

	  
<p>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.</p>	<p>FCC/ISED TEST REPORT Report Revision : Rev.A</p>
<p>Date/s Tested : 07-JAN-2025 - 24-JAN-2025 Report Issue Date : 24-MAR-2025 Manufacturer : MOTOROLA SOLUTIONS INC (SCHAUMBURG) Manufacturer Address : 1301 E. ALGONQUIN ROAD BLDG IL02 ROOM 3035 SCHAUMBURG, IL 60196 Requestor : BEDFORD PATRICE Product Type : Vehicle Mounted Product Marketing Version (PMN) : APX8500 Hardware Version Identification Number (HVIN) : M37TXS9PW1AN Frequency Band : 136-174 MHz Max RF Output Power : 120 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</p> <p>The equipment was tested accordance to the requirement listed below:</p> <p>(LMR) FCC 47 CFR Part 22 / 74 / 80 / 90 PASS ISED RSS- Gen Issue 5 / 119 Issue 12 / 182 Issue 6</p>	
<p>This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.</p>	
<p>Prepared By:  Farah Nur Arina Test Personnel</p>	<p>Approved Signatory: _____ Maheshvaran A/L Rajagopal Responsible Engineer</p>

Table of Contents

Report Revision History	3
1.0 General Information	4
2.0 Summary of Test Results	5
3.0 Measurement Uncertainty	6
4.0 Equipment List.....	7
5.0 Test Condition	10
5.1. Transmitter Test Conditions.....	10
6.0 Transmitter Test Parameters	11
6.1. RF Output Power.....	11
6.1.1. Test Setup	11
6.1.2. Test Result.....	11
6.2. Frequency Stability	12
6.2.1. Test Setup	12
6.2.2. Test Result.....	12
6.2.3. Test Limit.....	12
6.3. Modulation Characteristics	13
6.3.1. Test Setup	13
6.3.2. Test Result.....	13
6.3.3. Test Limit.....	14
6.4. Modulation Limiting	15
6.4.1. Test Setup	15
6.4.2. Test Result.....	15
6.4.3. Test Limit.....	15
6.5. Occupied Bandwidth	16
6.5.1. Test Setup (Analog).....	16
6.5.2. Test Result (Analog).....	16
6.5.3. Test Setup (Digital).....	17
6.5.4. Test Result (Digital)	17
6.5.5. Test Limit.....	17
6.6. Band Edge Conducted Spurious Emission (Part 22)	18
6.6.1. Test Setup (Analog).....	18
6.6.2. Test Result (Analog).....	18
6.6.3. Test Setup (Digital).....	19
6.6.4. Test Result (Digital)	19
6.6.5. Test Limit.....	19
6.7. Transient Frequency Behavior	20
6.7.1. Test Setup	20
6.7.2. Test Result.....	20
6.7.3. Test Limit.....	21
6.8. Adjacent Channel Power.....	22
6.8.1. Test Setup (Analog).....	22

6.8.2. Test Result.....22

6.8.3. Test Setup (Digital)23

6.8.4. Test Result.....23

6.8.5. Test Limit.....24

6.9. Conducted Spurious Emission26

6.9.1. Test Setup26

6.9.2. Test Result (Analog)27

6.9.3. Test Result (Digital)36

6.9.4. Test Limit.....52

6.10. Radiated Spurious Emission.....53

6.10.1. Test Setup53

6.10.2. Test Result (Analog)53

6.10.3. Test Result (Digital)53

6.10.4. Test Limit.....54

6.11. Effective Radiated Power (ERP)56

6.11.1. Test Setup56

6.11.2. Test Result.....56

6.11.3. Test Limit.....56

6.12. GNSS (EIRP for 1559 - 1610MHz)57

6.12.1. Test Setup57

6.12.1. Test Result.....57

6.12.2. Test Limit.....57

Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	16-Feb-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
2.4/5 GHZ WI-FI/BT AND GNSS BT/WiFi/GPS Antenna	MOTOROLA	AN000163A01
KEYPAD MICROPHONE	MOTOROLA	HMN4079G-R1
DC POWER CABLE	MOTOROLA	HKN4192C
10 CAN CABLE REMOTE MOUNT	MOTOROLA	HKN6170B-C1
CABLE, CH POWER AND SPEAKER	MOTOROLA	HKN6188B-3
USB CABLE, MAP CONNECTOR (6 FT)	MOTOROLA	HKN6163C-CF1
O7 CONTROL HEAD	MOTOROLA	PMHN4194C-CF16
O2/O7 REMOTE CHIB (CONTROL HEAD INTERFACE BOARD)	MOTOROLA	PMUN1057B-CF4
TRANCEIVER INTERFACE BOARD	MOTOROLA	TIB AS000016A02

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-Gen, RSS-119, RSS-182	RF Power Output	Pass		6811AN3383
-	-	Frequency Stability	NA	See NOTE 1	NA
-	-	Audio Frequency Response	NA	See NOTE 1	NA
-	-	Audio Low Pass Filter Response	NA	See NOTE 1	NA
-	-	Modulation limiting	NA	See NOTE 1	NA
-	-	Occupied Bandwidth	NA	See NOTE 1	NA
-	-	Band Edge Conducted Spurious Emission	NA	See NOTE 1	NA
-	-	Transient Frequency Behavior	NA	See NOTE 1	NA
-	-	Adjacent Channel Power	NA	See NOTE 1	NA
2.1051, 22.359, 90.210, 74.462(c), 80.211(c)	RSS-Gen, RSS-119	Conducted Spurious Emissions	Pass	Worst case: -24.55 dBm	6811AN3383
2.1051, 22.359, 74.462(c), 80.211(f)	RSS-Gen, RSS-119	Radiated Spurious Emission	Pass	Worst case: -56.0083 dBm (margin: 36.0083 dBm, NF)	6811AL4227
-	-	GNSS (EIRP for 1559 – 1610MHz)	NA	See NOTE 1	NA
-	-	Effective Radiated Power (ERP)	NA	See NOTE 1	NA

NA → Not Applicable

NOTE1: Selection of test parameters, the report contain a limited number of parameters deemed to be influenced by the relevant design changes, as agreed with the applicant.

3.0 Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.48 dB
Radiated Emissions up to 1 GHz dBµV/m(Field Strength)	30MHz ~ 1000MHz	5.88 dB
Radiated Emissions above 1 GHz dBµV/m(Field Strength)	1GHz ~ 18GHz	5.84 dB
	18GHz ~ 40GHz	6.02 dB
Radiated Emissions dBm (ERP/EiRP)	30MHz ~ 18GHz	4.03 dB
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82 dB
Frequency Stability	9kHz ~ 12.75GHz	0.0085 ppm
Audio Frequency Response / Low Pass 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	4-Mar-24	4-Mar-25
POWER SUPPLY	6031A	2729A00711	8-Jun-24	8-Jun-25
POWER SENSOR	E4412A	MY50000141	16-Aug-24	16-Aug-25
POWER METER	E4416A	MY45101448	23-Aug-24	23-Aug-25
CXA SIGNAL ANALYZER	N9000B	MY60250581	8-Jun-24	8-Jun-25
AUDIO ANALYZER	U8903B	MY61070007	17-Aug-24	17-Aug-25
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
AUDIO ANALYZER	8903B	2836A05866	9-Feb-24	9-Feb-25
POWER SENSOR	E9301B	MY50180003	19-Jul-24	19-Jul-25
SPECTRUM ANALYZER	E4445A	MY46181513	4-Jul-24	4-Jul-25
ATTENUATOR/11DB	8494G	MY52300223	15-Aug-24	15-Aug-25
ATTENUATOR/110DB	8496G	MY52300088	15-Aug-24	15-Aug-25
MODULATION ANALYZER	8901B	3403A04772	18-Sep-24	18-Sep-25
POWER SUPPLY	6031A	3506A03271	26-Sep-24	26-Sep-25
SIGNAL GENERATOR	8657A	3250A05137	16-Aug-24	16-Aug-25
CXA SIGNAL ANALYZER	N9000B	MY60250716	3-Dec-24	3-Dec-25
AUDIO ANALYZER	8903B	3729A17612	14-Feb-24	14-Feb-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	MY46181732	21-Nov-24	21-Nov-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 1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMI TEST RECEIVER	ESIB40	100307	23-Oct-24	23-Oct-25
3m Semi-anechoic Chamber	NA	888032	Not Required	Not Required
TURNTABLE FLUSH MOUNT 2M	T-200-S	N/A	Not Required	Not Required
PROGRAMMING CONTROLLER	MF-7802BS	N/A	Not Required	Not Required
POWER SUPPLY	6674A	3126A00133	13-Mar-24	13-Mar-25
SIGNAL ANALYZER	FSV40	101432	09-Aug-24	08-Aug-25
DATA LOGGER	SDL500	A.016800	26-Jun-24	26-Jun-25
BILOG ANTENNA	CBL6112D	55546	05-Jun-24	05-Jun-25
BILOG ANTENNA	CBL 6112B	2964	08-Oct-24	08-Oct-25
DRG HORN FREQ.	SAS-571	1027	01-Jul-24	01-Jul-25
DRG HORN FREQ.	SAS-571	720	18-Apr-23	18-Apr-25
PREAMPLIFIER	PAM-0118	427	15-Nov-24	15-Nov-25
SIGNAL GENERATOR	SMB100A	181117	06-Dec-21	06-Feb-25
LOOP ANTENNA	6502	00203479	06-Mac-24	06-Mac-25
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	13-Mar-24	13-Mar-25
Test Software	EMC_FCC_IC_Bluetooth_RE_Test			
Version	EMC_FCC_RE_v1.6.5			

5.0 Test Condition

5.1. Transmitter Test Conditions

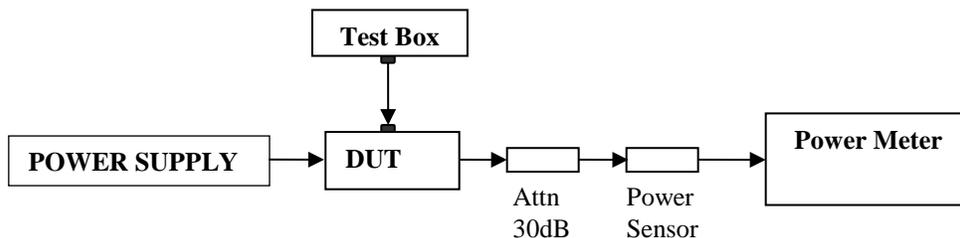
Test Item, (Channel Spacing)	Power (W)	Modulation	Test Frequency (MHz)	Tested By	Environmental conditions
RF Output Power	Low & Max	FM	138.0125, 158.5500, 161.7000, 173.9875	Farah	23.4°C, 50%RH
Frequency Stability	Max	FM	NA	NA	NA
Audio Frequency Response (12.5kHz / 25kHz)	Max	FM	NA	NA	NA
Audio Low Pass Filter Response (12.5kHz / 25kHz)	Max	FM	NA	NA	NA
Modulation limiting (12.5kHz / 25kHz)	Max	FM	NA	NA	NA
Occupied Bandwidth (12.5kHz / 20kHz / 25kHz)	Max	FM/C4FM/Phase II	NA	NA	NA
Band Edge Conducted Spurious Emissions (Part 22) (12.5kHz / 20kHz / 25kHz)	Max	FM/C4FM/Phase II	NA	NA	NA
Transient Frequency Behavior (UHF & VHF Band) (12.5kHz / 25kHz)	Max	FM/C4FM	NA	NA	NA
Adjacent Channel Power (700MHz Band) (12.5kHz / 25kHz)	Max	FM/C4FM/Phase II	NA	NA	NA
Conducted Spurious Emissions- (12.5kHz / 25kHz)	Low / Max	FM/C4FM/Phase II	138.0125, 158.5500, 161.7000, 173.9875	Farah	23.4°C, 50%RH
Radiated Spurious Emission (12.5kHz / 25kHz)	Max	C4FM	158.5500	Aiman	23.4°C, 50%RH
GNSS (EIRP for 1559 - 1610MHz) (12.5kHz / 25kHz)	Max	FM/C4FM/Phase II	NA	NA	NA
Effective Radiated Power (ERP) (12.5kHz / 25kHz)	Max	FM/C4FM/Phase II	NA	NA	NA

NA → Not Applicable

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



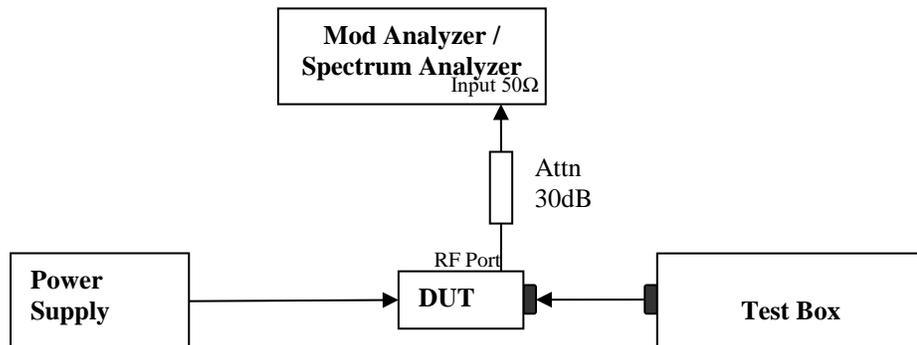
- 1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
- 2) Path loss for the measurement included.
- 3) All the measurement was done at low, mid, high frequency for each band.
- 4) Record the power into the test report.

