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.C

Date/s Tested	:	12-JUN-2019 - 25-JUN-2019
Report Issue Date	:	2-JUL-2019
Manufacturer/Location	:	Motorola Solutions Malaysia Sdn Bhd
Requestor	:	TEH TIAN HONG
Product Type	:	Base Station
Model Number	:	T7039A
Frequency Band	:	764-776MHz
Low / Max RF Output Power	:	2Watts /100Watts
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	:	35.0.9

The equipment was tested accordance to the requirement listed below:

(LMR) **FCC 47 CFR Part 27/90** **ISED RSS119**	**PASS**

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Prepared By:

Tan Sze Khai
Test Personnel

Approved By:

Vincent Foong Chuen Kit
Deputy Technical Manager

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Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	28-JUN-2019	Tan Sze Khai
Rev. B	Split report, cleaned up rules parts	10-OCT-2019	Vincent Foong
Rev. C	Rectified typo on cover page, updated modulation types, summary table	17-OCT-2019	Vincent Foong

1.0 General Information

EUT Description:

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

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, 90.205	RSS-119	RF Power Output	Pass	-
2.1055, 90.213	RSS-119	Frequency Stability	Pass	-
-	-	Audio Frequency Response	NA	-
-	-	Audio Low Pass Filter Response	NA	-
-	-	Modulation limiting	NA	-
-	-	Occupied Bandwidth	NA	-
-	-	Band Edge Conducted Spurious Emission	NA	-
-	-	Transient Frequency Behavior	NA	-
90.543, 27.53(e)	RSS-119	Adjacent Channel Power	Pass	-
90.210, 27.53(e)	RSS-119	Conducted Spurious Emissions	Pass	No spur detected (noise floor)
90.210, 27.53(e)	RSS-119	Radiated Spurious Emission	NA	Refer to external lab report
-	-	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	3.43
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

CNR → Calibration Not Require

5.0 Test Condition

5.1. Transmitter Test Conditions

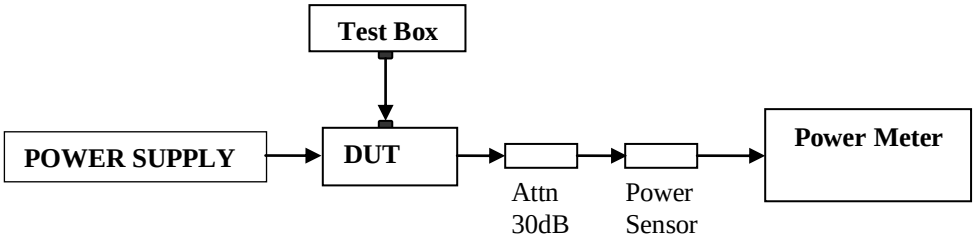
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By
RF Output Power	**Low & Max**	**Analog**	**764.0125,768.0125, 769.0125,769.0875, 774.8875,775.9875,**	**TAN SZE KHAI**
Frequency Stability	**Max**	**Analog**	**769.0875**	**TAN SZE KHAI**
Audio Frequency Response (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
Audio Low Pass Filter Response (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
Modulation limiting (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
Occupied Bandwidth (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
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**	**C4FM, Phase 2**	**764.0125,769.0875, 774.8875**	**TAN SZE KHAI**
Conducted Spurious Emissions- (12.5kHz / 25kHz)	**Low / Max**	**Analog, C4FM, Phase 2**	**764.0125,769.0125, 769.0875,774.8875,**	**TAN SZE KHAI**
Radiated Spurious Emission (12.5kHz / 25kHz)	**Low / Max**	**Analog**	**NA**	**NA**
GNSS (EIRP for 1559 - 1610MHz) (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**
Effective Radiated Power (ERP) (12.5kHz / 25kHz)	**Max**	**Analog**	**NA**	**NA**

NA → Not Applicable

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



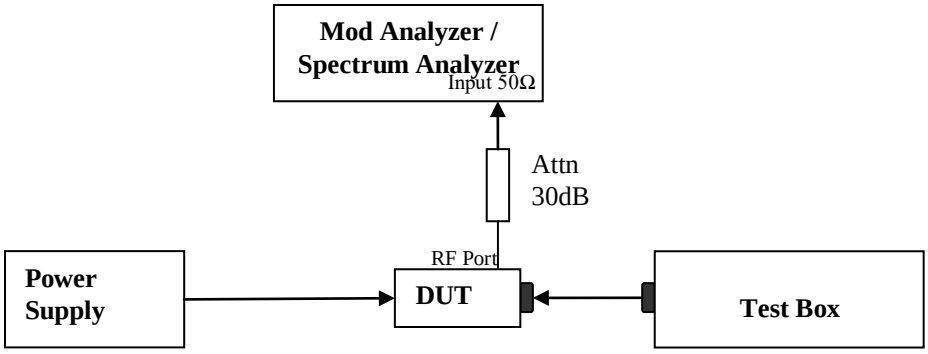
1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
2) Path loss for the measurement included.
3) All the measurement was done at low, mid, high frequency for each band.
4) Record the power into the test report.

6.1.2. Test Result

Temperature	25˚C				
Voltage (V)	48V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	Remarks
764.0125	1.96	2.88	95.1	4.96	
768.0125	2.02	2.90	95.63	5.01	
769.0125	2.02	2.90	95.02	4.99	
769.0875	2.03	2.90	95.13	5	
774.8875	2	2.89	95.1	4.98	
775.9875	2.01	2.89	95.54	4.95	

6.2. Frequency Stability

6.2.1. Test Setup



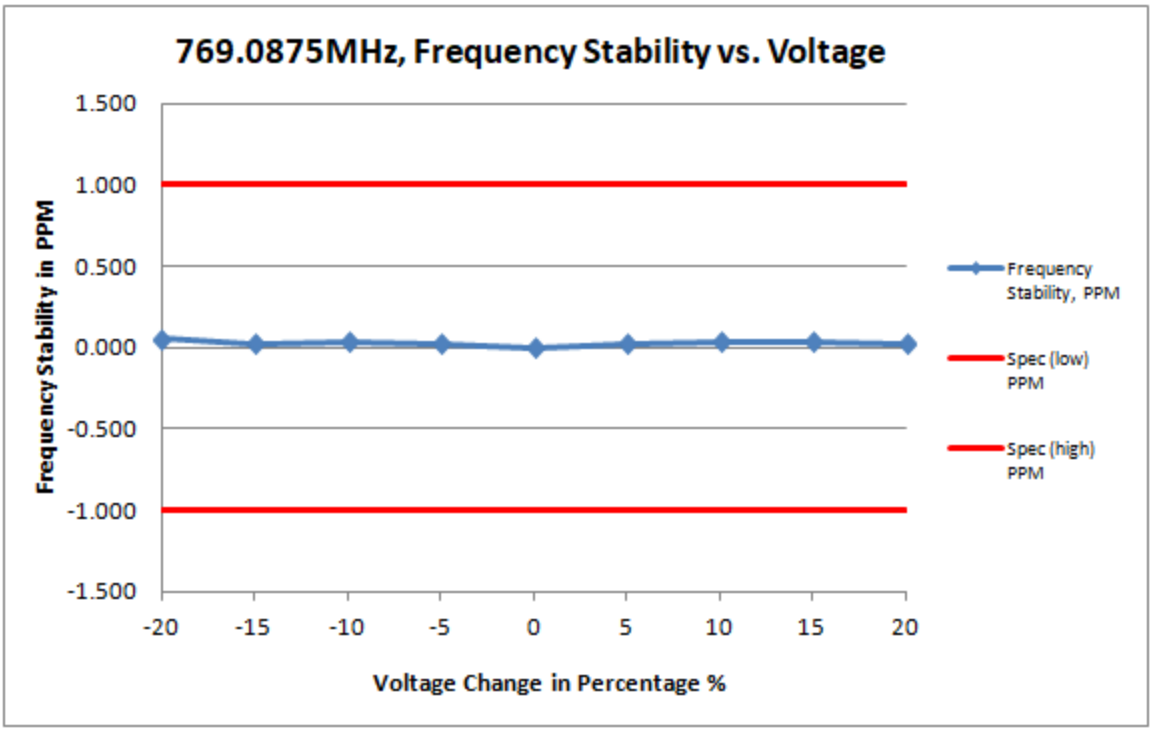
1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
2) Path loss for the measurement included.
3) Transmit the DUT and record the freq in MCF_{MHz}.
4) Test in 2 conditions:
   - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
   - Supply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

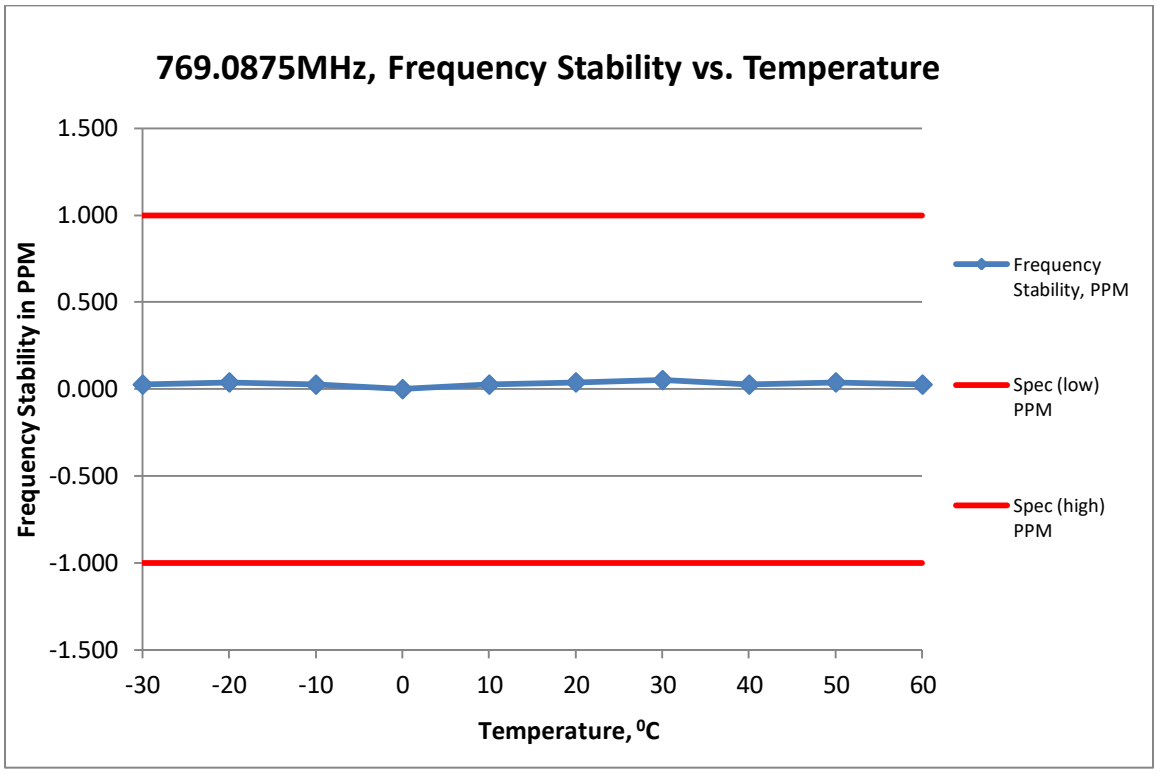
$$ppm\ error = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1\right) * 10^6$$

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	192.000	769.087540	0.052	-1.000	1.000
-15	204.000	769.087520	0.026	-1.000	1.000
-10	216.000	769.087530	0.039	-1.000	1.000
-5	228.000	769.087520	0.026	-1.000	1.000
0	240.000	769.087500	0.000	-1.000	1.000
5	252.000	769.087520	0.026	-1.000	1.000
10	264.000	769.087530	0.039	-1.000	1.000
15	276.000	769.087530	0.039	-1.000	1.000
20	288.000	769.087520	0.026	-1.000	1.000



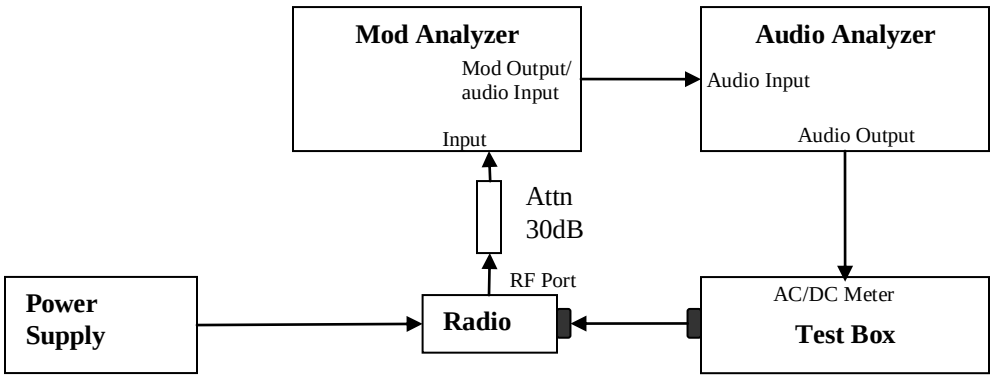
Frequency / Channel Spacing	769.0875 MHz / 12.5 kHz			
Voltage, V	240.0			
Temperature, ^{0}C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	769.087520	0.026	-1.000	1.000
-20	769.087530	0.039	-1.000	1.000
-10	769.087520	0.026	-1.000	1.000
0	769.087500	0.000	-1.000	1.000
10	769.087520	0.026	-1.000	1.000
20	769.087530	0.039	-1.000	1.000
30	769.087540	0.052	-1.000	1.000
40	769.087520	0.026	-1.000	1.000
50	769.087530	0.039	-1.000	1.000
60	769.087520	0.026	-1.000	1.000

6.2.3. Test Limit

As per manufacturer declared spec +/- 1ppm

6.3. Audio Frequency Response

6.3.1. Test Setup

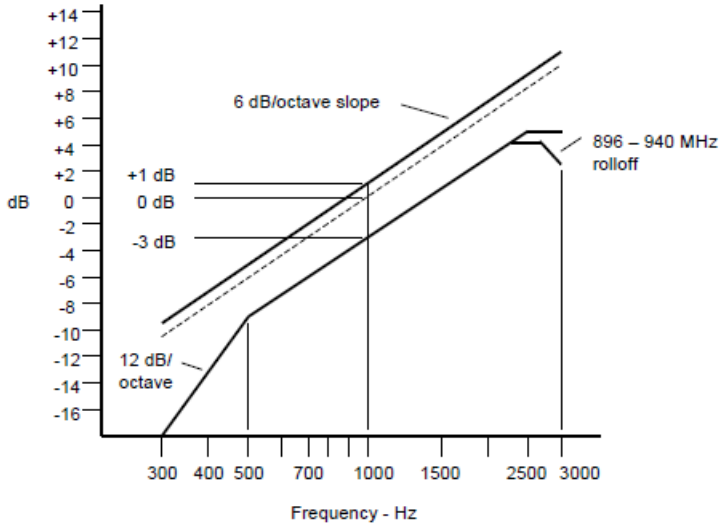


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz and 50 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the Full rated system deviation.
5) On audio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

NA → **Not Applicable**

6.3.3. Test Limit

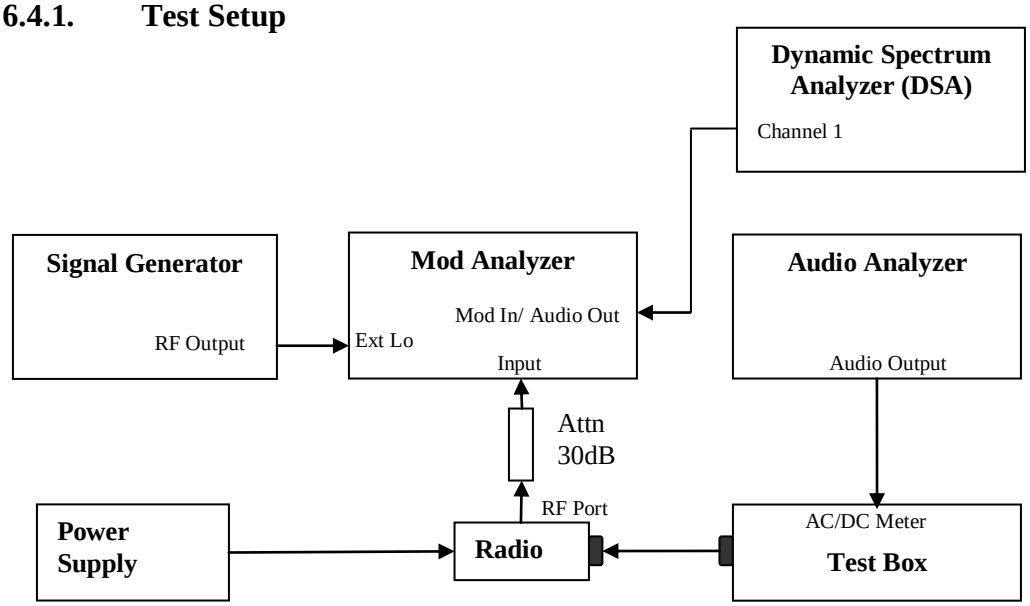


Note:

- *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

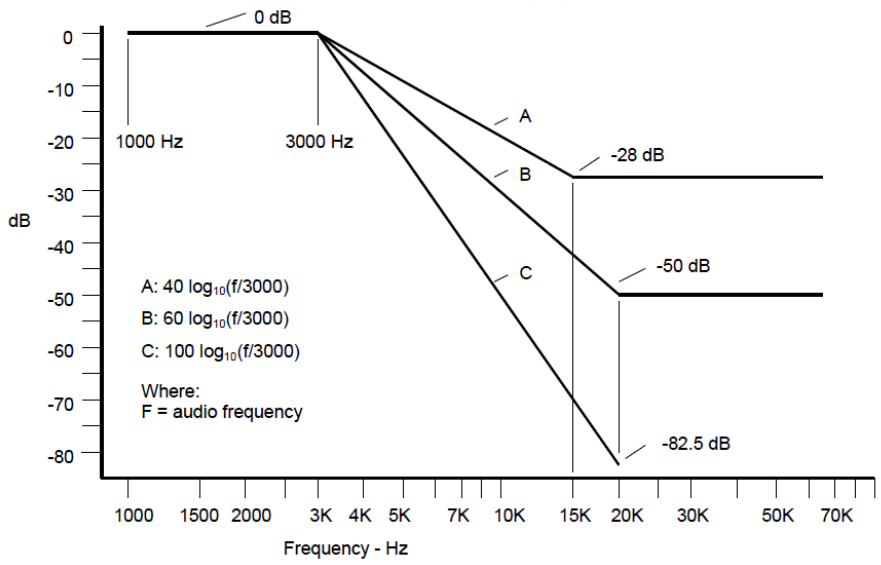


1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Press 23.1SPCL on modulation analyzer to enable the external LO from Sigen.
4) Set the Sigen frequency to Fc + 1.5 MHz, RF output level to 0dBm without modulation.
5) Transmit the radio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

NA → **Not Applicable**

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.

