

### **Digi International Inc**

Activity Tracking Belt FCC 15.247:2017

Report # DGII0215.1



TESTING NVLAP Lab Code: 200881-0

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# **CERTIFICATE OF TEST**



#### Last Date of Test: November 7, 2017 Digi International Inc Model: Activity Tracking Belt

### **Radio Equipment Testing**

Standards	
Specification	Method
FCC 15.247:2017	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Testing contained in original test report for FCC ID: 2ADHKATWINC1500
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.2.2.4	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	
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	No	N/A	Testing contained in original test report for FCC ID: 2ADHKATWINC1500

#### **Deviations From Test Standards**

None

**Approved By:** M

Matt Nuernberg, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in eport 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 – Validated by the European Commission as a Notified Body under the R&TTE Directive.

#### 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>

# FACILITIES





California	Minnesota	New York	Oregon	Texas	Washington	
Labs OC01-13	Labs MN01-08, MN10	Labs NY01-04	Labs EV01-12	Labs TX01-09	Labs NC01-05	
41 Tesla	9349 W Broadway Ave.	4939 Jordan Rd.	22975 NW Evergreen Pkwy	3801 E Plano Pkwy	19201 120 <sup>th</sup> Ave NE	
Irvine, CA 92618	Brooklyn Park, MN 55445	Elbridge, NY 13060	Hillsboro, OR 97124	Plano, TX 75074	Bothell, WA 98011	
(949) 861-8918	(612)-638-5136	(315) 554-8214	(503) 844-4066	(469) 304-5255	(425)984-6600	
		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	N/A	2834D-1, 2834D-2	2834G-1	2834F-1	
		BS	МІ			
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R	
		VC	CI			
A-0029	A-0109	N/A	A-0108	A-0201	A-0110	
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA						
US0158	US0175	N/A	US0017	US0191	US0157	



# **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

# **Test Setup Block Diagrams**



### **Antenna Port Conducted Measurements** DC Block and Spectrum EUT Analyzer Attenuator **RF** Adapter **Coaxial Cable Near Field Test Fixture Measurements** Spectrum Near Field Analyzer Probe EUT **Coaxial Cable Spurious Radiated Emissions** Fully anechoic shielded enclosure above 1 GHz. Semi-anechoic below 1 GHz 3m Test Distance (No absorber on the floor). Preamp **Coaxial Cable** and EUT **Filters** Measurement Antenna Spectrum Analyzer Flush Mounted Turn table, Non-reflective foam table to support EUT

# **PRODUCT DESCRIPTION**



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

Company Name:	Digi International Inc
Address:	11001 Bren Road E.
City, State, Zip:	Minnetonka, MN 55343
Test Requested By:	Collin LaFave
Model:	Activity Tracking Belt
First Date of Test:	November 7, 2017
Last Date of Test:	November 7, 2017
Receipt Date of Samples:	April 12, 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:

Battery powered Activity Tracking belt utilizing a low duty cycle 2.4 GHz Wi-Fi radio to send data to a network.

#### **Testing Objective:**

To demonstrate compliance of the Wi-Fi radio operating in the 2.4 GHz band to FCC 15.247 for a C2PC to FCC ID: 2AKXS-EJGKAJ3531 due to lowering the output power from the original Grant.

# CONFIGURATIONS



### Configuration DGII0263-1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Activity Tracking Belt	Digi International Inc.	Modjoul	None
Wifi Module	Atmel	AT-Wink 1500-MR210PB	F8F005FF1522

Peripherals in test setup boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
USB to I2C/SPI Adapter	Total Phase	Aardvark	2237-454813			
Laptop	HP	EliteBook	00669			
Power Supply (Laptop)	HP	PPP009L-E	WBGST0A3U0QU31			

Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2		
USB Cable (USB to I2C/SPI Adapter)	No	1.8m	Yes	Laptop	USB to I2C/SPI Adapter		
Ribbon Cable	No	0.25m	No	USB to I2C/SPI Adapter	Serial Leads		
USB Cable (Wifi Module)	No	0.5m	No	Laptop	Wifi Module		
Serial Leads	No	0.3m	No	Ribbon Cable	Wifi Module		
AC Mains Cable (Laptop)	No	1.0m	No	AC Mains	Power Supply (Laptop)		
DC Cable (Laptop)	No	1.8m	Yes	Laptop	Power Supply (Laptop)		

# **MODIFICATIONS**



### **Equipment Modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
			Tested as	No EMI suppression	EUT remained at
1	11/7/2017	Duty Cycle	delivered to	devices were added or	Element following
			Test Station.	modified during this test.	the test.
		Occupied	Tested as	No EMI suppression	EUT remained at
2	11/7/2017	Doccupieu	delivered to	devices were added or	Element following
		Danuwiulii	Test Station.	modified during this test.	the test.
			Tested as	No EMI suppression	EUT remained at
3	11/7/2017	Output Power	delivered to	devices were added or	Element following
			Test Station.	modified during this test.	the test.
		Power Speetral	Tested as	No EMI suppression	EUT remained at
4	11/7/2017	Power Spectral	delivered to	devices were added or	Element following
		Density	Test Station.	modified during this test.	the test.
		Pand Edga	Tested as	No EMI suppression	EUT remained at
5	11/7/2017		delivered to	devices were added or	Element following
		Compliance	Test Station.	modified during this test.	the test.
		Spurious	Tested as	No EMI suppression	Schodulod tecting
6	11/7/2017	Conducted	delivered to	devices were added or	was completed
		Emissions	Test Station.	modified during this test.	was completed.



XMit 2017.09.21

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

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	29-Sep-17	29-Sep-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Sep-17	11-Sep-18
Attenuator	S.M. Electronics	SA26B-20	RFW	14-Feb-17	14-Feb-18
Block - DC	Fairview Microwave	SD3379	AMI	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	16-Mar-17	16-Mar-18

#### **TEST DESCRIPTION**

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

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.

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

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.



							TbtTx 2017.10.04	XMit 2017.09.21
EUT:	Activity Tracking Belt					Work Order:	DGII0263	
Serial Number:	F8F005FF1522					Date:	7-Nov-17	
Customer:	Collin LaFavo					remperature:	21.9 °C	
Project:	None					Barometric Pres :	22.7% RF 1033 mbar	
Tested by:	Dustin Sparks		Power: 5VDC			Job Site:	MN08	
TEST SPECIFICATI	ONS		Test Method					
FCC 15.247:2017			ANSI C63.10:2013					
COMMENTS								
EUT powered by US	SB connection							
DEVIATIONS FROM	I TEST STANDARD							
None								
			200					
Configuration #	1	Cignoture	Justin Sparts					
		Signature	Α.		Number of	Value	Limit	
			Pulse Width	Period	Pulses	(%)	(%)	Results
2400 MHz - 2483.5 M	MHz Band							
	802.11(b) 1 Mbps							
	Low Channel	1, 2412 MHz	8.379 ms	8.443 ms	1	99.2	N/A	N/A
	Low Channel	1, 2412 MHZ	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHz	ο.387 ms N/Δ	0.435 ms N/A	5	99.4 N/A	N/A	N/A
	High Channel	11, 2462 MHz	8.38 ms	8.442 ms	1	99.3	N/A	N/A
	High Channe	l 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
	802.11(b) 11 Mbps							
	Low Channel	1, 2412 MHz	843.6 us	873.9 us	1	96.5	N/A	N/A
	Low Channel	1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHz 6, 2437 MHz	843.6 US	873.9 US	5	96.5 N/A	N/A	N/A N/A
	High Channel	11. 2462 MHz	843.6 µs	900.8 us	1	93.7	N/A	N/A
	High Channel	111, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
	802.11(g) 6 Mbps							
	Low Channel	1, 2412 MHz	1.393 ms	1.439 ms	1	96.8	N/A	N/A
	Low Channel	1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHZ	1.393 ms	1.448 ms	5	96.2	N/A	N/A
	High Channel	11. 2462 MHz	1.393 ms	1.457 ms	1	95.6	N/A	N/A
	High Channel	11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
	802.11(g) 36 Mbps							
	Low Channel	1, 2412 MHz	253.2 us	316.8 us	1	79.9	N/A	N/A
	Low Channel	1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHZ	253.2 US	307.8 US	5	82.3 N/A	N/A	N/A
	High Channel	11. 2462 MHz	253.2 LIS	316.8 US	1	79.9	N/A	N/A
	High Channel	I 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
	802.11(g) 54 Mbps							
	Low Channel	1, 2412 MHz	177.3 us	213.8 us	1	82.9	N/A	N/A
	Low Channel	1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHz 6, 2437 MHz	177.2 us	213.8 us	1	82.9 N/A	N/A	N/A
	High Channel	0, 2437 MHZ	177.2 us	213.8 με	1	82.9	N/A	N/A
	High Channel	11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
	802.11(n) MCS0				-			
	Low Channel	1, 2412 MHz	1.301 ms	1.365 ms	1	95.4	N/A	N/A
	Low Channel	1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHz	1.301 ms	1.356 ms	1 F	96	N/A	N/A
	High Channel	0, 2407 MHz	IN/A 1 301 mc	1 338 ms	5 1	IN/A 97 3	N/A N/Δ	N/A N/Δ
	High Channel	11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
	802.11(n) MCS7	, =						
	Low Channel	1, 2412 MHz	165.1 us	219.8 us	1	75.1	N/A	N/A
	Low Channel	1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel	6, 2437 MHz	165.2 us	210.8 us	1	78.4	N/A	N/A
	Mid Channel	6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel High Channel	1 11, 2402 MHZ 1 11 - 2462 MHz	IDD.1 US NI/A	201.9 US	1	81.8 N/A	N/A N/A	N/A N/A
	righ channe	1 11, 2402 WITZ	N/A	IN/A	5	IN/A	IN/A	IN/A