6.1.2. Test Result

Temperature	25°C				Remark
Voltage (V)	7.5V				
Frequency (MHz)	Low Power (W)	Current (A)	Max Power (W)	Current (A)	
138.01250	0.95	3.03	116.00	19.86	Not for FCC review Part 80
158.55000	0.98	3.06	115.00	20.60	
158.55000	0.93	3.06	4.93	5.25	
161.70000	0.98	3.06	117.00	20.80	
173.98750	0.99	3.21	118.00	22.70	

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 $-30^{\circ}C$ to $50^{\circ}C$.
 - 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

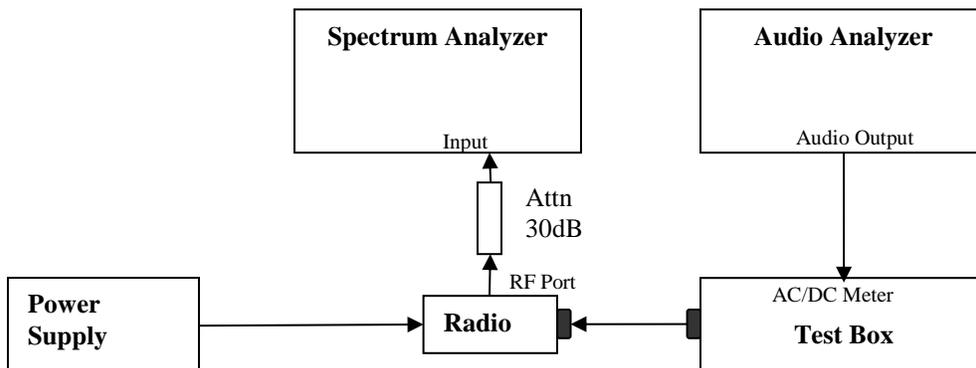
6.2.2. Test Result Not Applicable

6.2.3. Test Limit

The frequency stability limit is established as the most stringent value derived from the applicable regulatory requirements or the product-declared specifications.

6.3. Modulation Characteristics

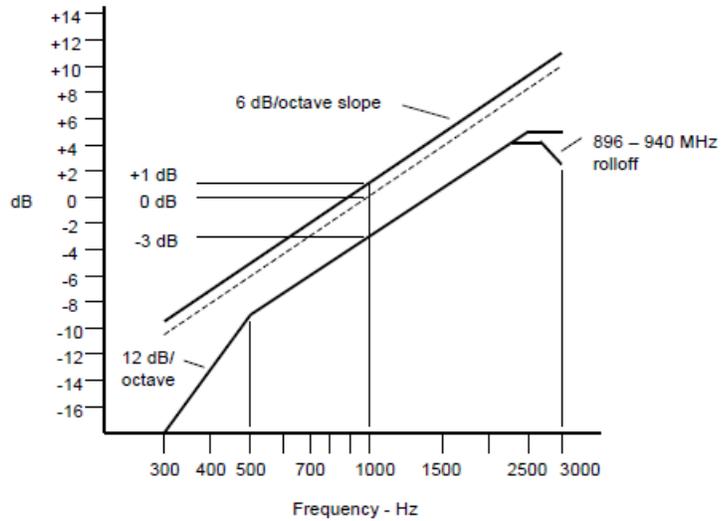
6.3.1. Test Setup



- 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 Applicable

6.3.3. Test Limit

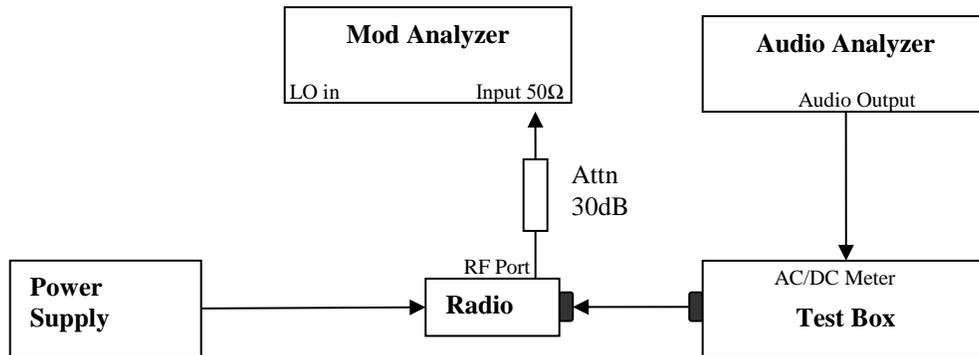


Note:

- 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



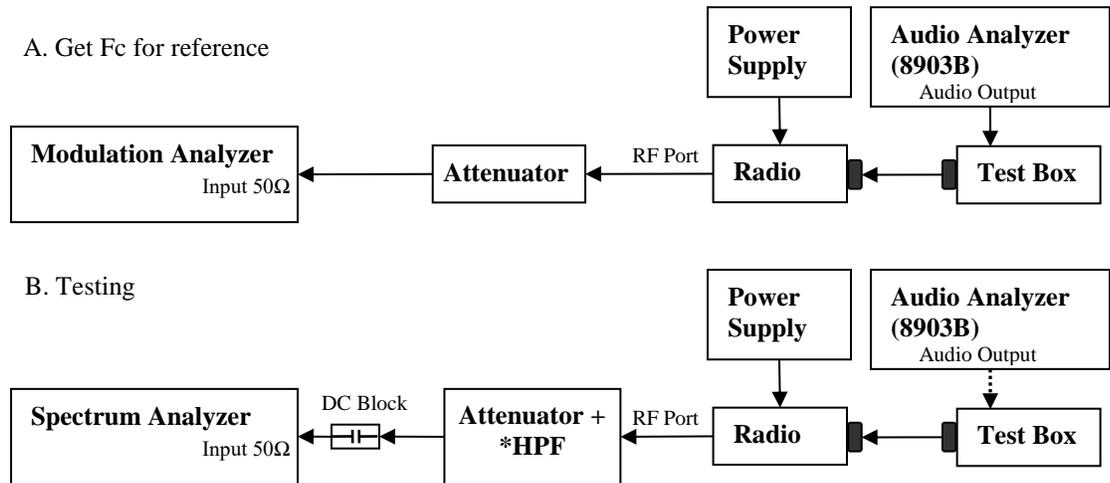
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Path loss for the measurement included.
- 3) Set the audio bandwidth filter to 15 kHz.
- 4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the Full rated system deviation.
- 5) Record the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

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

6.5. Occupied Bandwidth

6.5.1. Test Setup (Analog)



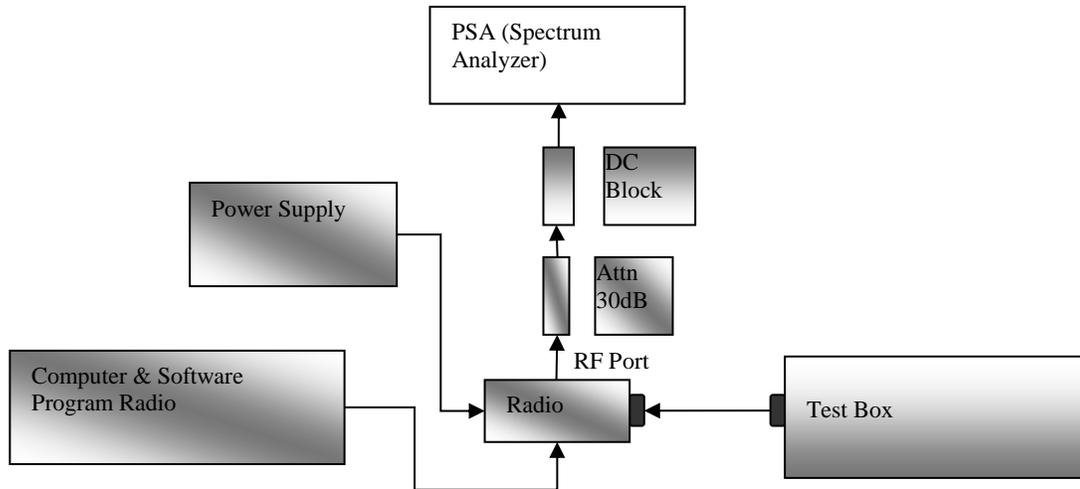
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
- 3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB.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

* Only HPF added for Mask 80.211 measurement with attenuator.

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

6.5.2. Test Result (Analog) Not Applicable

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.

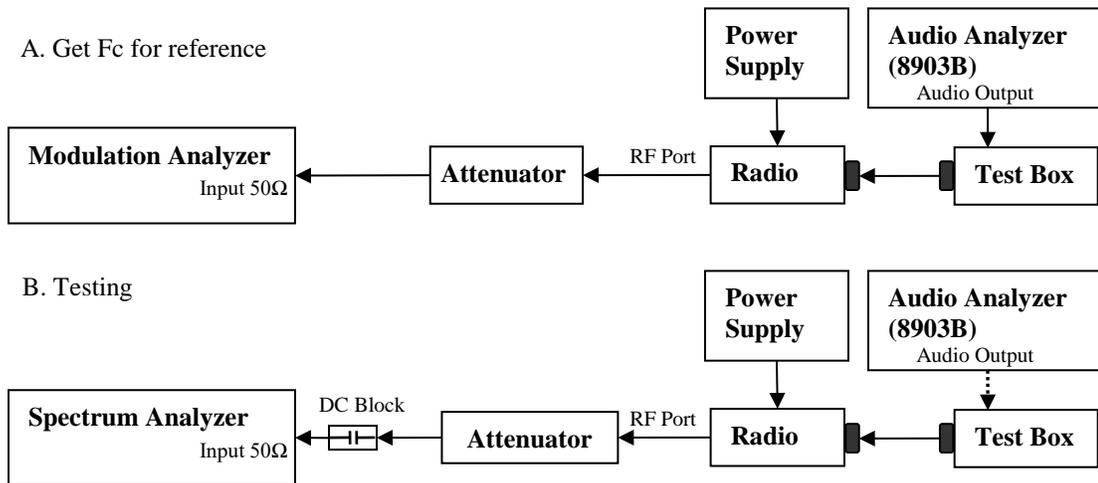
6.5.4. Test Result (Digital) Not Applicable

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)



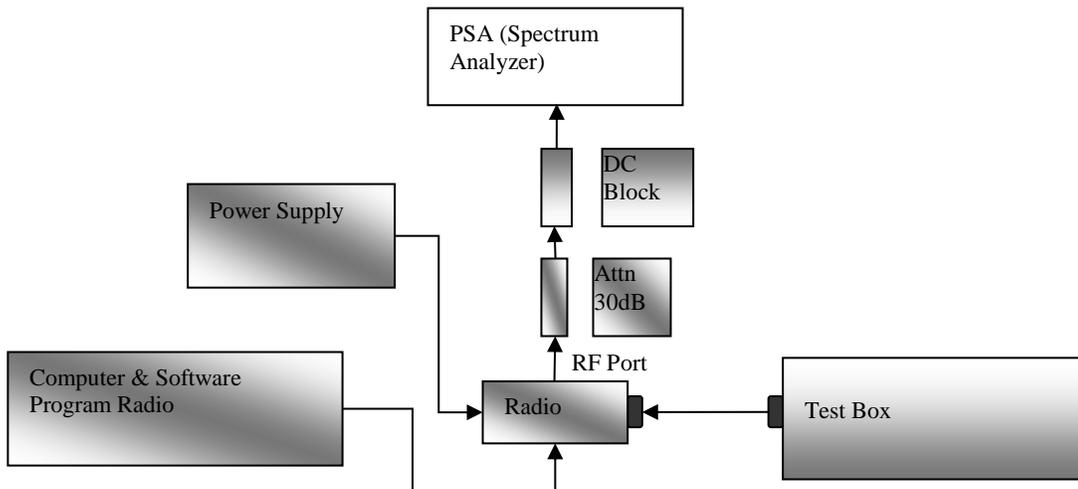
- 1) The DUT transmitter output port was connected to Modulation Analyzer.
- 2) Set the audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
- 3) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 50% of the rated deviation. Up the amplitude by 16 dB.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

