FCC Part 90 Rules
Test Report

Report No.: AGC02931200901FE10

FCC ID	:	POD-DMR3
PRODUCT DESIGNATION	:	DMR mobile radio
BRAND NAME	:	TYT
MODEL NAME	:	MD-9600-5P GPS, MD-9600-5P, MD-9600 GPS, MD-9600
APPLICANT	:	TYT ELECTRONICS CO., LTD
DATE OF ISSUE	:	Nov. 03, 2020
STANDARD(S)	:	FCC Part 90 Rules
REPORT VERSION	:	V 1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 03, 2020	Valid	Class II Permissive Change

Note: The original test report Ref. No. (RXM170927052-00) (dated 2017-12-06), was modified on 2020-11-03 to include the following changes and additions for:

-Update the main test model and series model

-Update hardware version.

- PCB board changed material

-Modify the maximum power of the VHF band to 40W.

For the above described changes, all the tests of 40W power in the VHF frequency band have been updated.

In response to material changes, re-evaluate the radiation stray and power tests of all powers of VHF and UHF. The rest of the conduction method test items refer to this FCC ID original report

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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 mobile radio
Brand Name:	TYT
Test Model	MD-9600-5P GPS
Serial Model	MD-9600-5P, MD-9600 GPS, MD-9600
Difference Description	The model is only GPS and 5-Pin cable installation difference MD-9600-5P GPS has GPS & 5-Pin cable MD-9600-5P only has 5-Pin cable MD-9600 GPS only GPS MD-9600 without GPS & 5-Pin cable
Measurement Procedure	TIA/EIA 603-E-2016
Deviation	No any deviation from the test method.
Date of Test:	Sep. 04, 2020~Nov. 03, 2020
Condition of Test Sample	Normal
Test Result	Pass

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

Prepared By

Donjon Huang
(Project Engineer)
Nov. 03, 2020

Reviewed By

Calvin Liu
(Reviewer)
Nov. 03, 2020

Approved By

Forrest Lei
Authorized Officer
Nov. 03, 2020

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2. GENERAL INFORMATION

2.1PRODUCT DESCRIPTION

The EUT is a **DMR mobile radio** designed for voice/data communication. It is designed by way of utilizing the FM/4FSK modulation achieves the system operating.

A major technical description of EUT is described as following:

Communication Type	Voice/ Data only	
Hardware Version	MD9600-UV-V4.1	
Software Version	MD9600-UV-V4.1	
Modulation	FM/4FSK	
Emission Type	7K60FXD/7K60FXE/11K0F3E	
Emission Bandwidth	Analog:10.67KHz(40W-12.5 KHz)---VHF Digital: 10.42KHz(40W-12.5KHz)---VHF	
Peak Frequency Deviation	1.85KHz	
Audio Frequency Response	7.69dB	
Maximum Transmitter Power	Analog:45.51dBm(40W-12.5 KHz), 35.50dBm (5W-12.5 KHz) ---VHF Digital: 45.34dBm(40W), 35.18dBm (5W) ---VHF Analog:45.27dBm(35W-12.5 KHz), 35.47dBm (5W-12.5 KHz) ---UHF Digital: 43.38dBm(35W), 33.74dBm (5W) ---UHF	
Output power Modification	VHF:40W/5W UHF:35W/5W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)	
Data Rate	9600bps/12.5KHz(Channel Spacing)	
Antenna Designation	Detachable	
Antenna Type	External Antenna	
Antenna Gain	0dBi	
Power Supply	DC 13.80V by battery	
Limiting Voltage	DC11.73V-15.87V	
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:151.850MHz Middle Channel:155.025MHz Middle Channel:161.610MHz High Channel: 173.975MHz	Bottom Channel: 400.025MHz Middle Channel: 453.225MHz Middle Channel: 454.025MHz High Channel: 479.975MHz
Frequency Tolerance	1.100ppm	

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Frequency Range (MHz)	Rated Transmit Power(W)(Conducted)	Transmit Mode/Emission Designator
400-480	35W/5W	11K0F3E(Analog Vioce;NB)
400-480	35W/5W	7K60FXD/7K60FXW(9600Data/Digital Voice NB)

Frequency Range (MHz)	Rated Transmit Power(W)(Conducted)	Transmit Mode/Emission Designator
136-174	40W/5W	11K0F3E(Analog Vioce;NB)
136-174	40W/5W	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		

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

For FM Mode (ChannelSpacing: 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 kHz + 2.5 kHz) = 11 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 kHz + 5.0 kHz) = 16 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.

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2.2RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **POD-DMR3 ,** filing to comply with Part 2, Part 22, and Part 90 of the Federal Communication Commission rules.

2.3 TEST METHODOLOGY

The tests were performed according to following standards:
FCC Part 90 Private Land Mobile Radio Services
FCC Part 2 Frequency Allocations And Radio Treaty Matters, General Rules And Regulations.
TIA/EIA 603 E: March 2016 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
ANSI C63.26 :2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.
KDB579009 D03 v01: Applications Part 90 Refarming Bands.

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.

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3. SYSTEM TEST CONFIGURATION

3.1EUT 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 requirements:

(1). Section 90.205 : RF Output Power

(2). Section 90.207 : Modulation Characteristic

(3). Section 90.209 : Occupied Bandwidth

(4). Section 90.210 : Emission Mask

(5). Section 90.213 : Frequency Tolerance

(6). Section 90.214: Transmitter Frequency Behavior

(7). Section 90.210 : Spurious Emission on Antenna Port

(8). Section 90.210 : Spurious Ratiated Emission

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3.4 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted, Uc = ±0.8dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %
- Uncertainty of Frequency: Uc = ±2 %
- Uncertainty of FM deviation: Uc=±2 %
- Uncertainty of Audio Level: Uc=±0.98dB
- Uncertainty of Modulation Limiting: Uc=±0.42 %
- Uncertainty of Transient Frequency Behavior: Uc=±6.8%
- Uncertainty of Low Pass Filter Response: Uc=±0.76dB

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3.5 CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System

EUT

Table 2-1 Equipment Used in Tested System

Item	Equipment	Model No.	Identifier	Note
1	DMR mobile radio	RDM-DB-G	FCC ID: POD-DMR3	EUT
3	Hand microphone	N/A	N/A	Accessory

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4. SUMMARY OF TEST RESULTS

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

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LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9020A	MY52090123	Sep. 03, 2020	Sep. 02, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.16, 2019	Sep.15, 2021
preamplifier	ChengYi	EMC184045SE	980508	Oct 27, 2020	Oct 26, 2021
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun. 09, 2020	Jun. 08, 2021
HORN ANTENNA	EM	EM-AH-10180	/	Feb.28, 2020	Feb.27, 2021
SIGNAL GENERATOR	AGILENT	E4421B	MY43351603	Jun. 09, 2020	Jun. 08, 2021
SIGNAL GENERATOR	R&S	SMT03	A0304261	Jun. 09, 2020	Jun. 08, 2021
ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 09, 2019	Jan. 08, 2021
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.20, 2019	Sep.19, 2021
Modulation Domain Analyzer	HP	53310A	3121A02467	Jul. 03, 2020	Jul. 02, 2022
Small environmental tester	ESPEC	SH-242	--	Sep. 03, 2020	Sep. 03, 2022
RF Communication Test Set	HP	8920B	--	Jun. 09, 2020	Jun. 08, 2021
Attenuator	Weinachel Corp	58-30-33	ML030	Oct. 26, 2020	Oct. 25, 2021
RF Cable	R&S	1#	--	Each time	N/A
RF Cable	R&S	2#	--	Each time	N/A
Fliter-UHF	Microwave	N25155M2	498705	May. 11, 2020	May. 10, 2021
Fliter-VHF	Microwave	N26460M1	498703	May. 11, 2020	May. 10, 2021

NOTE: 8920B can generate audio modulation frequency.

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5. DESCRIPTION OF TEST MODES

RF TEST MODES

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

Analog:

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

Digital:

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

Note: 1.Only the result of the worst case was recorded in the report.
2.The manufacturer provides the laboratory with a temporary external antenna connection for conducting measurements.

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6. FREQUENCY TOLERANCE

6.1 PROVISIONS APPLICABLE

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

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

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

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℃. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10℃ decreased per stage until the lowest temperature -30℃ is measured, record all measured frequencies on each temperature step.

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℃ to 25℃. Otherwise, an environment chamber set for a temperature of 20℃ shall be used. The EUT shall be powered by DC 13.80V.
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.

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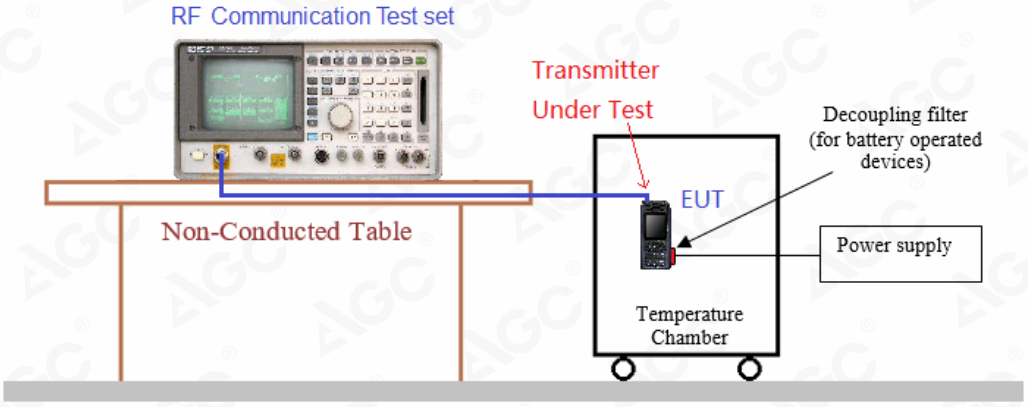
6.3 TEST SETUP BLOCK DIAGRAM



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6.4 TEST RESULTS

Analog:

(1) Frequency stability versus input voltage (Supply nominal voltage is 13.80V)**-40W-12.5KHz**

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 136.025MHz	155.025MHz	173.975MHz	Limit: ppm
50	DC 13.80V	0.977	0.653	0.917	5
40	DC 13.80V	0.613	0.832	0.690	
30	DC 13.80V	0.656	1.073	1.029	
20	DC 13.80V	0.598	0.901	0.923	
10	DC 13.80V	0.691	0.749	0.996	
0	DC 13.80V	0.806	0.588	0.855	
-10	DC 13.80V	0.546	0.833	0.976	
-20	DC 13.80V	1.000	1.031	0.924	
-30	DC 13.80V	1.097	0.737	0.918	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 151.85MHz	161.61MHz	Limit: ppm
50	DC 13.80V	0.368	0.587	5
40	DC 13.80V	0.402	0.340	
30	DC 13.80V	0.692	0.533	
20	DC 13.80V	0.401	0.938	
10	DC 13.80V	0.359	0.316	
0	DC 13.80V	0.441	0.627	
-10	DC 13.80V	0.462	0.722	
-20	DC 13.80V	0.588	0.765	
-30	DC 13.80V	0.912	0.508	
Result	Pass			

