

APANA Inc. PK1276 FCC 15.207:2017 FCC 15.247:2018 902.3 – 914.9 MHz Transceiver

Report # APAN0004





NVLAP Lab Code: 200629-0 NVLAP Lab Code: 200630-0

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# **CERTIFICATE OF TEST**



## Last Date of Test: January 16, 2018 APANA Inc. Model: PK1276

# **Radio Equipment Testing**

Standards	
Specification	Method
FCC 15.207:2017	ANSI C62 10:2012
FCC 15.247:2018	ANSI 003.10.2013

### Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
7.8.2	Carrier Frequency Separation	Yes	Pass	
7.8.3	Number of Hopping Frequencies	Yes	Pass	
7.8.4	Dwell Time	Yes	Pass	
7.8.6	Band Edge Compliance - Hopping Mode	Yes	Pass	
11.6	Duty Cycle	Yes	N/A	Characterization of radio operation.
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	

### **Deviations From Test Standards**

None

Approved By:

Rod Munro, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

# **REVISION HISTORY**



Revision Number	Description	Date	Page Number
00	None		

# ACCREDITATIONS AND AUTHORIZATIONS



### **United States**

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

### Canada

**ISED** - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

### European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

### Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

#### Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

#### Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

### Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

**NCC** - Recognized by NCC as a CAB for the acceptance of test data.

### Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

#### Israel

**MOC** – Recognized by MOC as a CAB for the acceptance of test data.

### Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

### Vietnam

**MIC** – Recognized by MIC as a CAB for the acceptance of test data.

## SCOPE

For details on the Scopes of our Accreditations, please visit: <u>http://portlandcustomer.element.com/ts/scope/scope.htm</u> <u>http://gsi.nist.gov/global/docs/cabs/designations.html</u>

# **MEASUREMENT UNCERTAINTY**



### **Measurement Uncertainty**

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

# FACILITIES





California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-17	Labs MN01-10	Labs NY01-04	Labs EV01-12	Labs TX01-09	Labs NC01-05
41 Tesla	9349 W Broadway Ave.	4939 Jordan Rd.	6775 NE Evergreen Pkwy #400	3801 E Plano Pkwy	19201 120 <sup>th</sup> Ave NE
(949) 861-8918	612)-638-5136	(315) 554-8214	(503) 844-4066	(469) 304-5255	(425)984-6600
(040)0010010	(012) 000 0100	(010) 004 0214	(000) 044 4000	(400) 004 0200	(420)004 0000
		NV	LAP		
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1, 2834E-3	N/A	2834D-1, 2834D- <i>2</i>	2834G-1	2834F-1
	BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
	VCCI				
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
	Recognized Phase	e I CAB for ACMA, BSM	I, IDA, KCC/RRA, MIC, M	OC, NCC, OFCA	
US0158	US0175	N/A	US0017	US0191	US0157



# **Test Setup Block Diagrams**





# **PRODUCT DESCRIPTION**



## **Client and Equipment Under Test (EUT) Information**

Company Name:	APANA Inc.
Address:	4290 Pacific Highway Ste A
City, State, Zip:	Bellingham, WA 98226
Test Requested By:	Matt W. Maher Peterson
Model:	PK1276
First Date of Test:	March 29, 2017
Last Date of Test:	January 16, 2018
Receipt Date of Samples:	March 2, 2017
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

### Information Provided by the Party Requesting the Test

### Functional Description of the EUT:

The PK1276 is a LoRa end node, which reads data from a water meter (once per 5 seconds is most frequent), and transmits the data at roughly 17 dBm in the 902 to 928 MHz range. The radio operates as a Hybrid radio. The PK1276 includes 3x Li-SOCL2 batteries size AA, and can operate for over 20 years on battery power (RF output +20dBm max). Alternatively, the device can be powered from wall power.

### **Testing Objective:**

Seeking to demonstrate compliance under FCC 15.247:2018 for Hybrid operation.



Software/Firmware Running during test		
Description	Version	
RealTerm	3.0.0.30	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Transmitter (Puck) Unit 2	APANA Inc	PK1276	7
Internal Antenna Chip	Antenova	A10472	None
External Antenna Dipole	2J-Antenna USA	2J2024B-915	None

Peripherals in test setup boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
USB HUB	Sabrant	HB-UM43	60013224614621	
AD/DC Adapter USB HUB	FLY Power	PS36A120K300UD	None	

Remote Equipment Outside of Test Setup Boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Laptop	Microsoft	Surface Pro 3	025613450653	
AC/DC Adapter Laptop	Microsoft	1625	0D130C0WZSF51	
DC Power Supply	TOPWARD Electronics	TPD	None	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.0m	No	USB HUB	PK1276 (Puck)
DC Power Cable USB HUB	No	1.52m	No	AC/DC Power Adapter	USB HUB
Antenna Cable	Unknown	5.1m	No	External Antenna	PK1276 (Puck)
Battery External DC Leads	No	9.1 m	Yes	DC Power Supply	PK1276 (Puck)
Nicor Cable	Yes	1.8 m	No	Unterminated	PK1276 (Puck)



Software/Firmware Running during test		
Description	Version	
RealTerm	3.0.0.30	

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Transmitter (Puck) Unit 3	APANA Inc	PK1276	12		
Internal Antenna Chip	Antenova	A10472	None		

Peripherals in test setup boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
USB HUB	Sabrant	HB-UM43	60013224614621		
AD/DC Adapter USB HUB	FLY Power	PS36A120K300UD	None		
50ohm load	None	None	None		

Remote Equipment Outside of Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Laptop	Microsoft	Surface Pro 3	025613450653		
AC/DC Adapter Laptop	Microsoft	1625	0D130C0WZSF51		
DC Power Supply	TOPWARD Electronics	TPD	None		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.0m	No	USB HUB	PK1276 (Puck)
DC Power Cable USB HUB	No	1.52m	No	AC/DC Power Adapter	USB HUB
Battery External DC Leads	No	9.1 m	Yes	DC Power Supply	PK1276 (Puck)
Nicor Cable	Yes	1.8 m	No	Unterminated	PK1276 (Puck)



Software/Firmware Running during test			
Description	Version		
RealTerm	3.0.0.30		

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Transmitter (Puck) Unit 3	APANA Inc	PK1276	12
Internal Antenna Chip	Antenova	A10472	None
External Antenna Dipole	2J-Antenna USA	2J2024B-915	None

Peripherals in test setup boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
AC/DC Adapter (Unit 1)	PHIHONG	PSA10F-050Q	None	

Remote Equipment Outside of Test Setup Boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Laptop	Microsoft	Surface Pro 3	025613450653	
DC Power Supply	TOPWARD Electronics	TPD	None	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Antenna cable	Unknown	5.1m	No	External Antenna	PK1276 (Puck)
Nicor Cable	Yes	1.8 m	No	Unterminated	PK1276 (Puck)
USB Cable	Yes	1.0m	No	AC/DC Adapter	PK1276 (Puck)



Software/Firmware Running during test			
Description	Version		
RealTerm	3.0.0.30		

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Transmitter (Puck) Unit 3	APANA Inc.	PK1276	12		
Internal Antenna Chip	Antenova	A10472	None		
External Antenna Dipole	2J-Antenna USA	2J2024B-915	None		

Peripherals in test setup boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
AC/DC Adapter (Unit 2)	Qualtek	QFAW-05-05	None	

Remote Equipment Outside of Test Setup Boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
Laptop	Microsoft	Surface Pro 3	025613450653			
DC Power Supply	TOPWARD Electronics	TPD	None			

Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2		
Antenna cable	Unknown	5.1m	No	External Antenna	PK1276 (Puck)		
Nicor Cable	Yes	1.8 m	No	Unterminated	PK1276 (Puck)		
USB Cable	Yes	1.0m	No	AC/DC Adapter	PK1276 (Puck)		



## Configuration APAN0004-1

Software/Firmware Running during test				
Description	Version			
RealTerm	3.0.0.33			
Firmware	6.2.3			

EUT						
Description	Manufacturer	Model/Part Number	Serial Number			
Transmitter (Puck)	Peckham Technology Inc.	PK1276	18-9B-A5-90-02-7B			

Peripherals in test setup boundary							
Description	Manufacturer	Model/Part Number	Serial Number				
Laptop	Microsoft	Surface Pro 3	025613450653				
USB HUB	Sabrant	HB-UM43	60013224614621				
AD/DC Adapter USB HUB	FLY Power	PS36A120K300UD	None				

Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2		
USB Cable	Yes	1.0m	No	USB HUB	PK1276 (Puck)		
DC Power Cable USB HUB	No	1.52m	No	AC/DC Power Adapter	USB HUB		
Nicor Cable	Yes	1.8 m	No	Unterminated	PK1276 (Puck)		
USB Cable	Yes	1.0m	Yes	USB HUB	Surface Pro 3		

# **MODIFICATIONS**



## **Equipment Modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
1	3/29/2017	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	4/14/2017	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client following the test.
3	1/16/2018	Dwell Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	1/16/2018	Band Edge Compliance – Hopping Mode	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	1/16/2018	Carrier Frequency Separation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	1/16/2018	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	1/16/2018	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	1/16/2018	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	1/16/2018	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	1/16/2018	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
11	1/16/2018	Number of Hopping Frequencies	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



### **TEST DESCRIPTION**

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 500hm measuring port is terminated by a 500hm EMI meter or a 500hm resistive load. All 500hm measuring ports of the LISN are terminated by 500hm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	10/4/2016	10/4/2018
Cable - Conducted Cable Assembly	Element	EVG, HHD, RKA	EVGA	5/10/2016	5/10/2017
Receiver	Rohde & Schwarz	ESCI	ARH	3/27/2017	3/27/2018

### **MEASUREMENT UNCERTAINTY**

Description						
Expanded k=2	2.4 dB	-2.4 dB				

### **CONFIGURATIONS INVESTIGATED**

PECK0001-13 PECK0001-14

### **MODES INVESTIGATED**

Tx, FHSS Single Channel Mode 125 kHz BW, Ext Antenna, Mid Ch. 908.7 MHz



EUT:	PK1276				Work Order:	PECK0001
Serial Number:	12				Date:	04/14/2017
Customer:	APANA Inc				Temperature:	23.2°C
Attendees:	Matt Maher	Matt Maher Peterson				34.5%
Customer Project:	None	None			Bar. Pressure:	1025 mb
Tested By:	Brandon Hot	obs			Job Site:	EV07
Power:	5 VDC Nominal via 120VAC/60Hz			Configuration:	PECK0001-14	
TEST SPECIFI	CATIONS					
Specification:				Method:		
FCC 15.207:2017				ANSI C63.1	0:2013	
TEST PARAMI	ETERS					
Run #: 9		Line:	High Line	A	Add. Ext. Attenuation (dB)	): 0
COMMENTS						
Customer provided software to control the radio Worst case antenna path was used for all measurements. An Attenuation setting of 10 was used for all measurements. Unit 2 power supply was used.						

### **EUT OPERATING MODES**

Tx, FHSS Single Channel Mode 125 kHz BW, Ext Antenna, Mid Ch. 908.7 MHz

### DEVIATIONS FROM TEST STANDARD

None



### 100 90 80 70 60 dBuV 50 40 30 20 10 0 0.1 1.0 10.0 100.0 MHz

#### Average Data - vs - Average Limit



### **RESULTS - Run #9**

Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
0.571	27.5	19.5	47.0	56.0	-9.0	
3.334	20.7	19.8	40.5	56.0	-15.5	
3.307	20.6	19.8	40.4	56.0	-15.6	
3.390	20.3	19.8	40.1	56.0	-15.9	
3.494	19.5	19.8	39.3	56.0	-16.7	
3.518	19.4	19.8	39.2	56.0	-16.8	
3.550	19.2	19.8	39.0	56.0	-17.0	

#### Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.571	17.6	19.5	37.1	46.0	-8.9
3.334	10.1	19.8	29.9	46.0	-16.1
3.307	10.0	19.8	29.8	46.0	-16.2
3.390	9.7	19.8	29.5	46.0	-16.5
3.494	8.4	19.8	28.2	46.0	-17.8
3.518	8.3	19.8	28.1	46.0	-17.9
3.550	8.0	19.8	27.8	46.0	-18.2

## CONCLUSION

Pass

Tested By



EUT:	PK1276				Work Order:	PECK0001				
Serial Number:	12			Date:	04/14/2017					
Customer:	APANA	APANA Inc Temperature: 23.2								
Attendees:	Matt Ma	her Peterson			Relative Humidity:	34.5%				
Customer Proje	ct: None				Bar. Pressure:	1025 mb				
Tested By:	Brandon	l Hobbs			Job Site:	EV07				
Power:	5 VDC N	ominal via 120	VAC/60Hz		Configuration:	PECK0001-14				
TEST SPEC	FICATION	S								
Specification:				Method:						
FCC 15.207:20	7			ANSI C63.10	0:2013					
TEST PARA	METERS									
Run #:	0	Line:	Neutral	A	dd. Ext. Attenuation (dB	): 0				
COMMENTS										
Customer provious setting of 10 wa	led software t s used for all	o control the rac measurements.	dio Worst case anter Unit 2 power supply	na path was use was used.	ed for all measurements.	An Attenuation				

**EUT OPERATING MODES** Tx, FHSS Single Channel Mode 125 kHz BW, Ext Antenna, Mid Ch. 908.7 MHz

### DEVIATIONS FROM TEST STANDARD

None



### 100 90 80 70 60 dBuV 50 40 30 20 10 0 0.1 1.0 10.0 100.0 MHz

### Average Data - vs - Average Limit



### **RESULTS - Run #10**

Q	Quasi Peak Data - vs - Quasi Peak Limit											
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)							
0.569	24.6	19.5	44.1	56.0	-11.9							
0.588	22.3	19.5	41.8	56.0	-14.2							
0.532	18.2	19.5	37.7	56.0	-18.3							
3.365	17.2	19.8	37.0	56.0	-19.0							
3.285	16.4	19.8	36.2	56.0	-19.8							
1.368	16.5	19.5	36.0	56.0	-20.0							

### Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.569	10.8	19.5	30.3	46.0	-15.7
0.588	8.6	19.5	28.1	46.0	-17.9
3.365	5.1	19.8	24.9	46.0	-21.1
0.532	5.1	19.5	24.6	46.0	-21.4
1.368	4.5	19.5	24.0	46.0	-22.0
3.285	3.9	19.8	23.7	46.0	-22.3

## CONCLUSION

Pass

Tested By



EUT:	PK1276				Work Order:	PECK0001
Serial Number:	12			Date:	04/14/2017	
Customer:	APANA Inc			Temperature:	23.2°C	
Attendees:	Matt Maher F	Peterson			Relative Humidity:	34.5%
Customer Project:	None				Bar. Pressure:	1025 mb
Tested By:	Brandon Hot	obs			Job Site:	EV07
Power:	5 VDC Nomi	nal via 120	VAC/60Hz		Configuration:	PECK0001-13
TEST SPECIFI	CATIONS					
Specification:				Method:		
FCC 15.207:2017				ANSI C63.1	0:2013	
TEST PARAME	ETERS					
Run #: 11		Line:	Neutral	ŀ	Add. Ext. Attenuation (dB)	): 0
COMMENTS						
Customer provided setting of 10 was u	software to co sed for all mea	ntrol the ra surements	idio Worst case antenna . Unit 1 power supply w	a path was us as used	ed for all measurements.	An Attenuation
EUT OPERATI	NG MODES					

