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 S.W.D, 11900 Bayan Lepas,
Penang, Malaysia.

TEST REPORT
Report Revision : Rev.F

Date/s Tested	:	29-JAN-2021 - 10-FEB-2021
Report Issue Date	:	5-OCT-2022
Manufacturer	:	Motorola Solutions Malaysia SDN BHD
Manufacturer Address	:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
Requestor	:	SZE KEAT NG
Product Type	:	Mobile
Product Version (PMN)	:	APX 6500
Model Number (HVIN)	:	M25VRS9PW1CN
Frequency Band	:	806-825MHz; 851-870MHz
Max RF Output Power	:	42 Watts
Applicant Name	:	Motorola Solutions Inc
Applicant Address	:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
ISED Registrations	:	MY0001
FCC Registrations	:	461337
Firmware Version (FVIN)	:	D23.50.04

The equipment was tested accordance to the requirement listed below:

(LMR)	
FCC 47 CFR Part 2/ 90	**PASS**
ISED RSS- Gen Issue 5 / 119 Issue 12	

Prepared By:

Putri Nur Sarah Sofia
Test Personnel

Approved Signatory:

Vincent Foong Chuen Kit
Responsible Engineer

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Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	11-FEB-2021	Putri Nur Sarah Sofia
Rev. B	Update Model Number (HVIN)	22-JUL-2022	Putri Nur Sarah Sofia
Rev. C	Update FCC and ISED General Rules Part	11-AUG-2022	Putri Nur Sarah Sofia
Rev. D	Update Product Version (PMN)	19-AUG-2022	Putri Nur Sarah Sofia
Rev. E	Update Occupied Bandwidth Test Data	23-SEPT-2022	Putri Nur Sarah Sofia
Rev. F	Update Occupied Bandwidth Test Data Remarks	5-OCT-2022	Putri Nur Sarah Sofia

1.0 General Information

EUT Description:

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

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
ANTENNA, STAMPED METAL, VEHICLE MOUNT 3DB LOW PROFILE ANTENNA KIT 764-870 MHz(7800 BAND); 806-941 MHZ(8900 BAND)	MOTOROLA	HAF4013A
O7 Control Head (English)	MOTOROLA	PMHN4194C
Water Resistant Microphone	MOTOROLA	HMN1089C

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

No modifications were done to the UUT to facilitate the tests in this report.

Deviation from standard

Not applicable as no deviation from standard test method

2.0 Summary of Test Results

FCC General Rules Part (47CFR)	ISED General Rules Part	Test Item	Result	Remarks	Serial number tested
2.1046, 90.541, 22.565, 74.461, 74.534, 80.215	RSS-119	RF Power Output	Pass		471TXB1932
2.1055, 90.213, 22.355, 74.464, 74.561	RSS-119	Frequency Stability	Pass		471TXB1932
2.1047, 74.463, 80.213	RSS-119	Audio Frequency Response	Pass		471TXB1932
2.1047, 74.463, 80.213	RSS-119	Audio Low Pass Filter Response	Pass		471TXB1932
2.1047, 74.463, 80.213	RSS-119	Modulation limiting	Pass		471TXB1932
90.210, 90.691	RSS-119, RSS-134	Occupied Bandwidth	Pass	16K0F3E- 15.0530kHz 20K0F1E- 12.1215kHz 11K0F3E- 9.9986kHz 8K10F1D- 8.0183kHz 8K10F1E- 7.4853kHz 8K10F1W- 7.8171kHz	471TXB1932
-	-	Band Edge Conducted Spurious Emission	NA		
-	-	Transient Frequency Behavior	NA		
-	-	Adjacent Channel Power	NA		
Part 90	RSS-119	Conducted Spurious Emissions	Pass	Highest spur: -28.40dBm	471TXB1932
Part 90	RSS-119	Radiated Spurious Emission	Pass	Highest spur: -39.30dBm	471TXB1946
-	-	GNSS (EIRP for 1559 – 1610MHz)	NA		
-	-	Effective Radiated Power (ERP)	NA		

NA → **Not Applicable**

3.0 Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±dB)
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
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82

4.0 Equipment List

FCC Analog ATE#1: (SW version: 2.4.6 & FCC_Frequency Stability 1.0.3 rev.)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
CHAMBER	SH-641	92009188	06-Mar-20	06-Mar-21
DSA Dynamic Signal Analyzer	35670A	MY42507095	19-Jun-20	19-Jun-21
ANALYZER AUDIO	8903B	3514A15797	28-Oct-21	28-Oct-21
POWER METER	E4416A	MY45102699	26-Jun-20	26-Jun-21
POWER SENSOR	E9301B	MY41498918	12-Aug-20	12-Aug-21
POWER SUPPLY	6032A	US38323921	27-Nov-20	27-Nov-21
SIGNAL GENERATOR	2042	119718/063	24-Jun-20	24-Jun-21
ANALYZER MODULATION	8901B	3122A03662	08-Jul-20	08-Jul-21
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_R1.1.3)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A36210	CNR	CNR
ATTENUATOR / SWITCH DRIVER	11713A	2508A10141	CNR	CNR
POWER METER	E4416A	GB41293866	26-Feb-19	26-Feb-21
POWER SUPPLY	6033A	3004A05137	4-Aug-20	4-Aug-21
SIGNAL GENERATOR	8657A	3250A05137	19-Jun-20	19-Jun-21
STEP ATTENUATOR	8494G	MY42143006	12-Jun-20	12-Jun-21
STEP ATTENUATOR	8496G	MY42143012	13-Jun-20	13-Jun-21
OSCILLOSCOPE	MSO8104A	MY45002372	26-Jun-20	26-Jun-21
ANALYZER MODULATION	8901B	3438A05093	23-Jun-20	23-Jun-21
ANALYZER AUDIO	8903B	3011A12671	11-Mar-20	11-Mar-21
ANALYZER AUDIO	8903B	3011A08952	29-Jul-20	29-Jul-21
SPECTRUM ANAYLYZER	E4440A	MY46181974	2-Aug-20	2-Aug-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

FCC CONDUCTED SPUR EMISSION ATE # 1 (SW version: Conducted Spur ATE_rev 1.23.03)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A32735	CNR	CNR
ANALYZER SPECTRUM	E4440A	MY46185415	10-Jan-20	10-Jan-22
POWER SUPPLY	6031A	3543A03489	05-Jun-20	05-Jun-21
HIGH PASS FILTER SWITCH BOX	-	CS001	2-Jul-20	2-Jul-21
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

EMC Chamber 1

DESCRIPTION	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
DRG HORN FREQ.	SAS-571	720	21-Mar-19	21-Mar-21
DRG HORN FREQ.	SAS-571	1143	14-Feb-19	14-Feb-21
POWER SUPPLY (0-60V / 0-50A, 1000W)	6032A	2615A01178	21-May-20	21-May-21
SIGNAL GENERATOR	SMB 100A	181117	8-Nov-18	8-Nov-21
EMI TEST RECEIVER	ESW44	101750	15-Jan-21	15-Jan-22
EMI TEST RECEIVER	ESIB26	100017	19-Jul-19	19-Mar-21
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	CNR	CNR
BILOG ANTENNA	CBL6112B	2964	23-Apr-19	23-Apr-21
BILOG ANTENNA	CBL6112B	2950	8-Jul-19	8-Jul-21
DATA LOGGER	SDL500	A.016776	4-Jun-20	4-Jun-21
SYSTEM CONTROLLER	SC104V	050806-1	CNR	CNR
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	CNR	CNR
ANTENNA POSITIONING TOWER	TLT2	NA	CNR	CNR
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	15-Jul-20	15-Jul-21
18 - 40GHz PREAMPLIFIER	MITEQ Hi GAIN SUCOFLEX	2006313	CNR	CNR
PREAMPLIFIER	PAM-0118	269	24-May-19	24-May-22
LOOP ANTENNA	6502	00208416	15-Sep-20	15-Sep-21
TEST SOFTWARE	EMC_FCC_IC_BLUETOOTH_RE_TEST			
VERSION	EMC_FCC_RE_v1.6.2			

5.0 Test Condition

5.1. Transmitter Test Conditions

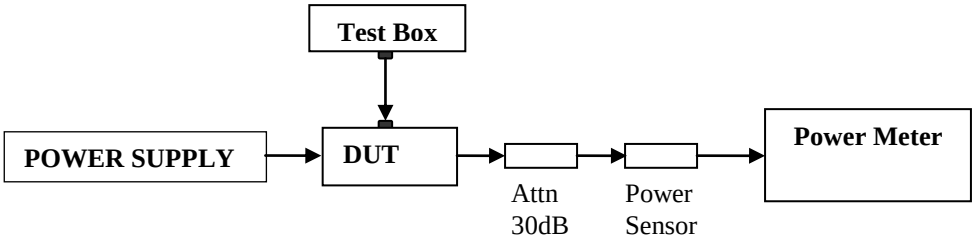
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By	Environmental conditions
RF Output Power	**Low & Max**	**Analog**	**806.0125, 814.9875, 823.9875, 851.0125, 860.0125, 868.8875**	**Putri**	**23.4°C, 50%RH**
Frequency Stability	**Max**	**Analog**	**823.9875**	**Putri**	**25.1°C, 54.3%RH, 60.3°C, 50%RH, -30.1°C, 51.2%RH**
Audio Frequency Response (12.5kHz / 25kHz)	**Max**	**Analog**	**823.9875**	**Putri**	**23.4°C, 50%RH**
Audio Low Pass Filter Response (12.5kHz / 25kHz)	**Max**	**Analog**	**823.9875**	**Putri**	**23.4°C, 50%RH**
Modulation limiting (12.5kHz / 25kHz)	**Max**	**Analog**	**823.9875, 896.0125**	**Putri**	**23.4°C, 50%RH**
Occupied Bandwidth (12.5kHz / 20kHz / 25kHz)	**Max**	**Analog, C4FM, Phase II**	**806.0125, 814.9875, 823.9875, 851.0125, 853.9875, 860.0125, 868.8875**	**Putri**	**23.4°C, 50%RH**
Band Edge Conducted Spurious Emissions (Part 22) (12.5kHz / 20kHz / 25kHz)	**Max**	**Analog, C4FM, Phase II**	**NA**		
Transient Frequency Behavior *(UHF & VHF Band)* (12.5kHz / 25kHz)	**Max**	**Analog, C4FM, Phase II**	**NA**		
Adjacent Channel Power *(700MHz Band)* (12.5kHz / 25kHz)	**Max**	**Analog, C4FM, Phase II**	**NA**		
Conducted Spurious Emissions- (12.5kHz / 25kHz)	**Low / Max**	**Analog, C4FM, Phase II**	**806.0125, 814.9875, 823.9875, 851.0125, 860.0125, 868.8875**	**Putri**	**23.4°C, 50%RH**
Radiated Spurious Emission (12.5kHz / 25kHz)	**Low / Max**	**Analog, C4FM, Phase II**	**806.0125, 814.9875, 823.9875, 851.0125, 860.0125, 868.8875**	**Nazrin&Qawiman**	**23.4 Hum(%RH)**
GNSS (EIRP for 1559 - 1610MHz) (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**		
Effective Radiated Power (ERP) (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**		

NA → Not Applicable

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



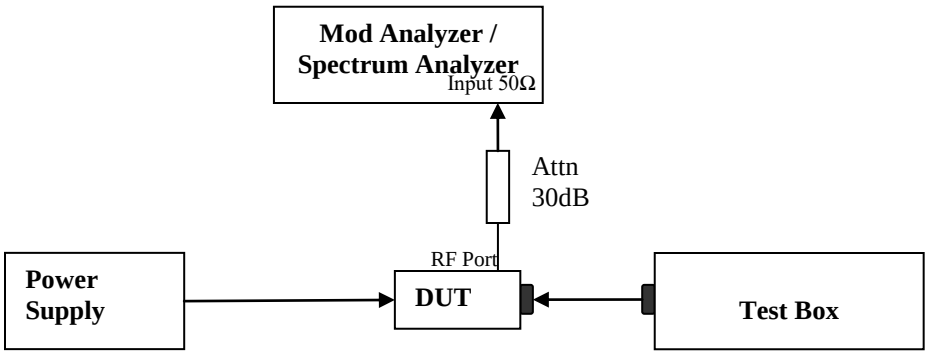
1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
2) Path loss for the measurement included.
3) All the measurement was done at low, mid, high frequency for each band.
4) Record the power into the test report.

6.1.2. Test Result

Temperature	25˚C			
Voltage (V)	13.6V			
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)
806.0125	3.00	2.68	41.80	9.18
814.98750	3.00	2.73	41.50	9.05
823.98750	2.99	2.66	41.50	8.94
851.01250	3.02	2.65	40.70	9.41
860.01250	2.97	2.63	40.40	9.11
868.88750	2.97	2.63	40.00	9.36

6.2. Frequency Stability

6.2.1. Test Setup



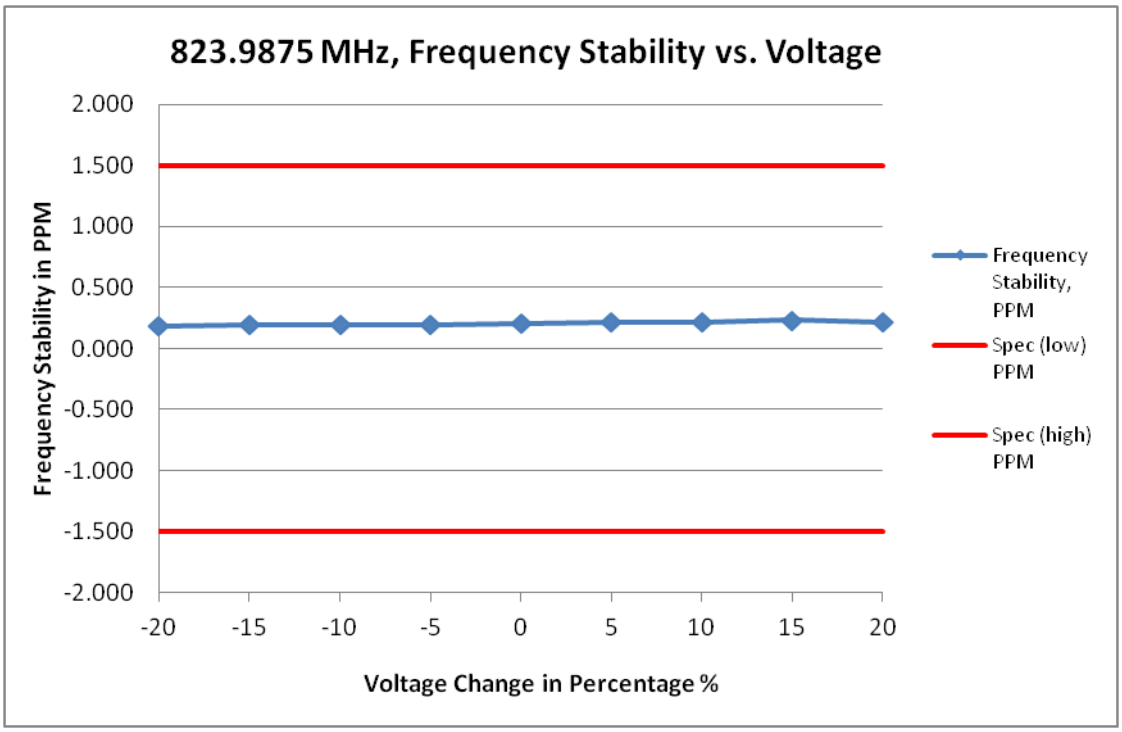
1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
2) Path loss for the measurement included.
3) Transmit the DUT and record the freq in MCF_{MHz}.
4) Test in 2 conditions:
   - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
   - Supply 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:

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

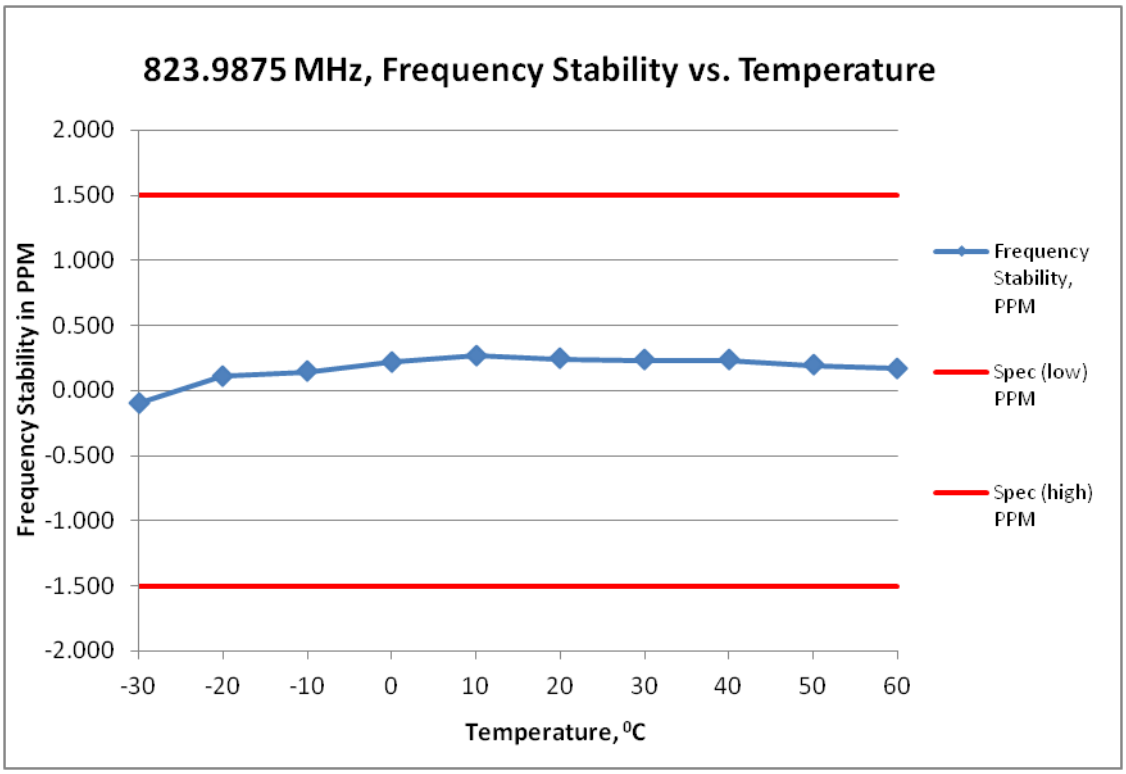
Where: MCF_{MHz} is the Measured Carrier Frequency in MHz
ACF_{MHz} is the Assigned Carrier Frequency in MHz

6.2.2. Test Result



(i) Frequency Stability VS Voltage

Frequency / Channel Spacing	823.9875 MHz / 12.5 kHz				
Temperature, ^{0}C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-20	10.880	823.987650	0.182	-1.500	1.500
-15	11.560	823.987660	0.194	-1.500	1.500
-10	12.240	823.987660	0.194	-1.500	1.500
-5	12.920	823.987660	0.194	-1.500	1.500
0	13.600	823.987670	0.206	-1.500	1.500
5	14.280	823.987680	0.218	-1.500	1.500
10	14.960	823.987680	0.218	-1.500	1.500
15	15.640	823.987690	0.231	-1.500	1.500
20	16.320	823.987680	0.218	-1.500	1.500



(ii) Frequency Stability VS temperature

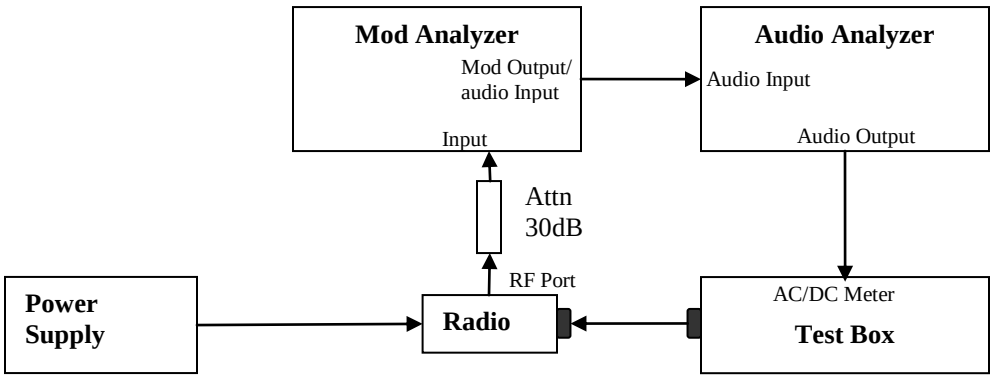
Frequency / Channel Spacing	823.9875 MHz / 12.5 kHz			
Voltage, V	13.6			
Temperature, °C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	823.987420	-0.097	-1.500	1.500
-20	823.987590	0.109	-1.500	1.500
-10	823.987620	0.146	-1.500	1.500
0	823.987680	0.218	-1.500	1.500
10	823.987720	0.267	-1.500	1.500
20	823.987700	0.243	-1.500	1.500
30	823.987690	0.231	-1.500	1.500
40	823.987690	0.231	-1.500	1.500
50	823.987660	0.194	-1.500	1.500
60	823.987640	0.170	-1.500	1.500

