

 MOTOROLA SOLUTIONS	    CERTIFICATE 2518.08 SAMM 825																																		
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.B																																		
<table><tr><td>Date/s Tested</td><td>: 23-JUNE-2025 - 29-AUGUST-2025</td></tr><tr><td>Report Issue Date</td><td>: 04-SEP-2025</td></tr><tr><td>Test Site Location</td><td>: Motorola Penang Advanced Communication Laboratory (ACL)</td></tr><tr><td>Manufacturer</td><td>: Motorola Solutions INC. (Plantation)</td></tr><tr><td>Manufacturer Address</td><td>: Motorola Solutions INC. (Plantation), 8000 West Sunrise Blvd MD 41-128, USA Plantation FL 333222-9947</td></tr><tr><td>Requestor</td><td>: GEDDIE CALEB</td></tr><tr><td>Product Type</td><td>: Portable</td></tr><tr><td>Product Marketing Version (PMN)</td><td>: APX 900</td></tr><tr><td>Hardware Version Identification Number (HVIN)</td><td>: H92QDH9PW7AN</td></tr><tr><td>Frequency Band</td><td>: 380-480MHz</td></tr><tr><td>Max RF Output Power</td><td>: 5.7 Watts</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions Inc</td></tr><tr><td>Applicant Address</td><td>: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia.</td></tr><tr><td>ISED Registrations</td><td>: MY0001</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>Firmware Version Identification Number (FVIN)</td><td>: R33.04.00</td></tr></table> The equipment was tested accordance to the requirement listed below: <table><tr><td>(LMR) FCC 47 CFR Part 22 / 74 / 80 / 90 ISED RSS-Gen Issue 5, Amendment 1 (Mar 2019) Amendment 2 (Feb 2021) / RSS-119 Issue 12 Amendment (April 1, 2022)</td><td>PASS</td></tr></table>		Date/s Tested	: 23-JUNE-2025 - 29-AUGUST-2025	Report Issue Date	: 04-SEP-2025	Test Site Location	: Motorola Penang Advanced Communication Laboratory (ACL)	Manufacturer	: Motorola Solutions INC. (Plantation)	Manufacturer Address	: Motorola Solutions INC. (Plantation), 8000 West Sunrise Blvd MD 41-128, USA Plantation FL 333222-9947	Requestor	: GEDDIE CALEB	Product Type	: Portable	Product Marketing Version (PMN)	: APX 900	Hardware Version Identification Number (HVIN)	: H92QDH9PW7AN	Frequency Band	: 380-480MHz	Max RF Output Power	: 5.7 Watts	Applicant Name	: Motorola Solutions Inc	Applicant Address	: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia.	ISED Registrations	: MY0001	FCC Registrations	: 461337	Firmware Version Identification Number (FVIN)	: R33.04.00	(LMR) FCC 47 CFR Part 22 / 74 / 80 / 90 ISED RSS-Gen Issue 5, Amendment 1 (Mar 2019) Amendment 2 (Feb 2021) / RSS-119 Issue 12 Amendment (April 1, 2022)	PASS
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Prepared By:  Farah Nur Arina Test Personnel	Approved Signatory:  Ho Sze Khian Responsible Engineer																																		

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Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	4-Sep-2025	Farah
Rev. B	Update Part 80 power and current	30-Sep-2025	Farah

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
BATT IMPRES LIION HIGH CAPACITY, LOW VOLTAGE, IP68 3000T	MOTOROLA	PMNN4493A
ANTENNA, STUBBY,UHF(450-527 MHZ) 9CM	MOTOROLA	PMAE4102A

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, 80.215	RSS-119	RF Power Output	Pass		837TBH5756
2.1055, 22.355, 74.464, 80.209	RSS-119	Frequency Stability	Pass		837TBH5746
2.1047	-	Audio Frequency Response	Pass		837TBH5756
2.1047	-	Audio Low Pass Filter Response	Pass		837TBH5756
2.1047, 74.463, 80.213	-	Modulation limiting	Pass		837TBH5756
2.1049, 22.359, 90.21, 74.462, 80.211(b), (c)	RSS-119	Occupied Bandwidth	Pass	16K0F3E: 15.0049 kHz 11K0F3E: 9.9677 kHz 8K10F1D: 7.9263 kHz 8K10F1E: 7.8349 kHz 8K10F1W: 8.1218 kHz	837TBH5746
2.1051, 22.359 (a), (b)	-	Band Edge Conducted Spurious Emission	Pass		837TBH5756
90.214	RSS-119	Transient Frequency Behavior	Pass		837TBH5746
90.543(a), (b)	RSS-119	Adjacent Channel Power	NA		
2.1051, 22.359, 90.210 74.462(c), 80.211(c)	RSS-119	Conducted Spurious Emissions	Pass	Worst case: -44.60 dBm	837TBH5756
2.1051, 22.359, 74.462(c), 80.211(c)	RSS-119	Radiated Spurious Emission	NA		
-	-	GNSS (EIRP for 1559 – 1610MHz)	NA		
80.215	RSS-119	Effective Radiated Power (ERP)	Pass		837TBH5744

NA → Not Applicable

3.0 Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.43 dB
Radiated Emissions up to 1 GHz dBμV/m(Field Strength)	30MHz ~ 1000MHz	6.00 dB
Radiated Emissions above 1 GHz dBμV/m(Field Strength)	1GHz ~ 18GHz	5.14 dB
	18GHz ~ 40GHz	5.36 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 FilterResponse	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	6-Mar-25	6-Mar-26
POWER SENSOR	E4412A	MY50290007	5-Feb-25	5-Feb-26
POWER METER	E4416A	MY50000115	5-Mar-25	5-Mar-26
AUDIO ANALYZER	U8903A	MY51290001	17-Dec-24	17-Dec-25
CXA SIGNAL ANALYZER	N9000B	MY60250694	16-Dec-24	16-Dec-25
POWER SUPPLY	6031A	3325A02771	23-Apr-25	23-Apr-26
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_R1.2.1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A36210	Not Required	Not Required
SWITCH DRIVER	11713A	3748A09090	Not Required	Not Required
POWER METER	E4416A	GB41293866	31-Dec-24	31-Dec-25
ATTENUATOR	8494G	MY42145194	18-Jun-25	18-Jun-26
ATTENUATOR/110DB	8496G	MY52300088	15-Aug-24	15-Aug-25
ATTENUATOR	8496G	MY52301112	29-Apr-25	29-Apr-26
MODULATION ANALYZER	8901B	3226A04052	8-Apr-25	8-Apr-26
POWER SUPPLY	6031A	3506A03271	26-Sep-24	26-Sep-25
CXA SIGNAL ANALYZER	N9000B	MY60250716	03-Dec-24	03-Dec-25
AUDIO ANALYZER	8903B	3011A12380	19-Mar-25	19-Mar-26
AUDIO ANALYZER	8903B	2836A05866	03-Apr-25	03-Apr-26
POWER SENSOR	E9301B	MY41495629	18-Jun-25	18-Jun-26
SIGNAL GENERATOR	8657A	3250A05137	16-Nov-24	16-Nov-25
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 1.23.06)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A32735	Not Required	Not Required
INTERFACE BOX - FILTER	NA	CS001	Not Required	Not Required
POWER SUPPLY	6031A	3416A02942	24-Sep-24	24-Sep-25
SPECTRUM ANALYZER	E4445A	MY46181250	19-Oct-24	19-Oct-25
N to N RF Cable # 1	SF126/11N/11N	NA	NA	NA
N to N RF Cable # 2	SF126/11N/11N	NA	NA	NA
BNC to BNC RF Cable # 1	RG 58	NA	NA	NA
Aeroflex Attenuator 30dB	49-30-43-LIM	NA	NA	NA
Aeroflex Attenuator 10dB	33-10-34-LIM	NA	NA	NA

RADIATED EMISSION CHAMBER

DESCRIPTION	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
DRG HORN FREQ.	SAS-571	566	09-Jan-25	09-Jan-26
DRG HORN FREQ.	SAS-571	719	09-Oct-24	09-Oct-25
DC Power Supply	N7977A	MY54420118	16-Apr-25	16-Apr-26
SIGNAL GENERATOR	SMB 100A	180683	20-Dec-24	20-Dec-27
EMI TEST RECEIVER	ESW44	101731	10-Aug-25	10-Aug-26
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	Not Required	Not Required
BILOG ANTENNA	CBL6112B	2964	08-Oct-24	08-Oct-25
BILOG ANTENNA	CBL6112D	30991	18-Mar-25	18-Mar-26
DATA LOGGER THERMOHYGROMETER	SDL500	A.016800	30-Jun-25	30-Jun-26
SYSTEM CONTROLLER	SC104V	050806-1	Not Required	Not Required
TURNTABLE FLUSH MOUNT 2M	FM2011	FM2011-001	Not Required	Not Required
ANTENNA POSITIONING TOWER	TLT2	090308-5	Not Required	Not Required
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	02-Apr-25	02-Apr-26
PREAMPLIFIER 18-40GHz	JS44-18004000-33-8P	2034566	Not Required	Not Required
PREAMPLIFIER 1-18GHz	EMC0518A45SE	980890	05-Aug-24	04-Nov-25
PREAMPLIFIER	PAM-0118P	361	29-Sep-23	29-Sep-26
LOOP ANTENNA	6502	00208416	08-Oct-24	08-Oct-25
TEST SOFTWARE	EMC.FCC.IC.RE.v1.7.1			
VERSION	1.7.1			

5.0 Test Condition

5.1. Transmitter Test Conditions

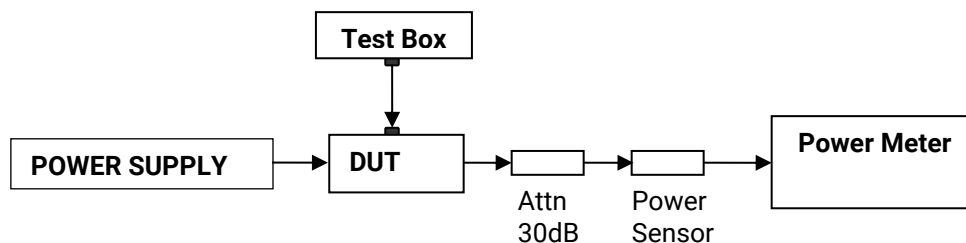
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By	Environmental conditions
RF Output Power	Low & Max	FM	380.0125, 406.2000, 450.0250, 459.1250, 467.7750, 469.9875, 479.9875	Farah	23.4°C, 50%RH
Frequency Stability	Max	FM	467.7750	Farah	25.1°C, 54.3%RH, 60.3°C, 50%RH, -30.1°C, 51.2%RH
Audio Frequency Response (12.5kHz / 25kHz)	Max	FM	459.1250, 467.7750	Farah	23.4°C, 50%RH
Audio Low Pass Filter Response (12.5kHz / 25kHz)	Max	FM	459.1250, 467.7750	Farah	23.4°C, 50%RH
Modulation limiting (12.5kHz / 25kHz)	Max	FM	459.1250, 467.7750	Farah	23.4°C, 50%RH
Occupied Bandwidth (12.5kHz / 20kHz / 25kHz)	Max	FM/C4FM/Phase II	406.2000, 450.0250, 459.1250, 467.7750, 473.0125	Farah	23.4°C, 50%RH
Band Edge Conducted Spurious Emissions (Part 22) (12.5kHz / 25kHz)	Max	FM/C4FM/Phase II	459.0250, 459.6500, 473.0125, 479.2875	Farah	23.4°C, 50%RH
Transient Frequency Behavior (UHF & VHF Band) (12.5kHz / 25kHz)	Max	FM/C4FM	467.7750	Farah	23.4°C, 50%RH
Adjacent Channel Power (700MHz Band) (12.5kHz / 20kHz)	Max	FM/C4FM/Phase II	NA		
Conducted Spurious Emissions (12.5kHz / 25kHz)	Low / Max	FM/C4FM/Phase II	380.0125, 406.2000, 450.0250, 459.1250, 467.7750, 469.9875, 479.9875	Farah	23.4°C, 50%RH
Radiated Spurious Emission (12.5kHz / 25kHz)	Low / Max	FM/C4FM/Phase II	NA		
GNSS (EIRP for 1559 - 1610MHz) (12.5kHz / 25kHz)	Max	FM	NA		
Effective Radiated Power (ERP) (25kHz)	Max	FM	467.77500	Fuad	23.4°C, 50%RH

NA → Not Applicable

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



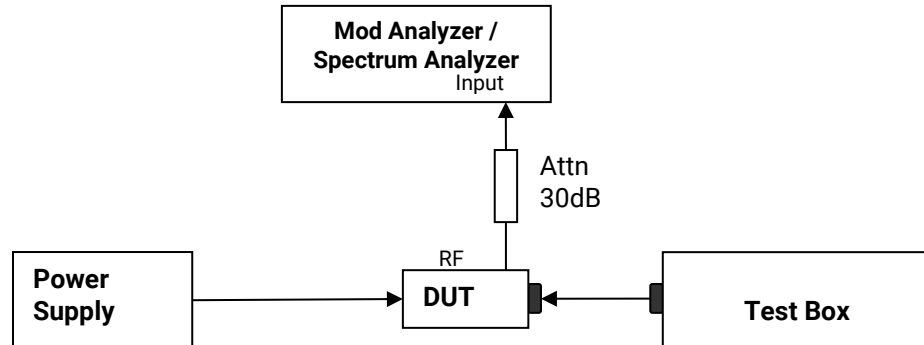
- 1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
- 2) Path loss for the measurement included.
- 3) All the measurement was done at low, mid, high frequency for each band.
- 4) Record the power into the test report.

6.1.2. Test Result

Temperature	25°C				Remark
Voltage (V)	7.5V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	
380.01250	1.02	0.79	5.62	1.68	Not for FCC review
406.20000	1.08	0.76	5.64	1.65	
450.02500	0.95	0.75	5.58	1.68	
459.12500	0.98	0.72	5.63	1.68	
467.77500	0.92	0.69	5.63	1.65	
467.77500			0.92	0.69	Part 80
469.98750	0.94	0.69	5.66	1.68	
479.98750	0.95	0.69	5.70	1.71	Not for FCC review

6.2. Frequency Stability

6.2.1. Test Setup

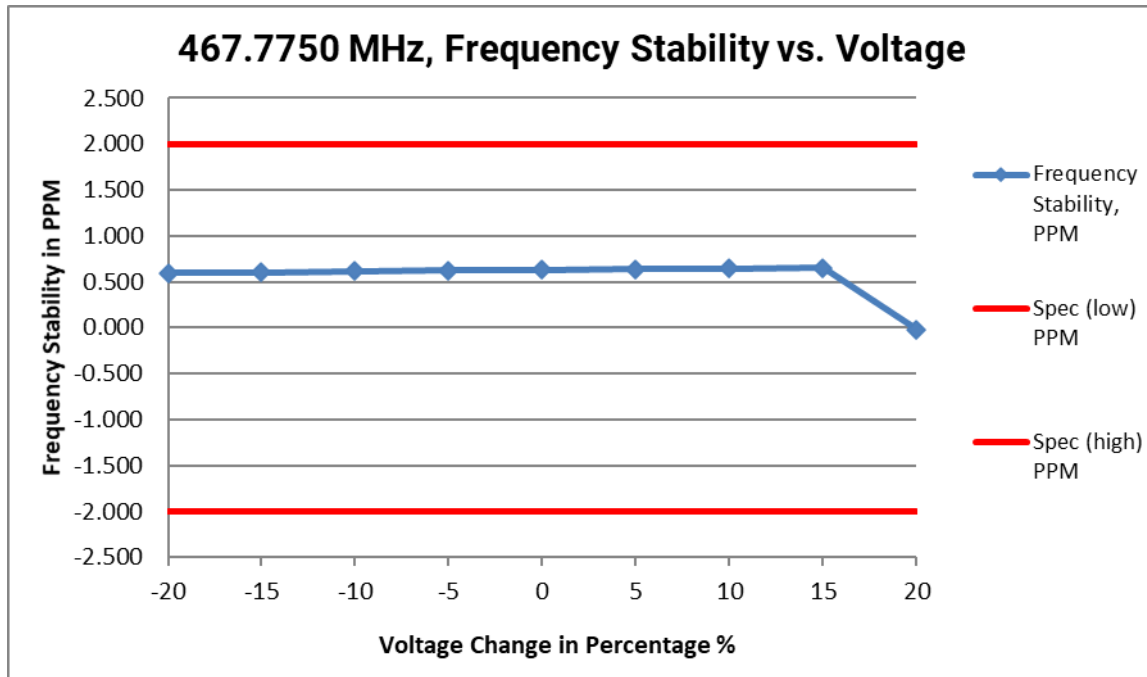


- 1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
- 2) Path loss for the measurement included.
- 3) Transmit the DUT and record the freq in MCF_{MHz} .
- 4) Test in 2 conditions:
 - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
 - Supply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

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

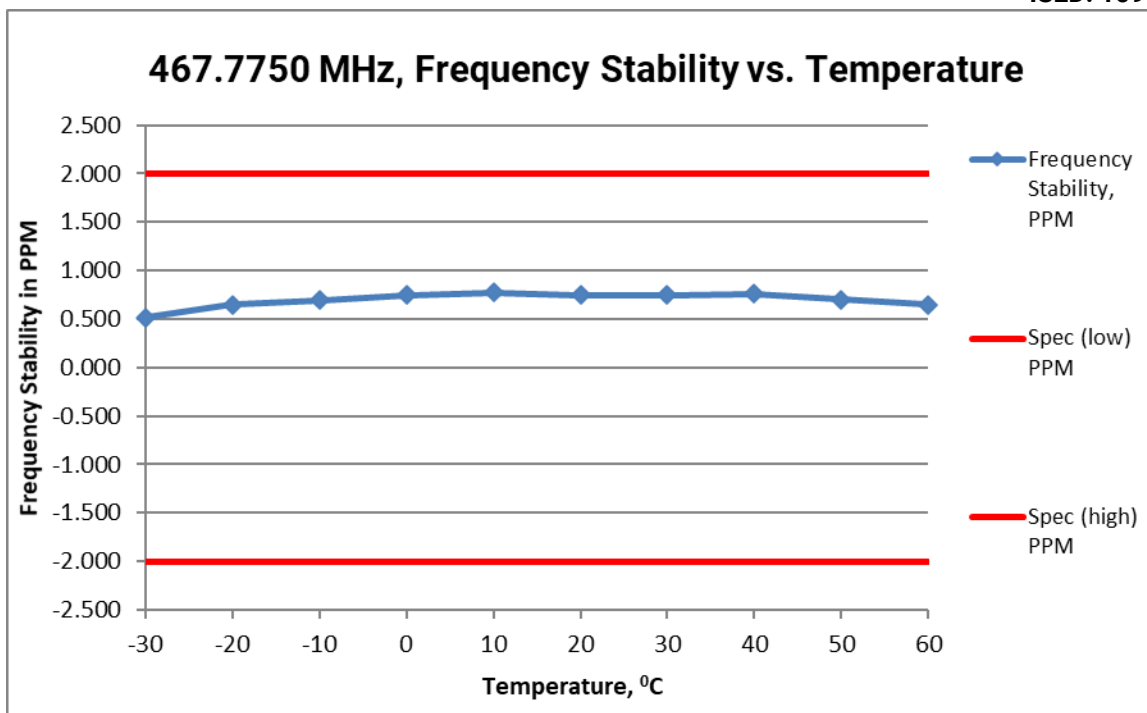
Where: MCF_{MHz} is the Measured Carrier Frequency in MHz
 ACF_{MHz} is the Assigned Carrier Frequency in MHz

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	6.000	467.775279	0.596	-2.000	2.000
-15	6.370	467.775283	0.604	-2.000	2.000
-10	6.750	467.775287	0.613	-2.000	2.000
-5	7.120	467.775291	0.622	-2.000	2.000
0	7.500	467.775294	0.629	-2.000	2.000
5	7.870	467.775297	0.635	-2.000	2.000
10	8.250	467.775300	0.642	-2.000	2.000
15	8.620	467.775303	0.648	-2.000	2.000
20	9.000	467.774990	-0.021	-2.000	2.000



(ii) Frequency Stability VS temperature

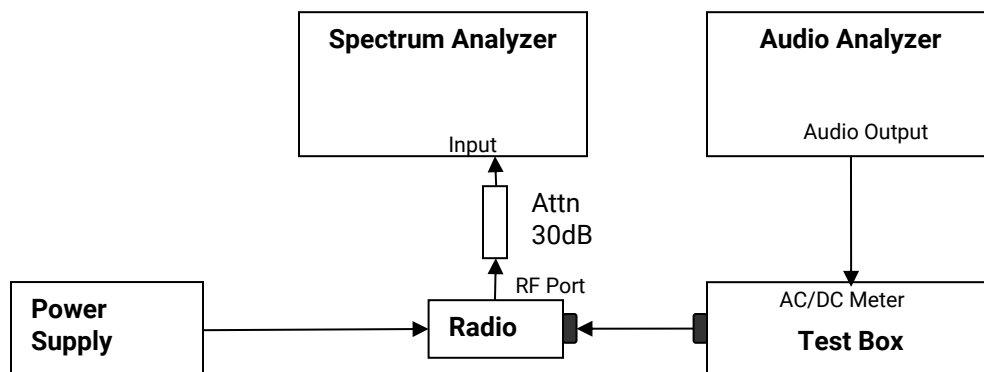
Frequency / Channel Spacing	467.7750 MHz / 12.5 kHz			
Voltage, V	7.5			
Temperature, °C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	467.775241	0.516	-2.000	2.000
-20	467.775303	0.647	-2.000	2.000
-10	467.775324	0.692	-2.000	2.000
0	467.775351	0.750	-2.000	2.000
10	467.775362	0.773	-2.000	2.000
20	467.775348	0.744	-2.000	2.000
30	467.775351	0.750	-2.000	2.000
40	467.775356	0.760	-2.000	2.000
50	467.775326	0.697	-2.000	2.000
60	467.775304	0.650	-2.000	2.000

6.2.3. Test Limit

As per manufacturer declared spec +/- 2.0ppm

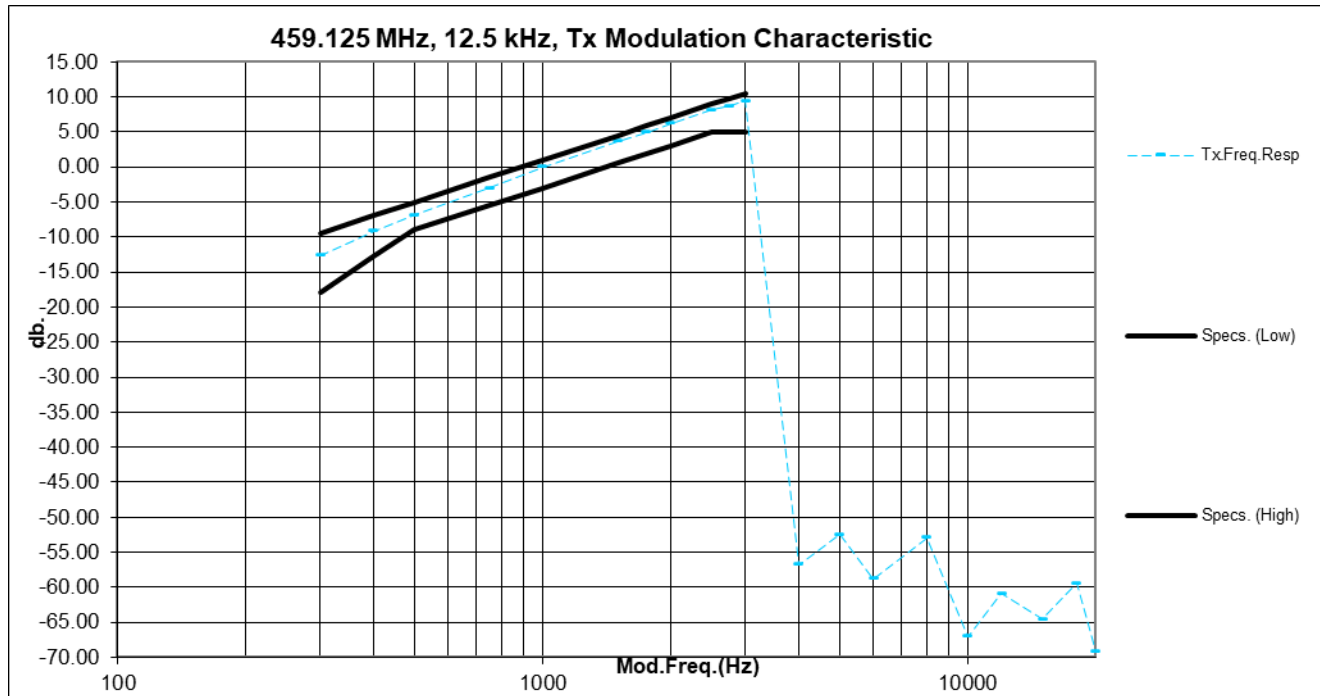
6.3. Modulation Characteristics

6.3.1. Test Setup

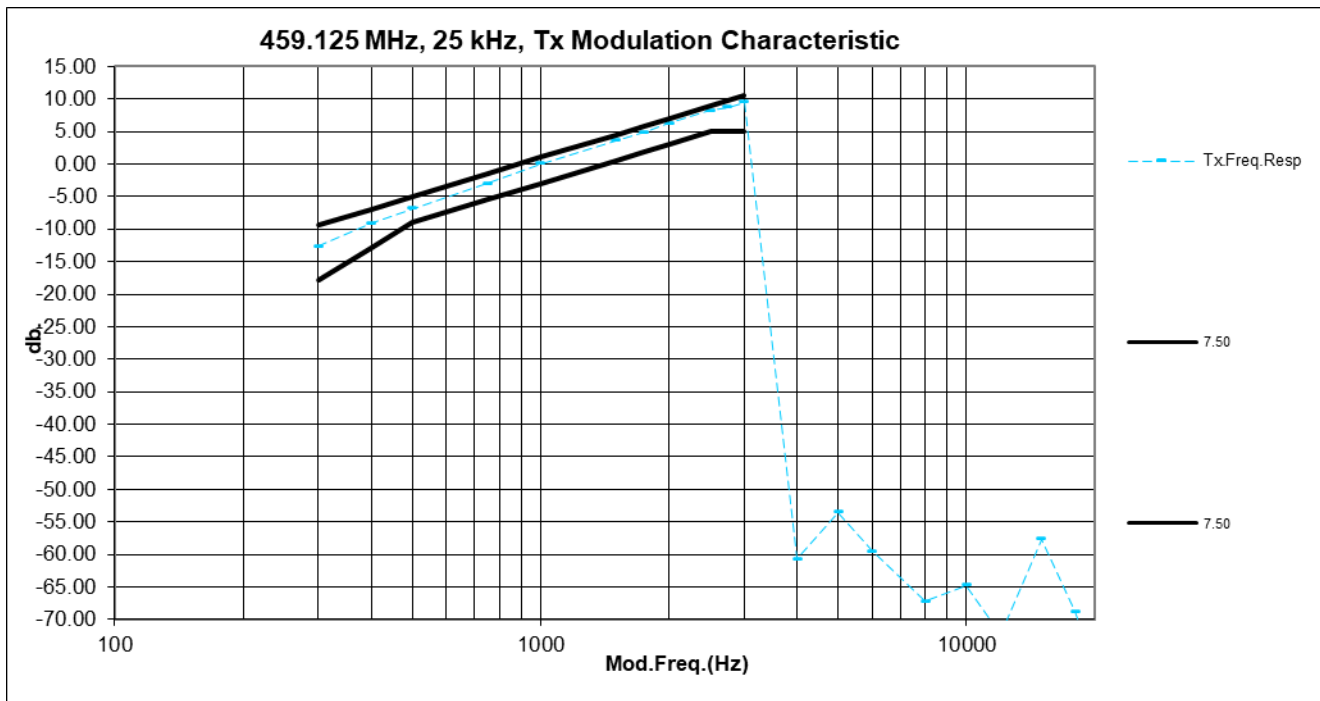


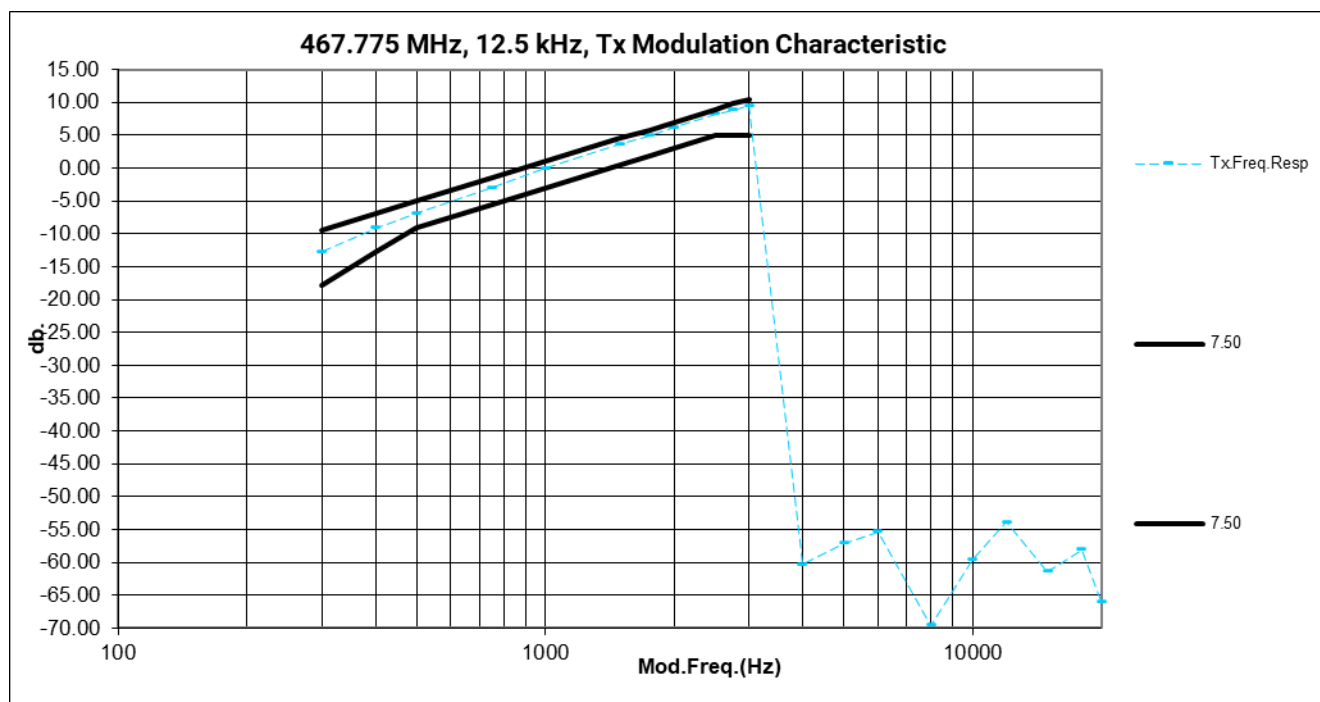
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Path loss for the measurement included.
- 3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
- 4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the Full rated system deviation.
- 5)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

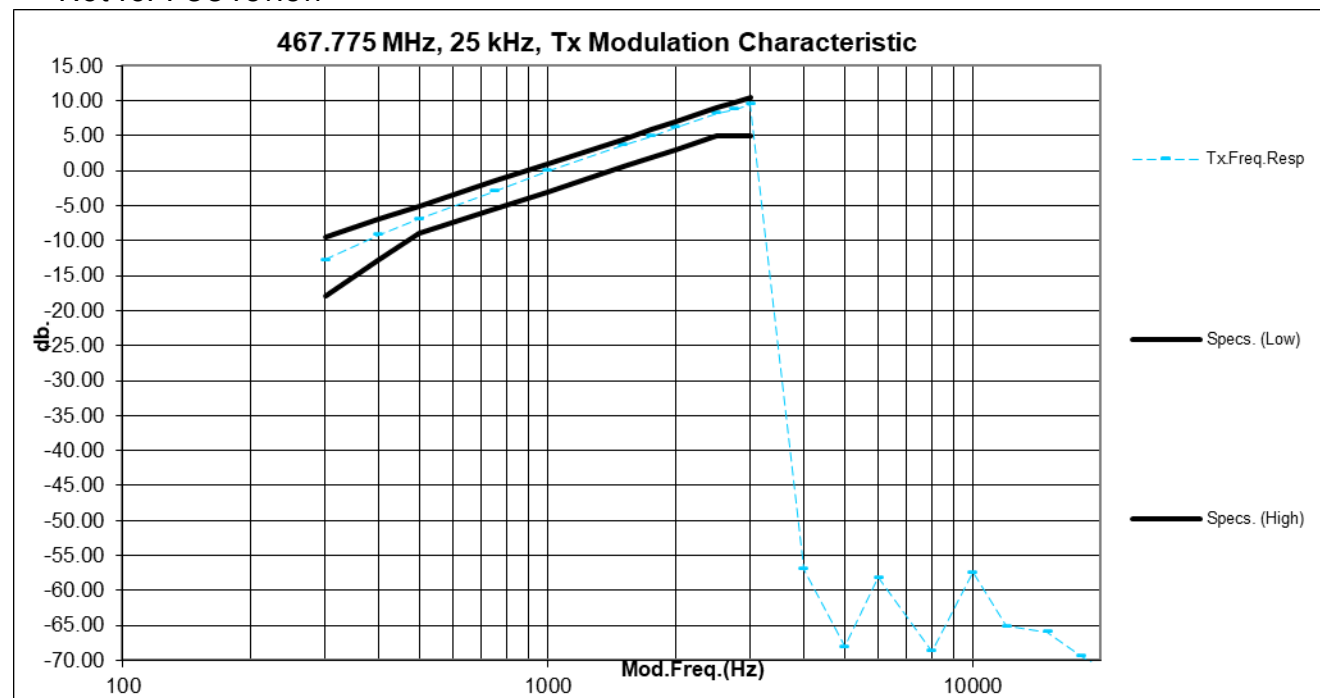


Not for FCC review

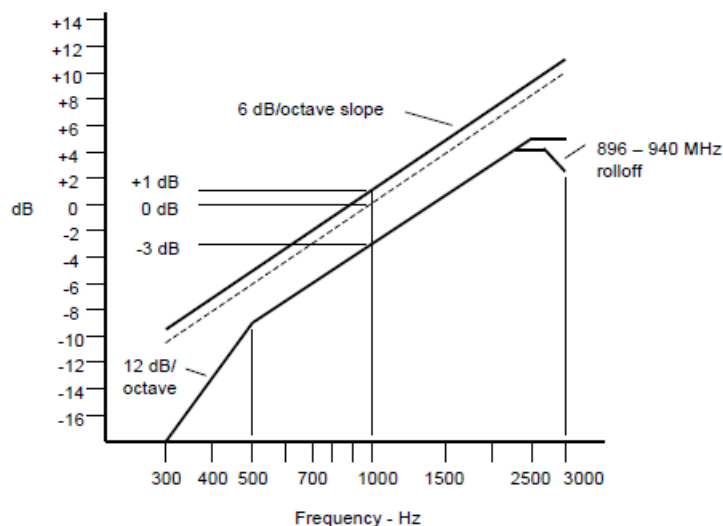




Not for FCC review



6.3.3. Test Limit

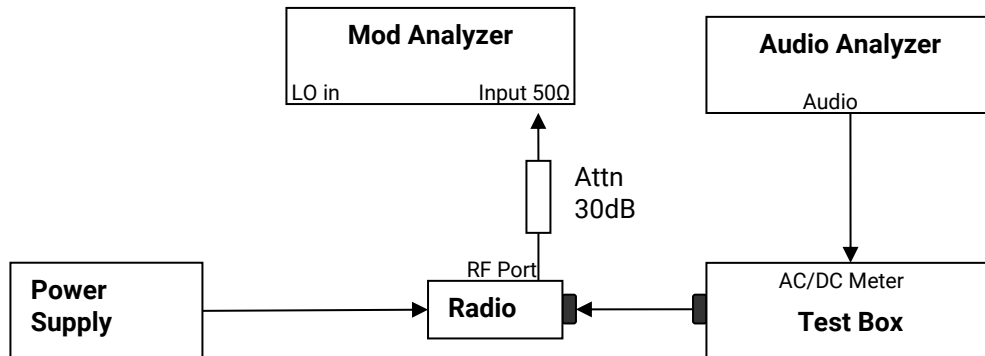


Note:

- 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.