Tx, FHSS Single Channel Mode 125 kHz BW, Ext Antenna, Mid Ch. 908.7 MHz

### DEVIATIONS FROM TEST STANDARD

None



### 100 90 80 70 60 dBuV 50 40 30 20 10 0 0.1 1.0 10.0 100.0 MHz

Peak Data - vs - Average Limit



#### #11

RESULIS - KUN #11 Peak Data - vs - Quasi Peak Limit												
Peak Data - vs - Quasi Peak Limit												
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)							
0.199	30.8	19.6	50.4	63.7	-13.3							
0.150	31.9	19.7	51.6	66.0	-14.4							
0.572	22.1	19.5	41.6	56.0	-14.4							
0.243	26.7	19.6	46.3	62.0	-15.7							
0.702	20.4	19.5	39.9	56.0	-16.1							
0.393	22.1	19.5	41.6	58.0	-16.4							
0.296	23.7	19.6	43.3	60.4	-17.1							
3.541	19.0	19.8	38.8	56.0	-17.2							
0.803	19.2	19.5	38.7	56.0	-17.3							
3.623	18.8	19.8	38.6	56.0	-17.4							
0.904	18.9	19.5	38.4	56.0	-17.6							
0.874	18.8	19.5	38.3	56.0	-17.7							
4.694	18.5	19.8	38.3	56.0	-17.7							
0.687	18.5	19.5	38.0	56.0	-18.0							
2.553	18.3	19.7	38.0	56.0	-18.0							
2.485	18.0	19.7	37.7	56.0	-18.3							
3.123	17.8	19.8	37.6	56.0	-18.4							
4.284	17.7	19.8	37.5	56.0	-18.5							
0.766	17.9	19.5	37.4	56.0	-18.6							
2.374	17.8	19.6	37.4	56.0	-18.6							
3.023	17.6	19.8	37.4	56.0	-18.6							
3.038	17.6	19.8	37.4	56.0	-18.6							
4.127	17.6	19.8	37.4	56.0	-18.6							
0.777	17.8	19.5	37.3	56.0	-18.7							
4.836	17.4	19.8	37.2	56.0	-18.8							
3.691	17.3	19.8	37.1	56.0	-18.9							

### Peak Data - vs - Average Limit

				Spec.	
Freq	Amp.	Factor	Adjusted	Limit	Margin
(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)
0.199	30.8	19.6	50.4	53.7	-3.3
0.150	31.9	19.7	51.6	56.0	-4.4
0.572	22.1	19.5	41.6	46.0	-4.4
0.243	26.7	19.6	46.3	52.0	-5.7
0.702	20.4	19.5	39.9	46.0	-6.1
0.393	22.1	19.5	41.6	48.0	-6.4
0.296	23.7	19.6	43.3	50.4	-7.1
3.541	19.0	19.8	38.8	46.0	-7.2
0.803	19.2	19.5	38.7	46.0	-7.3
3.623	18.8	19.8	38.6	46.0	-7.4
0.904	18.9	19.5	38.4	46.0	-7.6
0.874	18.8	19.5	38.3	46.0	-7.7
4.694	18.5	19.8	38.3	46.0	-7.7
0.687	18.5	19.5	38.0	46.0	-8.0
2.553	18.3	19.7	38.0	46.0	-8.0
2.485	18.0	19.7	37.7	46.0	-8.3
3.123	17.8	19.8	37.6	46.0	-8.4
4.284	17.7	19.8	37.5	46.0	-8.5
0.766	17.9	19.5	37.4	46.0	-8.6
2.374	17.8	19.6	37.4	46.0	-8.6
3.023	17.6	19.8	37.4	46.0	-8.6
3.038	17.6	19.8	37.4	46.0	-8.6
4.127	17.6	19.8	37.4	46.0	-8.6
0.777	17.8	19.5	37.3	46.0	-8.7
4.836	17.4	19.8	37.2	46.0	-8.8
3.691	17.3	19.8	37.1	46.0	-8.9

### CONCLUSION

Pass

Tested By



EUT:	PK1276				Work Order:	PECK0001
Serial Number:	12				Date:	04/14/2017
Customer:	APANA Inc				Temperature:	23.2°C
Attendees:	Matt Maher F	Peterson			Relative Humidity:	34.5%
Customer Project:	None				Bar. Pressure:	1025 mb
Tested By:	Brandon Hob	obs			Job Site:	EV07
Power:	5 VDC Nomi	nal via 120	VAC/60Hz		Configuration:	PECK0001-13
TEST SPECIFIC	CATIONS					
Specification:				Method:		
FCC 15.207:2017				ANSI C63.10	:2013	
TEST PARAME	TERS					
Run #: 12		Line:	High Line	A	dd. Ext. Attenuation (dB)	): 0
COMMENTS						
Customer provided setting of 10 was us	software to co ed for all meas	ntrol the ra surements	dio Worst case antenna Unit 1 power supply wa	a path was use as used	d for all measurements.	An Attenuation

### **EUT OPERATING MODES**

Tx, FHSS Single Channel Mode 125 kHz BW, Ext Antenna, Mid Ch. 908.7 MHz

### DEVIATIONS FROM TEST STANDARD

None





#### Average Data - vs - Average Limit



### **RESULTS - Run #12**

Q	Quasi Peak Data - vs - Quasi Peak Limit											
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)							
0.574	22.2	19.5	41.7	56.0	-14.3							
0.601	18.4	19.5	37.9	56.0	-18.1							
0.536	17.1	19.5	36.6	56.0	-19.4							
0.197	24.2	19.6	43.8	63.7	-19.9							
3.583	14.2	19.8	34.0	56.0	-22.0							
2.537	14.2	19.7	33.9	56.0	-22.1							

#### Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.574	12.2	19.5	31.7	46.0	-14.3
0.601	7.9	19.5	27.4	46.0	-18.6
0.536	7.5	19.5	27.0	46.0	-19.0
3.583	5.6	19.8	25.4	46.0	-20.6
2.537	5.7	19.7	25.4	46.0	-20.6
0.197	13.1	19.6	32.7	53.7	-21.0

## CONCLUSION

Pass

Tested By

# **SPURIOUS RADIATED EMISSIONS**



PSA-ESCI 2017.01.26

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

#### MODES OF OPERATION

Tx continuous FHSS 125 kHz BW, Spreading Factor 7

#### **CHANNEL OF OPERATION**

Low Ch. 902.3 MHz Mid Ch. 908.7 MHz High Ch. 914.9 MHz

#### **ANTENNA TYPES**

Internal Chip Antenna (P/N A10472) Peak 1.6 dBi External Dipole Antenna (P/N 2J2024B-915) Peak 3.0 dBi

#### POWER SETTINGS INVESTIGATED

5 VDC Nominal via 120VAC/60Hz

#### **CONFIGURATIONS INVESTIGATED**

PECK0001 - 1 PECK0001 - 8

#### FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 12400 MHz

#### SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50108	HFV	2/6/2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFB	5/18/2016	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HFT	1/4/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

#### **TEST DESCRIPTION**

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

## SPURIOUS RADIATED EMISSIONS



Worl	k Order:	PE	CK000	)1			Da	ite:	03/	29/17			>		1		
	Project:		None			Tem	nperatu	re:	22	.3 °C	/	1	-	1	1.	~	1
J	lob Site:		EV01				Humidi	ity:	43.6	6% RH	1	Tested by: Brandon Hobbs					
Serial N	Number:		07		B	arome	tric Pre	s.:	101	8 mbar							
	EUT:	PK1276	j														
Config	uration:	1															
Cu	stomer:	APANA	Inc														
Att	endees:	Canyon	Peckar	m, Ma	att Mah	ner-Pet	erson, l	David	Humph	ey							
EUT	Power:	5 VDC I	Vomina	ıl via 1	20VA	C/60Hz	7										
Operating	g Mode:	Tx conti	nuous I	FHSS	5 125 k	Hz BW	/ Pleas	e refer	ence th	e data com	ments for	additior	nal opera	ting mod	le cond	itions	
Dev	viations	None															
Con	nments	Please complet	eferend ed need	ce the d exte	e data ernal a	comme ntenna	ents for info no	EUT o w.	orientati	on, Antenna	a type, po	wer app	lied and	frequeny	. Intera	inl Ant	enn
t Specifi	cations									Test Met	hod						
15 247	2017									ANSI C6	3 10.2013						
Run #	106	Test	Distan	ce (m	)	3	Ante	nna H	leight(s	)	1 to 4(r	n)		Results		Pas	s
<b>Run #</b>	106	Test	Distan	ce (m	)	3	Ante	nna H	leight(s	)	1 to 4(r	n)		Results		Pas	s
80	106	Test	Distan	ce (m	)	3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	s
80	106	Test	Distan	ce (m	)	3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	s
<b>Run #</b>	106	Test	Distan	ce (m	)	3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	s
80 70	106	Test	Distan	ce (m	)	3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	S
80 70	106	Test	Distan	ce (m		3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	S
Run #       80       70       60	106	Test	Distan	ce (m		3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	S
Run #       80       70       60	106	Test	Distan	ce (m		3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	S
Run #       80       70       60       50	106	Test	Distan	ce (m		3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	S
Run #       80       70       60       50	106	Test		ce (m		3	Ante		leight(s		1 to 4(r	n)		Results		Pas	s
Run #       80       70       60       50	106	Test		ce (m		3	Ante		leight(s		1 to 4(r	n)		Results		Pas	SS
Run #       80       70       60       50	106	Test		ce (m		3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	5S
Run #       80       70       60       50       40	106					3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	SS
Run #       80       70       60       50       40		Test				3	Ante	nna H	leight(s		1 to 4(r	n)		Results		Pas	SS
Run #       80       70       60       50       40       30			Distan			3	Ante	nna H			1 to 4(r	n)				Pas	
Run #       80       70       60       50       50       30						3	Ante		leight(s		1 to 4(r	n)				Pas	
Run #       80       70       60       50       50       30						3	Ante		leight(s		1 to 4(r	n)				Pas	
Run #       80       70       60       50       40       30       20			Distan			3	Ante		leight(s		1 to 4(r	n)				Pas	
Run #       80       70       60       50       30       20						3	Ante		leight(s		1 to 4(r	n)				Pas	
Run #       80       70       60       50       50       30       20		Test	Distan			3	Ante		leight(s		1 to 4(r	n)				Pas	
Run #       80       70       60       50       50       30       20       10		Test				3	Ante				1 to 4(r	n)				Pas	\$\$
Run #     80     -       80     -     -       70     -     -       60     -     -       50     -     -       30     -     -       20     -     -       10     -     -						3	Ante				1 to 4(r	n)				Pas	
Run #     80						3	Ante				1 to 4(r	n)				Pas	
Run #     80       80     -       70     -       60     -       50     -       30     -       20     -       10     -       0     -						3	Ante				1 to 4(r	n)				Pas	
Run #     80     -       80     -     -       60     -     -       50     -     -       50     -     -       30     -     -       10     -     -       0     -     -			Distan			3					1 to 4(r	n)					

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
9149.085	54.3	-0.3	2.1	272.0	3.0	0.0	Horz	AV	0.0	54.0	54.0	0.0	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
9086.700	53.4	-0.3	1.0	166.0	3.0	0.0	Vert	AV	0.0	53.1	54.0	-0.9	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 8, EUT Vert
9086.970	52.8	-0.3	3.9	163.0	3.0	0.0	Vert	AV	0.0	52.5	54.0	-1.5	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 8, EUT On Side
9148.645	52.8	-0.3	1.8	267.0	3.0	0.0	Vert	AV	0.0	52.5	54.0	-1.5	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
9022.535	51.2	-0.3	2.1	267.0	3.0	0.0	Horz	AV	0.0	50.9	54.0	-3.1	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
8233,705	53.8	-3.0	2.2	284.0	3.0	0.0	Horz	AV	0.0	50.8	54.0	-3.2	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
9022.540	49.8	-0.3	1.8	276.0	3.0	0.0	Vert	AV	0.0	49.5	54.0	-4.5	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
8233,700	51.3	-3.0	1.9	303.0	3.0	0.0	Vert	AV	0.0	48.3	54.0	-5.7	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
7319.045	28.2	18.8	1.0	243.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
7269.345	28.2	18.6	2.3	221.0	3.0	0.0	Horz	AV	0.0	46.8	54.0	-7.2	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
7318.867	27.6	18.8	1.0	341.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
7269.640	27.7	18.6	1.0	220.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
9087.245	63.9	-0.3	2.0	265.0	3.0	0.0	Horz	PK	0.0	63.6	74.0	-10.4	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 8, EUT On Side
2706.785	41.0	1.5	1.0	332.0	3.0	0.0	Vert	AV	0.0	42.5	54.0	-11.5	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
9086.975	42.2	-0.3	1.2	9.0	3.0	0.0	Horz	AV	0.0	41.9	54.0	-12.1	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3609.285	34.1	6.9	1.0	211.0	3.0	0.0	Horz	AV	0.0	41.0	54.0	-13.0	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3609 215	33.8	6.9	1.0	179.0	3.0	0.0	Vert	AV	0.0	40.7	54.0	-13.3	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
3634 700	33.3	7 1	1.0	219.0	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
9086 410	60.6	-0.3	2.9	192.0	3.0	0.0	Vert	PK	0.0	60.3	74.0	-13.7	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 8, EUT Horz
9087 010	40.6	-0.3	2.0	265.0	3.0	0.0	Horz	AV	0.0	40.3	54.0	-13.7	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3659 605	33.0	7 1	1.0	243.0	3.0	0.0	Horz	AV	0.0	40.1	54.0	-13.9	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2744 750	38.2	1.6	3.9	24.0	3.0	0.0	Vert	AV	0.0	39.8	54.0	-14.2	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4511 580	29.0	10.2	2.5	287.0	3.0	0.0	Horz	AV	0.0	39.2	54.0	-14.8	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3634 690	32.0	7 1	1.0	182.0	3.0	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4511 440	28.6	10.2	1.0	298.0	3.0	0.0	Vert	AV	0.0	38.8	54.0	-15.2	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4543 465	28.2	10.3	1.0	360.0	3.0	0.0	Horz	AV	0.0	38.5	54.0	-15.5	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3659 542	31.1	7 1	1.0	180.0	3.0	0.0	Vert	AV	0.0	38.2	54.0	-15.8	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4543 495	27.9	10.3	12	284.0	3.0	0.0	Vert	AV	0.0	38.2	54.0	-15.8	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
7270 785	39.5	18.6	10	220.0	3.0	0.0	Vert	PK	0.0	58.1	74.0	-15.9	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4574 270	27.6	10.0	1.0	103.0	3.0	0.0	Horz		0.0	37.8	54.0	-16.2	High Ch 914 9 MHz Ext Antenna, 5VDC, Attenuation 10, EUT On Side
4574 908	27.5	10.2	1.0	118.0	3.0	0.0	Vert	AV/	0.0	37.7	54.0	-16.3	High Ch 914 9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
7319 330	38.5	18.8	1.0	243.0	3.0	0.0	Horz	PK	0.0	57.3	74.0	-16.7	High Ch 914 9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2726.010	35.7	1.6	1.0	15.0	3.0	0.0	Vert		0.0	37.3	54.0	-16.7	Mid Ch 908 7 MHz Ext Antenna 5V/DC Attenuation 10 EUT Horz
7317 759	38.3	19.9	1.0	341.0	3.0	0.0	Vert	DK	0.0	57.1	74.0	16.0	High Ch 914 9 MHz, Ext Antenna, 5V/DC, Attenuation 10, EUT Horz
7268 845	38.4	19.6	2.3	221.0	3.0	0.0	Horz		0.0	57.0	74.0	17.0	Mid Ch 908 7 MHz, Ext Antenna, 5V/DC, Attenuation 10, EUT Nor2
0087.015	56.8	0.3	2.0	265.0	3.0	0.0	Horz		0.0	56.5	74.0	17.5	Mid Ch 908 7 MHz, Ext Antenna, 5VDC, Attenuation 9, EUT On Side
0087 165	56.6	-0.3	2.0	320.0	3.0	0.0	Horz		0.0	56.3	74.0	17.7	Mid Ch 908 7 MHz, Ext Antenna, 5VDC, Attenuation 8, EUT Horz
0086 000	56.6	-0.3	2.5	265.0	3.0	0.0	Horz	PK	0.0	56.3	74.0	17.7	Mid Ch 908 7 MHz, Ext Antenna, 5VDC, Attenuation 9, EUT On Side
2744 630	34.7	-0.5	2.1	203.0	3.0	0.0	Horz		0.0	36.3	54.0	17.7	High Ch 914 9 MHz Ext Antenna 5\/DC Attenuation 10 EUT On Side
2144.030	56.3	1.0	1.0	165.0	3.0	0.0	Horz		0.0	56.0	74.0	-17.7	Mid Ch 908 7 MHz Ext Antenna 5V/DC Attenuation 8 ELIT Vert
3007.400	50.5	-0.3	1.0	272.0	3.0	0.0			0.0	50.0	74.0	-10.0	High Ch 014 0 MHz, Ext Antenna, 5VDC, Attenuation 0, EUT Velt
9146.290	56.1	-0.3	2.1	212.0	3.0	0.0	HUIZ	PK	0.0	00.6	74.0	-10.2	riigh Gh.314.3 Winz, ExcAntenna, 3VDC, Attenuation To, EUT On Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	
0000.045	55.0			007.0				DI		55.5	74.0	10.5	Low Ch 000 0 MULE Fut Astronge FV/DO. Attenuation 40. FUE On Side
9022.215	55.8	-0.3	2.1	267.0	3.0	0.0	Horz	PK	0.0	55.5	74.0	-18.5	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2706.945	33.0	1.5	1.0	213.0	3.0	0.0	Horz	AV	0.0	35.3	54.0	-10.7	Mid Ch 009 7 MHz, Ext Antenna, SVDC, Attenuation 9, EUT Visit
9087.340	22.1	-0.3	1.0	100.0	3.0	0.0	Ven	PK	0.0	24.8	74.0	-19.2	Mid Ch 908 7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2720.110	55.2	1.0	1.0	162.0	3.0	0.0	Vort	RV	0.0	54.0	54.0	-19.2	Mid Ch 008 7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
9060.030	54.0	-0.3	3.9	267.0	3.0	0.0	Vert		0.0	54.5	74.0	-19.7	High Ch 014 0 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
9149.200	55.6	-0.3	1.0	207.0	3.0	0.0	Horz		0.0	52.6	74.0	-19.7	High Ch 914 9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
0022 565	52.7	-5.0	1.8	276.0	3.0	0.0	Vert	PK	0.0	52.0	74.0	-21.4	Low Ch 902 3 MHz, Ext Antenna, 5V/DC, Attenuation 10, EUT Horz
8233 695	53.6	-3.0	1.0	303.0	3.0	0.0	Vert	PK	0.0	50.6	74.0	-23.4	High Ch 914 9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
9085 570	29.8	-0.0	1.0	173.0	3.0	0.0	Horz		0.0	29.5	54.0	-24.5	Mid Ch 908 7 MHz Ext Antenna Battery Attenuation 0 EUT On Side
9085 690	29.8	-0.3	2.6	310.0	3.0	0.0	Vert	AV	0.0	29.5	54.0	-24.5	Mid Ch.908.7 MHz, Ext Antenna, Battery, Attenuation 0, EUT Horz
9086 435	49.4	-0.3	2.0	265.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
4543 355	38.8	10.3	1.0	360.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	Mid Ch 908 7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
4510.640	38.8	10.2	1.0	298.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Low Ch.902.3 MHz. Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4542,635	38.6	10.3	1.2	284.0	3.0	0.0	Vert	PK	0.0	48.9	74.0	-25.1	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4511.700	38.7	10.2	2.5	287.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3609,260	41.9	6.9	1.0	179.0	3.0	0.0	Vert	PK	0.0	48.8	74.0	-25.2	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
4575.200	38.5	10.2	1.0	103.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3608.990	41.8	6.9	1.0	211.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3634.605	41.0	7.1	1.0	219.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
3659.130	40.9	7.1	1.0	243.0	3.0	0.0	Horz	PK	0.0	48.0	74.0	-26.0	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
4575.892	37.7	10.2	1.0	118.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
2707.090	46.2	1.5	1.0	332.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
3634.670	40.5	7.1	1.0	182.0	3.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
3659.583	39.4	7.1	1.0	180.0	3.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
9086.720	46.4	-0.3	1.2	9.0	3.0	0.0	Horz	PK	0.0	46.1	74.0	-27.9	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2744.583	43.9	1.6	3.9	24.0	3.0	0.0	Vert	PK	0.0	45.5	74.0	-28.5	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
2726.165	43.9	1.6	1.0	15.0	3.0	0.0	Vert	PK	0.0	45.5	74.0	-28.5	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT Horz
2744.595	42.9	1.6	1.0	241.0	3.0	0.0	Horz	PK	0.0	44.5	74.0	-29.5	High Ch.914.9 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2707.030	42.4	1.5	1.0	213.0	3.0	0.0	Horz	PK	0.0	43.9	74.0	-30.1	Low Ch.902.3 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
2725.910	42.2	1.6	1.0	272.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	Mid Ch.908.7 MHz, Ext Antenna, 5VDC, Attenuation 10, EUT On Side
9086.145	41.0	-0.3	1.0	173.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Mid Ch.908.7 MHz, Ext Antenna, Battery, Attenuation 0, EUT On Side
9086.945	40.7	-0.3	2.6	310.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Mid Ch.908.7 MHz, Ext Antenna, Battery, Attenuation 0, EUT Horz