6.2.3. Test Limit

As per manufacturer declared spec +/- 1.5ppm

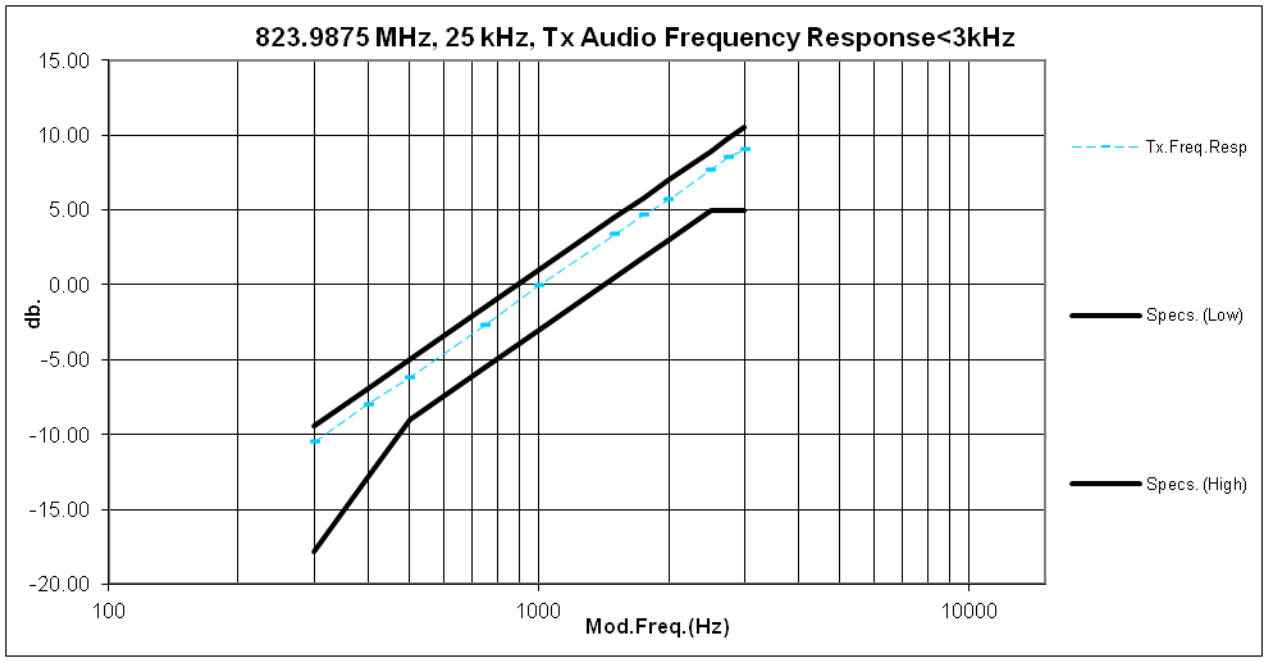
6.3. Audio Frequency Response

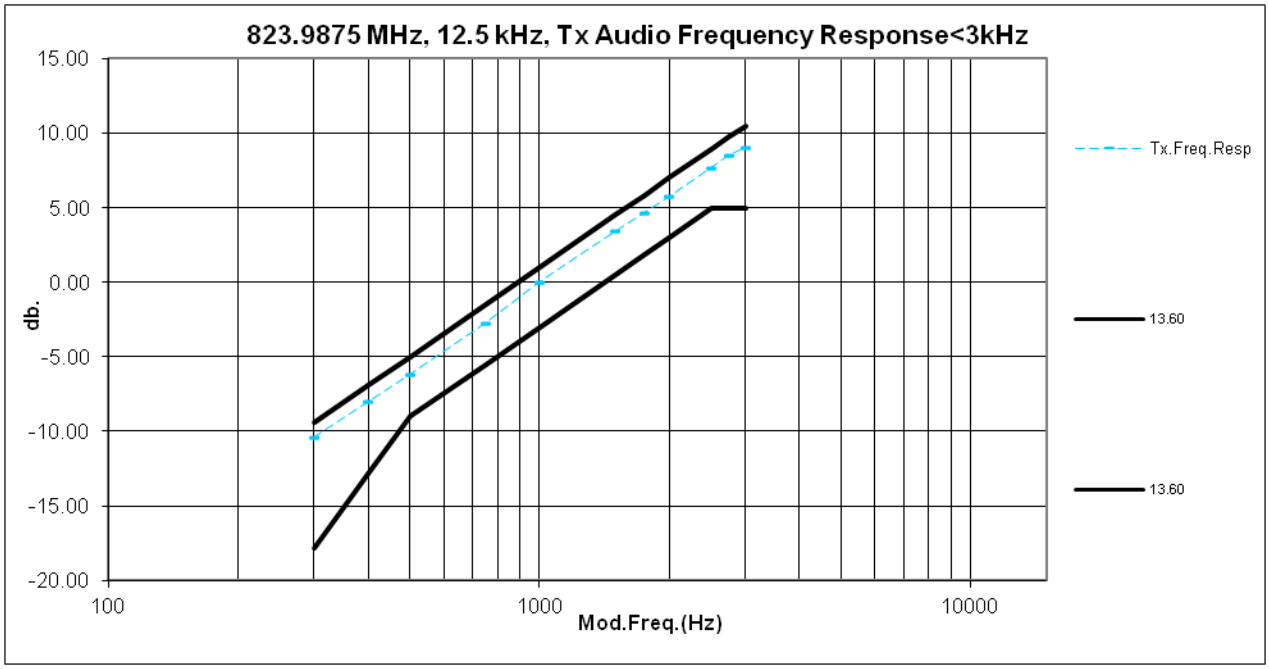
6.3.1. Test Setup



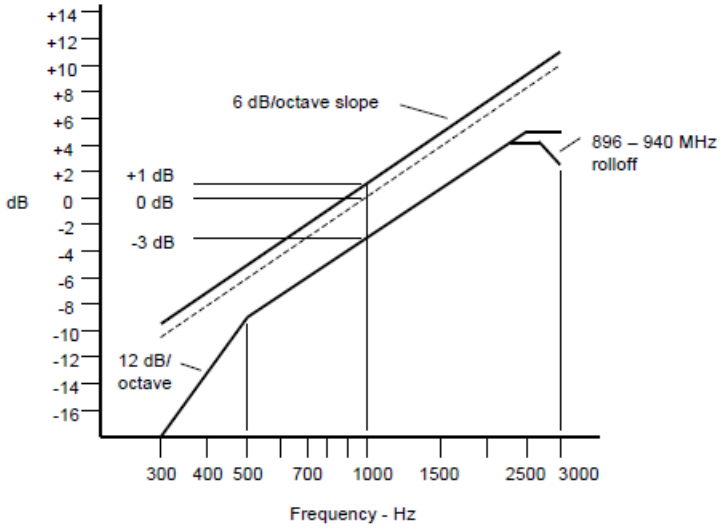
1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the Full rated system deviation.
5) On audio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

6.3.2. Test Result





6.3.3. Test Limit

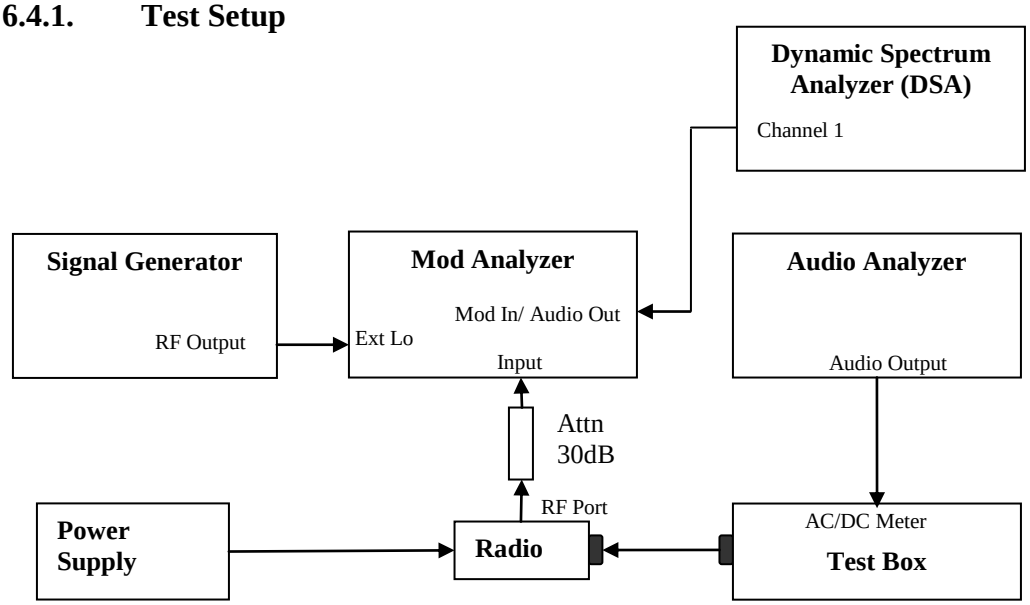


Note:

- *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.*

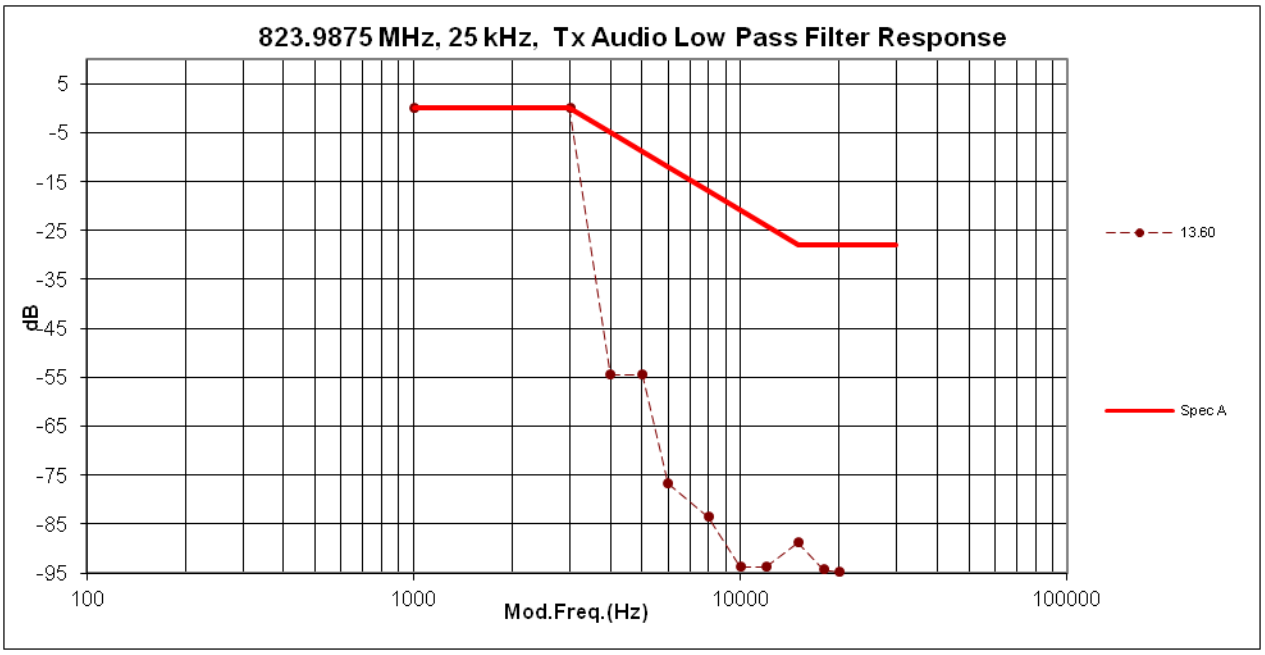
6.4. Audio Low Pass Filter Response

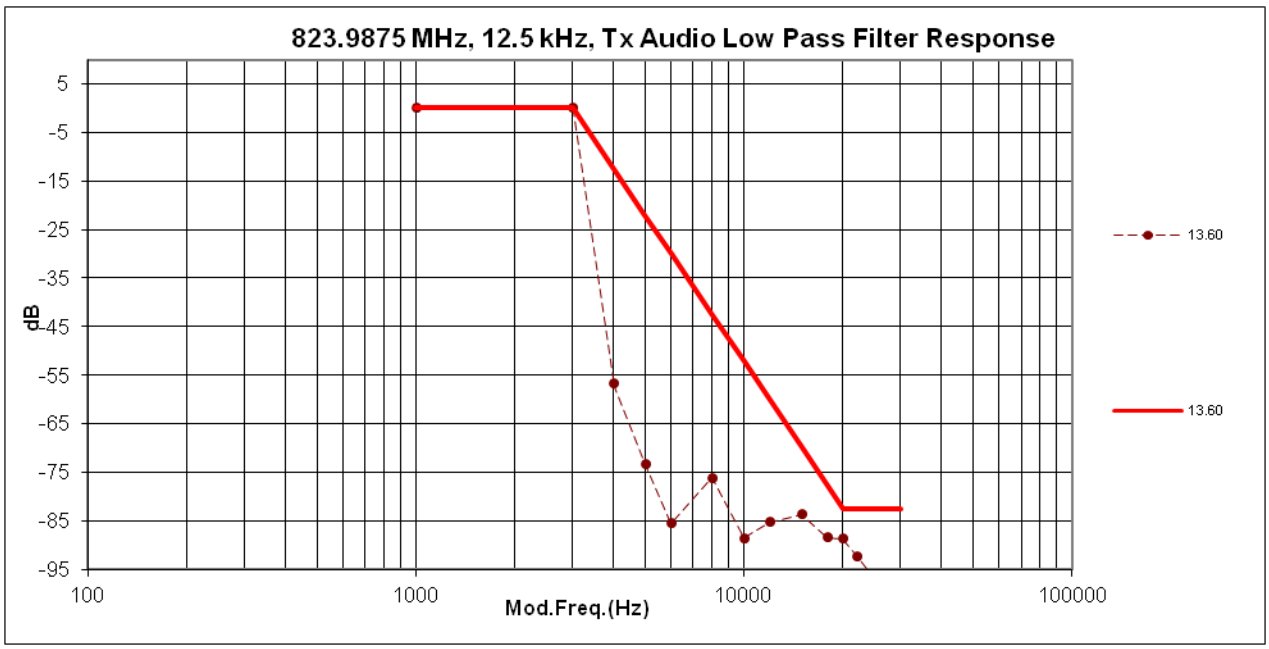
6.4.1. Test Setup



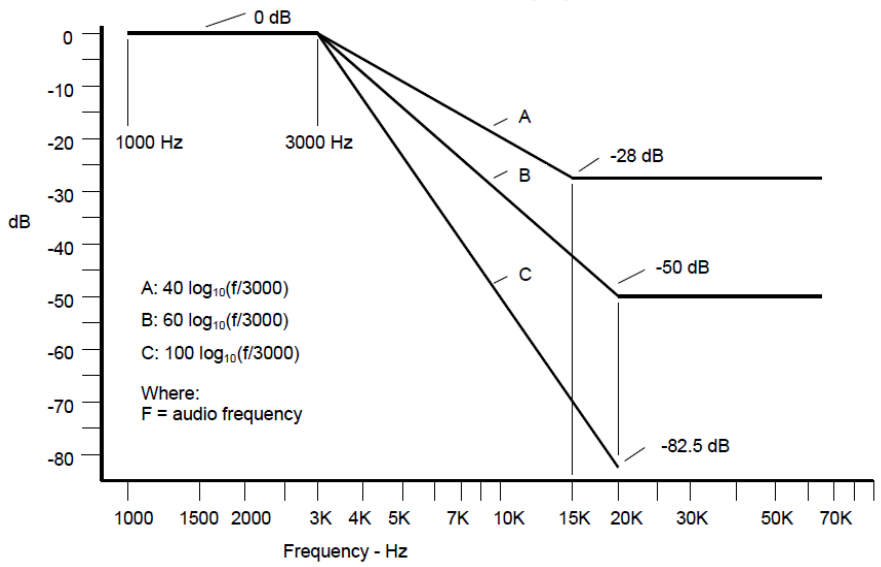
1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Press 23.1SPCL on modulation analyzer to enable the external LO from Sigen.
4) Set the Sigen frequency to Fc + 1.5 MHz, RF output level to 0dBm without modulation.
5) Transmit the radio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

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.

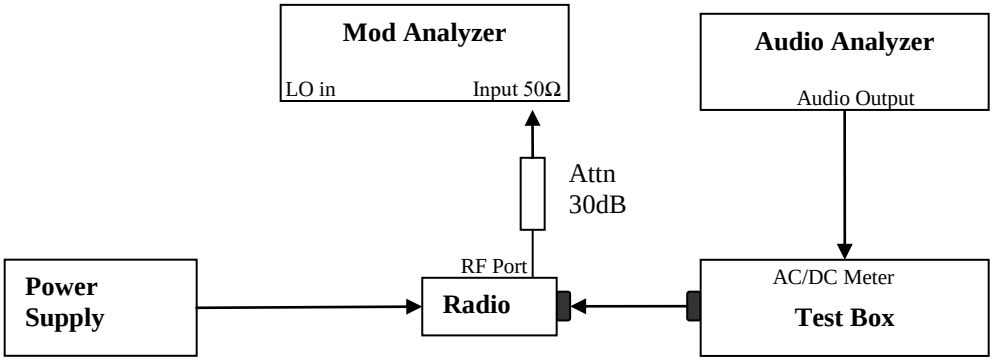
c) For equipment operating on channels between 896 MHz through 901 MHz, between 935 MHz through 940 MHz, and 12.5 or 15 kHz spaced channels in the frequency range 138-174 MHz and 406-512 MHz.

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.

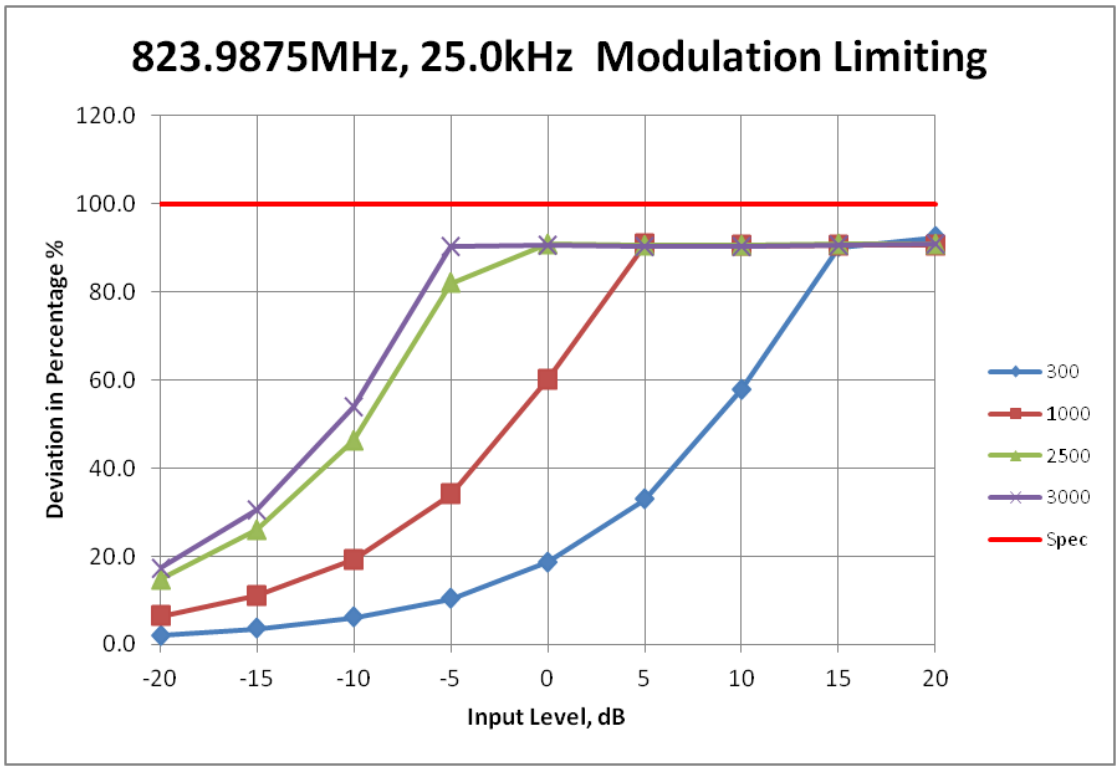
6.5. Modulation Limiting

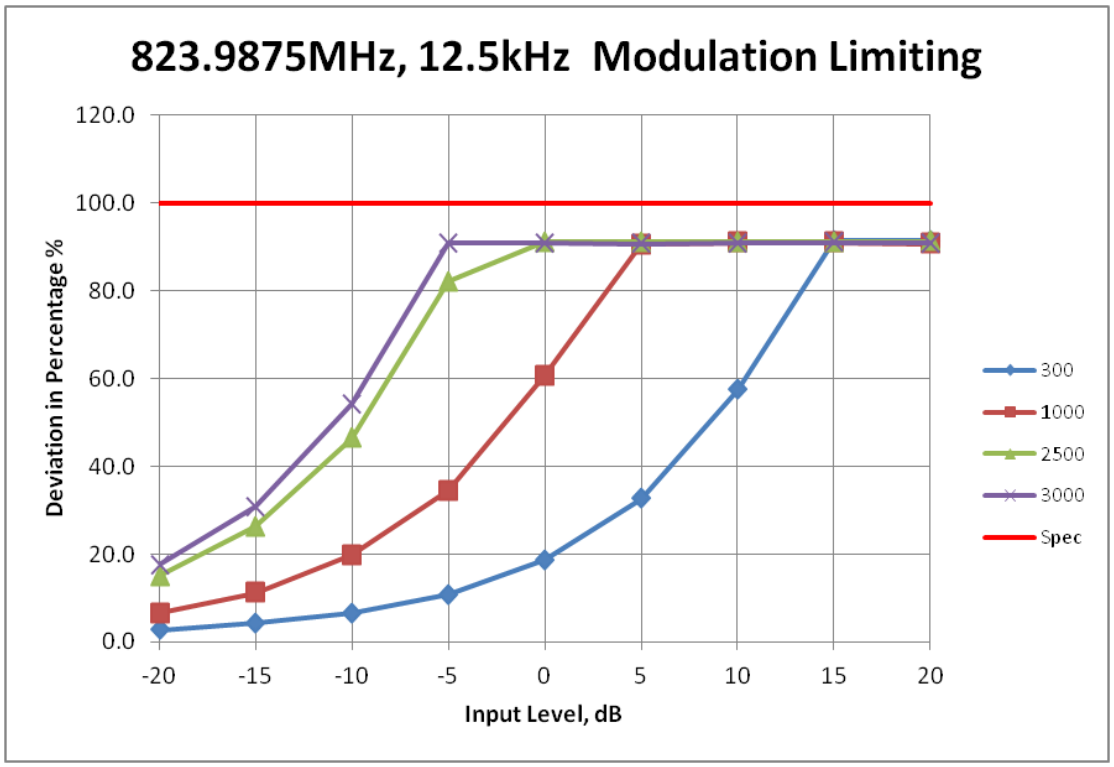
6.5.1. Test Setup



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 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.

6.5.2. Test Result





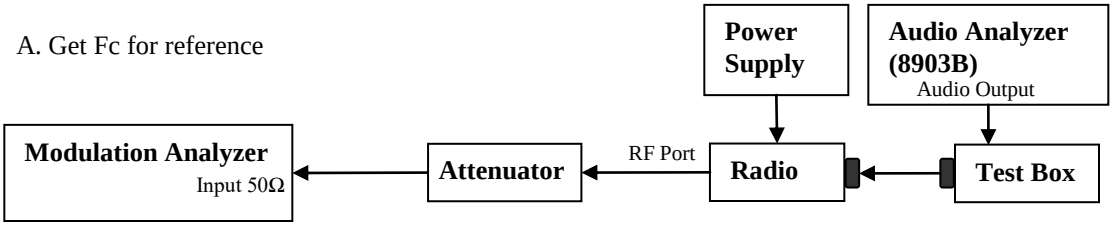
6.5.3. Test Limit

Modulation Limiting shall not exceed 100 percent.

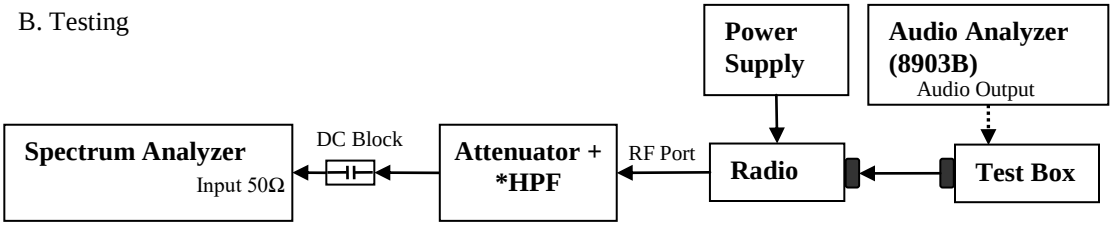
6.6. Occupied Bandwidth

6.6.1. Test Setup (Analog)

A. Get Fc for reference



B. Testing

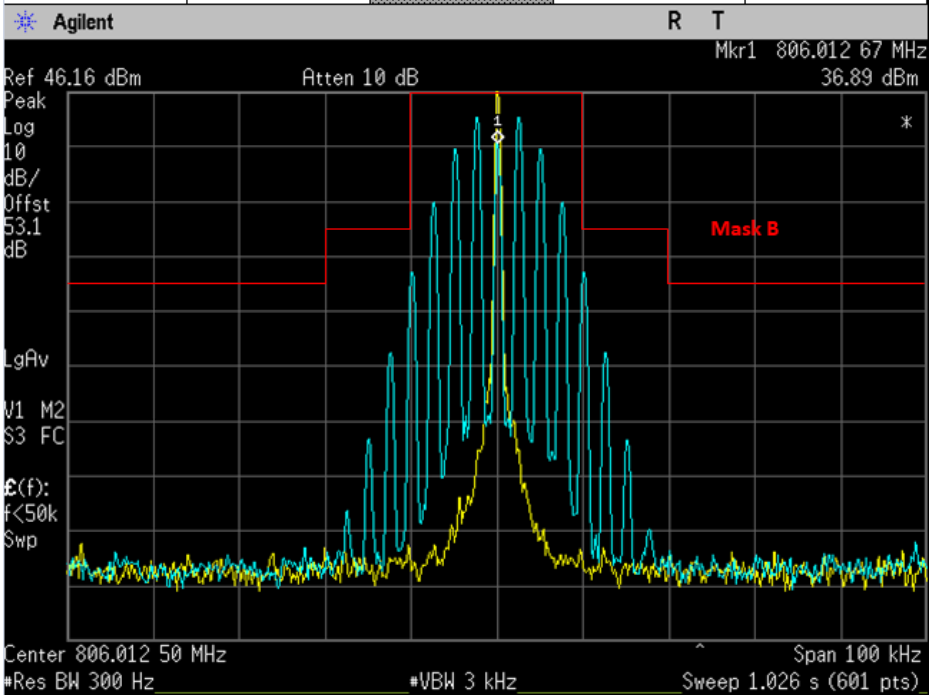


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey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

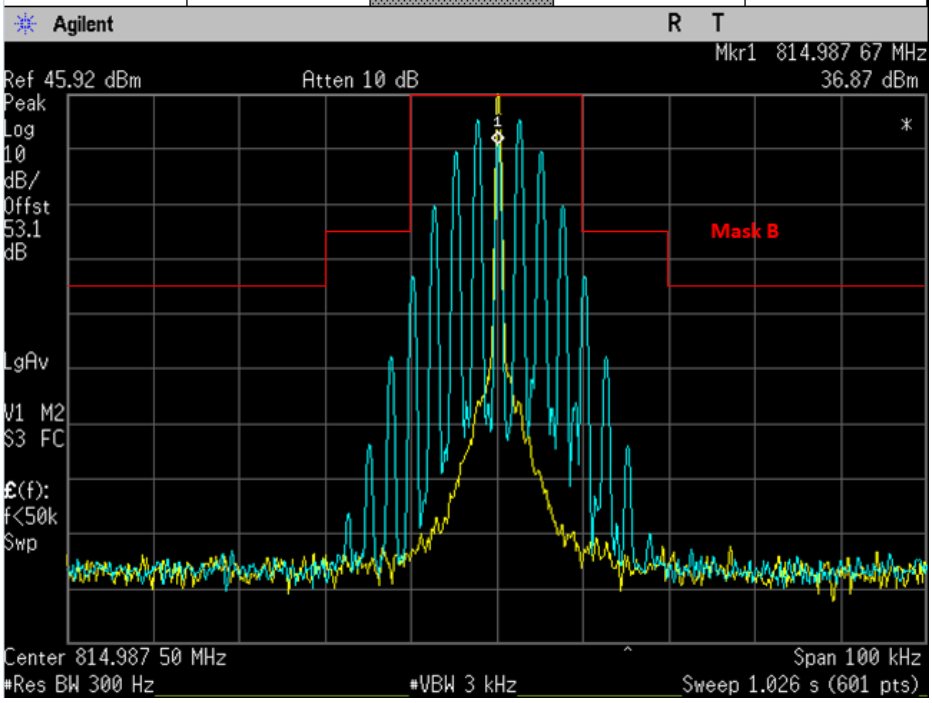
* Only HPF added for Mask 80.211 measurement with attenuator.