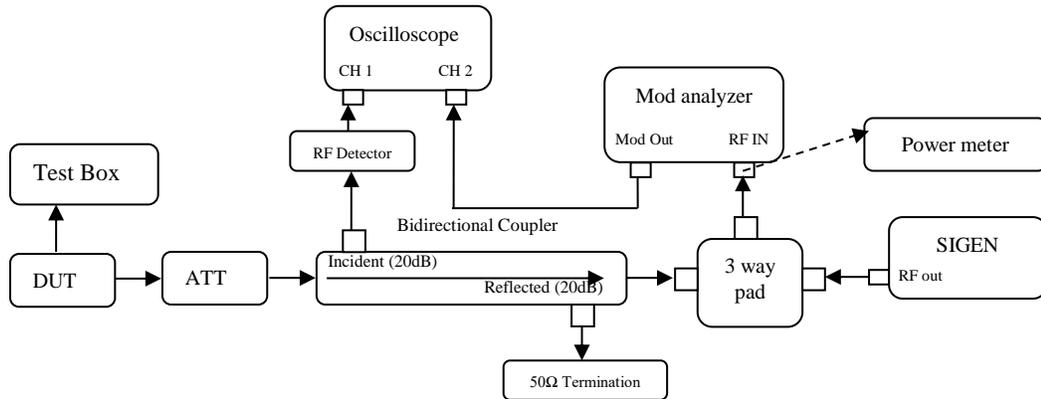
6.6.4. Test Result (Digital) **Not Applicable**

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 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 $\leq -11\text{dBm}$ 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 Not Applicable

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 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.

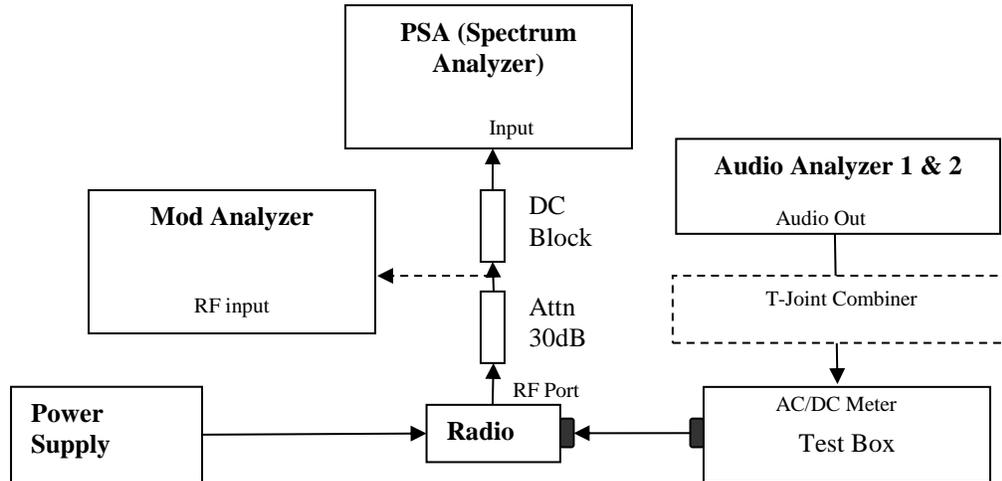
² During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in §90.213.

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.

6.8. Adjacent Channel Power

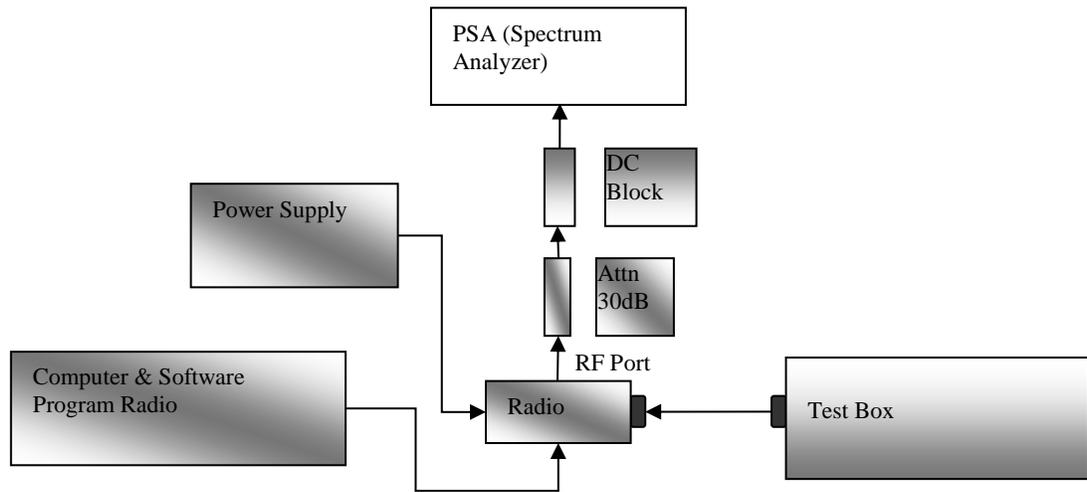
6.8.1. Test Setup (Analog)



- 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

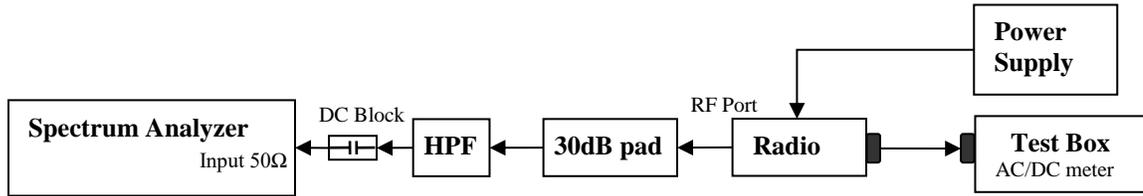
Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP (dBc)
9.375	6.25	-40
15.625	6.25	-60
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
350.00	100	-65
>400 kHz to 12 MHz	30 (s)	-80
12 MHz to paired receive band	30 (s)	-80
In the paired receive band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

