RF POWER OUTPUT

Pursuant to FCC Rules 2.985

AMPS	Freq.	Freq.	Freq.			
PL	824.04	848.97	836.52	Upper Spec	Lower Spec	Pass/Fail
0	22.54	22.37	22.40	28	24	Failed
1	22.57	22.41	22.45	28	24	Failed
2	22.58	22.41	22.47	28	24	Failed
3	21.56	21.44	21.35	26	20	Passed
4	19.14	19.06	18.82	22	16	Passed
5	15.09	15.18	14.83	18	12	Passed
6	11.04	11.20	10.70	14	8	Passed
7	7.12	7.28	6.79	10	4	Passed
8	7.24	7.49	6.89	10	4	Passed
9	7.21	7.49	6.88	10	4	Passed
10	7.20	7.52	6.90	10	4	Passed

NADC	Freq.	Freq.	Freq.			
PL	824.04	848.97	836.52	Upper Spec	Lower Spec	Pass/Fail
0	27.48	27.34	26.95	28	24	Passed
1	27.37	27.42	27.04	28	24	Passed
2	27.40	27.43	27.06	28	24	Passed
3	23.11	22.80	22.54	26	20	Passed
4	18.88	18.60	18.34	22	16	Passed
5	14.95	14.68	14.45	18	12	Passed
6	11.05	10.61	10.49	14	8	Passed
7	6.99	6.42	6.39	10	4	Passed
8	2.03	1.55	1.50	8	-6	Passed
9	-3.03	-3.34	-3.40	4	-12	Passed
10	-7.64	-7.91	-8.11	0	-18	Passed

PCS	Freq.	Freq.	Freq.			
PL	1850.04	1909.92	1879.98	Upper Spec	Lower Spec	Pass/Fail
0	26.49	26.74	26.61	28	24	Passed
1	26.58	26.76	26.63	28	24	Passed
2	26.48	26.78	26.67	28	24	Passed
3	22.63	22.80	22.88	26	20	Passed
4	18.60	18.69	18.86	22	16	Passed
5	14.43	14.70	14.78	18	12	Passed
6	10.48	10.55	10.78	14	8	Passed
7	6.46	6.61	6.76	10	4	Passed
8	1.44	1.49	1.87	8	-8	Passed
9	-3.45	-3.42	-3.10	4	-14	Passed
10	-7.75	-7.55	-7.52	0	-20	Passed

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Method of Measurement

The RF power output is measured with the transmitter adjusted in accordance with the tune-up procedure to give the value of voltage and current specified in the tune-up procedure to give the value of voltage and current specified in the operation description as required by 2.983(d) (5). A 50-ohm RF attenuator of proper power rating was used as a load for making these measurements. The power measurements are made using a Gigatronix 8541C power meter and 20-dB attenuator.

Minimum Standard

The specifications met are per IS137-A Tables 3.2.1-1 and 3.2.2-1.

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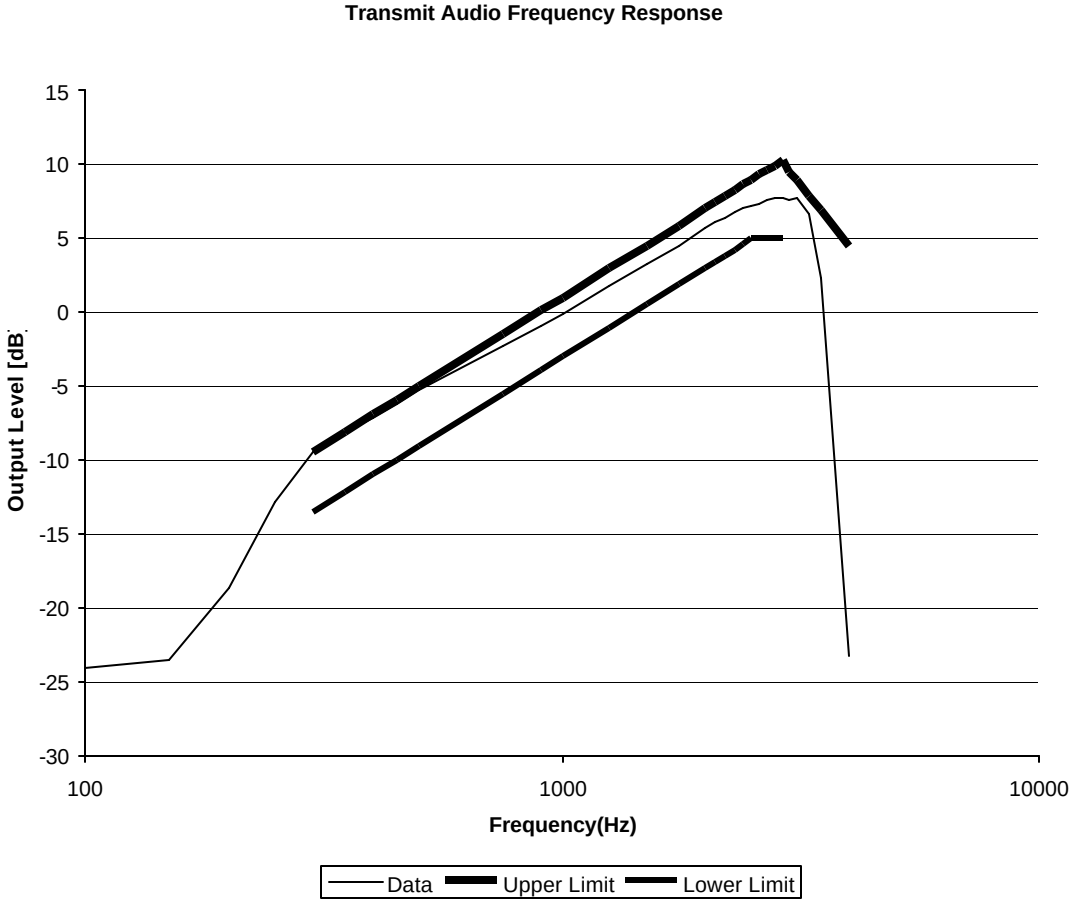
Audio Frequency Response AMPS

Pursuant to FCC Rules 2.987 (a)



Method of Measurement

Operate the transmitter under standard test conditions and monitor the output with a frequency deviation meter or calibrated test receiver. With 1004 Hz sine wave audio input applied through a dummy microphone circuit, adjust the audio input to give 30% of full rated system deviation. Maintaining constant input, vary the input frequency from 100 to 5000 Hz, and observe the level of modulation measured.

Minimum Standard

The audio frequency response shall not vary more than +1 or -3 dB from 300 to 3000 Hz as referenced to 1000 Hz level (with the exception of a permissible 6 dB/octave roll off from 2500 to 3000 Hz)

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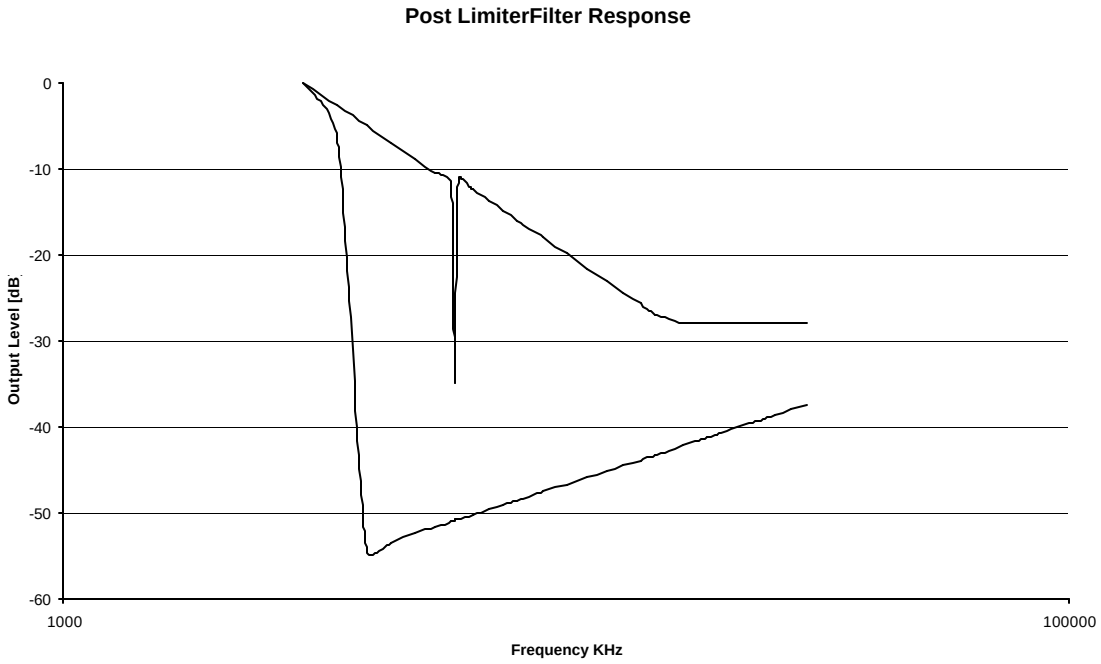
Post Limiter Filter Response

