TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.247
Industry Canada RSS-210 Issue 7

COMPANY	Corventis Inc 1410 Energy Park Dr # 1 St Paul MN 55108-5249
DESCRIPTION OF EQUIPMENT	Communications device for patient monitoring system
NAME OF EQUIPMENT	Gen1 Gateway
MODEL NUMBER(S) TESTED	MCT-ZD-001
SERIAL NUMBER(S) TESTED	n/a
TEST REPORT NUMBER	WC1003209 Rev A
TEST DATE(S)	26 April – 27 May 2010

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Section 15.247 *"Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz; General requirements."* and IC RSS-210 Issue 7 *"Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment".*

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

Date: 27 May 2010

Location: Taylors Falls MN
USA

Greg S Jakubowski
Senior EMC Technician

Joel T Schneider
Senior EMC Engineer

Not Transferable

EMC TEST REPORT

Test Report No.	**WC1003209 Rev A**	Date of issue:	27 May 2010
Manufacturer	Corventis Inc		
Address	1410 Energy Park Drive #1		
	St Paul MN 55108-5249		
Description of Equipment	Communications device for patient monitoring system		
Name of Equipment	Gen1 Gateway		
Model No(s) Tested	MCT-ZD-001		
Serial No(s) Tested	n/a		

Test Result ■ **Compliant** ☐ **Non-compliant**

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.

TÜV SÜD America Inc and its professional staff hold government and Professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI..

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	44	06 May 2010	Initial Release
A	43	27 May 2010	Revision Include: ▪ Additional testing per TCB application review.

TEST REPORT CONTENTS **Page(s)**

Sign Explanations:
☐ - not applicable
■ - applicable

EMC TEST REGULATIONS

The tests were performed according to the following regulations:

FCC Part 15 Subpart C Section 15.247

IC RSS-210 Issue 7

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 22-24°C
Atmospheric pressure	: 96-98 kPa
Relative Humidity	: 29-32 %

POWER SUPPLY UTILIZED

Power supply system	: 60 Hz 110 VAC

Carrier Frequency Separation
FCC 15.247(a)(1), IC RSS-210 A8.1(b)

Test summary
The requirements are: ■ - MET ☐ - NOT MET

Test was performed in accordance with the test procedure of FCC Public Notice DA 00-705

Carrier Frequency Separation = 1.005 MHz

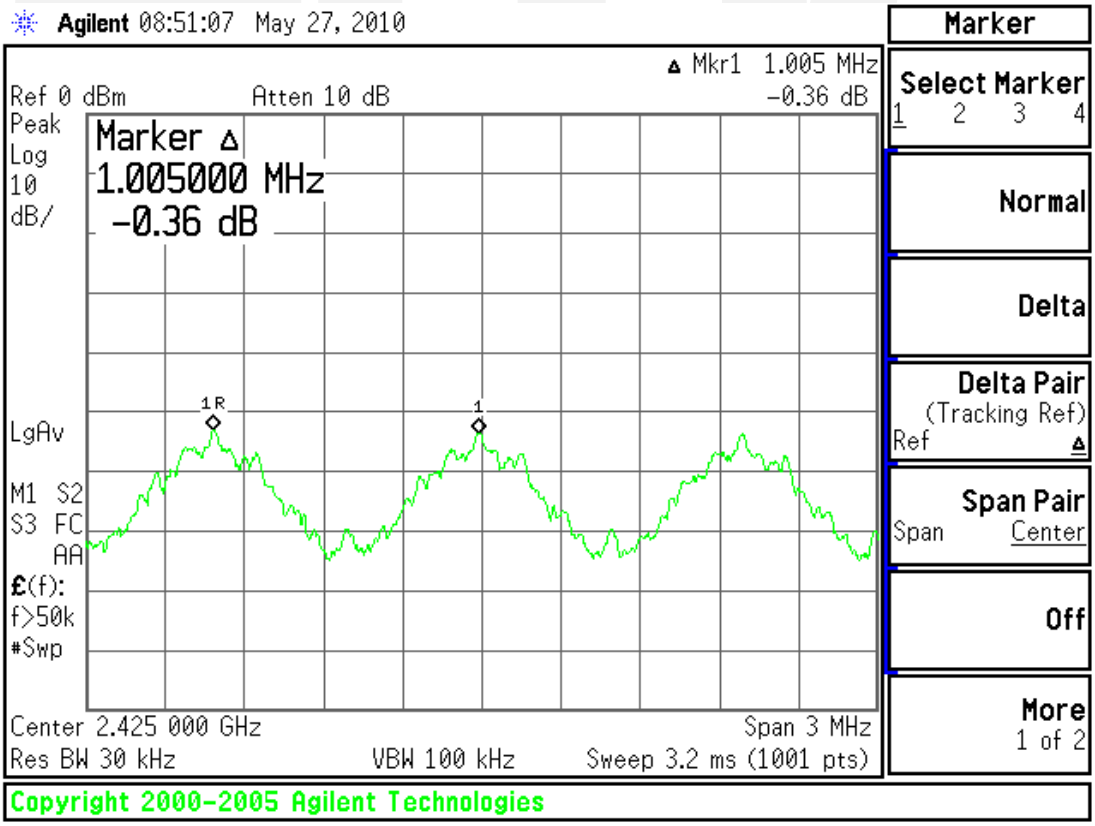
Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
■ - Wild River Lab Large Test Site - Tech area
☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
WRLE10435	E4440A	Agilent	Spectrum Analyzer	MY42510439	28 Jul 10

Test Limit
682.6 kHz (> 2/3 of the 20 dB bandwidth – 1.024 MHz - for Bluetooth 2.0 and later) minimum

Test data



Number of Hopping Frequencies
FCC 15.247(a)(1)(iii), IC RSS-210 A8.1(d)

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Number of hopping frequencies = 79

Test was performed in accordance with the test procedure of FCC Public Notice DA 00-705

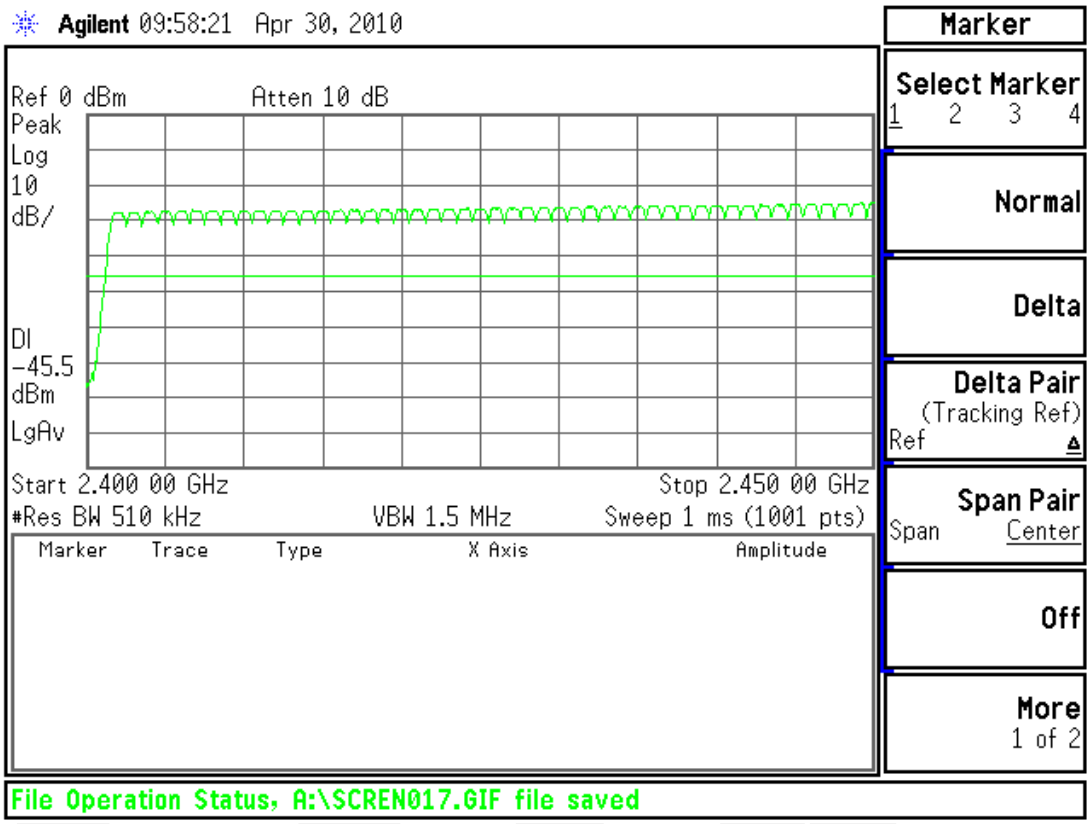
Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
■ - Wild River Lab Large Test Site - Tech area
☐ - Wild River Lab Small Test Site (Open Area Test Site)

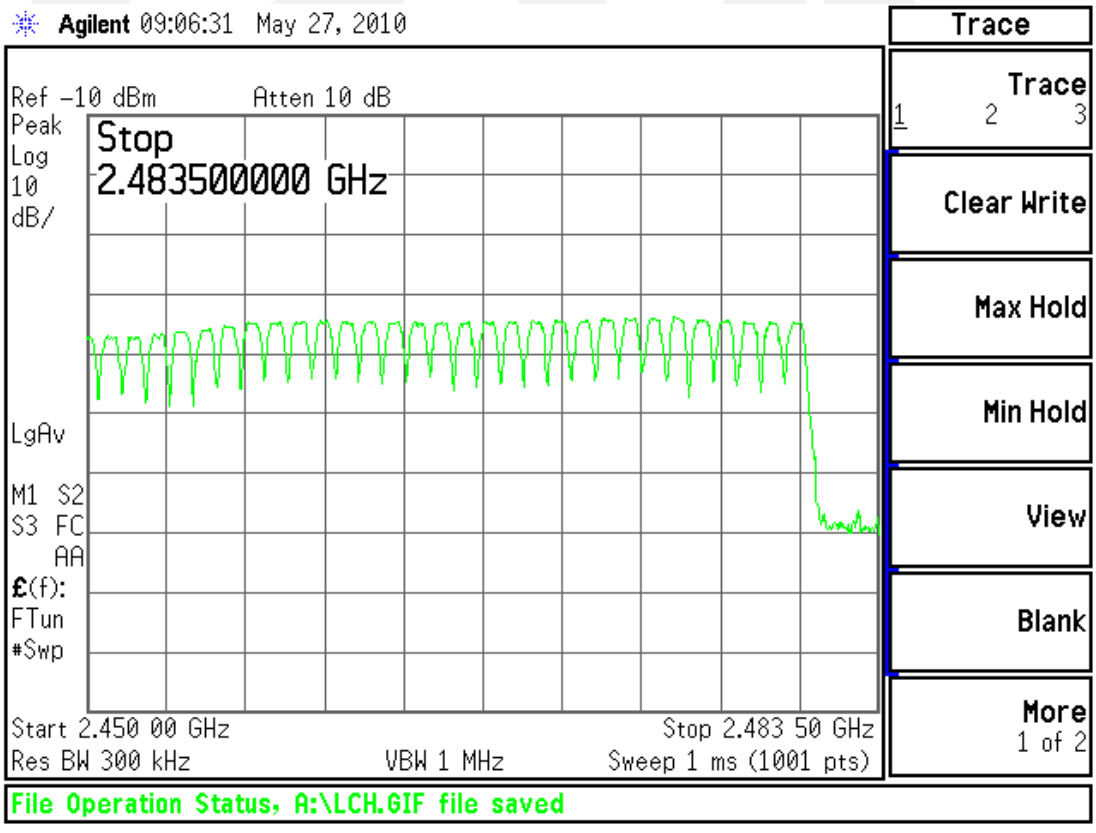
Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
WRLE10435	E4440A	Agilent	Spectrum Analyzer	MY42510439	28 Jul 10

Test limit
At least 15 channels

Test data
See following page


Agilent 09:58:21 Apr 30, 2010
Ref 0 dBm
Atten 10 dB
Peak
Log
10
dB/
Dl
-45.5
dBm
LgAv
Start 2.400 00 GHz
Stop 2.450 00 GHz
#Res BW 510 kHz
VBW 1.5 MHz
Sweep 1 ms (1001 pts)
Marker Trace Type X Axis Amplitude
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
File Operation Status, A:\SCREN017.GIF file saved


Agilent 09:06:31 May 27, 2010
Ref -10 dBm
Atten 10 dB
Peak
Log
10
dB/
Stop
2.483500000 GHz
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Start 2.450 00 GHz
Stop 2.483 50 GHz
Res BW 300 kHz
VBW 1 MHz
Sweep 1 ms (1001 pts)
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
File Operation Status, A:\LCH.GIF file saved

Time of Occupancy
FCC 15.247(a)(1)(iii), IC RSS-210 A8.1(d)

Test summary
The requirements are: ■ - MET ☐ - NOT MET

Time of occupancy = 284 msec in 31.6 seconds (79 channels X 400 msec)
Plot shows 276 msec/30.8 seconds, this ratio would indicate the above, and is representative of worst case.

