

# TEST RESULT SUMMARY

## FCC Part 15 Subpart D IC RSS-213 Issue 2

|                        |                                    |
|------------------------|------------------------------------|
| MANUFACTURER           | Revolabs Inc                       |
| NAME OF EQUIPMENT      | Solo Wireless Microphone           |
| MODEL NUMBERS          | <b>01-EXEMIC-BLK-11</b>            |
| MANUFACTURER'S ADDRESS | 63 Great Road<br>Maynard, MA 01754 |
| TEST REPORT NUMBER     | DI602355                           |
| TEST DATES             | 05 May-16 June 2006                |

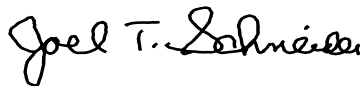
According to testing performed at TÜV America Inc and TRL, the above-mentioned system is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Parts 15 Subpart D and Industry Canada RSS-213 Issue 2.

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 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 D "Unlicensed Personal Communications Service Devices" and Industry Canada RSS-213 Issue 2 "2 GHz Licence-exempt Personal Communications Service Devices (LE-PCS)".

Date: 21 June 2006

Location: Taylors Falls MN  
USA



J. T. Schneider  
Senior Engineer



G. S. Jakubowski  
Test Engineer

Not Transferable

# EMC Emission - TEST REPORT

Test Report File No. : **DI602355** Date of issue: 21 June 2006

Model Nos. : **01-EXEMIC-BLK-11**

Product Name : **Sole Wireless Microphone System**

Product Type : **Transmitter operating in 1920-1930 MHz band**

Applicant : **Revolabs Inc.**

Manufacturer : **Revolabs Inc.**

License Holder : **Revolabs Inc.**

Address : **63 Great Road  
Maynard, MA 01754**

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

Test Project Number :  
Reference(s) **DI602355**

Total pages including Appendices **38**

*TÜV 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 America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV America Inc issued reports.*

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*TÜV America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI*

## D I R E C T O R Y

### Documentation

|                  |          |
|------------------|----------|
| Test Regulations | <u>3</u> |
|------------------|----------|

### Test Results

|                                                    | FCC           | IC RSS-213   |                |
|----------------------------------------------------|---------------|--------------|----------------|
| Subpart B requirements for system                  | 15.309 (b)    |              | <u>4 - 7</u>   |
| Conducted limits                                   | 15.315        | 6.3          | <u>8 - 13</u>  |
| Digital modulation techniques, Peak transmit power | 15.319 (b, c) | 6.1, 6.5     | <u>14 - 15</u> |
| Power spectral density                             | 15.319 (d)    | 6.6          | <u>16 - 17</u> |
| Emission bandwidth                                 | 15.323 (a)    | 6.4          | <u>18 - 21</u> |
| Emissions inside and outside the sub-band          | 15.323 (d)    | 6.7.2, 6.7.1 | <u>22 - 28</u> |
| Frequency stability                                | 15.323 (f)    | 6.2          | <u>29</u>      |

### Appendix A

|                          |                |
|--------------------------|----------------|
| Constructional data form | <u>A1 - A7</u> |
|--------------------------|----------------|

### Appendix B

|                      |                |
|----------------------|----------------|
| Measurement Protocol | <u>B1 - B2</u> |
|----------------------|----------------|

### Sign Explanations:

- ☐ - not applicable
- ☒ - applicable

## EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- |                                                             |                                                             |                                    |
|-------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|
| <input type="checkbox"/> - EN 50081-1 / 1991                | <input type="checkbox"/> - Group 1                          | <input type="checkbox"/> - Group 2 |
| <input type="checkbox"/> - EN 55011 / 1991                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - EN 55013 / 1990                  | <input type="checkbox"/> - Household appliances and similar |                                    |
| <input type="checkbox"/> - EN 55014 / 1987                  | <input type="checkbox"/> - Portable tools                   |                                    |
|                                                             | <input type="checkbox"/> - Semiconductor devices            |                                    |
| <input type="checkbox"/> - EN 55014 / A2:1990               | <input type="checkbox"/> - Household appliances and similar |                                    |
| <input type="checkbox"/> - EN 55014 / 1993                  | <input type="checkbox"/> - Portable tools                   |                                    |
|                                                             | <input type="checkbox"/> - Semiconductor devices            |                                    |
| <input type="checkbox"/> - EN 55015 / 1987                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - EN 55015 / A1:1990               | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - EN 55015 / 1993                  |                                                             |                                    |
| <input type="checkbox"/> - EN 55022 / 1987                  |                                                             |                                    |
| <input type="checkbox"/> - EN 55022 / 1991                  |                                                             |                                    |
| <input type="checkbox"/> - BS                               |                                                             |                                    |
| <input type="checkbox"/> - VCCI                             | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - FCC Part 15 Subpart B            | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input checked="" type="checkbox"/> - FCC Part 15 Subpart D |                                                             |                                    |
| <input type="checkbox"/> - FCC Part 24                      |                                                             |                                    |
| <input type="checkbox"/> - FCC Part 22                      |                                                             |                                    |
| <input type="checkbox"/> - CISPR 11 (1990)                  | <input type="checkbox"/> - Group 1                          | <input type="checkbox"/> - Group 2 |
|                                                             | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - CISPR 22 (1993)                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - IC RSS-Gen Issue 1               |                                                             |                                    |
| <input type="checkbox"/> - IC RSS-193 Issue 1               |                                                             |                                    |
| <input checked="" type="checkbox"/> - IC RSS-213 Issue 2    |                                                             |                                    |

## Subpart B requirements for system: FCC 15.309(b)

### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Minimum margin of compliance for radiated emissions is 4 dB at 47.4 MHz for the microphone battery charger.

### 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

☐ - Conducted measurement

### Test equipment

| TUV ID | Model Number | Manufacturer    | Description          | Serial Number | Cal Due      |
|--------|--------------|-----------------|----------------------|---------------|--------------|
| 3995   | EM-6917B     | Electro-Metrics | Biconicalog Periodic | 151           | 31-Mar-07    |
| 2679   | 85650A       | Hewlett-Packard | Quasi-Peak Adapter   | 2430A00550    | 23-Nov-06    |
| 8052   | 8566B        | Hewlett-Packard | Spectrum Analyzer    | 2115A00853    | 28-Mar-07    |
| 8051   | 85662A       | Hewlett-Packard | Analyzer Display     | 2112A02220    | 28-Mar-07    |
| 2665   | ZHL-1042J    | Mini-Circuits   | Preamplifier         | 32296         | 02/17/2007-B |

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

### Test limit

FCC Part 15 Subpart B

# RADIATED EMISSIONS



Test Report #: DI602355 Run 3 Test Area: STS

EUT Model #: SOLO BASE CHARGER(T1 Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART B Air Pressure: 96.0 kPa

Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat

Page: 1 of 3

## List of measurements for run #: 3

| FREQ                                                                                      | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | POL / HGT / AZ<br>(m)(DEG) | DELTA1<br>CISPR-22- B<br><1GHz 10m<br>(2005) | DELTA2 |
|-------------------------------------------------------------------------------------------|-----------------|-----------------------------------------|---------------------|----------------------------|----------------------------------------------|--------|
| 47.445 MHz                                                                                | 38.65 Qp        | 1.07 / 13.71 / 28.2 / 0.0               | 25.23               | V / 1.00 / 0               | -4.77                                        | n/a    |
| 50.475 MHz                                                                                | 33.6 Qp         | 1.09 / 12.99 / 28.13 / 0.0              | 19.54               | V / 1.00 / 0               | -10.46                                       | n/a    |
| 66.267 MHz                                                                                | 33.9 Qp         | 1.24 / 9.72 / 27.81 / 0.0               | 17.06               | V / 1.00 / 0               | -12.94                                       | n/a    |
| 73.827 MHz                                                                                | 32.35 Qp        | 1.32 / 8.54 / 27.85 / 0.0               | 14.37               | V / 1.00 / 0               | -15.63                                       | n/a    |
| 85.486 MHz                                                                                | 34.55 Qp        | 1.38 / 6.83 / 27.91 / 0.0               | 14.85               | V / 1.00 / 0               | -15.15                                       | n/a    |
| 103.174 MHz                                                                               | 42.05 Qp        | 1.49 / 8.04 / 28.0 / 0.0                | 23.57               | V / 1.00 / 0               | -6.43                                        | n/a    |
| 66.267 MHz                                                                                | 33.6 Qp         | 1.24 / 9.72 / 27.81 / 0.0               | 16.76               | V / 1.00 / 90              | -13.24                                       | n/a    |
| 66.267 MHz                                                                                | 34.55 Qp        | 1.24 / 9.72 / 27.81 / 0.0               | 17.71               | V / 1.00 / 180             | -12.29                                       | n/a    |
| 73.827 MHz                                                                                | 33.0 Qp         | 1.32 / 8.54 / 27.85 / 0.0               | 15.02               | V / 1.00 / 270             | -14.98                                       | n/a    |
| MAXIMIZED.                                                                                |                 |                                         |                     |                            |                                              |        |
| 47.445 MHz                                                                                | 38.74 Qp        | 1.07 / 13.71 / 28.2 / 0.0               | 25.32               | V / 1.20 / 0               | -4.68                                        | n/a    |
| END OF VERTICAL SCAN.                                                                     |                 |                                         |                     |                            |                                              |        |
| NO NEW OR HIGHER EMISSIONS FOUND WITH HORIZONTAL POLARIZATION AT ALL AZIMUTHS 1-4 METERS. |                 |                                         |                     |                            |                                              |        |
| END OF SCAN 30 - 1000MHz.                                                                 |                 |                                         |                     |                            |                                              |        |

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# RADIATED EMISSIONS



Test Report #: DI602355 Run 3 Test Area: STS

EUT Model #: SOLO BASE CHARGER(T1 Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART B Air Pressure: 96.0 kPa

Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat Page: 2 of 3

## Measurement summary for limit1: CISPR-22- B <1GHz 10m (2005) (Qp)

| FREQ        | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | POL / HGT / AZ<br>(m)(DEG) | DELTA1<br>CISPR-22- B<br><1GHz 10m<br>(2005) |
|-------------|-----------------|-----------------------------------------|---------------------|----------------------------|----------------------------------------------|
| 47.445 MHz  | 38.74 Qp        | 1.07 / 13.71 / 28.2 / 0.0               | 25.32               | V / 1.20 / 0               | -4.68                                        |
| 103.174 MHz | 42.05 Qp        | 1.49 / 8.04 / 28.0 / 0.0                | 23.57               | V / 1.00 / 0               | -6.43                                        |
| 50.475 MHz  | 33.6 Qp         | 1.09 / 12.99 / 28.13 / 0.0              | 19.54               | V / 1.00 / 0               | -10.46                                       |
| 66.267 MHz  | 34.55 Qp        | 1.24 / 9.72 / 27.81 / 0.0               | 17.71               | V / 1.00 / 180             | -12.29                                       |
| 73.827 MHz  | 33.0 Qp         | 1.32 / 8.54 / 27.85 / 0.0               | 15.02               | V / 1.00 / 270             | -14.98                                       |
| 85.486 MHz  | 34.55 Qp        | 1.38 / 6.83 / 27.91 / 0.0               | 14.85               | V / 1.00 / 0               | -15.15                                       |

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# RADIATED EMISSIONS



Test Report #: DI602355 Run 3 Test Area: STS

EUT Model #: SOLO BASE CHARGER(T1 Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART B Air Pressure: 96.0 kPa

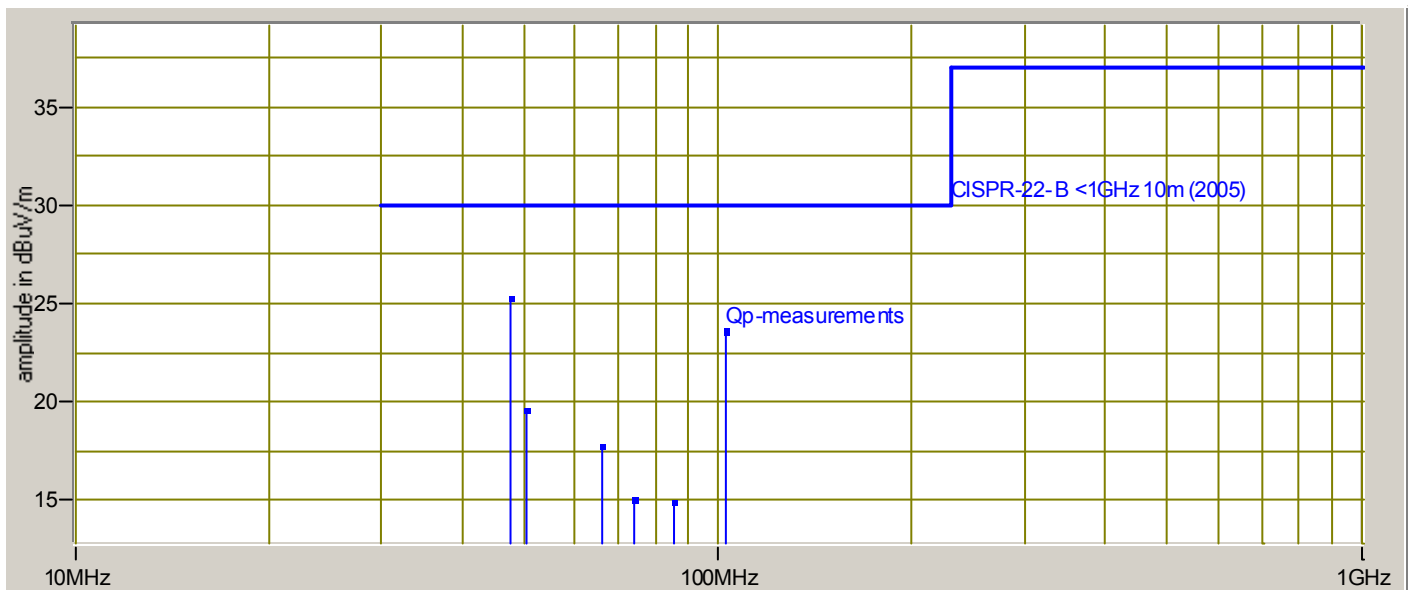
Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat Page: 3 of 3

## Graph:



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**Conducted limits: FCC 15.315, IC RSS-213 6.3****Test summary**

The requirements are: ■ - MET □ - NOT MET

Minimum margin of compliance for conducted emissions is 14 dB at 1.5 MHz for the microphone battery charger.

**Test location**

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)  
☒ - Wild River Lab Small Test Site (Open Area Test Site)  
☐ - Wild River Lab Shield Room

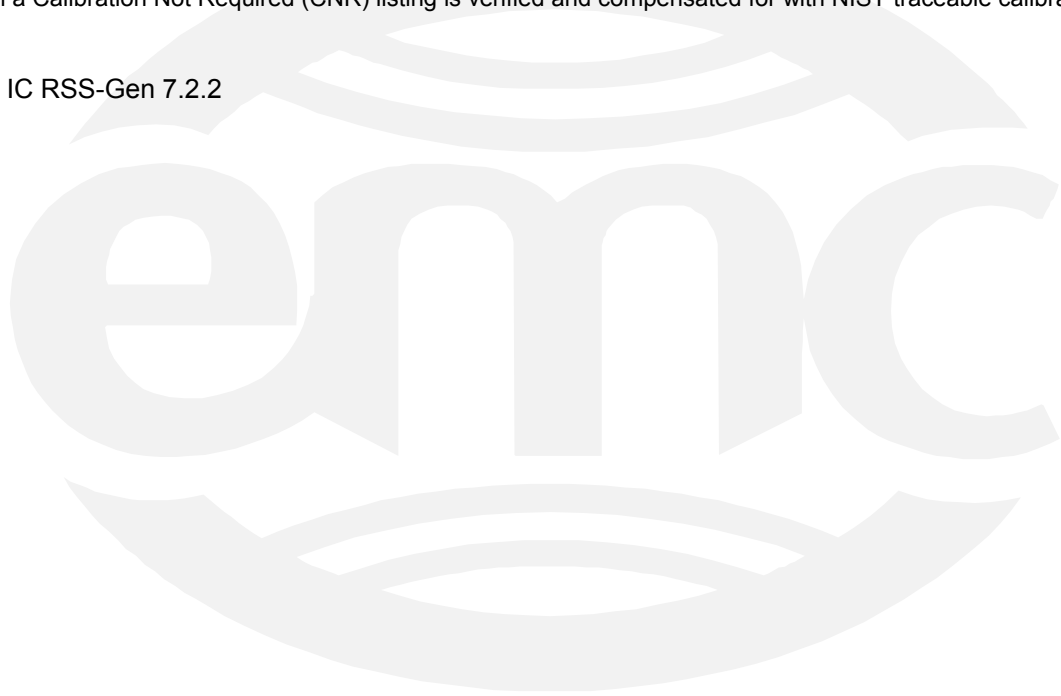
**Test equipment**

| <b>TUV ID</b> | <b>Model Number</b> | <b>Manufacturer</b> | <b>Description</b> | <b>Serial Number</b> | <b>Cal Due</b> |
|---------------|---------------------|---------------------|--------------------|----------------------|----------------|
| 2079          | 3825/2              | EMCO                | <b>LISN</b>        | 1329                 | 04/04/2007-B   |
| 2534          | ESHS-20             | RHODE & SCHWARZ     | <b>RECEIVER</b>    | 837055/003           | 02/27/2007     |

Equipment with a Calibration Not Required (CNR) listing is verified and compensated for with NIST traceable calibrated equipment.

**Test limit**

FCC 15.207, IC RSS-Gen 7.2.2



# CONDUCTED EMISSIONS



Test Report #: DI602355 Run 2 Test Area: STS

EUT Model #: SOLO BASE CHARGER (T1 UNIT #1) Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART D Air Pressure: 96.0 kPa

Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat

Page: 1 of 5

## List of measurements for run #: 2

| FREQ       | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | EUT Lead | DELTA1<br>EN55022 B Qp | DELTA2<br>EN55022 B<br>Avg |
|------------|-----------------|-----------------------------------------|---------------------|----------|------------------------|----------------------------|
| 16.995 MHz | -1.53 Qp        | 2.13 / 0.27 / 0.0 / 0.0                 | 0.87                | L1       | -59.13                 | n/a                        |
| 165.0 kHz  | 46.19 Qp        | 0.23 / 0.26 / 0.0 / 0.0                 | 46.68               | L1       | -18.52                 | n/a                        |
| 185.0 kHz  | 43.9 Qp         | 0.24 / 0.21 / 0.0 / 0.0                 | 44.35               | L1       | -19.91                 | n/a                        |
| 580.0 kHz  | 14.46 Qp        | 0.36 / 0.1 / 0.0 / 0.0                  | 14.92               | L1       | -41.08                 | n/a                        |
| 860.0 kHz  | 18.44 Qp        | 0.41 / 0.1 / 0.0 / 0.0                  | 18.95               | L1       | -37.05                 | n/a                        |
| 1.515 MHz  | 40.89 Qp        | 0.54 / 0.0 / 0.0 / 0.0                  | 41.43               | L1       | -14.57                 | n/a                        |
| 165.0 kHz  | 17.51 Av        | 0.23 / 0.26 / 0.0 / 0.0                 | 18.0                | L1       | n/a                    | -37.2                      |
| 185.0 kHz  | 16.57 Av        | 0.24 / 0.21 / 0.0 / 0.0                 | 17.02               | L1       | n/a                    | -37.24                     |
| 580.0 kHz  | 5.71 Av         | 0.36 / 0.1 / 0.0 / 0.0                  | 6.17                | L1       | n/a                    | -39.83                     |
| 860.0 kHz  | 14.32 Av        | 0.41 / 0.1 / 0.0 / 0.0                  | 14.83               | L1       | n/a                    | -31.17                     |
| 1.515 MHz  | 22.85 Av        | 0.54 / 0.0 / 0.0 / 0.0                  | 23.39               | L1       | n/a                    | -22.61                     |
| 16.995 MHz | -7.17 Av        | 2.13 / 0.27 / 0.0 / 0.0                 | -4.77               | L1       | n/a                    | -54.77                     |
| 165.0 kHz  | 46.45 Qp        | 0.23 / 0.26 / 0.0 / 0.0                 | 46.94               | N        | -18.26                 | n/a                        |
| 185.0 kHz  | 44.14 Qp        | 0.24 / 0.21 / 0.0 / 0.0                 | 44.59               | N        | -19.67                 | n/a                        |
| 580.0 kHz  | 14.7 Qp         | 0.36 / 0.1 / 0.0 / 0.0                  | 15.16               | N        | -40.84                 | n/a                        |
| 860.0 kHz  | 13.16 Qp        | 0.41 / 0.1 / 0.0 / 0.0                  | 13.67               | N        | -42.33                 | n/a                        |
| 1.515 MHz  | 22.74 Qp        | 0.54 / 0.0 / 0.0 / 0.0                  | 23.28               | N        | -32.72                 | n/a                        |
| 16.995 MHz | 2.51 Qp         | 2.13 / 0.27 / 0.0 / 0.0                 | 4.91                | N        | -55.09                 | n/a                        |
| 165.0 kHz  | 17.57 Av        | 0.23 / 0.26 / 0.0 / 0.0                 | 18.06               | N        | n/a                    | -37.14                     |
| 185.0 kHz  | 13.52 Av        | 0.24 / 0.21 / 0.0 / 0.0                 | 13.97               | N        | n/a                    | -40.29                     |
| 580.0 kHz  | 9.87 Av         | 0.36 / 0.1 / 0.0 / 0.0                  | 10.33               | N        | n/a                    | -35.67                     |
| 860.0 kHz  | 1.45 Av         | 0.41 / 0.1 / 0.0 / 0.0                  | 1.96                | N        | n/a                    | -44.04                     |
| 1.515 MHz  | 12.43 Av        | 0.54 / 0.0 / 0.0 / 0.0                  | 12.97               | N        | n/a                    | -33.03                     |
| 16.995 MHz | -3.17 Av        | 2.13 / 0.27 / 0.0 / 0.0                 | -0.77               | N        | n/a                    | -50.77                     |