	Pulse Width	Period	Pulses	(%)	(%)	Results
	8.379 ms	8.443 ms	1	99.2	N/A	N/A
						· · · ·
🗧 Agilent 09:3	0:31 Nov 7,	2017			RT	
ement Materials	s Technology					Mkr3 9.446 m
f 11 dBm		#Atten 10 d	B			5.76 dBm
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g 🖌						8
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fst						
ß					_	
gAv 🚽						
S2						
nter 2.412 00	0 GHz					Span 0 Hz
s BW 3 MHz		+	VBW 300 kHz	:	Sweep 10.3	8 ms (8192 pts)
Marker Trac	e Type	Х	Axis	Amp	litude	
1 (1)	Time	1.	.003 ms	5.6	5 dBm	
2 (1)	lime Timo	у.	381 ms 446 mc	4.4	5 dBm 6 dBm	
- J (1)	TIME		440 115	5.7		

	2400 MHz - 2	2483.5 MHz Banc	l, 802.11(b) 1 Mb	ps, Low Channel	1, 2412 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





	2400 IVIFIZ - 2	403.3 IVITZ Ban	Number of	Value	l imit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	8.387 ms	8.435 ms	1	99.4	N/A	N/A
🔆 Agilent 09:05	5:01 Nov 7,	2017			RT	
Element Materials	Technology					Mkr3 9.433 ms
Ref 13 dBm		#Atten 10 d	IB			-1.43 dBm
#Peak						
Log						
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dB/						<b>.</b>
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Marker Irace		 	Avie	 Ĥmo	litude	<del>50 m3 (01</del> 02 pt3)
	- ,ype Time	ĝ	98 <b>.</b> 1 µs	3.4	7 dBm	
2 (1)	Time	9.	.385 ms	-13.2	9 dBm	
	Time	a	433 me	_1 A	3 dBm	

	2400 MHz - 2	2483.5 MHz Band	d, 802.11(b) 1 Mb	ps, Mid Channel	6, 2437 MHz		
			Number of	Value	Limit		
	Pulse Width	Period	Pulses	(%)	(%)	Results	_
	N/A	N/A	5	N/A	N/A	N/A	



Ref 13 dBm #Peak

Log

5 dB/ Offst 23 dB



TbtTx 2017.10.04 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz Number of Value Limit Pulse Width **(%)** 99.3 **(%)** N/A Period Pulses Results 8.38 ms 8.442 ms N/A 1 R T 🔆 Agilent 08:54:56 Nov 7, 2017 Mkr3 9.444 ms Element Materials Technology #Atten 10 dB 6.54 dBm 23 a di na si di s العلاقين أتدرب الارد

₩LgHV											
W1 S2											
Center	2.462 0	00 GHz								Sp	an 0 Hz
Res BW	3 MHz			#	VBW 300 I	kHz	S	weep 10.	.38 ms	(81	92 pts)
Mark	er Tra	ice T	уре	Х	Axis		Amplitu	ude			
1	<1	.) .	Time	1.	002 ms		6.88 (	dBm			
2	<1	.) .	Time	9.3	382 ms		6.30 (	dBm			
3	<1	.) .	Time	9.4	444 ms		6.54 (	dBm			

	2400 MHz - 2	483.5 MHz Band,	, 802.11(b) 1 Mbp	os, High Channel	11, 2462 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





		Pulse Width	Period	Pulses	(%)	(%)	Results	
		843.6 us	873.9 us	1	96.5	N/A	N/A	
k	Agilent 09:3	34:00 Nov 7,2	2017			RT		
en	ent Material:	s Technology					Mkr3 1.001	ms
ef	13 dBm		#Atten 10 d	B			0.21 dE	Зm
Pea	ik 📃 🗌							
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len	er 2.412 00	0 GHz					Span 0	Hz
es	BW 3 MHz		+	WRW ЗОО kH:	7	Sween 3	2 ms (81.92 nt	s)
M	arker Trad	e Tyne	X	Axis	 Ĥmn	litude	- me toroc pt	
	1 (1)	D Tim <u>e</u>	12	27 <b>.</b> 2 µs	-0.8	1 dBm		
	2 (1)	D Time	97	70.8 µs	-30.8	7 dBm		
	3 (1)	) Time	1.	.001 ms	0.2	1 dBm		

	2400 MHz - 2	483.5 MHz Band	, 802.11(b) 11 Mt	ops, Low Channel	1, 2412 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





		2400 MHZ - 4	2483.5 MHZ Band	Number of	Value	Limit		
		Pulse Width	Period	Pulses	(%)	(%)	Results	
		843.6 us	873.9 us	1	96.5	N/A	N/A	
🔆 Agilen	<b>t</b> 09:3	7:33 Nov 7,	2017			RT		
lement Ma	terials	Technology					Mkr3 1.00	01 ms
Ref 15 dBr	n		#Atten 10 d	B			0.54	dBm
#Peak								
og 📙								
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enter 24	37 000	0 GHz	I				Snan	й Ну
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Marker	Trace	o Typo		Avie	12 Âmi	olitudo	2 1113 (0102	pt37
1	(1)	e rype Time	~	127 us	Ø.	56 dBm		
2	$\langle 1 \rangle$	Time	93	70.6 µs	-26.	35 dBm		
3	(1)	Time	1.	001 ms	0.	54 dBm		

	2400 MHz - 2	483.5 MHz Band	, 802.11(b) 11 Mi	ops, Mid Channel	6, 2437 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





	Du	leo Width	Period	Pulcor	01 V	(%)	LIM /0/ 1	1L \	Po	eulte	
	Pu		900.8 us	Puises	,	(%) 937	(%) N/A	)	ne	J/A	
		H0.0 U3	500.0 43			50.7	11/7			N/A	
dz.	00.44.00		0047				<u>р</u> т				
Agilent	09:41:00	NOV /,	2017				K I				
lement Mate	erials Teo	chnology							Mkr3	1.0	01 ms
Ref 15 dBm			#Atten 10 d	₽B						0.59	dBm
Peak											
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23							_				
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LgHv				2							
1 S2											
Center 2.462	2 000 GH	z								Span	0 Hz
Res BW 3 MH	lz			ŧVBW 300	kHz		Sw	eep 2	2 ms ()	8192	pts)
Marker	Trace	Type	Х	Axis		Ampli	tude				
1	(1)	Time	1	00.1 µs		0.52	dBm				
2	(1)	Time	9	43.7 µs		-29.93	dBm				
3	(1)	lime	1	.001 ms		0.59	dBm				

	2400 MHz - 24	83.5 MHz Band,	802.11(b) 11 Mb	ps, High Channel	11, 2462 MHz		
			Number of	Value	Limit		
	Pulse Width	Period	Pulses	(%)	(%)	Results	
	N/A	N/A	5	N/A	N/A	N/A	





2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz Number of Value Limit **(%)** N/A Pulse Width Period Pulses (%) Results 1.393 ms 1.439 ms 96.8 N/A R Т Agilent 09:55:54 Nov 7, 2017 ₩. Mkr3 2.439 ms Element Materials Technology <u>-3.6</u>4 dBm Ref 12 dBm #Atten 10 dB #Peak .og NH CL والمتراف الكوري بعالك للكار dB/ ò 0ffst 23 dB ø #LgAv W1 S2 Center 2.412 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 3 ms (8192 pts) Amplitude -3.12 dBm -20.93 dBm -3.64 dBm Trace (1) (1) (1) X Axis 1.001 ms Marker Type Time 2.394 ms 2.439 ms 23 Time Time