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(2) Frequency stability versus input voltage (Battery endpoint is 11.73V) **-40W-12.5KHz**

Environment Temperature(℃)	Power (V)	Reference Frequency			Limit: ppm
		136.025MHz	155.025MHz	173.975MHz	
50	DC 11.73V	0.657	0.568	0.900	5
40	DC 11.73V	0.716	0.647	0.504	
30	DC 11.73V	0.718	0.667	0.610	
20	DC 11.73V	0.988	1.074	0.899	
10	DC 11.73V	0.755	0.744	0.935	
0	DC 11.73V	0.577	0.622	0.770	
-10	DC 11.73V	0.976	1.038	0.525	
-20	DC 11.73V	0.982	0.533	0.627	
-30	DC 11.73V	0.772	0.733	0.986	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		151.85MHz	161.61MHz	
50	DC 11.73V	0.458	0.532	5
40	DC 11.73V	0.341	0.815	
30	DC 11.73V	0.453	0.664	
20	DC 11.73V	0.429	0.739	
10	DC 11.73V	0.611	0.997	
0	DC 11.73V	0.625	0.376	
-10	DC 11.73V	0.767	0.929	
-20	DC 11.73V	0.477	0.690	
-30	DC 11.73V	0.513	0.580	
Result	Pass			

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(3) Frequency stability versus input voltage (Supply nominal voltage is 13.80V)**-40W-12.5KHz**

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 136.025MHz	155.025MHz	173.975MHz	Limit: ppm
50	DC 13.80V	0.703	0.688	0.516	5
40	DC 13.80V	0.944	0.737	0.670	
30	DC 13.80V	0.910	0.610	0.798	
20	DC 13.80V	0.861	0.781	0.672	
10	DC 13.80V	0.722	0.995	0.854	
0	DC 13.80V	0.695	1.071	1.008	
-10	DC 13.80V	1.070	0.747	0.731	
-20	DC 13.80V	1.004	0.946	1.095	
-30	DC 13.80V	0.970	0.890	0.670	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 151.85MHz	161.61MHz	Limit: ppm
50	DC 13.80V	0.803	0.395	5
40	DC 13.80V	0.522	0.383	
30	DC 13.80V	0.337	0.702	
20	DC 13.80V	0.924	0.813	
10	DC 13.80V	0.673	0.715	
0	DC 13.80V	0.511	0.962	
-10	DC 13.80V	0.490	0.555	
-20	DC 13.80V	0.407	0.694	
-30	DC 13.80V	0.665	0.857	
Result	Pass			

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(4) Frequency stability versus input voltage (Battery endpoint is 11.73V) **-40W-12.5KHz**

Environment Temperature(℃)	Power (V)	Reference Frequency			Limit: ppm
		136.025MHz	155.025MHz	173.975MHz	
50	DC 11.73V	0.747	0.663	1.057	5
40	DC 11.73V	0.994	0.621	0.759	
30	DC 11.73V	0.918	0.603	0.566	
20	DC 11.73V	0.622	0.897	0.510	
10	DC 11.73V	0.585	1.053	1.055	
0	DC 11.73V	0.592	0.773	1.010	
-10	DC 11.73V	0.595	0.965	0.921	
-20	DC 11.73V	1.003	0.557	0.555	
-30	DC 11.73V	0.639	0.813	0.729	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		151.85MHz	161.61MHz	
50	DC 11.73V	0.535	0.629	5
40	DC 11.73V	0.641	0.936	
30	DC 11.73V	0.494	0.788	
20	DC 11.73V	0.929	0.956	
10	DC 11.73V	0.998	0.312	
0	DC 11.73V	0.782	0.586	
-10	DC 11.73V	0.790	0.521	
-20	DC 11.73V	0.667	0.963	
-30	DC 11.73V	0.844	0.929	
Result	Pass			

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Digital:

(1) Frequency stability versus input voltage (Supply nominal voltage is 13.80V)**-40W-12.5KHz**

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 136.025MHz	155.025MHz	173.975MHz	Limit: ppm
50	DC 13.80V	0.994	0.661	0.571	5
40	DC 13.80V	0.960	1.076	0.650	
30	DC 13.80V	0.594	0.588	0.671	
20	DC 13.80V	0.611	0.564	0.936	
10	DC 13.80V	0.642	0.890	0.695	
0	DC 13.80V	0.638	0.825	0.873	
-10	DC 13.80V	1.040	1.024	0.803	
-20	DC 13.80V	0.960	0.560	1.038	
-30	DC 13.80V	0.509	1.056	1.029	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 151.85MHz	161.61MHz	Limit: ppm
50	DC 13.80V	0.500	0.753	5
40	DC 13.80V	0.868	0.839	
30	DC 13.80V	0.928	0.623	
20	DC 13.80V	0.531	0.890	
10	DC 13.80V	0.978	0.756	
0	DC 13.80V	0.552	0.665	
-10	DC 13.80V	0.916	0.808	
-20	DC 13.80V	0.829	0.773	
-30	DC 13.80V	0.782	0.621	
Result	Pass			

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(2) Frequency stability versus input voltage (Battery endpoint is 11.73V) **-40W-12.5KHz**

Environment Temperature(℃)	Power (V)	Reference Frequency			Limit: ppm
		136.025MHz	155.025MHz	173.975MHz	
50	DC 11.73V	1.011	1.070	0.515	5
40	DC 11.73V	0.670	0.917	1.098	
30	DC 11.73V	0.836	0.708	0.965	
20	DC 11.73V	0.676	0.826	0.531	
10	DC 11.73V	0.569	0.660	0.840	
0	DC 11.73V	0.924	0.909	0.754	
-10	DC 11.73V	0.703	0.921	0.904	
-20	DC 11.73V	0.585	0.640	0.980	
-30	DC 11.73V	0.916	0.704	0.600	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		151.85MHz	161.61MHz	
50	DC 11.73V	0.529	0.702	5
40	DC 11.73V	0.522	0.711	
30	DC 11.73V	0.467	0.761	
20	DC 11.73V	0.358	0.471	
10	DC 11.73V	0.456	0.834	
0	DC 11.73V	0.855	0.504	
-10	DC 11.73V	0.452	0.535	
-20	DC 11.73V	0.373	0.373	
-30	DC 11.73V	0.396	0.908	
Result	Pass			

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(3) Frequency stability versus input voltage (Supply nominal voltage is 13.80V)**-40W-12.5KHz**

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 136.025MHz	155.025MHz	173.975MHz	Limit: ppm
50	DC 13.80V	0.393	0.653	0.885	5
40	DC 13.80V	0.874	0.955	0.745	
30	DC 13.80V	1.024	0.555	0.896	
20	DC 13.80V	0.829	0.731	1.100	
10	DC 13.80V	0.573	0.526	0.972	
0	DC 13.80V	0.540	0.543	0.771	
-10	DC 13.80V	0.774	0.521	0.726	
-20	DC 13.80V	0.562	1.005	0.960	
-30	DC 13.80V	0.680	0.751	0.617	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency 151.85MHz	161.61MHz	Limit: ppm
50	DC 13.80V	0.425	0.831	5
40	DC 13.80V	0.909	0.356	
30	DC 13.80V	0.308	0.856	
20	DC 13.80V	0.450	0.346	
10	DC 13.80V	0.665	0.857	
0	DC 13.80V	0.433	0.962	
-10	DC 13.80V	0.965	0.493	
-20	DC 13.80V	0.917	0.353	
-30	DC 13.80V	0.570	0.924	
Result	Pass			

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(4) Frequency stability versus input voltage (Battery endpoint is 11.73V) **-40W-12.5KHz**

Environment Temperature(℃)	Power (V)	Reference Frequency			Limit: ppm
		136.025MHz	155.025MHz	173.975MHz	
50	DC 11.73V	0.706	0.561	0.731	5
40	DC 11.73V	0.607	0.901	1.045	
30	DC 11.73V	0.664	0.564	0.567	
20	DC 11.73V	0.512	0.714	0.881	
10	DC 11.73V	0.527	1.061	0.767	
0	DC 11.73V	0.930	0.773	1.007	
-10	DC 11.73V	0.829	0.920	1.020	
-20	DC 11.73V	1.000	0.848	0.561	
-30	DC 11.73V	0.521	0.912	0.641	
Result	Pass				

Environment Temperature(℃)	Power Supply (V)	Reference Frequency		Limit: ppm
		151.85MHz	161.61MHz	
50	DC 11.73V	0.900	0.708	5
40	DC 11.73V	0.687	0.629	
30	DC 11.73V	0.999	0.694	
20	DC 11.73V	0.560	0.414	
10	DC 11.73V	0.359	0.328	
0	DC 11.73V	0.666	0.951	
-10	DC 11.73V	0.653	0.890	
-20	DC 11.73V	0.507	0.368	
-30	DC 11.73V	0.613	0.510	
Result	Pass			

Note: All test values are in “ppm”

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7. EMISSION BANDWIDTH

7.1 PROVISIONS APPLICABLE

For FCC Part 90 requirements:

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).

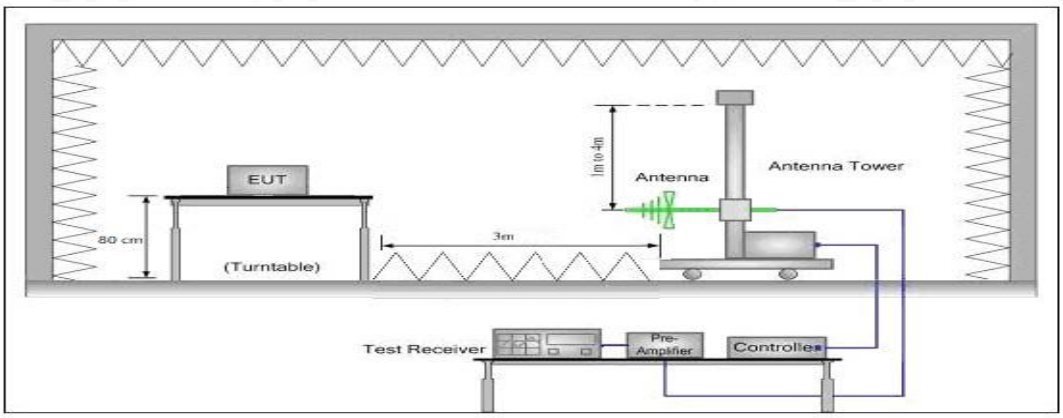
3). Set SPA Center Frequency = fundamental frequency, RBW=100Hz.VBW= 300 Hz, Span =50 KHz.

