NORTHWEST EMC

Esterline (Advanced Input Devices)

Medigenic K080/K081 Wireless USB Dongle

FCC 15.247:2015

Report # ESTE0018.2

NVLAP Lab Code: 200630-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: February 06, 2015
Esterline (Advanced Input Devices)
Model: Medigenic K080/K081 Wireless USB Dongle

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2014	ANSI C63.10:2009
	DA 00-705:2000

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	AC Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
6.7	Spurious Conducted Emissions	Yes	Pass	
6.9.1	Occupied Bandwidth	Yes	Pass	
6.10.1	Output Power	Yes	Pass	
6.11.2	Power Spectral Density	Yes	Pass	
7.5	Duty Cycle	Yes	N/A	Characterization of radio operation.
7.7.2	Channel Spacing	Yes	Pass	
7.7.3	Number of Hopping Frequencies	Yes	N/A	No limit for a Hybrid radio. Required for Dwell Time measurement.
7.7.4	Dwell Time	Yes	Pass	
7.7.9	Band Edge Compliance	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Kyle Holgate, 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.

REVISION HISTORY

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

REV 2015.2.10

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 Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and 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

OFTA – Recognized by OFTA 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:
http://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2014.12.03

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 WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. 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.

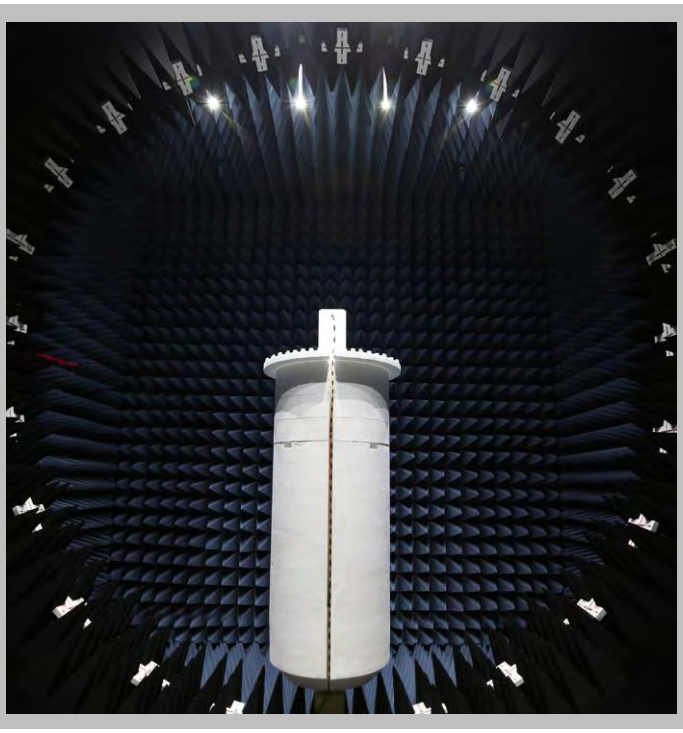
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

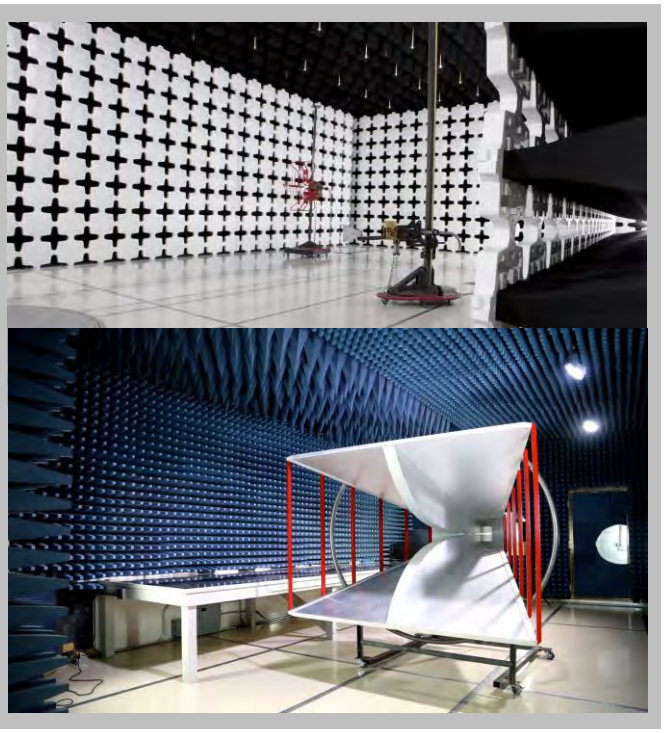
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.9 dB	-2.9 dB

FACILITIES

NORTHWEST EMC
REV 2015.2.10

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 9801 (425)984-6600
NVLAP					
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
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-*2*	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 I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFTA					
US0158	US0175	N/A	US0017	US0191	US0157





PRODUCT DESCRIPTION

NORTHWEST EMC 2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Esterline (Advanced Input Devices)
Address:	600 W. Wilbur Avenue
City, State, Zip:	Coeur d'Alene, ID 83815
Test Requested By:	Wayne Hash
Model:	Medigenic K080/K081 Wireless USB Dongle
First Date of Test:	February 02, 2015
Last Date of Test:	February 06, 2015
Receipt Date of Samples:	February 02, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Wireless Dongle.

Testing Objective:
To demonstrate compliance of the 5 channel hybrid radio to FCC 15.247 requirements in the 2.4 GHz band as set forth in KDB 453039.

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CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ESTE0018- 3

Software/Firmware Running during test	
Description	**Version**
Firmware ID Dongle (79 Channel)	9602-00995-001

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Dongle	Esterline (Advanced Input Devices)	9341-16008-001	P00001

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Computer (Lenovo)	Lenovo	CT01WW	MJ0159BT
LED Mouse (Lenovo)	Lenovo	M-U0025-0	None
AC/DC Adapter (Lenovo)	Lenovo	ADP-65FD B	11S0B56097ZVJ7644M78W
Monitor (Lenovo)	Lenovo	LT1952PWD	V9VMN29
USB Keyboard	Lenovo	54Y9400	004266

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB extension	Yes	2m	No	USB Dongle	Computer
USB Mouse	Unknown	2m	Unknown	Mouse	Computer
DC Cable (Lenovo)	No	2m	Yes	AC/DC Power Adapter	Computer
AC Cable (Lenovo)	No	1m	No	AC/DC Power Adapter	AC mains
USB Keyboard	Unknown	2m	Unknown	Keyboard	Computer

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ESTE0018- 7

Software/Firmware Running during test	
Description	**Version**
Firmware ID Dongle (5 Channel)	9602-00999-001

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Dongle (5 Channel)	Esterline (Advanced Input Devices)	9341-16008-001	00002

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Computer (Lenovo)	Lenovo	CT01WW	MJ0159BT
LED Mouse (Lenovo)	Lenovo	M-U0025-0	None
AC/DC Adapter (Lenovo)	Lenovo	ADP-65FD B	11S0B56097ZVJ7644M78W
Monitor (Lenovo)	Lenovo	LT1952PWD	V9VMN29
USB Keyboard	Lenovo	54Y9400	004266

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB extension	Yes	2m	No	USB Dongle	Computer
USB Mouse	Unknown	2m	Unknown	Mouse	Computer
DC Cable (Lenovo)	No	2m	Yes	AC/DC Power Adapter	Computer
AC Cable (Lenovo)	No	1m	No	AC/DC Power Adapter	AC mains
USB Keyboard	Unknown	2m	Unknown	Keyboard	Computer

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ESTE0018- 8

Software/Firmware Running during test	
Description	**Version**
Firmware ID Dongle (79 Channel)	9602-00995-001
Firmware ID Dongle (5 Channel)	9602-00999-001

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Dongle	Esterline (Advanced Input Devices)	9341-16008-001	P00001
USB Dongle (5 Channel)	Esterline (Advanced Input Devices)	9341-16008-001	00002

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Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Computer (Lenovo)	Lenovo	CT01WW	MJ0159BT
LED Mouse (Lenovo)	Lenovo	M-U0025-0	None
AC/DC Adapter (Lenovo)	Lenovo	ADP-65FD B	11S0B56097ZVJ7644M78W
Monitor (Lenovo)	Lenovo	LT1952PWD	V9VMN29
USB Keyboard	Lenovo	54Y9400	004266

Cables					
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USB Mouse	Unknown	2m	Unknown	Mouse	Computer
DC Cable (Lenovo)	No	2m	Yes	AC/DC Power Adapter	Computer
AC Cable (Lenovo)	No	1m	No	AC/DC Power Adapter	AC mains

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2/02/2015	Dwell Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	2/03/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	2/05/2015	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	2/05/2015	Channel Spacing	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	2/05/2015	Number of Hopping Frequencies	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	2/05/2015	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	2/05/2015	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	2/05/2015	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
9	2/05/2015	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
10	2/06/2015	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

AC POWERLINE CONDUCTED EMISSIONS

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. 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 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50Ω.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	01/12/2015	12 mo
EV07 Cables	N/A	Conducted Cables	EVG	02/03/2015	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HHD	01/05/2015	12 mo
LISN	Solar	9252-50-R-24-BNC	LIR	10/07/2014	12 mo
Attenuator, BNC 10 Watt	Fairview Microwave	SA6B10W-20	TQQ	11/20/2014	12 mo
LISN	Solar	9252-50-R-24-BNC	LIP	01/27/2015	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

ESTE0018-3

MODES INVESTIGATED

Continuous Tx, GFSK, High Ch. 78 2480MHz, Pwr 2
Continuous Tx, GFSK, Low Ch. 0 2402MHz, Pwr 2
Continuous Tx, GFSK, Mid Ch. 39 2441MHz, Pwr 2

AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

EUT:	Medigenic K080/K081 Wireless USB Dongle	Work Order:	ESTE0018
Serial Number:	P00001	Date:	02/06/2015
Customer:	Esterline (Advanced Input Devices)	Temperature:	22°C
Attendees:	Wayne Hash	Relative Humidity:	44%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	ESTE0018-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	10	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

EUT powered by USB via 110VAC/60Hz

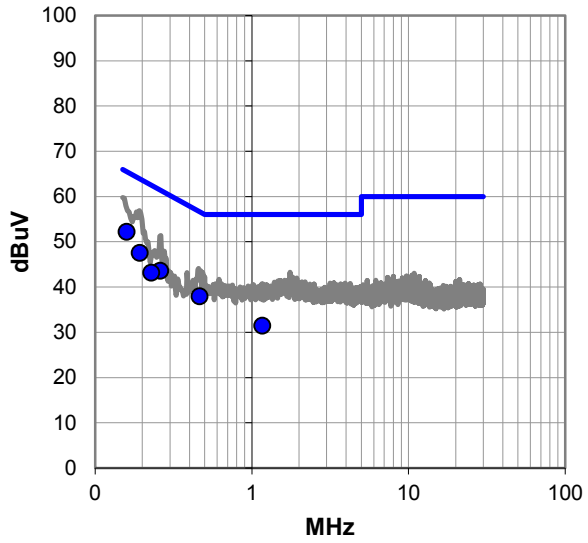
EUT OPERATING MODES

Continuous Tx, GFSK, Low Ch. 0 2402MHz, Pwr 2

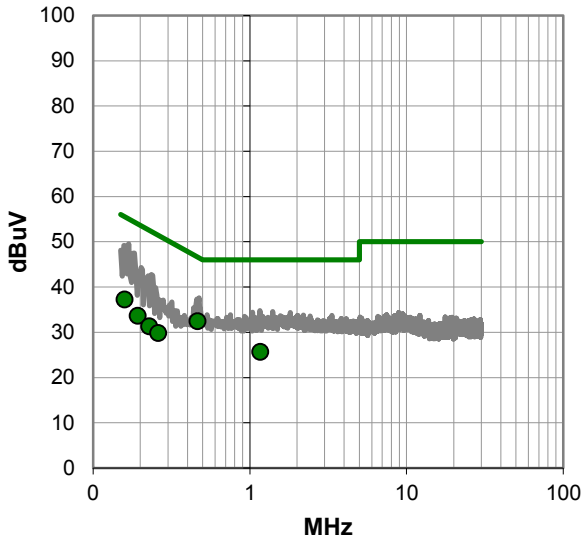
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

RESULTS - Run #10

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.159	31.7	20.5	52.2	65.5	-13.3
0.193	27.0	20.5	47.5	63.9	-16.4
0.261	23.1	20.4	43.5	61.4	-17.9
0.466	17.5	20.4	37.9	56.6	-18.7
0.229	22.7	20.5	43.2	62.5	-19.3
1.166	10.9	20.5	31.4	56.0	-24.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.466	12.0	20.4	32.4	46.6	-14.2
0.159	16.7	20.5	37.2	55.5	-18.3
0.193	13.1	20.5	33.6	53.9	-20.3
1.166	5.1	20.5	25.6	46.0	-20.4
0.229	10.8	20.5	31.3	52.5	-21.2
0.261	9.4	20.4	29.8	51.4	-21.6

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

EUT:	Medigenic K080/K081 Wireless USB Dongle	Work Order:	ESTE0018
Serial Number:	P00001	Date:	02/06/2015
Customer:	Esterline (Advanced Input Devices)	Temperature:	22°C
Attendees:	Wayne Hash	Relative Humidity:	44%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	ESTE0018-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	11	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