	2400 MHz - 2	2483.5 MHz Band	d, 802.11(g) 6 Mb	ps, Low Channel	1, 2412 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz Number of Value Limit **(%)** N/A Pulse Width Period Pulses (%) Results 1.393 ms 1.448 ms 96.2 N/A Agilent 09:59:13 Nov 7, 2017 R Т ₩. Mkr3 2.448 ms Element Materials Technology Ref 13 dBm #Peak #Atten 10 dB -1.33 dBm .og والمقابلة المواجرة ومالك and the later hild it such that ul<sub>l</sub>r, dB/ ò القنا فارتك 0ffst 23 dB ð #LgAv W1 S2 Center 2.437 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 3 ms (8192 pts) Trace (1) (1) (1) Amplitude -1.14 dBm X Axis 1.001 ms Marker Type Time 2.394 ms 2.448 ms 23 Time -24.30 dBm Time -1.33 dBm

	2400 MHz - 2	2483.5 MHz Band	d, 802.11(g) 6 Mb	pps, Mid Channel	6, 2437 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





	210010112 2	403.3 IVITZ Dariu	Number of	Value	l imit		
	Pulse Width	Period	Pulses	(%)	(%)	Reculte	
	1.393 ms	1.457 ms	1	95.6	(/8) N/A	N/A	1
🕴 Agilent 10:0	2:52 Nov 7,	2017			RT		
lement Materials	Technology					Mkr3 2.458	ms
ef 13 dBm		#Atten 10 c	зB			-1.09 d	Bm
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bg	1						
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87 - <mark>Maradadida</mark>	معارية أرفاني برابا علقي الارة	and State	n an	الأنبار والمأويا فأعاور أرزا	l de la tel servicio de la constanti de la cons	🖓 la di Har di La cata	a ha bi da
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enter 2.462 000	A GHz		I			Snan Ø	Hz
es RW 3 MHz			∎VBW З00 kH-		Sween	3 ms (8192 n	ts)
Marker Traci	o Tyne	X	Avis	Ĥmn	litude	0 m3 (010E p	,
1 (1)	Time	1	.001 ms	-2.0	4 dBm		
2 (1)	Time	2	.394 ms	-21.3	0 dBm		
	Timo	2	.458 ms	-1.0	9 dBm		

2400 MHz - 2	483.5 MHz Band	, 802.11(g) 6 Mbp	os, High Channel	11, 2462 MHz	
		Number of	Value	Limit	
 Pulse Width	Period	Pulses	(%)	(%)	Results
N/A	N/A	5	N/A	N/A	N/A





XMit 2017.09.21

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz Number of Value Limit **(%)** 79.9 **(%)** N/A Pulse Width Period Pulses Results 253.2 us 316.8 us N/A 🔆 Agilent 10:07:04 Nov 7, 2017 R Т Mkr3 385.2 µs -3.41 dBm Element Materials Technology Ref 13 dBm #Peak #Atten 10 dB Log 5 **h**in dB/ والقدار والمتعال , data 0ffst 23 dB #LgAv \$ W1 S2 Center 2.412 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 68.4 μs 321.6 μs 385.2 μs Amplitude -3.70 dBm -29.45 dBm -3.41 dBm Trace (1) (1) (1) (1) Marker Type Time 1 23 Time Time

	2400 MHz - 2	483.5 MHz Band	, 802.11(g) 36 Mb	ops, Low Channel	1, 2412 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





XMit 2017.09.21

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz Number of Value Limit **(%)** N/A Pulse Width Period Pulses (%) Results 253.2 us 307.8 us 82.3 N/A Agilent 10:11:04 Nov 7, 2017 R Т ₩. Element Materials Technology Mkr3 376.3 µs Ref 14 dBm #Peak #Atten 10 dB -1.14 dBm .og davidi <mark>svi devida je</mark> Na družen stalovana st , Luli I.L. had a life of the dB/ 0ffst 23 dB #LgAv W1 S2 Center 2.437 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 68.5 µs 321.7 µs 376.3 µs Amplitude -1.22 dBm -31.89 dBm -1.14 dBm Trace (1) (1) (1) Marker Type Time 23 Time Time















2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz Number of Value Limit **(%)** 82.9 **(%)** N/A Pulse Width Period Pulses Results 177.3 us 213.8 us N/A R Agilent 10:18:26 Nov 7, 2017 Т \*\* Mkr3 323.4 µs Element Materials Technology Ref 13 dBm #Peak #Atten 10 dB -4.20 dBm Log ALC: N dB/ 0ffst 23 dB #LgAv W1 S2 Center 2.412 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 109.6 μs 286.9 μs 323.4 μs Amplitude -3.81 dBm -32.18 dBm -4.20 dBm Trace (1) (1) (1) (1) Marker Type Time 1 23 Time Time

	2400 MHz - 2	483.5 MHz Band	, 802.11(g) 54 Mb	ops, Low Channel	1, 2412 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz Number of Value Limit **(%)** 82.9 **(%)** N/A Pulse Width Period Pulses Results 177.2 us 213.8 us N/A Agilent 10:22:22 Nov 7, 2017 R Т \*\* Mkr3 332.3 µs Element Materials Technology Ref 14 dBm #Peak #Atten 10 dB -1.39 dBm Log والبرا المامة وال هامية وجزئهما والع 1. 4. الملا بالاست ال 12 Sol La La Constanti dB/ 8 , d'ut din Mala δŀ h. at <u>, Ni</u> 0ffst 23 dB #LgAv W1 S2 Center 2.437 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 118.5 µs 295.7 µs 332.3 µs Trace (1) (1) (1) (1) Amplitude -0.99 dBm -25.84 dBm Marker Type Time 1 23 Time Time -1.39 dBm

	2400 MHz - 2	483.5 MHz Band	, 802.11(g) 54 MI	bps, Mid Channel	6, 2437 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A













