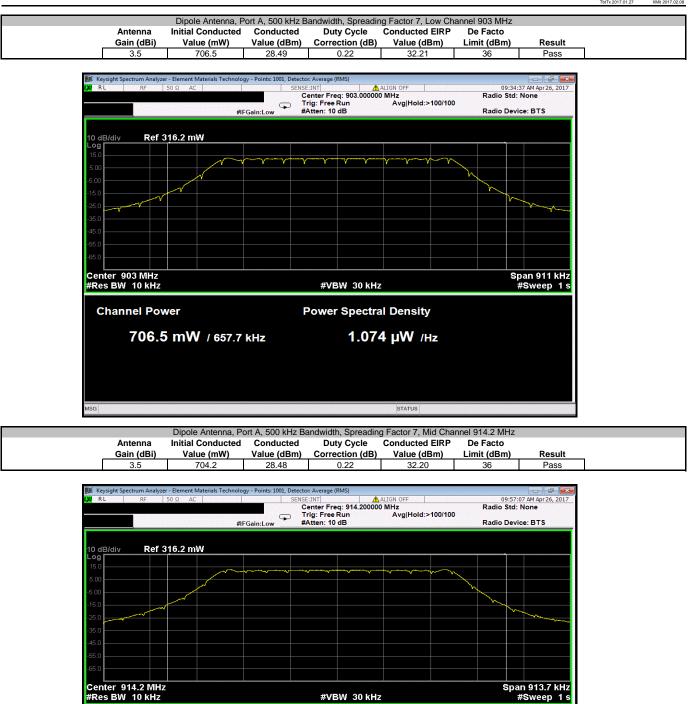


TbtTx 2017.01.27 XMit 2017.02.08





TbtTx 2017.01.27



#VBW 30 kHz **Channel Power Power Spectral Density** 704.2 mW / 659.7 kHz 1.067 µW /Hz STATUS



TbtTx 2017.01.27







TbtTx 2017.01.27



Center 927.5 MHz #Res BW 10 kHz Span 915.1 kHz #Sweep 1 s #VBW 30 kHz **Channel Power Power Spectral Density** 618.3 mW / 660.7 kHz 935.8 nW /Hz



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.



