MOTOROLA SOLUTIONS

TESTING CERT # 2786.01

MOTOROLA PENANG ADV. COMM. LABORATORY
Motorola Solutions Malaysia Sdn Bhd
Innoplex Plot 2A, Medan Bayan Lepas,
Mukim 12 S.W.D, 11900 Bayan Lepas,
Penang, Malaysia.

FCC / IC TEST REPORT
Report Revision : Rev.C

Date/s Tested	:	05-JUN-2017 - 14-JUN-2017
Report Issue Date	:	24-AUG-2017
Manufacturer/Location	:	Motorola Solutions Malaysia Sdn Bhd
Requestor	:	TEOH YEE TENG
Product Type	:	Portable
Model Number	:	H92SDF9PW6AN
Frequency Band	:	450-520 MHz
Low / Max RF Output Power	:	1 Watt / 5.6 Watts
Applicant Name	:	Motorola Solutions Malaysia Sdn Bhd
Applicant Address	:	Innoplex Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia
FCC Registrations	:	772092
IC Registrations	:	109AK

The equipment was tested accordance to the requirement listed below:

(LMR) **FCC 47 CFR Part 2 / 22 / 74 / 80 / 90** **IC RSS-119**	**PASS**

This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.

Prepared By:

SONG ZHI WEI
Test Personnel

Approved By:

GOH AIK HONG
Responsible Engineer

Table of Contents

Report Revision History 3
1.0 General Information 4
2.0 Summary of Test Results 5
3.0 Measurement Uncertainty 5
4.0 Equipment List 6
5.0 Test Condition 7
5.1. Transmitter Test Conditions 7
6.0 Transmitter Test Parameters 8
6.1. RF Output Power 8
6.1.1. Test Setup 8
6.1.2. Test Result 8
6.2. Frequency Stability 9
6.2.1. Test Setup 9
6.2.2. Test Result 10
6.2.3. Test Limit 11
6.3. Audio Frequency Response 12
6.3.1. Test Setup 12
6.3.2. Test Result 13
6.3.3. Test Limit 14
6.4. Audio Low Pass Filter Response 15
6.4.1. Test Setup 15
6.4.2. Test Result 16
6.4.3. Test Limit 17
6.5. Modulation Limiting 18
6.5.1. Test Setup 18
6.5.2. Test Result 19
6.5.3. Test Limit 19
6.6. Occupied Bandwidth 20
6.6.1. Test Setup (Analog) 20
6.6.2. Test Result (Analog) 21
6.6.3. Test Setup (Digital) 27
6.6.4. Test Result (Digital) 28
6.6.5. Test Limit 34
6.7. Band Edge Conducted Spurious Emission (Part 22) 35
6.7.1. Test Setup (Analog) 35
6.7.2. Test Result (Analog) 36
6.7.3. Test Result (Digital) 38
6.7.4. Test Limit 39
6.8. Transient Frequency Behavior 40
6.8.1. Test Setup 40
6.8.2. Test Result 41
6.8.3. Test Limit 43

6.9. Adjacent Channel Power 44
6.9.1. Test Setup (Analog) 44
6.9.2. Test Setup (Digital) 45
6.9.3. Test Result 45
6.9.4. Test Limit 46
6.10. Conducted Spurious Emission 48
6.10.1. Test Setup 48
6.10.2. Test Result (Analog) 49
6.10.1. Test Result (Digital) 62
6.10.2. Test Limit 109
6.11. Radiated Spurious Emission 110
6.11.1. Test Setup 110
6.11.2. Test Result 111
6.11.3. Test Limit 111
6.12. Effective Radiated Power (ERP) / GNSS (EIRP for 1559 - 1610MHz) 112
6.12.1. Test Setup 112
6.12.2. Test Result 112
6.12.3. Test Limit 113
6.13. AC Power Line Conducted Spur Emissions 114
6.13.1. Test Setup 114
6.13.2. Test Result 114
6.13.3. Test Limit 115

Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	27-JUL-2017	Song Zhi Wei
Rev. B	Amend on Occupied Bandwidth Result Format and Result.	17-AUG-2017	Song Zhi Wei
Rev. C	I. Amend on Occupied Bandwidth Part 22 16K0F3E plot for 459.125MHz. II. Remove Conducted Spurious Emission Part 22 and 74 from the title of the plot for 511.9875MHz.	24-AUG-2017	Song Zhi Wei

1.0 General Information

EUT Description:

Technologies	Land Mobile Radio (LMR)
Modulation Type	Analog, C4FM,Phase 2

General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

ANSI/TIA/-603-D
ANSI C63.4.2014
TIA-102 CCAA-A
TIA-102 CAAB-D
TIA-102 CAAA-D
ANSI C63.26-2015

2.0 Summary of Test Results

FCC General Rules Part (47CFR)	IC General Rules Part	Test Item	Result
2.1046(a), 22.565(f), 74.461, 74.467, 80.215	RSS-Gen, RSS-119	RF Power Output	Pass
2.1055, 22.355, 74.464, 74.561	-	Frequency Stability	Pass
2.107,74.463	-	Audio Frequency Response	Pass
2.107,74.463	-	Audio Low Pass Filter Response	Pass
2.107,74.463	-	Modulation limiting	Pass
2.1049, 22.359, 90.210, 74.462(b), 74.535, 80.211(c), (f)	RSS-Gen, RSS-119	Occupied Bandwidth	Pass
22.359(a),(b)	-	Band Edge Conducted Spurious Emission	Pass
90.214	-	Transient Frequency Behavior	Pass
-	-	Adjacent Channel Power	NA
2.1051, 22.359, 74.462(c), 80.211(c)	RSS-Gen, RSS-119	Conducted Spurious Emissions	Pass
2.1051, 22.359, 74.462(c), 80.211(c)	RSS-Gen, RSS-119	Radiated Spurious Emission	NA
-	-	GNSS (EIRP for 1559 – 1610MHz)	NA
-	-	Effective Radiated Power (ERP)	NA
-	-	AC Power Line Conducted Spurious Emission	NA

NA → **Not Applicable**

3.0 Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.43
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.01
	200MHz ~ 1000MHz	5.01
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.01
	18GHz ~ 25GHz	5.01

4.0 Equipment List

FCC Analog ATE#1: (SW Version: Analog ATE_Rev 2.4.2 & FCC_FreqStability_Rev 1.0.3)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
Audio Analyzer	8903B	3011A10475	2-May-17	2-May-18
SIGNAL GENERATOR	2042	203002/745	2-May-17	2-May-18
MODULATION ANALYZER	8901B	3216A03889	3-May-17	3-May-18
TRANSCEIVER INTERFACE	8954A	2234A00398	4-May-17	4-May-18
DSA	36570A	MY42506781	3-May-17	3-May-18
SIGNAL GENERATOR	E4425B	US39260201	2-May-17	2-May-18
SIGNAL GENERATOR	2042	203002/747	2-May-17	2-May-18
POWER SENSOR	E4412A	MY41502652	9-May-17	9-May-18
POWER METER	E4416A	GB41293855	9-May-17	9-May-18
POWER SUPPLY	6031A	3325A02771	3-May-17	28-Mar-18
CHAMBER	SH-641	92014678	4-Apr-17	4-Mar-18
RF TRANSCEIVER CONTROLLER	AX2007AI	NA	CNR	CNR

FCC Transient ATE #1: (SW Version: FCC Transient ATE_R 1.0.3)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
POWER SUPPLY	6032A	2818A03549	11-May-17	11-May-18
POWER SENSOR	E4412A	MY41498918	9-May-17	9-May-18
POWER METER	E4416A	MY45101016	11-Jan-17	11-Jan-18
ATTENUATORS/SWITCH DRIVER	11713A	2508A10141	CNR	CNR
STEP ATTENUATOR/11dB	8494G	MY52300223	9-May-17	9-May-18
STEP ATTENUATOR/110dB	8496G	MY52300176	9-May-17	9-May-18
OSCILLOSCOPE	MSO8064A	MY48240107	25-May-17	25-May-18
AUDIO ANALYZER	8903B	3729A17409	2-May-17	2-May-18
AUDIO ANALYZER	8903B	3011A08952	2-May-17	2-May-18
MODULATION ANALYZER	8901B	3019A02766	4-Mar-17	4-Mar-18
SIGNAL GENERATOR	8657A	3323A05725	2-May-17	2-May-18
SPECTRUM ANAYLYZER	E4440A	MY46185415	24-May-17	24-May-19
SWITCH CONTROL UNIT	-	-	CNR	CNR

Conducted Spurious Emission ATE # 1: (SW Version: Conducted Spur ATE_rev 1.22.07)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A32735	CNR	CNR
SPECTRUM ANALYZER	E4440A	US45303111	16-Feb-17	16-Feb-18
POWER SUPPLY	6032A	MY41002067	5-May-17	5-May-18
HIGH PASS FILTER SWITCH BOX	-	CS001	7-Apr-17	7-Apr-18
MICROWAVE GENERATOR	SMP 02	830682/015	19-Oct-16	19-Oct-17
MODULATION ANALYZER	8901B	3438A05278	3-Mar-17	3-Mar-18

CNR → Calibration Not Required

5.0 Test Condition

5.1. Transmitter Test Conditions

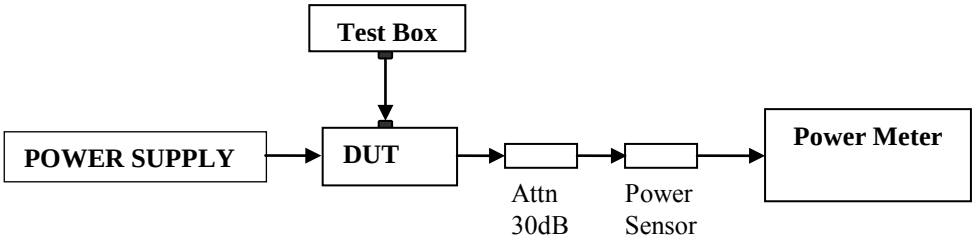
Test Item, (Channel Spacing)	Temperature (°C)	Voltage Supply (V)	Power (W)	Modulation	Test Frequency (MHz)
RF Output Power	25°C	Nominal	Low / Max	Analog	450.6500, 459.1250, 467.7750, 511.9875
Frequency Stability	-30°C ~ 60°C	80% ~ 120% of Nominal Volt	Max	Analog	467.7750
Audio Frequency Response (12.5kHz / 25kHz)	25°C	Nominal	Max	Analog	467.7750, 511.9875
Audio Low Pass Filter Response (12.5kHz / 25kHz)	25°C	Nominal	Max	Analog	467.7750, 511.9875
Modulation limiting (12.5kHz / 25kHz)	25°C	Nominal	Max	Analog	467.7750, 511.9875
Occupied Bandwidth (12.5kHz / 20kHz / 25kHz)	25°C	Nominal	Max	Analog, Digital	450.6500, 459.1250, 467.7750, 473.01250, 511.9875
Band Edge Conducted Spurious Emission (12.5kHz / 20kHz / 25kHz)	25°C	Nominal	Max	Analog, Digital	459.0250, 459.6500, 473.0125, 479.2875
Transient Frequency Behavior *(UHF & VHF Band)* (12.5kHz / 25kHz)	25°C	Nominal	Max	Analog, Digital	467.7750
Adjacent Channel Power *(700MHz Band)* (12.5kHz / 25kHz)	25°C	Nominal	Max	NA	NA
Conducted Spurious Emissions (12.5kHz / 20kHz / 25kHz)	25°C	Nominal	Low / Max	Analog, Digital	450.6500, 459.02500, 459.6500, 467.7750, 482.0125, 473.0125, 479.2875, 511.9875
Radiated Spurious Emission (12.5kHz / 25kHz)	25°C	Nominal	Low / Max	Analog, Digital	450.6500, 459.02500, 459.6500, 467.7750, 482.0125, 473.0125, 479.2875, 511.9875
GNSS *(700MHz Band)* (EIRP for 1559-1610MHz) (12.5kHz / 25kHz)	25°C	Nominal	Max	NA	NA
Effective Radiated Power (ERP) *(700MHz & 900MHz Band)* (12.5kHz / 25kHz)	25°C	Nominal	Max	NA	NA
AC Power Line Conducted Spurious Emissions* (12.5kHz)	25°C	Nominal	Max	NA	NA

* – ONLY tested if portables can be operated during charging OR mobiles can be used in desktop operation connected to a power supply **NA → Not Applicable**

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



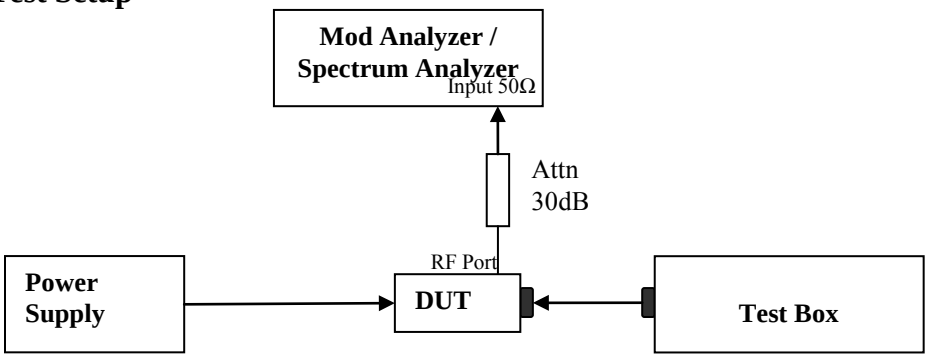
1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
2) Path loss for the measurement included.
3) All the measurement was done at low, mid, high frequency for each band.
4) Record the power into the test report.

6.1.2. Test Result

Temperature	25˚C				
Voltage (V)	7.5V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	Remarks
450.6500	1.03	0.90	5.40	2.03	
459.1250	1.03	0.90	5.41	2.05	
467.7750	1.00	0.87	5.45	2.06	
511.9875	1.03	0.91	5.54	2.09	
519.9875	1.05	0.95	5.59	2.10	Not For FCC Review

6.2. Frequency Stability

6.2.1. Test Setup

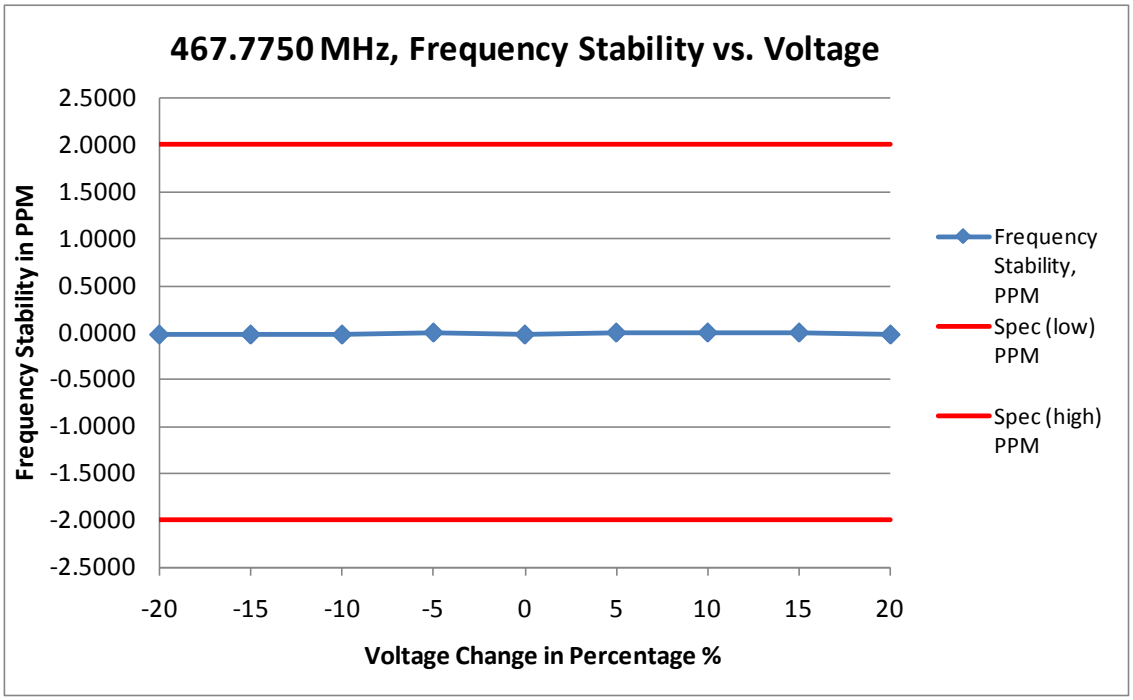


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Transmit the DUT and record the freq in MCF_{MHz}.
4) Test in 2 conditions: Different Temperature & Supply Voltage input.
    - Temperature: Vary voltage per test condition in Clause 5.1
    - Supply Voltage: Vary temperature per test condition in Clause 5.1
5) Calculate the ppm frequency error by the following:

$$ppm\ error = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1\right) * 10^6$$

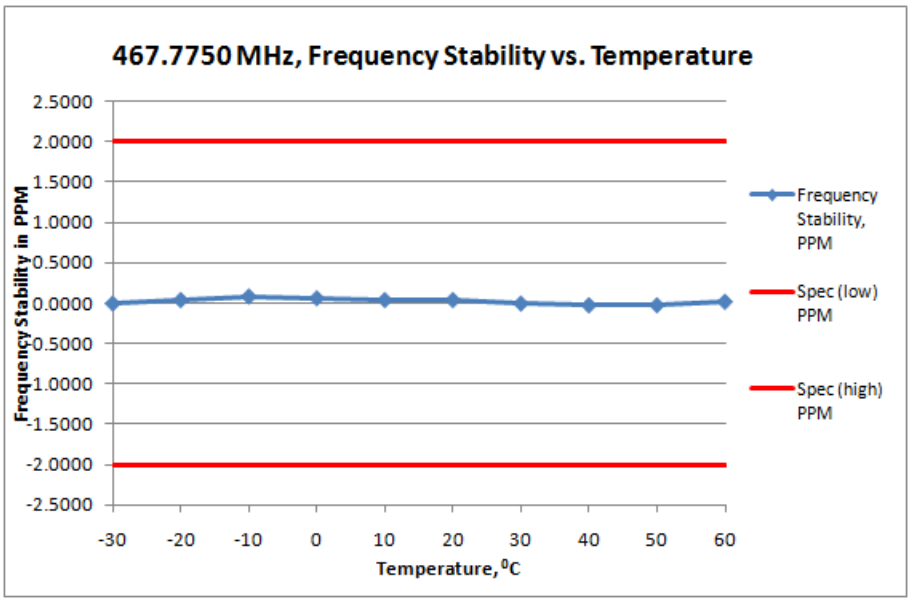
Where: MCF_{MHz} is the Measured Carrier Frequency in MHz
ACF_{MHz} is the Assigned Carrier Frequency in MHz

6.2.2. Test Result



(i) Frequency Stability VS Voltage

Frequency / Channel Spacing	467.7750 MHz / 25.00 kHz				
Temperature, ^{0}C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-20	6.0000	467.7750	-0.0214	-2.0000	2.0000
-15	6.3750	467.7750	-0.0214	-2.0000	2.0000
-10	6.7500	467.7750	-0.0214	-2.0000	2.0000
-5	7.1250	467.7750	0.0000	-2.0000	2.0000
0	7.5000	467.7750	-0.0214	-2.0000	2.0000
5	7.8750	467.7750	0.0000	-2.0000	2.0000
10	8.2500	467.7750	0.0000	-2.0000	2.0000
15	8.6250	467.7750	0.0000	-2.0000	2.0000
20	9.0000	467.7750	-0.0214	-2.0000	2.0000



(ii) Frequency Stability VS temperature

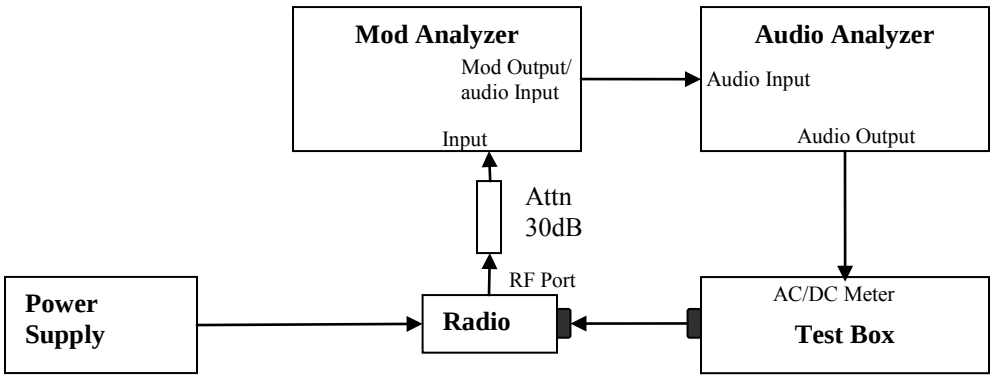
Frequency / Channel Spacing	467.7750 MHz / 25.00 kHz			
Voltage, V	7.5000			
Temperature, ^{0}C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	467.7750	0.0000	-2.0000	2.0000
-20	467.7750	0.0428	-2.0000	2.0000
-10	467.7750	0.0855	-2.0000	2.0000
0	467.7750	0.0641	-2.0000	2.0000
10	467.7750	0.0428	-2.0000	2.0000
20	467.7750	0.0428	-2.0000	2.0000
30	467.7750	0.0000	-2.0000	2.0000
40	467.7750	-0.0214	-2.0000	2.0000
50	467.7750	-0.0214	-2.0000	2.0000
60	467.7750	0.0214	-2.0000	2.0000

6.2.3. Test Limit

As per manufacturer declared spec +/- 2ppm

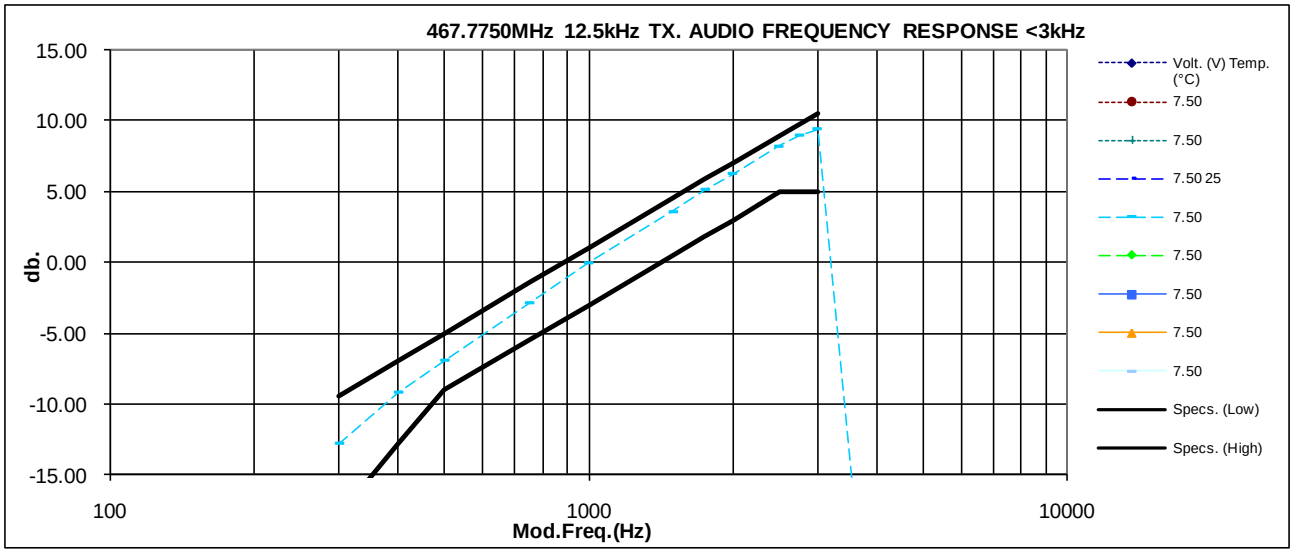
6.3. Audio Frequency Response

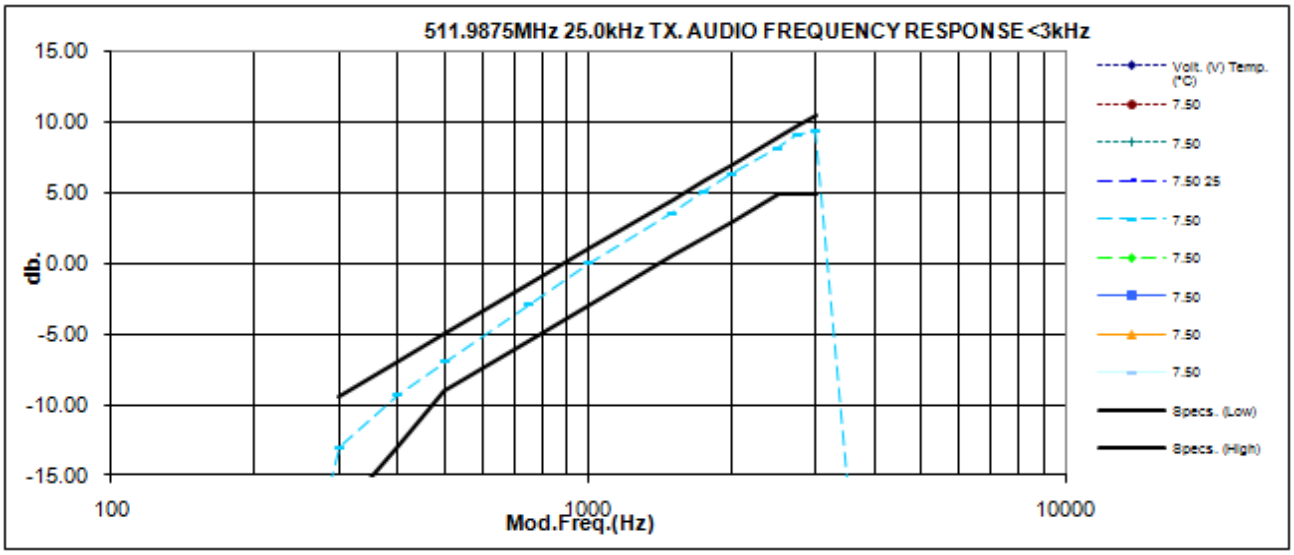
6.3.1. Test Setup



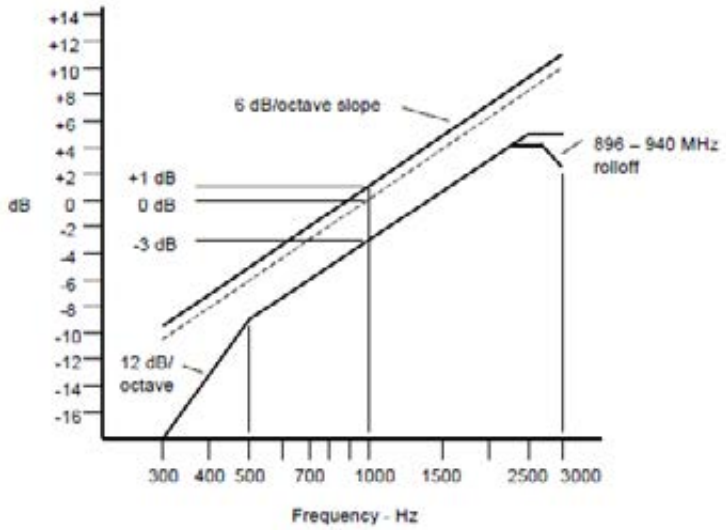
1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the maximum deviation.
5) On audio analyzer, set the rated level as reference to zero.
6) Vary the audio frequency from 300 Hz to 3 kHz. Record the change in dB on the audio analyzer.

6.3.2. Test Result





6.3.3. Test Limit

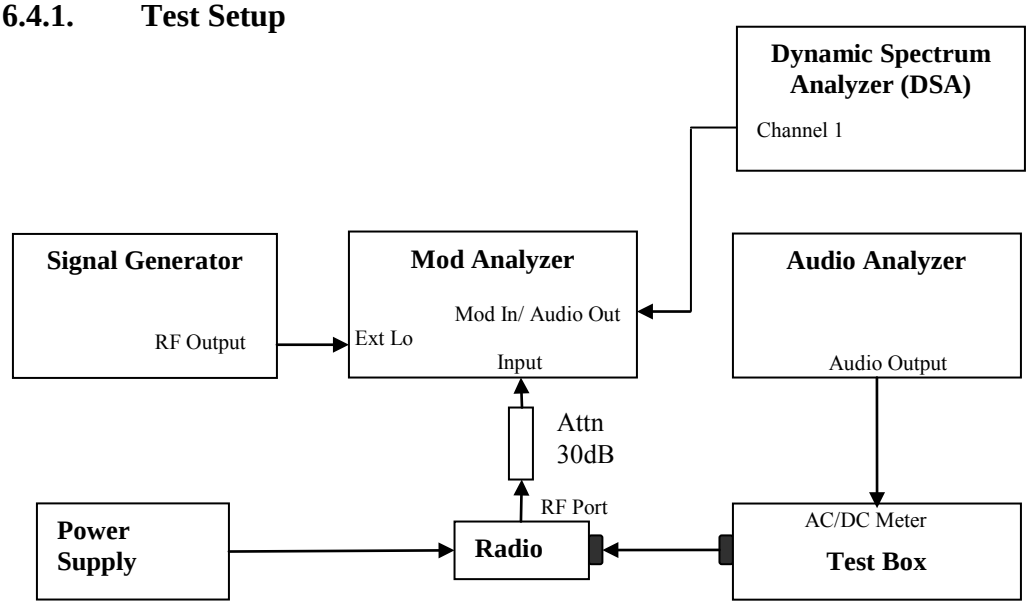


Note:

- *There are additional 6 dB per octave attenuation is allowed from 2.5KHz to 3KHz in equipment 25MHz to 869MHz radio.*
- *Additional 6 dB per octave attenuation is allowed from 2.3KHz to 2.7KHz & additional 12 dB per octave attenuation is allowed from 2.7KHz to 3KHz in equipment 896MHz to 940MHz radio.*

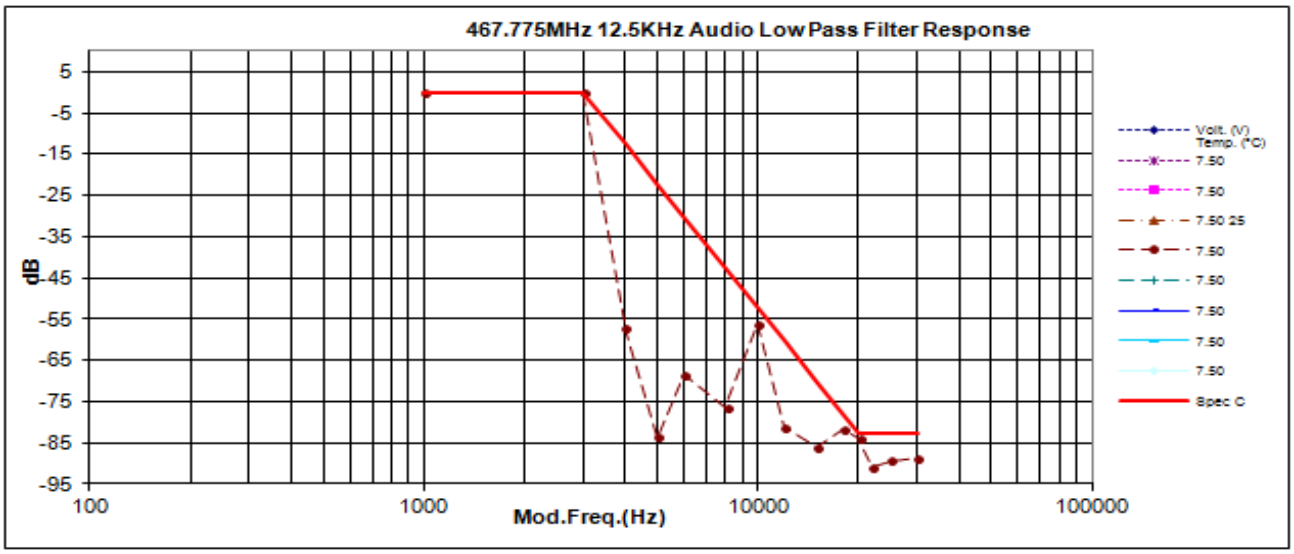
6.4. Audio Low Pass Filter Response

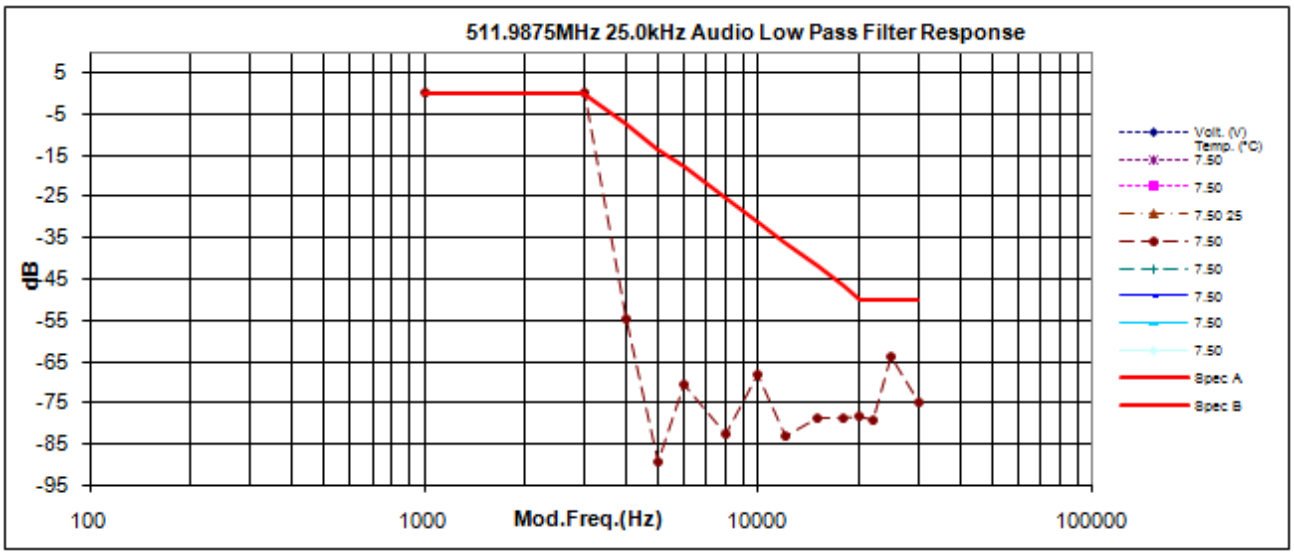
6.4.1. Test Setup



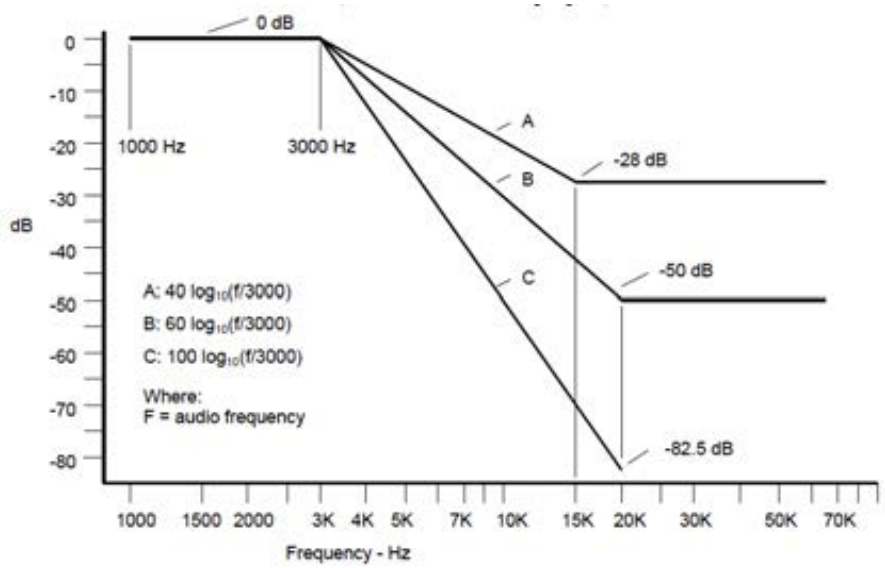
1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Press 23.1SPCL on modulation analyzer to enable the external LO from Sigen.
4) Set the Sigen frequency to Fc + 1.5 MHz, RF output level to 0dBm without modulation.
5) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the maximum deviation.
6) Up the amplitude by 20dB.
7) On DSA, get the reference point to 0dB.
8) Vary the frequency on audio analyzer from 3 kHz to 20 kHz, record the audio tone from DSA.

6.4.2. Test Result





6.4.3. Test Limit



For audio frequencies above 3000 Hz, the audio response of the post limiter low-pass filter shall meet or exceed the following requirements:

a) For equipment operating on 20, 25 or 30 kHz channel bandwidth in the 25 MHz to 174 MHz range:

At frequencies from 3000 Hz through 15,000 Hz the attenuation shall be greater than the attenuation at 1000 Hz by at least: 40 $\log_{10}(f / 3000)$ dB

where: f is the audio frequency in Hz.

At frequencies above 15,000 Hz, the attenuation shall be greater than the attenuation at 1000 Hz, by at least: 28 dB.

b) For equipment operating with 25 kHz bandwidth channels between 406 and 512 MHz through 896 MHz, and between 929 MHz through 930 MHz:

At frequencies from 3000 Hz through 20,000 Hz, the attenuation shall be greater than the attenuation at 1000 Hz by at least: 60 $\log_{10}(f / 3000)$ dB

where: f is the audio frequency in Hz.

At frequencies above 20,000 Hz the attenuation shall be greater than the attenuation at 1000 Hz by at least: 50 dB.

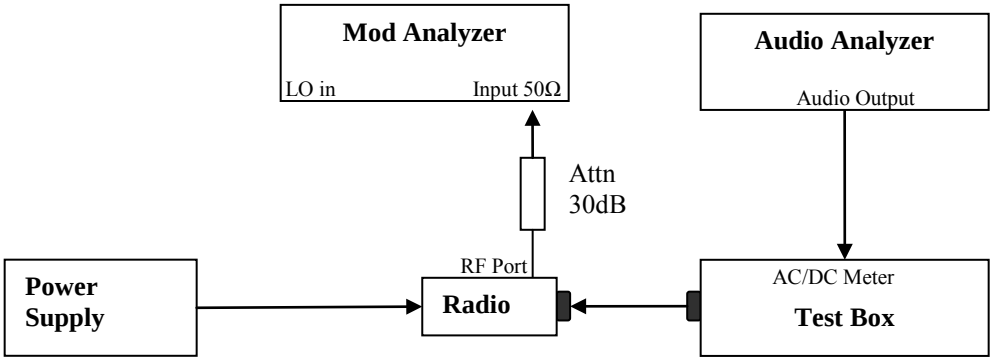
c) For equipment operating on channels between 896 MHz through 901 MHz, between 935 MHz through 940 MHz, and 12.5 or 15 kHz spaced channels in the frequency range 138-174 MHz and 406-512 MHz.

At frequencies from 3000 Hz through 20,000 Hz the attenuation shall be greater than the attenuation at 1000 Hz by at least: 100 $\log_{10}(f / 3000)$ dB

where: f is the audio frequency in Hz.