Test was performed in accordance with the test procedure of FCC Public Notice DA 00-705

Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
■ - Wild River Lab Large Test Site - Tech area
☐ - Wild River Lab Small Test Site (Open Area Test Site)

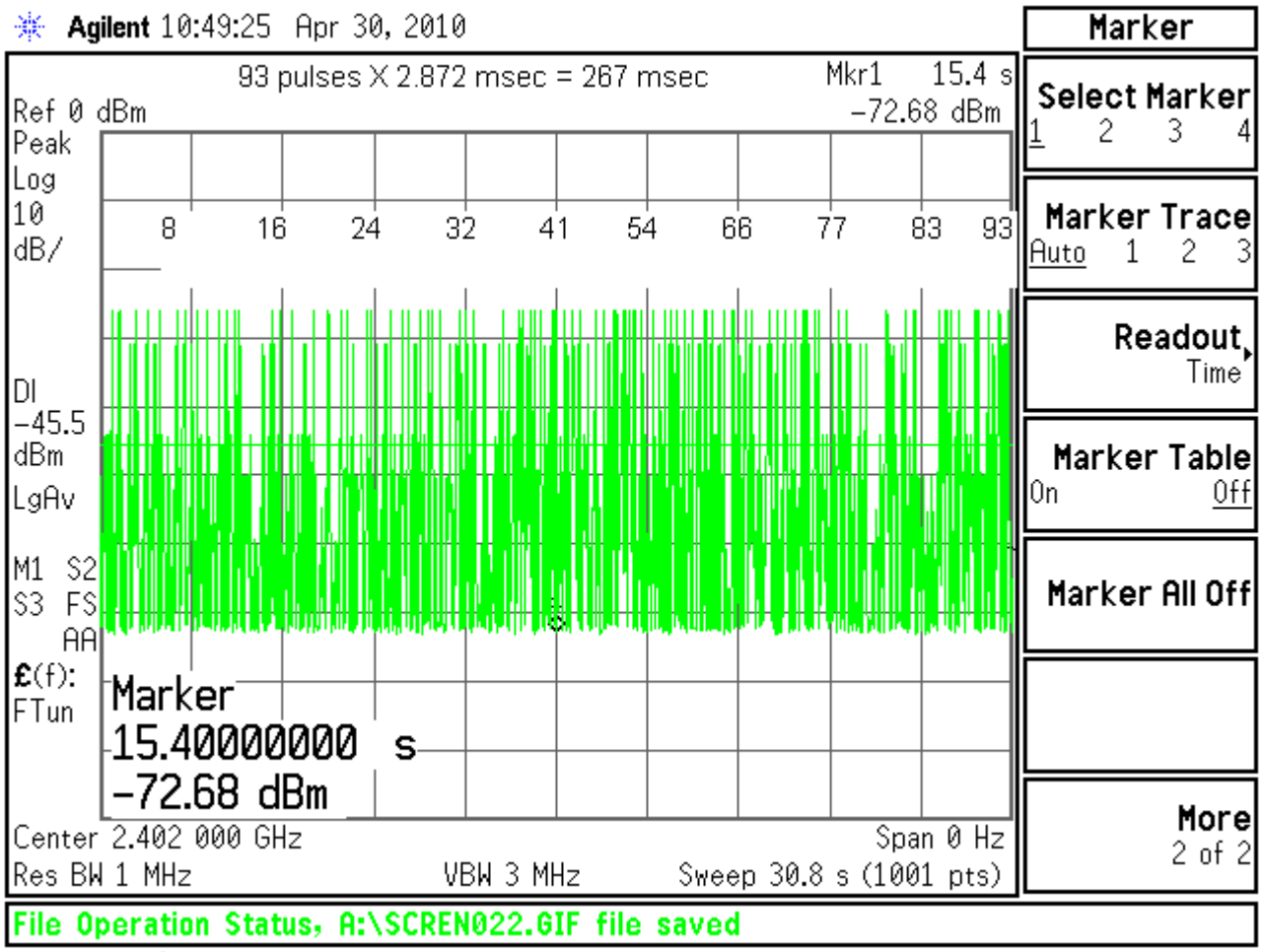
Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
WRLE10435	E4440A	Agilent	Spectrum Analyzer	MY42510439	28 Jul 10

Cal Code B = Calibration verification performed internally.

Test limit
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test data
See following page


Agilent 10:49:25 Apr 30, 2010
93 pulses X 2.872 msec = 267 msec
Mkr1 15.4 s
-72.68 dBm
Ref 0 dBm
Peak
Log
10
dB/
8 16 24 32 41 54 66 77 83 93
Dl
-45.5
dBm
LgAv
M1 S2
S3 FS
AA
£(f):
FTun
Marker
15.40000000 s
-72.68 dBm
Center 2.402 000 GHz
Span 0 Hz
Res BW 1 MHz
VBW 3 MHz
Sweep 30.8 s (1001 pts)
Marker
Select Marker
1 2 3 4
Marker Trace
Auto 1 2 3
Readout
Time
Marker Table
On Off
Marker All Off
More
2 of 2
File Operation Status, A:\SCREN022.GIF file saved

20 dB Bandwidth
FCC 15.247(a), IC RSS-210 A8.1

Test summary
The requirements are: ■ - MET ☐ - NOT MET
The 20 dB bandwidth on low channel = 1.024 MHz
The 20 dB bandwidth on mid channel = 1.020 MHz
The 20 dB bandwidth on low channel = 1.018 MHz

Test was performed in accordance with the test procedure of FCC Public Notice DA 00-705

Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
■ - Wild River Lab Large Test Site - Tech area
☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test equipment

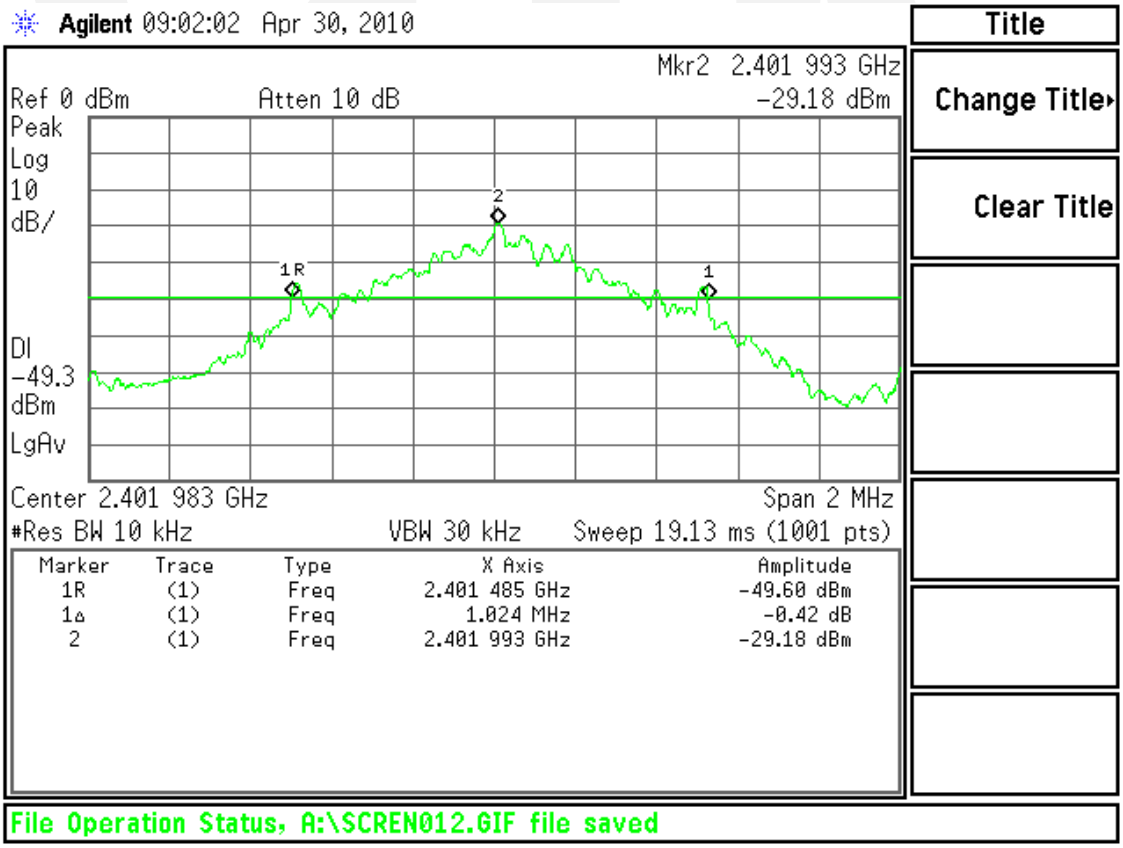
TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
WRLE10435	E4440A	Agilent	Spectrum Analyzer	MY42510439	28 Jul 10

Cal Code B = Calibration verification performed internally.