Pulse Width        Period        Pulses        (%)        (%)        Results          1.301 ms        1.365 ms        1        95.4        N/A        N/A          Agient 10:29:49        Nov 7, 2017        R        T          Element Materials Technology        #Atten 10 dB        -2.74 dBm          #Peak        -2.74 dBm        -2.74 dBm          09        -4.44 dB or dB ot to ut	Pulse Width        Period        Pulses        (%)        (%)        Results          1.301 ms        1.365 ms        1        95.4        N/A        N/A          Agilent 10:29:49        Nov 7, 2017        R        T          Element Materials Technology        #Atten 10 dB        -2.74 dBm          #Peak	Pulse Width        Period        Pulses        (%)        (%)        Results          1.301 ms        1.365 ms        1        95.4        N/A        N/A          # Agilent 10:29:49        Nov 7, 2017        R        T          lement Materials Technology        #Atten 10 dB        -2.74 dBm          Peak        #Atten 10 dB        -2.74 dBm          Peak        #Atten 10 dB        -2.74 dBm          B/        #Atten 10 dB        -2.74 dBm          Iffst        #Atten 10 dB        -2.74 dBm          galar        #Atten 10 dB        -2.84 dBm          galar        #Atten 10 dB        -2.82 dBm          galar        #Atten 10 dB        -2.82 dBm          galar        #Atten 10 dB        -2.82 dBm          galar        #VBW 300 kHz        Sweep 3 ms (8192 pts)		2400 101712 - 1	2403.3 WITZ Dati	Number of	Value	Limit		
Image: Note of the second s	Image: Note of the second sector of the sector of the second sector of the second sector of the second s	I.301 ms      I.365 ms      I      95.4      N/A      N/A        # Agilent 10:29:49      Nov 7, 2017      R      T        lement Materials Technology      Mkr3 2.365 ms      -2.74 dBm        ef 12 dBm      #Atten 10 dB      -2.74 dBm        Peak      -2.74 dBm      -2.74 dBm        09      -2.74 dBm      -2.74 dBm        B/      -2.74 dBm      -2.74 dBm        I solution of the second secon		Pulse Width	Period	Pulses	(%)	(%)	Results	
* Agilent 10:29:49 Nov 7, 2017      R T        Idement Materials Technology      Mkr3 2.365 ms        Ref 12 dBm      *Atten 10 dB        PPeak      -2.74 dBm        .09      -444 tH defective threads and the defective	Agilent 10:29:49 Nov 7, 2017      R T        Idement Materials Technology      Mkr3 2.365 ms        Aef 12 dBm      #Atten 10 dB        OP      444418 or draft termine termin	# Agilent 10:29:49 Nov 7, 2017    R T      lement Materials Technology    Mkr3 2.365 ms      ef 12 dBm    #Atten 10 dB      og    -2.74 dBm      B/    -4.44 dBm      og    -4.44 dBm      B/    -4.44 dBm      Issee    -4.44 dBm		1.301 ms	1.365 ms	1	95.4	N/A	N/A	
Agilent 10:29:49 Nov 7, 2017    R T      Element Materials Technology    Mkr3 2.365 ms      Agilent 10:29:49 Mov 7, 2017    Mkr3 2.365 ms      Agilent 10 dB    -2.74 dBm      Appeak    -2.74 dBm      Agilent 10:29:49 Mov 7, 2017    Mkr3 2.365 ms	** Agilent 10:29:49 Nov 7, 2017    R T      Element Materials Technology    Mkr3 2.365 ms      Agilent 10:29:49 Mov 7, 2017    Marker      Trace    Type      X Axis    Amplitude      Agilent 10:29:49 Mile    Mkr3 2.365 ms      Autor 10:40 Mile    Mkr3 2.365 ms      Agilent 10:29:49 Mile    Mkr3 2.365 ms	** Agilent 10:29:49    Nov 7, 2017    R    T      lement Materials Technology    #Atten 10 dB    -2.74 dBm      Peak    -2.74 dBm    -2.74 dBm      0g    -4.14144444    -4.1414444      0g    -4.1414444    -4.1414444      0g    -4.1414444    -4.1414444      0g    -4.1414444    -4.141444      0g    -4.141444    -4.141444      1    -4.141444    -4.141444      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1    1    1      1 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>								
Element Materials Technology Mkr3 2.365 ms Ref 12 dBm *Atten 10 dB -2.74 dBm *Peak Log 5 5 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Element Materials Technology      Mkr3 2,365 ms        Ref 12 dBm      *Atten 10 dB        *Peak         Log         5         6B/         0Ffst         23         dB         wLgAv         All S2         Center 2.412 000 GHz      XAxis        Marker Trace      Type        X Axis      Amplitude        Y      Yes        Y      Yes        Yes      Yes        Yes <td>lement Materials Technology ef 12 dBm #Atten 10 dB2.74 dBm Peak og b/ ffst B/ ffst B LgAv 1 S2 enter 2.412 000 GHz es BW 3 MHz #VBW 300 kHz Sweep 3 ms (8192 pts) Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms2.84 dBm 2 (1) Time 2.365 ms2.74 dBm</td> <td>🔆 Agilent 10:2</td> <td>9:49 Nov 7,</td> <td>2017</td> <td></td> <td></td> <td>RΤ</td> <td></td> <td></td>	lement Materials Technology ef 12 dBm #Atten 10 dB2.74 dBm Peak og b/ ffst B/ ffst B LgAv 1 S2 enter 2.412 000 GHz es BW 3 MHz #VBW 300 kHz Sweep 3 ms (8192 pts) Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms2.84 dBm 2 (1) Time 2.365 ms2.74 dBm	🔆 Agilent 10:2	9:49 Nov 7,	2017			RΤ		
Ref 12 dBm    #Atten 10 dB    -2.74 dBm      #Peak	Ref 12 dBm    *Atten 10 dB    -2.74 dBm      *Peak	ef 12 dBm *Atten 10 dB2.74 dBm Peak og bl/ ffst B/ LgAv 1 S2 enter 2.412 000 GHz *VBW 300 kHz Sweep 3 ms (8192 pts) Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms2.84 dBm 2 (1) Time 2.365 ms2.74 dBm	Element Materials	Technology					Mkr3 2.365	ms
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Log 5 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Log 5 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	og B/ ffst B LgAv 1 S2 enter 2.412 000 GHz s BH 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.801 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	#Peak							
5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5    5 <td>5      3      3      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4</td> <td>B/ ffst B LgAv 1 S2 enter 2.412 000 GHz marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm</td> <td></td> <td>1</td> <td>1.1</td> <td></td> <td></td> <td></td> <td></td> <td></td>	5      3      3      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4      4	B/ ffst B LgAv 1 S2 enter 2.412 000 GHz marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm		1	1.1					
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Offst    Image: Content of the second	Offst 23 dB *LgAv *LgAv W1 \$2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	And the second secon	dB/ <mark>"",  , 4,4,1</mark> "	لك إذا الأسرارية يا المثال إذ	ايرانوراني الواقي زرا	والماذة الأراط والطلا وعكر	a , tuli juli ji dalati , ju j	<mark>, Maral Maral In</mark>	ىزىلىمانىڭ ئەرارىقارارلىغ اللارىيە	<b>i L</b> i
23 dB    1    1    1    1    1    1      #LgAv    #LgAv    2    1    1    1    1      #LgAv    4    1    1    1    1    1      W1 \$2    1    1    1    1    1    1      Center 2.412 000 GHz    Span 0 Hz    Span 0 Hz    Span 0 Hz      Res BW 3 MHz    #VBW 300 kHz    Sweep 3 ms (8192 pts)      Marker    Trace    Type    X Axis    Amplitude      1    (1)    Time    1.001 ms    -2.84 dBm      2    (1)    Time    2.302 ms    -29.02 dBm      3    (1)    Time    2.365 ms    -2.74 dBm	23 dB	B B LgAv 1 S2 enter 2.412 000 GHz s BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	Offst	olimitation in a		1 F 1 P	an na sa	- I. I. I. I.	an at liter a second	
ab HLgAv HLgAv H1 S2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	ab   #LgAv   #LgAv   #LgAv   W1 S2   Center 2.412 000 GHz   Center 2.412 000 GHz   Res BW 3 MHz   #VBW 300 kHz   Sweep 3 ms (8192 pts)   Marker   1   (1)   Time   2   (1)   Time   2   (1)   Time   2.365 ms	B LgAv 1 S2 enter 2.412 000 GHz s BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	23							
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#LgAv W1 S2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	#LgAv    #LgAv      W1 S2    Image: Span 0 Hz      Center 2.412 000 GHz    Span 0 Hz      Res BW 3 MHz    #VBW 300 kHz    Sweep 3 ms (8192 pts)      Marker    Trace    Type      1    (1)    Time    1.001 ms      2    (1)    Time    2.302 ms      3    (1)    Time    2.365 ms	LgAv 1 S2 enter 2.412 000 GHz es BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm								
#LgAv    #LgAv      W1 \$2    Image: Span 0 Hz      Center 2.412 000 GHz    Span 0 Hz      Res BW 3 MHz    #VBW 300 kHz    Sweep 3 ms (8192 pts)      Marker Trace Type    X Axis    Amplitude      1    (1)    Time    1.001 ms    -2.84 dBm      2    (1)    Time    2.302 ms    -29.02 dBm      3    (1)    Time    2.365 ms    -2.74 dBm	#LgAv    #LgAv      W1 S2    W1 S2      Center 2.412 000 GHz    Span 0 Hz      Res BW 3 MHz    #VBW 300 kHz    Sweep 3 ms (8192 pts)      Marker    Trace    Type      X Axis    Amplitude      1    (1)    Time      2    (1)    Time      3    (1)    Time      3    (1)	LgAv 1 S2 enter 2.412 000 GHz es BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm								
#LgAv W1 S2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	#LgAv W1 S2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	LgAv 1 S2 enter 2.412 000 GHz es BW 3 MHz Marker Trace Type 1 (1) Time 2 (1) Time 3 (1) Time 2.385 ms Marker Trace Type 2.385 ms -2.74 dBm -2.74 dBm						2		
W1 S2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	W1 S2 Center 2.412 000 GHz Res BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	1 S2 enter 2.412 000 GHz es BW 3 MHz Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	#LgAv					→		
W1 S2      Center 2.412 000 GHz      Span 0 Hz        Center 2.412 000 GHz      sweep 3 ms (8192 pts)        Res BW 3 MHz      #VBW 300 kHz      Sweep 3 ms (8192 pts)        Marker      Trace      Type      X Axis      Amplitude        1      (1)      Time      1.001 ms      -2.84 dBm        2      (1)      Time      2.302 ms      -29.02 dBm        3      (1)      Time      2.365 ms      -2.74 dBm	W1 S2	1 S2      Span 0 Hz        enter 2.412 000 GHz      Span 0 Hz        es BW 3 MHz      #VBW 300 kHz      Sweep 3 ms (8192 pts)        Marker Trace Type      X Axis      Amplitude        1 (1)      Time      1.001 ms      -2.84 dBm        2 (1)      Time      2.302 ms      -29.02 dBm        3 (1)      Time      2.365 ms      -2.74 dBm						<u></u>		
Center 2.412 000 GHz        Span 0 Hz          Res BW 3 MHz        #VBW 300 kHz        Sweep 3 ms (8192 pts)          Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.302 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	Center 2.412 000 GHz        Span 0 Hz          Res BW 3 MHz        #VBW 300 kHz        Sweep 3 ms (8192 pts)          Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.302 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	enter        2.412        000        GHz        Span        0 Hz          es        BW 3        MHz        WBW 300        KHz        Sweep 3 ms (8192 pts)          Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.302 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	41 S2							
Res BW 3 MHz        #VBW 300 kHz        Sweep 3 ms (8192 pts)          Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.302 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	Res BW 3 MHz        #VBW 300 kHz        Sweep 3 ms (8192 pts)          Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.302 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	es BW 3 MHz #VBW 300 kHz Sweep 3 ms (8192 pts) Marker Trace Type X Axis Amplitude 1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	Center 2.412 000	0 GHz					Span Ø	Ηz
Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.302 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	MarkerTraceTypeX AxisAmplitude1(1)Time1.001 ms-2.84 dBm2(1)Time2.302 ms-29.02 dBm3(1)Time2.365 ms-2.74 dBm	Marker        Trace        Type        X Axis        Amplitude          1        (1)        Time        1.001 ms        -2.84 dBm          2        (1)        Time        2.382 ms        -29.02 dBm          3        (1)        Time        2.365 ms        -2.74 dBm	Res BW 3 MHz		+	VBW 300 kHz		Sweep	<u>3 ms (8192 pt</u>	:s)
1    (1)    1 me    1.001 ms    -2.84 dBm      2    (1)    Time    2.302 ms    -29.02 dBm      3    (1)    Time    2.365 ms    -2.74 dBm	1 (1) Time 1.001 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	1 (1) Time 1.801 ms -2.84 dBm 2 (1) Time 2.302 ms -29.02 dBm 3 (1) Time 2.365 ms -2.74 dBm	Marker Trac	e Type	X	Áxis	Ampl	itude 4 JB-		
3 (1) Time 2.365 ms -2.74 dBm	3 (1) Time 2.365 ms -2.74 dBm	3 (1) Time 2.365 ms -2.74 dBm	1 (1) 2 (1)	lime Timo	1.	.001 ms 302 me	-2.84 -29.02	4 abm 2 dBm		
			3 (1)	Time	2.	365 ms	-2.7	4 dBm		