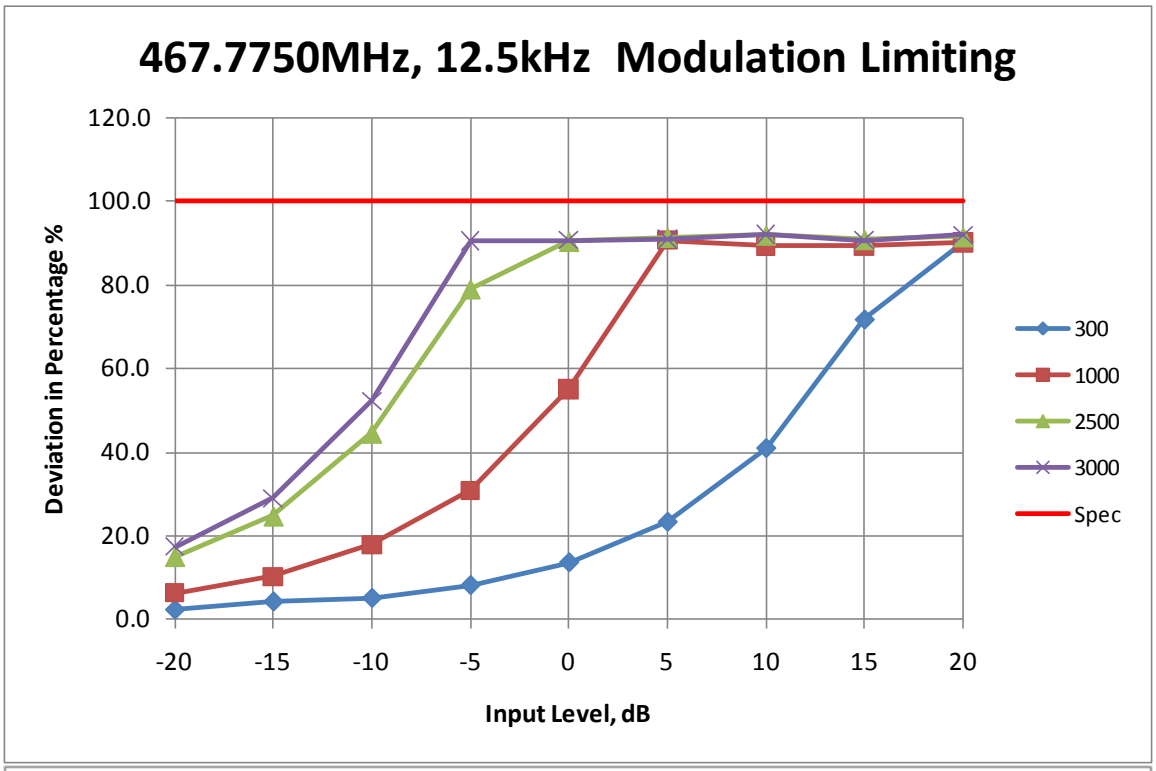
6.5. Modulation Limiting

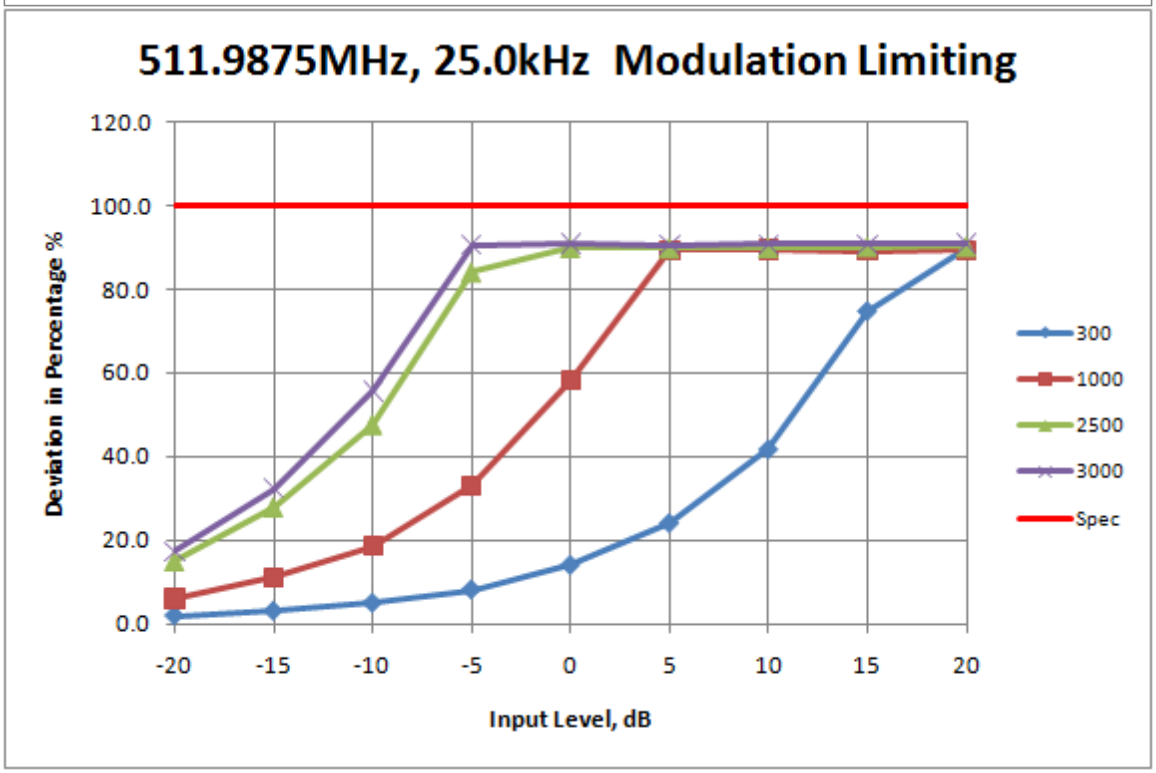
6.5.1. Test Setup



1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the maximum deviation.
5) Record the frequency deviation as 0dB input level at 1kHz audio frequency.
6) Repeat the step and record the frequency deviation from -20 dB to 20dB by 5 dB increments and different audio freq 300 Hz, 2.5 kHz and 3 kHz.

6.5.2. Test Result





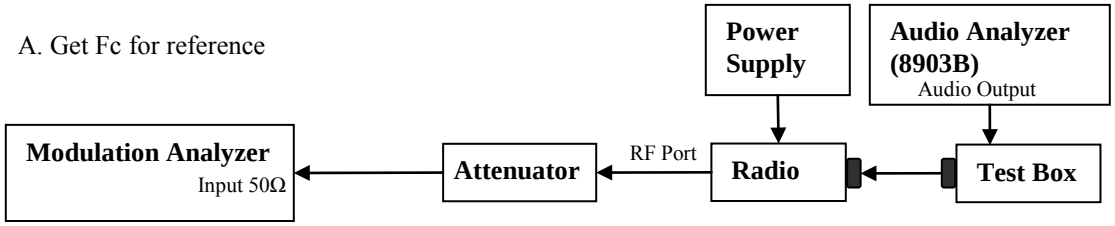
6.5.3. Test Limit

Modulation shall not exceed 100 percent if amplitude modulation is employed.

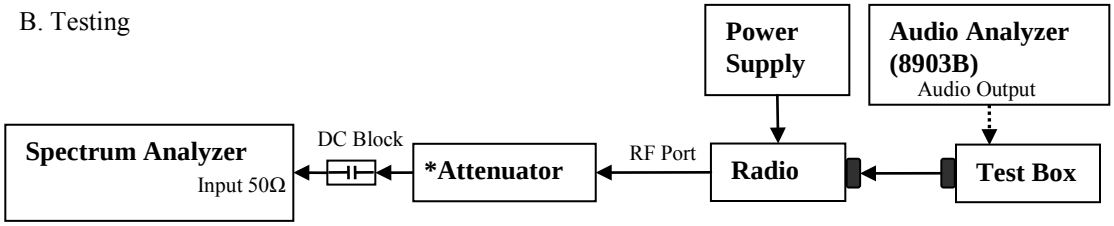
6.6. Occupied Bandwidth

6.6.1. Test Setup (Analog)

A. Get Fc for reference



B. Testing

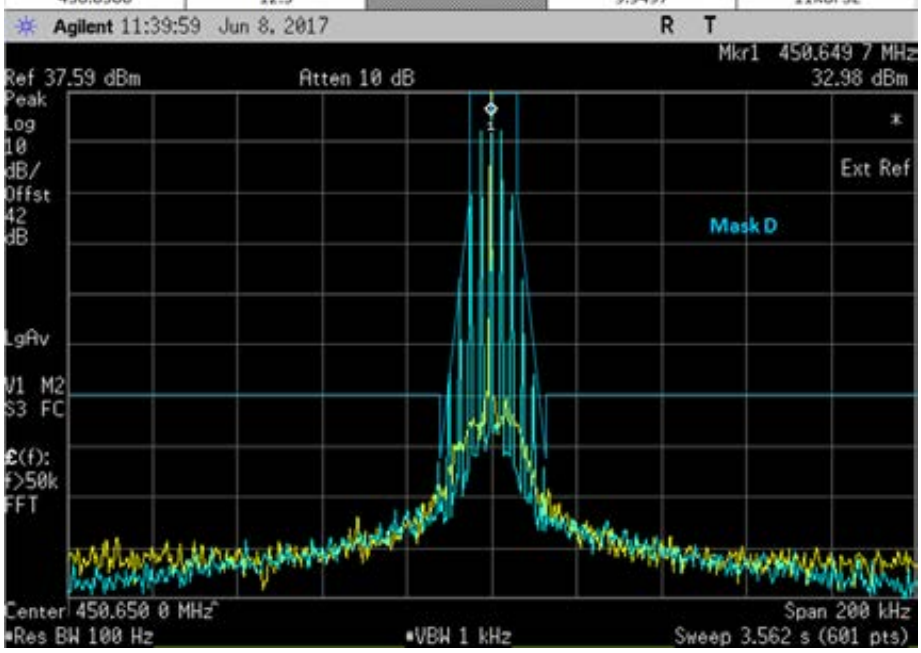


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey the DUT.
4) Path loss for the measurement included.
5) Select the Occupied Bandwidth measurement for 99% Bandwidth Measurement.
6) Key in the Fc and Resolution Bandwidth (1 ~ 5 % of emission designator).
7) Transmit the DUT and record the occupied Bandwidth frequency.
8) Preset the spectrum analyzer for sideband spectrum measurement.
9) Set the span to 100 KHz and Resolution Bandwidth (according to FCC/ ISED standard).
10) Save the screen shot as modulated signal
11) Remove the audio tone from audio analyzer to capture unmodulated signal.

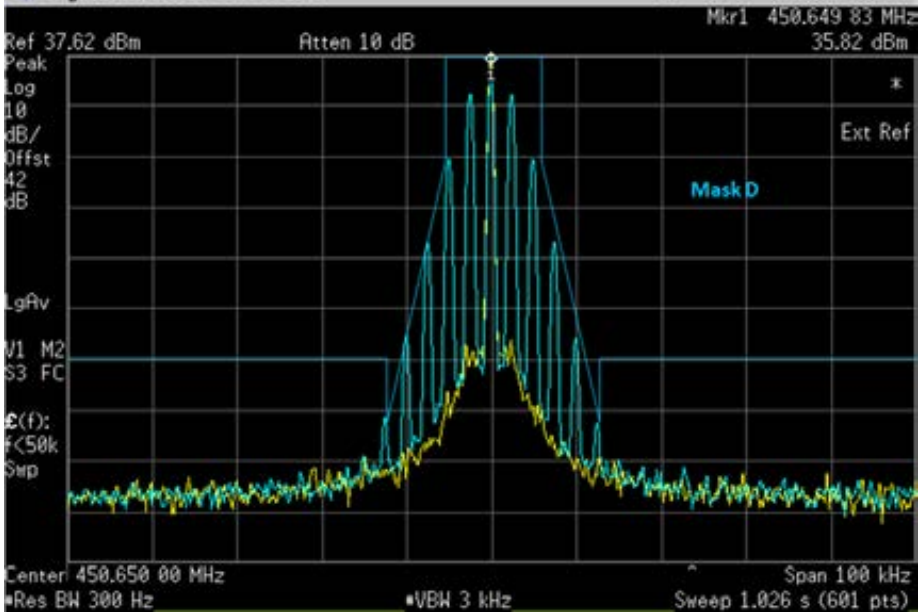
* Only HPF added for Mask 80.211 measurement with attenuator.

6.6.2. Test Result (Analog)

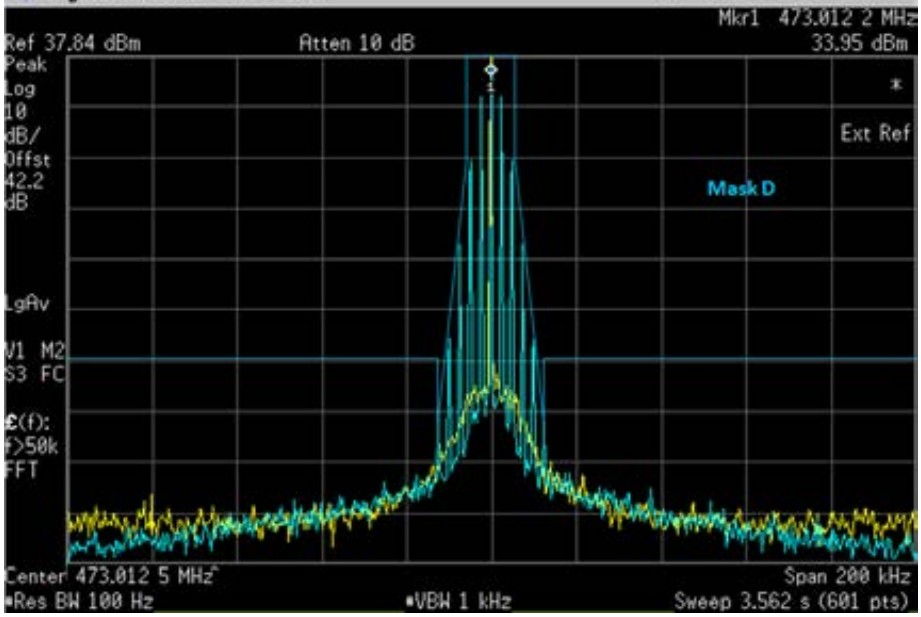
Modulation			Rules Part	
Analog Voice			FCC Part 90/RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
450.6500	12.5		9.9497	11K0F3E



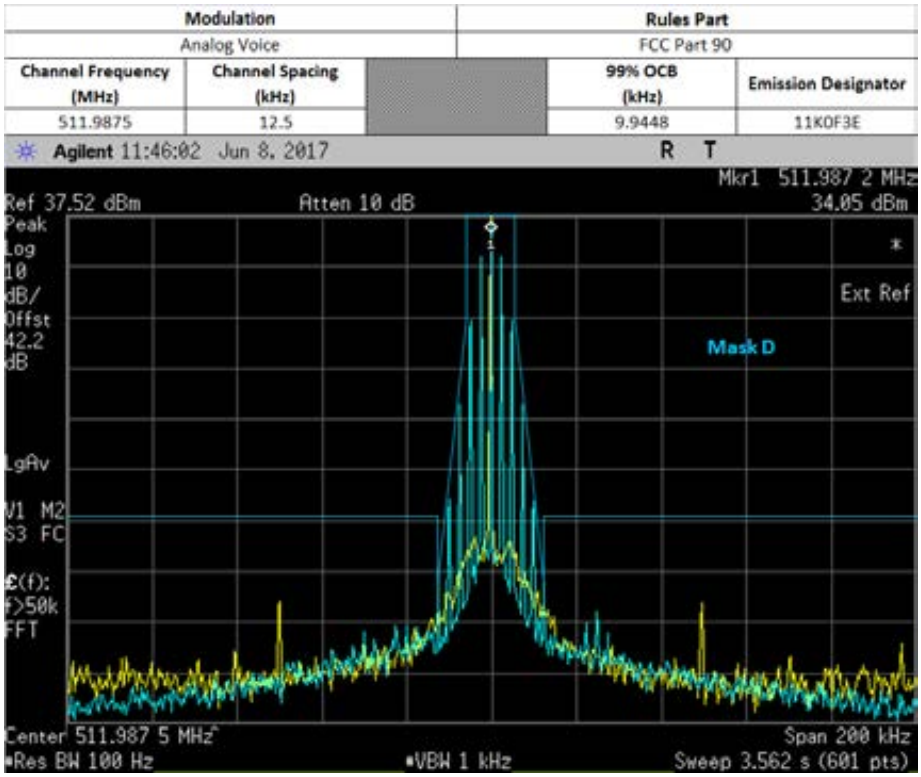
Modulation			Rules Part	
Analog Voice			FCC Part 74	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
450.6500	12.5		9.9442	11K0F3E



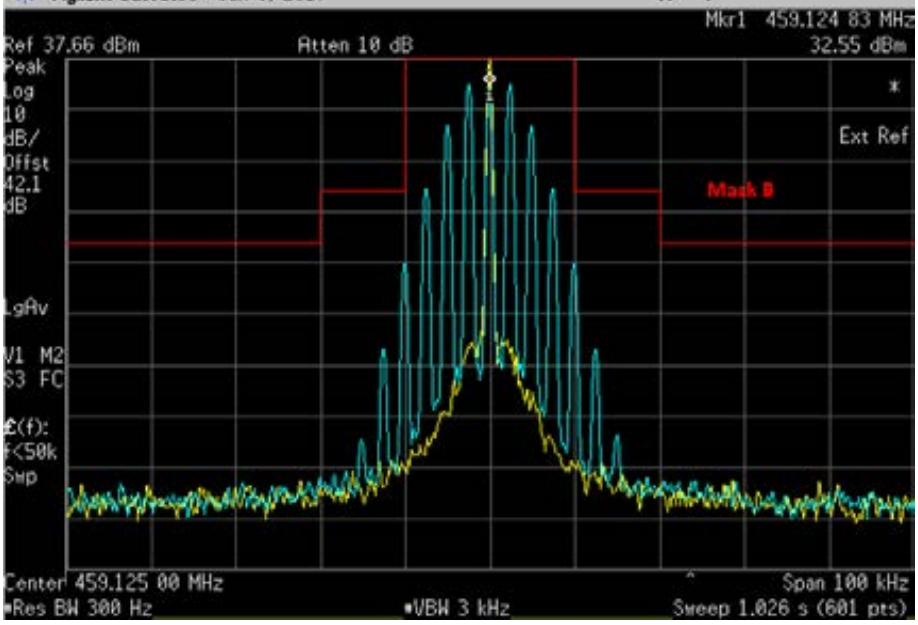
Modulation			Rules Part	
Analog Voice			FCC Part 90	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
473.0125	12.5		9.9427	11K0F3E



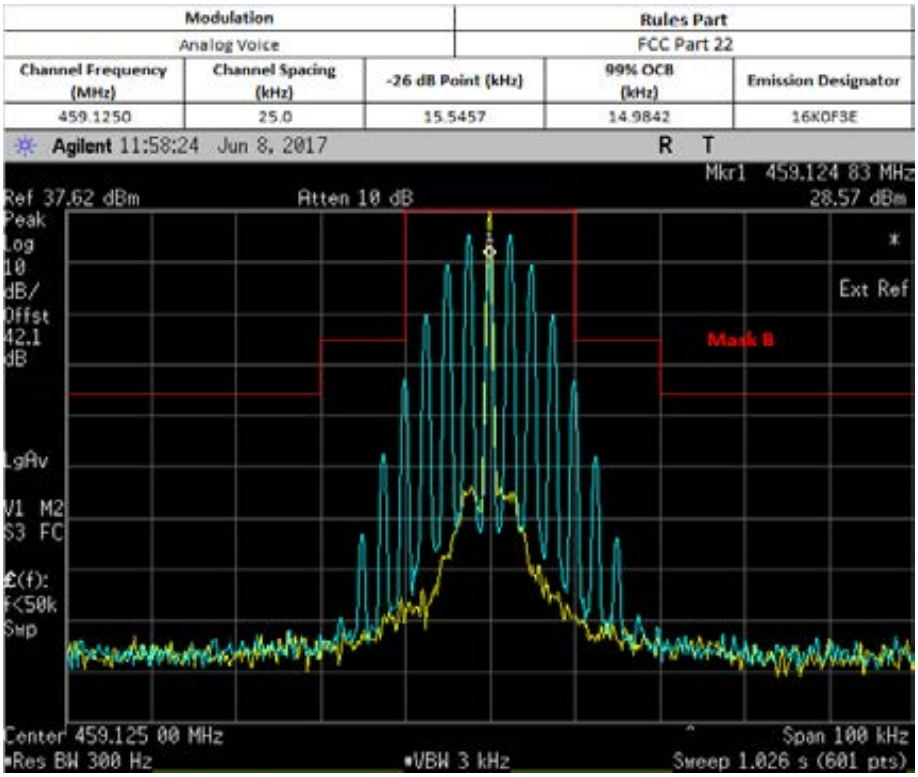
Modulation			Rules Part	
Analog Voice			FCC Part 90	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
511.9875	12.5		9.9448	11K0F3E



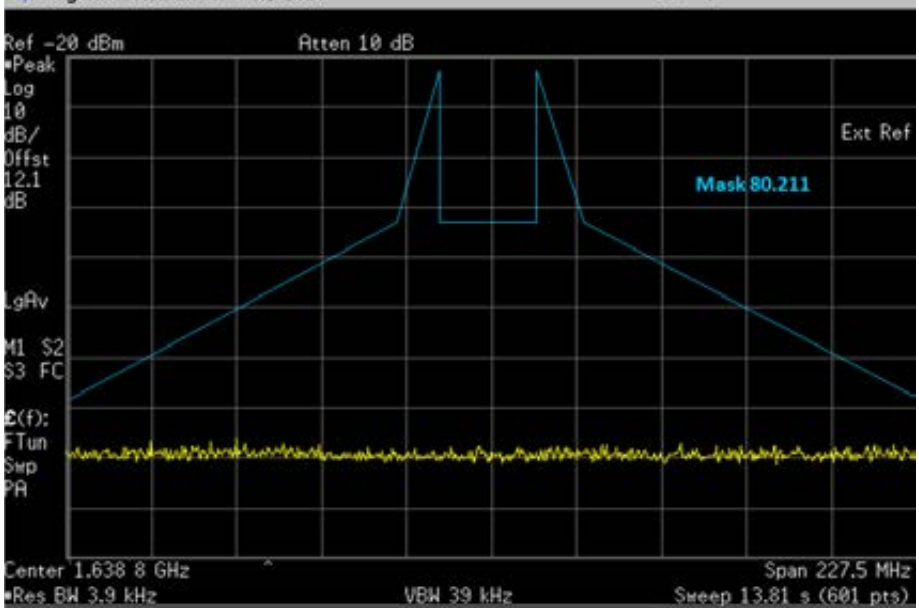
Modulation		Rules Part		
Analog Voice		FCC Part 22		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
459.1250	20.0	15.4077	10.3932	16K0F3E



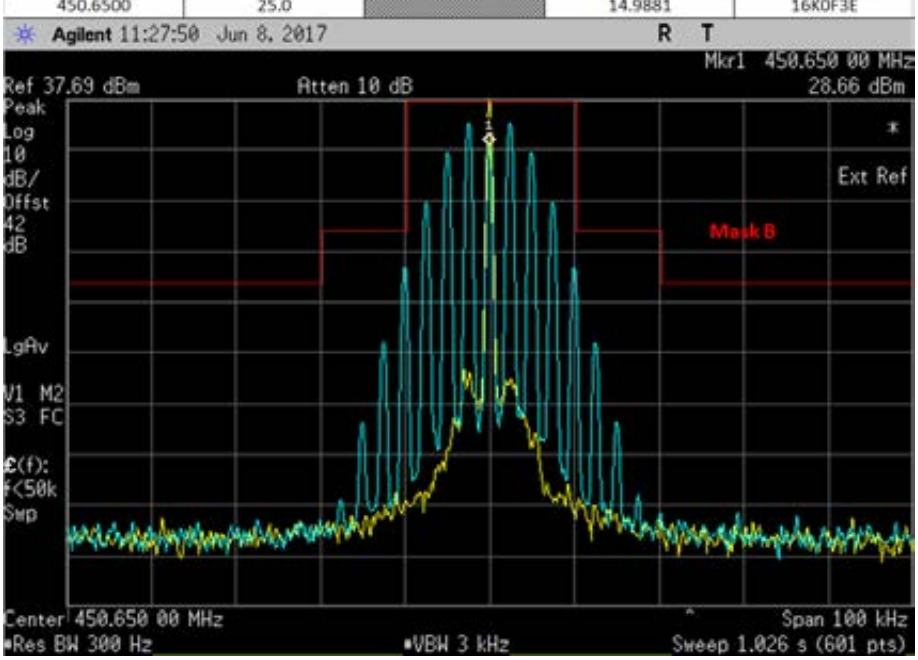
Modulation		Rules Part		
Analog Voice		FCC Part 22		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
459.1250	25.0	15.5457	14.9842	16K0F3E



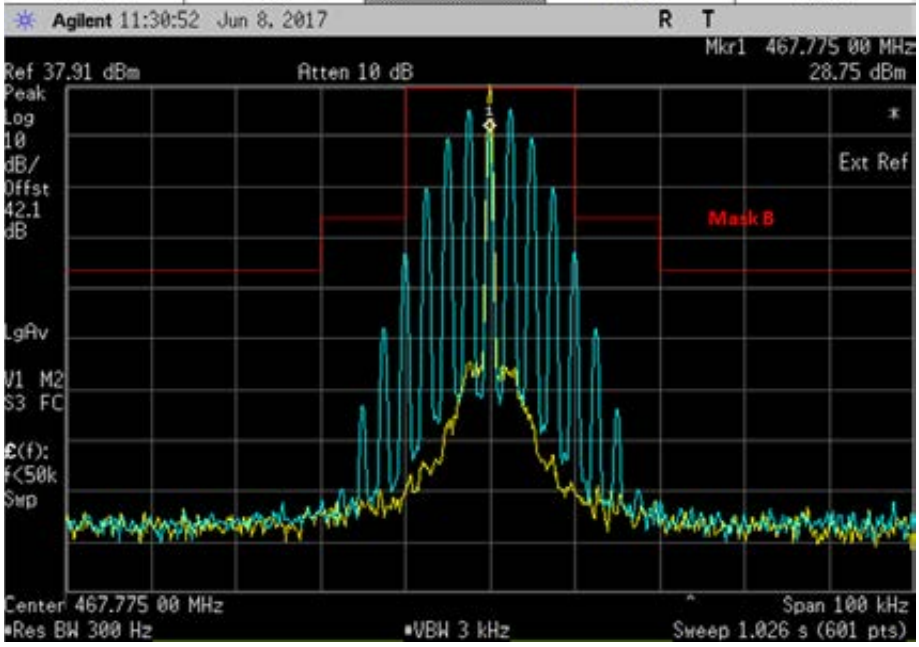
Modulation	Rules Part			
Analog Voice	FCC Part 80.211(c)			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
467.7750	25.0		14.9797	16K0F3E



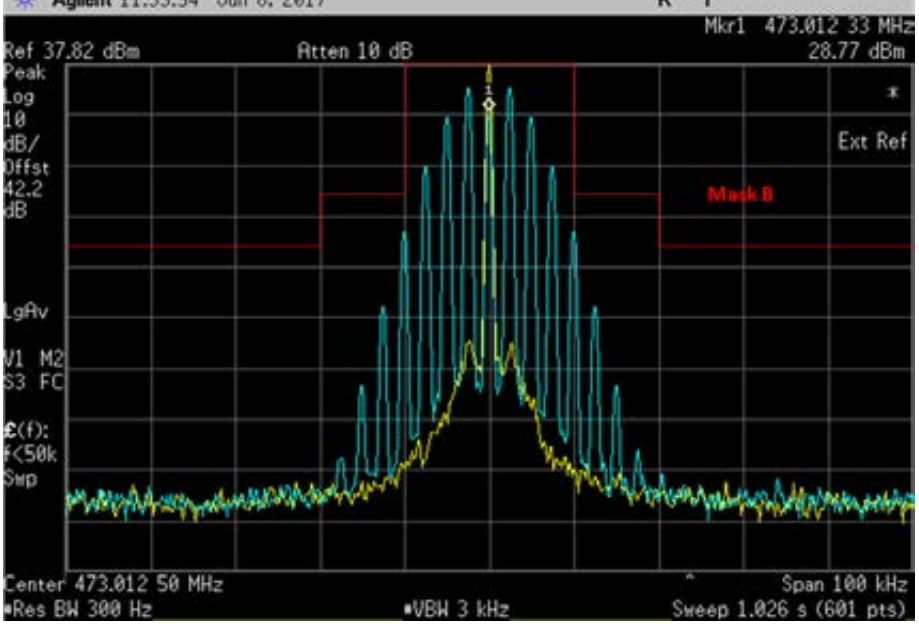
Modulation	Rules Part			
Analog Voice	FCC Part 74 / RSS 119			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.6500	25.0		14.9881	16K0F3E



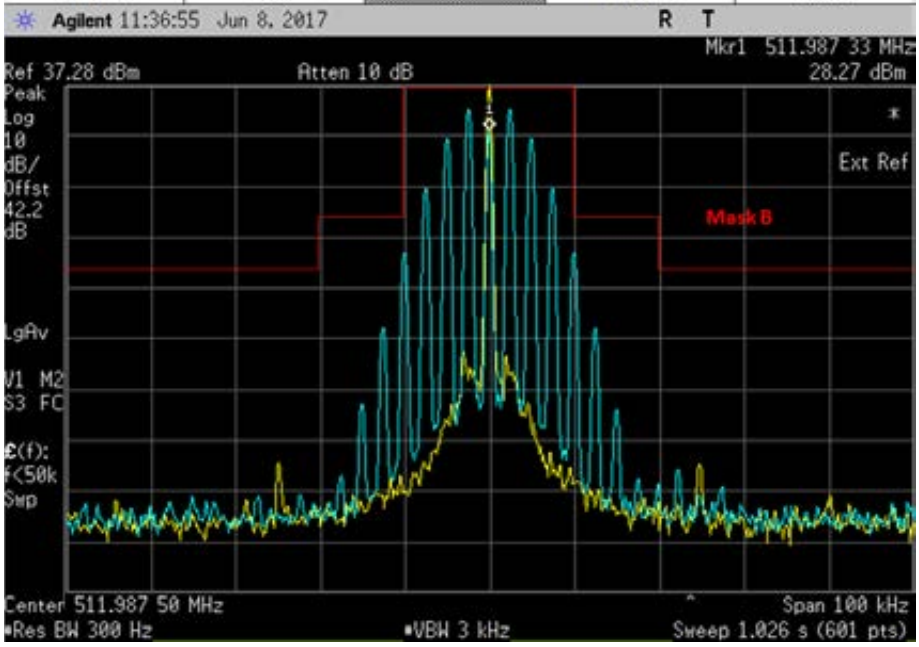
Modulation	Rules Part			
Analog Voice	FCC Part 80/RSS 119			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
467.7750	25.0		14.9797	16K0F3E



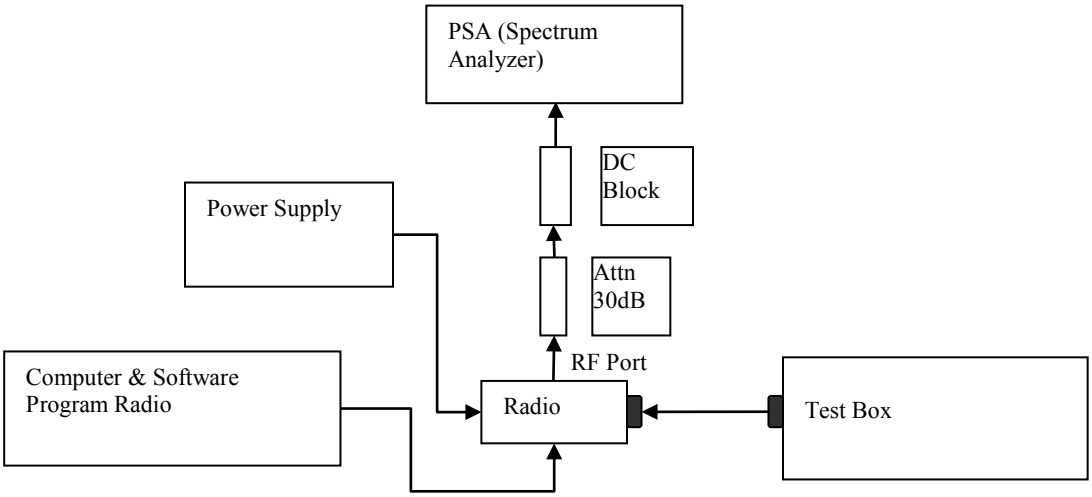
Modulation	Rules Part			
Analog Voice	FCC Part 90			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
473.0125	25.0		14.9877	16K0F3E



Modulation			Rules Part	
Analog Voice			FCC Part 90	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
511.9875	25.0		14.9761	16K0F3E



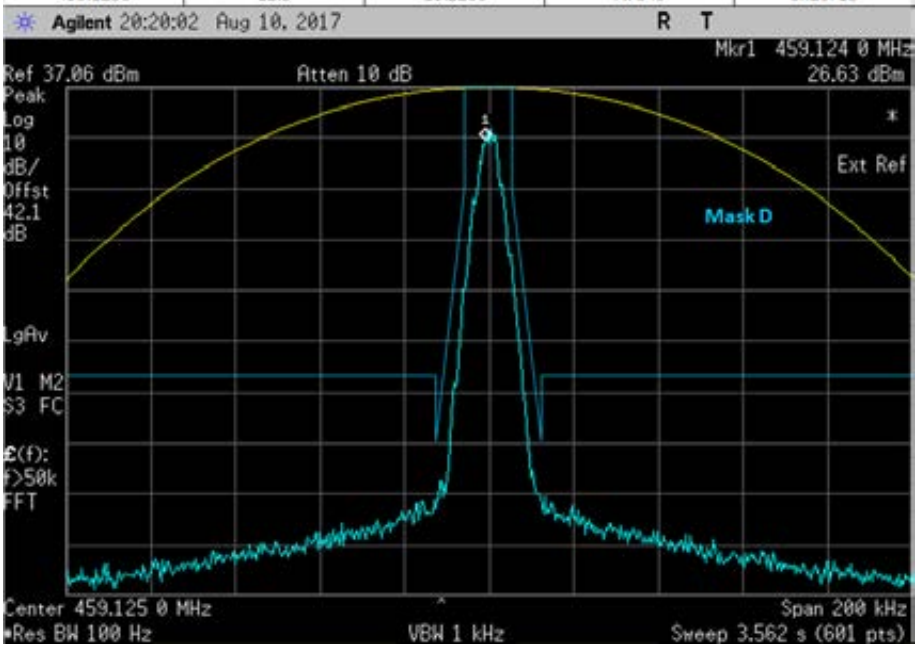
6.6.3. Test Setup (Digital)



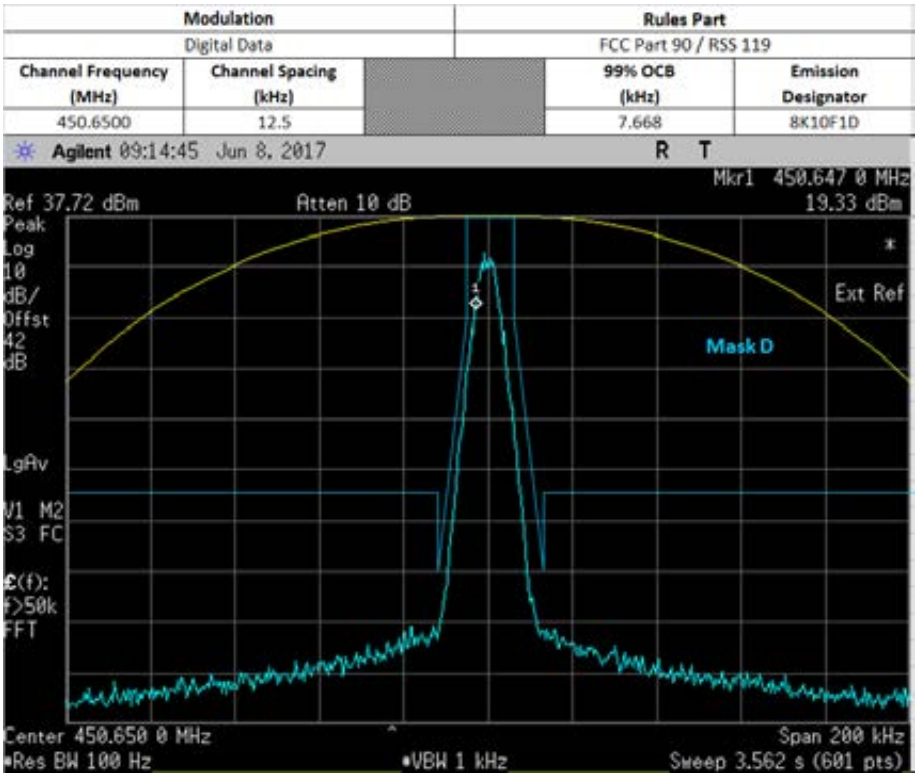
1) Program and set radio to operate in desire test frequency and digital mode with modulation. (4FSK, C4FM, CQPSK or other digital modulation form).
2) Path loss for the measurement included.
3) Select the Occupied Bandwidth measurement for 99% Bandwidth Measurement.
4) Key in the Fc and RBW (1 ~ 5 % of emission designator).
5) Transmit the DUT and record the occupied Bandwidth frequency.
6) Preset the spectrum analyzer for modulation emission spectrum measurement.
7) Set the span to 100 KHz and Resolution Bandwidth (according to FCC/ ISED standard).
8) Capture the screen shot as modulated signal.

6.6.4. Test Result (Digital)

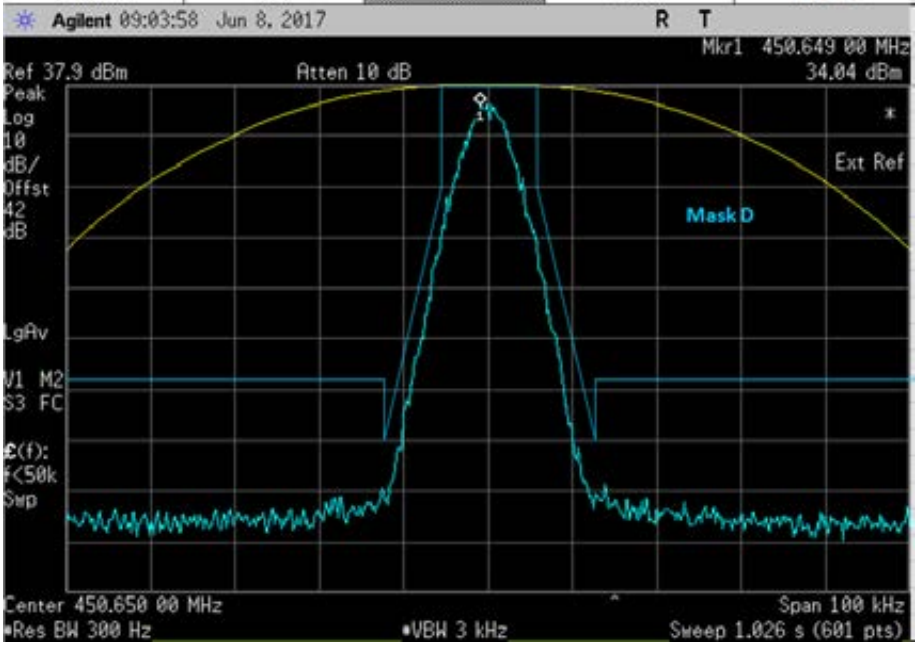
Modulation		Rules Part		
Digital Data		FCC Part 90		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	12.5	10.2200	7.7949	8K10F1D



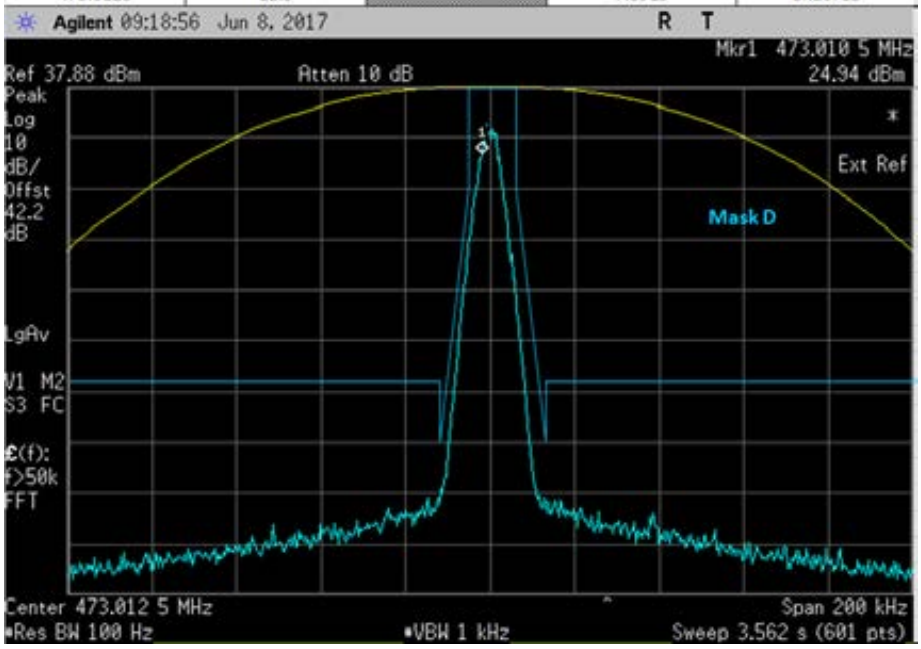
Modulation		Rules Part		
Digital Data		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.6500	12.5		7.668	8K10F1D



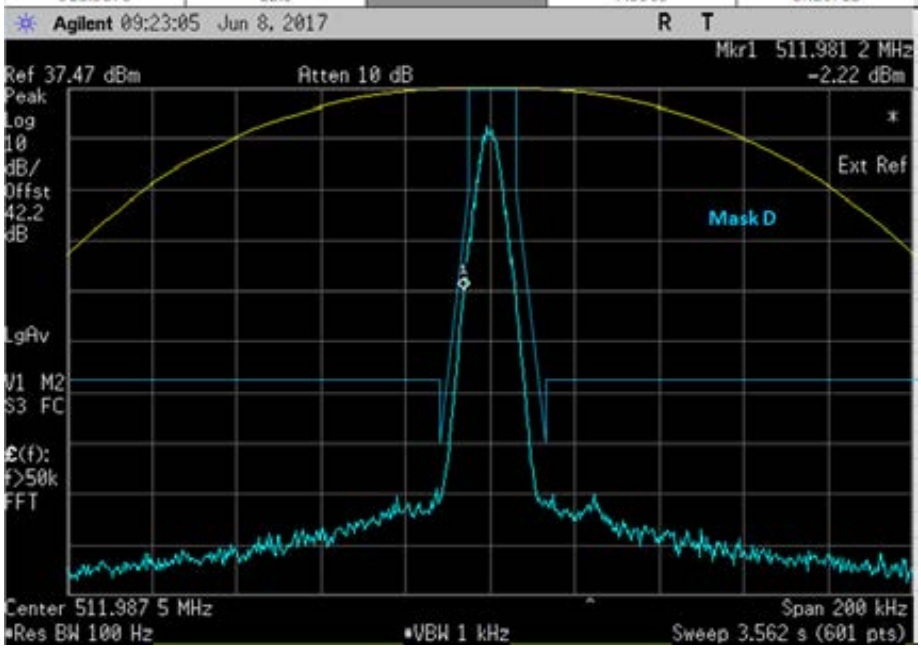
Modulation	Rules Part			
Digital Data	FCC Part 74			
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
450.6500	12.5		7.8486	8K10F1D



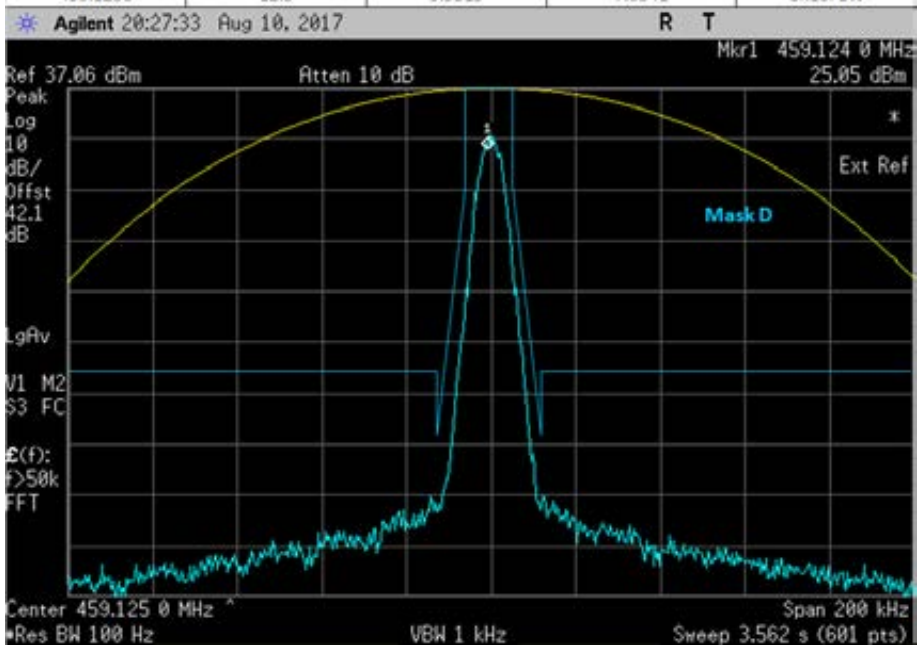
Modulation	Rules Part			
Digital Data	FCC Part 90			
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
473.0125	12.5		7.8919	8K10F1D



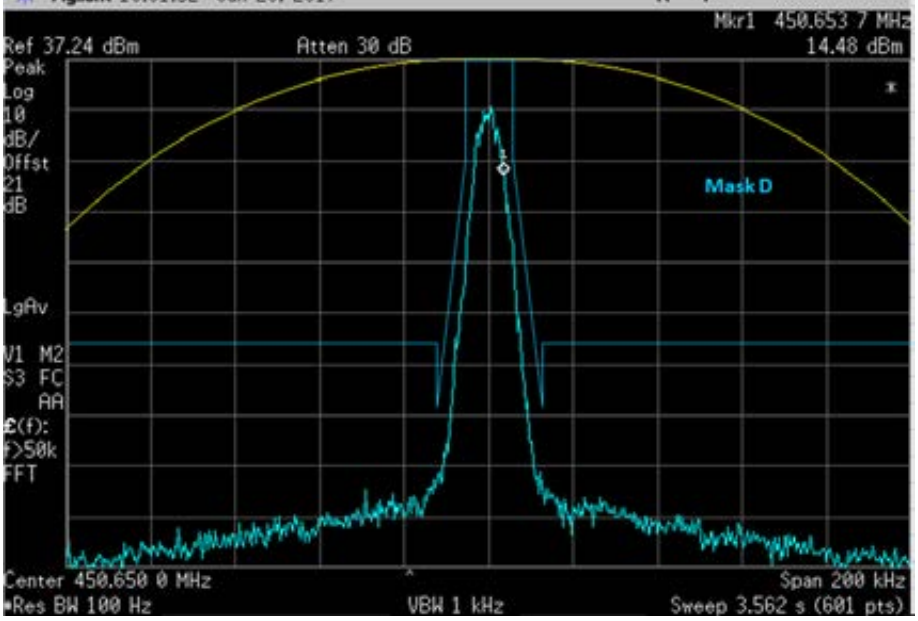
Modulation			Rules Part	
Digital Data			FCC Part 90	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
511.9875	12.5		7.5569	8K10F1D



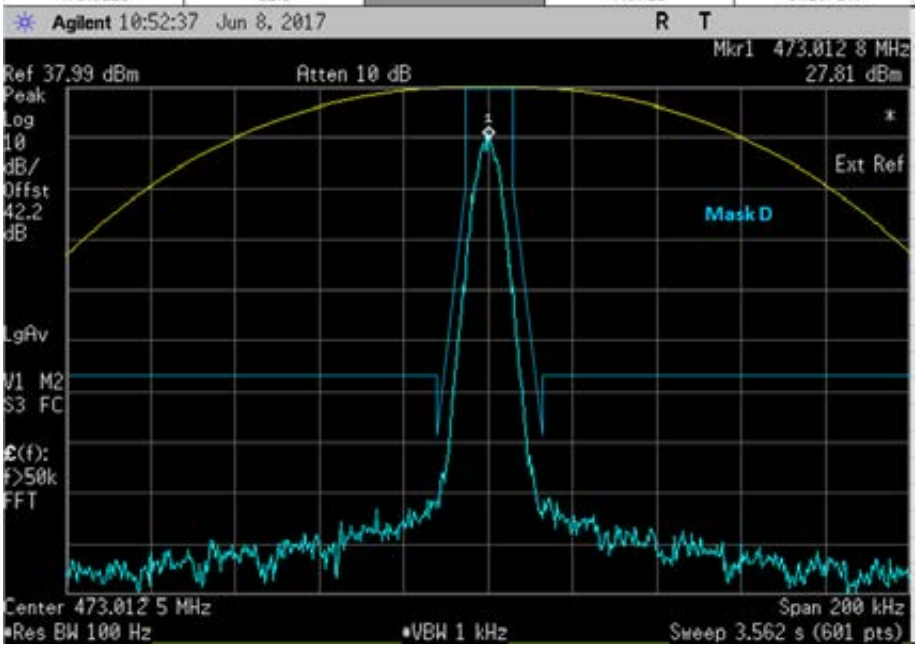
Modulation			Rules Part	
Phase II			FCC Part 90	
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	12.5	9.9319	7.6341	8K10F1W



Modulation	Rules Part		
Phase II	FCC Part 90 / RSS 119		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**99% OCB (kHz)**	**Emission Designator**
450.6500	12.5	7.6252	8K10F1W

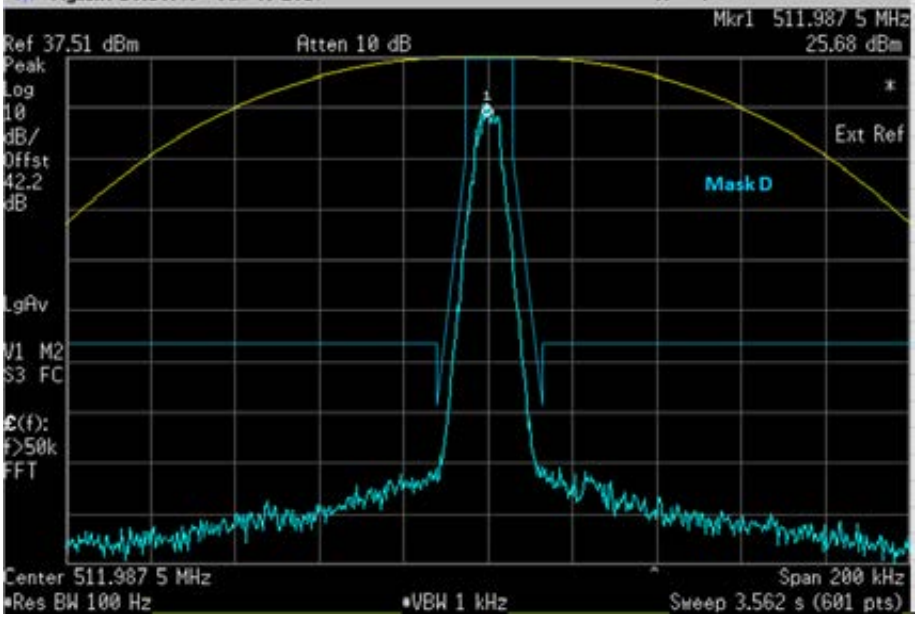


Modulation	Rules Part		
Phase II	FCC Part 90		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**99% OCB (kHz)**	**Emission Designator**
473.0125	12.5	7.6715	8K10F1W



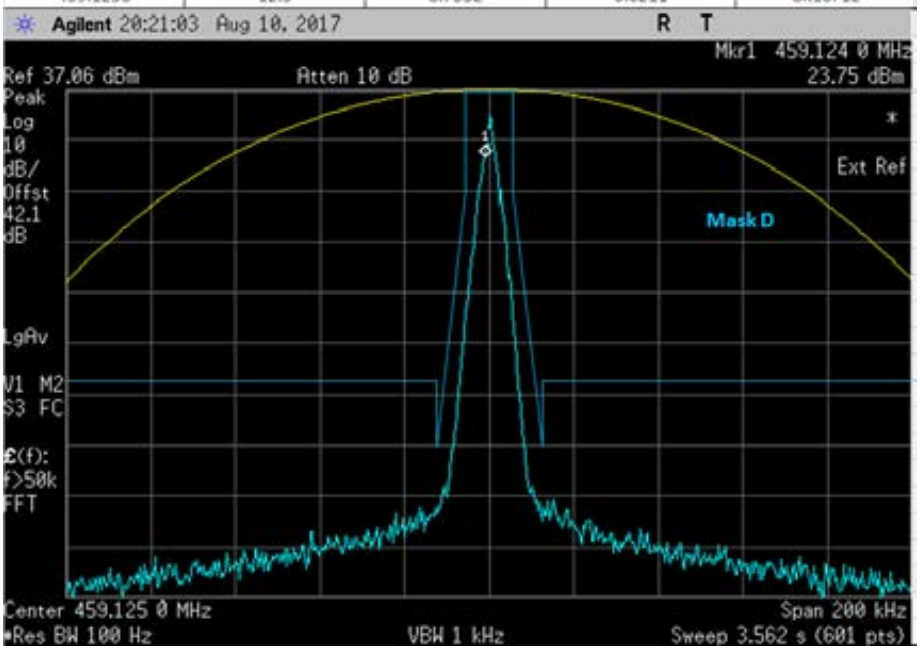
Modulation	Rules Part
Phase II	FCC Part 90

Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
511.9875	12.5	7.6339	8K10F1W

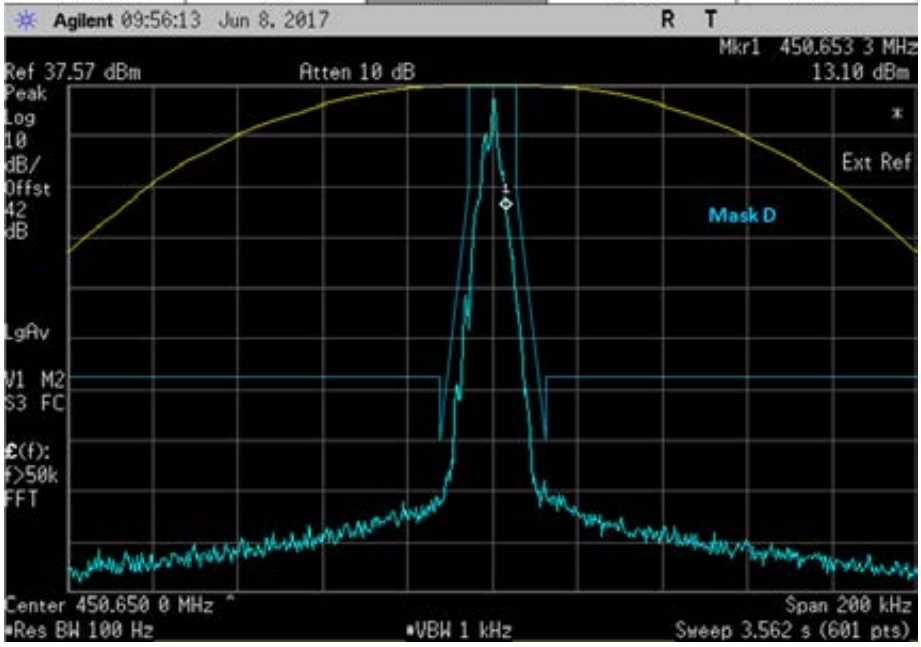


Modulation	Rules Part
Digital Voice	FCC Part 90

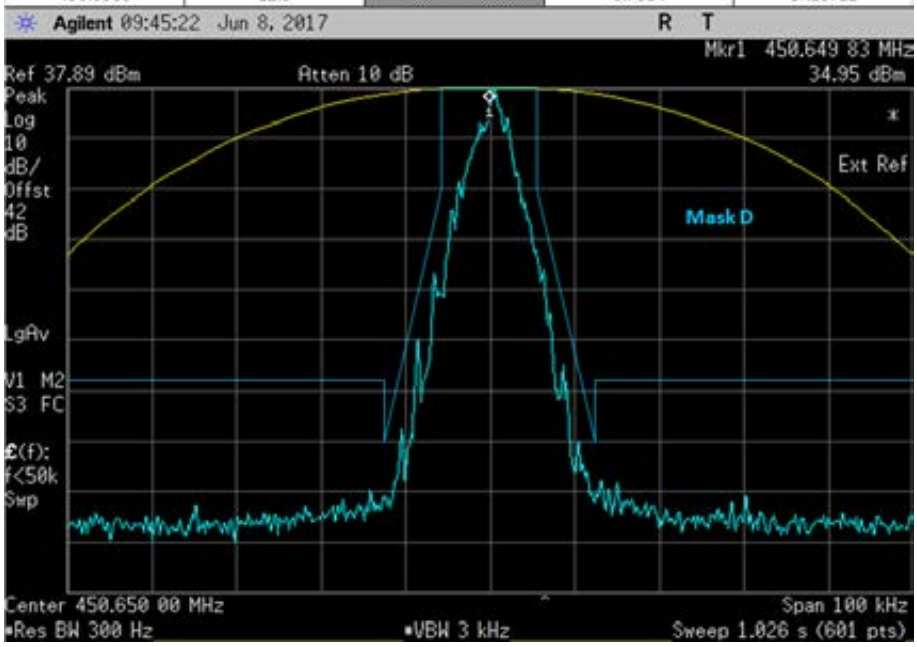
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
459.1250	12.5	8.7552	6.6211	8K10F1E



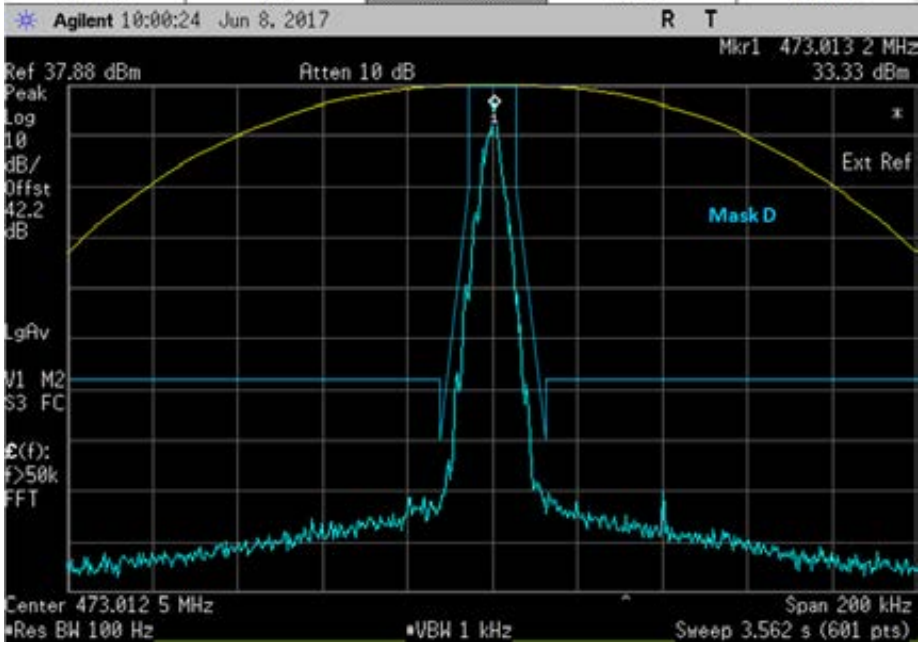
Modulation	Rules Part		
Digital Voice	FCC Part 90 / RSS 119		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**99% OCB (kHz)**	**Emission Designator**
450.6500	12.5	6.5673	8K10F1E



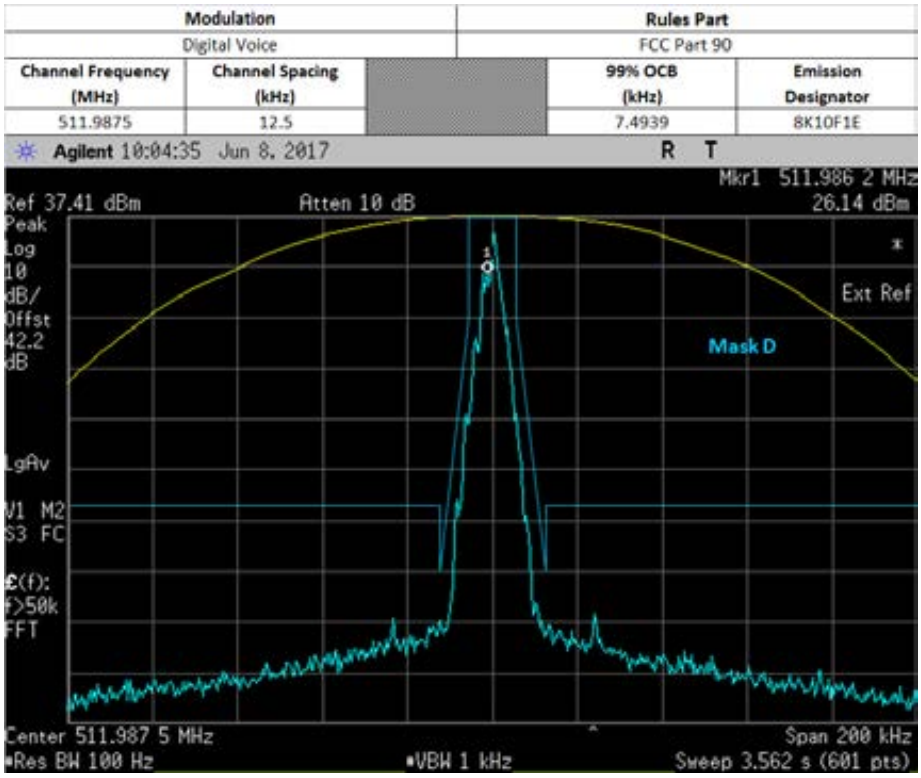
Modulation	Rules Part		
Digital Voice	FCC Part 74		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**99% OCB (kHz)**	**Emission Designator**
450.6500	12.5	6.7084	8K10F1E



Modulation	Rules Part		
Digital Voice	FCC Part 90		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**99% OCB (kHz)**	**Emission Designator**
473.0125	12.5	6.9738	8K10F1E



Modulation	Rules Part		
Digital Voice	FCC Part 90		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**99% OCB (kHz)**	**Emission Designator**
511.9875	12.5	7.4939	8K10F1E

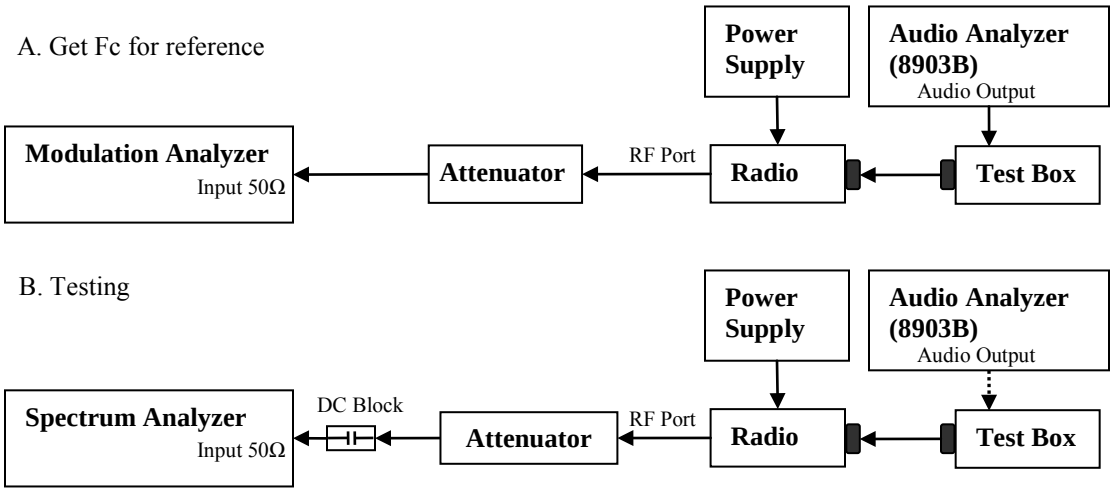


6.6.5. Test Limit

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

6.7. Band Edge Conducted Spurious Emission (Part 22)

6.7.1. Test Setup (Analog)

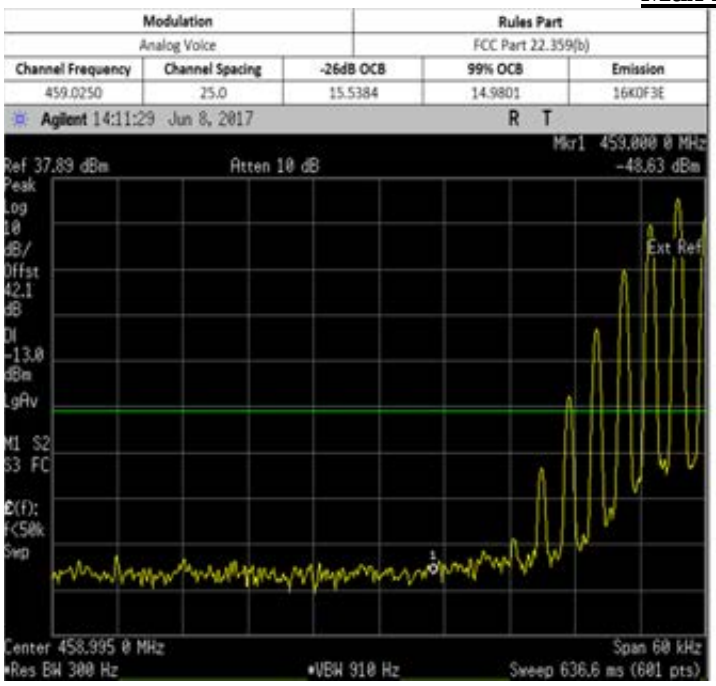


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Path loss for the measurement included.
4) Select the Occupied Bandwidth measurement for 99% and 26dB Emissions Bandwidth Measurement.
5) Key in the Fc and RBW= 100Hz.
6) Transmit the DUT and record the occupied Bandwidth frequencies.
7) Preset the spectrum analyzer for band edge measurement.
8) The band edges of lowest and highest channels were measured.
9) The center frequency of spectrum is the band edge frequency, span is 60 kHz and RBW is at least 1% of Emission Bandwidth.
10) Save the screen shot as modulated signal.
11) Remove the audio tone from audio analyzer to capture unmodulated signal.

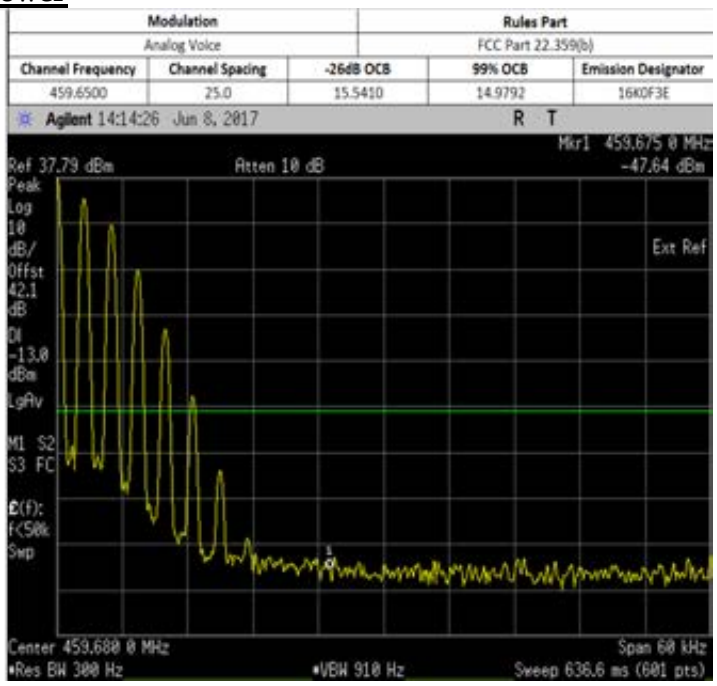
6.7.2. Test Result (Analog)

Max Power

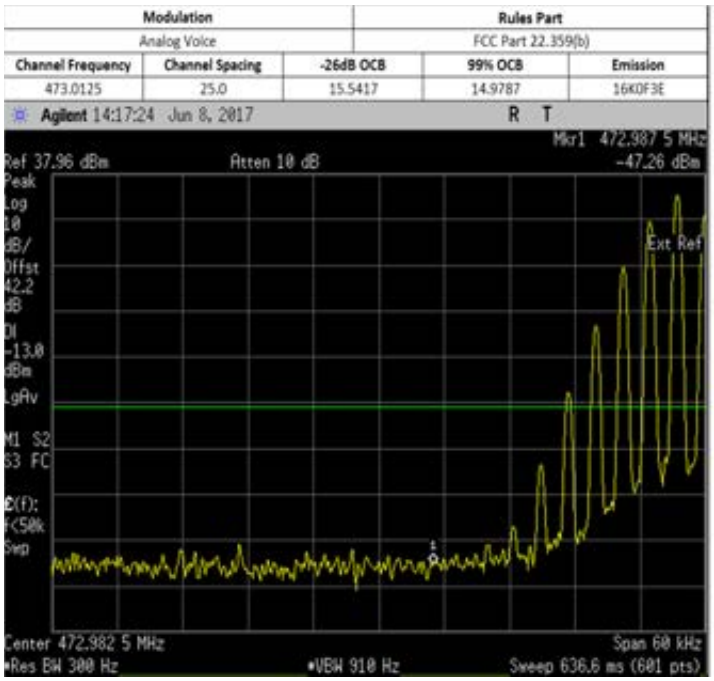
Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26dB OCB**	**99% OCB**	**Emission**
459.0250	25.0	15.5384	14.9801	16K0F3E



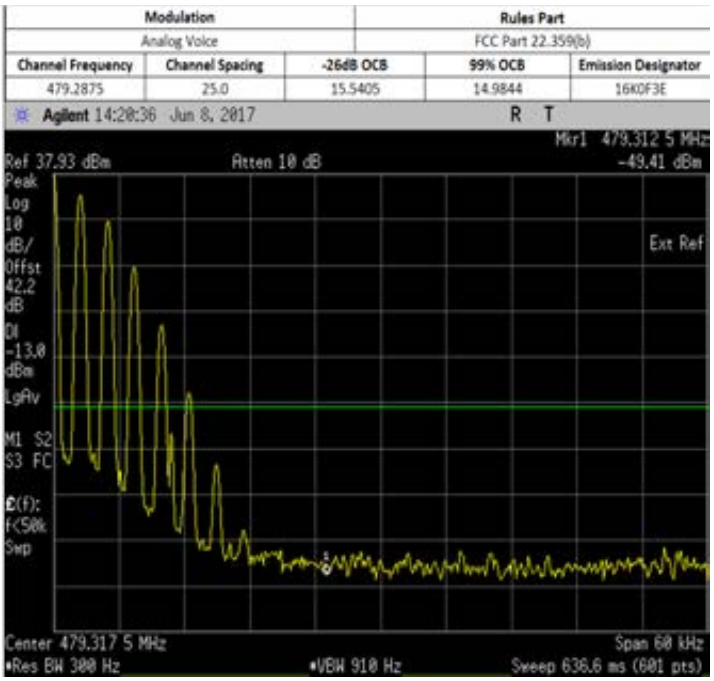
Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26dB OCB**	**99% OCB**	**Emission Designator**
459.6500	25.0	15.5410	14.9792	16K0F3E



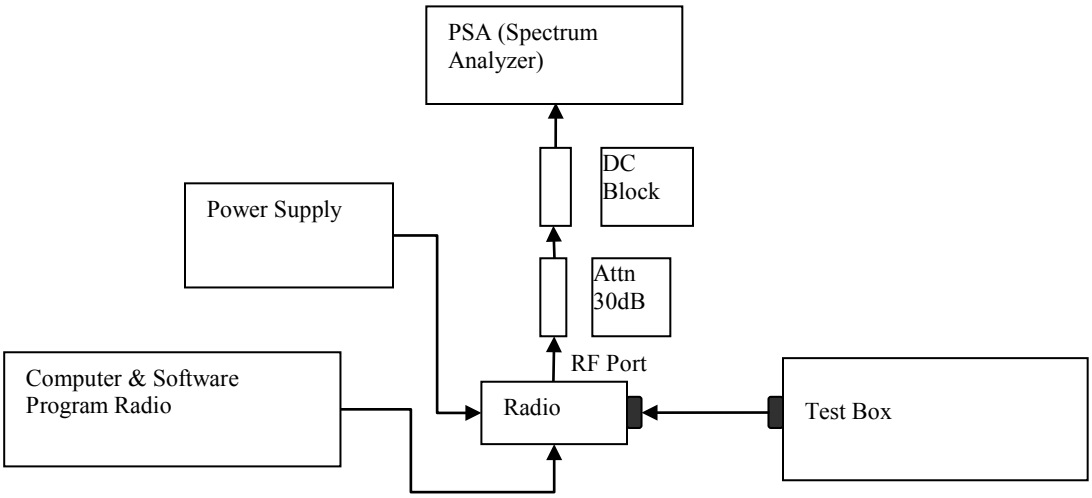
Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26dB OCB**	**99% OCB**	**Emission**
473.0125	25.0	15.5417	14.9787	16K0F3E



Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26dB OCB**	**99% OCB**	**Emission Designator**
479.2875	25.0	15.5405	14.9844	16K0F3E



Test Setup (Digital)



1) Program and set radio to operate in desire test frequency and digital mode with modulation. (4FSK**, C4FM or other digital modulation form).
2) Path loss for the measurement included.
3) Select the Occupied Bandwidth measurement for 99% and 26dB Emissions Bandwidth Measurement.
4) Key in the Fc and RBW= 100Hz.
5) Transmit radio record the occupied Bandwidth frequencies.
6) Preset the spectrum analyzer for band edge measurement.
7) The band edges of lowest and highest channels were measured.
8) The center frequency of spectrum is the band edge frequency, span is 60 kHz and RBW is at least 1% of Emission Bandwidth.
9) Save the screen shot.

**Note:

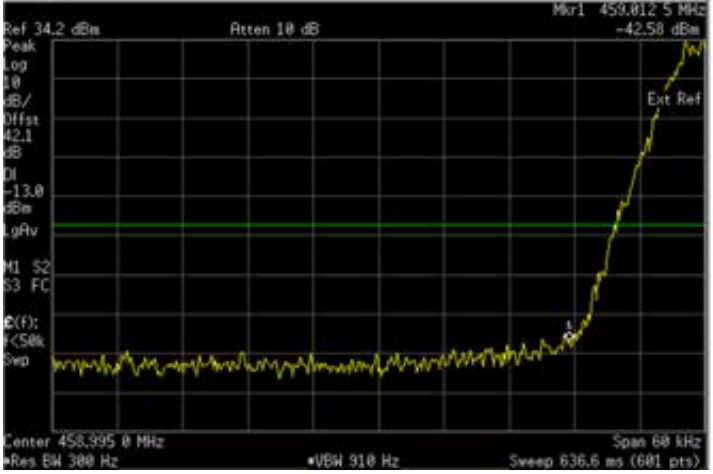
- For Digital Modulation for 12.5 kHz Voice (F1E) and 12.5 kHz Data (F1D) would be the same. Therefore only measurements with F1E modulation shown below.

