MOTOROLA SOLUTIONS

CERTIFICATE 2518.08

MS ISO/IEC 17025
TESTING
SAMM NO. 0825

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

FCC / ISED TEST REPORT
Report Revision : Rev.B

Date/s Tested	:	20-DEC-2019 - 9-JAN-2020
Report Issue Date	:	30-JAN-2020
Manufacturer/Location	:	Motorola Solutions Malaysia SDN BHD Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
Requestor	:	SZE KEAT NG
Product Type	:	Portable
Model Number	:	H98SDH9PW7BN
Frequency Band	:	450-520MHz
Max RF Output Power	:	5.6Watts
Applicant Name	:	Motorola Solutions Inc
ISED Registrations	:	MY0001
FCC Registrations	:	461337
Firmware Version	:	R20.61.00

The equipment was tested accordance to the requirement listed below:

(LMR) **FCC 47 CFR Part 22/74/80/90**	**PASS**

Prepared By:

AARON GOH
Test Personnel

Approved By:

VINCENT FOONG
Deputy Technical Manager

Table of Contents

Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	2-JAN-2020	Aaron Goh
Rev. B	Removed RSS references, invalid emission designators	8-APR-2020	Vincent Foong

2.0 General Information

EUT Description:

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

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 C63.4-2014
ANSI C63.26-2015

3.0 Summary of Test Results

FCC General Rules Part (47CFR)	Test Item	Result	Remark
2.1046,22.565,74.461, 74.534,80.215,80,90,74,22	RF Power Output	Pass	-
2.1055, 90.213, 22.355	Frequency Stability	Pass	-
2.1047,74.463,80.213, 22,90,80	Audio Frequency Response	Pass	-
2.1047,74.463,80.213, 22,90,80	Audio Low Pass Filter Response	Pass	-
2.1047,74.463,80.213, 22,90,80	Modulation limiting	Pass	-
2.1049,90.210, 22.359,74.462(c), 80.211(c),90.210, 90.210(T-band), 80.211(f),22.359(b)	Occupied Bandwidth	Pass	20K0F1E-12.0703kHz 16K0F3E-15.0333kHz 11K0F3E-9.9838kHz 8K10F1D-8.0718kHz 8K10F1E-6.7127kHz 8K10F1W-8.0937kHz
22.359(a),(b)	Band Edge Conducted Spurious Emission	Pass	16K0F3E-15.0391kHz 8K10F1D-7.2789kHz 8K10F1W-8.0530kHz
90.214	Transient Frequency Behavior	Pass	-
-	Adjacent Channel Power	NA	-
22,90,74D,74H,80,22E, High end of 90	Conducted Spurious Emissions	Pass	No spur detected (noise floor)
22,90,74D,74H,80,22E, High end of 90	Radiated Spurious Emission	Pass	Highest Spur Level-52.54dbm
-	GNSS (EIRP for 1559 – 1610MHz)	NA	-
-	Effective Radiated Power (ERP)	NA	-

NA → **Not Applicable**

4.0 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	4.03
	200MHz ~ 1000MHz	4.03
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.03
	18GHz ~ 25GHz	4.03
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82

5.0 Equipment List

FCC Analog ATE#1: (SW version: 2.4.5 & FCC_Frequency Stability 1.0.3 rev.)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
Audio Analyzer	8903B	3729A17612	15-Nov-17	15-Nov-20
SIGNAL GENERATOR	2042	203002/747	22-Jan-19	22-Jan-20
MODULATION ANALYZER	8901B	3538A5696	4-Apr-19	4-Apr-20
DSA	36570A	MY42506790	4-Apr-19	4-Apr-20
POWER SENSOR	E9301B	MY41502652	31-Jul-19	31-Jul-20
POWER METER	E4416A	GB41293747	19-Nov-18	19-Nov-20
POWER SUPPLY	6623A	2916A01562	31-Mar-19	31-Mar-20
CHAMBER	SH-641	92009188	29-Mar-19	29-Mar-20
N to N RF Cable # 1	M17/128-RG400	NA	NA	NA
BNC to N RF Cable # 1	RG 58	NA	NA	NA
BNC to BNC RF Cable # 1	RG 58	NA	NA	NA
BNC to BNC RF Cable # 2	RG 58	NA	NA	NA
BNC to BNC RF Cable # 3	RG 58	NA	NA	NA
BNC to BNC RF Cable # 4	RG 58	NA	NA	NA
BNC to BNC RF Cable # 5	RG 58	NA	NA	NA
BNC to BNC RF Cable # 6	RG 58	NA	NA	NA
BNC to BNC RF Cable # 7	RG 58	NA	NA	NA
N to SMA RF Cable # 1	RG 58	NA	NA	NA
N to SMA RF Cable # 2	RG 58	NA	NA	NA
N to SMA RF Cable # 3	RG 58	NA	NA	NA
Aeroflex Attenuator 30dB	49-30-34-LIM	NA	NA	NA

FCC Transient ATE #1: (SW version: FCC Transient ATE_R1.1.2)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
POWER SUPPLY	6031A	2430A00146	5-Apr-19	5-Apr-20
POWER SENSOR	E4412A	MY41498918	31-Jul-19	31-Jul-20
POWER METER	E4416A	GB41293866	26-Feb-19	26-Feb-21
ATTENUATORS/SWITCH DRIVER	11713A	2508A10141	CNR	CNR
STEP ATTENUATOR/11dB	8494G	MY42143870	17-May-19	17-May-20
STEP ATTENUATOR/110dB	8496G	MY42143622	17-May-19	17-May-20
OSCILLOSCOPE	MSO8104A	MY45002372	17-Jun-19	17-Jun-20
AUDIO ANALYZER	8903B	3011A08952	5-Jul-19	5-Jul-20
AUDIO ANALYZER	8903B	3729A17409	4-Jul-19	4-Jul-20
MODULATION ANALYZER	8901B	3226A04052	3-Apr-19	3-Apr-20
SIGNAL GENERATOR	8657B	3427U06025	5-Apr-19	5-Apr-20
SPECTRUM ANAYLYZER	E4440A	MY48250517	11-Sep-19	11-Sep-21
N to N RF Cable # 1	SF126/11N/11N	NA	NA	NA
N to N RF Cable # 2	M17/128-RG400	NA	NA	NA
N to N RF Cable # 3	M17/128-RG400	NA	NA	NA
N to N RF Cable # 4	M17/128-RG400	NA	NA	NA
N to N RF Cable # 5	M17/128-RG400	NA	NA	NA
N to N RF Cable # 6	M17/128-RG400	NA	NA	NA
N to N RF Cable # 7	M17/128-RG400	NA	NA	NA
N to N RF Cable # 8	M17/128-RG400	NA	NA	NA
N to N RF Cable # 9	M17/128-RG400	NA	NA	NA
BNC to BNC RF Cable # 1	RG 58	NA	NA	NA
BNC to BNC RF Cable # 2	RG 58	NA	NA	NA
BNC to BNC RF Cable # 3	RG 58	NA	NA	NA
BNC to BNC RF Cable # 4	RG 58	NA	NA	NA
BNC to BNC RF Cable # 5	RG 58	NA	NA	NA
BNC to BNC RF Cable # 6	RG 58	NA	NA	NA
BNC to N RF Cable # 1	RG 58	NA	NA	NA
Aeroflex Attenuator 10dB	49-10-43-LIM	NA	NA	NA
Aeroflex Attenuator 10dB	33-10-34-LIM	NA	NA	NA
SWITCH CONTROL UNIT	3488A	2719A36210	CNR	CNR

CONDUCTED SPUR EMISSION ATE # 1 (SW version: Conducted Spur ATE_rev 1.23.02)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A32735	CNR	CNR
PSA Series Spectrum Analyzer	E4445A	MY46181732	12-Mar-19	12-Mar-21
POWER SUPPLY	6032A	2723A02219	2-Jul-19	2-Jul-20
HIGH PASS FILTER SWITCH BOX	-	CS001	6-Jul-19	6-Jul-20
N to N RF Cable # 1	SF126/11N/11N	NA	NA	NA
N to N RF Cable # 2	SF126/11N/11N	NA	NA	NA
BNC to BNC RF Cable # 1	RG 58	NA	NA	NA
Aeroflex Attenuator 30dB	49-30-43-LIM	NA	NA	NA
Aeroflex Attenuator 10dB	33-10-34-LIM	NA	NA	NA

Radiated Emission: EMC Chamber 2

Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMI TEST RECEIVER	ESIB40	100264	17-Jul-19	17-Jul-20
3m Semi-anechoic Chamber	NA	888032	No Cal. Req'd	No Cal. Req'd
TURNTABLE FLUSH MOUNT 2M	T-200-S	N/A	No Cal. Req'd	No Cal. Req'd
Bore sight Antenna mast	MBS-500	N/A	No Cal. Req'd	No Cal. Req'd
PROGRAMMING CONTROLLER	3000	MF780208272	No Cal. Req'd	No Cal. Req'd
POWER SUPPLY (0-60V/0-35A)	6674A	3126A00133	11-Nov-19	11-Nov-21
SIGNAL ANALYZER	FSV40	101432	27-Jul-19	27-Jul-20
DATA LOGGER	SDL500	A.016776	05-Apr-19	05-Apr-20
BILOG ANTENNA	CBL6112D	30991	05-Aug-2019	5-Aug-20
DRG HORN FREQ.	SAS-571	1027	22-Apr-19	22-Apr-21
PREAMPLIFIER	PAM-0118	270	24-May-19	24-May-22
MICROWAVE GENERATOR	SMP04	100127	21-Mar-19	21-Mar-20
DRG HORN FREQ.	SAS-571	1143	14-Feb-19	14-Feb-21
BILOG ANTENNA	CBL6112B	2964	16-Feb-18	16-Feb-20
Test Software	EMC_FCC_IC_Bluetooth_RE_Test			
Version	EMC_FCC_RE_v1.6.1			

CNR → Calibration Not Required

6.0 Test Condition

6.1. Transmitter Test Conditions

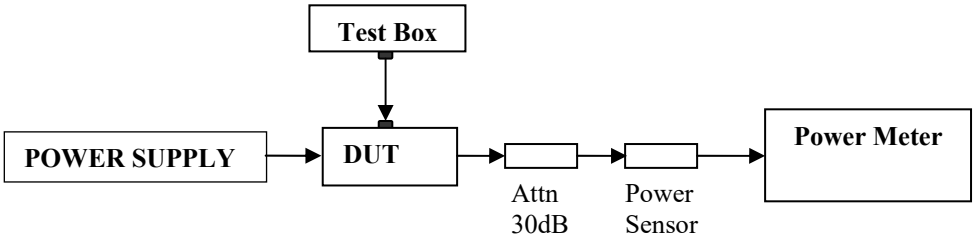
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By
RF Output Power	Low & Max	Analog	450.025,459.125, 459.025,459.65,467.775, 469.9875,473.0125, 479.2875,485.0125, 511.9875,519.9875	AARON GOH
Frequency Stability	Max	Analog	467.775	AARON GOH
Audio Frequency Response (12.5kHz / 25kHz)	Max	Analog	467.775,459.125, 511.9875	AARON GOH
Audio Low Pass Filter Response (12.5kHz / 25kHz)	Max	Analog	467.775,459.125, 511.9875	AARON GOH
Modulation limiting (12.5kHz / 25kHz)	Max	Analog	467.775,459.125, 511.9875	AARON GOH
Occupied Bandwidth (12.5kHz / 25kHz)	Max	Analog, C4FM, Phase II	450.025,459.125,467.775,473.0125,511.9875	AARON GOH
Band Edge Conducted Spurious Emissions (Part 22) (12.5kHz / 20kHz / 25kHz)	Max	Analog, C4FM, Phase II	459.025,459.65, 473.0125,479.2875	AARON GOH
Transient Frequency Behavior *(UHF & VHF Band)* (12.5kHz / 25kHz)	Max	Analog	467.775	AARON GOH
Adjacent Channel Power *(700MHz Band)* (12.5kHz)	Max	Analog	NA	NA
Conducted Spurious Emissions- (12.5kHz / 25kHz)	Low / Max	Analog, C4FM, Phase II	450.025,459.125, 467.775,511.9875, 519.9875	AARON GOH
Radiated Spurious Emission (12.5kHz / 25kHz)	Low / Max	Analog, C4FM, Phase II	450.025,459.125, 467.775,511.9875, 519.9875	FARIS
GNSS (EIRP for 1559 - 1610MHz) (12.5kHz / 25kHz)	Max	Analog	NA	NA
Effective Radiated Power (ERP) (12.5kHz / 25kHz)	Max	Analog	NA	NA

NA → Not Applicable

7.0 Transmitter Test Parameters

7.1. RF Output Power

7.1.1. Test Setup



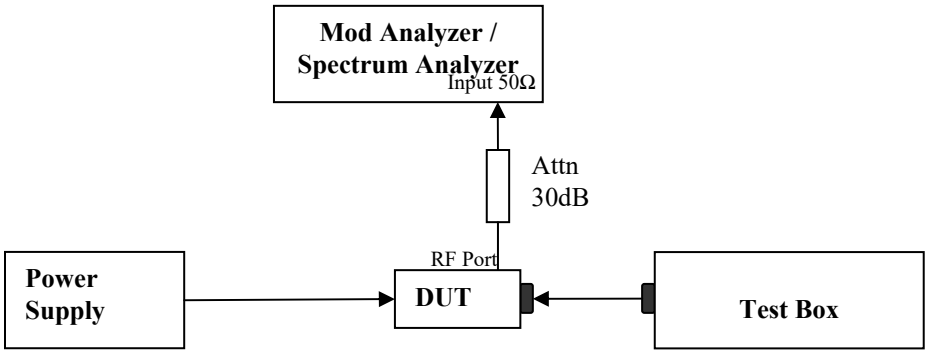
1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
2) Path loss for the measurement included.
3) All the measurement was done at low, mid, high frequency for each band.
4) Record the power into the test report.

7.1.2. Test Result

Temperature	25˚C				
Voltage (V)	7.5V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	Remarks
450.025	1.02	0.88	5.42	1.53	
459.025	1.01	1.05	5.32	2.19	
459.125	1.03	0.72	5.41	1.20	
459.65	1.03	0.68	5.42	1.18	
467.775	1.03	0.57	5.43	0.87	
469.9875	1.03	0.49	5.44	0.75	
473.0125	1.03	0.48	5.43	0.85	
479.2875	1.03	0.45	5.41	1.03	
485.0125	1.02	0.7	5.4	1.30	
511.9875	1.01	1.15	5.42	2.43	
519.9875	1.02	1.22	5.41	2.56	

7.2. Frequency Stability

7.2.1. Test Setup



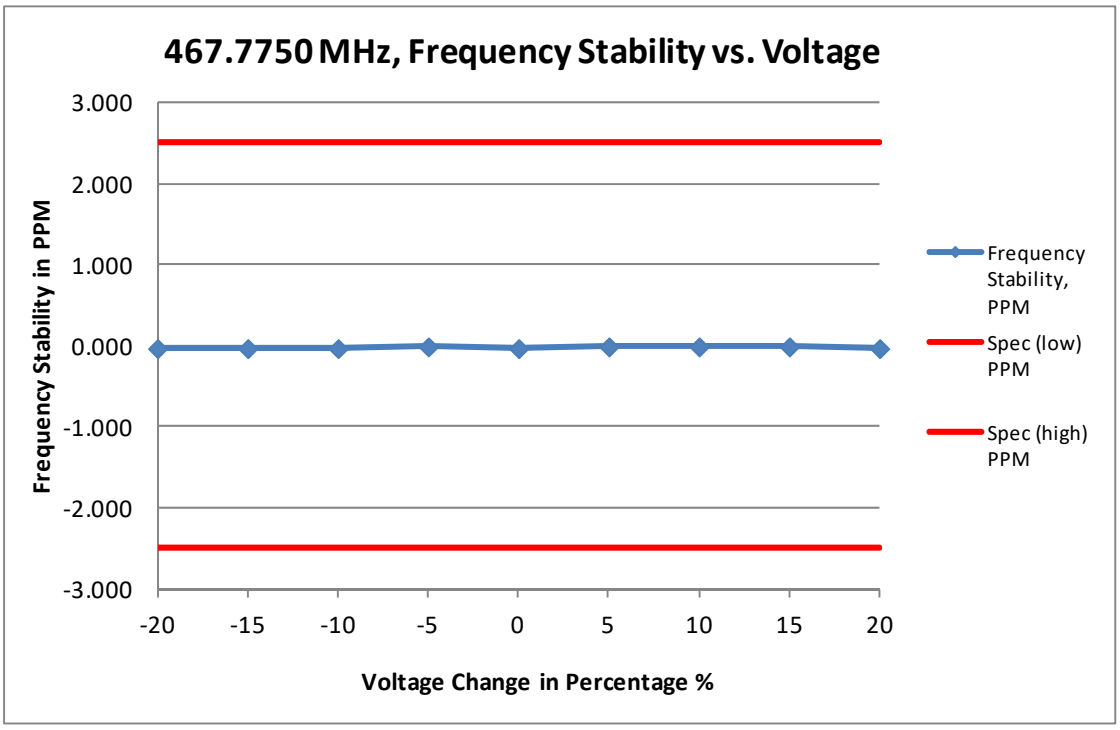
1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
2) Path loss for the measurement included.
3) Transmit the DUT and record the freq in MCF_{MHz}.
4) Test in 2 conditions:
   - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
   - Supply Voltage:
     -Mobile: The frequency of the transmitter was measured from 85% to 115% of the nominal operating input voltage.
     -Portable: The frequency of the transmitter was measured from nominal ± x % as specified by the manufacturer

5) Calculate the ppm frequency error by the following:

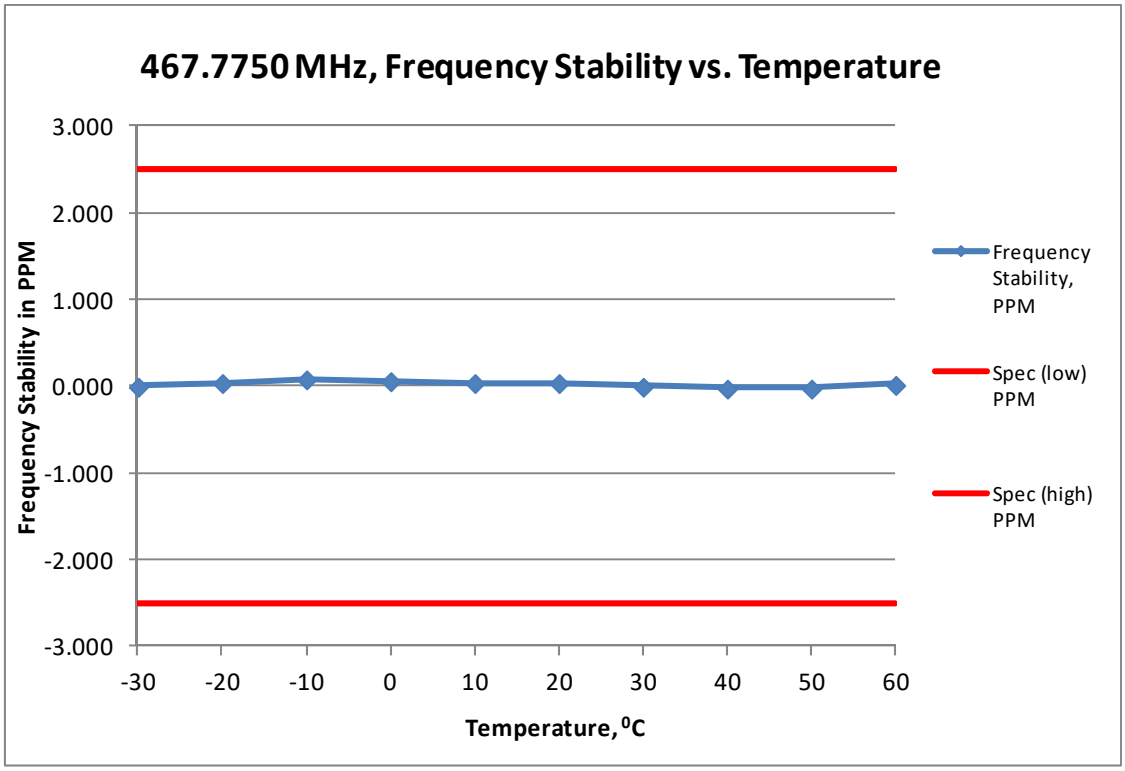
$$ppm\ error = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1\right) * 10^6$$

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

7.2.2. Test Result



Frequency / Channel Spacing	467.7750 MHz / 12.5 kHz				
Temperature, ^{0}C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-20	6.000	467.774990	-0.021	-2.500	2.500
-15	6.375	467.774990	-0.021	-2.500	2.500
-10	6.750	467.774990	-0.021	-2.500	2.500
-5	7.125	467.775000	0.000	-2.500	2.500
0	7.500	467.774990	-0.021	-2.500	2.500
5	7.875	467.775000	0.000	-2.500	2.500
10	8.250	467.775000	0.000	-2.500	2.500
15	8.625	467.775000	0.000	-2.500	2.500
20	9.000	467.774990	-0.021	-2.500	2.500



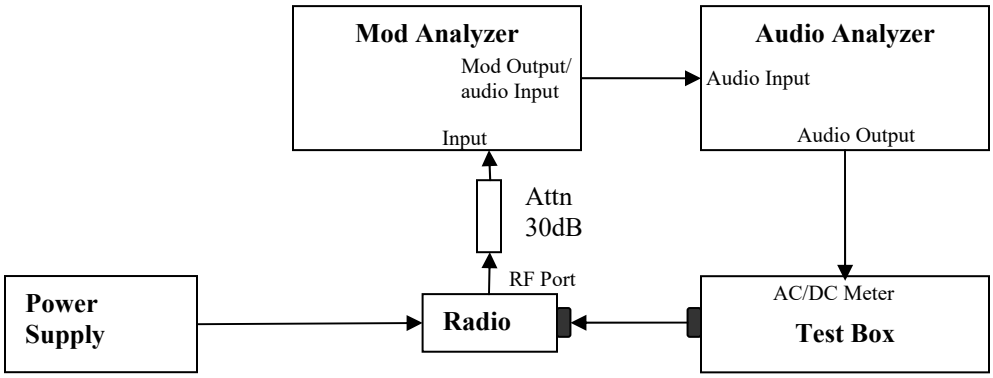
Frequency / Channel Spacing	467.7750 MHz / 12.5 kHz			
Voltage, V	7.5			
Temperature, ^{0}C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	467.775000	0.000	-2.500	2.500
-20	467.775020	0.043	-2.500	2.500
-10	467.775040	0.086	-2.500	2.500
0	467.775030	0.064	-2.500	2.500
10	467.775020	0.043	-2.500	2.500
20	467.775020	0.043	-2.500	2.500
30	467.775000	0.000	-2.500	2.500
40	467.774990	-0.021	-2.500	2.500
50	467.774990	-0.021	-2.500	2.500
60	467.775010	0.021	-2.500	2.500

7.2.3. Test Limit

As per manufacturer declared spec +/- 2.5ppm

7.3. Audio Frequency Response

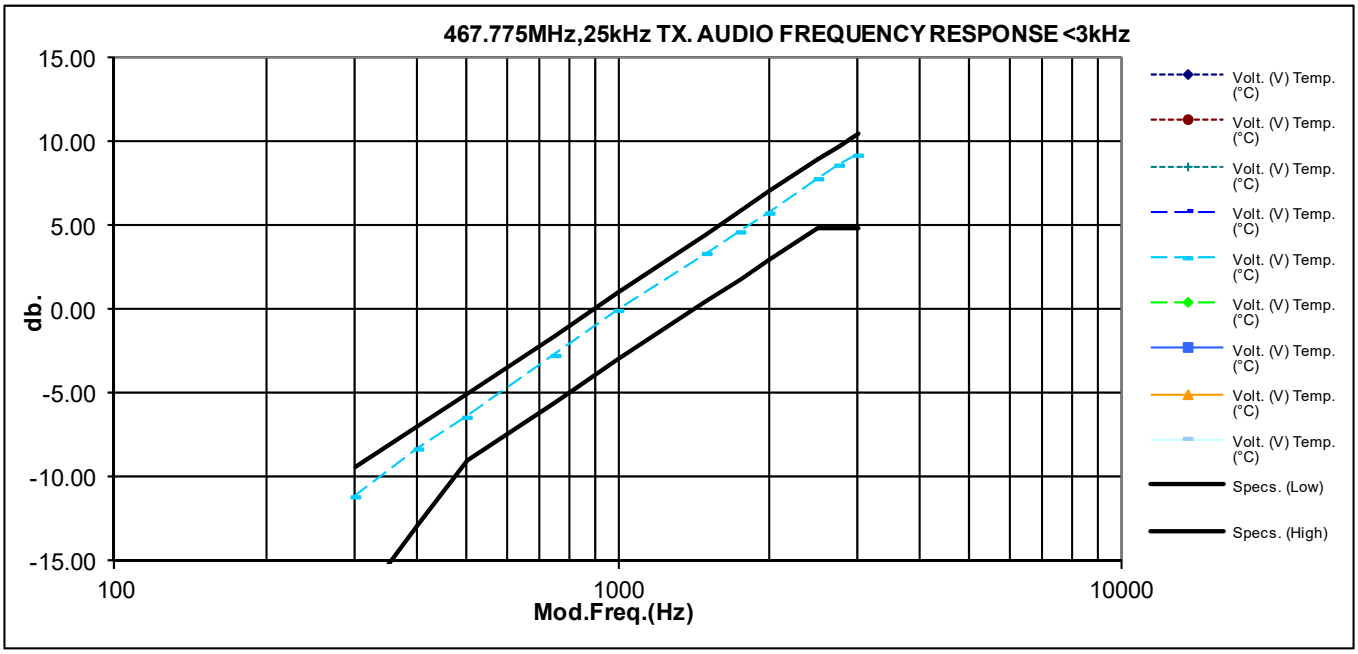
7.3.1. Test Setup

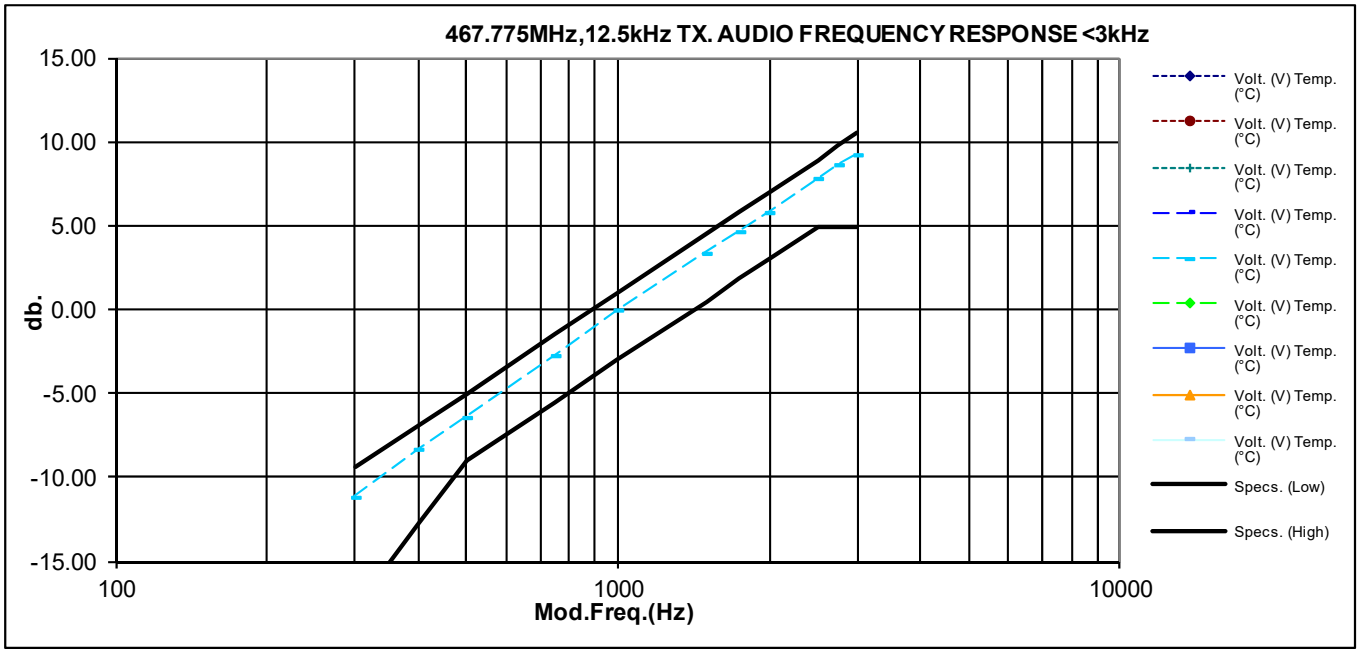


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the Full rated system deviation.
5) On audio 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.

