REPORT ON
Radio testing of the VERTEX STANDARD EVX-261-G6-5
In accordance with ANSI/TIA/EIA-603-D, RSS-119 Issue 12

Report No. TA100242 April 2016

MANUFACTURER'S DETAILS

| | |
|---|---|
| Company Name: | Vertex Standard LMR, Inc. |
| Address: | Tamachi First Bldg. 4-6-8 Shibaura Minato-Ku, Tokyo 108-0023, Japan |
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| Position: | Reader of TA Group |
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GENERAL INFORMATION

| | | |
|---|---|---|
| MODEL NAME: | EVX-261-G6-5 | |
| FCC ID: | AXI11374620 | |
| IC ID: | 10239A-11374620 | |
| MANUFACTURER: | Vertex Standard LMR, Inc. | |
| TRADE NAME: | VERTEX STANDARD | |
| EUT DESCRIPTION: | UHF Transceiver | |
| SERIAL NUMBER: | 2B6C800038 | |
| VOLTAGE RQUIREMENTS: | 7.4<br>DC | [V] |
| NUMBER OF CHANNELS: | 16 | |
| SPECIFICATION ARE REFERENCED: | ANSI/TIA/EIA-603-D<br>RSS-119 Issue 12 | |

TRANSMITTERS

| | | |
|---|---|---|
| TYPE OF EMISSION: | *16K0F3E , 11K0F3E<br>7K60F1D , 7K60F1E ,7K60FXD<br>7K60FXE , 7K60F1W<br>*: IC only | |
| FREQUENCY RANGE: | 403 to 470 | [MHz] |
| POWER OUTPUT RATING: | 1 to 5.5 (max)<br>__ Switchable<br>x Variable<br>__ N/A | [W] |
| INPUT IMPEDANCE (MIC): | 2000 | [Ω] |
| OUTPUT IMPEDANCE (RF): | 50 | [Ω] |
| Collector Voltage: | 7.4 | [V] |
| Collector Current: | 2 | [A] (max) |

RECEIVERS

| | | |
|---|---|---|
| FREQUENCY RANGE: | 403 to 470 | [MHz] |
| INTERMEDIATE FREQUENCIES: | 1st none<br>2nd none | [MHz]<br>[kHz] |
| INPUT IMPEDANCE (RF): | 50 | [Ω] |
| OUTPUT IMPEDANCE (SP): | 4 | [Ω] |
| AUDIO OUTPUT POWER: | 0.5 | [W] |

This report was prepared by Vertex Standard LMR, Inc.

Test performed by Toshiyuki Owaki

Date 28 / April /2016

EVX-261-G6-5 Channel Settings

| CH No. | Shown on Dial | Transmit Frequency [MHz] | Receive Frequency [MHz] | CH Spacing | Power | |
|---|---|---|---|---|---|---|
| | | | | | High | Low |
| 1 | 1 | 403.0125 | 403.0125 | 25k | 5 W | 1 W |
| 2 | 2 | 406.2000 | 406.5000 | 25k | 5 W | 1 W |
| 3 | 3 | 429.9875 | 429.9875 | 25k | 5 W | 1 W |
| 4 | 4 | 450.6500 | 450.6500 | 25k | 5 W | 1 W |
| 5 | 5 | 469.9875 | 469.9375 | 25k | 5 W | 1 W |
| 6 | 6 | 403.0125 | 403.0125 | *D 12.5k | 5 W | 1 W |
| 7 | 7 | 406.2000 | 406.2000 | *D 12.5k | 5 W | 1 W |
| 8 | 8 | 429.9875 | 429.9875 | *D 12.5k | 5 W | 1 W |
| 9 | 9 | 450.6500 | 450.6500 | *D 12.5k | 5 W | 1 W |
| 10 | 10 | 469.9875 | 469.9875 | *D 12.5k | 5 W | 1 W |
| 11 | 11 | 403.0125 | 403.0125 | 12.5k | 5 W | 1 W |
| 12 | 12 | 406.2000 | 406.5000 | 12.5k | 5 W | 1 W |
| 13 | 13 | 429.9875 | 429.9875 | 12.5k | 5 W | 1 W |
| 14 | 14 | 450.6500 | 450.6500 | 12.5k | 5 W | 1 W |
| 15 | 15 | 469.9875 | 469.9375 | 12.5k | 5 W | 1 W |

*D 12.5k : Digital Mode

Note: This Transmitter was design to operate in the frequency range 403-470MHz.
The following channels are for reference.
Not included in the application frequency of Part 90.
CH1 thru CH6, CH11: 403.0125MHz.

NAME OF TEST: R.F. Power Output (Conducted)
SPECIFICATION: 47 CFR 2.1046 (a)
GUIDE: ANSI/TIA/EIA-603-D, Paragraph 2.2.1
TEST EQUIPMENT: As per attached page

## MEASUREMENT PROCEDURE

1. The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the modulated output powerwas measured by means of an R.F. power meter.

2. Measurement accuracy is ± 4%

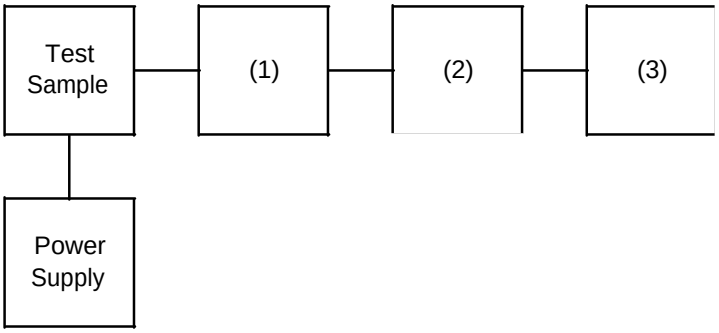
## MEASUREMENT RESULTS

| NOMINAL, MHz | CHANNEL | CURRENT A (max) | R.F. POWER, WATTS LOW | R.F. POWER, WATTS HIGH (Max) |
|---|---|---|---|---|
| 403.01250 | 1 | 1.85 | 1.0 | 5.5 |
| 406.20000 | 2 | 1.79 | 1.0 | 5.5 |
| 429.98750 | 3 | 1.65 | 1.0 | 5.5 |
| 450.65000 | 4 | 1.63 | 1.0 | 5.5 |
| 469.98750 | 5 | 1.75 | 1.0 | 5.5 |

Operatig Voltage: 7.4V

## TRANSMITTER POWER CONDUCTED MEASUREMENTS

TEST 1: R.F. POWER OUTPUT




| Instruments | Description | Serial Number |
|---|---|---|
| (1) COAXUAL ATTENUATOR | WEINSCHELL 49-10-43 | KL458 |
| (2) POWER SENSOR MODULE | Agilent 11722A | 2716A02970 |
| (3) POWER METER | Agilent 8901B POWER MODE | 3026A02806/2716A02970 |

| | |
|---|---|
| NAME OF TEST: | Unwanted Emissions (Conducted) |
| SPECIFICATION: | 47 CFR 2.1051 |
| GUIDE: | ANSI/TIA/EIA-603-D, Paragraph 2.2.13 |
| TEST EQUIPMENT: | As per attached page |

MEASUREMENT PROCEDURE

1. The emissions were measured for the worst case as follows:
   (a): within a band of frequencies defined by the carrier frequency plus and minus one channel.
   (b): from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40GHz, whichever is lower.

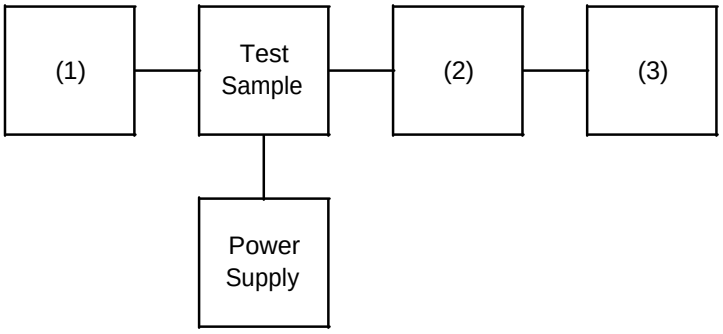
2. The magnitude of spurious emissions that are attenuated more than 20dB below the permissible value need not be specified.

3. MEASUREMENT RESULTS:

| | | |
|---|---|---|
| FREQUENCY OF CARRIER, MHz | = | 403.0125 , 406.2 , 429.9875<br>450.65 , 469.9875 |
| SPECTRUM SEARCHED, GHz | = | 0 to 10 x Fc |
| MAXIMUM RESPONSE, Hz | = | 2900 |
| ALL OTHER EMISSIONS | = | >= 20dB BELOW LIMIT |
| RBW 100kHz | = | Freq<1GHz |
| RBW 1MHz | = | Freq>1GHz |

## TRANSMITTER CONDUCTED SPURIOUS EMISSION MEASUREMENTS

TEST 1: UNWANTED EMISSION




| Instruments | Description | Serial Number |
|---|---|---|
| (1) AUDIO GENERATOR | Agilent 8903B | 2742A03633 |
| (2) COAXUAL ATTENUATOR | WEINSCHELL 49-10-43 | KL458 |
| (2) COAXUAL ATTENUATOR | Agilent 8498A | 1801A02723 |
| (3) SPECTRUM ANALYZER | Agilent E4445A | MY443000710 |

NAME OF TEST: Unwanted Emissions (Conducted)

LIMIT'S), dBc: Mask B:

-(43+10xLOG(P)) = -50 ( 5.50 Watts )

-(43+10xLOG(P)) = -43 ( 1.00 Watts )

Mask D:

-(50+10xLOG(P)) = -57 ( 5.50 Watts )

-(50+10xLOG(P)) = -50 ( 1.00 Watts )

5.5W Operatig Voltage: 7.4V

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|---|---|---|---|---|
| 403.0125 | | | | |
| 406.2000 | | | | |
| 429.9875 | | | | |
| 450.6500 | | | | |
| 469.9875 | | | | |
| | | | | |
| Mask B: | | | | |
| 403.0125 | 806.0250 | -43.0 | -80.4 | 30.4 |
| 406.2000 | 812.4000 | -43.5 | -80.8 | 30.8 |
| 429.9875 | 859.9750 | -45.5 | -82.8 | 32.8 |
| 450.6500 | 901.3000 | -44.9 | -82.2 | 32.2 |
| 469.9875 | 939.9750 | -44.3 | -81.5 | 31.5 |
| Mask D: | | | | |
| 403.0125 | 806.0250 | -43.0 | -80.4 | 23.4 |
| 406.2000 | 812.4000 | -43.5 | -80.8 | 23.8 |
| 429.9875 | 859.9750 | -45.5 | -82.8 | 25.8 |
| 450.6500 | 901.3000 | -44.9 | -82.2 | 25.2 |
| 469.9875 | 939.9750 | -44.3 | -81.5 | 24.5 |

NAME OF TEST: Unwanted Emissions (Conducted)

LIMIT'S), dBc: Mask B:

-(43+10xLOG(P)) = -50 ( 5.50 Watts )

-(43+10xLOG(P)) = -43 ( 1.00 Watts )

Mask D:

-(50+10xLOG(P)) = -57 ( 5.50 Watts )

-(50+10xLOG(P)) = -50 ( 1.00 Watts )

1W Operatig Voltage: 7.4V

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|---|---|---|---|---|
| 403.0125 | | | | |
| 406.2000 | | | | |
| 429.9875 | | | | |
| 450.6500 | | | | |
| 469.9875 | | | | |
| | | | | |
| Mask B: | | | | |
| 403.0125 | 806.0250 | -39.5 | -69.5 | 26.5 |
| 406.2000 | 812.4000 | -39.6 | -69.7 | 26.7 |
| 429.9875 | 859.9750 | -39.3 | -69.3 | 26.3 |
| 450.6500 | 901.3000 | -39.0 | -68.8 | 25.8 |
| 469.9875 | 939.9750 | -39.5 | -69.3 | 26.3 |
| Mask D: | | | | |
| 403.0125 | 806.0250 | -39.5 | -69.5 | 19.5 |
| 406.2000 | 812.4000 | -39.6 | -69.7 | 19.7 |
| 429.9875 | 859.9750 | -39.3 | -69.3 | 19.3 |
| 450.6500 | 901.3000 | -39.0 | -68.8 | 18.8 |
| 469.9875 | 939.9750 | -39.5 | -69.3 | 19.3 |

NAME OF TEST: Field Strength of Spurious Radiation
SPECIFICATION: 47 CFR 2.1053 (a)
GUIDE: ANSI/TIA/EIA-603-D, Paragraph 2.2.12

MEASUREMENT PROCEDURE

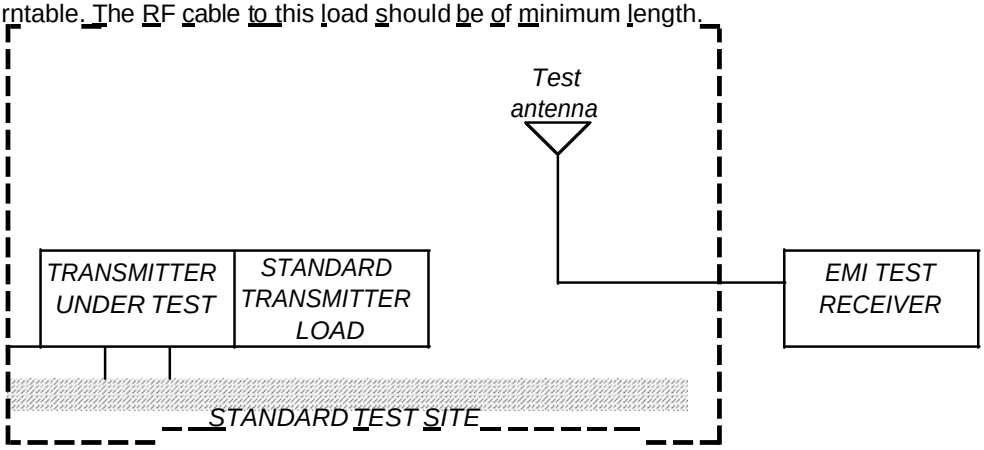
2.2.12.1 Definition: Radiated spurious emissions are emissions from the equipment when transmitting load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

2.2.12.2 Method of measurement

A) Connect the equipment as illustrated.

