FCC Part 95 Rules
Test Report

Report No.:AGC02294200401FE10

FCC ID	:	2AJGM-F10
PRODUCT DESIGNATION	:	TWO WAY RADIO
BRAND NAME	:	POFUNG, BAOFENG
MODEL NAME	:	F10, JP-1, F10P, F10R, F10T
APPLICANT	:	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
DATE OF ISSUE	:	Jun. 06, 2020
STANDARD(S)	:	FCC Part 95 Rules
REPORT VERSION	:	V 1.0

***A**ttestation of **G**lobal **C**ompliance (Shenzhen) Co., Ltd*

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 06, 2020	Valid	Initial release

VERIFICATION OF COMPLIANCE

Applicant	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
manufacturer	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
Factory	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
Product Designation:	TWO WAY RADIO
Brand Name:	POFUNG, BAOFENG
Test Model	F10
Serial Model	JP-1, F10P, F10R, F10T
Difference Description	All the same except the model name.
Date of Test:	May 15, 2020~Jun. 06, 2020

WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 95 requirements. The test results of this report relate only to the tested sample identified in this report.

Prepared By — Calvin Liu
Calvin Liu (Project Engineer) — Jun. 06, 2020

Reviewed By — Max Zhang
Max Zhang (Reviewer) — Jun. 06, 2020

Approved By — Forrest Lei
Forrest Lei (Authorized Officer) — Jun. 06, 2020

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a **TWO WAY RADIO** designed for voice communication. It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical description of EUT is described as following:

Product Designation	TWO WAY RADIO
Test Model	F10
Hardware Version	BF-V10-A21-V1.1
Software Version	BF-V10-A21-V1.1
Modulation	F3E
Channel Separation	12.5KHz
Emission Type	11K0F3E
Emission Bandwidth	10.661 KHz
Maximum Transmitter Power	32.62dBm
Rated Output power	2W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
Antenna Designation	Inseparable
Antenna Gain	1.5dBi
Power Supply	DC 3.70V
Limiting Voltage	DC 3.15V-4.26V
Operation Frequency Range and Channel	FRS: 462.5625MHz -462.7125MHz(2W) 462.5500MHz-462.7250MHz(2W) Test Channel :4 and 19 channel
Frequency Tolerance	1.070ppm

Channel List:

Operation Frequency Each of Channel					
FRS		FRS		FRS	
Channel	Frequency	Channel	Frequency	Channel	Frequency
1	462.5625 MHz	8	--	15	462.5500 MHz
2	462.5875 MHz	9	--	16	462.5750 MHz
3	462.6125 MHz	10	--	17	462.6000 MHz
4	462.6375 MHz	11	--	18	462.6250 MHz
5	462.6625 MHz	12	--	19	462.6500 MHz
6	462.6875 MHz	13	--	20	462.6750 MHz
7	462.7125 MHz	14	--	21	462.7000 MHz
				22	462.7250 MHz

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **2AJGM-F10**, filing to comply with the FCC Part 95 requirements.

1.3 TEST METHODOLOGY.

The radiated emission testing was performed according to the procedures of TIA/EIA 603.

1.4 TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong,China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

1.5 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

1.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.4 CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System

Table 2-1 Equipment Used in Tested System

Item	Equipment	Model No.	Identifier	Note
1	TWO WAY RADIO	F10	FCC ID: 2AJGM-F10	EUT
2	Back clip	N/A	N/A	Accessories
3	Battery	F10	DC 3.7V 1500mAh	Accessories
4	Adapter	N/A	DC 5.0V 1A	Accessories
5	Charger	N/A	Input: DC 5.0V 1A Output: DC 5V 0.5A	Accessories

Note：The battery is full-charged during the test.

3. SUMMARY OF TEST RESULTS

FCC 47 CFR Part 95 Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Maximum Transmitter Power	FCC 47 CFR Part 95.567 FCC 47 CFR Part 2.1046(a)	ANSI/TIA-603-E-2016	PASS
Modulation Limit	FCC 47 CFR Part 95.575 FCC 47 CFR Part 2.1047(a)(b)	ANSI/TIA-603-E-2016	PASS
Audio Frequency Response	FCC 47 CFR Part 95.575 FCC 47 CFR Part 2.1047(a)	ANSI/TIA-603-E-2016	PASS
Emission Bandwidth	FCC 47 CFR Part 95.573	ANSI/TIA-603-E-2016	PASS
Emission Mask	FCC 47 CFR Part 95.579	ANSI/TIA-603-E-2016	PASS
Transmitter Radiated Spurious Emission	FCC 47 CFR Part 95.579	ANSI/TIA-603-E-2016	PASS
Spurious Emission On Antenna Port	FCC 47 CFR Part 95.579	ANSI/TIA-603-E-2016	N/A Note 1, 2
Frequency Stability	FCC 47 CFR Part 95.565 FCC 47 CFR Part 2.1055 (a)(1)	ANSI/TIA-603-E-2016	PASS

Note:

1) N/A: In this whole report not application.
2) The EUT is Integral Antenna.

LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2019	Jun. 11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec. 11, 2020
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.18, 2018	Sep.17, 2020
preamplifier	ChengYi	EMC184045SE	980508	Sep. 23, 2019	Sep. 22, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun. 12, 2019	Jun. 11, 2020
Double-Ridged Waveguide Horn	ETS	3117	00154520	Oct. 26, 2019	Oct. 25, 2021
SIGNAL GENERATOR	AGILENT	E4421B	MY43351603	Jun. 12, 2019	Jun. 11, 2020
SIGNAL GENERATOR	R&S	SMT03	A0304261	Jun. 12, 2019	Jun. 11, 2020
ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 09, 2019	Jan. 08, 2021
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.26, 2018	Sep.25, 2020
Modulation Domain Analyzer	HP	53310A	3121A02467	Oct. 30, 2019	Oct. 29, 2020
Small environmental tester	ESPEC	SH-242	--	Oct. 08, 2019	Oct. 07, 2020
RF Communication Test Set	HP	8920B	--	Jun. 12, 2019	Jun. 11, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 13, 2019	Jun. 12, 2020
Attenuator	Schaffner	58-30-33	ML030	Oct. 28, 2019	Oct. 27, 2020
Vector Analyzer	Agilent	E4440A	US40420298	July 02, 2019	July 01, 2020
RF Cable	R&S	1#	--	Each time	N/A
Fliter-UHF	Microwave	N25155M2	498705	May. 11, 2020	May. 10, 2021

Note: 8920B can generate audio modulation frequency.

4. DESCRIPTION OF TEST MODES

RF TEST MODES

The EUT (**TWO WAY RADIO**) has been tested under normal operating condition. (FRS TX) are chosen for testing at each channel separation.

No.	TEST MODES	CHANNEL SEPARATION
1	FRS TX	12.5 KHz

Note:1. Only the result of the worst case was recorded in the report.

5. FREQUENCY TOLERANCE

5.1 PROVISIONS APPLICABLE

Standard Applicable [Part 95.565]The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.
FCC Part 95.565,
FRS: The carrier frequency tolerance shall be better than ±2.5 ppm.

5.2 MEASUREMENT PROCEDURE

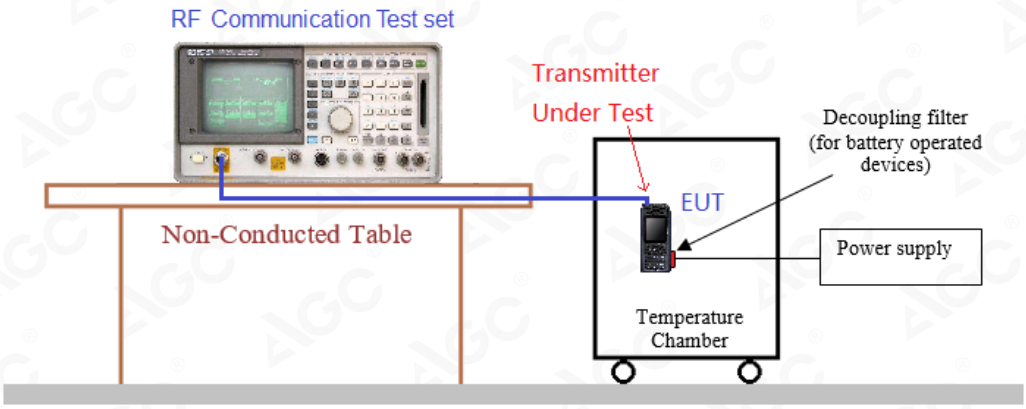
5.2.1 Frequency stability versus environmental temperature

1. Setup the configuration per figure 1 for frequencies measurement inside an environment chamber, Install new battery in the EUT.
2. Turn on EUT and set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1KHz and Video Resolution Bandwidth to 1KHz and Frequency Span to 50KHz.Record this frequency as reference frequency.
3. Set the temperature of chamber to 50℃. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10℃ decreased per stage until the lowest temperature -30℃ is measured, record all measured frequencies on each temperature step.

5.2.2 Frequency stability versus input voltage

1. Setup the configuration per figure 1 for frequencies measured at temperature if it is within 15℃ to 25℃. Otherwise, an environment chamber set for a temperature of 20℃ shall be used. The EUT shall be powered by DC 3.7V.
2. Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1 KHz and Video Resolution Bandwidth to 1KHz. Record this frequency as reference frequency.
3. Supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.

5.3 TEST SETUP BLOCK DIAGRAM



5.3 TEST RESULT

(1) Frequency stability versus input voltage (Supply nominal voltage is 3.7V)

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		462.6375MHz	462.6500MHz	
50	DC 3.70	0.388	0.653	±2.5for FRS
40	DC 3.70	0.884	0.852	
30	DC 3.70	0.642	0.644	
20	DC 3.70	1.070	0.752	
10	DC 3.70	0.818	0.568	
0	DC 3.70	0.928	0.691	
-10	DC 3.70	0.616	0.623	
-20	DC 3.70	0.654	1.005	
-30	DC 3.70	0.962	0.613	
Result	Pass			

(2) Frequency stability versus input voltage (Battery Fully Charged voltage is 4.26V)

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		462.6375MHz	462.6500MHz	
50	DC 4.26	0.511	0.414	±2.5for FRS
40	DC 4.26	0.857	0.776	
30	DC 4.26	0.760	0.512	
20	DC 4.26	0.962	0.902	
10	DC 4.26	0.468	0.481	
0	DC 4.26	0.404	0.942	
-10	DC 4.26	0.646	0.499	
-20	DC 4.26	0.658	0.388	
-30	DC 4.26	0.822	0.550	
Result	Pass			

(3) Frequency stability versus input voltage (Battery limiting voltage is 3.15V)

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		462.6375MHz	462.6500MHz	
50	DC 3.15	0.599	0.653	±2.5for FRS
40	DC 3.15	0.824	0.727	
30	DC 3.15	0.994	0.834	
20	DC 3.15	0.599	0.646	
10	DC 3.15	0.540	0.945	
0	DC 3.15	0.522	0.913	
-10	DC 3.15	0.876	0.609	
-20	DC 3.15	0.593	0.662	
-30	DC 3.15	0.597	0.636	
Result	Pass			

Note: 1.Battery terminal voltage is declared and specified by the manufacturer.
2. All test values are in "ppm"

6. EMISSION BANDWIDTH

6.1 PROVISIONS APPLICABLE

FCC Part 95.573: FRS: The authorized bandwidth for an FRS unit is 12.5 kHz.
Occupied Bandwidth (Section 2.1049, 95.573): The EUT was connected to the audio signal generator and the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer.

