
FCC Part 90& Part 22 Rules Test Report

Report No.: AGC02931191102FE10

FCC ID : POD-DMR6
PRODUCT DESIGNATION : DMR Digital Transceiver
BRAND NAME : TYT
MODEL NAME : MD-750
APPLICANT : TYT ELECTRONICS CO., LTD
DATE OF ISSUE : Jan. 05, 2020
STANDARD(S) : FCC Part 90 Rules
: FCC Part 22 Rules
REPORT VERSION : V 1.2

Attestation of Global Compliance (Shenzhen) Co., Ltd



Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 15, 2020	Invalid	Initial Release
V1.1	1 st	Nov. 20, 2020	Invalid	Updated Operation Frequency P6
V1.2	2 nd	Jan. 05, 2021	Valid	Updated test report

草案

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1. VERIFICATION OF COMPLIANCE

Applicant:	TYT ELECTRONICS CO., LTD
Address	Block 39-1, Optoelectronics-information industry base, Nan'an, Quanzhou, Fujian, China.
Manufacturer:	TYT ELECTRONICS CO., LTD
Address	Block 39-1, Optoelectronics-information industry base, Nan'an, Quanzhou, Fujian, China.
Factory	TYT ELECTRONICS CO., LTD
Address	Block 39-1, Optoelectronics-information industry base, Nan'an, Quanzhou, Fujian, China.
Product Designation:	DMR Digital Transceiver
Brand Name:	TYT
Test Model	MD-750
Date of Test:	Mar. 01, 2020~Apr. 15, 2020

WE HEREBY CERTIFY THAT:

The above equipment was tested by Shenzhen Attestation of Global Compliance Science & Technology Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-603-E (2016). 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.

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

The EUT is a **DMR Digital Transceiver** 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	MD750-V2.1.4	
Software Version	V1.1.1	
Modulation	FM/4FSK	
Emission Type	7K60FXD/7K60FXE/11K0F3E	
Emission Bandwidth	Analog:10.254KHz(5W-12.5 KHz), 10.251KHz(1W-12.5 KHz) ---VHF Digital: 9.264KHz(5W),9.824 KHz(1W) ---VHF Analog:10.275KHz(5W-12.5 KHz), 10.282KHz(1W-12.5 KHz) ---UHF Digital: 9.828KHz(5W), 9.250KHz(1W) ---UHF	
Peak Frequency Deviation	1.95KHz	
Audio Frequency Response	7.60dB	
Maximum Transmitter Power	Analog:36.90dBm(5W-12.5 KHz), 29.88dBm (1W-12.5 KHz) ---VHF Digital: 36.77dBm(5W), 29.83dBm (1W) ---VHF Analog:36.92dBm(5W-12.5 KHz), 29.85dBm (1W-12.5 KHz) ---UHF Digital: 36.78dBm(5W), 29.81dBm (1W) ---UHF	
Output power Modification	VHF:5W/1W UHF: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	1.2dBi	
Power Supply	DC 7.4V	
Limiting Voltage	DC 6.29 V~ 8.51V	
Operation Frequency Range and Channel	Frequency Range: 136 MHz to 174 MHz (VHF) 400 MHz to 480 MHz (UHF) Channel Separation: 12.5KHz(Digital/ Analog)	
	Bottom Channel: 136.025MHz Middle Channel:151.85MHz Middle Channel:155.025MHz Middle Channel:161.61MHz High Channel: 173.975MHz	Bottom Channel: 400.025MHz Middle Channel: 453.225MHz Middle Channel: 454.025MHz High Channel: 479.975MHz
Frequency Tolerance	1.096ppm	

Frequency Range (MHz)	Rated Transmit Power(W)(Conducted)	Transmit Mode/Emission Designator
400-480	5W/1W	11K0F3E(Analog Voice;NB)
400-480	5W/1W	7K60FXD/7K60FXW(9600Data/Digital Voice NB)

Frequency Range (MHz)	Rated Transmit Power(W)(Conducted)	Transmit Mode/Emission Designator
136-174	5W/1W	11K0F3E(Analog Voice;NB)
136-174	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		

Channel No. (6.25KHz)	Channel No. (12.5KHz)	12.5KHz Channel Spaced 136MHz Band Plan(MHz)
1	1-2	136.025
2		
3	3-4	155.025
4		
5	5-6	173.975
6		

FCC Rules and Regulations Part 2.202: Necessary Bandwidth and Emission Bandwidth

For FM Mode (Channel Spacing: 12.5kHz)

Emission Designator 11K0F3E

In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

$$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} = 11K0$$

F3E portion of the designator represents an FM voice transmission

Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

For FM Mode (Channel Spacing: 25kHz)

Emission Designator 16K0F3E

In this case, the maximum modulating frequency is 3.0 kHz with a 5.0 kHz deviation.

$$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 5.0 \text{ kHz}) = 16 \text{ kHz} = 16K0$$

F3E portion of the designator represents an FM voice transmission

Therefore, the entire designator for 25 kHz channel spacing FM mode is 16K0F3E.

For Digital Mode (Channel Spacing: 12.5 kHz)

Emission Designator 7K60F1D and

7K60F1E

The 99% energy rule was used for digital mode. It basically states that 99% of the modulation energy falls within X kHz, in this case, 7.60 kHz.

F1D and F1E portion of the designator indicates digital information.

Therefore, the entire designator for 12.5 kHz channel spacing digital mode is 7K60F1D and 7K60F1E.

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **POD-DMR6**, filing to comply with Part 2, Part 22, and Part 90 of the Federal Communication Commission rules.

2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI/TIA-603-E (2016).

2.4 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

2.5 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 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.

3.2 EUT EXERCISE

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

3.3 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
- (7). Section 90.210 & 22.359: Spurious Emission on Antenna Port
- (8). Section 90.210 & 22.359: Spurious Radiated Emission

3.4 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 Transceiver	MD-750	FCC ID: POD-DMR6	EUT
2	Battery	MD-750	DC 7.4V 2000mAh	Accessories
3	Back clip	N/A	N/A	Accessories
4	Adapter	DLD-418	N/A	Accessories
5	Charger	MD-750	Input: AC 100-240V 50/60Hz Output: DC 8.4V 0.5A	Accessories

4. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§90.205 & 22.565 §2.1046	Maximum Transmitter Power	Compliant
§90.207& 2.1047	Modulation Characteristic	Compliant
§90.209& 22.359 §2.1049	Occupied Bandwidth	Compliant
§90.210& 22.359 §2.1049	Emission Mask	Compliant
§90.213& 22.355 §2.1055	Frequency Tolerance	Compliant
§90.214	Transient Frequency Behavior	Compliant
§90.210& 22.359 §2.1051	Spurious Emission on Antenna Port	Compliant
§90.210& 22.359 §2.1053	Spurious Radiated Emission	Compliant

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. 18, 2019	Dec. 17, 2020
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.16, 2019	Sep.15, 2020
preamplifier	ChengYi	EMC184045SE	980508	Sep. 23, 2019	Sep. 22, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun. 12, 2019	Jun.11 , 2020
HORN ANTENNA	EM	EM-AH-10180	/	Mar.01, 2018	Feb.29, 2020
SIGNAL GENERATOR	AGILENT	E4421B	122501288	May. 13, 2019	May. 12, 2020
SIGNAL GENERATOR	R&S	SMT03	A0304261	Jun. 12, 2019	Jun.11 , 2020
ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 09, 2019	Jan. 08, 2020
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.24, 2019	Sep.23, 2020
Modulation Domain Analyzer	HP	53310A	3121A02467	Oct. 08, 2019	Oct. 07, 2020
Small environmental tester	ESPEC	SH-242	--	Feb. 25, 2019	Feb. 24, 2020
RF Communication Test Set	HP	8920B	--	Jun. 12, 2019	Jun.11 , 2020
Attenuator	Weinachel Corp	58-30-33	ML030	Jun. 12, 2019	Jun.11 , 2020
Vector Analyzer	Agilent	E4440A	--	Feb. 27, 2019	Feb. 26, 2020
RF Cable	R&S	1#	--	Each time	N/A
RF Cable	R&S	2#	--	Each time	N/A

5. DESCRIPTION OF TEST MODES

RF TEST MODES

The EUT (**DMR Digital Transceiver**) 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.

6. FREQUENCY TOLERANCE

6.1 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°C to $+50^{\circ}\text{C}$ 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.

6.2 MEASUREMENT PROCEDURE

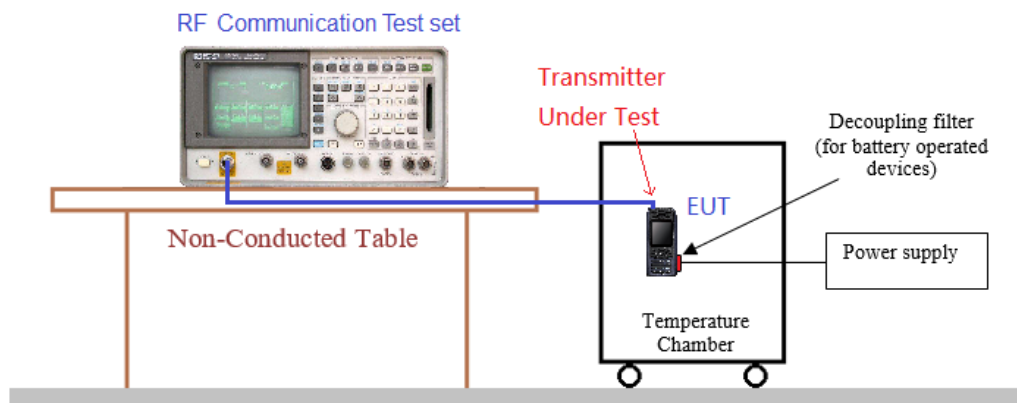
6.2.1 Frequency stability versus environmental temperature

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°C . 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°C decreased per stage until the lowest temperature -30°C is measured, record all measured frequencies on each temperature step.

6.2.2 Frequency stability versus input voltage

1. Setup the configuration per figure 1 for frequencies measured at temperature if it is within 15°C to 25°C . Otherwise, an environment chamber set for a temperature of 20°C 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.

6.3 TEST SETUP BLOCK DIAGRAM



6.4 TEST RESULTS

VHF-Analog:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)-5W-12.5KHz

1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V) SW 120KHz					
Environment Temperature(°C)	Power Supply	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 7.40 V	0.755	0.653	0.907	5
40	DC 7.40 V	0.593	1.064	0.919	
30	DC 7.40 V	0.632	0.962	0.942	
20	DC 7.40 V	0.666	0.522	0.811	
10	DC 7.40 V	0.886	0.639	0.528	
0	DC 7.40 V	0.506	0.798	0.521	
-10	DC 7.40 V	0.850	0.517	0.822	
-20	DC 7.40 V	1.085	0.735	0.617	
-30	DC 7.40 V	1.031	0.502	0.626	
Result	Pass				

Environment Temperature(℃)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 7.40 V	0.316	0.947	5
40	DC 7.40 V	0.672	0.535	
30	DC 7.40 V	0.775	0.901	
20	DC 7.40 V	0.555	0.462	
10	DC 7.40 V	0.938	0.494	
0	DC 7.40 V	0.330	0.431	
-10	DC 7.40 V	0.743	0.442	
-20	DC 7.40 V	0.485	0.560	
-30	DC 7.40 V	0.664	0.391	
Result	Pass			

(2) Frequency stability versus input voltage (Battery endpoint is 6.29V) **-5W-12.5KHz**

2) Frequency stability versus input voltage (Battery endpoint is 0.25V) SW 120KHz					
Environment Temperature(°C)	Power	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 6.29 V	0.959	0.743	0.828	5
40	DC 6.29 V	1.049	1.009	0.592	
30	DC 6.29 V	0.858	0.841	0.583	
20	DC 6.29 V	0.750	0.820	0.861	
10	DC 6.29 V	0.693	0.779	0.725	
0	DC 6.29 V	1.073	0.973	0.677	
-10	DC 6.29 V	0.567	0.722	0.702	
-20	DC 6.29 V	1.025	0.660	0.735	
-30	DC 6.29 V	1.092	1.078	0.959	
Result	Pass				

Environment Temperature(℃)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 6.29 V	0.475	0.549	5
40	DC 6.29 V	0.444	0.629	
30	DC 6.29 V	0.997	0.349	
20	DC 6.29 V	0.365	0.460	
10	DC 6.29 V	0.851	0.733	
0	DC 6.29 V	0.675	0.560	
-10	DC 6.29 V	0.897	0.770	
-20	DC 6.29 V	0.583	0.463	
-30	DC 6.29 V	0.361	0.420	
Result	Pass			

(3) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)-1W-12.5KHz

(c) Frequency stability versus input voltage (Supply nominal voltage is 7.40V) 1W 12.0KHz					
Environment Temperature(℃)	Power Supply	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 7.40 V	1.030	0.559	0.997	5
40	DC 7.40 V	0.829	0.854	0.865	
30	DC 7.40 V	0.802	1.067	1.043	
20	DC 7.40 V	0.683	0.923	0.994	
10	DC 7.40 V	0.726	1.012	0.935	
0	DC 7.40 V	1.083	1.054	0.519	
-10	DC 7.40 V	0.906	0.599	0.995	
-20	DC 7.40 V	0.551	1.092	0.745	
-30	DC 7.40 V	0.705	0.773	0.716	
Result	Pass				

Environment Temperature(℃)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 7.40 V	0.578	0.968	5
40	DC 7.40 V	0.500	0.317	
30	DC 7.40 V	0.344	0.973	
20	DC 7.40 V	0.525	0.802	
10	DC 7.40 V	0.817	0.656	
0	DC 7.40 V	0.384	0.995	
-10	DC 7.40 V	0.587	0.885	
-20	DC 7.40 V	0.639	0.906	
-30	DC 7.40 V	0.664	0.966	
Result	Pass			

(4) Frequency stability versus input voltage (Battery endpoint is 6.29V) **-1W-12.5KHz**

4) Frequency stability versus input voltage (Battery endpoint is 0.25V) - 1W 12.0KHz					
Environment Temperature(°C)	Power	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 6.29 V	0.529	0.452	0.478	5
40	DC 6.29 V	0.985	0.872	0.595	
30	DC 6.29 V	0.886	0.369	0.976	
20	DC 6.29 V	0.400	0.578	0.885	
10	DC 6.29 V	0.447	0.684	0.993	
0	DC 6.29 V	0.480	0.573	0.722	
-10	DC 6.29 V	0.990	0.504	0.740	
-20	DC 6.29 V	0.883	0.663	0.452	
-30	DC 6.29 V	0.672	0.705	0.750	
Result	Pass				

Environment Temperature(°C)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 6.29 V	0.579	0.947	5
40	DC 6.29 V	0.869	0.602	
30	DC 6.29 V	0.553	0.829	
20	DC 6.29 V	0.877	0.991	
10	DC 6.29 V	1.056	0.939	
0	DC 6.29 V	0.837	0.527	
-10	DC 6.29 V	0.744	0.791	
-20	DC 6.29 V	0.878	0.523	
-30	DC 6.29 V	1.088	0.891	
Result	Pass			

Digital:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)-**5W-12.5KHz**

Environment Temperature(℃)	Power Supply	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 7.40 V	0.921	0.653	0.733	5
40	DC 7.40 V	0.731	0.982	1.012	
30	DC 7.40 V	0.881	0.664	0.788	
20	DC 7.40 V	0.808	0.705	0.517	
10	DC 7.40 V	0.798	0.593	0.765	
0	DC 7.40 V	0.569	0.608	0.946	
-10	DC 7.40 V	1.031	0.808	1.017	
-20	DC 7.40 V	1.032	0.767	0.915	
-30	DC 7.40 V	0.646	0.753	1.076	
Result	Pass				

Environment Temperature(℃)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 7.40 V	0.910	0.512	5
40	DC 7.40 V	0.370	0.958	
30	DC 7.40 V	0.960	0.484	
20	DC 7.40 V	0.322	0.671	
10	DC 7.40 V	0.670	0.380	
0	DC 7.40 V	0.719	0.515	
-10	DC 7.40 V	0.986	0.452	
-20	DC 7.40 V	0.697	0.724	
-30	DC 7.40 V	0.379	0.947	
Result	Pass			

(2) Frequency stability versus input voltage (Battery endpoint is 6.29V) **-5W-12.5KHz**

Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 6.29 V	0.645	0.653	0.713	5
40	DC 6.29 V	0.568	1.027	0.824	
30	DC 6.29 V	1.090	0.881	0.572	
20	DC 6.29 V	0.502	1.068	0.536	
10	DC 6.29 V	0.748	1.083	0.635	
0	DC 6.29 V	0.631	0.687	0.744	
-10	DC 6.29 V	0.687	0.702	0.684	
-20	DC 6.29 V	0.598	0.820	0.811	
-30	DC 6.29 V	0.570	0.907	1.043	
Result	Pass				

Environment Temperature(°C)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 6.29 V	0.667	0.743	5
40	DC 6.29 V	0.329	0.496	
30	DC 6.29 V	0.534	0.863	
20	DC 6.29 V	0.956	0.403	
10	DC 6.29 V	0.401	0.362	
0	DC 6.29 V	0.783	0.735	
-10	DC 6.29 V	0.452	0.857	
-20	DC 6.29 V	0.959	0.520	
-30	DC 6.29 V	0.943	0.585	
Result	Pass			

(3) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V)-1W-12.5KHz

(c) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V) 1W 12.0KHz					
Environment Temperature(℃)	Power Supply	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 7.40 V	0.643	0.653	0.684	5
40	DC 7.40 V	0.675	0.987	0.592	
30	DC 7.40 V	0.545	1.090	0.796	
20	DC 7.40 V	0.593	0.912	1.096	
10	DC 7.40 V	0.623	0.622	0.705	
0	DC 7.40 V	1.090	1.016	1.049	
-10	DC 7.40 V	0.786	0.925	0.728	
-20	DC 7.40 V	0.941	0.755	0.928	
-30	DC 7.40 V	0.815	0.616	0.847	
Result	Pass				

Environment Temperature(℃)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 7.40 V	0.659	0.904	5
40	DC 7.40 V	0.621	0.526	
30	DC 7.40 V	0.331	0.866	
20	DC 7.40 V	0.429	0.571	
10	DC 7.40 V	0.900	0.990	
0	DC 7.40 V	0.379	0.335	
-10	DC 7.40 V	0.558	0.826	
-20	DC 7.40 V	0.993	0.550	
-30	DC 7.40 V	0.391	0.748	
Result	Pass			

(4) Frequency stability versus input voltage (Battery endpoint is 6.29V) **-1W-12.5KHz**

Environment Temperature(°C)	Power	Reference Frequency			Limit:
	(V)	136.025MHz	155.025MHz	173.975MHz	ppm
50	DC 6.29 V	0.946	0.740	0.880	5
40	DC 6.29 V	0.975	0.863	0.927	
30	DC 6.29 V	0.766	0.831	0.895	
20	DC 6.29 V	0.604	1.038	0.661	
10	DC 6.29 V	0.929	0.839	0.588	
0	DC 6.29 V	0.903	0.844	0.804	
-10	DC 6.29 V	0.522	0.799	0.510	
-20	DC 6.29 V	0.977	0.678	0.993	
-30	DC 6.29 V	1.093	0.911	0.983	
Result	Pass				

Environment Temperature(℃)	Power Supply	Reference Frequency		Limit:
	(V)	151.85MHz	161.61MHz	ppm
50	DC 6.29 V	0.688	0.454	5
40	DC 6.29 V	0.675	0.308	
30	DC 6.29 V	0.961	0.736	
20	DC 6.29 V	0.827	0.427	
10	DC 6.29 V	0.359	0.649	
0	DC 6.29 V	0.662	0.876	
-10	DC 6.29 V	0.413	0.714	
-20	DC 6.29 V	0.531	0.543	
-30	DC 6.29 V	0.916	0.603	
Result	Pass			

UHF:

Analog:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V) **-5W-12.5KHz**

1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V) 5W 12.0KHz					
Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40V	0.630	0.653	0.950	2.5
40	DC 7.40V	1.023	1.034	0.714	
30	DC 7.40V	0.802	0.990	0.997	
20	DC 7.40V	0.512	0.686	0.941	
10	DC 7.40V	0.732	0.990	0.672	
0	DC 7.40V	0.745	0.929	0.893	
-10	DC 7.40V	0.570	0.647	0.687	
-20	DC 7.40V	0.849	0.542	1.037	
-30	DC 7.40V	0.916	0.882	0.726	
Result	Pass				

(2) Frequency stability versus input voltage (Battery endpoint is 6.29V) **-5W-12.5KHz**

(2) Frequency stability (Load input voltage (Battery), chip pin 11 is GND, 5V, 140KHz)					
Environment Temperature(℃)	Power Supply	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29V	0.663	0.557	0.551	2.5
40	DC 6.29V	0.862	0.963	0.644	
30	DC 6.29V	0.601	0.668	0.368	
20	DC 6.29V	0.893	0.625	0.309	
10	DC 6.29V	0.623	0.998	0.579	
0	DC 6.29V	0.531	0.767	0.776	
-10	DC 6.29V	0.466	0.381	0.738	
-20	DC 6.29V	0.560	0.776	0.649	
-30	DC 6.29V	0.498	0.351	0.543	
Result	Pass				

(3) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V)-1W-12.5KHz

(c) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V) 1W 12.0KHz					
Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40V	1.065	1.042	0.874	2.5
40	DC 7.40V	0.553	0.533	0.557	
30	DC 7.40V	0.967	1.028	0.884	
20	DC 7.40V	0.806	0.568	0.665	
10	DC 7.40V	0.871	0.635	0.536	
0	DC 7.40V	0.829	0.864	0.828	
-10	DC 7.40V	0.681	0.669	0.553	
-20	DC 7.40V	0.959	0.656	0.914	
-30	DC 7.40V	0.534	0.851	0.908	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6.29V) -1W-12.5KHz

(4) Frequency stability versus input voltage (Battery endpoint is 6.29V) -1W-12.5KHz

Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29 V	0.340	0.987	0.751	2.5
40	DC 6.29 V	0.814	0.355	0.525	
30	DC 6.29 V	0.571	0.436	0.637	
20	DC 6.29 V	0.899	0.803	0.532	
10	DC 6.29 V	0.992	0.643	0.836	
0	DC 6.29 V	0.422	0.687	0.747	
-10	DC 6.29 V	0.886	0.572	0.834	
-20	DC 6.29 V	0.678	0.744	0.779	
-30	DC 6.29 V	0.515	0.577	0.996	
Result	Pass				

Digital:

(1) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V) **-5W-12.5KHz**

Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40V	0.597	0.759	0.838	2.5
40	DC 7.40V	1.073	0.861	0.704	
30	DC 7.40V	0.621	0.611	0.889	
20	DC 7.40V	1.011	0.600	0.891	
10	DC 7.40V	0.507	0.997	0.549	
0	DC 7.40V	0.778	0.681	0.563	
-10	DC 7.40V	0.941	0.876	0.950	
-20	DC 7.40V	0.849	0.934	1.042	
-30	DC 7.40V	0.883	1.034	0.983	
Result	Pass				

(2) Frequency stability versus input voltage (Battery endpoint is 6.29V) **-5W-12.5KHz**

(2) Frequency stability versus input voltage (Battery endpoint is 0.25V) 5W 12.0KHz					
Environment Temperature(℃)	Power Supply	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29V	0.427	0.451	0.754	2.5
40	DC 6.29V	0.429	0.835	0.979	
30	DC 6.29V	0.872	0.798	0.665	
20	DC 6.29V	0.317	0.402	0.917	
10	DC 6.29V	0.684	0.620	0.309	
0	DC 6.29V	0.800	0.761	0.396	
-10	DC 6.29V	0.749	0.473	0.437	
-20	DC 6.29V	0.835	0.636	0.422	
-30	DC 6.29V	0.905	0.731	0.748	
Result	Pass				

(3) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V)-1W-12.5KHz

(c) Frequency stability versus input voltage (Supply nominal voltage is DC 7.40V) 1W 12.0KHz					
Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 7.40V	1.016	0.760	0.540	2.5
40	DC 7.40V	0.584	1.067	1.058	
30	DC 7.40V	0.873	0.599	0.934	
20	DC 7.40V	0.538	0.991	0.878	
10	DC 7.40V	0.656	1.048	0.970	
0	DC 7.40V	0.671	0.953	0.739	
-10	DC 7.40V	0.951	1.098	0.809	
-20	DC 7.40V	0.764	0.698	0.842	
-30	DC 7.40V	0.636	0.645	0.531	
Result	Pass				

(4) Frequency stability versus input voltage (Battery endpoint is 6.29V) -1W-12.5KHz

(4) Frequency stability versus input voltage (Battery endpoint is 0.29V) -1W-12.5KHz					
Environment Temperature(℃)	Power	Reference Frequency			Limit:
	(V)	400.025MHz	454.025MHz	479.975MHz	ppm
50	DC 6.29 V	0.439	0.438	0.993	2.5
40	DC 6.29 V	0.866	0.708	0.512	
30	DC 6.29 V	0.381	0.879	0.925	
20	DC 6.29 V	0.760	0.492	0.960	
10	DC 6.29 V	0.699	0.444	0.680	
0	DC 6.29 V	0.983	0.958	0.759	
-10	DC 6.29 V	0.457	0.614	0.833	
-20	DC 6.29 V	0.936	0.391	0.835	
-30	DC 6.29 V	0.888	0.326	0.619	
Result	Pass				

7. EMISSION BANDWIDTH

7.1 PROVISIONS APPLICABLE

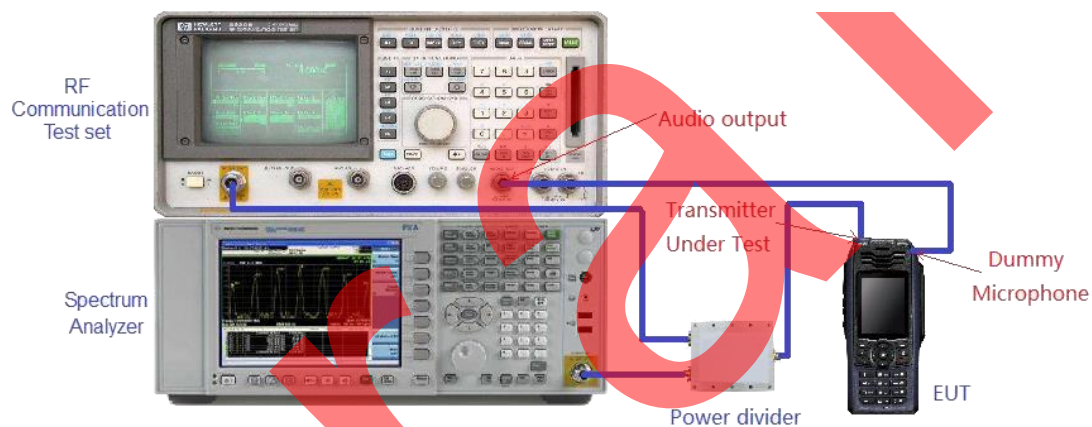
FCC Part 90.209 & FCC Part 22.359& FCC Part 2.1049:

The authorized bandwidth shall be 11.25 KHz for 12.5 KHz channel separation and 6 KHz for 6.25 KHz channel separation.

7.2 MEASUREMENT PROCEDURE

- 1). The EUT was placed on a turn table which is 0.8m above ground plane.
- 2). 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).
- 3). Set SPA Center Frequency = fundamental frequency, RBW=100Hz.VBW= 300 Hz, Span =50 KHz.
- 4). Set SPA Max hold. Mark peak, -26 dB.

7.3 TEST SETUP BLOCK DIAGRAM



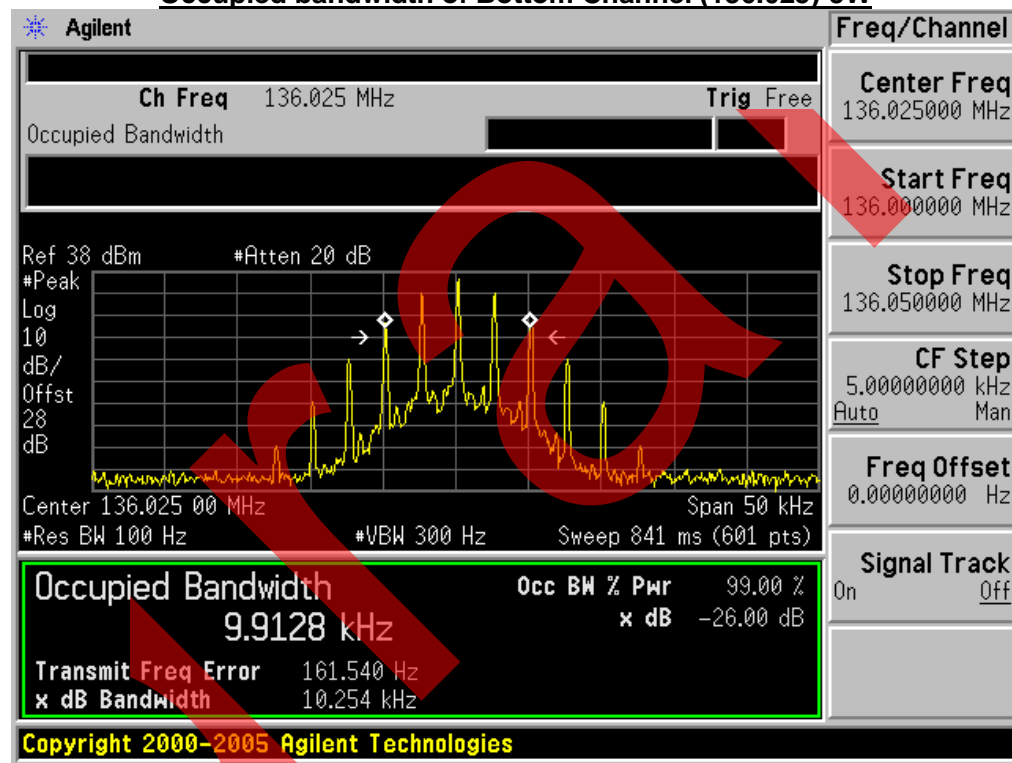
7.4 MEASUREMENT RESULT

VHF:

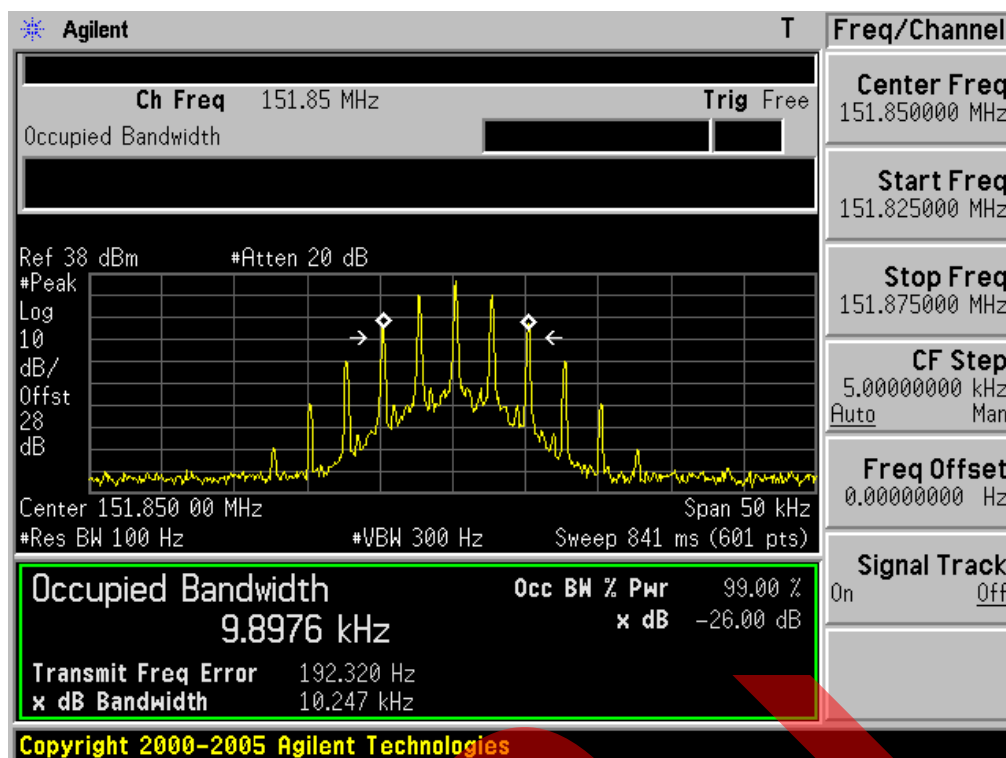
Analog: 12.5KHz

26 dB Bandwidth Measurement Result			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
136.025MHz	10.254 KHz	11.25 KHz	Pass
151.850MHz	10.247 KHz	11.25 KHz	Pass
155.025MHz	10.234 KHz	11.25 KHz	Pass
161.610MHz	10.226 KHz	11.25 KHz	Pass
173.975MHz	10.228 KHz	11.25 KHz	Pass

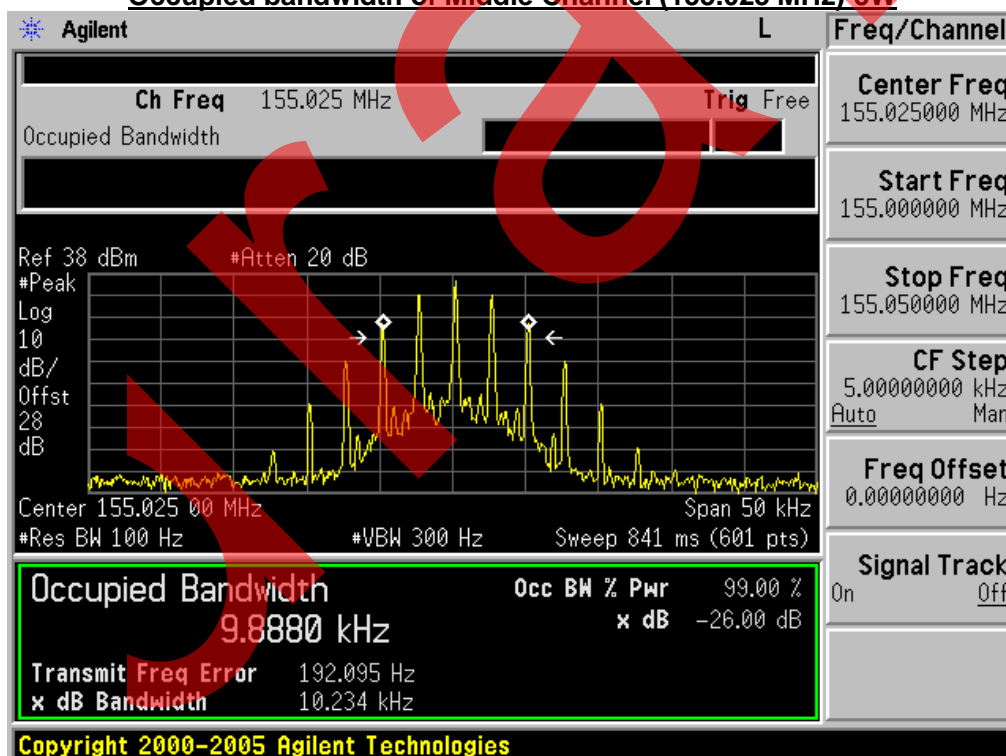
Occupied bandwidth of Bottom Channel (136.025)-5W



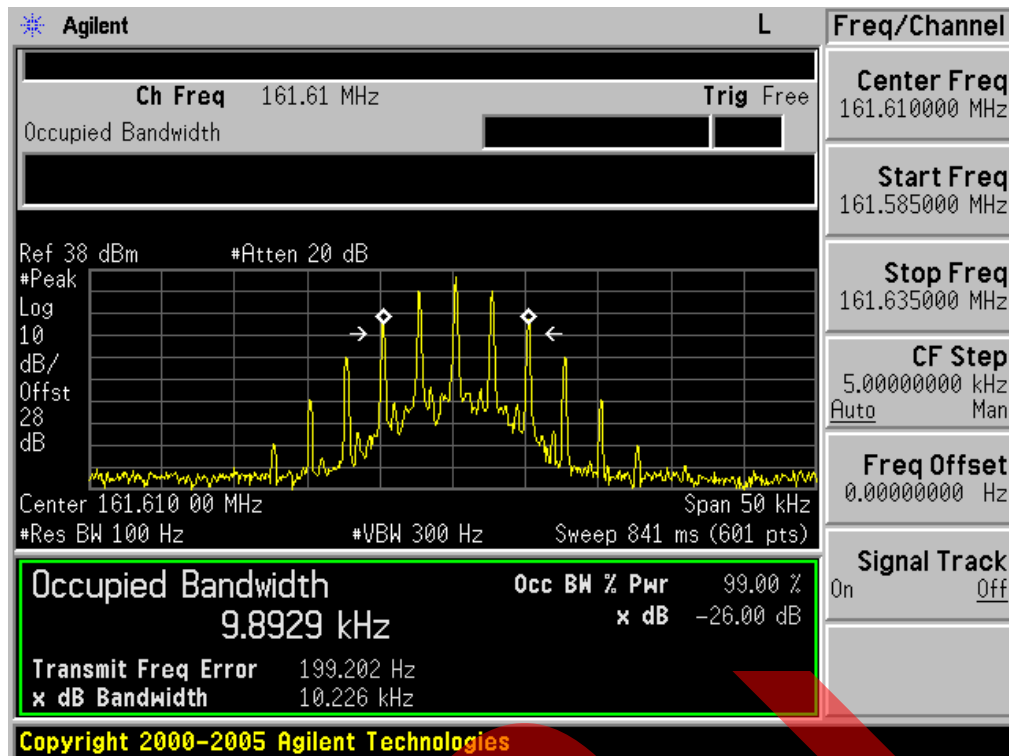
Occupied bandwidth of Middle Channel (151.850 MHz)-5W



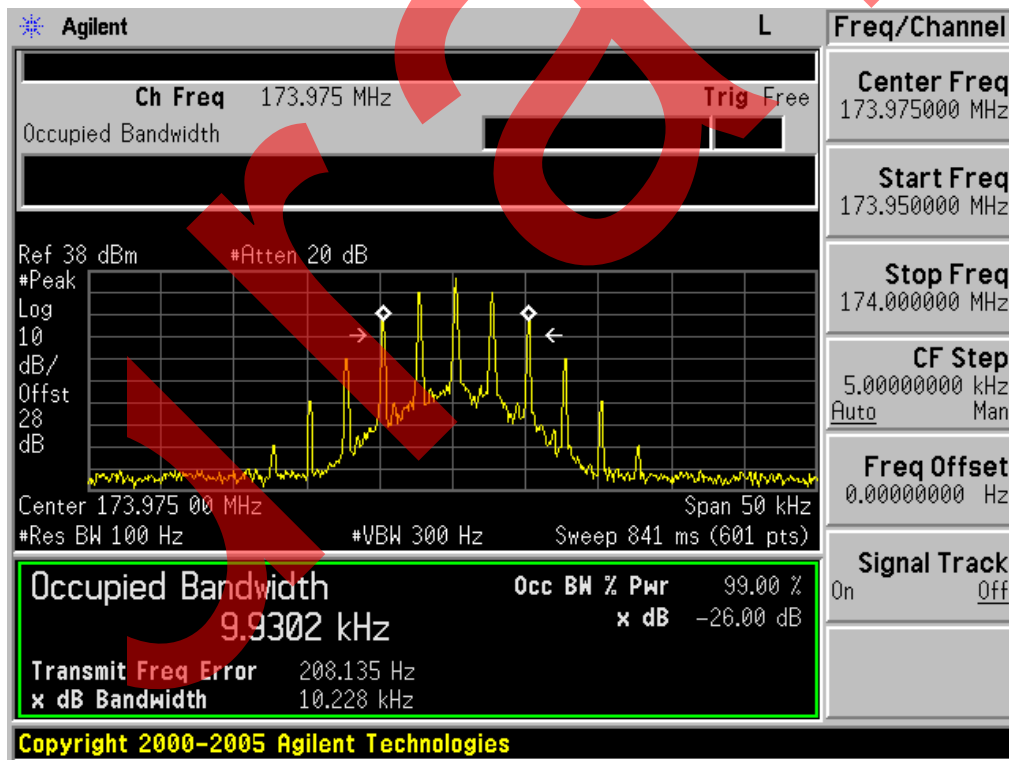
Occupied bandwidth of Middle Channel (155.025 MHz)-5W



Occupied bandwidth of Middle Channel (161.610 MHz)-5W

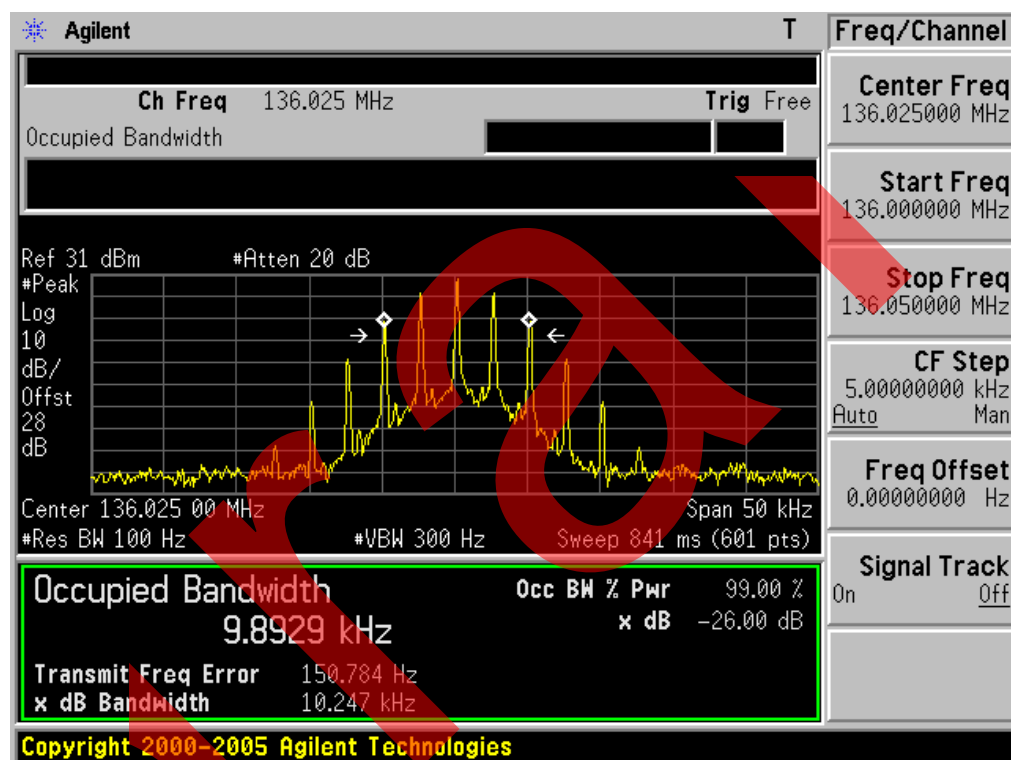


Occupied bandwidth of Top Channel (173.975 MHz)-5W

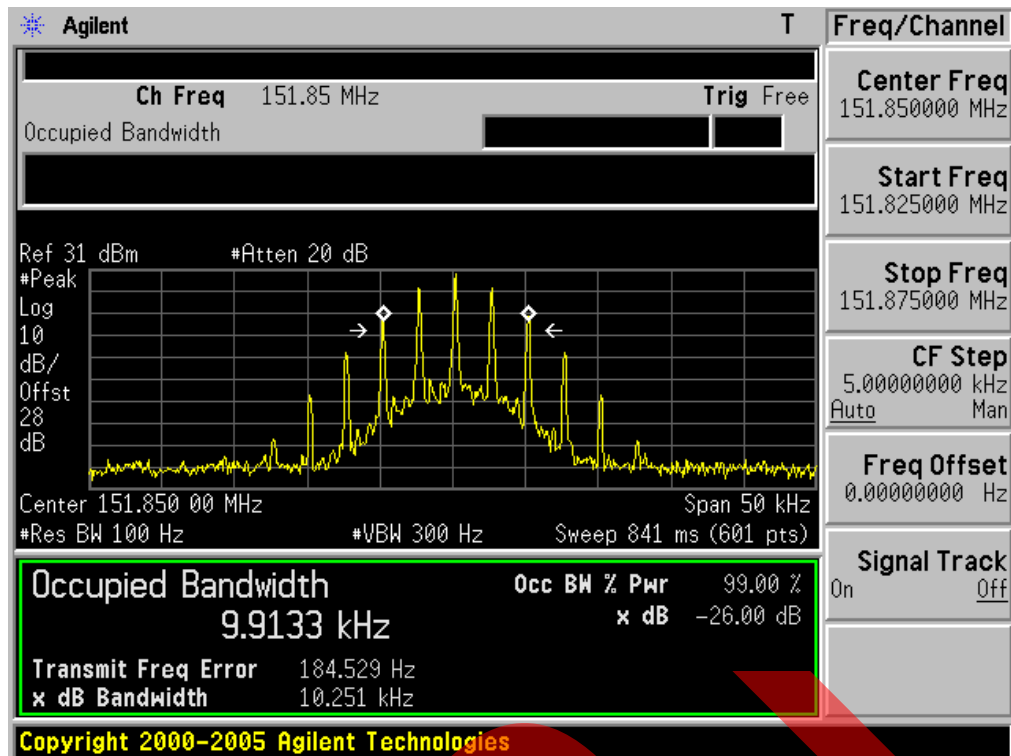


26 dB Bandwidth Measurement Result			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
136.025MHz	10.247 KHz	11.25 KHz	Pass
151.850MHz	10.251 KHz	11.25 KHz	Pass
155.025MHz	10.249 KHz	11.25 KHz	Pass
161.610MHz	10.227 KHz	11.25 KHz	Pass
173.975MHz	10.227 KHz	11.25 KHz	Pass

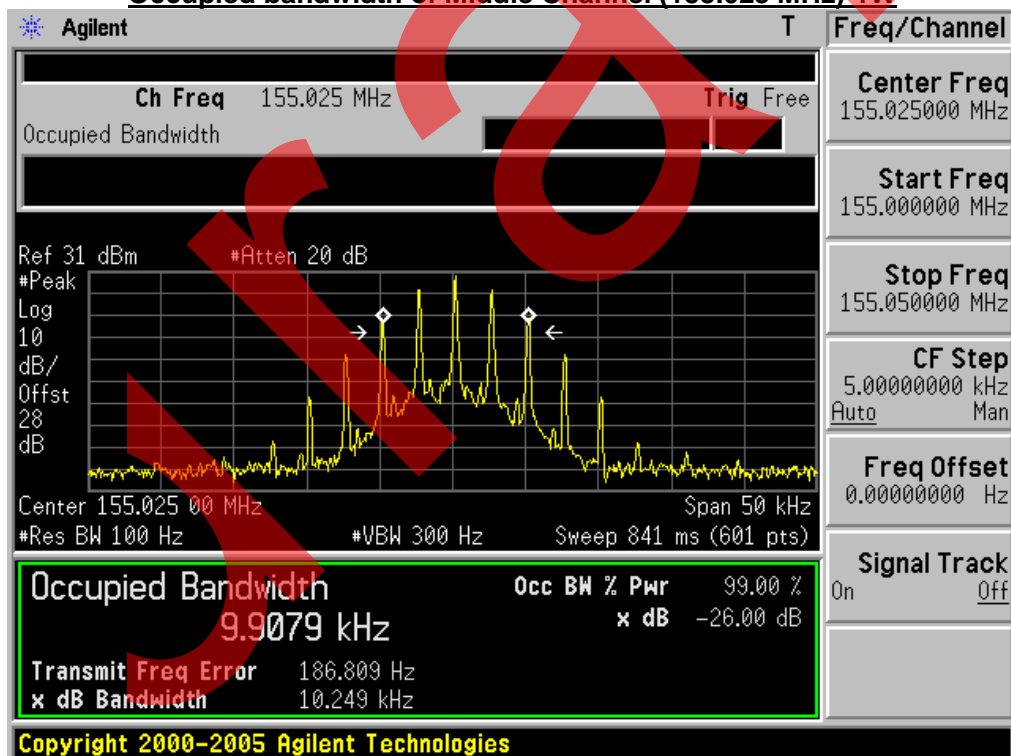
Occupied bandwidth of Bottom Channel (136.025)-1W



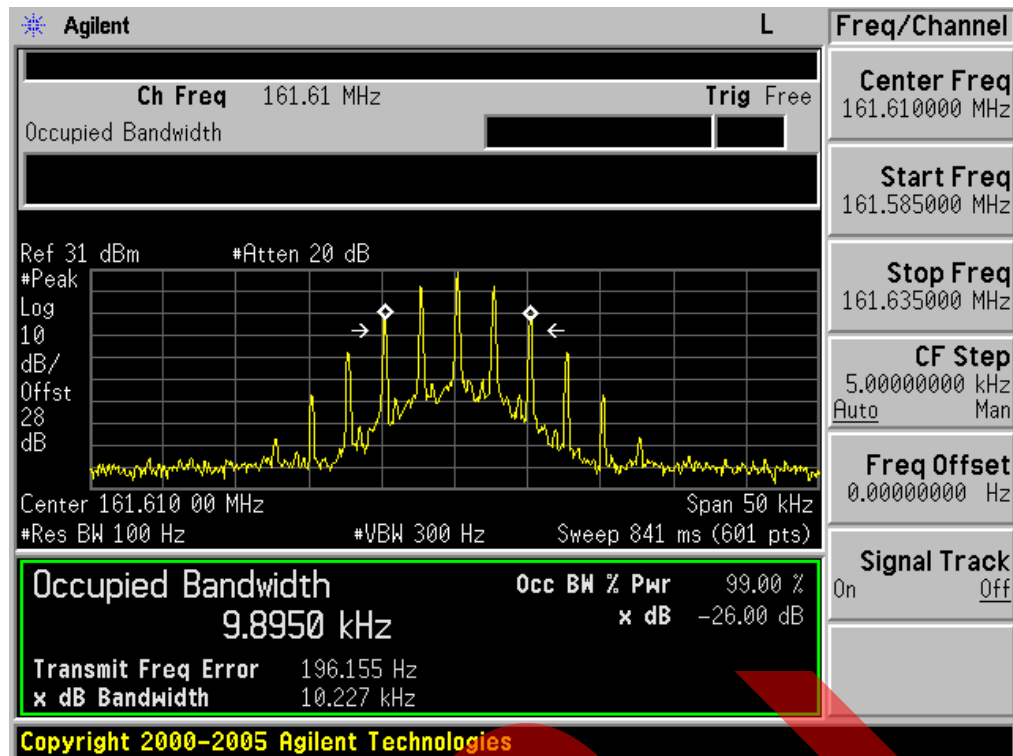
Occupied bandwidth of Middle Channel (151.850 MHz)-1W



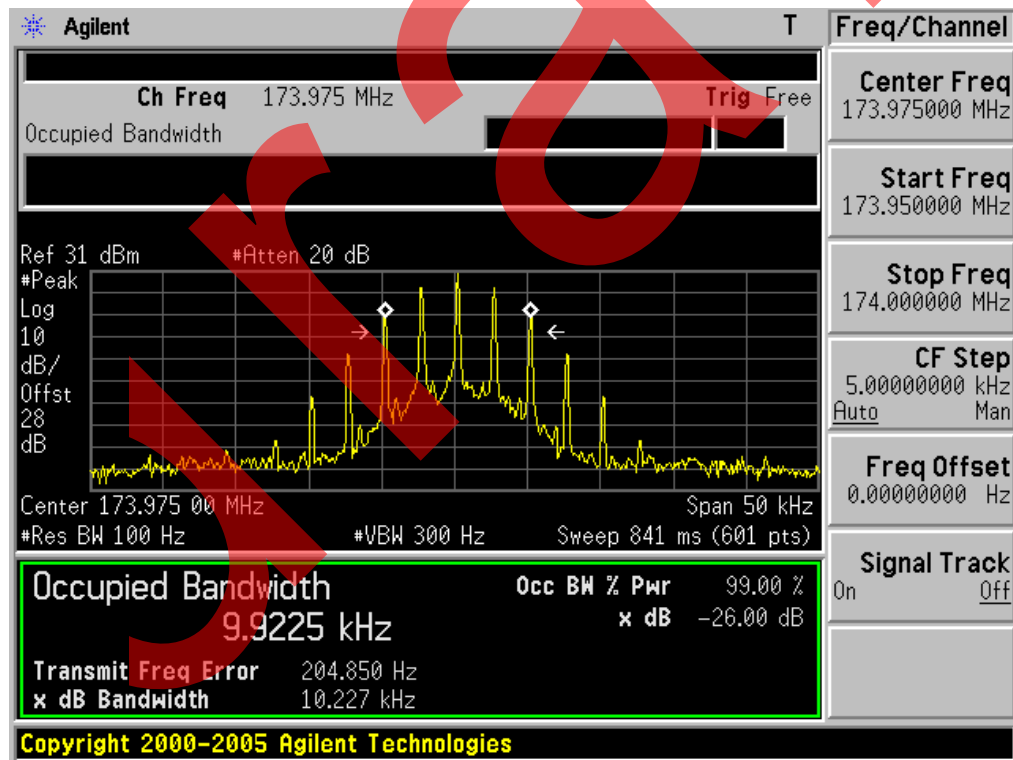
Occupied bandwidth of Middle Channel (155.025 MHz)-1W



Occupied bandwidth of Middle Channel (161.610 MHz)-1W



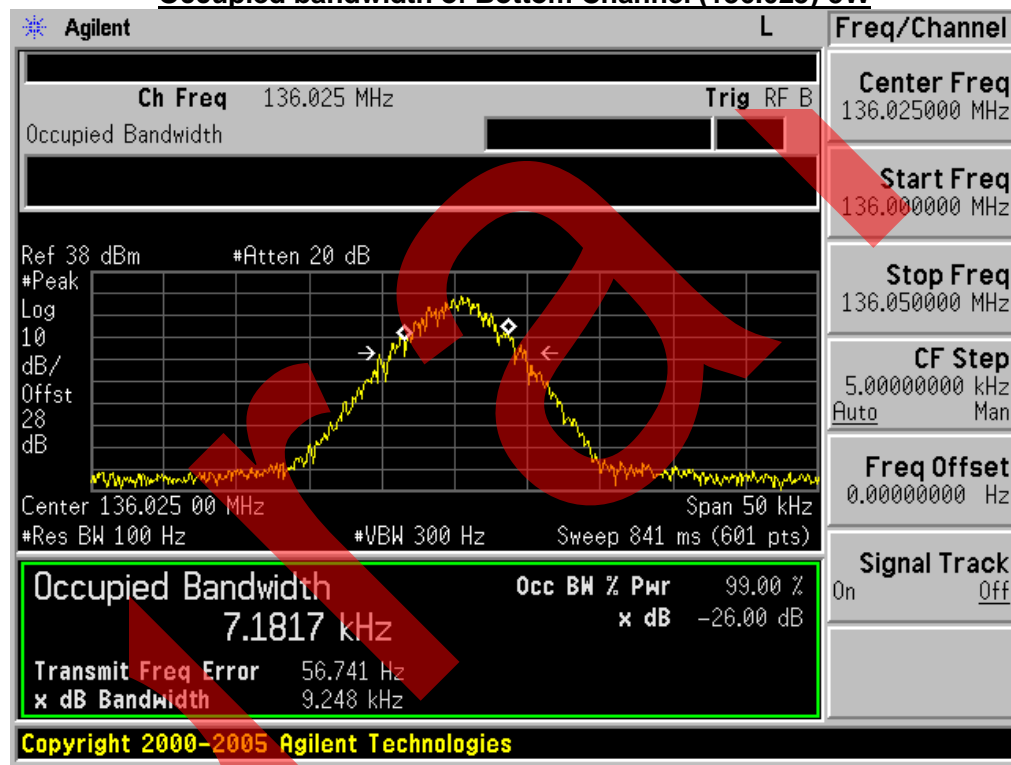
Occupied bandwidth of Top Channel (173.975 MHz)-1W



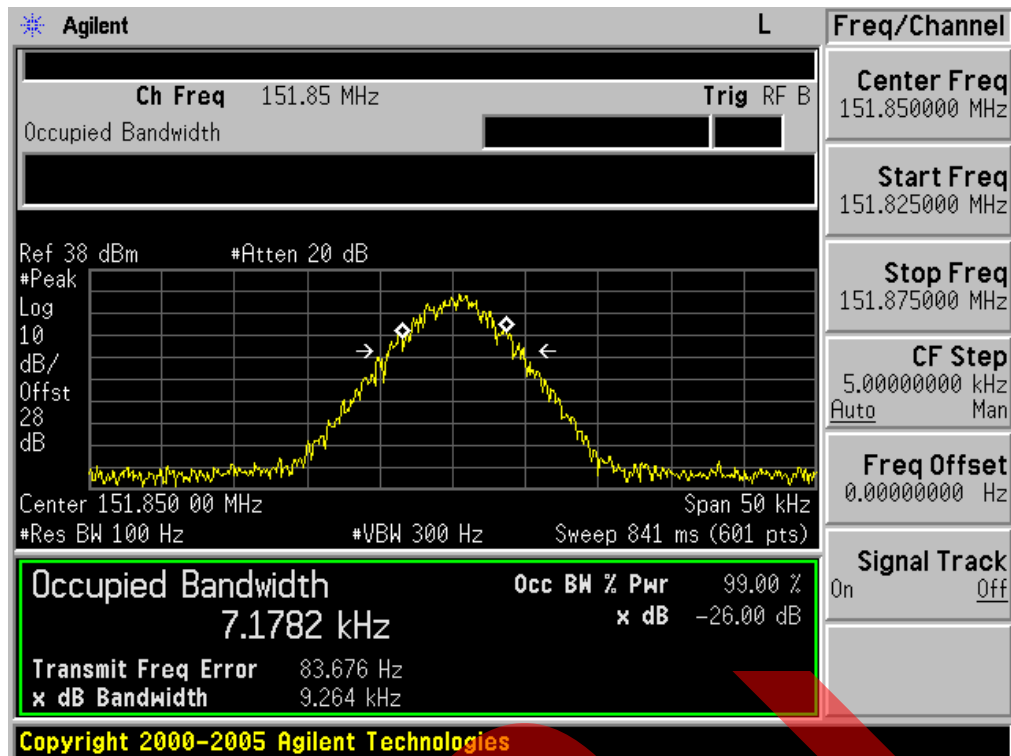
Digital:
VHF:
TEST RESULTS

26 dB Bandwidth Measurement Result			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
136.025MHz	9.248 KHz	11.25 KHz	Pass
151.850MHz	9.264 KHz	11.25 KHz	Pass
155.025MHz	9.256 KHz	11.25 KHz	Pass
161.610MHz	9.240 KHz	11.25 KHz	Pass
173.975MHz	8.935 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (136.025)-5W



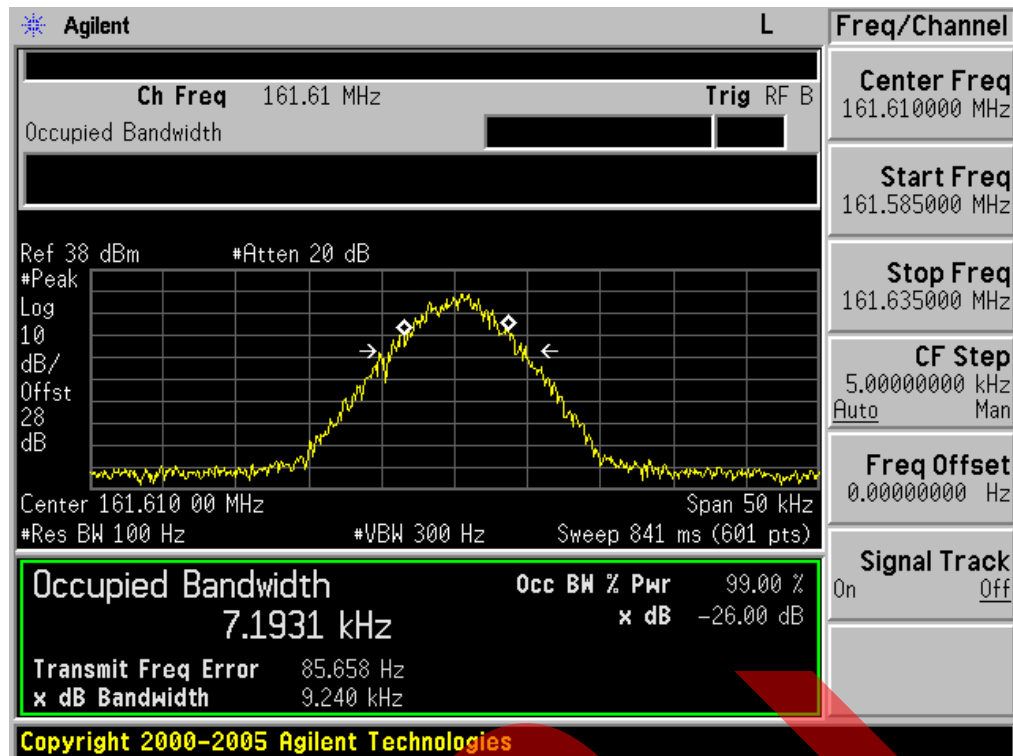
Occupied bandwidth of Middle Channel (151.850 MHz)-5W