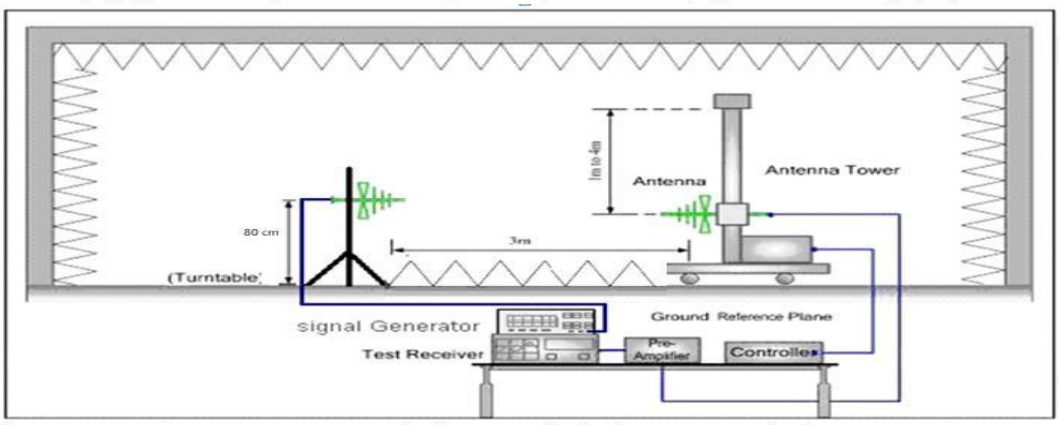
4). Set SPA Max hold. Mark peak, -26 dB.

7.3 TEST SETUP BLOCK DIAGRAM

Radiation method:

Radiated Below1GHz





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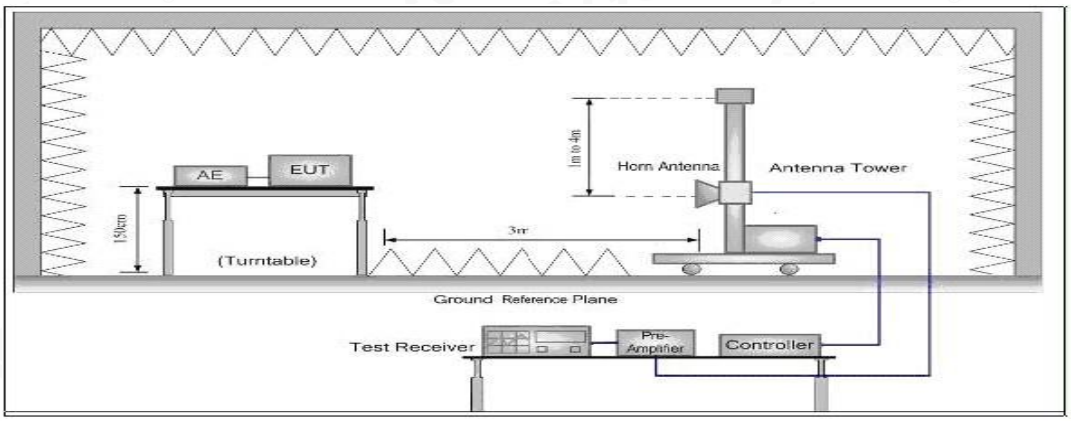
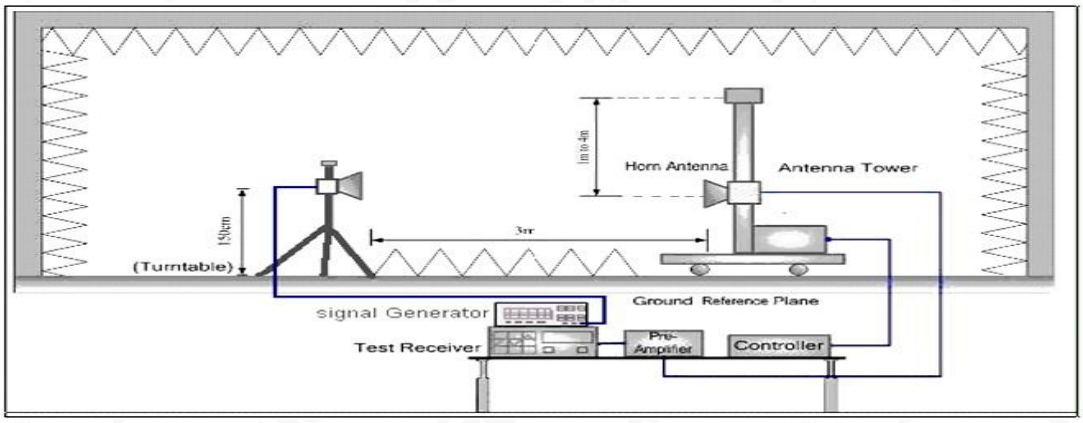
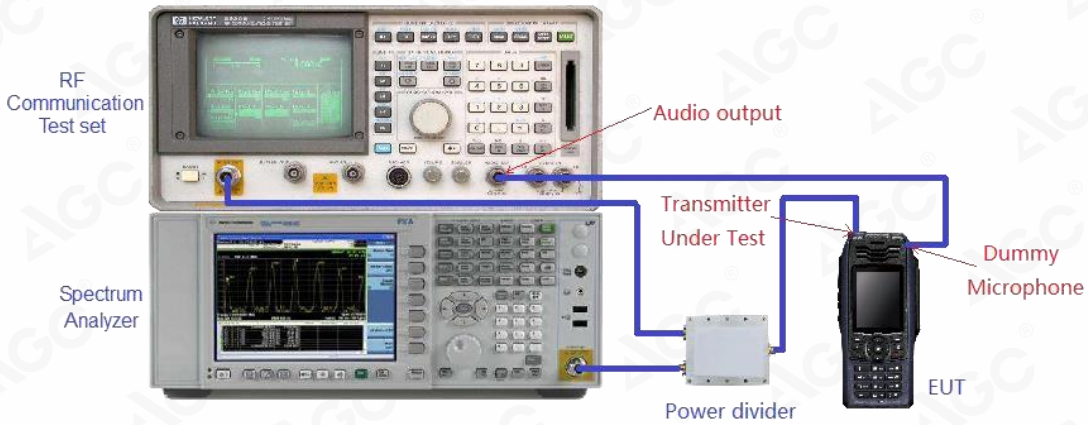
Radiated Above 1 GHz





Conduction method:



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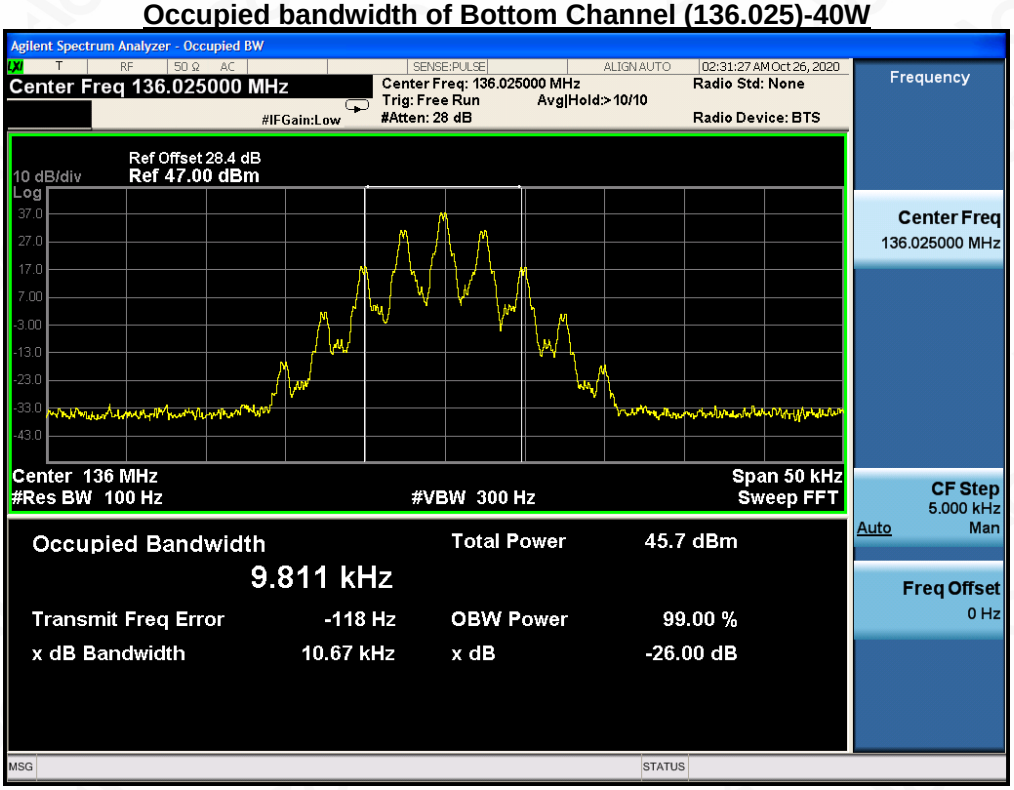
7.4 MEASUREMENT RESULT

Analog

Emission Bandwidth Measurement Result				
Operating Frequency	12.5 KHz Channel Separation			
	Occupied Bandwidth	Emission Bandwidth	Limits	Result
136.025MHz	9.811 KHz	10.67 KHz	11.25 KHz	Pass
151.850MHz	9.904 KHz	10.17 KHz	11.25 KHz	Pass
155.025MHz	9.818 KHz	10.16 KHz	11.25 KHz	Pass
161.610MHz	9.832 KHz	10.16 KHz	11.25 KHz	Pass
173.975MHz	9.938 KHz	10.17 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (136.025)-40W