6.6.2. Test Result (Analog)

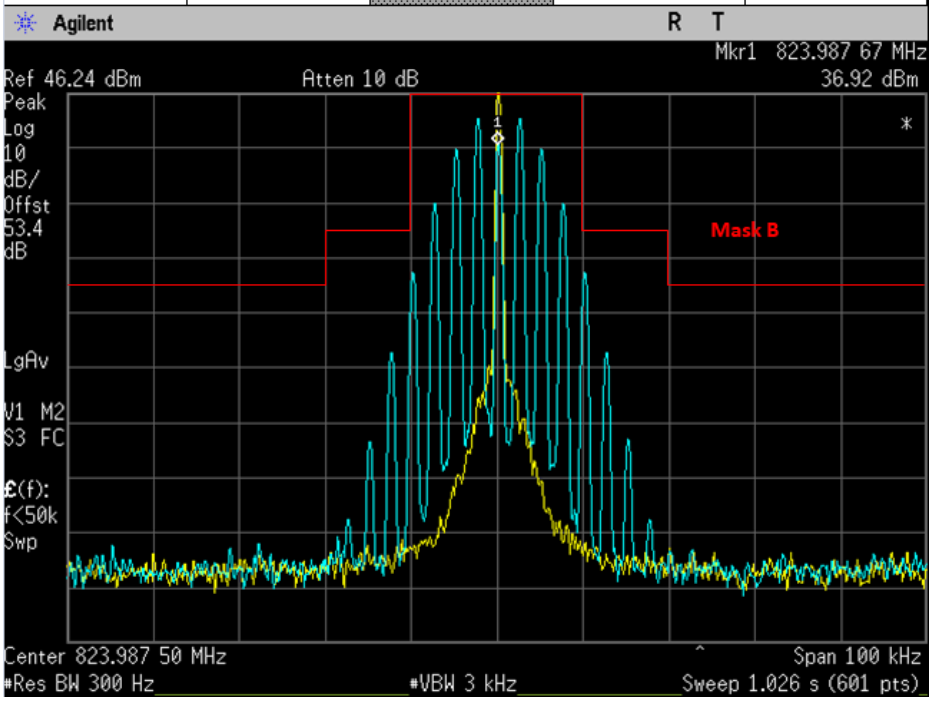
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	25.0		15.0064	16K0F3E



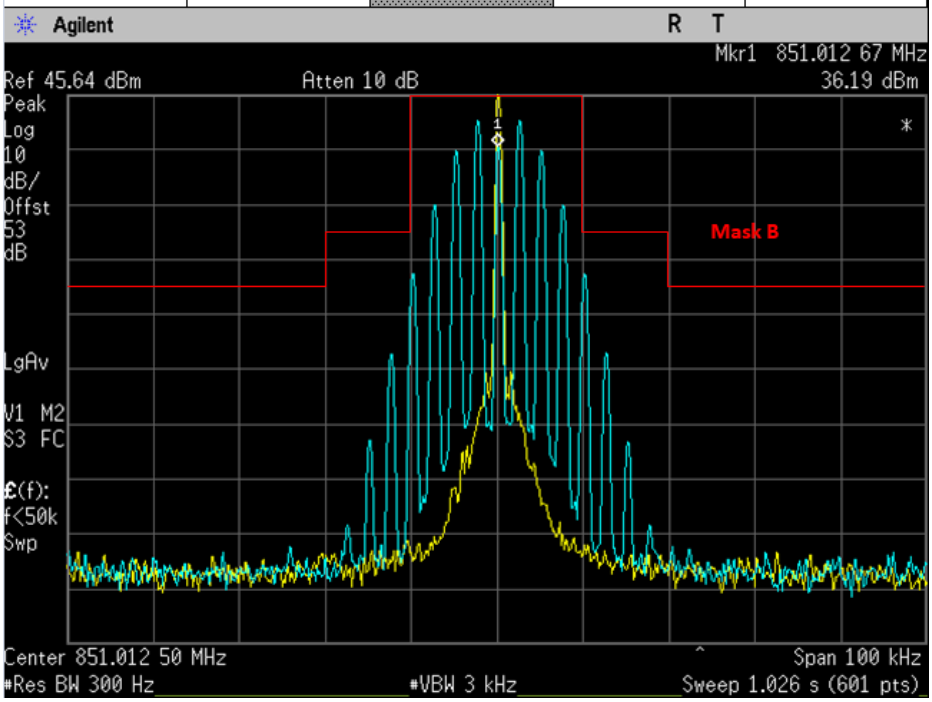
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	25.0		14.9849	16K0F3E



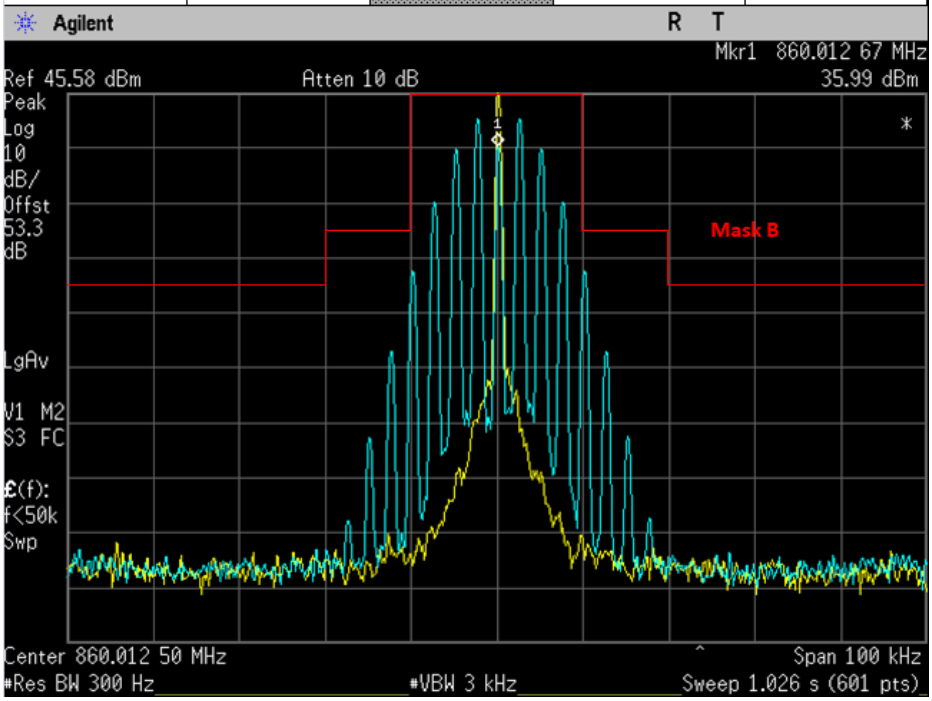
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	25.0		15.0051	16K0F3E



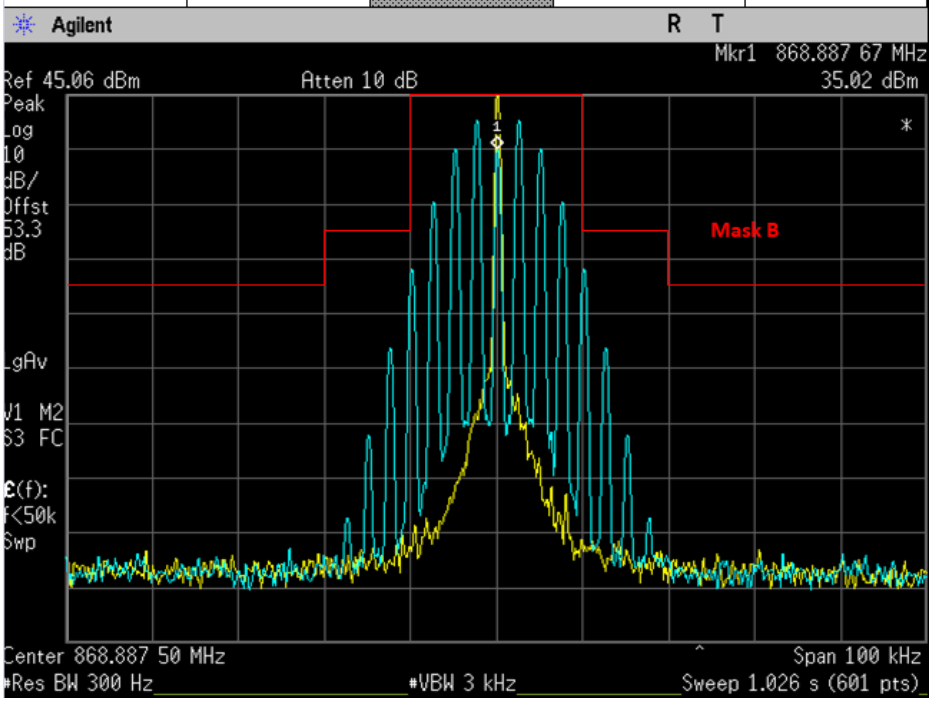
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	25.0		15.0139	16K0F3E



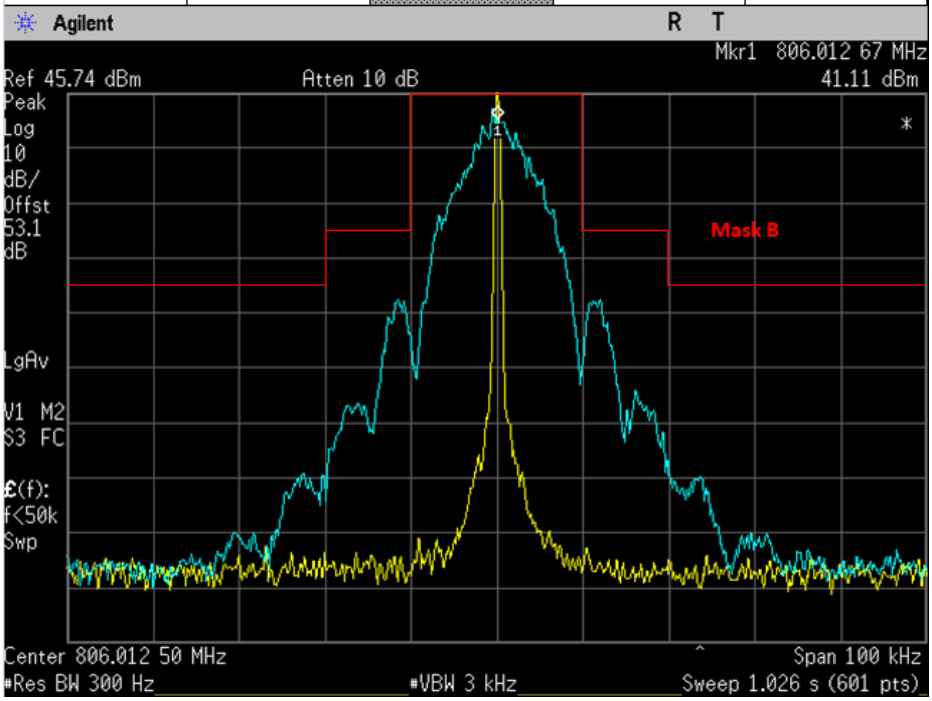
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	25.0		15.0227	16K0F3E



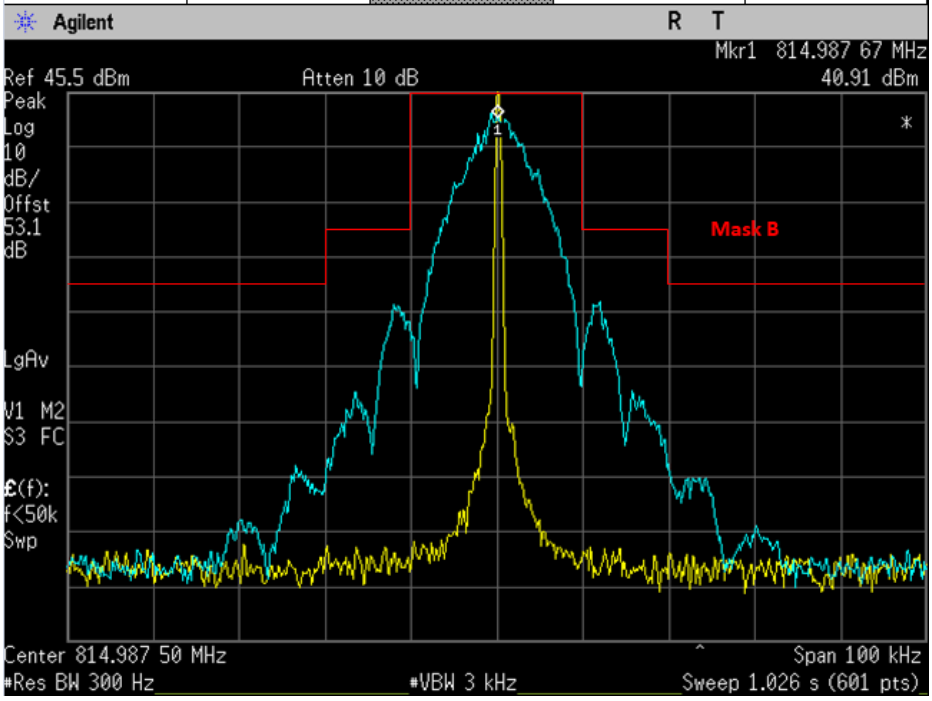
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	25.0		15.0560	16K0F3E



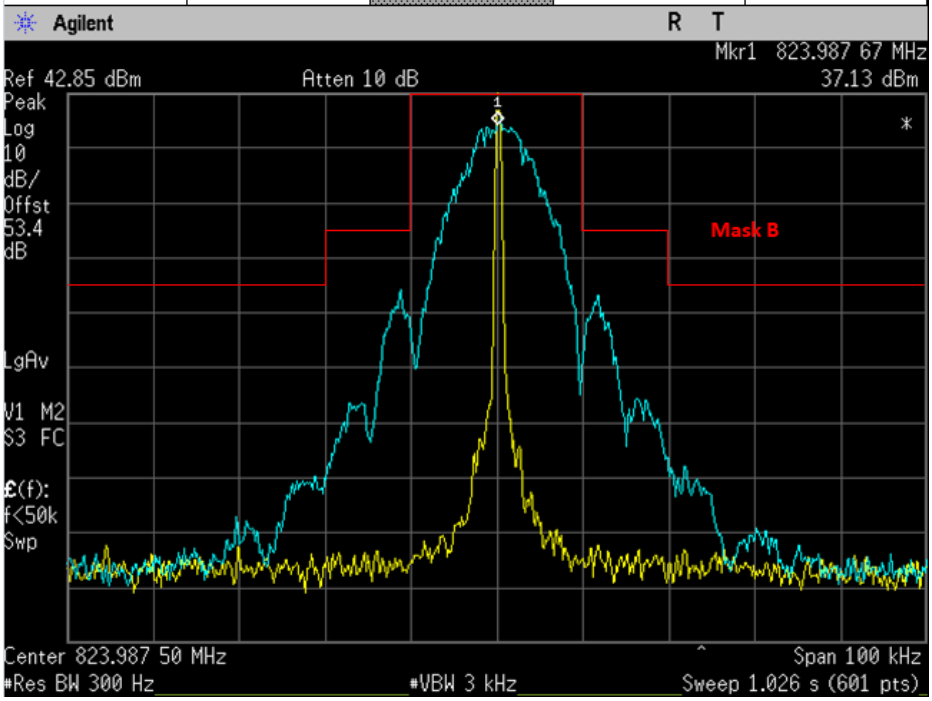
Modulation			Rules Part	
Analog Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	20.0		11.9742	20K0F1E



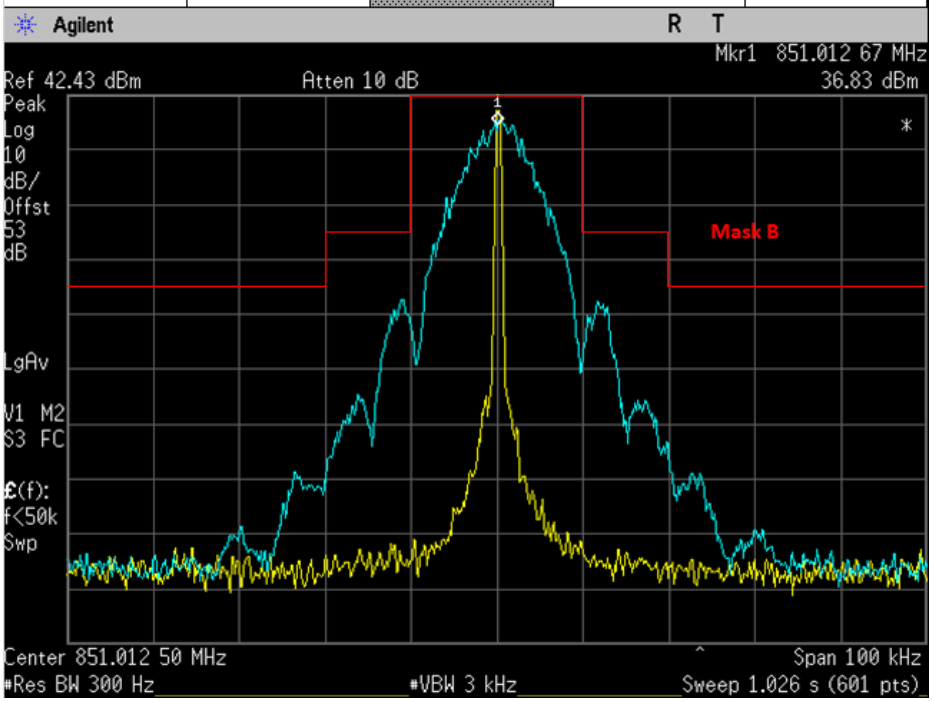
Modulation			Rules Part	
Analog Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	20.0		11.4174	20K0F1E



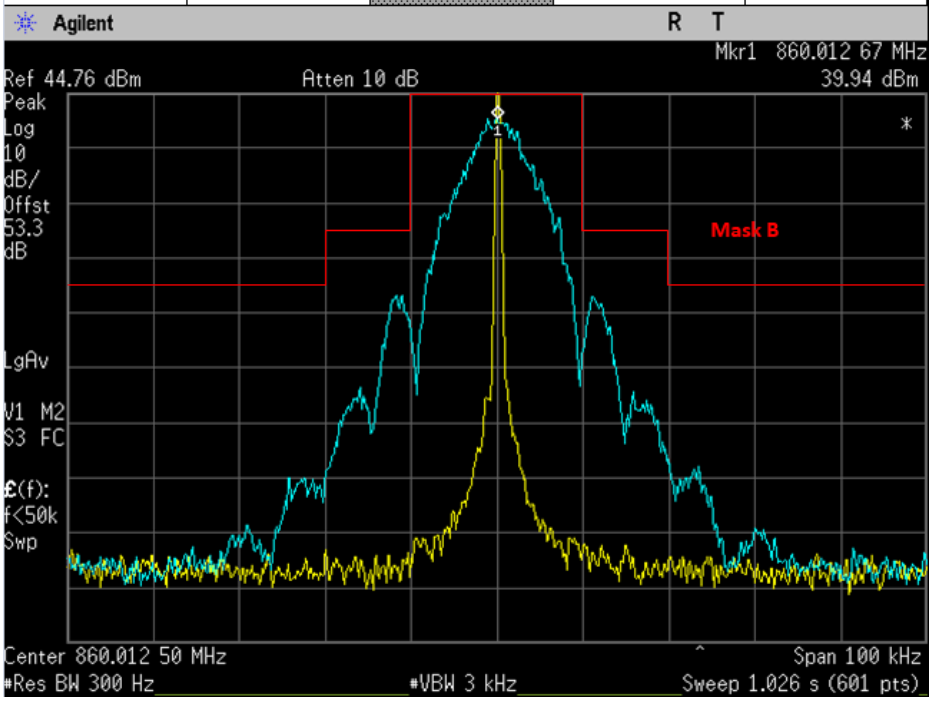
Modulation			Rules Part	
Analog Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	20.0		12.1160	20K0F1E



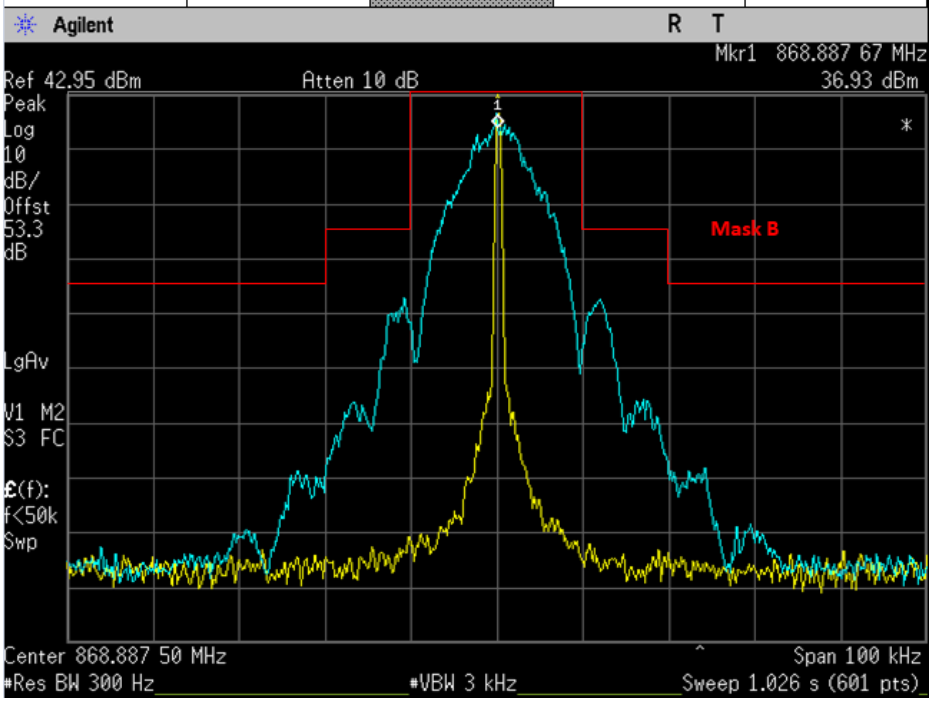
Modulation			Rules Part	
Analog Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	20.0		11.7364	20K0F1E