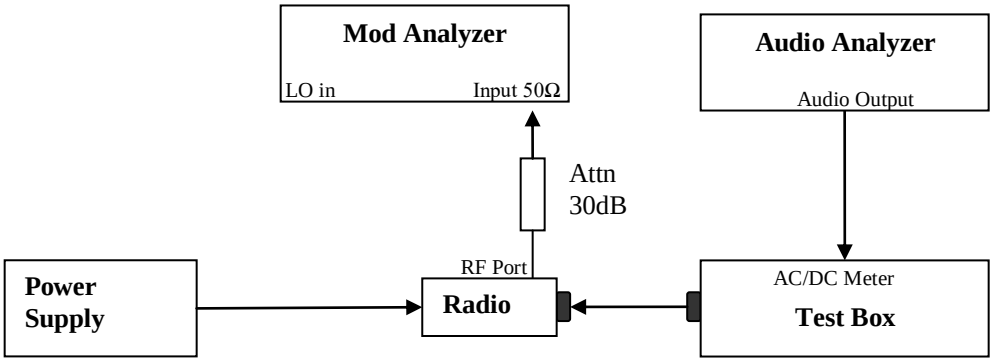
c) For equipment operating on channels between 896 MHz through 901 MHz, between 935 MHz through 940 MHz, and 12.5 or 15 kHz spaced channels in the frequency range 138-174 MHz and 406-512 MHz.

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

NA → **Not Applicable**

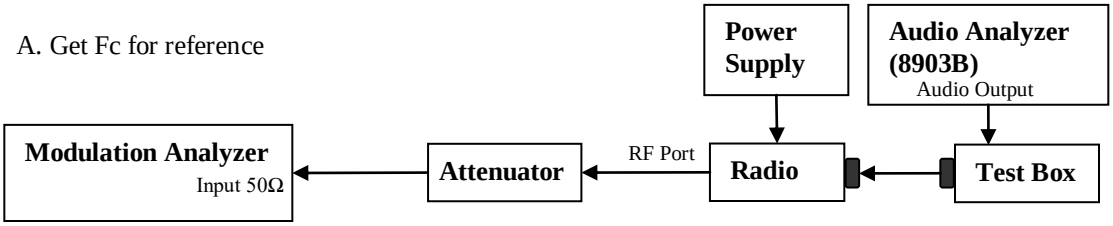
6.5.3. Test Limit

Modulation Limiting shall not exceed 100 percent.

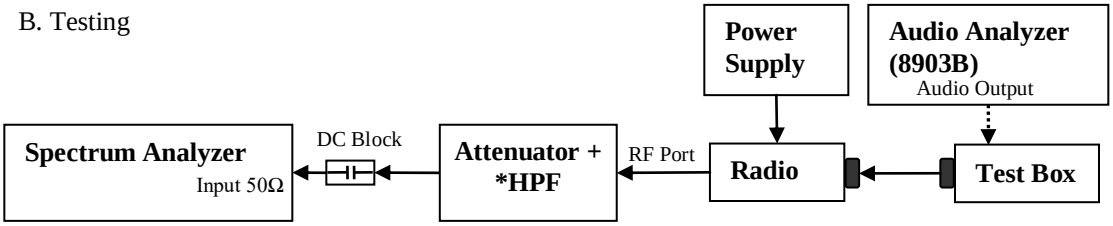
6.6. Occupied Bandwidth

6.6.1. Test Setup (Analog)

A. Get Fc for reference



B. Testing



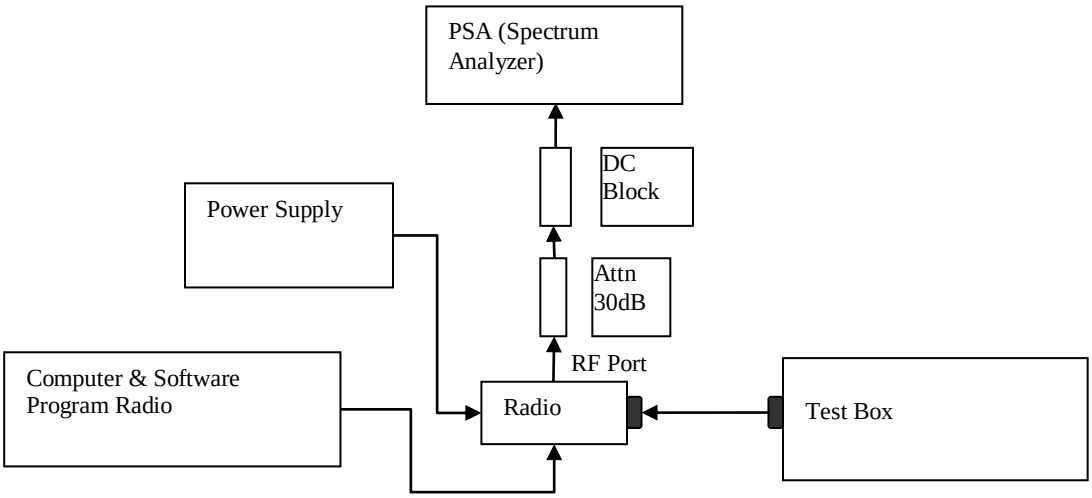
1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey the DUT.
4) Path loss for the measurement included.
5) Select the Occupied Bandwidth measurement for 99% Emissions Bandwidth Measurement.
6) Key in the Fc and Resolution Bandwidth (1 ~ 5 % of emission designator).
7) Transmit the DUT and record the occupied Bandwidth frequency.
8) Preset the spectrum analyzer for sideband spectrum measurement.
9) Set the span and Resolution Bandwidth (according to FCC/ ISED standard).
10) Save the screen shot as modulated signal
11) Remove the audio tone from audio analyzer to capture unmodulated signal.

* Only HPF added for Mask 80.211 measurement with attenuator.

6.6.2. Test Result (Analog)

NA → **Not Applicable**

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)

NA → **Not Applicable**

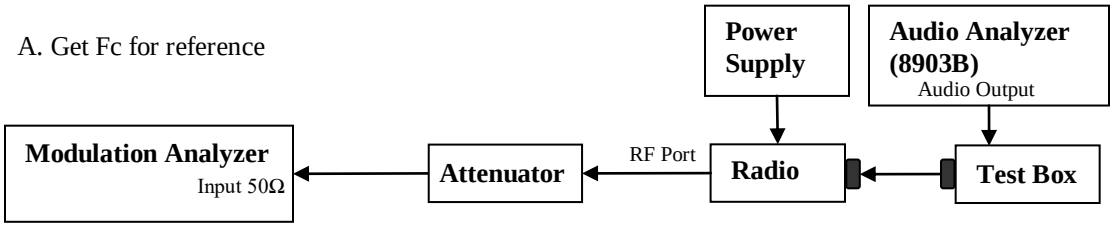
6.6.5. Test Limit

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

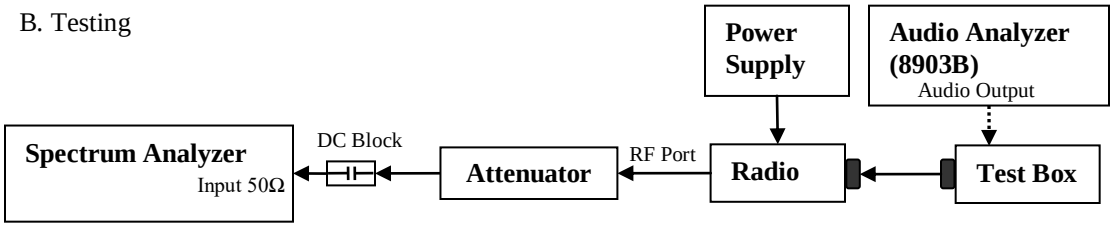
6.7. Band Edge Conducted Spurious Emission (Part 22)

6.7.1. Test Setup (Analog)

A. Get Fc for reference



B. Testing



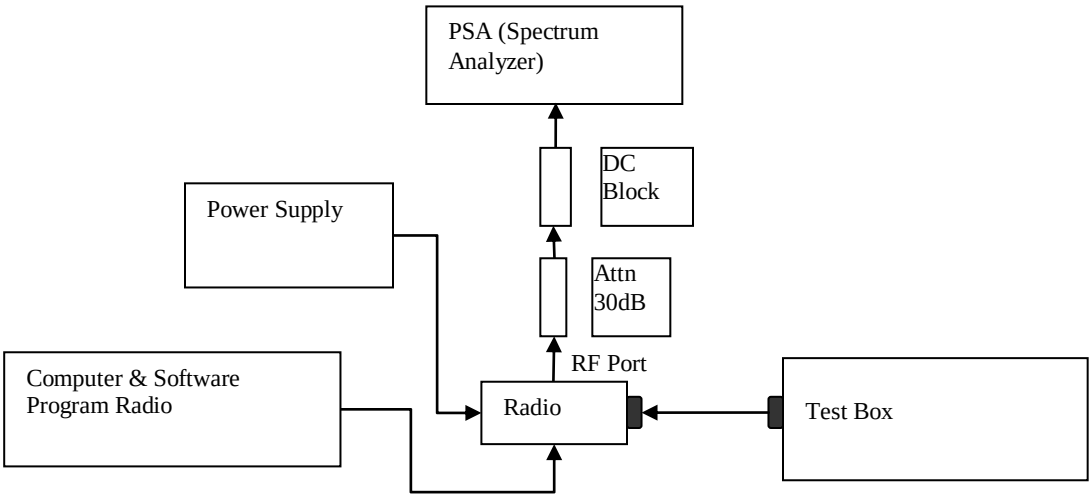
1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB. Dekey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

6.7.2. Test Result (Analog)

NA → **Not Applicable**

6.7.3. Test Setup (Digital)



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

*Note:
- All digital modulation modes utilize the same high deviation test pattern, and they are therefore identical. Hence, only F1D plots will be shown.

6.7.4. Test Result (Digital)

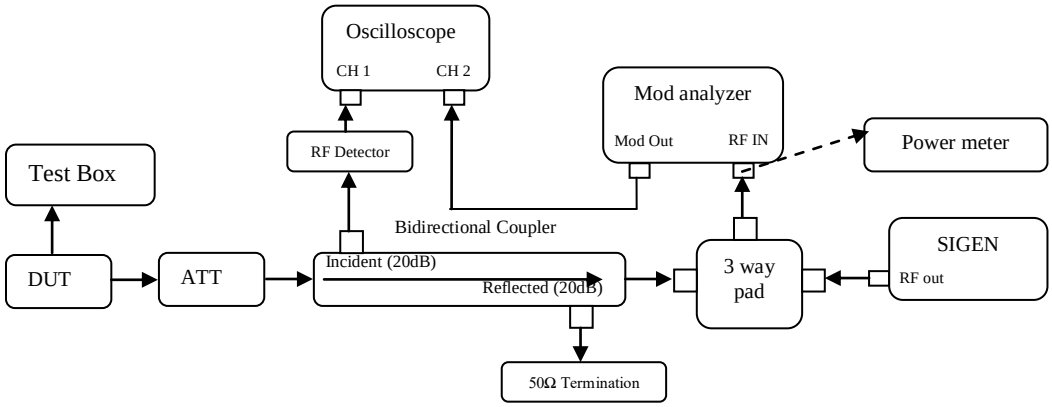
NA → **Not Applicable**

6.7.5. Test Limit

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

6.8. Transient Frequency Behavior

6.8.1. Test Setup



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

6.8.2. Test Result

NA → **Not Applicable**

6.8.3. Test Limit

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

Time intervals[1] [2]	Maximum frequency difference[3]	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t_1[4]	±25.0 kHz	5.0 ms	10.0 ms
t_2	±12.5 kHz	20.0 ms	25.0 ms
t_3[4]	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t_1[4]	±12.5 kHz	5.0 ms	10.0 ms
t_2	±6.25 kHz	20.0 ms	25.0 ms
t_3[4]	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t_1[4]	±6.25 kHz	5.0 ms	10.0 ms
t_2	±3.125 kHz	20.0 ms	25.0 ms
t_3[4]	±6.25 kHz	5.0 ms	10.0 ms

[1] t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.
t_1 is the time period immediately following t_{on}.
t_2 is the time period immediately following t_1.
t_3 is the time period from the instant when the transmitter is turned off until t_{off}.
t_{off} is the instant when the 1 kHz test signal starts to rise.

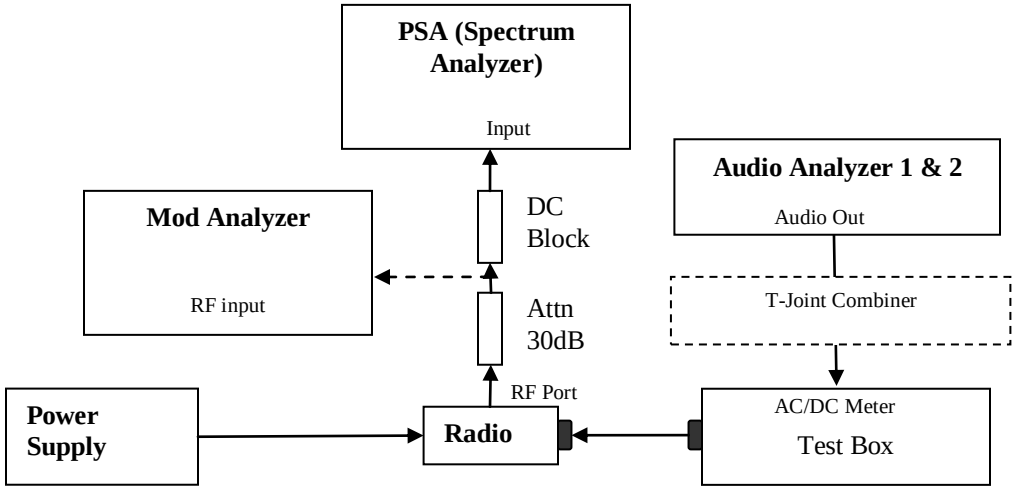
[2] During the time from the end of t_2 to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.