6.2 MEASUREMENT PROCEDURE

1). The EUT was modulated by 2.5 KHz Sine wave audio signal, The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing).

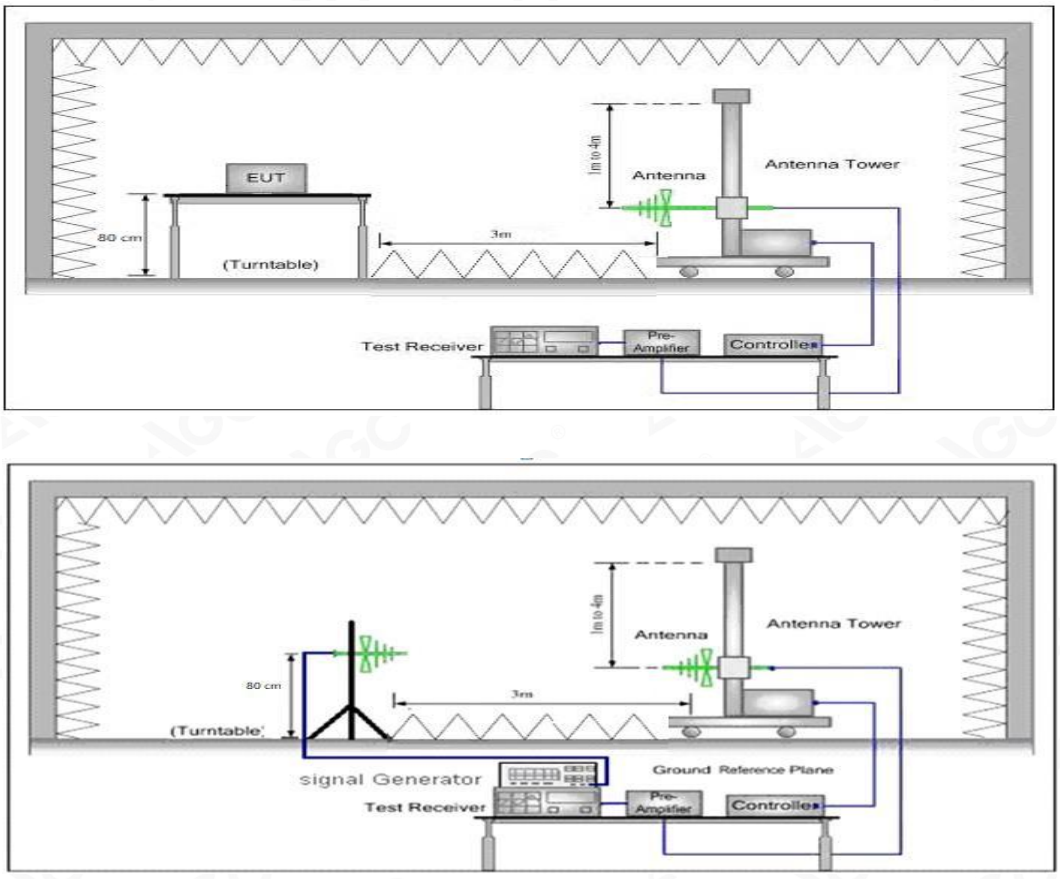
2). Set SPA Center Frequency = fundamental frequency, RBW=300Hz.VBW= 1KHz, Span =50 KHz.

3). Set SPA Max hold. Mark peak, -26 dB.

