

NORTHWEST EMC

**Esterline (Advanced Input Devices)
Medigenic K080/K081 Wireless USB Dongle
FCC 15.247:2015**

Report # ESTE0018.2



NVLAP Lab Code: 200630-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report may only be duplicated in its entirety

CERTIFICATE OF TEST

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

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 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

Measurement Uncertainty

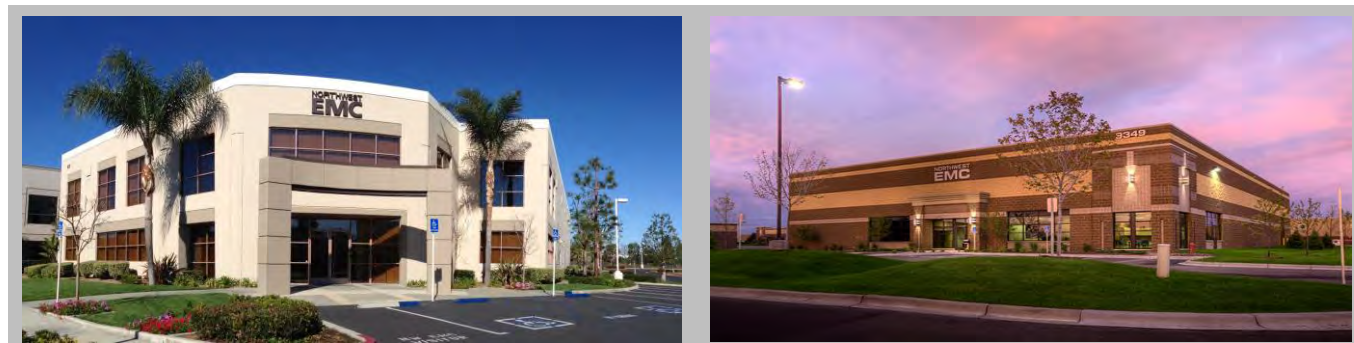
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement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

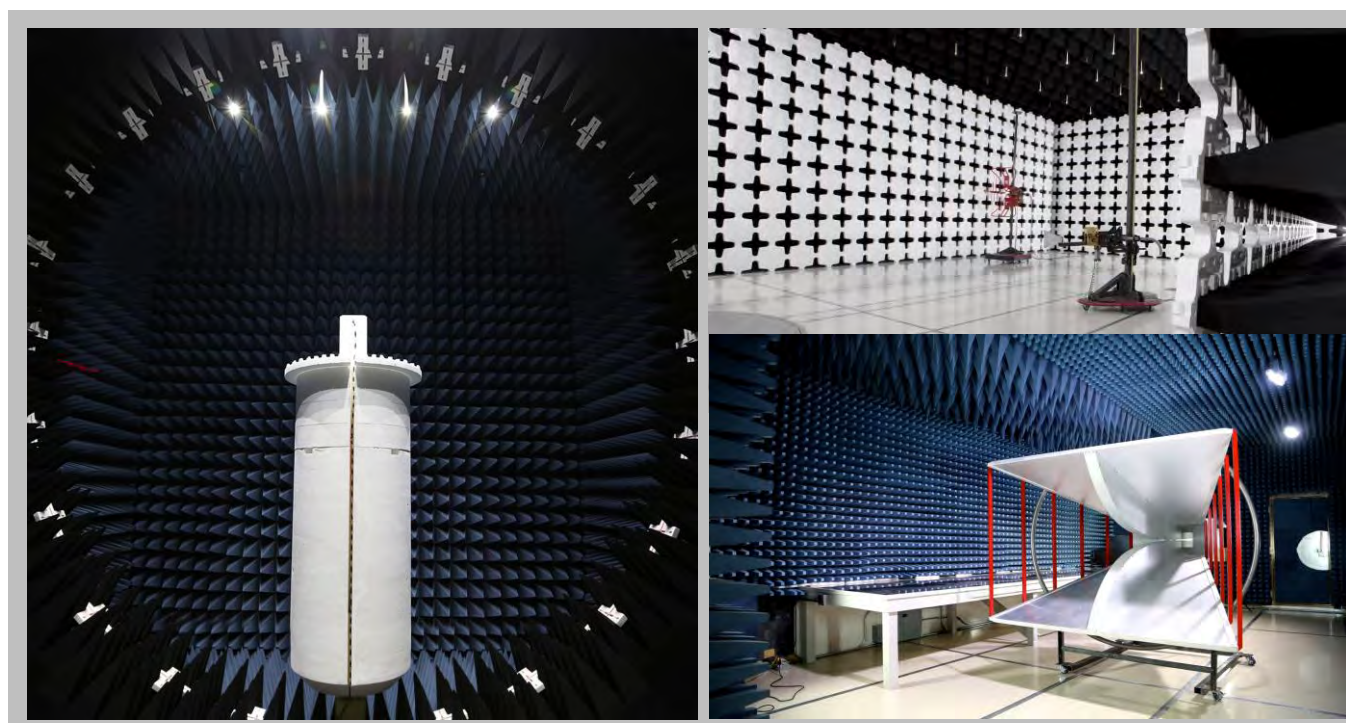
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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



California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th 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/RRR, MIC, MOC, NCC, OFTA					
US0158	US0175	N/A	US0017	US0191	US0157



PRODUCT DESCRIPTION

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.

CONFIGURATIONS

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

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

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

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					
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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

MODIFICATIONS

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 50 Ω .

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	HHH	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

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
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COMMENTS

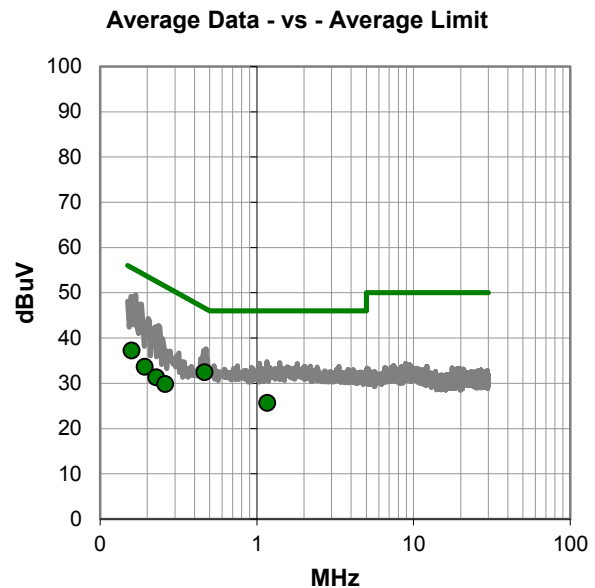
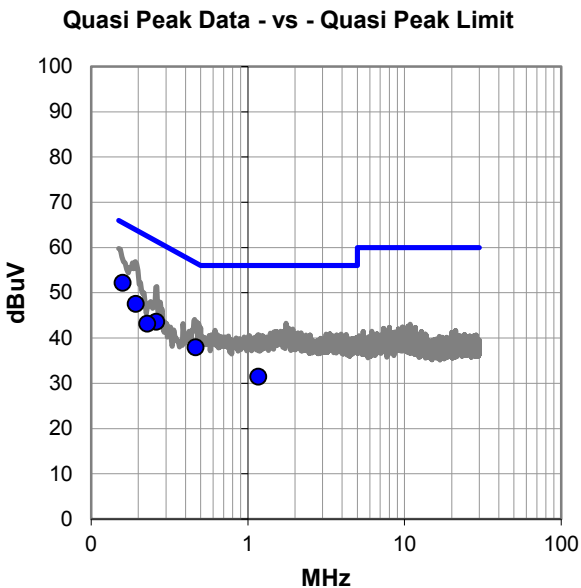
EUT powered by USB via 110VAC/60Hz

EUT OPERATING MODES

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

DEVIATIONS FROM TEST STANDARD

None



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

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
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COMMENTS

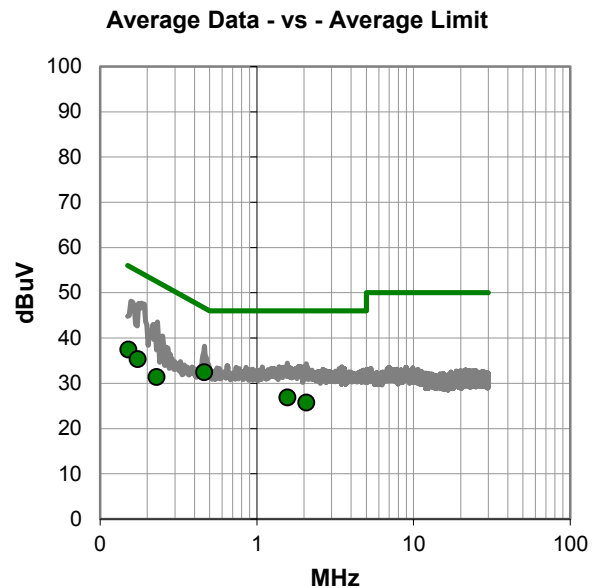
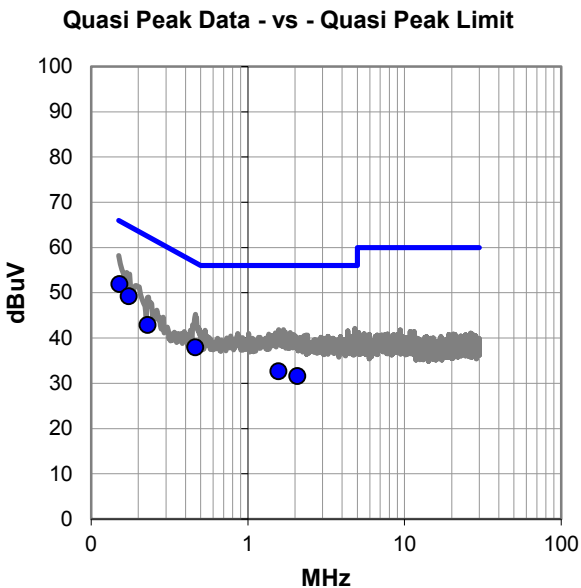
EUT powered by USB via 110VAC/60Hz

EUT OPERATING MODES

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

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

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

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
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COMMENTS