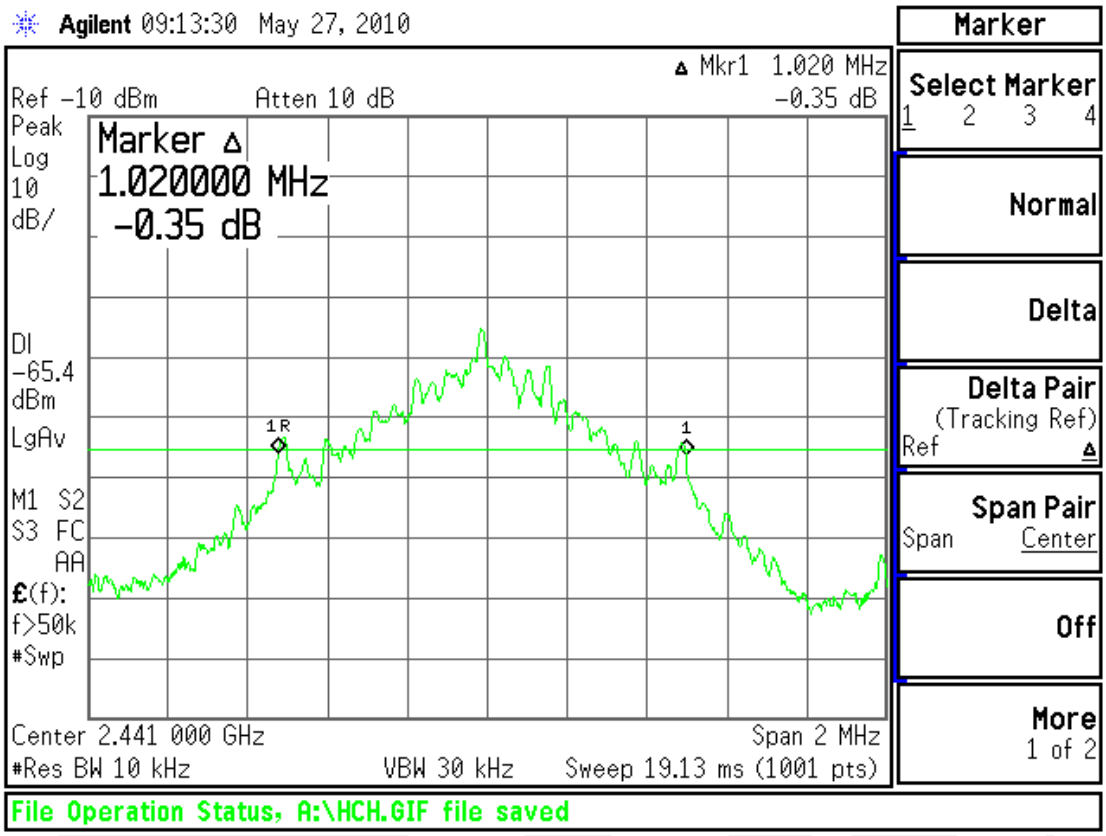
Test limit
No limit specified

Test data

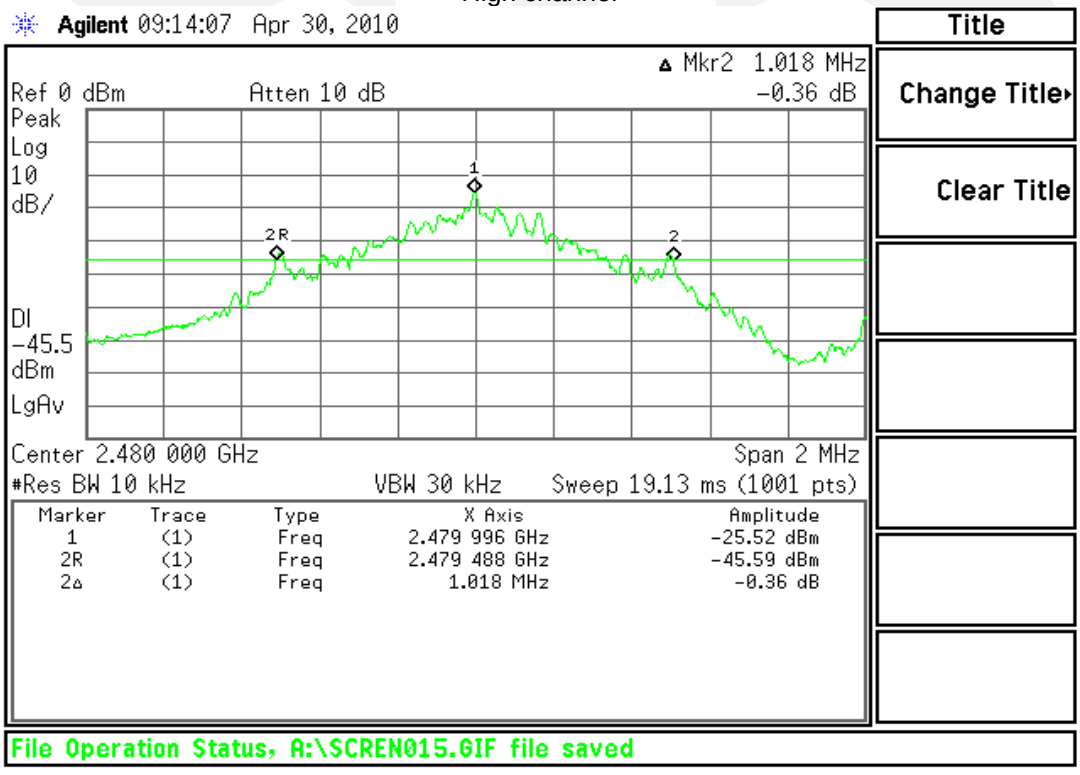
low channel



mid channel



High channel



Maximum peak output power
FCC 15.247(b)(1), IC RSS-210 A8.4 (2)

Test summary
The requirements are: ■ - MET ☐ - NOT MET
The maximum peak output power is 760 μW

Test was performed in accordance with the test procedure of FCC Public Notice DA 00-705 – Alternative Test Procedure – 3 MHz RBW

Test location
■ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Large Test Site - Tech area
☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
OWLE02074	3115	EMCO	Ridge Guide Antenna	2504	09-Feb-11
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Oct-10
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	28-Oct-10

Test limit
1 watt

Test data

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	Peak Output Power (microwatts)	
device antenna gain = 3 dBi or numerical gain of 2						
P = (ED)^2 / 30G, solving for E						
P = watts, E = limit in V/m, D = distance (3), G = antenna numerical gain (2)						
high channel						
device standing upright						
2.48 GHz	63.55 Pk	5.11 / 28.39 / 0.0 / 0.0	97.05	H / 1.09 / 25		n/a
device on left side						
2.48 GHz	63.5 Pk	5.11 / 28.39 / 0.0 / 0.0	97.0	V / 1.09 / 293		n/a
device on its back						
2.48 GHz	61.1 Pk	5.11 / 28.39 / 0.0 / 0.0	94.6	V / 1.15 / 331		n/a
mid channel						
device on its back						
2.441 GHz	62.55 Pk	5.07 / 28.28 / 0.0 / 0.0	95.9	V / 1.45 / 331		n/a
device on left side						
2.441 GHz	61.15 Pk	5.07 / 28.28 / 0.0 / 0.0	94.5	V / 1.10 / 291		n/a
device standing upright						
2.441 GHz	63.75 Pk	5.07 / 28.28 / 0.0 / 0.0	97.1	H / 1.61 / 169	760	n/a
low channel						
device standing upright						
2.402 GHz	61.85 Pk	5.03 / 28.17 / 0.0 / 0.0	95.05	V / 1.16 / 267		n/a
device on left side						
2.402 GHz	61.15 Pk	5.03 / 28.17 / 0.0 / 0.0	94.35	V / 1.14 / 106		n/a
device on its back						

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	Peak Output Power (microwatts)	
2.402 GHz	60.95 Pk	5.03 / 28.17 / 0.0 / 0.0	94.15	V / 1.20 / 342		n/a

Radiated Spurious Emissions
FCC 15.247(d), RSS-210 A8.5

Test summary
The requirements are: ■ - MET ☐ - NOT MET

Fundamental field strength = 97.1 dBuV/m
Maximum spurious radiated emission = 59.25 dBuV/m

Test was performed in accordance with the test procedure of FCC Public Notice DA 00-705

Test location
■ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Large Test Site - Tech area
☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE10435	E4440A	Agilent	Spectrum Analyzer	MY42510439	28 Jul 10
WRLE03203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	04-Jun-10
WRLE10616	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	QA0746005	Code B 23-Oct-10
OWLE02682	85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	03-Feb-11
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Oct-10
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	28-Oct-10
WRLE03978	SL26-3010	Phase One Microwave	Amplifier 18-26.5 GHz	0005	Code B 13-Jun-10
OWLE02074	3115	EMCO	Ridge Guide Antenna	2504	09-Feb-11
OWLE03996	SAS-572	A.H. Systems	STD Gain Horn	183	Code Y
WRLE06717	3116	EMCO	Ridge Guide Ant 18-40 GHz	2005	03-June-10
WRLE10527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B 28-Sep-10

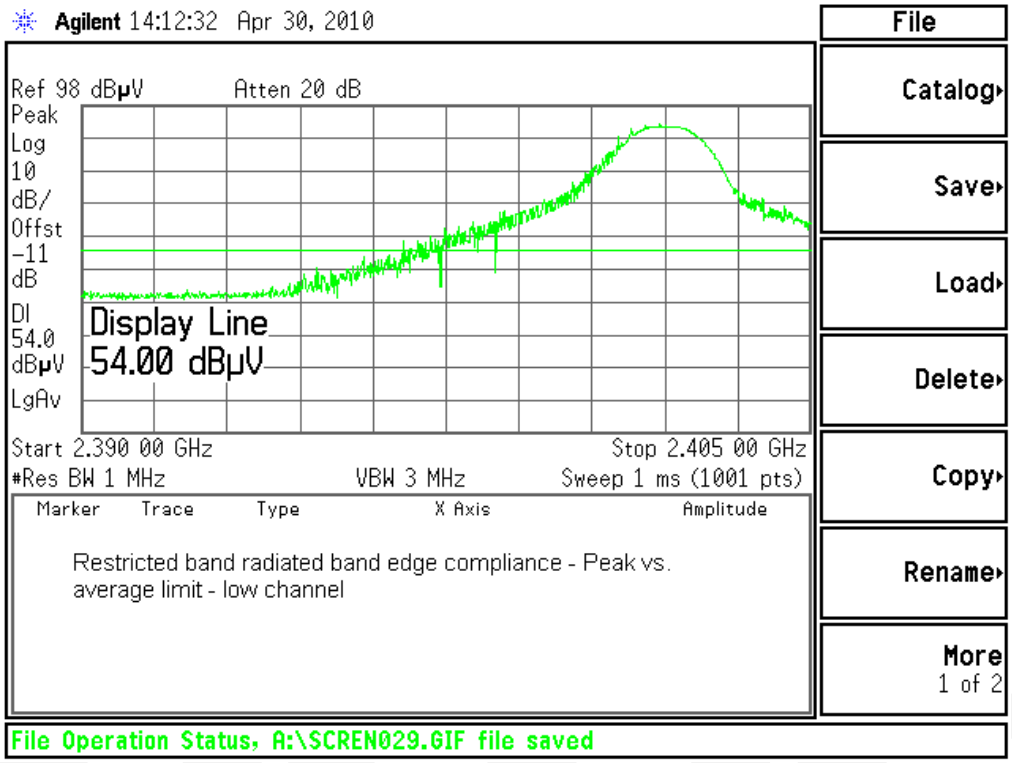
Cal Code B = Calibration verification performed internally.

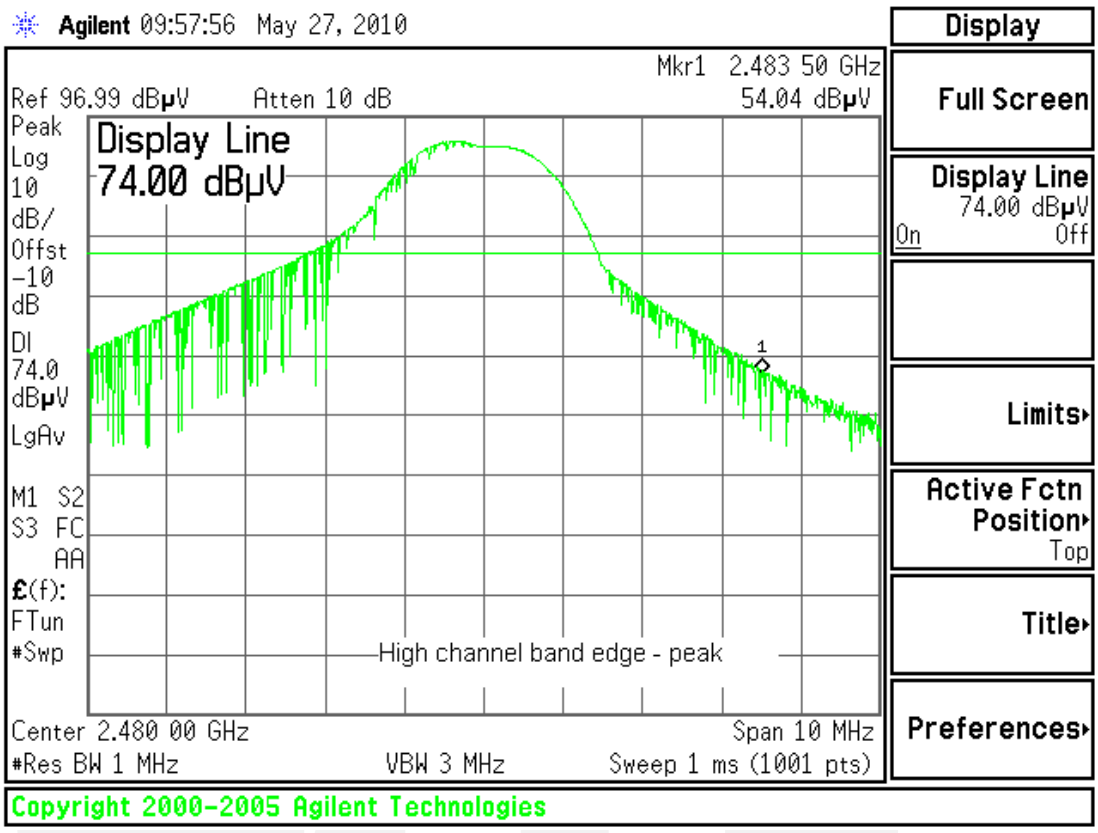
Test limit (in restricted bands)

