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800 MHz: AMPS RF POWER OUTPUT

Para. 2.1033 (c)(6)(7), 2.1046 and 22.913 (a)

For Canada use only (6A2 and 6A3): The RF power measured at the output terminal (antenna connector) is plotted against supply voltage variations and temperature variations at the highest levels.

Exhibit	Voltage (V)	Temperature	TX Freq	Power Level
6A2	3.8	Varied	Mid-Band	0
6A3	Varied	+25 C	Mid-Band	0

Note: The manufacturers rated voltage for the battery is 3.4 VDC to 4.2 VDC.

The measurements were made per IS 137 using the following equipment:

HP EPM-441A Power Meter (S/N: US37480855)

HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)

ESPEC Temperature Chamber S/N: (91004533)

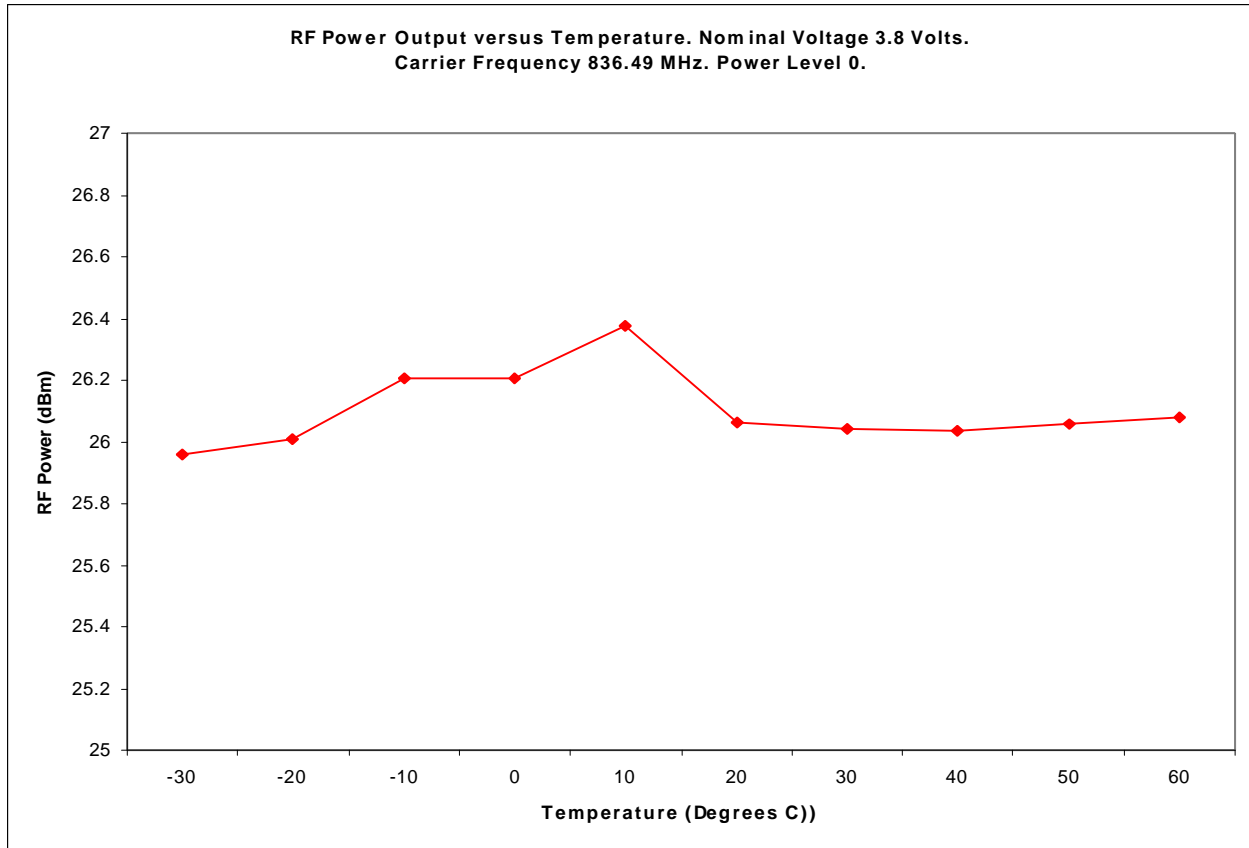
EFFECTIVE RADIATED POWER

The following is a description of the substitution method used in accordance with IS-137A to obtain accurate EDRP readings at the carrier fundamental frequency:

- (1) The unit under test is placed 3 m away from the measurement antenna in vertical position. The measurements are made by using calibrated antennas and equipment with known cable losses.
- (2) A maximized measurement is made by raising and lowering the measurement antenna and rotating the EUT 360 degrees. Horizontal and vertical polarization data is recorded as reference.
- (3) A generator, an amplifier, and a half-wave dipole antenna are then substituted for the EUT.
- (4) Data obtained with known power levels into the substitution antenna are then compared to the reference reading. The EDRP of the product is calculated.

Table: EDRP

Mode	f (MHz)	Radiated (dBm/mW)
AMPS	824	25.0 / 316.2
	836.5	24.1 / 257.0
	848	24.1 / 257.0



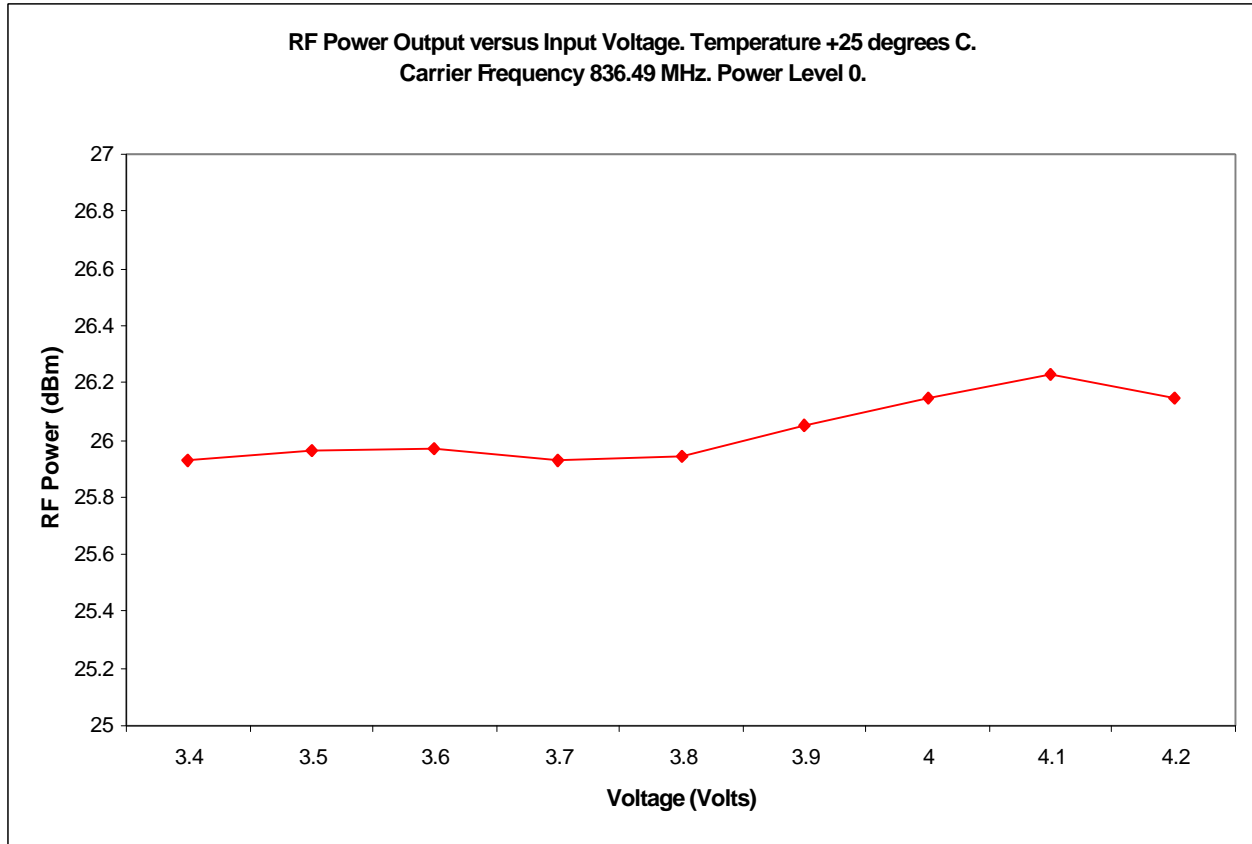


EXHIBIT 6B1

800 MHz AMPS MODULATION CHARACTERISTICS

Part 2.1047 and 22.915

The frequency and amplitude response to audio inputs measured per IS-137A shown on the following diagrams:

<u>Exhibit #</u>	<u>Description</u>	<u>Clause</u>
6B2	Transmit Audio Frequency Response	2.1047 (a,b)
6B3	Post Limiter Filter Attenuation	22.915 (d)
6B4	Modulation limiting vs. modulation Input Voltage	2.1047, 22.915 (b)(1)

The measurements were made per IS 137 using the following equipment:

HP 8901B Modulation Analyzer (S/N: 3226A03982)
HP 8903B Audio Analyzer (S/N: 3011A114448)
HP EPM-441A Power Meter (S/N: 3226A03982)
Anritzu 35665A Dynamic Signal Analyzer (S/N: 3603A03838)

EXHIBIT 6B2

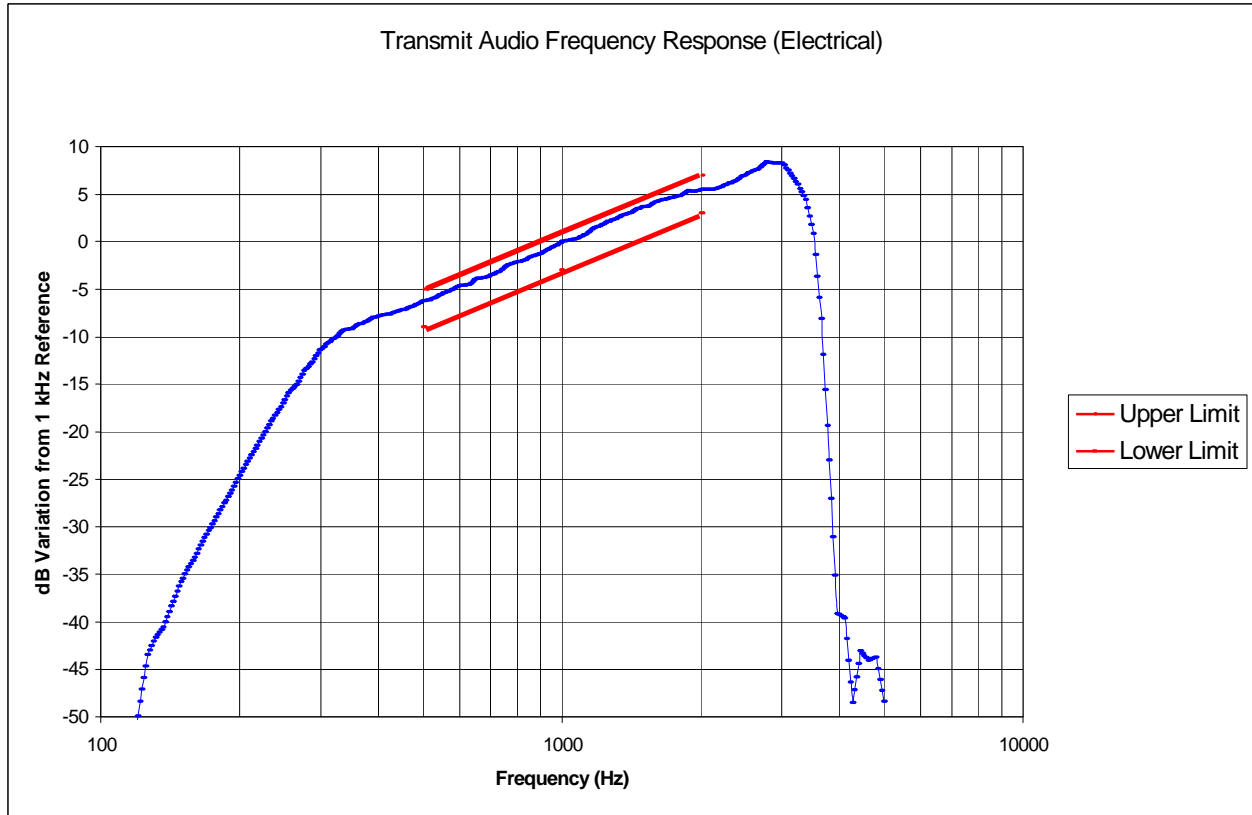


EXHIBIT 6B3

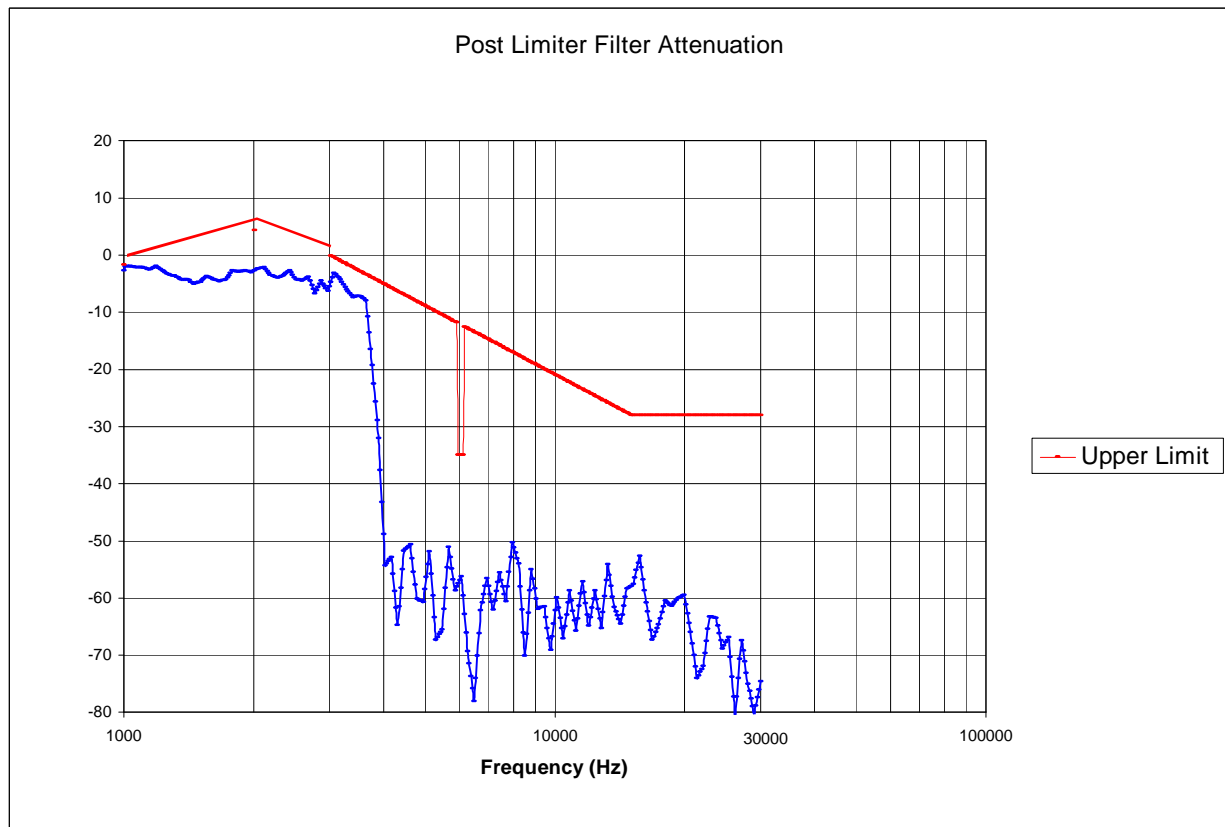
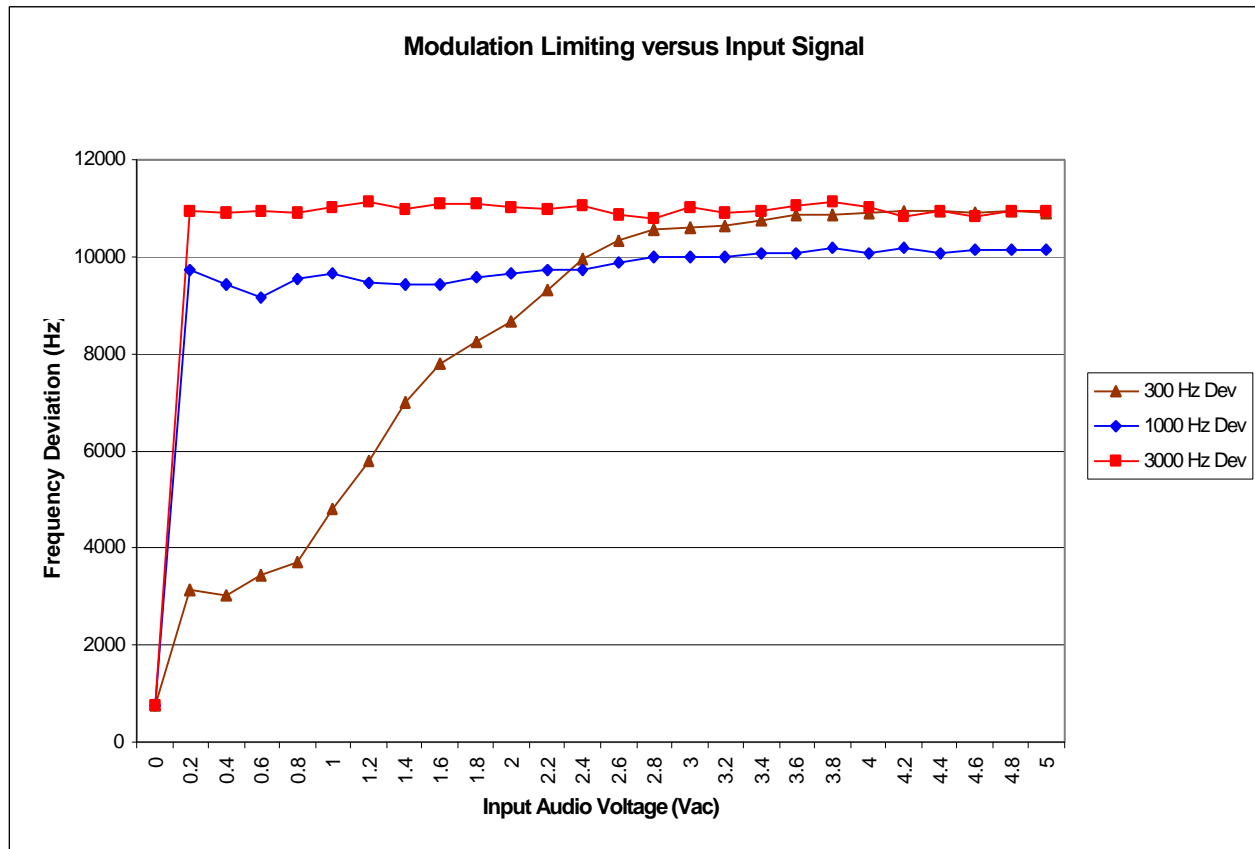