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

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

6.9. Adjacent Channel Power

6.9.1. Test Setup (Analog)

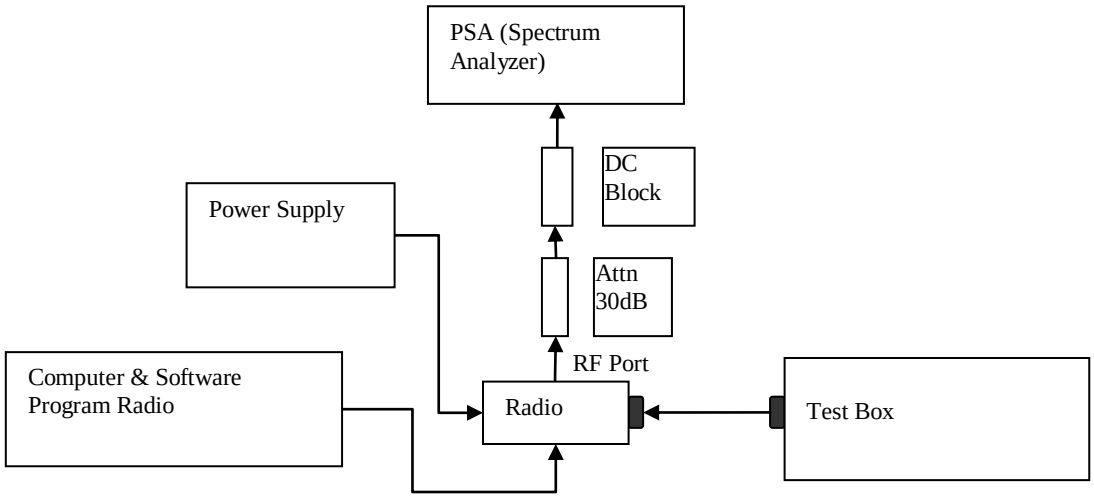


1) The DUT transmitter output port was connected to modulation analyzer.
2) Transmit the radio and turn on 1st audio analyzer with audio frequency 650Hz, 50% rated deviation, and record the amplitude value as AmpT1.
3) Turn off Audio analyzer 1 and turn on audio analyzer 2, set the audio frequency to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

6.9.2. Test Result(Analog)

NA → Not Applicable

6.9.3. Test Setup (Digital)



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

6.9.4. Test Result (Digital)

Mode	Digital Data			
Frequency, MHz	764.0125			
Channel Spacing, kHz	12.5			
Offset (kHz)	Meas BW (kHz)	Lower	Upper	Spec (dB)
9.375	6.25	-49.981	-50.217	-40
15.625	6.25	-77.840	-77.454	-60
21.875	6.25	-77.896	-77.794	-60
37.500	25	-72.629	-72.775	-65
62.500	25	-74.274	-74.403	-65
87.500	25	-76.403	-76.287	-65
150.000	100	-74.315	-73.493	-65
250.000	100	-79.533	-77.040	-65
350.000	100	-82.672	-80.535	-65
400k	30	-88.900	-86.336	-75
12M	30	-95.205	-95.007	-75

Mode	Digital Data			
Frequency, MHz	769.0875			
Channel Spacing, kHz	12.5			
Offset (kHz)	Meas BW (kHz)	Lower	Upper	Spec (dB)
9.375	6.25	-49.996	-50.174	-40
15.625	6.25	-76.792	-77.183	-60
21.875	6.25	-77.717	-78.563	-60
37.500	25	-72.574	-72.946	-65
62.500	25	-74.143	-73.946	-65
87.500	25	-76.720	-76.167	-65
150.000	100	-74.339	-73.371	-65
250.000	100	-79.345	-77.078	-65
350.000	100	-82.515	-80.671	-65
400k	30	-89.193	-86.688	-75
12M	30	-94.624	-94.965	-75

Mode	**Digital Data**			
Frequency, MHz	**774.8875**			
Channel Spacing, kHz	**12.5**			
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper	**Spec (dB)**
9.375	6.25	-49.962	-50.297	-40
15.625	6.25	-76.670	-77.861	-60
21.875	6.25	-78.426	-77.855	-60
37.500	25	-72.555	-72.471	-65
62.500	25	-74.108	-73.912	-65
87.500	25	-76.399	-76.043	-65
150.000	100	-74.071	-73.471	-65
250.000	100	-79.289	-77.517	-65
350.000	100	-82.503	-80.846	-65
400k	30	-89.055	-86.149	-75
12M	30	-94.975	-95.053	-75

Mode	**Digital Voice**			
Frequency, MHz	**764.0125**			
Channel Spacing, kHz	**12.5**			
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper	**Spec (dB)**
9.375	6.25	-50.076	-50.235	-40
15.625	6.25	-77.076	-77.355	-60
21.875	6.25	-77.754	-78.171	-60
37.500	25	-72.449	-72.585	-65
62.500	25	-74.033	-73.711	-65
87.500	25	-76.381	-76.237	-65
150.000	100	-74.209	-73.213	-65
250.000	100	-79.217	-76.977	-65
350.000	100	-82.635	-80.422	-65
400k	30	-89.053	-86.415	-75
12M	30	-95.412	-94.771	-75

Mode	**Digital Voice**			
Frequency, MHz	**769.0875**			
Channel Spacing, kHz	**12.5**			
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper	**Spec (dB)**
9.375	6.25	-49.964	-50.118	-40
15.625	6.25	-76.963	-77.129	-60
21.875	6.25	-78.139	-78.002	-60
37.500	25	-72.603	-72.592	-65
62.500	25	-74.151	-73.901	-65
87.500	25	-76.417	-75.897	-65
150.000	100	-74.031	-73.473	-65
250.000	100	-79.037	-76.976	-65
350.000	100	-82.094	-80.772	-65
400k	30	-88.212	-87.051	-75
12M	30	-95.378	-94.460	-75

Mode	**Digital Voice**			
Frequency, MHz	**774.8875**			
Channel Spacing, kHz	**12.5**			
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper	**Spec (dB)**
9.375	6.25	-50.129	-50.229	-40
15.625	6.25	-76.546	-77.602	-60
21.875	6.25	-78.184	-77.833	-60
37.500	25	-72.589	-72.351	-65
62.500	25	-74.079	-73.533	-65
87.500	25	-76.521	-75.735	-65
150.000	100	-74.080	-73.408	-65
250.000	100	-79.265	-77.380	-65
350.000	100	-82.407	-80.819	-65
400k	30	-88.654	-86.857	-75
12M	30	-94.805	-95.848	-75

Mode	**Phase II**			
Frequency, MHz	**764.0125**			
Channel Spacing, kHz	**12.5**			
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper	**Spec (dB)**
9.375	6.25	-41.256	-42.651	-40
15.625	6.25	-76.524	-75.761	-60
21.875	6.25	-78.101	-77.871	-60
37.500	25	-72.645	-72.507	-65
62.500	25	-74.331	-73.898	-65
87.500	25	-76.375	-75.956	-65
150.000	100	-73.937	-73.472	-65
250.000	100	-79.168	-77.163	-65
350.000	100	-82.324	-80.152	-65
400k	30	-88.422	-86.798	-75
12M	30	-94.791	-94.702	-75

Mode	**Phase II**			
Frequency, MHz	**769.0875**			
Channel Spacing, kHz	**12.5**			
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper	**Spec (dB)**
9.375	6.25	-41.259	-42.965	-40
15.625	6.25	-77.723	-76.012	-60
21.875	6.25	-78.959	-77.565	-60
37.500	25	-72.663	-72.572	-65
62.500	25	-74.212	-74.206	-65
87.500	25	-76.487	-76.277	-65
150.000	100	-74.101	-73.434	-65
250.000	100	-79.072	-77.363	-65
350.000	100	-82.150	-80.512	-65
400k	30	-87.788	-86.656	-75
12M	30	-95.162	-95.131	-75

Mode	Phase II			
Frequency, MHz	774.8875			
Channel Spacing, kHz	12.5			
Offset (kHz)	Meas BW (kHz)	Lower	Upper	Spec (dB)
9.375	6.25	-43.188	-42.325	-40
15.625	6.25	-76.817	-77.090	-60
21.875	6.25	-78.387	-77.789	-60
37.500	25	-72.399	-72.408	-65
62.500	25	-74.059	-73.727	-65
87.500	25	-76.357	-76.160	-65
150.000	100	-73.987	-73.365	-65
250.000	100	-79.030	-77.732	-65
350.000	100	-82.036	-80.805	-65
400k	30	-88.367	-86.937	-75
12M	30	-94.342	-95.140	-75

6.9.5. Test limit

12.5 kHz Mobile Transmitter ACP Requirements

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

25 kHz Mobile Transmitter ACP Requirements

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

12.5 kHz Base Transmitter ACP Requirements

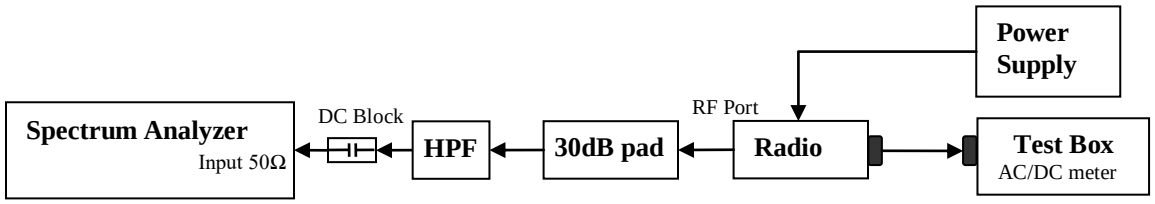
Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP (dBc)
9.375	6.25	−40
15.625	6.25	−60
21.875	6.25	−60
37.5	25	−60
62.5	25	−65
87.5	25	−65
150	100	−65
250	100	−65
350.00	100	−65
>400 kHz to 12 MHz	30 (s)	−80
12 MHz to paired receive band	30 (s)	−80
In the paired receive band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

25 kHz Base Transmitter ACP Requirements

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

6.10. Conducted Spurious Emission

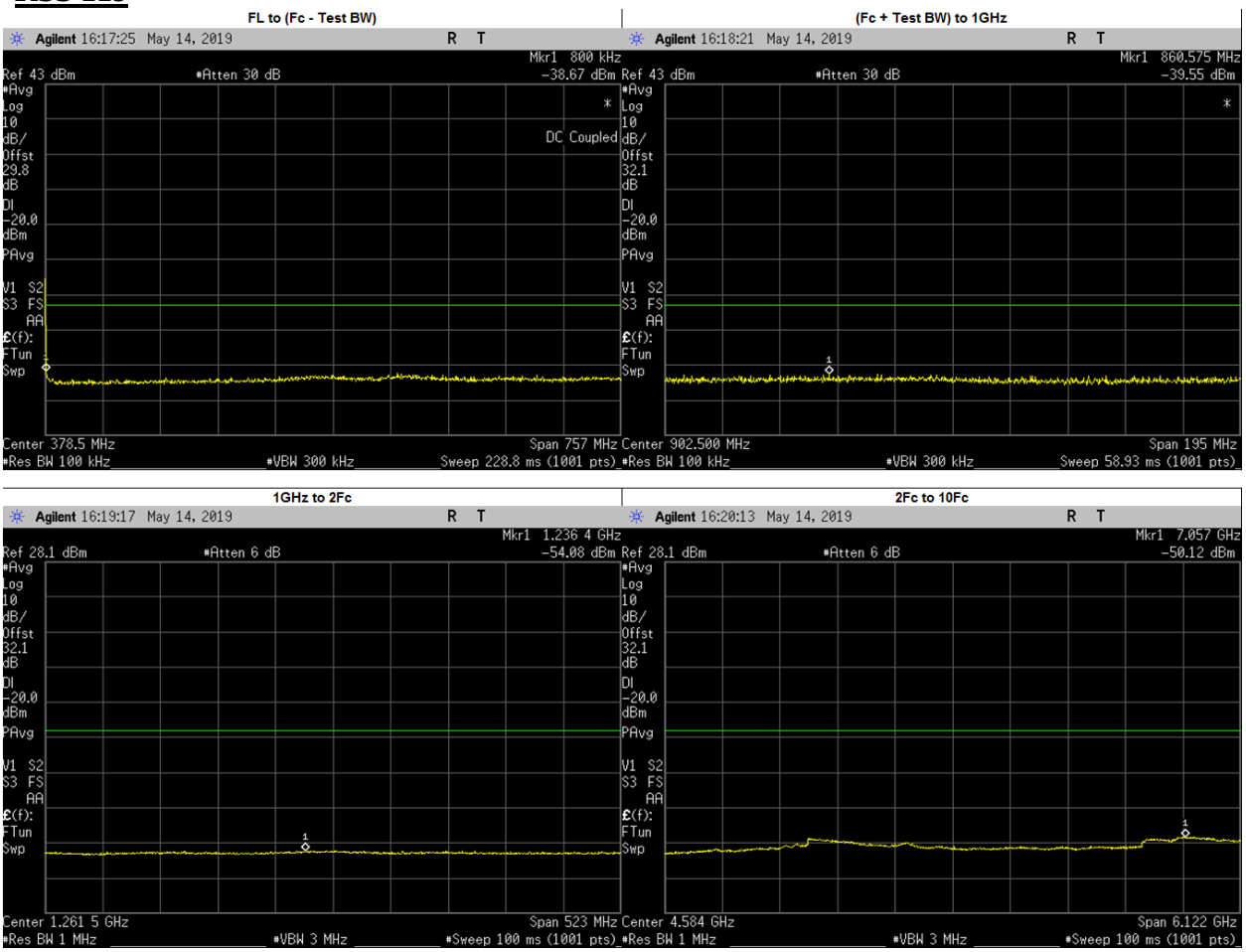
6.10.1. Test Setup



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

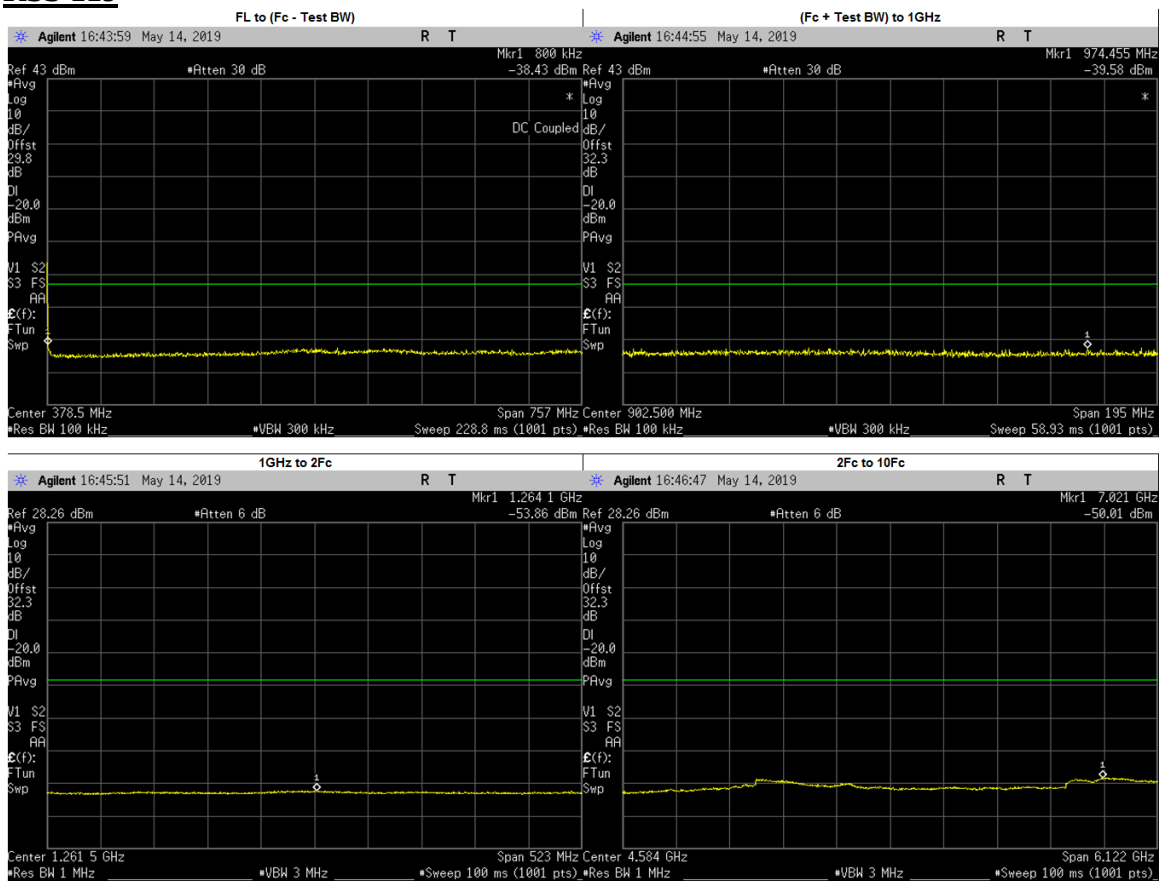
6.10.2. Test Result (Analog)