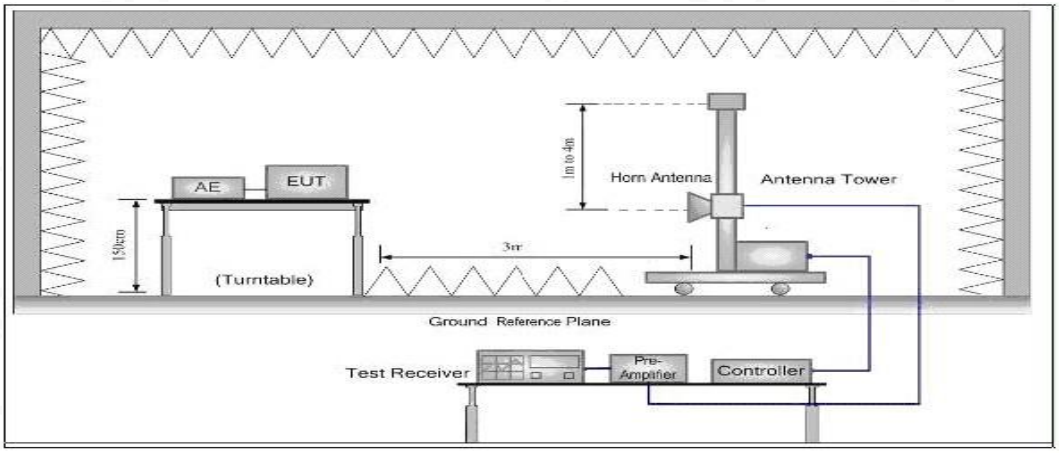
6.3 TEST SETUP BLOCK DIAGRAM

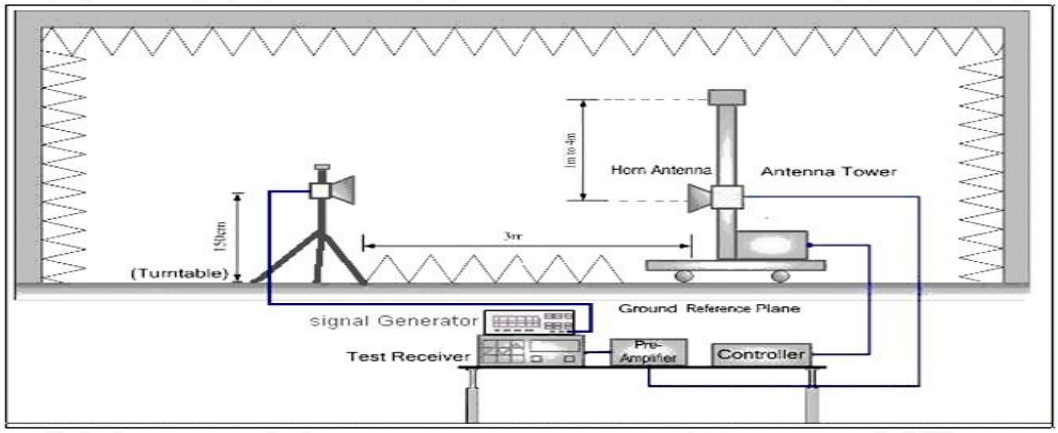
Radiation method:

Radiated Below1GHz

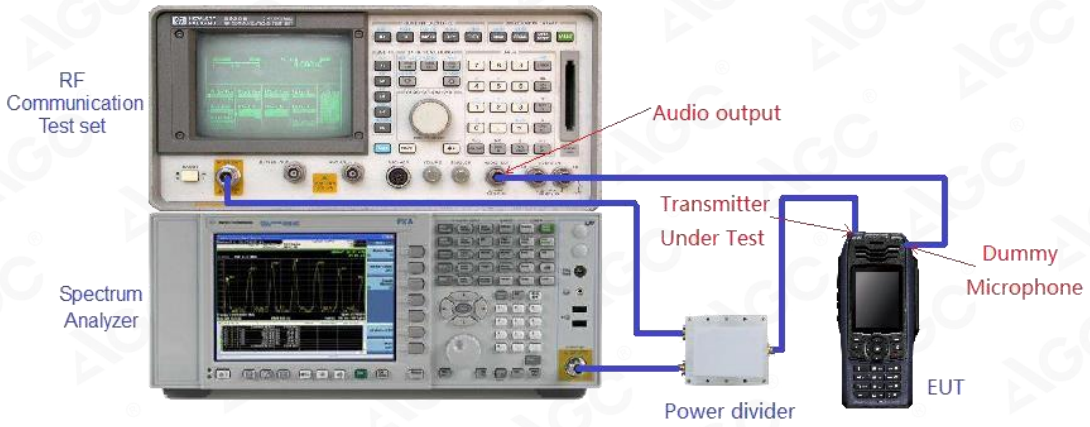


Radiated Above 1 GHz





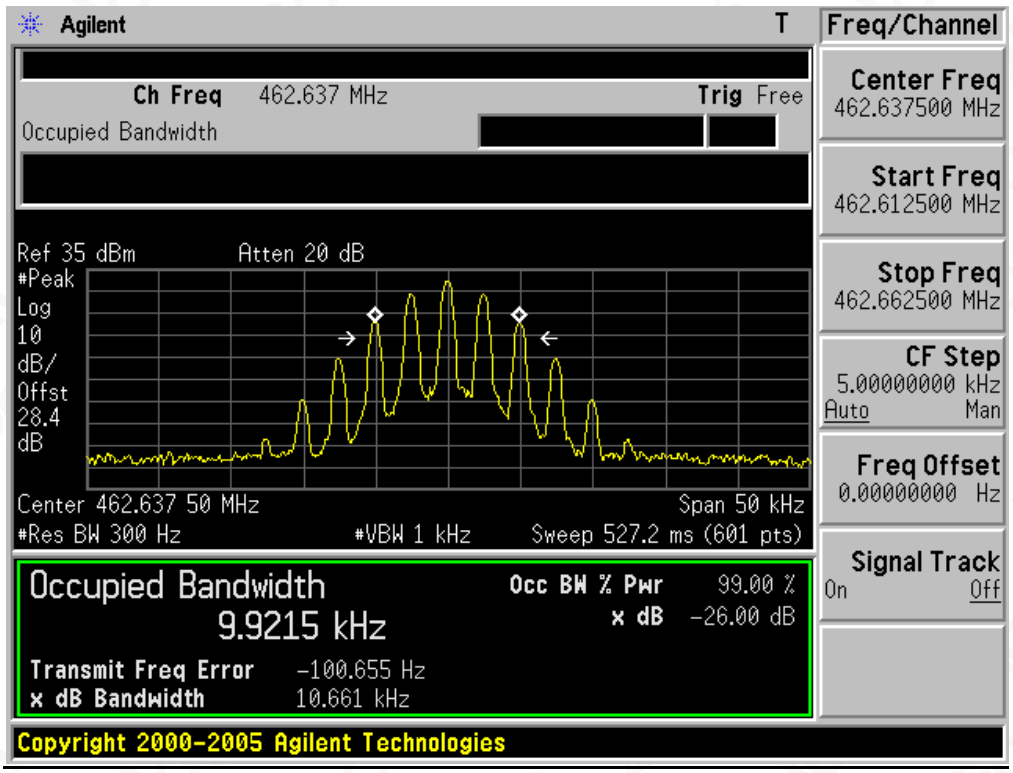
Conduction method:



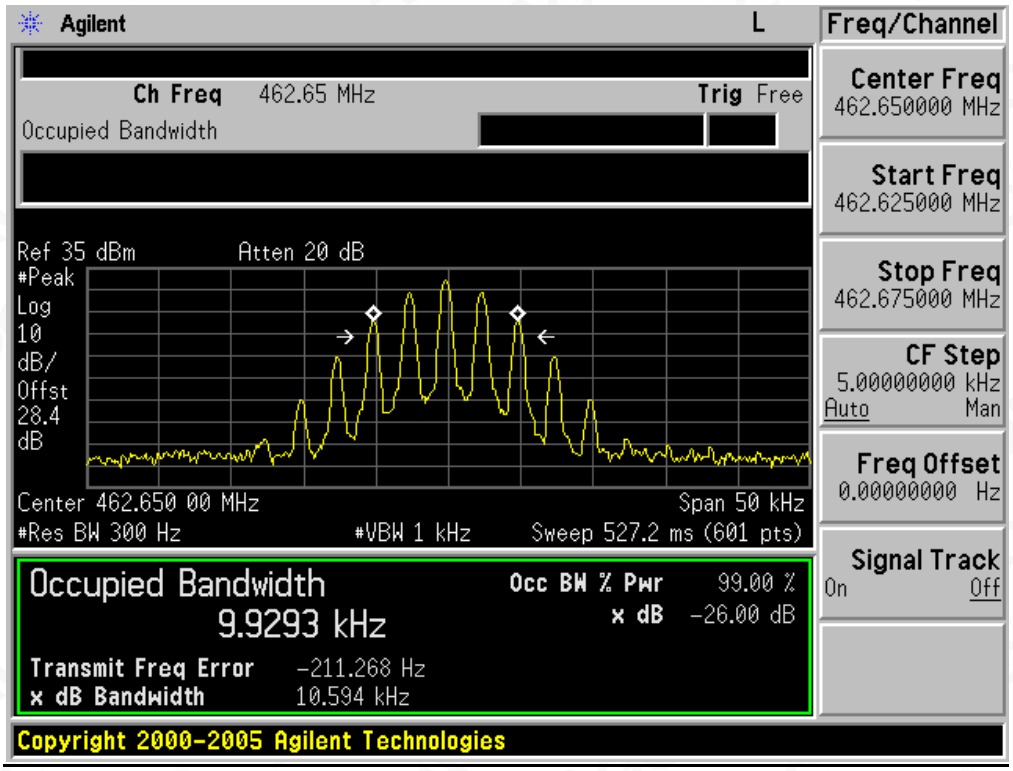
6.4 MEASUREMENT RESULT

26dB &99% Bandwidth Measurement Result				
Operating Frequency	12.5 KHz Channel Separation			
	26dB Bandwidth	99% Bandwidth	Limits	Result
462.6375MHz	10.661 KHz	9.9215 KHz	12.5 KHz	Pass
462.6500MHz	10.594 KHz	9.9293 KHz	12.5 KHz	Pass

Occupied bandwidth of 462.6375MHz-2W



Occupied bandwidth of 462.6500MHz-2W



7. UNWANTED RADIATION

7.1 PROVISIONS APPLICABLE

Standard Applicable [FCC Part 95.579]

According to FCC section 95.579, the unwanted emission should be attenuated below TP by at least 43+10 log(Transmit Power) dB.

7.2 MEASUREMENT PROCEDURE

(1)On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

(2)The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.

(3)The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

(4)The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

(5)The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.

(6)The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

(7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

(8)The maximum signal level detected by the measuring receiver shall be noted.

(9)The measurement shall be repeated with the test antenna set to horizontal polarization.

(10) Replace the antenna with a proper Antenna (substitution antenna).

(11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.

(12)The substitution antenna shall be connected to a calibrated signal generator.

(13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

(14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

(15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

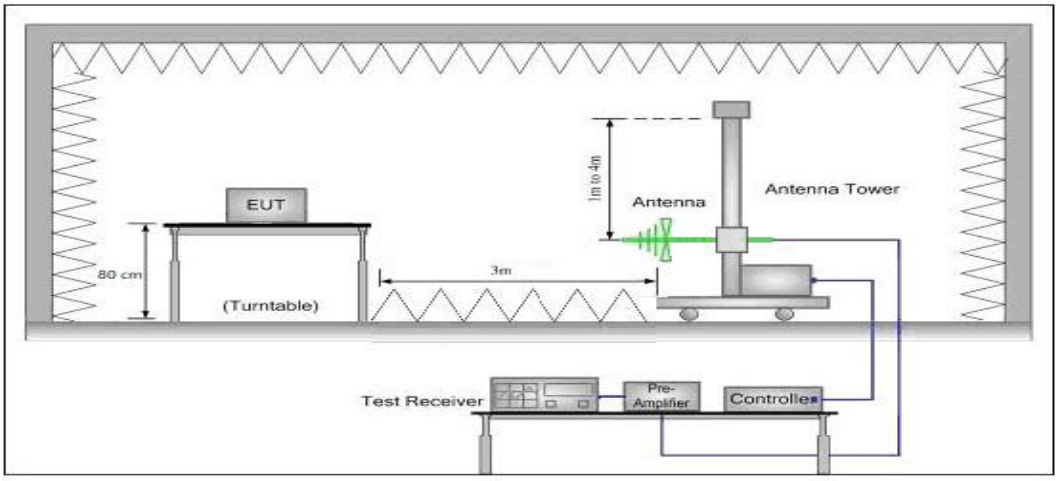
(16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