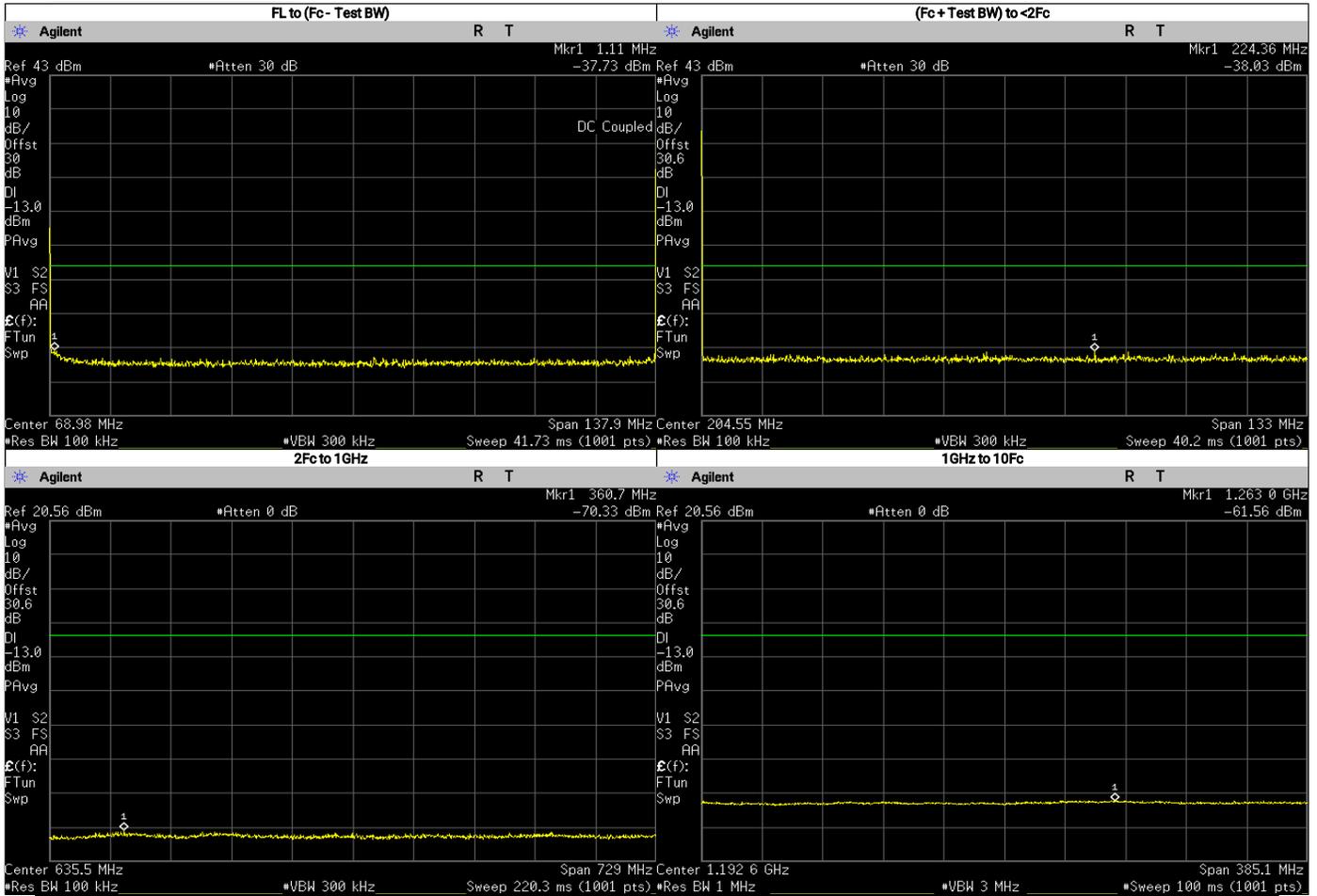
6.9. Conducted Spurious Emission

6.9.1. Test Setup



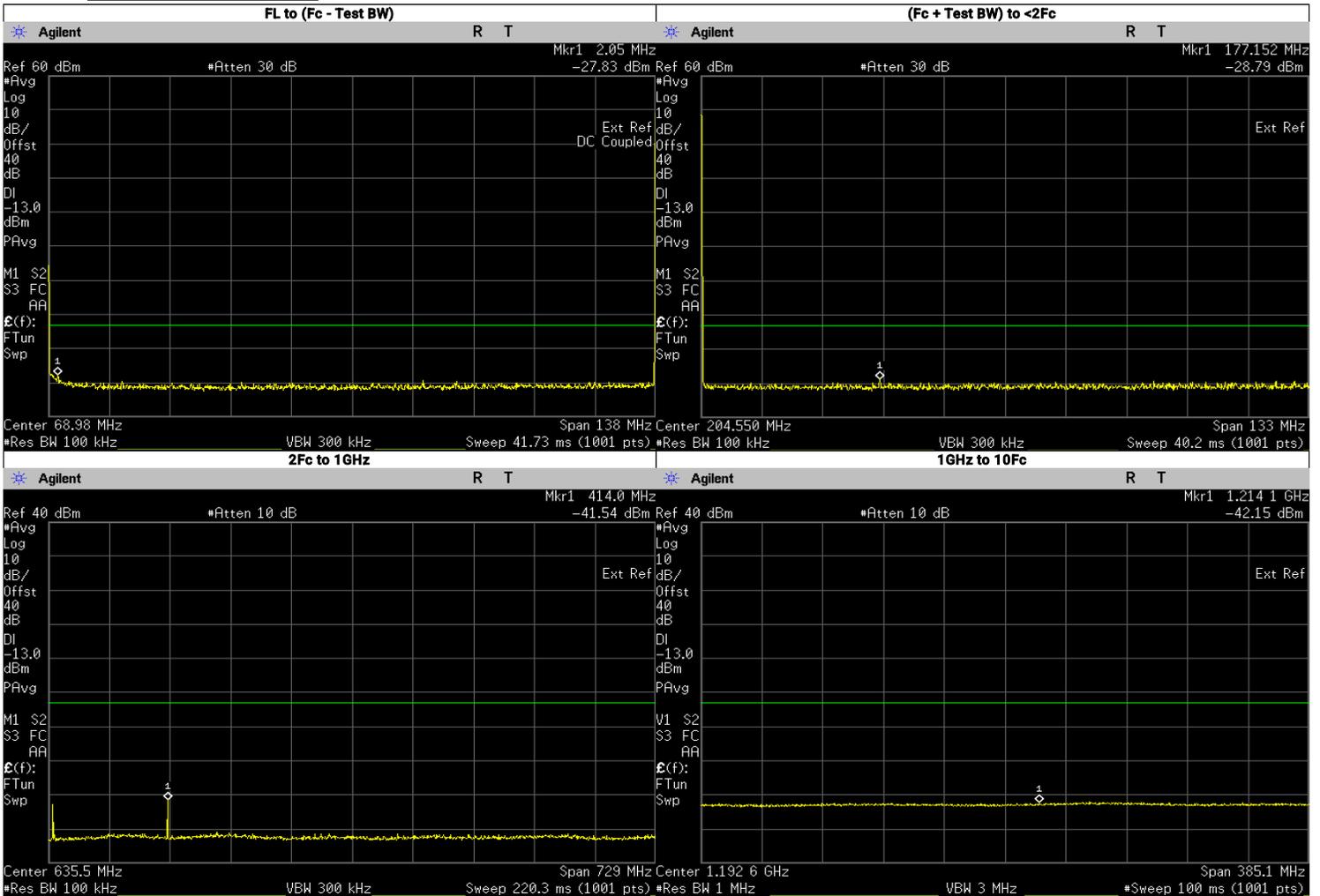
- 1) The DUT transmitter output port was connected to Spectrum Analyzer with above setup.
- 2) Program and set radio to operate in desire test frequency and mode. (Analog / digital modulation form).
- 3) Path loss for the measurement included.
- 4) Set the PSA Resolution Bandwidth as per rules part.
- 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. $9 \text{ KHz to } F_c - \text{Test Bandwidth}$
 - b. $F_c + \text{Test Bandwidth to } 2F_c - 5\text{MHz}$.
- 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: 138.0125 MHz, 25 kHz Channel Spacing, Low Power
Not for FCC review



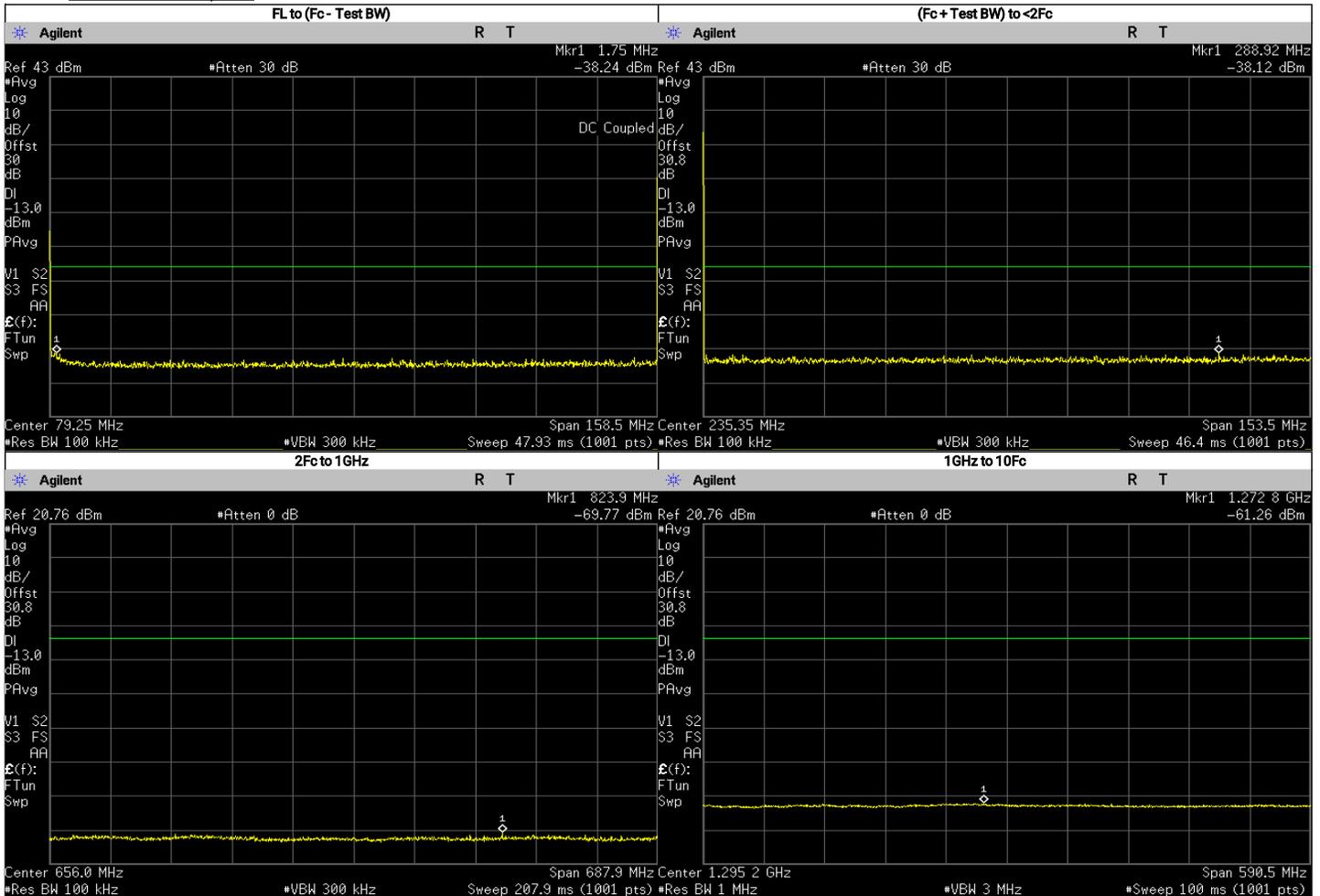
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.1100	-37.7300	-13	PASS
(Fc + Test BW) to <2Fc	224.3571	-38.0300	-13	PASS
2Fc to 1GHz	360.6889	-70.3300	-13	PASS
	276.0250	-71.9164	-13	PASS
	414.0375	-72.0294	-13	PASS
	552.0500	-72.0676	-13	PASS
	690.0625	-72.1379	-13	PASS
	828.0750	-72.3174	-13	PASS
	966.0875	-72.0652	-13	PASS
1GHz to 10Fc	1263.0400	-61.5600	-13	PASS
	1104.1000	-62.4585	-13	PASS
	1242.1120	-61.8969	-13	PASS
	1380.1250	-62.3069	-13	PASS

Analog: 138.0125 MHz, 25 kHz Channel Spacing, Max Power
Not for FCC review



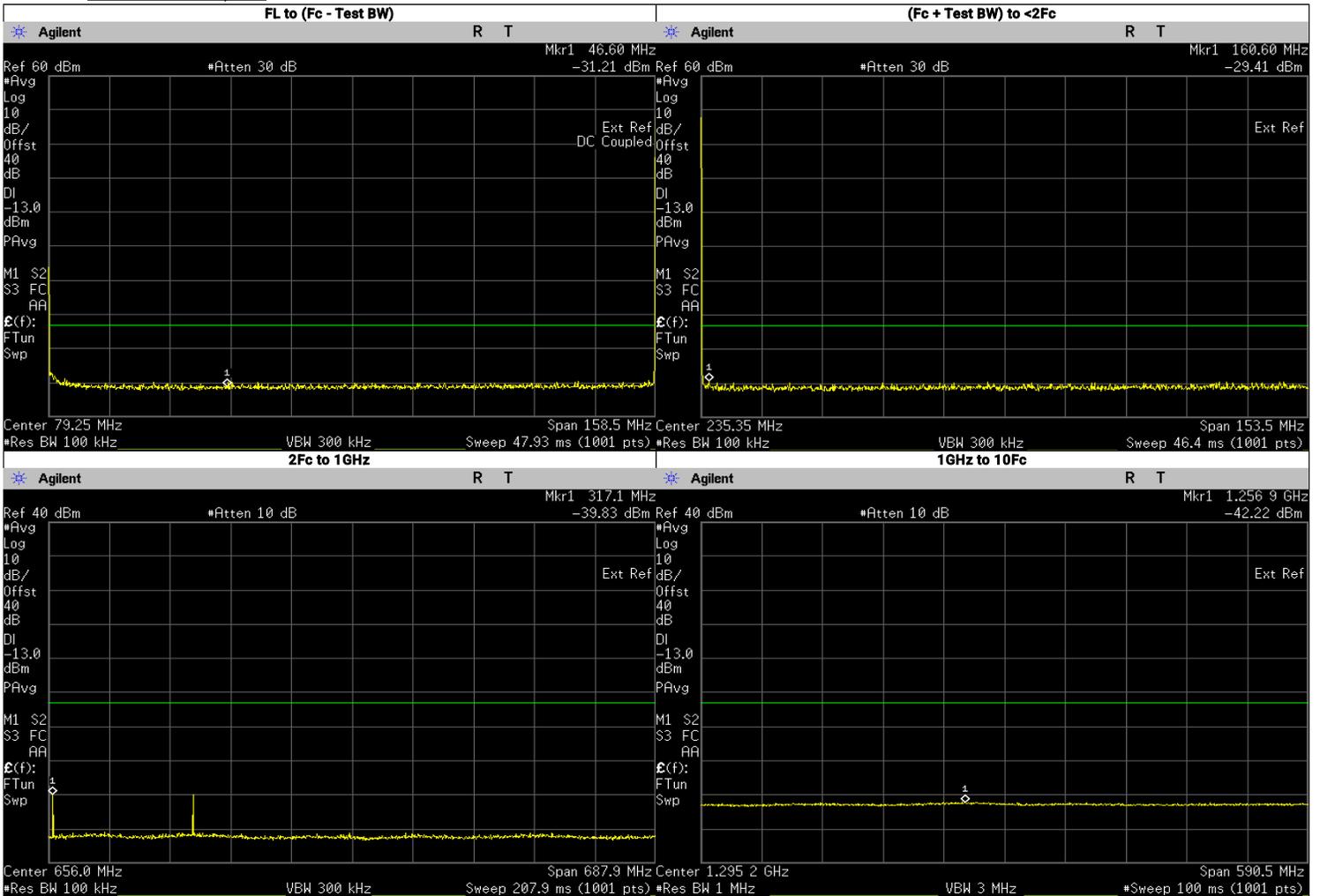
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	2.0500	-27.8300	-13	PASS
(Fc + Test BW) to <2Fc	117.1520	-28.7900	-13	PASS
2Fc to 1GHz	414.0375	-41.5400	-13	PASS
	276.0250	-42.7000	-13	PASS
	552.0500	-52.6700	-13	PASS
	690.0625	-51.4900	-13	PASS
	828.0750	-52.2200	-13	PASS
	966.0875	-52.3300	-13	PASS
1GHz to 10Fc	1214.1000	-42.1500	-13	PASS
	1104.1000	-43.0200	-13	PASS
	1242.1120	-42.6000	-13	PASS
	1380.1250	-42.8000	-13	PASS