FUT								TbtTx 2017.01.27	XMit 201
	T: XB1301						Work Order:		
Serial Number								05/11/17	
	r: APANA Ir	IC					Temperature:		
Attendees							Humidity:		
	t: None			Power: 5 VDC Nominal via	4401/40/0011-		Barometric Pres.:		
EST SPECIFICA	: Brandon	HODDS		Test Method	110VAC/60HZ		Job Site:	EV06	
CC 15.247:2017	TIONS			ANSI C63.10:2013					
00 13.247.2017				ANGI 003.10.2013					
OMMENTS									
			tenna data listed below are as follows: DAC =						
			lient's request. Power limit for the Yagi antenr						s: 24dBm +
2dBi = 36dBm (D	De Facto lim	it). This represents	the final Yagi conducted limit of 24dBm show	wn in the data below. A term	nination was pla	ced on the unused	antenna port while ι	inder test.	
EVIATIONS FRO	M TEST ST								
one		ANDARD							
one									
onfiguration #		1		-1-1					
			Signature	$\sim$					
				Initial Conducted	Conducted	Duty Cycle	Final Conducted	Conducted	
				Value (mW)	Value (dBm)	Correction (dB)	Value (dBm)	Limit (dBm)	Result
agi Antenna									
	Port A								
		500 kHz Bandwid							
		Spr	reading Factor 7 Low Channel 903 MHz	100.0	00.00	0.00	00.00	04	Deer
				199.2	22.99	0.22	23.22	24	Pass
			Mid Channel 914.2 MHz	213.4 187.3	23.29 22.73	0.22 0.22	23.51 22.95	24 24	Pass
	Port B		High Channel 927.5 MHz	187.3	22.73	0.22	22.95	24	Pass
	PULLE								
		500 kHz Bondwig	4th						
		500 kHz Bandwid							
			reading Factor 7	103.8	22.00	0.22	23.22	24	Pass
			reading Factor 7 Low Channel 903 MHz	193.8 198 5	22.99	0.22	23.22	24	Pass
			reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz	198.5	22.98	0.22	23.20	24	Pass
pole Antenna			reading Factor 7 Low Channel 903 MHz						
ipole Antenna	Port A		reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz	198.5	22.98	0.22	23.20	24	Pass
ipole Antenna	Port A		reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz	198.5	22.98	0.22	23.20	24	Pass
ipole Antenna	Port A	Spr 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz	198.5	22.98	0.22	23.20	24	Pass
ipole Antenna	Port A	Spr 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz	198.5	22.98	0.22	23.20	24	Pass
ipole Antenna	Port A	Spr 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7	198.5 172.7	22.98 22.37 28.49 28.48	0.22 0.22 0.22	23.20 22.60 28.71 28.70	24 24 30 30	Pass Pass
pole Antenna		Spr 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz	198.5 172.7 706.5	22.98 22.37 28.49	0.22 0.22 0.22	23.20 22.60 28.71	24 24 30	Pass Pass Pass
ipole Antenna	Port A Port B	Spr 500 kHz Bandwic Spr	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz	198.5 172.7 706.5 704.2	22.98 22.37 28.49 28.48	0.22 0.22 0.22	23.20 22.60 28.71 28.70	24 24 30 30	Pass Pass Pass Pass Pass
ipole Antenna		500 kHz Bandwic 500 kHz Bandwic 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth	198.5 172.7 706.5 704.2	22.98 22.37 28.49 28.48	0.22 0.22 0.22	23.20 22.60 28.71 28.70	24 24 30 30	Pass Pass Pass Pass Pass
ipole Antenna		500 kHz Bandwic 500 kHz Bandwic 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7	198.5 172.7 706.5 704.2 646.9	22.98 22.37 28.49 28.48 28.11	0.22 0.22 0.22 0.22 0.22 0.22	23.20 22.60 28.71 28.70 28.33	24 24 30 30 30	Pass Pass Pass Pass Pass Pass
ipole Antenna		500 kHz Bandwic 500 kHz Bandwic 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz	198.5 172.7 706.5 704.2 646.9 686.9	22.98 22.37 28.49 28.48 28.11 28.37	0.22 0.22 0.22 0.22 0.22 0.22 0.22	23.20 22.60 28.71 28.70 28.33 28.59	24 24 30 30 30 30	Pass Pass Pass Pass Pass Pass
ipole Antenna		500 kHz Bandwic 500 kHz Bandwic 500 kHz Bandwic	reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7 Low Channel 903 MHz Mid Channel 914.2 MHz High Channel 927.5 MHz dth reading Factor 7	198.5 172.7 706.5 704.2 646.9	22.98 22.37 28.49 28.48 28.11	0.22 0.22 0.22 0.22 0.22 0.22	23.20 22.60 28.71 28.70 28.33	24 24 30 30 30	Pass Pass Pass Pass Pass Pass

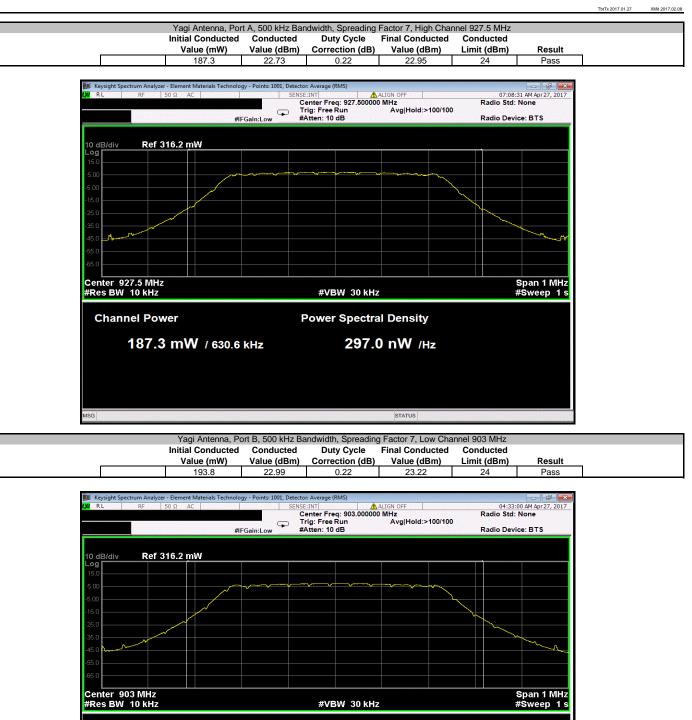


TbtTx 2017.01.27



Center 914.2 MHz #Res BW 10 kHz Span 1 MHz #Sweep 1 s #VBW 30 kHz **Channel Power Power Spectral Density** 213.4 mW / 630.5 kHz 338.5 nW /Hz





**Power Spectral Density** 

305.9 nW /Hz

STATUS

**Channel Power** 

193.8 mW / 633.6 kHz



TbtTx 2017.01.27 Mit 2017.