Analog: 764.0125 MHz, 12.5kHz Channel Spacing, Max Power
RSS 119



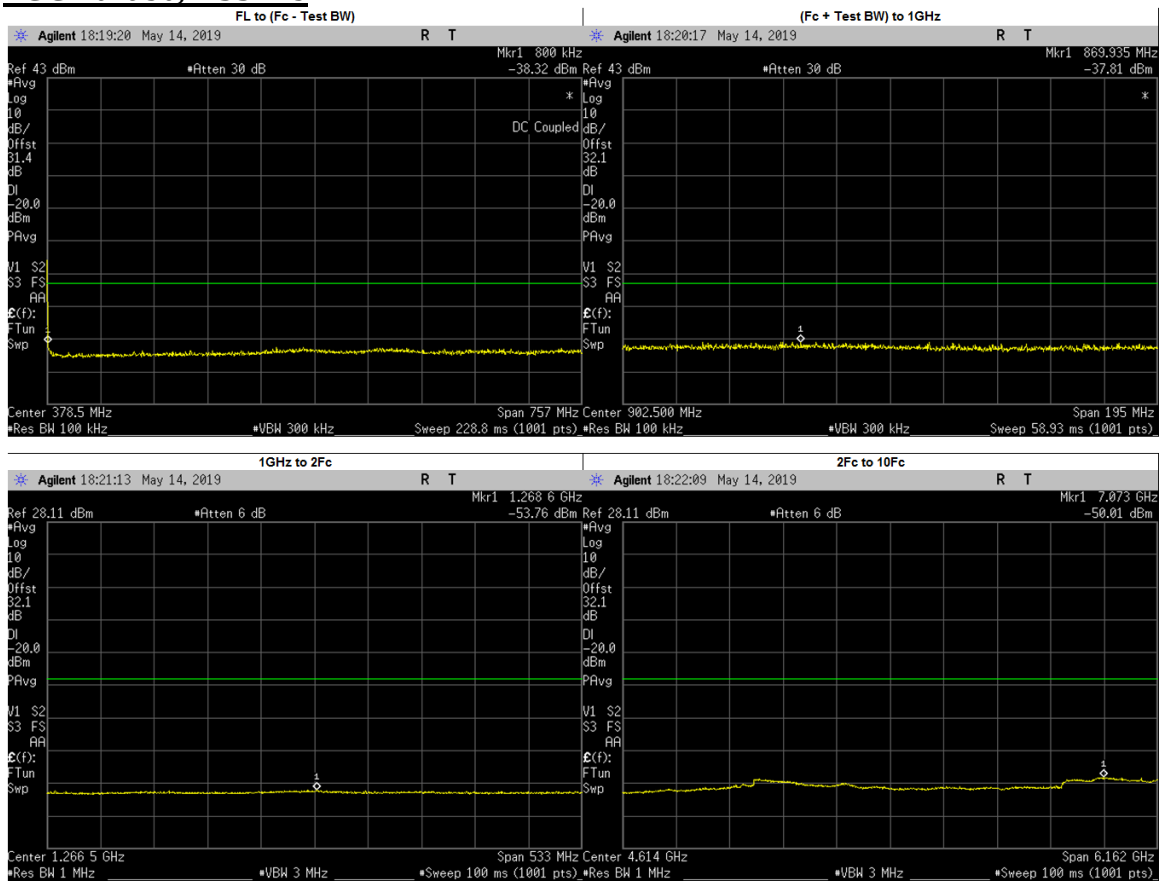
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	463.2875	-37.8459	-20	PASS
(Fc + Test BW) to 1GHz	860.5750	-39.5500	-20	PASS
1GHz to 2Fc	1236.4070	-54.0800	-20	PASS
2Fc to 10Fc	7057.4030	-50.1200	-20	PASS
	1528.0250	-54.8598	-20	PASS
	2292.0370	-54.1111	-20	PASS
	3056.0500	-50.7126	-20	PASS
	3820.0620	-52.3874	-20	PASS
	4584.0750	-53.4600	-20	PASS
	5348.0870	-53.2654	-20	PASS
	6112.1000	-53.2139	-20	PASS
	6876.1130	-51.0916	-20	PASS
	7640.1250	-51.3923	-20	PASS

Analog: 764.0125 MHz, 12.5kHz Channel Spacing, Low Power
RSS 119



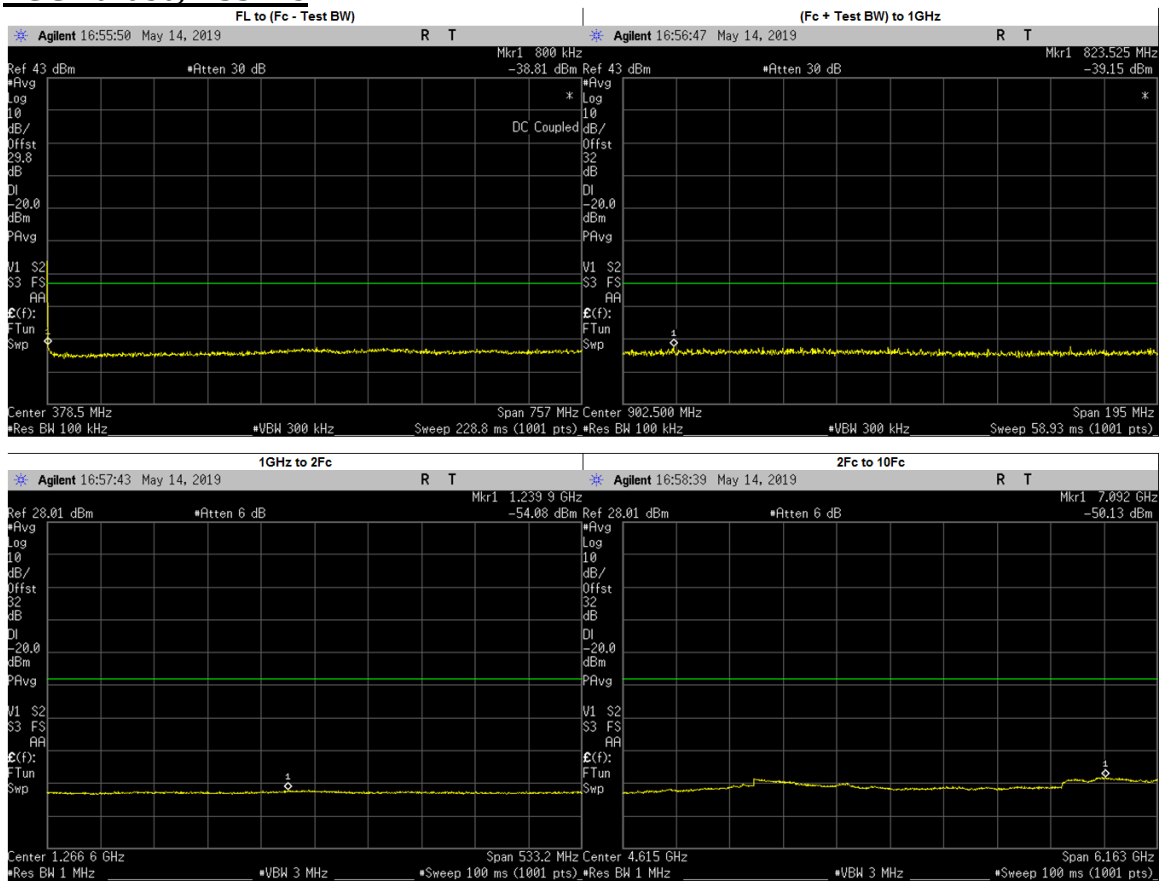
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	411.0551	-38.0102	-20	PASS
(Fc + Test BW) to 1GHz	974.4550	-39.5800	-20	PASS
1GHz to 2Fc	1264.1280	-53.8600	-20	PASS
2Fc to 10Fc	7021.0000	-50.0100	-20	PASS
	1528.0250	-54.6121	-20	PASS
	2292.0370	-53.8891	-20	PASS
	3056.0500	-50.5315	-20	PASS
	3820.0620	-52.4833	-20	PASS
	4584.0750	-53.3840	-20	PASS
	5348.0870	-52.9169	-20	PASS
	6112.1000	-52.8990	-20	PASS
	6876.1130	-51.2513	-20	PASS
	7640.1250	-51.0024	-20	PASS

Analog: 769.0125 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



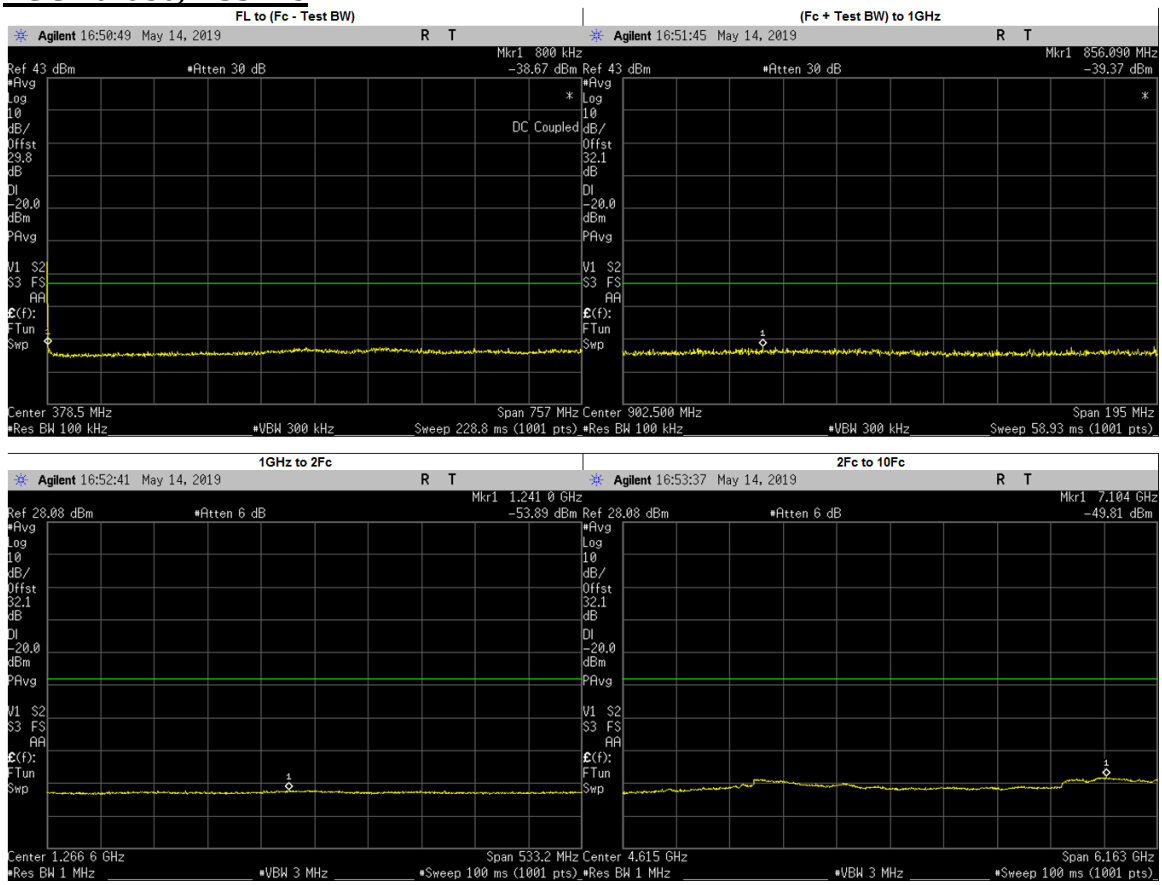
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	727.4774	-39.2493	-20	PASS
(Fc + Test BW) to 1GHz	869.9350	-37.8100	-20	PASS
1GHz to 2Fc	1268.6450	-53.7600	-20	PASS
2Fc to 10Fc	7073.0000	-50.0100	-20	PASS
	1538.0250	-54.8563	-20	PASS
	2307.0370	-54.0613	-20	PASS
	3076.0500	-50.7665	-20	PASS
	3845.0620	-52.7423	-20	PASS
	4614.0750	-53.6600	-20	PASS
	5383.0870	-53.3027	-20	PASS
	6152.1000	-53.1411	-20	PASS
	6921.1130	-51.2047	-20	PASS
	7690.1250	-50.7238	-20	PASS

Analog: 769.0875 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



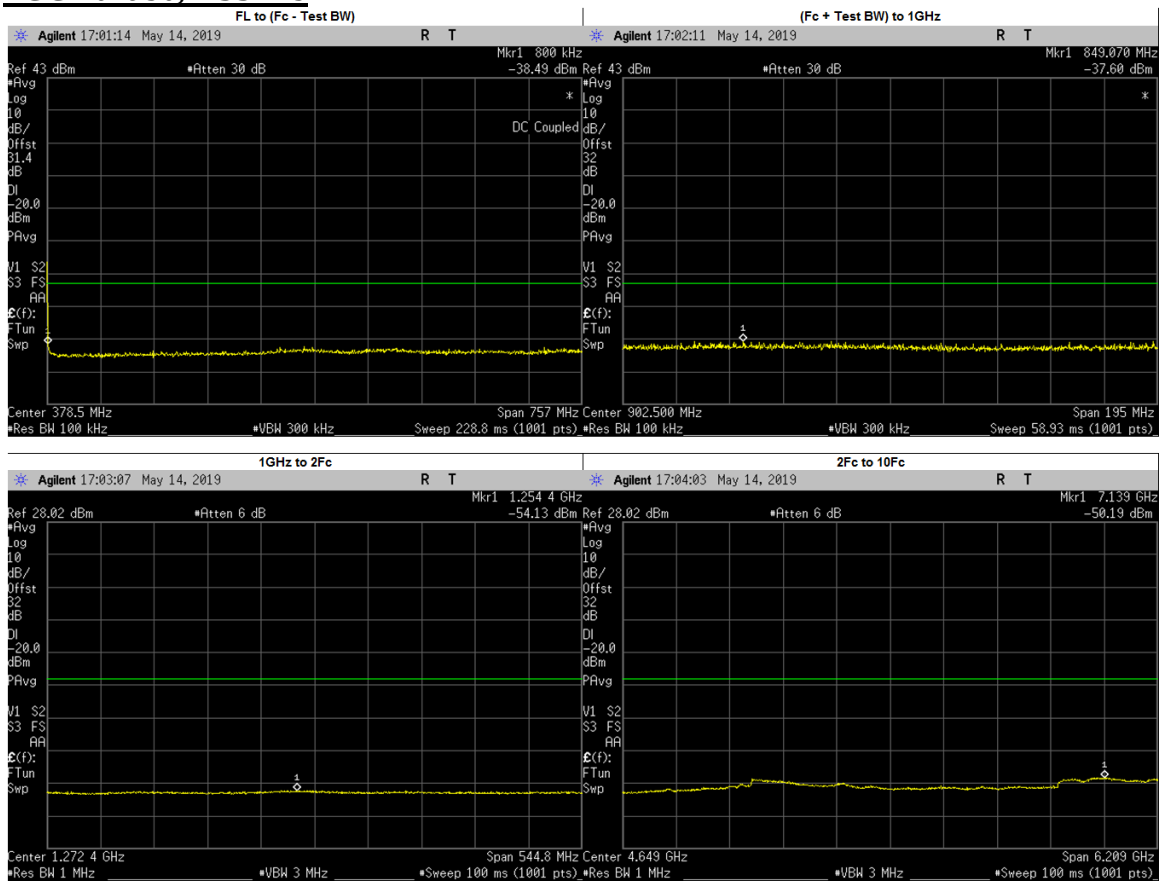
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	381.5325	-38.0030	-20	PASS
(Fc + Test BW) to 1GHz	823.5250	-39.1500	-20	PASS
1GHz to 2Fc	1239.9290	-54.0800	-20	PASS
2Fc to 10Fc	7091.9300	-50.1300	-20	PASS
	1538.1750	-54.7642	-20	PASS
	2307.2620	-54.1209	-20	PASS
	3076.3500	-50.9258	-20	PASS
	3845.4370	-52.8237	-20	PASS
	4614.5250	-53.4650	-20	PASS
	5383.6130	-53.4563	-20	PASS
	6152.7000	-53.3780	-20	PASS
	6921.7880	-51.3583	-20	PASS
	7690.8750	-50.8642	-20	PASS

Analog: 769.0875 MHz, 12.5kHz Channel Spacing, Low Power
FCC Part 90, RSS 119



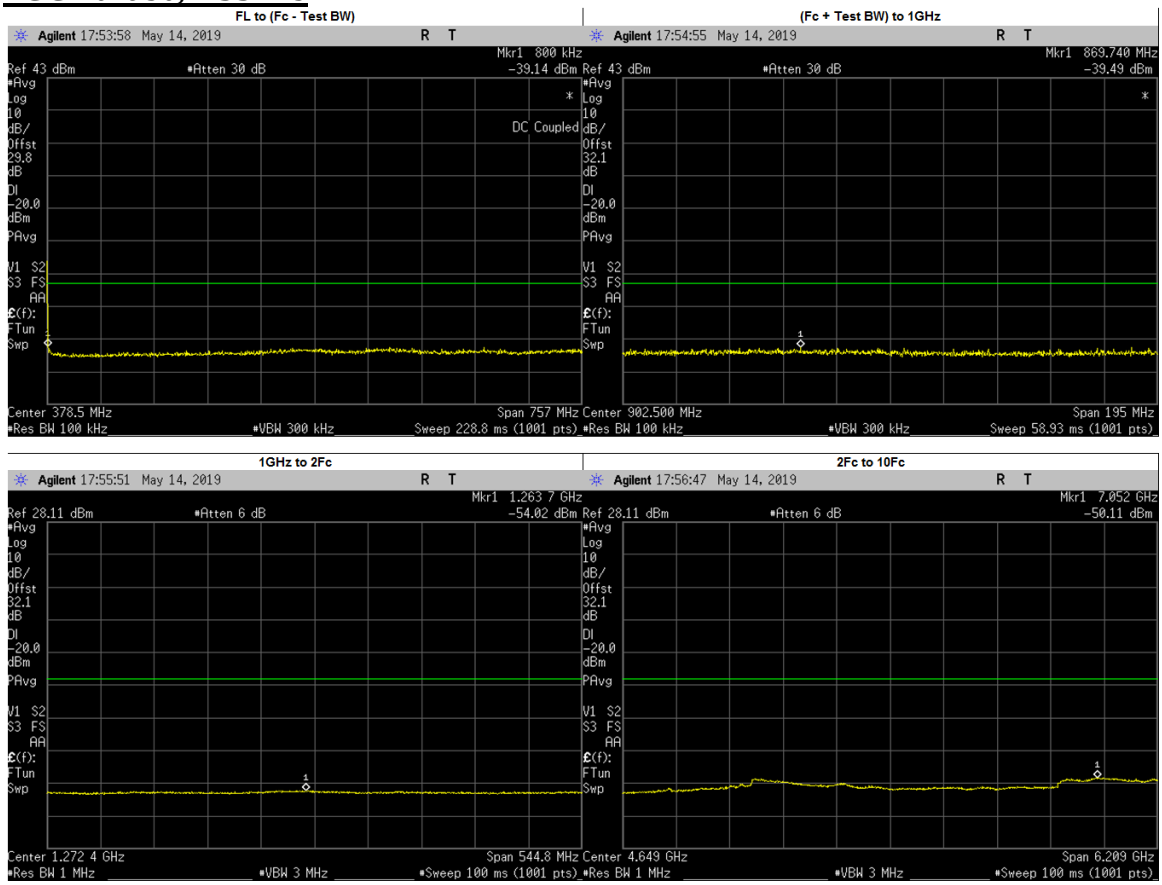
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	366.3926	-38.0936	-20	PASS
(Fc + Test BW) to 1GHz	856.0900	-39.3700	-20	PASS
1GHz to 2Fc	1241.0000	-53.8900	-20	PASS
2Fc to 10Fc	7104.2560	-49.8100	-20	PASS
	1538.1750	-54.6203	-20	PASS
	2307.2620	-54.0882	-20	PASS
	3076.3500	-50.8018	-20	PASS
	3845.4370	-52.9105	-20	PASS
	4614.5250	-53.6040	-20	PASS
	5383.6130	-53.4718	-20	PASS
	6152.7000	-53.0298	-20	PASS
	6921.7880	-51.1903	-20	PASS
	7690.8750	-50.8975	-20	PASS