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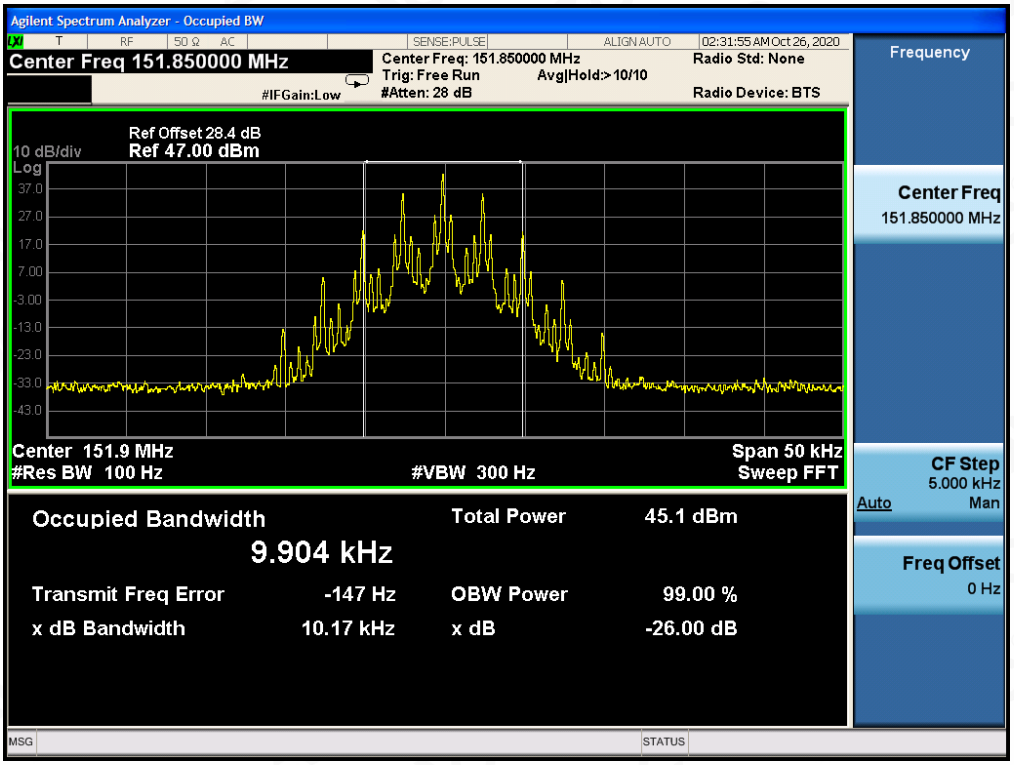
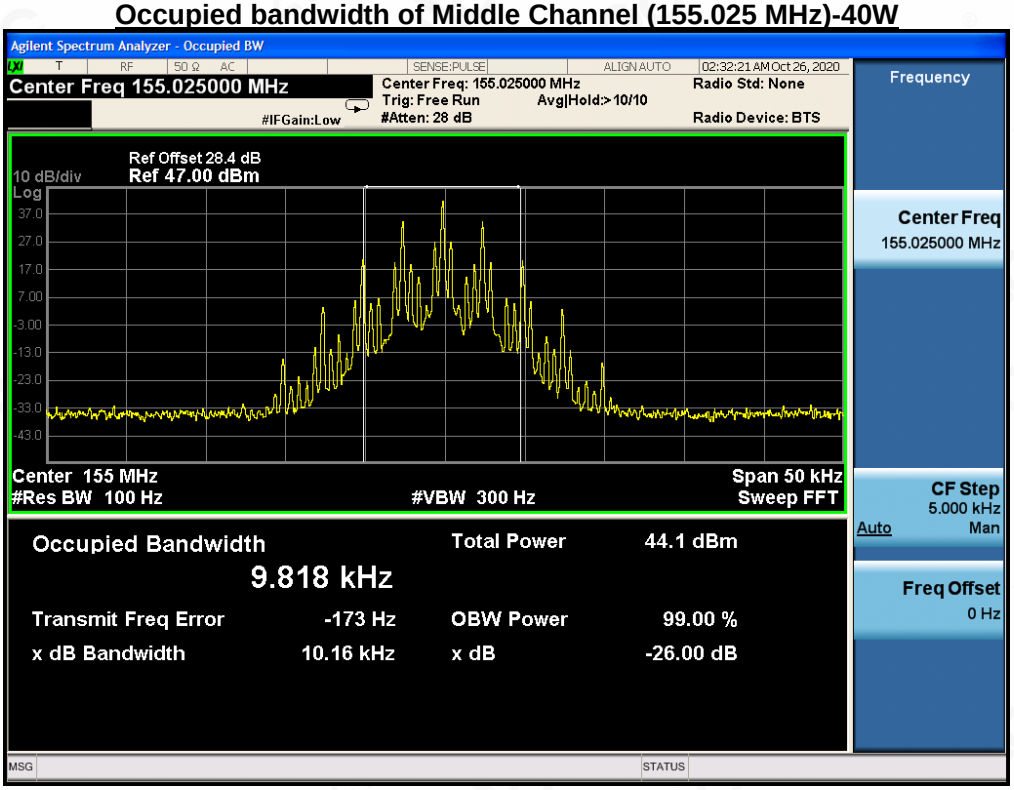
Occupied bandwidth of Middle Channel (151.850 MHz)-40W



Occupied bandwidth of Middle Channel (155.025 MHz)-40W



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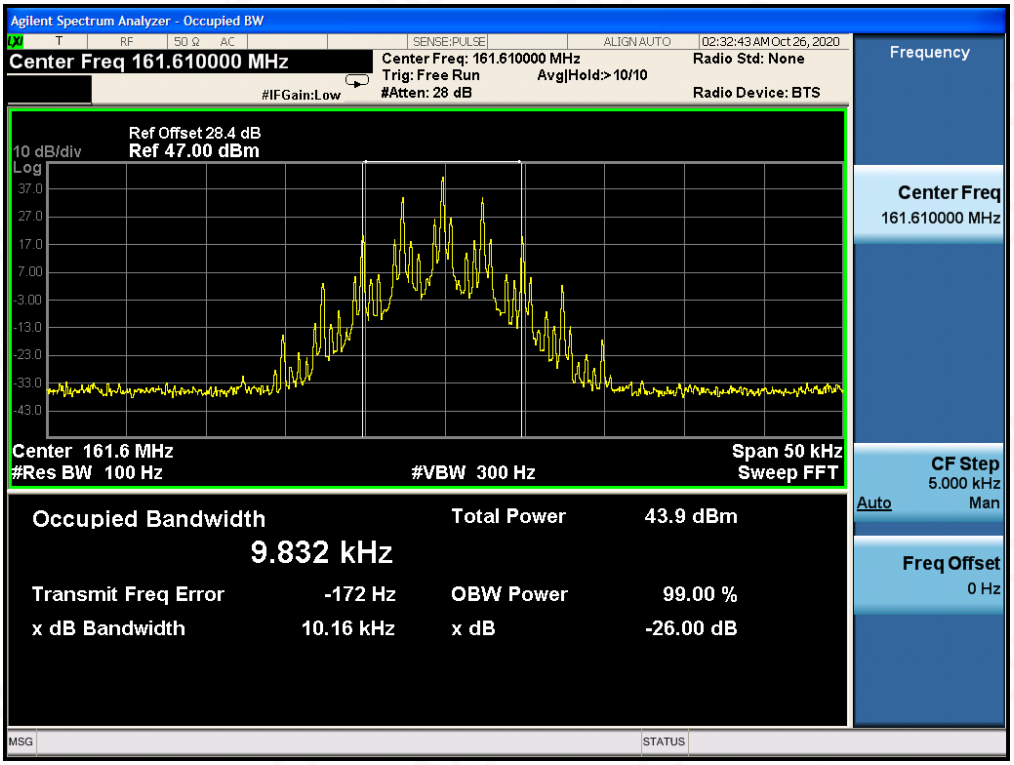
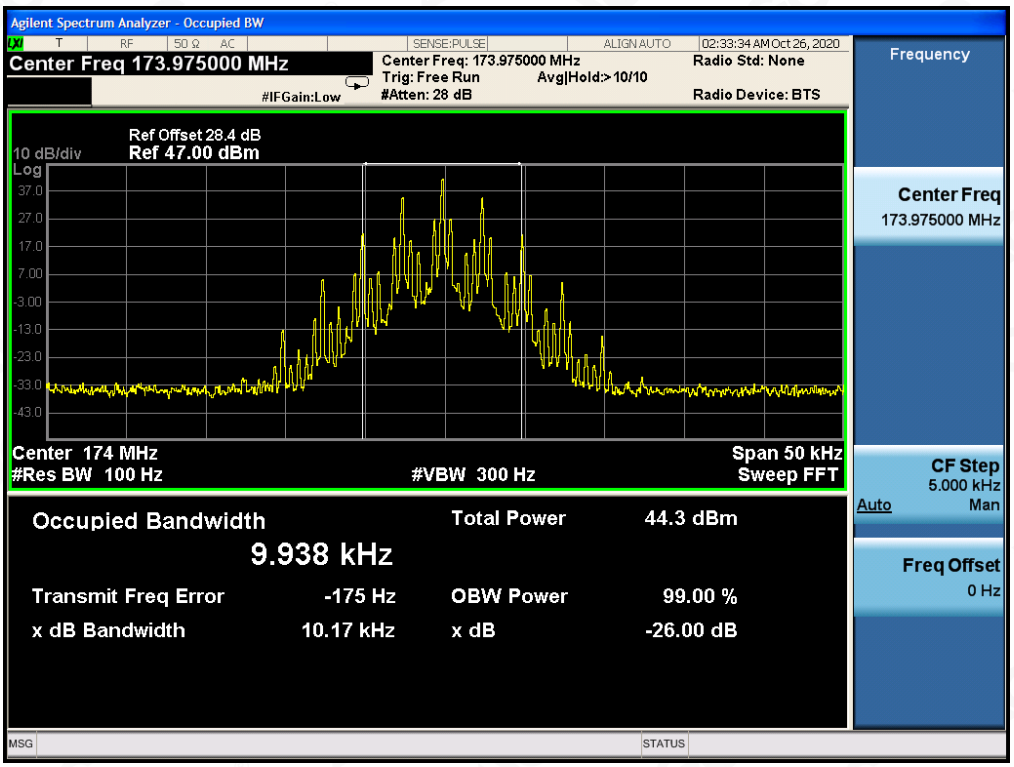
Occupied bandwidth of Middle Channel (161.610 MHz)-40W