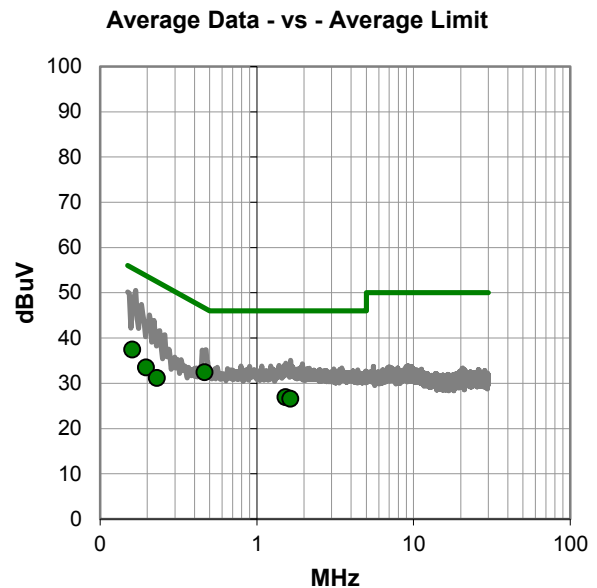
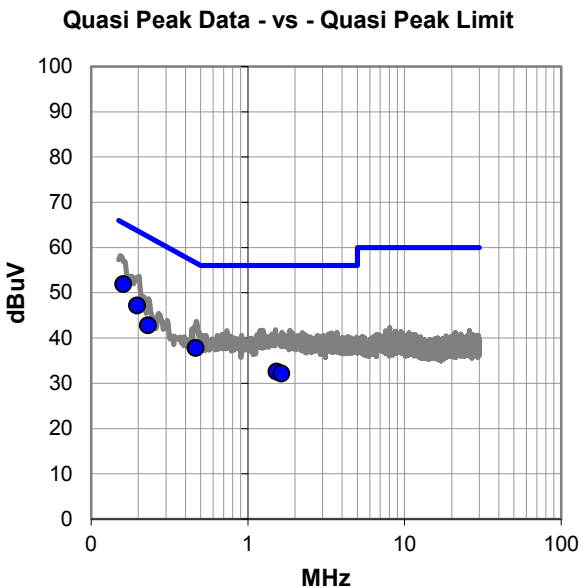
EUT powered by USB via 110VAC/60Hz

EUT OPERATING MODES

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

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

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

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
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COMMENTS

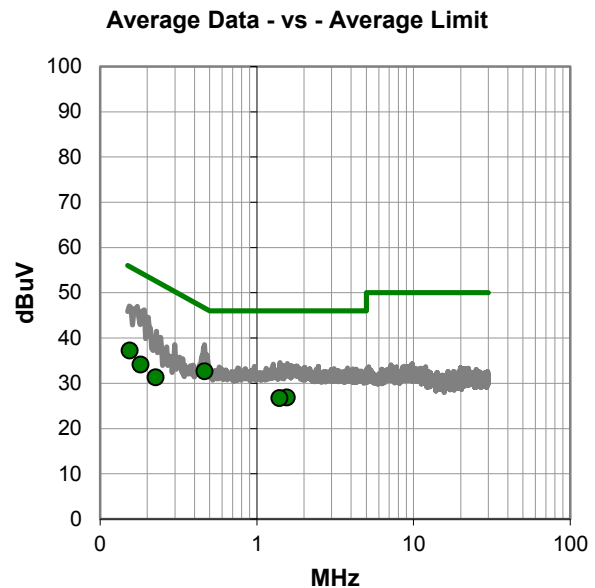
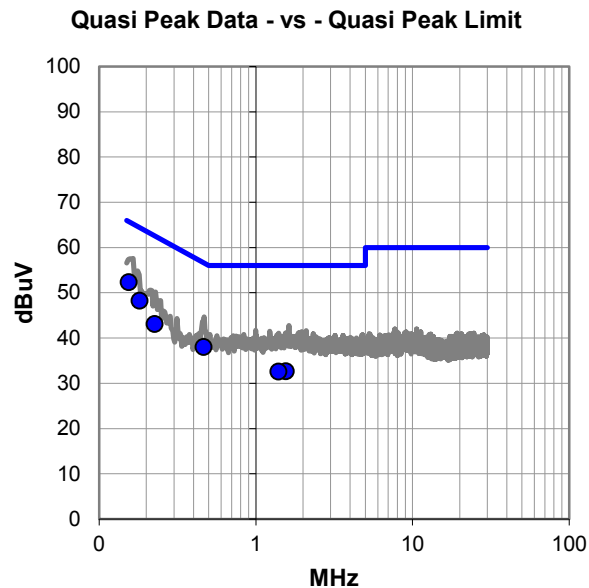
EUT powered by USB via 110VAC/60Hz

EUT OPERATING MODES

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

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

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

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
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COMMENTS

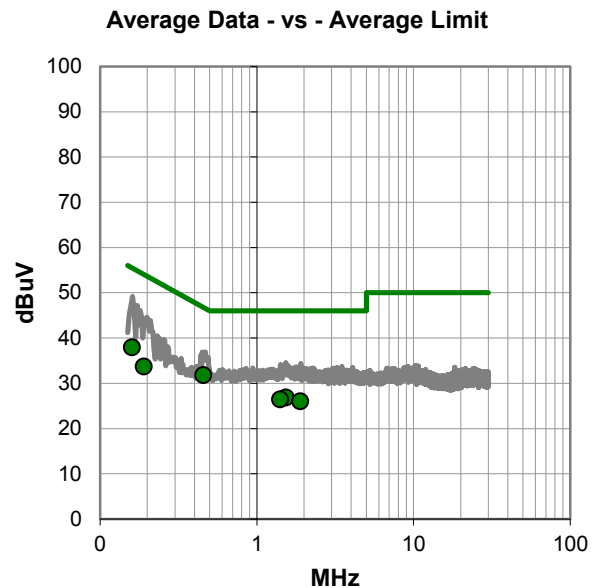
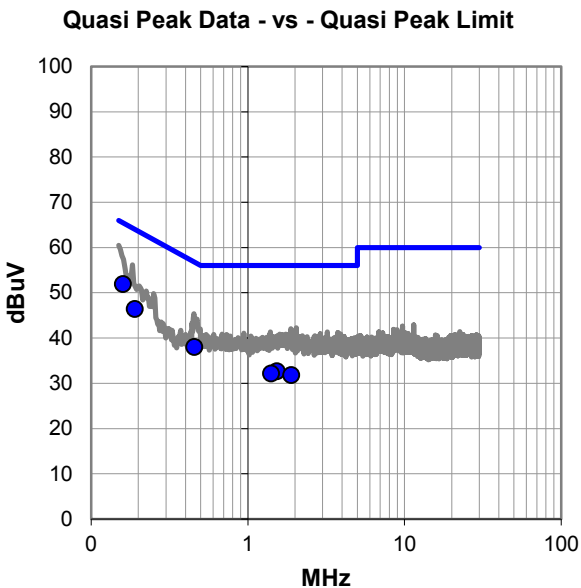
EUT powered by USB via 110VAC/60Hz

EUT OPERATING MODES

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

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

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

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
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COMMENTS

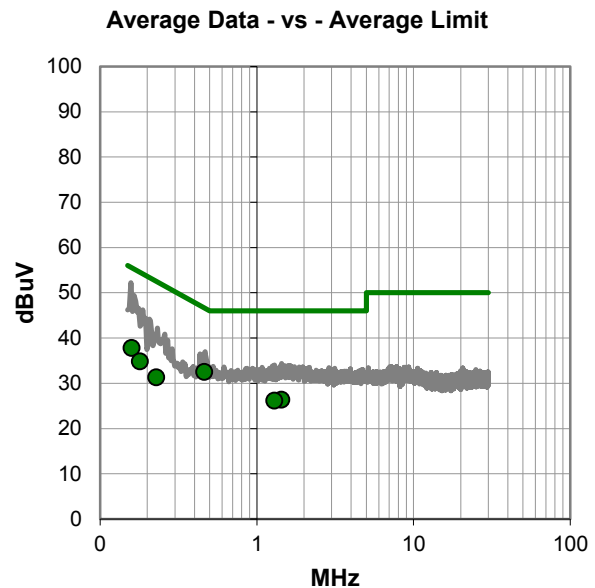
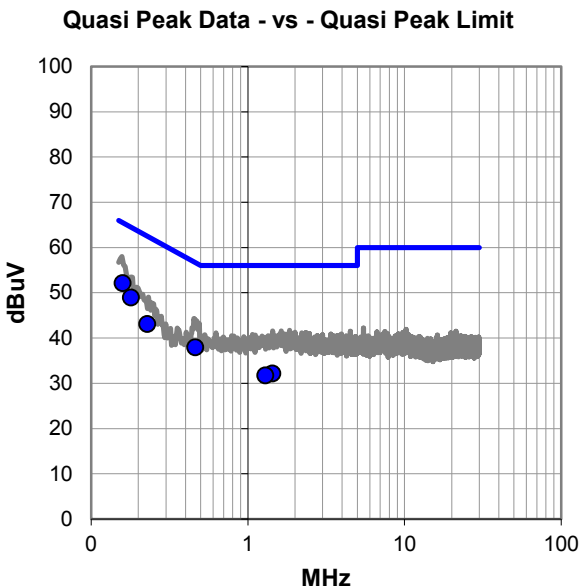
EUT powered by USB via 110VAC/60Hz

EUT OPERATING MODES

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

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

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

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
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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

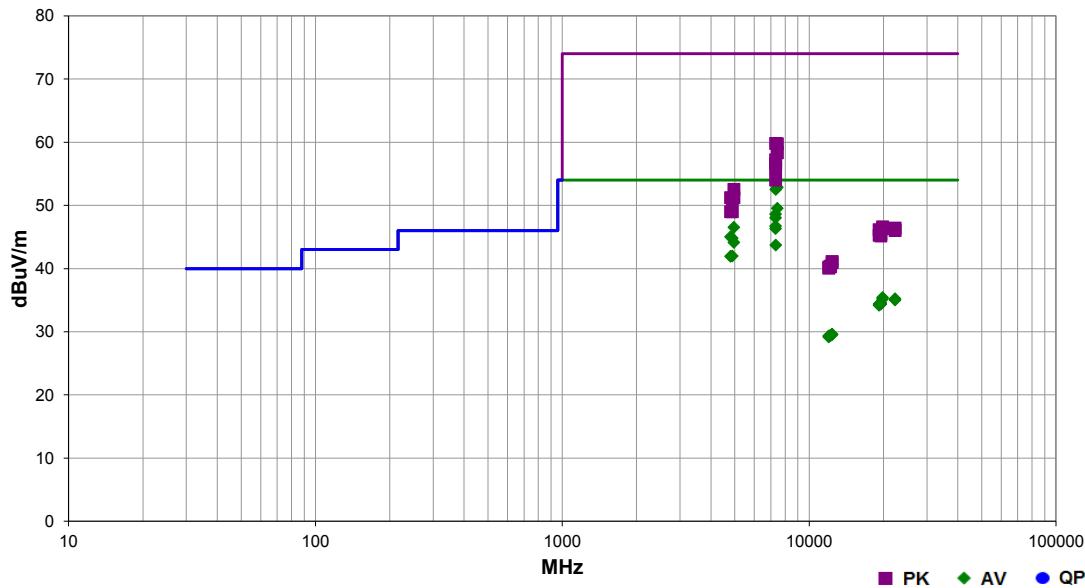
TEST DESCRIPTION

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.