EUT powered by USB via 110VAC/60Hz

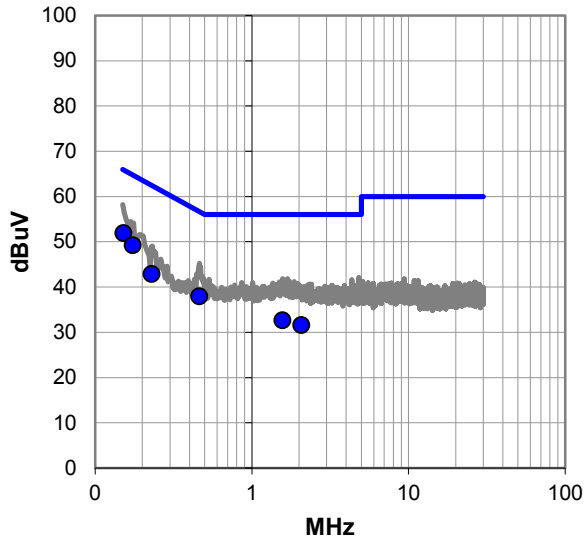
EUT OPERATING MODES

Continuous Tx, GFSK, Low Ch. 0 2402MHz, Pwr 2

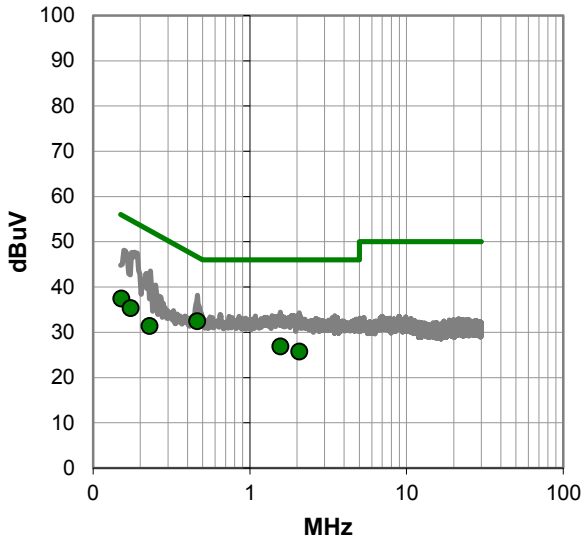
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

RESULTS - Run #11

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.152	31.4	20.5	51.9	65.9	-14.0
0.174	28.7	20.5	49.2	64.8	-15.6
0.462	17.5	20.4	37.9	56.7	-18.8
0.229	22.4	20.5	42.9	62.5	-19.6
1.567	12.1	20.6	32.7	56.0	-23.3
2.074	11.0	20.6	31.6	56.0	-24.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.462	12.0	20.4	32.4	46.7	-14.3
0.152	16.9	20.5	37.4	55.9	-18.5
1.567	6.3	20.6	26.9	46.0	-19.1
0.174	14.8	20.5	35.3	54.8	-19.5
2.074	5.1	20.6	25.7	46.0	-20.3
0.229	10.9	20.5	31.4	52.5	-21.1

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

EUT:	Medigenic K080/K081 Wireless USB Dongle	Work Order:	ESTE0018
Serial Number:	P00001	Date:	02/06/2015
Customer:	Esterline (Advanced Input Devices)	Temperature:	22°C
Attendees:	Wayne Hash	Relative Humidity:	44%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	ESTE0018-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	12	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

EUT powered by USB via 110VAC/60Hz

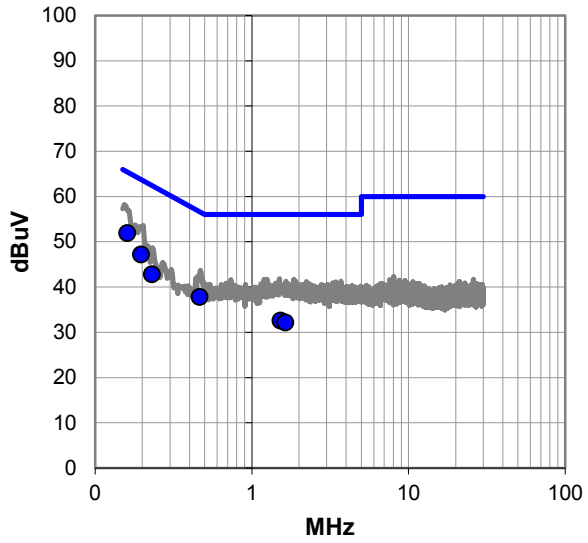
EUT OPERATING MODES

Continuous Tx, GFSK, Mid Ch. 39 2441MHz, Pwr 2

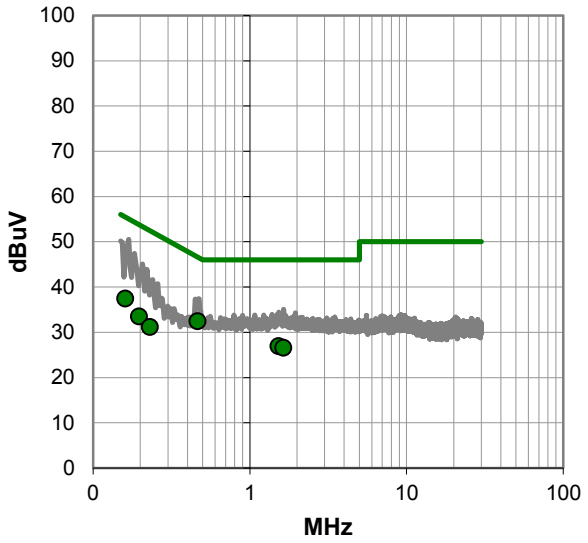
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

RESULTS - Run #12

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.160	31.4	20.5	51.9	65.4	-13.5
0.197	26.7	20.5	47.2	63.8	-16.6
0.465	17.4	20.4	37.8	56.6	-18.8
0.230	22.3	20.5	42.8	62.4	-19.7
1.530	12.0	20.6	32.6	56.0	-23.4
1.637	11.6	20.6	32.2	56.0	-23.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.465	12.0	20.4	32.4	46.6	-14.2
0.160	16.9	20.5	37.4	55.4	-18.0
1.530	6.4	20.6	27.0	46.0	-19.0
1.637	6.0	20.6	26.6	46.0	-19.4
0.197	13.0	20.5	33.5	53.8	-20.3
0.230	10.7	20.5	31.2	52.4	-21.3

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

EUT:	Medigenic K080/K081 Wireless USB Dongle	Work Order:	ESTE0018
Serial Number:	P00001	Date:	02/06/2015
Customer:	Esterline (Advanced Input Devices)	Temperature:	22°C
Attendees:	Wayne Hash	Relative Humidity:	44%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	ESTE0018-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	13	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

EUT powered by USB via 110VAC/60Hz

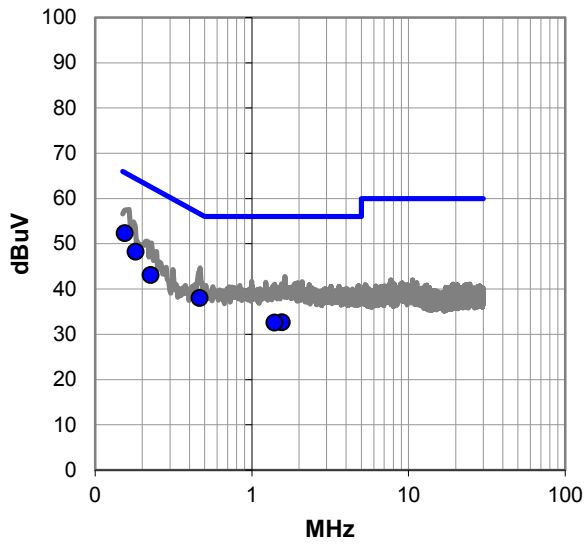
EUT OPERATING MODES

Continuous Tx, GFSK, Mid Ch. 39 2441MHz, Pwr 2

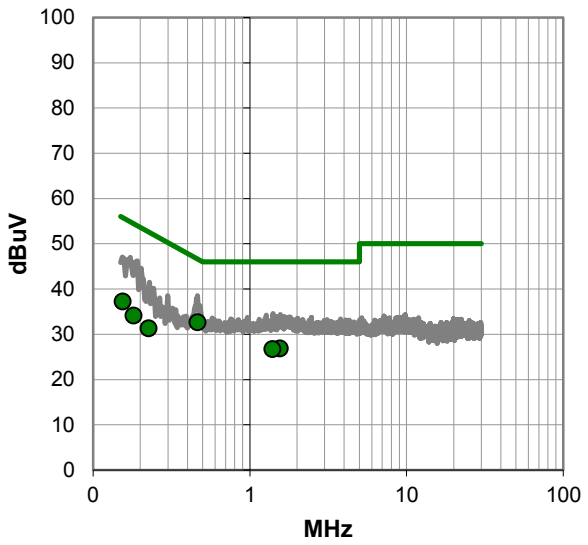
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

RESULTS - Run #13

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.154	31.8	20.5	52.3	65.8	-13.5
0.182	27.7	20.5	48.2	64.4	-16.2
0.463	17.6	20.4	38.0	56.6	-18.6
0.227	22.6	20.5	43.1	62.6	-19.5
1.556	12.1	20.6	32.7	56.0	-23.3
1.398	12.0	20.5	32.5	56.0	-23.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.463	12.2	20.4	32.6	46.6	-14.0
0.154	16.7	20.5	37.2	55.8	-18.6
1.556	6.3	20.6	26.9	46.0	-19.1
1.398	6.2	20.5	26.7	46.0	-19.3
0.182	13.6	20.5	34.1	54.4	-20.3
0.227	10.8	20.5	31.3	52.6	-21.3

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

EUT:	Medigenic K080/K081 Wireless USB Dongle	Work Order:	ESTE0018
Serial Number:	P00001	Date:	02/06/2015
Customer:	Esterline (Advanced Input Devices)	Temperature:	22°C
Attendees:	Wayne Hash	Relative Humidity:	44%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	ESTE0018-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	14	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

EUT powered by USB via 110VAC/60Hz

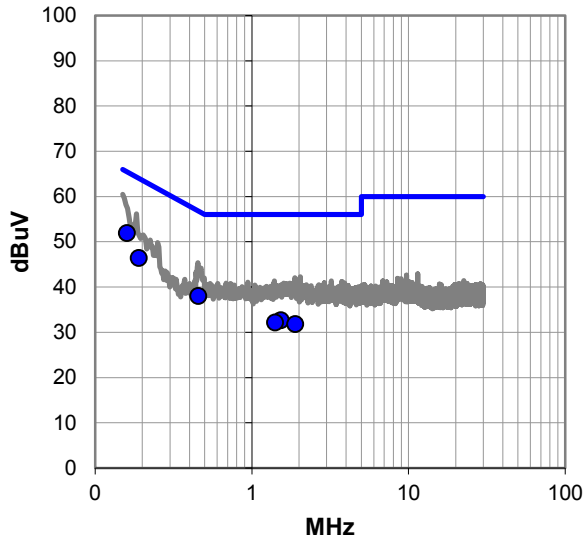
EUT OPERATING MODES

Continuous Tx, GFSK, High Ch. 78 2480MHz, Pwr 2

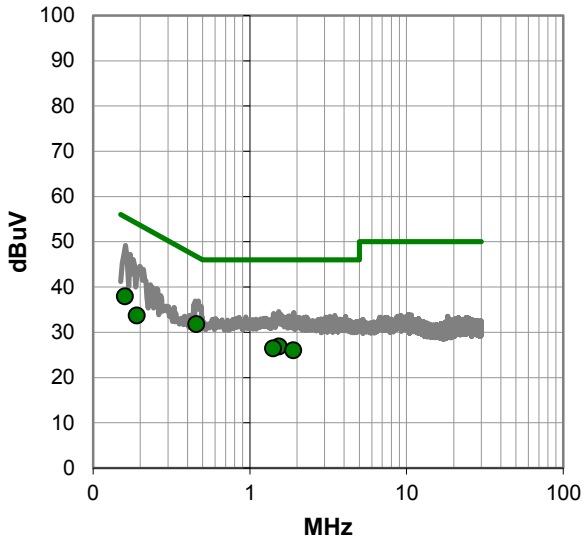
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

RESULTS - Run #14

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.160	31.4	20.5	51.9	65.5	-13.6
0.190	25.9	20.5	46.4	64.1	-17.7
0.456	17.6	20.4	38.0	56.8	-18.8
1.533	12.1	20.6	32.7	56.0	-23.3
1.410	11.6	20.5	32.1	56.0	-23.9
1.898	11.2	20.6	31.8	56.0	-24.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.456	11.4	20.4	31.8	46.8	-15.0
0.160	17.4	20.5	37.9	55.5	-17.6
1.533	6.3	20.6	26.9	46.0	-19.1
1.410	5.9	20.5	26.4	46.0	-19.6
1.898	5.4	20.6	26.0	46.0	-20.0
0.190	13.2	20.5	33.7	54.1	-20.4

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

EUT:	Medigenic K080/K081 Wireless USB Dongle	Work Order:	ESTE0018
Serial Number:	P00001	Date:	02/06/2015
Customer:	Esterline (Advanced Input Devices)	Temperature:	22°C
Attendees:	Wayne Hash	Relative Humidity:	44%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	ESTE0018-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	15	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

EUT powered by USB via 110VAC/60Hz

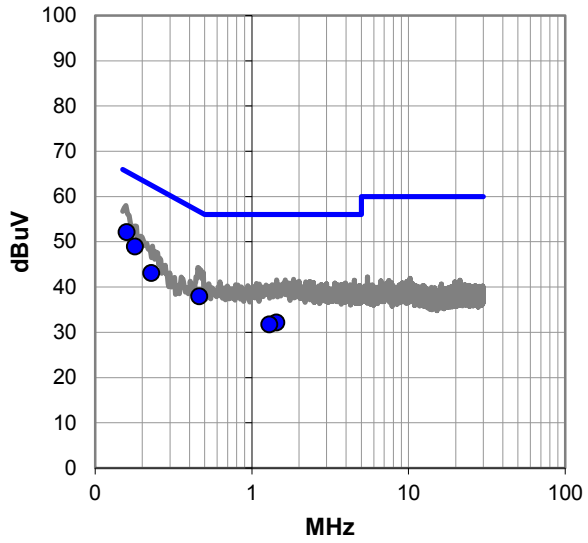
EUT OPERATING MODES

Continuous Tx, GFSK, High Ch. 78 2480MHz, Pwr 2

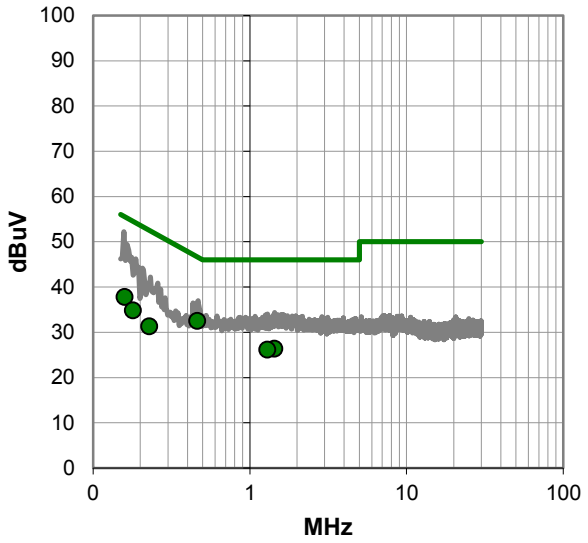
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.01.28
PSA-ESCI 2015.01.16, EmiR5 2014.11.19.2