**Analog: 158.5500 MHz, 25 kHz Channel Spacing, Low Power
 For Part 22, 80**



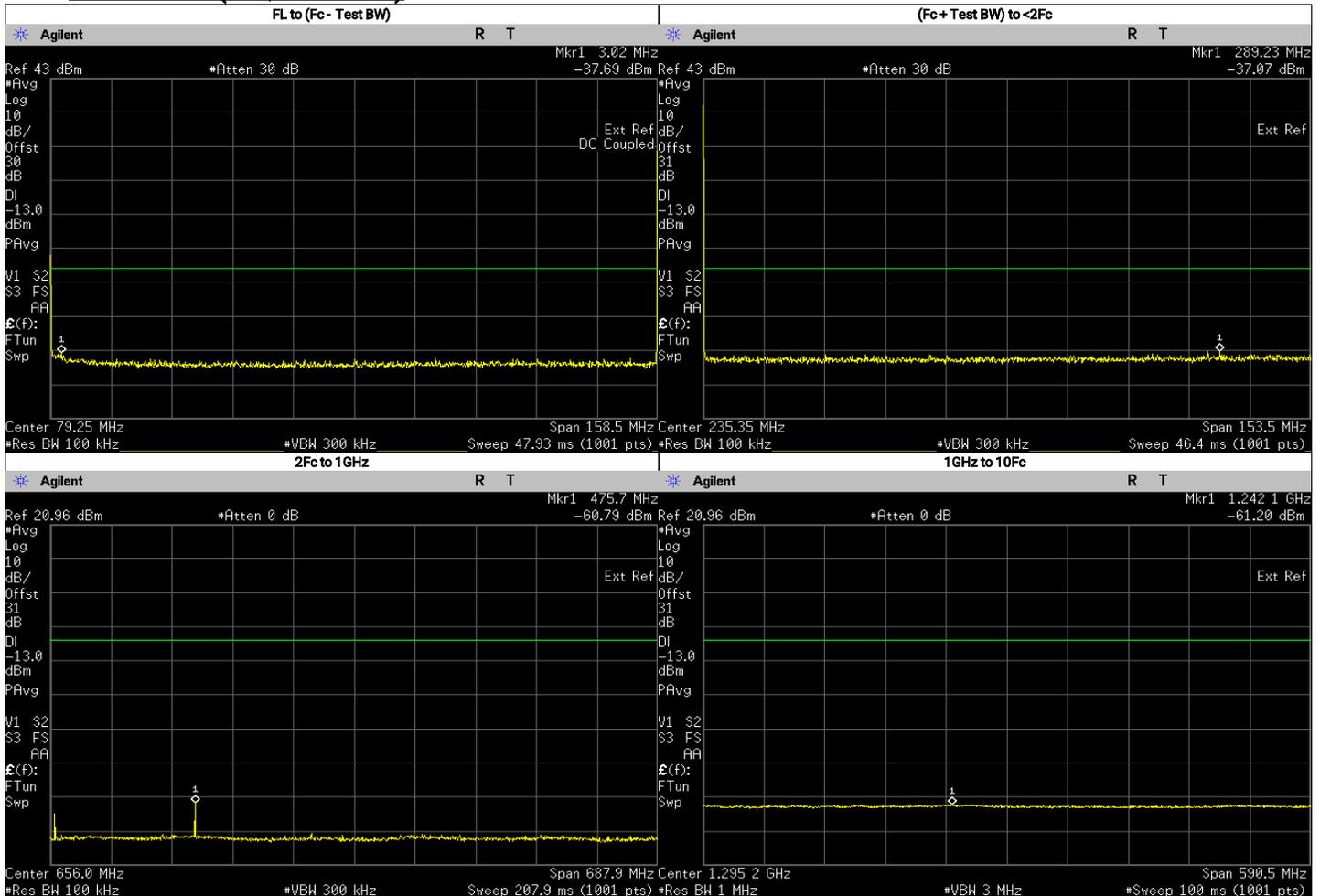
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.7500	-38.2400	-13	PASS
(Fc + Test BW) to <2Fc	288.9224	-38.1200	-13	PASS
2Fc to 1GHz	823.8976	-69.7700	-13	PASS
	317.1000	-71.5914	-13	PASS
	475.6500	-70.8357	-13	PASS
	634.2000	-71.8764	-13	PASS
	792.7500	-71.7922	-13	PASS
	951.3000	-71.5471	-13	PASS
1GHz to 10Fc	1272.8110	-61.2600	-13	PASS
	1109.8500	-62.1916	-13	PASS
	1268.4000	-61.8268	-13	PASS
	1426.9500	-62.1277	-13	PASS
	1585.5000	-62.0827	-13	PASS

**Analog: 158.5500 MHz, 25 kHz Channel Spacing, Max Power
 For Part 22, 80**



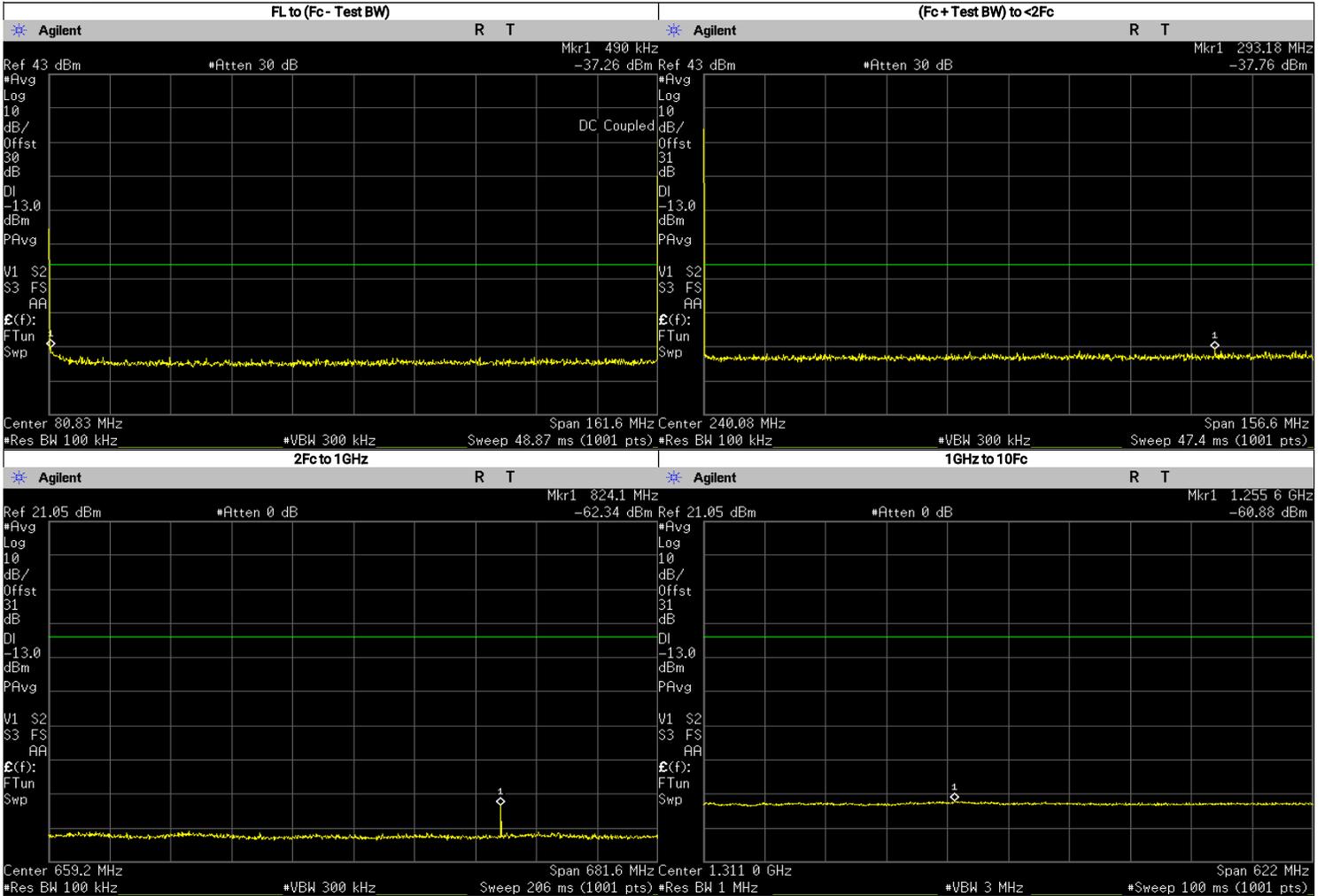
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	46.6000	-31.2100	-13	PASS
(Fc + Test BW) to <2Fc	160.6000	-29.4100	-13	PASS
2Fc to 1GHz	317.1000	-39.8300	-13	PASS
	475.6500	-39.8900	-13	PASS
	634.2000	-51.0200	-13	PASS
	792.7500	-51.8800	-13	PASS
	951.3000	-51.9400	-13	PASS
1GHz to 10Fc	1256.8870	-42.2200	-13	PASS
	1109.8500	-42.8400	-13	PASS
	1268.4000	-42.2900	-13	PASS
	1426.9500	-42.5900	-13	PASS
	1585.5000	-42.5600	-13	PASS

**Analog: 158.5500 MHz, 25 kHz Channel Spacing, Maritime
 For Part 80 (5W, Maritime)**



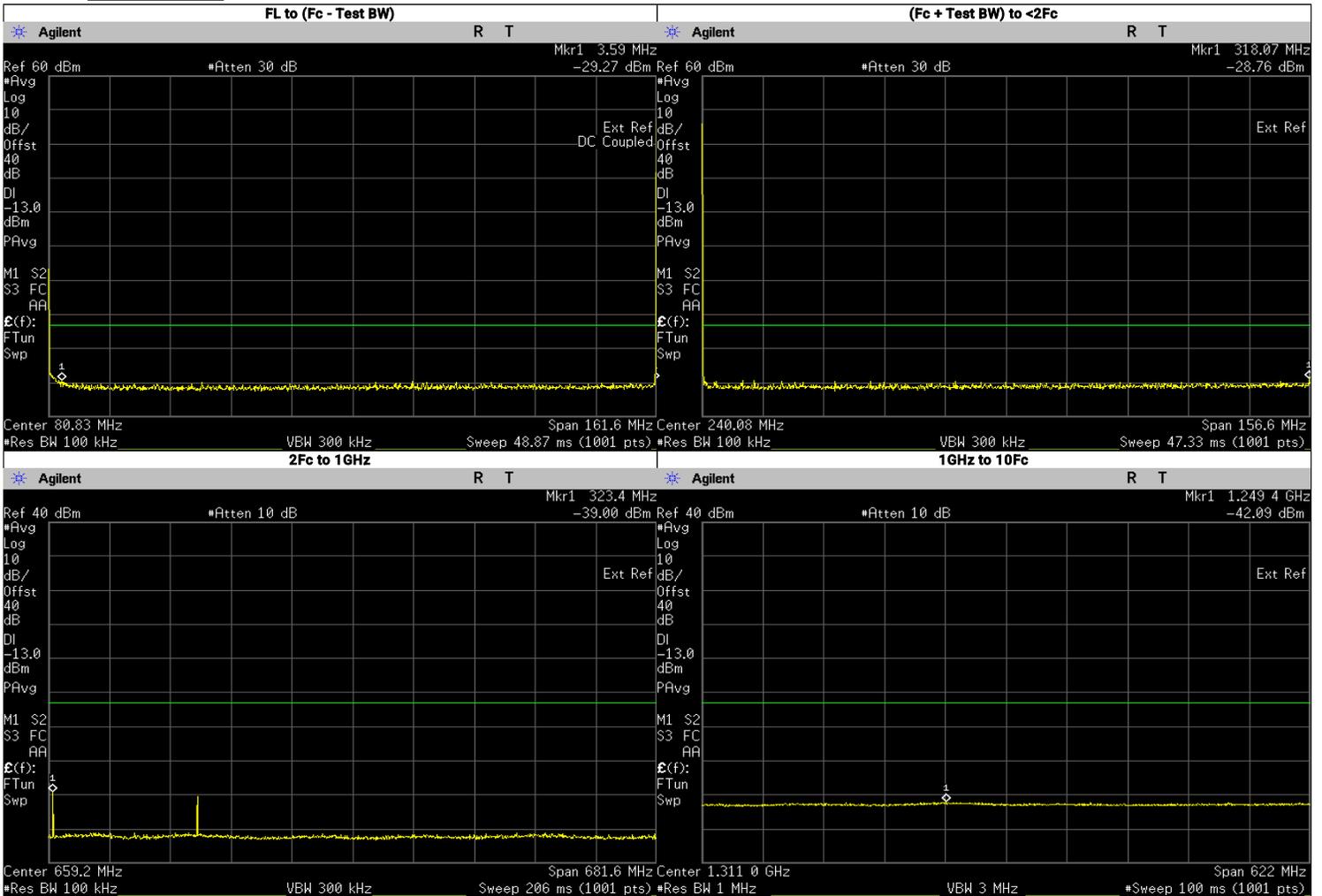
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	3.0200	-37.6950	-13	PASS
(Fc + Test BW) to <2Fc	289.2293	-37.0700	-13	PASS
2Fc to 1GHz	607.8970	-69.6900	-13	PASS
	317.1000	-65.9319	-13	PASS
	475.6500	-63.2194	-13	PASS
	634.2000	-71.0412	-13	PASS
	792.7500	-71.2549	-13	PASS
	951.3000	-71.7937	-13	PASS
1GHz to 10Fc	1242.1050	-61.2000	-13	PASS
	1109.8500	-62.0965	-13	PASS
	1268.4000	-61.4656	-13	PASS
	1426.9500	-61.6879	-13	PASS
	1585.5000	-61.9216	-13	PASS