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	
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	FCC 15.247:2014	Test Method	ANSI C63.10:2009
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Run #	40	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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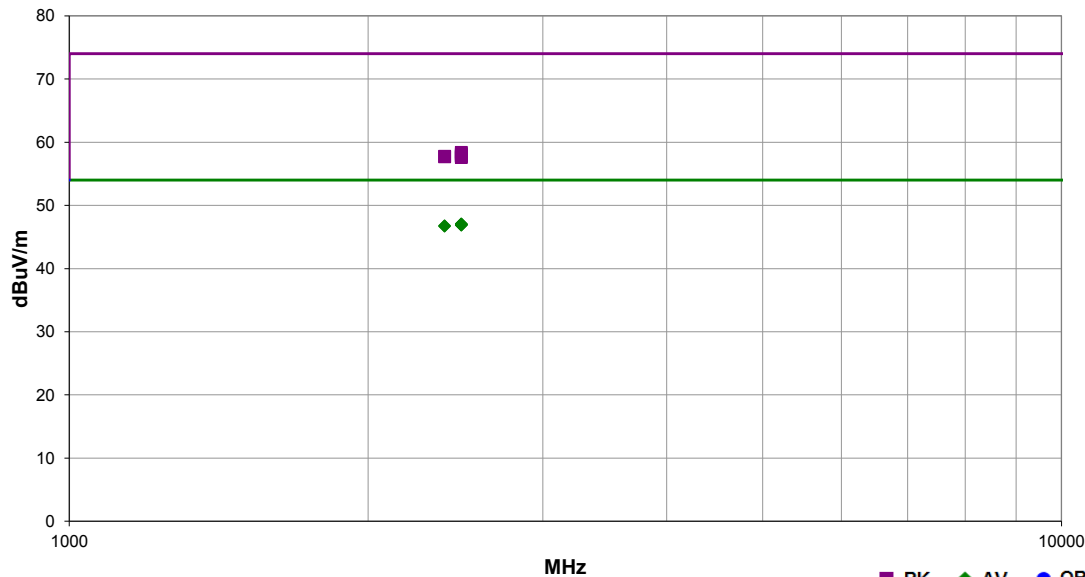
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.750	38.1	14.7	1.7	113.0	3.0	0.0	Horz	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

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	
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
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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

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

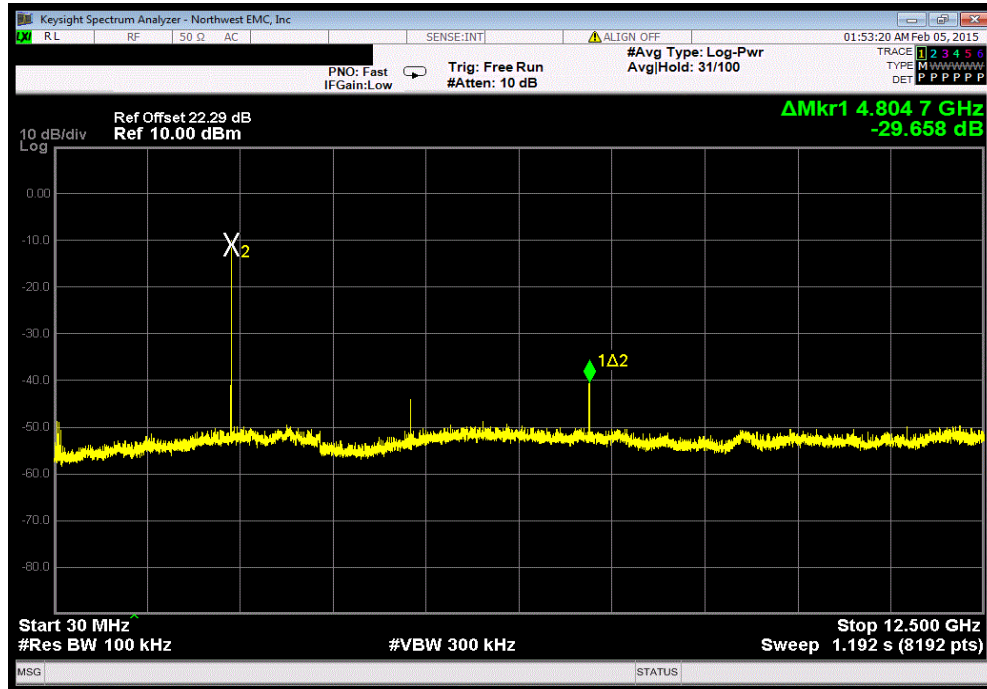
The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting using the modulation listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

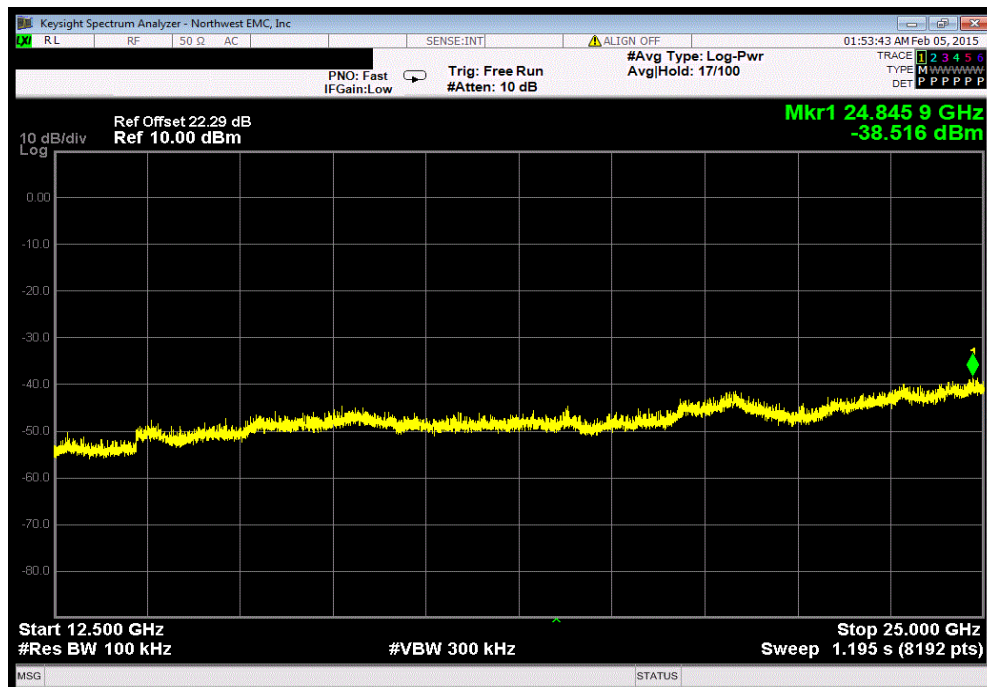
EUT: Medigenic K080/K081 Wireless USB Dongle		Work Order: ESTE0018	
Serial Number: 00002		Date: 02/05/15	
Customer: Esterline (Advanced Input Devices)		Temperature: 24.7°C	
Attendees: Wayne Hash		Humidity: 42%	
Project: None		Barometric Pres.: 1014.2	
Tested by: Brandon Hobbs		Power: 5 VDC	
Job Site: 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
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-27.5
	Mid Channel, 2441 MHz	30 MHz - 12.5 GHz	-32.39
	Mid Channel, 2441 MHz	12.5 GHz - 25 GHz	-28.29
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	-31.17
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	-27.94
			-20
			Pass

SPURIOUS CONDUCTED EMISSIONS

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	

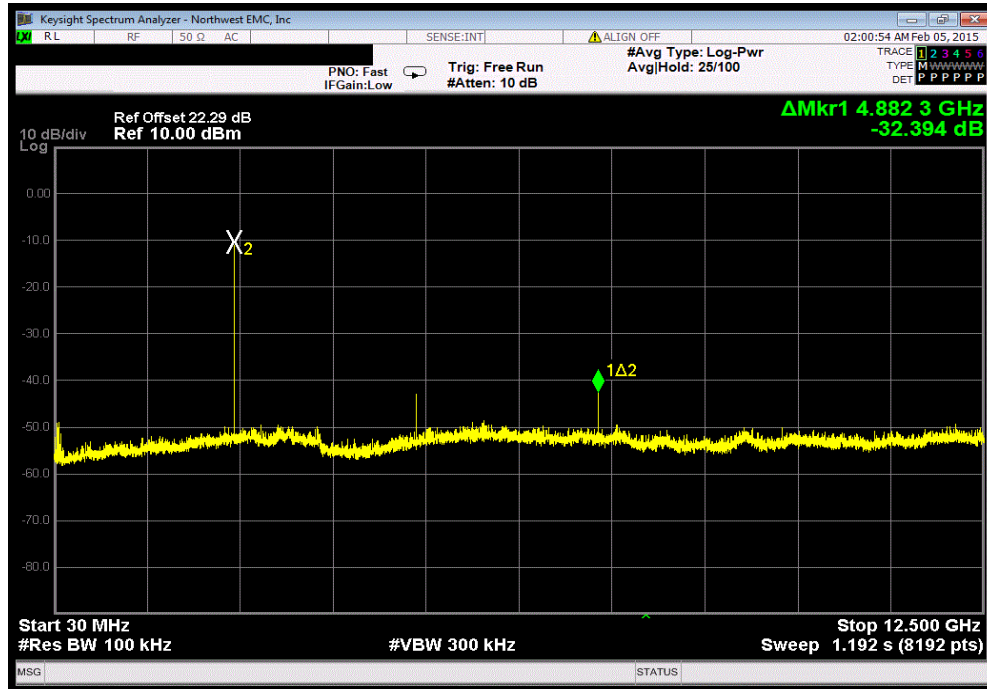


Hopping Mode, OFF, DH5, GFSK, Low Channel, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-27.5	-20	Pass	