B) Adjust the EMI test receiver for the following settings:
1) RBW = 100kHz for freq < 1GHz; 1MHz for freq >1GHz
2) VBW = 3 times of RBW
3) Sweep Speed = slow enough to maintain measurement calibration.
4) Detector Mode = Positive Peak

C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load which is placed on the turntable. The RF cable to this load should be of minimum length.

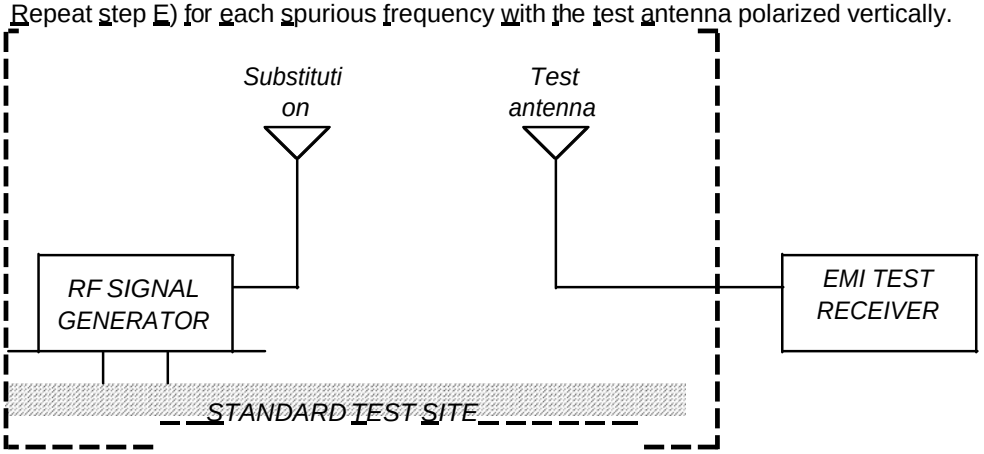



D) For each spurious measurment the test antenna should be adjusted to the correct length for the frequency involved. This length maybe determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier qeual to ± the test bandwidth (see section 1.3.4.4).

E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the EMI test receiver with the test antenna at horizontal polarity.

NAME OF TEST: Field Strength of Spurious Radiation

F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.




G) Reconnect the equipment as illustrated.

H) Keep the EMI test receiver adjusted as in step B).

I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved).
The center of the substitutuion antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is plarized vertically. In such case the lower end of the antenna should be 0.3m above the ground.

J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the EMI test receiver. Adjust the level of the signal generator output untill the previusl recorded maximum reading for the set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

K) Repeat step J) with both antennas vertically polarized for each spurious frequency.

L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in step J) and K) by the power loss in the cable between the generator and the antenna and futher corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB = 10log(TX power in watts/0.001) - the levels in step L)

NAME OF TEST: Field Strength of Spurious Radiation

MEASUREMENT RESULTS

This section refers to Appendix 1.
Appendix 1: Transmitter Analog Mode
No.: SR:05081-EMC-00001

This section refers to Appendix 2.
Appendix 2: Transmitter Digital Mode
No.: SR:05081-EMC-00001

| | | |
|---|---|---|
| Test Voltage: | 7.4V | |
| Transmitter Power: | 5.5W | (max) |

| | |
|---|---|
| NAME OF TEST: | Sideband Spectram |
| SPECIFICATION: | 47 CFR 2.1049 (c) (1) |
| GUIDE: | ANSI/TIA/EIA-603-D, Paragraph 2.2.11 |
| TEST EQUIPMENT: | As per previous page |

MEASUREMENT PROCEDURE

1. The EUT and test equipment ware set up as shown on the following page, with the spectrum analyzer connected.

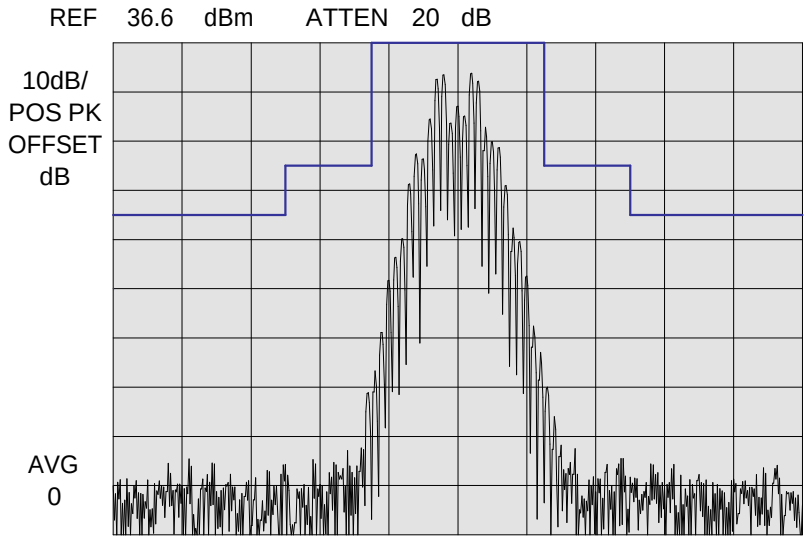
2. For EUT's supporting audio modulation, the audio signal generator was adjusted to the frequency of maxmum response and with output level set for ±2.5/±1.5kHz deviation (or 50% modulation). With level constant, the signal level was increased 16dB.

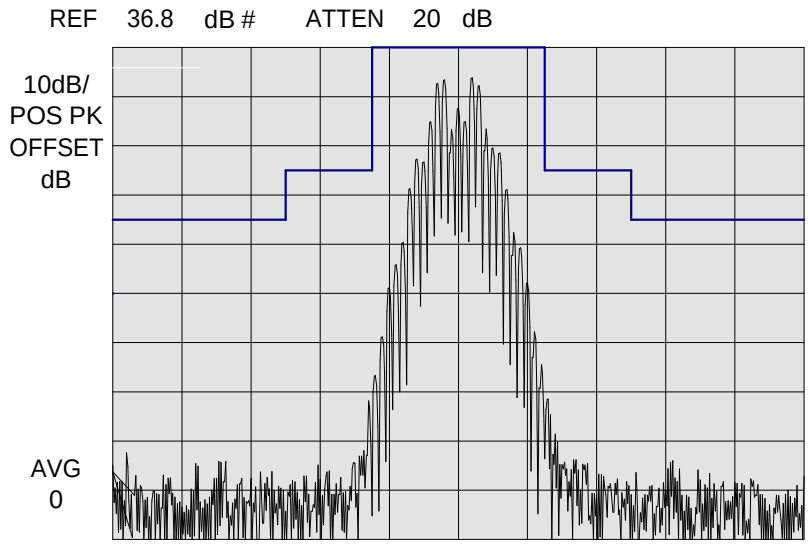
3. For EUT's supporting digital modulation, the digital modulation mode was operated to its maximum extent.

4. The occupied bandwidth was measured with the spectrum analyzer controls set as shown on the test results.

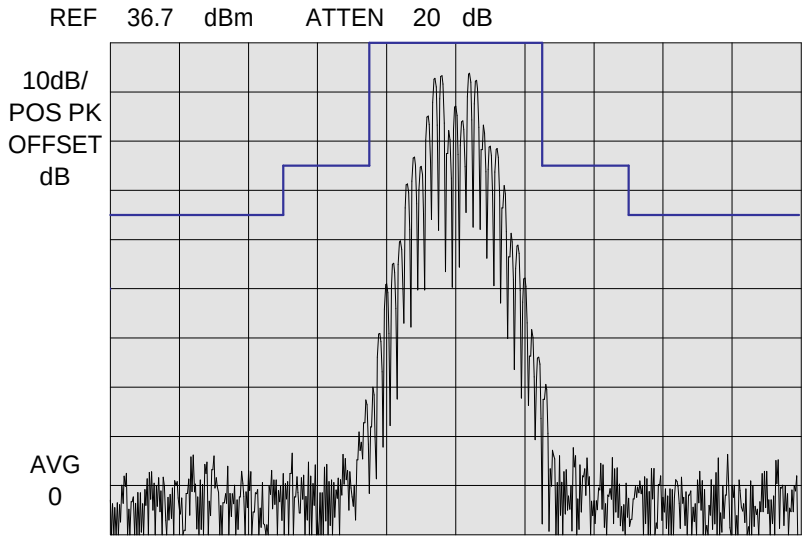
5. MEASUREMENT RESULTS: ATTACHED

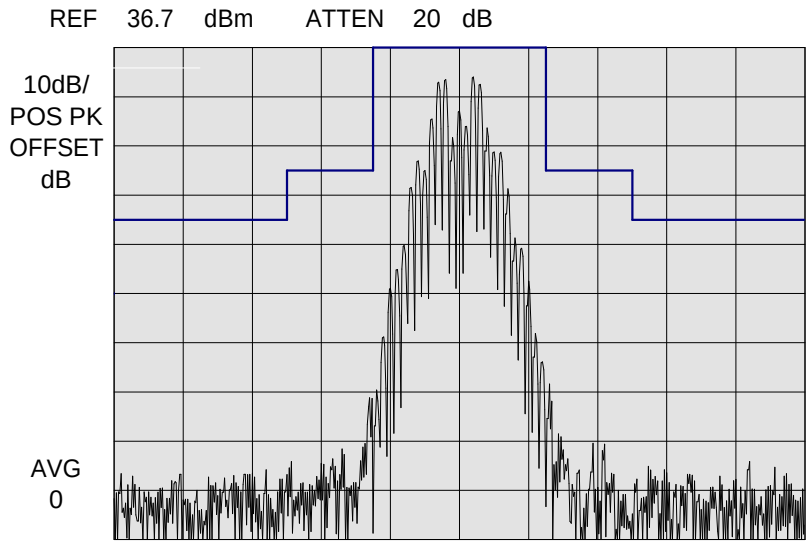
NAME OF TEST: Emission Masks (Occupied Bandwidth) : Analog Mode



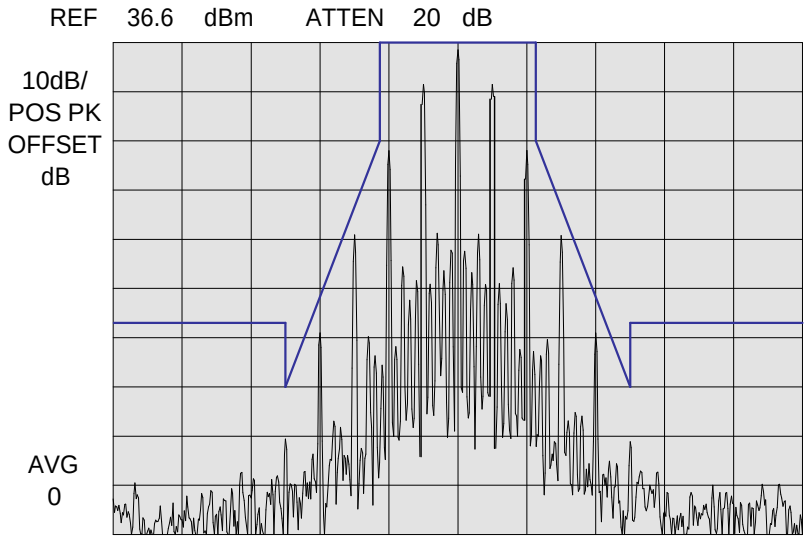



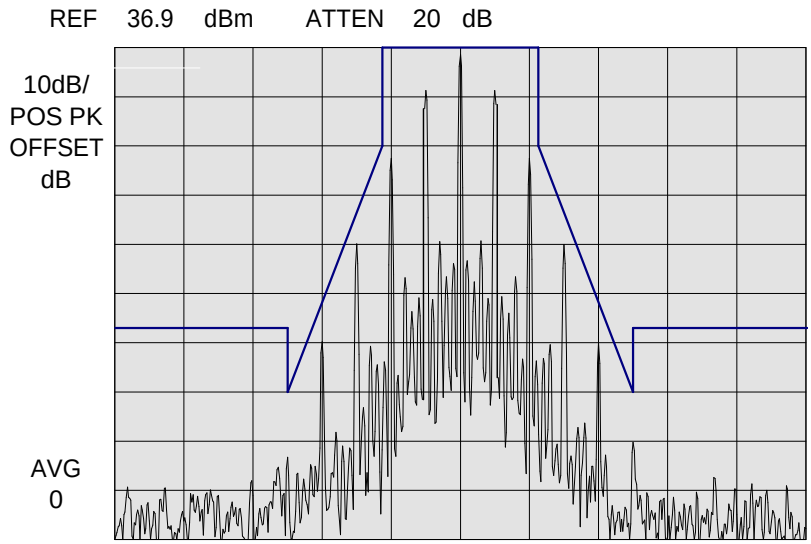
NAME OF TEST: Emission Masks (Occupied Bandwidth) : Analog Mode