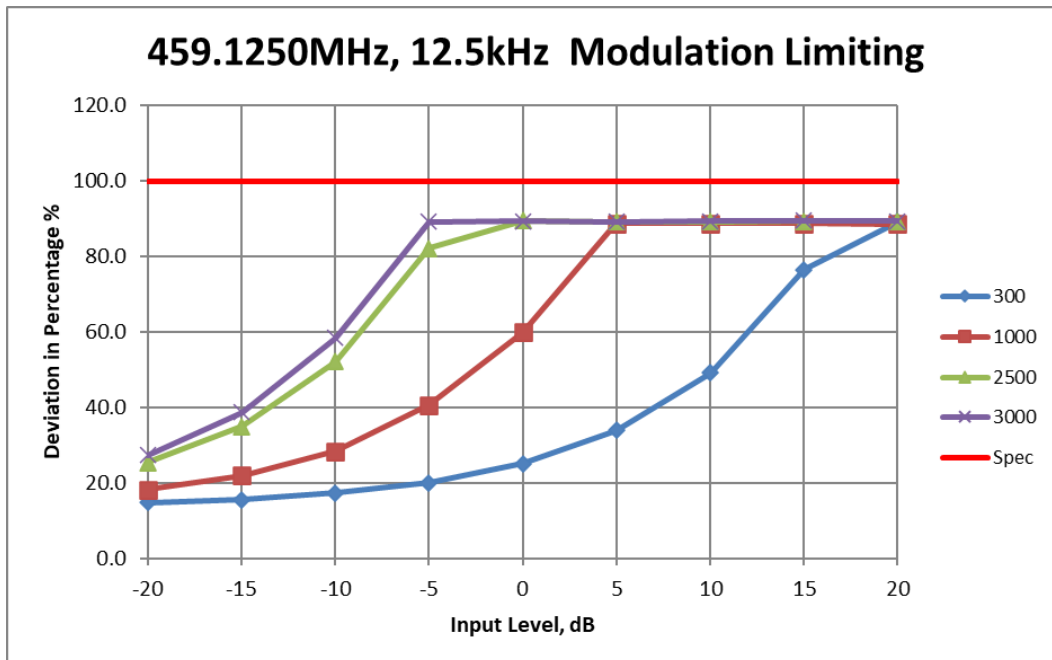
6.4. Modulation Limiting

6.4.1. Test Setup

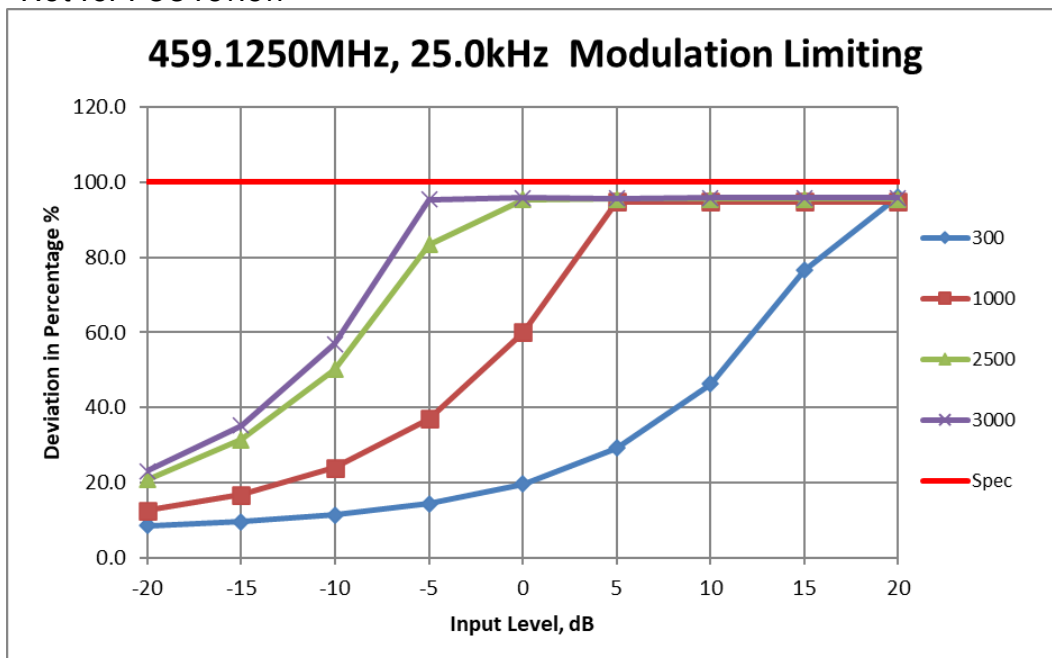


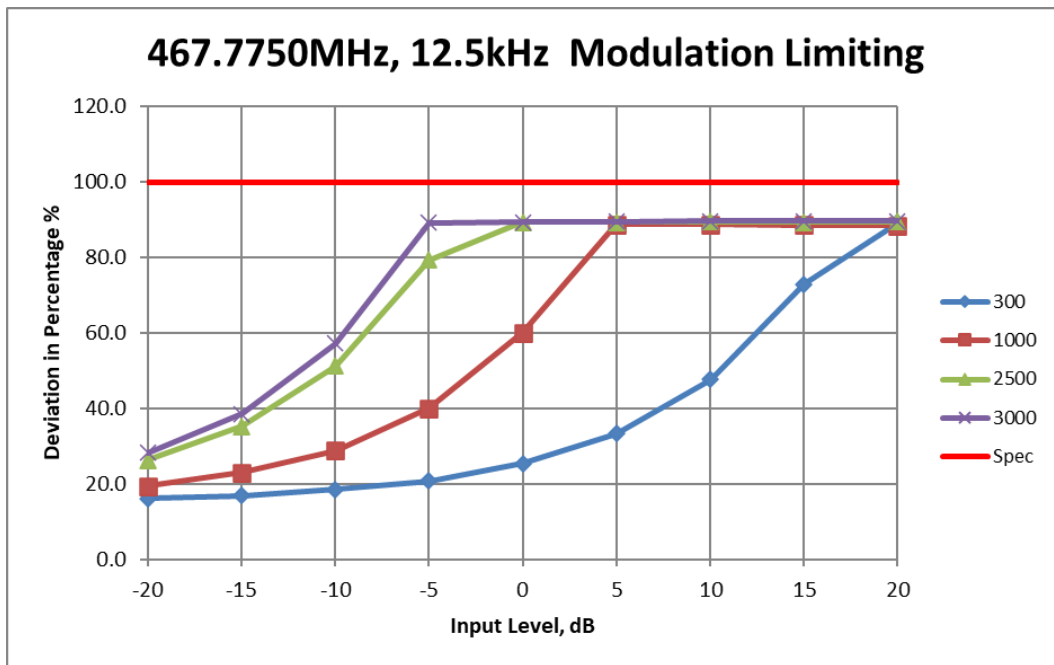
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Path loss for the measurement included.
- 3) Set the audio bandwidth filter to 15 kHz.
- 4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the Full rated system deviation.
- 5) Record the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

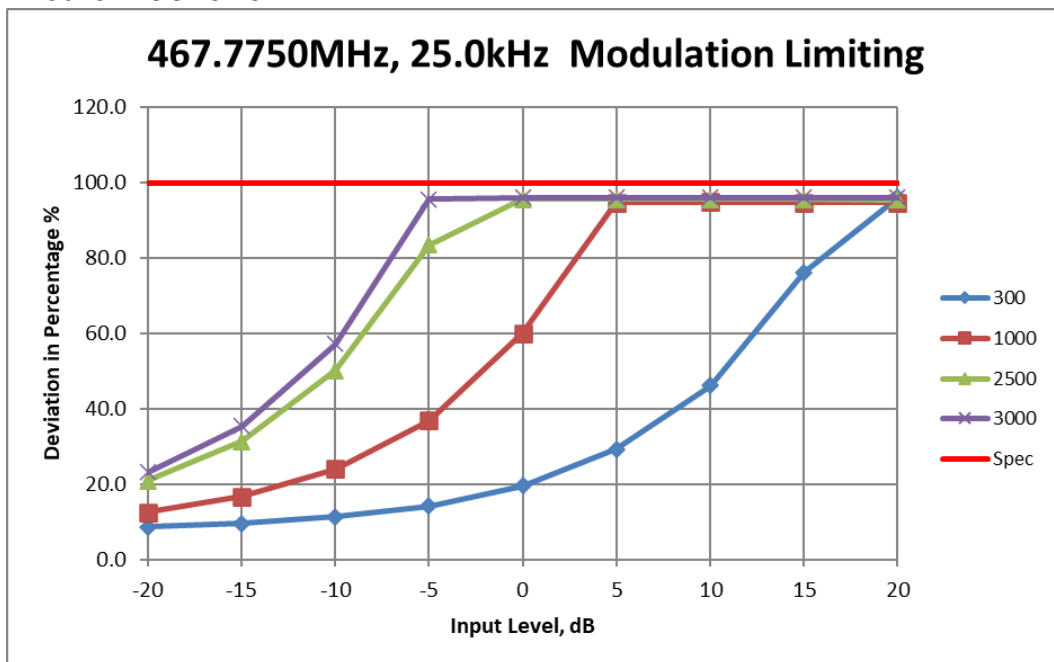


Not for FCC review





Not for FCC review

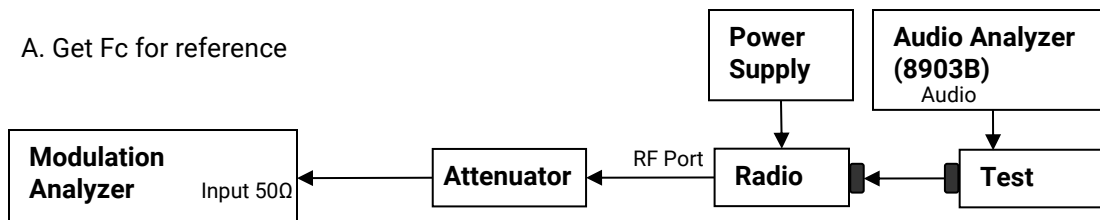


6.4.3. Test Limit
Modulation Limiting shall not exceed 100 percent.

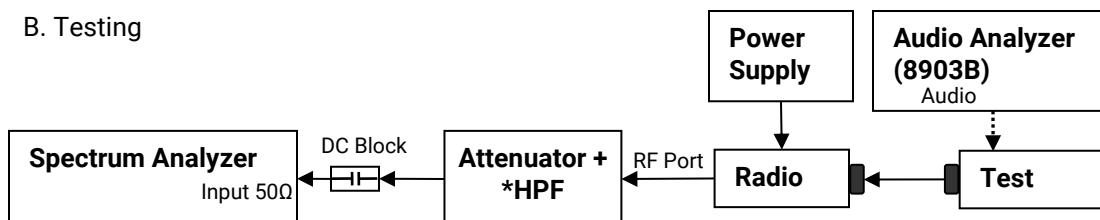
6.5. Occupied Bandwidth

6.5.1. Test Setup (Analog)

A. Get F_c 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 F_c 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.

$BW = 2(M+D) = 2*(3 \text{ kHz} + 5 \text{ kHz}) = 16 \text{ kHz} = 16K0F3E$ portion of the designator indicates voice.

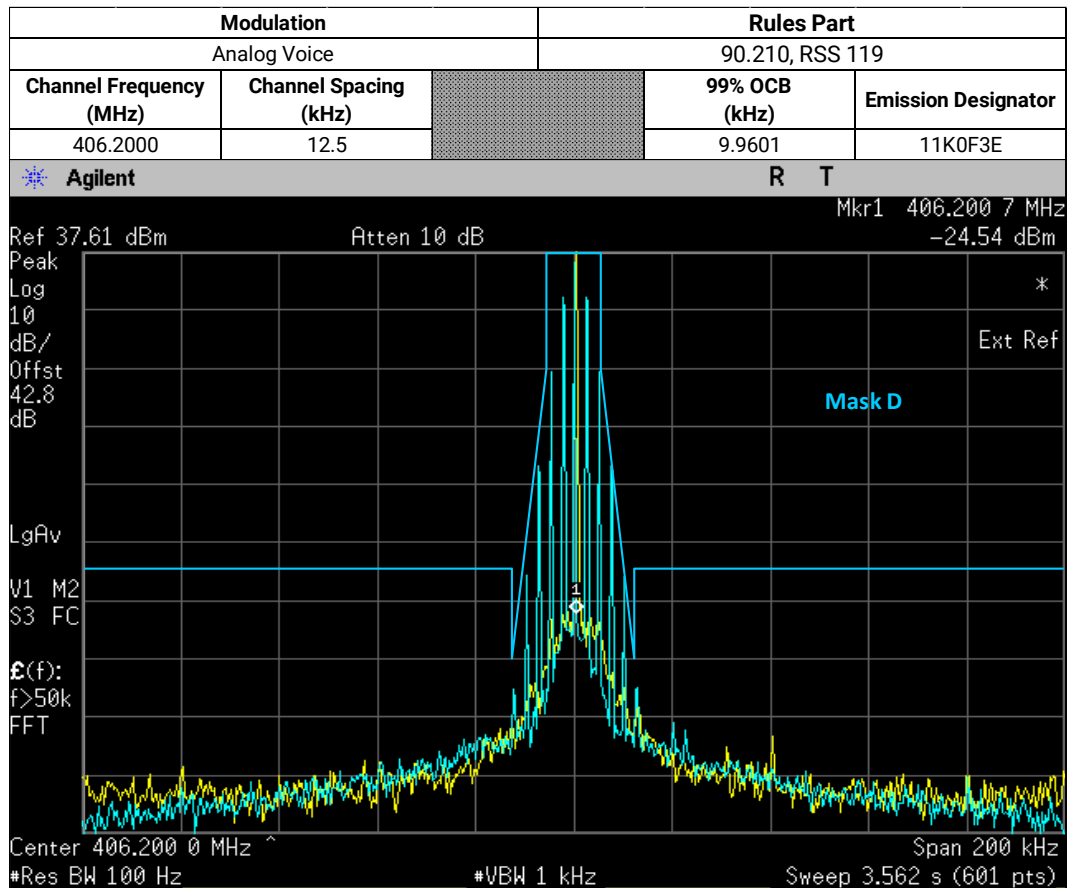
Therefore, the entire designator for 25 kHz channelization analog voice is 16K0F3E.

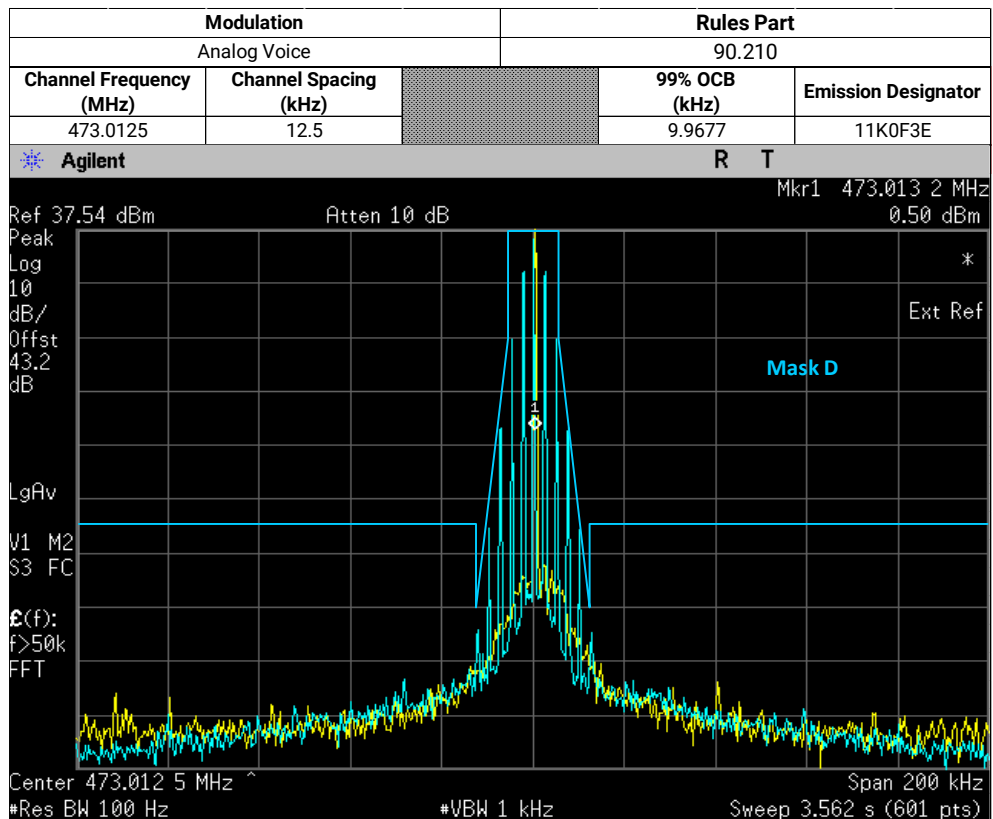
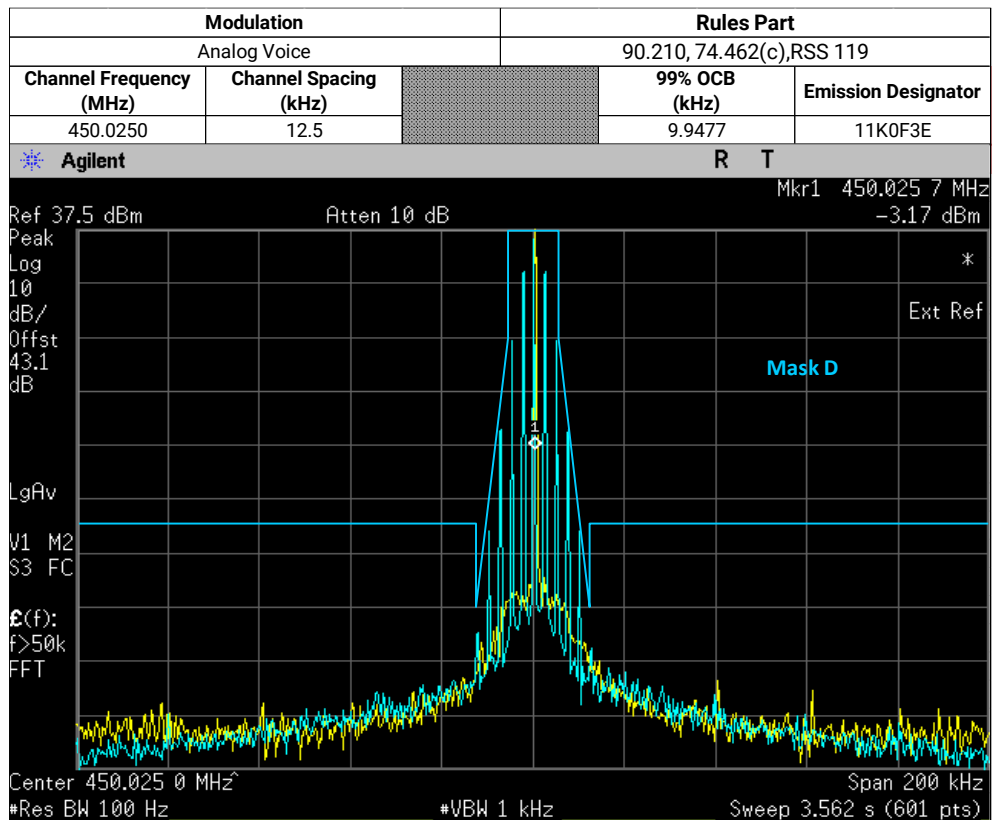
Standard Audio Modulation (12.5 kHz Channelization, Analog Voice):
 Emission Designator = 11K0F3E

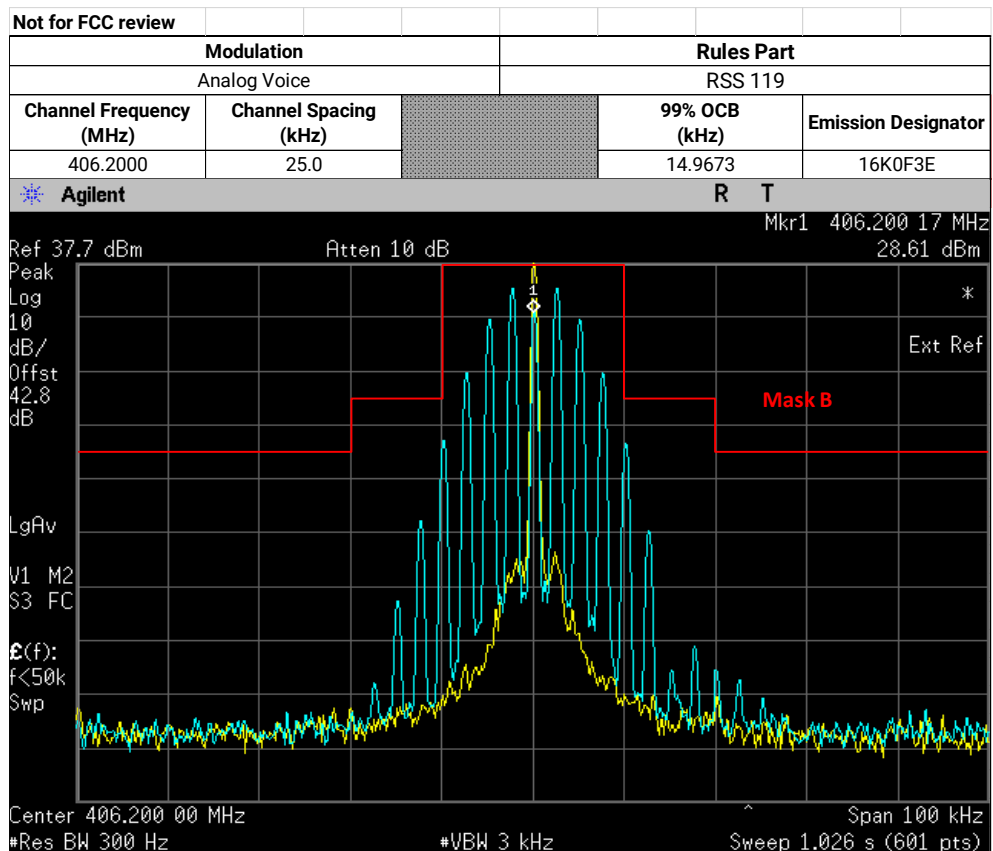
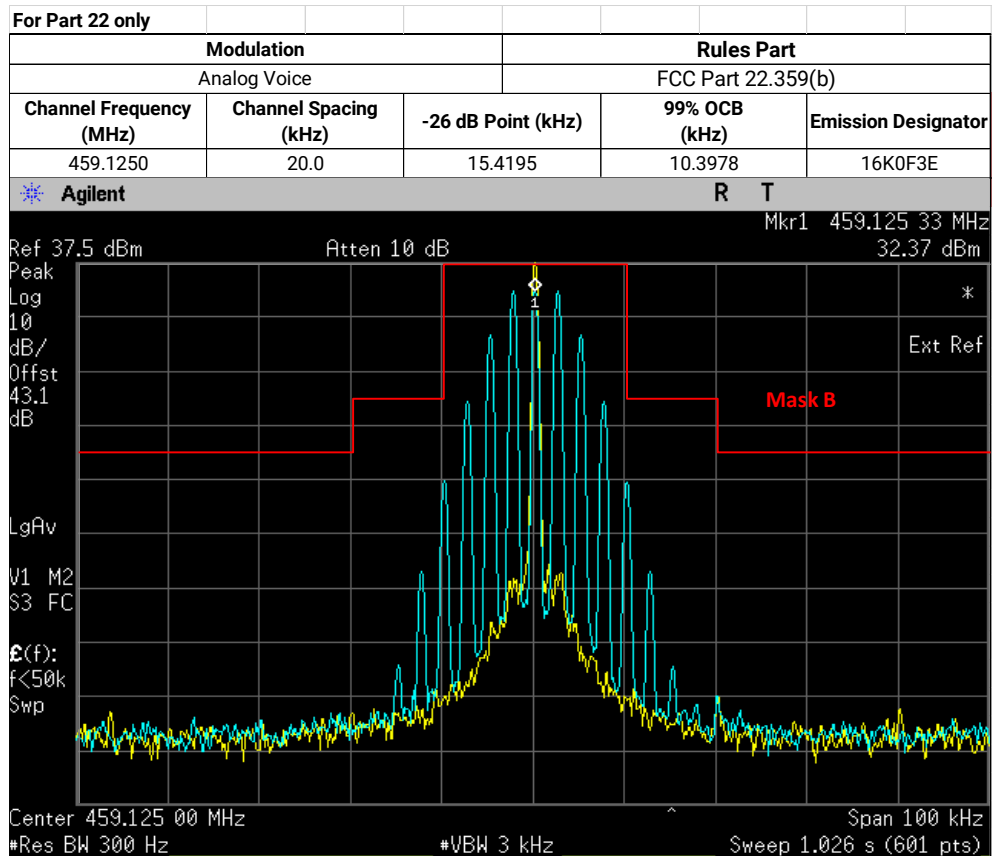
In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

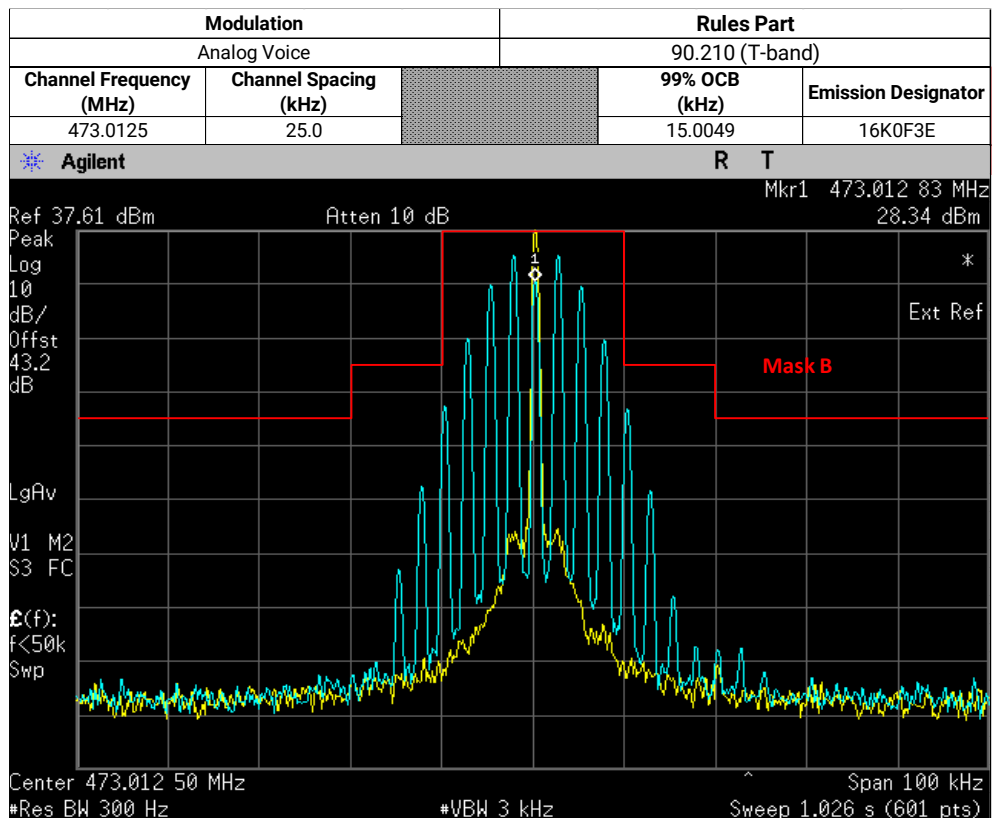
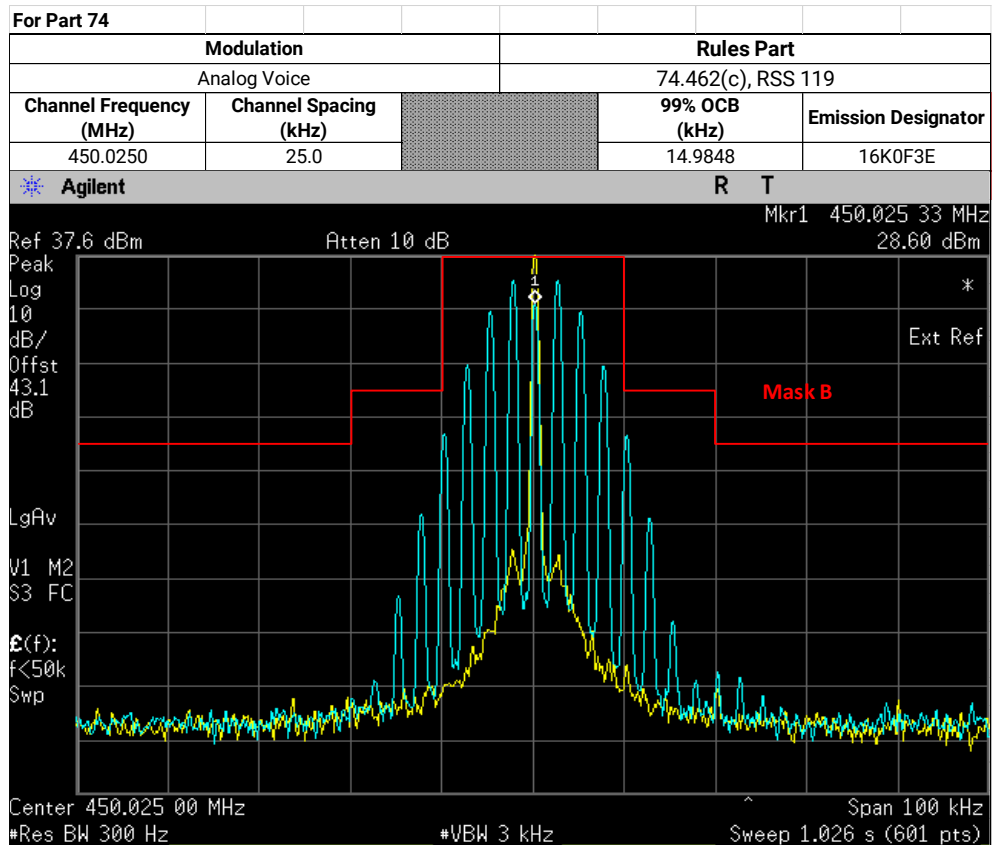
$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} = 11K0F3E$ portion of the designator indicates voice.