Analog: 774.8875 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	704.0106	-39.2965	-20	PASS
(Fc + Test BW) to 1GHz	849.0700	-37.6000	-20	PASS
1GHz to 2Fc	1254.4100	-54.1300	-20	PASS
2Fc to 10Fc	7139.1740	-50.1900	-20	PASS
	1549.7750	-54.8908	-20	PASS
	2324.6620	-54.0318	-20	PASS
	3099.5500	-50.8651	-20	PASS
	3874.4370	-52.7179	-20	PASS
	4649.3250	-53.6680	-20	PASS
	5424.2120	-53.4201	-20	PASS
	6199.1000	-53.1760	-20	PASS
	6973.9880	-50.7120	-20	PASS
	7748.8750	-50.7591	-20	PASS

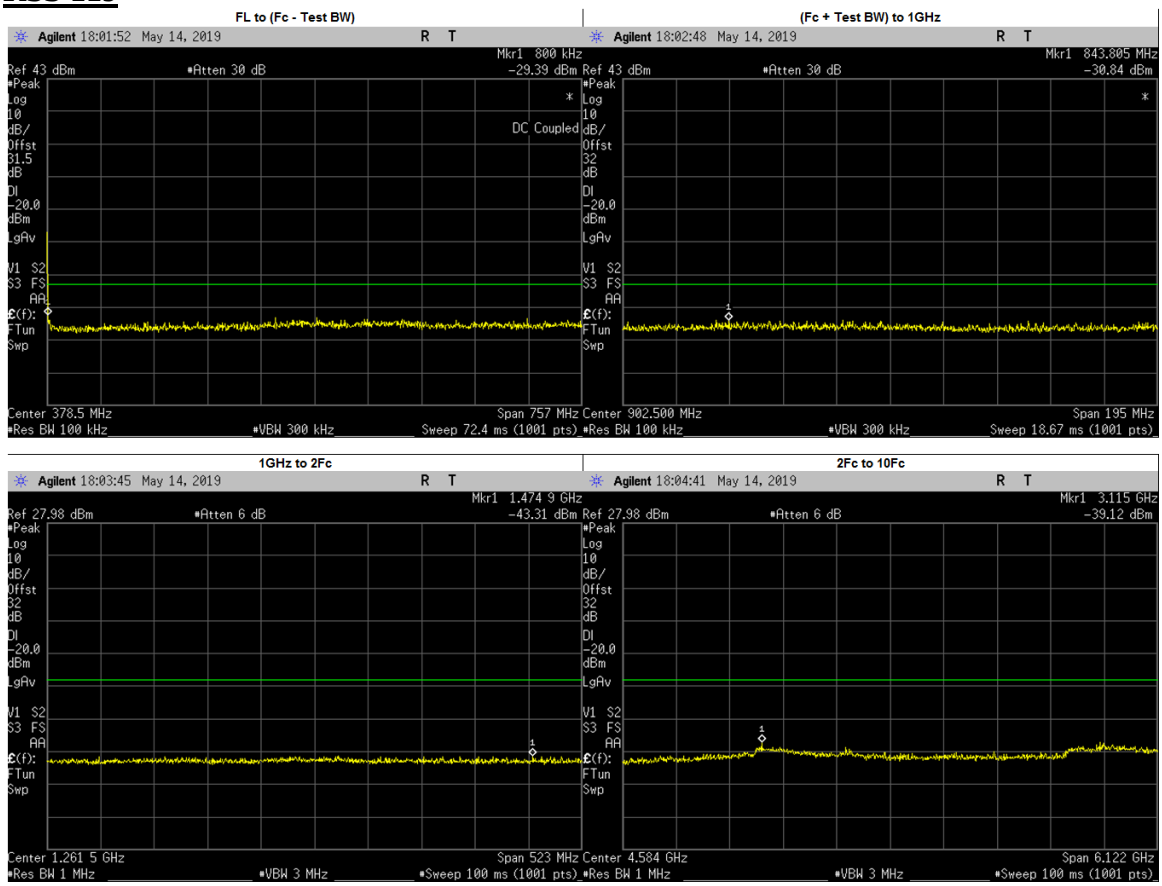
Analog: 774.8875 MHz, 12.5kHz Channel Spacing, Low Power
FCC Part 90, RSS 119



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	617.7137	-37.8488	-20	PASS
(Fc + Test BW) to 1GHz	869.7400	-39.4900	-20	PASS
1GHz to 2Fc	1263.7000	-54.0200	-20	PASS
2Fc to 10Fc	7052.2470	-50.1100	-20	PASS
	1549.7750	-54.9499	-20	PASS
	2324.6620	-53.7747	-20	PASS
	3099.5500	-50.8299	-20	PASS
	3874.4370	-52.7952	-20	PASS
	4649.3250	-53.7590	-20	PASS
	5424.2120	-53.1771	-20	PASS
	6199.1000	-53.1754	-20	PASS
	6973.9880	-50.8123	-20	PASS
	7748.8750	-50.7967	-20	PASS

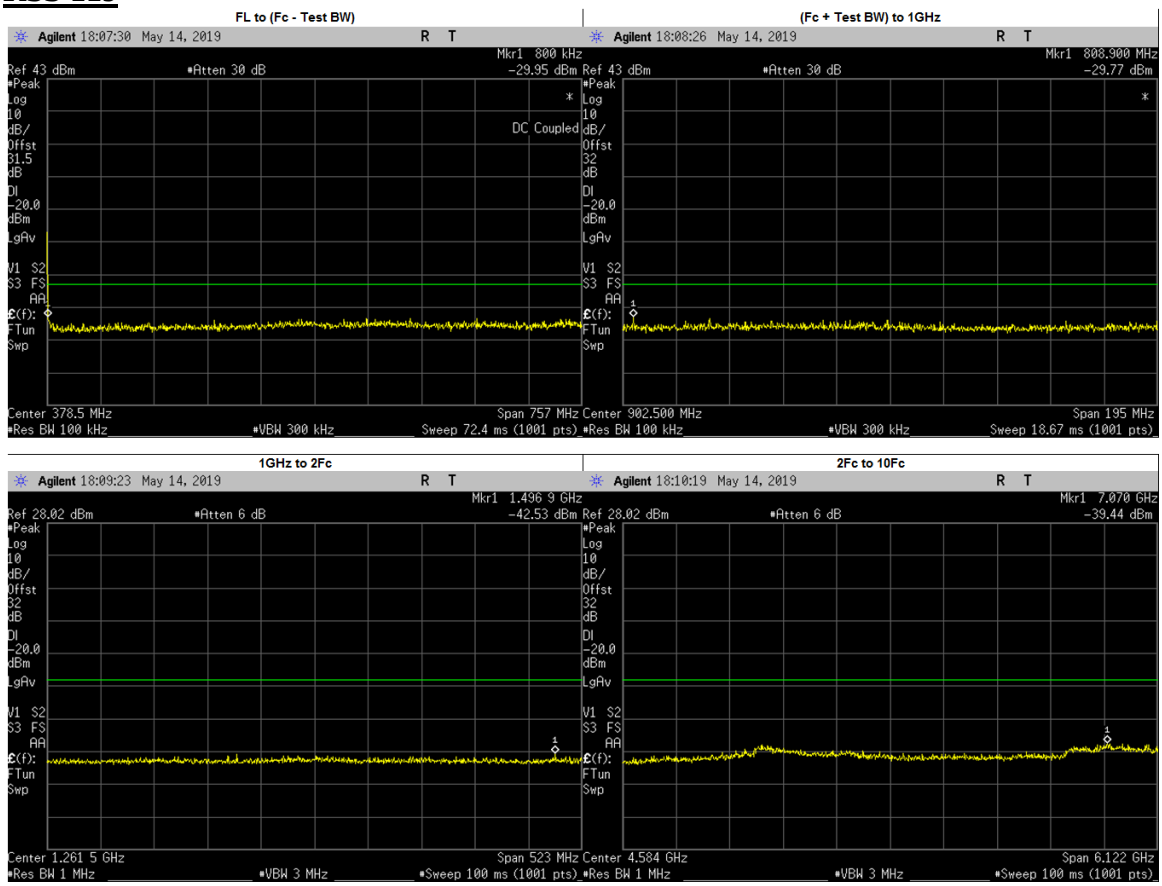
6.10.3. Test Result (Digital)

Digital: 764.0125 MHz, 12.5kHz Channel Spacing, Max Power
RSS 119



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	679.7869	-30.1314	-20	PASS
(Fc + Test BW) to 1GHz	843.8050	-30.8400	-20	PASS
1GHz to 2Fc	1474.9070	-43.3100	-20	PASS
2Fc to 10Fc	1528.0250	-45.2305	-20	PASS
	2292.0370	-44.4963	-20	PASS
	3056.0500	-41.2399	-20	PASS
	3820.0620	-42.7287	-20	PASS
	4584.0750	-44.6620	-20	PASS
	5348.0870	-43.7696	-20	PASS
	6112.1000	-43.2655	-20	PASS
	6876.1130	-41.5776	-20	PASS
	7640.1250	-41.6524	-20	PASS
	3115.0000	-39.1200	-20	PASS

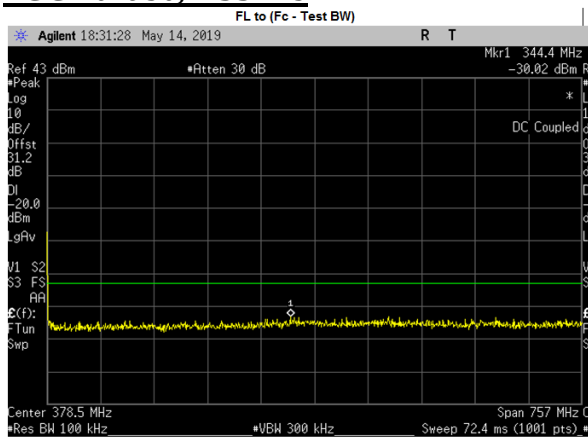
Digital: 764.0125 MHz, 12.5kHz Channel Spacing, Low Power
RSS 119



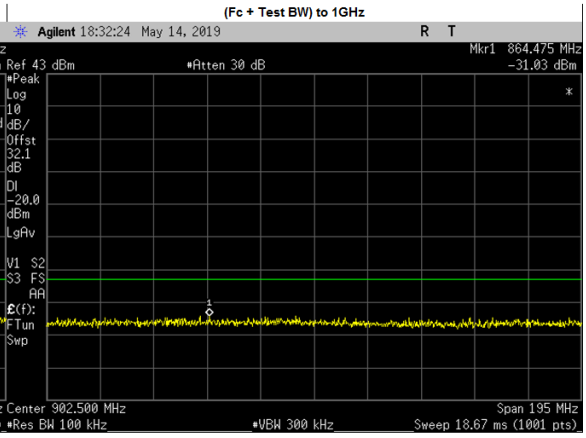
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	608.6298	-30.4664	-20	PASS
(Fc + Test BW) to 1GHz	808.9000	-29.7700	-20	PASS
1GHz to 2Fc	1496.9000	-42.5300	-20	PASS
2Fc to 10Fc	1528.0250	-45.2850	-20	PASS
	2292.0370	-44.1960	-20	PASS
	3056.0500	-41.1960	-20	PASS
	3820.0620	-43.3861	-20	PASS
	4584.0750	-43.6700	-20	PASS
	5348.0870	-44.1907	-20	PASS
	6112.1000	-43.5806	-20	PASS
	6876.1130	-41.7052	-20	PASS
	7640.1250	-40.7371	-20	PASS
	7070.0000	-39.4400	-20	PASS

Digital: 769.0125 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119

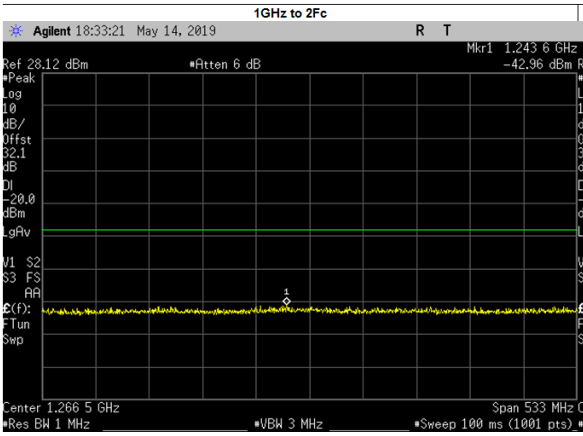
FL to (Fc - Test BW)