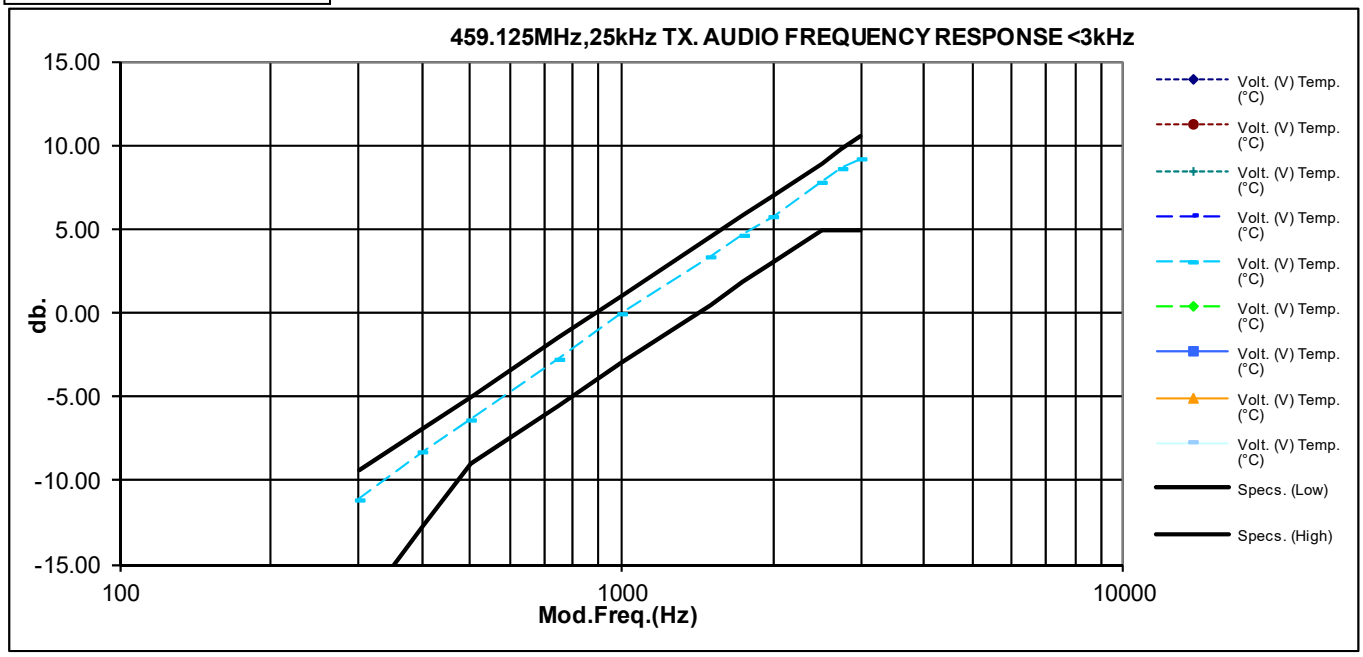
7.3.2. Test Result

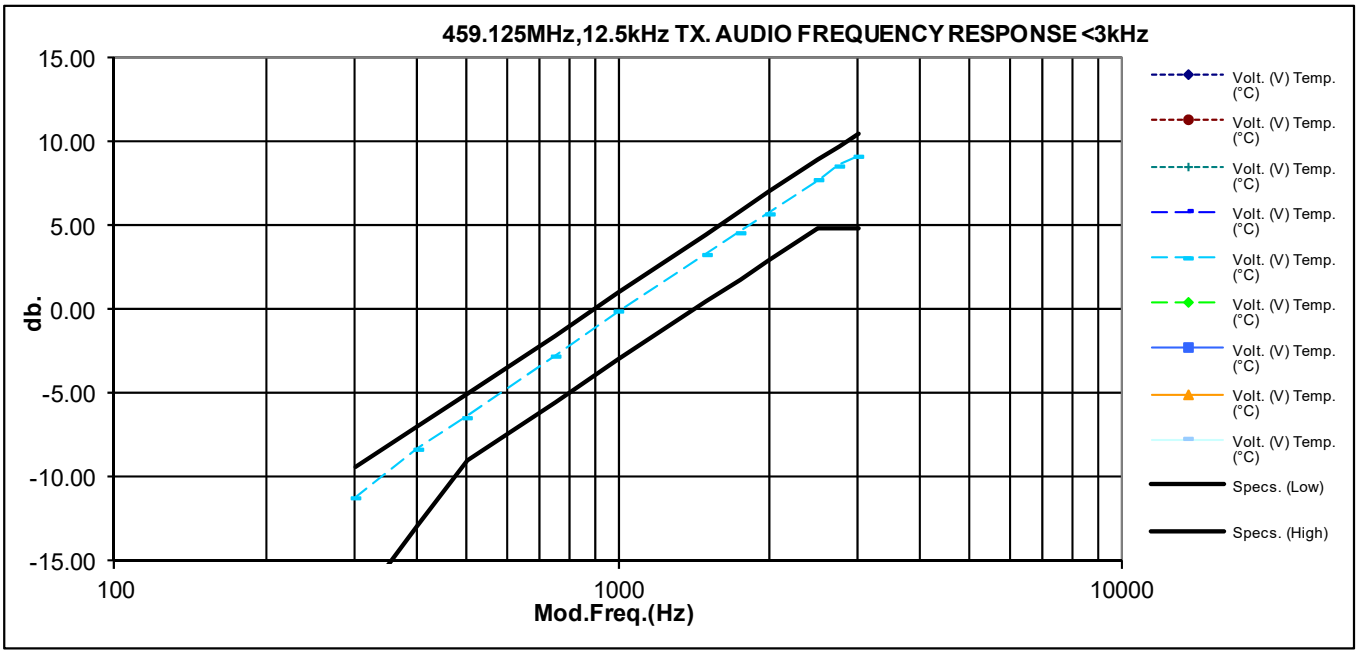
Not for FCC Review

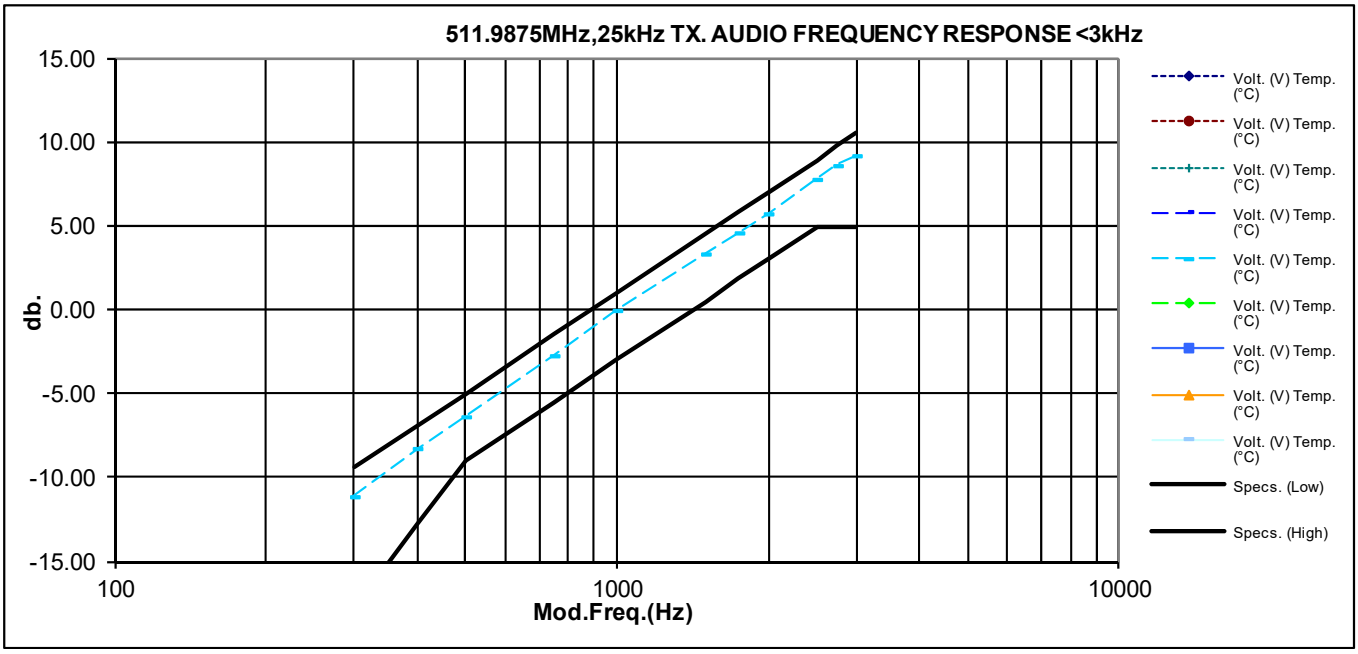


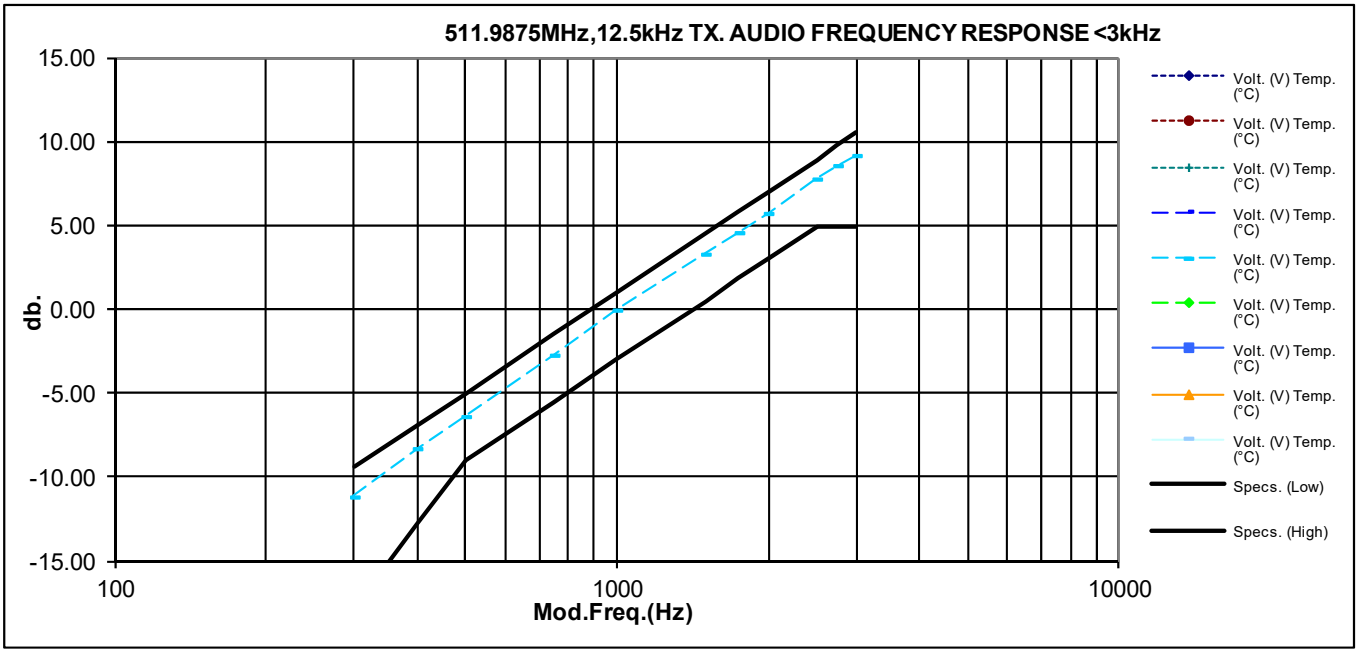


Not for FCC Review

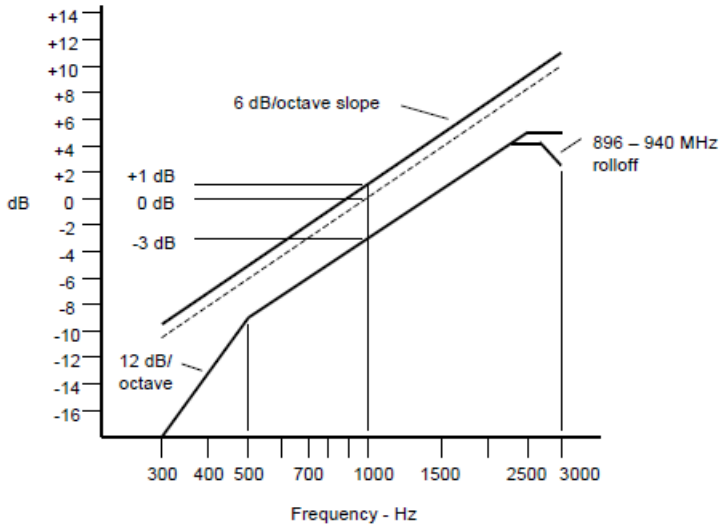





511.9875MHz,25kHz TX. AUDIO FREQUENCY RESPONSE <3kHz
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
db.
100
1000
10000
Mod.Freq.(Hz)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Specs. (Low)
Specs. (High)


511.9875MHz,12.5kHz TX. AUDIO FREQUENCY RESPONSE <3kHz
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
db.
100
1000
10000
Mod.Freq.(Hz)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Volt. (V) Temp. (°C)
Specs. (Low)
Specs. (High)

7.3.3. Test Limit

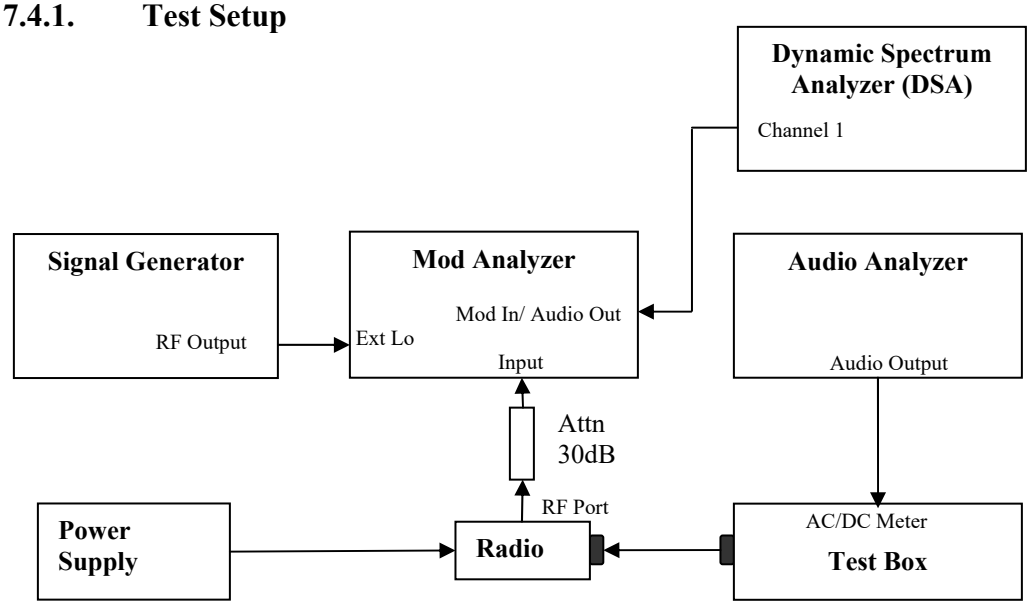


Note:

- *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.*

7.4. Audio Low Pass Filter Response

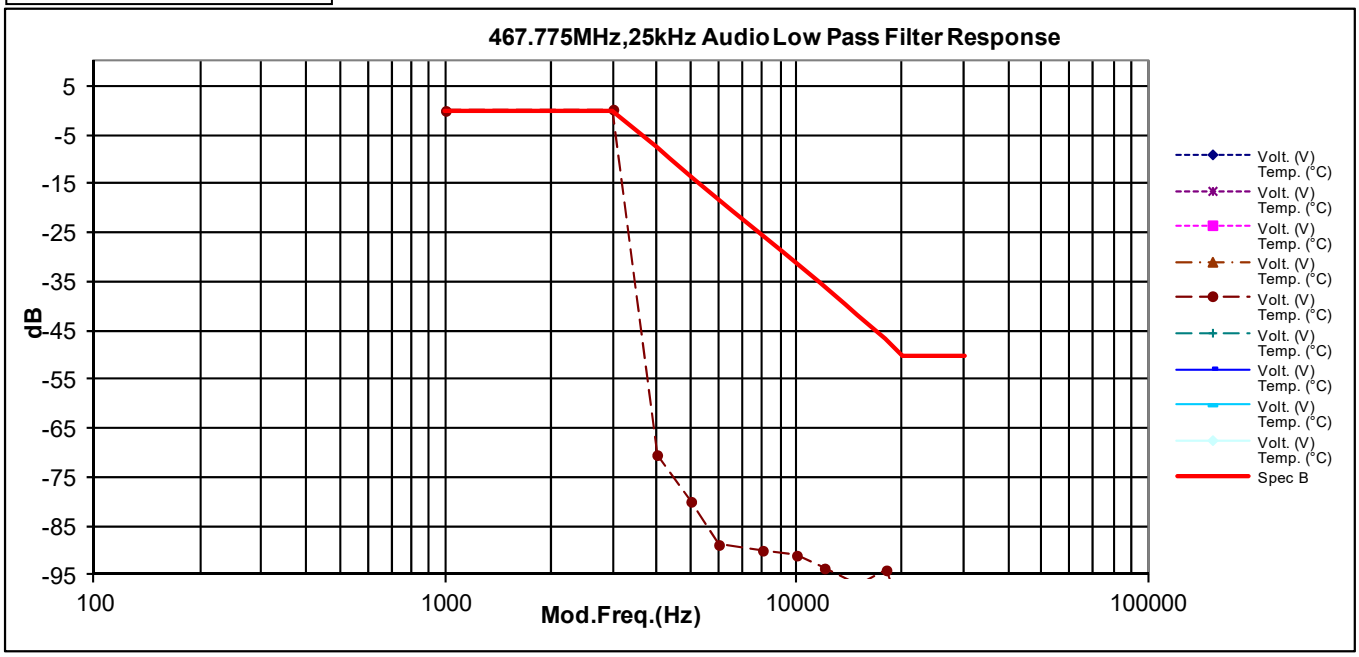
7.4.1. Test Setup

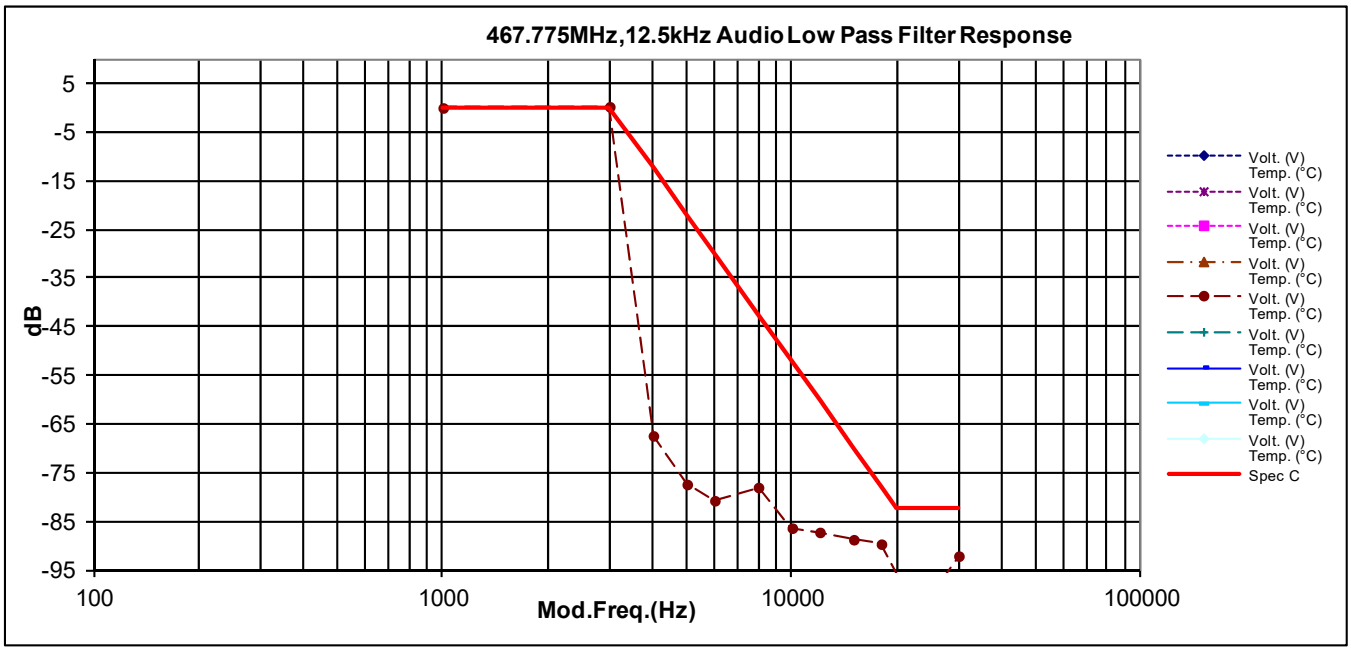


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Press 23.1SPCL on modulation analyzer to enable the external LO from Sigen.
4) Set the Sigen frequency to Fc + 1.5 MHz, RF output level to 0dBm without modulation.
5) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the Full rated system 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.

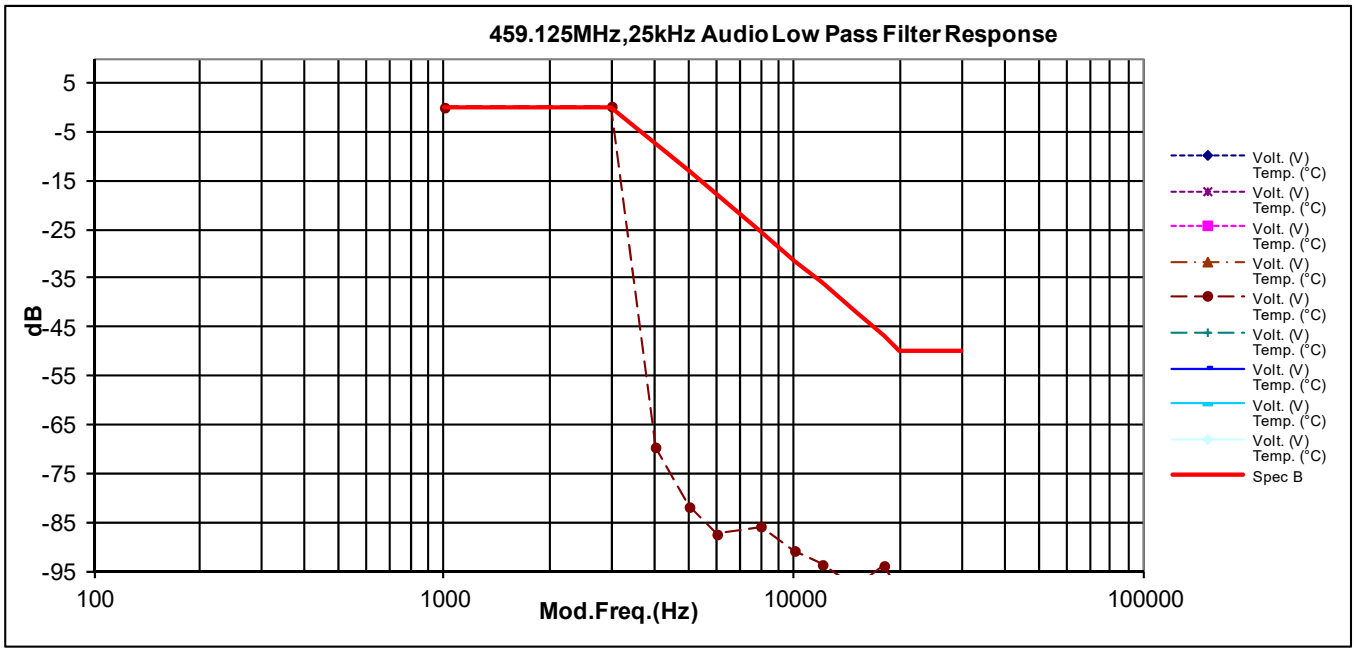
7.4.2. Test Result

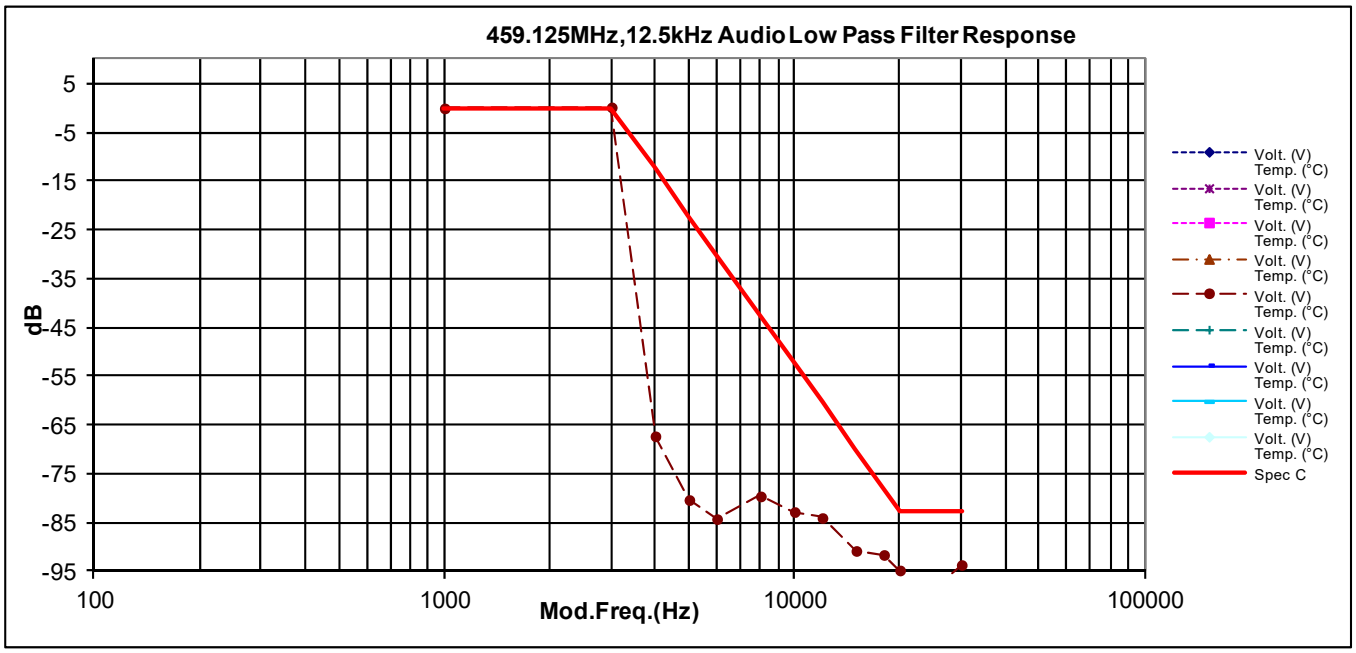
Not for FCC Review

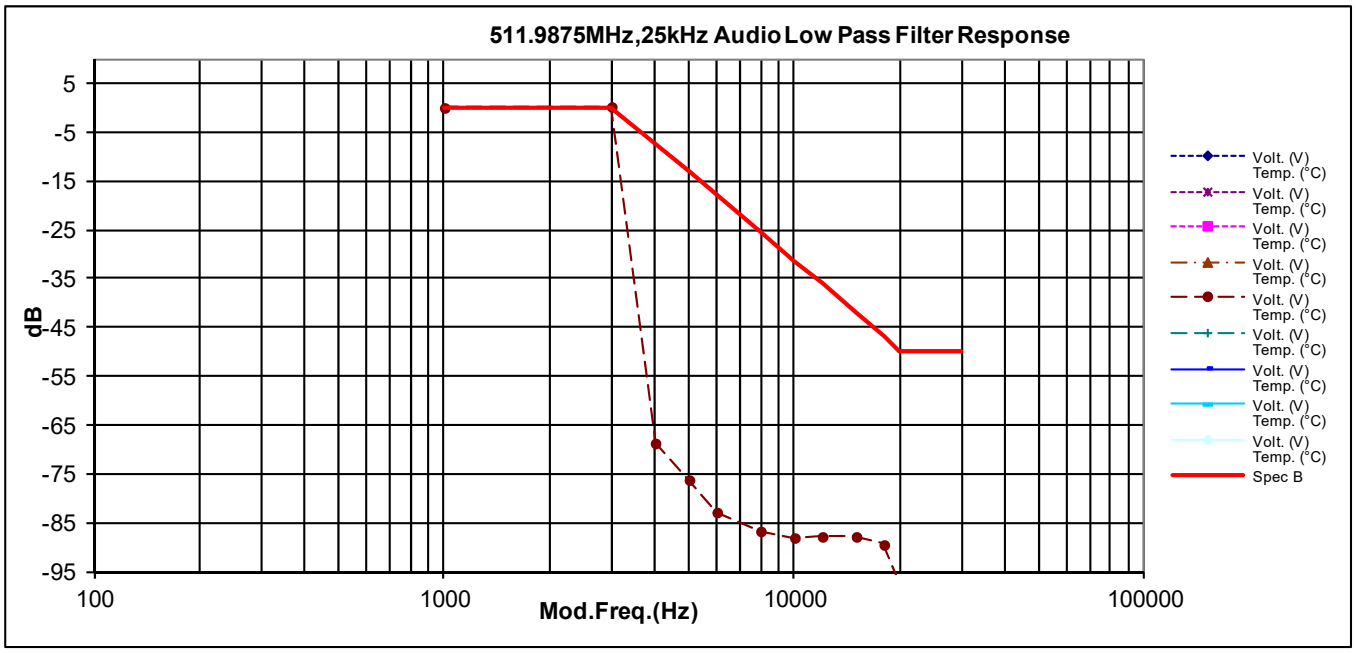


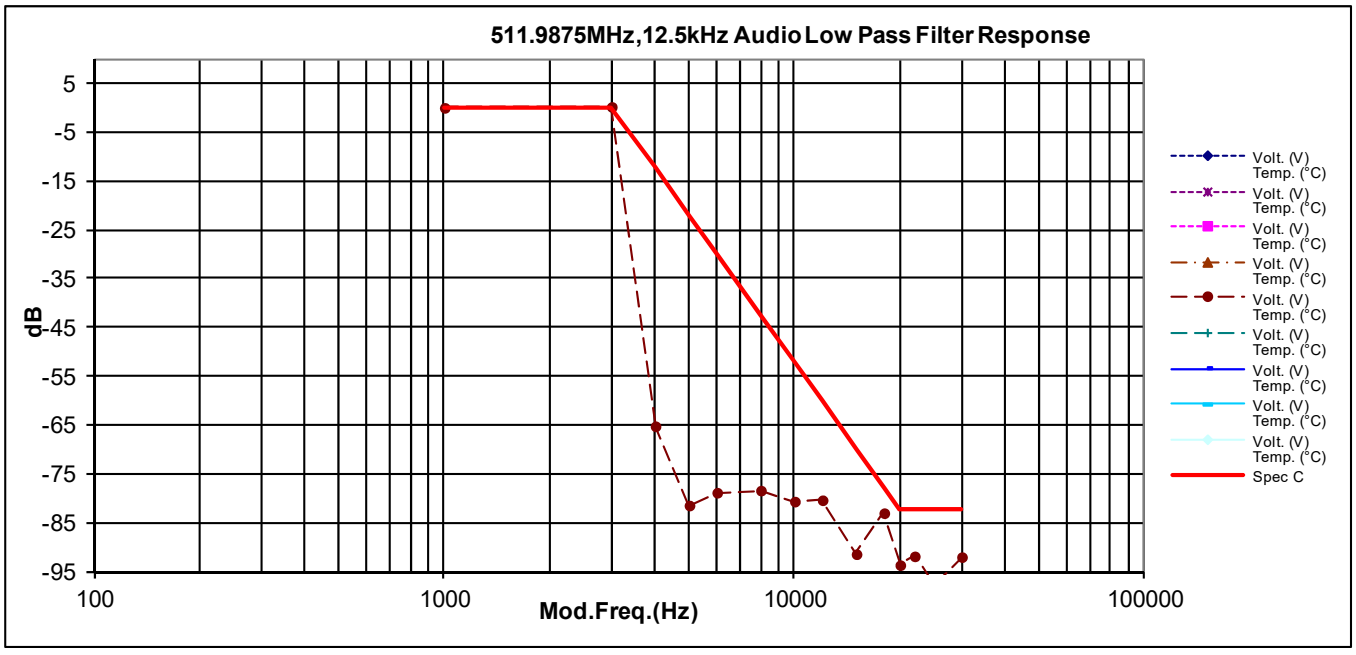


Not for FCC Review

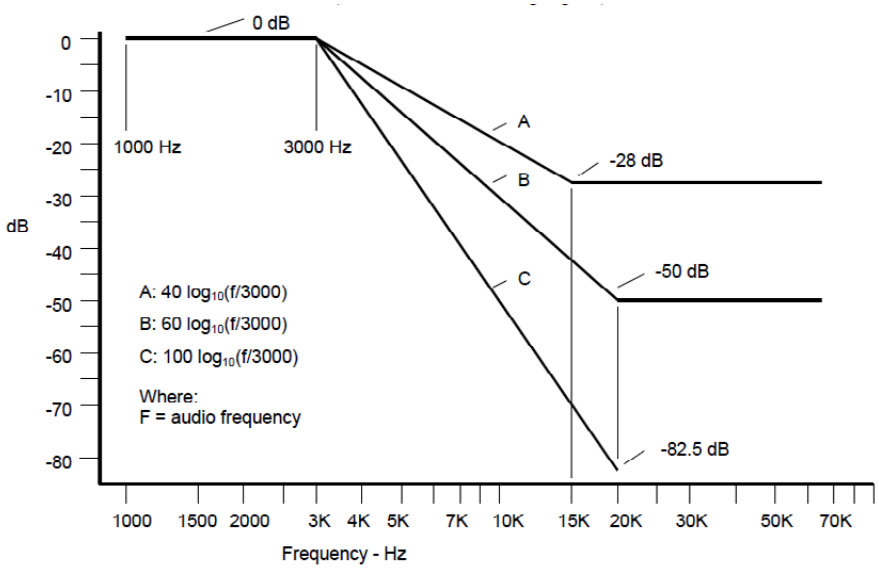





511.9875MHz,25kHz Audio Low Pass Filter Response
5
-5
-15
-25
-35
-45
-55
-65
-75
-85
-95
dB
100
1000
10000
100000
Mod.Freq.(Hz)
Volt. (V)
Temp. (°C)
Spec B


511.9875MHz,12.5kHz Audio Low Pass Filter Response
5
-5
-15
-25
-35
-45
-55
-65
-75
-85
-95
dB
100
1000
10000
100000
Mod.Freq.(Hz)
Volt. (V)
Temp. (°C)
Spec C

7.4.3. 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.