EXHIBIT 6B4



800 MHz AMPS OCCUPIED BANDWIDTH

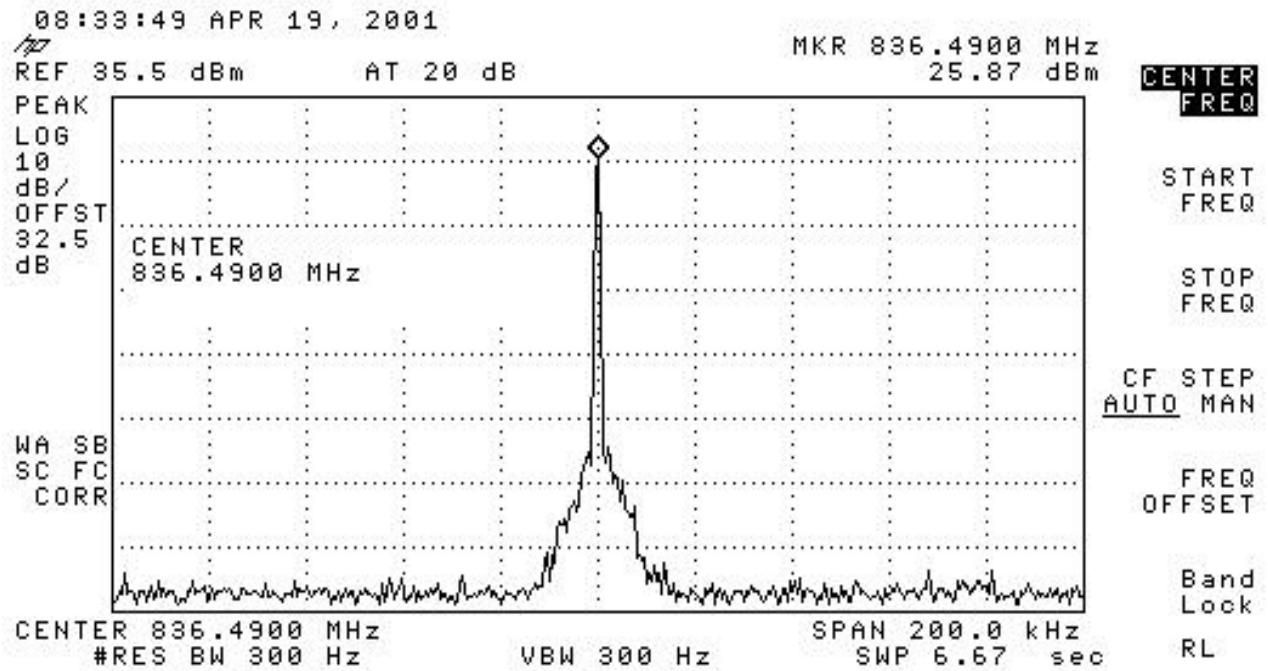
Part 2.1049 and 22.917 (b)(d) the exhibits presented below illustrate the modulations that co-exist in a cellular system:

<u>Exhibit #</u>	<u>Description</u>	<u>Power Level</u>	<u>Clause</u>
6C2	Unmodulated Carrier	0	
6C3	SAT w/ Carrier	0	22.917(b)
6C4	Signal Tone w / Carrier	0	22.917(b)
6C5	Voice w / Carrier	0	22.917(b)
6C6	10kb/s Wideband Data w/ Carrier	0	22.917(d)

The measurements were made per IS 137 using the following equipment:

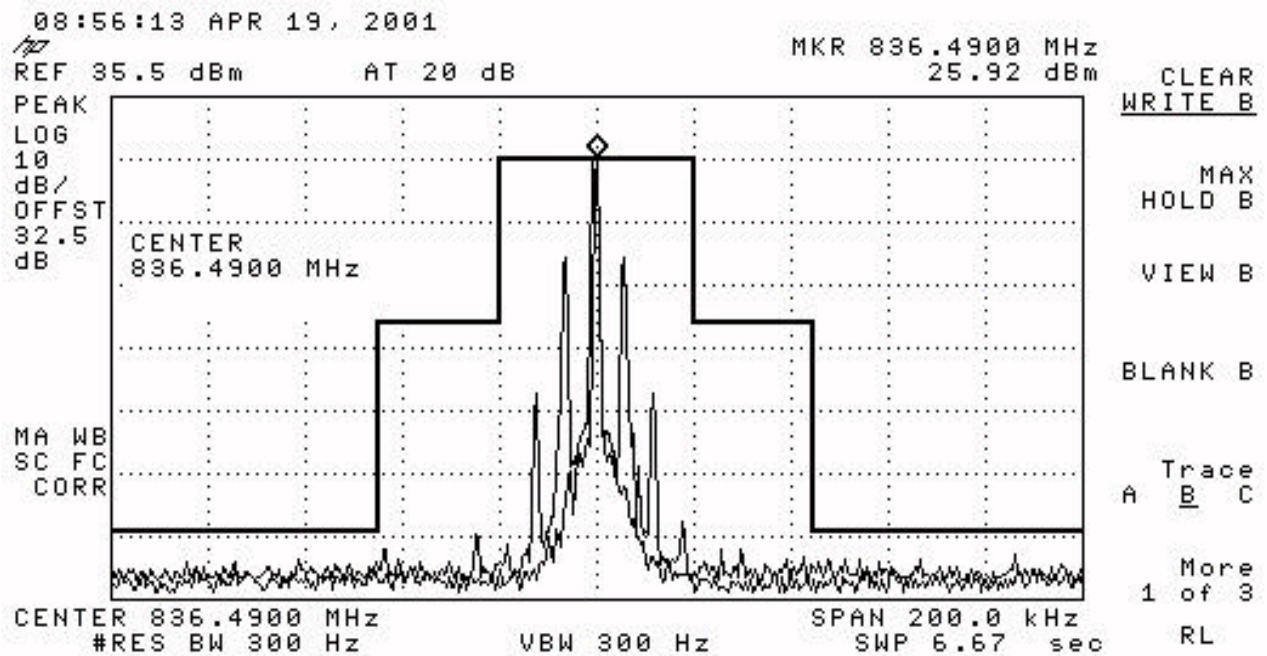
HP E8953	EMC Spectrum Analyzer 9 kHz – 26.5 GHz (S/N: US39150143)
HP EPM-441A	Power Meter (S/N: US37480855)
HP 66309B	Dual Output Mobile Comm. DC Source (S/N: US39050133)
HP 8901B	Modulation Analyzer (S/N: 3226A03982)
HP 8903B	Audio Analyzer (S/N: 3011A114448)

Exhibit 6C2



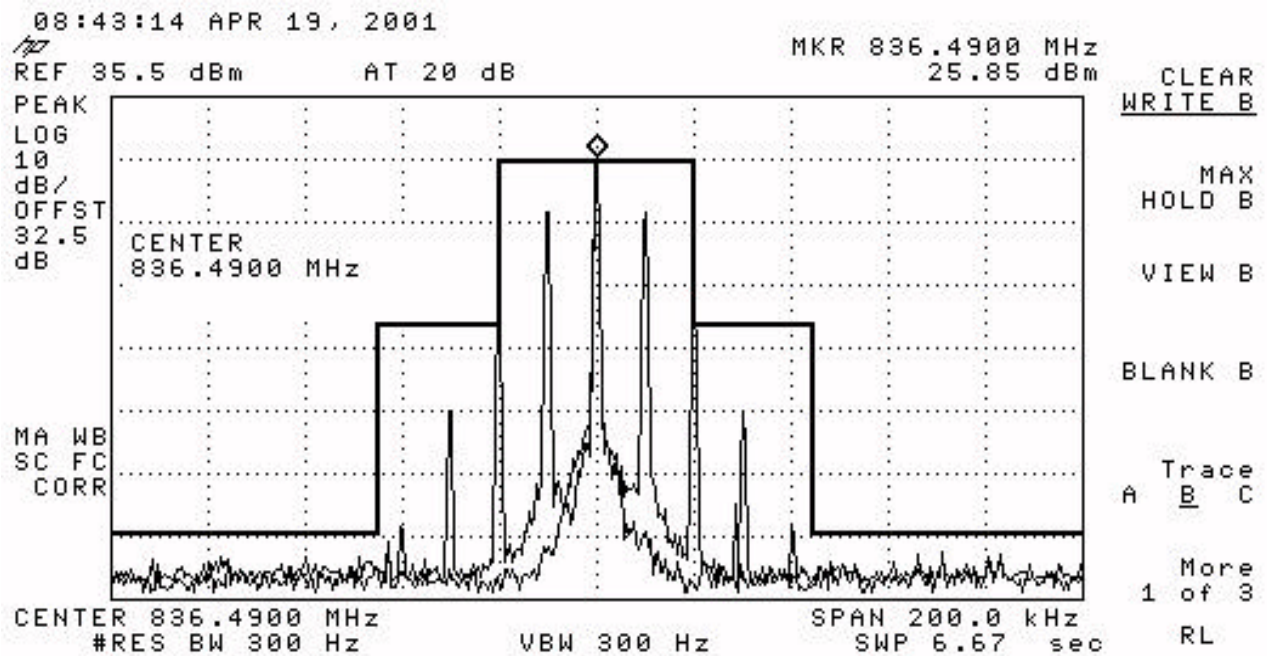
Occupied Bandwidth Unmodulated Carrier

Exhibit 6C3



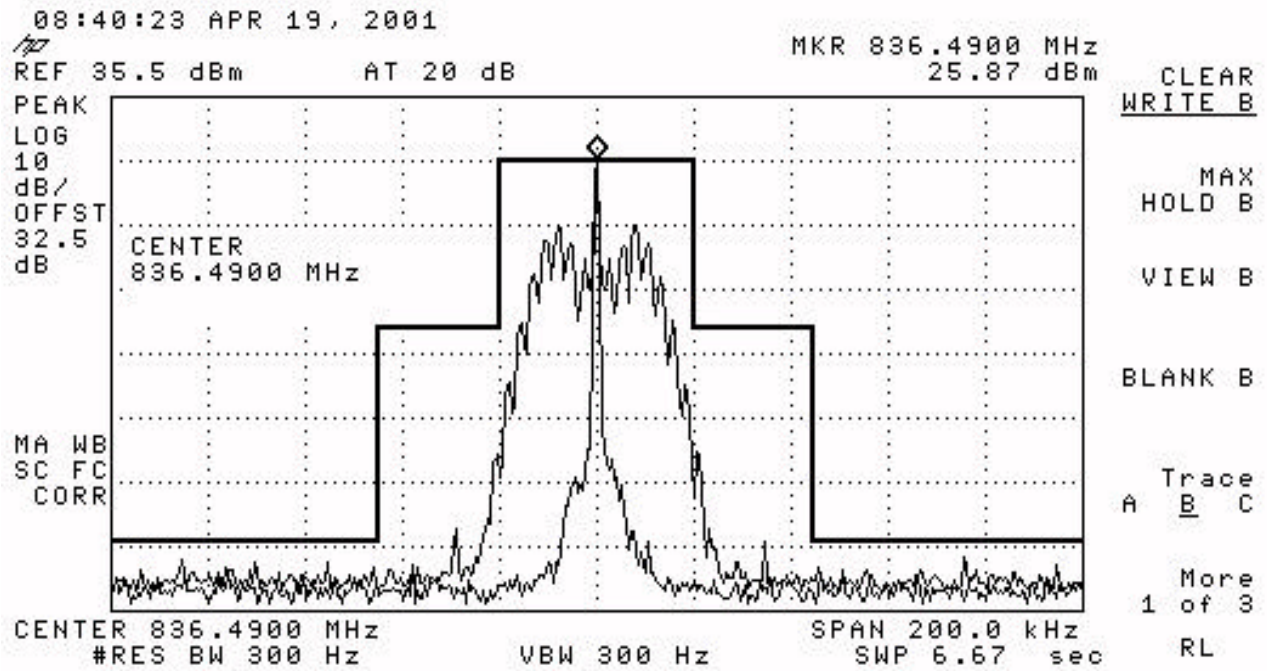
Occupied Bandwidth SAT w/ Carrier

Exhibit 6C4



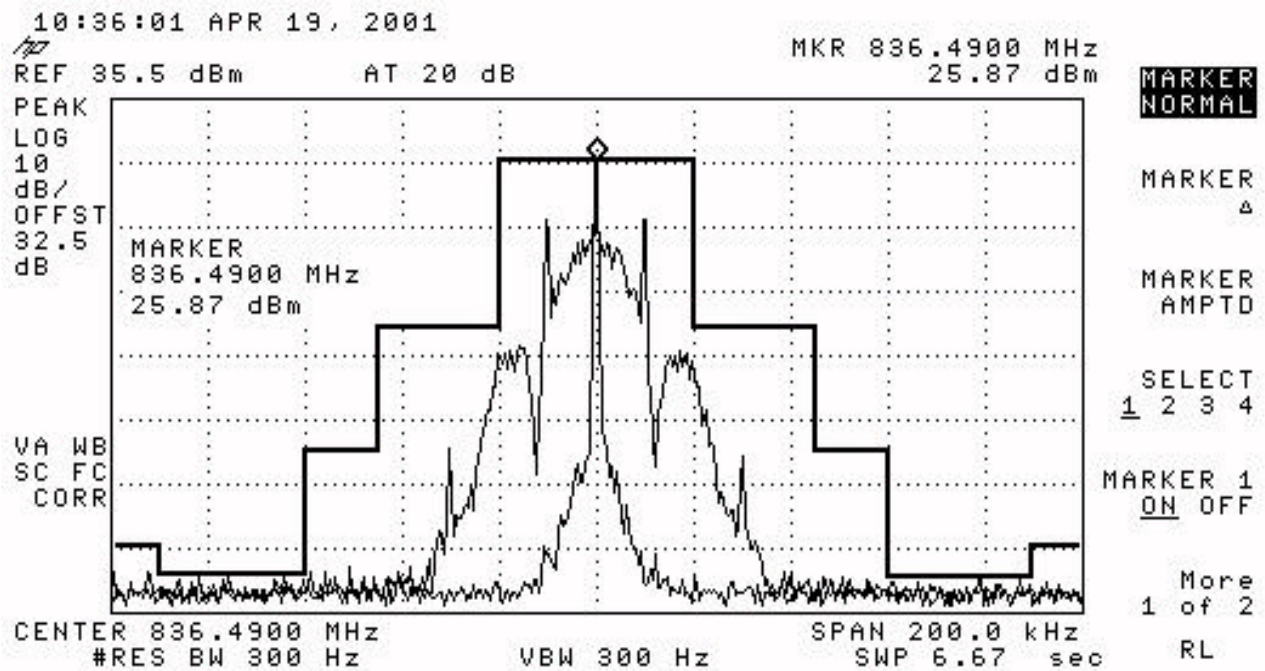
Occupied Bandwidth Signaling Tone w/ Carrier

Exhibit 6C5



Occupied Bandwidth Voice w/ Carrier

Exhibit 6C6



Occupied Bandwidth 10kb Wideband Data w/ Carrier

800 MHz AMPS SPURIOUS EMISSIONS (CONDUCTED)

Per 2.1051, 22.917(e) Spurious emissions at the antenna terminals (conducted) when properly loaded with an appropriate artificial antenna were measured per IS-137A.