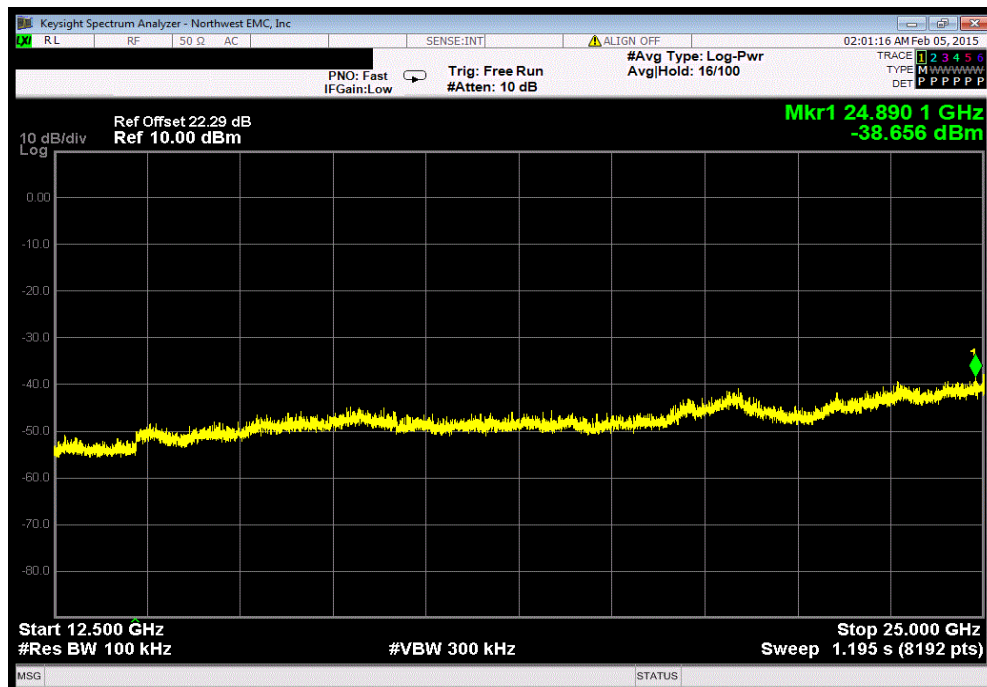


SPURIOUS CONDUCTED EMISSIONS

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	

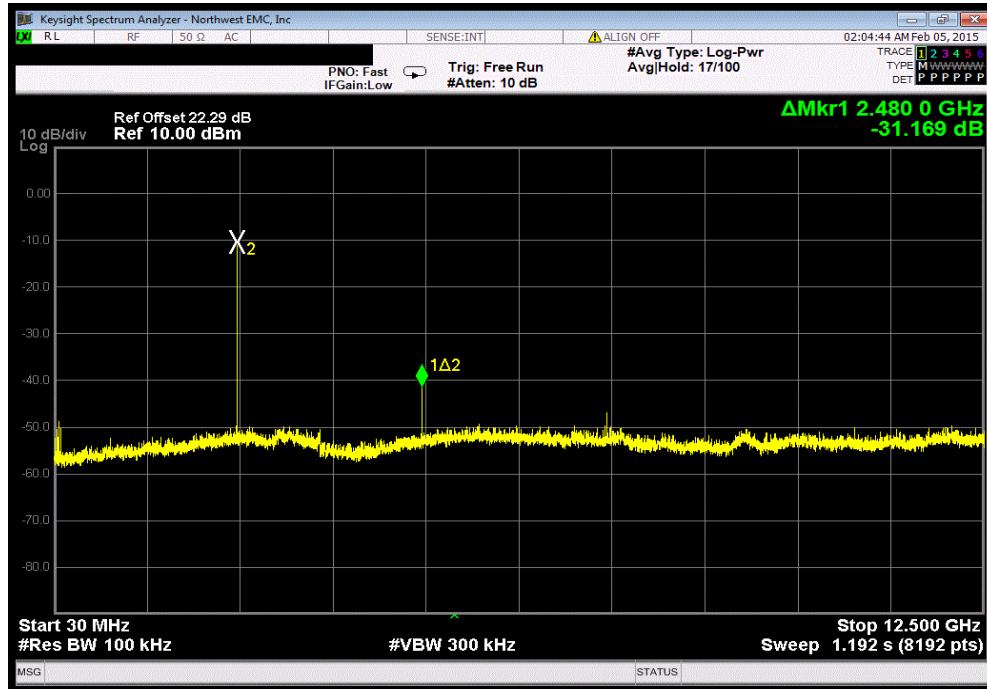


Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-28.29	-20	Pass	

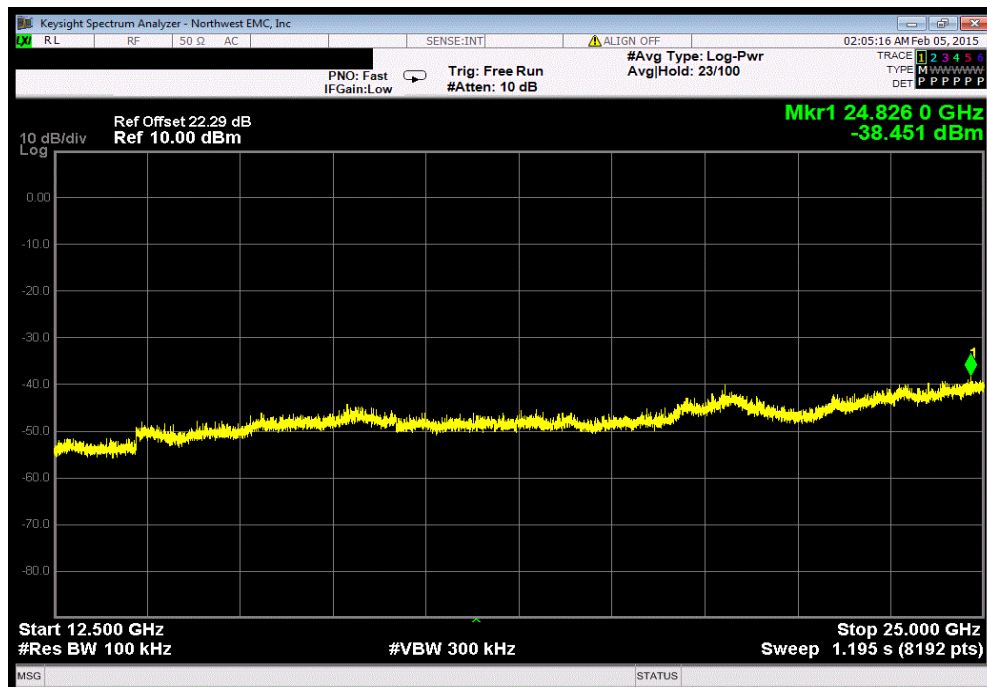


SPURIOUS CONDUCTED EMISSIONS

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

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

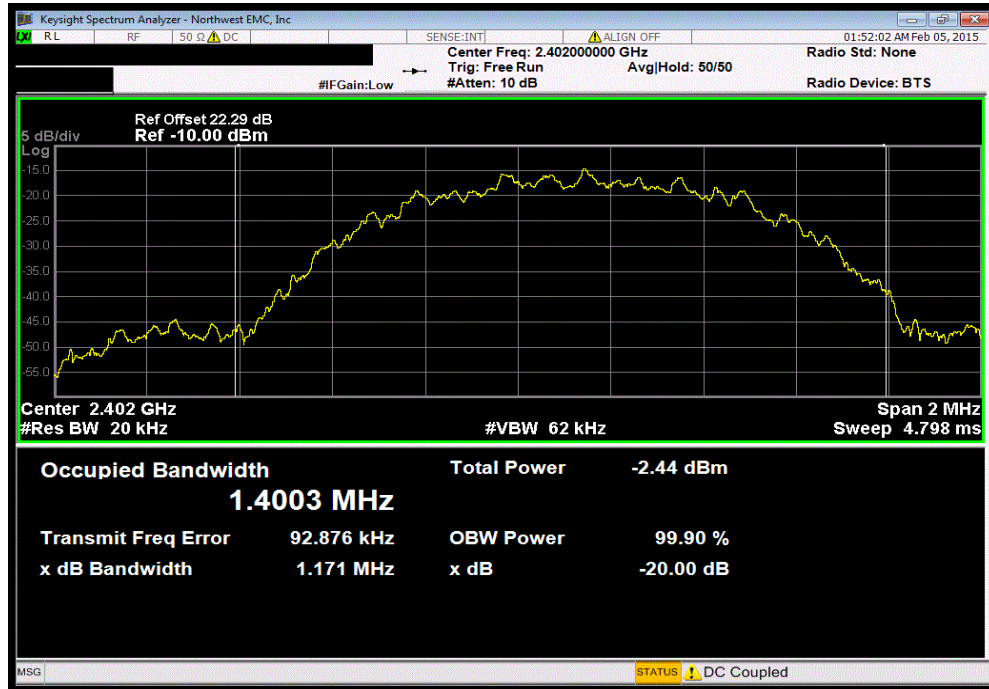
The occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.

OCCUPIED BANDWIDTH

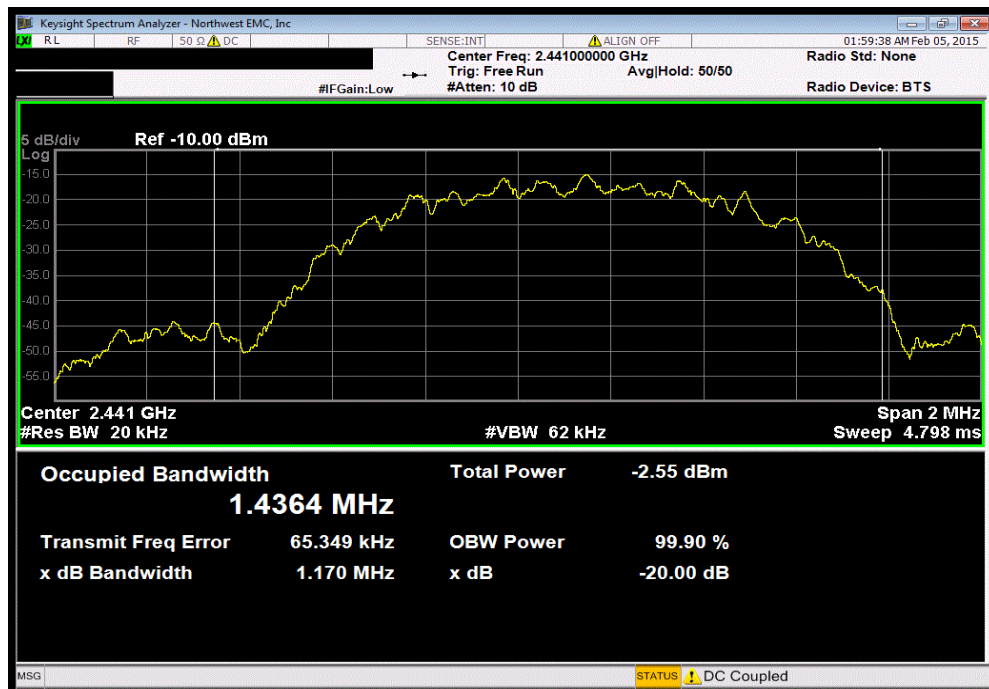
EUT: Medigenic K080/K081 Wireless USB Dongle		Work Order: ESTE0018	
Serial Number: 00002		Date: 02/05/15	
Customer: Esterline (Advanced Input Devices)		Temperature: 24.7°C	
Attendees: Wayne Hash		Humidity: 42%	
Project: None		Barometric Pres.: 1014.2	
Tested by: Brandon Hobbs	Power: 5 VDC	Job Site: EV06	
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 (>)
Hopping Mode, OFF			Result
GFSK			
Low Channel, 2402 MHz		1.171 MHz	500 kHz
Mid Channel, 2441 MHz		1.17 MHz	500 kHz
High Channel, 2480 MHz		1.162 MHz	500 kHz
			Pass
			Pass
			Pass