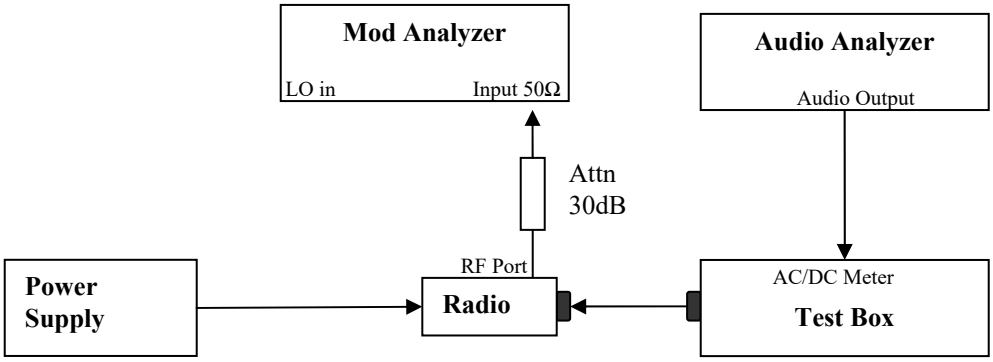
c) For equipment operating on channels between 896 MHz through 901 MHz, between 935 MHz through 940 MHz, and 12.5 or 15 kHz spaced channels in the frequency range 138-174 MHz and 406-512 MHz.

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.

7.5. Modulation Limiting

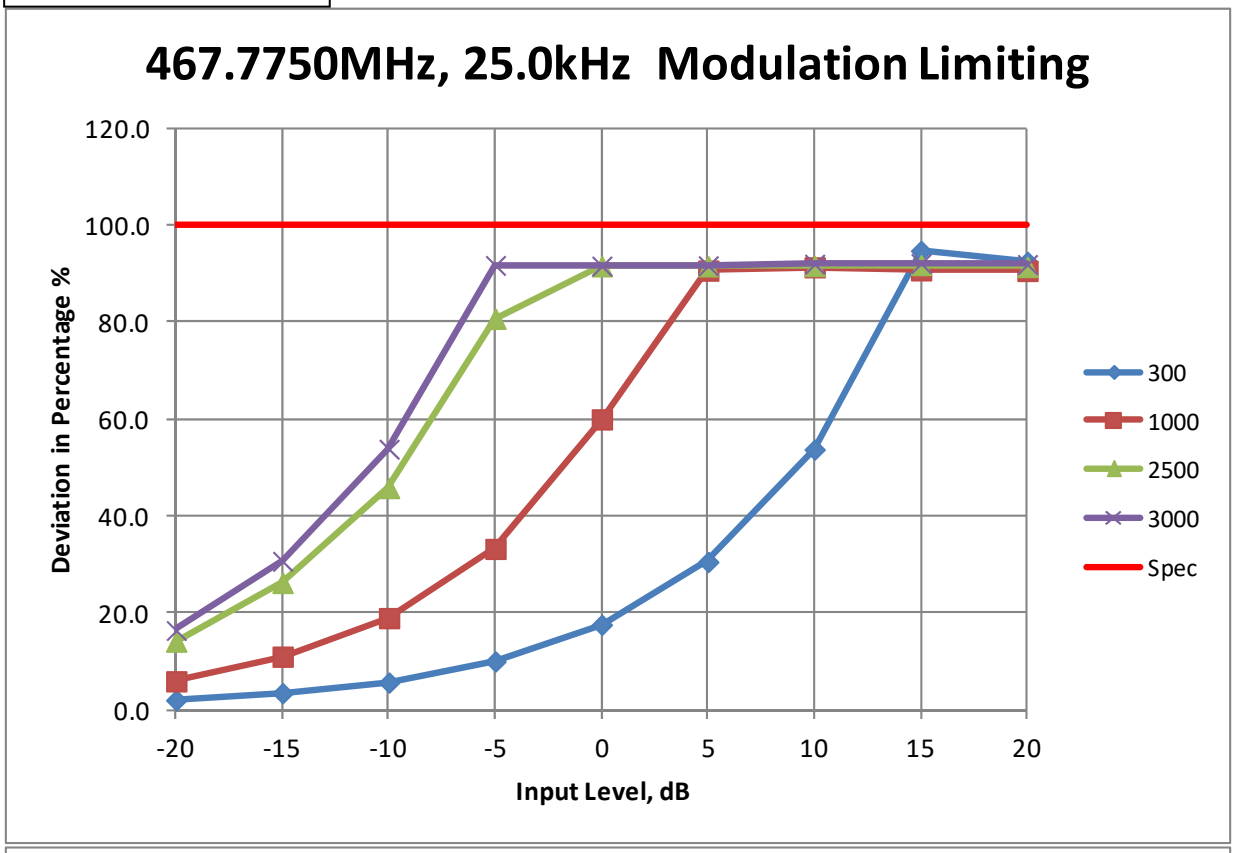
7.5.1. Test Setup

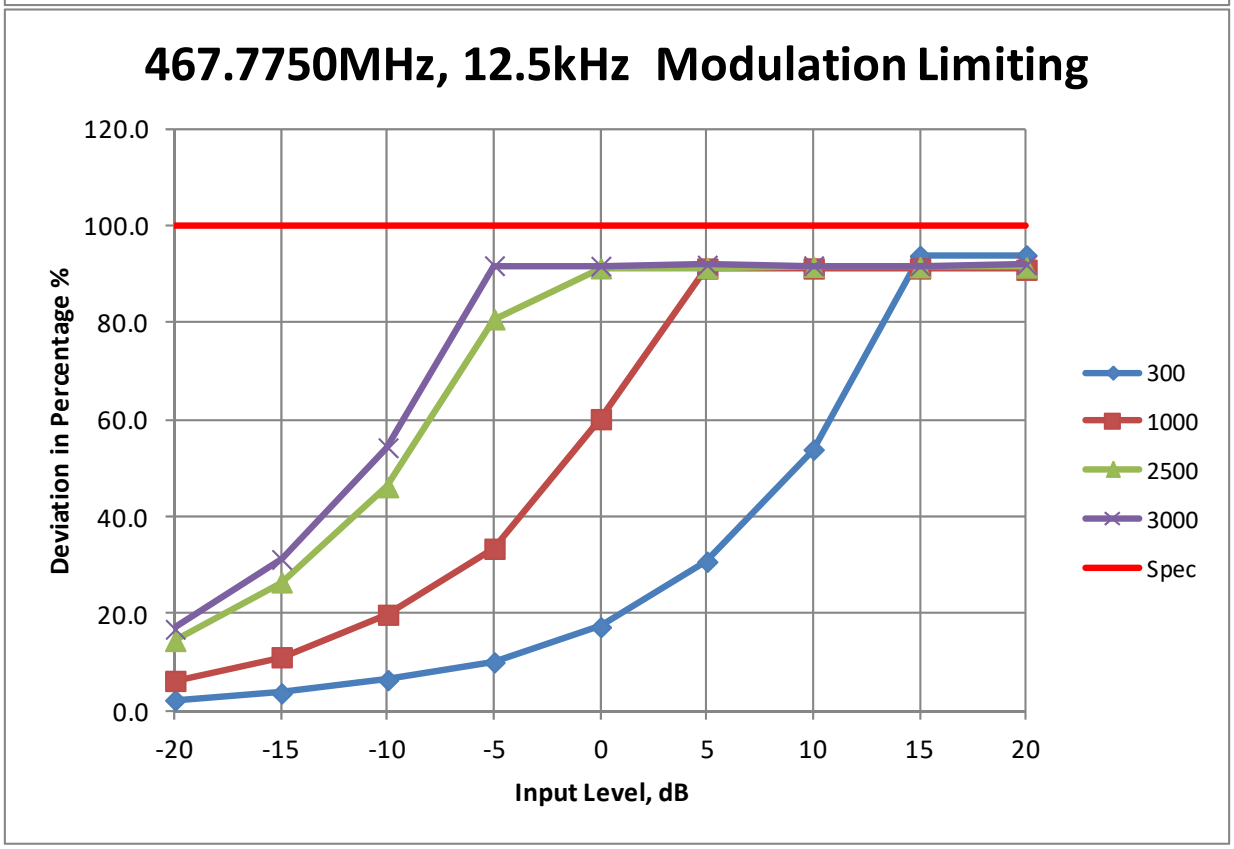


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the Full rated system deviation.
5) Record the frequency 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.

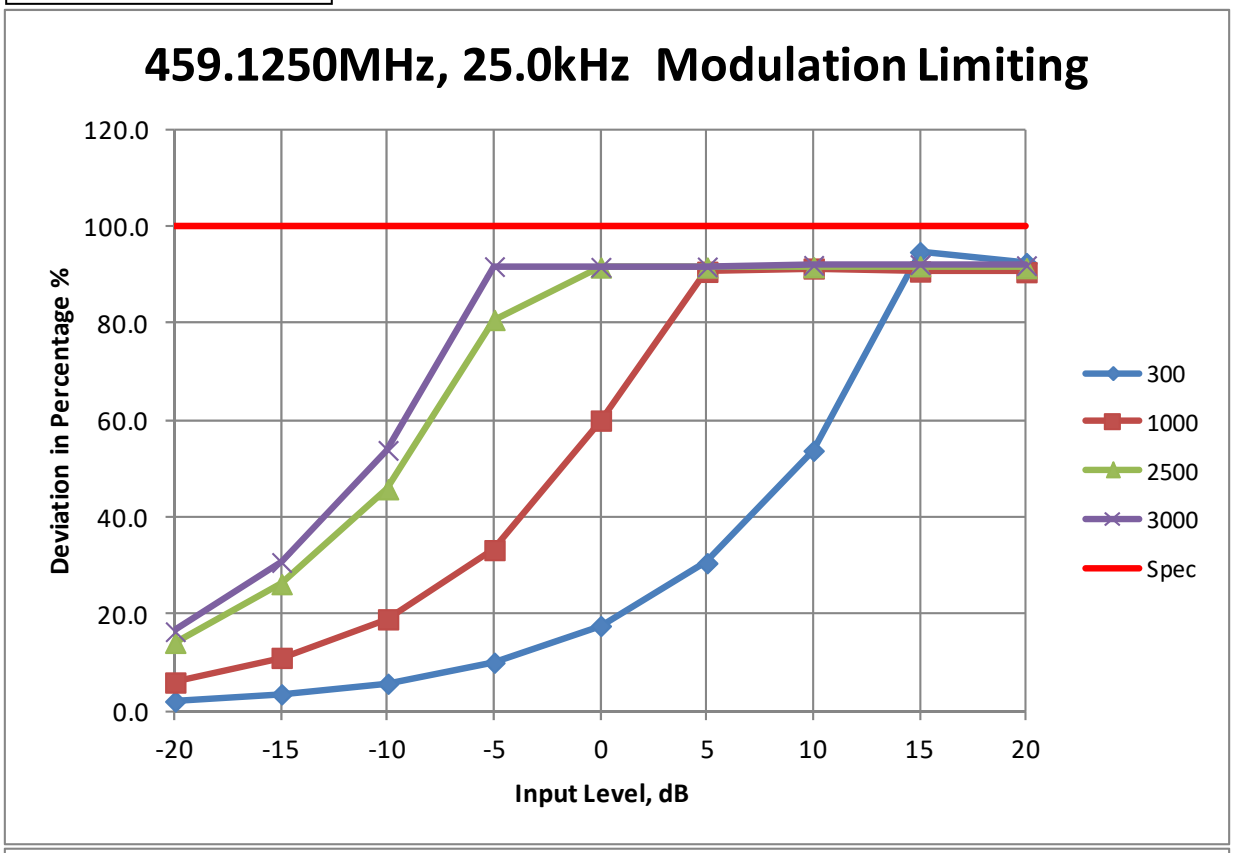
7.5.2. Test Result

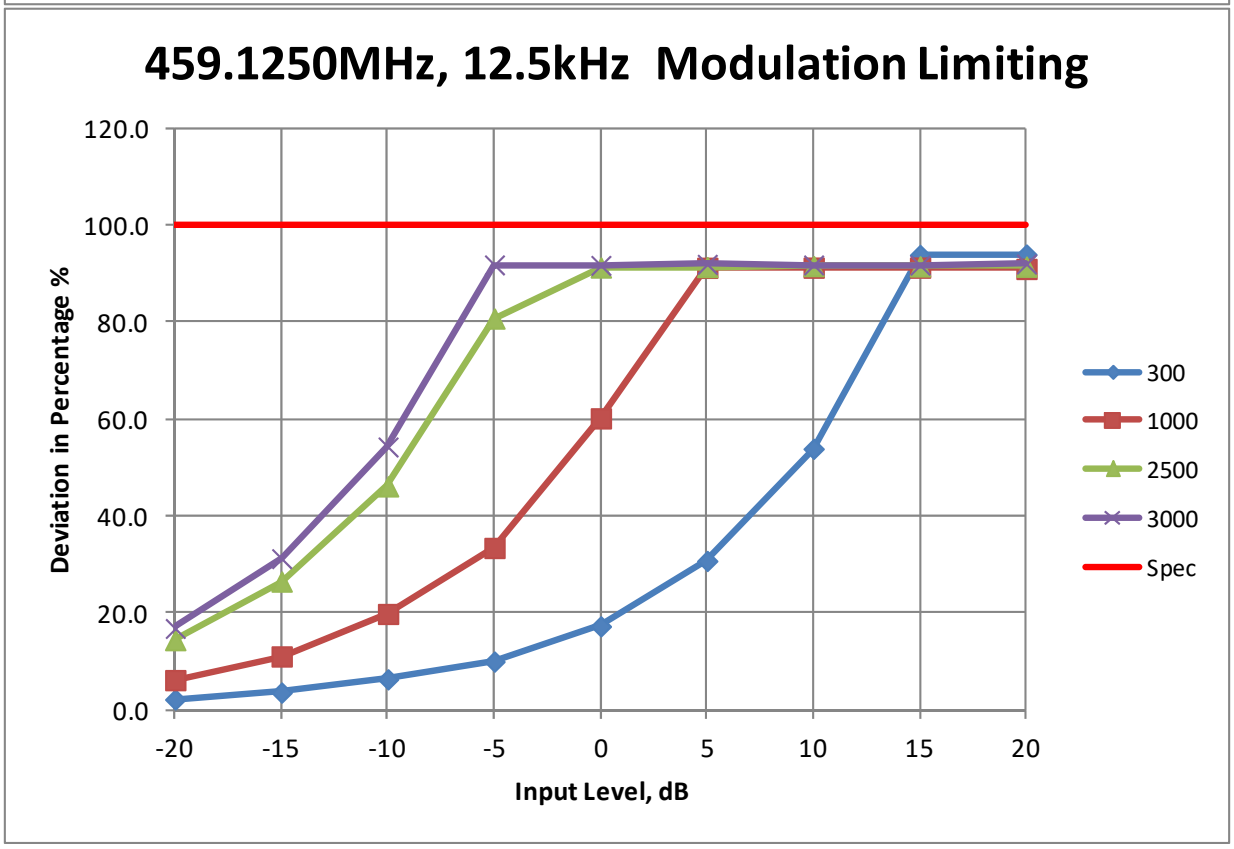
Not for FCC Review

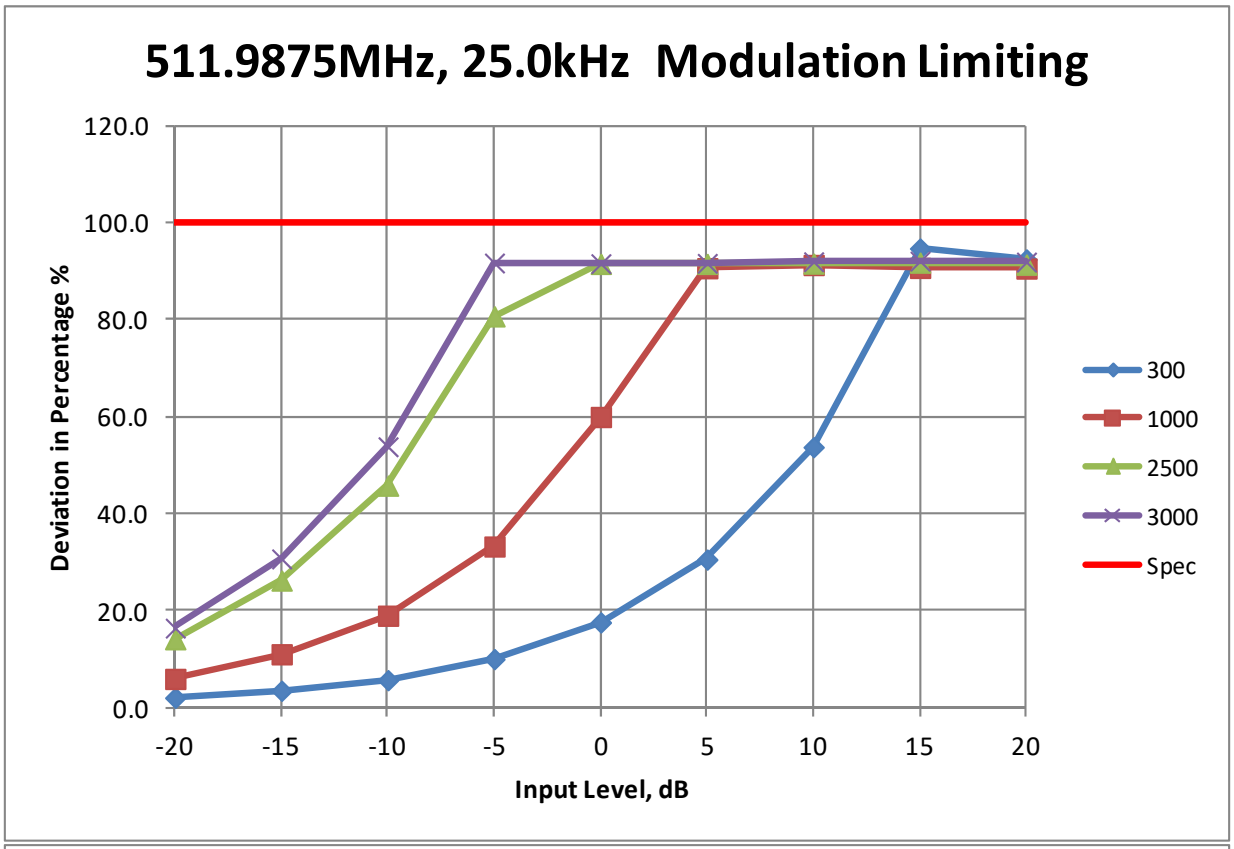


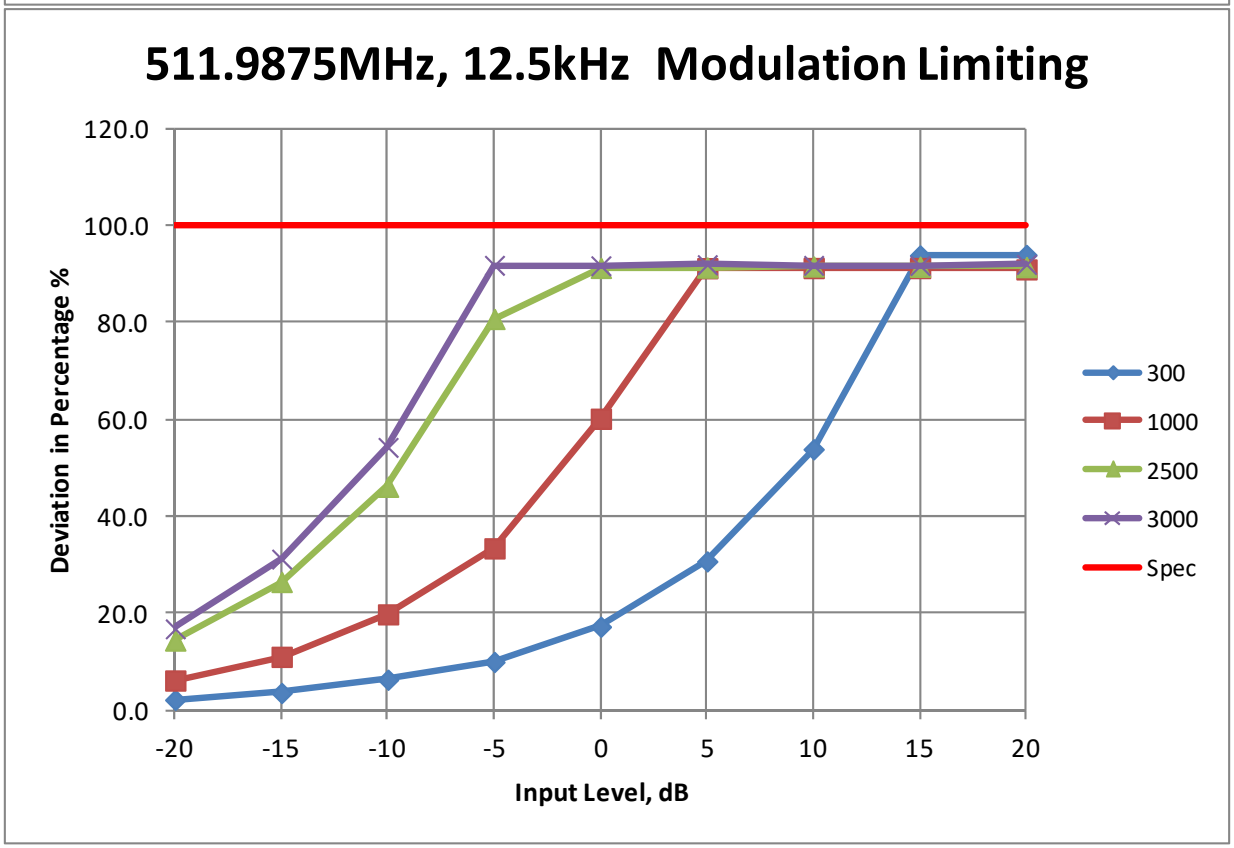


Not for FCC Review






511.9875MHz, 25.0kHz Modulation Limiting
Deviation in Percentage %
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20
-15
-10
-5
0
5
10
15
20
Input Level, dB
300
1000
2500
3000
Spec


511.9875MHz, 12.5kHz Modulation Limiting
Deviation in Percentage %
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20
-15
-10
-5
0
5
10
15
20
Input Level, dB
300
1000
2500
3000
Spec

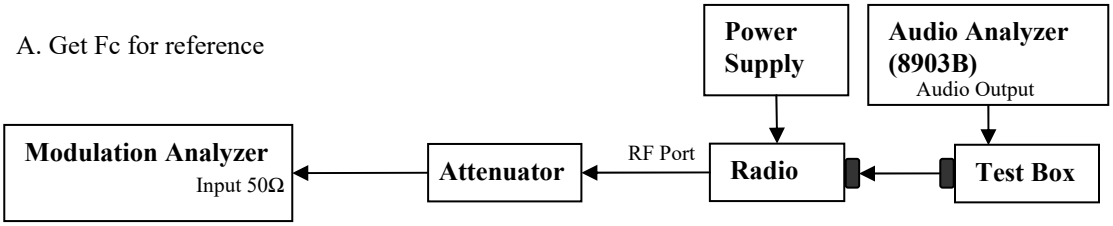
7.5.3. Test Limit

Modulation Limiting shall not exceed 100 percent.

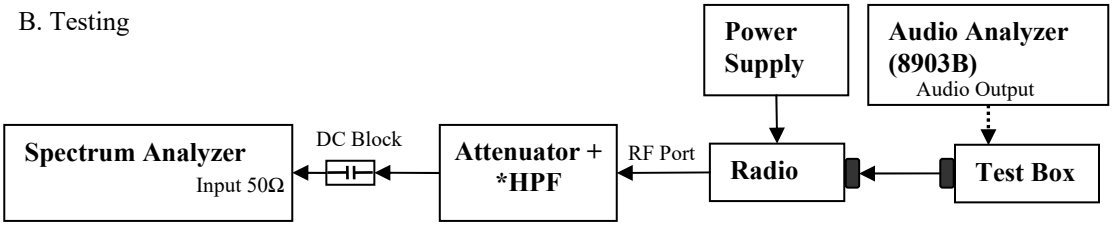
7.6. Occupied Bandwidth

7.6.1. Test Setup (Analog)

A. Get Fc for reference



B. Testing

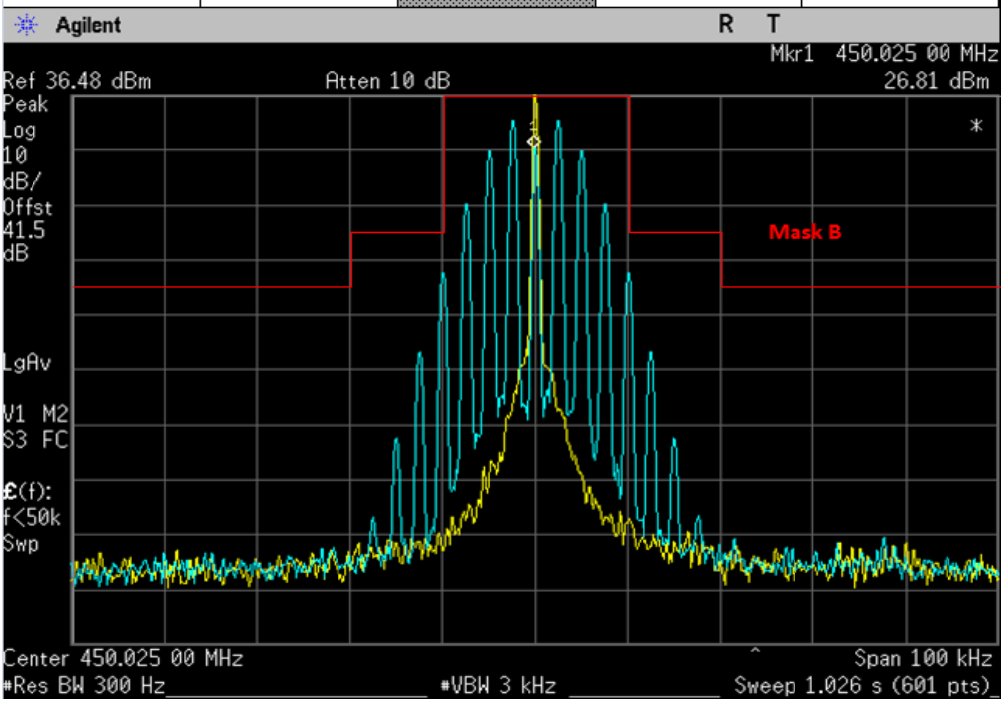


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey the DUT.
4) Path loss for the measurement included.
5) Select the Occupied Bandwidth measurement for 99% Emissions 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 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.

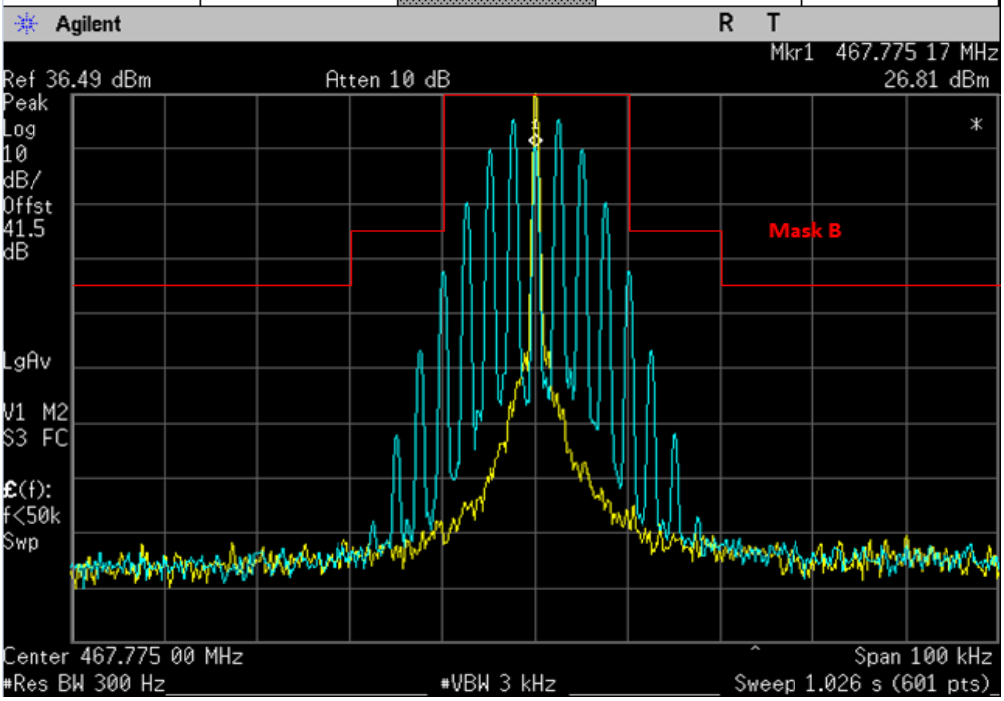
* Only HPF added for Mask 80.211 measurement with attenuator.

7.6.2. Test Result (Analog)

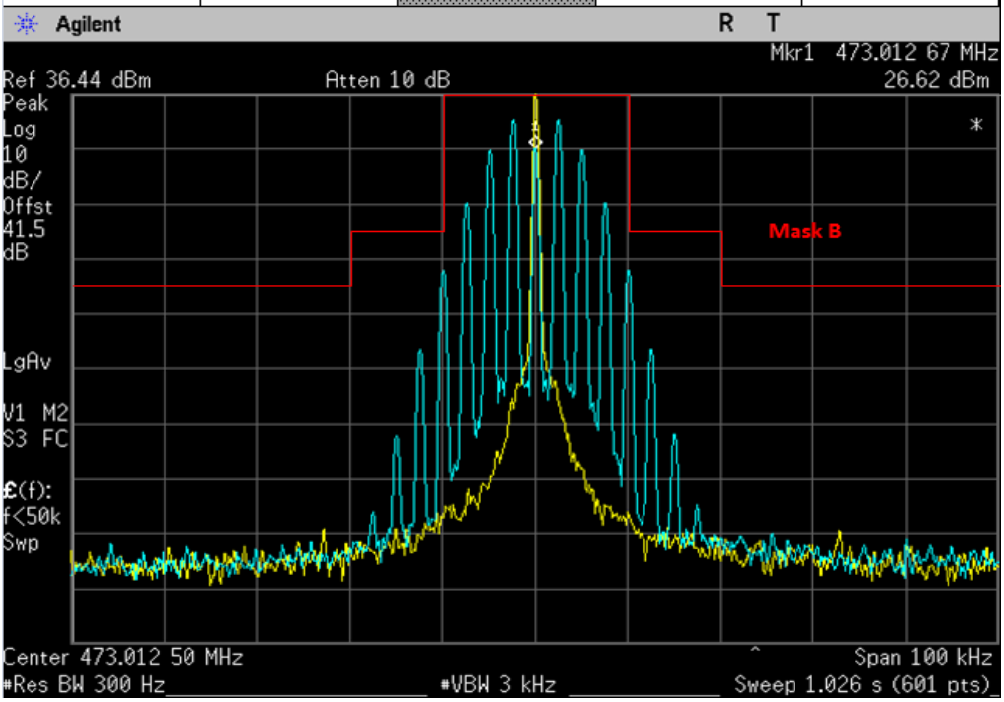
Modulation			Rules Part	
Analog Voice			74.462(c),RSS119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
450.0250	25.0		15.0273	16K0F3E



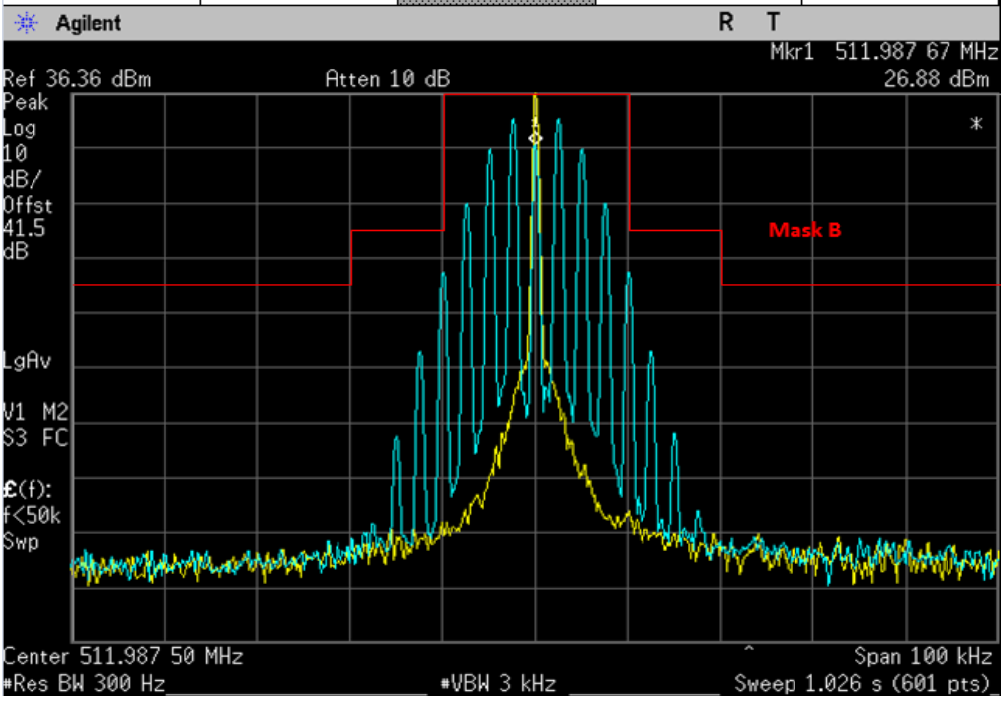
Modulation			Rules Part	
Analog Voice			80.211(f),RSS119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
467.7750	25.0		15.0303	16K0F3E



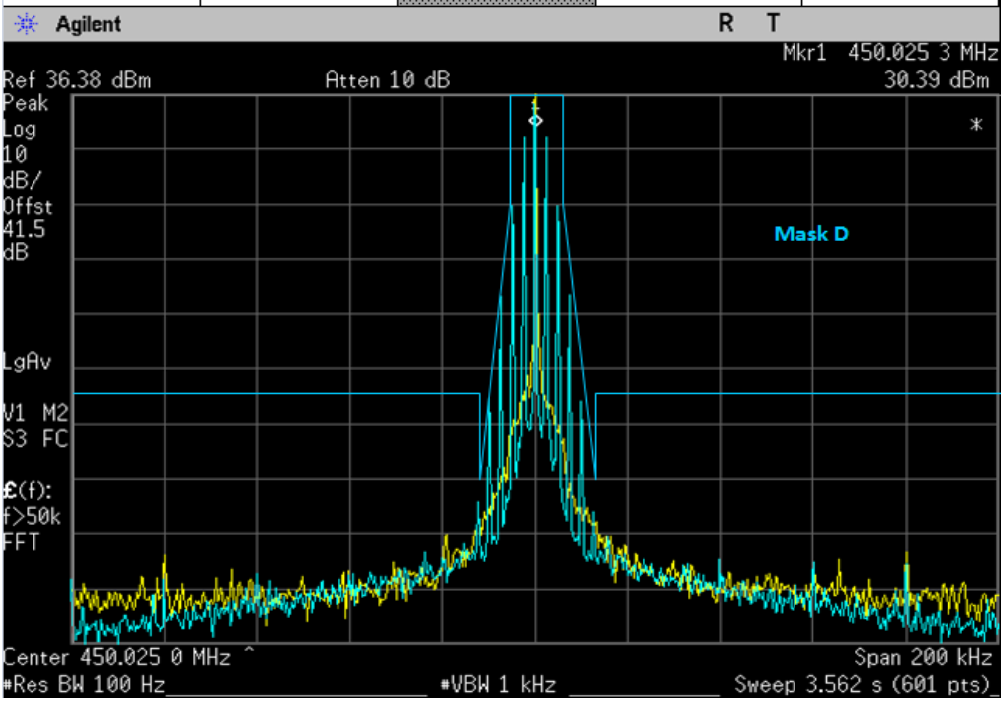
Modulation			Rules Part	
Analog Voice			90.210(T-band)	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
473.0125	25.0		15.0333	16K0F3E



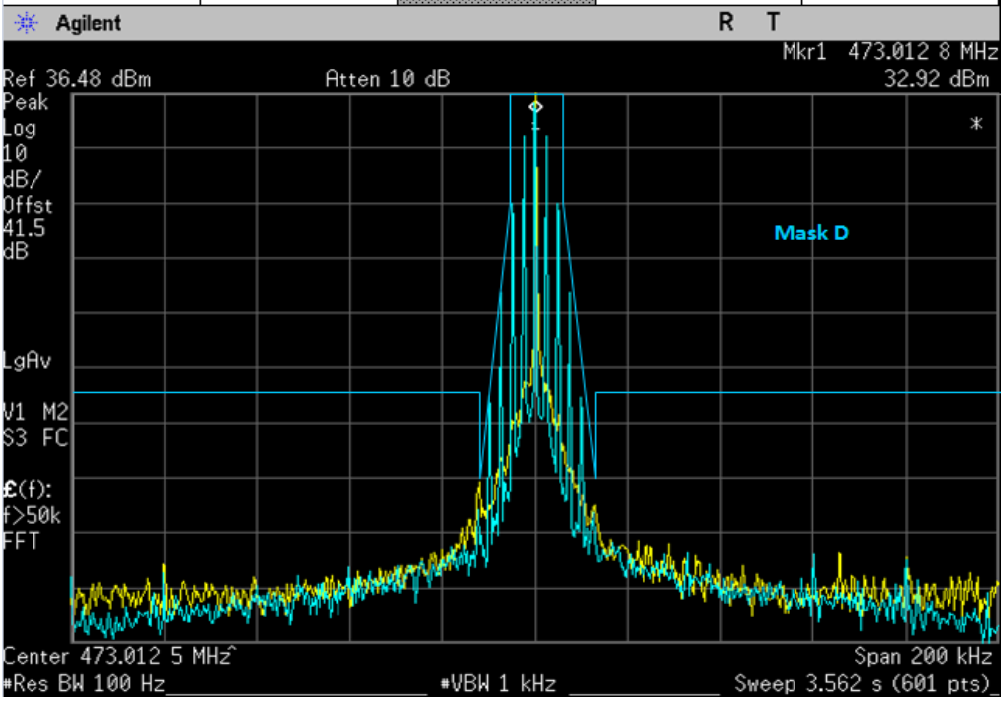
Modulation			Rules Part	
Analog Voice			90.210(T-band)	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
511.9875	25.0		15.0181	16K0F3E



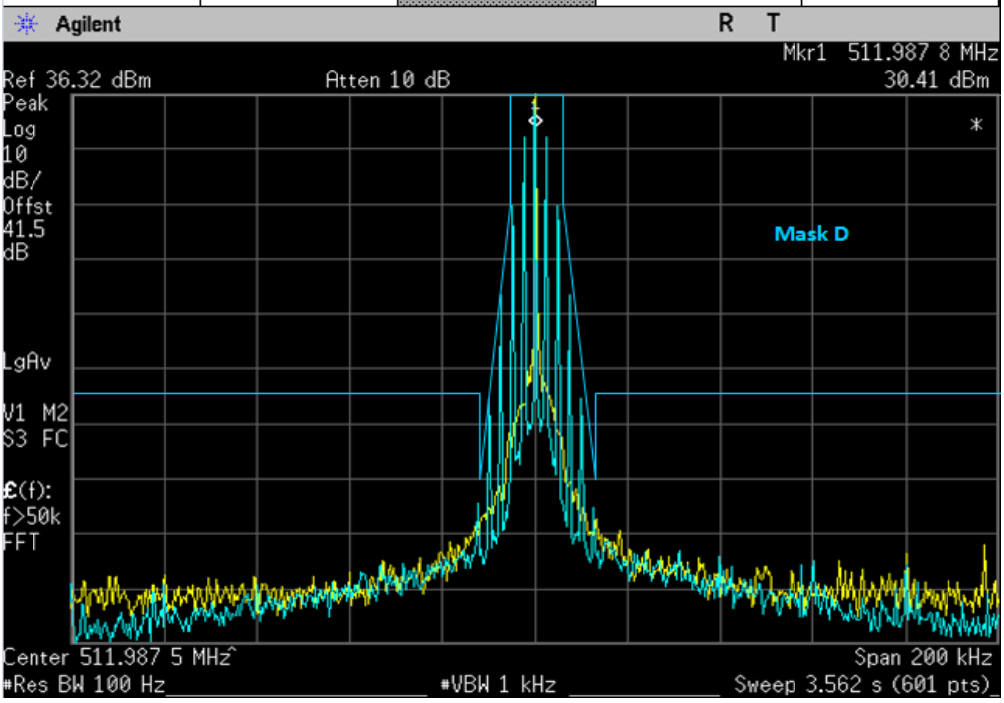
Modulation			Rules Part	
Analog Voice			90.210,74.462(c),RSS119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.0250	12.5		9.9636	11K0F3E



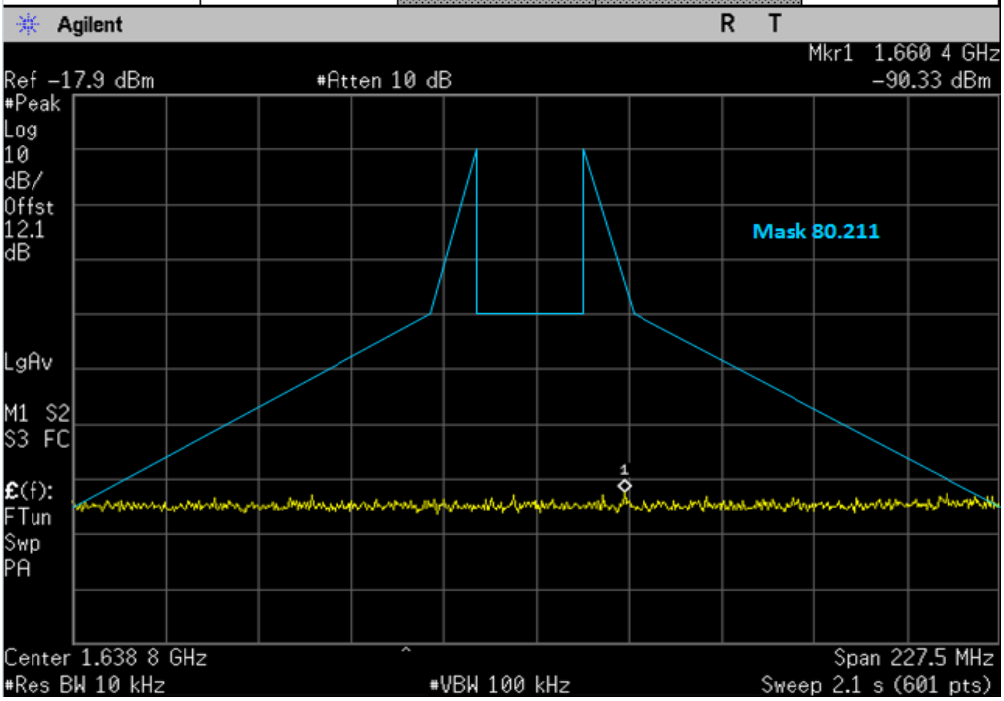
Modulation			Rules Part	
Analog Voice			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
473.0125	12.5		9.9838	11K0F3E



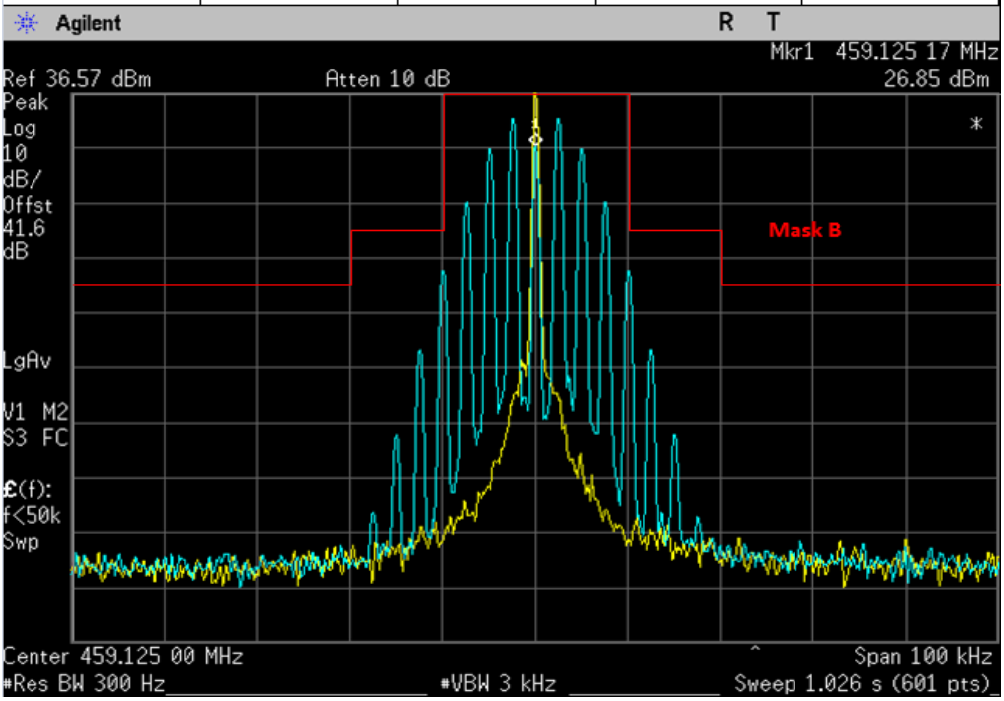
Modulation				Rules Part
Analog Voice				90.210
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
511.9875	12.5		9.9697	11K0F3E



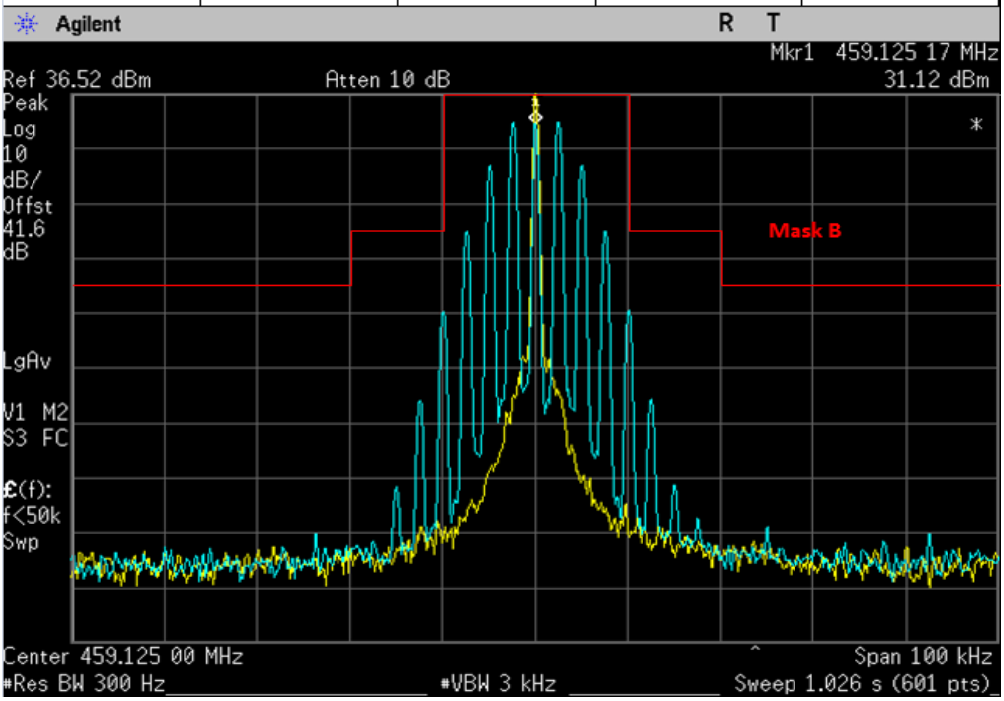
Modulation				Rules Part
Analog Voice				80.211(c)
Channel Frequency (MHz)	**Channel Spacing (kHz)**			**Emission Designator**
467.7750	25.0			16K0F3E



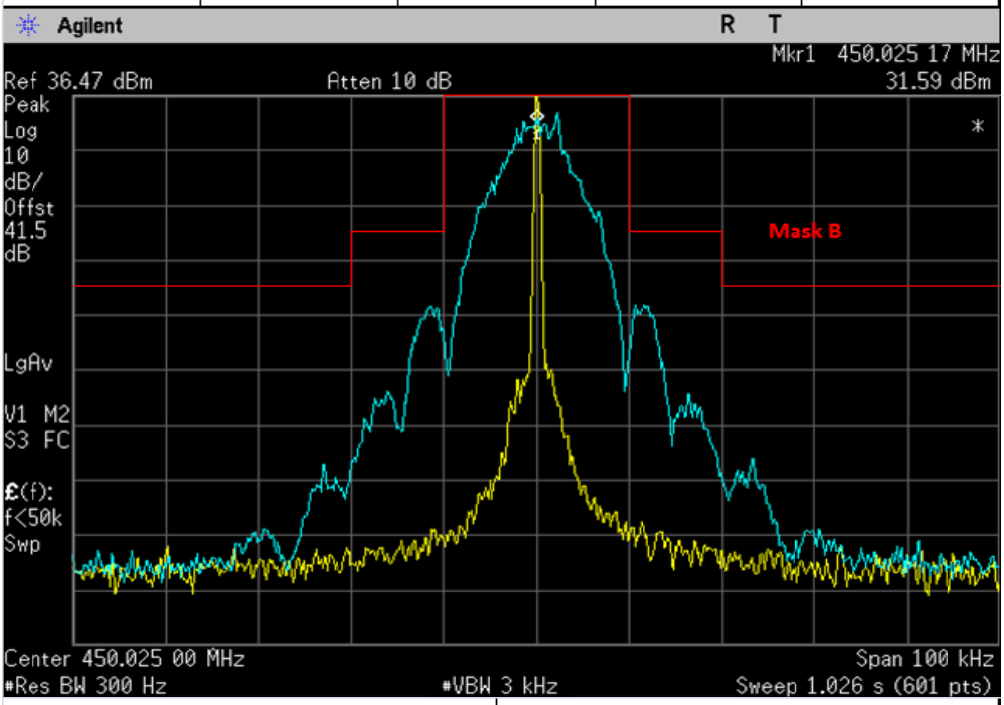
Modulation		Rules Part		
Analog Voice		FCC Part 22.359(b)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	25.0	15.5564	15.0319	16K0F3E



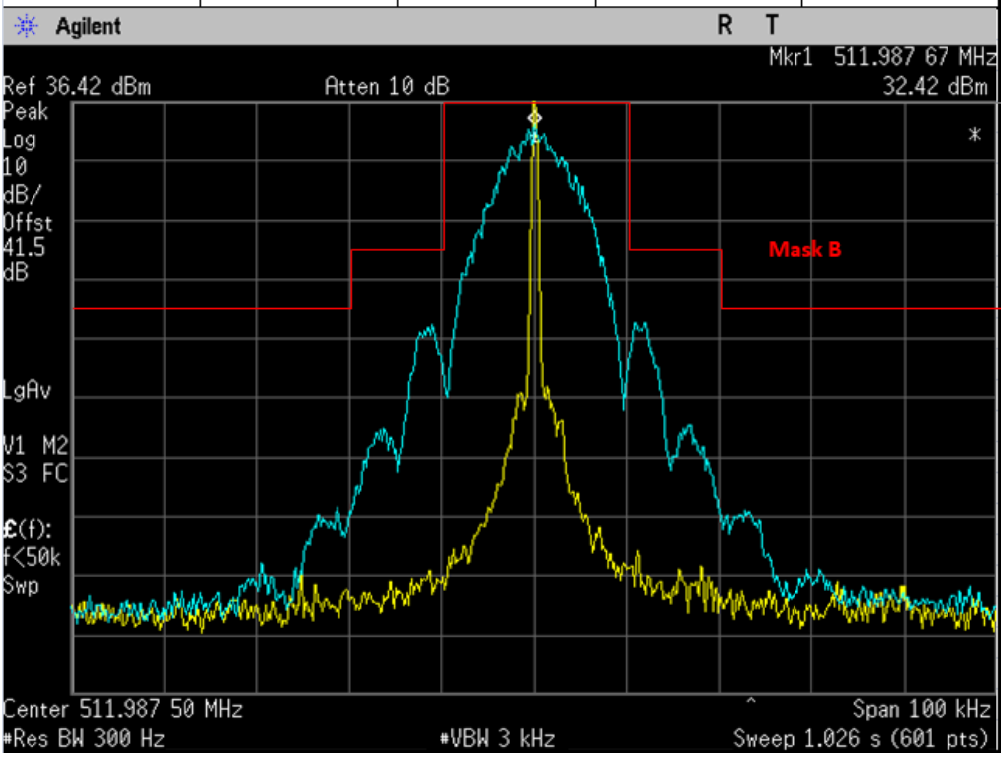
Modulation		Rules Part		
Analog Voice		FCC Part 22.359(b)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	20.0	15.4341	10.4287	16K0F3E



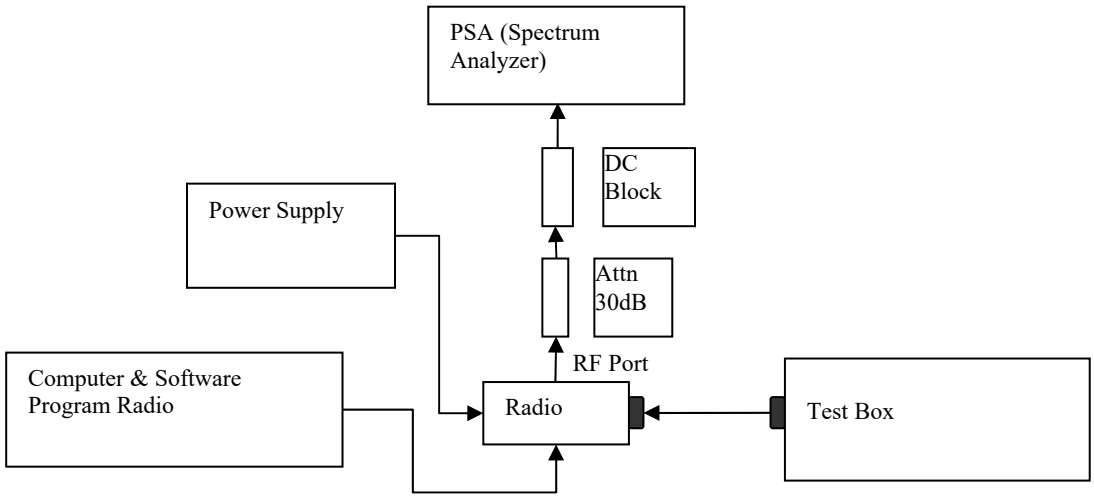
Modulation		Rules Part		
Analog Voice Encyption		74.462(c)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
450.0250	20.0	14.9100	12.0703	20K0F1E



Modulation		Rules Part		
Analog Voice Encyption		90.210(T-band)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
511.9875	20.0	15.1600	11.9757	20K0F1E



7.6.3. Test Setup (Digital)



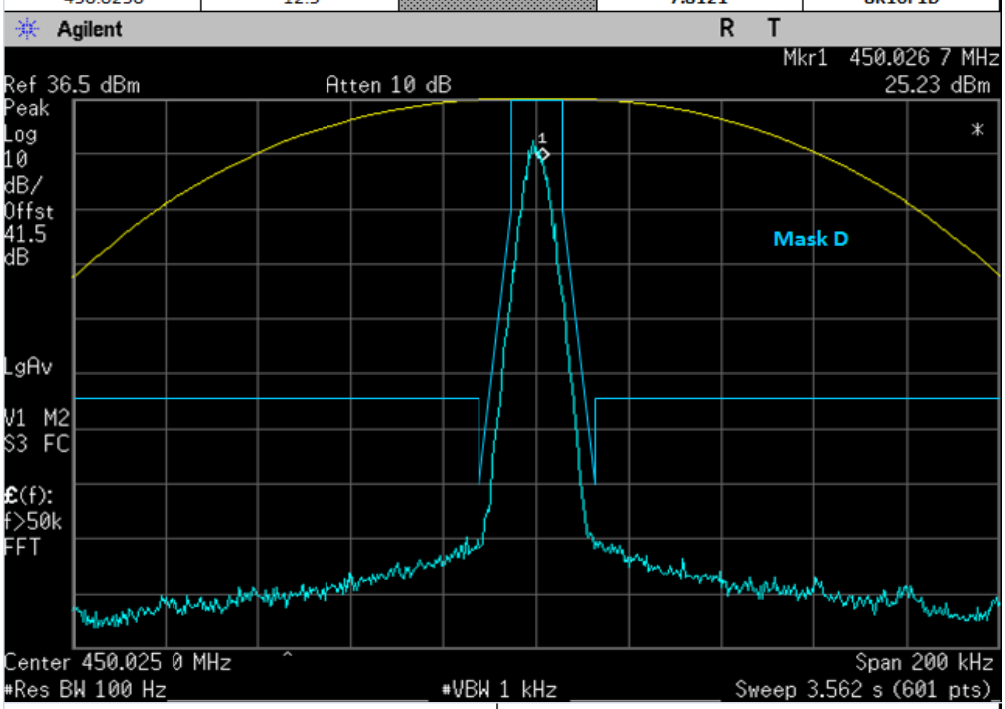
1) Program and set radio to operate in desire test frequency and digital mode with modulation. (*4FSK, C4FM or other digital modulation form).
2) Path loss for the measurement included.
3) Select the Occupied Bandwidth measurement for 99% Emissions Bandwidth Measurement.
4) Key in the Fc and Resolution Bandwidth (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 and Resolution Bandwidth (according to FCC/ ISED standard).
8) Capture the screen shot as modulated signal.

*Note:

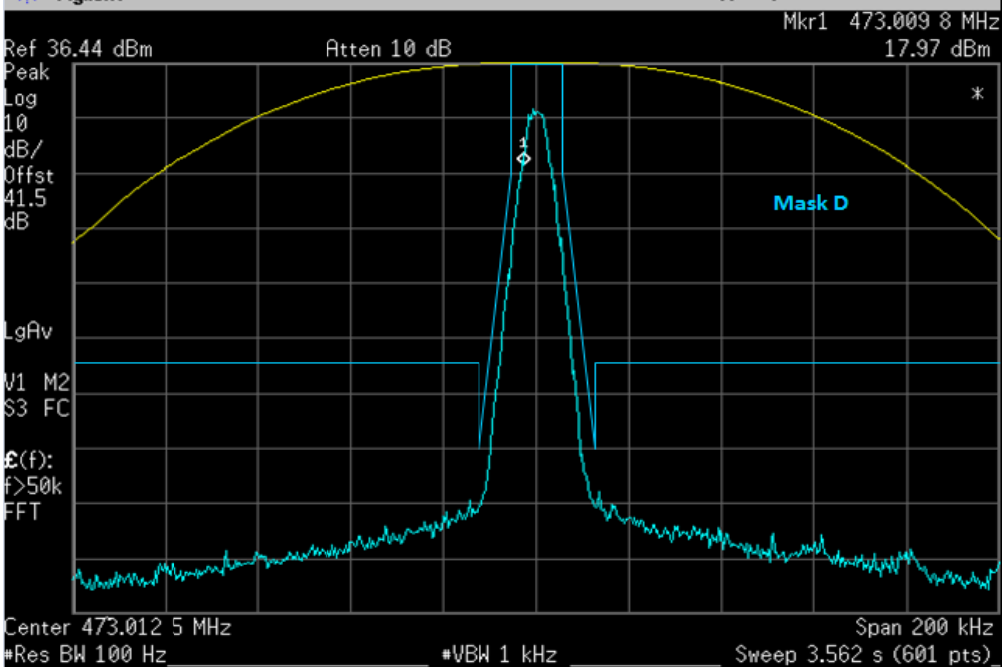
- For Digital Modulation, 12.5 kHz Data F1D & FXD would be the same. Therefore only measurements with F1D modulation shown below.
- For Digital Modulation, 12.5 kHz Data F1E & FXE would be the same. Therefore only measurements with F1E modulation shown below.

7.6.4. Test Result (Digital)

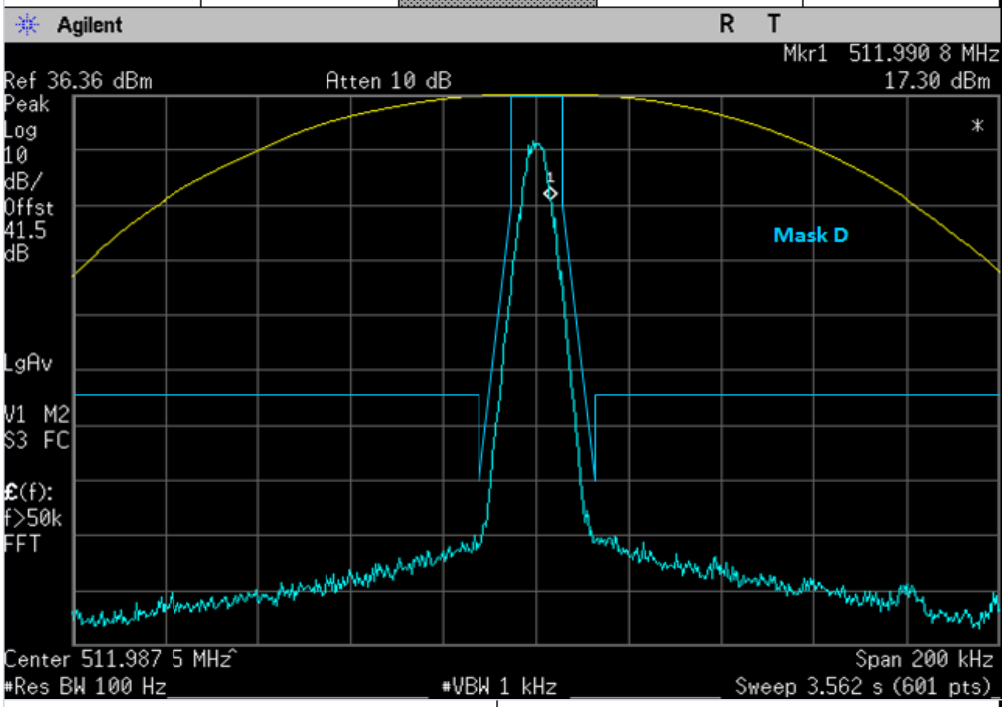
Modulation	Rules Part			
Digital Data	90.210,74.462(c),RSS119			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.0250	12.5		**7.8121**	**8K10F1D**



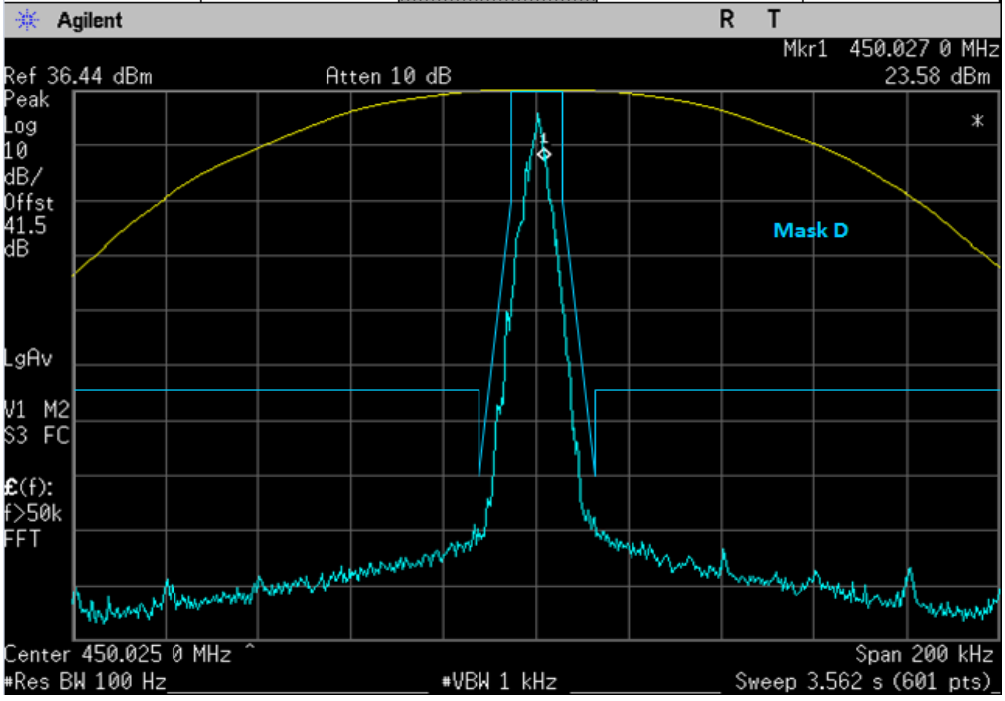
Modulation	Rules Part			
Digital Data	90.210			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
473.0125	12.5		**8.0718**	**8K10F1D**



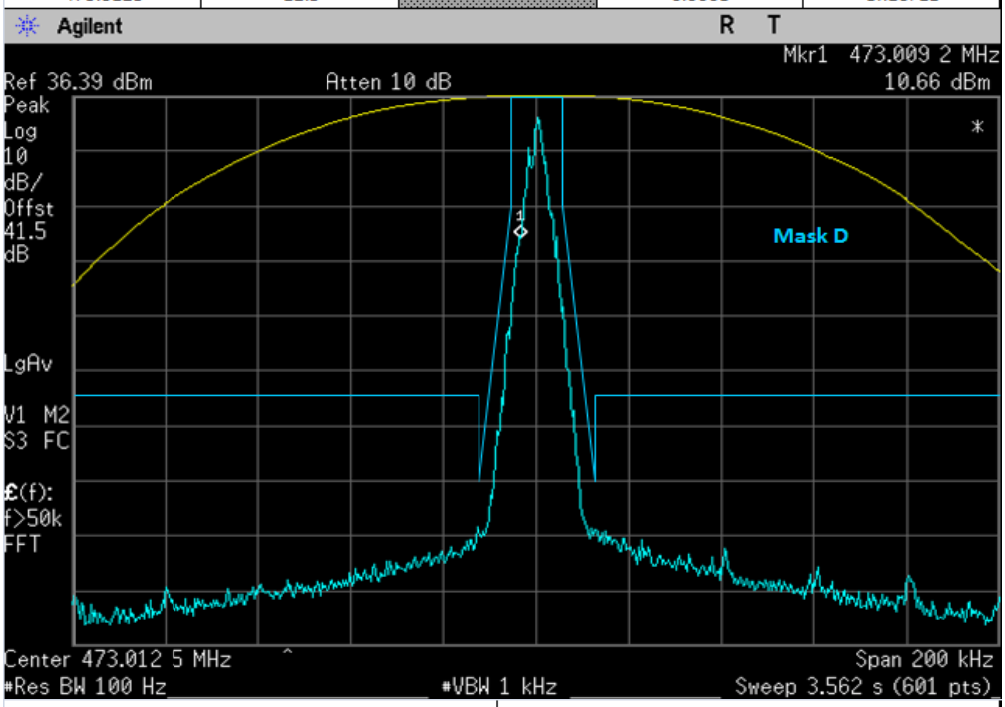
Modulation			Rules Part	
Digital Data			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
511.9875	12.5		**7.9804**	**8K10F1D**



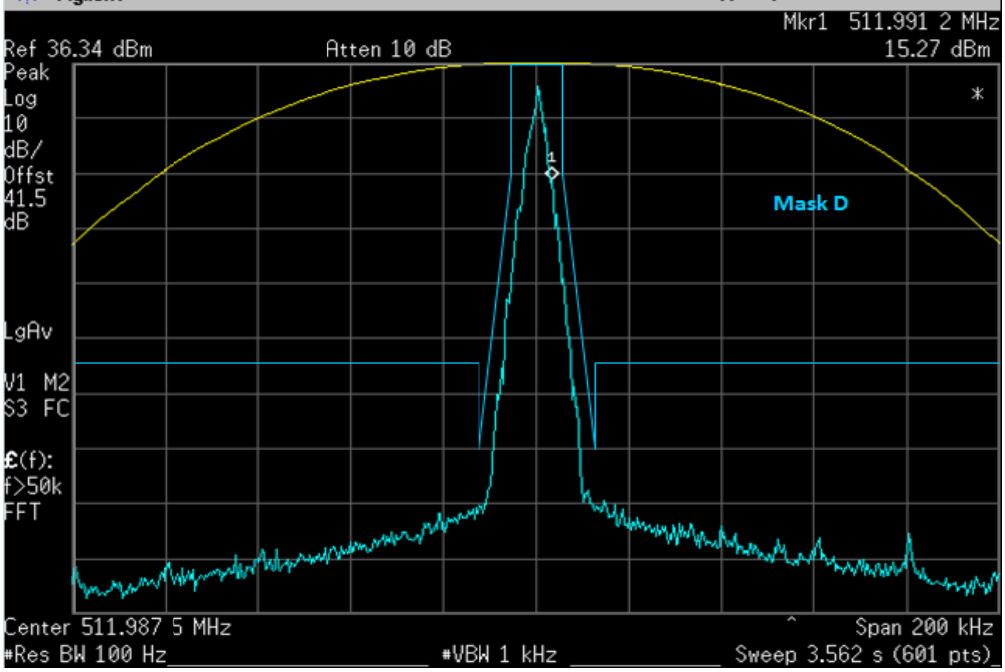
Modulation			Rules Part	
Digital Voice			90.210,74.462(c),RSS119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.0250	12.5		6.2579	8K10F1E



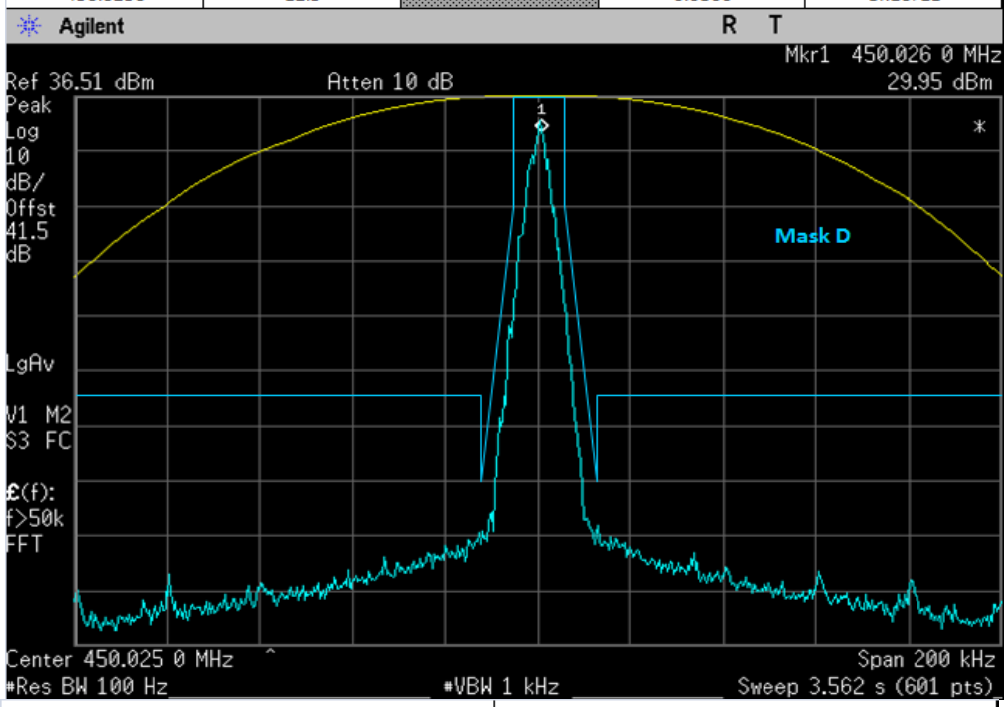
Modulation	Rules Part			
Digital Voice	90.210			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
473.0125	12.5		6.6668	8K10F1E



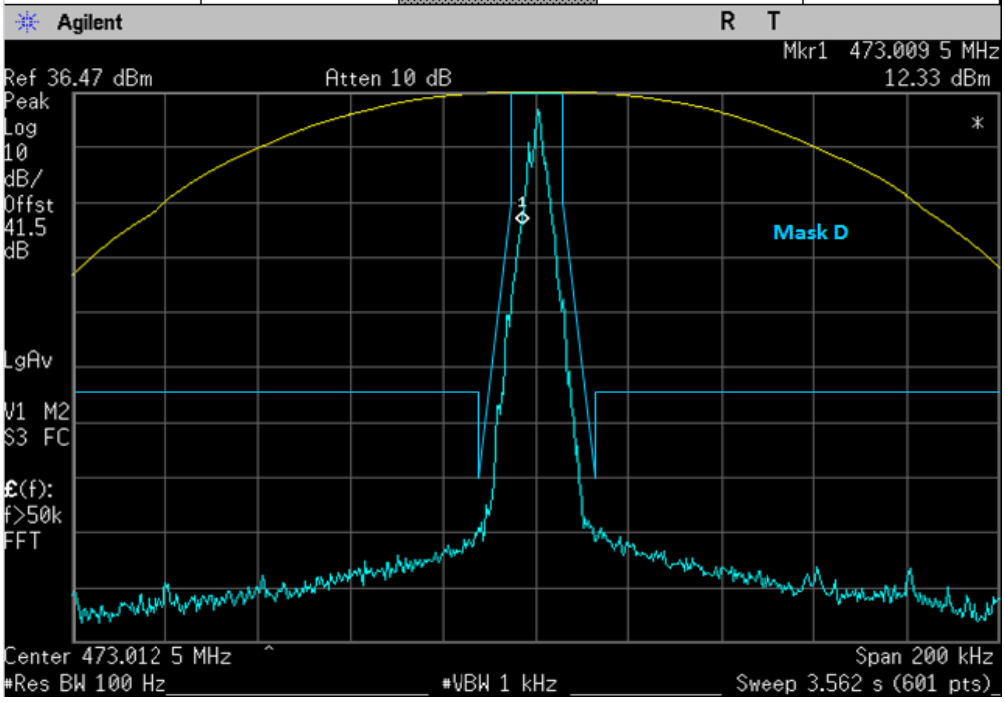
Modulation	Rules Part			
Digital Voice	90.210			
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
511.9875	12.5		6.0022	8K10F1E



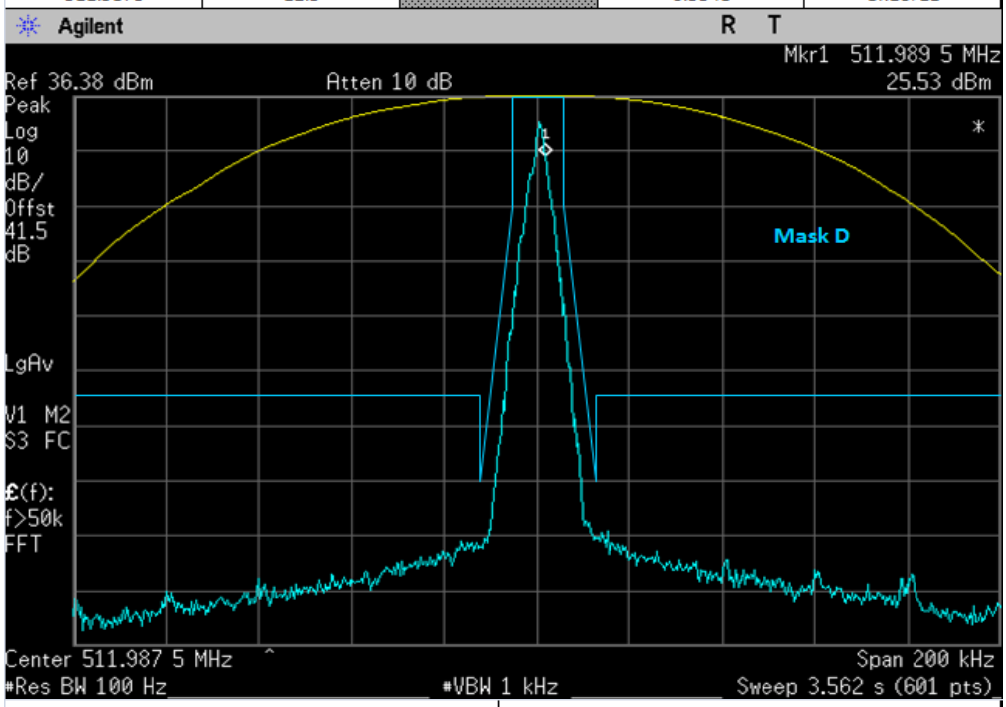
Modulation			Rules Part	
Digital Voice Encryption			90.210,74.462(c),RSS119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.0250	12.5		6.6866	8K10F1E



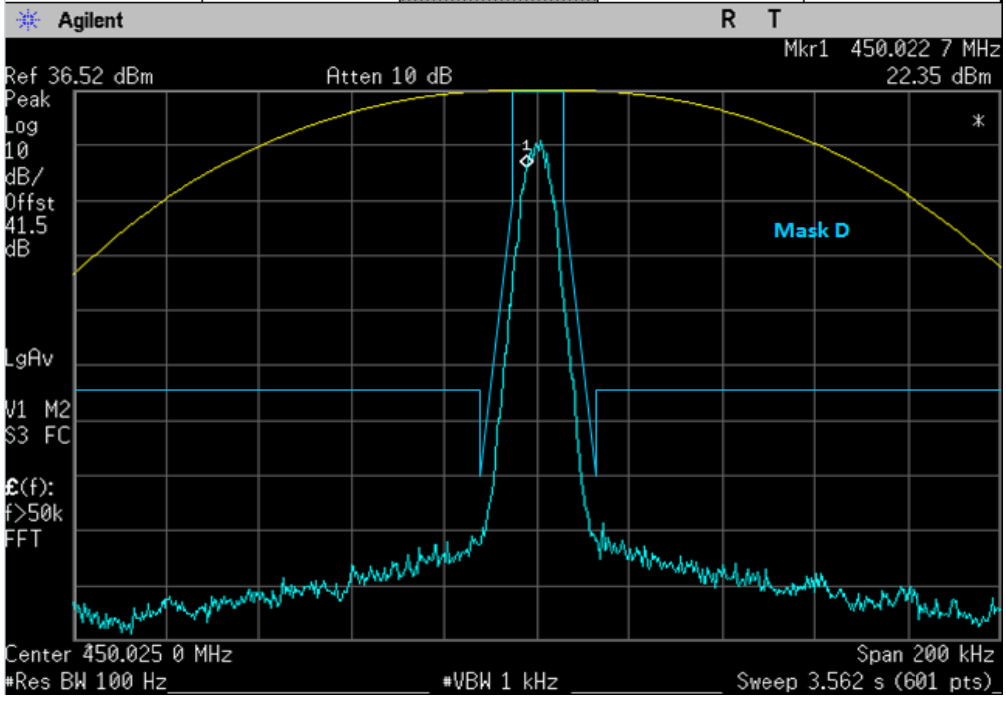
Modulation			Rules Part	
Digital Voice Encryption			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
473.0125	12.5		6.7127	8K10F1E



Modulation			Rules Part	
Digital Voice Encryption			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
511.9875	12.5		6.5548	8K10F1E

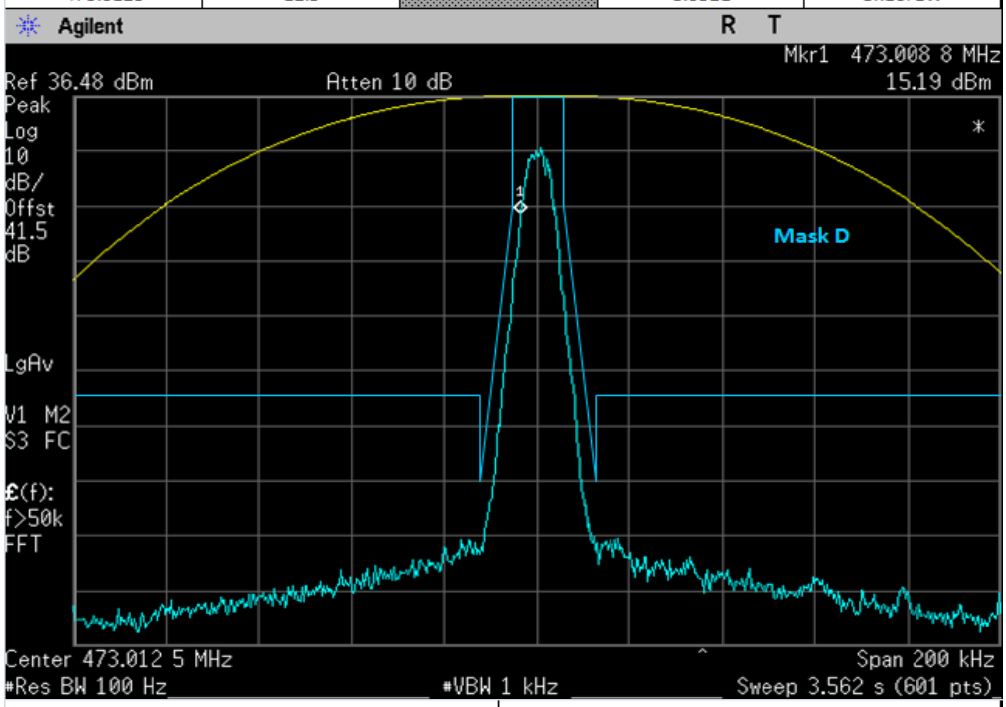


Modulation			Rules Part	
Phase II			90.210,74.462(c),RSS119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
450.0250	12.5		7.6068	8K10F1W



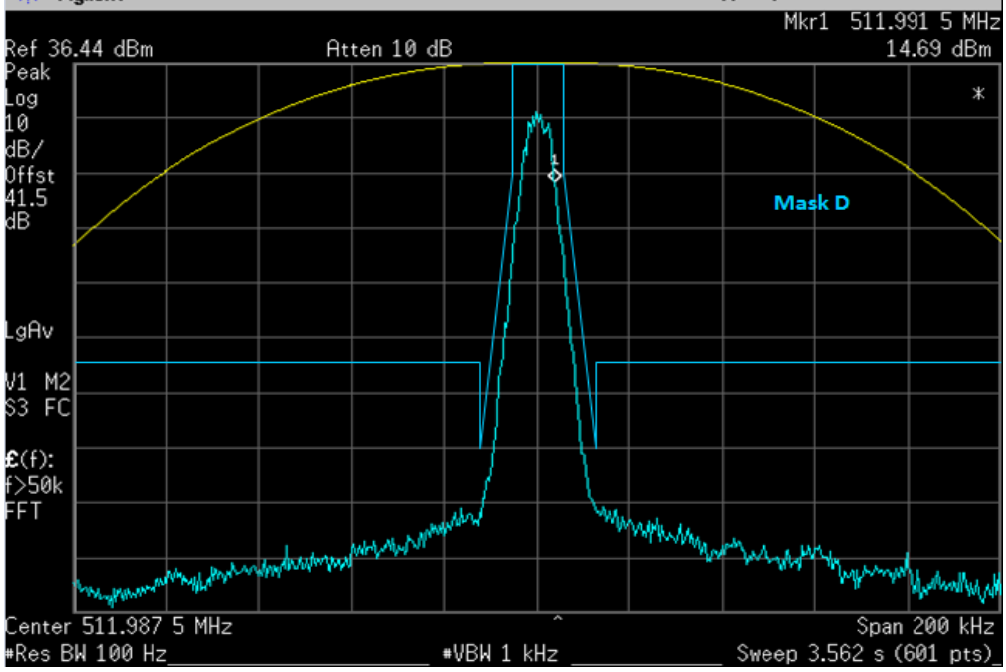
Modulation	Rules Part
Phase II	90.210

Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
473.0125	12.5	8.0521	8K10F1W

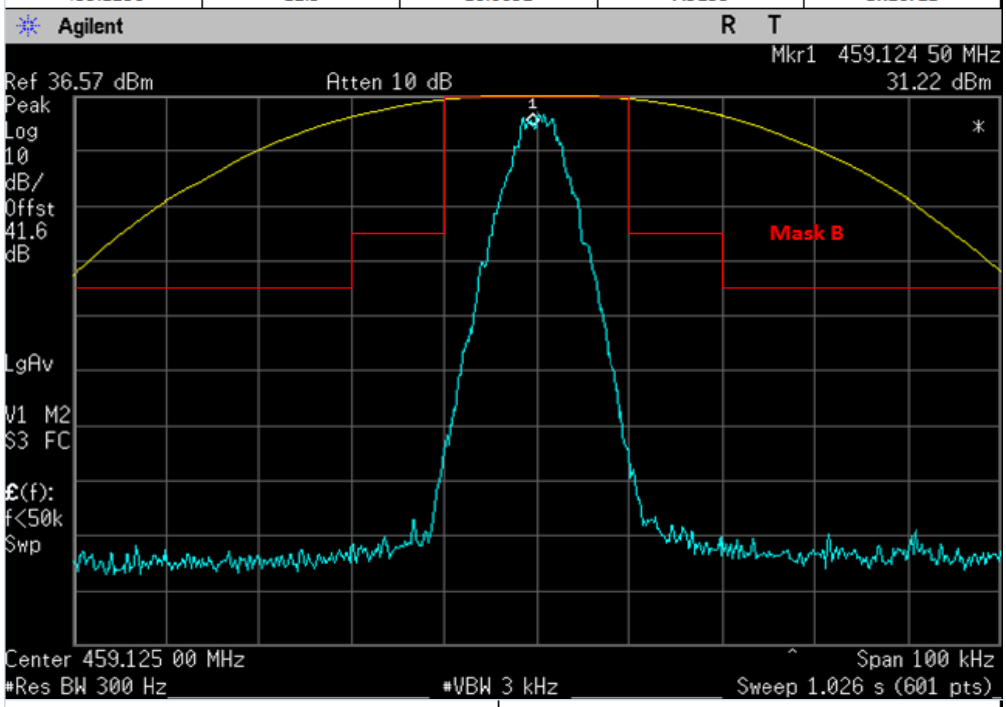


Modulation	Rules Part
Phase II	90.210

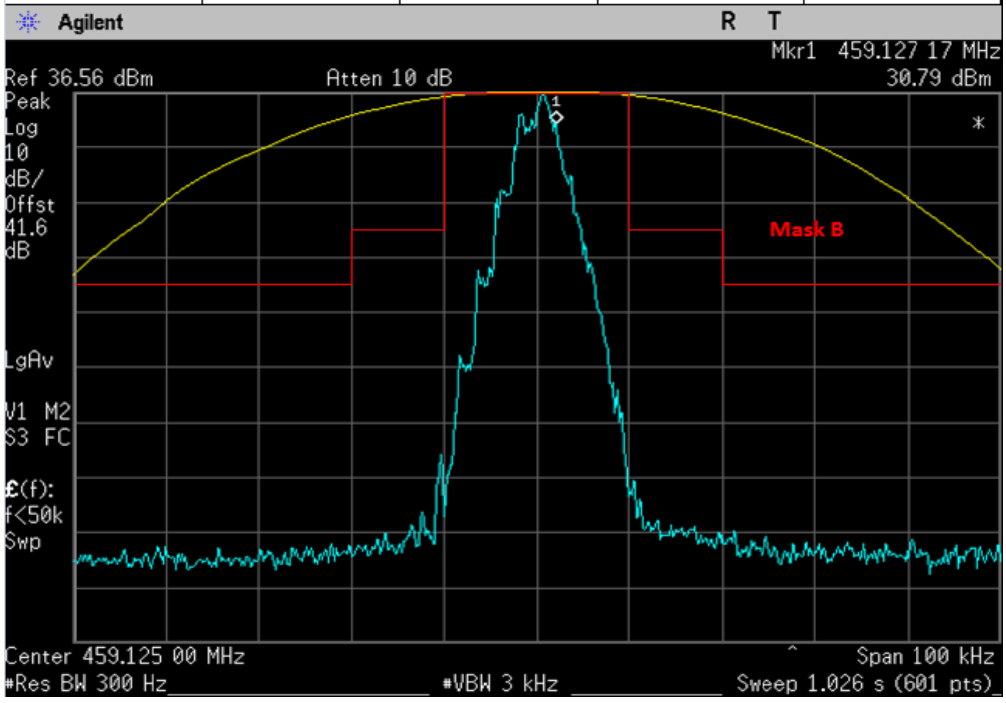
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
511.9875	12.5	8.0973	8K10F1W



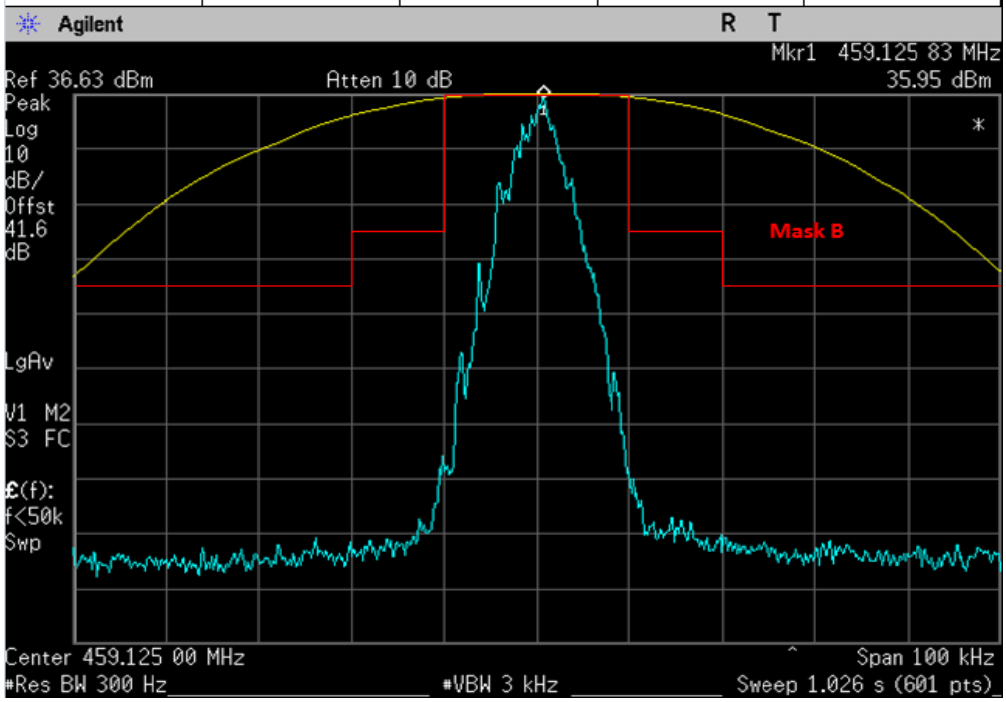
Modulation		Rules Part		
Digital Data		FCC Part 22.359(b)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	12.5	10.6692	**7.9199**	**8K10F1D**



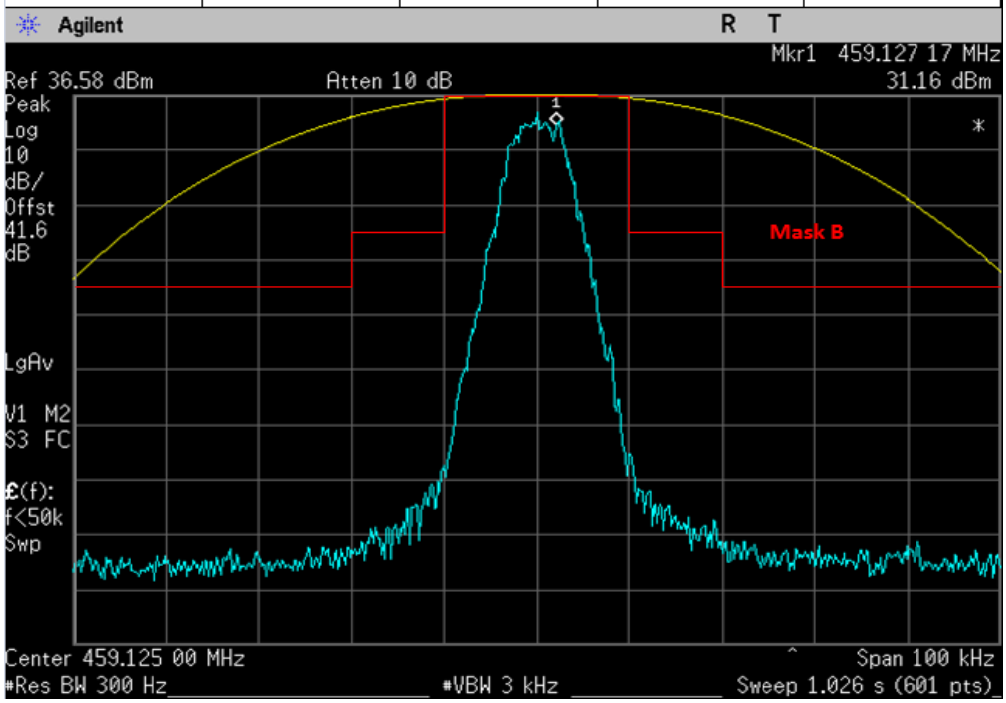
Modulation		Rules Part		
Digital Voice		FCC Part 22.359(b)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	12.5	7.8858	6.5490	8K10F1E



Modulation		Rules Part		
Digital Voice Encyption		FCC Part 22.359(b)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	12.5	8.2749	6.2164	8K10F1E



Modulation		Rules Part		
Phase II		FCC Part 22.359(b)		
Channel Frequency (MHz)	**Channel Spacing (kHz)**	**-26 dB Point (kHz)**	**99% OCB (kHz)**	**Emission Designator**
459.1250	12.5	10.0790	7.9331	8K10F1W

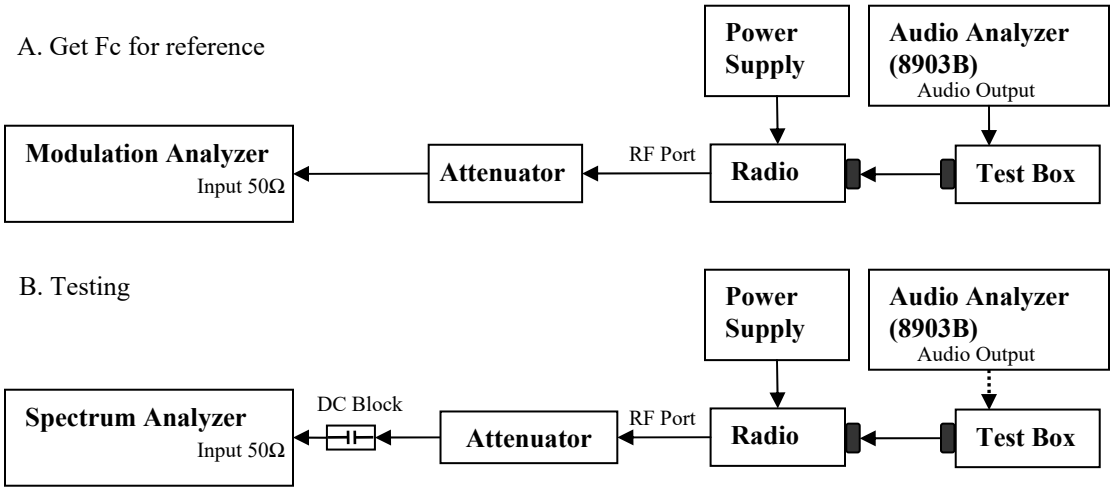


7.6.5. Test Limit

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.

7.7. Band Edge Conducted Spurious Emission (Part 22)

7.7.1. 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) 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% and 26dB Emissions Bandwidth Measurement.
6) Key in the Fc and Resolution Bandwidth.
7) Transmit the DUT and record the occupied Bandwidth frequencies.
8) Preset the spectrum analyzer for band edge measurement.
9) The band edges of lowest and highest channels were measured.
10) Key in the Lowest and highest channel frequency, span is 60 kHz and Resolution Bandwidth is at least 1% of Emission Bandwidth.
11) Save the screen shot as modulated signal.
12) Remove the audio tone from audio analyzer to capture unmodulated signal.

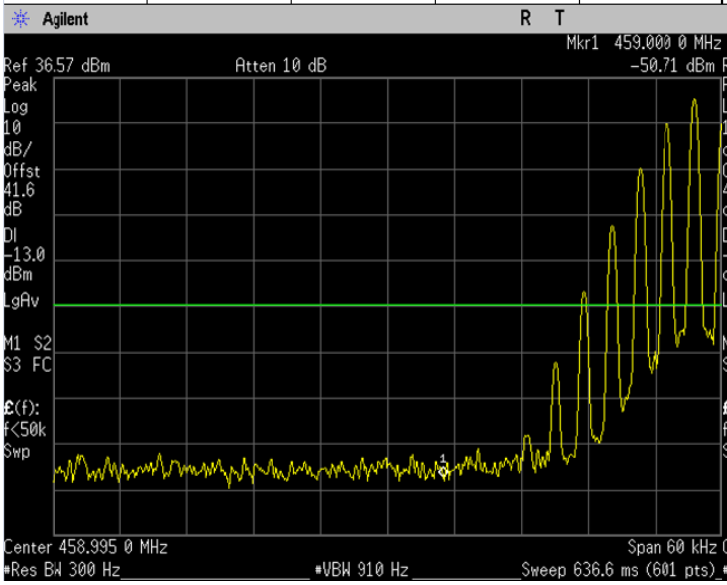
*Note:
- For emission designator ending with F3E, 16K0F3E is the worst case and therefore only 16K0F3E will be shown.

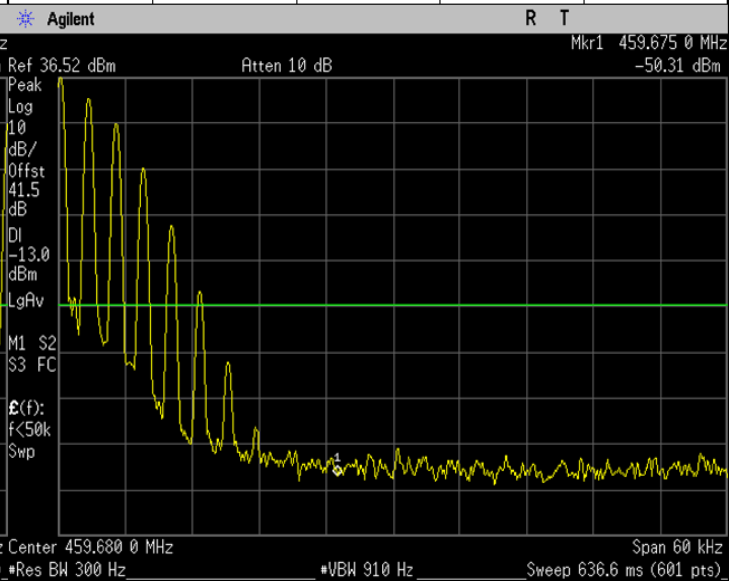
7.7.2. Test Result (Analog)

Max Power

Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
459.0250	25.0	15.5564	15.0303	16K0F3E

Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
459.6500	25.0	15.5623	15.0290	16K0F3E

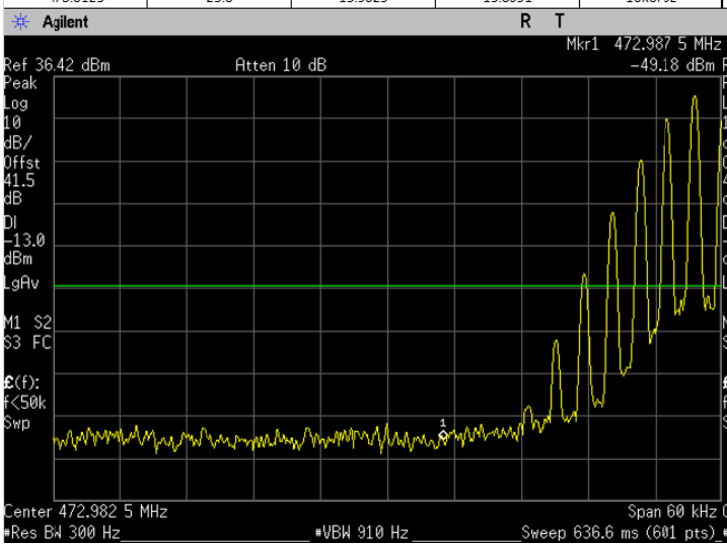


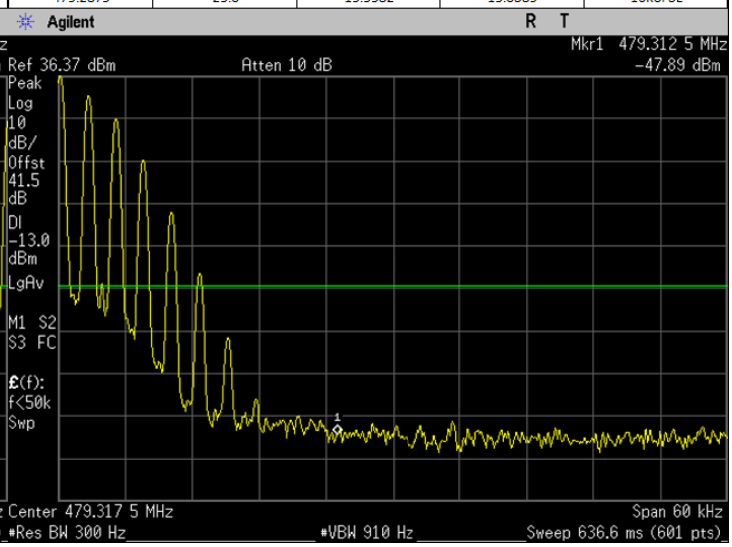


Max Power

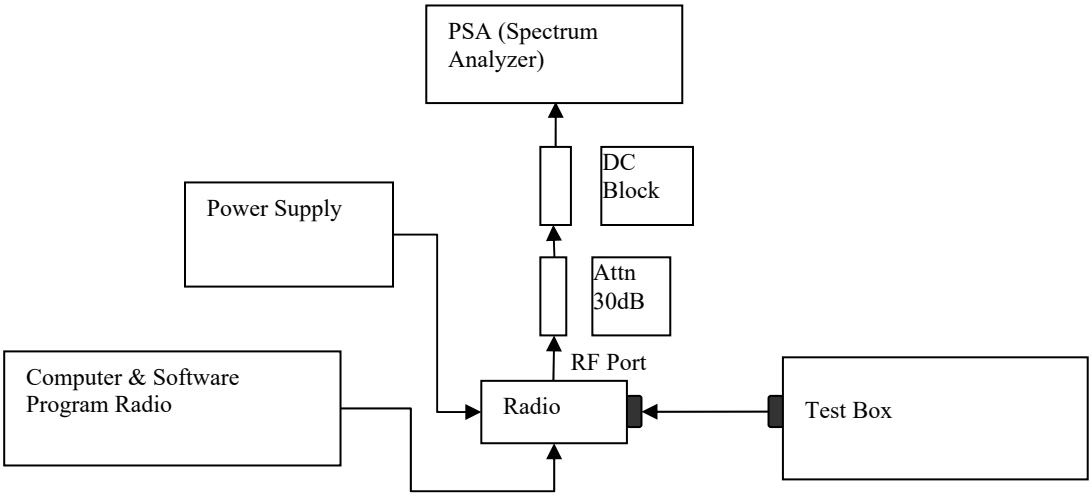
Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
473.0125	25.0	15.5629	15.0391	16K0F3E

Modulation	Rules Part			
Analog Voice	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
479.2875	25.0	15.5582	15.0389	16K0F3E





7.7.3. 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 Resolution Bandwidth.
5) Transmit radio record the occupied Bandwidth frequencies.
6) Preset the spectrum analyzer for band edge measurement.
7) Key in the lowest and highest channels frequency, span is 60 kHz and Resolution Bandwidth is at least 1% of Emission Bandwidth.
8) Save the screen shot.

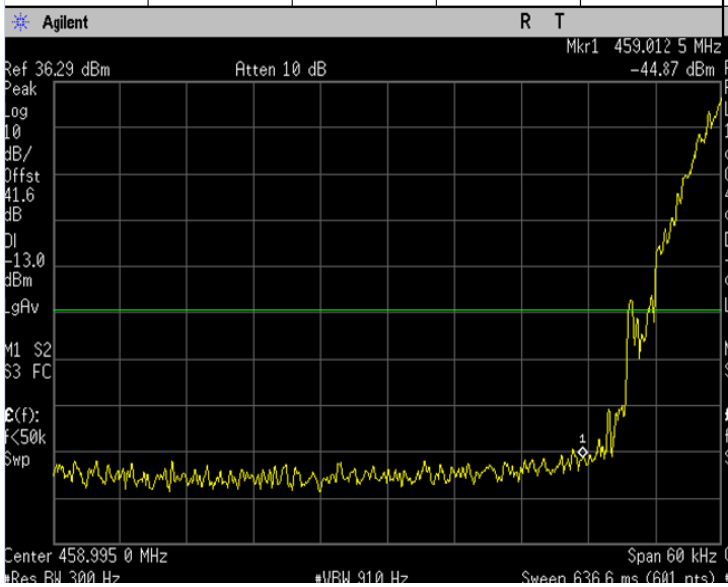
*Note:

- All digital modulation modes utilize the same high deviation test pattern, and they are therefore identical. Hence, only one plot per digital modulation scheme is shown

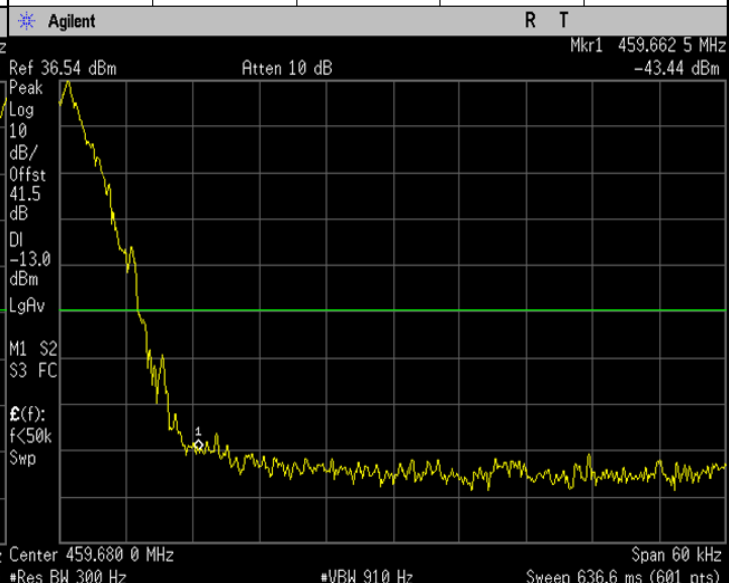
7.7.4. Test Result (Digital)

Max Power

Modulation	Rules Part			
Digital Data	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
459.0250	12.5	8.0920	6.5494	8K10F1D

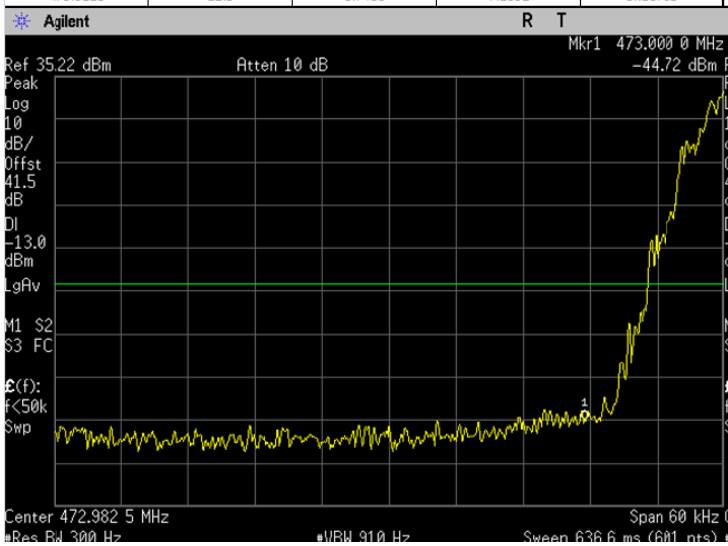


Modulation	Rules Part			
Digital Data	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
459.6500	12.5	8.8966	7.2789	8K10F1D

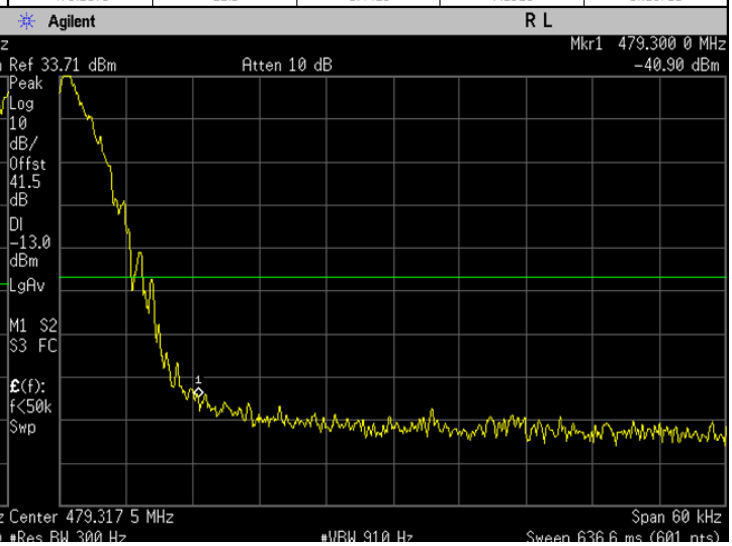


Max Power

Modulation	Rules Part			
Digital Data	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
473.0125	12.5	8.7483	7.1352	8K10F1D

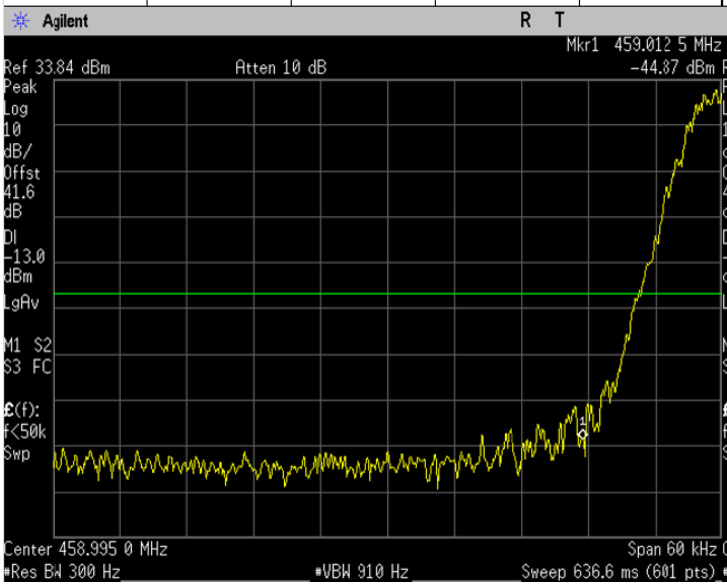


Modulation	Rules Part			
Digital Data	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
479.2875	12.5	8.4429	7.1923	8K10F1D

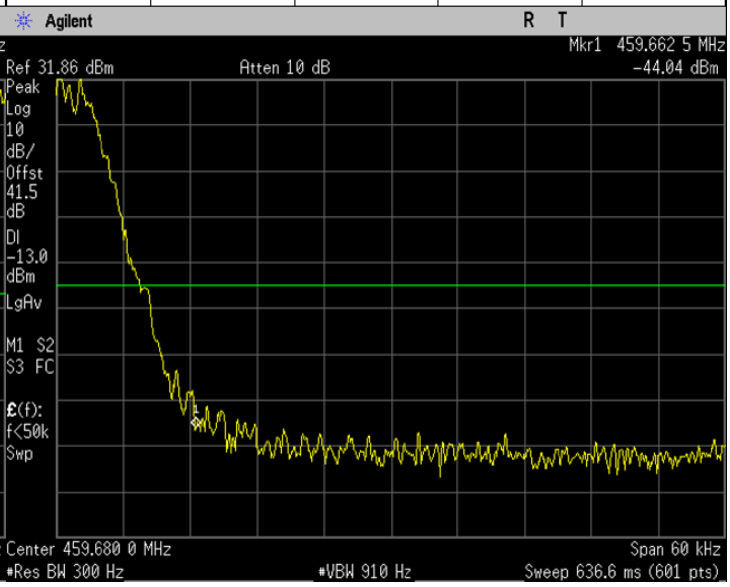


Max Power

Modulation	Rules Part			
Phase II	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
459.0250	12.5	10.3015	8.0530	8K10F1W

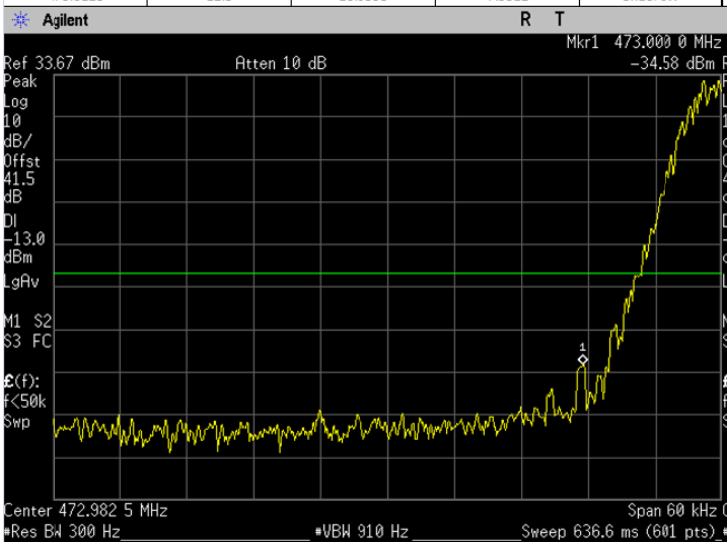


Modulation	Rules Part			
Phase II	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
459.6500	12.5	10.5231	7.9912	8K10F1W

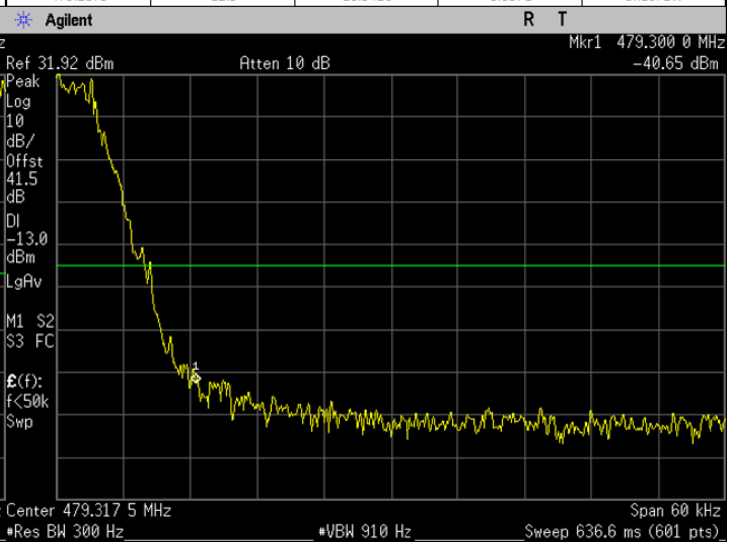


Max Power

Modulation	Rules Part			
Phase II	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
473.0125	12.5	10.3595	7.9912	8K10F1W



Modulation	Rules Part			
Phase II	FCC Part 22.359(b)			
Channel Frequency	**Channel Spacing**	**-26 dB Point (kHz)**	**99% OCB**	**Emission Designator**
479.2875	12.5	10.3426	8.0371	8K10F1W

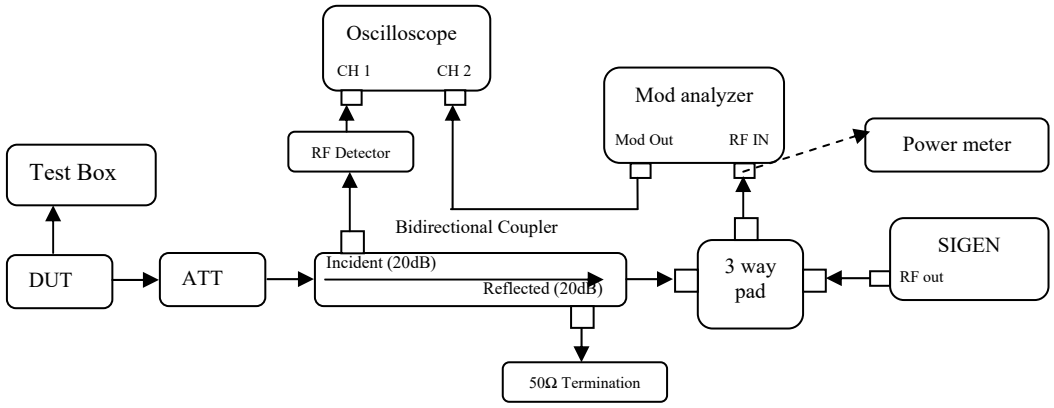


7.7.5. Test Limit

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.

7.8. Transient Frequency Behavior

7.8.1. Test Setup

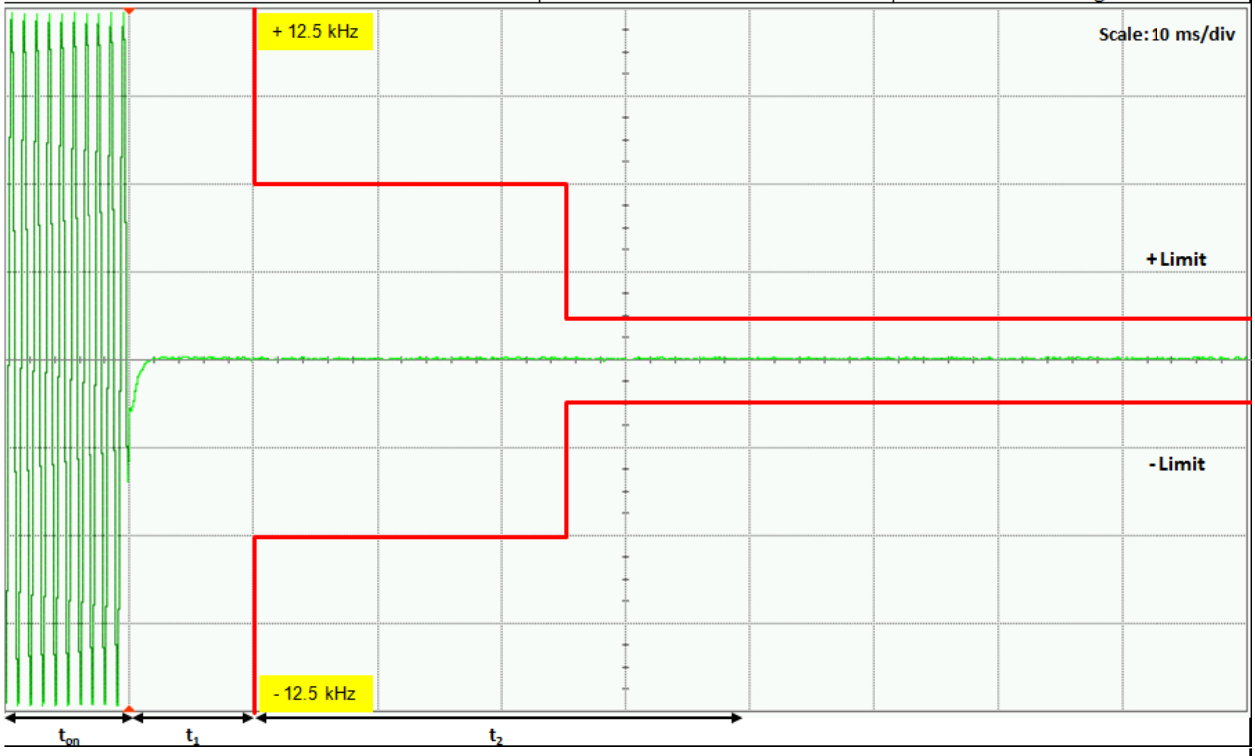


1) Connect the setup as figure above.
2) Path loss for the measurement included.
3) Set on Sigen with the assigned center frequency, internal 1 kHz FM tone.
   FM Deviation: Analog 25kHz Channel Spacing = 25 kHz
   Analog 12.5 kHz Channel Spacing = 12.5 kHz
   C4FM = 12.5 kHz
4) Turn on 50 kHz high pass 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 DUT is keying up.
6) Note the power level on power meter and dekey the DUT.
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) Reduce 30dB attenuation and transmit the radio to get the trigger line.
10) Capture the screen shot for key-up (rising edge) and de-key (falling edge) mode.

7.8.2. Test Result

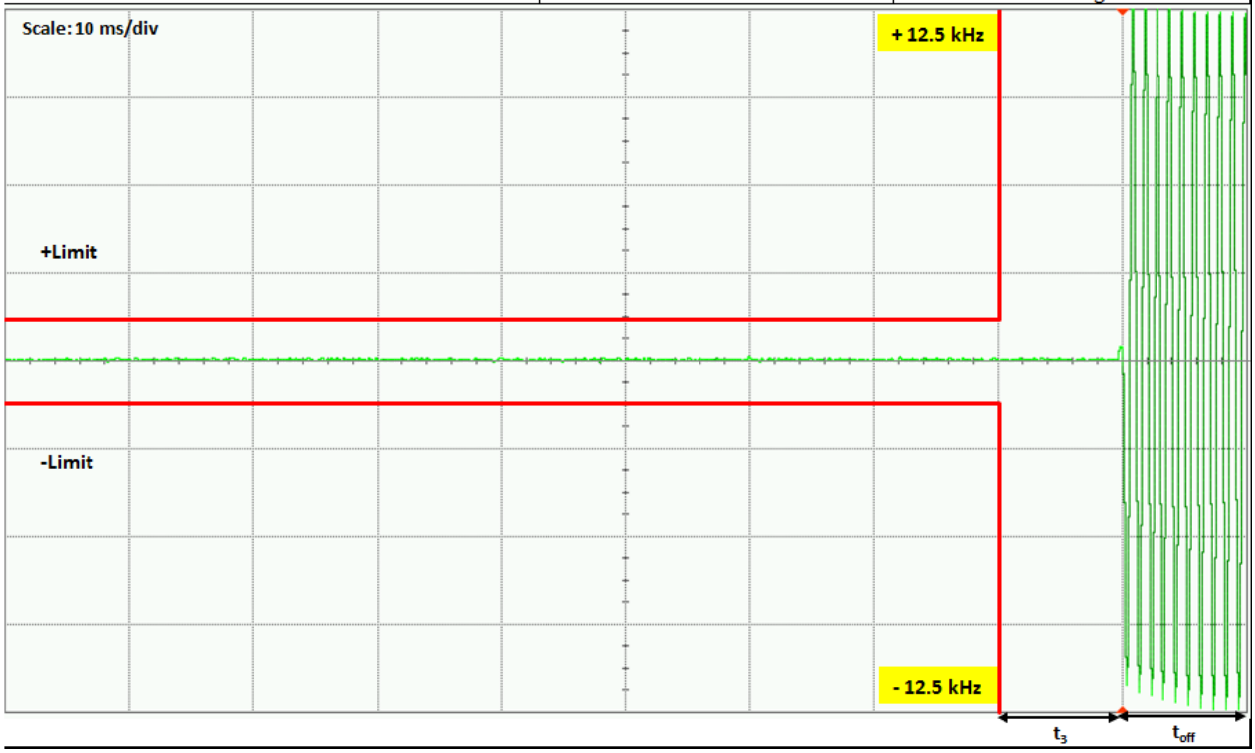
Switch On Condition $t_{on,}$ t_1 and t_2

Channel Frequency (MHz)	Channel Spacing (kHz)	Mode
467.7750	25.0	Analog



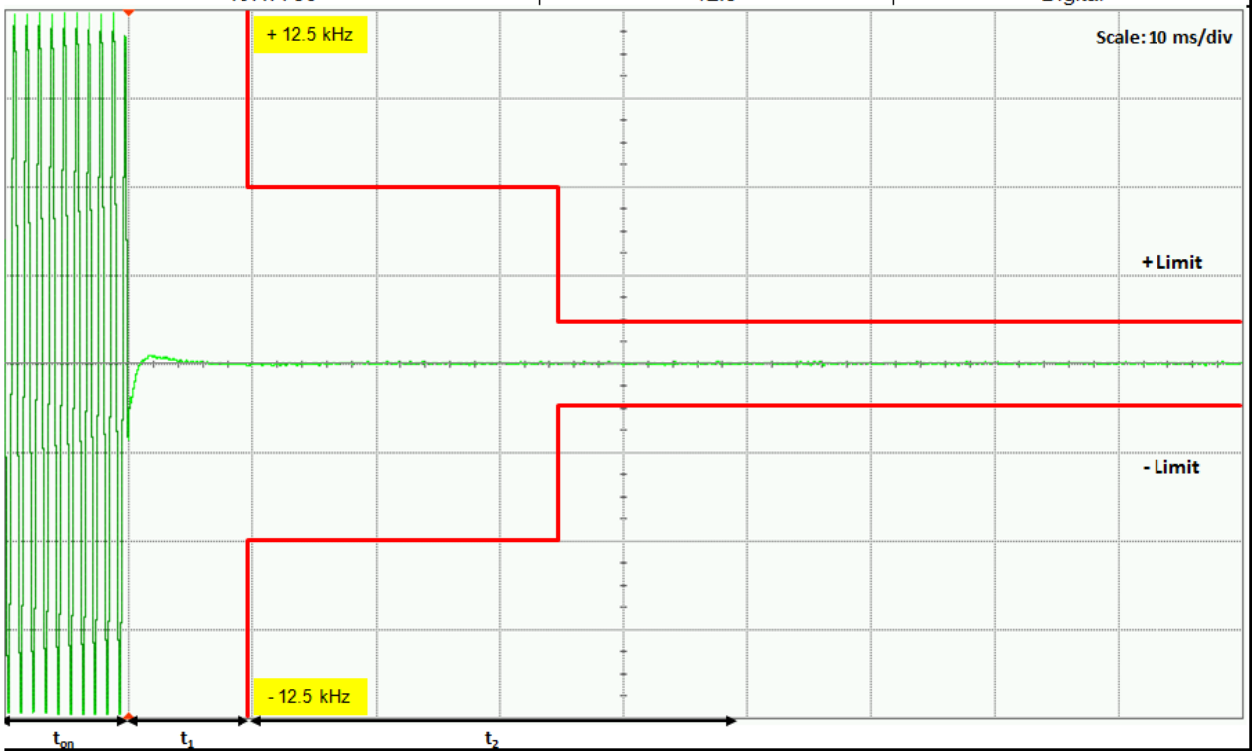
Switch Off Condition t_3 t_{off}

Channel Frequency (MHz)	Channel Spacing (kHz)	Mode
467.7750	25.0	Analog



Switch On Condition t_{on}, t_1 and t_2

Channel Frequency (MHz)	Channel Spacing (kHz)	Mode
467.7750	12.5	Digital



Not for FCC Review

Switch Off Condition t_3 t_{off}

Channel Frequency (MHz)	Channel Spacing (kHz)	Mode
467.7750	12.5	Digital

Not for FCC Review

7.8.3. 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.

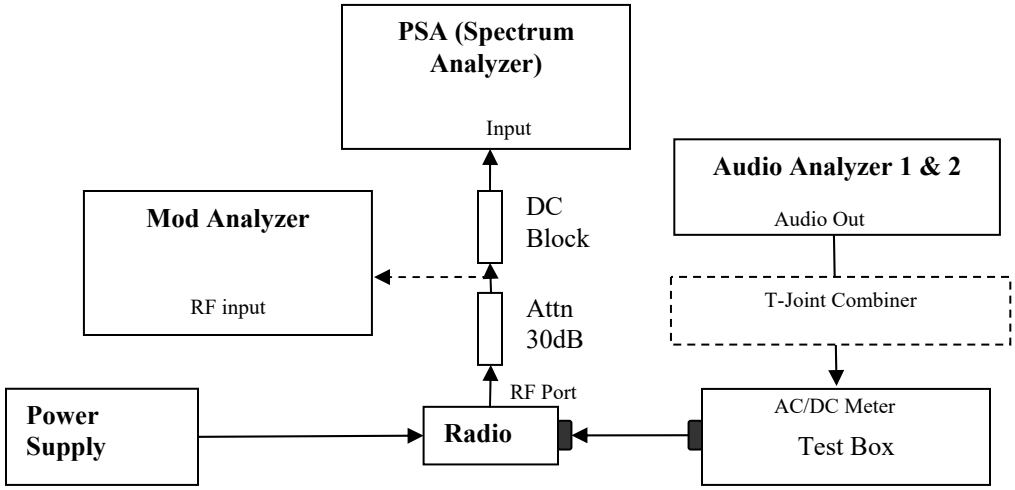
[2] During the time from the end of t_2 to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.

[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.

7.9. Adjacent Channel Power

7.9.1. Test Setup (Analog)

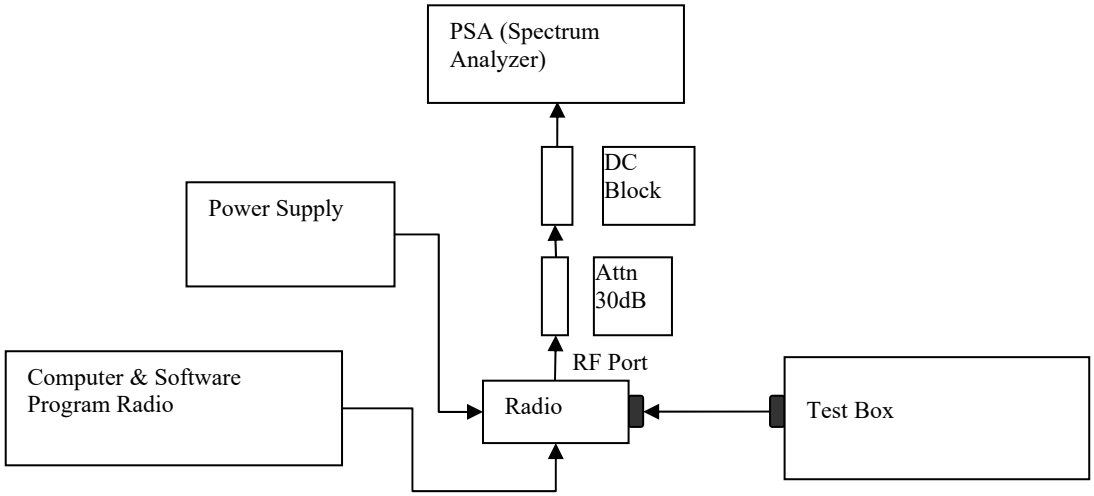


1) The DUT transmitter output port was connected to modulation analyzer.
2) Transmit the radio and turn on 1st audio analyzer with audio frequency 650Hz, 50% rated deviation, and record the amplitude value as AmpT1.
3) Turn off Audio analyzer 1 and turn on audio analyzer 2, set the audio frequency to 2.2 kHz and 50% deviation. Record the amplitude as AmpT2.
4) Turn both audio analyzers ON and up 10dB amplitude level.
5) Connect the output to PSA and set to assigned center frequency.
6) Set Span, Resolution Bandwidth and Video Bandwidth per rules part.
7) Transmit the radio and record the Adjacent Channel Power value in dBc.

7.9.2. Test Result(Analog)

NA → Not Applicable

7.9.3. 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) Prepare setup as per picture.
3) Turn on the ACP Measurement – Press Measure, ACP.
4) Set Span, Resolution Bandwidth and Video Bandwidth as per rules part.
5) Transmit the radio and record the Adjacent Channel Power value in dBc.

7.9.4. Test Result (Digital)

NA → Not Applicable

7.9.5. 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

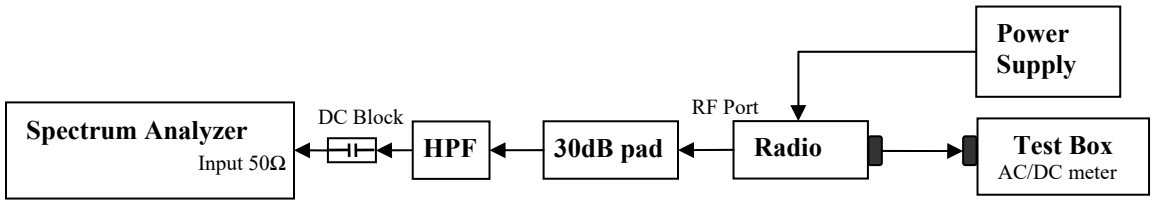
Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP (dBc)
9.375	6.25	−40
15.625	6.25	−60
21.875	6.25	−60
37.5	25	−60
62.5	25	−65
87.5	25	−65
150	100	−65
250	100	−65
350.00	100	−65
>400 kHz to 12 MHz	30 (s)	−80
12 MHz to paired receive band	30 (s)	−80
In the paired receive band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

7.10. Conducted Spurious Emission

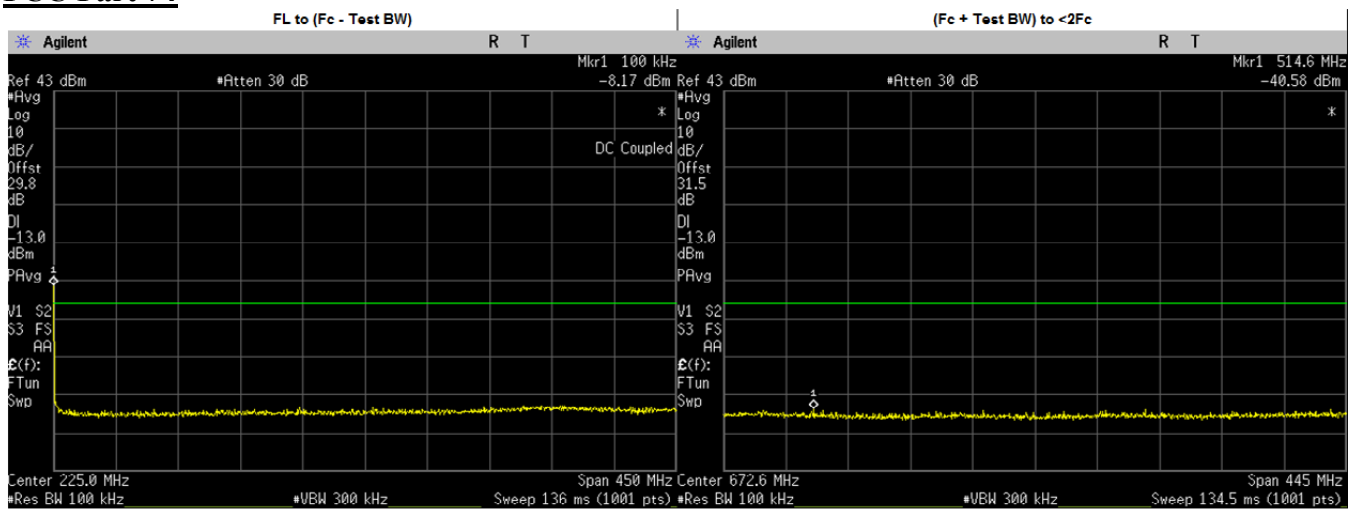
7.10.1. Test Setup

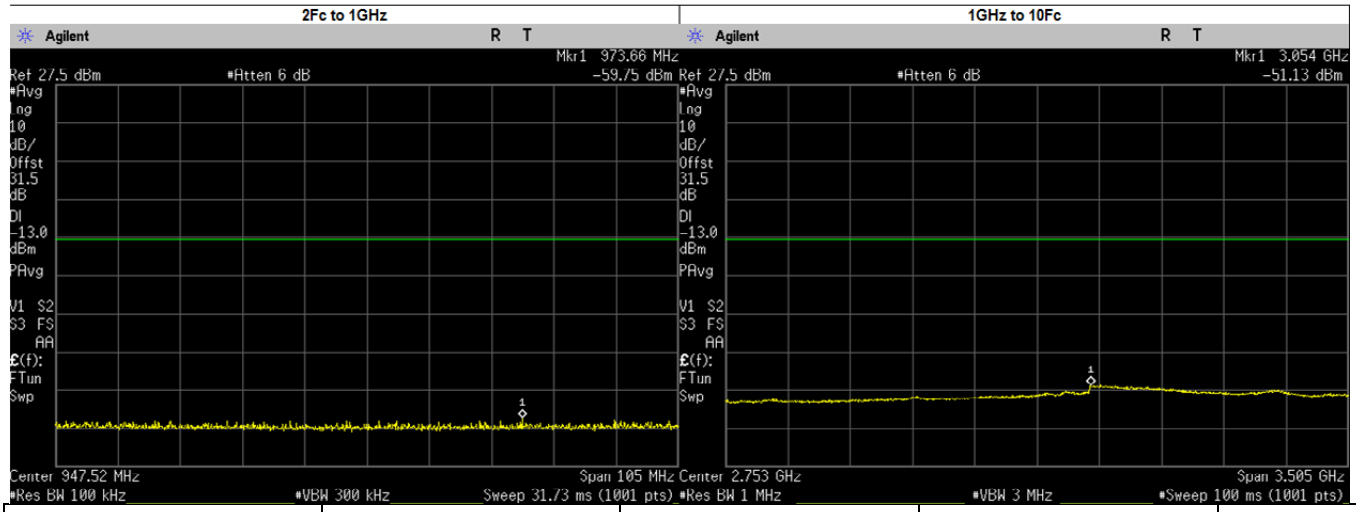


1) The DUT transmitter output port was connected to Spectrum Analyzer with above setup.
2) Program and set radio to operate in desire test frequency and mode. (Analog / digital modulation form).
3) Path loss for the measurement included.
4) Set the PSA Resolution Bandwidth as per rules part.
5) Set the Ref offset from the pathloss offset calibration file.
6) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:
    a. 9 KHz to Fc – Test Bandwidth
    b. Fc + Test Bandwidth to 2Fc – 5MHz.
7) Key up the DUT, Peak Search the highest Spur and record the levels of spurious emissions
8) Dekey the DUT.
9) Turn On High Pass Filter path and Key up the DUT.
10) Adjust the PSA Freq for incremental coverage of range from 2Fc to 10Fc
11) Key up the DUT and record the highest spur levels of spurious emissions.

7.10.2. Test Result (Analog)

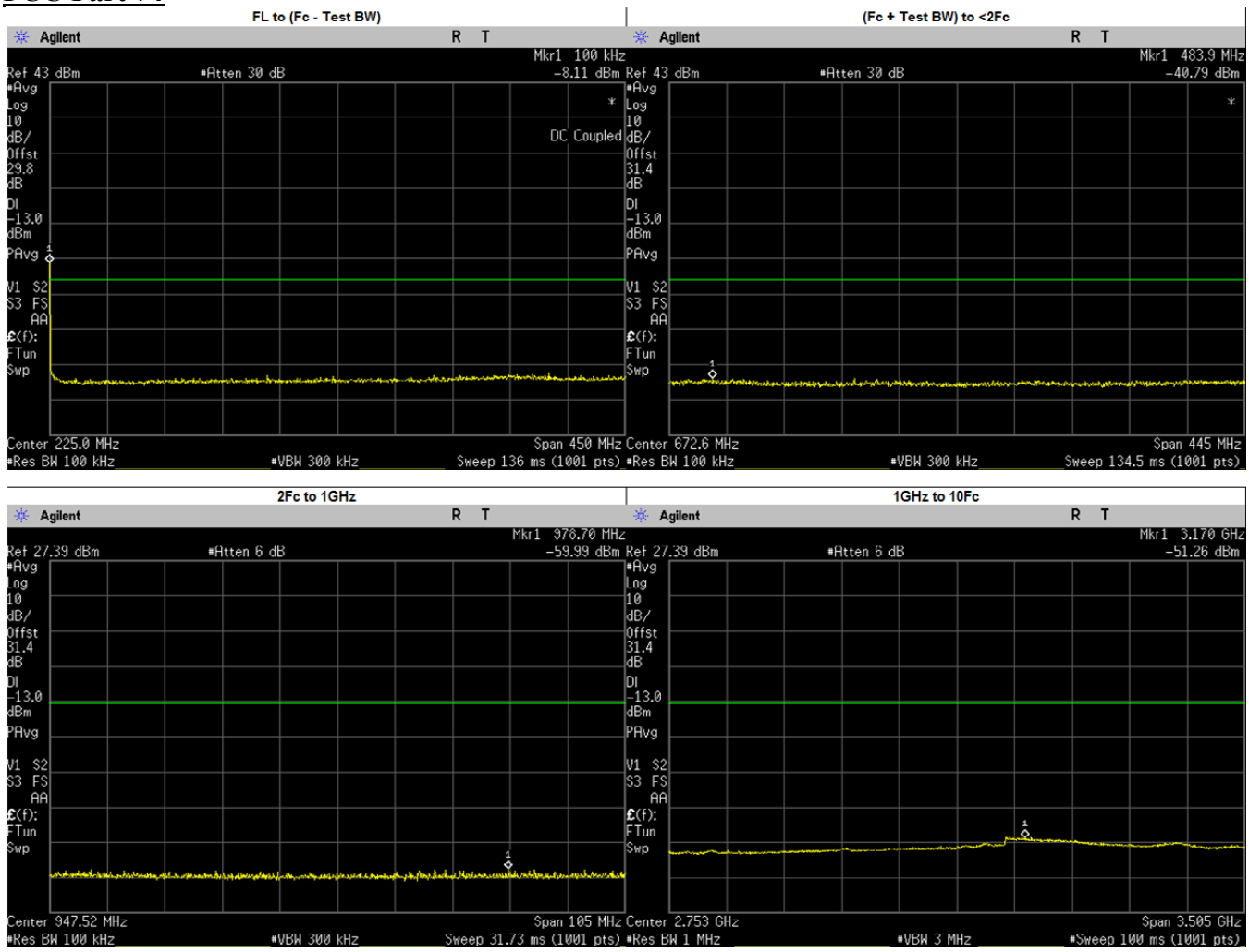
Analog: 450.025 MHz, 25.0kHz Channel Spacing, Max Power
FCC Part 74





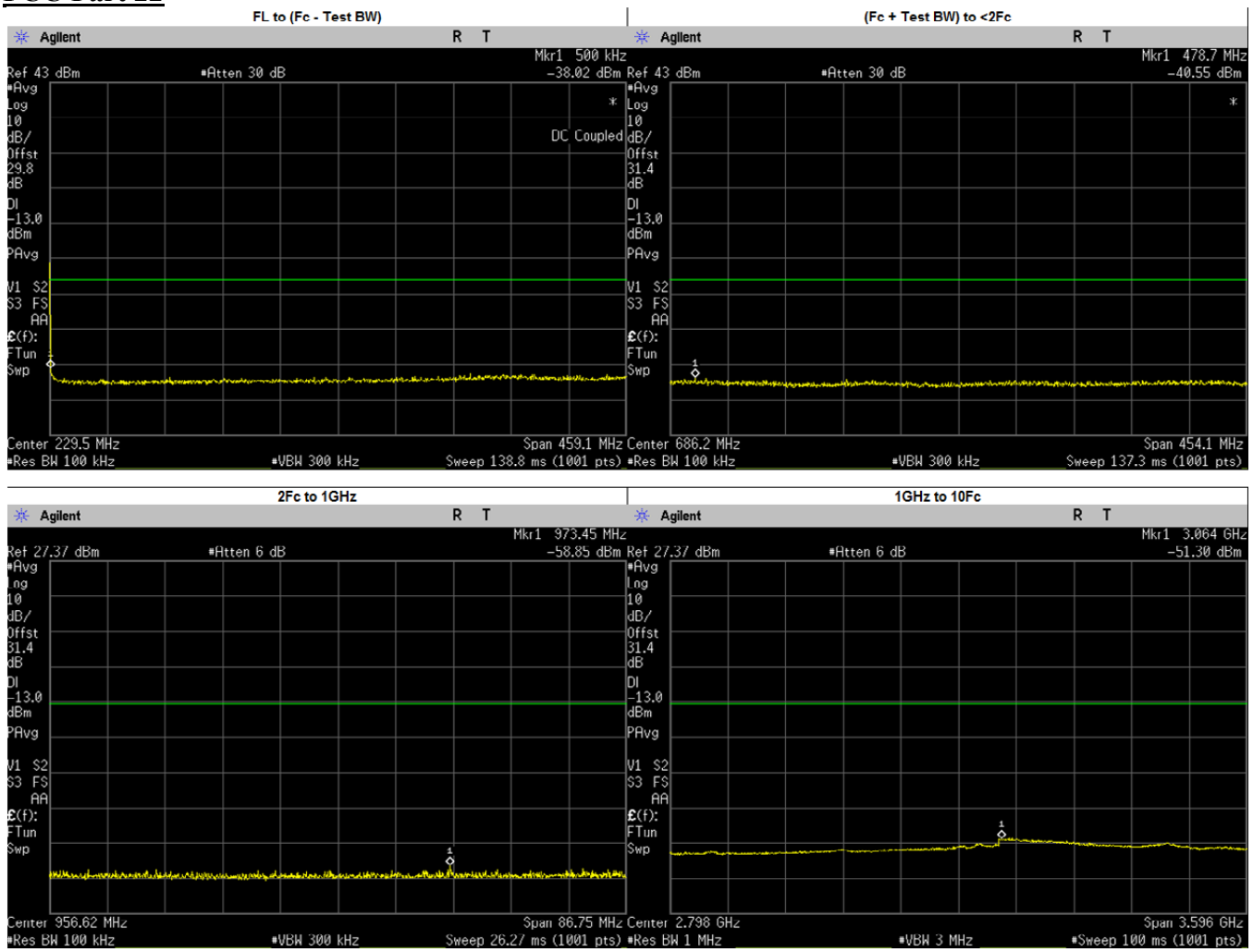
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.3589	-38.7100	-13	PASS
(Fc + Test BW) to <2Fc	514.6022	-40.5800	-13	PASS
2Fc to 1GHz	973.6576	-59.7500	-13	PASS
	900.0500	-60.9144	-13	PASS
1GHz to 10Fc	3054.0770	-51.1300	-13	PASS
	1350.0750	-55.5316	-13	PASS
	1800.1000	-55.0575	-13	PASS
	2250.1250	-54.8091	-13	PASS
	2700.1500	-53.8924	-13	PASS
	3150.1750	-51.5883	-13	PASS
	3600.2000	-52.8948	-13	PASS
	4050.2250	-52.8651	-13	PASS
	4500.2500	-53.7987	-13	PASS

Analog: 450.025 MHz, 25.0kHz Channel Spacing, Low Power
FCC Part 74



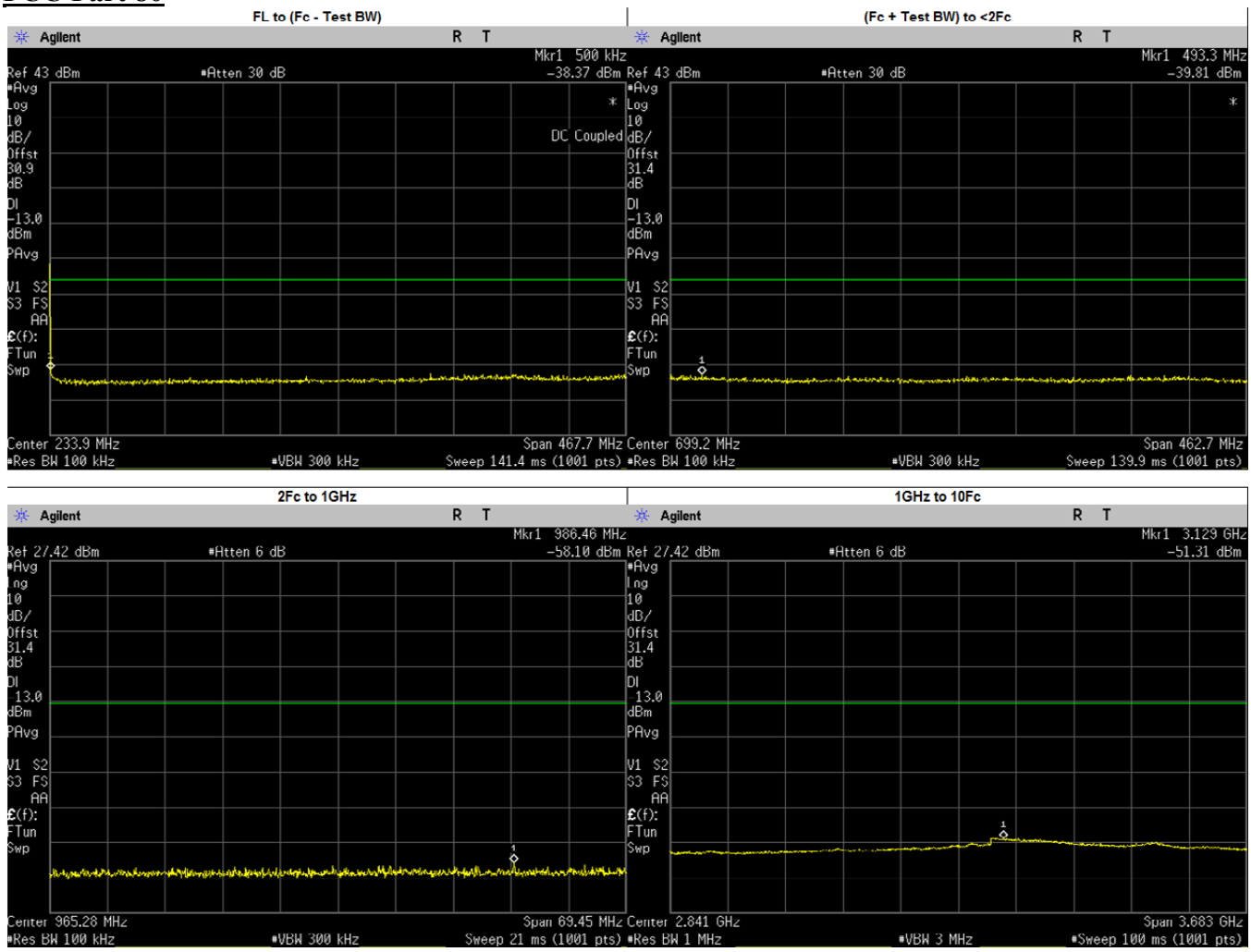
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	390.1236	-39.4400	-13	PASS
(Fc + Test BW) to <2Fc	483.8994	-40.7900	-13	PASS
2Fc to 1GHz	978.6952	-59.9900	-13	PASS
	900.0500	-61.6720	-13	PASS
1GHz to 10Fc	3169.7500	-51.2600	-13	PASS
	1350.0750	-55.5289	-13	PASS
	1800.1000	-55.2103	-13	PASS
	2250.1250	-54.8360	-13	PASS
	2700.1500	-53.9933	-13	PASS
	3150.1750	-51.4258	-13	PASS
	3600.2000	-52.8696	-13	PASS
	4050.2250	-52.7971	-13	PASS
	4500.2500	-53.8954	-13	PASS