Per 22.917f, the mean power of any emissions from the mobile's transmit antenna connector does not exceed the - 80dBm level in the base station frequency range of 869MHz to 894MHz.

<u>EXHIBIT #</u>	<u>FREQUENCY</u>	<u>Output Power level</u>
6D2	824.04	0
6D3	824.04	7
6D4	Base Band	0; -80dBm per 22.917(f)

Note: The spectrum was examined through the 10th harmonic of the carrier. Measurements recorded are peak measurements.

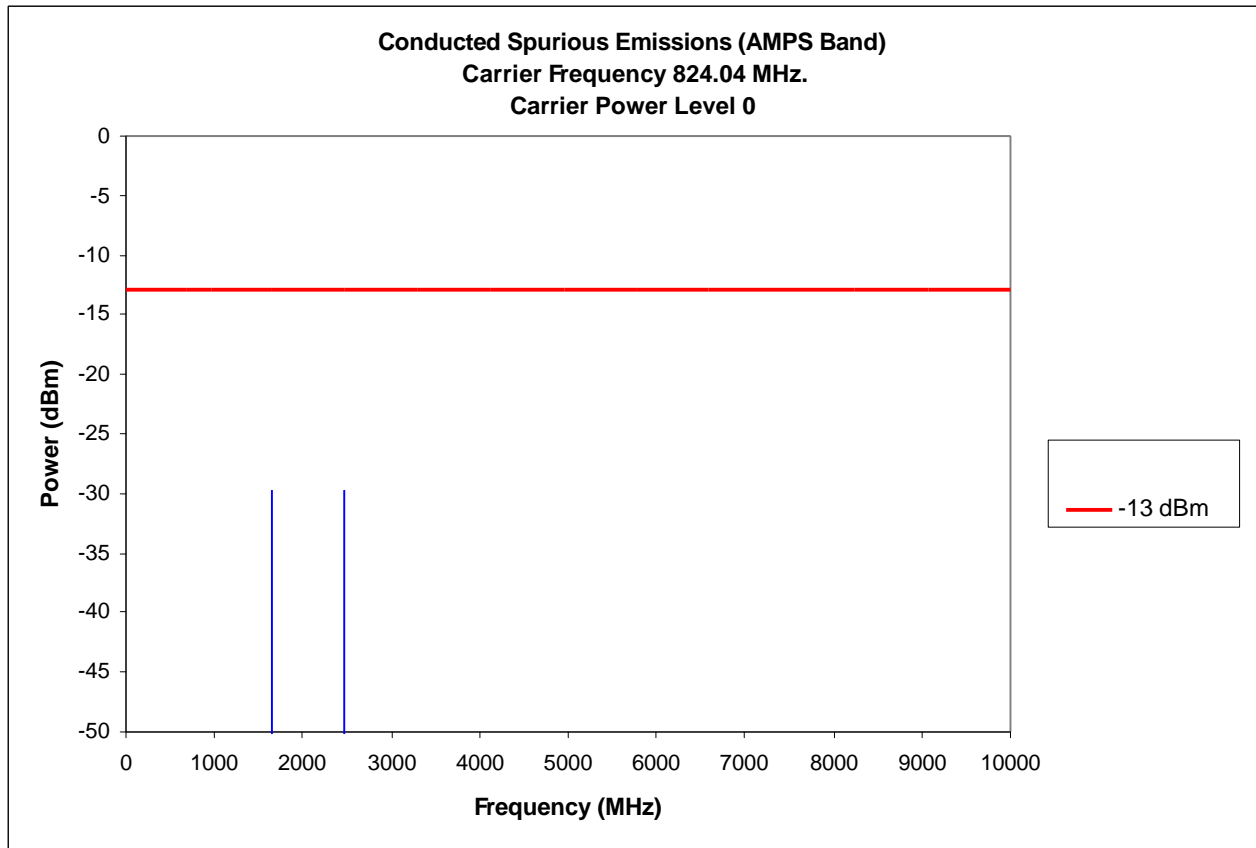
The measurements were made per IS-137A using the following equipment:

HP E7405A EMC Spectrum Analyzer 9 kHz – 26.5 GHz (S/N: US39150143)

HP EPM-441A Power Meter (S/N: US37480855)

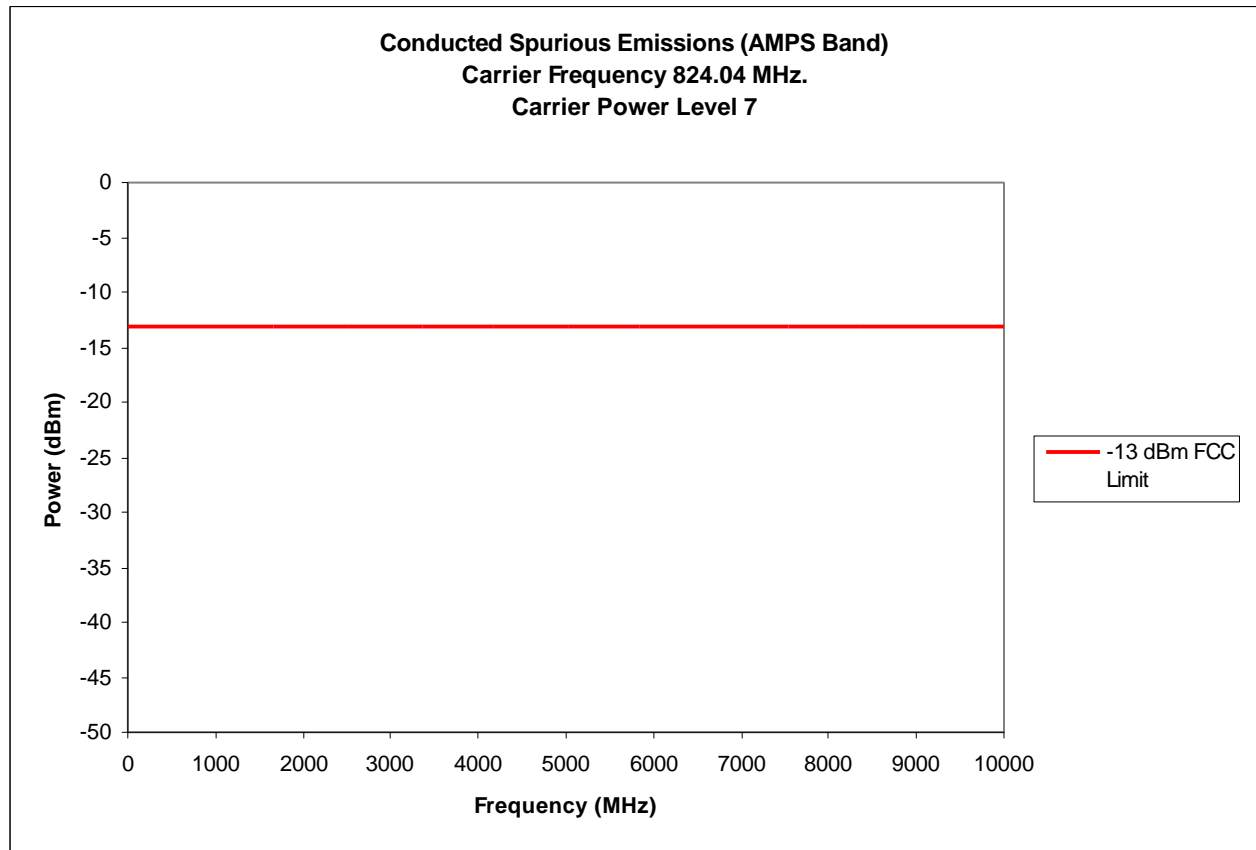
HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)

Exhibit 6D2



No other spurious emissions found within 20dB of limit

Exhibit 6D3



No spurious emissions found within 20dB of limit

Exhibit 6D4

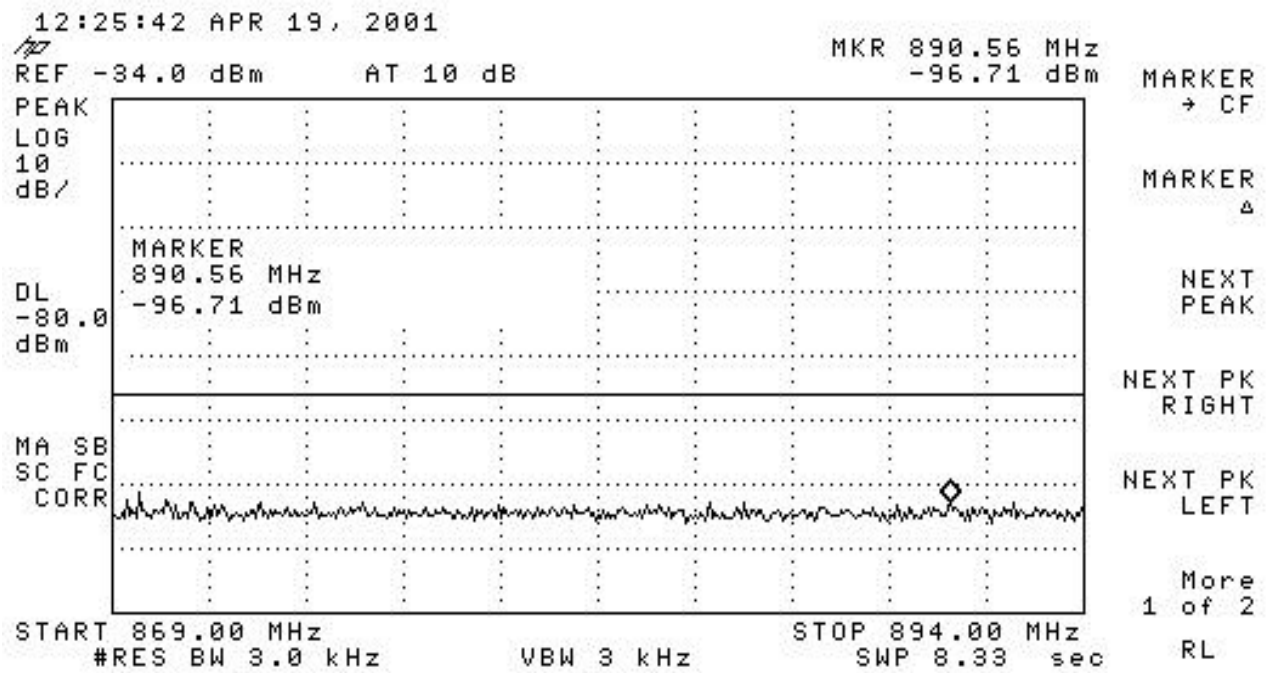


EXHIBIT 6E1

800 MHz AMPS SPURIOUS EMISSIONS (Radiated)

Per 2.1053 and 22.917 (e), field strength of spurious radiation was measured at Underwriters Laboratories Inc. Research Triangle Park, NC site. The measurement procedure is per EIA IS-137 conducted on a 3-meter test site. Results are shown on the following Exhibits.

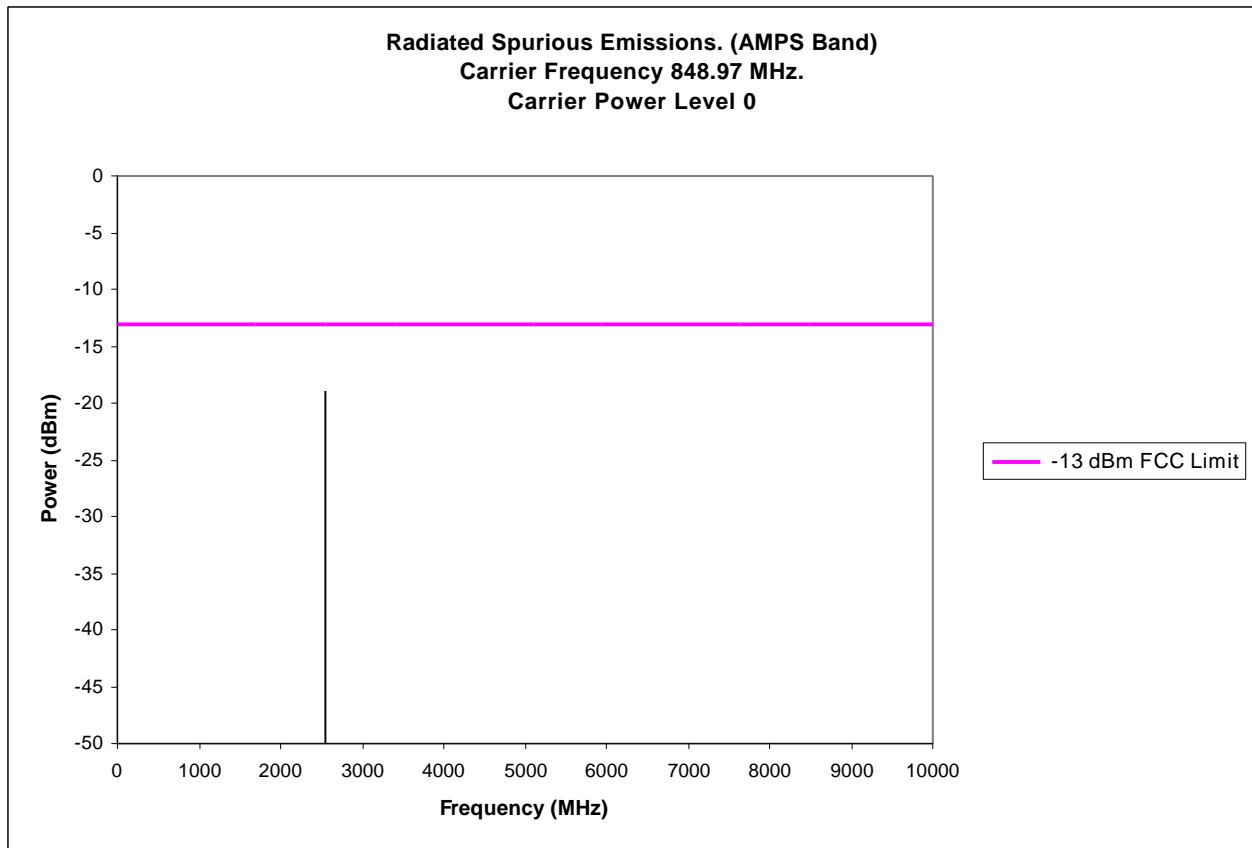
Note: The spectrum was examined through the 10th harmonic of the carrier. Maximum radiated emissions are recorded.

<u>EXHIBIT</u>	<u>FREQUENCY</u>	<u>OUTPUT POWER LEVEL</u>
6E2	848.97 MHz	0

The measurements were made per IS 137 using the following equipment:

HP8566B Spectrum Analyzer 100Hz 25GHz / 2 – 22GHz
HP 83752A Signal Generator (S/N: 361DA01426)
30dB Amplifier - Amplifier Research (AR) (S/N: 23413)
Power Meter - Rhode & Schwartz (S/N: DE21529)
Power Sensor (S/N: 8479771011)
2 Test Cables (S/N's: ZATA21, ATA055)
20dB Pad (S/N: ATA005)
EMCO 3115 Double Ridge Horn Antenna
Test Fixture (Fixture provides height adjustment for mobiles and antennas according to FCC requirements)

EXHIBIT 6E2



No other spurious emissions found within 20dB of limit

800 MHz AMPS FREQUENCY STABILITY

Per 2.1055 (a)(1)(b)(d)(2), 22.355

<u>EXHIBIT #</u>	<u>Voltage</u>	<u>Temperature</u>
6F2	3.4 to 4.2 Volts (varied)	+25 C
6F3	3.8	Varied (10 C increments)

Note: The manufacturers rated voltage for the battery is 3.4 VDC to 4.2 VDC.

