Report No.	T6474060741
Specifications Test Method	FCC Part 74 – Certification ANSI C63.4 2003
Applicant	JTS PROFESSIONAL CO., LTD.
Applicant address	No. 148, 9th Industry Road, Ta-Li Industrial Park, Ta-Li City, Taiwan, R.O.C.
Items tested Model No. EUT Condition	UHF PLL Stereo/Mono In Ear Monitoring System SIEM-101T ☒Engineering sample; ☐Pre-production; ☐Final production (Sample # T640741)
Results	**Compliance** (As detailed within this report)
Date	10/27/2006 (month / day / year) (Sample received) 11/06/2006 ~ 01/13/2007 (Test)
Prepared by	Project Engineer (Jack Tsai)
Authorized by	General Manager (Frank Tsai)
Issue date	*January 23, 2007* (month / day / year)
Modifications	**None**
Tested by	Training Research Co., Ltd.
Office at	No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan
Anechoic Chamber at	No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan

Conditions of issue :

(1) This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing..

FCC ID: INGSIEM-101T

Contents

Chapter 0 Application for Certification

74.861(e)(2) : Transmitters may be either crystal controlled or frequency synthesized.
☐ crystal controlled ☒ frequency synthesized

2.1033(c)(1) : *JTS PROFESSIONAL CO., LTD.*– applicant and manufacturer

2.1033(c)(2) : The equipment is a transmitter, wireless microphone
Model No.: SIEM-101T

2.1033(c)(3) : Quantity production is planned. See users manual

2.1033 (c)(4) : Type of emission – F3E- FM Modulation

2.1033(c)(5) : 614 ~ 806 MHz

2.1033(c)(6) : 68.596 mW

2.1033(c)(7) : Specification of 250 mW is met by the equipment in the applicable Part 74.861 (e)(1)(ii)

2.1033 (c)(8) : Final RF amplifier stage current : 100mA

2.1033(c)(9) : Description follows

2.1033(c)(10) : Complete circuit diagrams are included. No modification was made

2.1033(c)(11) : See label, Instruction sheet to user included

2.1033(c)(12) : See photos.

2.1033(c)(13) : N/A

2.1033(c)(14) : Description follows.

2.1033(c)(15) : N/A

2.1033(c)(16) : N/A

2.1033(c)(17) : N/A

Chapter 1 GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of *JTS PROFESSIONAL CO., LTD.* In support of the wireless microphone certification in accordance with FCC Rules 2.1031, 2.1046, 2.1047, 2.1049, 2.1053, 2.1055, 74.801, and 74.861.

Description of EUT:

EUT	:	UHF PLL Stereo/Mono In Ear Monitoring System
Model No.	:	SIEM-101T
FCC ID	:	INGSIEM-101T
Carrier Frequency Range	:	614.025MHz ~ 805.975MHz
RF Power Output	:	68.596 mW
Supply Voltage	:	120VAC
Supply Current	:	100mA
Frequency Response	:	300Hz ~ 15kHz
Frequency Stability	:	0.005%
Operating Temperature	:	– 30 to + 50 degree centigrade

Wireless microphone is a transmitter, which operates in the frequency range of 614.025MHz ~ 805.975MHz.(lowest: 614.025MHz, middle: 710.000MHz, and highest: 805.975MHz tested) This device is worn by a performer and other participants in a program, filming, reporting …etc.

1.2 Description of Support Equipment

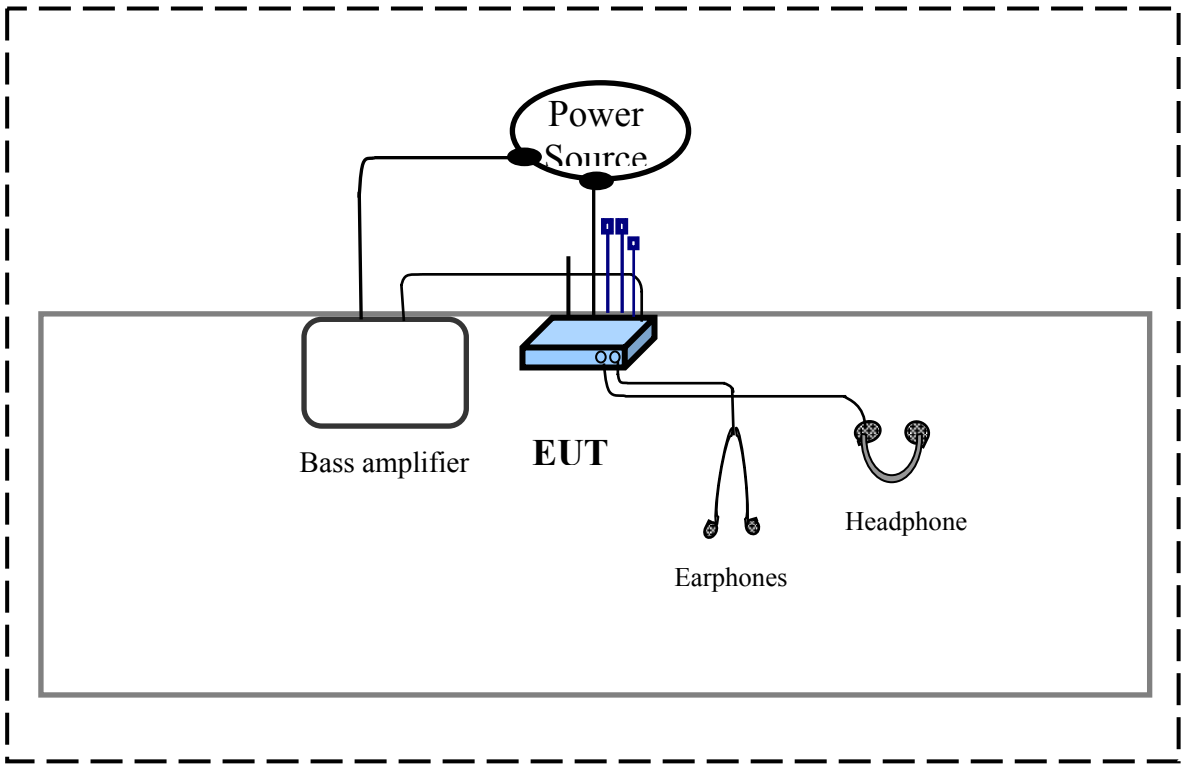
In order to construct the minimum testing, following equipment were used as the support units.

Earphones : PHILIPS
Model No : SBC-HE033
Serial No. : 670904
Power type : By EUT
Data Cable : Non-shielded, 1.05 m length, Plastic hood, No ferrite core

Headphone : God Information Inc.
Model No : GI02
Power type : By EUT
Data Cable : Non-shielded, 1.17 m length, Plastic hood, No ferrite core

Bass Amplifier : RMS
Model No. : RMS-20B
Serial No. : 960011
Power type : 120Vac, 10W, 50/60 Hz
Power cord : Non-shielded, 2.20m length, No ferrite core

1.3 Configuration of Test Setup



Connections of Equipment:

EUT:

(1)The POWER jack is connected with the AC power source by AC to DC adapter.

(2)The 1/8" stereo phone jack is connected with earphones.

(3)The 1/4" stereo phone jack is connected with a headphone.

(4)The balanced loop out connector CH01 is connected to bass amplifier by balanced cable.

(5)The balanced loop out connector CH02 is connected with balanced cable and un-terminated.

(6)The balanced XRL/Φ6.3mm combo input left/CH01 is connected with Balanced XRL/Φ6.3mm Cable and un-terminated.

(7)The balanced XRL/Φ6.3mm combo input right/CH02 is connected with Balanced XRL/Φ6.3mm Cable and un-terminated.

* Power Cable x 1…..…….. 1.90m length, non-shielded, no ferrite core, plastic hood

* Balanced Cable x 2…..... 1.63m length, shielded, no ferrite core, plastic hood

* Balanced XRL/Φ6.3mm Cable x 2……. 4.64m length, shielded, no ferrite core, metal hood

1.4 Location of the Measurement Site

The radiated emissions measurements required by the Rules were performed on the Three-meter, anechoic chamber at test site maintained by ***Training Research Co., Ltd.,*** *No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan*. Complete description and measurement data have been placed on file with the Commission. The conducted power line Emissions tests were performed in a shielded enclosure also located at the above facility.

Training Research Co., Ltd. is listed by the FCC (Registration Number: 93906) as a facility available to do measurement work for others on a contract basis.

1.5 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

Chapter 2 Conducted Emission Test

2.1 Test condition and setup

All the equipment is placed and setup according to the *ANSI C63.4 - 2003.*

The EUT is assembled on a wooden table, which is 80 cm high, is placed 40 cm from the back-wall, which is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT's LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 150KHz to 30 MHz. Conducted emission levels are detected at maximum peak mode. But if the maximum peak mode failed, it will be measured by CISPR's quasi-peak detection mode.

While testing, there is the worst-emission plot printed at peak detection mode, and there are more than 6 highest emissions relative to limit recorded. The plot is kept as the original data, not included in test report.

2.2 List of test Instrument

				Calibration Date
Instrument Name	**Model**	**Brand**	**Serial No.**	**Next time**
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
LISN (EUT)	LISN-01	TRC	99-05	03/10/07
LISN (Support E.)	LISN-01	TRC	9912-03, 04	02/26/07
Pre-amplifier	15542 ZFL-500	Mini – Circuits	0 0117	05/20/07
6dB Attenuator	MCL BW-S6W2	Mini – Circuits	9915 – Conducted	05/20/07
10dB Attenuator	A5542 VAT010	Mini – Circuits	0215 – Conducted	05/20/07
Coaxial Cable (2 meter)	A30A30-0058-50FS-2M	Jyebao	SMA-08	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	Jyebao	SMA-09	05/20/07
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-01	05/20/07
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-02	05/20/07

2.3 Test Result of Power Line Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions on the LIVE and NETURAL conductors of the EUT power cord. Show as follows.

Test Conditions: Temperature : 25 °C Humidity : 73 % RH

Test mode: Frequency: 614.025 MHz

Power Connected Emissions					*Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	172.240	56.60	55.94	44.43	65.37	55.37	-9.43
	206.000	49.90	---	---	64.40	54.40	-4.50
	238.000	46.32	---	---	63.49	53.49	-7.17
	308.000	42.80	---	---	61.49	51.49	-8.69
	341.000	39.88	---	---	60.54	50.54	-10.66
	2663.000	41.24	---	---	56.00	46.00	-4.76
Line 2	173.275	56.21	55.51	43.81	65.37	55.37	-9.86
	206.000	48.81	---	---	64.40	54.40	-5.59
	274.000	42.73	---	---	62.46	52.46	-9.73
	377.000	37.85	---	---	59.51	49.51	-11.66
	1437.000	32.96	---	---	56.00	46.00	-13.04
	2820.000	43.11	---	---	56.00	46.00	-2.89

NOTE:

(8)Margin = Peak Amplitude – Limit, The reading amplitudes are all under limit.

