

	    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.	FCC/ISED TEST REPORT Report Revision : Rev.A																																
<table><tr><td>Date/s Tested</td><td>: 19-AUG-2022 - 11-SEP-2022</td></tr><tr><td>Report Issue Date</td><td>: 28-SEP-2022</td></tr><tr><td>Manufacturer</td><td>: Motorola Solutions Malaysia SDN BHD</td></tr><tr><td>Manufacturer Address</td><td>: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>Requestor</td><td>: MOHD MAHAZIR BIN SHAFIE</td></tr><tr><td>Product Type</td><td>: Mobile</td></tr><tr><td>Product Version (PMN)</td><td>: XPR 2500</td></tr><tr><td>Model Number (HVIN)</td><td>: AAM02QPH9JA1AN</td></tr><tr><td>Frequency Band</td><td>: 403-470 MHz</td></tr><tr><td>Max RF Output Power</td><td>: 48 Watts</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions Inc</td></tr><tr><td>Applicant Address</td><td>: 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322</td></tr><tr><td>ISED Registrations</td><td>: MY0001</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>Firmware Version (FVIN)</td><td>: R02.22.01.1005</td></tr></table> The equipment was tested accordance to the requirement listed below: <table><tr><td>(LMR) FCC 47 CFR Part 22 / 74 /90 ISED RSS- Gen Issue 5 / 119 Issue 12</td><td>PASS</td></tr></table>		Date/s Tested	: 19-AUG-2022 - 11-SEP-2022	Report Issue Date	: 28-SEP-2022	Manufacturer	: Motorola Solutions Malaysia SDN BHD	Manufacturer Address	: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia	Requestor	: MOHD MAHAZIR BIN SHAFIE	Product Type	: Mobile	Product Version (PMN)	: XPR 2500	Model Number (HVIN)	: AAM02QPH9JA1AN	Frequency Band	: 403-470 MHz	Max RF Output Power	: 48 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)	: R02.22.01.1005	(LMR) FCC 47 CFR Part 22 / 74 /90 ISED RSS- Gen Issue 5 / 119 Issue 12	PASS
Date/s Tested	: 19-AUG-2022 - 11-SEP-2022																																
Report Issue Date	: 28-SEP-2022																																
Manufacturer	: Motorola Solutions Malaysia SDN BHD																																
Manufacturer Address	: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia																																
Requestor	: MOHD MAHAZIR BIN SHAFIE																																
Product Type	: Mobile																																
Product Version (PMN)	: XPR 2500																																
Model Number (HVIN)	: AAM02QPH9JA1AN																																
Frequency Band	: 403-470 MHz																																
Max RF Output Power	: 48 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)	: R02.22.01.1005																																
(LMR) FCC 47 CFR Part 22 / 74 /90 ISED RSS- Gen Issue 5 / 119 Issue 12	PASS																																
This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.																																	
Prepared By:  Putri Nur Sarah Sofia Test Personnel	Approved Signatory: Soon Oi May Responsible Engineer																																

Table of Contents

Report Revision History	3
1.0 General Information.....	4
2.0 Summary of Test Results	5
3.0 Measurement Uncertainty	6
4.0 Equipment List.....	7
5.0 Test Condition.....	10
5.1. Transmitter Test Conditions	10
6.0 Transmitter Test Parameters	11
6.1. RF Output Power	11
6.1.1. Test Setup	11
6.1.2. Test Result	11
6.2. Frequency Stability	12
6.2.1. Test Setup	12
6.2.2. Test Result	13
6.2.3. Test Limit.....	14
6.3. Modulation Characteristics	15
6.3.1. Test Setup	15
6.3.2. Test Result	16
6.3.3. Test Limit.....	18
6.4. Modulation Limiting.....	19
6.4.1. Test Setup	19
6.4.2. Test Result	20
6.4.3. Test Limit.....	21
6.5. Occupied Bandwidth.....	22
6.5.1. Test Setup (Analog).....	22
6.5.2. Test Result (Analog).....	23
6.5.3. Test Setup (Digital).....	28
6.5.4. Test Result (Digital).....	29
6.5.5. Test Limit.....	34
6.6. Band Edge Conducted Spurious Emission (Part 22)	35
6.6.1. Test Setup (Analog).....	35
6.6.2. Test Result (Analog).....	36
6.6.3. Test Setup (Digital).....	37
6.6.4. Test Result (Digital).....	38
6.6.5. Test Limit.....	38
6.7. Transient Frequency Behavior.....	39
6.7.1. Test Setup	39
6.7.2. Test Result	40
6.7.3. Test Limit.....	42
6.8. Adjacent Channel Power.....	43
6.8.1. Test Setup (Analog).....	43
6.8.2. Test Result	43
6.8.3. Test Setup (Digital).....	44

6.8.4.	Test Result	44
6.8.5.	Test Limit.....	45
6.9.	Conducted Spurious Emission	47
6.9.1.	Test Setup	47
6.9.2.	Test Result (Analog).....	48
6.9.3.	Test Result (Digital).....	54
6.9.4.	Test Limit.....	61
6.10.	Radiated Spurious Emission	62
6.10.1.	Test Setup	62
6.10.2.	Test Result (Analog).....	63
6.10.3.	Test Result (Digital).....	69
6.10.4.	Test Limit.....	76
6.11.	Effective Radiated Power (ERP)	77
6.11.1.	Test Setup	77
6.11.2.	Test Result	77
6.11.3.	Test Limit.....	77
6.12.	GNSS (EIRP for 1559 - 1610MHz).....	78
6.12.1.	Test Setup	78
6.12.1.	Test Result	78
6.12.2.	Test Limit.....	78

Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	21-Sep-2022	Putri

1.0 General Information

EUT Description:

Technologies	Land Mobile Radio (LMR)
Modulation Type	Analog, 4FSK

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
ENHANCED KEY PAD MICROPHONE	MOTOROLA	PMMN4089A
EXTERNAL SPEAKER 13W	MOTOROLA	RSN4001A
Mobile Power Cable 20 FT, 10 AWG, 20 A	MOTOROLA	HKN4192B

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 C63.26-2015

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

Antenna gain disclaimer

Antenna gain information is provided by customer. The validity of the results is dependent upon this information. The lab will not be held accountable in the event the supplied information affects compliance.

Test configuration of EUT

All relevant configurations involving radio models and accessories (including chargers, batteries, and antennas) were assessed. Only worst case configurations will be included in this report.

2.0 Summary of Test Results

FCC General Rules Part (47CFR)	ISED General Rules Part	Test Item	Result	Remarks	Serial number tested
2.1046(a), 22.565(f), 74.461	RSS-119	RF Power Output	Pass		776TYP1982
2.1055, 22.355, 74.464	-	Frequency Stability	Pass		776TYP1982
2.1047, 74.463	RSS-119	Audio Frequency Response	Pass		776TYP1982
2.1047, 74.463	RSS-119	Audio Low Pass Filter Response	Pass		776TYP1982
2.1047, 74.463	RSS-119	Modulation limiting	Pass		776TYP1982
2.1049, 22.359, 90.210, 74.462	RSS-119	Occupied Bandwidth	Pass	16K0F3E- 15.0039kHz 11K0F3E- 9.8400kHz 7K60F1D/FXD- 7.4423kHz 7K60F1E/FXE- 7.5591kHz 7K60F1W- 7.3848kHz	776TYP1982
2.1051, 22.359 (a), (b)	RSS-119	Band Edge Conducted Spurious Emission	Pass		776TYP1982
90.214	-	Transient Frequency Behavior	Pass		776TYP1982
-	-	Adjacent Channel Power	NA		
2.1051, 22.359, 90.210, 74.462(c)	RSS-119	Conducted Spurious Emissions	Pass	Worst case: -31.92dBm	776TYP1982
2.1051, 22.359, 90.210, 74.462(c)	RSS-119	Radiated Spurious Emission	Pass	Worst Case: -44.8dBm (margin: 24.8dB)	776TYP1987
-	-	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) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.48 dB
Radiated Emissions up to 1 GHz dB μ V/m (Field Strength)	30MHz ~ 1000MHz	5.88 dB
Radiated Emissions above 1 GHz dB μ V/m (Field Strength)	1GHz ~ 18GHz	5.84 dB
	18GHz ~ 40GHz	6.02 dB
Radiated Emissions dBm (ERP/EiRP)	30MHz ~ 18GHz	4.03 dB
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82 dB
Frequency Stability	9kHz ~ 12.75GHz	0.0085 ppm
Audio Frequency Response / Low Pass Filter Response	300Hz – 20kHz	4.09 %
Modulation Limiting	300Hz – 3kHz	1.15 %
Occupied Bandwidth	9kHz ~ 12.75GHz	2.82 dB
Band Edge Conducted Spurious Emission	9kHz ~ 12.75GHz	2.82 dB
Transient Frequency Behavior	9kHz ~ 12.75GHz	5.4 ms
Adjacent Channel Power	9kHz ~ 12.75GHz	2.82 dB

4.0 Equipment List

FCC Analog ATE#1: (SW version: FCC_Analog_v2.5.0)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
CHAMBER	SH-641	92009188	21-Mar-22	21-Mar-23
POWER SENSOR	E4412A	MY41502652	09-Sep-21	09-Sep-22
POWER SUPPLY	6032A	2723A02219	05-Aug-22	05-Aug-23
POWER METER	E4416A	MY45101705	04-Mar-22	04-Mar-23
MODULATION ANALYZER	8901B	3403A04974	06-Sep-21	06-Sep-22
AUDIO ANALYZER	U8903B	MY61340003	21-Mar-22	21-Mar-23
CXA SIGNAL ANALYZER	N9000B	MY60250694	14-Dec-21	14-Dec-22
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_R1.1.4)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A36210	CNR	CNR
ATTENUATOR / SWITCH DRIVER	11713A	2508A10141	CNR	CNR
POWER SENSOR	E9301B	MY41495393	09-Jun-22	09-Jun-23
SIGNAL GENERATOR	8657A	3315U04973	03-Sep-21	03-Sep-22
AUDIO ANALYZER	8903B	3011A10318	01-Nov-21	01-Nov-22
POWER METER	E4416A	GB41293240	14-Mar-22	14-Mar-23
STEP ATTENUATOR	8494G	MY42145194	12-Sep-21	12-Sep-22
POWER SUPPLY	6033A	3232A08203	03-Jun-22	03-Jun-23
ANALYZER SPECTRUM	E4445A	MY45301089	11-Oct-21	11-Oct-22
ATTENUATOR/110DB	8496G	MY42143970	12-Sep-21	12-Sep-22
AUDIO ANALYZER	8903B	3413A14586	13-Sep-21	13-Sep-22
ANALYZER MODULATION	8901B	2619A00845	30-Sep-21	30-Sep-22
AUDIO ANALYZER	8903B	3011A12488	13-Sep-21	13-Sep-22
N to N RF Cable # 1	SF126/11N/11N	NA	NA	NA
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

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	MY46181250	23-May-22	23-May-23
POWER SUPPLY	6031A	3506A08076	19-Jan-22	19-Jan-23
INTERFACE BOX - FILTER	CNR	CS001	NA	NA
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	06-Apr-21	06-Apr-23
DRG HORN FREQ.	SAS-571	1027	03-Jun-22	03-Jun-23
Advanced Power System - Dynamic DC Power Supply, 120V, 16.7A, 2000W	N7976A	MY53410110	30-Jun-22	30-Jun-23
SIGNAL GENERATOR	SMB 100A	182511	4-Jun-21	4-Jun-24
EMI TEST RECEIVER	ESW44	101751	24-Mar-22	24-Mar-23
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
BILOG ANTENNA	CBL6112B	2863	22-Jun-22	22-Jun-23
BILOG ANTENNA	CBL6112D	30991	05-Oct-21	05-Oct-22
DATA LOGGER THERMOHYGROMETER	SDL500	A.016785	23-Jun-22	23-Jun-23
SYSTEM CONTROLLER	SC104V	050806-1	No Cal. Req'd	No Cal. Req'd
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	No Cal. Req'd	No Cal. Req'd
ANTENNA POSITIONING TOWER	TLT2	NA	No Cal. Req'd	No Cal. Req'd
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	18-Feb-22	18-Feb-23
PREAMPLIFIER 18-40GHz	BBV9721	9721-007	No Cal. Req'd	No Cal. Req'd
PREAMPLIFIER	PAM-0118P	361	11-Sep-20	11-Sep-23
LOOP ANTENNA	6502	00208416	8-Oct-21	8-Oct-22
TEST SOFTWARE	EMC_FCC_IC_BLUETOOTH_RE_TEST			
VERSION	EMC_FCC_RE_v1.6.4			

5.0 Test Condition

5.1. Transmitter Test Conditions

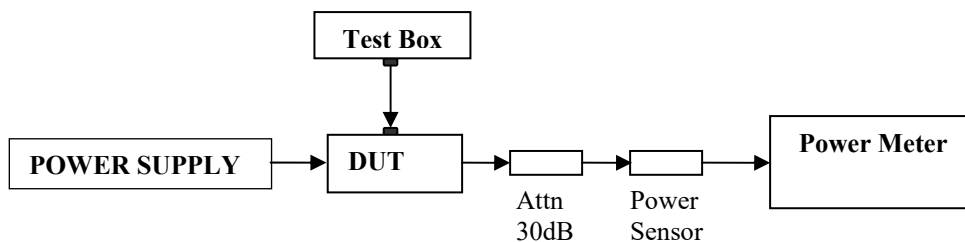
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By	Environmental conditions
RF Output Power	Low & Max	Analog	403.0125, 406.2, 450.025, 459.125, 467.775, 469.9875	Putri	23.4°C, 50%RH
Frequency Stability	Max	Analog	467.775	Putri	25.1°C, 54.3%RH, 60.3°C, 50%RH, -30.1°C, 51.2%RH
Audio Frequency Response (12.5kHz / 25kHz)	Max	Analog	459.125, 467.775	Putri	23.4°C, 50%RH
Audio Low Pass Filter Response (12.5kHz / 25kHz)	Max	Analog	459.125, 467.775	Putri	23.4°C, 50%RH
Modulation limiting (12.5kHz / 25kHz)	Max	Analog	459.125, 467.775	Putri	23.4°C, 50%RH
Occupied Bandwidth (12.5kHz / 20kHz / 25kHz)	Max	Analog, 4FSK	406.2, 450.025, 459.125, 467.775	Putri	23.4°C, 50%RH
Band Edge Conducted Spurious Emissions (Part 22) (12.5kHz / 20kHz / 25kHz)	Max	Analog, 4FSK	459.025, 459.65	Putri	23.4°C, 50%RH
Transient Frequency Behavior (UHF & VHF Band) (12.5kHz / 25kHz)	Max	Analog	467.775	Putri	23.4°C, 50%RH
Adjacent Channel Power (700MHz Band) (12.5kHz / 25kHz)	Max	Analog, 4FSK	NA		
Conducted Spurious Emissions- (12.5kHz / 25kHz)	Low / Max	Analog, 4FSK	403.0125, 406.2, 450.025, 459.125, 467.775, 469.9875	Putri	23.4°C, 50%RH
Radiated Spurious Emission (12.5kHz / 25kHz)	Low / Max	Analog, 4FSK	403.0125, 406.2, 450.025, 459.125, 467.775, 469.9875	Azil&Qawiman	23.8°C, 69.7%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



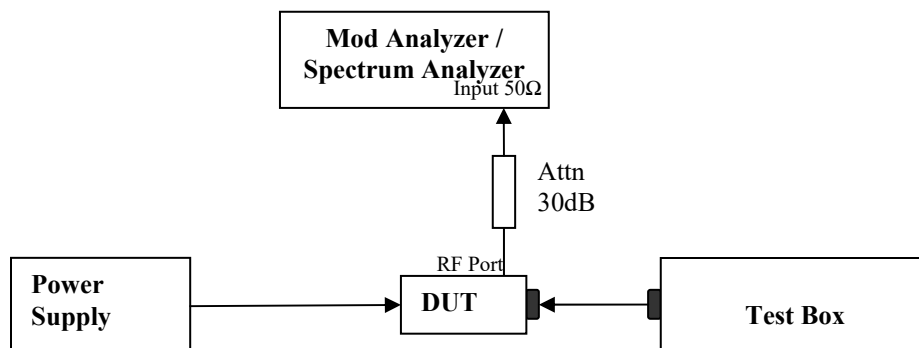
- 1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
- 2) Path loss for the measurement included.
- 3) All the measurement was done at low, mid, high frequency for each band.
- 4) Record the power into the test report.

6.1.2. Test Result

Temperature	25°C				REMARK
Voltage (V)	13.6V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	
403.01250	24.60	6.06	47.50	8.13	Not for FCC review
406.20000	24.50	5.76	46.90	7.80	
450.02500	25.00	5.73	48.00	8.01	
459.12500	25.00	5.88	47.50	8.01	
467.77500	25.00	5.79	47.10	7.77	
469.98750	25.00	5.73	47.20	7.74	

6.2. Frequency Stability

6.2.1. Test Setup

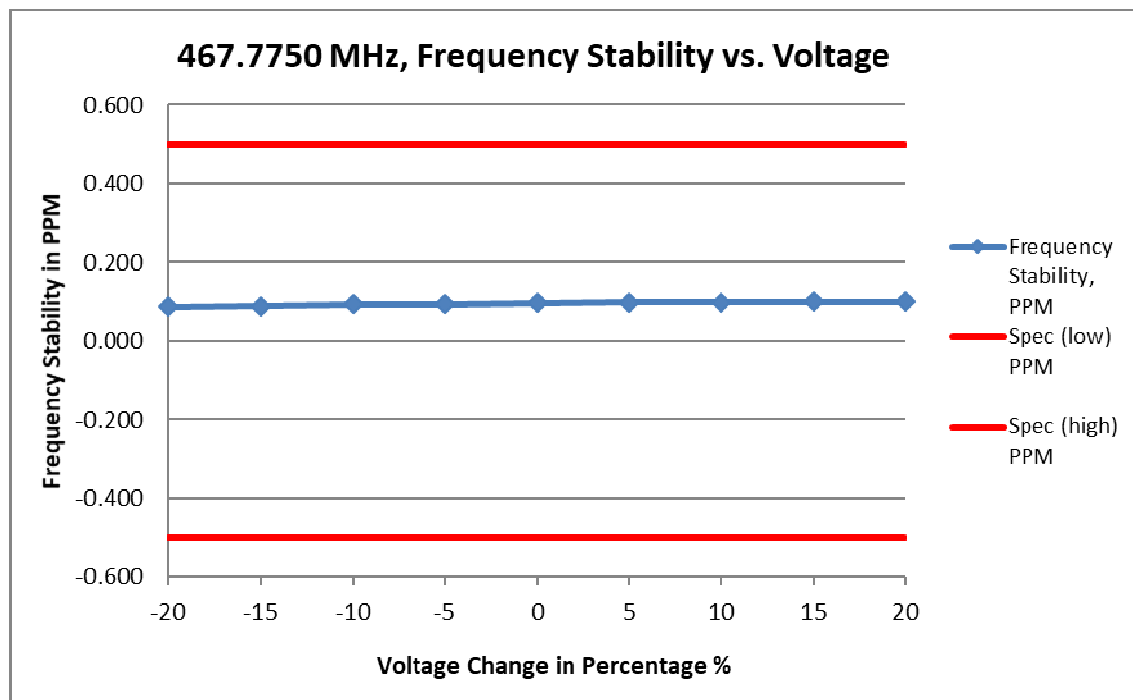


- 1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
- 2) Path loss for the measurement included.
- 3) Transmit the DUT and record the freq in MCF_{MHz} .
- 4) Test in 2 conditions:
 - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
 - Supply 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 $\pm x\%$ as specified by the manufacturer
- 5) Calculate the ppm frequency error by the following:

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

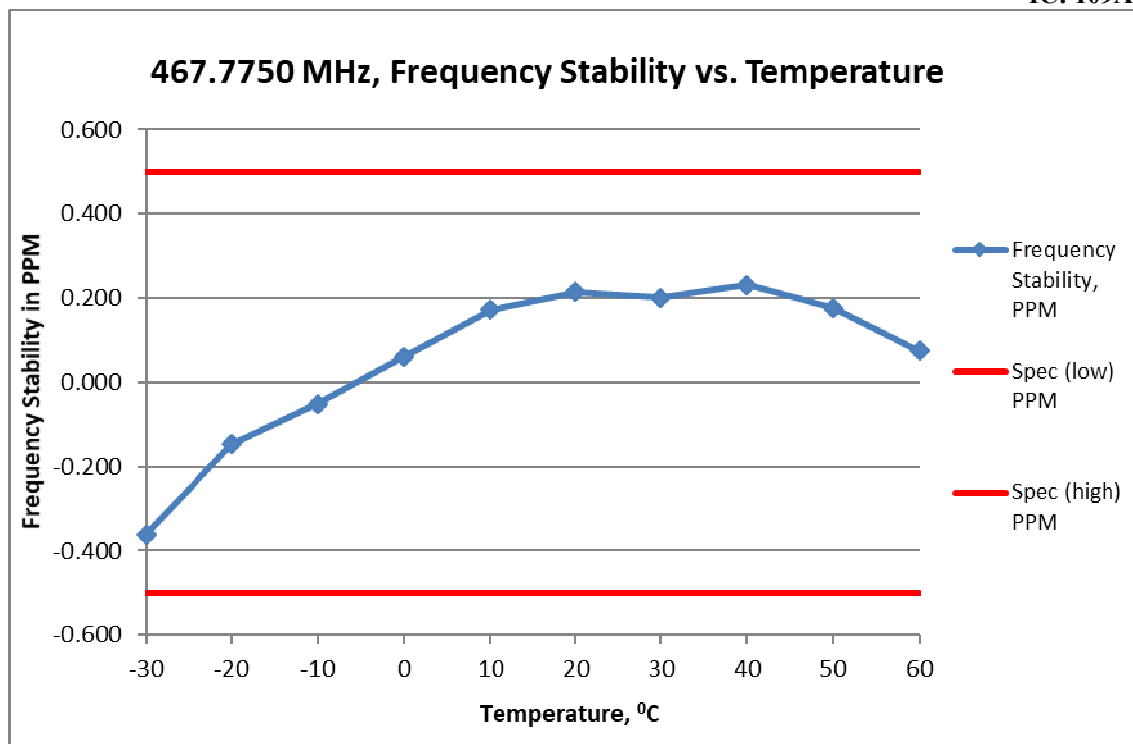
Where: MCF_{MHz} is the Measured Carrier Frequency in MHz
 ACF_{MHz} is the Assigned Carrier Frequency in MHz

6.2.2. Test Result



(i) Frequency Stability VS Voltage

Frequency / Channel Spacing	467.7750 MHz / 12.5 kHz				
Temperature, °C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-20	10.880	467.775041	0.087	-0.500	0.500
-15	11.560	467.775041	0.088	-0.500	0.500
-10	12.240	467.775044	0.094	-0.500	0.500
-5	12.920	467.775044	0.093	-0.500	0.500
0	13.600	467.775045	0.097	-0.500	0.500
5	14.280	467.775046	0.099	-0.500	0.500
10	14.960	467.775046	0.099	-0.500	0.500
15	15.640	467.775047	0.100	-0.500	0.500
20	16.320	467.775046	0.099	-0.500	0.500



(ii) Frequency Stability VS temperature

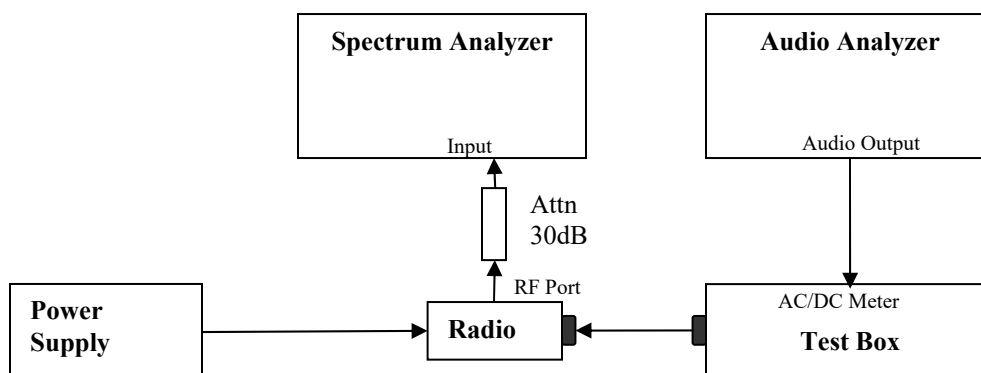
Frequency / Channel Spacing	467.7750 MHz / 12.5 kHz			
Voltage, V	13.6			
Temperature, °C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	467.774831	-0.361	-0.500	0.500
-20	467.774931	-0.147	-0.500	0.500
-10	467.774976	-0.051	-0.500	0.500
0	467.775028	0.061	-0.500	0.500
10	467.775080	0.172	-0.500	0.500
20	467.775100	0.214	-0.500	0.500
30	467.775094	0.200	-0.500	0.500
40	467.775108	0.231	-0.500	0.500
50	467.775082	0.176	-0.500	0.500
60	467.775035	0.074	-0.500	0.500

6.2.3. Test Limit

As per manufacturer declared spec +/- 0.5ppm

6.3. Modulation Characteristics

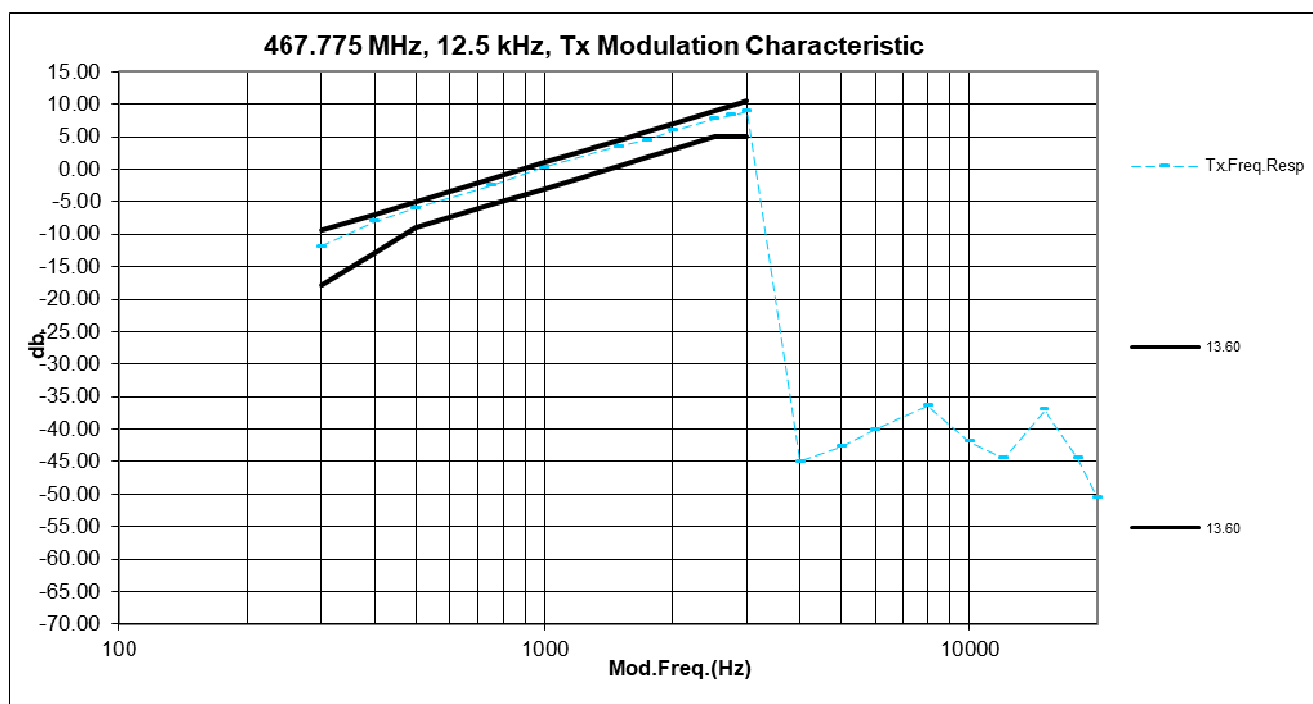
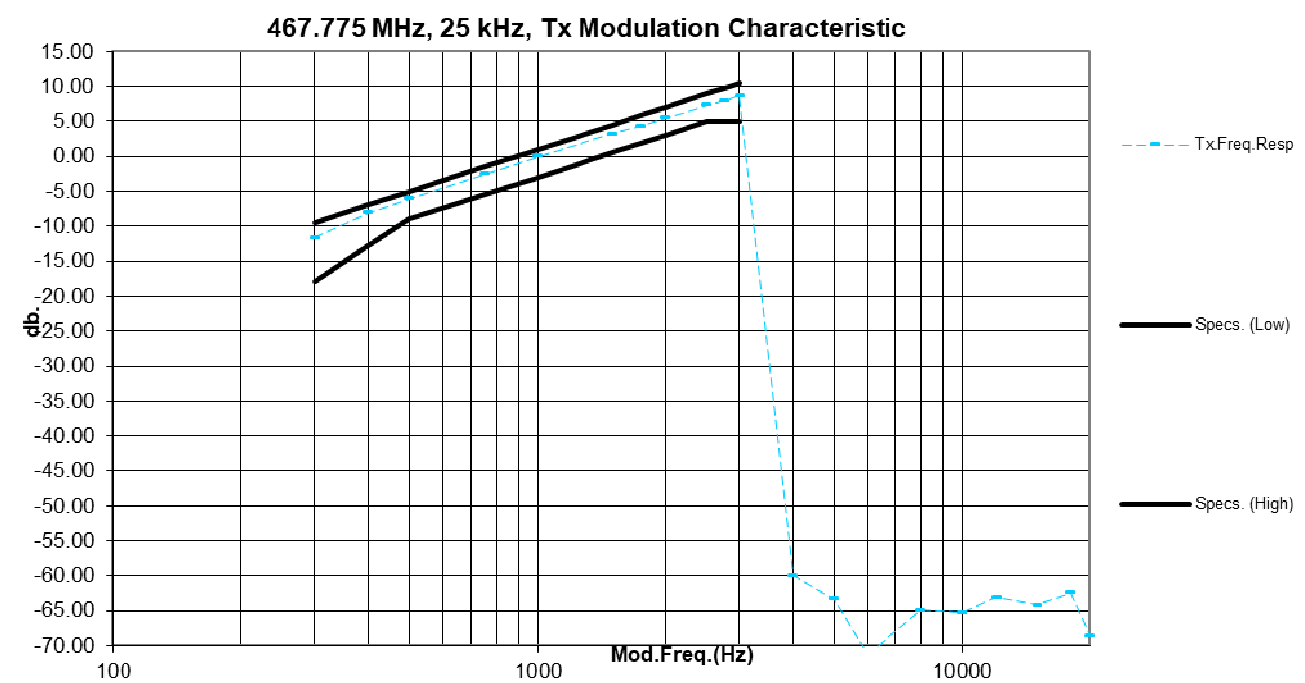
6.3.1. Test Setup



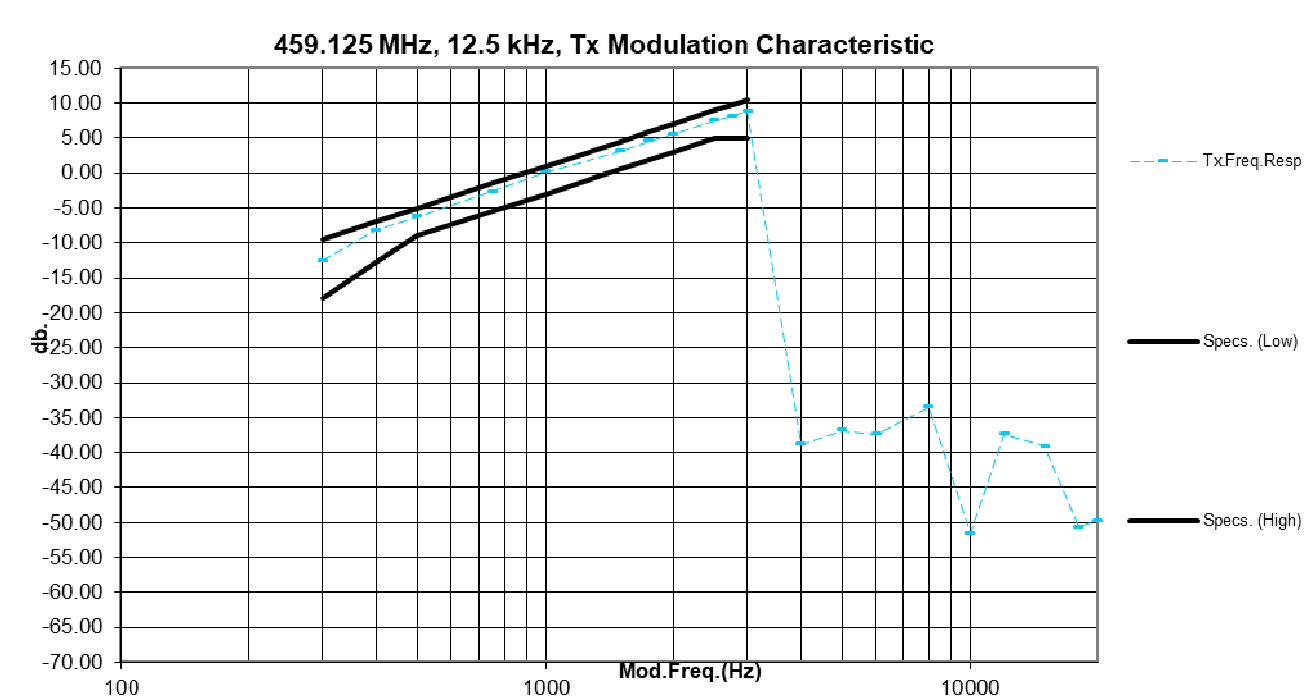
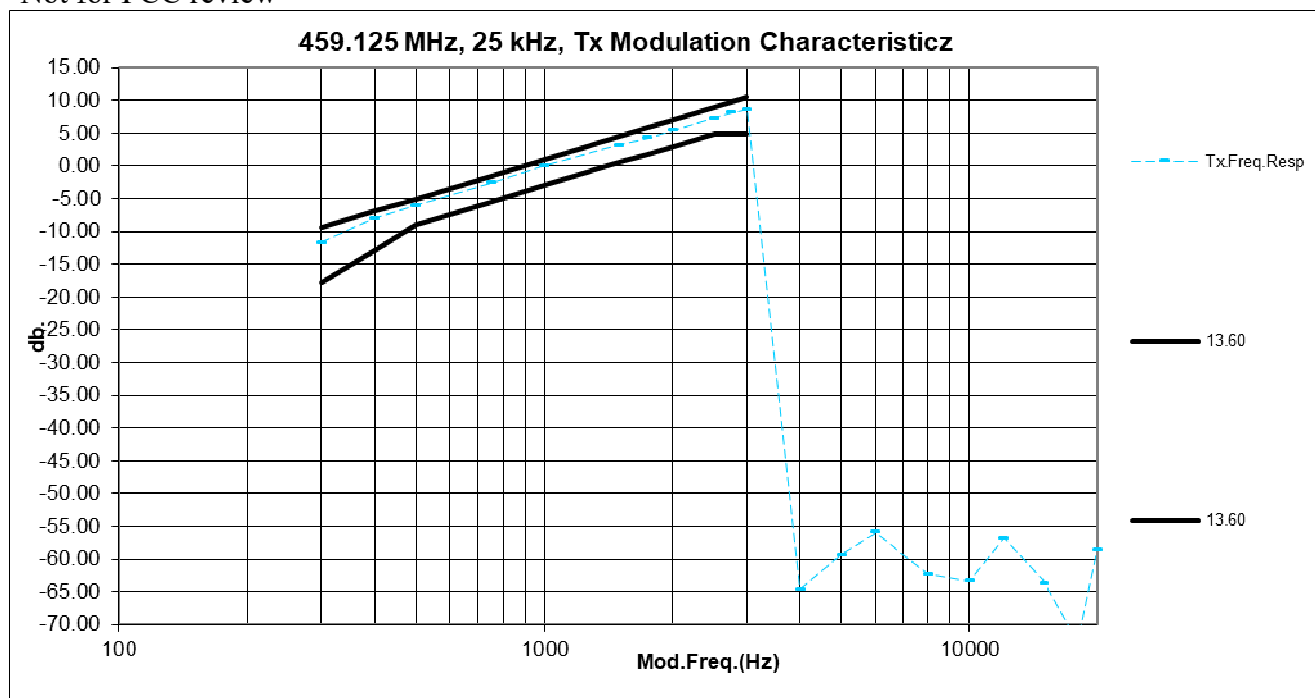
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Path loss for the measurement included.
- 3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
- 4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the Full rated system deviation.
- 5) On audio analyzer, set the rated level as 0dB reference
- 6) Vary the audio frequency from 300 Hz to 20 kHz. Record the change in modulation in reference to step 5.

6.3.2. Test Result

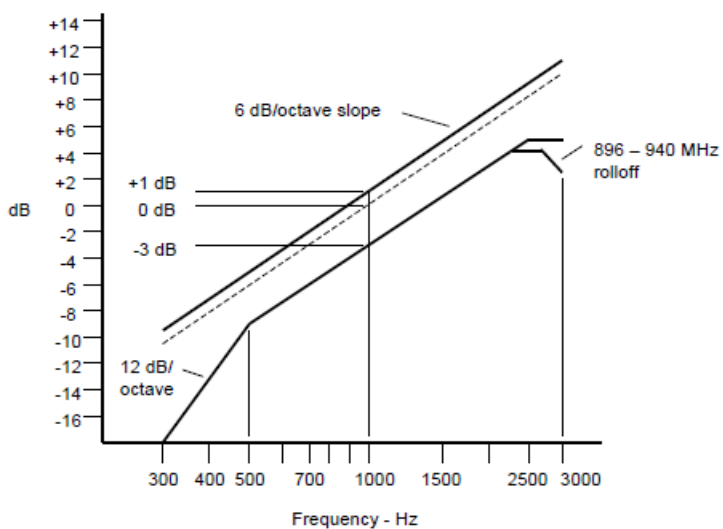
Not for FCC review



Not for FCC review



6.3.3. Test Limit

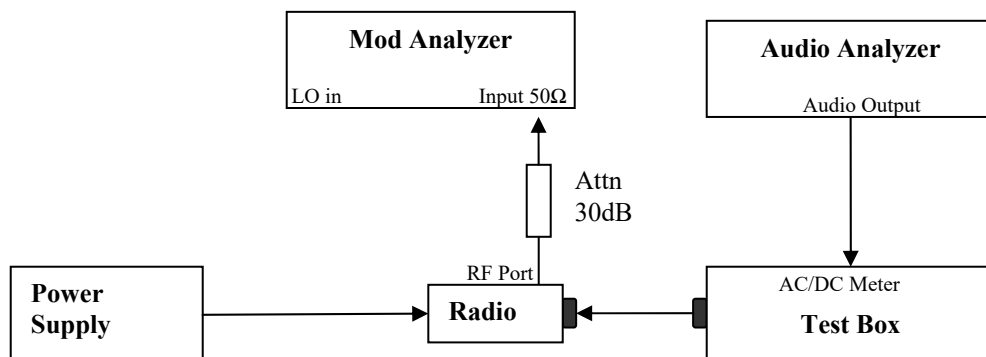


Note:

- o There are additional 6 dB per octave attenuation is allowed from 2.5KHz to 3KHz in equipment 25MHz to 869MHz radio.
- o 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. Modulation Limiting

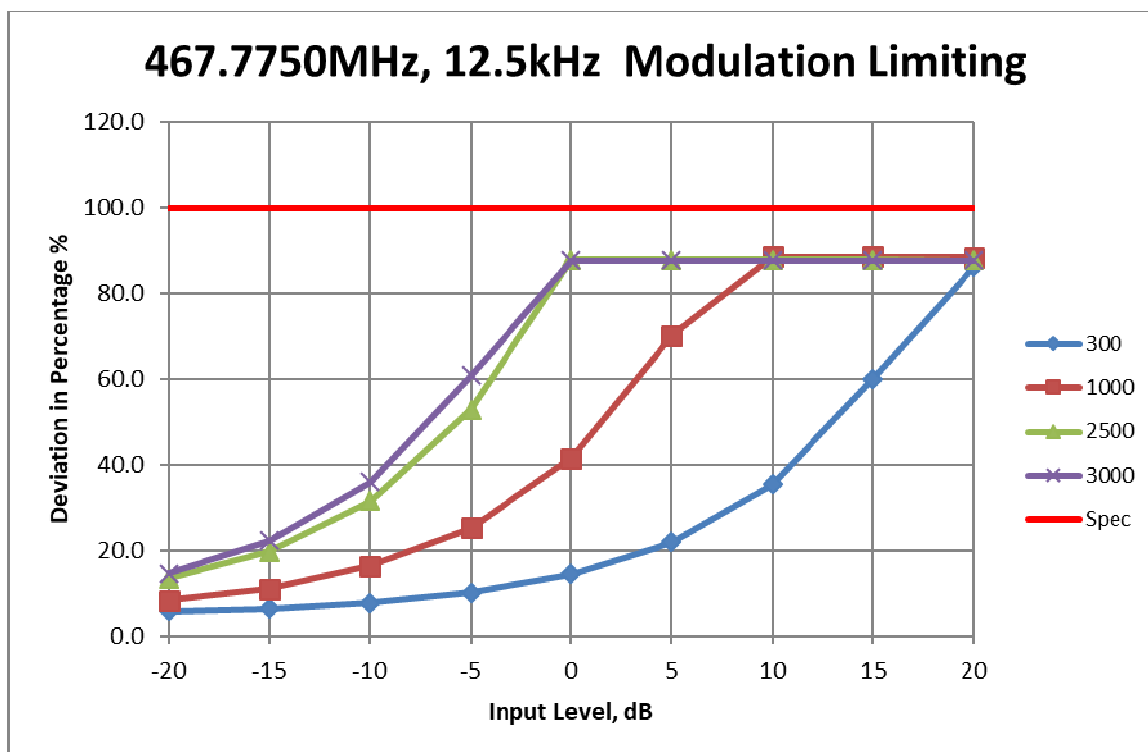
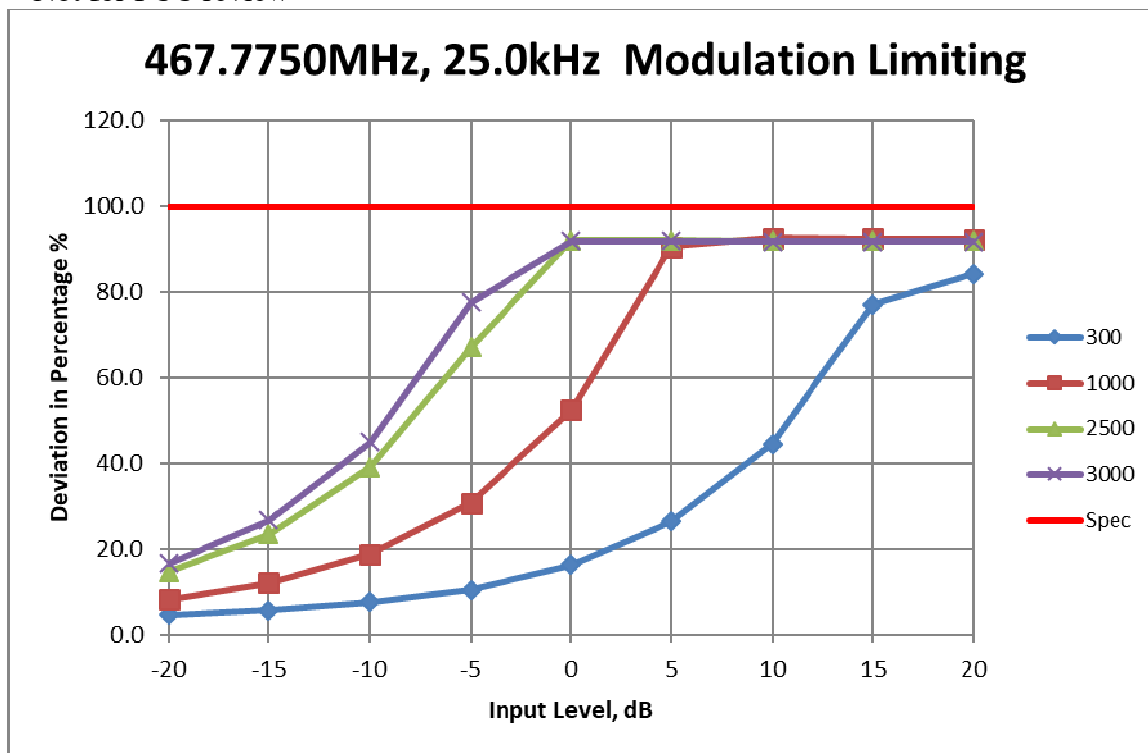
6.4.1. Test Setup



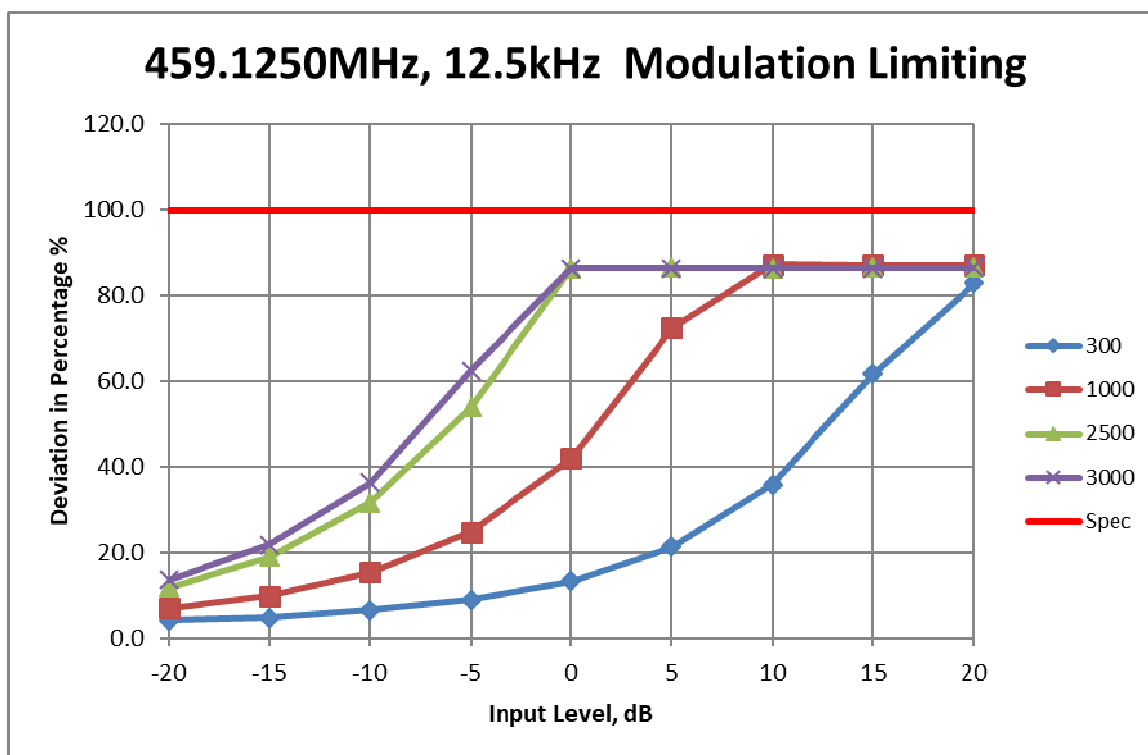
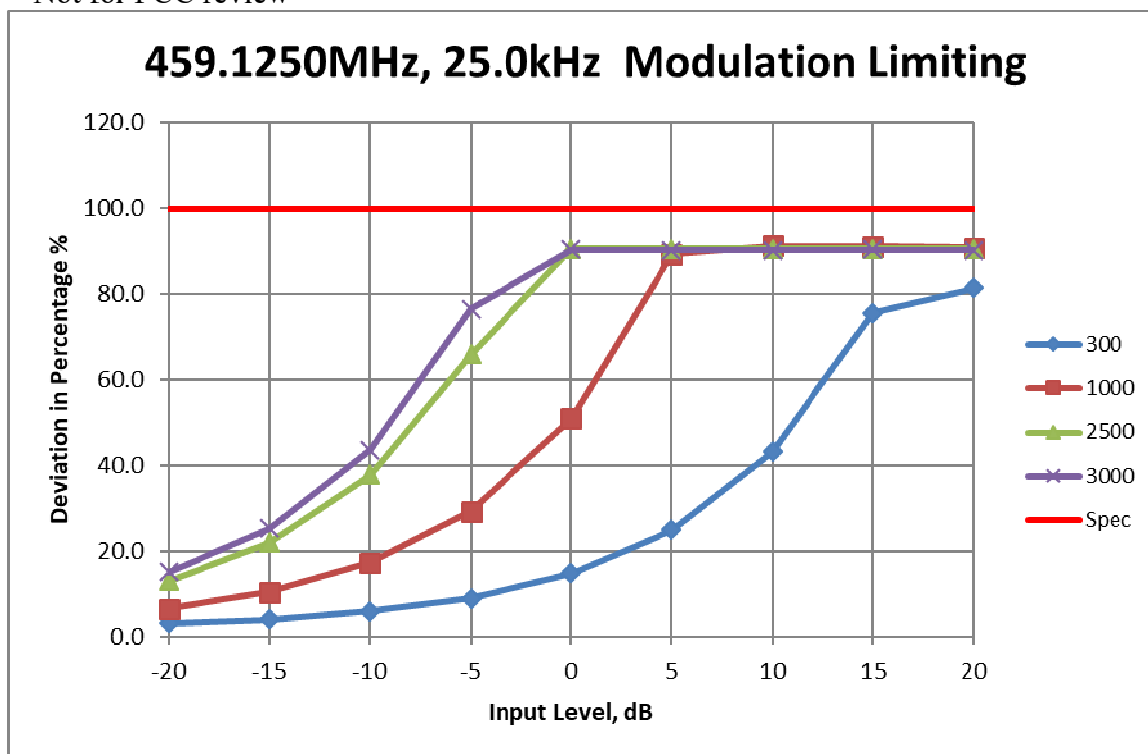
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Path loss for the measurement included.
- 3) Set the audio bandwidth filter to 15 kHz.
- 4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the Full rated system deviation.
- 5) Record the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

6.4.2. Test Result

Not for FCC review



Not for FCC review

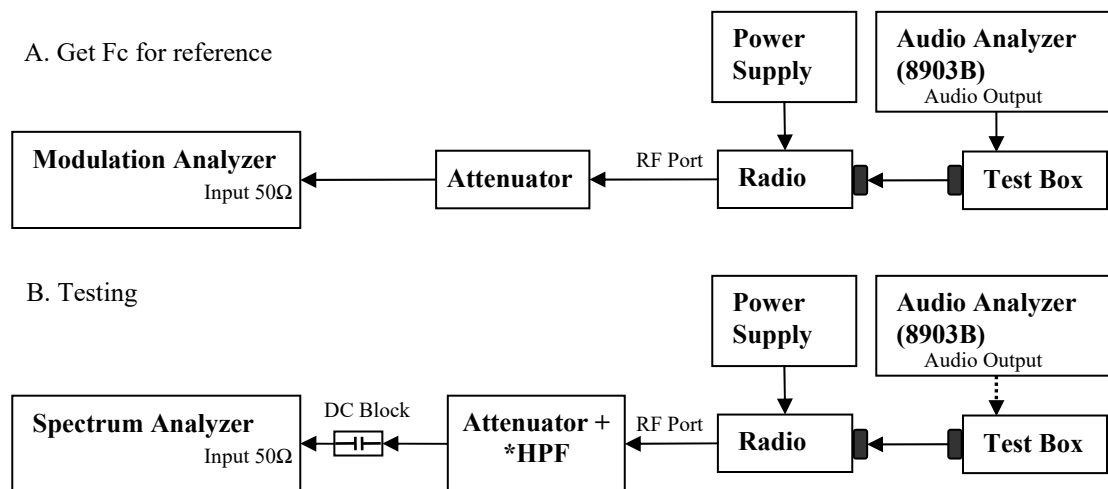


6.4.3. Test Limit

Modulation Limiting shall not exceed 100 percent.

6.5. Occupied Bandwidth

6.5.1. 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.

* 99% Bandwidth measurement is computed by the spectrum analyzer and is consistent with the C63.26 5.4.4 method.

6.5.2. Test Result (Analog)

Standard Audio Modulation (25 kHz Channelization, Analog Voice):
Emission Designator 16K0F3E

In this case, the maximum modulating frequency is 3 kHz with a 5 kHz deviation.

$BW = 2(M+D) = 2*(3 \text{ kHz} + 5 \text{ kHz}) = 16 \text{ kHz} = 16K0$
F3E portion of the designator indicates voice.

Therefore, the entire designator for 25 kHz channelization analog voice is 16K0F3E.

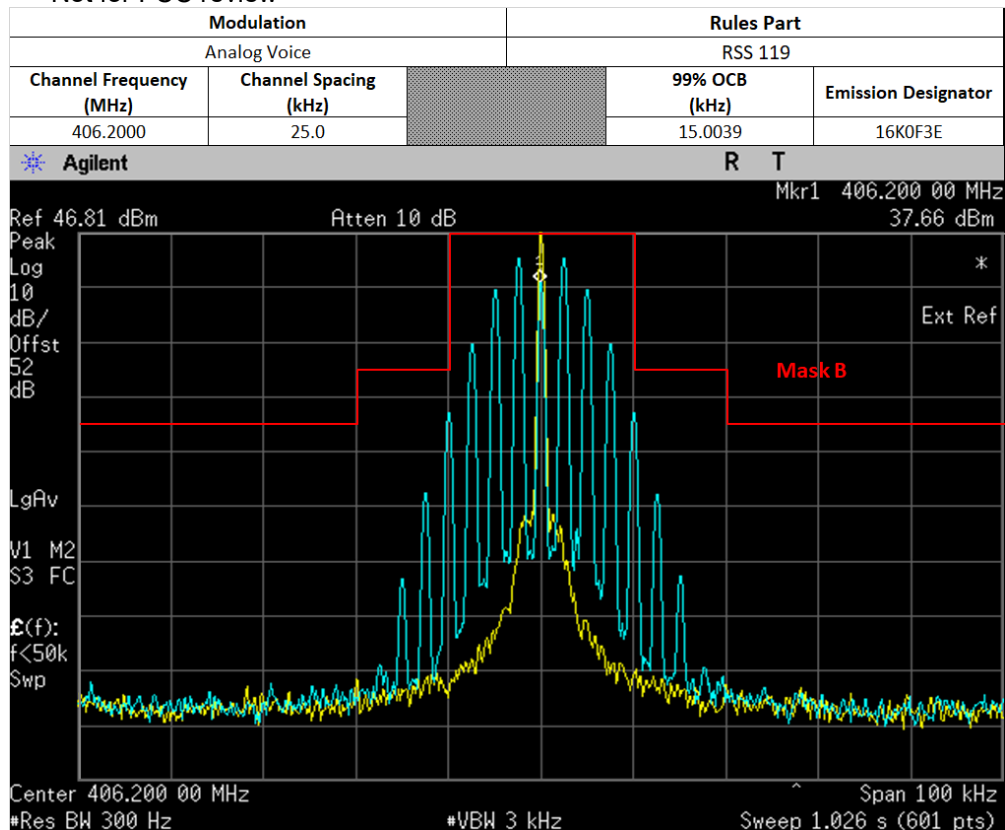
Standard Audio Modulation (12.5 kHz Channelization, Analog Voice):
Emission Designator 11K0F3E

In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

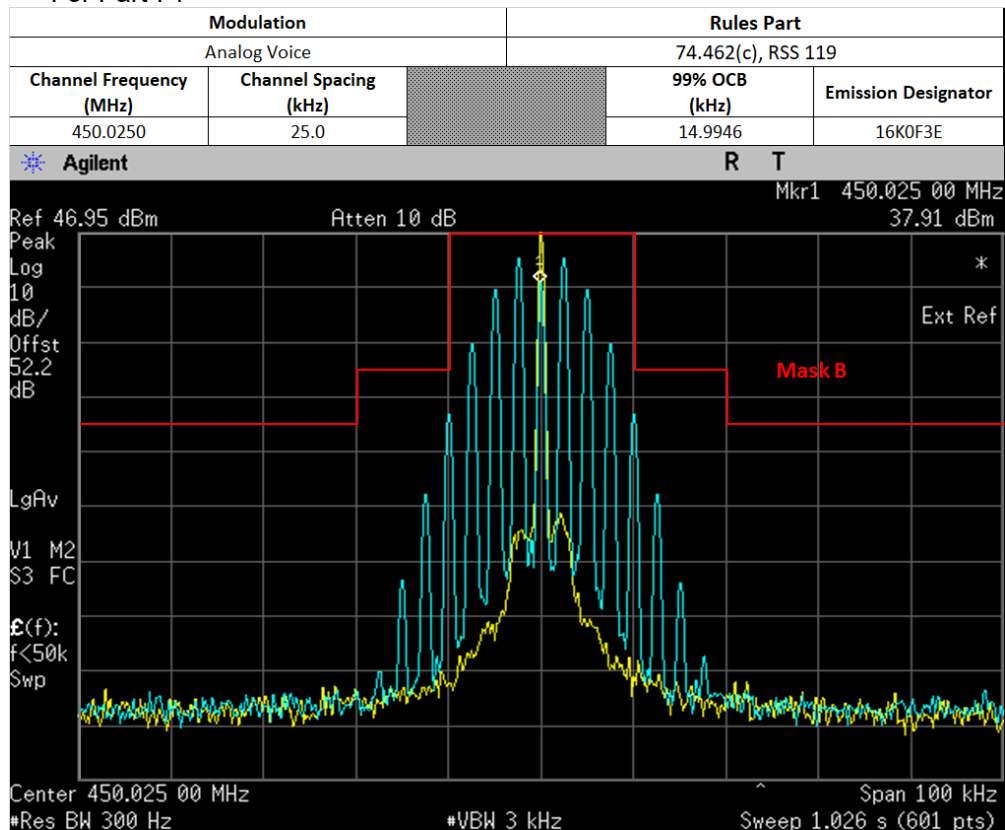
$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} = 11K0$
F3E portion of the designator indicates voice.

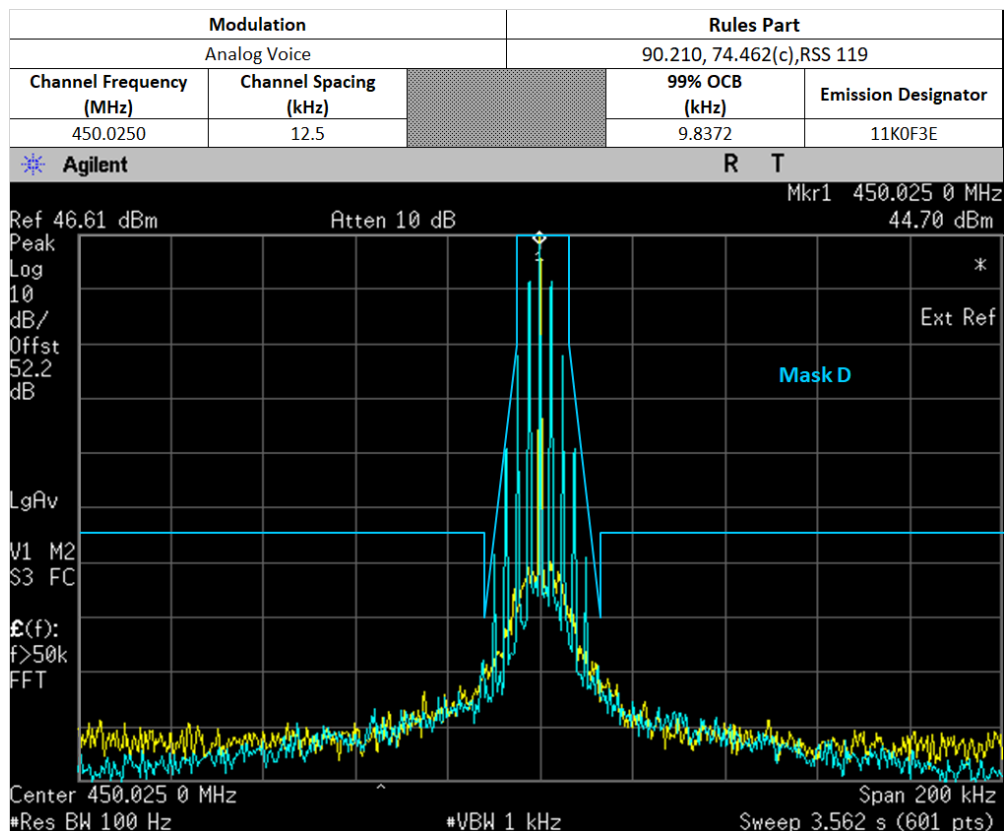
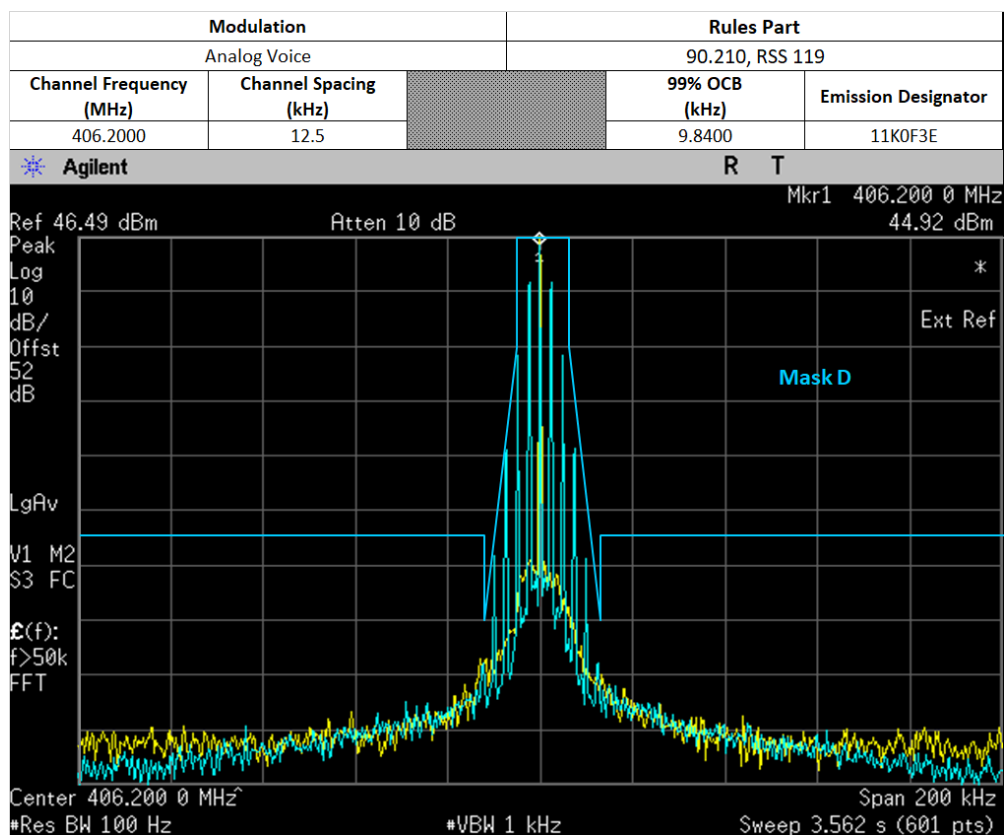
Therefore, the entire designator for 12.5 kHz channelization analog voice is 11K0F3E.

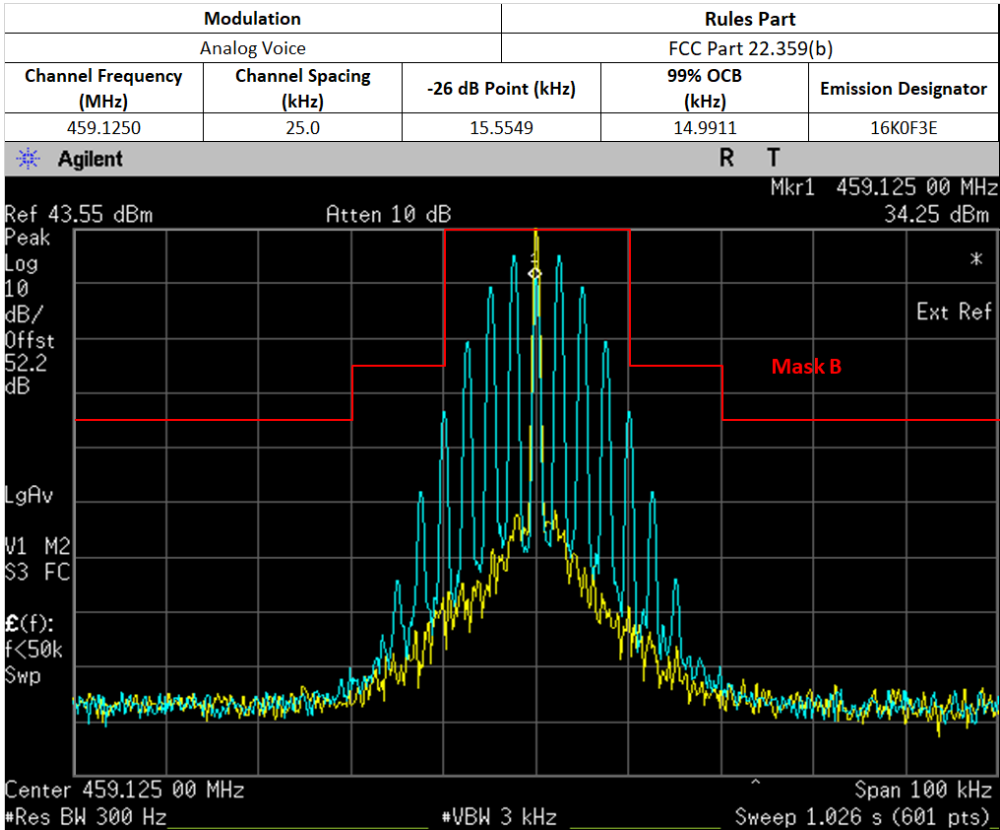
Not for FCC review

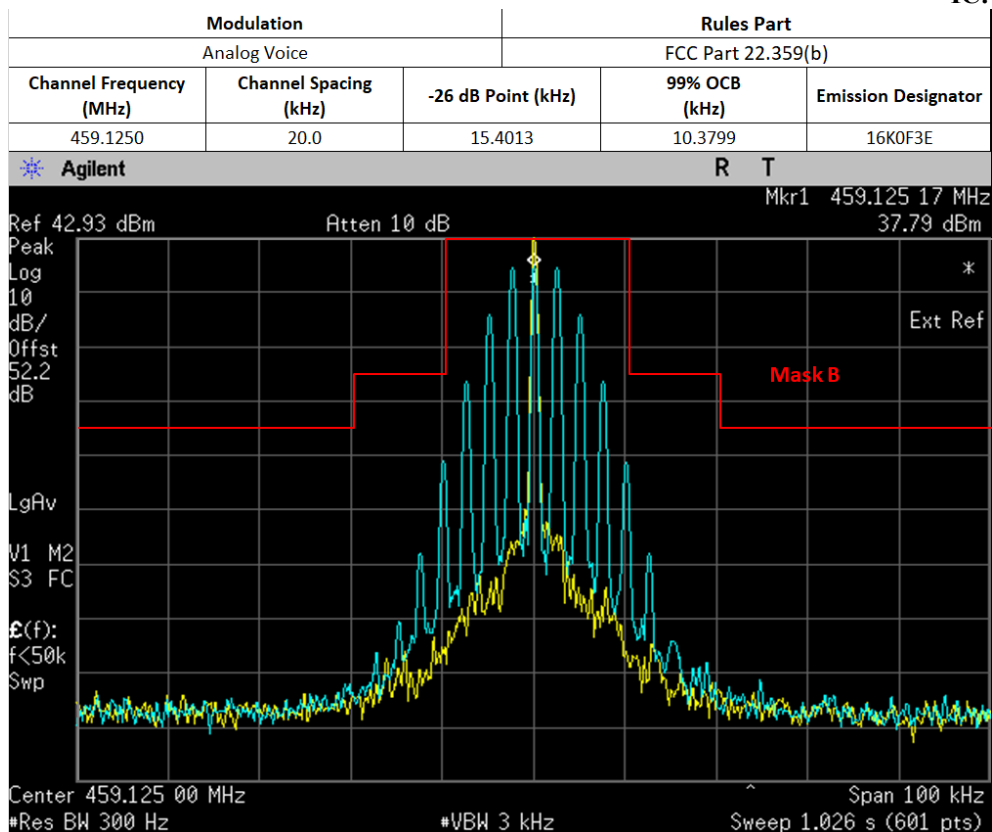


For Part 74

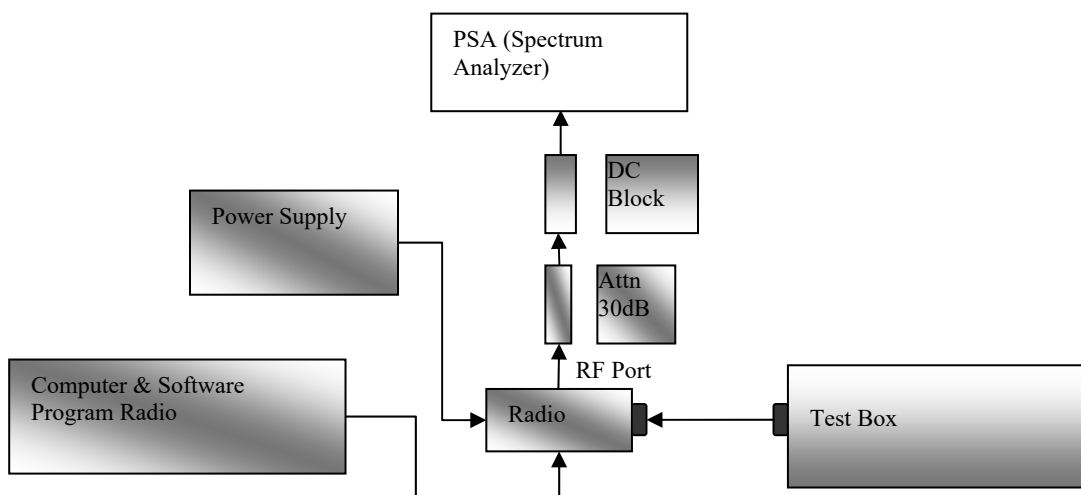








6.5.3. Test Setup (Digital)



- 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.

* 99% Bandwidth measurement is computed by the spectrum analyzer and is consistent with the C63.26 5.4.4 method.

*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.

6.5.4. Test Result (Digital)

Digital (12.5 kHz Channelization, Digital Voice/Data/Voice+Data):
Emission Designator 7K60F1E/D/W

The 99% energy rule (title 47CFR 2.989) was used for digital mode and is more accurate than Carson's rule. It basically states that 99% of the modulation energy falls within X kHz, in this case, 7.60 kHz. Measurements were performed in accordance with TIA/EIA TSB102.CAAB Section 2.2.5.2. The emission mask was obtained from 47CFR 90.210(d).

F1E/D/W portion of the designator indicates digital voice/data/voice+data.

Therefore, the entire designator for 12.5 kHz channelization digital voice is 7K60F1E/D/W.