6.7.3. Test Result (Digital)

Max Power

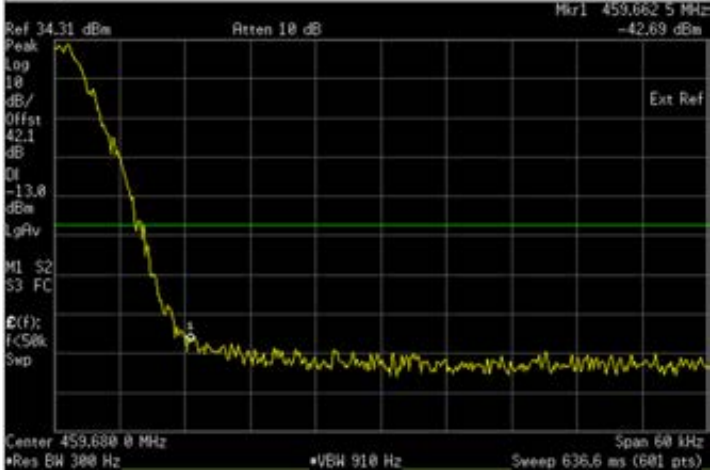
Modulation	Rules Part
APCO Digital	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission
459.0250	12.5	10.3119	7.9412	8K10F1D



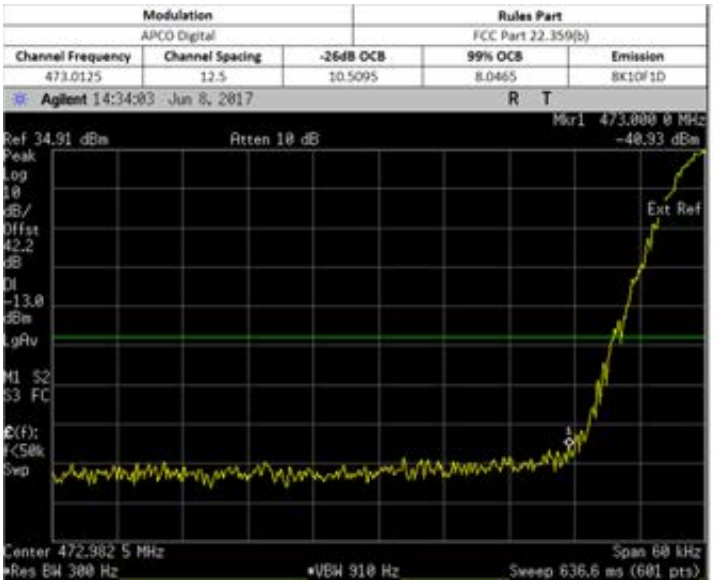
Modulation	Rules Part
APCO Digital	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission Designator
459.6500	12.5	10.3560	7.8404	8K10F1D



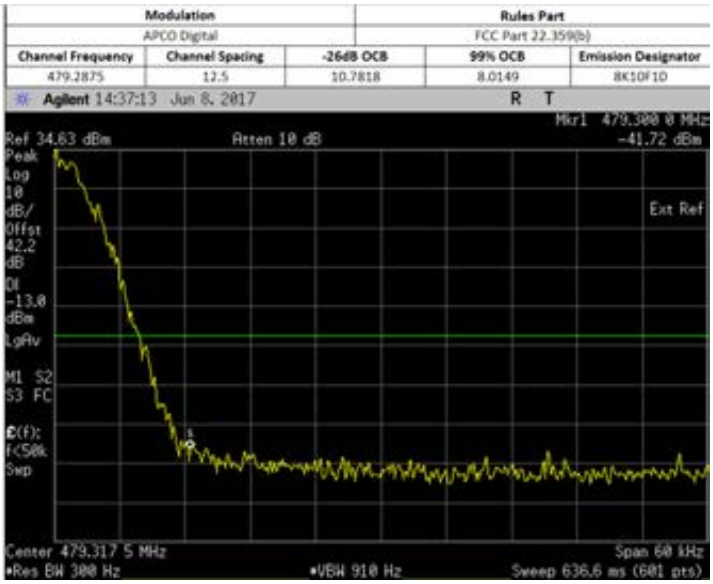
Modulation	Rules Part
APCO Digital	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission
473.0125	12.5	10.5095	8.0465	8K10F1D



Modulation	Rules Part
APCO Digital	FCC Part 22.359(b)

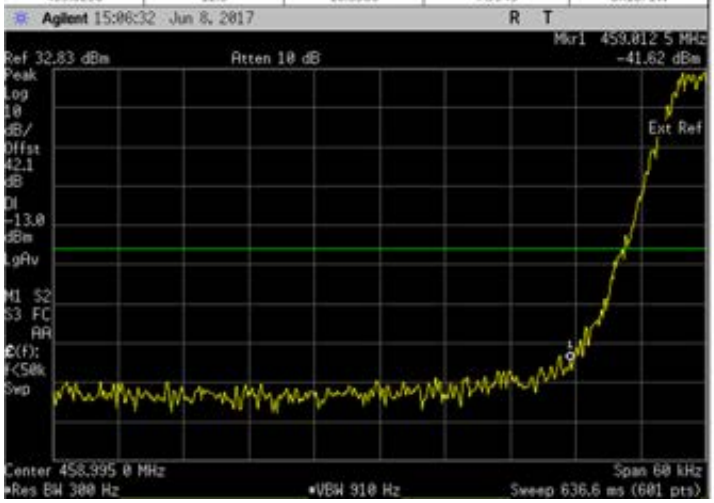
Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission Designator
479.2875	12.5	10.7818	8.0149	8K10F1D



Max Power

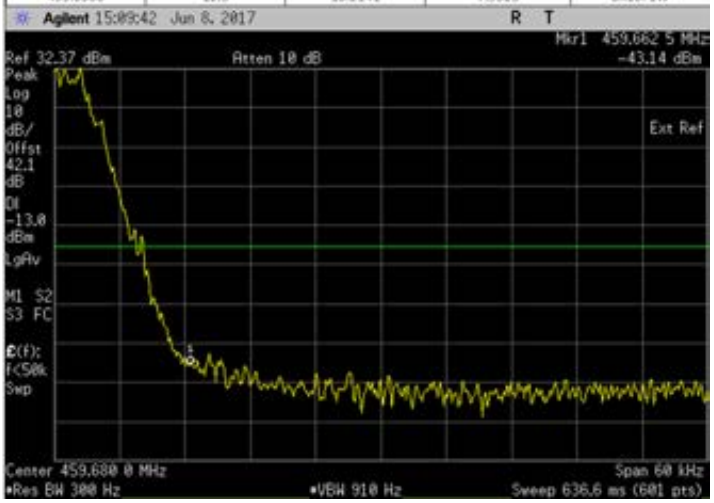
Modulation	Rules Part
Phase II	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission
459.0250	12.5	10.3300	7.9945	8K10F1W



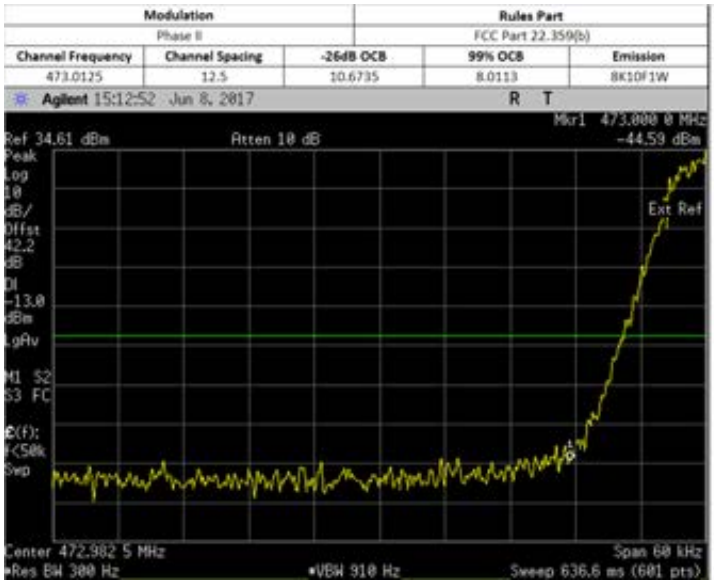
Modulation	Rules Part
Phase II	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission Designator
459.6500	12.5	10.2141	7.9523	8K10F1W



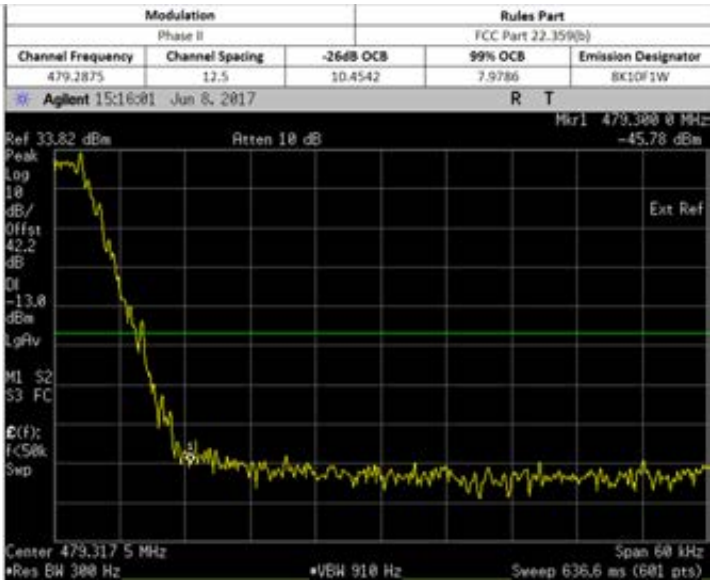
Modulation	Rules Part
Phase II	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission
473.0125	12.5	10.6735	8.0113	8K10F1W



Modulation	Rules Part
Phase II	FCC Part 22.359(b)

Channel Frequency	Channel Spacing	-26dB OCB	99% OCB	Emission Designator
479.2875	12.5	10.4542	7.9786	8K10F1W

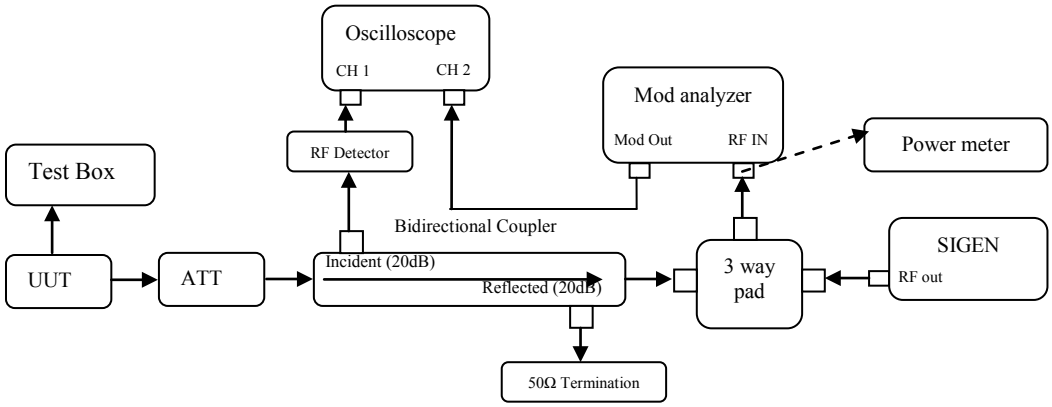


6.7.4. Test Limit

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.

6.8. Transient Frequency Behavior

6.8.1. Test Setup

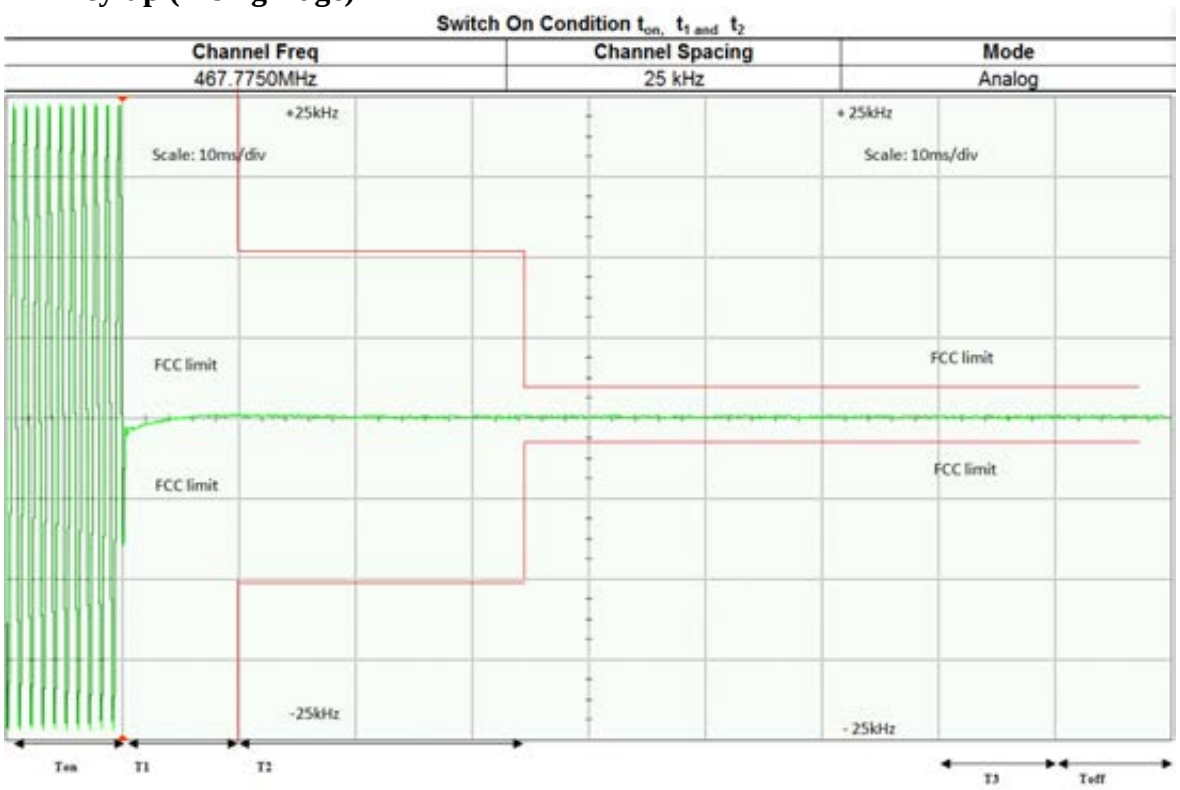


1) Connect the setup as figure above.
2) Path loss for the measurement included.
3) Set on Sigen with the assigned center frequency, internal 1 kHz FM tone.
   FM Deviation: Analog 25kHz Channel Spacing = 25 kHz
   Analog 12.5 kHz Channel Spacing = 12.5 kHz
   C4FM = 12.5 kHz
4) Turn on 50 kHz high pass filter and 15 kHz low pass filter on modulation analyzer.
5) Supply sufficient attenuation ATT to provide the output power of ≤ -11dBm into power meter when UUT is keying up.
6) Note the power level on power meter and dekey the UUT.
7) Adjust the amplitude of the signal generator to the level power meter, maintained the amplitude throughout the rest of the measurement.
8) Connect the output to modulation analyzer.
9) Set the horizontal sweep rate on the storage oscilloscope to 10 milliseconds per division and adjust the display to continuously view the 1000 Hz. Adjust the vertical amplitude control of the oscilloscope to display the 1000 Hz at □4 divisions vertically centered on the display.
10) Reduce 30dB attenuation and transmit the radio to get the trigger line.
11) Capture the screen shot for key-up (rising edge) and de-key (falling edge) mode.

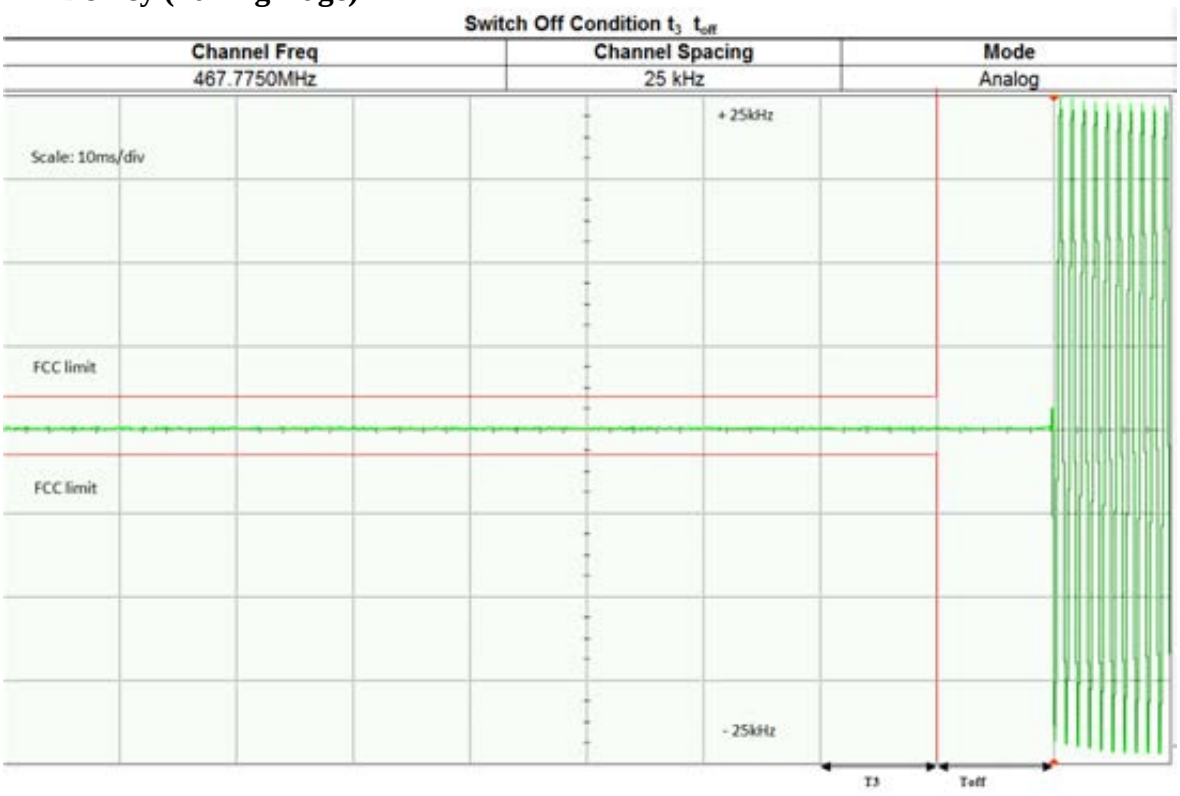
6.8.2. Test Result

Analog: 467.7750 MHz, 25.0 kHz Channel Spacing, Max Power (NOT FOR FCC REVIEW)

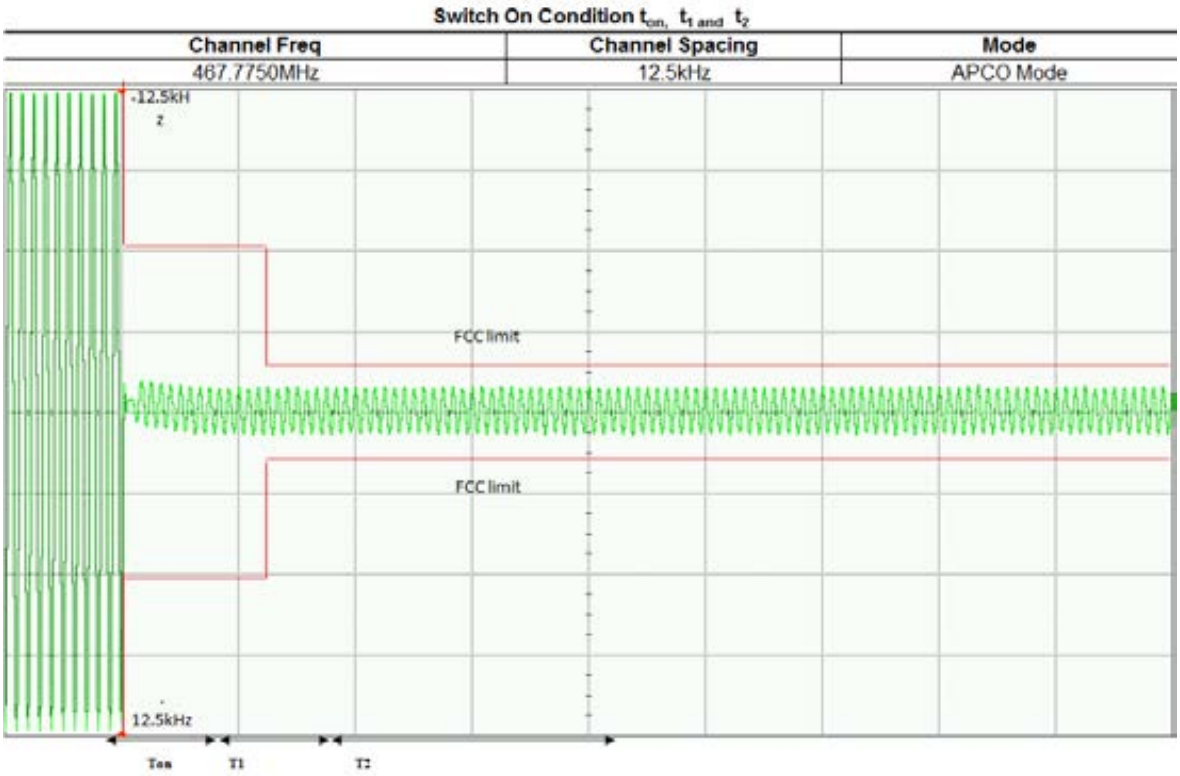
Key-up (Rising Edge)



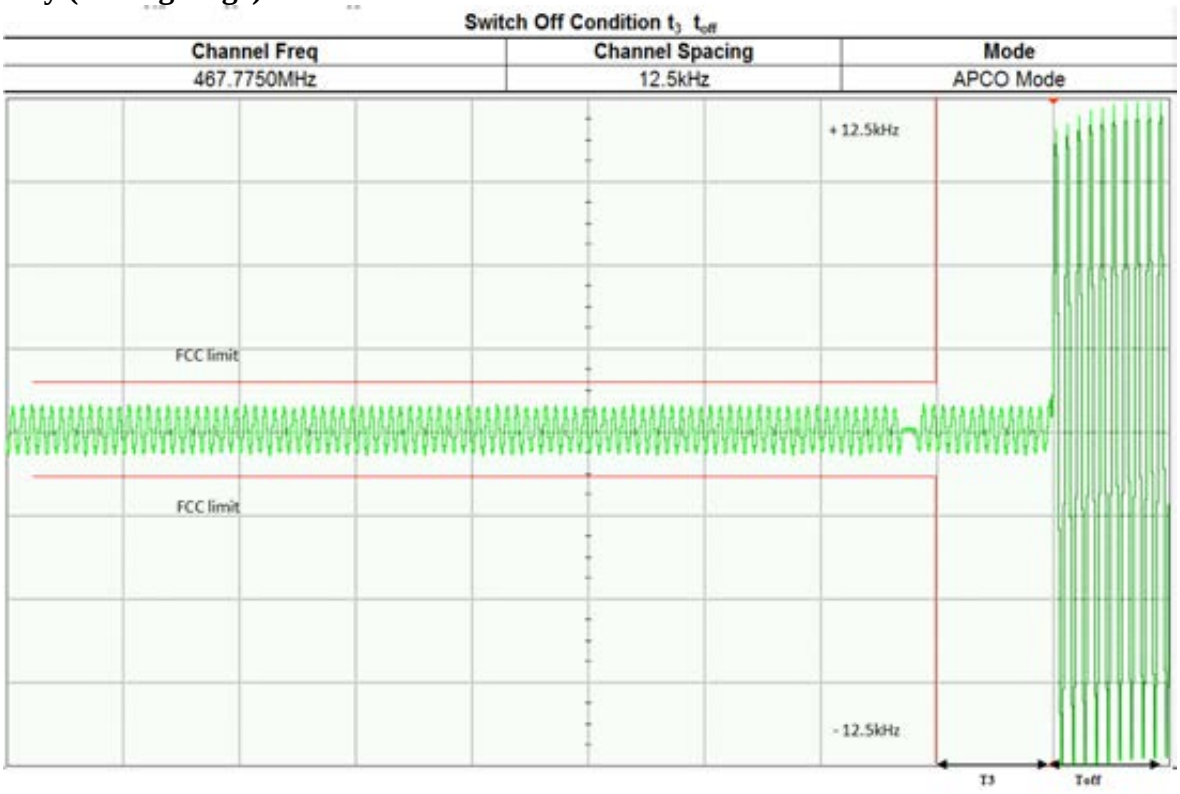
De-key (Falling Edge)



<u>APCO Digital:</u> 467.7750 MHz, 12.5 kHz Channel Spacing, Max Power
Key-up (Rising Edge)



De-key (Falling Edge)



6.8.3. Test Limit

Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

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.

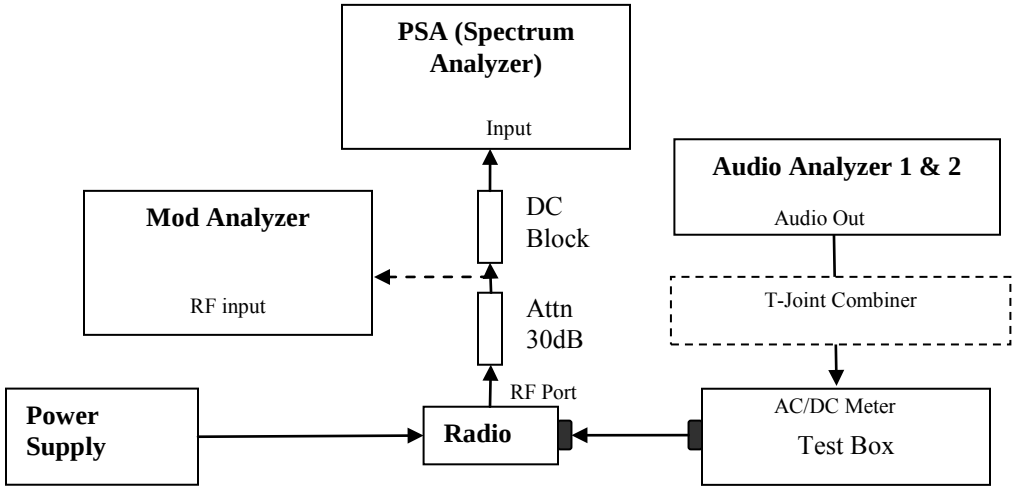
[2] During the time from the end of t_2 to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.

[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.

6.9. Adjacent Channel Power

6.9.1. Test Setup (Analog)

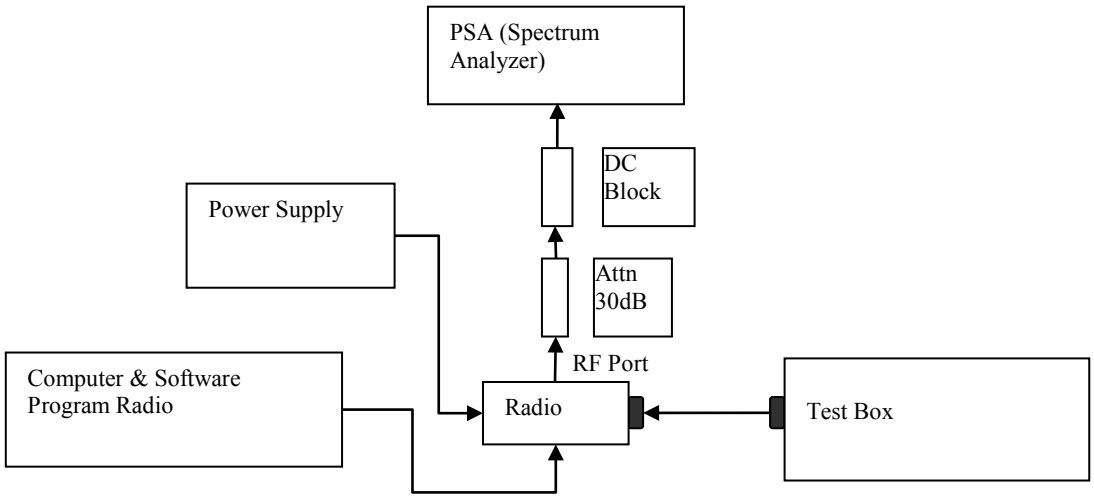


1) The DUT transmitter output port was connected to modulation analyzer.
2) Path loss for the measurement included.
3) Transmit the radio and turn on 1st audio analyzer with audio frequency 650Hz, 50% rated deviation, and record the amplitude value as AmpT1.
4) Turn off Audio analyzer 1 and turn on audio analyzer 2, set the audio frequency to 2.2 kHz and 50% deviation. Record the amplitude as AmpT2.
5) Turn both audio analyzers ON and up 10dB amplitude level.
6) Connect the output to PSA and set to assigned center frequency.
7) Set Span, RBW and VBW as shown in FCC rules part 90.543.
8) Transmit the radio and record the ACP value in dBc.

Test Result

Not Applicable

6.9.2. Test Setup (Digital)



1) Program and set radio to operate in desire test frequency and digital mode with modulation. (4FSK, C4FM, CQPSK or other digital modulation form).
2) Path loss for the measurement included.
3) Prepare setup as per picture.
4) Turn on the ACP Measurement – Press Measure, ACP.
5) Set Span, RBW and VBW as shown in FCC rules part 90.543.
6) Transmit the radio and record the ACP value in dBc.

6.9.3. Test Result

Not Applicable

6.9.4. Test Limit

12.5 kHz Mobile Transmitter ACP Requirements

Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP relative (dBc)
9.375	6.25	−40
15.625	6.25	−60
21.875	6.25	−60
37.50	25.00	−60
62.50	25.00	−65
87.50	25.00	−65
150.00	100	−65
250.00	100	−65
350.00	100	−65
>400 to 12 MHz	30 (s)	−75
12 MHz to paired receive band	30 (s)	−75
In the paired receive band	30 (s)	−100

25 kHz Mobile Transmitter ACP Requirements

Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP relative (dBc)
15.625	6.25	−40
21.875	6.25	−60
37.50	25	−60
62.50	25	−65
87.50	25	−65
150.00	100	−65
250.00	100	−65
350.00	100	−65
>400 kHz to 12 MHz	30 (s)	−75
12 MHz to paired receive band	30 (s)	−75
In the paired receive band	30 (s)	−100

12.5 kHz Base Transmitter ACP Requirements

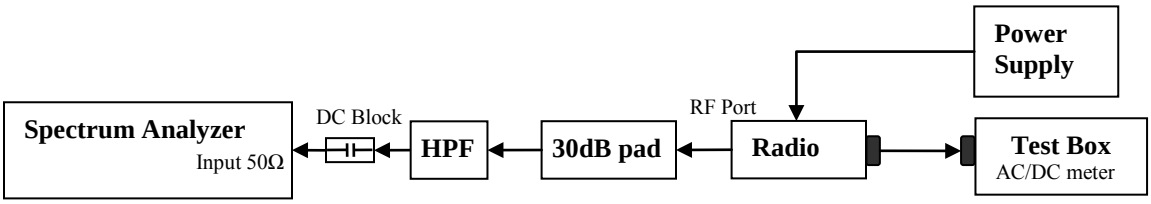
Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP (dBc)
9.375	6.25	-40
15.625	6.25	-60
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
350.00	100	-65
>400 kHz to 12 MHz	30 (s)	-80
12 MHz to paired receive band	30 (s)	-80
In the paired receive band	30 (s)	[1]-85

25 kHz Base Transmitter ACP Requirements

Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP (dBc)
15.625	6.25	-40
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
350	100.00	-65
>400 kHz to 12 MHz	30 (s)	-80
12 MHz to paired receive band	30 (s)	-80
In the paired receive band	30 (s)	[1]-85

6.10. Conducted Spurious Emission

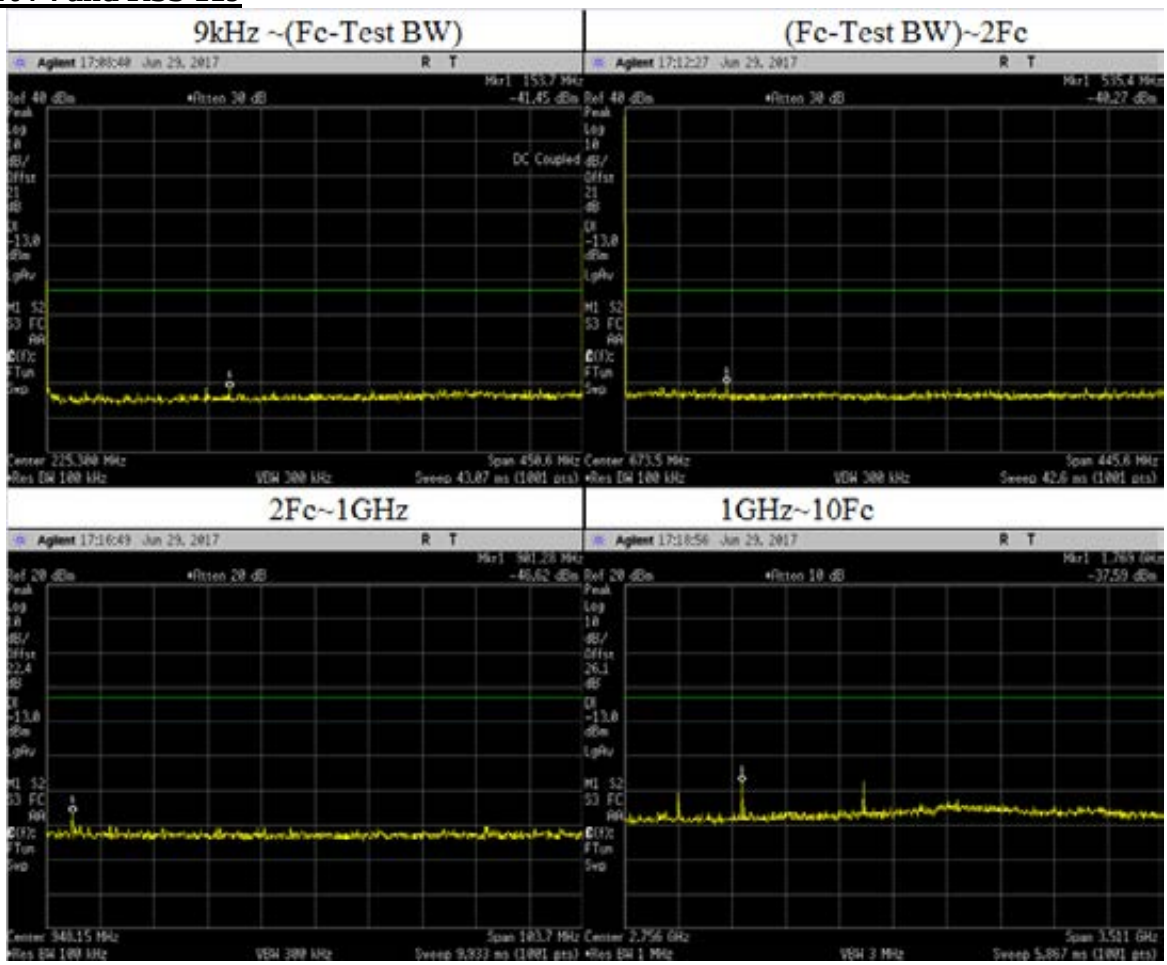
6.10.1. Test Setup



1) The DUT transmitter output port was connected to Spectrum Analyzer with above setup.
2) Program and set radio to operate in desire test frequency and mode. (Analog / digital modulation form).
3) Adjust the PSA RBW = 100kHz for spur emission below 1GHz, and 1MHz for spur emission above 1GHz.
4) Set the Ref offset from the pathloss offset calibration file.
5) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:
   (a) The lowest radio frequency to Fc – Test BW
   (b) Fc + Test BW to Freq < 2Fc.
6) Record the levels of spurious emissions and dekey the UUT.
7) Turn On HPF path and Key up the UUT.
8) Adjust the PSA Freq for incremental coverage of range from 2Fc to 10Fc.
9) The levels recorded are the absolute levels of conducted spurious emissions in dBm.

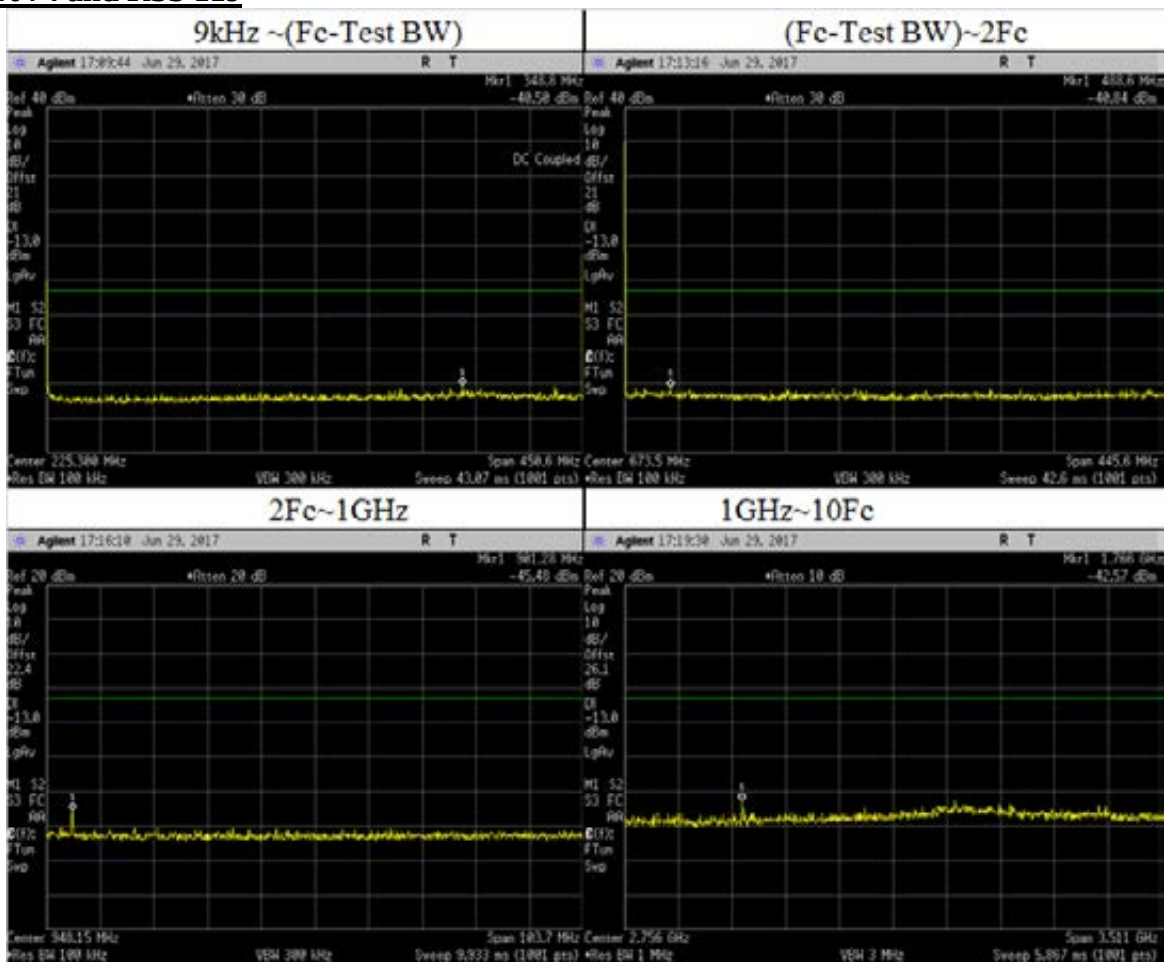
6.10.2. Test Result (Analog)

Analog: 450.6500 MHz, 25.0 kHz Channel Spacing, Max Power
Part 74 and RSS 119



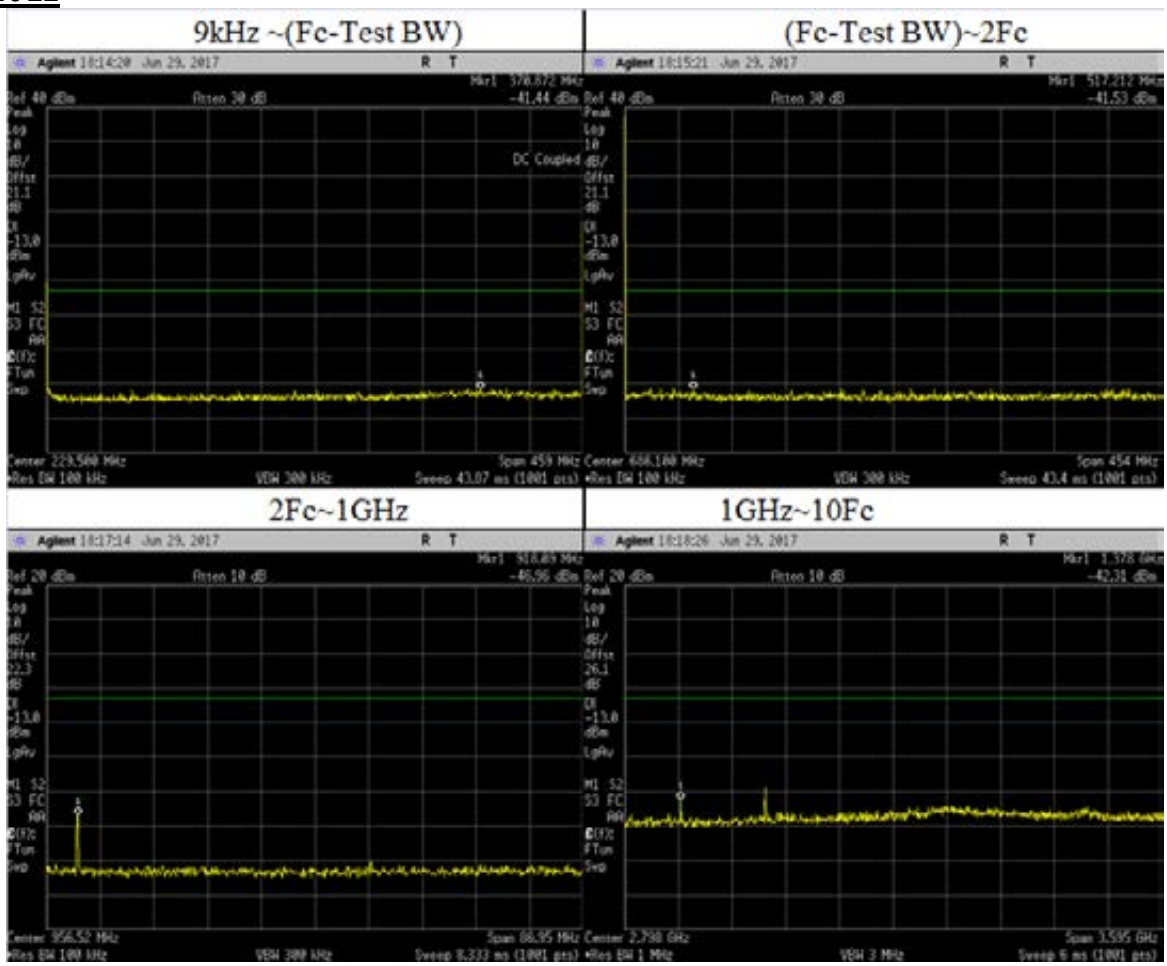
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	153.6546	-41.45	-13	Pass
(Fc-Test BW)~2Fc	535.3640	-40.27	-13	Pass
2Fc~1GHz	901.2800	-46.62	-13	Pass
1GHz~10Fc	1765.8980 1769.4090 2562.8950 1351.9500 1802.6000 2253.2500 2703.9000 3154.5500 3605.2000 4055.8500 4506.5000	-39.67 -37.59 -37.42 -40.77 -47.82 -47.93 -46.97 -44.41 -45.75 -46.16 -46.08	-13	Pass

Analog: 450.6500 MHz, 25.0 kHz Channel Spacing, Low Power
Part 74 and RSS 119



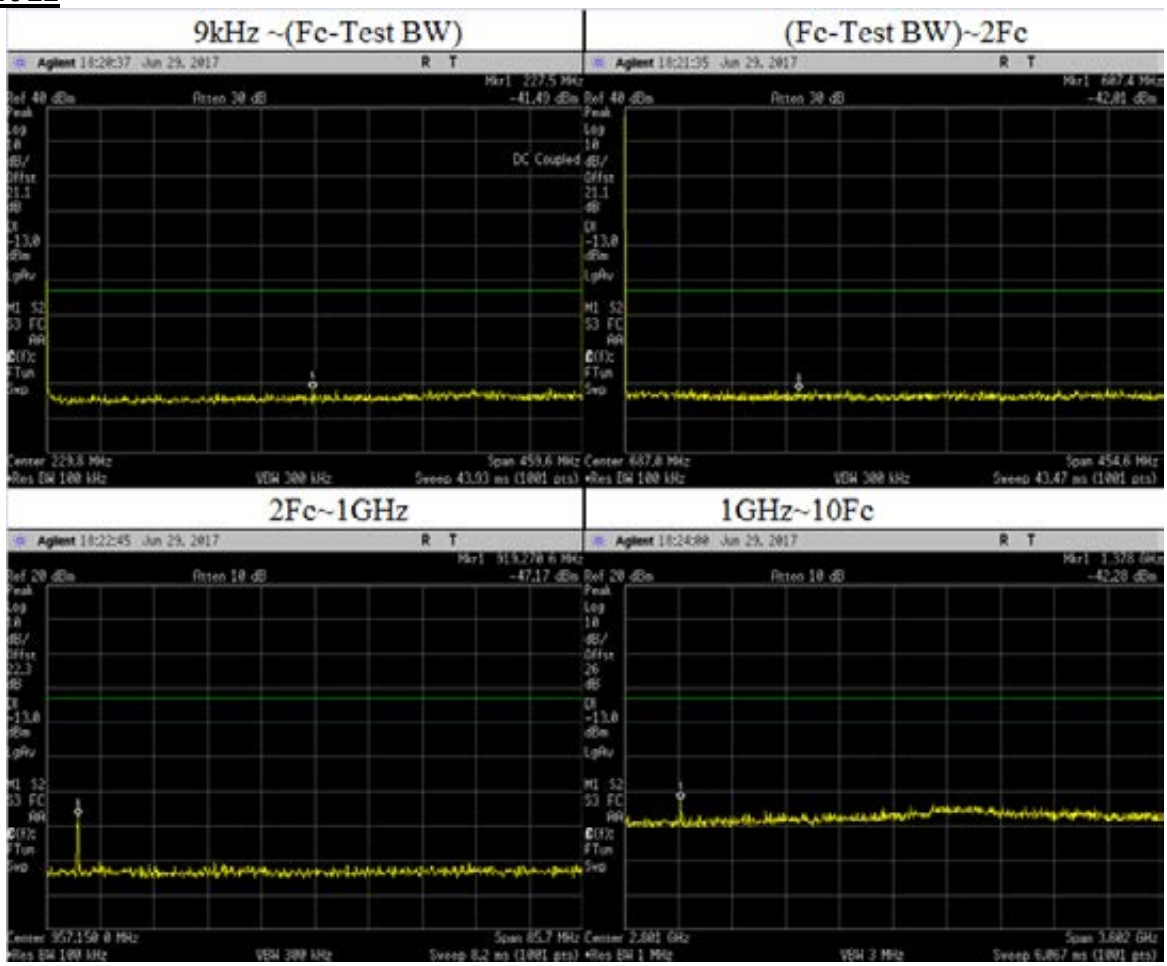
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	348.7644	-40.50	-13	Pass
(Fc-Test BW)~2Fc	488.5760	-40.84	-13	Pass
2Fc~1GHz	901.2800	-45.48	-13	Pass
1GHz~10Fc	1766.0000 1351.9500 1802.6000 2253.2500 2703.9000 3154.5500 3605.2000 4055.8500 4506.5000	-42.57 -47.65 -48.40 -48.41 -46.31 -44.67 -45.94 -46.00 -45.73	-13	Pass

Analog: 459.0250 MHz, 25.0 kHz Channel Spacing, Max Power
Part 22



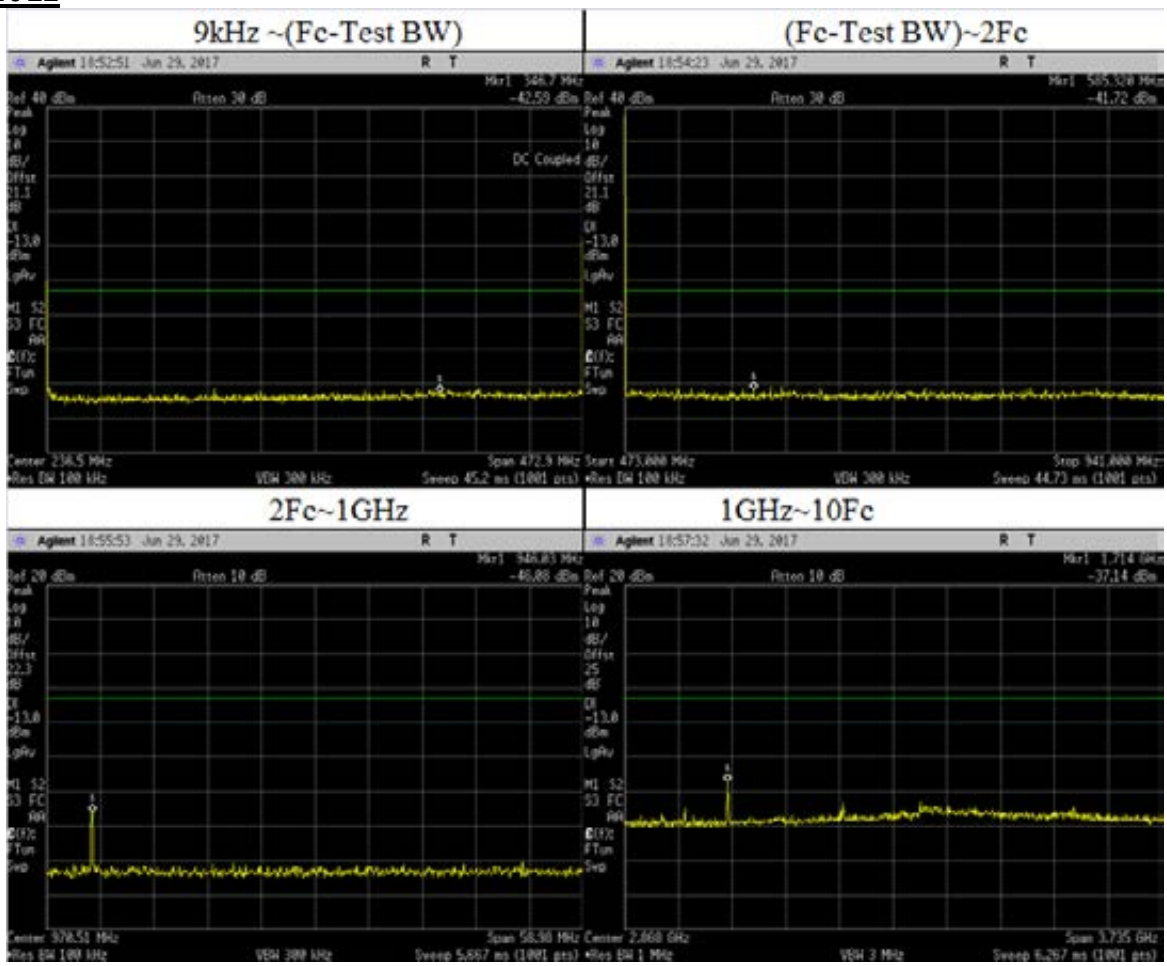
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	370.8720	-41.44	-13	Pass
(Fc-Test BW)~2Fc	517.2120	-41.53	-13	Pass
2Fc~1GHz	918.0900 918.0500	-46.96 -46.96	-13	Pass
1GHz~10Fc	1377.9750 1942.3900 1377.0750 1836.1000 2295.1250 2754.8600 3212.1750 3672.2000 4131.2250 4590.2500	-42.31 -38.20 -42.31 -47.40 -47.22 -46.75 -45.02 -46.47 -47.25 -48.13	-13	Pass

Analog: 459.6500 MHz, 25.0 kHz Channel Spacing, Max Power
Part 22



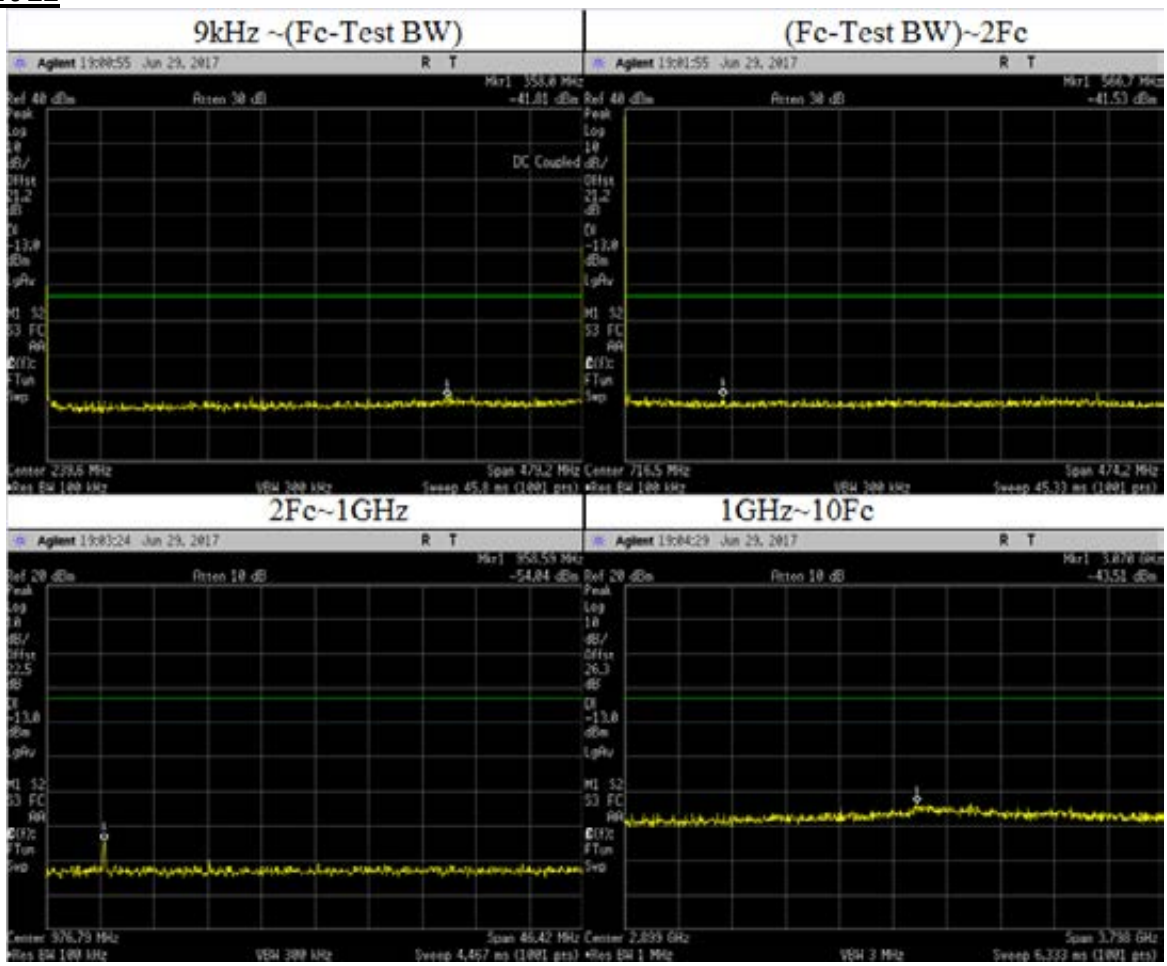
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	227.5000	-41.49	-13	Pass
(Fc-Test BW)~2Fc	607.4000	-42.01	-13	Pass
2Fc~1GHz	919.2700	-47.17	-13	Pass
1GHz~10Fc	1378.0000 1378.9500 1838.6000 2298.2500 2757.9000 3217.5500 4136.8500 4596.5000	-42.28 -42.28 -47.69 -47.85 -47.71 -44.81 -47.14 -47.98	-13	Pass

Analog: 473.0125 MHz, 25.0 kHz Channel Spacing, Max Power
Part 22



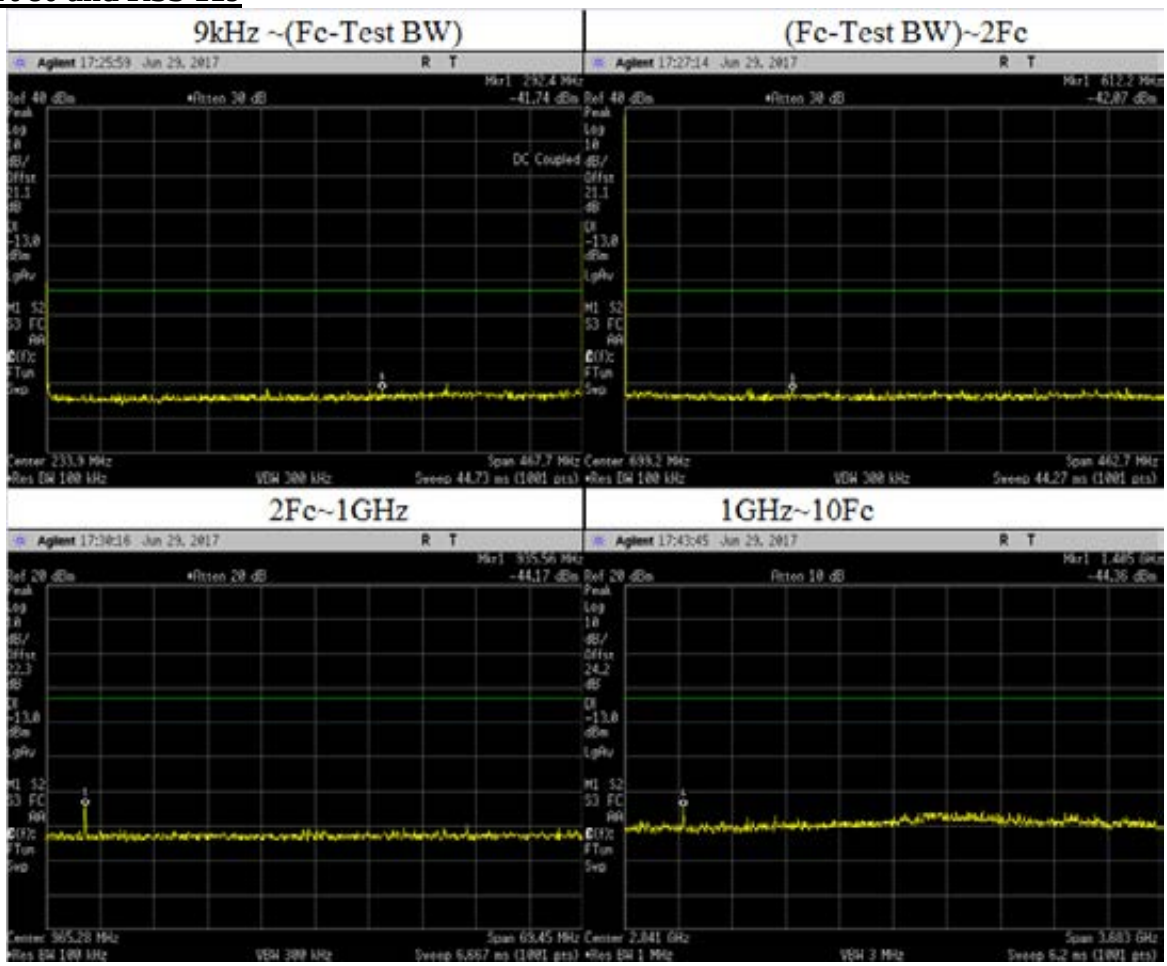
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	346.7000	-42.59	-13	Pass
(Fc-Test BW)~2Fc	565.7200	-41.72	-13	Pass
2Fc~1GHz	946.0300	-46.08	-13	Pass
1GHz~10Fc	1714.0000 1419.0380 1892.0500 2365.0630 2838.0750 3311.0880 3784.1000 4257.1130 4730.1250	-37.14 -44.92 -48.49 -48.22 -46.30 -46.88 -47.04 -47.32 -48.16	-13	Pass

Analog: 479.2875 MHz, 25.0 kHz Channel Spacing, Max Power
Part 22



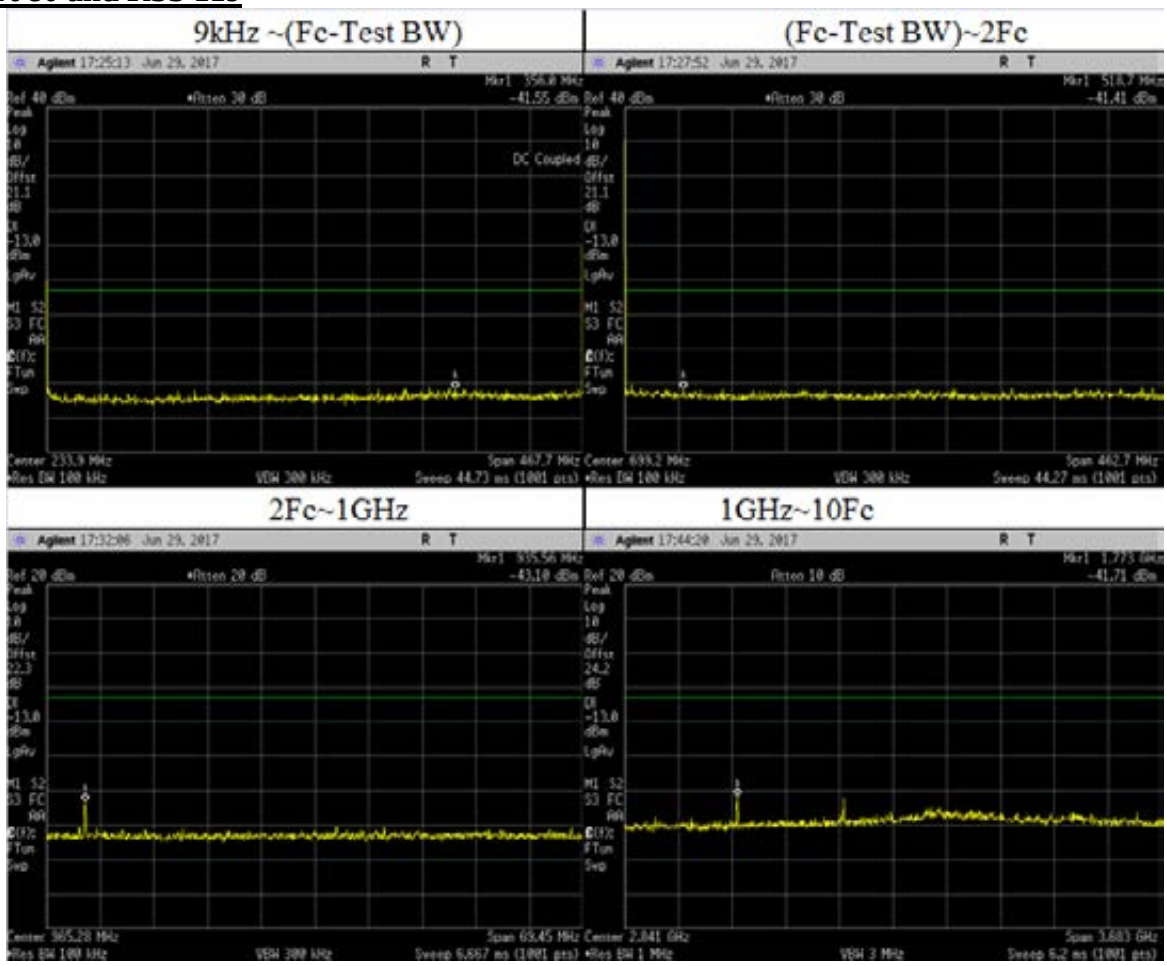
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	355.0000	-41.81	-13	Pass
(Fc-Test BW)~2Fc	566.7000	-41.53	-13	Pass
2Fc~1GHz	958.5900	-54.04	-13	Pass
1GHz~10Fc	30740.000 1437.8630 1917.1500 2396.4380 2875.7250 3355.0130 3834.3000 4313.5880 4792.8750	-43.51 -46.98 -48.20 -47.52 -46.83 -45.17 -46.91 -48.00 -47.97	-13	Pass

Analog: 467.7750 MHz, 25.0 kHz Channel Spacing, Max Power
Part 80 and RSS 119



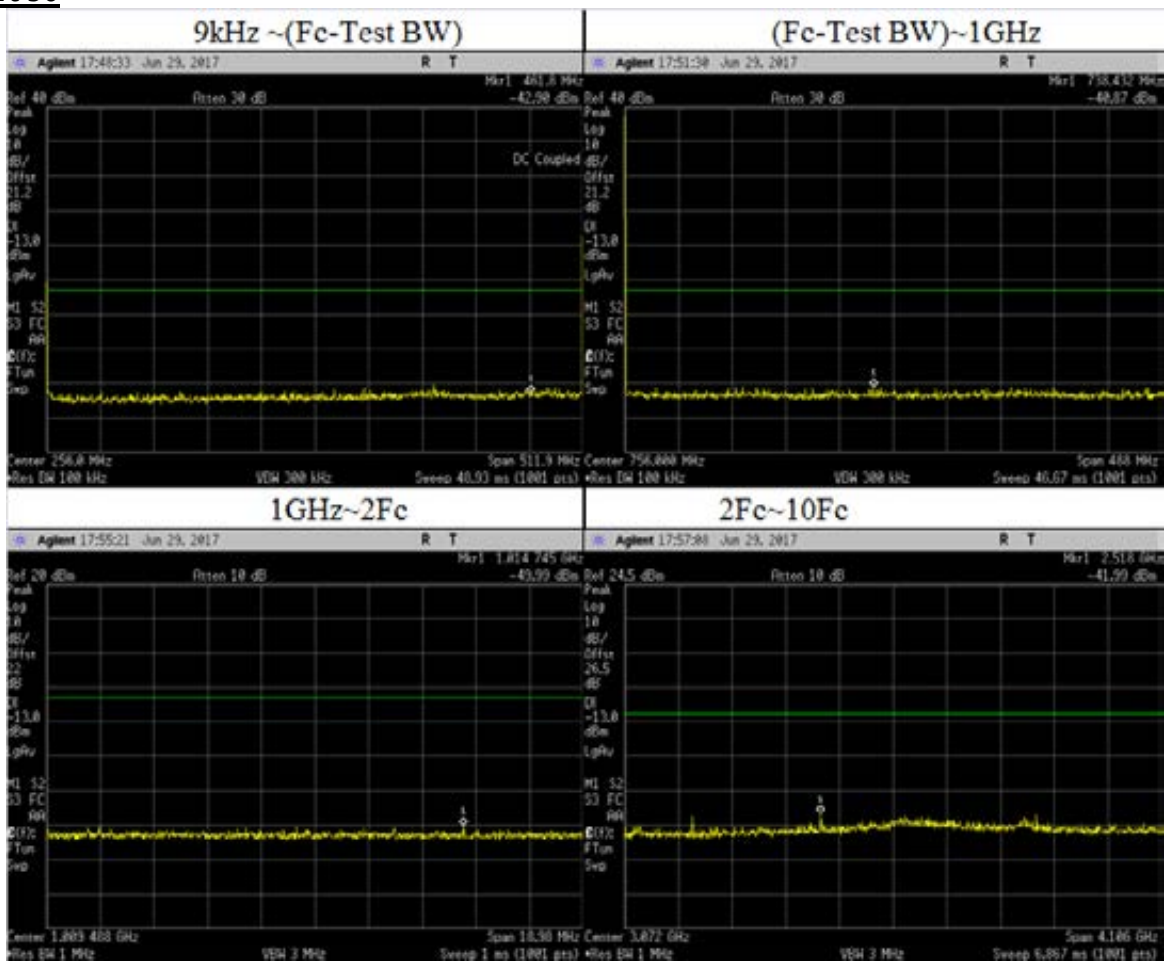
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	292.4000	-41.74	-13	Pass
(Fc-Test BW)~2Fc	612.2000	-42.07	-13	Pass
2Fc~1GHz	935.5600	-44.17	-13	Pass
1GHz~10Fc	1403.3250 1871.1000 2338.8750 2806.6500 3274.4250 3742.2000 4209.9750 4677.7500	-44.36 -49.88 -49.42 -49.22 -47.27 -48.01 -50.02 -50.10	-13	Pass

Analog: 467.7750 MHz, 25.0 kHz Channel Spacing, Low Power
Part 80 and RSS 119



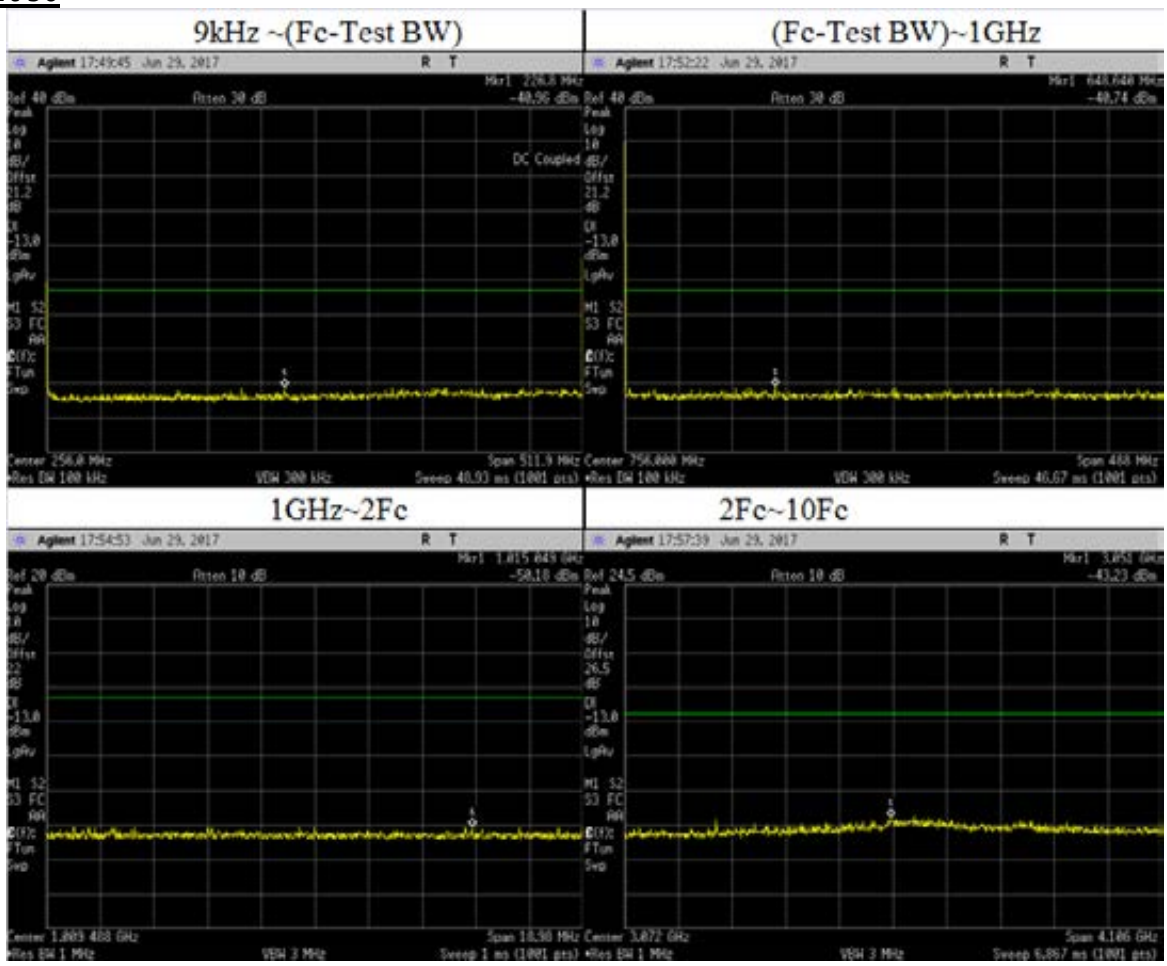
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	356.0000	-41.55	-13	Pass
(Fc-Test BW)~2Fc	518.7000	-41.41	-13	Pass
2Fc~1GHz	935.5600	-43.10	-13	Pass
1GHz~10Fc	1772.9300 2502.1640 1403.3250 1871.1000 2338.8750 2806.6500 3274.4250 3742.2000 4209.9750 4677.7500	-41.71 -42.08 -48.52 -49.68 -50.21 -48.49 -45.55 -48.46 -48.12 -47.68	-13	Pass

Analog: 511.9875 MHz, 25.0 kHz Channel Spacing, Max Power
Part 90



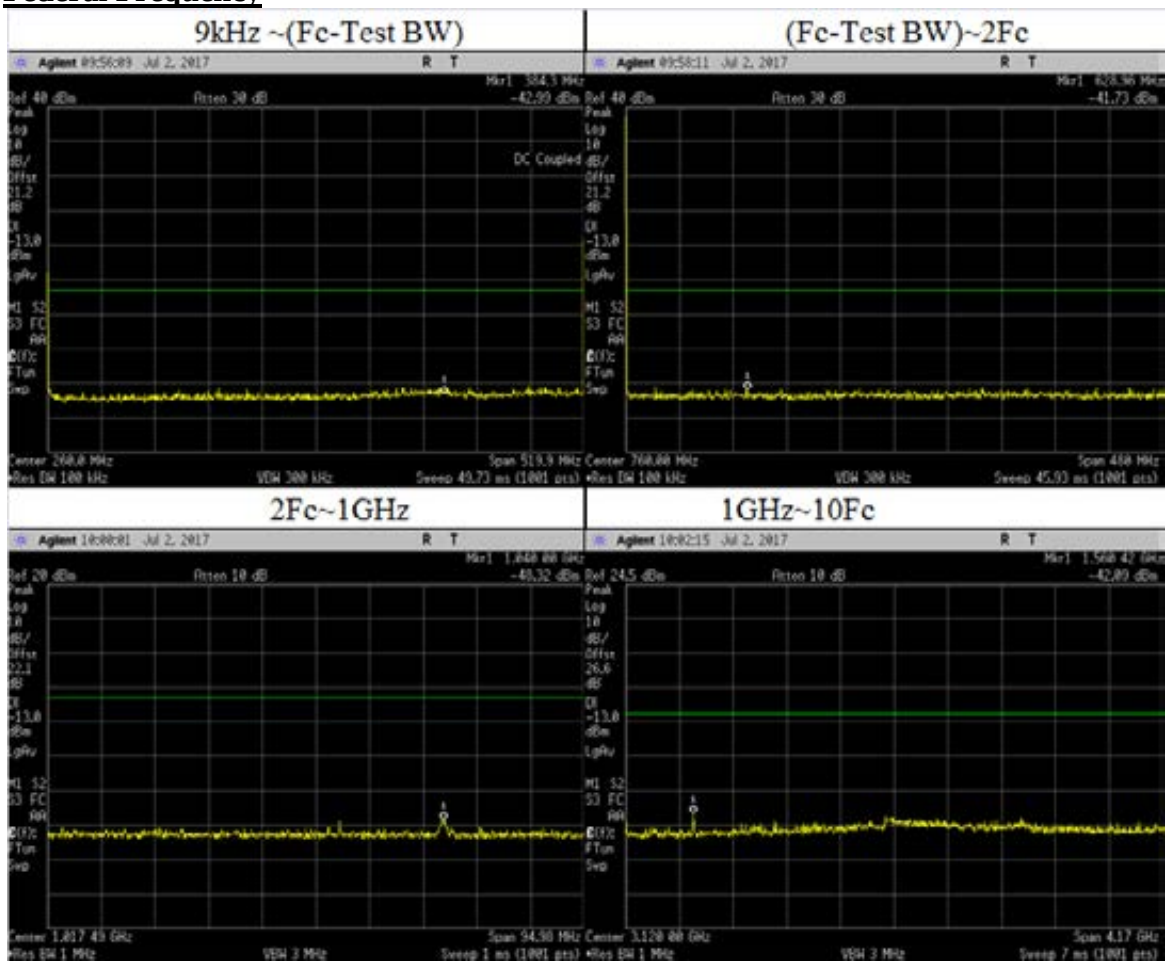
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	461.8000	-42.90	-13	Pass
(Fc-Test BW)~1GHz	738.4320	-40.87	-13	Pass
1GHz~2Fc	1014.7450	-49.99	-13	Pass
2Fc~10Fc	1536.3560 2517.6900 4168.3020 1023.9750 1535.9625 2047.9500 2559.9375 3071.9250 3583.9125 4095.9000 4607.8875 5119.8750	-42.83 -41.99 -42.58 -46.25 -42.83 -47.31 -46.91 -45.15 -45.83 -46.16 -47.40 -47.21	-13	Pass

Analog: 511.9875 MHz, 25.0 kHz Channel Spacing, Low Power
Part 90



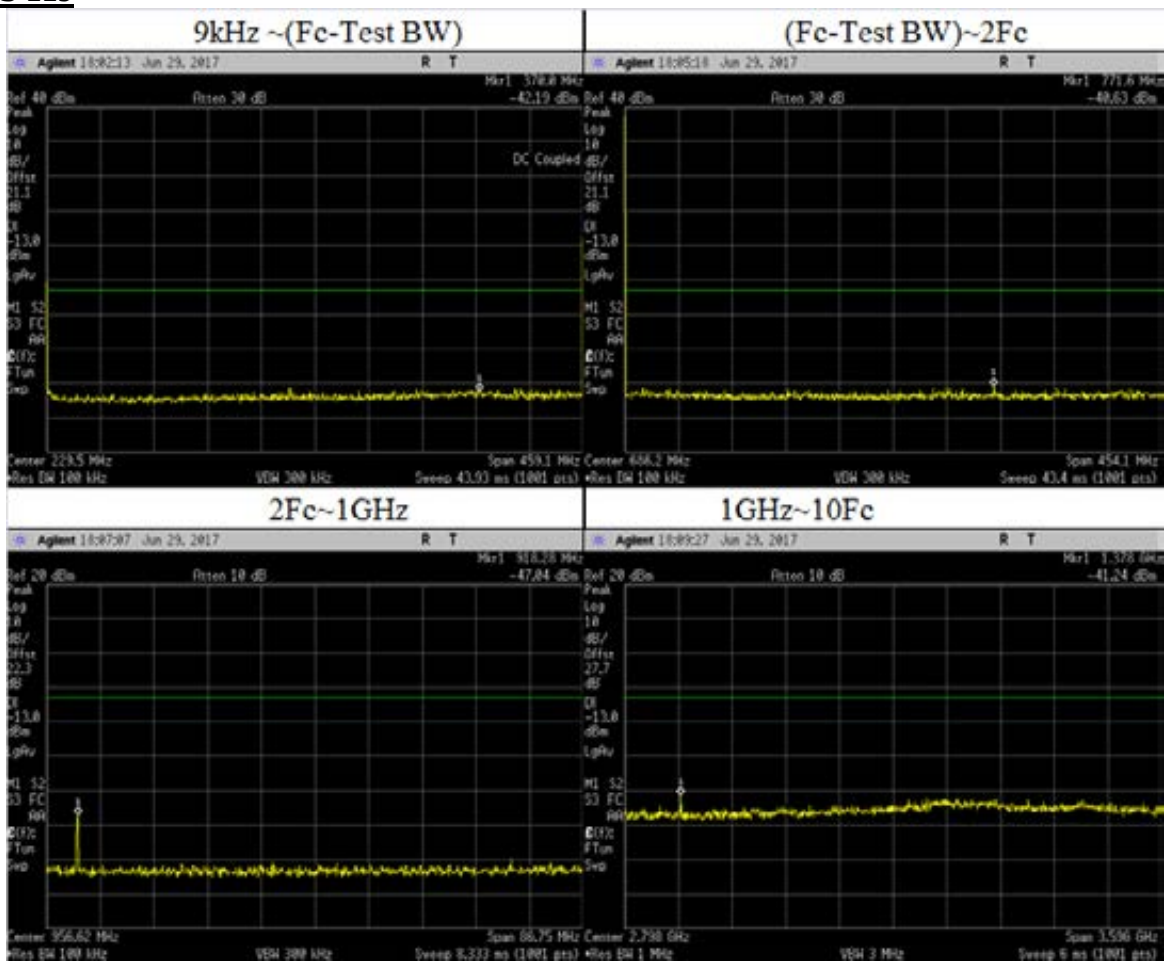
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	226.8000	-40.96	-13	Pass
(Fc-Test BW)~1GHz	648.6400	-40.74	-13	Pass
1GHz~2Fc	1015.0490	-50.18	-13	Pass
2Fc~10Fc	1023.9750 1535.9625 2047.9500 2559.9375 3071.9250 3583.9125 4095.9000 4607.8875 5119.8750	-47.85 -46.87 -47.29 -44.65 -44.28 -45.69 -45.73 -46.81 -46.01	-13	Pass