Occupied bandwidth of Middle Channel (155.025 MHz)-5W



Occupied bandwidth of Middle Channel (161.610 MHz)-5W

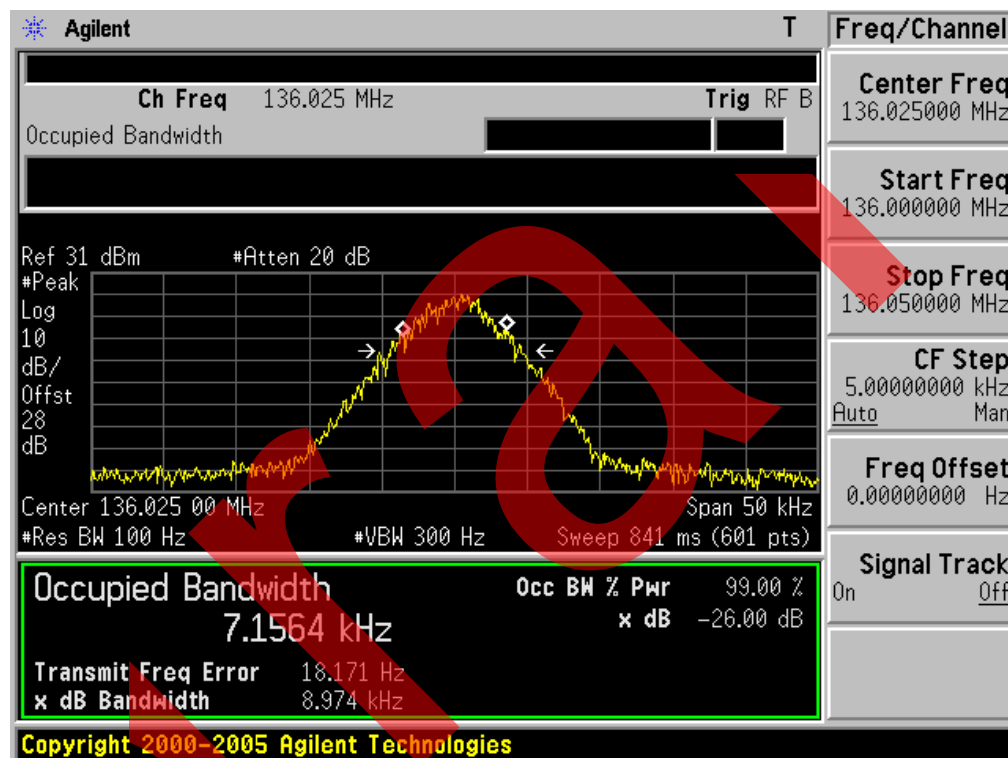


Occupied bandwidth of Top Channel (173.975 MHz)-5W

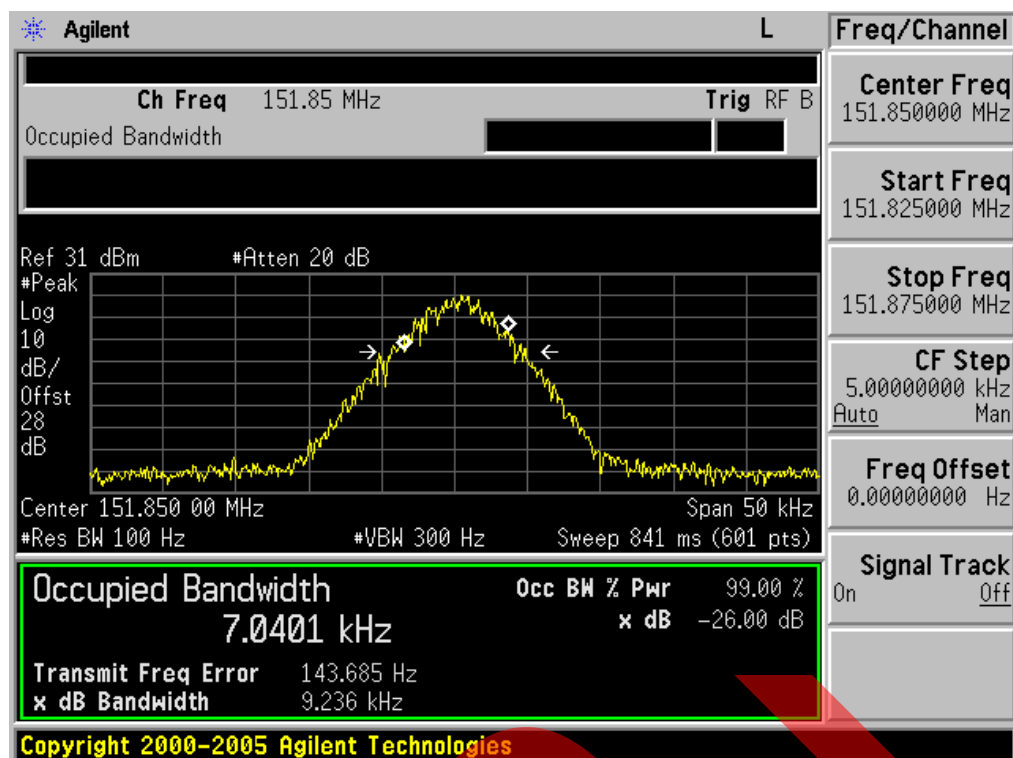


26 dB Bandwidth Measurement Result			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
136.025MHz	8.974 KHz	11.25 KHz	Pass
151.850MHz	9.236 KHz	11.25 KHz	Pass
155.025MHz	9.261 KHz	11.25 KHz	Pass
161.610MHz	9.824 KHz	11.25 KHz	Pass
173.975MHz	9.188 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (136.025)-1W



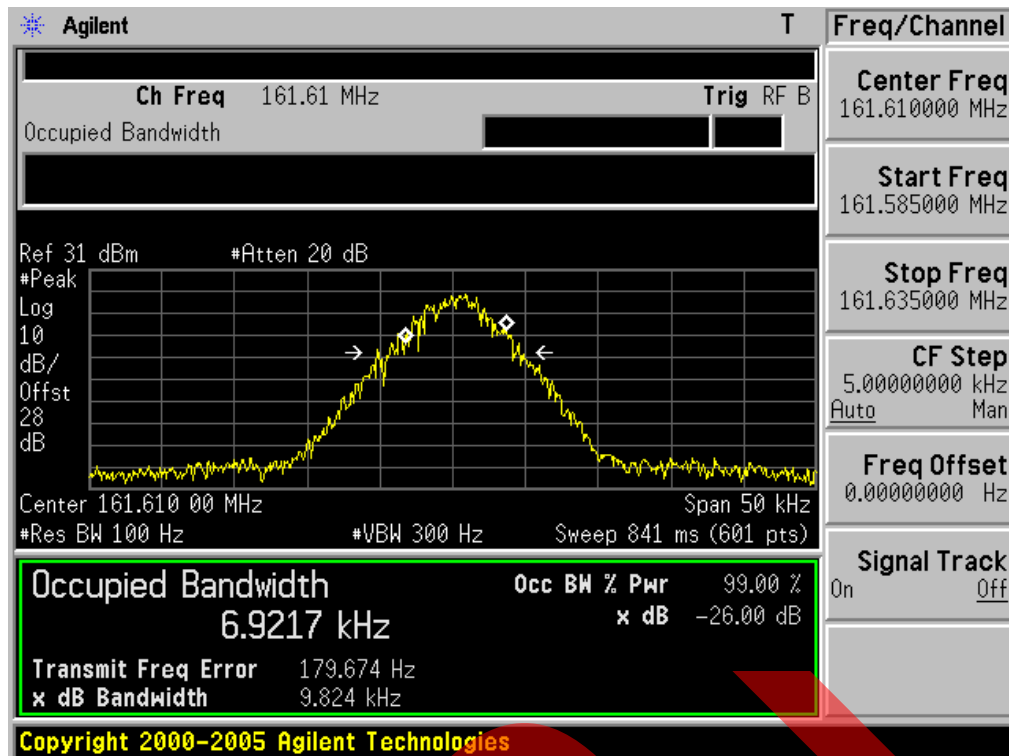
Occupied bandwidth of Middle Channel (151.850 MHz)-1W



Occupied bandwidth of Middle Channel (155.025 MHz)-1W



Occupied bandwidth of Middle Channel (161.610 MHz)-1W



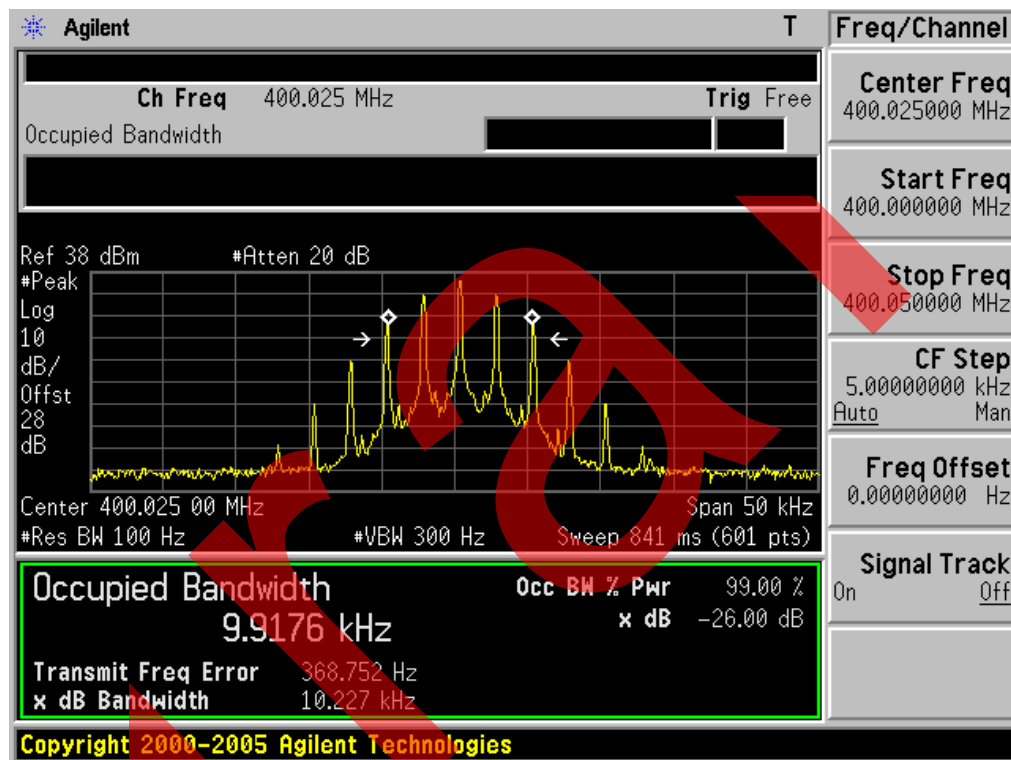
Occupied bandwidth of Top Channel (173.975 MHz)-1W



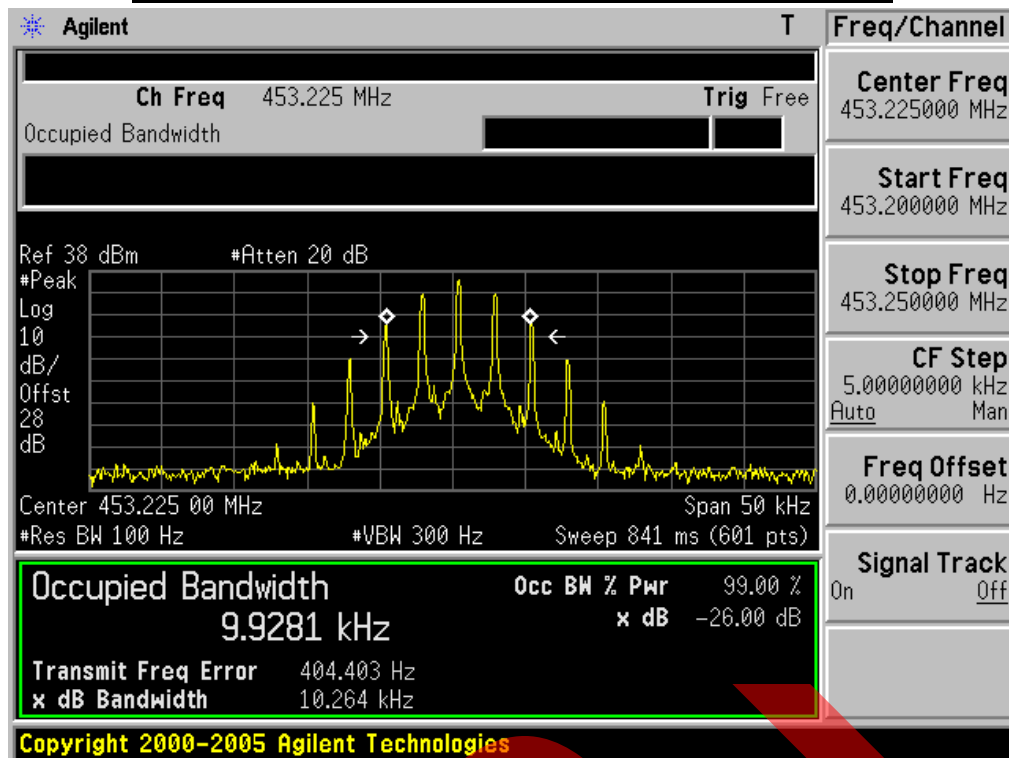
UHF:
Analog:

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	10.227 KHz	11.25 KHz	Pass
453.225MHz	10.264 KHz	11.25 KHz	Pass
454.025MHz	10.275 KHz	11.25 KHz	Pass
479.975MHz	10.258 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (400.025MHz)-5W



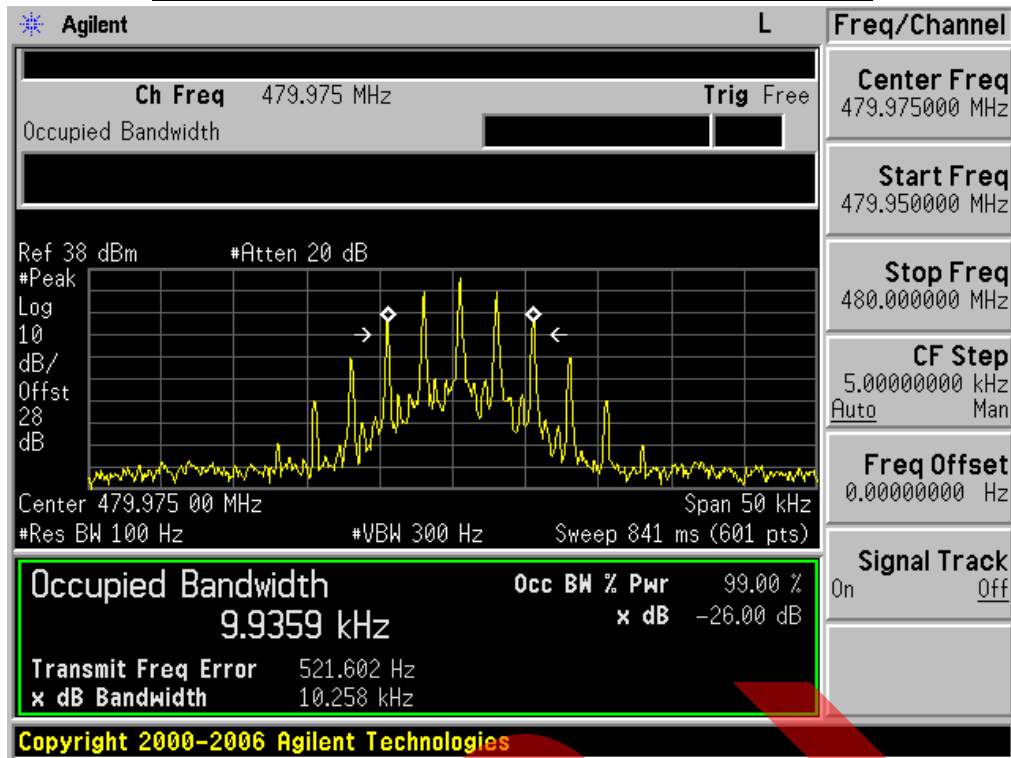
Occupied bandwidth of Middle Channel (453.225MHz)-5W



Occupied bandwidth of Middle Channel (454.025MHz)-5W

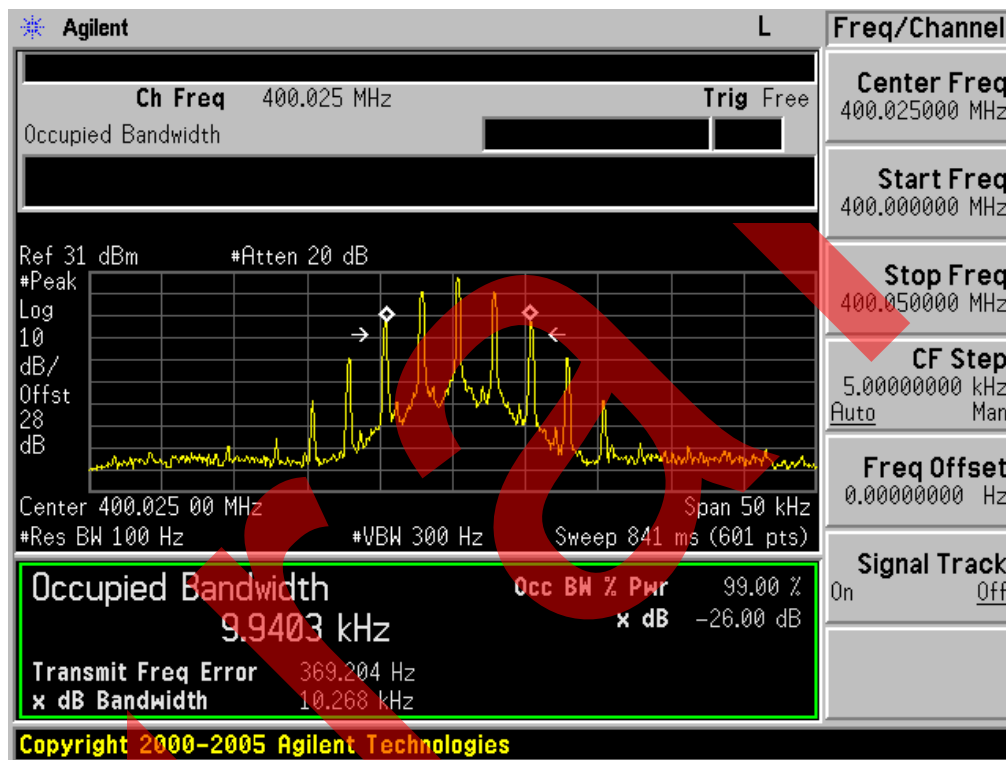


Occupied bandwidth of Top Channel (479.975MHz)-5W

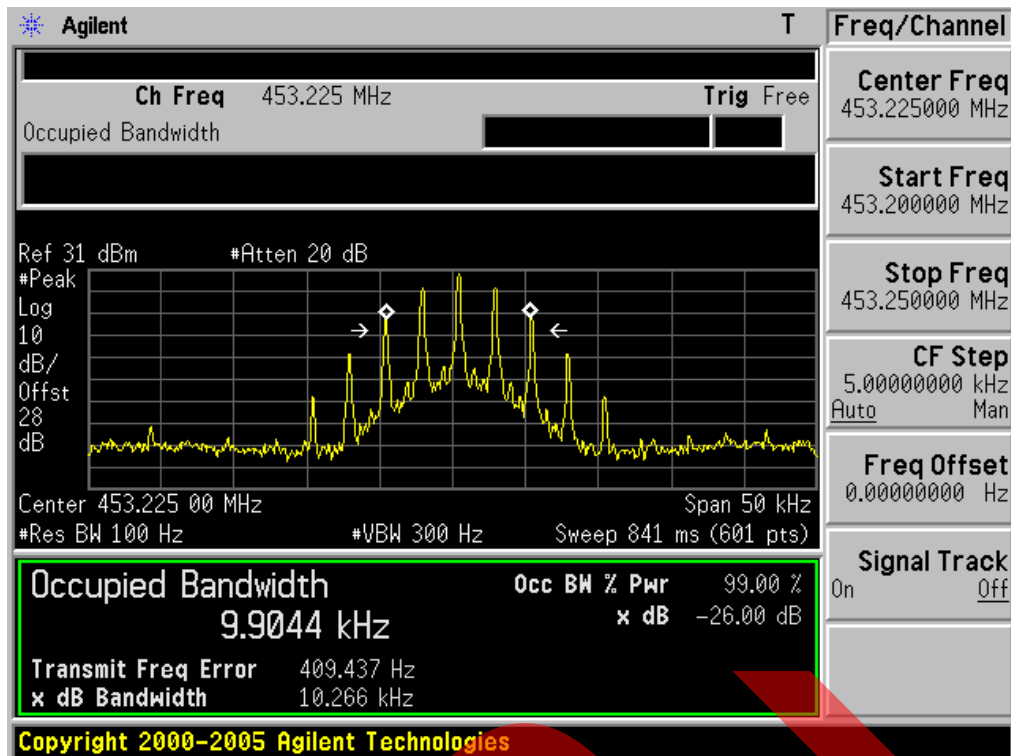


26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	10.268 KHz	11.25 KHz	Pass
453.225MHz	10.266 KHz	11.25 KHz	Pass
454.025MHz	10.282 KHz	11.25 KHz	Pass
479.975MHz	10.247 KHz	11.25 KHz	Pass

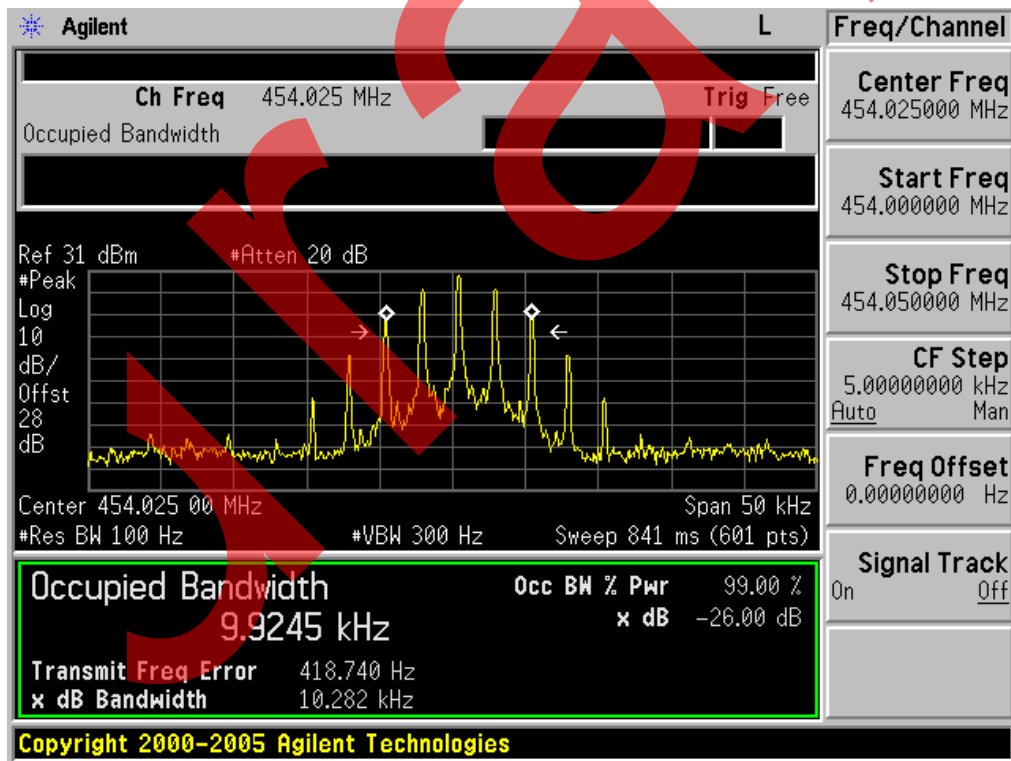
Occupied bandwidth of Bottom Channel (400.025MHz)-1W



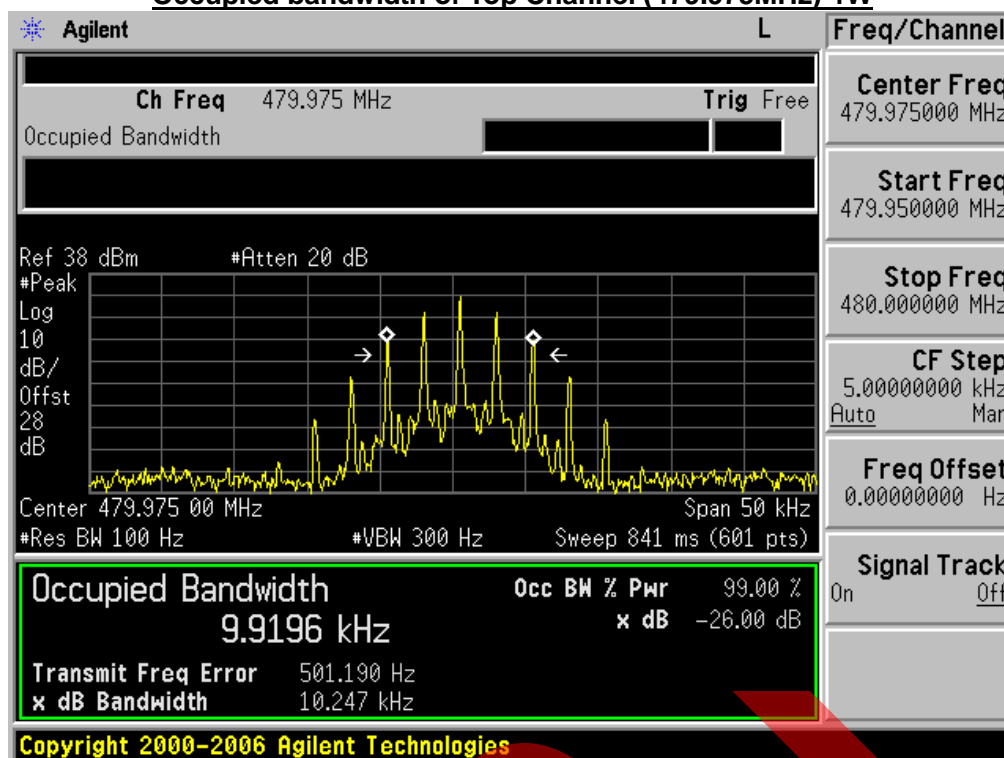
Occupied bandwidth of Middle Channel (453.225MHz)-1W



Occupied bandwidth of Middle Channel (454.025MHz)-1W



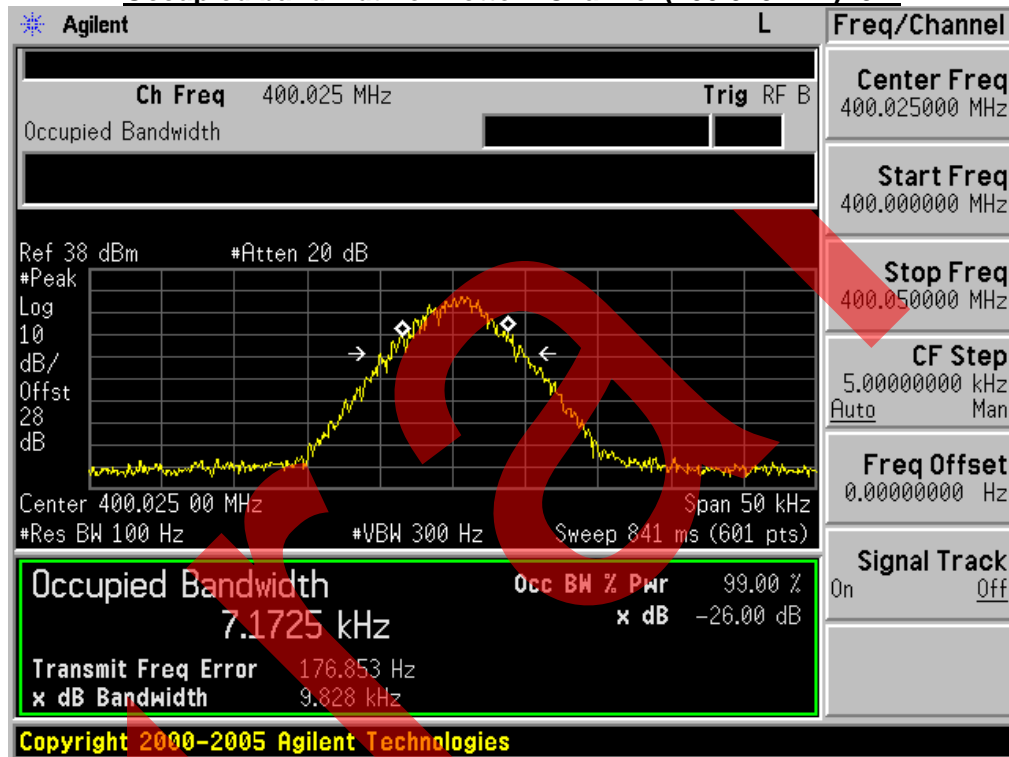
Occupied bandwidth of Top Channel (479.975MHz)-1W



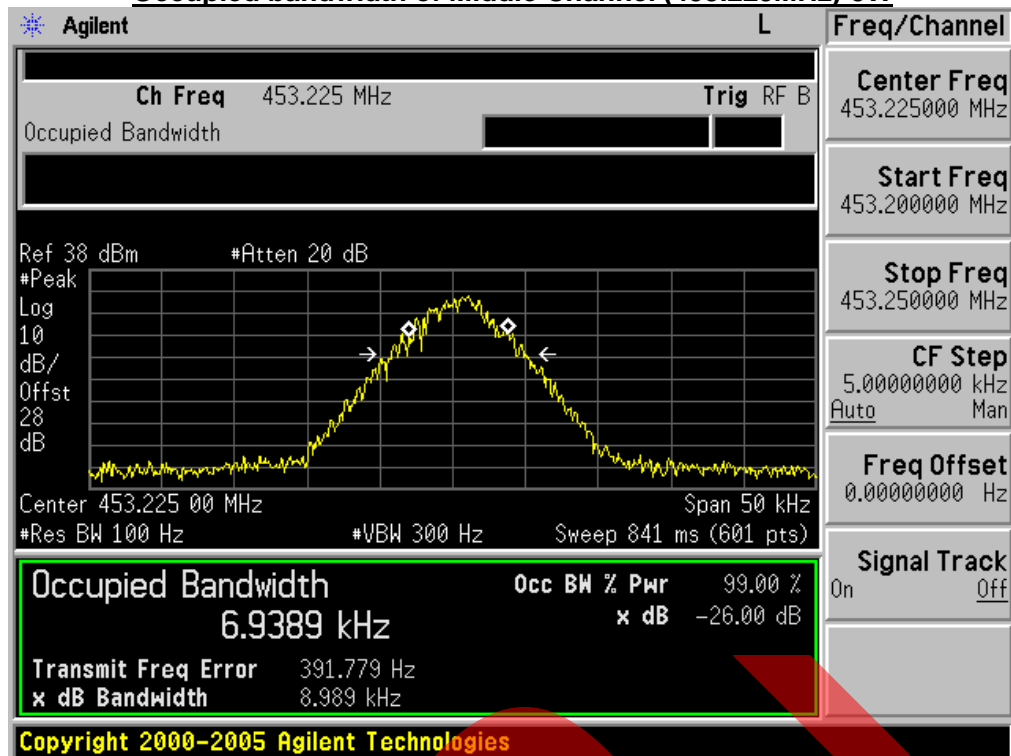
Digital:
TEST RESULTS

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	9.828 KHz	11.25 KHz	Pass
453.225MHz	8.989 KHz	11.25 KHz	Pass
454.025MHz	9.275 KHz	11.25 KHz	Pass
479.975MHz	8.358 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (400.025MHz) -5W



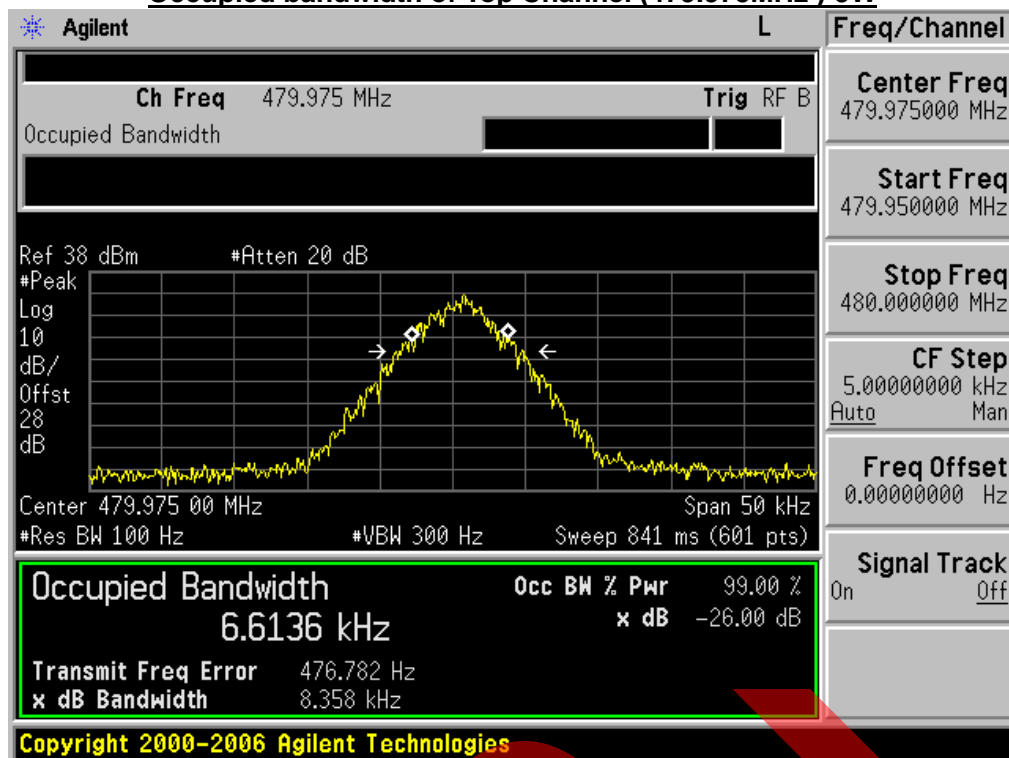
Occupied bandwidth of Middle Channel (453.225MHz)-5W



Occupied bandwidth of Middle Channel (454.025MHz)-5W



Occupied bandwidth of Top Channel (479.975MHz)-5W



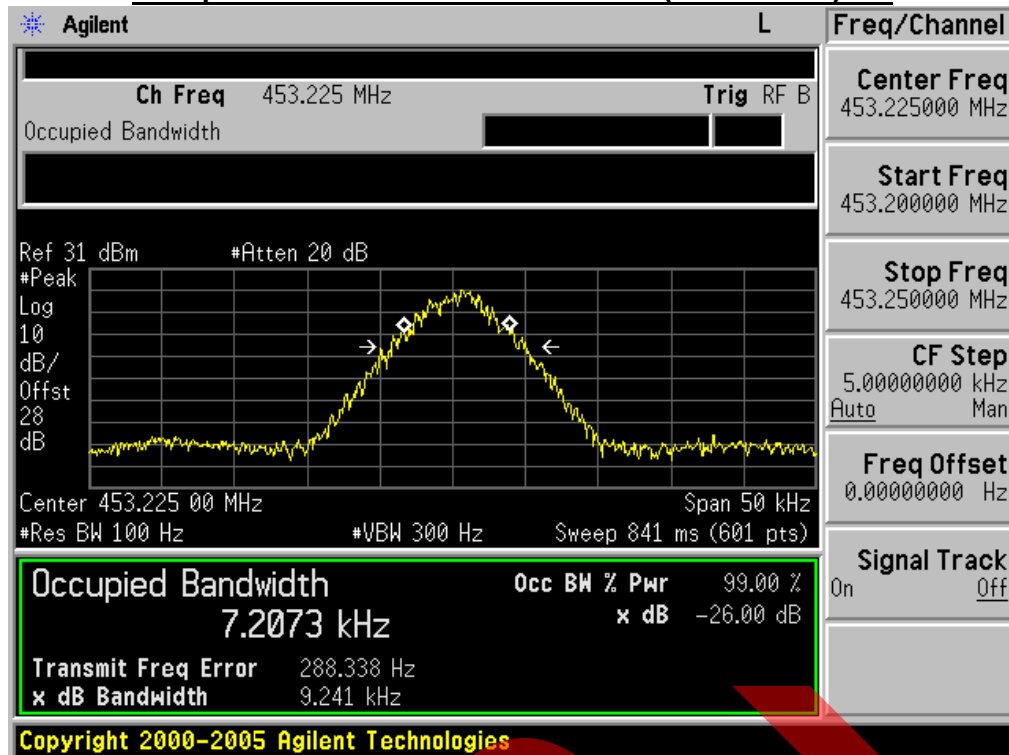
TEST RESULTS

26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation		
	Test Data	Limits	Result
400.025MHz	9.250 KHz	11.25 KHz	Pass
453.225MHz	9.241 KHz	11.25 KHz	Pass
454.025MHz	8.960 KHz	11.25 KHz	Pass
479.975MHz	8.874 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (400.025MHz)-1W



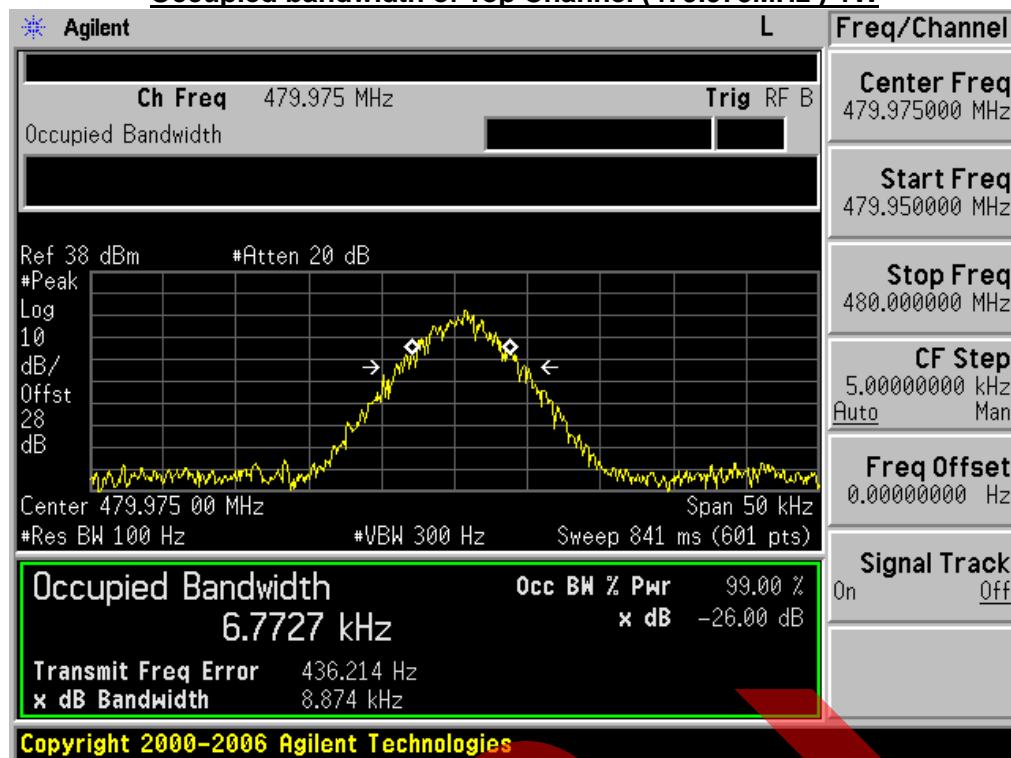
Occupied bandwidth of Middle Channel (453.225MHz)-1W



Occupied bandwidth of Middle Channel (454.025MHz)-1W



Occupied bandwidth of Top Channel (479.975MHz)-1W



8. SPURIOUS RADIATED EMISSION

8.1 PROVISIONS APPLICABLE

According to FCC §2.1053 §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 f_0 to 5.625 KHz removed from f_0 : Zero dB.
- (2). On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (f_d in KHz) f_0 of more than 5.625 KHz but no more than 12.5 KHz: At least $7.27(f_d - 2.88 \text{ KHz})$ dB
- (3). On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (f_d in KHz) f_0 of more than 12.5 KHz: At least $50 + 10 \log(P)$ dB or 70 dB, whichever is lesser attenuation.

According to FCC §22.359:

- (a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

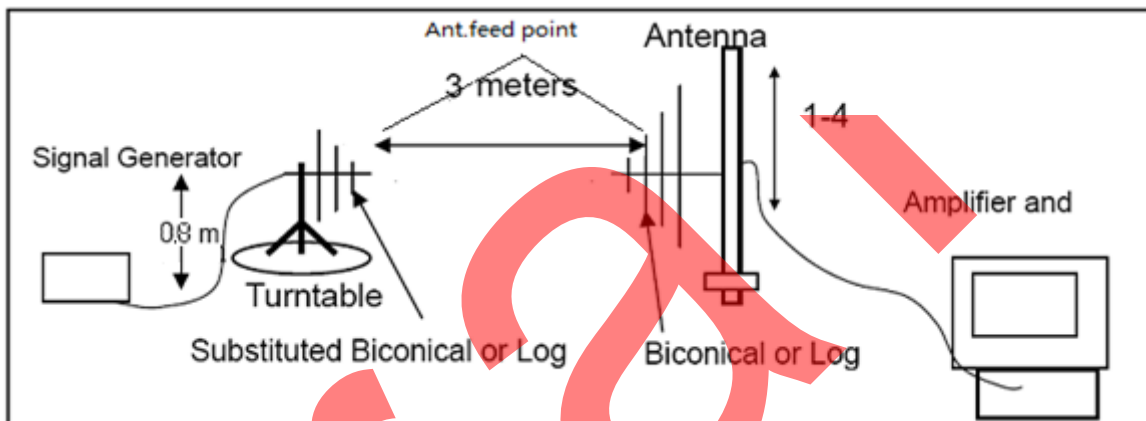
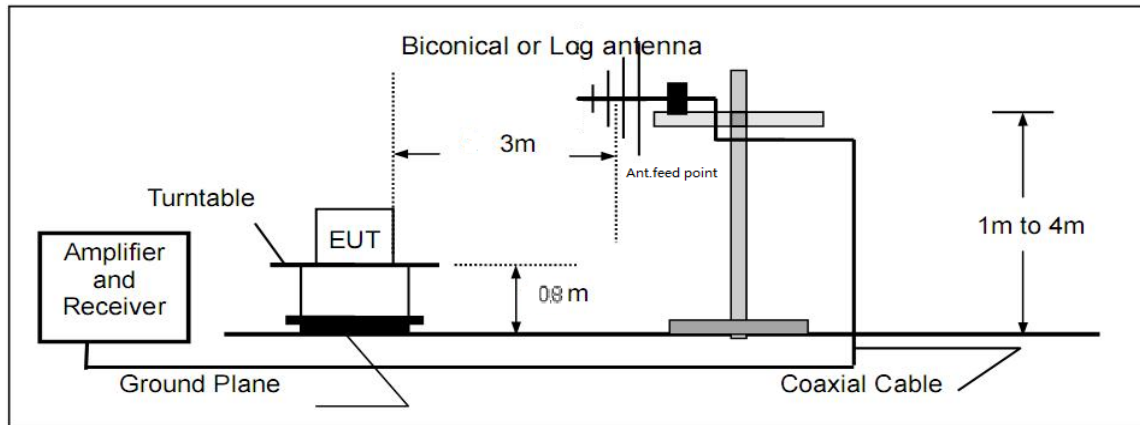
8.2 MEASUREMENT PROCEDURE

- (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 then 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.

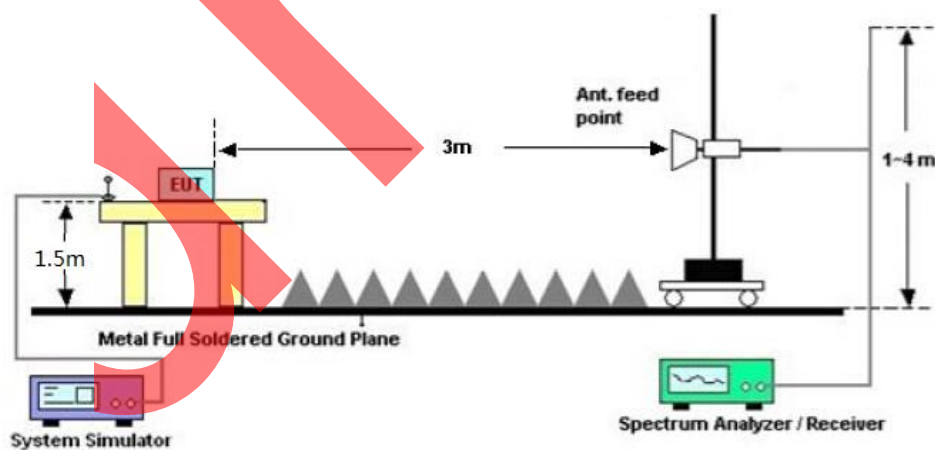
8.3 TEST SETUP BLOCK DIAGRAM

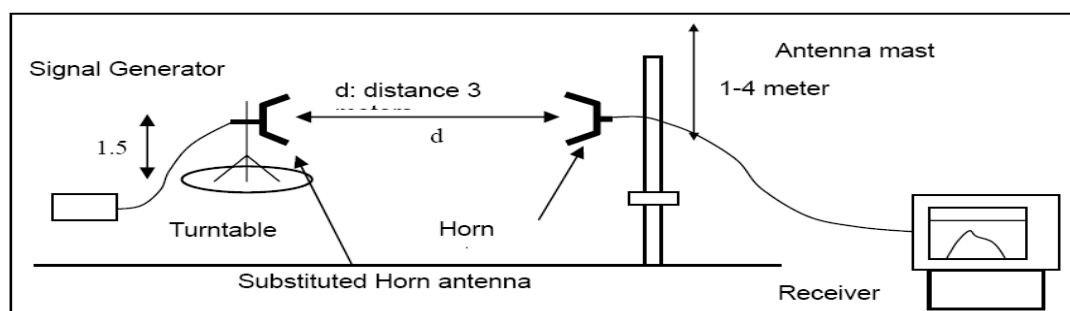
SUBSTITUTION METHOD: (Radiated Emissions)

Radiated Below 1GHz



Radiated Above 1 GHz





8.4 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 (f_d 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.

In the semi-anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The "Read Value" is the spectrum reading of maximum power value.

The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.

EIRP = "Read Value" + Measured substitution value + 2.15.

Limit: FCC PART 90:

At least $50+10 \log(P) = 50+10 \log(5) = 56.99$ (dB)—5W 36.99-56.99=-20dBm

At least $50+10 \log(P) = 50+10 \log(1) = 50$ (dB)—1W 30-50=-20dBm

FCC PART 22:

At least $43+10 \log(P) = 43+10 \log(5) = 49.99$ (dB)—5W 36.99-49.99=-13dBm

At least $43+10 \log(P) = 43+10 \log(1) = 43$ (dB)—1W 30-43=-13dBm

VHF:
Analog:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	0		pass
272.050	H	-35.88	-20	pass
408.080	H	-36.15	-20	pass
544.100	H	-38.97	-20	pass
680.125	H	-41.81	-20	pass
816.150	H	-42.17	-20	pass
952.175	H	-44.45	-20	pass
1088.200	H	-44.54	-20	pass
1224.225	H	-45.95	-20	pass
1360.250	H	-50.02	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	0		pass
272.050	V	-35.09	-20	pass
408.080	V	-37.95	-20	pass
544.100	V	-40.31	-20	pass
680.125	V	-41.53	-20	pass
816.150	V	-42.14	-20	pass
952.175	V	-44.93	-20	pass
1088.200	V	-46.58	-20	pass
1224.225	V	-48.42	-20	pass
1360.250	V	-48.71	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	0		pass
303.700	H	-34.49	-20	pass
455.550	H	-36.56	-20	pass
607.400	H	-38.69	-20	pass
759.250	H	-39.11	-20	pass
911.100	H	-40.41	-20	pass
1062.950	H	-39.93	-20	pass
1214.800	H	-41.45	-20	pass
1366.650	H	-41.41	-20	pass
1518.500	H	-43.34	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	0		pass
303.700	V	-32.47	-20	pass
455.550	V	-35.28	-20	pass
607.400	V	-37.09	-20	pass
759.250	V	-36.58	-20	pass
911.100	V	-38.55	-20	pass
1062.950	V	-43.51	-20	pass
1214.800	V	-42.48	-20	pass
1366.650	V	-43.06	-20	pass
1518.500	V	-48.09	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	0		pass
310.050	H	-30.01	-20	pass
465.075	H	-31.45	-20	pass
620.100	H	-31.58	-20	pass
775.125	H	-34.45	-20	pass
930.150	H	-39.56	-20	pass
1085.175	H	-41.25	-20	pass
1240.200	H	-46.35	-20	pass
1395.225	H	-47.86	-20	pass
1550.250	H	-49.27	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	0		pass
310.050	V	-33.20	-20	pass
465.075	V	-31.69	-20	pass
620.100	V	-35.93	-20	pass
775.125	V	-39.88	-20	pass
930.150	V	-36.63	-20	pass
1085.175	V	-38.23	-20	pass
1240.200	V	-42.30	-20	pass
1395.225	V	-42.71	-20	pass
1550.250	V	-46.29	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	0		pass
323.220	H	-32.7	-20	pass
484.830	H	-35.4	-20	pass
646.440	H	-35.6	-20	pass
808.050	H	-36.7	-20	pass
969.660	H	-38.4	-20	pass
1131.270	H	-41.9	-20	pass
1292.880	H	-43.0	-20	pass
1454.490	H	-44.5	-20	pass
1616.100	H	-49.9	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	0		pass
323.220	V	-36.4	-20	pass
484.830	V	-37.7	-20	pass
646.440	V	-39.8	-20	pass
808.050	V	-39.4	-20	pass
969.660	V	-41.4	-20	pass
1131.270	V	-43.1	-20	pass
1292.880	V	-45.3	-20	pass
1454.490	V	-46.6	-20	pass
1616.100	V	-50.1	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	0		pass
347.950	H	-35.4	-20	pass
521.925	H	-37.9	-20	pass
695.900	H	-36.3	-20	pass
869.875	H	-38.1	-20	pass
1043.850	H	-37.4	-20	pass
1217.825	H	-41.0	-20	pass
1391.800	H	-42.7	-20	pass
1565.775	H	-44.8	-20	pass
1739.750	H	-43.8	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	0		pass
347.950	V	-36.0	-20	pass
521.925	V	-37.1	-20	pass
695.900	V	-39.7	-20	pass
869.875	V	-40.4	-20	pass
1043.850	V	-42.6	-20	pass
1217.825	V	-45.4	-20	pass
1391.800	V	-44.8	-20	pass
1565.775	V	-49.4	-20	pass
1739.750	V	-50.0	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	0		pass
272.050	H	-33.9	-20	pass
408.075	H	-36.5	-20	pass
544.100	H	-39.3	-20	pass
680.125	H	-39.8	-20	pass
816.150	H	-40.8	-20	pass
952.175	H	-43.1	-20	pass
1088.200	H	-46.1	-20	pass
1224.225	H	-50.6	-20	pass
1360.250	H	-50.7	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	0		pass
272.050	V	-37.5	-20	pass
408.075	V	-37.4	-20	pass
544.100	V	-40.8	-20	pass
680.125	V	-41.2	-20	pass
816.150	V	-42.9	-20	pass
952.175	V	-43.8	-20	pass
1088.200	V	-51.7	-20	pass
1224.225	V	-52.3	-20	pass
1360.250	V	-51.7	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	0		pass
303.700	H	-38.0	-20	pass
455.550	H	-39.5	-20	pass
607.400	H	-42.2	-20	pass
759.250	H	-43.7	-20	pass
911.100	H	-43.5	-20	pass
1062.950	H	-48.0	-20	pass
1214.800	H	-49.9	-20	pass
1366.650	H	-51.5	-20	pass
1518.500	H	-53.4	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	0		pass
303.700	V	-34.7	-20	pass
455.550	V	-37.1	-20	pass
607.400	V	-37.4	-20	pass
759.250	V	-40.3	-20	pass
911.100	V	-43.6	-20	pass
1062.950	V	-46.5	-20	pass
1214.800	V	-49.2	-20	pass
1366.650	V	-50.5	-20	pass
1518.500	V	-50.8	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	0		pass
310.050	H	-39.1	-20	pass
465.075	H	-42.7	-20	pass
620.100	H	-40.1	-20	pass
775.125	H	-45.9	-20	pass
930.150	H	-45.7	-20	pass
1085.175	H	-50.6	-20	pass
1240.200	H	-51.5	-20	pass
1395.225	H	-50.7	-20	pass
1550.250	H	-49.2	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	0		pass
310.050	V	-40.7	-20	pass
465.075	V	-43.5	-20	pass
620.100	V	-45.8	-20	pass
775.125	V	-44.7	-20	pass
930.150	V	-44.9	-20	pass
1085.175	V	-43.8	-20	pass
1240.200	V	-49.6	-20	pass
1395.225	V	-52.1	-20	pass
1550.250	V	-52.4	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	0		pass
323.220	H	-39.6	-20	pass
484.830	H	-40.9	-20	pass
646.440	H	-44.5	-20	pass
808.050	H	-46.5	-20	pass
969.660	H	-46.2	-20	pass
1131.270	H	-48.5	-20	pass
1292.880	H	-50.0	-20	pass
1454.490	H	-49.7	-20	pass
1616.100	H	-51.1	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	0		pass
347.950	V	-36.8	-20	pass
521.925	V	-36.5	-20	pass
695.900	V	-39.9	-20	pass
869.875	V	-41.6	-20	pass
1043.850	V	-46.1	-20	pass
1217.825	V	-46.9	-20	pass
1391.800	V	-48.3	-20	pass
1565.775	V	-49.3	-20	pass
1739.750	V	-51.6	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	0		pass
347.950	H	-40.7	-20	pass
521.925	H	-44.5	-20	pass
695.900	H	-46.5	-20	pass
869.875	H	-44.2	-20	pass
1043.850	H	-45.5	-20	pass
1217.825	H	-47.7	-20	pass
1391.800	H	-48.1	-20	pass
1565.775	H	-49.1	-20	pass
1739.750	H	-50.3	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	0		pass
347.950	V	-36.06	-20	pass
521.925	V	-37.22	-20	pass
695.900	V	-40.84	-20	pass
869.875	V	-44.99	-20	pass
1043.850	V	-46.59	-20	pass
1217.825	V	-47.16	-20	pass
1391.800	V	-47.71	-20	pass
1565.775	V	-49.03	-20	pass
1739.750	V	-50.87	-20	pass

Digital:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	0		pass
272.050	H	-35.56	-20	pass
408.08	H	-37.81	-20	pass
544.100	H	-39.15	-20	pass
680.125	H	-41.31	-20	pass
816.150	H	-42.28	-20	pass
952.175	H	-43.27	-20	pass
1088.200	H	-44.15	-20	pass
1224.225	H	-48.81	-20	pass
1360.250	H	-50.41	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	0		pass
272.050	V	-38.09	-20	pass
408.08	V	-34.61	-20	pass
544.100	V	-37.18	-20	pass
680.125	V	-40.17	-20	pass
816.150	V	-38.37	-20	pass
952.175	V	-38.09	-20	pass
1088.200	V	-41.68	-20	pass
1224.225	V	-45.92	-20	pass
1360.250	V	-43.20	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	0		pass
303.700	H	-35.42	-20	pass
455.55	H	-35.94	-20	pass
607.400	H	-40.36	-20	pass
759.250	H	-41.02	-20	pass
911.100	H	-44.21	-20	pass
1062.950	H	-46.52	-20	pass
1214.800	H	-48.23	-20	pass
1366.650	H	-48.37	-20	pass
1518.500	H	-51.36	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	0		pass
303.700	V	-36.6	-20	pass
455.55	V	-39.4	-20	pass
607.400	V	-40.1	-20	pass
759.250	V	-43.6	-20	pass
911.100	V	-43.6	-20	pass
1062.950	V	-44.2	-20	pass
1214.800	V	-50.3	-20	pass
1366.650	V	-51.9	-20	pass
1518.500	V	-52.3	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	0		pass
310.050	H	-38.0	-20	pass
465.075	H	-38.4	-20	pass
620.100	H	-40.7	-20	pass
775.125	H	-40.5	-20	pass
930.150	H	-43.2	-20	pass
1085.175	H	-45.7	-20	pass
1240.200	H	-48.9	-20	pass
1395.225	H	-49.4	-20	pass
1550.250	H	-50.8	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	0		pass
310.050	V	-36.1	-20	pass
465.08	V	-35.9	-20	pass
620.100	V	-39.0	-20	pass
775.125	V	-40.0	-20	pass
930.150	V	-39.8	-20	pass
1085.175	V	-41.2	-20	pass
1240.200	V	-43.7	-20	pass
1395.225	V	-42.2	-20	pass
1550.250	V	-44.3	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.61MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	0		pass
323.220	H	-37.4	-20	pass
484.83	H	-38.4	-20	pass
646.440	H	-39.1	-20	pass
808.050	H	-41.0	-20	pass
969.660	H	-43.0	-20	pass
1131.270	H	-43.9	-20	pass
1292.880	H	-51.3	-20	pass
1454.490	H	-51.2	-20	pass
1616.100	H	-54.1	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	0		pass
323.220	V	-35.6	-20	pass
484.83	V	-36.3	-20	pass
646.440	V	-39.1	-20	pass
808.050	V	-39.7	-20	pass
969.660	V	-45.4	-20	pass
1131.270	V	-46.6	-20	pass
1292.880	V	-49.1	-20	pass
1454.490	V	-51.5	-20	pass
1616.100	V	-50.2	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	0		pass
347.950	H	-35.9	-20	pass
521.925	H	-36.5	-20	pass
695.900	H	-38.8	-20	pass
869.875	H	-41.3	-20	pass
1043.850	H	-42.7	-20	pass
1217.825	H	-42.7	-20	pass
1391.800	H	-46.2	-20	pass
1565.775	H	-51.4	-20	pass
1739.750	H	-52.8	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	0		pass
347.950	V	-34.1	58.45	pass
521.925	V	-35.7	58.45	pass
695.900	V	-38.4	58.45	pass
869.875	V	-41.1	58.45	pass
1043.850	V	-43.3	58.45	pass
1217.825	V	-48.2	58.45	pass
1391.800	V	-51.1	58.45	pass
1565.775	V	-51.9	58.45	pass
1739.750	V	-51.8	58.45	pass

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	0		pass
272.050	H	-35.6	-20	pass
408.08	H	-36.5	-20	pass
544.100	H	-39.2	-20	pass
680.125	H	-40.4	-20	pass
816.150	H	-42.1	-20	pass
952.175	H	-42.7	-20	pass
1088.200	H	-43.9	-20	pass
1224.225	H	-50.3	-20	pass
1360.250	H	-50.0	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	0		pass
272.050	V	-37.8	-20	pass
408.08	V	-38.4	-20	pass
544.100	V	-40.8	-20	pass
680.125	V	-43.9	-20	pass
816.150	V	-43.5	-20	pass
952.175	V	-46.2	-20	pass
1088.200	V	-51.0	-20	pass
1224.225	V	-51.5	-20	pass
1360.250	V	-54.1	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	0		pass
303.700	H	-40.2	-20	pass
455.55	H	-42.3	-20	pass
607.400	H	-47.6	-20	pass
759.250	H	-47.9	-20	pass
911.100	H	-44.3	-20	pass
1062.950	H	-43.0	-20	pass
1214.800	H	-46.1	-20	pass
1366.650	H	-48.1	-20	pass
1518.500	H	-53.6	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	0		pass
303.700	V	-37.8	-20	pass
455.55	V	-38.7	-20	pass
607.400	V	-40.0	-20	pass
759.250	V	-41.7	-20	pass
911.100	V	-44.3	-20	pass
1062.950	V	-47.0	-20	pass
1214.800	V	-46.2	-20	pass
1366.650	V	-51.8	-20	pass
1518.500	V	-53.3	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	0		pass
310.050	H	-40.3	-20	pass
465.075	H	-39.8	-20	pass
620.100	H	-41.3	-20	pass
775.125	H	-42.7	-20	pass
930.150	H	-42.5	-20	pass
1085.175	H	-45.1	-20	pass
1240.200	H	-51.5	-20	pass
1395.225	H	-52.4	-20	pass
1550.250	H	-51.0	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/H)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	0		pass
310.050	V	-34.3	-20	pass
465.075	V	-35.9	-20	pass
620.100	V	-38.7	-20	pass
775.125	V	-40.9	-20	pass
930.150	V	-47.0	-20	pass
1085.175	V	-48.7	-20	pass
1240.200	V	-49.8	-20	pass
1395.225	V	-51.8	-20	pass
1550.250	V	-52.7	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	0		pass
323.220	H	-37.5	-20	pass
484.83	H	-37.6	-20	pass
646.440	H	-38.4	-20	pass
808.050	H	-44.7	-20	pass
969.660	H	-47.5	-20	pass
1131.270	H	-48.1	-20	pass
1292.880	H	-49.3	-20	pass
1454.490	H	-50.3	-20	pass
1616.100	H	-52.8	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	0		pass
323.220	V	-36.4	-20	pass
484.83	V	-37.8	-20	pass
646.440	V	-40.6	-20	pass
808.050	V	-41.3	-20	pass
969.660	V	-42.5	-20	pass
1131.270	V	-47.5	-20	pass
1292.880	V	-51.3	-20	pass
1454.490	V	-50.9	-20	pass
1616.100	V	-52.5	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	0		pass
347.950	H	-34.3	-20	pass
521.925	H	-35.4	-20	pass
695.900	H	-38.2	-20	pass
869.875	H	-40.2	-20	pass
1043.850	H	-40.8	-20	pass
1217.825	H	-42.9	-20	pass
1391.800	H	-51.3	-20	pass
1565.775	H	-49.2	-20	pass
1739.750	H	-51.4	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	0		pass
347.950	V	-37.2	-20	pass
521.925	V	-38.6	-20	pass
695.900	V	-43.3	-20	pass
869.875	V	-47.1	-20	pass
1043.850	V	-48.9	-20	pass
1217.825	V	-50.4	-20	pass
1391.800	V	-49.6	-20	pass
1565.775	V	-52.5	-20	pass
1739.750	V	-53.5	-20	pass

UHF:
Analog:

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	0		pass
800.050	H	-32.4	-20	pass
1200.075	H	-33.5	-20	pass
1600.100	H	-37.8	-20	pass
2000.125	H	-37.6	-20	pass
2400.150	H	-39.3	-20	pass
2800.175	H	-41.0	-20	pass
3200.200	H	-50.7	-20	pass
3600.225	H	-52.8	-20	pass
4000.250	H	-53.3	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	0		pass
800.050	V	-37.0	-20	pass
1200.075	V	-38.0	-20	pass
1600.100	V	-36.5	-20	pass
2000.125	V	-42.2	-20	pass
2400.150	V	-41.7	-20	pass
2800.175	V	-42.0	-20	pass
3200.200	V	-40.4	-20	pass
3600.225	V	-50.9	-20	pass
4000.250	V	-51.9	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	0		pass
908.050	V	-36.8	-20	pass
1362.075	V	-39.4	-20	pass
1816.100	V	-40.3	-20	pass
2270.125	V	-46.0	-20	pass
2724.150	V	-47.7	-20	pass
3178.175	V	-50.5	-20	pass
3632.200	V	-50.0	-20	pass
4086.225	V	-51.9	-20	pass
4540.250	V	-51.3	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	0		pass
908.050	H	-34.6	-20	pass
1362.075	H	-34.8	-20	pass
1816.100	H	-36.5	-20	pass
2270.125	H	-40.1	-20	pass
2724.150	H	-42.2	-20	pass
3178.175	H	-43.1	-20	pass
3632.200	H	-45.3	-20	pass
4086.225	H	-52.3	-20	pass
4540.250	H	-53.1	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	0		pass
959.950	H	-37.3	-20	pass
1439.925	H	-39.5	-20	pass
1919.900	H	-41.1	-20	pass
2399.875	H	-43.7	-20	pass
2879.850	H	-42.0	-20	pass
3359.825	H	-44.6	-20	pass
3839.800	H	-50.6	-20	pass
4319.775	H	-51.7	-20	pass
4799.750	H	-52.7	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	0		pass
959.950	V	-38.4	-20	pass
1439.925	V	-37.8	-20	pass
1919.900	V	-38.8	-20	pass
2399.875	V	-39.2	-20	pass
2879.850	V	-41.4	-20	pass
3359.825	V	-44.0	-20	pass
3839.800	V	-50.3	-20	pass
4319.775	V	-51.7	-20	pass
4799.750	V	-53.6	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	0		pass
800.050	H	-36.9	-20	pass
1200.075	H	-36.8	-20	pass
1600.100	H	-40.7	-20	pass
2000.125	H	-43.7	-20	pass
2400.150	H	-43.4	-20	pass
2800.175	H	-45.6	-20	pass
3200.200	H	-49.4	-20	pass
3600.225	H	-50.6	-20	pass
4000.250	H	-52.1	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	0		pass
800.050	V	-37.6	-20	pass
1200.075	V	-39.9	-20	pass
1600.100	V	-40.8	-20	pass
2000.125	V	-41.0	-20	pass
2400.150	V	-43.7	-20	pass
2800.175	V	-47.4	-20	pass
3200.200	V	-50.1	-20	pass
3600.225	V	-52.4	-20	pass
4000.250	V	-54.1	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	0		pass
908.050	H	-37.5	-20	pass
1362.075	H	-38.7	-20	pass
1816.100	H	-39.7	-20	pass
2270.125	H	-42.8	-20	pass
2724.150	H	-45.9	-20	pass
3178.175	H	-47.1	-20	pass
3632.200	H	-46.9	-20	pass
4086.225	H	-51.7	-20	pass
4540.250	H	-51.5	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	0		pass
908.050	V	-38.4	-20	pass
1362.075	V	-40.5	-20	pass
1816.100	V	-45.3	-20	pass
2270.125	V	-47.2	-20	pass
2724.150	V	-49.0	-20	pass
3178.175	V	-50.7	-20	pass
3632.200	V	-52.3	-20	pass
4086.225	V	-51.1	-20	pass
4540.250	V	-53.9	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	0		pass
959.950	H	-35.4	-20	pass
1439.925	H	-35.3	-20	pass
1919.900	H	-40.1	-20	pass
2399.875	H	-43.0	-20	pass
2879.850	H	-44.1	-20	pass
3359.825	H	-45.4	-20	pass
3839.800	H	-49.3	-20	pass
4319.775	H	-50.4	-20	pass
4799.750	H	-52.3	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	0		pass
959.950	V	-38.8	-20	pass
1439.925	V	-40.4	-20	pass
1919.900	V	-41.2	-20	pass
2399.875	V	-43.3	-20	pass
2879.850	V	-45.2	-20	pass
3359.825	V	-47.1	-20	pass
3839.800	V	-51.3	-20	pass
4319.775	V	-52.6	-20	pass
4799.750	V	-51.8	-20	pass

Digital:

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	0		pass
800.050	H	-36.2	-20	pass
1200.075	H	-38.0	-20	pass
1600.100	H	-37.2	-20	pass
2000.125	H	-40.2	-20	pass
2400.150	H	-40.0	-20	pass
2800.175	H	-40.6	-20	pass
3200.200	H	-43.8	-20	pass
3600.225	H	-42.9	-20	pass
4000.250	H	-43.9	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	0		pass
800.050	V	-35.3	-20	pass
1200.075	V	-36.5	-20	pass
1600.100	V	-37.0	-20	pass
2000.125	V	-41.3	-20	pass
2400.150	V	-42.7	-20	pass
2800.175	V	-44.2	-20	pass
3200.200	V	-43.7	-20	pass
3600.225	V	-42.9	-20	pass
4000.250	V	-43.2	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	0		pass
908.050	H	-35.8	-20	pass
1362.075	H	-37.2	-20	pass
1816.100	H	-37.1	-20	pass
2270.125	H	-40.5	-20	pass
2724.150	H	-43.3	-20	pass
3178.175	H	-41.0	-20	pass
3632.200	H	-41.4	-20	pass
4086.225	H	-46.3	-20	pass
4540.250	H	-46.2	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	0		pass
908.050	V	-34.5	-20	pass
1362.075	V	-37.1	-20	pass
1816.100	V	-36.4	-20	pass
2270.125	V	-40.8	-20	pass
2724.150	V	-38.0	-20	pass
3178.175	V	-42.1	-20	pass
3632.200	V	-44.2	-20	pass
4086.225	V	-42.6	-20	pass
4540.250	V	-48.9	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	0		pass
959.950	H	-35.48	-20	pass
1439.925	H	-37.88	-20	pass
1919.900	H	-40.08	-20	pass
2399.875	H	-40.71	-20	pass
2879.850	H	-41.91	-20	pass
3359.825	H	-45.09	-20	pass
3839.800	H	-45.86	-20	pass
4319.775	H	-51.28	-20	pass
4799.750	H	-50.93	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	0		pass
959.950	V	-38.1	-20	pass
1439.925	V	-38.6	-20	pass
1919.900	V	-41.6	-20	pass
2399.875	V	-41.8	-20	pass
2879.850	V	-43.2	-20	pass
3359.825	V	-46.0	-20	pass
3839.800	V	-51.5	-20	pass
4319.775	V	-52.2	-20	pass
4799.750	V	-51.8	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	0		pass
800.050	H	-37.1	-20	pass
1200.075	H	-38.5	-20	pass
1600.100	H	-41.4	-20	pass
2000.125	H	-43.4	-20	pass
2400.150	H	-44.4	-20	pass
2800.175	H	-47.0	-20	pass
3200.200	H	-50.2	-20	pass
3600.225	H	-51.6	-20	pass
4000.250	H	-54.0	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	0		pass
800.050	V	-35.7	-20	pass
1200.075	V	-36.8	-20	pass
1600.100	V	-38.0	-20	pass
2000.125	V	-40.9	-20	pass
2400.150	V	-44.0	-20	pass
2800.175	V	-46.9	-20	pass
3200.200	V	-49.2	-20	pass
3600.225	V	-50.1	-20	pass
4000.250	V	-51.3	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	0		pass
908.050	H	-39.2	-20	pass
1362.075	H	-43.2	-20	pass
1816.100	H	-39.7	-20	pass
2270.125	H	-45.9	-20	pass
2724.150	H	-45.8	-20	pass
3178.175	H	-49.8	-20	pass
3632.200	H	-52.7	-20	pass
4086.225	H	-50.2	-20	pass
4540.250	H	-49.4	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	0		pass
908.050	V	-40.3	-20	pass
1362.075	V	-43.8	-20	pass
1816.100	V	-46.2	-20	pass
2270.125	V	-45.1	-20	pass
2724.150	V	-45.0	-20	pass
3178.175	V	-44.1	-20	pass
3632.200	V	-49.5	-20	pass
4086.225	V	-51.6	-20	pass
4540.250	V	-53.5	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	0		pass
959.950	H	-40.8	-20	pass
1439.925	H	-41.9	-20	pass
1919.900	H	-45.1	-20	pass
2399.875	H	-47.6	-20	pass
2879.850	H	-46.0	-20	pass
3359.825	H	-50.3	-20	pass
3839.800	H	-50.0	-20	pass
4319.775	H	-52.5	-20	pass
4799.750	H	-51.5	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	0		pass
959.950	V	-36.1	-20	pass
1439.925	V	-38.2	-20	pass
1919.900	V	-41.6	-20	pass
2399.875	V	-43.5	-20	pass
2879.850	V	-44.8	-20	pass
3359.825	V	-47.4	-20	pass
3839.800	V	-49.4	-20	pass
4319.775	V	-49.2	-20	pass
4799.750	V	-50.4	-20	pass

Note: In this case, Part 22 (-13 dBm) is less than the limit of Part 90 (-20 dBm), so we do not need to test Part 22, which meets the spurious limits of PART 90+22.