(9)A "+" sign in the margin column means the emission is OVER the Class B Limit and "–" sign of means UNDER the Class B limit

Test mode: Frequency: 710.000 MHz

Power Connected Emissions					*Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	172.825	56.53	55.86	43.91	65.37	55.37	-9.51
	208.000	48.72	---	---	64.34	54.34	-5.62
	308.000	42.40	---	---	61.49	51.49	-9.09
	341.000	40.64	---	---	60.54	50.54	-9.90
	2767.000	41.70	---	---	56.00	46.00	-4.30
	10730.000	37.01	---	---	60.00	50.00	-12.99
Line 2	173.005	56.12	55.45	43.43	65.37	55.37	-9.92
	206.000	49.02	---	---	64.40	54.40	-5.38
	240.000	44.14	---	---	63.43	53.43	-9.29
	308.000	41.28	---	---	61.49	51.49	-10.21
	2012.000	36.35	---	---	56.00	46.00	-9.65
	2767.000	43.06	---	---	56.00	46.00	-2.94

Test mode: Frequency: 805.975 MHz

Power Connected Emissions					*Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	172.870	56.70	56.00	44.47	65.37	55.37	-9.37
	206.000	49.55	---	---	64.40	54.40	-4.85
	274.000	43.13	---	---	62.46	52.46	-9.33
	311.000	38.62	---	---	61.40	51.40	-12.78
	1678.000	33.32	---	---	56.00	46.00	-12.68
	2767.000	41.72	---	---	56.00	46.00	-4.28
Line 2	173.960	56.19	54.95	43.08	65.31	55.31	-10.36
	206.000	48.95	---	---	64.40	54.40	-5.45
	238.000	44.40	---	---	63.49	53.49	-9.09
	308.000	41.47	---	---	61.49	51.49	-10.02
	2767.000	43.06	---	---	56.00	46.00	-2.94
	11060.000	35.69	---	---	60.00	50.00	-14.31

Chapter 3 Power Output Measurement

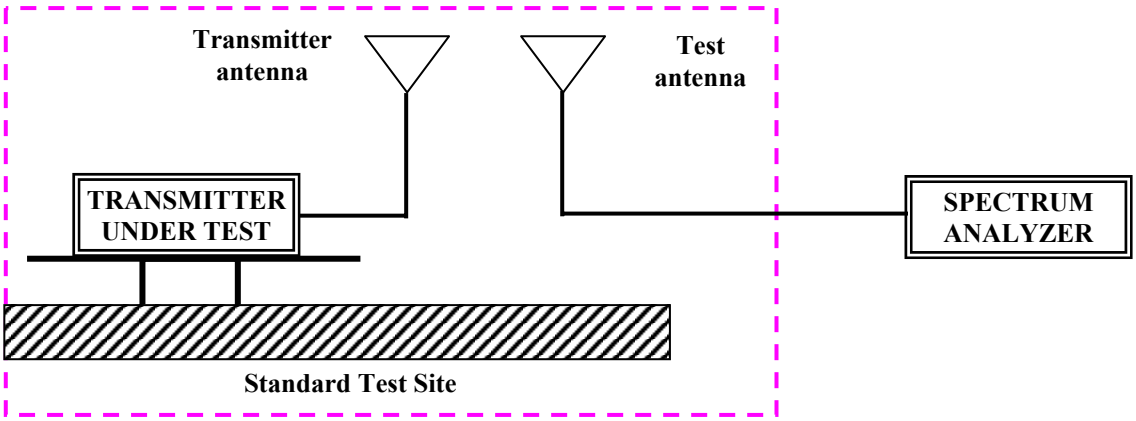
3.1 Rules and Specification Limits

2.1046(a), ANSI/ TIA/ EIA-603-1992, Paragraph 2.2.1.

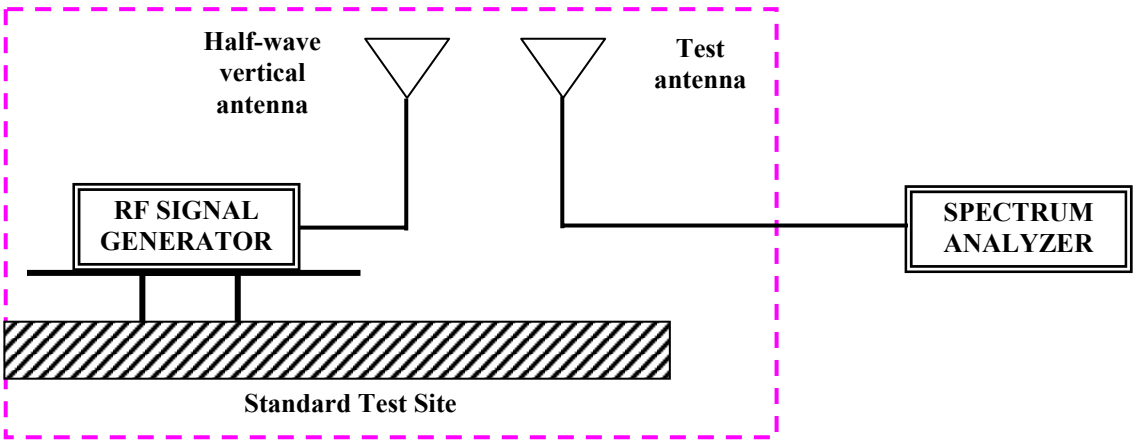
74.861 (e)(1) : The power of the measured unmodulated carrier power at output of the transmitter power amplifier (antenna input power) may not exceed the following:

1. 54 – 72, 76 – 88 and 174 – 216 MHz band 50 mW.
2. 470 – 608 and 614 – 806 MHz band 250 mW.

3.2 Test condition and setup



1. Measurement was made on anechoic chamber. The EUT system was placed on non-conductive turntable which is 0.8 meters height, top surface 1.0 X 1.5 meter. The EUT was placed in three direction of the space in order to obtain maximum emission.
2. Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the standard test site.
3. Raise and lower the test antenna from 1m to 4m with the transmitter facing the antenna and record the highest received signal.
4. Repeat step (3) for seven additional readings at 45 interval positions of the turn-table.



5. Replace the transmitter under test with a half-wave vertically polarized antenna. The center of the antenna should be at the same location as the transmitter under test. Connect the antenna to a signal generator with a known output and record value.

6. FI_a(dBm) = FI_r (dBm) – Corrected (dB)
   Corrected (dB) = AF(dB) + [CL(dB) – AG] + Switching Box Loss
   FI_a : Actual Field Intensity
   FI_r : Reading of the Field Intensity
   AF : Antenna Factor
   CL : Cable Loss
   AG : Amplitude Gain

7. The field intensity in Watt can then be determined by the following equation:
   P (watt) = FI^2(Volt) X d^2 (meter) / 49.2
   P : Power in Watt
   D : Measurement Distance (3 m)

3.3 Test condition and setup

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	12/07/07
Pre-amplifier	PA1F	TRC	1FAC	05/20/07
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/07
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/07

3.4 Measurement Result

(1) Frequency: 614.025 MHz

The maximum field measured is 15.29 dBm

FI (Volt) = $10^{112.67/20}$ X 10^{-6} = 0.43003 V

FI (W) = $(0.43003 \text{ X } 3)^2 / 49.2$ = 33.828 mW

Angle of Turn Table (°)	Spectrum Reading (dBm)	Corrected (dB)	Actually Value (dBm)	E. R. P. (mW)	Average (W)
0°	5.82	6.79	12.61	18.251	2.780E-01
45°	8.15	6.79	14.94	31.209	
90°	8.50	6.79	15.29	33.828	
135°	8.41	6.79	15.20	33.134	
180°	7.87	6.79	14.66	29.260	
225°	7.19	6.79	13.98	25.019	
270°	7.53	6.79	14.32	27.057	
315°	7.12	6.79	13.91	24.619	

(2) Frequency: 710.000 MHz

The maximum field measured is 5.64 dBm

FI (Volt) = $10^{103.02/20}$ X 10^{-6} = 0.14158 V

FI (W) = $(0.14158 \text{ X } 3)^2 / 49.2$ = 3.667 mW

Angle of Turn Table (°)	Spectrum Reading (dBm)	Corrected (dB)	Actually Value (dBm)	E. R. P. (mW)	Average (W)
0°	-4.67	9.49	4.82	3.036	2.563E-02
45°	-5.03	9.49	4.46	2.794	
90°	-7.82	9.49	1.67	1.470	
135°	-4.62	9.49	4.87	3.071	
180°	-6.70	9.49	2.79	1.902	
225°	-6.62	9.49	2.87	1.933	
270°	-5.29	9.49	4.20	2.632	
315°	-3.85	9.49	5.64	3.667	

(3) Frequency: 805.975 MHz

The maximum field measured is 18.36 dBm

FI (Volt) = $10^{115.74/20}$ X 10^{-6} = 0.61235 V

FI (W) = $(0.61235 \text{ X } 3)^2 / 49.2$ = 68.596 mW

Angle of Turn Table (°)	Spectrum Reading (dBm)	Corrected (dB)	Actually Value (dBm)	E. R. P. (mW)	Average (W)
0°	2.29	12.14	14.43	27.752	2.524E-01
45°	6.22	12.14	18.36	68.596	
90°	-0.84	12.14	11.30	13.499	
135°	-0.18	12.14	11.96	15.714	
180°	-4.74	12.14	7.40	5.499	
225°	0.94	12.14	13.08	20.337	
270°	1.66	12.14	13.80	24.005	
315°	2.10	12.14	14.24	26.564	

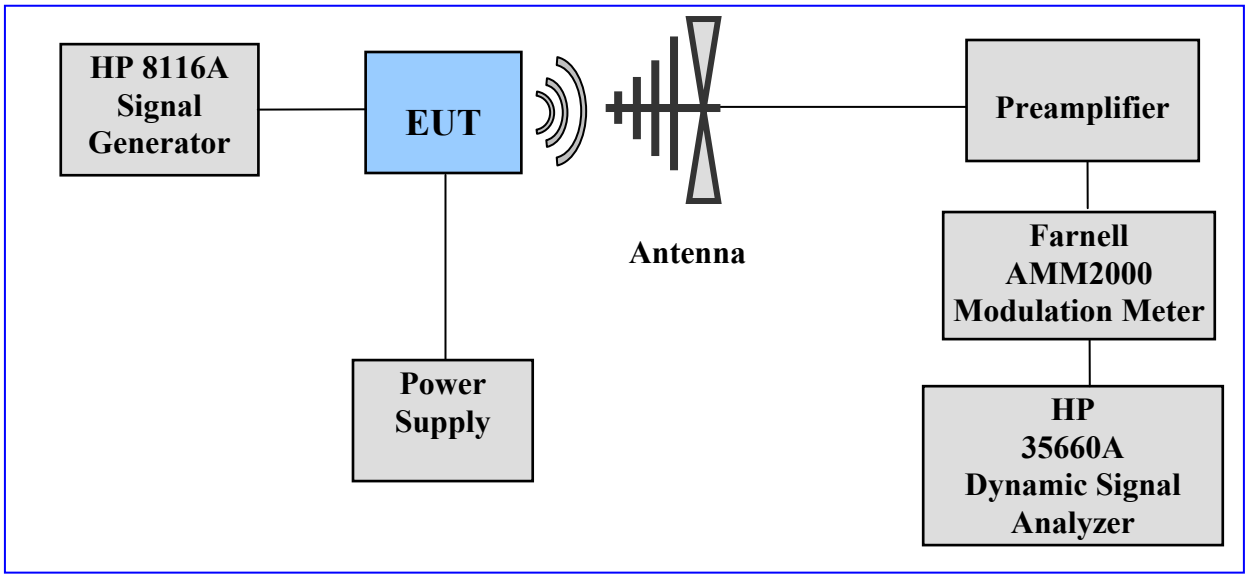
Chapter 4 Modulation Characteristics Measurement