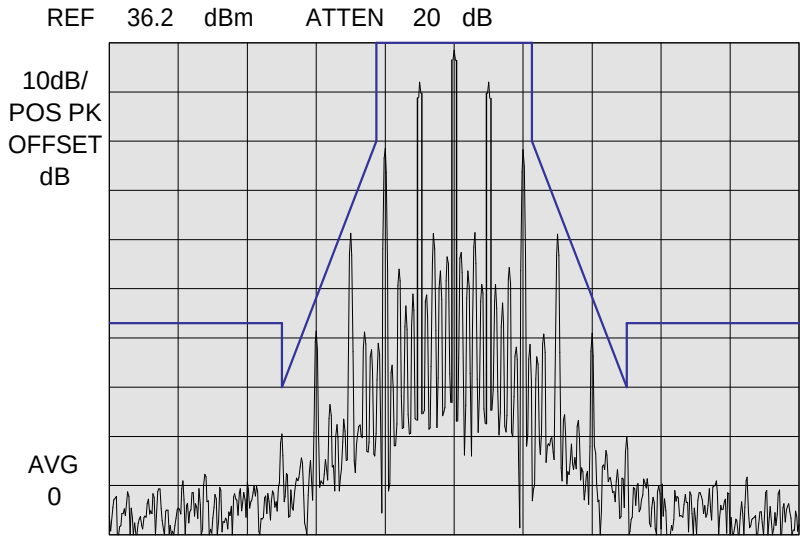



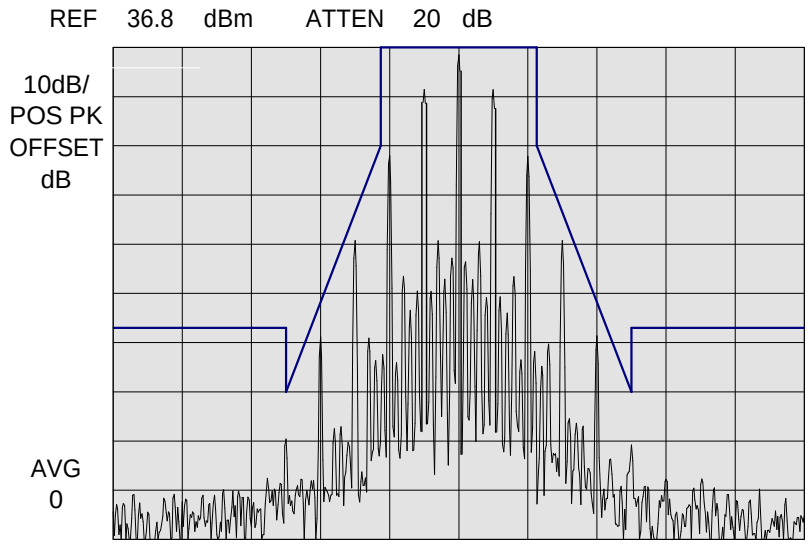
NAME OF TEST: Emission Masks (Occupied Bandwidth) : Analog Mode



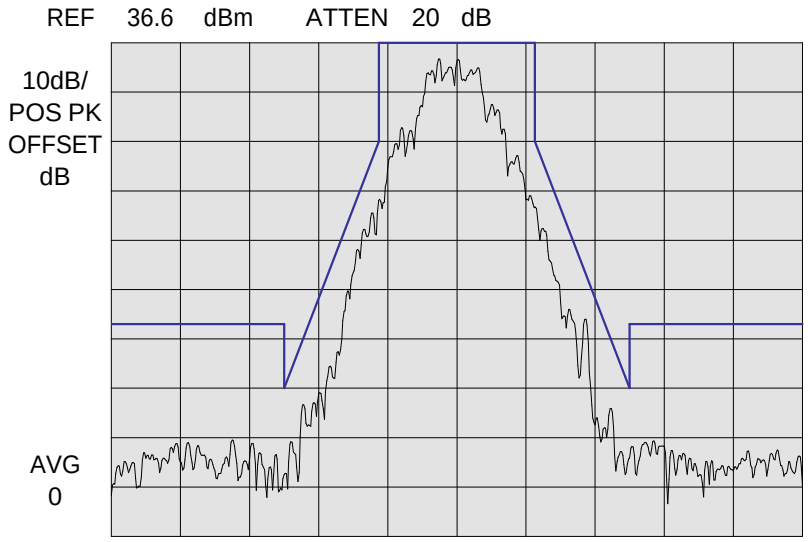



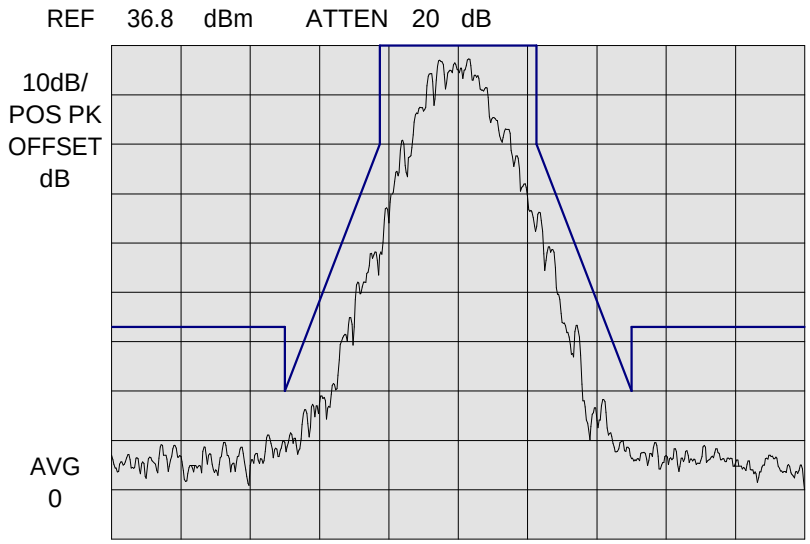
NAME OF TEST: Emission Masks (Occupied Bandwidth) : Analog Mode



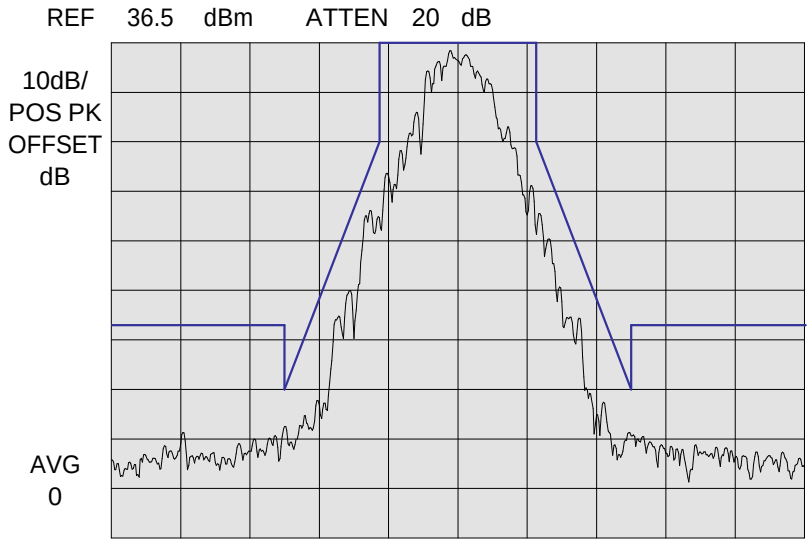



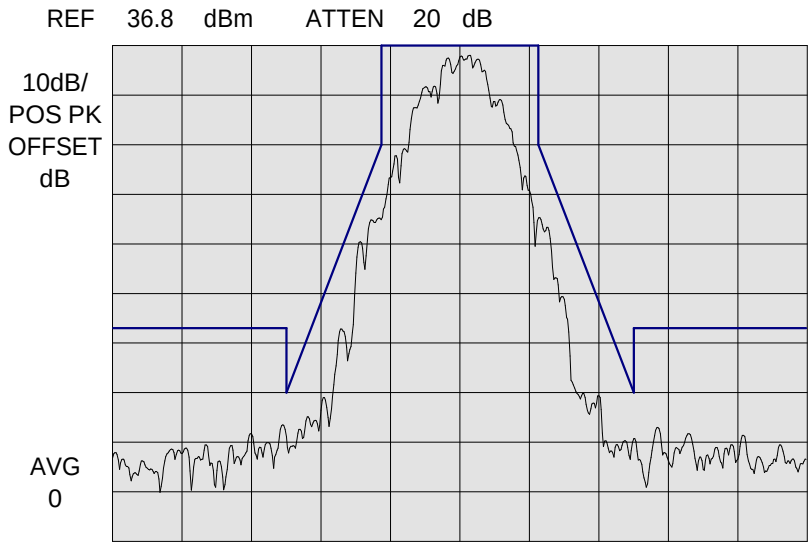
NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode



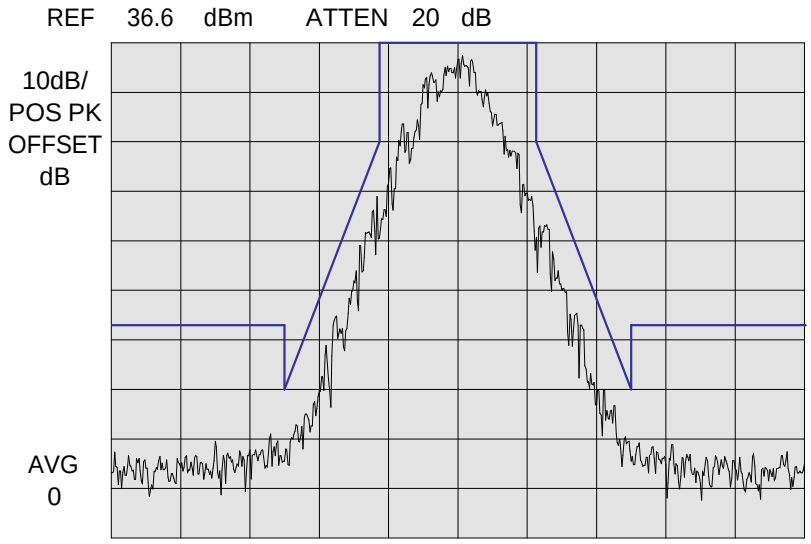



NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode

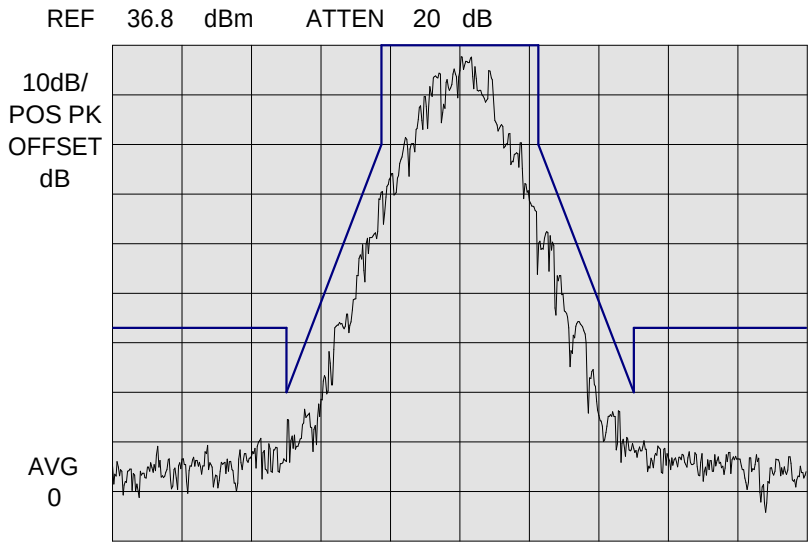


NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode

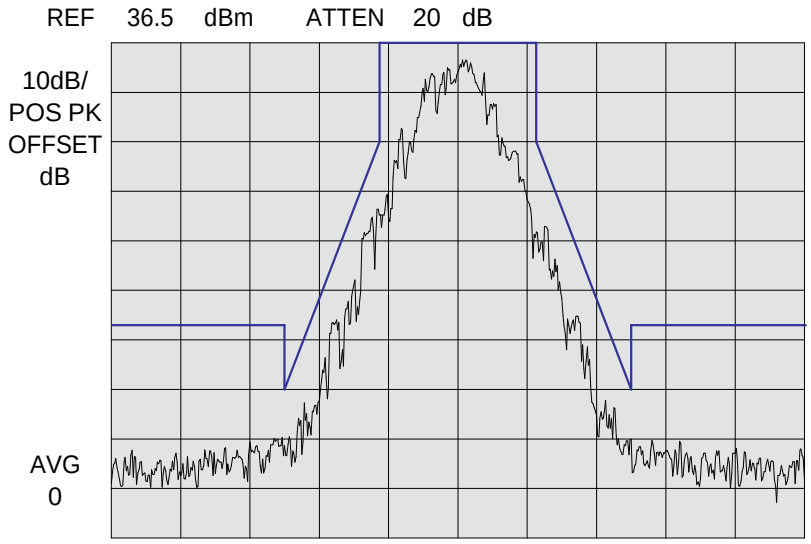


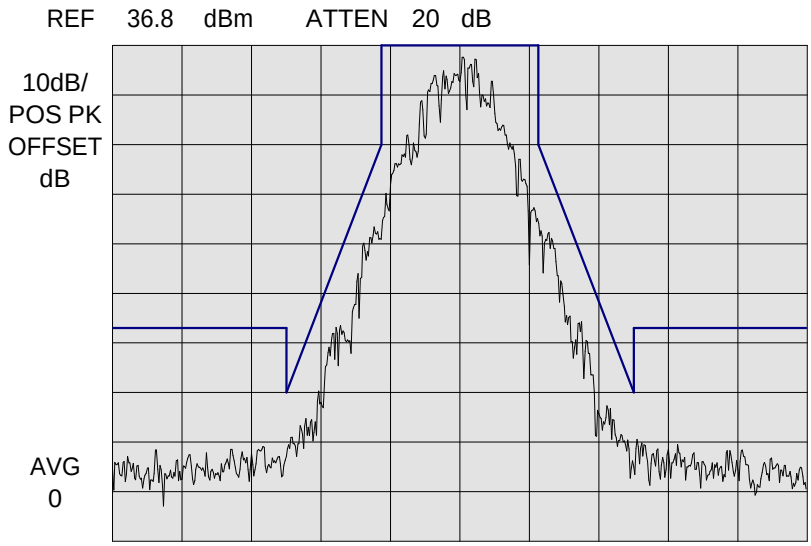

Power: 5.5W High
Modulation: 7k60F1E Voice (Digital)
12.5 kHz, MASK D



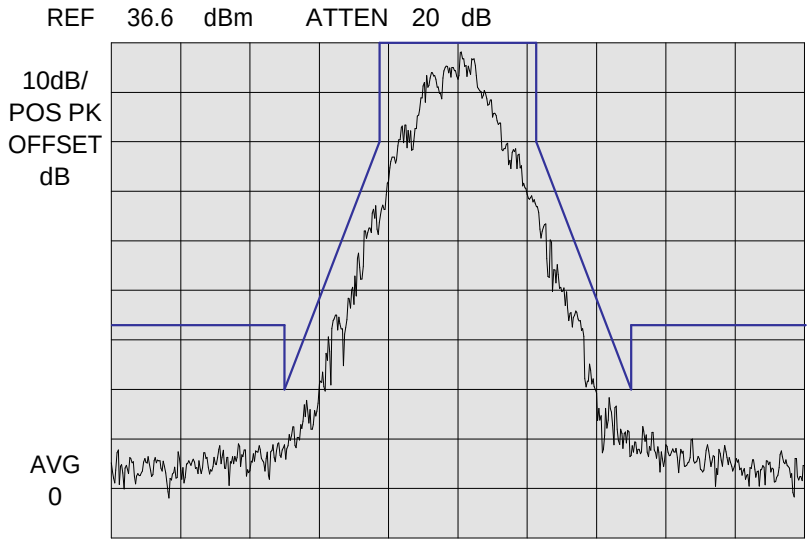

Power: 5.5W High
Modulation: 7k60F1E Voice (Digital)
12.5 kHz, MASK D

NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode

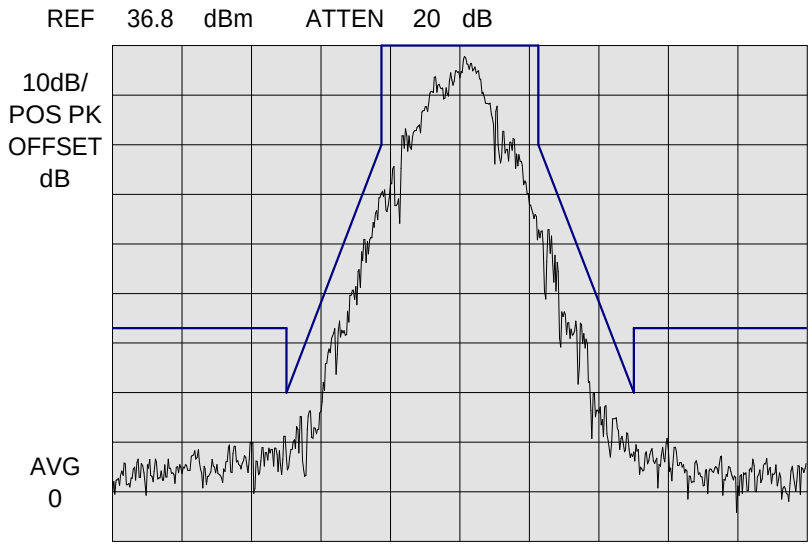


NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode

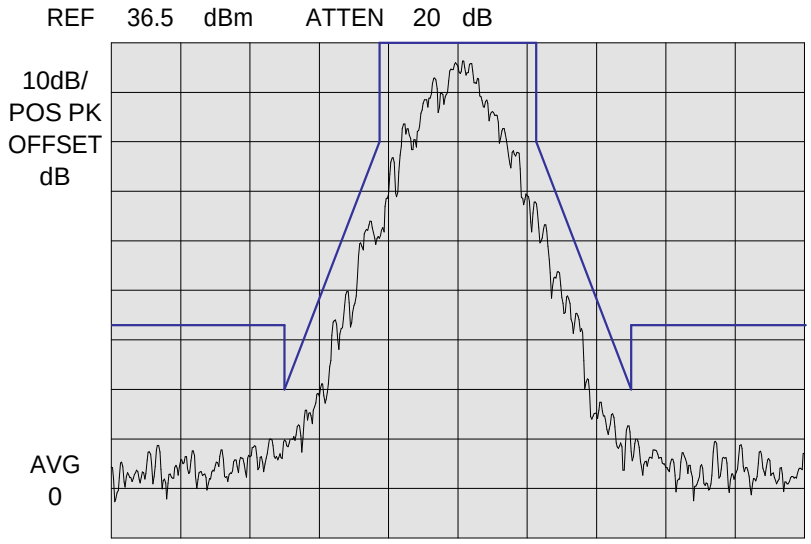



Power: 5.5W High
Modulation: 7k60F1E Voice Encryption (Digital)
12.5 kHz, MASK D

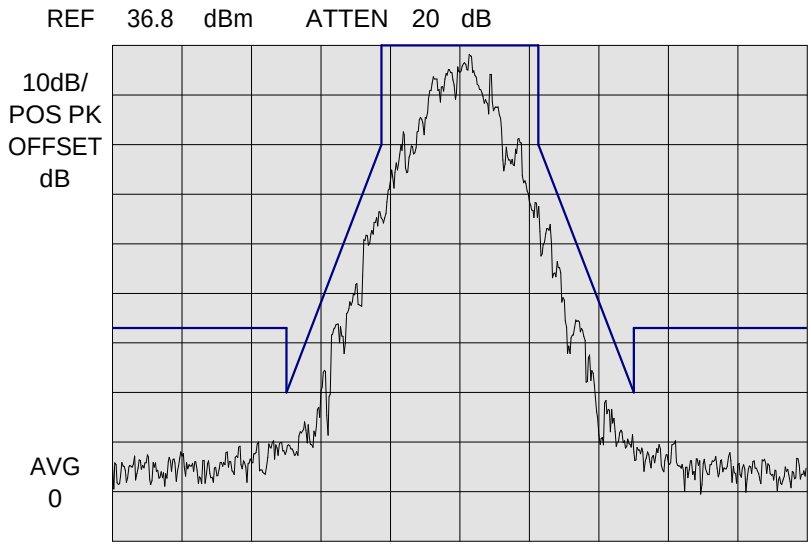



Power: 5.5W High
Modulation: 7k60F1E Voice Encryption (Digital)
12.5 kHz, MASK D

NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode

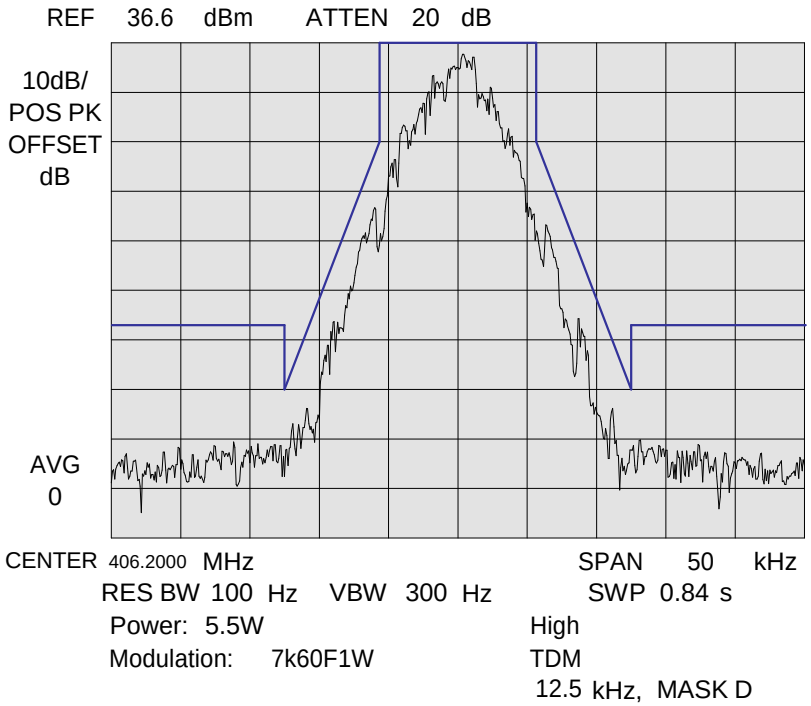


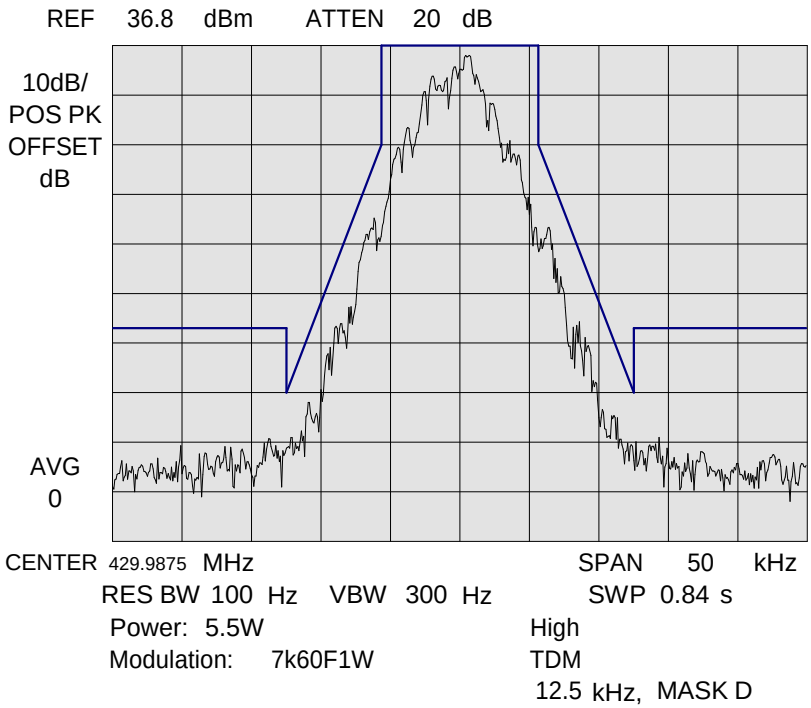

Power: 5.5W High
Modulation: 7k60F1E Voice Encryption (Digital)
12.5 kHz, MASK D



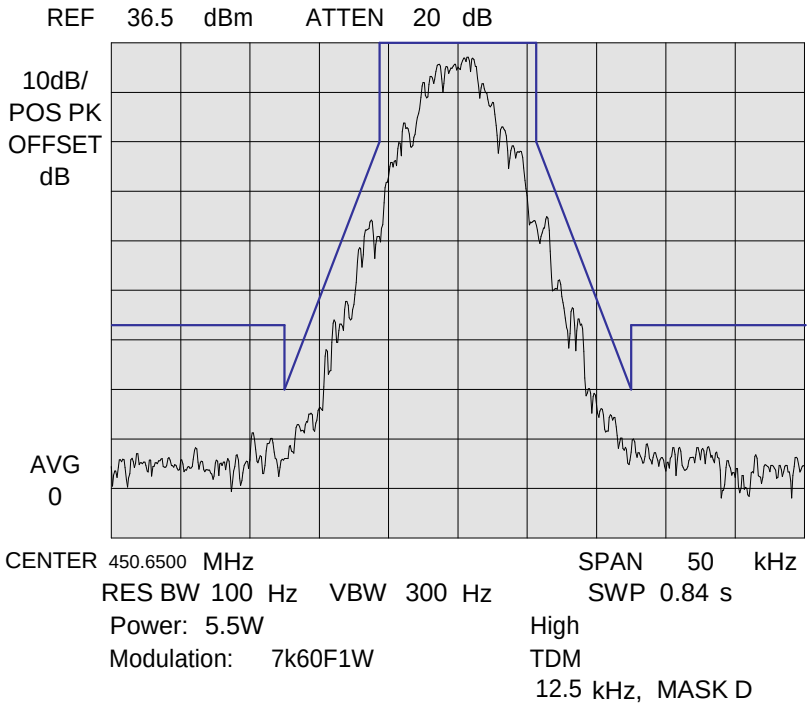

Power: 5.5W High
Modulation: 7k60F1E Voice Encryption (Digital)
12.5 kHz, MASK D

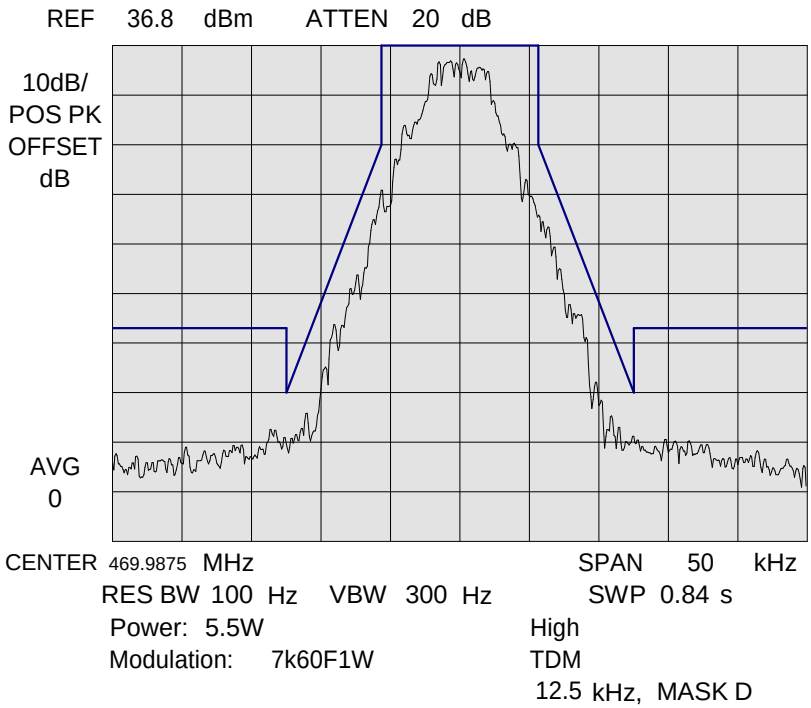
NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode



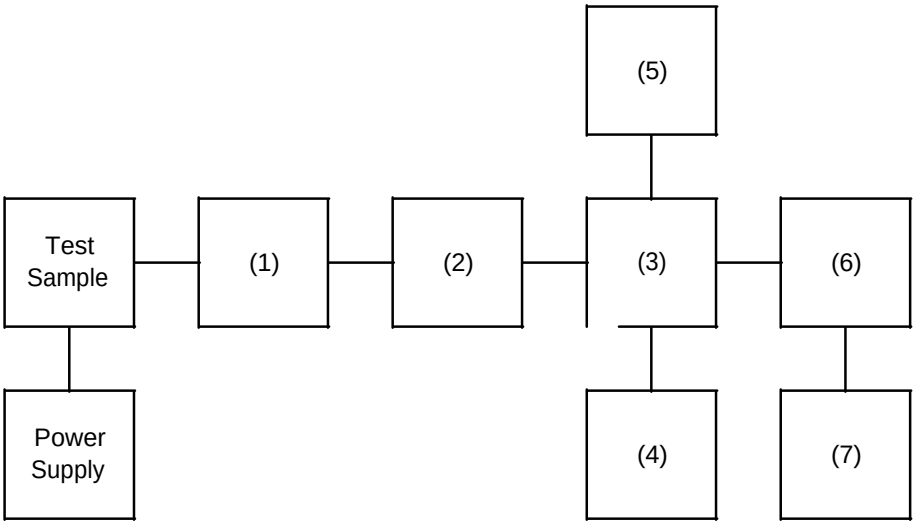