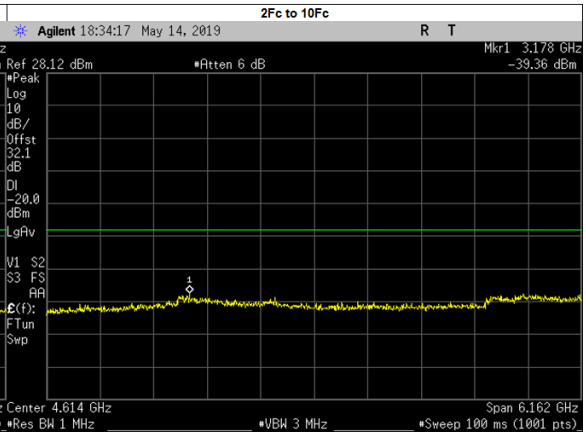
(Fc + Test BW) to 1GHz



1GHz to 2Fc

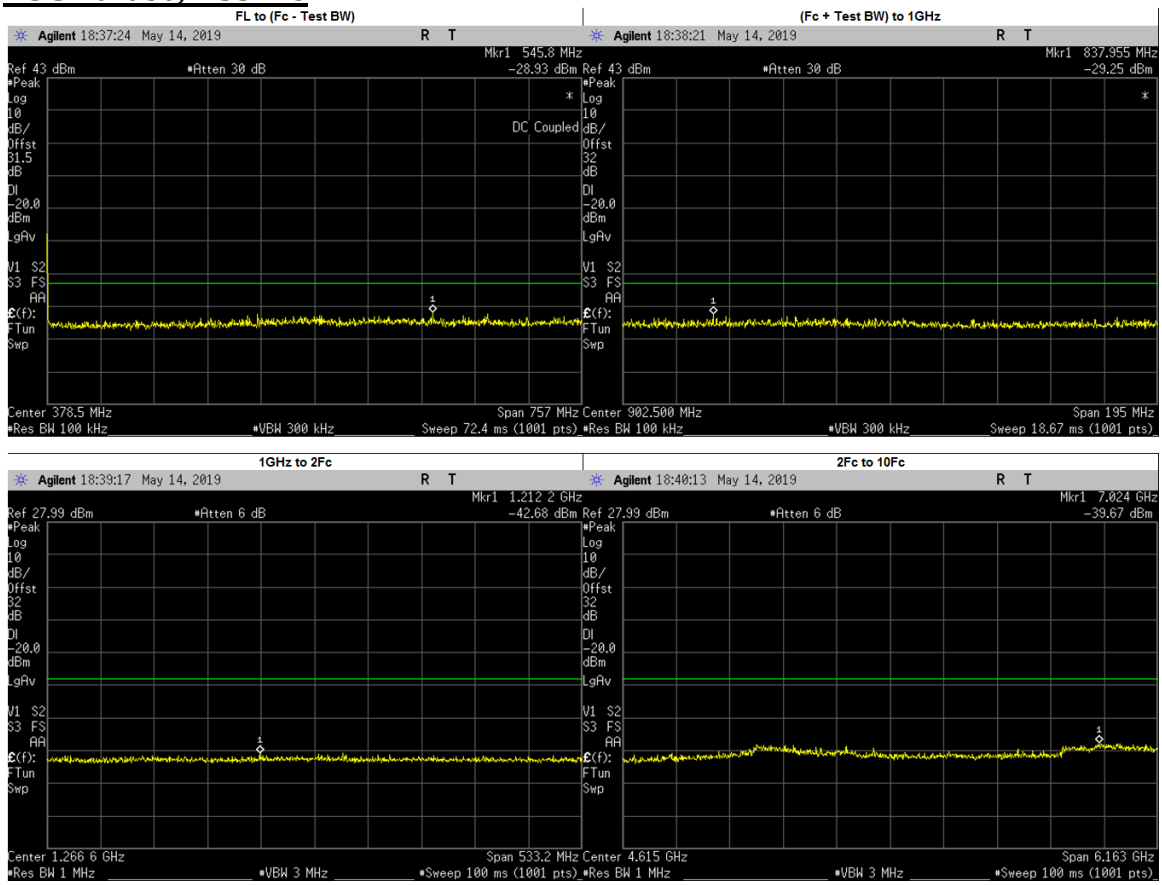


2Fc to 10Fc



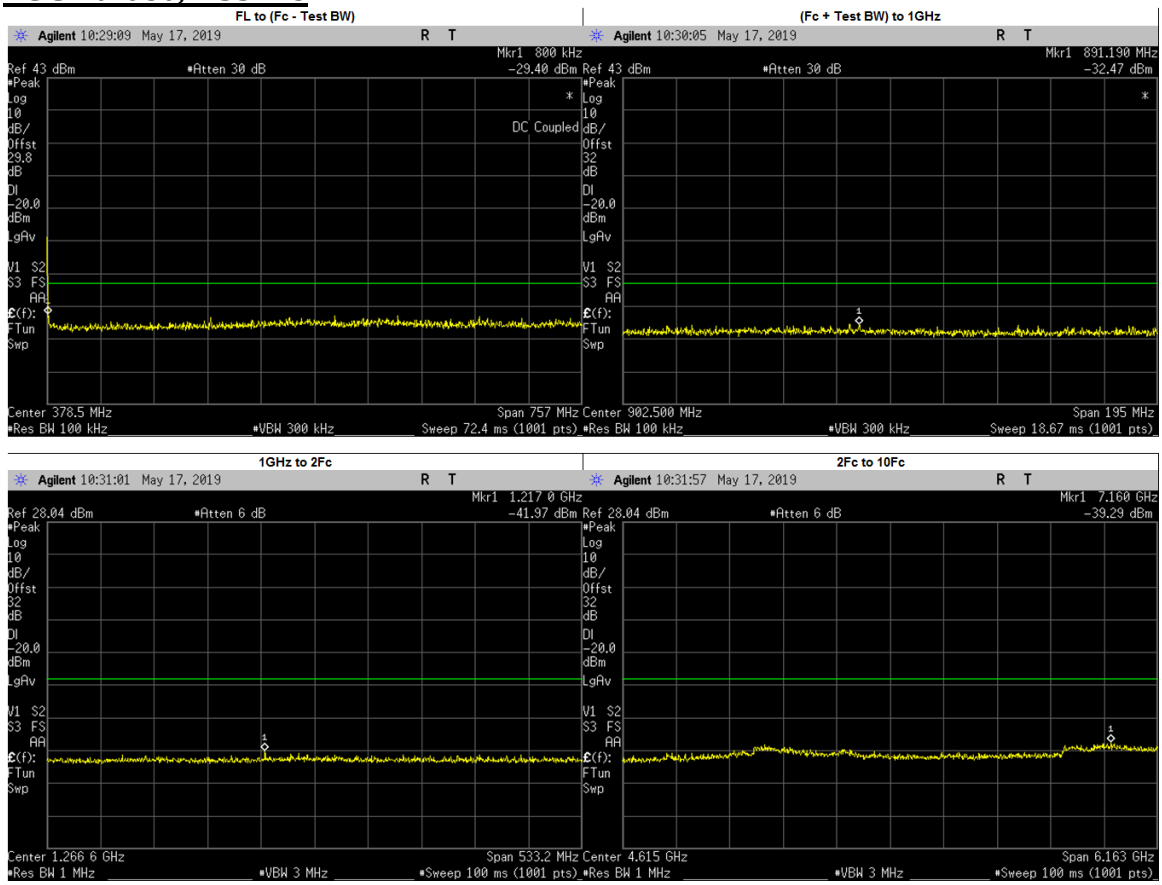
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	482.9693	-30.1784	-20	PASS
(Fc + Test BW) to 1GHz	864.4750	-31.0300	-20	PASS
1GHz to 2Fc	1243.6000	-42.9600	-20	PASS
2Fc to 10Fc	1538.0250	-44.9761	-20	PASS
	2307.0370	-43.8767	-20	PASS
	3076.0500	-40.7830	-20	PASS
	3845.0620	-42.5358	-20	PASS
	4614.0750	-43.8640	-20	PASS
	5383.0870	-43.3574	-20	PASS
	6152.1000	-43.5103	-20	PASS
	6921.1130	-41.7340	-20	PASS
	7690.1250	-41.2770	-20	PASS
	3178.0000	-39.3600	-20	PASS

Digital: 769.0875 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



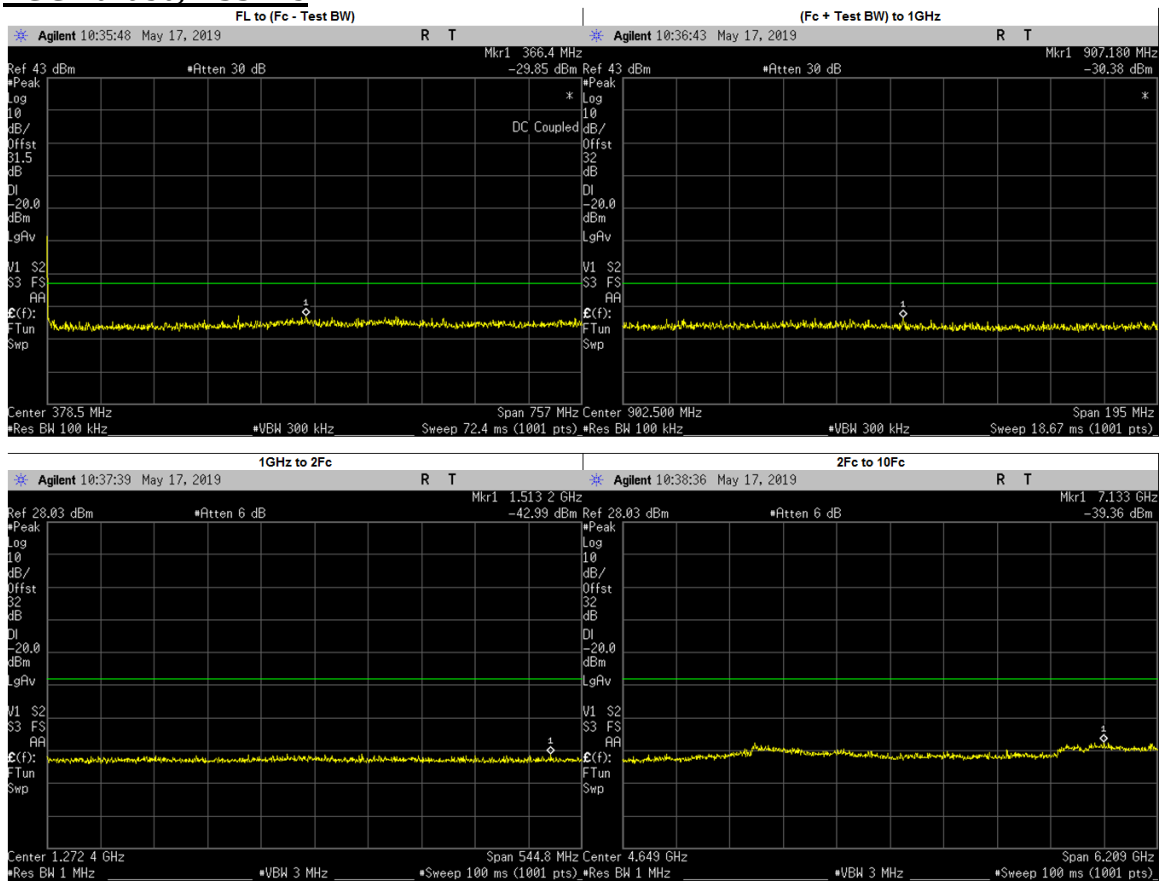
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	545.7995	-29.1887	-20	PASS
(Fc + Test BW) to 1GHz	837.9550	-29.2500	-20	PASS
1GHz to 2Fc	1212.2040	-42.6800	-20	PASS
2Fc to 10Fc	1538.1750	-44.6593	-20	PASS
	2307.2620	-44.0796	-20	PASS
	3076.3500	-40.7604	-20	PASS
	3845.4370	-43.5382	-20	PASS
	4614.5250	-43.0790	-20	PASS
	5383.6130	-43.2200	-20	PASS
	6152.7000	-43.6695	-20	PASS
	6921.7880	-41.5647	-20	PASS
	7690.8750	-41.6526	-20	PASS

Digital: 769.0875 MHz, 12.5kHz Channel Spacing, Low Power
FCC Part 90, RSS 119



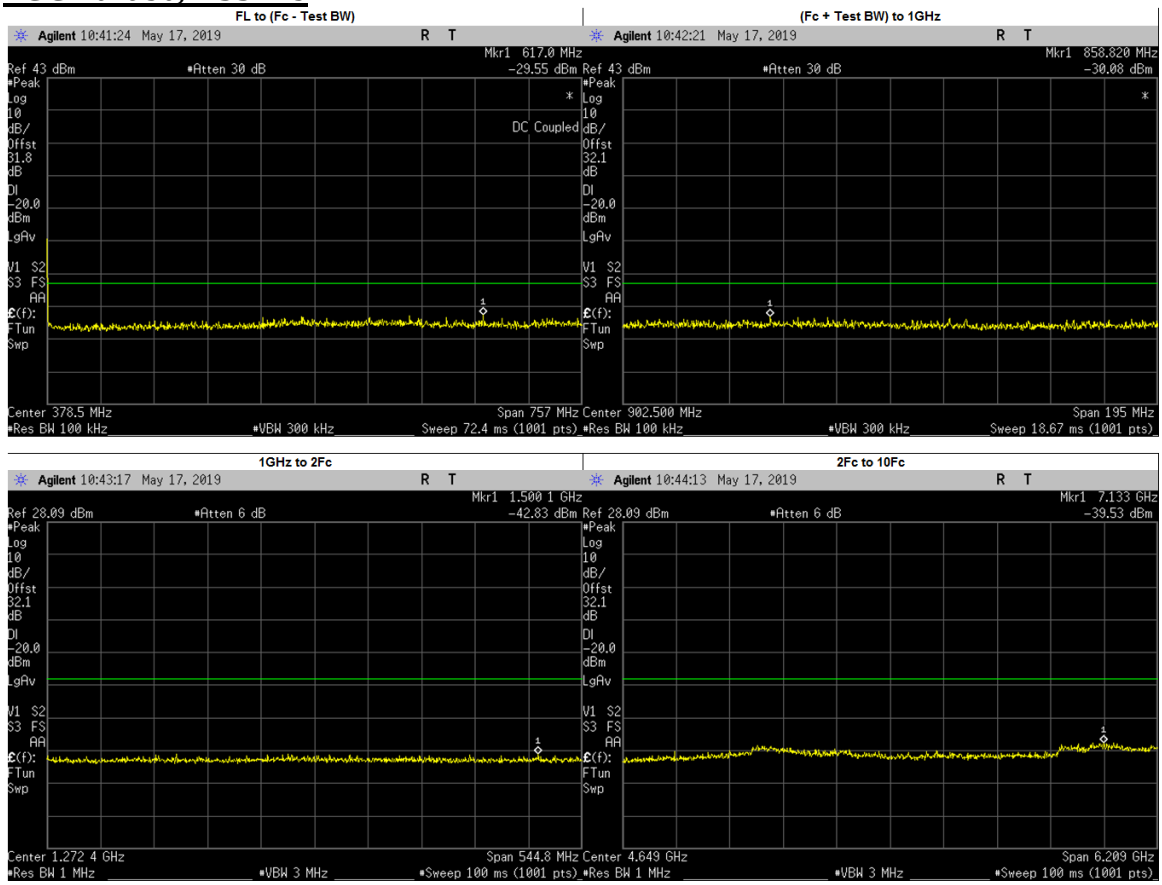
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	406.5132	-28.3215	-20	PASS
(Fc + Test BW) to 1GHz	891.1900	-32.4700	-20	PASS
1GHz to 2Fc	1217.0020	-41.9700	-20	PASS
2Fc to 10Fc	1538.1750	-44.3045	-20	PASS
	2307.2620	-44.2692	-20	PASS
	3076.3500	-41.7622	-20	PASS
	3845.4370	-43.0201	-20	PASS
	4614.5250	-44.4400	-20	PASS
	5383.6130	-42.9341	-20	PASS
	6152.7000	-43.2218	-20	PASS
	6921.7880	-41.6911	-20	PASS
	7690.8750	-40.7067	-20	PASS
	7160.0000	-39.2900	-20	PASS

Digital: 774.8875 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	366.3926	-30.0476	-20	PASS
(Fc + Test BW) to 1GHz	907.1800	-30.6900	-20	PASS
1GHz to 2Fc	1513.1780	-42.9900	-20	PASS
2Fc to 10Fc	1549.7750	-45.1460	-20	PASS
	2324.6620	-44.4188	-20	PASS
	3099.5500	-41.1803	-20	PASS
	3874.4370	-42.5236	-20	PASS
	4649.3250	-44.3290	-20	PASS
	5424.2120	-43.6932	-20	PASS
	6199.1000	-43.4439	-20	PASS
	6973.9880	-41.0553	-20	PASS
	7748.8750	-41.4387	-20	PASS
	7132.9650	-41.5784	-20	PASS

Digital: 774.8875 MHz, 12.5kHz Channel Spacing, Low Power
FCC Part 90, RSS 119

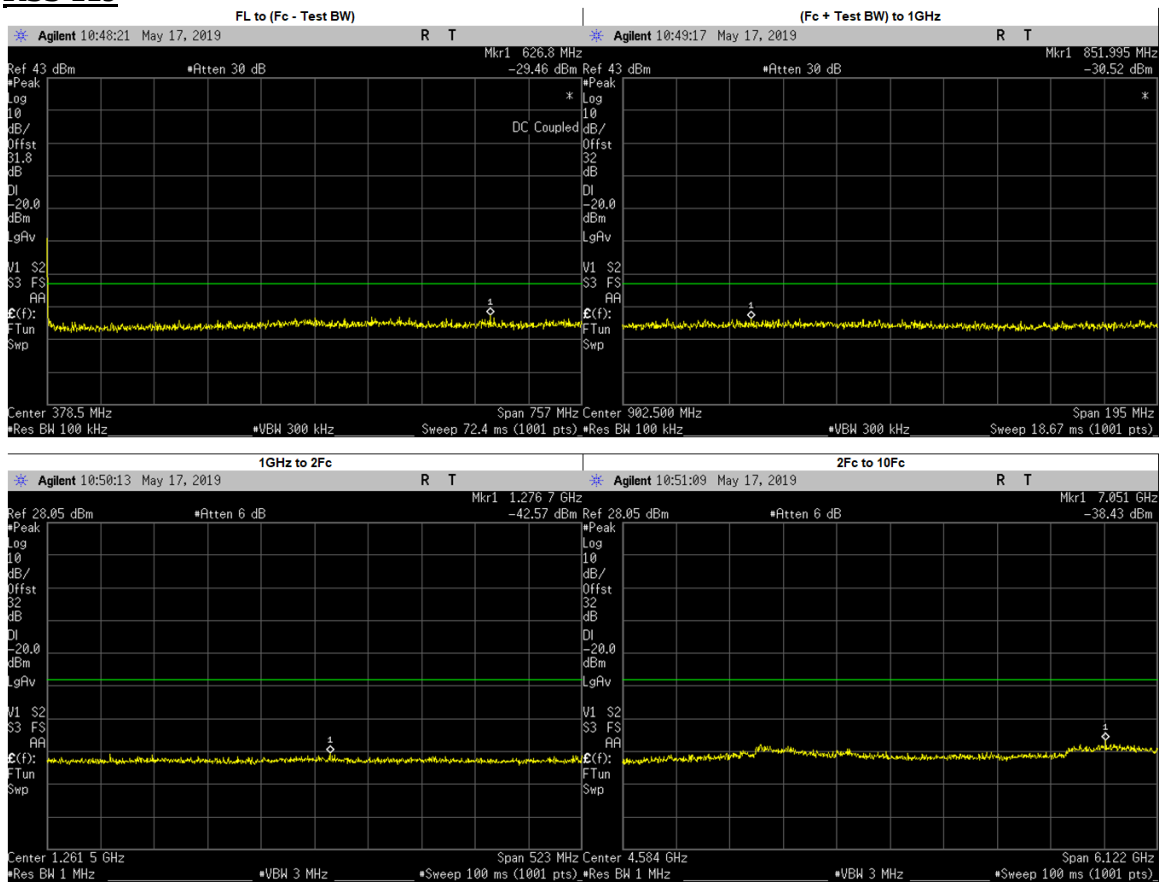


Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	616.9567	-29.8574	-20	PASS
(Fc + Test BW) to 1GHz	858.8200	-30.0800	-20	PASS
1GHz to 2Fc	1500.1030	-42.8300	-20	PASS
2Fc to 10Fc	1549.7750	-45.3193	-20	PASS
	2324.6620	-43.8950	-20	PASS
	3099.5500	-41.1331	-20	PASS
	3874.4370	-42.2284	-20	PASS
	4649.3250	-43.8720	-20	PASS
	5424.2120	-43.4302	-20	PASS
	6199.1000	-43.6815	-20	PASS
	6973.9880	-40.2399	-20	PASS
	7748.8750	-40.9926	-20	PASS
	7133.0000	-39.5300	-20	PASS