Pursuant to FCC Rules 2.987 (a)



Method of Measurement

Operate the transmitter under standard test conditions and monitor the output with a calibrated test receiver. With 1004 Hz sine wave audio input applied through a dummy microphone circuit adjust the audio input to give 30% of full rated system deviation. Maintaining constant input, vary the input frequency from 100 to 5000 Hz, and observe the level of modulation measured.

Minimum Standard

The response shall not exceed from: 3KHz to 5.9KHz – 40Log(f/3000) dB
5.9 to 6.1 kHz – 35 dB
6.1 to 15 kHz - 40Log(f/3000) dB
15 to 30 kHz - 28 dB

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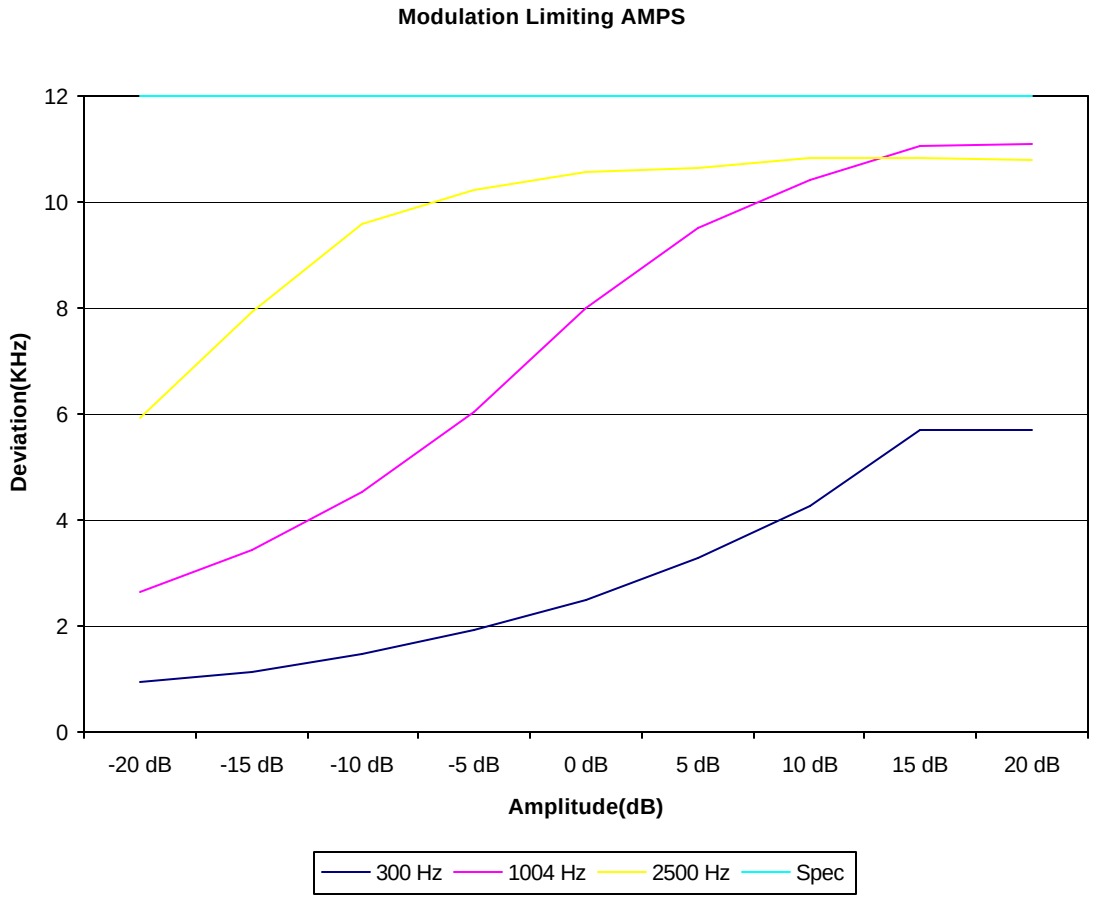
MODULATION LIMITING

Pursuant FCC Rules 2.987 (a), 22.915(b)



Method of Measurement

The transmitter shall be adjusted for full rated system deviation. Adjust the audio input for 60% of rated system deviation at 1000 Hz. Using this level as a reference (0 dB) vary the audio input level from the reference to a level 20 dB above it for modulation frequencies of 300, 1004 and 2500 Hz. Record the system deviation obtained as a function of the input level.

FCC Limits

Minimum Standard

The transmitter modulation must not exceed rated system deviation at any audio frequency input or reasonable change in input level.

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OCCUPIED BANDWIDTH

Pursuant to FCC Rules 2.989, 22.917(b & d)

Method of Measurement
Data on occupied bandwidth is presented in the form of a spectrum analyzer photograph that illustrates the transmitter sidebands. An unmodulated carrier is used for reference and the spectrum analyzer is set to the center with a 0 dBc at the top of the screen. Each plot is superimposed with the proper modulation activated. For any display generated by modulating the carrier with audio, a 2500 Hz tone at a level 16 dB greater than required to produce 50 percent modulation is injected. The phone generates all signaling tones internally. The spectrum analyzer settings are as follows: Span 100KHz, Resolution BW 1KHz, and Video BW 1KHz. A HP8566B spectrum analyzer was used to acquire the AMPS plots. An Anritsu 8802A Telecommunications Analyzer was used to acquire both TDMA800 and TDMA1900 plots
The following Plots are provided:

AMPS Wide Band Data
AMPS Voice
AMPS Voice + SAT2
AMPS ST
AMPS DTMF 9
800 MHz TDMA
1900 MHz TDMA

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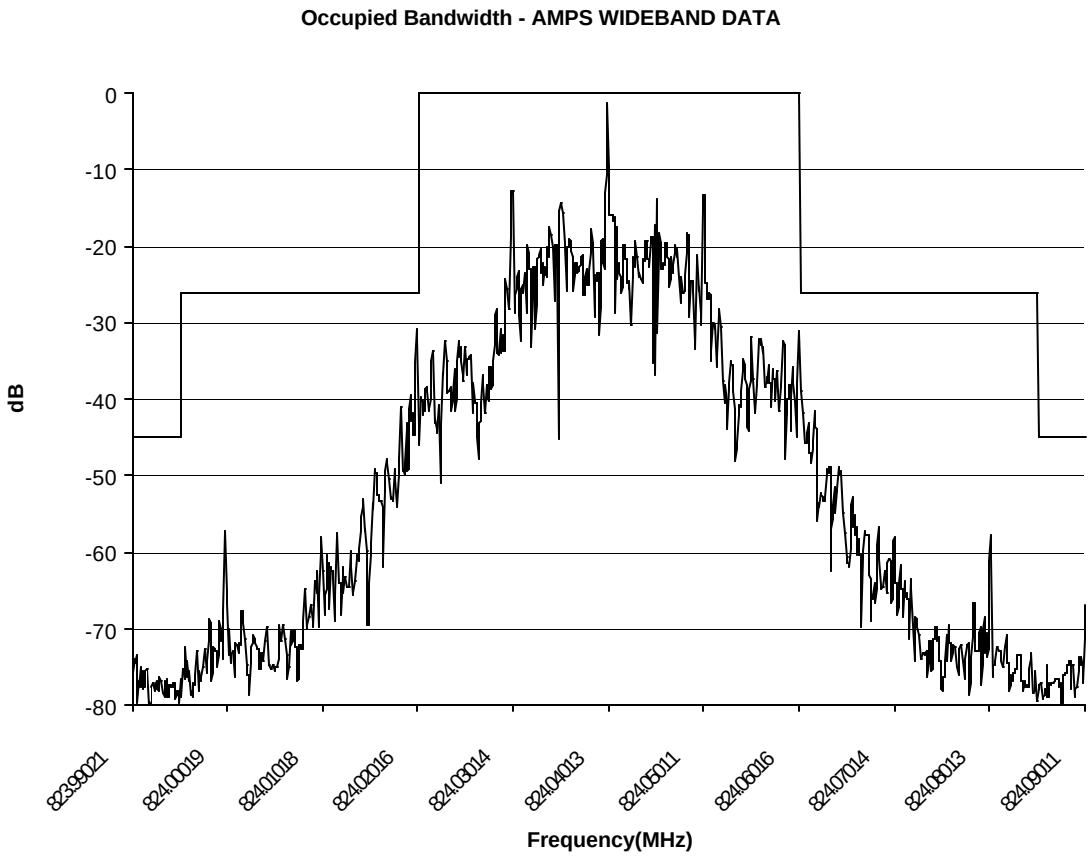
OCCUPIED BANDWIDTH – Wideband Data