Analog: 459.125 MHz, 25.0kHz Channel Spacing, Max Power
FCC Part 22



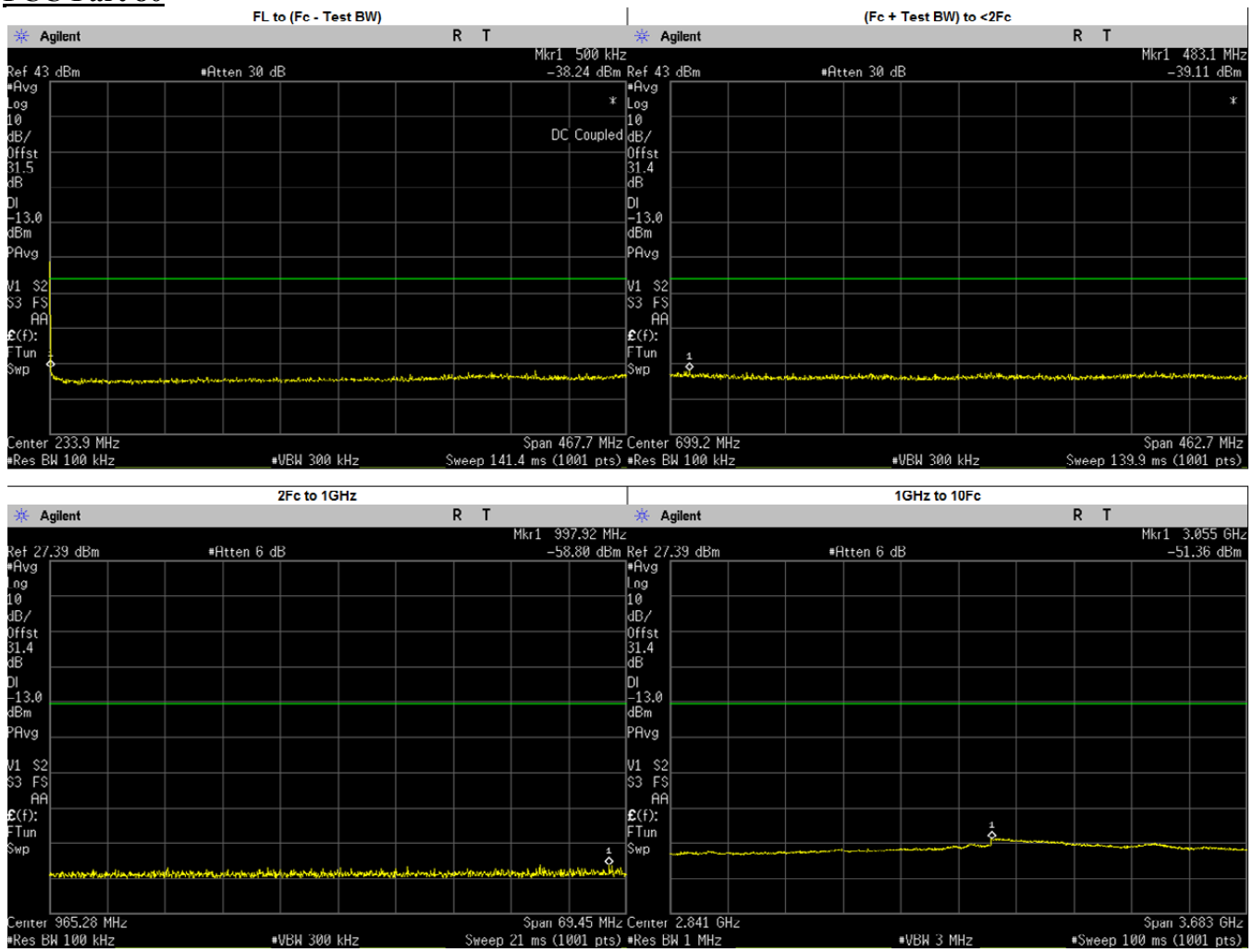
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	334.6632	-39.4000	-13	PASS
(Fc + Test BW) to <2Fc	478.7067	-40.5500	-13	PASS
2Fc to 1GHz	973.4545	-58.8500	-13	PASS
	918.2500	-62.4455	-13	PASS
1GHz to 10Fc	3064.2470	-51.3000	-13	PASS
	1377.3750	-55.5151	-13	PASS
	1836.5000	-55.0811	-13	PASS
	2295.6250	-54.7504	-13	PASS
	2754.7500	-54.0741	-13	PASS
	3213.8750	-51.8331	-13	PASS
	3673.0000	-53.2107	-13	PASS
	4132.1250	-52.9439	-13	PASS
	4591.2500	-54.1113	-13	PASS

Analog: 467.775 MHz, 25.0kHz Channel Spacing, Max Power
FCC Part 80



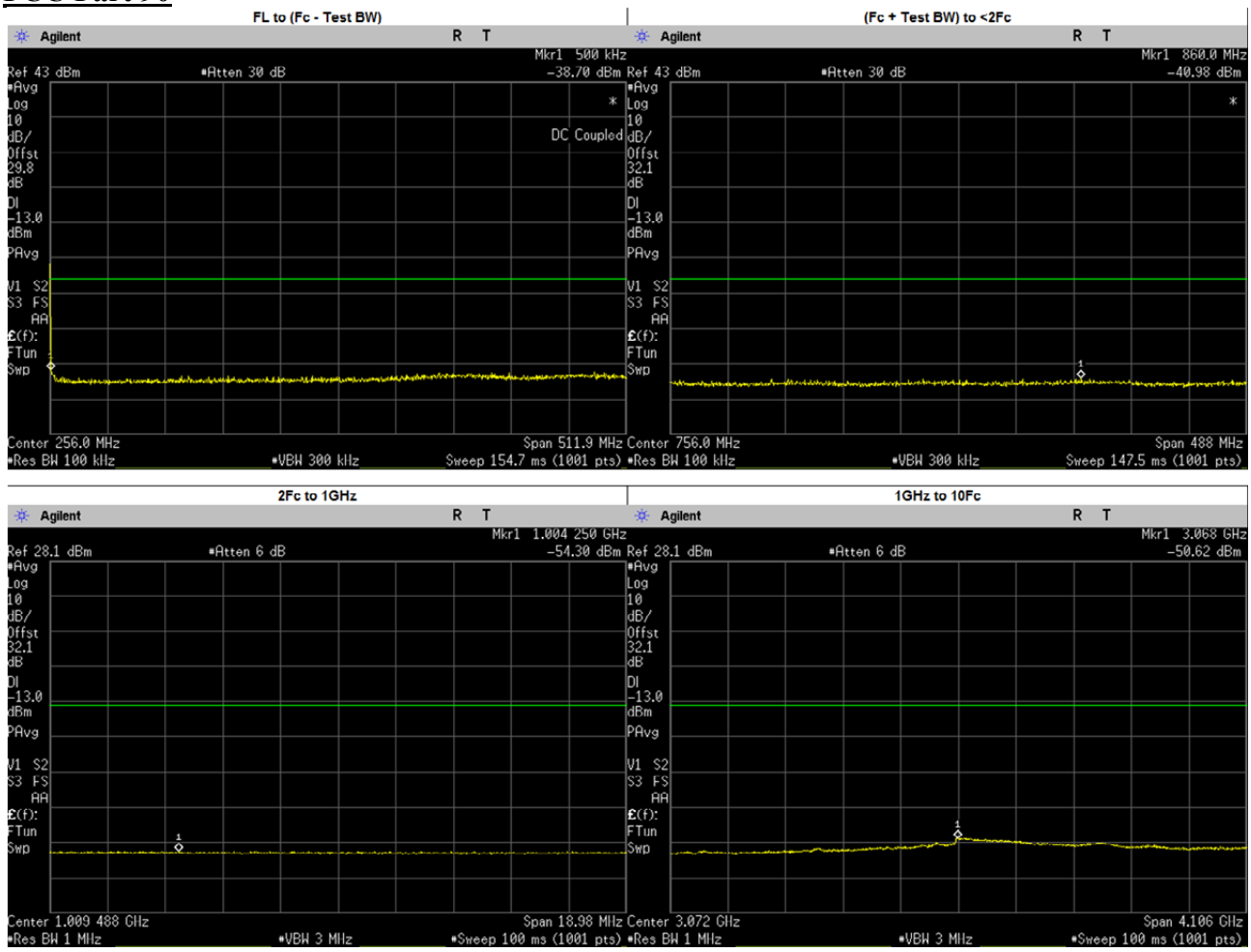
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	309.1648	-39.5600	-13	PASS
(Fc + Test BW) to <2Fc	493.2813	-39.8100	-13	PASS
2Fc to 1GHz	986.4573	-58.1000	-13	PASS
	935.5500	-61.1621	-13	PASS
1GHz to 10Fc	3128.6300	-51.3100	-13	PASS
	1403.3250	-55.5864	-13	PASS
	1871.1000	-55.2217	-13	PASS
	2338.8750	-54.5582	-13	PASS
	2806.6500	-53.5879	-13	PASS
	3274.4250	-52.1140	-13	PASS
	3742.2000	-53.1981	-13	PASS
	4209.9750	-53.6916	-13	PASS
	4677.7500	-54.4041	-13	PASS

Analog: 467.775 MHz, 25.0kHz Channel Spacing, Low Power
FCC Part 80



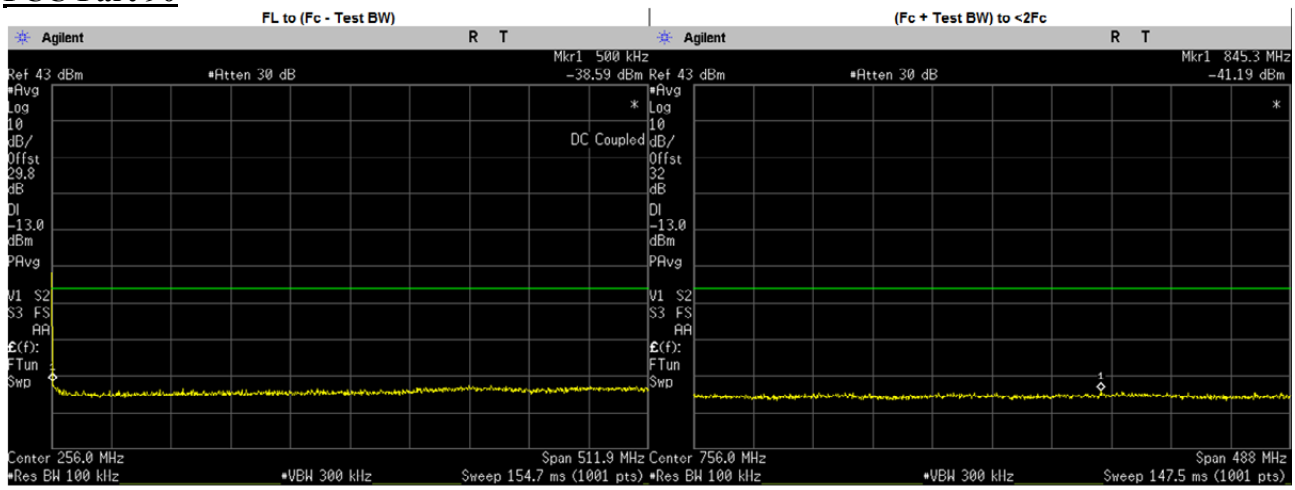
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	393.8201	-39.0000	-13	PASS
(Fc + Test BW) to <2Fc	483.1015	-39.1100	-13	PASS
2Fc to 1GHz	997.9165	-58.8000	-13	PASS
	935.5500	-61.2464	-13	PASS
1GHz to 10Fc	3054.9740	-51.3600	-13	PASS
	1403.3250	-55.6198	-13	PASS
	1871.1000	-55.1462	-13	PASS
	2338.8750	-54.5407	-13	PASS
	2806.6500	-53.4678	-13	PASS
	3274.4250	-52.1407	-13	PASS
	3742.2000	-53.1337	-13	PASS
	4209.9750	-53.6855	-13	PASS
	4677.7500	-54.4189	-13	PASS

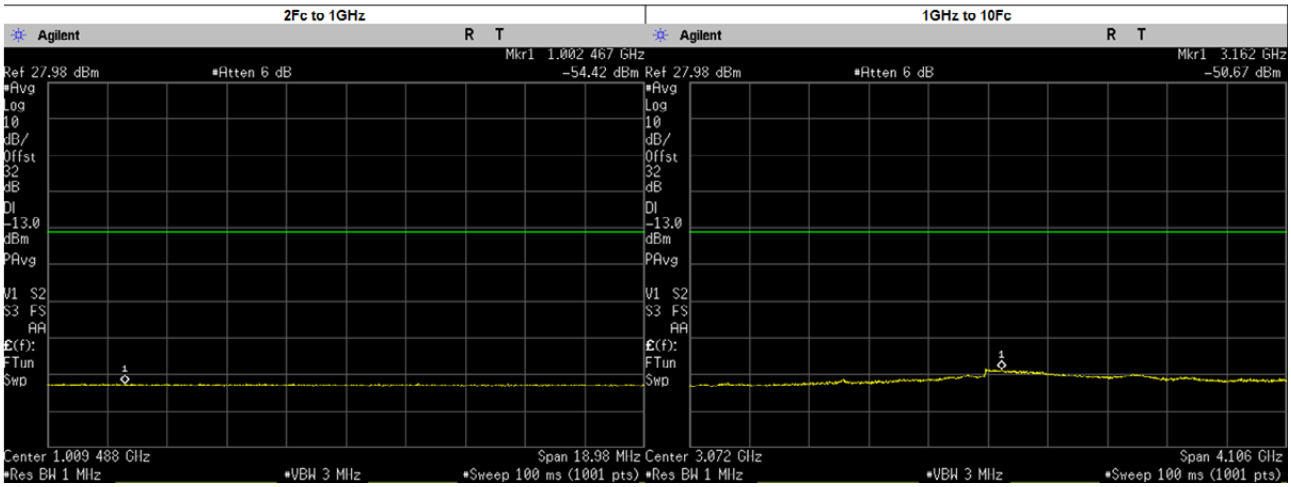
Analog: 511.9875 MHz, 25.0kHz Channel Spacing, Max Power
FCC Part 90



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	483.7750	-39.1900	-13	PASS
(Fc + Test BW) to <2Fc	859.9567	-40.9800	-13	PASS
2Fc to 1GHz	1004.2500	-54.3000	-13	PASS
1GHz to 10Fc	3067.8190	-50.6200	-13	PASS
	1023.9750	-54.9595	-13	PASS
	1535.9630	-54.8378	-13	PASS
	2047.9500	-53.8186	-13	PASS
	2559.9370	-53.4624	-13	PASS
	3071.9250	-50.6680	-13	PASS
	3583.9120	-52.1454	-13	PASS
	4095.9000	-52.0377	-13	PASS
	4607.8870	-53.5546	-13	PASS
	5119.8750	-53.4121	-13	PASS

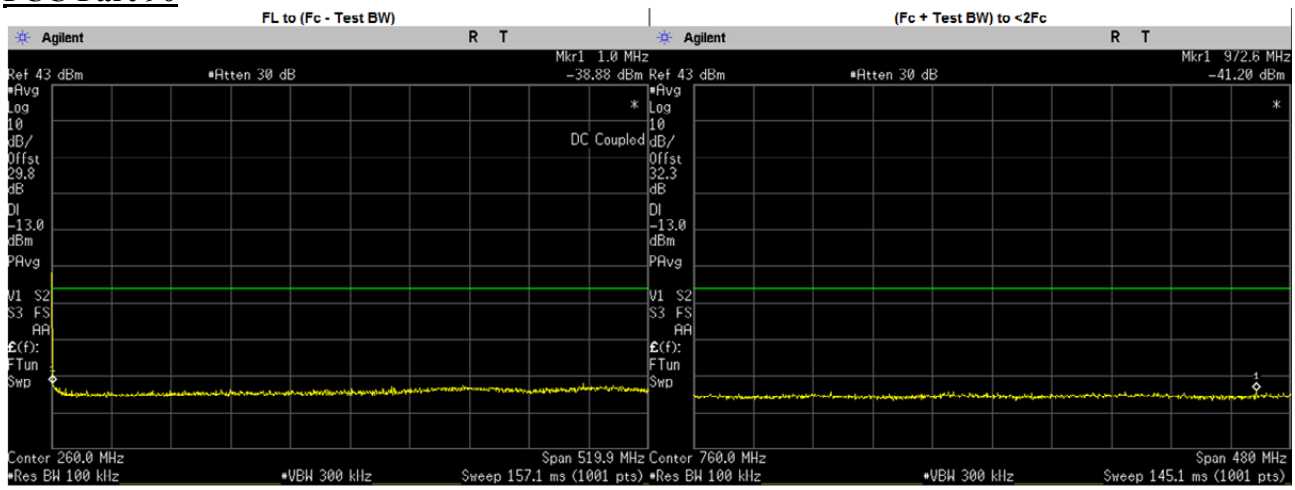
Analog: 511.9875 MHz, 25.0kHz Channel Spacing, Low Power
FCC Part 90

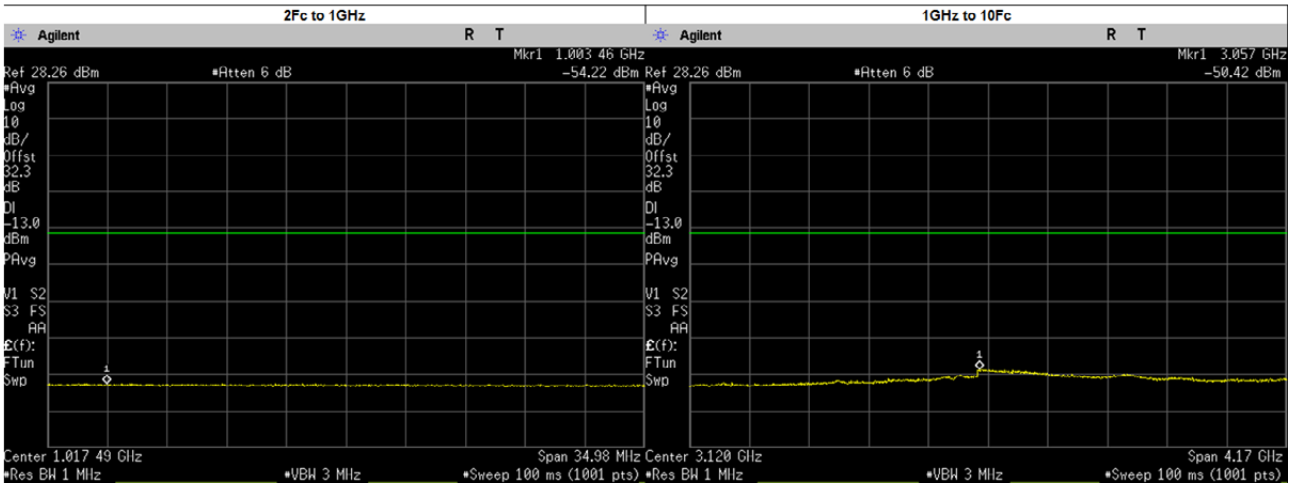




Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	376.7834	-39.4400	-13	PASS
(Fc + Test BW) to <2Fc	845.3180	-41.1900	-13	PASS
2Fc to 1GHz	1002.4670	-54.4200	-13	PASS
1GHz to 10Fc	3162.2550	-50.6700	-13	PASS
	1023.9750	-54.9484	-13	PASS
	1535.9630	-55.0129	-13	PASS
	2047.9500	-54.0019	-13	PASS
	2559.9370	-53.7117	-13	PASS
	3071.9250	-50.8980	-13	PASS
	3583.9120	-52.0465	-13	PASS
	4095.9000	-52.1461	-13	PASS
	4607.8870	-53.6768	-13	PASS
	5119.8750	-53.7094	-13	PASS

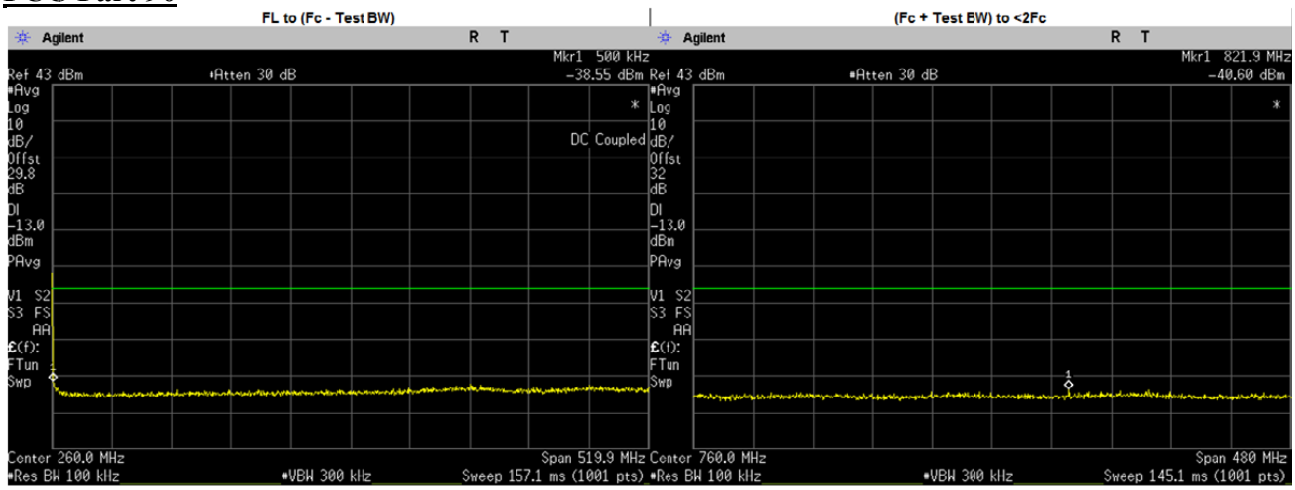
Analog: 519.9875 MHz, 25.0kHz Channel Spacing, Max Power
FCC Part 90

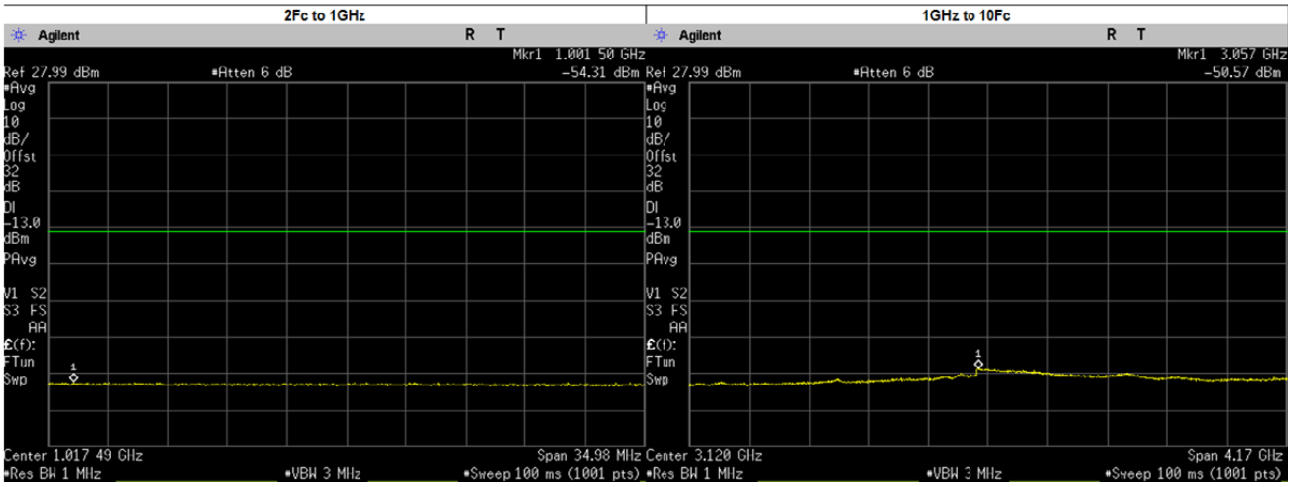




Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	462.7393	-39.1000	-13	PASS
(Fc + Test BW) to <2Fc	972.6425	-41.2000	-13	PASS
2Fc to 1GHz	1003.4620	-54.2200	-13	PASS
1GHz to 10Fc	3057.3760	-50.4200	-13	PASS
	1039.9750	-54.9423	-13	PASS
	1559.9630	-54.6354	-13	PASS
	2079.9500	-53.3845	-13	PASS
	2599.9370	-53.3949	-13	PASS
	3119.9250	-50.7430	-13	PASS
	3639.9120	-51.9546	-13	PASS
	4159.9000	-52.3144	-13	PASS
	4679.8870	-53.5122	-13	PASS
	5199.8750	-53.2108	-13	PASS

Analog: 519.9875 MHz, 25.0kHz Channel Spacing, Low Power
FCC Part 90

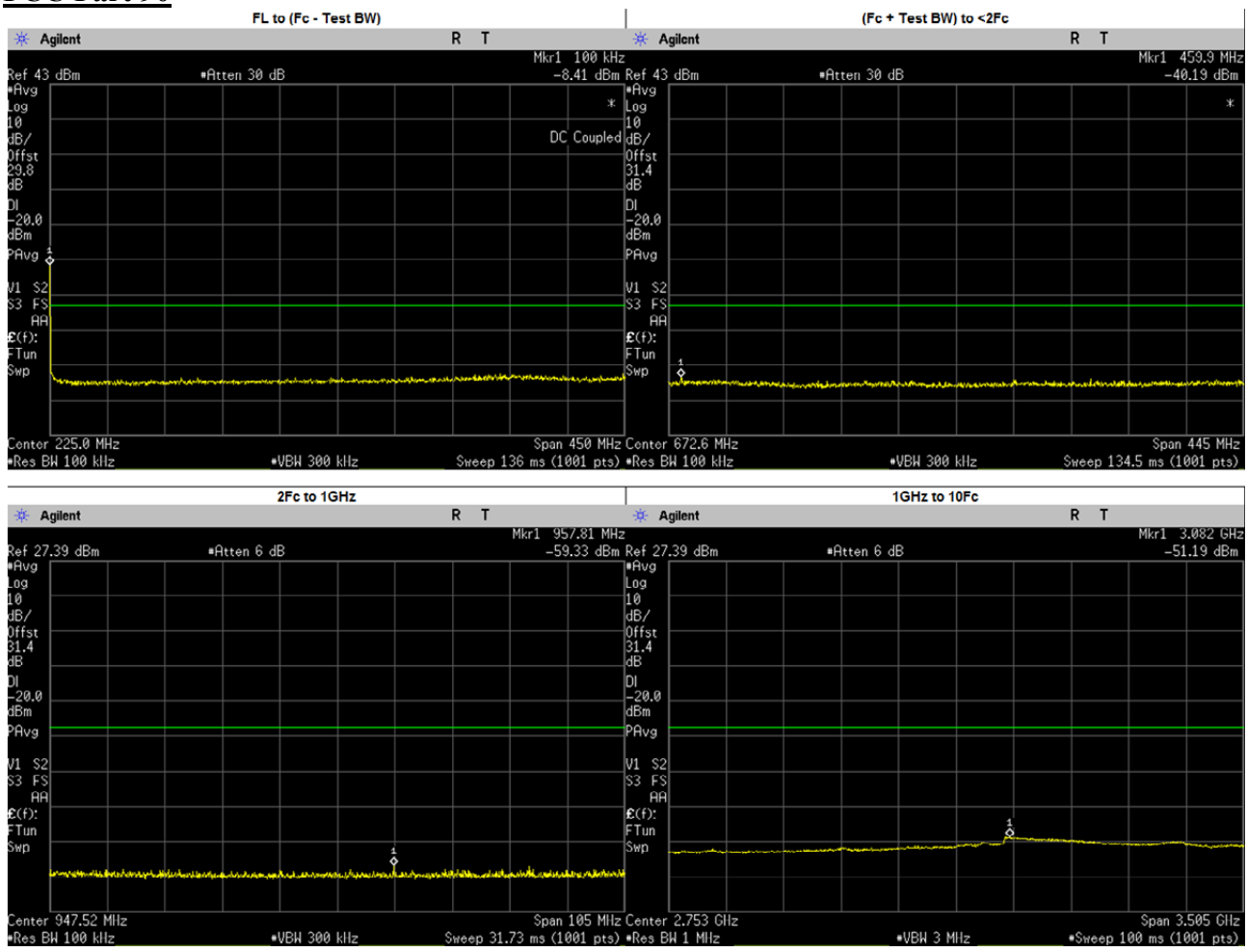




Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	364.4741	-39.3600	-13	PASS
(Fc + Test BW) to <2Fc	821.9364	-40.6000	-13	PASS
2Fc to 1GHz	1001.5040	-54.3100	-13	PASS
1GHz to 10Fc	3057.3760	-50.5700	-13	PASS
	1039.9750	-55.2000	-13	PASS
	1559.9630	-54.5103	-13	PASS
	2079.9500	-53.5977	-13	PASS
	2599.9370	-53.5011	-13	PASS
	3119.9250	-50.9280	-13	PASS
	3639.9120	-52.3220	-13	PASS
	4159.9000	-52.6933	-13	PASS
	4679.8870	-53.9855	-13	PASS
	5199.8750	-53.5303	-13	PASS

7.10.3. Test Result (Digital)

Digital : 450.025 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	352.7770	-38.0691	-20	PASS
(Fc + Test BW) to <2Fc	459.8711	-40.1900	-20	PASS
2Fc to 1GHz	957.8101	-59.3300	-20	PASS
	900.0500	-61.0758	-20	PASS
1GHz to 10Fc	3082.1190	-51.1900	-20	PASS
	1350.0750	-55.5468	-20	PASS
	1800.1000	-55.2136	-20	PASS
	2250.1250	-54.8799	-20	PASS
	2700.1500	-54.2052	-20	PASS
	3150.1750	-51.7553	-20	PASS
	3600.2000	-52.8436	-20	PASS
	4050.2250	-52.9759	-20	PASS
	4500.2500	-53.8959	-20	PASS