**Channel Power Power Spectral Density** 172.7 mW / 632.9 kHz 272.8 nW /Hz





#VBW 30 kHz

**Power Spectral Density** 

1.067 µW /Hz

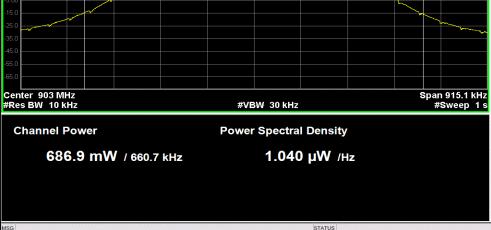
STATUS

**Channel Power** 

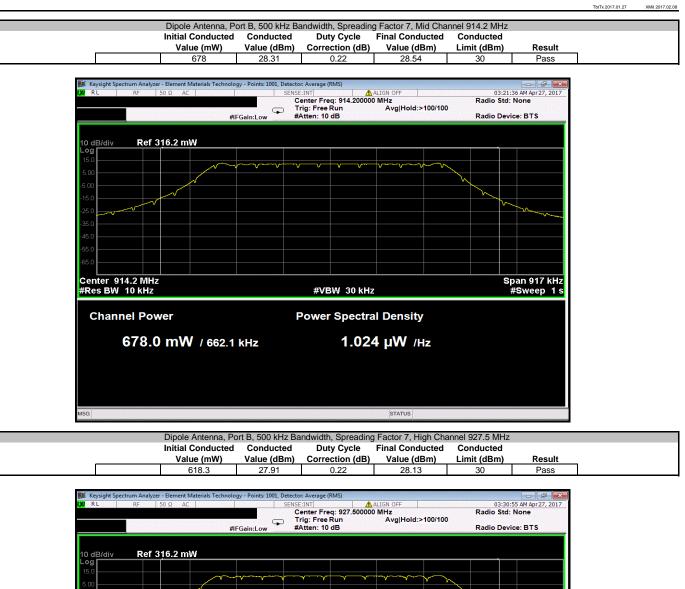
704.2 mW / 659.7 kHz











X/RL	RF	50 Ω AC				SE:INT	n saises		LIGN OFF				AM Apr 27, 2017
			ŧ	/IFGain:Low	· ·	Center Fre Trig: Free #Atten: 10	Run	500000	MHz Avg Hold:>	100/100	Radio Radio		
10 dB/div	Ref 3	316.2 m	w										
-og													
15.0			~~~		_								
5.00				- V V	¥	Y Y	Y	ν	V - V	Y N			
5.00			~~										
15.0		Y										~	
25.0													and an and a second sec
35.0													
45.0													
55.0													

Center 927.5 MHz #Res BW 10 kHz Span 915.1 kHz #Sweep 1 s #VBW 30 kHz **Channel Power Power Spectral Density** 935.8 nW /Hz 618.3 mW / 660.7 kHz



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



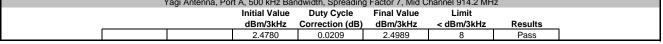
EUS	T: XB1301				Work Order:	TbtTx 2017.01.27	XMit 20
EU Serial Numbe						04/26/17	
	er: 17 er: APANA Inc						
					Temperature:		
Attendees	s: None				Humidity: Barometric Pres.:		
	y: Brandon H	labba Bauran E )	/DC Nominal via 110VAC/60Hz		Job Site:		
ST SPECIFICA			st Method		Job Site:	EVU6	
C 15.247:2017			ISI C63.10:2013				
50 15.247.2017		AN	131 C03. 10.2013				
OMMENTS							
		ne Yagi (12dBi) antenna data listed below are as follows: DAC = 4000, MXG					
<ol><li>All measurem ntenna port while</li></ol>		ade at -20°C per client's request. Power limit for the Yagi antenna was low	vered to accommodate for an ante	enna gain greater tha	n 6dBi. A terminat	ion was placed on t	he unused
EVIATIONS FRO	DM TEST STA	NDARD					
one							
onfiguration #		1	1 1				
oninguration #		1 Signature	Jarl				
	_	Ognadie	Initial Value	Duty Cycle	Final Value	Limit	
			dBm/3kHz	Correction (dB)	dBm/3kHz	< dBm/3kHz	Results
agi 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
pole Antenna							
	Port A						
		500 kHz Bandwidth					
		Spreading Factor 7	0.67.1				_
		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
	Dort D	·					
	Port B						
	Port B	500 kHz Bandwidth					
	Port B	500 kHz Bandwidth Spreading Factor 7	7 701	0.021	77	0	Baca
	Port B	500 kHz Bandwidth Spreading Factor 7 Low Channel 903 MHz	7.721	0.021	7.7	8	Pass
	Port B	500 kHz Bandwidth Spreading Factor 7	7.721 7.725 7.169	0.021 0.021 0.021	7.7 7.7 7.1	8 8 8	Pass Pass Pass