8.5 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.

Handwritten signature

Agilent L

Ref 39 dBm #Atten 22 dB

Norm Log

10 dB/

Offst 28 dB

LgAv

V1 W2

S3 FC

AA

$\mathcal{E}(f)$:

f<50k

FFT

PASS LIMIT1

Center 136.025 00 MHz

Span 50 kHz

#Res BW 100 Hz

#VBW 300 Hz

Sweep 841.5 ms (8192 pts)

Freq/Channel

Center Freq
136.025000 MHz

Start Freq
136.000000 MHz

Stop Freq
136.050000 MHz

CF Step
5.00000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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Agilent

Ref 32 dBm #Atten 22 dB

Norm Log

10 dB/

Offst 28 dB

LgAv

V1 W2

S3 FC

AA

f(f):

f<50k

FFT

PASS LIMIT1

Center 136.025 00 MHz

#Res BW 100 Hz

#VBW 300 Hz

Sweep 841.5 ms (8192 pts)

Span 50 kHz

Freq/Channel

Center Freq 136.025000 MHz

Start Freq 136.000000 MHz

Stop Freq 136.050000 MHz

CF Step 5.00000000 kHz

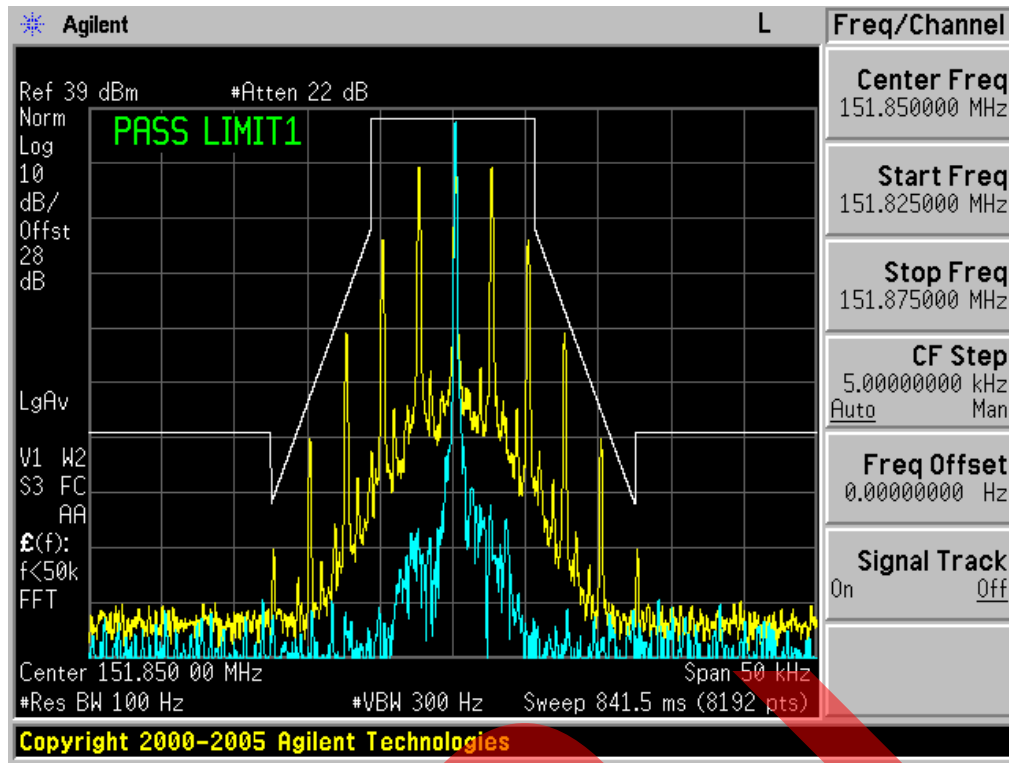
Auto Man

Freq Offset 0.00000000 Hz

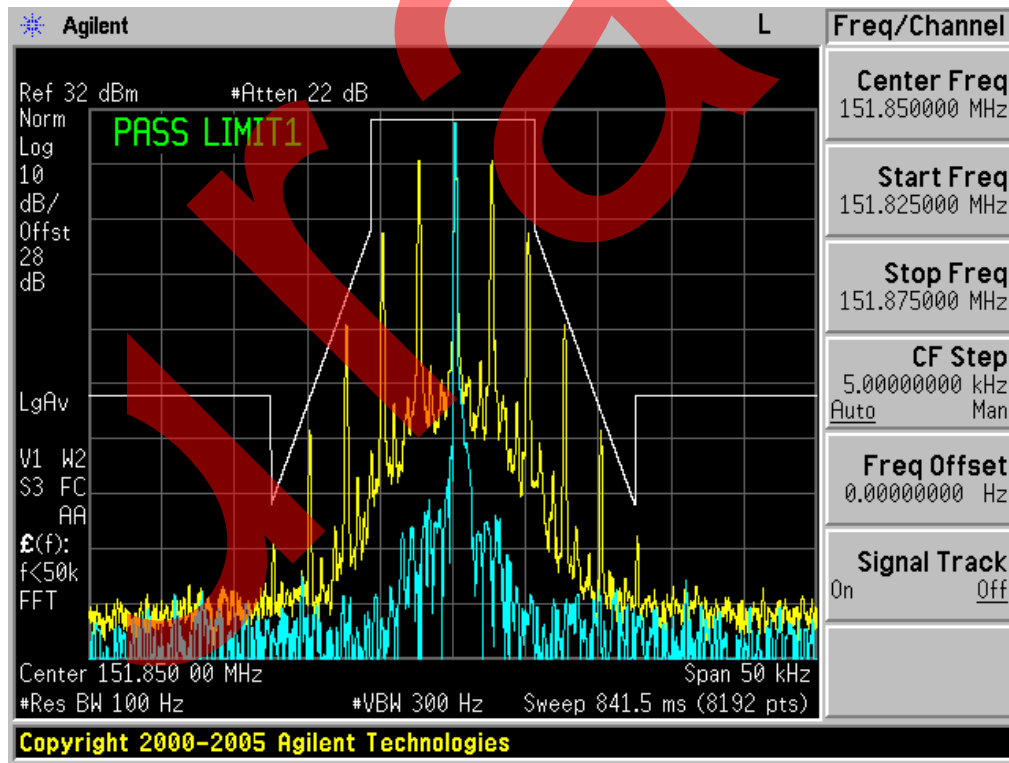
Signal Track On Off

Copyright 2000-2005 Agilent Technologies

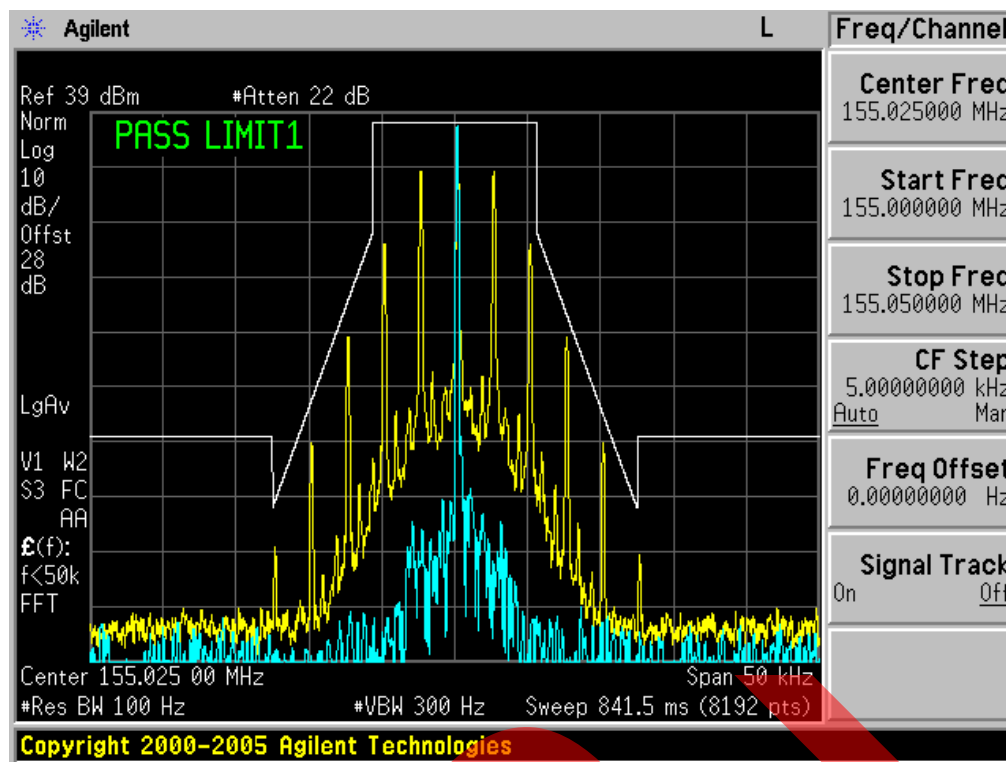
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (5W)



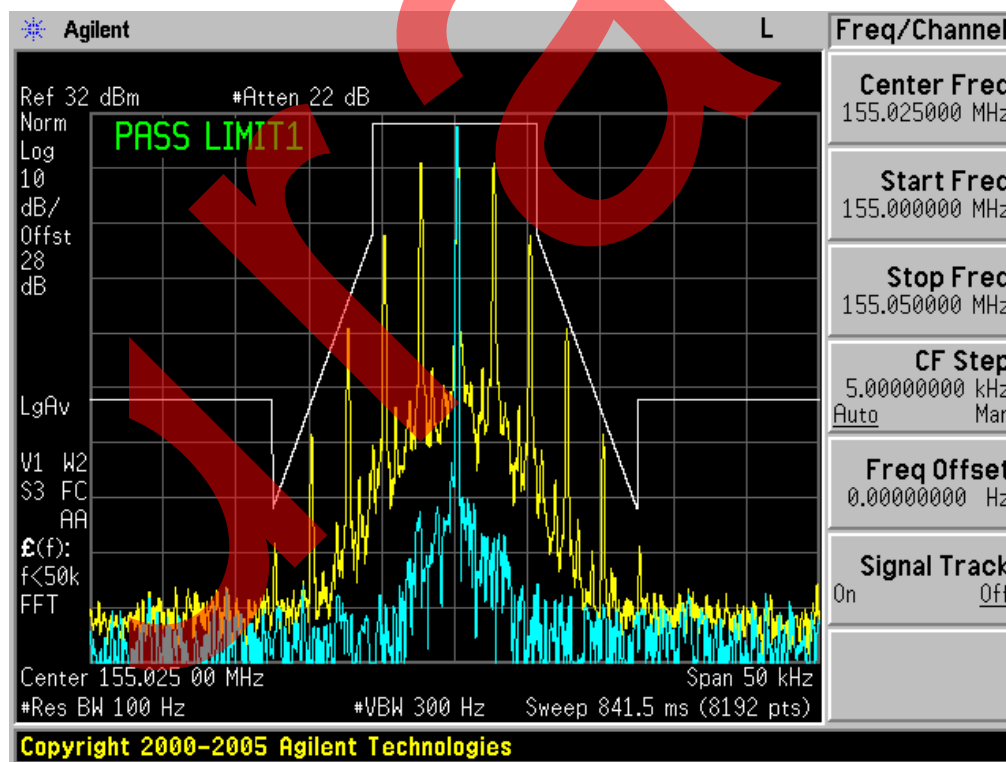
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (1W)



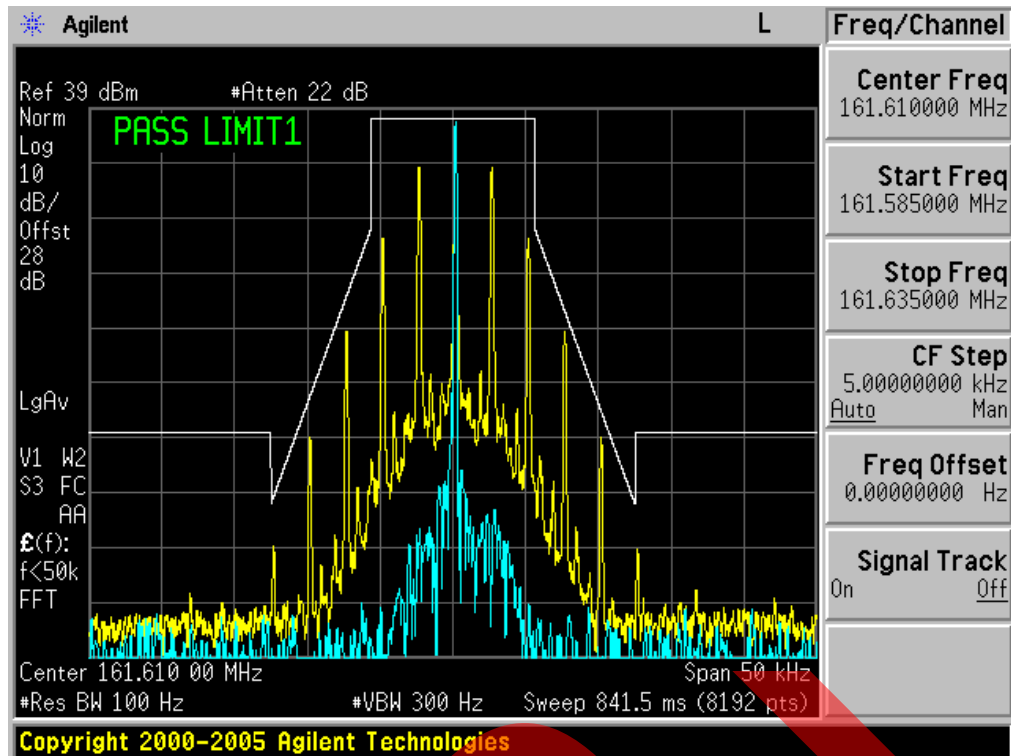
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (5W)



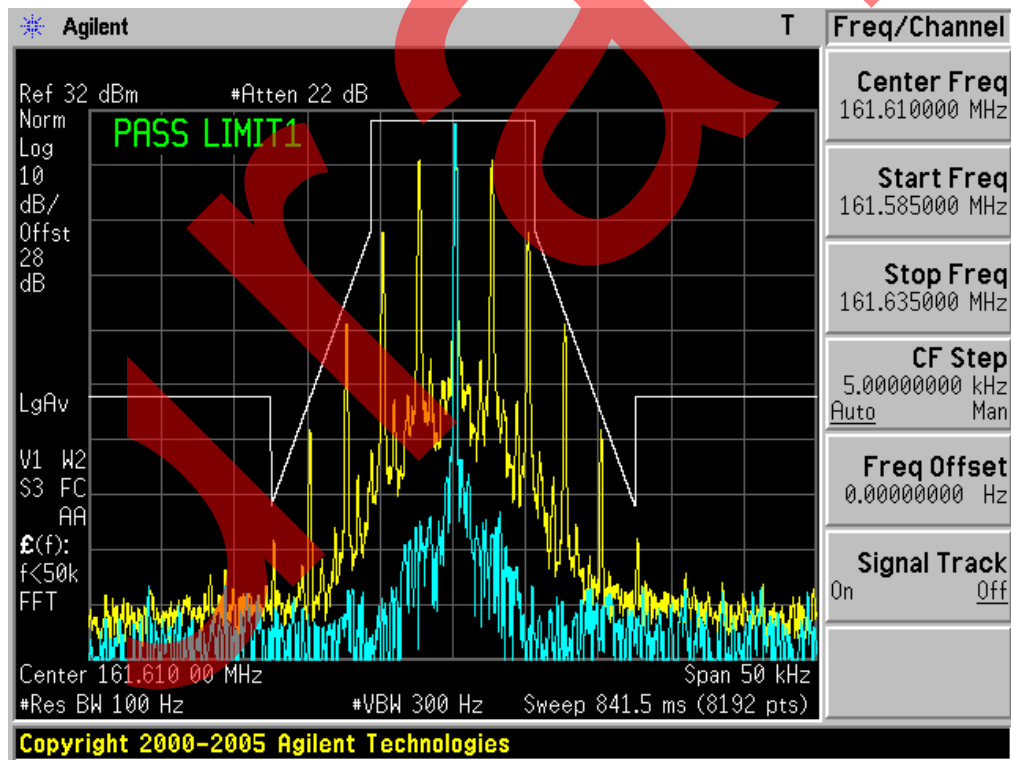
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (1W)



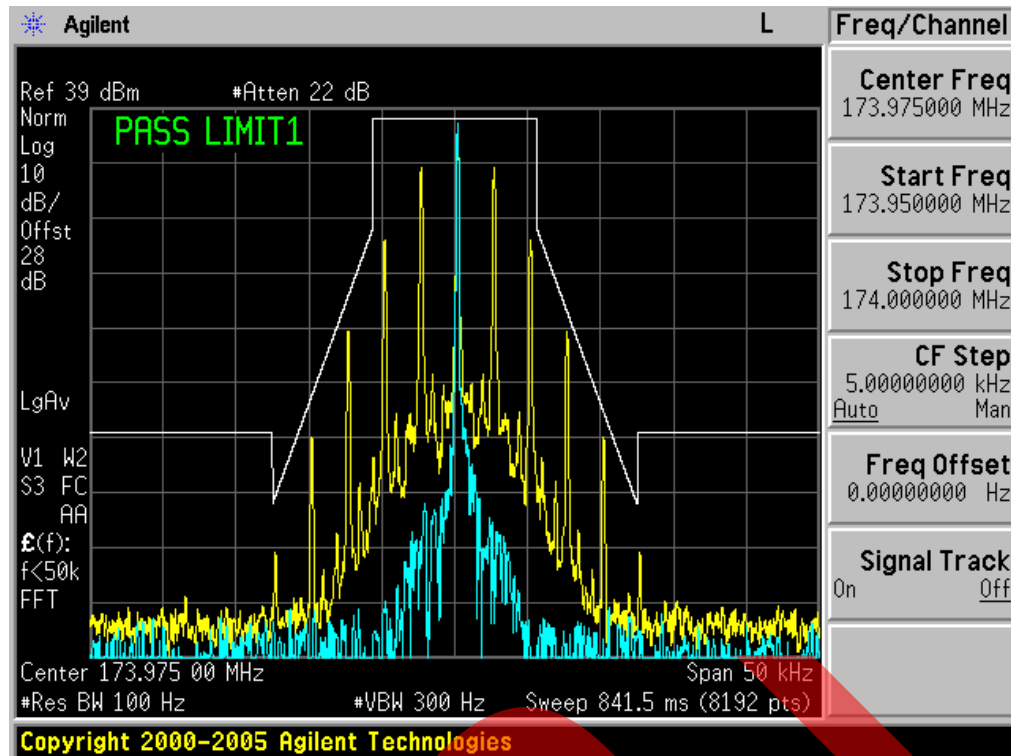
The Worst Emission Mask D for (161.61MHz) of 12.5 KHz channel Separation (5W)



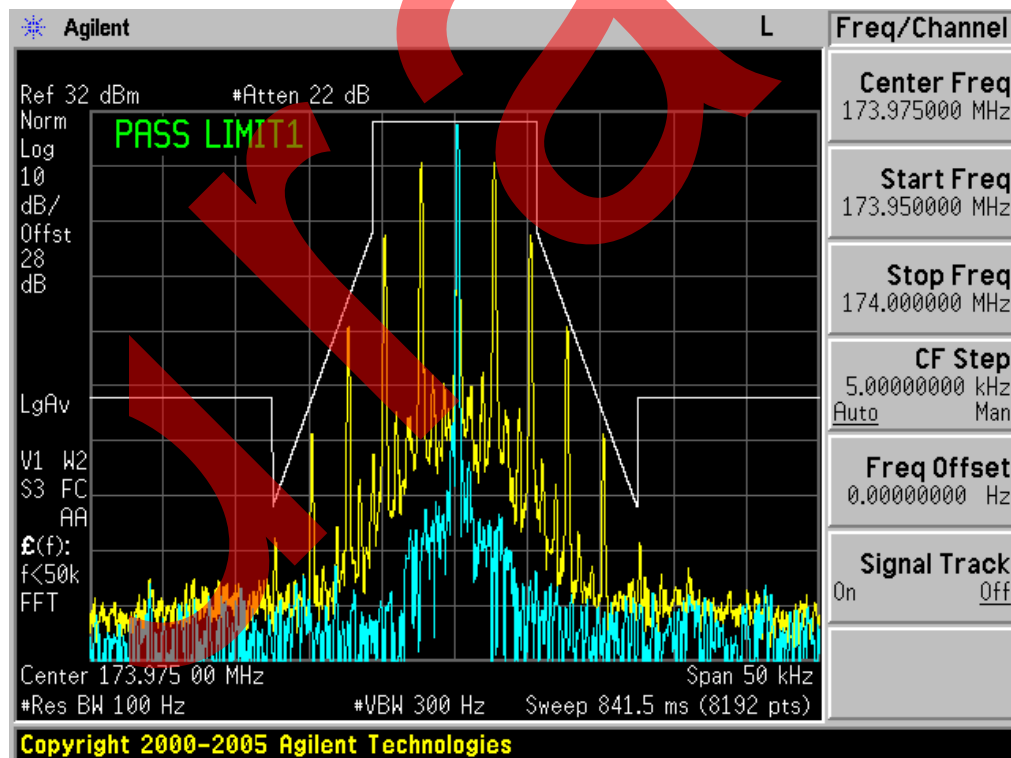
The Worst Emission Mask for (161.61MHz) of 12.5 KHz channel Separation (1W)



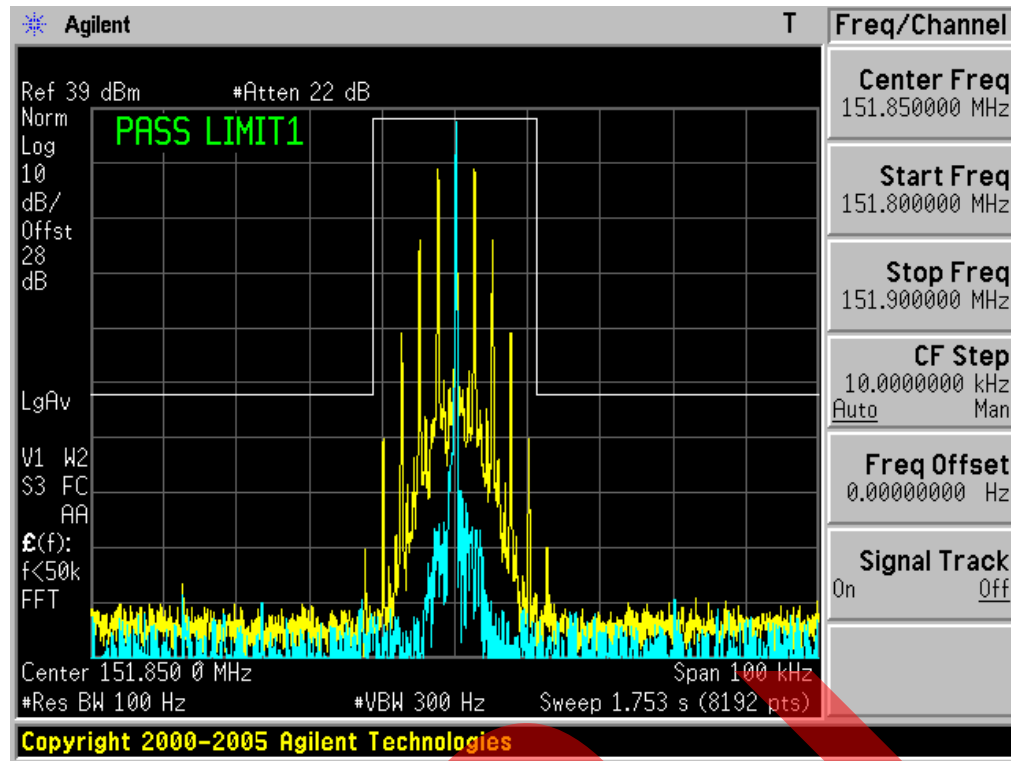
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (5W)



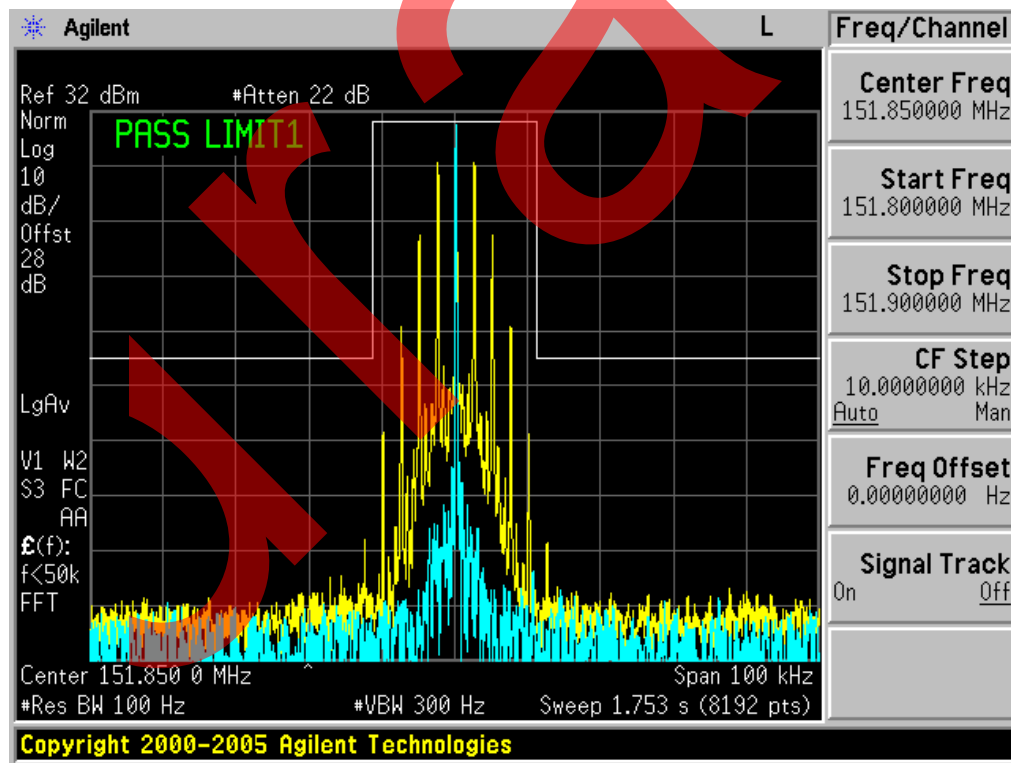
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (1W)



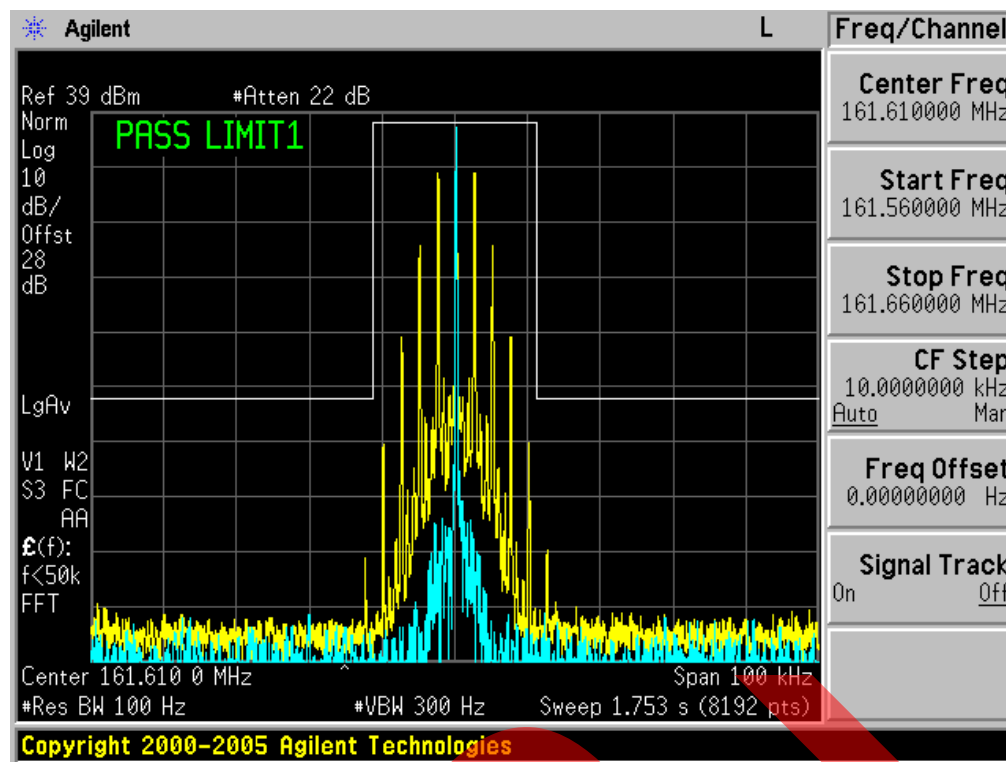
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (5W)



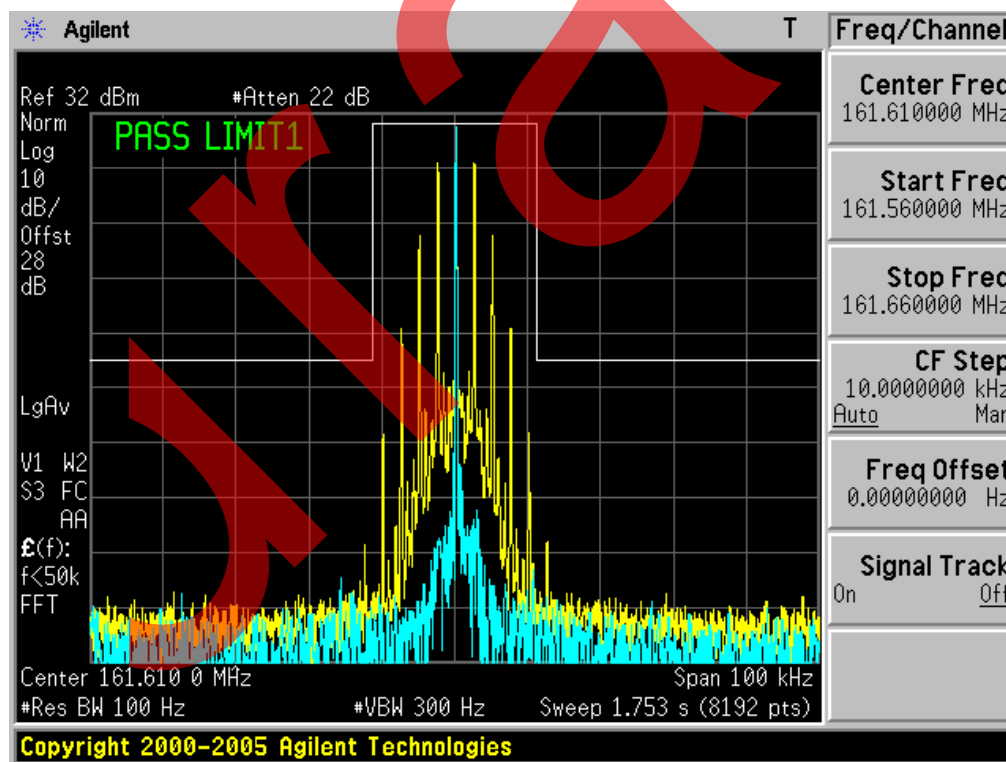
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (1W)



The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (5W)

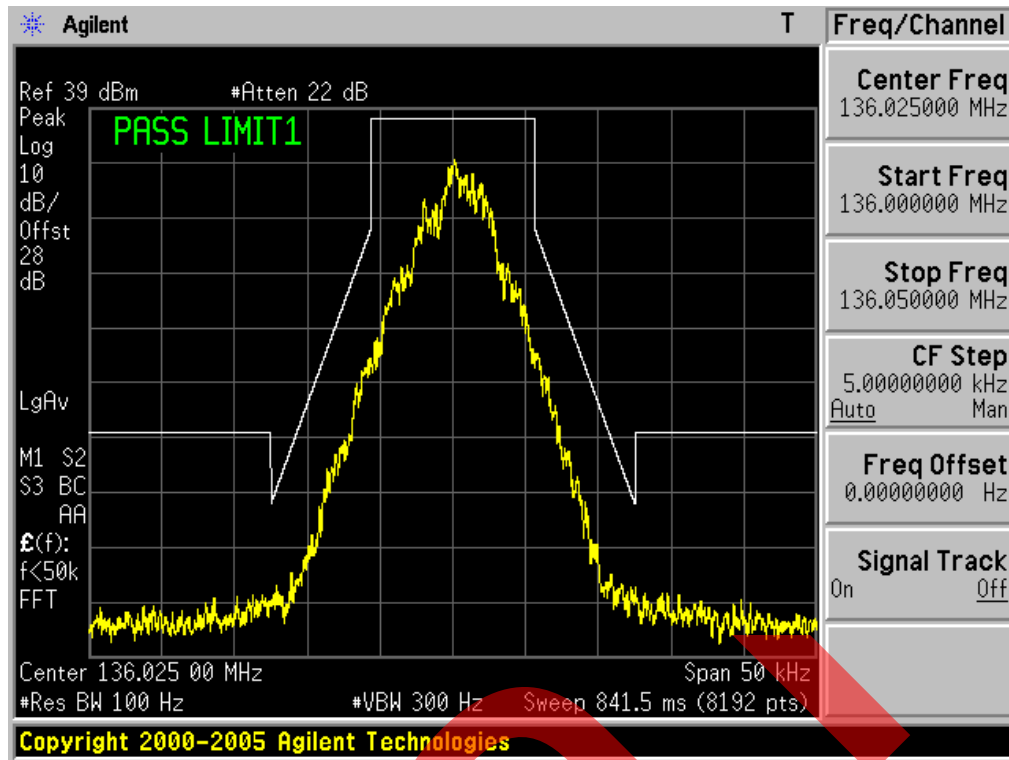


The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (1W)

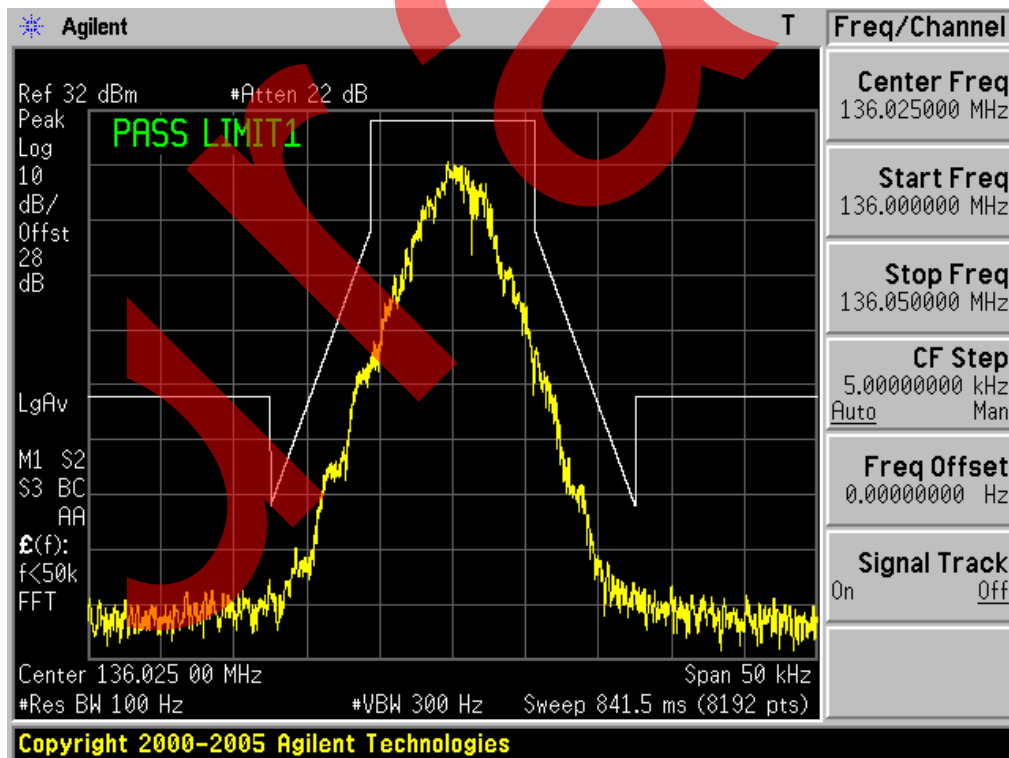


Digital:

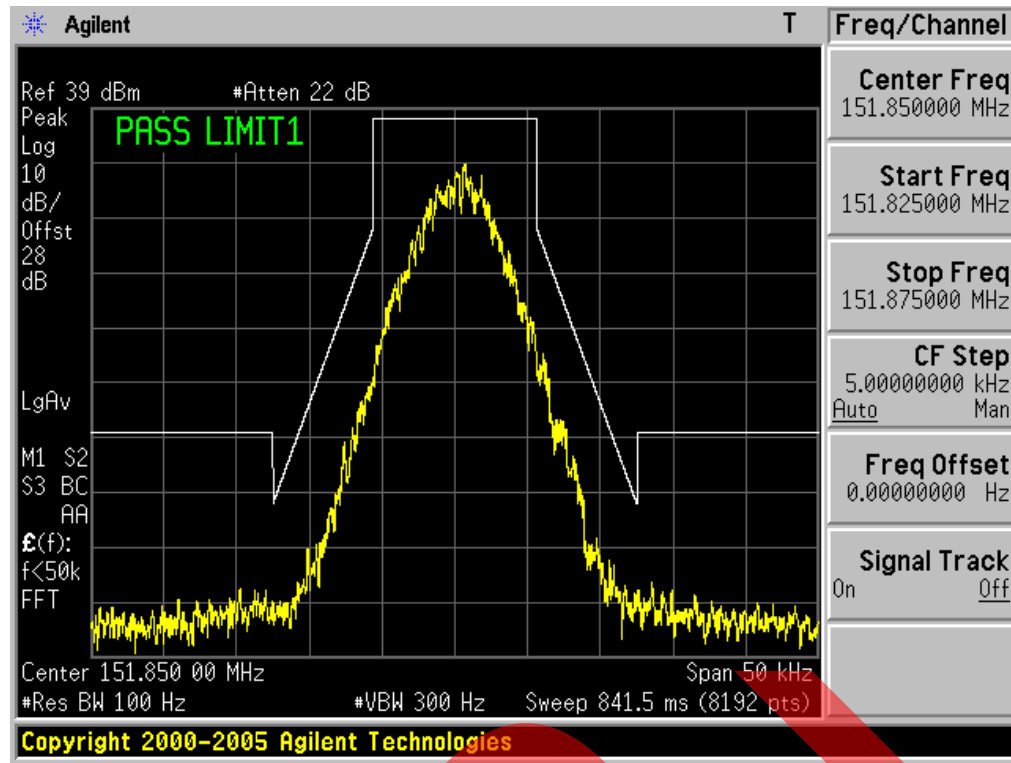
The Worst Emission Mask D for (136.025MHz) of 12.5 KHz channel Separation (5W)



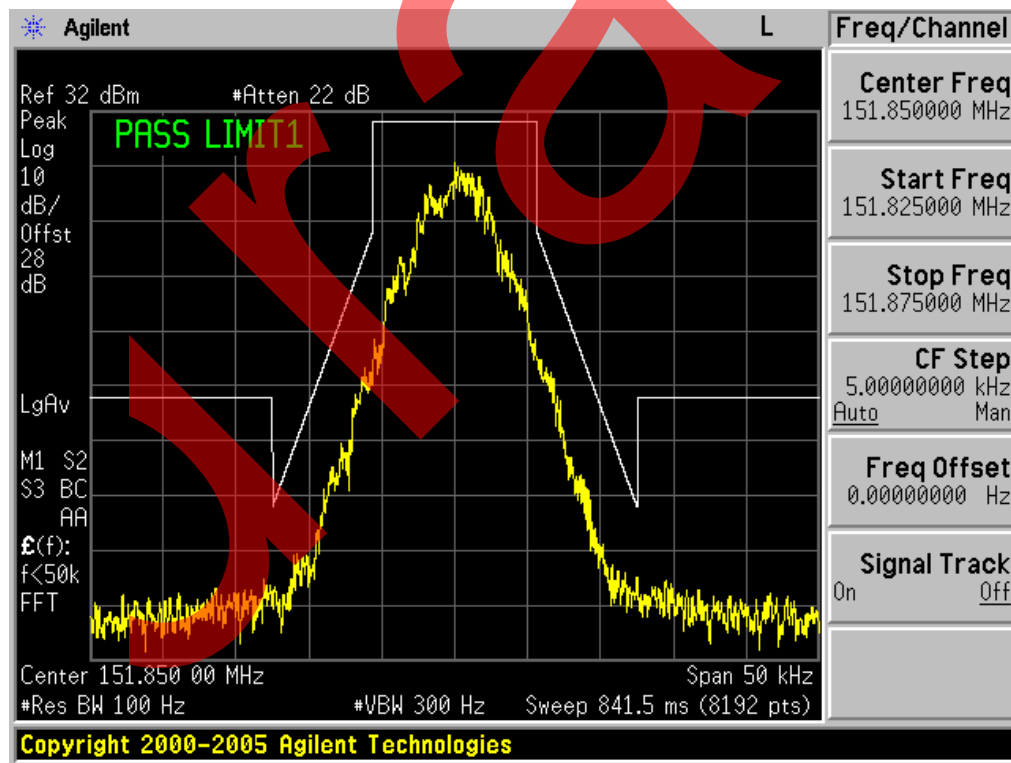
The Worst Emission Mask D for (136.025MHz) of 12.5 KHz channel Separation (1W)



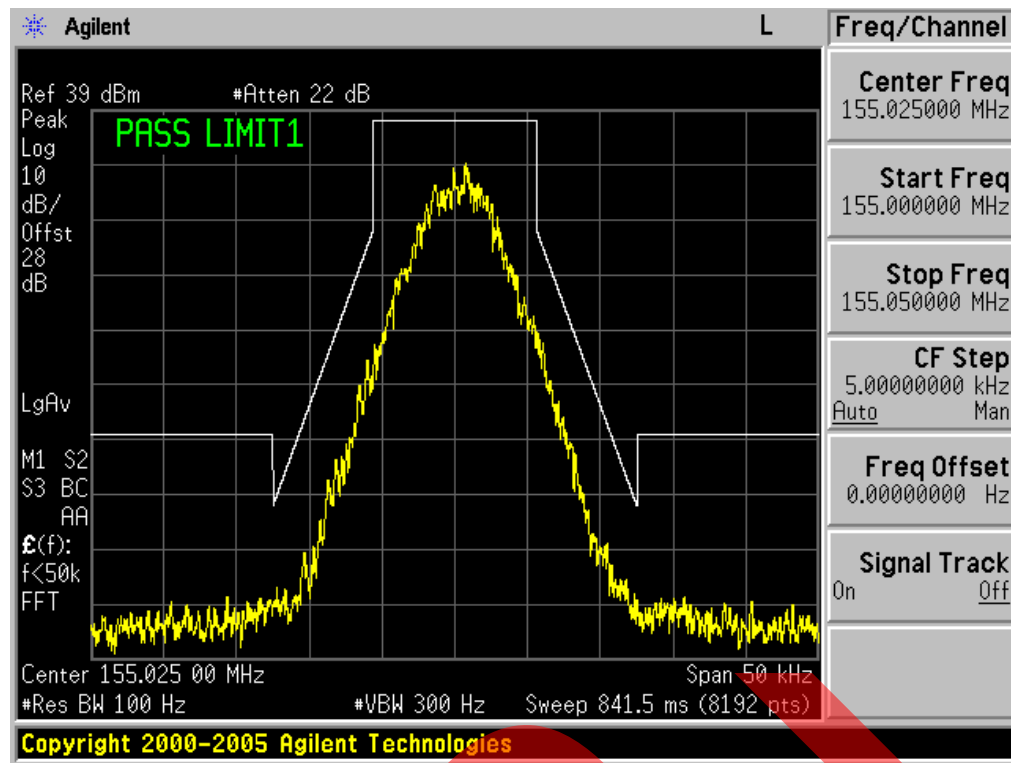
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (5W)



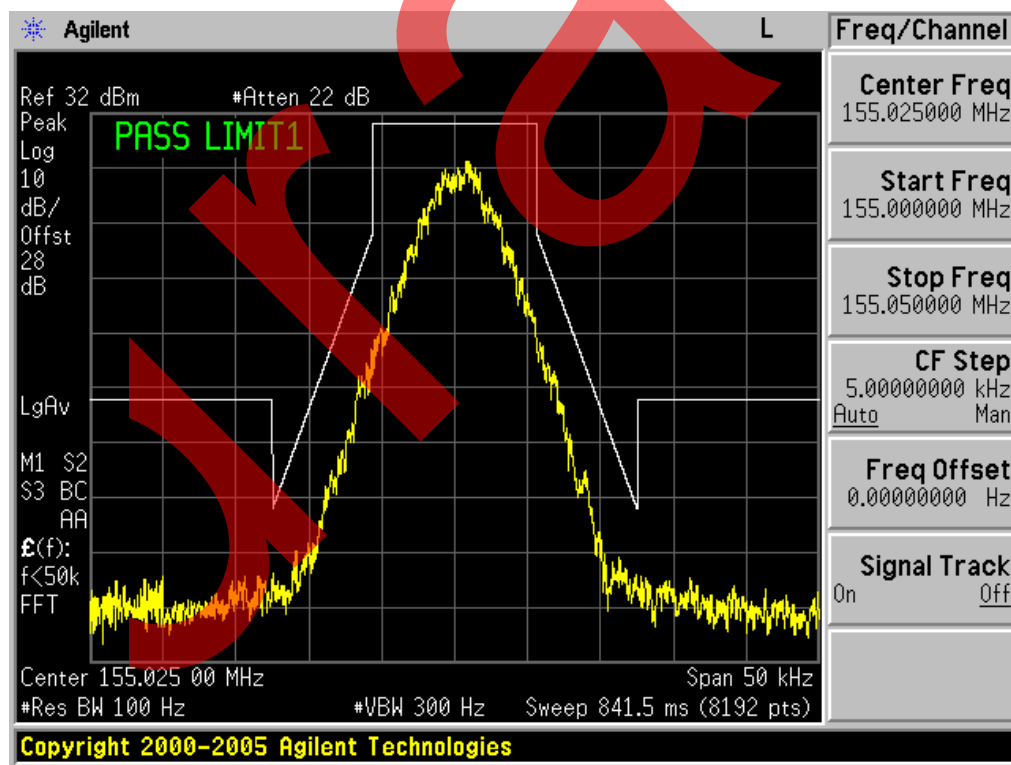
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (1W)



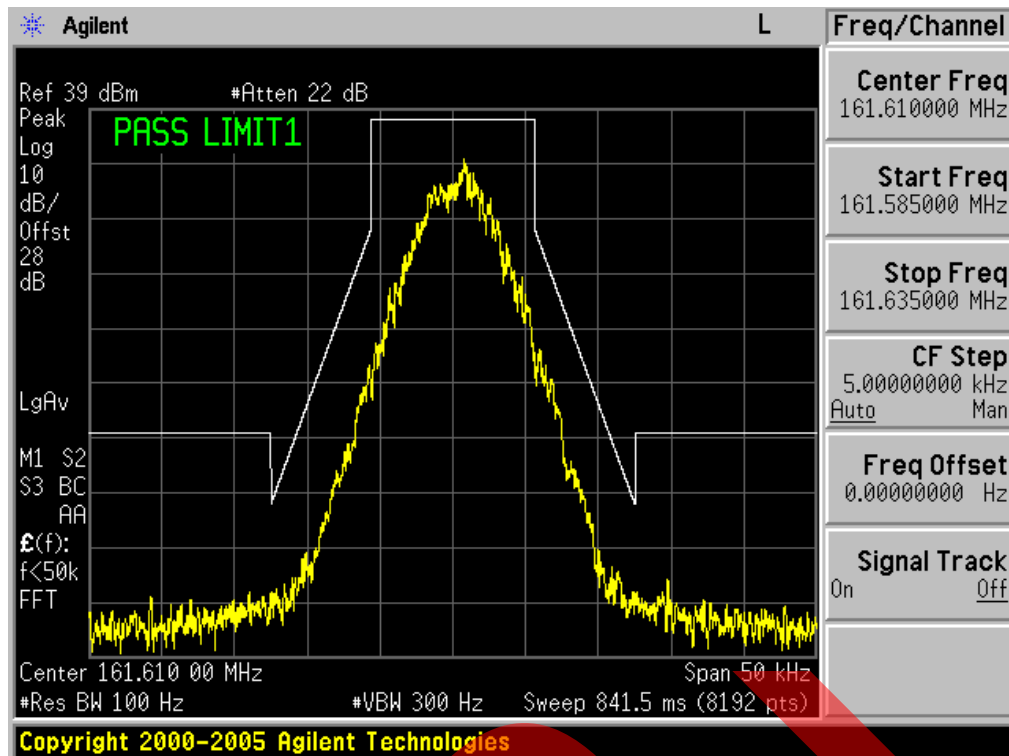
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (5W)



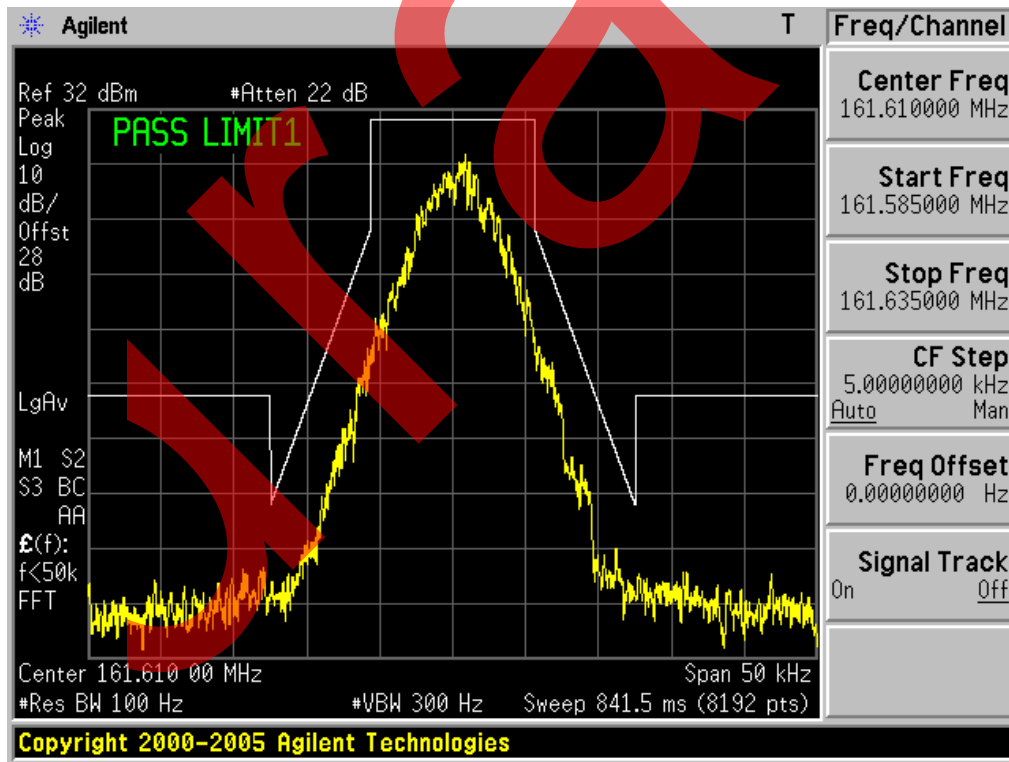
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (1W)



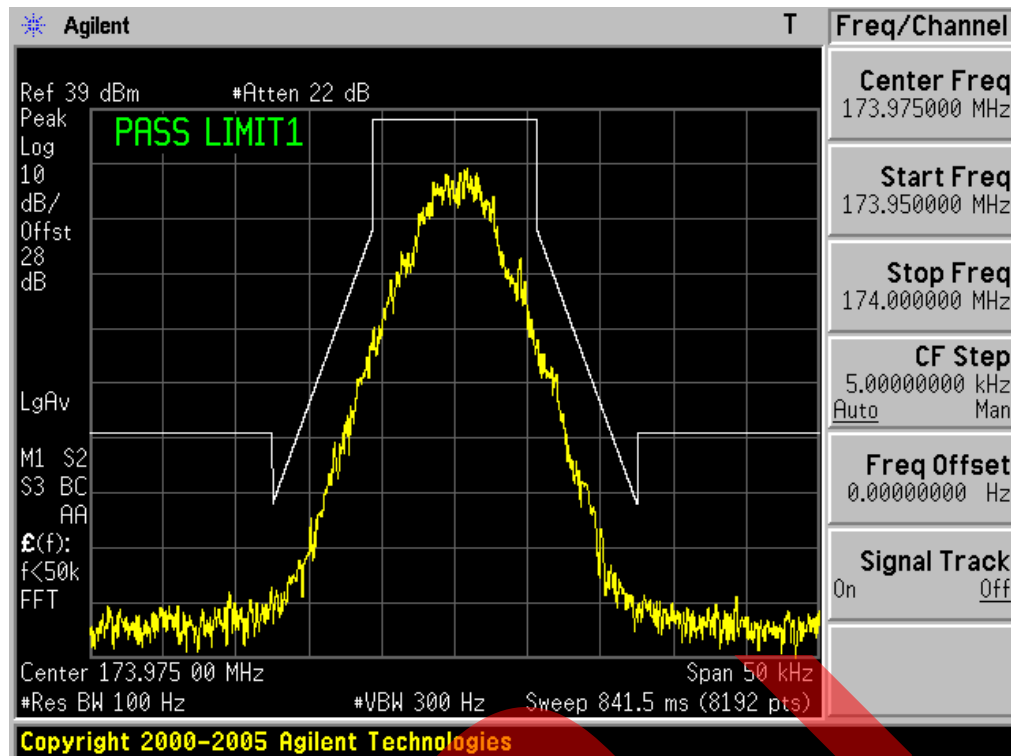
The Worst Emission Mask D for (161.61MHz) of 12.5 KHz channel Separation (5W)



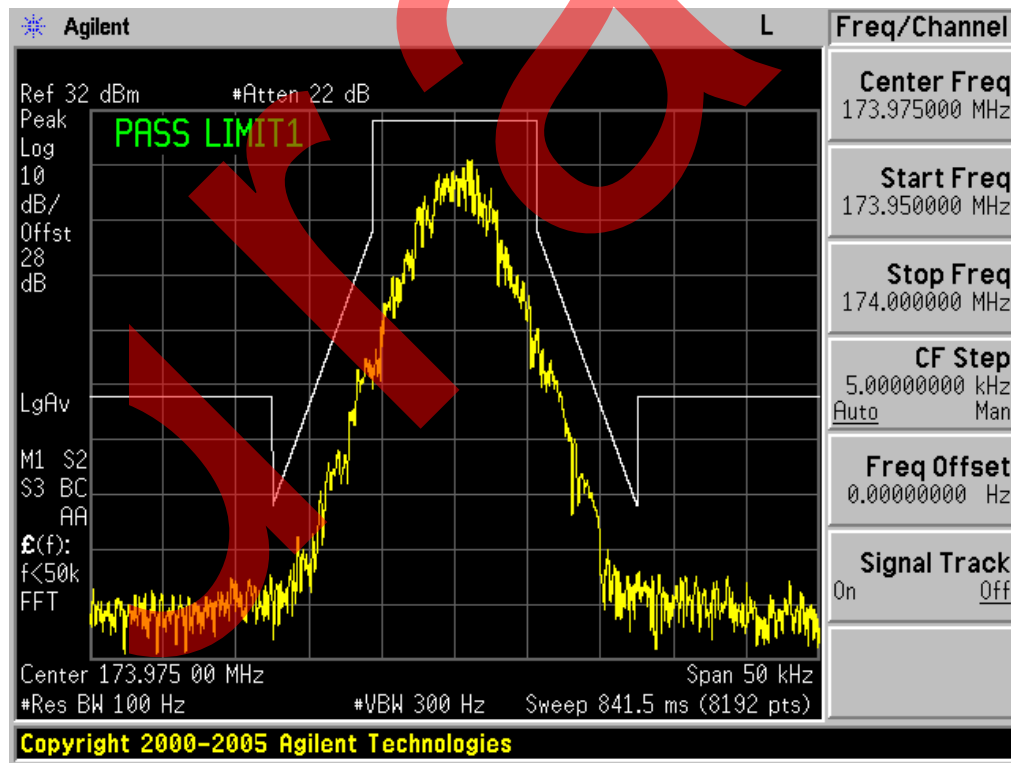
The Worst Emission Mask for (161.61MHz) of 12.5 KHz channel Separation (1W)



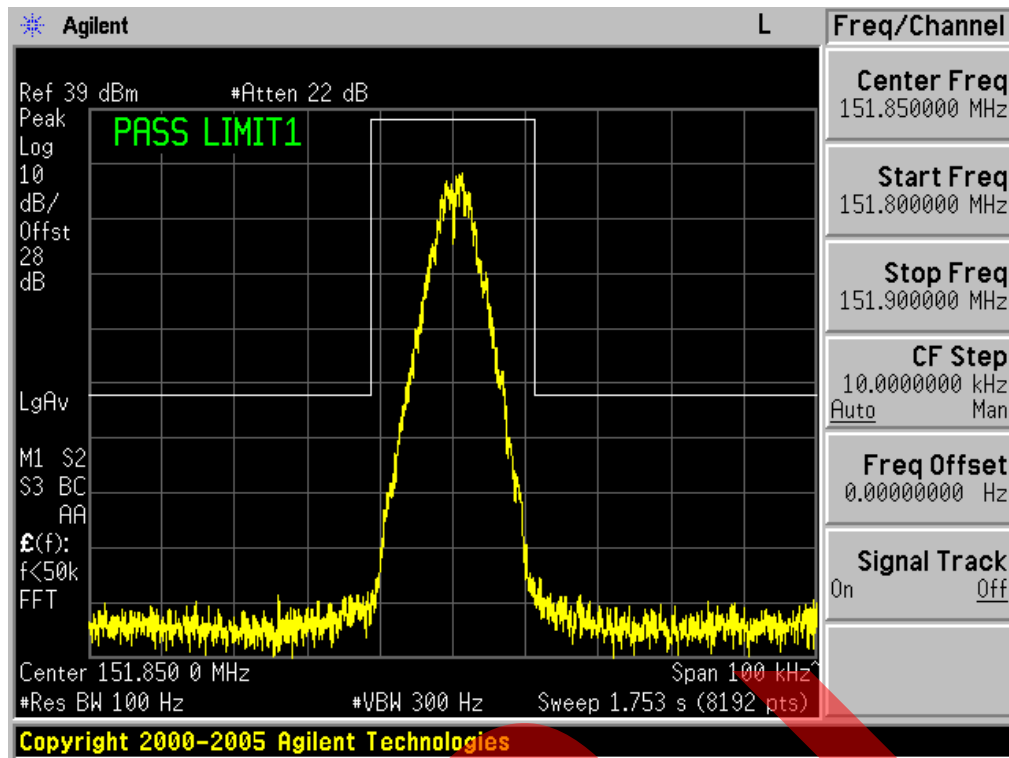
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (5W)