NAME OF TEST: Emission Masks (Occupied Bandwidth) : Digital Mode



TRANSIENT FREQUENCY BEHAVIOR



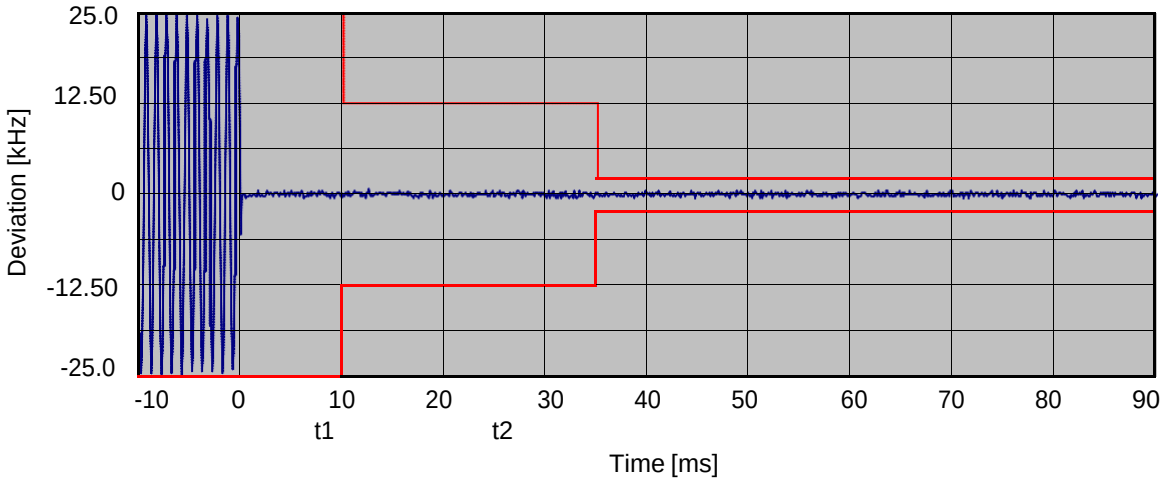

| Instruments | Description | Serial Number |
|---|---|---|
| (1) COAXUAL ATTENUATOR | WEINSCHELL 49-10-43 | KL458 |
| (2) COAXUAL ATTENUATOR | Agilent 8498A | 1801A02723 |
| (3) COMBINER | IWATSU B-50D4 | 520 |
| (4) CRYSTAL DETECTOR | Agilent 8470B | MY42241063 |
| (5) RF SIGNAL GENERATOR | Agilent 8642B | 2709A01050 |
| (6) MODULATION ANALYZER | Agilent 8901B | 3026A02806 |
| (7) SCOPE | Agilent DSO3062A | CN45001514 |

Transient Frequency Behavior (Per 47 CFR 90.214).
Transient Duration Limits
t1: 10ms
t2: 25ms
t3: 10ms

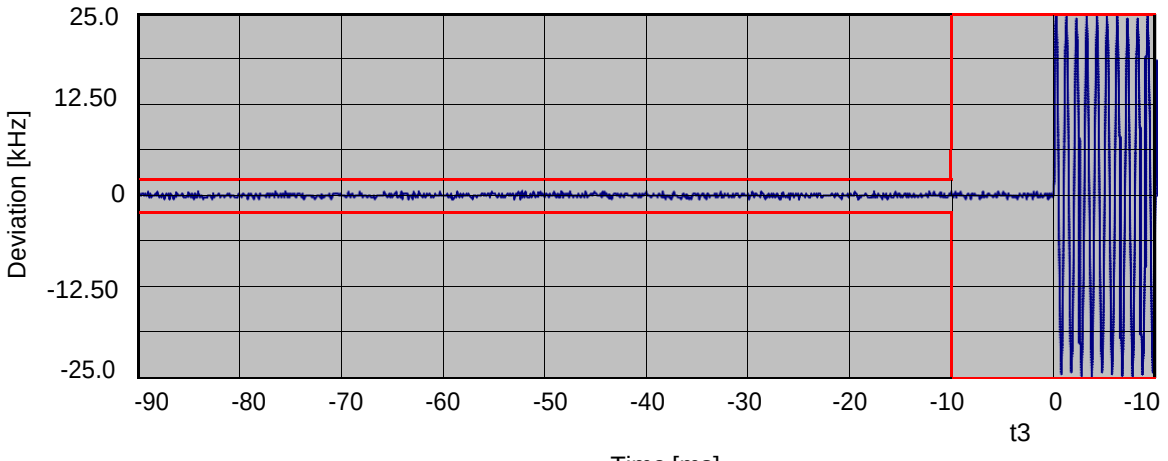
25kHz/CH;
During the period t1 and t3, the frequency difference shall not exceed ±25 kHz.
During the period t2, the frequency difference shall not exceed ±12.5 kHz.
12.5kHz/CH;
During the period t1 and t3, the frequency difference shall not exceed ±12.5 kHz.
During the period t2, the frequency difference shall not exceed ±6.25 kHz.

NAME OF TEST: Transient Frequency Behaviour : Analog Mode

STATE: 1 : Power: 5.5W



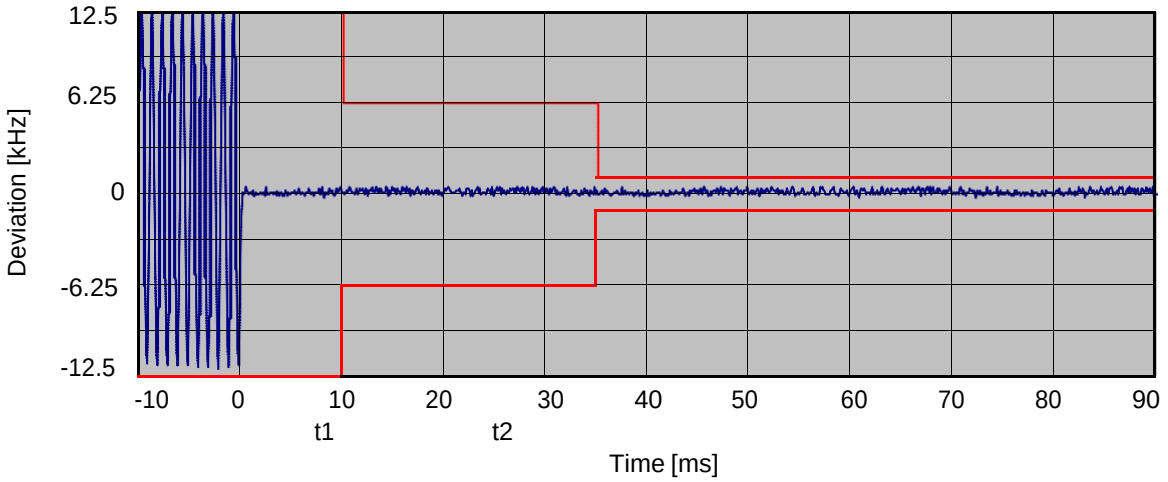

| | | | |
|---|---|---|---|
| Model Name: | EVX-261-G6-5 | Type: | Portable |
| Serial Number: | 2B6C800038 | Trigger Direction: | Rise |
| Test Frequency: | 450.65 | | |
| Channel Spacing: | 25 kHz (for IC) | Ref. Standard | EIA-603-D |