The measurements were made per IS 137 using the following equipment:

HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)
HP 83712B CW Signal Generator 10 MHz – 20 GHz (S/N: US37100945)
Anritzu MT 8802A Radio Communications Analyzer 300 kHz – 3 GHz (S/N: MB25017)

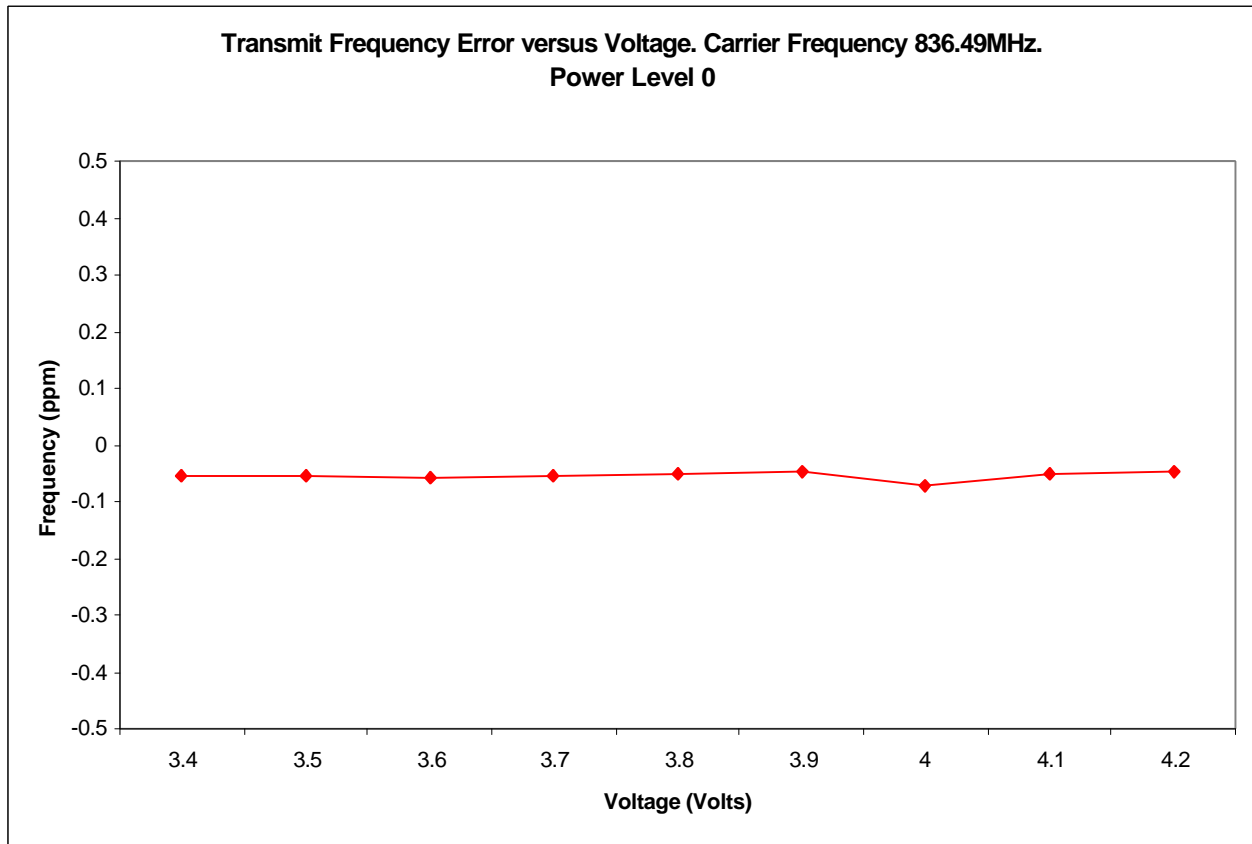
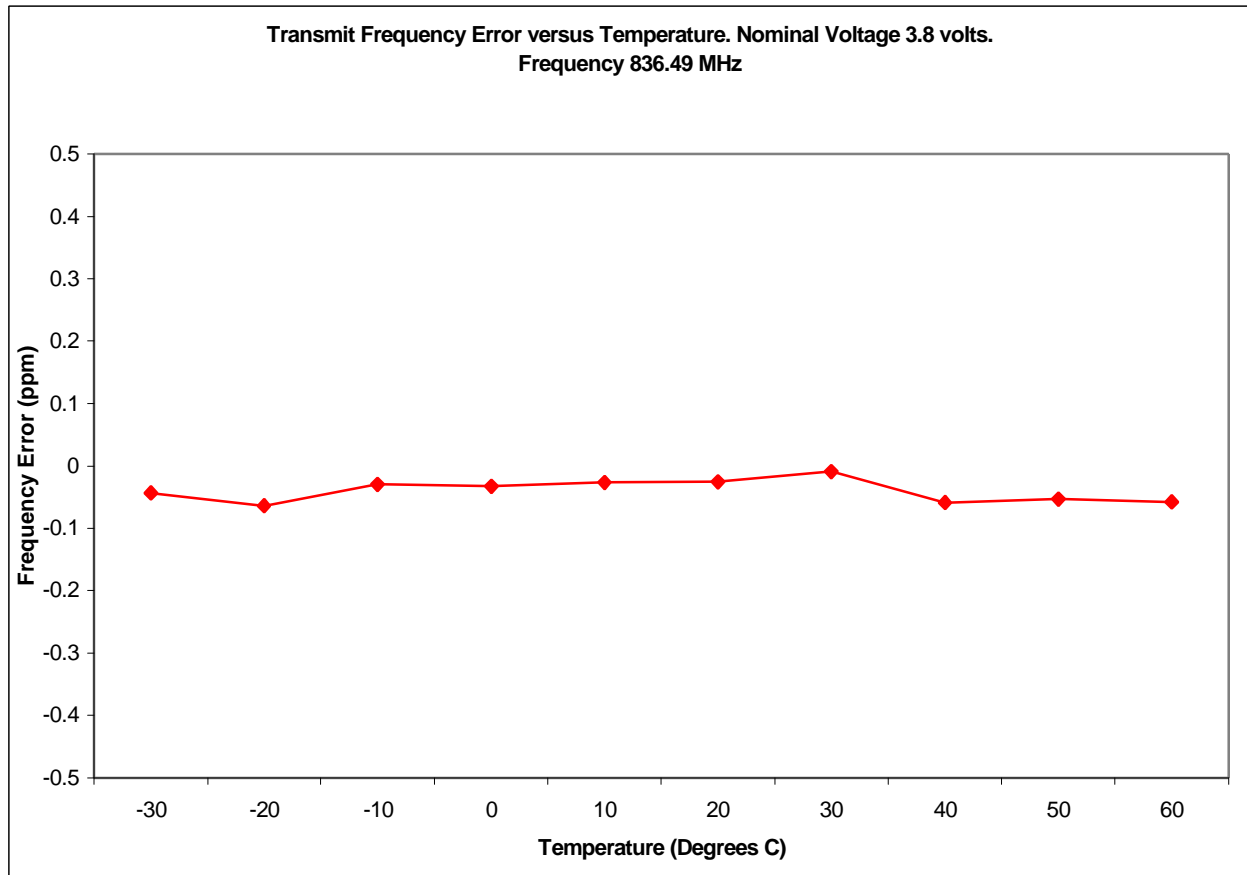


EXHIBIT 6F3



800 MHz DAMPS RF POWER OUTPUT

Para.2.1033 (c)(6)(7) 2.1046 (a) 22.913(a).

For Canada use only (6G2 and 6G3): The RF power measured at the output terminals (antenna connector) is plotted against supply voltage variations at the highest levels.

Exhibit	Voltage (V)	Temperature	TX Freq	Power Level
6G2	3.8	Varied	Mid-Band	0
6G3	Varied	+25 C	Mid-Band	0

Note: The manufacturers rated voltage for the battery is 3.4 VDC to 4.2 VDC.

The measurements were made per IS 137 using the following equipment:

HP EPM-441A Power Meter (S/N: US37480855)
HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)
ESPEC Temperature Chamber (S/N: 91004533)

EFFECTIVE RADIATED POWER

The following is a description of the substitution method used in accordance with IS-137A to obtain accurate EDRP readings at the carrier fundamental frequency:

1. The unit under test is placed 3 m away from the measurement antenna in vertical position. The measurements are made by using calibrated antennas and equipment with known cable losses.
2. A maximized measurement is made by raising and lowering the measurement antenna and rotating the EUT 360 degrees. Horizontal and vertical polarization data is recorded as reference.
3. A generator, an amplifier, and a half-wave dipole antenna are then substituted for the EUT.
4. Data obtained with known power levels into the substitution antenna are then compared to the reference reading. The EDRP of the product is calculated.

Table: EDRP

Mode	f (MHz)	* Radiated (dBm/mW)
DAMPS	824	26.9 / 489.8
	836.5	26.6 / 457.1
	848	25.7 / 371.5

EXHIBIT 6G2

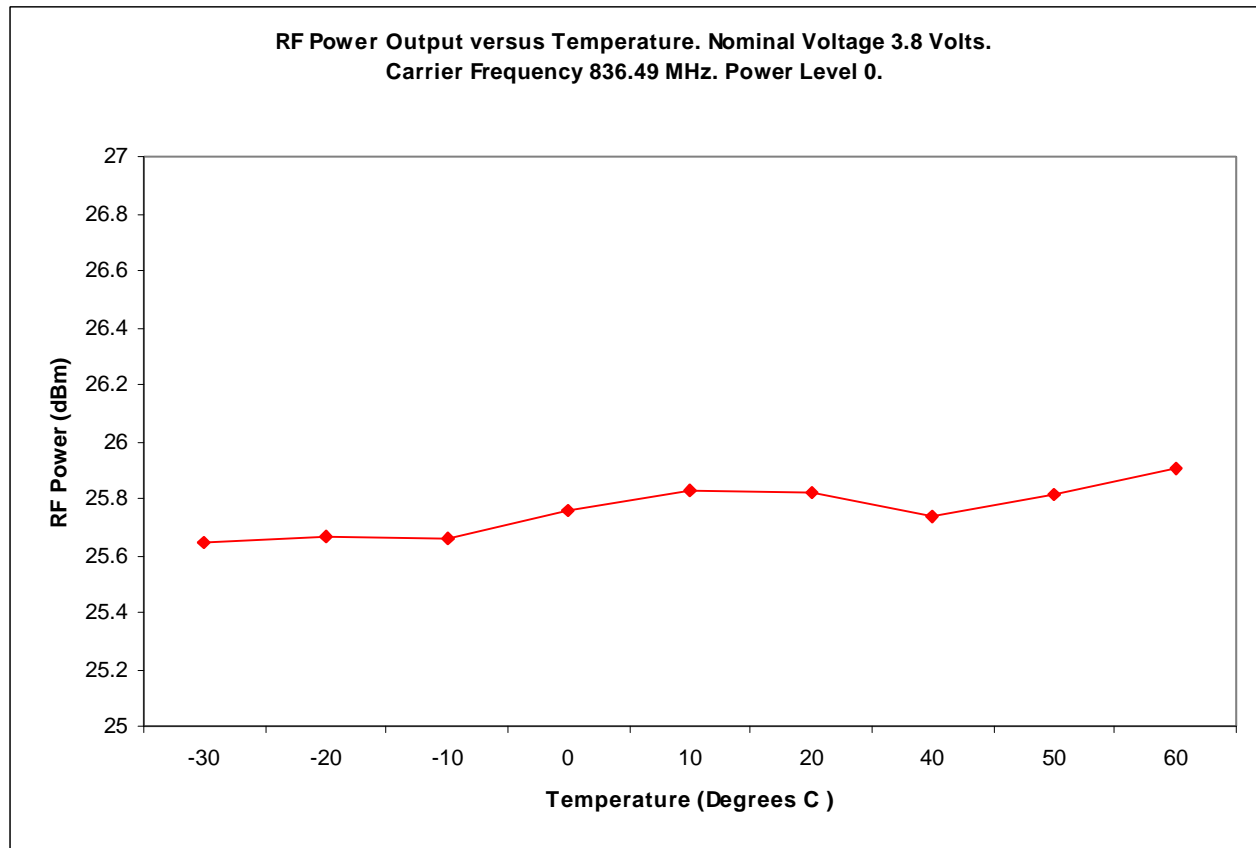
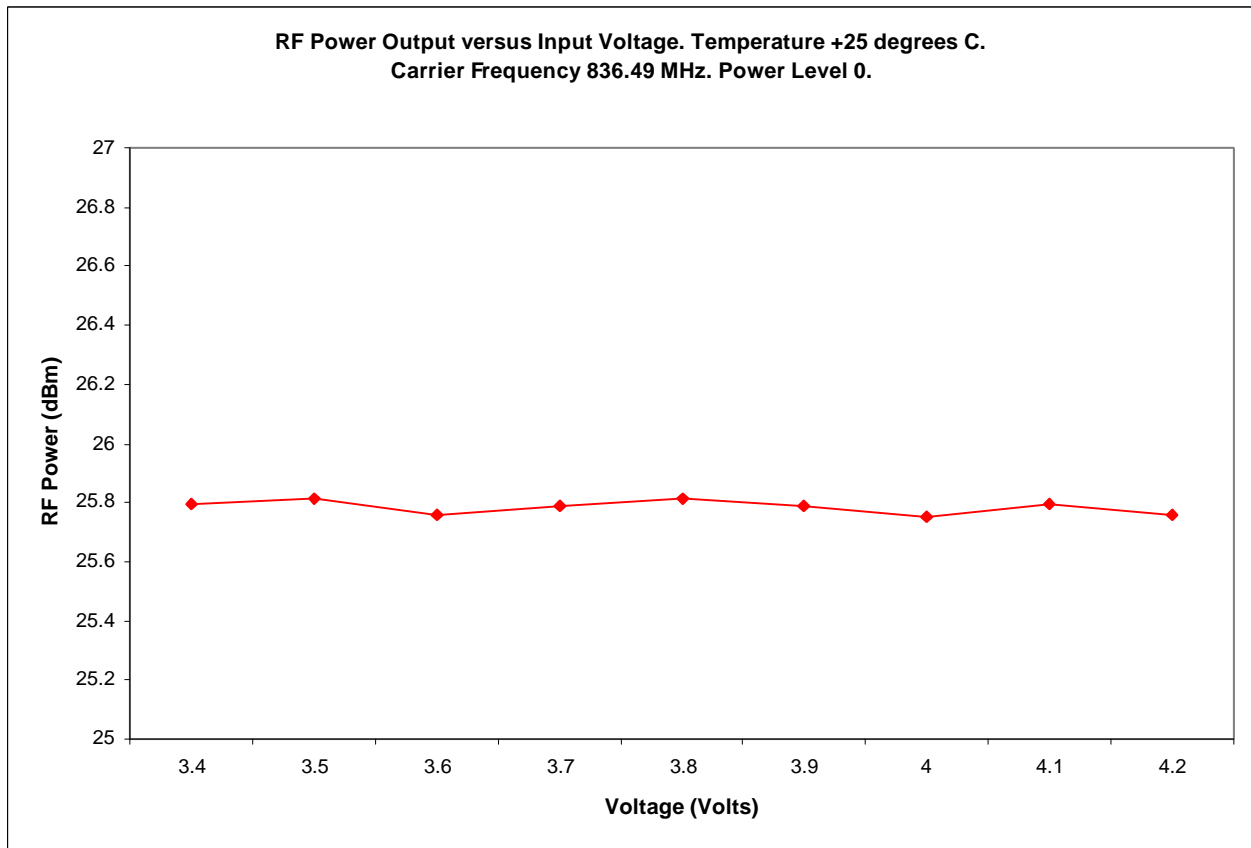


EXHIBIT 6G3



800 DAMPS MODULATION CHARACTERISTICS

2.1033 (c)(13)

The transceiver shall be capable of generating $\pi/4$ shifted differentially encoded quadrature phase shift keying signals. The transmitted signal is given by:

$$S(t) = \sum_n g(t-nT) \cos(f_n) \cos(\omega_c t) - \sum_n g(t-nT) \sin(f_n) \sin(\omega_c t)$$

where $g(t)$ is the pulse shaping function that corresponds to a square root raised cosine baseband filter with roll off factor of 0.35, ω_c is the radian carrier frequency, T is the symbol period, and f_n is the absolute phase corresponding to the n th symbol interval. The symbol rate ($1/T$) is 24.3 k symbols/sec.}

The modulation accuracy requirement is specified by setting limits on the RMS difference between the actual transmitted signal waveform and the ideal signal waveform. The ideal waveform is derived mathematically from the specification of modulation shown above. The specified requirement is error vector magnitude.

For this measurement, frequency accuracy shall meet the requirements of Section 3.1 prior to measurement.

The average carrier frequency error is the difference between the average carrier frequency of the actual transmitted waveform and the average signal waveform carrier frequency.

The ideal modulation is defined above. The definition is such that, observing an ideal transmitter through an ideal root raised-cosine receiver filter at the correct sampling instants one symbol apart would result in the sequence of values given by:

$$S(k) = S(k-1)e^{j\{\pi/4 + B(k)\pi/2\}}$$

where $B(k) = 0, 1, 2, 3$ according to the following table:

X_k	Y_k	$B(k)$
0	0	0
0	1	1
1	1	2
1	0	3

In the forward channel, $S(k)$ forms part of a continuous data stream. In the reverse channel, the transit bursts from the mobile are truncated by power up and down ramping. In this case, $S(6)$ is the first sample that enters into demodulation, which yields the first two information bits by comparing $S(6)$ with $S(7)$. The last information bits lie in the comparison of $S(162)$ and $S(161)$.

The ideal transmit and receive filters in cascade form a raised cosine Nyquist filter having an impulse response going through zero at symbol period intervals, so there is no inter-symbol interference at the ideal sampling points. The ideal signal sampler therefore, take on one of the eight values defined above, at the output of the receive filter.

This section defines how the output signal from a transmitter is to be evaluated against the ideal signal.