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# CONDUCTED EMISSIONS



Test Report #: DI602355 Run 2 Test Area: STS  
EUT Model #: SOLO BASE CHARGER (T1 UNIT #1) Date: 5/19/2006  
EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C  
Test Method: FCC 15 SUBPART D Air Pressure: 96.0 kPa  
Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat

Page: 2 of 5

## List of measurements for run #: 2

| FREQ         | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | EUT Lead | DELTA1<br>EN55022 B Qp | DELTA2<br>EN55022 B<br>Avg |
|--------------|-----------------|-----------------------------------------|---------------------|----------|------------------------|----------------------------|
| END OF SCAN. |                 |                                         |                     |          |                        |                            |

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# CONDUCTED EMISSIONS



Test Report #: DI602355 Run 2 Test Area: STS

EUT Model #: SOLO BASE CHARGER (T1 UNIT #1) Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART D Air Pressure: 96.0 kPa

Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat Page: 3 of 5

## Measurement summary for limit1: EN55022 B Qp (Qp)

| FREQ       | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | EUT Lead | DELTA1<br>EN55022 B Qp |
|------------|-----------------|-----------------------------------------|---------------------|----------|------------------------|
| 1.515 MHz  | 40.89 Qp        | 0.54 / 0.0 / 0.0 / 0.0                  | 41.43               | L1       | -14.57                 |
| 165.0 kHz  | 46.45 Qp        | 0.23 / 0.26 / 0.0 / 0.0                 | 46.94               | N        | -18.26                 |
| 185.0 kHz  | 44.14 Qp        | 0.24 / 0.21 / 0.0 / 0.0                 | 44.59               | N        | -19.67                 |
| 860.0 kHz  | 18.44 Qp        | 0.41 / 0.1 / 0.0 / 0.0                  | 18.95               | L1       | -37.05                 |
| 580.0 kHz  | 14.7 Qp         | 0.36 / 0.1 / 0.0 / 0.0                  | 15.16               | N        | -40.84                 |
| 16.995 MHz | 2.51 Qp         | 2.13 / 0.27 / 0.0 / 0.0                 | 4.91                | N        | -55.09                 |

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# CONDUCTED EMISSIONS



Test Report #: DI602355 Run 2 Test Area: STS

EUT Model #: SOLO BASE CHARGER (T1 UNIT #1) Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART D Air Pressure: 96.0 kPa

Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat Page: 4 of 5

## Measurement summary for limit2: EN55022 B Avg (Av)

| FREQ       | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | EUT Lead | DELTA2<br>EN55022 B<br>Avg |
|------------|-----------------|-----------------------------------------|---------------------|----------|----------------------------|
| 1.515 MHz  | 22.85 Av        | 0.54 / 0.0 / 0.0 / 0.0                  | 23.39               | L1       | -22.61                     |
| 860.0 kHz  | 14.32 Av        | 0.41 / 0.1 / 0.0 / 0.0                  | 14.83               | L1       | -31.17                     |
| 580.0 kHz  | 9.87 Av         | 0.36 / 0.1 / 0.0 / 0.0                  | 10.33               | N        | -35.67                     |
| 165.0 kHz  | 17.57 Av        | 0.23 / 0.26 / 0.0 / 0.0                 | 18.06               | N        | -37.14                     |
| 185.0 kHz  | 16.57 Av        | 0.24 / 0.21 / 0.0 / 0.0                 | 17.02               | L1       | -37.24                     |
| 16.995 MHz | -3.17 Av        | 2.13 / 0.27 / 0.0 / 0.0                 | -0.77               | N        | -50.77                     |

Tested by: Ross M Johnson

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# CONDUCTED EMISSIONS



Test Report #: DI602355 Run 2 Test Area: STS

EUT Model #: SOLO BASE CHARGER (T1 UNIT #1) Date: 5/19/2006

EUT Serial #: N/A EUT Power: 60Hz/120VAC Temperature: 18.0 °C

Test Method: FCC 15 SUBPART D Air Pressure: 96.0 kPa

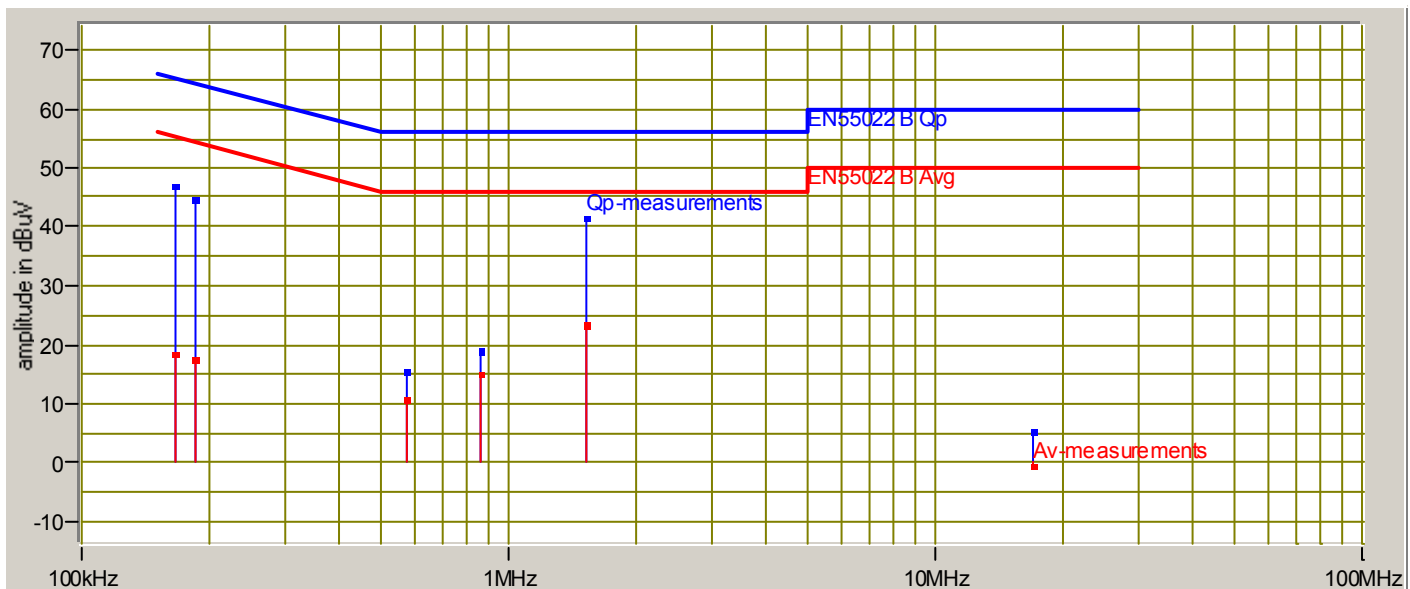
Customer: REVOLABS Rel. Humidity: 78.0 %

EUT Description: WIRELESS MICROPHONE BASE CHARGER

Notes: CHARGING MODE

Data File Name: 2355.dat Page: 5 of 5

## Graph:



Tested by: Ross M Johnson

Printed

Signature

Reviewed by: Greg Jakubowski

Printed

Signature

## General technical requirements

### Digital modulation techniques: FCC 15.319(b), IC RSS-213 6.1

The DECT standard GFSK modulation is used.

### Peak transmit power: FCC 15.319(c), IC RSS-213 6.5

#### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

The peak transmit power does not exceed 100 microwatts multiplied by the square root of the emission bandwidth in Hertz.