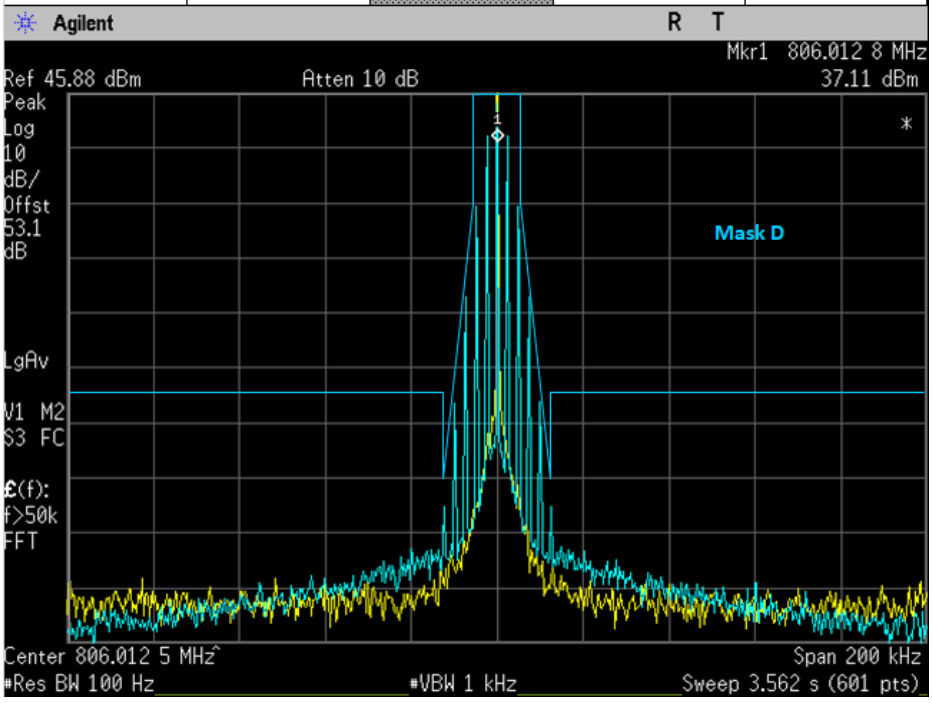
Modulation			Rules Part	
Analog Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	20.0		11.8740	20K0F1E



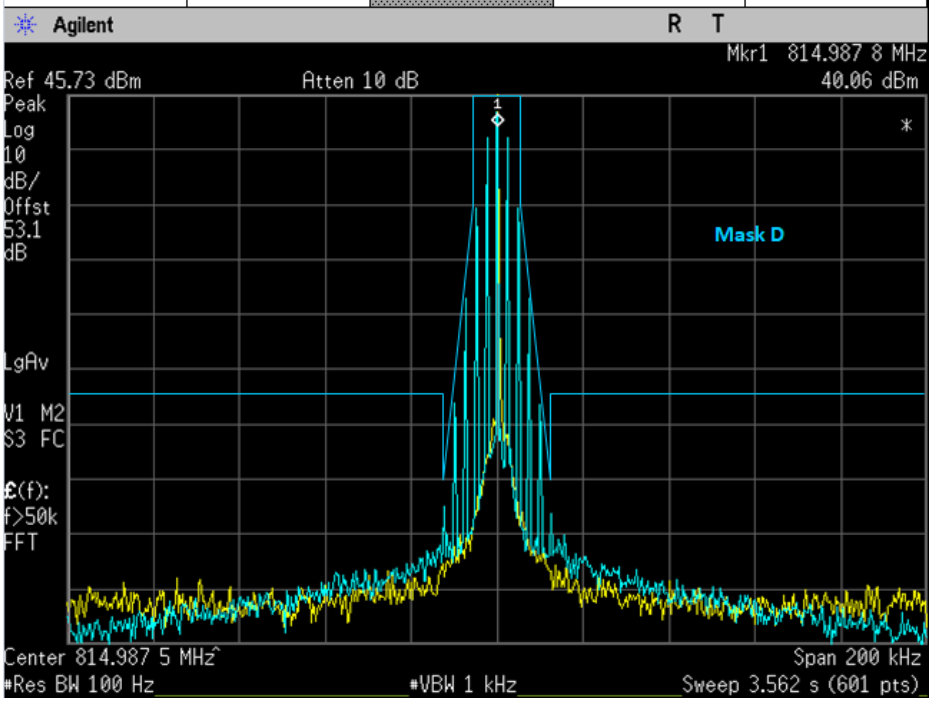
Modulation			Rules Part	
Analog Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	20.0		12.1215	20K0F1E



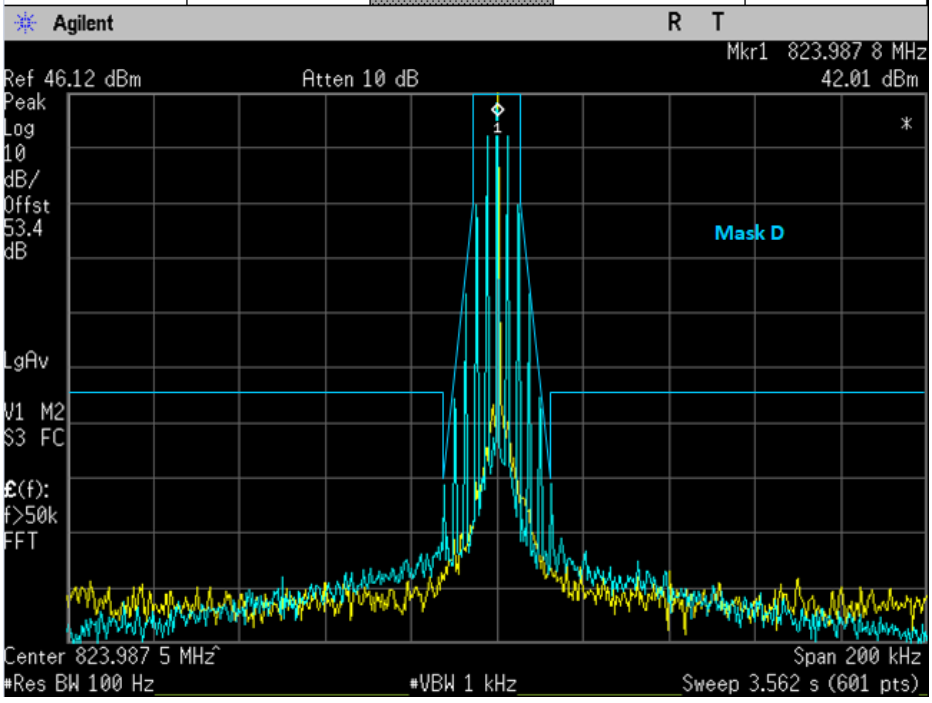
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		9.9535	11K0F3E



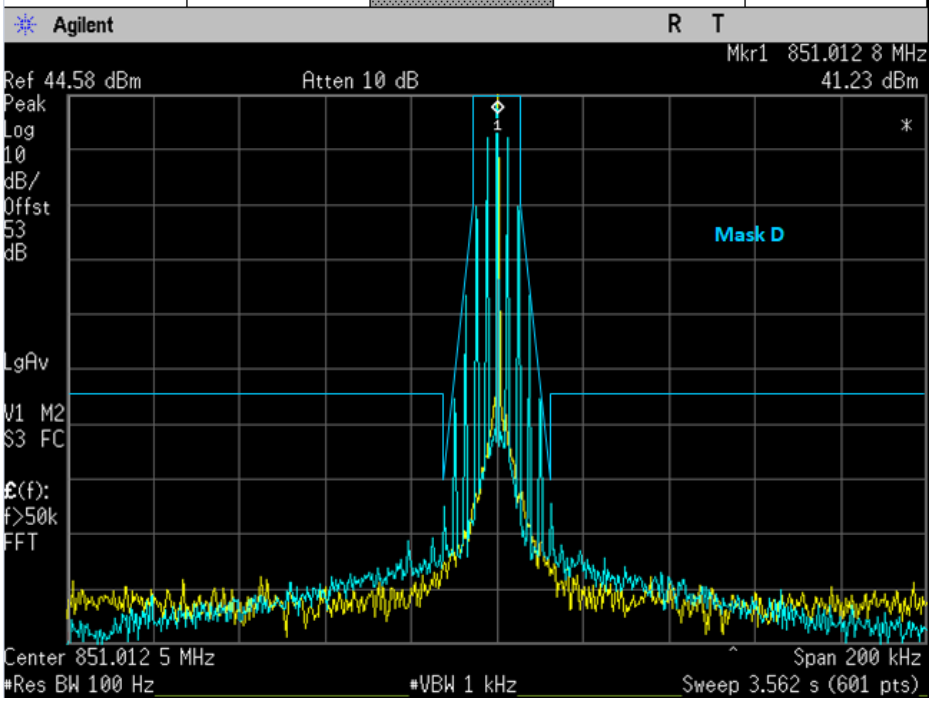
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		9.9427	11K0F3E



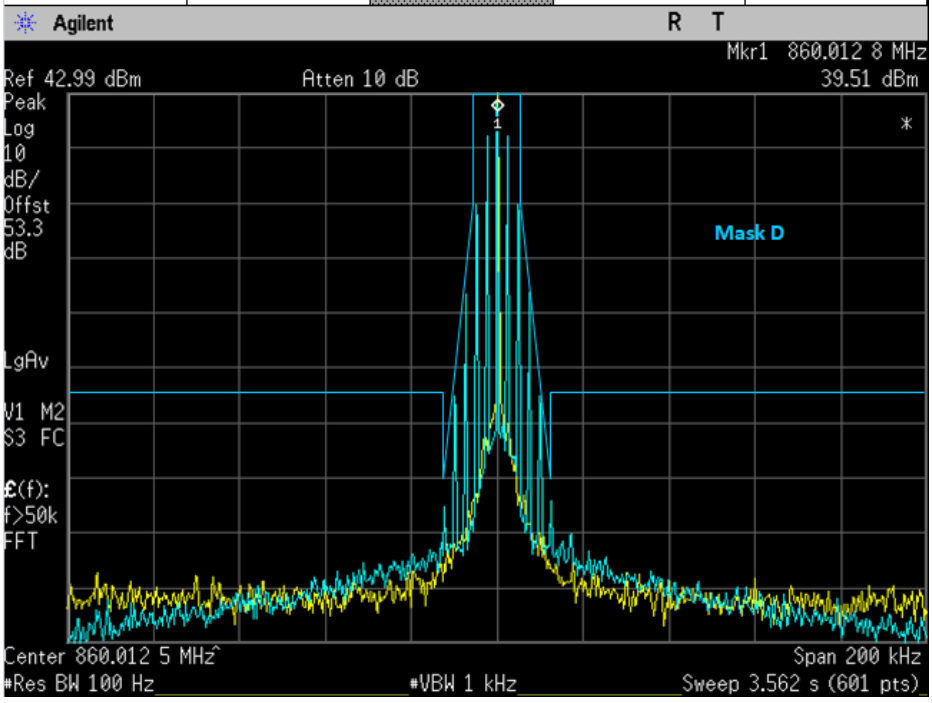
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	12.5		9.9658	11K0F3E



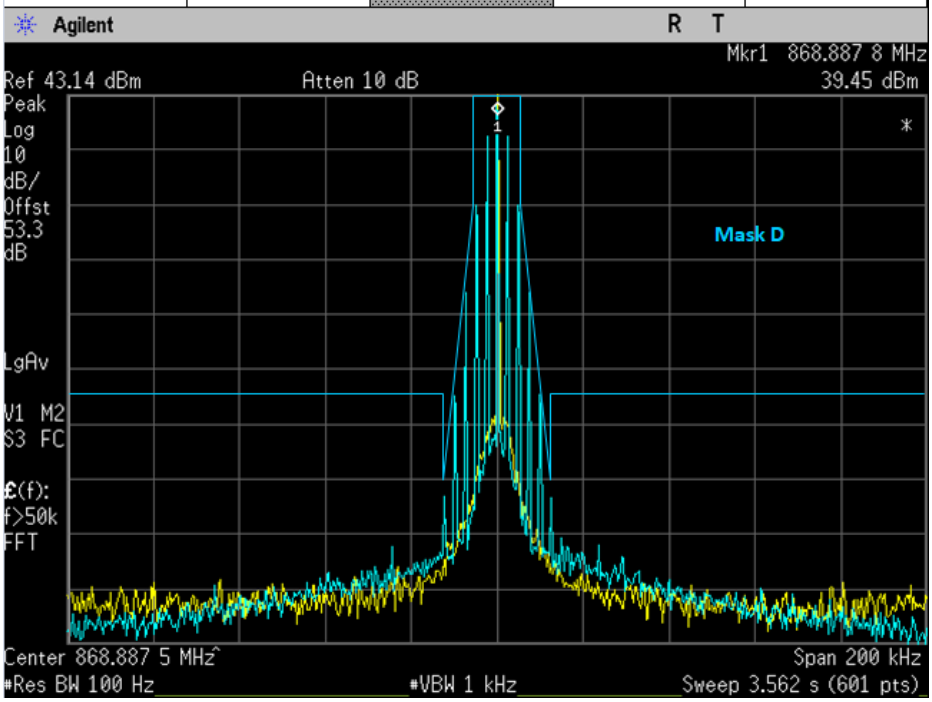
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	12.5		9.9902	11K0F3E



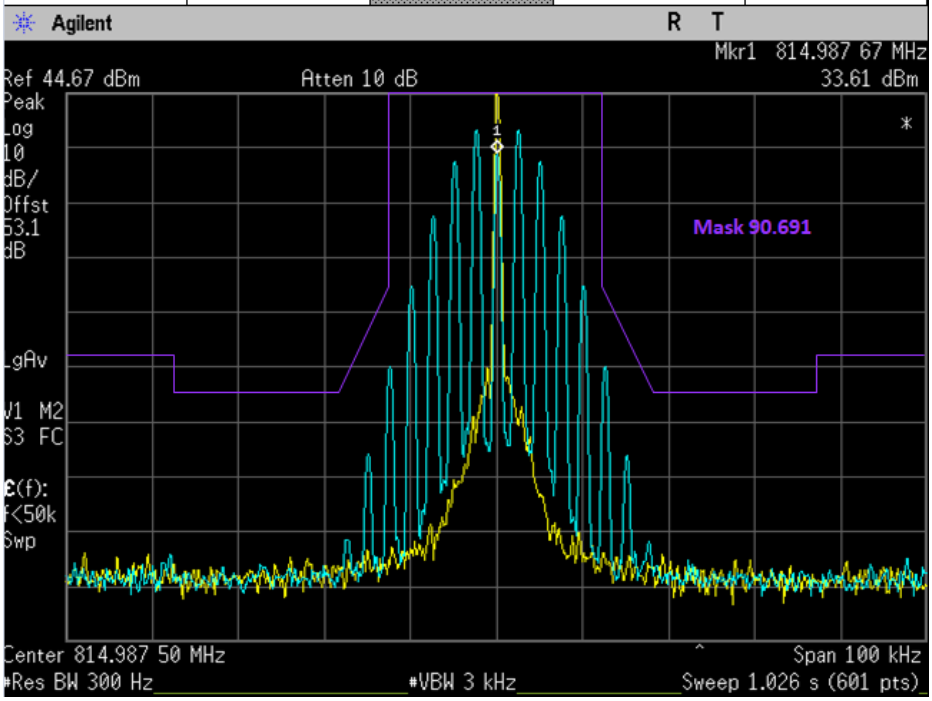
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		9.9834	11K0F3E



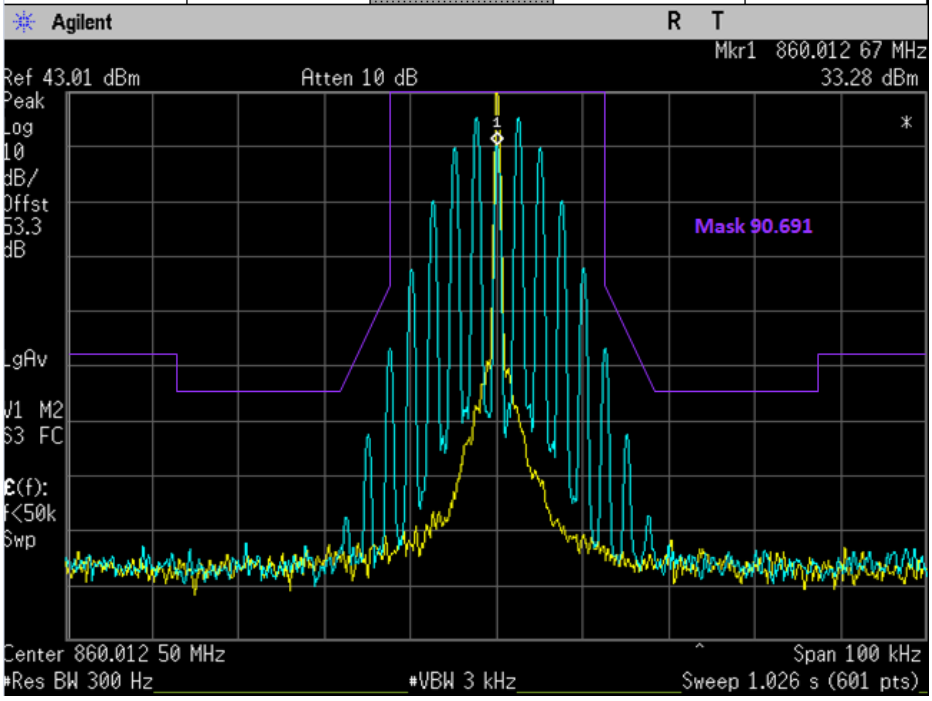
Modulation			Rules Part	
Analog Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	12.5		9.9986	11K0F3E



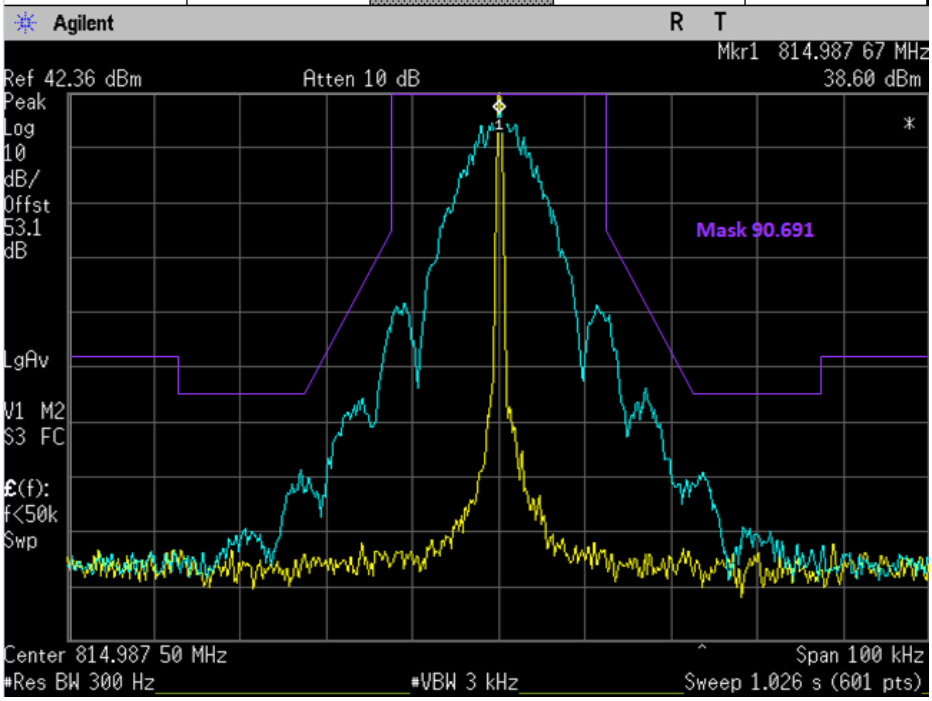
Modulation			Rules Part	
Analog Voice			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	25.0		14.9833	16K0F3E



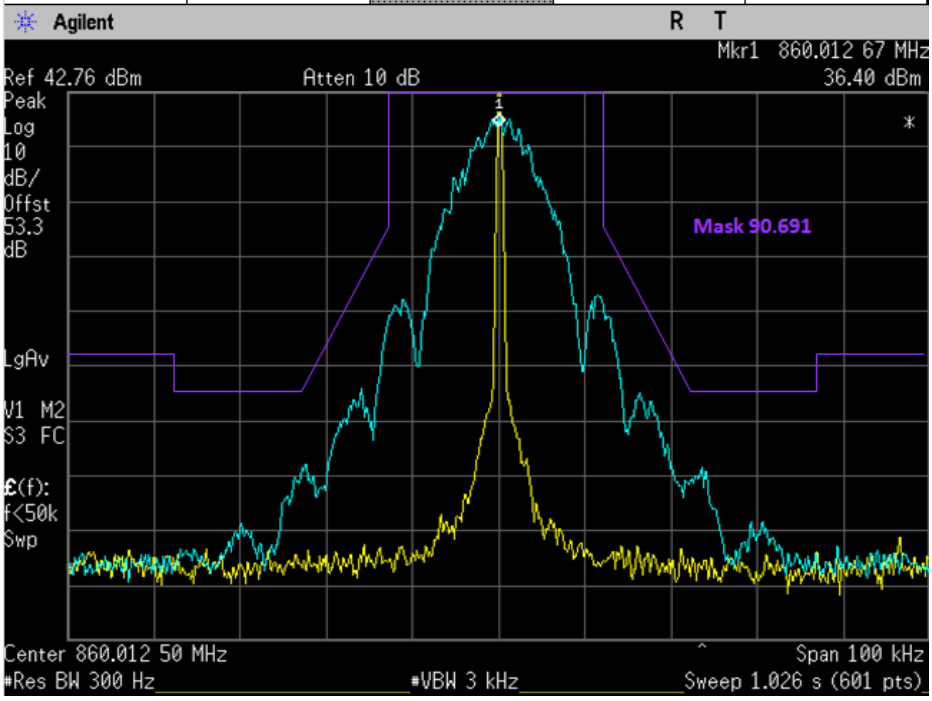
Modulation			Rules Part	
Analog Voice			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	25.0		15.0309	16K0F3E



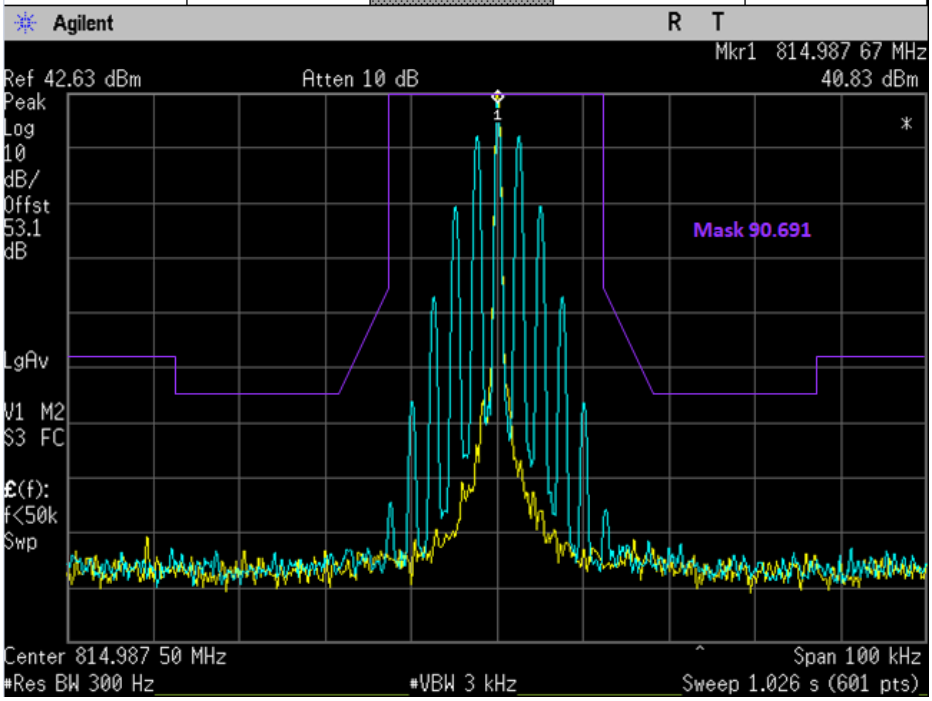
Modulation			Rules Part	
Analog Voice Encyption			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	20.0		11.8749	20K0F1E