Pursuant to FCC Rules 2.989, 22.917(d)



FCC Limits - (F1D Mask)

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to and including 90 kHz, the side band is at least 45 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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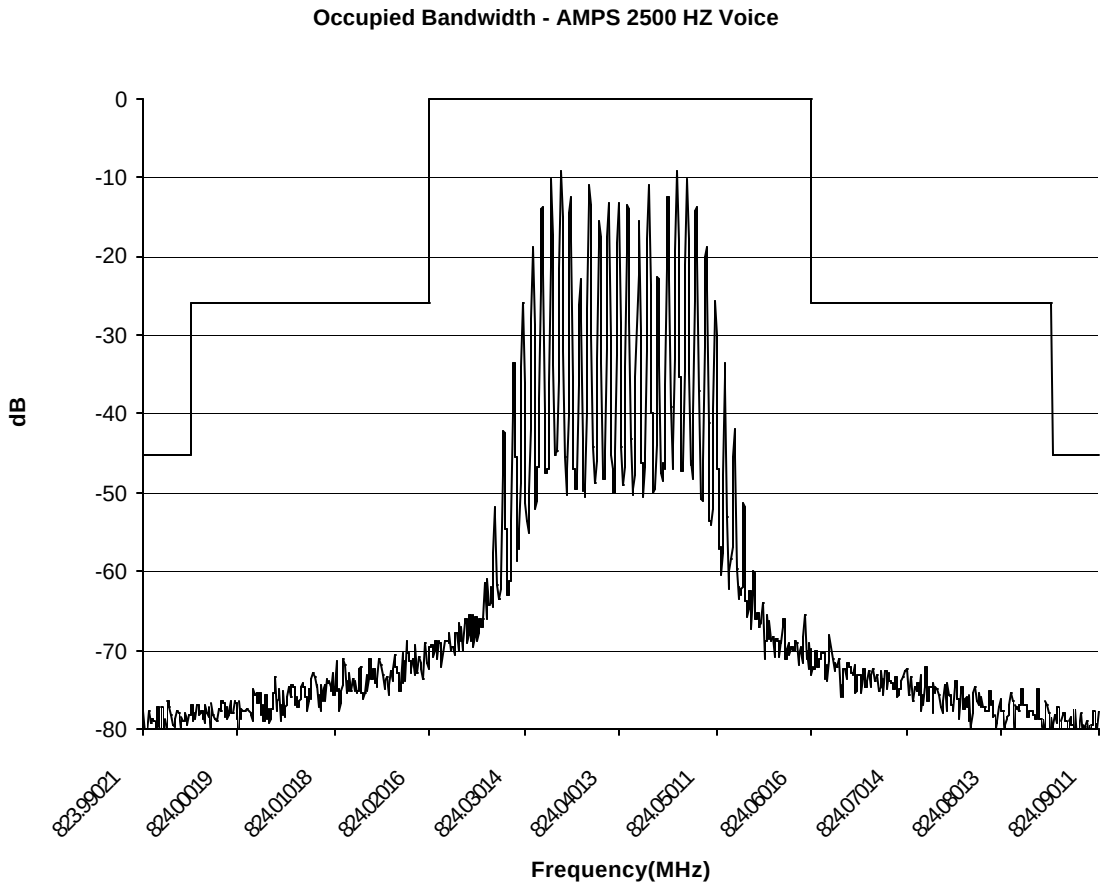
OCCUPIED BANDWIDTH – Voice

Pursuant to FCC Rules 2.989, 22.917(b)



FCC Limits - (F3E Mask)

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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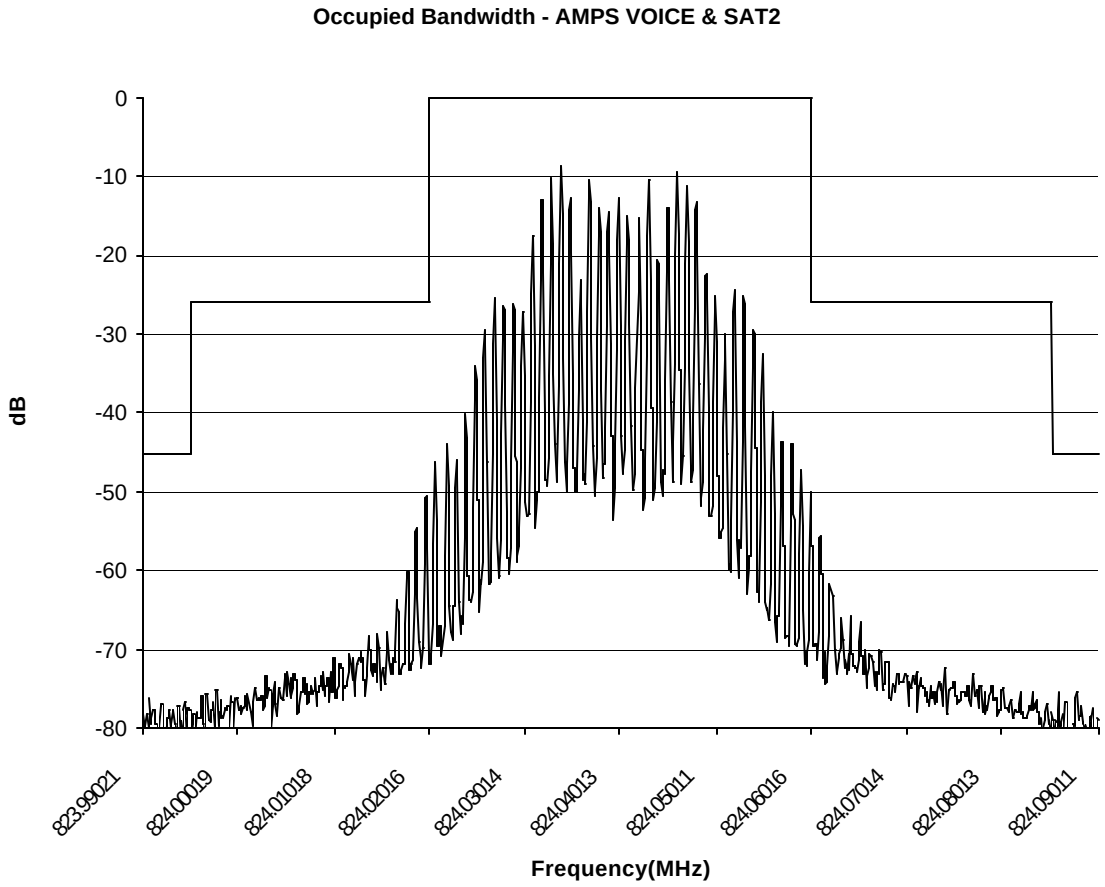
OCCUPIED BANDWIDTH – Voice & SAT2

Pursuant to FCC Rules 2.989, 22.917(b)



FCC Limits - (F3E Mask)