#### Test location

- ☒ - Wild River Lab Large Test Site (Open Area Test Site) – radiated measurement for microphone
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Wild River Lab Shield Room – conducted measurement for base station

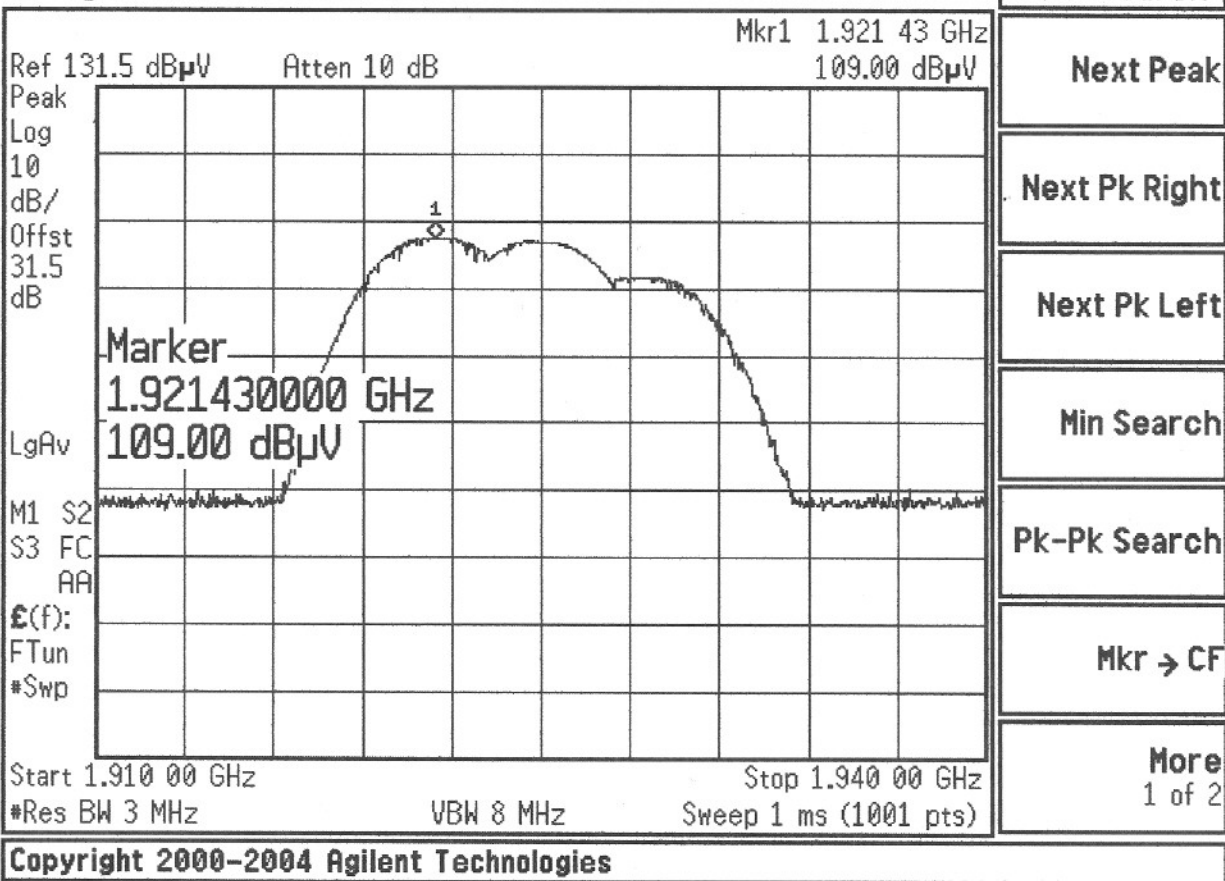
#### Test equipment

| TUV ID | Model Number | Manufacturer             | Description         | Serial Number | Cal Due   |
|--------|--------------|--------------------------|---------------------|---------------|-----------|
| 3371   | E4440A       | Agilent                  | Spectrum Analyzer   | MY43362222    | 03-Nov-06 |
| 2075   | 3115         | Electro-Mechanics (EMCO) | Ridge Guide Antenna | 9001-3275     | 08-Dec-06 |

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

#### Test limits

120 milliwatts, based on 100 microwatts x (1460000 Hz)<sup>1/2</sup>



x-axis - hor. ant. pol. - worst case

mike 105

109 dBμV/m = 14.5 mW ERP @ 3m

$$\text{LIMIT} = 100 \mu\text{W} \times \sqrt{1.46 \times 10^6} = 120 \text{ mW}$$

all channels

## Power spectral density: FCC 15.319(d), IC RSS-213 6.6

### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Power spectral density does not exceed 3 milliwatts in any bandwidth of 3 kHz as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

### 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  
☐ - Conducted measurement

### Test equipment

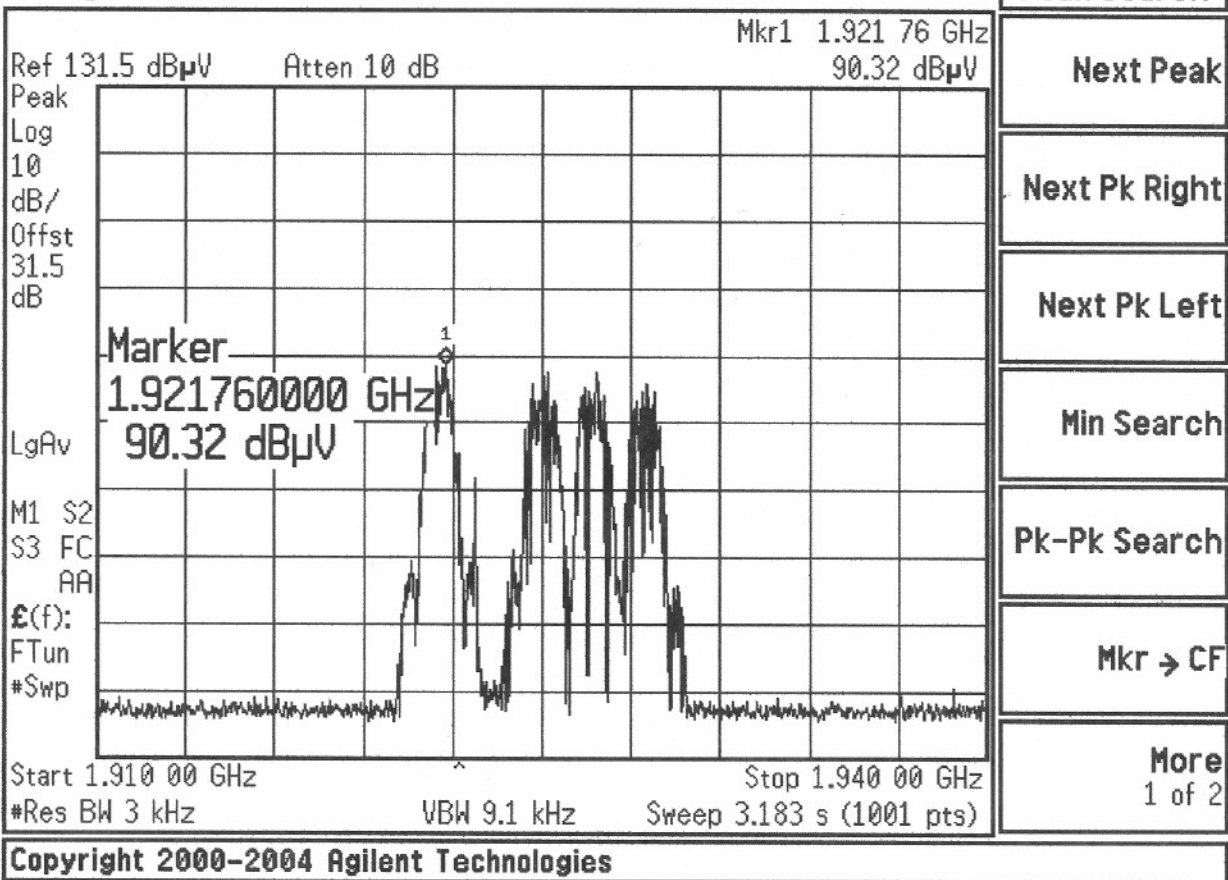
| TUV ID | Model Number | Manufacturer             | Description         | Serial Number | Cal Due   |
|--------|--------------|--------------------------|---------------------|---------------|-----------|
| 3371   | E4440A       | Agilent                  | Spectrum Analyzer   | MY43362222    | 03-Nov-06 |
| 2075   | 3115         | Electro-Mechanics (EMCO) | Ridge Guide Antenna | 9001-3275     | 08-Dec-06 |

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

### Test limit

3 milliwatts in any bandwidth of 3 kHz

\* Agilent 13:39:27 May 5, 2006



power density limit = 3 mW / 3 KHz

90.3 dB $\mu$ V/m = 196  $\mu$ W ERP @ 3 m

all channels

microphone

**Emission bandwidth: FCC 15.323(a), IC RSS-213 6.4****Test summary**

The requirements are: ☒ - MET ☐ - NOT MET

Operation is contained within the 1920-1930 MHz band. The emission bandwidth is less than 2.5 MHz. The power level is as specified in 15.319(c), but in no event is the emission bandwidth less than 50 kHz.

**Test Distance**

- ☒ - 3 meters  
☐ - 10 meters  
☐ - Conducted measurement

**Test equipment**

| TUV ID | Model Number | Manufacturer             | Description         | Serial Number | Cal Due   |
|--------|--------------|--------------------------|---------------------|---------------|-----------|
| 3371   | E4440A       | Agilent                  | Spectrum Analyzer   | MY43362222    | 03-Nov-06 |
| 2075   | 3115         | Electro-Mechanics (EMCO) | Ridge Guide Antenna | 9001-3275     | 08-Dec-06 |