Analog: 519.9875 MHz, 25.0 kHz Channel Spacing, Max Power (NOT FOR FCC REVIEW)
Federal Frequency



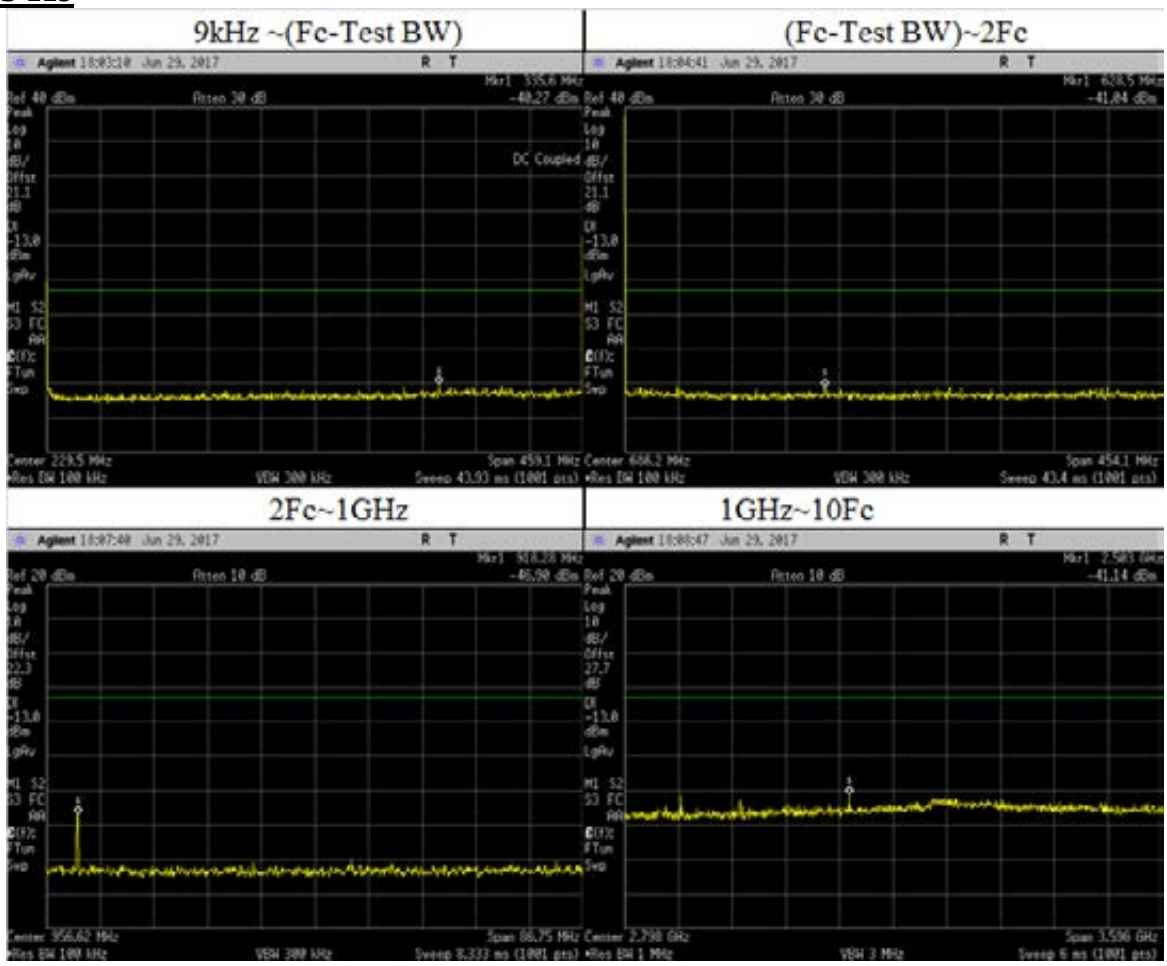
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	384.3000	-42.99	-13	Pass
(Fc-Test BW)~1GHz	628.9600	-41.73	-13	Pass
1GHz~2Fc	1040.0000	-48.32	-13	Pass
2Fc~10Fc	1560.4200 1039.9750 1559.9625 2079.9500 2599.9375 3119.9250 3639.9125 4159.9000 4679.88755 5199.8750	-42.09 -44.65 -42.09 -47.86 -46.87 -44.53 -46.02 -46.08 -47.86 -46.23	-13	Pass

<u>Analog:</u> 459.1250 MHz, 20.0 kHz Channel Spacing, Max Power
<u>RSS 119</u>



Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	370.0000	-42.19	-13	Pass
(Fc-Test BW)~2Fc	771.6000	-40.63	-13	Pass
2Fc~1GHz	918.2800	-47.04	-13	Pass
1GHz~10Fc	1377.5800 1377.3750 1836.5000 2295.6250 2754.7500 3213.8750 3673.0000 4132.1250 4591.2500	-41.24 -41.24 -47.22 -44.77 -45.45 -42.42 -45.27 -44.15 -46.79	-13	Pass

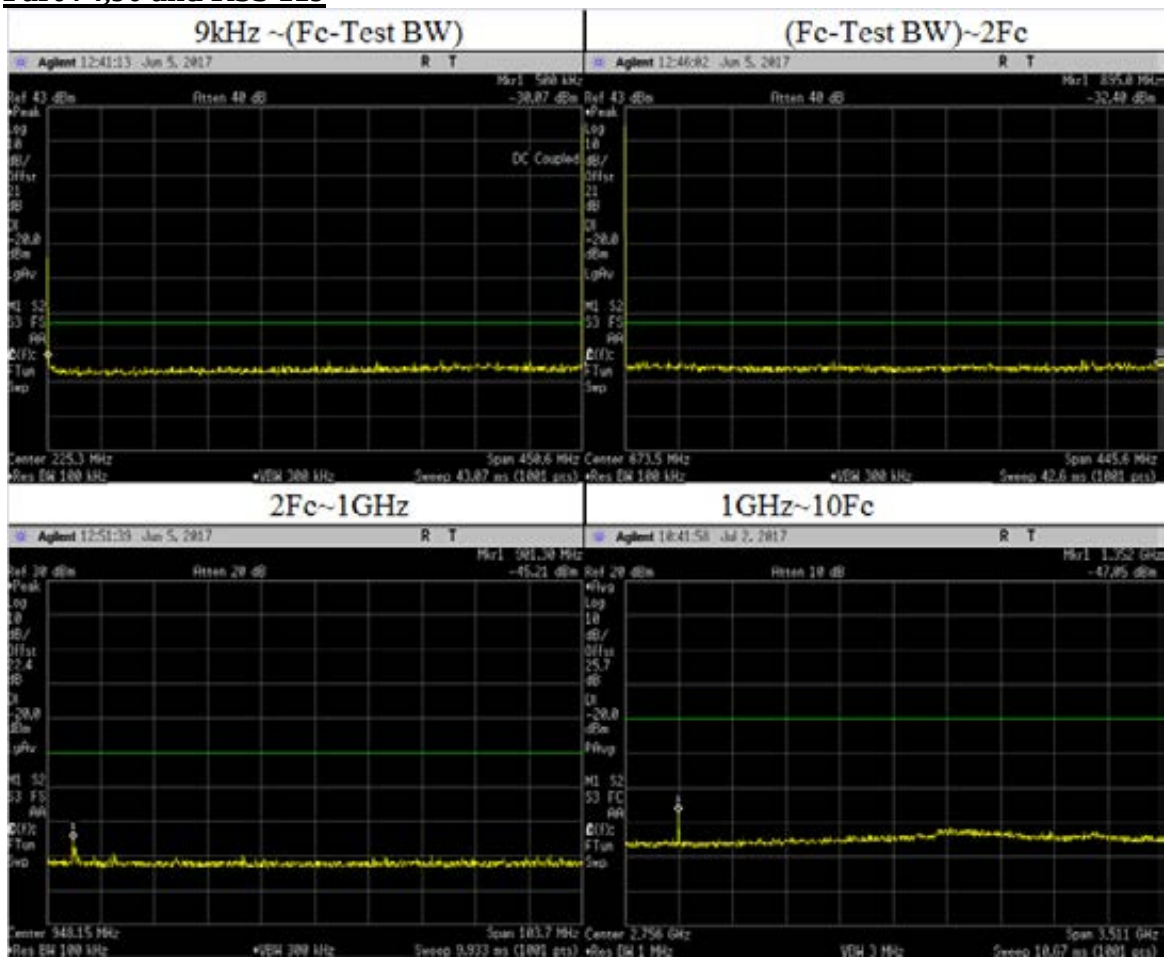
<u>Analog:</u> 459.1250 MHz, 25.0 kHz Channel Spacing, Max Power
<u>RSS 119</u>



Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	335.6000	-40.27	-13	Pass
(Fc-Test BW)~2Fc	628.5000	-41.04	-13	Pass
2Fc~1GHz	918.2800	-46.90	-13	Pass
1GHz~10Fc	1377.5800 1773.1400 2503.1280 1377.3750 1836.5000 2295.6250 2754.7500 3213.8750 3673.0000 4132.1250 4591.2500	-41.56 -42.66 -41.14 -41.56 -46.65 -46.10 -45.15 -44.45 -45.20 -44.27 -45.04	-13	Pass

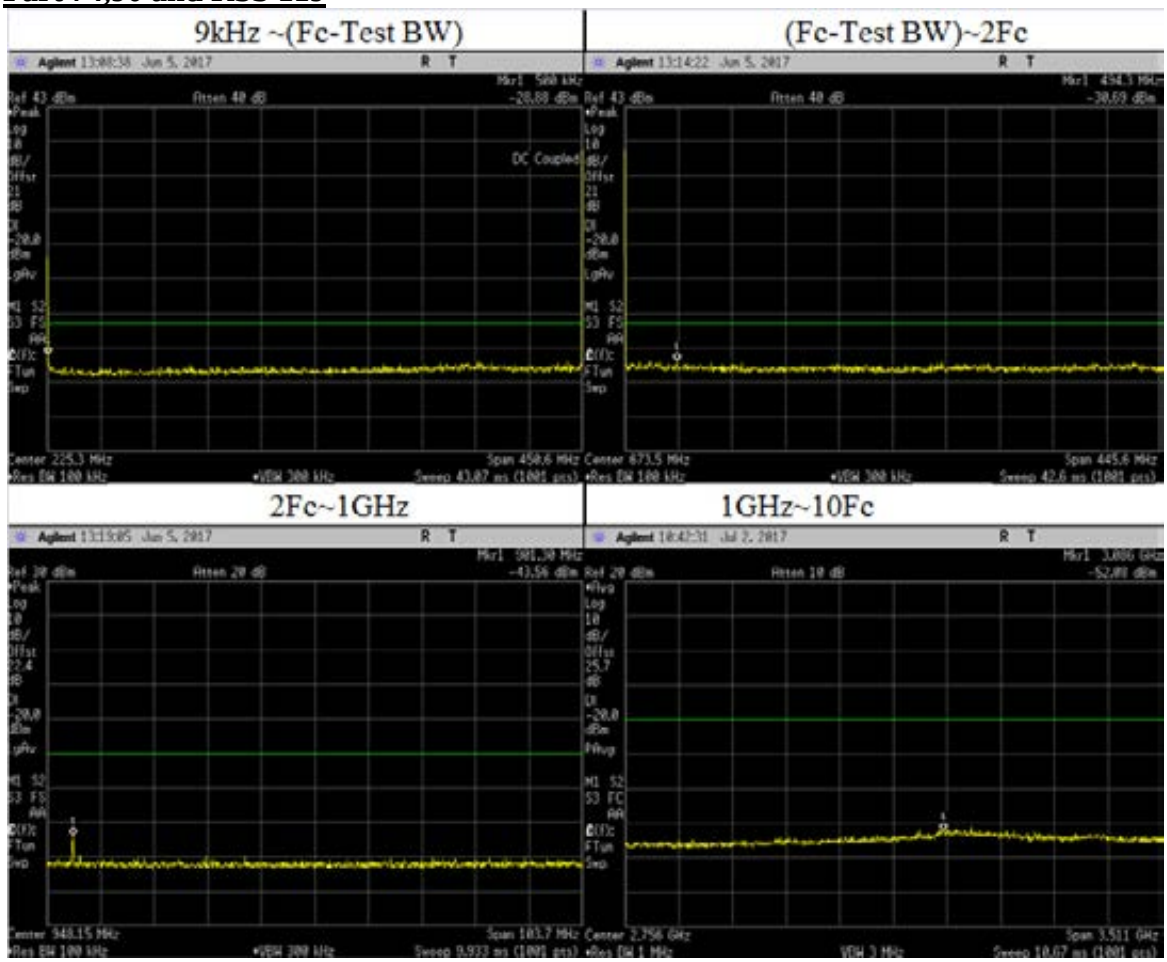
6.10.1. Test Result (Digital)

C4FM: 450.6500 MHz, 12.5 kHz Channel Spacing, Max Power
Part 74,90 and RSS 119



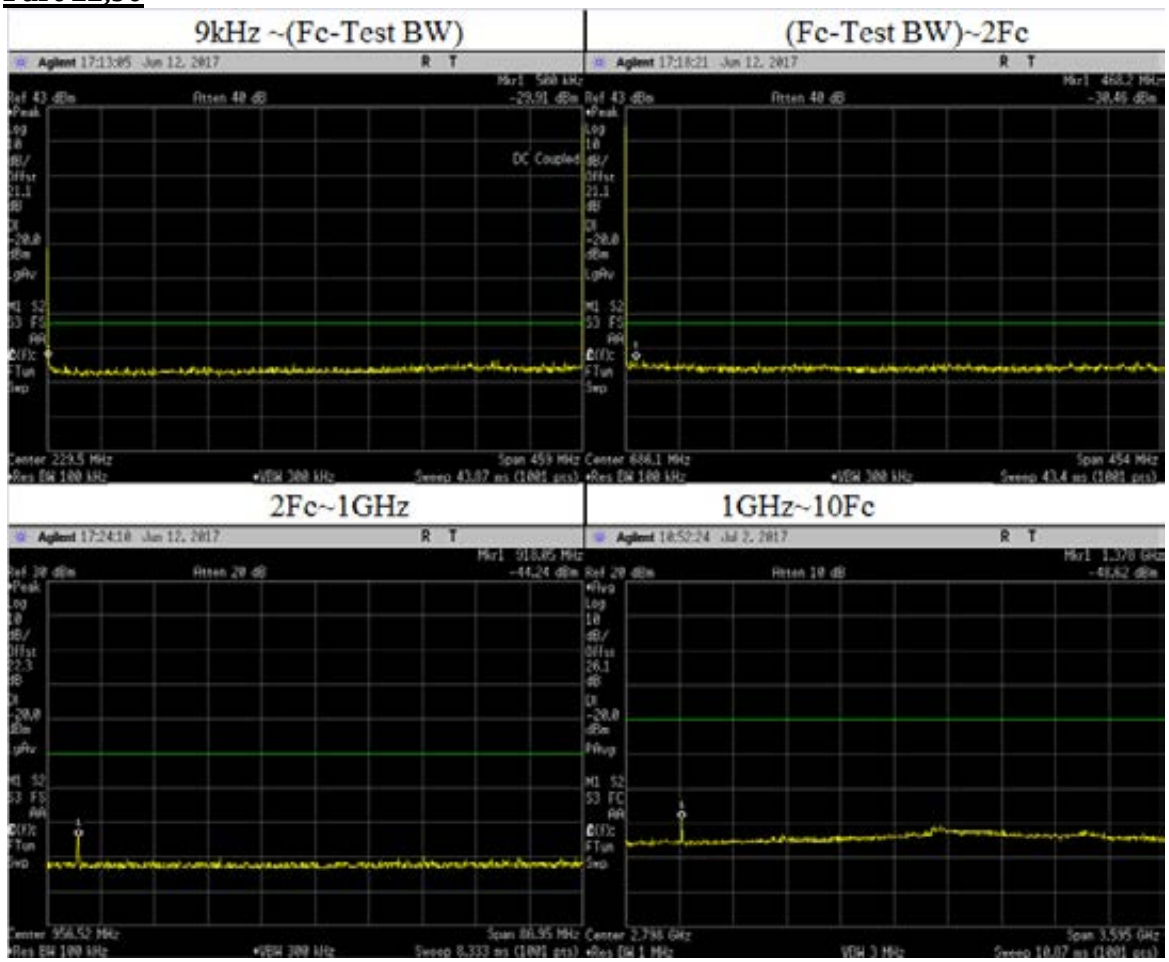
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4600 331.3100 236.7800 405.5800 277.2900	-31.42 -30.93 -31.44 -31.23 -31.44	-20	Pass
(Fc-Test BW)~1GHz	894.9600 624.3100 839.7700 831.3100 487.6500	-29.89 -30.43 -30.29 -30.33 -30.98	-20	Pass
1GHz~2Fc	901.3800	-45.34	-20	Pass
1GHz~10Fc	1351.9500 1802.6000 2253.2500 2703.9000 3154.5500 3605.2000 4055.8500 4506.5000	-45.20 -53.06 -53.05 -52.77 -50.57 -51.71 -51.72 -52.08	-20	Pass

C4FM: 450.6500 MHz, 12.5 kHz Channel Spacing, Low Power
Part 74,90 and RSS 119



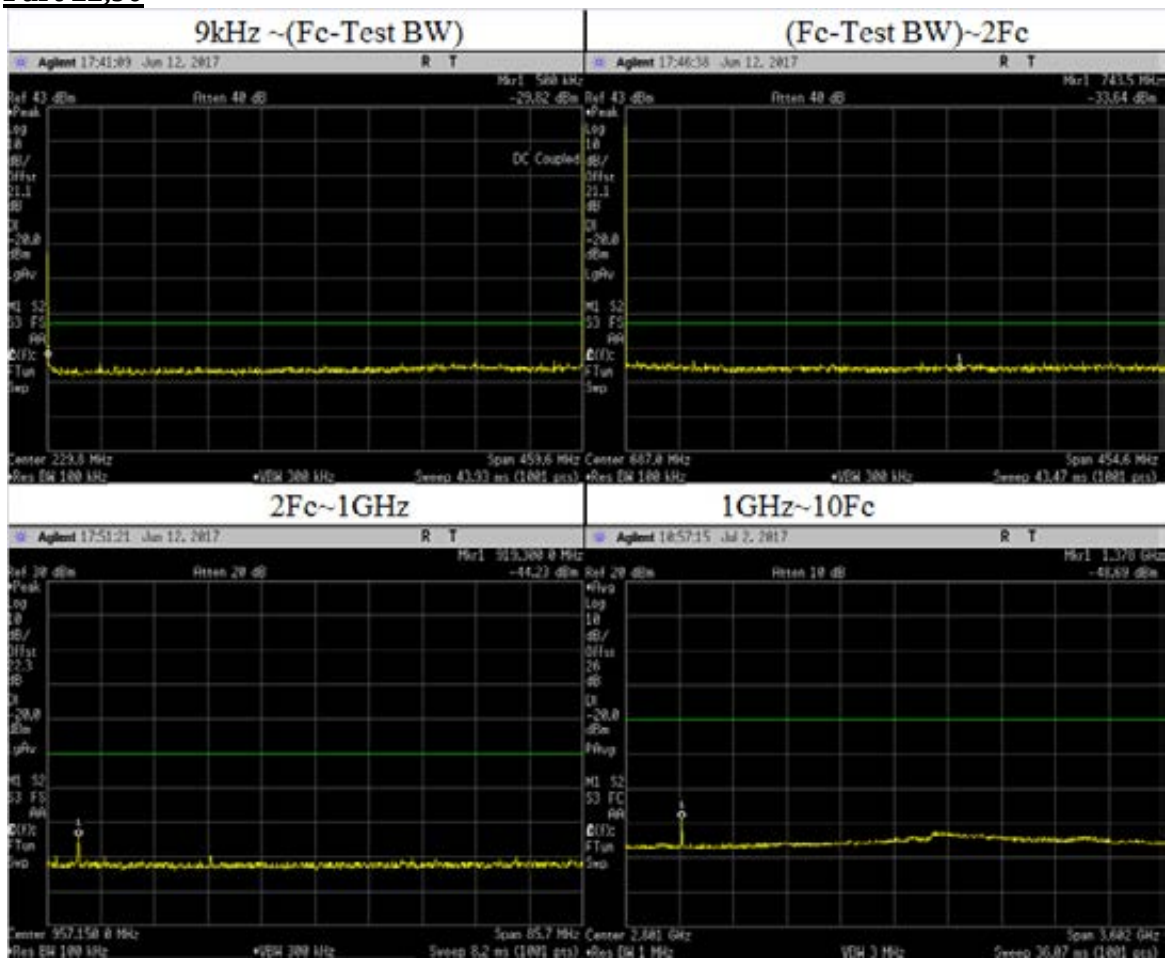
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4600 362.8200 437.0900 353.8200 330.4100	-30.23 -31.14 -31.25 -31.44 -31.60	-20	Pass
(Fc-Test BW)~1GHz	494.3300 471.6300 873.6000 713.7900 480.0900	-30.47 -30.68 -30.32 -30.73 -31.02	-20	Pass
1GHz~2Fc	901.3800	-44.85	-20	Pass
1GHz~10Fc	1351.9500 1802.6000 2253.2500 2703.9000 3154.5500 3605.2000 4055.8500 4506.5000	-53.23 -54.63 -52.65 -52.33 -50.68 -51.64 -51.53 -53.06	-20	Pass

C4FM: 459.0250 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22,90



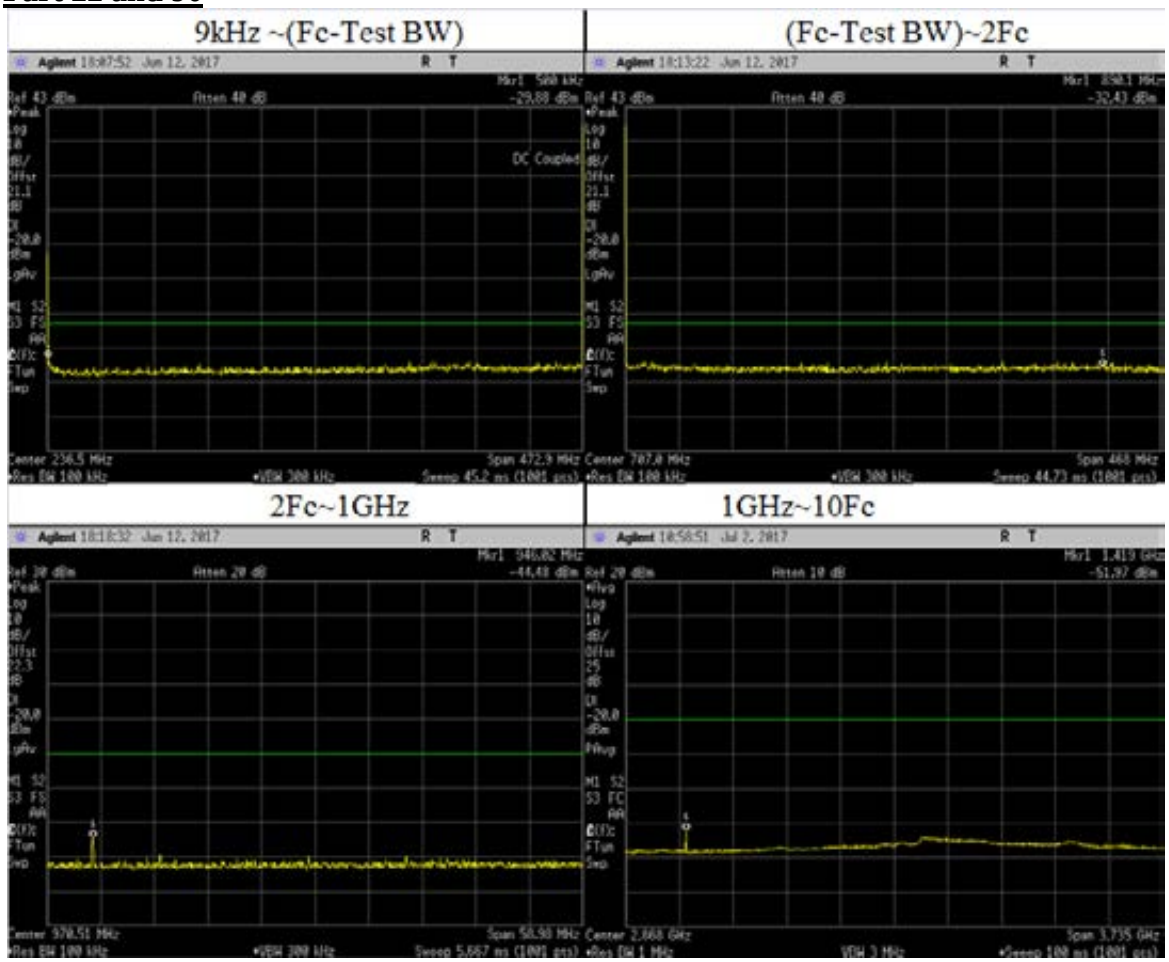
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4700 385.1500 381.0200 442.9200 351.6800	-31.31 -30.29 -30.78 -31.07	-20	Pass
(Fc-Test BW)~1GHz	468.1500 474.5000 464.5200 891.7300 835.9500	-30.41 -30.58 -30.70 -30.47 -30.61	-20	Pass
1GHz~2Fc	918.0500	-44.35	-20	Pass
1GHz~10Fc	1378.0000 1377.0750 1836.1000 2295.1250 2754.8600 3212.1750 3672.2000 4131.2250 4590.2500	-48.62 -48.50 -55.84 -55.97 -54.71 -51.94 -53.63 -53.55 -53.67	-20	Pass

C4FM: 459.6500 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22,90



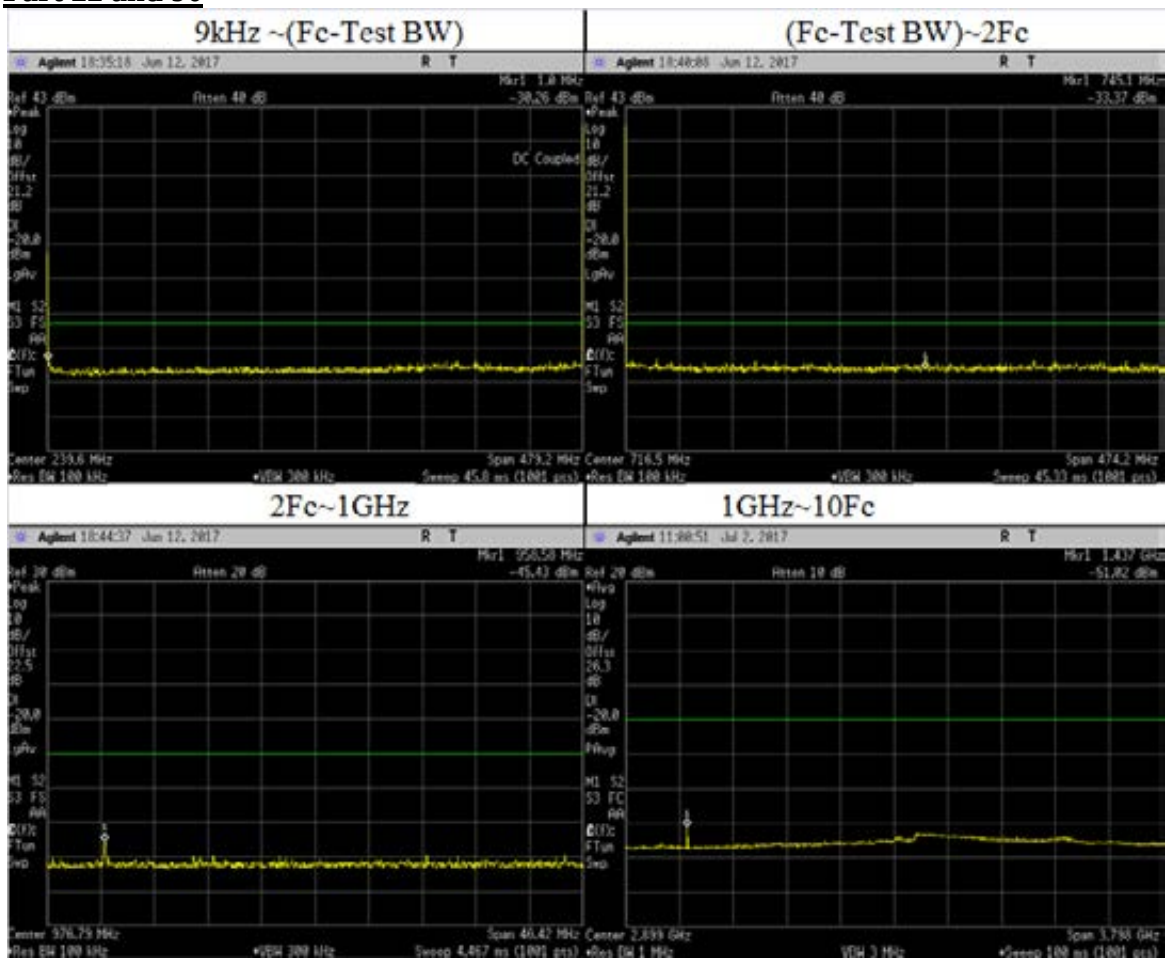
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4700 367.3100 434.3400 387.9700 303.9500	-31.22 -30.17 -30.99 -31.29 -31.61	-20	Pass
(Fc-Test BW)~1GHz	743.5400 517.8400 469.7000 814.8400 710.8500	-30.05 -30.49 -30.80 -30.56 -30.80	-20	Pass
1GHz~2Fc	919.3000	-44.24	-20	Pass
1GHz~10Fc	1378.0000 1378.9500 1838.6000 2298.2500 2757.9000 3217.5500 4136.8500 4596.5000	-48.69 -48.57 -56.37 -56.27 -54.95 -53.16 -54.73 -55.47	-20	Pass

C4FM: 473.0125 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22 and 90



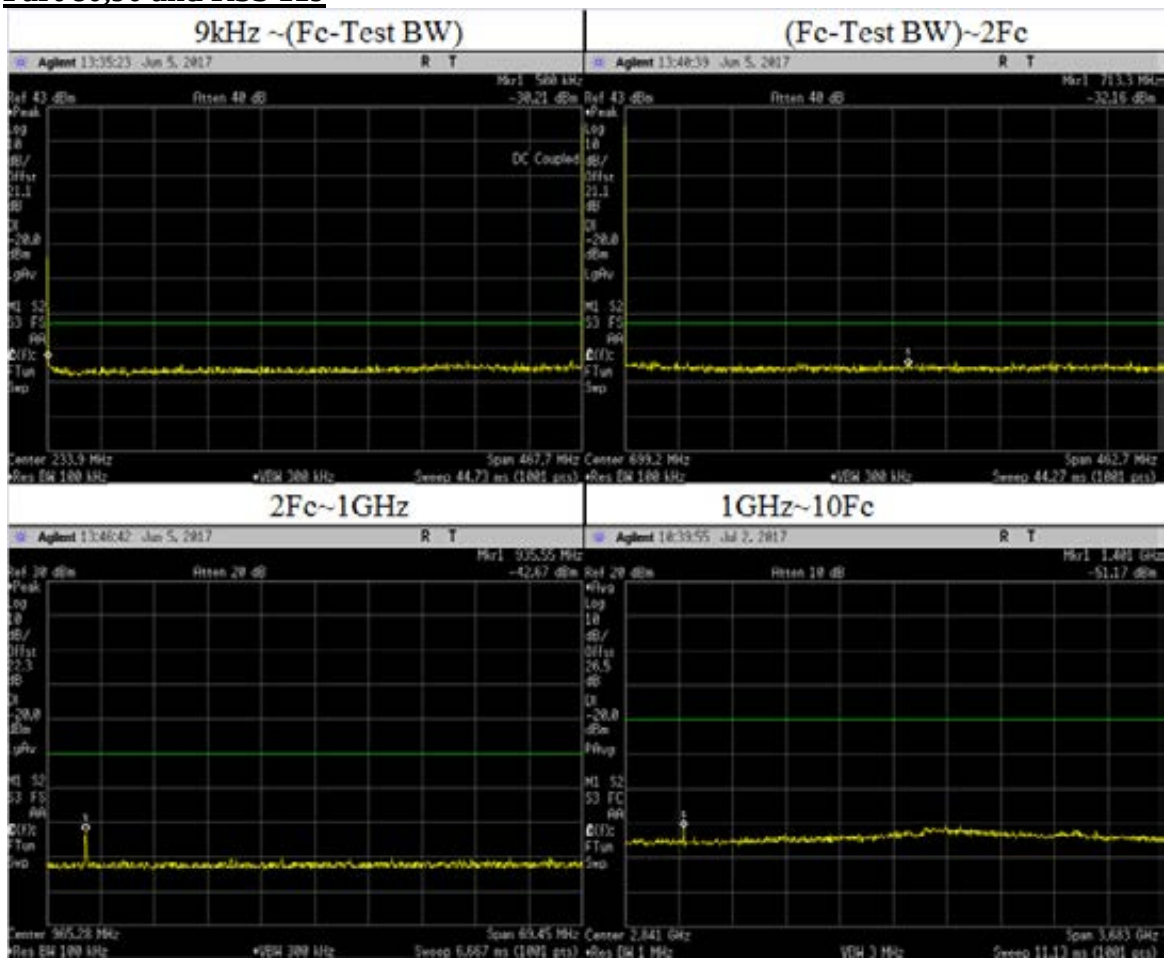
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4800 338.7700 372.3200 1.9000 448.8600	-31.26 -31.30 -31.03 -32.43 -31.21	-20	Pass
(Fc-Test BW)~1GHz	890.0700 802.6500 489.9000 850.3300 496.9100	-30.29 -30.40 -30.91 -30.45 -30.98	-20	Pass
1GHz~2Fc	946.0200	-44.48	-20	Pass
1GHz~10Fc	1419.0380 1892.0500 2365.0630 2838.0750 3311.0900 3784.0880 4257.1130 4730.1250	-51.97 -57.79 -57.22 -56.20 -54.91 -55.75 -56.68 -57.09	-20	Pass

C4FM: 479.2875 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22 and 90



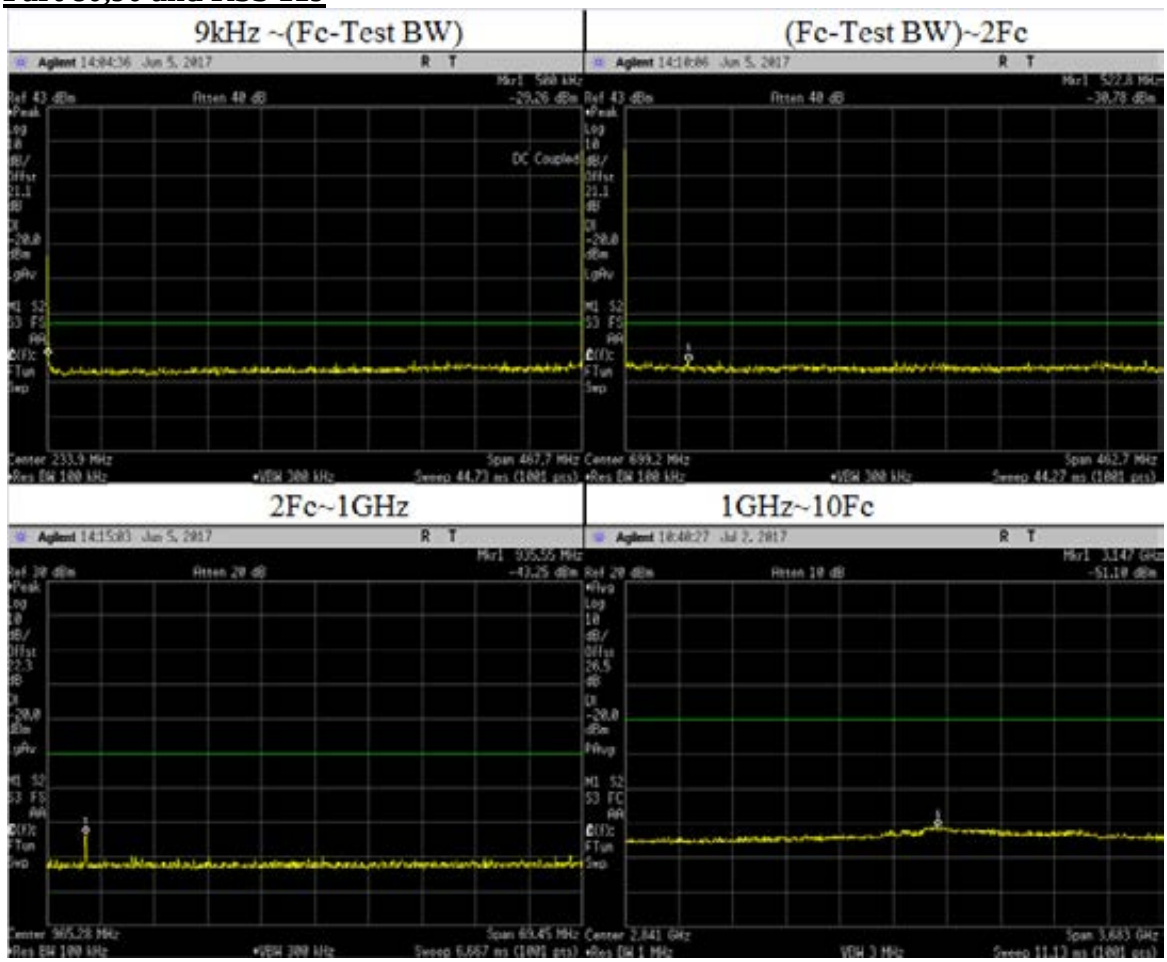
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.9700 366.2500 471.0900 356.6700 457.6900	-31.70 -30.91 -31.04 -31.25 -31.28	-20	Pass
(Fc-Test BW)~1GHz	745.1200 506.8200 840.8200 922.3100 593.9900	-29.48 -30.11 -29.98 -30.12 -30.66	-20	Pass
1GHz~2Fc	958.5800	-45.43	-20	Pass
1GHz~10Fc	1437.0000 1437.8630 1917.1500 2396.4380 2875.7250 3355.0130 3834.3000 4313.5880 4792.8750	-51.02 -51.02 -56.27 -56.06 -55.14 -53.71 -55.11 -55.57 -55.33	-20	Pass