4.1 Rules and Specification Limits

2.1047 (a), ANSI/ TIA/ EIA-603-1992, Paragraph 2.2.6.
Voice modulated communication equipment

2.1047 (b), ANSI/ TIA/ EIA-603-1992, Paragraph 2.2.3.
Equipment which employs modulation limiting

4.2 Test Configuration & List of Test Instruments



4.3 List of test instrument

Manufacturer	Device	Model No.	Input Impedance
HP	Dynamic Signal Analyzer	35660A	50
HP	Signal Generator 50 MHz	8116A	50
SCHAFFNER	Bi-log Antenna	CBL6141A	50
Farnell	Modulation Meter	AMM2000	50
TRC	Preamplifier	TRC001	50

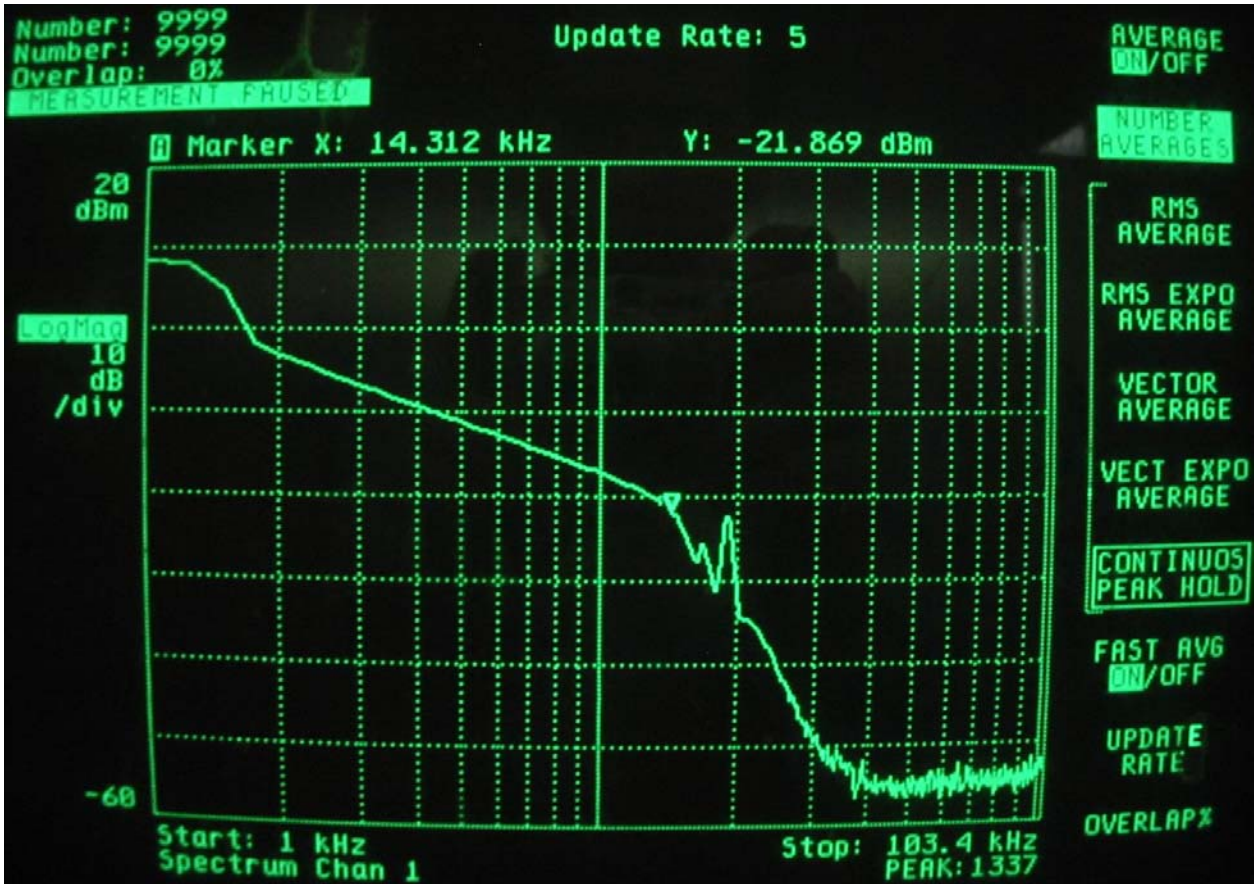
4.4 Frequency Response of Audio Modulation Circuit and Low Pass Filter Measurement Condition & Setup

2.1047 (a)

1. The EUT and test equipment were set up as shown on the Section 4.2.
2. The Plus/Function generator was connected to the microphone of EUT, via an artificial mouth simulator.
3. The audio signal input was adjusted to obtain 50% modulation at 1 kHz.
4. With input levels held constant and below limiting at all frequencies, the generator was varied from 100Hz to 51.3kHz, 1kHz to 103.4kHz
5. The response in dBm relative to 1kHz was then measured, using the HP 35660A Dynamic Signal Analyzer as follow page.

100Hz to 51.3kHz

1kHz to 103.4kHz



4.5 Modulation Limiting Measurement Condition & Setup

2.1047 (b)

1. The Plus/Function generator was connected to the microphone of EUT, via an artificial mouth simulator.
2. The modulation response was measured for each of following frequencies: 300Hz, 1.0kHz, 1.768kHz, 2.5kHz, 12.5kHz and 15kHz.
3. The input level was varied from 30% modulation to at least 20dB higher than the saturation point.
4. Measurements were performed for both negative and positive modulation and the respective results were recorded.
5. Measurement results as Chart 4.1 and Chart 4.2

Chart 4.1 Modulation Limiting Measuerment Negative

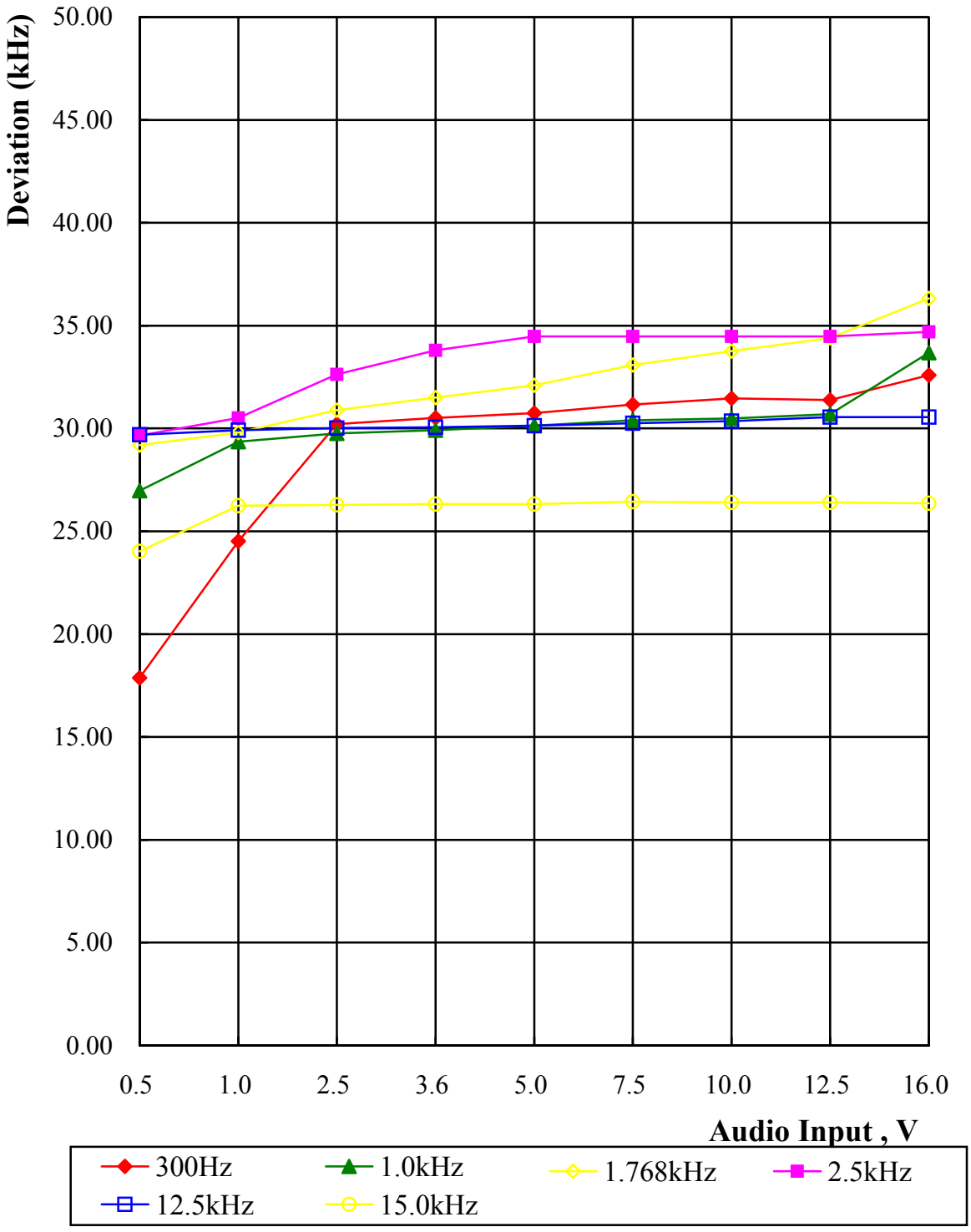
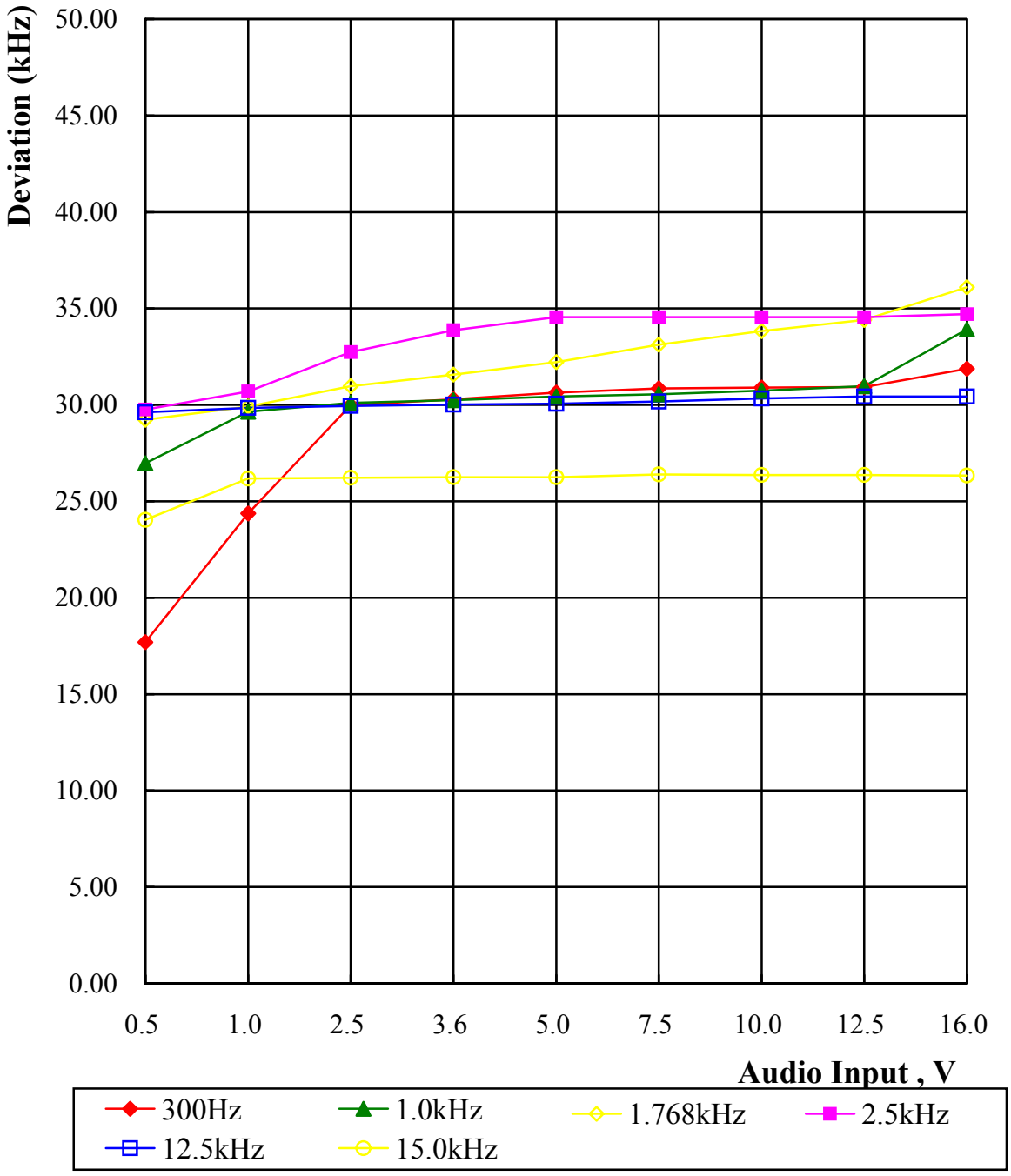