## SPURIOUS RADIATED EMISSIONS



Work Order					
WORK Order	: PECK0001	Date:	03/29/17		1 1
Project	: None	Temperature:	22.4 °C	frit	fart
Job Site	: EV01	Humidity:	34.8% RH	1 6	
Serial Number	: 12	Barometric Pres.:	1021 mbar	Tested by: Brandor	n Hobbs
EUT	: PK1276				
Configuration	: 8				
Customer	: APANA Inc				
Attendees	: David Humphrey				
EUT Power	: 5 VDC Nominal via 12	20VAC/60Hz			
Operating Mode	: Tx continuous FHSS	ments for additional operating m	ode conditions		
Deviations	None				
Comments	Please reference the completed need exter	data comments for EUT o rnal antenna info now.	prientation, Antenna	a type, power applied and freque	ny. Interanl Antenna
st Specifications			Test Met	hod	
<b>Run #</b> 114	Test Distance (m)	3 Antenna H	leight(s)	1 to 4(m) Resul	ts Pass
80					
70					
70 60					
70       60       50					
70					
70 60 50 40 30					
70   60   50   40   30   20					
70 60 50 50 40 30 20 10					
70 60 50 40 30 20 10 0					

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
9148.530	48.5	-0.3	2.1	240.0	3.0	0.0	Vert	AV	0.0	48.2	54.0	-5.8	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
7318.850	27.6	18.8	1.0	351.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
7269.500	27.7	18.6	1.2	273.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
7270.460	27.6	18.6	1.0	127.0	3.0	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
7319.325	27.4	18.8	1.0	215.0	3.0	0.0	Horz	AV	0.0	46.2	54.0	-7.8	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9086.965	46.0	-0.3	2.3	130.0	3.0	0.0	Horz	AV	0.0	45.7	54.0	-8.3	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Vert
2706.785	44.2	1.5	1.0	126.0	3.0	0.0	Vert	AV	0.0	45.7	54.0	-8.3	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
9086.735	44.6	-0.3	2.4	303.0	3.0	0.0	Vert	AV	0.0	44.3	54.0	-9.7	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2726.070	42.4	1.6	1.0	126.0	3.0	0.0	Vert	AV	0.0	44.0	54.0	-10.0	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
2744.605	42.2	1.6	1.0	340.0	3.0	0.0	Vert	AV	0.0	43.8	54.0	-10.2	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
2726.020	41.3	1.6	1.0	148.0	3.0	0.0	Horz	AV	0.0	42.9	54.0	-11.1	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2744.560	41.3	1.6	1.0	256.0	3.0	0.0	Horz	AV	0.0	42.9	54.0	-11.1	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9022.660	43.0	-0.3	2.0	301.0	3.0	0.0	Vert	AV	0.0	42.7	54.0	-11.3	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9022.865	42.7	-0.3	1.2	164.0	3.0	0.0	Horz	AV	0.0	42.4	54.0	-11.6	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
2706.910	40.9	1.5	1.0	152.0	3.0	0.0	Horz	AV	0.0	42.4	54.0	-11.6	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9148.500	42.5	-0.3	1.0	154.0	3.0	0.0	Horz	AV	0.0	42.2	54.0	-11.8	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3634.670	33.9	7.1	1.0	304.0	3.0	0.0	Horz	AV	0.0	41.0	54.0	-13.0	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
5415.175	27.5	11.9	1.0	349.0	3.0	0.0	Horz	AV	0.0	39.4	54.0	-14.6	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3659.470	32.3	7.1	1.0	309.0	3.0	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
5413.835	27.4	11.9	1.0	278.0	3.0	0.0	Vert	AV	0.0	39.3	54.0	-14.7	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
3659.535	32.2	7.1	1.0	320.0	3.0	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3609.020	31.9	6.9	1.0	275.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3634.780	31.7	7.1	1.0	230.0	3.0	0.0	Vert	AV	0.0	38.8	54.0	-15.2	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
3609.020	31.2	6.9	1.0	245.0	3.0	0.0	Vert	AV	0.0	38.1	54.0	-15.9	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
8233.630	40.9	-3.0	1.1	192.0	3.0	0.0	Vert	AV	0.0	37.9	54.0	-16.1	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4543.520	27.5	10.3	1.0	142.0	3.0	0.0	Vert	AV	0.0	37.8	54.0	-16.2	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4544.375	27.5	10.3	1.0	0.0	3.0	0.0	Horz	AV	0.0	37.8	54.0	-16.2	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
8234.075	40.7	-3.0	2.2	257.0	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
4575.615	27.5	10.2	1.0	0.0	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
4511.215	27.5	10.2	3.2	211.0	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
4512.390	27.5	10.2	1.0	298.0	3.0	0.0	Vert	AV	0.0	37.7	54.0	-16.3	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4574.805	27.5	10.2	2.0	295.0	3.0	0.0	Vert	AV	0.0	37.7	54.0	-16.3	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
7269.925	38.9	18.6	1.2	273.0	3.0	0.0	Vert	PK	0.0	57.5	74.0	-16.5	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4575.290	27.3	10.2	1.0	331.0	3.0	0.0	Horz	AV	0.0	37.5	54.0	-16.5	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
7269.725	38.7	18.6	1.0	127.0	3.0	0.0	Horz	PK	0.0	57.3	74.0	-16.7	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
7320.625	38.3	18.8	1.0	351.0	3.0	0.0	Vert	PK	0.0	57.1	74.0	-16.9	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
7318.025	37.9	18.8	1.0	215.0	3.0	0.0	Horz	PK	0.0	56.7	74.0	-17.3	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3659.990	28.2	7.1	1.0	131.0	3.0	0.0	Horz	AV	0.0	35.3	54.0	-18.7	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2743.320	30.6	1.6	1.2	260.0	3.0	0.0	Horz	AV	0.0	32.2	54.0	-21.8	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9148.825	31.7	-0.3	1.0	301.0	3.0	0.0	Vert	AV	0.0	31.4	54.0	-22.6	High Ch.914.9 MHz, Int Antenna, Battery, Attenuation 0, EUT Horz
9148.735	31.4	-0.3	1.0	32.0	3.0	0.0	Horz	AV	0.0	31.1	54.0	-22.9	High Ch.914.9 MHz, Int Antenna, Battery, Attenuation 0, EUT On Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
9148 325	51.2	-0.3	21	240.0	3.0	0.0	Vert	PK	0.0	50.9	74.0	-23.1	High Ch.914.9 MHz. Int Antenna, 5VDC, Attenuation 10, EUT Horz
5415.040	38.4	11.9	1.0	349.0	3.0	0.0	Horz	PK	0.0	50.3	74.0	-23.7	Low Ch.902.3 MHz. Int Antenna, 5VDC, Attenuation 10, EUT On Side
5415,150	38.3	11.9	1.0	278.0	3.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
2706.670	47.9	1.5	1.0	126.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
9086.655	49.4	-0.3	2.3	130.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Vert
4573.390	38.9	10.2	2.0	295.0	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4511.830	38.6	10.2	1.0	298.0	3.0	0.0	Vert	PK	0.0	48.8	74.0	-25.2	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
3634.785	41.7	7.1	1.0	304.0	3.0	0.0	Horz	PK	0.0	48.8	74.0	-25.2	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
4512.825	38.5	10.2	3.2	211.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
4544.545	38.3	10.3	1.0	0.0	3.0	0.0	Horz	PK	0.0	48.6	74.0	-25.4	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2726.060	46.9	1.6	1.0	126.0	3.0	0.0	Vert	PK	0.0	48.5	74.0	-25.5	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4574.280	38.3	10.2	1.0	331.0	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9086.665	48.6	-0.3	2.4	303.0	3.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
4573.625	37.9	10.2	1.0	0.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2744.685	46.5	1.6	1.0	340.0	3.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
3609.180	41.1	6.9	1.0	245.0	3.0	0.0	Vert	PK	0.0	48.0	74.0	-26.0	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
4544.375	37.7	10.3	1.0	142.0	3.0	0.0	Vert	PK	0.0	48.0	74.0	-26.0	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
3659.485	40.8	7.1	1.0	309.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
2744.555	46.2	1.6	1.0	256.0	3.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3659.735	40.7	7.1	1.0	320.0	3.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2725.950	46.1	1.6	1.0	148.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
2706.780	46.0	1.5	1.0	152.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3609.130	40.6	6.9	1.0	275.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9022.605	47.4	-0.3	1.2	164.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
3635.325	39.8	7.1	1.0	230.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Mid Ch.908.7 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
9148.380	47.1	-0.3	1.0	154.0	3.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9023.295	47.1	-0.3	2.0	301.0	3.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
3659.855	38.9	7.1	1.0	131.0	3.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
8234.235	47.3	-3.0	2.2	257.0	3.0	0.0	Horz	PK	0.0	44.3	74.0	-29.7	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
8233.445	47.0	-3.0	1.1	192.0	3.0	0.0	Vert	PK	0.0	44.0	74.0	-30.0	High Ch.914.9 MHz, Int Antenna, 5VDC, Attenuation 10, EUT Horz
2745.590	42.2	1.6	1.2	260.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	Low Ch.902.3 MHz, Int Antenna, 5VDC, Attenuation 10, EUT On Side
9148.940	43.0	-0.3	1.0	301.0	3.0	0.0	Vert	PK	0.0	42.7	74.0	-31.3	High Ch.914.9 MHz, Int Antenna, Battery, Attenuation 0, EUT Horz
9147.800	42.7	-0.3	1.0	32.0	3.0	0.0	Horz	PK	0.0	42.4	74.0	-31.6	High Ch.914.9 MHz, Int Antenna, Battery, Attenuation 0, EUT On Side



XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The channel carrier frequencies in the 902-928 MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.



						NweTx 2016.09.14.2	XMit 2017.12.13
EUT	: PK1276				Work Order:	APAN0004	
Serial Number	: 18-9B-A5-90-02-7B				Date:	16-Jan-18	
Customer	: APANA Inc.				Temperature:	23 °C	
Attendees	: Matt Maher Peterson, Da	vid Humphrey			Humidity:	35% RH	
Project	: None		Barometric Pres.:	1025 mbar			
Tested by	Richard Mellroth		Power:	USB	Job Site:	NC02	
TEST SPECIFICAT	TIONS			Test Method			
FCC 15.247:2018				ANSI C63.10:2013			
COMMENTS							
Power Setting = D	efault = 10.						
•							
DEVIATIONS FRO	M TEST STANDARD						
None							
			01 h				
Configuration #	1		VIEN				
		Signature	por ic				
						Limit	
					Value	(≥)	Results
Hopping Mode							
	Spreading Factor 7						
	Lower Chanr	nel Set (Ch 0 - Ch 3)			200.1 kHz	140 kHz	Pass
	Upper Chanr	nel Set (Ch 4 - Ch 7)			200.6 kHz	140 kHz	Pass
	Spreading Factor 10						
	Lower Chann	nel Set (Ch 0 - Ch 3)			185.1 kHz	140 kHz	Pass
	Upper Chanr	nel Set (Ch 4 - Ch 7)			200.1 kHz	140 kHz	Pass



NweTx 2016.09.14.2 XMit 2017.12.13





NweTx 2016.09.14.2 XMit 2017.12.13



Center 914.6000 MHz #Res BW 100 kHz

#VBW 10 kHz

Span 1.500 MHz Sweep 1.200 ms (3000 pts)

# NUMBER OF HOPPING FREQUENCIES



XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

Per FCC publication 453039, for Hybrid systems using both digtal modulation and frequency hopping techniques at the same time on the same carrier, there is no requirement on the minimum number of channels associated with this type of hybrid system.