6.10.4. Test Result (PHASE 2)

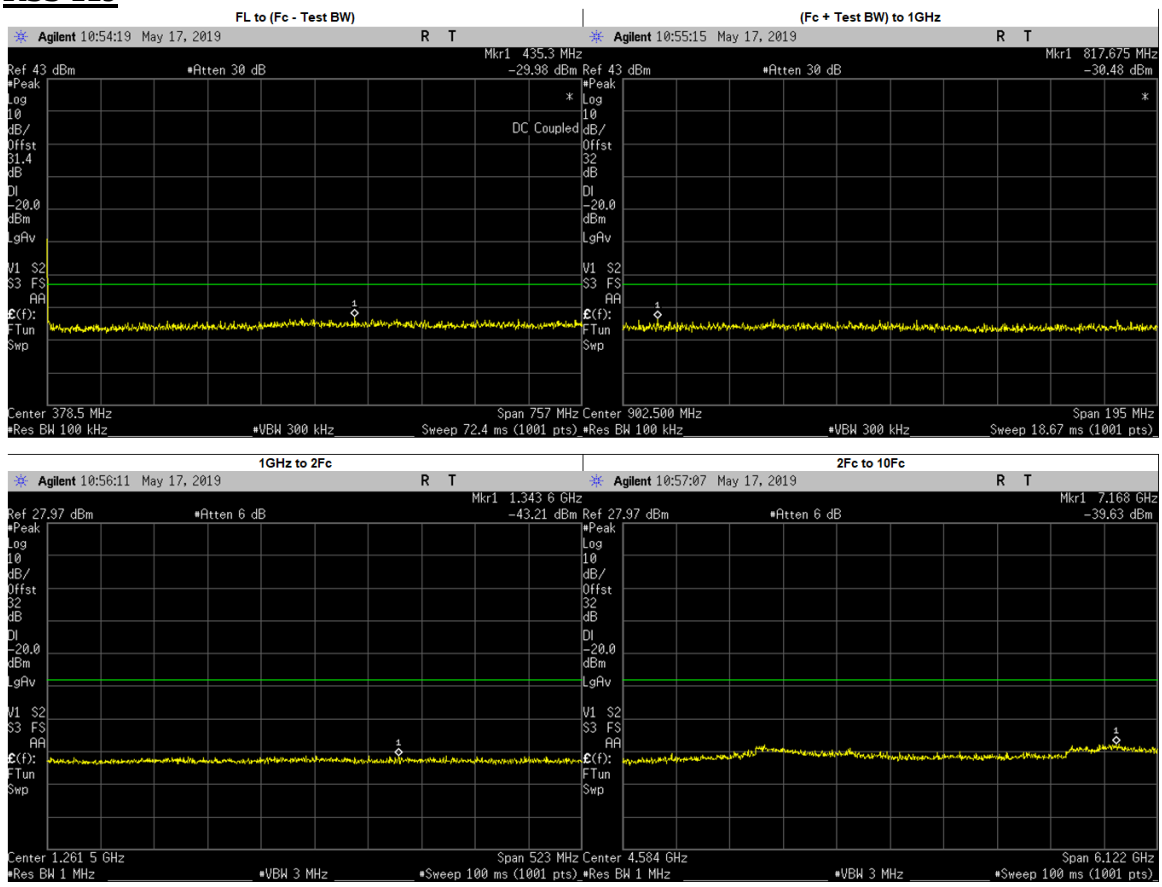
<u>Phase 2:</u> 764.0125 MHz, 12.5kHz Channel Spacing, Max Power

<u>RSS 119</u>



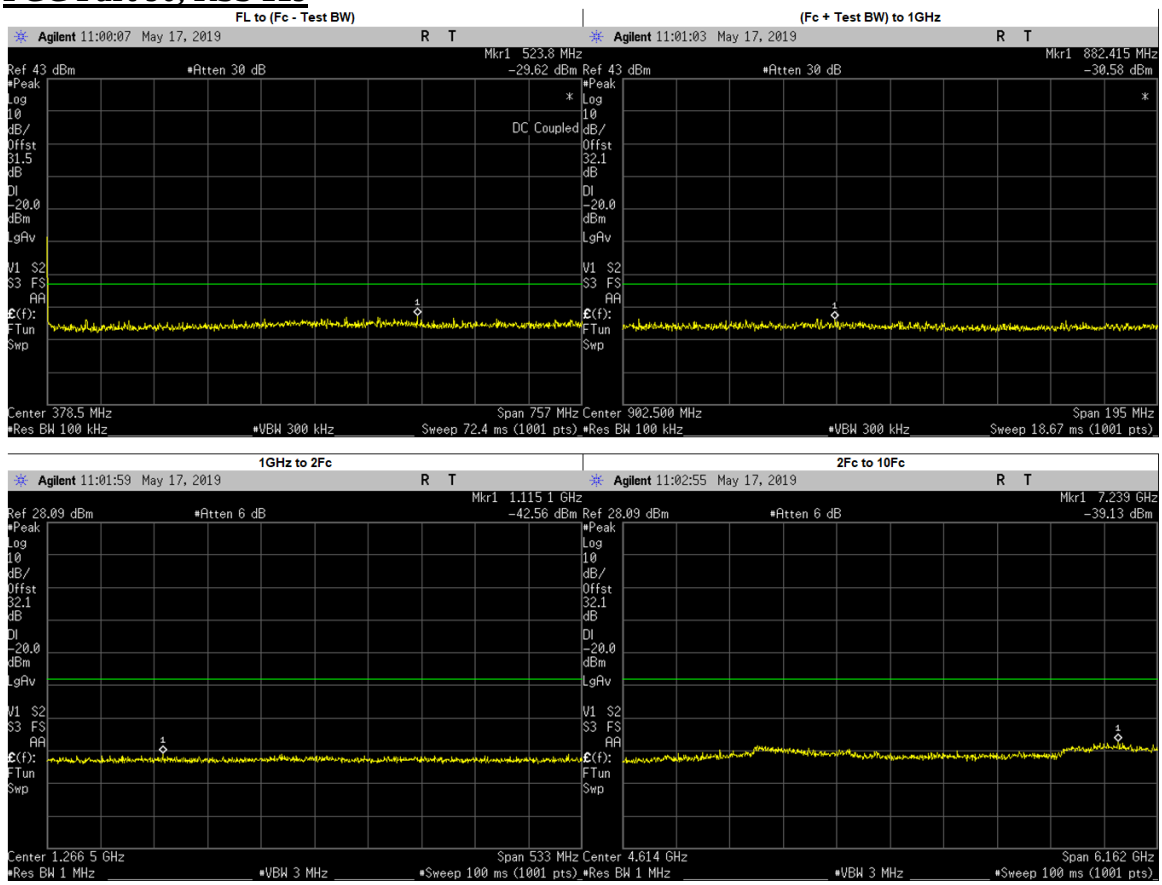
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	458.7455	-30.8139	-20	PASS
(Fc + Test BW) to 1GHz	851.9950	-30.9139	-20	PASS
1GHz to 2Fc	1276.6800	-42.5700	-20	PASS
2Fc to 10Fc	1528.0250	-44.5333	-20	PASS
	2292.0370	-43.7182	-20	PASS
	3056.0500	-40.6252	-20	PASS
	3820.0620	-43.2702	-20	PASS
	4584.0750	-44.1250	-20	PASS
	5348.0870	-43.7493	-20	PASS
	6112.1000	-43.3824	-20	PASS
	6876.1130	-41.4218	-20	PASS
	7640.1250	-40.9264	-20	PASS
	7051.0000	-38.4300	-20	PASS

Phase 2: 764.0125 MHz, 12.5kHz Channel Spacing, Low Power
RSS 119



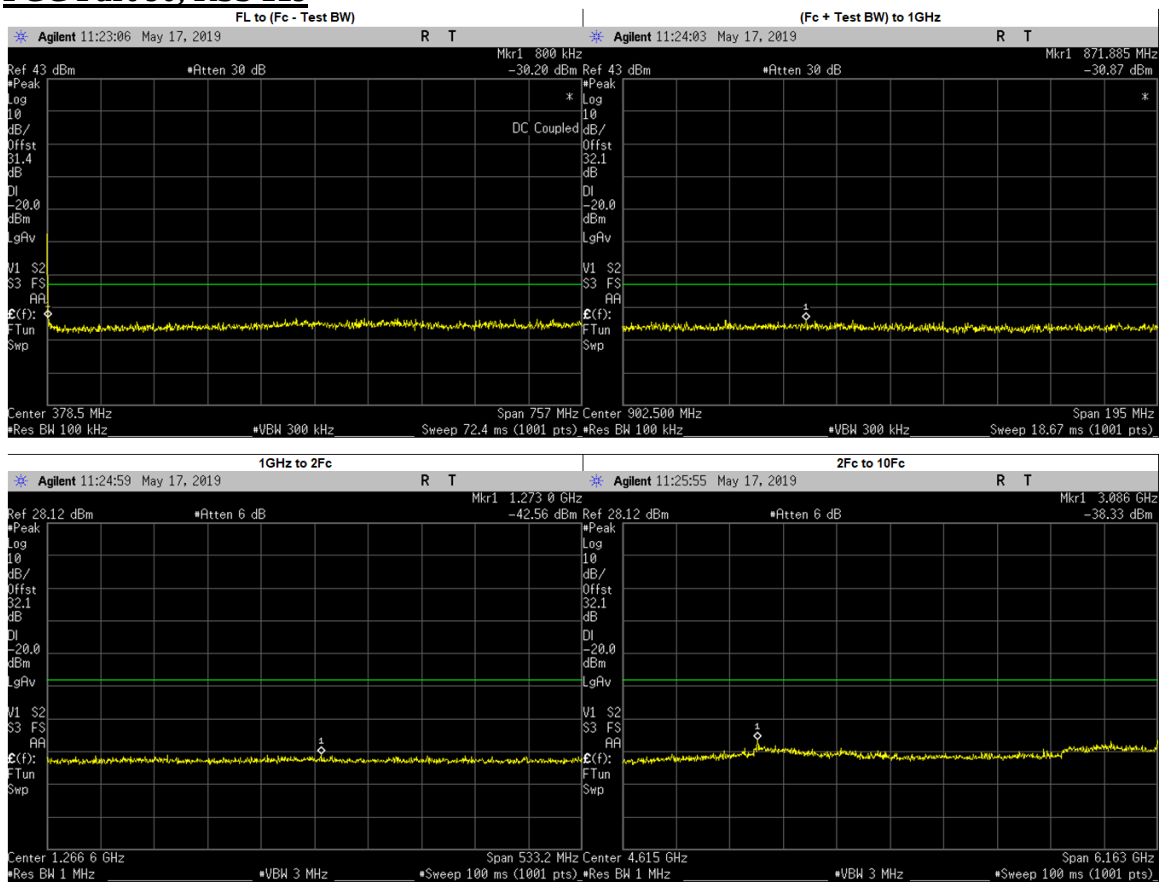
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	376.2335	-30.7871	-20	PASS
(Fc + Test BW) to 1GHz	817.6750	-30.8200	-20	PASS
1GHz to 2Fc	1343.6270	-43.2100	-20	PASS
2Fc to 10Fc	1528.0250	-45.2984	-20	PASS
	2292.0370	-44.2500	-20	PASS
	3056.0500	-40.6095	-20	PASS
	3820.0620	-42.8567	-20	PASS
	4584.0750	-43.4410	-20	PASS
	5348.0870	-43.7743	-20	PASS
	6112.1000	-43.3140	-20	PASS
	6876.1130	-41.7277	-20	PASS
	7640.1250	-41.4790	-20	PASS
	7168.0000	-39.6500	-20	PASS

Phase 2: 769.0125 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



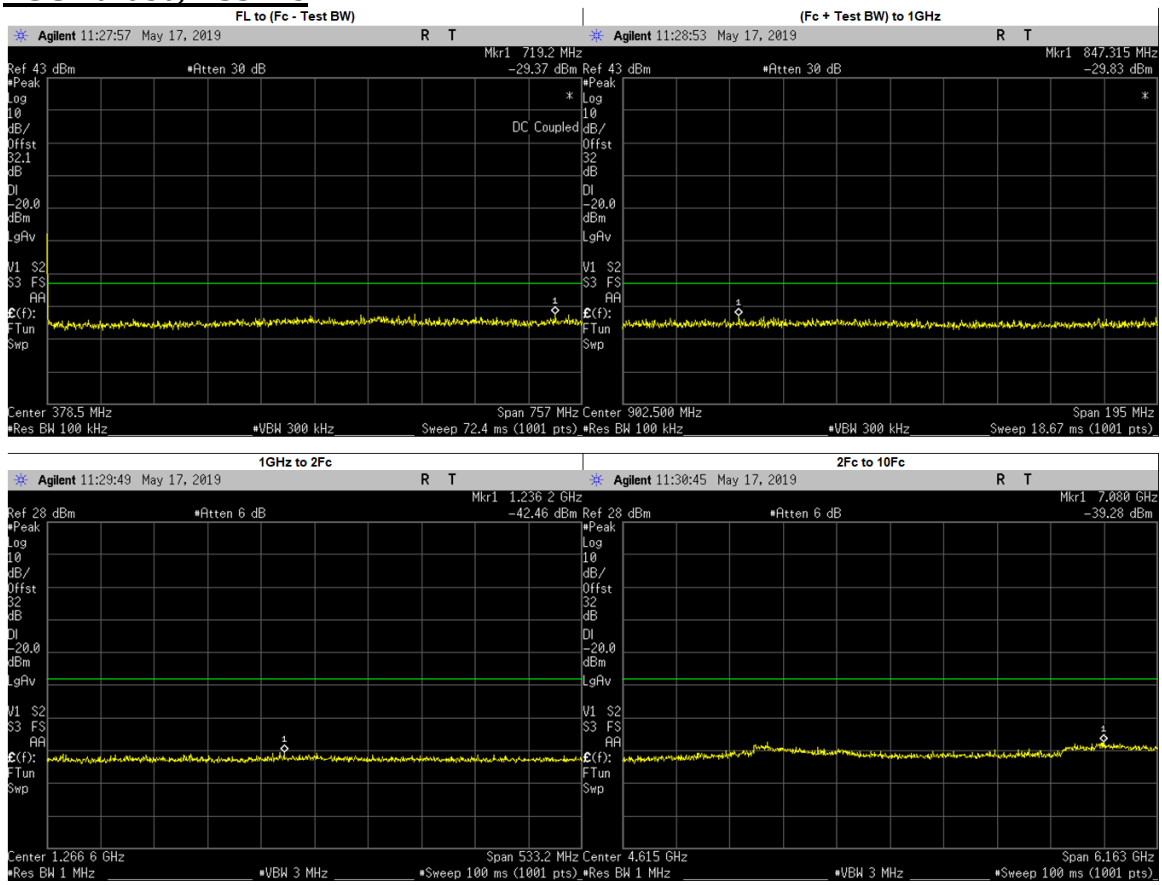
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	423.9240	-30.3571	-20	PASS
(Fc + Test BW) to 1GHz	882.4150	-30.5800	-20	PASS
1GHz to 2Fc	1115.1330	-42.5600	-20	PASS
2Fc to 10Fc	1538.0250	-45.2620	-20	PASS
	2307.0370	-44.2219	-20	PASS
	3076.0500	-41.5397	-20	PASS
	3845.0620	-43.2836	-20	PASS
	4614.0750	-43.1970	-20	PASS
	5383.0870	-43.7690	-20	PASS
	6152.1000	-42.7840	-20	PASS
	6921.1130	-41.2555	-20	PASS
	7690.1250	-41.5914	-20	PASS
	7239.1300	-39.1300	-20	PASS