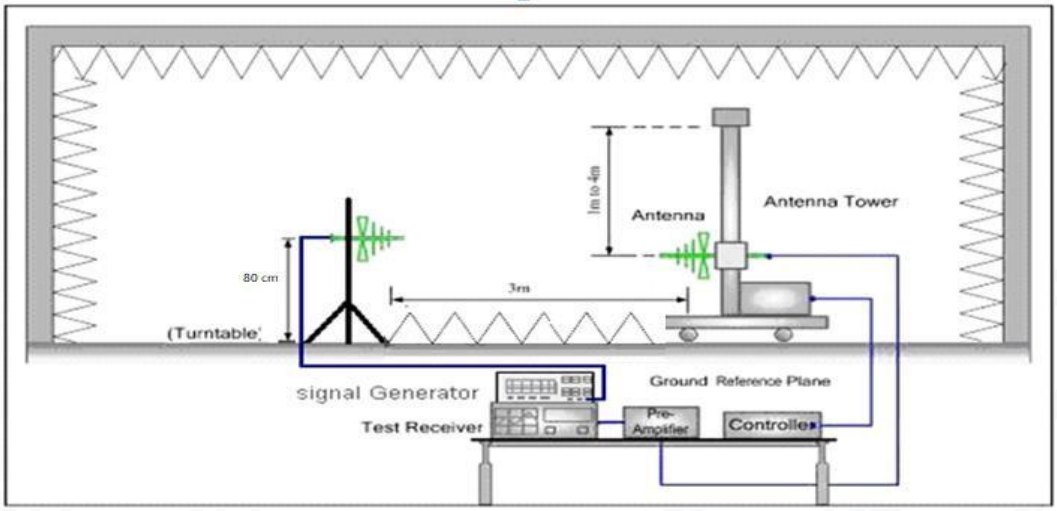
(17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

7.3 TEST SETUP BLOCK DIAGRAM

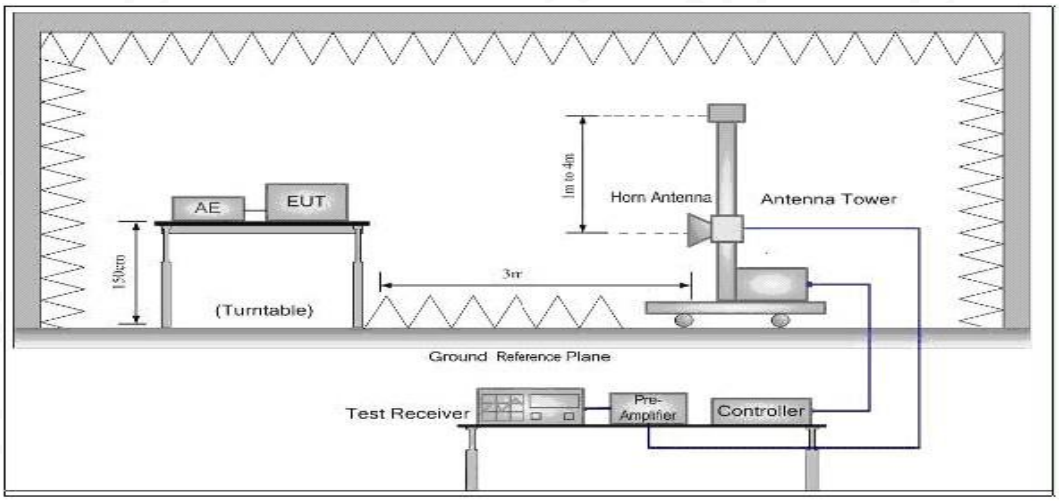
SUBSTITUTION METHOD: (Radiated Emissions)