**Analog: 161.7000 MHz, 25 kHz Channel Spacing, Low Power
 For Part 74**



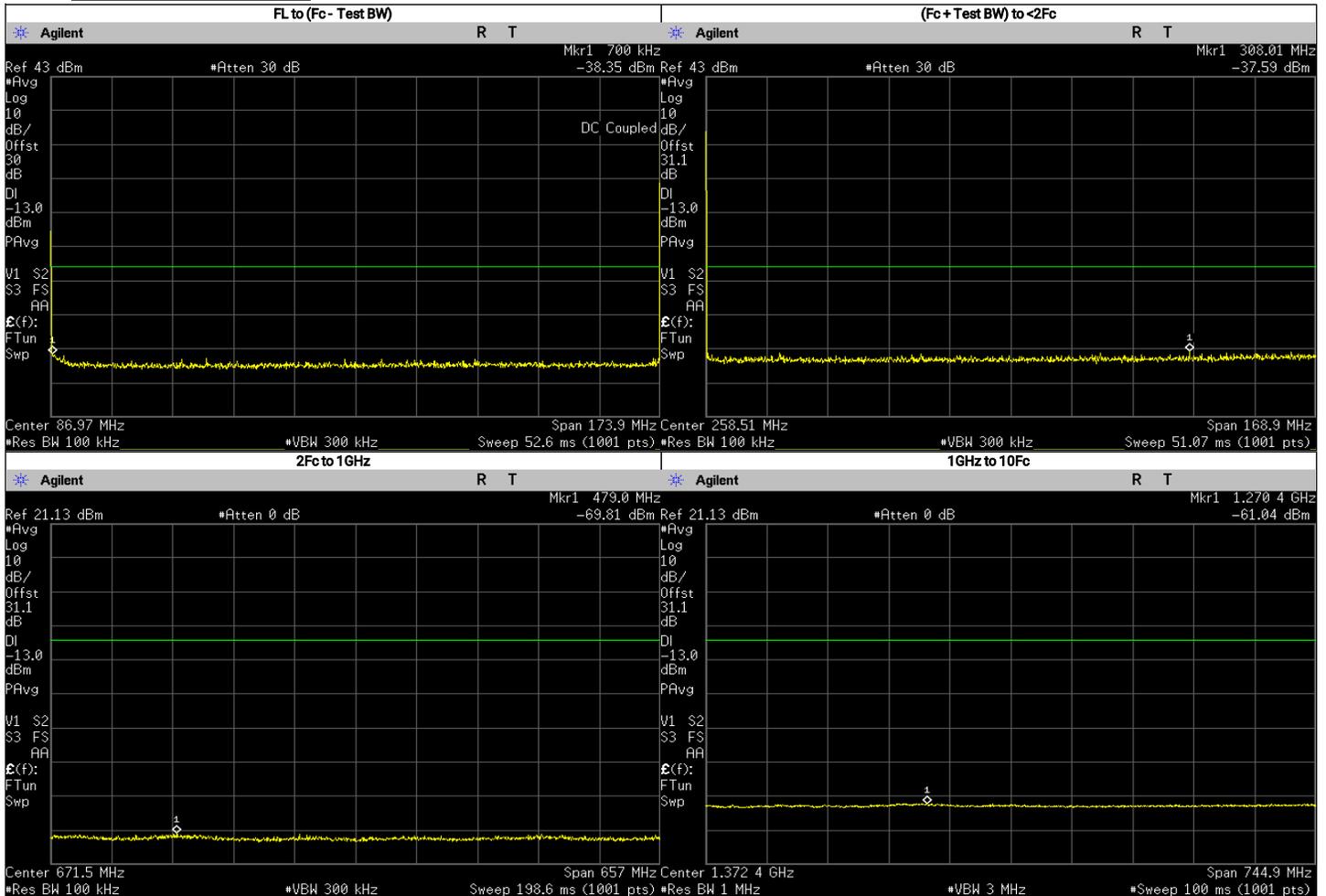
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.4900	-37.2650	-13	PASS
(Fc + Test BW) to <2Fc	293.1803	-37.7600	-13	PASS
2Fc to 1GHz	824.1472	-62.3400	-13	PASS
	323.4000	-71.2320	-13	PASS
	485.1000	-70.8783	-13	PASS
	646.8000	-71.9755	-13	PASS
	808.5000	-71.8501	-13	PASS
	970.2000	-71.7335	-13	PASS
1GHz to 10Fc	1255.6420	-60.8800	-13	PASS
	1131.9000	-62.0883	-13	PASS
	1293.6000	-61.3037	-13	PASS
	1455.3000	-61.7736	-13	PASS
	1617.0000	-61.8266	-13	PASS

**Analog: 161.7000 MHz, 25 kHz Channel Spacing, Max Power
 For Part 74**



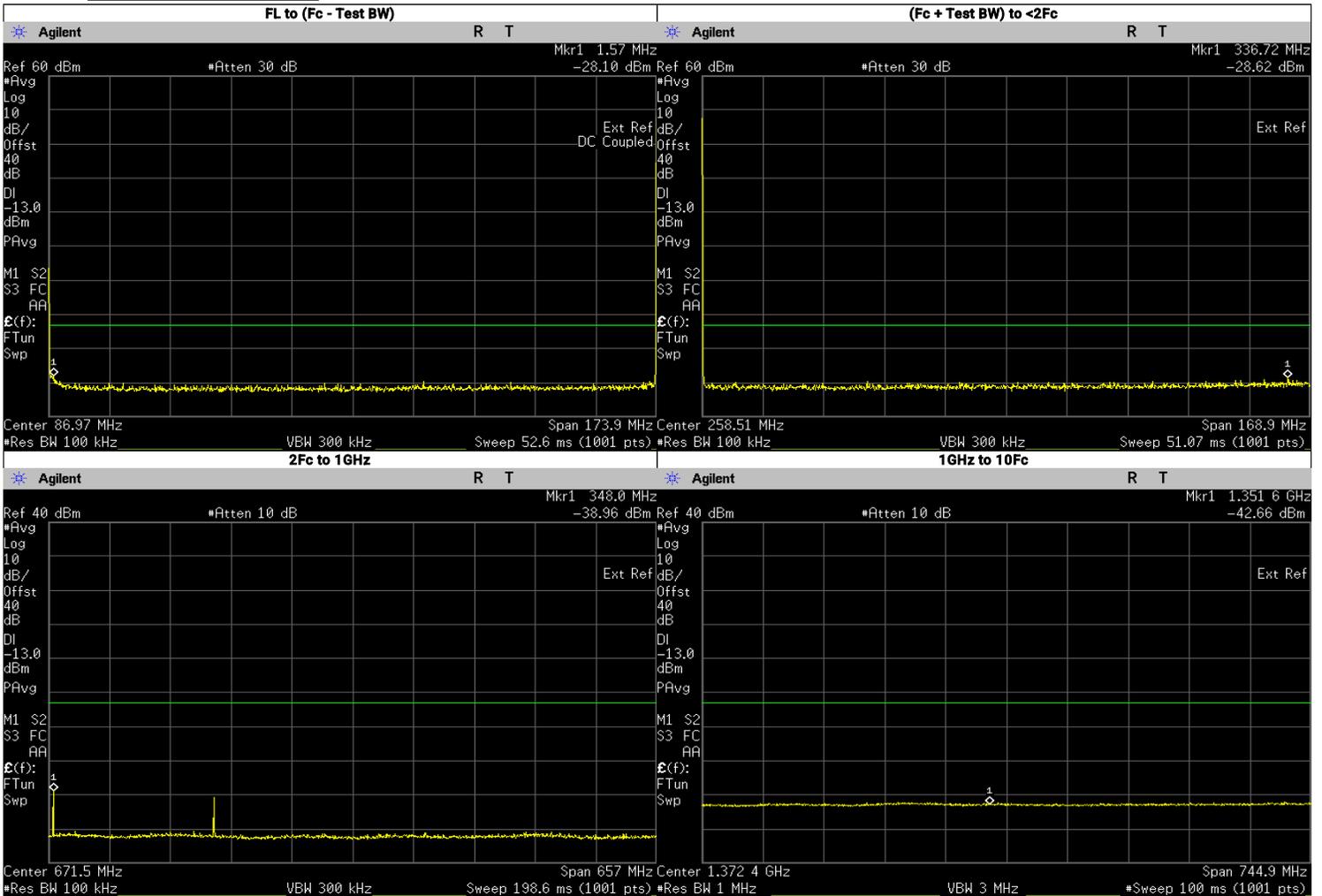
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	3.5900	-29.2700	-13	PASS
(Fc + Test BW) to <2Fc	318.0700	-28.7600	-13	PASS
2Fc to 1GHz	323.4000	-39.0030	-13	PASS
	485.1000	-40.4500	-13	PASS
	646.8000	-52.6000	-13	PASS
	808.5000	-51.4100	-13	PASS
	970.2000	-52.0100	-13	PASS
1GHz to 10Fc	1249.4000	-42.0900	-13	PASS
	1131.9000	-42.8200	-13	PASS
	1293.6000	-42.5200	-13	PASS
	1455.3000	-42.8000	-13	PASS
	1617.0000	-42.5200	-13	PASS

Analog: 173.9875 MHz, 25 kHz Channel Spacing, Low Power
Not for FCC review



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.7000	-38.3510	-13	PASS
(Fc + Test BW) to <2Fc	308.0061	-37.5900	-13	PASS
2Fc to 1GHz	478.9792	-69.8100	-13	PASS
	347.9750	-70.4256	-13	PASS
	521.9625	-70.8812	-13	PASS
	695.9500	-71.4199	-13	PASS
	869.9375	-71.4299	-13	PASS
1GHz to 10Fc	1270.3900	-61.0400	-13	PASS
	1043.9250	-62.0632	-13	PASS
	1217.9120	-61.8233	-13	PASS
	1391.9000	-61.8913	-13	PASS
	1565.8880	-61.6187	-13	PASS
	1739.8750	-61.3153	-13	PASS

