

# TEST RESULT SUMMARY

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

MANUFACTURER'S NAME	Wallace Technologies, LLC.
NAME OF EQUIPMENT	Vu Qube, Mobile Satellite TV Antenna Wireless Remote
MODEL NUMBER(S) TESTED	VQV10RP
MANUFACTURER'S ADDRESS	8300 89 <sup>th</sup> Avenue North Brooklyn Park MN 55445
TEST REPORT NUMBER	WC703793.1
TEST DATE(S)	04 - 15 June 2007

According to testing performed at TÜV SÜD America Inc, the above mentioned unit is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 15 Subpart C Section 15.247 and IC RSS-210 Issue 7.

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.

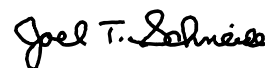
TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Section 15.247 *"Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz; General requirements."* and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

Date: 17 August 2007

Location: Taylors Falls MN  
USA



Greg Jakubowski  
Senior EMC Technician



Joel Schneider  
Senior EMC Engineer

Not Transferable

# EMC TEST REPORT

Test Report File No. : **WC703793.1** Date of issue: **17 August 2007**

Model / Serial No(s) Tested : **VQV10RP / ---**

Product Type : **Vu Qube, Mobile Satellite TV Antenna wireless remote**

Applicant : **Wallace Technologies, LLC**

Manufacturer : **Wallace Technologies, LLC**

License holder : **Wallace Technologies, LLC**

Address : **8300 89<sup>th</sup> Avenue North  
Brooklyn Park MN 55445**

Test Result : ☒ **Positive** ☐ **Negative**

Test Project Number  
References : **WC703793.1**

Total pages including  
Appendices : **46**

*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.*

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*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.*

## D I R E C T O R Y

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### Sign Explanations:

- ☐ - not applicable
- ☒ - applicable

## EMC TEST REGULATIONS:

The tests were performed according to the following regulations :

- ☐ - EN 50081-1 / 1991
- ☐ - EN 55014-2: 1997 + Amendment A1: 2001 - Category \_\_\_\_
- ☐ - EN 55024: 1998 + Amendments A1: 2001 + A2: 2003
- ☐ - EN 60601-1-2: 2001
- ☐ - EN 61000-6-1: 2001
- ☐ - EN 61000-6-2: 2001
- ☐ - EN 61326: 1997 + Amendments A1: 1998 + A2: 2001 + A3: 2003
- ☐ - EN 61800-3: 1996 + Amendment A11: 2000
- ☐ - ETS 300 683: 1997
- ☐ - ETS 300 683: 1997
- ☐ - ETSI EN 301 489-3 V1.4.1: 2002
- ☐ - EN 300 220-3 V1.1.1
- ☐ - EN 300 330-2 V1.1.1
- ☐ - FCC Part 15 Subpart C Section 15.207
- ☐ - FCC Part 15 Subpart C Section 15.209
- ☒ - FCC Part 15 Subpart C Section 15.247
- ☐ - FCC Part 15 Subpart C Section 15.249
- ☒ - IC RSS-210 Issue 7
- ☐ - IC RSS-Gen Issue 1
- ☐ - IC RSS-Gen Issue 1

## ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 23 - 24 °C
Atmospheric pressure	: 98 - 99 kPa
Relative Humidity	: 35 - 75 %

## POWER SUPPLY UTILIZED

Power supply system : 13 VDC

## 6 dB Bandwidth

FCC 15.247(a)(2), IC RSS-210 A8.1(2)

### Test summary

The requirements are: ■ - MET □ - NOT MET

The minimum 6 dB bandwidth = 834 kHz

### Test location

■ - Wild River Lab Large Test Site (Open Area Test Site)

□ - Wild River Lab Small Test Site (Open Area Test Site)

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3371	E4440A	Agilent	Spectrum Analyzer	MY43362222	29 Nov 07
3844	61697	---	High Frequency SMA cable	---	Code B

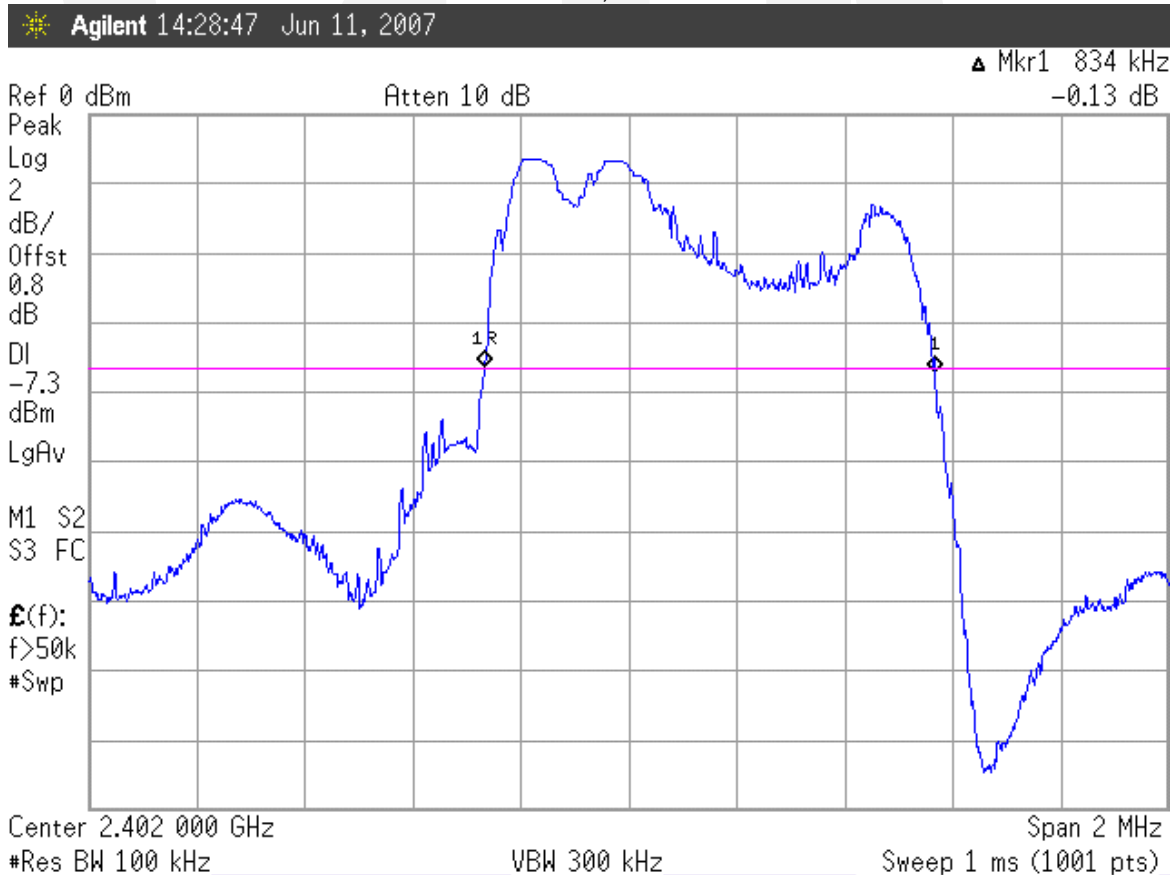
Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

### Test limit

Minimum 500 kHz

### Test data

6 dB Bandwidth, Low channel



6 dB Bandwidth, mid channel

Agilent 14:31:40 Jun 11, 2007

▲ Mkr1 838 kHz  
0.19 dB

Ref 0 dBm

Atten 10 dB

Peak

Log

2

dB/

Offst

0.8

dB

DI

-7.8

dBm

LgAv

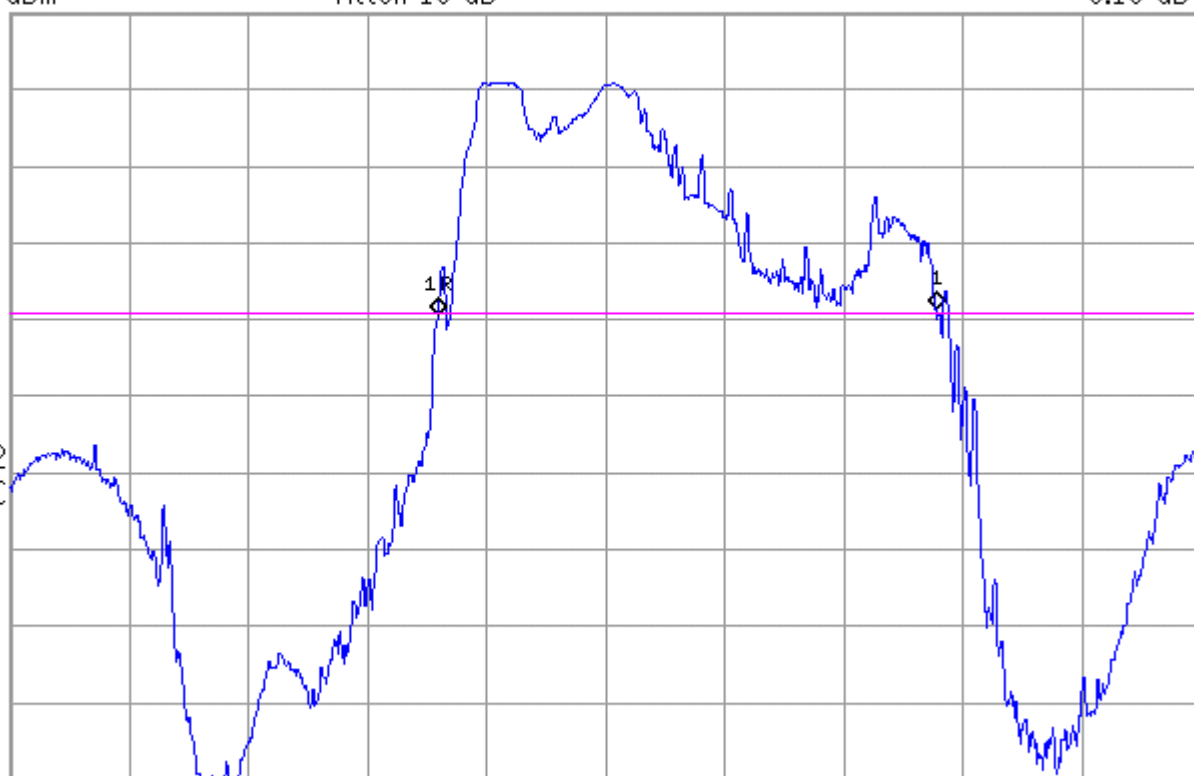
M1 S2

S3 FC

$\mathcal{E}(f)$ :

f>50k

#Swp



Center 2.435 000 GHz

Span 2 MHz

#Res BW 100 kHz

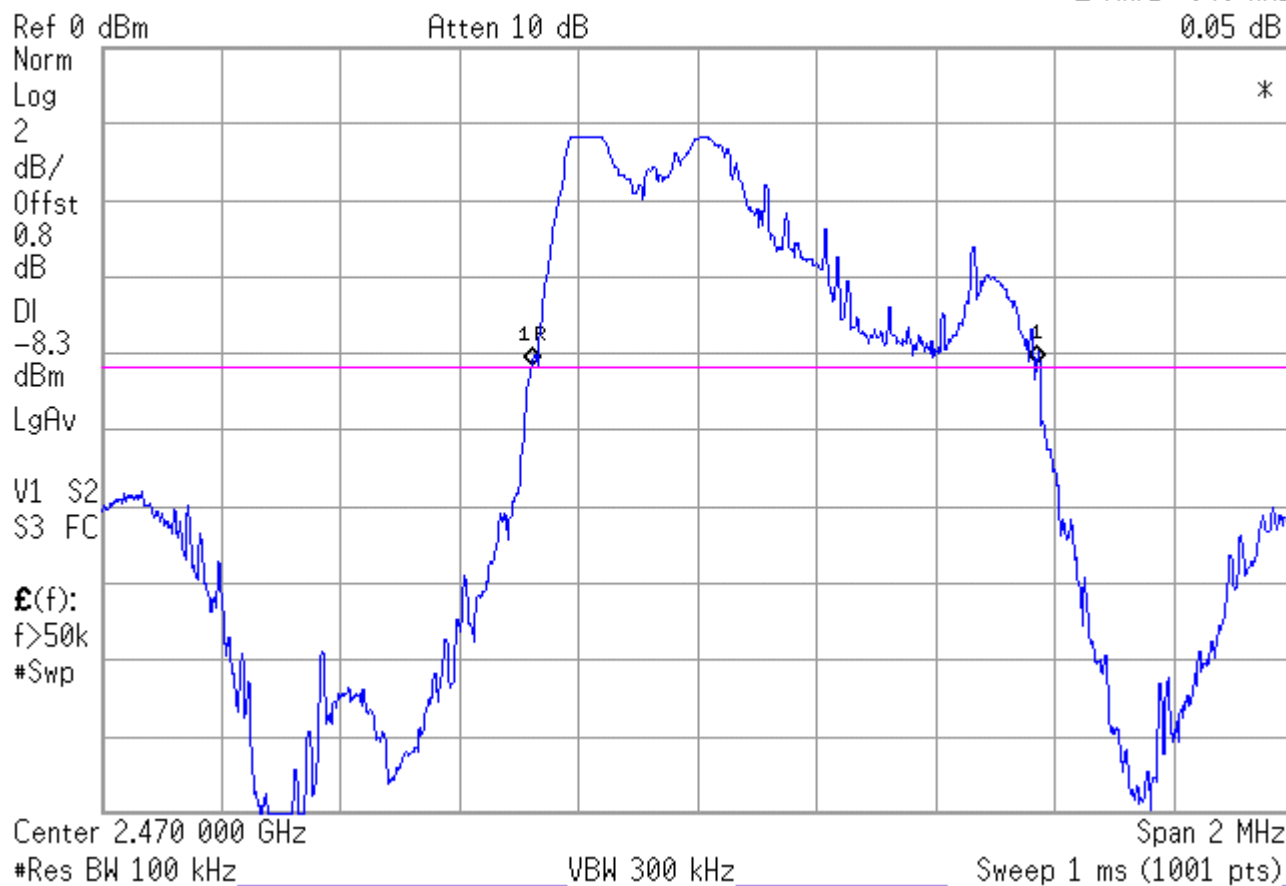
VBW 300 kHz

Sweep 1 ms (1001 pts)