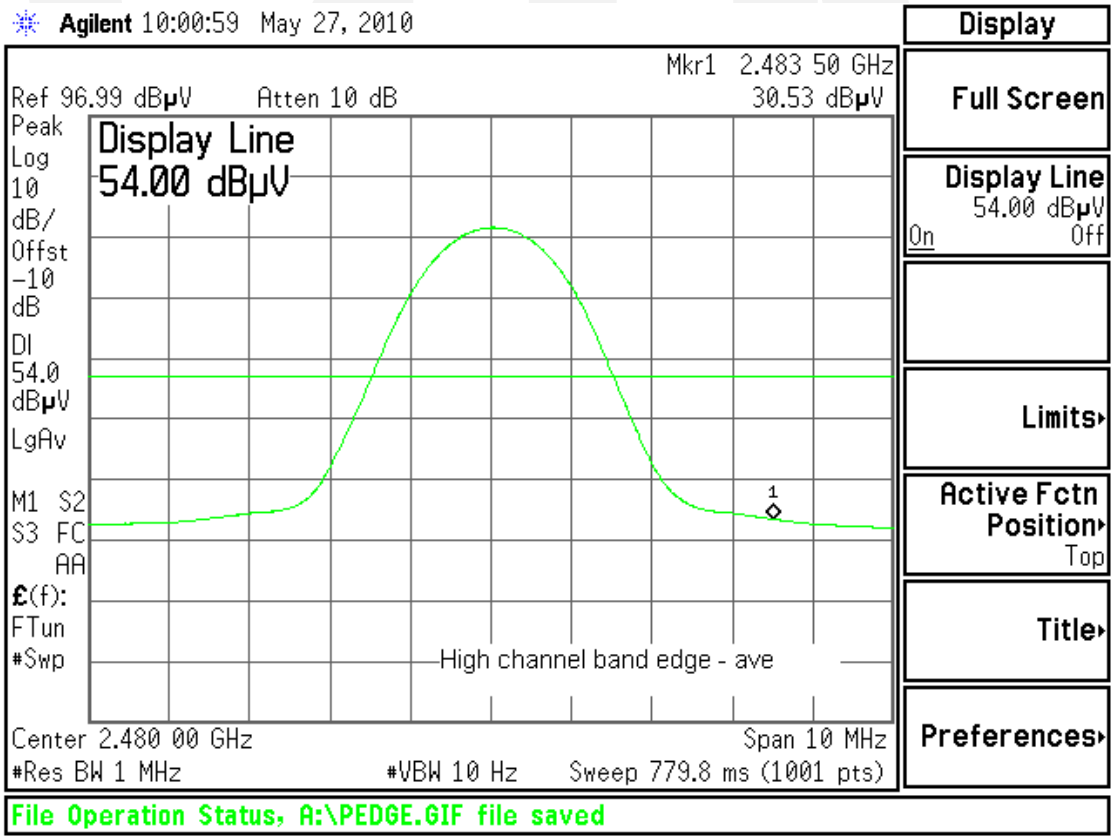
Frequncy (MHz)	Field strength (μV/meter)	Field strength (dBμV/meter)
30 - 88	100 – QP	40.0
88 - 216	150 – QP	43.5
216 - 960	200 – QP	46.0
960-1000	500 – QP	54.0
>1000	500 – AV 5000 – PK	54.0 74.0

Test limit
-20 dBc

Test data
See following pages.


Agilent 14:12:32 Apr 30, 2010
File
Ref 98 dBµV
Atten 20 dB
Peak
Log
10
dB/
Offst
-11
dB
Dl
54.0
dBµV
LgAv
Display Line
54.00 dBµV
Start 2.390 00 GHz
Stop 2.405 00 GHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (1001 pts)
Marker
Trace
Type
X Axis
Amplitude
Restricted band radiated band edge compliance - Peak vs. average limit - low channel
Catalog
Save
Load
Delete
Copy
Rename
More
1 of 2
File Operation Status, A:\SCREN029.GIF file saved


Agilent 09:57:56 May 27, 2010
Mkr1 2.483 50 GHz
Ref 96.99 dBµV
Atten 10 dB
54.04 dBµV
Peak
Log
10
dB/
Offst
-10
dB
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Display Line
74.00 dBµV
High channel band edge - peak
Center 2.480 00 GHz
Span 10 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (1001 pts)
Display
Full Screen
Display Line
74.00 dBµV
On
Off
Limits
Active Fctn
Position
Top
Title
Preferences
Copyright 2000-2005 Agilent Technologies


Agilent 10:00:59 May 27, 2010
Mkr1 2.483 50 GHz
Ref 96.99 dBµV
Atten 10 dB
30.53 dBµV
Peak
Log
10
dB/
Offst
-10
dB
Dl
54.0
dBµV
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Display Line
54.00 dBµV
High channel band edge - ave
Center 2.480 00 GHz
Span 10 MHz
#Res BW 1 MHz
#VBW 10 Hz
Sweep 779.8 ms (1001 pts)
Display
Full Screen
Display Line
54.00 dBµV
On
Off
Limits
Active Fctn
Position
Top
Title
Preferences
File Operation Status, A:\PEDGE.GIF file saved

List of measurements for run #: 3

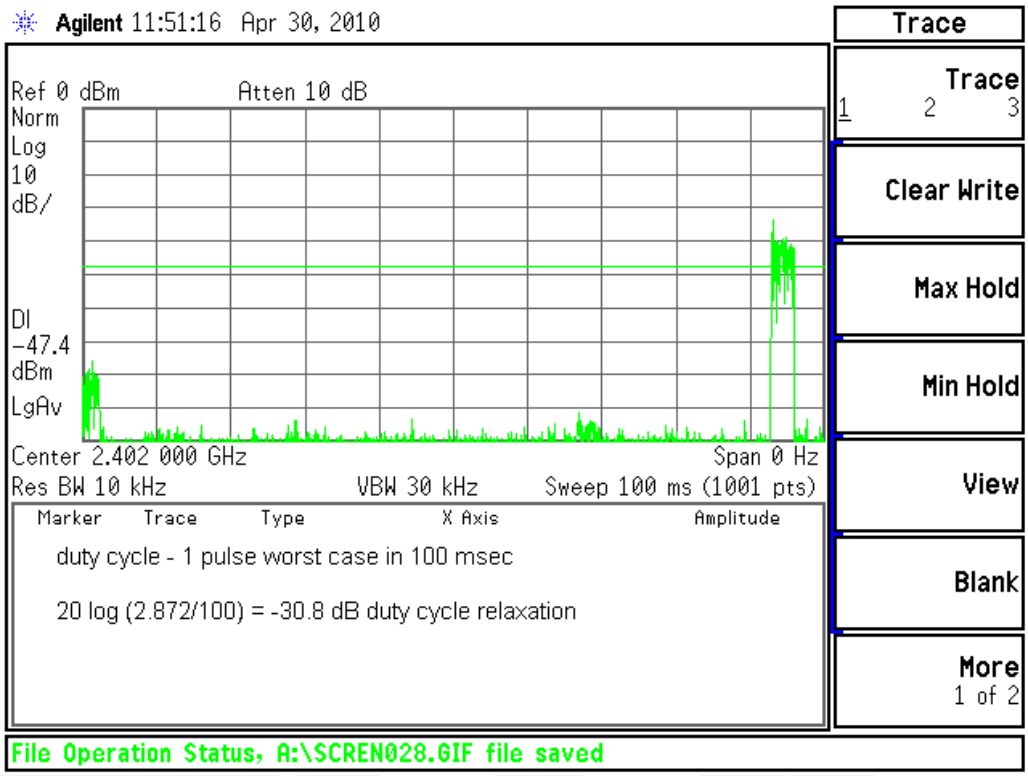
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 EN 55011 B Grp 1 3M
begin scan 30 - 1000 MHz						
bluetooth on mid channel						
46.59 MHz	33.5 Qp	0.48 / 14.7 / 29.68 / 0.0	19.0	V / 1.00 / 0	-21.0	-21.0
56.075 MHz	41.45 Qp	0.55 / 12.35 / 29.67 / 0.0	24.68	V / 1.00 / 0	-15.32	-15.32
481.017 MHz	31.06 Qp	2.1 / 17.31 / 29.35 / 0.0	21.12	V / 1.00 / 0	-24.88	-25.88
maximized						
481.005 MHz	37.09 Qp	2.1 / 17.31 / 29.35 / 0.0	27.15	V / 1.00 / 100	-18.85	-19.85
rotated device 360 degrees, measurement antenna 1-4 meters high, vertical & horizontal						
no other significant emissions detected						
low channel						
46.536 MHz	37.05 Qp	0.48 / 14.72 / 29.68 / 0.0	22.57	V / 1.00 / 0	-17.43	-17.43
72.046 MHz	43.6 Qp	0.68 / 8.68 / 29.66 / 0.0	23.3	V / 1.00 / 0	-16.7	-16.7
120.07 MHz	41.4 Qp	0.98 / 9.35 / 29.61 / 0.0	22.12	V / 1.00 / 0	-21.38	-17.88
408.227 MHz	39.25 Qp	1.92 / 16.23 / 29.43 / 0.0	27.97	V / 1.00 / 0	-18.03	-19.03
432.258 MHz	36.55 Qp	1.98 / 16.68 / 29.4 / 0.0	25.81	V / 1.00 / 0	-20.19	-21.19
456.27 MHz	35.05 Qp	2.04 / 16.74 / 29.31 / 0.0	24.52	V / 1.00 / 0	-21.48	-22.48
481.005 MHz	32.5 Qp	2.1 / 17.31 / 29.35 / 0.0	22.56	V / 1.00 / 0	-23.44	-24.44
504.3 MHz	35.15 Qp	2.16 / 17.98 / 29.38 / 0.0	25.91	V / 1.00 / 0	-20.09	-21.09
481.005 MHz	37.95 Qp	2.1 / 17.31 / 29.35 / 0.0	28.01	V / 1.00 / 90	-17.99	-18.99
high channel						
no other significant emissions detected						
end scan 30 - 1000 MHz						