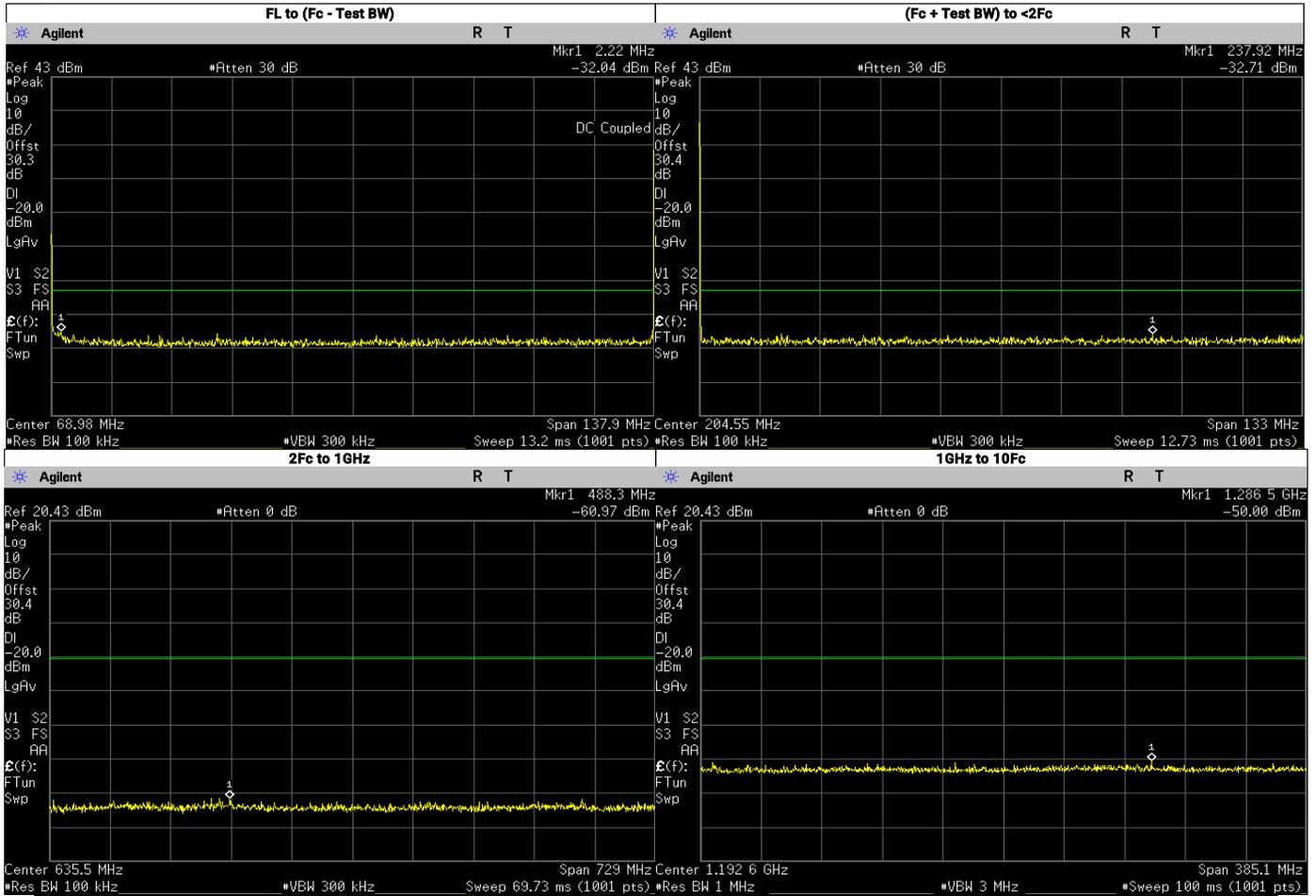
Analog: 173.9875 MHz, 25 kHz Channel Spacing, Max Power
Not for FCC review



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.5700	-28.1000	-13	PASS
(Fc + Test BW) to <2Fc	336.7200	-28.6200	-13	PASS
2Fc to 1GHz	347.9750	-38.9600	-13	PASS
	521.9625	-40.7500	-13	PASS
	695.9500	-52.4100	-13	PASS
	869.9375	-51.2000	-13	PASS
1GHz to 10Fc	1351.6000	-42.6600	-13	PASS
	1043.9250	-43.2200	-13	PASS
	1217.9120	-42.4100	-13	PASS
	1391.9000	-42.5600	-13	PASS
	1565.8880	-42.6000	-13	PASS
	1739.8750	-42.4000	-13	PASS

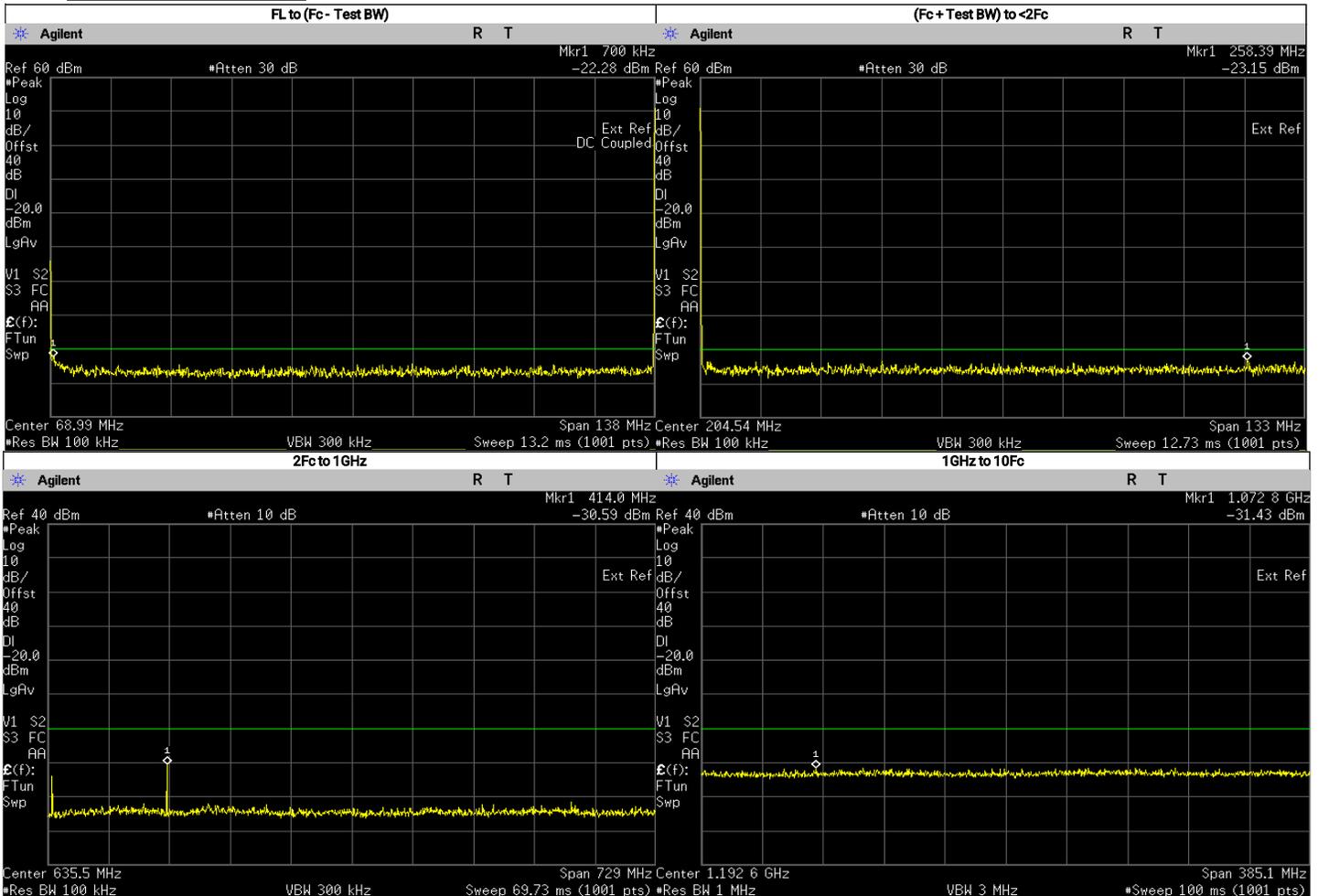
6.9.3. Test Result (Digital)

Digital: 138.0125 MHz, 12.5 kHz Channel Spacing, Low Power
Not for FCC review



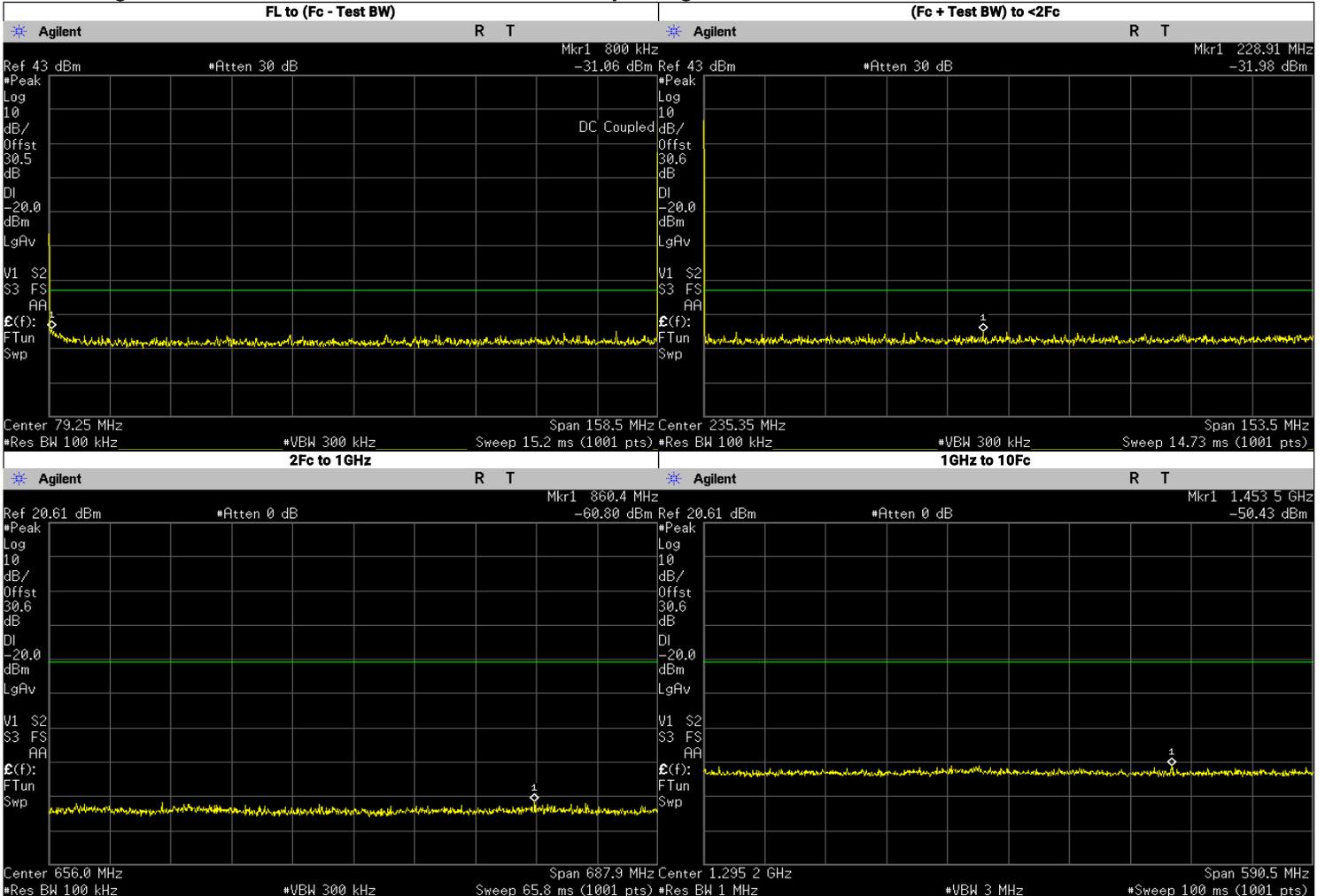
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	2.2200	-32.0390	-20	PASS
(Fc + Test BW) to <2Fc	237.9187	-32.7100	-20	PASS
2Fc to 1GHz	488.2595	-60.9700	-20	PASS
	276.0250	-61.9250	-20	PASS
	414.0375	-62.4756	-20	PASS
	552.0500	-64.0160	-20	PASS
	690.0625	-63.9442	-20	PASS
	828.0750	-63.8210	-20	PASS
	966.0875	-63.7265	-20	PASS
1GHz to 10Fc	1286.5330	-50.0000	-20	PASS
	1104.1000	-52.0938	-20	PASS
	1242.1120	-52.1372	-20	PASS
	1380.1250	-52.9281	-20	PASS