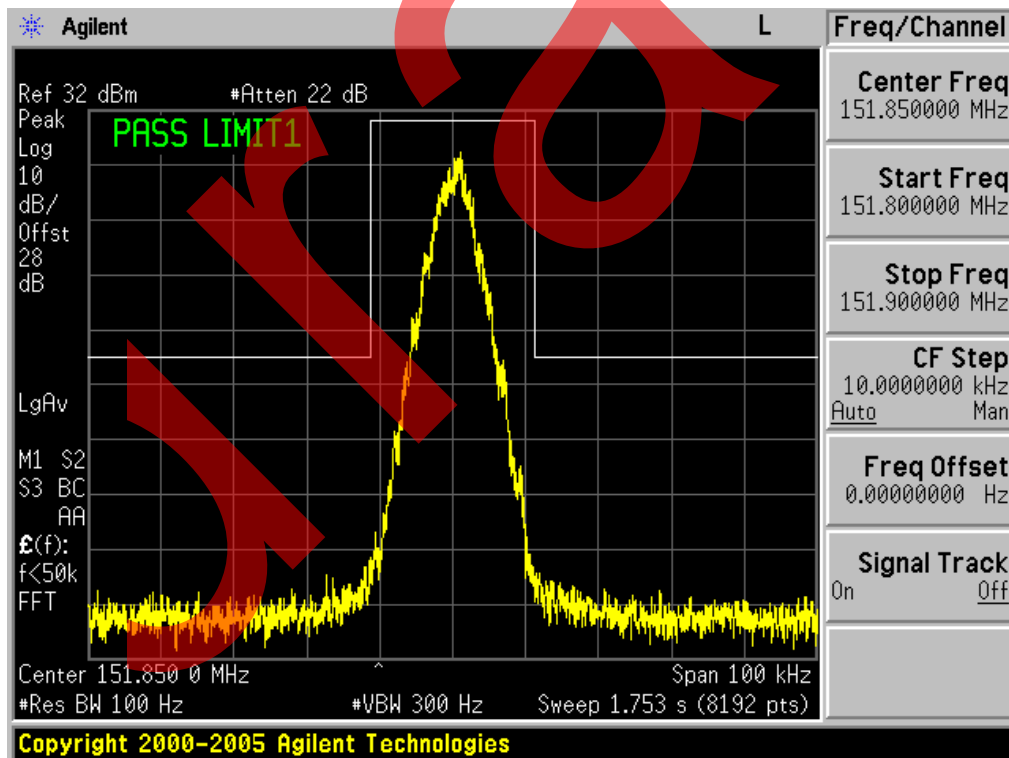
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (1W)



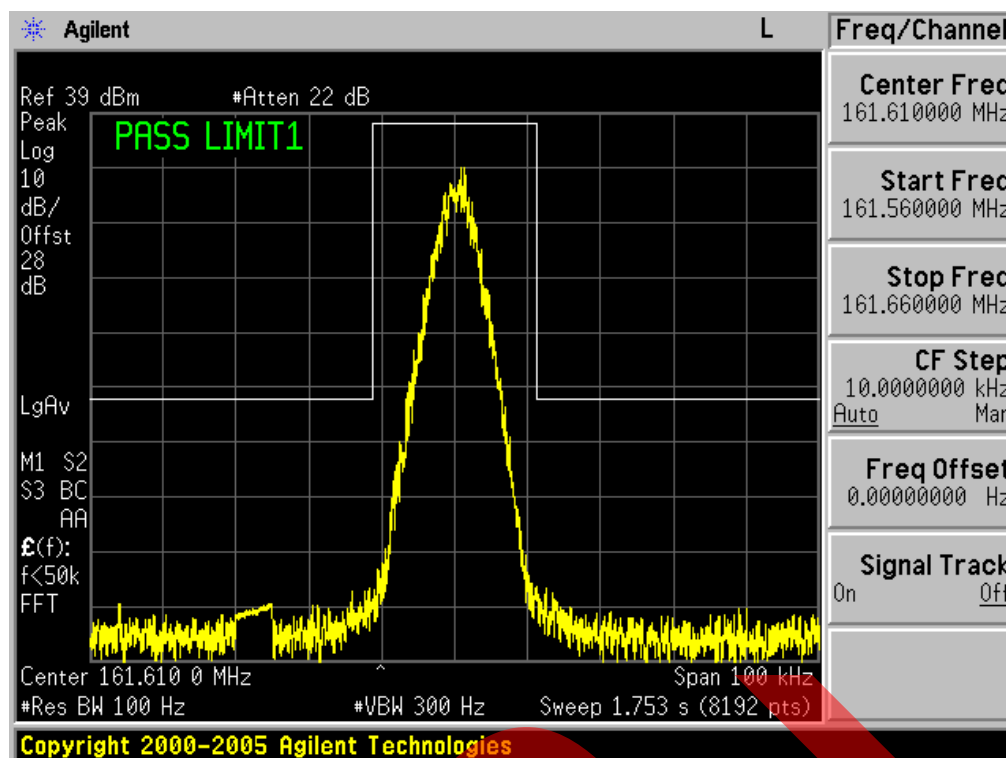
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (5W)



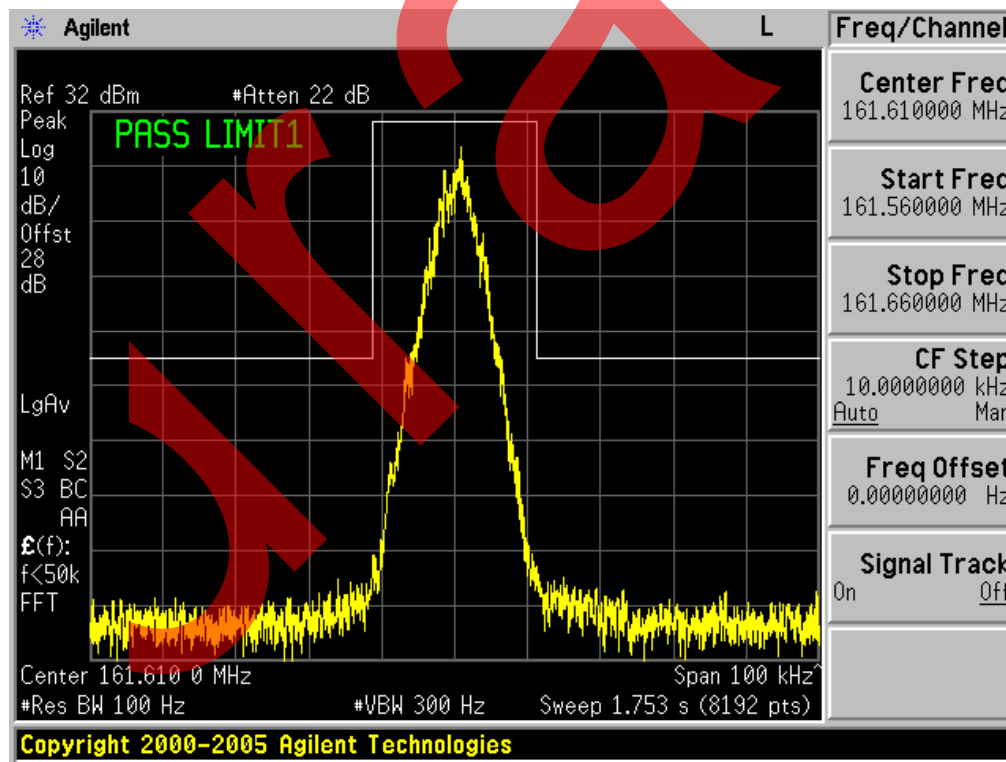
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (1W)



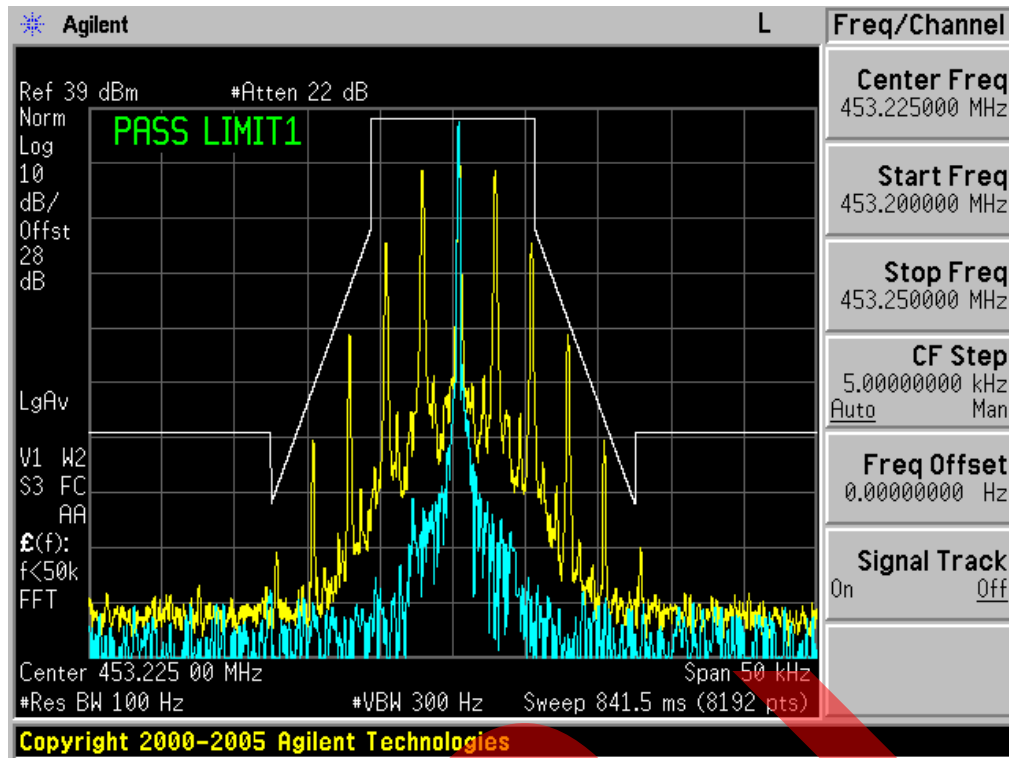
The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (5W)



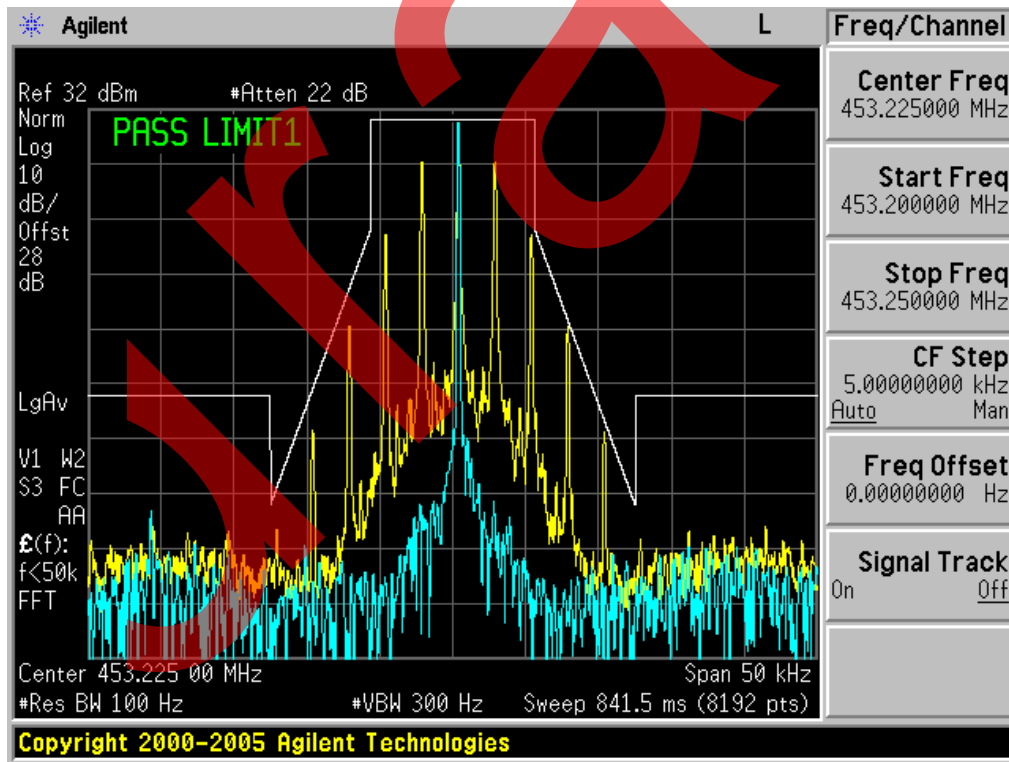
The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (1W)



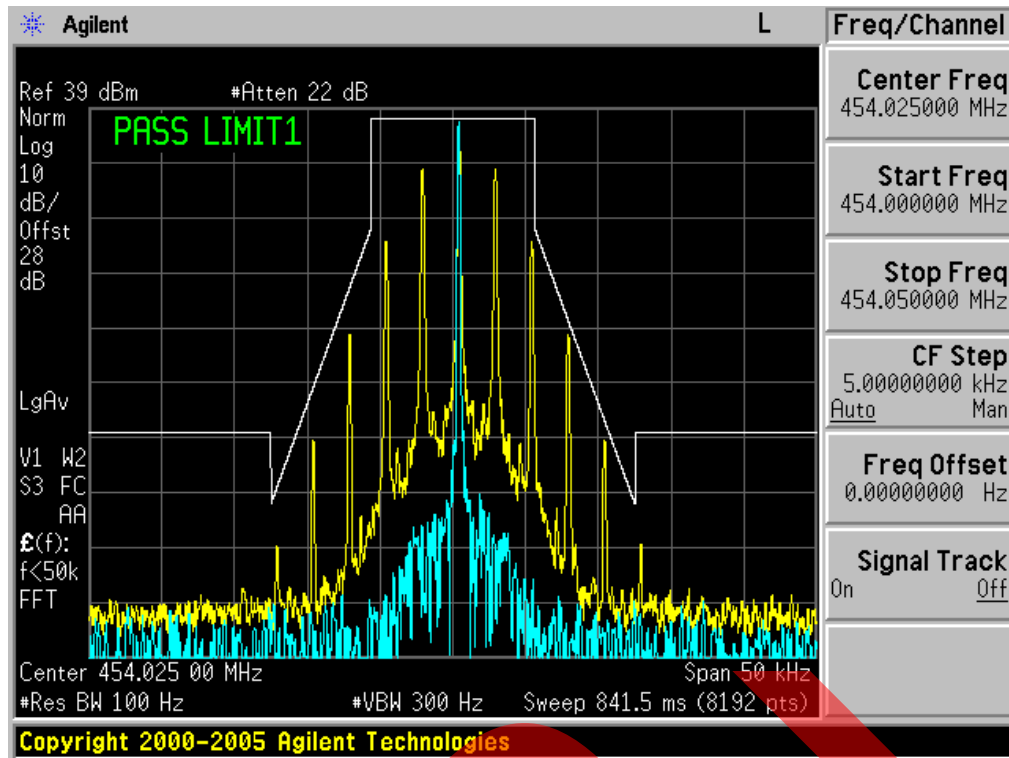
The Worst Emission Mask D for (453.225 MHz) of 12.5 KHz channel Separation (5W)



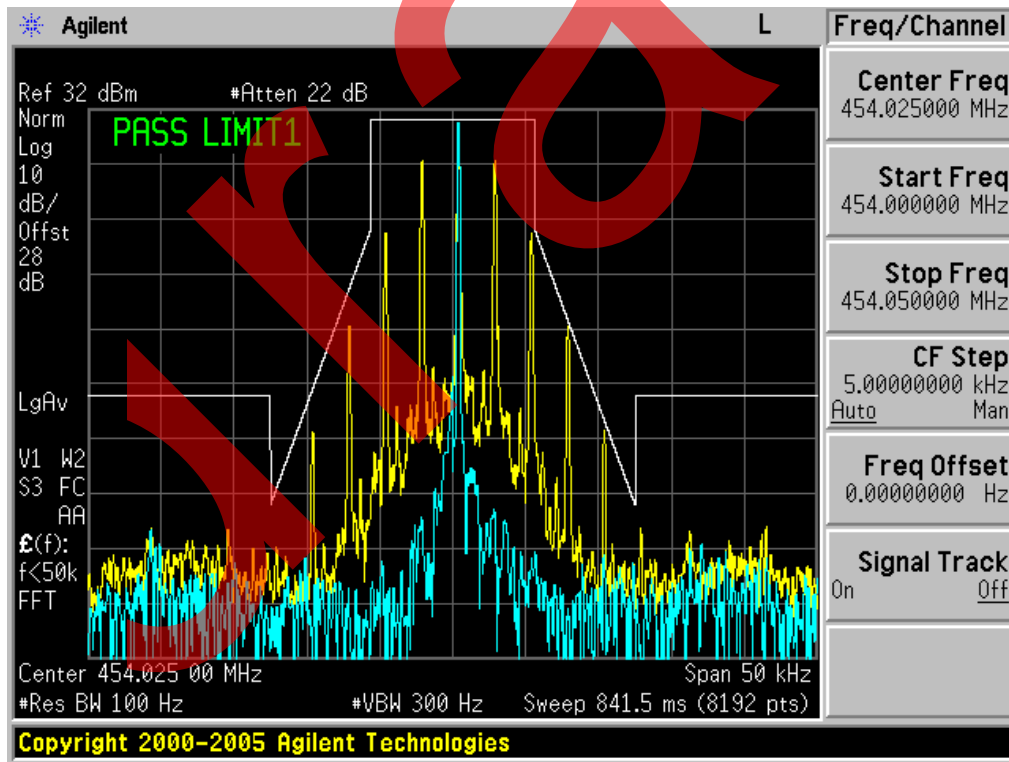
The Worst Emission Mask D for (453.225 MHz) of 12.5 KHz channel Separation (1W)



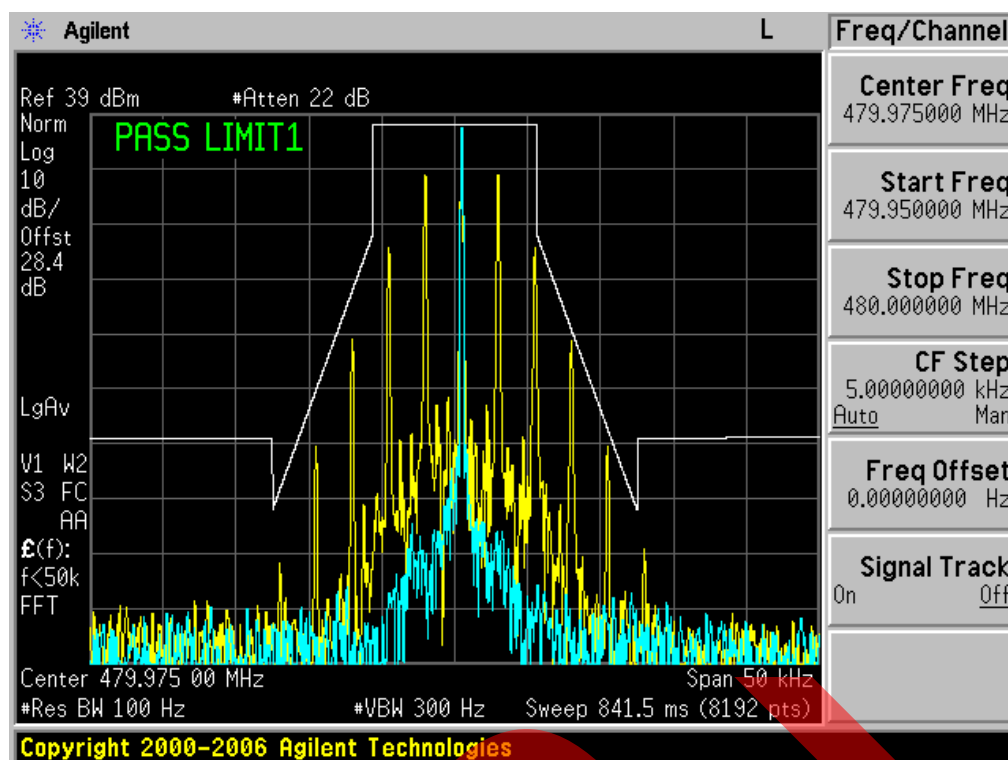
The Worst Emission Mask D for (454.025 MHz) of 12.5 KHz channel Separation (5W)



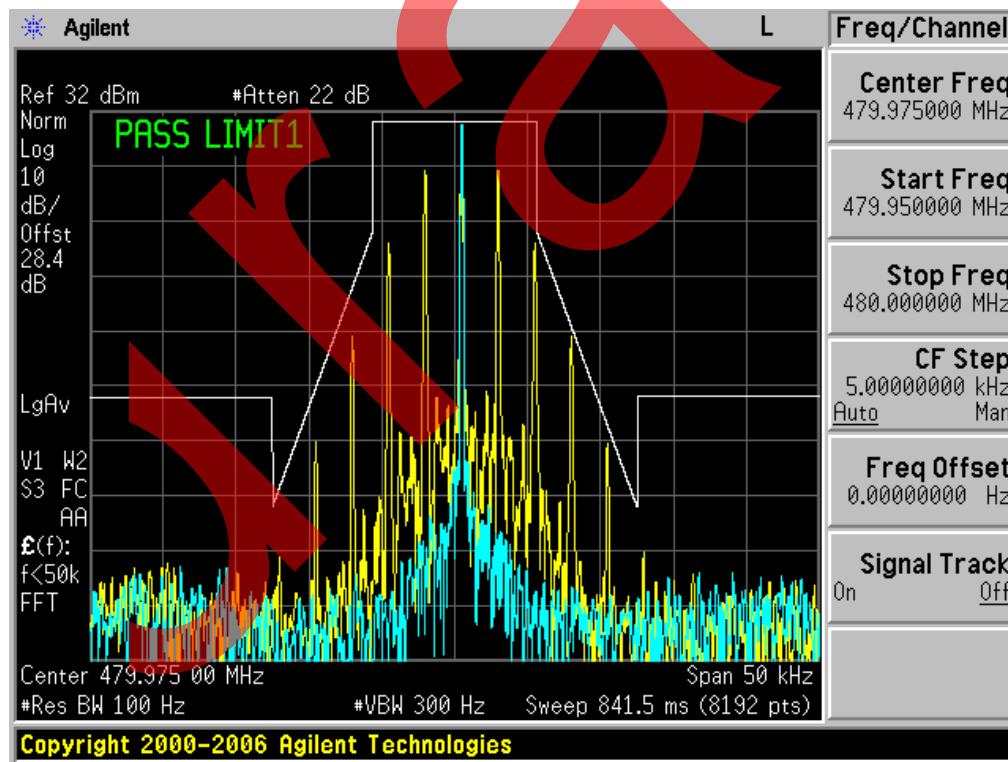
The Worst Emission Mask D for (454.025 MHz) of 12.5 KHz channel Separation (1W)



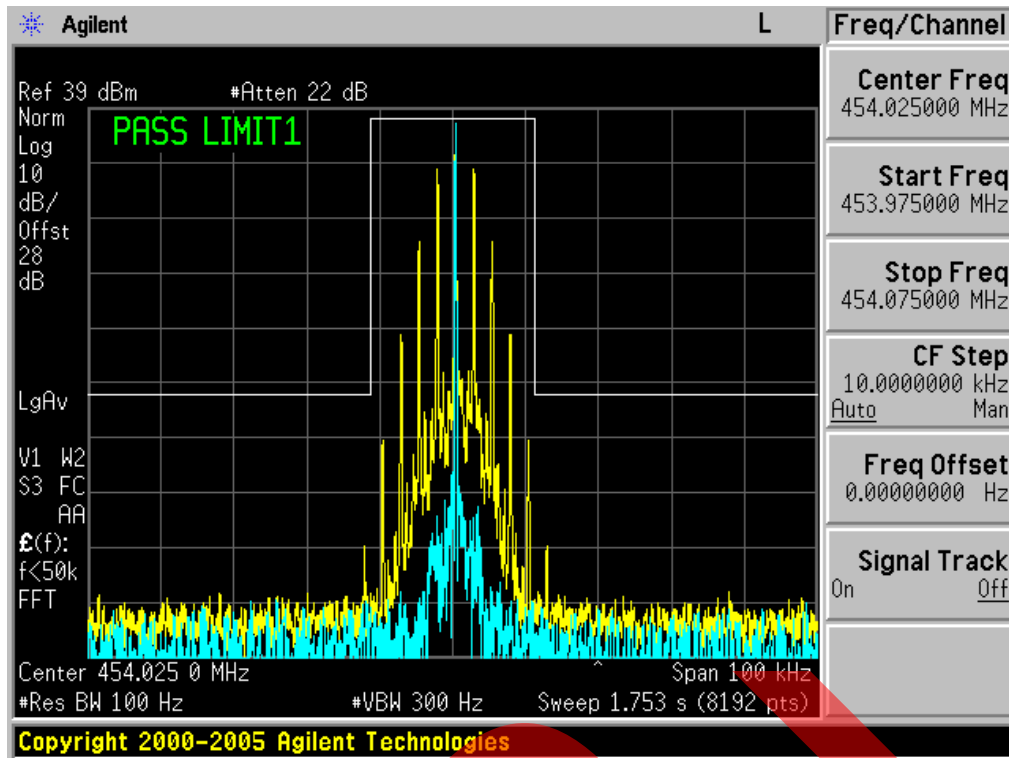
The Worst Emission Mask D for (479.975 MHz) of 12.5 KHz channel Separation (5W)



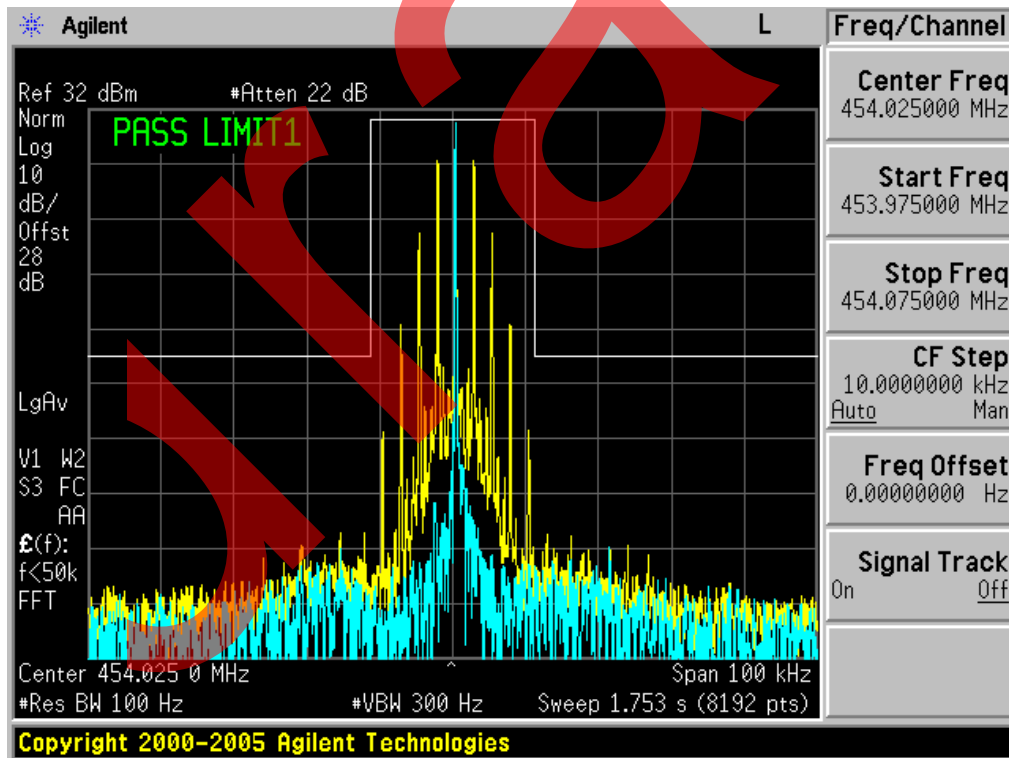
The Worst Emission Mask D for (479.975 MHz) of 12.5 KHz channel Separation (1W)



The Worst Emission Mask § 22.359 for (454.025 MHz) of 12.5 KHz channel Separation (5W)

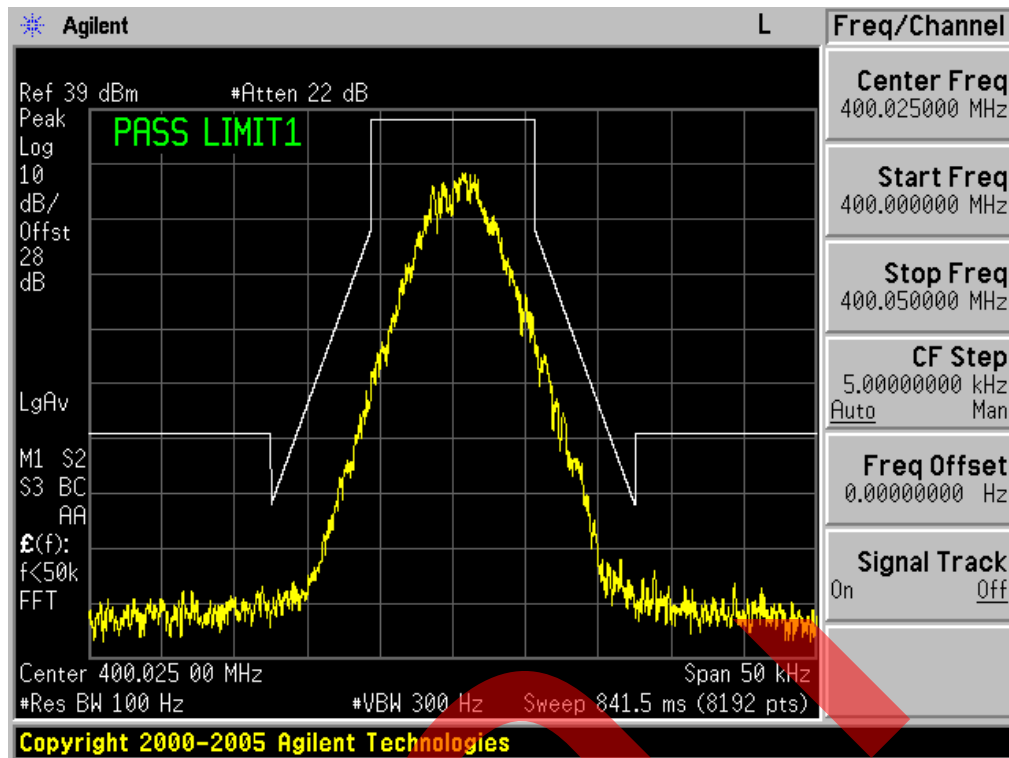


The Worst Emission Mask § 22.359 for (454.025 MHz) of 12.5 KHz channel Separation (1W)



Digital:

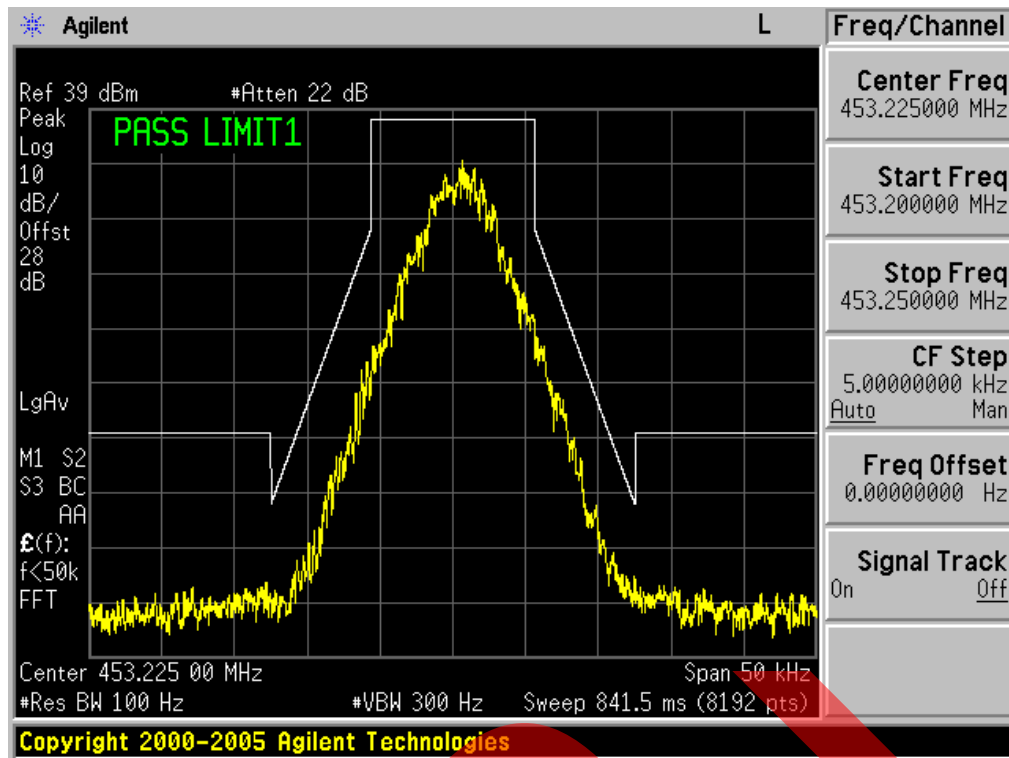
The Worst Emission Mask D for (400.025 MHz) of 12.5 KHz channel Separation (5W)



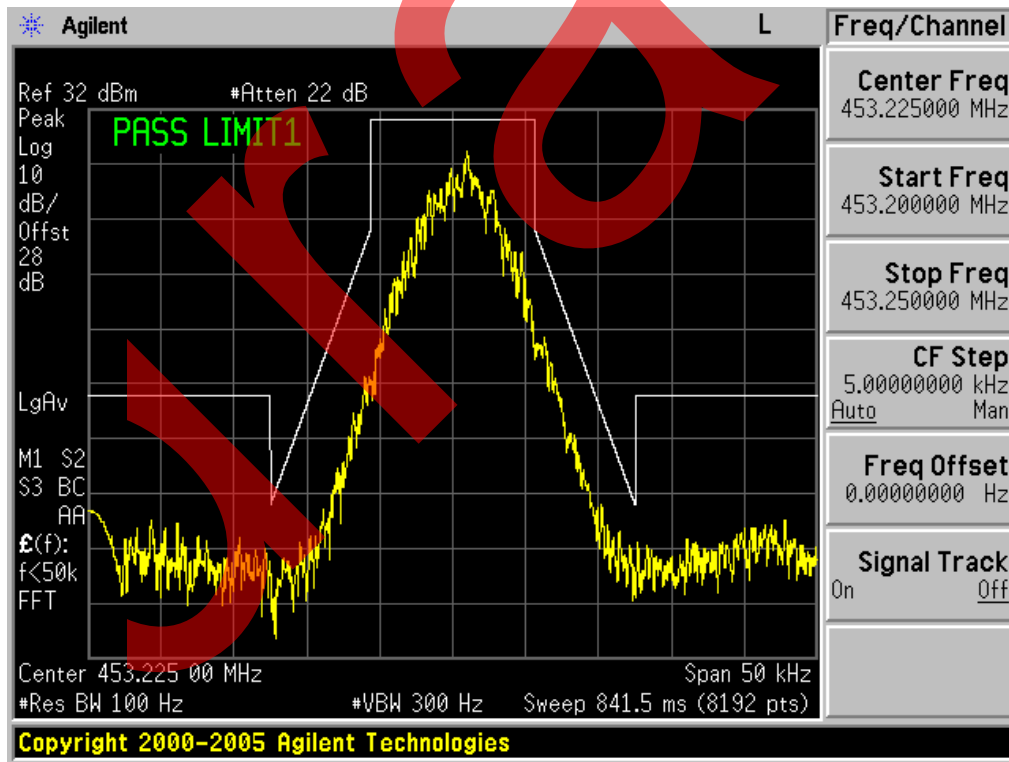
The Worst Emission Mask D for (400.025 MHz) of 12.5 KHz channel Separation (1W)



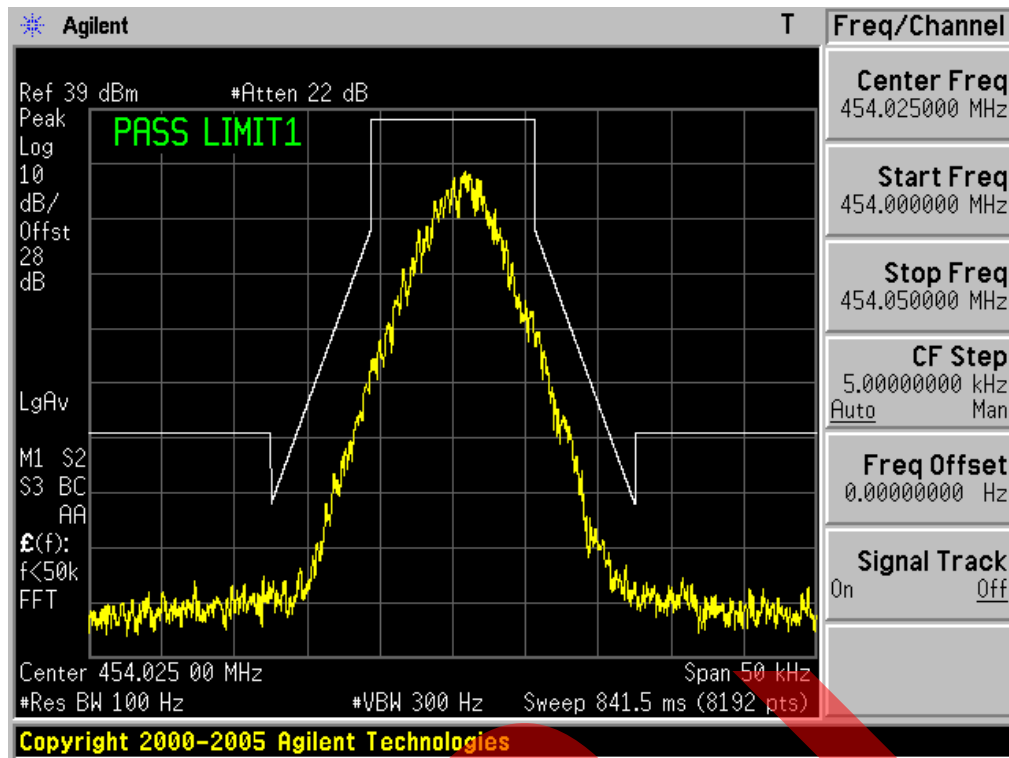
The Worst Emission Mask D for (453.225 MHz) of 12.5 KHz channel Separation (5W)



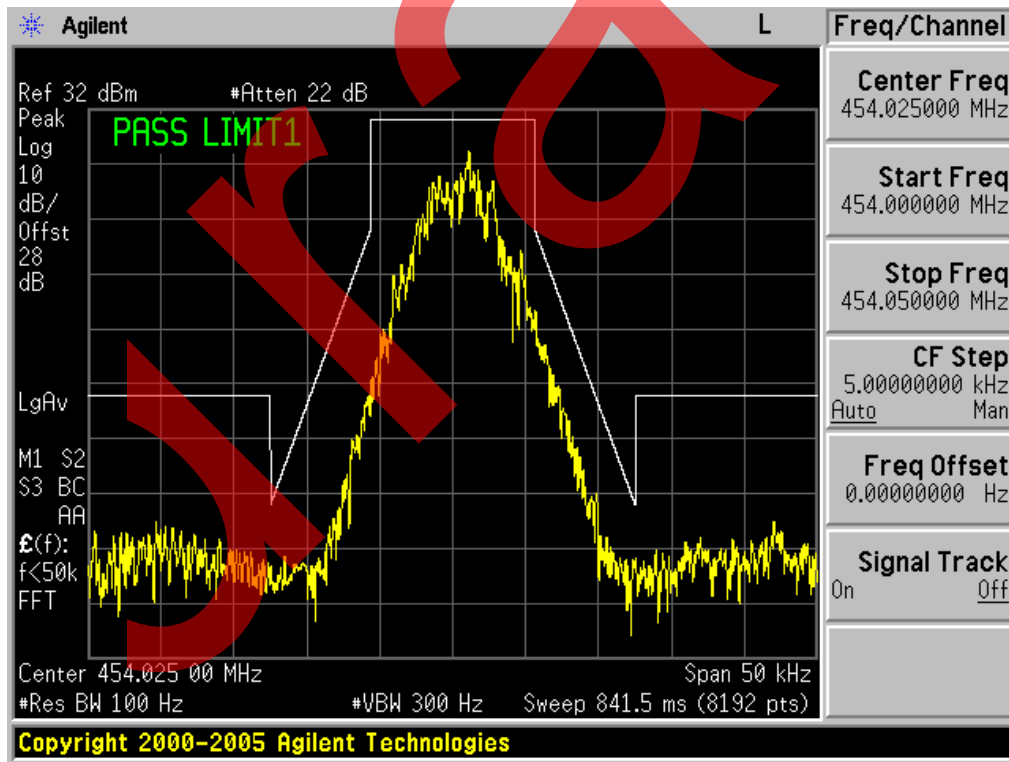
The Worst Emission Mask D for (453.225 MHz) of 12.5 KHz channel Separation (1W)



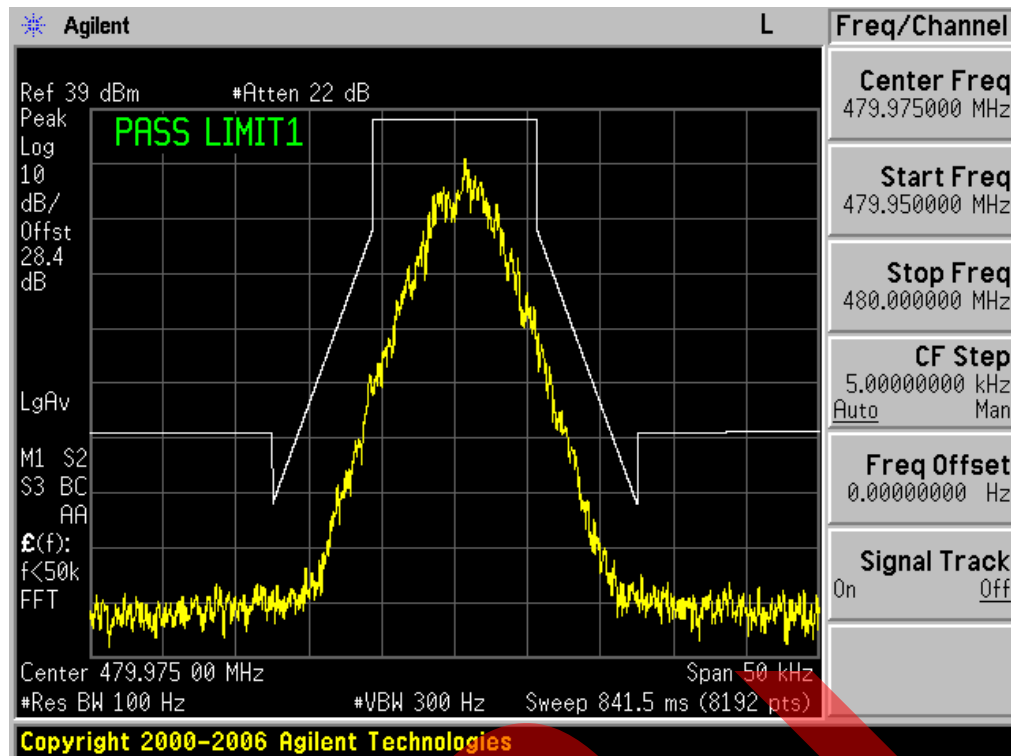
The Worst Emission Mask D for (454.025 MHz) of 12.5 KHz channel Separation (5W)



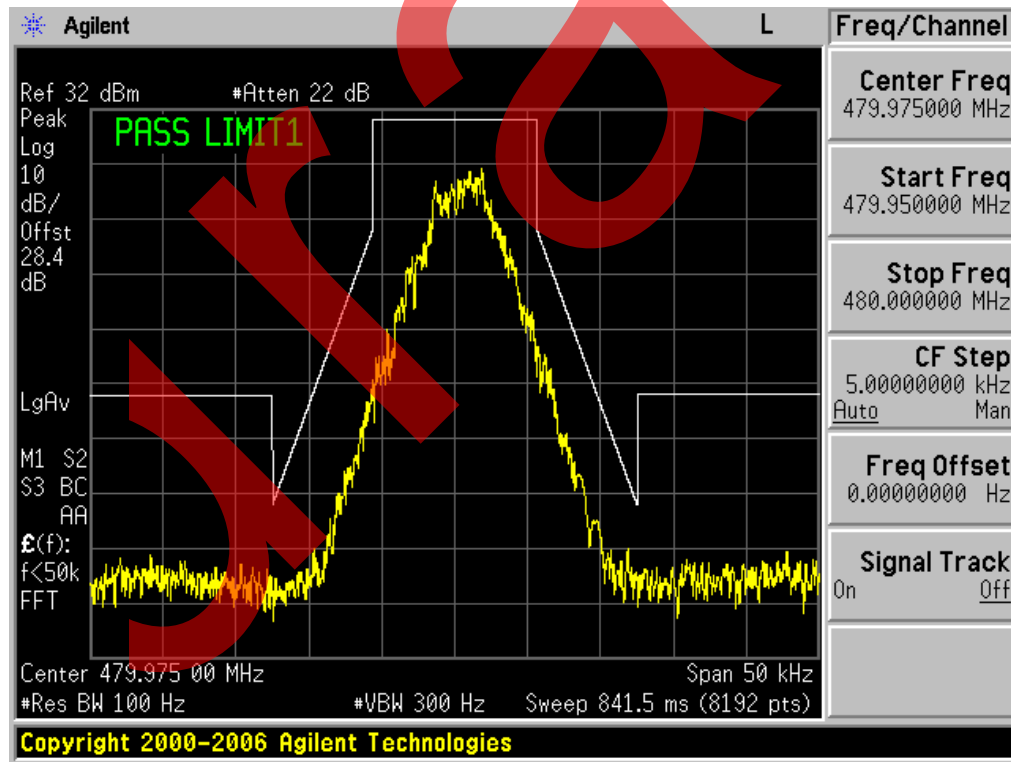
The Worst Emission Mask D for (454.025 MHz) of 12.5 KHz channel Separation (1W)



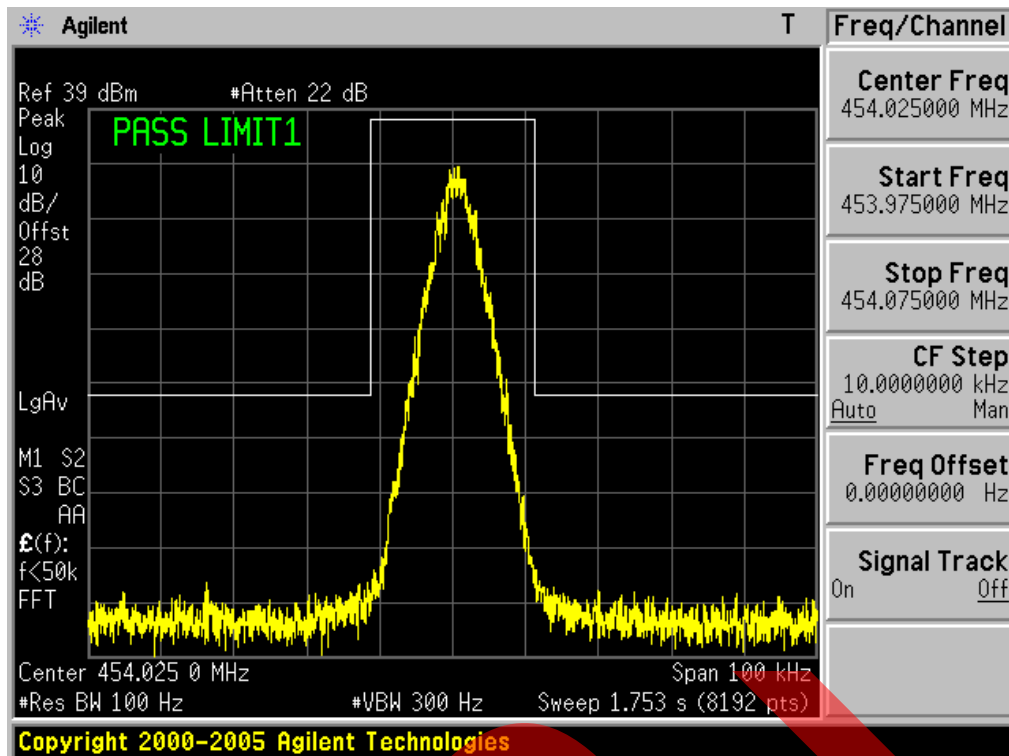
The Worst Emission Mask D for (479.975 MHz) of 12.5 KHz channel Separation (5W)



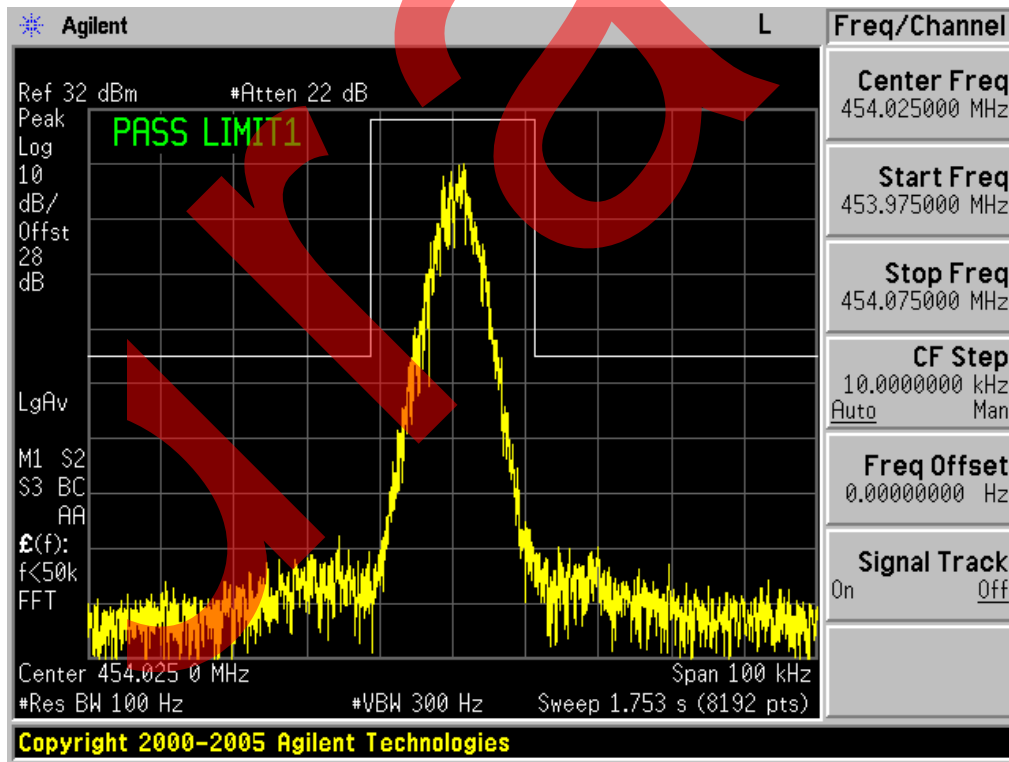
The Worst Emission Mask D for (479.975 MHz) of 12.5 KHz channel Separation (1W)



The Worst Emission Mask § 22.359 for (454.025 MHz) of 12.5 KHz channel Separation (5W)



The Worst Emission Mask § 22.359 for (454.025 MHz) of 12.5 KHz channel Separation (1W)



9. MODULATION CHARACTERISTICS

9.1 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.

9.2 MEASUREMENT METHOD

9.2.1 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.

9.2.2 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 = $20\log_{10} (\text{Deviation of test frequency} / \text{Deviation of 1 KHz reference})$.



9.3 MEASUREMENT RESULT

VHF:

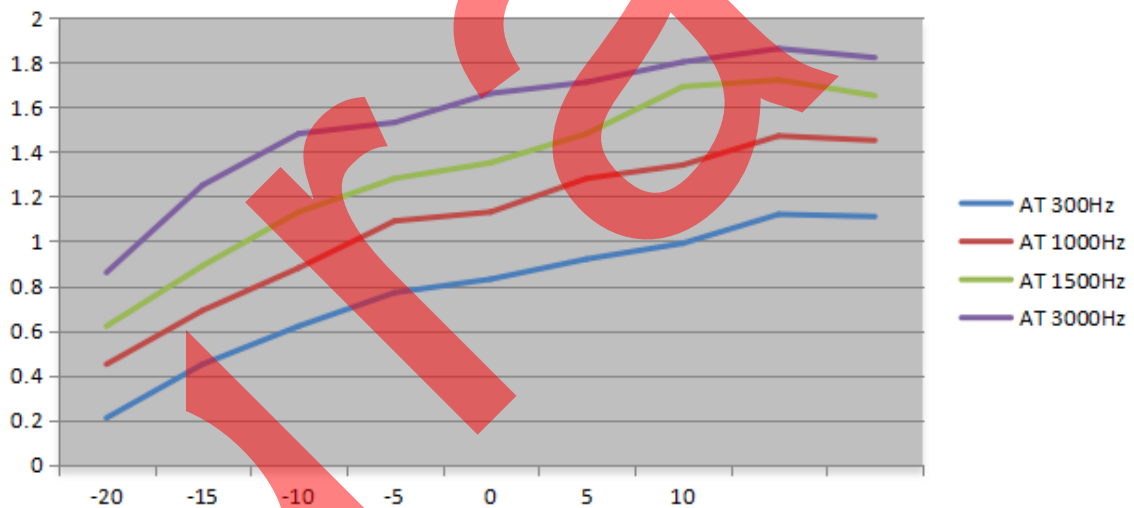
Analog:

TEST RESULTS FOR H POWER

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations-5W

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	0.21	0.45	0.62	0.86
-15	0.45	0.69	0.89	1.25
-10	0.62	0.88	1.13	1.48
-5	0.77	1.09	1.28	1.53
0	0.83	1.13	1.35	1.66
+5	0.92	1.28	1.48	1.71
+10	0.99	1.34	1.69	1.80
+15	1.12	1.47	1.72	1.86
+20	1.11	1.45	1.65	1.82



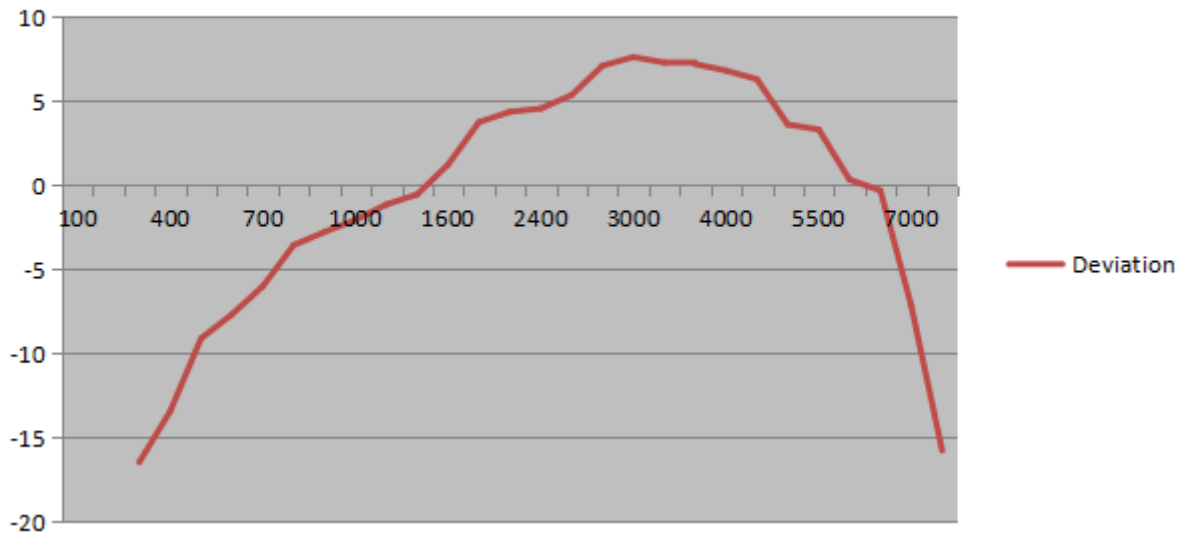
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations-5W

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.12	-16.48
400	0.17	-13.45
500	0.28	-9.12
600	0.33	-7.69
700	0.40	-6.02
800	0.53	-3.58
900	0.58	-2.79
1000	0.63	-2.07
1200	0.70	-1.16
1400	0.75	-0.56
1600	0.92	1.21
1800	1.23	3.74
2000	1.32	4.35
2400	1.35	4.54
2500	1.48	5.34
2800	1.81	7.09
3000	1.92	7.60
3200	1.85	7.28
3600	1.83	7.19
4000	1.75	6.80
4500	1.65	6.29
5000	1.21	3.59
5500	1.17	3.30
6000	0.83	0.32
6500	0.77	-0.33
7000	0.35	-7.18
7500	0.13	-15.78
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel
12.5 KHz Channel Separations



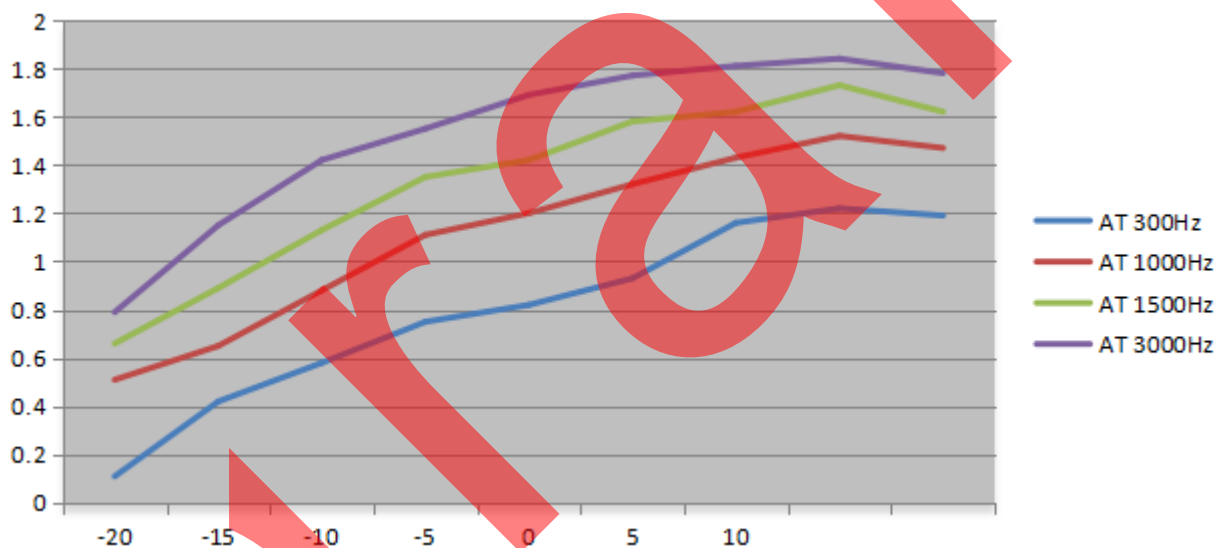
Note: All the modes had been tested, but only the worst data recorded in the report.