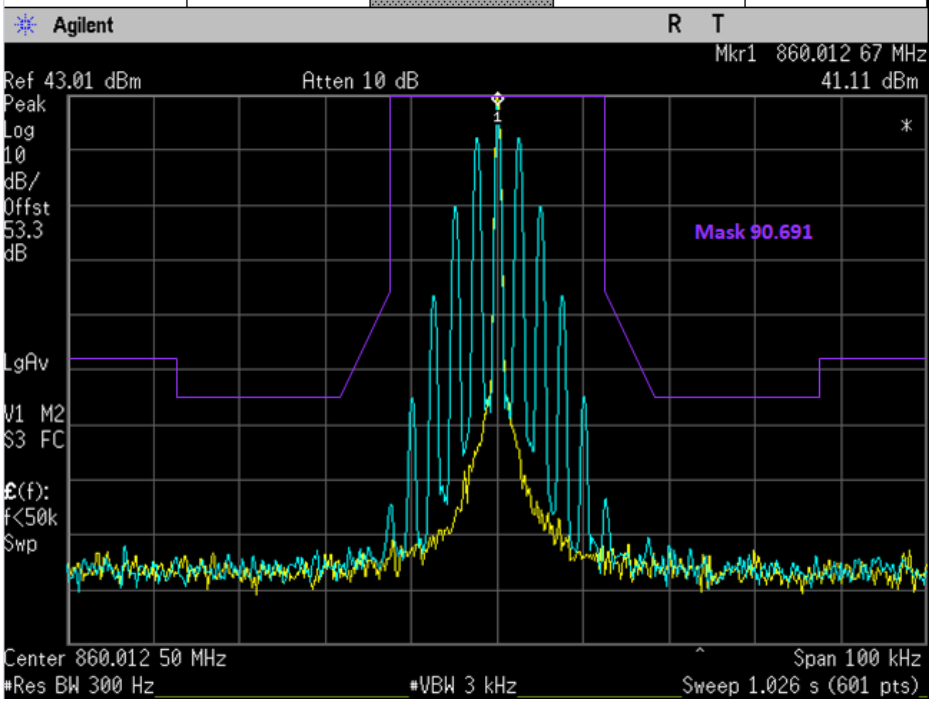
Modulation			Rules Part	
Analog Voice Encyption			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	20.0		11.6513	20K0F1E



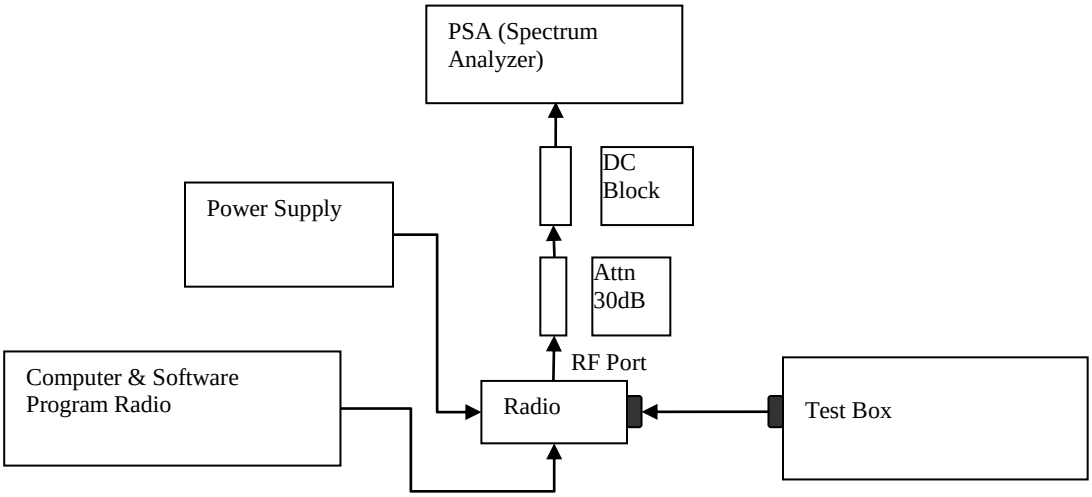
Modulation			Rules Part	
Analog Voice			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		9.9433	11K0F3E



Modulation			Rules Part	
Analog Voice			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		9.9844	11K0F3E



6.6.3. Test Setup (Digital)



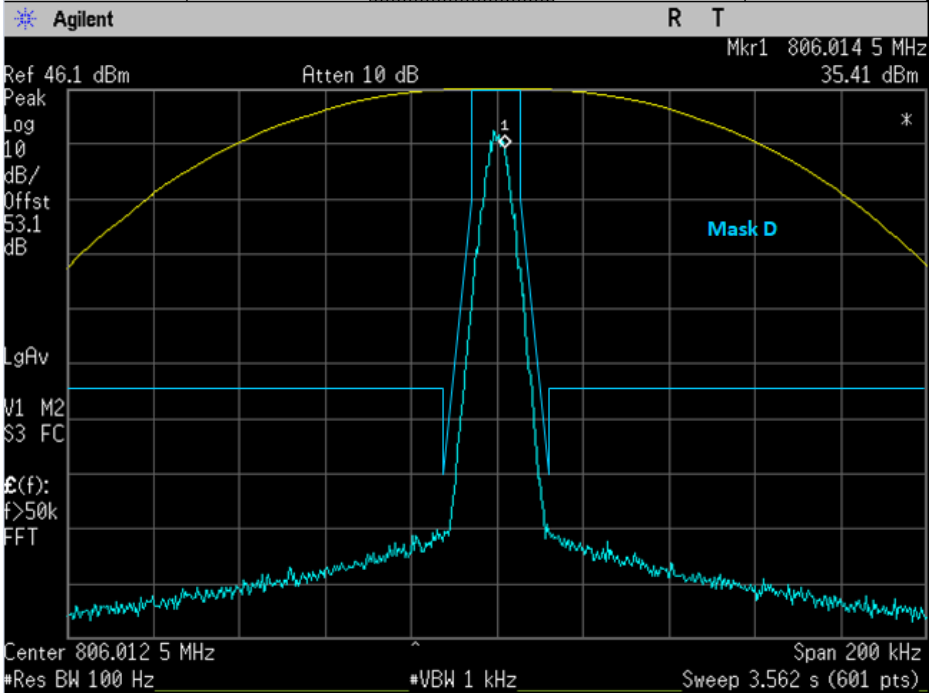
1) Program and set radio to operate in desire test frequency and digital mode with modulation. (*4FSK, C4FM or other digital modulation form).
2) Path loss for the measurement included.
3) Select the Occupied Bandwidth measurement for 99% Emissions Bandwidth Measurement.
4) Key in the Fc and Resolution 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:

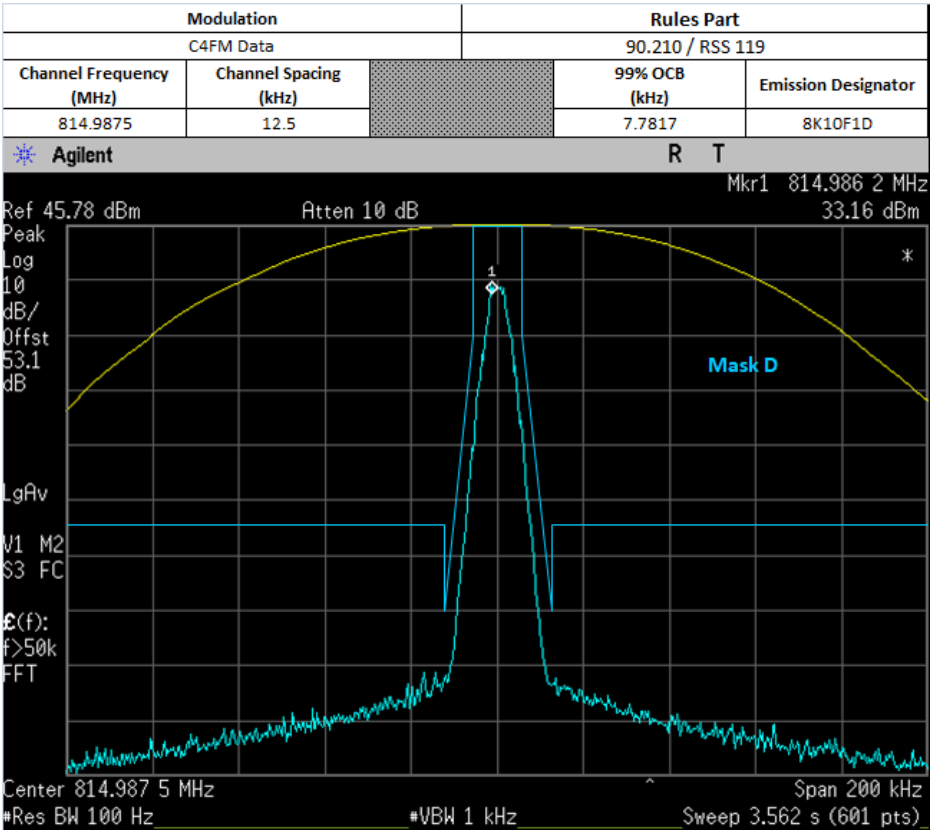
- For Digital Modulation, 12.5 kHz Data F1D & FXD would be the same. Therefore only measurements with F1D modulation shown below.
- For Digital Modulation, 12.5 kHz Data F1E & FXE would be the same. Therefore only measurements with F1E modulation shown below.

6.6.4. Test Result (Digital)

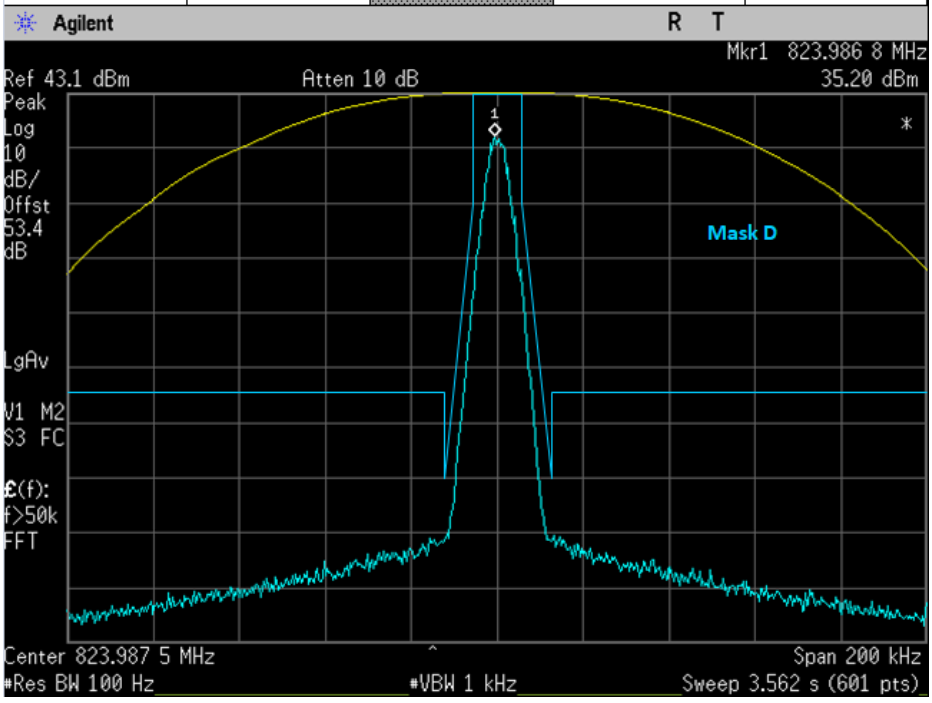
Modulation			Rules Part	
C4FM Data			90.210 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
806.0125	12.5		7.9315	8K10F1D



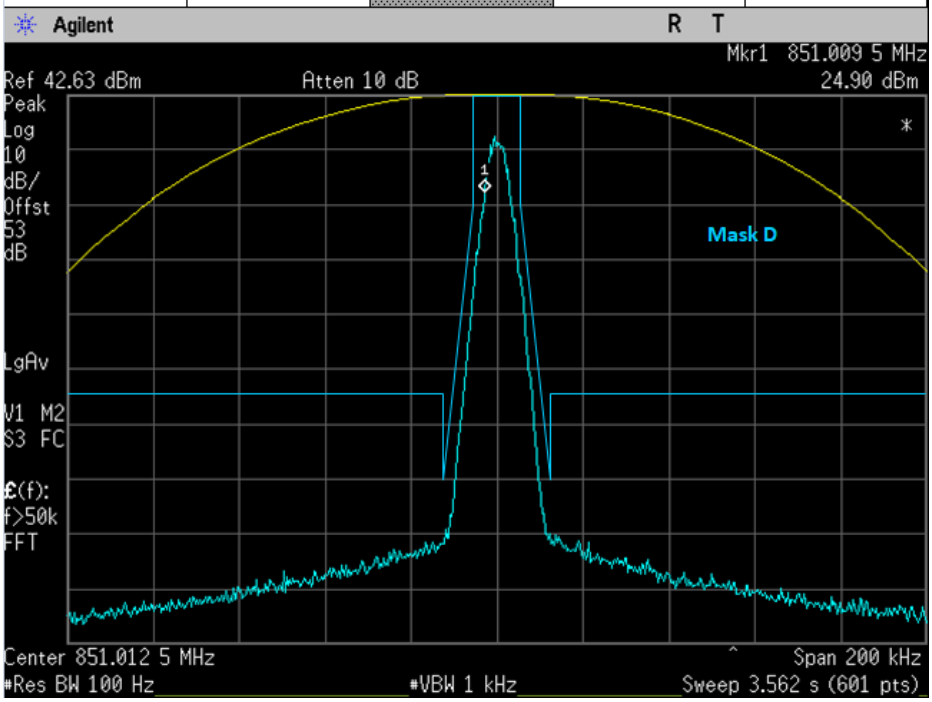
Modulation			Rules Part	
C4FM Data			90.210 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
814.9875	12.5		7.7817	8K10F1D



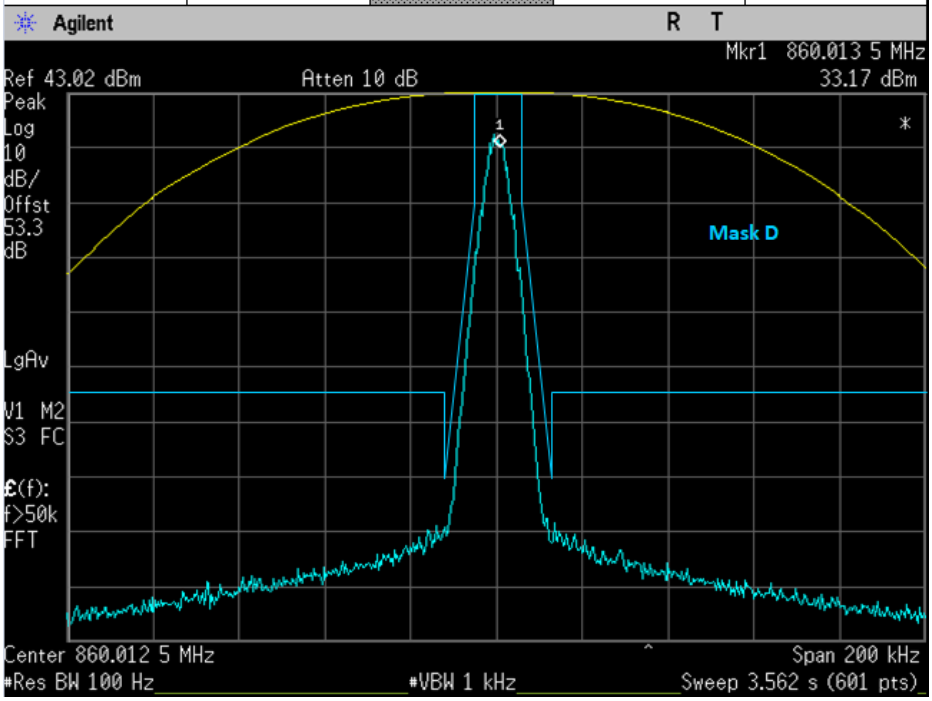
Modulation			Rules Part	
C4FM Data			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	12.5		7.9668	8K10F1D



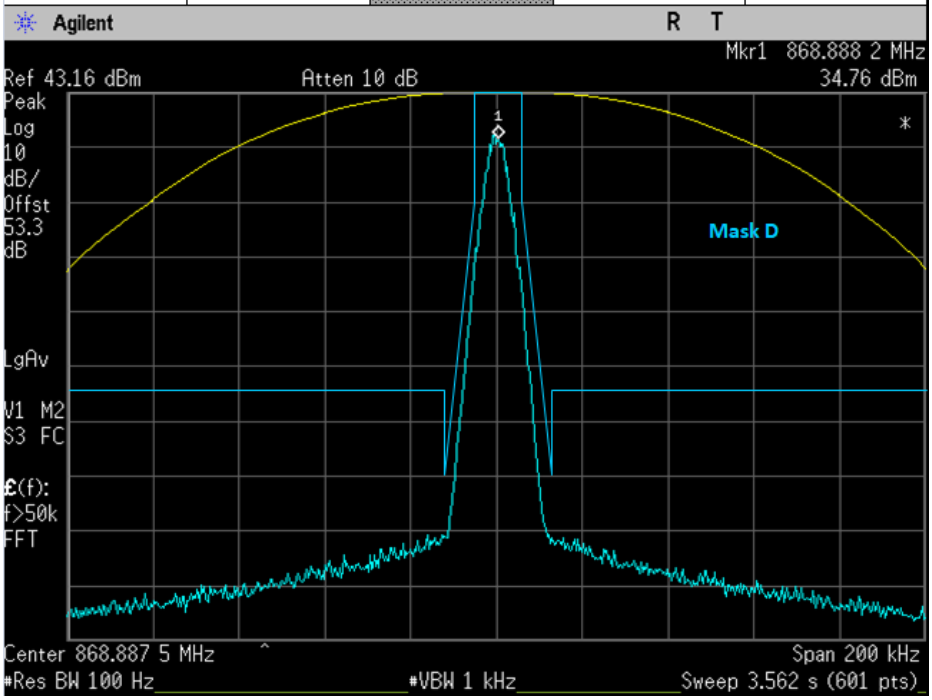
Modulation			Rules Part	
C4FM Data			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	12.5		7.8592	8K10F1D



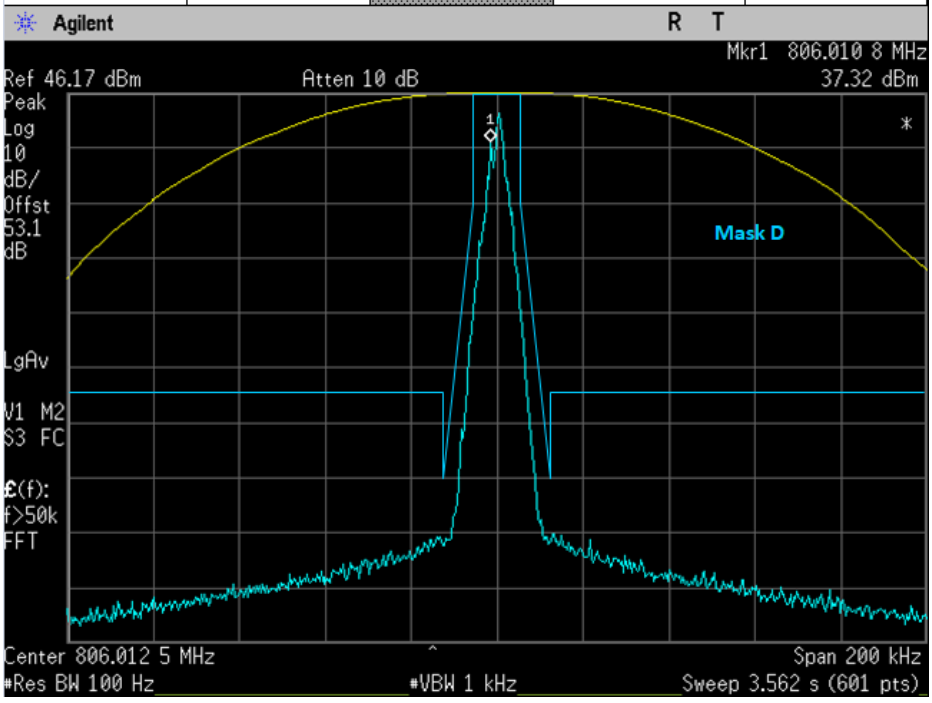
Modulation			Rules Part	
C4FM Data			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		7.8081	8K10F1D



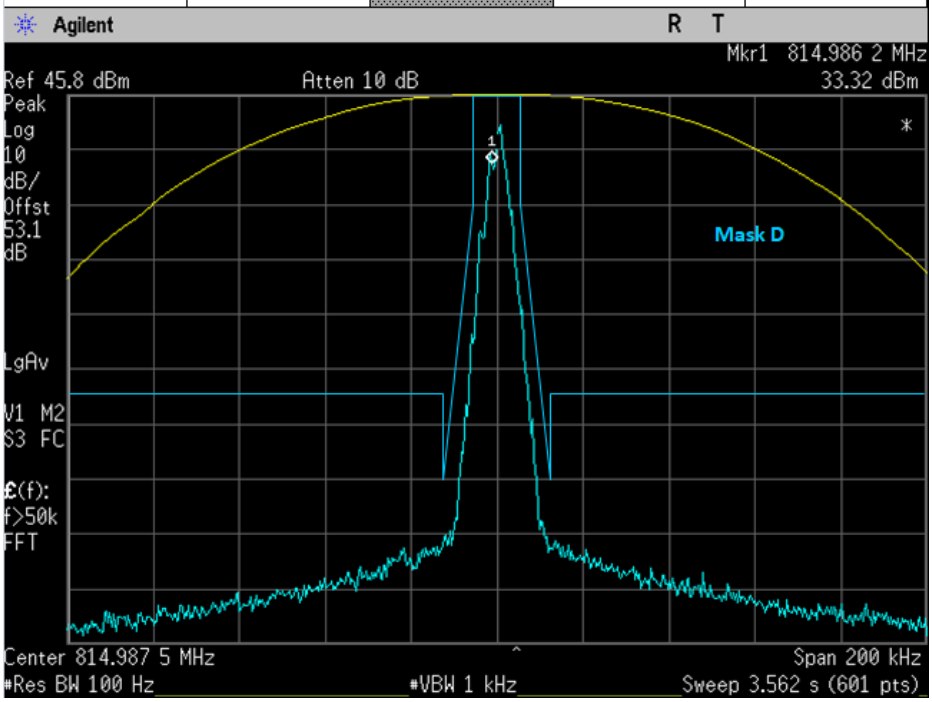
Modulation			Rules Part	
C4FM Data			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	12.5		8.1360	8K10F1D



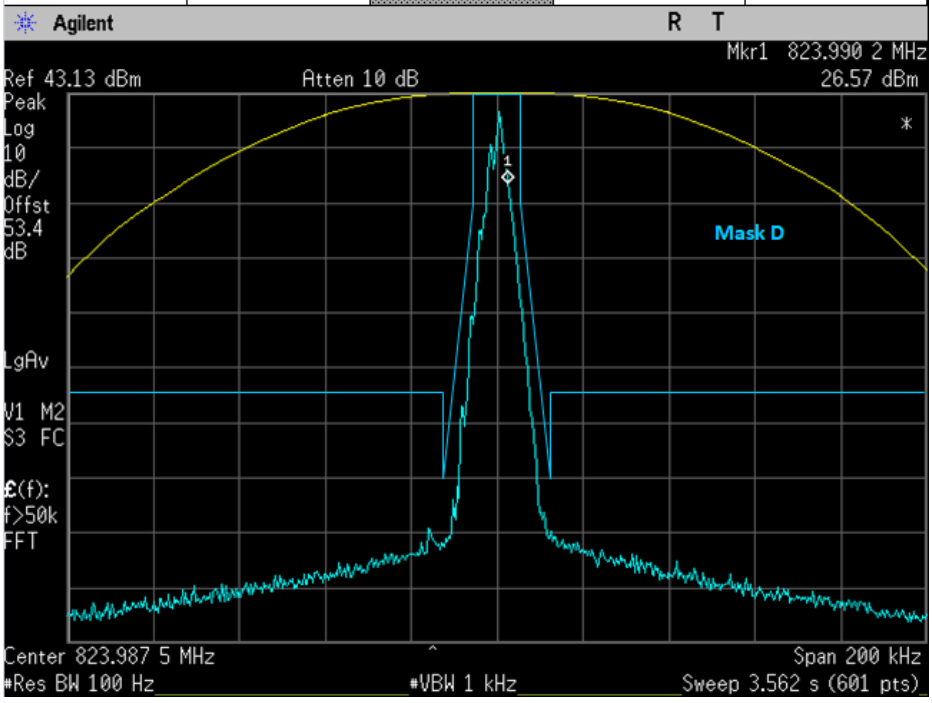
Modulation			Rules Part	
C4FM Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		6.5223	8K10F1E