# NUMBER OF HOPPING FREQUENCIES

8

						NweTx 2016.09.14.	2 XMit 2017.12.13		
EUT	: PK1276				Work Order:	APAN0004			
Serial Number	: 18-9B-A5-90-02-7B				Date:	16-Jan-18			
Customer	: APANA Inc.				Temperature:	23 °C			
Attendees	: Matt Maher Peterson, Da	avid Humphrey	Humidity:	35% RH					
Project	: None		Barometric Pres.:	1025 mbar					
Tested by	Richard Mellroth		Power:	USB	Job Site:	NC02			
TEST SPECIFICAT	TIONS			Test Method					
FCC 15.247:2018				ANSI C63.10:2013					
COMMENTS									
Power Setting = D	Power Setting = Default = 10.								
<b>DEVIATIONS FRO</b>	M TEST STANDARD								
None									
Configuration #	1	Signature	flight						
					Number of	Limit	Posulte		
Honning Mode					Channels	Lannt	Results		
Hopping Mode	Spreading Eactor 7								
	Upper and L	ower Channel Sets	8	N/A	N/A				
	Spreading Factor 10				0				
	Upper and L	ower Channel Sets			8	N/A	N/A		
	Opper and L	ower Channel Sets	0	IN/A	IN/A				

## NUMBER OF HOPPING FREQUENCIES



weTx 2016.09.14.2 XMit 2017.12.13



Start 902.000 MHz #Res BW 51 kHz

STATUS

#VBW 10 kHz

Stop 916.000 MHz Sweep 21.99 ms (3000 pts)


XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The hopping function of the EUT was enabled.

The dwell time limit for a hybrid system operating in the 902-928 MHz is based on the -20dB bandwidth of the hopping channel. For operating channels with -20dB bandwidths less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.



								XMit 2017.12.13
EUT	: PK1276					Work Order:	APAN0004	
Serial Number	: 18-9B-A5-90-02-7B					Date: 1	16-Jan-18	
Customer	: APANA Inc.					Temperature: 2	23 °C	
Attendees	Matt Maher Peterson, Da	avid Humphrev				Humidity: 3	35% RH	
Project	: None					Barometric Pres.: 1	1025 mbar	
Tested by	Richard Mellroth		Power: USB			Job Site: N	NC02	
TEST SPECIFICAT	TIONS		Test Method					
ECC 15 247 2018			ANSI C63 10:2013					
			74101 00011012010					
COMMENTS								
Power Setting = D	efault = 10.							
DEVIATIONS FRO	M TEST STANDARD							
None		T						
Configuration #	1		01.1					
Configuration #	· ·	Signature	hisic					
				Pulse Width	Number of	On Time per	Limit	
				(mS)	Pulses	20 Sec (mS)	(mS)	Result
Hopping Mode								
	Spreading Factor 7							
	Low Channe	el 0, 902.3 MHz						
		Pulse Width		51.35	N/A	N/A	N/A	N/A
		60 second sweep (1)		N/A	1	51.35	400	Pass
		60 second sweep (2)		N/A	1	51.35	400	Pass
		60 second sweep (3)		N/A	1	51.35	400	Pass
	High Channe	el 7, 914.9 MHz						
		Pulse Width		51.69	N/A	N/A	N/A	N/A
		60 second sweep (1)		N/A	1	51.69	400	Pass
		60 second sweep (2)		N/A	2	51.69	400	Pass
		60 second sweep (3)		N/A	2	103.38	400	Pass
	Spreading Factor 10							
	Low Channe	el 0, 902.3 MHz						
		Pulse Width		329.8	N/A	N/A	N/A	N/A
		60 second sweep (1)		N/A	1	329.8	400	Pass
		60 second sweep (2)		N/A	1	329.8	400	Pass
		60 second sweep (3)		N/A	1	329.8	400	Pass
	High Channe	el 7, 914.9 MHz						
		Pulse Width		329.8	N/A	N/A	N/A	N/A
		60 second sweep (1)		N/A	1	329.8	400	Pass
		60 second sweep (2)		N/A	1	329.8	400	Pass
		60 second sweep (3)		N/A	1	329.8	400	Pass
		1 1 7						



XMit 2017.12.13

Hopping Mode, Spreading Factor 7, Low Channel 0, 902.3 MHz, Pulse Width Pulse Width Number of On Time per Limit (mS) 51.35 20 Sec (mS) (mS) Pulses Result N/A N/A N/A N/A 09:07:25 AM Jan 17, 2018 TRACE 1 2 3 4 5 6 TYPE DET NNNNN m Analyzer - Northwest EMC, Inc Keysight Sp SENSE:INT ALIGN OFF Trig Delay-100.0 ms Trig: Video Atten: 10 dB PNO: Wide ↔ IFGain:Low ΔMkr1 51.35 ms -6.96 dB Ref Offset 20.59 dB Ref 20.59 dBm 5 dB/div X 1Δ2 Center 902.300000 MHz Res BW 51 kHz Span 0 Hz Sweep 1.000 s (3000 pts) #VBW 10 kHz STATUS

Hopping Mode, Spreading Factor 7, Low Channel 0, 902.3 MHz, 60 second sweep (1)										
		Pulse Width	Number of	On Time per	Limit					
		(mS)	Pulses	20 Sec (mS)	(mS)	Result				
		N/A	1	51.35	400	Pass				

🔤 Keysigl	ht Spectrum Anal	yzer - Northwest EMC,	Inc					
LXI RL	RF	50 Ω DC		SENSE:INT	ALIGN OFF		08:40:27	AM Jan 17, 2018
			PNO: Wide ↔ IFGain:Low	. Trig: Free R #Atten: 10 d	#Avg Typ un B	e: Log-Pwr	T	ACE 1 2 3 4 5 6 YPE WWWWWWWW DET P P P P P P
5 dB/div	Ref Of Ref 2	fset 20.59 dB 0.59 dBm						
Log								
15.6								
10.6								
10.0								
5.59								
0.590								
-4.41								
-9.41								
-14.4								
-19.4								
-24.4								
Center	902.3000	00 MHz						Span 0 Hz
Res B	N 51 kHz		#VB	W 10 kHz		Swe	ep 60.00 s	(3000 pts)
MSG					STATUS			



Keysight Spectrum Analyzer - Northwest EMC, Inc	SE				
XX RL RF 50Ω DC	SE				
	PNO: Wide ↔ IFGain:Low	VSE:INT Trig: Free Run Atten: 10 dB	ALIGN OFF Avg Type: L	og-Pwr	08:52:05 AM Jan 17, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWW DET N N N N N
Ref Offset 20.59 dB 5 dB/div Ref 20.59 dBm					
15.0					
10.0					
10.8					
5.59					
0.690					
-4.41					
-9.41					
-14,4					
-19.4					
-24.4					
Center 902.300000 MHz Res BW 51 kHz	#VBW	10 kHz		Sweep	Span 0 Hz 50.00 s (3000 pts)
MSG			STATUS		
Hopping Mode	, Spreading Factor	7, Low Channel 0	, 902.3 MHz, 60 se	econd sweep (3)	

	Hopping Mode, S	Spreading Factor	7, Low Channel 0	, 902.3 MHz, 60 s	second sweep (3)	)
		Pulse Width	Number of	On Time per	Limit	
		(mS)	Pulses	20 Sec (mS)	(mS)	Result
		N/A	1	51.35	400	Pass

Keysight Spe	ctrum Analyzer - Northwest EMC, Inc	c					
IXI RL	RF 50 Ω DC		SENSE:INT	ALIGN OFF		08:54:49 AM Ja	n 17, 2018
		PNO: Wide ↔ IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Type:	Log-Pwr	TRACE TYPE DET	23456 WWWWWW NNNNN
5 dB/div Log	Ref Offset 20.59 dB Ref 20.59 dBm						
15.6							
10.6							
5.59							
0.590							
-4.41							
-9.41							
-14.4							
-19.4							
-24.4							
Center 90 Res BW 5	2.300000 MHz 1 kHz	#VB1	N/ 10 kHz		Swe	Spa ep 60.00 s (30	n 0 Hz 00 pts)
MSG				STATUS			



	Dules Width		,	,	
	Puise Width	Number of	On Time per	Limit	
	(mS)	Pulses	20 Sec (mS)	(mS)	Result
	51.69	N/A	N/A	N/A	N/A
					-
Keysight Spectrum Analyzer - Northwest EMC, I	nc	NCCANT	A NICH OFF		
KE KF 50 12 DC	SE	Trig Delay-100.0 m	IS #Avg Type	: Log-Pwr	TRACE 1 2 3 4 5 6
	PNO: Wide	Trig: Video			DET P P P P P P
	IFGain:Low	#Atten: To db			Mkr1 51 60 mc
Ref Offset 20.59 dB				L	-8 37 dB
15.6					
10.6					
5.59					
		V.			
0.590		^2			
4.44					TRICINA
-4.41			1Δ2		
-9 41					
-14.4					
-19.4					
-24.4					
Cepter 014 300000 MHz					Span 0 Hz
Res BW 51 kHz	#VBW	/ 10 kHz		Sweep	1.000 s (3000 pts)
MSG			STATUS	•	
Hopping Mod	le, Spreading Factor	7, High Channel 7	7, 914.9 MHz, 60	second sweep (1	I)
	Pulse Width	Number of	On Time per	Limit	

	11 0 ,	Pulse Width	Number of	On Time per	Limit	
		(mS)	Pulses	20 Sec (mS)	(mS)	Result
		N/A	1	51.69	400	Pass

🔤 Keysight Sp	ectrum Analyzer - North	west EMC, Inc					
LX/RL	RF 50 Ω	DC	S	ENSE:INT	ALIGN OFF		09:50:48 AM Jan 17, 2018
			PNO: Wide +++ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P P P P P P
5 dB/div Log <sub>v</sub> r	Ref Offset 20.59 Ref 20.59 dE	9 dB 3m					
15.6							
10.6							
5.59							
0.590							
-4.41							
-9.41							
-19.4							
-24.4							
Center 91	14.300000 MHz	2	4\/D\			0	Span 0 Hz
Kes BW 5	DIEKEZ		#VBV	N TU KHZ	STATUS	Swee	p 60.00 s (3000 pts)



	Puise width (mS)	Number of Pulses	On Time per 20 Sec (mS)	Limit (mS)	Result
	N/A	2	51.69	400	Pass
RL RF 50 Ω DC	<u> </u>	ENSE:INT	ALIGN OFF		09:58:37 AM Jan 17, 2018
	PNO: Wide ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: L	og-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET PPPPP
Ref Offset 20.59 dB					ΔMkr1 20.91 s
Log			1/2		0.00 ab
15.5	X2				
13.0					
10.6					
5.70					
5.59					
0.590					
4 41					
~44,441					
-9.41					
-14.4					
-19.4					
-24.4					
Center 914.300000 MHz	#\/B\/			Swoor	Span 0 Hz

	I	Hopping Mode, S	preading Factor 7	7, High Channel 7	7, 914.9 MHz, 60	second sweep (3	)	
			Pulse Width	Number of	On Time per	Limit		
			(mS)	Pulses	20 Sec (mS)	(mS)	Result	
Γ			N/A	2	103.38	400	Pass	

Keysight Specific Keysight	ectrum Anal	lyzer - Northwest EMC,	Inc			
LXI RL	RF	50 Ω DC		SENSE:INT	ALIGN OFF	10:00:05 AM Jan 17, 2018
			PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Log-Pw	TRACE 2 3 4 5 6 TYPE WWWWWW DET P P P P P P
5 dB/div Log	Ref Of Ref 2	fset 20.59 dB 0.59 dBm				
15.6						
10.6						
5.59						
0.590						
-4.41						
-9.41						
-14.4						
-19.4						
-24.4						
Center 91 Res BW 5	4.3000 1 kHz	00 MHz	#V	BW 10 kHz		Span 0 Hz Sweep 60.00 s (3000 pts)
MSG					STATUS	



		Pulse Width (mS)	Number of Pulses	On Time per 20 Sec (mS)	Limit (mS)	Result
		329.8	N/A	N/A	N/A	N/A
Keysight Spectrum	Analyzer - Northwest EMC, Inc					
L <mark>XU</mark> RL R	F 50 Ω DC	PNO: Wide	ENSE:INT Trig Delay-100.0 Trig: Video #Atten: 10 dB	ALIGN OFF 0 ms #Avg Type	e: Log-Pwr	08:18:41 AM Jan 17, 2018 TRACE 1 2 3 4 5 6 TYPE DET P P P P P
Re 5 dB/div <b>R</b> e	f Offset 20.59 dB f 20.00 dBm				L	Mkr1 329.8 ms -32.70 dB
15.0	<u> </u>		<u>ANNINA MA</u>			
10.0	X2					
5.00						
0.00						
-5.00						TRIG LVL
-10.0						
-15.0						
-20.0			142	2		
26.0						
Center 902.3	00000 MHz	#\/B)/	V 10 kHz		Sween	Span 0 Hz

ŀ	Hopping Mode, S	preading Factor 1	0, Low Channel	0, 902.3 MHz, 60	second sweep (1	)	
		Pulse Width	Number of	On Time per	Limit		
		(mS)	Pulses	20 Sec (mS)	(mS)	Result	
		N/A	1	329.8	400	Pass	

Keysight Spectrum Analyzer - Northwest I	EMC, Inc			
LX/ RL   RF   50 Ω DC	S	ENSE:INT	ALIGN OFF #Avg Type: Log-F	08:31:14 AM Jan 17, 2018 Wr TRACE 1 2 3 4 5 6 TYPE Watananaa
	PNO: Wide	#Atten: 10 dB		DET PPPPP
Ref Offset 20.59 dE 5 dB/div Ref 20.59 dBm	3			
Log				
15.6				
10.6				
5.50				
5.59				
0.590				
-4.41				
-9.41				
-14.4				
-19.4				
-24.4				
Center 902.300000 MHz				Span 0 Hz
Res BW 51 KHZ	#VBV	N 10 KHŻ	STATUS	Sweep 60.00 s (3000 pts)



	Pulse Width (mS)	Number of Pulses	On Time per 20 Sec (mS)	Limit (mS)	) Result
	IN/A	I	329.0	400	Pass
Keysight Spectrum Analyzer - Northwest EMC, Inc.	SE	NSEIINT	ALIGN OFF		08:33:43 AM Ian 17, 2018
			#Avg Type: L	.og-Pwr	TRACE 1 2 3 4 5 6
	PNO: Wide	#Atten: 10 dB			DET PPPPP
Ref Offset 20.59 dB 5 dB/div Ref 20.59 dBm					
Log					
15.6					
10.6					
5.59					
0.590					
-4.41					
0.41					
-9,41					
14.4					
-14.4					
-19.4					
10.4					
-24.4			<u> </u>		
Center 902.300000 MHz	-41 (D) M	10 ku-		<b>O</b> ::::::::::::::::::::::::::::::::::::	Span 0 Hz
Res BW 51 KHZ	#VBW	10 KH2		Sweep	au.uu s (auuu pis)
MSG			STATUS		
Llowning Mode	Our and in a Franks of	Channel	0.000 0 MULT 00 -	()	\
Hopping Mode	, Spreading Factor	U, Low Channel	0, 902.3 MHZ, 60 Se	econd sweep (3	)
	Fuise Width			Lilling	
	(mS)	Pulses	20 Sec (mS)	(mS)	Result