RESULTS - Run #15

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.159	31.6	20.5	52.1	65.5	-13.4
0.179	28.4	20.5	48.9	64.5	-15.6
0.462	17.5	20.4	37.9	56.6	-18.7
0.229	22.6	20.5	43.1	62.5	-19.4
1.439	11.6	20.5	32.1	56.0	-23.9
1.294	11.2	20.5	31.7	56.0	-24.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.462	12.1	20.4	32.5	46.6	-14.1
0.159	17.3	20.5	37.8	55.5	-17.7
1.439	5.8	20.5	26.3	46.0	-19.7
0.179	14.3	20.5	34.8	54.5	-19.7
1.294	5.6	20.5	26.1	46.0	-19.9
0.229	10.8	20.5	31.3	52.5	-21.2

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

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

GFSK, Power Level 2

CHANNEL OF OPERATION

Ch.0, 2402MHz
Ch. 39, 2441MHz
Ch. 78, 2480MHz

POWER SETTINGS INVESTIGATED

5 VDC

CONFIGURATIONS INVESTIGATED

ESTE0018 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

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
Spectrum Analyzer	Agilent	E4446A	AAQ	1/21/2014	12 mo
HP Filter	Micro-Tronics	HPM50111	HFO	7/6/2013	24 mo
LP Filter	Micro-Tronics	LPM50004	LFD	6/18/2014	12 mo
Attenuator - 20dB, HF (1000MHz - 18000MHz)	Coaxicom	3910-20	AXZ	6/19/2014	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	11/9/2014	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	11/9/2014	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/18/2014	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/18/2014	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/18/2014	12 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	8/26/2014	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2014	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/18/2014	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	8/26/2014	12 mo
EV01 Cables	N/A	Bilog Cables	EVA	2/18/2014	12 mo
Antenna, Biconilog	EMCO	3141	AXE	8/29/2014	24 mo

TEST DESCRIPTION

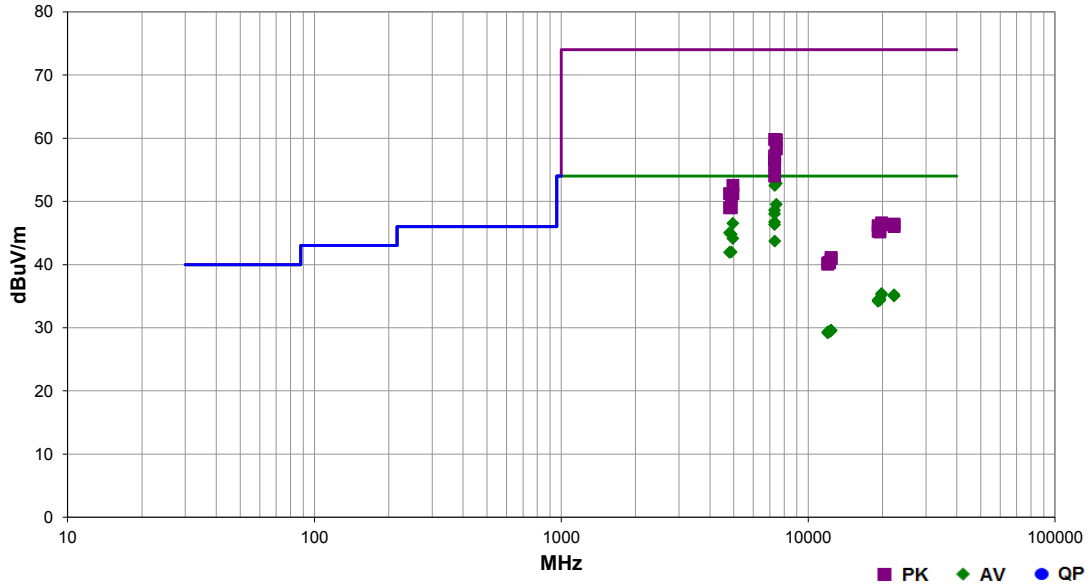
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

Work Order:	ESTE0018	**Date:**	02/03/15		
Project:	None	**Temperature:**	22.6 °C		
Job Site:	EV01	**Humidity:**	41.3% RH		
Serial Number:	P00001	**Barometric Pres.:**	1019 mbar	**Tested by:**	Cole Ghizzone
EUT:	Medigenic K080/K081 Wireless USB Dongle				
Configuration:	3				
Customer:	Esterline (Advanced Input Devices)				
Attendees:	Wayne Hash				
EUT Power:	5 VDC				
Operating Mode:	Continuous Tx GFSK				
Deviations:	None				
Comments:	Please reference EUT data comments for EUT orientation, frequency, power level and channel.				

Test Specifications	**Test Method**
FCC 15.247:2014	ANSI C63.10:2009

Run #	40	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



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
7439.750	38.1	14.7	1.7	113.0	3.0	0.0	Horz	AV	0.0	52.8	54.0	-1.2	High Ch.78 2480MHz, Pwr 2, EUT Horz
7323.940	38.4	14.1	1.2	117.0	3.0	0.0	Horz	AV	0.0	52.5	54.0	-1.5	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
7439.740	34.8	14.7	2.2	177.0	3.0	0.0	Vert	AV	0.0	49.5	54.0	-4.5	High Ch.78 2480MHz, Pwr 2, EUT On Side
7322.815	34.5	14.1	1.2	218.0	3.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
7322.770	33.9	14.1	1.8	215.0	3.0	0.0	Horz	AV	0.0	48.0	54.0	-6.0	Mid Ch. 39 2441MHz, Pwr 2, EUT Vert
7322.800	32.6	14.1	2.0	310.0	3.0	0.0	Vert	AV	0.0	46.7	54.0	-7.3	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
4960.320	40.2	6.3	1.1	99.0	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	High Ch.78 2480MHz, Pwr 2, EUT Horz
7322.825	32.2	14.1	1.8	226.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch. 39 2441MHz, Pwr 2, EUT Vert
4804.300	39.3	5.7	1.2	100.0	3.0	0.0	Horz	AV	0.0	45.0	54.0	-9.0	Low Ch. 0 2402MHz, Pwr 2, EUT Horz
4882.340	38.8	6.0	1.1	100.0	3.0	0.0	Horz	AV	0.0	44.8	54.0	-9.2	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
4960.295	37.8	6.3	1.1	210.0	3.0	0.0	Vert	AV	0.0	44.1	54.0	-9.9	High Ch.78 2480MHz, Pwr 2, EUT On Side
7323.745	29.6	14.1	1.2	256.0	3.0	0.0	Vert	AV	0.0	43.7	54.0	-10.3	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
4882.345	36.0	6.0	1.0	8.0	3.0	0.0	Vert	AV	0.0	42.0	54.0	-12.0	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
4804.315	36.2	5.7	1.1	107.0	3.0	0.0	Vert	AV	0.0	41.9	54.0	-12.1	Low Ch. 0 2402MHz, Pwr 2, EUT On Side
7322.575	45.7	14.1	1.2	117.0	3.0	0.0	Horz	PK	0.0	59.8	74.0	-14.2	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
7439.410	45.0	14.7	1.7	113.0	3.0	0.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch.78 2480MHz, Pwr 2, EUT Horz
7439.670	43.6	14.7	2.2	177.0	3.0	0.0	Vert	PK	0.0	58.3	74.0	-15.7	High Ch.78 2480MHz, Pwr 2, EUT On Side
7323.110	43.1	14.1	1.2	218.0	3.0	0.0	Horz	PK	0.0	57.2	74.0	-16.8	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
7322.850	42.5	14.1	2.0	310.0	3.0	0.0	Vert	PK	0.0	56.6	74.0	-17.4	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
7322.490	42.5	14.1	1.8	215.0	3.0	0.0	Horz	PK	0.0	56.6	74.0	-17.4	Mid Ch. 39 2441MHz, Pwr 2, EUT Vert
7323.400	41.8	14.1	1.8	226.0	3.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	Mid Ch. 39 2441MHz, Pwr 2, EUT Vert
19839.840	35.9	-0.5	1.1	351.0	3.0	0.0	Vert	AV	0.0	35.4	54.0	-18.6	High Ch.78 2480MHz, Pwr 2, EUT On Side
22320.150	35.1	0.1	1.1	101.0	3.0	0.0	Vert	AV	0.0	35.2	54.0	-18.8	High Ch.78 2480MHz, Pwr 2, EUT On Side
19839.760	35.7	-0.5	1.1	187.0	3.0	0.0	Horz	AV	0.0	35.2	54.0	-18.8	High Ch.78 2480MHz, Pwr 2, EUT Horz
22319.750	34.9	0.1	1.1	57.0	3.0	0.0	Horz	AV	0.0	35.0	54.0	-19.0	High Ch.78 2480MHz, Pwr 2, EUT Horz
19528.390	35.0	-0.5	1.1	210.0	3.0	0.0	Vert	AV	0.0	34.5	54.0	-19.5	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
19216.140	35.0	-0.6	1.1	17.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	Low Ch. 0 2402MHz, Pwr 2, EUT On Side
19527.580	34.8	-0.5	1.1	33.0	3.0	0.0	Horz	AV	0.0	34.3	54.0	-19.7	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
19215.580	34.8	-0.6	1.1	352.0	3.0	0.0	Horz	AV	0.0	34.2	54.0	-19.8	Low Ch. 0 2402MHz, Pwr 2, EUT Horz
7323.275	39.9	14.1	1.2	256.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz

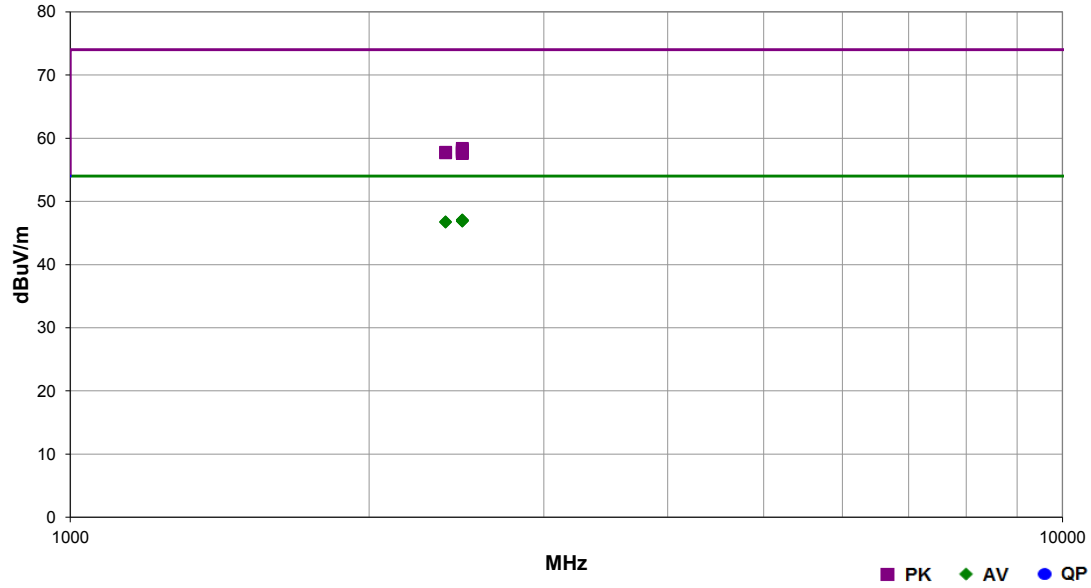
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4959.790	46.2	6.3	1.1	99.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	High Ch.78 2480MHz, Pwr 2, EUT Horz
4960.830	44.9	6.3	1.1	210.0	3.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	High Ch.78 2480MHz, Pwr 2, EUT On Side
4804.805	45.5	5.7	1.2	100.0	3.0	0.0	Horz	PK	0.0	51.2	74.0	-22.8	Low Ch. 0 2402MHz, Pwr 2, EUT Horz
4882.825	45.0	6.0	1.1	100.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
12399.890	30.3	-0.7	1.0	180.0	3.0	0.0	Horz	AV	0.0	29.6	54.0	-24.4	High Ch.78 2480MHz, Pwr 2, EUT Horz
12399.990	30.2	-0.7	1.0	135.0	3.0	0.0	Vert	AV	0.0	29.5	54.0	-24.5	High Ch.78 2480MHz, Pwr 2, EUT On Side
12204.900	30.0	-0.6	1.0	115.0	3.0	0.0	Vert	AV	0.0	29.4	54.0	-24.6	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
12203.750	30.0	-0.6	1.0	343.0	3.0	0.0	Horz	AV	0.0	29.4	54.0	-24.6	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
12008.530	31.7	-2.4	3.1	298.0	3.0	0.0	Horz	AV	0.0	29.3	54.0	-24.7	Low Ch. 0 2402MHz, Pwr 2, EUT Horz
12009.610	31.5	-2.3	1.0	112.0	3.0	0.0	Vert	AV	0.0	29.2	54.0	-24.8	Low Ch. 0 2402MHz, Pwr 2, EUT On Side
4803.370	43.3	5.7	1.1	107.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Low Ch. 0 2402MHz, Pwr 2, EUT On Side
4882.825	43.0	6.0	1.0	8.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
19840.040	47.1	-0.5	1.1	187.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	High Ch.78 2480MHz, Pwr 2, EUT Horz
22319.990	46.3	0.1	1.1	101.0	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	High Ch.78 2480MHz, Pwr 2, EUT On Side
19840.480	46.8	-0.5	1.1	351.0	3.0	0.0	Vert	PK	0.0	46.3	74.0	-27.7	High Ch.78 2480MHz, Pwr 2, EUT On Side
19216.360	46.8	-0.6	1.1	17.0	3.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	Low Ch. 0 2402MHz, Pwr 2, EUT On Side
22319.710	45.9	0.1	1.1	57.0	3.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	High Ch.78 2480MHz, Pwr 2, EUT Horz
19527.590	45.9	-0.5	1.1	210.0	3.0	0.0	Vert	PK	0.0	45.4	74.0	-28.6	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
19216.410	45.9	-0.6	1.1	352.0	3.0	0.0	Horz	PK	0.0	45.3	74.0	-28.7	Low Ch. 0 2402MHz, Pwr 2, EUT Horz
19528.410	45.6	-0.5	1.1	33.0	3.0	0.0	Horz	PK	0.0	45.1	74.0	-28.9	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
12399.720	41.8	-0.7	1.0	135.0	3.0	0.0	Vert	PK	0.0	41.1	74.0	-32.9	High Ch.78 2480MHz, Pwr 2, EUT On Side
12398.540	41.6	-0.7	1.0	180.0	3.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	High Ch.78 2480MHz, Pwr 2, EUT Horz
12206.150	41.0	-0.6	1.0	343.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	Mid Ch. 39 2441MHz, Pwr 2, EUT Horz
12204.570	40.9	-0.6	1.0	115.0	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Mid Ch. 39 2441MHz, Pwr 2, EUT On Side
12010.080	42.6	-2.3	1.0	112.0	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Low Ch. 0 2402MHz, Pwr 2, EUT On Side
12008.850	42.4	-2.4	3.1	298.0	3.0	0.0	Horz	PK	0.0	40.0	74.0	-34.0	Low Ch. 0 2402MHz, Pwr 2, EUT Horz