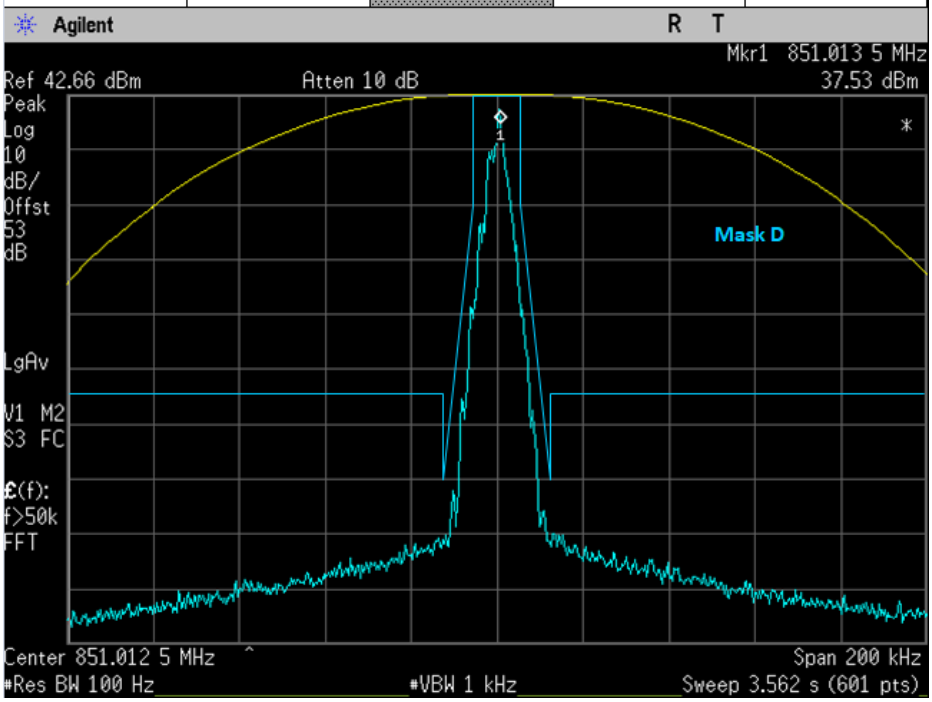
Modulation			Rules Part	
C4FM Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		6.2489	8K10F1E



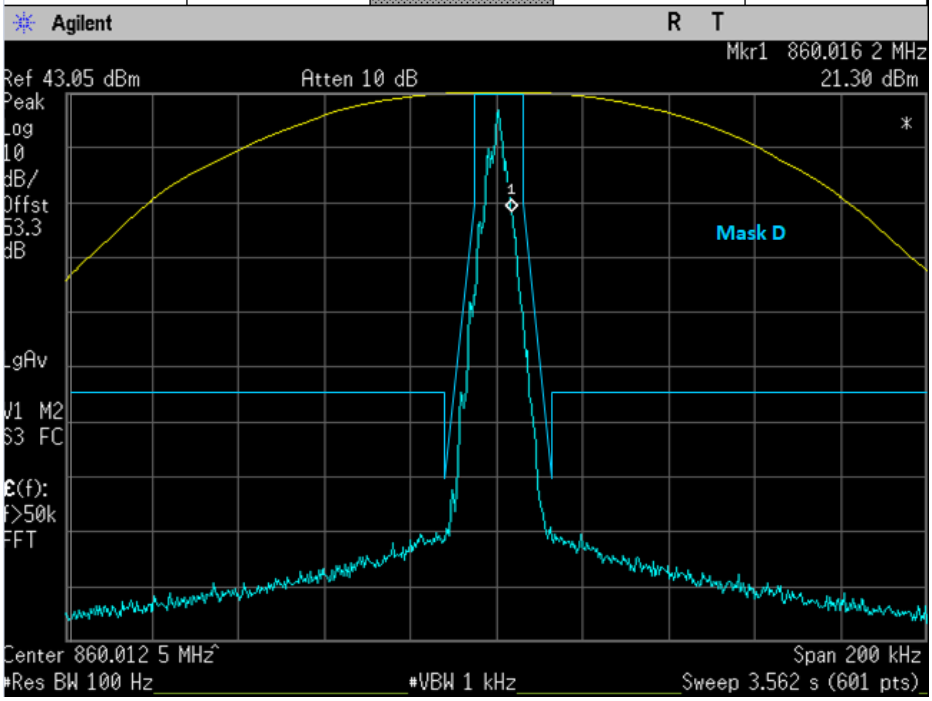
Modulation			Rules Part	
C4FM Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	12.5		6.1471	8K10F1E



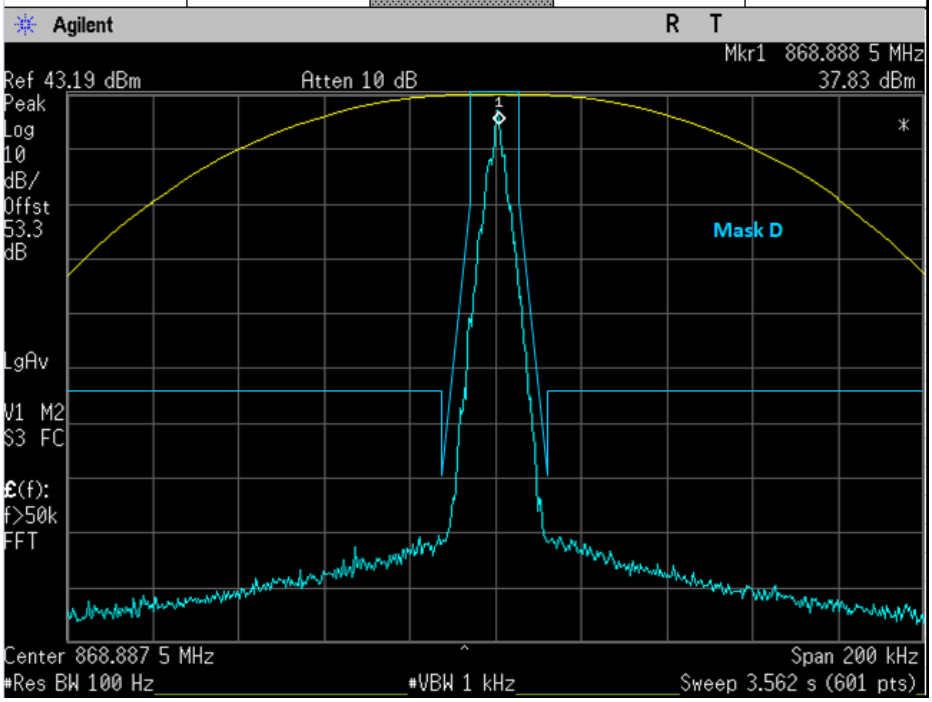
Modulation			Rules Part	
C4FM Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	12.5		7.4853	8K10F1E



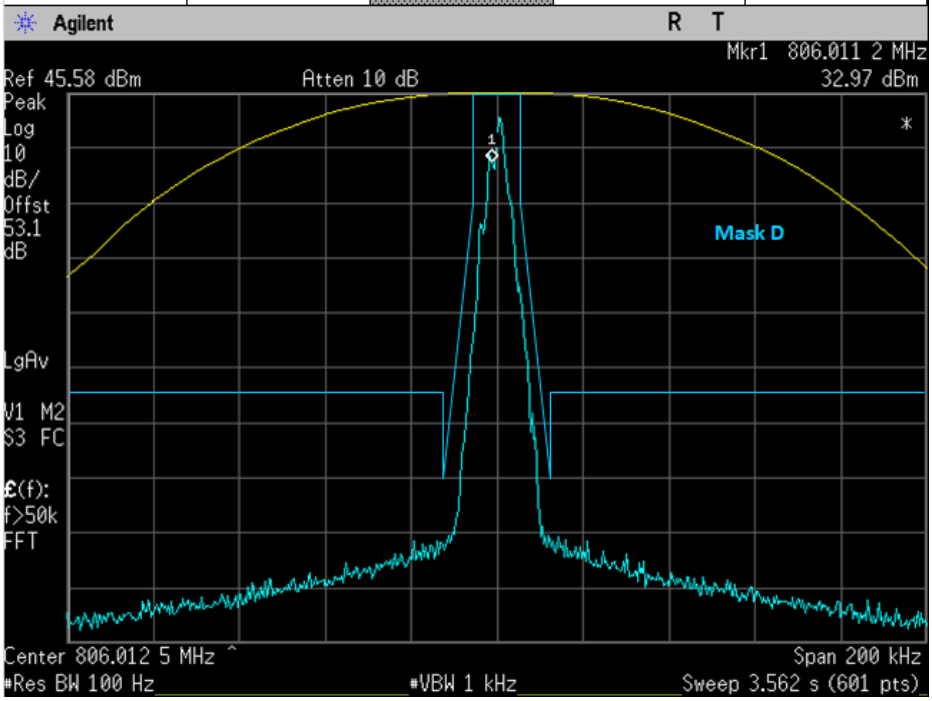
Modulation			Rules Part	
C4FM Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		6.9401	8K10F1E



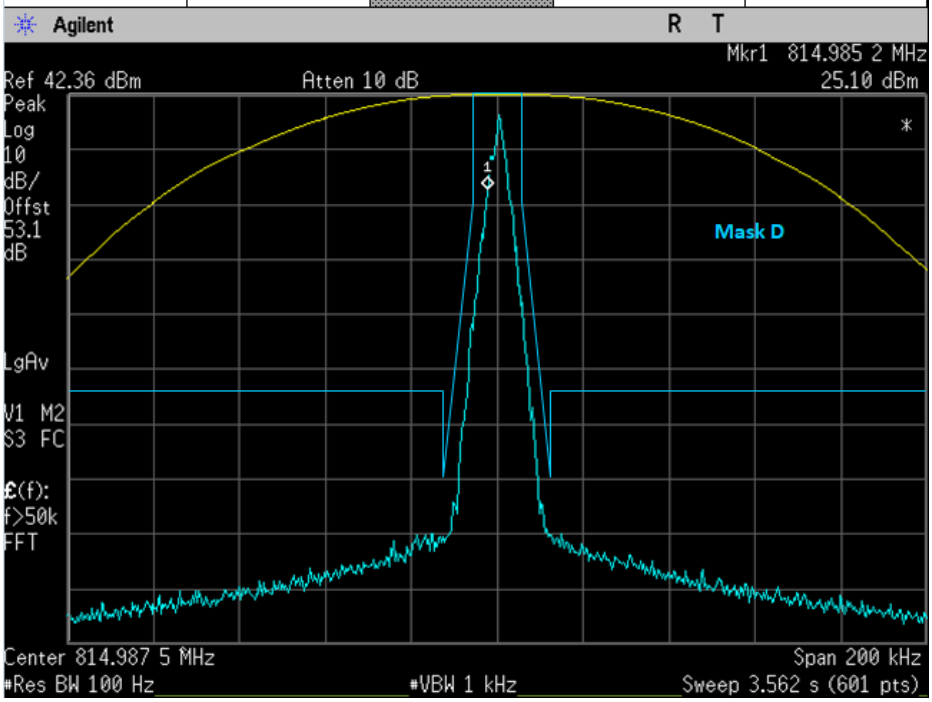
Modulation			Rules Part	
C4FM Voice			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	12.5		6.6532	8K10F1E



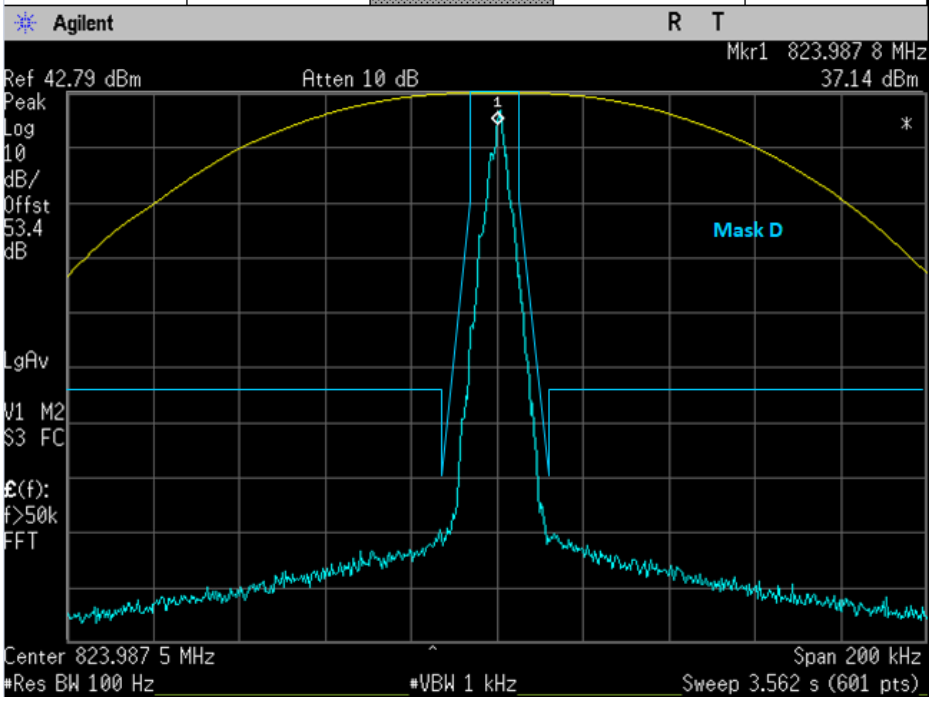
Modulation			Rules Part	
C4FM Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		6.3140	8K10F1E



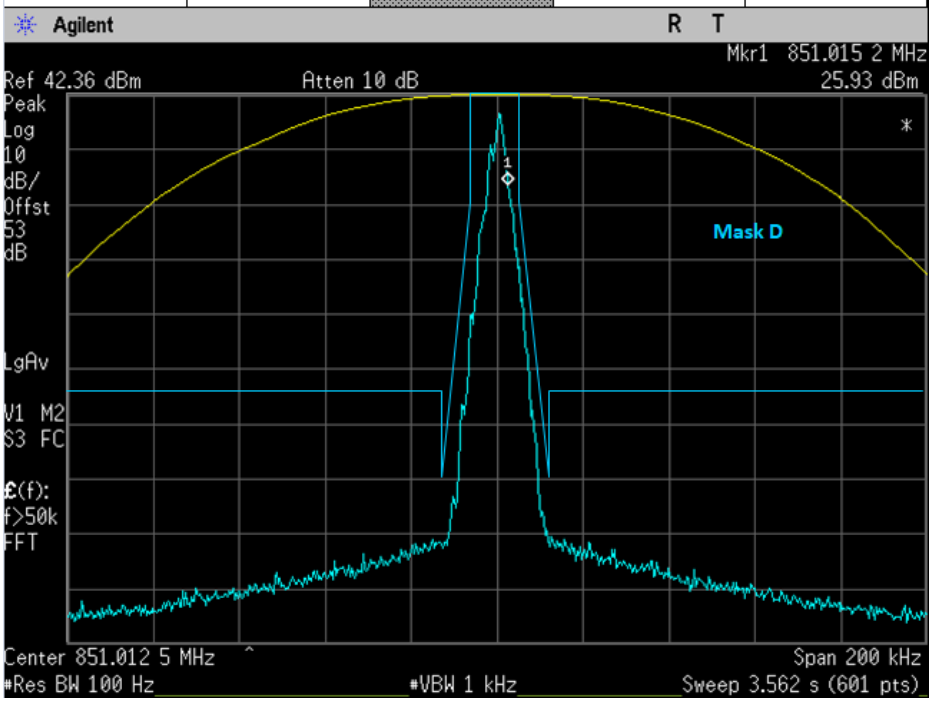
Modulation			Rules Part	
C4FM Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		6.4558	8K10F1E



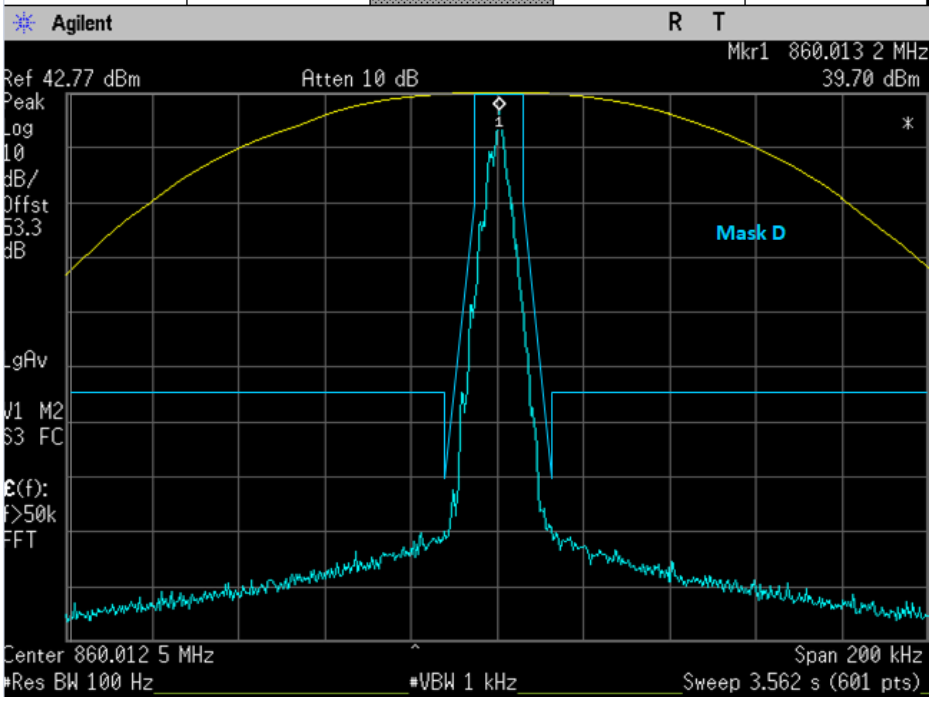
Modulation			Rules Part	
C4FM Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	12.5		6.6186	8K10F1E



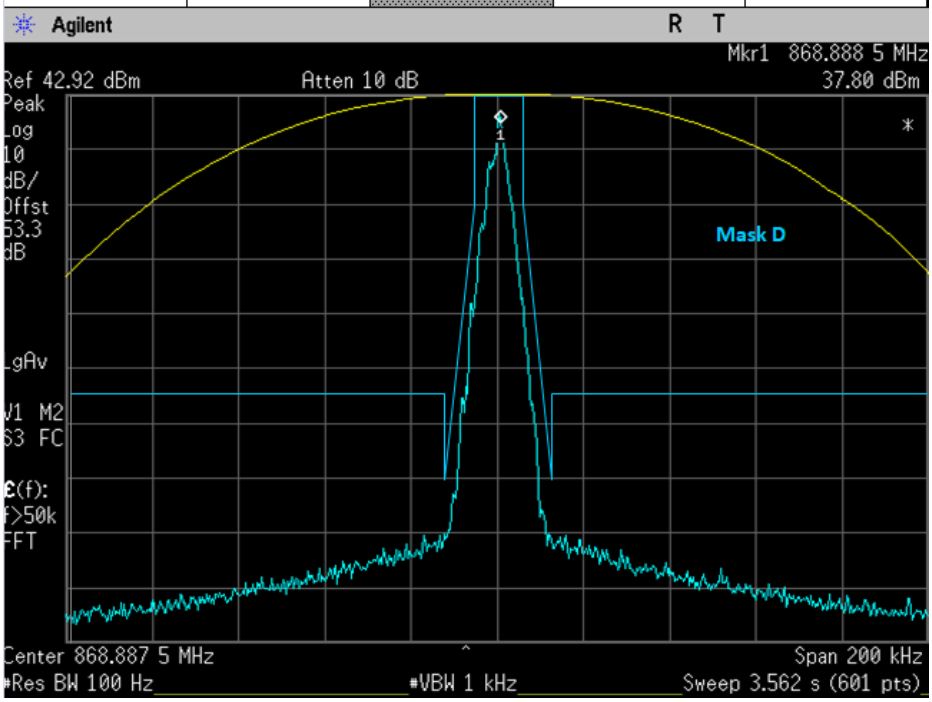
Modulation			Rules Part	
C4FM Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	12.5		7.0692	8K10F1E



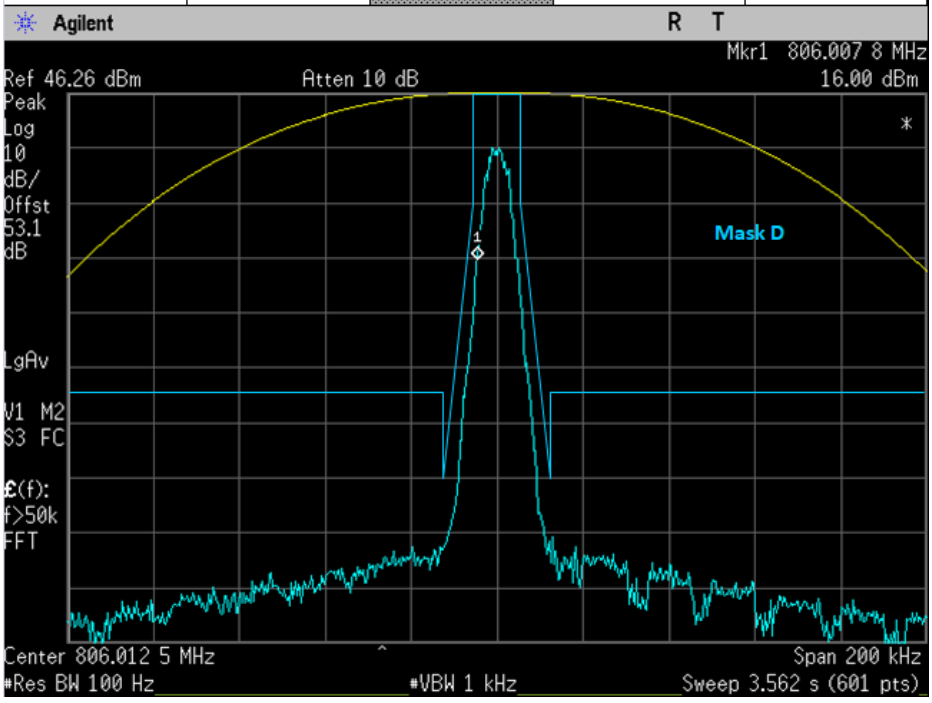
Modulation			Rules Part	
C4FM Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		7.4065	8K10F1E



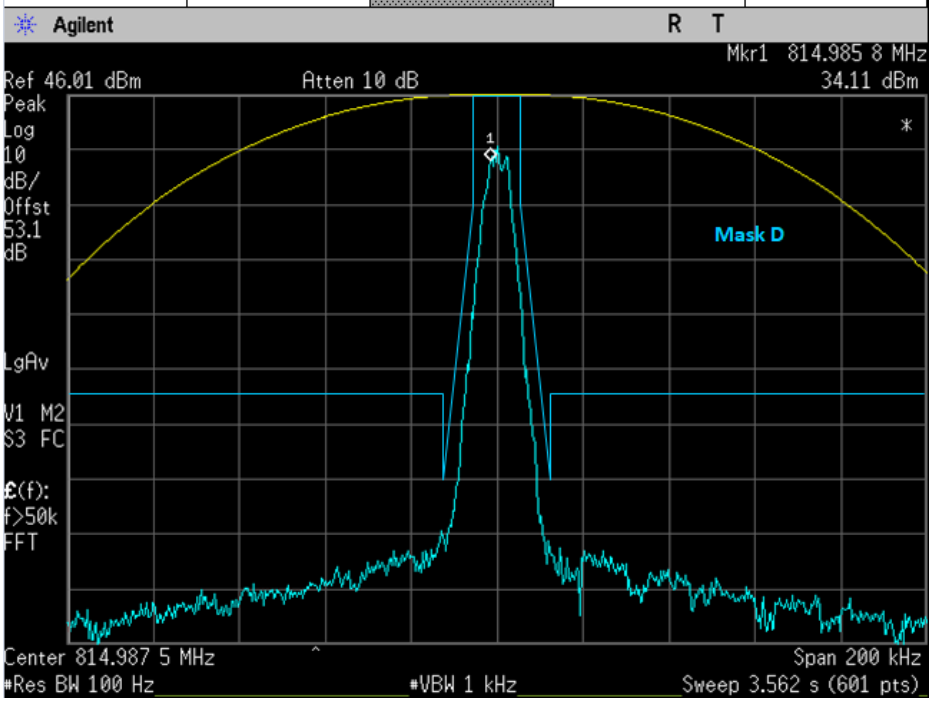
Modulation			Rules Part	
C4FM Voice Encyption			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	12.5		6.7482	8K10F1E



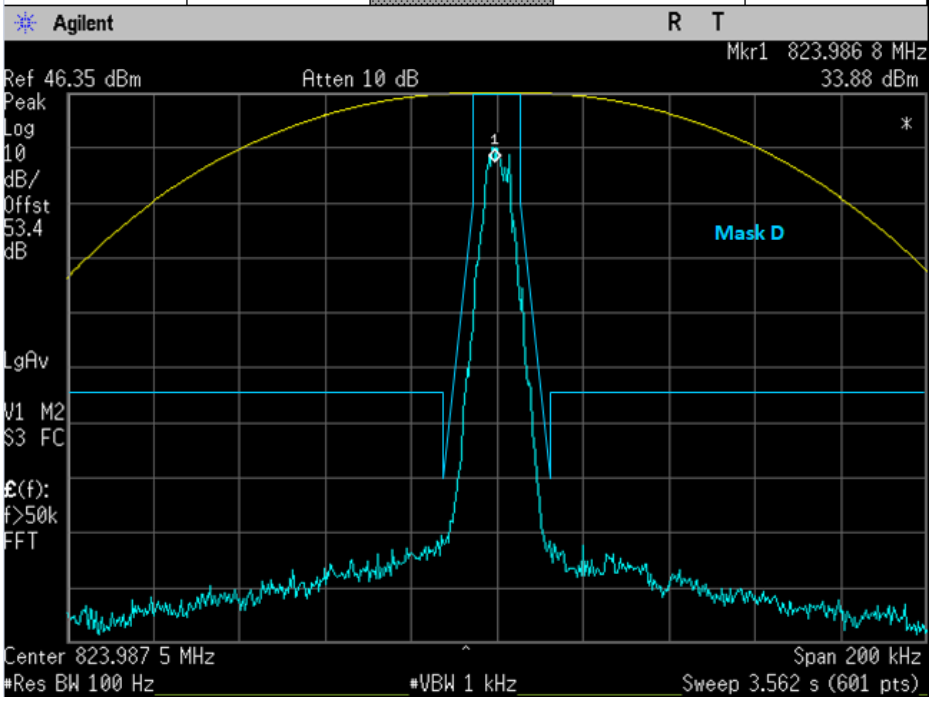
Modulation			Rules Part	
Phase II			90.210 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
806.0125	12.5		7.8171	8K10F1W



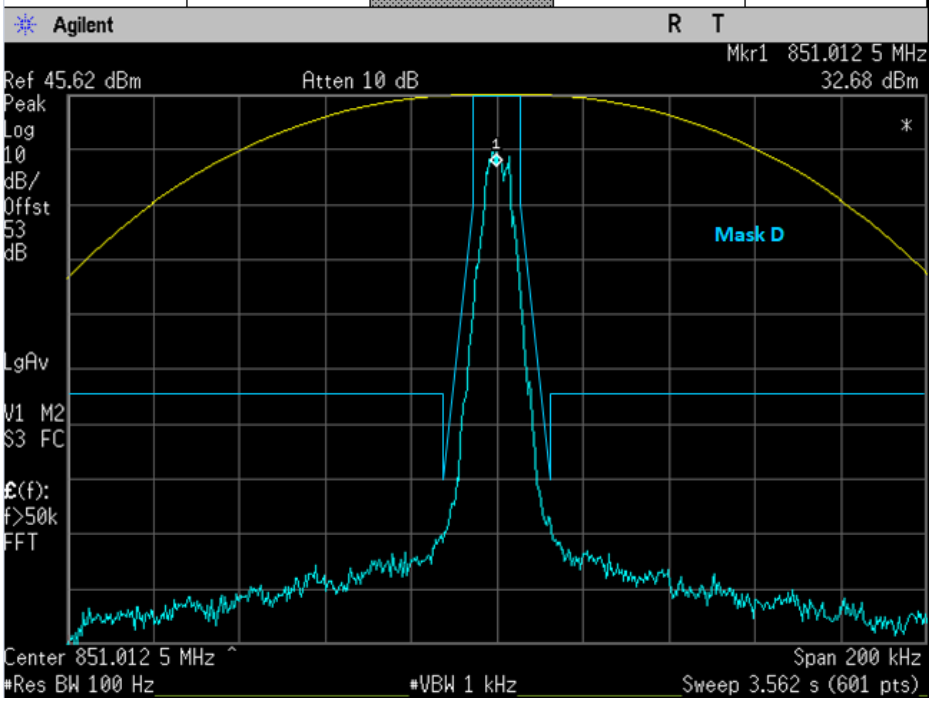
Modulation			Rules Part	
Phase II			90.210 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
814.9875	12.5		7.7924	8K10F1W



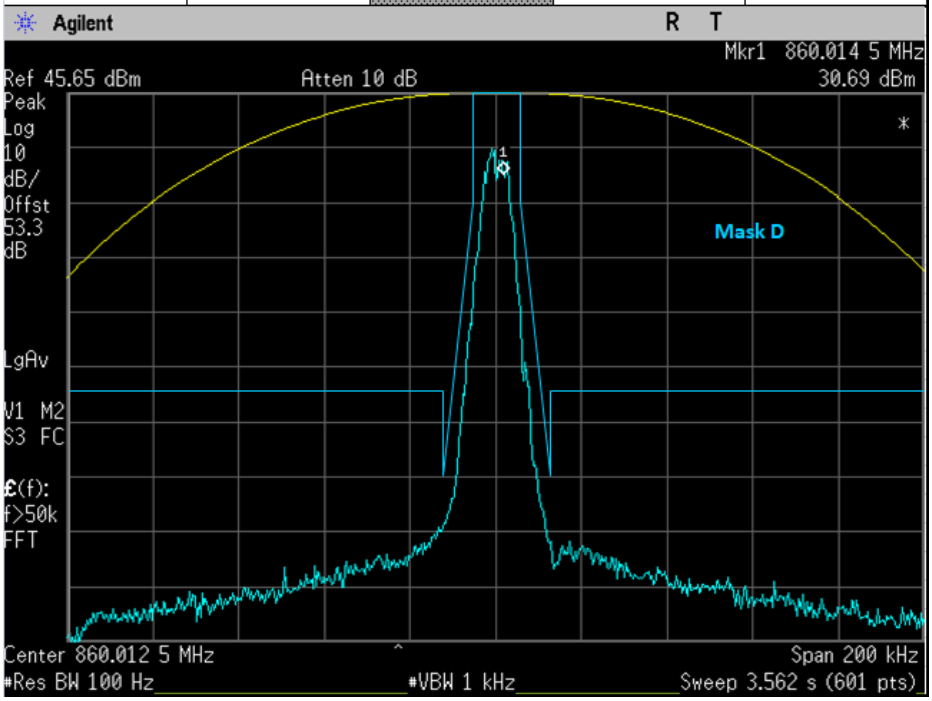
Modulation			Rules Part	
Phase II			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	12.5		7.7617	8K10F1W



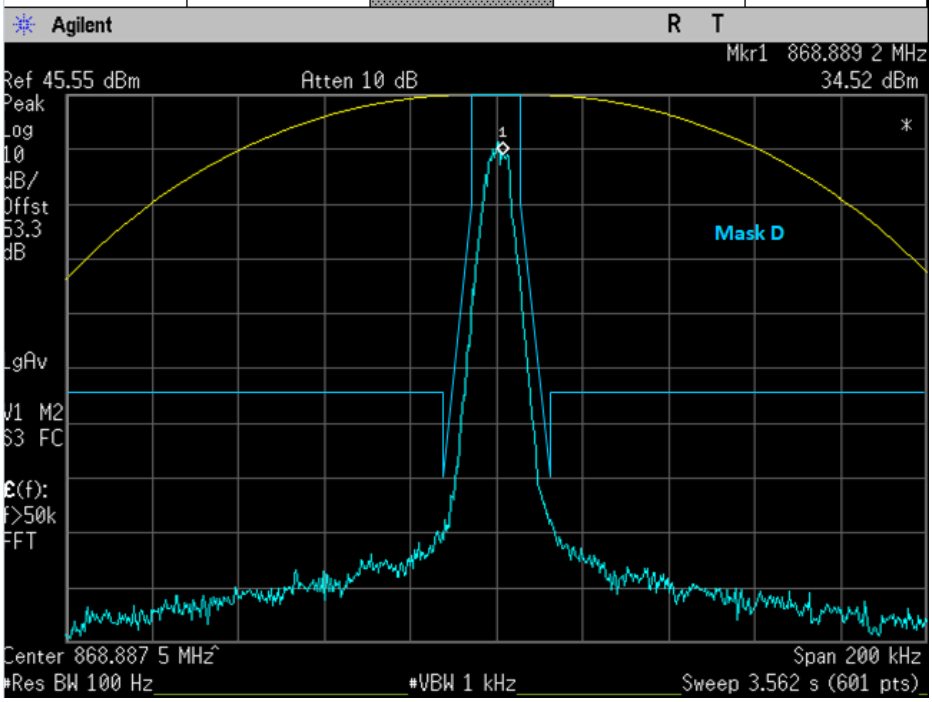
Modulation			Rules Part	
Phase II			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
851.0125	12.5		7.6162	8K10F1W



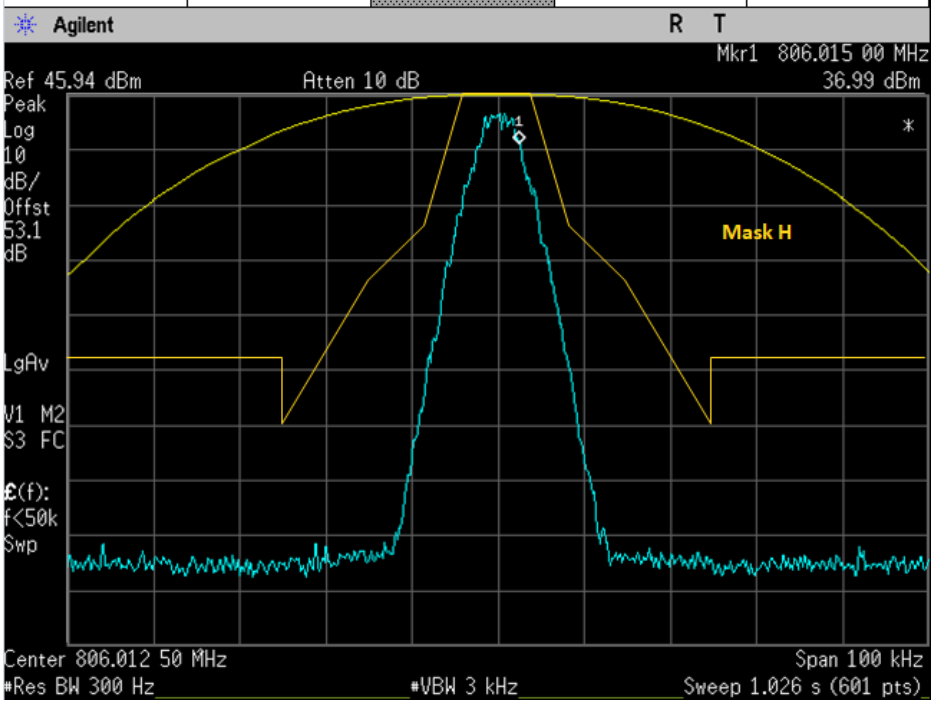
Modulation			Rules Part	
Phase II			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		6.9939	8K10F1W



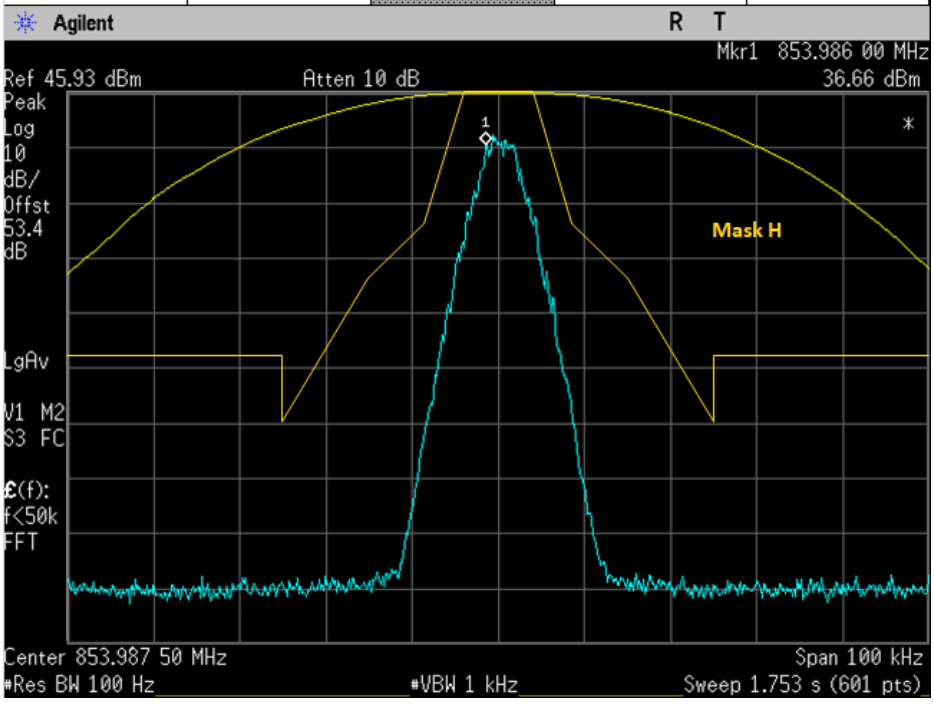
Modulation			Rules Part	
Phase II			90.210 / RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	12.5		7.7020	8K10F1W



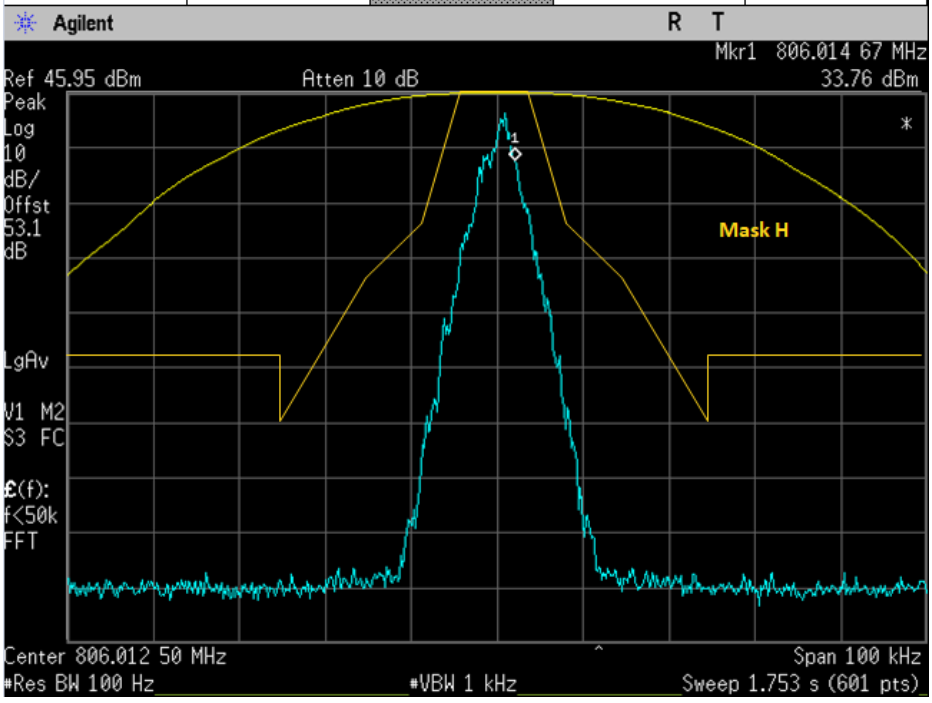
Modulation			Rules Part	
C4FM Data			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		8.0314	8K10F1D



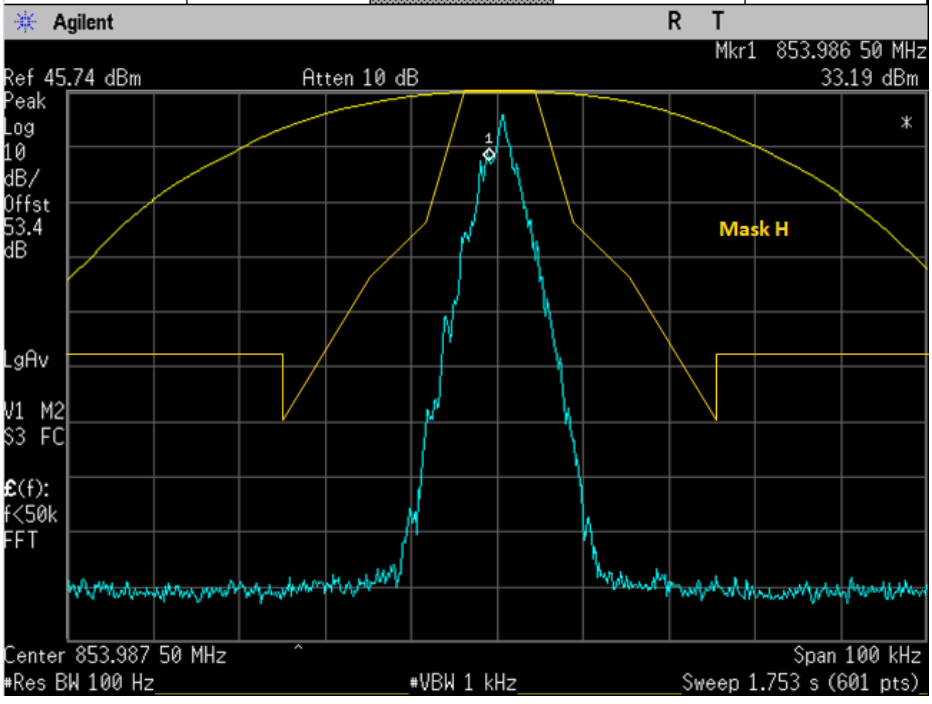
Modulation			Rules Part	
C4FM Data			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
853.9875	12.5		7.8556	8K10F1D



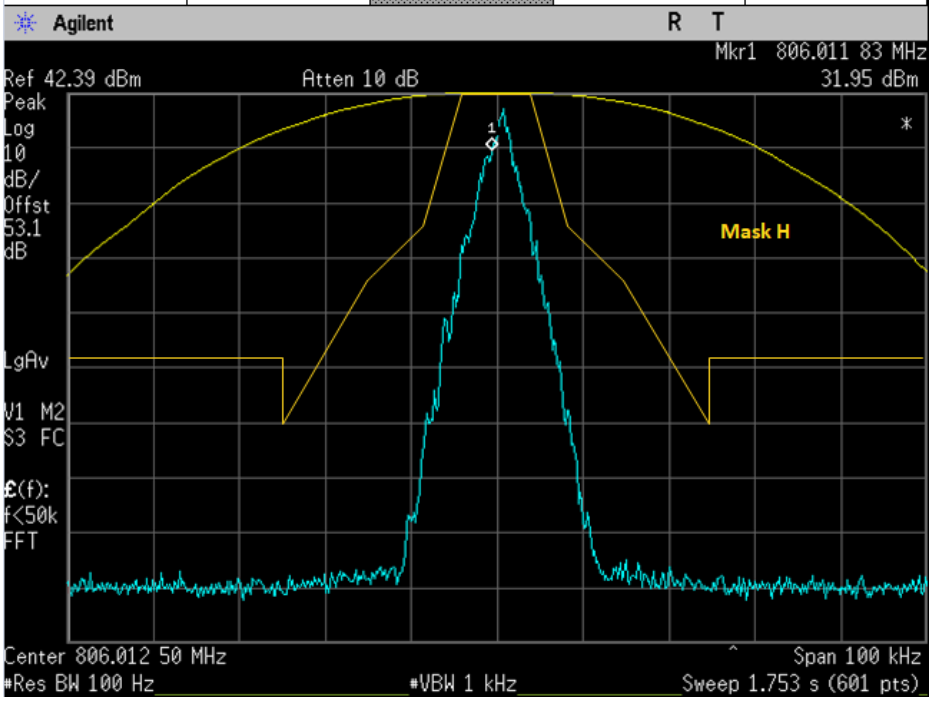
Modulation			Rules Part	
C4FM Voice			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		6.5531	8K10F1E



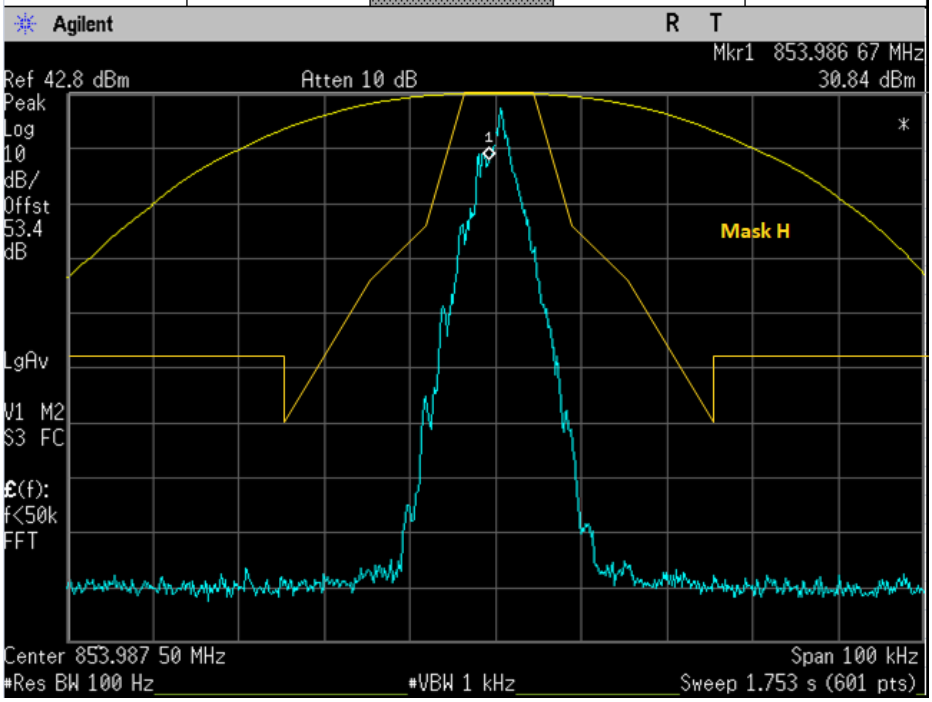
Modulation			Rules Part	
C4FM Voice			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
853.9875	12.5		6.6478	8K10F1E



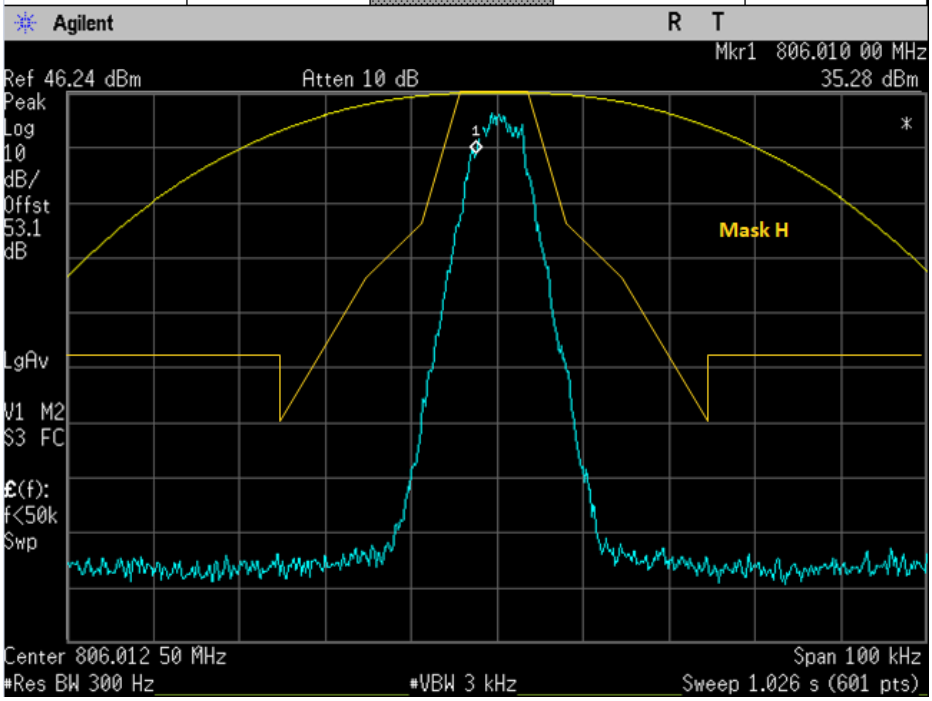
Modulation			Rules Part	
C4FM Voice Encyption			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		6.4152	8K10F1E



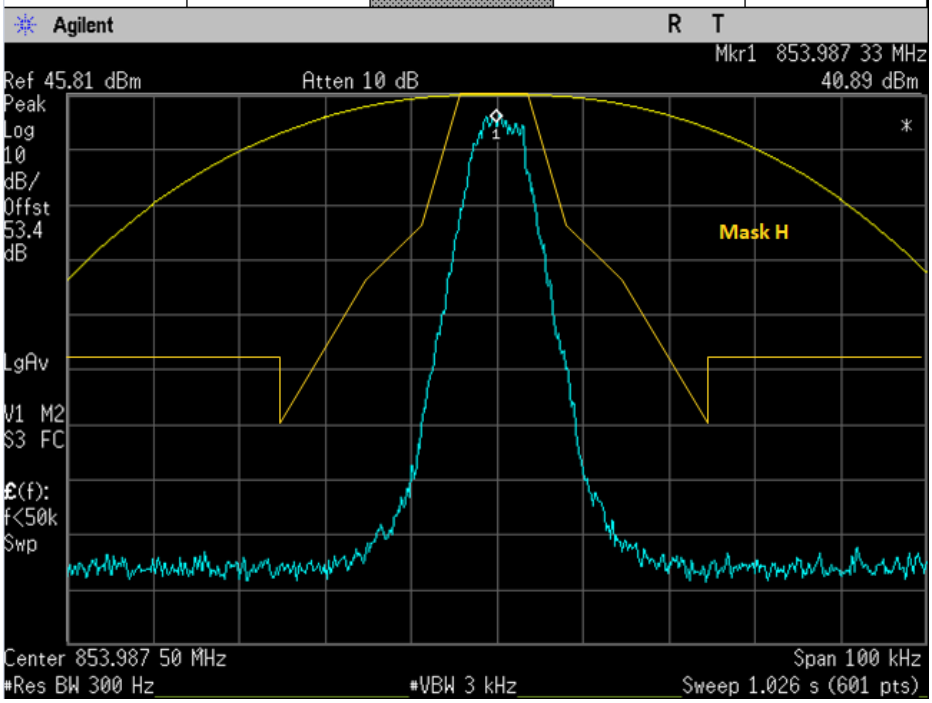
Modulation			Rules Part	
C4FM Voice Encyption			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
853.9875	12.5		6.2758	8K10F1E



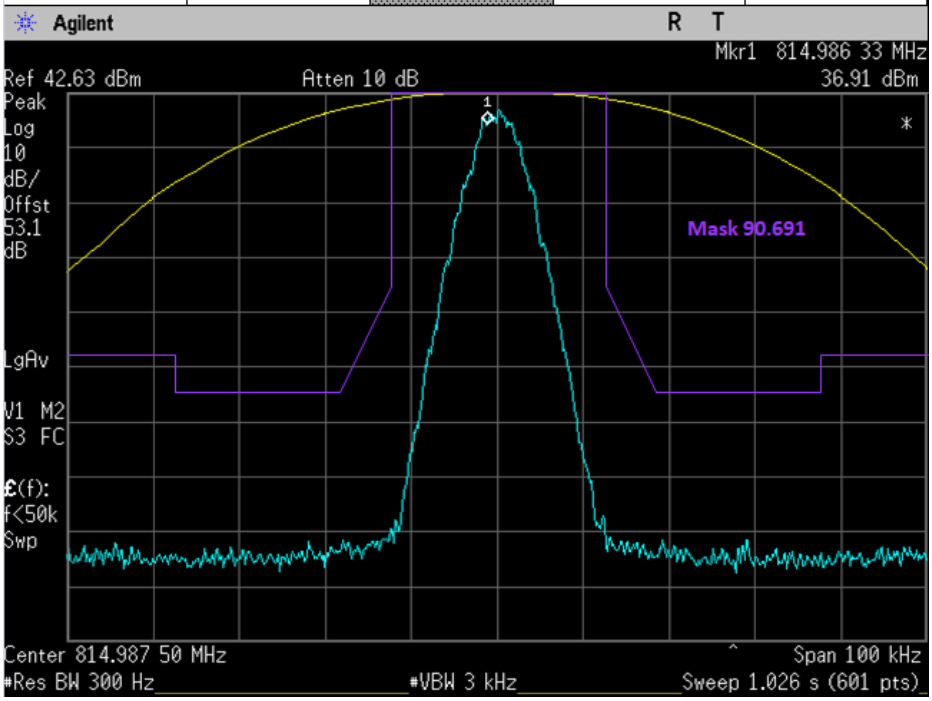
Modulation			Rules Part	
Phase II			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
806.0125	12.5		7.2158	8K10F1W



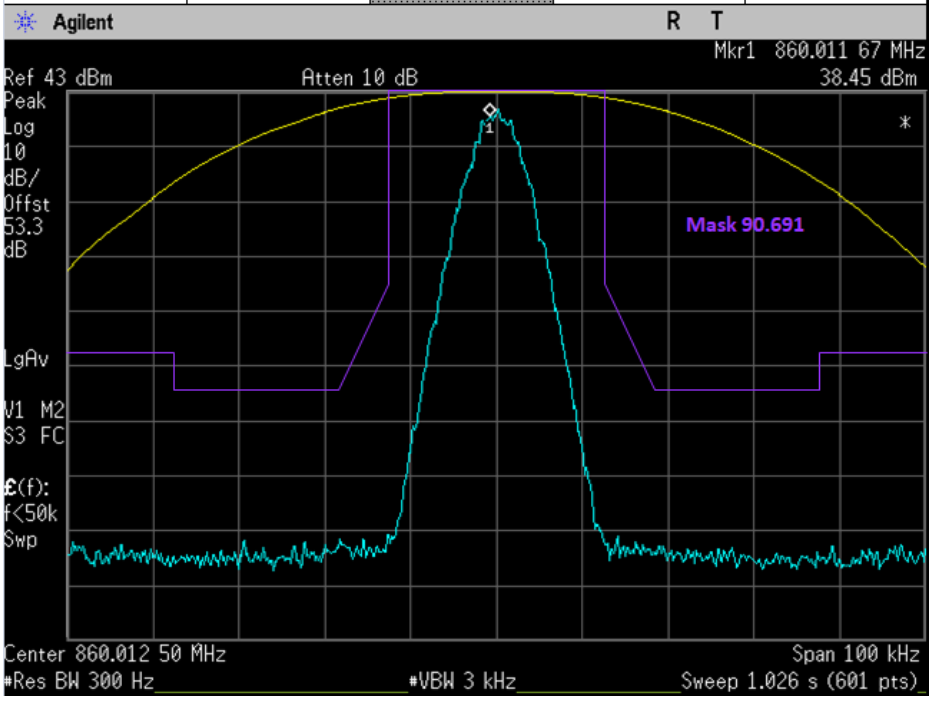
Modulation			Rules Part	
Phase II			90.210	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
853.9875	12.5		7.9166	8K10F1W



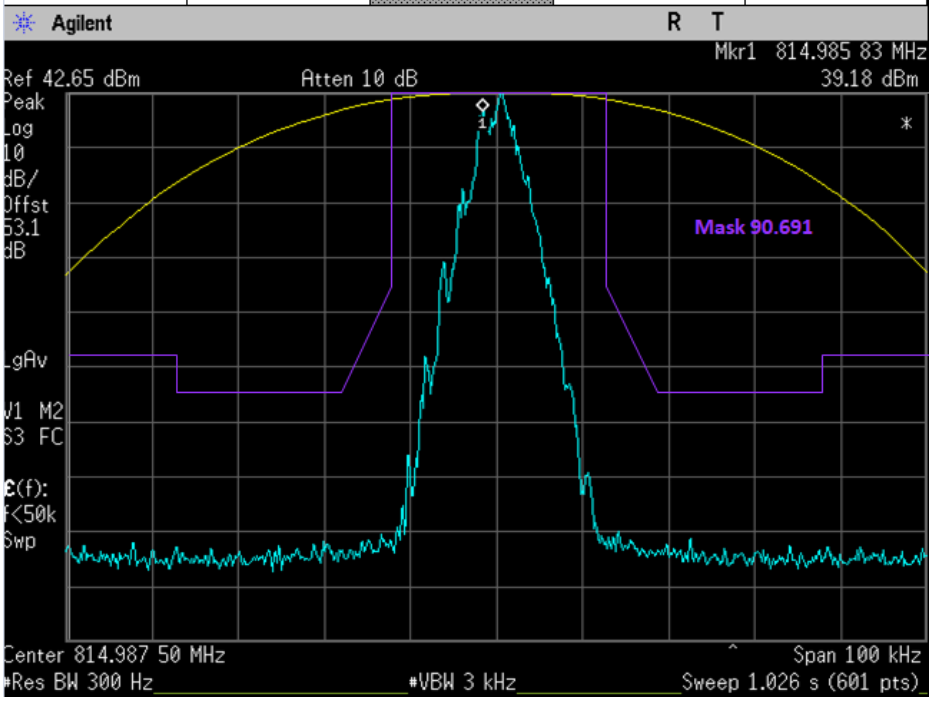
Modulation			Rules Part	
C4FM Data			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		7.7374	8K10F1D



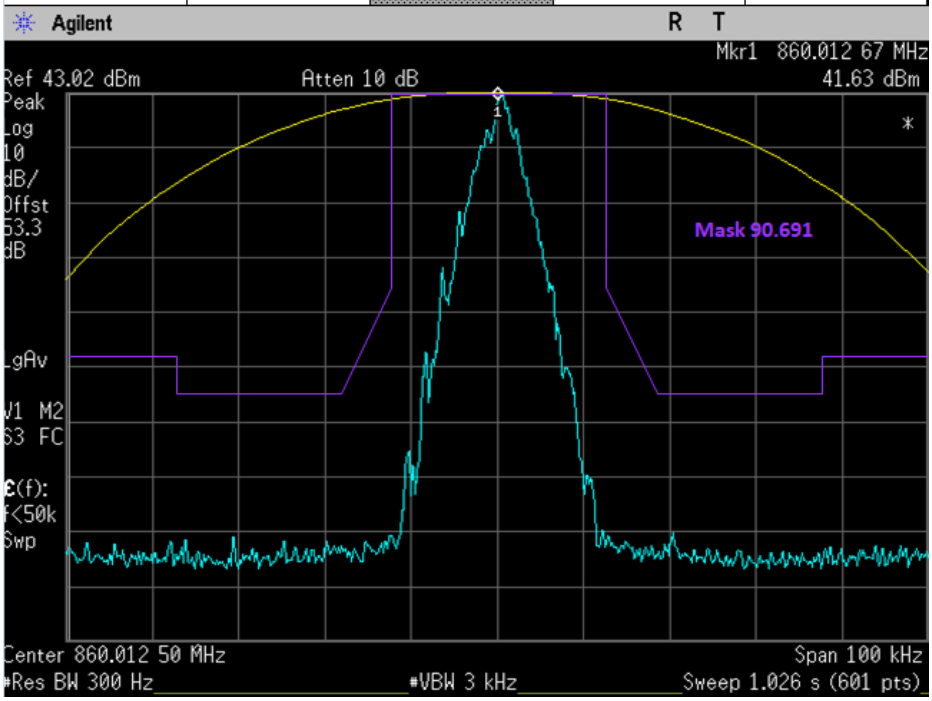
Modulation			Rules Part	
C4FM Data			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		8.0183	8K10F1D



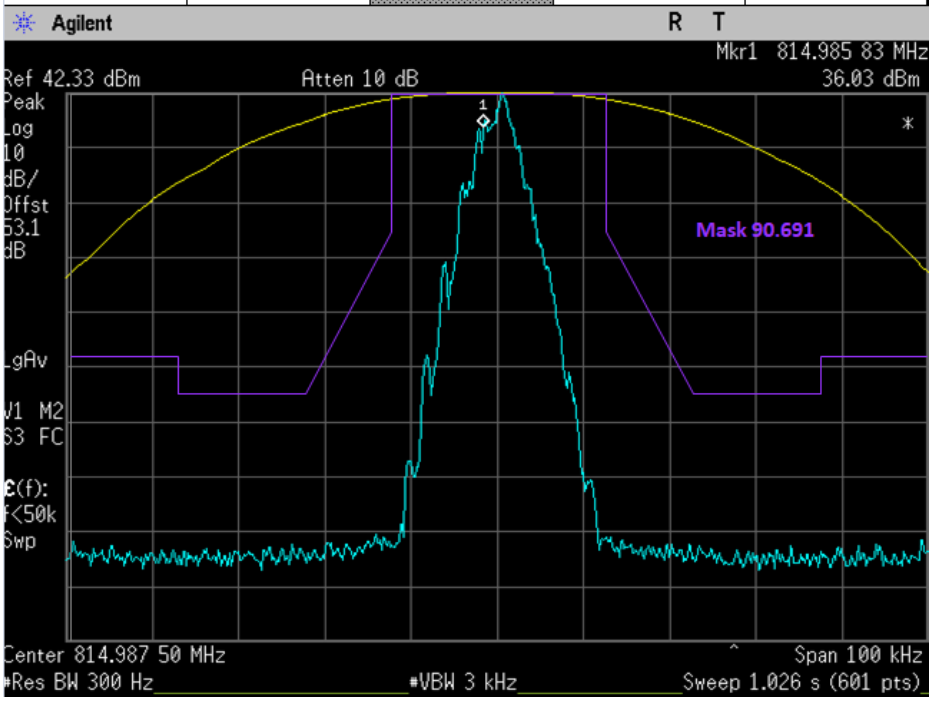
Modulation			Rules Part	
C4FM Voice			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		6.2939	8K10F1E



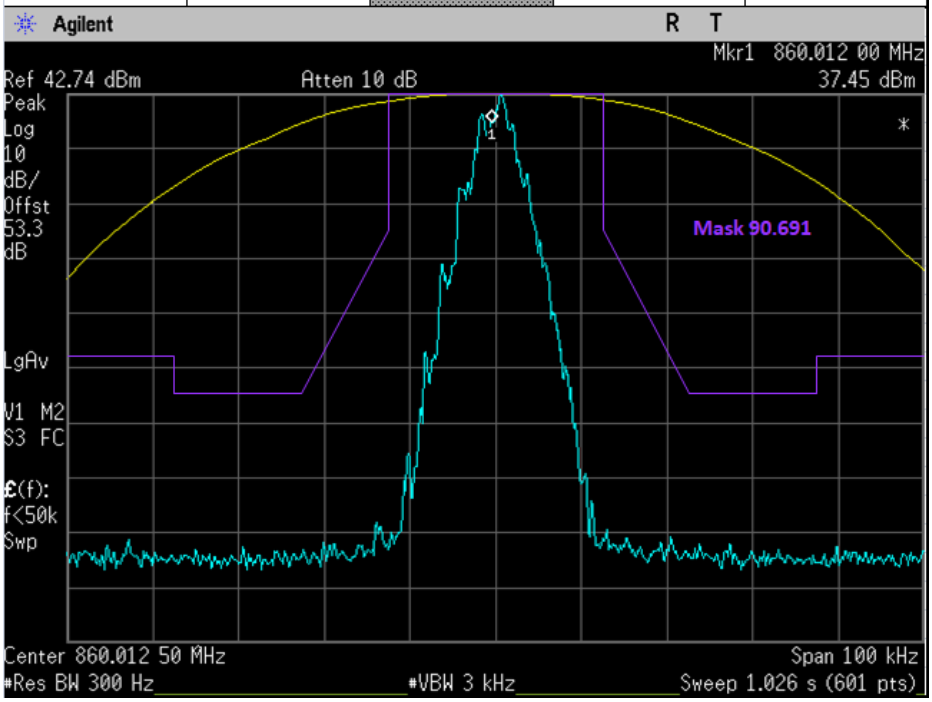
Modulation			Rules Part	
C4FM Voice			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		6.4533	8K10F1E



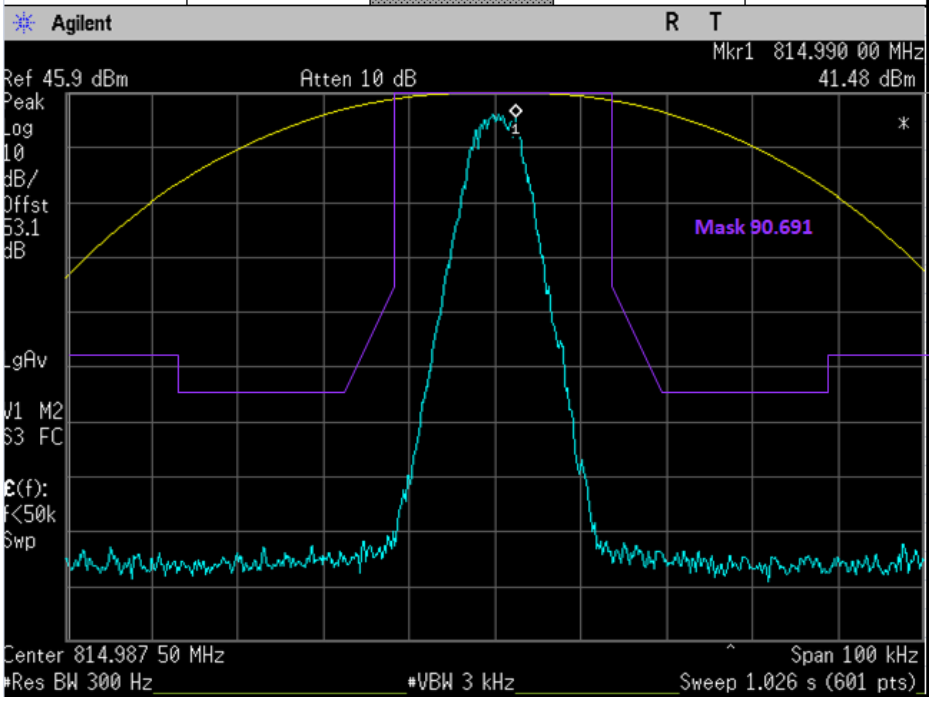
Modulation			Rules Part	
C4FM Voice Encyption			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	12.5		6.2302	8K10F1E



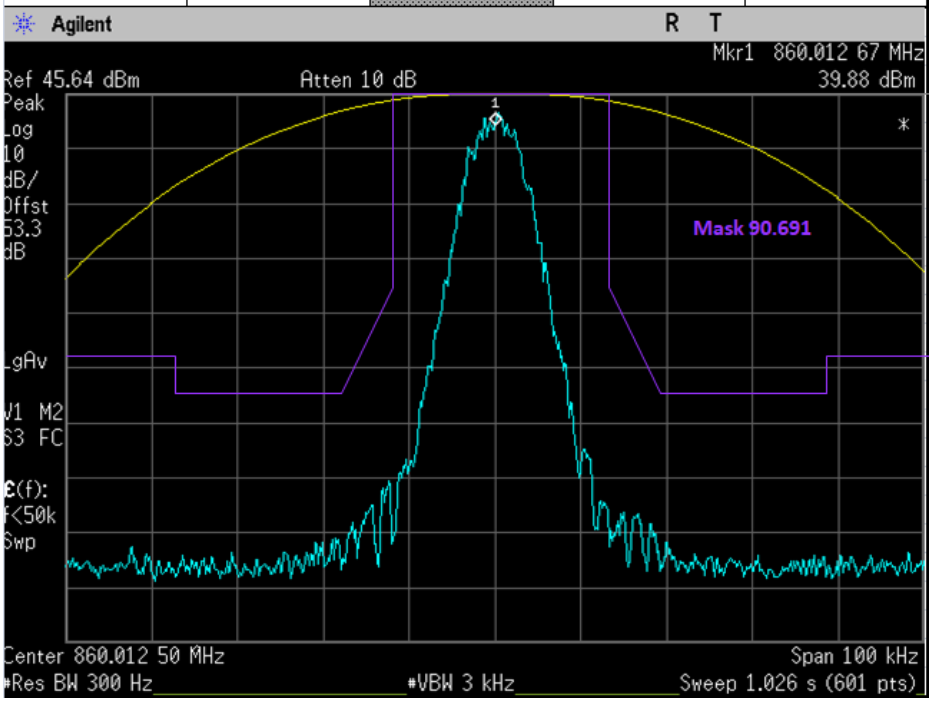
Modulation			Rules Part	
C4FM Voice Encyption			90.691	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	12.5		7.1740	8K10F1E



Modulation			Rules Part	
Phase II			90.691	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
814.9875	12.5		7.6950	8K10F1W



Modulation			Rules Part	
Phase II			90.691	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
860.0125	12.5		7.6081	8K10F1W



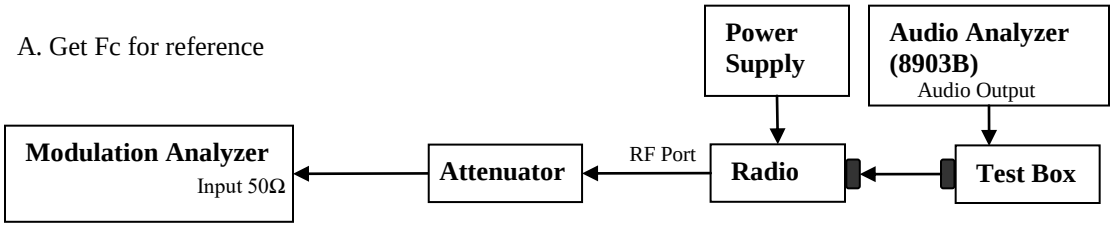
6.6.5. Test Limit

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.

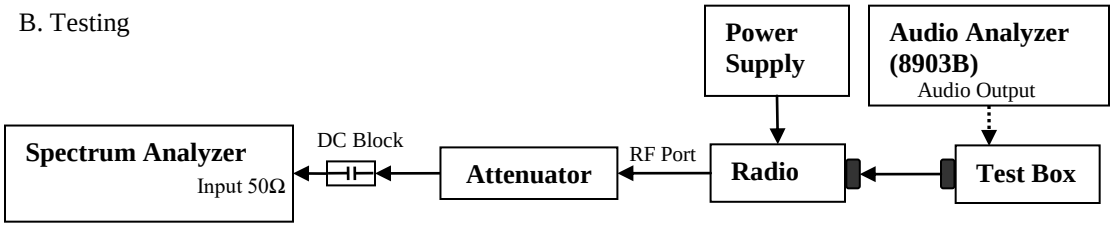
6.7. Band Edge Conducted Spurious Emission (Part 22)

6.7.1. Test Setup (Analog)

A. Get Fc for reference



B. Testing



2) The DUT transmitter output port was connected to Modulation Analyzer.
3) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
4) 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.
5) Path loss for the measurement included.
6) Select the Occupied Bandwidth measurement for 99% and 26dB Emissions Bandwidth Measurement.
7) Key in the Fc and Resolution Bandwidth.
8) Transmit the DUT and record the occupied Bandwidth frequencies.
9) Preset the spectrum analyzer for band edge measurement.
10) The band edges of lowest and highest channels were measured.
11) Key in the Lowest and highest channel frequency, span is 60 kHz and Resolution Bandwidth is at least 1% of Emission Bandwidth.
12) Save the screen shot as modulated signal.
13) 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.

6.7.2. Test Result (Analog)

Not Applicable.