	ł	Hopping Mode, S	preading Factor 1	0, Low Channel	0, 902.3 MHz, 60	second sweep (3	5)
			Pulse Width	Number of	On Time per	Limit	
_			(mS)	Pulses	20 Sec (mS)	(mS)	Result
			N/A	1	329.8	400	Pass

Keysight Specific Control	ectrum Anal	yzer - Northwest EMC,	Inc			
LXI RL	RF	50 Ω DC		SENSE:INT	ALIGN OFF	08:37:05 AM Jan 17, 2018
			PNO: Wide ↔ IFGain:Low		#Avg Type: Log-Pv	VF TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P
5 dB/div Log <sub>w</sub>	Ref Of Ref 2	fset 20.59 dB 0.59 dBm		1		
15.6						
10.6						
5.59						
0.590						
-4.41						
-9.41						
-14.4						
-19.4						
24.4						
Center 90 Res BW 5	2.3000 1 kHz	00 MHz	#VE	3W 10 kHz		Span 0 Hz Sweep 60.00 s (3000 pts)
MSG					STATUS	



Pulse Width (mS)       Number of Pulses       On Time per 20 Sec (mS)       Limit (mS)       Result         329.8       N/A       N/A       N/A       N/A       N/A       N/A         Keysight Spectrum Analyzer - Northwest EMC, Inc       Image: Comparison of the sector		· · ·	stor ro, riigh chan	IEI 7, 914.9 M⊓Z,		
(mS)         Puises         20 Sec (mS)         (mS)         Résult           329.8         N/A         N/A         N/A         N/A         N/A           Keysight Spectrum Analyzer - Northwest EMC, Inc         Comparison         #Aulen OFF         09:35:54 AM Jan 17.7           PNO: Wide         Trig Delay-100.0 ms         #Aulen OFF         09:35:54 AM Jan 17.7         Trig Delay-100.0 ms         #Aulen OFF         09:35:54 AM Jan 17.7           PNO: Wide         Trig Delay-100.0 ms         #Aulen OFF         09:35:54 AM Jan 17.7         Trig Delay-100.0 ms         #Aulen OFF         09:35:54 AM Jan 17.7           PNO: Wide         Trig Video         Trig: Video         #Aulen OFF         09:35:54 AM Jan 17.7         Trie Delay-100.0 ms         #Aulen OFF         09:35:54 AM Jan 17.7           PNO: Wide         Trig: Video         Trig: Video         #Aulen OFF         09:35:54 AM Jan 17.7         Trie Delay-100.0 ms         #Aulen OFF         09:35:54 AM Jan 17.7           GB/div         Ref Offset 20.59 dB         Comparison         Trie Delay-100.0 ms         #Aulen OFF         00:17.1         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2         10.2 <td< th=""><th></th><th>Pulse Width</th><th>Number of</th><th>On Time per</th><th>Limit</th><th></th></td<>		Pulse Width	Number of	On Time per	Limit	
329.8         N/A         N/A         N/A         N/A         N/A           Keysight Spectrum Analyzer - Northwest EMC, Inc         Control         Contro         Contro         Contro		(mS)	Pulses	20 Sec (mS)	(mS)	Result
Keysight Spectrum Analyzer - Northwest EMC, Inc         ALION OFF         09:35:54 AM Jan 17,2           RL         RF         50 Ω         DC         SENSE:INT         ALION OFF         09:35:54 AM Jan 17,2         23           PNO: Wide           Trig Delay-100.0 ms         #Avg Type: Log-Pwr         TRACE         23           PNO: Wide          Trig: Video          Trig: Video         24         00         Det         Det </th <th></th> <th>329.8</th> <th>N/A</th> <th>N/A</th> <th>N/A</th> <th>N/A</th>		329.8	N/A	N/A	N/A	N/A
RL         RF         50 Ω         DC         SENSE:INT         ALIGN OFF         09:35:54 AMJan 17,2           PNO: Wide IFGain:Low          Trig Delay-100.0 ms         #Avg Type: Log-Pwr         Trace         22.8           Ref Offset 20.59 dB         Common Section 10 dB         Align OFF         09:35:54 AMJan 17,2         09:35:54 AMJan 17,2           Common Section 2000          Trig: Video #Atten: 10 dB          Trig: Video #Atten: 10 dB         09:35:54 AMJan 17,2           Common Section 2000             #Aug 17,2           Common Section 2000             #Aug 17,2         09:35:54 AMJan 17,2           Common Section 2000              09:35:54 AMJan 17,2           Common Section 2000	t Spectrum Analyzer - Northwest FMC Inc					
PNO: Wide → Trig: Video #Atten: 10 dB AMy 1 ype: Log-Pwr Trig: Video #Atten: 10 dB 23 a Ref Offset 20.59 dB 222.03 d 5 dB/div Ref 20.59 dB 222.03 d 15.6 10.6 5.69 0.500 4.41 4.41 4.41 5.41 4.41 5.41 5.42 5.42 5.42 5.42 5.43 5.44	RF 50 Ω DC	SE	ENSE:INT	ALIGN OFF	-	09:35:54 AM Jan 17, 2018
Ref Offset 20.59 dB         AMkr1 329.8 r           166         10.0         1		PNO: Wide ↔ IFGain:Low	Trig Delay-100.0 ms Trig: Video #Atten: 10 dB	#Avg Type:	Log-Pwr	TYPE WWWWWW DET PPPPP
Log 15.6 10.6 5.69 4.41 -9.41 -2.2 	Ref Offset 20.59 dB Ref 20.59 dBm				Δ	Mkr1 329.8 ms 22.03 dB
16.6     10.6     10.7						
10.6 5.69 -4.41 -9.41 -9.41 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2		A ALARARA ALARAR M	Y MAAMALAN, MIAAAAAA	6 A		
10.6 5.69 -4.41 -9.41 -9.41				142		
5.69 -4.41 -9.41 -2						
5.59 0.590 -4.41 -9.41 X2				<u>9</u>		
0.590 4.41 -9.41 X2						
-4.41 -9.41 X2						
-4.41						
-9.41			<u>, , ,, 1 ,, ,</u>			TRIG-LYL
<sup>49,41</sup> X <sub>2</sub>						
	X <sub>2</sub>					
-14.4						
-19.4						
Center 914.300000 MHz Span 0	914.300000 MHz					Span 0 Hz

ŀ	lopping Mode, Sp	preading Factor 1	0, High Channel	7, 914.9 MHz, 60	second sweep (1	)	
		Pulse Width	Number of	On Time per	Limit		
		(mS)	Pulses	20 Sec (mS)	(mS)	Result	
		N/A	1	329.8	400	Pass	

Keysight Sp	ectrum Anal	yzer - Northwest EMC,	, Inc				
LXI RL	RF	50 Ω DC		SENSE:INT	ALIGN OFF		09:37:30 AM Jan 17, 2018
			PNO: Wide IFGain:Low	+ Trig: Free Ru #Atten: 10 dB	#Avg Type: L In 3	og-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWW DET PPPPP
5 dB/div Log	Ref Of Ref 2	fset 20.59 dB 0.59 dBm					
15.6							
10.6							
5.59							
0.590							
-4.41							
-9.41							
-19.4							
-24.4							
Center 91 Res BW \$	4.3000 1 kHz	00 MHz	#	/BW 10 kHz		Swee	Span 0 Hz p 60.00 s (3000 pts)
MSG					STATUS		



		Pulse Width (mS)	Number of Pulses	On Time per 20 Sec (mS)	Limit (mS)	Result
		N/A	1	329.8	400	Pass
Keysight Spe	ctrum Analyzer - Northwest EMC, Inc	:	NCEANT			00:41:22 AM Jap 17, 2016
	NF 30 32 DC	30	NSE.INT	#Avg Type:	Log-Pwr	TRACE 1 2 3 4 5
		PNO: Wide	Trig: Free Run #Atten: 10 dB			DET P P P P P
		IFGain:Low	#Atten: To db			
5 dB/div	Ref Offset 20.59 dB Ref 20.59 dBm					
Log						
					n	
15.6						
40.0						
IU.6						
5 59						
0.00						
0.590						
-4.41						
-9.41						
-14.4						
19.4						
-13.4						
-24.4						
0	4.000000 8411-					
Center 914 Res BIM 5	4.300000 MHZ 1 kHz	#\/B\A	10 kHz		Sween	Span 0 Hz 60 00 s (3000 pts
MSG				STATUS	oweep	sonse a (acces pra
mod				STATUS		
	Hopping Mode	, Spreading Factor 1	0, High Channel	7, 914.9 MHz, 60 s	second sweep (3	.)
		Pulse Width	Number of	On Time per	Limit	
		(mc)	Dulege	20 Sec (mS)	(mS)	Pocult
		(113)	Fuises	20 360 (113)	(113)	Result

Hopping Mode, Spreading Factor 10, High Channel 7, 914.9 MHz, 60 second sweep (3)							
		Pulse Width	Number of	On Time per	Limit		
		(mS)	Pulses	20 Sec (mS)	(mS)	Result	
		N/A	1	329.8	400	Pass	

Keysight Spect	rum Analy	yzer - Northwe	st EMC, Inc							
LX/RL	RF	50 Ω D			SENSE:INT		ALIGN OFF	and the second second	09:43:3	1 AM Jan 17, 2018
							#Avg Type	: Log-Pwr	TI	RACE 1 2 3 4 5 6
				DNO. Wills	Tria: Free	Run				TYPE WWWWWW
				IEGain:Low	#Atten: 10	) dB				DET PPPPP
				II Guilleon						
	Dof Off	Fact 20 50								
	Dof 2	0 60 dBn	2							
	REI Z	u.Ja ubii								
31										
15.6										
10.0										
10.6										
10.0										
5 59										
0.00										
0.590										
0.000										
-4.41										
4.41										
9.41										
0.41										
-14.4										
-19.4										
-24.4										
4										
Center 914	.3000	00 MHz								Span 0 Hz
Res BW 51	kH7			4	VBW 10 kHz			Swe	ep 60.00	s (3000 pts)
				"						
MSG							STATUS			
NUMBER OF STREET, STRE	100000200000000000000000000000000000000	CONTRACTOR CONTRACTOR CONTRACTOR	*****	*****	****	CONTRACTOR CONTRACTOR	CONSISTING CONTRACTOR OF CONSISTENCES AND ADDRESS AND ADDRESS ADDR			



XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### 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 band were measured with the EUT set to its normal pseudo-random hopping sequence. The EUT was transmitting at the data rate(s) listed in the datasheet.

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



Result
Pass
Pass
Pass
Pass





	lioppii	ig mode, oprodu	Value	Limit	
			(dBc)	≤ (dBc)	Result
			-78.51	-30	Pass

Key	/sight Spe	ctrum Ana	lyzer - Northwes	t EMC, Inc							
L <mark>XI</mark> RI		RF	50 Ω DC			SENSE:INT	A	ALIGN OFF #Avg Type	Voltage	07:59:1	AM Jan 17, 2018
				I	PNO: Fast 🕞 FGain:Low	Trig: Free #Atten: 10	Run dB	Avg Hold:>	100/100		DET PPPPP
10 dE	3/div	Ref 0 Ref 2	ffset 20.59 d 20.59 dBm	IB I						ΔMkr1 1 -7	4.53 MHz ′8.514 dB
Log	X	2					Y				
10.6											
0.590											
-9.41											
-19.4		_									
-29.4											
-39.4											
-49.4	p <sup>r¶</sup>	Wu	1								
-59.4			WWWWWWWW	hat n d			1∆2				
				™՞∿ՄԴնտվնչչ	www.	longer of the second	<u>ֆ</u> ությունչ-Արևյ	www.maren	hondra	adan <sup>a</sup> riyyahaan	1. M. ryward
-69.4											
Cent #Rea	ter 92	8.00 N	IHz Iz		#VB	NA 300 kHz	<u>.</u>		Swe	Span	30.00 MHz
MSG		160 KI						STATUS	Gine	op 2.000 m	, inclusion presi)







# **DUTY CYCLE**



#### **TEST DESCRIPTION**

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

The EUT operates at 100% Duty Cycle.



XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The 20 dB occupied bandwidth can be no greater than the channel separation which was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.



							NweTx 2016.09.14.2	XMit 2017.12.13
EUT:	PK1276					Work Order:	APAN0004	
Serial Number:	: 18-9B-A5-90-02-7B					Date:	16-Jan-18	
Customer:	APANA Inc.					Temperature:	23 °C	
Attendees:	Matt Maher Peterson, Da	vid Humphrey				Humidity	35% RH	
Project:	None				B	arometric Pres.:	1025 mbar	
Tested by:	Richard Mellroth		Power:	USB		Job Site:	NC02	
TEST SPECIFICAT	TIONS			Test Method				
FCC 15.247:2018				ANSI C63.10:2013				
COMMENTS								
Power Setting = De	efault = 10.							
DEVIATIONS FROM	M TEST STANDARD							
None								
			OL D					
Configuration #	1		VIEN					
		Signature	pro ic					
							Limit < /=	
						Value	(ch separation)	Result
External Port								
	125 kHz Bandwidth							
	Spreading Fa	actor 7						
		Low Channel 0, 902.3 MHz				137.201 kHz	185.1 kHz	Pass
		Mid Channel 3, 902.9 MHz				137.151 kHz	185.1 kHz	Pass
		Mid Channel 4, 914.3 MHz				140.038 kHz	185.1 kHz	Pass
		High Channel 7, 914.9 MHz				139.032 kHz	185.1 kHz	Pass
	Spreading Fa	actor 10						
		Low Channel 0, 902.3 MHz				134.774 kHz	185.1 kHz	Pass
						122 004 64-	105 1 107	Pass
		Mid Channel 3, 902.9 MHz				133.004 KHZ	100. I KHZ	1 455
		Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz				135.891 kHz	185.1 kHz	Pass
		Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914.9 MHz				135.891 kHz 134.934 kHz	185.1 kHz 185.1 kHz	Pass Pass



weTx 2016.09.14.2 XMit 2017.12.13 External Port, 125 kHz Bandwidth, Spreading Factor 7, Low Channel 0, 902.3 MHz Limit < /= Value (ch separation) Result 137.201 kHz 185.1 kHz Pass NSE:INT ALIGN OFF Center Freq: 902.300000 MHz Trig: Free Run Avg|Hold: 50/50 #Atten: 10 dB 10:10:01 AM Jan 17, 2018 RL Radio Std: None ----Radio Device: BTS #IFGain:Low dBidi Ref 18.00 dBm 2 March March Mr. In An Arten and r li li Span 250 kHz Sweep 41.45 ms Center 902.3 MHz #Res BW 2.4 kHz #VBW 7.5 kHz Total Power 26.2 dBm **Occupied Bandwidth** 124.46 kHz -9.368 kHz Transmit Freq Error % of OBW Power 99.00 % x dB Bandwidth 137.2 kHz x dB -20.00 dB STATUS External Port, 125 kHz Bandwidth, Spreading Factor 7, Mid Channel 3, 902.9 MHz Limit < /=







weTx 2016.09.14.2 (Mit 2017.12.13 External Port, 125 kHz Bandwidth, Spreading Factor 7, Mid Channel 4, 914.3 MHz Limit < /= (ch separation) Value Result 140.038 kHz 185.1 kHz Pass NSE:INT ALIGN OFF Center Freq: 914.300000 MHz Trig: Free Run Avg|Hold: 50/50 #Atten: 10 dB 10:11:26 AM Jan 17, 2018 Radio Std: None RL ----Radio Device: BTS #IFGain:Low Ref 19.00 dBm dB/d man Center 914.3 MHz #Res BW 2.4 kHz Span 250 kHz Sweep 41.45 ms #VBW 7.5 kHz Total Power 25.9 dBm **Occupied Bandwidth** 125.27 kHz -9.670 kHz Transmit Freq Error % of OBW Power 99.00 % 140.0 kHz x dB Bandwidth x dB -20.00 dB STATUS

	External Port, 1	25 KHZ Bandwidi	n, Spreading Fac	lor 7, High Chanr	1017,914.9 MHZ	
					Limit < /=	
				Value	(ch separation)	Result
				139.032 kHz	185.1 kHz	Pass





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veTx 2016.09.14.