Phase 2: 769.0875 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



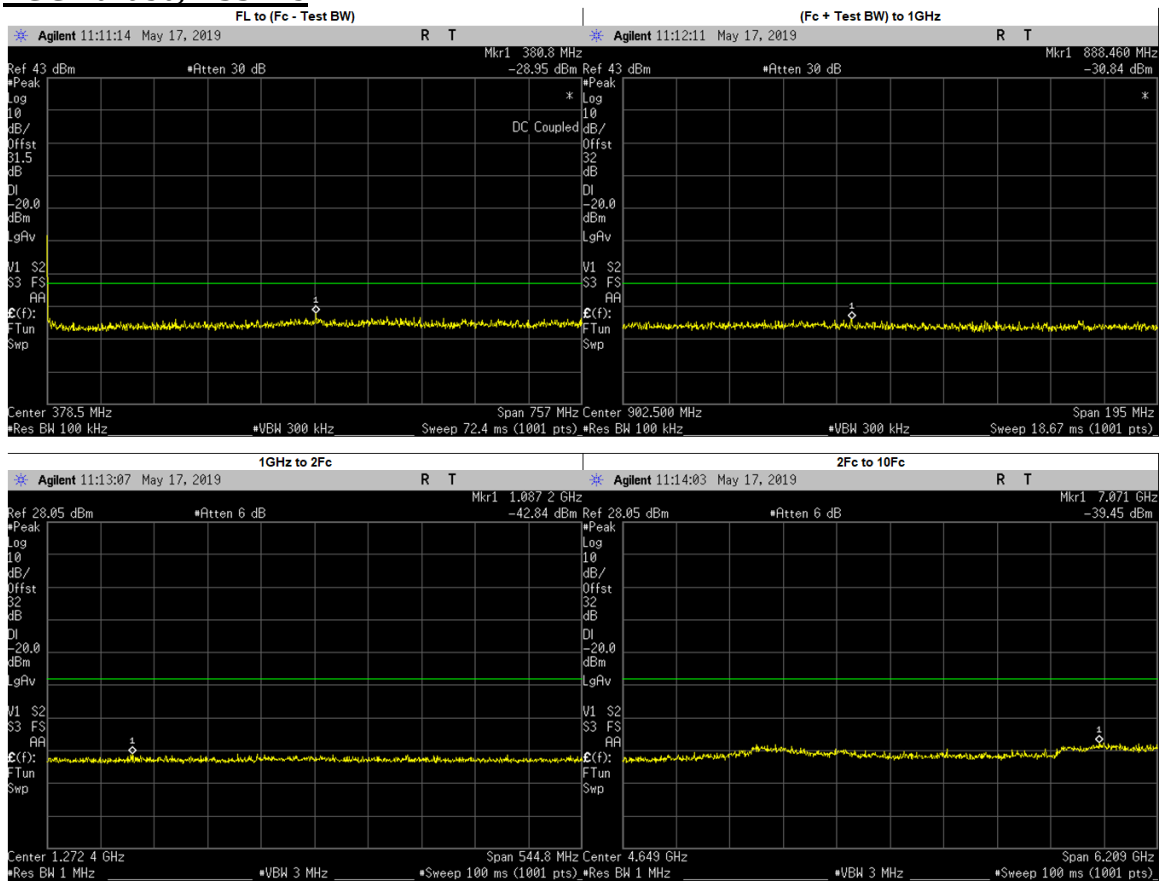
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	448.9047	-30.4375	-20	PASS
(Fc + Test BW) to 1GHz	871.8850	-31.2100	-20	PASS
1GHz to 2Fc	1272.9860	-42.5600	-20	PASS
2Fc to 10Fc	1538.1750	-45.0429	-20	PASS
	2307.2620	-43.9747	-20	PASS
	3076.3500	-41.4812	-20	PASS
	3845.4370	-43.0995	-20	PASS
	4614.5250	-43.9070	-20	PASS
	5383.6130	-43.5449	-20	PASS
	6152.7000	-43.7112	-20	PASS
	6921.7880	-40.8912	-20	PASS
	7690.8750	-40.4789	-20	PASS
	3086.1750	-46.4105	-20	PASS
	7695.8750	-39.7665	-20	PASS

Phase 2: 769.0875 MHz, 12.5kHz Channel Spacing, Low Power
FCC Part 90, RSS 119



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	738.0752	-29.9322	-20	PASS
(Fc + Test BW) to 1GHz	847.3150	-29.8300	-20	PASS
1GHz to 2Fc	1236.2000	-42.4600	-20	PASS
2Fc to 10Fc	1538.1750	-44.5800	-20	PASS
	2307.2620	-44.6681	-20	PASS
	3076.3500	-41.1948	-20	PASS
	3845.4370	-42.8453	-20	PASS
	4614.5250	-43.7150	-20	PASS
	5383.6130	-44.0633	-20	PASS
	6152.7000	-43.6553	-20	PASS
	6921.7880	-41.6312	-20	PASS
	7690.8750	-41.4228	-20	PASS
	7080.0000	-39.2800	-20	PASS

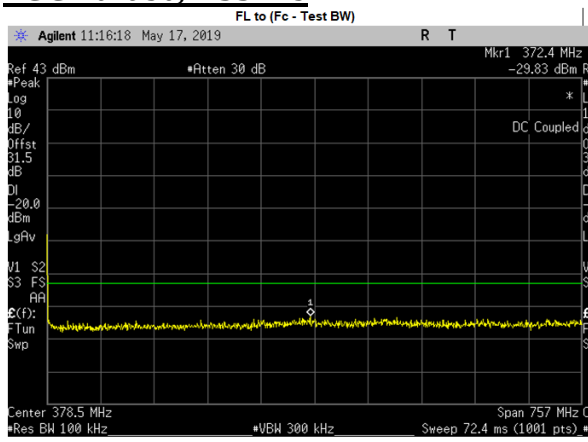
Phase 2: 774.8875 MHz, 12.5kHz Channel Spacing, Max Power
FCC Part 90, RSS 119



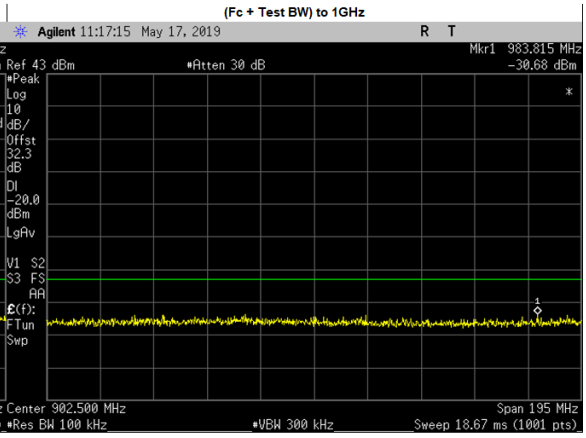
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	755.4860	-30.1912	-20	PASS
(Fc + Test BW) to 1GHz	888.4600	-30.8400	-20	PASS
1GHz to 2Fc	1087.2000	-42.8400	-20	PASS
2Fc to 10Fc	1549.7750	-45.1661	-20	PASS
	2324.6620	-44.6460	-20	PASS
	3099.5500	-40.9754	-20	PASS
	3874.4370	-43.2049	-20	PASS
	4649.3250	-43.9600	-20	PASS
	5424.2120	-43.5153	-20	PASS
	6199.1000	-43.5801	-20	PASS
	6973.9880	-41.1496	-20	PASS
	7748.8750	-41.1532	-20	PASS
	7071.0000	-39.4500	-20	PASS

Phase 2: 774.8875 MHz, 12.5kHz Channel Spacing, Low Power
FCC Part 90, RSS 119

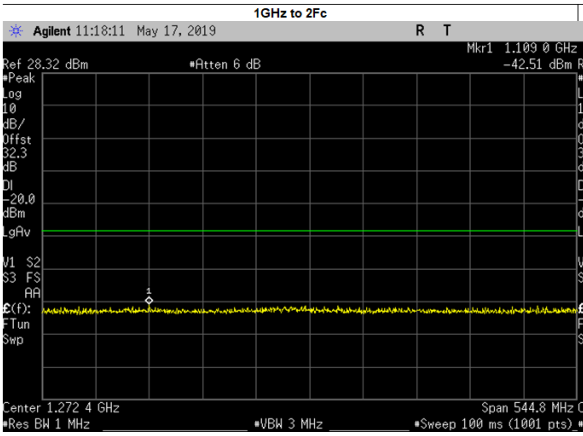
FL to (Fc - Test BW)



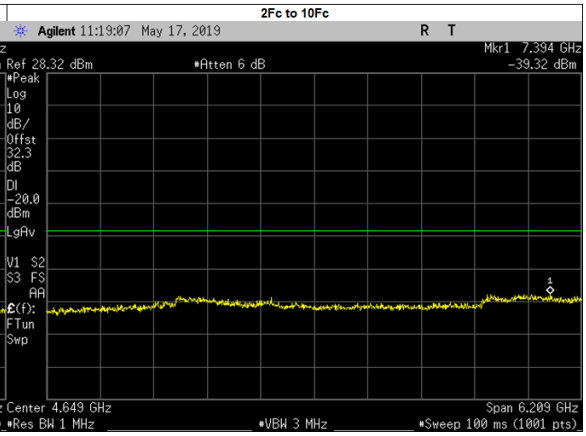
(Fc + Test BW) to 1GHz



1GHz to 2Fc



2Fc to 10Fc



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dbm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	495.0811	-30.6787	-20	PASS
(Fc + Test BW) to 1GHz	983.8150	-30.6800	-20	PASS
1GHz to 2Fc	1109.0000	-42.5100	-20	PASS
2Fc to 10Fc	1549.7750	-44.5856	-20	PASS
	2324.6620	-44.3553	-20	PASS
	3099.5500	-40.5593	-20	PASS
	3874.4370	-42.4071	-20	PASS
	4649.3250	-43.8730	-20	PASS
	5424.2120	-43.5012	-20	PASS
	6199.1000	-43.0058	-20	PASS
	6973.9880	-40.3830	-20	PASS
	7748.8750	-41.0536	-20	PASS
	7394.0000	-39.3200	-20	PASS

6.10.5. Test Limit

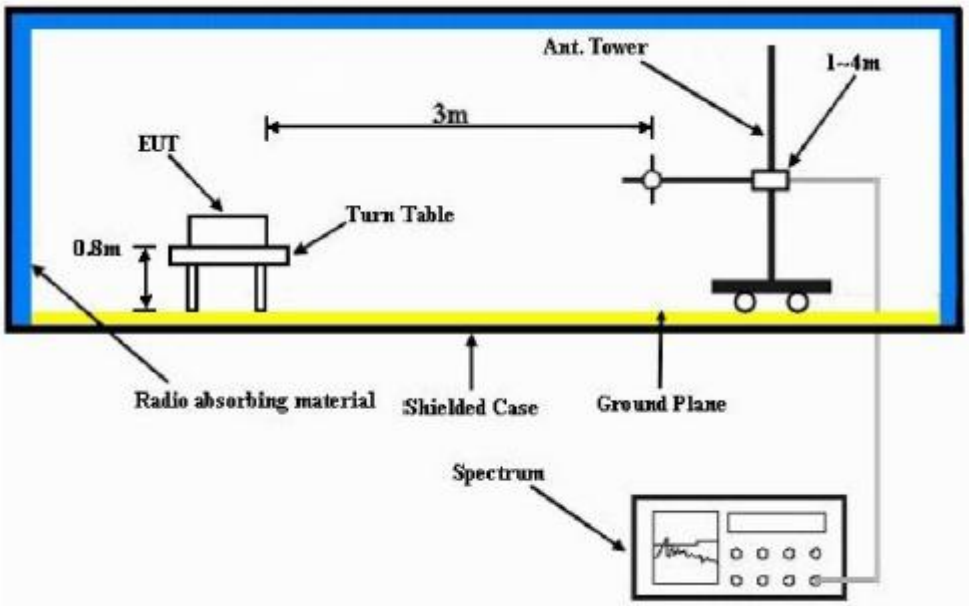
Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90 (UHF, VHF, 800, 900)	Part 90 (700)
12.5kHz	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	Not Applicable	50 + log10(P) (-20 dBm)	43 + log10(P) (-13 dBm)
25kHz		Not Applicable		43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)

Channel Spacing	RSS 134	RSS 182	RSS 119 (UHF, VHF, 800, 900)	RSS 119 (700)
12.5kHz	43 + log10(P) (-13 dBm)	Not Applicable	50 + log10(P) (-20 dBm)	43 + log10(P) (-13 dBm)
25kHz	Not Applicable	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)

6.11. Radiated Spurious Emission

6.11.1. 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 frequencies < 1GHz) or 1.5m (for frequencies > 1GHz) 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.

6.11.1. Test Result (Analog)

NA → Not Applicable

6.11.2. Test Limit

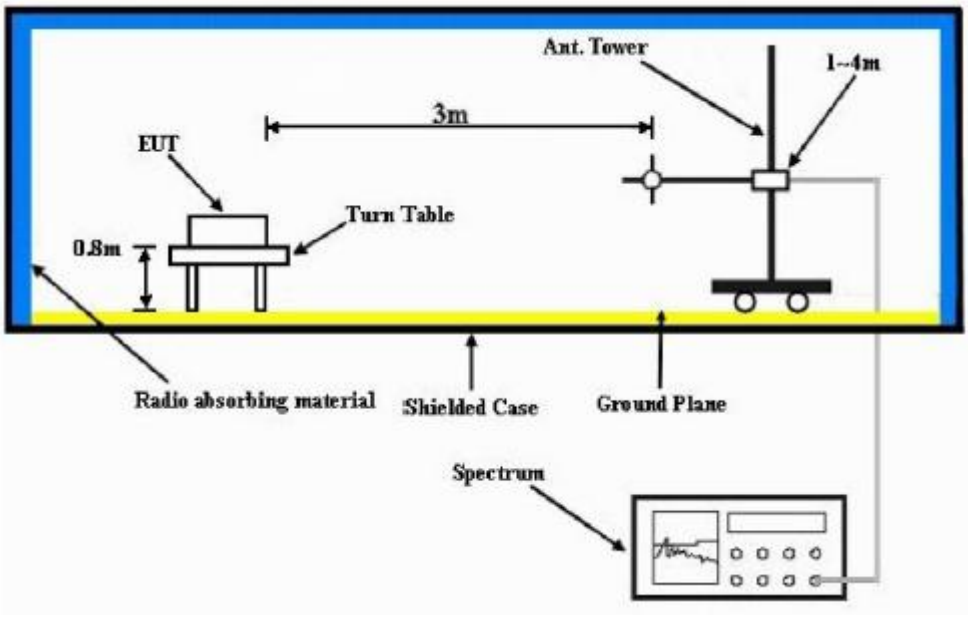
Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90 (UHF, VHF, 800, 900)	Part 90 (700)
12.5kHz	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	Not Applicable	50 + log10(P) (-20 dBm)	43 + log10(P) (-13 dBm)
25kHz		Not Applicable		43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)

Channel Spacing	RSS 134	RSS 182	RSS 119 (UHF, VHF, 800, 900)	RSS 119 (700)
12.5kHz	43 + log10(P) (-13 dBm)	Not Applicable	50 + log10(P) (-20 dBm)	43 + log10(P) (-13 dBm)
25kHz	Not Applicable	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)	43 + log10(P) (-13 dBm)

6.12. Effective Radiated Power (ERP)

6.12.1. 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 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.

6.12.2. Test Result

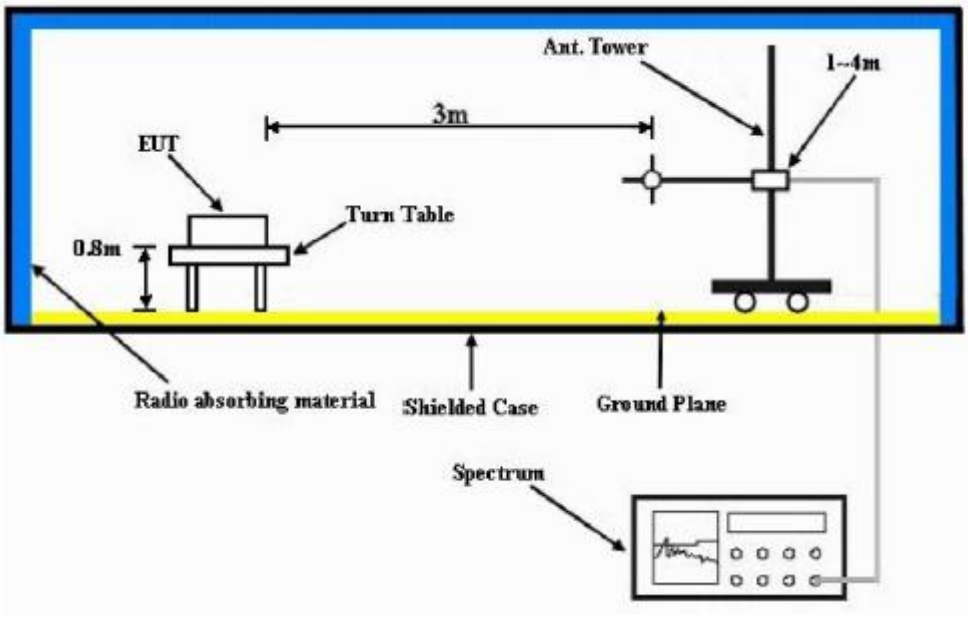
NA → Not Applicable

6.12.3. Test Limit

The maximum output power of the transmitter for mobile stations is 100 watts (20 dB). Power is given in terms of effective radiated power (ERP).

6.13. GNSS (EIRP for 1559 - 1610MHz)

6.13.1. 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 = "Read Value" + Measured substitution value + 2.15.

6.13.1. Test Result

NA → Not Applicable

6.13.2. 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 Report ~