FCC Part 90 Rules
Test Report

Report No.: AGC00589170706FE10

FCC ID	:	T4KD868SUHF
PRODUCT DESIGNATION	:	DMR Digital Radio
BRAND NAME	:	N/A
MODEL NAME	:	D868S
CLIENT	:	Qixiang Electron Science & Technology Co., Ltd
DATE OF ISSUE	:	Jul. 03,2017
STANDARD(S)	:	FCC Part 90 Rules FCC Part 22 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	/	Jul. 03,2017	Valid	Original Report

VERIFICATION OF COMPLIANCE

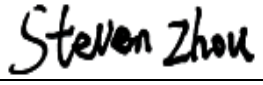
Applicant:	Qixiang Electron Science & Technology Co., Ltd
	Qixiang Building, Tangxi Industrial Zone, Luojiang,Quanzhou, Fujian, 362011 China
Manufacturer:	Qixiang Electron Science & Technology Co., Ltd
	Qixiang Building, Tangxi Industrial Zone, Luojiang,Quanzhou, Fujian, 362011 China
Product Designation:	DMR Digital Radio
Brand Name:	N/A
Test Model	D868S
Date of Test:	Jun. 26,2017 to Jul. 03,2017

WE HEREBY CERTIFY THAT:

The above equipment was tested by Dongguan Precise Testing Service 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 90 and FCC Rules Part 22 requirements

The test results of this report relate only to the tested sample identified in this report.

Tested by

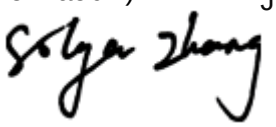


Steven Zhou(Zhou Pengyun) Jul. 03,2017

Reviewed by

Bart Xie(Xie Xiaobin) Jul. 03,2017

Approved by



Solger Zhang(Zhang Hongyi) Jul. 03,2017
Authorized Officer

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a **DIGITAL/ANALOG RADIO** designed for voice/data communication. It is designed by way of utilizing the FM/4FSK modulation achieves the system operating.
A major technical description of EUT is described as following:

Communication Type	Voice / Data
Hardware Version	V3.0
Software Version	V1.0
Modulation	FM/4FSK
Emission Type	11K0F3E, 7K60FXD, 7K60FXW
Emission Bandwidth	Analog:10.14KHz(9W),10.17KHz(4.5W) ---UHF -12.5KHz Analog:10.15KHz(2.5W),10.19KHz(1W) ---UHF -12.5KHz Digital:9.071KHz(9W), 9.038KHz(4.5W) ---UHF-12.5KHz Digital:8.938KHz(2.5W), 9.316KHz(1W) ---UHF-12.5KHz
Peak Frequency Deviation	1.93KHz
Audio Frequency Response	11.08 dB
Maximum Transmitter Power	Analog:39.48 dBm(9W), 36.42dBm (4.5W) --- UHF-12.5KHz Analog:33.85 dBm(2.5W), 29.87dBm (1W) --- UHF-12.5KHz Digital: 39.43 dBm(9W), 36.47dBm (4.5W) ---UHF-12.5KHz Digital: 33.87 dBm(2.5W), 29.88dBm (1W) ---UHF-12.5KHz
Output power Modification	9W/4.5W/2.5W/1W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
Data Rate	9600bps/12.5KHz(Channel Spacing)
Antenna Designation	Detachable
Antenna Gain	2.15 dBi
Power Supply	DC 7.4V, 2000mAh (by battery)
Adapter Parameter	INPUT：AC 100V-240V , 50/60Hz , 0.3A OUTPUT：DC 12V, 1A
Limiting Voltage	DC 6.00V- 8.51V
Operation Frequency Range and Channel	Frequency Range: 400 MHz to 480 MHz Channel Separation: 12.5KHz (Analog), 12.5KHz(Digital)
	Bottom Channel: 400.025MHz Middle Channel: 453.225MHz Middle Channel: 454.025MHz Top Channel: 479.975MHz
Frequency Tolerance	1.244ppm

Frequency Range (MHz)	Rated Transmit Power(W)(Conducted)	Transmit Mode/Emission Designator
400-480	9W/4.5W/2.5W/1W	11K0F3E(Analog Vioce;NB)
400-480	9W/4.5W/2.5W/1W	7K60FXD/7K60FXW(9600Data/Digital Voice NB)

Channel No. (6.25KHz)	Channel No. (12.5KHz)	12.5KHz Channel Spaced 400MHz Band Plan(MHz)
1	1-2	400.025
2		
3	3-4	440.025
4		
5	5-6	479.975
6		

FCC Rules and Regulations Part 2.202: Necessary Bandwidth and Emission Bandwidth
Voice –FM Analog (12.5KHz)
Calculation:
Max modulation (M) in kHz : 3.0
Max deviation(D) in kHz:2.5
Constant factor (K): 1(assumed)
Bn= 2XM +2XDK=11.0 KHz
Emission designator: 11K0F3E

9600 Digital Vioce/date (12.5KHz)
Calculation:
Data rate in bps(R)=9600
Deviation Peak deviation of carrier(D)=2359.585
Constant factor (K): 1 (default)
Bn= 3.86D+1.27RK= 3.86(2359.585)+0.27(9600)(1)=11.7KHz
Emission designator: 11K0FXD

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: T4KD868SUHF, filing to comply with Part 2, Part 22, and Part 90 of the Federal Communication Commission rules.

1.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

1.4 TEST FACILITY

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D, Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan, Guangdong, China.
Description	The test site is constructed and calibrated to meet the FCC requirements in documents TIA/EIA 603
FCC Registration No.	371540

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.

2.3 GENERAL TECHNICAL REQUIREMENTS

For FCC Part 90& Part 22 requirements:
(1). Section 90.205 &22.565: RF Output Power
(2). Section 90.207: Modulation Characteristic
(3). Section 90.209 &22.359: Occupied Bandwidth
(4). Section 90.210&22.359: Emission Mask
(5). Section 90.213&22.355: Frequency Tolerance
(6). Section 90.214: Transient Frequency Behavior

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	DMR Digital Radio	D868S	FCC ID: T4KD868SUHF	EUT

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§90.205 & 22.565	Maximum Transmitter Power	Compliant
§90.207	Modulation Characteristic	Compliant
§90.209& 22.359	Occupied Bandwidth	Compliant
§90.210& 22.359	Emission Mask	Compliant
§90.213& 22.355	Frequency Tolerance	Compliant
§90.214	Transient Frequency Behavior	Compliant

LIST OF EQUIPMENTS USED

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NO.	Cal. Date	Cal. Due
CLIMATE CHAMBER	EXPERY	TN-400	TN2007SR038	2017.06.20	2018.06.19
ATTENUATOR	WEINSCHEL CORP	58-30-33	ML030	2017.06.20	2018.06.19
DC POWER SUPPLY	ZHAOXIN	RXN-605D	N/A	2017.06.20	2018.06.19
MODULATION ANALYZER	HP	8920B	3104A03367	2017.06.20	2018.06.19
SIGNAL GENERATOR	AGILENT	E4421B	122501288	2017.07.02	2018.07.01
SIGNAL GENERATOR	R&S	SMT03	A0304261	2017.07.02	2018.07.01
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	2017.07.02	2018.07.01
Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3355	2017.07.02	2018.07.01
Substitution Antenna	SCHWARZBECK	VULB9160	9168-494	2017.07.02	2018.07.01
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	2017.07.02	2018.07.01
RF Cable	SCHWARZBECK	AK9515E	96221	2017.07.02	2018.07.01
3m Anechoic Chamber	CHENGYU	966	PTS-001	2017.06.02	2018.06.01
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	2017.06.02	2018.06.01
Spectrum analyzer	Agilent	E4407B	MY46185649	2017.06.02	2018.06.01
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	2017.06.02	2018.06.01
Substitution ANTENNA	EM	EM-AH-10180	67	2017.06.02	2018.06.01
Modulation Domain Analyzer	HP	53310A	3121A02467	2017.06.02	2018.06.01
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	2017.06.02	2018.06.01
RF Cable	SCHWARZBECK	AK9515E	96222	2017.06.02	2018.06.01
Shielded Room	CHENGYU	843	PTS-002	2017.06.02	2018.06.01

Note: 8920B can generate audio modulation frequency.

4. DESCRIPTION OF TEST MODES

RF TEST MODES

The EUT (DMR Digital Radio) has been tested under normal operating condition. (The top channel, the middle channel and the bottom channel) are chosen for testing at each channel separation.

Analog:

No.	TEST MODES	CHANNEL SEPARATION
1	Low Channel	12.5 KHz
2	Middle Channel	12.5 KHz
3	High Channel	12.5 KHz

Digital:

No.	TEST MODES	CHANNEL SEPARATION
1	Low Channel	12.5 KHz
2	Middle Channel	12.5 KHz
3	High Channel	12.5 KHz

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

5. FREQUENCY TOLERANCE

5.1 PROVISIONS APPLICABLE

a). According to FCC §2.1055, § 22.355 and §90.213, the frequency stability shall be measured with variation of ambient temperature from –30℃ to +50℃ centigrade.

b). According to FCC Part 2 Section 2.1055(d)(2), for battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacturer.

c). According to FCC Part 90 Section 90.213, the frequency tolerance must be maintained within 0.00025% for 12.5 KHz channel separation and 0.0001% for 6.25 KHz channel separation.

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 7.4V.
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

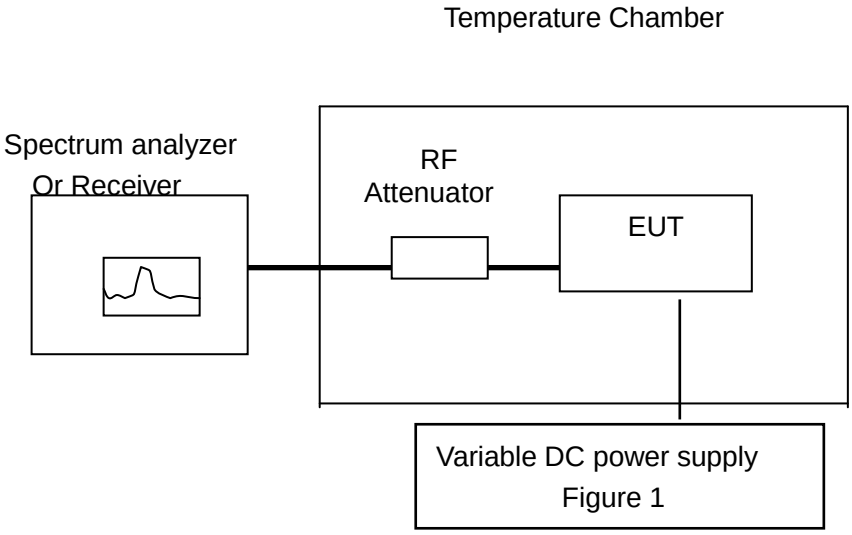


Figure 1

5.3 TEST RESULT

UHF:

Analog-12.5KHz:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.838	0.777	0.847	2.5
40	DC 7.40	0.558	0.550	0.773	
30	DC 7.40	0.949	0.598	1.065	
20	DC 7.40	0.719	0.808	0.718	
10	DC 7.40	0.944	0.664	0.767	
0	DC 7.40	0.723	0.570	0.905	
-10	DC 7.40	0.570	0.757	0.945	
-20	DC 7.40	1.064	0.789	0.928	
-30	DC 7.40	0.735	0.508	1.002	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	1.026	0.952	0.897	2.5
40	DC 6.29	0.943	0.740	0.503	
30	DC 6.29	0.553	1.020	0.681	
20	DC 6.29	0.949	0.831	0.659	
10	DC 6.29	0.890	1.014	1.016	
0	DC 6.29	0.992	0.540	0.844	
-10	DC 6.29	1.083	0.800	0.780	
-20	DC 6.29	0.543	0.772	0.833	
-30	DC 6.29	0.768	1.051	0.839	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	1.064	0.914	0.900	2.5
40	DC 8.51	0.877	0.658	0.567	
30	DC 8.51	0.809	0.594	0.882	
20	DC 8.51	0.885	0.775	0.795	
10	DC 8.51	0.896	0.898	0.668	
0	DC 8.51	0.939	0.894	1.087	
-10	DC 8.51	1.077	0.509	0.780	
-20	DC 8.51	0.832	0.733	1.059	
-30	DC 8.51	0.604	1.054	0.798	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.506	0.508	0.929	2.5
40	DC 6.00	0.786	0.635	0.953	
30	DC 6.00	0.958	1.046	0.627	
20	DC 6.00	0.746	1.079	0.503	
10	DC 6.00	0.928	0.659	1.052	
0	DC 6.00	0.906	0.836	0.832	
-10	DC 6.00	1.032	0.954	0.762	
-20	DC 6.00	0.956	0.891	0.711	
-30	DC 6.00	0.760	1.001	0.531	
Result	Pass				

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.643	0.514	0.848	2.5
40	DC 7.40	0.678	0.566	0.680	
30	DC 7.40	0.927	0.764	1.074	
20	DC 7.40	1.020	0.893	1.035	
10	DC 7.40	0.908	0.623	0.712	
0	DC 7.40	0.559	1.085	0.909	
-10	DC 7.40	0.895	0.726	0.573	
-20	DC 7.40	0.987	0.612	0.641	
-30	DC 7.40	0.988	0.815	1.066	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	0.731	0.763	0.821	2.5
40	DC 6.29	0.947	0.666	0.787	
30	DC 6.29	0.892	0.567	0.987	
20	DC 6.29	0.729	0.638	0.502	
10	DC 6.29	0.694	0.641	0.739	
0	DC 6.29	0.780	0.567	0.558	
-10	DC 6.29	0.710	1.098	0.660	
-20	DC 6.29	1.069	0.807	0.749	
-30	DC 6.29	0.977	0.528	0.993	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.949	0.595	0.993	2.5
40	DC 8.51	1.043	1.048	0.722	
30	DC 8.51	0.591	0.891	0.641	
20	DC 8.51	0.883	0.948	0.923	
10	DC 8.51	0.502	0.757	0.769	
0	DC 8.51	0.521	0.759	0.614	
-10	DC 8.51	1.024	0.774	0.857	
-20	DC 8.51	0.560	1.023	0.976	
-30	DC 8.51	1.077	0.599	0.676	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.680	1.027	0.864	2.5
40	DC 6.00	1.031	0.827	0.612	
30	DC 6.00	0.592	0.755	0.764	
20	DC 6.00	0.706	0.668	1.041	
10	DC 6.00	0.647	0.577	1.022	
0	DC 6.00	1.038	0.881	0.582	
-10	DC 6.00	1.054	0.829	0.972	
-20	DC 6.00	0.536	0.720	0.874	
-30	DC 6.00	0.689	0.629	1.090	
Result	Pass				

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.975	0.924	1.039	2.5
40	DC 7.40	0.674	0.652	0.805	
30	DC 7.40	1.009	1.015	0.504	
20	DC 7.40	1.088	0.736	0.978	
10	DC 7.40	0.743	0.829	1.009	
0	DC 7.40	0.781	0.596	0.624	
-10	DC 7.40	0.880	0.659	0.731	
-20	DC 7.40	1.093	0.623	0.681	
-30	DC 7.40	1.043	0.929	0.824	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	0.975	0.924	1.039	5
40	DC 6.29	0.674	0.652	0.805	
30	DC 6.29	1.009	1.015	0.504	
20	DC 6.29	1.088	0.736	0.978	
10	DC 6.29	0.743	0.829	1.009	
0	DC 6.29	0.781	0.596	0.624	
-10	DC 6.29	0.880	0.659	0.731	
-20	DC 6.29	1.093	0.623	0.681	
-30	DC 6.29	1.043	0.929	0.824	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.734	0.904	0.988	2.5
40	DC 8.51	0.624	0.594	0.844	
30	DC 8.51	0.613	0.820	0.793	
20	DC 8.51	1.045	1.075	1.062	
10	DC 8.51	0.908	0.583	1.043	
0	DC 8.51	0.723	0.886	0.556	
-10	DC 8.51	0.691	0.506	0.524	
-20	DC 8.51	0.907	0.663	1.069	
-30	DC 8.51	0.541	0.641	0.947	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.577	0.529	0.723	2.5
40	DC 6.00	0.684	0.825	0.702	
30	DC 6.00	0.520	0.722	0.937	
20	DC 6.00	0.651	0.798	0.937	
10	DC 6.00	1.003	0.942	0.855	
0	DC 6.00	0.660	1.038	0.777	
-10	DC 6.00	0.513	0.741	0.724	
-20	DC 6.00	0.626	1.066	0.974	
-30	DC 6.00	0.859	0.805	0.832	
Result	Pass				

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.813	0.807	0.756	2.5
40	DC 7.40	0.576	0.948	1.032	
30	DC 7.40	0.637	0.821	1.034	
20	DC 7.40	0.655	0.689	0.543	
10	DC 7.40	1.069	0.598	0.710	
0	DC 7.40	1.068	0.714	0.604	
-10	DC 7.40	0.796	0.629	1.039	
-20	DC 7.40	1.082	0.556	0.971	
-30	DC 7.40	1.029	0.910	0.769	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	1.063	0.641	0.520	2.5
40	DC 6.29	0.617	1.076	0.520	
30	DC 6.29	0.624	0.639	1.088	
20	DC 6.29	0.951	1.010	0.811	
10	DC 6.29	0.993	1.016	1.018	
0	DC 6.29	0.632	0.720	0.770	
-10	DC 6.29	0.744	0.792	1.092	
-20	DC 6.29	1.033	1.051	0.555	
-30	DC 6.29	1.001	1.093	0.999	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.876	0.733	0.725	2.5
40	DC 8.51	0.558	0.648	0.572	
30	DC 8.51	0.795	0.809	1.079	
20	DC 8.51	0.574	0.949	0.544	
10	DC 8.51	0.882	0.585	0.587	
0	DC 8.51	0.853	1.074	1.082	
-10	DC 8.51	0.783	0.771	0.631	
-20	DC 8.51	0.887	1.084	0.596	
-30	DC 8.51	0.501	1.030	0.603	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.822	0.974	0.976	2.5
40	DC 6.00	0.963	1.027	0.741	
30	DC 6.00	1.091	0.760	0.878	
20	DC 6.00	0.538	0.980	0.651	
10	DC 6.00	0.729	0.854	1.020	
0	DC 6.00	0.673	0.766	0.702	
-10	DC 6.00	0.912	0.939	0.746	
-20	DC 6.00	0.676	0.937	0.815	
-30	DC 6.00	0.911	0.922	0.887	
Result	Pass				

Digital-12.5KHz:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.881	0.525	0.906	2.5
40	DC 7.40	0.642	1.035	0.859	
30	DC 7.40	0.911	0.601	0.598	
20	DC 7.40	0.877	0.675	0.975	
10	DC 7.40	0.672	0.575	0.956	
0	DC 7.40	0.788	1.048	1.099	
-10	DC 7.40	0.636	0.575	1.046	
-20	DC 7.40	0.915	0.678	0.579	
-30	DC 7.40	0.864	0.559	1.048	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	0.814	0.574	0.598	2.5
40	DC 6.29	0.845	0.912	0.514	
30	DC 6.29	0.795	0.799	0.936	
20	DC 6.29	0.717	0.519	1.058	
10	DC 6.29	0.716	0.783	0.775	
0	DC 6.29	1.091	0.501	0.679	
-10	DC 6.29	1.056	0.599	0.884	
-20	DC 6.29	0.688	1.082	1.038	
-30	DC 6.29	0.704	0.590	1.042	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.837	0.615	0.752	2.5
40	DC 8.51	0.587	0.524	1.074	
30	DC 8.51	0.816	0.818	1.081	
20	DC 8.51	0.553	0.629	0.664	
10	DC 8.51	0.932	0.935	0.749	
0	DC 8.51	1.034	0.712	0.779	
-10	DC 8.51	1.091	0.883	1.085	
-20	DC 8.51	0.728	0.769	0.682	
-30	DC 8.51	1.010	0.964	1.063	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-9W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.571	1.048	0.848	2.5
40	DC 6.00	0.974	1.088	0.649	
30	DC 6.00	0.921	0.702	0.790	
20	DC 6.00	0.971	0.965	1.094	
10	DC 6.00	0.717	0.536	0.833	
0	DC 6.00	1.025	0.614	1.003	
-10	DC 6.00	0.646	0.566	0.771	
-20	DC 6.00	0.908	0.814	0.645	
-30	DC 6.00	0.709	0.530	0.854	
Result	Pass				

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.825	1.094	0.770	2.5
40	DC 7.40	0.870	0.524	0.614	
30	DC 7.40	1.062	1.097	0.898	
20	DC 7.40	0.945	0.964	0.728	
10	DC 7.40	0.999	1.060	1.029	
0	DC 7.40	0.796	1.077	0.581	
-10	DC 7.40	0.893	0.526	0.802	
-20	DC 7.40	0.979	0.626	1.032	
-30	DC 7.40	0.524	0.791	0.851	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	0.978	0.759	0.681	2.5
40	DC 6.29	0.965	0.535	0.891	
30	DC 6.29	0.823	0.547	0.768	
20	DC 6.29	0.889	0.979	0.695	
10	DC 6.29	0.899	0.574	0.887	
0	DC 6.29	0.821	0.863	0.921	
-10	DC 6.29	0.794	0.904	0.589	
-20	DC 6.29	0.635	1.094	0.586	
-30	DC 6.29	0.519	0.579	0.737	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.854	0.672	0.522	2.5
40	DC 8.51	0.839	0.818	0.556	
30	DC 8.51	0.873	0.810	1.094	
20	DC 8.51	0.554	0.549	0.874	
10	DC 8.51	0.905	0.954	0.712	
0	DC 8.51	1.059	0.945	1.085	
-10	DC 8.51	0.640	0.576	0.547	
-20	DC 8.51	1.034	0.703	0.730	
-30	DC 8.51	1.069	0.960	0.792	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-4.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	1.068	1.031	1.013	2.5
40	DC 6.00	0.706	0.858	0.725	
30	DC 6.00	0.704	0.943	1.079	
20	DC 6.00	0.861	1.018	0.724	
10	DC 6.00	0.950	0.829	0.842	
0	DC 6.00	0.902	1.001	0.799	
-10	DC 6.00	0.765	0.503	1.056	
-20	DC 6.00	0.791	0.540	0.837	
-30	DC 6.00	0.808	0.613	0.670	
Result	Pass				

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.568	0.618	0.851	2.5
40	DC 7.40	0.770	0.788	0.981	
30	DC 7.40	1.078	1.062	0.801	
20	DC 7.40	0.811	0.804	0.591	
10	DC 7.40	1.041	0.778	0.508	
0	DC 7.40	1.052	0.753	0.988	
-10	DC 7.40	0.759	0.845	0.953	
-20	DC 7.40	1.071	0.691	1.007	
-30	DC 7.40	0.508	0.512	1.060	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	0.978	1.023	0.570	2.5
40	DC 6.29	0.772	0.880	0.926	
30	DC 6.29	0.631	0.637	0.530	
20	DC 6.29	0.982	0.837	0.718	
10	DC 6.29	0.895	1.047	0.690	
0	DC 6.29	0.812	1.010	0.851	
-10	DC 6.29	0.736	0.923	0.607	
-20	DC 6.29	0.605	0.691	0.644	
-30	DC 6.29	1.061	0.898	0.981	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.582	0.924	0.945	2.5
40	DC 8.51	0.662	1.036	0.976	
30	DC 8.51	0.804	1.081	0.949	
20	DC 8.51	0.730	1.032	0.596	
10	DC 8.51	0.976	0.962	0.877	
0	DC 8.51	0.590	0.857	1.020	
-10	DC 8.51	0.778	0.988	0.844	
-20	DC 8.51	0.928	0.658	0.628	
-30	DC 8.51	0.607	1.042	0.669	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-2.5W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.885	0.937	0.592	2.5
40	DC 6.00	0.663	0.830	1.057	
30	DC 6.00	1.086	1.030	0.515	
20	DC 6.00	0.694	0.699	0.876	
10	DC 6.00	0.880	0.793	0.507	
0	DC 6.00	0.873	0.673	0.882	
-10	DC 6.00	0.796	0.895	0.705	
-20	DC 6.00	0.957	1.076	1.034	
-30	DC 6.00	1.086	0.662	0.656	
Result	Pass				

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40	0.528	0.588	0.859	2.5
40	DC 7.40	0.658	1.045	0.749	
30	DC 7.40	0.710	0.877	1.029	
20	DC 7.40	0.790	0.956	0.904	
10	DC 7.40	0.542	0.968	0.987	
0	DC 7.40	1.019	0.625	0.702	
-10	DC 7.40	0.550	0.913	1.004	
-20	DC 7.40	0.800	0.591	1.090	
-30	DC 7.40	1.091	1.048	0.518	
Result	Pass				

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29	0.764	0.962	0.644	2.5
40	DC 6.29	1.026	0.526	1.054	
30	DC 6.29	0.794	0.658	0.806	
20	DC 6.29	0.852	0.764	0.856	
10	DC 6.29	1.037	0.961	1.008	
0	DC 6.29	1.039	0.616	0.886	
-10	DC 6.29	0.744	0.960	0.882	
-20	DC 6.29	0.932	1.098	0.881	
-30	DC 6.29	0.985	1.029	0.972	
Result	Pass				

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 8.51	0.788	1.054	1.034	2.5
40	DC 8.51	0.967	0.779	0.773	
30	DC 8.51	0.590	0.947	1.011	
20	DC 8.51	0.675	0.697	0.557	
10	DC 8.51	0.524	0.653	0.893	
0	DC 8.51	0.750	0.544	0.589	
-10	DC 8.51	0.794	1.082	0.857	
-20	DC 8.51	0.739	1.040	0.906	
-30	DC 8.51	0.595	0.981	0.566	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-1W**

Environment	Power	Reference Frequency			Limit:
Temperature(℃)	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.00	0.919	0.504	0.977	2.5
40	DC 6.00	0.699	0.807	0.899	
30	DC 6.00	0.687	0.667	0.823	
20	DC 6.00	0.632	0.615	1.021	
10	DC 6.00	0.685	1.244	0.945	
0	DC 6.00	0.777	0.803	0.701	
-10	DC 6.00	0.662	1.035	0.705	
-20	DC 6.00	0.965	0.965	1.034	
-30	DC 6.00	0.688	0.541	0.644	
Result	Pass				

6. EMISSION BANDWIDTH

6.1 PROVISIONS APPLICABLE

FCC Part 90 & FCC Part 22:

The authorized bandwidth shall be 11.25 KHz for 12.5 KHz channel separation and 20 KHz for 25 KHz channel separation.

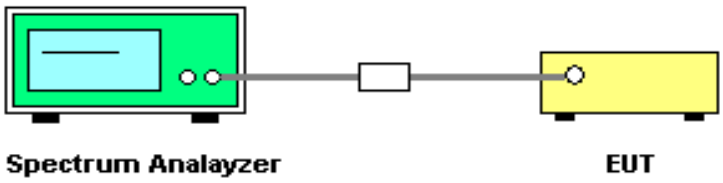
6.2 MEASUREMENT PROCEDURE

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=100Hz.VBW= 300 Hz, Span =50 KHz.

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

6.3 TEST SETUP BLOCK DIAGRAM



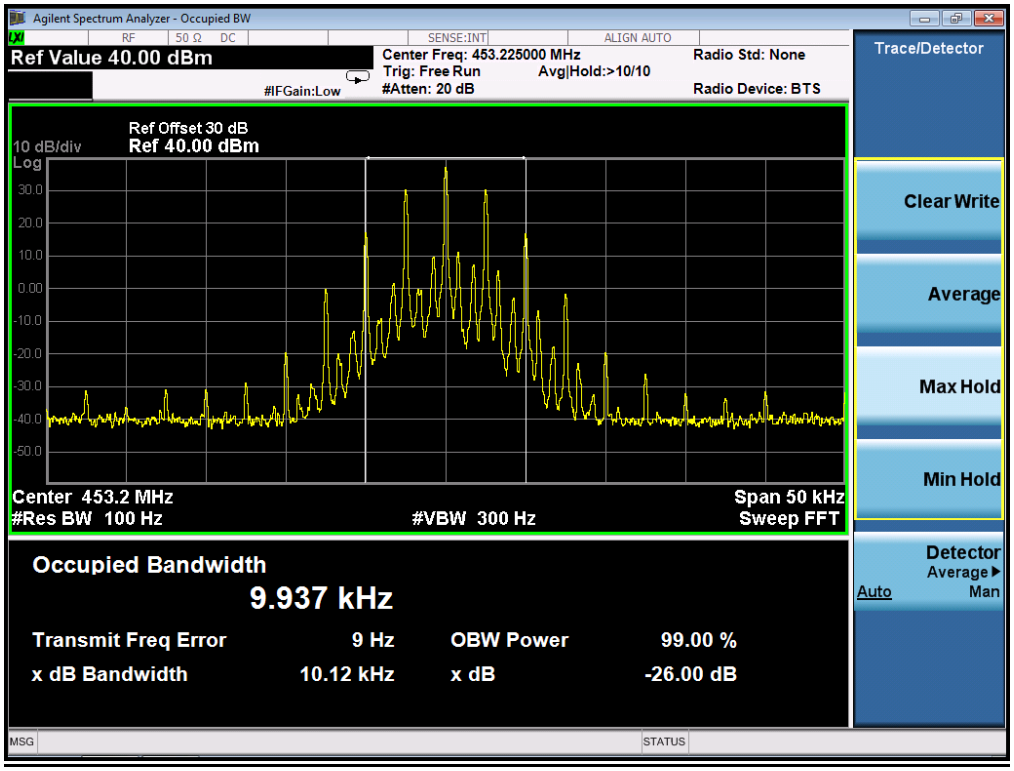
6.4 MEASUREMENT RESULT

UHF:

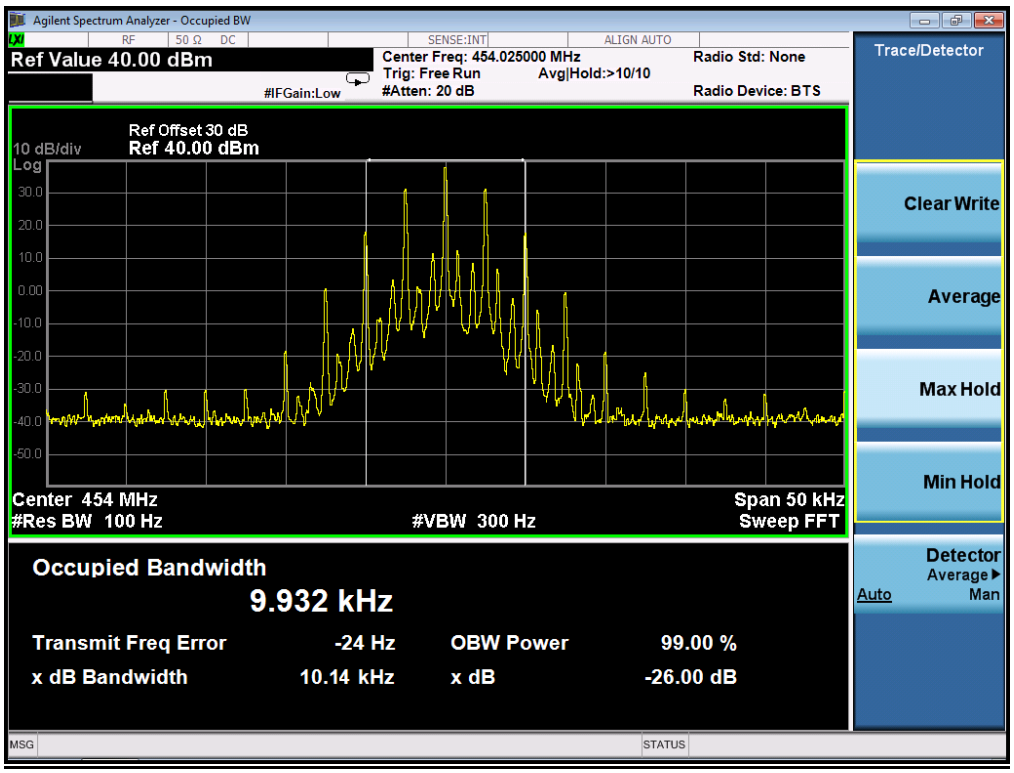
Analog-12.5KHz:

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	10.08KHz	11.25 KHz	Pass
453.225MHz	10.12KHz	11.25 KHz	Pass
454.025MHz	10.14KHz	11.25 KHz	Pass
479.975MHz	10.10KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-9W

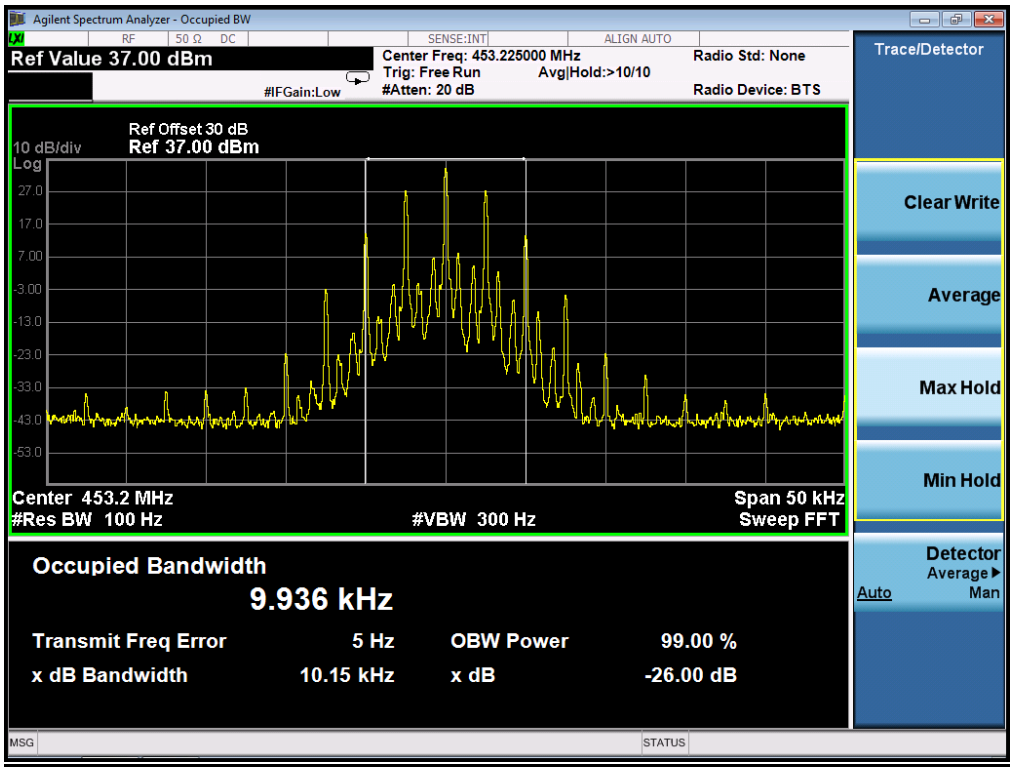


Occupied bandwidth of Middle Channel (Maximum)-9W

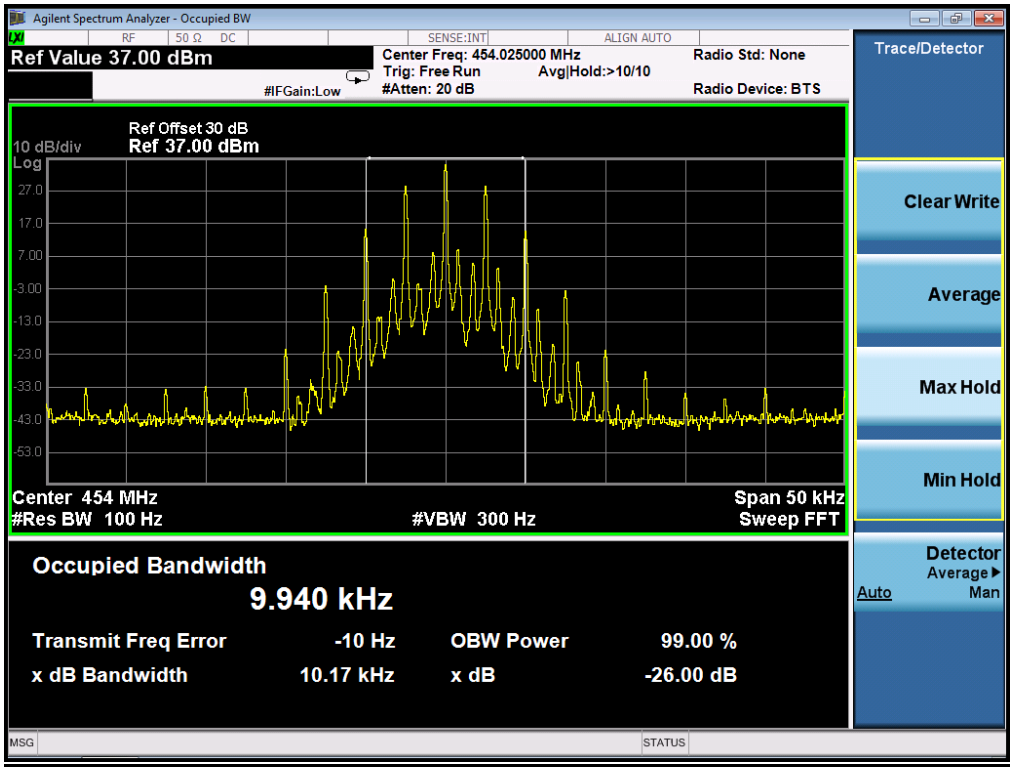


26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	10.12KHz	11.25 KHz	Pass
453.225MHz	10.15KHz	11.25 KHz	Pass
454.025MHz	10.17KHz	11.25 KHz	Pass
479.975MHz	10.09KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-4.5W

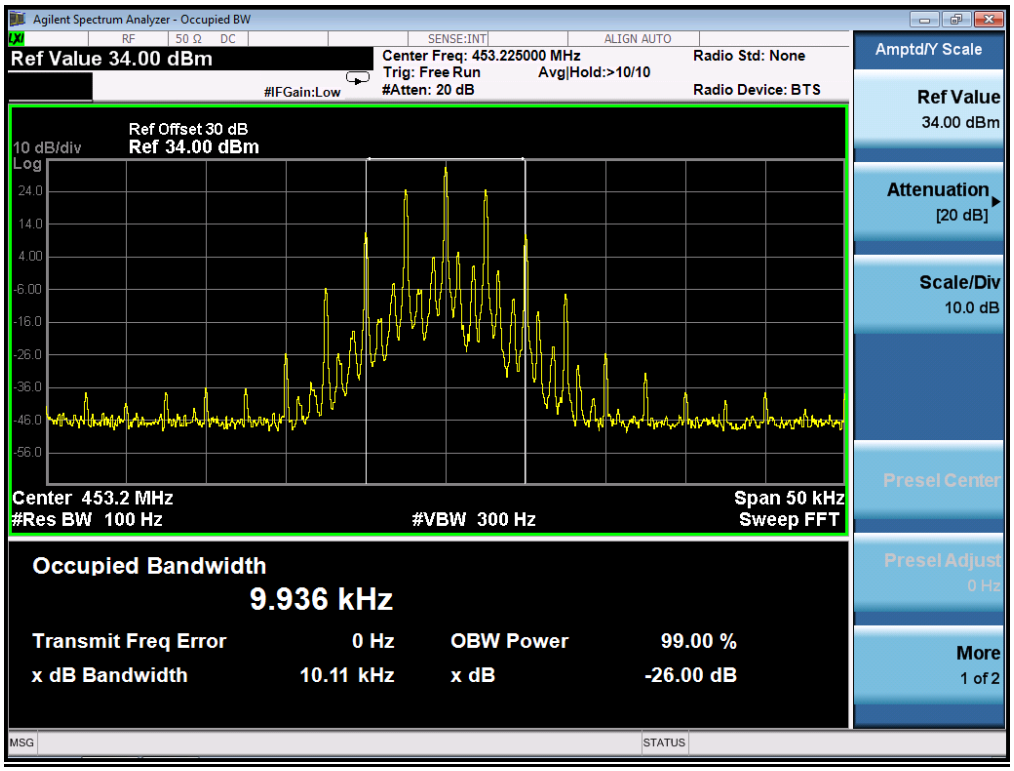


Occupied bandwidth of Middle Channel (Maximum)-4.5W

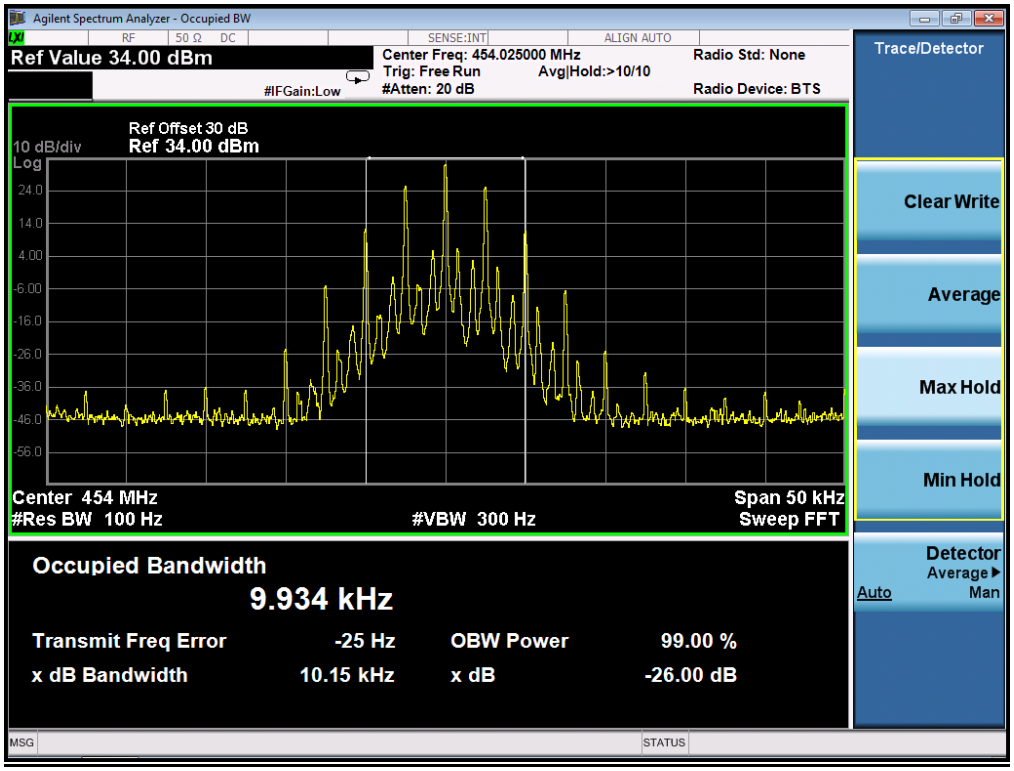


26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	10.07KHz	11.25 KHz	Pass
453.225MHz	10.11KHz	11.25 KHz	Pass
454.025MHz	10.15KHz	11.25 KHz	Pass
479.975MHz	10.05KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-2.5W

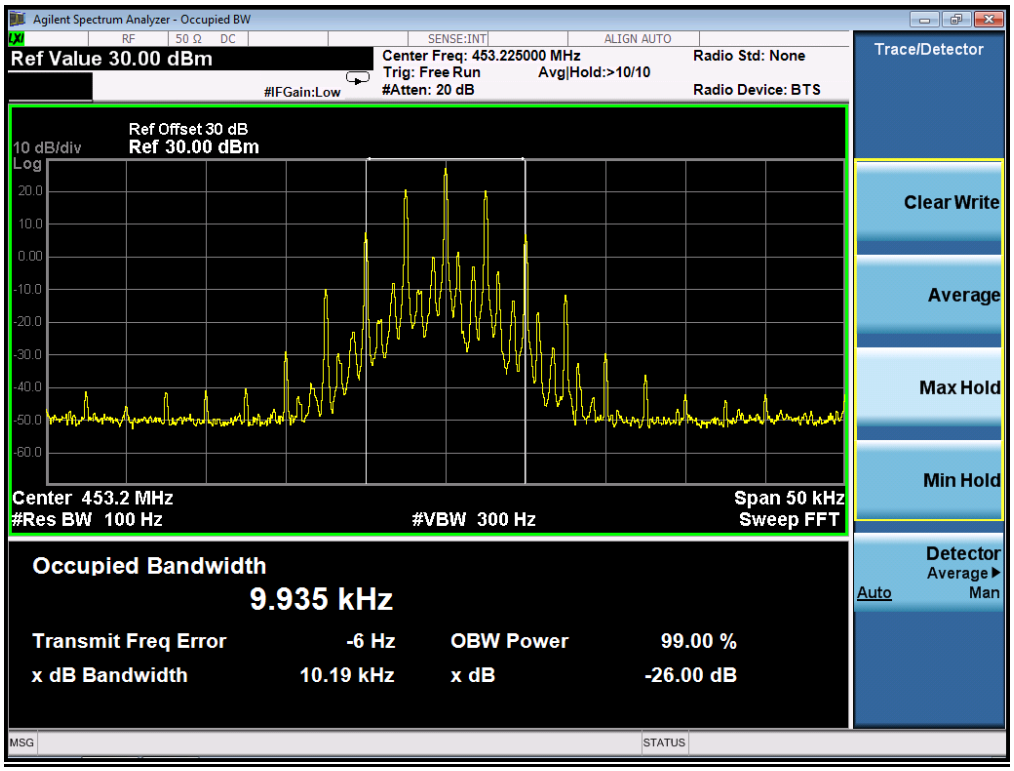


Occupied bandwidth of Middle Channel (Maximum)-2.5W

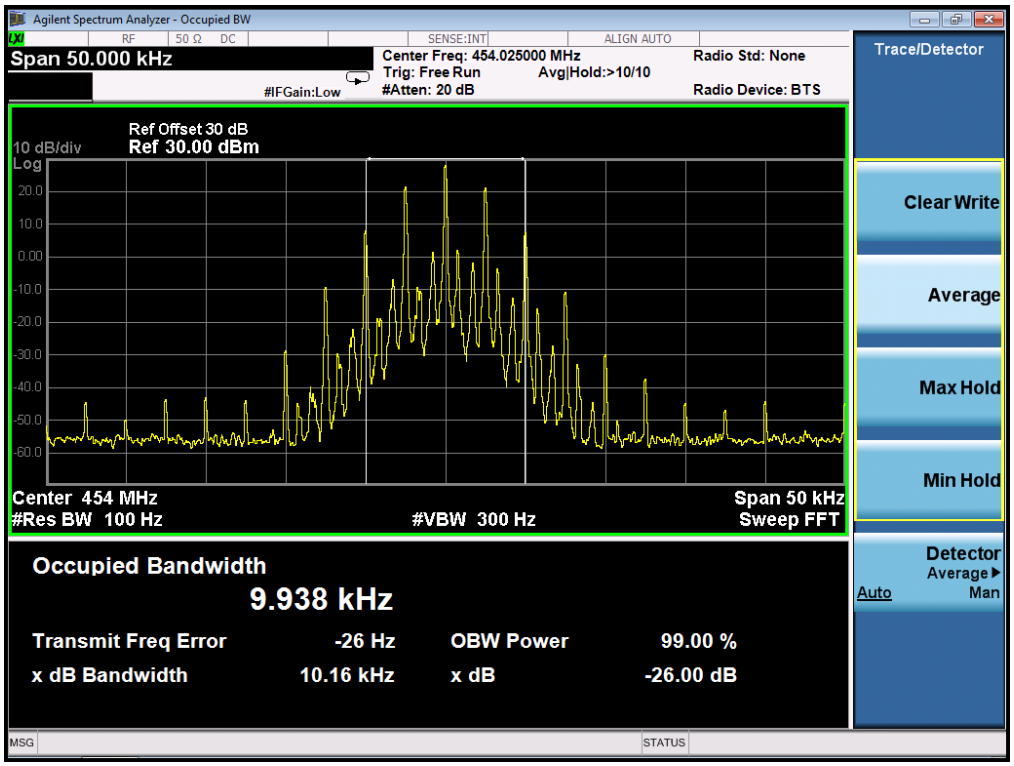


26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	10.12KHz	11.25 KHz	Pass
453.225MHz	10.19KHz	11.25 KHz	Pass
454.025MHz	10.16KHz	11.25 KHz	Pass
479.975MHz	10.11KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-1W



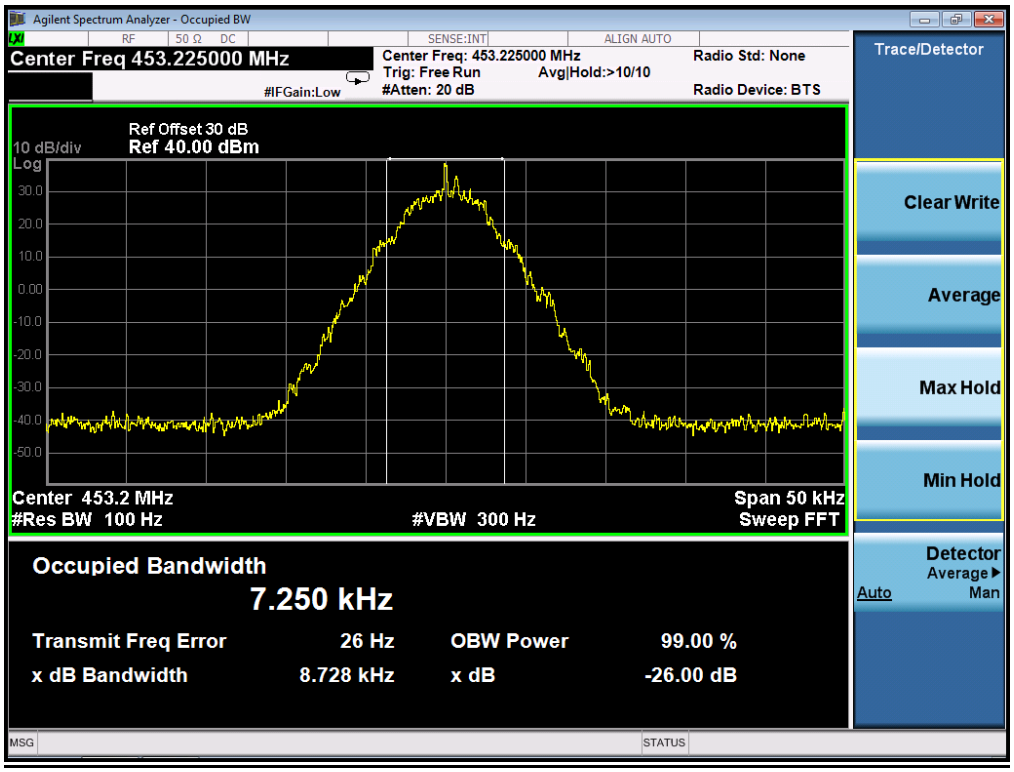
Occupied bandwidth of Middle Channel (Maximum)-1W



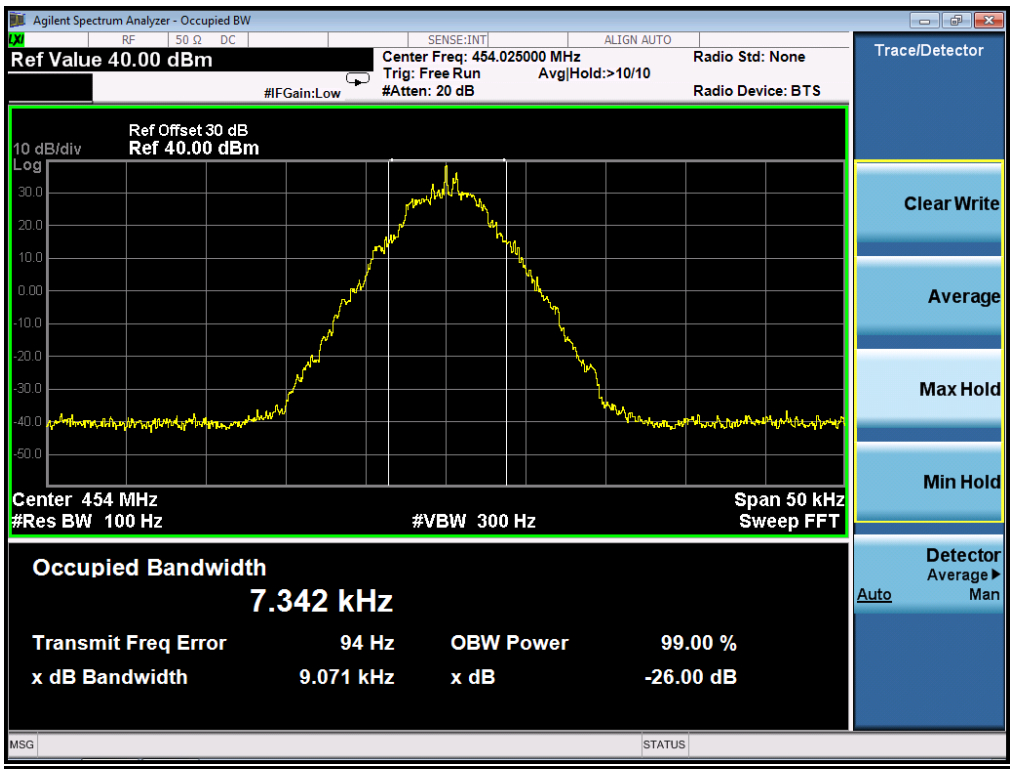
Digital:

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	8.053KHz	11.25 KHz	Pass
453.225MHz	8.728KHz	11.25 KHz	Pass
454.025MHz	9.071KHz	11.25 KHz	Pass
479.975MHz	8.051KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-9W



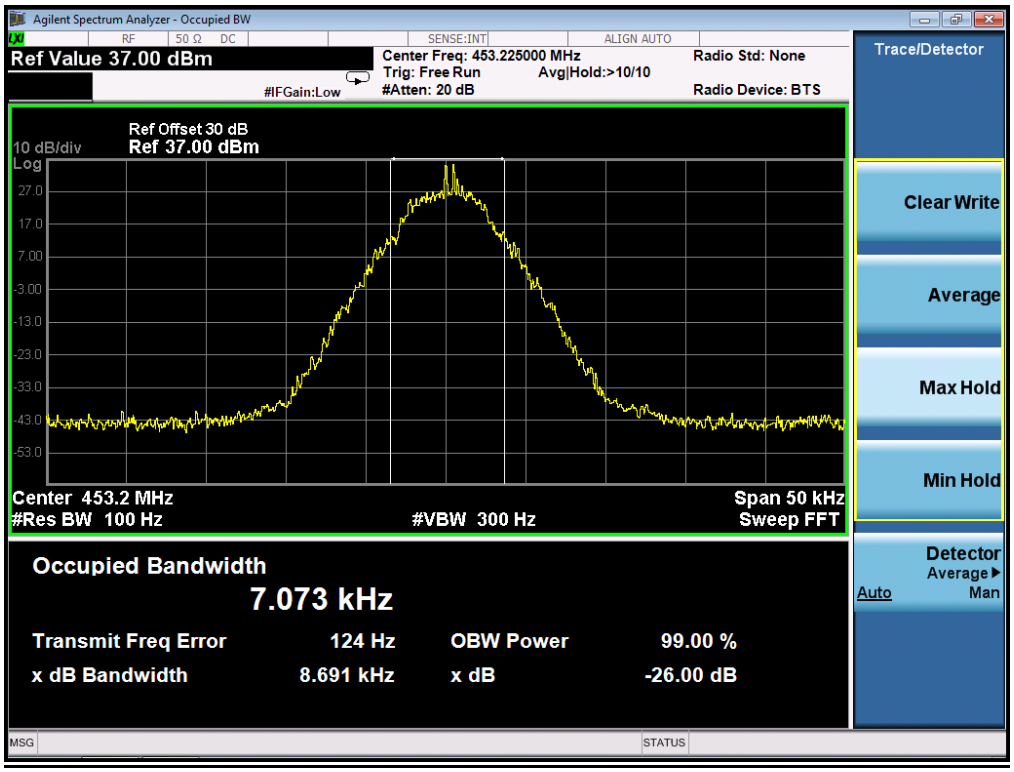
Occupied bandwidth of Middle Channel (Maximum)-9W



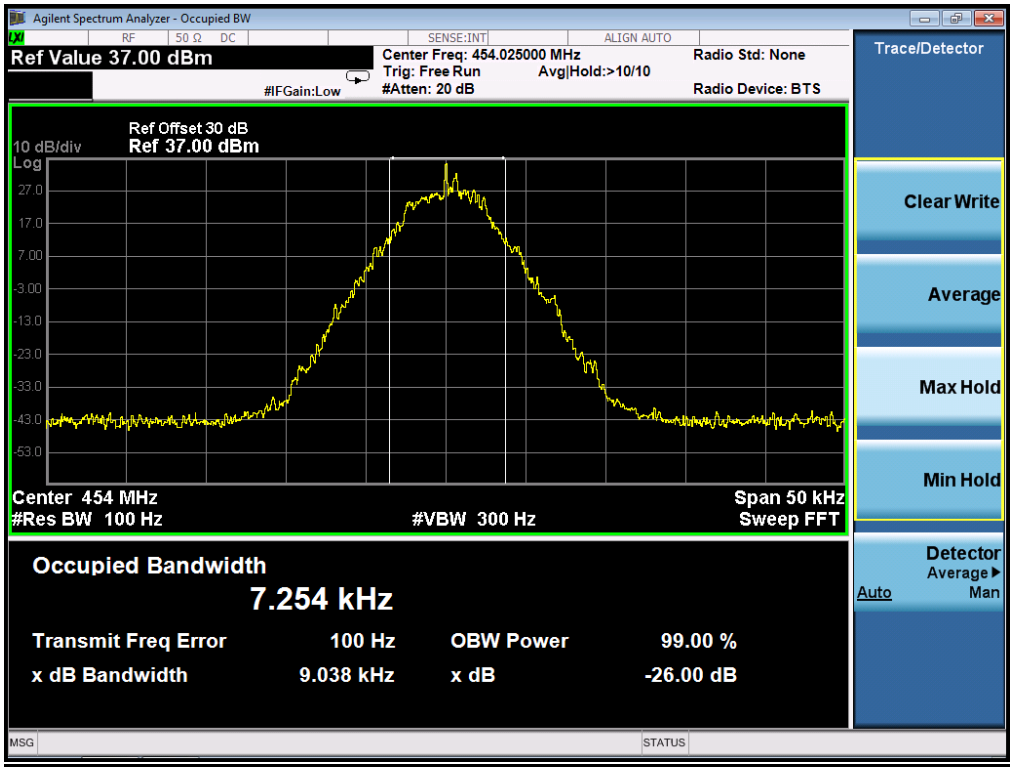
TEST RESULTS

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	8.539KHz	11.25 KHz	Pass
453.225MHz	8.691KHz	11.25 KHz	Pass
454.025MHz	9.038KHz	11.25 KHz	Pass
479.975MHz	8.605KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-4.5W

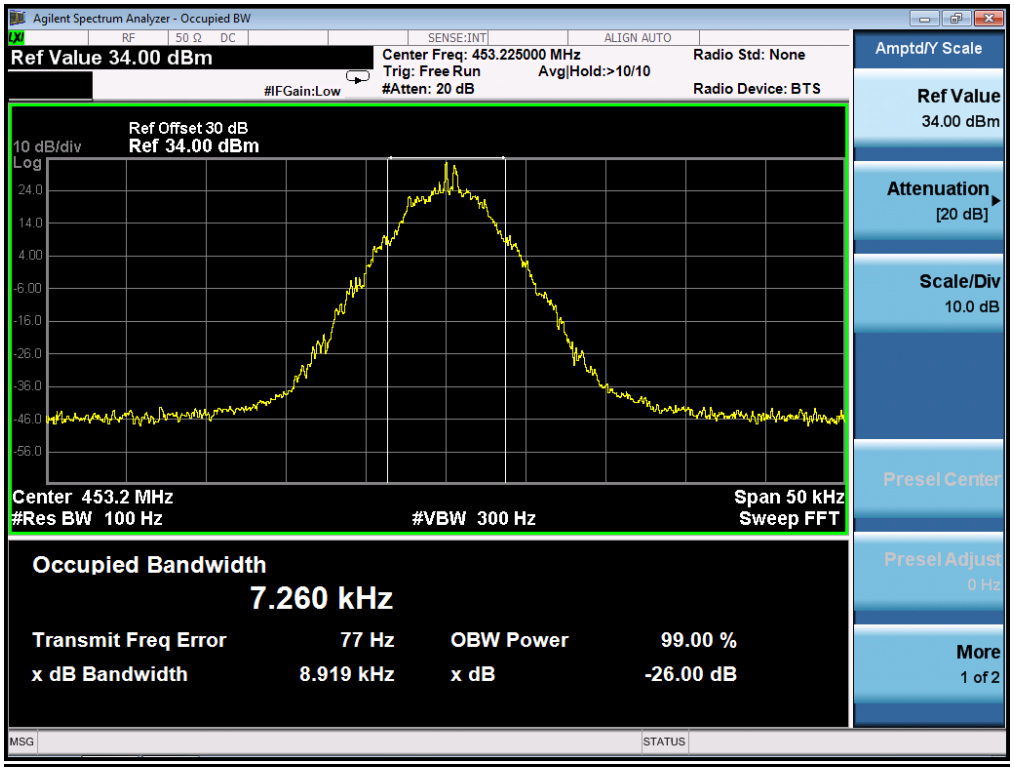


Occupied bandwidth of Middle Channel (Maximum)-4.5W

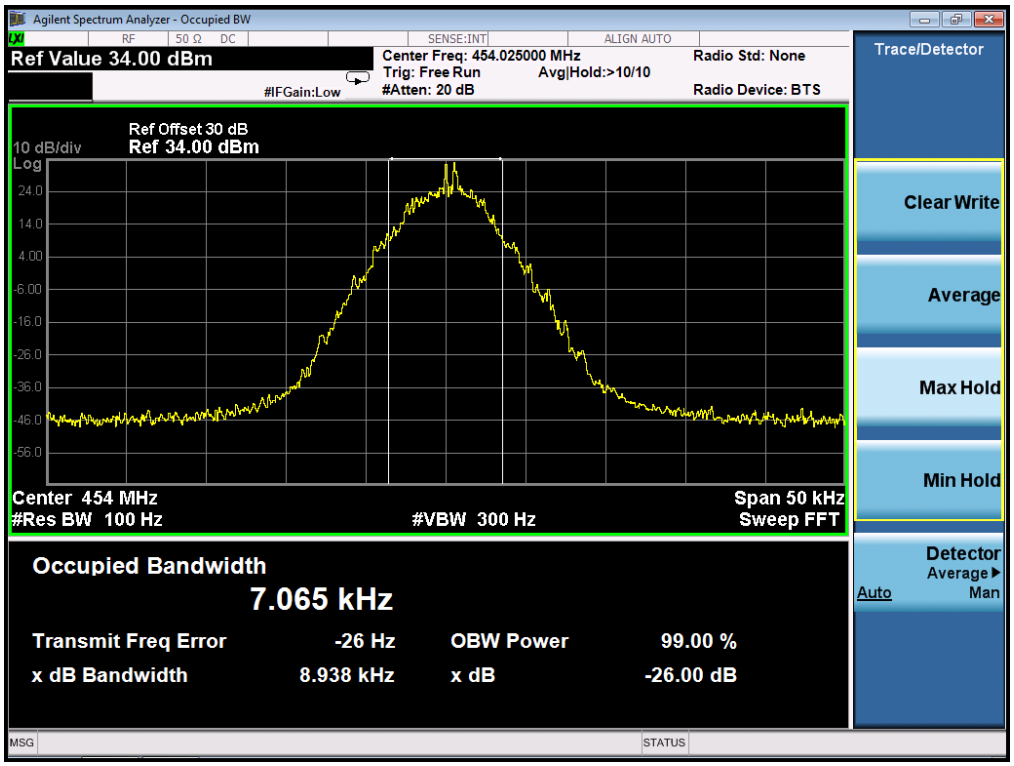


26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	8.859 KHz	11.25 KHz	Pass
453.225MHz	8.919KHz	11.25 KHz	Pass
454.025MHz	8.938KHz	11.25 KHz	Pass
479.975MHz	8.905KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-2.5W



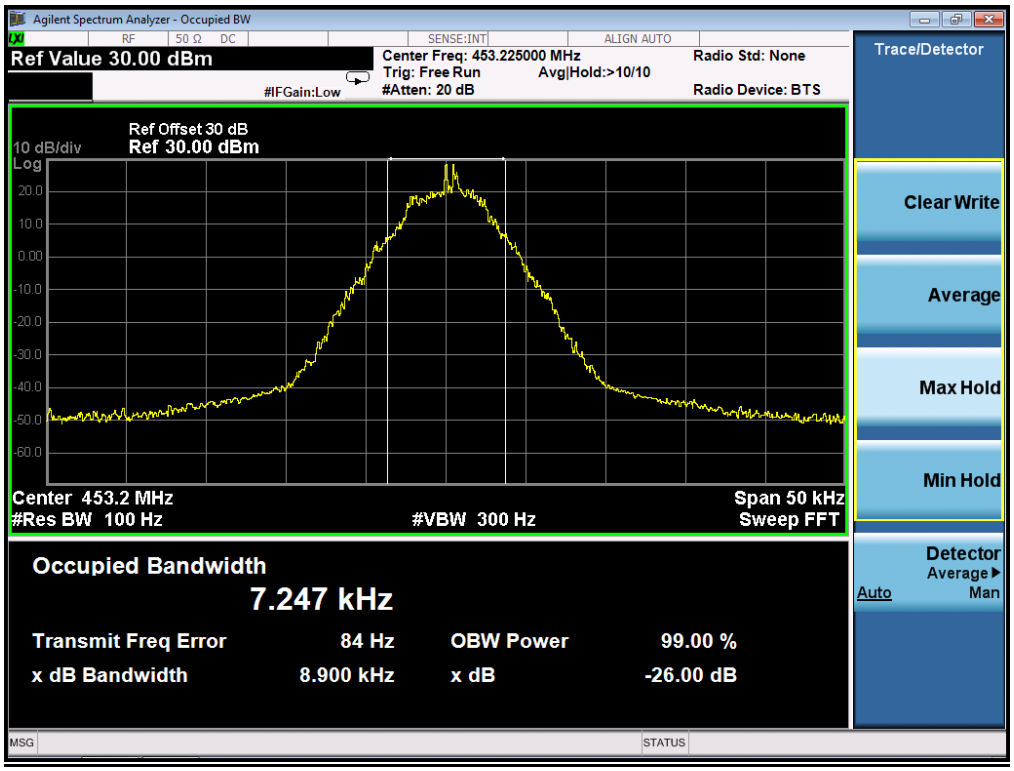
Occupied bandwidth of Middle Channel (Maximum)-2.5W



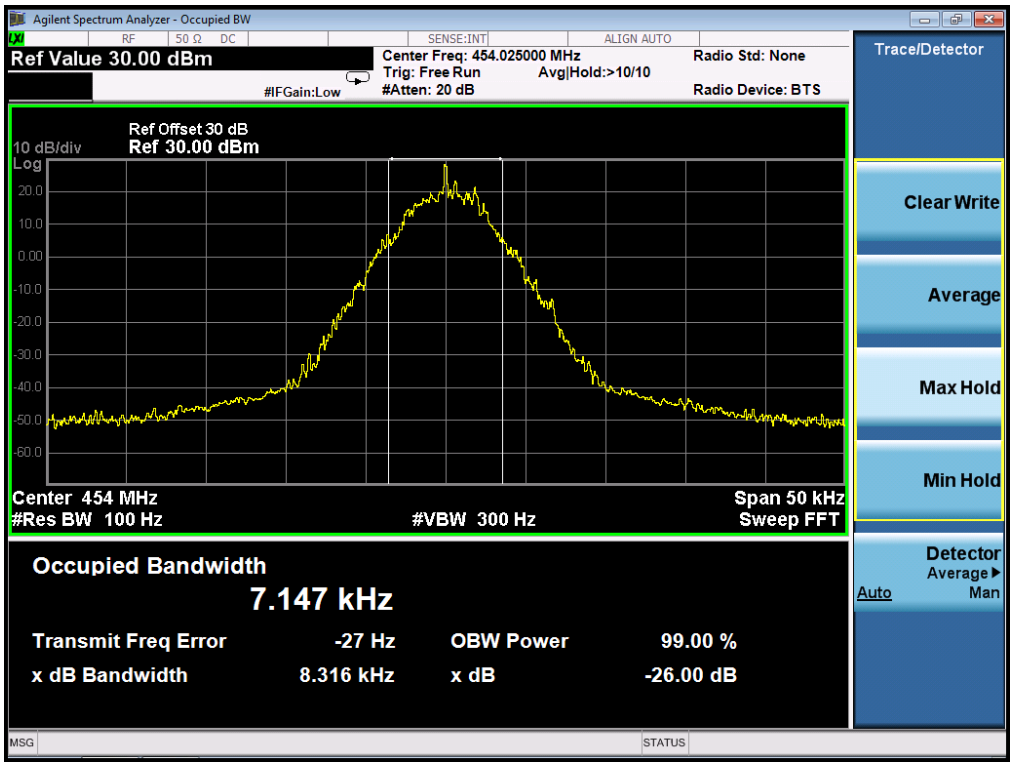
TEST RESULTS

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	8.846KHz	11.25 KHz	Pass
453.225MHz	8.900KHz	11.25 KHz	Pass
454.025MHz	9.316KHz	11.25 KHz	Pass
479.975MHz	8.852KHz	11.25 KHz	Pass

Occupied bandwidth of Middle Channel (Maximum)-1W



Occupied bandwidth of Middle Channel (Maximum)-1W



7. UNWANTED RADIATION

7.1 PROVISIONS APPLICABLE

8.1.1 According to FCC §2.1049, §22.359 and §90.210, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with each channel separation.

Emission Mask D -for 12.5 KHz Channel Separation:

(1).On any frequency removed from the center of the authorized bandwidth fo to 5.625 KHz removed from fo: Zero dB.

(2).On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz) fo of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27(fd-2.88 KHz) dB

(3).On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz)fo of more than 12.5 KHz: At least 50+10 log(P) dB or 70 dB, whichever is lesser attenuation.

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.

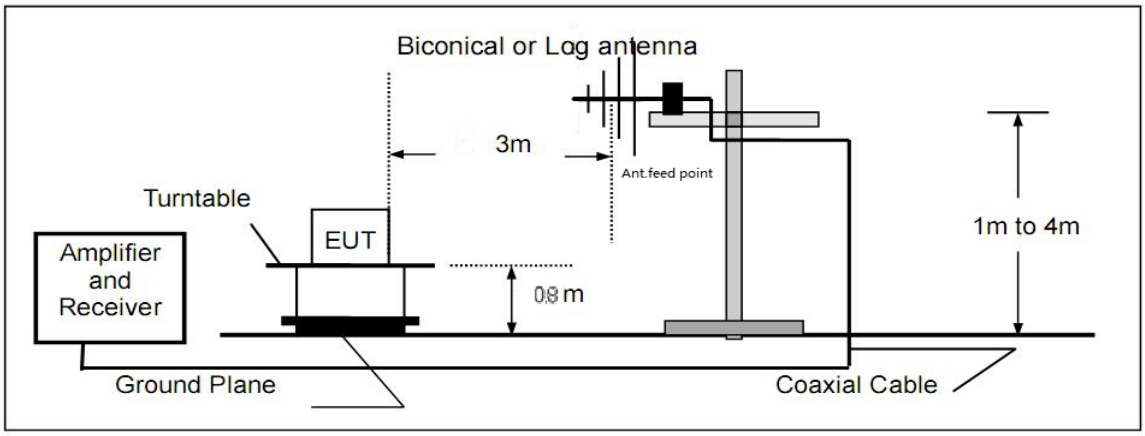
(16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

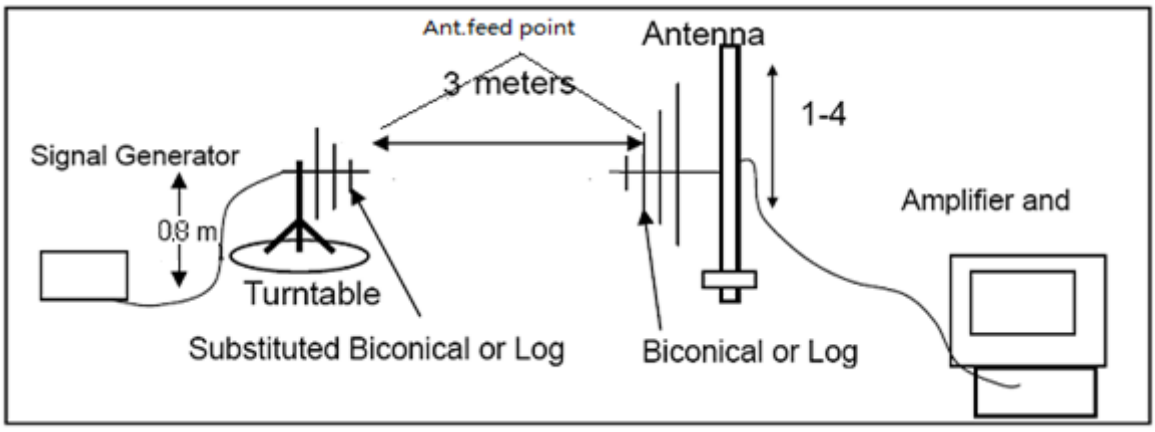
(17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

7.3 TEST SETUP BLOCK DIAGRAM

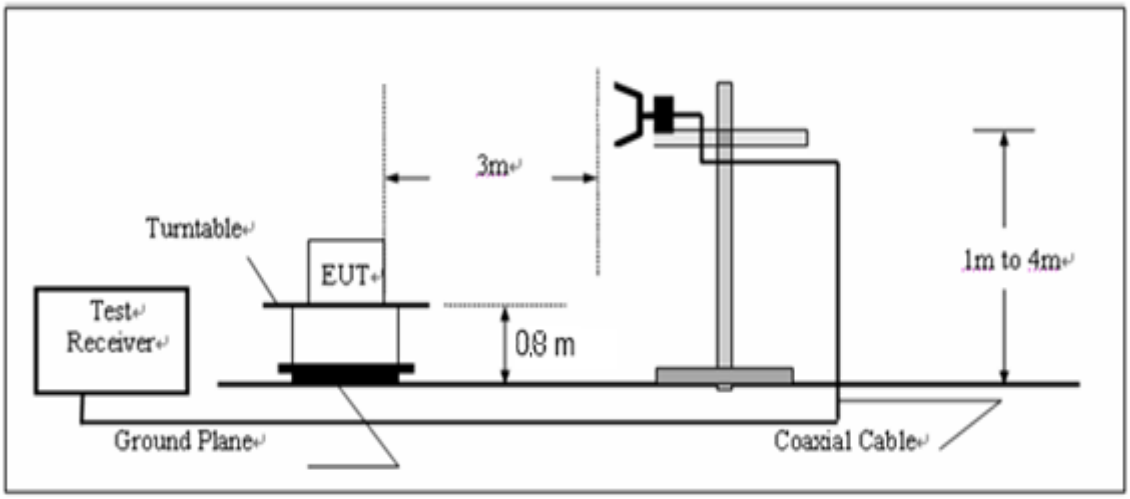
SUBSTITUTION METHOD: (Radiated Emissions)

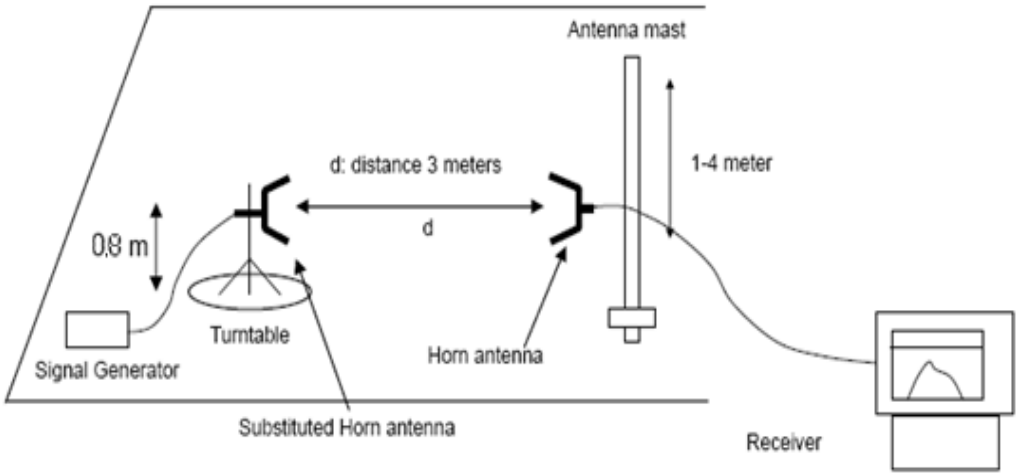
Radiated Below1GHz





Radiated Above 1 GHz





7.4 MEASUREMENT RESULTS:

Applicable Standard

FCC §2.1053, §22.359 and §90.210

On any frequency removed from the center of the authorized bandwidth by a displacement

Frequency (fd in KHz)for of more than 12.5 KHz: at least 50+10 log(P) dB or 70 dB, whichever is lesser attenuation.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10 harmonic.

Limit: At least 50+10 log (P) =50+10log (9) =59.54 (dB)—9W

TEST RESULTS (UHF) -9W:

Transmitter Spurious Emission (30MHz-6GHz)

Frequency	Reading Level	Antenna	S.G.	Cable Loss	Ant.Gain	Emission Level	Limit	Margin
(MHz)	(dBuv/m)	Polarization	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)
Analog Modulation 453.225MHz—part 90								
906.45	43.82	V	-53.57	0.71	6.36	-47.91	-20.00	27.91
906.45	41.15	H	-57.57	0.71	6.36	-51.92	-20.00	31.92
1359.68	44.63	H	-51.35	0.98	5.58	-46.74	-20.00	26.74
1359.68	44.63	V	-52.91	0.98	5.58	-48.31	-20.00	28.31
Analog Modulation 454.025MHz—part 22								
908.05	44.27	V	-52.23	0.71	6.38	-46.56	-13.00	33.56
908.05	42.49	H	-52.60	0.71	6.38	-46.93	-13.00	33.93
1362.08	43.83	V	-50.67	0.98	5.59	-46.07	-13.00	33.07
1362.08	42.72	H	-52.48	0.98	5.59	-47.88	-13.00	34.88
Digital Modulation 453.225MHz—part 90								
906.45	41.15	V	-57.28	0.71	6.36	-51.63	-20.00	31.63
906.45	41.49	H	-56.88	0.71	6.36	-51.23	-20.00	31.23
1359.68	43.35	H	-50.82	0.98	5.58	-46.22	-20.00	26.22
1359.68	44.49	V	-53.31	0.98	5.58	-48.71	-20.00	28.71
Digital Modulation 454.025MHz—part 22								
908.05	43.35	V	-55.10	0.71	6.38	-49.43	-13.00	36.43
908.05	42.48	H	-55.89	0.71	6.38	-50.22	-13.00	37.22
1362.08	41.92	H	-54.66	0.98	5.59	-50.06	-13.00	37.06
1362.08	42.51	V	-53.04	0.98	5.59	-48.44	-13.00	35.44

Note: All the test frequencies was tested, but only the worst data be recorded in this part.

7.5 EMISSION MASK PLOT

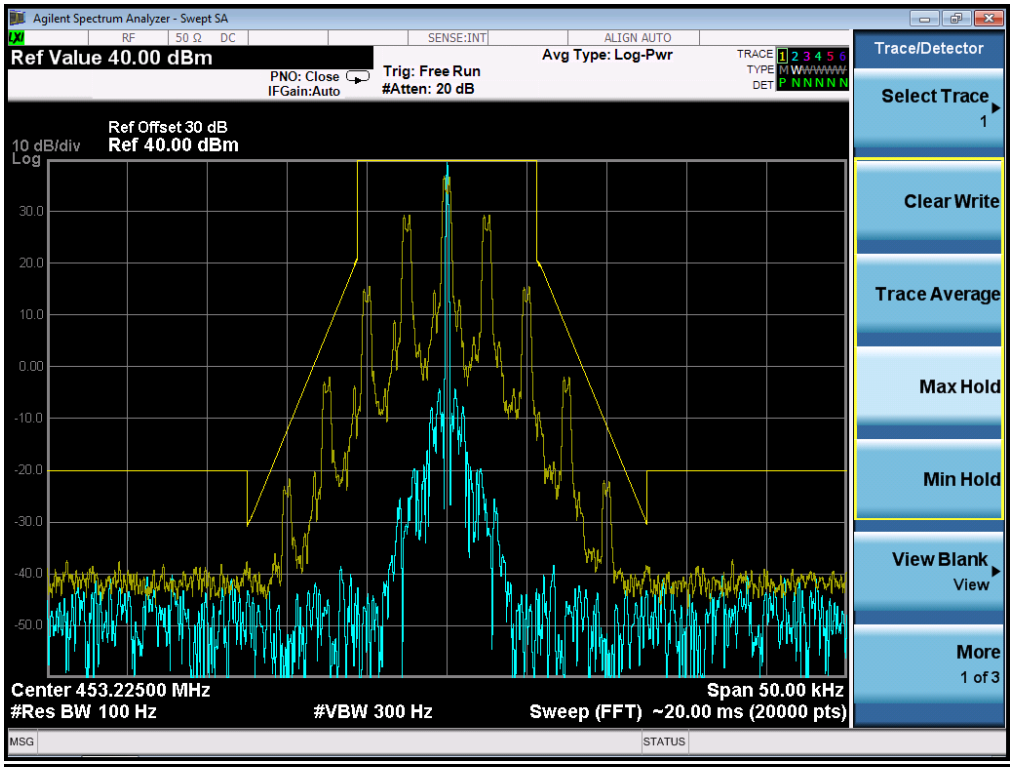
The detailed procedure employed for Emission Mask measurements are specified as following:

- 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.

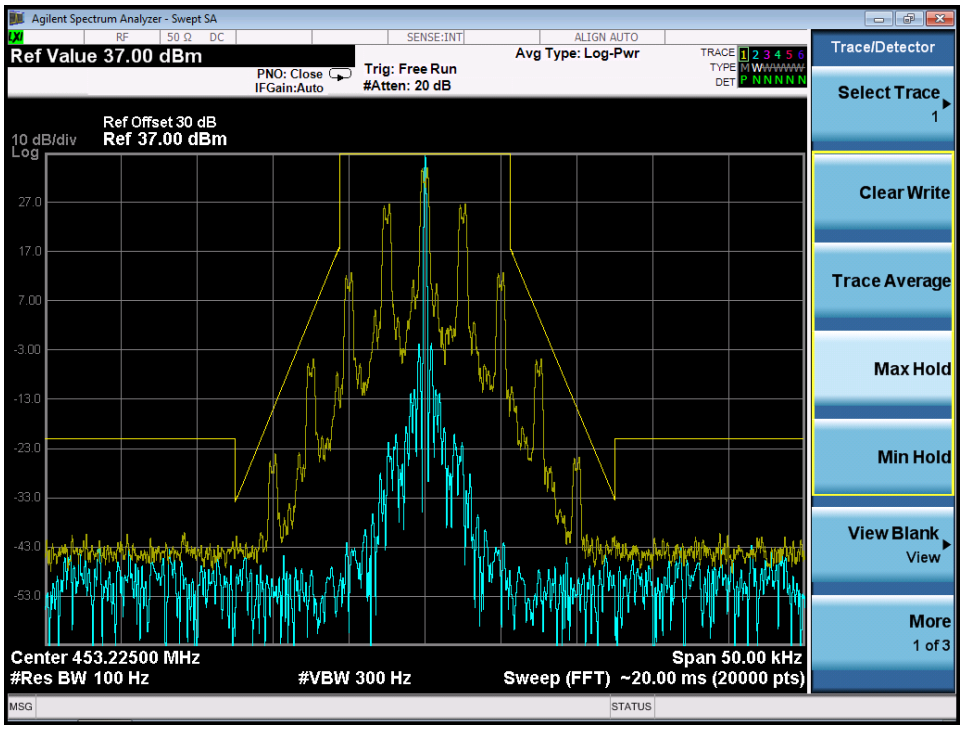
UHF:

Analog:

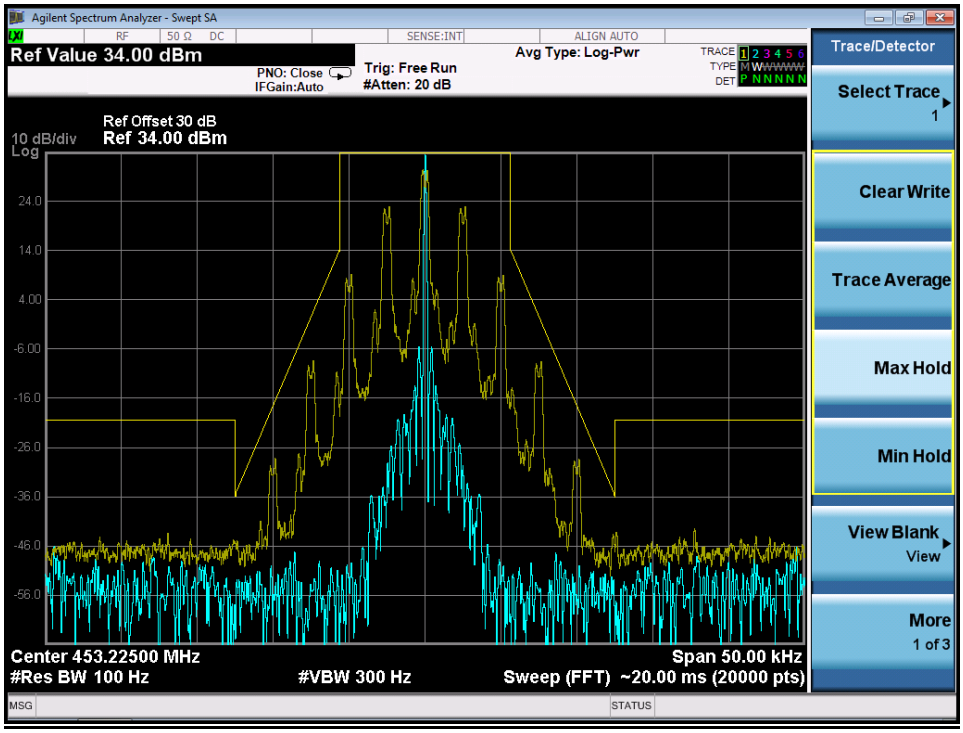
The Worst Emission Mask D for 12.5 KHz channel Separation-453.225MHz (9W)



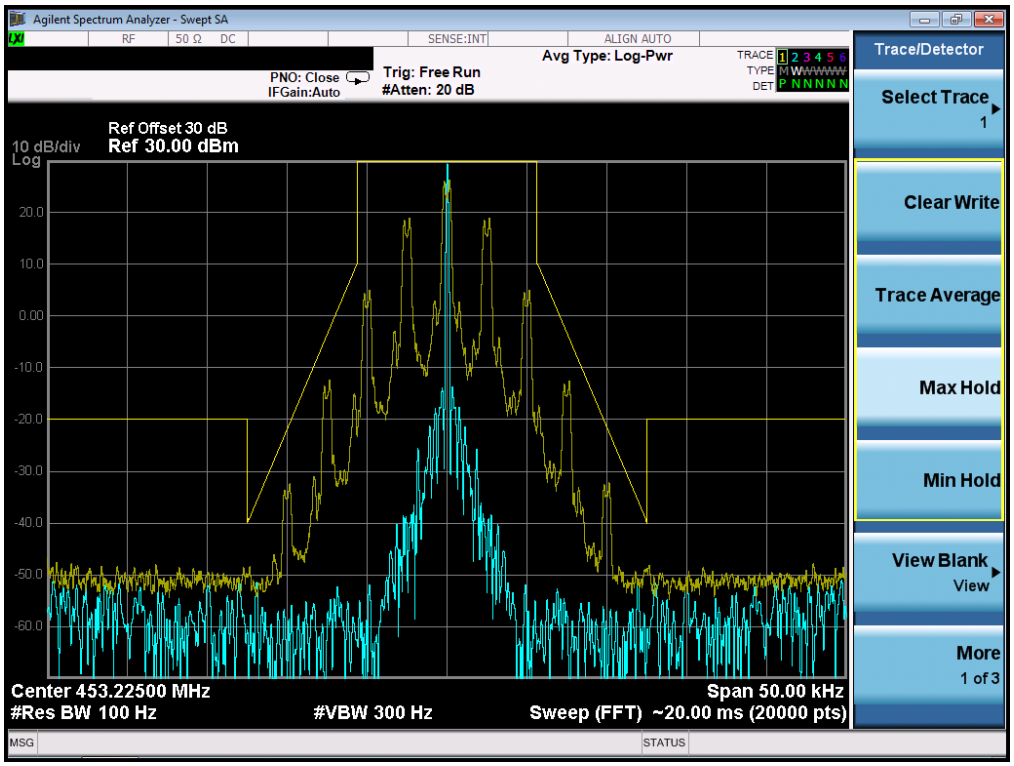
The Worst Emission Mask D for 12.5 KHz channel Separation-453.225MHz (4.5W)



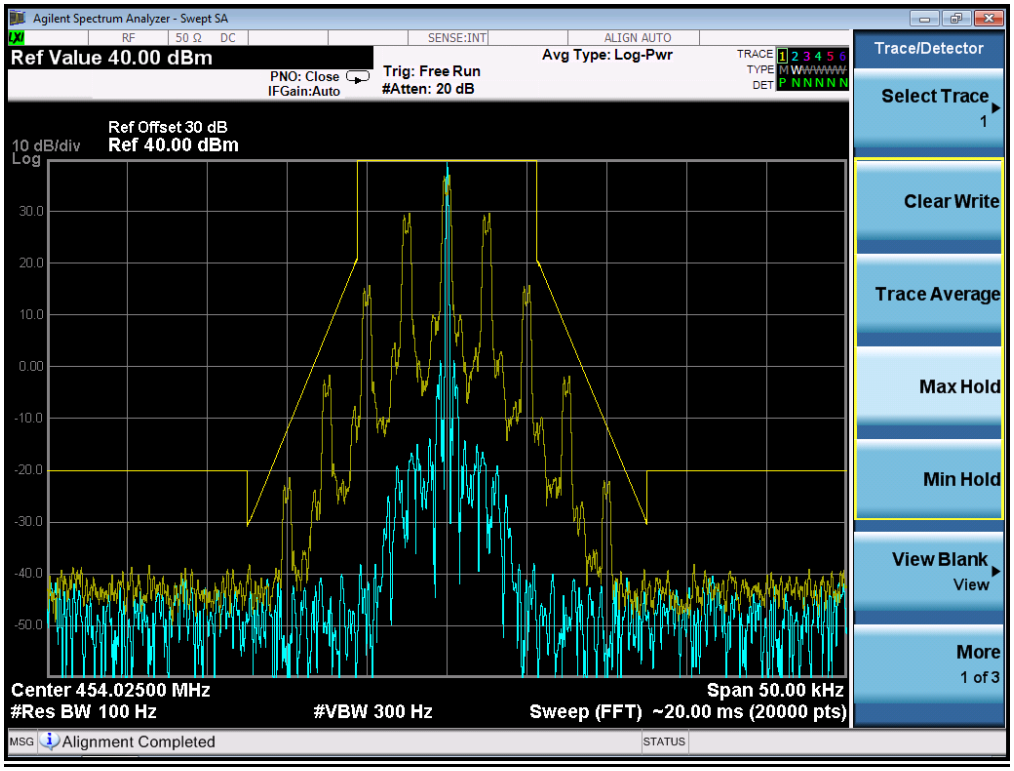
The Worst Emission Mask D for 12.5 KHz channel Separation-453.225MHz (2.5W)



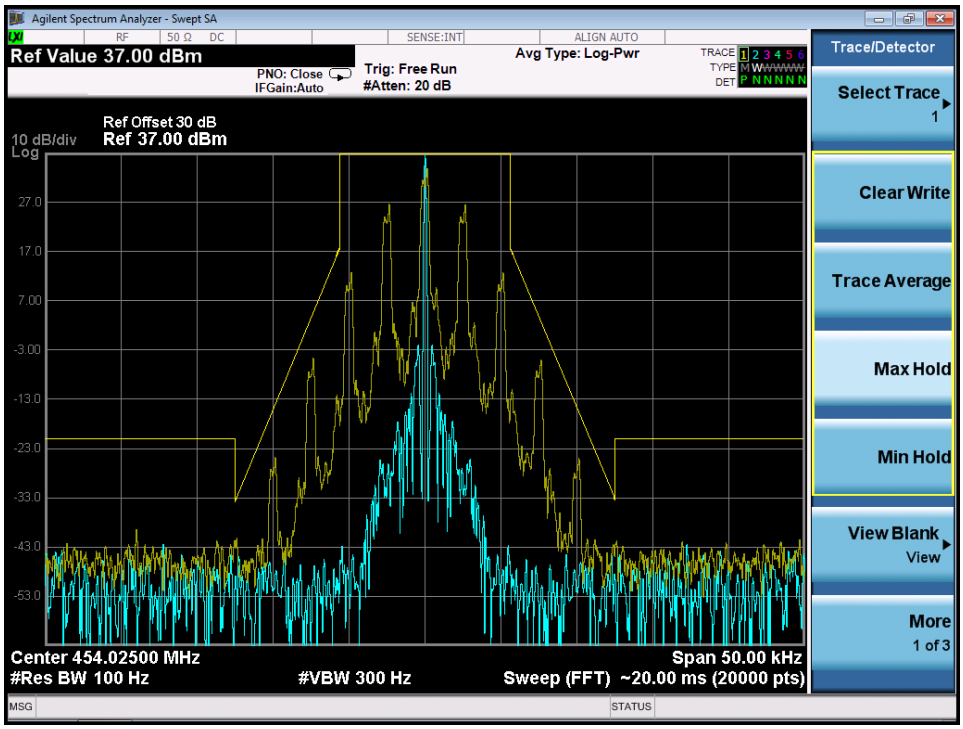
The Worst Emission Mask for 25 KHz channel Separation-453.225MHz (1W)



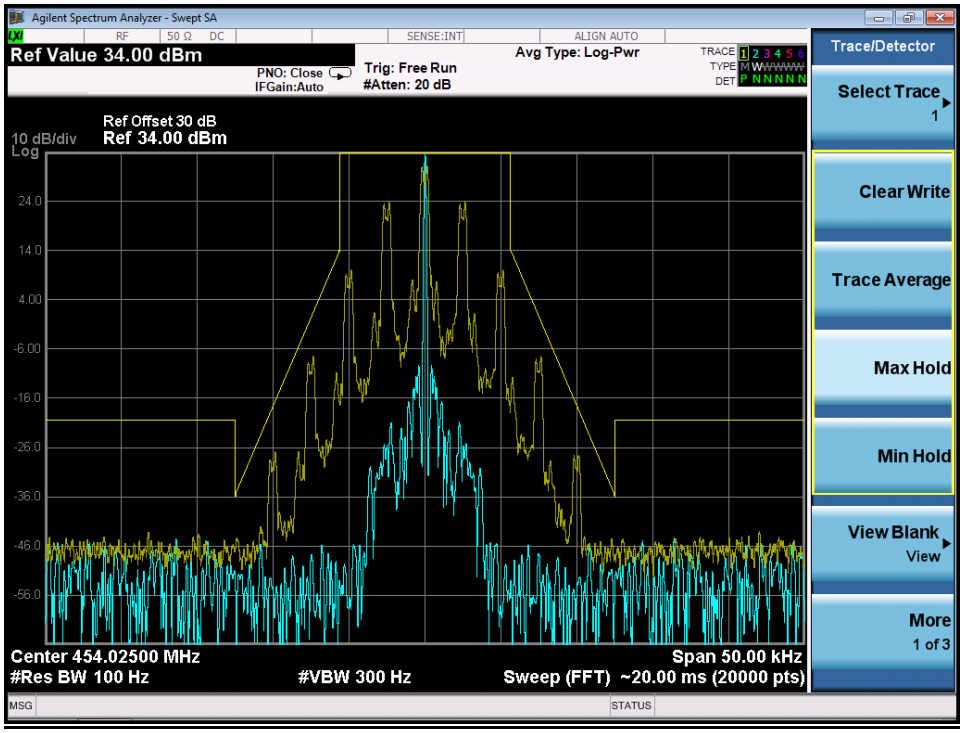
The Worst Emission Mask D for 12.5 KHz channel Separation-454.025 MHz (9W)



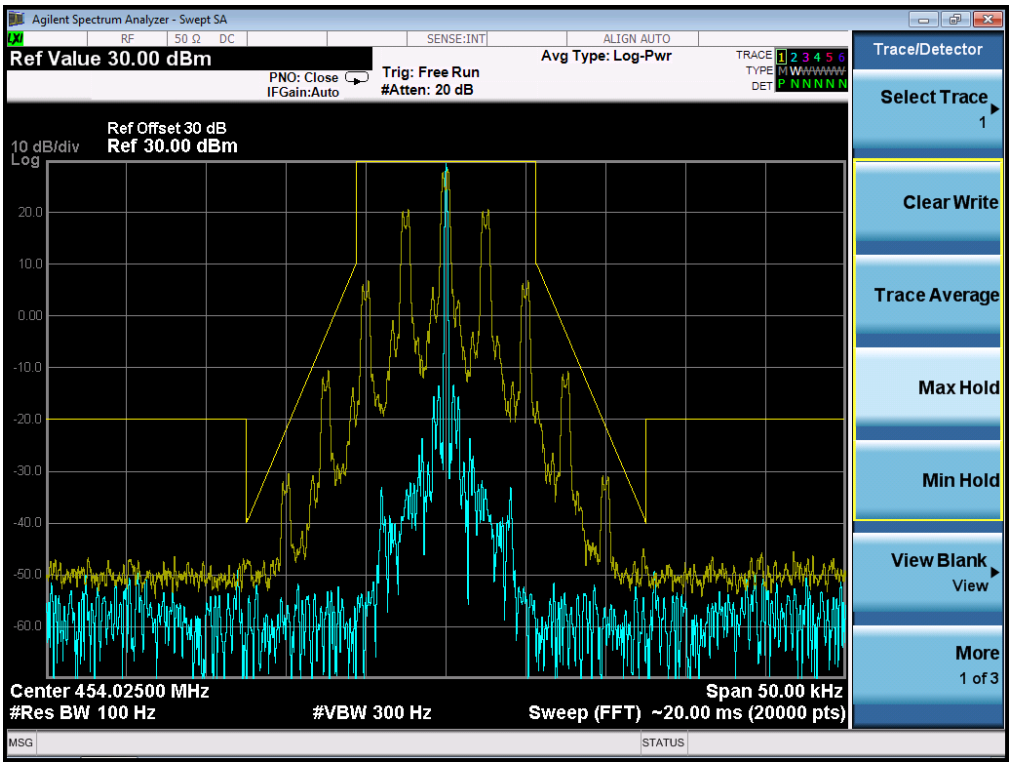
The Worst Emission Mask D for 12.5 KHz channel Separation-454.025 MHz (4.5W)



The Worst Emission Mask D for 12.5 KHz channel Separation-454.025 MHz (2.5W)

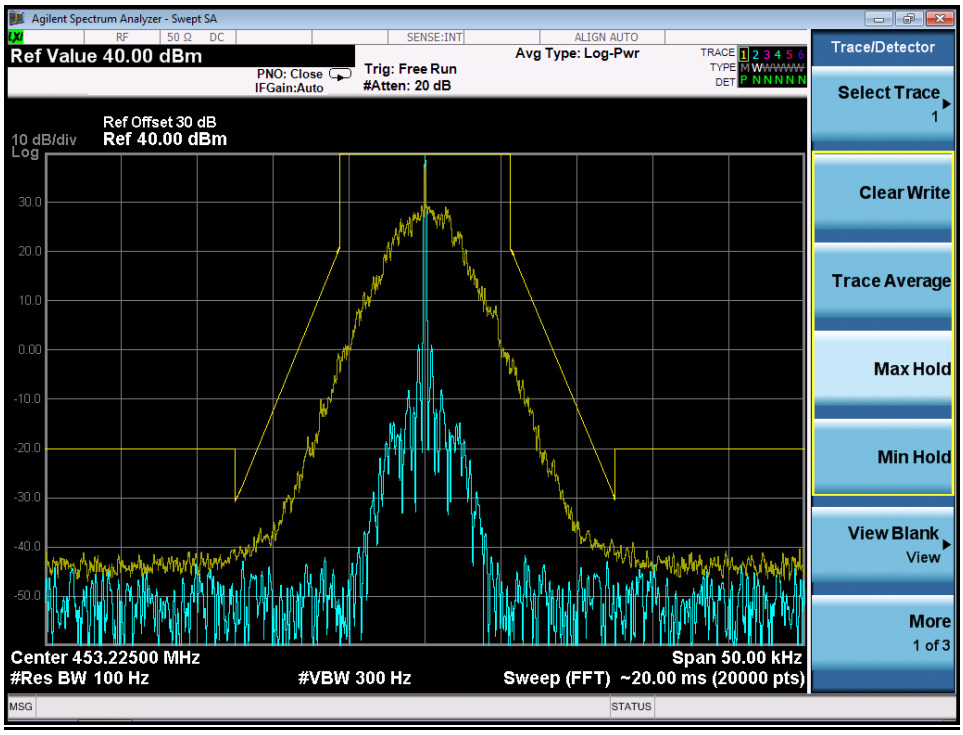


The Worst Emission Mask for 12.5 KHz channel Separation-454.025 MHz (1W)

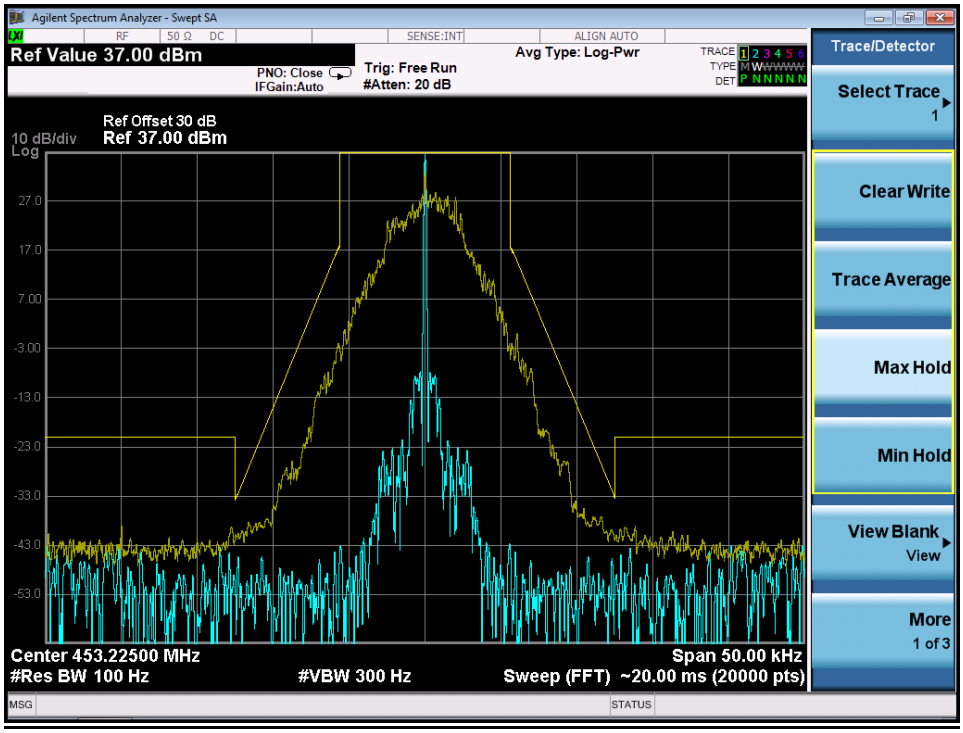


Digital：

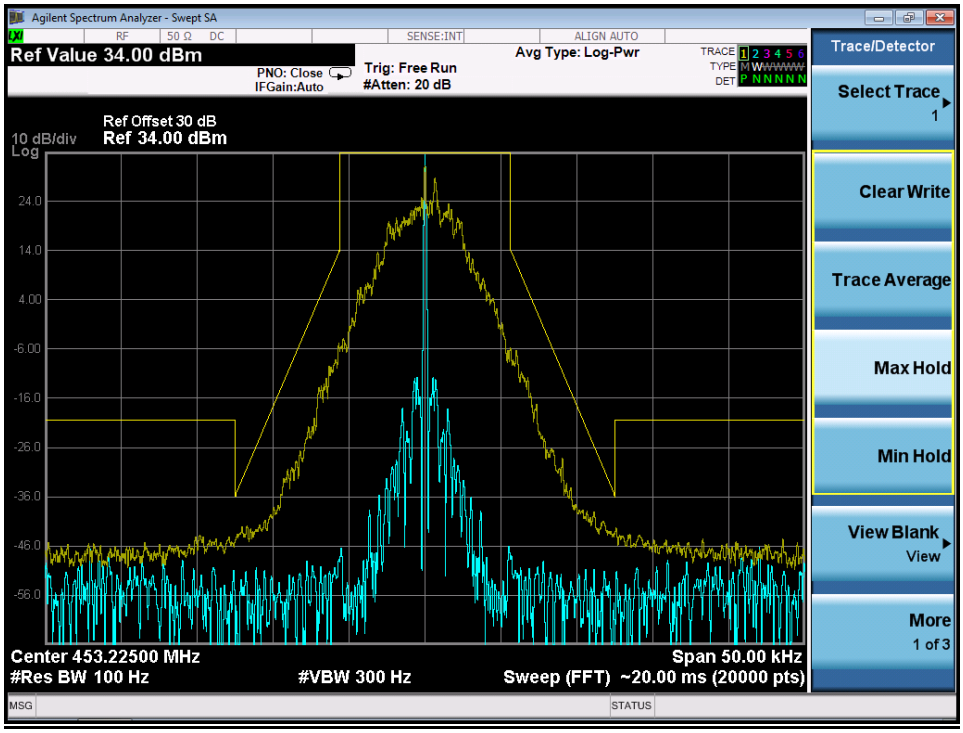
The Worst Emission Mask D for 12.5 KHz channel Separation-453.225MHz (9W)



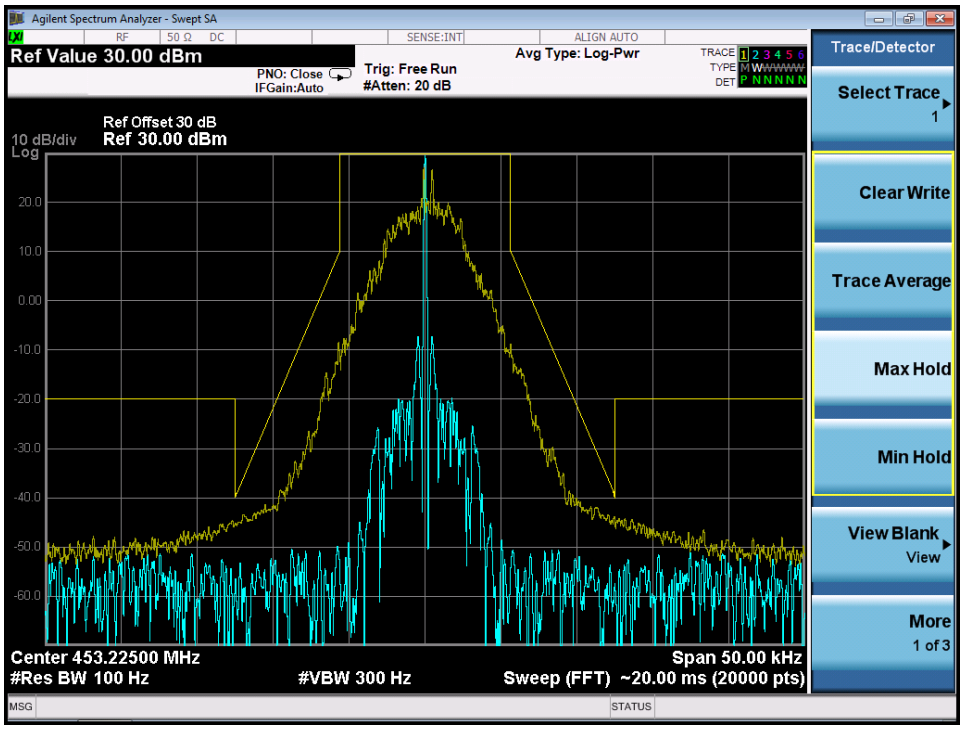
The Worst Emission Mask D for 12.5 KHz channel Separation-453.225MHz (4.5W)



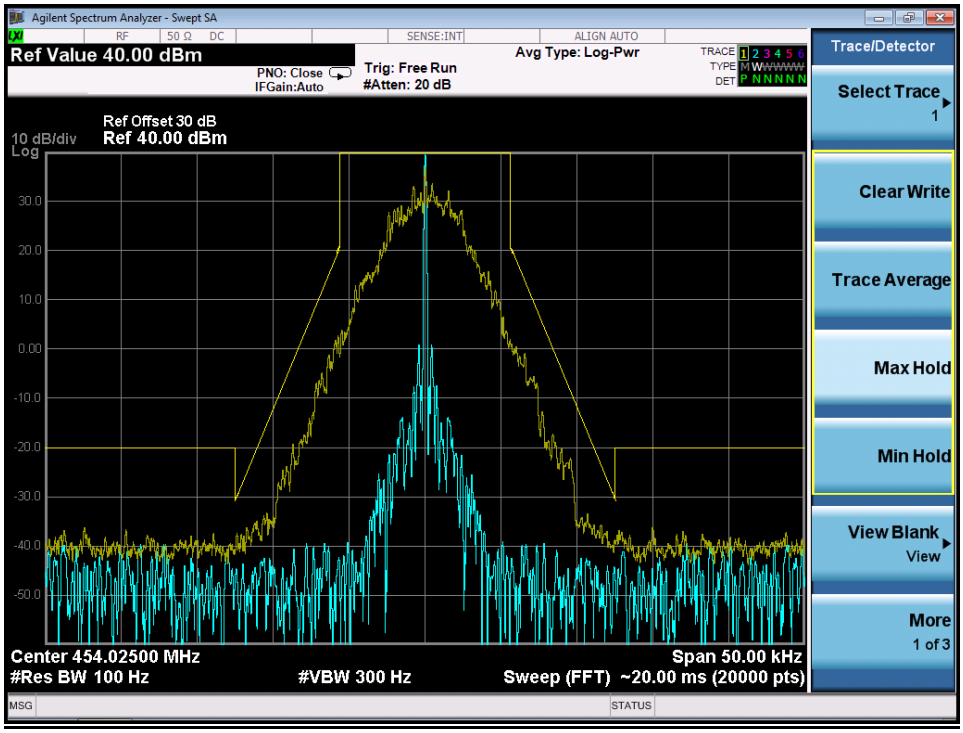
The Worst Emission Mask D for 12.5 KHz channel Separation-453.225MHz (2.5W)



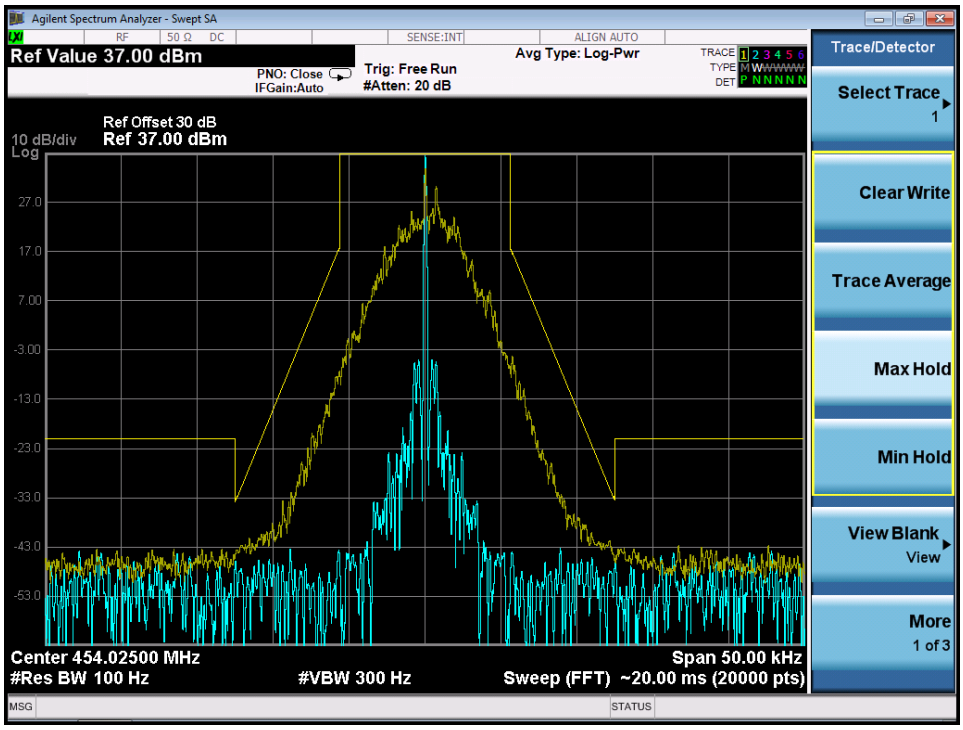
The Worst Emission Mask for 25 KHz channel Separation-453.225MHz (1W)



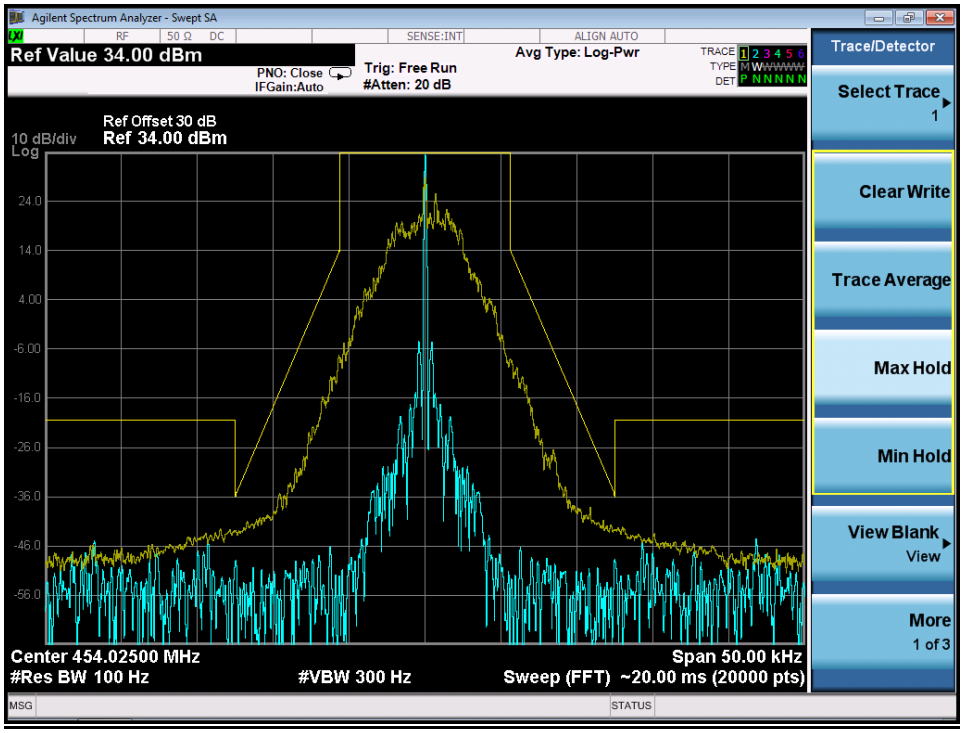
The Worst Emission Mask D for 12.5 KHz channel Separation-454.025 MHz (9W)



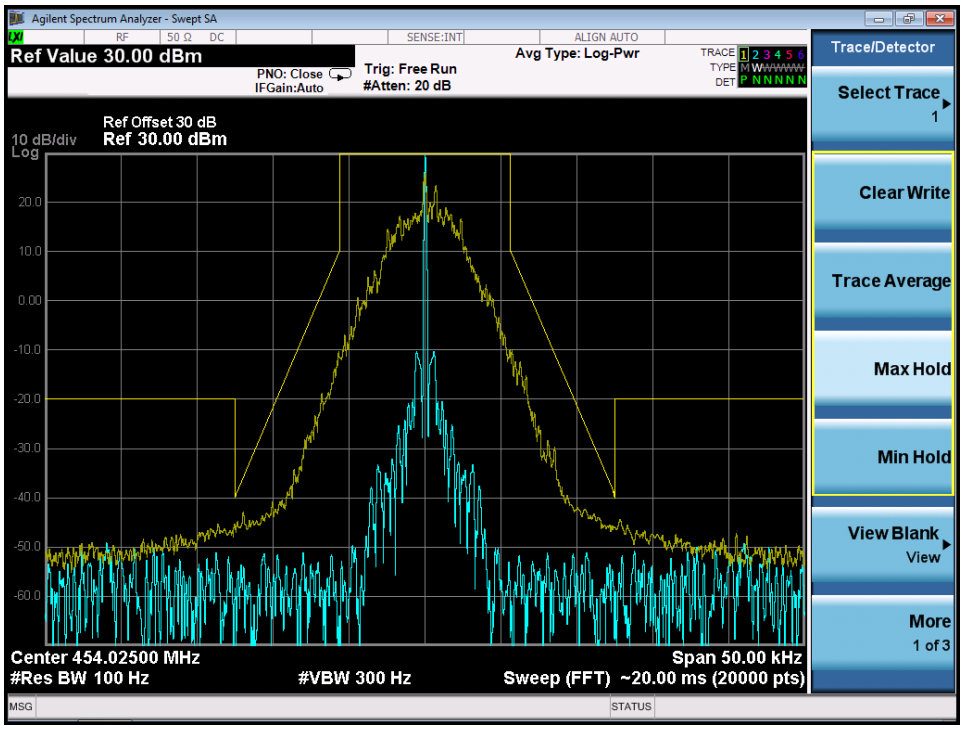
The Worst Emission Mask D for 12.5 KHz channel Separation-454.025 MHz (4.5W)



The Worst Emission Mask D for 12.5 KHz channel Separation-454.025 MHz (2.5W)



The Worst Emission Mask for 12.5 KHz channel Separation-454.025 MHz (1W)



8. MODULATION CHARACTERISTICS

8.1 PROVISIONS APPLICABLE

According to FCC§2.1047 and §90.207, for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

8.2 MEASUREMENT METHOD

8.2.1 Modulation Limit

(1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1KHz using this level as a reference (0dB) and vary the input level from –20 to +20dB. Record the frequency deviation obtained as a function of the input level.

(2). Repeat step 1 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

8.2.2 Audio Frequency Response

(1). Configure the EUT as shown in figure 1.

(2). Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0 dB).

(3). Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.

(4). Audio Frequency Response = 20log10 (Deviation of test frequency/Deviation of 1 KHz reference).

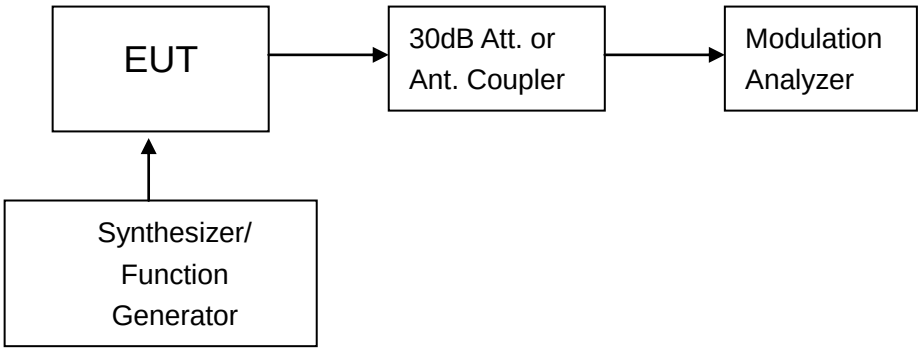


Figure 1: Modulation characteristic measurement configuration

8.3 MEASUREMENT RESULT

UHF:

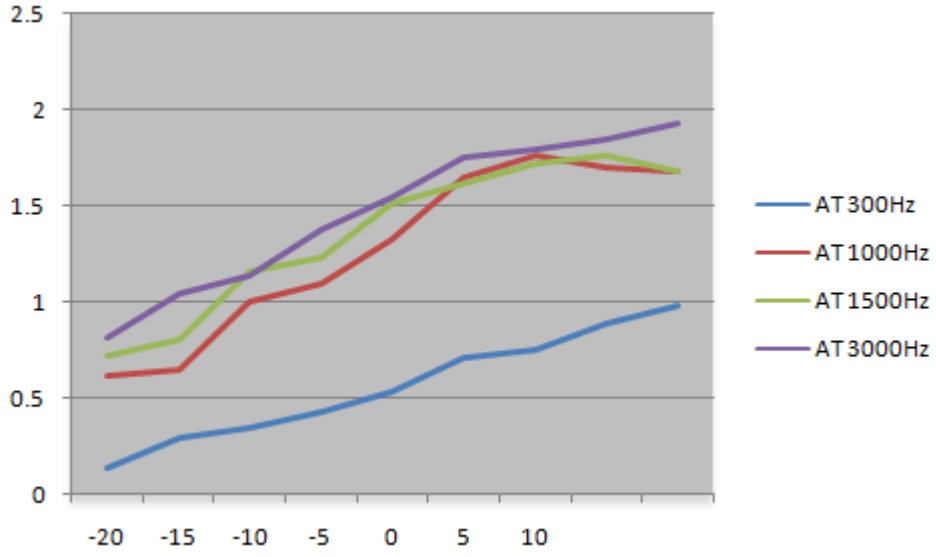
Analog:

TEST RESULT TS FOR H POWER H LEVEL

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.13	0.61	0.72	0.81
-15	0.29	0.64	0.80	1.04
-10	0.34	1.00	1.16	1.13
-5	0.42	1.09	1.23	1.38
0	0.53	1.32	1.51	1.54
+5	0.71	1.64	1.61	1.75
+10	0.75	1.76	1.72	1.79
+15	0.89	1.70	1.76	1.85
+20	0.98	1.68	1.68	1.93



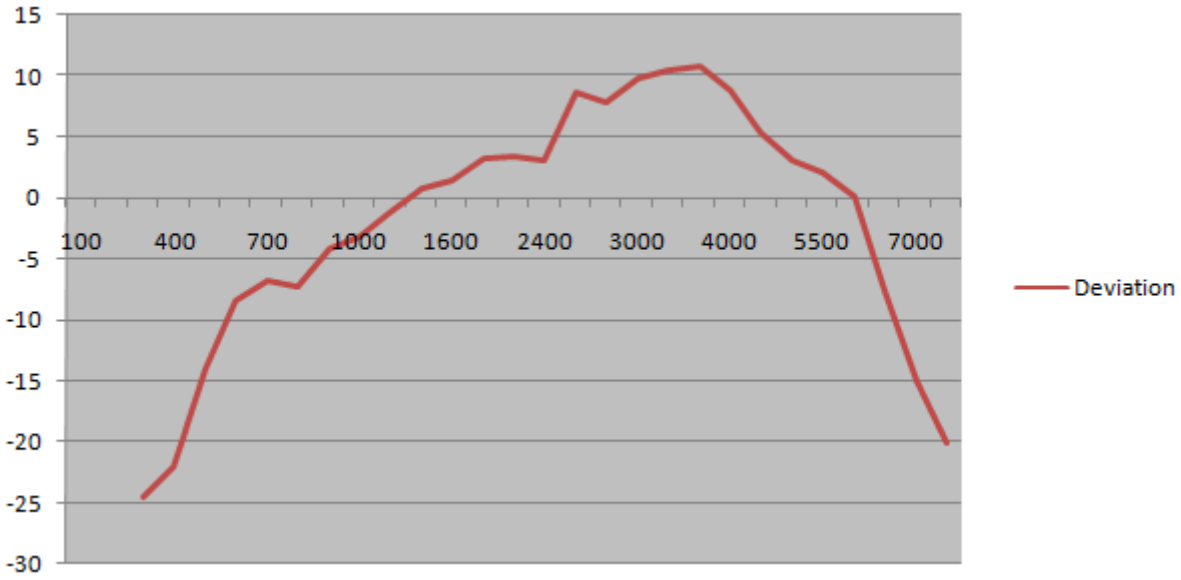
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	0.03	-24.44
300	0.04	-21.94
400	0.10	-13.98
500	0.19	-8.40
600	0.23	-6.74
700	0.22	-7.13
800	0.31	-4.15
900	0.35	-3.10
1000	0.44	-1.11
1200	0.55	0.83
1400	0.59	1.44
1600	0.73	3.29
1800	0.75	3.52
2000	0.72	3.17
2400	1.35	8.63
2500	1.24	7.89
2800	1.56	9.88
3000	1.68	10.53
3200	1.74	10.83
3600	1.39	8.88
4000	0.94	5.48
4500	0.72	3.17
5000	0.64	2.14
5500	0.51	0.17
6000	0.21	-7.54
6500	0.09	-14.89
7000	0.05	-20.00
7500	0.01	-33.98
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel



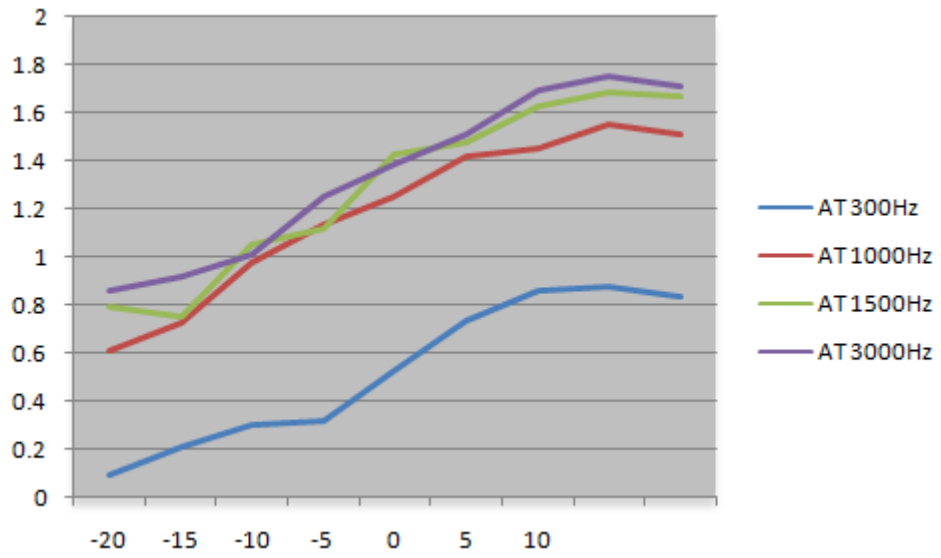
Note: All the modes had been tested, but only the worst data recorded in the report.

Digital:

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations---H Power

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.09	0.61	0.79	0.86
-15	0.21	0.73	0.75	0.92
-10	0.3	0.98	1.05	1.01
-5	0.32	1.13	1.12	1.25
0	0.53	1.25	1.434	1.38
+5	0.74	1.42	1.48	1.51
+10	0.86	1.45	1.63	1.69
+15	0.88	1.55	1.69	1.75
+20	0.84	1.51	1.67	1.71



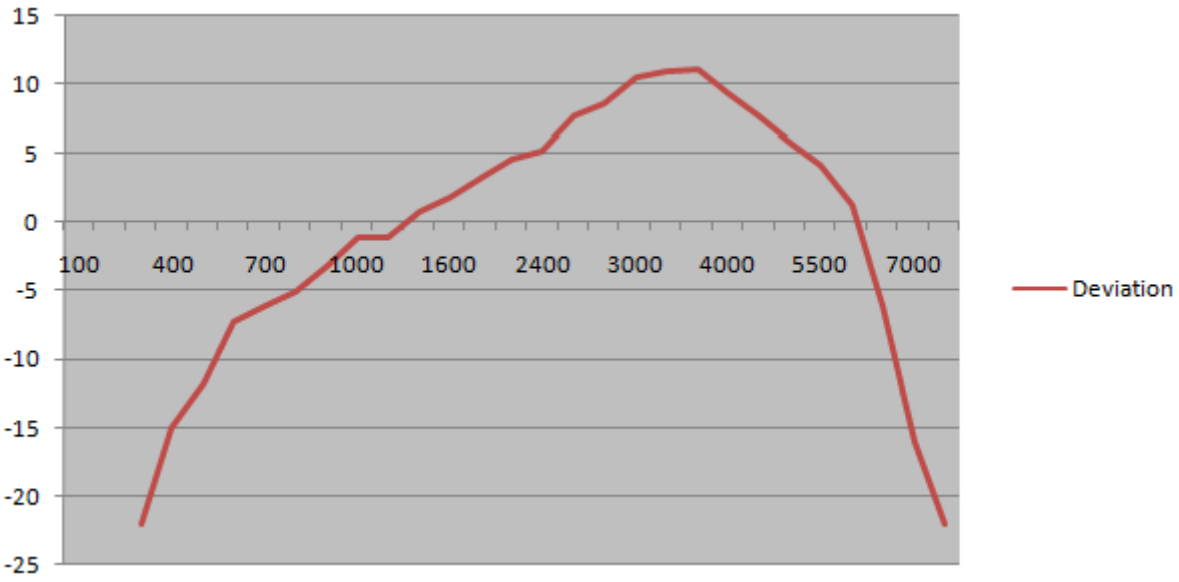
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations---L Power

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	0.04	-21.94
300	0.09	-14.89
400	0.13	-11.70
500	0.22	-7.13
600	0.25	-6.02
700	0.28	-5.04
800	0.35	-3.10
900	0.44	-1.11
1000	0.44	-1.11
1200	0.55	0.83
1400	0.62	1.87
1600	0.74	3.41
1800	0.86	4.71
2000	0.91	5.20
2400	1.22	7.75
2500	1.35	8.63
2800	1.67	10.47
3000	1.75	10.88
3200	1.79	11.08
3600	1.47	9.37
4000	1.21	7.68
4500	0.98	5.85
5000	0.81	4.19
5500	0.58	1.29
6000	0.25	-6.02
6500	0.08	-15.92
7000	0.04	-21.94
7500	0.01	-33.98
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Bottom Channel---H Power



Note: All the modes had been tested, but only the worst data recorded in the report.

9. MAXIMUMN TRANSMITTER POWER (CONDUCTED OUTPUT POWER)

9.1 PROVISIONS APPLICABLE

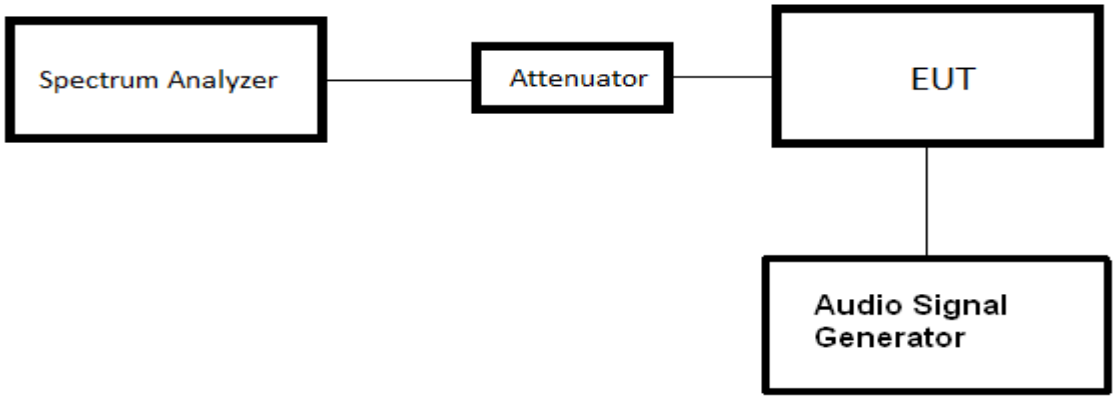
Per FCC §2.1046 § 22.565 and §90.205: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

9.2 TEST PROCEDURE

The RF output of Two-way Radio was conducted to a spectrum analyzer through an appropriate attenuator.

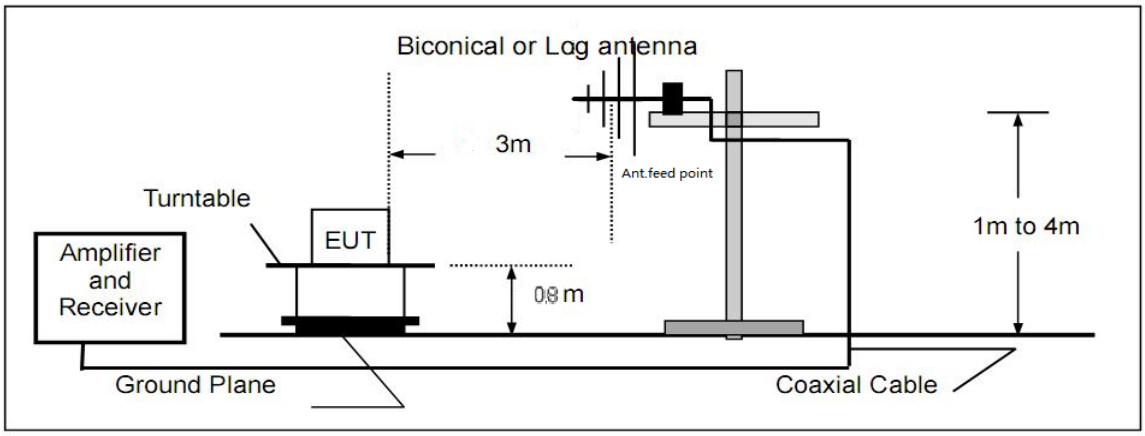
9.3 TEST CONFIGURATION

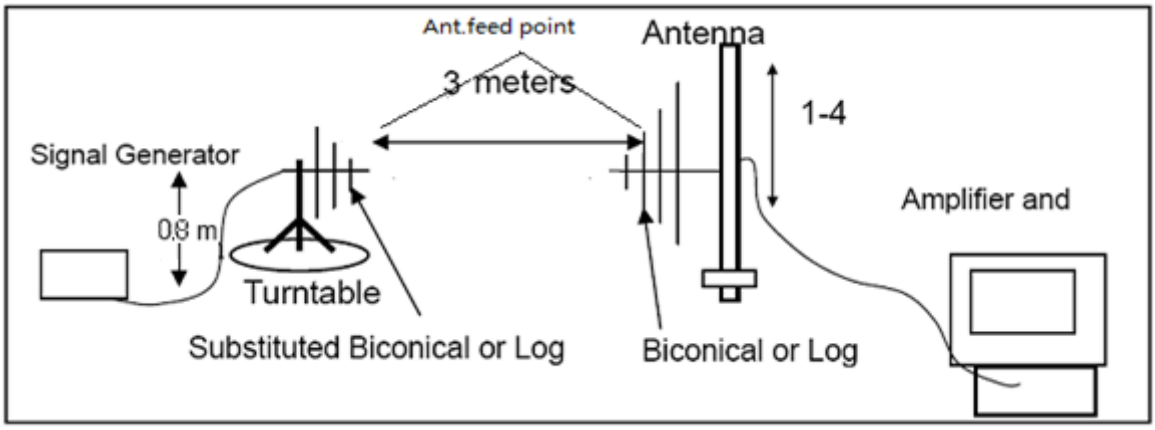
Conducted Output Power:



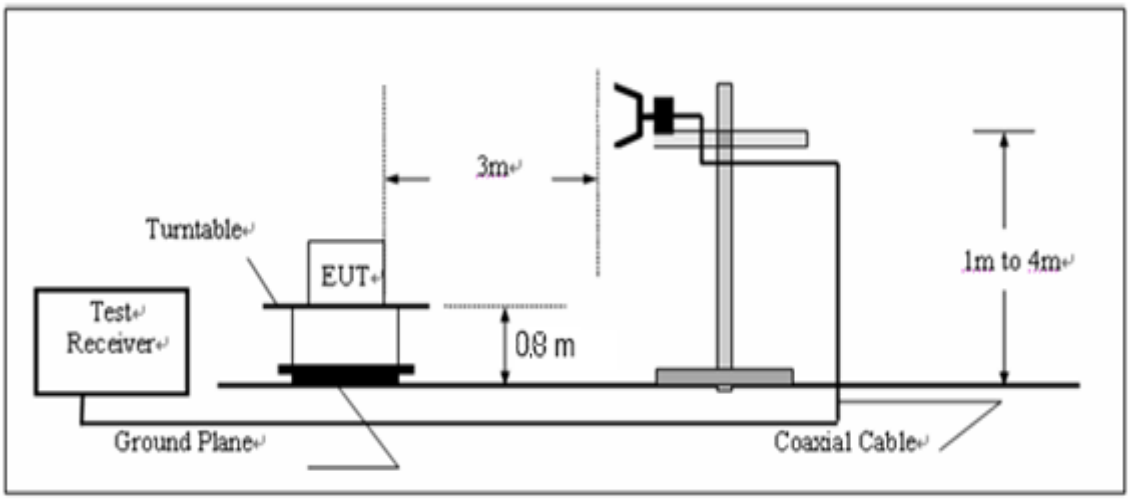
Effective Radiated Power

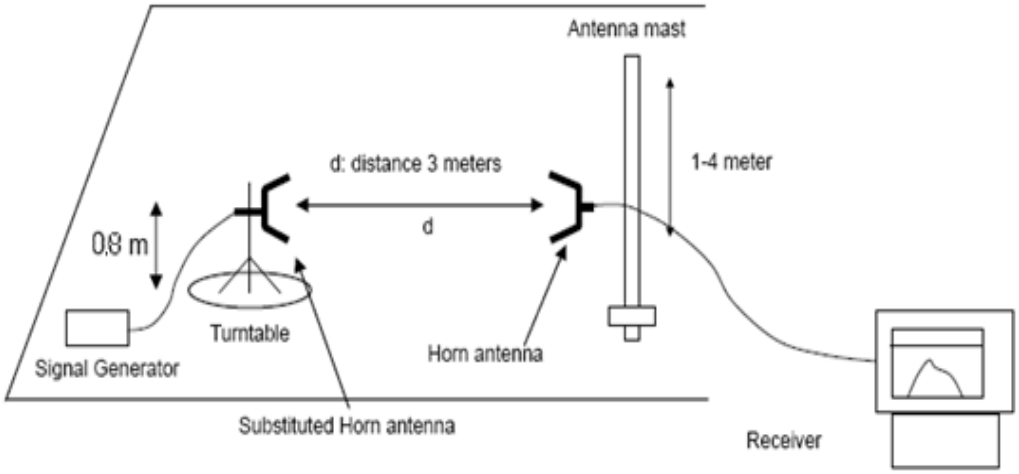
Radiated Below1GHz





Radiated Above 1 GHz





9.4 TEST RESULT

The maximum Conducted Power (CP) for VHF/UHF is

Analog: UHF/VHF for 12.5 KHz/25 KHz Channel Separation

Digital: UHF/VHF for 12.5 KHz Channel Separation

Calculation Formula: CP = R + A + L

***** Note:

CP: The final Conducted Power

R : The reading value from spectrum analyzer

A : The attenuation value of the used attenuator

L : The loss of all connection cables

UHF:

Analog:

12.5 KHz:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 39.54dBm(9W)
12.5 KHz	Bottom(400.025MHz)	39.32
	Middle(453.225MHz)	39.31
	Middle(454.025MHz)	39.29
	Top (479.975MHz)	39.33

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 39.54dBm(9W)
12.5 KHz	Bottom(400.025MHz)	39.39
	Middle(453.225MHz)	39.48
	Middle(454.025MHz)	39.32
	Top (479.975MHz)	39.20

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.53dBm(4.5W)
12.5 KHz	Bottom(400.025MHz)	36.22
	Middle(453.225MHz)	36.35
	Middle(454.025MHz)	36.42
	Top (479.975MHz)	36.38

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.53dBm(4.5W)
12.5 KHz	Bottom(400.025MHz)	36.25
	Middle(453.225MHz)	36.17
	Middle(454.025MHz)	36.28
	Top (479.975MHz)	36.36

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 33.98dBm(2.5W)
12.5 KHz	Bottom(400.025MHz)	33.72
	Middle(453.225MHz)	33.84
	Middle(454.025MHz)	33.67
	Top (479.975MHz)	33.85

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 33.98dBm(2.5W)
12.5 KHz	Bottom(400.025MHz)	33.85
	Middle(453.225MHz)	33.72
	Middle(454.025MHz)	33.83
	Top (479.975MHz)	33.81

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.86
	Middle(453.225MHz)	29.78
	Middle(454.025MHz)	29.77
	Top (479.975MHz)	29.65

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.73
	Middle(453.225MHz)	29.85
	Middle(454.025MHz)	29.87
	Top (479.975MHz)	29.65

Digital:

Date + voice:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 39.54dBm(9W)
12.5 KHz	Bottom(400.025MHz)	39.22
	Middle(453.225MHz)	39.11
	Middle(454.025MHz)	39.35
	Top (479.975MHz)	39.43

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 39.54dBm(9W)
12.5 KHz	Bottom(400.025MHz)	39.25
	Middle(453.225MHz)	39.42
	Middle(454.025MHz)	39.34
	Top (479.975MHz)	39.31

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.53dBm(4.5W)
12.5 KHz	Bottom(400.025MHz)	36.28
	Middle(453.225MHz)	36.39
	Middle(454.025MHz)	36.15
	Top (479.975MHz)	36.27

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.53dBm(4.5W)
12.5 KHz	Bottom(400.025MHz)	36.24
	Middle(453.225MHz)	36.36
	Middle(454.025MHz)	36.47
	Top (479.975MHz)	36.36

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 33.98dBm(2.5W)
12.5 KHz	Bottom(400.025MHz)	33.71
	Middle(453.225MHz)	33.63
	Middle(454.025MHz)	33.82
	Top (479.975MHz)	33.74

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 33.98dBm(2.5W)
12.5 KHz	Bottom(400.025MHz)	33.62
	Middle(453.225MHz)	33.65
	Middle(454.025MHz)	33.87
	Top (479.975MHz)	33.78

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.75
	Middle(453.225MHz)	29.86
	Middle(454.025MHz)	29.87
	Top (479.975MHz)	29.78

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.86
	Middle(453.225MHz)	29.75
	Middle(454.025MHz)	29.67
	Top (479.975MHz)	29.88

Date transmission mode:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 39.54dBm(9W)
12.5 KHz	Bottom(400.025MHz)	39.32
	Middle(453.225MHz)	39.45
	Middle(454.025MHz)	39.27
	Top (479.975MHz)	39.36

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 39.54dBm(9W)
12.5 KHz	Bottom(400.025MHz)	39.25
	Middle(453.225MHz)	39.36
	Middle(454.025MHz)	39.15
	Top (479.975MHz)	39.45

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.53dBm(4.5W)
12.5 KHz	Bottom(400.025MHz)	36.12
	Middle(453.225MHz)	36.23
	Middle(454.025MHz)	36.34
	Top (479.975MHz)	36.49

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.53dBm(4.5W)
12.5 KHz	Bottom(400.025MHz)	36.25
	Middle(453.225MHz)	36.38
	Middle(454.025MHz)	36.22
	Top (479.975MHz)	36.41

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 33.98dBm(2.5W)
12.5 KHz	Bottom(400.025MHz)	33.75
	Middle(453.225MHz)	33.81
	Middle(454.025MHz)	33.79
	Top (479.975MHz)	33.68

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 33.98dBm(2.5W)
12.5 KHz	Bottom(400.025MHz)	33.85
	Middle(453.225MHz)	33.73
	Middle(454.025MHz)	33.78
	Top (479.975MHz)	33.86

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.85
	Middle(453.225MHz)	29.74
	Middle(454.025MHz)	29.82
	Top (479.975MHz)	29.76

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.79
	Middle(453.225MHz)	29.78
	Middle(454.025MHz)	29.77
	Top (479.975MHz)	29.75

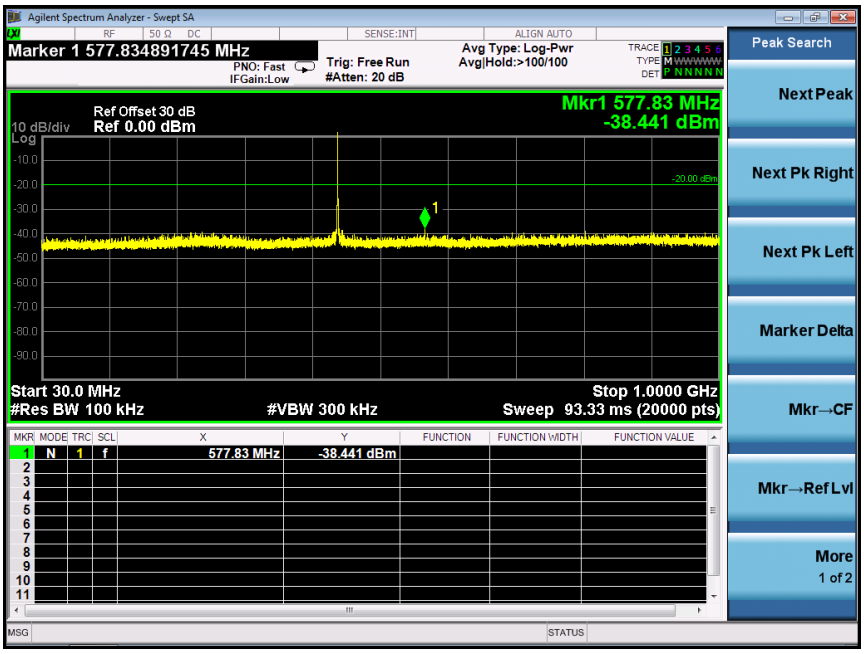
9.5 CONDUCT SPURIOUS PLOT

UHF:ANALOG:

12.5 KHz:

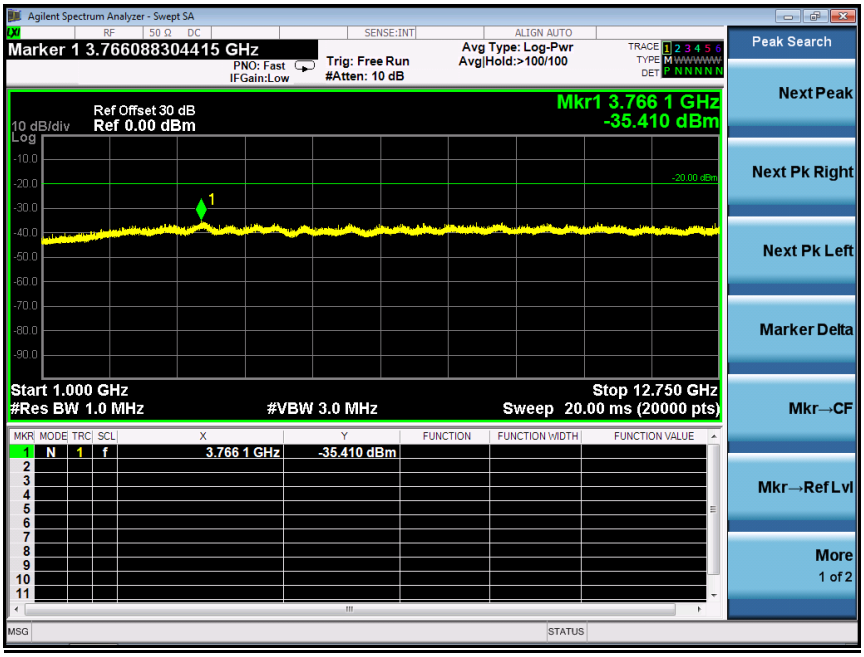
Conducted Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-9W

30MHz-1GHz



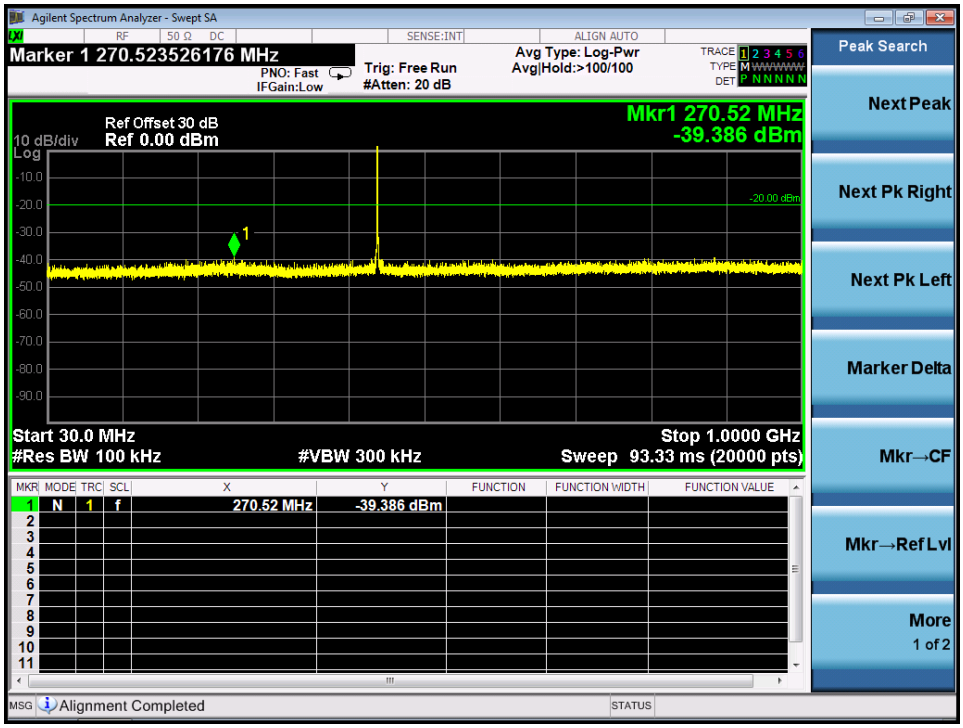
Conduct Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-9W

1GHz-12.75GHz



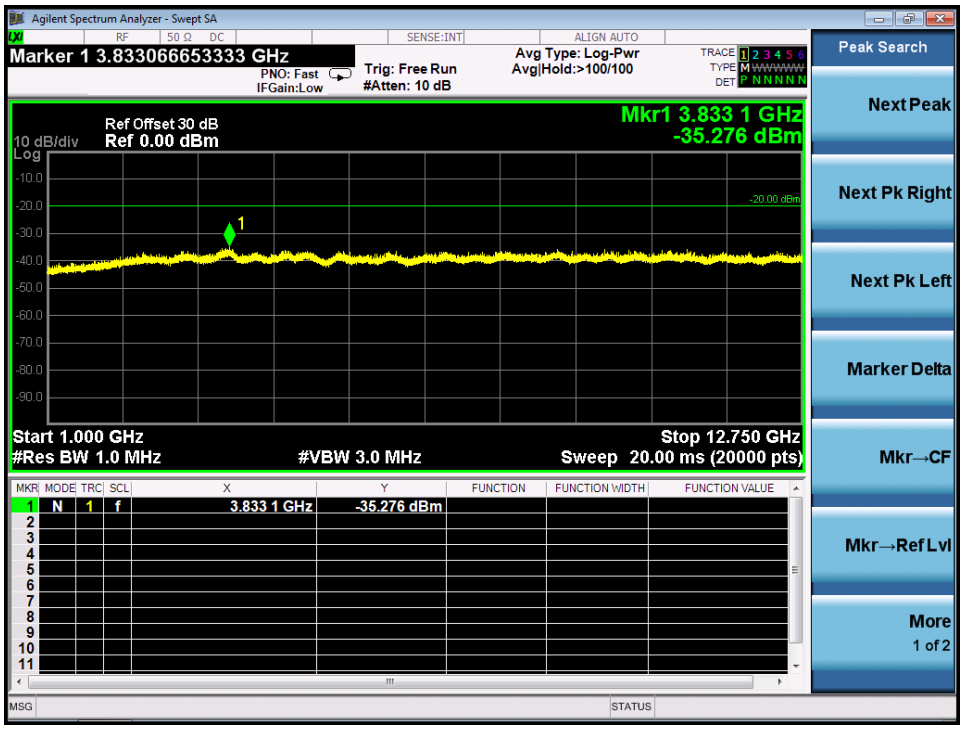
Conducted Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-9W

30MHz-1GHz



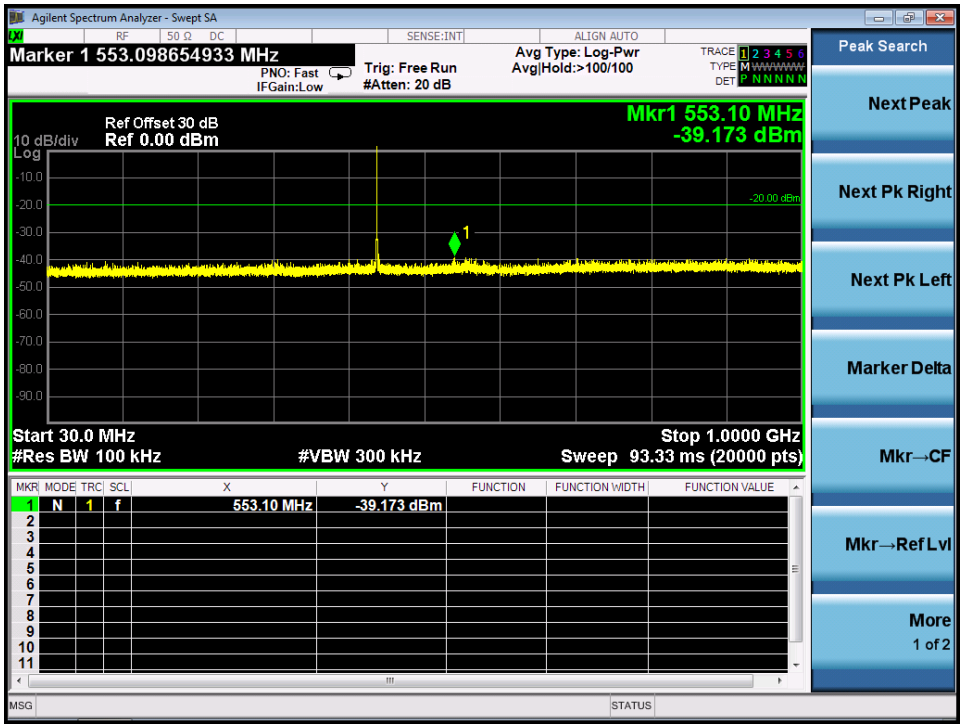
Conduct Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-9W

1GHz-12.75GHz



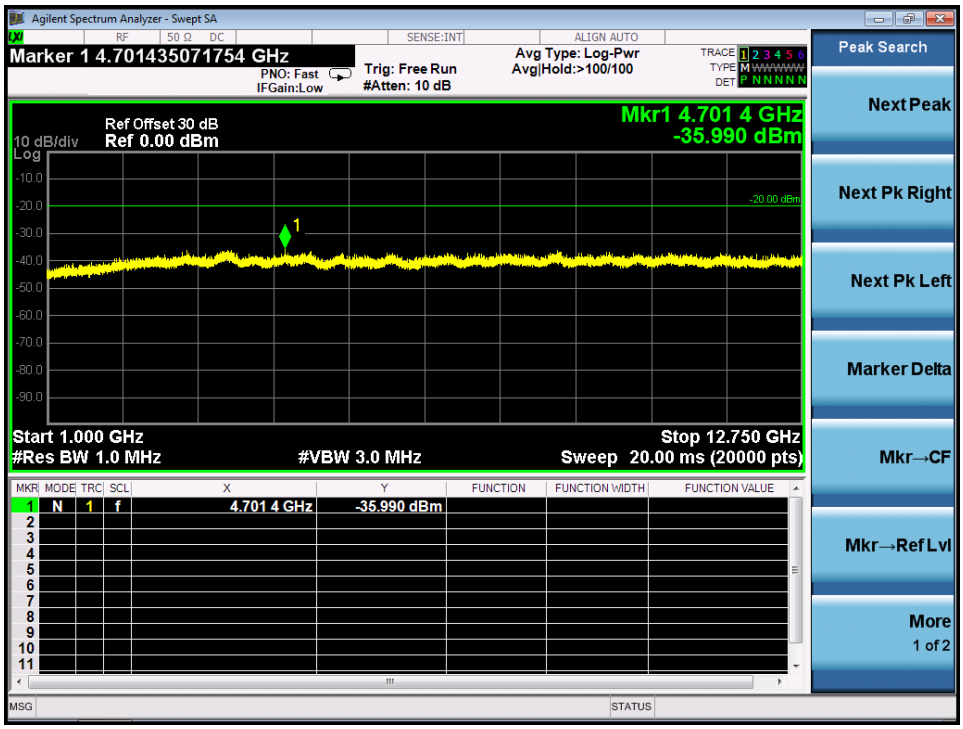
Conducted Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-4.5W

30MHz-1GHz



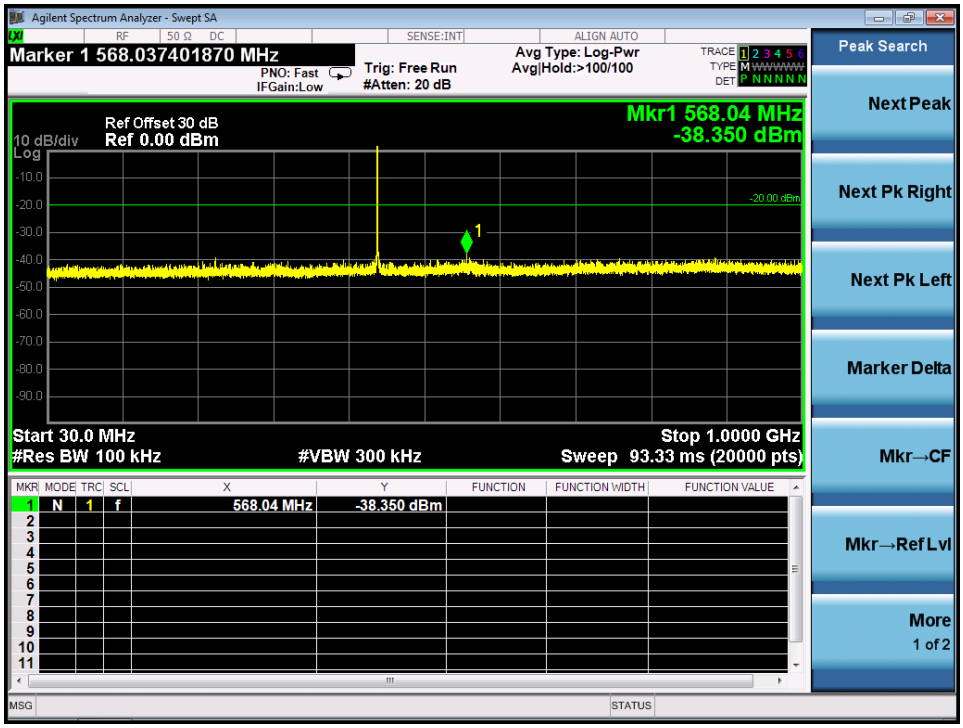
Conduct Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-4.5W

1GHz-12.75GHz



Conducted Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-4.5W

30MHz-1GHz



Conduct Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-4.5W

1GHz-12.75GHz