Chart 4.2 Modulation Limiting Measuerment Positive



Chapter 5 Occupied Bandwidth Measurement

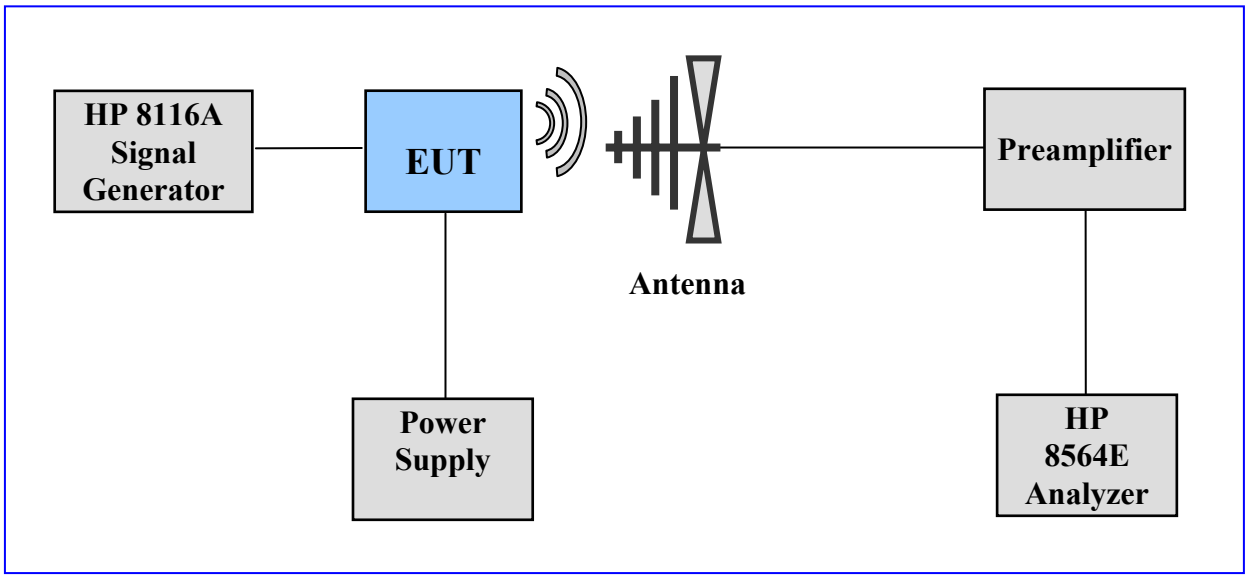
5.1 Rules and Specification Limits

2.1049(c)(1): ANSI/ TIA / EIA-603-2003, Paragraph 2.2.11.

74.861(e)(3): Any form of modulation may be used. A maximum deviation of ±75kHz is permitted when frequency modulation is employed.

74.861(e)(5): The operation bandwidth shall not exceed 200kHz.

5.2 Test Configuration & List of Test Instruments



5.3 List of test Instrument

Instrument Name	Model No.	Brand	Input Impedance
Spectrum analyzer (9K~1.8GHz)	8564E	HP	50
Preamplifier (30MHz~1GHz)	TRC001	TRC	50
Signal Generator 50 MHz	HP8116A	HP	50
Bi-log Antenna	CBL6141A	SCHAFFNER	50

5.4 Measurement Procedure

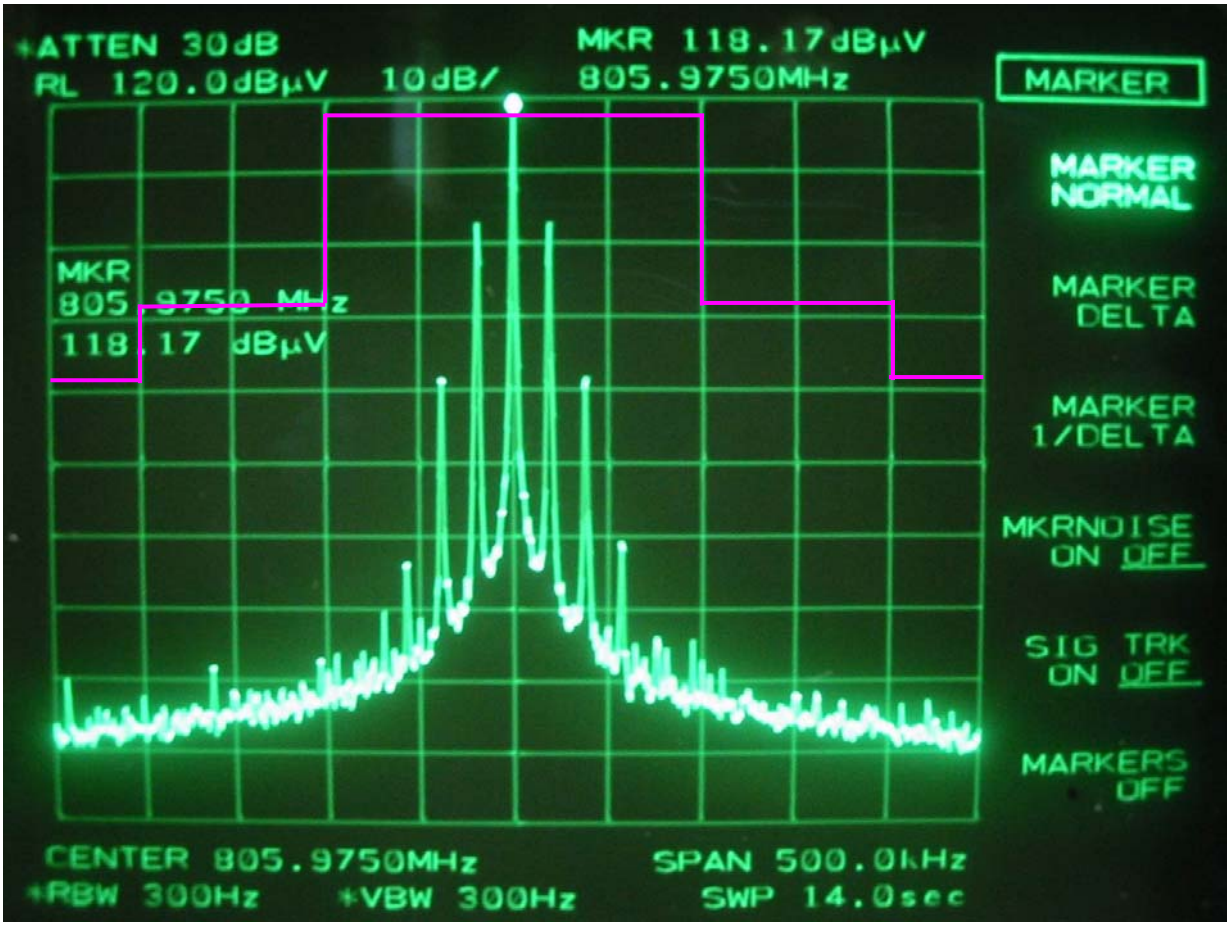
1. Connect the EUT as Section 4.2 .
2. Plot the unmodulated chart shows on spectrum.
3. Set the output of the signal generator to 300Hz, 1.0kHz, 1.768kHz, 2.5kHz, 12.5kHz and 15kHz. Increase the amplitude of the signal, while monitoring the modulation meter. Until modulation is maximum measure the bandwidth under 26dB compared to the unmodulated fundamental carrier peak level of the modulated signal displayed on the spectrum analyzer.
4. The occupied Bandwidth was measured as follow pages.