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

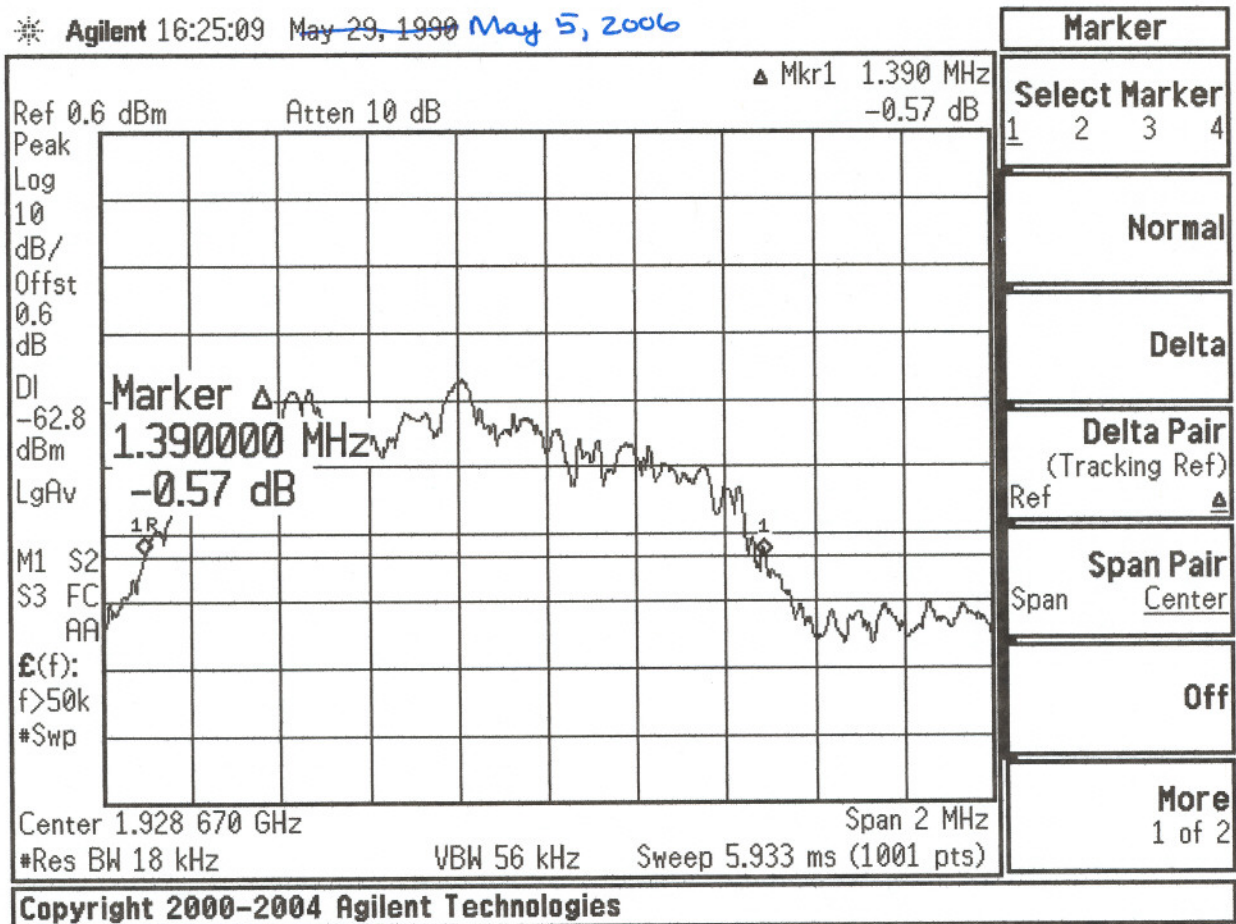
**Test limit**

Minimum 50 kHz, maximum 2.5 MHz

**Test data**

Maximum measured 1.46 MHz, minimum measured 1.39 MHz

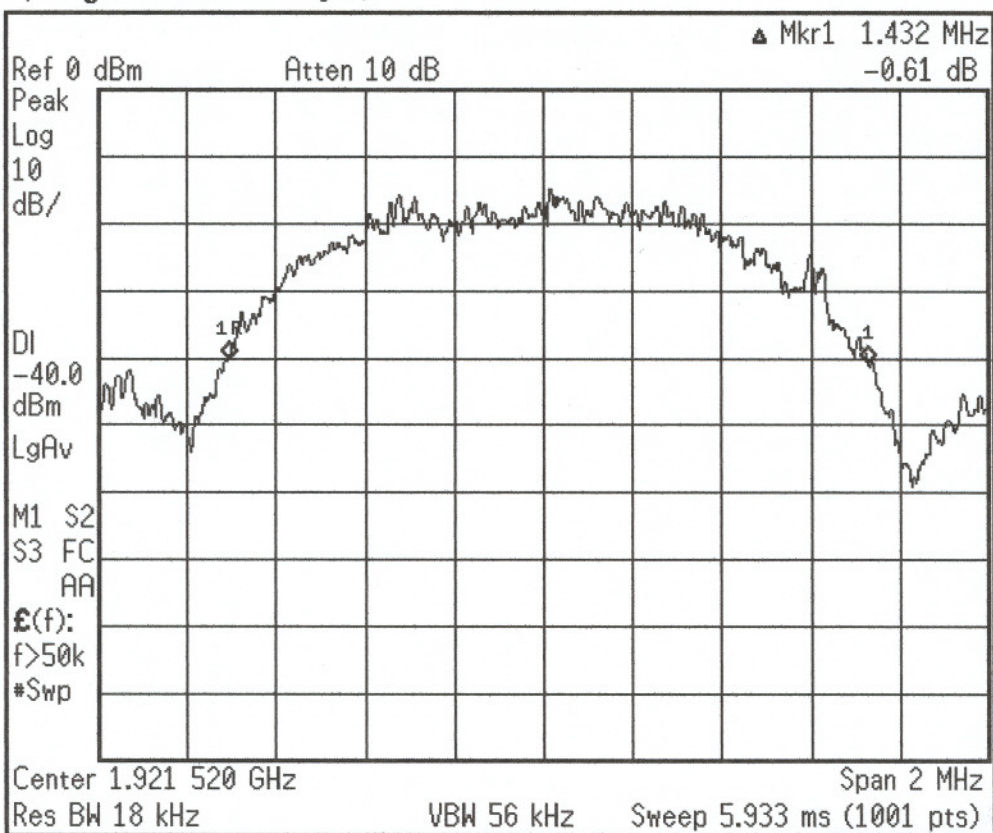
\* Agilent 16:25:09 May 29, 1990 May 5, 2006



microphone

emission bw - high channel

✱ Agilent 10:43:48 May 5, 2006

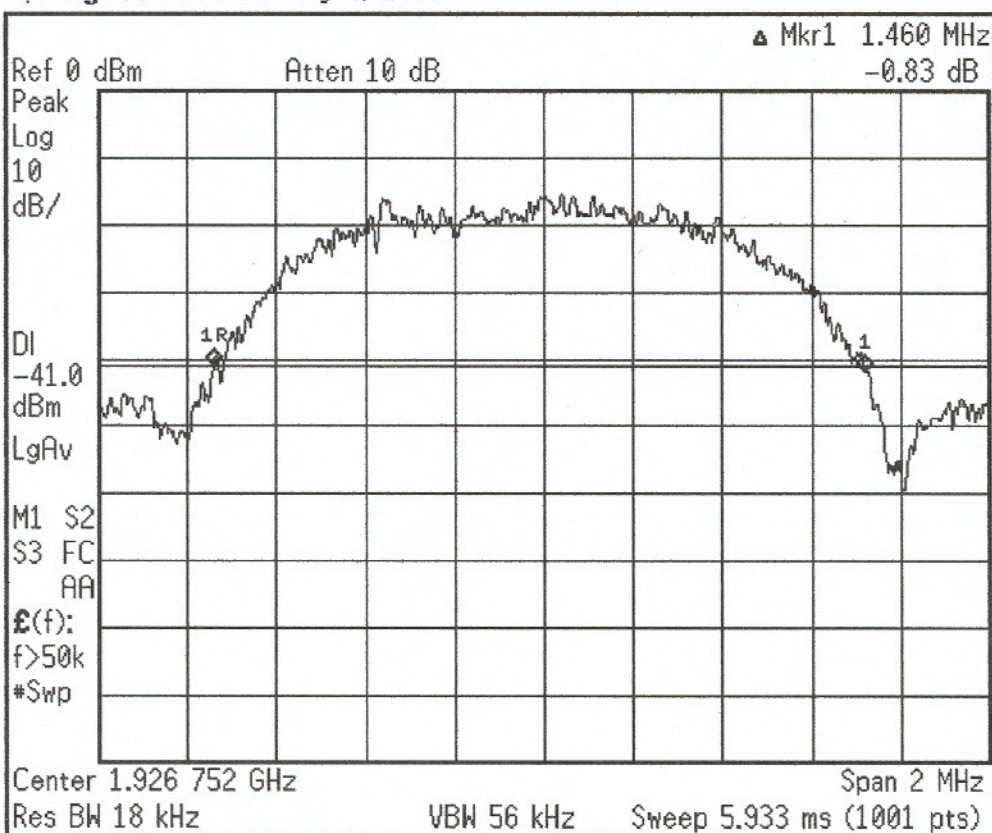


|              |
|--------------|
| Title        |
| Change Title |
| Clear Title  |
|              |
|              |
|              |
|              |
|              |

Copyright 2000-2004 Agilent Technologies

mike 106 - emission bw  
mike 103 - emission bw  
mike 100 - emission bw

\* Agilent 10:50:12 May 5, 2006



|              |
|--------------|
| Title        |
| Change Title |
| Clear Title  |
|              |
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|              |
|              |
|              |

Copyright 2000-2004 Agilent Technologies

mike 101 - emission bw  
mike 110 - emission bw  
base port 1 - emission bw  
All channels tested - this is max.

## Emissions outside and inside the sub-band: FCC 15.323(d), IC RSS-213 6.7.2, 6.7.1

### Test summary

The requirements are: ■ - MET □ - NOT MET

### Test Distance

- - 3 meters
- - 10 meters
- - Conducted measurement

### Test equipment

| TUV ID | Model Number | Manufacturer             | Description          | Serial Number | Cal Due      |
|--------|--------------|--------------------------|----------------------|---------------|--------------|
| 3995   | EM-6917B     | Electro-Metrics          | Biconicalog Periodic | 151           | 31-Mar-07    |
| 2679   | 85650A       | Hewlett-Packard          | Quasi-Peak Adapter   | 2430A00550    | 23-Nov-06    |
| 8052   | 8566B        | Hewlett-Packard          | Spectrum Analyzer    | 2115A00853    | 28-Mar-07    |
| 8051   | 85662A       | Hewlett-Packard          | Analyzer Display     | 2112A02220    | 28-Mar-07    |
| 2665   | ZHL-1042J    | Mini-Circuits            | Preamplifier         | 32296         | 02/17/2007-B |
| 2075   | 3115         | Electro-Mechanics (EMCO) | Ridge Guide Antenna  | 9001-3275     | 08-Dec-06    |
| 3371   | E4440A       | Agilent                  | Spectrum Analyzer    | MY43362222    | 03-Nov-06    |
| 6717   | 3116         | Electro-Mechanics (EMCO) | Ridge Guide Antenna  | 2005          | 19-Sep-06    |
| 3958   | SL18B4020    | Phase One Microwave      | Preamplifier         | 0002          | Code B       |

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

### Test limits

Emissions outside the sub-band shall be attenuated below a reference power of 112 milliwatts as follows:  
 30 dB between the sub-band and 1.25 MHz above or below the sub-band  
 50 dB between 1.25 and 2.5 MHz above or below the sub-band  
 60 dB between 2.5 MHz or greater above or below the sub-band

Emissions inside the sub-band must comply with the following emission mask:

30 dB below 120 mW between 1B and 2B  
 50 dB below 120 mW between 2B and 3B  
 60 dB below 120 mW between 3B and sub-band edge

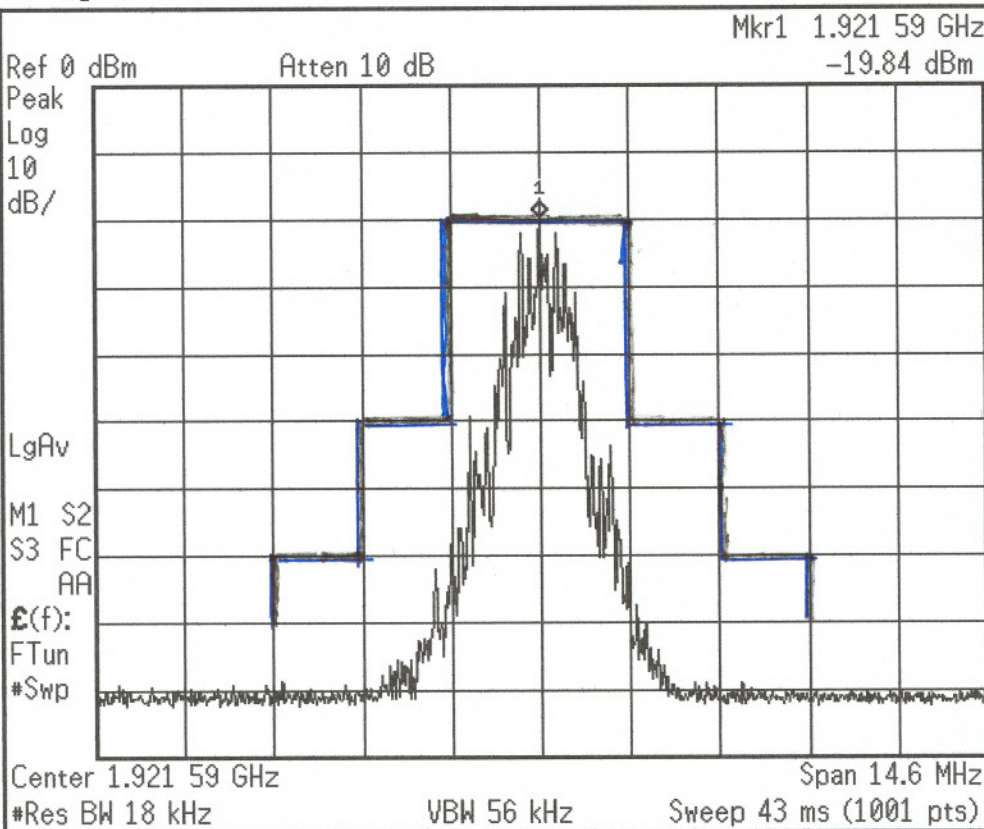
### Test data

Plot demonstrates device meets inside sub-band mask for 15 mW, so also meets inside sub-band mask for 120 mW (9 dB higher). B = 1.46 MHz.

Plots demonstrate device meets outside sub-band, band edge limits are met by 60 dB below 112 mW level being reached inside sub-band.

Radiated emissions show outside sub-band requirements met by minimum of 5 dB at 960.7 MHz.

Agilent 20:42:47 ~~Sep 30, 1998~~ 17 MAY 2006



Display

Full Screen

Display Line

-73.50 dBm

On

Off

Limits

Active Fctn

Position

Center

Title

Preferences

Copyright 2000-2004 Agilent Technologies

in-band mask - low channel

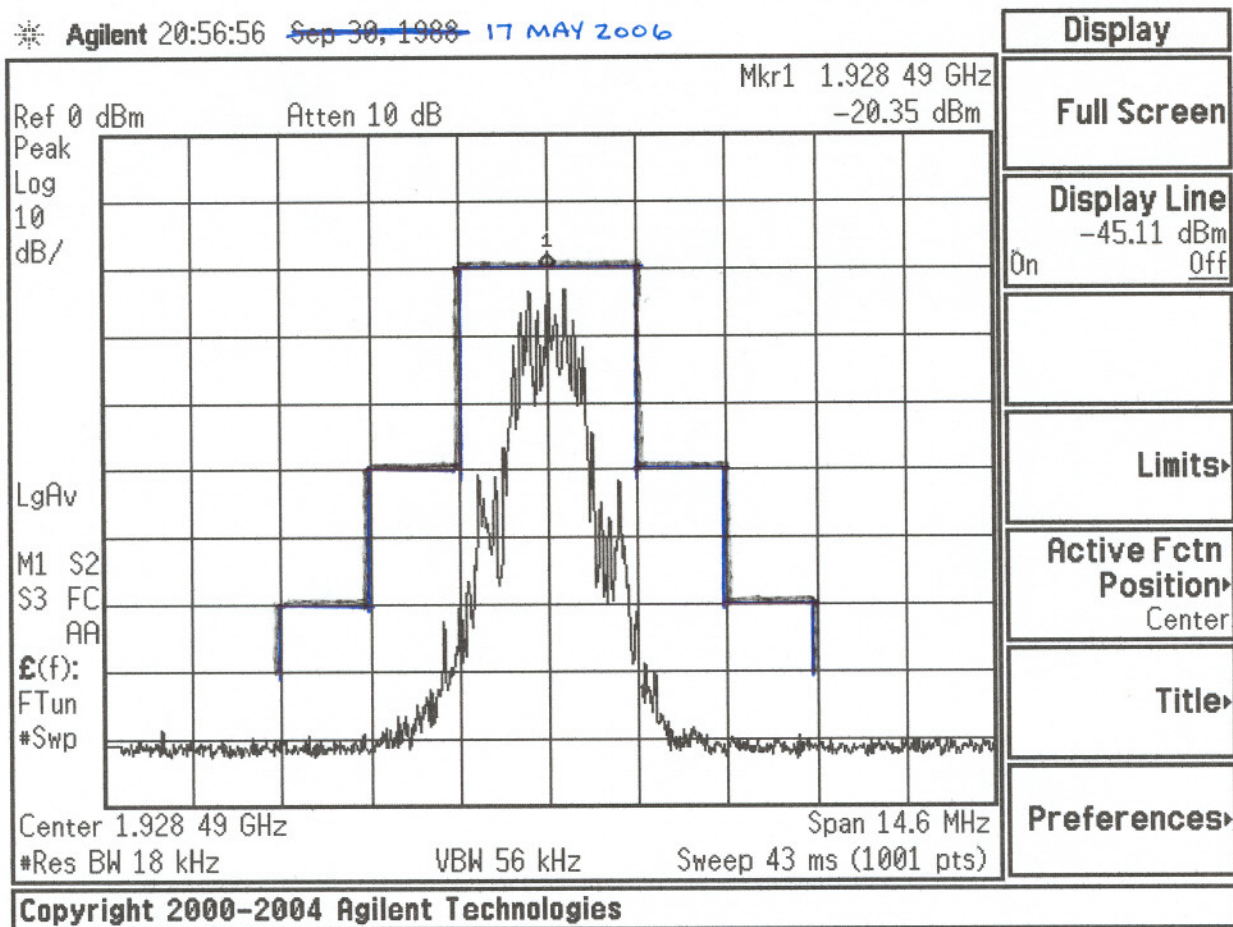
$B = 1.46 \text{ MHz}$

same for base + mic

mask drawn is for 15mW permitted xmit power

mask for 120mw transmit power would be

9 dB higher



in-band mask - high channel

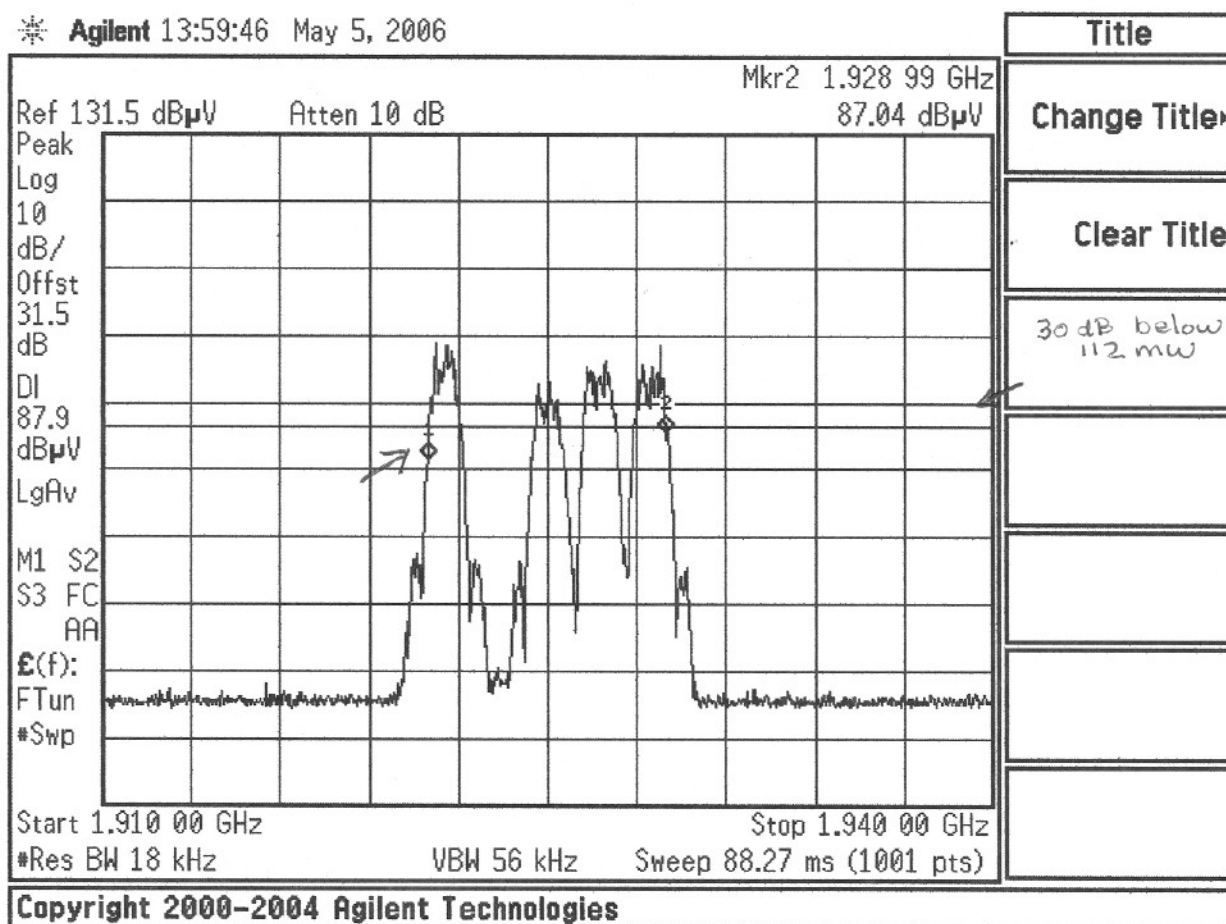
$$B = 1.46 \text{ MHz}$$

same for base + mic

mask drawn is for 15 mw permitted xmit power

mask for 120 mw transmit power would be  
9 dB higher

✱ Agilent 13:59:46 May 5, 2006



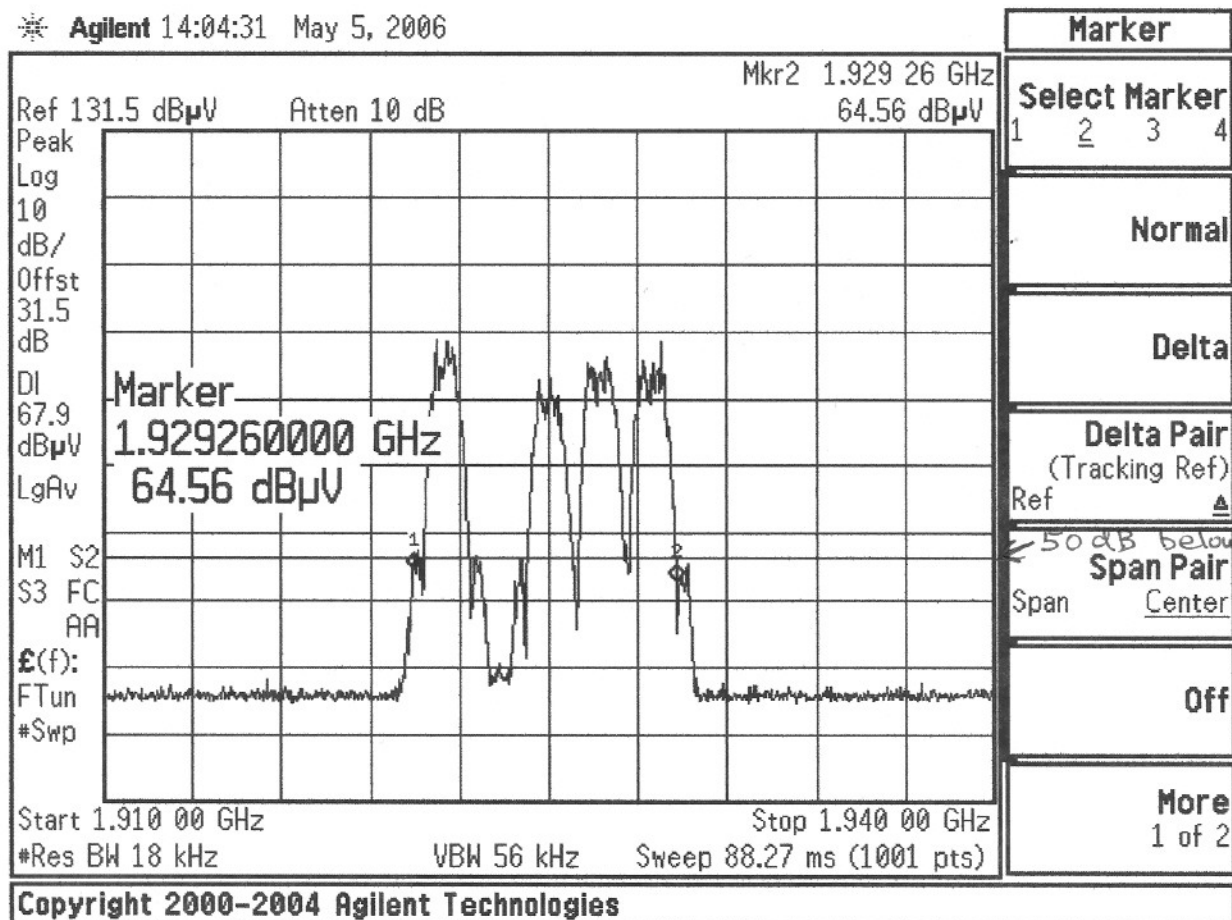
Marker 1 - 1920.9 MHz  
 Marker 2 - 1928.9 MHz

reaches 30dB below 112mW in sub-band

emissions outside sub-band

microphone

✱ Agilent 14:04:31 May 5, 2006



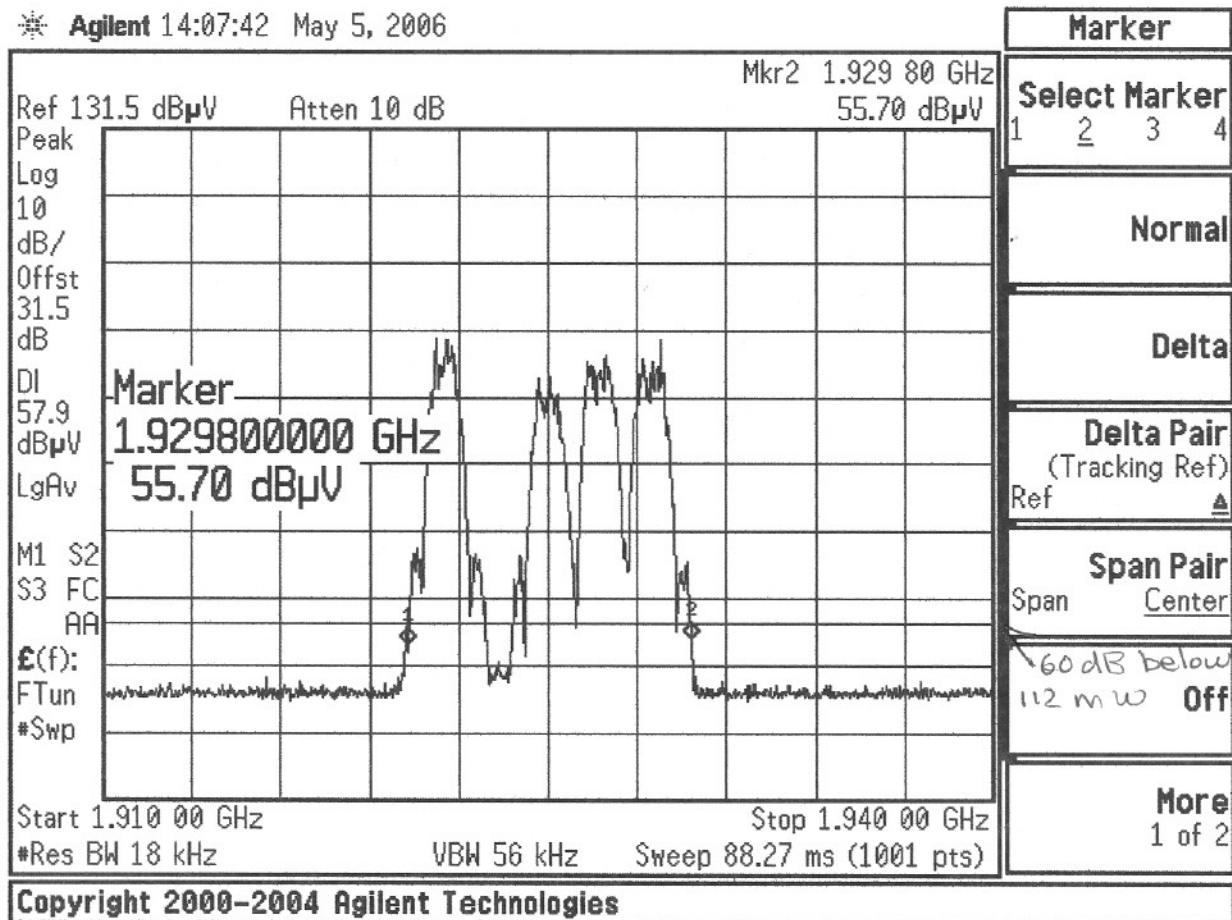
Marker 1 = 1920.4 MHz

Marker 2 = 1929.2 MHz

reaches 50 dB below 112 mW in sub-band

emissions outside sub-band

✱ Agilent 14:07:42 May 5, 2006



Marker 1 = 1920.2 MHz

Marker 2 = 1929.8 MHz

reaches 60 dB below 112 mW in sub-band

emissions outside sub-band

microphone

# RADIATED EMISSIONS



Test Report #: DI602355 Run 1 Test Area: LTS  
EUT Model #: SOLO Date: 5/18/2006  
EUT Serial #: 105 EUT Power: BATTERY Temperature: 21.0 °C  
Test Method: FCC 15 SUBPART D Air Pressure: 98.0 kPa  
Customer: REVOLABS Rel. Humidity: 32.0 %

EUT Description: WIRELESS MICROPHONE

Notes: SPURIOUS SCAN

Data File Name: \_\_\_\_\_ Page: 1 of 1

## List of measurements for run #: 1

| FREQ                                                | LEVEL<br>(dBuV) | CABLE / ANT / PREAMP /<br>ATTEN<br>(dB) | FINAL<br>(dBuV / m) | POL / HGT / AZ<br>(m)(DEG) | FCC Part 15<br>Subpart D –<br>dBuV/m | DELTA2 |
|-----------------------------------------------------|-----------------|-----------------------------------------|---------------------|----------------------------|--------------------------------------|--------|
| ALL READINGS MAXIMIZED.                             |                 |                                         |                     |                            |                                      |        |
| 57.9 dBuV/m = 60 dB below 112 mW                    |                 |                                         |                     |                            |                                      |        |
| LOW CHANNEL.                                        |                 |                                         |                     |                            |                                      |        |
| 960.753 MHz                                         | 52.8 Pk         | 2.59 / 22.82 / 27.5 / 0.0               | 50.7                | V / 1.00 / 0               | 57.9                                 | n/a    |
| HIGH CHANNEL.                                       |                 |                                         |                     |                            |                                      |        |
| 964.242 MHz                                         | 50.2 Pk         | 2.59 / 22.88 / 27.51 / 0.0              | 48.17               | V / 1.00 / 30              | 57.9                                 | n/a    |
| NO EMISSIONS DETECTED ABOVE 1GHz IN EITHER CHANNEL. |                 |                                         |                     |                            |                                      |        |
| END OF SCAN 30MHz - 19.3GHz.                        |                 |                                         |                     |                            |                                      |        |