Let $Z(k)$ be the complex vectors produced by observing the real transmitter through an ideal measuring receive filter at instants k , one symbol period apart. With $S(k)$ defined as above, the transmitter is modeled as:

$$Z(k) = [C0 + C1 * [S(k) + E(k)]] * W^k$$

where:

$$k = n/24.3\text{KHz}$$

$$dr = jda$$

$W = e^{dr}$ accounts for both a frequency offset giving "da" radians per symbol phase rotation and an amplitude changes of "dr" nepers per symbol:

$C0$ is a constant origin offset representing quadrature modulator imbalance, $C1$ is a complex constant representing the arbitrary phase and output power of the transmitter, and $E(k)$ is the residual vector error on sample $S(k)$

The sum square vector error is then:

$$k = \text{MAX}$$

$$\sum_{k = \text{MIN}}^k |E(k)|^2$$

$$k = \text{MAX}$$

$$\sum_{k = \text{MIN}}^k |([Z(k) * W - C0]/C1) - S(k)|^2$$

$C0$, $C1$ and W shall be chosen to minimize this expression and are then used to compute the individual vector errors $E(k)$ on each symbol. The symbol timing phase of the receiver output samples used to compute the vector error shall also be chosen to give the lowest value.

The values of MAX and MIN for the reverse channel (mobile station transmitter) are:

$$\begin{aligned} \text{MIN} &= 6 \\ \text{MAX} &= 162 \end{aligned}$$

The RMS vector error is then computed as the square root of the sum-square vector divided by the number of symbols in the slot, (157 in the reverse direction).

Method of Measurement

Connect the mobile station to the Standard Test Source and Modulation Accuracy Equipment. Modulate the Standard Test Source with pseudo-random Data Field bits. The mobile station shall transpond the Data Field bits using the TDMAON command. Use the Modulation Accuracy Measurement Equipment to measure the modulation accuracy of the mobile station.

Minimum Standard

The RMS vector error in any burst shall be less than 12.5%. In addition, the normalized error vector magnitude during the first 10 symbols (20 bits) of a burst following the ramp-up, must have an RMS value of less than 25% when averaged over 10 bursts within a 1 minute interval. The minimum standard for frequency offset is specified in section 3.1.2.2.3 of IS 137. The origin offset in any burst shall be less than -20 dBc.

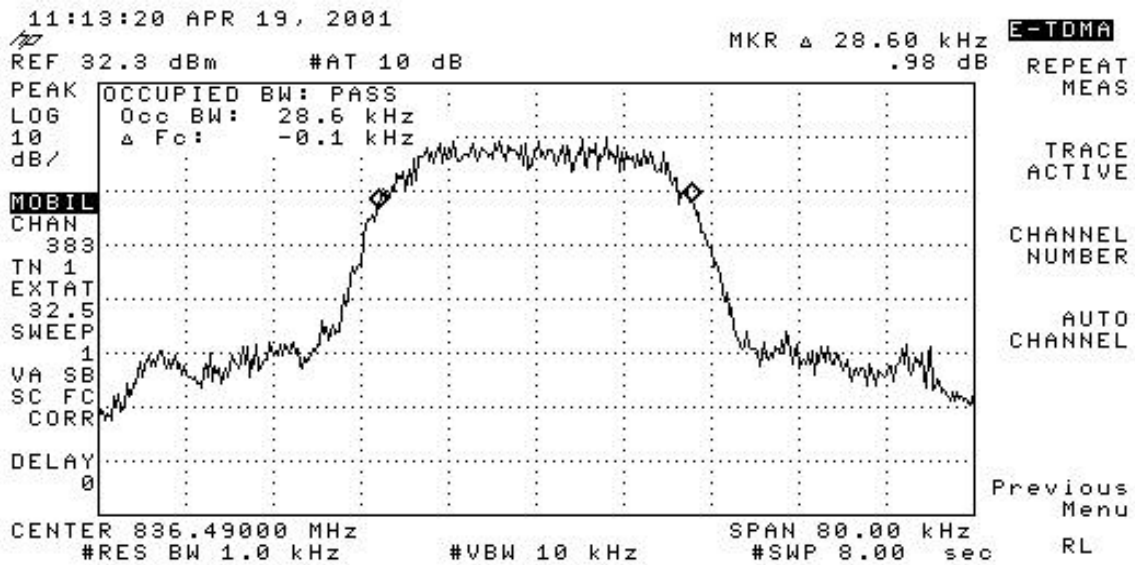
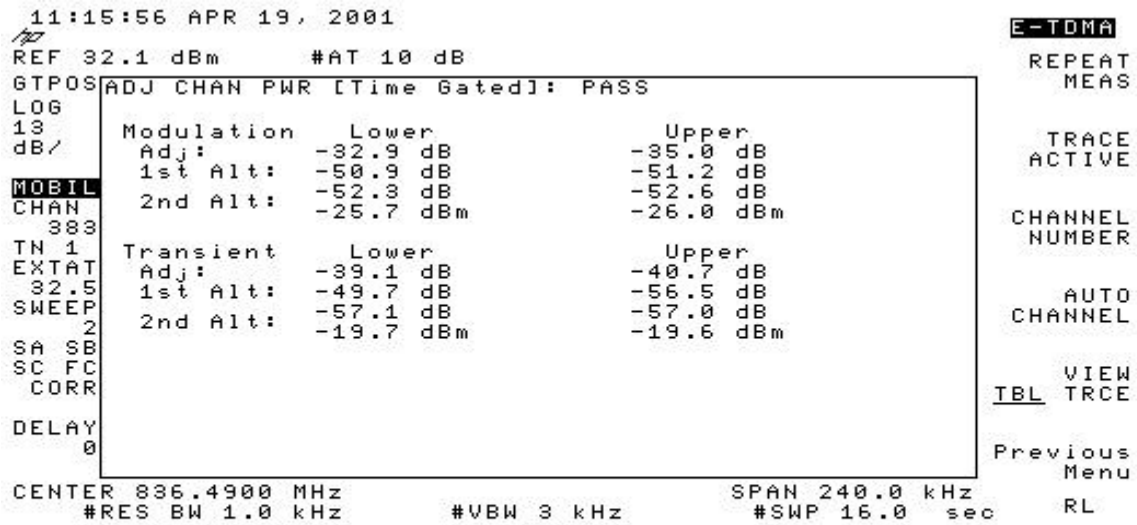
800 MHz DAMPS OCCUPIED BANDWIDTH

Part 2.1049 and 22.901 (d) the exhibit presented show the modulation that exist in a DAMPS cellular system:

<u>Exhibit #</u>	<u>Description</u>	<u>Power Level</u>
612	48.6kb/s Wideband Data	0

The measurements were made per IS 137 using the following equipment:

HP 8593E Spectrum Analyzer 9 kHz – 22 GHz (S/N: 3829A03592)
Anritzu MT 8802A Radio Communications Analyzer 300 kHz – 3 GHz (S/N: MB25017)
HP EPM-441A Power Meter (S/N: US37480855)



Plots showing occupied bandwidth of 28 kHz and alternate and adjacent power.

800 MHz DAMPS SPURIOUS EMISSIONS (CONDUCTED)

Per 2.1051, 22.917(e) Spurious emissions at the antenna terminals (conducted) when properly loaded with an appropriate artificial antenna were measured per IS-137A.

Per 22.917f, the mean power of any emissions from the mobile's transmit antenna connector does not exceed the - 80dBm level in the base station frequency range of 869MHz to 894MHz.

Note: The spectrum was examined through the 10th harmonic of the carrier. Measurements recorded are peak measurements.

<u>EXHIBIT #</u>	<u>FREQUENCY</u>	<u>Output Power Level</u>
6J2	824.04	0
6J3	824.04	7
6J4	Base Band	0; -80dBm per 22.917(f) (Not needed if shown in AMPS mode)

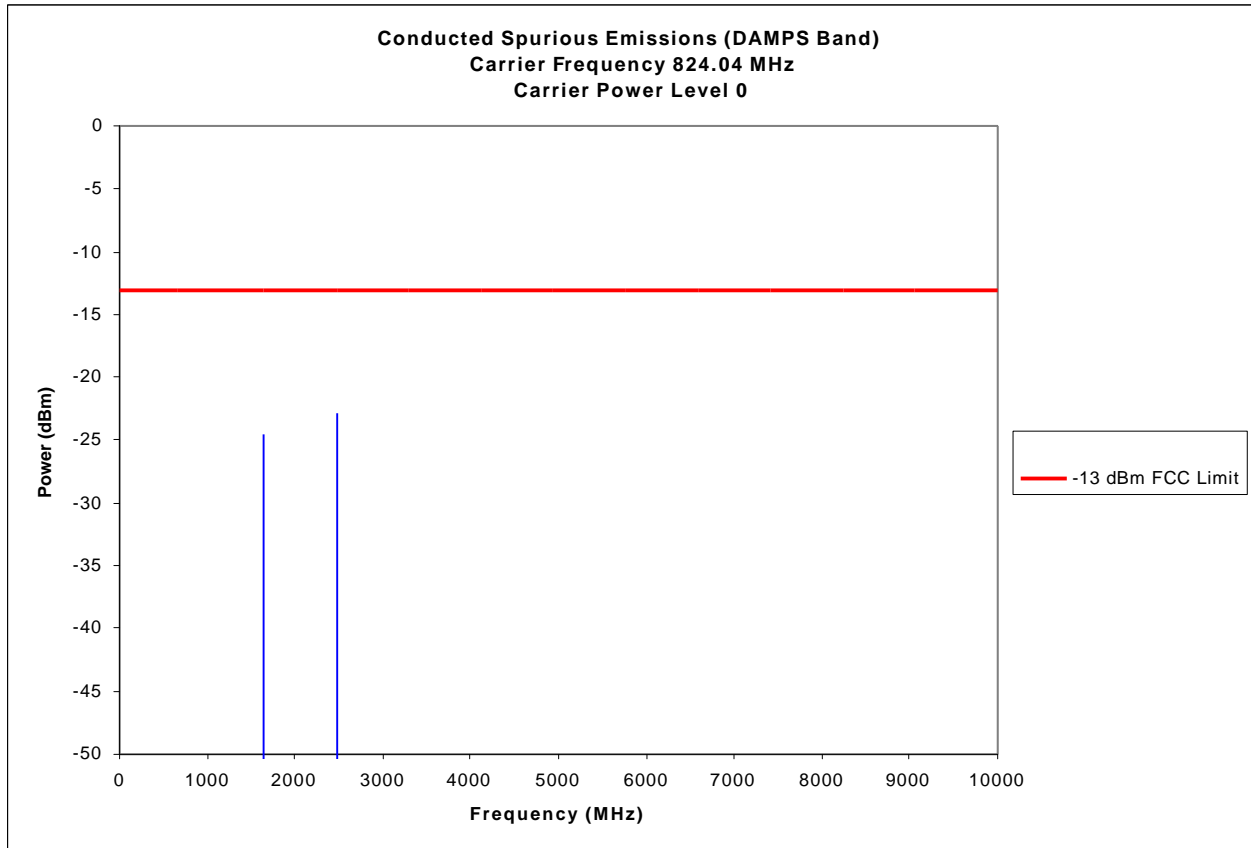
The measurements were made per IS-137A using the following equipment:

HP E7405A EMC Spectrum Analyzer 9 kHz – 26.5 GHz (S/N: US39150143)

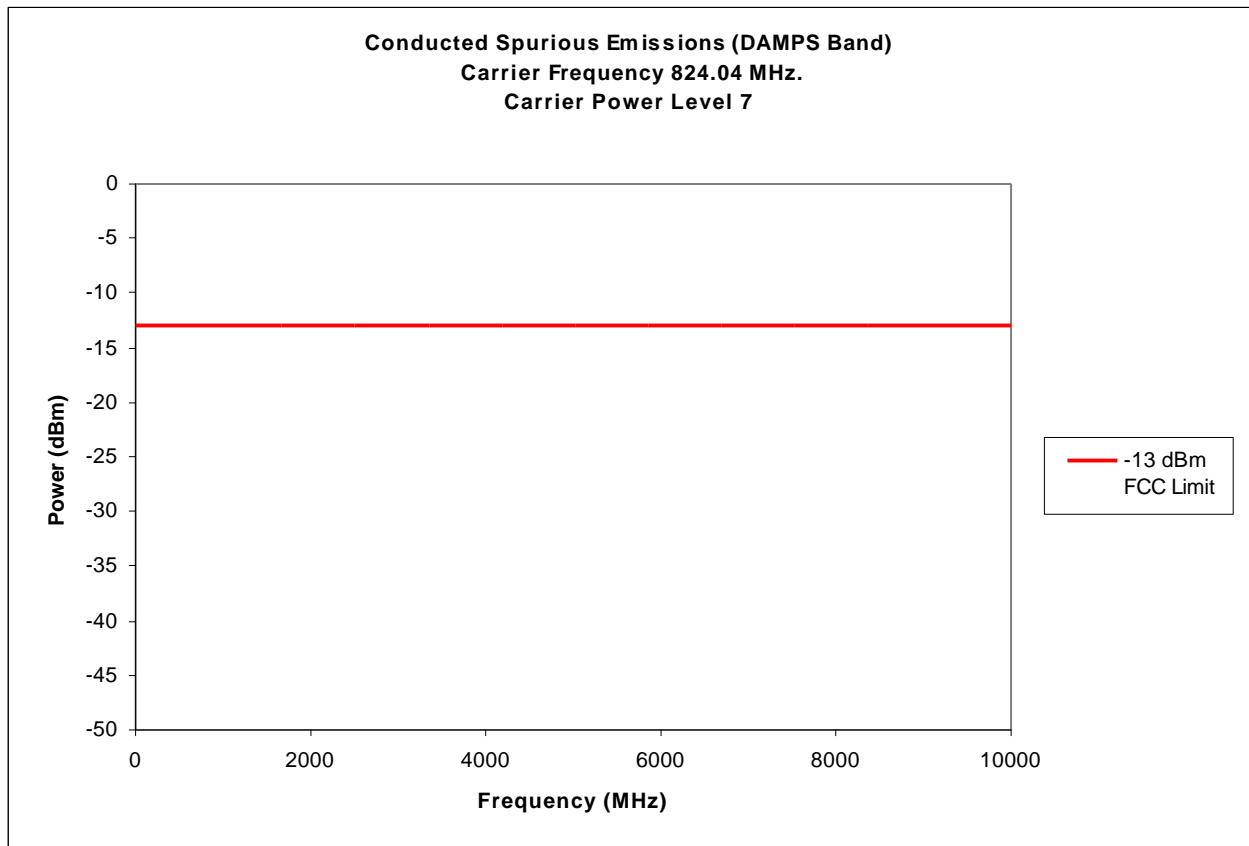
HP EPM-441A Power Meter (S/N: US37480855)

HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)

EXHIBIT 6J2



No other spurious emissions found within 20dB of limit



No spurious emissions found within 20dB of limit

EXHIBIT 6K1

800 MHz DAMPS SPURIOUS EMISSIONS RADIATED

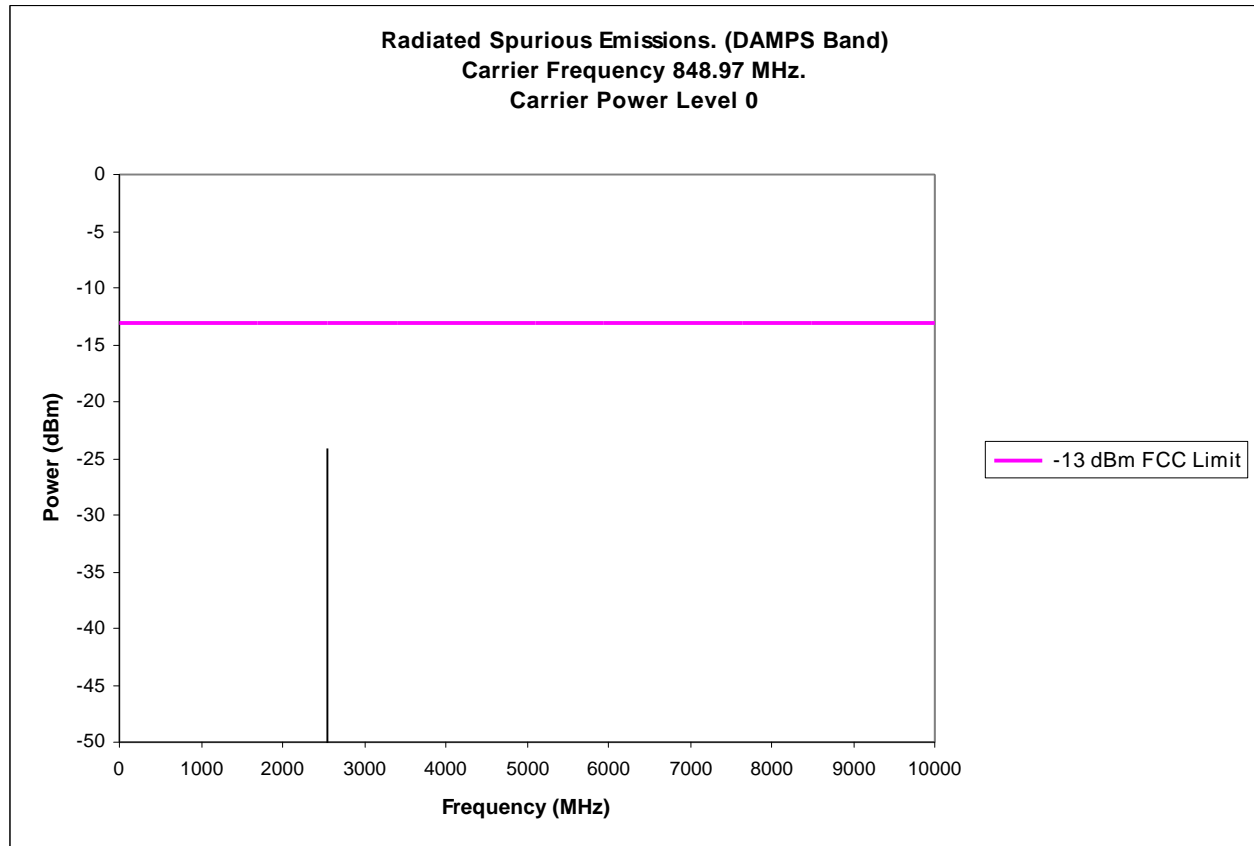
Per 2.1053 and 22.917 (e), field strength of spurious radiation was measured at Underwriters Laboratories Inc. Research Triangle Park, NC site. The measurement procedure is per EIA IS-137 conducted on a 3-meter test site. Results are shown on the following Exhibits.