5.5 Measurement Result

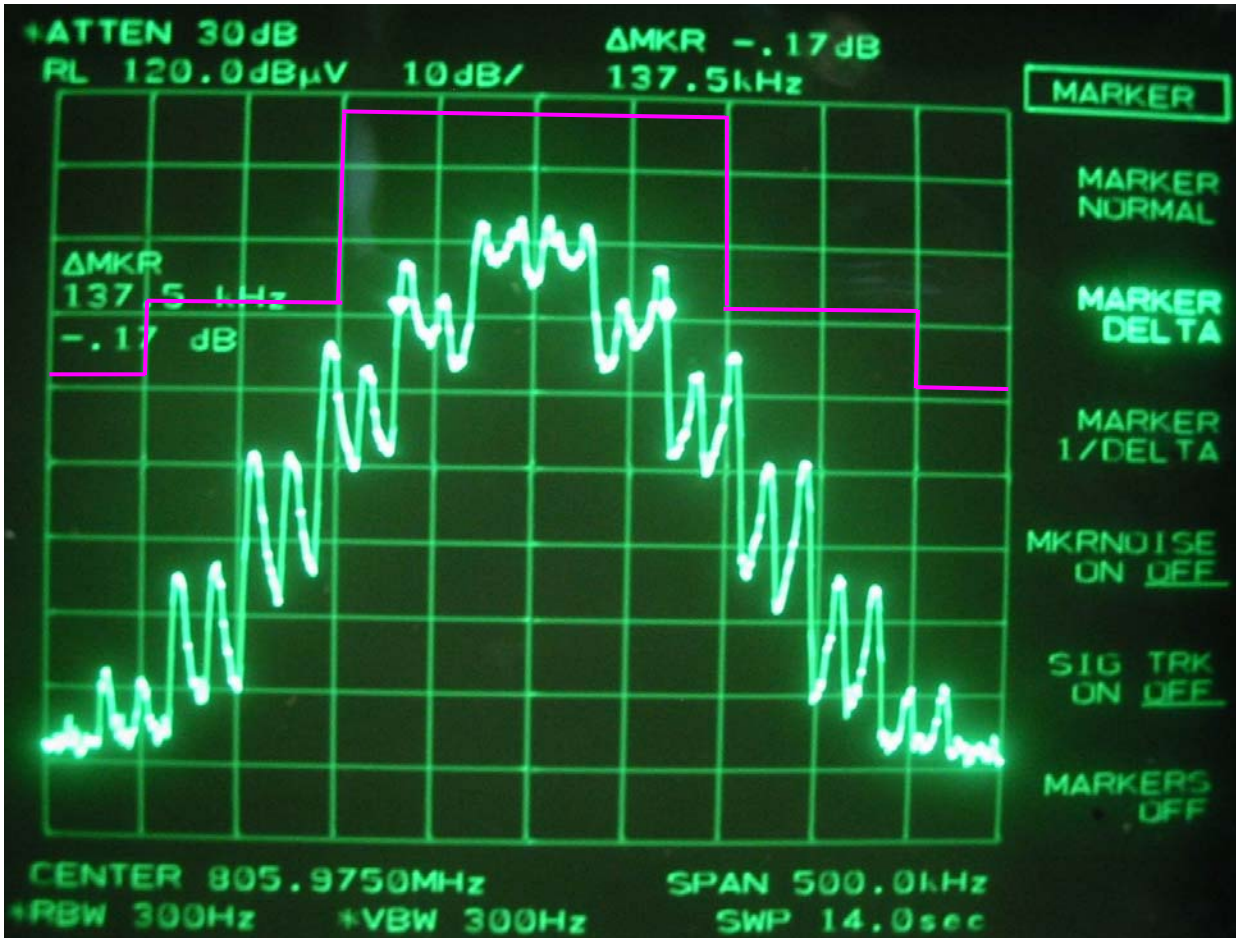
The occupied bandwidth's plot is presented on following pager, which illustrates compliance with the rules.

Calculation of Necessary Bandwidth (Bn)
Bn = 2M + 2D
M = Max. Modulation Frequency = 15.00 kHz
D = Peak Frequency Deviation = 36.32 kHz (Chart 4-1, Page22)
K = 1
Bn = 102.64 kHz