Tested by: Ross M Johnson

Printed

Signature

Reviewed by: Greg Jakubowski

Printed

Signature

## Frequency stability: FCC 15.323(f), IC RSS-213 6.2

### Test summary

The requirements are: ■ - MET □ - NOT MET

| Degrees C | Frequency (MHz) – Channel 1 | Frequency (MHz) – Channel 5 |
|-----------|-----------------------------|-----------------------------|
| -20       | 1921.558 (+4 ppm)           | 1928.492 (+4 ppm)           |
| -10       | 1921.550 (0 ppm)            | 1928.483 (0 ppm)            |
| 0         | 1921.558 (+4 ppm)           | 1928.500 (+8 ppm)           |
| 10        | 1921.550 (0 ppm)            | 1928.500 (+8 ppm)           |
| 20        | 1921.550                    | 1928.483                    |
| 30        | 1921.567 (+8 ppm)           | 1928.492 (+4 ppm)           |
| 40        | 1921.550 (0 ppm)            | 1928.467 (-8 ppm)           |
| 50        | 1921.550 (0 ppm)            | 1928.467 (-8 ppm)           |
| VAC       |                             |                             |
| 102       | 1921.560 (+5 ppm)           | 1928.480 (-1 ppm)           |
| 138       | 1921.568 (+9 ppm)           | 1928.480 (-1 ppm)           |

Environtronics SH27, s/n 09963482-S

Agilent E4440A spectrum analyzer, #3367, cal due 02 September 2006.

Staco variac, #3846

Fluke 77 voltmeter, #2103, cal due 30 March 2007

Worst case of microphone/base station over 15 minute period are recorded, voltage measurements only apply to base station.

### Test limits

±10 ppm

## Appendix A

### Constructional Data Form





## EMC Test Plan and Constructional Data Form

America

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: Revolabs, Incorporated  
 Address: 63 Great Road  
Maynard, MA 01754  
 Contact: Edward Chu Position: Senior Program Manager  
 Phone: 978.897.5655 x113 Fax: 978.897.5616  
 E-mail Address: echu@revolabs.com

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

EUT Description Wireless Microphone Base Station & Wireless Microphone  
 EUT Name Solo Executive Base Station & Solo Executive Microphones  
 Model No.: 01-EXERAC-BLK-11 Serial No.: 501050000001  
& 01-EXEMIC-BLK-11 & 501050000003  
 Product Options: \_\_\_\_\_  
 Configurations to be tested: \_\_\_\_\_

### 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: \_\_\_\_\_  
 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 checked="" type="checkbox"/> FCC: Class <input type="checkbox"/> A <input checked="" type="checkbox"/> B Part <u>15</u> |
| <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 checked="" type="checkbox"/> Canada: Class <input type="checkbox"/> A <input checked="" 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)*<br>Protection Class (N/A for vehicles) | <input type="checkbox"/> Compliance Document*                                                         |
| (Press F1 when field is selected to show additional information on Protection Class.)            | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |
| <input checked="" type="checkbox"/> FCC / TCB Certification                                      | <input checked="" type="checkbox"/> Industry Canada / FCB Certification                               |
| <input type="checkbox"/> E-Mark Certification                                                    | <input type="checkbox"/> Taiwan Certification                                                         |

**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 America should:

- ☐ Call contact listed above, if not available then stop testing. (After hrs phone): 508.494.4439
- ☒ Continue testing to complete test series.
- ☐ Continue testing to define corrective action.
- ☐ Stop testing.

**EUT Specifications and Requirements**Length: 16.9" Width: 8.0" Height: 1.7" Weight: 6.5 lbs.**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: 110 (If battery powered, make sure battery life is sufficient to complete testing.)# of Phases: 1Current (Amps/phase(max)): 1 Current (Amps/phase(nominal)): .09Other Charger Base 110 V, 0.3A AC, 5V 2A DC (max)**Other Special Requirements****Typical Installation and/or Operating Environment**(ie. Hospital, Small Business, Industrial/Factory, etc.)  
Business conference room.**EUT Power Cable**

☐ Permanent OR ☒ Removable Length (in meters): 1.8

☐ Shielded OR ☒ Unshielded

☐ Not Applicable



# EMC Test Plan and Constructional Data Form

America

| EUT Interface Ports and Cables |                                     |                                     |                                     |                          |     |                                     |                          |                              |                |                        |                           |           |                                     |                          |
|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|-----|-------------------------------------|--------------------------|------------------------------|----------------|------------------------|---------------------------|-----------|-------------------------------------|--------------------------|
| Type                           | Analog                              | Digital                             | During Test                         |                          | Qty | Shielding                           |                          | Termination                  | Connector Type | Port Termination       | Length tested (in meters) | Removable | Permanent                           |                          |
|                                |                                     |                                     | Active                              | Passive                  |     | Yes                                 | No                       |                              |                |                        |                           |           |                                     | Type                     |
| <b>EXAMPLE:</b><br>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"/> |
| Audio line-level in/out        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 16  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 2 condutor audio with shield | bare wire      | 3.5mm mini-phoenix     | none                      | 1         | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |
|                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |     | <input type="checkbox"/>            | <input type="checkbox"/> |                              |                |                        |                           |           | <input type="checkbox"/>            | <input type="checkbox"/> |



## EMC Test Plan and Constructional Data Form

### EUT Software.

Revision Level: c7490\_r4

Description: Operating software

**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. Base Station and eight microphones, all connected over air.
2. Base Station powered on but no connections. Eight microphones docked in charger, and synchronized to Base (i.e. listening within radio range)
- 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 #   |
|----------------------------------------------|------------------|-------------------|------------|
| Solo Executive Base Station (1)              | 01-EXERAC-BLK-11 | 501050000001      | 0014898290 |
| Solo Executive Charger Base (1) includes PSU | 01-EXECHG-STD-11 | 501050000002      | 0014898290 |
| Solo Executive Microphone (8)                | 01-EXEMIC-BLK-11 | 501050000003 - 10 | 0014898290 |



# EMC Test Plan and Constructional Data Form

America

**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.

| <i>Description</i>        | <i>Model #</i> | <i>Serial #</i> | <i>FCC ID #</i> |
|---------------------------|----------------|-----------------|-----------------|
| None - EUT is standalone. |                |                 |                 |

## Oscillator Frequencies

| <i>Frequency</i> | <i>Derived Frequency</i> | <i>Component # / Location</i>   | <i>Description of Use</i>                      |
|------------------|--------------------------|---------------------------------|------------------------------------------------|
| 10.368MHz        |                          | 4 Crystal on Base Station       | processor clock and radio sythesizer reference |
| 10.368Mhz        |                          | 1 Crystal on microphone         | processor clock and radio sythesizer reference |
| 315MHz           |                          | 1 SAW resonator on Charger Base | 315MHz transmitter module                      |
| 315MHz           |                          | 1 SAW receiver on Base Station  | 315MHz receiver module                         |
|                  |                          |                                 |                                                |
|                  |                          |                                 |                                                |

## Power Supply

| <i>Manufacturer</i> | <i>Model #</i> | <i>Serial #</i> | <i>Type</i>                                                                                                                                              |
|---------------------|----------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phihong             | PSC10A-050S    |                 | <input checked="" type="checkbox"/> Switched-mode: (Frequency) _____<br><input type="checkbox"/> Linear <input type="checkbox"/> Other: _____            |
| XP Power            | ACS20US05      |                 | <input checked="" type="checkbox"/> Switched-mode: (Frequency) <u>50-70 kHz</u><br><input type="checkbox"/> Linear <input type="checkbox"/> Other: _____ |

## Power Line Filters

| <i>Manufacturer</i> | <i>Model #</i> | <i>Location in EUT</i> |
|---------------------|----------------|------------------------|
|                     |                |                        |
|                     |                |                        |



## EMC Test Plan and Constructional Data Form

### Critical EMI Components (Capacitors, ferrites, etc.)

| <i>Description</i>                    | <i>Manufacturer</i> | <i>Part # or Value</i> | <i>Qty</i> | <i>Component # / Location</i> |
|---------------------------------------|---------------------|------------------------|------------|-------------------------------|
| No major components.                  |                     |                        |            |                               |
| Many small ceramic bypass capacitors. |                     |                        |            |                               |
|                                       |                     |                        |            |                               |
|                                       |                     |                        |            |                               |

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

Multilayer PCBs with ground planes and careful layout.  
 Series resistance on most external connections.  
 BPF and LPF on RF connections.

(PLEASE INSERT "ELECTRONIC SIGNATURE" BELOW IF POSSIBLE)

### Authorization Signatures (Signature Required for Certifications checked on pg 1)

Marty Bodley, CEO

June 21, 2006

Customer authorization to perform tests  
 according to this test plan.

Date

Tom Zimmerman

June 21, 2006

Test Plan/CDF Prepared By (please print)

Date

## Appendix B

### Measurement Protocol



## MEASUREMENT PROTOCOL

### Environmental conditions in the lab, (TUV)

Temperature: 22 - 26° C

Relative Humidity: 20 - 22 %

Atmospheric pressure: 98.0 – 99.0 kPa

### 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.

### 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.

Example:

| FREQ<br>(MHz) | LEVEL<br>(dB $\mu$ V) | CABLE/ANT/PREAMP<br>(dB) (dB/m) (dB) | FINAL<br>(dB $\mu$ V/m) | POL/HGT/AZ<br>(m) (deg) | DELTA1 |
|---------------|-----------------------|--------------------------------------|-------------------------|-------------------------|--------|
| 60.80         | 42.5Qp +              | 1.2 + 10.9 - 25.5 =                  | 29.1                    | V 1.0 0.0               | -10.9  |

### Substitution Method

Radiated emissions from the EUT are measured in the frequency range of 30 to 19500 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. 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 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. Intentional radiators are positioned through 3 orthogonal axes to determine the maximum level. The field strength levels were measured per ANSI C63.4. The EUT is then replaced with a tuned dipole antenna (below 1 GHz) or horn antenna (above 1 GHz). The substitute antenna was placed in the same polarization as the test antenna. A signal generator was used to generate a signal level that matched the highest level measured from the EUT. The signal generator level minus the cable loss from the signal generator to the substitute antenna plus the substitute antenna gain equals the power level.

### Test Equipment

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