

Nutek Corporation

TEST REPORT FOR

**Bluetooth Interface Module
Model: 4360528**

Tested To The Following Standards:

**FCC Part 15 Subpart C Section(s)
15.207 & 15.249**

Report No.: 95998-5

Date of issue: September 30, 2014



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

TABLE OF CONTENTS

Administrative Information	3
Test Report Information	3
Report Authorization	3
Test Facility Information	4
Software Versions	4
Site Registration & Accreditation Information	4
Summary of Results	5
Modifications/Conditions During Testing	5
Equipment Under Test	6
Peripheral Devices	6
FCC Part 15 Subpart C	7
15.207 AC Conducted Emissions	7
15.249(a)(b) RF Power Output	16
15.31(e) Voltage Variations	24
15.215(c) -20dBc Occupied Bandwidth	28
15.249(d) Radiated Spurious Emissions and Band Edge	38
Supplemental Information	49
Measurement Uncertainty	49
Emissions Test Details	49

ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Nutek Corporation
No.167, Lane 235, Bauchiau Rd.,
Xindian District
New Taipei City , 231
Taiwan

Representative: Anita Lai - Nutek Corporation
Laszlo Barabas - Voxx International
Customer Reference Number: 1294785

DATE OF EQUIPMENT RECEIPT:

DATE(S) OF TESTING:

REPORT PREPARED BY:

Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 95998

August 1, 2014

August 1 – September 18, 2014

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea A	US0060	SL2-IN-E-1146R	3082D-1	90473	A-0147
Brea D	US0060	SL2-IN-E-1146R	3082D-2	100638	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C, Sections 15.207 and 15.249

Test Procedure/Method	Description	Modifications*	Results
15.207 / ANSI C63.4	Conducted Emissions	NA	Pass
15.249(a)(b)	RF Power Output	NA	Pass
15.31(e)	Voltage Variation	NA	Pass
15.215(c)	-20dBc Occupied Bandwidth	NA	Pass
15.249(d)	Radiated Spurious Emissions and Band Edge	NA	Pass

Modifications*/Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

***Modifications listed above must be incorporated into all production units.**

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Bluetooth Interface Module

Manuf: Nutek Corporation
Model: 4360528
Serial: 140800001043605280

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

DC Power Supply

Manuf: Topward
Model: 6306D
Serial: 988614

Adaptor board

Manuf: Generic
Model: NA
Serial: NA

Radio Tuner

Manuf: SiriusXM
Model: SXV200
Serial: NA

1324 USB-SPI Converter

Manuf: CSR plc
Model: 186196
Serial: NA

Remote Dongle

Manuf: Nutek Corporation
Model: NA
Serial: NA

Laptop

Manuf: Gateway
Model: TA7
Serial: 1101257267

Laptop Power Supply

Manuf: Gateway
Model: ADP-90SB BB
Serial: 84W0821021482

Radio Tuner Antenna

Manuf: SiriusXM
Model: XVANT1
Serial: 1032

50uH LISN

Manuf: Emco
Model: 3816/2nm
Serial: 1102

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) CFR 47 Section 15 Subpart C requirements for Intentional Radiators.

15.207 AC Conducted Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	Nutek Corporation	Date:	9/17/2014
Specification:	15.207 AC Mains - Average	Time:	10:45:34
Work Order #:	95998	Sequence#:	1
Test Type:	Conducted Emissions	Tested By:	Don Nguyen
Equipment:	Bluetooth interface module		120V 60Hz
Manufacturer:	Nutek Corporation		
Model:	4360528		
S/N:	140800001043605280		

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T2	ANP01910	Cable	RG-142	1/8/2014	1/8/2016
T3	AN00847.1	50uH LISN-Line 1 (dB)	3816/2NM	6/26/2014	6/26/2015
	AN00847.1	50uH LISN-Line 2 (dB)	3816/2NM	6/26/2014	6/26/2015
T4	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
50uH LISN	Emco	3816/2nm	1102
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Software BlueTest3 is running on support laptop to control the EUT.

Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.

The EUT obtains DC 12 V from support DC power supply.

Support laptop is connected to 2nd LISN.

The support laptop runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:
 GFSK (packet: DH5, packet type: 15, packet size: 339)
 pi/4-DQPSK (packet: 2-DH5, packet type: 30, packet size: 679)
 8-DPSK (packet: 3-DH5, packet type: 31, packet size: 1031)
 Transmit packet: TXData1
 Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz
 TX freq: 2402MHz, 2441MHz, 2480MHz

Frequency range of measurement = 150kHz-30MHz
 RBW=9kHz,VBW=9kHz.

Recorded data represent worse case emission based on Fundamental emission level.

Temperature: 28°C, Relative Humidity: 49%, Atmospheric Pressure: 100.1kPa
 Site D

Ext Attn: 0 dB

Measurement Data:

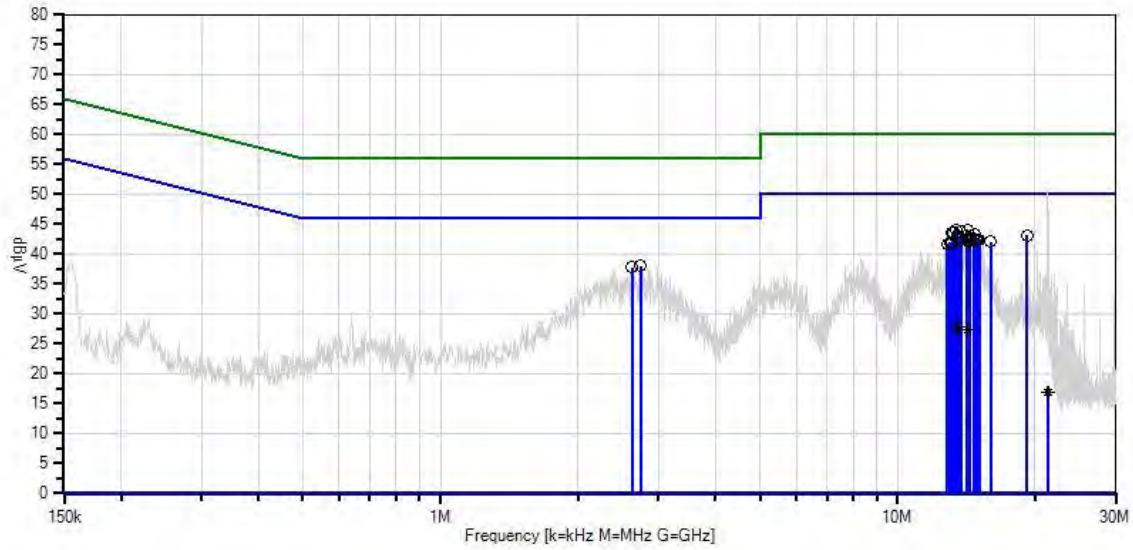
Reading listed by margin.

Test Lead: L1(L)

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.427M	37.6	+5.8	+0.3	+0.1	+0.2	+0.0	44.0	50.0	-6.0	L1(L)
2	14.211M	37.6	+5.8	+0.3	+0.1	+0.2	+0.0	44.0	50.0	-6.0	L1(L)
3	13.743M	37.4	+5.8	+0.3	+0.1	+0.2	+0.0	43.8	50.0	-6.2	L1(L)
4	13.256M	37.2	+5.8	+0.3	+0.1	+0.2	+0.0	43.6	50.0	-6.4	L1(L)
5	13.157M	37.1	+5.8	+0.3	+0.1	+0.2	+0.0	43.5	50.0	-6.5	L1(L)
6	14.761M	36.9	+5.8	+0.3	+0.1	+0.2	+0.0	43.3	50.0	-6.7	L1(L)
7	13.535M	36.8	+5.8	+0.3	+0.1	+0.2	+0.0	43.2	50.0	-6.8	L1(L)
8	14.139M	36.8	+5.8	+0.3	+0.1	+0.2	+0.0	43.2	50.0	-6.8	L1(L)
9	19.229M	36.6	+5.8	+0.4	+0.2	+0.2	+0.0	43.2	50.0	-6.8	L1(L)
10	13.634M	36.3	+5.8	+0.3	+0.1	+0.2	+0.0	42.7	50.0	-7.3	L1(L)

11	14.427M	36.3	+5.8	+0.3	+0.1	+0.2	+0.0	42.7	50.0	-7.3	L1(L)
12	14.661M	36.3	+5.8	+0.3	+0.1	+0.2	+0.0	42.7	50.0	-7.3	L1(L)
13	13.706M	36.1	+5.8	+0.3	+0.1	+0.2	+0.0	42.5	50.0	-7.5	L1(L)
14	14.337M	36.0	+5.8	+0.3	+0.1	+0.2	+0.0	42.4	50.0	-7.6	L1(L)
15	14.986M	36.0	+5.8	+0.3	+0.1	+0.2	+0.0	42.4	50.0	-7.6	L1(L)
16	15.121M	36.0	+5.8	+0.3	+0.1	+0.2	+0.0	42.4	50.0	-7.6	L1(L)
17	14.851M	35.9	+5.8	+0.3	+0.1	+0.2	+0.0	42.3	50.0	-7.7	L1(L)
18	14.301M	35.8	+5.8	+0.3	+0.1	+0.2	+0.0	42.2	50.0	-7.8	L1(L)
19	16.013M	35.7	+5.8	+0.3	+0.1	+0.2	+0.0	42.1	50.0	-7.9	L1(L)
20	2.740M	32.0	+5.7	+0.1	+0.0	+0.2	+0.0	38.0	46.0	-8.0	L1(L)
21	13.058M	35.6	+5.8	+0.3	+0.1	+0.2	+0.0	42.0	50.0	-8.0	L1(L)
22	13.112M	35.5	+5.8	+0.3	+0.1	+0.2	+0.0	41.9	50.0	-8.1	L1(L)
23	2.625M	31.8	+5.7	+0.1	+0.0	+0.2	+0.0	37.8	46.0	-8.2	L1(L)
24	13.184M	35.4	+5.8	+0.3	+0.1	+0.2	+0.0	41.8	50.0	-8.2	L1(L)
25	12.869M	35.3	+5.8	+0.3	+0.1	+0.2	+0.0	41.7	50.0	-8.3	L1(L)
26	13.580M Ave	21.4	+5.8	+0.3	+0.1	+0.2	+0.0	27.8	50.0	-22.2	L1(L)
^	13.580M	38.3	+5.8	+0.3	+0.1	+0.2	+0.0	44.7	50.0	-5.3	L1(L)
28	13.499M Ave	21.0	+5.8	+0.3	+0.1	+0.2	+0.0	27.4	50.0	-22.6	L1(L)
^	13.499M	39.0	+5.8	+0.3	+0.1	+0.2	+0.0	45.4	50.0	-4.6	L1(L)
30	14.283M Ave	20.9	+5.8	+0.3	+0.1	+0.2	+0.0	27.3	50.0	-22.7	L1(L)
^	14.283M	38.1	+5.8	+0.3	+0.1	+0.2	+0.0	44.5	50.0	-5.5	L1(L)
32	21.346M Ave	10.3	+5.8	+0.4	+0.2	+0.2	+0.0	16.9	50.0	-33.1	L1(L)
^	21.346M	40.7	+5.8	+0.4	+0.2	+0.2	+0.0	47.3	50.0	-2.7	L1(L)
34	21.301M Ave	10.3	+5.8	+0.4	+0.2	+0.2	+0.0	16.9	50.0	-33.1	L1(L)
^	21.301M	44.1	+5.8	+0.4	+0.2	+0.2	+0.0	50.7	50.0	+0.7	L1(L)

CKC Laboratories, Inc Date: 9/17/2014 Time: 10:45:34 Nutek Corporation WO#: 95998
 15.207 AC Mains - Average Test Lead: L1(L) 120V 60Hz Sequence#: 1 Ext ATTN: 0 dB



- | | |
|---------------------------------|------------------------------------|
| — Sweep Data | — Readings |
| ○ Peak Readings | × QP Readings |
| * Average Readings | ▼ Ambient |
| — 1 - 15.207 AC Mains - Average | — 2 - 15.207 AC Mains - Quasi-peak |

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Nutek Corporation**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **95998**
 Test Type: **Conducted Emissions**
 Equipment: **Bluetooth interface module**
 Manufacturer: Nutek Corporation
 Model: 4360528
 S/N: 140800001043605280

Date: 9/17/2014
 Time: 10:51:09 AM
 Sequence#: 2
 Tested By: Don Nguyen
 120V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T2	ANP01910	Cable	RG-142	1/8/2014	1/8/2016
	AN00847.1	50uH LISN-Line 1 (dB)	3816/2NM	6/26/2014	6/26/2015
T3	AN00847.1	50uH LISN-Line 2 (dB)	3816/2NM	6/26/2014	6/26/2015
T4	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
50uH LISN	Emco	3816/2nm	1102
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Software BlueTest3 is running on support laptop to control the EUT.
 Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.
 The EUT obtains DC 12 V from support DC power supply.
 Support laptop is connected to 2nd LISN.
 The support laptop runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:
 GFSK (packet: DH5, packet type: 15, packet size: 339)
 pi/4-DQPSK (packet: 2-DH5, packet type: 30, packet size: 679)
 8-DPSK (packet: 3-DH5, packet type: 31, packet size: 1031)
 Transmit packet: TXData1
 Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz
 TX freq: 2402MHz, 2441MHz, 2480MHz

Frequency range of measurement = 150kHz-30MHz
 RBW=9kHz, VBW=9kHz.