SPURIOUS RADIATED EMISSIONS

Work Order:	ESTE0018	**Date:**	02/03/15		
Project:	None	**Temperature:**	22.6 °C		
Job Site:	EV01	**Humidity:**	41.3% RH		
Serial Number:	P00001	**Barometric Pres.:**	1019 mbar	**Tested by:**	Cole Ghizzone
EUT:	Medigenic K080/K081 Wireless USB Dongle				
Configuration:	3				
Customer:	Esterline (Advanced Input Devices)				
Attendees:	Wayne Hash				
EUT Power:	5 VDC				
Operating Mode:	Continuous Tx GFSK				
Deviations:	None				
Comments:	Please reference EUT data comments for EUT orientation, frequency, power level and channel.				

Test Specifications	**Test Method**
FCC 15.247:2014	ANSI C63.10:2009

Run #	43	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



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
2483.908	31.5	-4.4	1.4	58.0	3.0	20.0	Vert	AV	0.0	47.1	54.0	-6.9	High Ch.78 2480MHz, Pwr 2, EUT Vert
2484.450	31.4	-4.4	1.0	335.0	3.0	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch.78 2480MHz, Pwr 2, EUT Horz
2483.733	31.4	-4.4	1.0	120.0	3.0	20.0	Horz	AV	0.0	47.0	54.0	-7.0	High Ch.78 2480MHz, Pwr 2, EUT Vert
2483.850	31.3	-4.4	3.5	246.0	3.0	20.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch.78 2480MHz, Pwr 2, EUT On Side
2483.752	31.3	-4.4	2.1	257.0	3.0	20.0	Vert	AV	0.0	46.9	54.0	-7.1	High Ch.78 2480MHz, Pwr 2, EUT On Side
2483.667	31.3	-4.4	1.0	279.0	3.0	20.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch.78 2480MHz, Pwr 2, EUT Horz
2389.800	31.4	-4.6	1.0	21.0	3.0	20.0	Horz	AV	0.0	46.8	54.0	-7.2	Low Ch. 0 2402MHz, Pwr 2, EUT Vert
2389.573	31.3	-4.6	1.0	26.0	3.0	20.0	Vert	AV	0.0	46.7	54.0	-7.3	Low Ch. 0 2402MHz, Pwr 2, EUT Vert
2483.935	42.8	-4.4	1.0	120.0	3.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	High Ch.78 2480MHz, Pwr 2, EUT Vert
2484.023	42.6	-4.4	1.0	335.0	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	High Ch.78 2480MHz, Pwr 2, EUT Horz
2483.635	42.4	-4.4	2.1	257.0	3.0	20.0	Vert	PK	0.0	58.0	74.0	-16.0	High Ch.78 2480MHz, Pwr 2, EUT On Side
2484.373	42.2	-4.4	1.0	279.0	3.0	20.0	Horz	PK	0.0	57.8	74.0	-16.2	High Ch.78 2480MHz, Pwr 2, EUT Horz
2484.177	42.2	-4.4	3.5	246.0	3.0	20.0	Horz	PK	0.0	57.8	74.0	-16.2	High Ch.78 2480MHz, Pwr 2, EUT On Side
2389.690	42.4	-4.6	1.0	21.0	3.0	20.0	Horz	PK	0.0	57.8	74.0	-16.2	Low Ch. 0 2402MHz, Pwr 2, EUT Vert
2389.350	42.3	-4.6	1.0	26.0	3.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	Low Ch. 0 2402MHz, Pwr 2, EUT Vert
2483.883	42.0	-4.4	1.4	58.0	3.0	20.0	Vert	PK	0.0	57.6	74.0	-16.4	High Ch.78 2480MHz, Pwr 2, EUT Vert

SPURIOUS CONDUCTED EMISSIONS

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting using the modulation 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

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			**Work Order:**	ESTE0018
Serial Number:	00002			**Date:**	02/05/15
Customer:	Esterline (Advanced Input Devices)			**Temperature:**	24.7°C
Attendees:	Wayne Hash			**Humidity:**	42%
Project:	None			**Barometric Pres.:**	1014.2
Tested by:	Brandon Hobbs	**Power:**	5 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

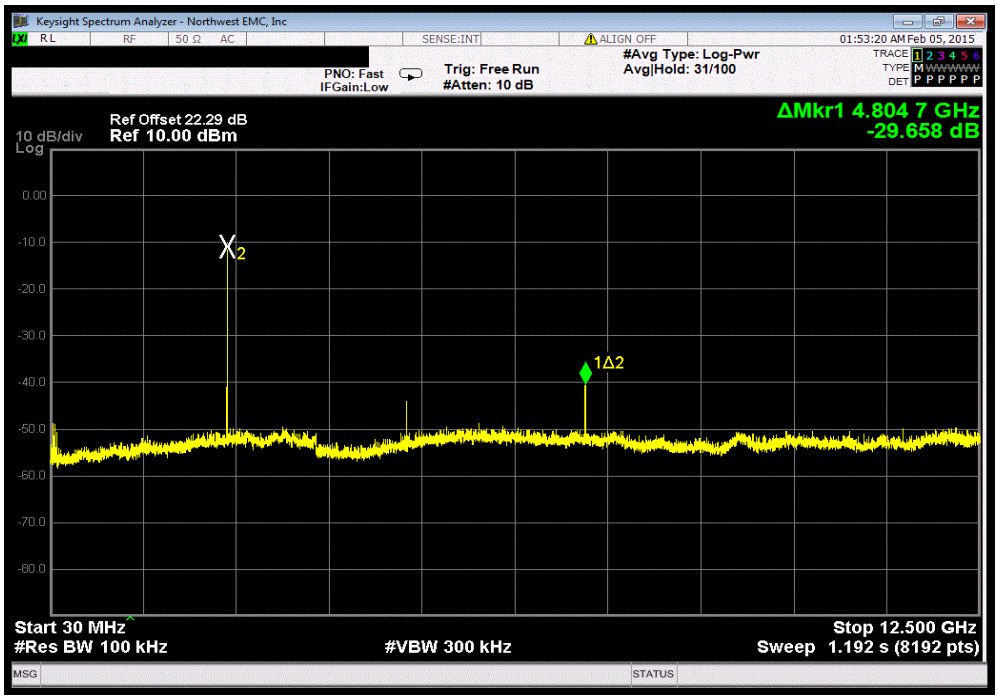
DEVIATIONS FROM TEST STANDARD

None

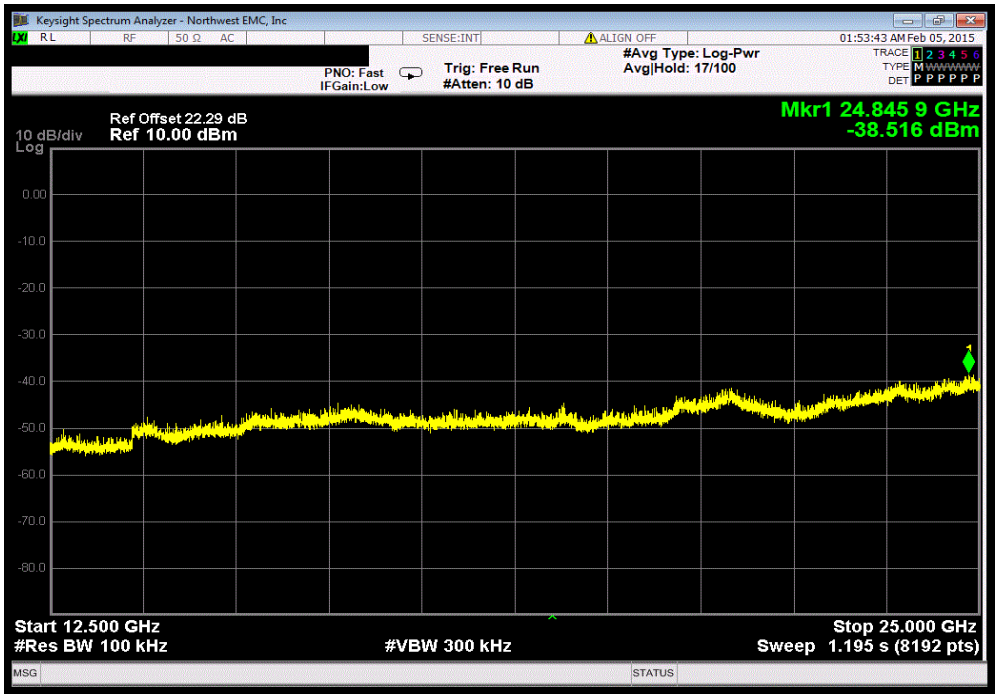
Configuration #	7	Signature

		Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result
Hopping Mode, OFF					
	GFSK				
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	-29.66	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-27.5	-20	Pass
	Mid Channel, 2441 MHz	30 MHz - 12.5 GHz	-32.39	-20	Pass
	Mid Channel, 2441 MHz	12.5 GHz - 25 GHz	-28.29	-20	Pass
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	-31.17	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	-27.94	-20	Pass

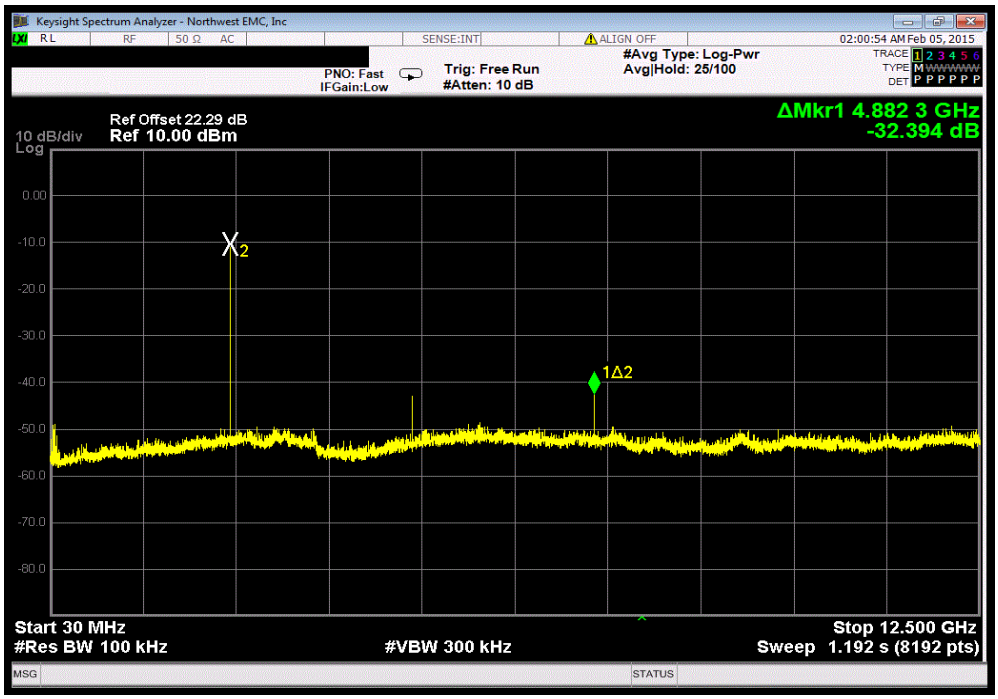
Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-29.66	-20	Pass



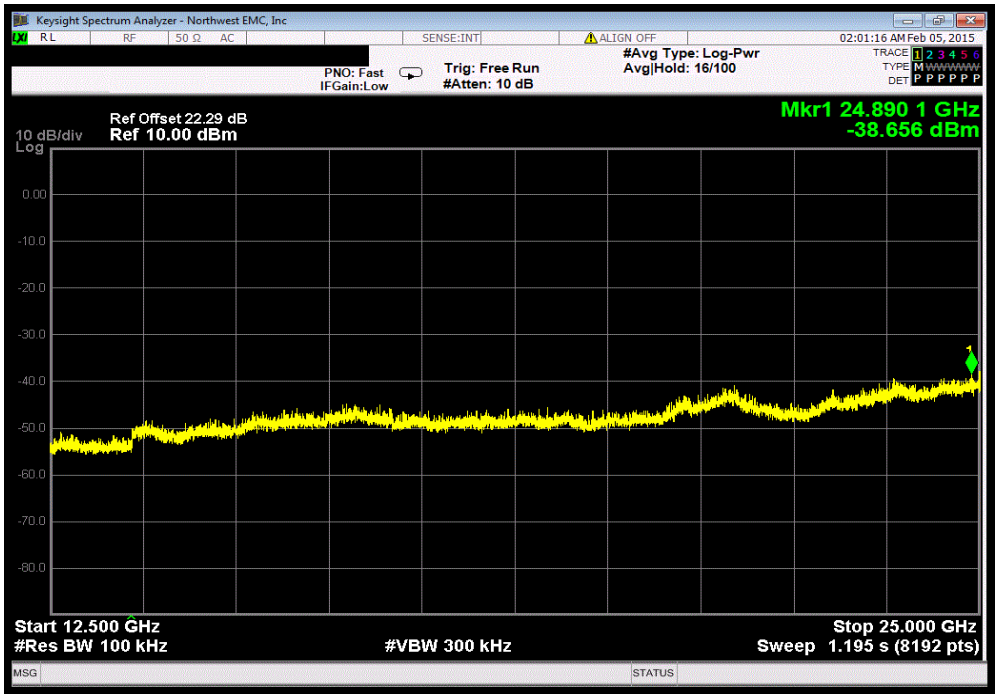
Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-27.5	-20	Pass



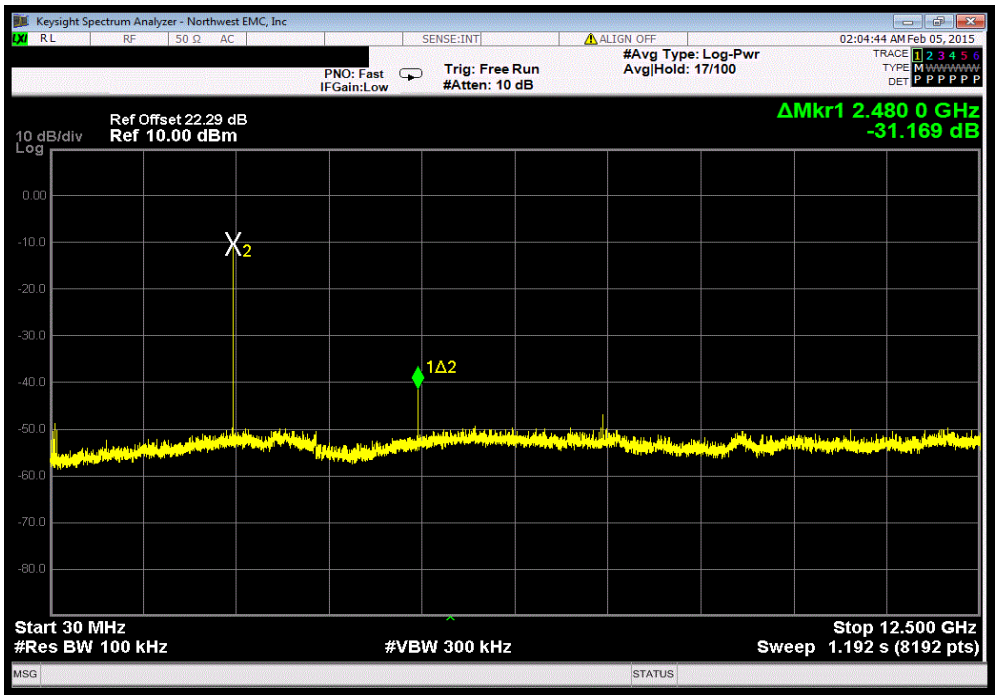
Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-32.39	-20	Pass



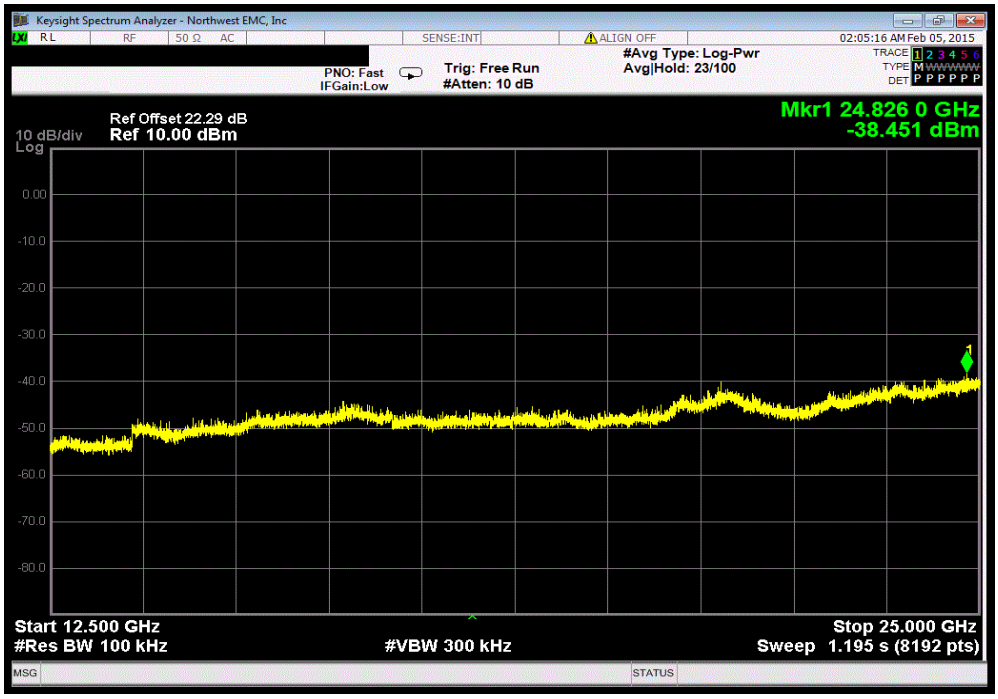
Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-28.29	-20	Pass



Hopping Mode, OFF, DH5, GFSK, High Channel, 2480 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-31.17	-20	Pass



Hopping Mode, OFF, DH5, GFSK, High Channel, 2480 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-27.94	-20	Pass



OCCUPIED BANDWIDTH

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

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

OCCUPIED BANDWIDTH

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			**Work Order:**	ESTE0018
Serial Number:	00002			**Date:**	02/05/15
Customer:	Esterline (Advanced Input Devices)			**Temperature:**	24.7°C
Attendees:	Wayne Hash			**Humidity:**	42%
Project:	None			**Barometric Pres.:**	1014.2
Tested by:	Brandon Hobbs	**Power:**	5 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

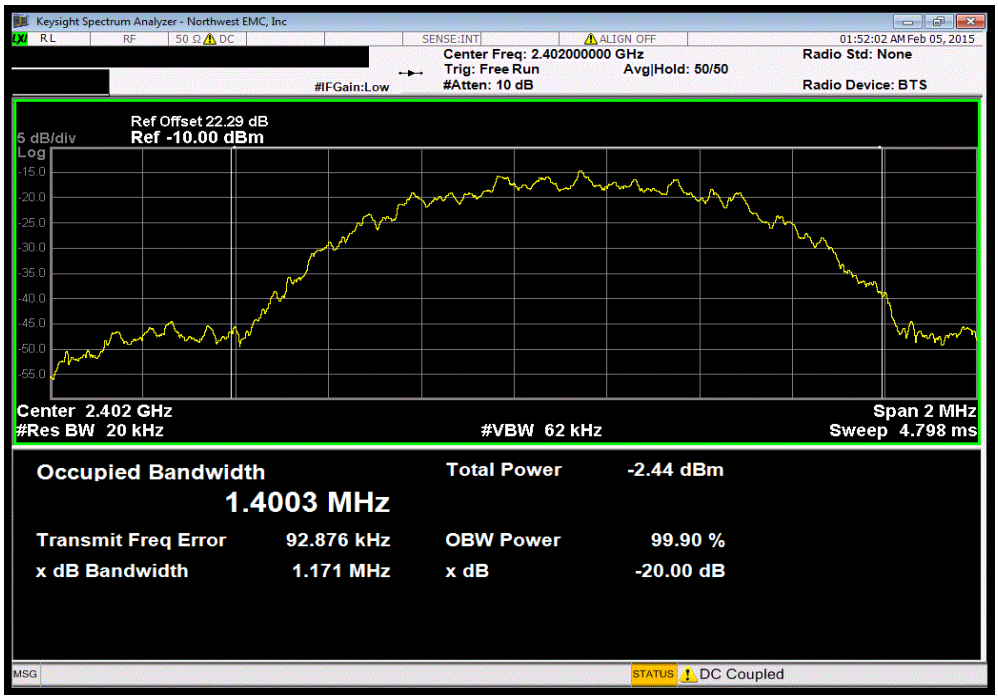
DEVIATIONS FROM TEST STANDARD

None

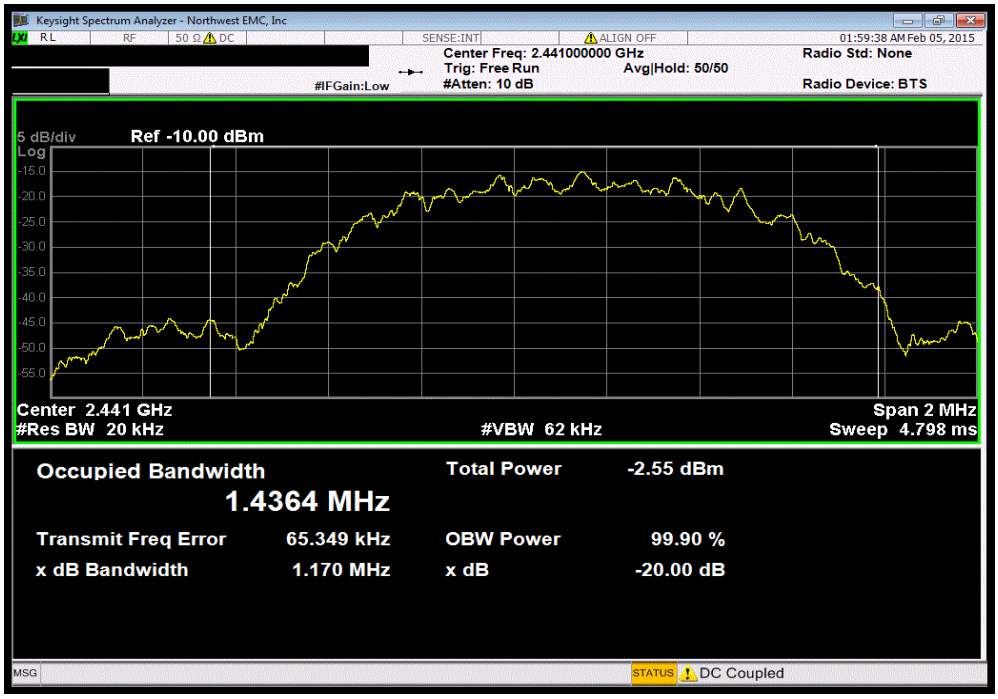
Configuration #	7	Signature

		Value	Limit (>)	Result
Hopping Mode, OFF				
	GFSK			
	Low Channel, 2402 MHz	1.171 MHz	500 kHz	Pass
	Mid Channel, 2441 MHz	1.17 MHz	500 kHz	Pass
	High Channel, 2480 MHz	1.162 MHz	500 kHz	Pass

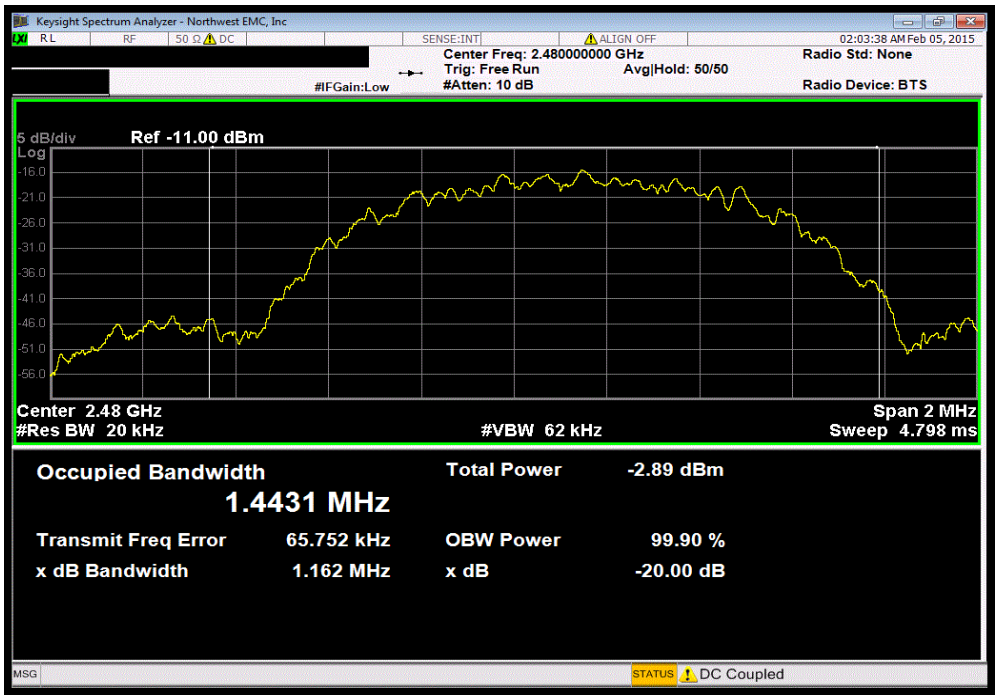
Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz						
				Value	Limit (>)	Result
				1.171 MHz	500 kHz	Pass



Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (>)	Result
				1.17 MHz	500 kHz	Pass



Hopping Mode, OFF, DH5, GFSK, High Channel, 2480 MHz						
				Value	Limit (>)	Result
				1.162 MHz	500 kHz	Pass



OUTPUT POWER

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting in a no hop mode using the modulation listed in the datasheet.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +27dBm.