Note: The spectrum was examined through the 10th harmonic of the carrier. Maximum radiated emissions were recorded.

<u>EXHIBIT</u>	<u>FREQUENCY</u>	<u>OUTPUT POWER LEVEL</u>
6K2	848.97	0

The measurements were made per IS 137 using the following equipment:

HP8566B Spectrum Analyzer 100Hz 25GHz / 2 – 22GHz
HP 83752A Signal Generator (S/N: 361DA01426)
30dB Amplifier - Amplifier Research (AR) (S/N: 23413)
Power Meter - Rhode & Schwartz (S/N: DE21529)
Power Sensor (S/N: 8479771011)
2 Test Cables (S/N's: ZATA21, ATA055)
20dB Pad (S/N: ATA005)
EMCO 3115 Double Ridge Horn Antenna
Test Fixture (Fixture provides height adjustment for mobiles and antennas according to FCC requirements)



No other spurious emissions found within 20dB of limit

800 MHz DAMPS FREQUENCY STABILITY

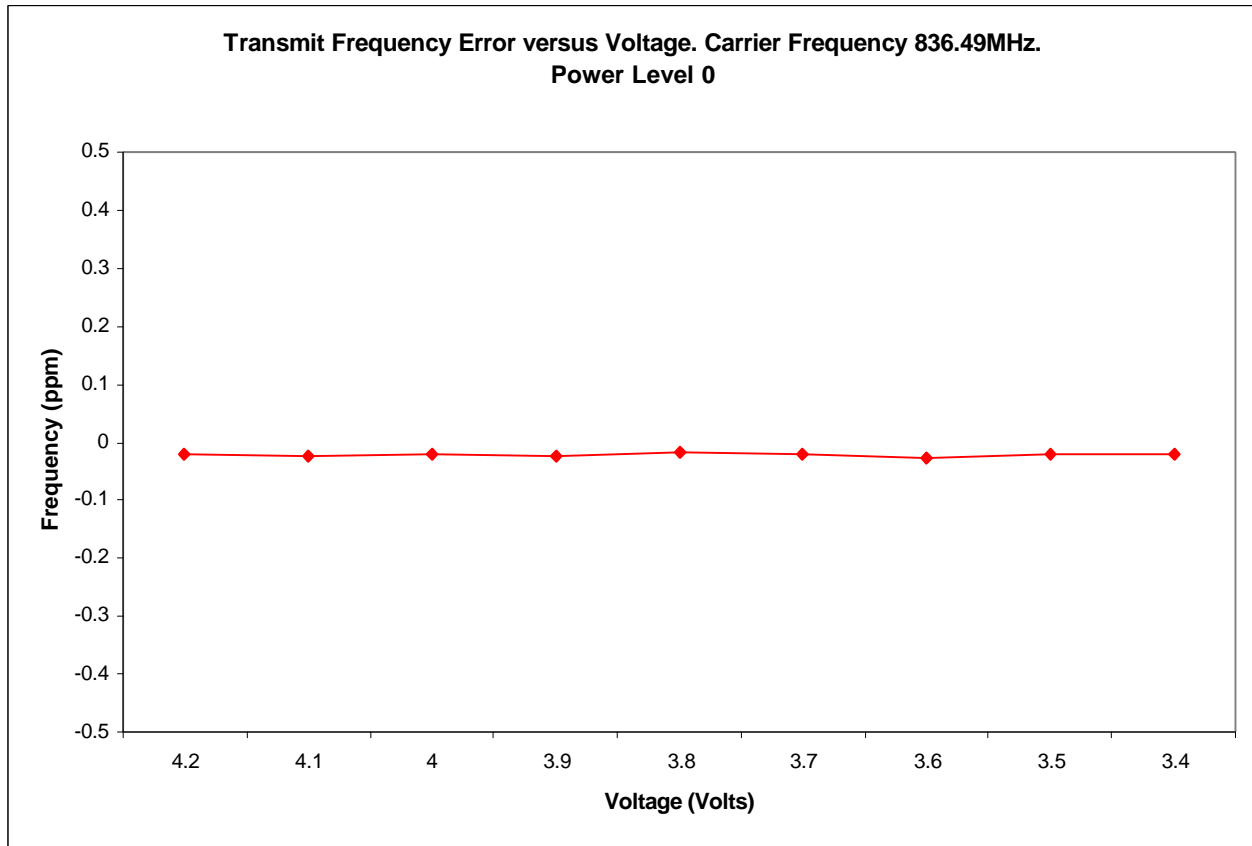
Per 2.1055 (a)(1)(b)(d)(2), 22.355

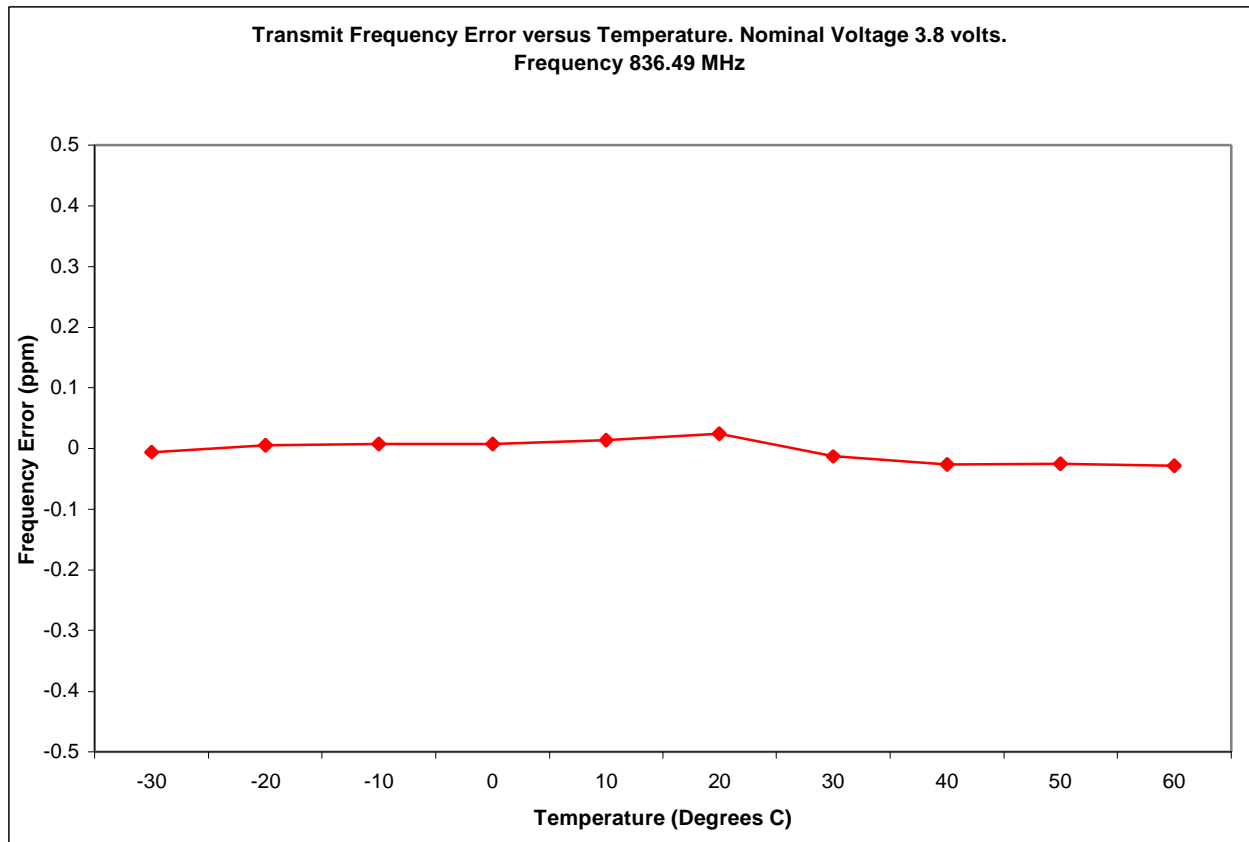
<u>EXHIBIT #</u>	<u>Voltage</u>	<u>Temperature</u>
6L2	3.4 to 4.2 Volts (varied)	+25 C
6L3	3.8	Varied (10 C increments)

Note: The manufacturers rated voltage for the battery is 3.4 VDC to 4.2 VDC.

The measurements were made per IS 137 using the following equipment:

HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)
HP 83712B CW Signal Generator 10 MHz – 20 GHz (S/N: US37100945)
Anritzu MT 8802A Radio Communications Analyzer 300 kHz – 3 GHz (S/N: MB25017)





1900 MHz DAMPS RF POWER OUTPUT

Para. 2.1033 (c)(6)(7), 2.1046 and 24.232 (b)(c)

For Canada use only (6M2 and 6M3): The RF power measured at the output terminals (antenna connector) is plotted against supply voltage variation and temperature variations at the highest levels.

Exhibit	Voltage (V)	Temperature	TX Freq	Power Level
6M2	3.8	Varied	1879.98 MHz	0
6M3	Varied	+25 C	1879.98 MHz	0

Note: The manufacturers rated voltage for the battery is 3.4 VDC to 4.2 VDC.

The measurements were made per IS 137 using the following equipment:

HP EPM-441A Power Meter (S/N: US37480855)
HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)
ESPEC Temperature Chamber (S/N: 91004533)

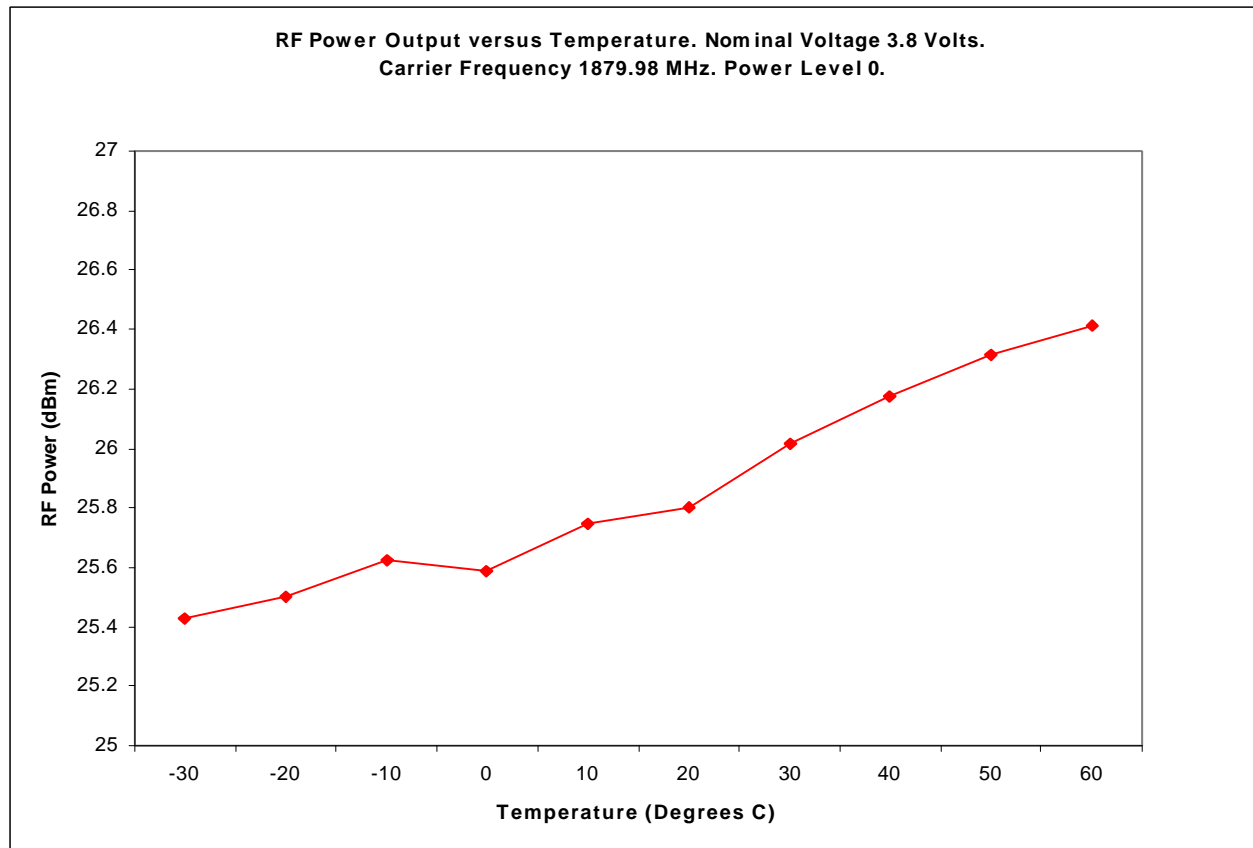
EFFECTIVE RADIATED POWER

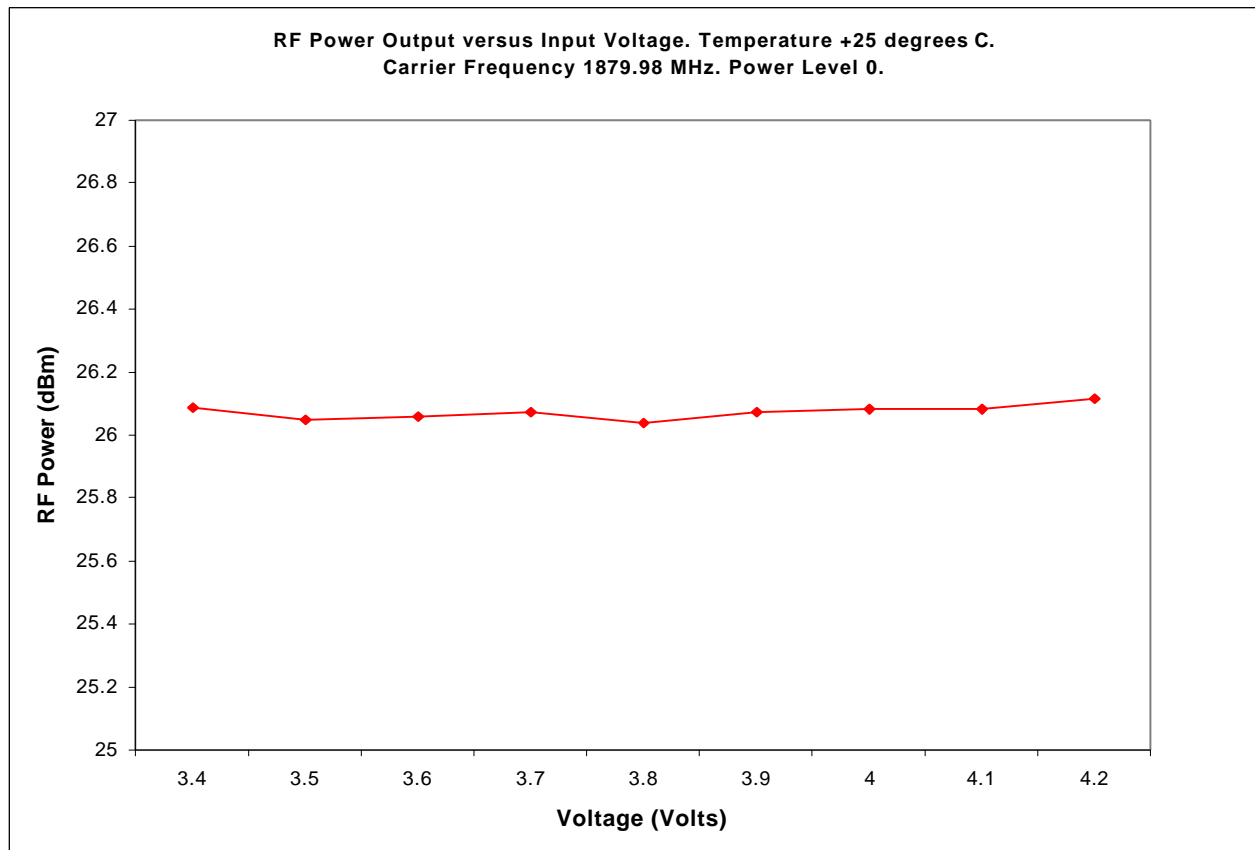
The following is a description of the substitution method used in accordance with IS-137A to obtain accurate EIRP readings at the carrier fundamental frequency:

- (1) The unit under test is placed 3 m away from the measurement antenna in vertical position. The measurements are made by using calibrated antennas and equipment with known cable losses.
- (2) A maximized measurement is made by raising and lowering the measurement antenna and rotating the EUT 360 degrees. Horizontal and vertical polarization data is recorded as reference.
- (3) A generator, an amplifier, and a horn antenna are then substituted for the EUT.
- (4) Data obtained with known power levels into the substitution antenna are then compared to the reference reading. The EDRP of the product is calculated.