Occupied bandwidth of Top Channel (173.975 MHz)-40W



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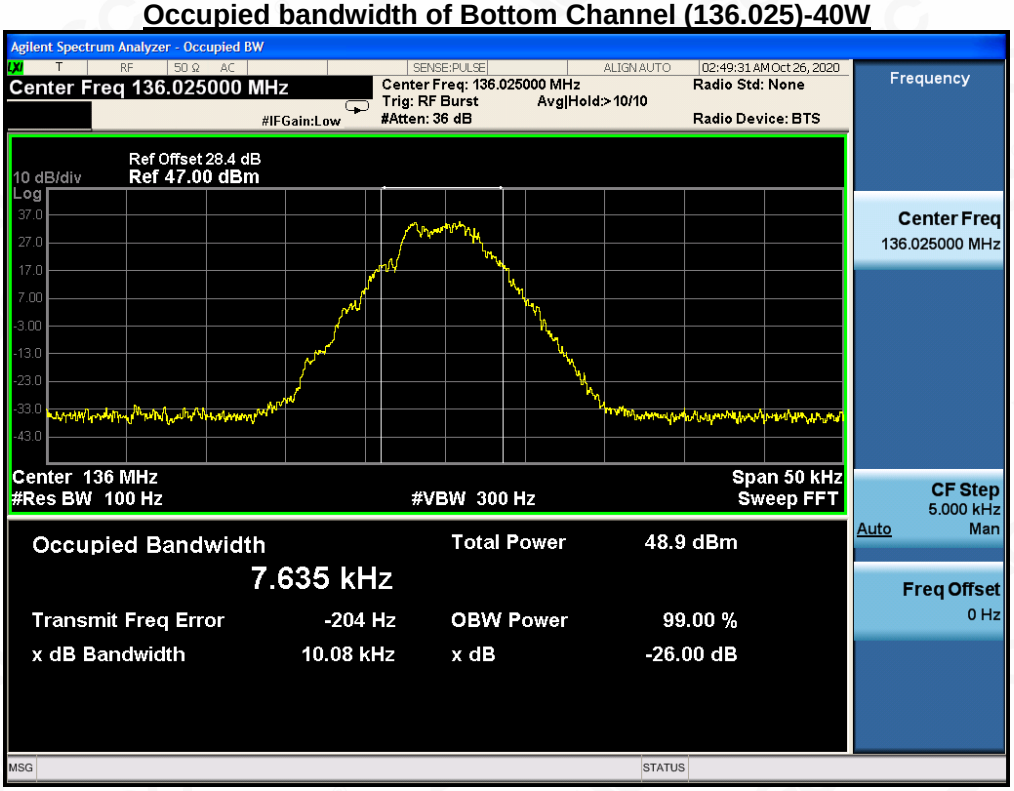
Digital:

Emission Bandwidth Measurement Result				
Operating Frequency	12.5 KHz Channel Separation			
	Occupied Bandwidth	Emission Bandwidth	Limits	Result
136.025MHz	7.635 KHz	10.080 KHz	11.25 KHz	Pass
151.850MHz	7.830 KHz	10.220 KHz	11.25 KHz	Pass
155.025MHz	7.747 KHz	9.793 KHz	11.25 KHz	Pass
161.610MHz	7.613 KHz	9.953 KHz	11.25 KHz	Pass
173.975MHz	7.517 KHz	10.420 KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (136.025)-40W



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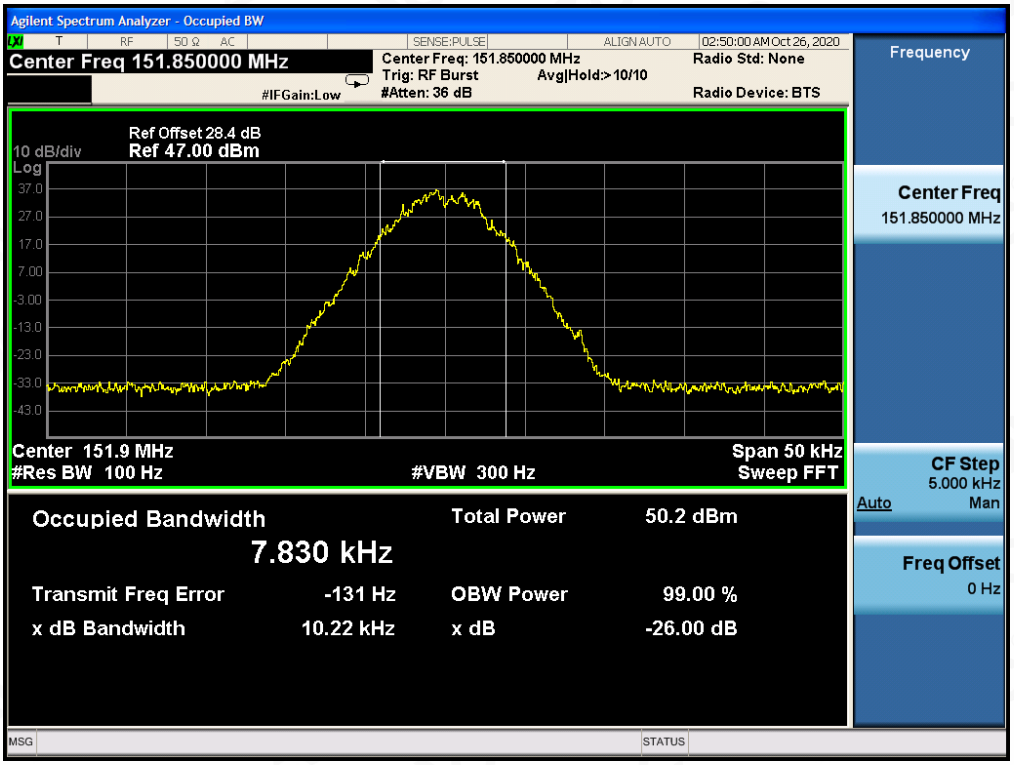
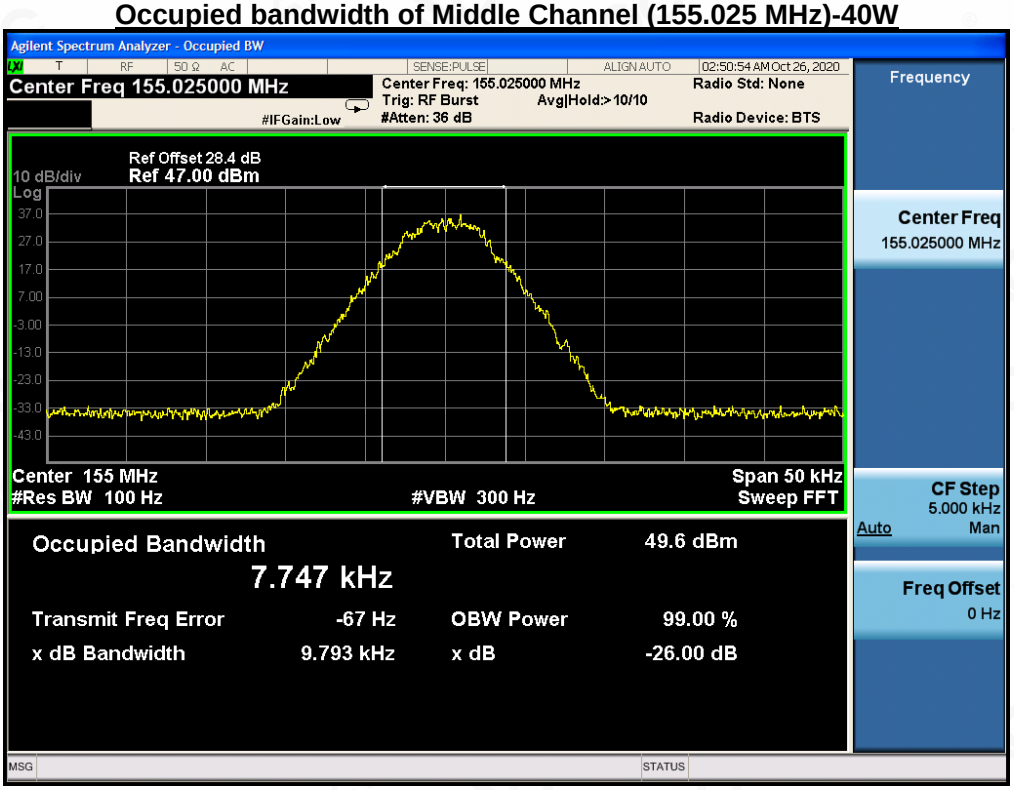
Occupied bandwidth of Middle Channel (151.850 MHz)-40W