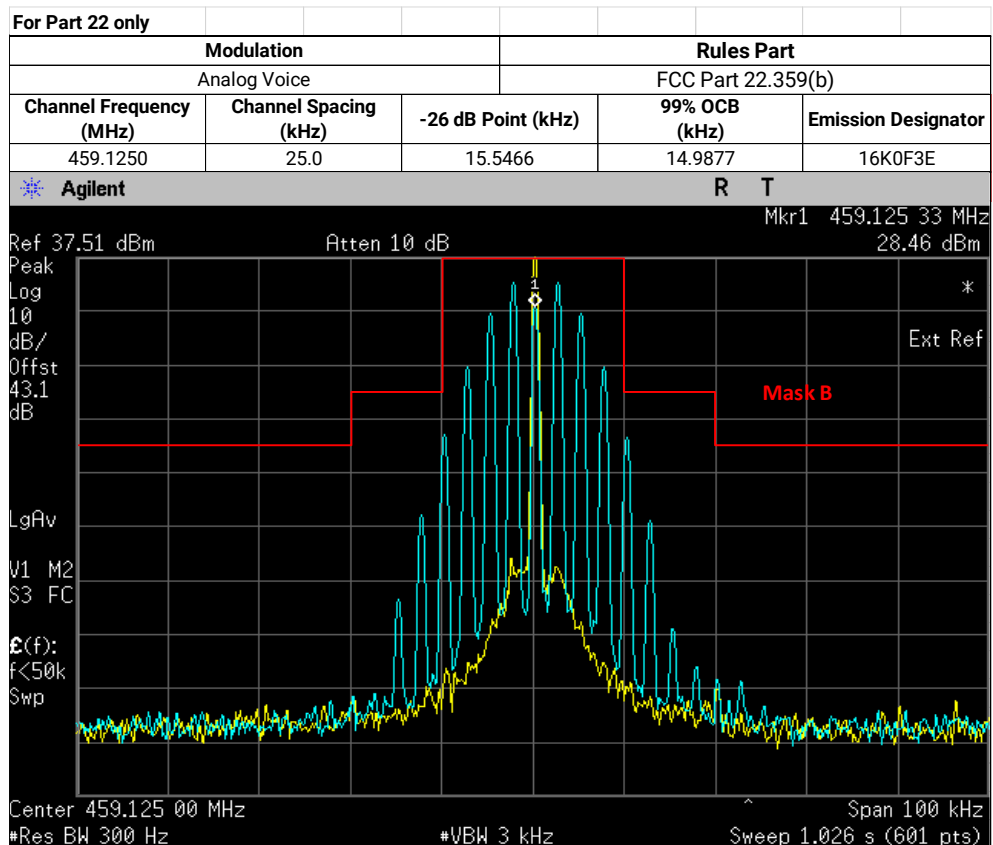
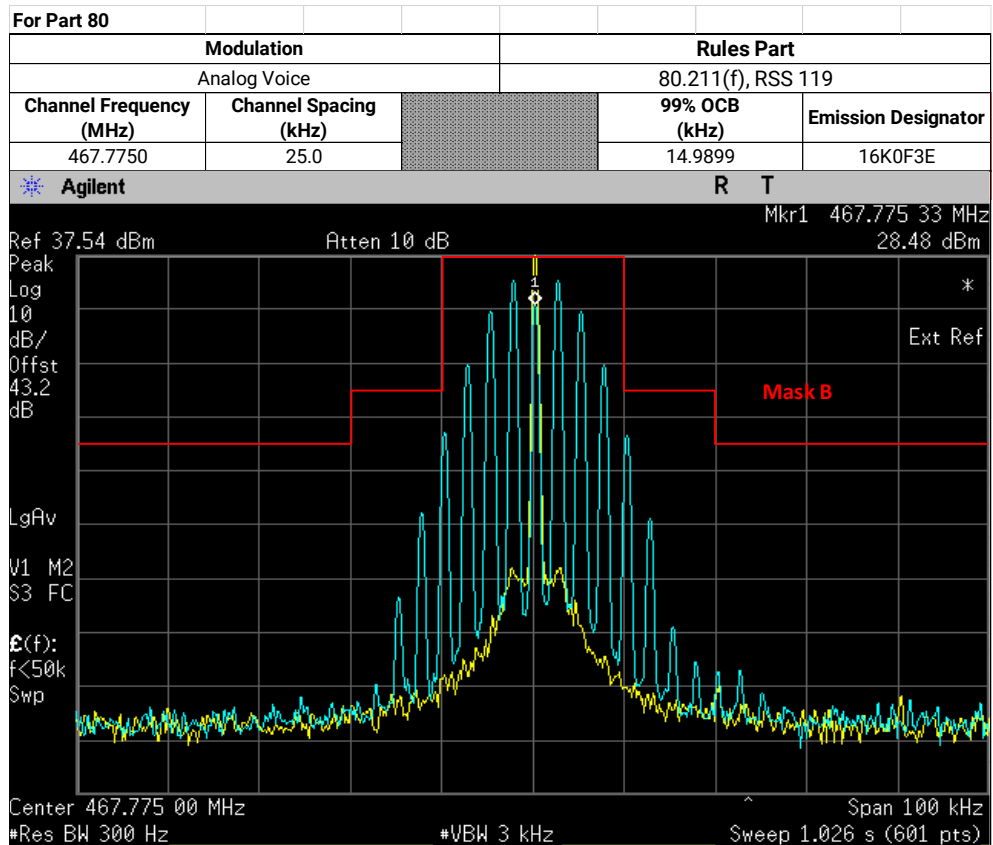
Therefore, the entire designator for 12.5 kHz channelization analog voice is 11K0F3E.

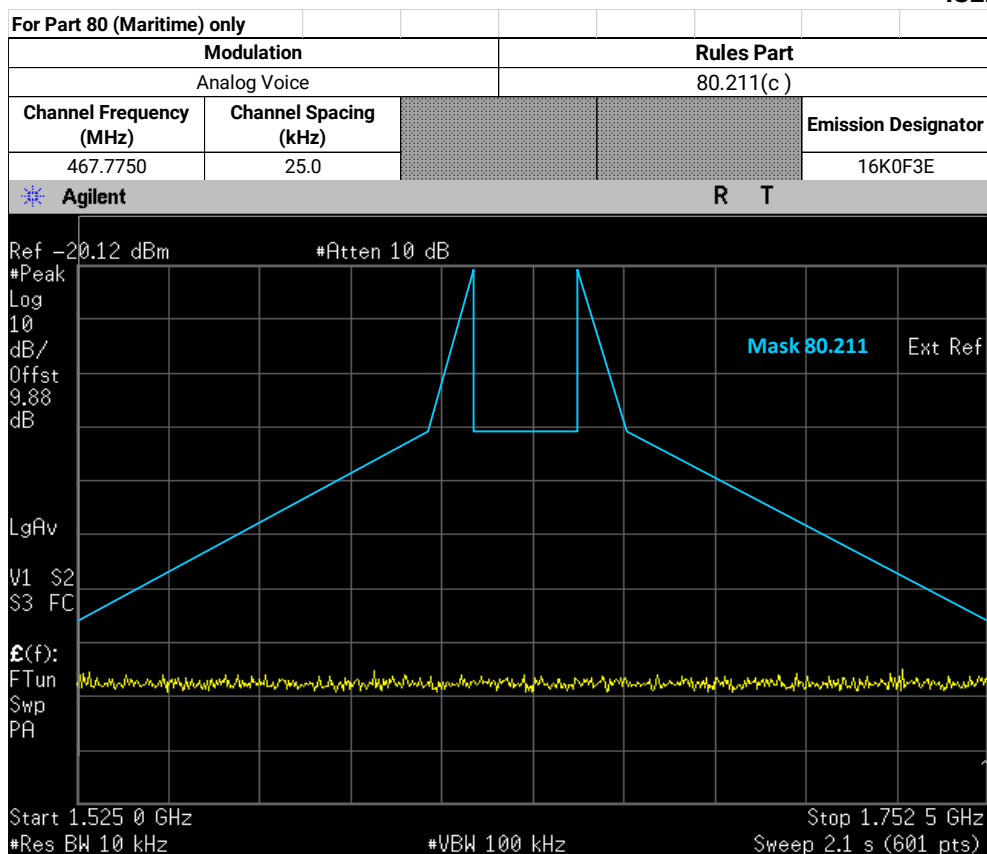




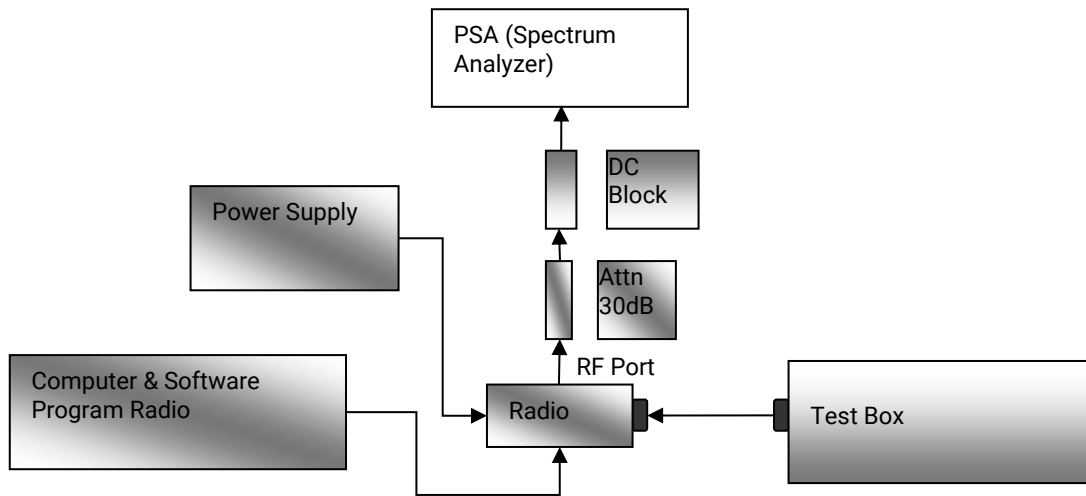








6.5.3. Test Setup (Digital)



- 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.

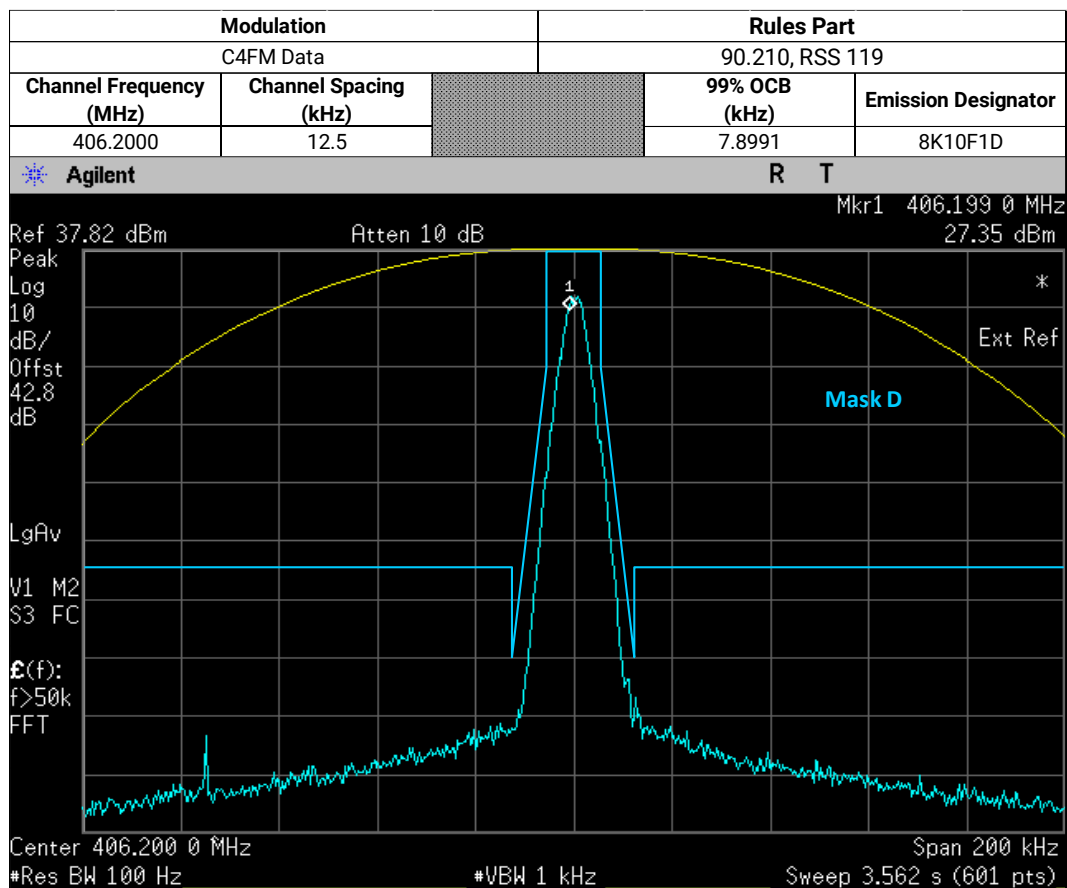
6.5.4. Test Result (Digital)

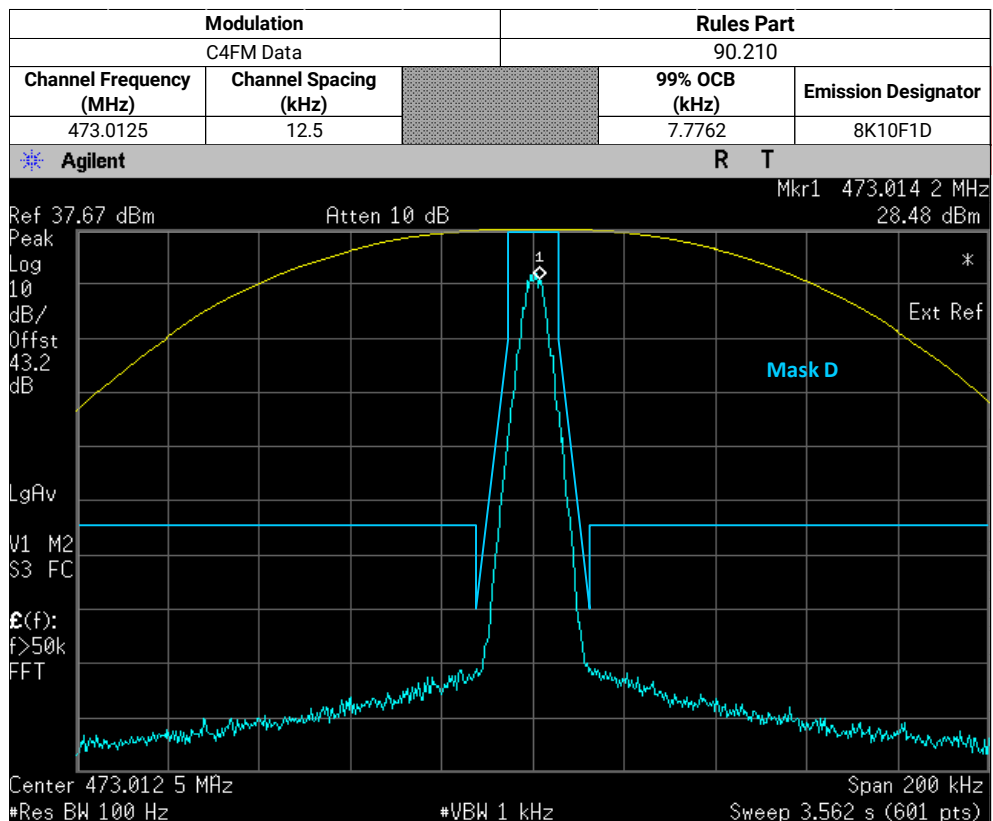
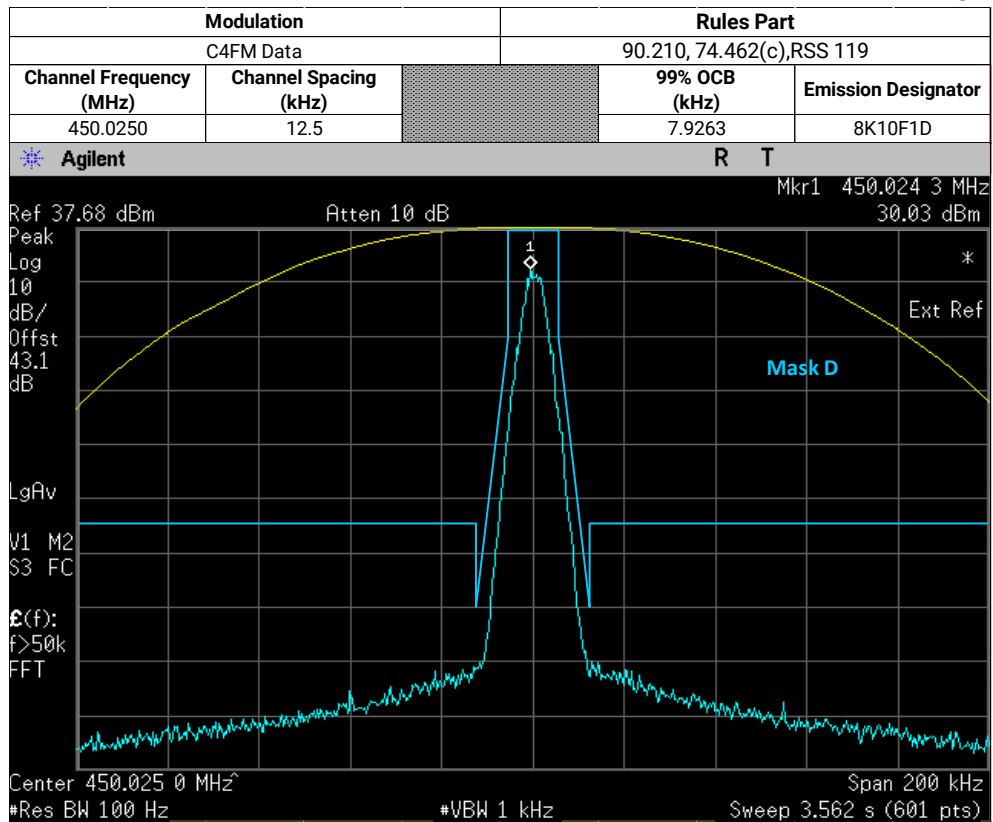
Digital (12.5 kHz Channelization, Digital Voice/Data/Voice+Data):
 Emission Designator = 8K10F1E/D/W

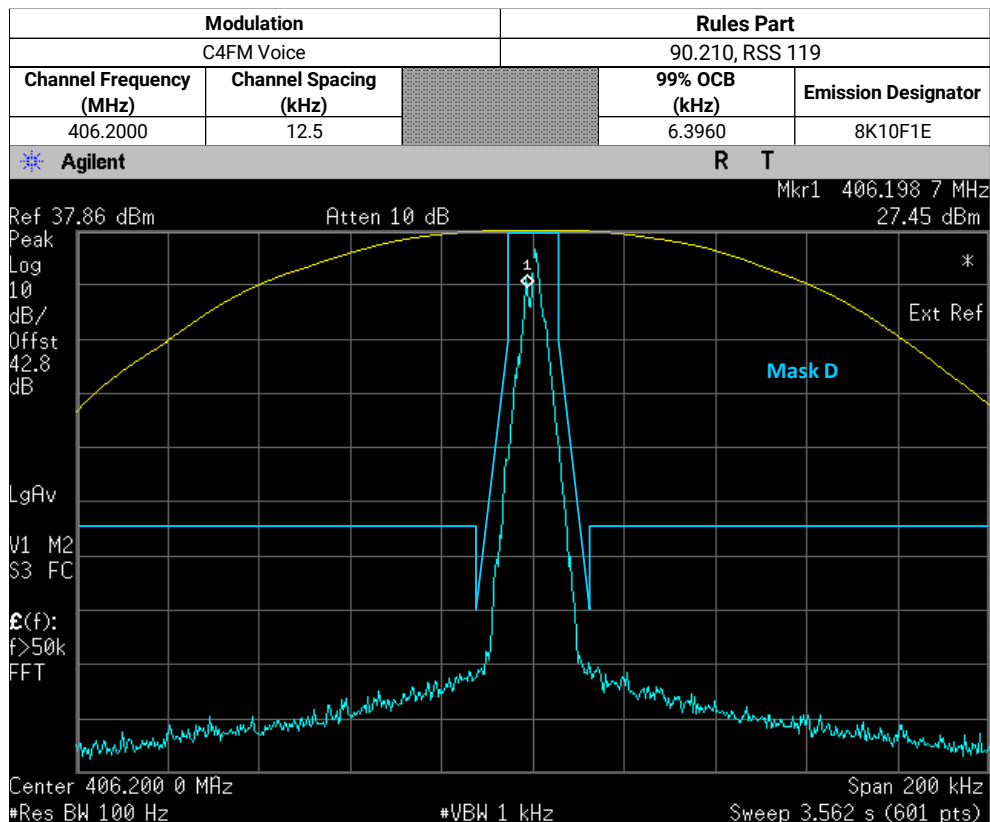
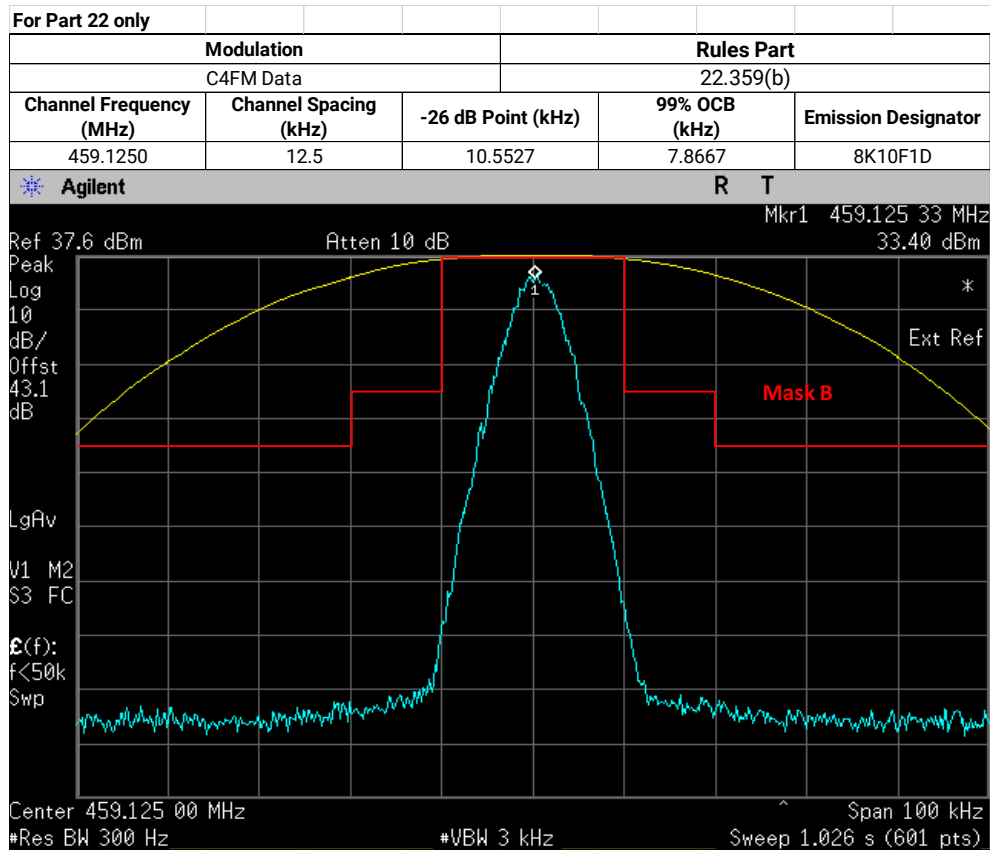
The 99% energy rule (title 47CFR 2.989) was used for digital mode and is more accurate than Carson's rule. It basically states that 99% of the modulation energy falls within X kHz, in this case, 7.60 kHz. Measurements were performed in accordance with TIA/EIA TSB102.CAAB Section 2.2.5.2. The emission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

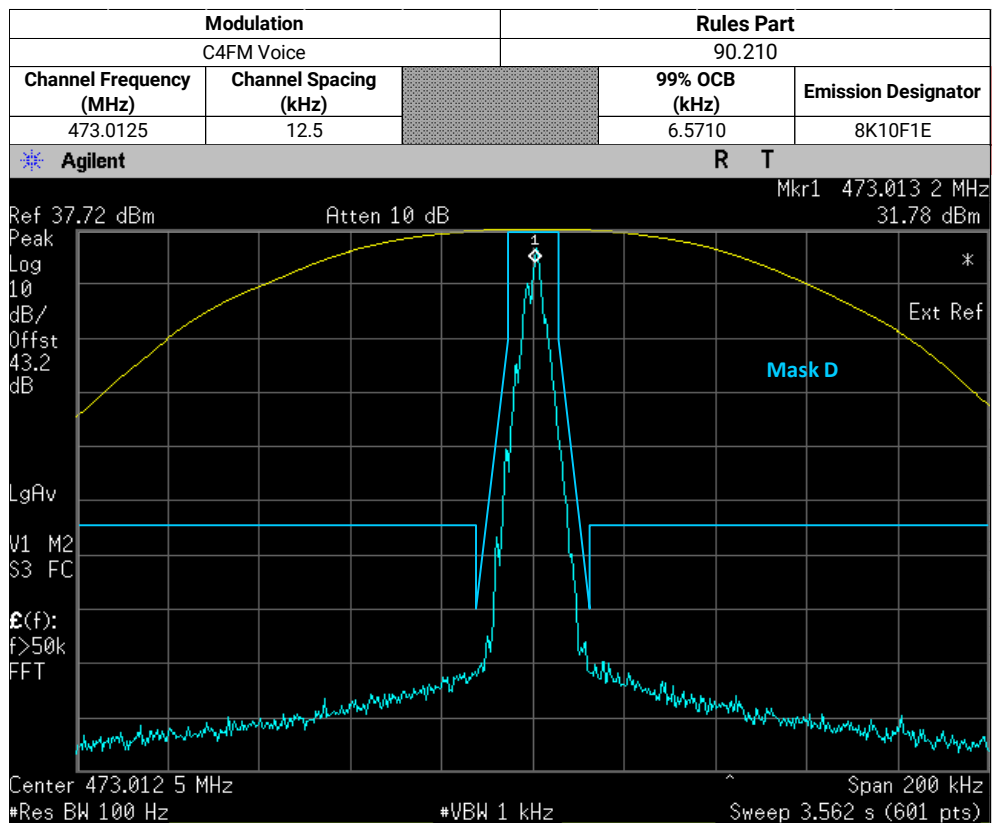
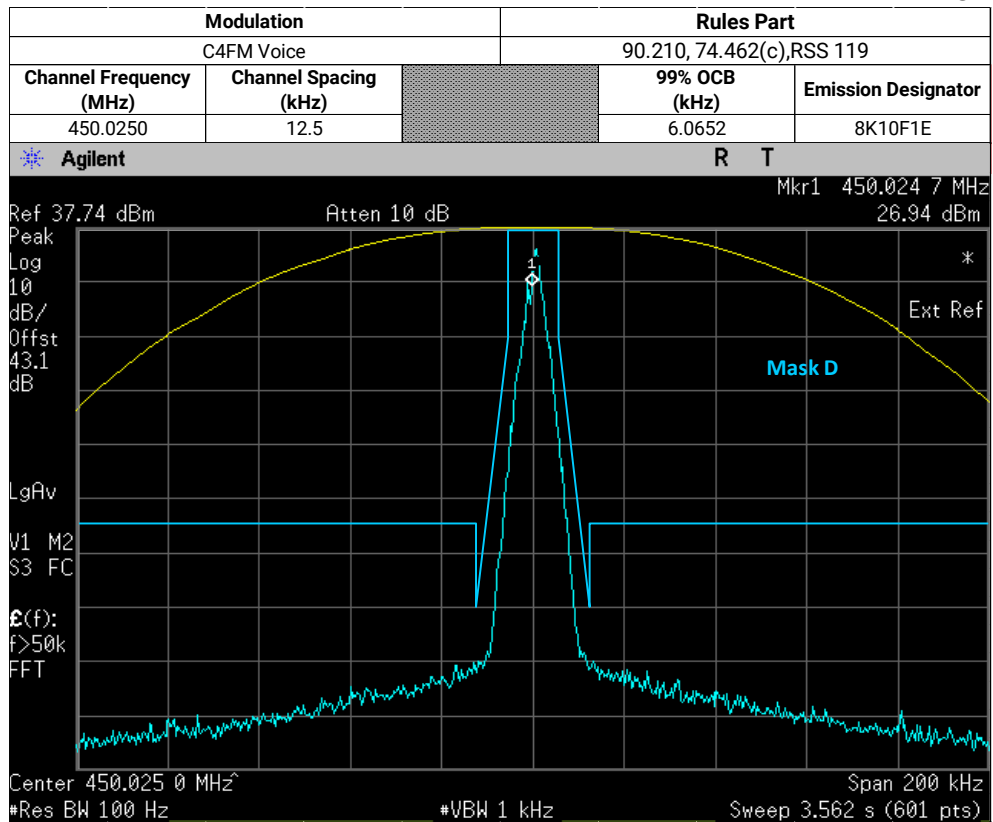
F1E/D/W portion of the designator indicates digital voice/data/voice+data.

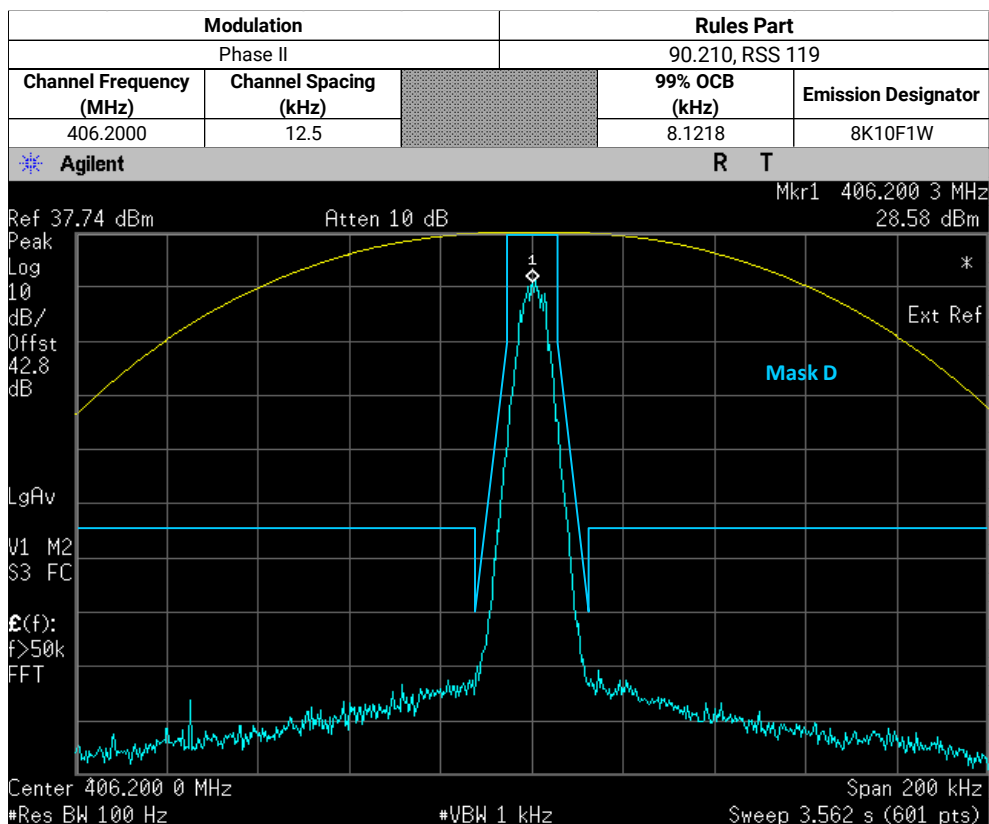
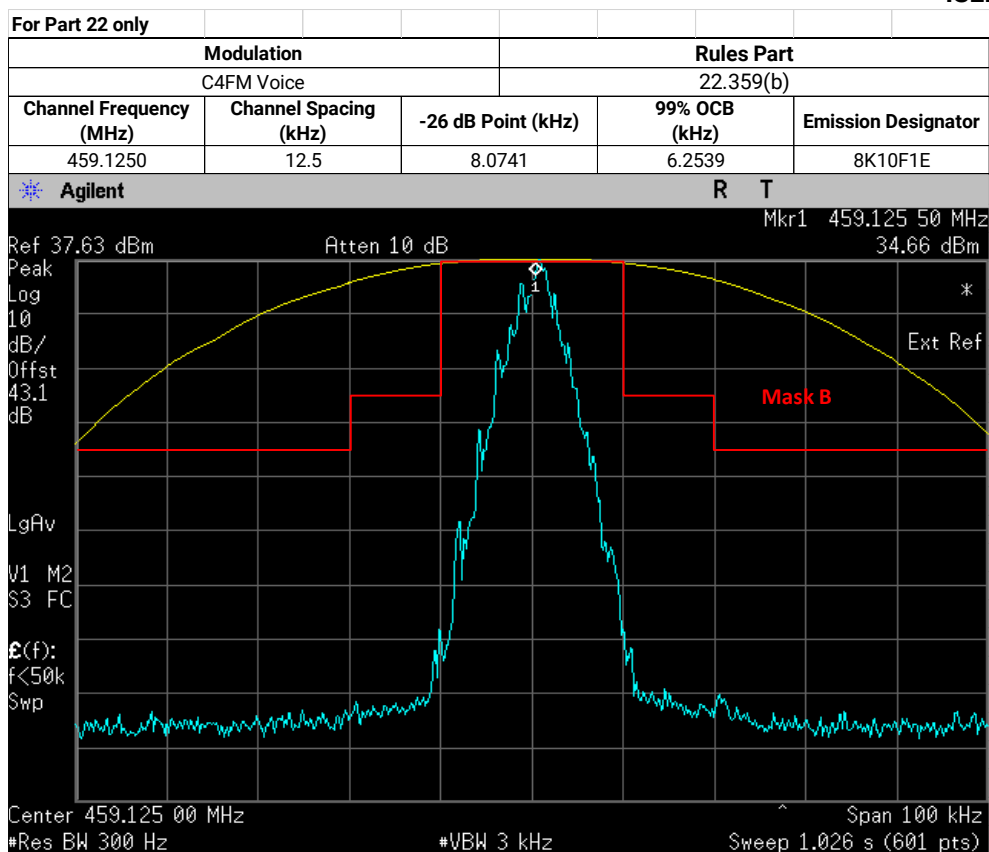
Therefore, the entire designator for 12.5 kHz channelization digital voice is 8K10F1E/D/W.

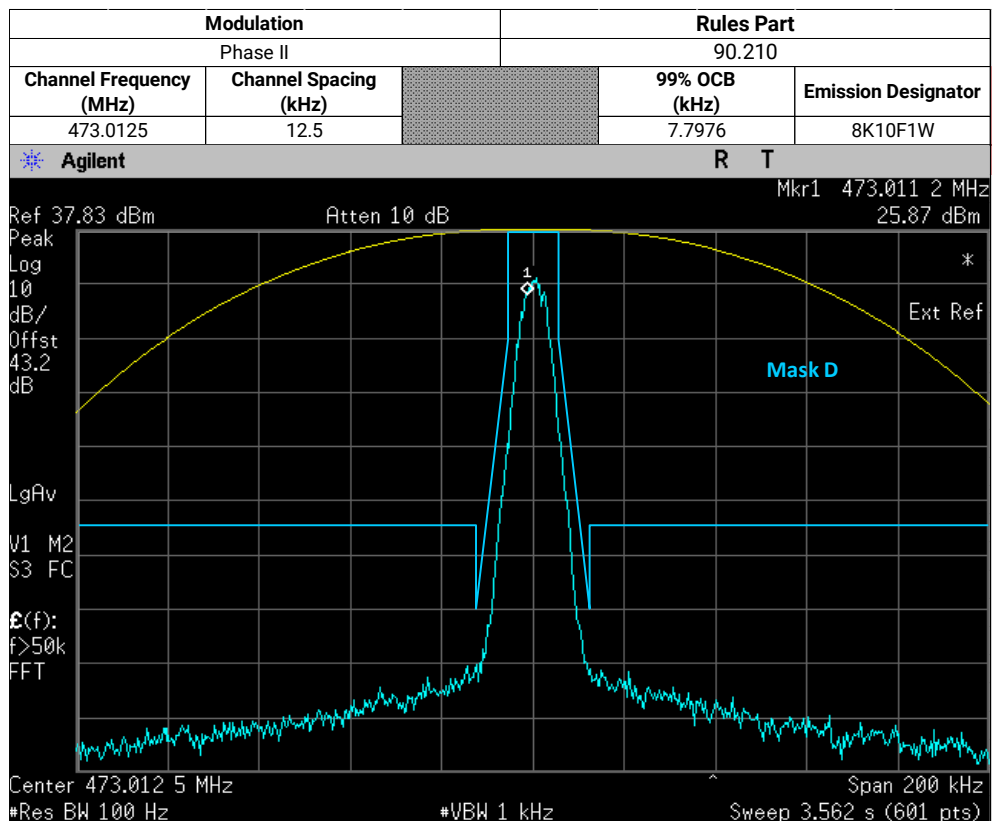
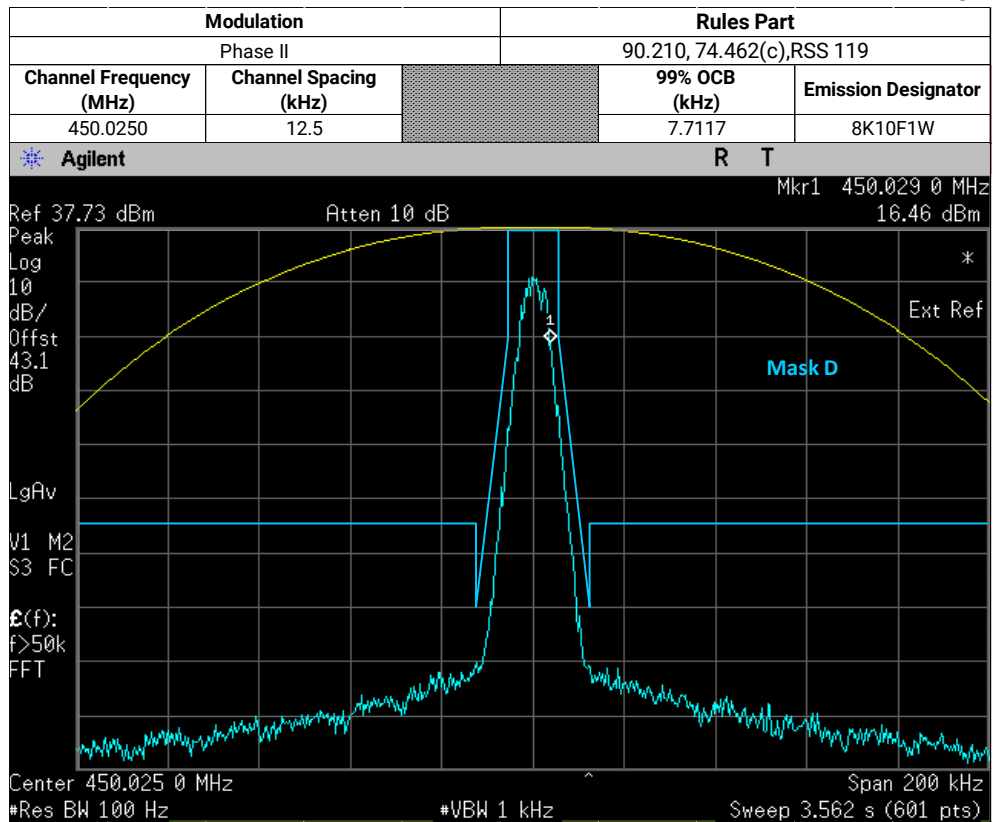


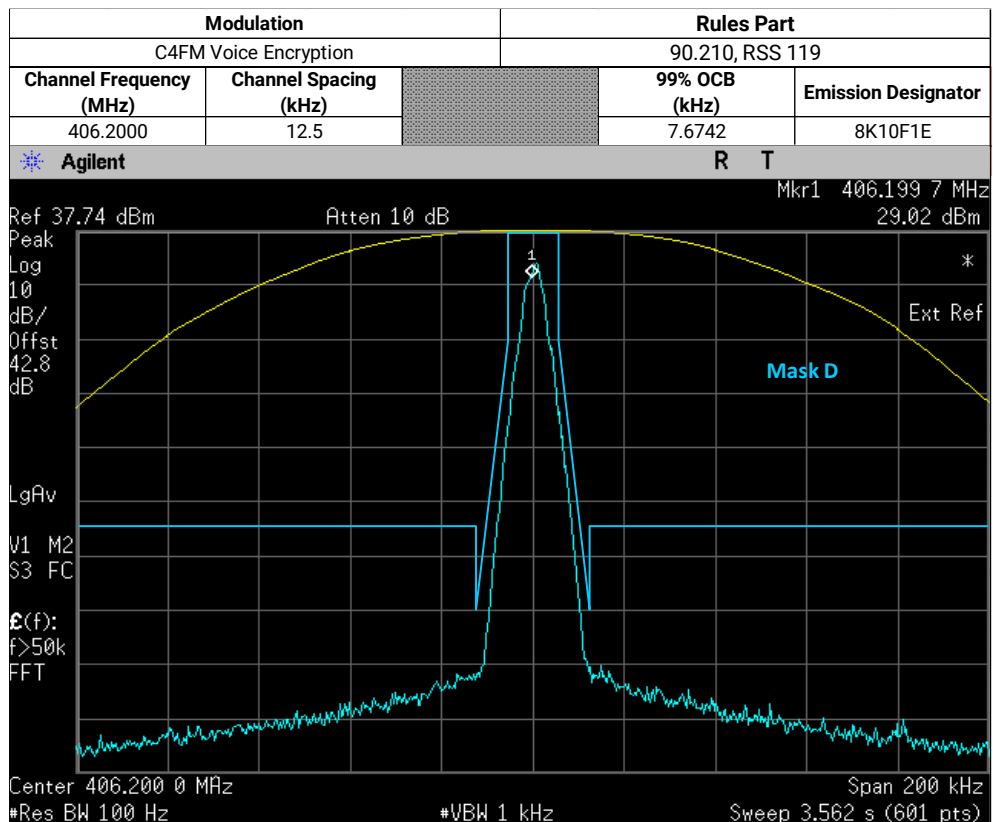
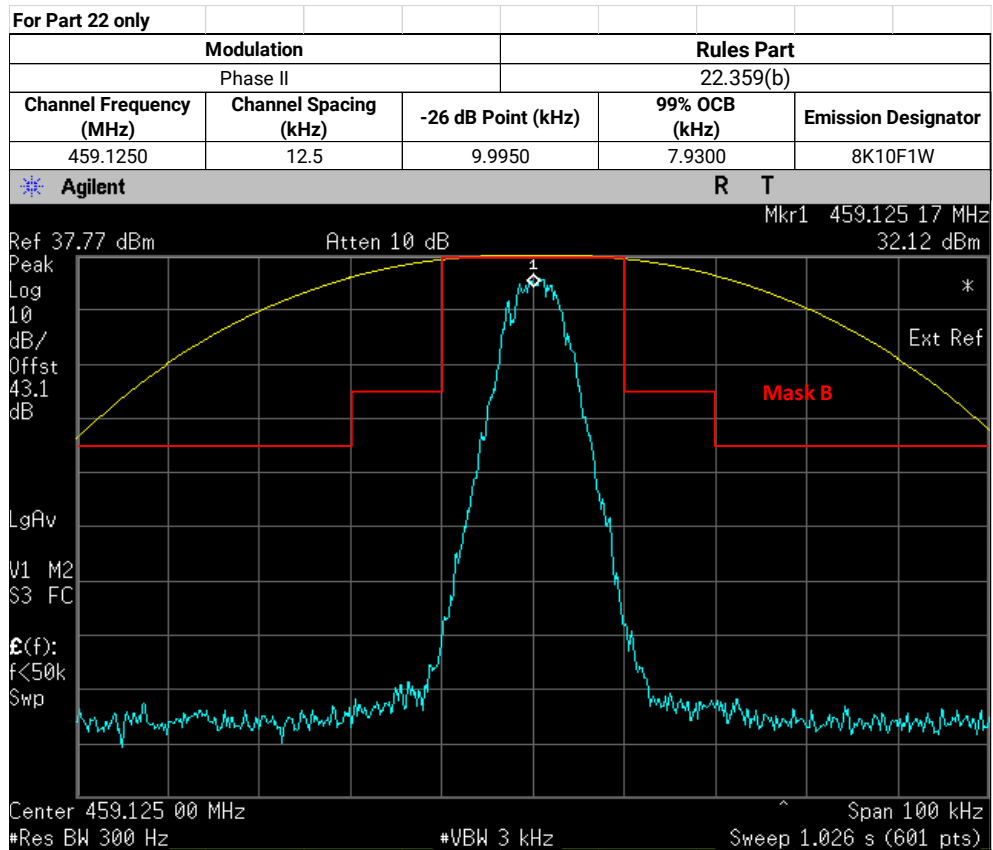


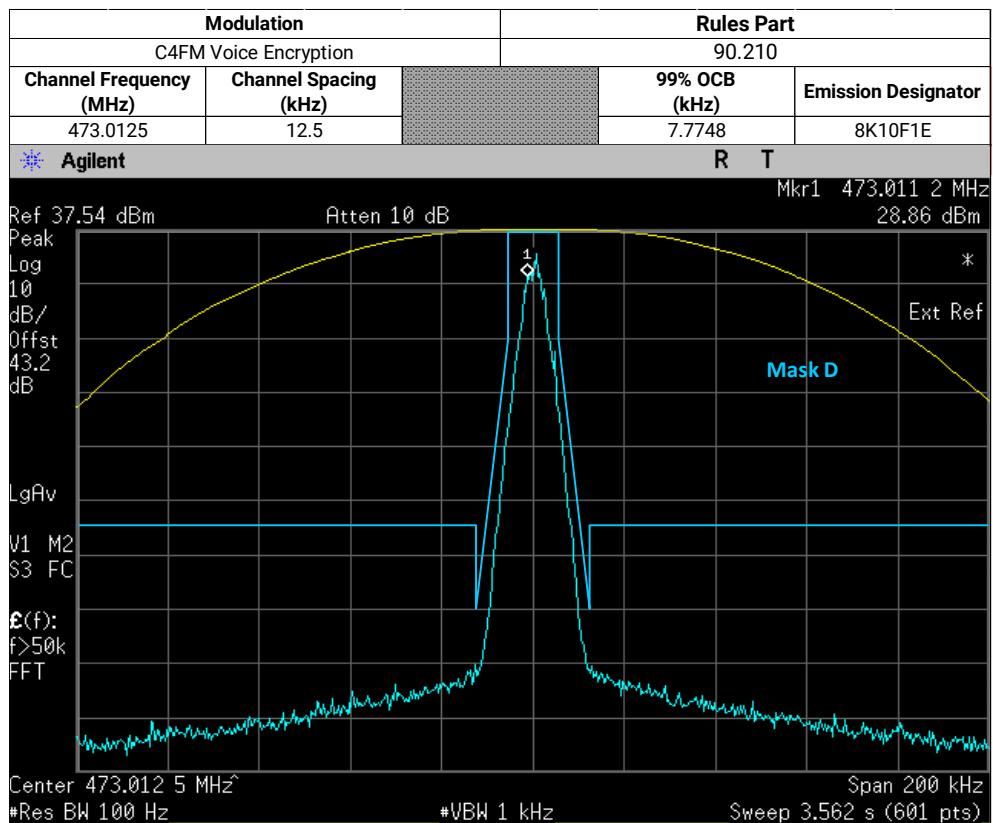
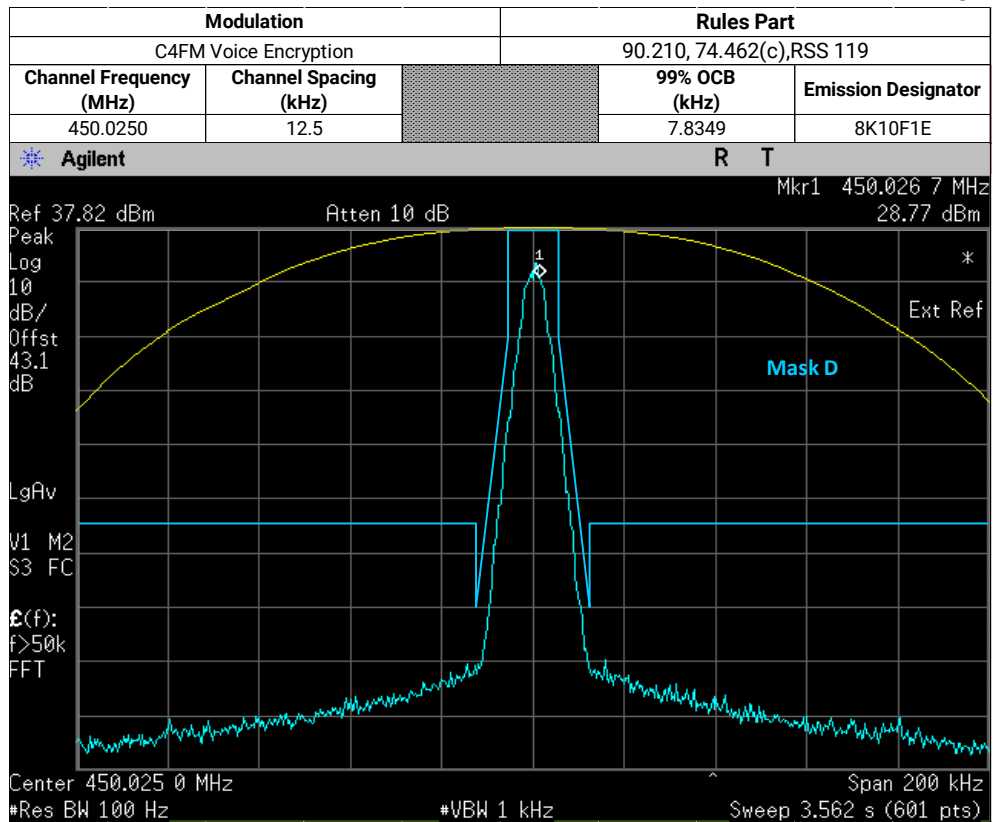


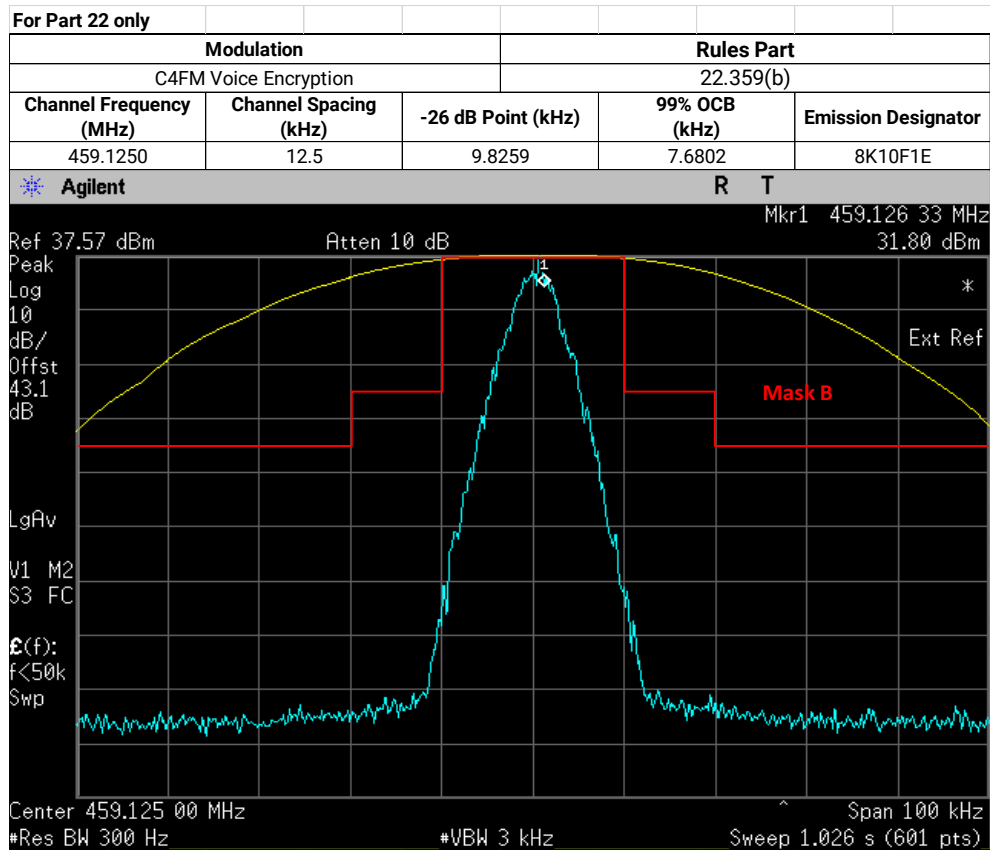










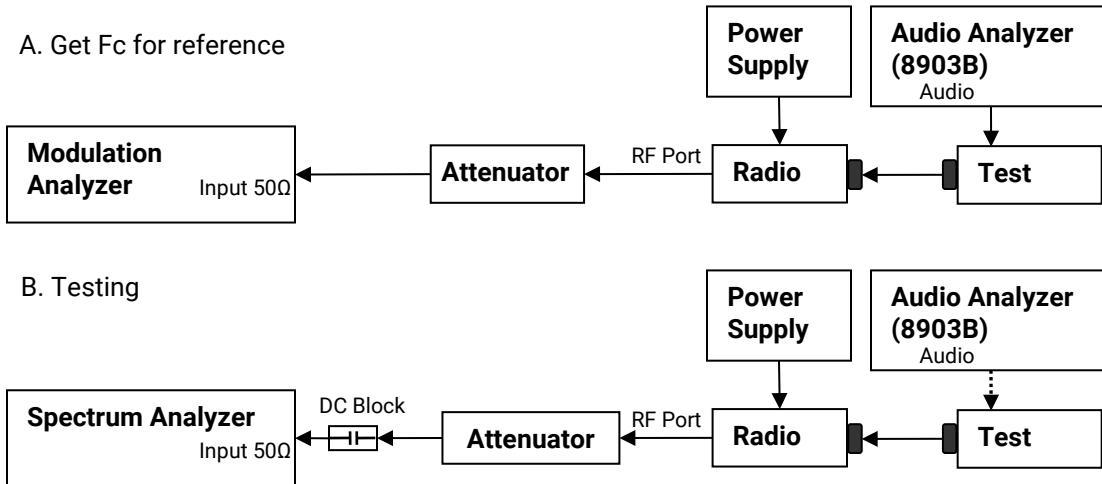


6.5.5. Test Limit

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.

6.6. Band Edge Conducted Spurious Emission (Part 22)

6.6.1. Test Setup (Analog)



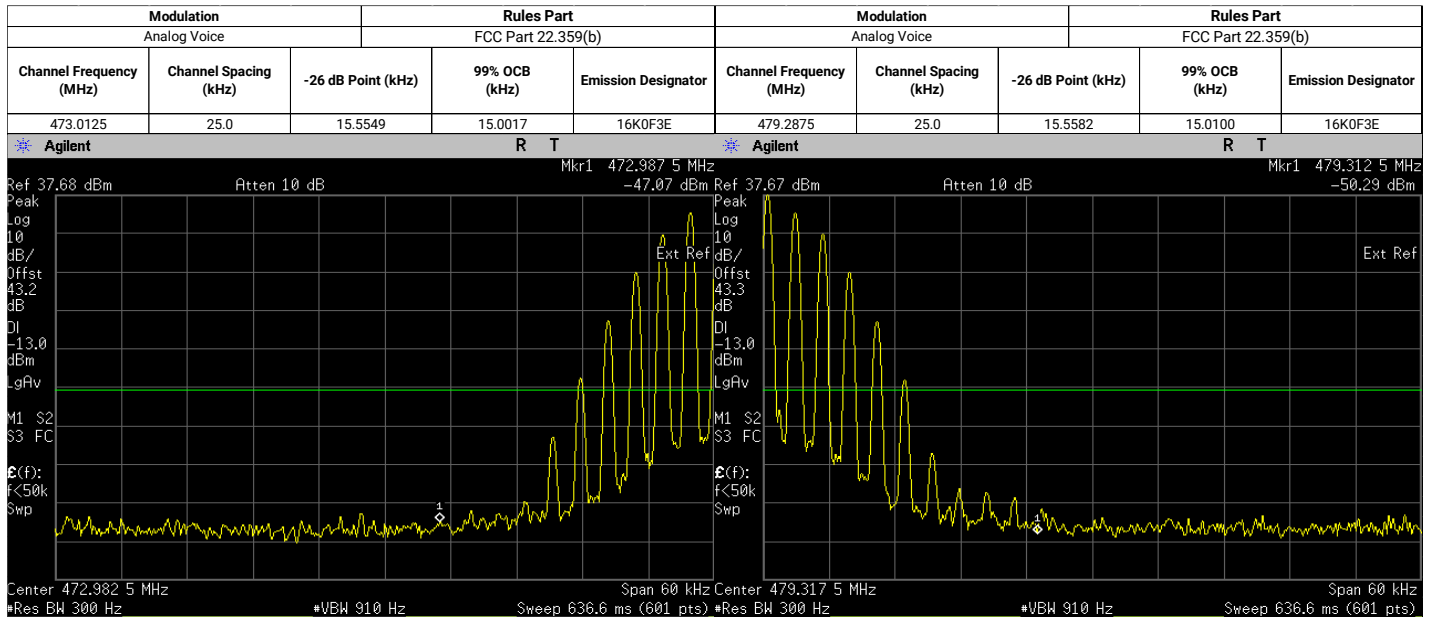
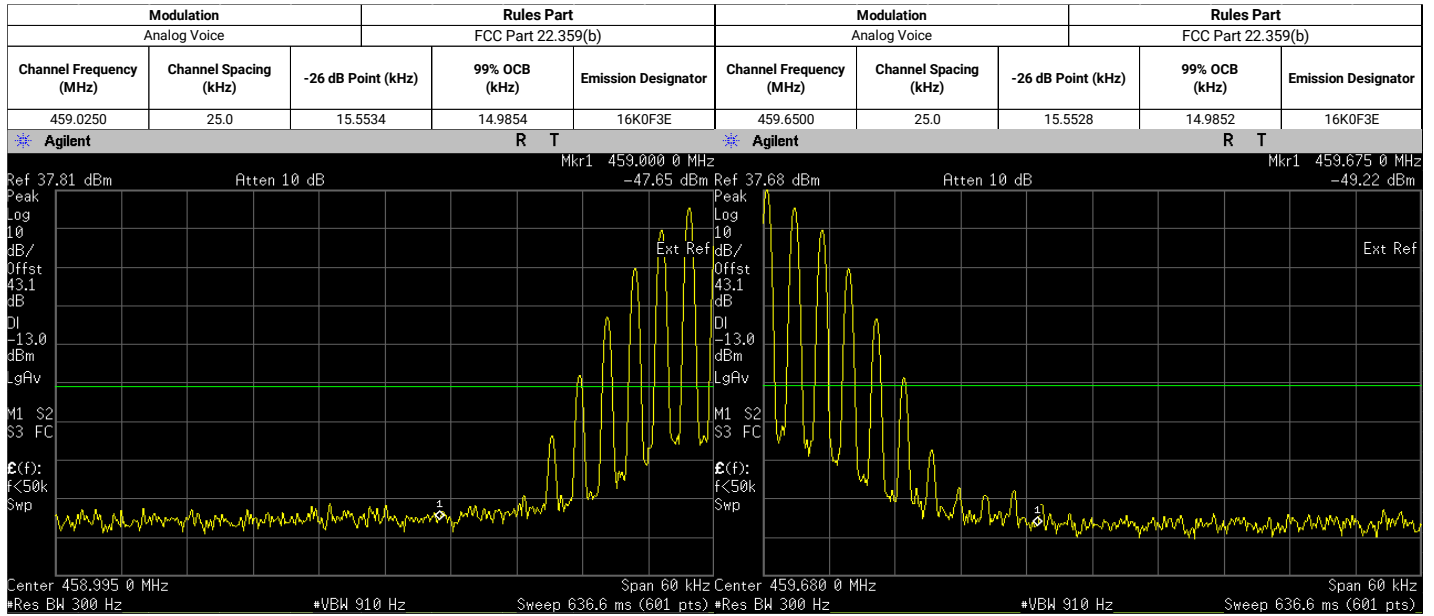
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
- 3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey the DUT.
- 4) Path loss for the measurement included.
- 5) Select the Occupied Bandwidth measurement for 99% and 26dB Emissions Bandwidth Measurement.
- 6) Key in the Fc and Resolution Bandwidth.
- 7) Transmit the DUT and record the occupied Bandwidth frequencies.
- 8) Preset the spectrum analyzer for band edge measurement.
- 9) The band edges of lowest and highest channels were measured.
- 10) Key in the Lowest and highest channel frequency, span is 60 kHz and Resolution Bandwidth is at least 1% of Emission Bandwidth.
- 11) Save the screen shot as modulated signal.
- 12) Remove the audio tone from audio analyzer to capture unmodulated signal.

***Note:**

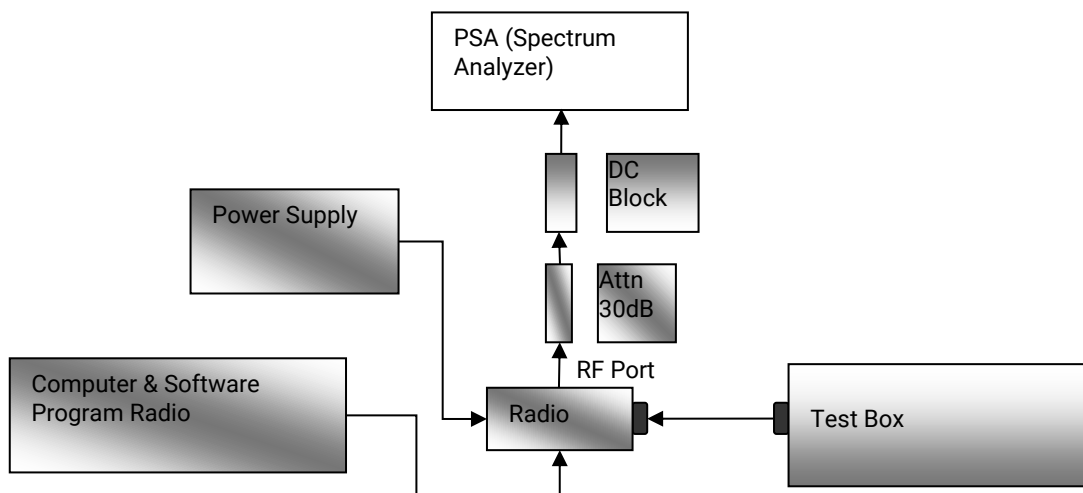
- For emission designator ending with F3E, 16K0F3E is the worst case and therefore only 16K0F3E will be shown.

6.6.2. Test Result (Analog)

For Part 22



6.6.3. Test Setup (Digital)



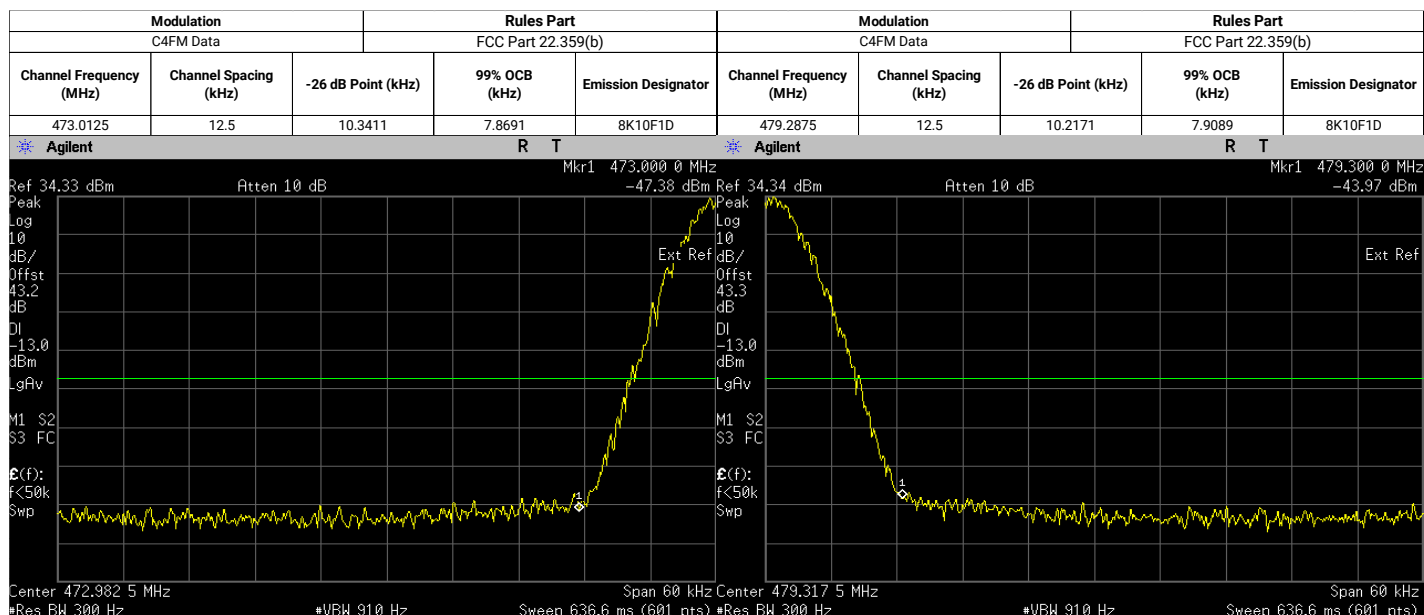
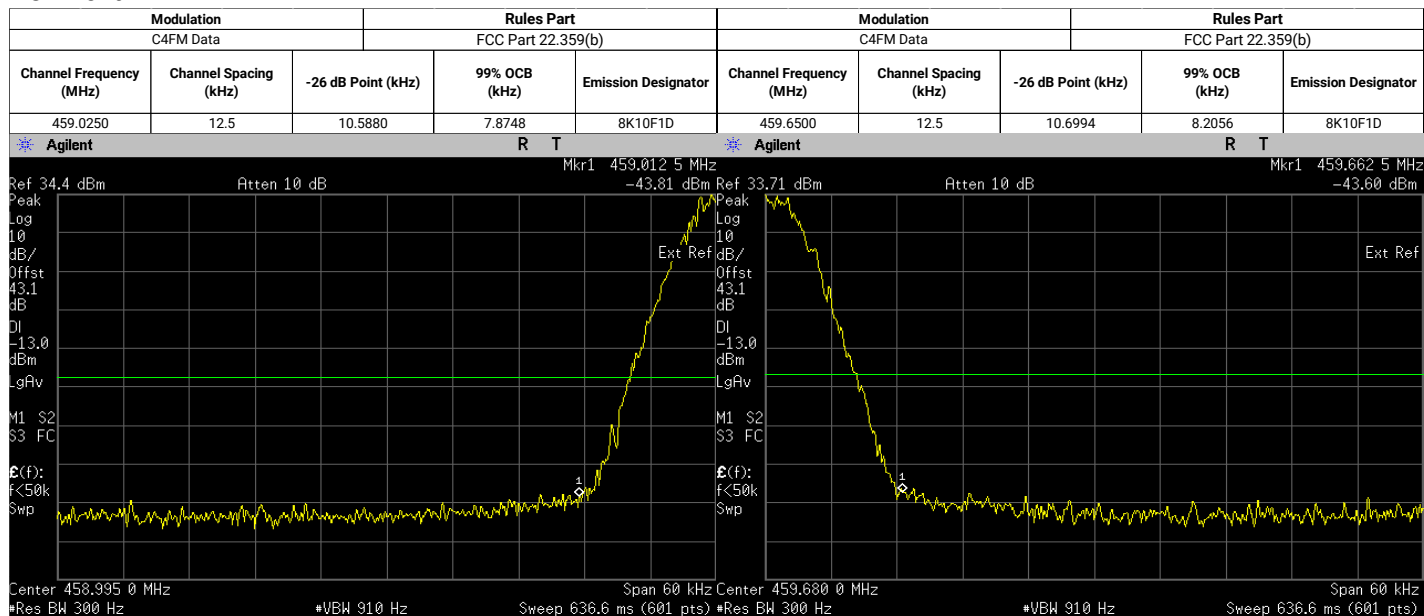
- 1) Program and set radio to operate in desire test frequency and digital mode with modulation. (*4FSK, C4FM or other digital modulation form).
- 2) Path loss for the measurement included.
- 3) Select the Occupied Bandwidth measurement for 99% and 26dB Emissions Bandwidth Measurement.
- 4) Key in the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

***Note:**

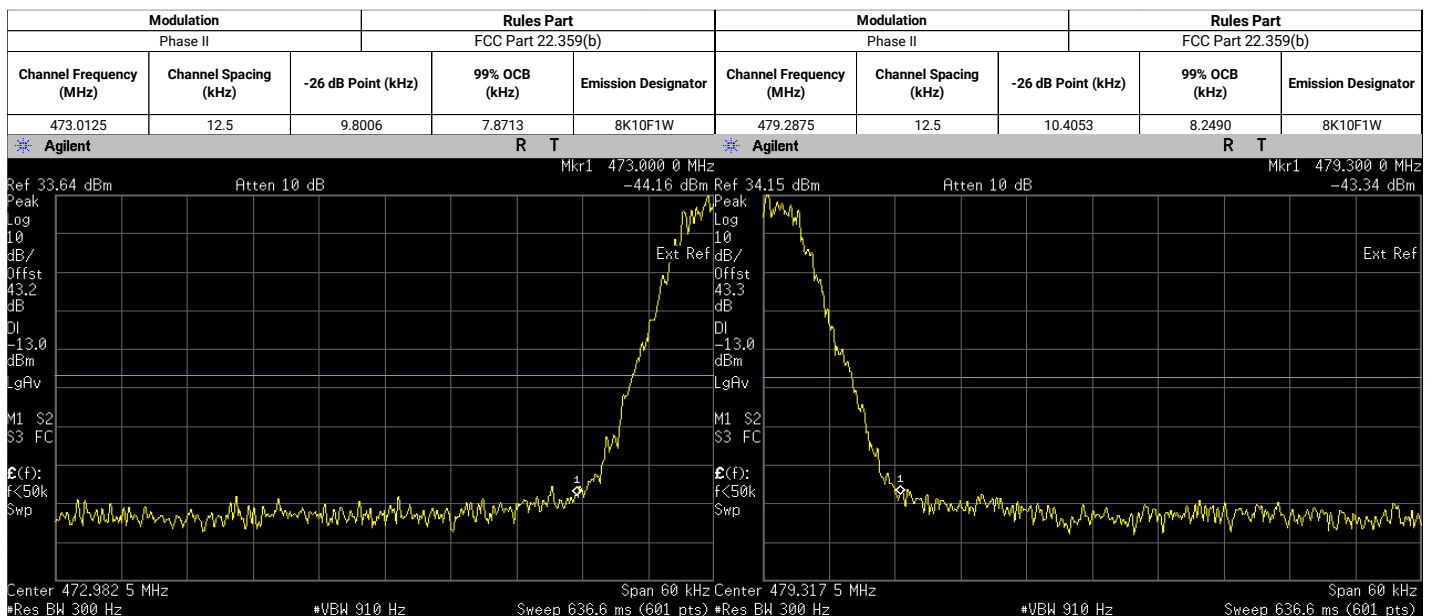
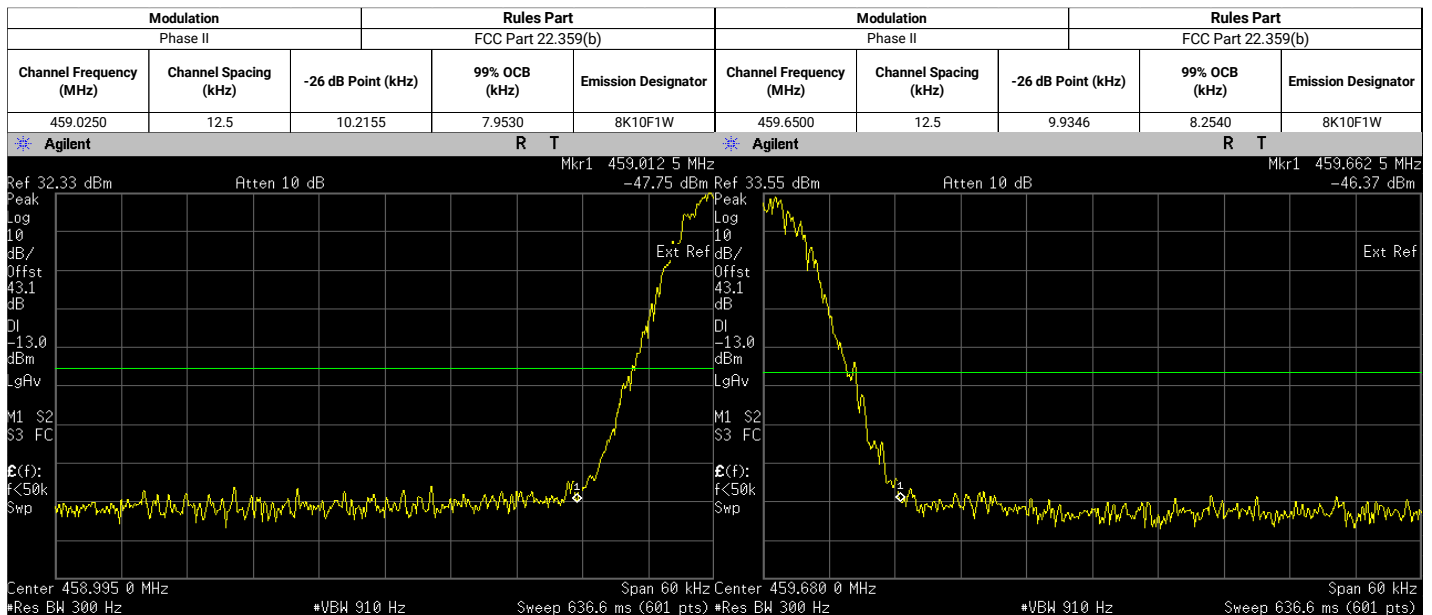
- For Digital Modulation, 12.5 kHz Data F1D & FXD would be the same. Therefore only measurements with F1D modulation shown below.
- For Digital Modulation, 12.5 kHz Data F1E & FXE would be the same. Therefore only measurements with F1E modulation shown below.

6.6.4. Test Result (Digital)

For Part 22



For Part 22

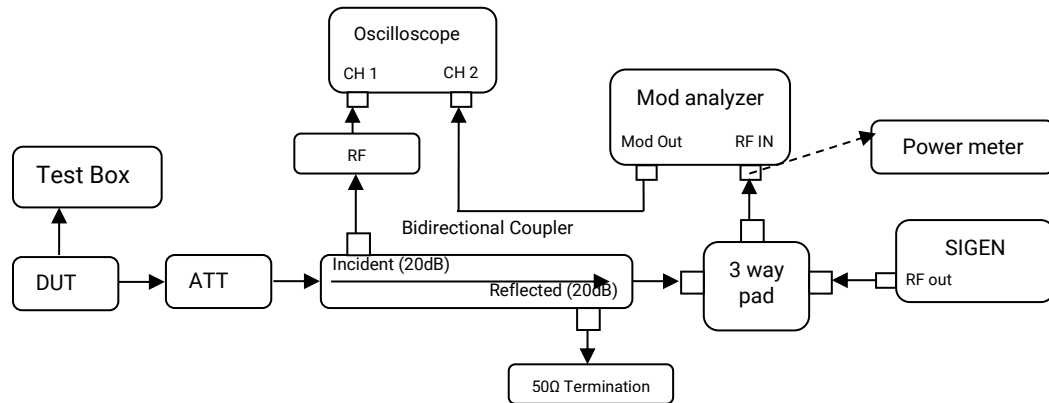


6.6.5. Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

6.7. Transient Frequency Behavior

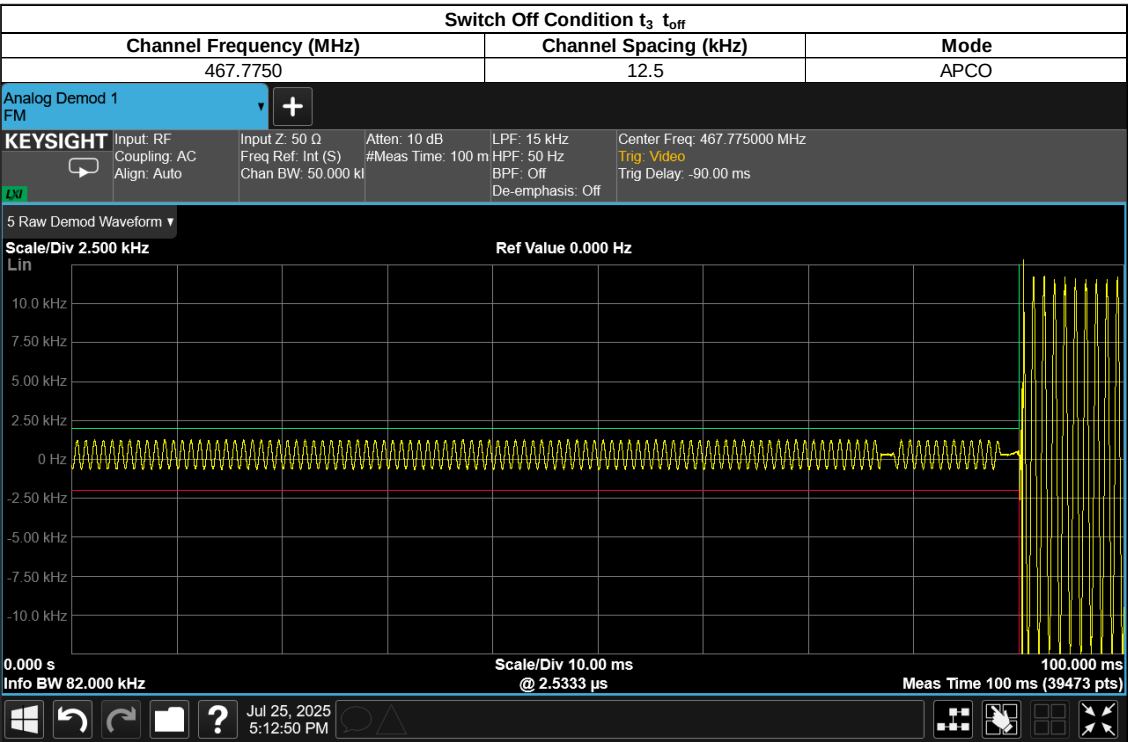
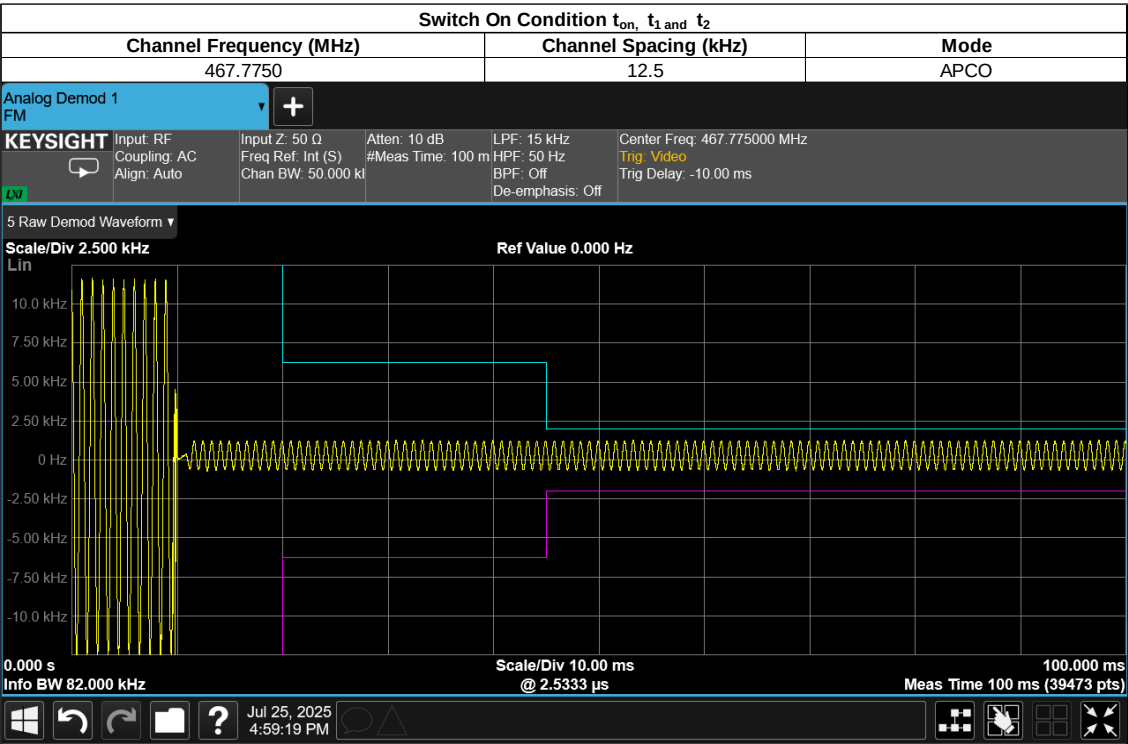
6.7.1. Test Setup



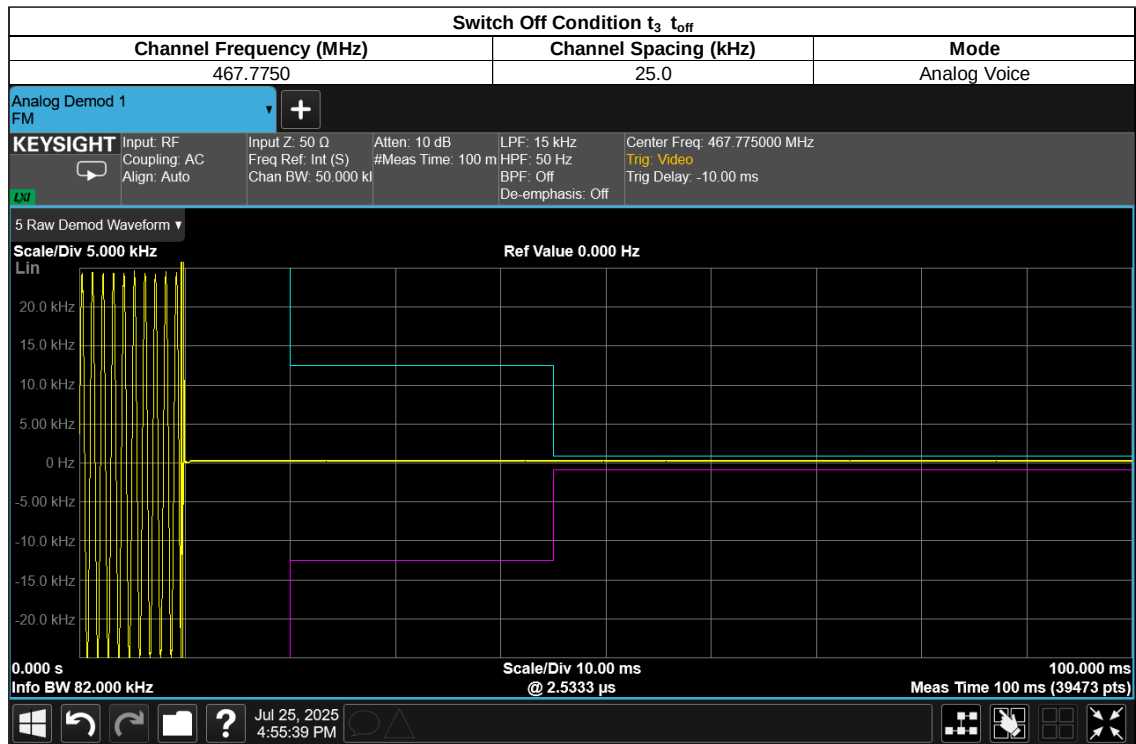
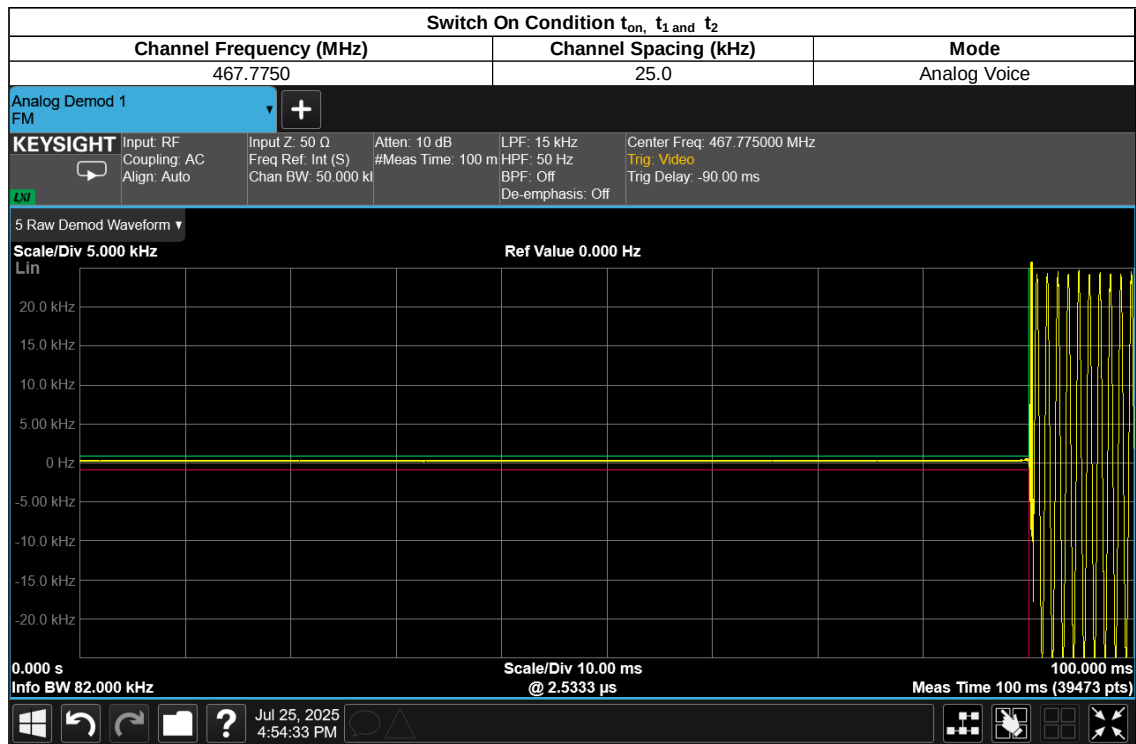
- 1) Connect the setup as figure above.
- 2) Path loss for the measurement included.
- 3) Set on Siggen with the assigned center frequency, internal 1 kHz FM tone.
FM Deviation: Analog 25kHz Channel Spacing = 25 kHz
Analog 12.5 kHz Channel Spacing = 12.5 kHz
C4FM = 12.5 kHz
- 4) Turn on 50 kHz high pass filter and 15 kHz low pass filter on modulation analyzer.
- 5) Supply sufficient attenuation ATT to provide the output power of $\leq -11\text{dBm}$ into power meter when DUT is keying up.
- 6) Note the power level on power meter and dekey the DUT.
- 7) Adjust the amplitude of the signal generator to the level power meter, maintained the amplitude throughout the rest of the measurement.
- 8) Connect the output to modulation analyzer.
- 9) Reduce 30dB attenuation and transmit the radio to get the trigger line.
- 10) Capture the screen shot for key-up (rising edge) and de-key (falling edge) mode.

6.7.2. Test Result

Max Power



Max Power
Not for FCC review



6.7.3. Test Limit

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

Time intervals ¹ 2	Maximum frequency difference ³	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t ₁ ⁴	±25.0 kHz	5.0 ms	10.0 ms
t ₂	±12.5 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t ₁ ⁴	±12.5 kHz	5.0 ms	10.0 ms
t ₂	±6.25 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t ₁ ⁴	±6.25 kHz	5.0 ms	10.0 ms
t ₂	±3.125 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±6.25 kHz	5.0 ms	10.0 ms

¹_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on} .

t_2 is the time period immediately following t_1 .

t_3 is the time period from the instant when the transmitter is turned off until t_{off} .

t_{off} is the instant when the 1 kHz test signal starts to rise.

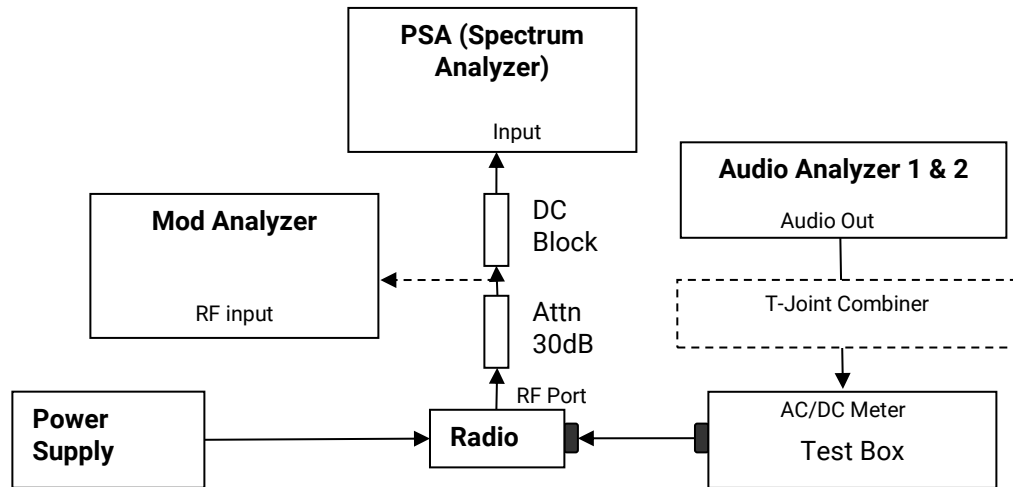
² During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in §90.213.

³ Difference between the actual transmitter frequency and the assigned transmitter frequency.

⁴ If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

6.8. Adjacent Channel Power

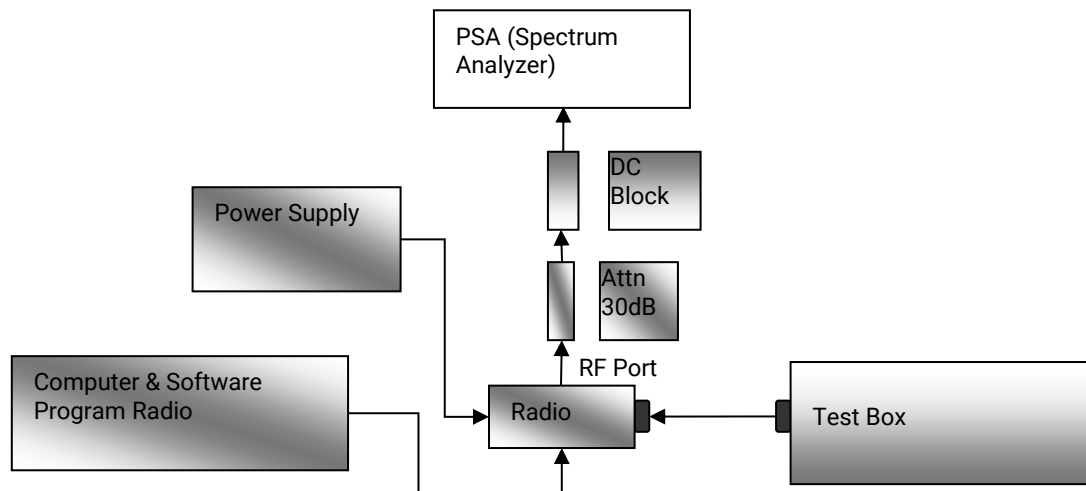
6.8.1. Test Setup (Analog)



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

6.8.2. Test Result Not Applicable

6.8.3. Test Setup (Digital)



- 1) Program and set radio to operate in desire test frequency and digital mode with modulation. (4FSK, C4FM or other digital modulation form).
- 2) Prepare setup as per picture.
- 3) Turn on the ACP Measurement – Press Measure, ACP.
- 4) Set Span, Resolution Bandwidth and Video Bandwidth as per rules part.
- 5) Transmit the radio and record the Adjacent Channel Power value in dBc.

6.8.4. Test Result Not Applicable

6.8.5. Test Limit

12.5 kHz MOBILE TRANSMITTER ACP REQUIREMENTS

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

25 kHz MOBILE TRANSMITTER ACP REQUIREMENTS

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

12.5 kHz BASE TRANSMITTER ACP REQUIREMENTS

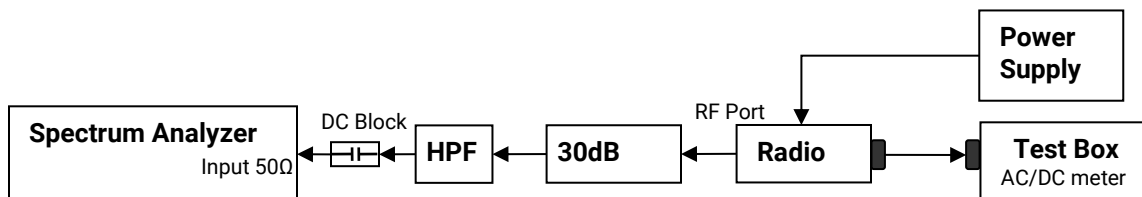
Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP (dBc)
9.375	6.25	-40
15.625	6.25	-60
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
350.00	100	-65
>400 kHz to 12 MHz	30 (s)	-80
12 MHz to paired receive band	30 (s)	-80
In the paired receive band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

25 kHz BASE TRANSMITTER ACP REQUIREMENTS

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

6.9. Conducted Spurious Emission

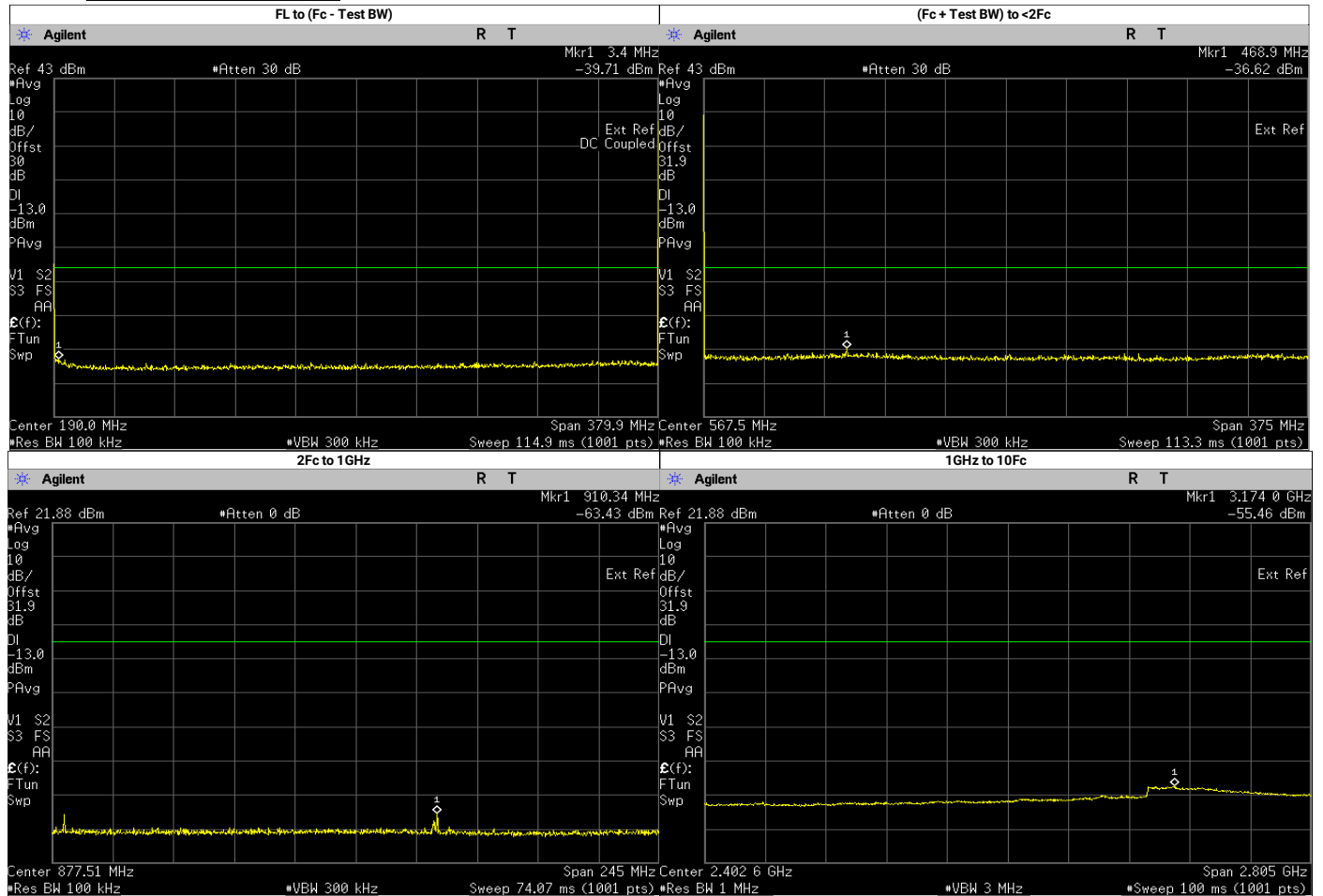
6.9.1. Test Setup



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

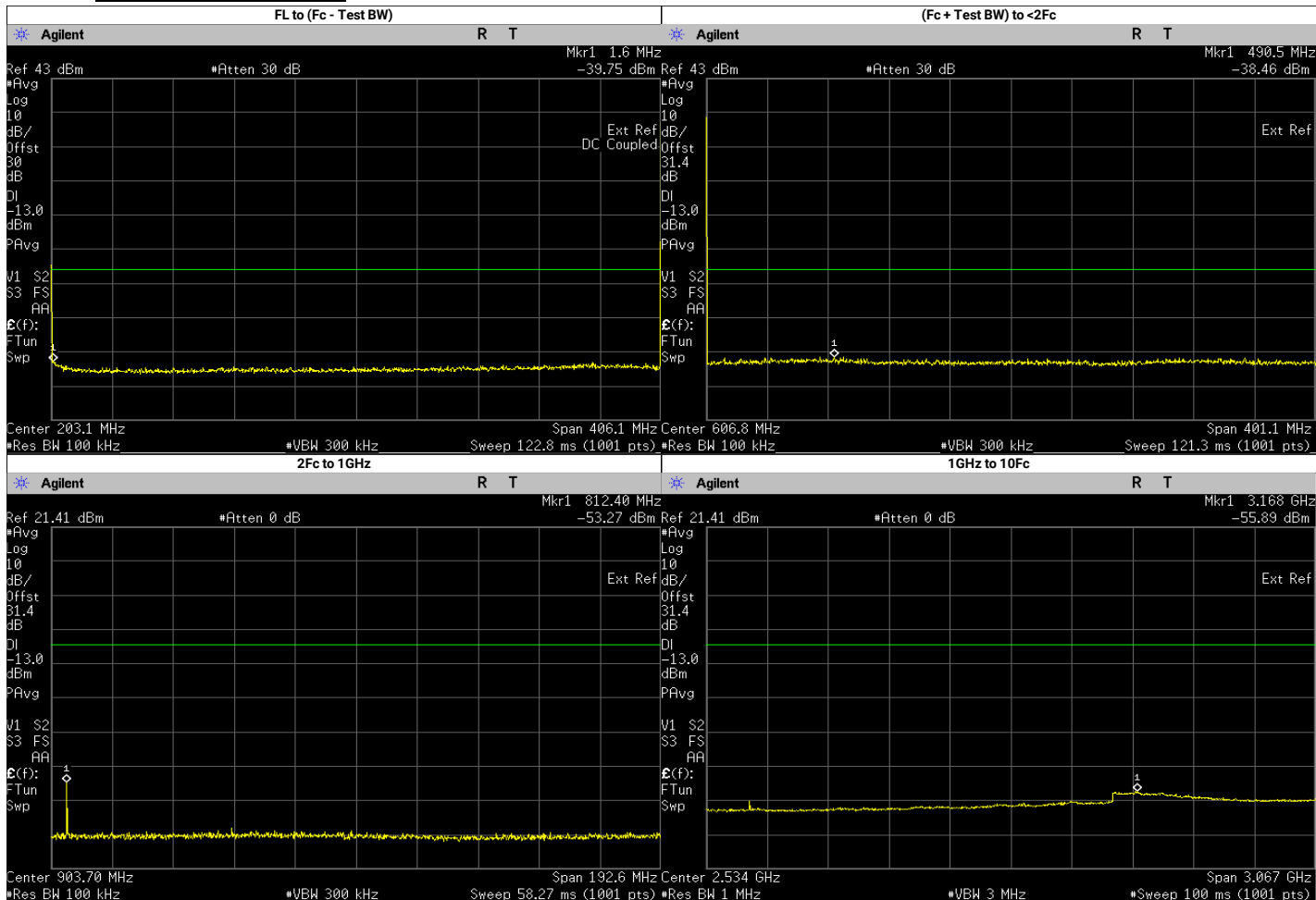
6.9.2. Test Result (Analog)

Analog: 380.0125 MHz, 25 kHz Channel Spacing, Max Power
Not for FCC review



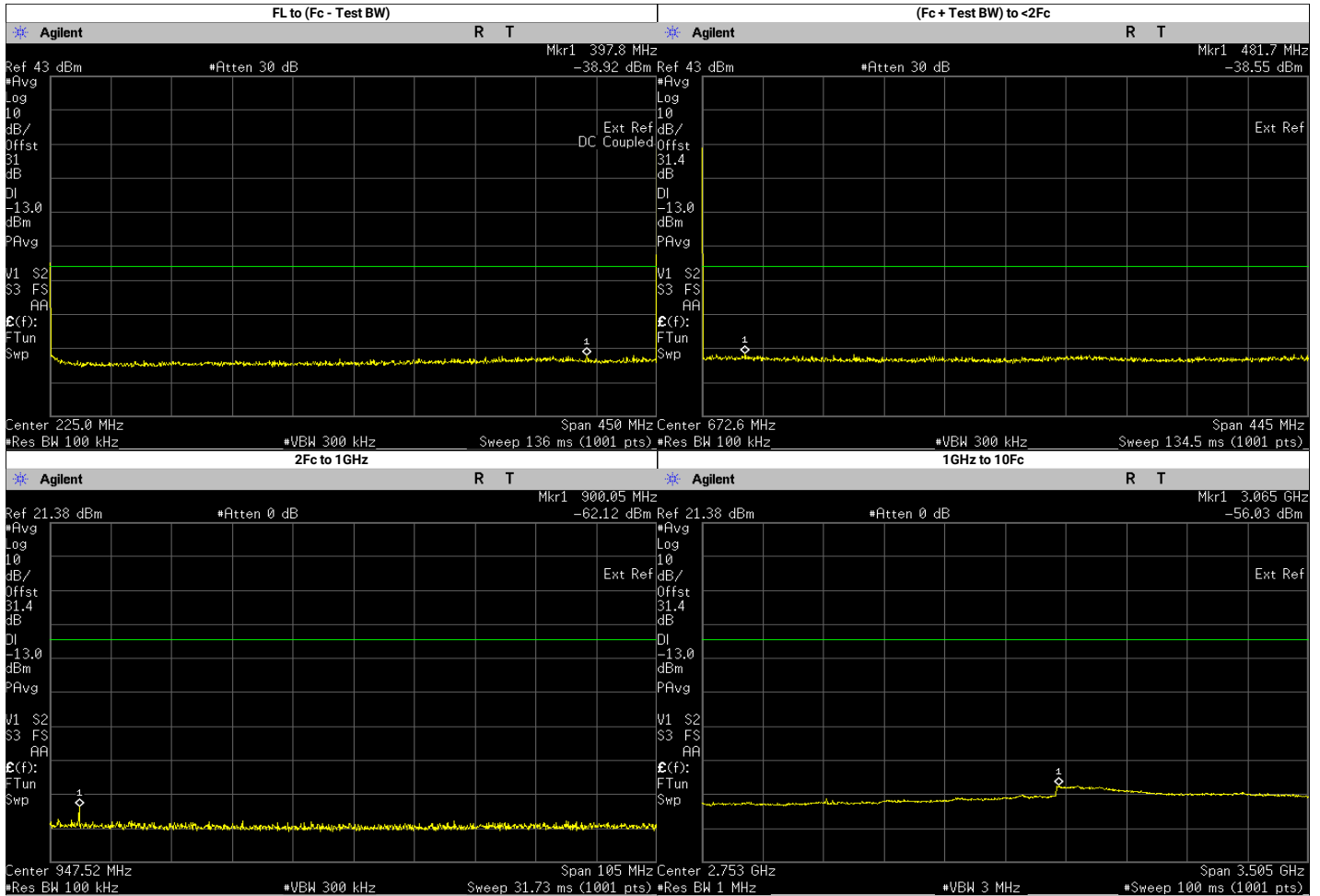
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	3.4000	-39.7080	-13	PASS
(Fc + Test BW) to <2Fc	468.9329	-36.6200	-13	PASS
2Fc to 1GHz	910.3392	-63.4300	-13	PASS
	760.0250	-64.1371	-13	PASS
1GHz to 10Fc	3173.9720	-55.4550	-13	PASS
	1140.0370	-60.7412	-13	PASS
	1520.0500	-60.7305	-13	PASS
	1900.0620	-60.4231	-13	PASS
	2280.0750	-60.0943	-13	PASS
	2660.0880	-59.5405	-13	PASS
	3040.1000	-58.4266	-13	PASS
	3420.1130	-56.6445	-13	PASS
	3800.1250	-58.2787	-13	PASS

Analog: 406.2000 MHz, 25 kHz Channel Spacing, Max Power
Not for FCC review



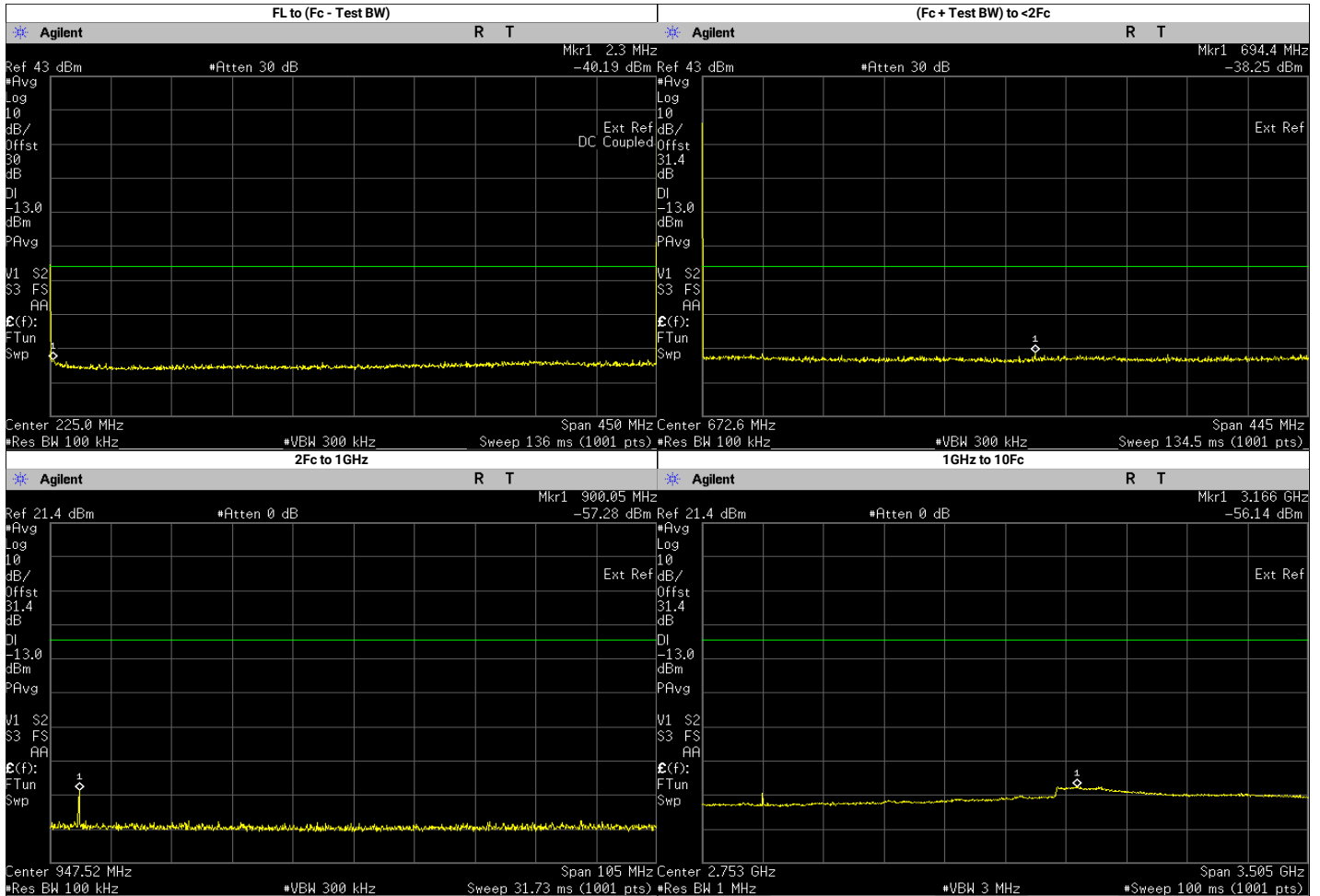
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.6000	-39.7510	-13	PASS
(Fc + Test BW) to <2Fc	490.4959	-38.4600	-13	PASS
2Fc to 1GHz	812.4000	-53.2700	-13	PASS
1GHz to 10Fc	3168.3690	-55.8900	-13	PASS
	1218.6000	-59.4128	-13	PASS
	1624.8000	-61.0516	-13	PASS
	2031.0000	-60.6170	-13	PASS
	2437.2000	-60.3105	-13	PASS
	2843.4000	-58.9400	-13	PASS
	3249.6000	-56.7445	-13	PASS
	3655.8000	-58.4080	-13	PASS
	4062.0000	-58.4817	-13	PASS

Analog: 450.0250 MHz, 25 kHz Channel Spacing, Low Power **For Part 74**



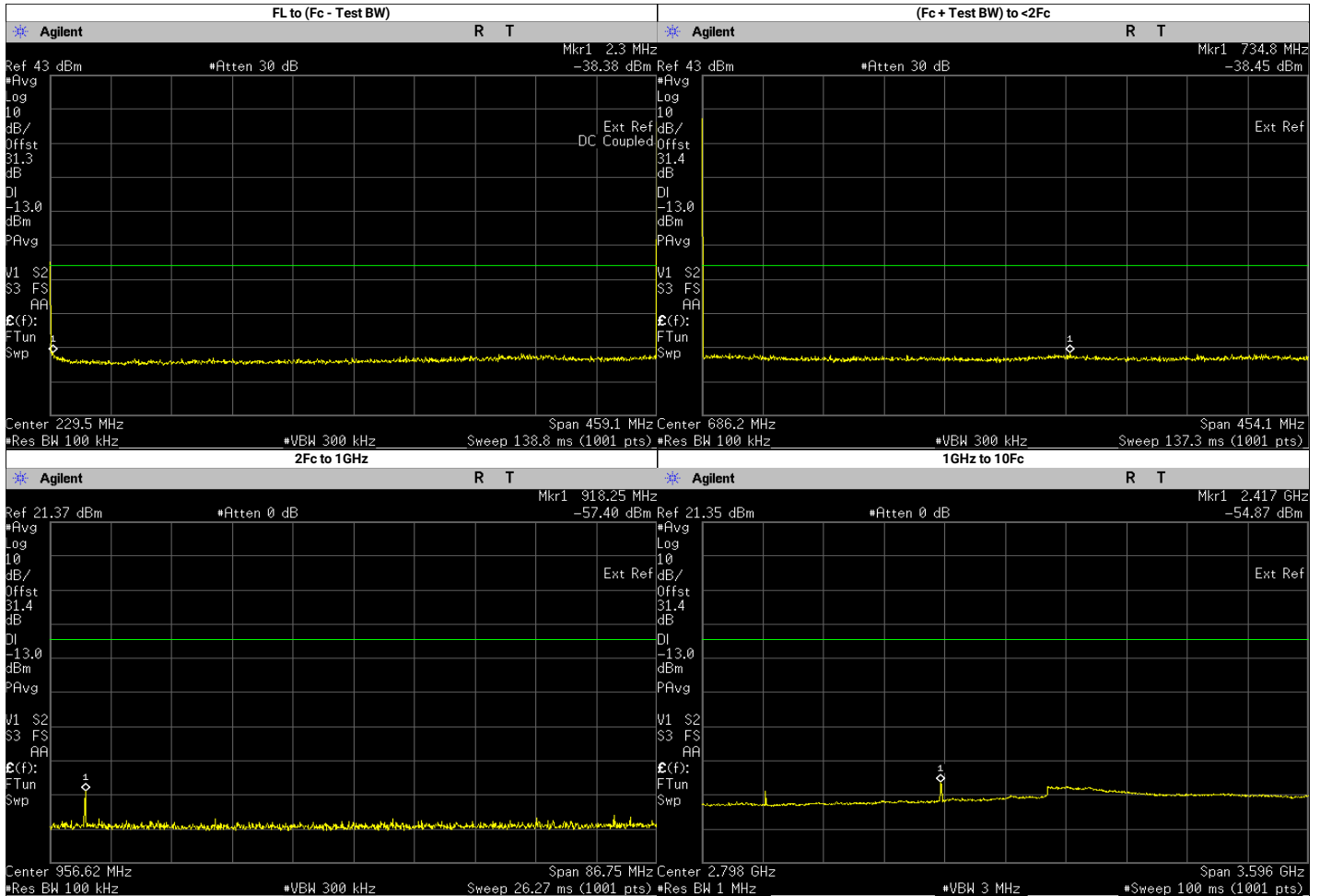
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	397.8000	-38.9180	-13	PASS
(Fc + Test BW) to <2Fc	481.6745	-38.5500	-13	PASS
2Fc to 1GHz	900.0500	-63.2795	-13	PASS
1GHz to 10Fc	3064.5920	-56.0300	-13	PASS
	1350.0750	-61.5103	-13	PASS
	1800.1000	-61.1534	-13	PASS
	2250.1250	-60.6982	-13	PASS
	2700.1500	-60.1263	-13	PASS
	3150.1750	-56.5343	-13	PASS
	3600.2000	-58.2926	-13	PASS
	4050.2250	-58.4645	-13	PASS
	4500.2500	-59.3590	-13	PASS

Analog: 450.0250 MHz, 25 kHz Channel Spacing, Max Power For Part 74



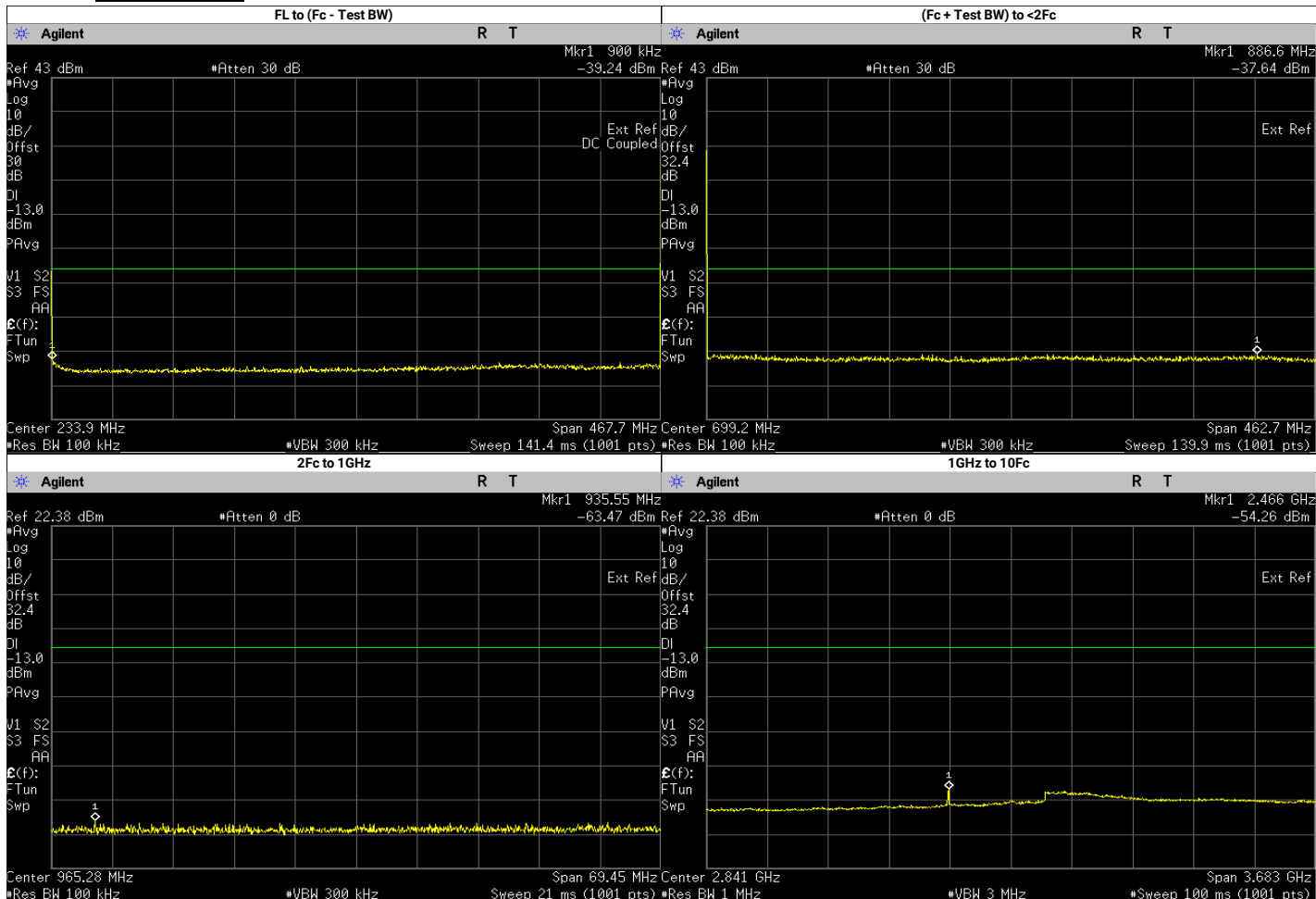
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	2.3000	-40.1870	-13	PASS
(Fc + Test BW) to <2Fc	694.3693	-38.2500	-13	PASS
2Fc to 1GHz	900.0500	-57.2800	-13	PASS
1GHz to 10Fc	3166.2440	-56.1400	-13	PASS
	1350.0750	-58.4797	-13	PASS
	1800.1000	-61.0203	-13	PASS
	2250.1250	-60.8056	-13	PASS
	2700.1500	-60.1083	-13	PASS
	3150.1750	-56.5130	-13	PASS
	3600.2000	-58.1165	-13	PASS
	4050.2250	-58.5178	-13	PASS
	4500.2500	-59.2614	-13	PASS

Analog: 459.1250 MHz, 25 kHz Channel Spacing, Max Power For Part 22



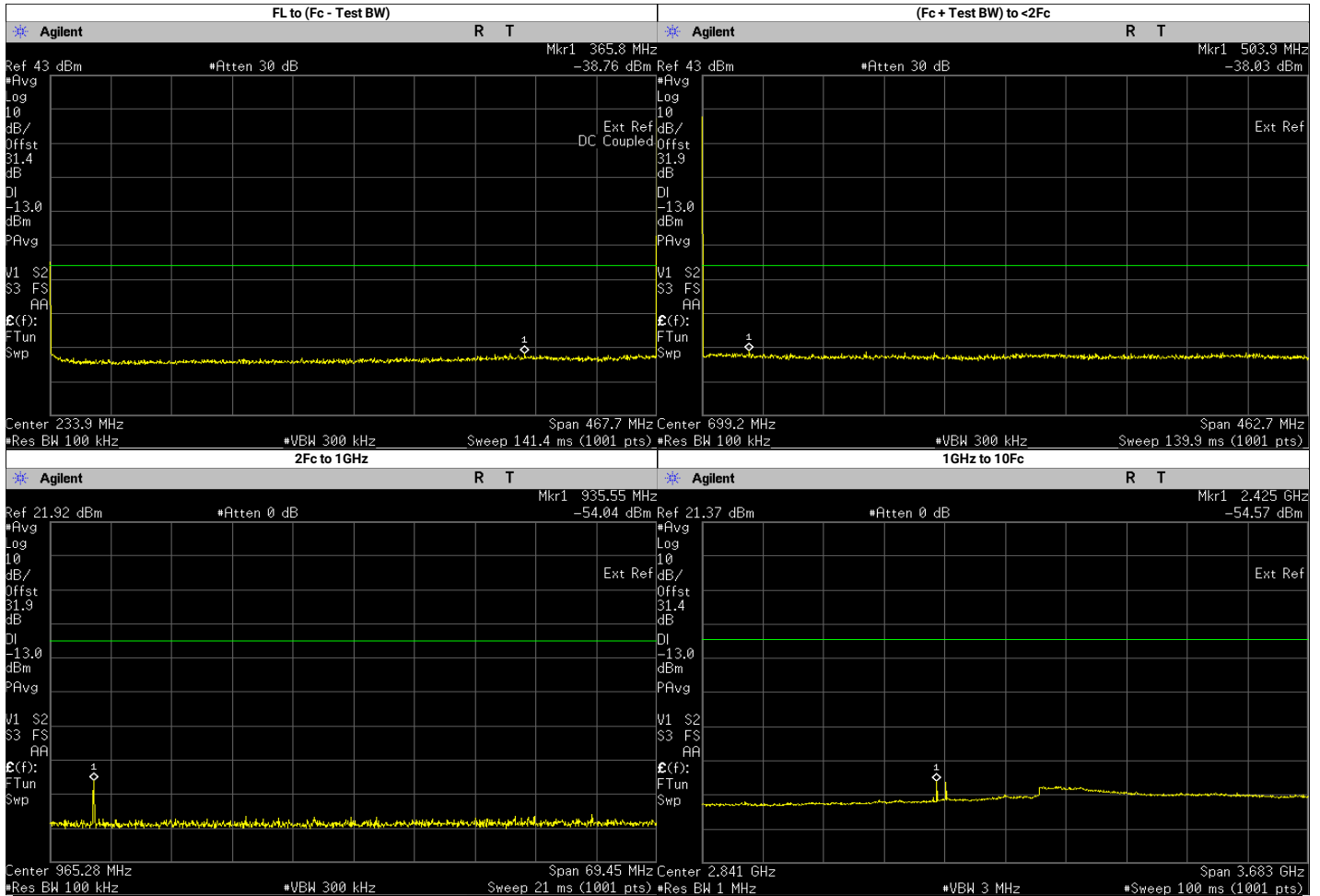
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	2.3000	-38.3790	-13	PASS
(Fc + Test BW) to <2Fc	734.8012	-38.4500	-13	PASS
2Fc to 1GHz	918.2500	-57.4000	-13	PASS
1GHz to 10Fc	2417.0000	-54.8700	-13	PASS
	1377.3750	-57.3570	-13	PASS
	1836.5000	-61.2498	-13	PASS
	2295.6250	-60.6628	-13	PASS
	2754.7500	-59.5317	-13	PASS
	3213.8750	-56.8905	-13	PASS
	3673.0000	-58.4962	-13	PASS
	4132.1250	-58.3954	-13	PASS
	4591.2500	-59.1842	-13	PASS

Analog: 467.7750 MHz, 25 kHz Channel Spacing, Low Power **For Part 80**



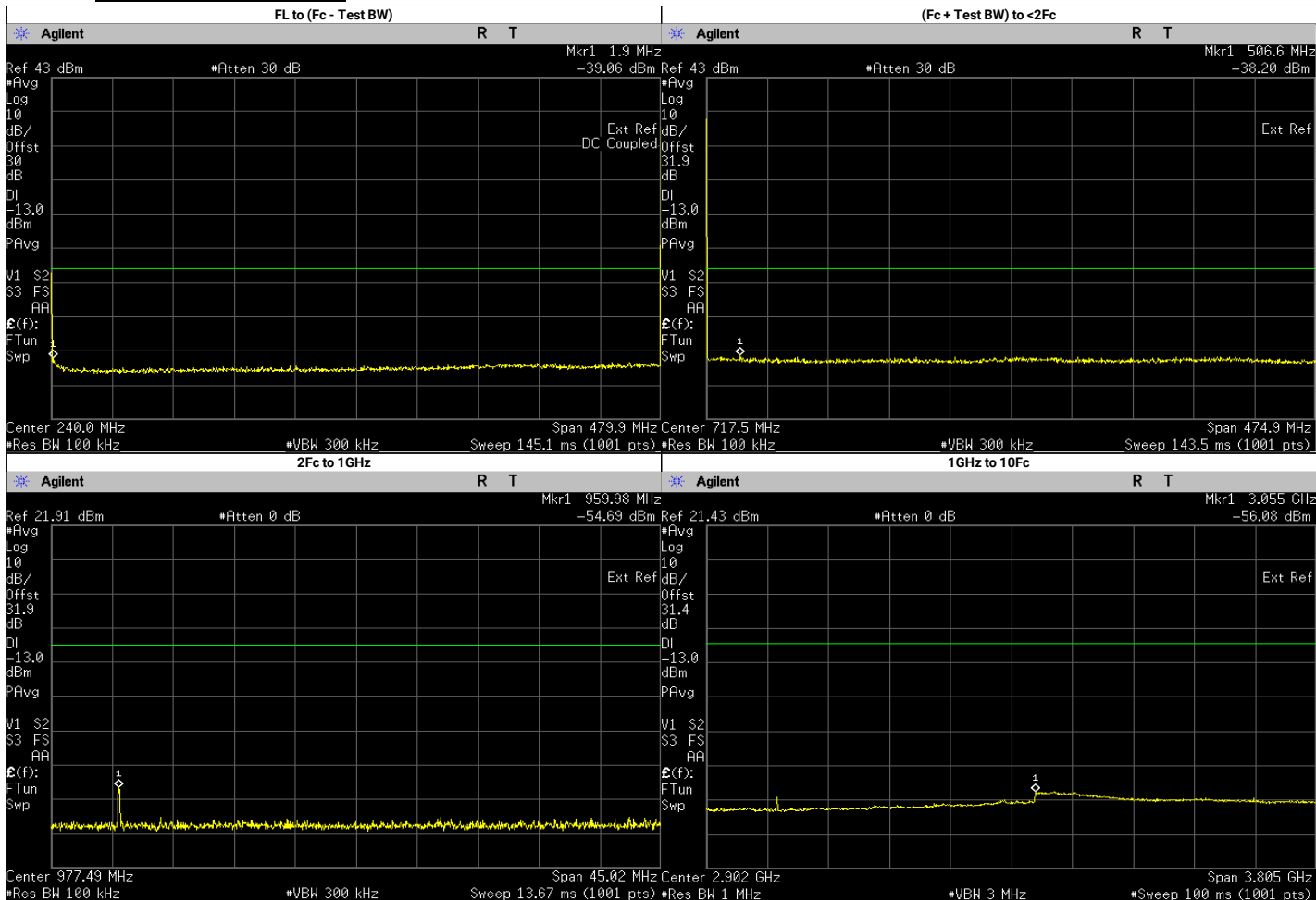
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.9000	-39.2360	-13	PASS
(Fc + Test BW) to <2Fc	886.5918	-37.6400	-13	PASS
2Fc to 1GHz	935.5500	-63.4707	-13	PASS
1GHz to 10Fc	2465.7350	-54.2600	-13	PASS
	1403.3250	-60.6383	-13	PASS
	1871.1000	-60.1626	-13	PASS
	2338.8750	-59.6876	-13	PASS
	2806.6500	-58.4621	-13	PASS
	3274.4250	-55.7727	-13	PASS
	3742.2000	-57.5671	-13	PASS
	4209.9750	-57.6303	-13	PASS
	4677.7500	-58.1309	-13	PASS

Analog: 467.7750 MHz, 25 kHz Channel Spacing, Max Power For Part 80



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	365.8000	-38.7610	-13	PASS
(Fc + Test BW) to <2Fc	503.9238	-38.0300	-13	PASS
2Fc to 1GHz	935.5500	-54.0394	-13	PASS
1GHz to 10Fc	2425.2240	-54.5700	-13	PASS
	1403.3250	-58.8186	-13	PASS
	1871.1000	-60.7182	-13	PASS
	2338.8750	-60.1296	-13	PASS
	2806.6500	-58.9653	-13	PASS
	3274.4250	-56.1670	-13	PASS
	3742.2000	-58.1913	-13	PASS
	4209.9750	-58.2057	-13	PASS
	4677.7500	-58.6620	-13	PASS

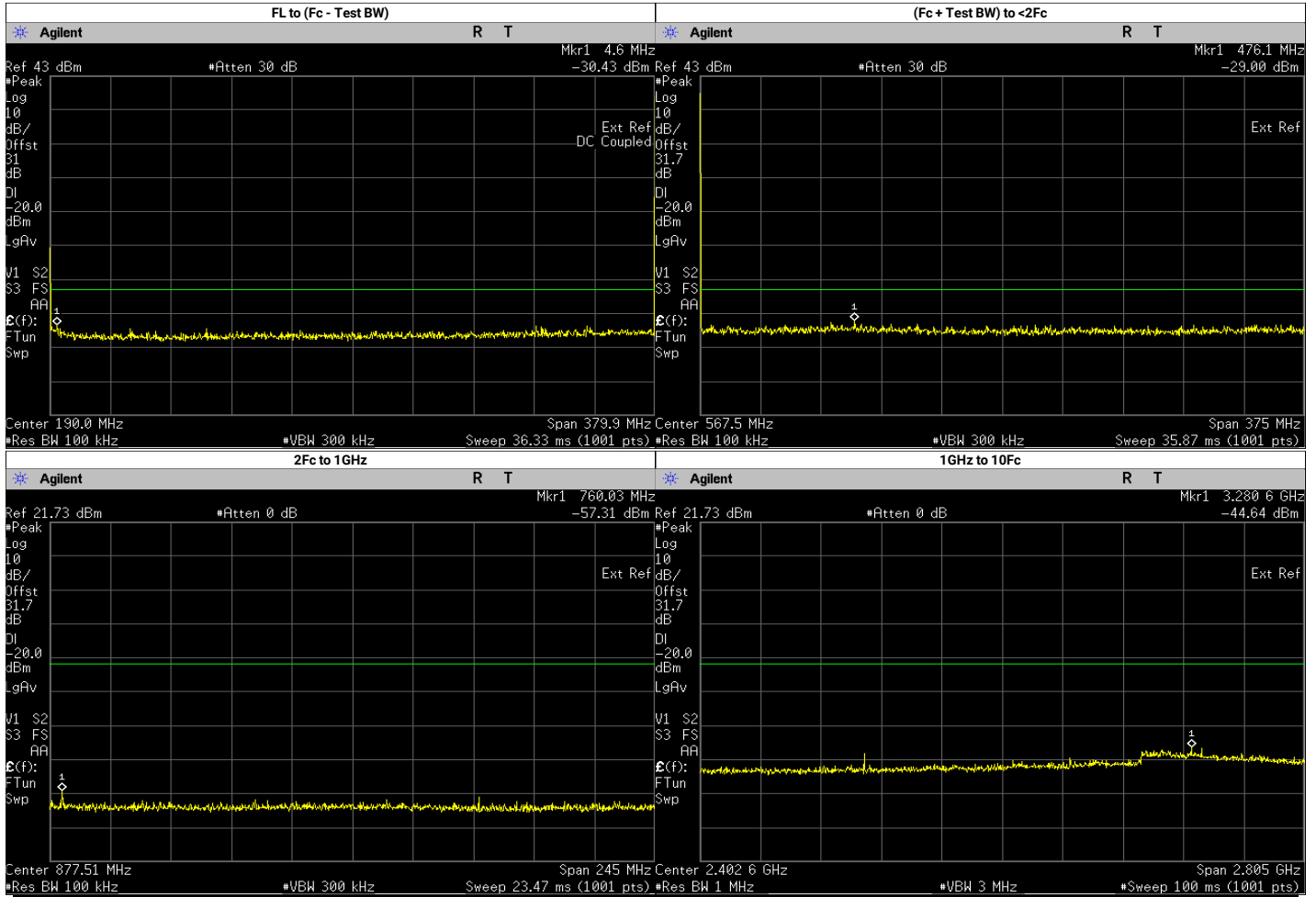
Analog: 479.9875 MHz, 25 kHz Channel Spacing, Max Power
Not for FCC review



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.9000	-39.0610	-13	PASS
(Fc + Test BW) to <2Fc	506.6404	-38.2000	-13	PASS
2Fc to 1GHz	959.9750	-54.6900	-13	PASS
1GHz to 10Fc	3055.0000	-56.0800	-13	PASS
	1439.9630	-58.2281	-13	PASS
	1919.9500	-60.4567	-13	PASS
	2399.9370	-58.5542	-13	PASS
	2879.9250	-58.8062	-13	PASS
	3359.9120	-56.5890	-13	PASS
	3839.9000	-58.0606	-13	PASS
	4319.8870	-58.1905	-13	PASS
	4799.8750	-58.6418	-13	PASS