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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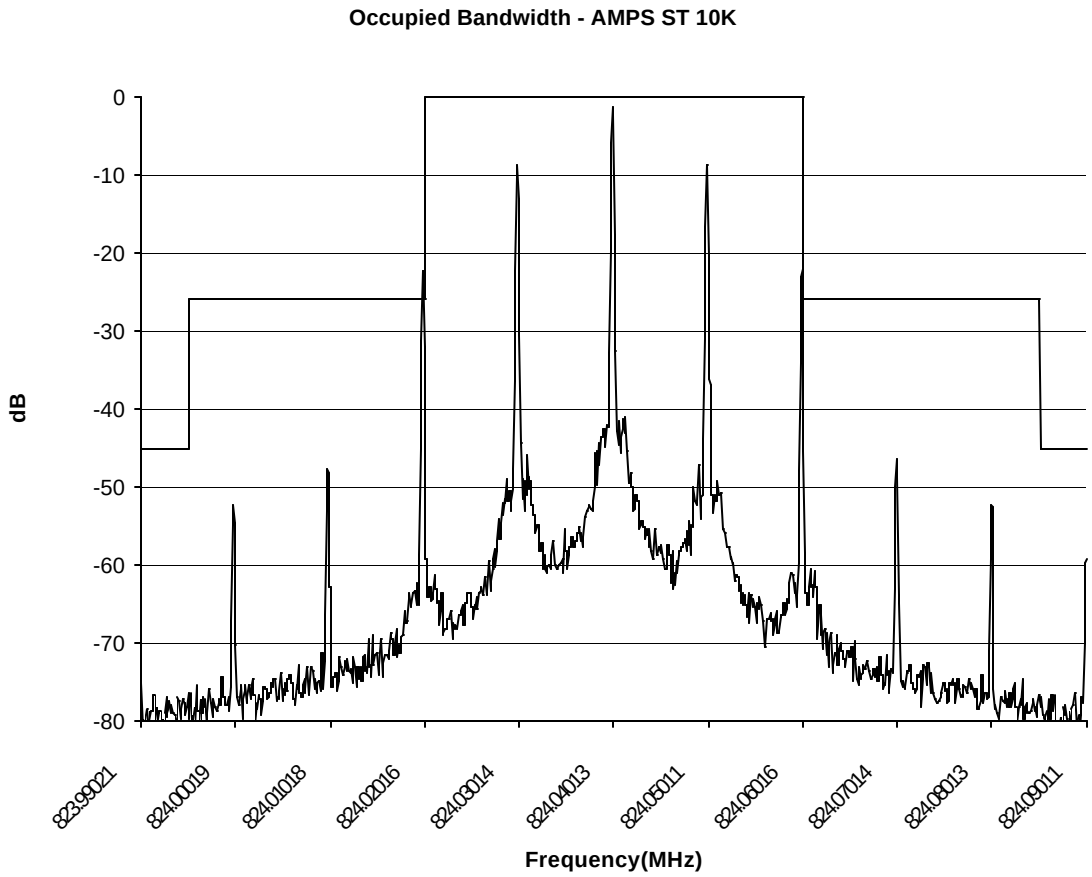
OCCUPIED BANDWIDTH – ST

Pursuant to FCC Rules 2.989, 22.917(b)



FCC Limits - (F3E Mask)

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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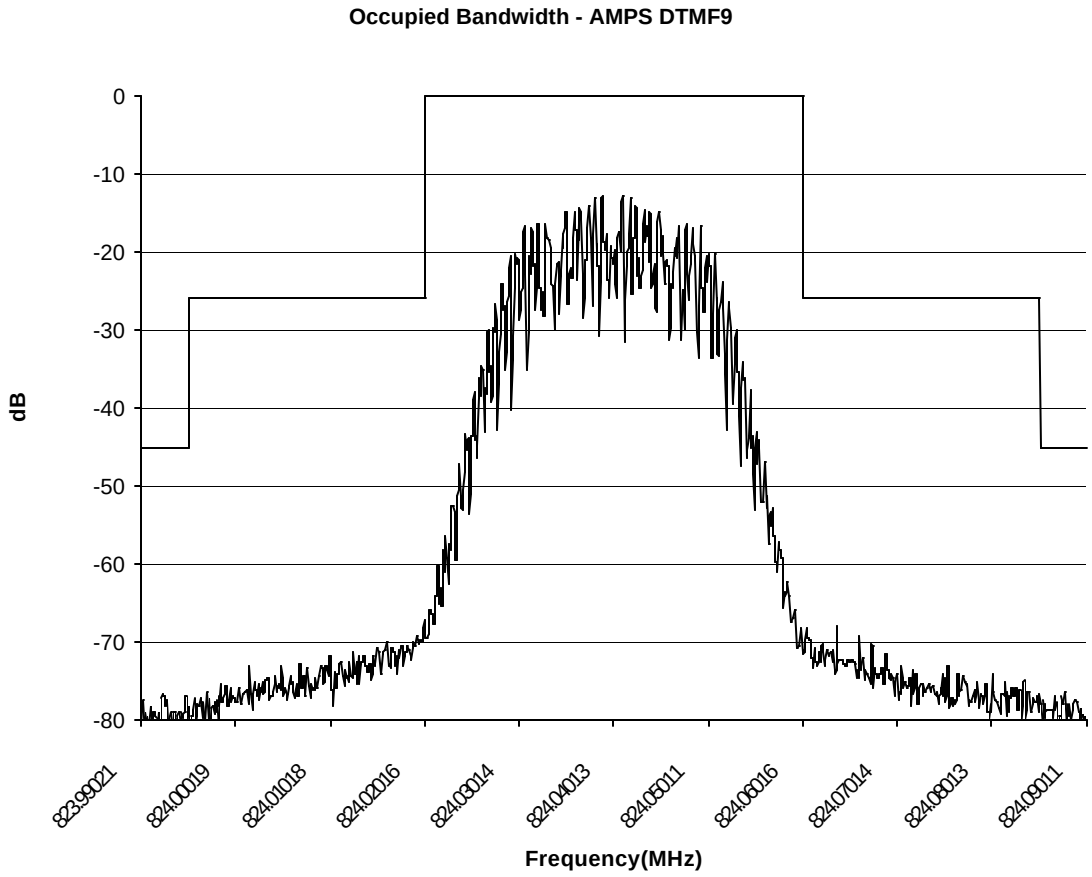
OCCUPIED BANDWIDTH – DTMF 9

Pursuant to FCC Rules 2.989, 22.917(b)



FCC Limits - (F3E Mask)

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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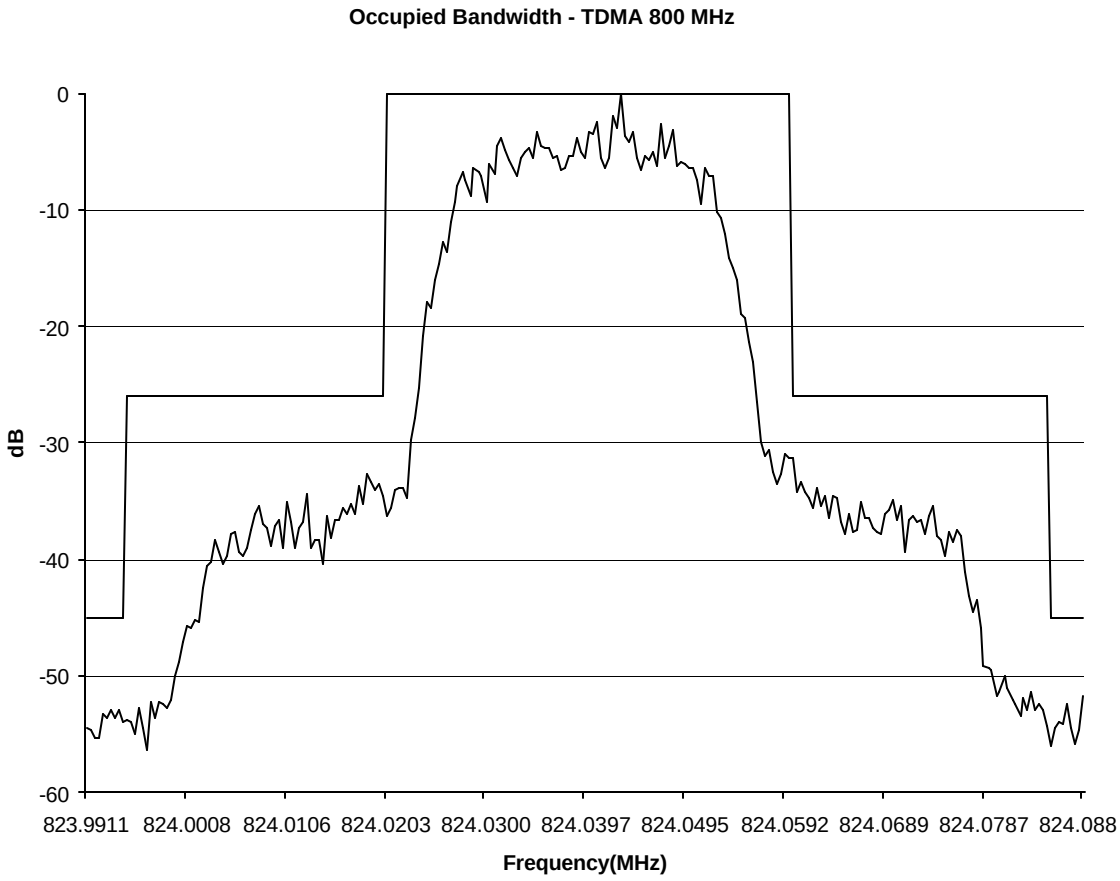
OCCUPIED BANDWIDTH – 800 MHz TDMA