Digital:

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations-5W

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	0.11	0.51	0.66	0.79
-15	0.42	0.65	0.89	1.15
-10	0.58	0.88	1.13	1.42
-5	0.75	1.11	1.35	1.55
0	0.82	1.20	1.42	1.69
+5	0.93	1.32	1.58	1.77
+10	1.16	1.43	1.62	1.81
+15	1.22	1.52	1.73	1.84
+20	1.19	1.47	1.62	1.78



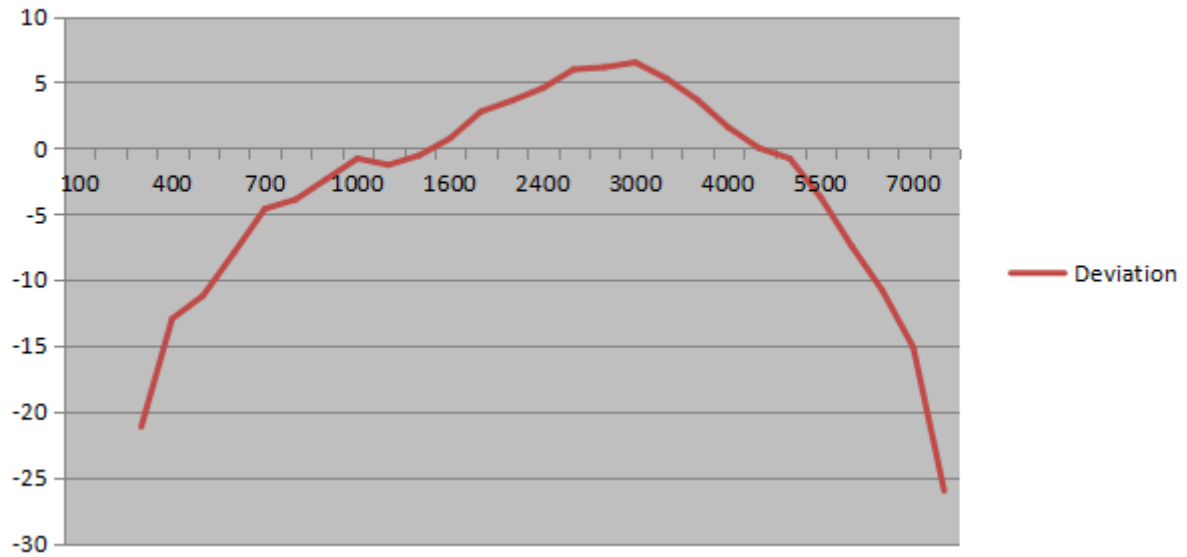
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations-5W

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.07	-21.16
400	0.18	-12.96
500	0.22	-11.21
600	0.32	-7.96
700	0.47	-4.62
800	0.51	-3.91
900	0.61	-2.36
1000	0.73	-0.80
1200	0.69	-1.28
1400	0.75	-0.56
1600	0.87	0.73
1800	1.10	2.77
2000	1.21	3.59
2400	1.35	4.54
2500	1.59	5.97
2800	1.62	6.13
3000	1.69	6.50
3200	1.47	5.28
3600	1.22	3.67
4000	0.96	1.58
4500	0.80	0.00
5000	0.73	-0.80
5500	0.52	-3.74
6000	0.34	-7.43
6500	0.23	-10.83
7000	0.14	-15.14
7500	0.04	-26.02
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel
12.5 KHz Channel Separations



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

UHF:

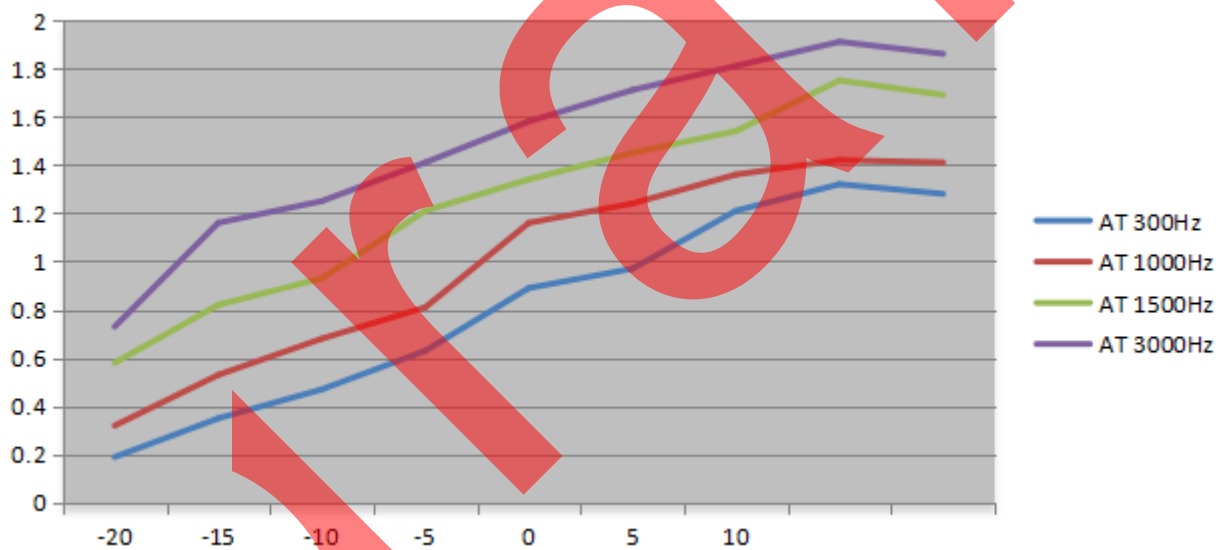
Analog:

TEST RESULT TS FOR H POWER H LEVEL

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations-5W

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	0.19	0.32	0.58	0.73
-15	0.35	0.53	0.82	1.16
-10	0.47	0.68	0.93	1.25
-5	0.63	0.81	1.21	1.41
0	0.89	1.16	1.34	1.58
+5	0.97	1.24	1.45	1.71
+10	1.21	1.36	1.54	1.81
+15	1.32	1.42	1.75	1.91
+20	1.28	1.41	1.69	1.86

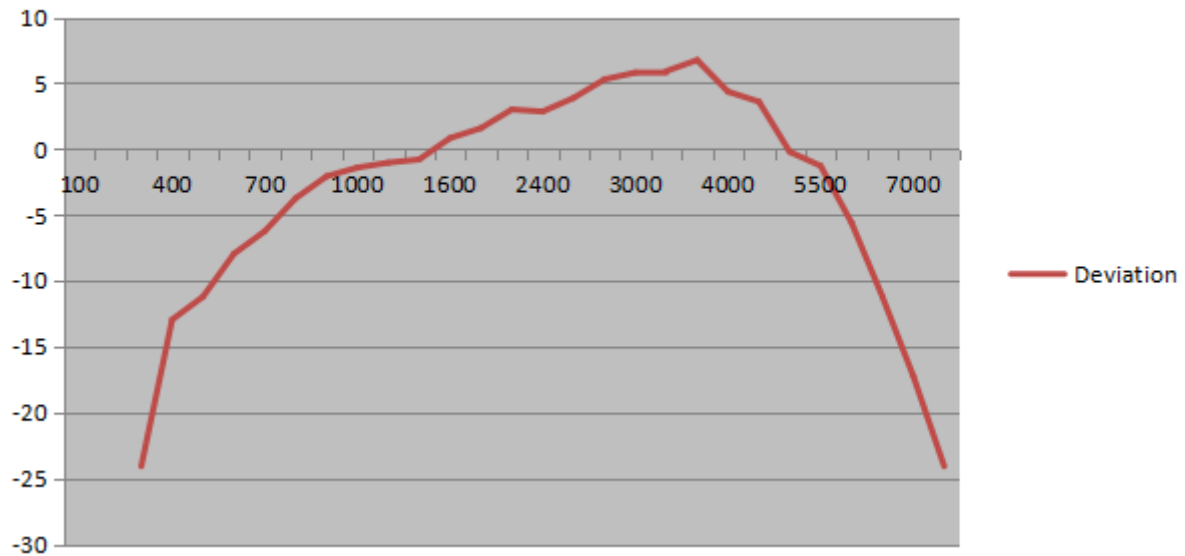


Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:
Middle Channel @ 12.5 KHz Channel Separations-5W

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.05	-24.08
400	0.18	-12.96
500	0.22	-11.21
600	0.32	-7.96
700	0.39	-6.24
800	0.52	-3.74
900	0.63	-2.07
1000	0.68	-1.41
1200	0.71	-1.04
1400	0.73	-0.80
1600	0.88	0.83
1800	0.96	1.58
2000	1.13	3.00
2400	1.11	2.84
2500	1.25	3.88
2800	1.47	5.28
3000	1.56	5.80
3200	1.58	5.91
3600	1.74	6.75
4000	1.32	4.35
4500	1.21	3.59
5000	0.78	-0.22
5500	0.69	-1.28
6000	0.42	-5.60
6500	0.22	-11.21
7000	0.11	-17.23
7500	0.05	-24.08
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of High Channel
12.5 KHz Channel Separations



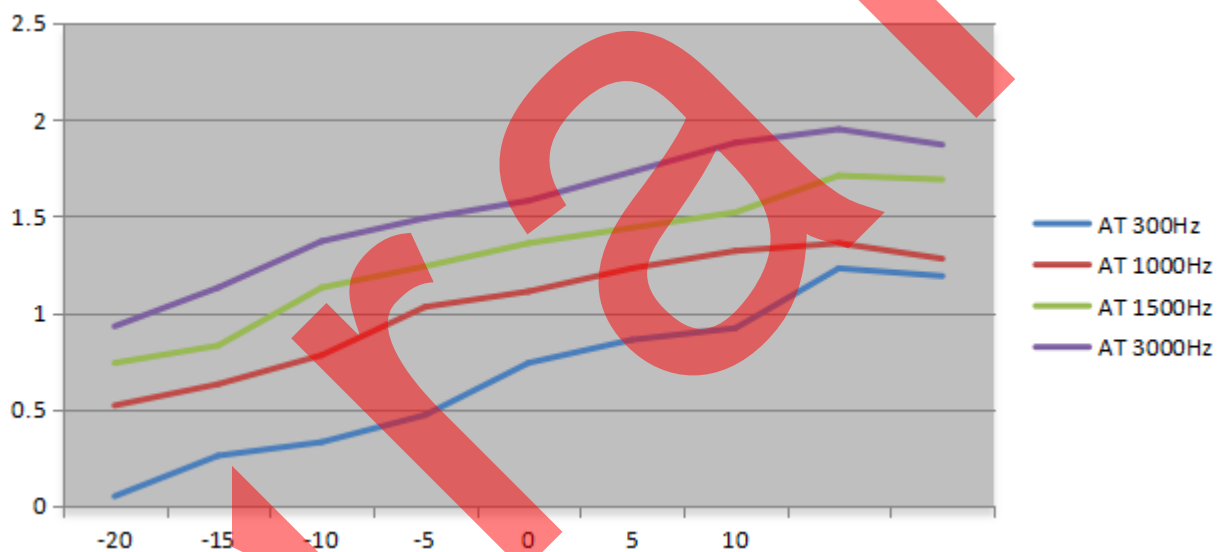
Note: All the modes had been tested, but only the worst data recorded in the report.

Digital:

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations-5W

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	0.05	0.52	0.74	0.93
-15	0.26	0.63	0.83	1.13
-10	0.33	0.78	1.13	1.37
-5	0.47	1.03	1.24	1.49
0	0.74	1.11	1.36	1.58
+5	0.86	1.23	1.44	1.73
+10	0.92	1.32	1.52	1.88
+15	1.23	1.36	1.71	1.95
+20	1.19	1.28	1.69	1.87

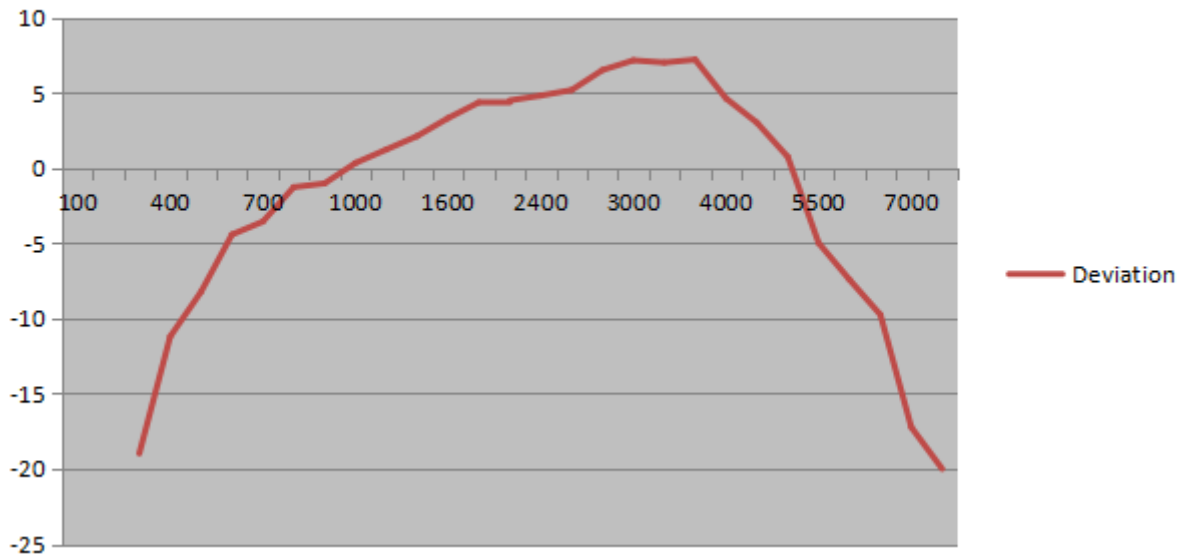


Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:
Middle Channel @ 12.5 KHz Channel Separations-5W

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.09	-18.98
400	0.22	-11.21
500	0.31	-8.23
600	0.48	-4.44
700	0.53	-3.58
800	0.69	-1.28
900	0.71	-1.04
1000	0.83	0.32
1200	0.92	1.21
1400	1.02	2.11
1600	1.17	3.30
1800	1.32	4.35
2000	1.34	4.48
2400	1.39	4.80
2500	1.45	5.17
2800	1.69	6.50
3000	1.82	7.14
3200	1.79	7.00
3600	1.83	7.19
4000	1.36	4.61
4500	1.13	3.00
5000	0.87	0.73
5500	0.45	-5.00
6000	0.34	-7.43
6500	0.26	-9.76
7000	0.11	-17.23
7500	0.08	-20.00
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel-5W
12.5 KHz Channel Separations



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

10. MAXIMUM TRANSMITTER POWER (CONDUCTED OUTPUT POWER) PEAK POWER

10.1 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.

10.2 TEST PROCEDURE

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

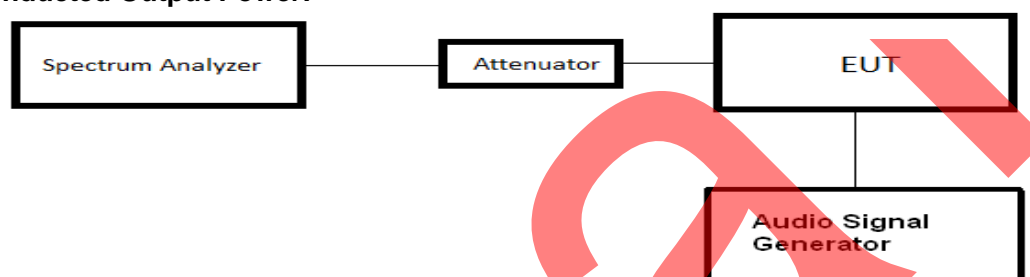
In the semi-anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The "Read Value" is the spectrum reading of maximum power value.

The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.

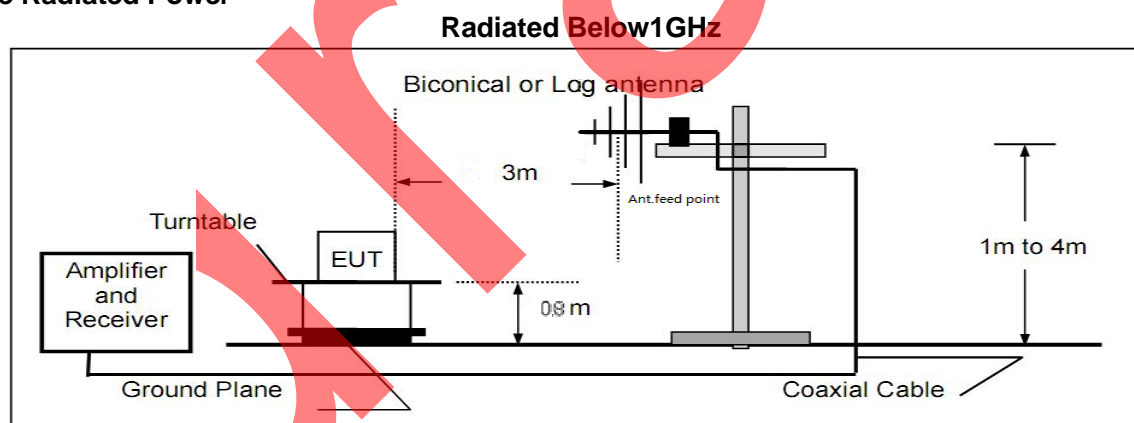
$EIRP = \text{"Read Value"} + \text{Measured substitution value} + 2.15.$

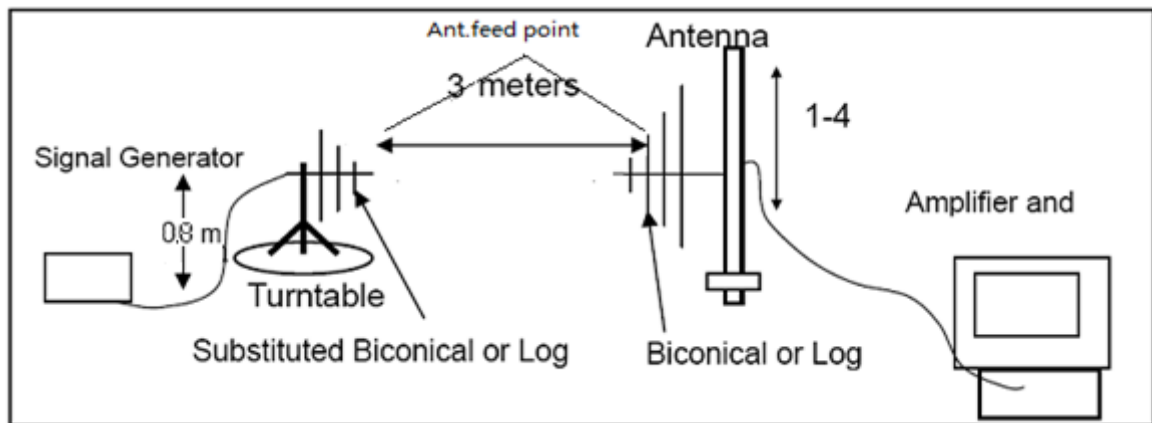
10.3 TEST CONFIGURATION

Conducted Output Power:

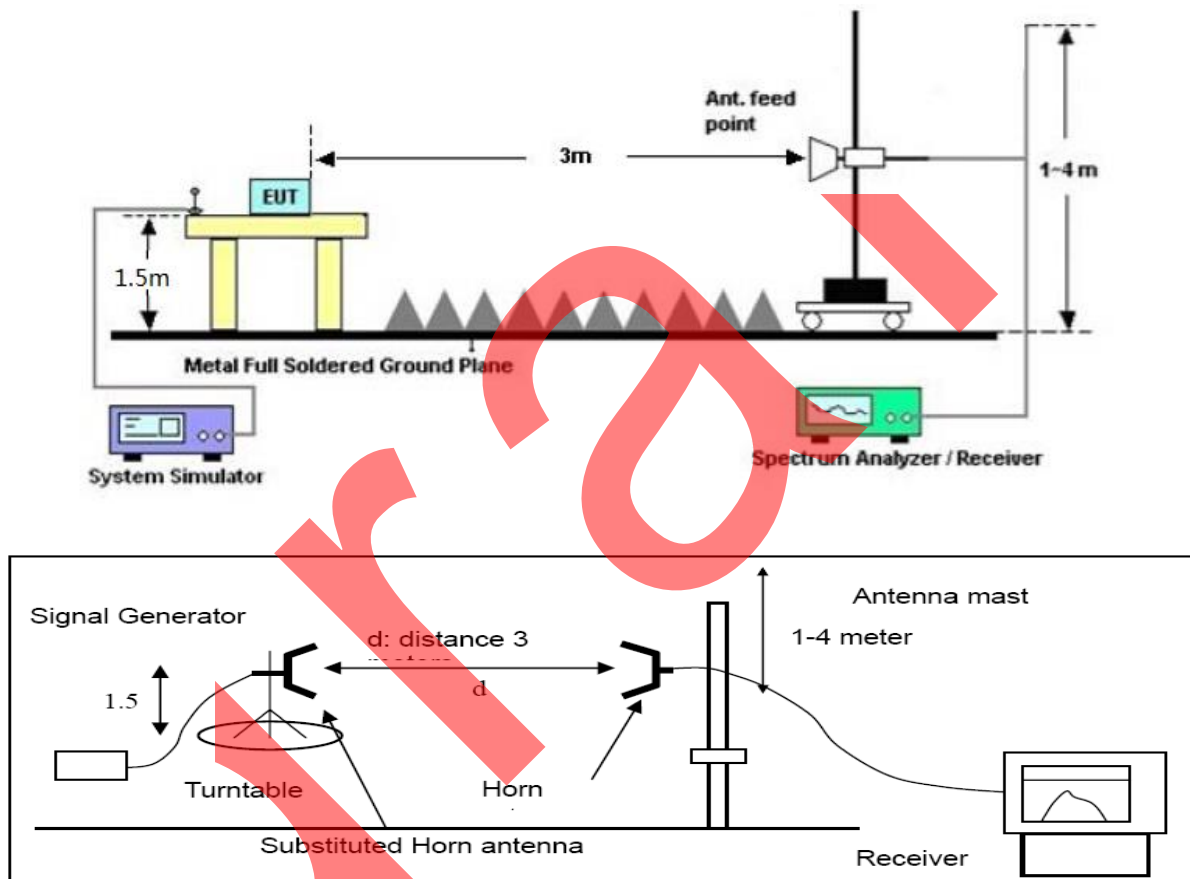


Effective Radiated Power





Radiated Above 1 GHz



10.4 TEST RESULT

The maximum Conducted Power (CP) for VHF/UHF is
 Analog: 5W/1W for 12.5 KHz Channel Separation VHF
 Analog: 5W/1W for 12.5 KHz Channel Separation UHF
 Digital: 5W/1W for 12.5 KHz Channel Separation VHF
 Digital: 5W/1W for 12.5 KHz Channel Separation UHF
 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

VHF:

Analog:

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(136.025MHz)	36.87
	Middle(151.850MHz)	36.85
	Middle(155.025MHz)	36.90
	Middle(161.610MHz)	36.88
	Top (173.975MHz)	36.86

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(136.025MHz)	36.74
	Middle(151.850MHz)	36.79
	Middle(155.025MHz)	36.75
	Middle(161.610MHz)	36.78
	Top (173.975MHz)	36.77

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(136.025MHz)	29.88
	Middle(151.850MHz)	29.83
	Middle(155.025MHz)	29.87
	Middle(161.610MHz)	29.84
	Top (173.975MHz)	29.85

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(136.025MHz)	29.74
	Middle(151.850MHz)	29.71
	Middle(155.025MHz)	29.73
	Middle(161.610MHz)	29.72
	Top (173.975MHz)	29.75

Digital:
Data + voice:

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(136.025MHz)	36.78
	Middle(151.850MHz)	36.80
	Middle(155.025MHz)	36.75
	Middle(161.610MHz)	36.82
	Top (173.975MHz)	36.73

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(136.025MHz)	36.65
	Middle(151.850MHz)	36.67
	Middle(155.025MHz)	36.66
	Middle(161.610MHz)	36.70
	Top (173.975MHz)	36.68

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(136.025MHz)	29.80
	Middle(151.850MHz)	29.79
	Middle(155.025MHz)	29.83
	Middle(161.610MHz)	29.81
	Top (173.975MHz)	29.75

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(136.025MHz)	29.70
	Middle(151.850MHz)	29.75
	Middle(155.025MHz)	29.77
	Middle(161.610MHz)	29.76
	Top (173.975MHz)	29.73

Data transmission mode:

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(136.025MHz)	36.64
	Middle(151.850MHz)	36.69
	Middle(155.025MHz)	36.65
	Middle(161.610MHz)	36.62
	Top (173.975MHz)	36.61

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(136.025MHz)	36.58
	Middle(151.850MHz)	36.61
	Middle(155.025MHz)	36.60
	Middle(161.610MHz)	36.63
	Top (173.975MHz)	36.59

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(136.025MHz)	29.69
	Middle(151.850MHz)	29.70
	Middle(155.025MHz)	29.66
	Middle(161.610MHz)	29.63
	Top (173.975MHz)	29.64

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(136.025MHz)	29.58
	Middle(151.850MHz)	29.64
	Middle(155.025MHz)	29.60
	Middle(161.610MHz)	29.63
	Top (173.975MHz)	29.59

UHF:
Analog:

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.89
	Middle(453.225MHz)	36.83
	Middle(454.025MHz)	36.92
	Top (479.975MHz)	36.87

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.85
	Middle(453.225MHz)	36.79
	Middle(454.025MHz)	36.88
	Top (479.975MHz)	36.77

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.85
	Middle(453.225MHz)	29.83
	Middle(454.025MHz)	29.90
	Top (479.975MHz)	29.80

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.75
	Middle(453.225MHz)	29.73
	Middle(454.025MHz)	29.81
	Top (479.975MHz)	29.74

Digital:
Data + voice:

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.77
	Middle(453.225MHz)	36.75
	Middle(454.025MHz)	36.74
	Top (479.975MHz)	36.78

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.71
	Middle(453.225MHz)	36.69
	Middle(454.025MHz)	36.70
	Top (479.975MHz)	36.67

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.79
	Middle(453.225MHz)	29.74
	Middle(454.025MHz)	29.77
	Top (479.975MHz)	29.81

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.74
	Middle(453.225MHz)	29.68
	Middle(454.025MHz)	29.75
	Top (479.975MHz)	29.73

Data transmission mode:

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.71
	Middle(453.225MHz)	36.69
	Middle(454.025MHz)	36.66
	Top (479.975MHz)	36.73

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.65
	Middle(453.225MHz)	36.63
	Middle(454.025MHz)	36.64
	Top (479.975MHz)	36.62

Conducted Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.69
	Middle(453.225MHz)	29.71
	Middle(454.025MHz)	29.70
	Top (479.975MHz)	29.61

Radiated Power Measurement Results		
Channel Separation	Channel	Measurement Result (dBm)
		For 30dBm(1W)
12.5 KHz	Bottom(400.025MHz)	29.59
	Middle(453.225MHz)	29.63
	Middle(454.025MHz)	29.66
	Top (479.975MHz)	29.57

11. SPURIOUS EMISSION ON ANTENNA PORT

11.1 PROVISIONS APPLICABLE

Please refer to FCC 47 CFR 2.1051, 2.1057, 22.359 & 90.210 for specification details.
Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Attenuation Limit (dBc)
§ 22.359	At least $43 + 10 \log (P)$ dB
§ 90.210	At least $50 + 10 \log (P)$ dB

$50 + 10 \log (P_{\text{watts}})$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = EL - 50 - 10 log₁₀ (TP)

EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is P (dBm)

Limit (dBm) = P (dBm) - 50 - 10 log (Pwatts) = -20 dBm

$43 + 10 \log (P_{\text{watts}})$

Calculation: Limit (dBm) = EL - 43 - 10 log₁₀ (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

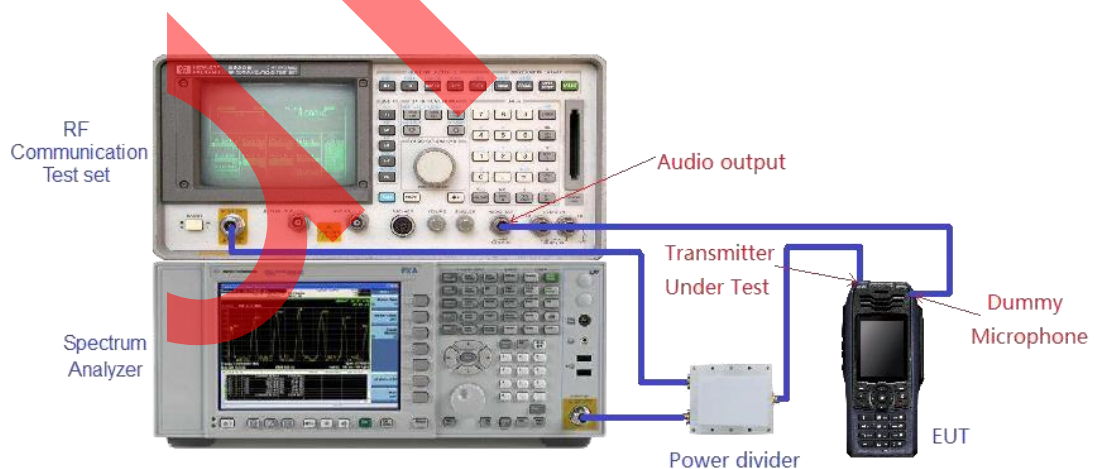
In this application, the EL is P (dBm).

Limit (dBm) = P (dBm) - 43 - 10 log (Pwatts) = -13 dBm

11.2 TEST PROCEDURE

1. The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to show any out of band emission up to 10th Harmonic for the lower and the highest frequency range.
3. Set RBW 100 kHz, VBW 300 kHz in the frequency band 30MHz to 1GHz, while set RBW=1MHz, VBW=3MHz from the 1GHz to 10th Harmonic.
4. The audio input was set the unmodulated carrier, the resulting picture is print out for each channel separation.

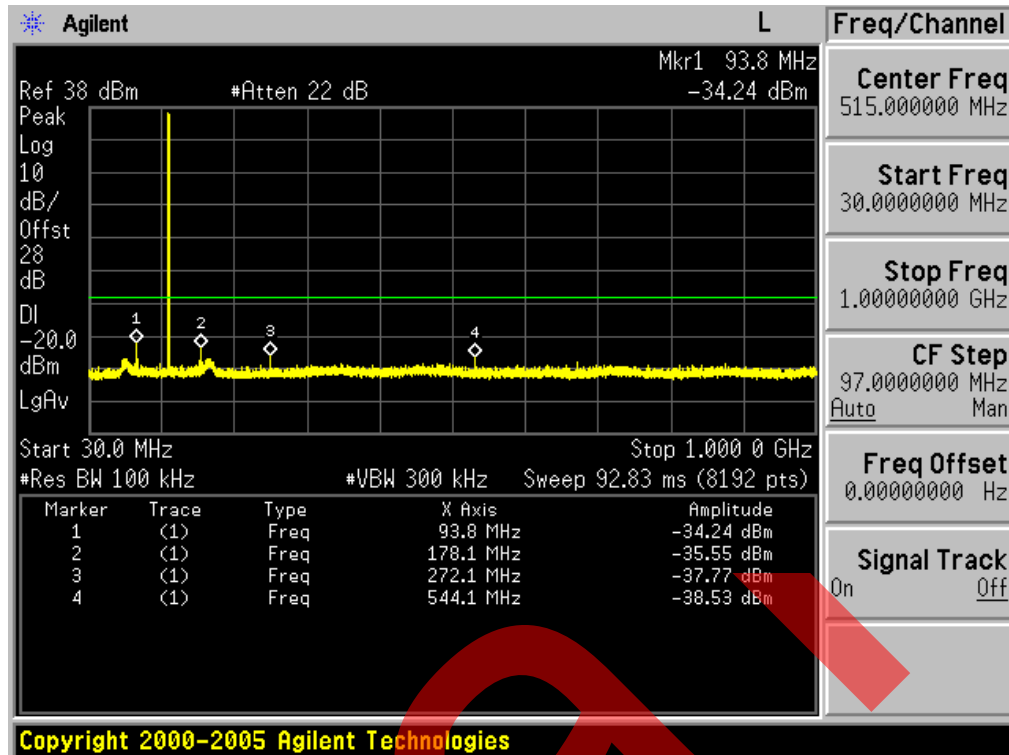
11.3 TEST CONFIGURATION



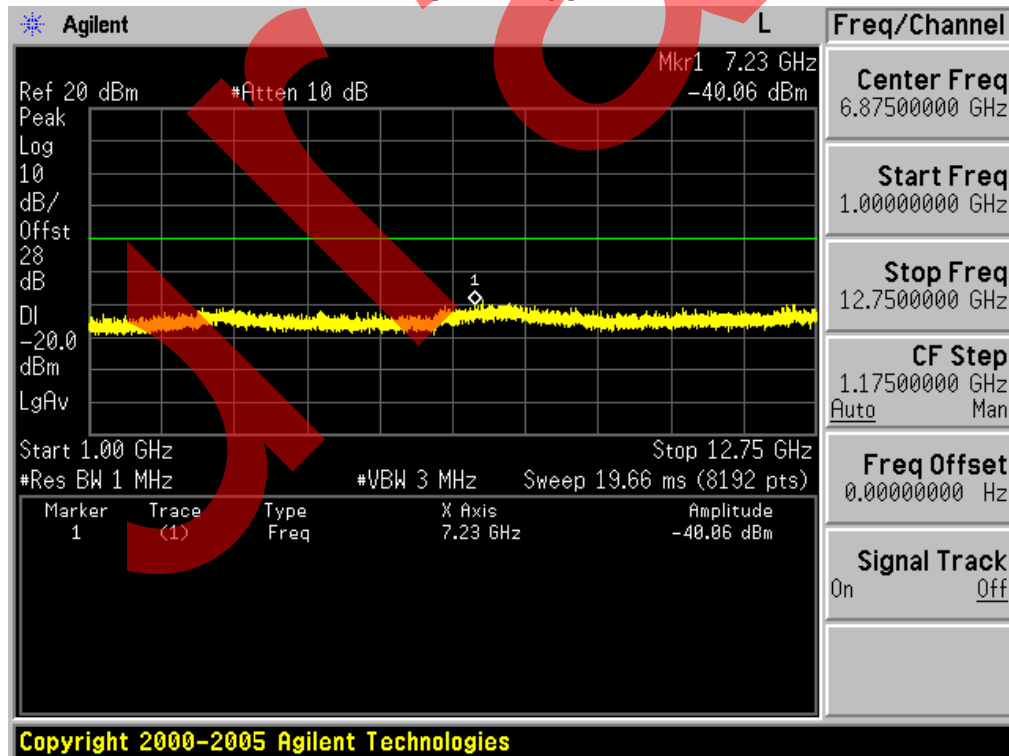
11.4 TEST RESULT

VHF: Analog:

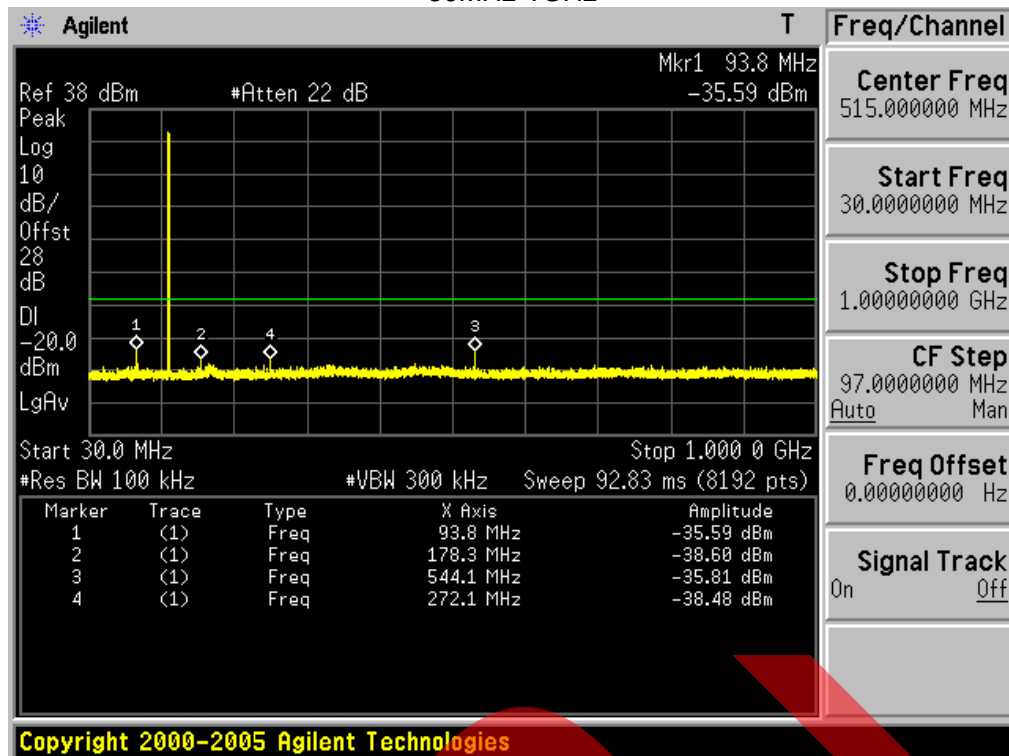
Conducted Spurious Emission (worst) @136.025MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



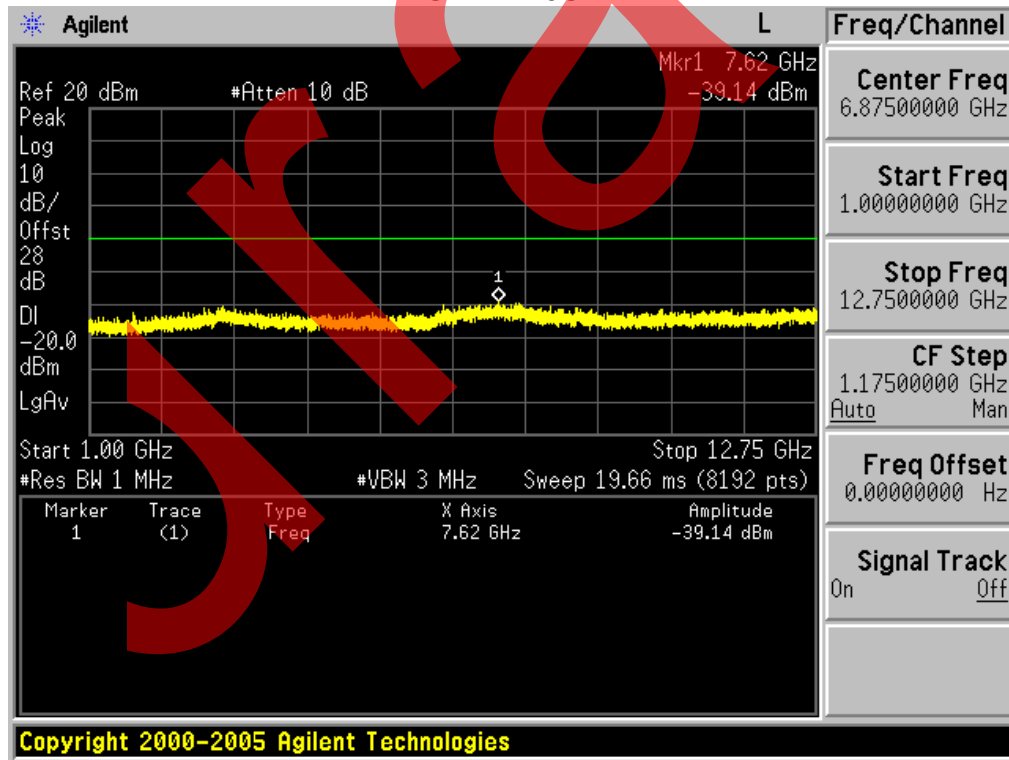
Conduct Spurious Emission (worst) @ 136.025MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



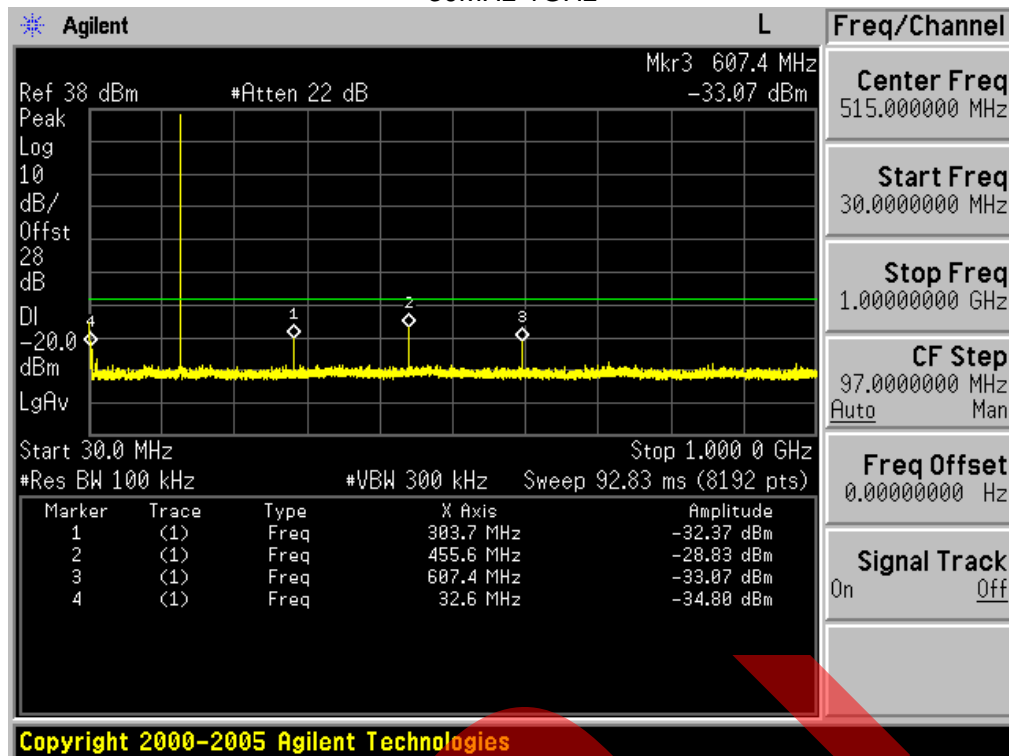
Conducted Spurious Emission (worst) @136.025MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



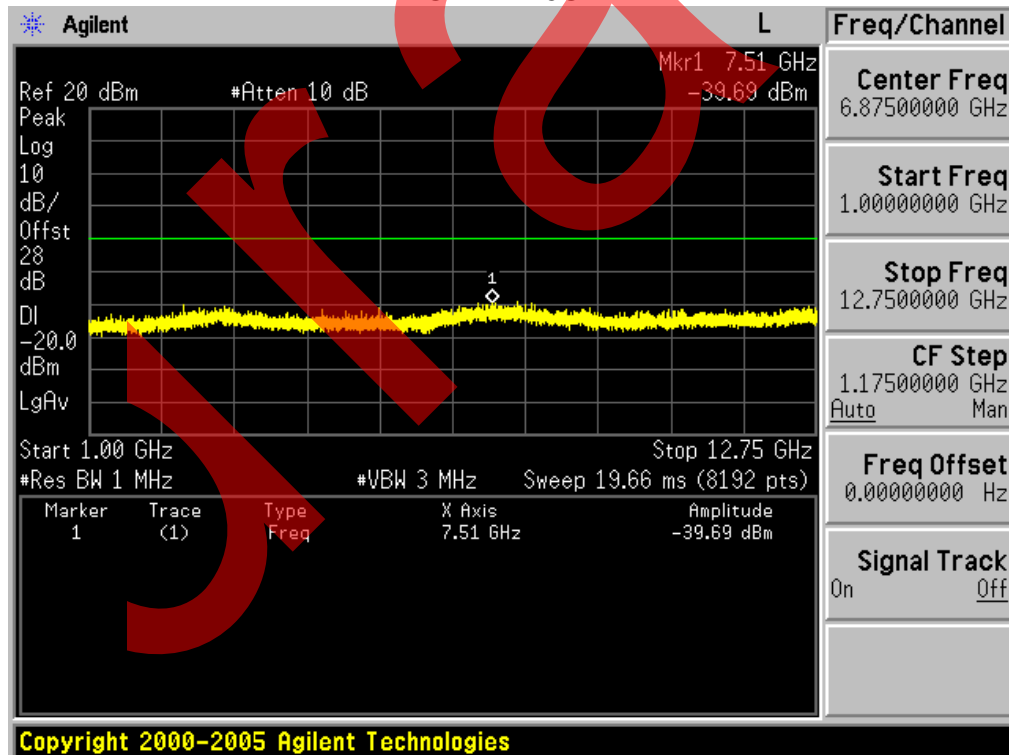
Conduct Spurious Emission (worst) @ 136.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



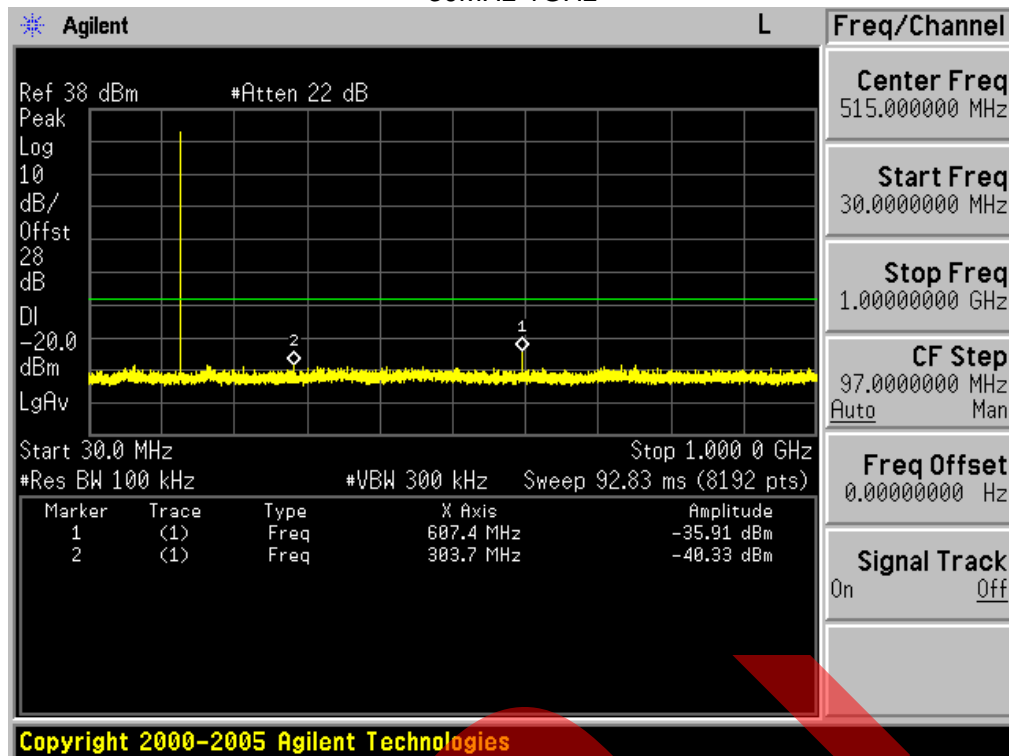
Conducted Spurious Emission (worst) @151.850 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



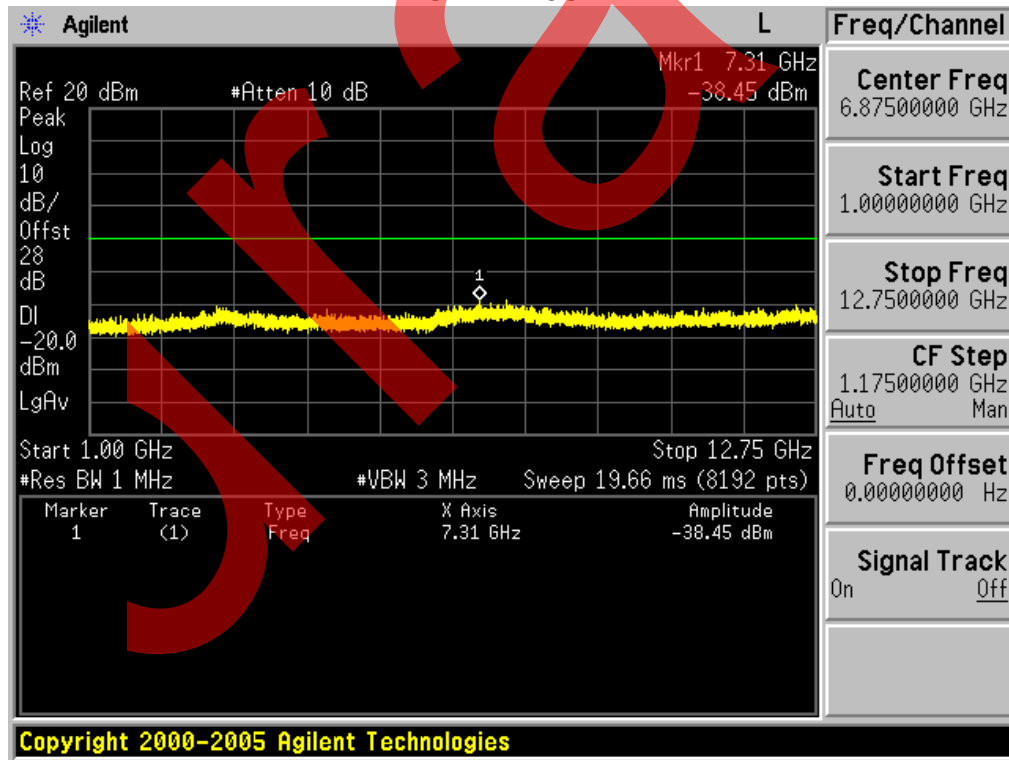
Conduct Spurious Emission (worst) @ 151.850MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



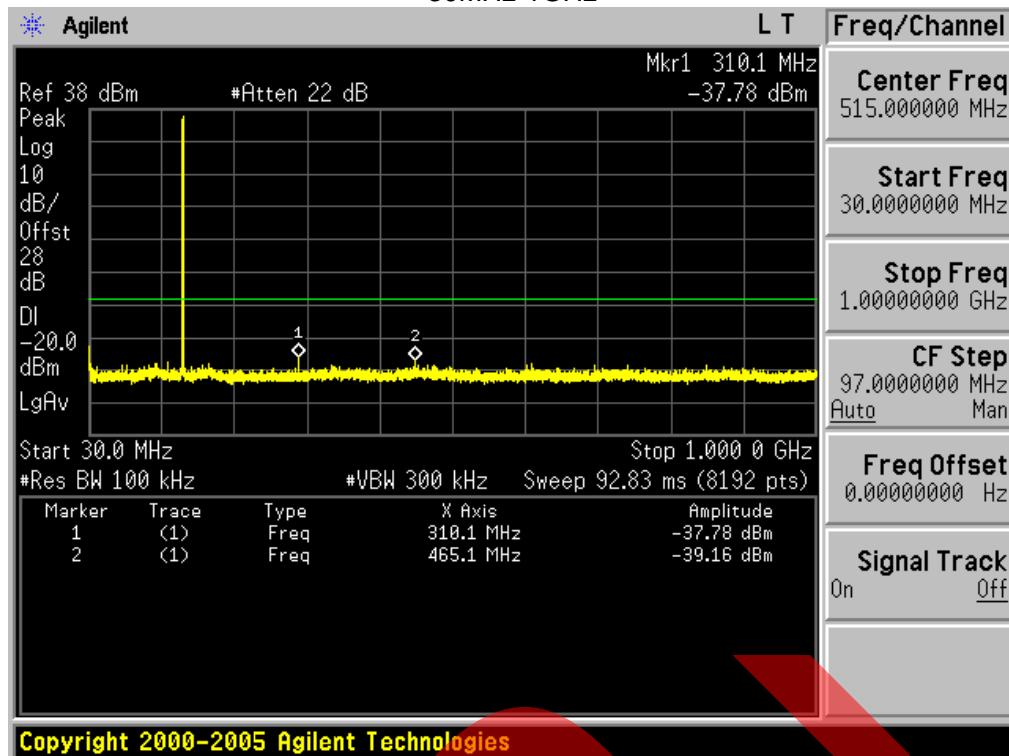
Conducted Spurious Emission (worst) @151.850 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



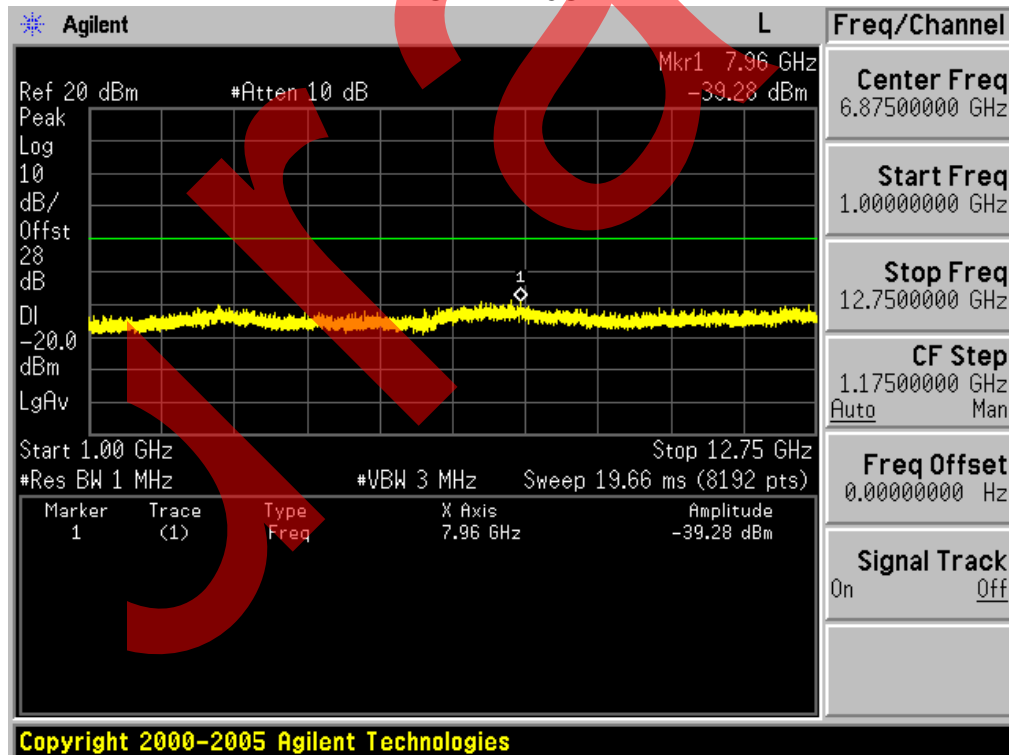
Conduct Spurious Emission (worst) @ 151.850MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



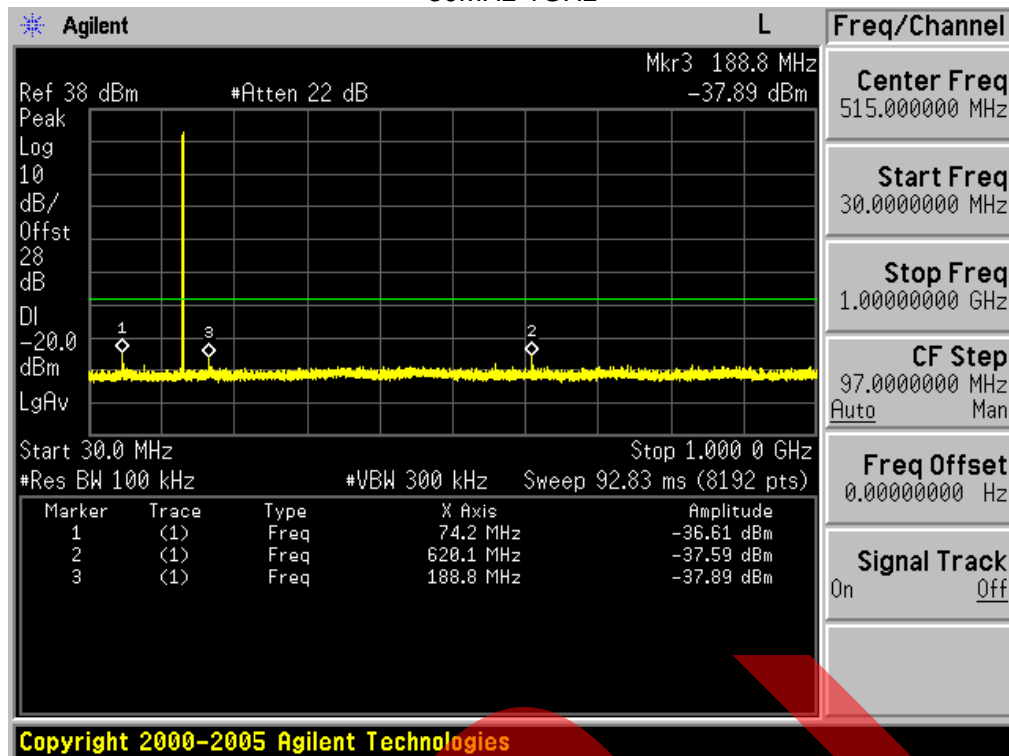
Conducted Spurious Emission (worst) @155.025 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



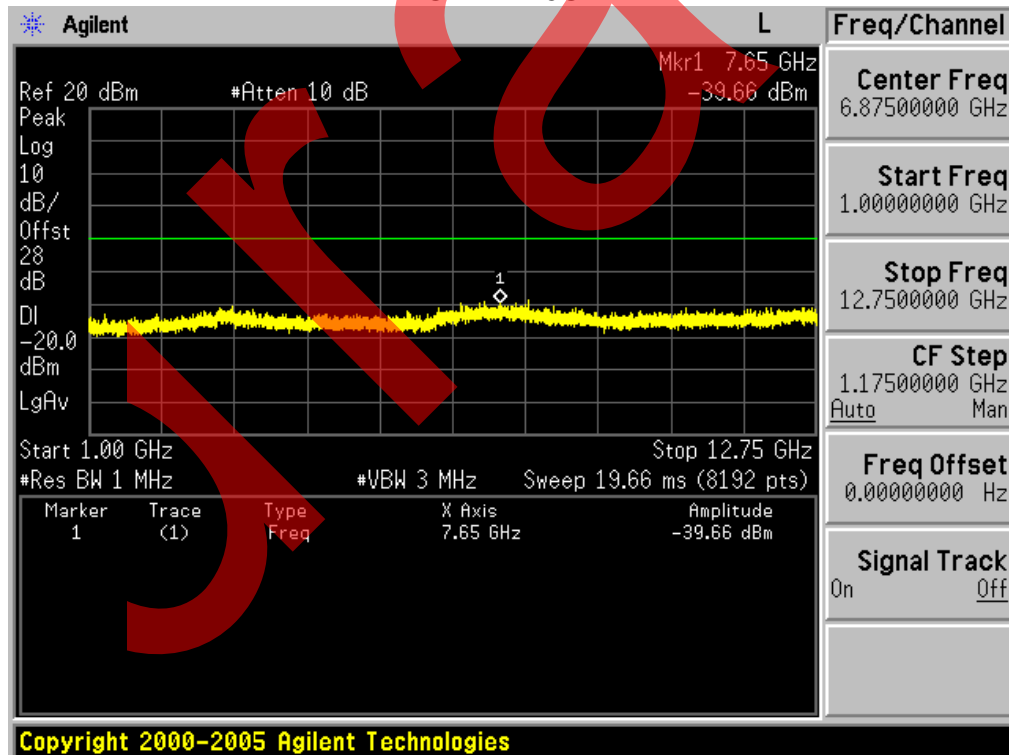
Conduct Spurious Emission (worst) @ 155.025 MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



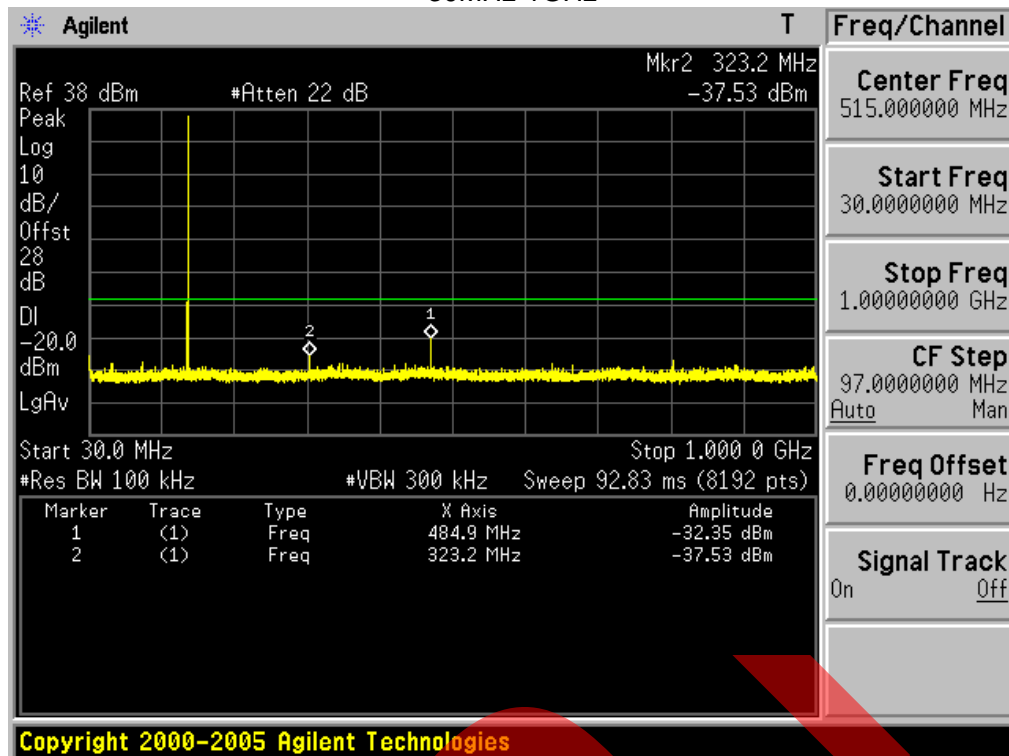
Conducted Spurious Emission (worst) @155.025 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



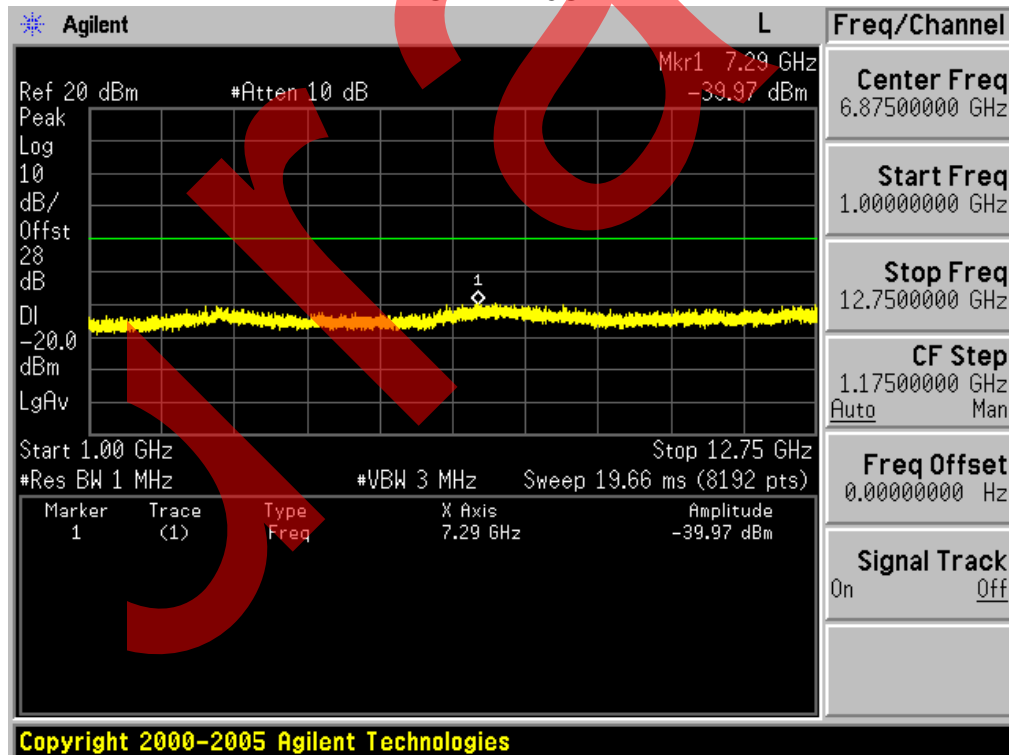
Conduct Spurious Emission (worst) @ 155.025 MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



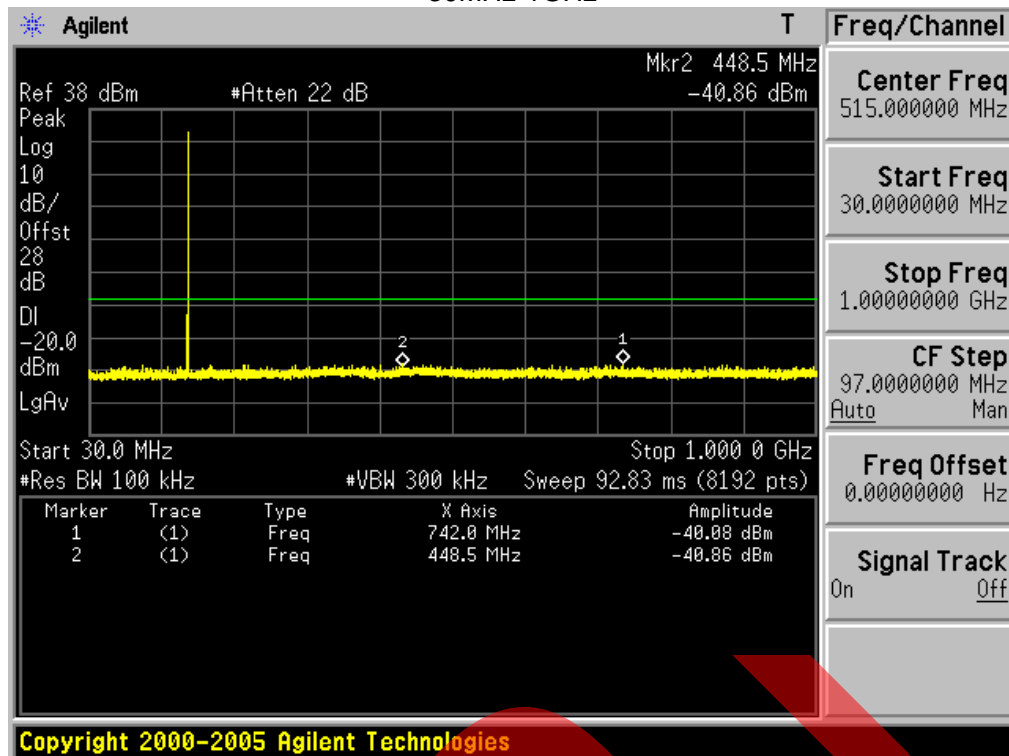
Conducted Spurious Emission (worst) @161.610 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