Occupied bandwidth of Middle Channel (155.025 MHz)-40W



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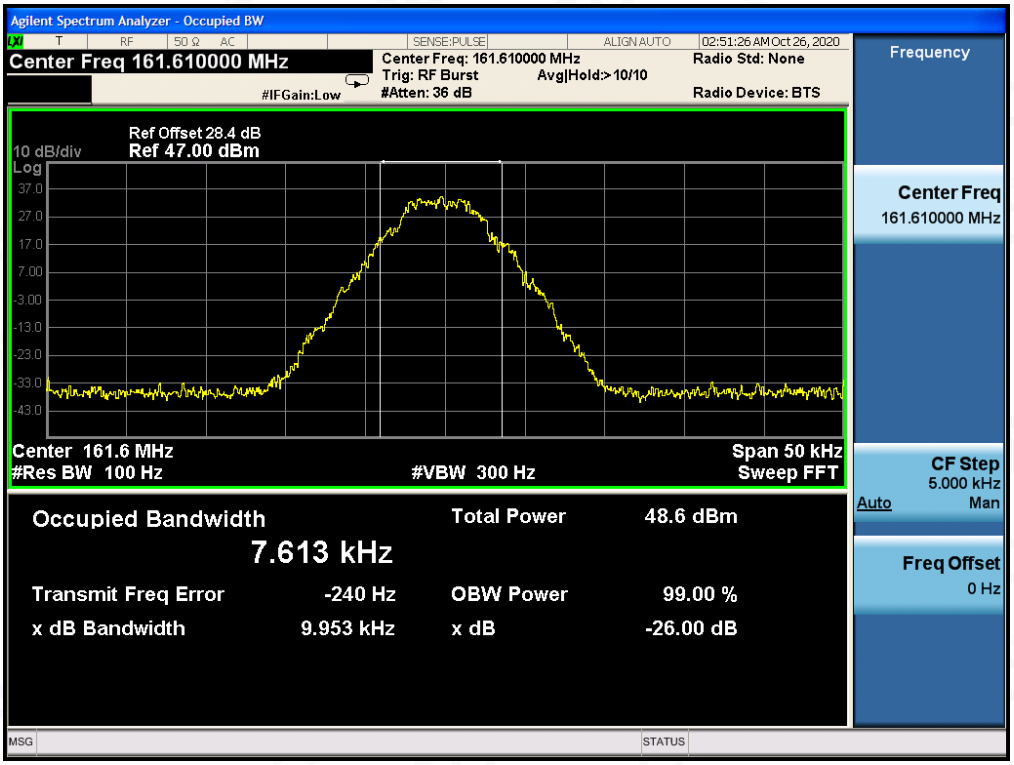
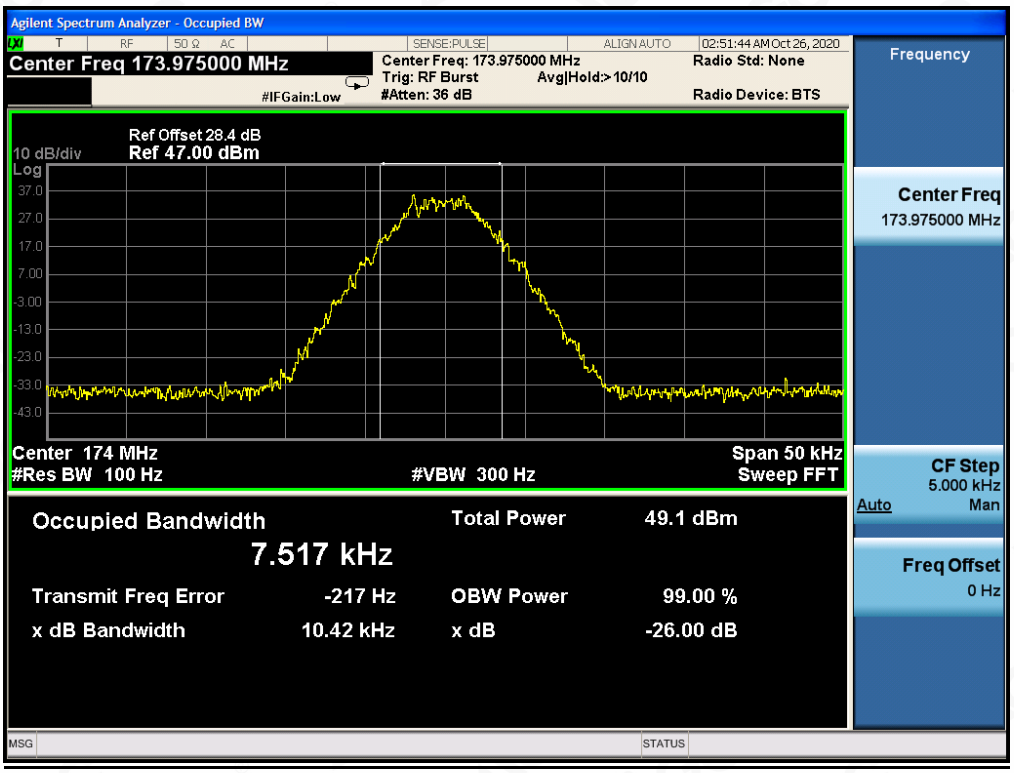
Occupied bandwidth of Middle Channel (161.610 MHz)-40W



Occupied bandwidth of Top Channel (173.975 MHz)-40W



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8. UNWANTED RADIATION

8.1 PROVISIONS APPLICABLE

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

Emission Mask D -for 12.5 KHz Channel Separation:

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

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

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

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 than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

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

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

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

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

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

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

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

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

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

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

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

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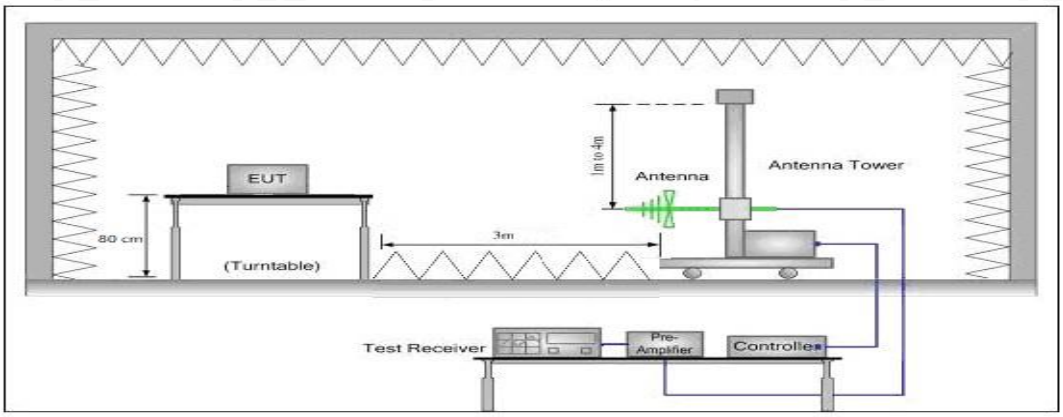
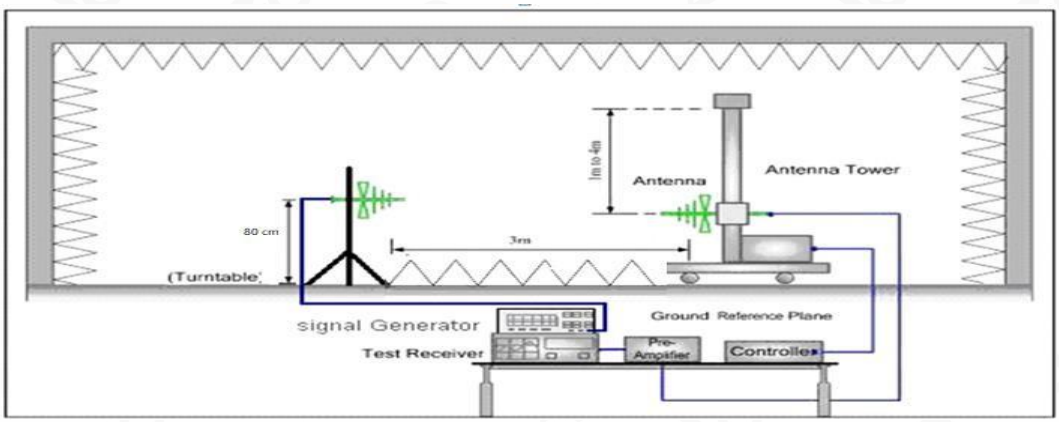
8.3 TEST SETUP BLOCK DIAGRAM

SUBSTITUTION METHOD: (Radiated Emissions)

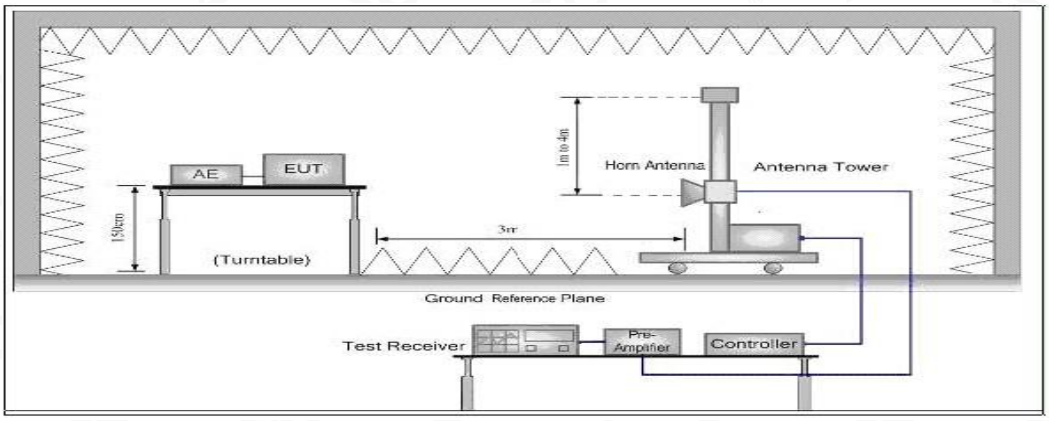
Radiation method:

Radiated Below1GHz





Radiated Above 1 GHz



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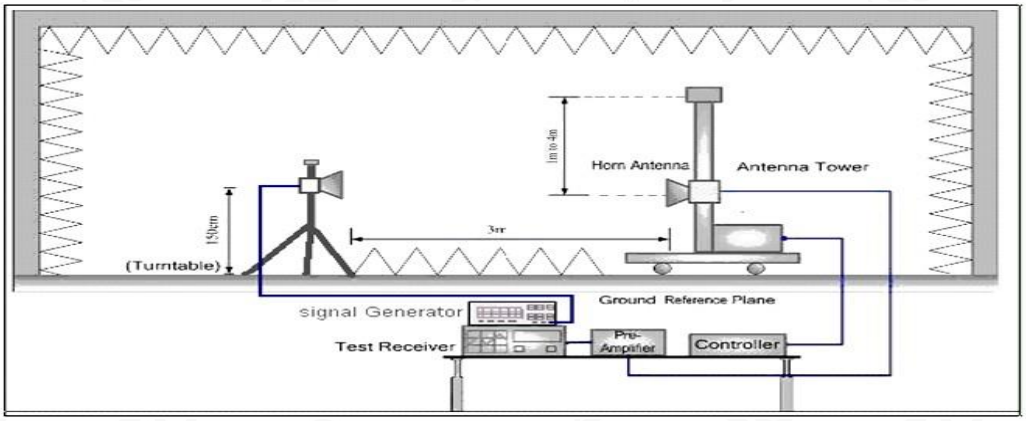

8.4 MEASUREMENT RESULTS:

Applicable Standard

FCC §2.1053 and §90.210

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

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

Test Procedure

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

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: At least 50+10 log (P) =50+10log (40) =66.02 (dB)—40W 46.02-66.02=-20dBm