6 dB Bandwidth, high channel

Agilent 14:23:28 Jun 11, 2007

▲ Mkr1 848 kHz  
0.05 dB



## Maximum peak output power

### FCC 15.247(b)(3), IC RSS-210 A8.4(4)

#### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Maximum peak output power = -1.35 dBm = 733 mW

#### Test location

☒ - Wild River Lab Large Test Site (Open Area Test Site)

☐ - Wild River Lab Small Test Site (Open Area Test Site)

#### Test equipment

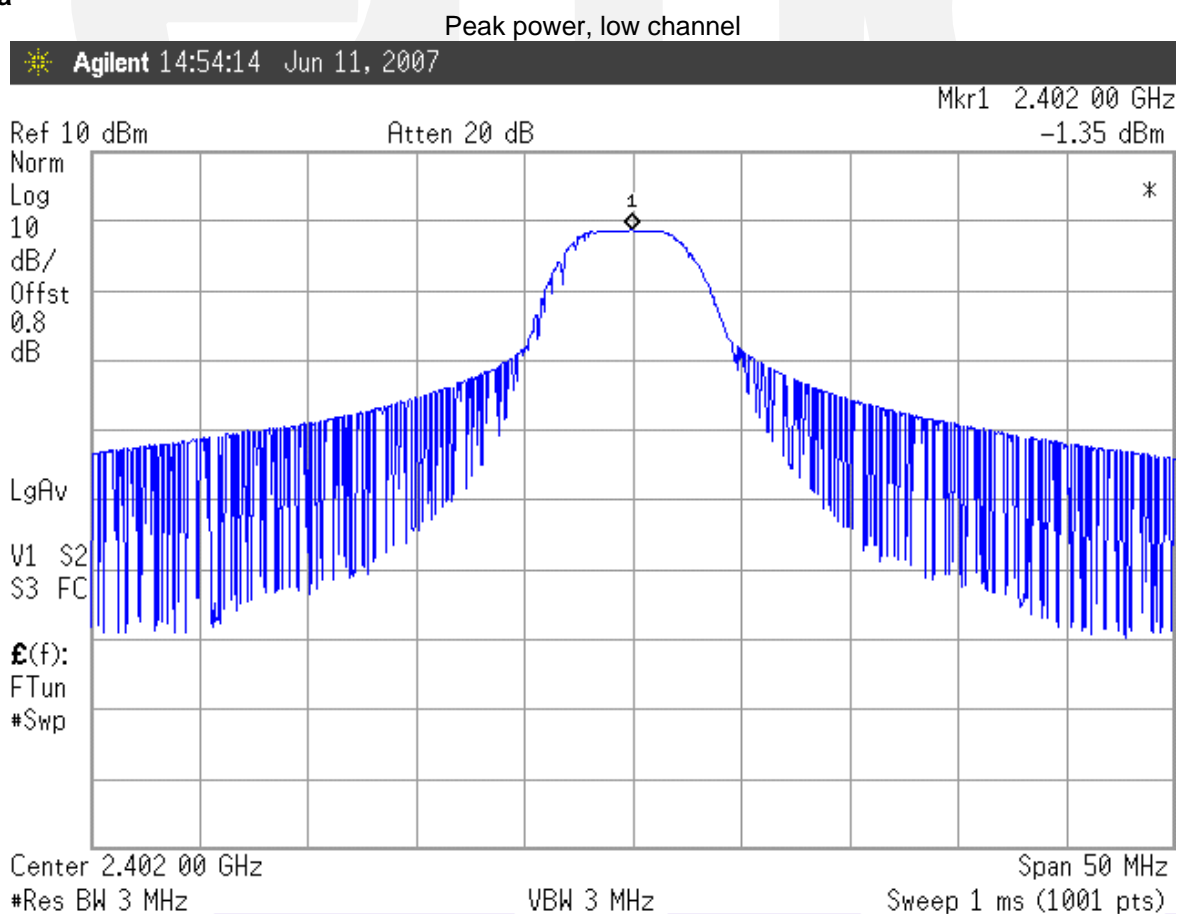
TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3371	E4440A	Agilent	Spectrum Analyzer	MY43362222	29 Nov 07
3844	61697	---	High Frequency SMA cable	---	Code B

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

#### Test limit

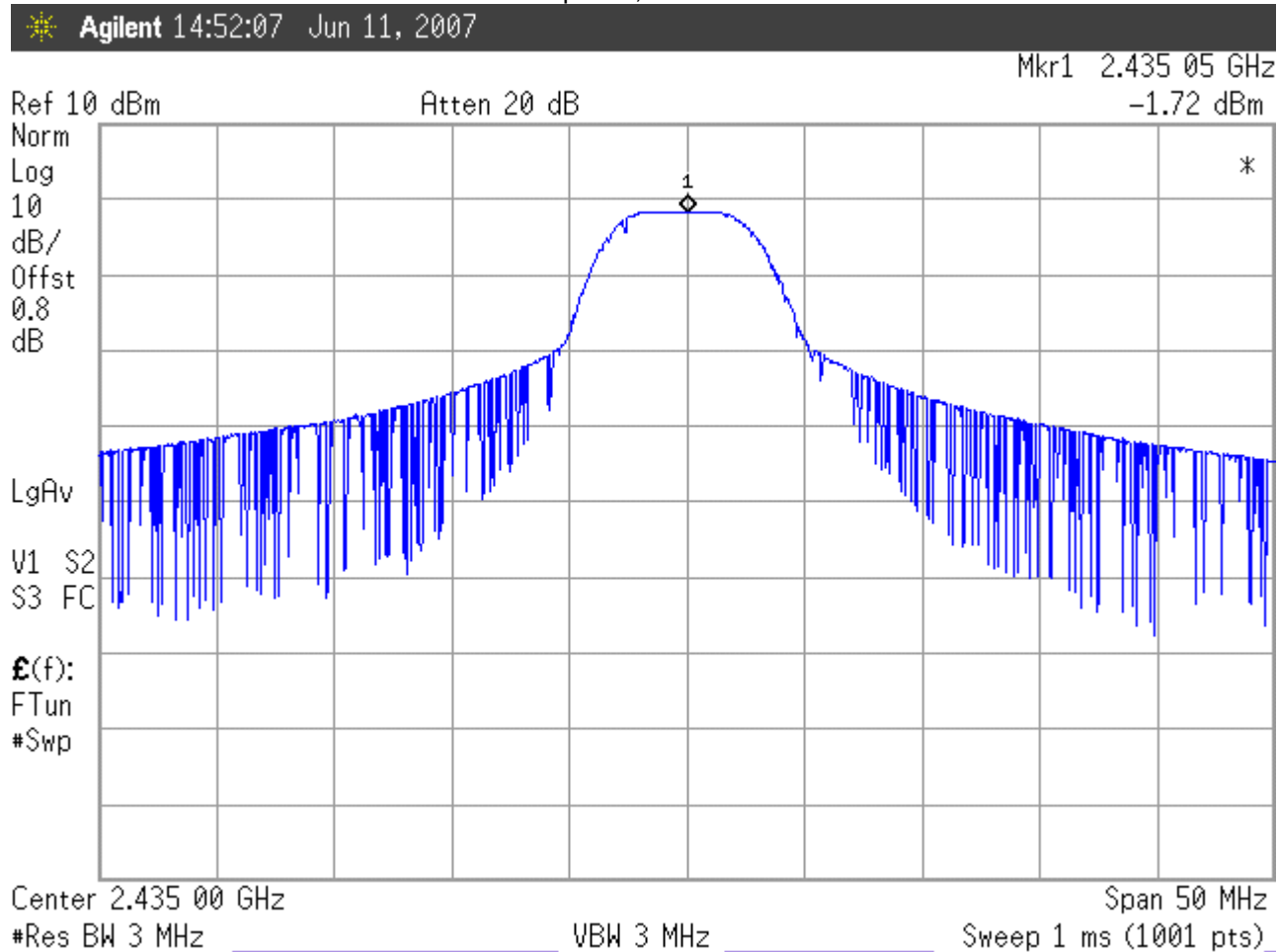
1 watt

#### Test data





# Peak power, mid channel



# Peak power, high channel

Agilent 14:59:30 Jun 11, 2007

Mkr1 2.469 90 GHz  
-2.37 dBm

Ref 10 dBm

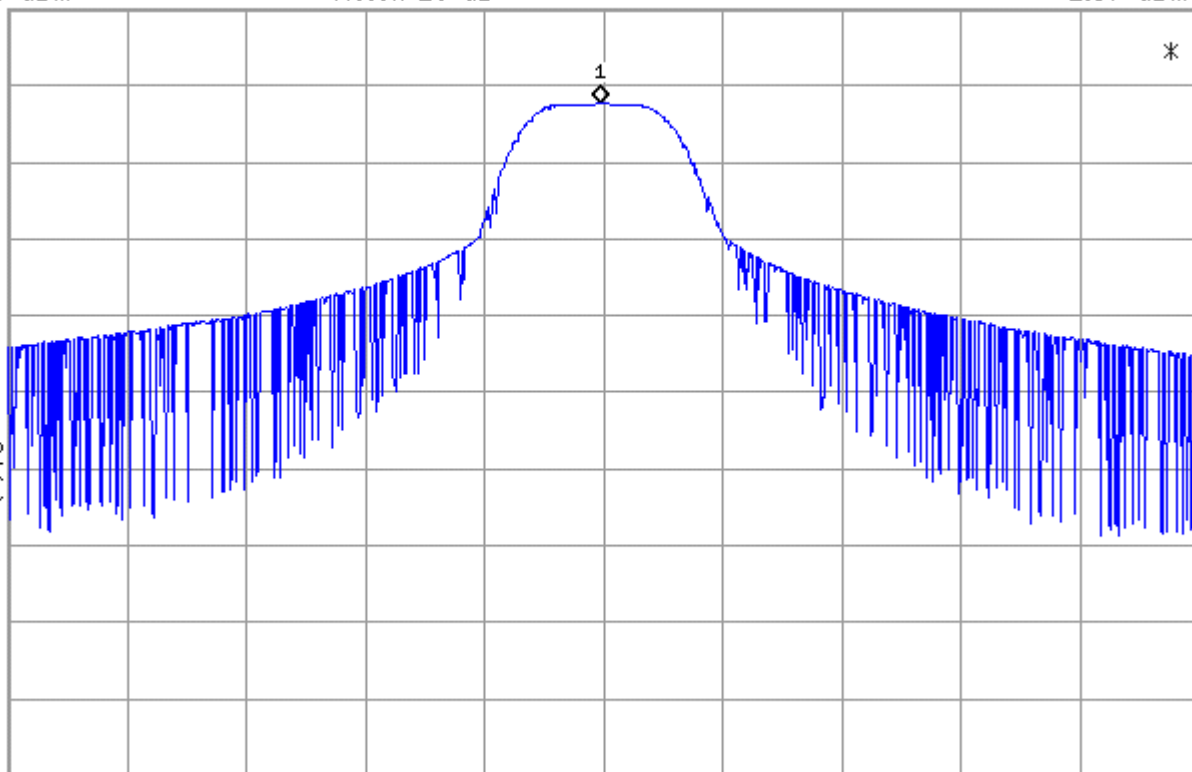
Atten 20 dB

Norm  
Log  
10  
dB/  
Offst  
0.8  
dB

LgAv

V1 S2  
S3 FC

$\mathcal{E}(f)$ :  
FTun  
#Swp



Center 2.470 00 GHz

Span 50 MHz

\*Res BW 3 MHz

VBW 3 MHz

Sweep 1 ms (1001 pts)

## Spurious emissions

FCC 15.247(d), IC RSS-210 A8.5

### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Minimum margin of compliance is 9 dB at 7.409 GHz

### Test location

☒ - Wild River Lab Large Test Site (Open Area Test Site)

☐ - Wild River Lab Small Test Site (Open Area Test Site)

### Test distance

☒ - 3 meters

☐ - 10 meters

### Test Equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	22-Nov-07
2665	ZHL-1042J	Mini-Circuits	Preamplifier 30 - 5000 MHz	32296	Code B
8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	03-Apr-08
2075	3115	EMCO	Ridge Guide Ant. 1-18 GHz	9001-3275	12-Jan-08
3294	8566B	Hewlett-Packard	Spectrum Analyzer	2349A03098	16-May-08
3295	85662A	Hewlett-Packard	Analyzer Display	2349A06144	16-May-08
2681	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00562	23-Mar-08
3371	E4440A	Agilent	Spectrum Analyzer	MY43362222	29-Nov-07
6717	3116	EMCO	Ridge Guide Ant 18-40 GHz	2005	05-Oct-07
3978	SL26-3010	Phase One Microwave	Amplifier 18-26.5 GHz	0005	26-Mar-08

Cal Code B = Calibration verification performed internally.