Unmodulation

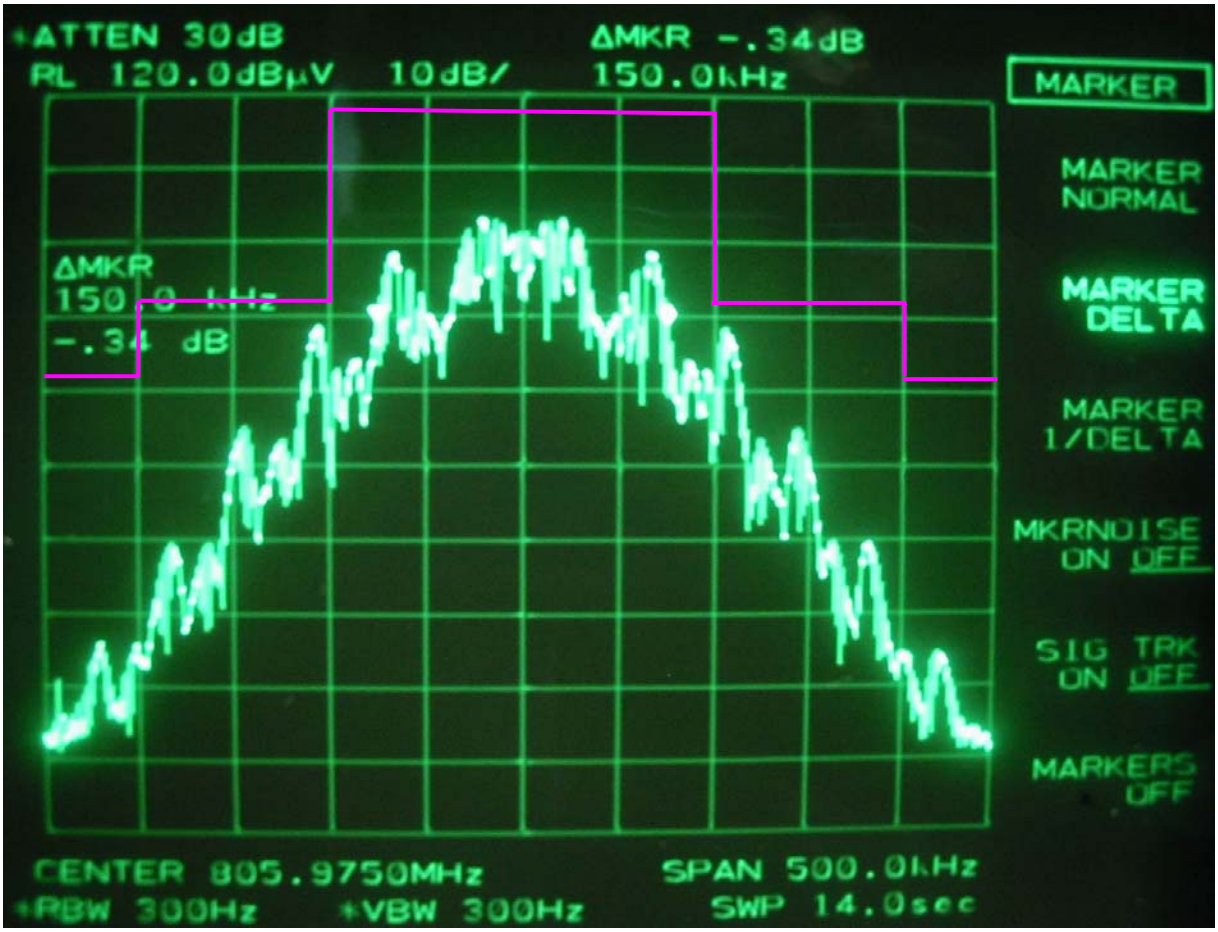


300Hz modulation

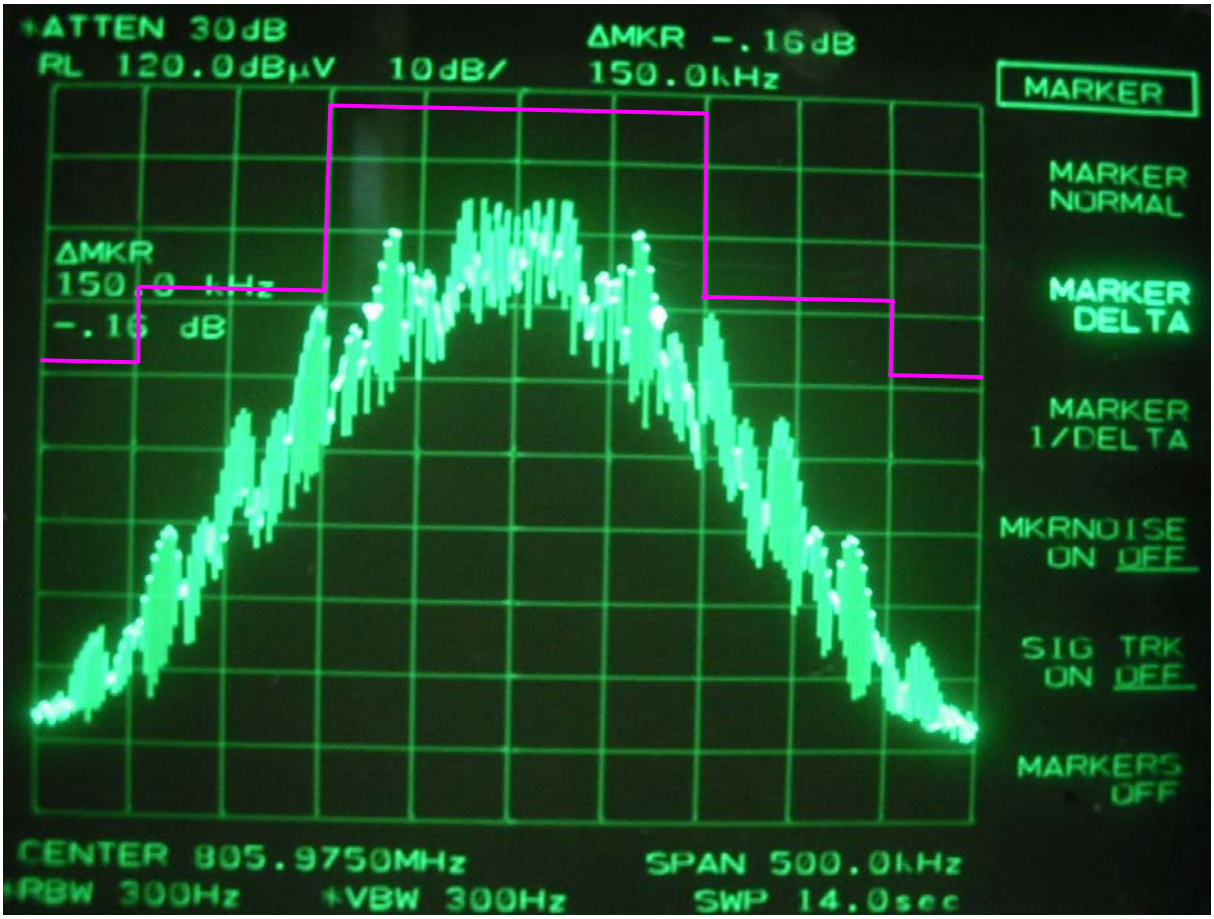


1.0kHz modulation

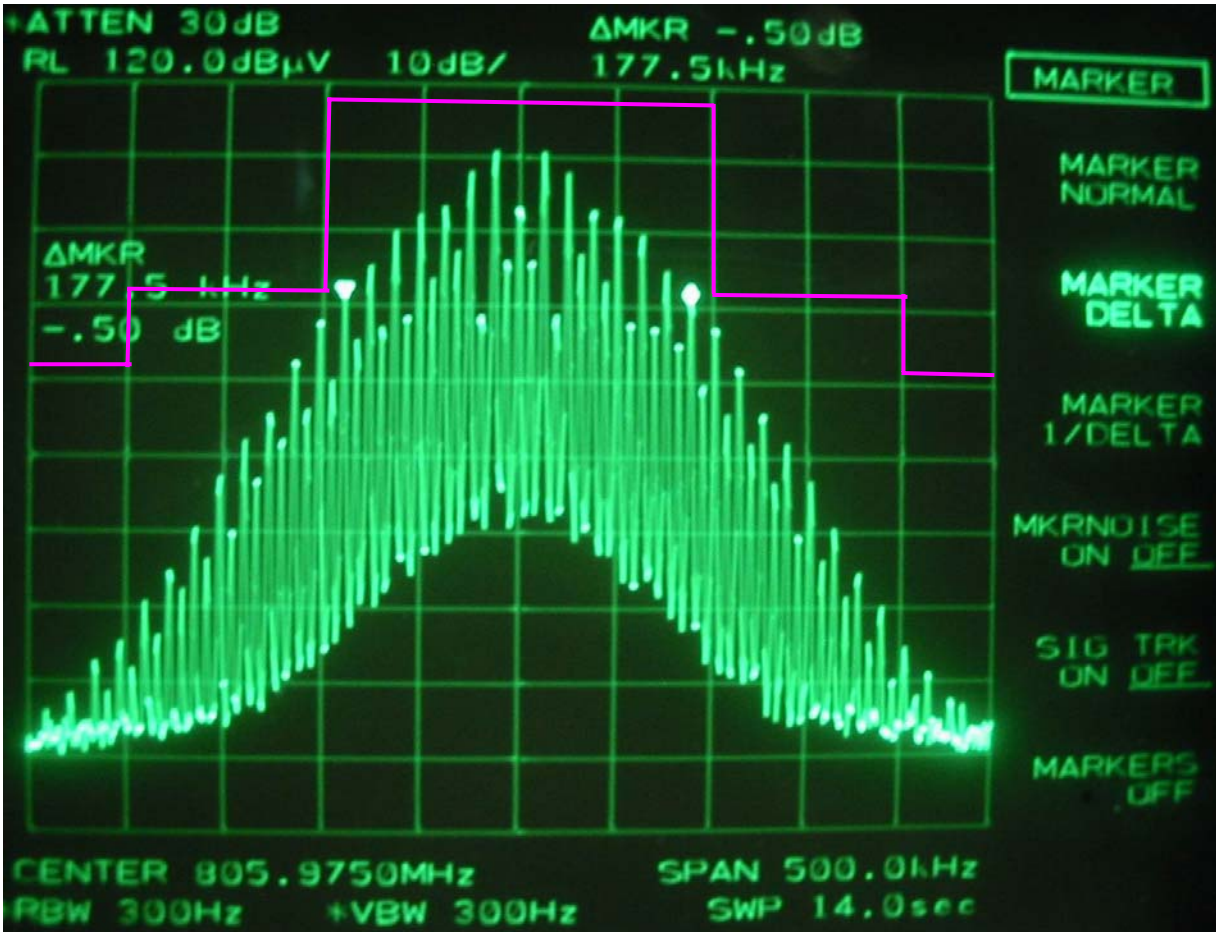
1.768kHz modulation



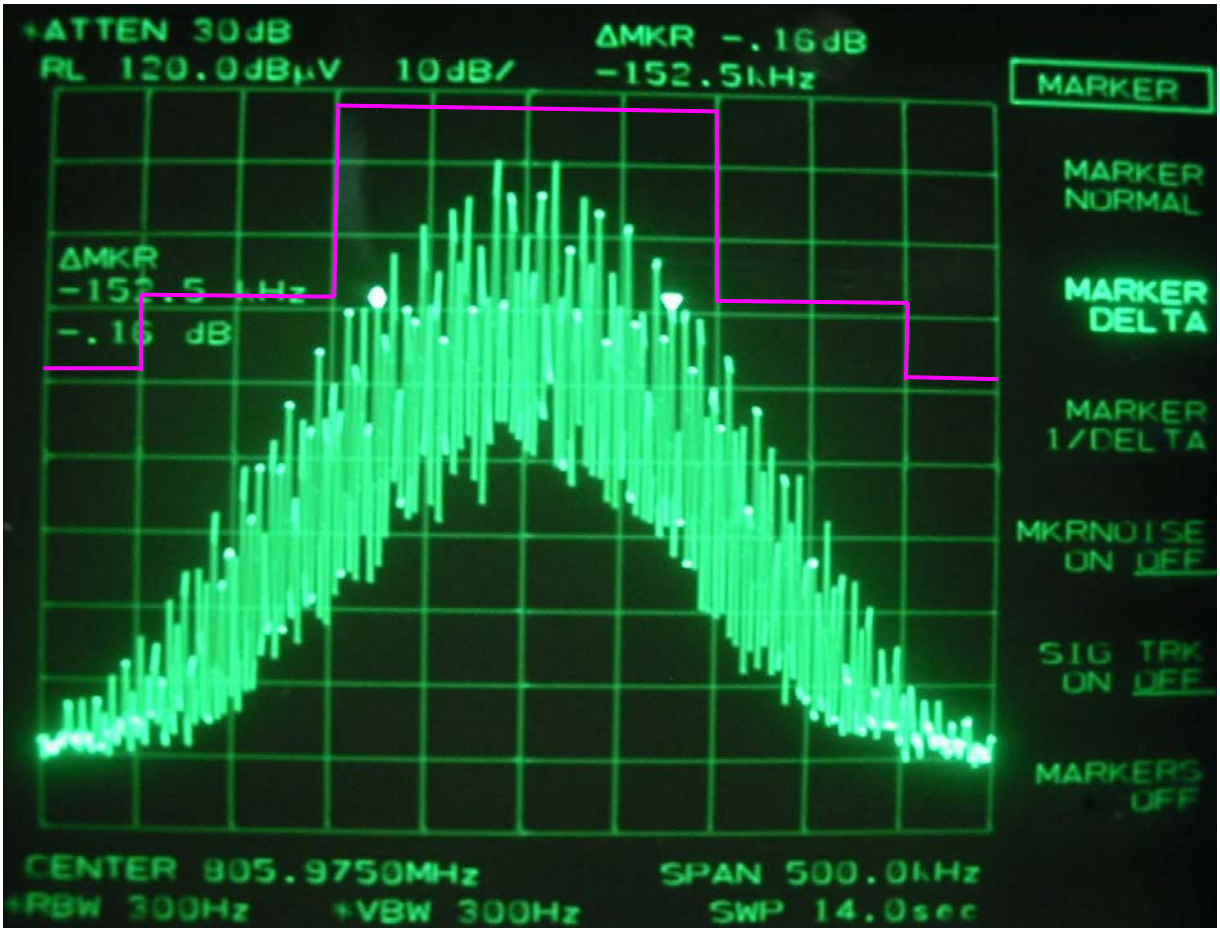
2.5kHz modulation



12.5kHz modulation



15kHz modulation



Chapter 6 Field Strength of Spurious Radiation Measurement

6.1 Rules and Specification Limits

2.1053(a): ANSI/ TIA/ EIA-603-1992, Paragraph 2.2.12

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, Power leads, or intermediate circuit elements under normal conditions of installation and operation.

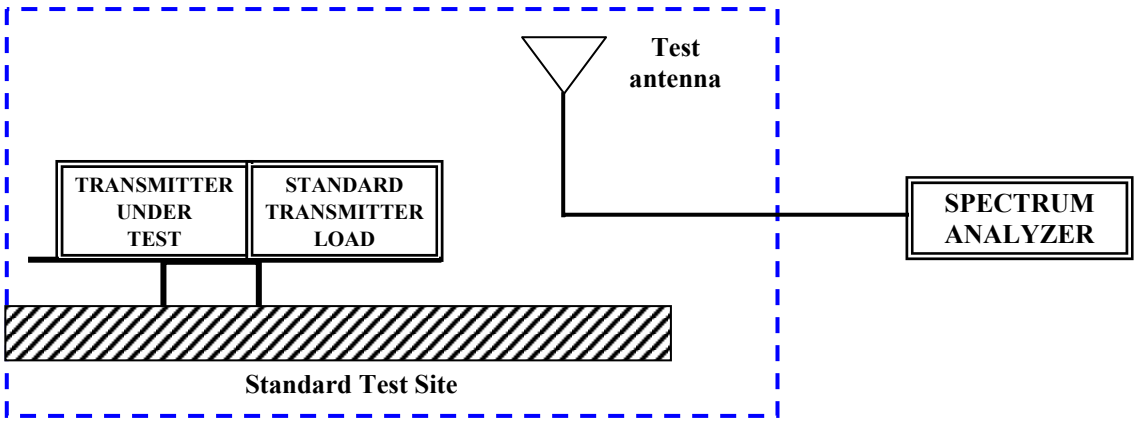
74.861(e)(6)(iii):

Spurious and harmonics must be at least 43 + 10 log (Output Power) below the Carrier peak

2.1057:

In all measurements set forth, the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10^{th} harmonic of the carrier frequency.

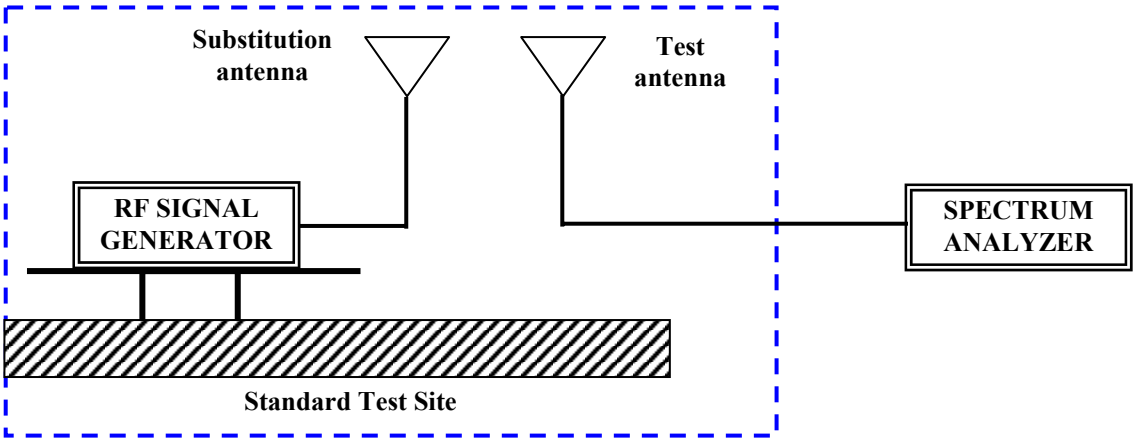
6.2 Measurement Condition & Setup



1. Connect the equipment as illustrated.

2. Adjust the spectrum analyzer for the following setting:
   a) Resolution Bandwidth ≦ 3kHz
   b) Video Bandwidth ≧ 10kHz
   c) Sweep Speed ≦ 2000Hz /second
   d) Detector mode = Positive Peak

3. 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.
4. For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. The length may be determined form a calibration ruler supplied with the equipment. Measurements shall be made form the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to ±the test bandwidth (see section 1.3.4.4)
5. For each spurious frequency, raise and lower the test antenna from 1m to 4m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360º to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
6. Repeat step (5) for each spurious frequency with the test antenna polarized vertically.



7. Reconnect the equipment as illustrated.
8. Keep the spectrum analyzer adjusted as in step (2)

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

10. 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 spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

11. Repeat step (10) with both antennas vertically polarized for each spurious frequency.

12. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps (10) and (11) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to and ideal half-wave dipole antenna.

13. The levels record in step (12) are the absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

    Radiated spurious emissions (dB) =

    $$10 \log_{10}\left[\frac{\text{TX power in watts}}{0.001}\right] - \text{the levels in step (12)}$$

6.3 List of Measurement Instruments

				Calibration Date
Instrument Name	**Model**	**Brand**	**Serial No.**	**Next time**
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	12/07/07
Pre-amplifier	PA1F	TRC	1FAC	05/20/07
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/07
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/07
Spectrum Analyzer	8564E	HP	3720A00840	12/11/07
Microwave Preamplifier	84125C	HP	US36433002	11/18/07
Horn Antenna	3115	EMCO	9104-3668	01/23/07
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	12/12/07
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	12/12/07
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	01/26/07
Pre-amplifier	PA2F	TRC	2F1GZ	06/20/07
Coaxial Cable (3 miter)	A30A30-0058-50FST118	JYEBAO	MSA-05	06/20/07
Coaxial Cable (1 meter)	A30A30-0058-50FST118	JYEBAO	MSA-04	06/20/07

6.4 Measurement Result:

Test Conditions: Testing room : Temperature : 25 °C Humidity : 73 % RH

Test mode: Lowest CH – 614.025MHz (Horizontal)

Frequency	*Reading Amplitude*	*Ant. Height*	*Table*	*Correction Factors*	*Corrected Power*	*Attenuated below the mean power*	*Minimum Attenuation limit*
MHz	**dBm**	**m**	**degree**	**dB**	**dBm**	**dBc**	**dBc**
159.74	-61.57	1.00	62	-3.49	-65.06	80.35	28.29
604.12	-65.76	1.00	138	6.41	-59.35	74.64	
1228.75	-51.66	1.00	187	1.00	-50.66	65.95	
1840.00	-37.82	1.00	286	2.14	-35.68	50.97	
2455.00	-47.99	1.00	312	6.65	-41.34	56.63	
3070.00	-44.83	1.00	113	9.37	-35.46	50.75	

Test mode: Lowest CH – 614.025MHz (Vertical)

Frequency	*Reading Amplitude*	*Ant. Height*	*Table*	*Correction Factors*	*Corrected Power*	*Attenuated below the mean power*	*Minimum Attenuation limit*
MHz	**dBm**	**m**	**degree**	**dB**	**dBm**	**dBc**	**dBc**
38.49	-64.91	1.00	170	5.78	-59.13	74.42	28.29
604.12	-63.86	1.00	298	6.41	-57.45	72.74	
1840.00	-41.16	1.00	69	2.14	-39.02	54.31	
2455.00	-46.66	1.00	358	6.65	-40.01	55.30	
3070.00	-48.16	1.00	38	9.37	-38.79	54.08	
3685.00	-45.32	1.00	320	11.14	-34.18	49.47	

Note:

1. **Corrected Amplitude = Reading Amplitude + Correction Factors**
2. **The maximum field measured is 15.29 dBm**
   Attenuated below the mean power = Power – Corrected Power
   { For example: 15.29 – (-35.46) = 50.75 dBc }
3. **Attenuation required = 43 + 10 log (33.828 mW) = 28.29**

Test mode: Middle CH – 710.000MHz (Horizontal)

Frequency	*Reading Amplitude*	*Ant. Height*	*Table*	*Correction Factors*	*Corrected Power*	*Attenuated below the mean power*	*Minimum Attenuation limit*
MHz	**dBm**	**m**	**degree**	**dB**	**dBm**	**dBc**	**dBc**
159.13	-61.51	1.00	65	-3.50	-65.01	70.75	18.64
699.91	-66.97	1.00	256	9.30	-57.67	63.31	
2837.50	-38.32	1.00	144	8.75	-29.57	35.21	
3550.00	-50.32	1.00	95	10.60	-39.72	45.36	
4258.75	-48.66	1.00	34	12.91	-35.75	41.39	
4971.25	-55.49	1.00	75	15.46	-40.03	45.67	

Test mode: Middle CH – 710.000MHz (Vertical)

Frequency	*Reading Amplitude*	*Ant. Height*	*Table*	*Correction Factors*	*Corrected Power*	*Attenuated below the mean power*	*Minimum Attenuation limit*
MHz	**dBm**	**m**	**degree**	**dB**	**dBm**	**dBc**	**dBc**
37.88	-64.14	1.00	155	5.88	-58.26	63.90	18.64
699.91	-65.79	1.00	48	9.30	-56.49	62.13	
2837.50	-41.16	1.00	357	8.75	-32.41	38.05	
3550.00	-47.66	1.00	251	10.60	-37.06	42.70	
4258.75	-49.66	1.00	125	12.91	-36.75	42.39	
4971.25	-49.82	1.00	17	15.46	-34.36	40.00	

Note:

1. **Corrected Amplitude = Reading Amplitude + Correction Factors**
2. **The maximum field measured is 5.64 dBm**
   Attenuated below the mean power = Power – Corrected Power
3. **Attenuation required = 43 + 10 log (3.667mW) = 18.64**

Test mode: Highest CH – 805.975MHz (Horizontal)

Frequency	*Reading Amplitude*	*Ant. Height*	*Table*	*Correction Factors*	*Corrected Power*	*Attenuated below the mean power*	*Minimum Attenuation limit*
MHz	**dBm**	**m**	**degree**	**dB**	**dBm**	**dBc**	**dBc**
114.27	-63.83	1.00	88	-2.02	-65.85	84.10	31.36
795.69	-67.85	1.00	130	11.84	-56.01	74.26	
2417.50	-41.49	1.00	302	6.44	-35.05	53.30	
3223.75	-46.16	1.00	172	9.66	-36.50	54.75	
1030.00	-55.66	1.00	299	12.55	-43.11	61.36	
4836.25	-54.15	1.00	234	14.81	-39.34	57.59	

Test mode: Highest CH – 805.975MHz (Vertical)

Frequency	*Reading Amplitude*	*Ant. Height*	*Table*	*Correction Factors*	*Corrected Power*	*Attenuated below the mean power*	*Minimum Attenuation limit*
MHz	**dBm**	**m**	**degree**	**dB**	**dBm**	**dBc**	**dBc**
121.54	-60.53	1.00	146	-2.28	-62.81	81.06	31.36
795.69	-63.47	1.00	31	11.84	-51.63	69.88	
1611.25	-29.49	1.00	242	0.36	-29.13	47.38	
2417.50	-26.33	1.00	233	6.44	-19.89	38.14	
3227.50	-51.15	1.00	0	9.66	-41.49	59.74	
4030.00	-43.83	1.00	145	12.55	-31.28	49.53	

Note:

1. Corrected Amplitude = Reading Amplitude + Correction Factors

2. The maximum field measured is 18.36 dBm

Attenuated below the mean power = Power – Corrected Power

3. Attenuation required = 43 + 10 log (68.596mW) = 31.36

Chapter 7 Frequency Stability Tolerance Measurement

7.1 Rules and Specification Limits

2.1055, ANSI/ TIA/ EIA-603-1992, Paragraph 2.2.2 .

74.861(e)(4): The frequency tolerance of the transmitter shall be 0.005 percent.

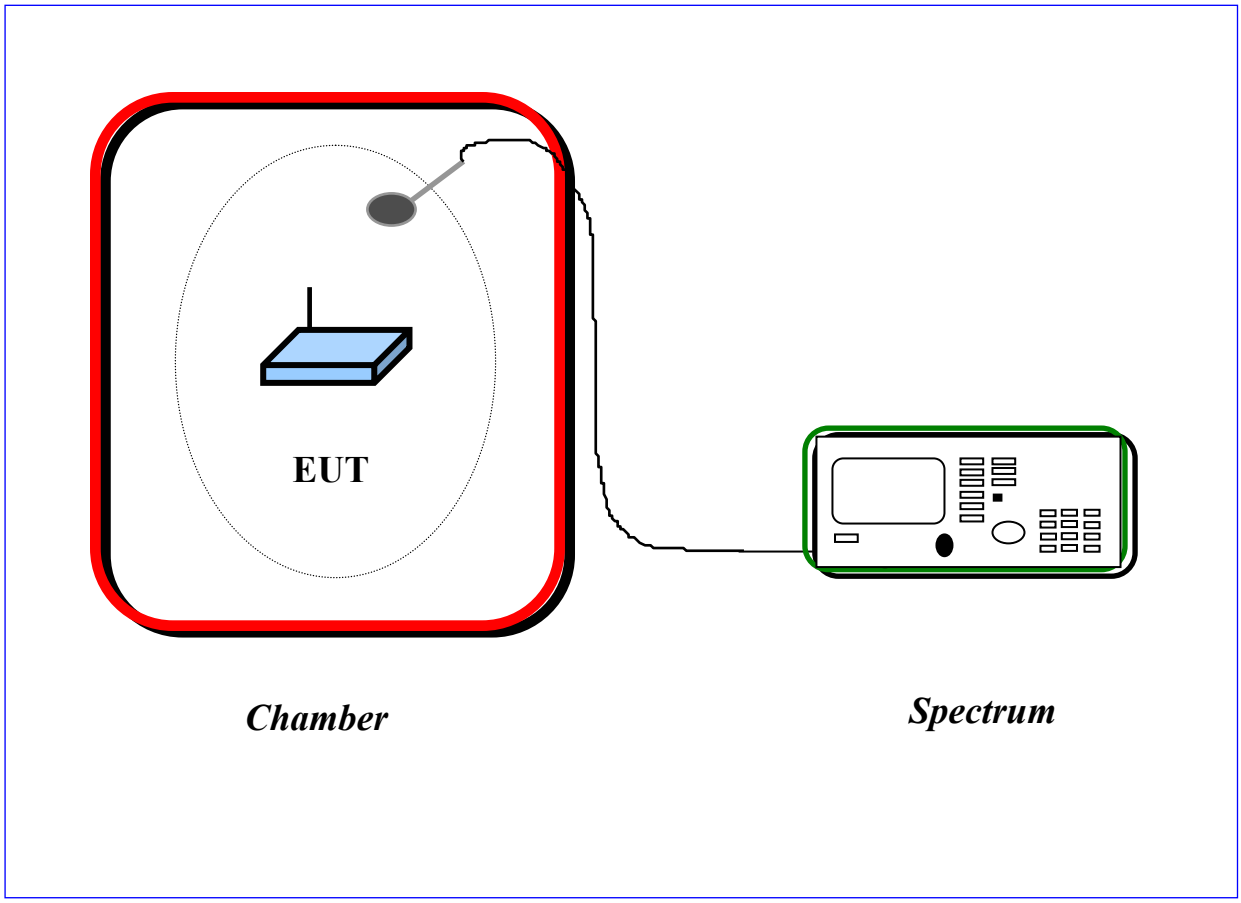
7.2 Measurement Condition & Setup with Temperature Variation