At least 50+10 log (P) =50+10log (35) =65.44 (dB)—35W 45.44-65.44=-20dBm

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

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Analog:
VHF:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	0		pass
272.050	H	-25.70	-20	pass
408.075	H	-27.83	-20	pass
544.100	H	-28.83	-20	pass
680.125	H	-31.80	-20	pass
816.150	H	-31.48	-20	pass
952.175	H	-32.47	-20	pass
1088.200	H	-29.23	-20	pass
1224.225	H	-31.16	-20	pass
1360.250	H	-31.26	-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	-25.56	-20	pass
408.075	V	-26.63	-20	pass
544.100	V	-28.73	-20	pass
680.125	V	-30.35	-20	pass
816.150	V	-29.08	-20	pass
952.175	V	-32.84	-20	pass
1088.200	V	-28.04	-20	pass
1224.225	V	-32.65	-20	pass
1360.250	V	-34.25	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	0		pass
303.700	H	-26.84	-20	pass
455.550	H	-28.36	-20	pass
607.400	H	-29.17	-20	pass
759.250	H	-30.78	-20	pass
911.100	H	-30.27	-20	pass
1062.950	H	-30.98	-20	pass
1214.800	H	-28.45	-20	pass
1366.650	H	-31.53	-20	pass
1518.500	H	-31.92	-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	-26.30	-20	pass
455.550	V	-24.67	-20	pass
607.400	V	-28.04	-20	pass
759.250	V	-29.27	-20	pass
911.100	V	-32.46	-20	pass
1062.950	V	-34.38	-20	pass
1214.800	V	-28.53	-20	pass
1366.650	V	-27.71	-20	pass
1518.500	V	-33.60	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	0		pass
310.050	H	-29.81	-20	pass
465.075	H	-29.01	-20	pass
620.100	H	-28.40	-20	pass
775.125	H	-31.46	-20	pass
930.150	H	-30.35	-20	pass
1085.175	H	-31.34	-20	pass
1240.200	H	-29.03	-20	pass
1395.225	H	-30.93	-20	pass
1550.250	H	-32.72	-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	-27.02	-20	pass
465.075	V	-28.82	-20	pass
620.100	V	-30.79	-20	pass
775.125	V	-30.40	-20	pass
930.150	V	-29.01	-20	pass
1085.175	V	-32.47	-20	pass
1240.200	V	-28.20	-20	pass
1395.225	V	-29.81	-20	pass
1550.250	V	-32.63	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	0		pass
323.220	H	-27.40	-20	pass
484.830	H	-29.40	-20	pass
646.440	H	-30.62	-20	pass
808.050	H	-31.84	-20	pass
969.660	H	-28.58	-20	pass
1131.270	H	-32.06	-20	pass
1292.880	H	-28.48	-20	pass
1454.490	H	-31.45	-20	pass
1616.100	H	-32.98	-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	-27.64	-20	pass
484.830	V	-30.06	-20	pass
646.440	V	-29.11	-20	pass
808.050	V	-30.45	-20	pass
969.660	V	-29.75	-20	pass
1131.270	V	-32.21	-20	pass
1292.880	V	-29.36	-20	pass
1454.490	V	-31.14	-20	pass
1616.100	V	-34.27	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	0		pass
347.950	H	-26.54	-20	pass
521.925	H	-27.57	-20	pass
695.900	H	-27.08	-20	pass
869.875	H	-27.48	-20	pass
1043.850	H	-31.06	-20	pass
1217.825	H	-33.24	-20	pass
1391.800	H	-29.45	-20	pass
1565.775	H	-30.23	-20	pass
1739.750	H	-33.12	-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	-26.10	-20	pass
521.925	V	-26.16	-20	pass
695.900	V	-24.95	-20	pass
869.875	V	-24.50	-20	pass
1043.850	V	-30.32	-20	pass
1217.825	V	-28.29	-20	pass
1391.800	V	-31.70	-20	pass
1565.775	V	-33.59	-20	pass
1739.750	V	-35.32	-20	pass

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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	-27.08	-20	pass
408.075	H	-26.38	-20	pass
544.100	H	-29.74	-20	pass
680.125	H	-29.59	-20	pass
816.150	H	-33.19	-20	pass
952.175	H	-35.52	-20	pass
1088.200	H	-30.07	-20	pass
1224.225	H	-30.21	-20	pass
1360.250	H	-34.46	-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	-27.40	-20	pass
408.075	V	-29.51	-20	pass
544.100	V	-30.85	-20	pass
680.125	V	-30.06	-20	pass
816.150	V	-31.07	-20	pass
952.175	V	-33.13	-20	pass
1088.200	V	-28.87	-20	pass
1224.225	V	-34.28	-20	pass
1360.250	V	-32.64	-20	pass

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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	-27.19	-20	pass
455.550	H	-28.43	-20	pass
607.400	H	-28.37	-20	pass
759.250	H	-28.63	-20	pass
911.100	H	-28.66	-20	pass
1062.950	H	-32.67	-20	pass
1214.800	H	-29.10	-20	pass
1366.650	H	-31.95	-20	pass
1518.500	H	-33.40	-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	-28.22	-20	pass
455.550	V	-24.84	-20	pass
607.400	V	-30.06	-20	pass
759.250	V	-29.92	-20	pass
911.100	V	-34.27	-20	pass
1062.950	V	-34.11	-20	pass
1214.800	V	-28.84	-20	pass
1366.650	V	-29.01	-20	pass
1518.500	V	-35.46	-20	pass

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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	-27.82	-20	pass
465.075	H	-25.27	-20	pass
620.100	H	-27.76	-20	pass
775.125	H	-29.03	-20	pass
930.150	H	-32.92	-20	pass
1085.175	H	-34.78	-20	pass
1240.200	H	-29.45	-20	pass
1395.225	H	-28.54	-20	pass
1550.250	H	-35.51	-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	-27.22	-20	pass
465.075	V	-27.49	-20	pass
620.100	V	-28.51	-20	pass
775.125	V	-29.45	-20	pass
930.150	V	-30.60	-20	pass
1085.175	V	-33.50	-20	pass
1240.200	V	-27.98	-20	pass
1395.225	V	-31.52	-20	pass
1550.250	V	-33.94	-20	pass

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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	-26.53	-20	pass
484.830	H	-27.65	-20	pass
646.440	H	-28.31	-20	pass
808.050	H	-30.53	-20	pass
969.660	H	-30.77	-20	pass
1131.270	H	-33.80	-20	pass
1292.880	H	-28.52	-20	pass
1454.490	H	-32.39	-20	pass
1616.100	H	-34.27	-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	-25.53	-20	pass
484.830	V	-27.67	-20	pass
646.440	V	-28.40	-20	pass
808.050	V	-31.62	-20	pass
969.660	V	-30.72	-20	pass
1131.270	V	-30.82	-20	pass
1292.880	V	-32.30	-20	pass
1454.490	V	-33.23	-20	pass
1616.100	V	-34.62	-20	pass

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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	-27.85	-20	pass
521.925	H	-27.85	-20	pass
695.900	H	-29.34	-20	pass
869.875	H	-29.91	-20	pass
1043.850	H	-31.91	-20	pass
1217.825	H	-34.21	-20	pass
1391.800	H	-30.80	-20	pass
1565.775	H	-30.87	-20	pass
1739.750	H	-34.02	-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	-26.82	-20	pass
521.925	V	-26.63	-20	pass
695.900	V	-27.05	-20	pass
869.875	V	-27.68	-20	pass
1043.850	V	-30.41	-20	pass
1217.825	V	-29.60	-20	pass
1391.800	V	-32.62	-20	pass
1565.775	V	-33.73	-20	pass
1739.750	V	-35.50	-20	pass

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UHF:

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-35W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	0		pass
800.050	H	-26.08	-20	pass
1200.075	H	0.00	-20	pass
1600.100	H	-28.71	-20	pass
2000.125	H	-30.57	-20	pass
2400.150	H	-31.11	-20	pass
2800.175	H	-33.22	-20	pass
3200.200	H	-28.89	-20	pass
3600.225	H	-31.12	-20	pass
4000.250	H	-30.83	-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	-25.83	-20	pass
1200.075	V	-27.07	-20	pass
1600.100	V	-28.11	-20	pass
2000.125	V	-29.83	-20	pass
2400.150	V	-29.16	-20	pass
2800.175	V	-33.06	-20	pass
3200.200	V	-27.55	-20	pass
3600.225	V	-32.32	-20	pass
4000.250	V	-33.11	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 453.225MHz-35W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
453.225	H	0		pass
906.450	H	-26.22	-20	pass
1359.675	H	0.00	-20	pass
1812.900	H	-29.23	-20	pass
2266.125	H	-30.56	-20	pass
2719.350	H	-31.72	-20	pass
3172.575	H	-31.95	-20	pass
3625.800	H	-29.14	-20	pass
4079.025	H	-31.12	-20	pass
4532.250	H	-31.08	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
453.225	V	0		pass
906.450	V	-25.57	-20	pass
1359.675	V	-27.84	-20	pass
1812.900	V	-28.09	-20	pass
2266.125	V	-30.94	-20	pass
2719.350	V	-29.36	-20	pass
3172.575	V	-33.29	-20	pass
3625.800	V	-28.99	-20	pass
4079.025	V	-32.15	-20	pass
4532.250	V	-33.81	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-35W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	0		pass
908.050	H	-25.69	-20	pass
1362.075	H	-29.72	-20	pass
1816.100	H	-29.47	-20	pass
2270.125	H	-30.84	-20	pass
2724.150	H	-32.65	-20	pass
3178.175	H	-28.86	-20	pass
3632.200	H	-28.84	-20	pass
4086.225	H	-31.31	-20	pass
4540.250	H	-35.85	-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	-25.99	-20	pass
1362.075	V	-24.60	-20	pass
1816.100	V	-28.14	-20	pass
2270.125	V	-29.06	-20	pass
2724.150	V	-33.34	-20	pass
3178.175	V	-33.93	-20	pass
3632.200	V	-34.67	-20	pass
4086.225	V	-35.88	-20	pass
4540.250	V	-36.21	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-35W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	0		pass
959.950	H	-28.72	-20	pass
1439.925	H	-28.54	-20	pass
1919.900	H	-29.42	-20	pass
2399.875	H	-30.39	-20	pass
2879.850	H	-30.91	-20	pass
3359.825	H	-30.55	-20	pass
3839.800	H	-28.95	-20	pass
4319.775	H	-31.68	-20	pass
4799.750	H	-36.95	-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	-27.36	-20	pass
1439.925	V	-28.12	-20	pass
1919.900	V	-30.14	-20	pass
2399.875	V	-30.79	-20	pass
2879.850	V	-28.56	-20	pass
3359.825	V	-31.54	-20	pass
3839.800	V	-27.77	-20	pass
4319.775	V	-29.84	-20	pass
4799.750	V	-32.85	-20	pass

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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	-27.40	-20	pass
1200.075	H	-28.50	-20	pass
1600.100	H	-30.06	-20	pass
2000.125	H	-30.77	-20	pass
2400.150	H	-29.51	-20	pass
2800.175	H	-31.67	-20	pass
3200.200	H	-28.54	-20	pass
3600.225	H	-34.69	-20	pass
4000.250	H	-34.40	-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	-27.63	-20	pass
1200.075	V	-28.66	-20	pass
1600.100	V	-29.39	-20	pass
2000.125	V	-29.48	-20	pass
2400.150	V	-30.75	-20	pass
2800.175	V	-32.66	-20	pass
3200.200	V	-28.94	-20	pass
3600.225	V	-31.41	-20	pass
4000.250	V	-34.55	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 453.225MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
453.225	H	0		pass
906.450	H	-25.20	-20	pass
1359.675	H	-28.15	-20	pass
1812.900	H	-27.16	-20	pass
2266.125	H	-27.73	-20	pass
2719.350	H	-32.03	-20	pass
3172.575	H	-33.00	-20	pass
3625.800	H	-34.89	-20	pass
4079.025	H	-36.39	-20	pass
4532.250	H	-36.51	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
453.225	V	0		pass
906.450	V	-27.97	-20	pass
1359.675	V	-29.41	-20	pass
1812.900	V	-28.97	-20	pass
2266.125	V	-29.16	-20	pass
2719.350	V	-30.00	-20	pass
3172.575	V	-27.95	-20	pass
3625.800	V	-31.92	-20	pass
4079.025	V	-33.32	-20	pass
4532.250	V	-35.74	-20	pass