### Test limit

-20 dBc and;

Test limit in restricted bands

Frequency (MHz)	Field strength ( $\mu$ V/meter)	Field strength (dB $\mu$ V/meter)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

### Test data

see following pages

# RADIATED EMISSIONS



Test Report #: WC703793 Run 1 Test Area: LTS

EUT Model #: VQV10RP Date: 6/5/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C

Test Method: FCC 15.247 Air Pressure: 99.0 kPa

Customer: Wallace Technologies Rel. Humidity: 35.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 1 of 8

## List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m	DELTA2 FCC B >1G 3 M
Antenna #ANT-2.4-CW-RCL, 2.9 dBi gain						
Begin spurious emissions scan in restricted bands per FCC 15.205, 1 - 25GHz						
Low channel						
Scan 1 - 2 GHz, w/1-2GHz BPF						
Maximized						
1.201 GHz	54.44 Av	3.51 / 25.12 / 50.68 / 0.06	32.45	V / 1.00 / 176	-21.55	n/a
1.201 GHz	69.15 Pk	3.51 / 25.12 / 50.68 / 0.06	47.16	V / 1.00 / 176	-6.84*	-26.84
Scan 2-4 GHz w/2.4GHz notch filter						
Max'd						
2.334 GHz	59.32 Av	4.93 / 28.8 / 49.81 / 0.63	43.86	V / 1.00 / 355	-10.14	n/a
2.334 GHz	63.8 Pk	4.93 / 28.8 / 49.81 / 0.63	48.34	V / 1.00 / 355	-5.66*	-25.66
2.747 GHz	48.53 Av	5.31 / 29.67 / 49.12 / 0.3	34.69	V / 1.00 / 84	-19.31	n/a
2.747 GHz	60.0 Pk	5.31 / 29.67 / 49.12 / 0.3	46.16	V / 1.00 / 84	-7.84*	-27.84
2.818 GHz	41.97 Av	5.41 / 29.82 / 49.01 / 0.29	28.49	V / 1.00 / 84	-25.51	n/a
2.818 GHz	57.35 Pk	5.41 / 29.82 / 49.01 / 0.29	43.87	V / 1.00 / 84	-10.13*	-30.13
Scan 4 - 8 GHz w/4-8GHz BPF						
Max'd						
4.804 GHz	45.15 Av	7.61 / 32.81 / 46.37 / 0.27	39.47	V / 1.30 / 210	-14.53	n/a
4.804 GHz	62.35 Pk	7.61 / 32.81 / 46.37 / 0.27	56.67	V / 1.30 / 210	2.67*	-17.33
7.205 GHz	43.01 Av	9.66 / 36.02 / 46.54 / 1.06	43.21	V / 1.00 / 0	-10.79	n/a
7.205 GHz	57.6 Pk	9.66 / 36.02 / 46.54 / 1.06	57.8	V / 1.00 / 0	3.8*	-16.2
Scan 8 - 12 GHz w/8-12GHz BPF						

Tested by: Greg Jakubowski

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Reviewed by: J. T. Schneider

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# RADIATED EMISSIONS



Test Report #: WC703793 Run 1 Test Area: LTS

EUT Model #: VQV10RP Date: 6/5/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C

Test Method: FCC 15.247 Air Pressure: 99.0 kPa

Customer: Wallace Technologies Rel. Humidity: 35.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 2 of 8

## List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m	DELTA2 FCC B >1G 3 M
Scan 12 - 18 GHz						
Scan 18 - 25 GHz						
Mid channel						
1.218 GHz	52.11 Av	3.54 / 25.11 / 50.75 / 0.48	30.5	V / 1.00 / 176	-23.5	n/a
1.218 GHz	67.05 Pk	3.54 / 25.11 / 50.75 / 0.48	45.44	V / 1.00 / 176	-8.56*	-28.56
2.785 GHz	48.06 Av	5.36 / 29.75 / 49.06 / 0.3	34.41	V / 1.00 / 84	-19.59	n/a
2.785 GHz	60.05 Pk	5.36 / 29.75 / 49.06 / 0.3	46.4	V / 1.00 / 84	-7.6*	-27.6
4 - 8GHz						
4.87 GHz	44.72 Av	7.63 / 32.94 / 46.31 / 0.59	39.56	V / 1.28 / 212	-14.44	n/a
4.87 GHz	63.05 Pk	7.63 / 32.94 / 46.31 / 0.59	57.89	V / 1.28 / 212	3.89*	-16.11
7.304 GHz	42.77 Av	9.76 / 36.15 / 46.6 / 1.18	43.26	V / 1.00 / 202	-10.74	n/a
7.304 GHz	56.75 Pk	9.76 / 36.15 / 46.6 / 1.18	57.24	V / 1.00 / 202	3.24*	-16.76
High channel						
4.94 GHz	44.84 Av	7.65 / 33.08 / 46.25 / 0.56	39.88	V / 1.40 / 317	-14.12	n/a
4.94 GHz	64.5 Pk	7.65 / 33.08 / 46.25 / 0.56	59.54	V / 1.40 / 317	5.54*	-14.46
7.409 GHz	43.63 Av	9.86 / 36.28 / 46.67 / 1.3	44.41	V / 1.00 / 187	-9.59	n/a
7.409 GHz	59.7 Pk	9.86 / 36.28 / 46.67 / 1.3	60.48	V / 1.00 / 187	6.48*	-13.52
1.235 GHz	51.98 Av	3.57 / 25.11 / 50.79 / 0.06	29.93	V / 1.00 / 185	-24.07	n/a
1.235 GHz	65.5 Pk	3.57 / 25.11 / 50.79 / 0.06	43.45	V / 1.00 / 185	-10.55*	-30.55
1.413 GHz	48.4 Av	3.84 / 25.03 / 50.74 / 0.07	26.6	V / 1.20 / 110	-27.4	n/a
1.413 GHz	58.25 Pk	3.84 / 25.03 / 50.74 / 0.07	36.45	V / 1.20 / 110	-17.55*	-37.55

Tested by: Greg Jakubowski

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Reviewed by: J. T. Schneider

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# RADIATED EMISSIONS



Test Report #: WC703793 Run 1 Test Area: LTS

EUT Model #: VQV10RP Date: 6/5/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C

Test Method: FCC 15.247 Air Pressure: 99.0 kPa

Customer: Wallace Technologies Rel. Humidity: 35.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 3 of 8

## Measurement summary for limit1: FCC B >1GHz 3m (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m
7.409 GHz	43.63 Av	9.86 / 36.28 / 46.67 / 1.3	44.41	V / 1.00 / 187	-9.59
2.334 GHz	59.32 Av	4.93 / 28.8 / 49.81 / 0.63	43.86	V / 1.00 / 355	-10.14
7.304 GHz	42.77 Av	9.76 / 36.15 / 46.6 / 1.18	43.26	V / 1.00 / 202	-10.74
7.205 GHz	43.01 Av	9.66 / 36.02 / 46.54 / 1.06	43.21	V / 1.00 / 0	-10.79
4.94 GHz	44.84 Av	7.65 / 33.08 / 46.25 / 0.56	39.88	V / 1.40 / 317	-14.12
4.87 GHz	44.72 Av	7.63 / 32.94 / 46.31 / 0.59	39.56	V / 1.28 / 212	-14.44
4.804 GHz	45.15 Av	7.61 / 32.81 / 46.37 / 0.27	39.47	V / 1.30 / 210	-14.53
2.747 GHz	48.53 Av	5.31 / 29.67 / 49.12 / 0.3	34.69	V / 1.00 / 84	-19.31
2.785 GHz	48.06 Av	5.36 / 29.75 / 49.06 / 0.3	34.41	V / 1.00 / 84	-19.59
1.201 GHz	54.44 Av	3.51 / 25.12 / 50.68 / 0.06	32.45	V / 1.00 / 176	-21.55
1.218 GHz	52.11 Av	3.54 / 25.11 / 50.75 / 0.48	30.5	V / 1.00 / 176	-23.5
1.235 GHz	51.98 Av	3.57 / 25.11 / 50.79 / 0.06	29.93	V / 1.00 / 185	-24.07
2.818 GHz	41.97 Av	5.41 / 29.82 / 49.01 / 0.29	28.49	V / 1.00 / 84	-25.51
1.413 GHz	48.4 Av	3.84 / 25.03 / 50.74 / 0.07	26.6	V / 1.20 / 110	-27.4
1.201 GHz	69.15 Pk	3.51 / 25.12 / 50.68 / 0.06	47.16	V / 1.00 / 176	-6.84*
2.334 GHz	63.8 Pk	4.93 / 28.8 / 49.81 / 0.63	48.34	V / 1.00 / 355	-5.66*
2.747 GHz	60.0 Pk	5.31 / 29.67 / 49.12 / 0.3	46.16	V / 1.00 / 84	-7.84*
2.818 GHz	57.35 Pk	5.41 / 29.82 / 49.01 / 0.29	43.87	V / 1.00 / 84	-10.13*
4.804 GHz	62.35 Pk	7.61 / 32.81 / 46.37 / 0.27	56.67	V / 1.30 / 210	2.67*
7.205 GHz	57.6 Pk	9.66 / 36.02 / 46.54 / 1.06	57.8	V / 1.00 / 0	3.8*
1.218 GHz	67.05 Pk	3.54 / 25.11 / 50.75 / 0.48	45.44	V / 1.00 / 176	-8.56*
2.785 GHz	60.05 Pk	5.36 / 29.75 / 49.06 / 0.3	46.4	V / 1.00 / 84	-7.6*
4.87 GHz	63.05 Pk	7.63 / 32.94 / 46.31 / 0.59	57.89	V / 1.28 / 212	3.89*
7.304 GHz	56.75 Pk	9.76 / 36.15 / 46.6 / 1.18	57.24	V / 1.00 / 202	3.24*
4.94 GHz	64.5 Pk	7.65 / 33.08 / 46.25 / 0.56	59.54	V / 1.40 / 317	5.54*
7.409 GHz	59.7 Pk	9.86 / 36.28 / 46.67 / 1.3	60.48	V / 1.00 / 187	6.48*

Tested by: Greg Jakubowski

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Reviewed by: J. T. Schneider

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Signature

# RADIATED EMISSIONS



Test Report #: WC703793 Run 1 Test Area: LTS

EUT Model #: VQV10RP Date: 6/5/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C

Test Method: FCC 15.247 Air Pressure: 99.0 kPa

Customer: Wallace Technologies Rel. Humidity: 35.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 4 of 8

## Measurement summary for limit1: FCC B >1GHz 3m (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m
1.235 GHz	65.5 Pk	3.57 / 25.11 / 50.79 / 0.06	43.45	V / 1.00 / 185	-10.55*
1.413 GHz	58.25 Pk	3.84 / 25.03 / 50.74 / 0.07	36.45	V / 1.20 / 110	-17.55*

\* Peak measurement against an average limit

Tested by: Greg Jakubowski

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Reviewed by: J. T. Schneider

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# RADIATED EMISSIONS



Test Report #: WC703793 Run 1 Test Area: LTS

EUT Model #: VQV10RP Date: 6/5/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C

Test Method: FCC 15.247 Air Pressure: 99.0 kPa

Customer: Wallace Technologies Rel. Humidity: 35.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 5 of 8

## Measurement summary for limit2: FCC B >1G 3 M (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC B >1G 3 M
7.409 GHz	59.7 Pk	9.86 / 36.28 / 46.67 / 1.3	60.48	V / 1.00 / 187	-13.52
4.94 GHz	64.5 Pk	7.65 / 33.08 / 46.25 / 0.56	59.54	V / 1.40 / 317	-14.46
4.87 GHz	63.05 Pk	7.63 / 32.94 / 46.31 / 0.59	57.89	V / 1.28 / 212	-16.11
7.205 GHz	57.6 Pk	9.66 / 36.02 / 46.54 / 1.06	57.8	V / 1.00 / 0	-16.2
7.304 GHz	56.75 Pk	9.76 / 36.15 / 46.6 / 1.18	57.24	V / 1.00 / 202	-16.76
4.804 GHz	62.35 Pk	7.61 / 32.81 / 46.37 / 0.27	56.67	V / 1.30 / 210	-17.33
2.334 GHz	63.8 Pk	4.93 / 28.8 / 49.81 / 0.63	48.34	V / 1.00 / 355	-25.66
1.201 GHz	69.15 Pk	3.51 / 25.12 / 50.68 / 0.06	47.16	V / 1.00 / 176	-26.84
2.785 GHz	60.05 Pk	5.36 / 29.75 / 49.06 / 0.3	46.4	V / 1.00 / 84	-27.6
2.747 GHz	60.0 Pk	5.31 / 29.67 / 49.12 / 0.3	46.16	V / 1.00 / 84	-27.84
1.218 GHz	67.05 Pk	3.54 / 25.11 / 50.75 / 0.48	45.44	V / 1.00 / 176	-28.56
2.818 GHz	57.35 Pk	5.41 / 29.82 / 49.01 / 0.29	43.87	V / 1.00 / 84	-30.13
1.235 GHz	65.5 Pk	3.57 / 25.11 / 50.79 / 0.06	43.45	V / 1.00 / 185	-30.55
1.413 GHz	58.25 Pk	3.84 / 25.03 / 50.74 / 0.07	36.45	V / 1.20 / 110	-37.55