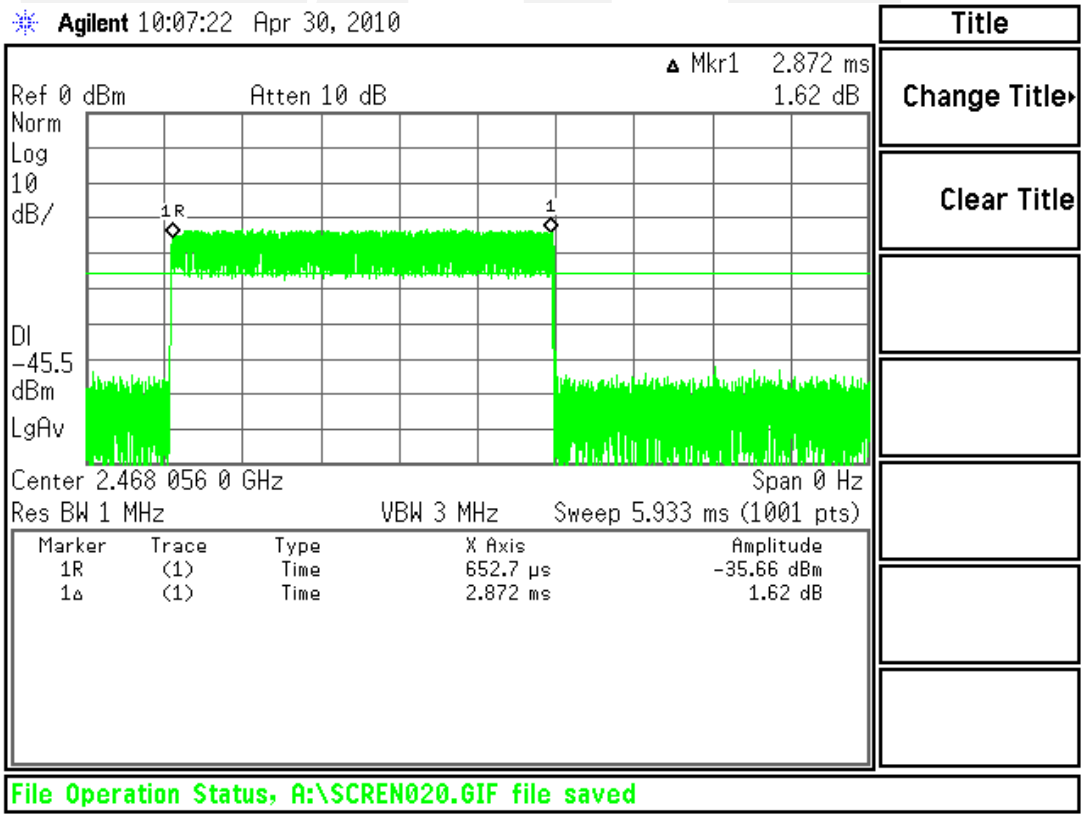
List of measurements for run #: 2

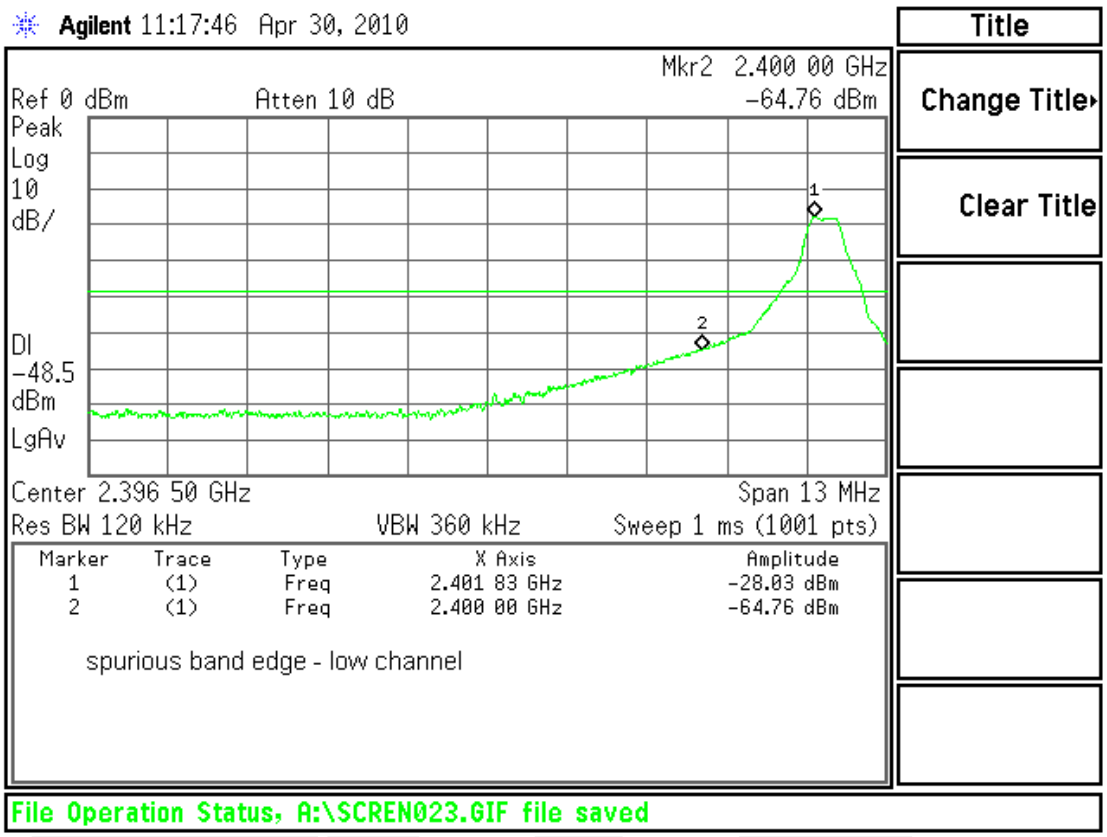
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 bluetooth >1GHz 3m avg	DELTA2 FCC bluetooth 15.247 >1G 3m pk
begin scan 1 - 18 GHz						
Maximized						
device standing upright						
mid channel						
4.882 GHz	55.79 Av	8.81 / 33.15 / 43.09 / 0.23	54.89	H / 1.11 / 212		n/a
4.882 GHz	55.79 Av	8.81 / 33.15 / 43.09 / 0.23	24.09*	H / 1.11 / 212	-29.01	n/a
4.882 GHz	60.15 Pk	8.81 / 33.15 / 43.09 / 0.23	59.25	H / 1.11 / 212	n/a	-14.75
*With duty cycle correction						
high channel						
Maximized						
4.96 GHz	55.32 Av	8.94 / 33.29 / 43.03 / 0.15	54.66	H / 1.04 / 242		n/a
4.96 GHz	55.32 Av	8.94 / 33.29 / 43.03 / 0.15	23.86*	H / 1.04 / 242	-30.14	n/a
4.96 GHz	59.25 Pk	8.94 / 33.29 / 43.03 / 0.15	58.59	H / 1.04 / 242	n/a	-15.41
average values need duty cycle correction						

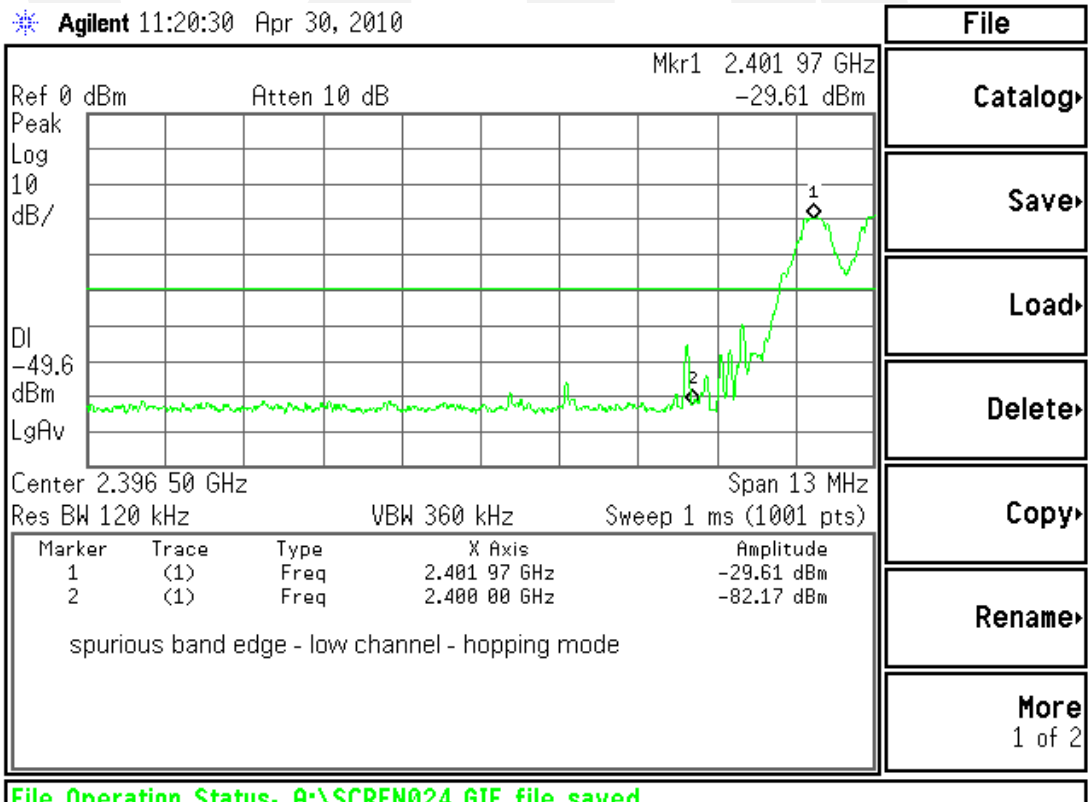
List of measurements for run #: 4

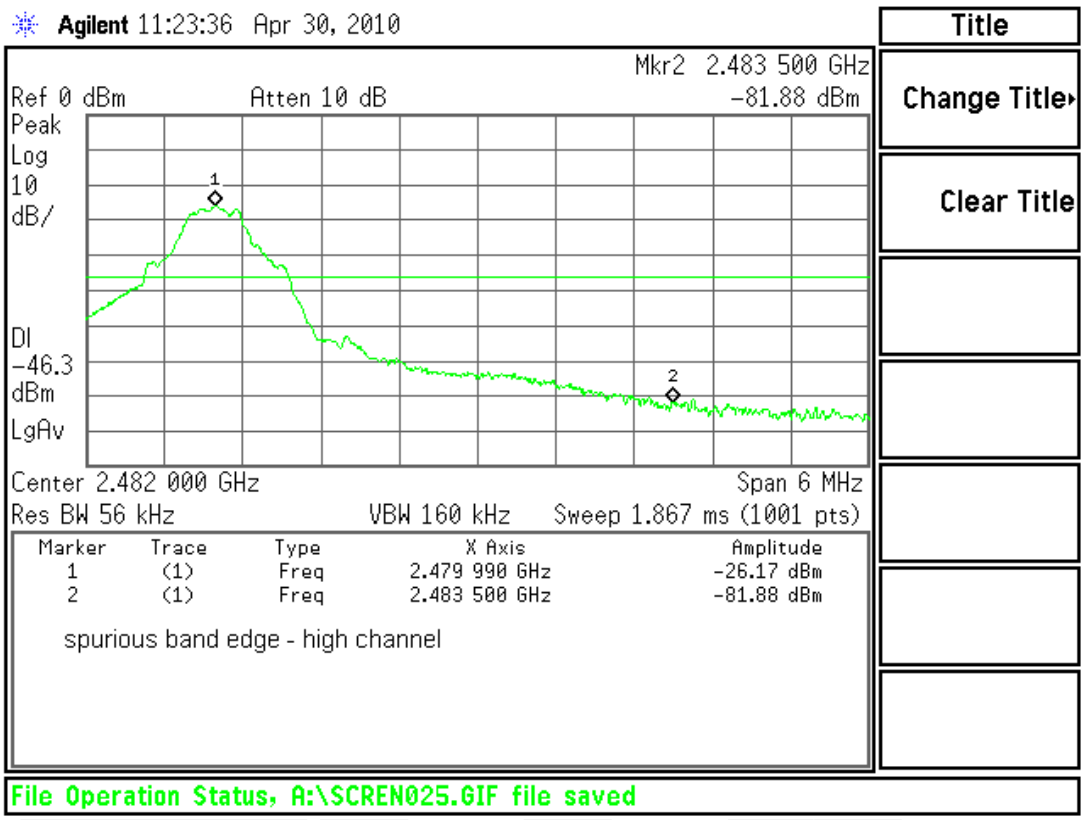
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1G 3 M peak	DELTA2 FCC B >1GHz 3m av
4.804 GHz	59.3 Pk	6.49 / 33.02 / 43.16 / 0.0	55.66	V / 1.10 / 0	-18.34	n/a
4.804 GHz	52.49 Av	6.49 / 33.02 / 43.16 / 0.0	48.85	V / 1.10 / 0	n/a	-5.15
Low channel						
no higher levels up to 25 GHz						

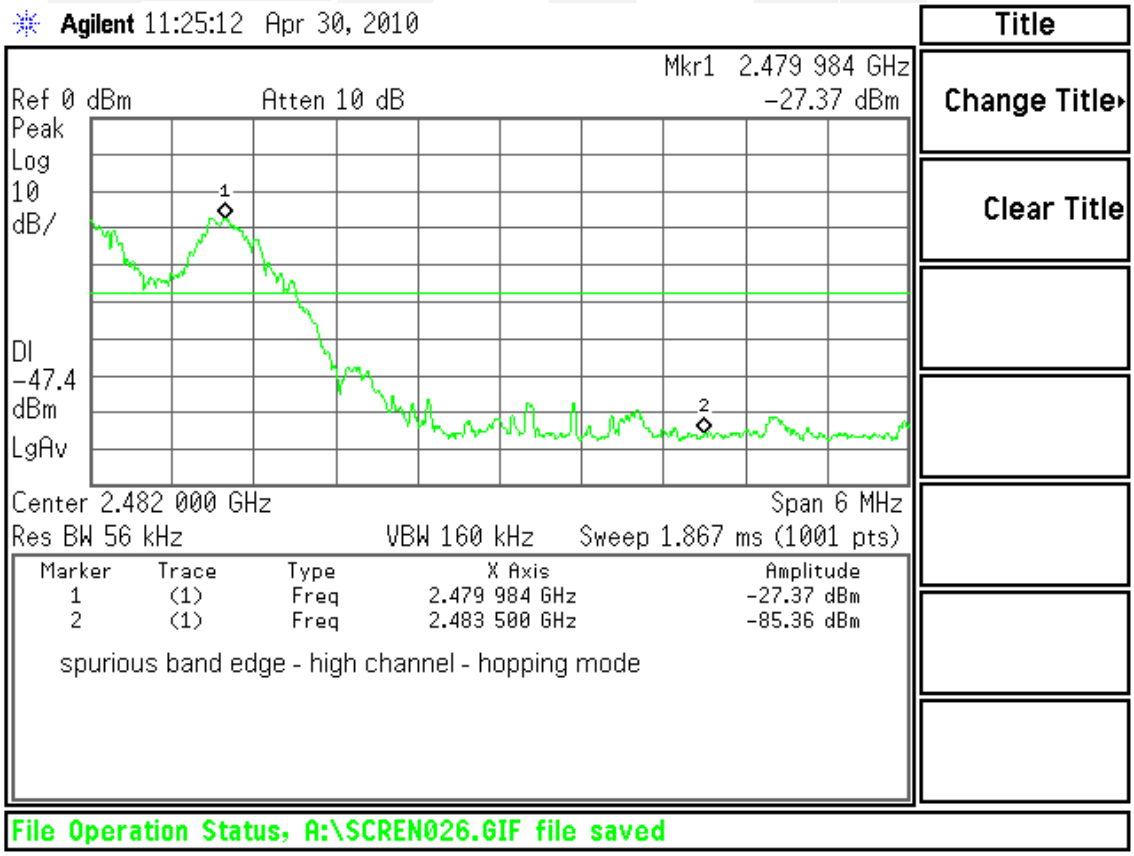

Agilent 11:51:16 Apr 30, 2010
Ref 0 dBm
Atten 10 dB
Norm
Log
10
dB/
Dl
-47.4
dBm
LgAv
Center 2.402 000 GHz
Span 0 Hz
Res BW 10 kHz
VBW 30 kHz
Sweep 100 ms (1001 pts)
Marker Trace Type X Axis Amplitude
duty cycle - 1 pulse worst case in 100 msec
20 log (2.872/100) = -30.8 dB duty cycle relaxation
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
File Operation Status, A:\SCREN028.GIF file saved