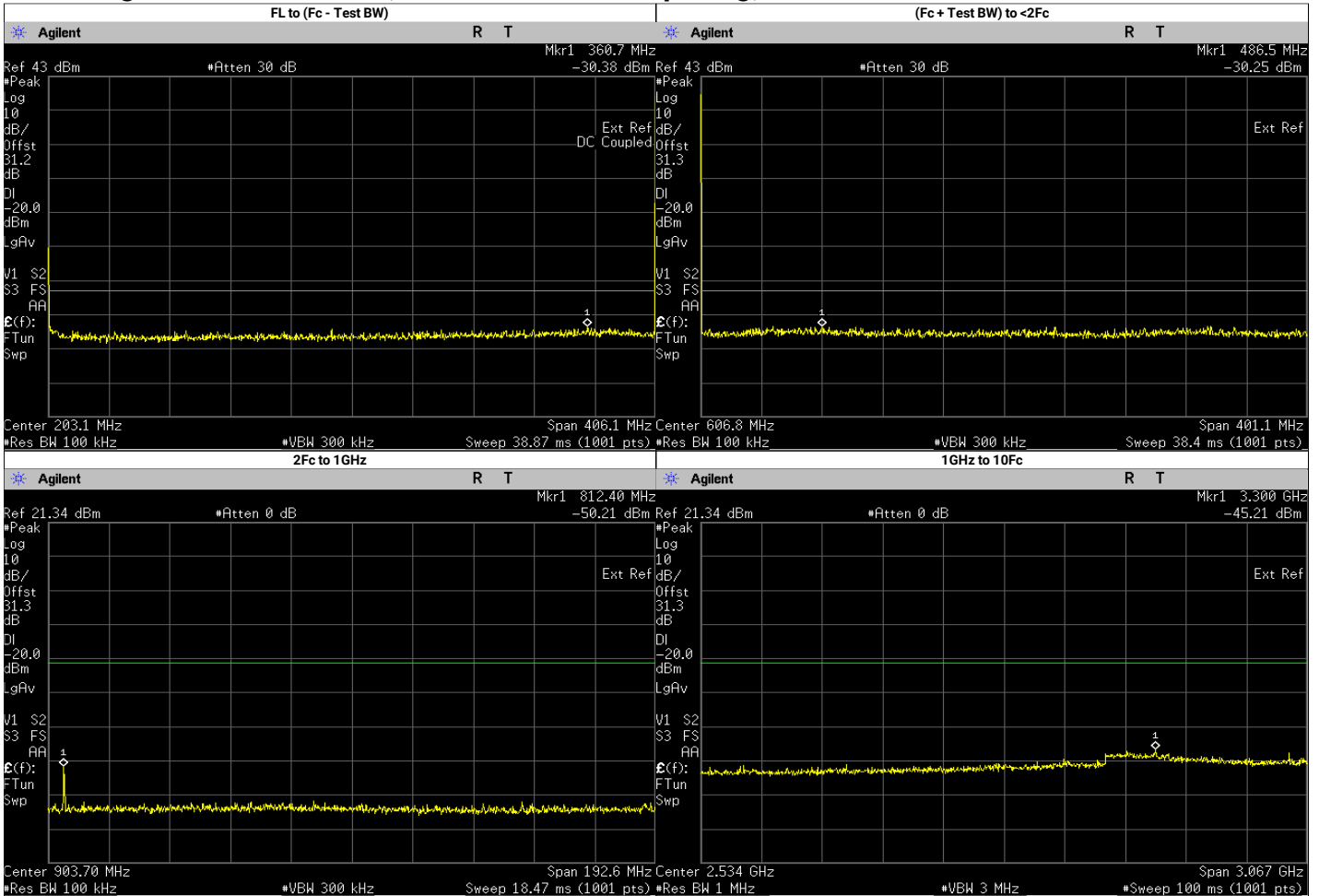
6.9.3. Test Result (Digital)

Digital: 380.0125 MHz, 12.5 kHz Channel Spacing, Max Power Not for FCC review



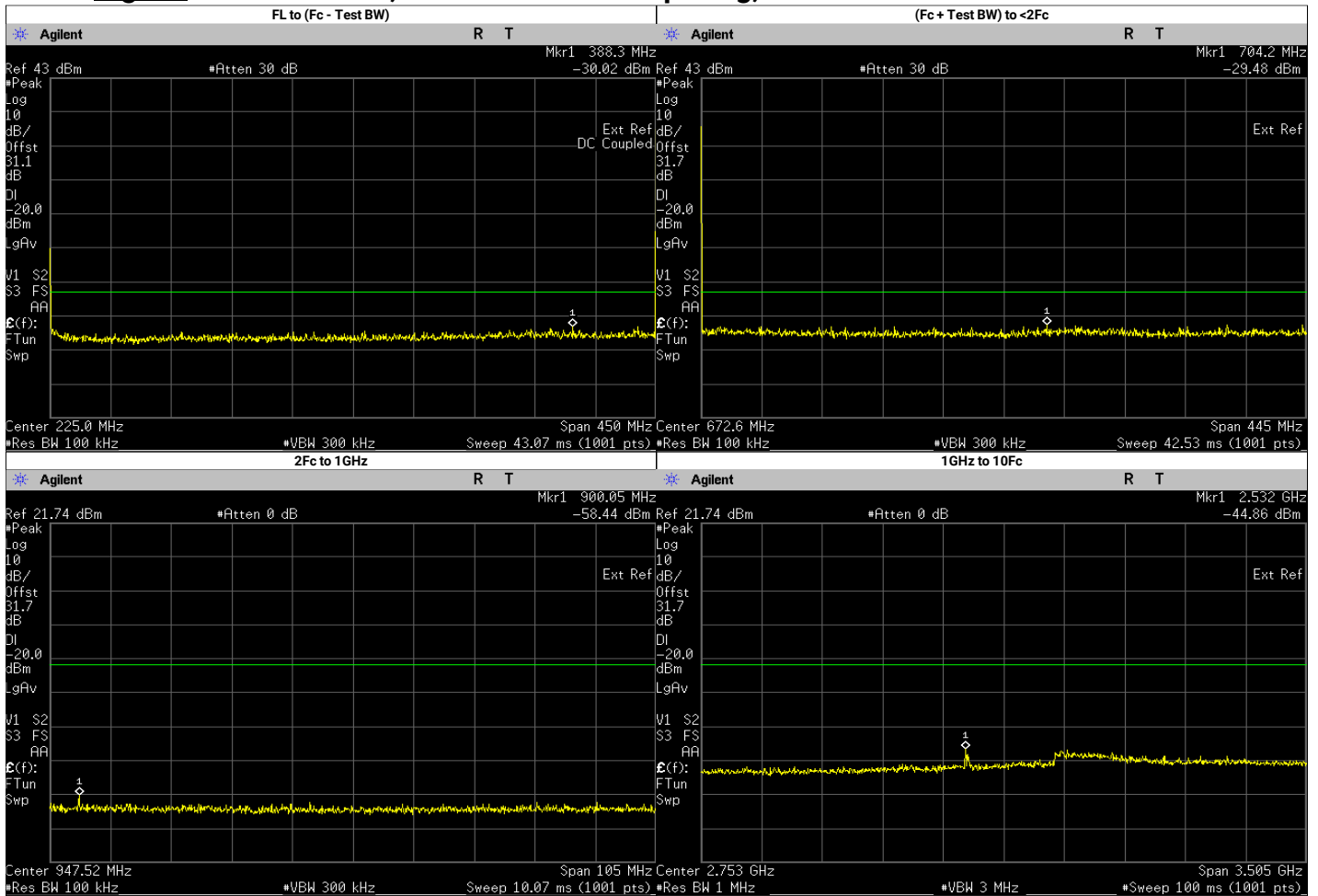
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	4.6000	-30.4315	-20	PASS
(Fc + Test BW) to <2Fc	476.0571	-29.0000	-20	PASS
2Fc to 1GHz	760.0250	-57.3146	-20	PASS
1GHz to 10Fc	3280.5670	-44.6400	-20	PASS
	1140.0370	-51.8620	-20	PASS
	1520.0500	-51.7751	-20	PASS
	1900.0620	-51.6314	-20	PASS
	2280.0750	-50.9549	-20	PASS
	2660.0880	-50.8573	-20	PASS
	3040.1000	-48.8755	-20	PASS
	3420.1130	-47.8580	-20	PASS
	3800.1250	-48.3717	-20	PASS

Digital: 406.2000 MHz, 12.5 kHz Channel Spacing, Max Power



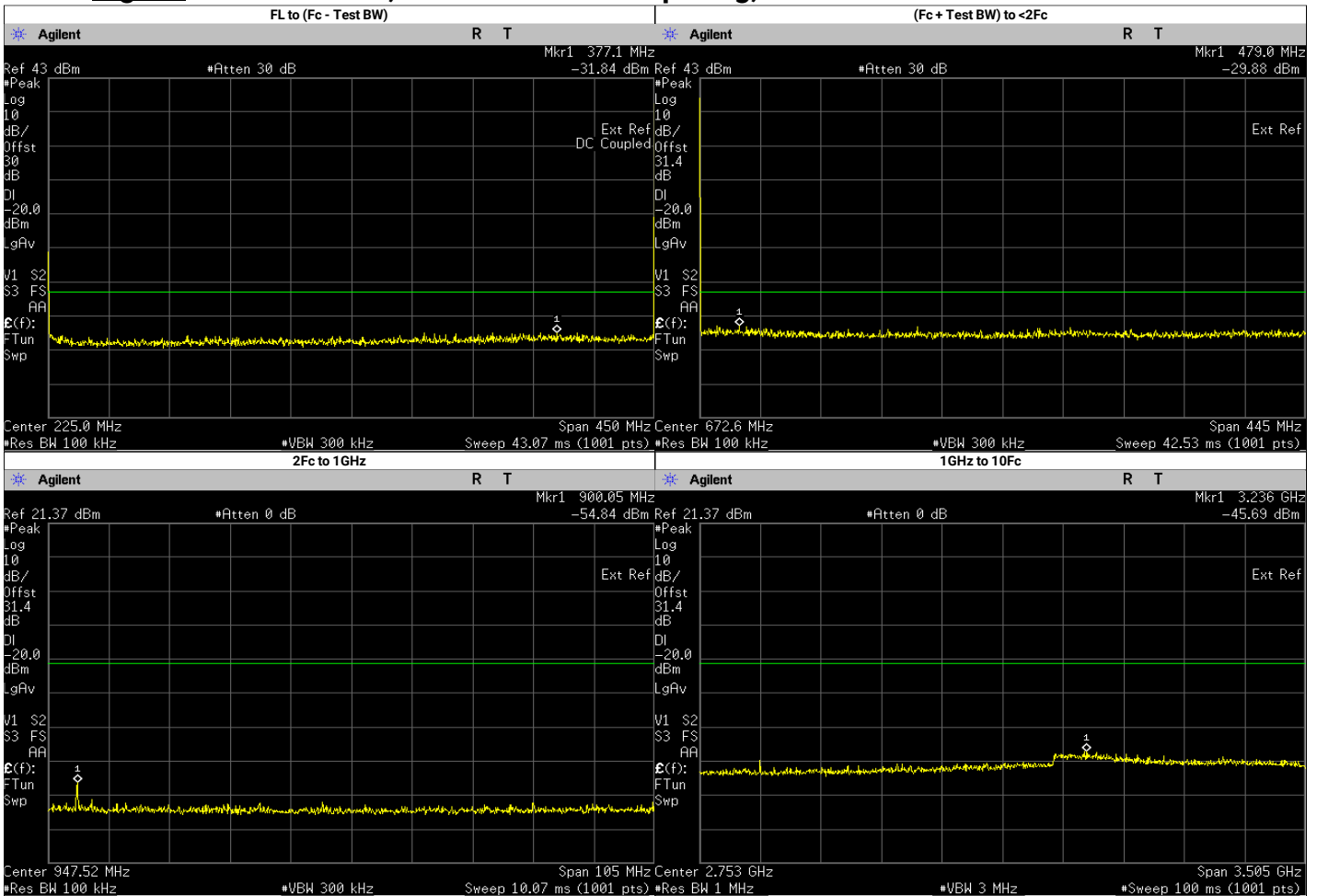
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	360.7000	-30.3770	-20	PASS
(Fc + Test BW) to <2Fc	486.4845	-30.2500	-20	PASS
2Fc to 1GHz	812.4000	-50.2100	-20	PASS
1GHz to 10Fc	3300.2500	-45.2100	-20	PASS
	1218.6000	-50.5365	-20	PASS
	1624.8000	-51.7584	-20	PASS
	2031.0000	-51.2040	-20	PASS
	2437.2000	-50.3462	-20	PASS
	2843.4000	-49.0032	-20	PASS
	3249.6000	-46.9051	-20	PASS
	3655.8000	-48.8245	-20	PASS
	4062.0000	-48.9588	-20	PASS

Digital: 450.0250 MHz, 12.5 kHz Channel Spacing, Low Power



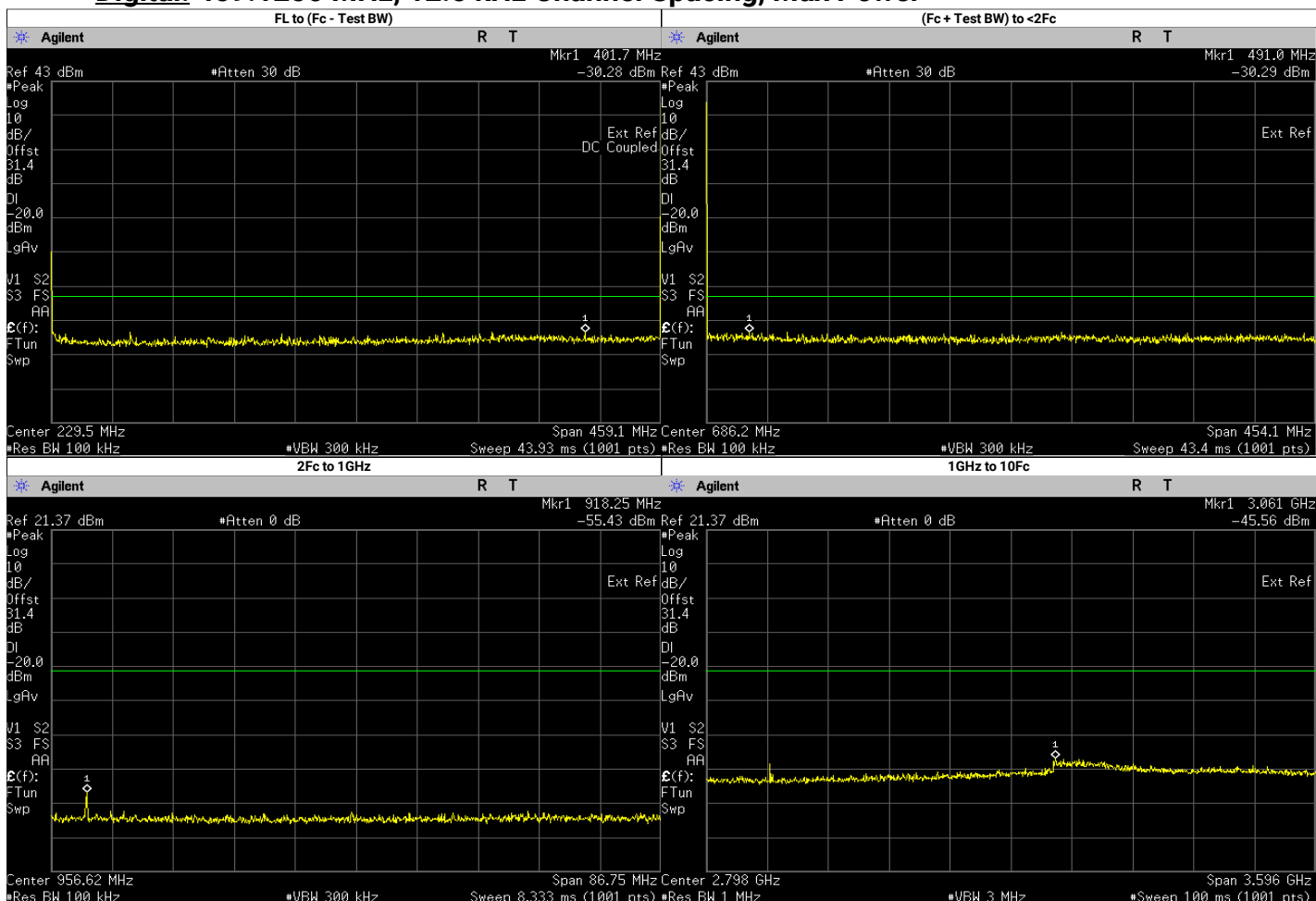
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	388.3000	-30.0160	-20	PASS
(Fc + Test BW) to <2Fc	704.1586	-29.4800	-20	PASS
2Fc to 1GHz	900.0500	-58.4400	-20	PASS
1GHz to 10Fc	2531.7940	-44.8600	-20	PASS
	1350.0750	-51.5272	-20	PASS
	1800.1000	-51.4182	-20	PASS
	2250.1250	-50.3649	-20	PASS
	2700.1500	-49.3001	-20	PASS
	3150.1750	-46.5995	-20	PASS
	3600.2000	-48.5595	-20	PASS
	4050.2250	-48.4736	-20	PASS
	4500.2500	-49.4678	-20	PASS

Digital: 450.0250 MHz, 12.5 kHz Channel Spacing, Max Power



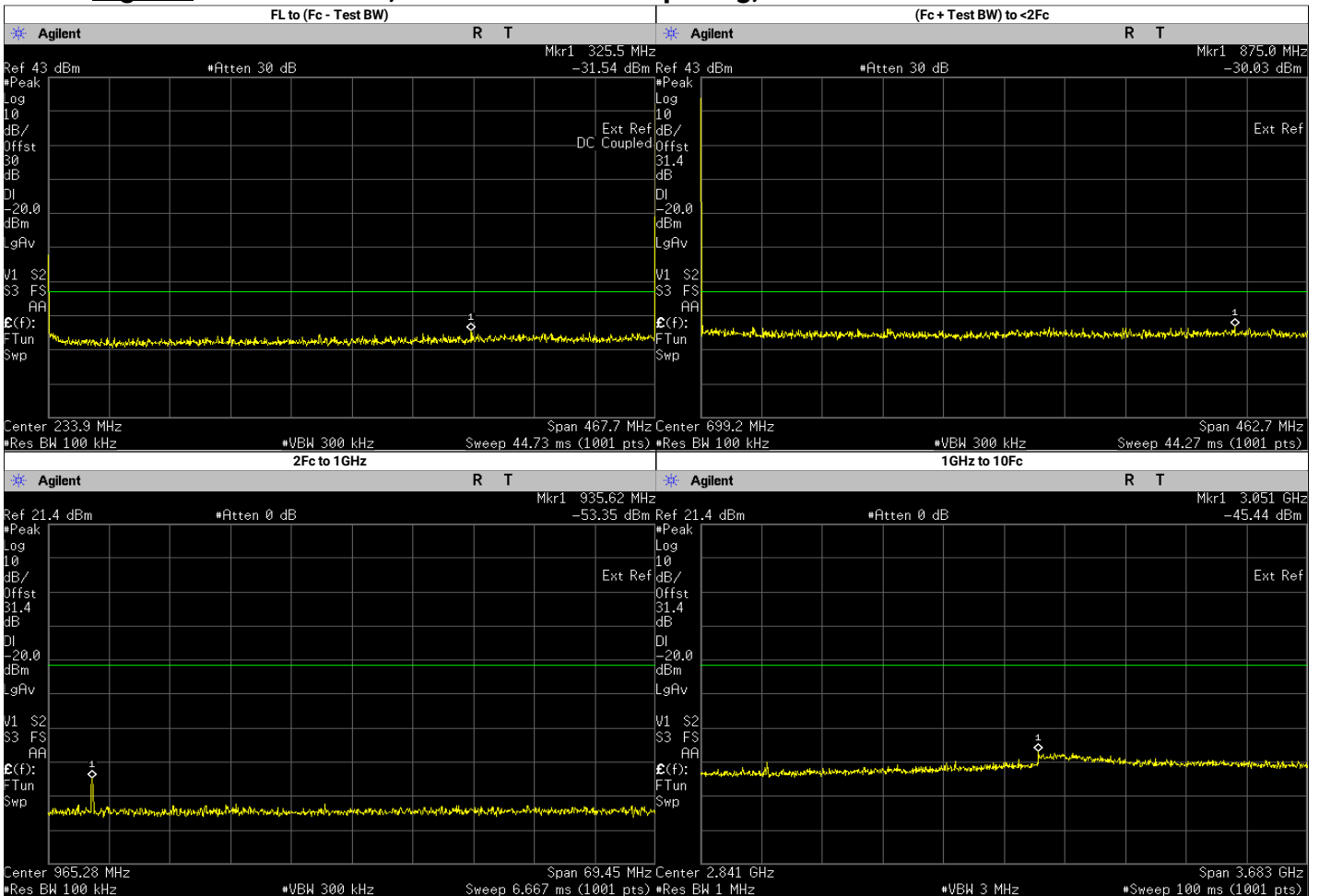
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	377.1000	-31.8430	-20	PASS
(Fc + Test BW) to <2Fc	479.0047	-29.8800	-20	PASS
2Fc to 1GHz	900.0500	-55.8390	-20	PASS
1GHz to 10Fc	3236.3490	-45.6900	-20	PASS
	1350.0750	-48.7609	-20	PASS
	1800.1000	-51.9248	-20	PASS
	2250.1250	-51.3551	-20	PASS
	2700.1500	-50.6634	-20	PASS
	3150.1750	-47.2891	-20	PASS
	3600.2000	-47.9876	-20	PASS
	4050.2250	-48.1655	-20	PASS
	4500.2500	-49.9164	-20	PASS

Digital: 459.1250 MHz, 12.5 kHz Channel Spacing, Max Power



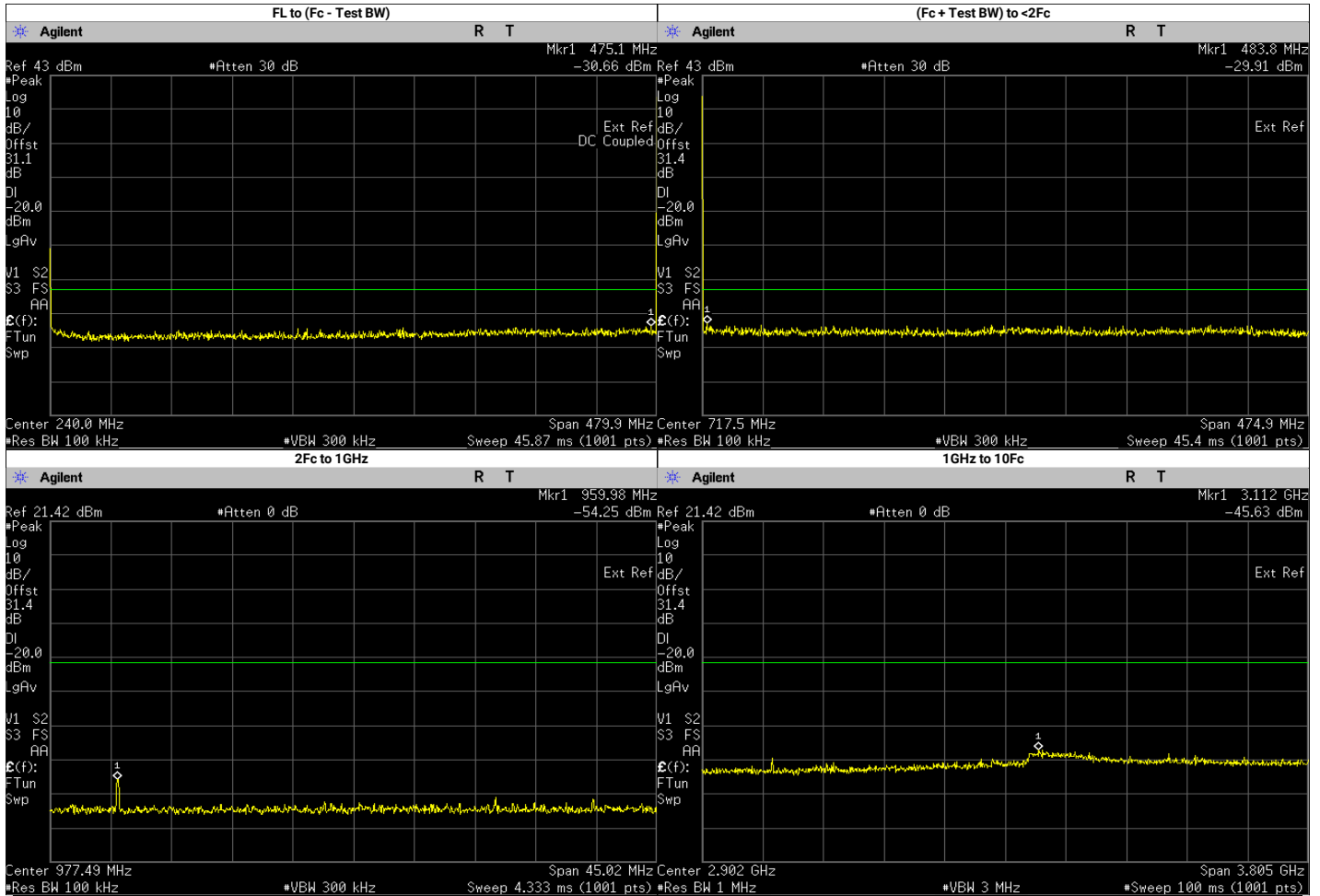
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	401.7000	-30.2810	-20	PASS
(Fc + Test BW) to <2Fc	490.9666	-30.2900	-20	PASS
2Fc to 1GHz	918.2500	-55.4300	-20	PASS
1GHz to 10Fc	3060.6510	-45.5600	-20	PASS
	1377.3750	-47.3370	-20	PASS
	1836.5000	-51.5010	-20	PASS
	2295.6250	-51.1202	-20	PASS
	2754.7500	-49.8362	-20	PASS
	3213.8750	-47.0336	-20	PASS
	3673.0000	-48.8648	-20	PASS
	4132.1250	-49.3620	-20	PASS
	4591.2500	-49.9077	-20	PASS

Digital: 467.7750 MHz, 12.5 kHz Channel Spacing, Max Power



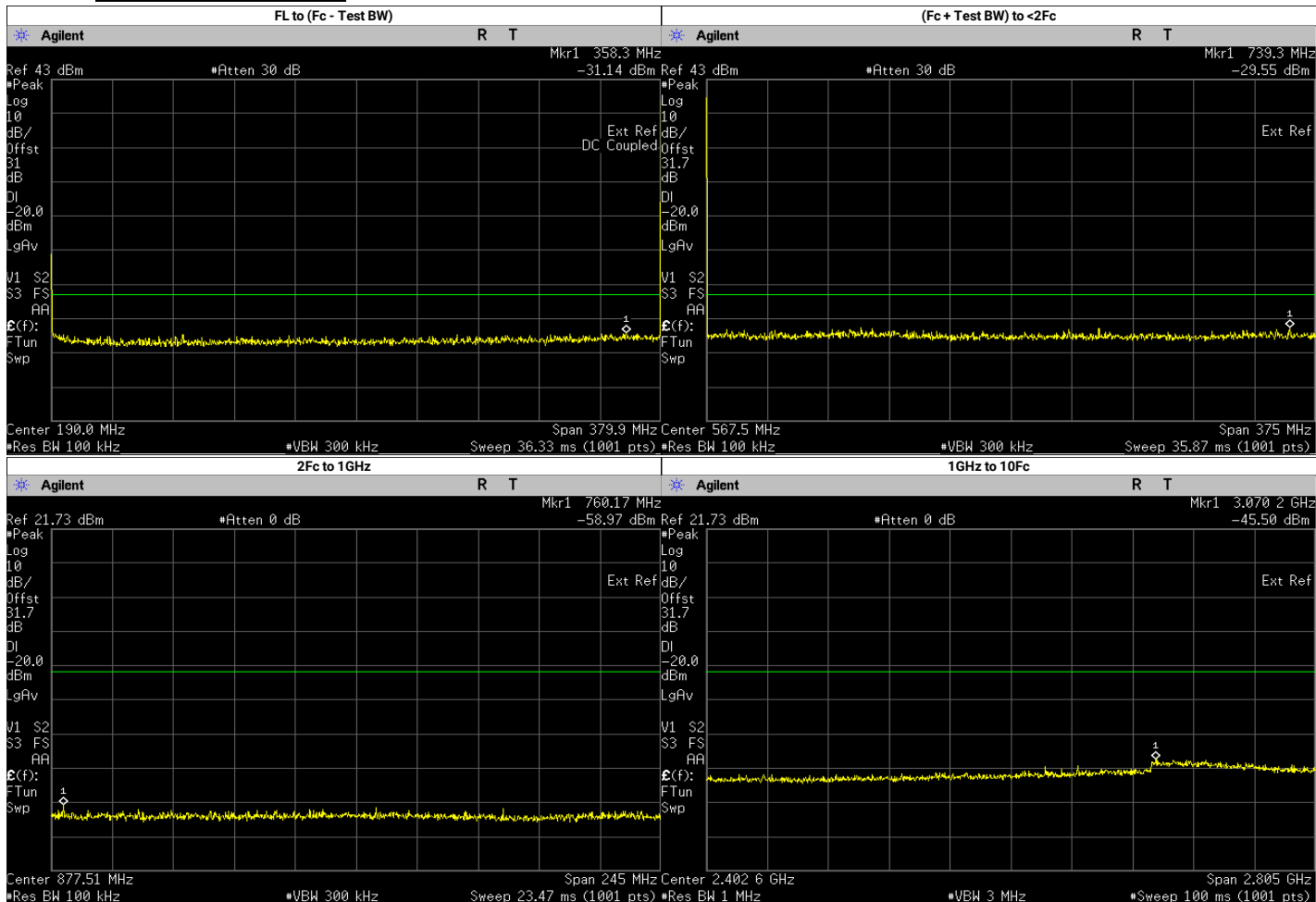
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	325.5000	-31.5360	-20	PASS
(Fc + Test BW) to <2Fc	875.0238	-30.0300	-20	PASS
2Fc to 1GHz	935.6199	-53.3500	-20	PASS
	935.5500	-53.4283	-20	PASS
1GHz to 10Fc	3051.2920	-45.4400	-20	PASS
	1403.3250	-49.1338	-20	PASS
	1871.1000	-51.3083	-20	PASS
	2338.8750	-50.8649	-20	PASS
	2806.6500	-49.9611	-20	PASS
	3274.4250	-47.2803	-20	PASS
	3742.2000	-49.1256	-20	PASS
	4209.9750	-49.4939	-20	PASS
	4677.7500	-49.3894	-20	PASS

Digital: 479.9875 MHz, 12.5 kHz Channel Spacing, Max Power
Not for FCC review



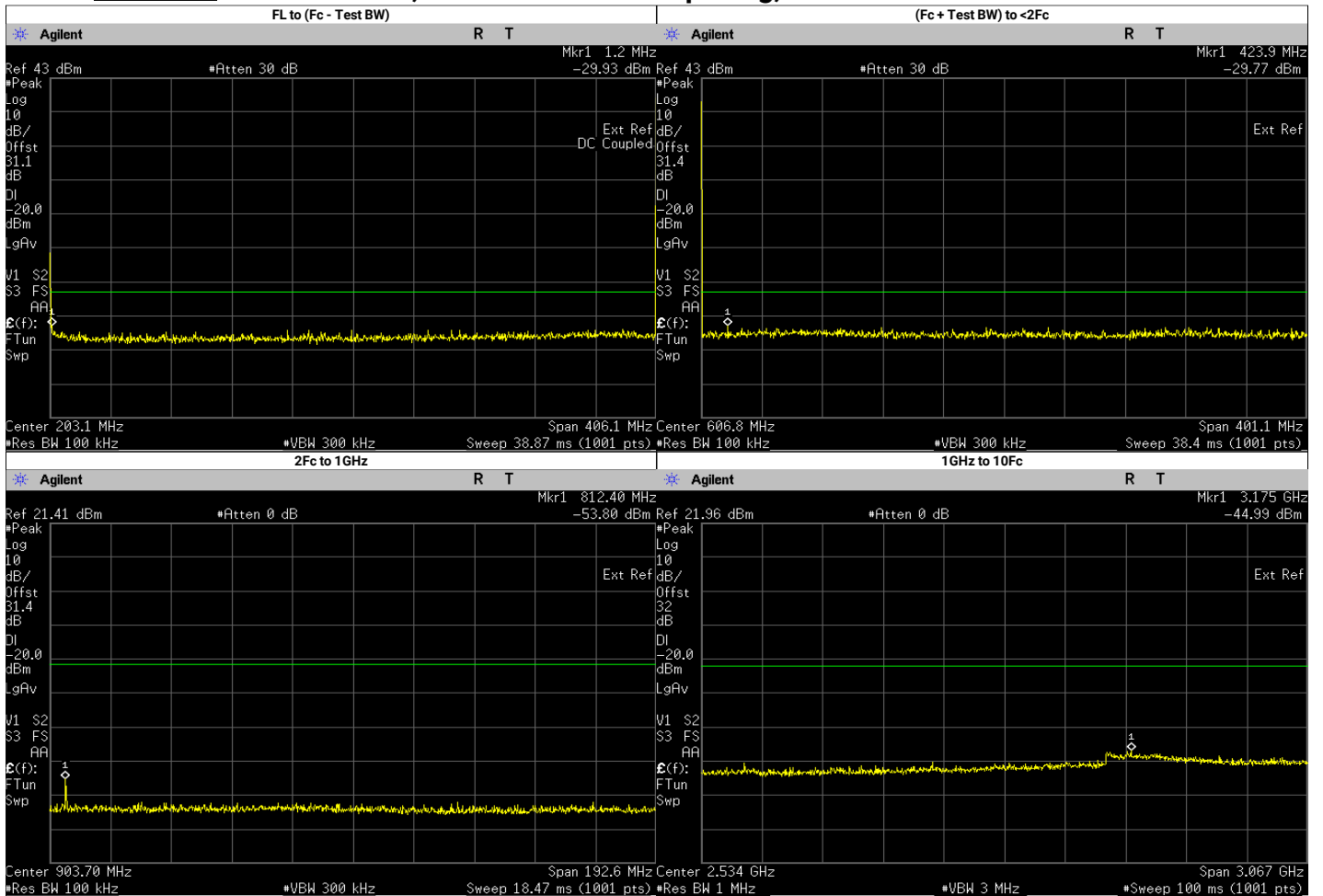
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	475.1000	-30.6610	-20	PASS
(Fc + Test BW) to <2Fc	483.8437	-29.9100	-20	PASS
2Fc to 1GHz	959.9750	-54.2540	-20	PASS
1GHz to 10Fc	3111.7060	-45.6300	-20	PASS
	1439.9630	-48.8708	-20	PASS
	1919.9500	-52.3818	-20	PASS
	2399.9370	-51.0156	-20	PASS
	2879.9250	-49.1229	-20	PASS
	3359.9120	-47.6882	-20	PASS
	3839.9000	-49.1793	-20	PASS
	4319.8870	-49.6319	-20	PASS
	4799.8750	-49.5285	-20	PASS