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature



# RADIATED EMISSIONS



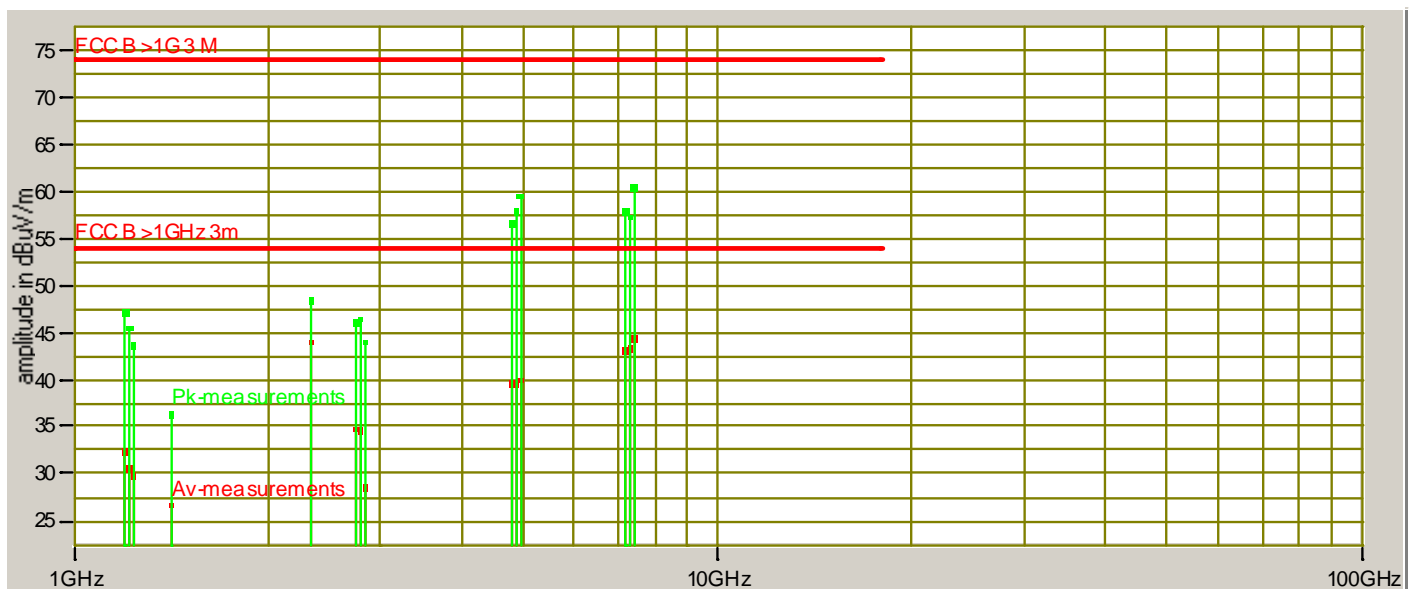
Test Report #: WC703793 Run 1 Test Area: LTS  
EUT Model #: VQV10RP Date: 6/5/2007  
EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C  
Test Method: FCC 15.247 Air Pressure: 99.0 kPa  
Customer: Wallace Technologies Rel. Humidity: 35.0 %  
EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 6 of 8

## Graph:



Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

# RADIATED EMISSIONS



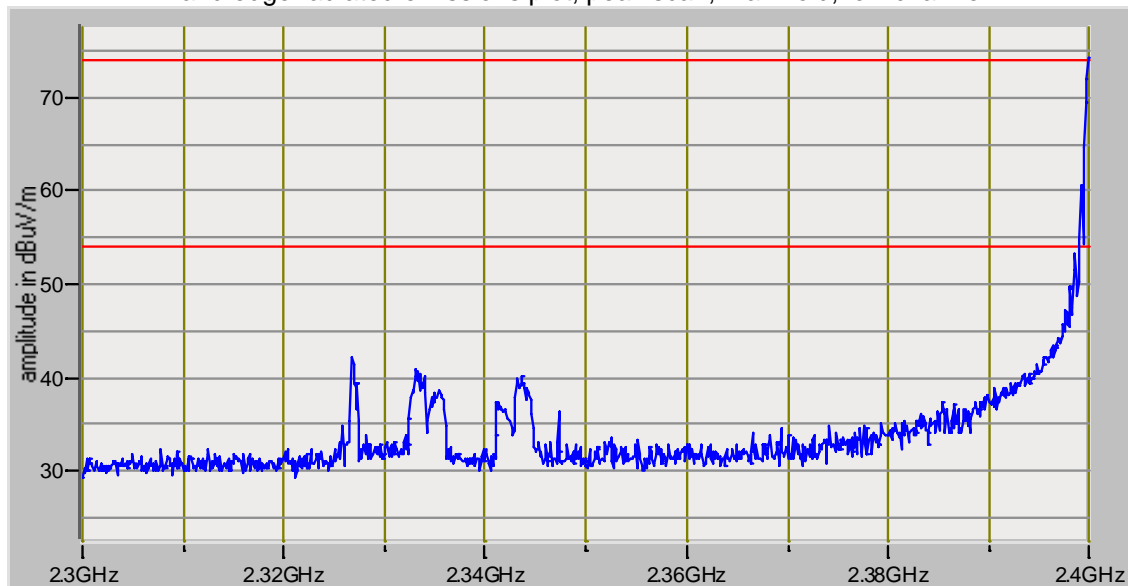
Test Report #: WC703793 Run 1 Test Area: LTS  
EUT Model #: VQV10RP Date: 6/5/2007  
EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C  
Test Method: FCC 15.247 Air Pressure: 99.0 kPa  
Customer: Wallace Technologies Rel. Humidity: 35.0 %  
EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 7 of 8

Band edge radiated emissions plot, peak scan, max hold, low channel



Tested by: Greg Jakubowski

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Signature

Reviewed by: J. T. Schneider

Printed

Signature

# RADIATED EMISSIONS



Test Report #: WC703793 Run 1 Test Area: LTS

EUT Model #: VQV10RP Date: 6/5/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 23.0 °C

Test Method: FCC 15.247 Air Pressure: 99.0 kPa

Customer: Wallace Technologies Rel. Humidity: 35.0 %

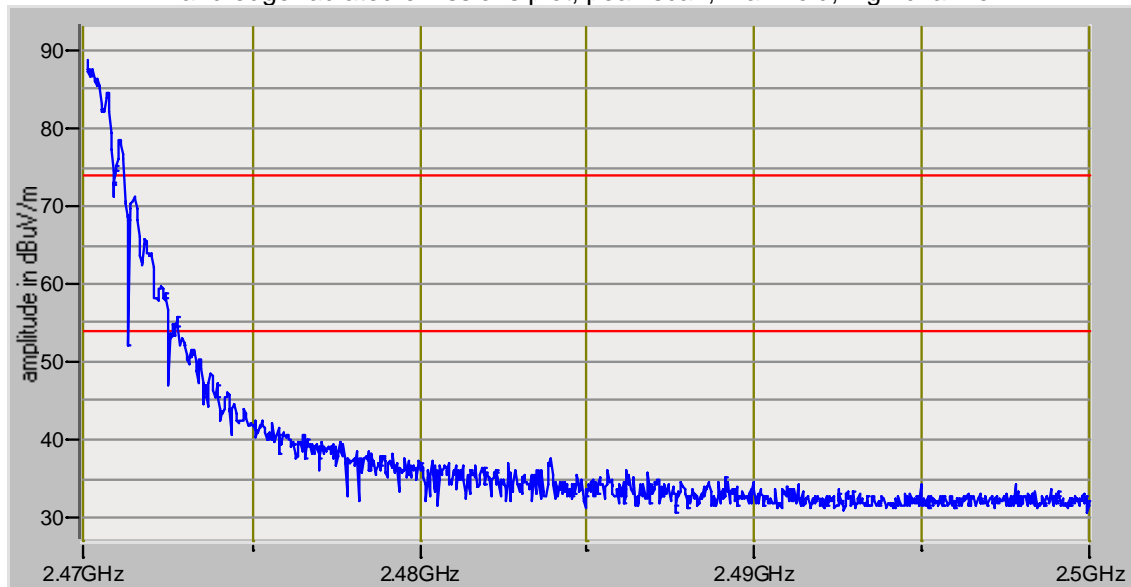
EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 8 of 8

Band edge radiated emissions plot, peak scan, max hold, high channel



Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

# RADIATED EMISSIONS



Test Report #: WC703793 Run 3 Test Area: STS

EUT Model #: VQV10RP Date: 6/11/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 24.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: Wallace Technologies Rel. Humidity: 75.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 1 of 5

## 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
Begin spurious emissions scan in restricted bands per FCC 15.205, 30 - 1000 MHz						
Remote on Left Side with Long Antenna. Low Channel						
115.585 MHz	32.45 Qp	1.34 / 9.35 / 27.63 / 0.0	15.52	V / 1.00 / 0	-27.98	n/a
118.674 MHz	31.65 Qp	1.35 / 9.11 / 27.66 / 0.0	14.45	V / 1.00 / 0	-29.05	n/a
137.646 MHz	30.45 Qp	1.44 / 8.3 / 27.88 / 0.0	12.31	V / 1.00 / 0	-31.19	n/a
244.188 MHz	29.4 Qp	1.91 / 12.11 / 27.74 / 0.0	15.68	V / 1.00 / 0	-30.32	n/a
74.398 MHz	32.3 Qp	1.1 / 7.62 / 27.83 / 0.0	13.19	V / 1.00 / 180	-26.81	n/a
126.605 MHz	30.25 Qp	1.39 / 8.47 / 27.76 / 0.0	12.35	V / 1.00 / 180	-31.15	n/a
130.446 MHz	43.35 Qp	1.4 / 8.16 / 27.8 / 0.0	25.12	V / 1.00 / 180	-18.38	n/a
130.4 MHz Maximized						
130.446 MHz	42.75 Qp	1.4 / 8.16 / 27.8 / 0.0	24.52	V / 1.00 / 270	-18.98	n/a
Start of Horizontal Scan						
110.748 MHz	30.45 Qp	1.32 / 9.17 / 27.62 / 0.0	13.32	H / 3.00 / 0	-30.18	n/a
253.734 MHz	29.15 Qp	1.96 / 12.53 / 27.65 / 0.0	15.99	H / 3.00 / 0	-30.01	n/a
137.646 MHz	31.55 Qp	1.44 / 8.3 / 27.88 / 0.0	13.41	H / 3.00 / 90	-30.09	n/a
110.598 MHz	30.5 Qp	1.32 / 9.17 / 27.62 / 0.0	13.36	H / 3.00 / 270	-30.14	n/a
400.59 MHz	29.5 Qp	2.52 / 15.72 / 27.75 / 0.0	20.0	H / 3.00 / 270	-26.0	n/a
End of Scan 30 - 1000 MHz						
Start of Scan, Mid Channel.						

Tested by: Robert Behringer

Printed

*Robert Behringer*

Signature

Reviewed by: J. T. Schneider

Printed

*Joel T. Schneider*

Signature

# RADIATED EMISSIONS



Test Report #: WC703793 Run 3 Test Area: STS

EUT Model #: VQV10RP Date: 6/11/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 24.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: Wallace Technologies Rel. Humidity: 75.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 2 of 5

## 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
126.583 MHz	30.3 Qp	1.39 / 8.47 / 27.75 / 0.0	12.4	V / 1.00 / 0	-31.1	n/a
249.298 MHz	29.35 Qp	1.94 / 12.33 / 27.69 / 0.0	15.93	V / 1.00 / 0	-30.07	n/a
126.593 MHz	30.2 Qp	1.39 / 8.47 / 27.76 / 0.0	12.3	V / 1.00 / 270	-31.2	n/a
137.443 MHz	31.05 Qp	1.44 / 8.26 / 27.88 / 0.0	12.87	V / 1.00 / 270	-30.63	n/a
74.398 MHz	32.05 Qp	1.1 / 7.62 / 27.83 / 0.0	12.94	V / 1.00 / 270	-27.06	n/a
110.598 MHz	28.7 Qp	1.32 / 9.17 / 27.62 / 0.0	11.56	V / 1.00 / 270	-31.94	n/a
110.748 MHz	29.75 Qp	1.32 / 9.17 / 27.62 / 0.0	12.62	V / 1.00 / 270	-30.88	n/a
115.585 MHz	28.7 Qp	1.34 / 9.35 / 27.63 / 0.0	11.77	V / 1.00 / 270	-31.73	n/a
118.674 MHz	31.9 Qp	1.35 / 9.11 / 27.66 / 0.0	14.7	V / 1.00 / 270	-28.8	n/a
126.583 MHz	30.65 Qp	1.39 / 8.47 / 27.75 / 0.0	12.75	V / 1.00 / 270	-30.75	n/a
137.443 MHz	30.0 Qp	1.44 / 8.26 / 27.88 / 0.0	11.82	V / 1.00 / 270	-31.68	n/a
244.188 MHz	29.1 Qp	1.91 / 12.11 / 27.74 / 0.0	15.38	V / 1.00 / 270	-30.62	n/a
249.298 MHz	29.3 Qp	1.94 / 12.33 / 27.69 / 0.0	15.88	V / 1.00 / 270	-30.12	n/a
Start of Horizontal Scan						
137.443 MHz	36.4 Qp	1.44 / 8.26 / 27.88 / 0.0	18.22	H / 3.00 / 0	-25.28	n/a
125.225 MHz	32.6 Qp	1.38 / 8.58 / 27.74 / 0.0	14.82	H / 3.00 / 0	-28.68	n/a
110.598 MHz	33.4 Qp	1.32 / 9.17 / 27.62 / 0.0	16.26	H / 3.00 / 90	-27.24	n/a
110.748 MHz	33.75 Qp	1.32 / 9.17 / 27.62 / 0.0	16.62	H / 3.00 / 90	-26.88	n/a
115.585 MHz	34.45 Qp	1.34 / 9.35 / 27.63 / 0.0	17.52	H / 3.00 / 90	-25.98	n/a
126.583 MHz	31.5 Qp	1.39 / 8.47 / 27.75 / 0.0	13.6	H / 3.00 / 90	-29.9	n/a
126.583 MHz	32.8 Qp	1.39 / 8.47 / 27.75 / 0.0	14.9	H / 3.00 / 270	-28.6	n/a
End of Scan						