	2400 MHz - 3	2483.5 MHz Ban	d, 802.11(n) MCS	60, Low Channel <sup>-</sup>	1, 2412 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A





		Dan	Number of	Value	Limit		
	Pulse Width	Period	Pulses	(%)	(%)	Results	
	1.301 ms	1.356 ms	1	96	N/A	N/A	
🔆 Agilent 10:33	3:36 Nov 7, 2	017			RΤ		
Element Materials	Technology					Mkr3 2.357	ms
Ref 13 dBm	#	Atten 10 d	В			-1.16 d	Bm
#Peak							
Log	J. I. J. Lu			L MIL A LA LAL	1 4		
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dB/ <mark>MINING MINING MI</mark>	المراجع الشاري المراجع المراجع المراجع	<mark>(19) (1</mark> ) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1			<mark>, Pl Philip</mark> 🎸		. Lubi
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dB							
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#LaAv					¥_		
W1 S2							
Center 2.437 000	) GHz					Span Ø	Hz
Res BW 3 MHz		#	VBW 300 kHz	,	Sween	3 ms (8192 n	ts)
Marker Trace	e Tvpe	X	Axis	Ámo	litude		
1 (1)	Time	1.	001 ms	-1.3	6 dBm		
2 (1)	Time	2.	302 ms	-25.3	4 dBm		
				_1 1	the second s		

	2400 MHz -	2483.5 MHz Ban	d, 802.11(n) MCS	60, Mid Channel 6	6, 2437 MHz	
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A

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Element	t Material	s Technol	logy								
Ref 13	dBm		#At	ten 10 dE	3						
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Log											
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res DM	I D MIHZ			#1	IDM 200	KNZ	3	wee	p 0.5:	<del>.</del> ס, אורכנ	ισζ μτς)_



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz Number of Value Limit **(%)** 97.3 **(%)** N/A Pulse Width Period Pulses Results 1.301 ms 1.338 ms N/A R Т Agilent 10:37:09 Nov 7, 2017 \*\* Mkr3 2.338 ms Element Materials Technology Ref 12 dBm #Peak #Atten 10 dB -2.59 dBm .og المحمل والمتعر ومتماطية والكالك ومحمل والمتراجع والمتواف والمعاد فرجاوف بلدى فور وللقرو عربي والمراجع المراجعة والمنافقة والمراجع والمناجع والمتعادية والمنافعة والمنافعة والمنافعة والمراجع ومتقافه dB/ اراعة لترزريا للترقي تلازيقها فتغاريهم ك اللافية إلى إل 0ffst 23 dB 2 #LgAv W1 S2 Center 2.462 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 3 ms (8192 pts) Trace (1) (1) (1) (1) Amplitude -2.33 dBm -29.71 dBm X Axis 1.001 ms Marker Type Time 2.302 ms 2.338 ms 23 Time -2.59 dBm Time

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
		Number of	Value	Limit		
Pulse Width	Period	Pulses	(%)	(%)	Results	
N/A	N/A	5	N/A	N/A	N/A	





2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz Number of Value Limit **(%)** 75.1 **(%)** N/A Pulse Width Period Pulses Results 165.1 us 219.8 us N/A Agilent 10:41:31 Nov 7, 2017 R Т ₩. Mkr3 350.4 µs Element Materials Technology Ref 12 dBm #Peak -2.99 dBm #Atten 10 dB .og dB/ 0ffst 23 dB ł #LgAv W1 S2 Center 2.412 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 130.6 µs 295.7 µs 350.4 µs Trace (1) (1) (1) (1) Amplitude -3.24 dBm -27.19 dBm Marker Type Time 23 Time Time -2.99 dBm







2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz Number of Value Limit **(%)** 78.4 **(%)** N/A Pulse Width Period Pulses Results 165.2 us 210.8 us N/A Agilent 10:45:38 Nov 7, 2017 R Т ₩. Mkr3 359.4 µs Element Materials Technology Ref 14 dBm #Peak #Atten 10 dB -1.10 dBm Log والألار والأخلا والمارية dB/ r n'njolar njo £ <mark>С</mark>ънч 0ffst 23 dB #LgAv W1 S2 Center 2.437 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 148.6 µs 313.8 µs 359.4 µs Amplitude -1.38 dBm -29.95 dBm -1.10 dBm Trace (1) (1) (1) (1) Marker Type Time 23 Time Time







2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz Number of Value Limit **(%)** 81.8 **(%)** N/A Pulse Width Period Pulses Results 165.1 us 201.9 us N/A Agilent 10:48:58 Nov 7, 2017 R Т ₩. Element Materials Technology Mkr3 368.5 µs Ref 13 dBm #Peak #Atten 10 dB -2.10 dBm .og and the second a di <mark>biana a</mark> dB/ 0ffst 23 dB ó #LgAv W1 S2 Center 2.462 000 GHz Res BW 3 MHz Span 0 Hz #VBW 300 kHz Sweep 1 ms (8192 pts) X Axis 166.6 µs 331.7 µs 368.5 µs Trace (1) (1) (1) (1) Amplitude -2.05 dBm Marker Type Time -25.08 dBm -2.10 dBm 23 Time Time





## **OCCUPIED BANDWIDTH**



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

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due	
Generator - Signal	Agilent	N5183A	TIK	29-Sep-17	29-Sep-20	
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Sep-17	11-Sep-18	
Attenuator	S.M. Electronics	SA26B-20	RFW	14-Feb-17	14-Feb-18	
Block - DC	Fairview Microwave	SD3379	AMI	12-Sep-17	12-Sep-18	
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	16-Mar-17	16-Mar-18	