OCCUPIED BANDWIDTH

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

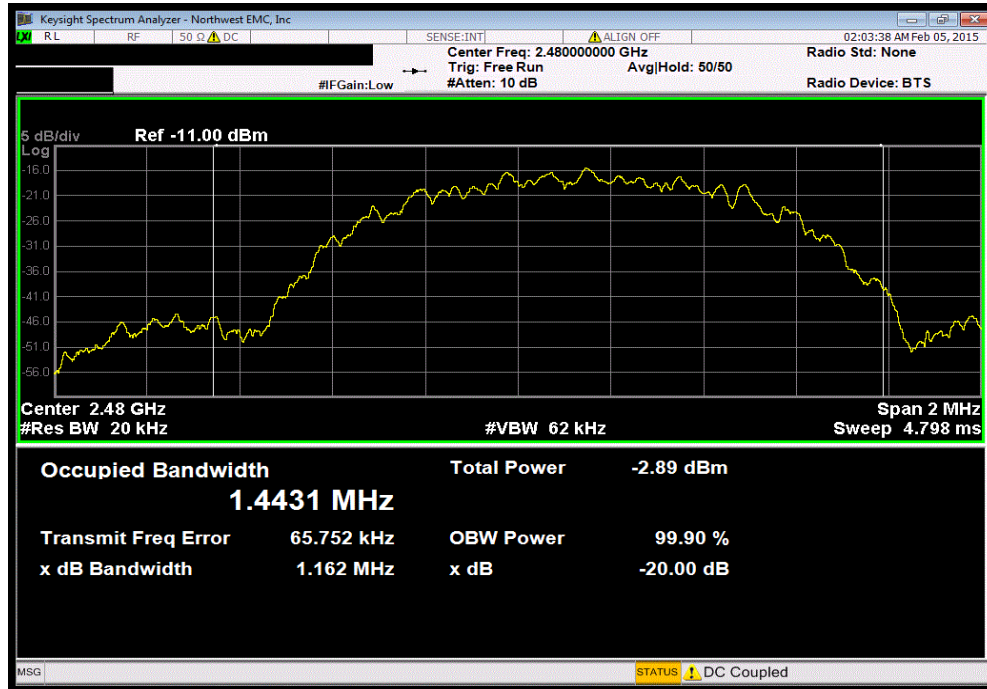


Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (>)	Result
				1.17 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

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



OUTPUT POWER

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.

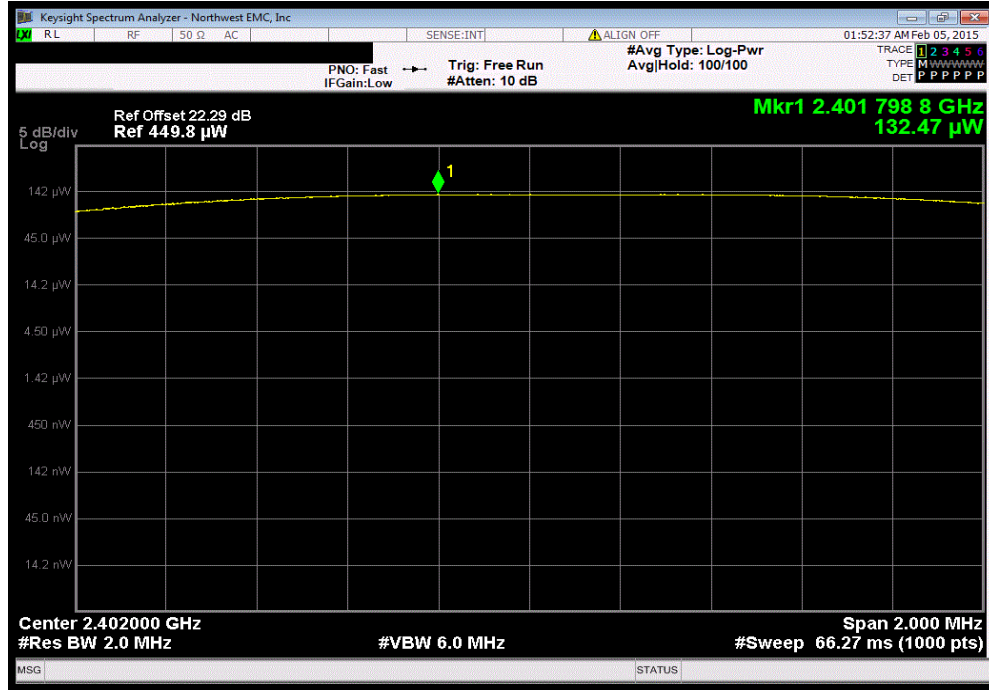
De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +27dBm.

OUTPUT POWER

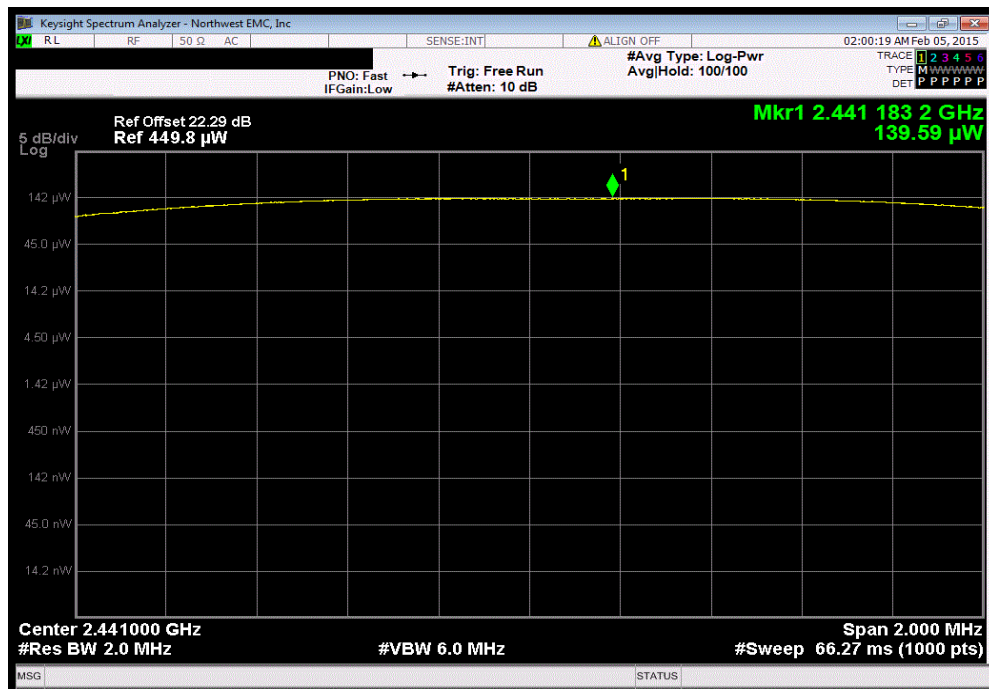
EUT: Medigenic K080/K081 Wireless USB Dongle		Work Order: ESTE0018	
Serial Number: 00002		Date: 02/05/15	
Customer: Esterline (Advanced Input Devices)		Temperature: 24.7°C	
Attendees: Wayne Hash		Humidity: 42%	
Project: None		Barometric Pres.: 1014.2	
Tested by: Brandon Hobbs	Power: 5 VDC	Job Site: EV06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

OUTPUT POWER

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

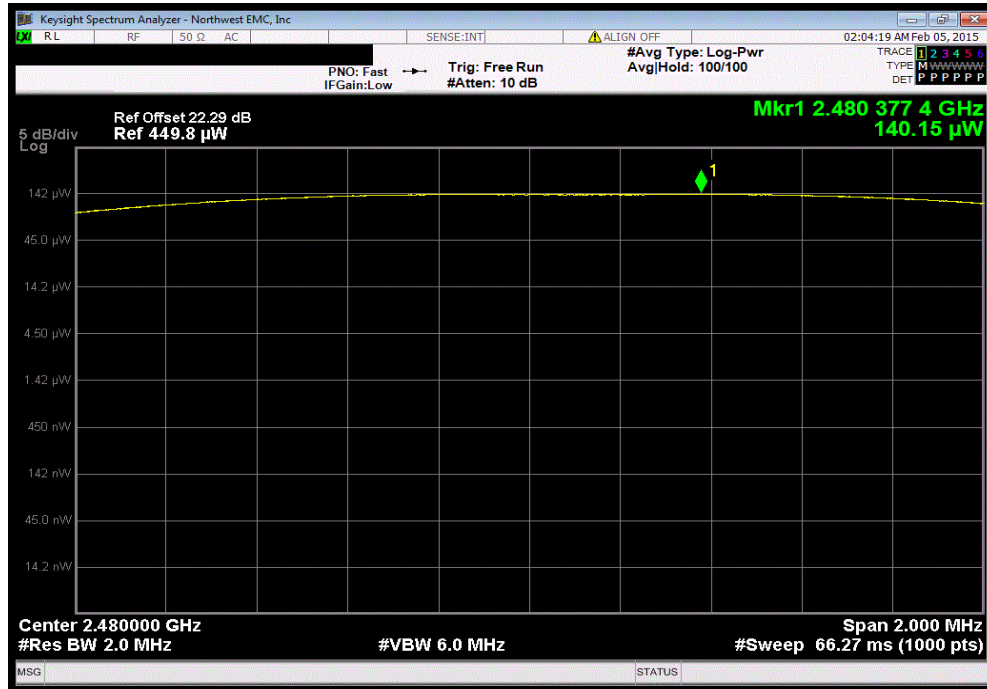


Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz						
				Value	Limit (<)	Result
				139.59 uW	125 mW	Pass



OUTPUT POWER

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



POWER SPECTRAL DENSITY

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:

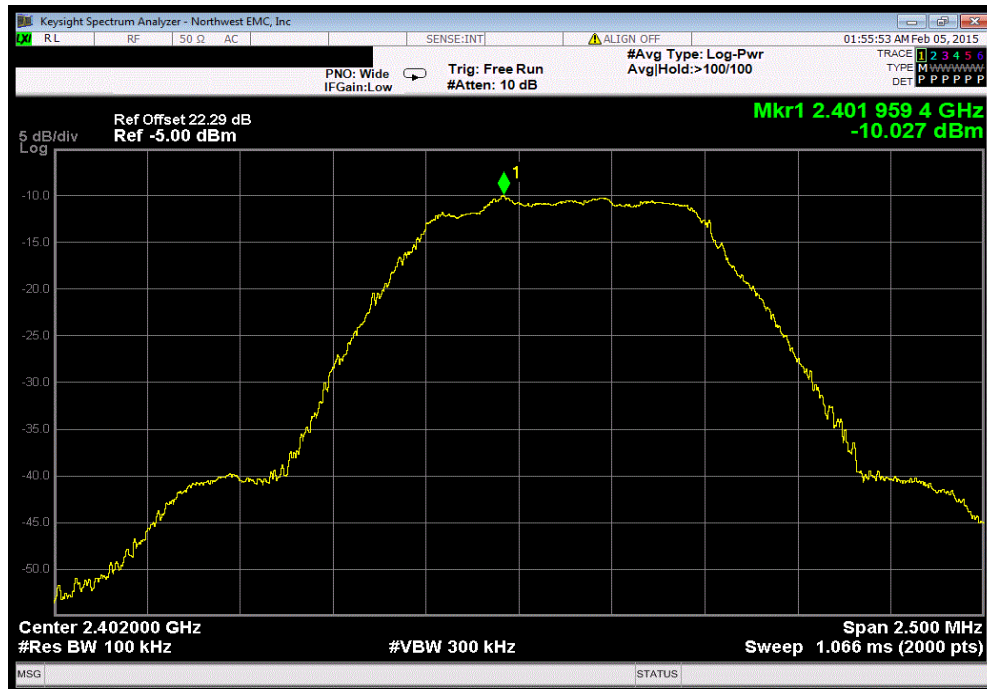
$$BWCF = 10 \cdot \log(3 \text{ kHz} / 100 \text{ kHz}) = -15.2 \text{ dB}$$

POWER SPECTRAL DENSITY

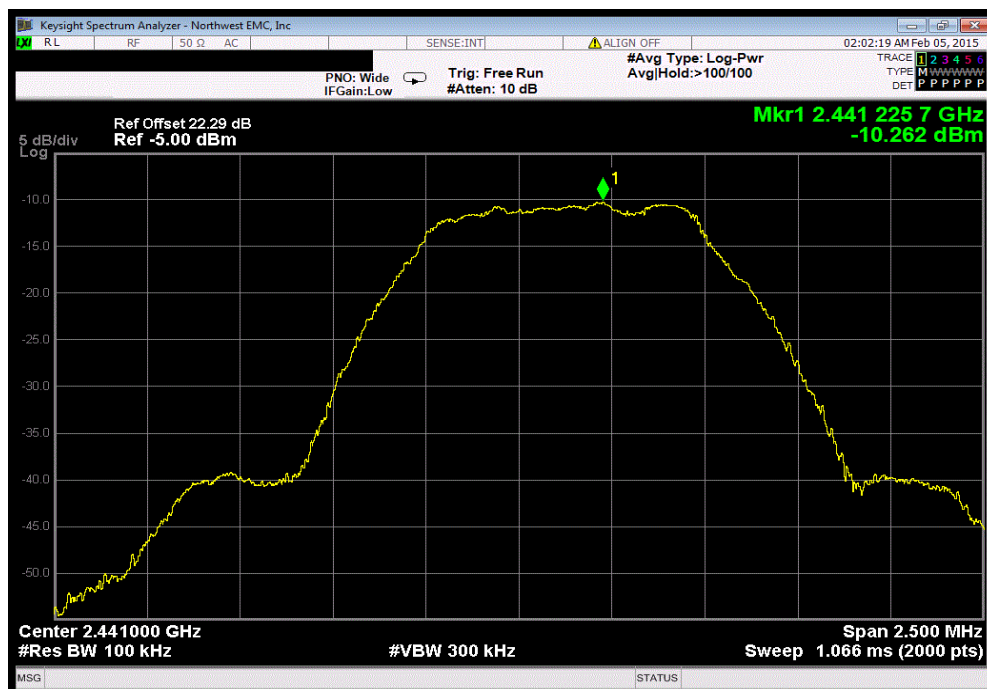
EUT: Medigenic K080/K081 Wireless USB Dongle		Work Order: ESTE0018	
Serial Number: 00002		Date: 02/05/15	
Customer: Esterline (Advanced Input Devices)		Temperature: 24.7°C	
Attendees: Wayne Hash		Humidity: 42%	
Project: None		Barometric Pres.: 1014.2	
Tested by: Brandon Hobbs	Power: 5 VDC	Job Site: EV06	
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
	Mid Channel, 2441 MHz	-10.262	-15.2
	High Channel, 2480 MHz	-10.195	-15.2
		-25.227	8
		-25.462	8
		-25.395	8
			Pass
			Pass
			Pass

POWER SPECTRAL DENSITY

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

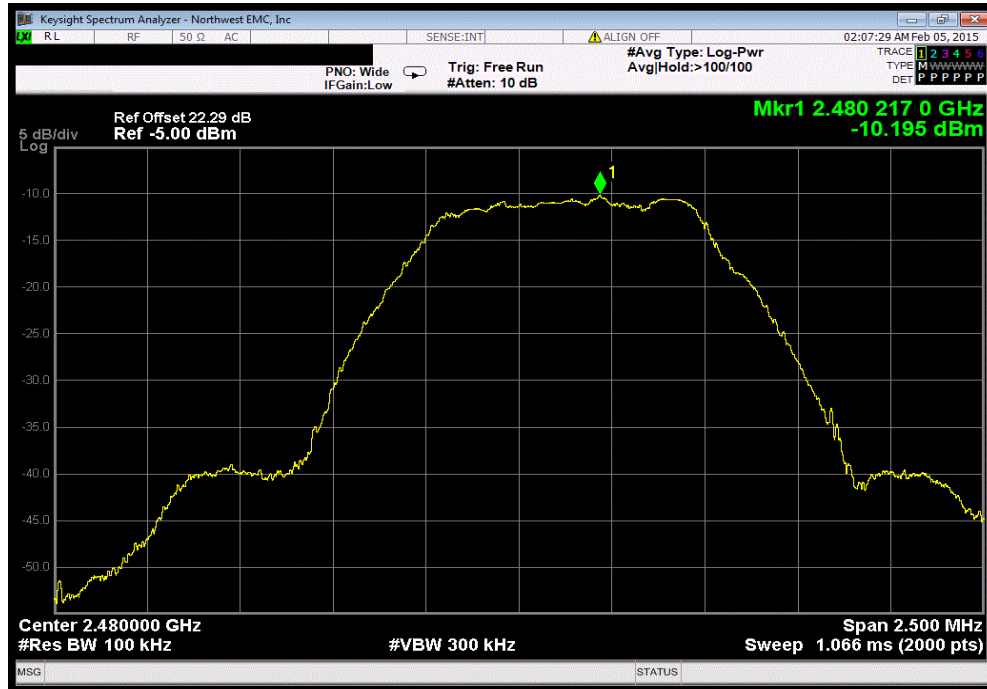


Hopping Mode, OFF, DH5, GFSK, Mid Channel, 2441 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-10.262	-15.2	-25.462	8	Pass	



POWER SPECTRAL DENSITY

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



Duty Cycle

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

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

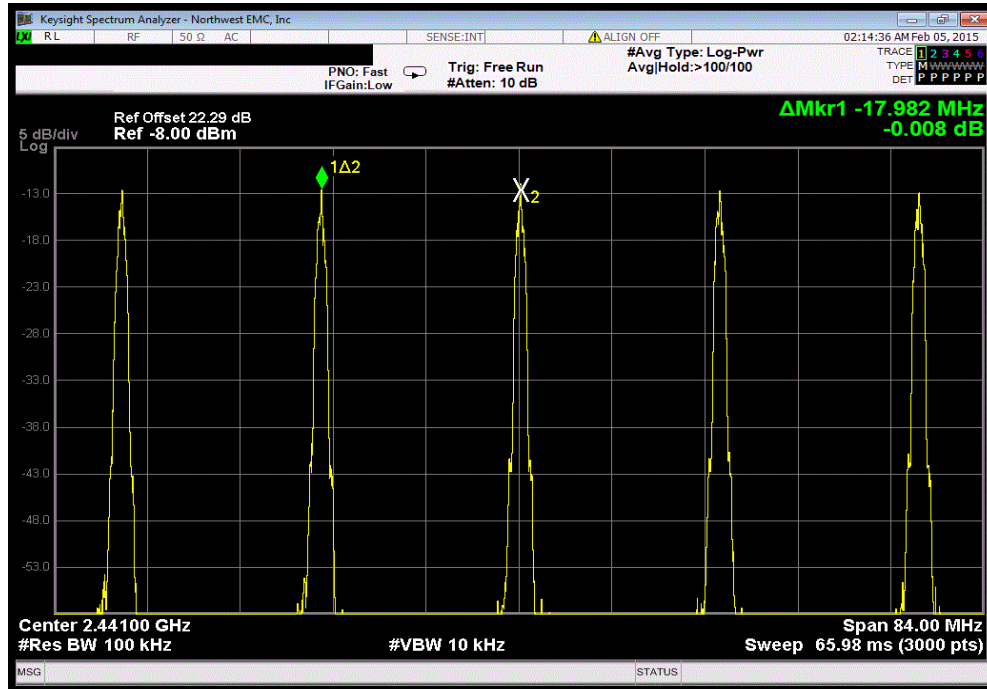
The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

CHANNEL SPACING

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

CHANNEL SPACING

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



NUMBER OF HOPPING FREQUENCIES

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.

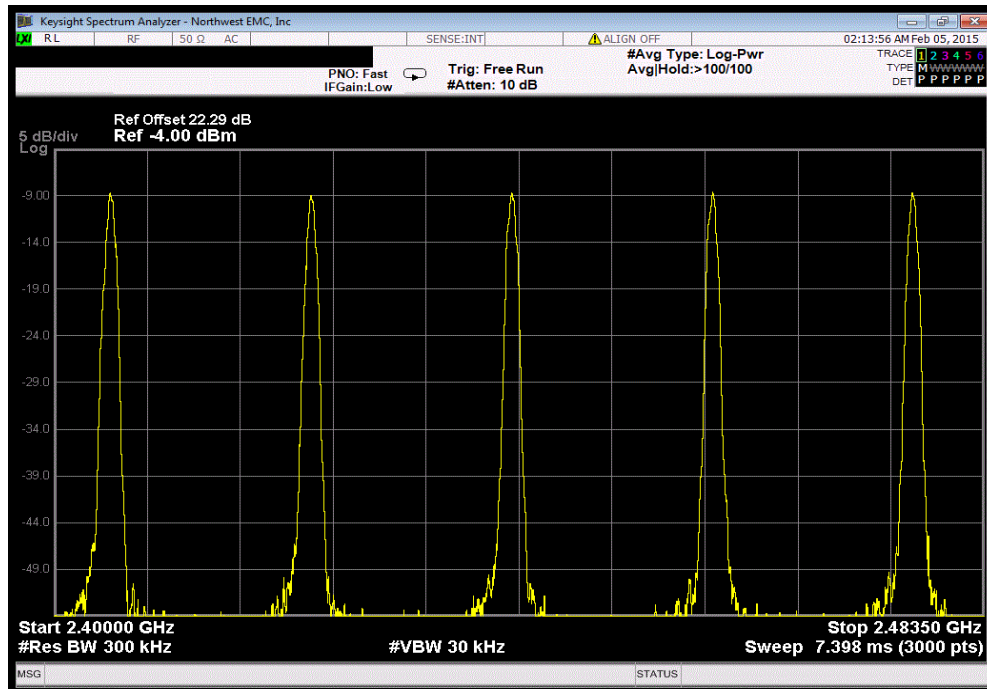
For Hybrid systems there is no minimum or maximum number of channels specified. The number of channels is measured to characterize the system and for dwell time calculations contained elsewhere in the report.

NUMBER OF HOPPING FREQUENCIES

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

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



DWELL TIME

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

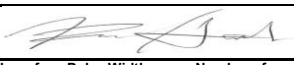
$$.399 \text{ ms} = 3 * .133 \text{ ms}$$

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

➤Average Number of Pulses is based on 4 samples.

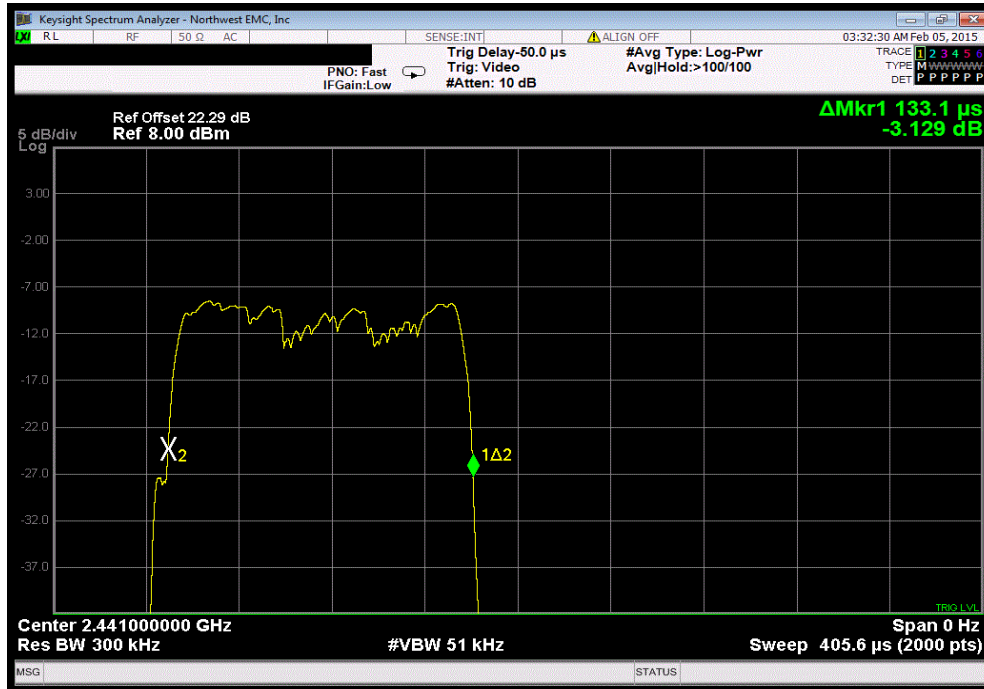
➤Scale Factor = 2 Sec / Screen Capture Sweep Time = 2 Sec / .4 Sec = 5

DWELL TIME

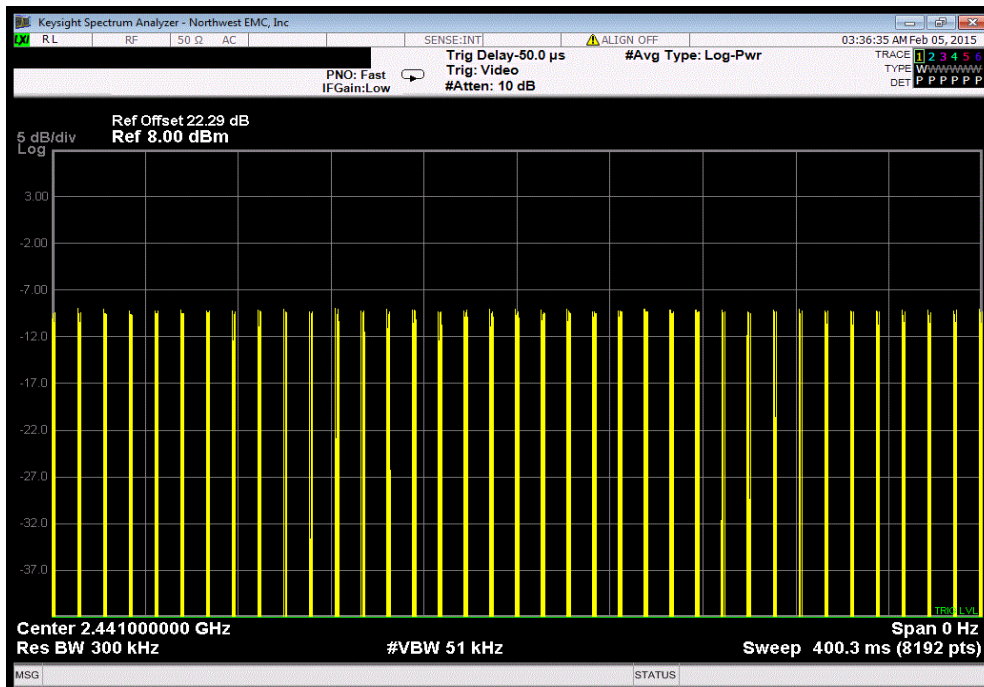
EUT: Medigenic K080/K081 Wireless USB Dongle		Work Order: ESTE0018	
Serial Number: 00002		Date: 02/02/15	
Customer: Esterline		Temperature: 24.7°C	
Attendees: Wayne Hash		Humidity: 42%	
Project: None		Barometric Pres.: 1014.2	
Tested by: Brandon Hobbs		Power: 5 VDC	Job Site: EV06
TEST SPECIFICATIONS		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 burst 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
	Mid Channel, 2441 MHz	N/A	N/A
	Mid Channel, 2441 MHz	N/A	37
	Mid Channel, 2441 MHz	N/A	N/A
	Mid Channel, 2441 MHz	N/A	37
	Mid Channel, 2441 MHz	N/A	N/A
	Mid Channel, 2441 MHz	N/A	37
	Mid Channel, 2441 MHz	N/A	0.399
			37
			5
			73.8
			400
			Pass

DWELL TIME

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

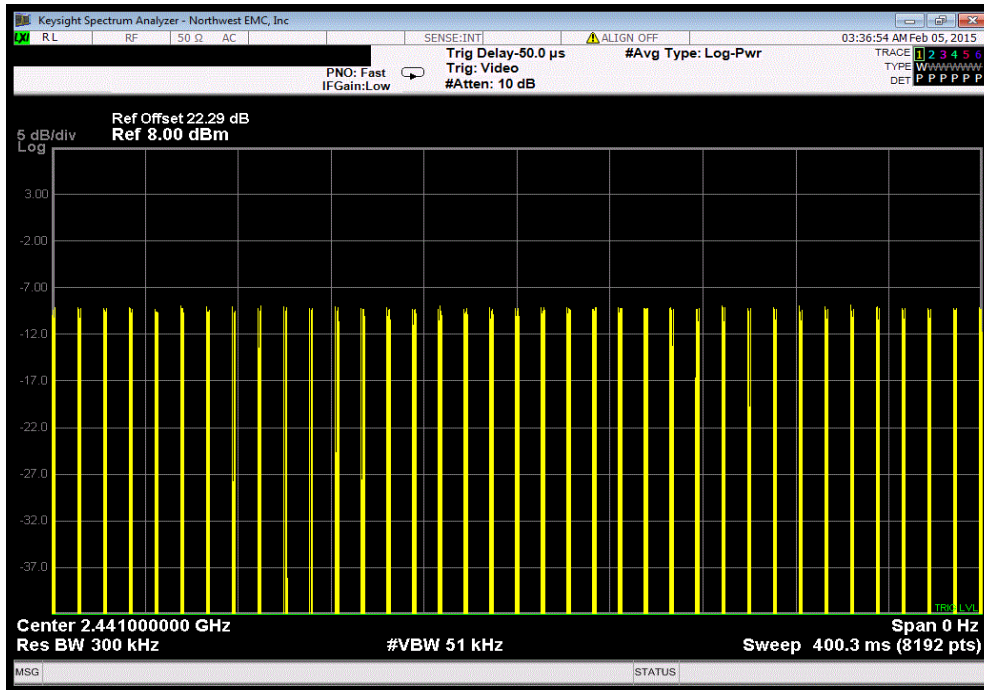


Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	N/A	37	N/A	N/A	N/A	N/A	N/A

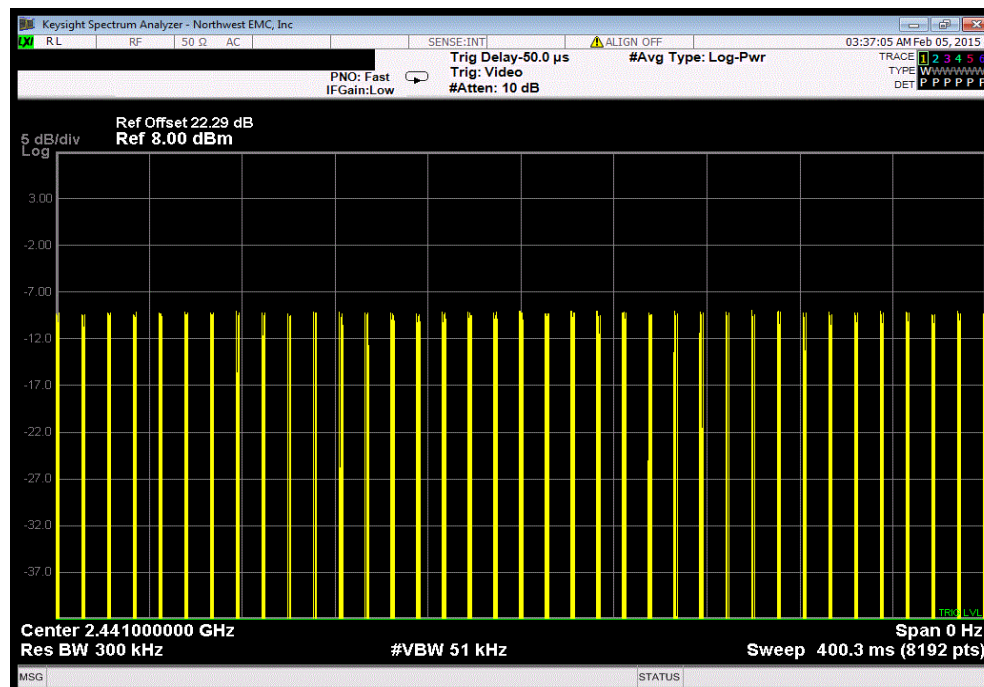


DWELL TIME

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

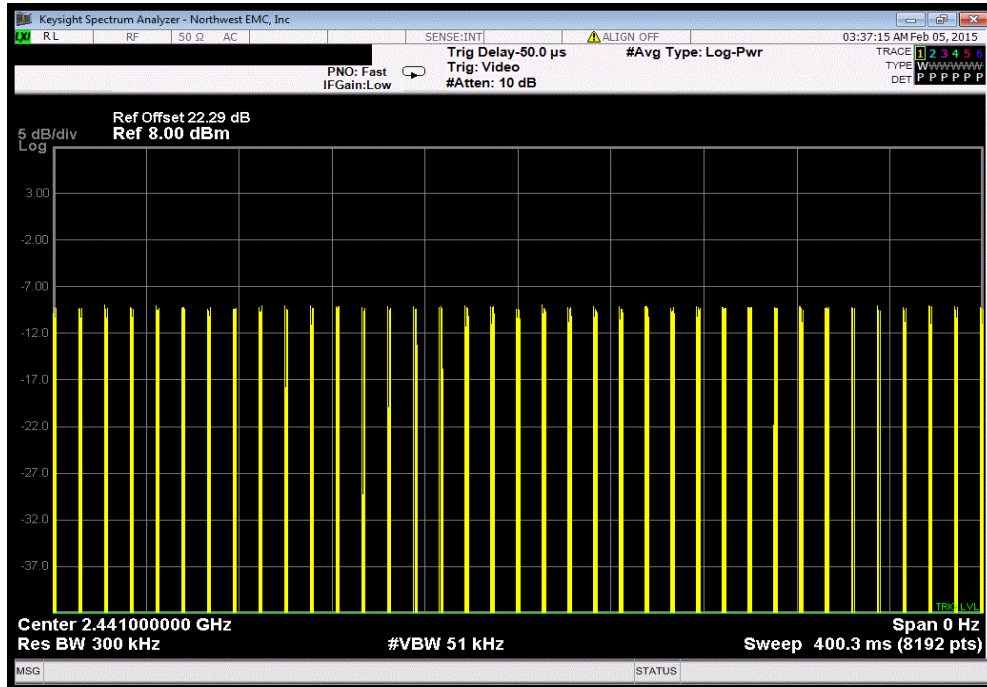


Hopping Mode, ON, DH5, GFSK, Mid Channel, 2441 MHz							
Number of Bursts	Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 2 s	Limit (ms)	Results
N/A	N/A	37	N/A	N/A	N/A	N/A	N/A