Tested by: Robert Behringer

Printed

*Robert Behringer*

Signature

Reviewed by: J. T. Schneider

Printed

*Joel T. Schneider*

Signature

# RADIATED EMISSIONS



Test Report #: WC703793 Run 3 Test Area: STS

EUT Model #: VQV10RP Date: 6/11/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 24.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: Wallace Technologies Rel. Humidity: 75.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 3 of 5

## 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
Start of Vertical Scan. High Channel						
118.674 MHz	32.15 Qp	1.35 / 9.11 / 27.66 / 0.0	14.95	V / 3.00 / 0	-28.55	n/a
249.298 MHz	29.45 Qp	1.94 / 12.33 / 27.69 / 0.0	16.03	V / 3.00 / 180	-29.97	n/a
118.674 MHz	32.05 Qp	1.35 / 9.11 / 27.66 / 0.0	14.85	V / 3.00 / 180	-28.65	n/a
No New or Higer Emission in Horizontal Polarization at all Azimuths						
End of Scan 30 - 1000 MHz						

Tested by: Robert Behringer

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Reviewed by: J. T. Schneider

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# RADIATED EMISSIONS



Test Report #: WC703793 Run 3 Test Area: STS

EUT Model #: VQV10RP Date: 6/11/2007

EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 24.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: Wallace Technologies Rel. Humidity: 75.0 %

EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 4 of 5

## Measurement summary for limit1: FCC-B <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m
130.446 MHz	43.35 Qp	1.4 / 8.16 / 27.8 / 0.0	25.12	V / 1.00 / 180	-18.38
137.443 MHz	36.4 Qp	1.44 / 8.26 / 27.88 / 0.0	18.22	H / 3.00 / 0	-25.28
115.585 MHz	34.45 Qp	1.34 / 9.35 / 27.63 / 0.0	17.52	H / 3.00 / 90	-25.98
400.59 MHz	29.5 Qp	2.52 / 15.72 / 27.75 / 0.0	20.0	H / 3.00 / 270	-26.0
74.398 MHz	32.3 Qp	1.1 / 7.62 / 27.83 / 0.0	13.19	V / 1.00 / 180	-26.81
110.748 MHz	33.75 Qp	1.32 / 9.17 / 27.62 / 0.0	16.62	H / 3.00 / 90	-26.88
110.598 MHz	33.4 Qp	1.32 / 9.17 / 27.62 / 0.0	16.26	H / 3.00 / 90	-27.24
118.674 MHz	32.15 Qp	1.35 / 9.11 / 27.66 / 0.0	14.95	V / 3.00 / 0	-28.55
126.583 MHz	32.8 Qp	1.39 / 8.47 / 27.75 / 0.0	14.9	H / 3.00 / 270	-28.6
125.225 MHz	32.6 Qp	1.38 / 8.58 / 27.74 / 0.0	14.82	H / 3.00 / 0	-28.68
249.298 MHz	29.45 Qp	1.94 / 12.33 / 27.69 / 0.0	16.03	V / 3.00 / 180	-29.97
253.734 MHz	29.15 Qp	1.96 / 12.53 / 27.65 / 0.0	15.99	H / 3.00 / 0	-30.01
137.646 MHz	31.55 Qp	1.44 / 8.3 / 27.88 / 0.0	13.41	H / 3.00 / 90	-30.09
244.188 MHz	29.4 Qp	1.91 / 12.11 / 27.74 / 0.0	15.68	V / 1.00 / 0	-30.32

Tested by: Robert Behringer

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*Robert Behringer*

Signature

Reviewed by: J. T. Schneider

Printed

*Joel T. Schneider*

Signature

# RADIATED EMISSIONS



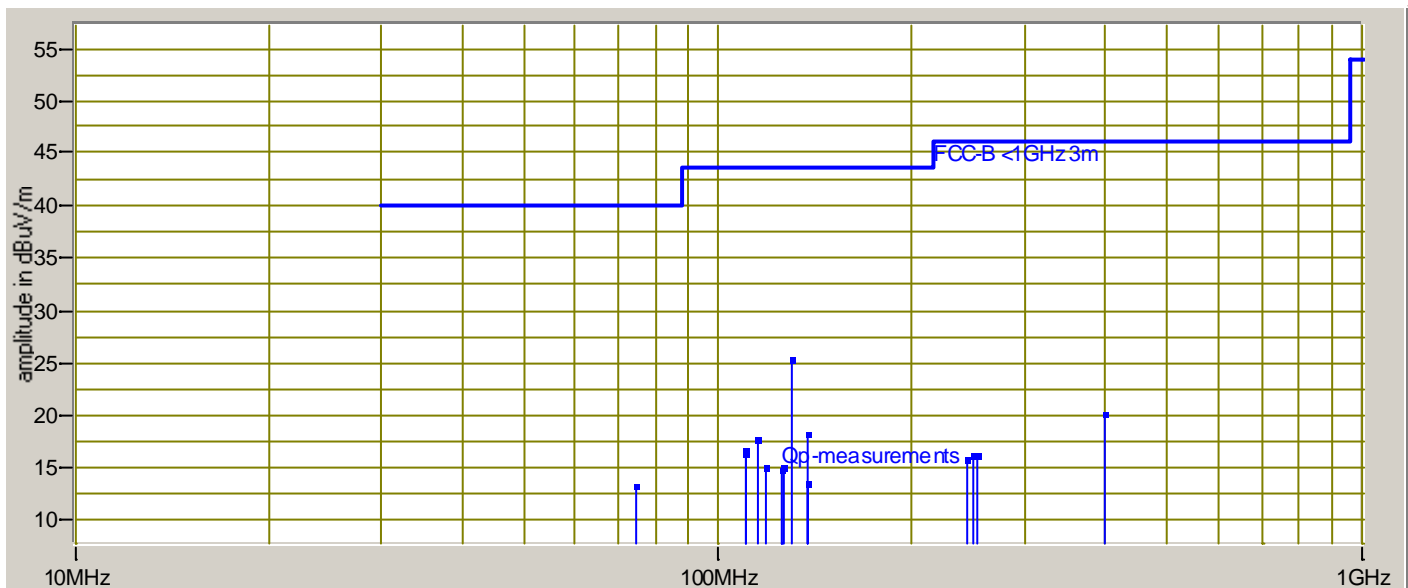
Test Report #: WC703793 Run 3 Test Area: STS  
EUT Model #: VQV10RP Date: 6/11/2007  
EUT Serial #: \_\_\_\_\_ EUT Power: 3 VDC Temperature: 24.0 °C  
Test Method: FCC 15.247 Air Pressure: 98.0 kPa  
Customer: Wallace Technologies Rel. Humidity: 75.0 %  
EUT Description: Vu Qube mobile satellite antenna, wireless remote

Notes: \_\_\_\_\_

Data File Name: 3793.dat

Page: 5 of 5

## Graph:



Tested by: Robert Behringer

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Signature

Reviewed by: J. T. Schneider

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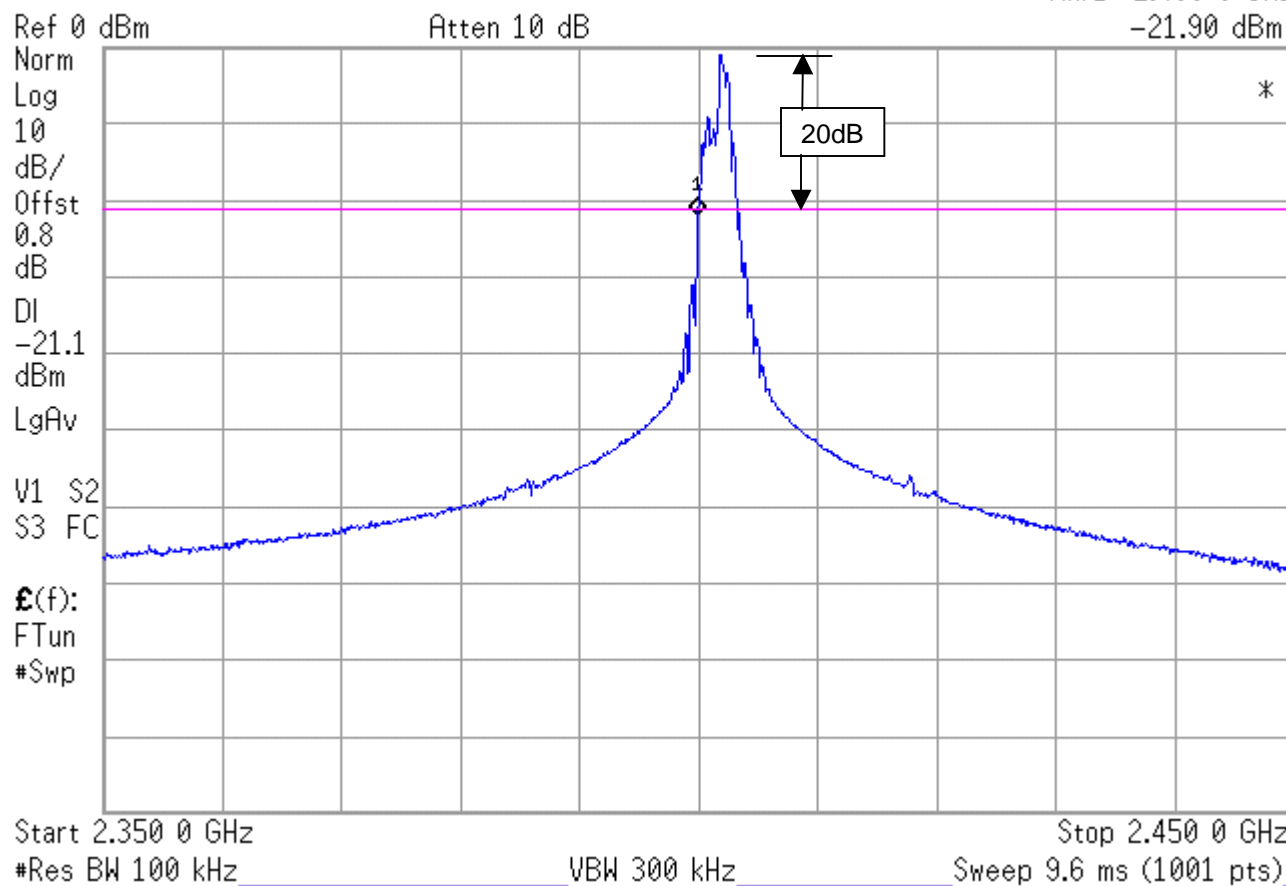
Signature