OUTPUT POWER

NORTHWEST EMC

XMit 2015.01.14

EUT:	**Medigenic K080/K081 Wireless USB Dongle**			**Work Order:**	**ESTE0018**
Serial Number:	**00002**			**Date:**	**02/05/15**
Customer:	**Esterline (Advanced Input Devices)**			**Temperature:**	**24.7°C**
Attendees:	**Wayne Hash**			**Humidity:**	**42%**
Project:	**None**			**Barometric Pres.:**	**1014.2**
Tested by:	**Brandon Hobbs**	**Power:**	**5 VDC**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

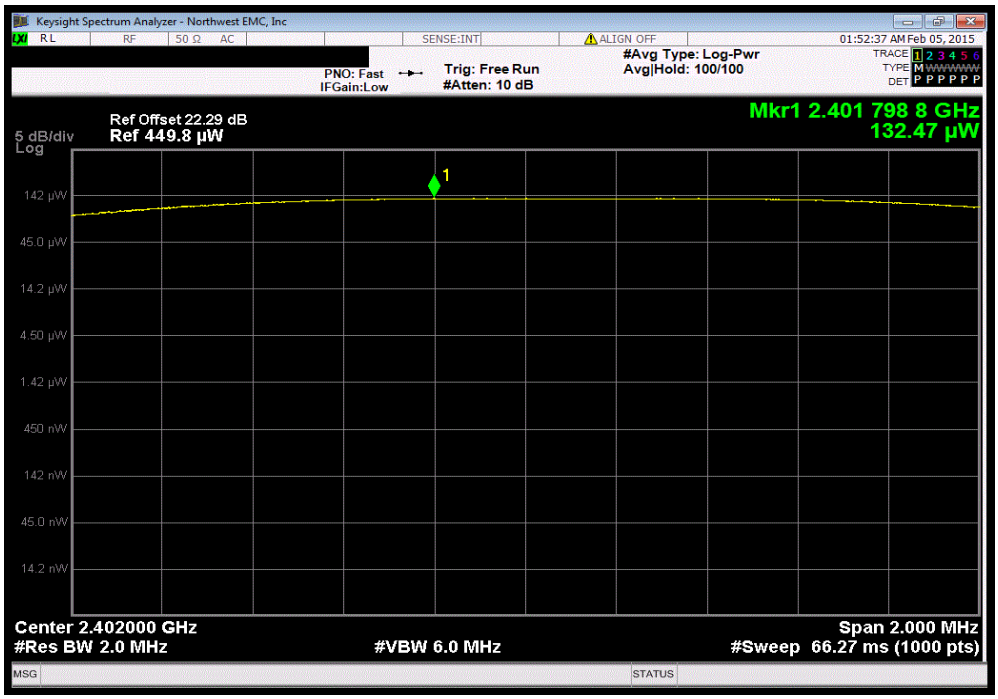
DEVIATIONS FROM TEST STANDARD

None

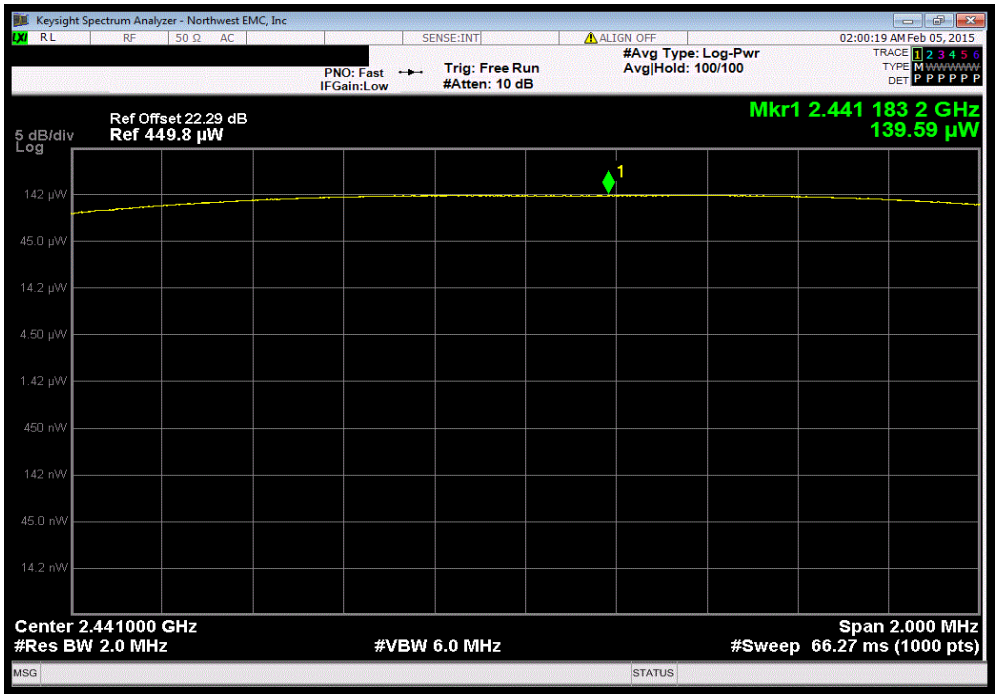
Configuration #	**7**	*Signature*

		Value	**Limit (<)**	**Result**
Hopping Mode, OFF				
	GFSK			
	Low Channel, 2402 MHz	132.47 uW	125 mW	Pass
	Mid Channel, 2441 MHz	139.59 uW	125 mW	Pass
	High Channel, 2480 MHz	140.15 uW	125 mW	Pass

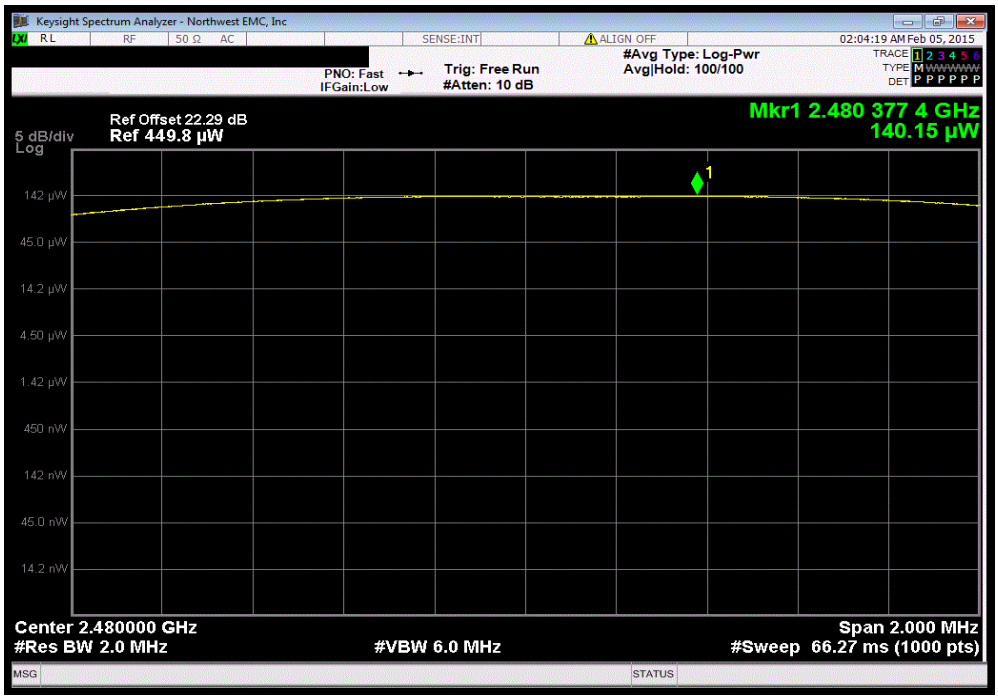
Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				132.47 uW	125 mW	Pass



Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (<)	Result
				139.59 uW	125 mW	Pass



Hopping Mode, OFF, DH5, GFSK, High Channel, 2480 MHz						
				Value	Limit (<)	Result
				140.15 uW	125 mW	Pass



POWER SPECTRAL DENSITY

XMit 2015.01.14

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.	Interval (mo)
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

Per the procedure outlined in FCC KDB 558074 D01 DTS Measurement Section 10.2, the spectrum analyzer was used as follows:

- RBW = 100 kHz
- VBW = 300 kHz
- Detector = Peak (to match method used for power measurement)
- Trace = Max hold

The observed power level is then scaled to an equivalent value in 3 kHz by adding a Bandwidth Correction Factor (BWCF) where:

BWCF = 10*LOG (3 kHz / 100 kHz) = -15.2 dB

POWER SPECTRAL DENSITY

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			**Work Order:**	ESTE0018
Serial Number:	00002			**Date:**	02/05/15
Customer:	Esterline (Advanced Input Devices)			**Temperature:**	24.7°C
Attendees:	Wayne Hash			**Humidity:**	42%
Project:	None			**Barometric Pres.:**	1014.2
Tested by:	Brandon Hobbs	**Power:**	5 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

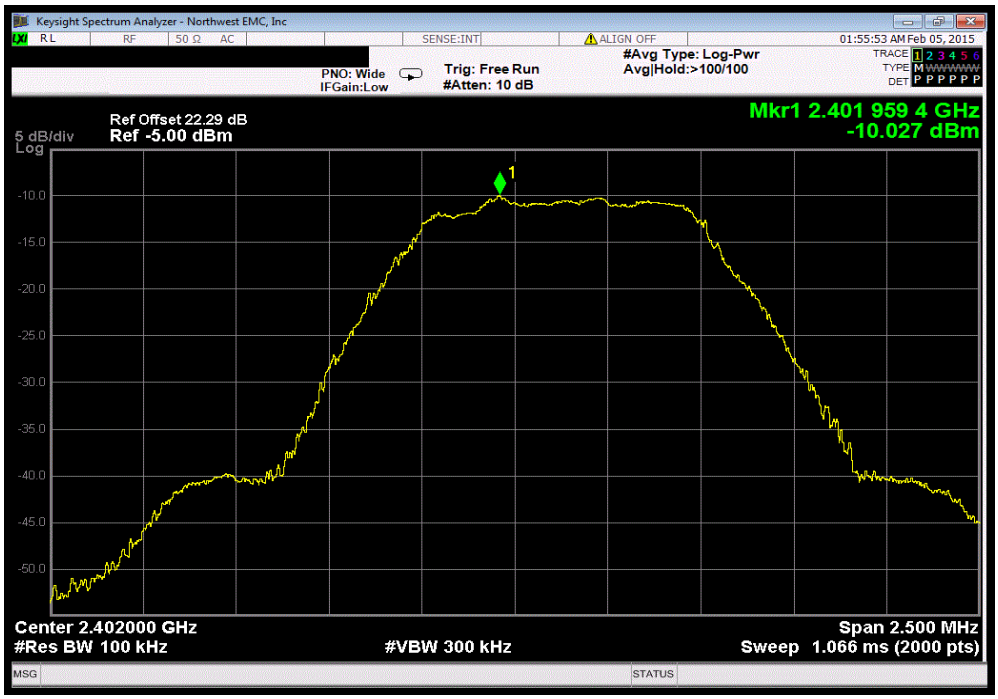
DEVIATIONS FROM TEST STANDARD

None

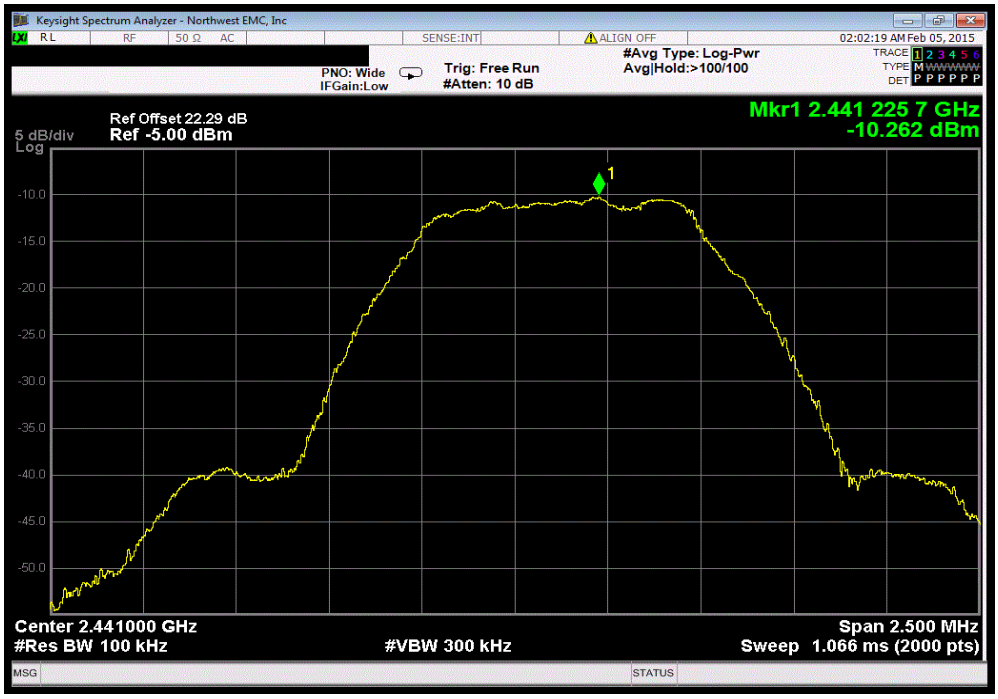
Configuration #	7	Signature

		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
Hopping Mode, OFF						
	GFSK					
	Low Channel, 2402 MHz	-10.027	-15.2	-25.227	8	Pass
	Mid Channel, 2441 MHz	-10.262	-15.2	-25.462	8	Pass
	High Channel, 2480 MHz	-10.195	-15.2	-25.395	8	Pass

Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
		-10.027	-15.2	-25.227	8	Pass