External Port, 125 kHz Bandwidth, Spreading Factor 10, Low Channel 0, 902.3 MHz Limit < /= (ch separation) Value Result 134.774 kHz 185.1 kHz Pass NSE:INT ALIGN OFF Center Freq: 902.300000 MHz Trig: Free Run Avg|Hold: 50/50 #Atten: 10 dB 10:13:32 AM Jan 17, 2018 RL Radio Std: None ----Radio Device: BTS #IFGain:Low Ref 22.00 dBm dB/d www.Vu wy ymy Center 902.3 MHz #Res BW 2.4 kHz Span 250 kHz Sweep 41.45 ms #VBW 7.5 kHz Total Power 33.4 dBm **Occupied Bandwidth** 124.17 kHz -10.615 kHz 99.00 % Transmit Freq Error % of OBW Power x dB Bandwidth 134.8 kHz x dB -20.00 dB STATUS External Port, 125 kHz Bandwidth, Spreading Factor 10, Mid Channel 3, 902.9 MHz Limit < /=







weTx 2016.09.14.2 (Mit 2017.12.13 External Port, 125 kHz Bandwidth, Spreading Factor 10, Mid Channel 4, 914.3 MHz Limit < /= (ch separation) Value Result 135.891 kHz 185.1 kHz Pass NSE:INT ALIGN OFF Center Freq: 914.300000 MHz Trig: Free Run Avg|Hold: 50/50 #Atten: 10 dB 10:15:14 AM Jan 17, 2018 RL Radio Std: None ----Radio Device: BTS #IFGain:Low Ref 22.00 dBm dB/di Center 914.3 MHz #Res BW 2.4 kHz Span 250 kHz Sweep 41.45 ms #VBW 7.5 kHz Total Power 33.4 dBm **Occupied Bandwidth** 124.22 kHz -10.834 kHz Transmit Freq Error % of OBW Power 99.00 % x dB Bandwidth 135.9 kHz x dB -20.00 dB STATUS 05.1.1. D . .. .

	20 KI IZ Dahuwuuli	i, opreading r acit	n Tu, Flight Ghan	1017, 314.3 WI11Z	
				Limit < /=	
			Value	(ch separation)	Result
			134.934 kHz	185.1 kHz	Pass





XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### 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.



							NweTx 2016.09.14.2	XMit 2017.12.13
EUT:	PK1276					Work Order:	APAN0004	
Serial Number:	18-9B-A5-90-02-7B					Date:	16-Jan-18	
Customer:	APANA Inc.					Temperature:	23 °C	
Attendees:	Matt Maher Peterson, David Humphrey					Humidity:	35% RH	
Project:	None					Barometric Pres.:	1025 mbar	
Tested by:	Richard Mellroth	Power:	USB			Job Site:	NC02	
TEST SPECIFICAT	IONS		Test Method					
FCC 15.247:2018		A	ANSI C63.10:2013					
COMMENTS								
Power Setting = De	efault = 10.							
•								
DEVIATIONS FROM	I TEST STANDARD							
None								
		01 0						
Configuration #	1	VILLI						
	Signature	pro in						
				Avg Cond	Duty Cycle	Value	Limit	
				Pwr (mW)	Factor (dB)	(W)	(W)	Results
External Port								
	125 kHz Bandwidth							
	Spreading Factor 7							
	Low Channel 0, 902.3 MHz			50.647	0	0.051	≤ 1	Pass
	Mid Channel 3, 902.9 MHz			50.387	0	0.050	≤ 1	Pass
	Mid Channel 4, 914.3 MHz			51.495	0	0.051	≤ 1	Pass
	High Channel 7, 914.9 MHz			51.374	0	0.051	≤ 1	Pass
	Spreading Factor 10							
	Low Channel 0, 902.3 MHz			53.530	0	0.054	≤ 1	Pass
	Mid Channel 3, 902.9 MHz			53.449	0	0.053	≤ 1	Pass
	Mid Channel 4, 914.3 MHz			54.577	0	0.055	≤ 1	Pass
	High Channel 7, 914.9 MHz			54.319	0	0.054	≤ 1	Pass





	External Port, 1	25 kHz Bandwidt	h, Spreading Fac	tor 7, Mid Channe	el 3, 902.9 MHz	
		Avg Cond	Duty Cycle	Value	Limit	
		Pwr (mW)	Factor (dB)	(W)	(W)	Results
		50.387	0	0.050	≤ 1	Pass





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veTx 2016.09.14.

External Port, 125 kHz Bandwidth, Spreading Factor 7, Mid Channel 4, 914.3 MHz Avg Cond Duty Cycle Value Limit **(W)** Pwr (mW) Factor (dB) (W) Results 51.495 0 < 1 Pass ALIGN OFF Center Freq: 914.300000 MHz Trig: Free Run Avg|Hold: 100/100 #Atten: 10 dB RL 10:58:42 AM Jan 17, 2018 Radio Std: None ----Radio Device: BTS #IEGain:Low 10 dB/div Log **Г** Ref 200.0 mW Center 914.3 MHz #Res BW 10 kHz Span 500 kHz #Sweep 1 s #VBW 30 kHz **Channel Power Power Spectral Density** 51.49 mW / 314.3 kHz 163.8 nW /Hz STATUS MSG

External Port, 125 kHz Bandwidth, Spreading Factor 7, High Channel 7, 914.9 MHz										
			Avg Cond	Duty Cycle	Value	Limit				
			Pwr (mW)	Factor (dB)	(W)	(W)	Results			
			51.374	0	0.051	≤ 1	Pass			







External Port, 125 KHz Bandwidth, Spreading Pactor 10, Mid Charner 5, 902.9 MHz								
		Avg Cond	Duty Cycle	Value	Limit			
		Pwr (mW)	Factor (dB)	(W)	(W)	Results		
		53 1/0	0	0.053	< 1	Pass		











XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### 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. This method is allowed as the same method has been used to determine the conducted output power.



							Nwe1x 2016.09.14.2	XMit 2017.12.13
EUT:	PK1276					Work Order	APAN0004	
Serial Number:	18-9B-A5-90-02-7B					Date	16-Jan-18	
Customer:	APANA Inc.					Temperature	23 °C	
Attendees:	Matt Maher Peterson, Da	vid Humphrey				Humidity	35% RH	
Project:	None				Ba	arometric Pres.:	1025 mbar	
Tested by:	Richard Mellroth		Power:	USB		Job Site	NC02	
TEST SPECIFICAT	IONS			Test Method				
FCC 15.247:2018				ANSI C63.10:2013				
COMMENTS								
Power Setting = De	efault = 10.							
DEVIATIONS FROM	M TEST STANDARD							
None								
			01 10					
Configuration #	1	<u>.</u>	Rush					
Configuration #	1	Signature	fren			Malua	1	
Configuration #	1	Signature	flict			Value	Limit	Boquito
Configuration #	1	Signature	fuer			Value dBm/3kHz	Limit < dBm/3kHz	Results
Configuration #	1	Signature	fliet		_	Value dBm/3kHz	Limit < dBm/3kHz	Results
Configuration #	1 125 kHz Bandwidth	Signature	flitt			Value dBm/3kHz	Limit < dBm/3kHz	Results
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature	fuer			Value dBm/3kHz	Limit < dBm/3kHz	Results
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 3, 902 9 MHz	friet		_	Value dBm/3kHz 3.335 3.151	Limit < dBm/3kHz 8 8	Results Pass Pass
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 4, 914.3 MHz	flict			Value dBm/3kHz 3.335 3.151 3.106	Limit < dBm/3kHz 8 8 8	Results Pass Pass Pass
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914 9 MHz	fuer			Value dBm/3kHz 3.335 3.151 3.106 3.309	Limit < dBm/3kHz 8 8 8 8	Results Pass Pass Pass Pass
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914.9 MHz actor 10	fuer			Value dBm/3kHz 3.335 3.151 3.106 3.309	Limit < dBm/3kHz 8 8 8 8 8 8 8 8	<b>Results</b> Pass Pass Pass Pass Pass
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914.9 MHz actor 10 Low Channel 0, 902.3 MHz	flict			Value dBm/3kHz 3.335 3.151 3.106 3.309 4.024	Limit < dBm/3kHz 8 8 8 8 8 8 8	Results Pass Pass Pass Pass Pass Pass
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914.9 MHz actor 10 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz	Puet			Value dBm/3kHz 3.335 3.151 3.106 3.309 4.024 3.176	Limit < dBm/3kHz 8 8 8 8 8 8 8 8 8	Results Pass Pass Pass Pass Pass Pass
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature actor 7 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914.9 MHz actor 10 Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz	fuet			Value dBm/3kHz 3.335 3.151 3.106 3.309 4.024 3.176 3.561	Limit < dBm/3kHz 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Results Pass Pass Pass Pass Pass Pass Pass Pa
Configuration #	1 125 kHz Bandwidth Spreading Fa	Signature Signature Low Channel 0, 902.3 MHz Mid Channel 3, 902.9 MHz Mid Channel 4, 914.3 MHz High Channel 7, 914.9 MHz actor 10 Low Channel 3, 902.9 MHz Mid Channel 3, 902.9 MHz Mid Channel 7, 914.9 MHz	flict			Value dBm/3kHz 3.335 3.151 3.106 3.309 4.024 3.176 3.561 3.35	Limit < dBm/3kHz 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Results Pass Pass Pass Pass Pass Pass Pass Pa





























# SPURIOUS CONDUCTED EMISSIONS



XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### **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 spectrum was scanned throughout the specified frequency range.

### SPURIOUS CONDUCTED EMISSIONS



				NweTx 2016.09.14.2	XMit 2017.12.13		
EUT	PK1276		Work Order:	APAN0004			
Serial Number	r: 18-9B-A5-90-02-7B		Date:	16-Jan-18			
Customer	r: APANA Inc.		Temperature:	23 °C			
Attendees	: Matt Maher Peterson, David Humphrey		Humidity:	35% RH			
Project	t: None		Barometric Pres.: 1025 mbar				
Tested by	Richard Mellroth	Power: USB	Job Site:	NC02			
TEST SPECIFICAT	TIONS	Test Method					
FCC 15.247:2018		ANSI C63.10:2013					
COMMENTS							
Power Setting = D	Default = 10.						
_							
DEVIATIONS FRO	OM TEST STANDARD						
None							
		OI M					
Configuration #	1	VALEN					
	Signature	Part					
		Frequency	Max Value	Limit			
		Range	(dBc)	≤ (dBc)	Result		
External Port							
	125 kHz Bandwidth						
	Spreading Factor /	Even down out al	N1/A	N1/A	N1/A		
	Low Channel U, 902.3 MHz	Fundamental	N/A	N/A	N/A		
	Low Channel 0, 902.3 MHz	30 MHz - 12.5 GHz	-72.98	-30	Pass		
	Low Channel U, 902.3 MHz	12.5 GHz - 25 GHz	-69.71	-30	Pass		
	Mid Channel 3, 902.9 MHz	Fundamental	N/A	N/A	N/A		
	Mid Channel 3, 902.9 MHz	30 MHz - 12.5 GHz	-73.79	-30	Pass		
	Mid Channel 3, 902.9 MHz	12.5 GHz - 25 GHz	-69.22	-30	Pass		
	Mid Channel 4, 914.3 MHz	Fundamental	N/A	N/A	N/A		
	Mid Channel 4, 914.3 MHz	30 MHz - 12.5 GHz	-61.4	-30	Pass		
	Mid Channel 4, 914.3 MHz	12.5 GHz - 25 GHz	-70.19	-30	Pass		
	High Channel 7, 914.9 MHz	Fundamental	N/A	N/A	N/A		
	High Channel 7, 914.9 MHz	30 MHz - 12.5 GHz	-73.79	-30	Pass		
	High Channel 7, 914.9 MHz	12.5 GHz - 25 GHz	-69.22	-30	Pass		
	Spreading Factor 10	Even down out of		N1/A	N1/A		
	Low Channel 0, 902.3 MHz	Fundamental	N/A	N/A	N/A		
	Low Channel 0, 902.3 MHz	30 MHZ - 12.5 GHZ	-61.77	-30	Pass		
	Low Channel 0, 902.3 MHz	12.5 GHZ - 25 GHZ	-69.82	-30	Pass		
	Mid Channel 3, 902.9 MHz	Fundamental	N/A	N/A	N/A		
	Mid Channel 3, 902.9 MHz	30 MHZ - 12.5 GHZ	-72.98	-30	Pass		
	Mid Channel 3, 902.9 MHz	12.5 GHz - 25 GHz	-69.71	-30	Pass		
	Mid Channel 4, 914.3 MHz	Fundamental	N/A	N/A	N/A		
	Mid Channel 4, 914.3 MHz	30 MHz - 12.5 GHz	-59.26	-30	Pass		
	Mid Channel 4, 914.3 MHz	12.5 GHz - 25 GHz	-70.55	-30	Pass		
	High Channel 7, 914.9 MHz	Fundamental	N/A	N/A	N/A		
	High Channel 7, 914.9 MHz	30 MHz - 12.5 GHz	-72.25	-30	Pass		
	High Channel 7, 914.9 MHz	12.5 GHz - 25 GHz	-69.49	-30	Pass		