# Conducted band edge, low channel

Agilent 13:06:33 Jun 11, 2007

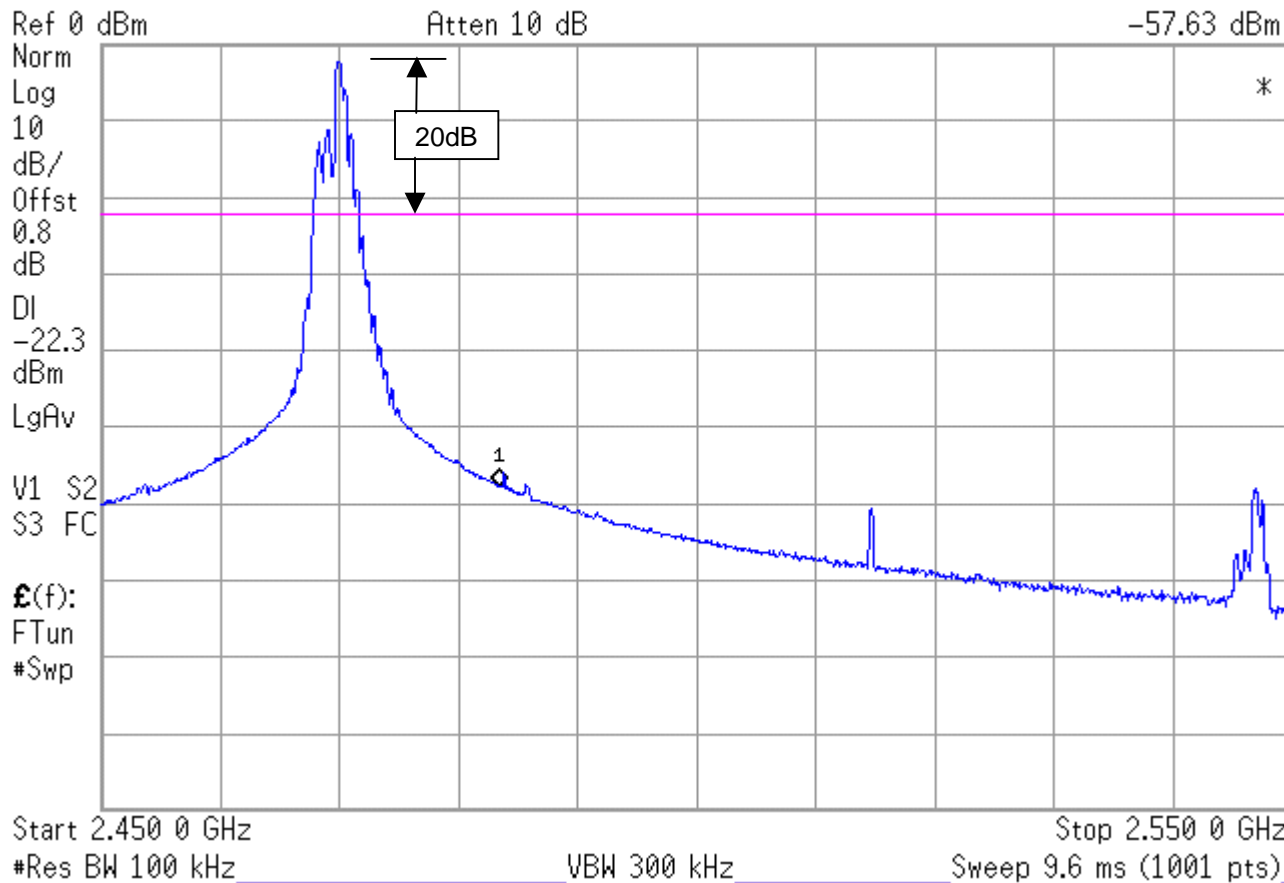
Mkr1 2.400 0 GHz  
-21.90 dBm



Conducted band edge, high channel

Agilent 13:01:26 Jun 11, 2007

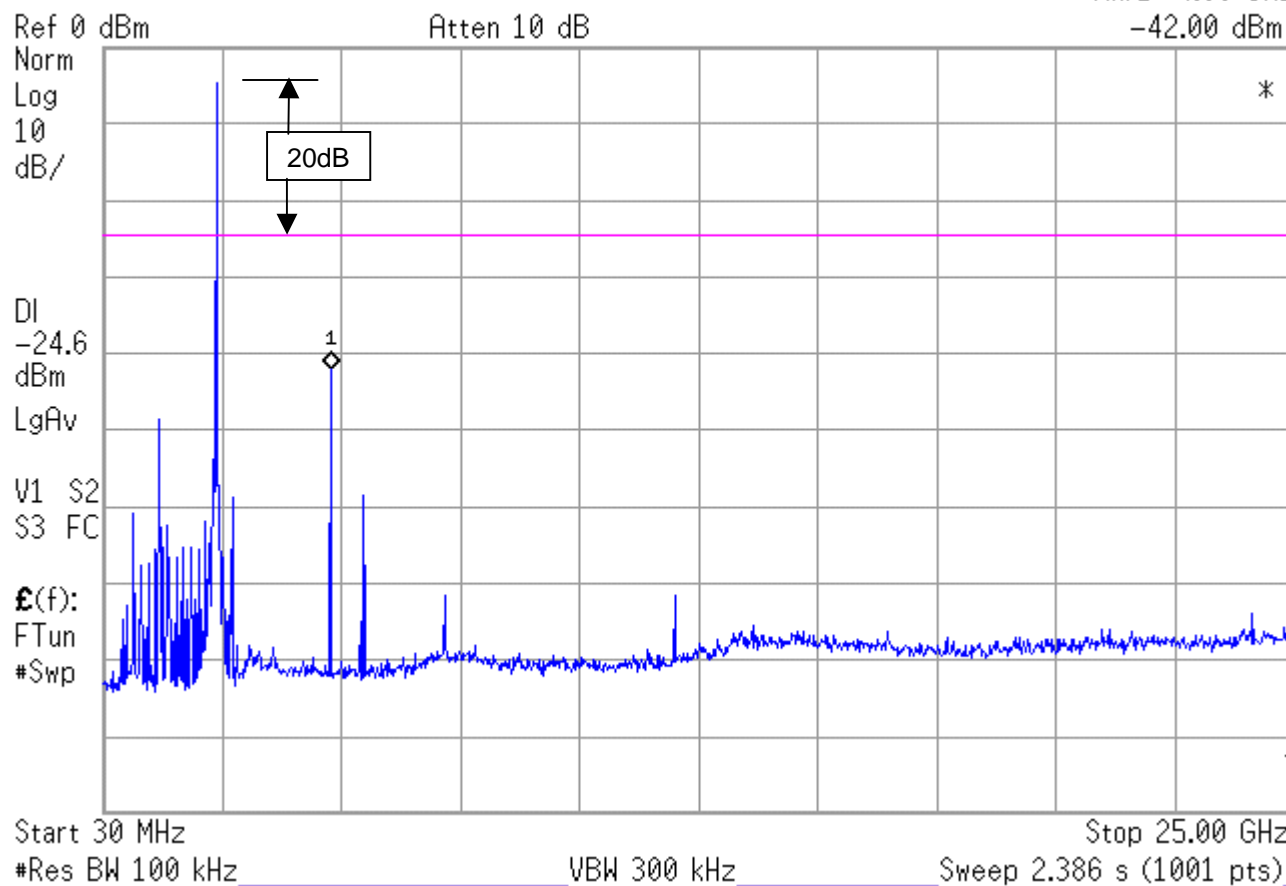
Mkr1 2.483 5 GHz  
-57.63 dBm



# Conducted spurious, low channel

Agilent 15:09:01 Jun 11, 2007

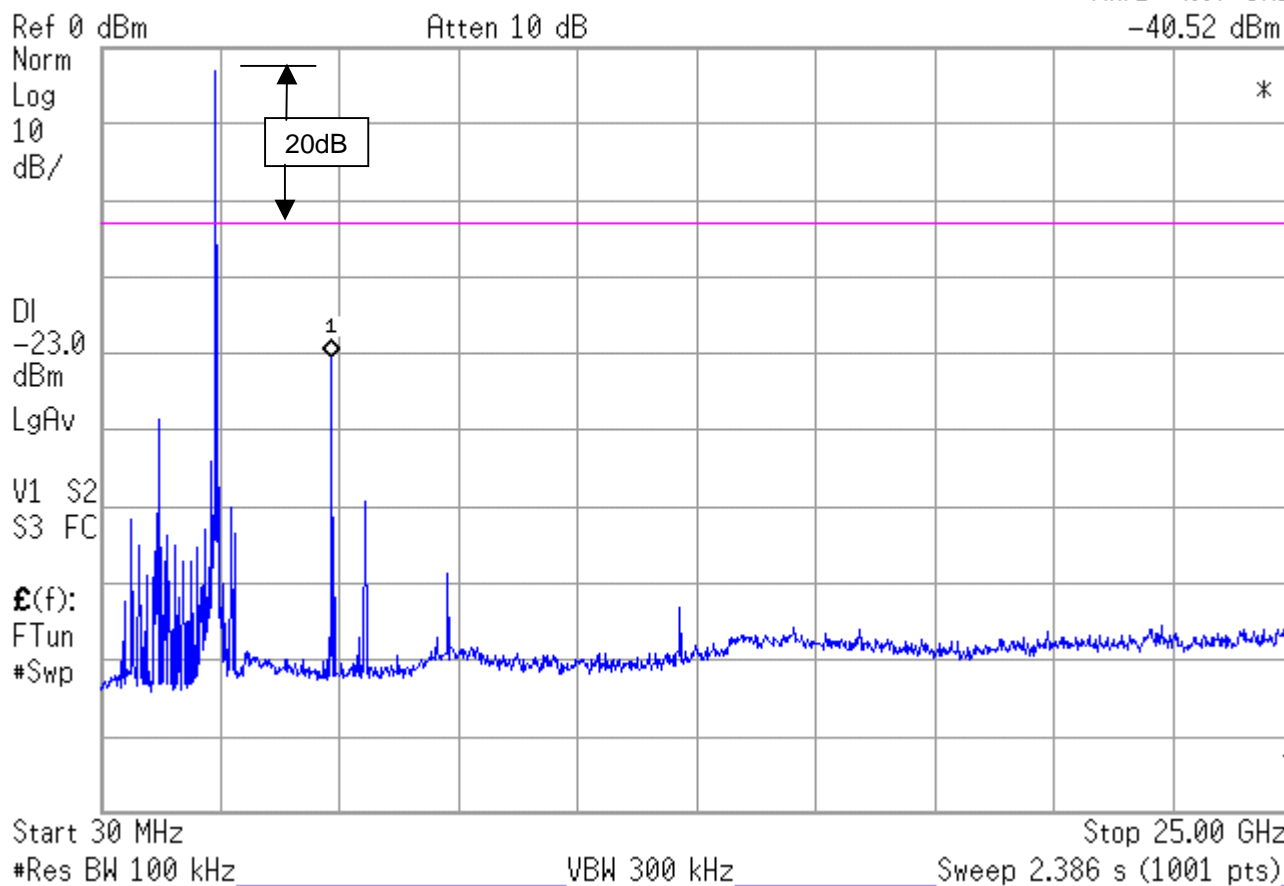
Mkr1 4.80 GHz  
-42.00 dBm



# Conducted spurious, mid channel

Agilent 15:13:20 Jun 11, 2007

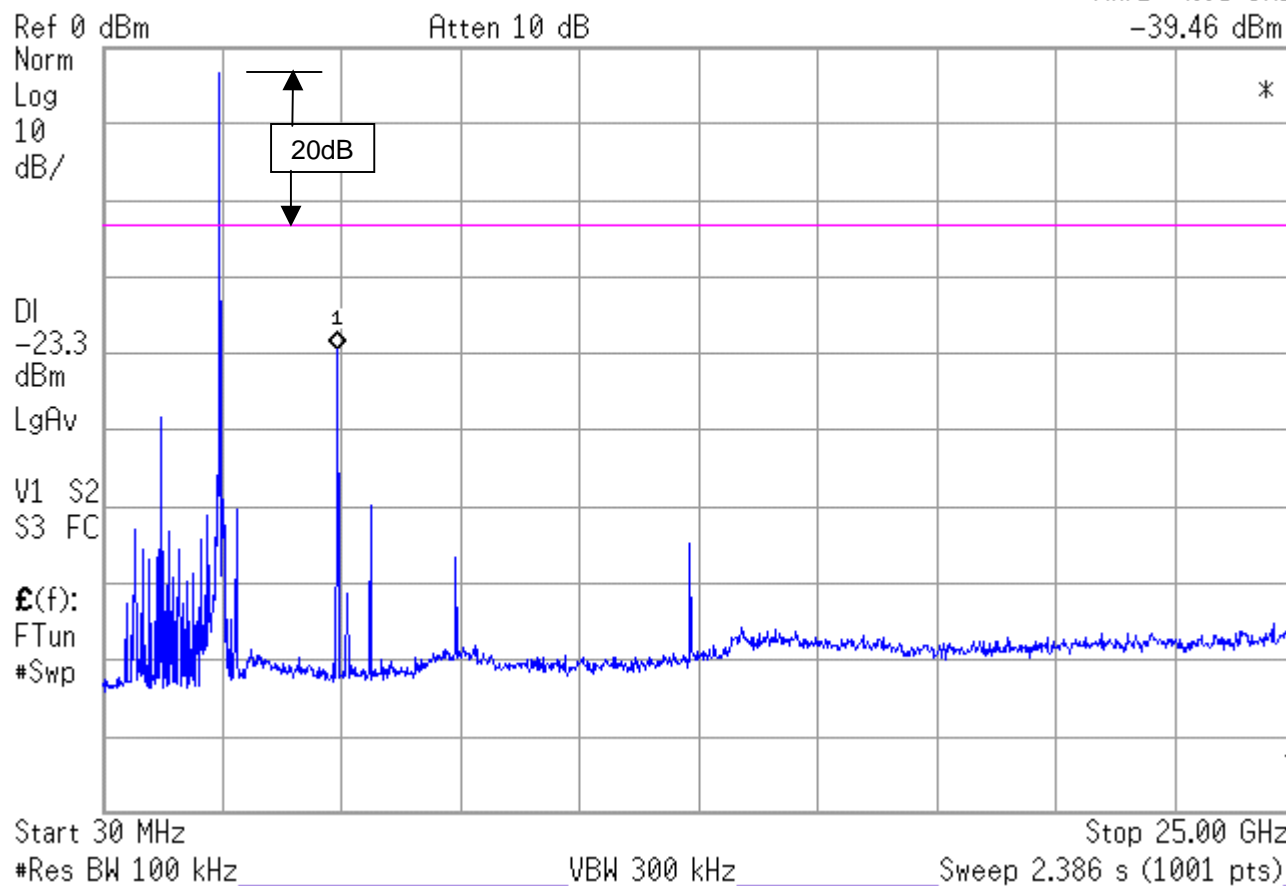
Mkr1 4.87 GHz  
-40.52 dBm



# Conducted spurious, high channel

Agilent 15:04:53 Jun 11, 2007

Mkr1 4.95 GHz  
-39.46 dBm



## Power spectral density

### FCC 15.247(e), IC RSS-210 A8.2(2)

#### Test summary

The requirements are: ■ - MET □ - NOT MET  
Maximum power spectral density = -14.51 dBm

#### Test location

- - Wild River Lab Large Test Site (Open Area Test Site)
- - Wild River Lab Small Test Site (Open Area Test Site)