#### **TEST DESCRIPTION**

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

### **OCCUPIED BANDWIDTH**



					TbtTx 2017.10.04	XMit 2017.09.21
EUT	Activity Tracking Belt			Work Order:	DGII0263	
Serial Number:	F8F005FF1522			Date:	7-Nov-17	
Customer	Digi International Inc			Temperature:	21.8 °C	
Attendees	Collin LaFave			Humidity:	22.7% RH	
Project	bject: None			Barometric Pres.:		
Tested by:	Dustin Sparks		Power: 5VDC	Job Site:	MN08	
TEST SPECIFICAT	IONS		Test Method			
FCC 15.247:2017			ANSI C63.10:2013			
COMMENTS						
EUT powered by U	ISB connection					
DEVIATIONS FROM	M TEST STANDARD					
None						
			6			
Configuration #	1		XIII 2 Q			
J		Signature	- month parco			
	1	0.9.1010			Limit	
				Value	(>)	Result
2400 MHz - 2483.5	MHz Band					
	802.11(b) 1 Mbps					
	Low Channel	1, 2412 MHz		11.068 MHz	500 kHz	Pass
	Mid Channel 6	6, 2437 MHz		10.935 MHz	500 kHz	Pass
	High Channel	11.888 MHz	500 kHz	Pass		
	802.11(b) 11 Mbps					
	Low Channel	1, 2412 MHz		11.914 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz				11.66 MHz	500 kHz	Pass
	High Channel	11.816 MHz	500 kHz	Pass		
	802.11(g) 6 Mbps					
	Low Channel	15.527 MHz	500 kHz	Pass		
Mid Channel 6, 2437 MHz			16.077 MHz	500 kHz	Pass	
	High Channel	15.623 MHz	500 kHz	Pass		
802.11(g) 36 Mbps						
Low Channel 1, 2412 MHz				16.016 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz			16.224 MHz	500 kHz	Pass	
High Channel 11, 2462 MHz				16.286 MHz	500 kHz	Pass
802.11(g) 54 Mbps						
	Low Channel	1, 2412 MHz		16.126 MHz	500 kHz	Pass
	Mid Channel 6	6, 2437 MHz		15.727 MHz	500 kHz	Pass
	High Channel	15.973 MHz	500 kHz	Pass		
	802.11(n) MCS0					
	Low Channel	1, 2412 MHz		16.036 MHz	500 kHz	Pass
	Mid Channel 6	6, 2437 MHz		16.456 MHz	500 kHz	Pass
	High Channel	11, 2462 MHz		16.072 MHz	500 kHz	Pass
	802.11(n) MCS7					
	Low Channel	1, 2412 MHz		16.362 MHz	500 kHz	Pass
	Mid Channel 6	6, 2437 MHz		16.382 MHz	500 kHz	Pass
	High Channel	11, 2462 MHz		16.761 MHz	500 kHz	Pass

### **OCCUPIED BANDWIDTH**



TbtTx 2017.10.04 XMit 2017.09.21 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz Limit Value **(>)** 500 kHz Result 11.068 MHz Pass Agilent 09:31:04 Nov 7, 2017 R T ₩. Element Materials Technology Ref 7 dBm #Peak #Atten 10 dB .og My physical and U. M. Malan → ÷ dB/ 0ffst 23 dB 4 #LgAv M1 S2 WALLAN l.a х Center 2.412 000 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.999 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -6.00 dB 13.8722 MHz x dB **Transmit Freq Error** -139.895 kHz **Occupied Bandwidth** 11.068 MHz 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz Limit Value (>) Result 10.935 MHz 500 kHz Pass Agilent 09:05:32 Nov 7, 2017 R T 兼 Element Materials Technology Ref 8 dBm #Peak #Atten 10 dB .og a when the way MMALA






#VBW 300 kHz

#LgAv

M1 S2

M1 S2

Transmit Freq Error Occupied Bandwidth

Occupied Bandwidth

13.7842 MHz

-105.519 kHz

11.914 MHz

#Res BW 100 kHz

Span 30 MHz

99.00 % -6.00 dB

Sweep 2.999 ms (3000 pts)

x dB

Occ BW % Pwr



TbtTx 2017.10.04 XMit 2017.09.21 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz Limit Value **(>)** 500 kHz Result 11.66 MHz Pass Agilent 09:38:04 Nov 7, 2017 R Т ₩. Element Materials Technology Ref 8 dBm #Atten 10 dB #Peak .og abile many many many many Ŷ dB/ 0ffst 23 dB Altran Indenen Iste #LgAv M1 S2 (M)). Center 2.437 000 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.999 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 13.7968 MHz -6.00 dB x dB **Transmit Freq Error** -103.762 kHz **Occupied Bandwidth** 11.660 MHz 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz Limit Value (>) Result 11.816 MHz 500 kHz Pass Agilent 09:41:29 Nov 7, 2017 R T 兼 Element Materials Technology Ref 7 dBm #Peak #Atten 10 dB .og rwryth. m/Mi ÷ ⇒ dB/ 0ffst 23 dB Mandal and Market #LgAv n Mile M1 S2

M1 S2 Center 2.462 000 GHz \*Res BW 100 kHz \*VBW 300 kHz Sweep 2.999 ms (3000 pts) Occupied Bandwidth 13.7872 MHz \* dB -6.00 dB Transmit Freq Error -104.908 kHz Occupied Bandwidth 11.816 MHz





Occ BW % Pwr

x dB

99.00 % -6.00 dB

Occupied Bandwidth

Transmit Freq Error Occupied Bandwidth

16.6437 MHz

-78.605 kHz 16.077 MHz





Occ BW % Pwr

x dB

99.00 % -6.00 dB

Occupied Bandwidth

Transmit Freq Error Occupied Bandwidth

16.4327 MHz

-39.225 kHz 16.016 MHz







TbtTx 2017.10.04 XMit 2017.09.21 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz Limit Value **(>)** 500 kHz Result 16.126 MHz Pass Agilent 10:18:57 Nov 7, 2017 R T ₩. Element Materials Technology Ref 6 dBm #Atten 10 dB #Peak .og بدارير العنبا متلمدارير when when the stand X → **d** AN ALA LALAN DALA MARANA dB/ 0ffst 23 dB www. www.whetheliny.uh #LgAv M1 S2 Center 2.412 000 GHz Span 35 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.399 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -6.00 dB 16.4391 MHz x dB **Transmit Freq Error** -18.459 kHz **Occupied Bandwidth** 16.126 MHz 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz Limit Value (>) Result 15.727 MHz 500 kHz Pass Agilent 10:22:50 Nov 7, 2017 R T 兼 Element Materials Technology Ref 7 dBm #Peak #Atten 10 dB Log her the est of the dB/ 0ffst 23 dB n...... MANAMANAMALANA #LgAv M1 S2 Center 2.437 000 GHz Span 35 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.399 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -6.00 dB x dB 16.4946 MHz

> Transmit Freq Error -40.516 kHz Occupied Bandwidth 15.727 MHz





Transmit Freq Error-34.399 kHzOccupied Bandwidth16.036 MHz



TbtTx 2017.10.04 XMit 2017.09.21 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz Limit Value **(>)** 500 kHz Result 16.456 MHz Pass Agilent 10:34:05 Nov 7, 2017 R Т ₩. Element Materials Technology Ref 6 dBm #Peak #Atten 10 dB - ----.og as al. 1 dB/ 6 0ffst 23 dB han the second second halfrankan analysin a #LgAv M1 S2 Center 2.437 000 GHz Span 35 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.399 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 17.7226 MHz -6.00 dB x dB **Transmit Freq Error** -40.301 kHz **Occupied Bandwidth** 16.456 MHz 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz Limit Value (>) Result 16.072 MHz 500 kHz Pass Agilent 10:37:40 Nov 7, 2017 R T 兼 Element Materials Technology Ref 6 dBm #Peak #Atten 10 dB Log **€**⊳ > 💦 dB/ 0ffst 23 dB Aber the WWWWWWWWWW #LgAv M1 S2 Center 2.462 000 GHz Span 35 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.399 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -6.00 dB x dB 17.6587 MHz

> Transmit Freq Error -46.973 kHz Occupied Bandwidth 16.072 MHz





htter white the second http://www.unipons #LgAv M1 S2 Center 2.437 000 GHz Span 35 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.399 ms (3000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -6.00 dB x dB 17.6277 MHz Transmit Freq Error Occupied Bandwidth -42.056 kHz 16.382 MHz







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

#### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	29-Sep-17	29-Sep-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Sep-17	11-Sep-18
Attenuator	S.M. Electronics	SA26B-20	RFW	14-Feb-17	14-Feb-18
Block - DC	Fairview Microwave	SD3379	AMI	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	16-Mar-17	16-Mar-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.