## SPURIOUS CONDUCTED EMISSIONS



		actor 1, LOW Charline	10, 302.0 101	16
Frequency	, , , , , , , , , , , , , , , , , , ,	Max Value	Limit	
Range Fundamenta		(dBc)	<u>≤ (dBc)</u> N/∆	Result N/A
	u	N/A	19/73	19/75
Keysight Spectrum Analyzer - Northwest EMC, Inc.				
<b>ίχα RL</b> RF 50 Ω DC	SENSE:INT	ALIGN OFF #Avg Type: I	_og-Pwr	10:28:01 AM Jan 17, 2018 TRACE 1 2 3 4 5 6
	PNO: Wide C Trig: Free Run IFGain:Low #Atten: 10 dB			DET P P P P P
Ref Offset 20.59 dB			Mkr1	902.850 77 MHz 17 34 dBm
	¥1¥			11.04 dBm
10.0				
0.00				www.
-10.0				- WWWWW
				M M M
-20.0				ŤV M.
-30.0				
-40.0				
-50.0				
-60.0				
-70.0				
-70.0				
Center 902.9000 MHz #Res BW 100 kHz	#VBW 300 kHz		Sweep	Span 500.0 kHz 1.092 ms (8192 pts)
-70.0 Center 902.9000 MHz #Res BW 100 kHz	#VBW 300 kHz	STATUS	Sweep	Span 500.0 kHz 1.092 ms (8192 pts)
Center 902.9000 MHz #Res BW 100 kHz Msg	#VBW 300 kHz	status	Sweep	Span 500.0 kHz 1.092 ms (8192 pts)
Center 902,9000 MHz #Res BW 100 kHz Msg	#VBW 300 kHz ; 125 kHz Bandwidth, Spreading Fa	status actor 7, Low Channe Max Value	Sweep	Span 500.0 kHz 1.092 ms (8192 pts) z
Center 902.9000 MHz #Res BW 100 kHz Msg External Port Frequency Range	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa	actor 7, Low Channe Max Value (dBc) 72 08	Sweep 10, 902.3 MF Limit ≤ (dBc) 30	Span 500.0 kHz 1.092 ms (8192 pts) iz Result Pase
Center 902.9000 MHz #Res BW 100 kHz #sg External Port Frequency Range 30 MHz - 12.5 0	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa	actor 7, Low Channe Max Value (dBc) -72.98	Sweep I 0, 902.3 MF Limit ≤ (dBc) -30	Span 500.0 kHz 1.092 ms (8192 pts) iz Result Pass
Center 902.9000 MHz #Res BW 100 KHz #SG External Port Frequency Range 30 MHz - 12.5 C	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa	actor 7, Low Channe Max Value (dBc) -72.98	Sweep 10, 902.3 MF Limit ≤ (dBc) -30	Span 500.0 kHz 1.092 ms (8192 pts) Iz Result Pass
Center 902.9000 MHz #Res BW 100 kHz msg External Port Frequency Range 30 MHz - 12.5 0 Keysight Spectrum Analyzer - Northwest EMC, Inc	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa GHz	status actor 7, Low Channe Max Value (dBc) -72.98	Sweep I 0, 902.3 MH Limit ≤ (dBc) -30	Span 500.0 kHz 1.092 ms (8192 pts) Iz Result Pass 10:30:15 AM Jan 17, 2018
Center 902.9000 MHz #Res BW 100 kHz #Res BW 100 kHz External Port Frequency Range 30 MHz - 12.5 ( Keysight Spectrum Analyzer - Northwest EMC, Inc	#VBW 300 kHz #VBW 300 kHz 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain.Low Trig: Free Run IFGain.Low #Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 1 0, 902.3 M⊦ Limit ≤ (dBc) -30	Span 500.0 kHz 1.092 ms (8192 pts) Iz Result Pass 10:30:15 MJan 17, 2018 TRACE 2345 6 TRACE 2345 6 TRACE P P P P P
Center 902,9000 MHz #Res BW 100 kHz Msg External Port Frequency Range 30 MHz - 12.5 C	#VBW 300 kHz , 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 10,902.3 MF Limit ≤ (dBc) -30 -og-Pwr	Span 500.0 kHz 1.092 ms (8192 pts) iz Result Pass 10:30:15 AM Jan 17, 2018 TRACE 2345 0 TRACE 2345 0 DET P P P P P
Center 902,9000 MHz #Res BW 100 kHz Msg External Port Frequency Range 30 MHz - 12.5 C Keysight Spectrum Analyzer - Northwest EMC, Inc M RL RF 50 Ω DC M RL RF 50 Ω DC	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 1 0, 902.3 MF Limit ≤ (dBc) -30 -og-Pwr	Span 500.0 kHz 1.092 ms (8192 pts) iz Result Pass 10:30:15 AM Jan 17, 2018 TRACE 10:30:15 AM Jan 17, 2018 10:30
Center 902.9000 MHz #Res BW 100 kHz msg External Port Frequency Range 30 MHz - 12.5 C Keysight Spectrum Analyzer - Northwest EMC, Inc Ref Offfset 20.59 dB 10 dB/div Ref 20.00 dBm	#VBW 300 kHz ; 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain:Low Trig: Free Run IFGain:Low Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 10, 902.3 MF Limit ≤ (dBc) -30 -og-Pwr	Span 500.0 kHz 1.092 ms (8192 pts) iz Result Pass 10:30:15 M1an 17, 2018 TRACE 02 34 Constraints TARCE 02 34 Const
Center 902.9000 MHz #Res BW 100 kHz msg External Port Frequency Range 30 MHz - 12.5 C Ref Offset 20.59 dB 10 dB/div Ref 20.00 dBm	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 10, 902.3 MF Limit ≤ (dBc) -30 -og-Pwr	Span 500.0 kHz 1.092 ms (8192 pts) Iz Result Pass 10:30:15 AHJan 17, 2018 TRACE 2 3 45 TYPE 0 P P P P Akr1 1.806 6 GHz -55.64 dBm
Center 902.9000 MHz #Res BW 100 kHz Msg External Port Frequency Range 30 MHz - 12.5 ( Keysight Spectrum Analyzer - Northwest EMC, Inc M RL RF 50 Ω DC 10 dB/div Ref Offfset 20.59 dB 10 dB/div Ref 20.00 dBm	#VBW 300 kHz ;, 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 10, 902.3 MH Limit ≤ (dBc) -30 -og-Pwr	Span 500.0 kHz 1.092 ms (8192 pts) iz Result Pass 10:30:15 AH Jan 17, 2018 TRACE 2 3 4 5 0 TYPE WALL Akr1 1.806 6 GHz -55.64 dBm
-20.0       -70.0         -70.0       -70.0         Center 902.9000 MHz         #Res BW 100 kHz         #Res BW 100 kHz         Msg         External Port         Frequency         Range         30 MHz - 12.5 (         Msg         Msg         Ref Offset 20.59 dB         10 dB/div       Ref 20.00 dBm         0.00       0.00         10.0       0.00	#VBW 300 kHz a 125 kHz Bandwidth, Spreading Fa GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 10 dB	STATUS actor 7, Low Channe Max Value (dBc) -72.98	Sweep 10,902.3 MF Limit ≤ (dBc) -30 -og-Pwr	Span 500.0 kHz 1.092 ms (8192 pts) dz Result Pass 10:30:15 AMJan 17, 2018 TRACE 12.3 4 5 00 TYPE P P P P P Akr1 1.806 6 GHz -55.64 dBm

Star #Re	t 30 MHz s BW 10	2 0 kHz		#VB	W 300 kHz		STATUS	Swe	Stop 1 ep 1.192 s	2.500 GHz (8192 pts)
-70.0										
-60.0	مانى بەر يەر يەر يەر يەر يەر يەر يەر يەر يەر ي		an fan a	The line and the	and the second	Contraction of the second s	Contraction of the local data			na she ilina ta pilinishi ke cata bila an
-30.0			فيدر وبمعليه فأليه	ومناقر بالمانية وروينا أقا	والمتعاقلين ومعالله	رومانیک روز رو می وارونو		a bilipute abdus, baabba	and is felterated	and receive a dur
-40.0		1								
40.0										
-20.0										
-10.0										


	External Port, 125 kł	Hz Bandwidth, Spread	ding Factor 7, Low Char	nel 0, 902.3 MHz	
	Frequency	· · ·	Max Value	Limit	
	Range		(dBc)	≤ (dBc)	Result
	12.5 GHz - 25 GHz		-69.71	-30	Pass
Wantak Caste	an Analogue Mandalanda CMAC Tan				
LXI RL	RF 50 Ω DC	SENSE:INT	ALIGN OFF		10:31:15 AM Jan 17, 2018
	PN	D: Fast Trig: Free	#Avg Typ e Run 0 dB	e: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P
R 10 dB(div B	ef Offset 20.59 dB			Mkr	1 23.704 4 GHz -52.37 dBm
			¥ I		
10.0					
0.00					
0.00					
-10.0					
-20.0					
-30.0					
-40.0					
50.0					1
-30.0			and the straight of the state o	n e i nanch that all a ddin dda	and and the second s
-60.0				A STREET BUILDER STREET STREET	in a state of the
-70.0					
Start 12.500	GHz			I	Stop 25.000 GHz
#Res BW 10	0 kHz	#VBW 300 kH	z	Sweep	1.195 s (8192 pts)
MSG			STATUS		
	External Dart 405 H	Ha Bandwidth Same	ding Factor 7 Mid Char	nol 2, 002 0 MU	
	External Port, 125 K	nz bandwidth, Sprea	Max Value	l imit	
	Range		(dBc)	≤ (dBc)	Result
	Fundamental		N/A	Ν/Δ	N/Δ

Keysight Spectrum Analyzer - Northwest EMC, Inc.				
LX RL RF 50Ω DC	S	ENSE:INT	ALIGN OFF	10:49:36 AM Jan 17, 2018
	PNO: Wide 🖵 IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWW DET PPPPP
Ref Offset 20.59 dB			Mk	r1 902.837 46 MHz 17.37 dBm
Log		v		
-10.0				
-20.0				
-30.0				
-40.0				
-50.0				
-60.0				
-70.0				
Center 902.9000 MHz #Res BW 100 kHz	#VBV	V 300 kHz	Swee	Span 500.0 kHz p 1.092 ms (8192 pts)
MSG			STATUS	





Frequency	Max Value	Limit	
Range	(dBc)	≤ (dBc)	Result
12.5 GHz - 25 GHz	-69.22	-30	Pass

🔤 Ke	ysight Spectru	m Analyz	er - Northwes	t EMC, Inc							
LXI R	L	RF	50 Ω DC			SENSE:INT	<u>∧</u> ∧	LIGN OFF		10:51:49	AM Jan 17, 2018
					PNO: Fast	Trig: Free	Run	#Avg Type:	Log-Pwr	TR T	ACE 1 2 3 4 5 6 YPE M WWWWW DET P P P P P P
				I	FGain:Low	#Attent. 10	ub		M	kr1 23 5	
10 di	R B/div R	tef Offs tef 20	et 20.59 d .00 dBm	IB I						-51	.85 dBm
209											
10.0											
0.00											
-10.0											
-20.0											
-30.0											
-40.0											
50.0										▲1	
-30.0						ىرلىمىرى بار .	أقدر والقطوطية والمقارط	والمراجع والمراجع والمراجع	domore faldeding	Sector States	and the provident
-60.0	us line of the					and two sid blocks	and the second street, some	and the second	والتالعاني والاطناري	المتدفية ويربيها الأربية	
70.0											
-70.0											
	1 10 500									<b>2</b> 4 0	5 000 <b>0</b> 11-
star #Re	t 12.500 s BW 10	GHZ 0 kHz			#VB	W 300 kHz			Swee	stop 2 ep 1.195 s	5.000 GHz (8192 pts)
MSG								STATUS			



	Frequ	uency			Max Value	Limit	Pocult
	Funda	mental			N/A	N/A	N/A
Keysight Spectrun	n Analyzer - Northwest	EMC, Inc					
LXIRL F	RF 50 Ω DC		SEN	SE:INT	ALIGN OFF	a: Log-Pwr	10:59:06 AM Jan 17, 201
		PN	D: Wide 😱	Trig: Free Run	#read 13be	E. Log-I WI	
		IFG	ain:Low	#Atten: 10 dB		D.U.S.	
Re Re	ef Offset 20.59 dE	3				WKPT	914.240 94 MH
	er 20.00 uBm	T	1	Y			
j ,							
10.0							
0.00							
	N						
-10.0							- Non
An and the							Mar Alex
-20.0							11 Day
-30.0							
-40.0							
-50.0							
j ,							
-60.0							
-70.0							
				<b>k</b>			Spap 500.0 kH
Contor 014 2	0 kHz		#VBW	300 kHz		Sweep	1.092 ms (8192 pts
Center 914.3 #Res BW 100					STATUS		
Center 914.3 #Res BW 100							Contraction of the second state of the second s
Center 914.3 #Res BW 100							
Center 914.3 #Res BW 100	Externa	al Port, 125 k	Hz Bandwidth	i, Spreading F	actor 7, Mid Chanr	nel 4, 914.3 MH	Ζ
Center 914.3 #Res BW 100	Externa Frequ Par	al Port, 125 k u <b>ency</b> nge	Hz Bandwidth	ı, Spreading F	actor 7, Mid Chanr Max Value (dBc)	nel 4, 914.3 MH Limit < (dBc)	Z
Center 914.3 #Res BW 100	Externa Frequ Rar 30 MHz -	al Port, 125 k uency nge 12.5 GHz	Hz Bandwidth	ı, Spreading F	actor 7, Mid Chann Max Value (dBc) -61.4	nel 4, 914.3 MH Limit <u>≤ (dBc)</u> -30	z Result Pass
Center 914.3 #Res BW 100	Extern Frequ Rar 30 MHz -	al Port, 125 k uency nge 12.5 GHz	Hz Bandwidth	i, Spreading F	actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH Limit ≤ (dBc) -30	z Result Pass
Center 914.3 #Res BW 100 MSG Keysight Spectrum	Extern Frequ Rar 30 MHz - n Analyzer - Northwest I	al Port, 125 k uency nge 12.5 GHz EMC, Inc	Hz Bandwidth	n, Spreading F	actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH. Limit ≤ (dBc) -30	z Result Pass
Center 914.3 #Res BW 10( MSG Keysight Spectrum	Extern Freq Rai 30 MHz - n Analyzer - Northwest F 50 Ω DC	al Port, 125 k uency nge 12.5 GHz <sup>EMC, Inc</sup>	Hz Bandwidth	n, Spreading F	Actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH. Limit ≤ (dBc) -30	Z Result Pass 11:00:05 AM Jan 17, 2011 TRACE
Center 914.3 #Res BW 10( MSG Keysight Spectrum () RL F	Extern Freq Rai 30 MHz - n Analyzer - Northwest RF 50 Ω DC	al Port, 125 k uency nge 12.5 GHz EMC, Inc	Hz Bandwidth	se:INT Trig: Free Run	Actor 7, Mid Chanr Max Value (dBc) -61.4	el 4, 914.3 MH. Limit ≤ (dBc) -30 e: Log-Pwr	Z Result Pass 11:00:05 AM Jan 17, 2011 TRACE TYPE
Center 914.3 #Res BW 10( MSG Keysight Spectrum	Extern Freq Rai 30 MHz - n Analyzer - Northwest RF 50 Ω DC	al Port, 125 k uency nge 12.5 GHz EMC, Inc	Hz Bandwidth	n, Spreading F SE:INT Trig: Free Run #Atten: 10 dB	Actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH Limit ≤(dBc) -30 e: Log-Pwr	Z Result Pass 11:00:05 AM Jan 17, 201 TRACE TYPE PPPPP Mkr-1 913 0 AM
Center 914.3 #Res BW 100 MSG W RL F	Extern Freq Ra 30 MHz - n Analyzer - Northwest I RF 50 Ω DC	al Port, 125 k uency nge 12.5 GHz EMC, Inc EMC, Inc IFG	Hz Bandwidth	I, Spreading F SE:INT Trig: Free Run #Atten: 10 dB	Actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH Limit ≤(dBc) -30 e: Log-Pwr	Z Result Pass 11:00:05 AM Jan 17, 201 TRACE TARE TYPE PPPPP Mkr1 913.0 MH -43.97 dBr
Center 914.3 #Res BW 100 MSG Keysight Spectrum W RL F 10 dB/div Re Log	Extern Freq Rai 30 MHz - n Analyzer - Northwest I RF 50 Ω DC ef Offiset 20.59 dE ef 20.00 dBm	al Port, 125 k uency nge 12.5 GHz EMC, Inc IFG B	Hz Bandwidth	I, Spreading F SE:INT  Trig: Free Run #Atten: 10 dB	Actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH Limit ≤ (dBc) -30 e: Log-Pwr	z Result Pass 11:00:5 AM Jan 17, 2011 TRACE 12 3 4 5 TYPE WAYNY DCT P PP PP Mkr1 913.0 MH -43.97 dBr
Center 914.3 #Res BW 100 MSG Keysight Spectrum Ud RL F 10 dB/div Re	Externa Frequ Rai 30 MHz - n Analyzer - Northwest I RF 50 Ω DC ef Offfset 20.59 dE ef 20.00 dBm	al Port, 125 k Jency nge 12.5 GHz EMC, Inc EMC, Inc IFG	Hz Bandwidth	I, Spreading F SE:INT  Trig: Free Run #Atten: 10 dB	Actor 7, Mid Chanr Max Value (dBc) -61.4	nel 4, 914.3 MH Limit ≤ (dBc) -30 e: Log-Pwr	z Result Pass 11:00:5 MJ an 0.7, 2011 TRACE 11.2 at 45 TYPE WAYNY DCT P PP PP Mkr1 913.0 MH -43.97 dBr

MSG								STATUS	0	op - 1192 s	terrer proj
Star #Re:	t 30 MH s BW 10	Z 10 kHz			#VB	W 300 kHz			Swe	Stop 1 ep 1,192 s	2.500 GHz
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Frequer Range	icy e		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 2	25 GHz		-70.19	-30	Pass
Keysight Spectrum Analyzer - Northwest EMC Keysight Spectrum Analyzer - Northwest EMC Keysight Spectrum Analyzer - Northwest EMC	, Inc SE	NSE:INT	ALIGN OFF		11:01:01 AM Jan 17, 2018
	PNO: Fast 😱	Trig: Free Run #Atten: 10 dB	#Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P
Ref Offset 20.59 dB 10 dB/div Ref 20.00 dBm				Mkr	23.712 0 GHz -52.76 dBm
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Start 12.500 GHz #Res BW 100 kHz	#VBW	300 kHz		Sweep	Stop 25.000 GHz 1.195 s (8192 pts)
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	23 KHZ Bahuwiuun	, Spreaulity Faci	tor 7, myn Chann		
Frequency			Max Value	Limit	
Range			(dBc)	≤ (dBc)	Result
Fundamental			N/A	N/A	N/A