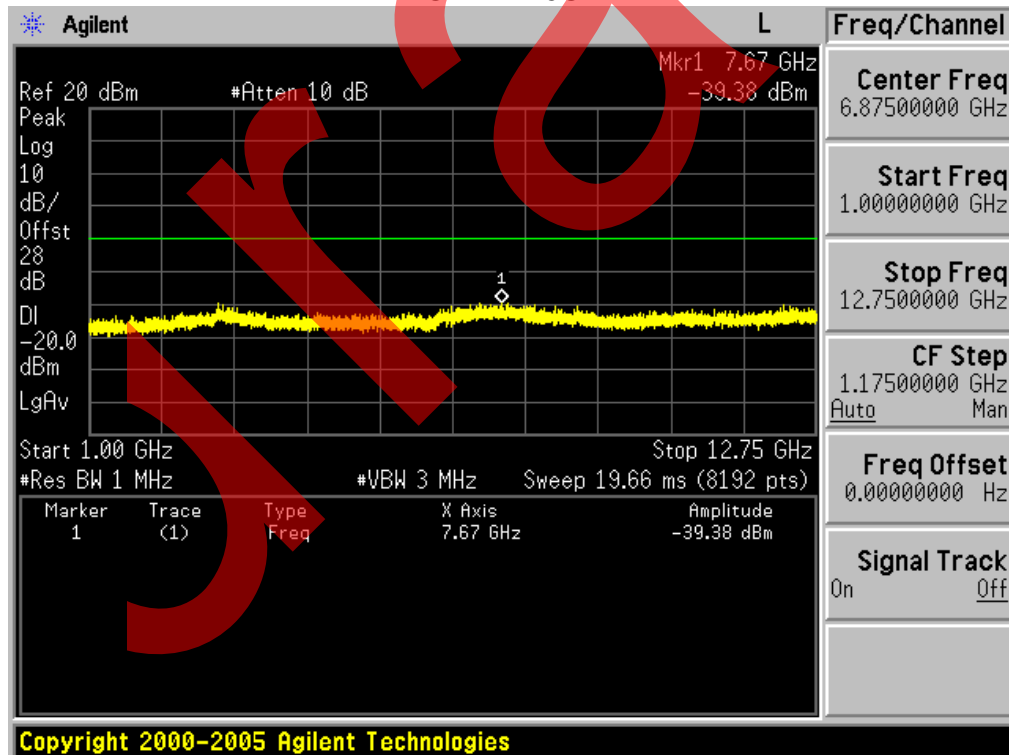
Conduct Spurious Emission (worst) @ 161.610MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



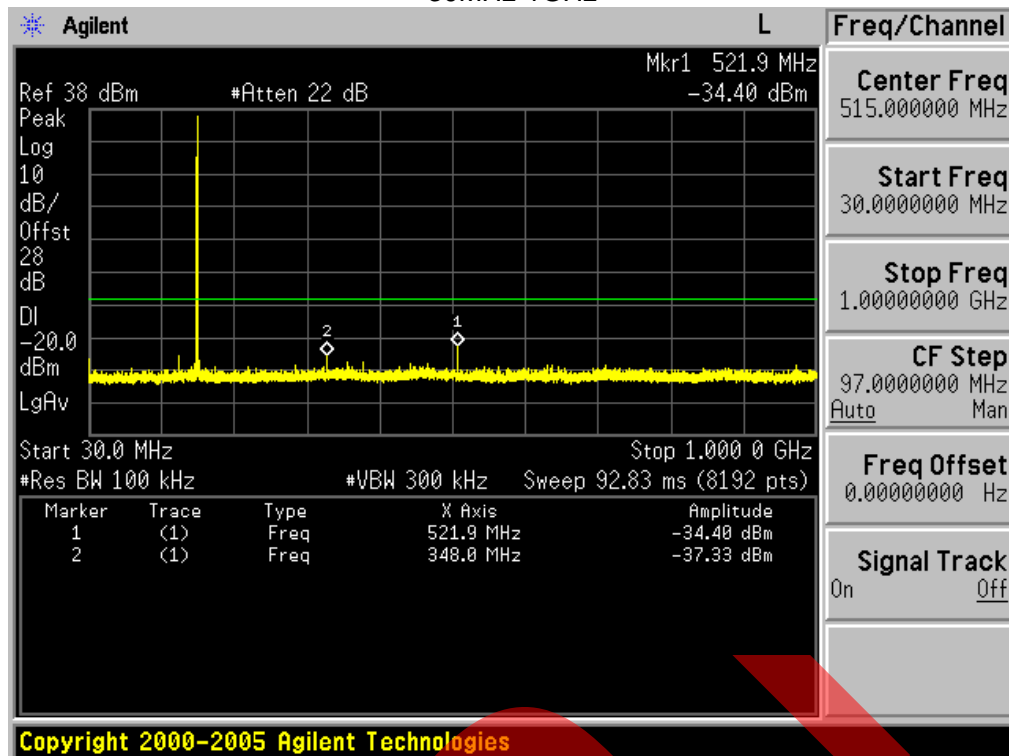
Conducted Spurious Emission (worst) @161.610MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



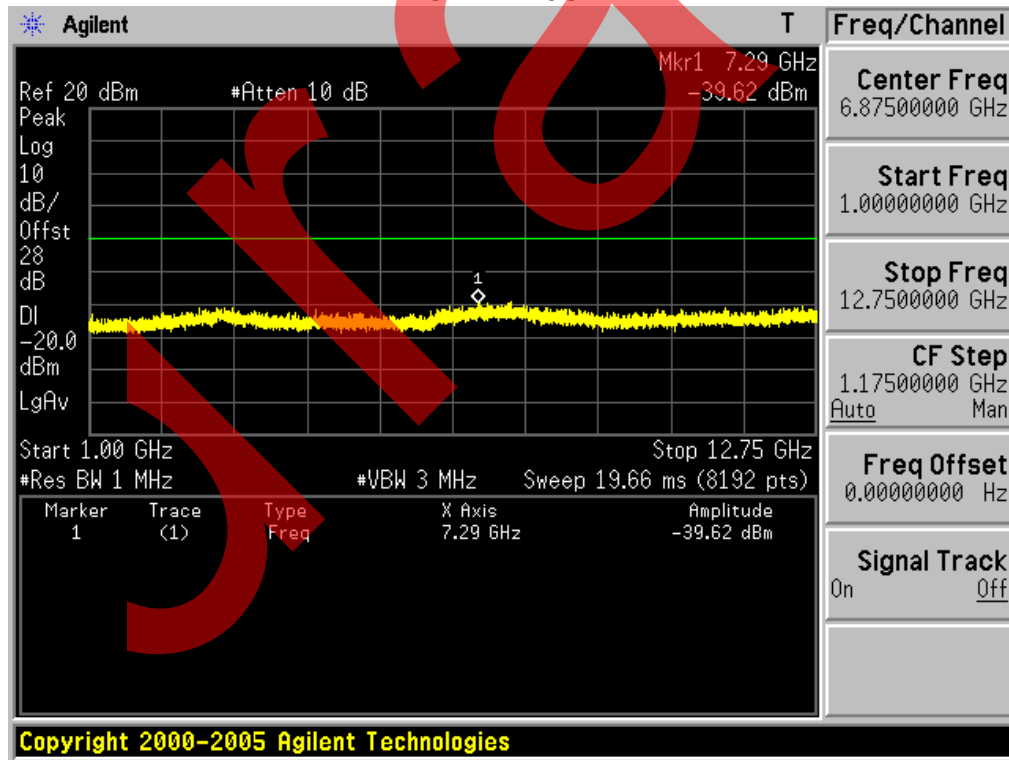
Conduct Spurious Emission (worst) @ 161.610MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



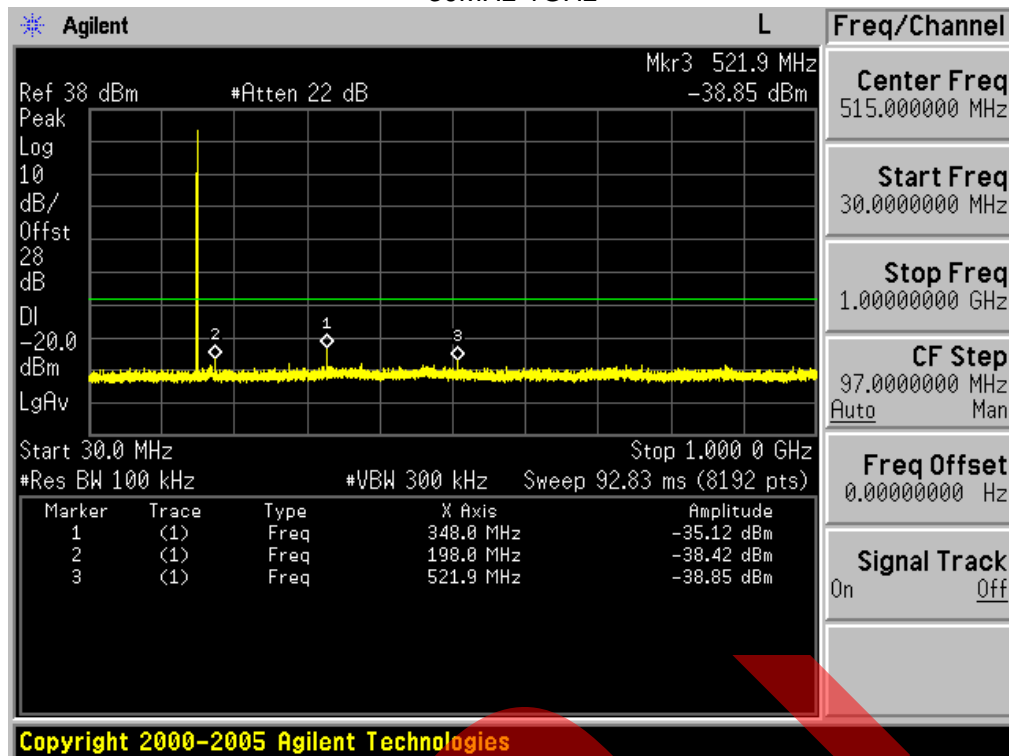
Conducted Spurious Emission (worst) @173.975 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



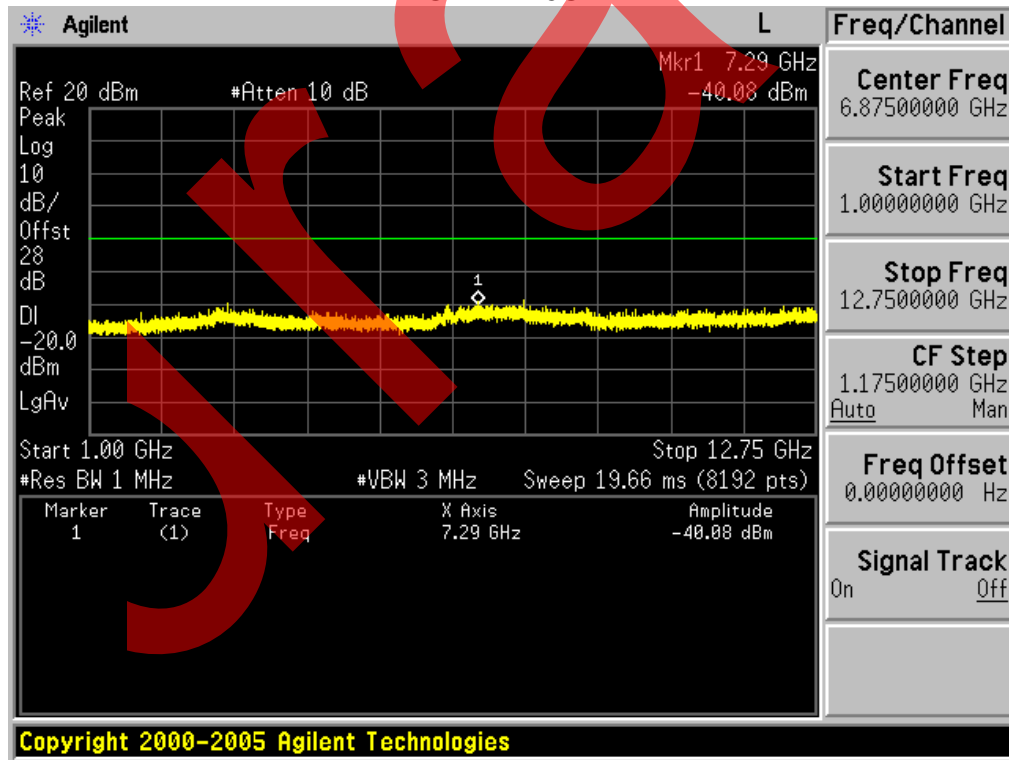
Conduct Spurious Emission (worst) @ 173.975MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



Conducted Spurious Emission (worst) @173.975 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz

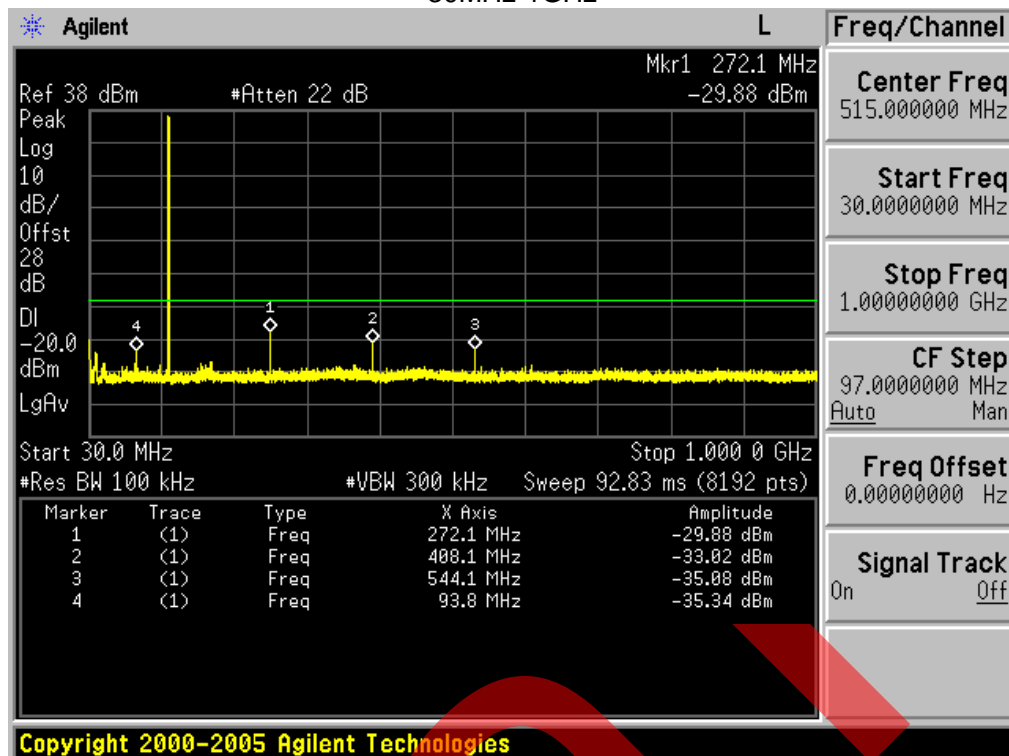


Conduct Spurious Emission (worst) @ 173.975MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz

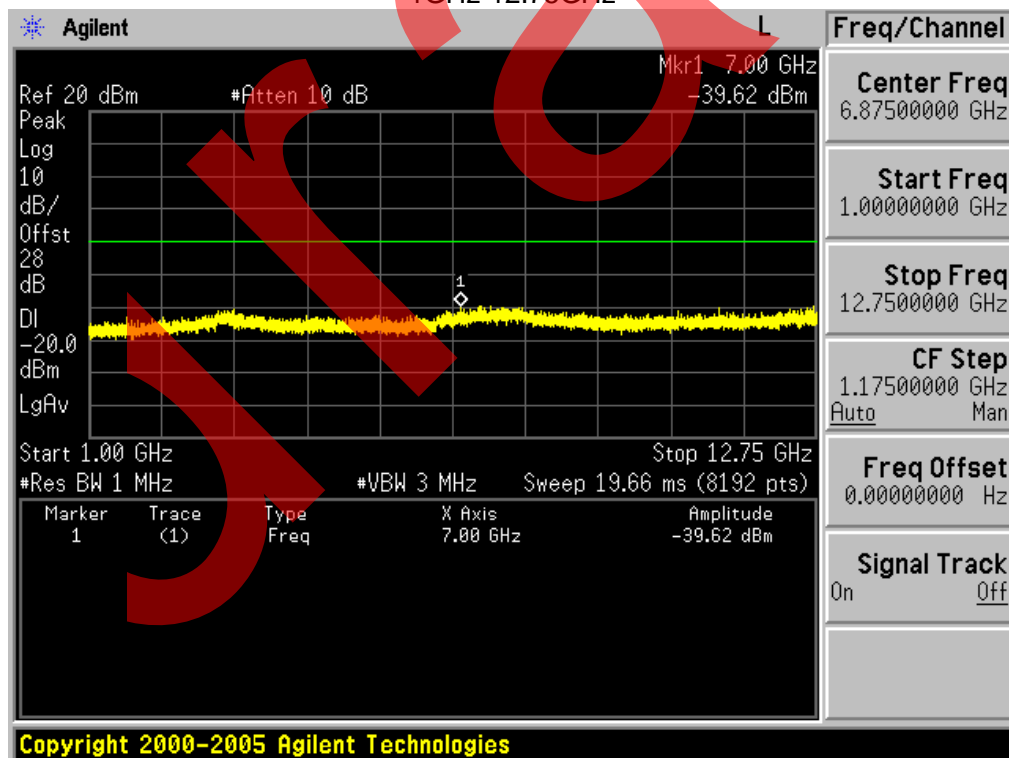


Digital:

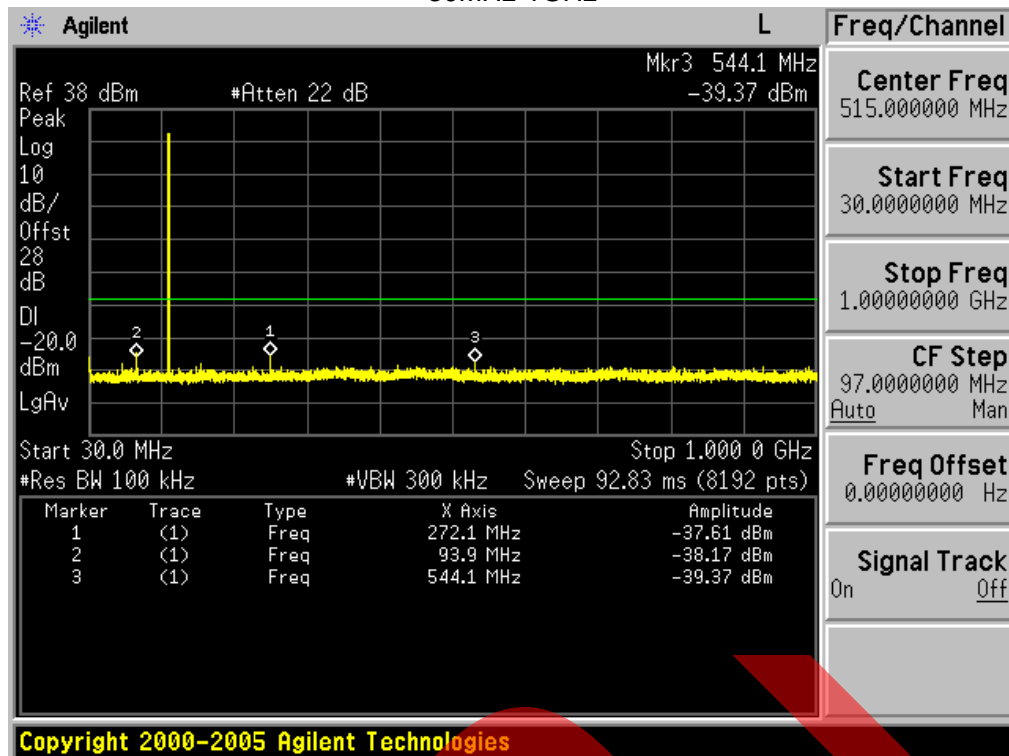
Conducted Spurious Emission (worst) @136.025MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



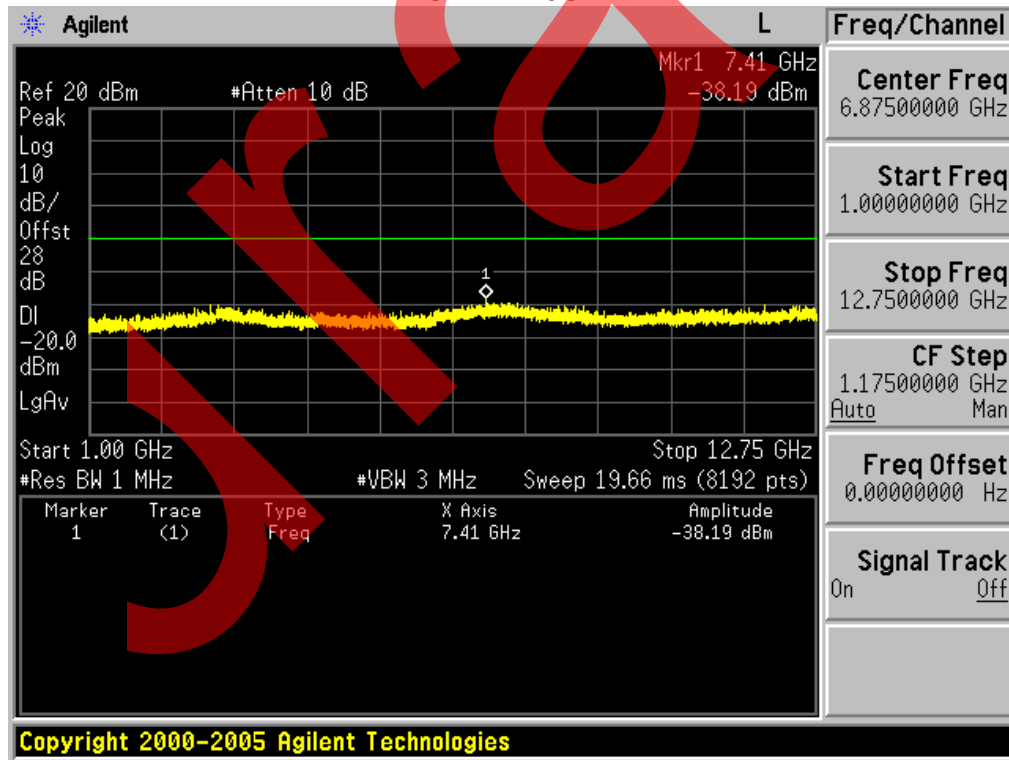
Conduct Spurious Emission (worst) @ 136.025MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



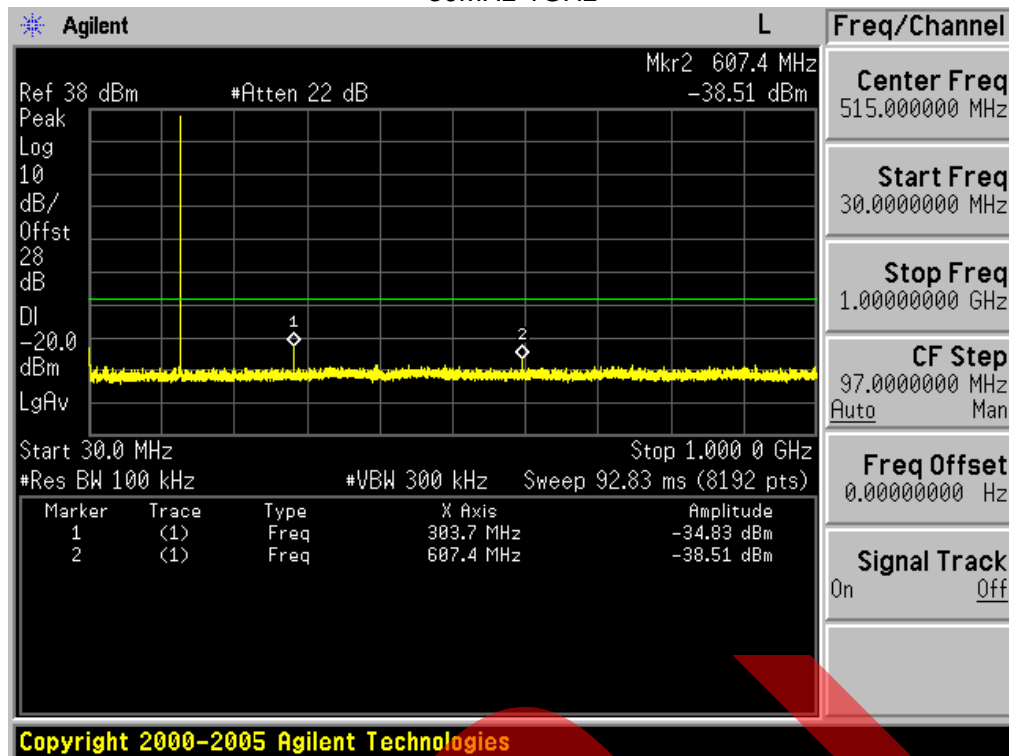
Conducted Spurious Emission (worst) @136.025MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



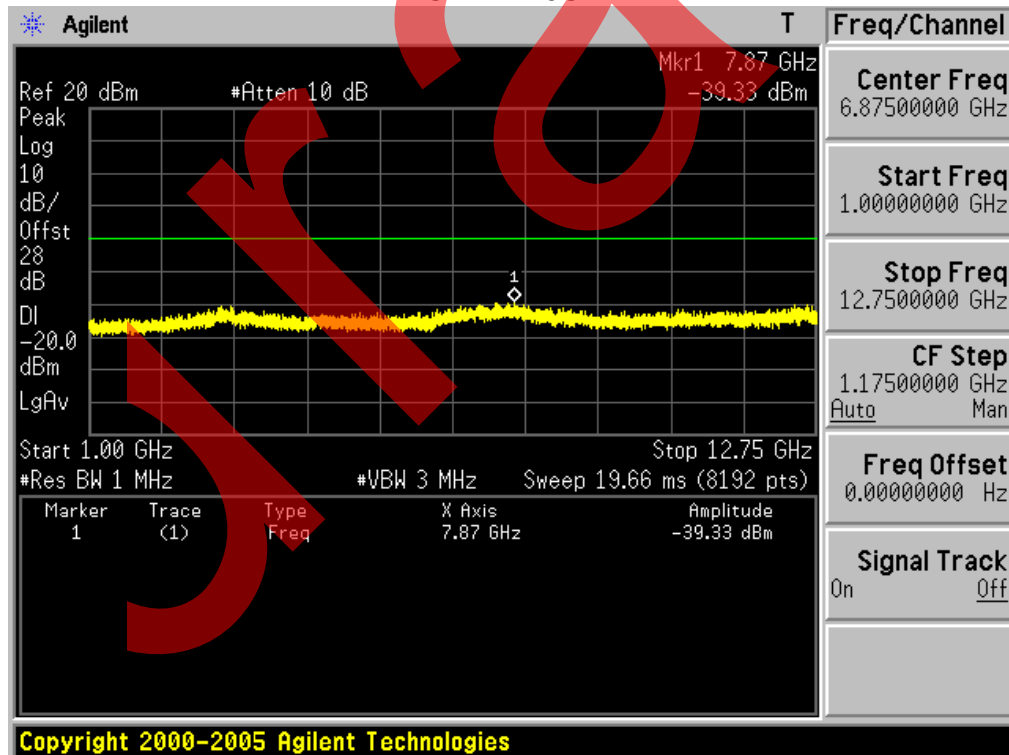
Conduct Spurious Emission (worst) @ 136.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



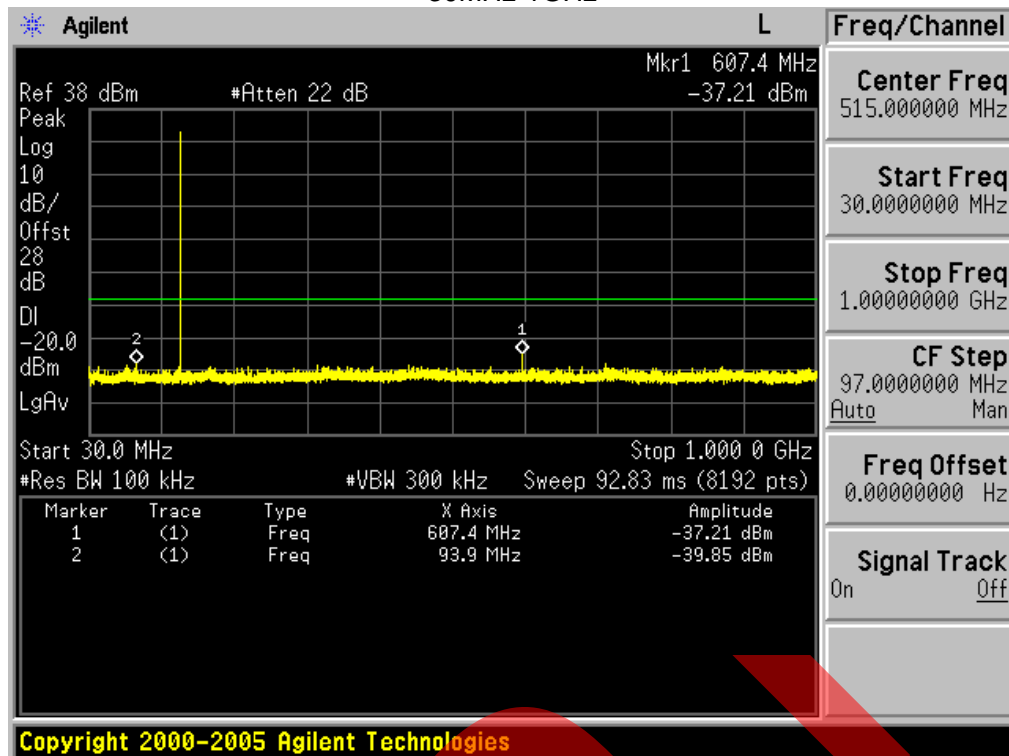
Conducted Spurious Emission (worst) @151.850 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



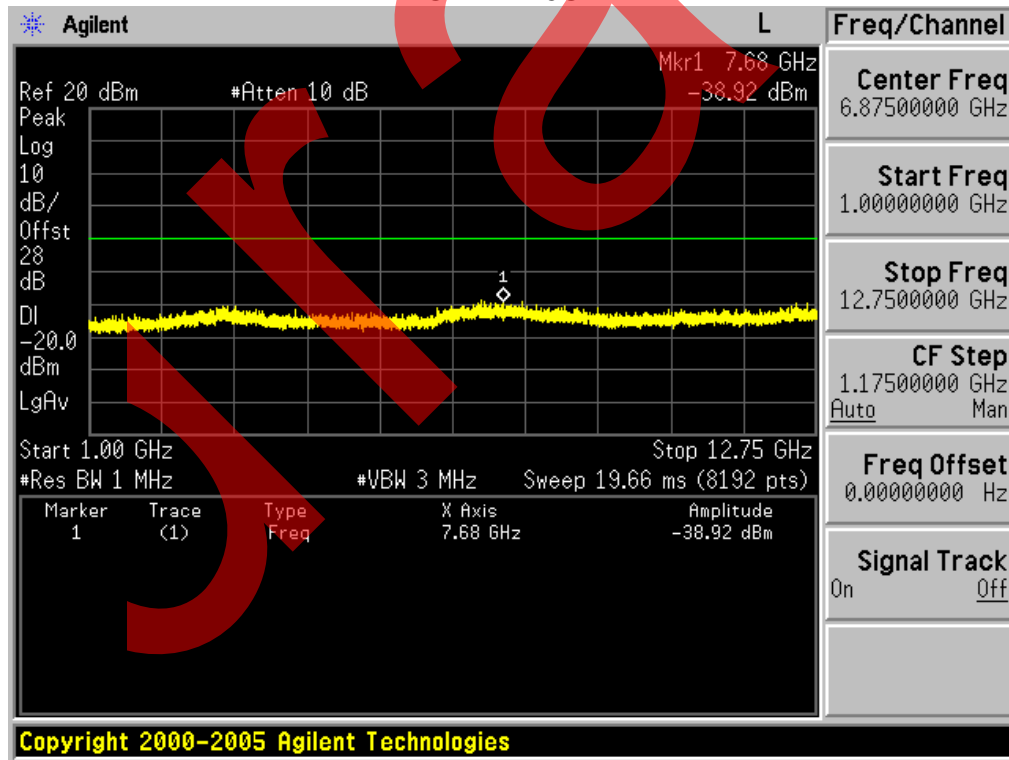
Conduct Spurious Emission (worst) @ 151.850MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



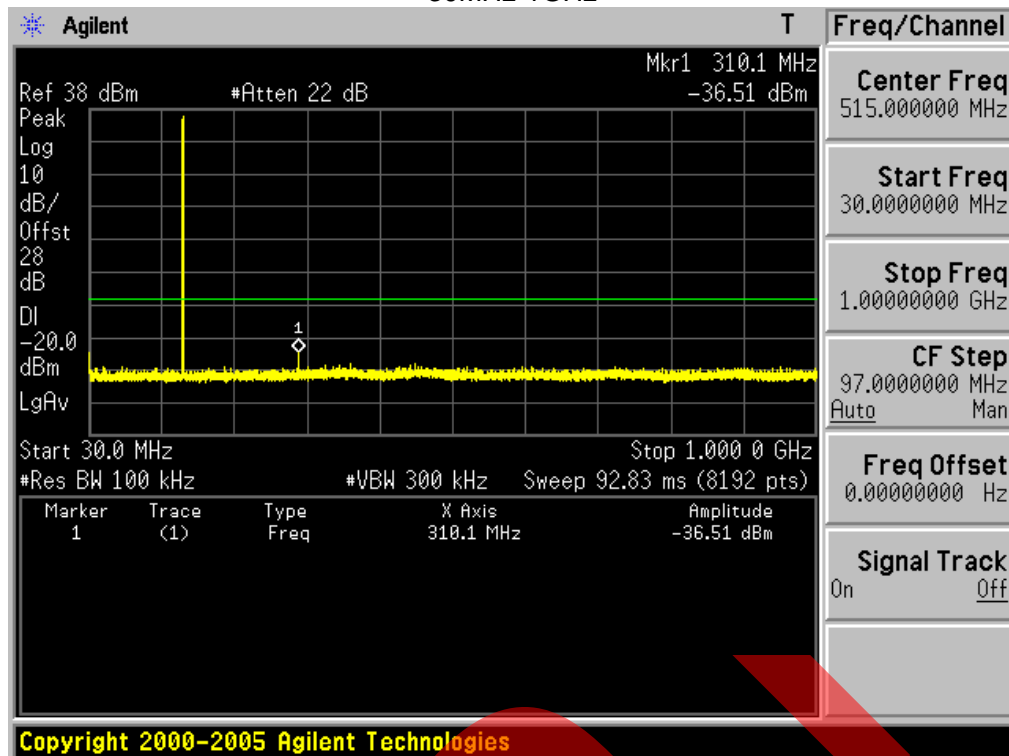
Conducted Spurious Emission (worst) @151.850 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



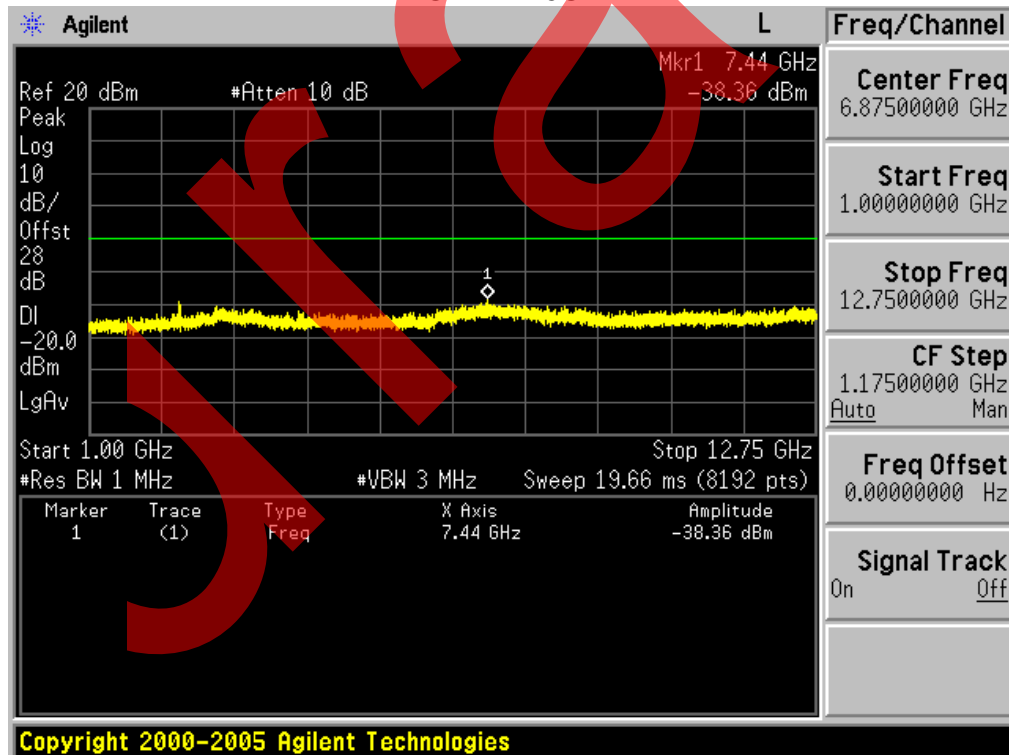
Conduct Spurious Emission (worst) @ 151.850MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



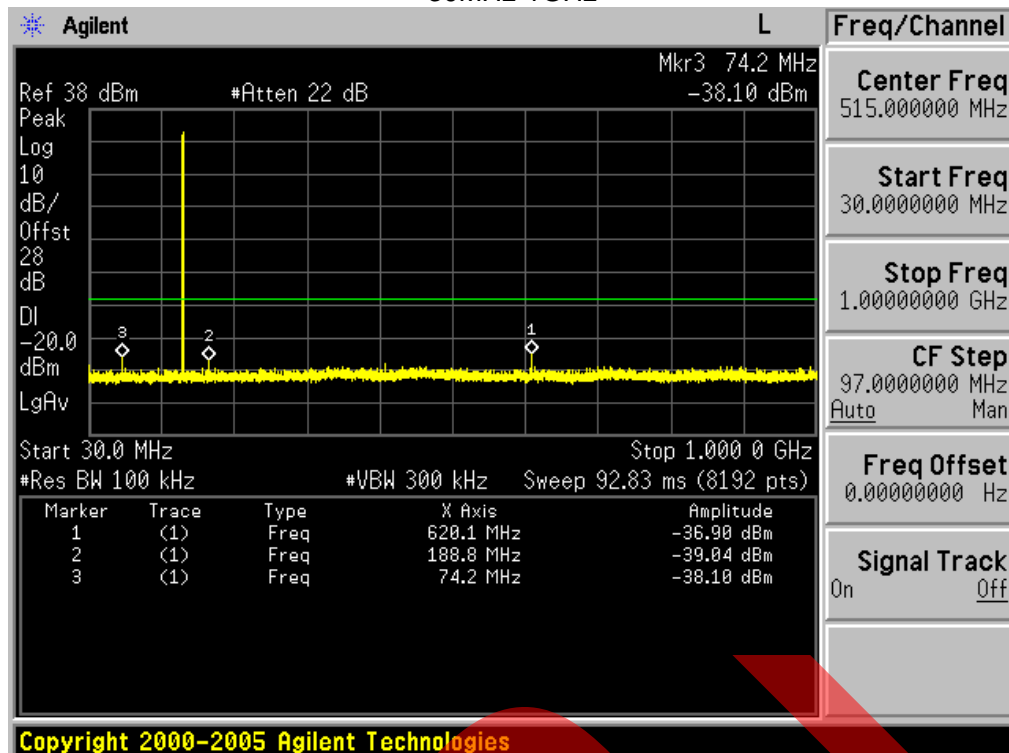
Conducted Spurious Emission (worst) @155.025 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



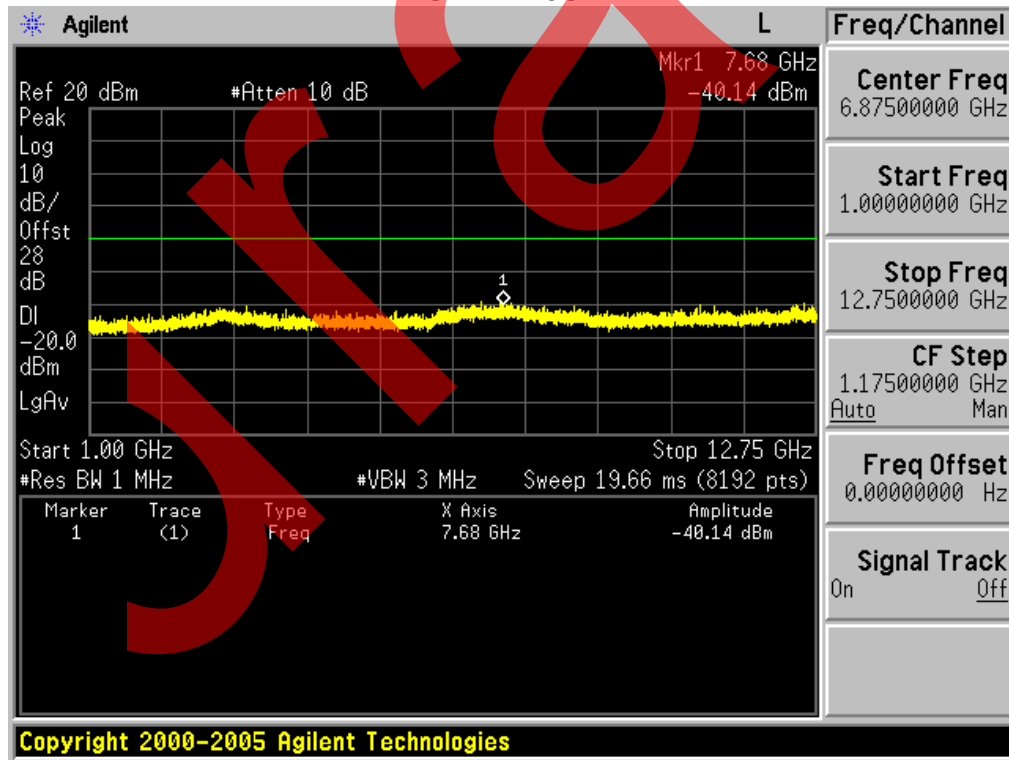
Conduct Spurious Emission (worst) @ 155.025 MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



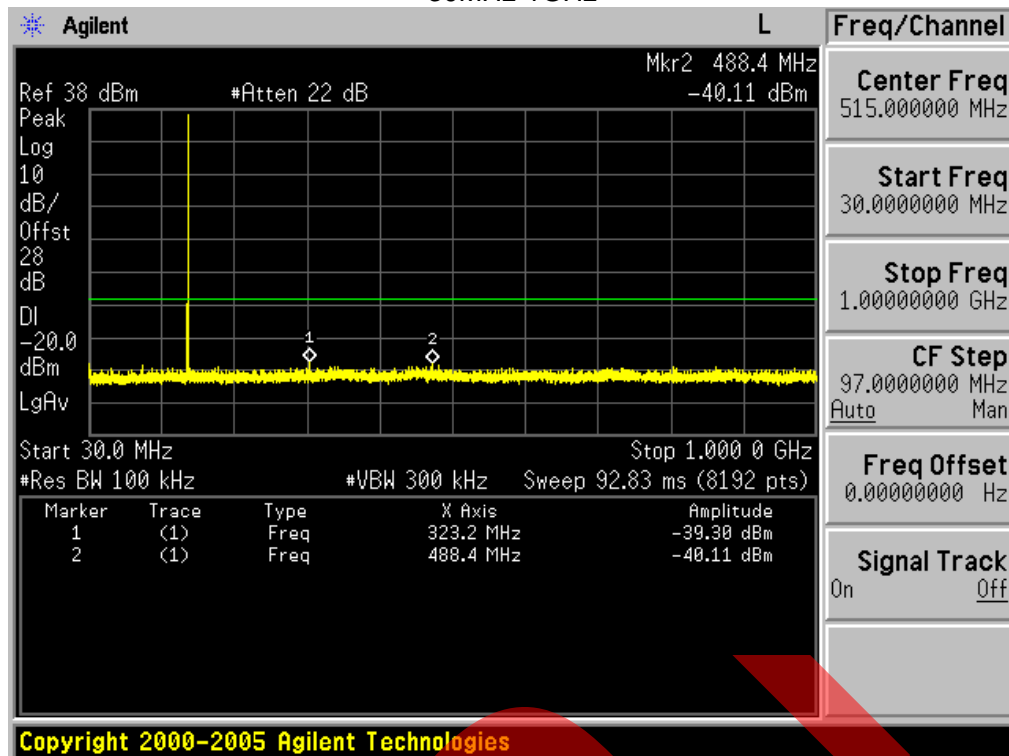
Conducted Spurious Emission (worst) @155.025 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



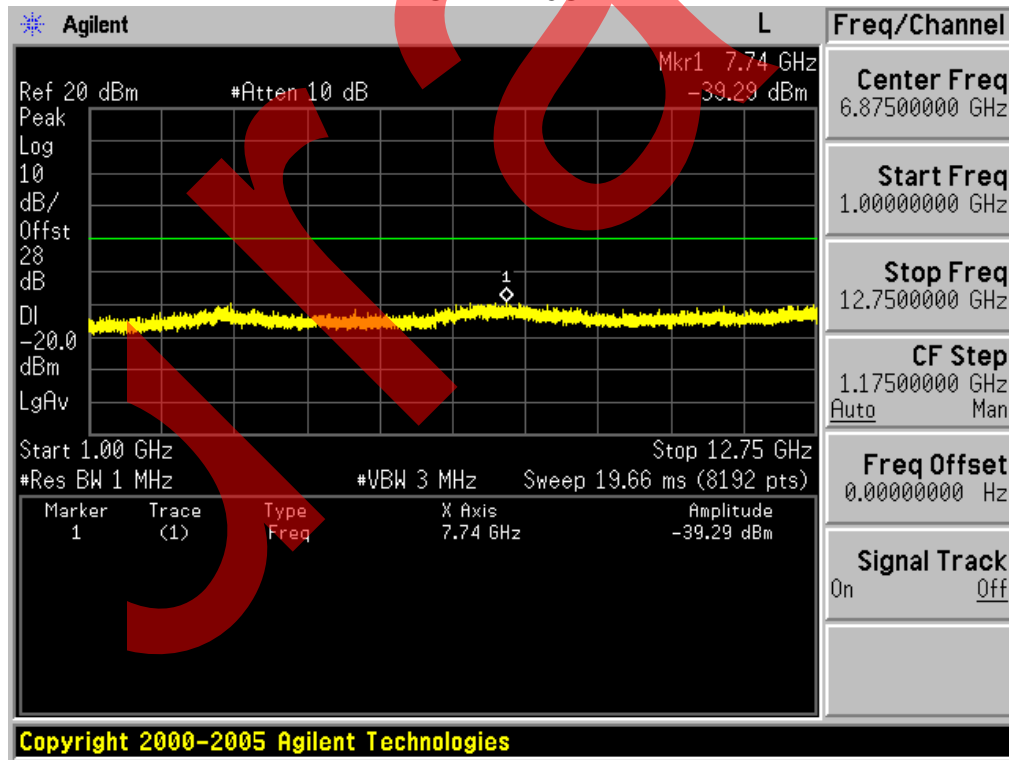
Conduct Spurious Emission (worst) @155.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



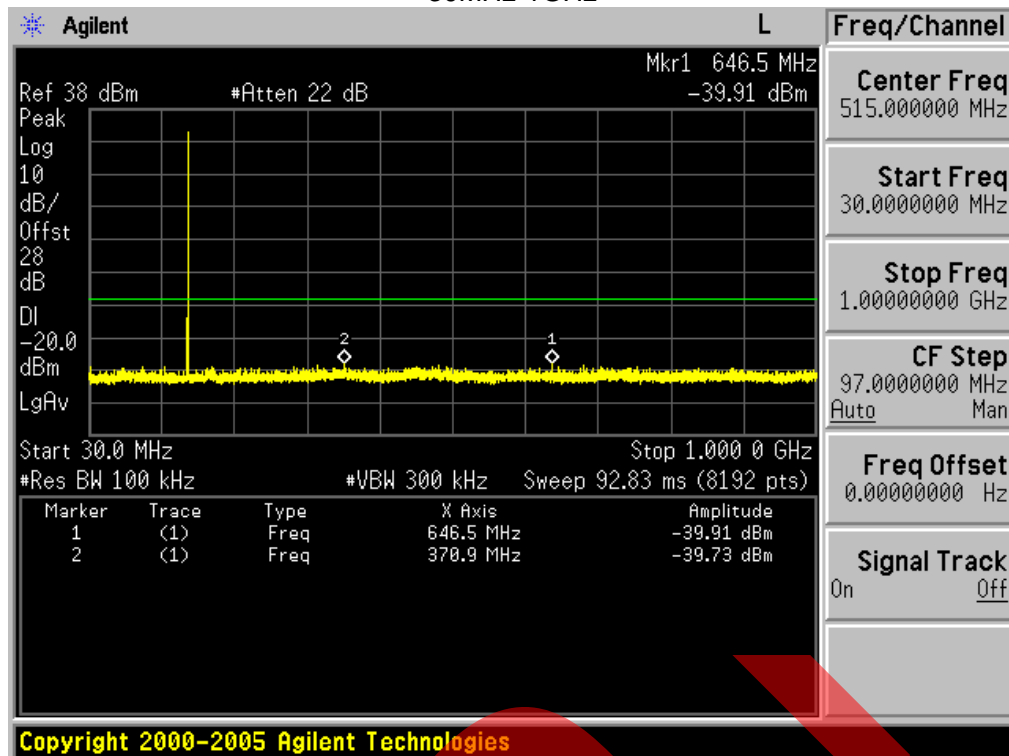
Conducted Spurious Emission (worst) @161.610 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



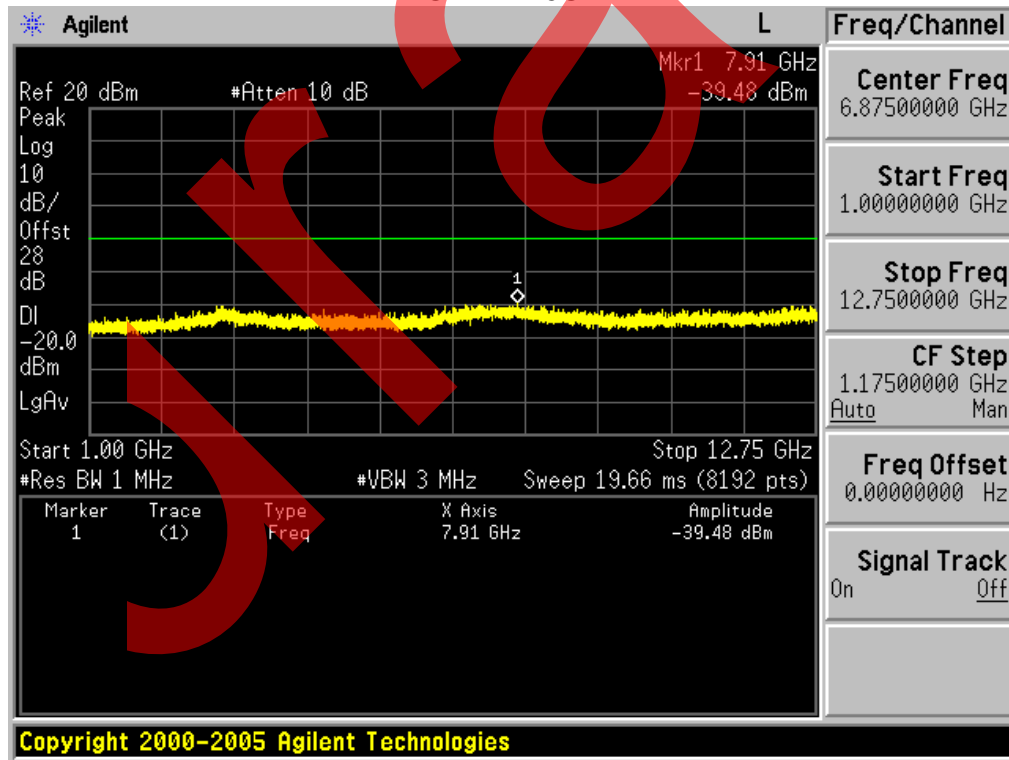
Conduct Spurious Emission (worst) @ 161.610MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



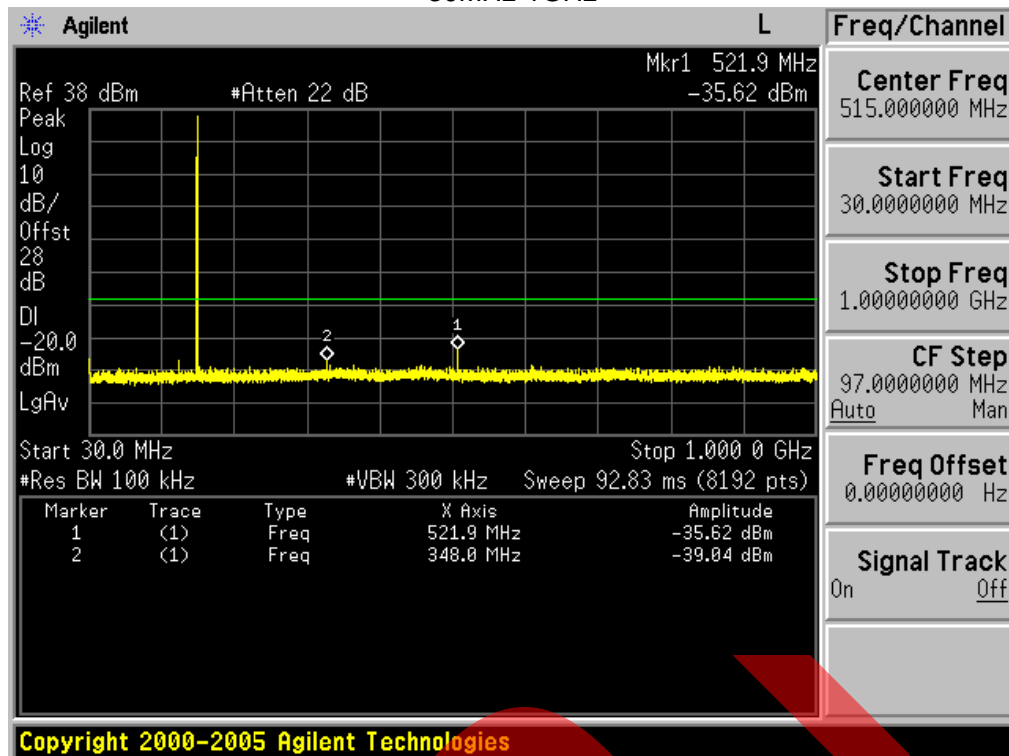
Conducted Spurious Emission (worst) @161.610 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



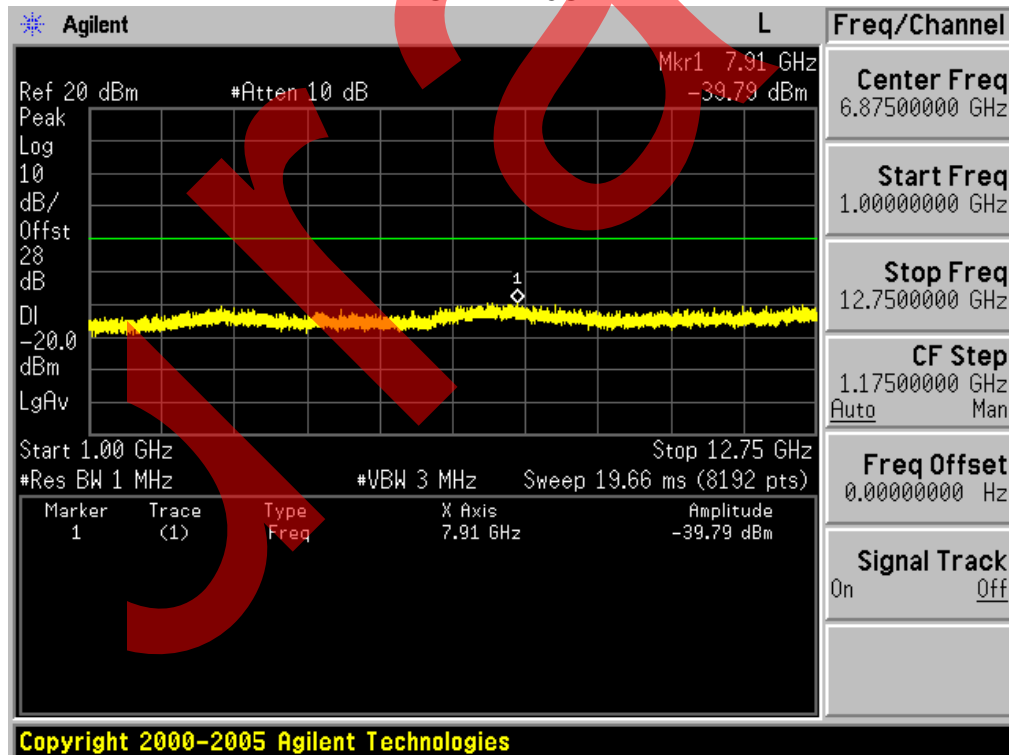
Conduct Spurious Emission (worst) @ 161.610MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



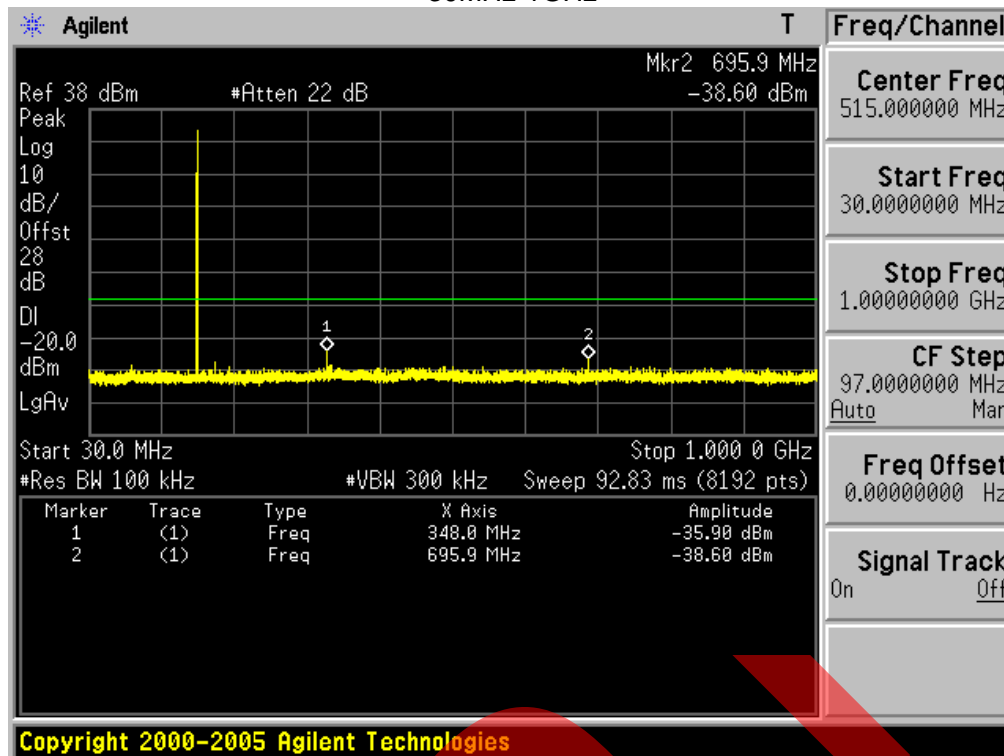
Conducted Spurious Emission (worst) @173.975 MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



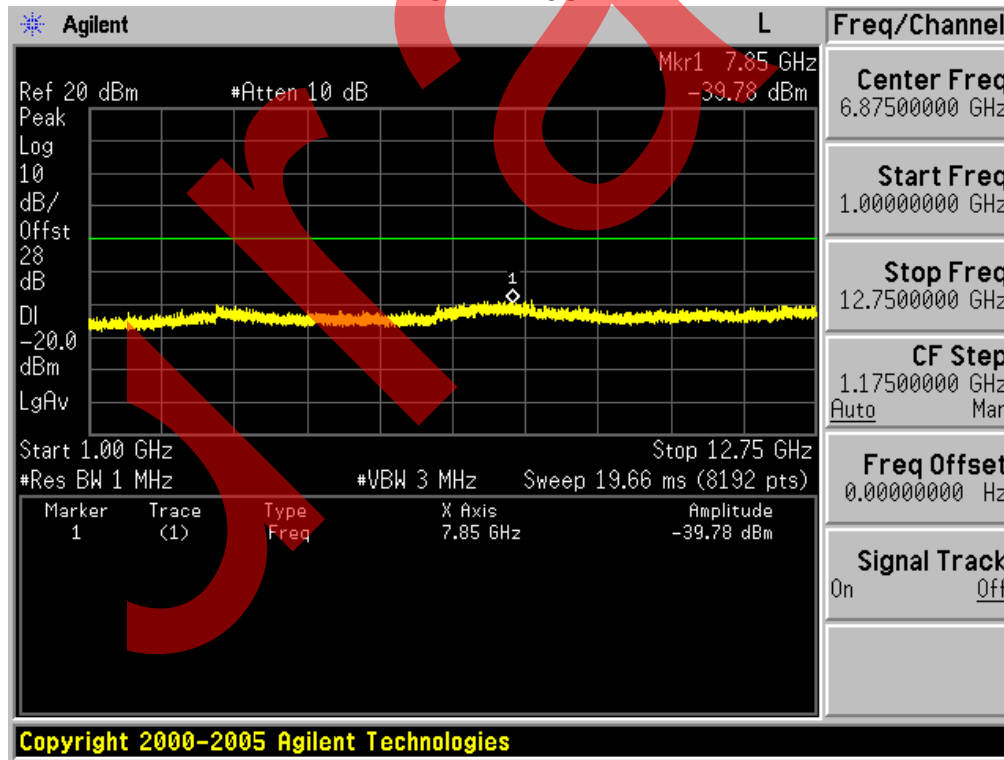
Conduct Spurious Emission (worst) @ 173.975MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



Conducted Spurious Emission (worst) @173.975 MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



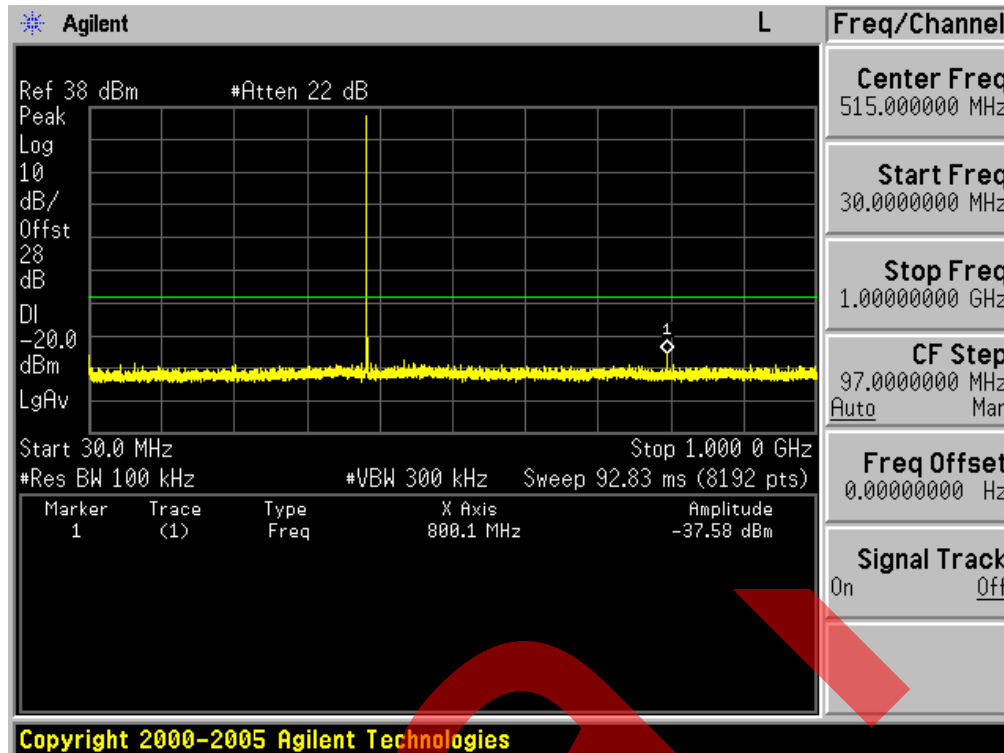
Conduct Spurious Emission (worst) @ 173.975MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



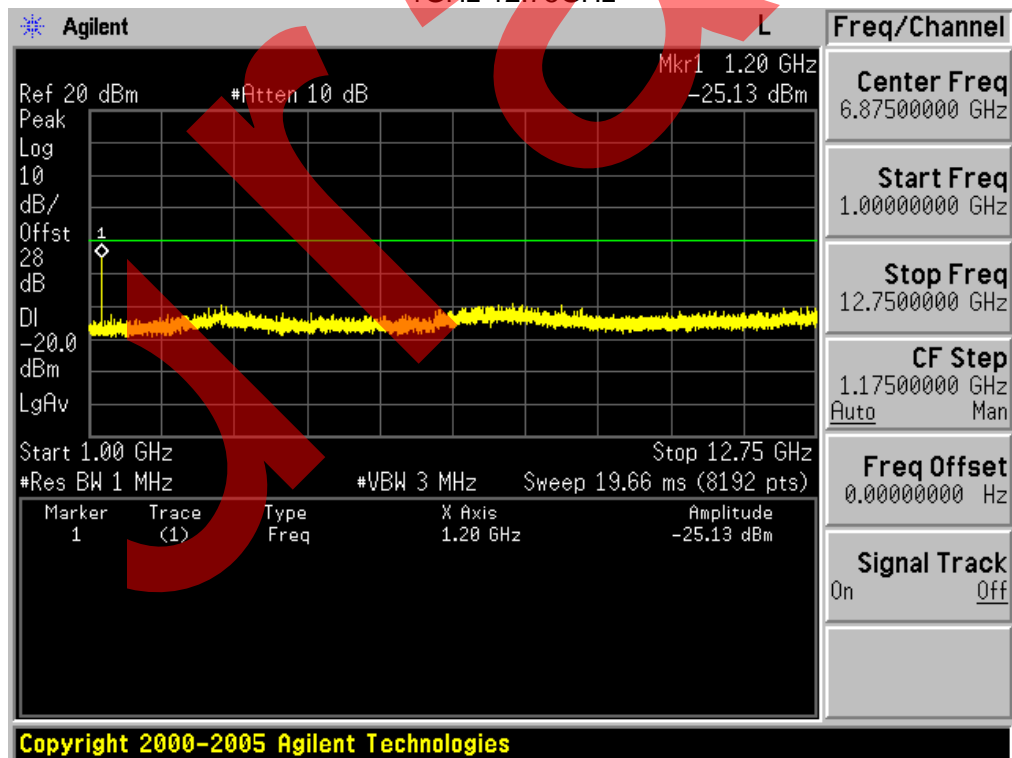
Note: only result the worst case in this part.