Agilent 10:07:22 Apr 30, 2010
Δ Mkr1 2.872 ms
Ref 0 dBm
Atten 10 dB
1.62 dB
Norm
Log
10
dB/
1R
1
Dl
-45.5
dBm
LgAv
Center 2.468 056 0 GHz
Span 0 Hz
Res BW 1 MHz
VBW 3 MHz
Sweep 5.933 ms (1001 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 652.7 µs -35.66 dBm
1Δ (1) Time 2.872 ms 1.62 dB
Title
Change Title
Clear Title
File Operation Status, A:\SCREN020.GIF file saved


Agilent 11:17:46 Apr 30, 2010
Mkr2 2.400 00 GHz
Ref 0 dBm
Atten 10 dB
-64.76 dBm
Peak
Log
10
dB/
Dl
-48.5
dBm
LgAv
Center 2.396 50 GHz
Span 13 MHz
Res BW 120 kHz
VBW 360 kHz
Sweep 1 ms (1001 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.401 83 GHz -28.03 dBm
2 (1) Freq 2.400 00 GHz -64.76 dBm
spurious band edge - low channel
Title
Change Title
Clear Title
File Operation Status, A:\SCREN023.GIF file saved


Agilent 11:20:30 Apr 30, 2010
Mkr1 2.401 97 GHz
Ref 0 dBm
Atten 10 dB
-29.61 dBm
Peak
Log
10
dB/
Dl
-49.6
dBm
LgAv
Center 2.396 50 GHz
Span 13 MHz
Res BW 120 kHz
VBW 360 kHz
Sweep 1 ms (1001 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.401 97 GHz -29.61 dBm
2 (1) Freq 2.400 00 GHz -82.17 dBm
spurious band edge - low channel - hopping mode
File
Catalog
Save
Load
Delete
Copy
Rename
More
1 of 2
File Operation Status, A:\SCREN024.GIF file saved


Agilent 11:23:36 Apr 30, 2010
Mkr2 2.483 500 GHz
Ref 0 dBm
Atten 10 dB
-81.88 dBm
Peak
Log
10
dB/
DI
-46.3
dBm
LgAv
Center 2.482 000 GHz
Span 6 MHz
Res BW 56 kHz
VBW 160 kHz
Sweep 1.867 ms (1001 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.479 990 GHz -26.17 dBm
2 (1) Freq 2.483 500 GHz -81.88 dBm
spurious band edge - high channel
Title
Change Title
Clear Title
File Operation Status, A:\SCREN025.GIF file saved


Agilent 11:25:12 Apr 30, 2010
Mkr1 2.479 984 GHz
Ref 0 dBm
Atten 10 dB
-27.37 dBm
Peak
Log
10
dB/
DI
-47.4
dBm
LgAv
Center 2.482 000 GHz
Span 6 MHz
Res BW 56 kHz
VBW 160 kHz
Sweep 1.867 ms (1001 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.479 984 GHz -27.37 dBm
2 (1) Freq 2.483 500 GHz -85.36 dBm
spurious band edge - high channel - hopping mode
Title
Change Title
Clear Title
File Operation Status, A:\SCREN026.GIF file saved

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage) AC Power Lines

The measurements were performed at the following TÜV SÜD America test location:

☐ **- Test not applicable**

■ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Wild River Shield Room 1 - Anechoic ferrite-lined shielded room (7.3m x 3.7m x 3.7m) or (24' x 12' x 12')
☐ - Wild River Shield Room 2 - Shielded room (3.7m x 3.5m x 2.4m) or (12' x 11.5' x 8')
☐ - Oakwood Lab (Open Area Test Site)
☐ - New Brighton Lab Shielded Room

■ - Tabletop equipment is placed on a non-conducting table 80 centimeters above the floor, 40 centimeters from a vertical ground plane.
☐ - Floor standing equipment is placed directly on the turntable/ground plane.

Test equipment used:

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE02416	3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1437	Code B 06-Jan-11
WRLE02534	ESHS-20	Rohde & Schwarz	EMI Receiver	837055/003	29-Mar-11

Code B = Calibration verification performed internally. Code Y = Calibration not required when used with other calibrated equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak/average detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω/50 μH (CISPR 16-1-1) characteristics.

Test specification:

Frequency - range: ■ - 150 kHz to 30 MHz
EUT Power: ■ - 60 Hz ■ - 110 VAC

Test Results - Conducted emissions 150 kHz - 30 MHz

The requirements are ☐ **- N/A** ■ **- MET** ☐ **- NOT MET**

Minimum margin of compliance (Average) 18 dB at 5.29 MHz

Minimum margin of compliance (Quasi-peak) 24 dB at 5.29 MHz

Maximum margin of non-compliance _____ dB at _____ MHz

Remarks: _____

See the following pages for test data.

CONDUCTED EMISSIONS

Test Report #:	WC1003209 Run 5	Test Area:	LTS		
EUT Model #:	MCT-ZD-001	Date:	4/30/2010		
EUT Serial #:		EUT Power:	110V /60Hz	Temperature:	24.0 °C
Test Method:	FCC 15.247			Air Pressure:	96.0 kPa
Customer:	Corventis			Rel. Humidity:	32.0 %
EUT Description:	Patient monitor.				
Notes:					
Data File Name:	3209.dat			Page:	1 of 5

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
150.0 kHz	33.32 Qp	0.12 / 0.3 / 0.0 / 0.0	33.74	L1	-32.26	n/a
225.0 kHz	25.1 Qp	0.13 / 0.1 / 0.0 / 0.0	25.33	L1	-37.3	n/a
300.0 kHz	20.45 Qp	0.15 / 0.1 / 0.0 / 0.0	20.7	L1	-39.55	n/a
1.62 MHz	26.68 Qp	0.31 / 0.0 / 0.0 / 0.0	26.99	L1	-29.01	n/a
2.05 MHz	24.38 Qp	0.35 / 0.0 / 0.0 / 0.0	24.73	L1	-31.27	n/a
3.02 MHz	21.6 Qp	0.42 / 0.0 / 0.0 / 0.0	22.02	L1	-33.98	n/a
5.29 MHz	35.08 Qp	0.57 / 0.0 / 0.0 / 0.0	35.65	L1	-24.35	n/a
7.99 MHz	22.66 Qp	0.69 / 0.04 / 0.0 / 0.0	23.39	L1	-36.61	n/a
8.21 MHz	30.96 Qp	0.7 / 0.06 / 0.0 / 0.0	31.71	L1	-28.29	n/a
16.96 MHz	22.42 Qp	1.01 / 0.27 / 0.0 / 0.0	23.7	L1	-36.3	n/a
150.0 kHz	11.33 Av	0.12 / 0.3 / 0.0 / 0.0	11.75	L1	n/a	-44.25
225.0 kHz	3.41 Av	0.13 / 0.1 / 0.0 / 0.0	3.64	L1	n/a	-48.99
300.0 kHz	-0.41 Av	0.15 / 0.1 / 0.0 / 0.0	-0.16	L1	n/a	-50.41
1.62 MHz	21.86 Av	0.31 / 0.0 / 0.0 / 0.0	22.17	L1	n/a	-23.83
2.05 MHz	18.74 Av	0.35 / 0.0 / 0.0 / 0.0	19.09	L1	n/a	-26.91
3.02 MHz	15.16 Av	0.42 / 0.0 / 0.0 / 0.0	15.58	L1	n/a	-30.42
5.29 MHz	30.49 Av	0.57 / 0.0 / 0.0 / 0.0	31.06	L1	n/a	-18.94
7.99 MHz	21.18 Av	0.69 / 0.04 / 0.0 / 0.0	21.91	L1	n/a	-28.09
8.21 MHz	29.63 Av	0.7 / 0.06 / 0.0 / 0.0	30.38	L1	n/a	-19.62
16.96 MHz	17.51 Av	1.01 / 0.27 / 0.0 / 0.0	18.79	L1	n/a	-31.21
1.62 MHz	26.76 Qp	0.31 / 0.0 / 0.0 / 0.0	27.07	N	-28.93	n/a
2.05 MHz	25.94 Qp	0.35 / 0.0 / 0.0 / 0.0	26.29	N	-29.71	n/a
3.02 MHz	24.67 Qp	0.42 / 0.0 / 0.0 / 0.0	25.09	N	-30.91	n/a
7.99 MHz	23.16 Qp	0.69 / 0.04 / 0.0 / 0.0	23.89	N	-36.11	n/a
16.96 MHz	23.25 Qp	1.01 / 0.27 / 0.0 / 0.0	24.53	N	-35.47	n/a
1.62 MHz	21.86 Av	0.31 / 0.0 / 0.0 / 0.0	22.17	N	n/a	-23.83
2.05 MHz	20.62 Av	0.35 / 0.0 / 0.0 / 0.0	20.97	N	n/a	-25.03
3.02 MHz	16.77 Av	0.42 / 0.0 / 0.0 / 0.0	17.19	N	n/a	-28.81

Tested by: J. T. Schneider (Printed) _____ (Signature)

Reviewed by: Greg S Jakubowski (Printed) _____ (Signature)

CONDUCTED EMISSIONS

Test Report #:	WC1003209 Run 5	Test Area:	LTS		
EUT Model #:	MCT-ZD-001	Date:	4/30/2010		
EUT Serial #:		EUT Power:	110V /60Hz	Temperature:	24.0 °C
Test Method:	FCC 15.247			Air Pressure:	96.0 kPa
Customer:	Corventis			Rel. Humidity:	32.0 %
EUT Description:	Patient monitor.				
Notes:					
Data File Name:	3209.dat			Page:	2 of 5

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
7.99 MHz	21.43 Av	0.69 / 0.04 / 0.0 / 0.0	22.16	N	n/a	-27.84
16.96 MHz	18.16 Av	1.01 / 0.27 / 0.0 / 0.0	19.44	N	n/a	-30.56

Tested by: J. T. Schneider (Printed) — Joel T. Schneider (Signature)

Reviewed by: Greg S Jakubowski (Printed) — G Jakubowski (Signature)

CONDUCTED EMISSIONS

Test Report #:	WC1003209 Run 5	Test Area:	LTS			
EUT Model #:	MCT-ZD-001	Date:	4/30/2010			
EUT Serial #:		EUT Power:	110V /60Hz	Temperature:	24.0	°C
Test Method:	FCC 15.247			Air Pressure:	96.0	kPa
Customer:	Corventis			Rel. Humidity:	32.0	%
EUT Description:	Patient monitor.					
Notes:						
Data File Name:	3209.dat			Page:	3 of 5	