C4FM: 467.7750 MHz, 12.5 kHz Channel Spacing, Max Power
Part 80,90 and RSS 119



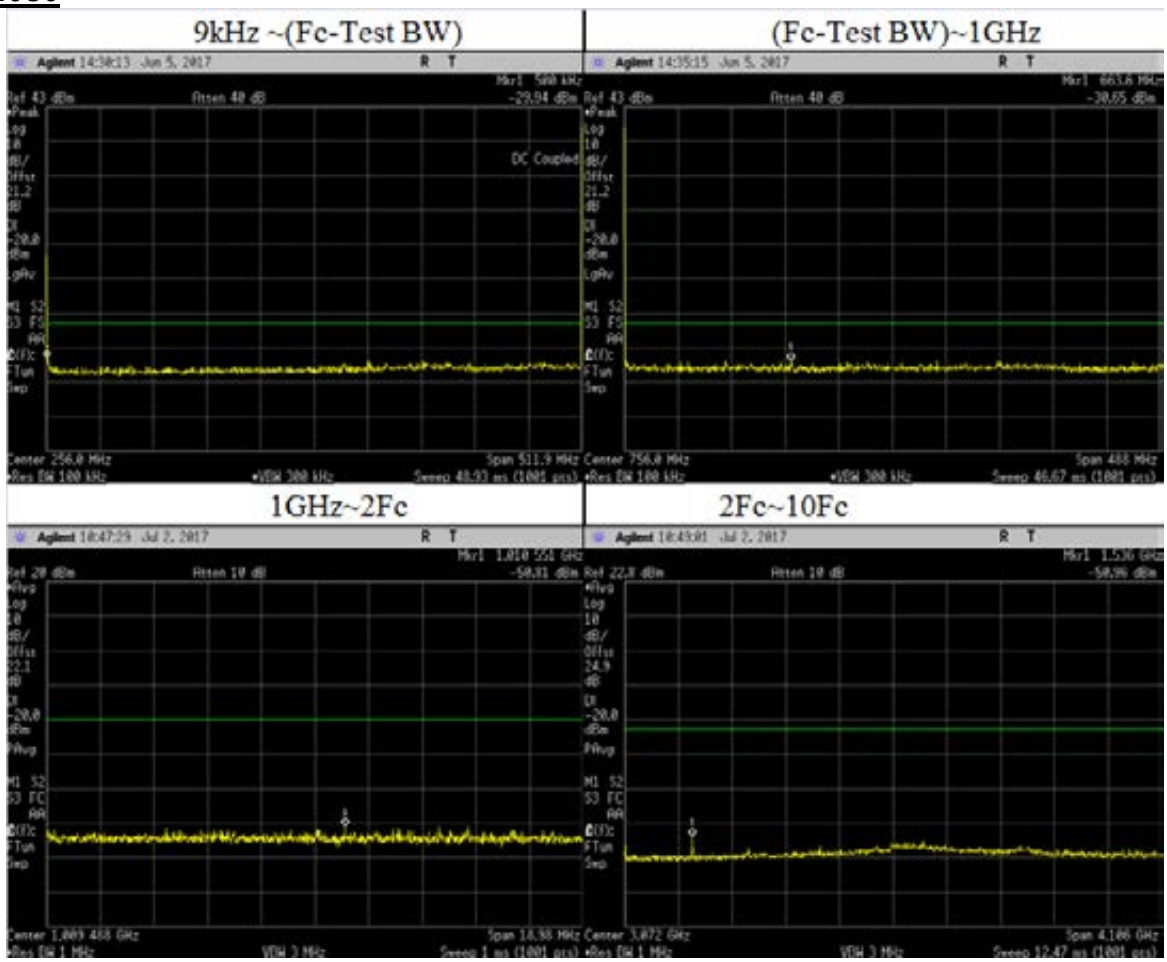
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4800 366.7900 457.9100 409.3100 357.9200	-31.62 -30.85 -30.87 -31.35 -31.46	-20	Pass
(Fc-Test BW)~1GHz	713.2900 904.6600 688.3300 493.7200 753.5100	-30.35 -30.11 -30.54 -30.81 -30.51	-20	Pass
1GHz~2Fc	935.5500	-42.67	-20	Pass
1GHz~10Fc	1401.0000 1403.3250 1871.1000 2338.8750 2806.6500 3274.4250 3742.2000 4209.9750 4677.7500	-51.17 -49.98 -55.01 -54.02 -52.56 -51.94 -53.05 -53.33 -53.59	-20	Pass

C4FM: 467.7750 MHz, 12.5 kHz Channel Spacing, Low Power
Part 80,90 and RSS 119



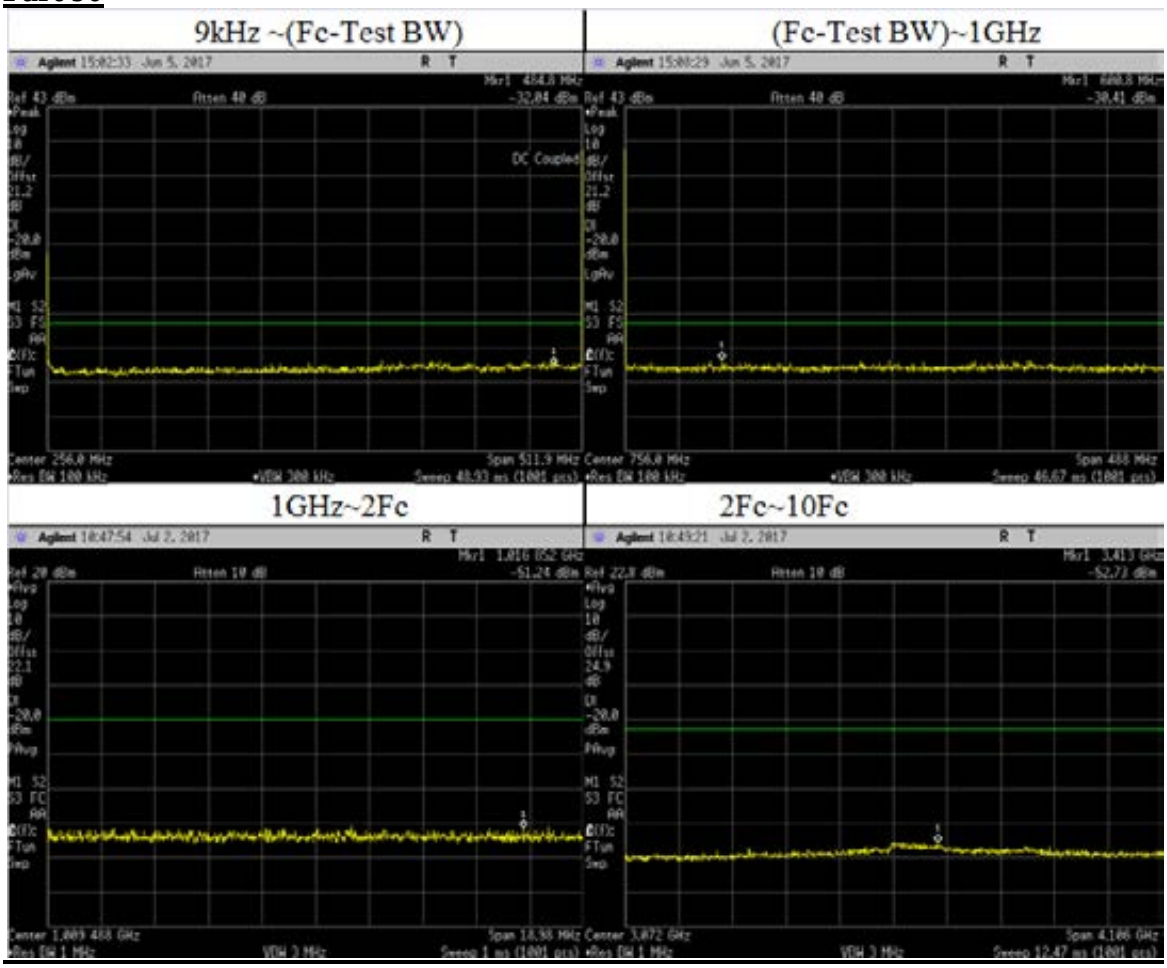
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4800 320.0700 349.5100 456.9700 398.5700	-30.67 -31.03 -31.15 -30.99 -31.13	-20	Pass
(Fc-Test BW)~1GHz	522.8400 486.3200 879.7000 549.1900 917.1400	-30.63 -30.72 -30.27 -30.81 -30.28	-20	Pass
1GHz~2Fc	935.5500	-43.25	-20	Pass
1GHz~10Fc	3147.0000 1403.3250 1871.1000 2338.8750 2806.6500 3274.4250 3742.2000 4209.9750 4677.7500	-51.10 -56.05 -55.39 -52.99 -53.28 -52.86 -53.16 -54.22 -54.39	-20	Pass

C4FM: 511.9875 MHz, 12.5 kHz Channel Spacing, Max Power
Part 90



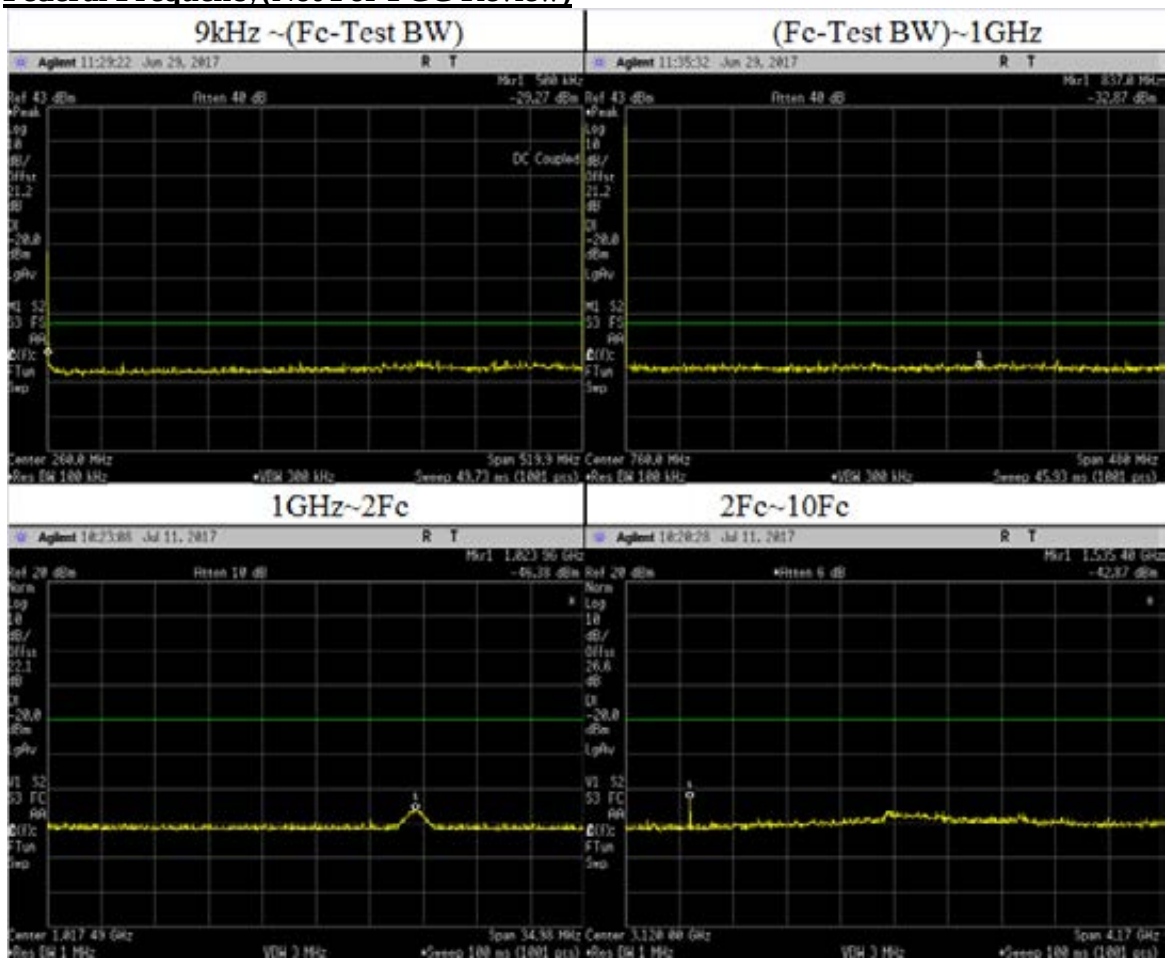
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.5200 1.5400 359.5300 306.8600 471.0200	-31.46 -31.43 -31.19 -31.43 -31.26	-20	Pass
(Fc-Test BW)~1GHz	663.6500 796.7300 850.8300 853.7600 733.3500	-30.44 -30.23 -30.40 -30.50 -30.64	-20	Pass
1GHz~2Fc	1010.5510	-50.81	-20	Pass
1GHz~10Fc	1023.9750 1535.9625 2047.9500 2559.9375 3071.9250 3583.9125 4095.9000 4607.8875 5119.8750	-53.40 -50.96 -55.91 -55.33 -53.13 -55.52 -54.80 -56.30 -55.90	-20	Pass

C4FM: 511.9875 MHz, 12.5 kHz Channel Spacing, Low Power
Part 90



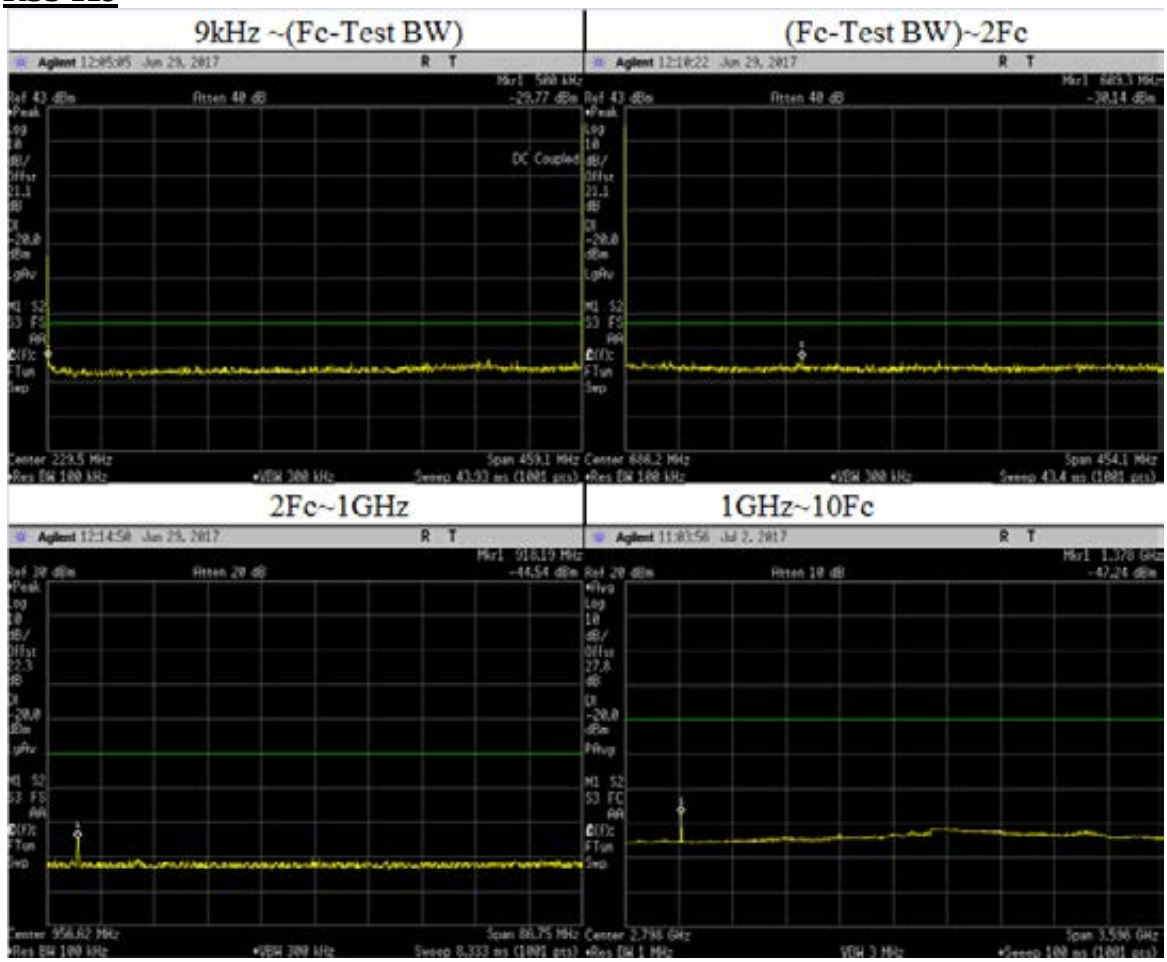
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	484.8300 319.6400 374.3600 1.5400 367.7100	-30.65 -31.20 -30.89 -32.24 -31.00	-20	Pass
(Fc-Test BW)~1GHz	600.7600 752.8500 880.5700 855.7100 727.0200	-30.31 -30.22 -30.18 -30.32 -30.52	-20	Pass
1GHz~2Fc	1016.8520	-51.24	-20	Pass
1GHz~10Fc	3413.0000 1023.9750 1535.9625 2047.9500 2559.9375 3071.9250 3583.9125 4095.9000 4607.8875 5119.8750	-52.73 -56.35 -56.69 -56.11 -55.70 -52.88 -55.62 -54.70 -55.67 -56.22	-20	Pass

C4FM: 519.9875 MHz, 12.5 kHz Channel Spacing, Max Power
Federal Frequency(Not For FCC Review)



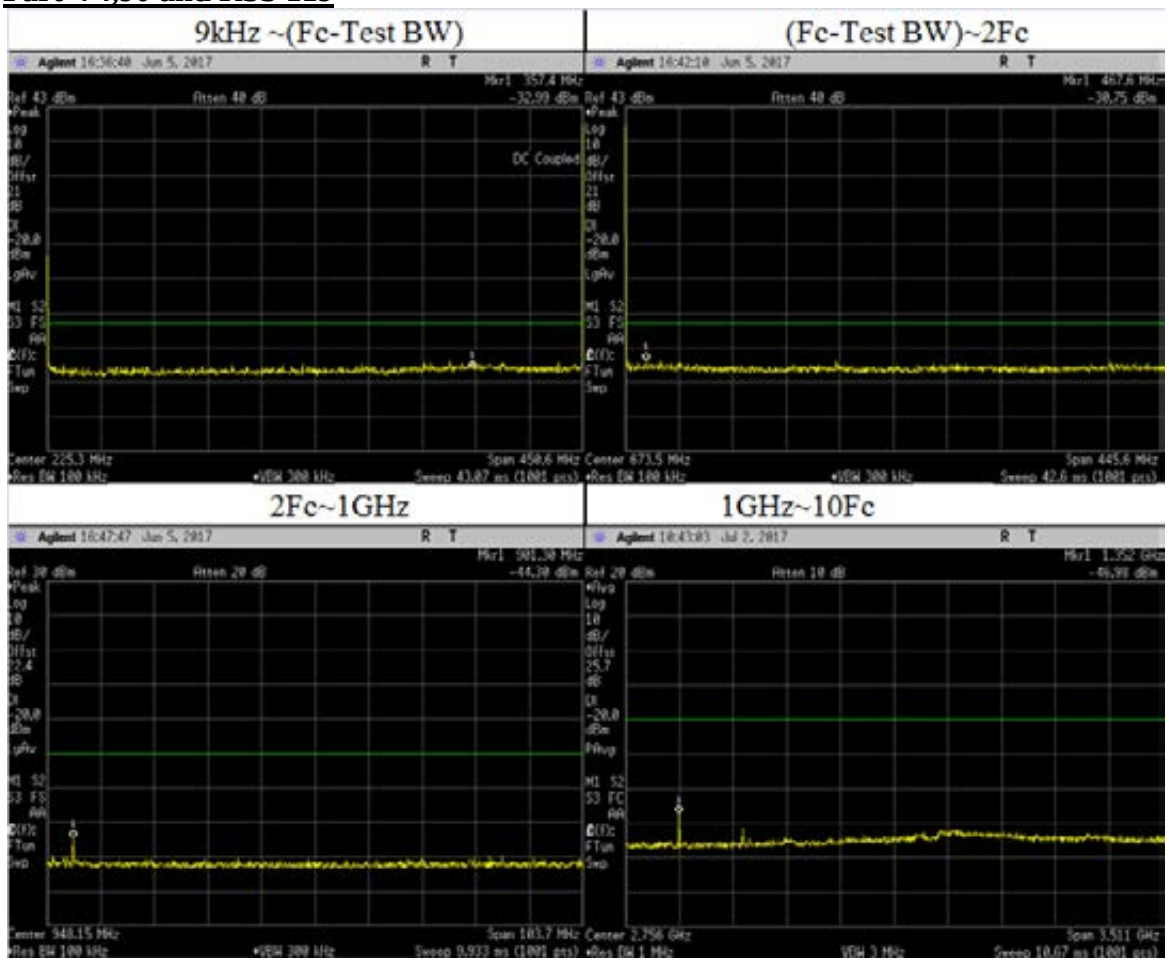
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.5300 458.6400 434.7500 445.6600 358.9200	-30.80 -30.61 -30.81 -30.80 -30.91	-20	Pass
(Fc-Test BW)~1GHz	836.9800 906.5000 968.3500 693.1300 866.2300	-30.00 -29.89 -30.17 -30.74 -30.52	-20	Pass
1GHz~2Fc	1023.9600	-46.38	-20	Pass
1GHz~10Fc	1535.4000 1039.9750 1559.9625 2079.9500 2599.9375 3119.9250 3639.9125 4159.9000 4679.8875 5199.8750	-42.87 -52.03 -51.25 -49.41 -49.52 -47.60 -49.48 -49.44 -49.46 -50.00	-20	Pass

C4FM: 459.1250 MHz, 12.5 kHz Channel Spacing, Max Power
RSS 119



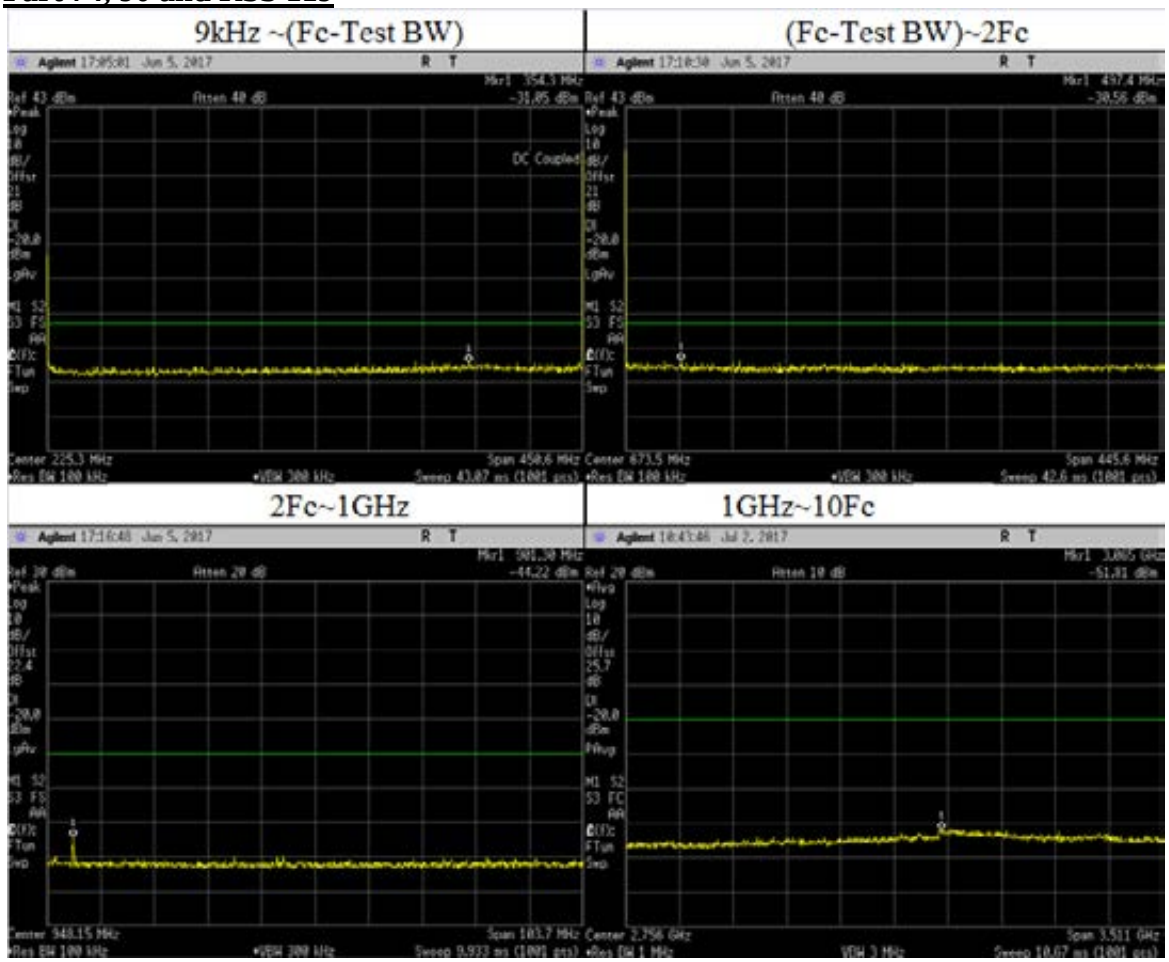
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4700 378.3600 402.6600 371.0200 451.7300	-31.17 -30.09 -30.86 -31.01 -31.16	-20	Pass
(Fc-Test BW)~1GHz	609.3300 725.0000 497.2800 605.7000 693.7000	-29.89 -30.26 -30.69 -30.84 -30.71	-20	Pass
1GHz~2Fc	918.1900 918.2500	-44.54 -44.55	-20	Pass
1GHz~10Fc	1378.0000 1377.3750 1836.5000 2295.6250 2754.7500 3213.8750 3673.0000 4132.1250 4591.2500	-47.24 -54.21 -53.69 -53.15 -51.44 -50.28 -51.66 -51.91 -53.06	-20	Pass

Phase II: 450.6500 MHz, 12.5 kHz Channel Spacing, Max Power
Part 74,90 and RSS 119



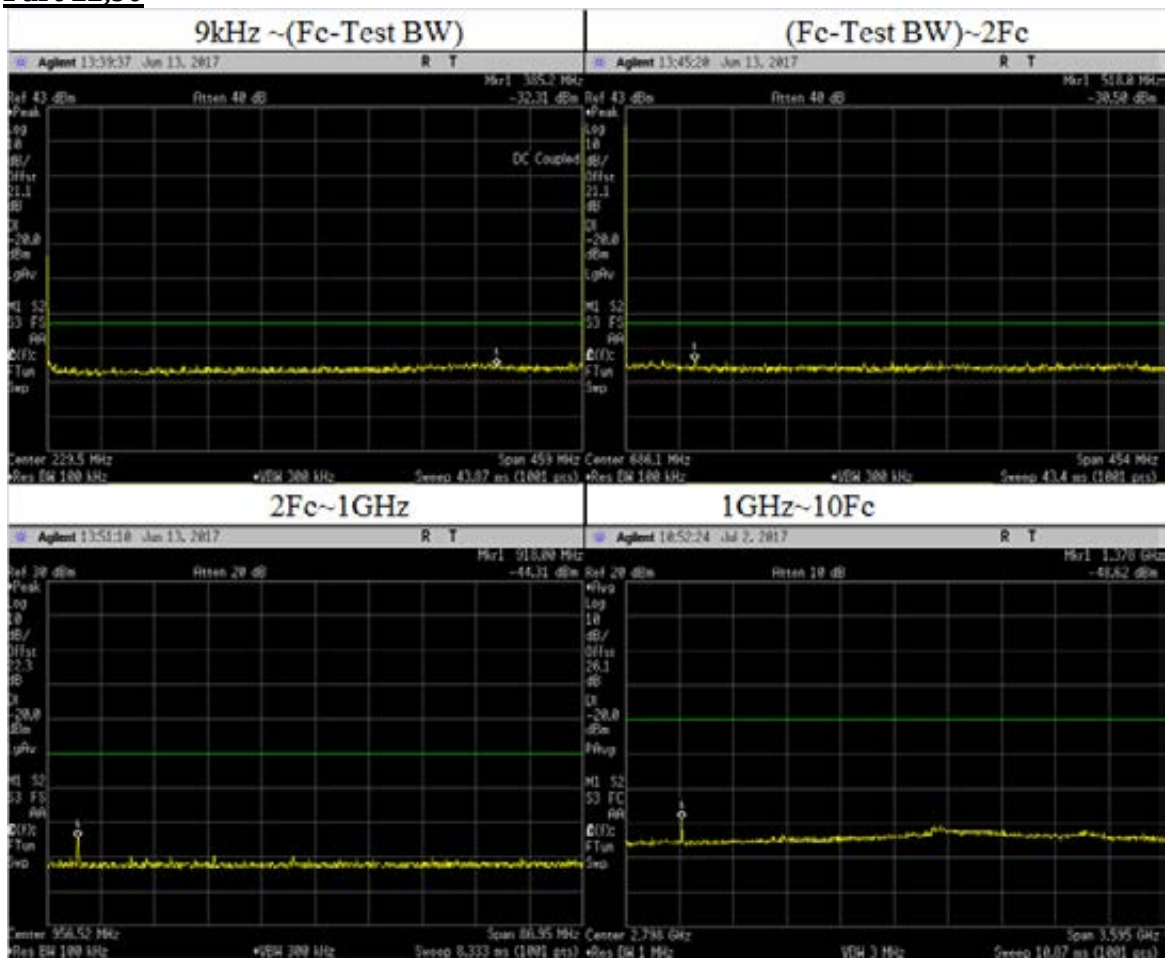
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	357.4200 0.4600 338.5100 429.8900 322.3100	-30.83 -32.19 -31.15 -31.20 -31.67	-20	Pass
(Fc-Test BW)~1GHz	467.6200 626.0900 480.0900 853.1200 884.2800	-30.65 -30.43 -30.82 -30.45 -30.54	-20	Pass
1GHz~2Fc	901.3000 901.3800	-44.30 -44.75	-20	Pass
1GHz~10Fc	1352.0000 1351.9500 1802.6000 2253.2500 2703.9000 3154.5500 3605.2000 4055.8500 4506.5000	-46.98 -45.30 -53.82 -54.64 -52.76 -50.35 -52.34 -53.19 -53.28	-20	Pass

Phase II: 450.6500 MHz, 12.5 kHz Channel Spacing, Low Power
Part 74, 90 and RSS 119



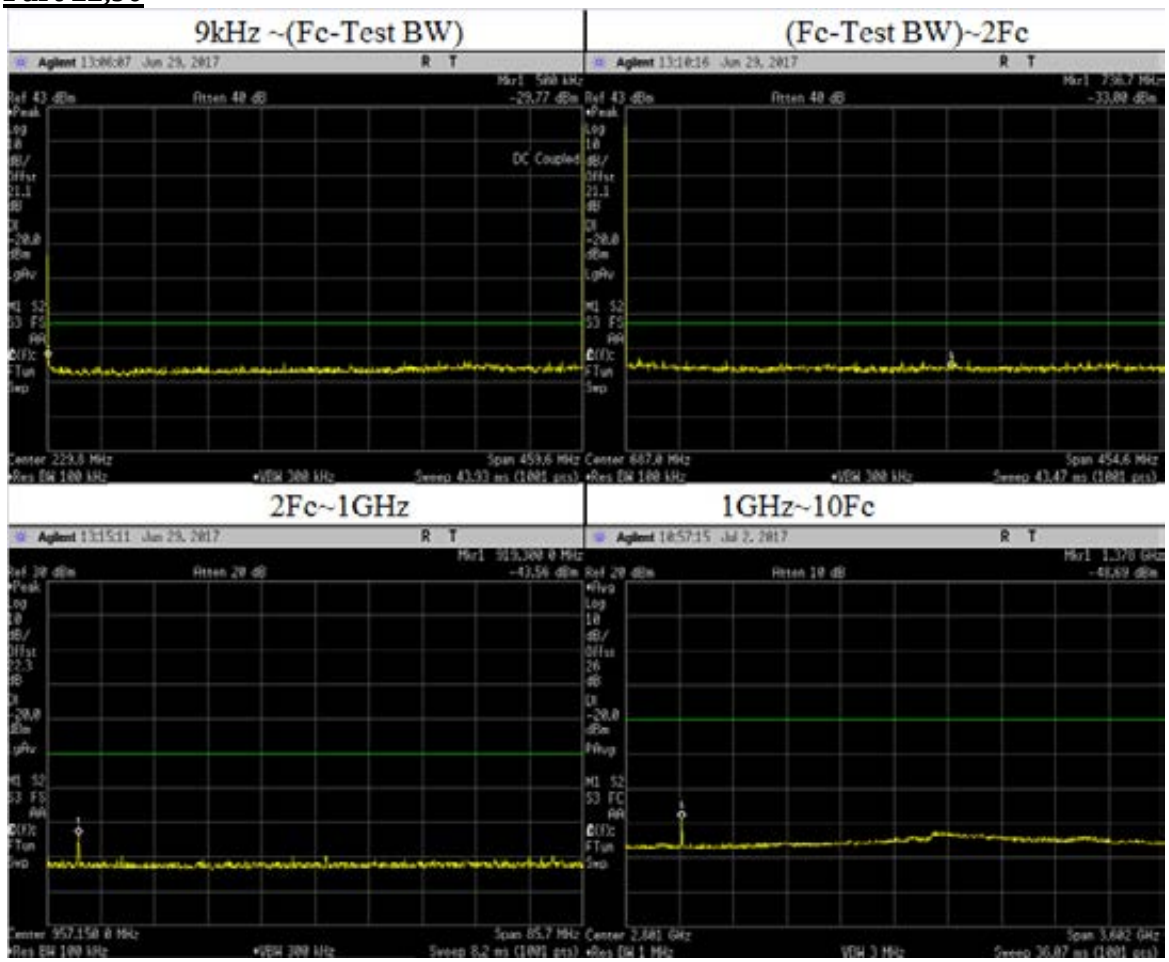
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	354.2700 0.4600 323.6600 309.2500 446.5400	-30.46 -31.93 -31.47 -31.44 -31.29	-20	Pass
(Fc-Test BW)~1GHz	497.4500 545.5200 483.2000 638.1100 514.3600	-30.36 -30.37 -30.88 -30.98 -31.14	-20	Pass
1GHz~2Fc	901.3000	-44.22	-20	Pass
1GHz~10Fc	3065.0000 1351.9500 1802.6000 2253.2500 2703.9000 3154.5500 3605.2000 4055.8500 4506.5000	-51.81 -55.65 -55.50 -55.42 -54.63 -51.75 -54.22 -53.92 -53.98	-20	Pass

Phase II: 459.0250 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22,90



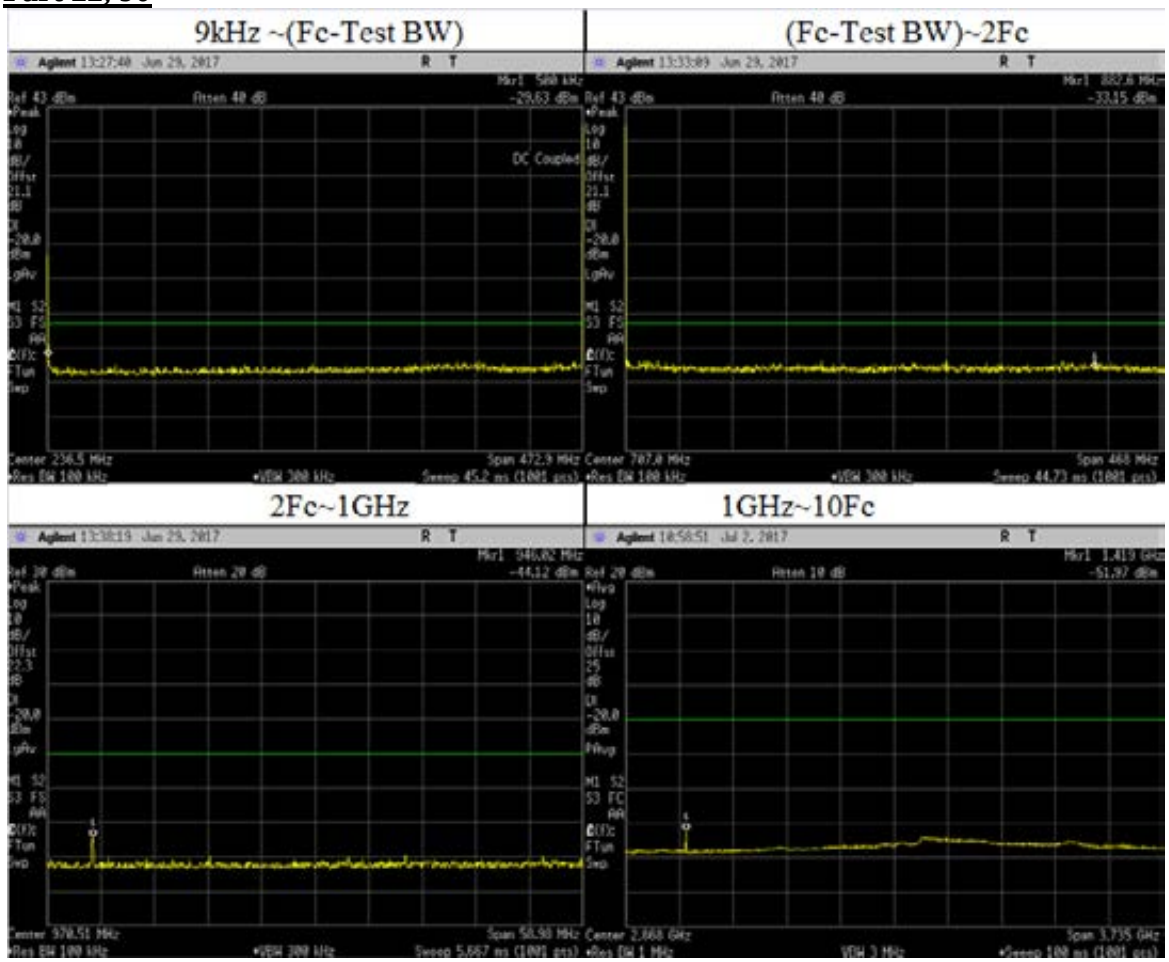
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	385.1500 0.4700 447.5100 1.8400 367.2700	-30.73 -32.25 -31.19 -32.48 -31.26	-20	Pass
(Fc-Test BW)~1GHz	518.0400 491.2800 490.3700 726.2000 714.8600	-30.37 -30.37 -30.66 -30.42 -30.67	-20	Pass
1GHz~2Fc	918.0000	-44.31	-20	Pass
1GHz~10Fc	1378.0000 1377.0750 1836.1000 2295.1250 2754.8600 3212.1750 3672.2000 4131.2250 4590.2500	-48.62 -48.62 -55.52 -54.86 -53.77 -52.33 -52.67 -53.49 -55.12	-20	Pass