Pursuant to FCC Rules 2.989



FCC Limits

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to and including 90kHz, the side band is at least 45 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 90 kHz, up to and including the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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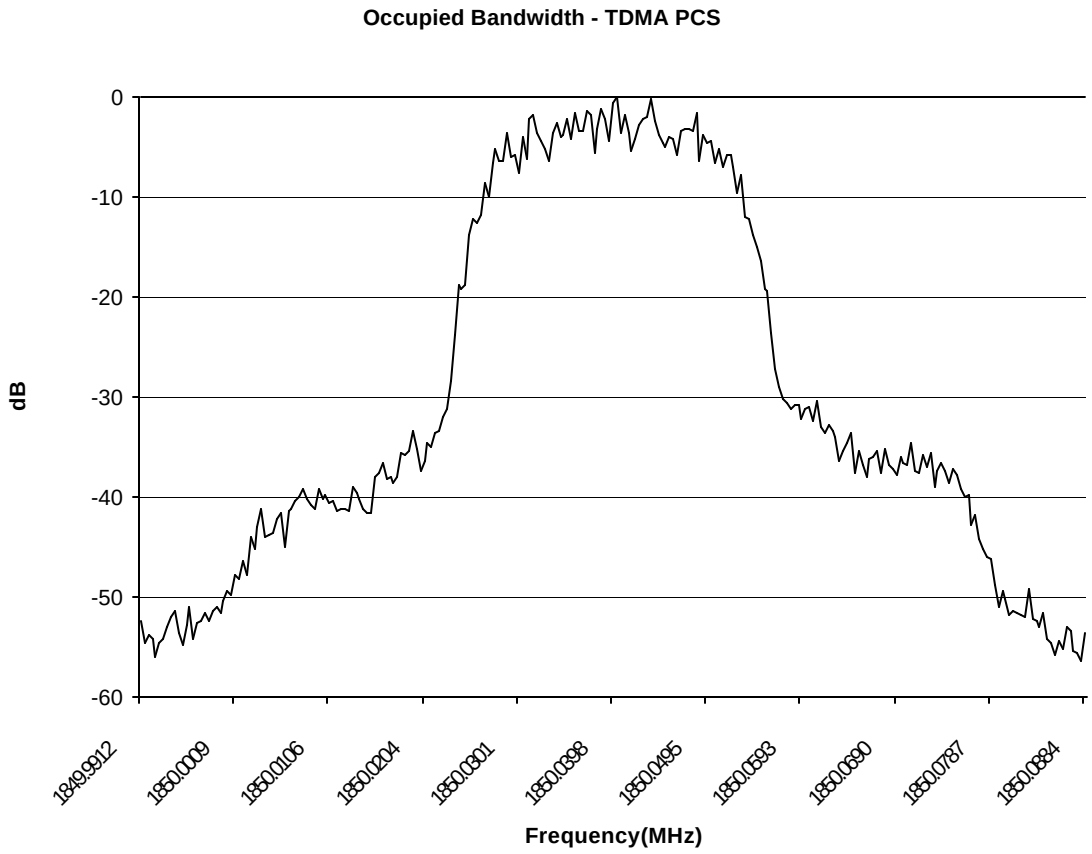
OCCUPIED BANDWIDTH – 1900 MHz TDMA

Pursuant to FCC Rules 2.989



FCC Limits

On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the side band is at least 26 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to and including 90kHz, the side band is at least 45 dB below the carrier. On any frequency removed from the assigned carrier frequency by more than 90 kHz, up to and including the first multiple of the carrier frequency, the side band is at least 60 dB below the carrier or 43 + log (mean output power in Watts) dB, whichever is the smaller attenuation.

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Conducted Spurious Emission – 800 MHz AMPS

Pursuant to FCC Rules 2.991, 22.917(e)

Spur Name	Freq. (MHz)	Amp(dBc)	Spec (dBc)	P/F
AMPS	1648.08	-47.16	-13.02	Passed
AMPS	1793.17	-58.31	-13.02	Passed

Method of Measurement:

The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that required to produce 50% of rated system deviation at 1000 Hz.

Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier. Or as high as the state of the art permits except for that region close to the carrier equal to + 250% of the authorized bandwidth.

FCC Limits

On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency: at least 60 dB or 43 + 10 log P dB, whichever is the lesser attenuation.

Out of band emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by: at least 43+10 log P dB.

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Conducted Spurious Emission – 800 MHz TDMA

Pursuant to FCC Rules 2.991, 22.917(e)

Spur Name	Freq. (MHz)	Amp(dBc)	Spec (dBc)	P/F
TDMA 800	682.62	-53.20	-13.00	Passed
TDMA 800	683.08	-53.80	-13.00	Passed
TDMA 800	818.84	-71.78	-13.00	Passed
TDMA 800	968.15	-71.30	-13.00	Passed
TDMA 800	1648.09	-55.56	-13.00	Passed
TDMA 800	1652.03	-68.95	-13.00	Passed

Method of Measurement:

The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. The transmitter is modulated with a pseudo random data. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier. or as high as the state of the art permits except for that region close to the carrier equal to + 250% of the authorized bandwidth.

FCC Limits

On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency: at least 60 dB or 43 + 10 log P dB, whichever is the lesser attenuation.

Out of band emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by: at least 43+10 log P dB.

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Conducted Spurious Emission – 1900 MHz TDMA

Pursuant to FCC Rules 2.991, 24.238

Spur Name	Freq. (MHz)	Amp(dBc)	Spec (dBc)	P/F
PCS	1668.78	-47.30	-13.00	Passed
PCS	1887.48	-47.92	-13.00	Passed
PCS	2031.30	-27.56	-13.00	Passed
PCS	3700.09	-26.19	-13.00	Passed
PCS	5550.11	-38.65	-13.00	Passed

Method of Measurement:

The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. The transmitter is modulated with a pseudo random data. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier. Or as high as the state of the art permits except for that region close to the carrier equal to + 250% of the authorized bandwidth.

FCC Limits

The mean power of emissions must be attenuated below the mean power of the carrier (P) on any frequency outside the frequency block by: at least 43+10 log P dB.