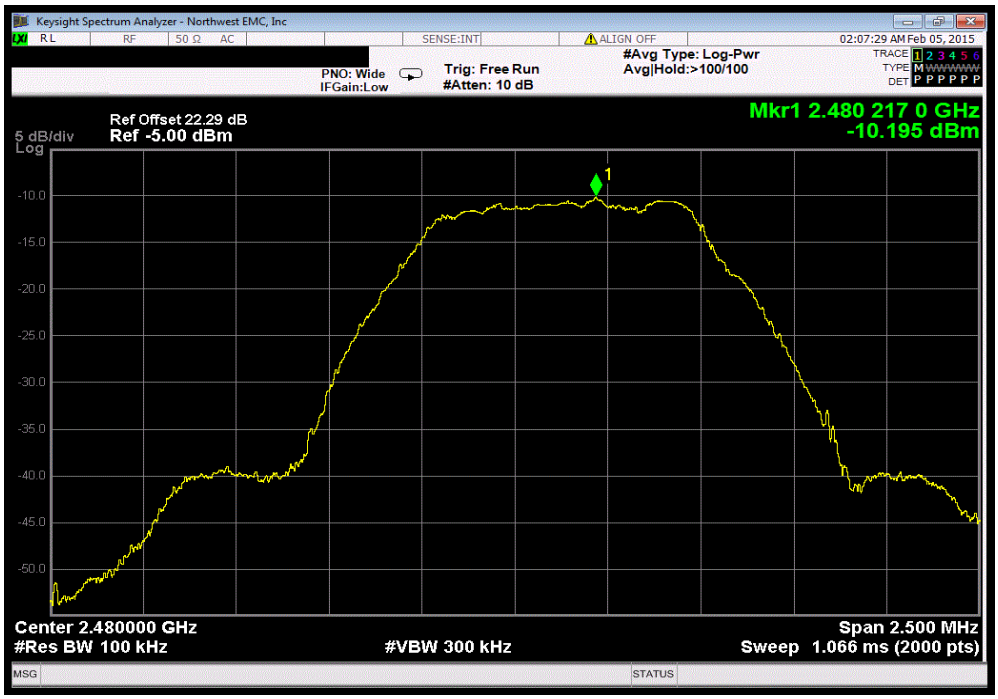
Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
		-10.262	-15.2	-25.462	8	Pass



POWER SPECTRAL DENSITY

XMit 2015.01.14

Hopping Mode, OFF, DH5, GFSK, High Channel, 2480 MHz						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
		-10.195	-15.2	-25.395	8	Pass



Duty Cycle

NORTHWEST EMC

#REF!

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 DESCRIPTION

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.

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 test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle.

CHANNEL SPACING

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. 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.

CHANNEL SPACING

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			Work Order:	ESTE0018
Serial Number:	00002			Date:	02/05/15
Customer:	Esterline (Advanced Input Devices)			Temperature:	24.7°C
Attendees:	Wayne Hash			Humidity:	42%
Project:	None			Barometric Pres.:	1014.2
Tested by:	Brandon Hobbs	Power:	5 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	7	Signature

		Value	Limit (≥)	Results
Hopping Mode, ON				
	GFSK			
	Mid Channel, 2441 MHz	18.0 MHz	1 MHz	Pass

Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (≥)	Results
				18.0 MHz	1 MHz	Pass

NUMBER OF HOPPING FREQUENCIES

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

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

For Hybrid systems there is no minumum or maximum number of channels specified. The number of channels is measured to characterize the system and for dwell time calculations contained elsewhere in the report.

NUMBER OF HOPPING FREQUENCIES

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			**Work Order:**	ESTE0018
Serial Number:	00002			**Date:**	02/05/15
Customer:	Esterline (Advanced Input Devices)			**Temperature:**	24.7°C
Attendees:	Wayne Hash			**Humidity:**	42%
Project:	None			**Barometric Pres.:**	1014.2
Tested by:	Brandon Hobbs	**Power:**	5 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

DEVIATIONS FROM TEST STANDARD

None

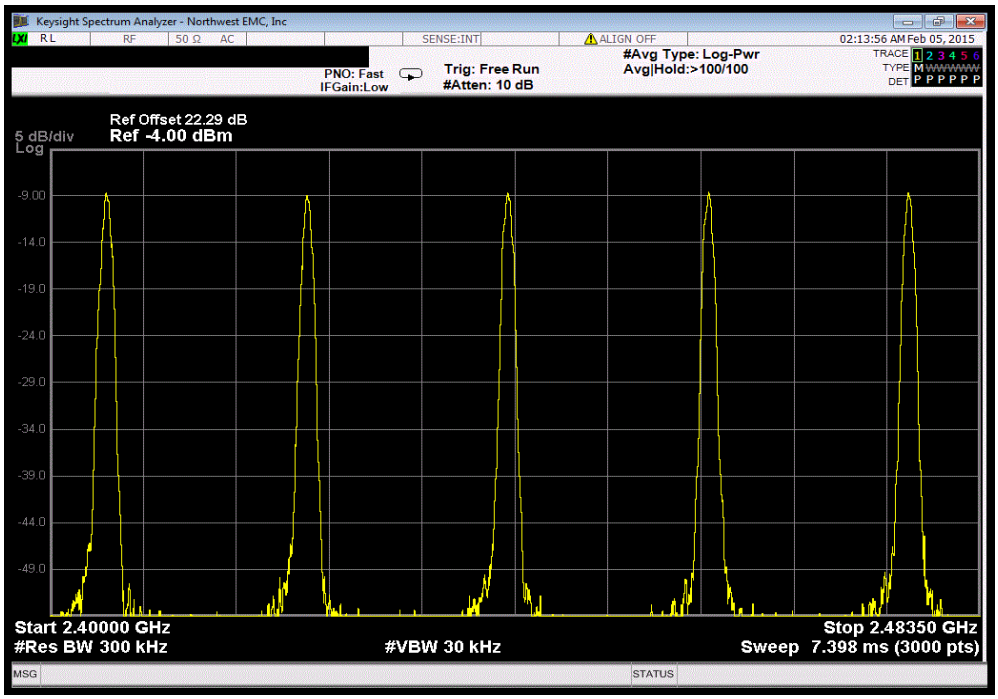
Configuration #	7	Signature

		Number of Channels	Limit	Results
Hopping Mode, ON				
	GFSK			
	Mid Channel, 2441 MHz	5	N/A	N/A

NUMBER OF HOPPING FREQUENCIES

XMit 2015.01.14

Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz						
				Number of Channels	Limit	Results
				5	N/A	N/A



DWELL TIME

NORTHWEST EMC

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
Multimeter	Tektronix	DMM912	MMH	2/5/2013	36
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
Spectrum Analyzer	Keysight	N9010A	AFM	7/14/2014	24

TEST DESCRIPTION

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

The dwell time limit is based on the Number of Hopping Channels * 400 mS. This would be 5 Channels * 400mS = 2 Sec.

Pulse Width = Number of Bursts * Burst width

.399 ms = 3 * .133 ms

On Time During 2 Sec = Pulse Width * Average Number of Pulses * Scale Factor

- Average Number of Pulses is based on 4 samples.
- Scale Factor = 2 Sec / Screen Capture Sweep Time = 2 Sec / .4 Sec = 5

DWELL TIME

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			**Work Order:**	ESTE0018
Serial Number:	00002			**Date:**	02/02/15
Customer:	Esterline			**Temperature:**	24.7°C
Attendees:	Wayne Hash			**Humidity:**	42%
Project:	None			**Barometric Pres.:**	1014.2
Tested by:	Brandon Hobbs	**Power:**	5 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test. The three bust pulse width was account for while under test.

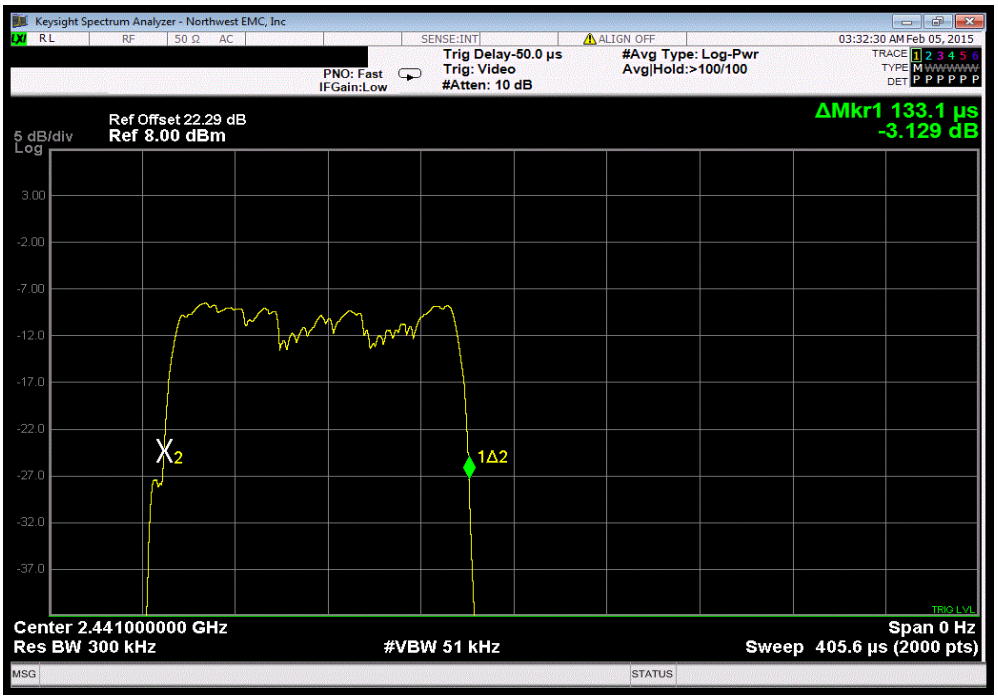
DEVIATIONS FROM TEST STANDARD

None

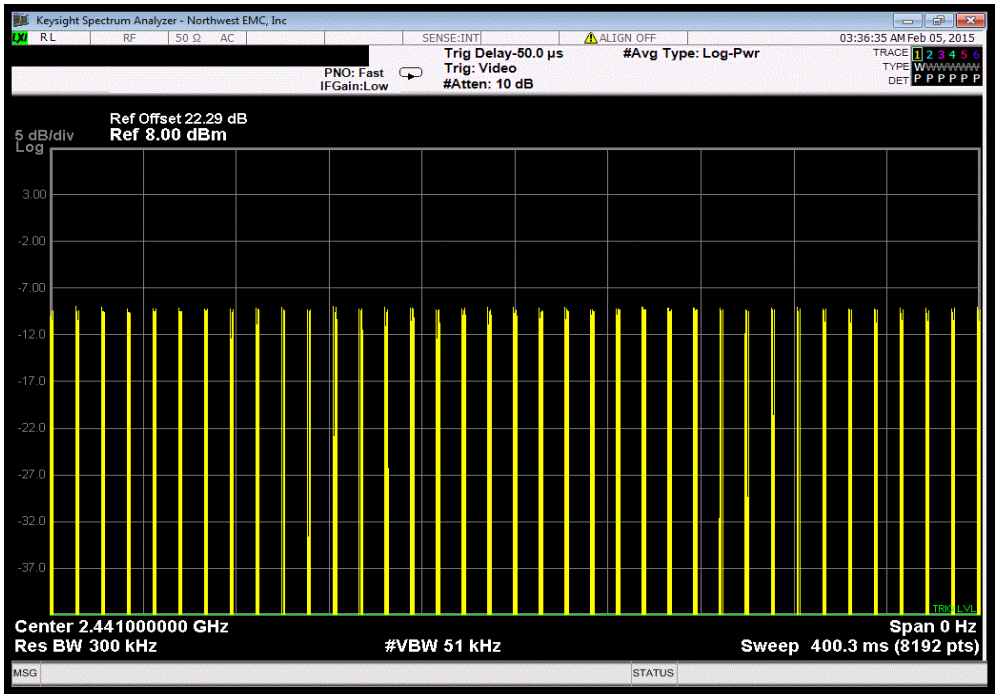
Configuration #	7	Signature

		Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
Hopping Mode, ON									
	GFSK								
	Mid Channel, 2441 MHz	N/A	0.133	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2441 MHz	N/A	N/A	37	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2441 MHz	N/A	N/A	37	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2441 MHz	N/A	N/A	37	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2441 MHz	N/A	N/A	37	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2441 MHz	N/A	0.399	N/A	37	5	73.8	400	Pass

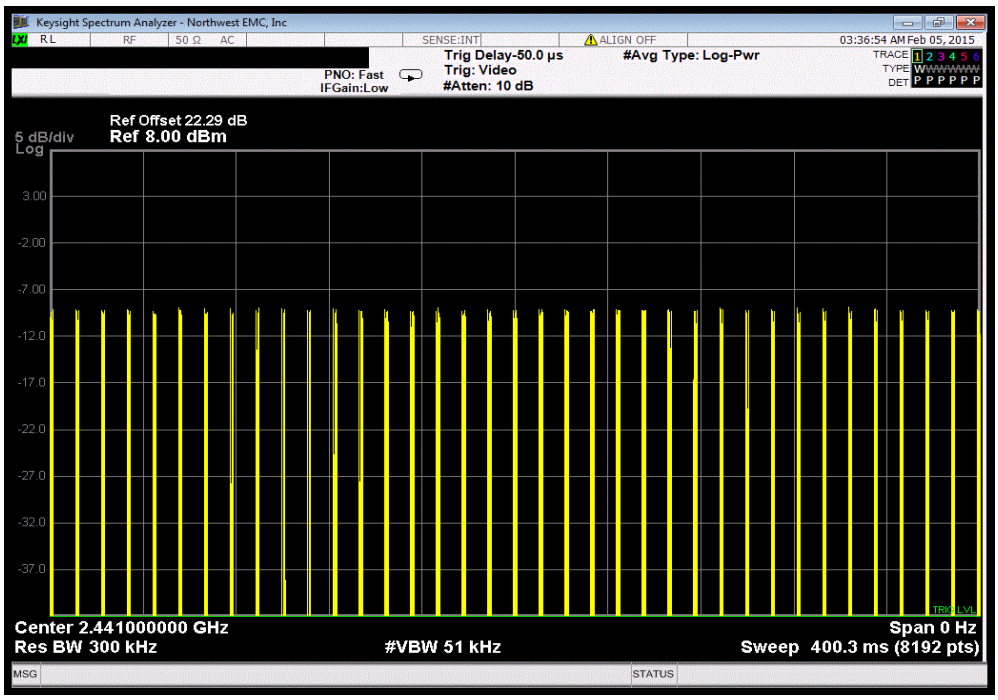
Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	0.133	N/A	N/A	N/A	N/A	N/A	N/A