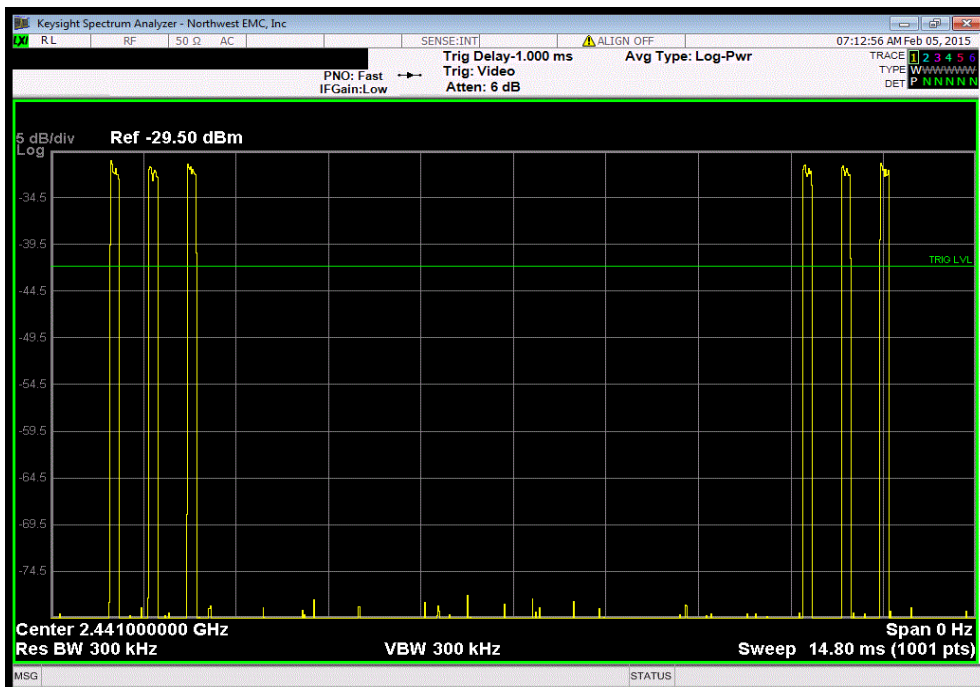


DWELL TIME

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

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.

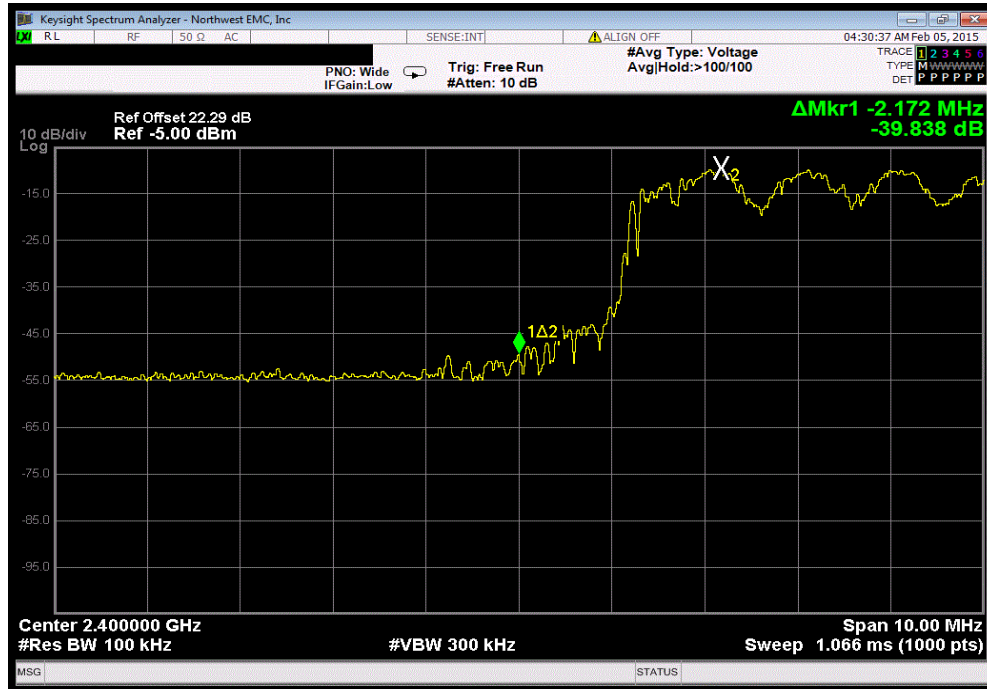
The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

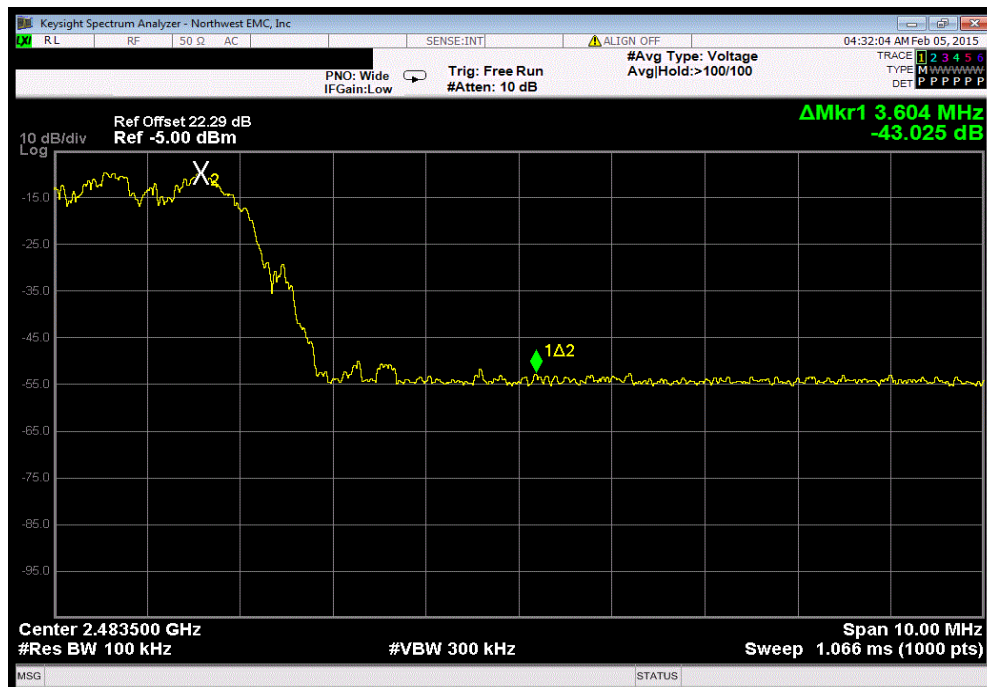
EUT: Medigenic K080/K081 Wireless USB Dongle		Work Order: ESTE0018	
Serial Number: 00002, P00001		Date: 02/05/15	
Customer: Esterline (Advanced Input Devices)		Temperature: 24.7°C	
Attendees: Wayne Hash		Humidity: 42%	
Project: None		Barometric Pres.: 1014.2	
Tested by: Brandon Hobbs	Power: 5 VDC	Job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

BAND EDGE COMPLIANCE

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

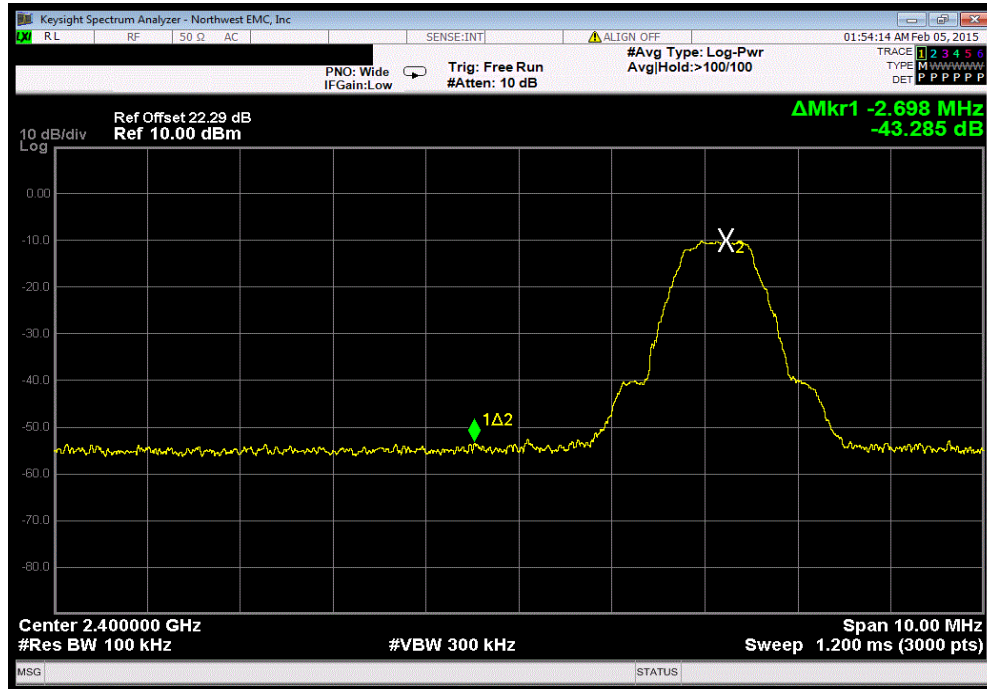


Hopping Mode, ON, DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.03	-20	Pass



BAND EDGE COMPLIANCE

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