UHF:
Analog:

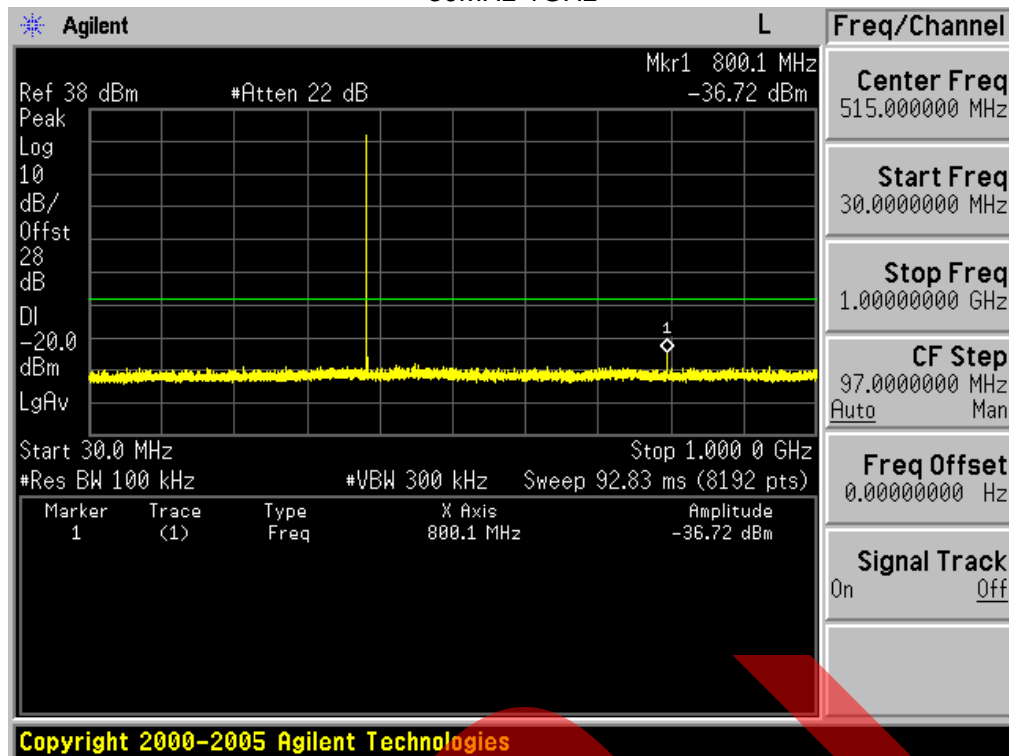
Conducted Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



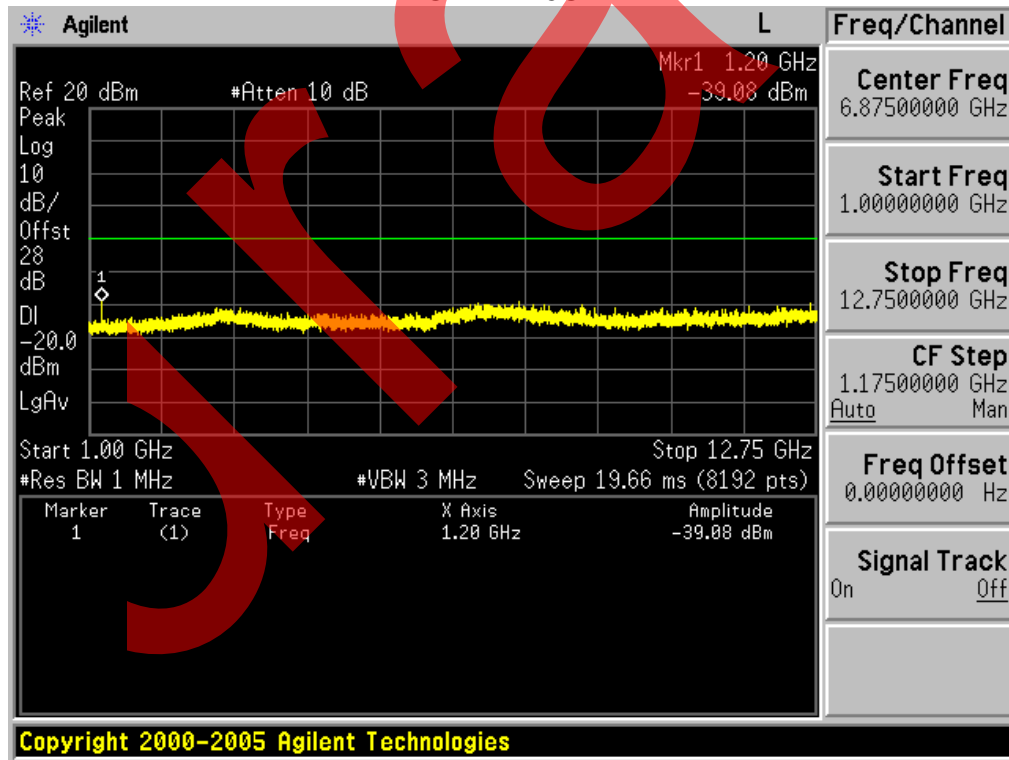
Conduct Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



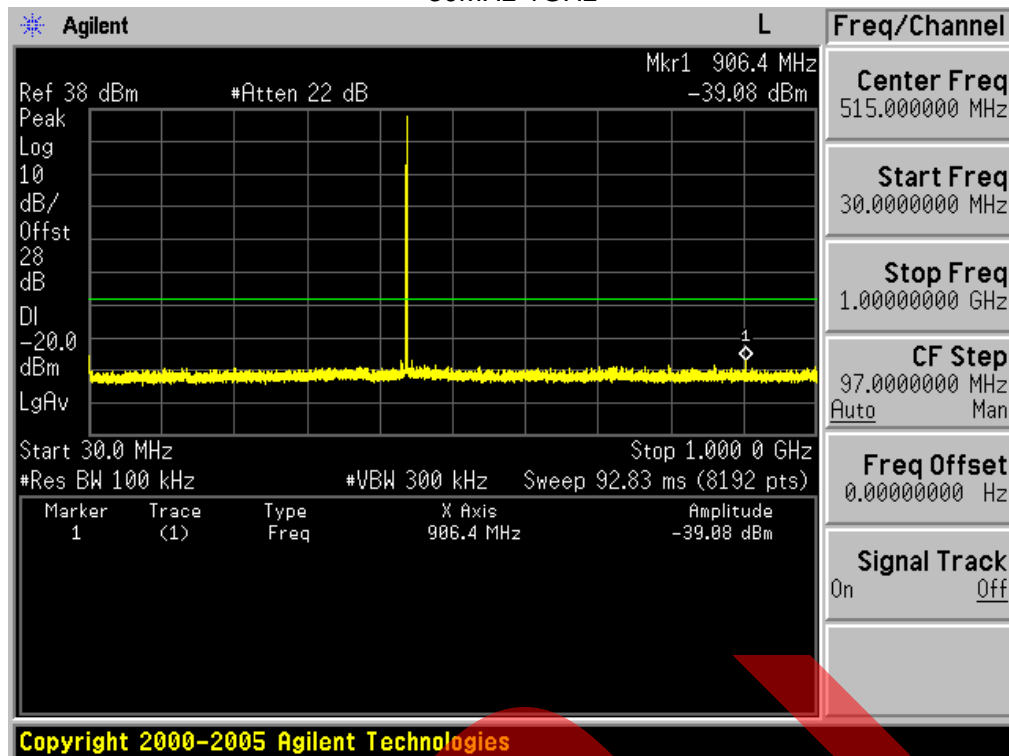
Conducted Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



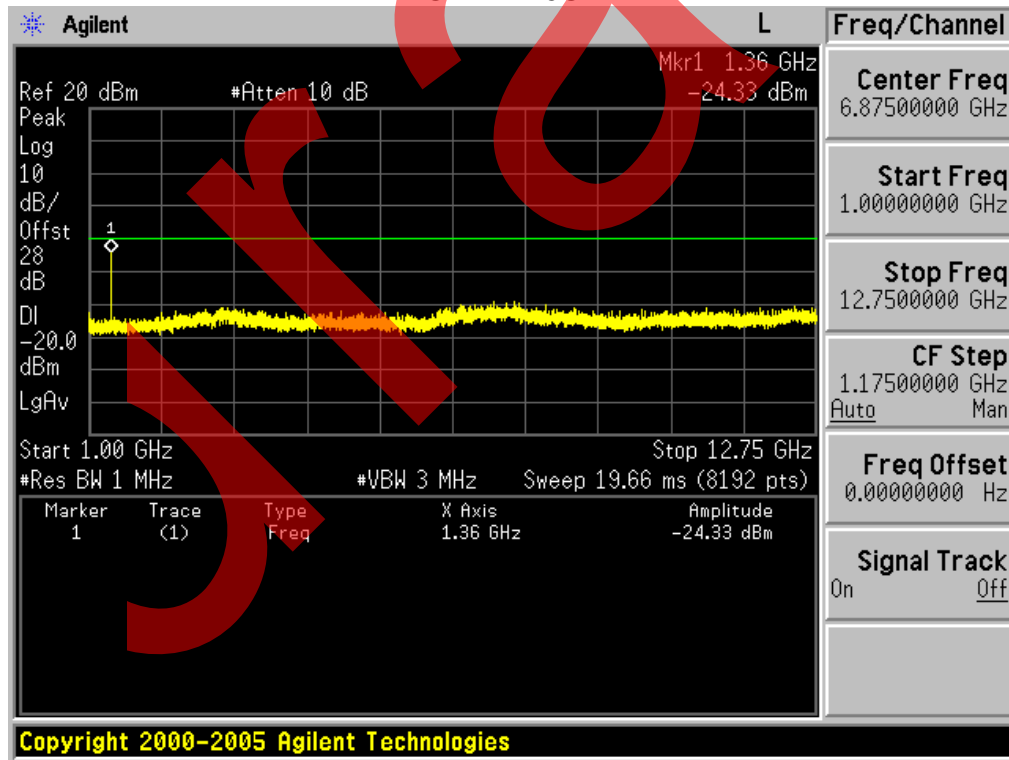
Conduct Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



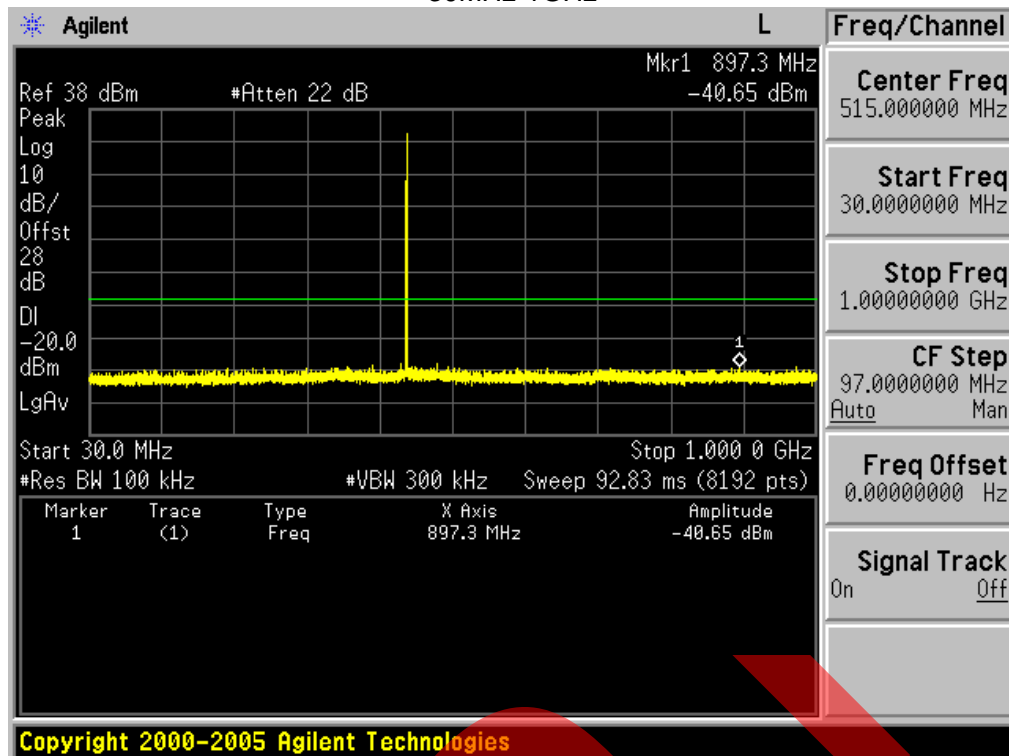
Conducted Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



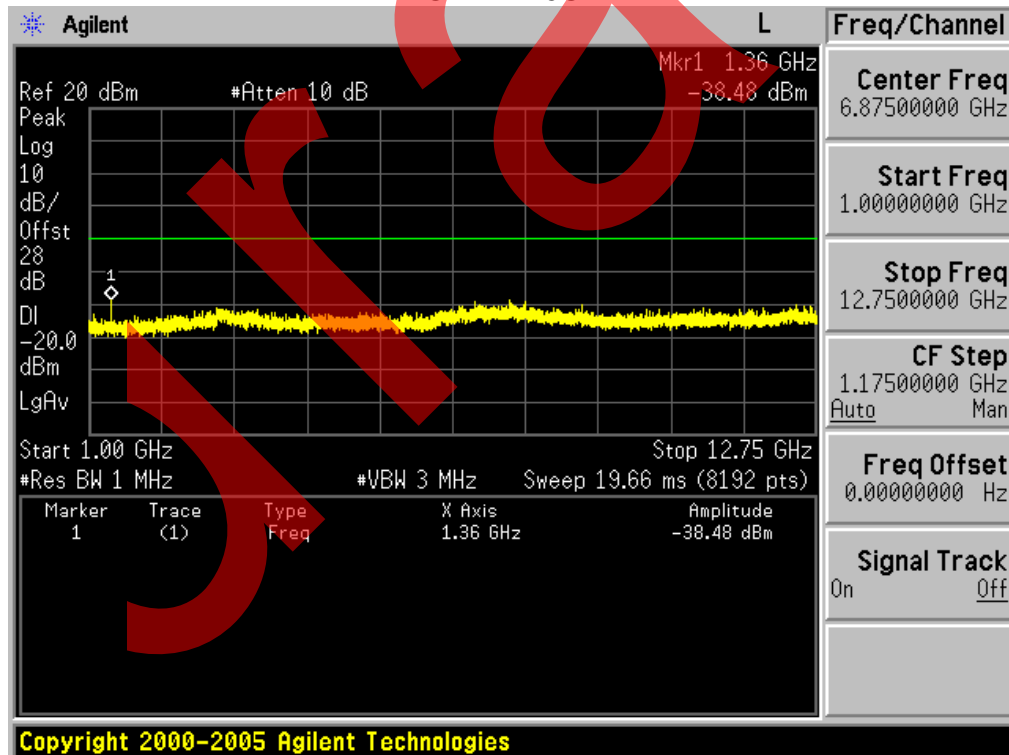
Conduct Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



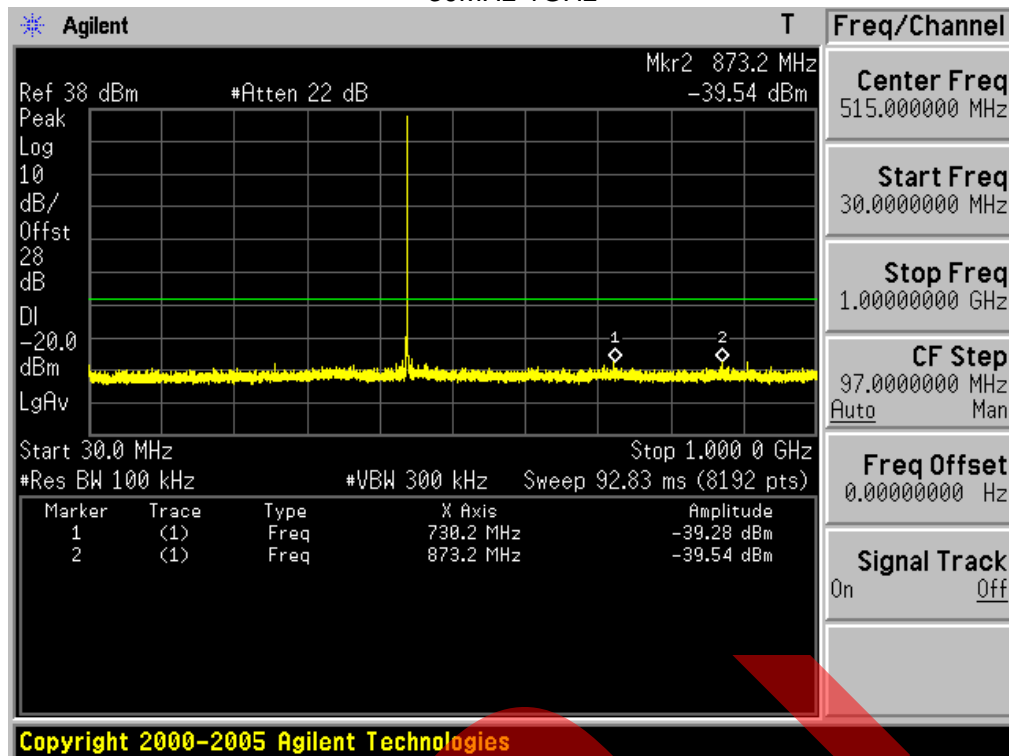
Conducted Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



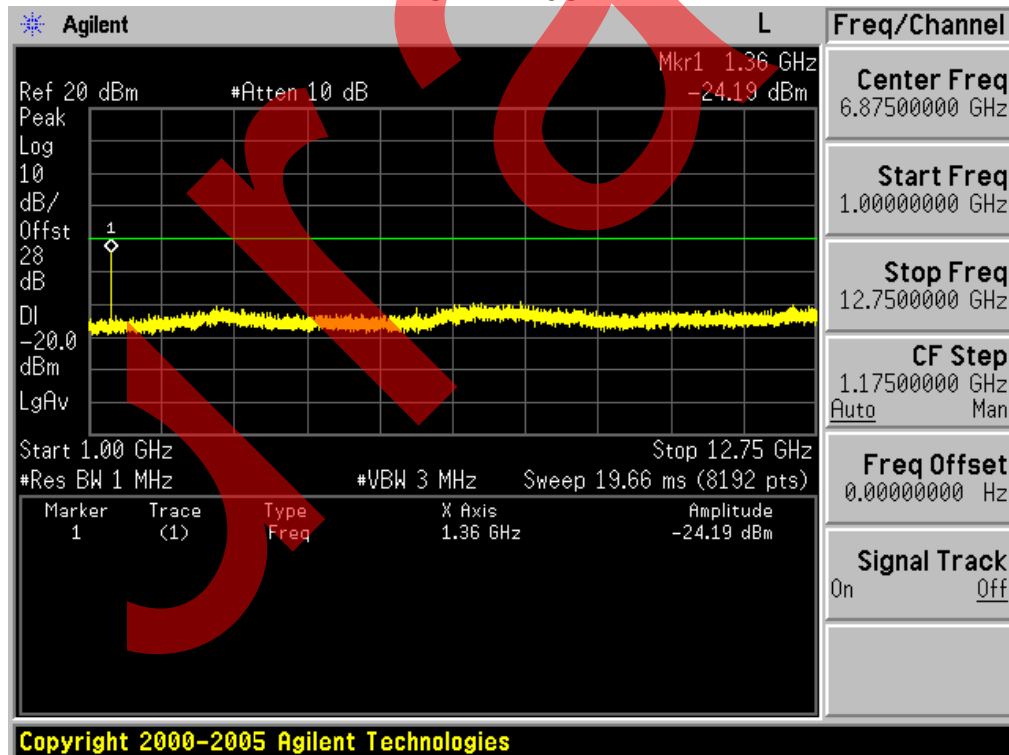
Conduct Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



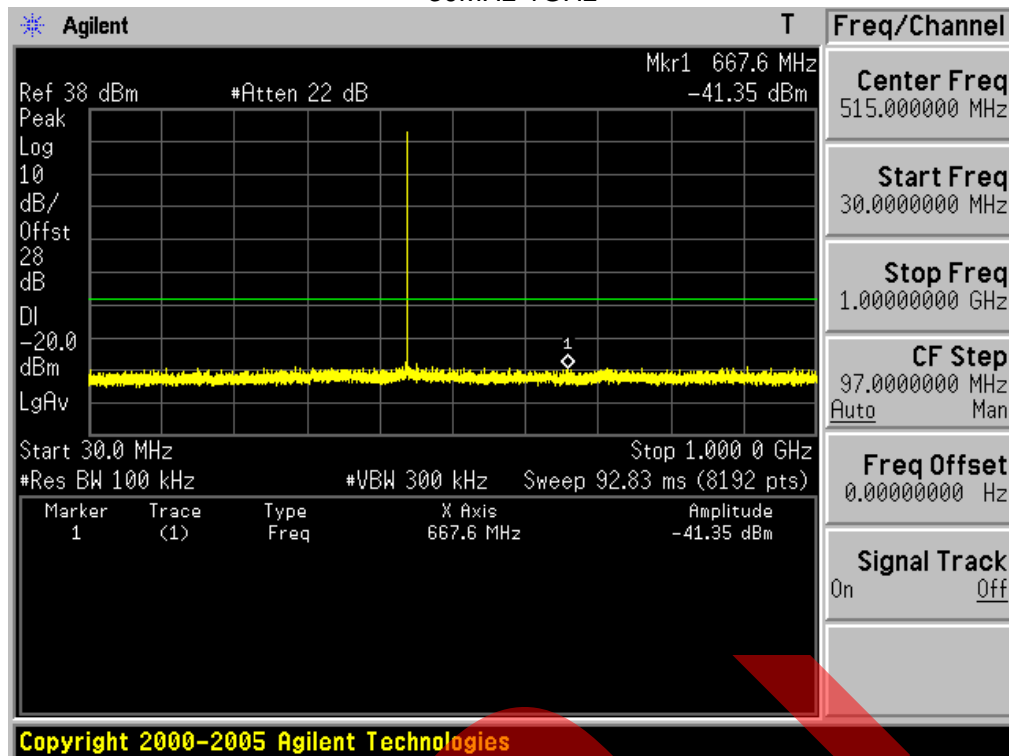
Conducted Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



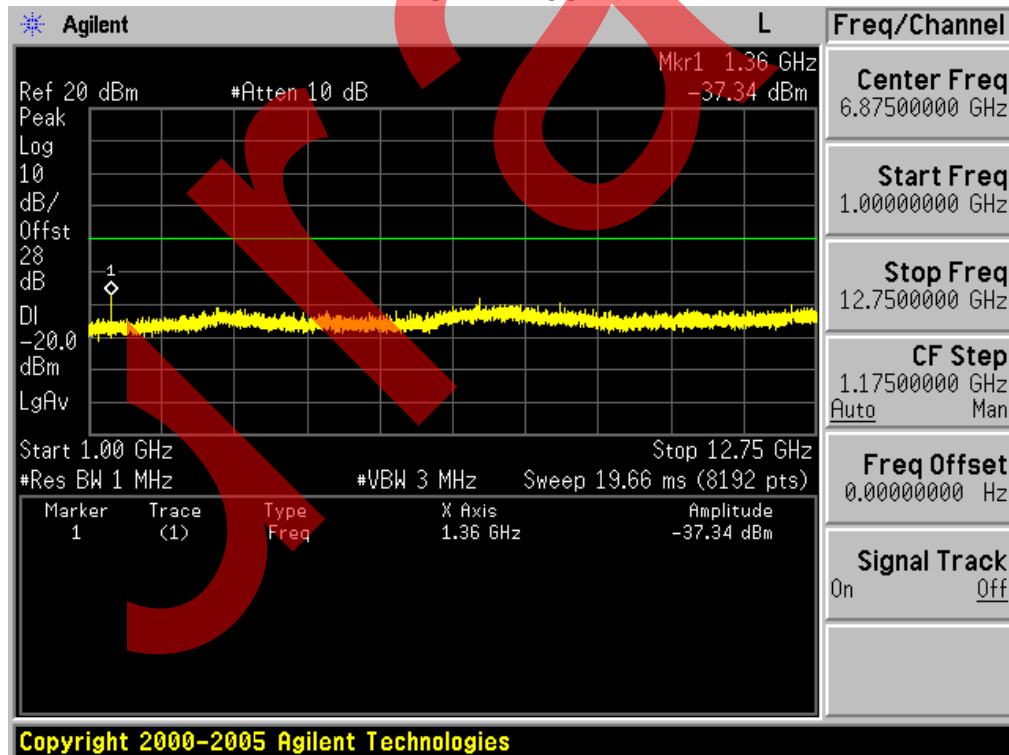
Conduct Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



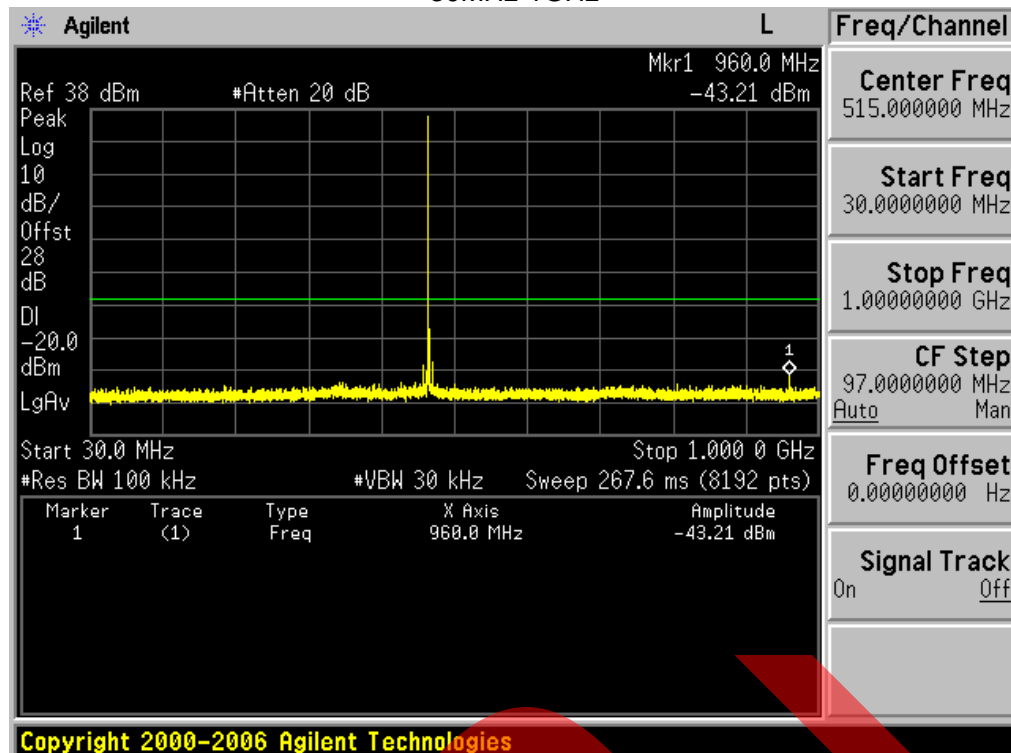
Conducted Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



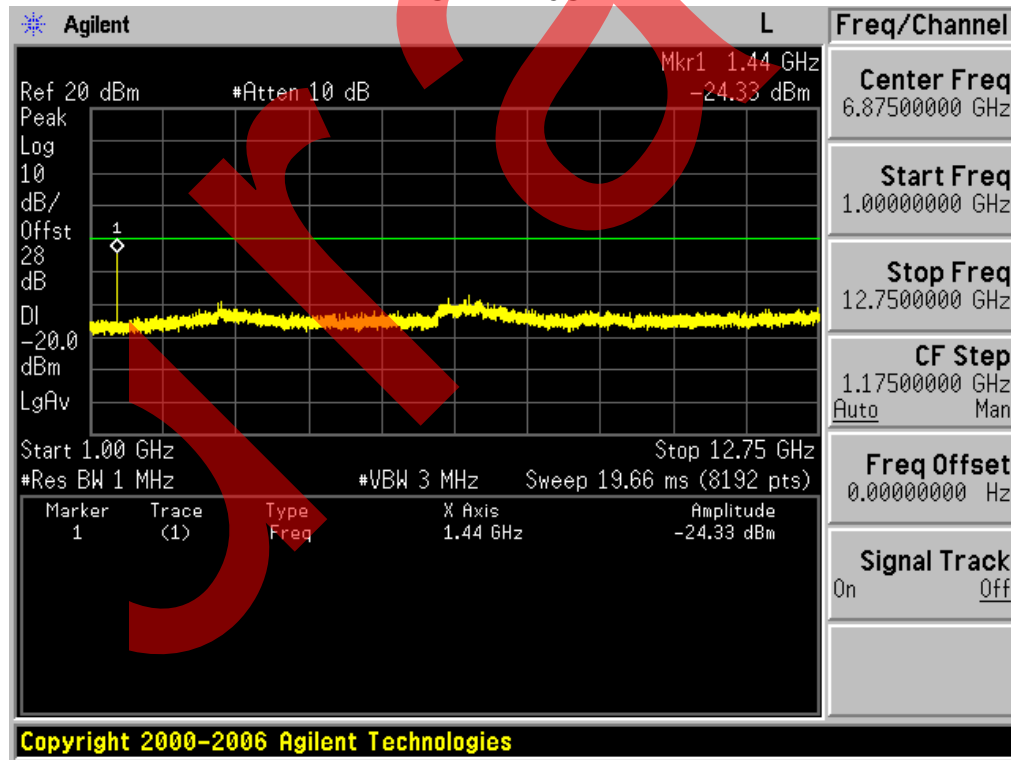
Conduct Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



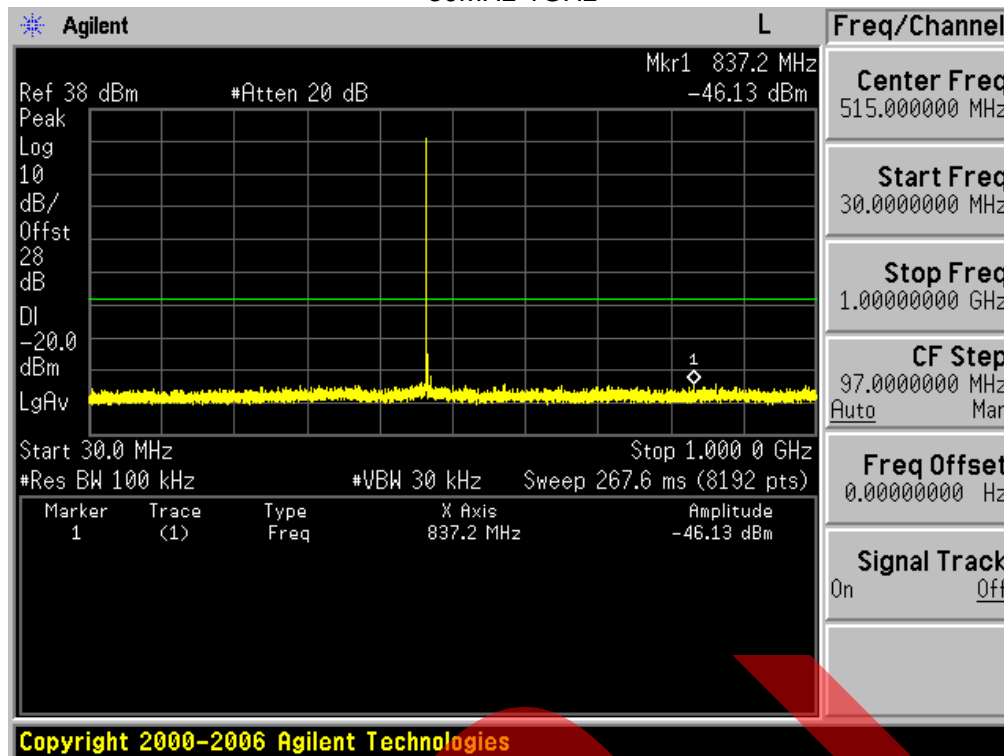
Conducted Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



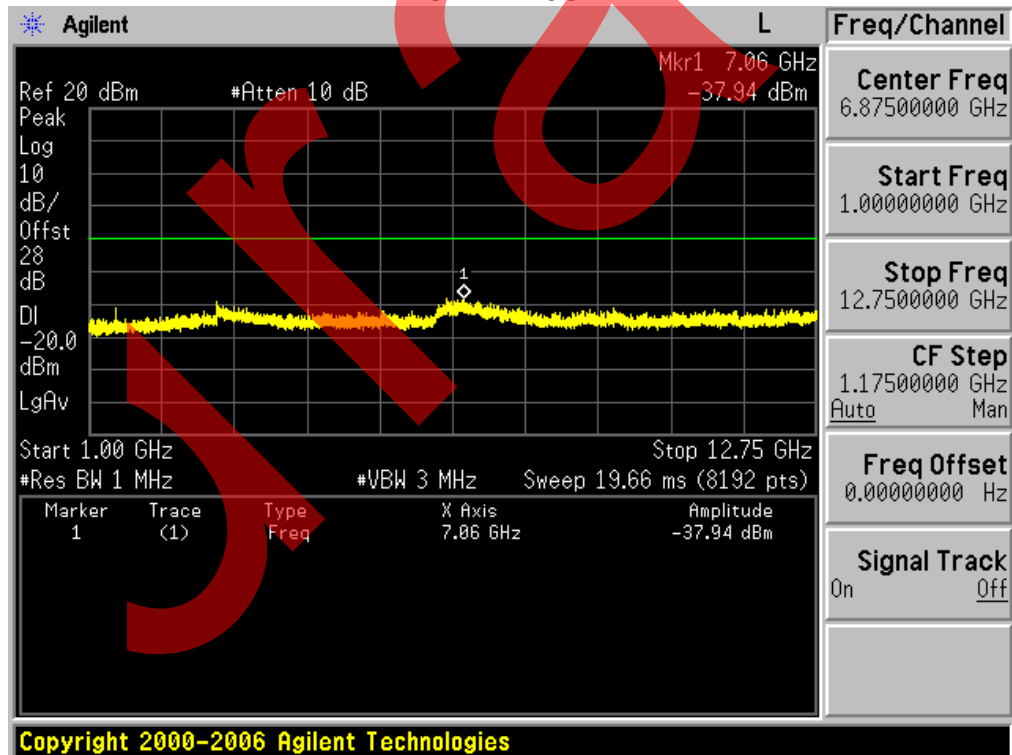
Conduct Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



Conducted Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



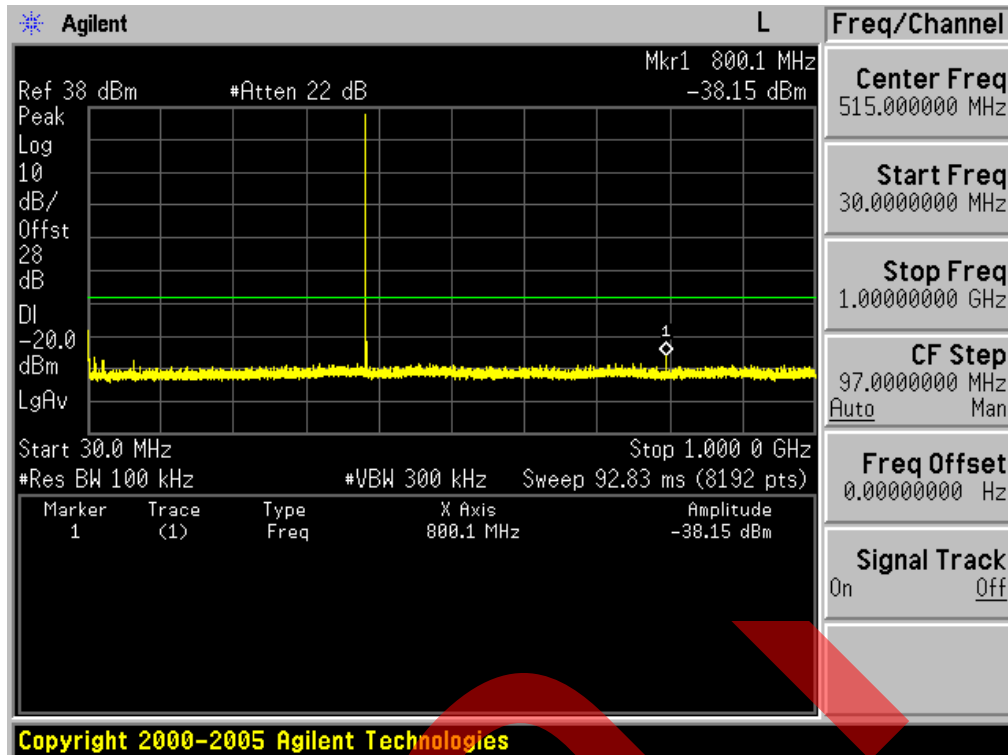
Conduct Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



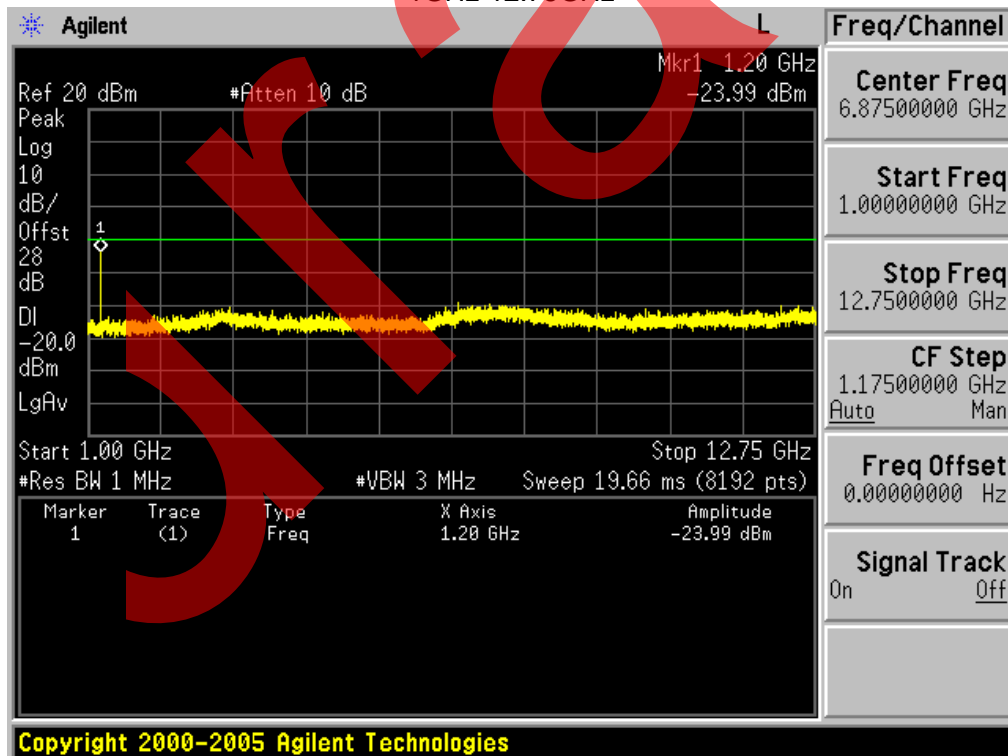
Note: All the test frequencies was tested, but only the worst data be recorded in this part.

Digital:

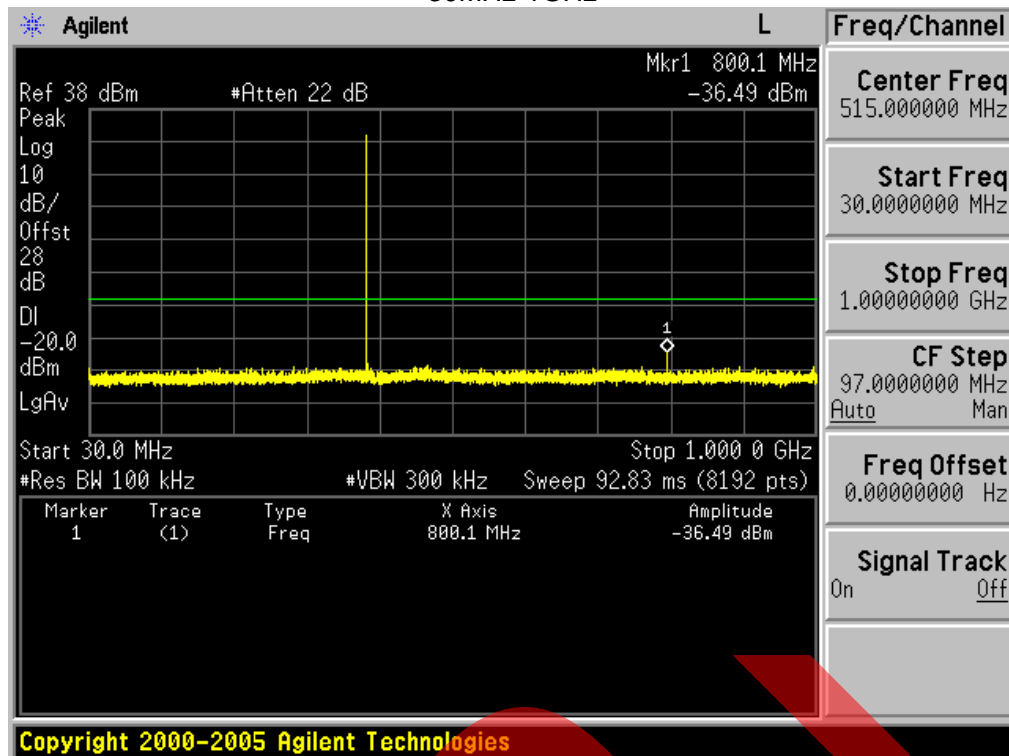
Conducted Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



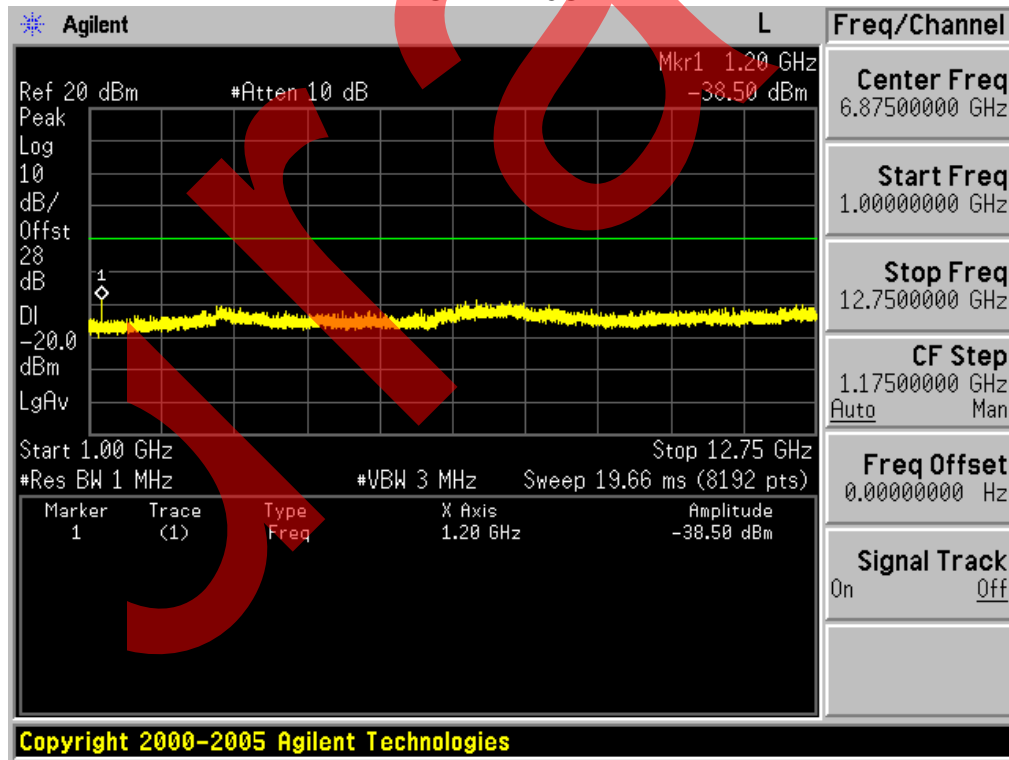
Conduct Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



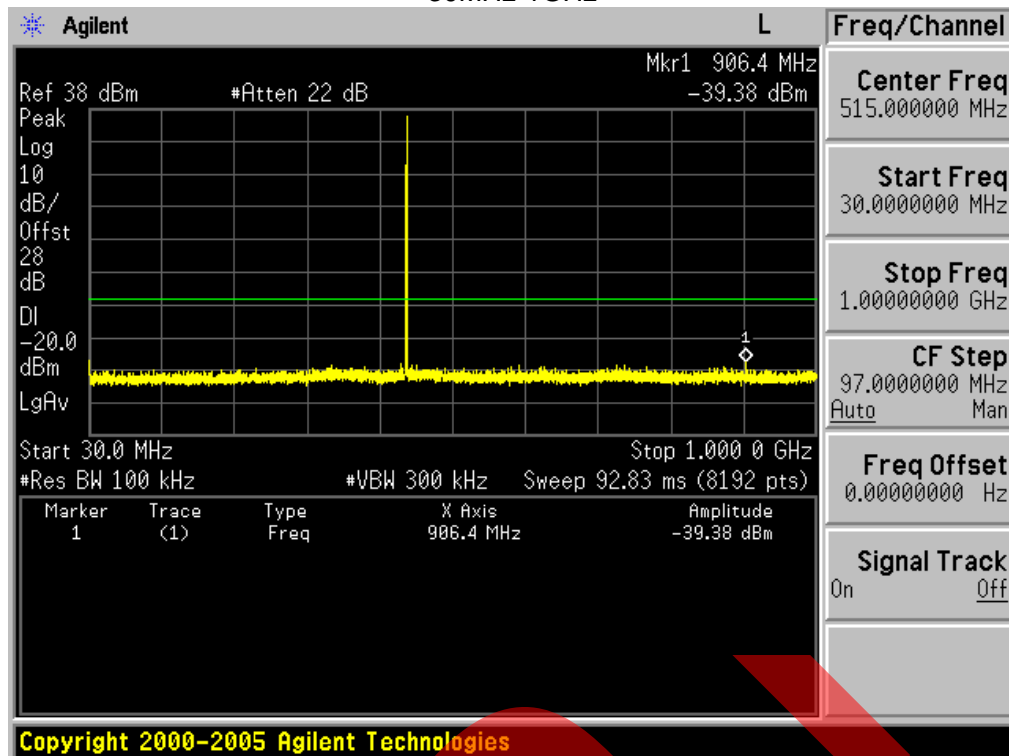
Conducted Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



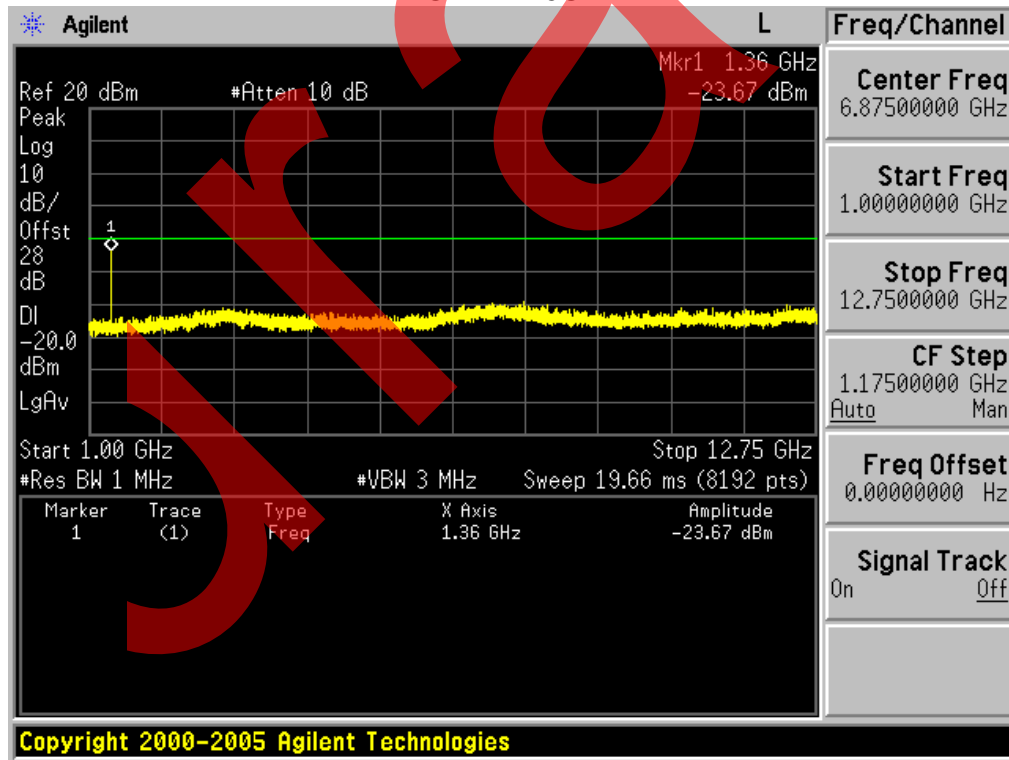
Conduct Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



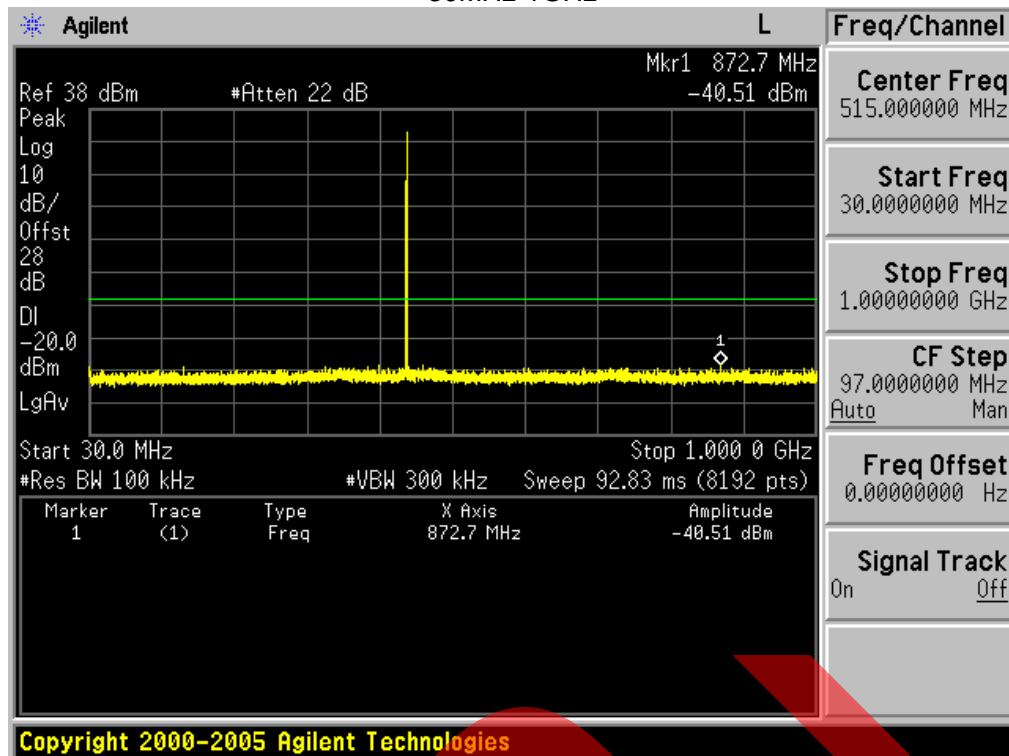
Conducted Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



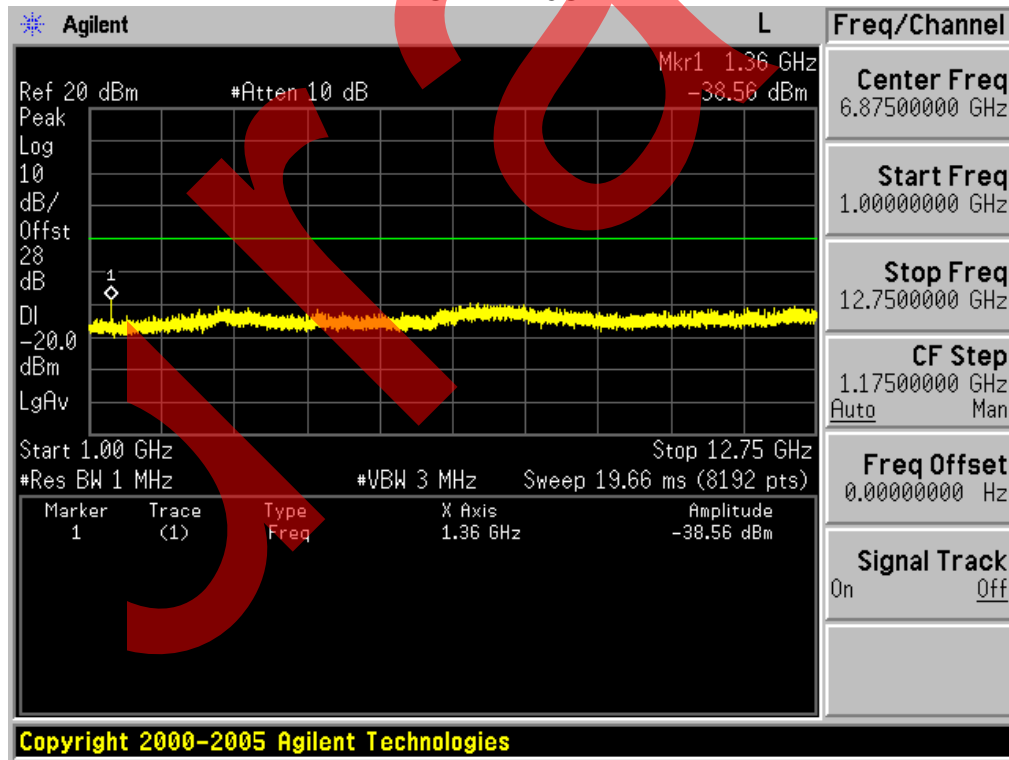
Conduct Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



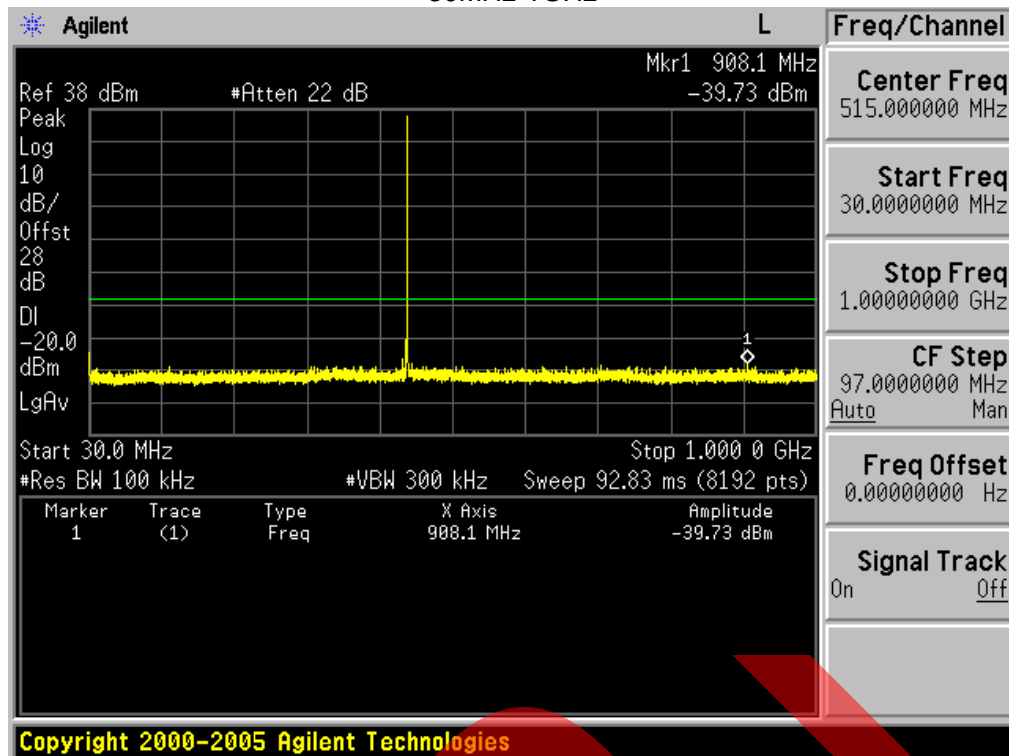
Conducted Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



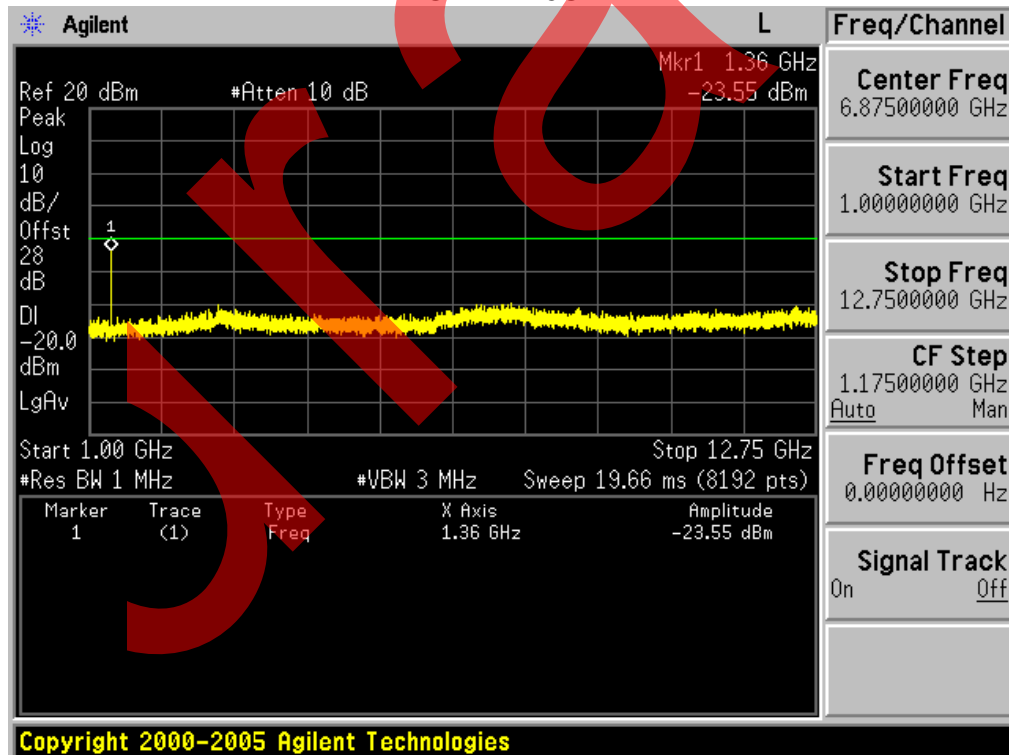
Conduct Spurious Emission (worst) @ 453.225MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