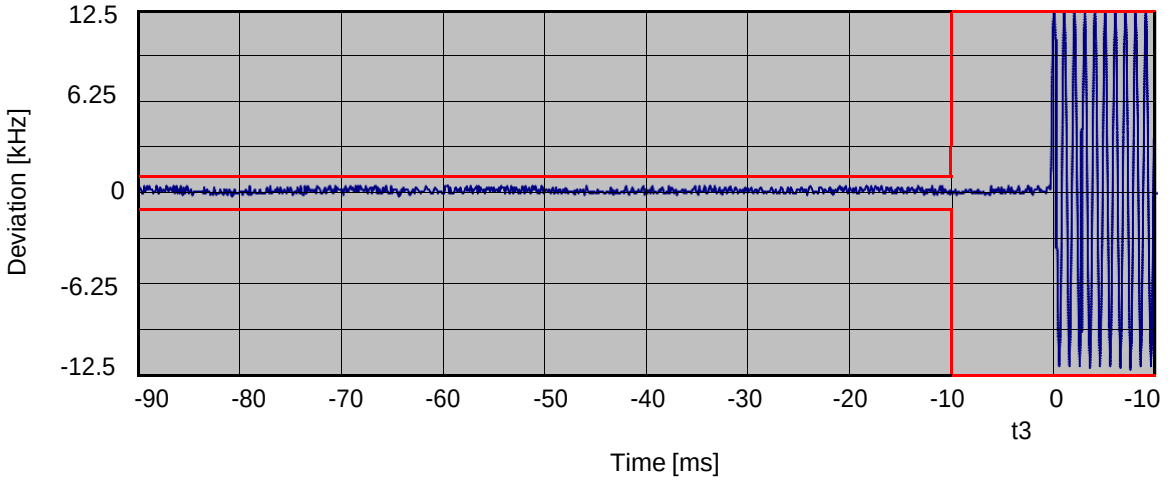

| | | | |
|---|---|---|---|
| Model Name: | EVX-261-G6-5 | Type: | Portable |
| Serial Number: | 2B6C800038 | Trigger Direction: | Fall |
| Test Frequency: | 450.65 | | |
| Channel Spacing: | 25 kHz (for IC) | Ref. Standard | EIA-603-D |

NAME OF TEST: Transient Frequency Behaviour : Analog Mode STATE:

1 Power: 5.5W



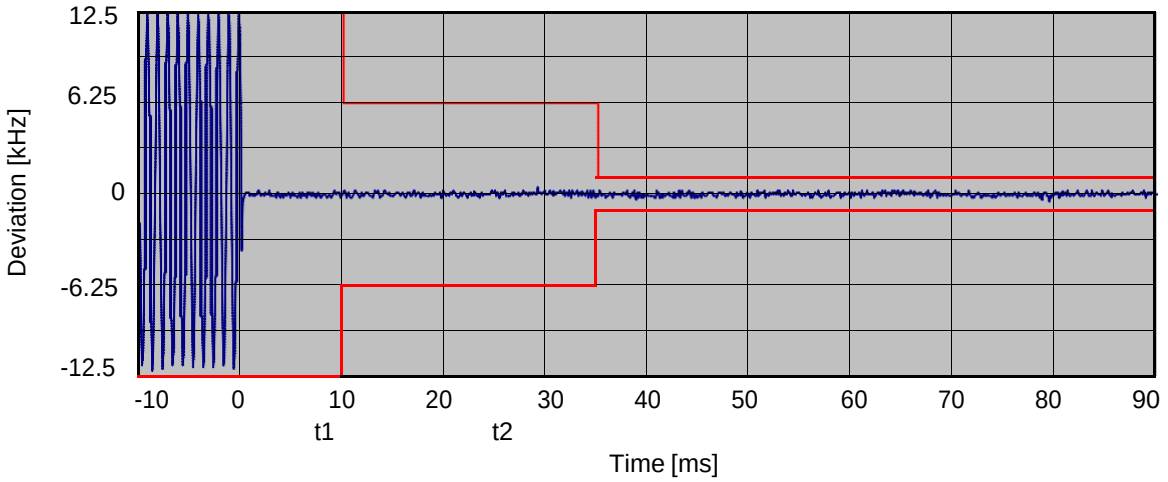

| | | | |
|---|---|---|---|
| Model Name: | EVX-261-G6-5 | Type: | Portable |
| Serial Number: | 2B6C800038 | Trigger Direction: | Rise |
| Test Frequency: | 450.65 | | |
| Channel Spacing: | 12.5 kHz | Ref. Standard | EIA-603-D |



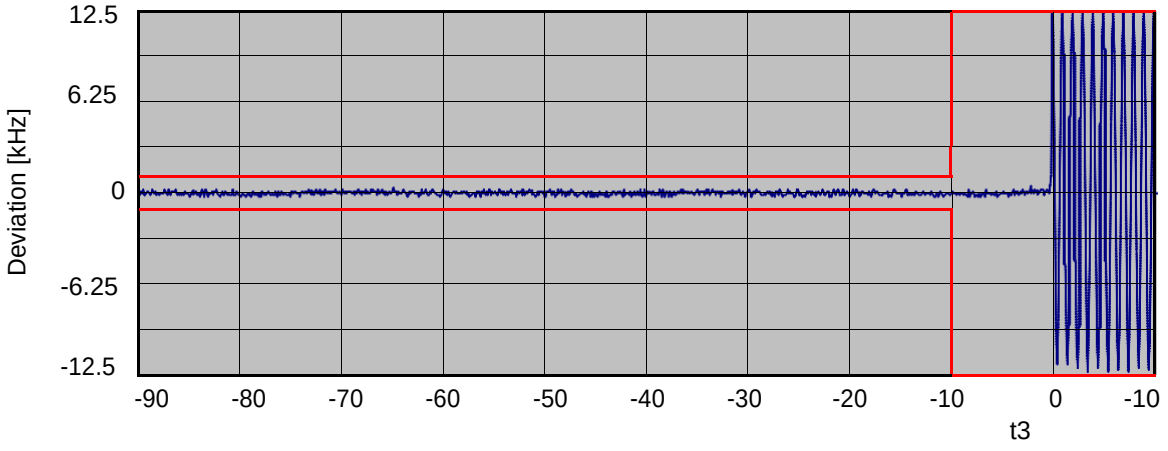

| | | | |
|---|---|---|---|
| Model Name: | EVX-261-G6-5 | Type: | Portable |
| Serial Number: | 2B6C800038 | Trigger Direction: | Fall |
| Test Frequency: | 450.65 | | |
| Channel Spacing: | 12.5 kHz | Ref. Standard | EIA-603-D |

NAME OF TEST: Transient Frequency Behaviour : Digital Mode STATE:

1 Power: 5.5W




| | | | |
|---|---|---|---|
| Model Name: | EVX-261-G6-5 | Type: | Portable |
| Serial Number: | 2B6C800038 | Trigger Direction: | Rise |
| Test Frequency: | 450.65 | | |
| Channel Spacing: | 12.5 kHz | Ref. Standard | EIA-603-D |




| | | | |
|---|---|---|---|
| Model Name: | EVX-261-G6-5 | Type: | Portable |
| Serial Number: | 2B6C800038 | Trigger Direction: | Fall |
| Test Frequency: | 450.65 | | |
| Channel Spacing: | 12.5 kHz | Ref. Standard | EIA-603-D |

NAME OF TEST: Audio Low Pass Filter (Voice Input)
SPECIFICATION: 47 CFR 2.1047 (a)
GUIDE: ANSI/TIA/EIA-603-D, Paragraph 2.2.15
TEST EQUIPMENT: As per attached page

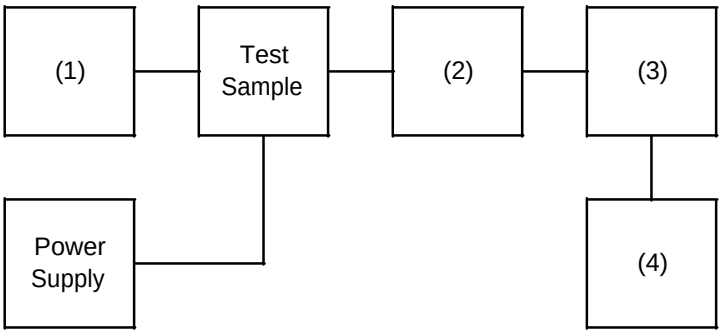
MEASUREMENT PROCEDURE

1. The EUT and test equipment ware set up such that the audio input was connected at the input of the modulation limiter, and the modulated stage.

2. The audio output was connected at the output to the modulated stage.

3. MEASUREMENT RESULTS: ATTACHED

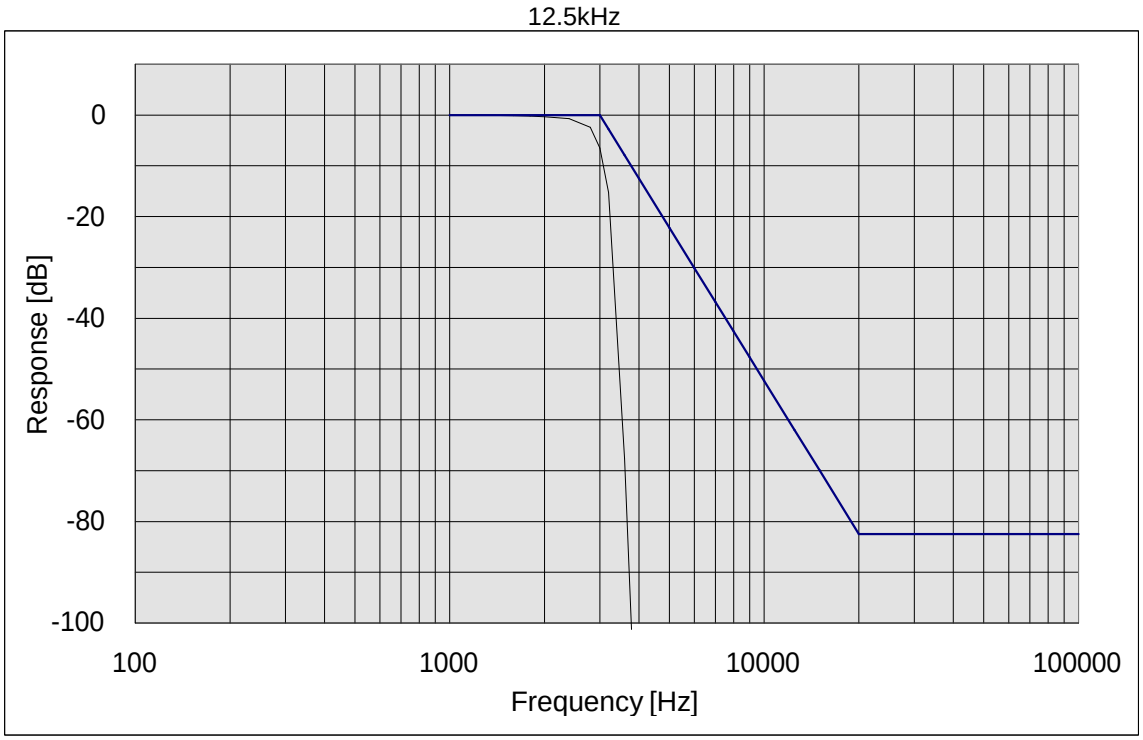
TRANSMITTER TEST SET-UP




| Instruments | Description | Serial Number |
|---|---|---|
| (1) AUDIO GENERATOR | Agilent 8903B | 2742A03633 |
| (2) COAXIAL ATTENUATOR | Agilent 8498A | 1801A02723 |
| (3) MODULATION ANALYZER | Agilent 8901B | 3026A02806 |
| (4) AUDIO ANALYZER | Agilent 8903B | 2742A03633 |

NAME OF TEST: Audio Low Pass Filter (Voice Input)

STATE: 0 : General




Measuring frequency: 450.65MHz

NAME OF TEST: Audio Frequency Response
SPECIFICATION: 47 CFR 2.1047 (a)
GUIDE: ANSI/TIA/EIA-603-D, Paragraph 2.2.6

MEASUREMENT PROCEDURE

1. The EUT and test equipment ware set up as shown on the following page.

2. The audio signal generator was connected to the audio input circuit/microphone of the EUT.

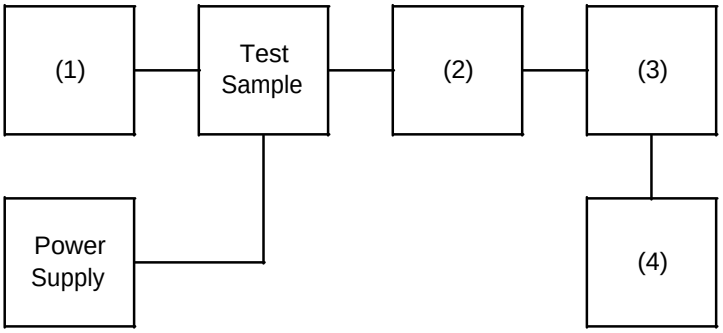
3. The audio signal input was adjusted to obtain 20% modulation at 1kHz, and this point was taken as the 0dB reference level.

4. Which input levels hold constant and below limiting at all frequencies, the audio signal generator was varied from 100Hz to 5kHz.