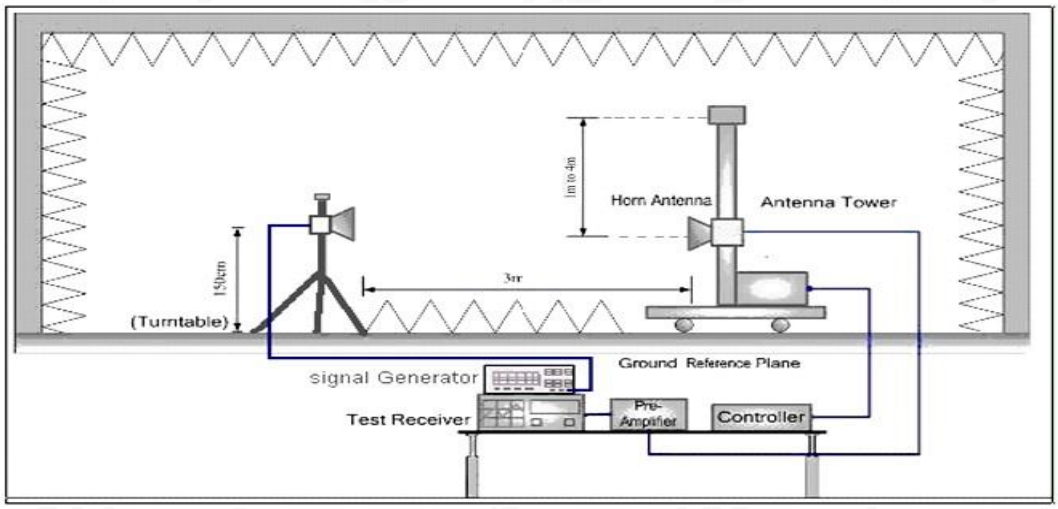
Radiated Below1GHz





Radiated Above 1 GHz





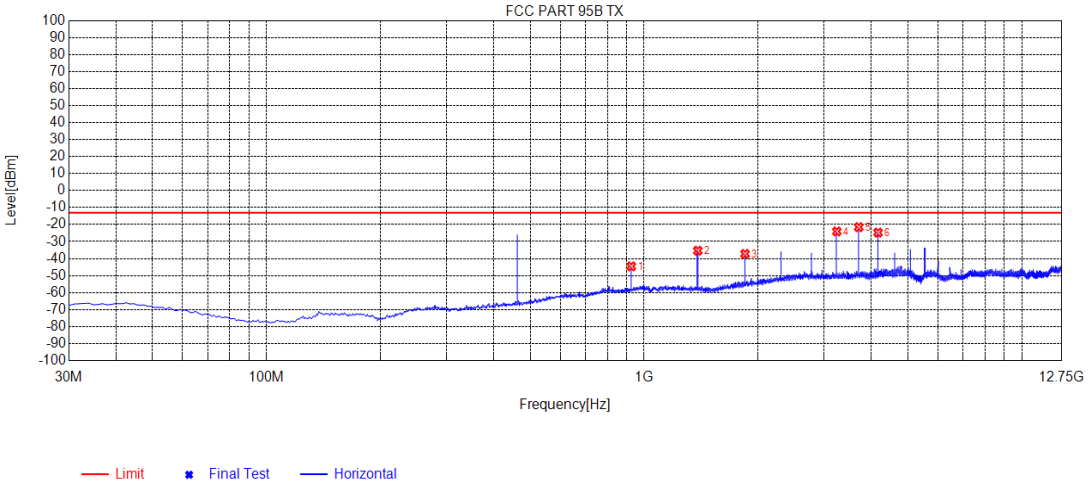
7.4 MEASUREMENT RESULTS:

the unwanted emission should be attenuated below TP by at least 43+10 log(Transmit Power) dB

Limit: At least 43+10 log (P) =43+10log (2) =46(dBc) 33-46= -13dBm
At least 43+10 log (P) =43+10log (0.5) =39.99(dBc) 26.99-39.99= -13dBm

Note: The margin of the spurious emission results below 30MHz is less than 20dB. The default meets the requirements and only reflects the worst mode.

Measurement Result for 12.5 KHz Channel Separation @ 462.6375MHz-2W-Horizontal

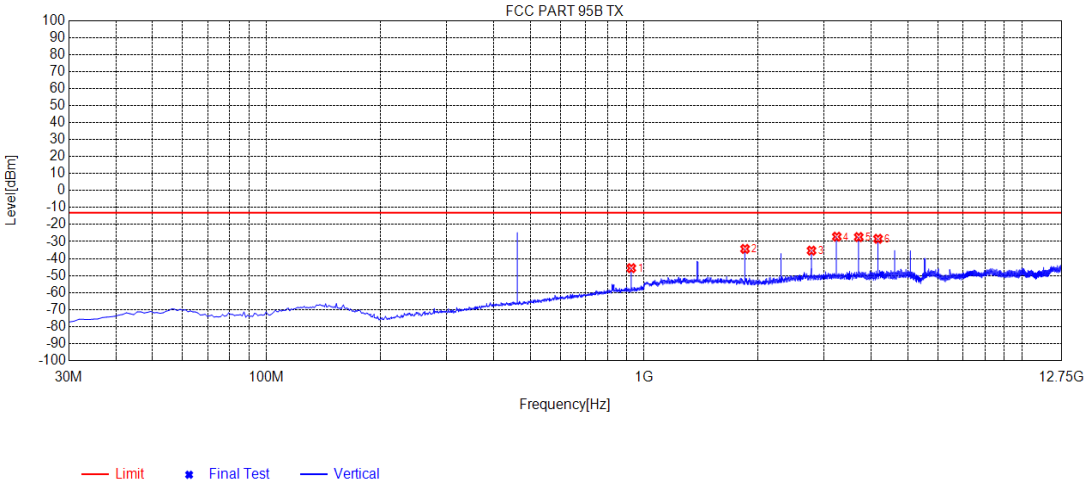


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	925.3100	-88.07	-44.58	-13.00	31.58	43.49	0	Horizontal
2	1387.7888	-31.92	-35.37	-13.00	22.37	-3.45	334	Horizontal
3	1850.7851	-36.67	-37.26	-13.00	24.26	-0.59	250	Horizontal
4	3238.5989	-29.77	-24.06	-13.00	11.06	5.71	15	Horizontal
5	3701.5952	-28.34	-21.53	-13.00	8.53	6.81	315	Horizontal
6	4163.4163	-33.04	-24.72	-13.00	11.72	8.32	53	Horizontal

Note:

1. Factor=Antenna Factor + Cable loss. (Below 1GHz)
2. Factor=Antenna Factor+ Cable loss-Pre-amplifier.(Above 1 GHz)
3. Margin=Limit- Level