1. Place the EUT in the chamber, powered in its normal operation.
2. Set the temperature of the chamber -30 degree Centigrade. Allow the equipment to stabilize at that temperature.
3. Measured the carrier frequency using preamplifier and frequency counter.
4. Repeated procedures 1 to 3 from -20 to 50 degree Centigrade at internals of 10 degree.

7.3 List of Measurement Instruments with Temperature Variation List of test Instrument

Instrument Name	Model No.	Brand	Remark
Spectrum Analyzer	8591A	H P	1.8GHz
Temperature Chamber	THS-MV2	King Son	
Near field Probe	7405-901	EMCO	
Power Supply	GPR-6030	Good Will	
Auto Transformer	Powerstat	Supprior Elec. Co.	

7.4 Measurement Configuration of Temperature Variation Test



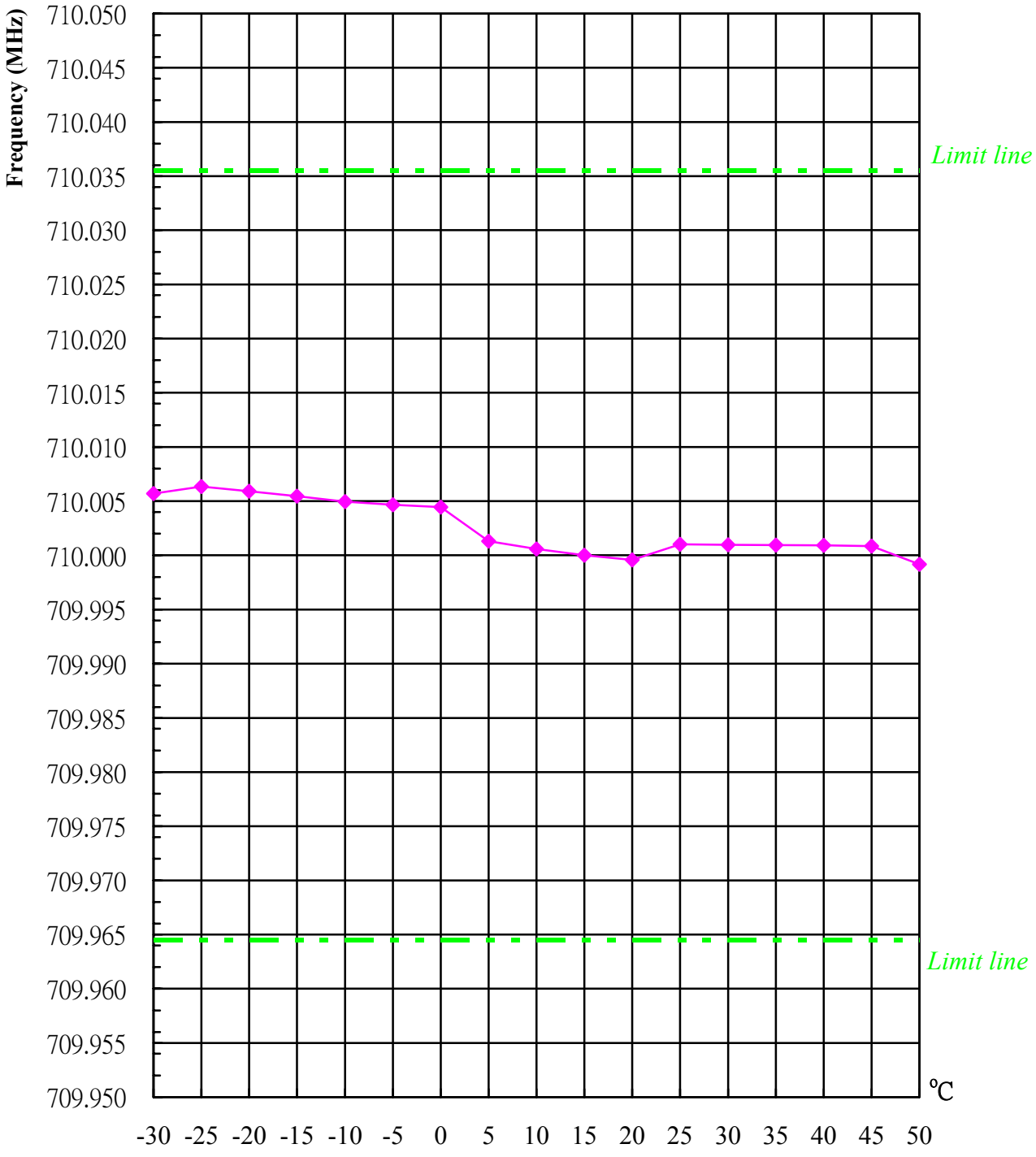
7.5 Measurement Result with Temperature Variation

A plot and table is presented which illustrates compliance with the rule where the center frequency is 710.000MHz.

Temperature Variation Table

Temperature (Centigrade)	*Frequency (MHz)*	*Tolerance (MHz)*
-30	710.00571	709.9645 To 710.0355
-25	710.00635	
-20	710.00592	
-15	710.00546	
-10	710.00496	
-5	710.00467	
0	710.00446	
5	710.00130	
10	710.00058	
15	710.00002	
20	709.99957	
25	710.00101	
30	710.00096	
35	710.00094	
40	710.00092	
45	710.00085	
50	709.99917	

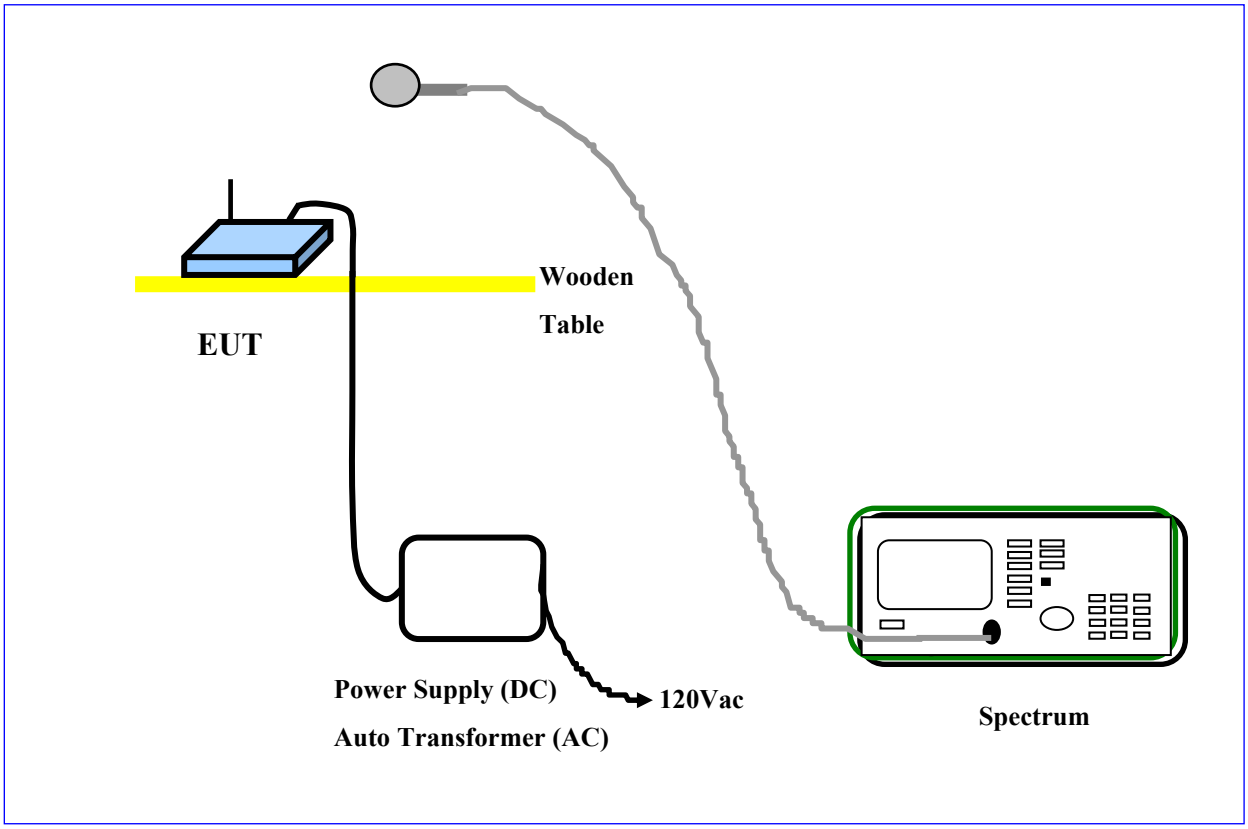
Chart 7.1 Temperatuer Variation Vs. Frequency



7.6 Measurement Condition & Setup with Voltage Variation

1. Attached the power line of the power supply to the battery position of the EUT.
2. Tuned the output power level to battery end point, 85 %, 100%, 115% of the normal operation power of EUT.
3. Recorded the frequency with a frequency counter.

7.7 Configuration of Voltage Variation Test



7.8 Measurement Result with Voltage Variation

Frequency Stability of Voltage Variation Measurement Table

Supply Voltage (Volt)	*Frequency (MHz)*	*Tolerance (MHz)*
102 (85%)	710.00465	709.9645 To 710.0355
120 (100%)	710.00726	
138 (115%)	710.00568	
Endpoint Voltage (Volt)	***Frequency (MHz)***	***Tolerance (MHz)***
10	710.0025	709.9645 ~ 710.0355

Chart 7.2 Voltage Variation Vs. Frequency