🧱 Keysight Spec	trum Analyzer - Northwe	st EMC, Inc						
LXI RL	RF 50 Ω DC		9	SENSE:INT	ALIGN OFF		10:49:36	AM Jan 17, 2018
		P II	NO: Wide 🖵 Gain:Low	Trig: Free R #Atten: 10 d	#Avg un  B	Type: Log-Pwr	TF	ACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P
10 dB/div	Ref Offset 20.59 o Ref 20.00 dBm	iB 1				Mk	r1 902.83 17	7 46 MHz 7.37 dBm
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Center 902 #Res BW 1	2.9000 MHz 100 kHz		#VB\	N 300 kHz		Swee	Spar p 1.092 ms	i 500.0 kHz s (8192 pts)
MSG					STAT	rus		





Frequency	Max Value	Limit	
Range	(dBc)	≤ (dBc)	Result
12.5 GHz - 25 GHz	-69.22	-30	Pass

🔤 Keysight Sp	ectrum Analyzer - North	west EMC, Inc							
LXI RL	RF 50 Ω	DC		SENSE:INT	<u>A</u> A	LIGN OFF		10:51:49	AM Jan 17, 2018
		I	PNO: Fast 🖵 FGain:Low	Trig: Free R #Atten: 10 d	un IB	#Avg Type:	Log-Pwr	TR. T	ACE 1 2 3 4 5 6 YPE M WWWWW DET P P P P P P
10 dB/div	Ref Offset 20.5 Ref 20.00 dE	9 dB Sm					M	kr1 23.53 -51	39 6 GHz .85 dBm
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Start 12.	500 GHz							Stop 2	5.000 GHz
#Res BW	100 kHz		#VB	W 300 kHz			Swee	p 1.195 s	(8192 pts)
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-70.0											
Star #Res	t 30 MH s BW 10	z 10 k	Hz		#VB	W 300 kHz			Swe	Stop 1 ep 1.192 s	2.500 GHz (8192 pts)
MSG								STATUS			



Frequenc	у		Max Value	Limit < (dBc)	Result
12.5 GHz - 25	GHz		-69.82	-30	Pass
Keysight Spectrum Analyzer - Northwest EMC, In	nc SE	NSE:INT	ALIGN OFF		03:59:50 AM Jan 17, 2018
	PNO: Fast 😱	PNO: Fast 🕞 Trig: Free Run IFGain:Low #Atten: 10 dB		Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P P
Ref Offset 20.59 dB 10 dB/div Ref 20.00 dBm				Mkr	1 23.342 7 GHz -52.47 dBm
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Start 12.500 GHz #Res BW 100 kHz	#VBW	300 kHz		Sweep	Stop 25.000 GHz 1.195 s (8192 pts)
MSG			STATUS		

External Fort, T20 KH2 Ballawia	in, oproduing r dot	or ro, mia oriani	101 0, 002.0 1011 12	
Frequency		Max Value	Limit	
Range		(dBc)	≤ (dBc)	Result
Fundamental		N/A	N/A	N/A

🔤 Keysi	ight Spectru	m Analyzer - Northwe	st EMC, Inc							
LXI RL		RF 50 Ω D0			SENSE:INT	<u>^</u>	ALIGN OFF		10:28:01	AM Jan 17, 2018
			F	PNO: Wide 😱 FGain:Low	Trig: Free #Atten: 10	Run dB	#Avg Type	: Log-Pwr	AT T	ACE 1 2 3 4 5 6 TYPE MWWWWW DET PPPPPP
10 dB/	R Idiv <b>R</b>	ef Offset 20.59 ( ef 20.00 dBn	dB N					Mkı	1 902.85 <sup>°</sup> 17	0 77 MHz /.34 dBm
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Cente #Res	er 902.9 BW 10	9000 MHz 0 kHz		#VB	W 300 kHz			Swee	Spar p 1.092 ms	500.0 kHz (8192 pts)
MSG							STATUS			





	External Port, 125 kHz Bandwidth	n, Spreading Fac	tor 10, Mid Chann	el 3, 902.9 MHz		
	Frequency		Max Value	Limit		
-	Range		(dBc)	≤ (dBc)	Result	
[	12.5 GHz - 25 GHz		-69.71	-30	Pass	

Keysight Spectrum Analyzer	- Northwest EMC, Inc							
KARL RF 5	50 Ω DC		SENSE:INT	<u>^</u> A	#Avg Type:	Log-Pwr	10:31:15 TR	AM Jan 17, 2018 ACE 1 2 3 4 5 6
	P	NO: Fast 🖵 Gain:Low	Trig: Free #Atten: 10	Run dB			1	
Ref Offset 10 dB/div Ref 20.0	: 20.59 dB 10 dBm					N	lkr1 23.7 -52	04 4 GHz 2.37 dBm
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Start 12.500 GHz #Res BW 100 kHz		#VB	W 300 kHz			Swe	Stop 2 ep 1.195 s	5.000 GHz (8192 pts)
MSG					STATUS			



	Frequency	120 KHZ Bullaw	iuii, opreauliy	Max	v Value	Limit	12	
	Range	. [	- 1	(	dBc)	≤ (dBc)	Re	sult
	Fundamenta	1			N/A	N/A	N	/A
Keysight Spectrum A	Analyzer - Northwest EMC, Inc 50 Ω DC		SENSE:INT	ALI	SN OFF		10:40:54	AM Jan 17, 2018
		BNO: Wide	- Trig: Free Ru	n	#Avg Type: I	_og-Pwr	TR T	ACE 1 2 3 4 5 6 YPE MWWWW
		IFGain:Low	#Atten: 10 dE					DET <u>PPPP</u>
Ref	Offset 20.59 dB					Mkr1	914.33	66 MHz
10 dB/div Ref	f 20.00 dBm	1		<b></b> 1				.45 UBIII
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Contor 014 20							<b>S</b> non	500 0 kHz
#Res BW 100	kHz	#VE	3W 300 kHz			Sweep	1.092 ms	(8192 pts)
MSG					STATUS			
		105111 D						
	Esterned B. 1				VIID Channe		17	
	External Port, Frequency	125 kHz Bandw	idth, Spreading	Factor 10, 1	Value	Limit	12	
	External Port, Frequency Range	125 KHZ Bandw	idth, Spreading	Max (	(Value dBc)	Limit ≤ (dBc)	Re	sult
	External Port, Frequency Range 30 MHz - 12.5 C	, 125 kHz Bandw GHz	ioth, Spreading	Factor 10, 1 Max ((	<b>Value</b> dBc) 59.26	Limit ≤ (dBc) -30	Re	sult ass
	External Port, Frequency Range 30 MHz - 12.5 C	GHz	lath, Spreading	Factor 10, 1 Max ((	<b>v Value</b> d <b>Bc)</b> 59.26	Limit ≤ (dBc) -30	Re	sult ass
w Keysight Spectrum A	External Port, Frequency Range 30 MHz - 12.5 C	325 KHz Bandw		Factor 10, 1 Max (( 	C Value dBc) 59.26	Limit <u>≤ (dBc)</u> -30	12 Re Pa 10:41:54	sult ASS AM Jan 17, 2018
Keysight Spectrum A	External Port, Frequency Range 30 MHz - 12.5 C Analyzer - Northwest EMC, Inc 50 Ω DC	Hz Bandw	SENSE:INT	Factor 10, 1 Max (( -5	c Value dBc) 59.26 SN OFF #Avg Type: I	Limit ≤ (dBc) -30	12 Re Pa 10:41:54 TR TR	Sult ass AMJan 17, 2018 ACE 12,345 6 YPE
Keysight Spectrum A	External Port, Frequency Range 30 MHz - 12.5 C Analyzer - Northwest EMC, Inc	125 KHz Bandw GHz PNO: Fast	SENSE:INT	Factor 10, I Max (( 	c Value dBc) 59.26	Limit ≤ (dBc) -30	е Понитики Понитик П	sult   ass   AMJan 17, 2018   ACE 1 2 3 4 5 6   YPE P P P P P P
Keysight Spectrum A	External Port, Frequency Range 30 MHz - 12.5 C Analyzer - Northwest EMC, Inc 50 Ω DC	Hz Bandw	SENSE:INT	Factor 10, 1 Max (( 	c Value dBc) 59.26	Limit <u>≤ (dBc)</u> -30 _og-Pwr	Re Pa 10:41:54 TR T Mkr1 9' -41	sult ass AMJan 17, 2018 ACE 1 2 3 4 5 6 YPE NOWER STATE 13.0 MHz 83 dBm
Keysight Spectrum A RL RF 10 dB/div Ref	External Port, Frequency Range 30 MHz - 12.5 C Analyzer - Northwest EMC, Inc 50 Ω DC Offset 20.59 dB f 20.00 dBm	PNO: Fast	SENSE:INT  Trig: Free Ru #Atten: 10 dE	Factor 10, 1 Max (( 	c Value dBc) 59.26	Limit ≤ (dBc) -30	Re Pa 10:41:54 TR T Mkr1 9' -41	sult ass AMJan 17, 2018 ACE 1 2 3 4 5 6 YPE I WAY WAY DET P P P P P 13.0 MHz .83 dBm
Keysight Spectrum / WRLRF 0 dB/divRef	External Port, Frequency Range 30 MHz - 12.5 C Analyzer - Northwest EMC, Inc 50 Ω DC Offset 20.59 dB f 20.00 dBm	PNO: Fast	SENSE:INT	Factor 10, 1 Ma) ( 5	c Value dBc) 59.26	Limit ≤ (dBc) -30	Re Pa 10:41:54 TR T Mkr1 9' -41	sult ass AMJan 17, 2018 ACE   2 3 4 5 0 YPE M DE P P P P I 3.0 MHZ .83 dBm

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Star	t 30 MH	z					R			Stop 1	2.500 GHz
#Res	s BW 10	10 k	Hz		#VB	W 300 kHz			Swe	ep 1.192 s	; (8192 pts)
MSG								STATUS			and the second



Frequen	су		Max Value	Limit	Posult
12.5 GHz - 2	5 GHz		-70.55	-30	Pass
Keysight Spectrum Analyzer - Northwest EMC,	Inc				
LXI RL RF 50Ω DC	SI	ENSE:INT	ALIGN OFF	Log-Pwr	10:42:55 AM Jan 17, 2018
	PNO: Fast 🖵 IFGain:Low	Trig: Free Run #Atten: 10 dB	wavy type.		TYPE M WWWW DET PPPPP
Ref Offset 20.59 dB 10 dB/div Ref 20.00 dBm				Mkr	1 23.855 5 GHz -53.12 dBm
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Start 12.500 GHz #Res BW 100 kHz	#VBV	/ 300 kHz		Sweep	Stop 25.000 GHz 1.195 s (8192 pts)
MSG			STATUS		

External Port, 125 kHz Band	width, Spreading Fact	or 10, High Chanı	nel 7, 914.9 MHz	
Frequency		Max Value	Limit	
Range		(dBc)	≤ (dBc)	Result
Fundamental		N/A	N/A	N/A

🔤 Key	sight Spec	trum Analyzer - No	orthwest EMC, Inc						
LXI RI	L. S.	RF 50 Ω	DC		SENSE:INT	ALIGN OFF		04:32:37	AM Jan 17, 2018
				PNO: Wide 😱 IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type Avg Hold:>	: Log-Pwr •100/100	IR T	ACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P
10 dE	3/div	Ref Offset 20 Ref 20.00 (	.59 dB dBm				Mkr	1 914.88 17.	6 48 MHz 409 dBm
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Cen	er Q1/	9000 MHz						Span	500 0 kHz
#Re:	5 BW 1	100 kHz		#VB	W 300 kHz		Sweep	1.092 ms	(8192 pts)
MSG						STATUS			





Frequency	Max Value	Limit	
Range	(dBc)	≤ (dBc)	Result
12.5 GHz - 25 GHz	-69.49	-30	Pass

🔤 Kej	/sight Spec	trum Anal	/zer - Northwe	st EMC, Inc							
LXI R	L	RF	50 Ω DC			SENSE:INT	<u>A</u> A	LIGN OFF	Lea Dur	04:34:37	AM Jan 17, 2018
					PNO: Fast G	Trig: Free #Atten: 10	Run dB	#Avg Type.	Log-Pwr	1	
10 dI	3/div	Ref Off Ref 2	set 20.59 o 0.00 dBn	dB 1					N	1kr1 24.0 -52	32 5 GHz 2.06 dBm
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star #Res	s BW 1	100 kH	z		#VB	W 300 kHz			Swe	ep 1.195 s	5.000 GHZ 6 (8192 pts)
MSG								STATUS			



XMit 2017.12.13

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	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

#### 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(s) listed in the datasheet.

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



			INWEIX 2010.09.14.2	AMIL 2017.12.13
EUT:	PK1276	Work Order:	APAN0004	
Serial Number:	18-9B-A5-90-02-7B	Date:	16-Jan-18	
Customer:	APANA Inc.	Temperature:	23 °C	
Attendees:	Matt Maher Peterson, David Humphrey	Humidity:	35% RH	
Project:	None	Barometric Pres.:	1025 mbar	
Tested by:	Richard Mellroth Power: USB	Job Site:	NC02	
TEST SPECIFICAT	ONS Test Method			
FCC 15.247:2018	ANSI C63.10:2013			
COMMENTS				
Power Setting = De	fault = 10.			
DEVIATIONS FROM	I TEST STANDARD			
None				
0	01.1			
Configuration #				
	Signature	Value	Linelé	
		value (dBo)		Becult
Extornal Port		(uBC)	2 (UBC)	Result
External Full	125 kHz Rondwidth			
	Spreading Factor 7			
		-44.98	-30	Pass
	High Channel 7	-78.06	-30	Pass
	Spreading Factor 10	-10.00	50	
	Low Channel 0.	-45.59	-30	Pass
	High Channel Z	-77 98	-30	Pass
	right of data of the	-11.50	50	. 455





		Value	Limit	
		(dBc)	≤ (dBc)	Result
		-78.06	-30	Pass

Keysight Sp	ectrum Analyzer - North	west EMC, Inc					
LXI RL	RF 50 Ω	DC	PNO: Fast 😱 IFGain:Low	SENSE:INT Trig: Free Run #Atten: 10 dB	ALIGN OFF #Avg Type	: Log-Pwr	05:05:13 AM Jan 17, 2018 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET PPPPPP
10 dB/div	Ref Offset 20.5 Ref 20.00 dE	9 dB Sm				Δ	Mkr1 29.293 MHz -78.06 dB
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0.00							
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70.0							
Center 92 #Res BW	8.00 MHz 100 kHz		#VB	W 300 kHz		Sweep	Span 35.00 MHz 3.399 ms (3000 pts)
MSG					STATUS		





Keysight Spectrum Analyzer - Northwest EMC, Inc											
LXI R	L	RF	50 Ω DC			SENSE:INT	<u>^</u>	#Avg Type	Log-Pwr	04:35:43	AM Jan 17, 2018
				F	PNO: Fast 🖵 Gain:Low	Trig: Free #Atten: 10	Run dB	Avg Hold:>	100/100		
10 dE	Ref Offset 20.59 dB ΔMkr1 13.203 MHz   10 dB/div Ref 20.00 dBm -77.983 dB										
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-70.0											
Cen	Center 928.00 MHz Span 35.00 MHz										
#Re	S BW 10	JU KHZ			#vB	W JUU KHZ		STATUS	Swe	ep - 3.399 ms	s (auno pre)
318103											