Phase II: 380.0125 MHz, 12.5 kHz Channel Spacing, Max Power
Not for FCC review



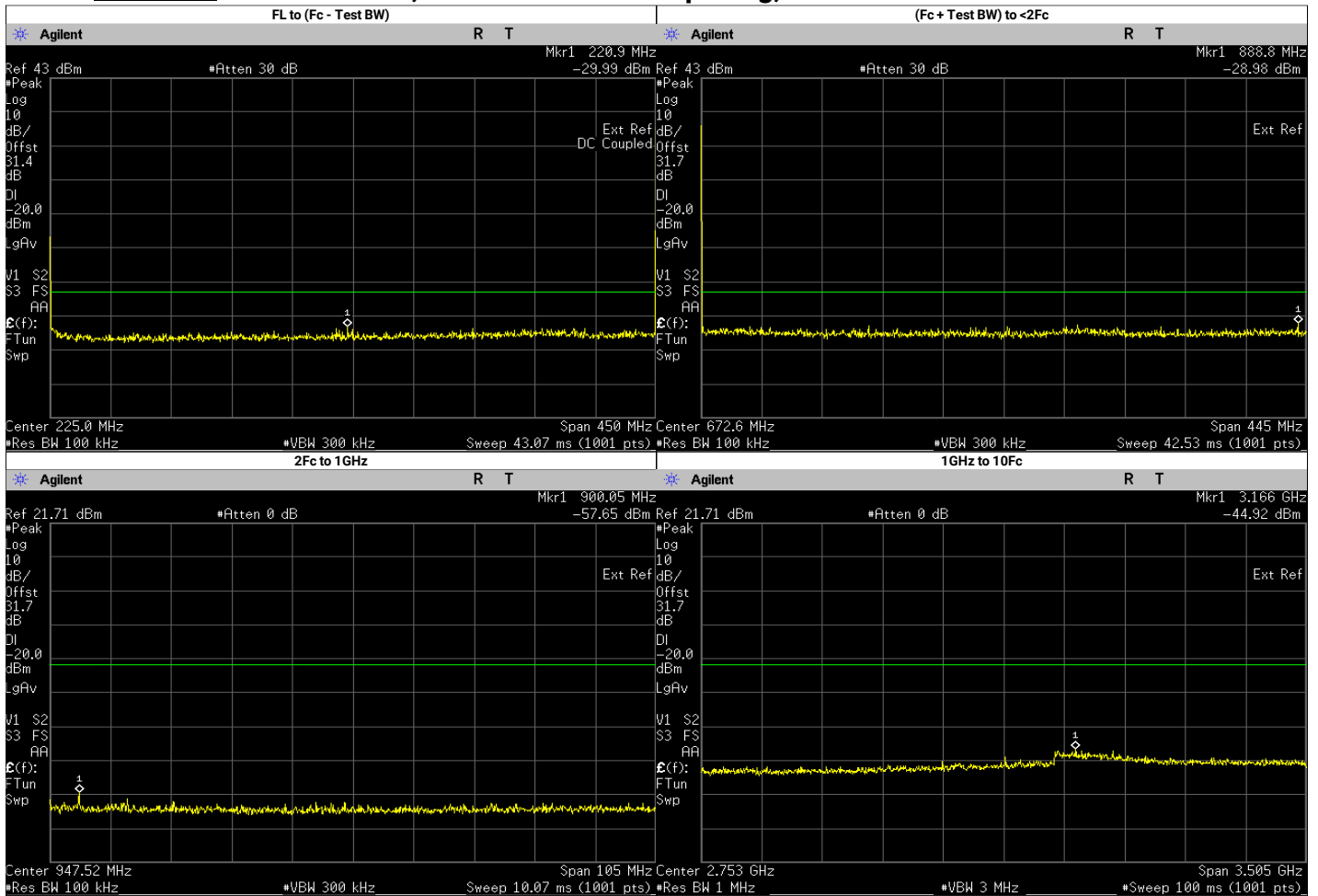
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	358.3000	-31.1350	-20	PASS
(Fc + Test BW) to <2Fc	739.2768	-29.5500	-20	PASS
2Fc to 1GHz	760.1695	-58.9700	-20	PASS
	760.0250	-59.2600	-20	PASS
1GHz to 10Fc	3070.1820	-45.5000	-20	PASS
	1140.0370	-51.5771	-20	PASS
	1520.0500	-51.5882	-20	PASS
	1900.0620	-50.0063	-20	PASS
	2280.0750	-50.9368	-20	PASS
	2660.0880	-50.2477	-20	PASS
	3040.1000	-49.0876	-20	PASS
	3420.1130	-47.8351	-20	PASS
	3800.1250	-48.2197	-20	PASS

Phase II: 406.2000 MHz, 12.5 kHz Channel Spacing, Max Power



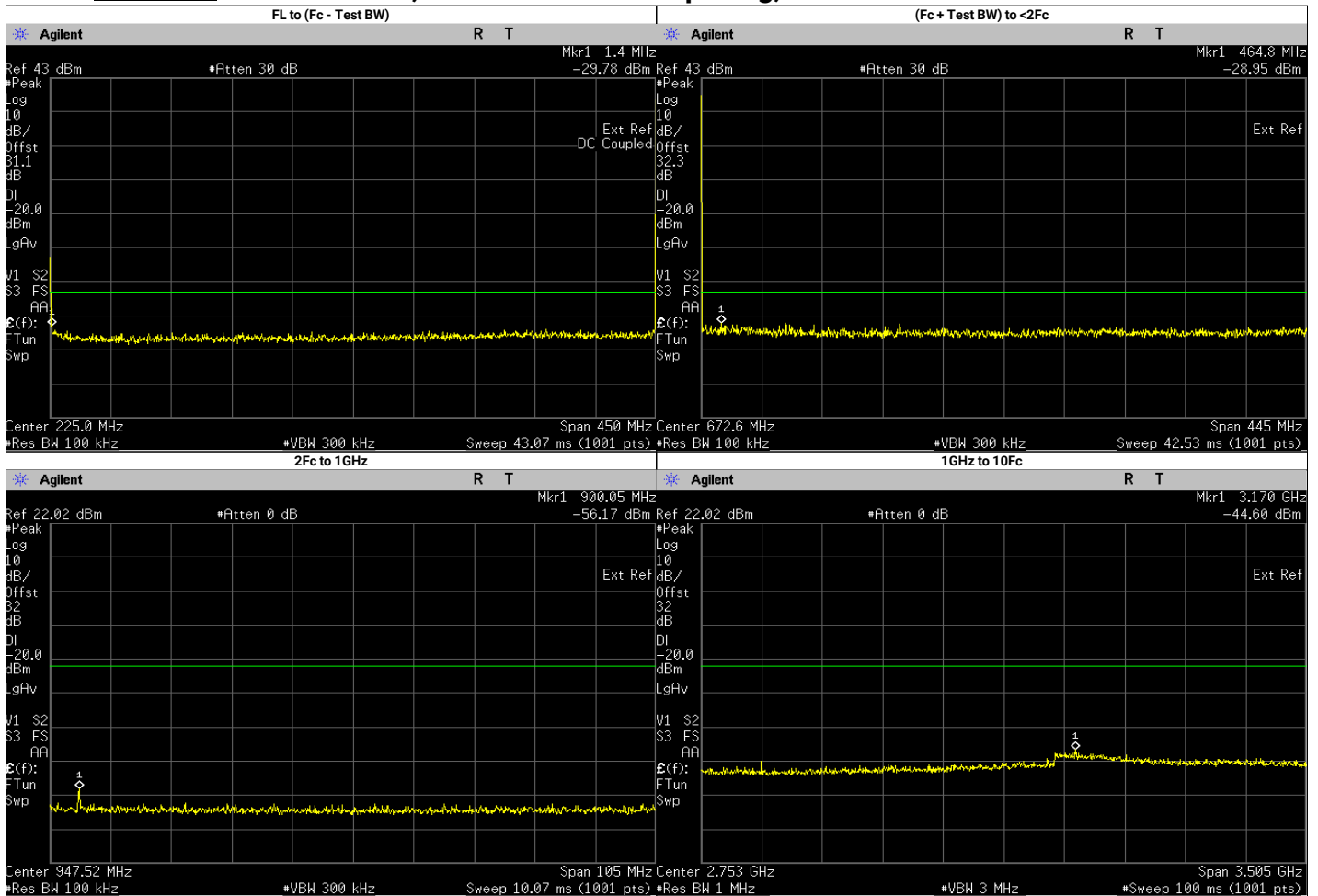
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.2000	-29.9260	-20	PASS
(Fc + Test BW) to <2Fc	423.9060	-29.7700	-20	PASS
2Fc to 1GHz	812.4000	-53.8000	-20	PASS
1GHz to 10Fc	3175.1360	-44.9900	-20	PASS
	1218.6000	-50.3213	-20	PASS
	1624.8000	-51.4120	-20	PASS
	2031.0000	-51.6264	-20	PASS
	2437.2000	-50.9554	-20	PASS
	2843.4000	-49.4742	-20	PASS
	3249.6000	-47.0819	-20	PASS
	3655.8000	-48.8325	-20	PASS
	4062.0000	-49.1675	-20	PASS

Phase II: 450.0250 MHz, 12.5 kHz Channel Spacing, Low Power



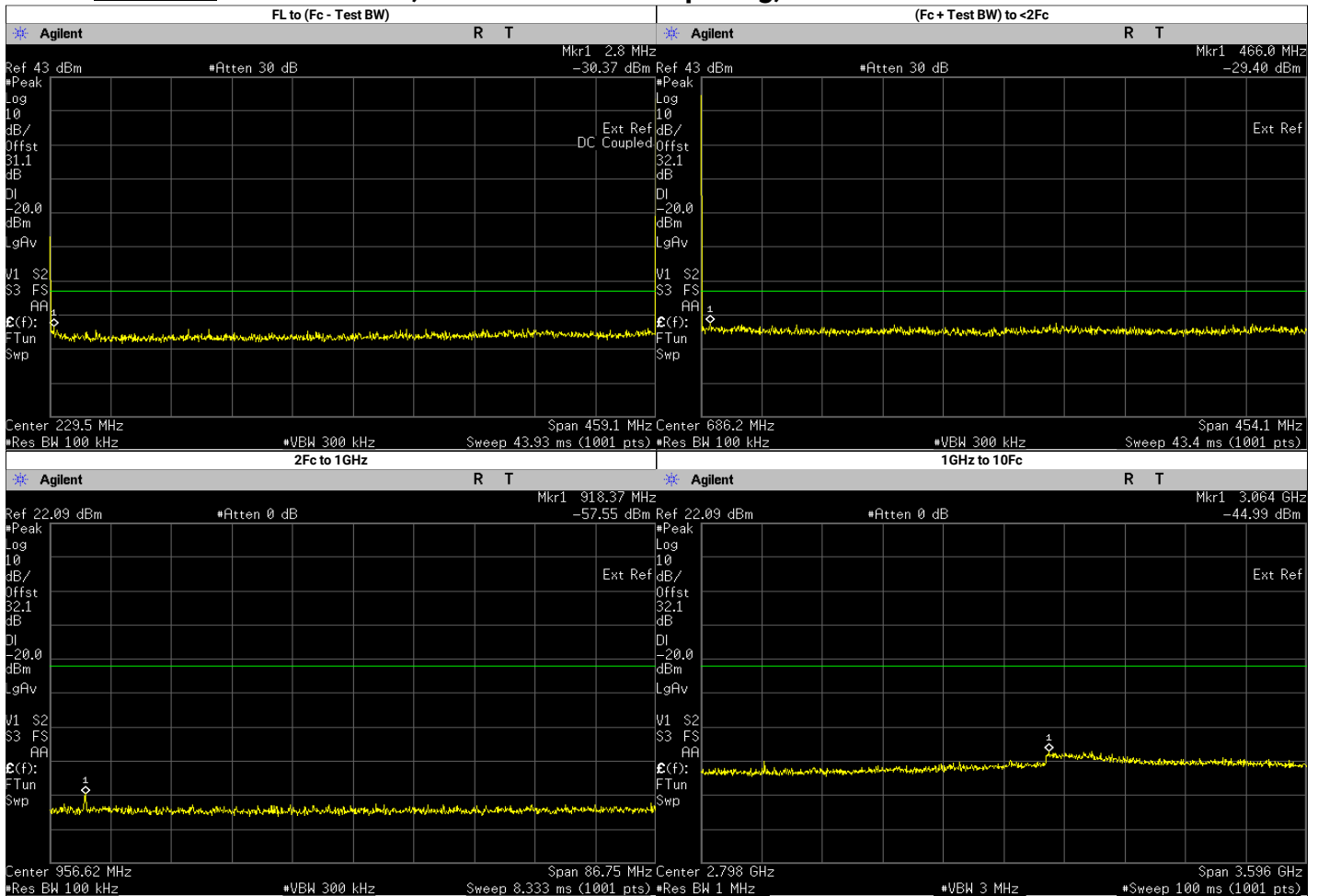
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	220.9000	-29.9890	-20	PASS
(Fc + Test BW) to <2Fc	888.8204	-28.9800	-20	PASS
2Fc to 1GHz	900.0500	-58.2936	-20	PASS
1GHz to 10Fc	3166.2440	-44.9200	-20	PASS
	1350.0750	-52.1022	-20	PASS
	1800.1000	-51.2417	-20	PASS
	2250.1250	-50.3139	-20	PASS
	2700.1500	-50.4608	-20	PASS
	3150.1750	-45.9795	-20	PASS
	3600.2000	-48.5872	-20	PASS
	4050.2250	-48.3203	-20	PASS
	4500.2500	-49.6243	-20	PASS

Phase II: 450.0250 MHz, 12.5 kHz Channel Spacing, Max Power



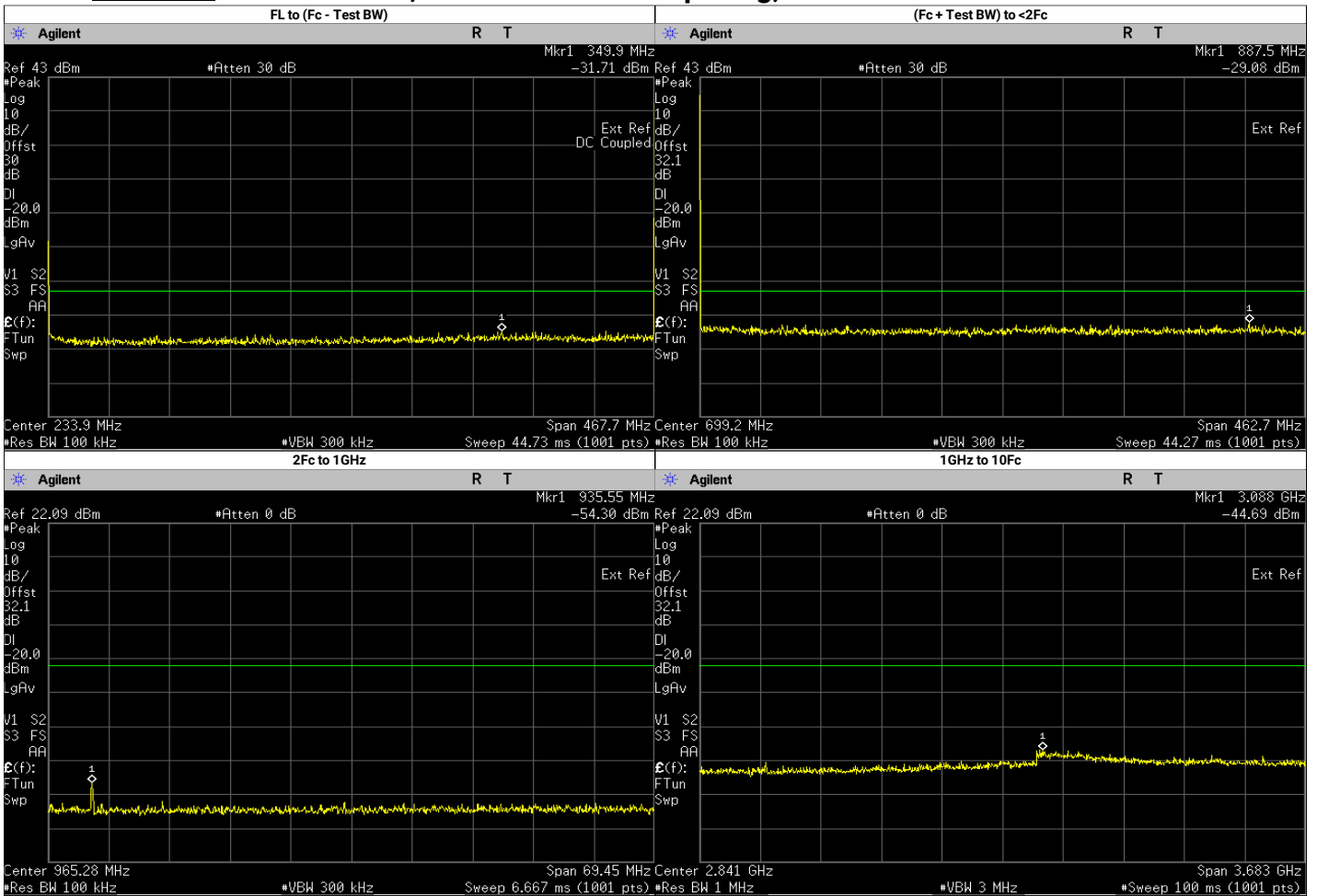
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.4000	-29.7830	-20	PASS
(Fc + Test BW) to <2Fc	464.8000	-28.9500	-20	PASS
2Fc to 1GHz	900.0500	-56.5368	-20	PASS
1GHz to 10Fc	3169.7500	-44.6000	-20	PASS
	1350.0750	-48.4052	-20	PASS
	1800.1000	-51.1040	-20	PASS
	2250.1250	-50.3914	-20	PASS
	2700.1500	-50.0998	-20	PASS
	3150.1750	-46.1559	-20	PASS
	3600.2000	-48.0883	-20	PASS
	4050.2250	-48.1308	-20	PASS
	4500.2500	-48.7549	-20	PASS

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



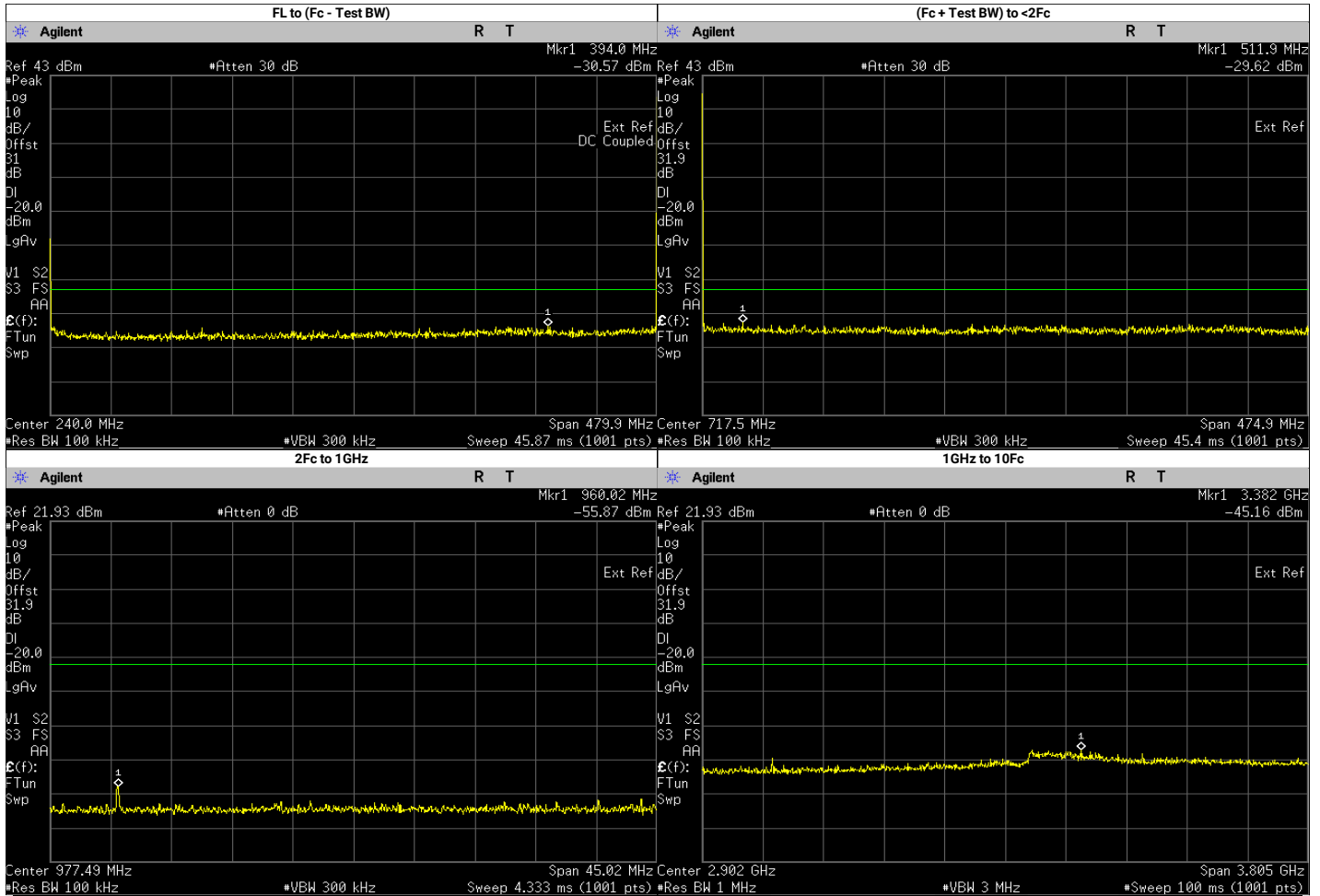
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	2.8000	-30.3720	-20	PASS
(Fc + Test BW) to <2Fc	465.9928	-29.4000	-20	PASS
2Fc to 1GHz	918.3682	-57.5500	-20	PASS
	918.2500	-57.7986	-20	PASS
1GHz to 10Fc	3064.2470	-44.9800	-20	PASS
	1377.3750	-48.2303	-20	PASS
	1836.5000	-51.2594	-20	PASS
	2295.6250	-50.7535	-20	PASS
	2754.7500	-49.2256	-20	PASS
	3213.8750	-46.4997	-20	PASS
	3673.0000	-47.6975	-20	PASS
	4132.1250	-49.0483	-20	PASS
	4591.2500	-48.8919	-20	PASS

Phase II: 467.7750 MHz, 12.5 kHz Channel Spacing, Max Power



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	349.9000	-31.7080	-20	PASS
(Fc + Test BW) to <2Fc	887.5172	-29.0800	-20	PASS
2Fc to 1GHz	935.5500	-54.3040	-20	PASS
1GHz to 10Fc	3088.1190	-44.6900	-20	PASS
	1403.3250	-48.5428	-20	PASS
	1871.1000	-51.2475	-20	PASS
	2338.8750	-49.6507	-20	PASS
	2806.6500	-49.4251	-20	PASS
	3274.4250	-46.8352	-20	PASS
	3742.2000	-48.1331	-20	PASS
	4209.9750	-49.0505	-20	PASS
	4677.7500	-49.0210	-20	PASS

Phase II: 479.9875 MHz, 12.5 kHz Channel Spacing, Max Power
Not for FCC review



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	394.0000	-30.5720	-20	PASS
(Fc + Test BW) to <2Fc	511.8647	-29.6200	-20	PASS
2Fc to 1GHz	960.0178	-55.8700	-20	PASS
	959.9750	-55.9072	-20	PASS
1GHz to 10Fc	3381.8520	-45.1600	-20	PASS
	1439.9630	-48.6965	-20	PASS
	1919.9500	-50.8103	-20	PASS
	2399.9370	-50.5515	-20	PASS
	2879.9250	-49.6485	-20	PASS
	3359.9120	-47.1781	-20	PASS
	3839.9000	-48.0668	-20	PASS
	4319.8870	-48.4526	-20	PASS
	4799.8750	-49.1471	-20	PASS

6.9.4. Test Limit

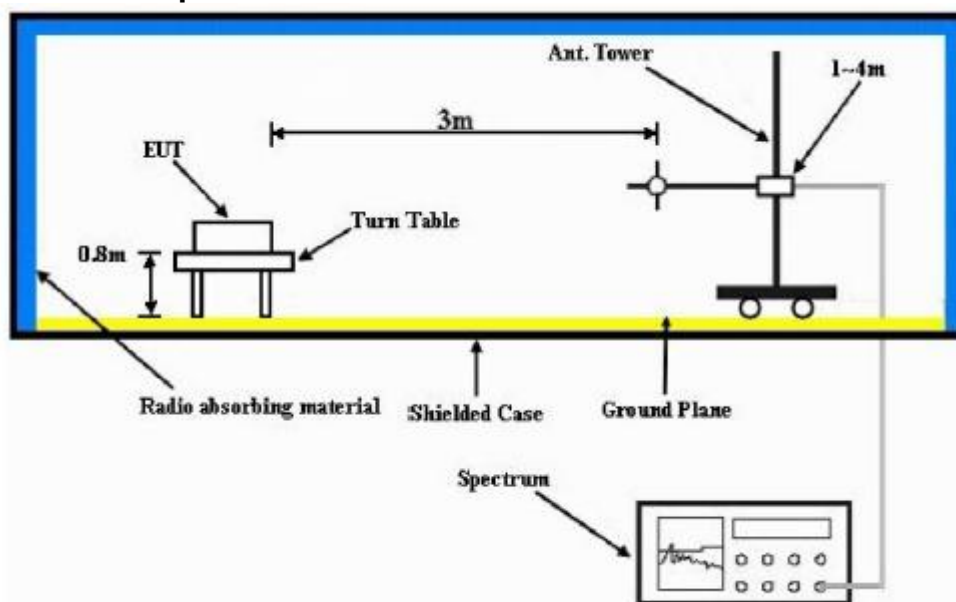
Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90 (UHF, VHF, 800, 900)	Part 90 (700)
12.5kHz	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	Not Applicable	50 + log ₁₀ (P) (-20 dBm)	43 + log ₁₀ (P) (-13 dBm)
25kHz		Not Applicable		43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)

Channel Spacing	RSS 134	RSS 182	RSS 119 (UHF, VHF, 800, 900)	RSS 119 (700)
12.5kHz	43 + log ₁₀ (P) (-13 dBm)	Not Applicable	50 + log ₁₀ (P) (-20 dBm)	43 + log ₁₀ (P) (-13 dBm)
25kHz	Not Applicable	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)

6.10. Radiated Spurious Emission

6.10.1. Test Setup



- 1) The Resolution Bandwidth for scanning Radiated Emission below 1 GHz is 100 kHz with Video Bandwidth = 300 kHz and Resolution Bandwidth for above 1 GHz is 1 MHz with Video Bandwidth = 3 MHz. Detector mode is positive peak.
- 2) In the semi- anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height (for $F_c < 1\text{GHz}$) or 1.5m height (for $F_c > 1\text{GHz}$) of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Final Radiated Spurious Emission = "Read Value" + Measured substitution value.

6.10.2. Test Result (Analog) Not Applicable

6.10.3. Test Result (Digital)

Not Applicable

6.10.4. Test Limit

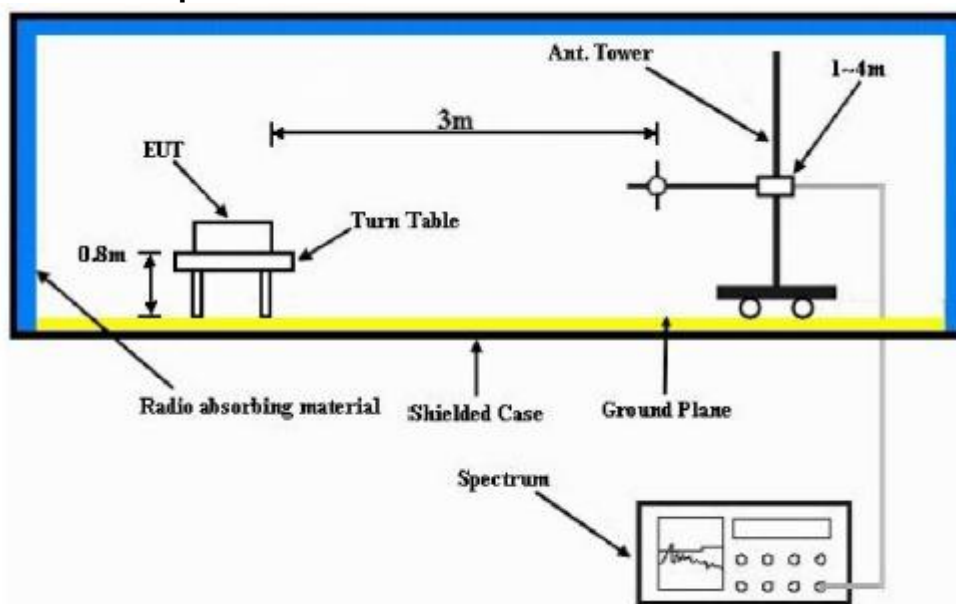
Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90 (UHF, VHF, 800, 900)	Part 90 (700)
12.5kHz	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	Not Applicable	50 + log ₁₀ (P) (-20 dBm)	43 + log ₁₀ (P) (-13 dBm)
25kHz		Not Applicable		43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)

Channel Spacing	RSS 134	RSS 182	RSS 119 (UHF, VHF, 800, 900)	RSS 119 (700)
12.5kHz	43 + log ₁₀ (P) (-13 dBm)	Not Applicable	50 + log ₁₀ (P) (-20 dBm)	43 + log ₁₀ (P) (-13 dBm)
25kHz	Not Applicable	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)	43 + log ₁₀ (P) (-13 dBm)

6.11. Effective Radiated Power (ERP)

6.11.1. Test Setup



- 1) The Resolution Bandwidth for Equivalent Radiated Power (ERP) below 1 GHz is 100 kHz with Video Bandwidth = 300 kHz and Resolution Bandwidth for EIRP above 1 GHz is 1 MHz with Video Bandwidth = 3 MHz. Detector Mode is RMS.
- 2) In the semi-anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height (for $F_c < 1\text{GHz}$) or 1.5m (for $F_c > 1\text{GHz}$) of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The "Read Value" is the spectrum reading of maximum power value.
- 3) The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.

6.11.2. Test Result

Part 80 EIRP/ERP

SRID: 1393P00-EMC-00004

S/N: 837TBH5744

Channel Spacing: 25kHz

Accessory: PMAE4102A

Tx Measured Conducted Power: 2.000 Watts

Modulation: Analog

Battery: PMNN4493A

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)	ERP (Watts)	Limit (Watts)	Result
Vert.	467.7750	35.06	32.91	1.95	2	Pass

6.11.3. Test Limit

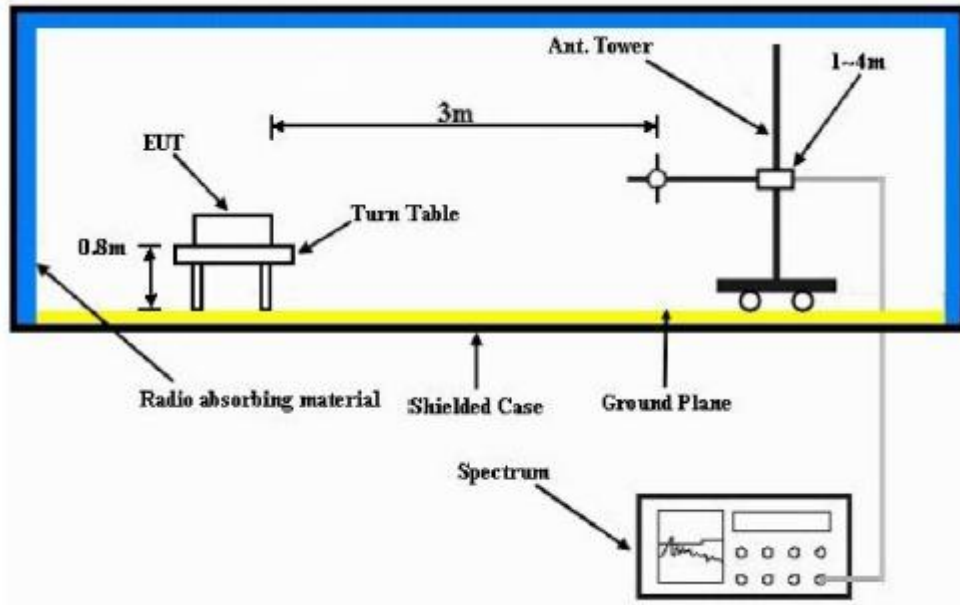
FCC CFR 47 Part90.541 The transmitting power and antenna height of base, mobile, portable and control stations operating in the 769-775 MHz and 799-805 MHz frequency bands must not exceed the maximum limits in this section. Power limits are listed in effective radiated power (ERP).

- a) The transmitting power and antenna height of base stations must not exceed the limits given in paragraph (a) of § 90.635.
- b) The transmitting power of a control station must not exceed 200 watts ERP.
- c) The transmitting power of a mobile unit must not exceed 100 watts ERP.
- d) The transmitting power of a portable (hand-held) unit must not exceed 3 watts ERP.
- e) Transmitters operating on the narrowband low power channels listed in § 90.531(b)(3) and (4), must not exceed 2 watts ERP.

FCC CFR 47 Part80.215 the transmitter power based on carrier power of 4 watts with transmitter connected to a dummy load of matching impedance. The effective radiated power must not exceed 2 watts.

6.12. GNSS (EIRP for 1559 - 1610MHz)

6.12.1. Test Setup



- 4) The Resolution Bandwidth for Equivalent Isotropically Radiated Power (EIRP) below 1 GHz is 100 kHz with Video Bandwidth = 300 kHz and Resolution Bandwidth for EIRP above 1 GHz is 1 MHz with Video Bandwidth = 3 MHz. Detector Mode is RMS.
- 5) In the semi-anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The "Read Value" is the spectrum reading of maximum power value.
- 6) The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 7) $EIRP = \text{"Read Value"} + \text{Measured substitution value} + 2.15$.

6.12.1. Test Result Not Applicable

6.12.2. Test Limit

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

~ End of Test Report ~