XMit 2017.02.08

TbtTx 2017.01.27

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz Initial Value Duty Cycle Final Value Limit Correction (dB) dBm/3kHz dBm/3kHz < dBm/3kHz Results 2.4090 0.0209 2.4299 8 Pass 06:36:50 AM Apr 27, 2017 RL ALIGN TRACE 1 2 3 4 5 6 TYPE A WWWW DET A P P P P P #Avg Type: RMS Avg|Hold:>100/100 PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 903.011 5 MHz 2.420 dBm Ref Offset 31.87 dB Ref 21.00 dBm 5 dB/div Ø Center 903.0000 MHz #Res BW 3.0 kHz Span 1.000 MHz #Sweep 1.000 s (1000 pts) #VBW 9.1 kHz\* STATUS Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz



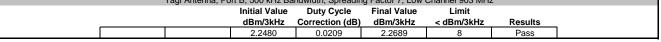




XMit 2017.02.08

TbtTx 2017.01.27

Yagi Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz Initial Value Duty Cycle Final Value Limit Correction (dB) dBm/3kHz dBm/3kHz < dBm/3kHz Results 1.687 0.0209 1.7079 8 Pass 07:27:49 AM Apr 27, 2017 RL ALIGN TRACE 1 2 3 4 5 6 TYPE A WWWW DET A P P P P P #Avg Type: RMS Avg|Hold:>100/100 PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 927.550 6 MHz 1.687 dBm Ref Offset 31.87 dB Ref 21.00 dBm 5 dB/div **♦**<sup>1</sup> Center 927.5000 MHz #Res BW 3.0 kHz Span 1.000 MHz #Sweep 1.000 s (1000 pts) #VBW 9.1 kHz\* STATUS Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz



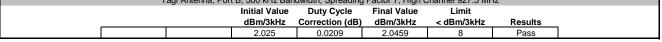


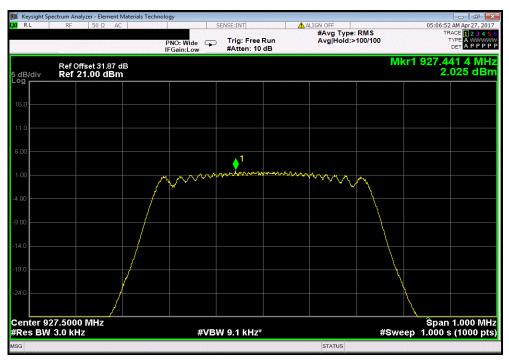


XMit 2017.02.08

TbtTx 2017.01.27

Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz Initial Value Duty Cycle Final Value Limit Correction (dB) dBm/3kHz dBm/3kHz < dBm/3kHz Results 2.4520 0.0209 2.4729 8 Pass 04:52:14 AM Apr 27, 2017 RL ALIGN TRACE 1 2 3 4 5 6 TYPE A WWWW DET A P P P P P #Avg Type: RMS Avg|Hold:>100/100 PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 914.195 5 MHz 2.452 dBm Ref Offset 31.87 dB Ref 21.00 dBm 5 dB/div Center 914.2000 MHz #Res BW 3.0 kHz Span 1.000 MHz #Sweep 1.000 s (1000 pts) #VBW 9.1 kHz\* STATUS Yagi Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz Initial Value **Final Value** Limit



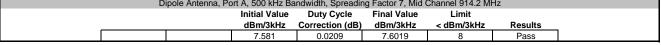


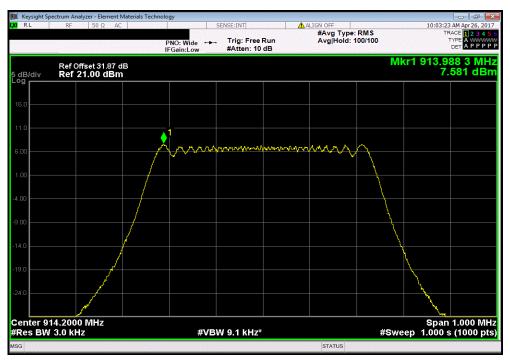


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TbtTx 2017.01.27

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz Initial Value Duty Cycle Final Value Limit Correction (dB) dBm/3kHz dBm/3kHz < dBm/3kHz Results 0.0209 0.0209 7.659 8 Pass RL ALIGN 09:39:16 AM Apr 26, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A P P P P P #Avg Type: RMS Avg|Hold: 100/100 PNO: Wide ++ Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 903.207 7 MHz 7.659 dBm Ref Offset 31.87 dB Ref 21.00 dBm 5 dB/div LAAA Center 903.0000 MHz #Res BW 3.0 kHz Span 1.000 MHz #Sweep 1.000 s (1000 pts) #VBW 9.1 kHz\* STATUS Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz



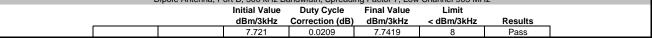


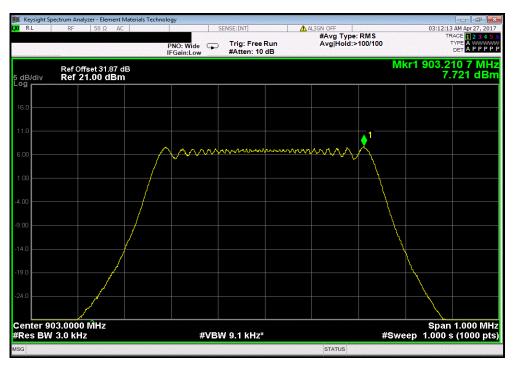


XMit 2017.02.08

TbtTx 2017.01.27

Dipole Antenna, Port A, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz Initial Value Duty Cycle Final Value Limit Correction (dB) dBm/3kHz dBm/3kHz < dBm/3kHz Results 7.38 0.0209 7.4009 8 Pass 02:17:10 AM Apr 27, 2017 RL ALIGN TRACE 1 2 3 4 5 6 TYPE A WWWW DET A P P P P P #Avg Type: RMS Avg|Hold:>100/100 PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 927.708 7 MHz 7.380 dBm Ref Offset 31.87 dB Ref 21.00 dBm 5 dB/div ø mm MM Center 927.5000 MHz #Res BW 3.0 kHz Span 1.000 MHz #Sweep 1.000 s (1000 pts) #VBW 9.1 kHz\* STATUS Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Low Channel 903 MHz Initial Value Final Value Duty Cycle Limit

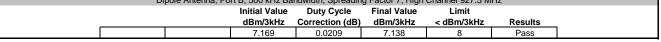






XMit 2017.02.08

TbtTx 2017.01.27 Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, Mid Channel 914.2 MHz Initial Value Duty Cycle Final Value Limit Correction (dB) dBm/3kHz dBm/3kHz < dBm/3kHz Results 7.725 0.0209 7.7459 8 Pass 03:25:46 AM Apr 27, 2017 RL ALIGN TRACE 1 2 3 4 5 6 TYPE A WWWW DET A P P P P P #Avg Type: RMS Avg|Hold:>100/100 PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 914.410 7 MHz 7.725 dBm Ref Offset 31.87 dB Ref 21.00 dBm 5 dB/div ♦1  $\Lambda \Lambda \Lambda$ AAA north Center 914.2000 MHz #Res BW 3.0 kHz Span 1.000 MHz #Sweep 1.000 s (1000 pts) #VBW 9.1 kHz\* STATUS Dipole Antenna, Port B, 500 kHz Bandwidth, Spreading Factor 7, High Channel 927.5 MHz Limit







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



			TbtTx 2017.01.27	XMit 201
	: XB1301	Work Order:		
Serial Number			04/26/17	
	: APANA Inc	Temperature:		
Attendees			40.7% RH	
		Barometric Pres.:		
	: Brandon Hobbs Power: 5 VDC Nominal via 110VAC/60Hz	Job Site:	EV06	
EST SPECIFICAT				
CC 15.247:2017	ANSI C63.10:2013			
COMMENTS				
he power level se	ettings for the Yagi (12dBi) antenna data listed below are as follows: DAC = 4000, MXG = 8. The power level settings for ents were made at -20°C per client's request. A termination was placed on the unused antenna port while under test.	the Dipole antenna data listed below a	are as follows: DAC	C = 4000, MXG
EVIATIONS FRO	M TEST STANDARD			
None				
Configuration #	1 Skanature			
	- Ogradaro	Final Value (dBc)	Limit ≤ (dBc)	Result
'agi 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
Dinala Antonno	High Channel 927.5 MHz	-50.86	-30	Pass
ipole 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		00	1 433
	500 kHz Bandwidth			
	Spreading Factor 7			
	Low Channel 903 MHz	-60.48	-30	Pass
	High Channel 927.5 MHz	-43.39	-30	Pass
	·			