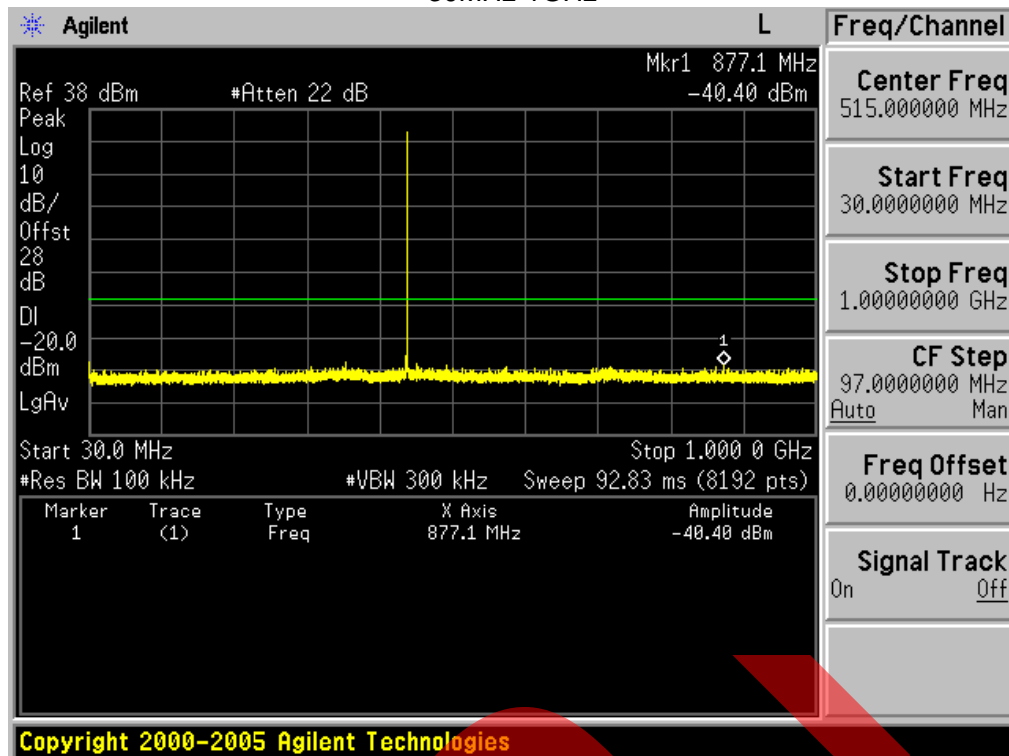
Conducted Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



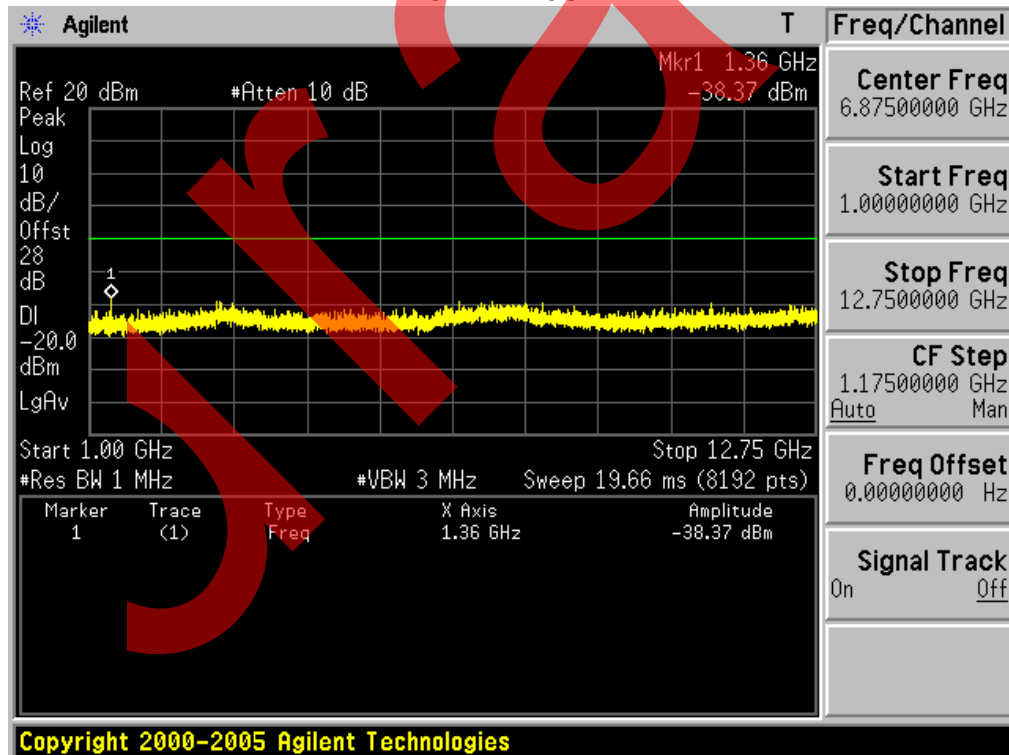
Conduct Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



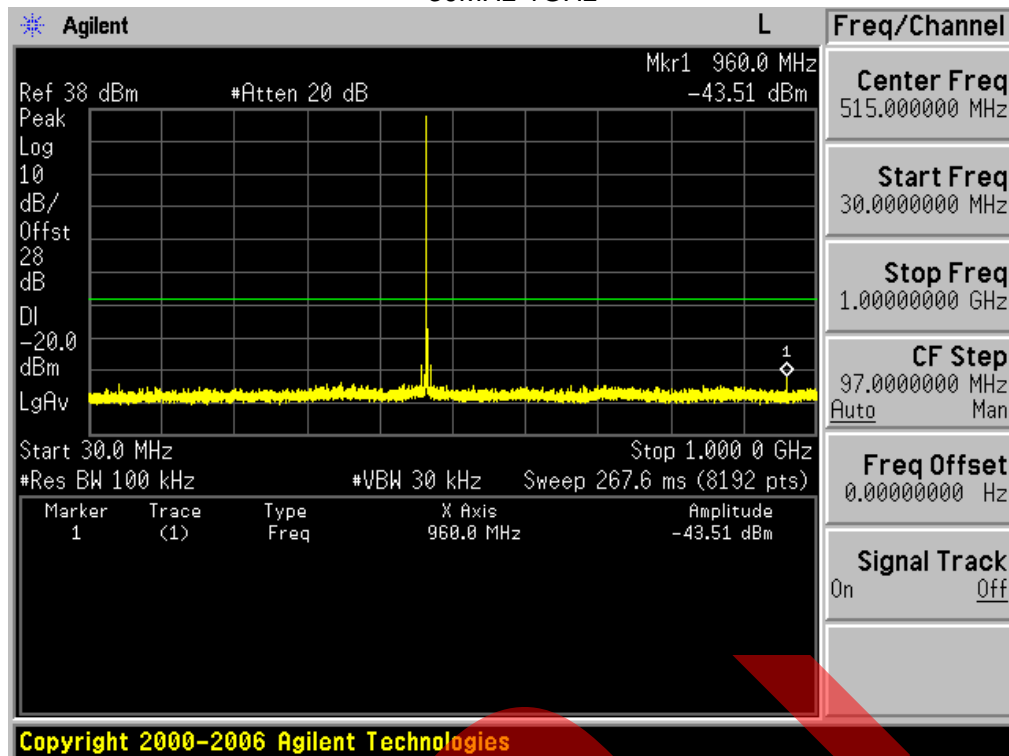
Conducted Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



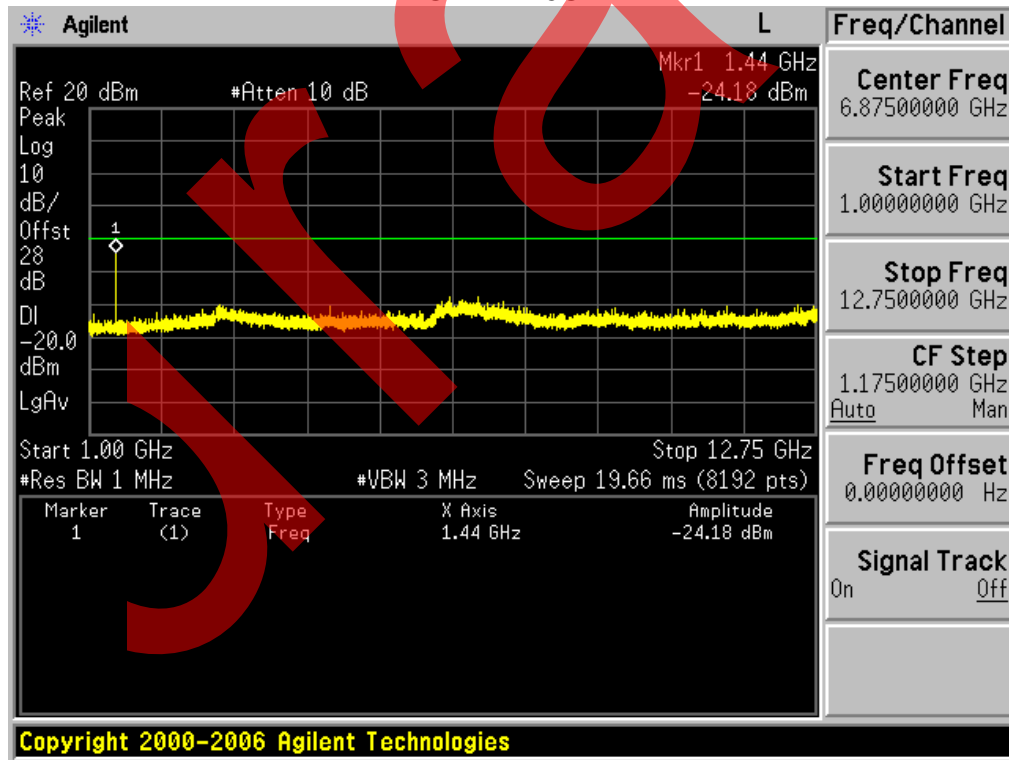
Conduct Spurious Emission (worst) @ 454.025MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



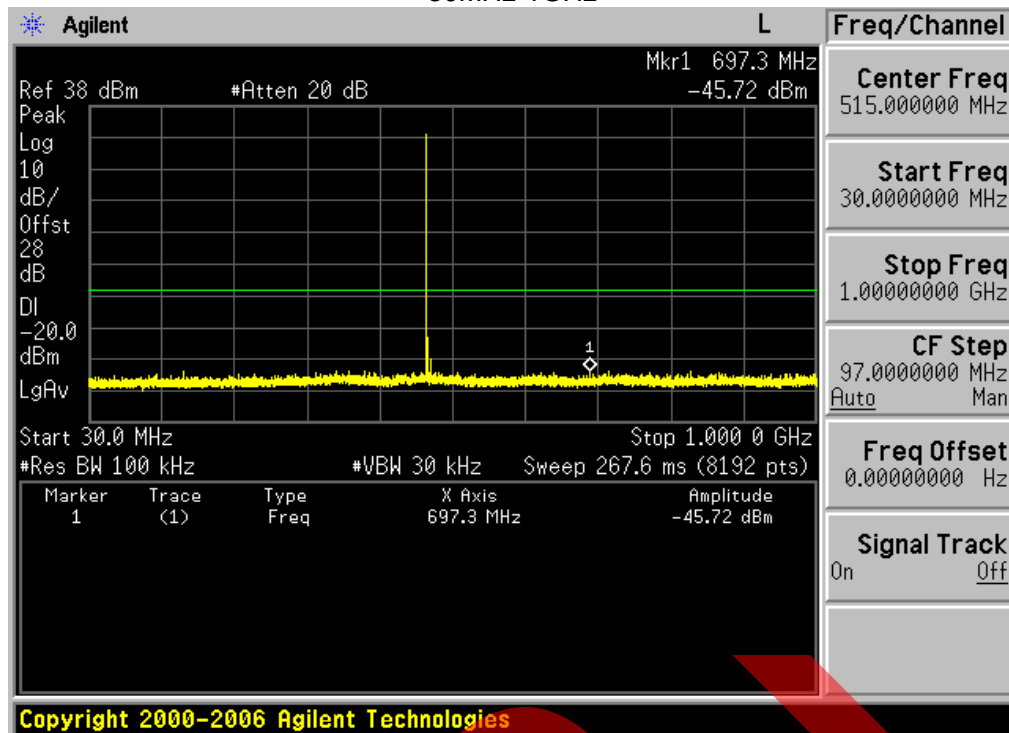
Conducted Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-5W
30MHz-1GHz



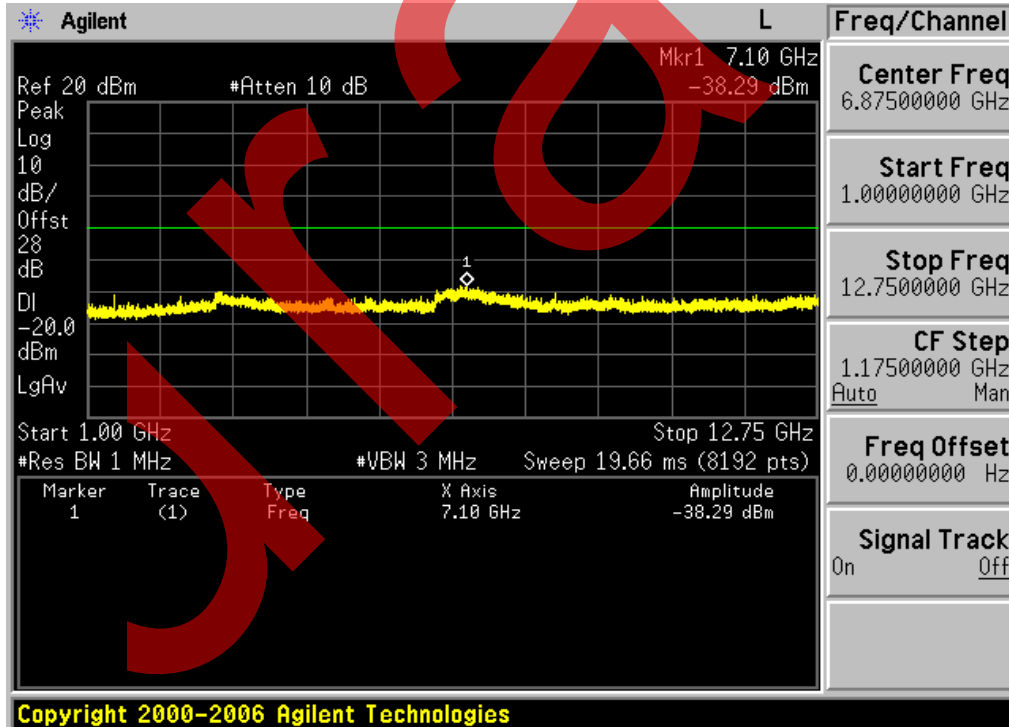
Conduct Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-5W
1GHz-12.75GHz



Conducted Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-1W
30MHz-1GHz



Conduct Spurious Emission (worst) @ 479.975MHz With 12.5 KHz Channel Separation-1W
1GHz-12.75GHz



Note:

1. In this case, Part 22 (-13 dBm) is less than the limit of Part 90 (-20 dBm), so we do not need to test Part 22, which meets the spurious limits of PART 90+22.
2. All the test frequencies was tested, but only the worst data be recorded in this part.

12. TRANSMITTER FREQUENCY BEHAVIOR

12.1 PROVISIONS APPLICABLE

FCC §90.214

Time intervals ^{1, 2}	Maximum frequency difference ³	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t ₁ ⁴	± 25.0 kHz	5.0 ms	10.0 ms
t ₂	± 12.5 kHz	20.0 ms	25.0 ms
t ₃ ⁴	± 25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t ₁ ⁴	± 12.5 kHz	5.0 ms	10.0 ms
t ₂	± 6.25 kHz	20.0 ms	25.0 ms
t ₃ ⁴	± 12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t ₁ ⁴	± 6.25 kHz	5.0 ms	10.0 ms
t ₂	± 3.125 kHz	20.0 ms	25.0 ms
t ₃ ⁴	± 6.25 kHz	5.0 ms	10.0 ms

¹ t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on} .

t_2 is the time period immediately following t_1 .

t_3 is the time period from the instant when the transmitter is turned off until t_{off} .

t_{off} is the instant when the 1 kHz test signal starts to rise.

² During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in §90.213.

³ Difference between the actual transmitter frequency and the assigned transmitter frequency.

⁴ If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

12.2 TEST METHOD

TIA/EIA-603 2.2.19.3

12.3 DESCRIBE LIMIT LINE OF TRANSMITTER FREQUENCY BEHAVIOR

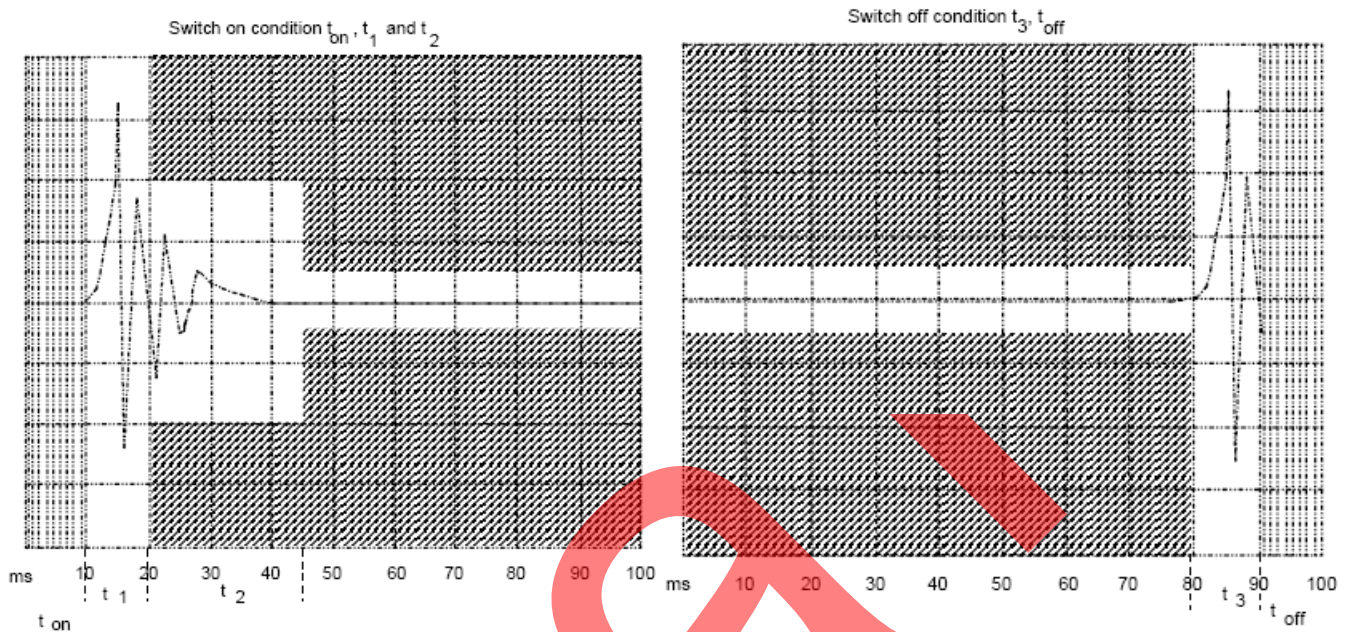
ton: The switch-on instant t_{on} of a transmitter is defined by the condition when the output power, measured at the antenna terminal, exceeds 0,1 % of the full output power (-30 dBc).

t1: period of time starting at t_{on} and finishing according to above 11.1

t2: period of time starting at the end of t_1 and finishing according to above 11.1

toff: switch-off instant defined by the condition when the output power falls below 0,1 % of the full output power (-30 dBc).

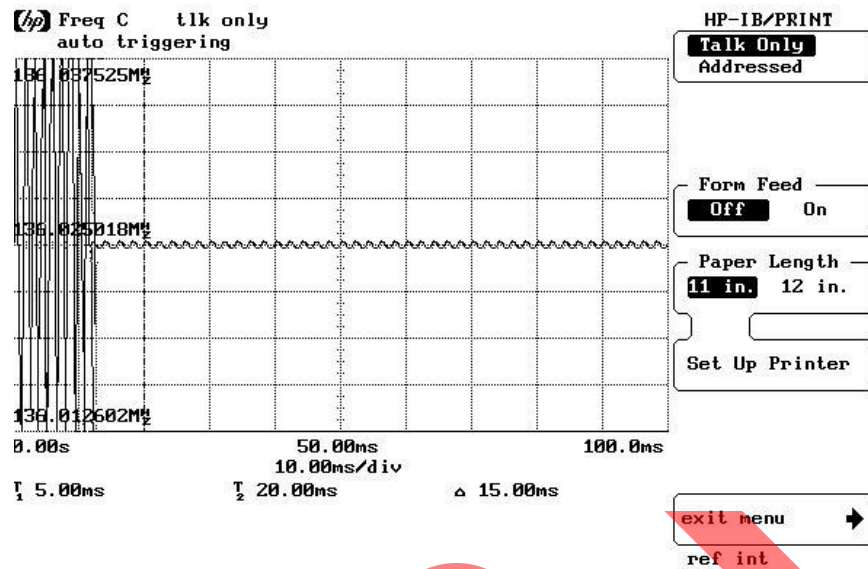
t3: period of time that finishing at t_{off} and starting according to above 11.1



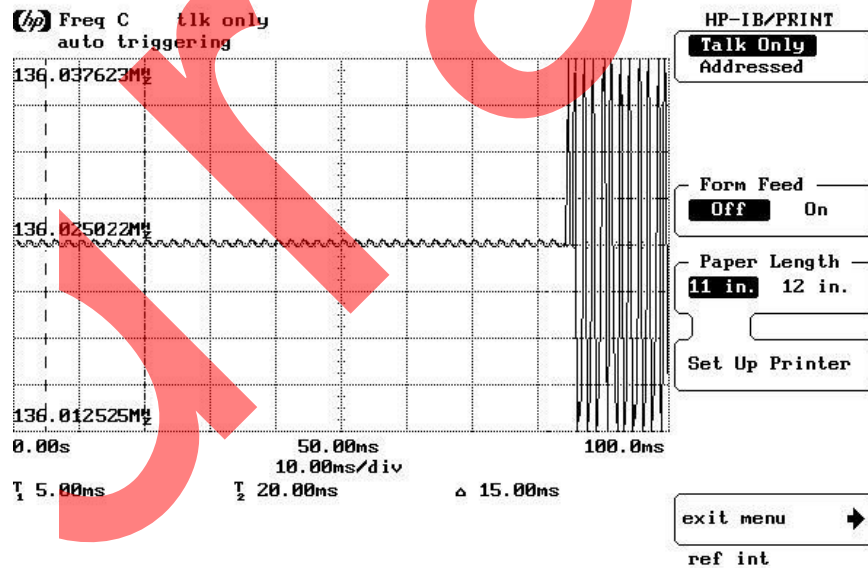
12.4 MEASURE RESULT

VHF:

Transmitter Frequency Behavior @ 12.5 KHz Channel Separation--Off to On

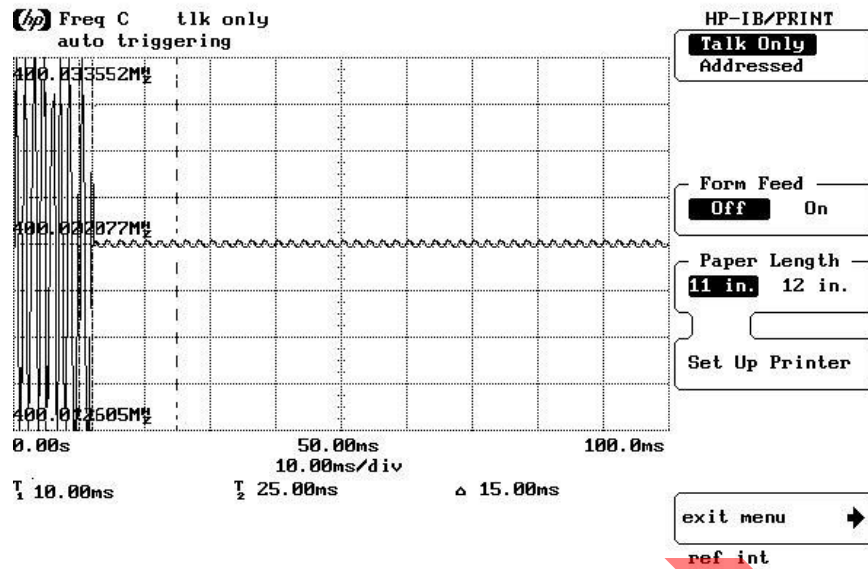


Transmitter Frequency Behavior @ 12.5 KHz Channel Separation--On to Off

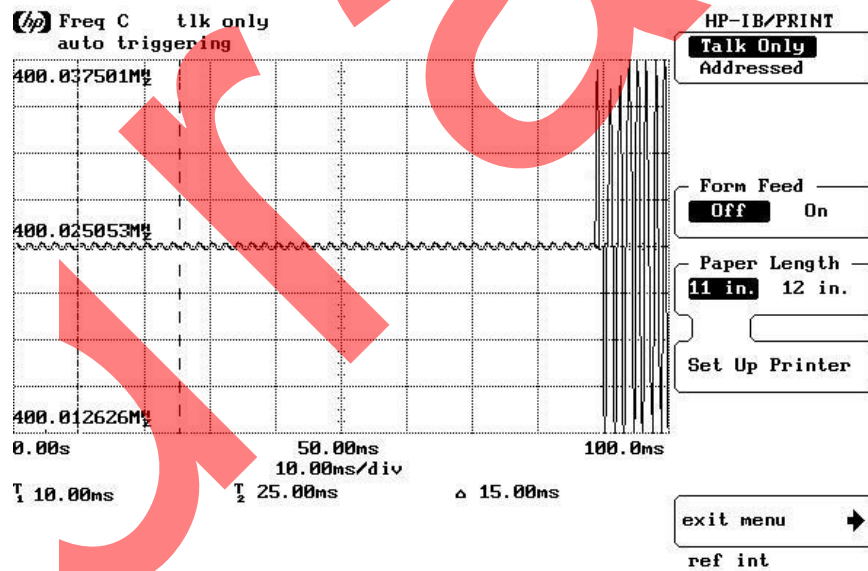


UHF:

Transmitter Frequency Behavior @ 12.5 KHz Channel Separation--Off to On



Transmitter Frequency Behavior @ 12.5 KHz Channel Separation--On to Off



13. AUDIO LOW PASS FILTER RESPONSE

13.1.TEST LIMITS

2.1047(a): Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

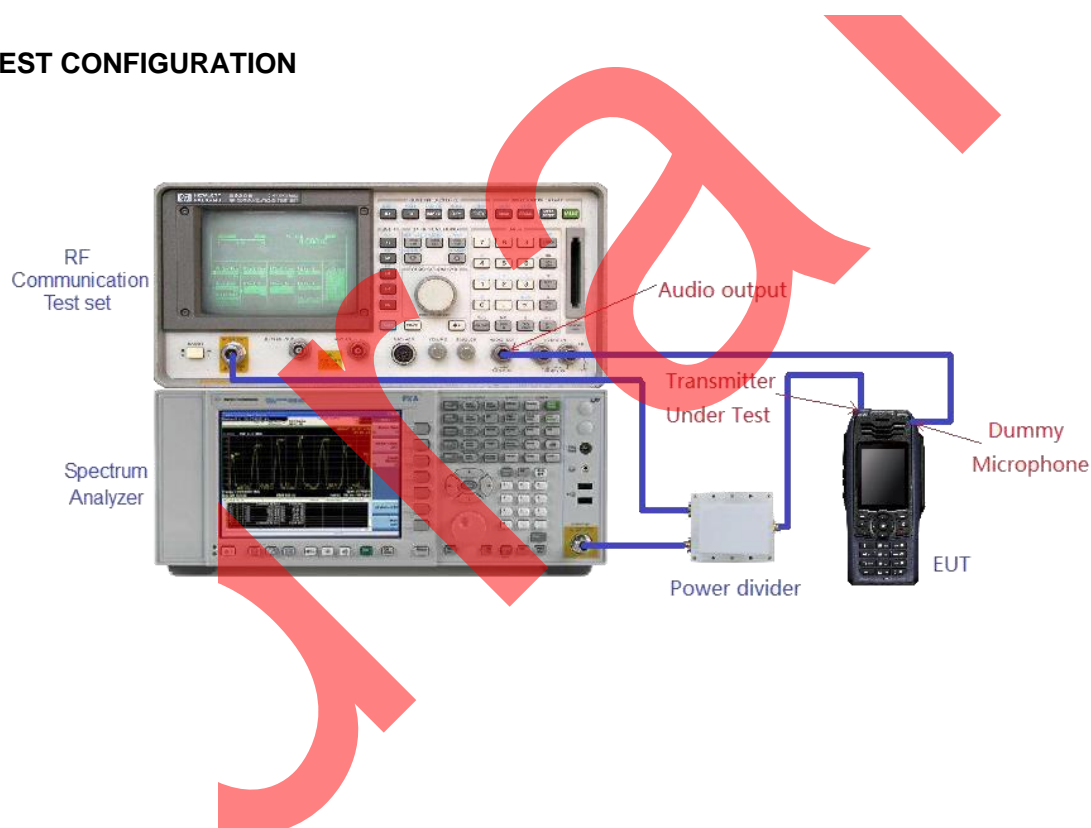
90.242(b)(8): Recommended audio filter attenuation characteristics are given below:

Audio band	Minimum Attenuation Rel. to 1 KHz Attenuation
3 –20 KHz	$60 \log_{10}(f/3)$ dB where f is in KHz
20 – 30 KHz	50dB

13.2. METHOD OF MEASUREMENTS

The rated audio input signal was applied to the input of the audio low-pass filter (or of all modulation stages) using an audio oscillator, this input signal level and its corresponding output signal were then measured and recorded using the FFT Digital Spectrum Analyzer. Tests were repeated at different audio signal frequencies from 0 to 50 KHz.

13.3.TEST CONFIGURATION

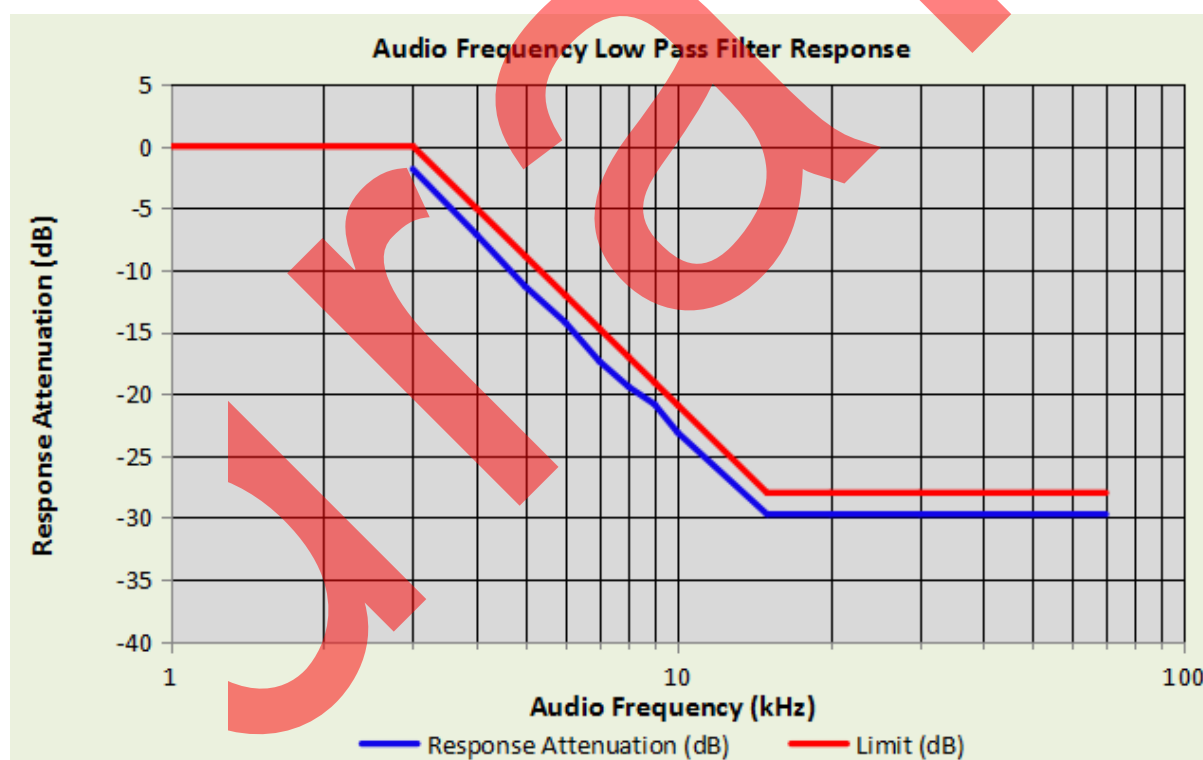


13.4.MEASURE RESULT

Analog:

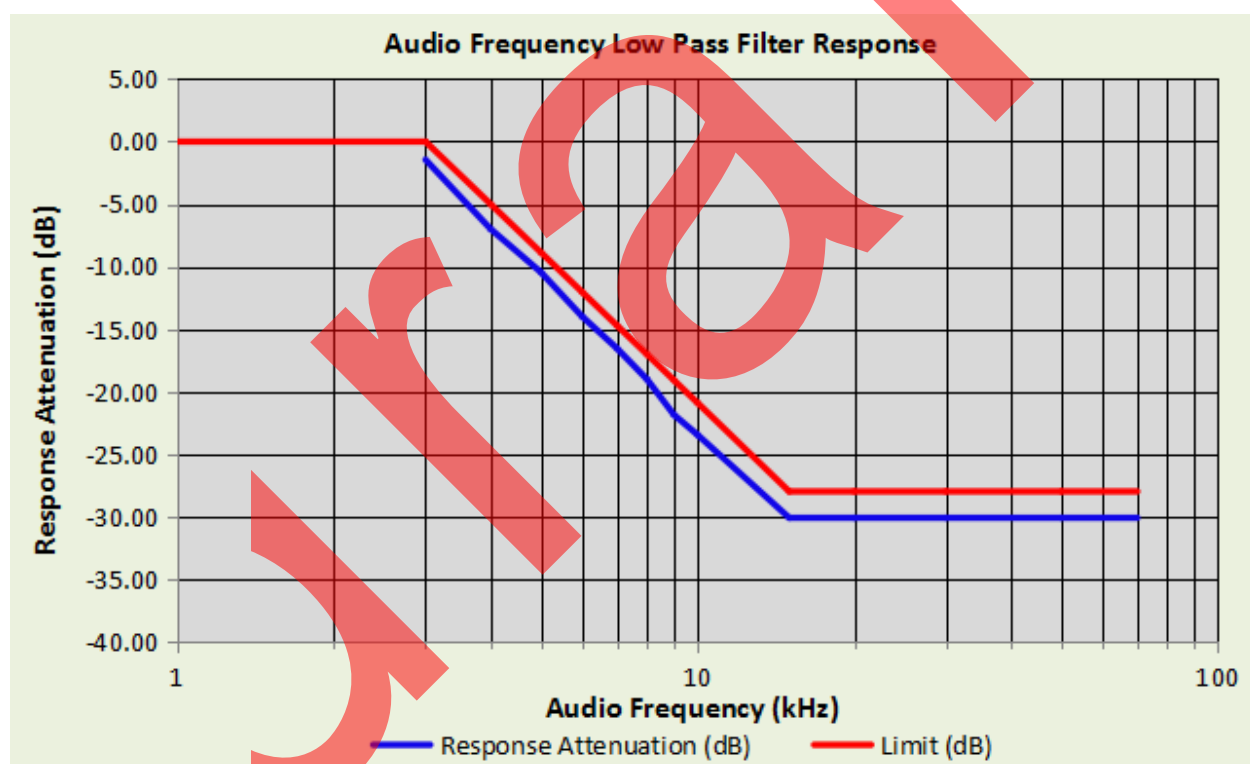
12.5 KHZ CHANNEL SPACING, F3E, FREQUENCY OF ALL MODULATION STATES (TEST RESULT FOR UHF)-5W

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1	0	/
3	-1.85	0.00
4	-7.11	-5.00
5	-11.33	-8.87
6	-14.24	-12.04
7	-17.37	-14.72
8	-19.44	-17.04
9	-20.85	-19.08
10	-23.14	-20.92
15	-29.73	-28.00
20	-29.73	-28.00
30	-29.73	-28.00
50	-29.73	-28.00
70	-29.73	-28.00

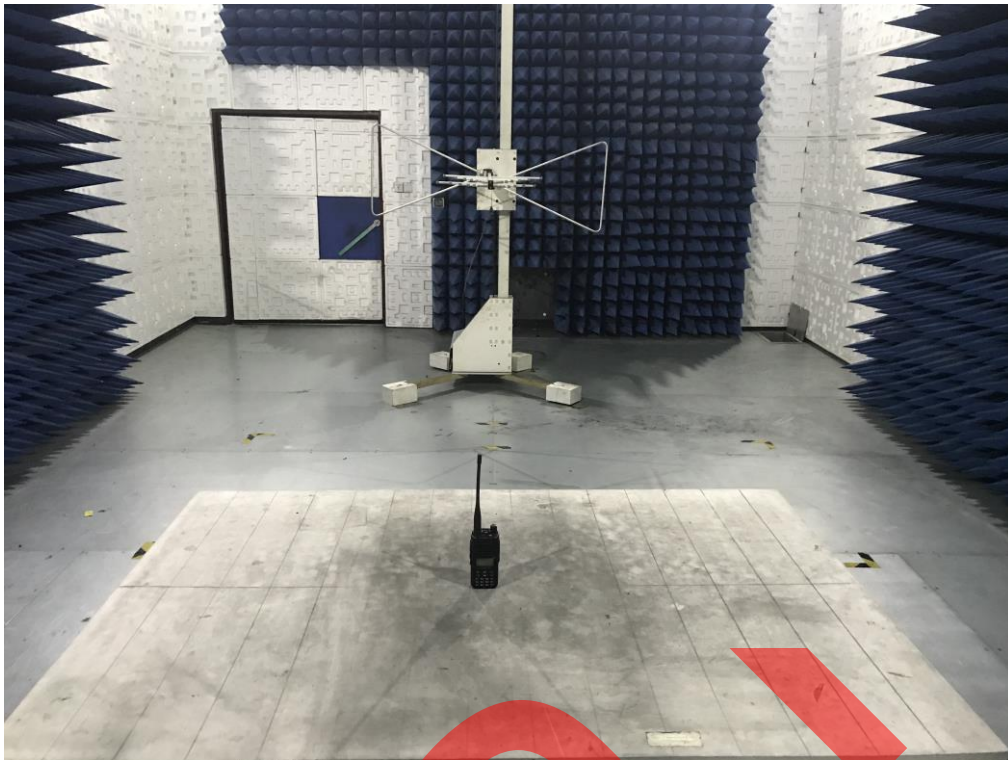


12.5 KHZ CHANNEL SPACING, F3E, FREQUENCY OF ALL MODULATION STATES (TEST RESULT FOR VHF)-5W

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1	0	/
3	-1.45	0.00
4	-6.99	-5.00
5	-10.46	-8.87
6	-14.00	-12.04
7	-16.55	-14.72
8	-19.04	-17.04
9	-21.85	-19.08
10	-23.47	-20.92
15	-30.11	-28.00
20	-30.11	-28.00
30	-30.11	-28.00
50	-30.11	-28.00
70	-30.11	-28.00



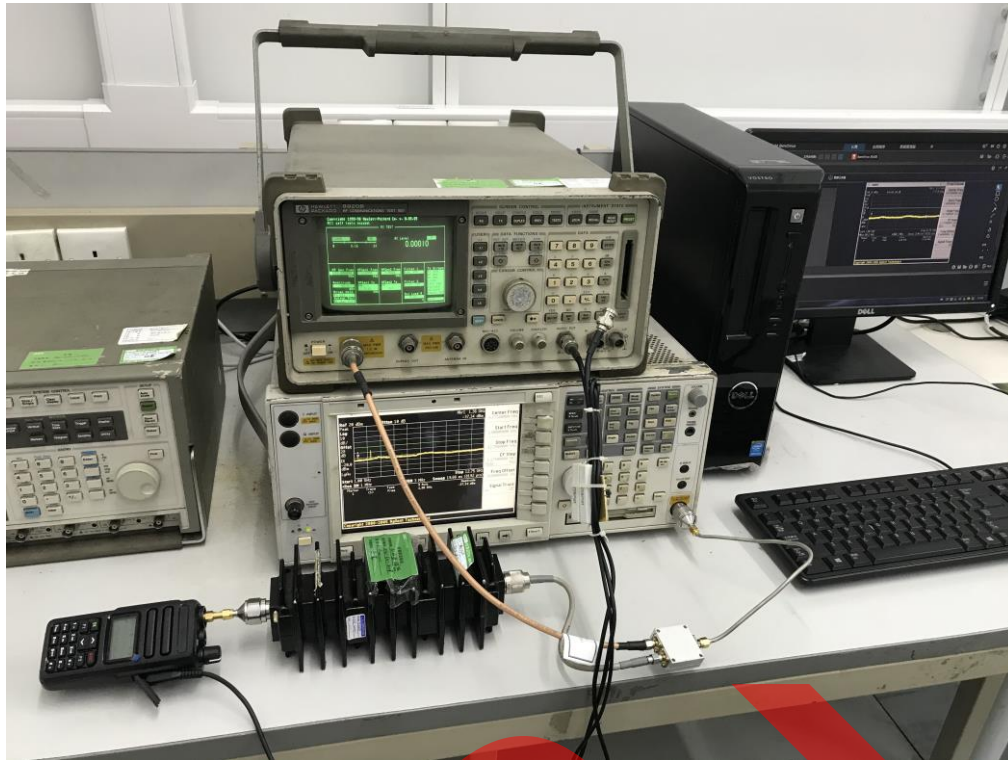
APPENDIX I: PHOTOGRAPHS OF SETUP
RADIATED EMISSION TEST SETUP



RADIATED EMISSION ABOVE 1G TEST SETUP



CONDUCTED TEST SETUP



APPENDIX II: EXTERNAL VIEW OF EUT

WHOLE VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



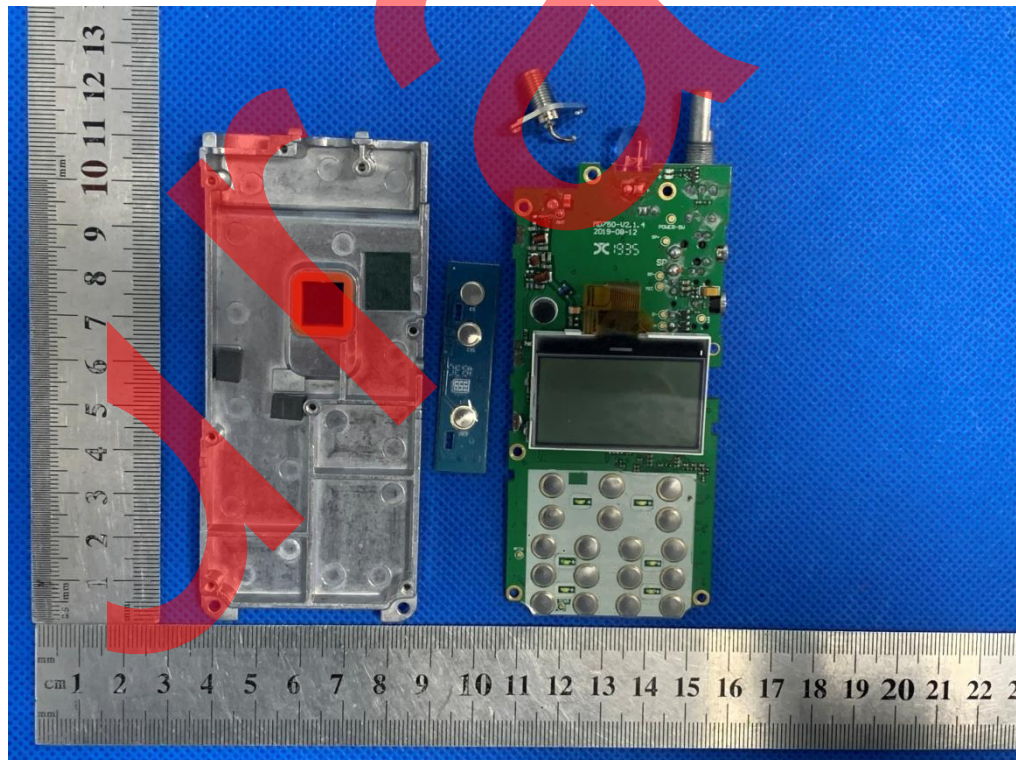
OPEN VIEW-1 OF EUT



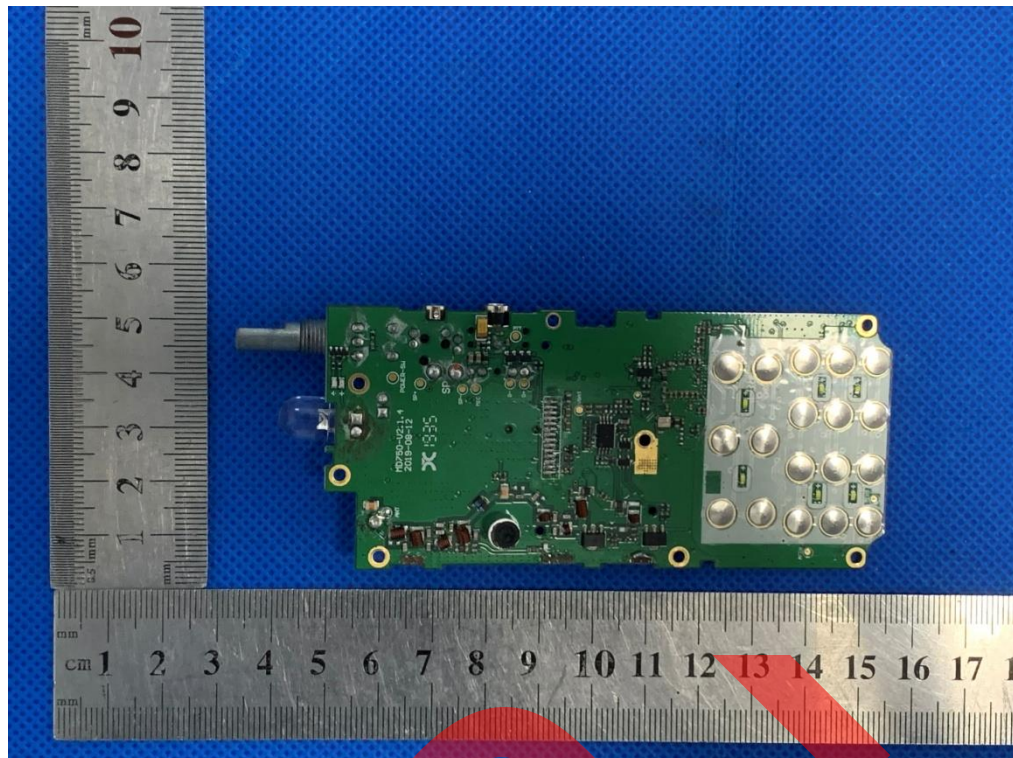
OPEN VIEW-2 OF EUT



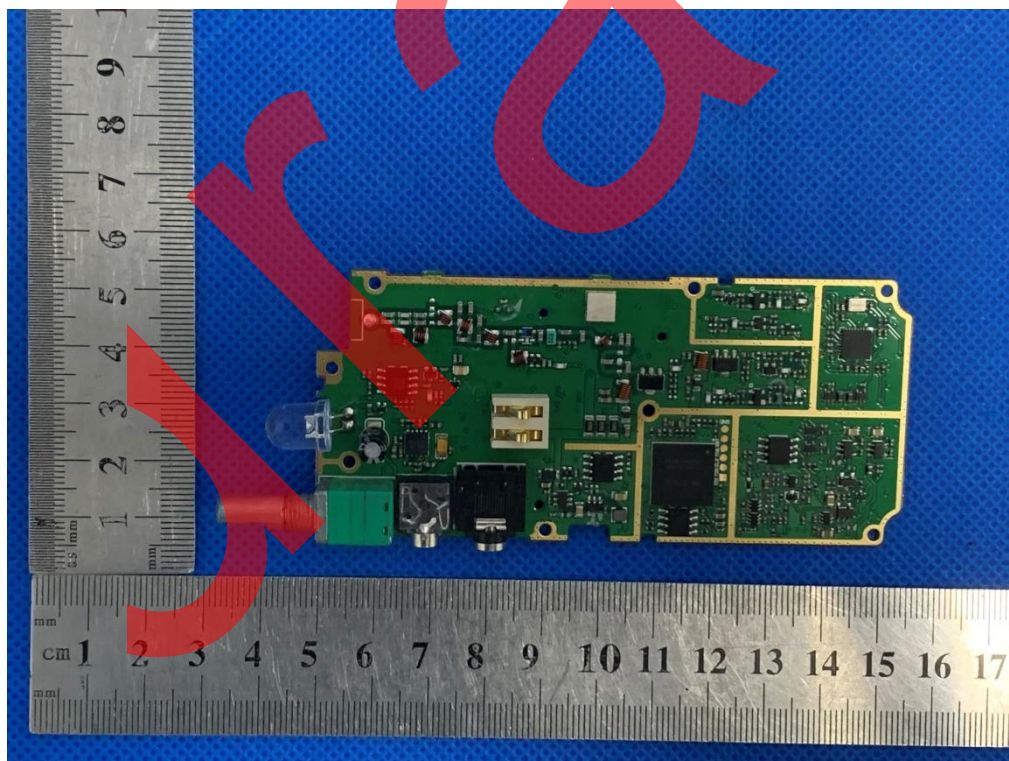
OPEN VIEW-3 OF EUT



INTERNAL VIEW-1 OF EUT



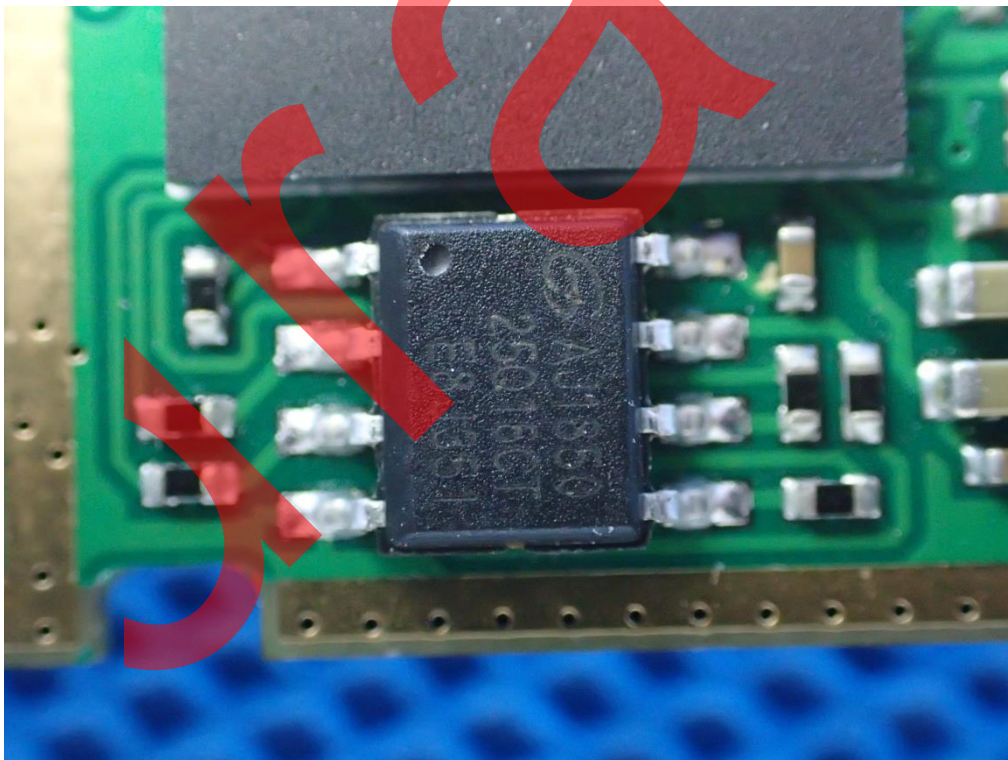
INTERNAL VIEW-2 OF EUT



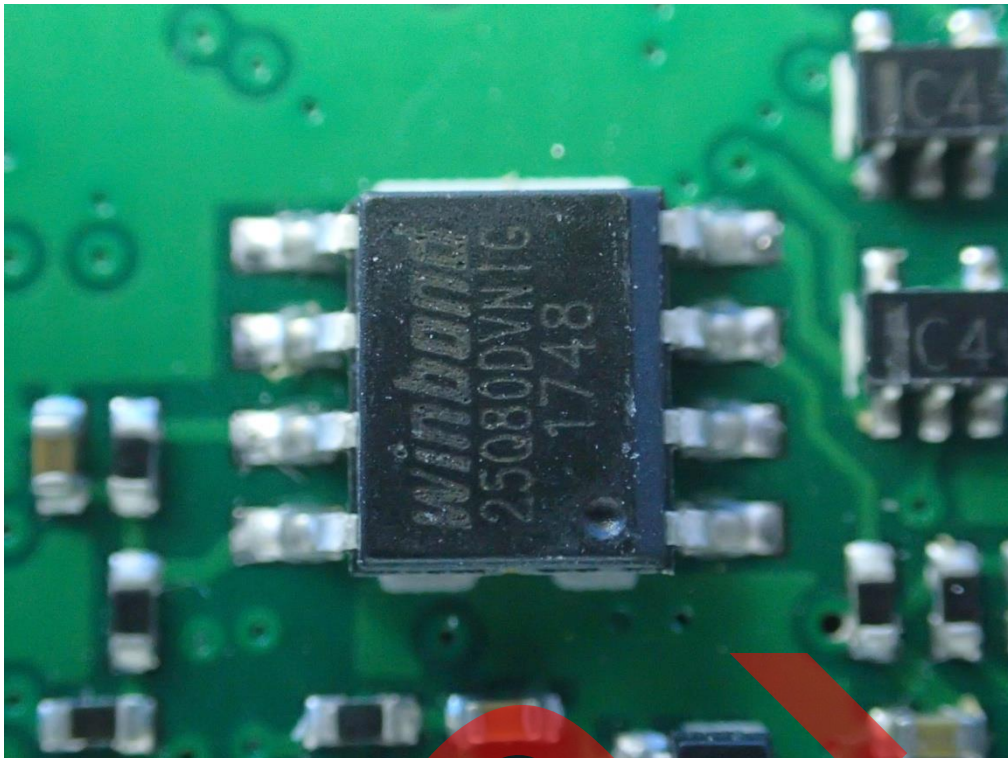
INTERNAL VIEW-3 OF EUT



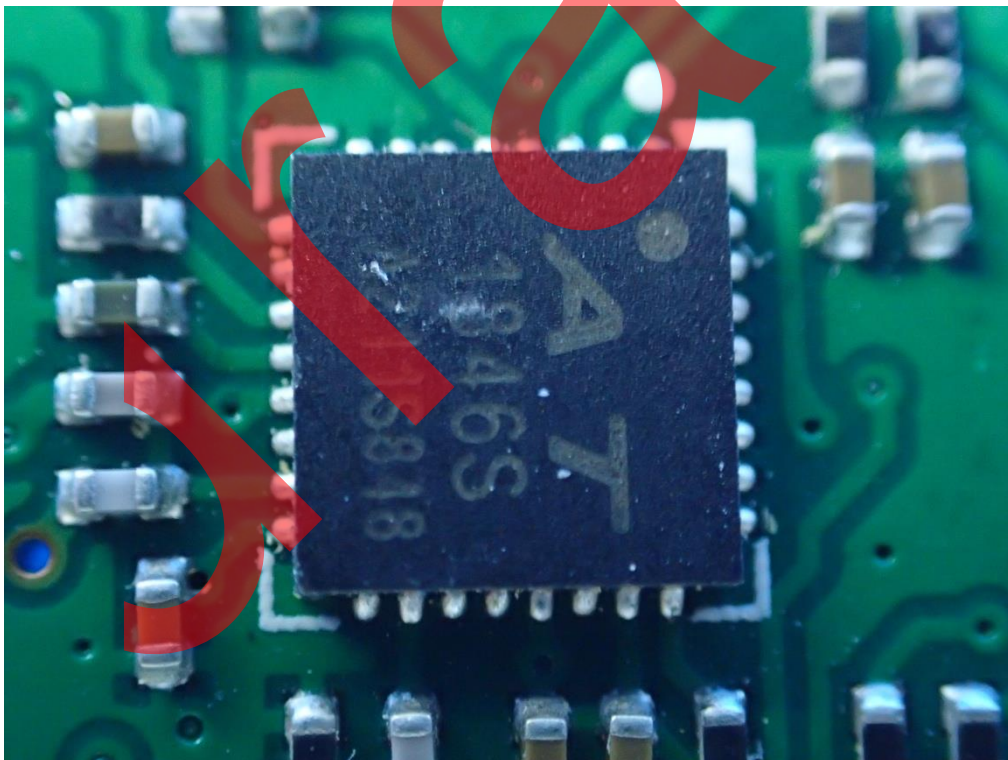
INTERNAL VIEW-4 OF EUT



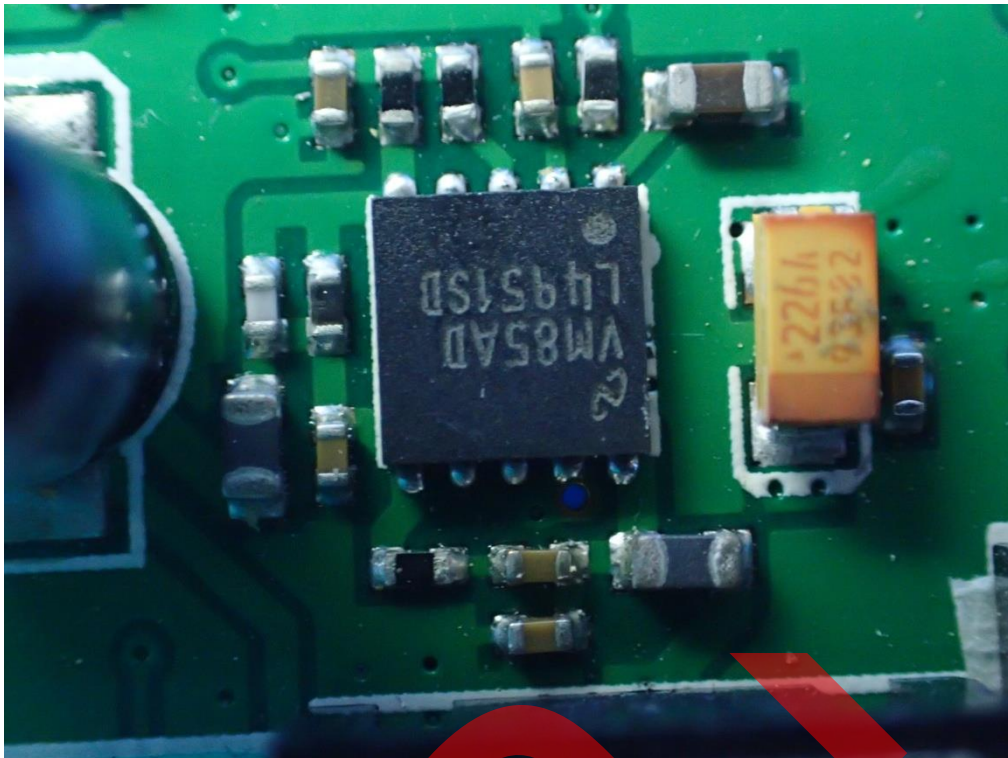
INTERNAL VIEW-5 OF EUT



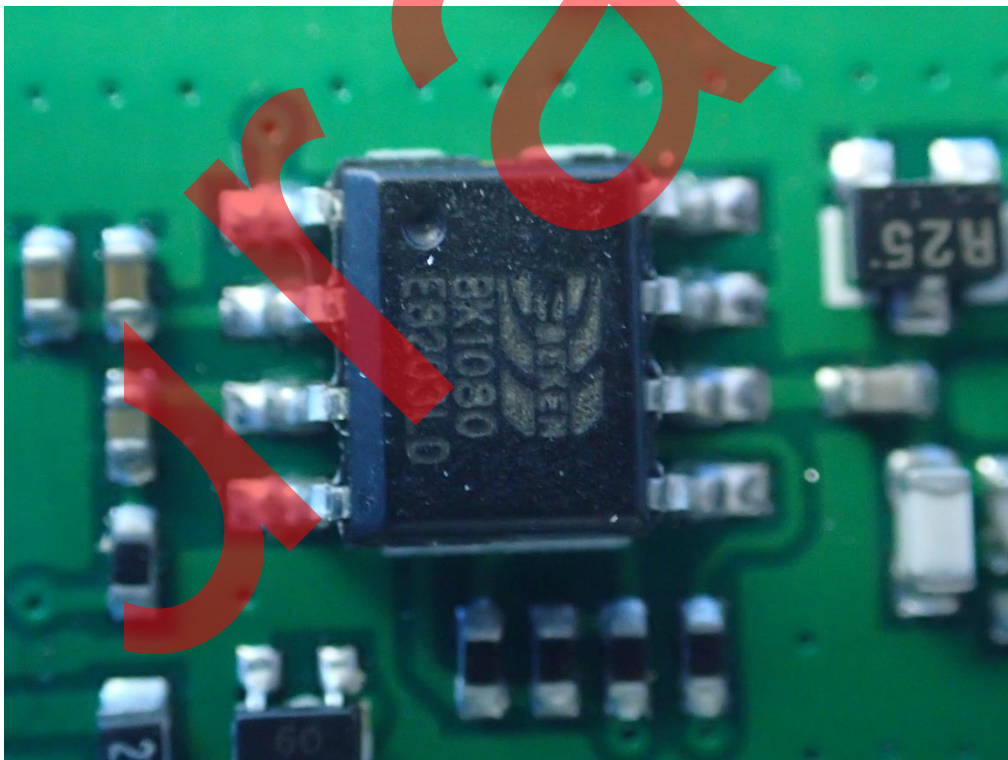
INTERNAL VIEW-6 OF EUT



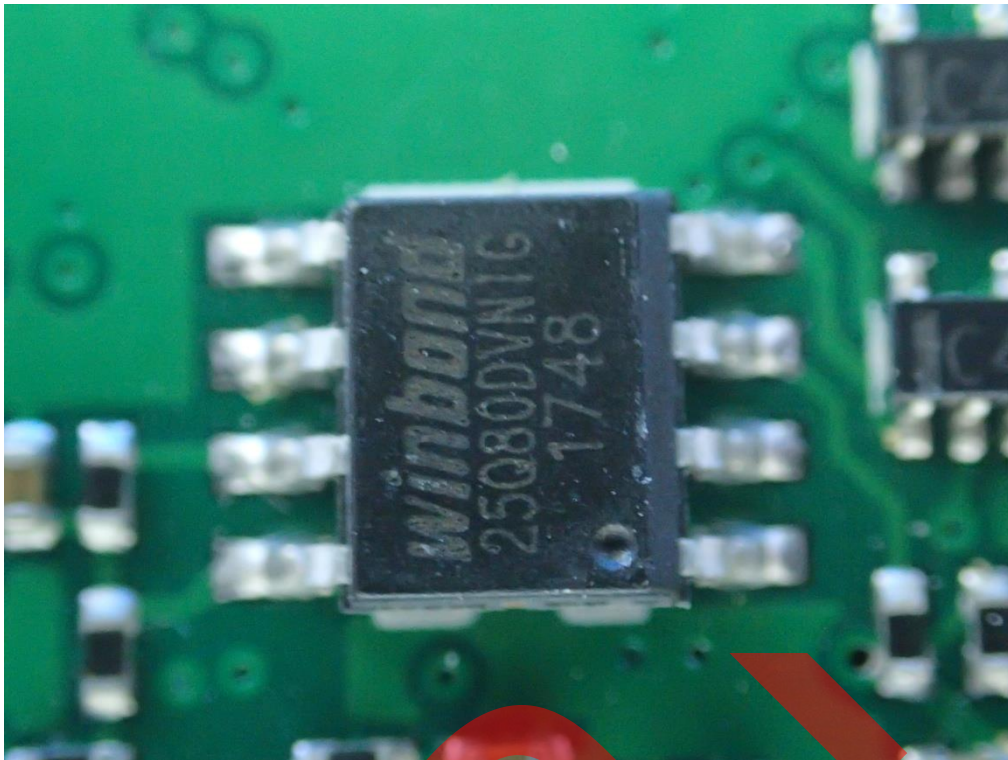
INTERNAL VIEW-7 OF EUT



INTERNAL VIEW-8 OF EUT



INTERNAL VIEW-9 OF EUT



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