Recorded data represent worse case emission based on Fundamental emission level.

Temperature: 28°C, Relative Humidity: 49%, Atmospheric Pressure: 100.1kPa
 Site D

Ext Attn: 0 dB

Measurement Data:

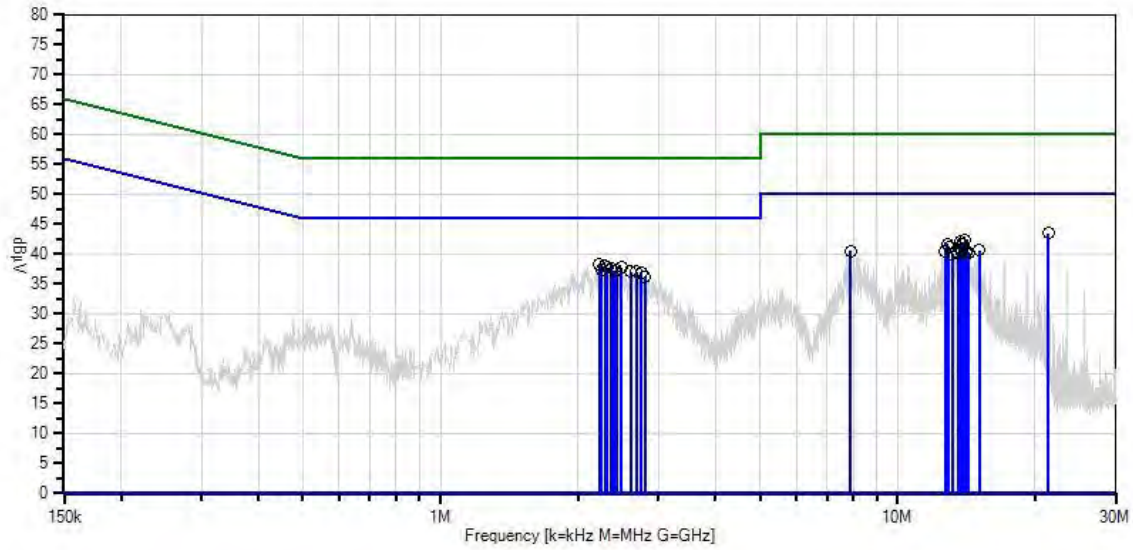
Reading listed by margin.

Test Lead: L2(N)

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	21.364M	36.8	+5.8	+0.4	+0.3	+0.2	+0.0	43.5	50.0	-6.5	L2(N)
2	2.225M	32.4	+5.7	+0.1	+0.0	+0.2	+0.0	38.4	46.0	-7.6	L2(N)
3	14.049M	35.9	+5.8	+0.3	+0.2	+0.2	+0.0	42.4	50.0	-7.6	L2(N)
4	2.293M	32.1	+5.7	+0.1	+0.0	+0.2	+0.0	38.1	46.0	-7.9	L2(N)
5	13.770M	35.6	+5.8	+0.3	+0.2	+0.2	+0.0	42.1	50.0	-7.9	L2(N)
6	2.319M	31.8	+5.7	+0.1	+0.0	+0.2	+0.0	37.8	46.0	-8.2	L2(N)
7	2.485M	31.8	+5.7	+0.1	+0.0	+0.2	+0.0	37.8	46.0	-8.2	L2(N)
8	2.366M	31.7	+5.7	+0.1	+0.0	+0.2	+0.0	37.7	46.0	-8.3	L2(N)
9	12.869M	35.2	+5.8	+0.3	+0.2	+0.2	+0.0	41.7	50.0	-8.3	L2(N)
10	13.914M	35.2	+5.8	+0.3	+0.2	+0.2	+0.0	41.7	50.0	-8.3	L2(N)

11	13.797M	35.1	+5.8	+0.3	+0.2	+0.2	+0.0	41.6	50.0	-8.4	L2(N)
12	2.429M	31.4	+5.7	+0.1	+0.0	+0.2	+0.0	37.4	46.0	-8.6	L2(N)
13	2.251M	31.3	+5.7	+0.1	+0.0	+0.2	+0.0	37.3	46.0	-8.7	L2(N)
14	2.404M	31.2	+5.7	+0.1	+0.0	+0.2	+0.0	37.2	46.0	-8.8	L2(N)
15	12.959M	34.7	+5.8	+0.3	+0.2	+0.2	+0.0	41.2	50.0	-8.8	L2(N)
16	2.604M	31.1	+5.7	+0.1	+0.0	+0.2	+0.0	37.1	46.0	-8.9	L2(N)
17	2.685M	31.1	+5.7	+0.1	+0.0	+0.2	+0.0	37.1	46.0	-8.9	L2(N)
18	13.661M	34.6	+5.8	+0.3	+0.2	+0.2	+0.0	41.1	50.0	-8.9	L2(N)
19	2.753M	30.9	+5.7	+0.1	+0.0	+0.2	+0.0	36.9	46.0	-9.1	L2(N)
20	13.752M	34.3	+5.8	+0.3	+0.2	+0.2	+0.0	40.8	50.0	-9.2	L2(N)
21	13.851M	34.3	+5.8	+0.3	+0.2	+0.2	+0.0	40.8	50.0	-9.2	L2(N)
22	15.094M	34.1	+5.8	+0.3	+0.2	+0.2	+0.0	40.6	50.0	-9.4	L2(N)
23	7.887M	34.2	+5.8	+0.2	+0.1	+0.2	+0.0	40.5	50.0	-9.5	L2(N)
24	12.706M	33.9	+5.8	+0.3	+0.2	+0.2	+0.0	40.4	50.0	-9.6	L2(N)
25	14.085M	33.9	+5.8	+0.3	+0.2	+0.2	+0.0	40.4	50.0	-9.6	L2(N)
26	2.804M	30.3	+5.7	+0.1	+0.0	+0.2	+0.0	36.3	46.0	-9.7	L2(N)
27	14.301M	33.8	+5.8	+0.3	+0.2	+0.2	+0.0	40.3	50.0	-9.7	L2(N)
28	13.580M	33.7	+5.8	+0.3	+0.2	+0.2	+0.0	40.2	50.0	-9.8	L2(N)
29	14.148M	33.7	+5.8	+0.3	+0.2	+0.2	+0.0	40.2	50.0	-9.8	L2(N)
30	13.184M	33.6	+5.8	+0.3	+0.2	+0.2	+0.0	40.1	50.0	-9.9	L2(N)

CKC Laboratories, Inc Date: 9/17/2014 Time: 10:51:09 AM Nutek Corporation WO#: 95998
15.207 AC Mains - Average Test Lead: L2(N) 120V 60Hz Sequence#: 2 Ext ATTN: 0 dB



— Sweep Data
○ Peak Readings
* Average Readings
— Readings
× QP Readings
▼ Ambient
— 1 - 15.207 AC Mains - Average
— 2 - 15.207 AC Mains - Quasi-peak

Test Setup Photos



15.249(a)(b) RF Power Output

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Nutek Corporation**
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
 Work Order #: **95998** Date: 9/17/2014
 Test Type: **Maximized Emissions** Time: 14:10:57
 Equipment: **Bluetooth interface module** Sequence#: 0
 Manufacturer: Nutek Corporation Tested By: Don Nguyen
 Model: 4360528
 S/N: 140800001043605280

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T2	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T3	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T4	ANP06360	Cable	L1-PNMMN-48	7/29/2014	7/29/2016
T5	ANP06544	Cable	32026-29094K- 29094K-36TC	11/20/2013	11/20/2015
T6	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Support laptop is placed underneath the platform. Software BlueTest3 is running on support laptop to control the EUT. Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.

The EUT obtains DC 12 V from support DC power supply placed underneath the platform.

The tablet runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:
 GFSK (packet: DH5, packet type: 15, packet size: 339)
 pi/4-DQPSK (packet: 2-DH5, packet type: 30, packet size: 679)
 8-DPSK (packet: 3-DH5, packet type: 31, packet size: 1031)
 Transmit packet: TXData1
 Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz
 TX freq: 2402MHz, 2441MHz, 2480MHz

Frequency range of measurement = 2400-2483.5MHz
 RBW=1 MHz, VBW=1 MHz.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission based on Fundamental emission level.

Temperature: 28°C, Relative Humidity: 49%, Atmospheric Pressure: 100.1kPa
 Site D

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 T6 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	2402.000M	92.4	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	88.4	94.0 low CH, GFSK, Z axis	-5.6	Vert
2	2480.000M	91.3	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	87.7	94.0 hi CH, GFSK, Z axis	-6.3	Vert
3	2441.000M	91.4	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	87.6	94.0 mid CH, 8-DPSK, Z axis	-6.4	Vert
4	2441.000M	91.4	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	87.6	94.0 mid CH, pi/4- DQPSK, Z axis	-6.4	Vert
5	2441.000M	91.3	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	87.5	94.0 mid CH, GFSK, Y axis	-6.5	Vert
6	2441.000M	91.2	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	87.4	94.0 mid CH, GFSK, Z axis	-6.6	Vert

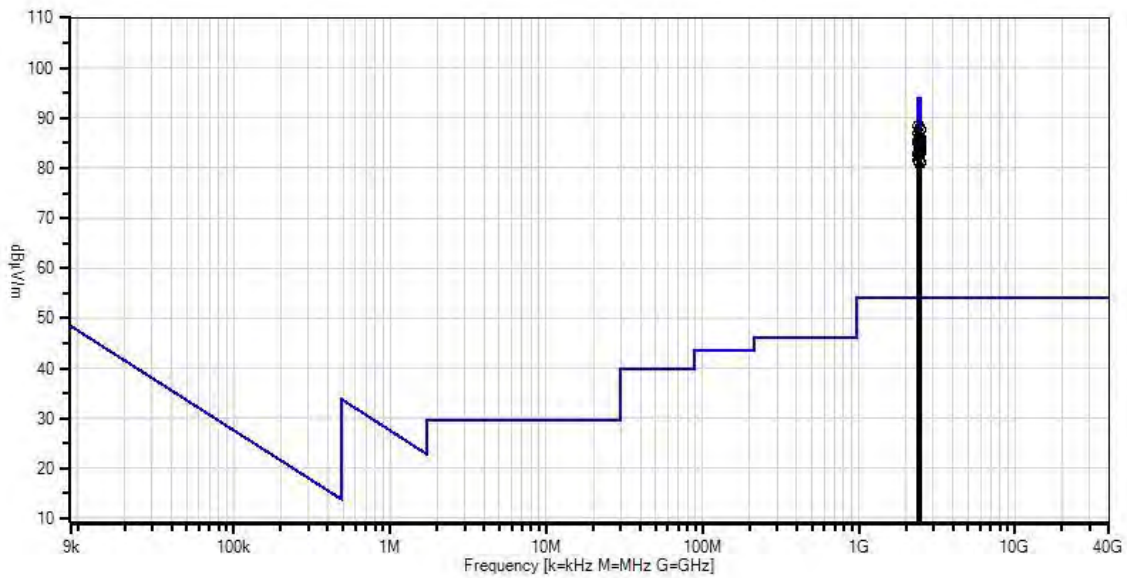
7	2402.000M	91.0	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	87.0	94.0	-7.0	Vert
									low CH, GFSK, Y axis		
8	2402.000M	90.9	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	86.9	94.0	-7.1	Vert
									low CH, 8-DPSK, Z axis		
9	2402.000M	90.9	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	86.9	94.0	-7.1	Vert
									low CH, pi/4-DQPSK, Z axis		
10	2402.000M Ave	90.8	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	86.8	94.0	-7.2	Horiz
									low CH, GFSK, Y axis		
11	2480.000M Ave	90.0	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	86.4	94.0	-7.6	Horiz
									hi CH, GFSK, Y axis		
^	2480.000M	92.7	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	89.1	94.0	-4.9	Horiz
									hi CH, GFSK, Y axis		
^	2480.000M	91.2	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	87.6	94.0	-6.4	Horiz
									hi CH, 8-DPSK, Y axis		
^	2480.000M	91.2	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	87.6	94.0	-6.4	Horiz
									hi CH, pi/4-DQPSK, Y axis		
^	2480.000M	90.6	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	87.0	94.0	-7.0	Horiz
									hi CH, GFSK, X axis		
^	2480.000M	89.5	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	85.9	94.0	-8.1	Horiz
									hi CH, pi/4-DQPSK, X axis		
^	2480.000M	89.3	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	85.7	94.0	-8.3	Horiz
									hi CH, 8-DPSK, X axis		
^	2480.000M	89.0	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	85.4	94.0	-8.6	Horiz
									hi CH, GFSK, Z axis		
^	2480.000M	87.3	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	83.7	94.0	-10.3	Horiz
									hi CH, pi/4-DQPSK, Z axis		
^	2480.000M	87.3	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	83.7	94.0	-10.3	Horiz
									hi CH, 8-DPSK, Z axis		
21	2480.000M	89.6	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	86.0	94.0	-8.0	Vert
									hi CH, pi/4-DQPSK, Z axis		
22	2480.000M	89.6	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	86.0	94.0	-8.0	Vert
									hi CH, 8-DPSK, Z axis		
23	2441.000M Ave	89.7	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	85.9	94.0	-8.1	Horiz
									mid CH, GFSK, Y axis		