TuTx 2017.10.04								4 XMit 2017.09.21		
EUT	: Activity Tracking Belt		Work Order: DGII0263							
Serial Number	F8F005FF1522					Date: 7-Nov-17				
Customer	: Digi International Inc		Temperature	:: 21.8 °C						
Attendees	: Collin LaFave		Humidity: 22.8% RH							
Project	: None		Barometric Pres							
Tested by	: Dustin Sparks		Power:	5VDC		Job Site	: MN08			
TEST SPECIFICAT	TIONS			Test Method						
FCC 15.247:2017				ANSI C63.10:2013						
COMMENTS										
EUT powered by L	USB connection									
DEVIATIONS FRO	M IESI SIANDARD									
None			6							
Configuration #	1		29-1'	$\sum n$						
configuration #		Signature	Custine	sparto						
		Signature		Avg Cond	Duty Cycle	Value	Limit			
				Pwr (dBm)	Factor (dB)	(dBm)	(dBm)	Results		
2400 MHz - 2483.5	MHz Band				. ,					
	802.11(b) 1 Mbps									
	Low Channel	l 1, 2412 MHz		10.969	0	11	30	Pass		
	Mid Channel	6, 2437 MHz		12.713	0	12.7	30	Pass		
	High Channe		12.74	0	12.8	30	Pass			
	802.11(b) 11 Mbps									
	Low Channel	l 1, 2412 MHz		10.806	0.2	11	30	Pass		
	Mid Channel	6, 2437 MHz		12.645	0.2	12.8	30	Pass		
	High Channe	el 11, 2462 MHz		12.568	0.3	12.9	30	Pass		
	802.11(g) 6 Mbps			10.000		10.5				
	Low Channel	11, 2412 MHz		10.399	0.1	10.5	30	Pass		
	Mid Channel	6, 2437 MHZ		12.208	0.2	12.4	30	Pass		
	High Channe	ei 11, 2462 MHZ		11.327	0.2	11.5	30	Pass		
	802.11(g) 36 Mbps	1.0410 MU-		0.700	4	10.0	20	Deee		
	Mid Channel	6 2/37 MHz		11 503	0.8	10.0	30	Pace		
	High Channe	al 11 2462 MHz		10 748	1	12.4	30	Pass		
	802 11(a) 54 Mbps			10.740			00	1 455		
	Low Channel	1, 2412 MHz		9.618	0.8	10.4	30	Pass		
	Mid Channel	6. 2437 MHz		11.465	0.8	12.3	30	Pass		
	High Channe	el 11. 2462 MHz		10.621	0.8	11.4	30	Pass		
	802.11(n) MCS0									
	Low Channel	l 1, 2412 MHz		10.378	0.2	10.6	30	Pass		
	Mid Channel	6, 2437 MHz		12.197	0.2	12.4	30	Pass		
	High Channe	el 11, 2462 MHz		11.346	0.1	11.5	30	Pass		
	802.11(n) MCS7									
	Low Channel	l 1, 2412 MHz		9.483	1.2	10.7	30	Pass		
	Mid Channel		11.389	1.1	12.4	30	Pass			
	High Channe	el 11, 2462 MHz		10.528	0.9	11.4	30	Pass		











TbtTx 2017.10.04 XMit 2017.09.21 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz Avg Cond Duty Cycle Value Limit Pwr (dBm) Factor (dB) (dBm) (dBm) Results 12.74 0 12.8 30 Pass Agilent 08:57:18 Nov 7, 2017 R T ¥£-Element Materials Technology Ref 9 dBm #Atten 10 dB #Avg Log dB/ 0ffst 23 dB #PAvg M1 S2 Center 2.462 00 GHz #Res BW 1 MHz Span 30 MHz #Sweep 601 ms (601 pts) #VBW 3 MHz **Channel Power Power Spectral Density** 12.74 dBm /13.9613 MHz -58.71 dBm/Hz







XMit 2017.09.21

TbtTx 2017.10.04 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz Avg Cond Duty Cycle Value Limit Pwr (dBm) Factor (dB) (dBm) (dBm) Results 12.645 0.2 12.8 30 Pass R T Agilent 09:39:51 Nov 7, 2017 ж. Element Materials Technology Ref 8 dBm #Atten 10 dB #Avg Log dB/ 0ffst 23 dB #PAvg M1 S2 Center 2.437 00 GHz #Res BW 1 MHz Span 30 MHz #Sweep 601 ms (601 pts) #VBW 3 MHz **Channel Power Power Spectral Density** 12.65 dBm /13.7968 MHz -58.75 dBm/Hz

 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz

 Avg Cond
 Duty Cycle
 Value
 Limit

 Pwr (dBm)
 Factor (dB)
 (dBm)
 Results

 12.568
 0.3
 12.9
 30
 Pass







2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz							
		Avg Cond	Duty Cycle		Value	Limit	
		Pwr (dBm)	Factor (dB)		(dBm)	(dBm)	Results
		12.208	0.2		12.4	30	Pass





XMit 2017.09.21

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz Avg Cond Duty Cycle Value Limit Pwr (dBm) Factor (dB) (dBm) (dBm) Results 11.327 0.2 11.5 30 Pass R T Agilent 10:05:04 Nov 7, 2017 ¥£-Element Materials Technology Ref 6 dBm #Atten 10 dB #Avg Log dB/ 0ffst 23 dB #PAvg M1 S2 Center 2.462 00 GHz #Res BW 1 MHz Span 35 MHz #Sweep 601 ms (601 pts) #VBW 3 MHz **Channel Power Power Spectral Density** 11.33 dBm /16.5095 MHz -60.85 dBm/Hz







TbtTx 2017.10.04 XMit 2017.09.21









TbtTx 2017.10.04 XMit 2017.09.21 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz Avg Cond Duty Cycle Value Limit Pwr (dBm) Factor (dB) (dBm) (dBm) Results 9.618 0.8 10.4 30 Pass Agilent 10:20:37 Nov 7, 2017 R T ¥£-Element Materials Technology Ref 4 dBm #Atten 10 dB #Avg Log dB/ 0ffst 23 dB #PAvg M1 S2 Center 2.412 00 GHz Span 35 MHz #Res BW 1 MHz #Sweep 601 ms (601 pts) #VBW 3 MHz **Channel Power Power Spectral Density** /16.4391 MHz -62.54 dBm/Hz 9.62 dBm







XMit 2017.09.21

TbtTx 2017.10.04

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz Avg Cond Duty Cycle Value Limit Pwr (dBm) Factor (dB) (dBm) (dBm) Results 10.621 0.8 11.4 30 Pass R T Agilent 10:28:01 Nov 7, 2017 ж. Element Materials Technology Ref 5 dBm #Atten 10 dB #Avg Log dB/ 0ffst 23 dB #PAvg M1 S2 Center 2.462 00 GHz #Res BW 1 MHz Span 35 MHz #Sweep 601 ms (601 pts) #VBW 3 MHz **Channel Power Power Spectral Density** 10.62 dBm /16.4496 MHz -61.54 dBm/Hz







TbtTx 2017.10.04 XMit 2017.09.21









TbtTx 2017.10.04 XMit 2017.09.21



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz							
		Avg Cond	Duty Cycle		Value	Limit	
		Pwr (dBm)	Factor (dB)		(dBm)	(dBm)	Results
		11.389	1.1		12.4	30	Pass





XMit 2017.09.21

TbtTx 2017.10.04

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz Avg Cond Duty Cycle Value Limit Pwr (dBm) Factor (dB) (dBm) (dBm) Results 10.528 0.9 11.4 30 Pass R T 🔆 Agilent 10:51:05 Nov 7, 2017 Element Materials Technology Ref 5 dBm #Avg #Atten 10 dB Log 5 dB/ Offst 23 dB #PAvg M1 S2 Center 2.462 00 GHz #Res BW 1 MHz Span 40 MHz ₩VBW 3 MHz #Sweep 601 ms (601 pts) **Channel Power Power Spectral Density** 10.53 dBm /17.6030 MHz -61.93 dBm/Hz



XMit 2017.09.21

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

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	29-Sep-17	29-Sep-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Sep-17	11-Sep-18
Attenuator	S.M. Electronics	SA26B-20	RFW	14-Feb-17	14-Feb-18
Block - DC	Fairview Microwave	SD3379	AMI	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	16-Mar-17	16-Mar-18

#### **TEST DESCRIPTION**

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.