5. The response in dB relative to 1kHz was then measured, using the Agilent 8901B modulation analyzer.

6. MEASUREMENT RESULTS: ATTACHED

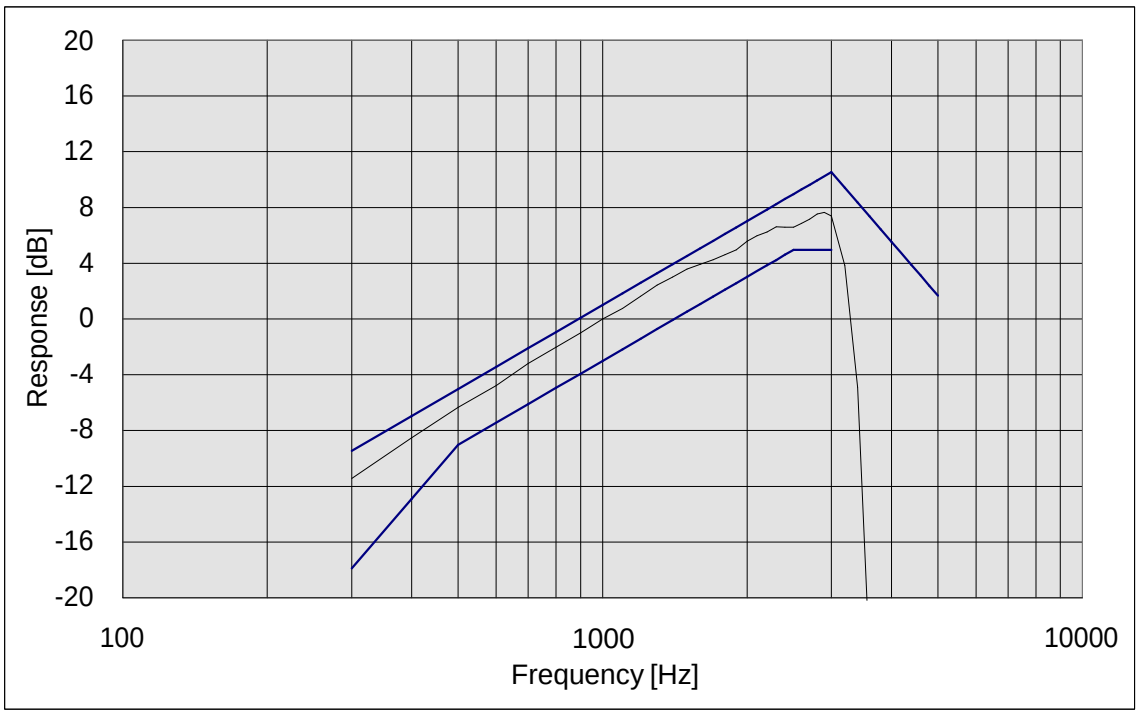
TRANSMITTER TEST SET-UP




| Instruments | Description | Serial Number |
|---|---|---|
| (1) AUDIO GENERATOR | Agilent 8903B | 2742A03633 |
| (2) COAXIAL ATTENUATOR | Agilent 8498A | 1801A02723 |
| (3) MODULATION ANALYZER | Agilent 8901B | 3026A02806 |
| (4) AUDIO ANALYZER | Agilent 8903B | 2742A03633 |

NAME OF TEST: Audio Frequency Response

STATE: 0 : General




PEAK AUDIO FREQUENCY : 2900 [Hz]

Measuring frequency: 450.65MHz

NAME OF TEST: Modulation Limiting
SPECIFICATION: 47 CFR 2.1047 (b)
GUIDE: ANSI/TIA/EIA-603-D, Paragraph 2.2.3

MEASUREMENT PROCEDURE

1. The signal generator was connected to the input of the EUT as for "Frequency Response of the Modulating Circuit".

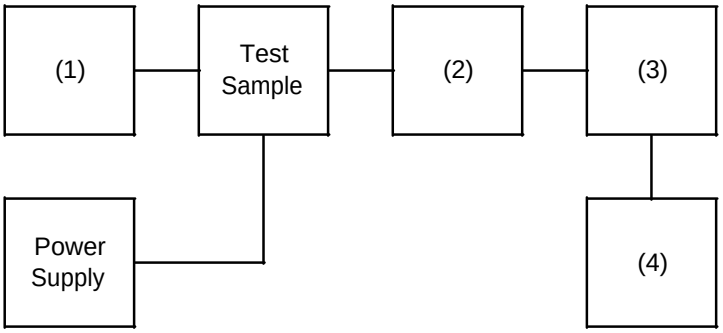
2. The modulation response was measured for each of three frequencies (one of which was the frequency of maximum response), and the input voltage was varied and was observed on an Agilent 8901B modulation analyzer.

3. The input level was varied from 30% modulation (± 1.5kHz deviation) to at least 20dB higher than the saturation point.

4. Measurements ware performed for both negative and positive modulation and the respective results ware recorded.

5. MEASUREMENT RESULTS: ATTACHED

TRANSMITTER TEST SET-UP

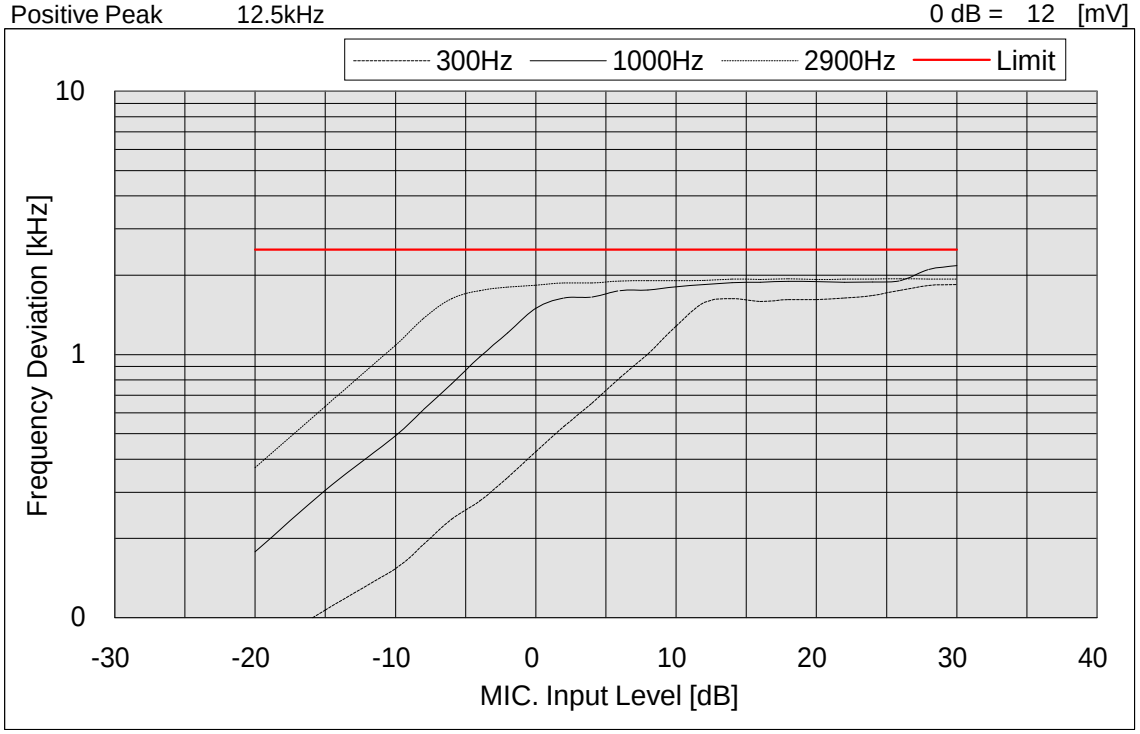



| Instruments | Description | Serial Number |
|---|---|---|
| (1) AUDIO GENERATOR | Agilent 8903B | 2742A03633 |
| (2) COAXIAL ATTENUATOR | Agilent 8498A | 1801A02723 |
| (3) MODULATION ANALYZER | Agilent 8901B | 3026A02806 |
| (4) AUDIO ANALYZER | Agilent 8903B | 2742A03633 |

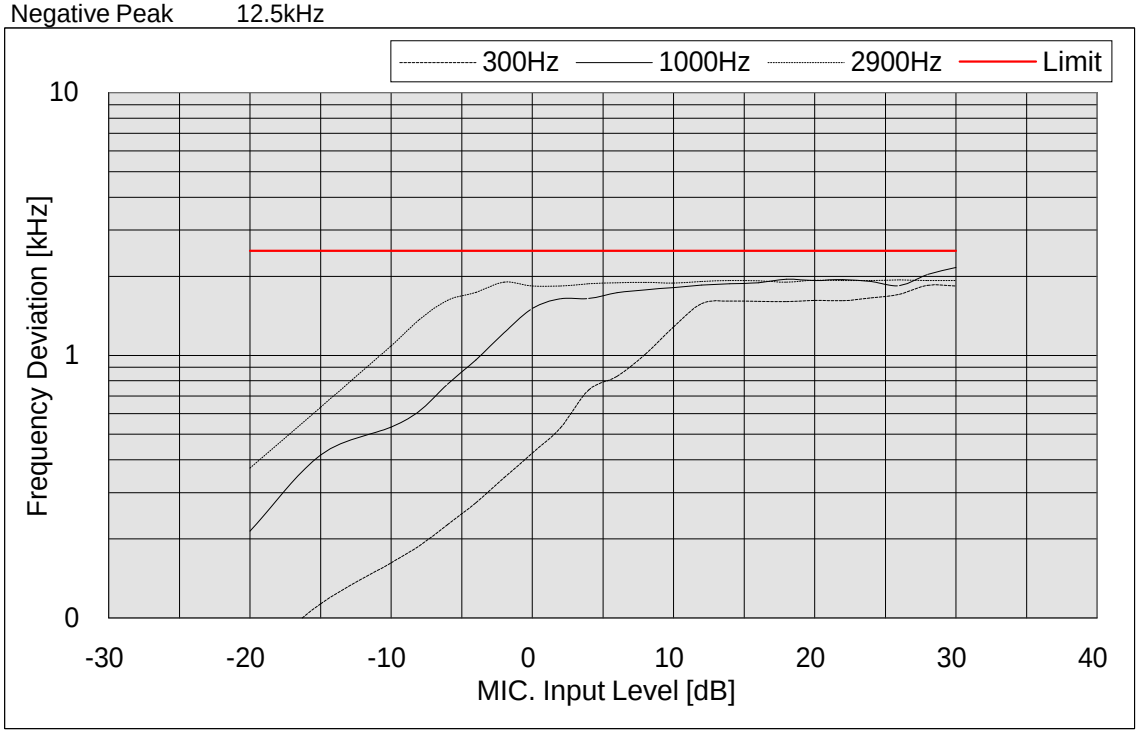
NAME OF TEST: Modulation Limiting
Measuring frequency: 450.65MHz

STATE: 0 : General

Positive Peak 12.5kHz 0 dB = 12 [mV]




Negative Peak 12.5kHz



| | |
|---|---|
| NAME OF TEST: | Frequency Stability (Temperature Variation) |
| SPECIFICATION: | 47 CFR 2.1055 (a) (1) |
| GUIDE: | ANSI/TIA/EIA-603-D, Paragraph 2.2.2 |
| TEST CONDITIONS: | As indicated |
| TEST EQUIPMENT: | As per attached page |

MEASUREMENT PROCEDURE

1. The EUT and test equipment ware set up as shown on the following page.

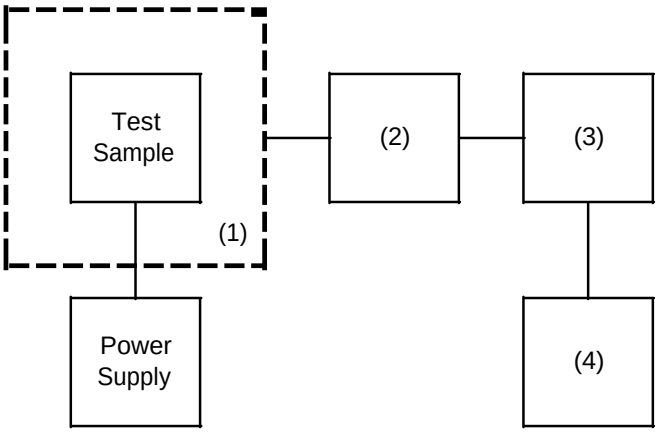
2. With all power removed, the temperature was decreased to -30℃ and permitted to stabilize for three hours. Power was applied and themaximum change in frequency was noted within one minute.