#### Test Equipment

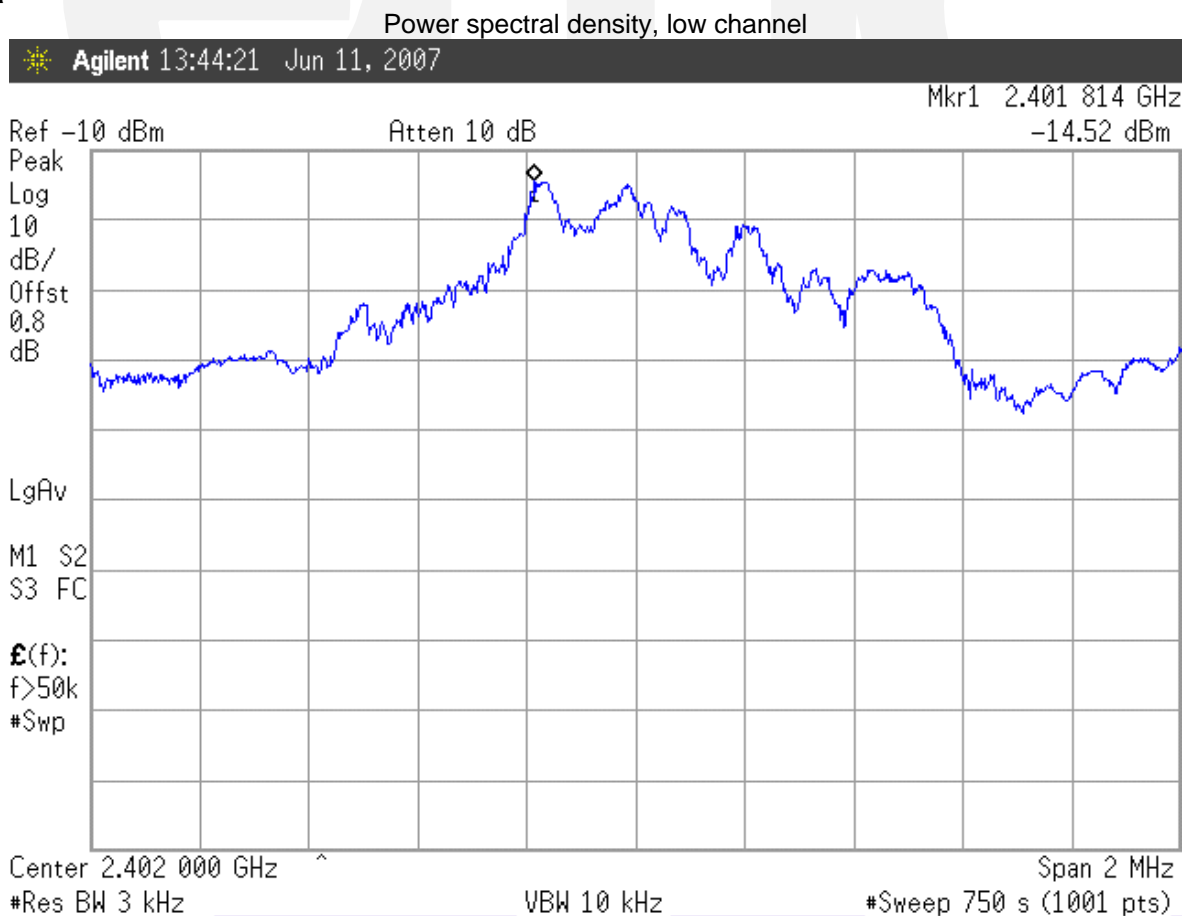
TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3371	E4440A	Agilent	Spectrum Analyzer	MY43362222	29 Nov 07
3844	61697	---	High Frequency SMA cable	---	Code B

Cal Code B = Calibration verification performed internally.

#### Test limit

No greater than 8 dBm in any 3 kHz band

#### Test data



Power spectral density, mid channel

Agilent 14:04:41 Jun 11, 2007

Mkr1 2.435 006 GHz  
-14.60 dBm

Ref -10 dBm

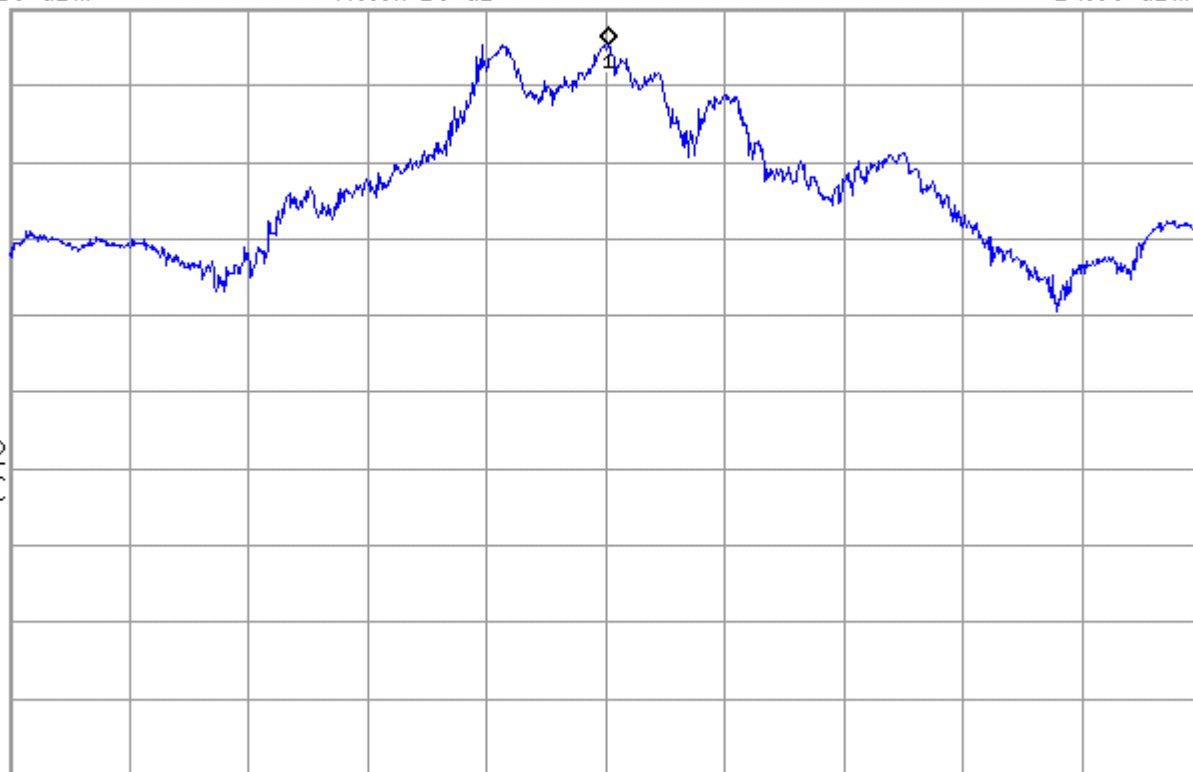
Atten 10 dB

Peak  
Log  
10  
dB/  
Offst  
0.8  
dB

LgAv

M1 S2  
S3 FC

$\mathcal{E}(f)$ :  
f>50k  
#Swp



Center 2.435 000 GHz

Span 2 MHz

#Res BW 3 kHz

VBW 10 kHz

#Sweep 750 s (1001 pts)

# Power spectral density, high channel

Agilent 14:18:41 Jun 11, 2007

Mkr1 2.470 004 GHz  
-14.71 dBm

Ref -10 dBm

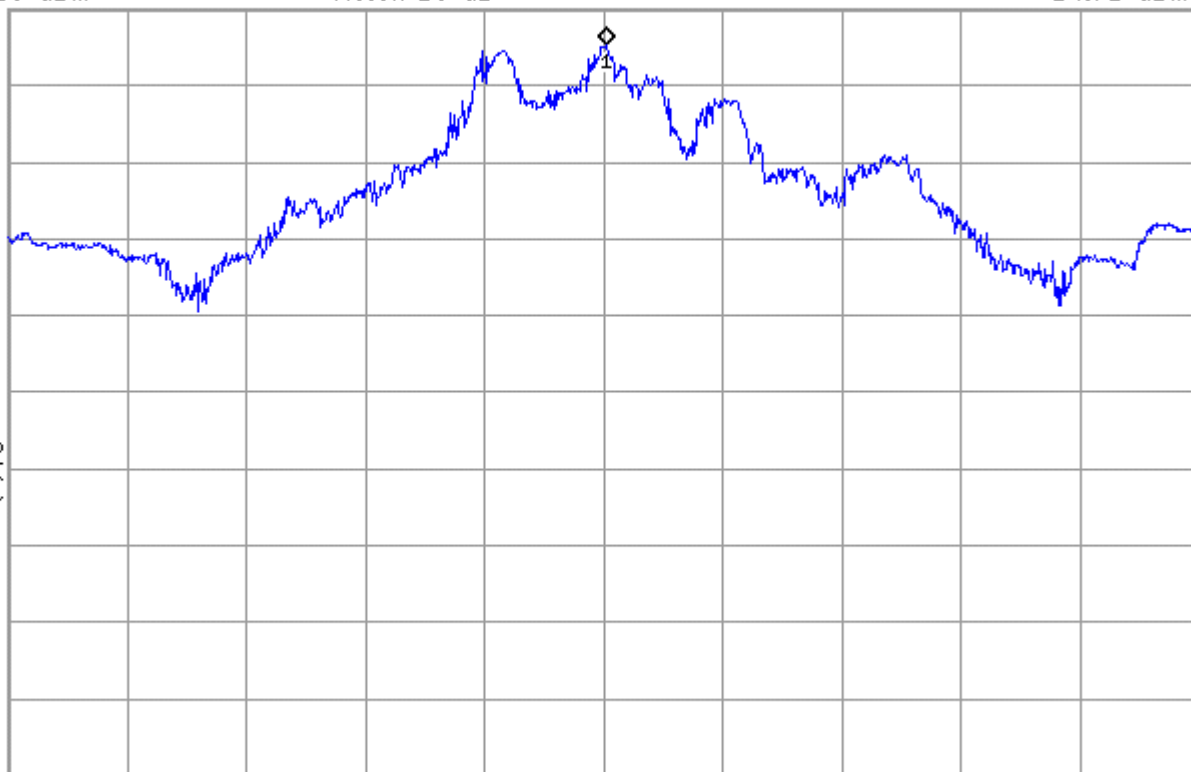
Atten 10 dB

Peak  
Log  
10  
dB/  
Offst  
0.8  
dB

LgAv

M1 S2  
S3 FC

$\mathcal{E}(f)$ :  
f>50k  
#Swp



Center 2.470 000 GHz

Span 2 MHz

#Res BW 3 kHz

VBW 10 kHz

#Sweep 750 s (1001 pts)

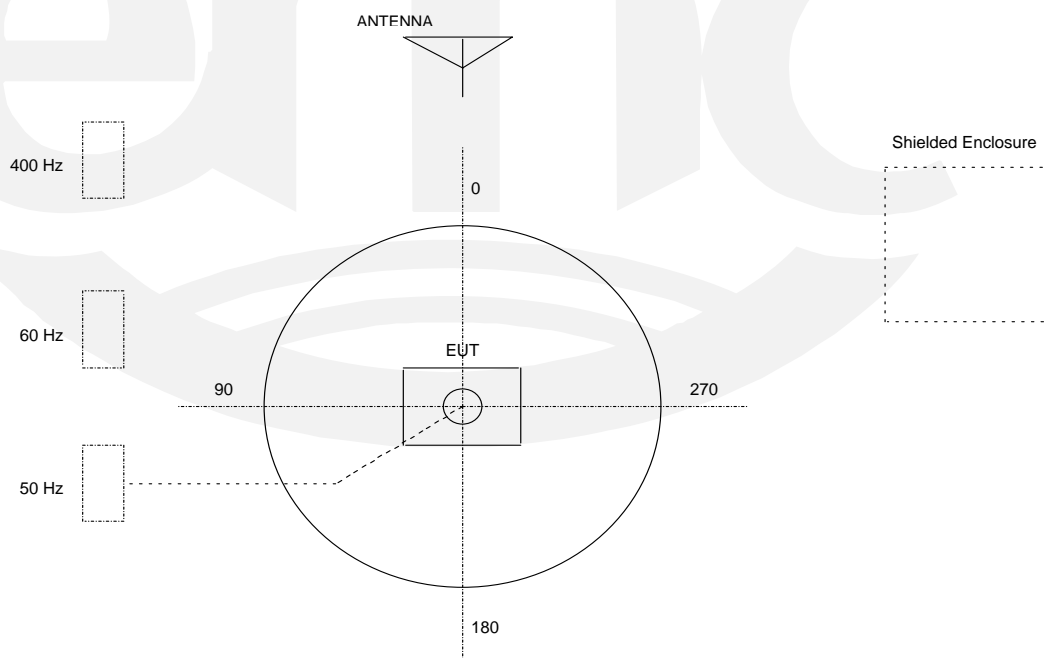


## TEST SETUP FOR EMISSIONS TESTING

### 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, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 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



### **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

### **Configuration of the device under test:**

- ☒ - See Appendix A and test setup photo(s)
- ☐ - See Product Information Form(s) in Appendix A

## DEVIATIONS FROM STANDARD:

None.

## GENERAL REMARKS:

Radiated spurious emissions data states that the #ANT-2.4-CW-RCL antenna was used for measurements below 1 GHz. The #ANT-2.4-CW-RCL antenna has a higher gain than the actual #ANT2.4CW-RH-RPS antenna to be included in the final design.