^	2441.000M	92.5	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	88.7	94.0	-5.3	Horiz
									mid CH, GFSK, X axis		
^	2441.000M	92.4	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	88.6	94.0	-5.4	Horiz
									mid CH, GFSK, Y axis		
^	2441.000M	91.2	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	87.4	94.0	-6.6	Horiz
									mid CH, pi/4- DQPSK, X axis		
^	2441.000M	91.1	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	87.3	94.0	-6.7	Horiz
									mid CH, 8-DPSK, X axis		
^	2441.000M	90.7	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	86.9	94.0	-7.1	Horiz
									mid CH, 8-DPSK, Y axis		
^	2441.000M	90.6	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	86.8	94.0	-7.2	Horiz
									mid CH, pi/4- DQPSK, Y axis		
^	2441.000M	90.6	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	86.8	94.0	-7.2	Horiz
									mid CH, GFSK, Z axis		
^	2441.000M	89.3	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	85.5	94.0	-8.5	Horiz
									mid CH, pi/4- DQPSK, Z axis		
^	2441.000M	89.0	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	85.2	94.0	-8.8	Horiz
									mid CH, 8-DPSK, Z axis		
33	2441.000M	89.6	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	85.8	94.0	-8.2	Vert
									mid CH, 8-DPSK, Y axis		
34	2441.000M	89.5	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	85.7	94.0	-8.3	Vert
									mid CH, pi/4- DQPSK, Y axis		
35	2480.000M	89.1	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	85.5	94.0	-8.5	Vert
									hi CH, GFSK, Y axis		
36	2402.000M	89.4	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	85.4	94.0	-8.6	Vert
									low CH, 8-DPSK, Y axis		
37	2441.000M	88.9	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	85.1	94.0	-8.9	Vert
									mid CH, GFSK, X axis		
38	2402.000M	88.9	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	84.9	94.0	-9.1	Vert
									low CH, pi/4- DQPSK, Y axis		
39	2480.000M	87.7	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	84.1	94.0	-9.9	Vert
									hi CH, 8-DPSK, Y axis		
40	2441.000M	87.4	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	83.6	94.0	-10.4	Vert
									mid CH, pi/4- DQPSK, X axis		

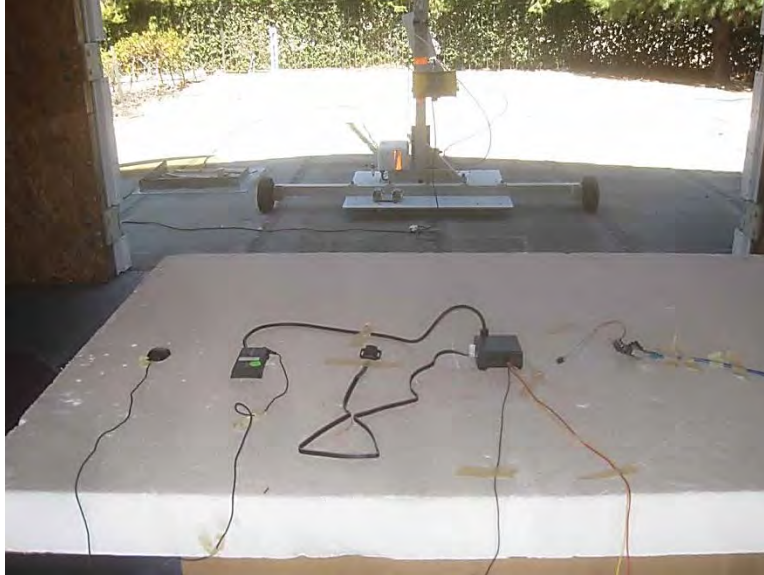
41	2480.000M	87.0	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	83.4	94.0	-10.6	Vert
									hi CH, pi/4- DQPSK, Y axis		
42	2441.000M	87.2	-39.7 +0.7	+25.4 +0.0	+6.5	+3.3	+0.0	83.4	94.0	-10.6	Vert
									mid CH, 8-DPSK, X axis		
43	2402.000M Ave	87.2	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	83.2	94.0	-10.8	Horiz
									low CH, pi/4- DQPSK, Y axis		
44	2480.000M	86.7	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	83.1	94.0	-10.9	Vert
									hi CH, GFSK, X axis		
45	2402.000M Ave	87.1	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	83.1	94.0	-10.9	Horiz
									low CH, 8-DPSK, Y axis		
^	2402.000M	93.5	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	89.5	94.0	-4.5	Horiz
									low CH, GFSK, Y axis		
^	2402.000M	92.1	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	88.1	94.0	-5.9	Horiz
									low CH, pi/4- DQPSK, Y axis		
^	2402.000M	91.9	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	87.9	94.0	-6.1	Horiz
									low CH, 8-DPSK, Y axis		
^	2402.000M	90.6	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	86.6	94.0	-7.4	Horiz
									low CH, GFSK, X axis		
^	2402.000M	89.5	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	85.5	94.0	-8.5	Horiz
									low CH, GFSK, Z axis		
^	2402.000M	89.3	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	85.3	94.0	-8.7	Horiz
									low CH, pi/4- DQPSK, X axis		
^	2402.000M	89.3	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	85.3	94.0	-8.7	Horiz
									low CH, 8-DPSK, X axis		
^	2402.000M	88.1	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	84.1	94.0	-9.9	Horiz
									low CH, 8-DPSK, Z axis		
^	2402.000M	88.1	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	84.1	94.0	-9.9	Horiz
									low CH, pi/4- DQPSK, Z axis		
55	2402.000M	86.8	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	82.8	94.0	-11.2	Vert
									mid CH, 8-DPSK, Z axis		

56	2402.000M	85.5	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	81.5	94.0	-12.5	Vert
									low CH, pi/4- DQPSK, X axis		
57	2402.000M	85.5	-39.7 +0.6	+25.4 +0.0	+6.5	+3.2	+0.0	81.5	94.0	-12.5	Vert
									low CH, 8-DPSK, X axis		
58	2480.000M	85.0	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	81.4	94.0	-12.6	Vert
									hi CH, 8-DPSK, X axis		
59	2480.000M	84.7	-39.7 +0.7	+25.5 +0.0	+6.5	+3.4	+0.0	81.1	94.0	-12.9	Vert
									hi CH, pi/4- DQPSK, X axis		

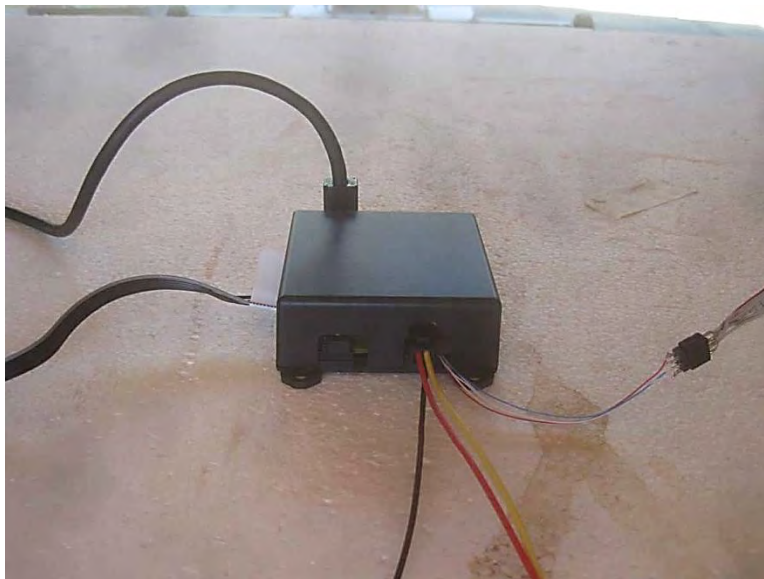
CKC Laboratories, Inc Date: 9/17/2014 Time: 14:10:57 Nutek Corporation WO#: 95998
 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Sequence#: 0 Ext
 ATTN: 0 dB



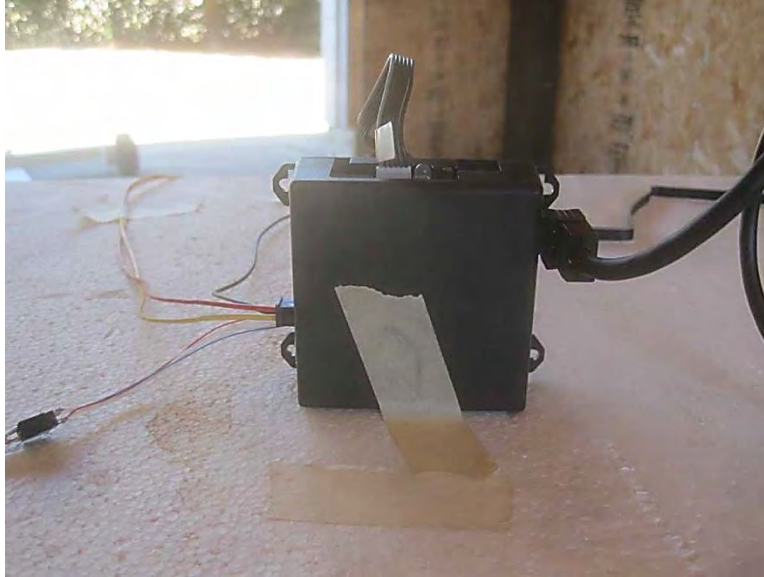
Test Setup Photos



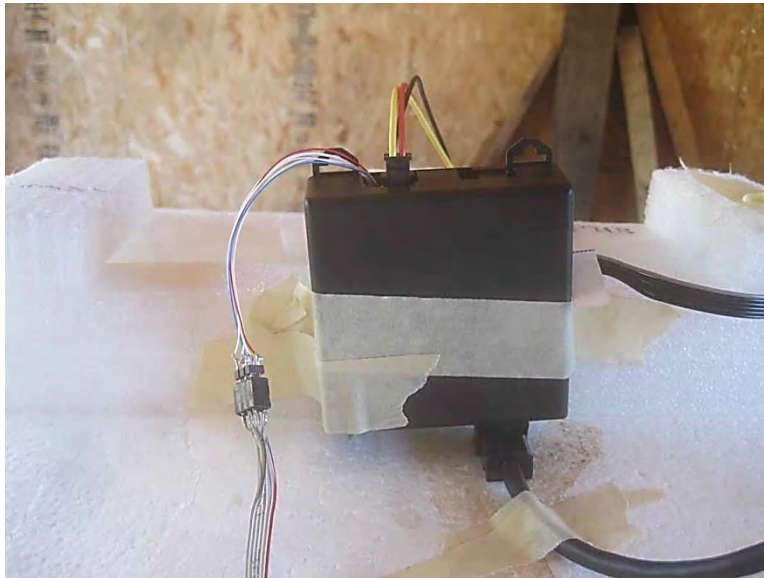
Test Setup



X-Axis



Y-Axis



Z-Axis

15.31(e) Voltage Variations

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Nutek Corporation**

Specification: **15.31e**

Work Order #: **95998**

Date: 9/17/2014

Test Type: **Maximized Emissions**

Time: 14:10:57

Equipment: **Bluetooth interface module**

Sequence#: 0

Manufacturer: Nutek Corporation

Tested By: Don Nguyen

Model: 4360528

S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T2	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T3	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T4	ANP06360	Cable	L1-PNMMN-48	7/29/2014	7/29/2016
T5	ANP06544	Cable	32026-29094K- 29094K-36TC	11/20/2013	11/20/2015
T6	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Support laptop is placed underneath the platform. Software BlueTest3 is running on support laptop to control the EUT. Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.

The EUT obtains DC 12 V from support DC power supply placed underneath the platform.

The tablet runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:

GFSK (packet: DH5, packet type: 15, packet size: 339)

pi/4-DQPSK (packet: 2-DH5, packet type: 30, packet size: 679)

8-DPSK (packet: 3-DH5, packet type: 31, packet size: 1031)

Transmit packet: TXData1

Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz

TX freq: 2402MHz, 2441MHz, 2480MHz

Frequency range of measurement = 2400-2483.5MHz

RBW=1 MHz,VBW=1 MHz.

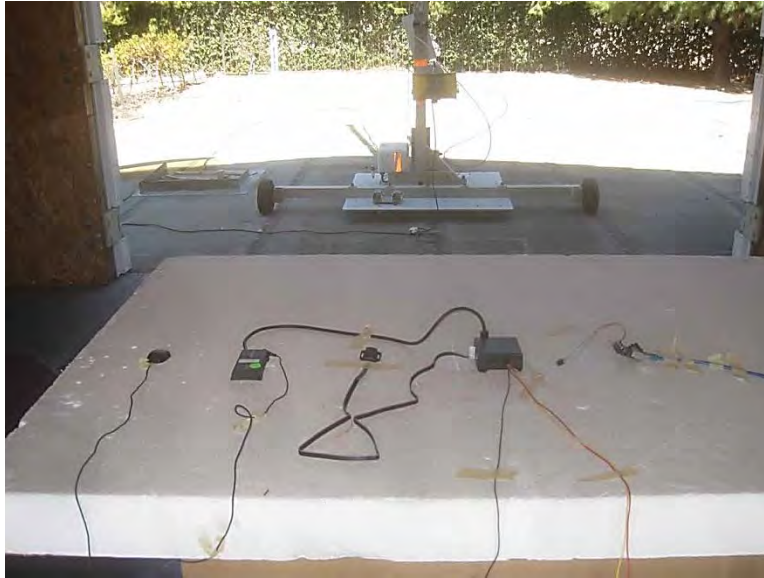
Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission based on Fundamental emission level.

Temperature: 28°C, Relative Humidity: 49%, Atmospheric Pressure: 100.1kPa

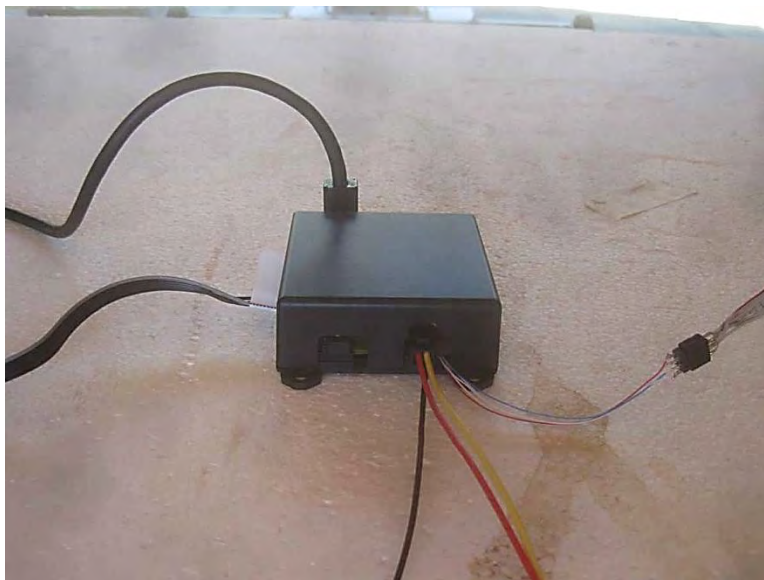
Site D

15.31(e) compliance: the supply voltage was varied between 85% and 115% of the nominal rated supply voltage, no change in the fundamental signal level was observed.

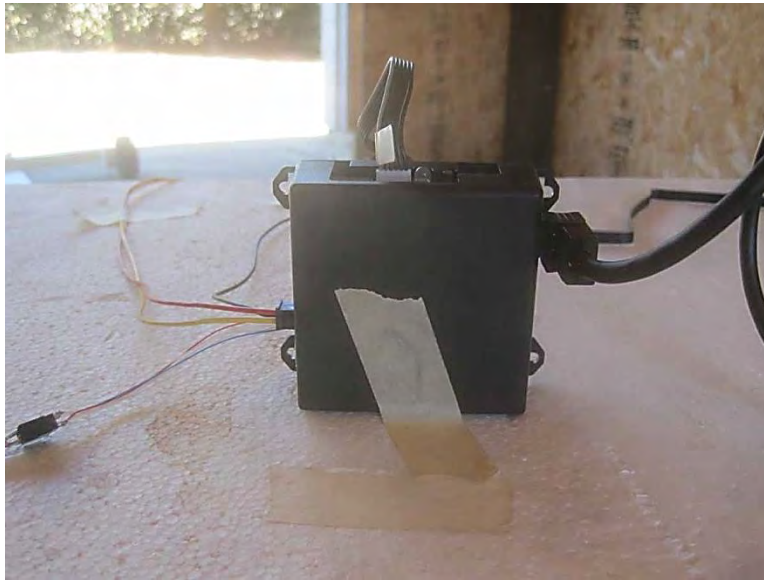
Test Setup Photos



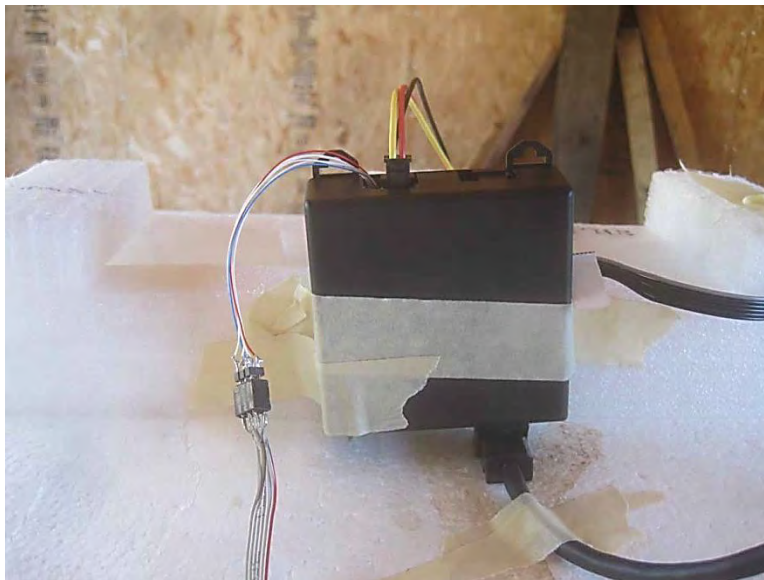
Test Setup



X-Axis



Y-Axis



Z-Axis

15.215(c) -20dBc Occupied Bandwidth

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Nutek Corporation**
 Specification: **-20dBc Occupied Bandwidth**
 Work Order #: **95998** Date: 9/17/2014
 Test Type: **Maximized Emissions** Time: 14:10:57
 Equipment: **Bluetooth interface module** Sequence#: 0
 Manufacturer: Nutek Corporation Tested By: Don Nguyen
 Model: 4360528
 S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T2	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T3	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T4	ANP06360	Cable	L1-PNMMN-48	7/29/2014	7/29/2016
T5	ANP06544	Cable	32026-29094K- 29094K-36TC	11/20/2013	11/20/2015
T6	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Support laptop is placed underneath the platform. Software BlueTest3 is running on support laptop to control the EUT. Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.

The EUT obtains DC 12 V from support DC power supply placed underneath the platform.

The tablet runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:
 GFSK (packet: DH5, packet type: 15, packet size: 339)
 pi/4-DQPSK (packet: 2-DH5, packet type: 30, packet size: 679)
 8-DPSK (packet: 3-DH5, packet type: 31, packet size: 1031)
 Transmit packet: TXData1
 Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz
 TX freq: 2402MHz, 2441MHz, 2480MHz

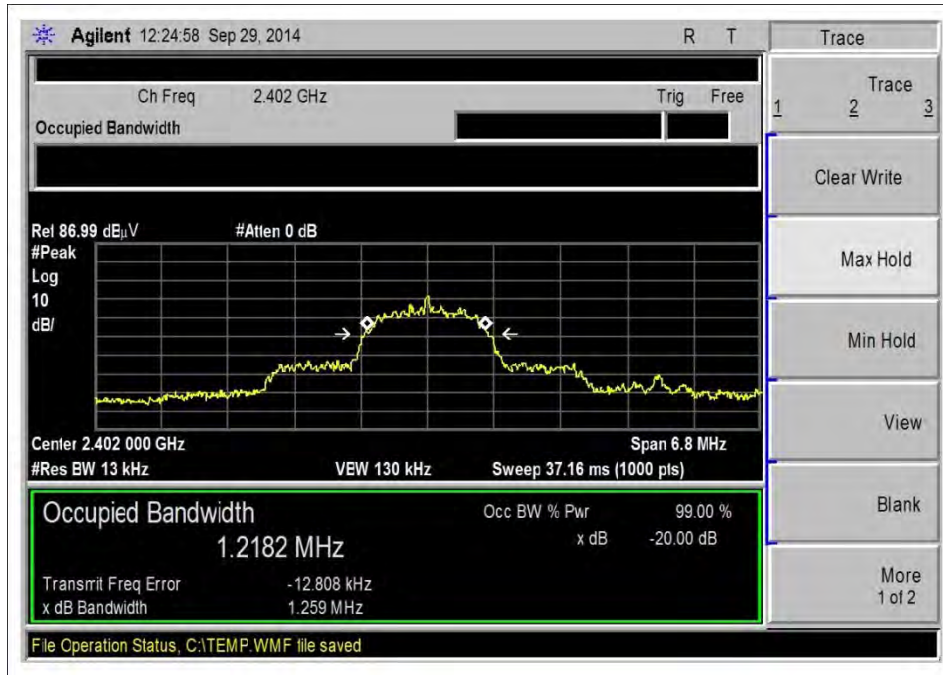
Frequency range of measurement = 2400-2483.5MHz
 RBW=1 MHz, VBW=1 MHz.

Emission profile of the EUT rotated along three orthogonal axis was investigated. Recorded data represent worse case emission based on Fundamental emission level.

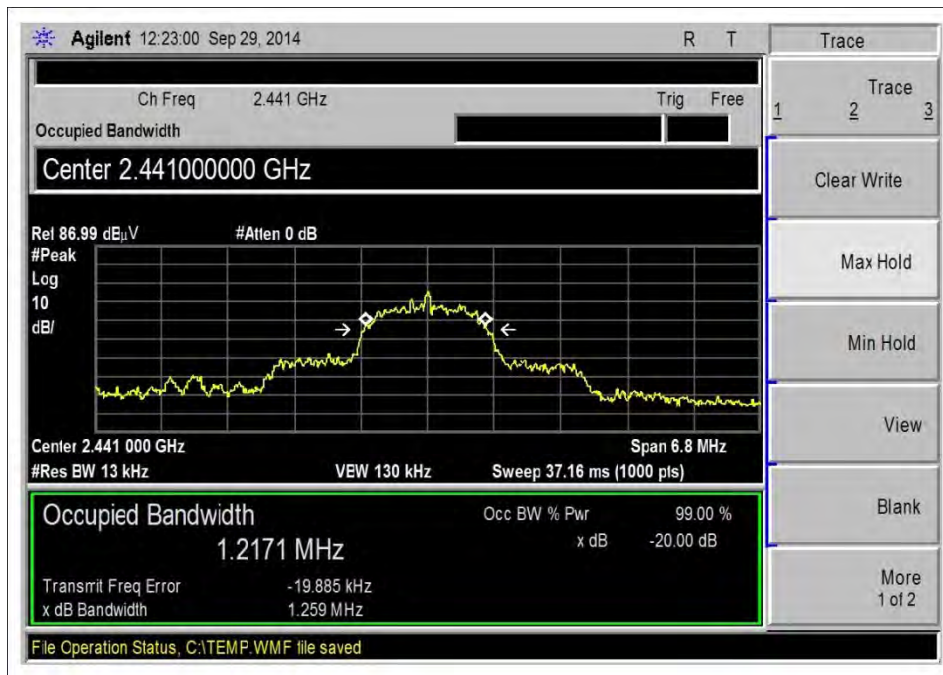
Temperature: 28°C, 49% Relative Humidity, Pressure 100.1kPa
 Site D

-20dBc Occupied Bandwidth			
Channel			
Modulation	Low	Mid	High
GFSK	930.523kHz	928.382kHz	926.018kHz
pi/4-DQPSK	1.339MHz	1.388MHz	1.368MHz
8-DPSK	1.259MHz	1.259MHz	1.251MHz

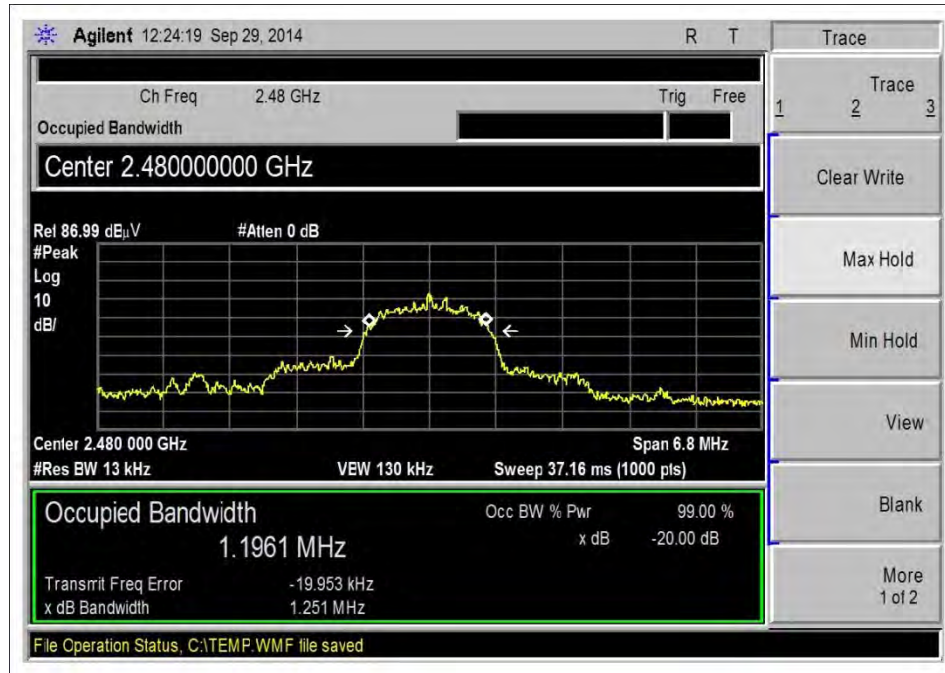
Test Data



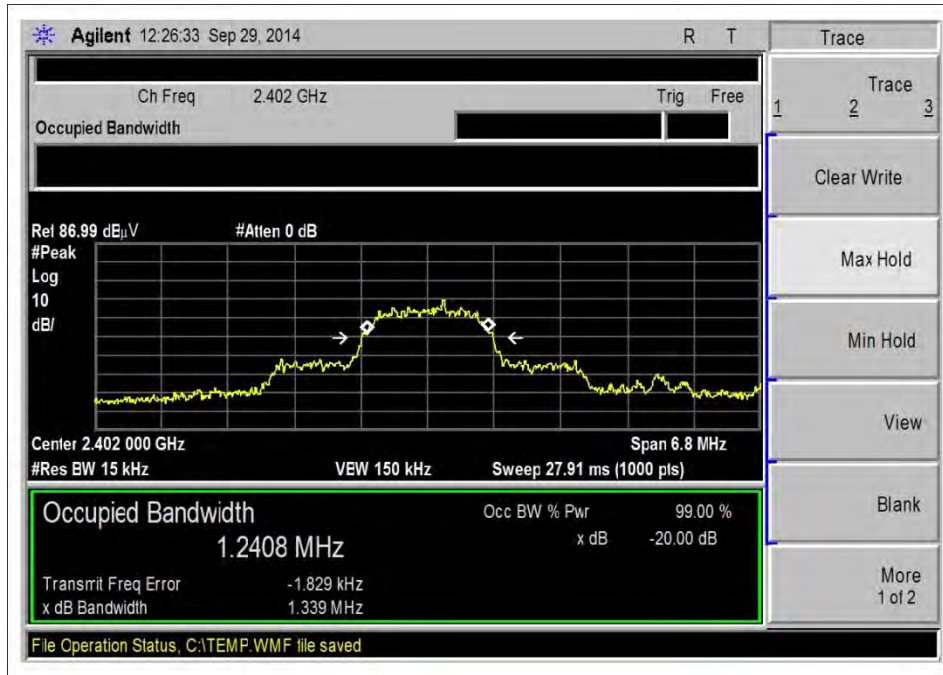
Low Channel, 8-DPSK



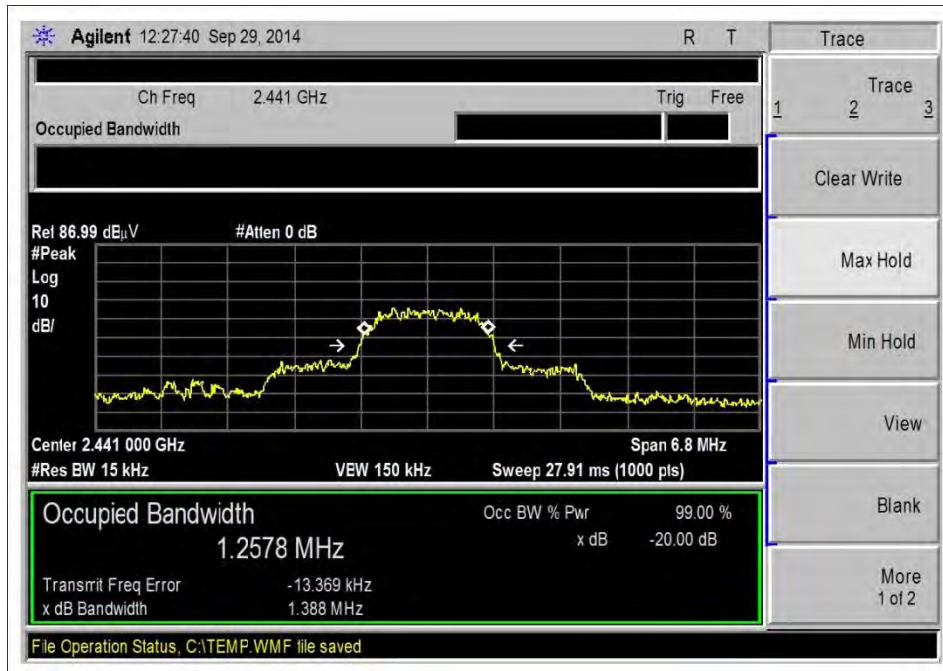
Middle Channel, 8-DPSK



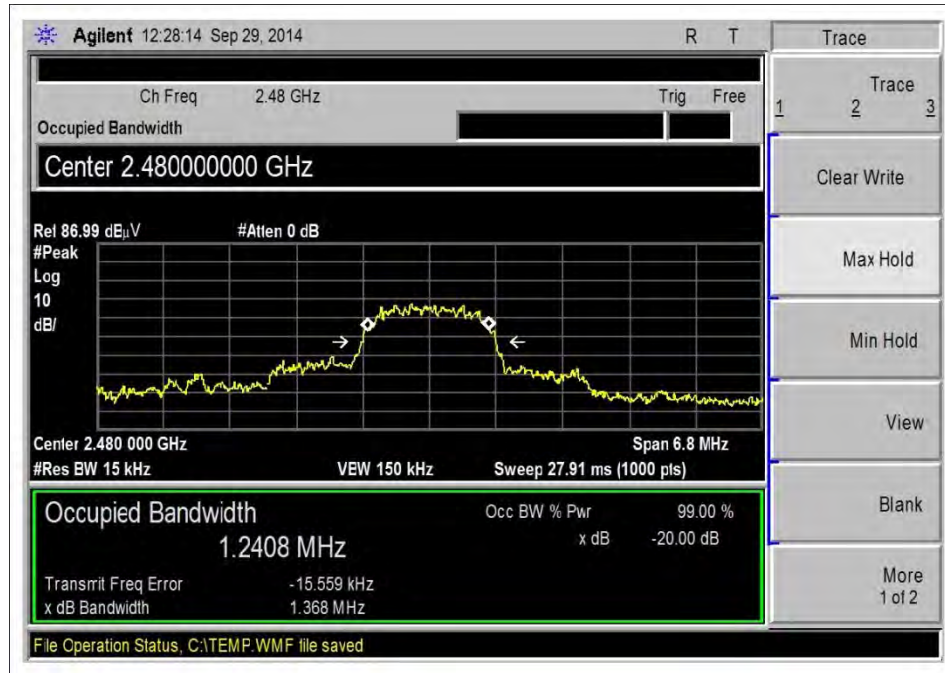
High Channel, 8-DPSK



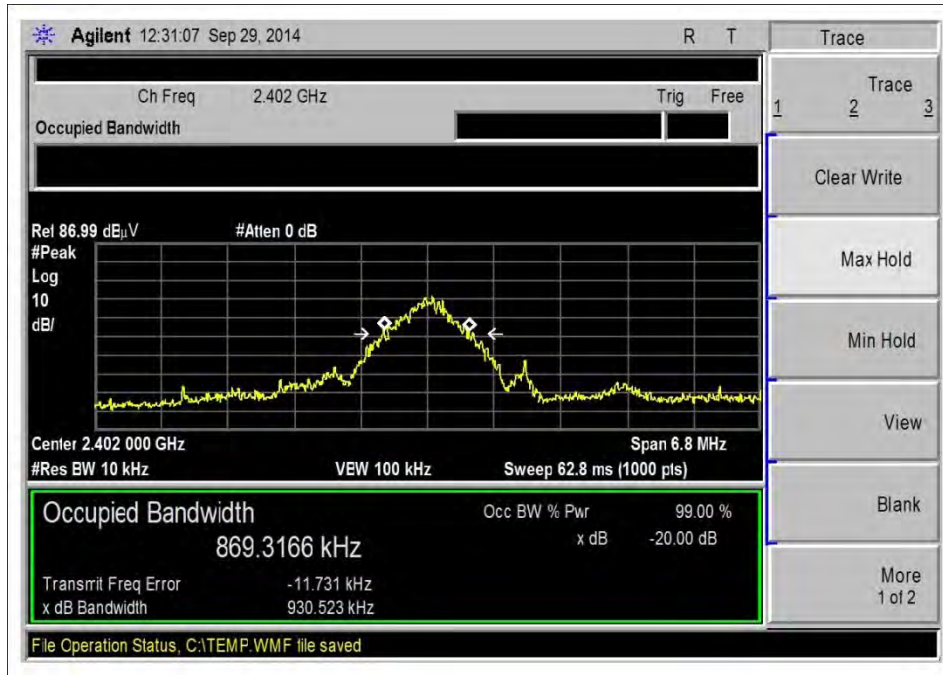
Low Channel, DQPSK



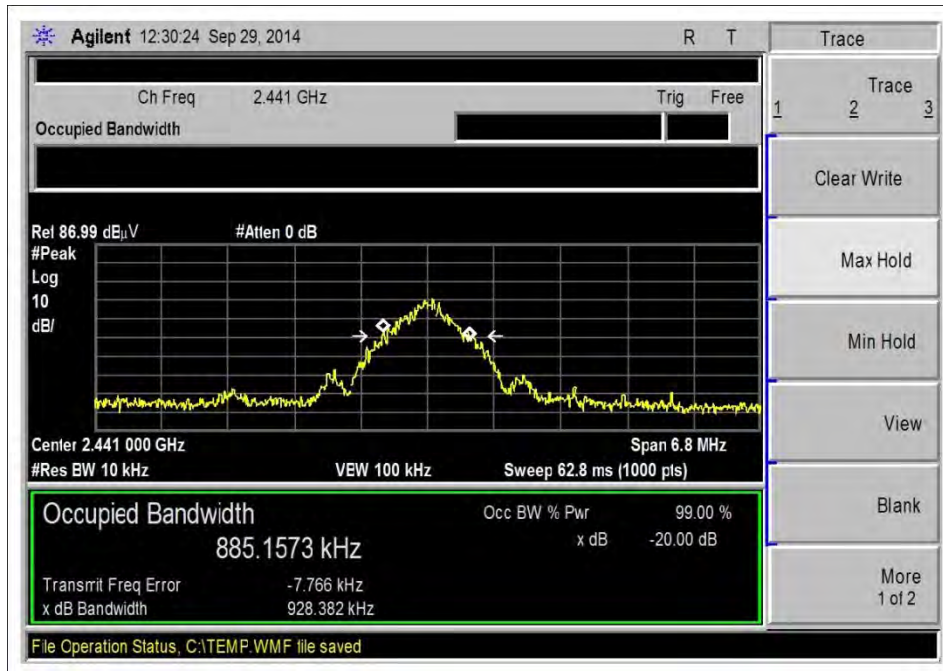
Middle Channel, DQPSK



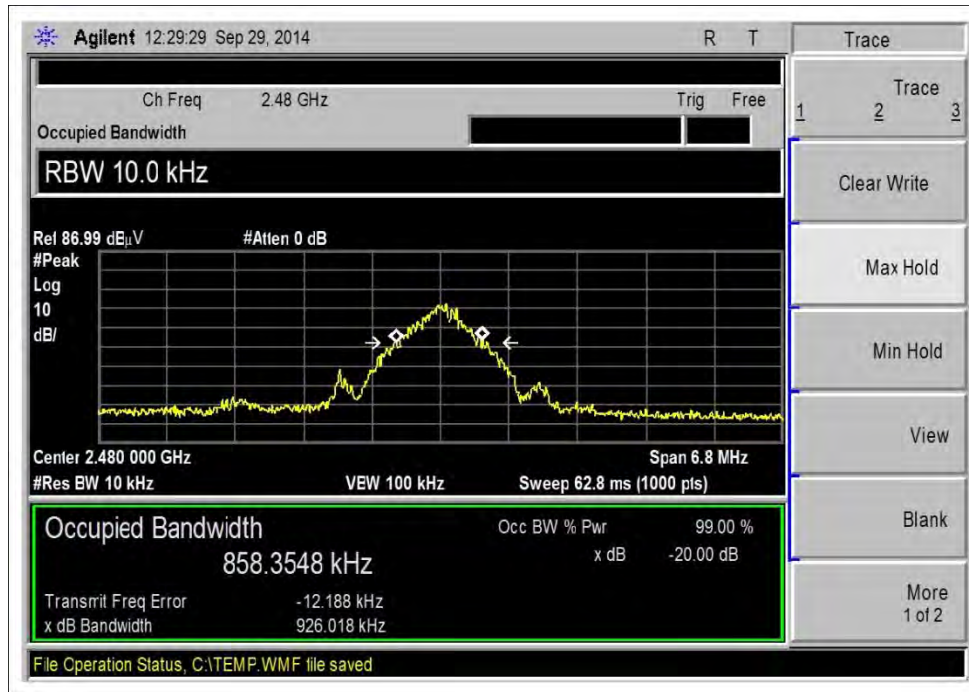
High Channel, DQPSK



Low Channel, GFSK

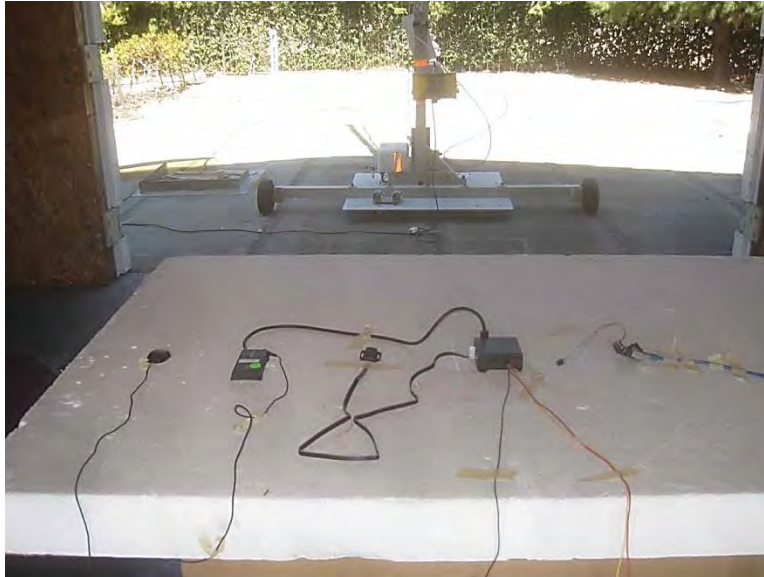


Middle Channel, GFSK

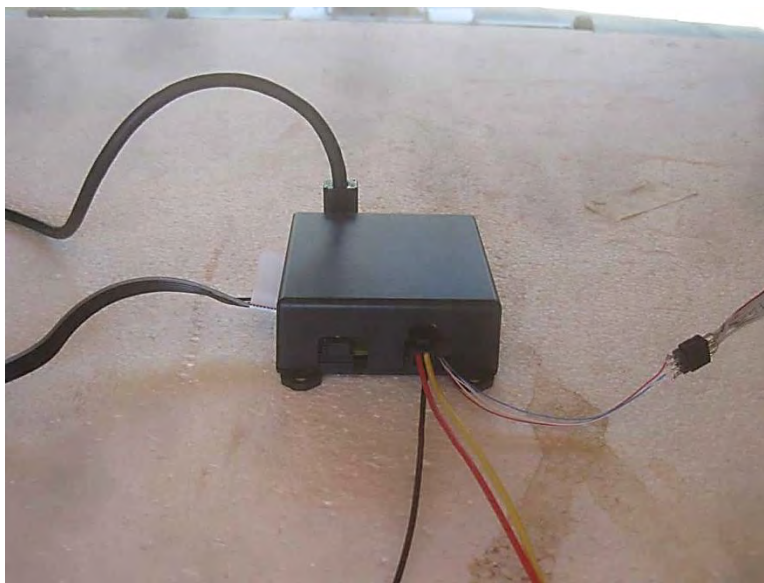


High Channel, GFSK

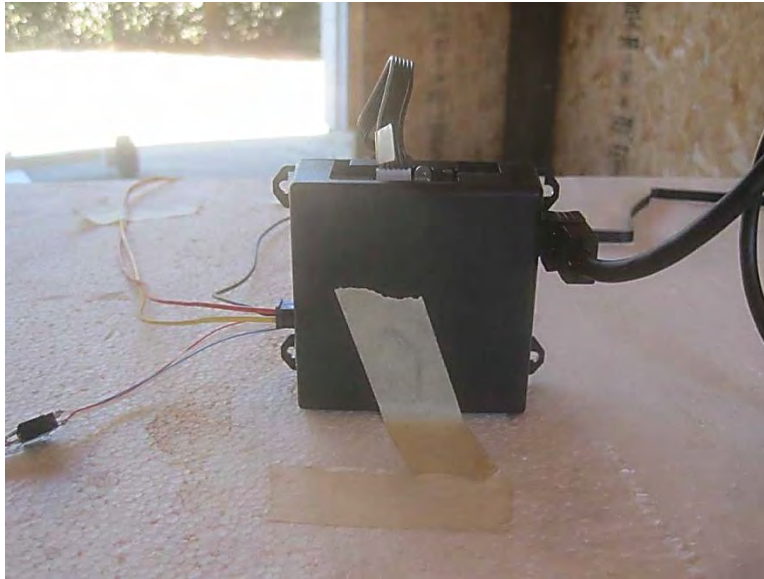
Test Setup Photos



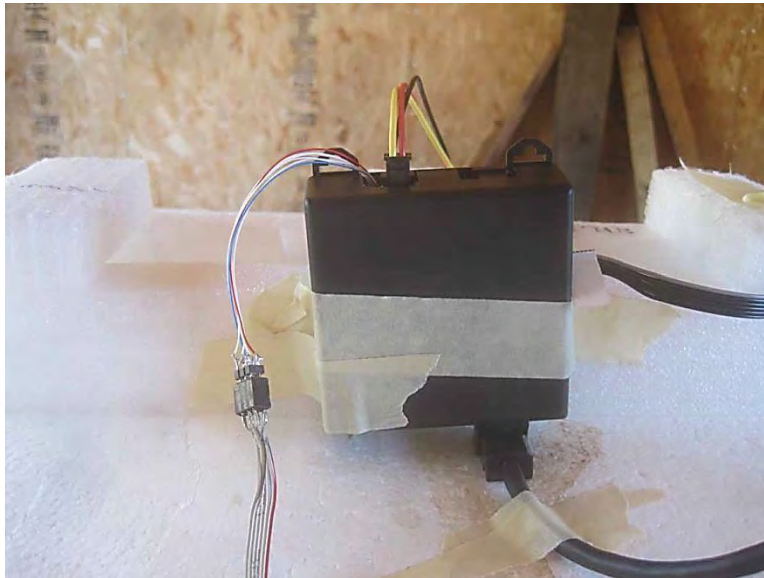
Test Setup



X-Axis



Y-Axis



Z-Axis

15.249(d) Radiated Spurious Emissions and Band Edge

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112
 Customer: **Nutek Corporation**
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
 Work Order #: **95998** Date: 9/18/2014
 Test Type: **Maximized Emissions** Time: 10:14:14
 Equipment: **Bluetooth interface module** Sequence#: 1
 Manufacturer: Nutek Corporation Tested By: Don Nguyen
 Model: 4360528
 S/N: 140800001043605280

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T2	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T3	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T4	ANP06360	Cable	L1-PNMNM-48	7/29/2014	7/29/2016
T5	ANP06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015
T6	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T7	AN03385	High Pass Filter	11SH10-3000/T10000-O/O	6/5/2013	6/5/2015
	AN00314	Loop Antenna	6502	7/2/2014	7/2/2016
	AN01413	Horn Antenna-ANSI C63.5 (dB/m)	84125-80008	11/9/2012	11/9/2014
T8	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T9	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T10	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T11	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Support laptop is placed underneath the platform. Software BlueTest3 is running on support laptop to control the EUT. Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.

The EUT obtains DC 12 V from support DC power supply placed underneath the platform.

The tablet runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:
 GFSK (packet: DH5, packet type: 15, packet size: 339)
 Transmit packet: TXData1
 Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz
 TX freq: 2402MHz, 2441MHz, 2480MHz

Frequency range of measurement = 9KHz-25GHz
 9 kHz -150 kHz;RBW=200 Hz,VBW=200 Hz
 150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz
 30 MHz-1000 MHz;RBW=120 kHz,VBW=120 kHz
 1000 MHz-25000 MHz;RBW=1 MHz,VBW=1 MHz.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission based on Fundamental emission level.

Temperature: 28°C, Relative Humidity: 49%, Atmospheric Pressure: 100.1kPa
 Site D

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

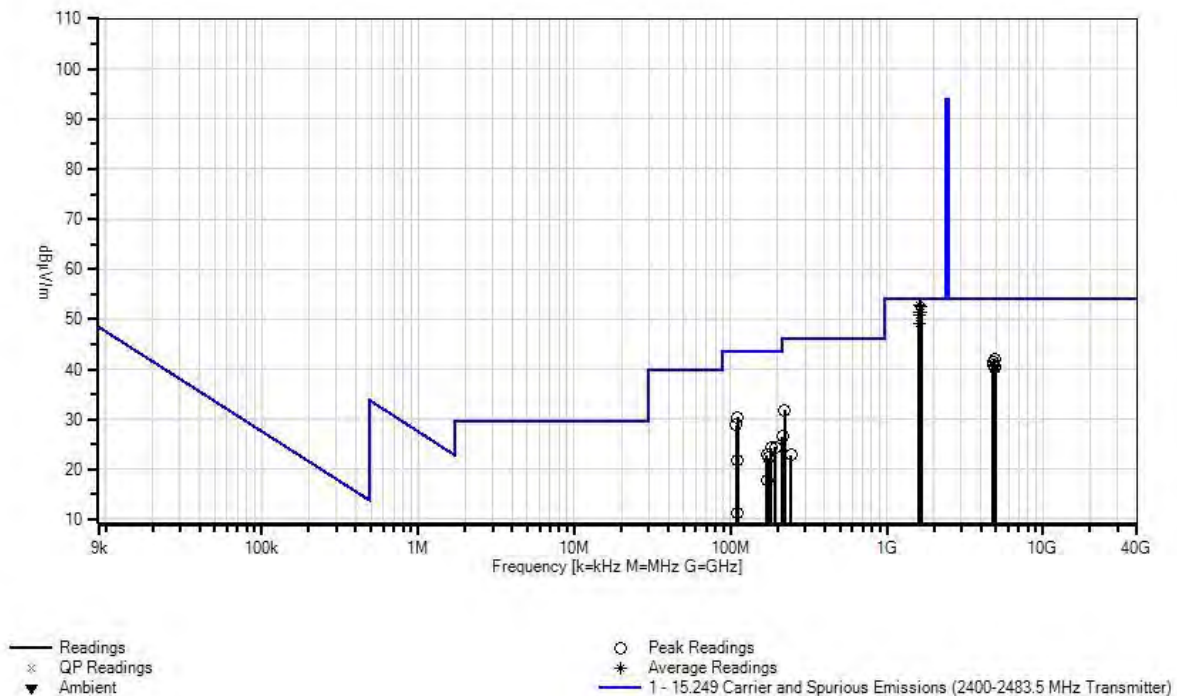
Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	1626.700M	61.2	-39.8	+23.5	+4.8	+2.5	+0.0	52.7	54.0	-1.3	Horiz
	Ave		+0.5	+0.0	+0.0	+0.0			mid CH		
			+0.0	+0.0	+0.0						
^	1626.700M	62.2	-39.8	+23.5	+4.8	+2.5	+0.0	53.7	54.0	-0.3	Horiz
			+0.5	+0.0	+0.0	+0.0			mid CH		
			+0.0	+0.0	+0.0						
3	1652.700M	60.8	-39.8	+23.6	+4.9	+2.6	+0.0	52.6	54.0	-1.4	Horiz
	Ave		+0.5	+0.0	+0.0	+0.0			hi CH		
			+0.0	+0.0	+0.0						
^	1652.700M	61.5	-39.8	+23.6	+4.9	+2.6	+0.0	53.3	54.0	-0.7	Horiz
			+0.5	+0.0	+0.0	+0.0			hi CH		
			+0.0	+0.0	+0.0						
5	1602.000M	60.2	-39.8	+23.4	+4.7	+2.5	+0.0	51.5	54.0	-2.5	Horiz
	Ave		+0.5	+0.0	+0.0	+0.0			low CH		
			+0.0	+0.0	+0.0						
^	1602.000M	61.0	-39.8	+23.4	+4.7	+2.5	+0.0	52.3	54.0	-1.7	Horiz
			+0.5	+0.0	+0.0	+0.0			low CH		
			+0.0	+0.0	+0.0						

7	1652.650M Ave	59.6	-39.8 +0.5 +0.0	+23.6 +0.0 +0.0	+4.9 +0.0 +0.0	+2.6 +0.0 +0.0	+0.0	51.4	54.0 hi CH	-2.6	Vert
^	1652.650M	60.6	-39.8 +0.5 +0.0	+23.6 +0.0 +0.0	+4.9 +0.0 +0.0	+2.6 +0.0 +0.0	+0.0	52.4	54.0 hi CH	-1.6	Vert
9	1626.700M Ave	59.4	-39.8 +0.5 +0.0	+23.5 +0.0 +0.0	+4.8 +0.0 +0.0	+2.5 +0.0 +0.0	+0.0	50.9	54.0 mid CH	-3.1	Vert
^	1626.700M	60.3	-39.8 +0.5 +0.0	+23.5 +0.0 +0.0	+4.8 +0.0 +0.0	+2.5 +0.0 +0.0	+0.0	51.8	54.0 mid CH	-2.2	Vert
11	1602.000M Ave	57.8	-39.8 +0.5 +0.0	+23.4 +0.0 +0.0	+4.7 +0.0 +0.0	+2.5 +0.0 +0.0	+0.0	49.1	54.0 low CH	-4.9	Vert
^	1602.000M	58.9	-39.8 +0.5 +0.0	+23.4 +0.0 +0.0	+4.7 +0.0 +0.0	+2.5 +0.0 +0.0	+0.0	50.2	54.0 low CH	-3.8	Vert
13	4882.000M	36.2	-39.7 +0.9 +0.0	+30.3 +0.0 +0.0	+9.3 +0.2 +0.0	+4.8 +0.0 +0.0	+0.0	42.0	54.0 mid CH	-12.0	Vert
14	4882.000M	36.1	-39.7 +0.9 +0.0	+30.3 +0.0 +0.0	+9.3 +0.2 +0.0	+4.8 +0.0 +0.0	+0.0	41.9	54.0 mid CH	-12.1	Horiz
15	4804.000M	36.2	-39.7 +0.9 +0.0	+30.1 +0.0 +0.0	+9.2 +0.1 +0.0	+4.7 +0.0 +0.0	+0.0	41.5	54.0 low CH	-12.5	Horiz
16	111.397M	44.0	+0.0 +0.0 +11.2	+0.0 +0.0 +0.1	+1.1 +0.0 +1.1	+0.0 -27.1 +0.0	+0.0	30.4	43.5	-13.1	Vert
17	4804.000M	35.6	-39.7 +0.9 +0.0	+30.1 +0.0 +0.0	+9.2 +0.1 +0.0	+4.7 +0.0 +0.0	+0.0	40.9	54.0 low CH	-13.1	Vert
18	4960.100M	34.7	-39.7 +0.9 +0.0	+30.4 +0.0 +0.0	+9.4 +0.1 +0.0	+4.8 +0.0 +0.0	+0.0	40.6	54.0 hi CH	-13.4	Vert
19	4960.100M	34.5	-39.7 +0.9 +0.0	+30.4 +0.0 +0.0	+9.4 +0.1 +0.0	+4.8 +0.0 +0.0	+0.0	40.4	54.0 hi CH	-13.6	Horiz
20	220.725M	44.5	+0.0 +0.0 +10.6	+0.0 +0.0 +0.2	+1.7 +0.0 +1.5	+0.0 -26.6 +0.0	+0.0	31.9	46.0	-14.1	Horiz
21	108.872M	42.7	+0.0 +0.0 +11.0	+0.0 +0.0 +0.1	+1.1 +0.0 +1.0	+0.0 -27.1 +0.0	+0.0	28.8	43.5	-14.7	Vert
22	193.842M	38.9	+0.0 +0.0 +9.0	+0.0 +0.0 +0.2	+1.6 +0.0 +1.4	+0.0 -26.7 +0.0	+0.0	24.4	43.5	-19.1	Vert
23	182.200M	39.1	+0.0 +0.0 +9.0	+0.0 +0.0 +0.2	+1.5 +0.0 +1.3	+0.0 -26.8 +0.0	+0.0	24.3	43.5	-19.2	Horiz

24	216.025M	39.6	+0.0	+0.0	+1.7	+0.0	+0.0	26.6	46.0	-19.4	Horiz
			+0.0	+0.0	+0.0	-26.6					
			+10.2	+0.2	+1.5						
25	171.450M	37.0	+0.0	+0.0	+1.5	+0.0	+0.0	22.8	43.5	-20.7	Horiz
			+0.0	+0.0	+0.0	-26.8					
			+9.6	+0.2	+1.3						
26	173.918M	36.7	+0.0	+0.0	+1.5	+0.0	+0.0	22.3	43.5	-21.2	Vert
			+0.0	+0.0	+0.0	-26.8					
			+9.4	+0.2	+1.3						
27	110.422M	35.5	+0.0	+0.0	+1.1	+0.0	+0.0	21.8	43.5	-21.7	Vert
			+0.0	+0.0	+0.0	-27.1					
			+11.1	+0.1	+1.1						
28	242.640M	33.6	+0.0	+0.0	+1.8	+0.0	+0.0	22.8	46.0	-23.2	Vert
			+0.0	+0.0	+0.0	-26.5					
			+12.1	+0.2	+1.6						
29	171.518M	32.0	+0.0	+0.0	+1.5	+0.0	+0.0	17.7	43.5	-25.8	Vert
			+0.0	+0.0	+0.0	-26.8					
			+9.5	+0.2	+1.3						
30	109.300M	25.3	+0.0	+0.0	+1.1	+0.0	+0.0	11.4	43.5	-32.1	Horiz
			+0.0	+0.0	+0.0	-27.1					
			+11.0	+0.1	+1.0						

CKC Laboratories, Inc Date: 9/18/2014 Time: 10:14:14 Nutek Corporation WO#: 95998
 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Sequence#: 1 Ext
 ATTN: 0 dB



Band Edge

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Nutek Corporation**
 Specification: **Band Edge Plots**
 Work Order #: **95998** Date: 9/17/2014
 Test Type: **Maximized Emissions** Time: 14:10:57
 Equipment: **Bluetooth interface module** Sequence#: 0
 Manufacturer: Nutek Corporation Tested By: Don Nguyen
 Model: 4360528
 S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T2	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T3	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T4	ANP06360	Cable	L1-PNMMN-48	7/29/2014	7/29/2016
T5	ANP06544	Cable	32026-29094K- 29094K-36TC	11/20/2013	11/20/2015
T6	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Bluetooth interface module*	Nutek Corporation	4360528	140800001043605280

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614
Laptop	Gateway	TA7	1101257267
Adaptor board	Generic	NA	NA
Laptop power supply	Gateway	ADP-90SB BB	84W0821021482
Radio Tuner	SiriusXM	SXV200	NA
Radio Tuner Antenna	SiriusXM	XVANT1	1032
1324 USB-SPI Converter	CSR plc	186196	NA
Remote dongle	Nutek Corporation	NA	NA

Test Conditions / Notes:

Placed on a Styrofoam platform, the EUT is connected to a Satellite Radio Tuner, antenna, and adaptor board which is connected to support laptop via USB-SPI Converter. Remote port is connected to remote dongle. Support laptop is placed underneath the platform. Software BlueTest3 is running on support laptop to control the EUT.

Two mini USB ports of the EUT are a service ports for programming purpose only and not available to normal user.

The EUT obtains DC 12 V from support DC power supply placed underneath the platform.

The tablet runs test routine to put the EUT in test mode and operation mode as applicable.

Modulation:

GFSK (packet: DH5, packet type: 15, packet size: 339)

pi/4-DQPSK (packet: 2-DH5, packet type: 30, packet size: 679)

8-DPSK (packet: 3-DH5, packet type: 31, packet size: 1031)

Transmit packet: TXData1

Software power setting gain: internal 46, external 255

Freq range: 2400-2483.5MHz

TX freq: 2402MHz, 2441MHz, 2480MHz

Frequency range of measurement = 2400-2483.5MHz

RBW=1 MHz,VBW=1 MHz.

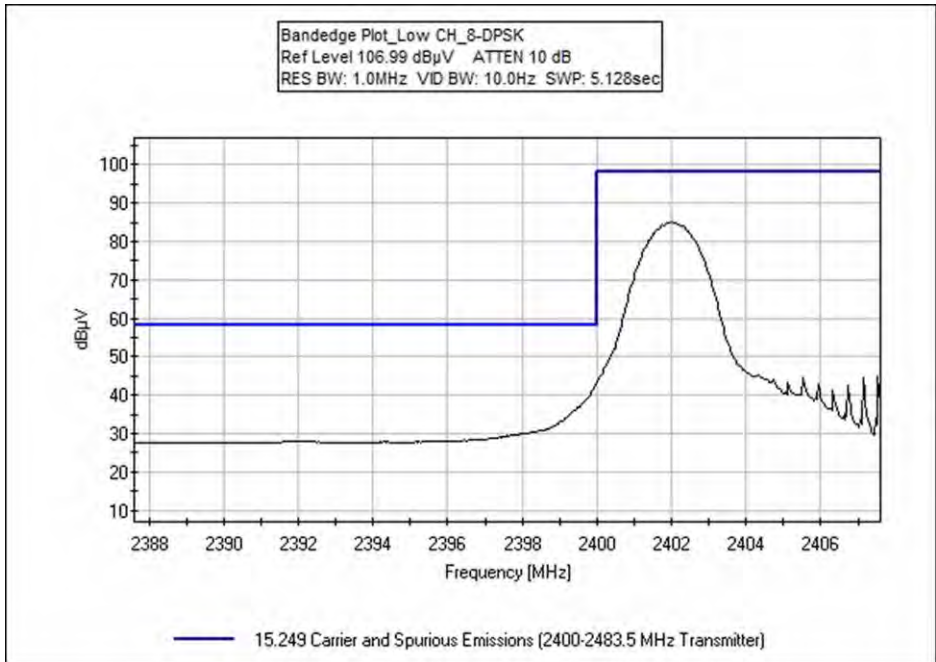
SA detector mode: average

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission based on Fundamental emission level.

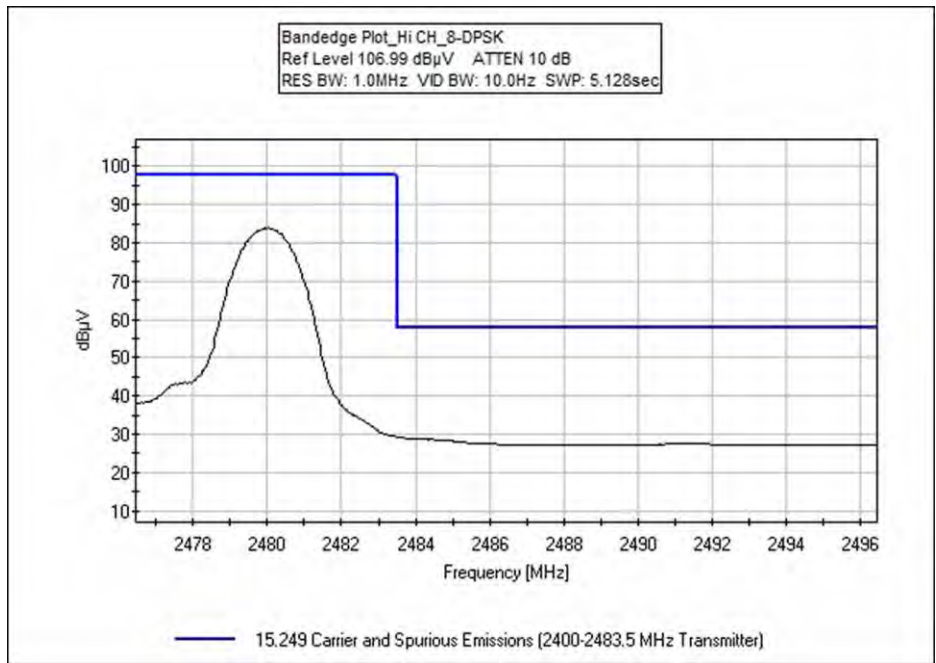
Temperature: 28°C, Relative Humidity: 49%, Atmospheric Pressure: 100.1kPa