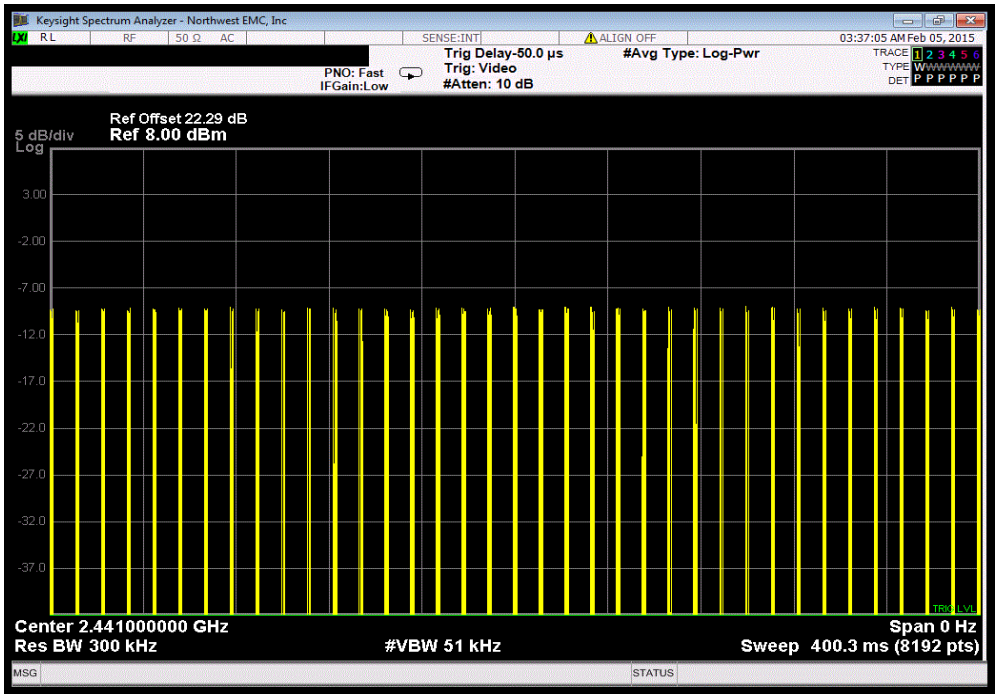
Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	N/A	37	N/A	N/A	N/A	N/A	N/A



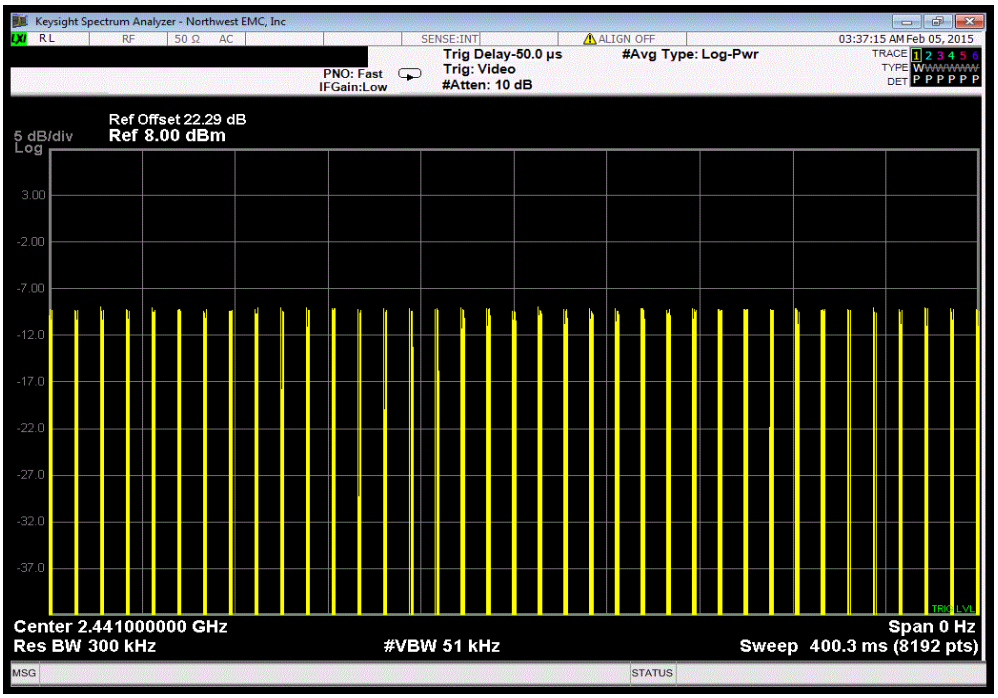
Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	N/A	37	N/A	N/A	N/A	N/A	N/A



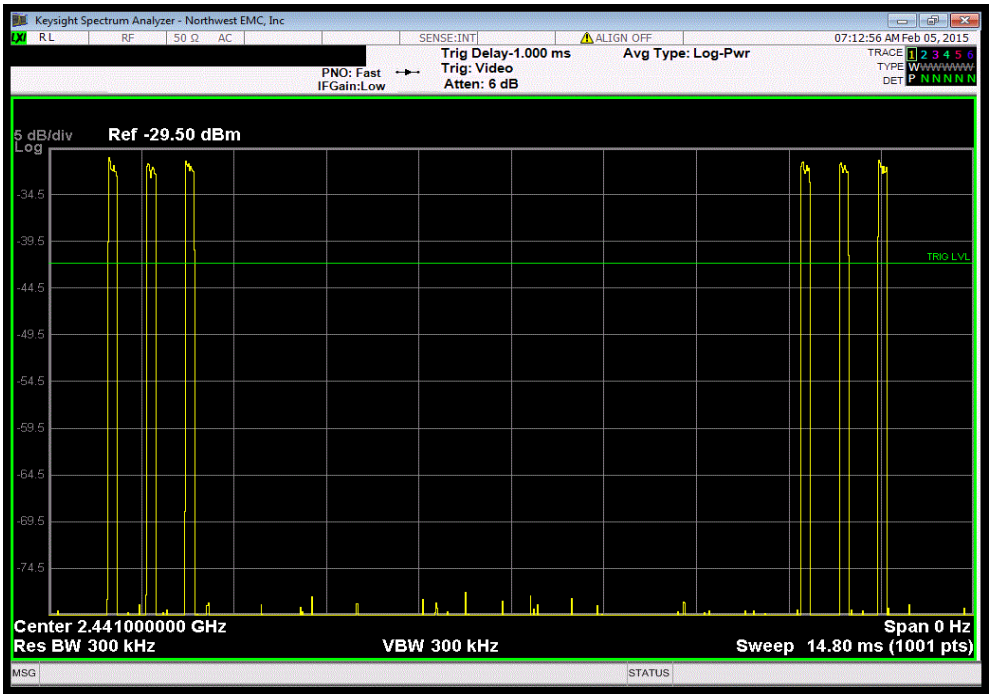
Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	N/A	37	N/A	N/A	N/A	N/A	N/A



Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	N/A	37	N/A	N/A	N/A	N/A	N/A



Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	0.399	N/A	37	5	73.815	400	Pass



BAND EDGE COMPLIANCE

NORTHWEST EMC

XMit 2015.01.14

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.	Interval (mo)
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	1/7/2015	12
RF Vector Signal Generator (FOR REFERENCE ONLY)	Agilent	V2920A	TIH	NCR	0
Power Meter	Gigatronics	8651A	SPM	9/17/2014	12
Power Sensor	Gigatronics	80701A	SPL	5/28/2014	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40 GHz DC Block	Fairview Microwave	SD3379	AMK	12/11/2014	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
Signal Analyzer	Keysight	N9010A	AFM	1/28/2015	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting using the modulation listed in the datasheet in both hopping and non hopping modes. The channels closest to the band edges were selected.

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

BAND EDGE COMPLIANCE

NORTHWEST EMC

XMit 2015.01.14

EUT:	Medigenic K080/K081 Wireless USB Dongle			**Work Order:**	ESTE0018
Serial Number:	00002, P00001			**Date:**	02/05/15
Customer:	Esterline (Advanced Input Devices)			**Temperature:**	24.7°C
Attendees:	Wayne Hash			**Humidity:**	42%
Project:	None			**Barometric Pres.:**	1014.2
Tested by:	Brandon Hobbs	**Power:**	5 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2013

COMMENTS

All cable losses were accounted for. The EUT was operating on 5 channels while under test. The EUT power level was set to 2 while under test.

DEVIATIONS FROM TEST STANDARD

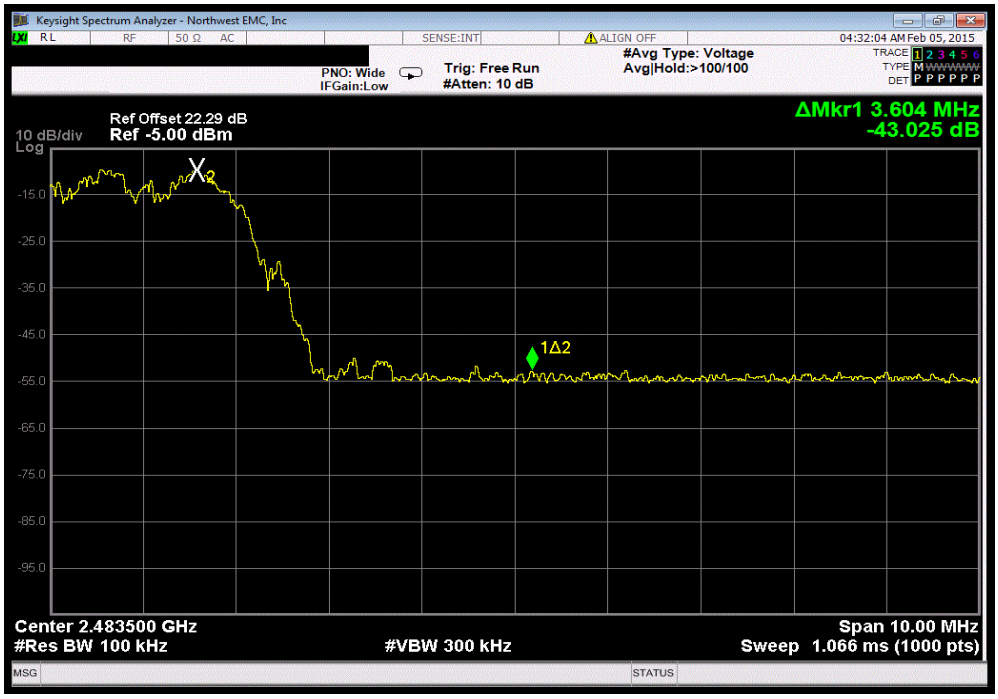
None

Configuration #	8	Signature

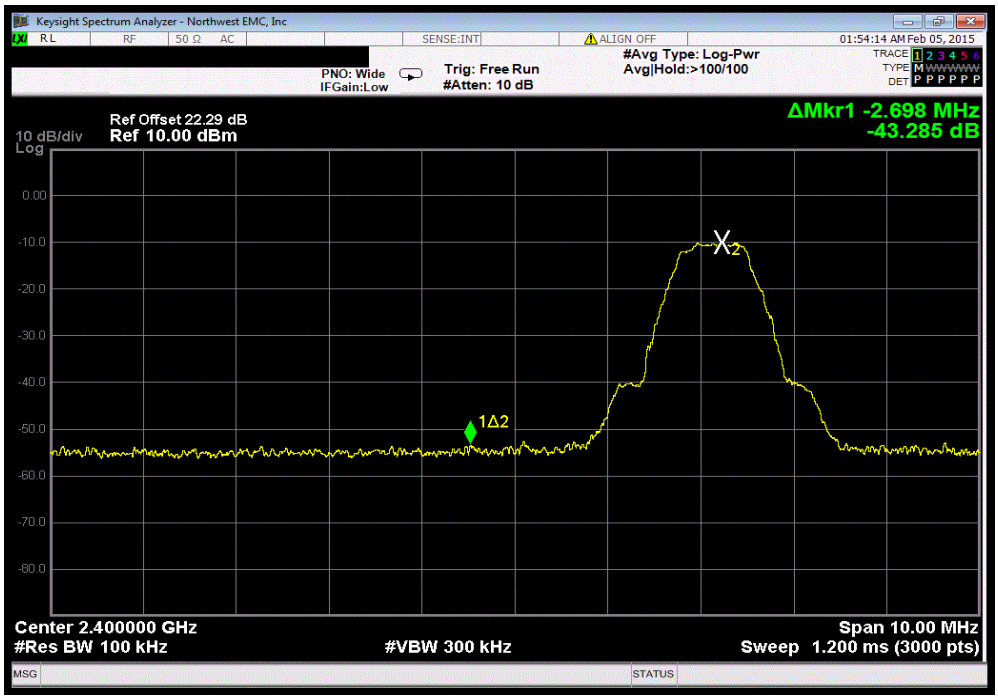
		Value (dBc)	Limit ≤ (dBc)	Result
Hopping Mode, ON				
	GFSK			
	Low Channel, 2402 MHz	-39.84	-20	Pass
	High Channel, 2480 MHz	-43.03	-20	Pass
Hopping Mode, OFF				
	GFSK			
	Low Channel, 2402 MHz	-43.29	-20	Pass
	High Channel, 2480 MHz	-42.86	-20	Pass

Hopping Mode, ON, DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.84	-20	Pass

Hopping Mode, ON, DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.03	-20	Pass



Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.29	-20	Pass



Hopping Mode, OFF, DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-42.86	-20	Pass