Phase II: 459.6500 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22,90



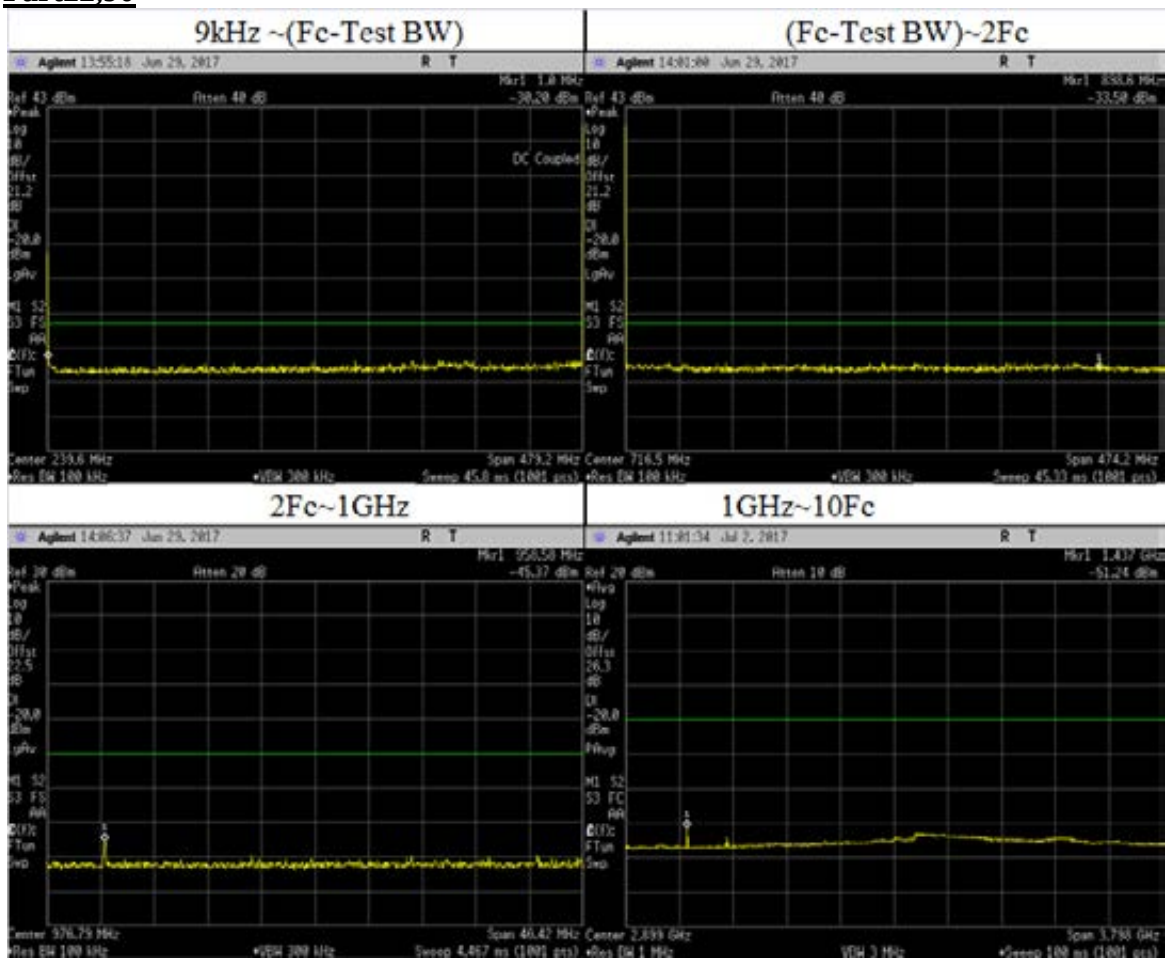
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4700 335.6300 1.3900 361.8000 357.6700	-31.17 -31.11 -32.22 -30.98 -31.10	-20	Pass
(Fc-Test BW)~1GHz	736.7300 471.5100 491.9500 545.5400 750.3600	-28.83 -29.81 -30.54 -30.62 -30.23	-20	Pass
1GHz~2Fc	919.3000	-43.56	-20	Pass
1GHz~10Fc	1378.0000 1378.9500 1838.6000 2298.2500 2757.9000 3217.5500 4136.8500 4596.5000	-48.69 -48.99 -56.48 -55.92 -55.73 -53.60 -54.75 -56.17	-20	Pass

Phase II: 473.0125 MHz, 12.5 kHz Channel Spacing, Max Power
Part 22, 90



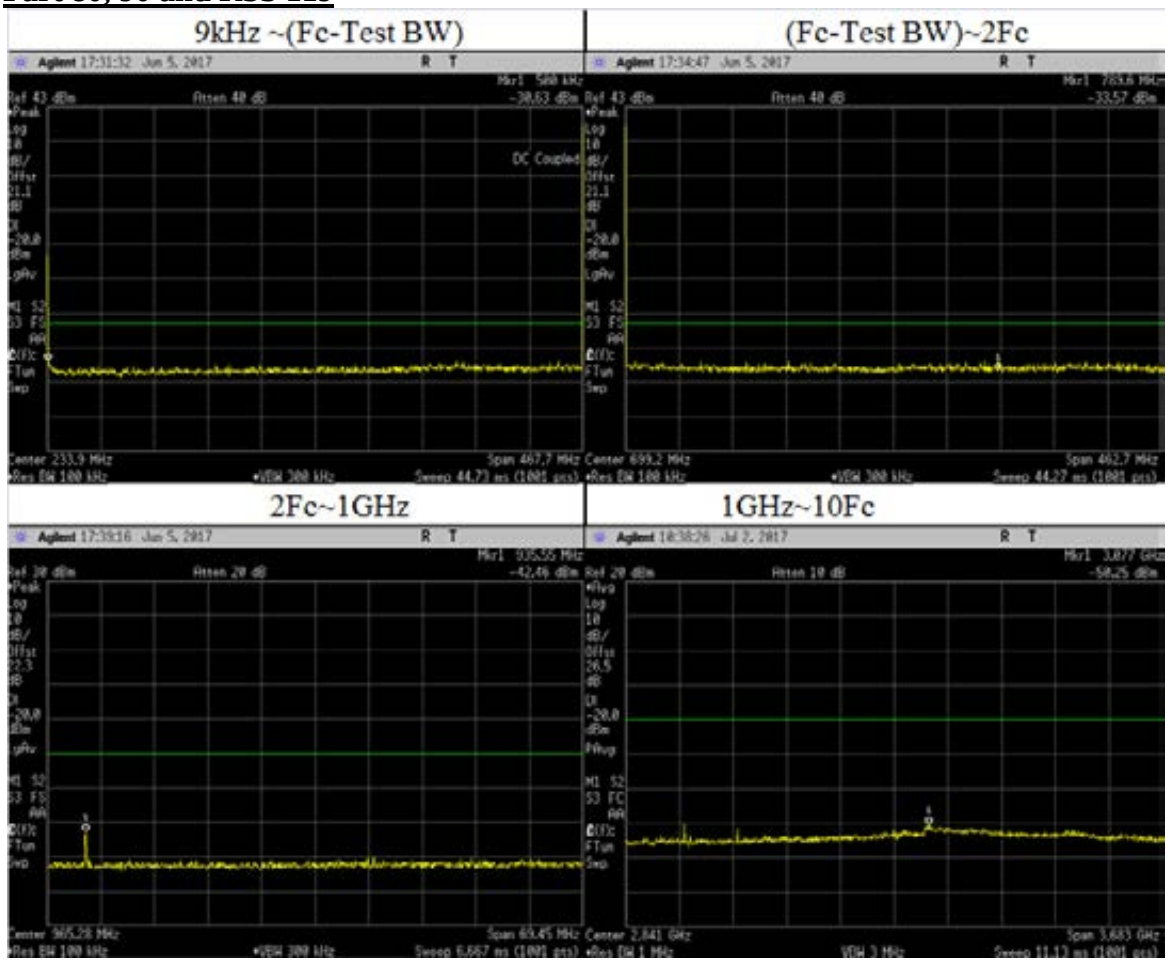
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4800 1.4300 380.8200 361.4500 464.9200	-31.02 -31.86 -30.88 -31.10 -31.03	-20	Pass
(Fc-Test BW)~1GHz	882.5900 501.1200 752.6300 489.9000 644.6400	-29.69 -30.41 -30.05 -30.55 -30.53	-20	Pass
1GHz~2Fc	946.0200	-44.12	-20	Pass
1GHz~10Fc	1419.0000 1419.0380 1892.0500 2365.0630 2838.0750 3311.0880 3784.1000 4257.1130 4730.1250	-51.97 -51.97 -57.59 -57.01 -56.21 -55.35 -55.94 -56.71 -57.25	-20	Pass

Phase II: 479.2875 MHz, 12.5 kHz Channel Spacing, Max Power
Part22,90



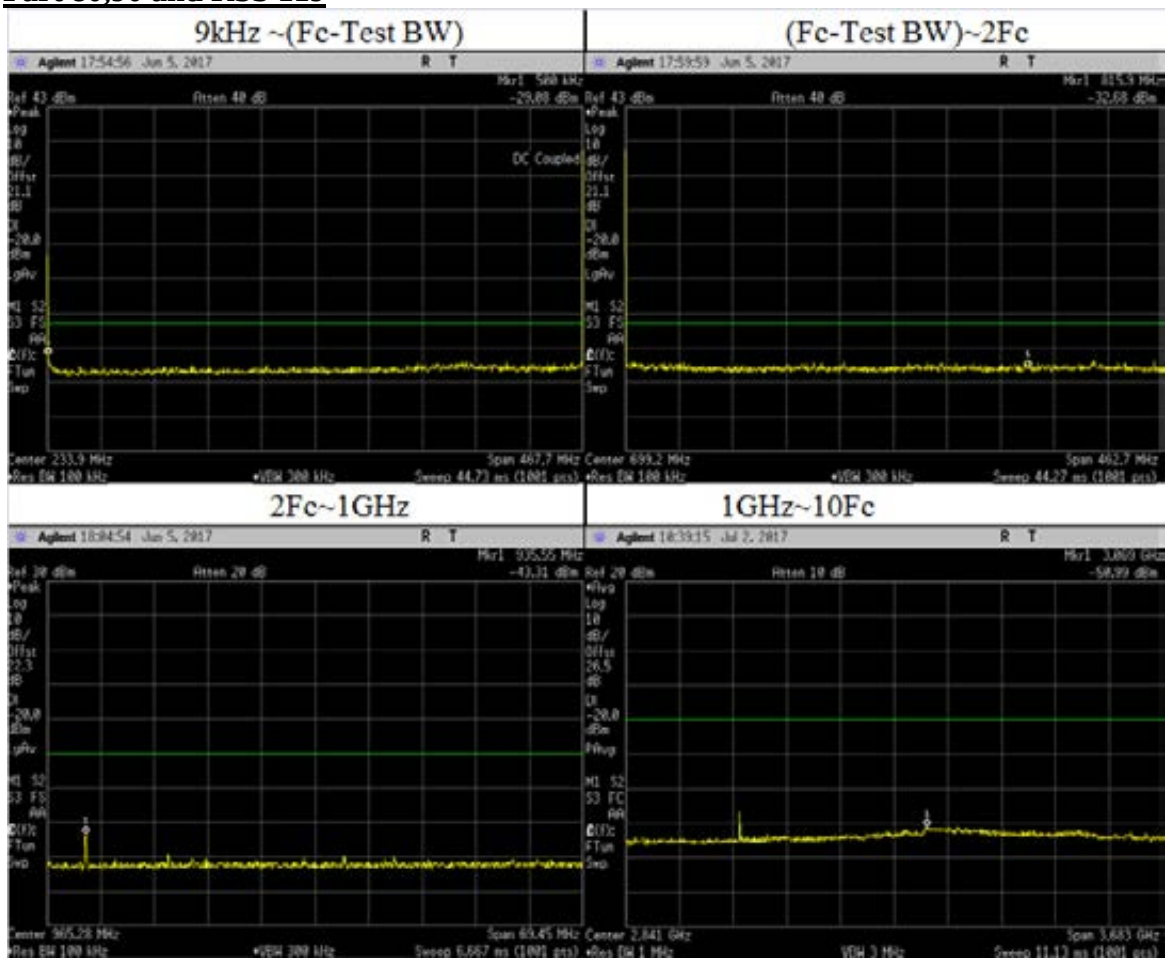
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.9700 472.0500 275.2900 349.9700 326.5100	-31.64 -30.56 -30.91 -30.84 -31.05	-20	Pass
(Fc-Test BW)~1GHz	898.6200 707.2200 834.6600 734.7000 530.0400	-29.83 -31.05 -30.86 -30.94 -31.36	-20	Pass
1GHz~2Fc	958.5800	-45.37	-20	Pass
1GHz~10Fc	1437.0000 1437.8630 1917.1500 2396.4380 2875.7250 3355.0130 3834.3000 4313.5880 4792.8750	-51.24 -51.24 -56.35 -55.76 -55.05 -53.69 -55.03 -55.73 -55.95	-20	Pass

Phase II: 467.7750 MHz, 12.5 kHz Channel Spacing, Max Power
Part 80, 90 and RSS 119



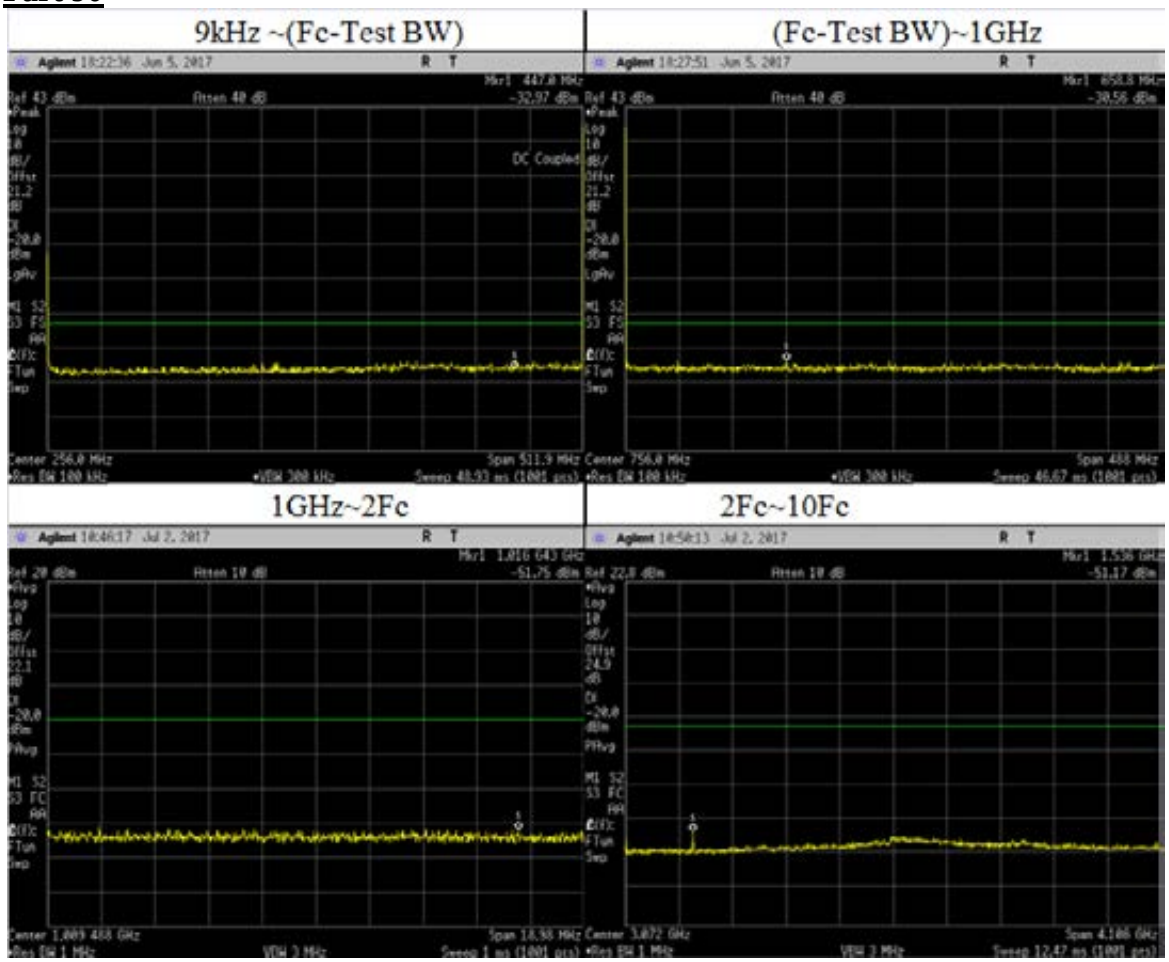
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4800 445.7600 356.9800 1.4100 363.0600	-32.04 -30.80 -31.01 -32.39 -31.13	-20	Pass
(Fc-Test BW)~1GHz	789.5600 777.5400 608.8200 476.1500 884.3200	-30.17 -30.12 -30.55 -30.79 -30.37	-20	Pass
1GHz~2Fc	935.5500	-42.46	-20	Pass
1GHz~10Fc	3076.7120 1403.3250 1871.1000 2338.8750 2806.6500 3274.4250 3742.2000 4209.9750 4677.7500	-50.25 -50.13 -54.34 -54.37 -53.13 -52.71 -53.06 -53.82 -54.08	-20	Pass

Phase II: 467.7750 MHz, 12.5 kHz Channel Spacing, Low Power
Part 80,90 and RSS 119



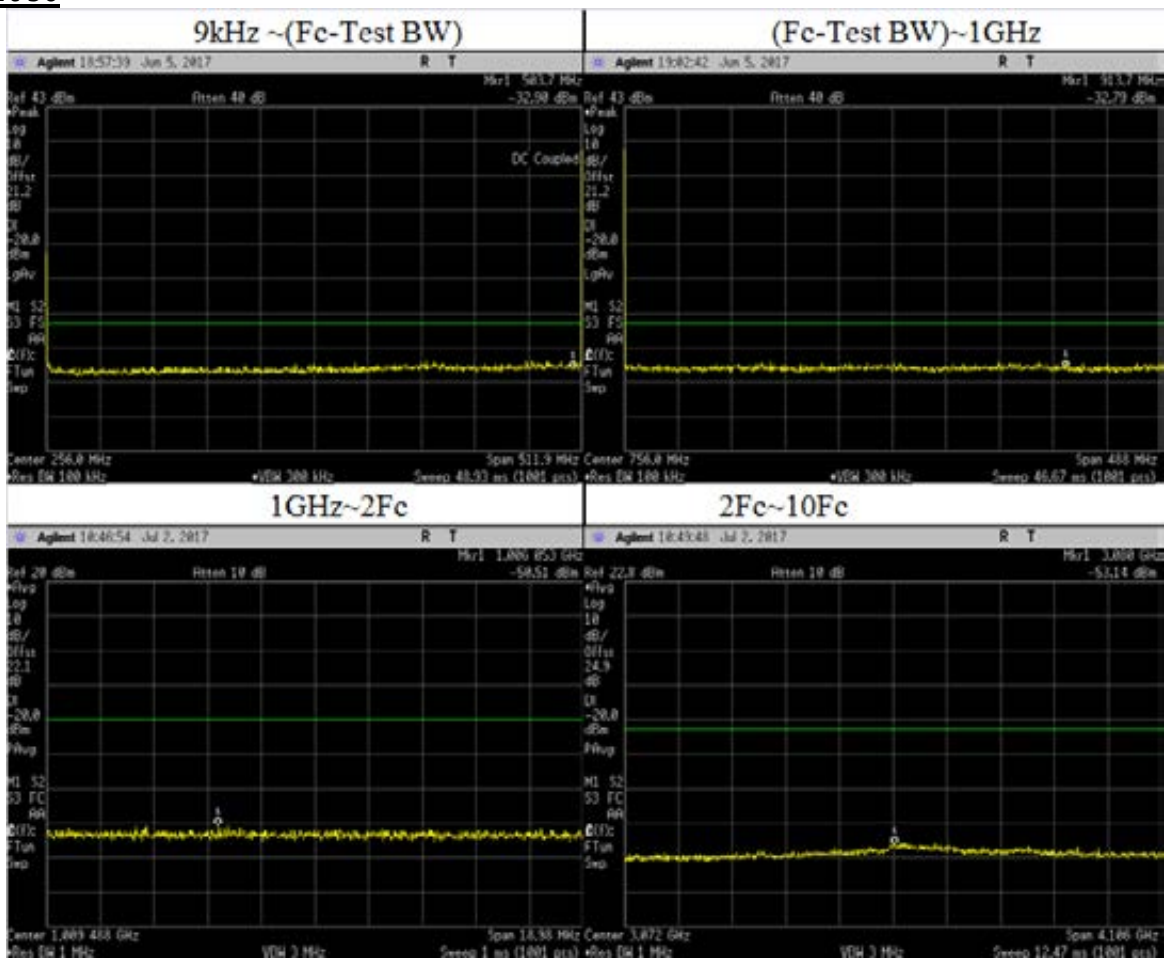
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4800 365.8600 362.1200 400.9000 356.5200	-30.49 -30.95 -31.12 -31.13 -31.48	-20	Pass
(Fc-Test BW)~1GHz	815.9100 924.0800 871.8400 656.4300 472.9200	-30.20 -30.25 -30.33 -30.85 -31.09	-20	Pass
1GHz~2Fc	935.5500	-43.31	-20	Pass
1GHz~10Fc	3069.3460 1403.3250 1871.1000 2338.8750 2806.6500 3274.4250 3742.2000 4209.9750 4677.7500	-50.99 -55.54 -55.16 -54.34 -53.70 -51.74 -53.39 -53.21 -54.82	-20	Pass

Phase II: 511.9875 MHz, 12.5 kHz Channel Spacing, Max Power
Part 90



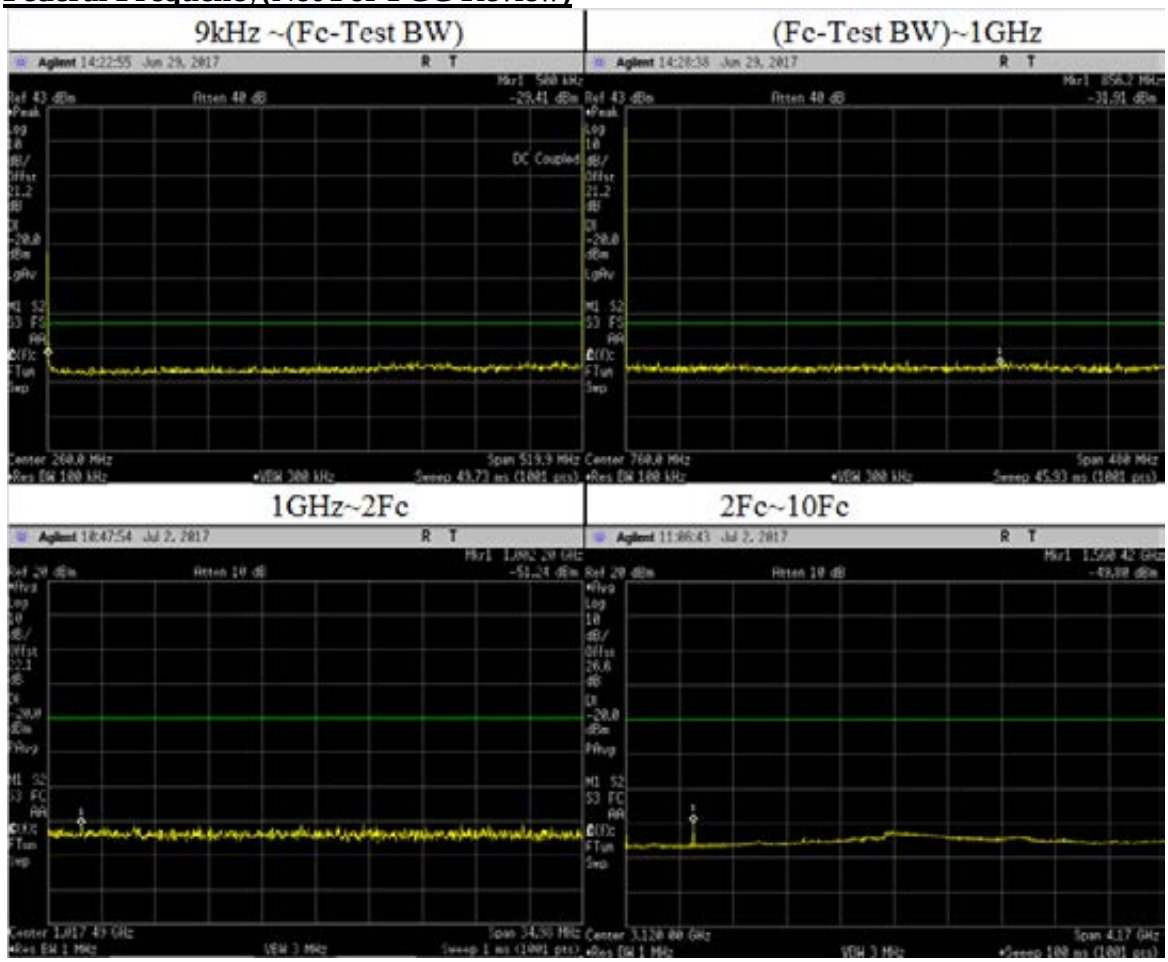
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	446.9800 1.0300 463.8600 352.3700 503.2400	-30.58 -32.13 -30.90 -31.21 -31.01	-20	Pass
(Fc-Test BW)~1GHz	658.7700 752.3700 559.8200 735.3000 961.4900	-30.40 -30.48 -30.97 -30.62 -30.54	-20	Pass
1GHz~2Fc	1016.6430	-51.75	-20	Pass
1GHz~10Fc	1536.3560 1023.9750 1535.9625 2047.9500 2559.9375 3071.9250 3583.9125 4095.9000 4607.8875 5119.8750	-51.17 -53.40 -50.99 -55.92 -55.33 -53.12 -54.95 -54.85 -56.31 -55.91	-20	Pass

Phase II: 511.9875 MHz, 12.5 kHz Channel Spacing, Low Power
Part 90



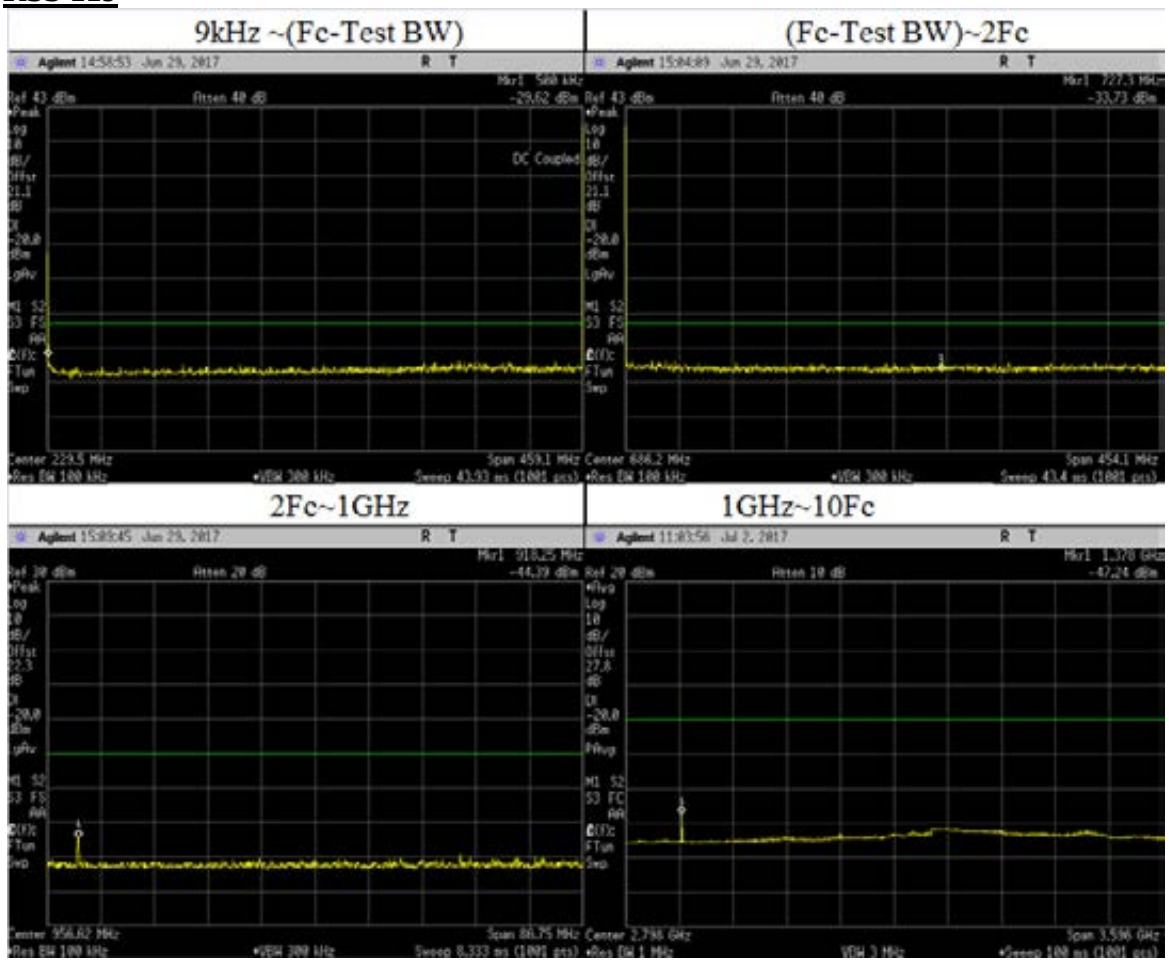
Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	503.7500 1.0300 362.6000 463.3500 458.2300	-30.45 -31.98 -30.86 -30.80 -30.86	-20	Pass
(Fc-Test BW)~1GHz	913.7200 999.5100 888.8600 851.8100 645.1200	-30.05 -30.34 -30.60 -30.66 -31.14	-20	Pass
1GHz~2Fc	1006.0530	-50.51	-20	Pass
1GHz~10Fc	3080.0000 1023.9750 1535.9625 2047.9500 2559.9375 3071.9250 3583.9125 4095.9000 4607.8875 5119.8750	-53.14 -57.11 -56.95 -56.26 -55.76 -53.53 -54.46 -55.31 -55.51 -55.98	-20	Pass

<u>Phase II:</u> 519.9875 MHz, 12.5 kHz Channel Spacing, Max Power
<u>Federal Frequency(Not For FCC Review)</u>



Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.5300 359.4400 2.0900 464.8800 501.7500	-30.94 -30.97 -32.29 -31.14 -31.12	-20	Pass
(Fc-Test BW)~1GHz	856.1600 772.2500 896.9100 864.7900 816.3600	-29.97 -30.09 -30.30 -30.39 -30.69	-20	Pass
1GHz~2Fc	1002.2000	-51.24	-20	Pass
1GHz~10Fc	1560.4200 1039.9750 1559.9625 2079.9500 2599.9375 3119.925 3639.9125 4159.9000 4679.8875 5199.8750	-49.80 -53.41 -49.57 -55.51 -55.27 -52.73 -54.37 -54.49 -55.54 -55.03	-20	Pass

Phase II: 459.1250 MHz, 12.5 kHz Channel Spacing, Max Power
RSS 119



Frequency Range	Highest Spur Freq (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Remark
9kHz ~ (Fc-Test BW)	0.4700 352.6700 434.7600 361.8500 394.8700	-31.02 -30.83 -31.15 -31.34 -31.34	-20	Pass
(Fc-Test BW)~2Fc	727.2700 481.8600 464.6200 493.2000 500.9100	-30.01 -30.89 -31.04 -31.00 -31.07	-20	Pass
2Fc~1GHz	918.2500	-44.39	-20	Pass
1GHz~10Fc	1377.3750 1836.5000 2295.6250 2754.7500 3213.8750 3673.0000 4132.1250 4591.2500	-47.10 -54.84 -54.38 -53.72 -51.96 -53.15 -52.81 -54.20	-20	Pass

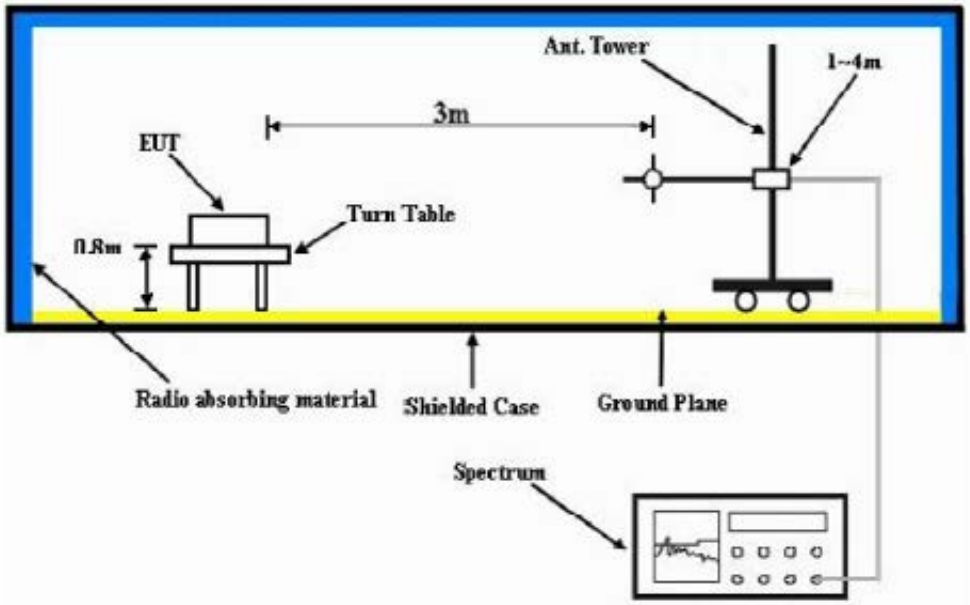
6.10.2. Test Limit

Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90
12.5kHz	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	Not Applicable	50 + log10(P) (-20 dBm)
25kHz		Not Applicable		43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)

6.11. Radiated Spurious Emission

6.11.1. Test Setup



1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1 MHz, VBW = 3 MHz. Detector mode is positive peak.
2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees 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. The "Read Value" is the spectrum reading the maximum power value.
3) The substitution antenna is substituted for EUT 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.
4) Final Radiated Spurious Emission = "Read Value" + Measured substitution value.

6.11.2. Test Result

Not Applicable

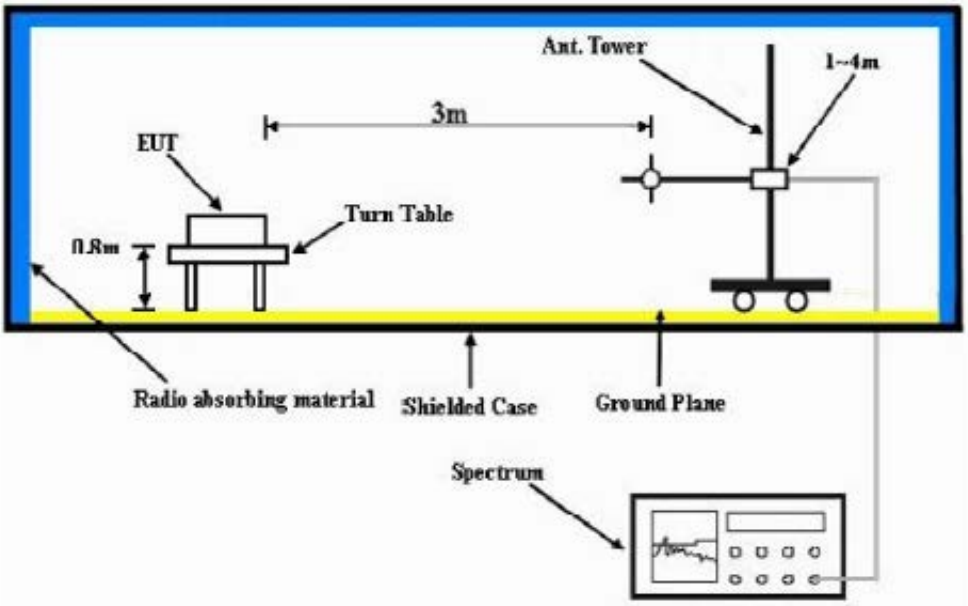
6.11.3. Test Limit

Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90
12.5kHz	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	Not Applicable	50 + log10(P) (-20 dBm)
25kHz		Not Applicable		43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)

6.12. Effective Radiated Power (ERP) / GNSS (EIRP for 1559 - 1610MHz)

6.12.1. Test Setup



1) The spectrum setting for Equivalent Isotropically Radiated Power (EIRP) is RBW = 100 kHz, VBW = 300 kHz. Detector Mode is RMS.
2) In the semi-anechoic chamber, setup as illustrated above the EUT 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.
3) The substitution antenna is substituted for EUT 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.
4) EIRP = "Read Value" + Measured substitution value + 2.15.

6.12.2. Test Result

Not Applicable

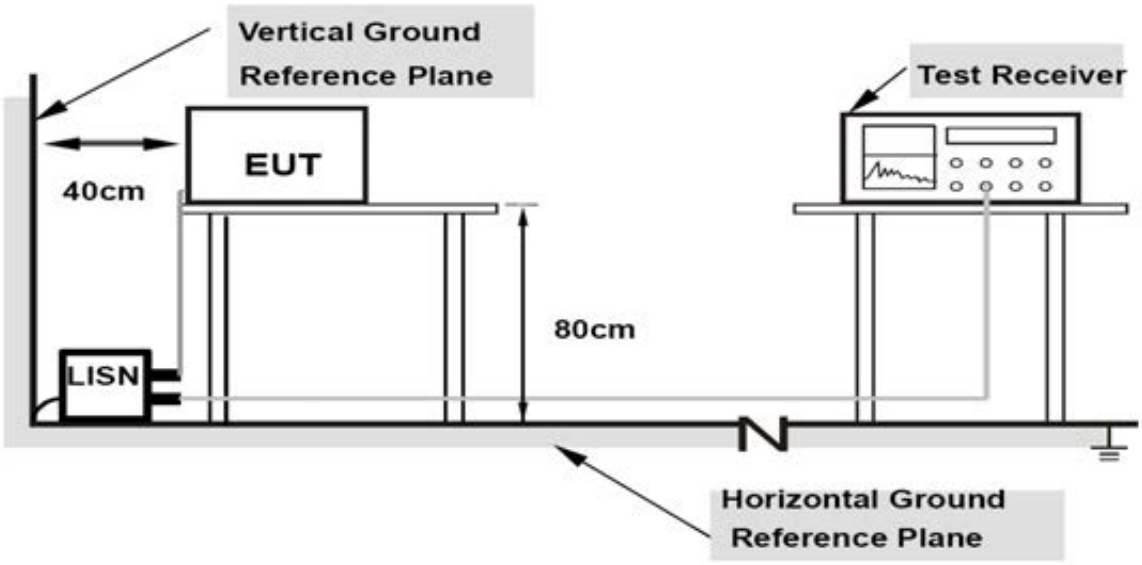
6.12.3. Test Limit

The maximum output power of the transmitter for mobile stations is 100 watts (20 dBW). Power is given in terms of effective radiated power (ERP).

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

6.13. AC Power Line Conducted Spur Emissions

6.13.1. Test Setup



1) Tests were conducted for both Receive and Transmit Mode of the EUT.
2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm / 50 µH of coupling impedance for the measuring instrument.
3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
4) The frequency range from 150 kHz to 30 MHz was measured.

6.13.2. Test Result

Not Applicable

6.13.3. Test Limit

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

Limits for conducted disturbance at the mains ports of class A ITE

Frequency range MHz	Limits dB(µV)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Limits for conducted disturbance at the mains ports of class B ITE

Frequency range MHz	Limits dB(µV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		