Measurement summary for limit1: EN55022 B Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 EN55022 B Qp
5.29 MHz	35.08 Qp	0.57 / 0.0 / 0.0 / 0.0	35.65	L1	-24.35
8.21 MHz	30.96 Qp	0.7 / 0.06 / 0.0 / 0.0	31.71	L1	-28.29
1.62 MHz	26.76 Qp	0.31 / 0.0 / 0.0 / 0.0	27.07	N	-28.93
2.05 MHz	25.94 Qp	0.35 / 0.0 / 0.0 / 0.0	26.29	N	-29.71
3.02 MHz	24.67 Qp	0.42 / 0.0 / 0.0 / 0.0	25.09	N	-30.91
150.0 kHz	33.32 Qp	0.12 / 0.3 / 0.0 / 0.0	33.74	L1	-32.26
16.96 MHz	23.25 Qp	1.01 / 0.27 / 0.0 / 0.0	24.53	N	-35.47
7.99 MHz	23.16 Qp	0.69 / 0.04 / 0.0 / 0.0	23.89	N	-36.11
225.0 kHz	25.1 Qp	0.13 / 0.1 / 0.0 / 0.0	25.33	L1	-37.3
300.0 kHz	20.45 Qp	0.15 / 0.1 / 0.0 / 0.0	20.7	L1	-39.55

Tested by: J. T. Schneider (Printed) — Joel T. Schneider (Signature)

Reviewed by: Greg S Jakubowski (Printed) — G Jakubowski (Signature)

CONDUCTED EMISSIONS

Test Report #:	WC1003209 Run 5	Test Area:	LTS		
EUT Model #:	MCT-ZD-001	Date:	4/30/2010		
EUT Serial #:		EUT Power:	110V /60Hz	Temperature:	24.0 °C
Test Method:	FCC 15.247			Air Pressure:	96.0 kPa
Customer:	Corventis			Rel. Humidity:	32.0 %
EUT Description:	Patient monitor.				
Notes:					
Data File Name:	3209.dat			Page:	4 of 5

Measurement summary for limit2: EN55022 B Avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA2 EN55022 B Avg
5.29 MHz	30.49 Av	0.57 / 0.0 / 0.0 / 0.0	31.06	L1	-18.94
8.21 MHz	29.63 Av	0.7 / 0.06 / 0.0 / 0.0	30.38	L1	-19.62
1.62 MHz	21.86 Av	0.31 / 0.0 / 0.0 / 0.0	22.17	L1	-23.83
2.05 MHz	20.62 Av	0.35 / 0.0 / 0.0 / 0.0	20.97	N	-25.03
7.99 MHz	21.43 Av	0.69 / 0.04 / 0.0 / 0.0	22.16	N	-27.84
3.02 MHz	16.77 Av	0.42 / 0.0 / 0.0 / 0.0	17.19	N	-28.81
16.96 MHz	18.16 Av	1.01 / 0.27 / 0.0 / 0.0	19.44	N	-30.56
150.0 kHz	11.33 Av	0.12 / 0.3 / 0.0 / 0.0	11.75	L1	-44.25
225.0 kHz	3.41 Av	0.13 / 0.1 / 0.0 / 0.0	3.64	L1	-48.99
300.0 kHz	-0.41 Av	0.15 / 0.1 / 0.0 / 0.0	-0.16	L1	-50.41

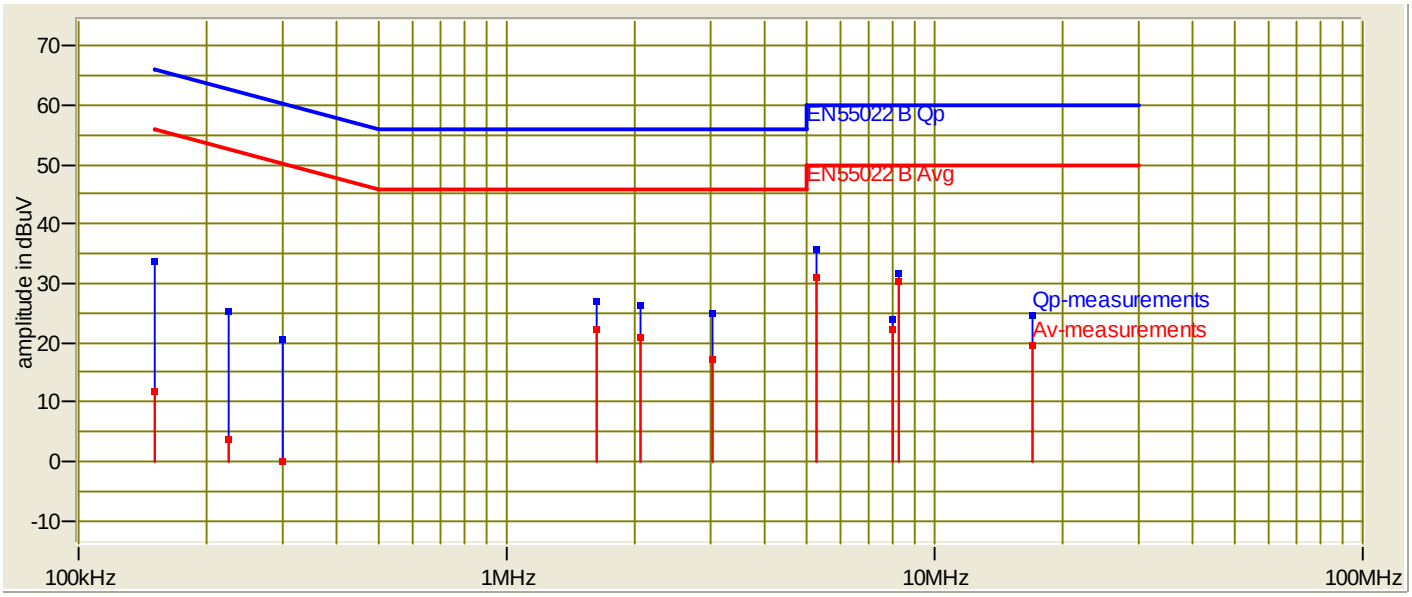
Tested by: J. T. Schneider (Printed) _____ (Signature)

Reviewed by: Greg S Jakubowski (Printed) _____ (Signature)

CONDUCTED EMISSIONS

Test Report #:	WC1003209 Run 5	Test Area:	LTS		
EUT Model #:	MCT-ZD-001	Date:	4/30/2010		
EUT Serial #:		EUT Power:	110V /60Hz	Temperature:	24.0 °C
Test Method:	FCC 15.247			Air Pressure:	96.0 kPa
Customer:	Corventis			Rel. Humidity:	32.0 %
EUT Description:	Patient monitor.				
Notes:					
Data File Name:	3209.dat			Page:	5 of 5

Graph:



Tested by: J. T. Schneider (Printed) _____ (Signature)

Reviewed by: Greg S Jakubowski (Printed) _____ (Signature)

TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Large Test Site

Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.

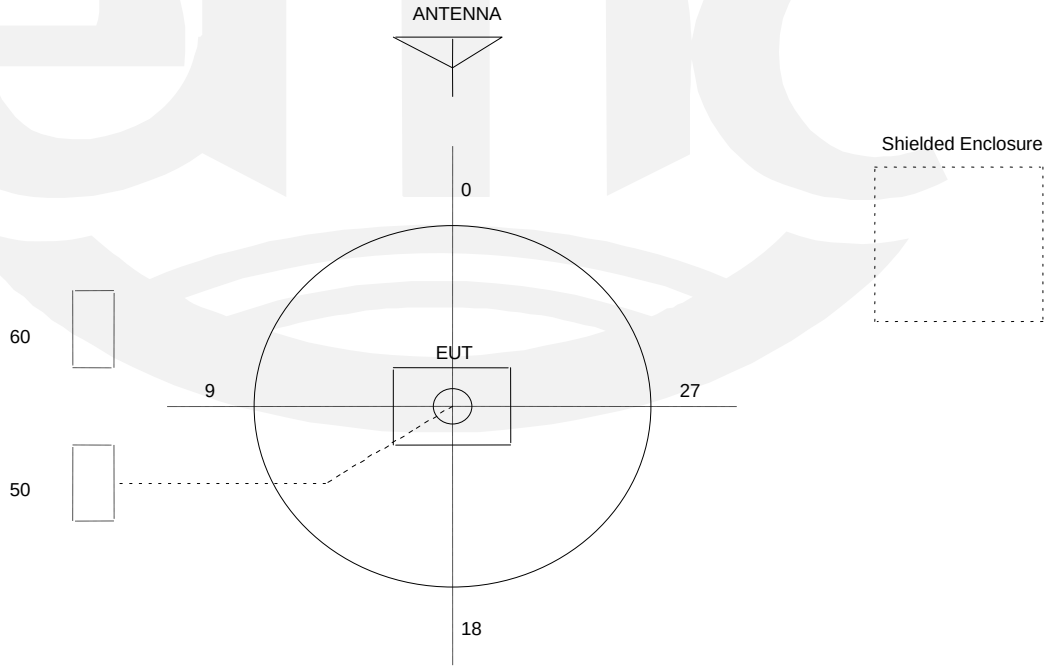
2. 50 Hz and 60 Hz are power panels for alternating current.

3. The antenna may be positioned horizontally 3 and 10 meters from the center of the turntable.

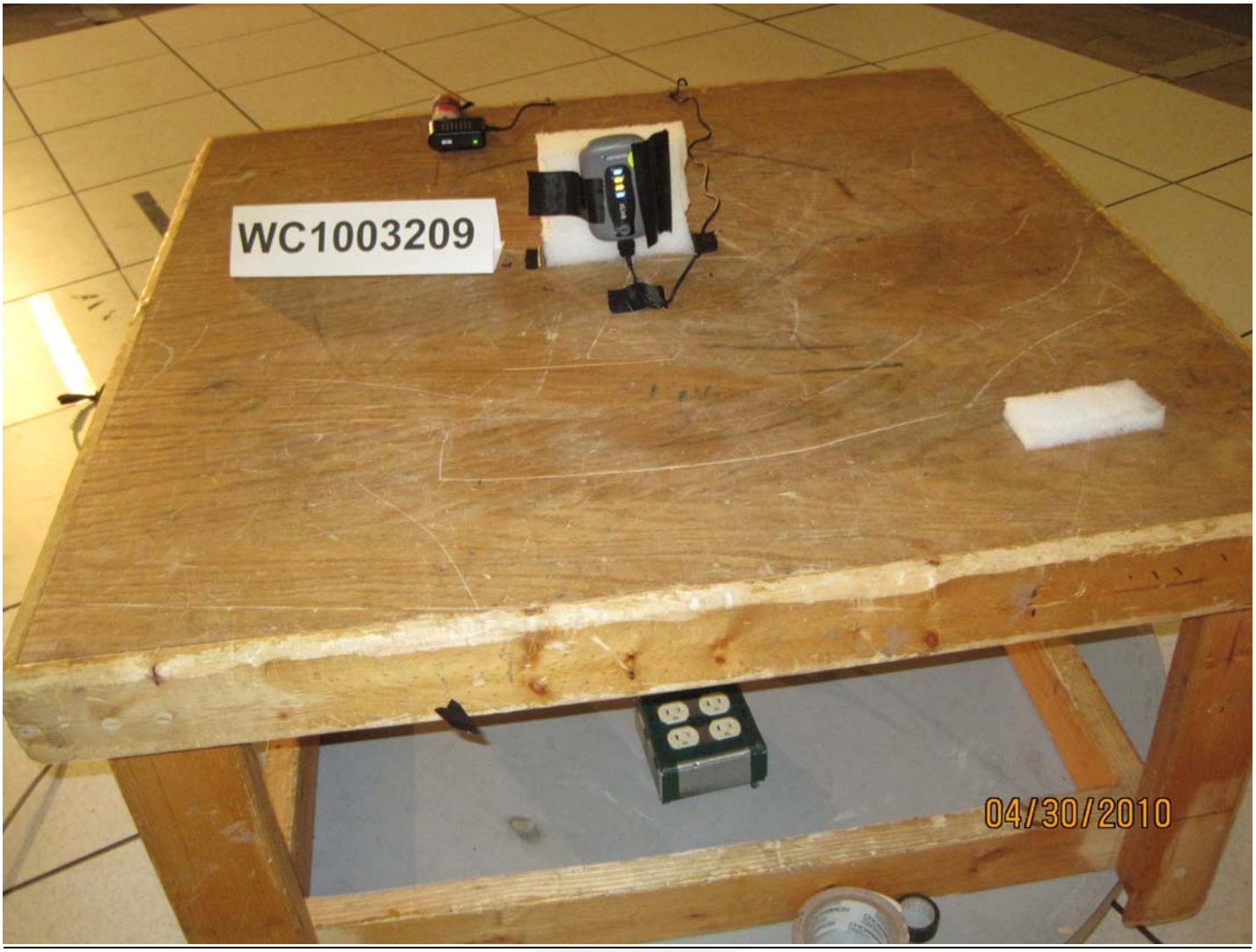
4. The circle is either a 6.7 meter or 1.2 meter diameter turntable.