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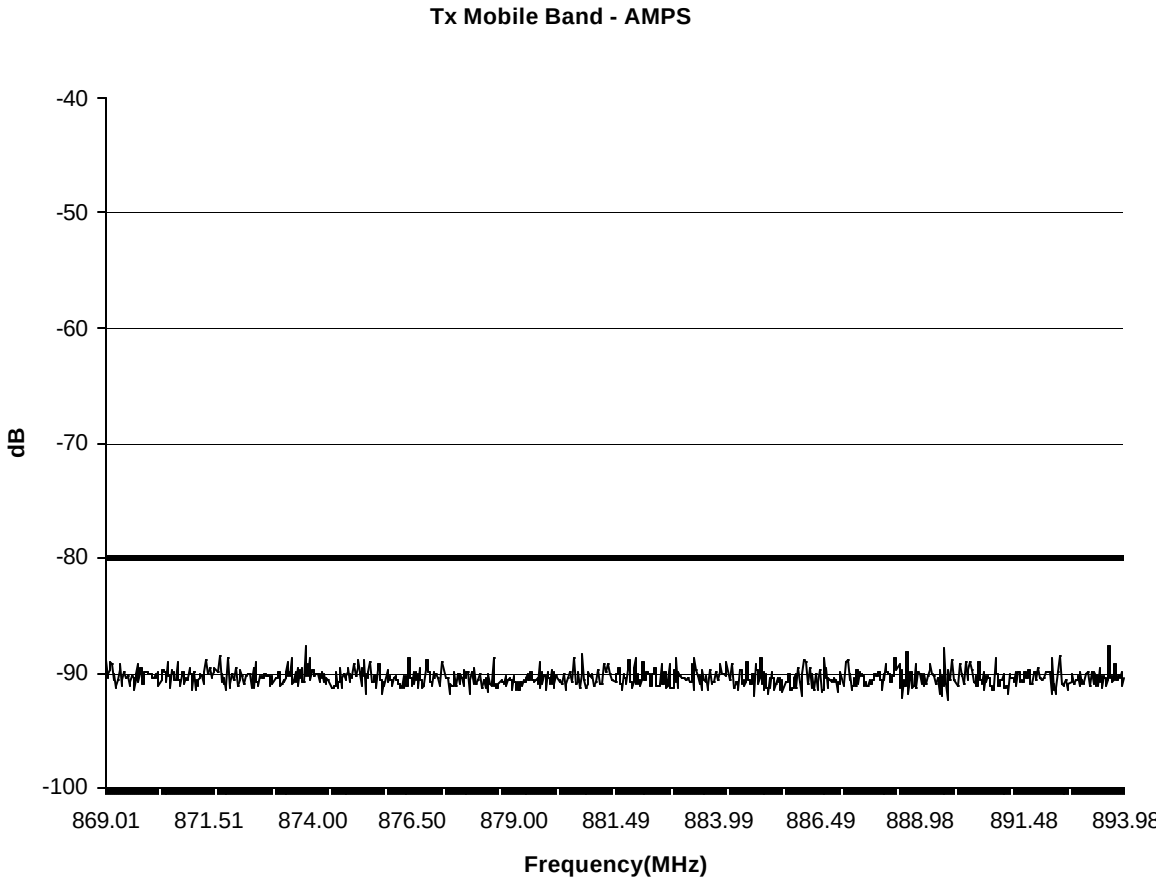
Conducted Spurious Emission – Base Tx Band - AMPS

Pursuant to FCC Rules 2.991, 22.917(f)



Method of Measurement:
The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that required to produce 50% of rated system deviation at 1000 Hz.
Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier. or as high as the state of the art permits except for that region close to the carrier equal to + 250% of the authorized bandwidth.
FCC Limits
• Mobile emissions in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed -80 dBm at the transmit antenna connector.

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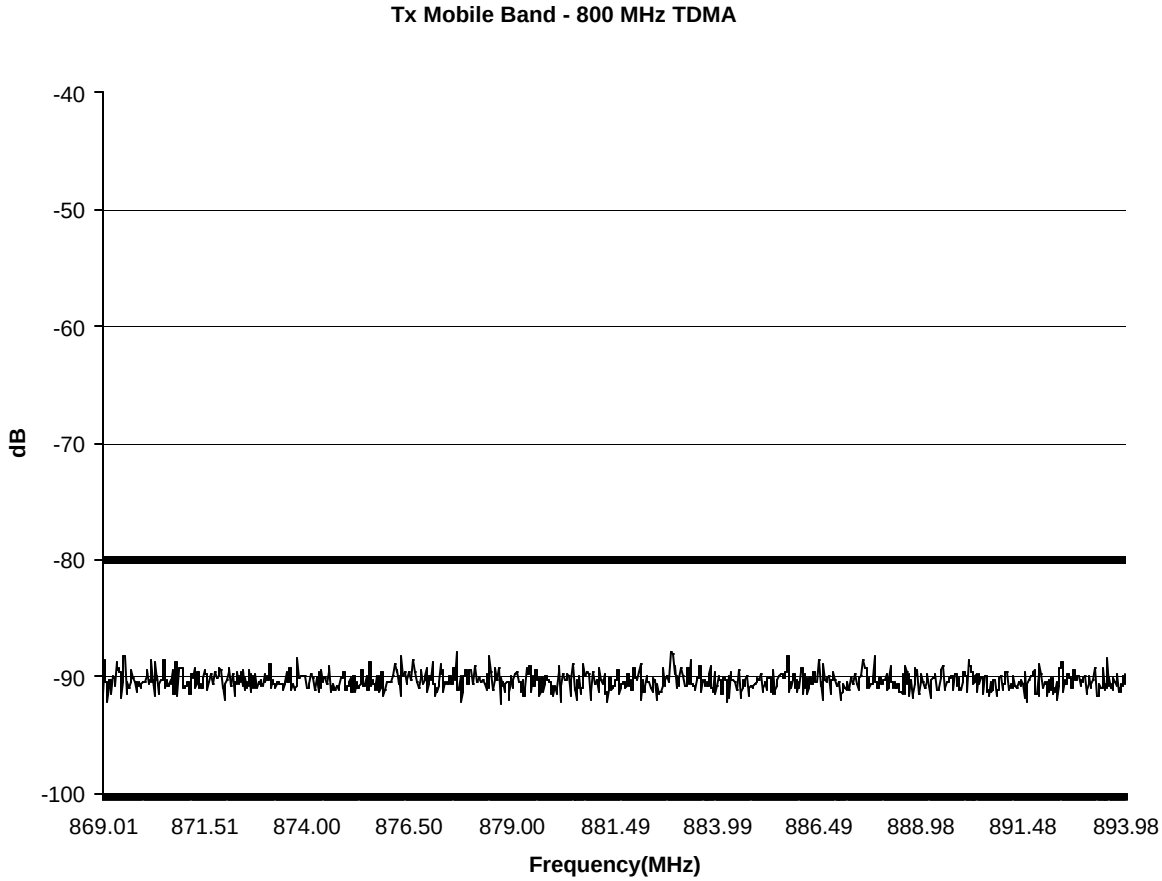
Conducted Spurious Emission – Base Tx Band – 800 MHZ TDMA

Pursuant to FCC Rules 2.991, 22.917(f)



Method of Measurement:
The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. The transmitter is modulated with a pseudo random data. Measurements shall be made from the lowest radio channel and the highest radio channel. One plots for each is shown.
FCC Limits
• Mobile emissions in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed -80 dBm at the transmit antenna connector.