3. With power OFF, the temperature was raised in 10℃ steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.

4. The temperature tests ware performed for the worst case.

5. MEASUREMENT RESULTS: ATTACHED

TRANSMITTER TEST SET-UP

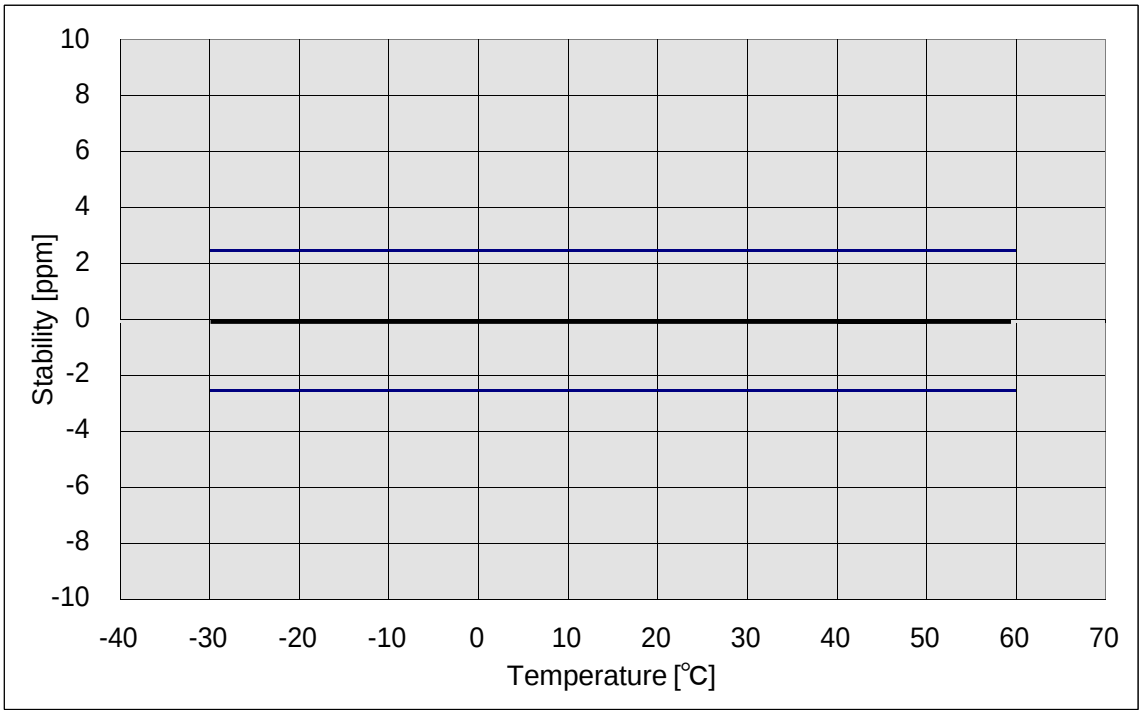



| Instruments | Description | Serial Number |
|---|---|---|
| (1) TEMPERATURE CHAMBER | ETAC FX4100 | C8031K01 |
| (2) COAXIAL ATTENUATOR | Weinschel 53-30-33 | SR803 |
| (3) POWER METER | Agilent 436A | 2604A25299 |
| (4) FREQUENCY COUNTER | Agilent 8901B FREQUENCY MODE | 3026A02806 |

NAME OF TEST: Frequency Stability (Temperature Variation)
Measuring frequency: 450.65MHz

STATE: 0 : General

LIMIT', ppm = 2.5
LIMIT', Hz = 1127



NAME OF TEST: Frequency Stability (Voltage Variation)
SPECIFICATION: 47 CFR 2.1055 (b)
GUIDE: ANSI/TIA/EIA-603-D, Paragraph 2.2.2
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT was placed in a temperature chamber at 25±5℃ and connected as for "Frequency Stability - Temperature Variation" test.

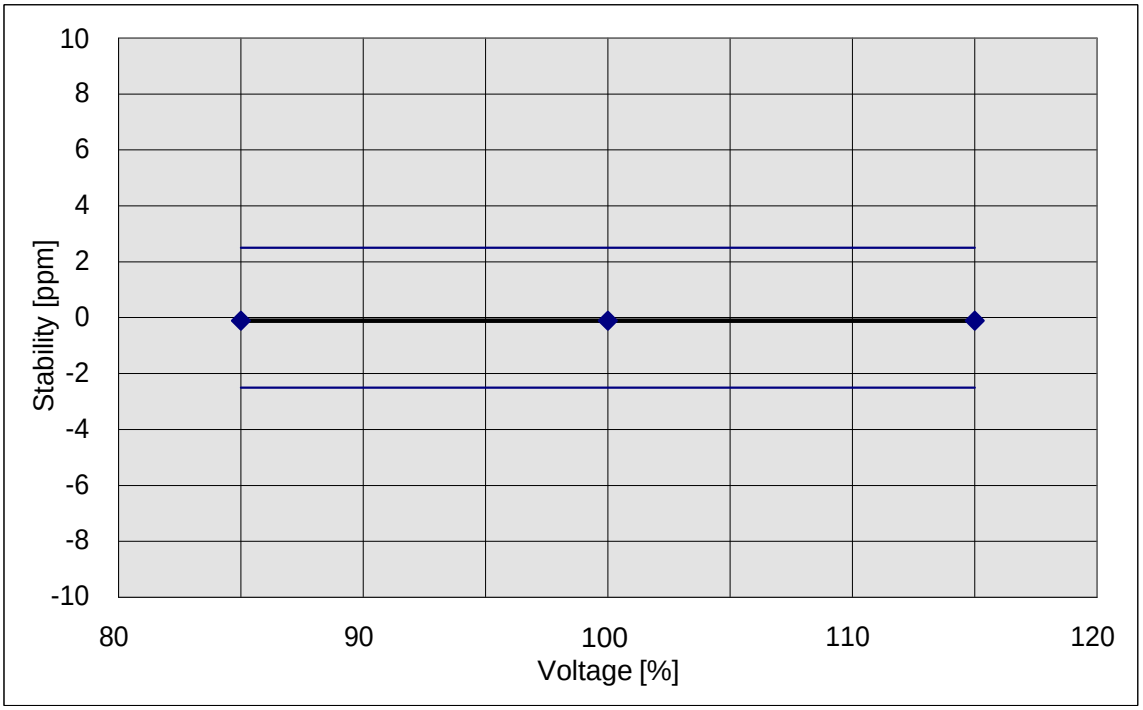
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

3. The variation in frequency was measured for the worst case.

RESULTS: Frequency Stability (Voltage Variation)
Measuring frequency: 450.65MHz

STATE: 0 : General

LIMIT', ppm = 2.5
LIMIT', Hz = 1127



NAME OF TEST: Necessary Bandwidth and Emission Bandwidth
SPECIFICATION: 47 CFR 2.202 (g)

NECESSARY BANDWIDTH CALUCULATION:

Analog Mode

MODULATION = 16K0F3E

| | | |
|---|---|---|
| MAXIMUM MODULATION (M), kHz | = | 3 |
| MAXIMUM DEVIATION (D), kHz | = | 5 |
| CONSTANT FACTOR (K) | = | 1 |
| NECESSARY BANDWIDTH (BN), kHz | = | (2xM) + (2xDxK) |
| | = | 16 |

MODULATION = 11K0F3E

| | | |
|---|---|---|
| MAXIMUM MODULATION (M), kHz | = | 3 |
| MAXIMUM DEVIATION (D), kHz | = | 2.5 |
| CONSTANT FACTOR (K) | = | 1 |
| NECESSARY BANDWIDTH (BN), kHz | = | (2xM) + (2xDxK) |
| | = | 11 |

Digital Mode The EVX-261-G6-5 Digital functions comply with DMR (Digital Mobile Radio).

Format: 2-Slot TDMA
Moduration: 4FSK
Bandwidth: 12.5kHz
Data rate: 9600bps (bit per second)
Voice: AMBE+2 Vocoder (digitized) 3600bps
Using the 99% bandwidth method yields a emission designator of:
7K60F1D, 7K60F1E, 7K60F1W, 7K60FXE, 7K60FXD

Occupied Bandwidth Power (99%)
Spectrum Analyzer setting as below;
RBW: 300Hz, VBW: 3kHz, Span: 40kHz

| Description | Occupied Bandwidth Power (99%) |
|---|---|
| Carrier, Analog Voice, 25kHz channel, 16K0F3E | 10.19 kHz |
| Carrier, Analog Voice, 12.5kHz channel, 11K0F3E | 6.11 kHz |
| Carrier, Digital Data, 12.5kHz channel, 7k60F1D | 5.55 kHz |
| Carrier, Digital Voice, 12.5kHz channel, 7k60F1E | 5.59 kHz |
| Carrier, Digital Voice+Emcryption, 12.5kHz channel, 7k60F1E | 5.55 kHz |
| Carrier, Digital TDMA, 12.5kHz channel, 7k60F1W | 5.55 kHz |

Test Equipment Used During Testing

| No. | Description | Manufacturer | Model | Serial Number | Cal. Date | Cal. Due |
|---|---|---|---|---|---|---|
| 1 | Coaxicial Attenuator | Weinschell | 49-10-43 | KL458 | 2016/1/8 | 2017/1/7 |
| 2 | Coaxicial Attenuator | Advantest | 8498A | 1801A02723 | 2016/1/8 | 2017/1/7 |
| 3 | Coaxicial Attenuator | Agilent | 53-30-33 | SR803 | 2016/1/8 | 2017/1/7 |
| 4 | RF Coupler | Agilent | TR4153 | 39730008 | 2016/1/8 | 2017/1/7 |
| 5 | Power Meter | Agilent | 436A | 2604A25299 | 2015/12/3 | 2016/12/2 |
| 6 | Power Sensor | Agilent | 8482B | 2349A02533 | 2015/12/4 | 2016/12/3 |
| 7 | Power Senser/ Meter | Agilent | 11722A/ 8901B | 2716A02970/ 3026A02806 | 2015/12/8 | 2016/12/7 |
| 8 | Power Senser/ Frequency Counter | Agilent | 11722A/ 8901B | 2716A02970/ 3026A02806 | 2015/12/8 | 2016/12/7 |
| 9 | Audio Generator/Analyzer | Agilent | 8903B | 2742A03633 | 2015/12/4 | 2016/12/3 |
| 10 | Spectrum Analyzer | Agilent | E4445A | MY44300710 | 2015/10/30 | 2016/10/29 |
| 11 | Spectrum Analyzer | Agilent | 8561B | 3040A00541 | 2015/12/28 | 2016/12/27 |
| 12 | Transducer | Schaffner | CBL6143 | 5001 | 2016/1/12 | 2019/1/11 |
| 13 | Transducer | Advantest | TR17206 | 43370002 | 2015/12/19 | 2018/12/18 |
| 14 | Amplifier | Agilent | 8447D | 2944A09741 | 2016/1/5 | 2017/1/4 |
| 15 | Amplifier | Agilent | 8449B | 3008A00120 | 2016/1/5 | 2017/1/4 |
| 16 | Combiner | Iwatsu | B-50D4 | 520 | 2016/1/8 | 2017/1/7 |
| 17 | Cristal Detector | Agilent | 8470B | MY42241063 | 2016/1/8 | 2017/1/7 |
| 18 | Temperature Chamber | Etac | FX4100 | C8031K01 | NA | NA |
| 19 | Modulation Analyzer | Agilent | 8901B | 3026A02806 | 2015/12/8 | 2016/12/7 |
| 20 | Signal Generator | Agilent | 8624B | 2709A01050 | 2015/12/8 | 2016/12/7 |
| 21 | Oscilloscope | Agilent | DSO3062A | CN45001514 | 2016/1/8 | 2017/1/7 |
| 22 | Horn Freq | DRG | SAS-571 | 566 | 2015/8/2 | 2016/8/2 |
| 23 | Bilog Antenna | Schaffner | CBL6112B | 2964 | 2014/5/23 | 2016/5/23 |
| 24 | Power Supply | HP | 6031A | 3121A02341 | 2014/6/12 | 2016/6/12 |
| 25 | EMI Test Receiver | R&S | ESIB26 | 100336 | 2015/6/17 | 2016/6/17 |
| 26 | Microwave Sig Gen | R&S | SMP04 | 100131 | 2015/6/25 | 2016/6/25 |
| 27 | System Controller | Sunol Sciences | SC104V | 050806-1 | NA | NA |
| 28 | Turntable Flush Mount 2M | Sunol Sciences | FM2011 | NA | NA | NA |
| 29 | Antenna Positioning Tower | Sunol Sciences | TLT2 | NA | NA | NA |
| 30 | Test Receiver | R&S | ESIB26 | 827769/009 | 2015/6/16 | 2016/6/16 |
| 31 | Signal Analyzer | R&S | FSV40 | 101103 | 2015/6/25 | 2016/6/25 |
| 32 | 5m Semi-anechoic Chamber | RFI Industries | S800-HX | J2308 | 2015/7/29 | 2016/7/29 |
| 33 | Data logger | Dickson | TM320 | 12249289 | 2016/4/27 | 2017/4/27 |
| 34 | Bilog Antenna | TESEQ | CBL6112D | 25516 | 2015/5/23 | 2016/5/23 |