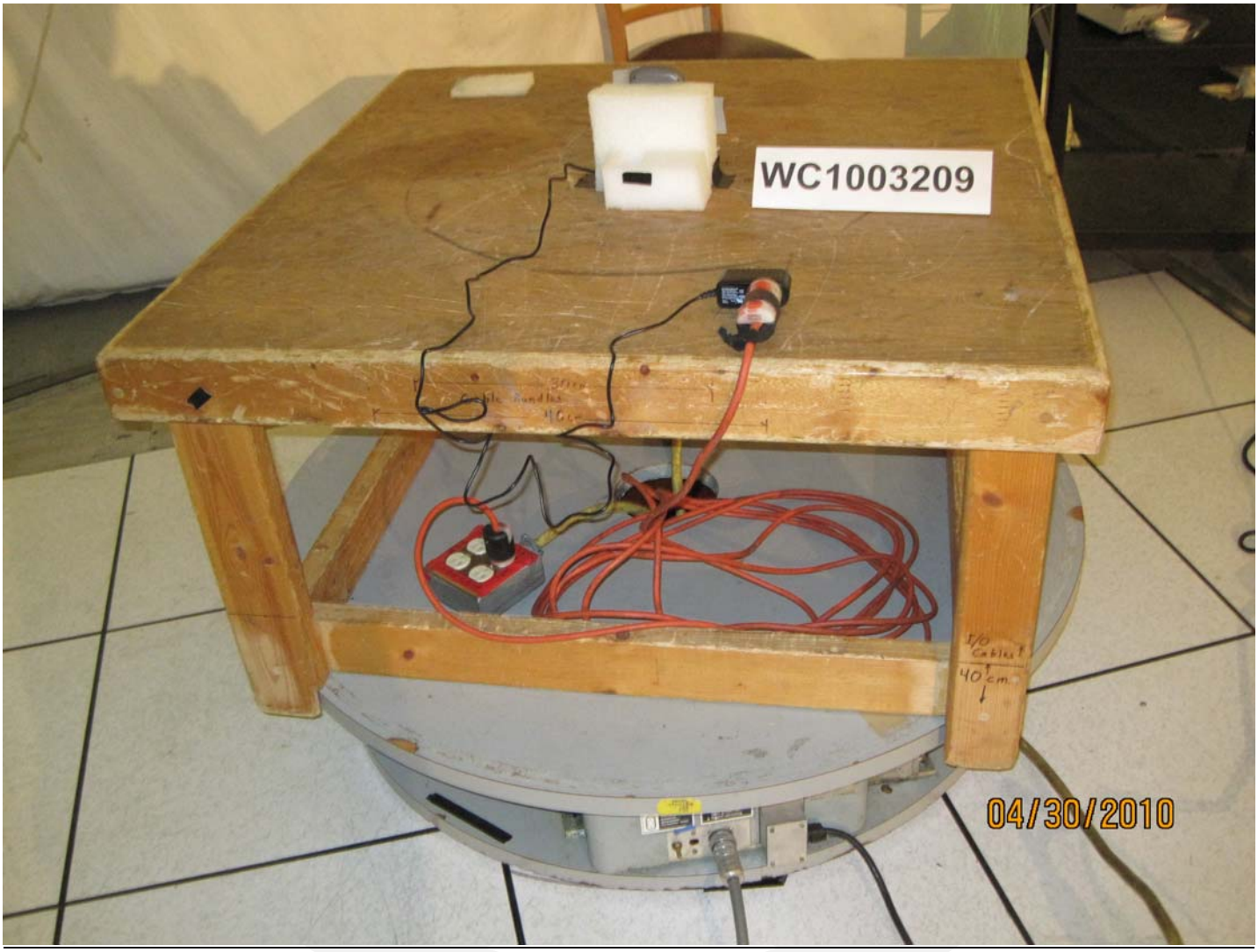
5. A ground plane is in the plane of this sheet.

6. The test sample is shown in the azimuthal position representing zero degrees.



Test-setup photo(s):
Radiated emissions




WC1003209
I/O Cables
40 cm.
04/30/2010

Test-setup photo(s):
Conducted emissions

Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during immunity testing:

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

☐ - Normal operating mode

■ - Transmit frequency locked at low, mid or high channel as needed

■ - Both unmodulated & modulated as needed

Configuration of the device under test:

■ - See Appendix A and test setup photo(s)

☐ - See Product Information Form(s) in Appendix B

DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

Modifications required to pass:

■ None
☐ As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

■ None
☐ As indicated in the Test Plan

SUMMARY:

The requirements according to the technical regulations are

■ - met and the device under test does fulfill the general approval requirements.
☐ - **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date:	26 April 2010
Condition of EUT:	Normal
Testing Start Date:	26 April 2010
Testing End Date:	27 May 2010

TÜV SÜD AMERICA INC

Greg S Jakubowski
Senior EMC Technician

Joel T Schneider
Senior EMC Engineer

Appendix A

Constructional Data Form

and

Block Diagram

Form

EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company:	Corventis , Inc		
Address:	1410 Energy Park Dr # 1,		
	St Paul, MN 55108-5249		
Contact:	Krishna Sridharan	Position:	Director, Engineering
Phone:	651-925-3804	Fax:	651.389.3251
E-mail Address:	krishna.sridharan@corventis.com		

General Equipment Description -- ***NOTE: This information will be input into your test report as shown below.***

EUT Description	Gen 1 Gateway is a communications device, used in patient monitoring system. It is capable of receiving data from a single adherent device, known as patient patch via Blue tooth, store the data in the gateway and transmit the stored data to a server via GSM/GPRS network.
EUT Name	Gen1 Gateway
Model No.:	MCT-ZD-001
Serial No.:	Various --- See individual test reports.
Product Options:	Not applicable
Configurations to be tested:	GPRS/GSM

Equipment Modification (*If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)*

Modifications since last test:	NA
Modifications made during test:	NA.

Test Objective(s): ***Please indicate the tests to be performed, entering the applicable standard(s) where noted.***

- ☐ EMC Directive 2004/108/EC (EMC) Std: ____
- ☐ Machinery Directive 89/392/EEC (EMC) Std: ____
- ☐ Medical Device Directive 93/42/EEC (EMC) Std: ____
- ☐ Vehicle Directive: ☐ 2001/3/EC (EMC) ☐ 2004/104/EC (EMC) ☐ Other Vehicle Std: ____
- ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

- ☒ FCC: Class ☐ A ☒ B Part 15
- ☐ VCCI: Class ☐ A ☐ B
- ☐ BSMI: Class ☐ A ☐ B (Separate Report)
- ☐ Canada: Class ☐ A ☒ B
- ☐ Australia: Class ☐ A ☐ B
- ☐ Other: ____

EMC Test Plan and Constructional Data Form

Third Party Certification, if applicable (*Signature on Page 6 Required)

- ☐ Attestation of Conformity (AoC)*
- ☐ Statement of Compliance (previously CoC)*
- ☐ EMC Certification (used with Octagon Mark)*
- ☐ Compliance Document*

Protection Class (N/A for vehicles) ☐ Class I ☐ Class II ☐ Class III

(Press **F1** when field is selected to show additional information on Protection Class.)

- ☒ FCC / TCB Certification
- ☐ E-Mark Certification
- ☐ Industry Canada / FCB Certification
- ☐ Taiwan Certification

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Failure - *Complete this section if testing will not be attended by the customer.*

If a failure occurs, TÜV SÜD America should:

- ☒ Call contact listed above, if not available then stop testing. (After hrs phone): 763 360 9829
- ☐ Continue testing to complete test series.
- ☐ Continue testing to define corrective action.
- ☐ Stop testing.

EUT Specifications and Requirements

Length: 118 mm Width: 70 mm Height: 19 mm Weight: 90.7 grams

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 100-240 V, 50-60 Hz (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 5 mA

Current (Amps/phase(nominal)): 1 mA

Other: The above current calculations assume line powered (120 V) with a discharged battery. The device is battery powered with a charger for recharging.

Other Special Requirements

None

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
Residential

EUT Power Cable

- ☐ Permanent OR ☒ Removable — Length (in meters): 1.8
- ☐ Shielded OR ☒ Unshielded
- ☐ Not Applicable

EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables

Type	Analog	Digital	Active (During Test)	Passive (During Test)	Qty	Shielding: Yes	Shielding: No	Shielding: Type	Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent
EXAMPLE: *RS232*	☐	☒	☒	☐	*2*	☒	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒	☐
ST40-10S-CVR (80) HIROSE 10 PIN connector	☒	☐	☒	☐	1	☐	☒		10 pin connector	HIROSE	NA	1.8	☒	☐
	☐	☐	☐	☐		☐	☐	NA					☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: Various (see description below)

Description: The following versions support Normal operation modes;

The following versions were used to support RF emissions testing (Bluetooth chip test modes):

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Normal operation mode (in battery mode)

2. Normal operation mode (wall powered mode) with Charger

3.

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #
PEI GENESIS	FW7333M/05	SN C6	
Gen1 Gateway	ZLINK	0947G00561	

EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc) This information is required for FCC & Taiwan testing.

Description	*Model #*	*Serial #*	*FCC ID #*
PIC32 System board	P00512-001	Various	
Toshiba Laptop	Satellite L455D	X9190158K	TX2RTL8187SE

Oscillator Frequencies

Manufacturer	*Frequency*	*Derived Frequency*	*Component # / Location*	*Description of Use*
CRYSTAL 13MHZ 18PF 5X3.2 SMD	13 MHz	13 MHz	Y1	Crystal for BT module

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
PEI GENESIS	FW7333M/05	SN C6	☒ Switched-mode: (Frequency) Not specified ☐ Linear ☐ Other:
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*
None		

EMC Test Plan and Constructional Data Form

Critical EMI Components (Capacitors, ferrites, etc.)

Description	*Manufacturer*	*Part # or Value*	*Qty*	*Component # / Location*
None				

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

Decoupling capacitors and multilayer board design to suppress noise.

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

Authorization (Signature Required if a Third Party Certification is checked on pg 1)

	09/12/2009
Customer authorization to perform tests according to this test plan.	Date
Krishna Sridharan	09/12/2009
Test Plan/CDF Prepared By (please print)	Date

Appendix B

Measurement Protocol

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emission testing is performed according to the procedures in ANSI C63.4-2003.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ±1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ±4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Conducted Emissions

A coax cable was mounted to the PCB instead of the antenna. Measurements were made by connecting directly to a spectrum analyzer. Coax loss was corrected for by applying a 0.6 dB offset to the analyzer.

Radiated Emissions

The final level, in dBμV/m, equals the reading from the spectrum analyzer (Level dBμV), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A. Intentional radiators are rotated through 3 orthogonal axes to determine the test position yielding the maximum emission levels.

Example:

FREQ	LEVEL		CABLE/ANT/PREAMP			FINAL	POL/HGT/AZ			DELTA1
(MHz)	(dBuV)		(dB)	(dB/m)	(dB)	(dBuV/m)		(m)	(deg)	
60.80	42.5Qp	+	1.2	+ 10.9	- 25.5 =	29.1	V	1.0	0.0	-10.9

.

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

DETAILS OF TEST PROCEDURES

Radiated Emissions

Radiated emissions in the frequency range of 10kHz to 30 MHz, including the fundamental transmit signal, are measured using a receiver capable of quasi-peak and average measurements and a magnetic loop antenna. The transmitter is rotated through 3 orthogonal axes in order to determine the maximum emission levels. If the signal cannot be measured at the specified limit distance, measurements are recorded at multiple distances nearer to the device and the final level mathematically extrapolated. Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.