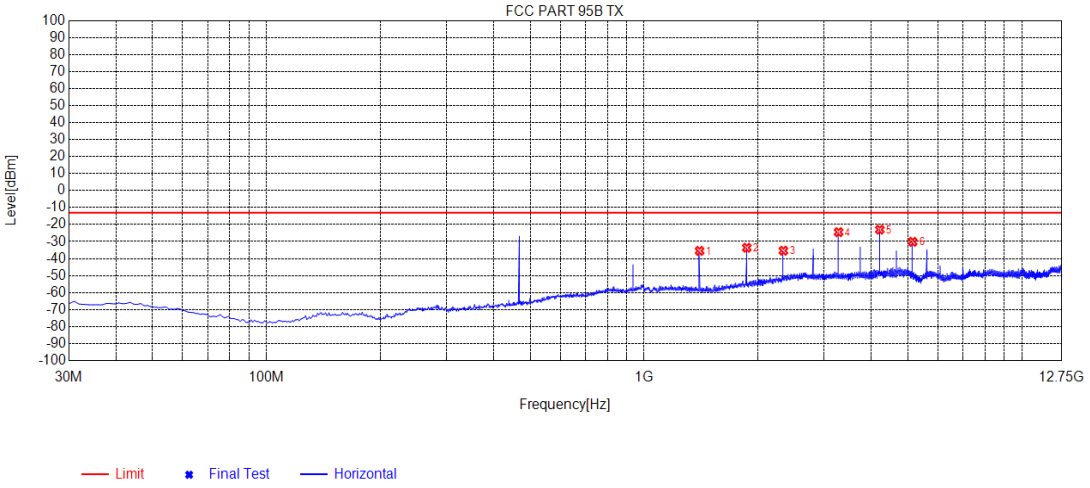
Measurement Result for 12.5 KHz Channel Separation @ 462.6375MHz-2W-Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	925.3100	-89.22	-45.65	-13.00	32.65	43.57	360	Vertical
2	1850.7851	-35.26	-34.33	-13.00	21.33	0.93	139	Vertical
3	2775.6026	-39.82	-35.35	-13.00	22.35	4.47	9	Vertical
4	3238.5989	-32.77	-27.15	-13.00	14.15	5.62	139	Vertical
5	3701.5952	-33.92	-27.36	-13.00	14.36	6.56	101	Vertical
6	4163.4163	-35.92	-28.38	-13.00	15.38	7.54	308	Vertical

Note:
1. Factor=Antenna Factor + Cable loss. (Below 1GHz)
2. Factor=Antenna Factor+ Cable loss-Pre-amplifier.(Above 1 GHz)
3. Margin=Limit- Level

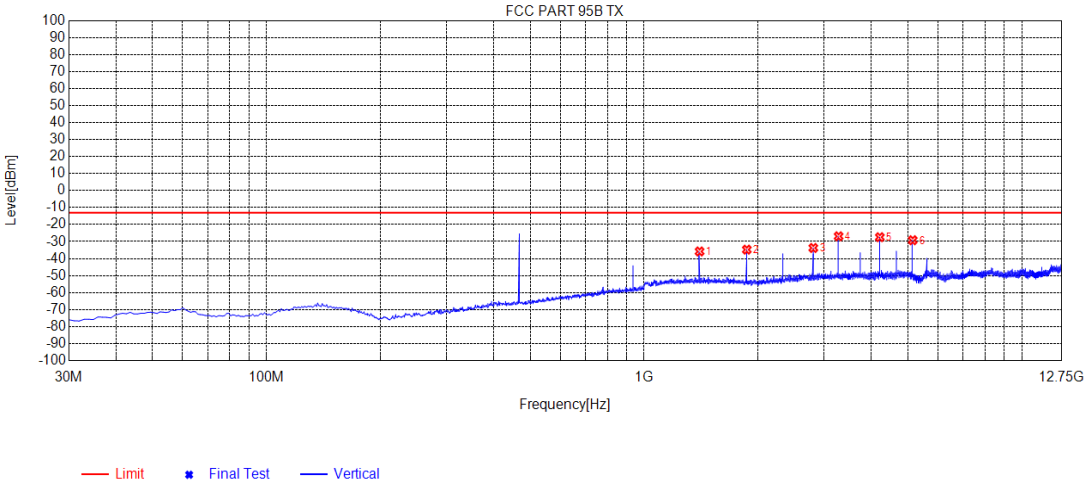
Measurement Result for 12.5 KHz Channel Separation @ 462.6500MHz-2W-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	1403.0653	-32.08	-35.49	-13.00	22.49	-3.41	289	Horizontal
2	1870.7621	-33.18	-33.62	-13.00	20.62	-0.44	205	Horizontal
3	2338.4588	-38.56	-35.38	-13.00	22.38	3.18	167	Horizontal
4	3273.8524	-30.24	-24.46	-13.00	11.46	5.78	46	Horizontal
5	4209.2459	-31.46	-22.99	-13.00	9.99	8.47	64	Horizontal
6	5144.6395	-39.94	-30.15	-13.00	17.15	9.79	130	Horizontal

Note:
1. Factor=Antenna Factor + Cable loss. (Below 1GHz)
2. Factor=Antenna Factor+ Cable loss-Pre-amplifier.(Above 1 GHz)
3. Margin=Limit- Level

Measurement Result for 12.5 KHz Channel Separation @ 462.6500MHz-2W -Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	1403.0653	-37.35	-35.83	-13.00	22.83	1.52	350	Vertical
2	1870.7621	-35.62	-34.76	-13.00	21.76	0.86	99	Vertical
3	2806.1556	-38.34	-33.77	-13.00	20.77	4.57	332	Vertical
4	3273.8524	-32.58	-26.90	-13.00	13.90	5.68	117	Vertical
5	4209.2459	-35.04	-27.43	-13.00	14.43	7.61	314	Vertical
6	5144.6395	-38.46	-29.22	-13.00	16.22	9.24	15	Vertical

Note:
1. Factor=Antenna Factor + Cable loss. (Below 1GHz)
2. Factor=Antenna Factor+ Cable loss-Pre-amplifier.(Above 1 GHz)
3. Margin=Limit- Level

7.5 EMISSION MASK PLOT

Standard Applicable [FCC Part 95.579] FRS: Unwanted emissions shall be attenuated below the unmodulated carrier power in accordance with the following:

(1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50 %up to and including 100% of the authorized bandwidth.

(2) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100 % up to and including 250 % of the authorized bandwidth.

(3) At least 43 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than250 %.

The detailed procedure employed for Emission Mask measurements are specified as following:

- The transmitter shall be modulated by a 2.5 kHz audio signal,
- The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz.