MOTOROLA SOLUTIONS

MS ISO/IEC 17025
TESTING
SAMM No. 0825

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

FCC / ISED TEST REPORT
Report Revision : Rev.E

Date/s Tested	:	15-APR-2019 - 23-APR-2019
Report Issue Date	:	19-JUL-2019
Manufacturer/Location	:	Motorola Solutions Malaysia Sdn Bhd
Requestor	:	TANG, GARY
Product Type	:	Mobile
Model Number	:	M25URS9PW1BN
Frequency Band	:	762-776MHz, 792-806MHz, 806-825MHz, 851-870MHz
Low / Max RF Output Power	:	3Watts / 36,42 Watts
Applicant Name	:	Motorola Solutions Inc
Manufacturer Address	:	Plot 2, Bayan Lepas Technoplex, 11900 Bayan Lepas, Penang, Malaysia
ISED Registrations	:	109AK
FCC Registrations	:	461337
Firmware Version	:	D19.71.01

The equipment was tested accordance to the requirement listed below:

(LMR)
FCC 47 CFR Part 90 **PASS**
ISED RSS119

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

Prepared By:

Tan Sze Khai
Test Personnel

Approved Signatory:

Vincent Foong Chuen Kit
Deputy Technical Manager

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Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	12-MAY-2019	Tan Sze Khai
Rev.B	Add digital information in sections 1 and 5	16-AUG-2019	Vincent Foong
Rev. C	Amended voltage tx power data	19-AUG-2019	Vincent Foong
Rev. D	Amended voltage Frequency Stability data	20-AUG-2019	Tan Sze Khai
Rev. E	Removed “not for fcc review” for 25k points 806 and 851	30-SEP-2019	Vincent Foong

1.0 General Information

EUT Description:

Technologies	Land Mobile Radio (LMR)
Modulation Type	Analog C4FM

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

2.0 Summary of Test Results

FCC General Rules Part (47CFR)	ISED General Rules Part	Test Item	Result	Remark
2.1046,90.541(700MHz)	RSS-119	RF Power Output	Pass	-
2.1055, 90.213	RSS-119	Frequency Stability	Pass	-
2.1047	RSS-119	Audio Frequency Response	Pass	-
2.1047	RSS-119	Audio Low Pass Filter Response	Pass	-
2.1047	RSS-119	Modulation limiting	Pass	-
2.1049,90.210, 90.691	RSS-119	Occupied Bandwidth	Pass	20K0F1E-10.5935kHz 16K0F3E–15.0100kHz 11K0F3E –9.9613kHz 8K10F1D-8.0054 kHz 8K10F1E-8.0579kHz 8K10F1W-7.9074kHz
-	-	Band Edge Conducted Spurious Emission	NA	-
-	-	Transient Frequency Behavior	NA	-
90.543	RSS-119	Adjacent Channel Power	NA	-
90.543	RSS-119	Conducted Spurious Emissions	Pass	Highest Spur Level -25.97dBm
90.543	RSS-119	Radiated Spurious Emission	Pass	Highest Radiated Emission Level -41.0631dBm
90.543	-	GNSS (EIRP for 1559 – 1610MHz)	Pass	-
90.531	-	Effective Radiated Power (ERP)	Pass	-

NA → **Not Applicable**

3.0 Measurement Uncertainty

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

4.0 Equipment List

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

Description	Model	Serial Number	Calibration Date	Calibration Due Date
Audio Analyzer	8903B	3011A10475	9-Jul-18	9-Jul-19
SIGNAL GENERATOR	2042	203002/747	22-Jan-19	22-Jan-20
MODULATION ANALYZER	8901B	3216A03889	9-Jul-18	9-Jul-19
DSA	36570A	MY42506781	6-Jul-18	6-Jul-19
POWER SENSOR	E9031A	MY41502652	19-Nov-18	19-Nov-19
POWER METER	E4412A	MY41293855	27-Jul-18	27-Jul-19
POWER SUPPLY	E4416A	GB41293747	11-Apr-19	11-Apr-20
CHAMBER	SH-641	92009188	29-Mar-2019	29-Mar-2020
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	6032A	2818A03549	11-Jul-18	11-Jul-19
POWER SENSOR	E4412A	MY41498918	29-Jul-18	29-Jul-19
POWER METER	E4416A	GB41293866	26-Feb-19	26-Feb-21
ATTENUATORS/SWITCH DRIVER	11713A	2508A10141	CNR	CNR
STEP ATTENUATOR/11dB	8494G	MY52300223	26-Jul-18	26-Jul-19
STEP ATTENUATOR/110dB	8496G	MY52300176	26-Jul-18	26-Jul-19
OSCILLOSCOPE	MSO8104A	MY45002372	26-Jun-18	26-Jun-19
AUDIO ANALYZER	8903B	3729A17409	18-Jul-18	18-Jul-19
AUDIO ANALYZER	8903B	3413A14586	7-Jul-18	7-Jul-19
MODULATION ANALYZER	8901B	3616A03889	9-Jul-18	9-Jul-19
SIGNAL GENERATOR	8657A	3039A3205	5-Jul-18	5-Jul-19
SPECTRUM ANAYLYZER	E4440A	MY46185415	16-Aug-17	16-Aug-19
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	MY41002067	11-Jul-18	11-Jul-19
HIGH PASS FILTER SWITCH BOX	-	CS001	5-Jul-18	5-Jul-19
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
Vector Signal Generator	SMU200A	103537	22-Jul-17	22-Jul-20

Chamber 2

Description	Model #	Serial Number	Calibration Date	Calibration Due Date
EMI TEST RECEIVER	ESIB40	100264	04-Jul-2018	04-Jul-2019
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	6674A	3126A-00133	07-Nov-17	07-Nov-19
SIGNAL ANALYZER	FSV40	101103	03-Ju1-18	03-Jul-19
DATA LOGGER	SDL500	A.016776	05-Apr-19	05-Apr-20
BILOG ANTENNA	CBL6112D	30991	23-Apr-18	23-Apr-19
DRG HORN FREQ.	SAS-571	566	27-Sep-17	27-Sep-19
PREAMPLIFIER	PAM-0118	427	No Cal. Req'd	No Cal. Req'd
MICROWAVE GENERATOR	SMP04	100146	11-Jul-18	11-Jul-19
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_v1.5.2			

CNR → Calibration Not Require

5.0 Test Condition

5.1. Transmitter Test Conditions

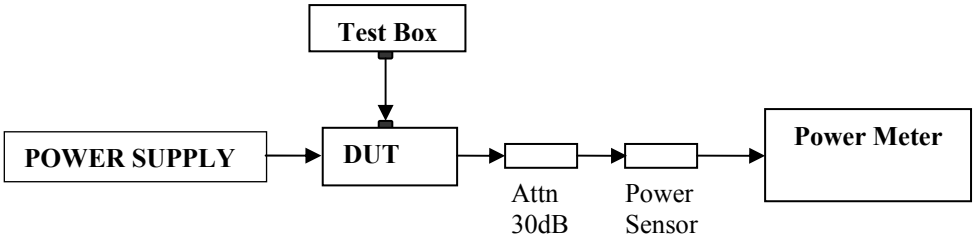
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By
RF Output Power	**Low & Max**	**Analog**	**762.0125,764.0125, 768.0125,769.0125, 769.0875,774.8875, 775.9875,792.0125, 798.0125,799.1875, 799.0875,804.9125, 805.9875,806.0125, 814.9875,823.9875, 851.0125,860.0125, 868.8875**	TAN SZE KHAI
Frequency Stability	**Max**	**Analog**	**769.0875,823.9875**	TAN SZE KHAI
Audio Frequency Response (12.5kHz / 25kHz)	**Max**	**Analog**	**769.0875,823.9875**	TAN SZE KHAI
Audio Low Pass Filter Response (12.5kHz / 25kHz)	**Max**	**Analog**	**769.0875,823.9875**	TAN SZE KHAI
Modulation limiting (12.5kHz / 25kHz)	**Max**	**Analog**	**769.0875,823.9875**	TAN SZE KHAI
Occupied Bandwidth (12.5kHz / 25kHz)	**Max**	**Analog, Digital**	**806.0125,814.9875, 823.9875,851.0125, 853.9875,860.0125, 868.8875**	TAN SZE KHAI
Band Edge Conducted Spurious Emissions (Part 22) (12.5kHz / 20kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
Transient Frequency Behavior *(UHF & VHF Band)* (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
Adjacent Channel Power *(700MHz Band)* (12.5kHz)	**Max**	**Analog, Digital**	**769.0875, 774.8875, 799.0875, 804.9125**	TAN SZE KHAI
Conducted Spurious Emissions- (12.5kHz / 25kHz)	**Low / Max**	**Analog, Digital**	**762.0125,764.0125, 769.0125,769.0875, 774.8875,792.0125, 794.0125,799.0875, 804.9125,806.0125, 814.9875,823.9875, 851.0125,860.0125, 868.8875**	TAN SZE KHAI
Radiated Spurious Emission (12.5kHz / 25kHz)	**Low / Max**	**Analog, Digital**	**762.0125,764.0125, 769.0125,769.0875, 774.8875,792.0125, 794.0125,799.0875, 804.9125,806.0125, 814.9875,823.9875, 851.0125,860.0125, 868.8875**	Azil,Faris & Aiman
GNSS (EIRP for 1559 - 1610MHz) (12.5kHz / 25kHz)	**Max**	**Analog**	**769.0125,769.0875, 799.0125,804.9125**	Azil, Faris & Aiman
Effective Radiated Power (ERP) (12.5kHz / 25kHz)	**Max**	**Analog**	**799.0875,804.9125**	Azil, Faris & Aiman

NA → Not Applicable

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



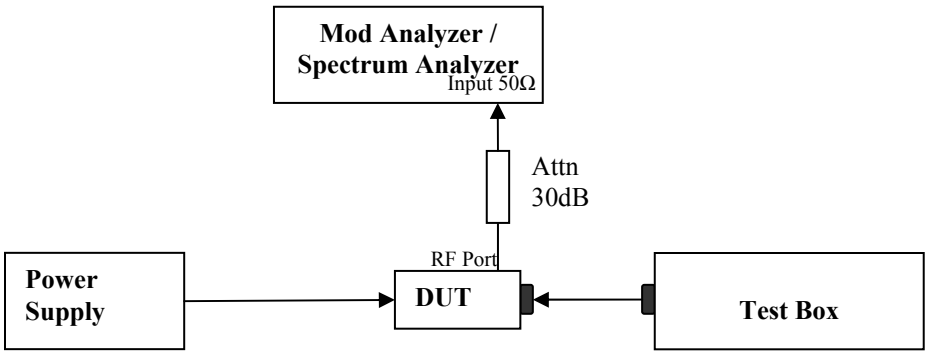
1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
2) Path loss for the measurement included.
3) All the measurement was done at low, mid, high frequency for each band.
4) Record the power into the test report.

6.1.2. Test Result

Temperature	25˚C				
Voltage (V)	13.6V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	Remarks
762.0125	3.02	1.72	35.38	4.58	
764.0125	3.02	1.64	35.11	4.67	
768.0125	3.01	1.67	35.01	5.09	
769.0125	3.01	1.69	35.45	5.13	
769.0875	3.01	1.75	34.9	5.24	
774.8875	3.03	2.04	35.5	5.93	
775.9875	3.03	2.15	35.19	6.18	
792.0125	3.01	3.19	34.85	8.61	
794.0125	3.05	3.32	35.08	8.96	
798.0125	3.01	3.44	34.21	9.41	
799.0875	3.02	3.51	34.25	9.65	
804.9125	3.01	3.65	34.25	9.64	
805.9875	3.03	3.68	34.64	10.07	
806.0125	3.03	3.71	40.21	10.01	
814.9875	3.08	4.02	41.91	10.01	
823.9875	3.01	4.22	41.04	10.01	
851.0125	3.02	3.93	41.18	10.03	
853.9875	3.03	3.78	41.44	9.71	
860.0125	3.02	3.38	40.91	6.75	
868.8875	3.03	2.71	41.64	4.83	

6.2. Frequency Stability

6.2.1. Test Setup



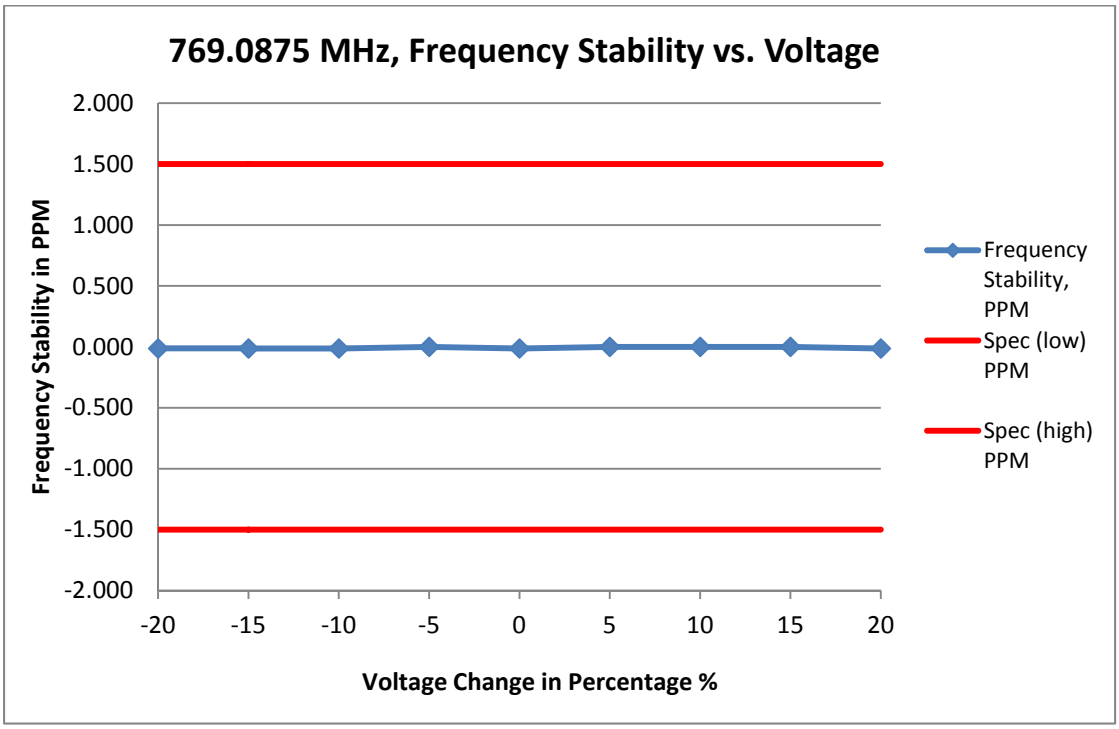
1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
2) Path loss for the measurement included.
3) Transmit the DUT and record the freq in MCF_{MHz}.
4) Test in 2 conditions:
   - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
   - Supply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

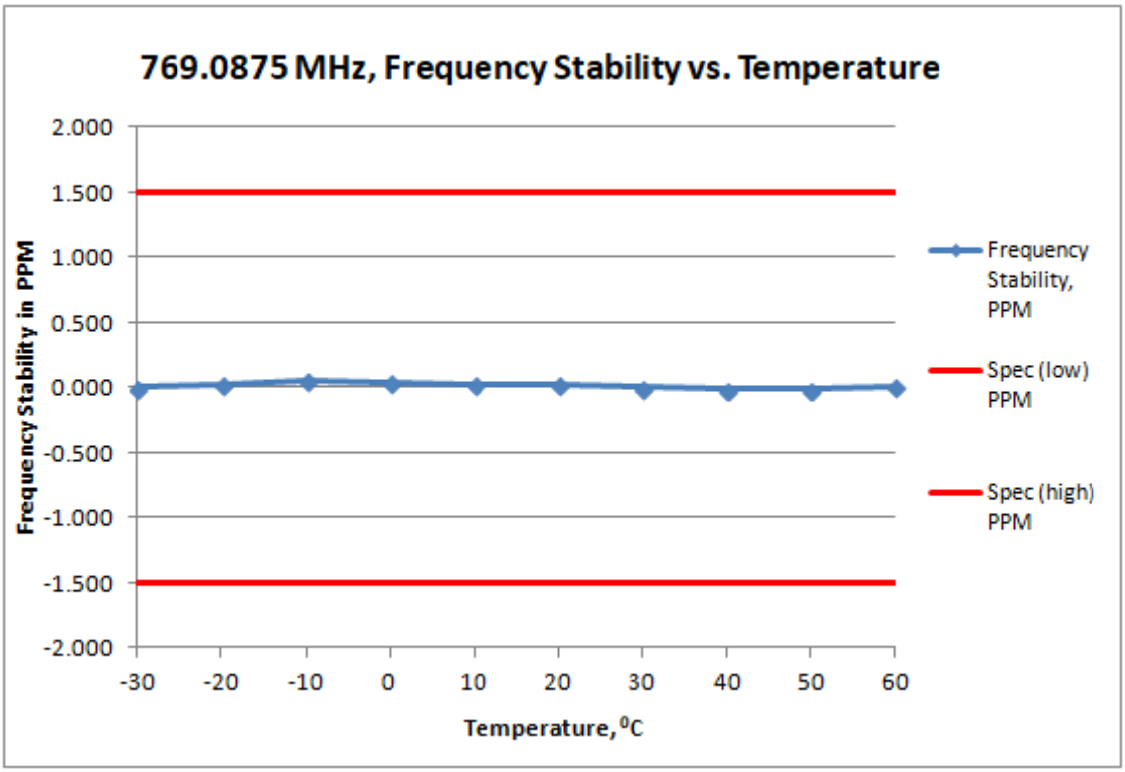
$$ppm\ error = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1\right) * 10^6$$

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

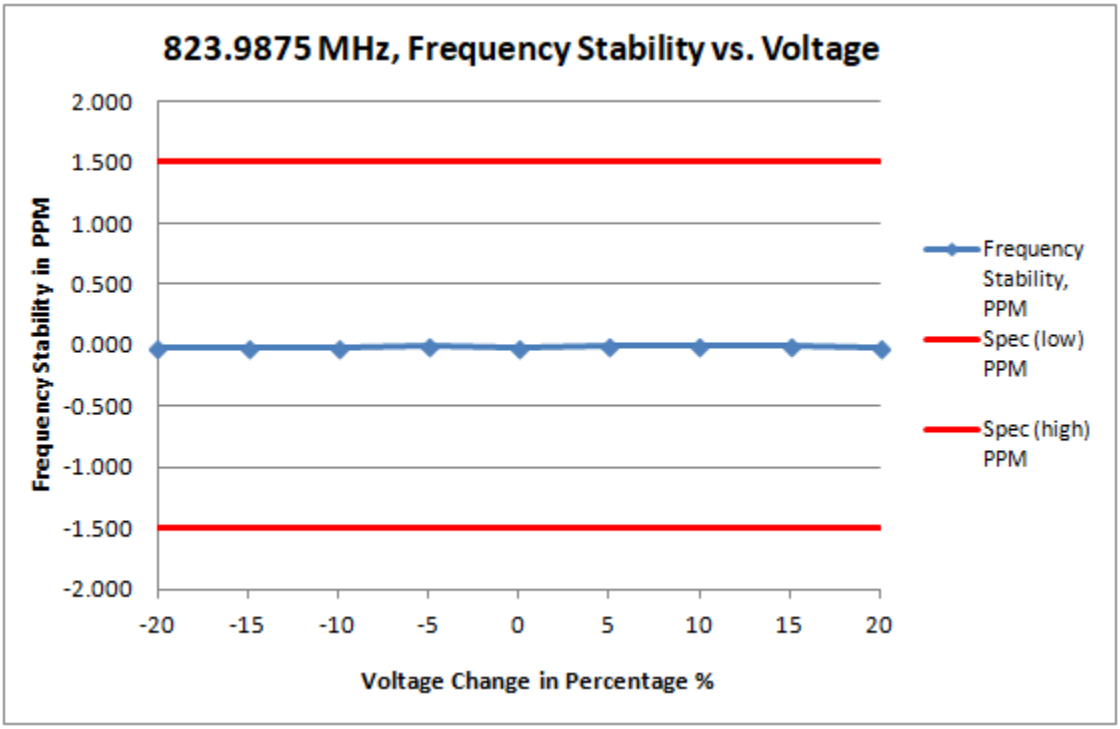
6.2.2. Test Result



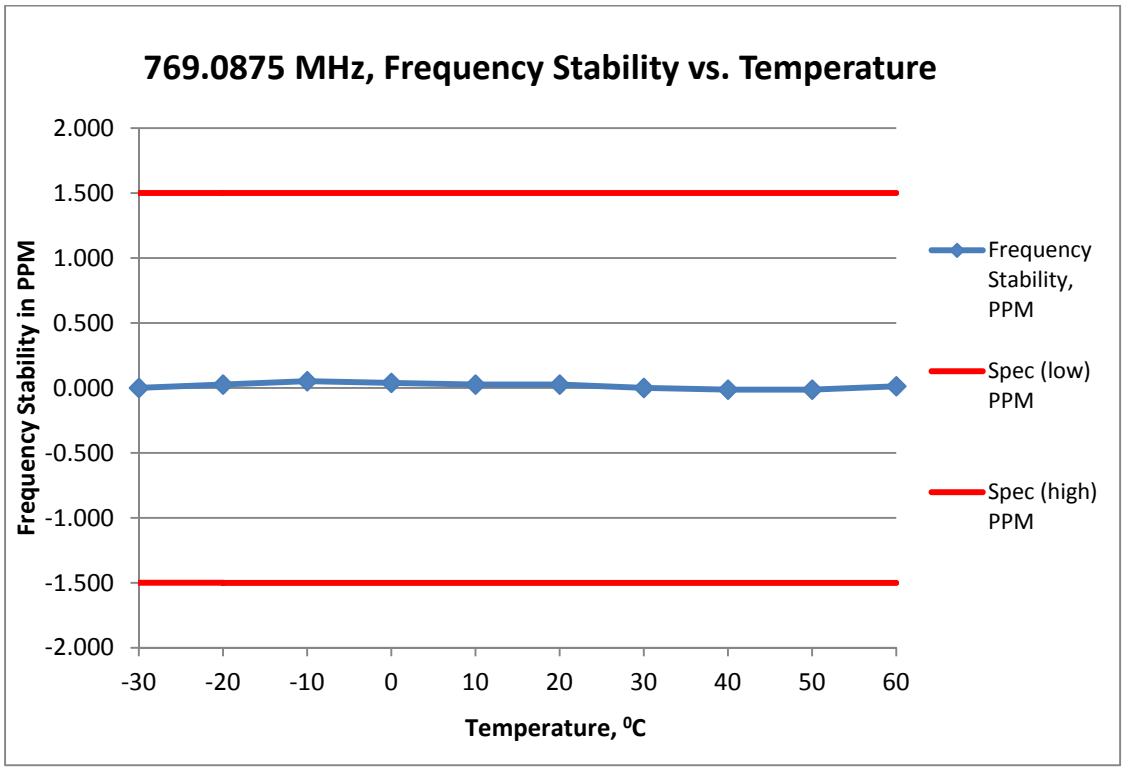
Frequency / Channel Spacing	769.0875 MHz / 12.5 kHz				
Temperature, ^{0}C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-20	10.880	769.087490	-0.013	-1.500	1.500
-15	11.560	769.087490	-0.013	-1.500	1.500
-10	12.240	769.087490	-0.013	-1.500	1.500
-5	12.920	769.087500	0.000	-1.500	1.500
0	13.600	769.087490	-0.013	-1.500	1.500
5	14.280	769.087500	0.000	-1.500	1.500
10	14.960	769.087500	0.000	-1.500	1.500
15	15.640	769.087500	0.000	-1.500	1.500
20	16.320	769.087490	-0.013	-1.500	1.500



Frequency / Channel Spacing	769.0875 MHz / 12.5 kHz			
Voltage, V	13.6			
Temperature, ^{0}C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	769.087500	0.000	-1.500	1.500
-20	769.087520	0.026	-1.500	1.500
-10	769.087540	0.052	-1.500	1.500
0	769.087530	0.039	-1.500	1.500
10	769.087520	0.026	-1.500	1.500
20	769.087520	0.026	-1.500	1.500
30	769.087500	0.000	-1.500	1.500
40	769.087490	-0.013	-1.500	1.500
50	769.087490	-0.013	-1.500	1.500
60	769.087510	0.013	-1.500	1.500



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	823.987490	-0.012	-1.500	1.500
-15	11.560	823.987490	-0.012	-1.500	1.500
-10	12.240	823.987490	-0.012	-1.500	1.500
-5	12.920	823.987500	0.000	-1.500	1.500
0	13.600	823.987490	-0.012	-1.500	1.500
5	14.280	823.987500	0.000	-1.500	1.500
10	14.960	823.987500	0.000	-1.500	1.500
15	15.640	823.987500	0.000	-1.500	1.500
20	16.320	823.987490	-0.012	-1.500	1.500



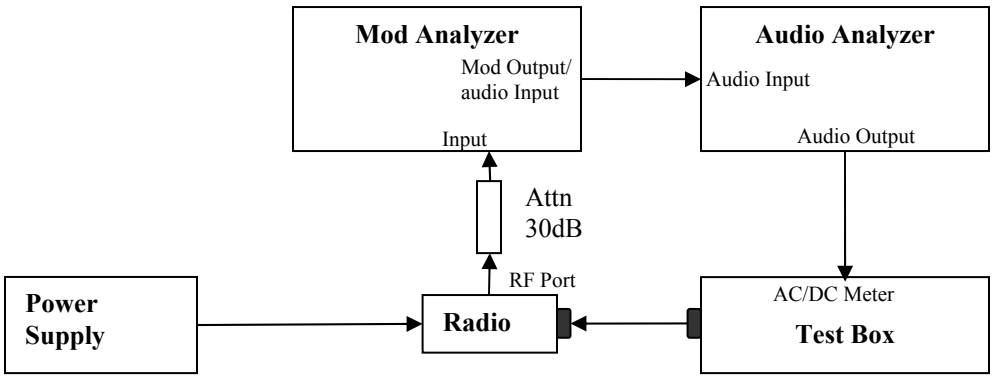
Frequency / Channel Spacing	823.9875 MHz / 12.5 kHz			
Voltage, V	13.6			
Temperature, ^{0}C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	823.987500	0.000	-1.500	1.500
-20	823.987520	0.024	-1.500	1.500
-10	823.987540	0.049	-1.500	1.500
0	823.987530	0.036	-1.500	1.500
10	823.987520	0.024	-1.500	1.500
20	823.987520	0.024	-1.500	1.500
30	823.987500	0.000	-1.500	1.500
40	823.987490	-0.012	-1.500	1.500
50	823.987490	-0.012	-1.500	1.500
60	823.987510	0.012	-1.500	1.500

6.2.3. Test Limit

As per manufacturer declared spec +/- 1.5ppm

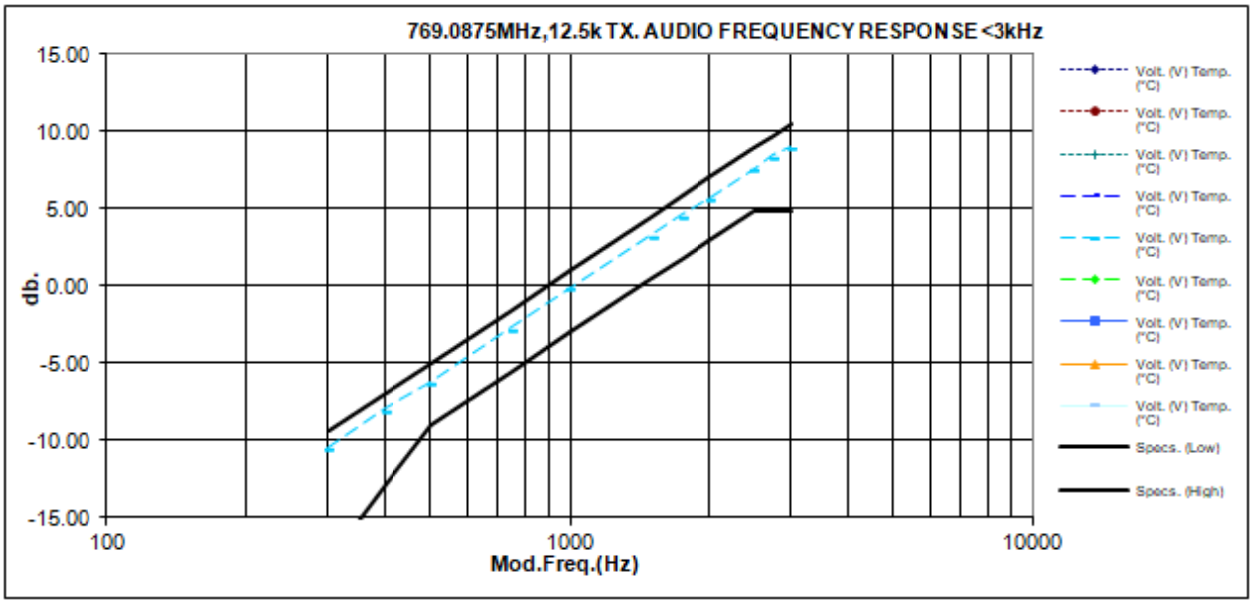
6.3. Audio Frequency Response

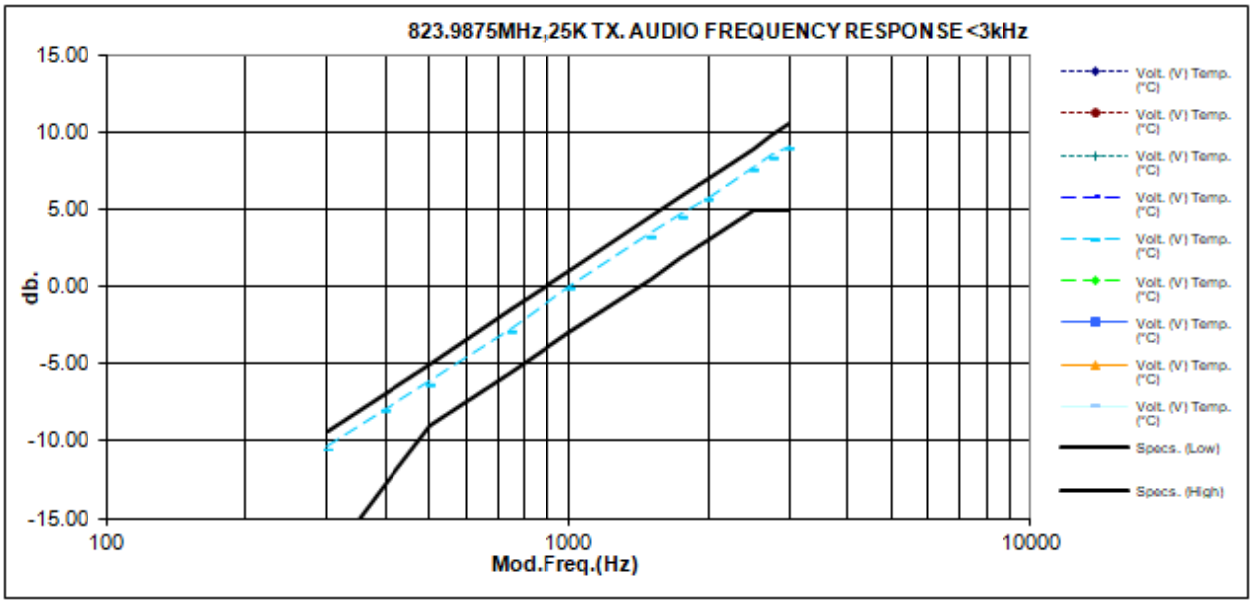
6.3.1. Test Setup

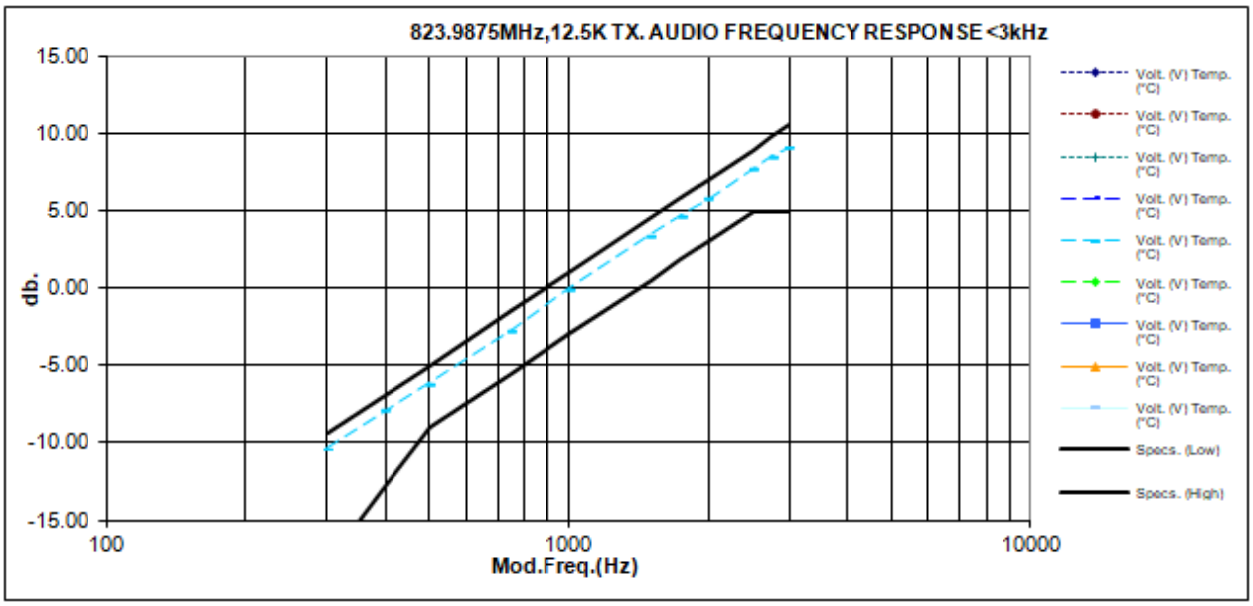


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the Full rated system deviation.
5) On audio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

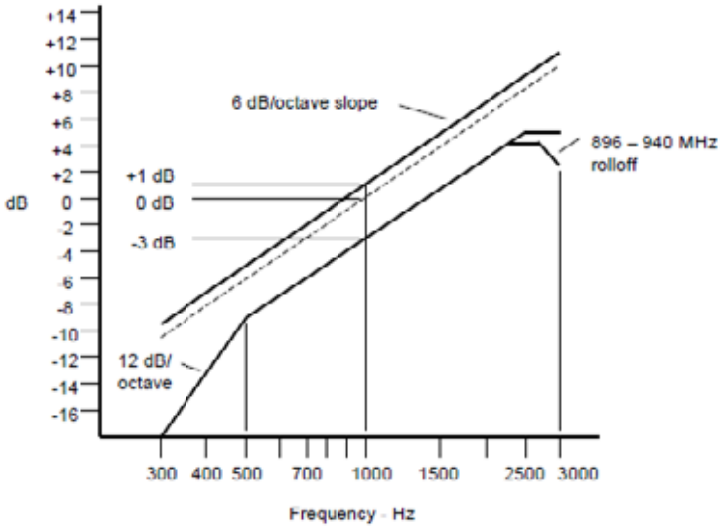
6.3.2. Test Result







6.3.3. Test Limit

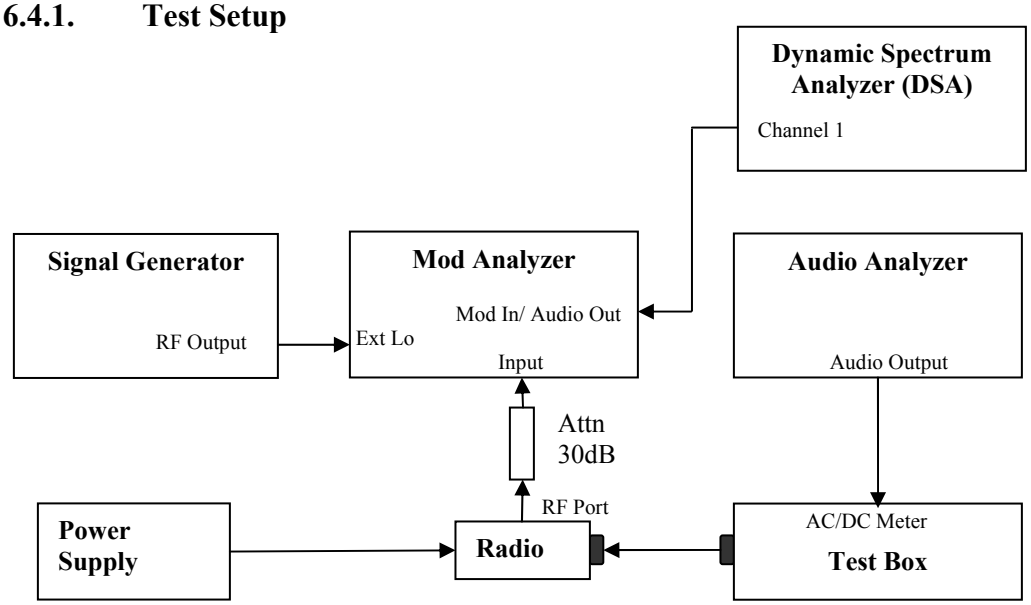


Note:

- *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.*

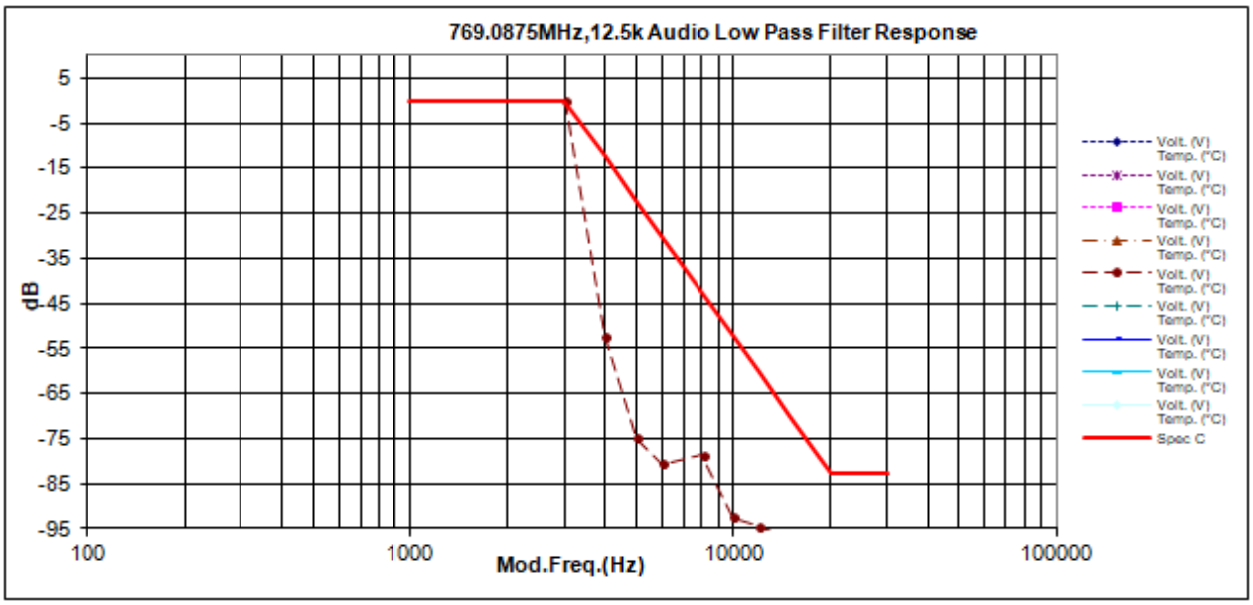
6.4. Audio Low Pass Filter Response

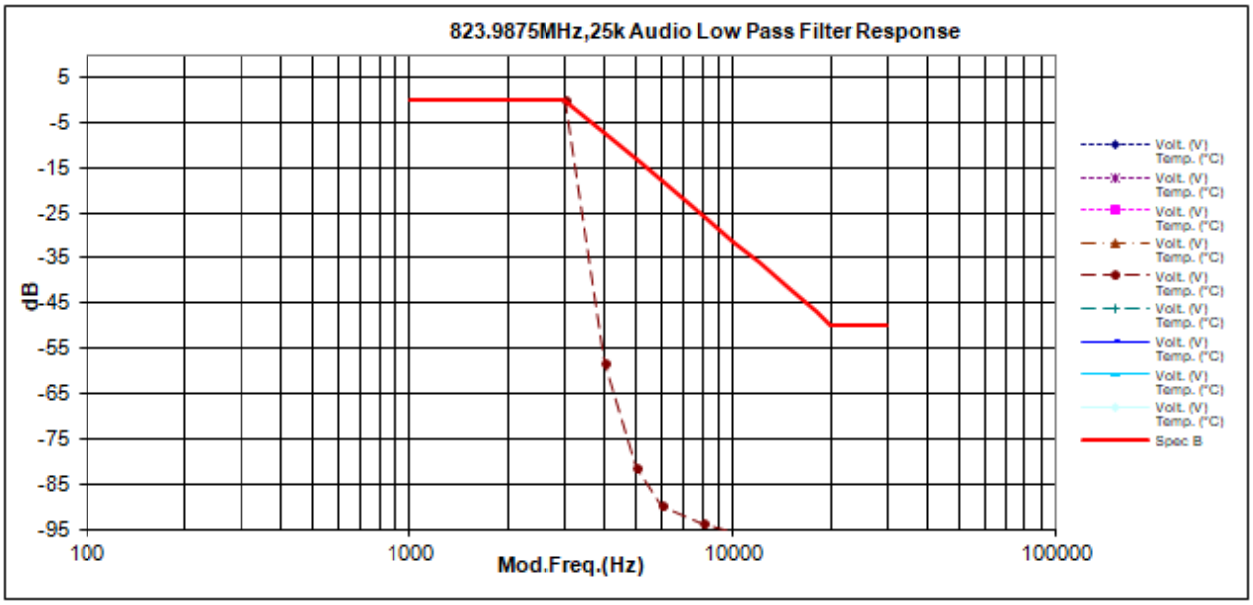
6.4.1. Test Setup

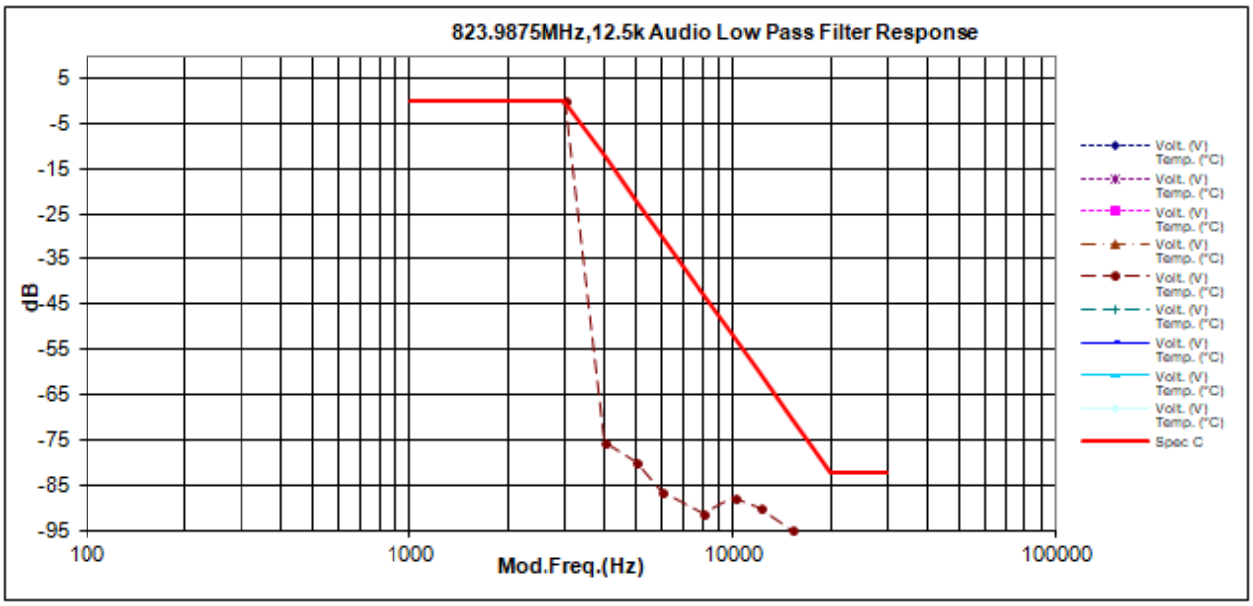


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Press 23.1SPCL on modulation analyzer to enable the external LO from Sigen.
4) Set the Sigen frequency to Fc + 1.5 MHz, RF output level to 0dBm without modulation.
5) Transmit the radio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

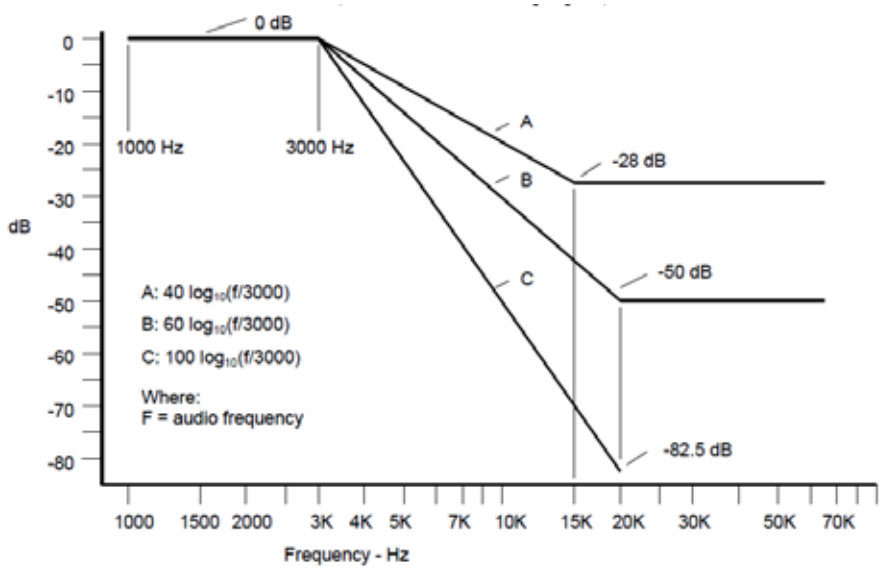
6.4.2. Test Result






823.9875MHz,12.5k 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)
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)
Spec C

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.

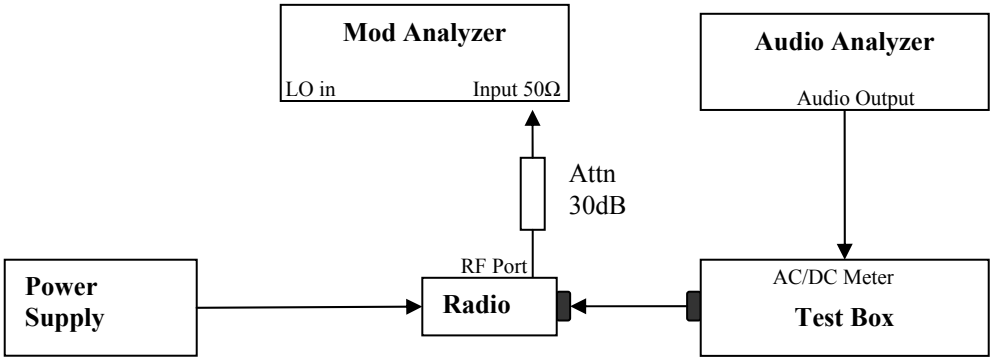
c) For equipment operating on channels between 896 MHz through 901 MHz, between 935 MHz through 940 MHz, and 12.5 or 15 kHz spaced channels in the frequency range 138-174 MHz and 406-512 MHz.

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.

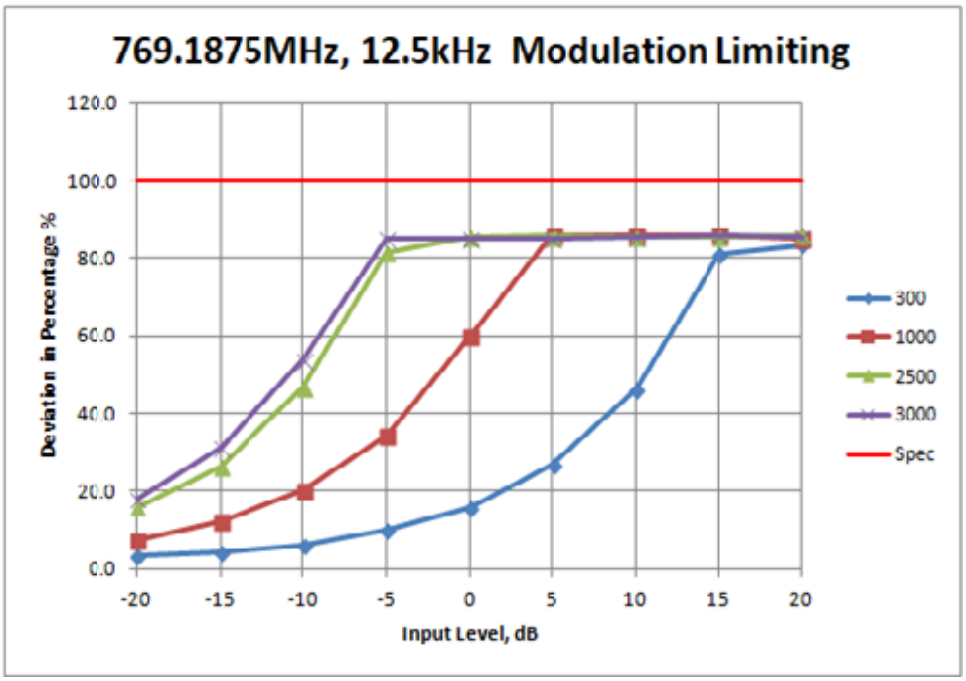
6.5. Modulation Limiting

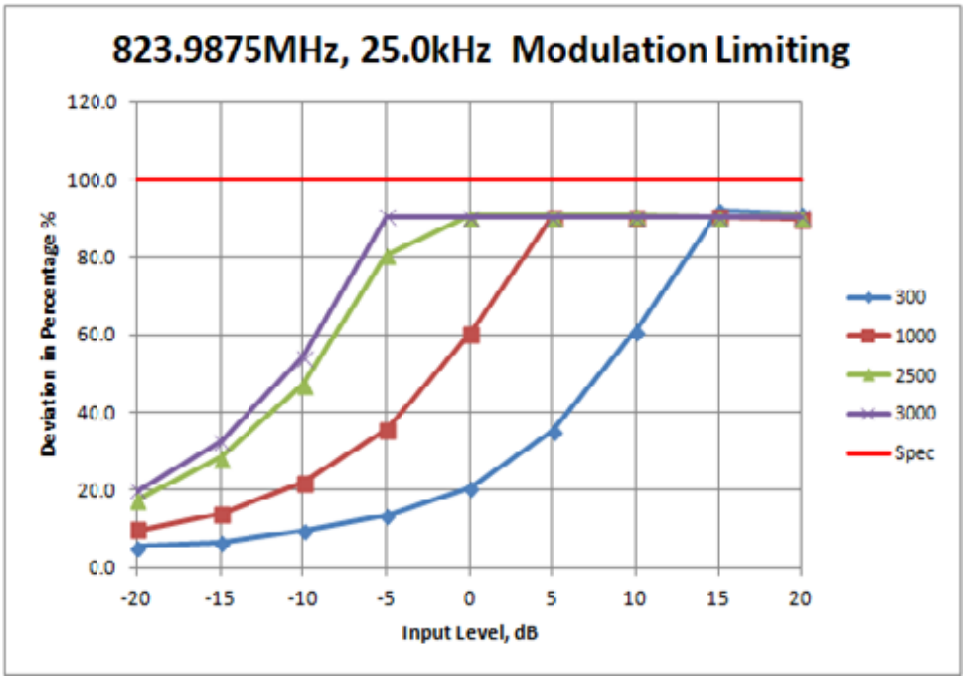
6.5.1. Test Setup

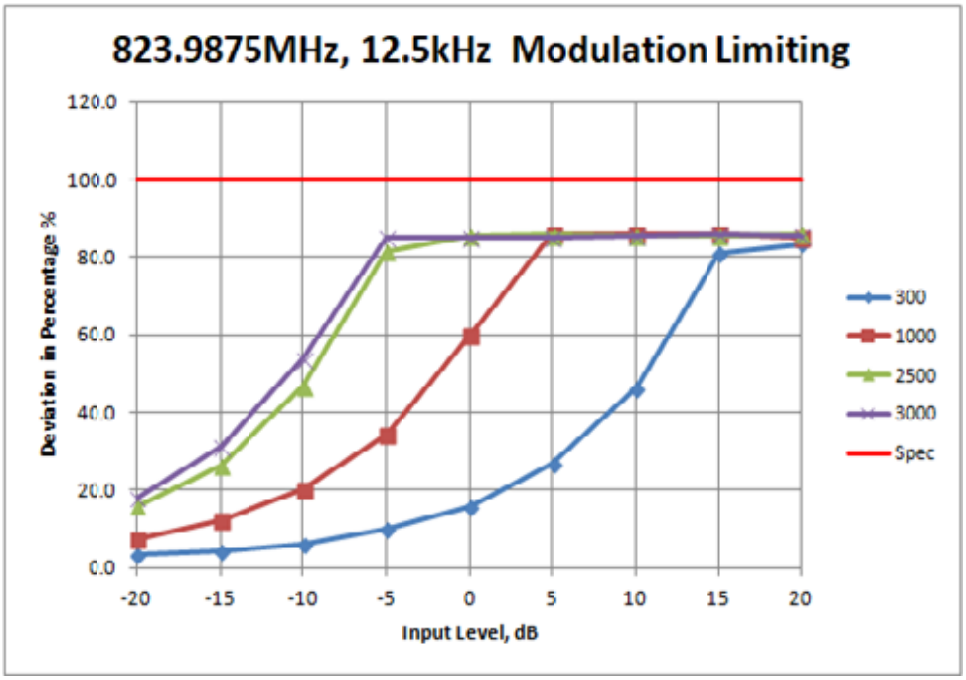


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the Full rated system deviation.
5) Record the frequency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





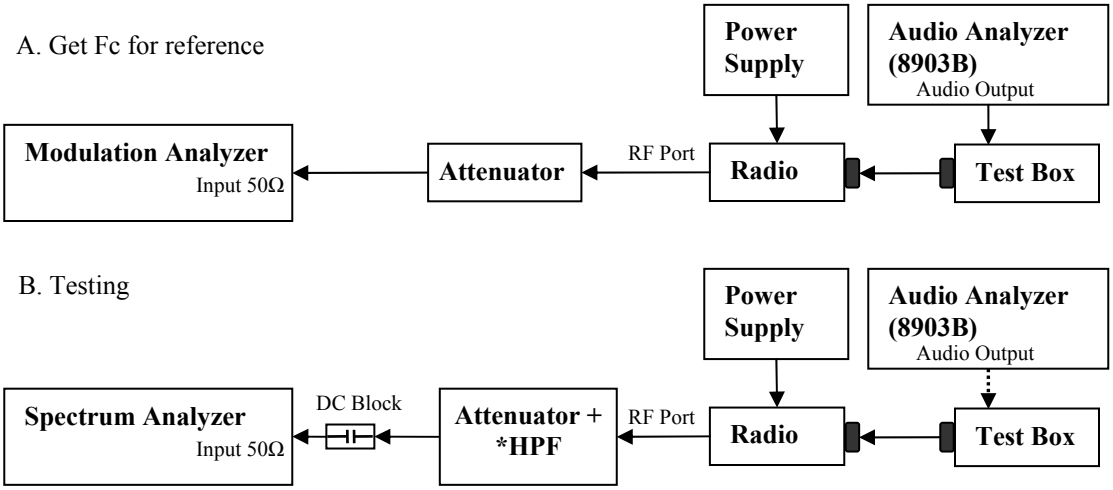


6.5.3. Test Limit

Modulation Limiting shall not exceed 100 percent.

6.6. Occupied Bandwidth

6.6.1. Test Setup (Analog)

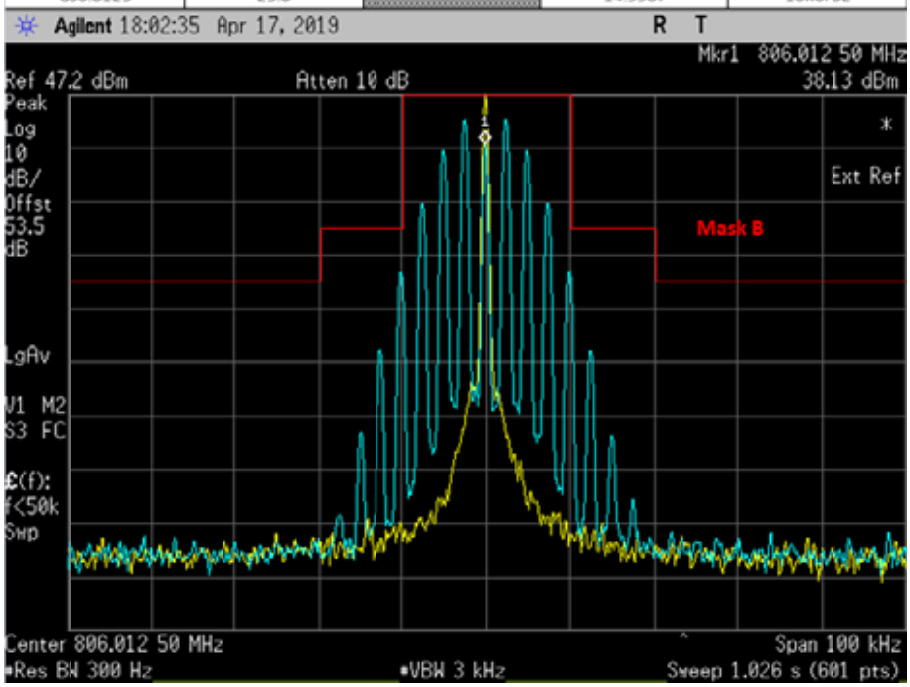


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey 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.

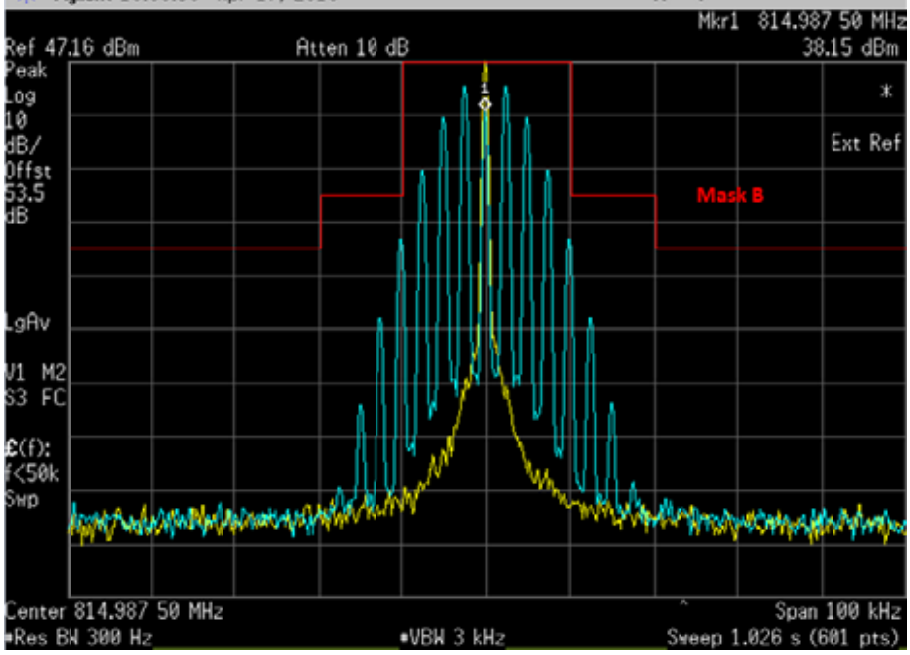
* Only HPF added for Mask 80.211 measurement with attenuator.

6.6.2. Test Result (Analog)

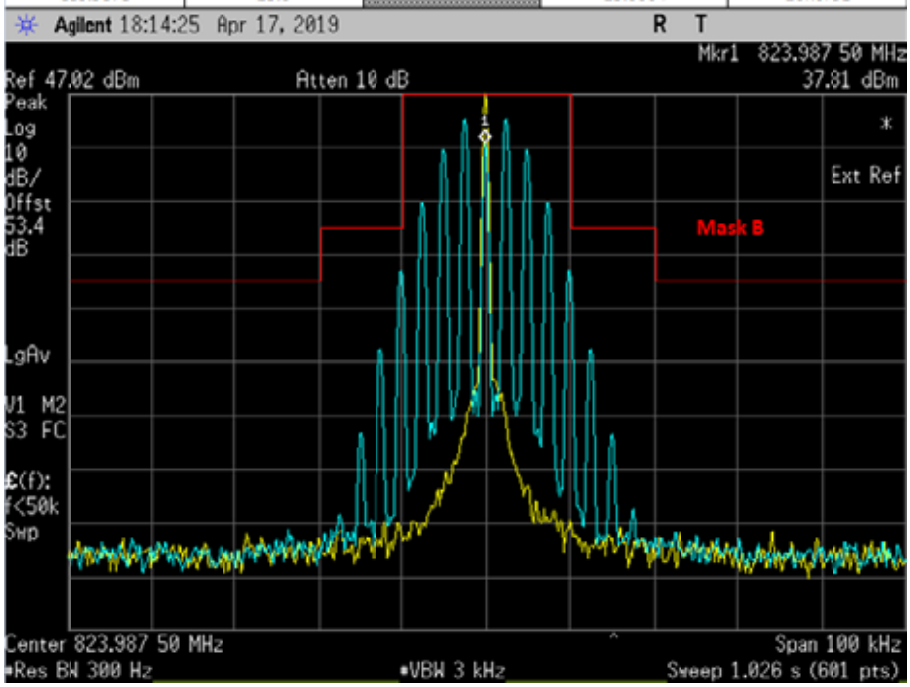
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	25.0	14.9907	16K0F3E



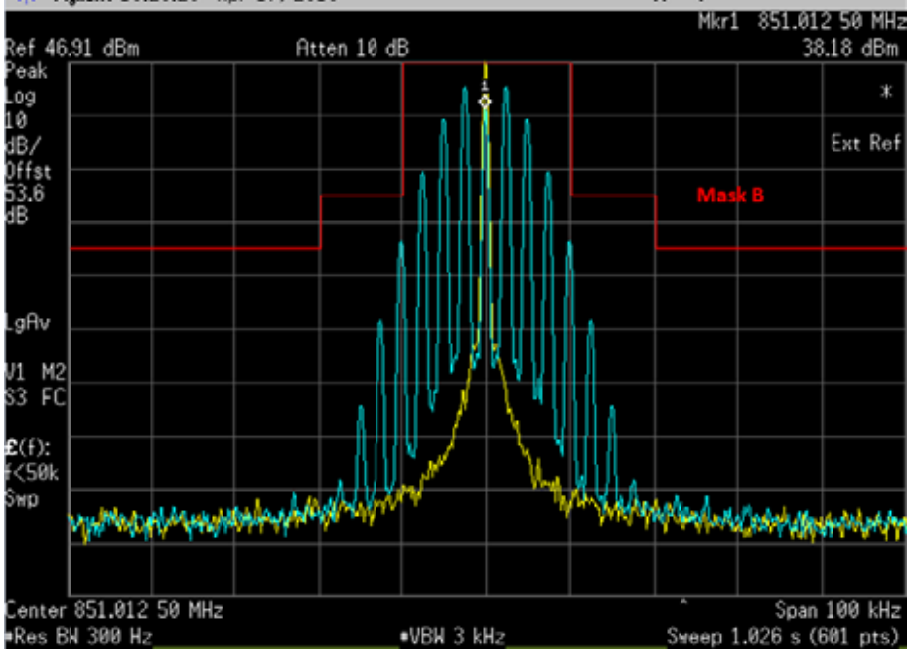
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	25.0	14.9858	16K0F3E



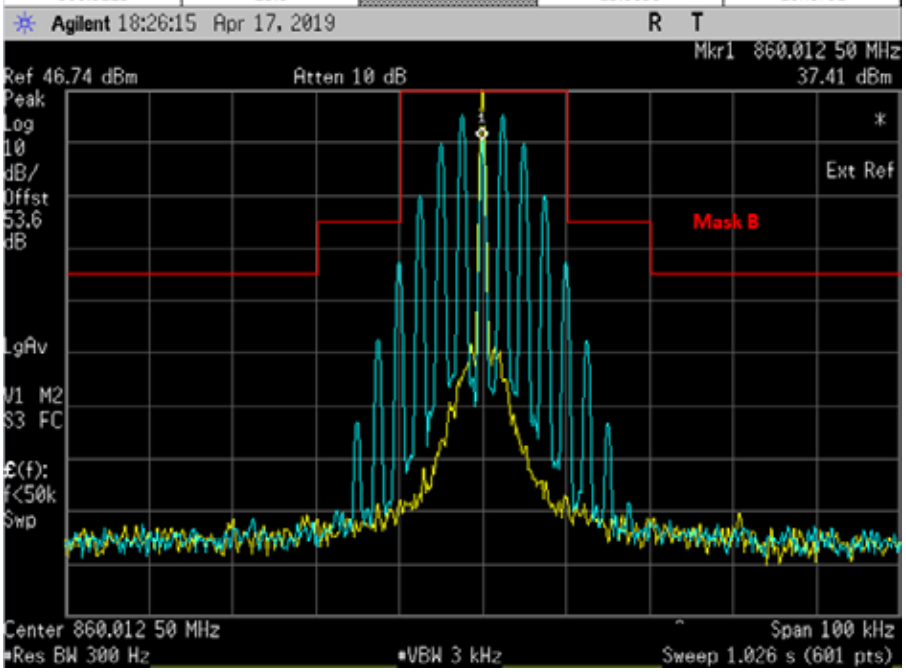
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	25.0	15.0004	16K0F3E



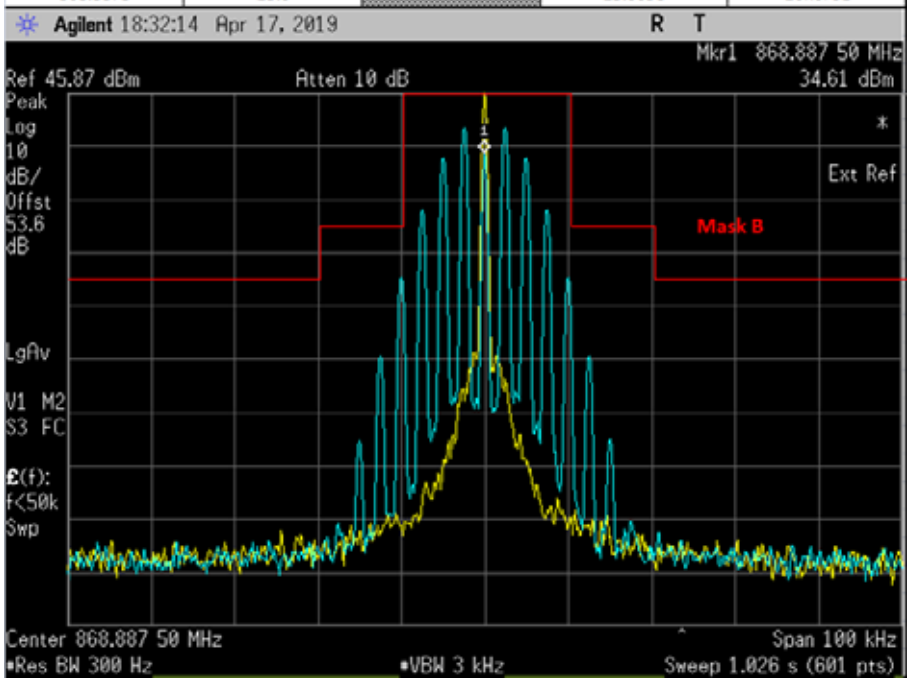
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
851.0125	25.0	14.9636	16K0F3E



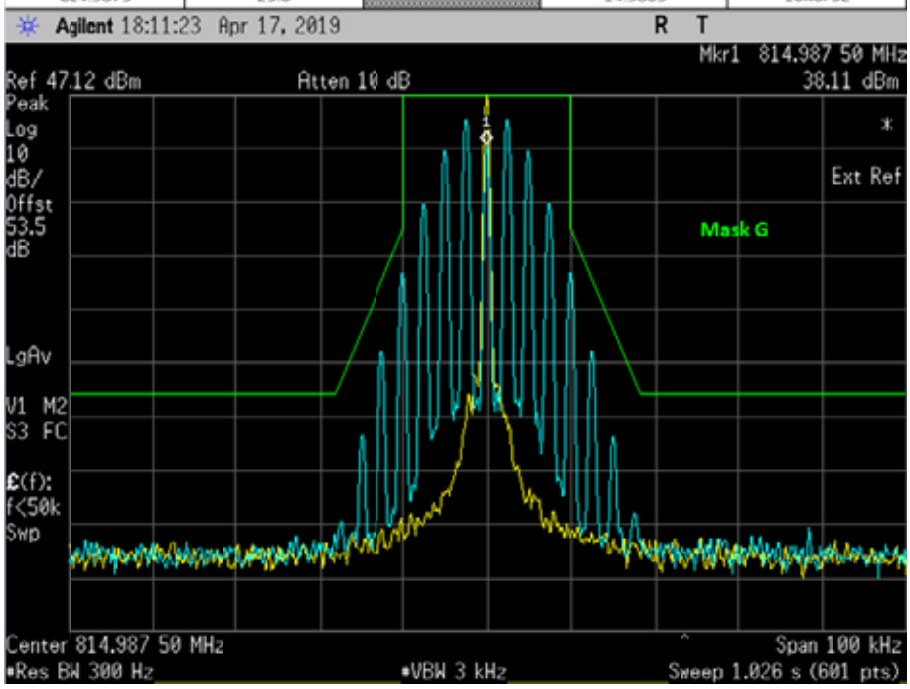
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
860.0125	25.0	15.0093	16K0F3E



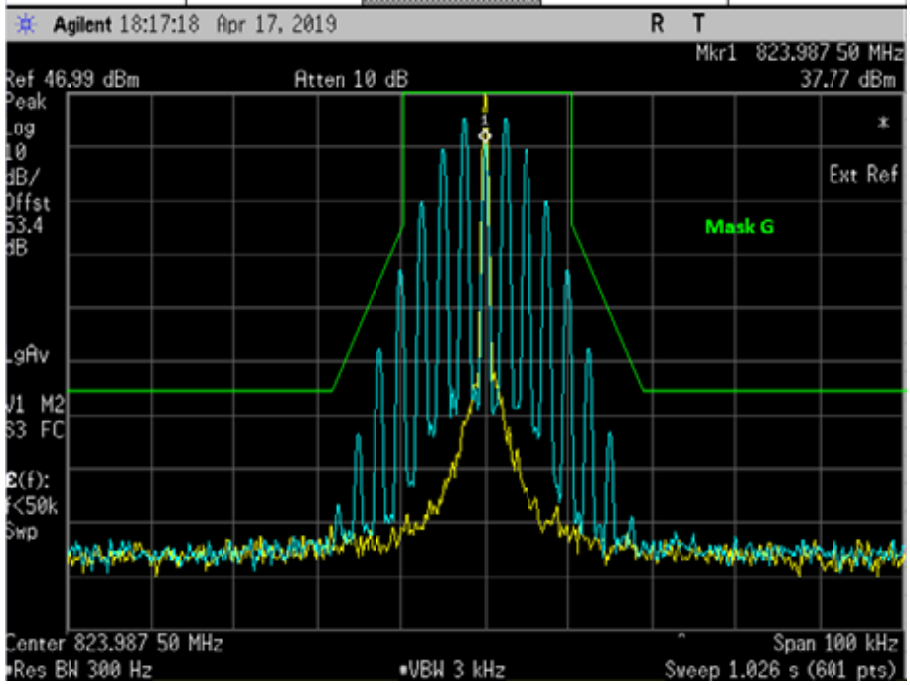
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
868.8875	25.0	15.0098	16K0F3E



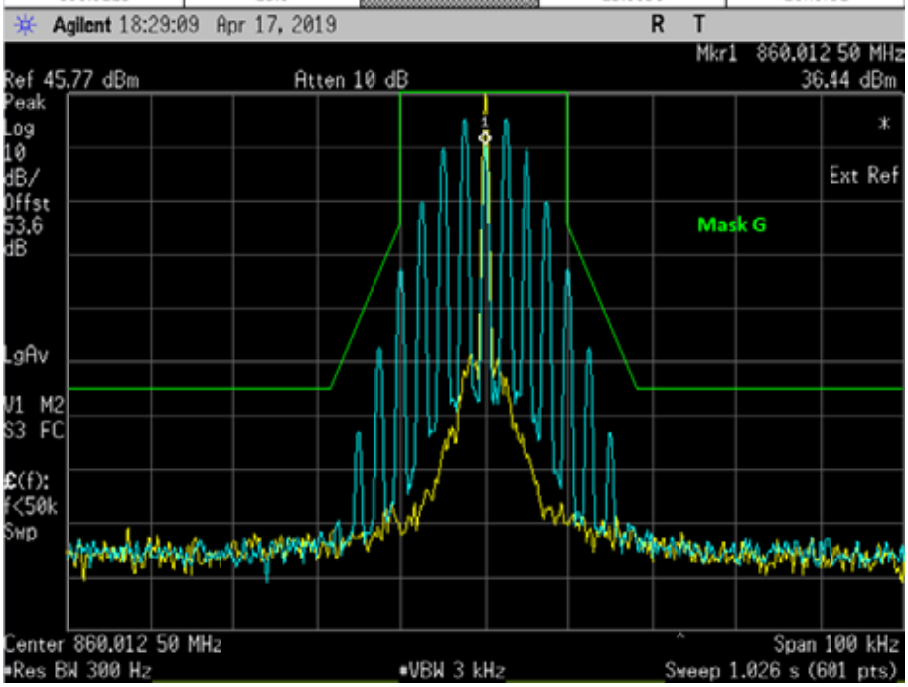
Modulation			Rules Part	
Analog Voice			90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
814.9875	25.0		14.9865	16K0F3E



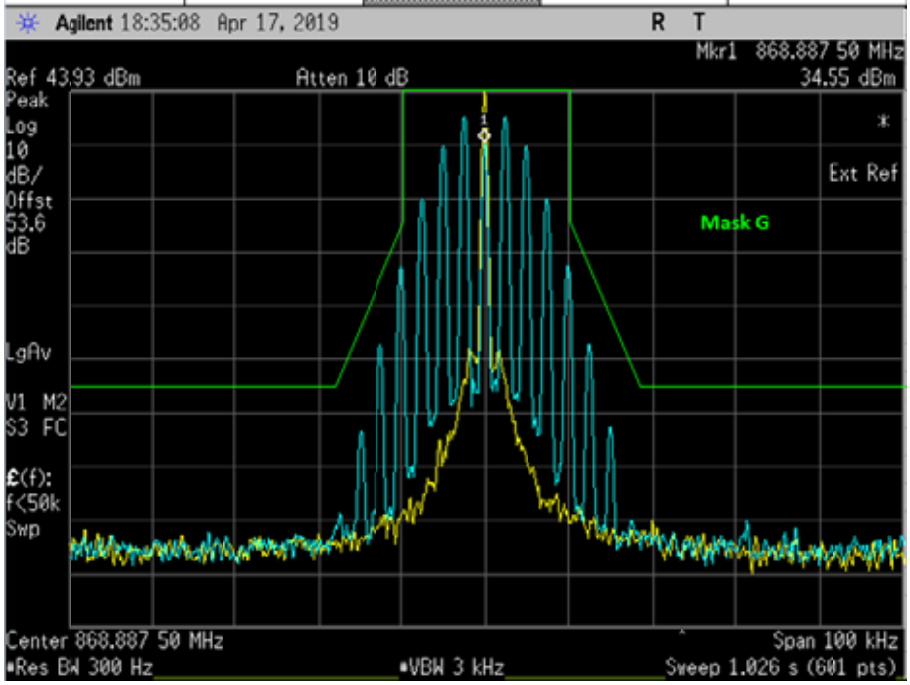
Modulation			Rules Part	
Analog Voice			90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
823.9875	25.0		15.0001	16K0F3E



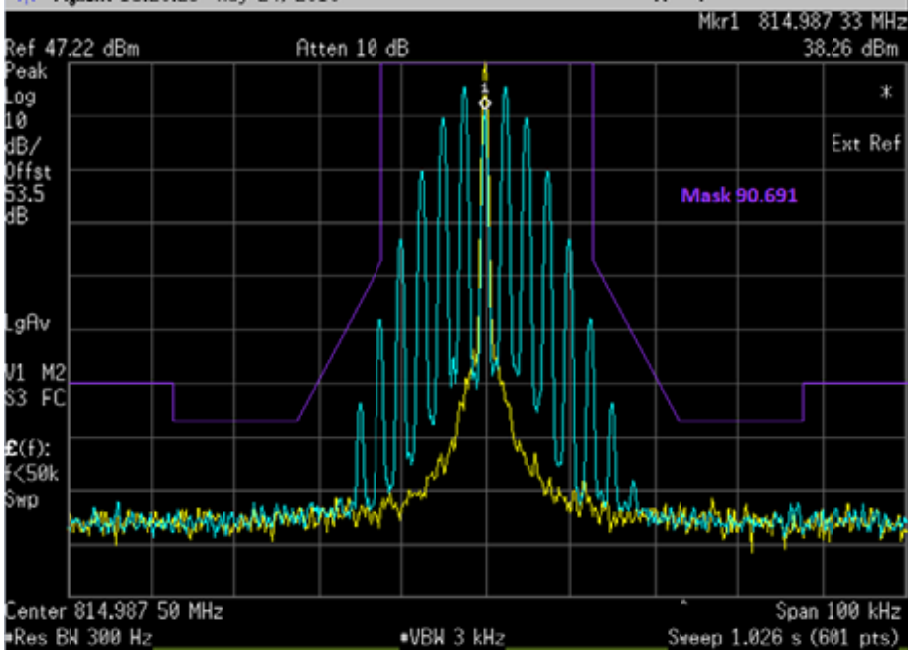
Modulation			Rules Part	
Analog Voice			90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
860.0125	25.0		15.0090	16K0F3E



Modulation			Rules Part	
Analog Voice			90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
858.8875	25.0		15.0100	16K0F3E

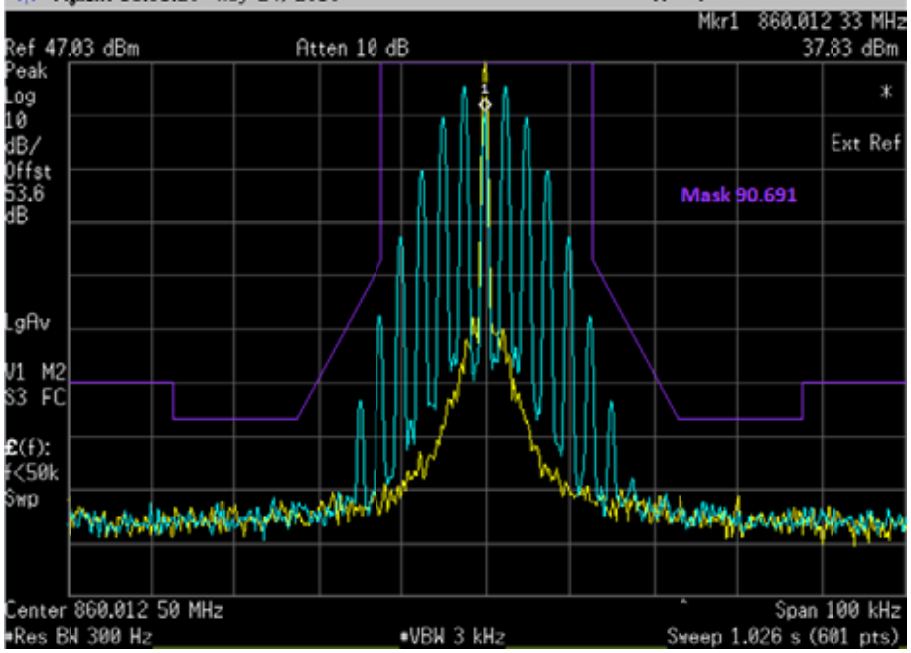


Modulation		Rules Part	
Analog Voice		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	25.0	14.9798	16K0F3E



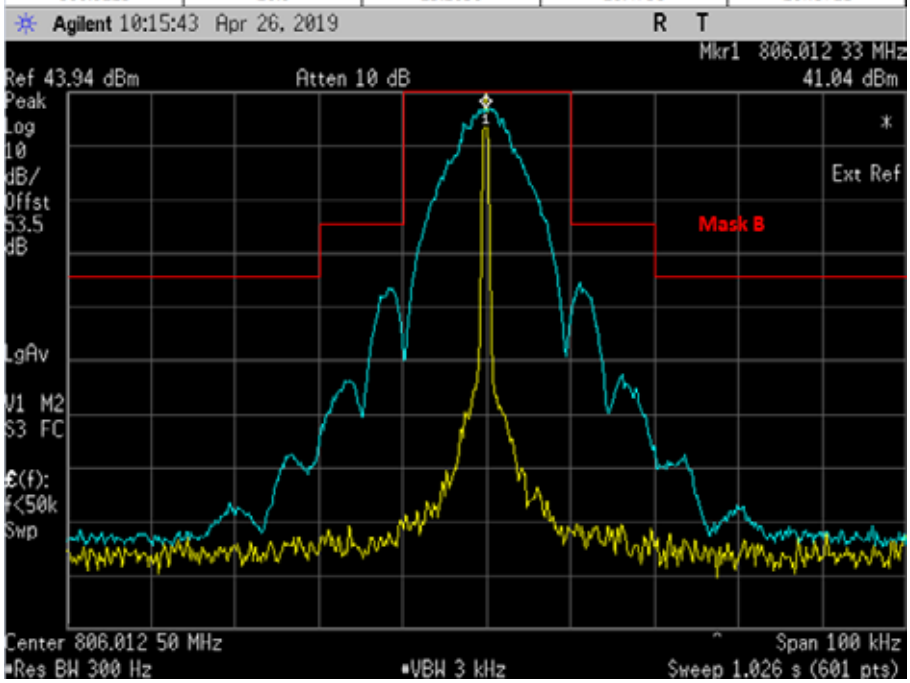
NOT FOR IC REVIEW

Modulation		Rules Part	
Analog Voice		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
850.0125	25.0	14.9985	16K0F3E

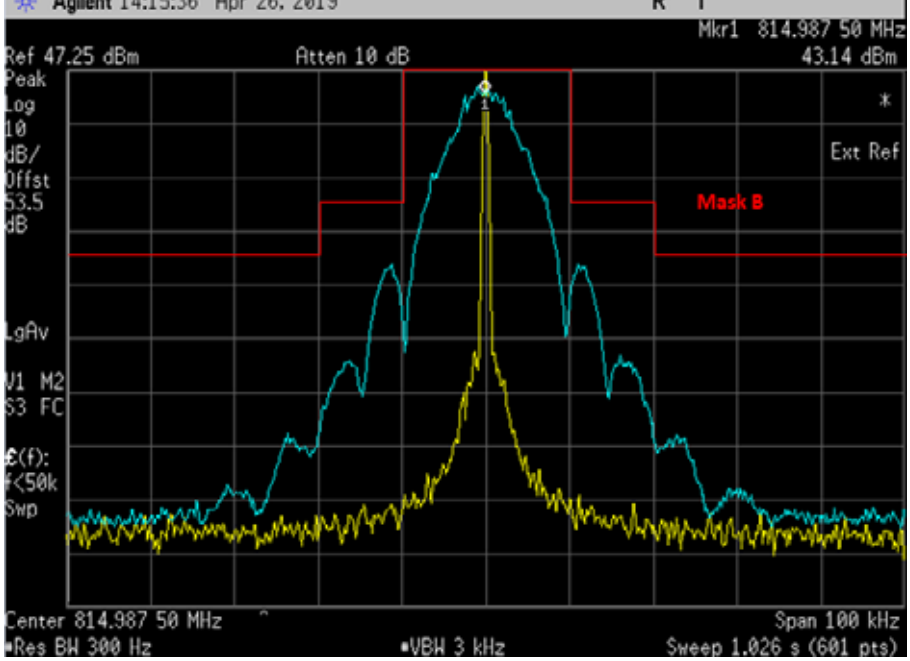


NOT FOR IC REVIEW

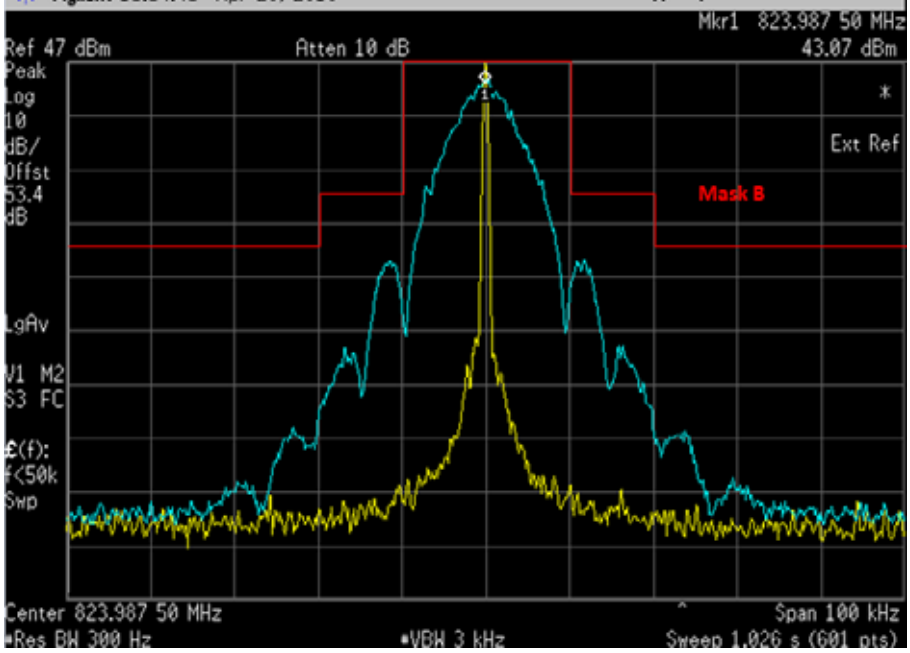
Modulation		Rules Part		
Analog Voice Encyption		90.210,RSS119		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
806.0125	20.0	15.2650	10.4758	20K0F1E



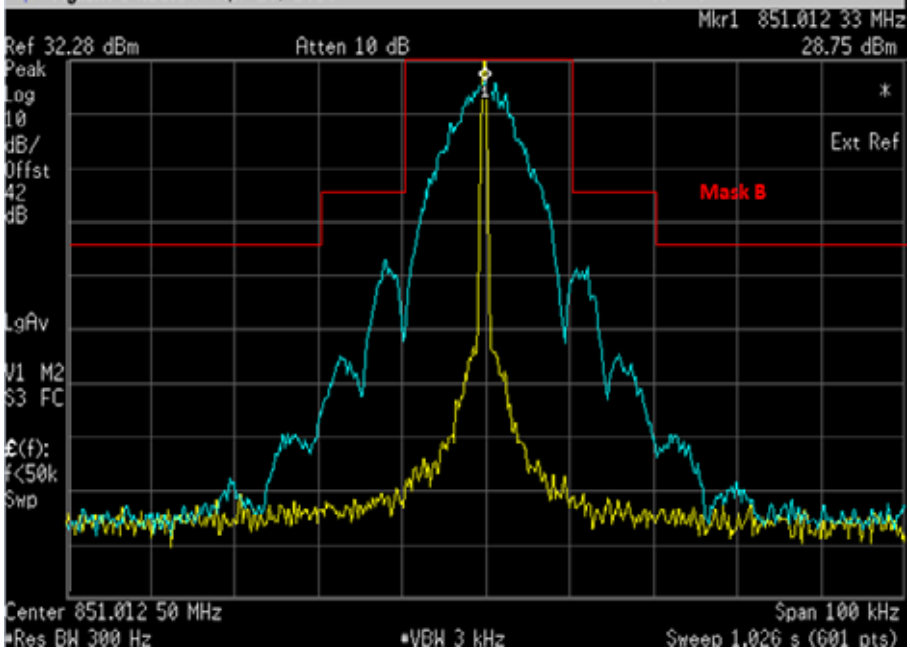
Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
814.9875	20.0	15.3220	10.4277	20K0F1E



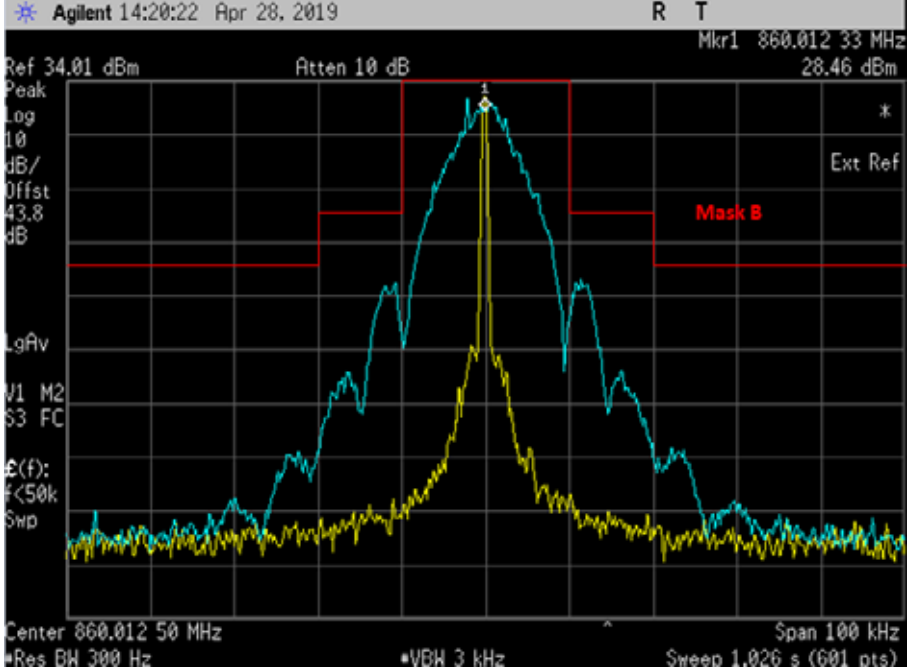
Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
823.9875	20.0	15.4340	10.4266	20K0F1E



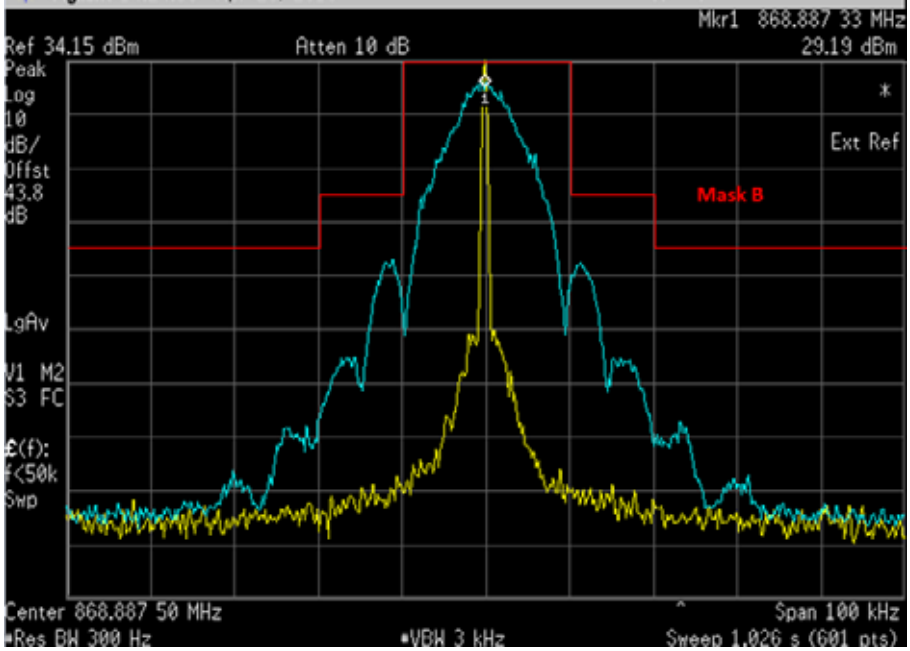
Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
851.0125	20.0	15.4300	10.4214	20K0F1E



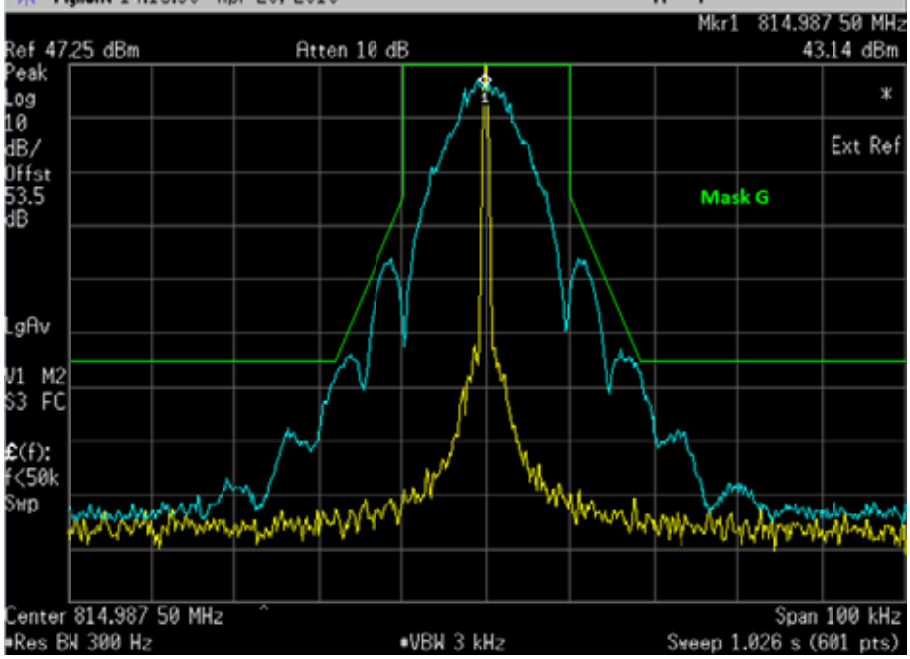
Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
860.0125	20.0	15.4320	10.4282	20K0F1E



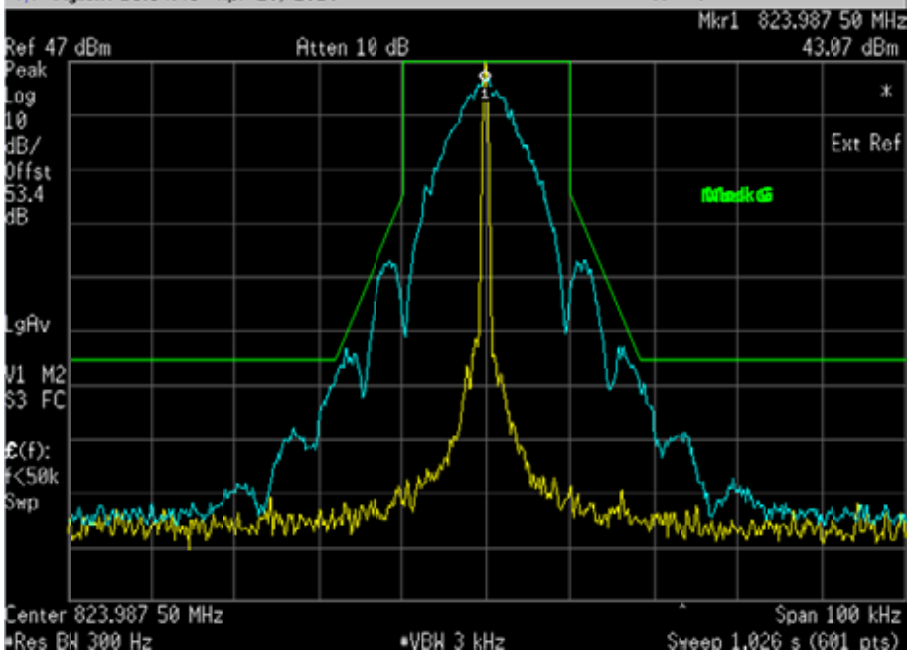
Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
868.8875	20.0	15.4350	10.4346	20K0F1E



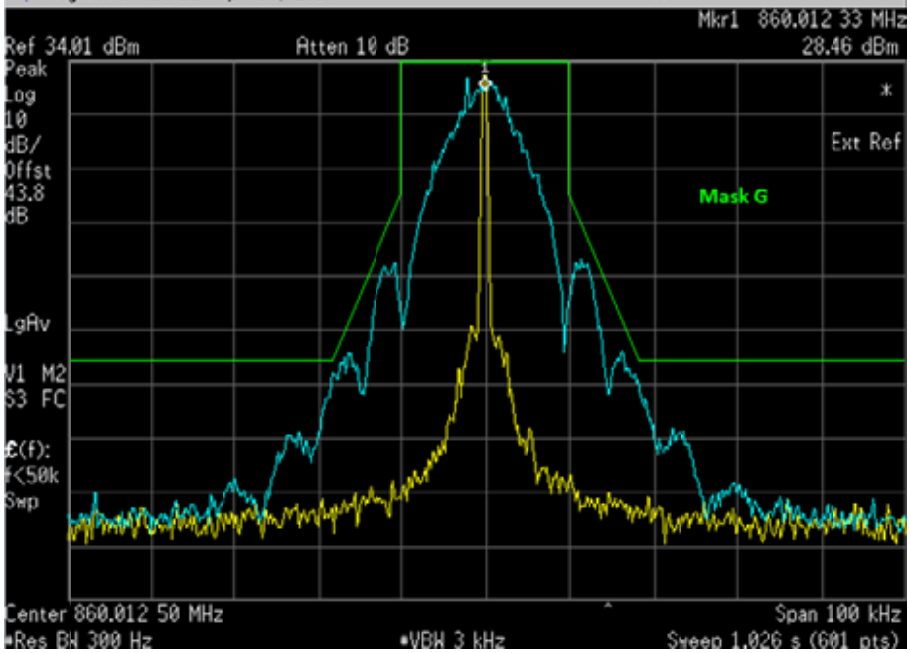
Modulation		Rules Part	
Analog Voice Encyption		90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	20.0	10.4275	20K0F1E



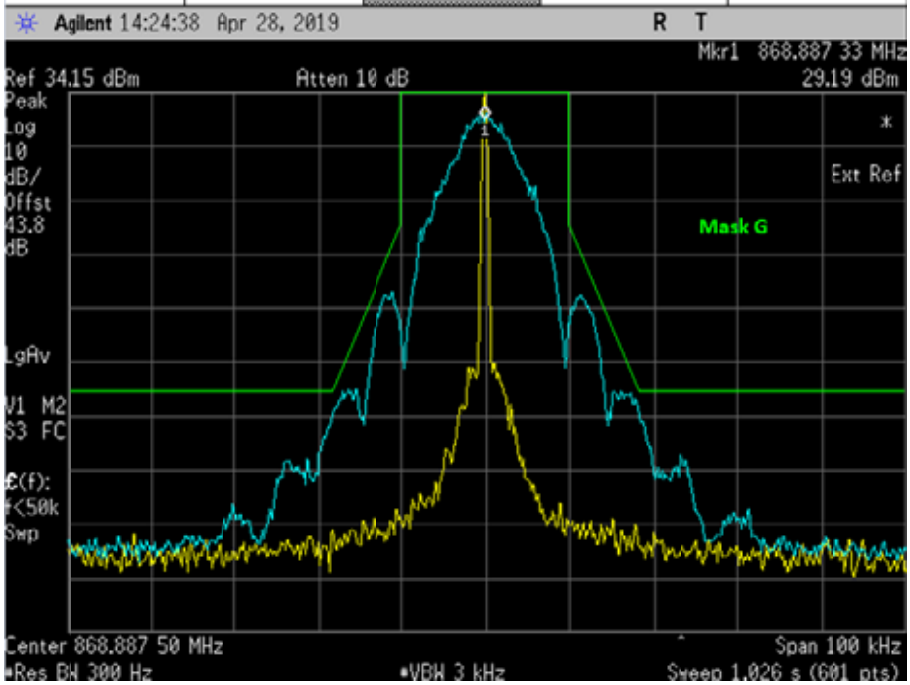
Modulation		Rules Part	
Analog Voice Encyption		90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	20.0	10.4263	20K0F1E



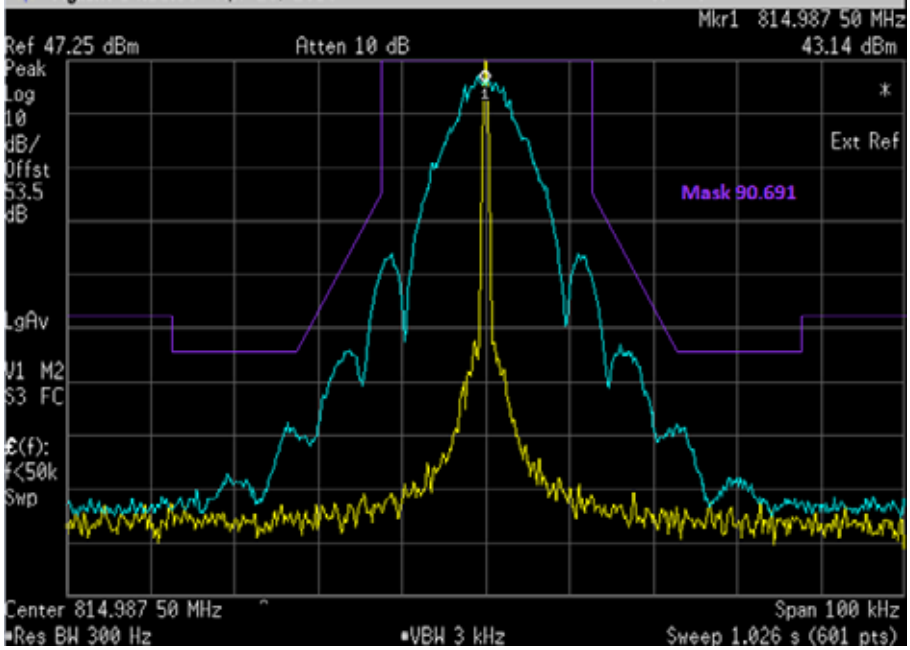
Modulation			Rules Part	
Analog Voice Encyption			90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
850.0125	20.0		10.4271	20K0F1E



Modulation			Rules Part	
Analog Voice Encyption			90.210	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
868.8875	20.0		10.5935	20K0F1E

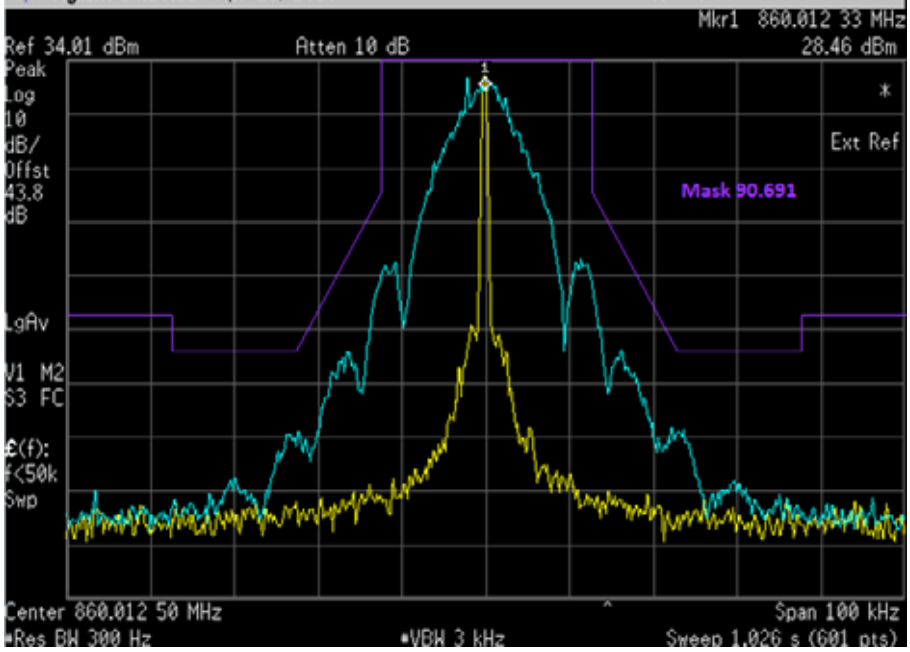


Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90.691		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
814.9875	20.0	15.4350	10.4385	20K0F1E



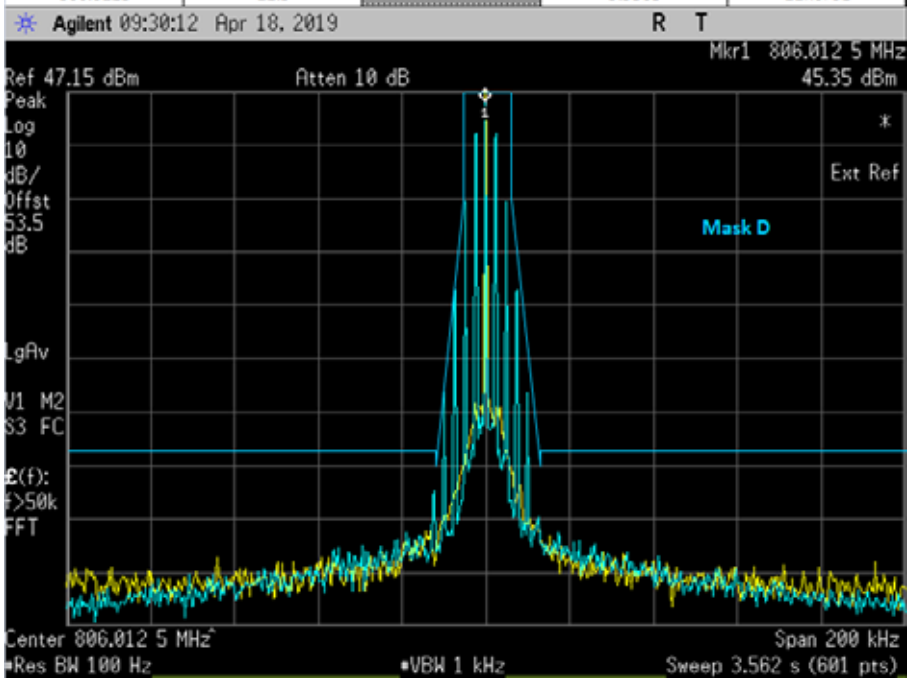
NOT FOR IC REVIEW

Modulation		Rules Part		
Analog Voice Encyption		FCC Part 90.691		
Channel Frequency (MHz)	Channel Spacing (kHz)	-26 dB Point (kHz)	99% OCB (kHz)	Emission Designator
860.0125	20.0	15.4320	10.4305	20K0F1E

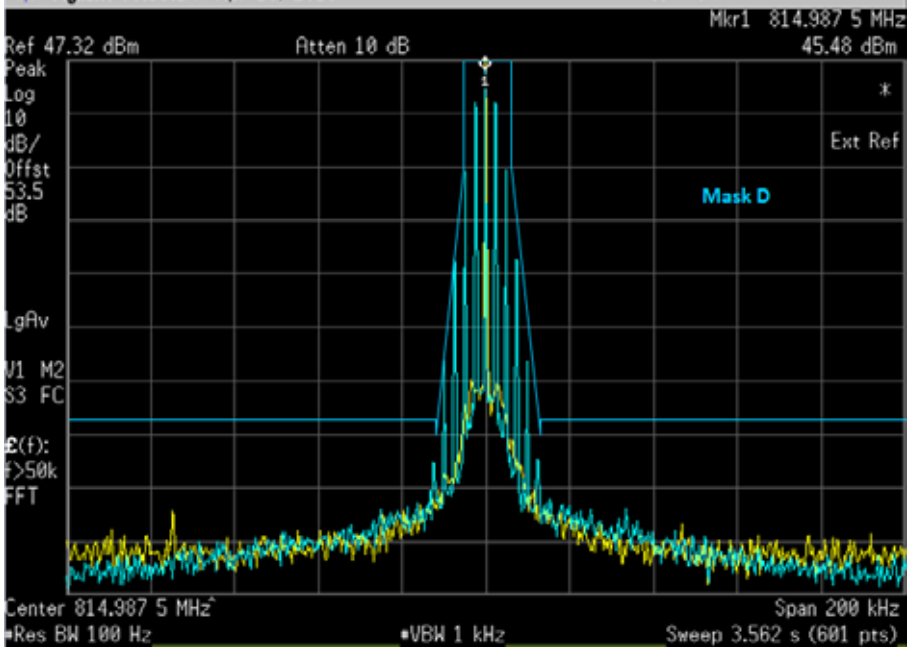


NOT FOR IC REVIEW

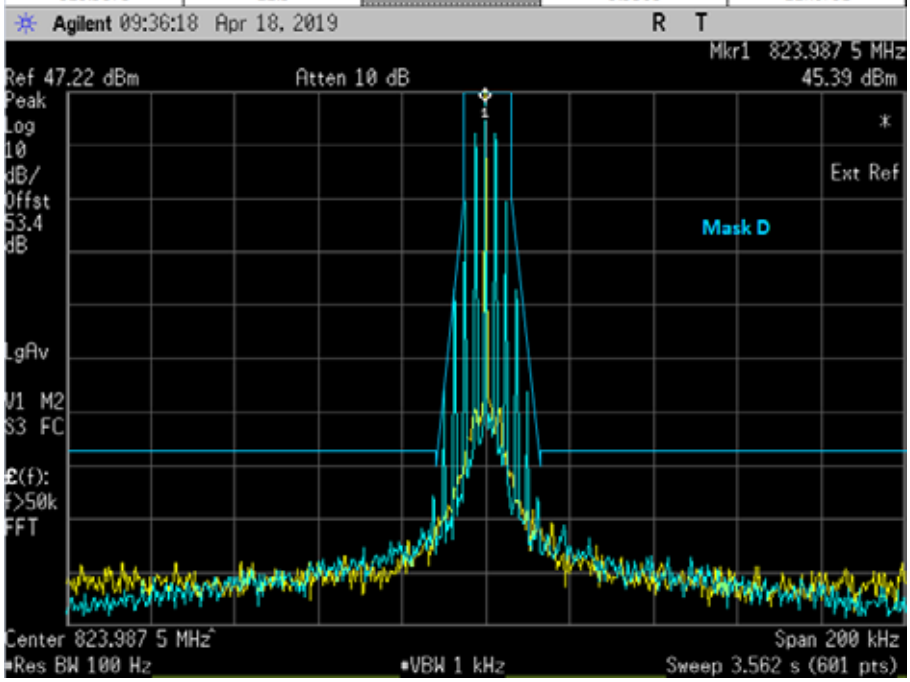
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	9.9505	11K0F3E



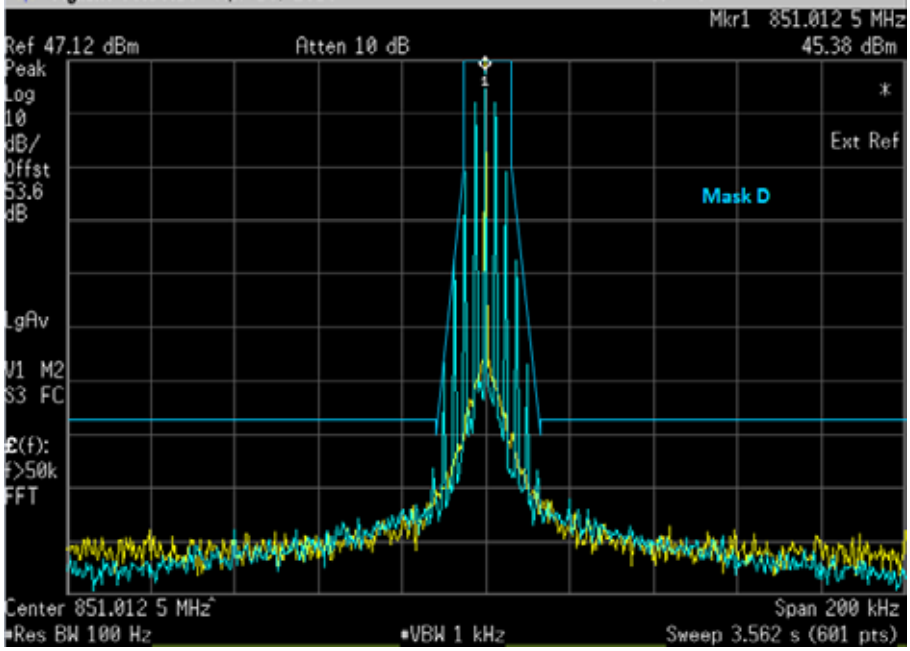
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	9.9477	11K0F3E



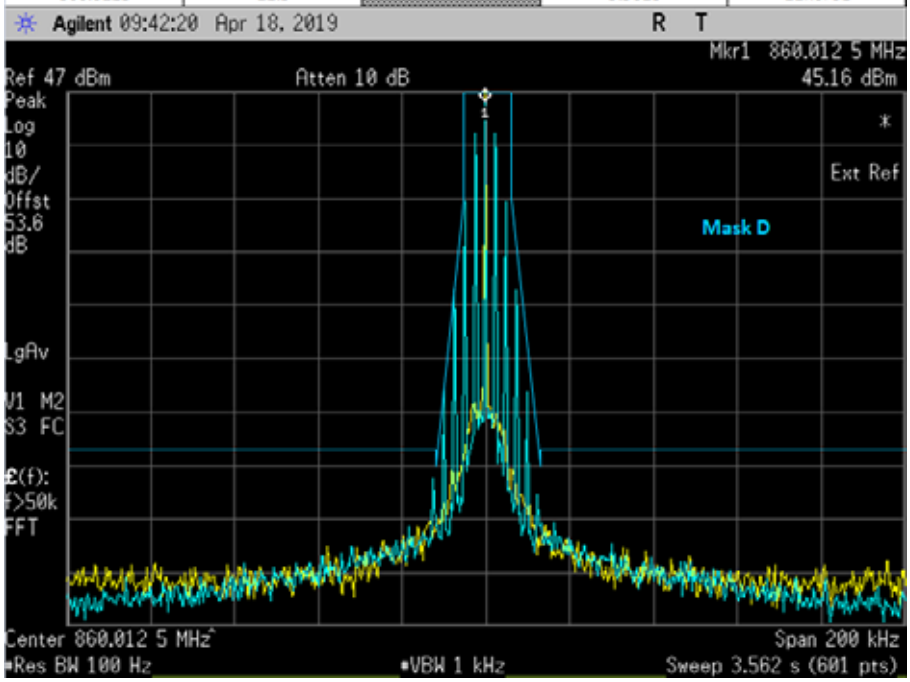
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	12.5	9.9568	11K0F3E



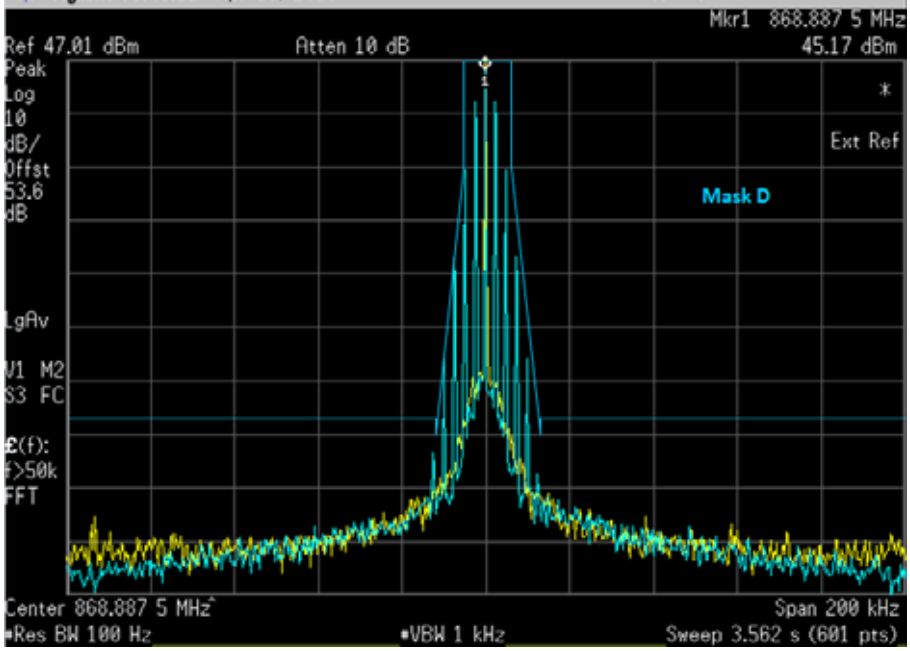
Modulation		Rules Part	
Analog Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
851.0125	12.5	9.9256	11K0F3E



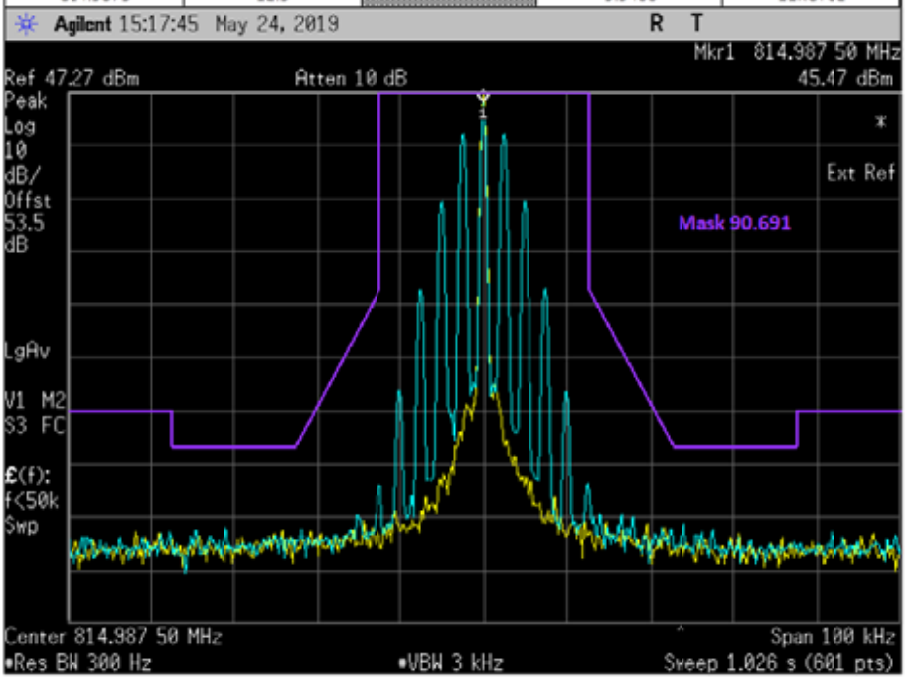
Modulation			Rules Part	
Analog Voice			FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
860.0125	12.5		9.9613	11K0F3E



Modulation			Rules Part	
Analog Voice			FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
868.8875	12.5		9.9574	11K0F3E

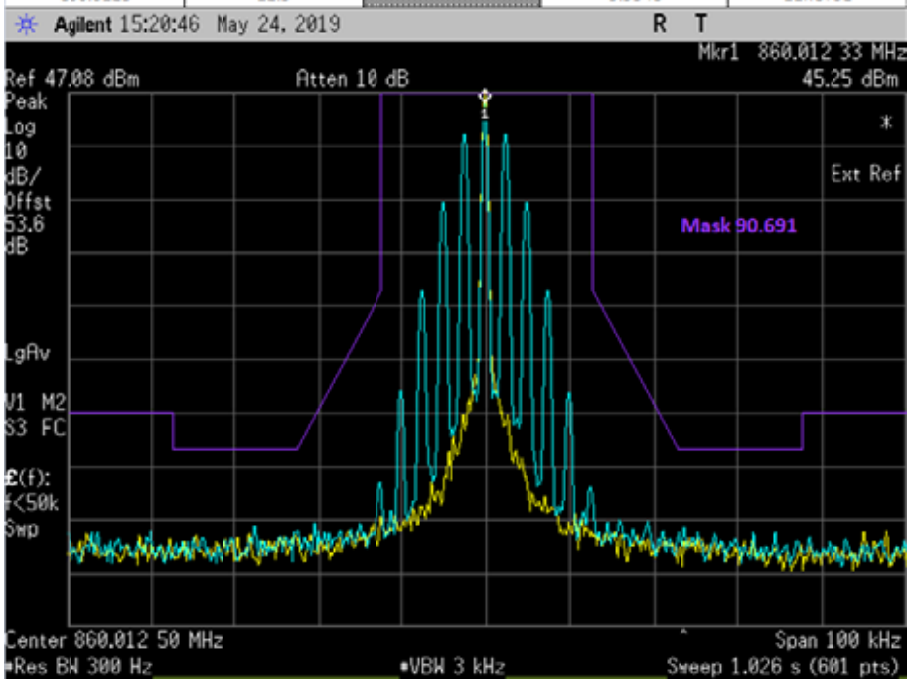


Modulation		Rules Part	
Analog Voice		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	9.9433	11K0F3E



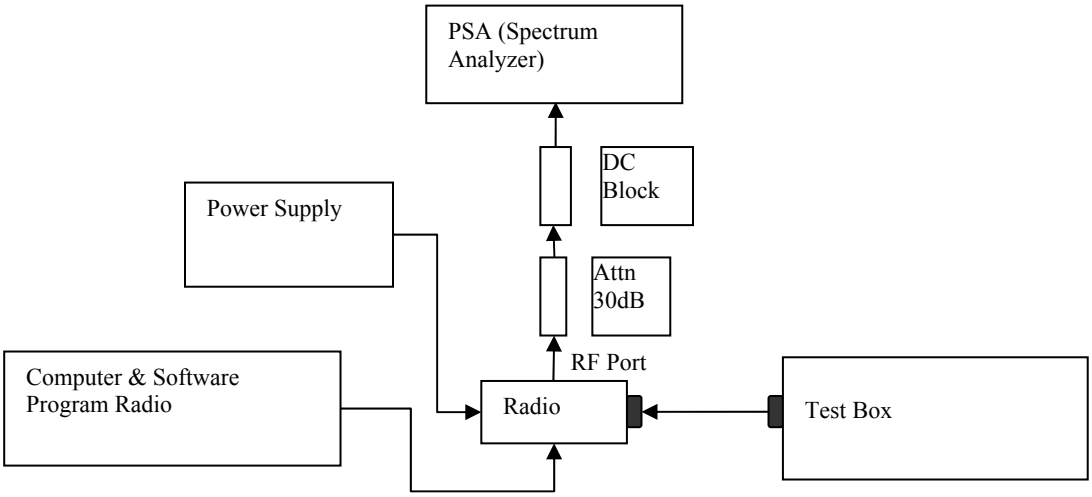
NOT FOR IC REVIEW

Modulation		Rules Part	
Analog Voice		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
850.0125	12.5	9.9548	11K0F3E



NOT FOR IC REVIEW

6.6.3. Test Setup (Digital)



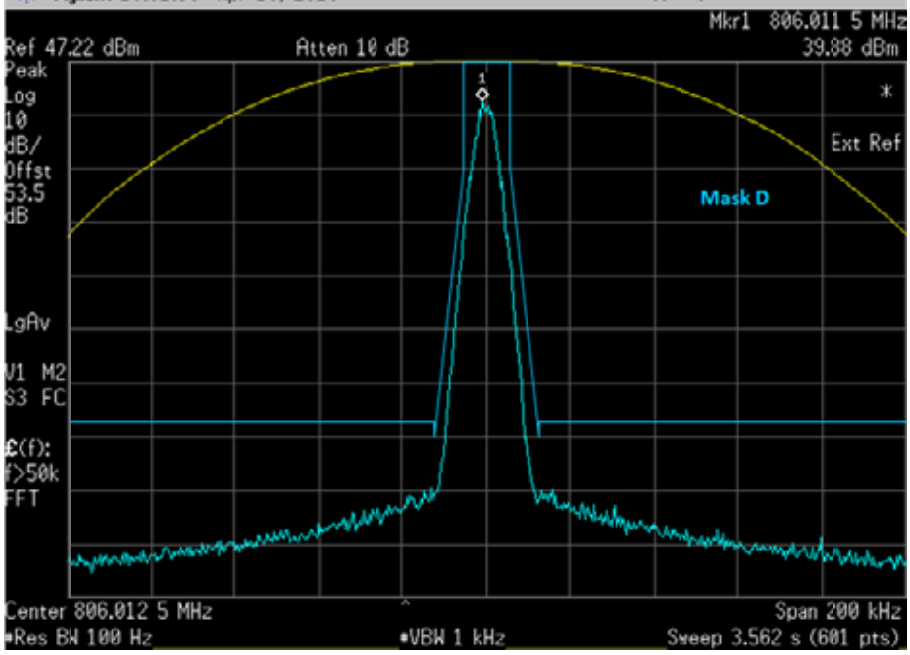
1) Program and set radio to operate in desire test frequency and digital mode with modulation. (*4FSK, C4FM or other digital modulation form).
2) Path loss for the measurement included.
3) Select the Occupied Bandwidth measurement for 99% Emissions Bandwidth Measurement.
4) Key in the Fc and Resolution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

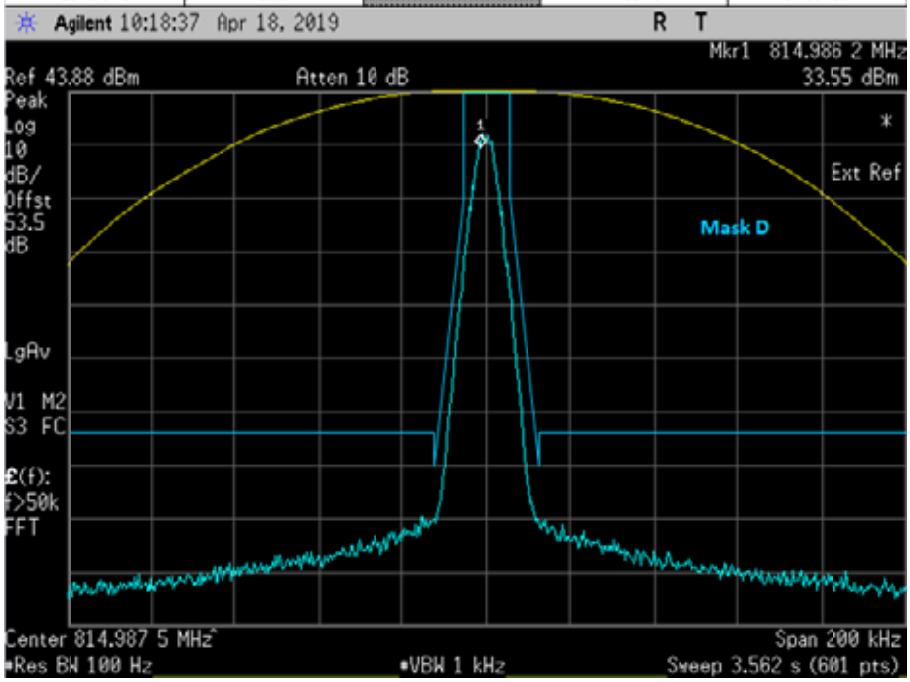
- For Digital Modulation, 12.5 kHz Data F1D & FXD would be the same. Therefore only measurements with F1D modulation shown below.
- For Digital Modulation, 12.5 kHz Data F1E & FXE would be the same. Therefore only measurements with F1E modulation shown below.

6.6.4. Test Result (Digital)

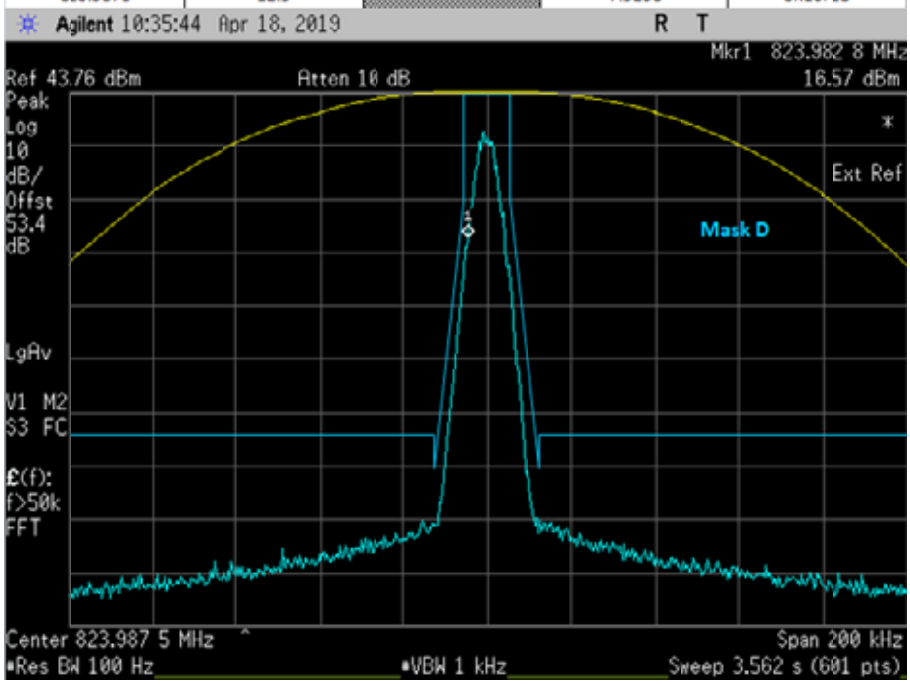
Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	7.6912	8K10F1D



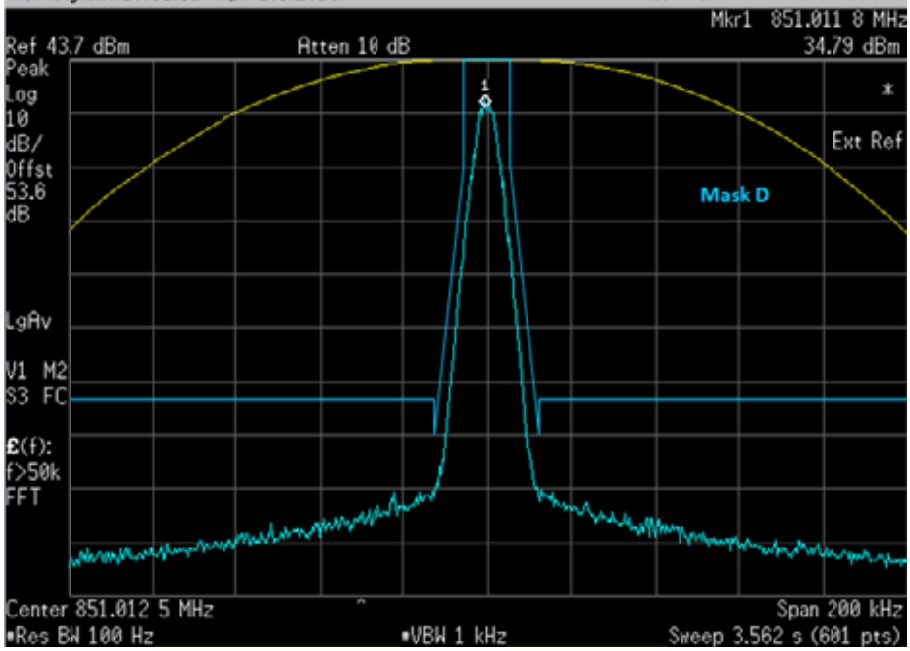
Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	7.8946	8K10F1D



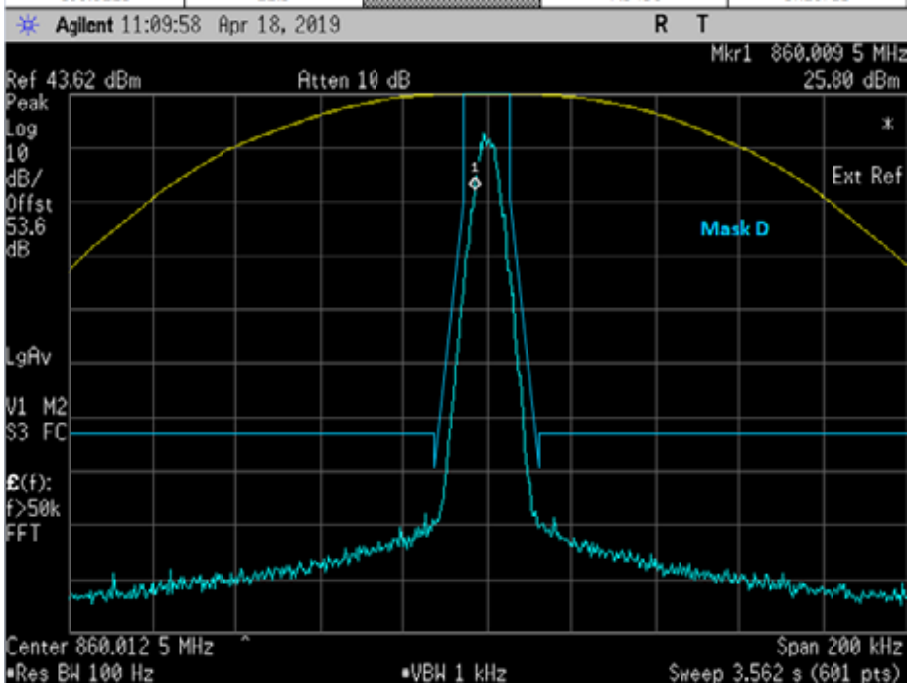
Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	12.5	7.9298	8K10F1D



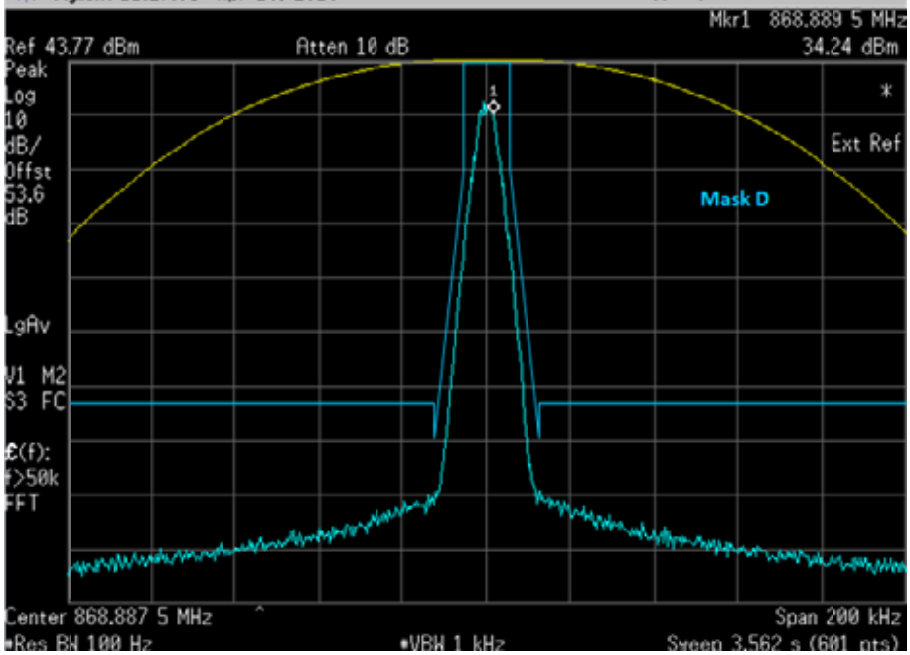
Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
851.0125	12.5	7.9432	8K10F1D



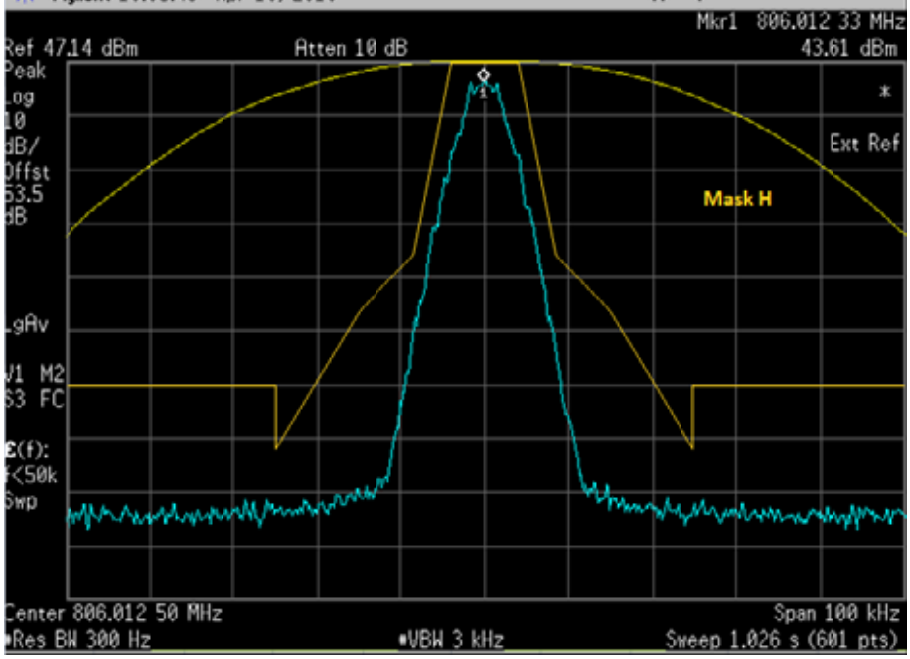
Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
860.0125	12.5	7.9456	8K10F1D



Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
868.8875	12.5	7.9875	8K10F1D

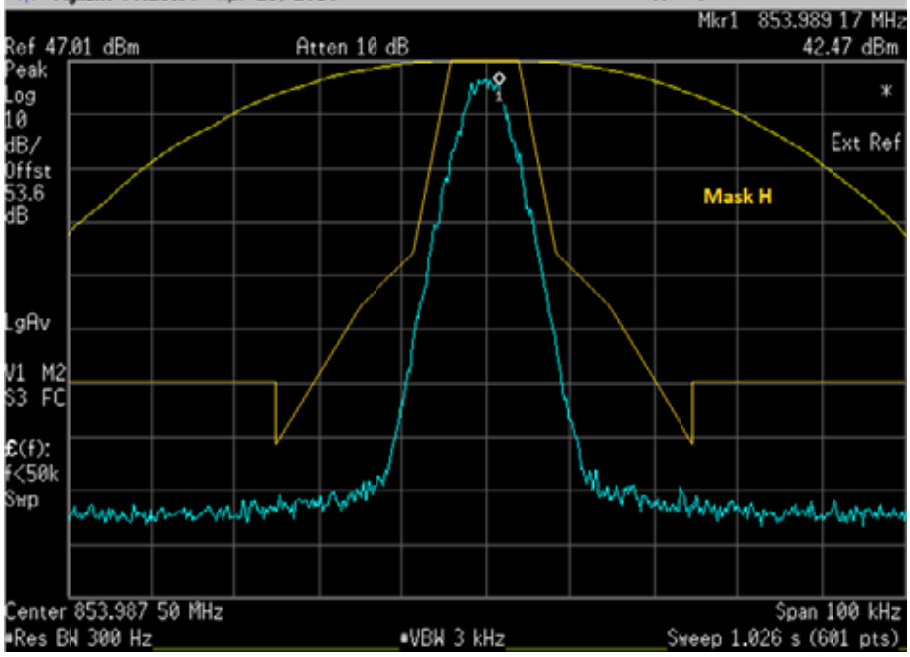


Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	7.7744	8K10F1D



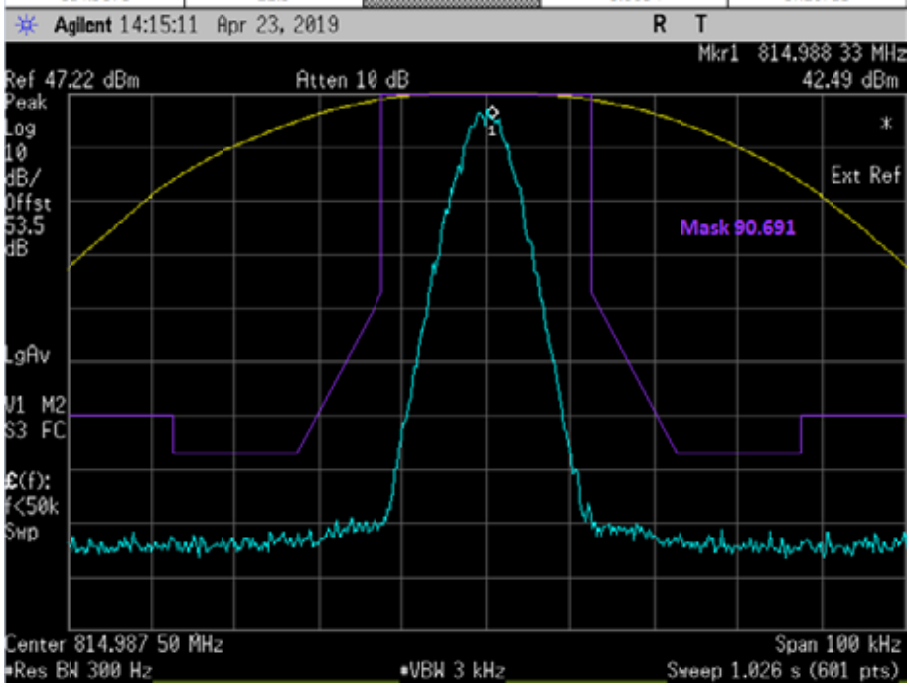
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Data		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
853.9875	12.5	7.7382	8K10F1D



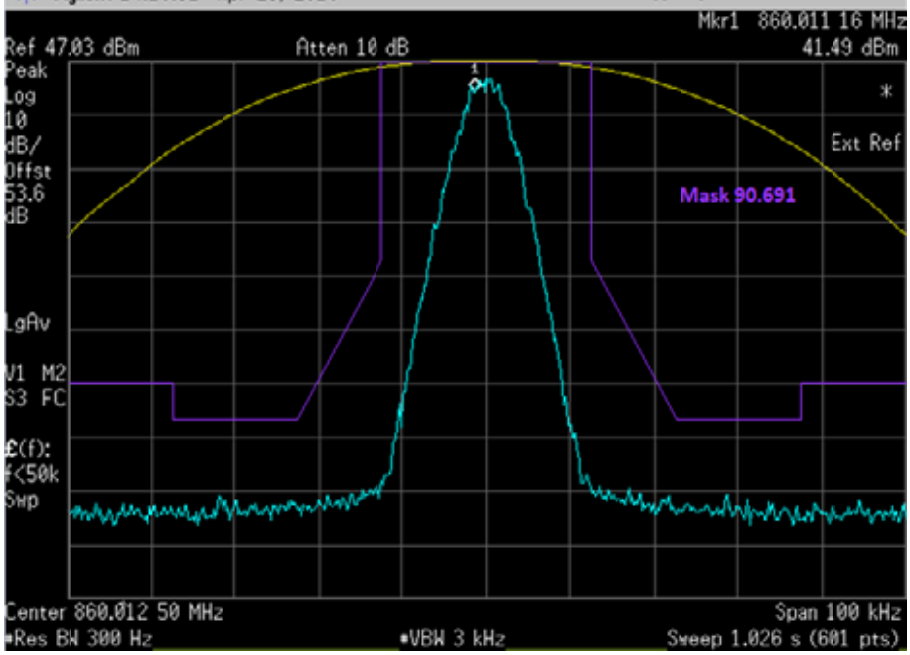
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Data		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	8.0054	8K10F1D



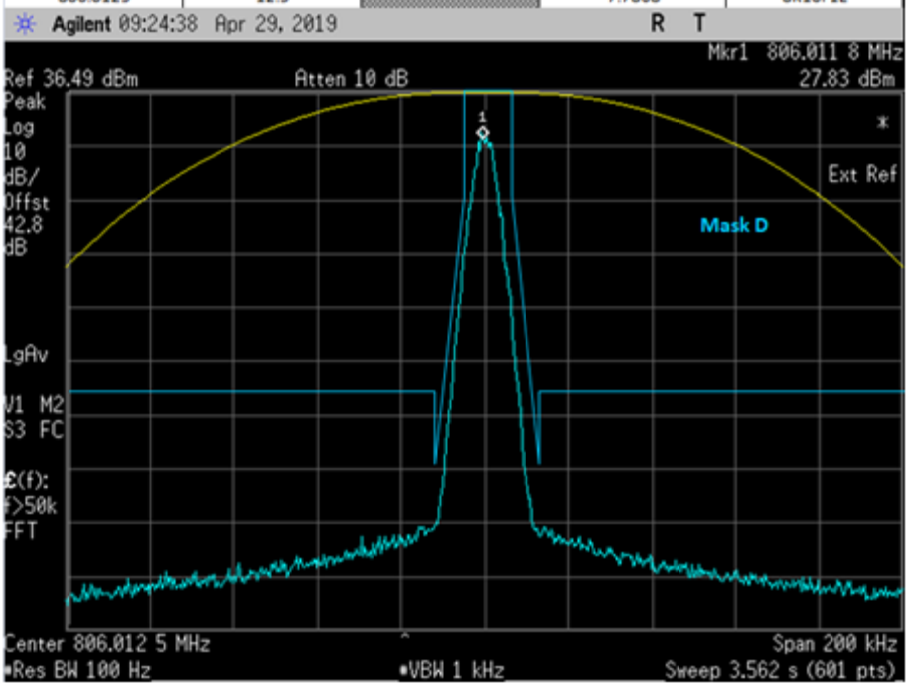
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Data		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
850.0125	12.5	7.8586	8K10F1D

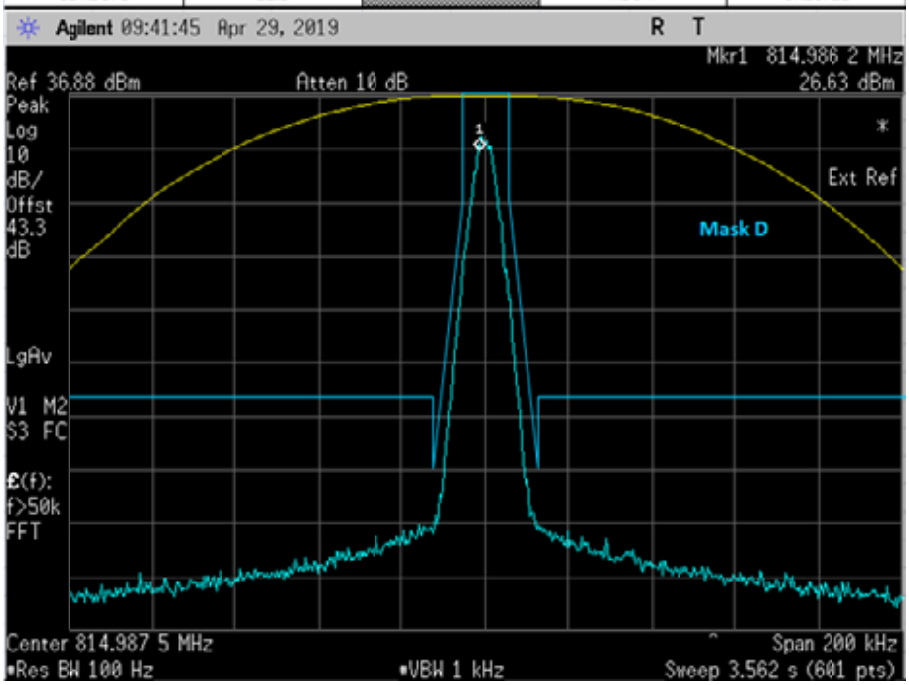


NOT FOR IC REVIEW

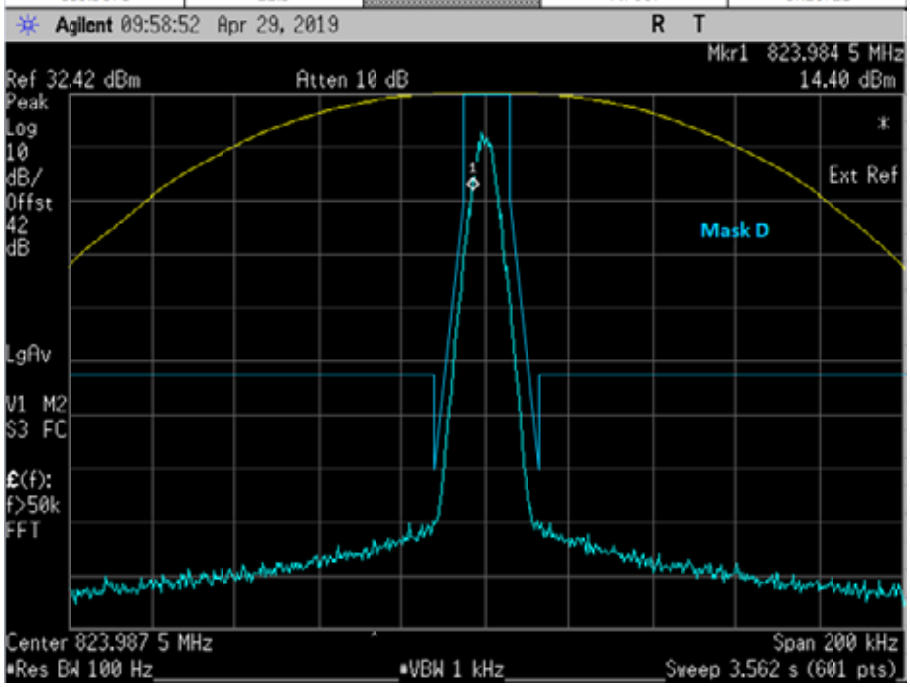
Modulation		Rules Part		
Digital Voice		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
806.0125	12.5		7.7868	8K10F1E



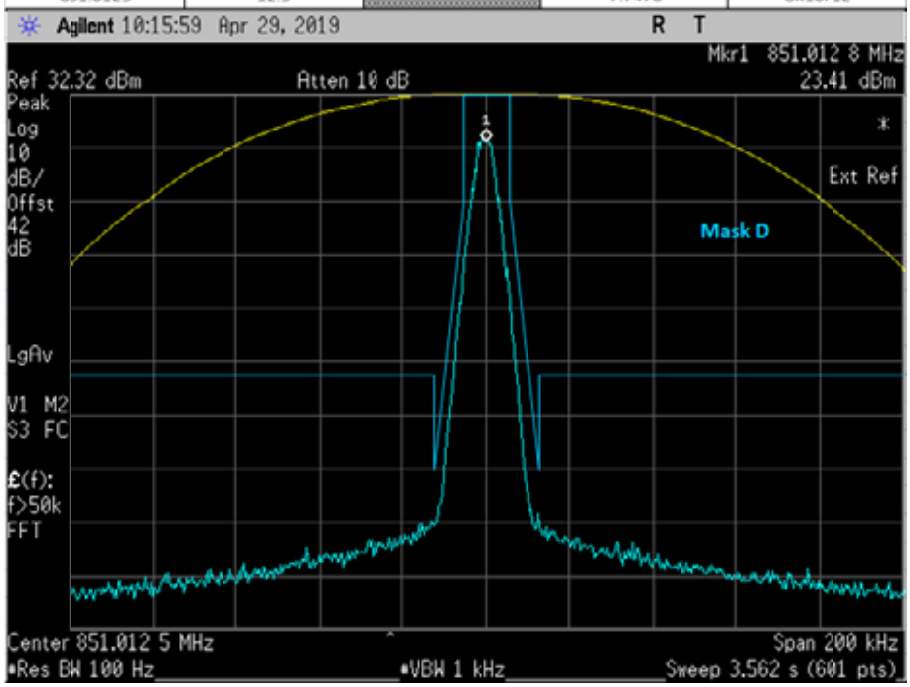
Modulation		Rules Part		
Digital Voice		FCC Part 90 / RSS 119		
Channel Frequency (MHz)	Channel Spacing (kHz)		99% OCB (kHz)	Emission Designator
814.9875	12.5		7.9647	8K10F1E



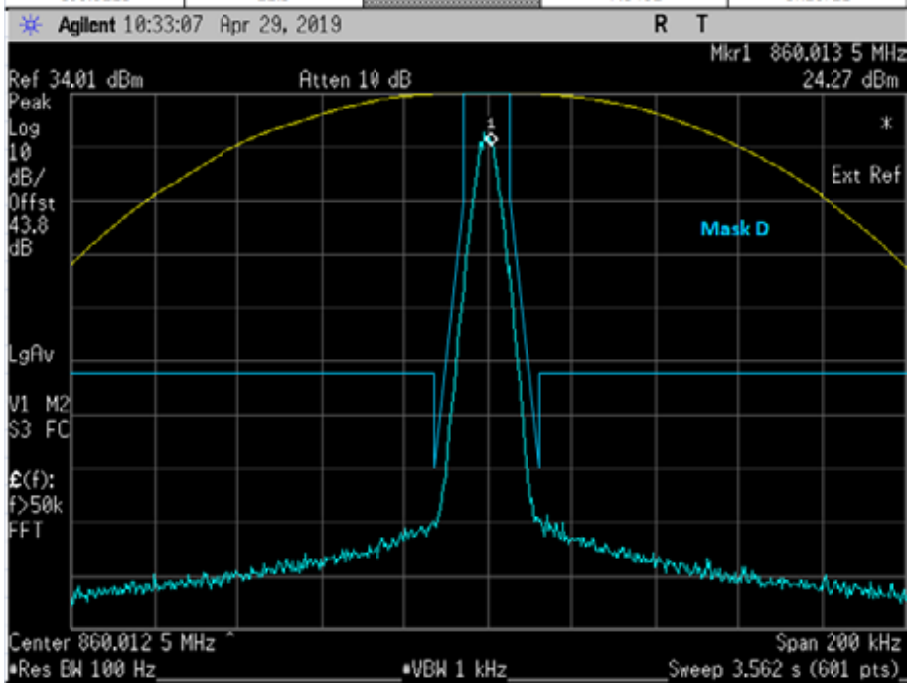
Modulation		Rules Part	
Digital Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	12.5	7.7667	8K10F1E



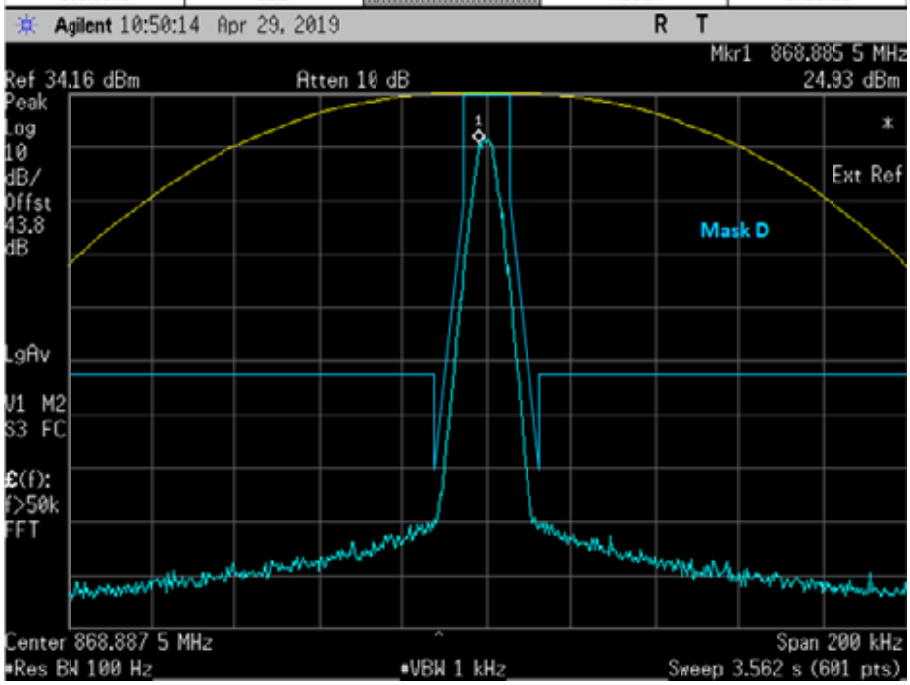
Modulation		Rules Part	
Digital Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
851.0125	12.5	7.7470	8K10F1E



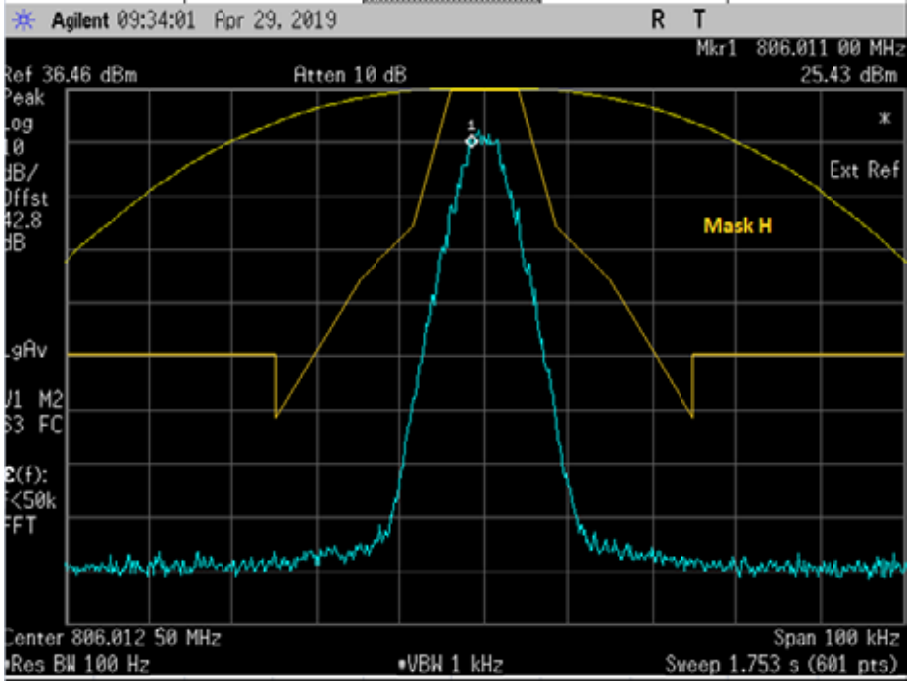
Modulation		Rules Part	
Digital Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
860.0125	12.5	7.8401	8K10F1E



Modulation		Rules Part	
Digital Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
868.8875	12.5	7.9524	8K10F1E

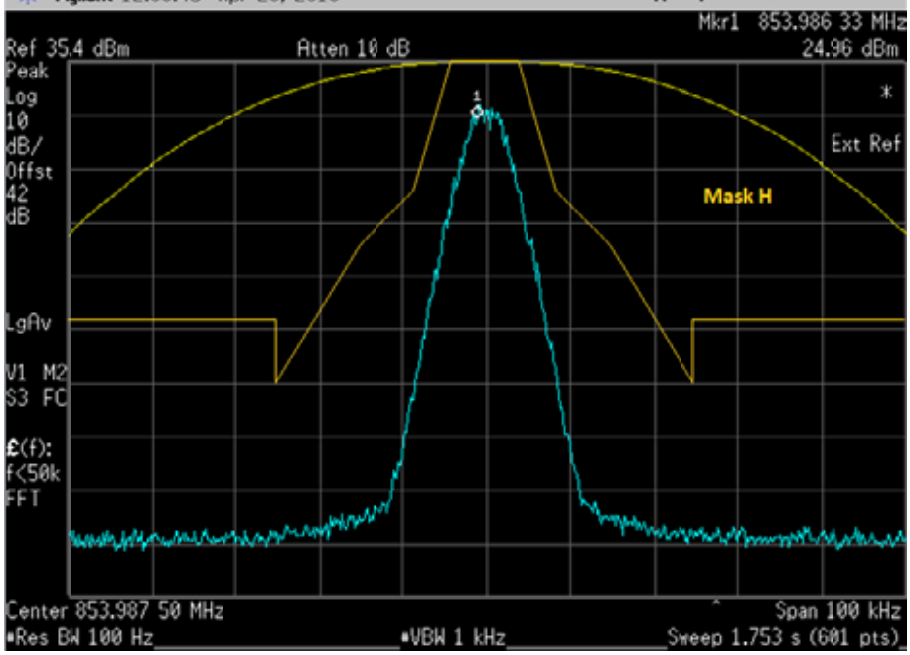


Modulation		Rules Part	
Digital Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	7.6581	8K10F1E



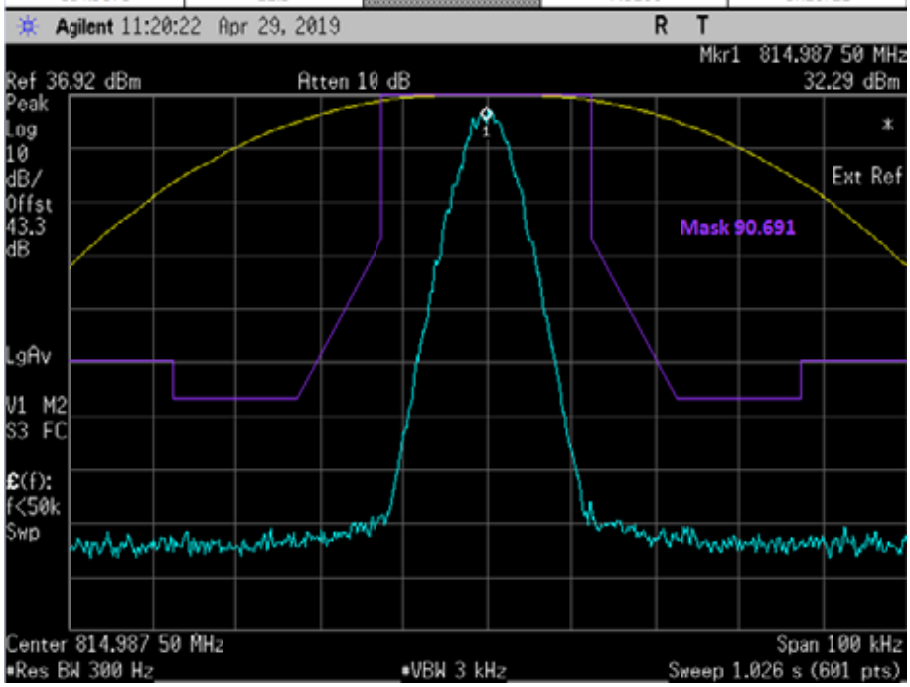
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Voice		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
853.9875	12.5	7.8751	8K10F1E



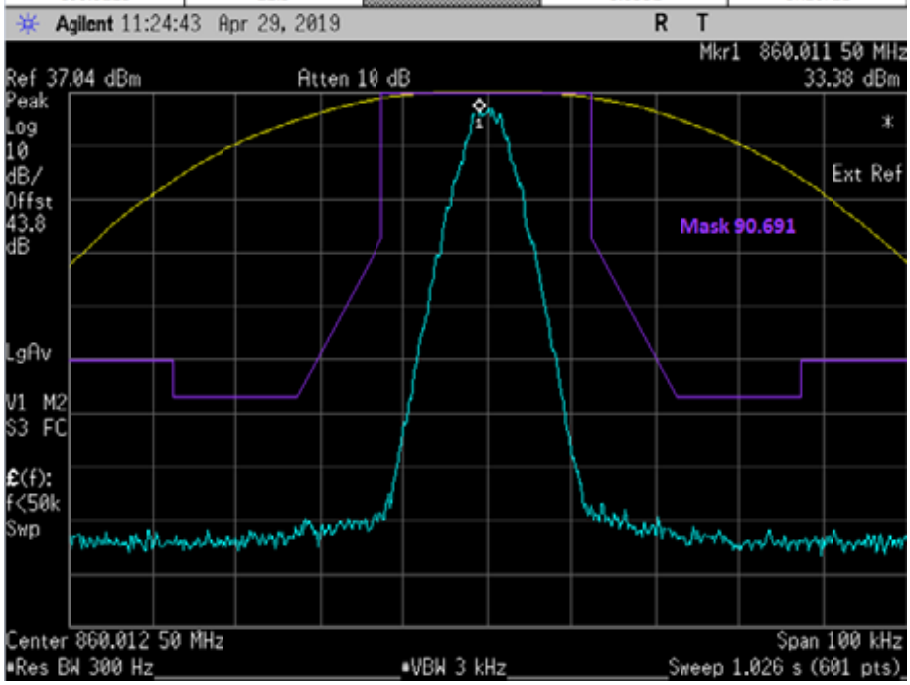
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Voice		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	7.8106	8K10F1E



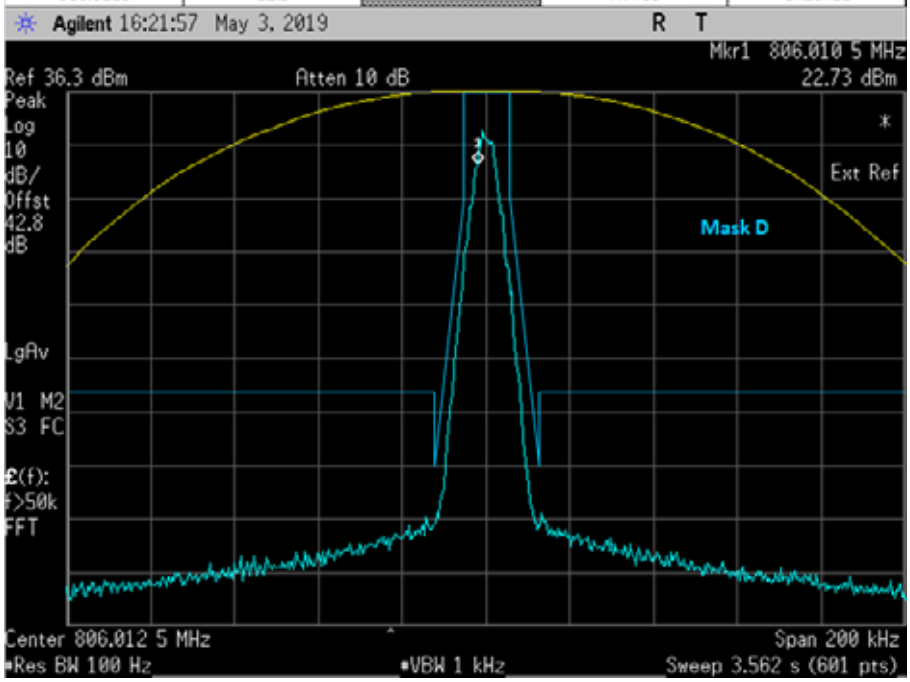
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Voice		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
860.0125	12.5	8.0552	8K10F1E

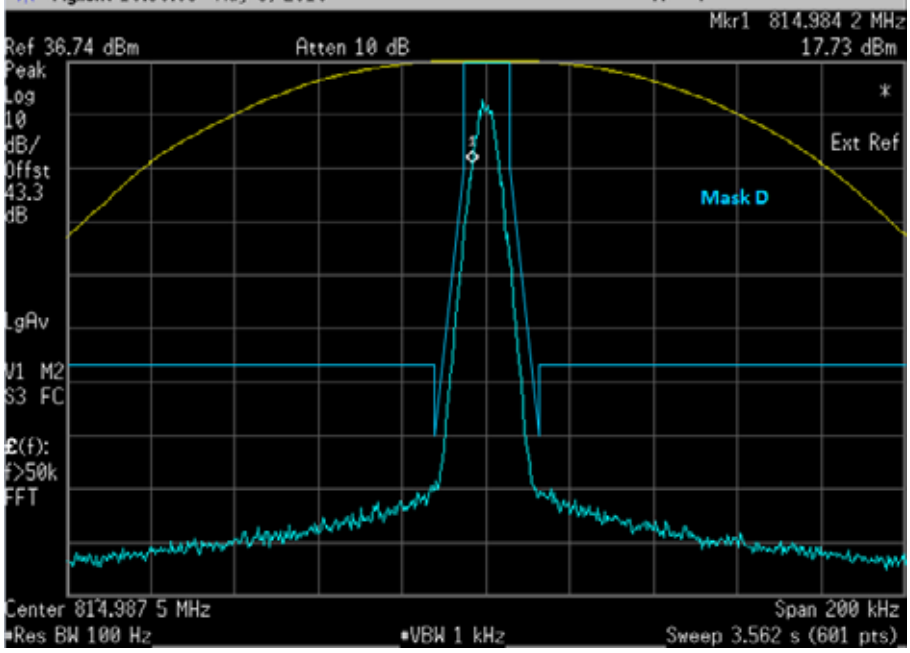


NOT FOR IC REVIEW

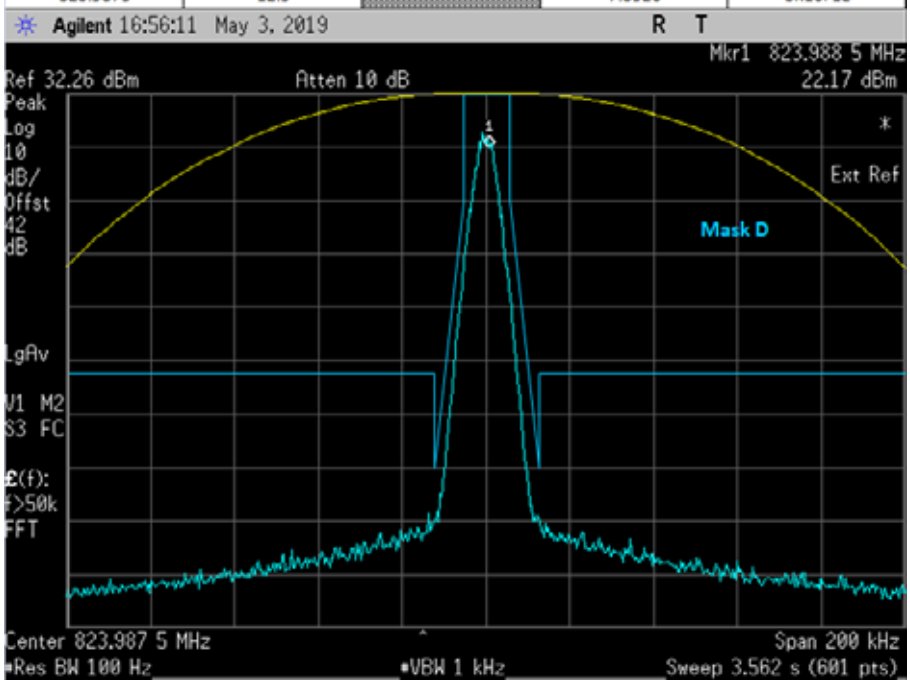
Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	7.7739	8K10F1E



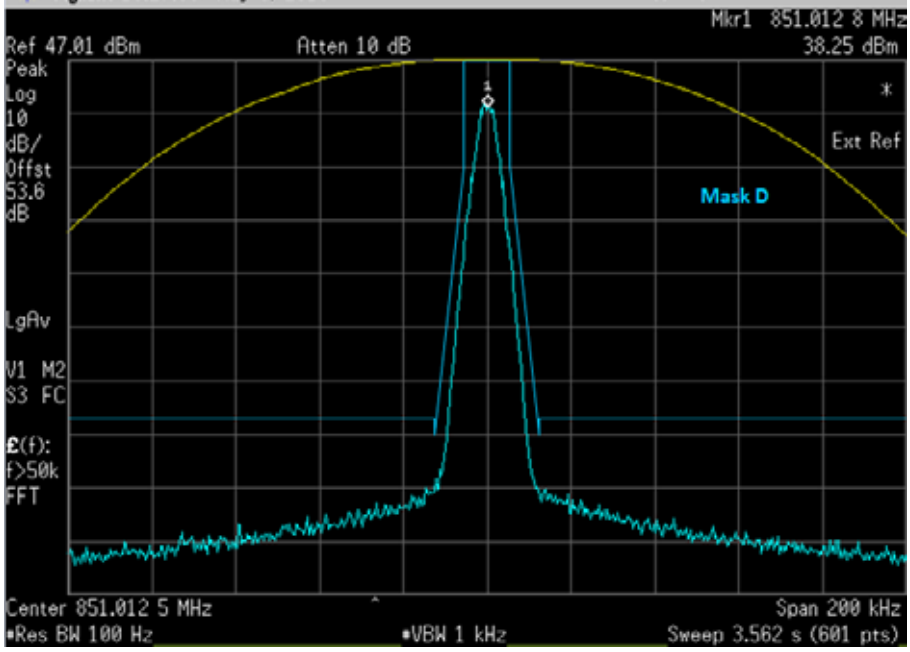
Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	7.6973	8K10F1E



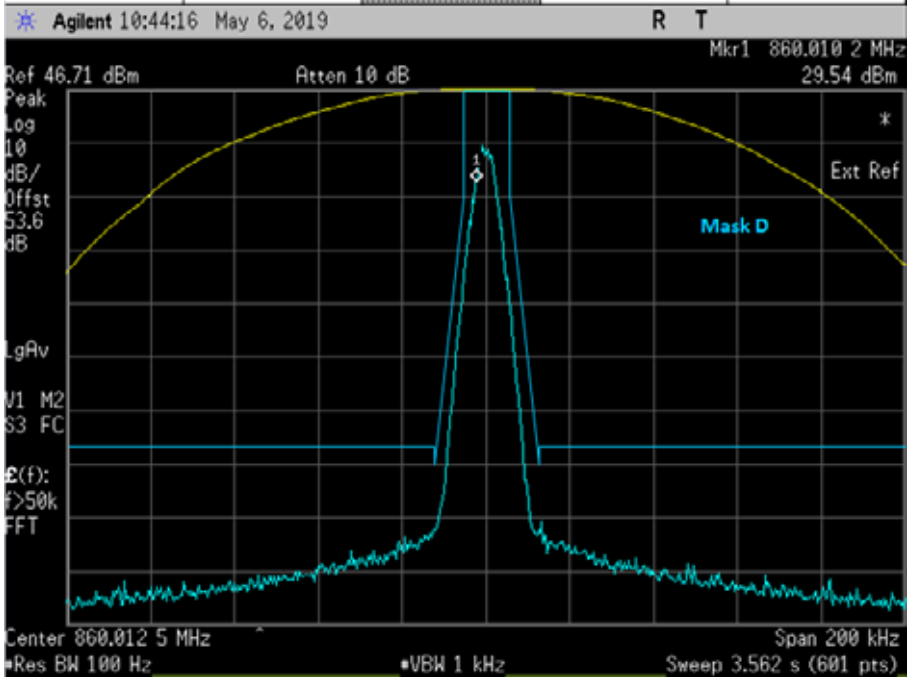
Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	12.5	7.8520	8K10F1E



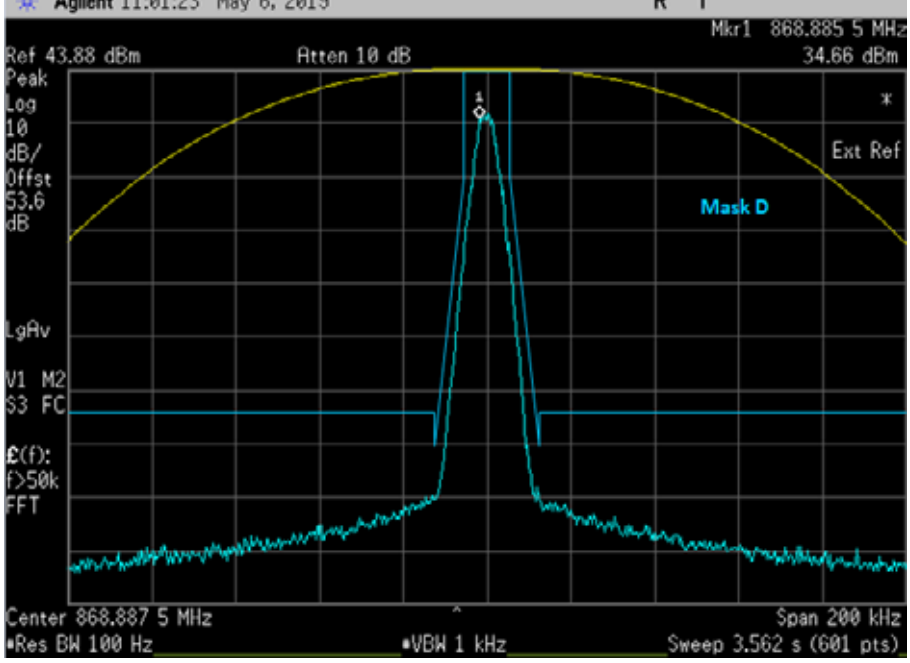
Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
851.0125	12.5	7.9434	8K10F1E



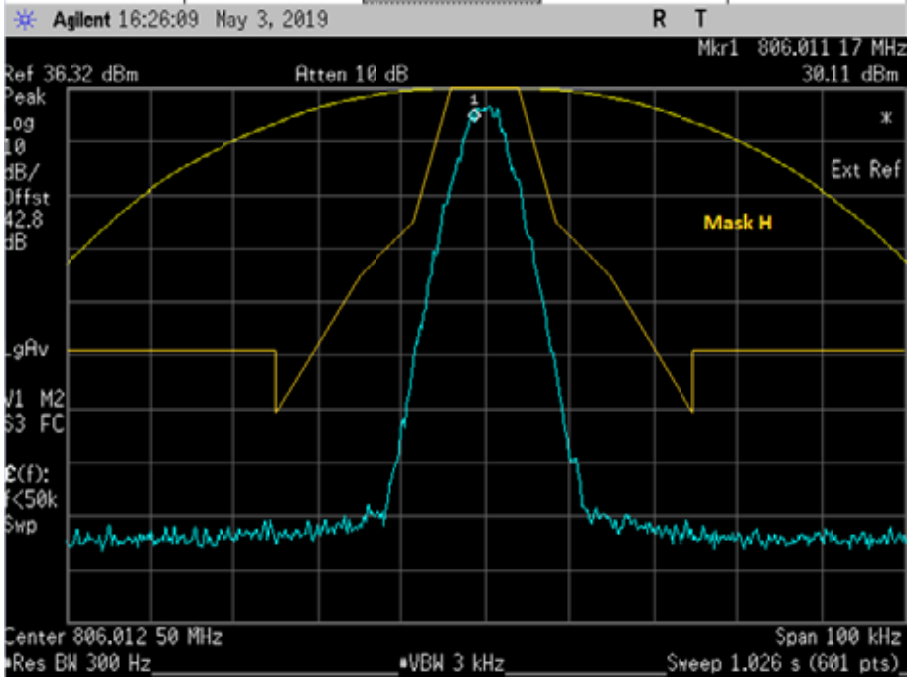
Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
860.0125	12.5	7.6540	8K10F1E



Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
868.8875	12.5	7.8668	8K10F1E

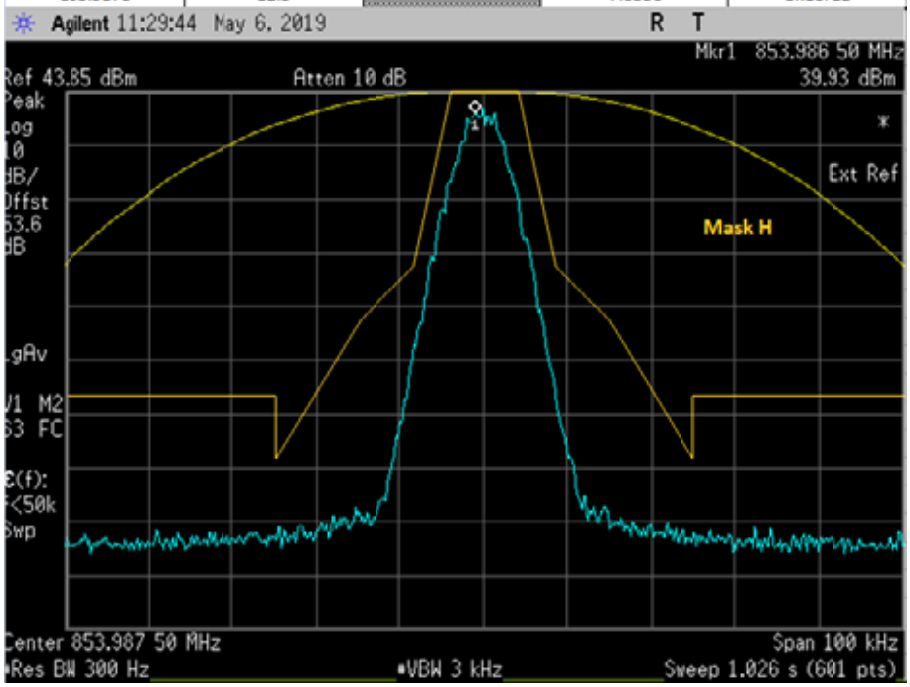


Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	7.9695	8K10F1E



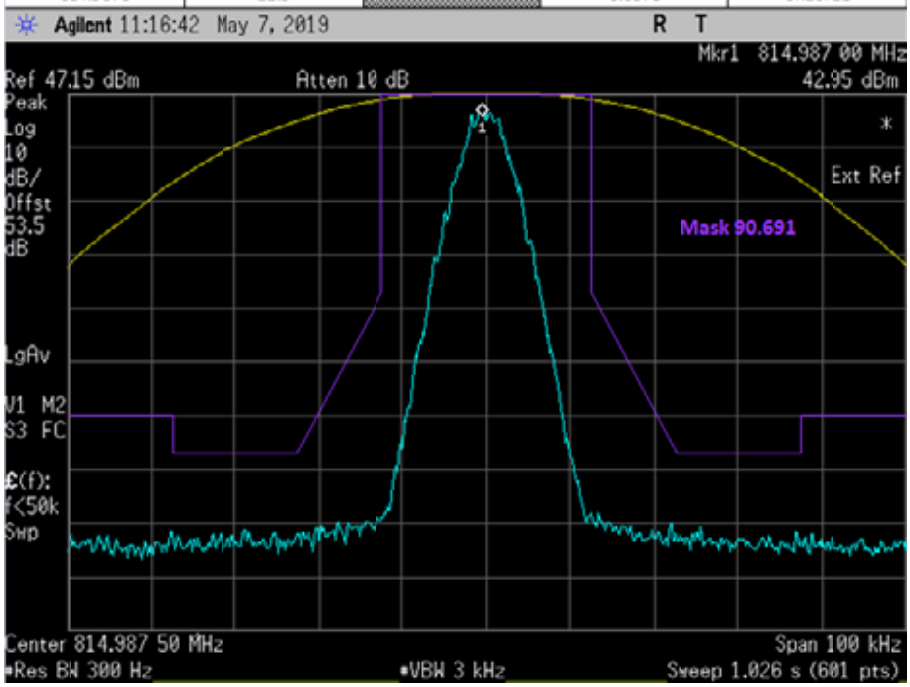
NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
853.9875	12.5	7.6336	8K10F1E



NOT FOR IC REVIEW

Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	8.0579	8K10F1E



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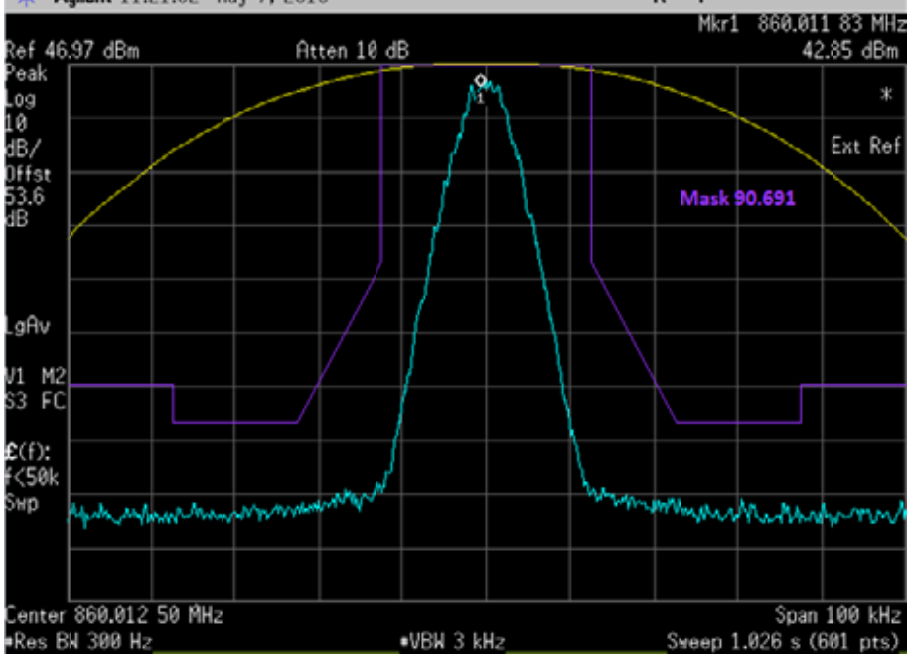
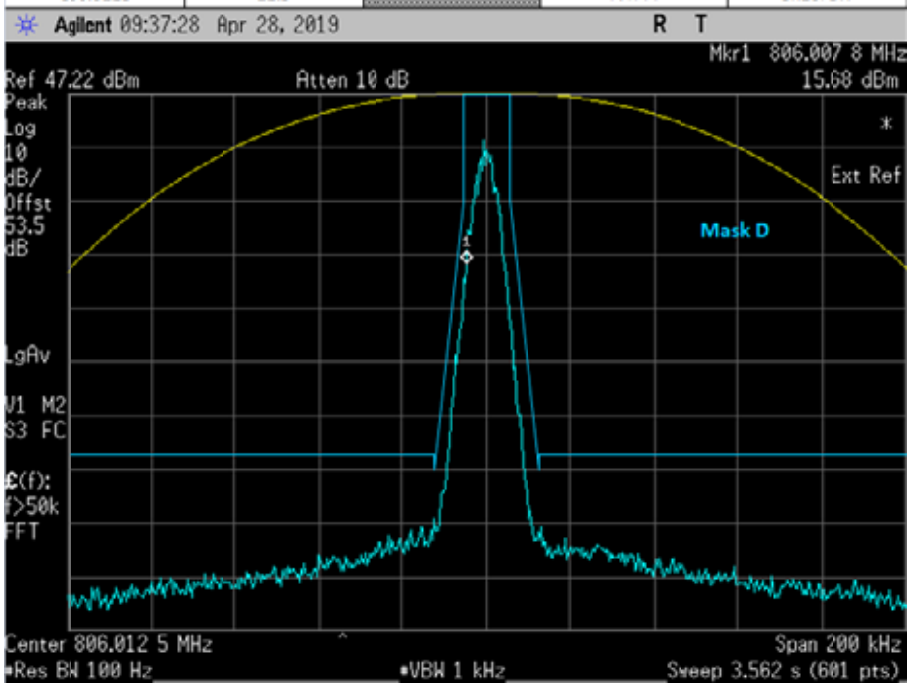
Modulation		Rules Part	
Digital Voice Encryption		FCC Part 90.691 (EA)	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
850.0125	12.5	7.6658	8K10F1E

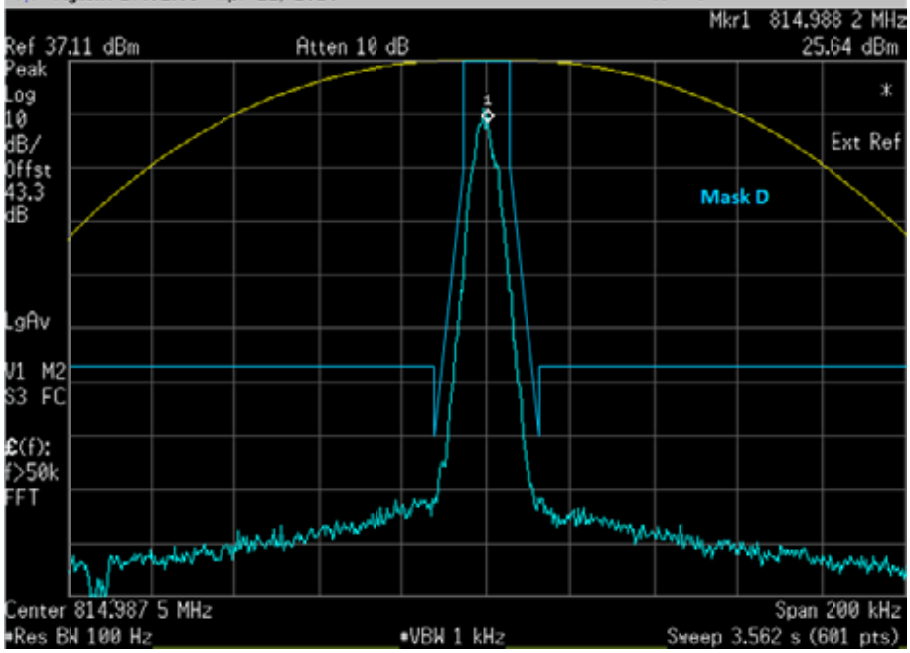


NOT FOR IC REVIEW

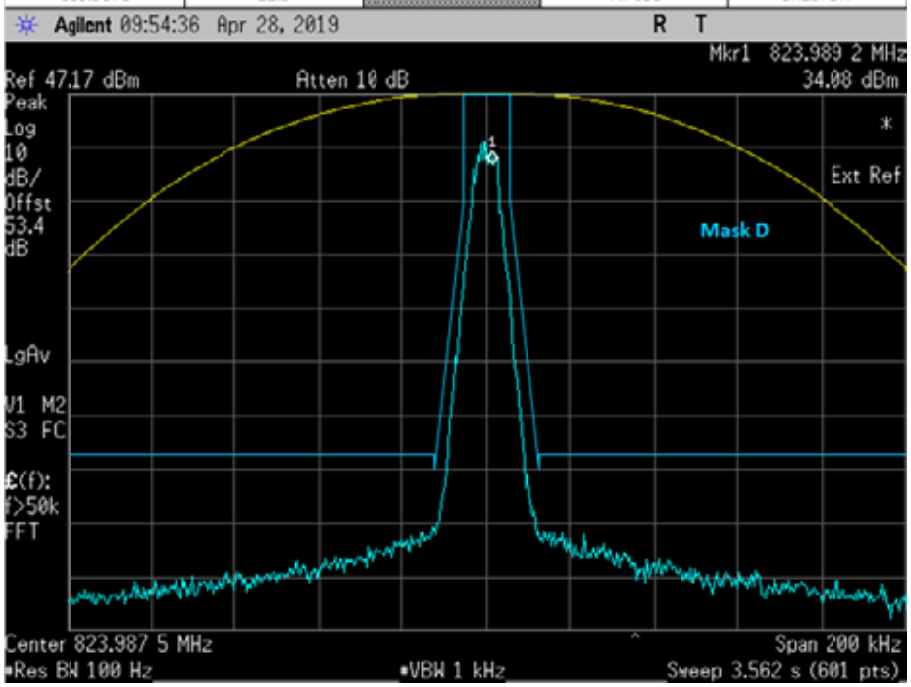
Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0125	12.5	7.4777	8K10F1W



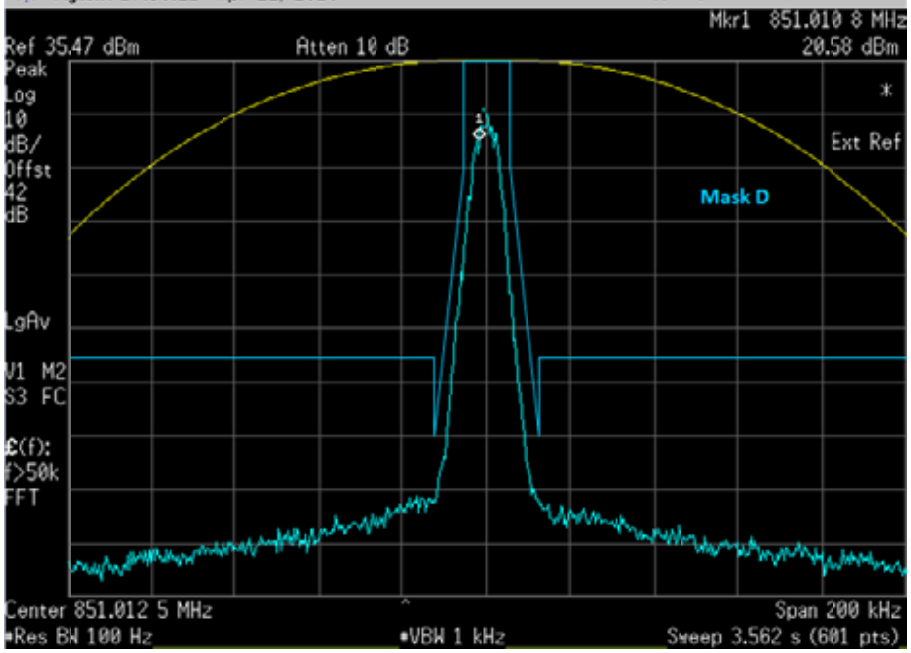
Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
814.9875	12.5	7.8994	8K10F1W



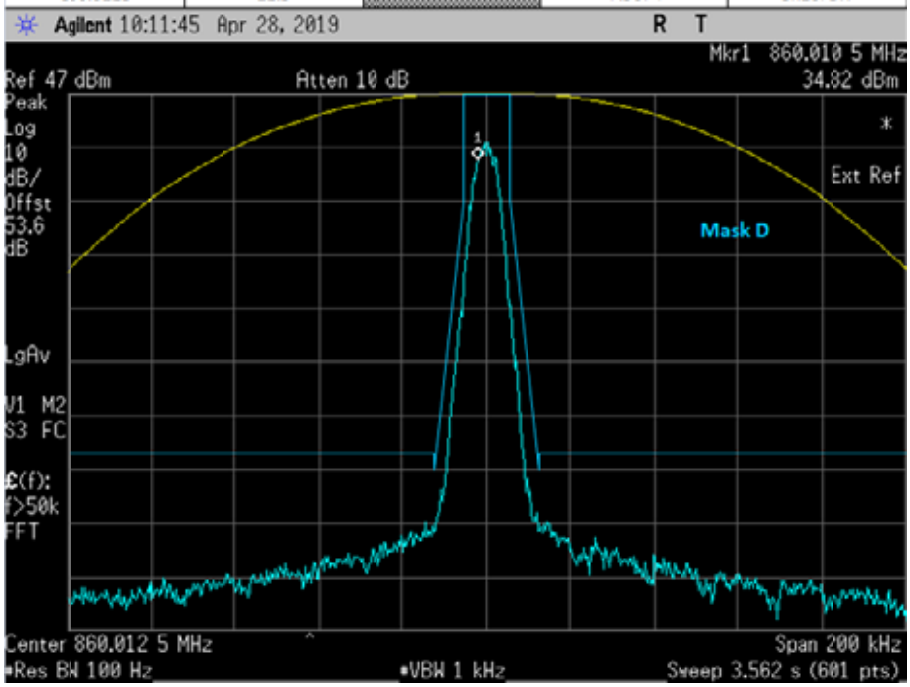
Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
823.9875	12.5	7.7653	8K10F1W



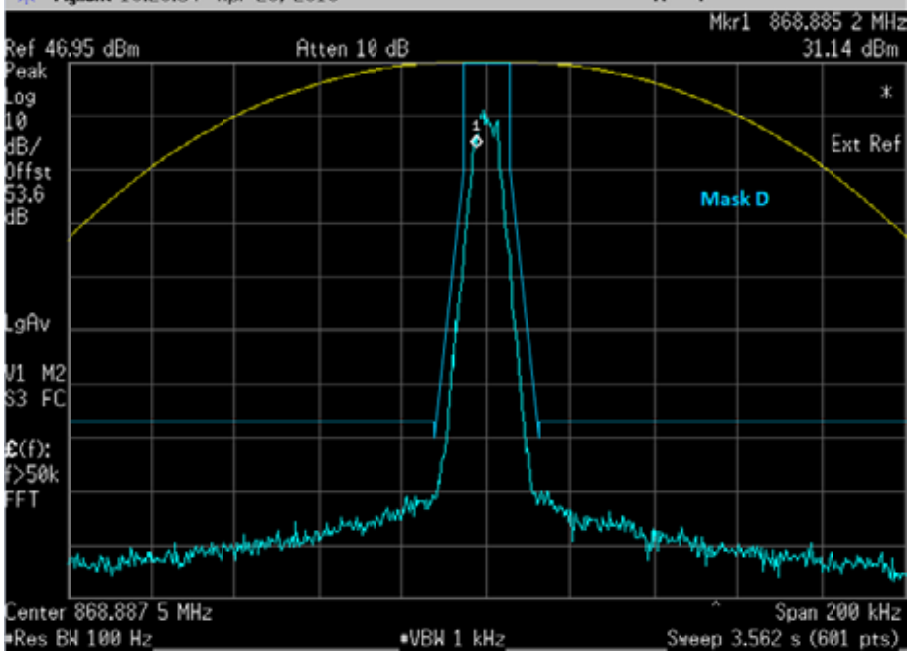
Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
851.0125	12.5	7.5777	8K10F1W



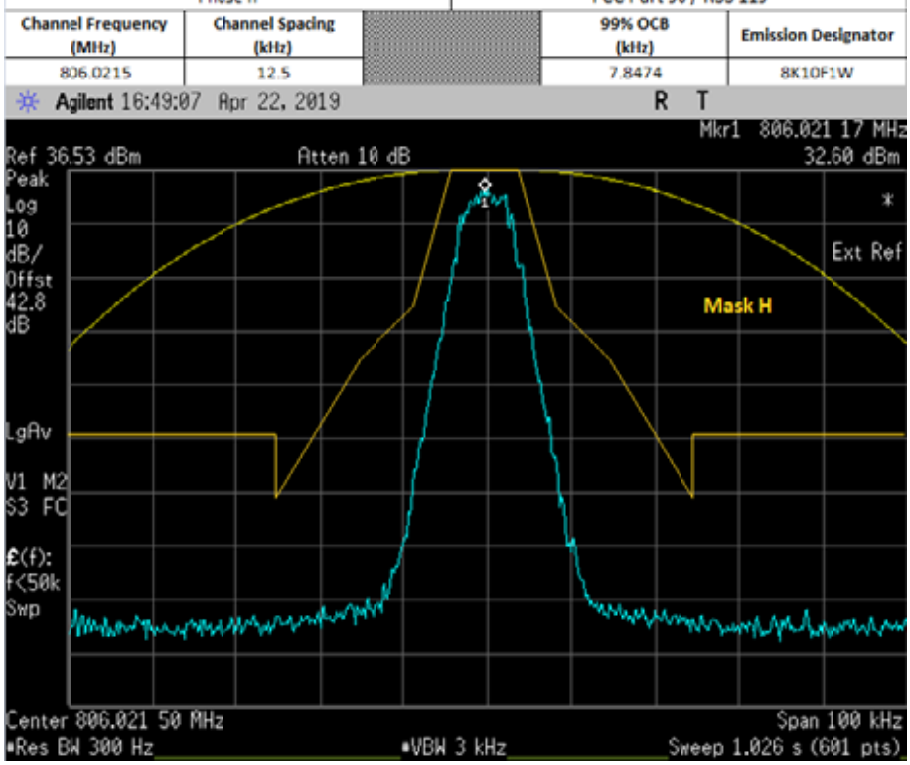
Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
860.0125	12.5	7.9074	8K10F1W



Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
868.8875	12.5	7.6634	8K10F1W



Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
806.0215	12.5	7.8474	8K10F1W



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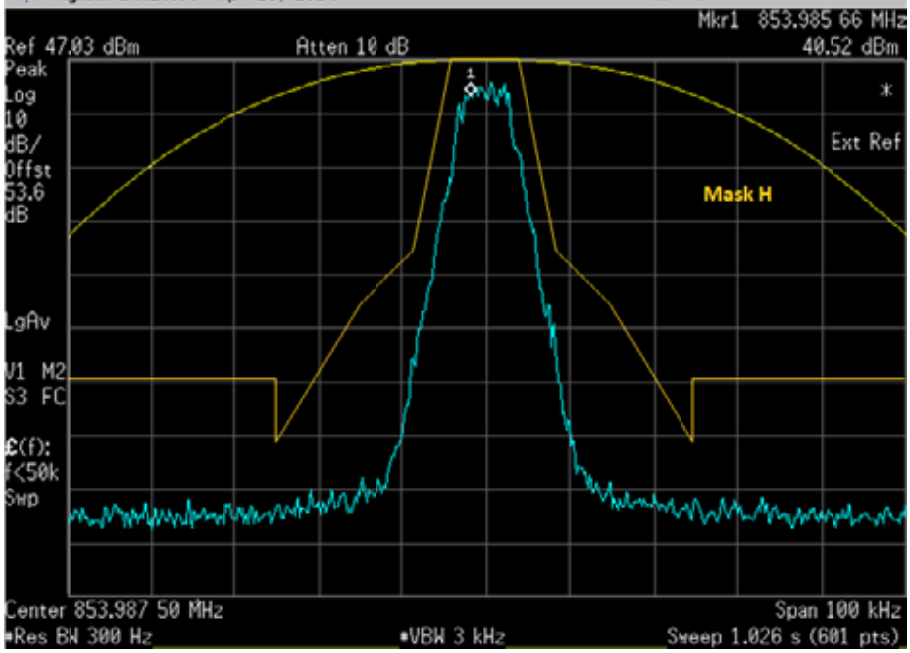
Modulation		Rules Part	
Phase II		FCC Part 90 / RSS 119	
Channel Frequency (MHz)	Channel Spacing (kHz)	99% OCB (kHz)	Emission Designator
853.9875	12.5	7.3811	8K10F1W



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