					TbtTx 2017.10.04	XMit 2017.09.21
EUT	Activity Tracking Belt			Work Order:	DGII0263	
Serial Number:	F8F005FF1522			Date:	7-Nov-17	
Customer:	Digi International Inc			Temperature:	21.9 °C	
Attendees:	Collin LaFave			Humidity:	22.7% RH	
Project:	None			Barometric Pres.:	1033 mbar	
Tested by:	Dustin Sparks		Power: 5VDC	Job Site:	MN08	
TEST SPECIFICAT	IONS		Test Method			
FCC 15.247:2017			ANSI C63.10:2013			
COMMENTS						
EUT powered by U	ISB connection					
DEVIATIONS FROM	M TEST STANDARD					
None						
			2000			
Configuration #	1		Vusting parts			
		Signature	(			
				Value	Limit	
				dBm/3kHz	< dBm/3kHz	Hesults
2400 MHz - 2483.5	MHz Band					
	802.11(b) 1 Mbps				-	_
	Low Channel	el 1, 2412 MHz		-12.748	8	Pass
	Mid Channel	16, 2437 MHz		-11.249	8	Pass
	High Channe	el 11, 2462 MHz		-10.562	8	Pass
	802.11(b) 11 Mbps			10.400	0	Deve
	Low Channel	9 1, 2412 MHZ		-10.426	8	Pass
	Mid Channel	1 6, 2437 MHZ		-11.579	8	Pass
	High Channe	ei 11, 2462 MHZ		-10.942	0	Pass
	602.11(g) 6 Mbps	1 0410 MH-		12.492	0	Bass
	Low Champel			-13.403	0	Pass
	High Chappe	10, 2437 MHZ		-11.508	0	Pass
	R02 11(a) 36 Mbps	BI TT, 2402 MINZ		-12.000	0	F 455
	Low Channel	1 2412 MHz		-14 257	8	Pass
	Mid Channel	6 2437 MHz		-14.237	8	Pass
	High Channel	al 11 2462 MHz		-12 835	8	Pass
	802 11(a) 54 Mbps			12.000	0	1 433
	Low Channel	1 2412 MHz		-14.396	8	Pass
	Mid Channel	6 2437 MHz		-11 761	8	Pass
	High Channe	el 11, 2462 MHz		-12.875	8	Pass
	802.11(n) MCS0	. ,		12.070	-	
	Low Channel	1 2412 MHz		-12 973	8	Pass
	Mid Channel	6. 2437 MHz		-12.537	8	Pass
	High Channe	el 11. 2462 MHz		-13.307	8	Pass
	802.11(n) MCS7	. ,		10.007		
	Low Channel	1. 2412 MHz		-13.981	8	Pass
	Mid Channel	6, 2437 MHz		-12.07	8	Pass
	High Channe	el 11, 2462 MHz		-13.662	8	Pass
	3	-				









#VBW 9.1 kHz

Center 2.462 000 0 GHz

#Res BW 3 kHz

Span <mark>20</mark> MHz

Sweep 2.123 s (8192 pts)




































XMit 2017.09.21

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

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	29-Sep-17	29-Sep-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Sep-17	11-Sep-18
Attenuator	S.M. Electronics	SA26B-20	RFW	14-Feb-17	14-Feb-18
Block - DC	Fairview Microwave	SD3379	AMI	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	16-Mar-17	16-Mar-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.

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



					TbtTx 2017.10.04	XMit 2017.09.21
EUT: Activity Tracking Belt				Work Order:	DGII0263	
Serial Number: F8F005FF1522				Date:	7-Nov-17	
Customer: Digi International Inc				Temperature:	21.8 °C	
Attendees: Collin LaFave				Humidity:	22.8% RH	
Project: None				Barometric Pres.:	1034 mbar	
Tested by: Dustin Sparks		P	ower: 5VDC	Job Site:	MN08	
TEST SPECIFICATIONS			Test Method			
FCC 15.247:2017			ANSI C63.10:2013			
COMMENTS						
EUT powered by USB connection						
. ,						
DEVIATIONS FROM TEST STANDARD						
None						
		1 11	0			
Configuration # 1		Austr	nt sando			
	Signature		-1			
				Value	Limit	
				(dBc)	≤ (dBc)	Result
2400 MHz - 2483.5 MHz Band						
802.11(b) 1 Mbps						-
Low Channel 1, 24	12 MHz			-33.86	-30	Pass
High Channel 11, 2	2462 MHz			-57.65	-30	Pass
802.11(b) 11 Mbps	10 MU=			20.04	20	Deee
Low Channel 1, 24				-36.64	-30	Pass
High Channel 11, 2	2462 MHZ			-58.53	-30	Pass
low Channel 1, 24	110 MH-			20.59	20	Bass
Low Granner 1, 24				-30.36	-30	Pass
802 11(a) 36 Mbps				-42.4	-30	F d55
Low Channel 1 24	L12 MHz			-31 55	-30	Pass
High Channel 11	2462 MHz			-42 97	-30	Pass
802 11(g) 54 Mbps				42.07	00	1 435
Low Channel 1, 24	12 MHz			-31.81	-30	Pass
High Channel 11.	2462 MHz			-42.94	-30	Pass
802.11(n) MCS0						
Low Channel 1, 24	12 MHz			-30.64	-30	Pass
High Channel 11.2	2462 MHz			-39.5	-30	Pass
802.11(n) MCS7						
Low Channel 1, 24	12 MHz			-31.86	-30	Pass
High Channel 11,	2462 MHz			-40.98	-30	Pass
<b>5 • • • • •</b>						



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz Value Limit ≤ (dBc) (dBc) Result 33.86 -30 Pass Agilent 09:29:26 Nov 7, 2017 R T ☀ Element Materials Technology ▲ Mkr1 -12.075 MHz Ref 20 dBm #Avg #Atten 10 dB -33.86 dB Log LUG 10 dB/ 0ffst 23 dB 1 R #PAvg V1 S3 S2 FC Ô  $\searrow$ Δ £(f): FTun M Swp Λl Center 2.400 000 GHz Span 45 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 601.2 ms (601 pts) 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz Value Limit (dBc) ≤ (dBc) Result -57.65 -30 Pass

























#VBW 300 kHz

Center 2.483 50 GHz

#Res BW 100 kHz

Span 100 MHz

#Sweep 601 ms (601 pts)









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

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	29-Sep-17	29-Sep-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Sep-17	11-Sep-18
Attenuator	S.M. Electronics	SA26B-20	RFW	14-Feb-17	14-Feb-18
Block - DC	Fairview Microwave	SD3379	AMI	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	16-Mar-17	16-Mar-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. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.







TbtTx 2017.10.04 XMit 2017.09.21





TbtTx 2017.10.04 XMit 2017.09.21





TbtTx 2017.10.04 XMit 2017.09.21





XMit 2017.09.21

TbtTx 2017.10.04

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz Frequency Max Value Limit ≤ (dBc) Range (dBc) Result Fundamental N/A N/A N/A Agilent 08:57:46 Nov 7, 2017 R Т ₩. Mkr1 2.458 997 1 GHz Element Materials Technology Ref 15 dBm #Peak #Atten 10 dB 3.19 dBm Log 10 dB/ In man mannen MAN Andre 0ffst 23 dB #LgAv V1 S3 S2 FC £(f): FTun Swp Start 2.453 000 0 GHz Stop 2.471 000 0 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.184 ms (8192 pts) 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz Max Value Frequency Limit (dBc) ≤ (dBc) Result Range 30 MHz - 12.5 GHz -53.63 -30 Pass ⋇ Agilent 08:58:45 Nov 7, 2017 R Т Element Materials Technology 2.219 2 GHz Mkr1 Ref 15 dBm #Peak -50.44 dBm #Atten 10 dB Log 10 dB/ 0ffst 23 dB #LgAv V1 S3 S2 FC 1 £(f): Lange La Line and the lat nas a tala. Tun Swp Start 3<mark>0.0 MH</mark>z Stop 12.500 0 GHz

#VBW 300 kHz

Sweep 1.192 s (8192 pts)

#Res BW 100 kHz



XMit 2017.09.21

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz Frequency Max Value Limit Range 12.5 GHz - 25 GHz (dBc) ≤ (dBc) Result 54.29 -30 Pass R T 🔆 Agilent 08:59:42 Nov 7, 2017 Element Materials Technology Mkr1 24.910 0 GHz Ref 15 dBm #Peak #Atten 10 dB -51.10 dBm Log 10 dB/ Offst 23 dB #LgAv V1 S2 S3 FC . I. **£**(f): FTun Real Property in Swp Start 12.500 0 GHz Stop 25.000 0 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.195 s (8192 pts)