Table: EDRP

Mode	f (MHz)	* Radiated (dBm/mW)
DAMPS	1850	25.9/ 385.5
	1880	25.8/ 376.7
	1910	24.9/ 306.2





1900 MHz DAMPS MODULATION CHARACTERISTICS

2.1037(c)(13)

The transceiver shall be capable of generating $\pi/4$ shifted differentially encoded quadrature phase shift keying signals. The transmitted signal is given by:

$$S(t) = \sum_n g(t-nT) \cos(f_n) \cos(\omega_c t) - \sum_n g(t-nT) \sin(f_n) \sin(\omega_c t)$$

where $g(t)$ is the pulse shaping function that corresponds to a square root raised cosine baseband filter with roll off factor of 0.35, ω_c is the radian carrier frequency, T is the symbol period, and f_n is the absolute phase corresponding to the n th symbol interval. The symbol rate ($1/T$) is 24.3 k symbols/sec.

The modulation accuracy requirement is specified by setting limits on the RMS difference between the actual transmitted signal waveform and the ideal signal waveform. The ideal waveform is derived mathematically from the specification of modulation shown above. The specified requirement is error vector magnitude.

For this measurement, frequency accuracy shall meet the requirements of Section 3.1 prior to measurement.

The average carrier frequency error is the difference between the average carrier frequency of the actual transmitted waveform and the average signal waveform carrier frequency.

The ideal modulation is defined above. The definition is such that, observing an ideal transmitter through an ideal root raised-cosine receiver filter at the correct sampling instants one symbol apart would result in the sequence of values given by:

$$S(k) = S(k-1)e^{j\{\pi/4 + B(k)\pi/2\}}$$

where $B(k) = 0, 1, 2, 3$ according to the following table:

X_k	Y_k	$B(k)$
0	0	0
0	1	1
1	1	2
1	0	3

In the forward channel, $S(k)$ forms part of a continuous data stream. In the reverse channel, the transit bursts from the mobile are truncated by power up and down ramping. In this case, $S(6)$ is the first sample that enters into demodulation, which yields the first two information bits by comparing $S(6)$ with $S(7)$. The last information bits lie in the comparison of $S(162)$ and $S(161)$.

The ideal transmit and receive filters in cascade form a raised cosine Nyquist filter having an impulse response going through zero at symbol period intervals, so there is no inter-symbol interference at the ideal sampling points. The ideal signal sampler therefore, take on one of the eight values defined above, at the output of the receive filter.

This section defines how the output signal from a transmitter is to be evaluated against the ideal signal.

Let $Z(k)$ be the complex vectors produced by observing the real transmitter through an ideal measuring receive filter at instants k , one symbol period apart. With $S(k)$ defined as above, the transmitter is modeled as:

$$Z(k) = [C_0 + C_1 * [S(k) + E(k)]] * W^k$$

where:

$$k = n/24.3\text{KHz}$$

$$W = e^{j\phi}$$

accounts for both a frequency offset giving “ ϕ ” radians per symbol phase rotation and an amplitude changes of “ ϕ ” nepers per symbol:

C_0 is a constant origin offset representing quadrature modulator imbalance, C_1 is a complex constant representing the arbitrary phase and output power of the transmitter, and $E(k)$ is the residual vector error on sample $S(k)$

The sum square vector error is then:

$$k = \text{MAX}$$

$$k = \text{MAX}$$

$$\sum_{k=\text{MIN}}^{\text{MAX}} |E(k)|^2$$

$$\sum_{k=\text{MIN}}^{\text{MAX}} |[Z(k) * W - C_0/C_1] - S(k)|^2$$

C_0 , C_1 and W shall be chosen to minimize this expression and are then used to compute the individual vector errors $E(k)$ on each symbol. The symbol timing phase of the receiver output samples used to compute the vector error shall also be chosen to give the lowest value.

The values of MAX and MIN for the reverse channel (mobile station transmitter) are:

$$\text{MIN} = 6$$

$$\text{MAX} = 162$$

The RMS vector error is then computed as the square root of the sum-square vector divided by the number of symbols in the slot, (157 in the reverse direction).

Method of Measurement

Connect the mobile station to the Standard Test Source and Modulation Accuracy Equipment. Modulate the Standard Test Source with pseudo-random Data Field bits. The mobile station shall transpond the Data Field bits using the TDMAON command. Use the Modulation Accuracy Measurement Equipment to measure the modulation accuracy of the mobile station.

Minimum Standard

The RMS vector error in any burst shall be less than 12.5%. In addition, the normalized error vector magnitude during the first 10 symbols (20 bits) of a burst following the ramp-up, must have an RMS value of less than 25% when averaged over 10 bursts within a 1 minute interval. The minimum standard for frequency offset is specified in section 3.1.2.2.3 of IS 137. The origin offset in any burst shall be less than -20 dBc.

1900 MHz: OCCUPIED BANDWIDTH

Per 2.1049 (h) and 24.238 (a)(b)(c)(d) the exhibits presented show the modulation that has to exist in a 1900 MHz Cellular System.

All the exhibits listed below are plots where the modulation condition is Psuedorandom Data (48.6 kb/s switched), operating in the DAMPS (TDMA) mode. All plots were taken while transmitting at Power Level 0. Any frequency span not covered in the exhibits below was found to be unaffected by the transmitter/modulation.

EXHIBIT

Lower Channel (Example, Channel 2)

Normal bursted operation; data rate 48.6 kb/s, Output power level 0.

6O2 1 MHz Resolution Bandwidth reference plot.

6O3 Emission Bandwidth

6O4 1 MHz span, Center Frequency.

Upper Channel (Example, Channel 1998)

Normal bursted operation; data rate 48.6 kb/s, Output power level 0.

6O5 1 MHz Resolution Bandwidth reference plot.

6O6 Emission Bandwidth

6O7 1 MHz span, Center Frequency

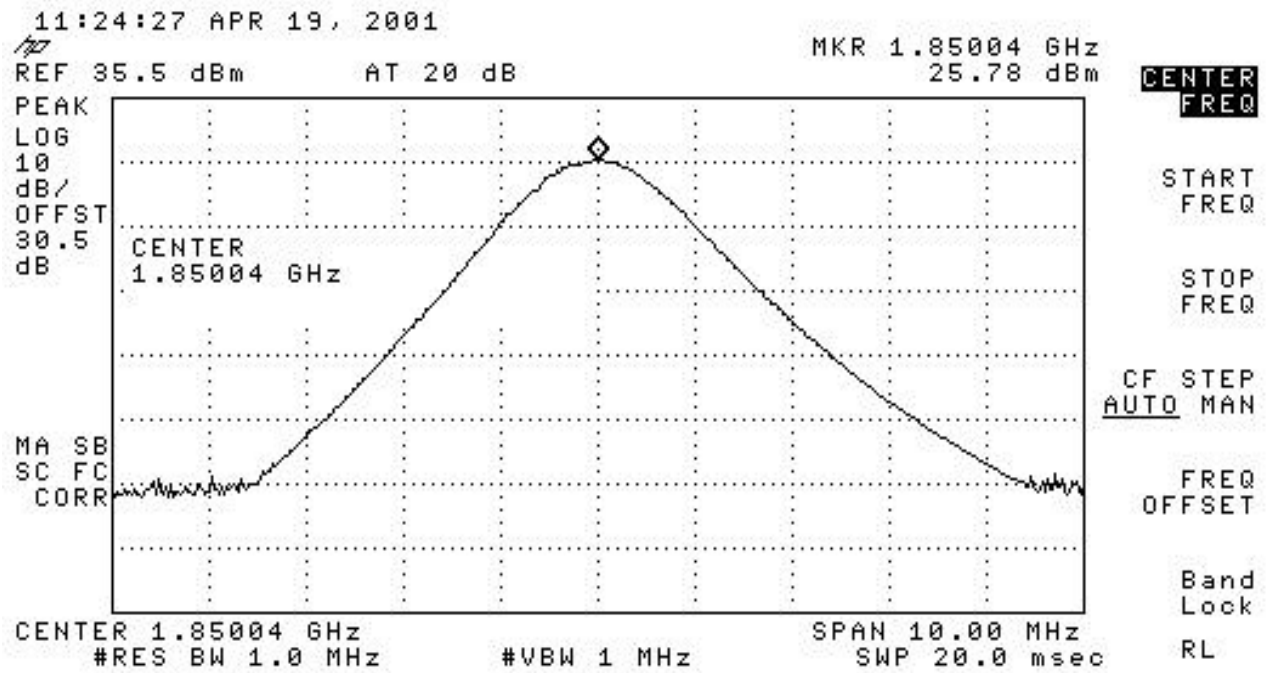
The measurements were made per IS 137 using the following equipment:

HP 8593E Spectrum Analyzer 9 kHz – 22 GHz (S/N: 3829A03592)

Anritzu MT 8802A Radio Communications Analyzer 300 kHz – 3 GHz (S/N: MB25017)

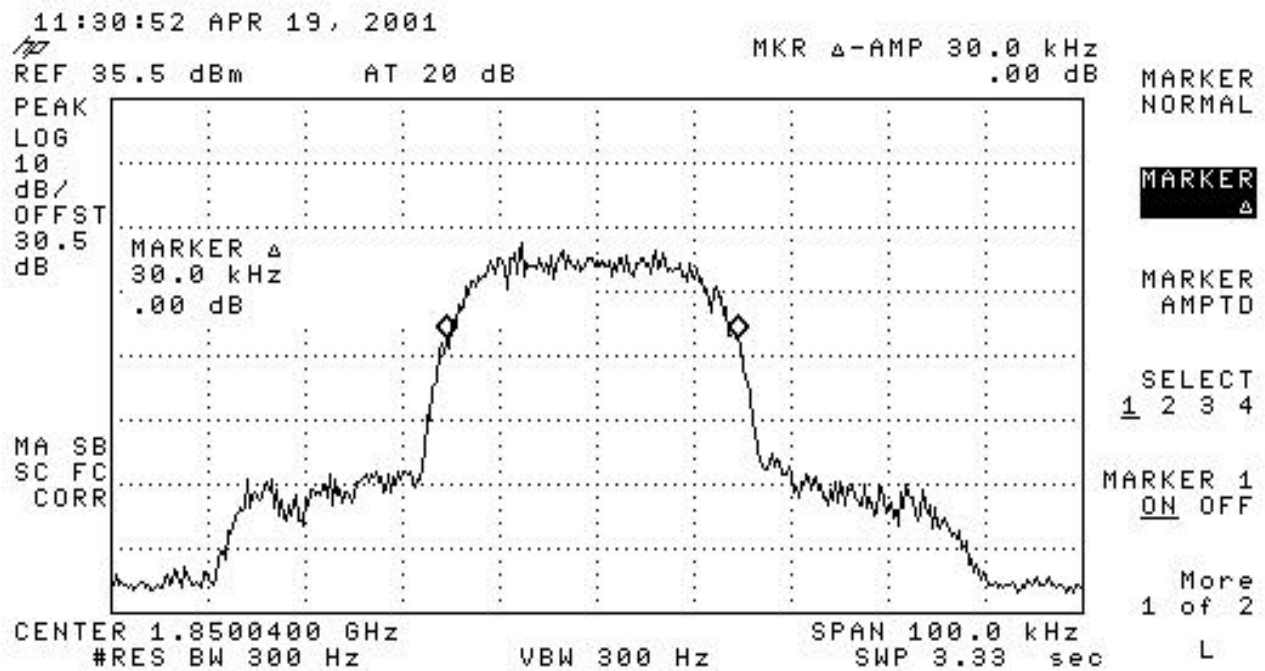
HP EPM-441A Power Meter (S/N: US37480855)

Exhibit 602



1900 MHz Occupied BW 1 MHz Res BW Ch. 2

Exhibit 6O3



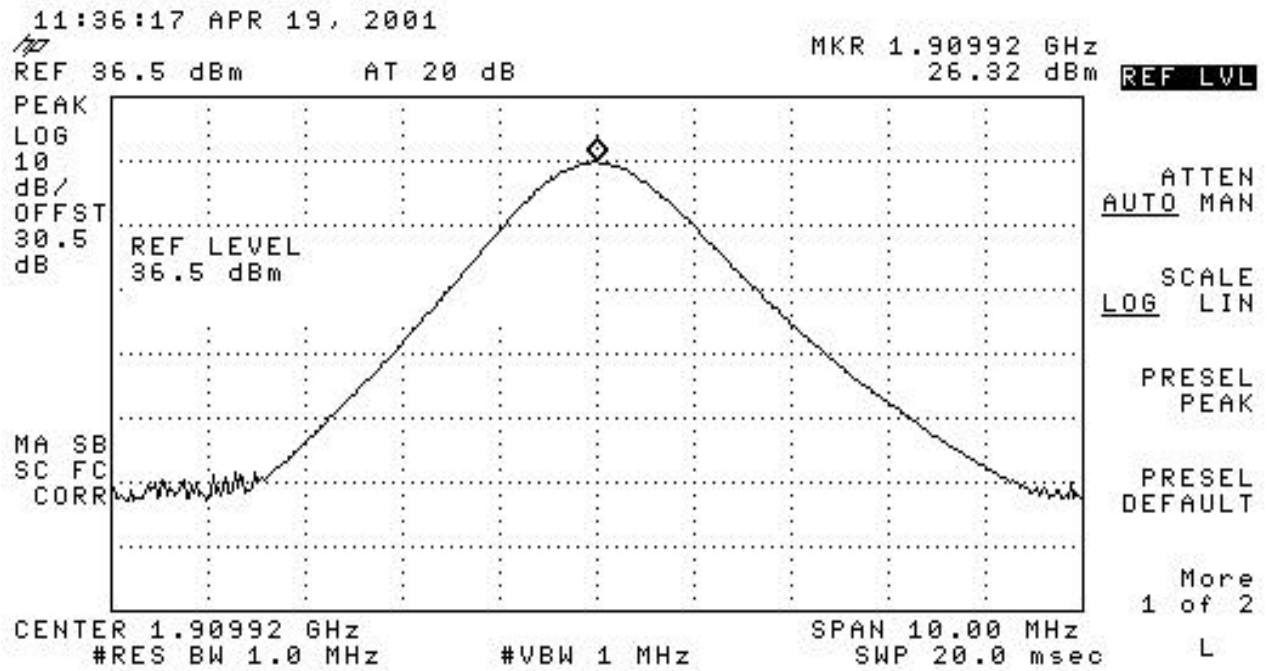
1900 MHz Occupied BW Emission Bandwidth Ch. 2

Exhibit 6O4



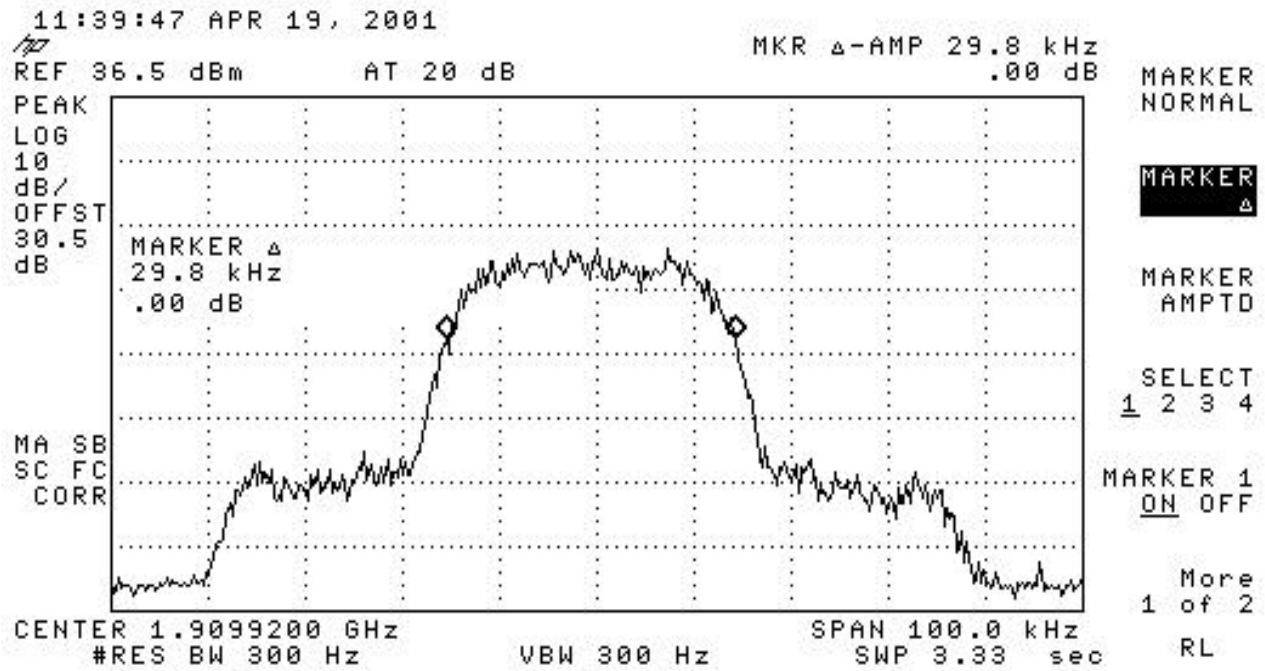
1900 MHz Occupied Bandwidth 1 MHz Span Ch. 2