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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	-27.58	-20	pass
1362.075	H	-28.26	-20	pass
1816.100	H	-30.14	-20	pass
2270.125	H	-29.62	-20	pass
2724.150	H	-33.34	-20	pass
3178.175	H	-36.25	-20	pass
3632.200	H	-29.90	-20	pass
4086.225	H	-33.33	-20	pass
4540.250	H	-34.75	-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	-27.65	-20	pass
1439.925	V	-25.65	-20	pass
1919.900	V	-30.93	-20	pass
2399.875	V	-28.65	-20	pass
2879.850	V	-33.16	-20	pass
3359.825	V	-34.26	-20	pass
3839.800	V	-32.19	-20	pass
4319.775	V	-31.91	-20	pass
4799.750	V	-34.54	-20	pass

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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	-26.20	-20	pass
1439.925	H	-27.99	-20	pass
1919.900	H	-28.65	-20	pass
2399.875	H	-29.06	-20	pass
2879.850	H	-28.80	-20	pass
3359.825	H	-32.42	-20	pass
3839.800	H	-27.96	-20	pass
4319.775	H	-32.74	-20	pass
4799.750	H	-34.55	-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	-27.36	-20	pass
1439.925	V	-28.12	-20	pass
1919.900	V	-30.14	-20	pass
2399.875	V	-30.79	-20	pass
2879.850	V	-28.56	-20	pass
3359.825	V	-31.54	-20	pass
3839.800	V	-27.77	-20	pass
4319.775	V	-29.84	-20	pass
4799.750	V	-32.85	-20	pass

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Digital:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	0		pass
272.050	H	-26.93	-20	pass
408.075	H	-25.76	-20	pass
544.100	H	-27.94	-20	pass
680.125	H	-28.82	-20	pass
816.150	H	-32.88	-20	pass
952.175	H	-35.79	-20	pass
1088.200	H	-29.45	-20	pass
1224.225	H	-33.86	-20	pass
1360.250	H	-34.97	-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	-27.77	-20	pass
408.075	V	-27.63	-20	pass
544.100	V	-28.06	-20	pass
680.125	V	-29.63	-20	pass
816.150	V	-29.60	-20	pass
952.175	V	-33.49	-20	pass
1088.200	V	-29.46	-20	pass
1224.225	V	-31.05	-20	pass
1360.250	V	-33.40	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	0		pass
303.700	H	-25.07	-20	pass
455.550	H	-28.44	-20	pass
607.400	H	-28.46	-20	pass
759.250	H	-29.86	-20	pass
911.100	H	-31.45	-20	pass
1062.950	H	-33.62	-20	pass
1214.800	H	-29.57	-20	pass
1366.650	H	-31.68	-20	pass
1518.500	H	-33.16	-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	-26.55	-20	pass
455.550	V	-26.74	-20	pass
607.400	V	-28.86	-20	pass
759.250	V	-32.40	-20	pass
911.100	V	-29.44	-20	pass
1062.950	V	-30.67	-20	pass
1214.800	V	-31.83	-20	pass
1366.650	V	-34.11	-20	pass
1518.500	V	-34.13	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	0		pass
310.050	H	-29.81	-20	pass
465.075	H	-29.01	-20	pass
620.100	H	-28.40	-20	pass
775.125	H	-31.46	-20	pass
930.150	H	-30.35	-20	pass
1085.175	H	-31.34	-20	pass
1240.200	H	-29.03	-20	pass
1395.225	H	-30.93	-20	pass
1550.250	H	-32.72	-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	-25.86	-20	pass
465.075	V	-27.63	-20	pass
620.100	V	-27.37	-20	pass
775.125	V	-27.92	-20	pass
930.150	V	-31.63	-20	pass
1085.175	V	-28.85	-20	pass
1240.200	V	-31.98	-20	pass
1395.225	V	-33.92	-20	pass
1550.250	V	-34.42	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	0		pass
323.220	H	-27.94	-20	pass
484.830	H	-28.28	-20	pass
646.440	H	-28.26	-20	pass
808.050	H	-31.61	-20	pass
969.660	H	-31.90	-20	pass
1131.270	H	-30.70	-20	pass
1292.880	H	-29.23	-20	pass
1454.490	H	-31.64	-20	pass
1616.100	H	-35.15	-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	-26.80	-20	pass
484.830	V	-27.76	-20	pass
646.440	V	-27.53	-20	pass
808.050	V	-30.66	-20	pass
969.660	V	-31.59	-20	pass
1131.270	V	-33.50	-20	pass
1292.880	V	-34.93	-20	pass
1454.490	V	-34.65	-20	pass
1616.100	V	-35.79	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-40W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	0		pass
347.950	H	-25.99	-20	pass
521.925	H	-28.44	-20	pass
695.900	H	-28.52	-20	pass
869.875	H	-31.73	-20	pass
1043.850	H	-32.29	-20	pass
1217.825	H	-33.14	-20	pass
1391.800	H	-28.65	-20	pass
1565.775	H	-30.48	-20	pass
1739.750	H	-33.77	-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	-25.54	-20	pass
521.925	V	-27.99	-20	pass
695.900	V	-29.13	-20	pass
869.875	V	-30.82	-20	pass
1043.850	V	-30.07	-20	pass
1217.825	V	-34.04	-20	pass
1391.800	V	-27.98	-20	pass
1565.775	V	-31.67	-20	pass
1739.750	V	-34.02	-20	pass

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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	-26.86	-20	pass
408.075	H	-29.76	-20	pass
544.100	H	-29.99	-20	pass
680.125	H	-31.25	-20	pass
816.150	H	-32.32	-20	pass
952.175	H	-29.41	-20	pass
1088.200	H	-29.25	-20	pass
1224.225	H	-34.06	-20	pass
1360.250	H	-36.35	-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	-26.64	-20	pass
408.075	V	-24.63	-20	pass
544.100	V	-27.34	-20	pass
680.125	V	-29.52	-20	pass
816.150	V	-32.75	-20	pass
952.175	V	-34.80	-20	pass
1088.200	V	-33.87	-20	pass
1224.225	V	-35.67	-20	pass
1360.250	V	-36.53	-20	pass

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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	-29.13	-20	pass
455.550	H	-28.60	-20	pass
607.400	H	-28.28	-20	pass
759.250	H	-30.64	-20	pass
911.100	H	-29.49	-20	pass
1062.950	H	-30.60	-20	pass
1214.800	H	-28.62	-20	pass
1366.650	H	-32.39	-20	pass
1518.500	H	-34.31	-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	-27.57	-20	pass
455.550	V	-28.57	-20	pass
607.400	V	-31.17	-20	pass
759.250	V	-30.73	-20	pass
911.100	V	-28.43	-20	pass
1062.950	V	-32.34	-20	pass
1214.800	V	-28.60	-20	pass
1366.650	V	-30.86	-20	pass
1518.500	V	-33.39	-20	pass

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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	-27.27	-20	pass
465.075	H	-28.81	-20	pass
620.100	H	-30.32	-20	pass
775.125	H	-31.88	-20	pass
930.150	H	-29.91	-20	pass
1085.175	H	-31.49	-20	pass
1240.200	H	-27.74	-20	pass
1395.225	H	-33.87	-20	pass
1550.250	H	-34.80	-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	-27.31	-20	pass
465.075	V	-29.63	-20	pass
620.100	V	-28.92	-20	pass
775.125	V	-30.21	-20	pass
930.150	V	-30.85	-20	pass
1085.175	V	-32.06	-20	pass
1240.200	V	-28.37	-20	pass
1395.225	V	-31.43	-20	pass
1550.250	V	-33.78	-20	pass

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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	-26.13	-20	pass
484.830	H	-28.42	-20	pass
646.440	H	-26.96	-20	pass
808.050	H	-27.85	-20	pass
969.660	H	-32.12	-20	pass
1131.270	H	-33.32	-20	pass
1292.880	H	-34.40	-20	pass
1454.490	H	-35.13	-20	pass
1616.100	H	-36.22	-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	-27.78	-20	pass
484.830	V	-29.25	-20	pass
646.440	V	-28.10	-20	pass
808.050	V	-29.19	-20	pass
969.660	V	-29.47	-20	pass
1131.270	V	-27.55	-20	pass
1292.880	V	-32.07	-20	pass
1454.490	V	-33.46	-20	pass
1616.100	V	-35.29	-20	pass

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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	-26.75	-20	pass
521.925	H	-28.60	-20	pass
695.900	H	-30.84	-20	pass
869.875	H	-30.24	-20	pass
1043.850	H	-33.49	-20	pass
1217.825	H	-35.55	-20	pass
1391.800	H	-29.45	-20	pass
1565.775	H	-32.00	-20	pass
1739.750	H	-34.49	-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	-28.60	-20	pass
521.925	V	-28.97	-20	pass
695.900	V	-29.81	-20	pass
869.875	V	-31.21	-20	pass
1043.850	V	-31.48	-20	pass
1217.825	V	-32.71	-20	pass
1391.800	V	-29.09	-20	pass
1565.775	V	-33.32	-20	pass
1739.750	V	-36.45	-20	pass

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Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-35W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	0		pass
800.050	H	-27.01	-20	pass
1200.075	H	-27.62	-20	pass
1600.100	H	-29.29	-20	pass
2000.125	H	-28.84	-20	pass
2400.150	H	-29.10	-20	pass
2800.175	H	-31.76	-20	pass
3200.200	H	-28.93	-20	pass
3600.225	H	-32.93	-20	pass
4000.250	H	-34.20	-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	-28.62	-20	pass
1200.075	V	-25.15	-20	pass
1600.100	V	-31.17	-20	pass
2000.125	V	-29.13	-20	pass
2400.150	V	-33.49	-20	pass
2800.175	V	-34.69	-20	pass
3200.200	V	-32.42	-20	pass
3600.225	V	-32.54	-20	pass
4000.250	V	-35.29	-20	pass

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