Site D

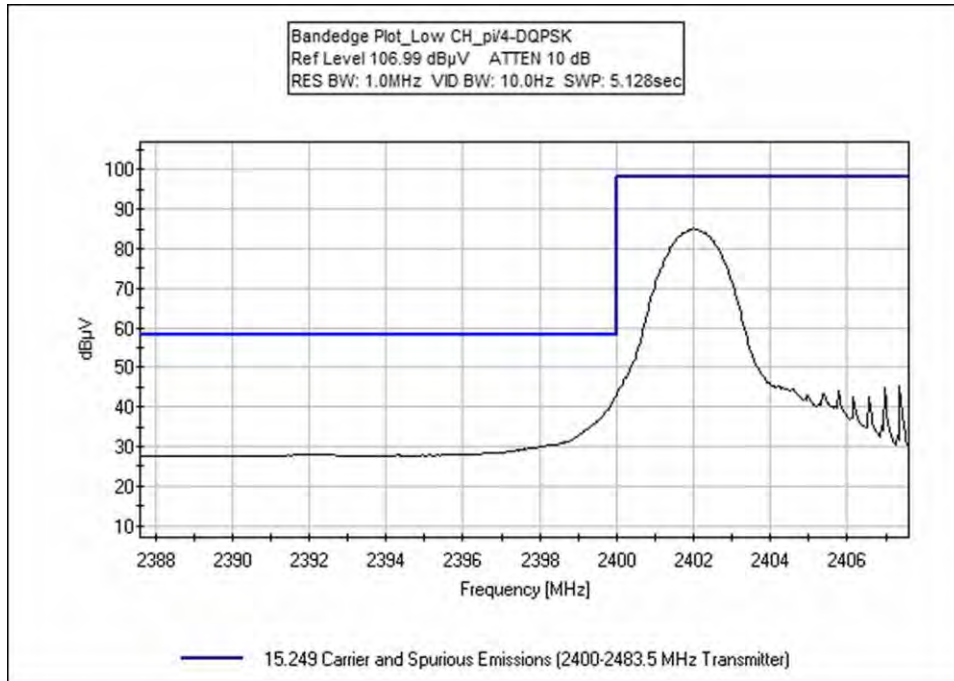
Test Data



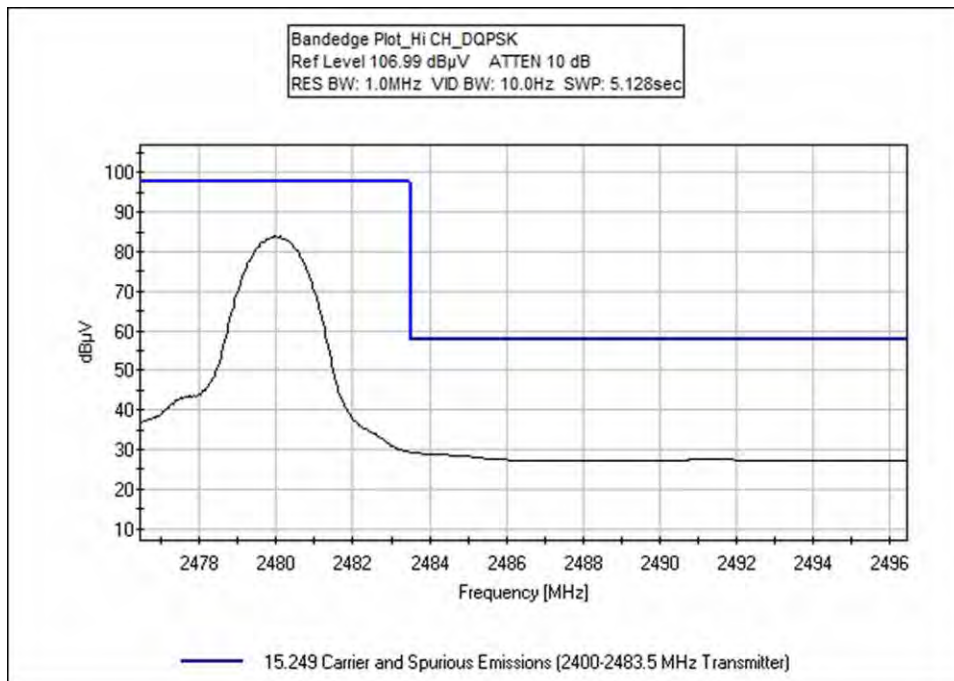
Low Channel, 8-DPSK



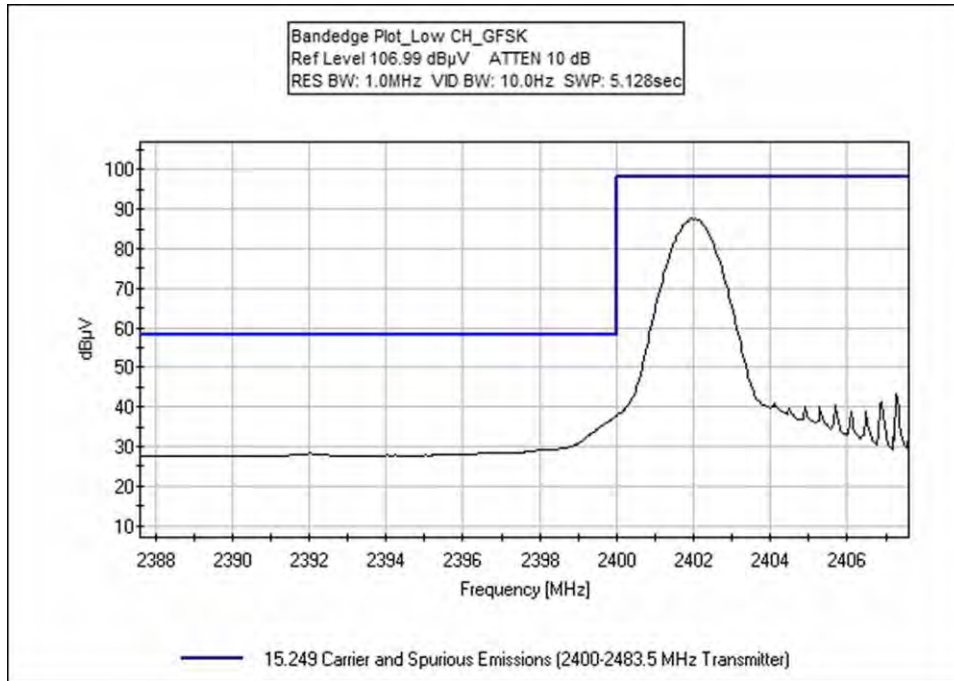
High Channel, 8-DPSK



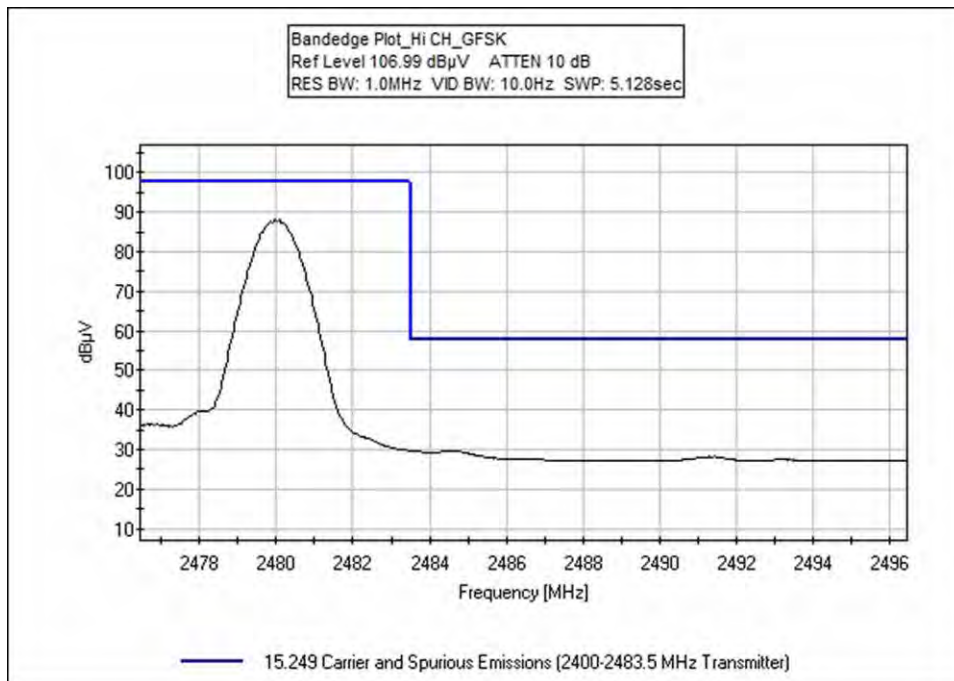
Low Channel, DQPSK



High Channel, DQPSK

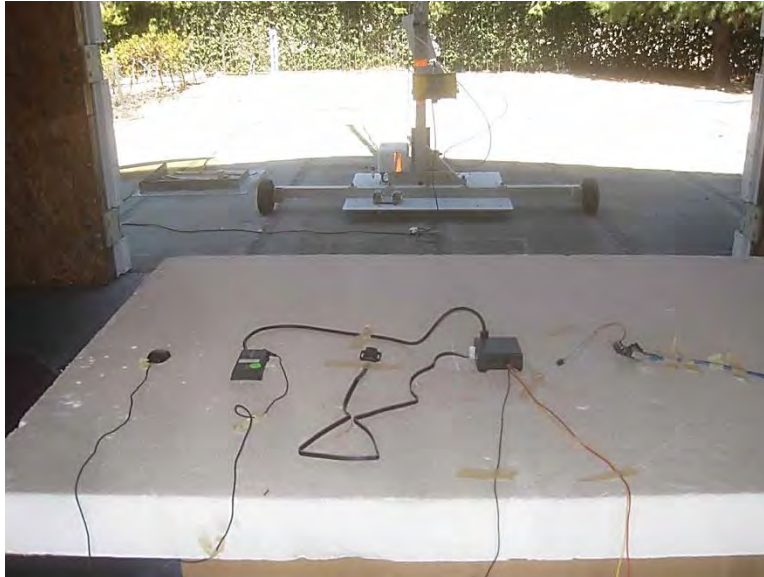


Low Channel, GFSK

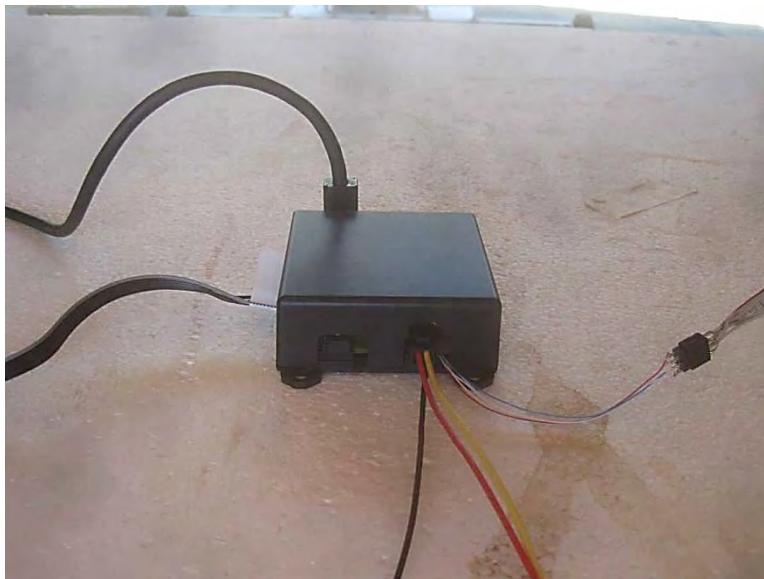


High Channel, GFSK

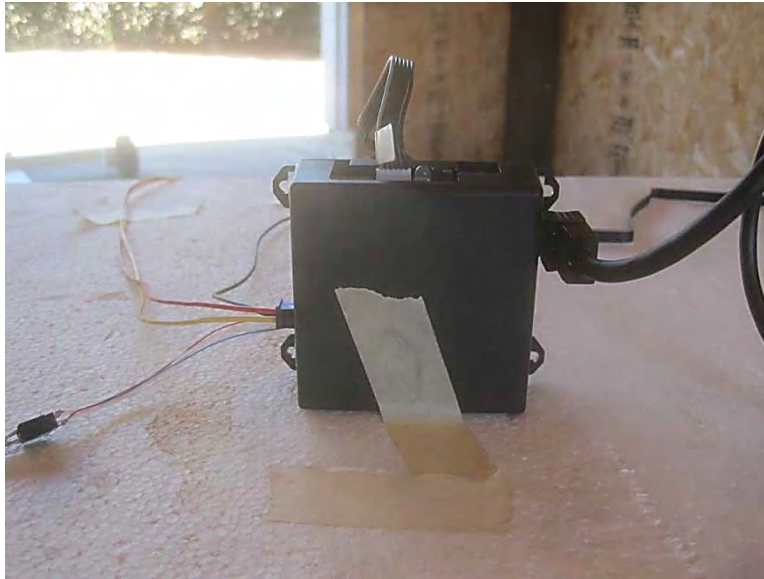
Test Setup Photos



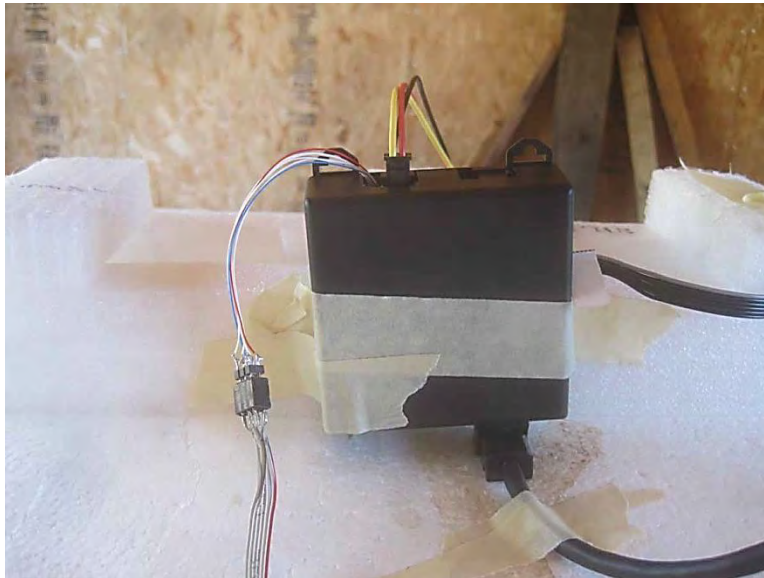
Test Setup



X-Axis



Y-Axis



Z-Axis

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBμV/m, the spectrum analyzer reading in dBμV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dB μ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB μ V/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.