Exhibit 605



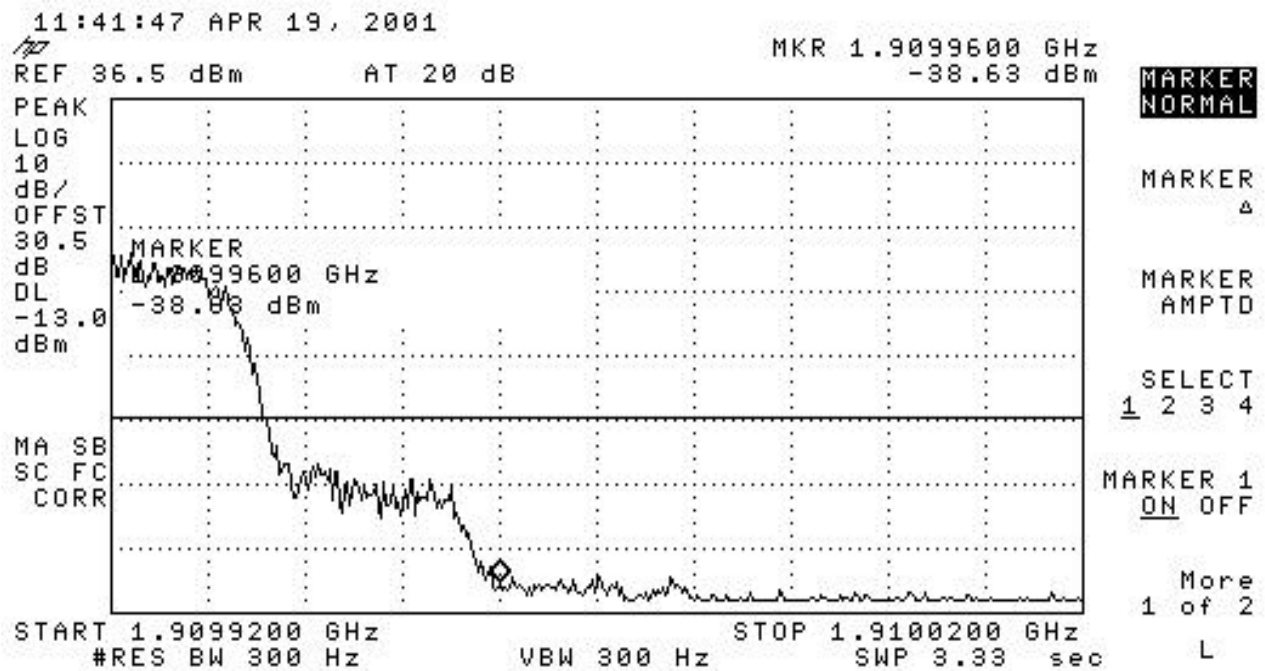
1900 MHz Occupied BW 1 MHz Res BW Ch. 1998

Exhibit 6O6



1900 MHz Occupied BW Emission BW Ch. 1998

Exhibit 607



1900 MHz Occupied BW 1 MHz Span Ch. 1998

1900MHz SPURIOUS EMISSIONS (CONDUCTED)

Per 2.1051, 24.238 Spurious emissions at the antenna terminals (conducted) when properly loaded with an appropriate artificial antenna were measured per IS-137A.

Note: The spectrum was examined through the 10th harmonic of the carrier.

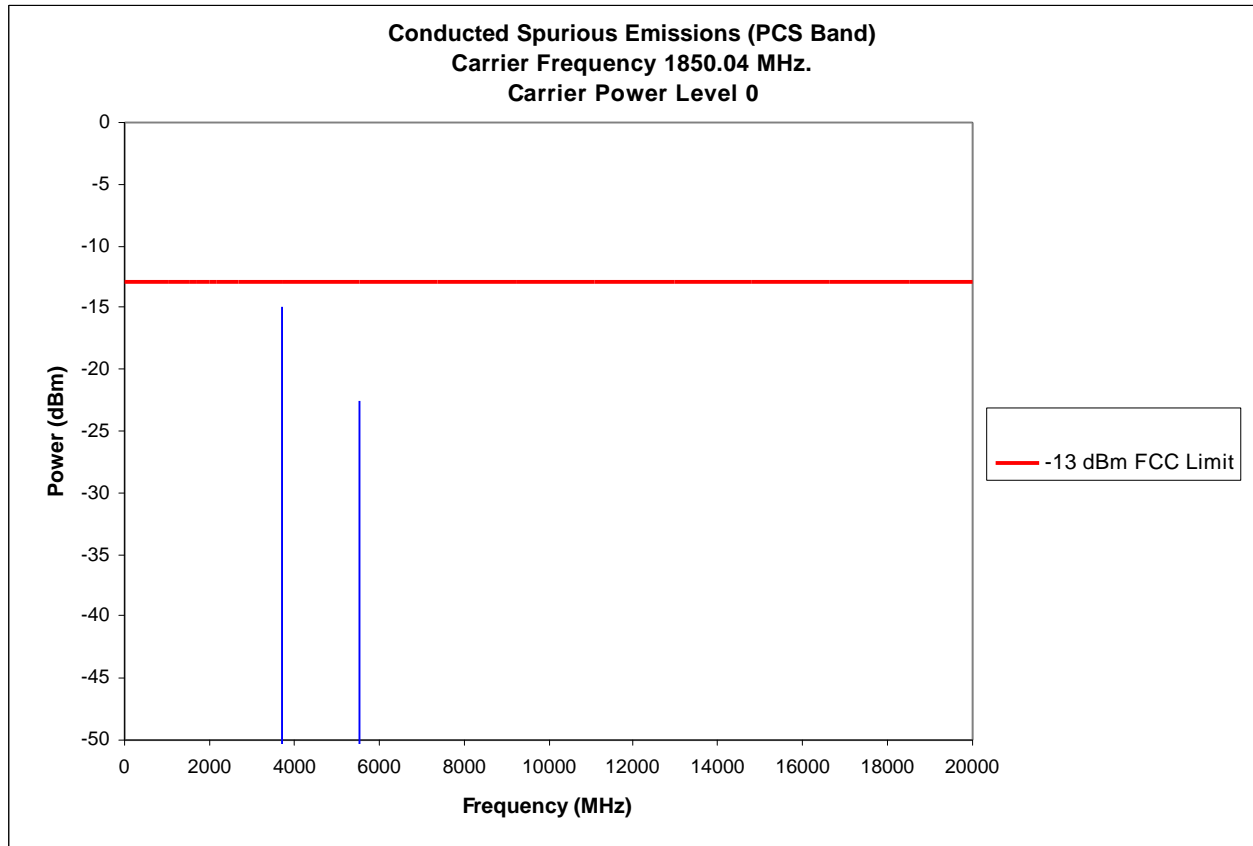
<u>EXHIBIT #</u>	<u>FREQUENCY (MHz)</u>	<u>Output Power level</u>
6P2	1850.04 MHz	0
6P3	1850.04 MHz	7

The measurements were made per IS-137A using the following equipment:

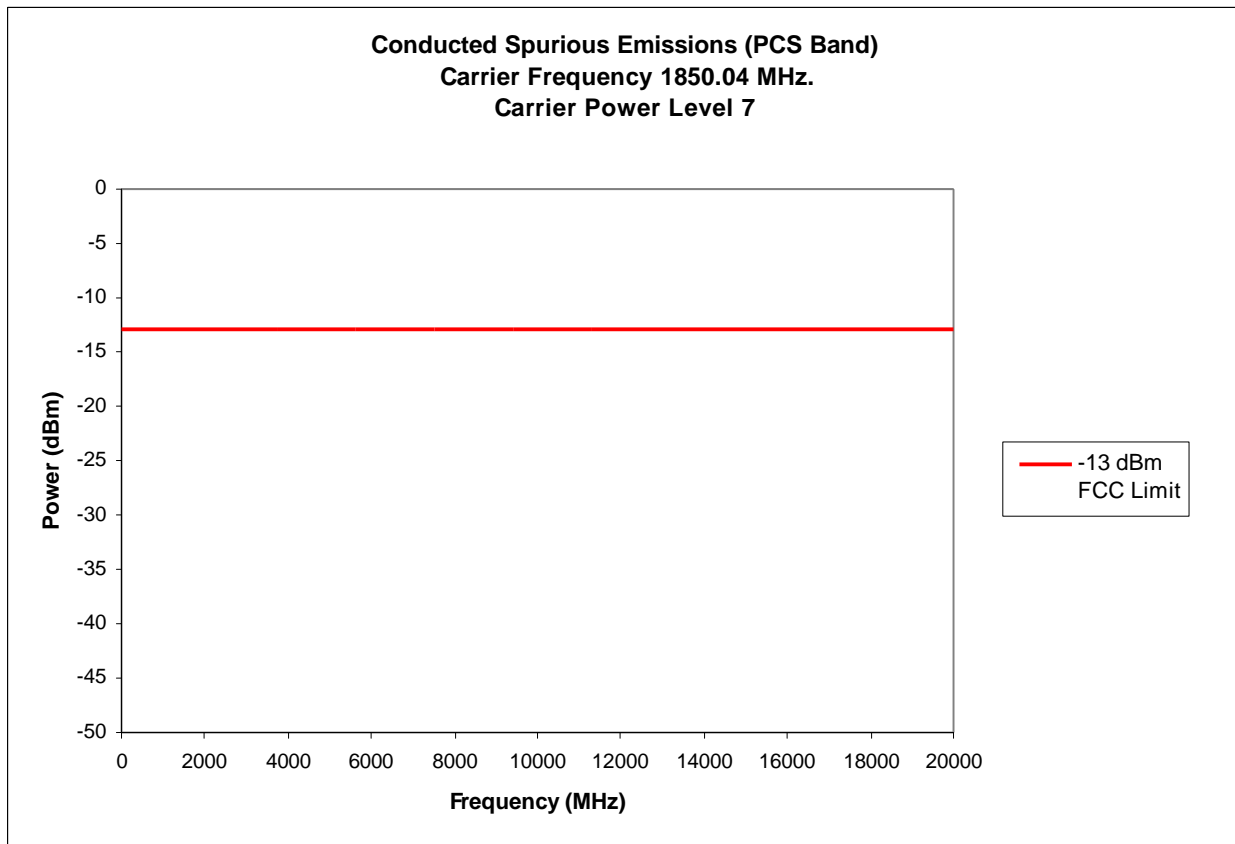
HP E7405A EMC Spectrum Analyzer 9 kHz – 26.5 GHz (S/N: US39150143)

HP EPM-441A Power Meter (S/N: US37480855)

HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)



No other spurious emissions found within 20dB of limit



No spurious emissions found within 20dB of limit

1900 MHz: SPURIOUS EMISSIONS (Radiated)

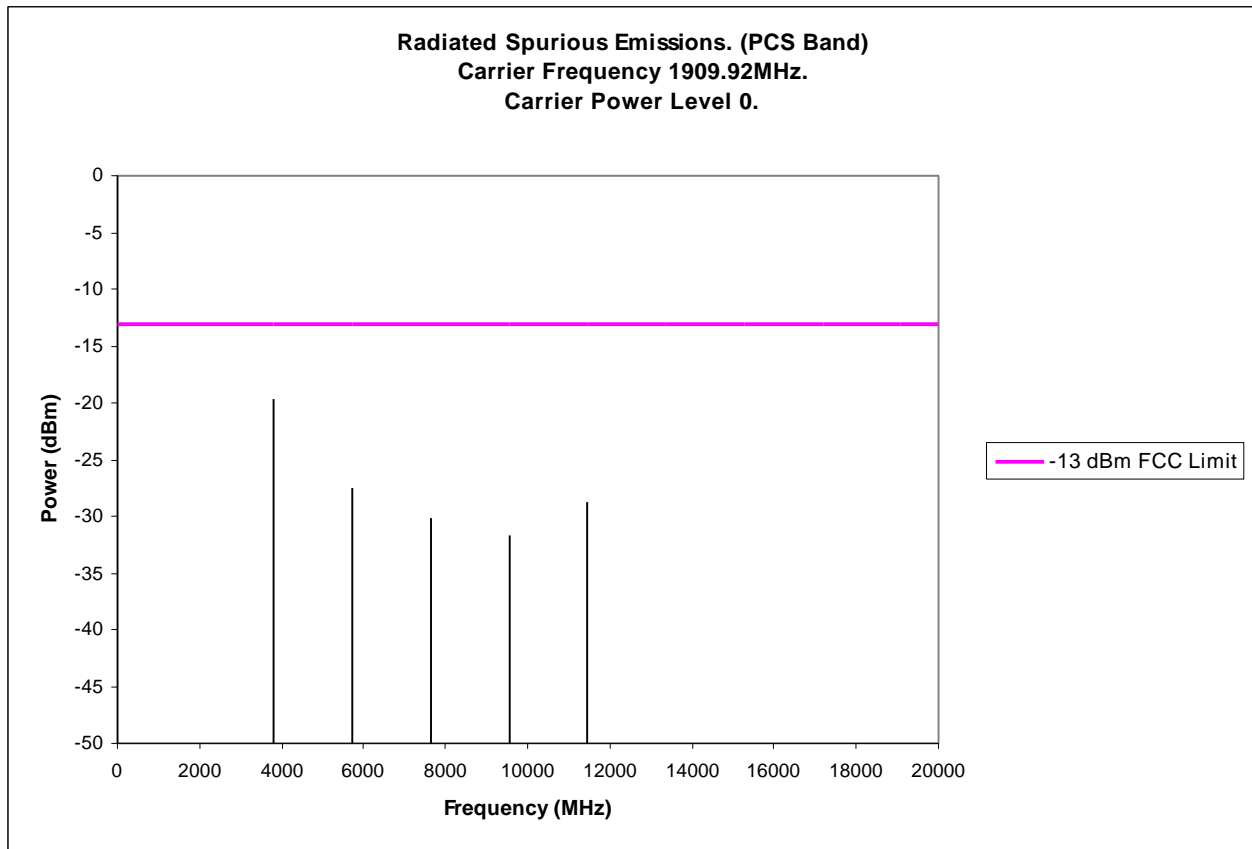
Per 2.1053 and 22.917 (e), field strength of spurious radiation was measured at Underwriters Laboratories Inc. Research Triangle Park, NC site. The measurement procedure is per EIA IS-137 conducted on a 3-meter test site. Results are shown on the following Exhibits.

Note: The spectrum was examined through the 10th harmonic of the carrier. Peak radiated emissions were recorded.

<u>EXHIBIT</u>	<u>FREQUENCY</u>	<u>OUTPUT POWER LEVEL</u>
6Q2	1909.92	0

The measurements were made per IS 137 using the following equipment:

HP8566B Spectrum Analyzer 100Hz 25GHz / 2 – 22GHz
HP 83752A Signal Generator (S/N: 361DA01426)
30dB Amplifier - Amplifier Research (AR) (S/N: 23413)
Power Meter - Rhode & Schwartz (S/N: DE21529)
Power Sensor (S/N: 8479771011)
2 Test Cables (S/N's: ZATA21, ATA055)
20dB Pad (S/N: ATA005)
EMCO 3115 Double Ridge Horn Antenna
Test Fixture (Fixture provides height adjustment for mobiles and antennas according to FCC requirements)



No other spurious emissions were found within 20 dB of limit

1900 MHz: FREQUENCY STABILITY

Per 2.1055 (a)(1),(b),(d)(2), 24.235

<u>EXHIBIT #</u>	<u>Voltage</u>	<u>Temperature</u>
6R2	3.4 to 4.2 Volts (varied)	+25 C
6R3	3.8	Varied

Note: The manufacturers rated voltage for the battery is 3.4 VDC to 4.2 VDC.

The measurements were made per IS 137 using the following equipment:

HP 66309B Dual Output Mobile Comm. DC Source (S/N: US39050133)
HP 83712B CW Signal Generator 10 MHz – 20 GHz (S/N: US37100945)
Anritzu MT 8802A Radio Communications Analyzer 300 kHz – 3 GHz (S/N: MB25017)