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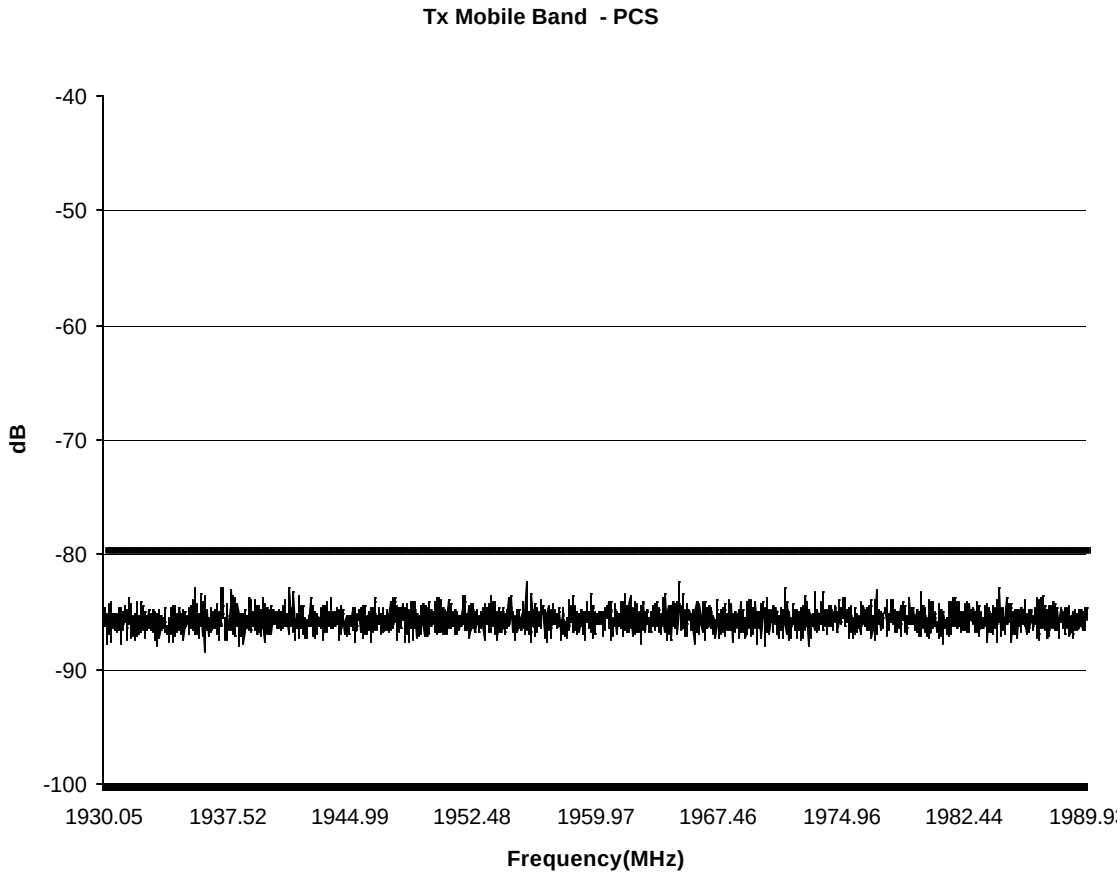
Conducted Spurious Emission – Base Tx Band – 1900 MHZ TDMA

Pursuant to FCC Rules 2.991, 24.238



Method of Measurement:
The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. The transmitter is modulated with a pseudo random data. Measurements shall be made from the lowest radio channel and the highest radio channel. One plots for each is shown.
FCC Limits
• Mobile emissions in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed -80 dBm at the transmit antenna connector.

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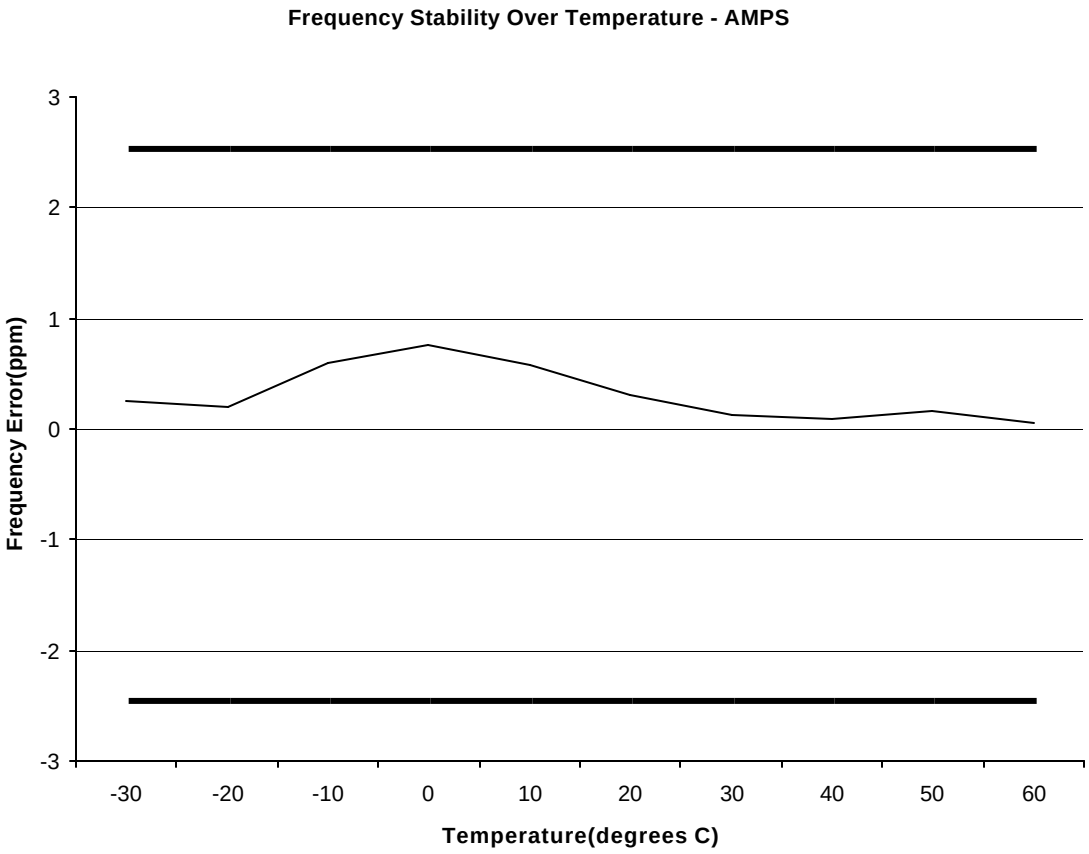
Frequency Stability over Temperature-AMPS

Pursuant to FCC Rules 2.995(a)



Method of Measurement:

Frequency measurements are made at the extremes of the temperature range -30 to +60 degrees centigrade and at intervals of not more than 10 degrees centigrade through out the range. Sufficient time is allowed prior to each measurement for the circuit components to stabilize.

FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 22: - +2.5ppm from -30 to +60 degrees centigrade
Part 24: - +200 Hz from -30 to +60 degrees centigrade

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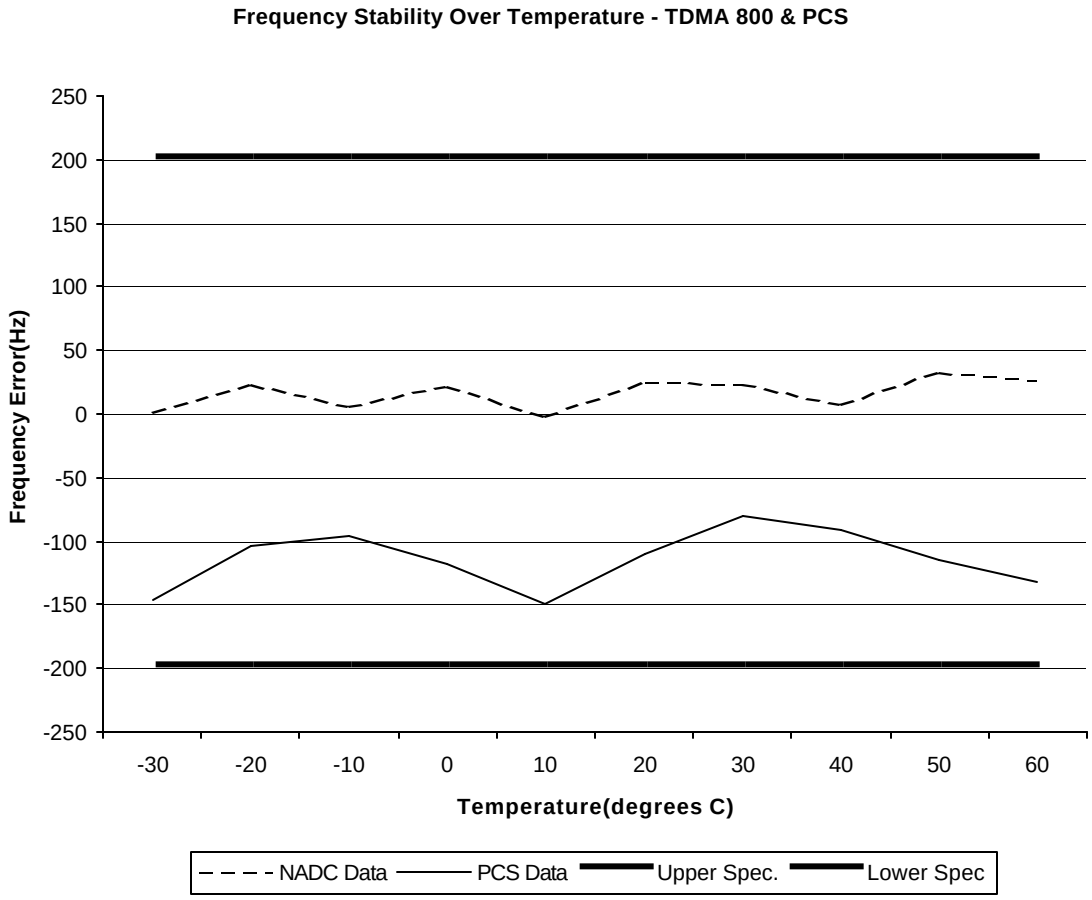
Frequency Stability over Temperature - TDMA

Pursuant to FCC Rules 2.995(a)



Method of Measurement:

Frequency measurements are made at the extremes of the temperature range -30 to +60 degrees centigrade and at intervals of not more than 10 degrees centigrade through out the range. Sufficient time is allowed prior to each measurement for the circuit components to stabilize.

FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 22: - +2.5ppm from -30 to +60 degrees centigrade
Part 24: - +200 Hz from -30 to +60 degrees centigrade

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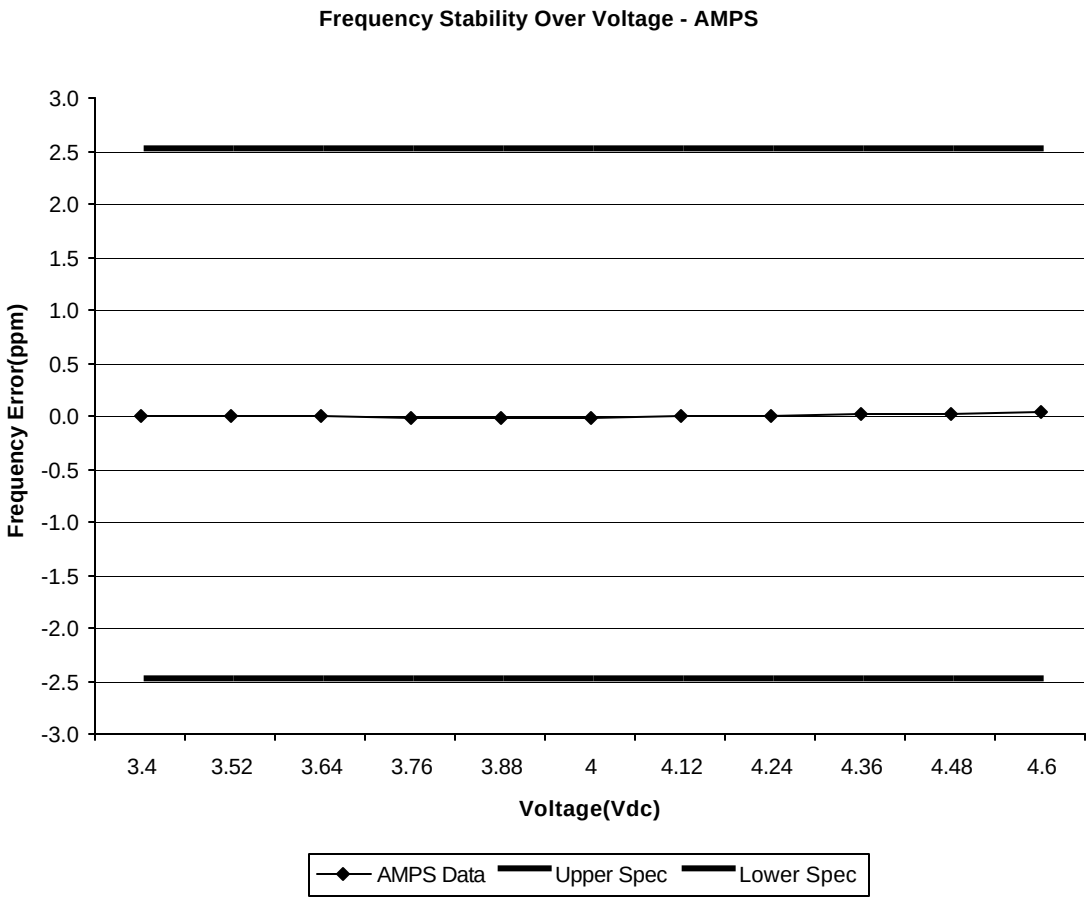
Frequency Stability over Voltage

Pursuant to FCC Rules 2.995(d)



Method of Measurement:

The primary voltage was varied from 85% to 115% of the normal supply voltage. Voltage is measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 22: - +2.5ppm from 85% to 115% of nominal voltage.
Part 24: - +200 Hz from 85% to 115% of nominal voltage.

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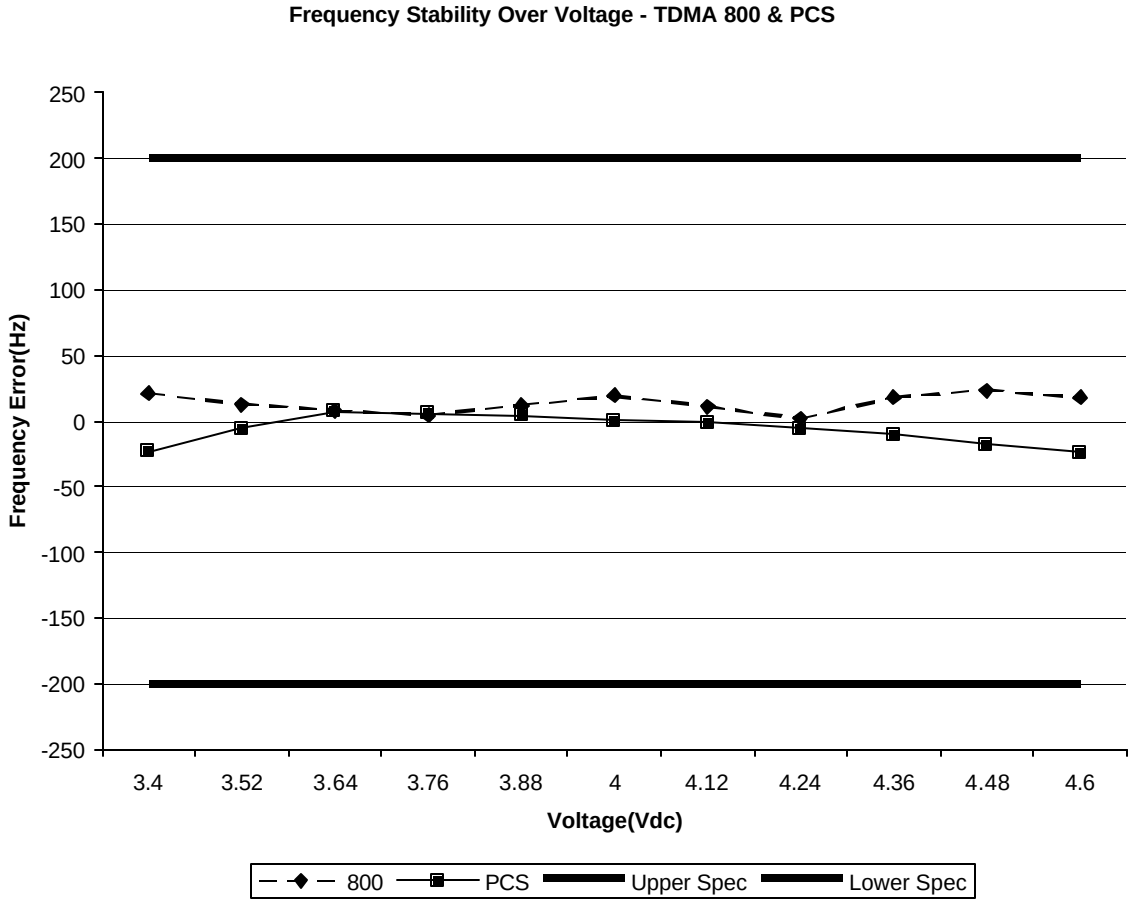
Frequency Stability over Voltage (cont.)

Pursuant to FCC Rules 2.995(d)



Method of Measurement:

The primary voltage was varied from 85% to 115% of the normal supply voltage. Voltage is measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 22: - +2.5ppm from 85% to 115% of nominal voltage.
Part 24: - +200 Hz from 85% to 115% of nominal voltage.

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