### 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: 04 June 2007

Condition of EUT: Normal

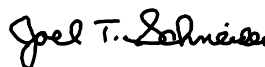
Testing Start Date: 04 June 2007

Testing End Date: 15 June 2007

TÜV SÜD AMERICA INC



Greg Jakubowski  
Senior EMC Technician



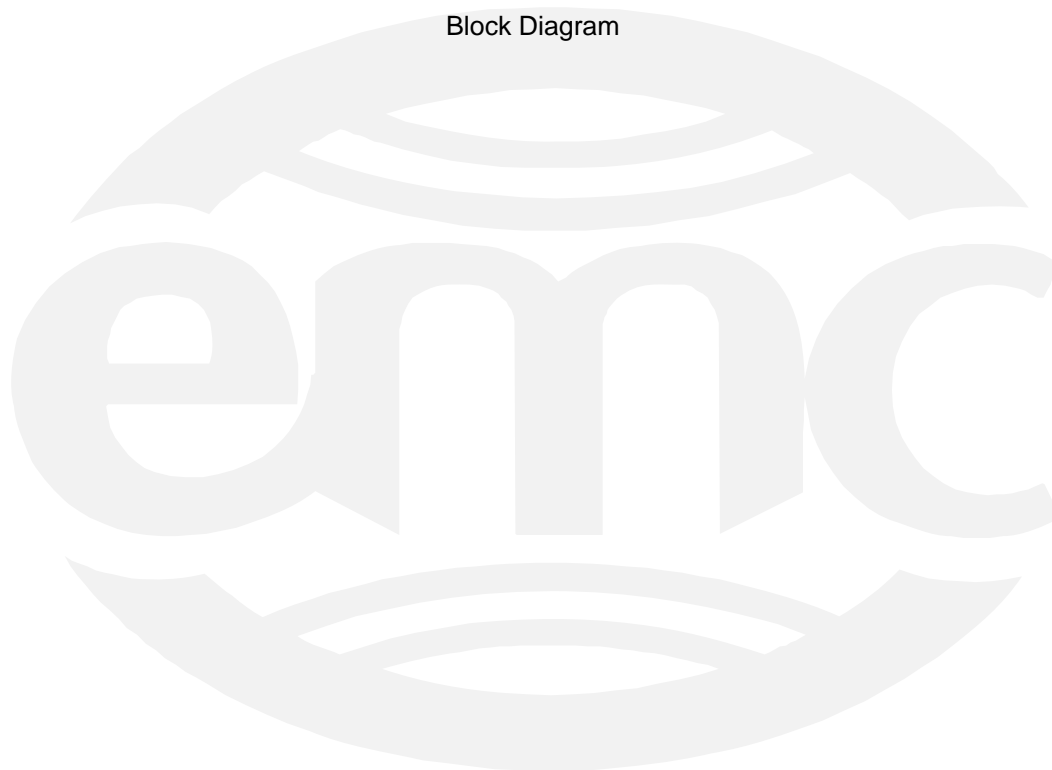
Joel Schneider  
Senior EMC Engineer

## Appendix A

Constructional Data Form

and

Block Diagram



Form

Remote



## 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: Wallace Technologies, LLC.  
 Address: 8300 89<sup>th</sup> Ave North  
Brooklyn Park, MN 55445  
 Contact: Sam Shuster Position: President  
 Phone: 763-416-5671 Fax: 763-416-5670  
 E-mail Address: sam.shuster@wallacet.com

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

EUT Description Mobile Satellite TV Antenna Remote Controller  
 EUT Name Vu Qube Hand Held Remote  
 Model No.: VQV10R Serial No.: n/a  
 Product Options: \_\_\_\_\_  
 Configurations to be tested: Using RF transceiver to position Elevation and Azimuth of Antenna

**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: Added SMA connector so we can make conducted measurements  
 Modifications made during test: \_\_\_\_\_

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

- |   |   |
|---|---|
| <input type="checkbox"/> EMC Directive 89/336/EEC (EMC)<br>Std: _____                           | <input type="checkbox"/> FCC: Class <input type="checkbox"/> A <input checked="" type="checkbox"/> B Part _____ |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC)<br>Std: _____                     | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B                      |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC)<br>Std: _____                 | <input type="checkbox"/> BSMI: Class <input type="checkbox"/> A <input type="checkbox"/> B                      |
| <input type="checkbox"/> Vehicle Directive 72/245/EEC (EMC)<br>Std: _____                       | <input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B                    |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket<br>Notification Submissions (EMC) | <input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B                 |
|   | <input type="checkbox"/> Other: _____   |

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

- |   |   |
|---|---|
| <input type="checkbox"/> Attestation of Conformity (AoC)*                             | <input type="checkbox"/> EMC Certification (used with Octagon Mark)*                                  |
| <input type="checkbox"/> Certificate of Conformity (CoC)*                             | <input type="checkbox"/> Compliance Document*   |
| Protection Class (N/A for vehicles)   | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |
| (Press F1 when field is selected to show additional information on Protection Class.) |   |
| <input type="checkbox"/> FCC / TCB Certification                                      | <input type="checkbox"/> Industry Canada / FCB Certification  |
| <input type="checkbox"/> E-Mark Certification   | <input type="checkbox"/> Taiwan Certification   |

Form

**EMC Test Plan and Constructional Data Form****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): \_\_\_\_\_
- ☐ Continue testing to complete test series.
- ☐ Continue testing to define corrective action.
- ☐ Stop testing.

**EUT Specifications and Requirements**

Length: \_\_\_\_\_ Width: 18" Height: 17.5" Weight: 10.5"

**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: \_\_\_\_\_ Battery (AA) (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: \_\_\_\_\_

Current (Amps/phase(max)): \_\_\_\_\_ Current (Amps/phase(nominal)): \_\_\_\_\_

Other \_\_\_\_\_

**Other Special Requirements****Typical Installation and/or Operating Environment**

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

The Vu Qube hand held remote will be used by the operator either from within a vehicle or next to the vehicle.

**EUT Power Cable**

- ☐ Permanent OR ☐ Removable
- ☐ Shielded OR ☐ Unshielded
- ☒ Not Applicable

Length (in meters) \_\_\_\_\_

Form



America

## EMC Test Plan and Constructional Data Form

## EUT Interface Ports and Cables

Type	During Test				Qty	Shielding		Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent
	Analog	Digital	Active	Passive		Yes	No						
<b>EXAMPLE:</b>					2								
RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/> <input type="checkbox"/>
n/a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>		n/a			3	<input checked="" type="checkbox"/> <input type="checkbox"/>
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Form



## EMC Test Plan and Constructional Data Form

### EUT Software

Revision Level: 19

Description: The software controls the communication between the Vu Qube antenna and the hand held remote, the positioning of the motors, and power consumption.

**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 SÜD America Representative if additional assistance is required.

1. The remote buttons (arrows) actived to move the Dish Antenna up and down
2. The remote buttons (arrows) activated to move the Antenna left and right
3. the remote buttons (1 & 2) to store and recall antenna positions.

**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 #
Vu Qube Antenna	VQV10; VQV10P	n/a	UUM10156V10
Vu Qube handheld remote	VQV10R	n/a	UUM10157V10

Form



America

# 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 #
DBS receiver	D11	A01DA5QC20145	n/a

## Oscillator Frequencies

Frequency	Derived Frequency	Component # / Location	Description of Use
31kHz	n/a	U1; PCB for Vu Qube and Vu Qube handheld remote	Used to drive LCD and system clock
52 kHz	n/a	U2; PCB for Vu Qube and Vu Qube handheld remote	Switching power supply chip
8 MHz	n/a	U1; PCB for Vu Qube and Vu Qube handheld remote	System clock
16 MHz	Multi by U4 up to (MHz): 2402, 2405, 2408, 2411, 2432, 2435, 2439, 2441, 2462, 2465, 2468, 2470	Y1; PCB for Vu Qube and Vu Qube handheld remote	

## Power Supply

Manufacturer	Model #	Serial #	Type
n/a			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

## Power Line Filters

Manufacturer	Model #	Location in EUT
n/a		

Form

**EMC Test Plan and Constructional Data Form**

America

**Power Line Filters**

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>
n/a		

Form



America

**EMC Test Plan and Constructional Data Form****Critical EMI Components (Capacitors, ferrites, etc.)**

Description	Manufacturer	Part # or Value	Qty	Component # / Location
n/a				

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

(PLEASE INSERT "ELECTRONIC SIGNATURE" BELOW IF POSSIBLE)

**Authorization Signatures (Signature Required for Certifications checked on pg 1)**Customer authorization to perform tests  
according to this test plan.

Date

Test Plan/CDF Prepared By (please print)

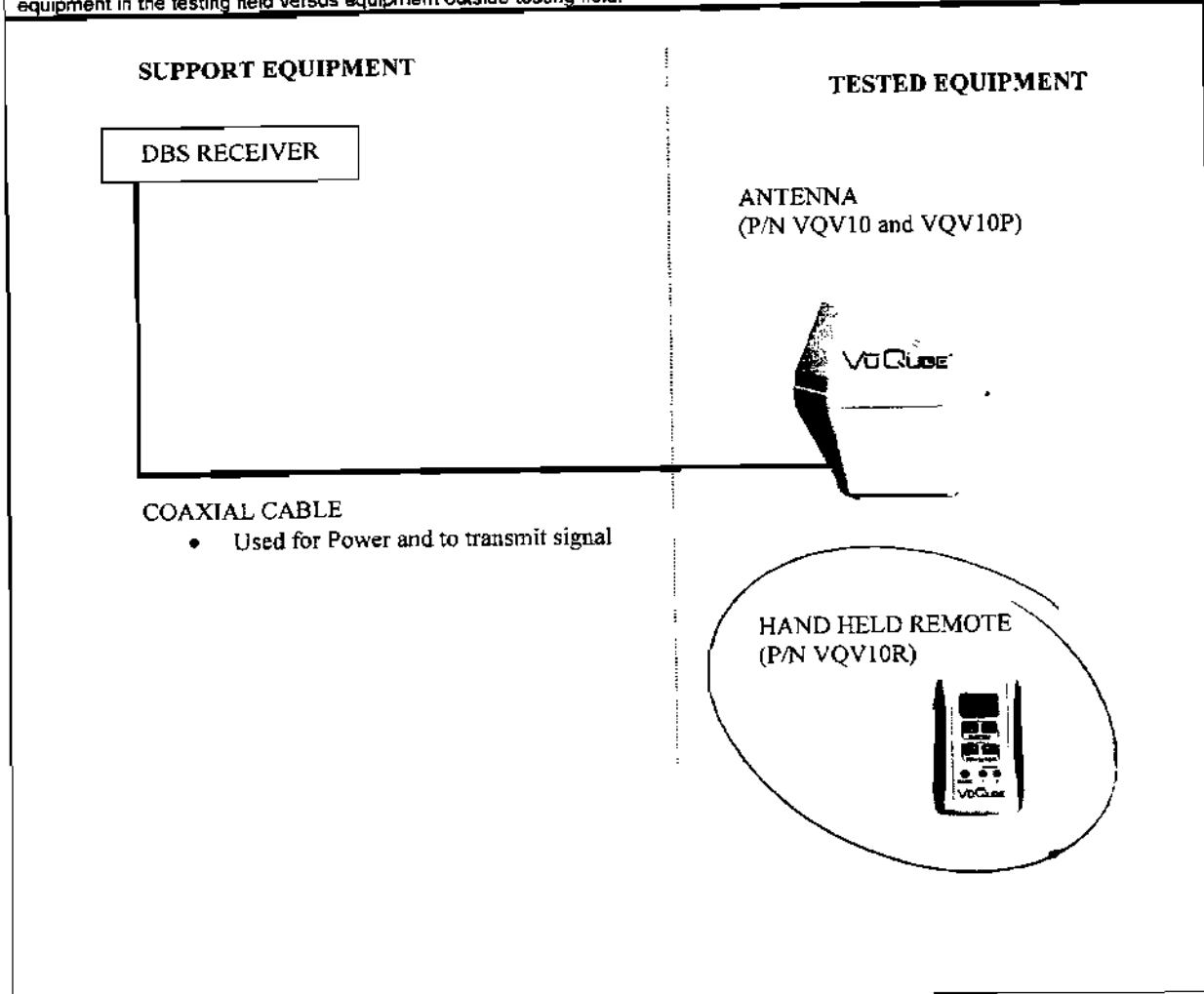
Date

Form




## EMC Block Diagram Form

**System Configuration Block Diagram** -- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



## Authorization Signatures

  
Customer authorization to perform tests  
according to this test plan.

Date

7/9/07

Test Plan/CDF Prepared By (please print)

Date

## Appendix B

### Measurement Protocol



# MEASUREMENT PROTOCOL

## GENERAL INFORMATION

### Test Methodology

Emissions 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  $\pm 1.8$  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  $\pm 4.8$  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

The final level, in dB $\mu$ V, equals the EMI receiver level plus the cable loss and LISN factor.

### Radiated Emissions

The final level, in dB $\mu$ V/m, equals the reading from the spectrum analyzer (Level dB $\mu$ V), 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.

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/average detection. The average measurements are made using a 1 MHz resolution bandwidth and a 10 Hz video bandwidth per FCC guidelines. Tabletop equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the 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. 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.

Example:

FREQ (MHz)	LEVEL (dB $\mu$ V)	CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL (dB $\mu$ V/m)	POL/HGT/AZ (m) (deg)	DELTA1
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.