Digital: 138.0125 MHz, 12.5 kHz Channel Spacing, Max Power
Not for FCC review



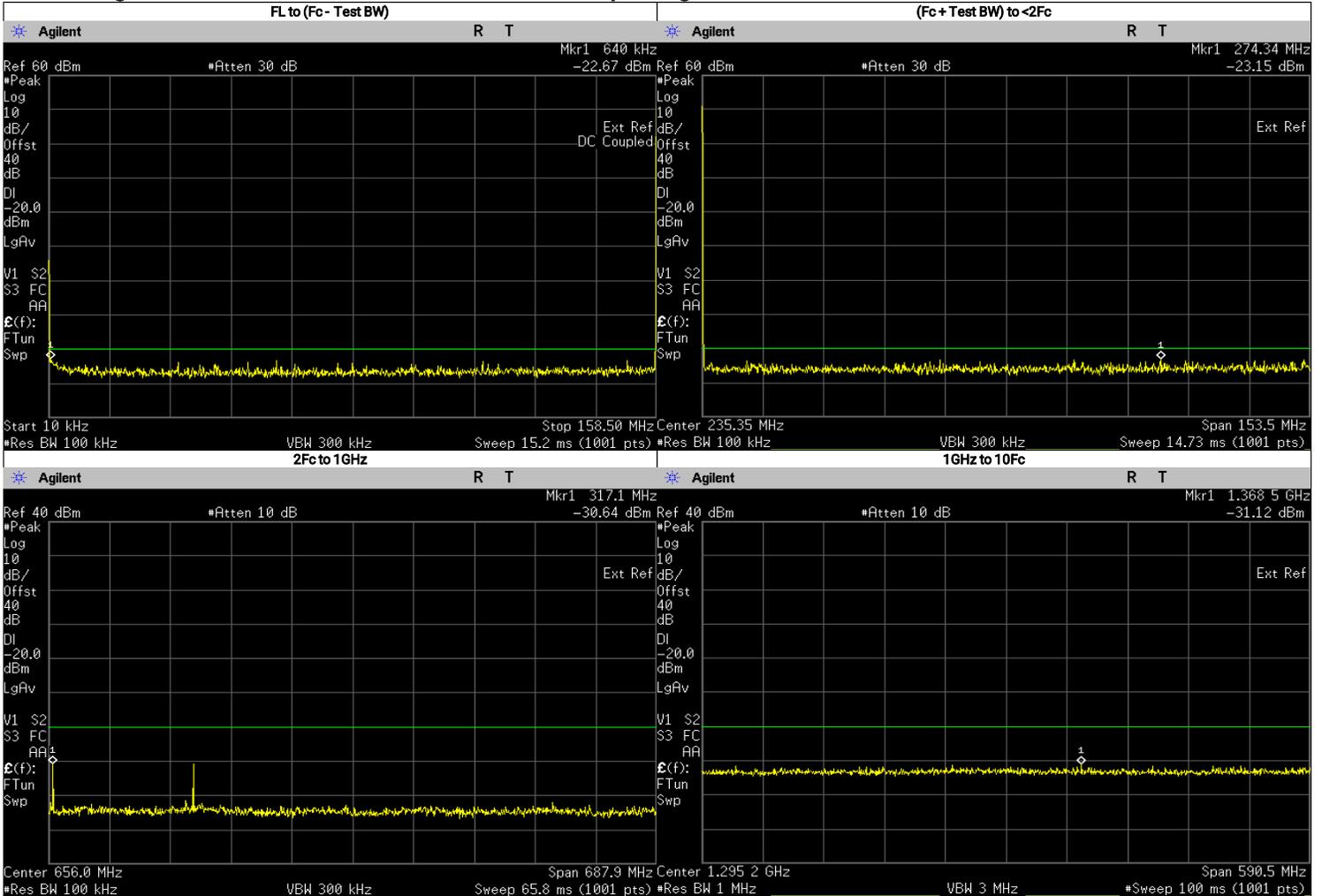
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.7000	-22.2800	-20	PASS
(Fc + Test BW) to <2Fc	258.3900	-23.1500	-20	PASS
2Fc to 1GHz	414.0375	-30.5900	-20	PASS
	276.0250	-33.9900	-20	PASS
	552.0500	-44.0100	-20	PASS
	690.0625	-43.2800	-20	PASS
	828.0750	-43.4500	-20	PASS
	966.0875	-45.3600	-20	PASS
1GHz to 10Fc	1072.8114	-31.4300	-20	PASS
	1104.1000	-32.9400	-20	PASS
	1242.1120	-32.7000	-20	PASS
	1380.1250	-33.8700	-20	PASS

Digital: 158.5500 MHz, 12.5 kHz Channel Spacing, Low Power



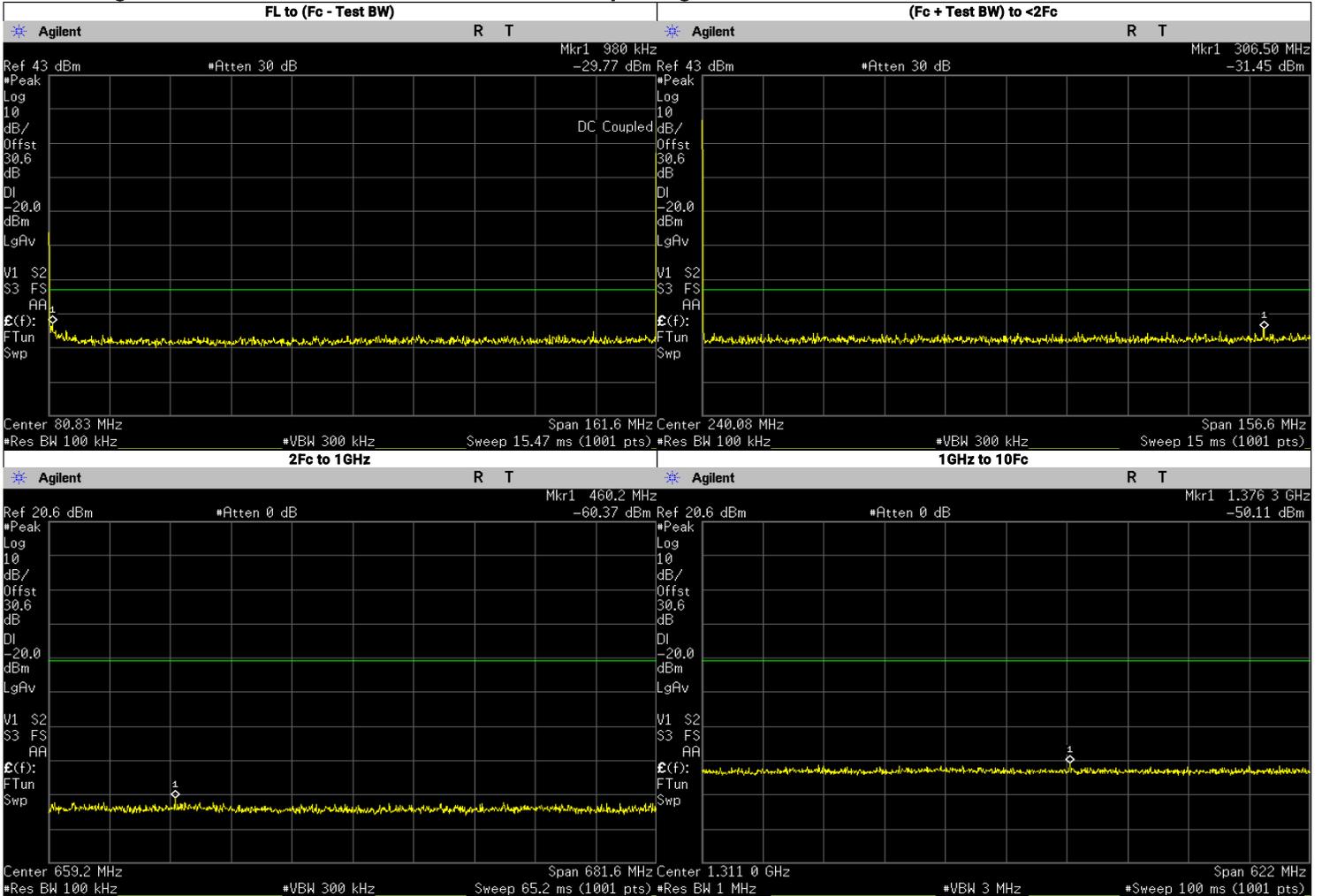
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.8000	-31.0590	-20	PASS
(Fc + Test BW) to <2Fc	228.9060	-31.9800	-20	PASS
2Fc to 1GHz	860.3563	-60.8000	-20	PASS
	317.1000	-63.7113	-20	PASS
	475.6500	-62.7485	-20	PASS
	634.2000	-63.2187	-20	PASS
	792.7500	-64.2745	-20	PASS
	951.3000	-64.4024	-20	PASS
1GHz to 10Fc	1453.5040	-50.4300	-20	PASS
	1109.8500	-53.0006	-20	PASS
	1268.4000	-51.5301	-20	PASS
	1426.9500	-52.0937	-20	PASS
	1585.5000	-52.4536	-20	PASS

Digital: 158.5500 MHz, 12.5 kHz Channel Spacing, Max Power



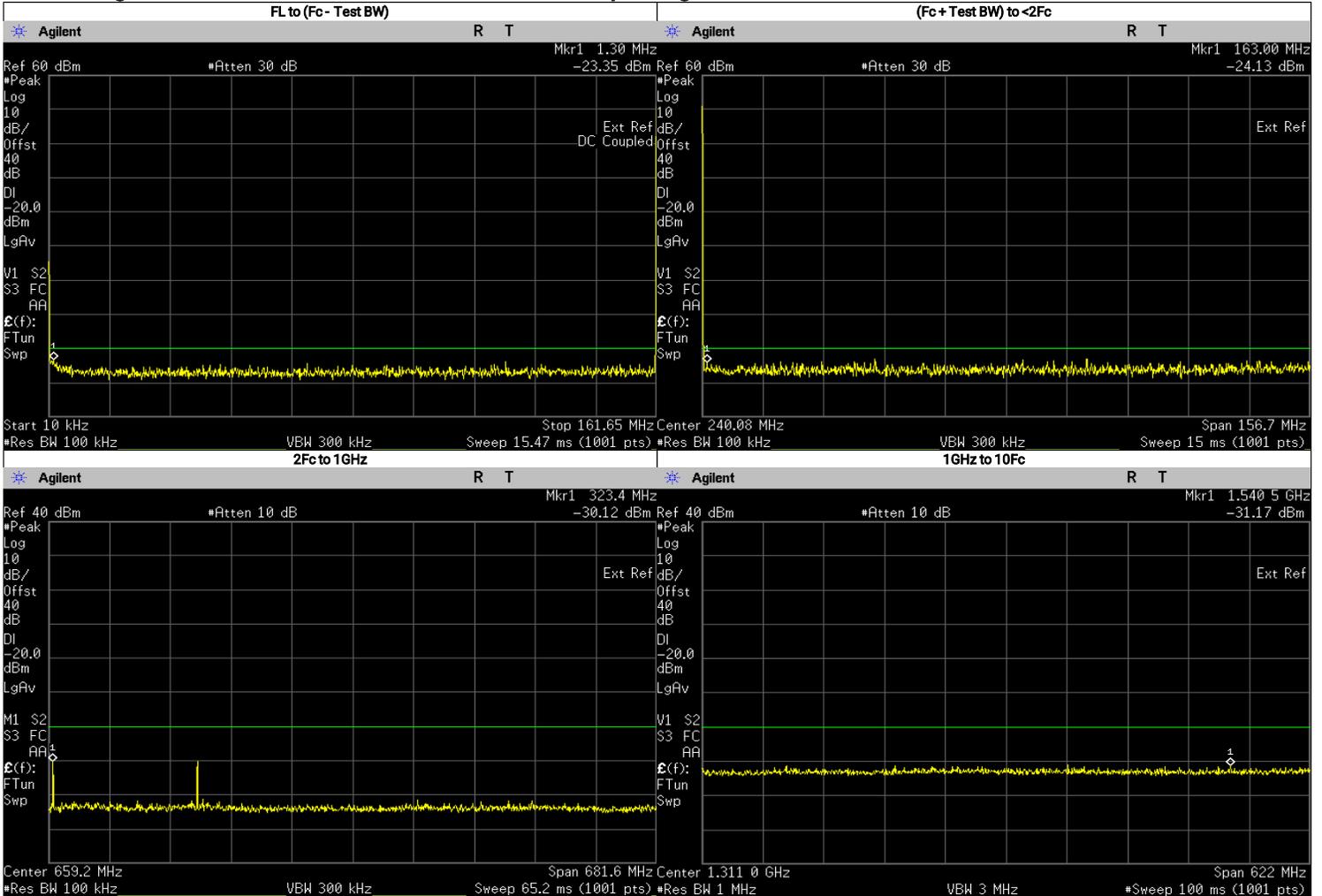
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.6401	-22.6700	-20	PASS
(Fc + Test BW) to <2Fc	274.3400	-23.1500	-20	PASS
2Fc to 1GHz	317.1000	-30.6400	-20	PASS
	475.6500	-30.8100	-20	PASS
	634.2000	-43.7000	-20	PASS
	792.7500	-43.2200	-20	PASS
	951.3000	-45.2300	-20	PASS
1GHz to 10Fc	1368.5121	-31.1200	-20	PASS
	1109.8500	-33.1400	-20	PASS
	1268.4000	-32.5700	-20	PASS
	1426.9500	-33.6600	-20	PASS
	1585.5000	-32.5900	-20	PASS

Digital: 161.7000 MHz, 12.5 kHz Channel Spacing, Low Power



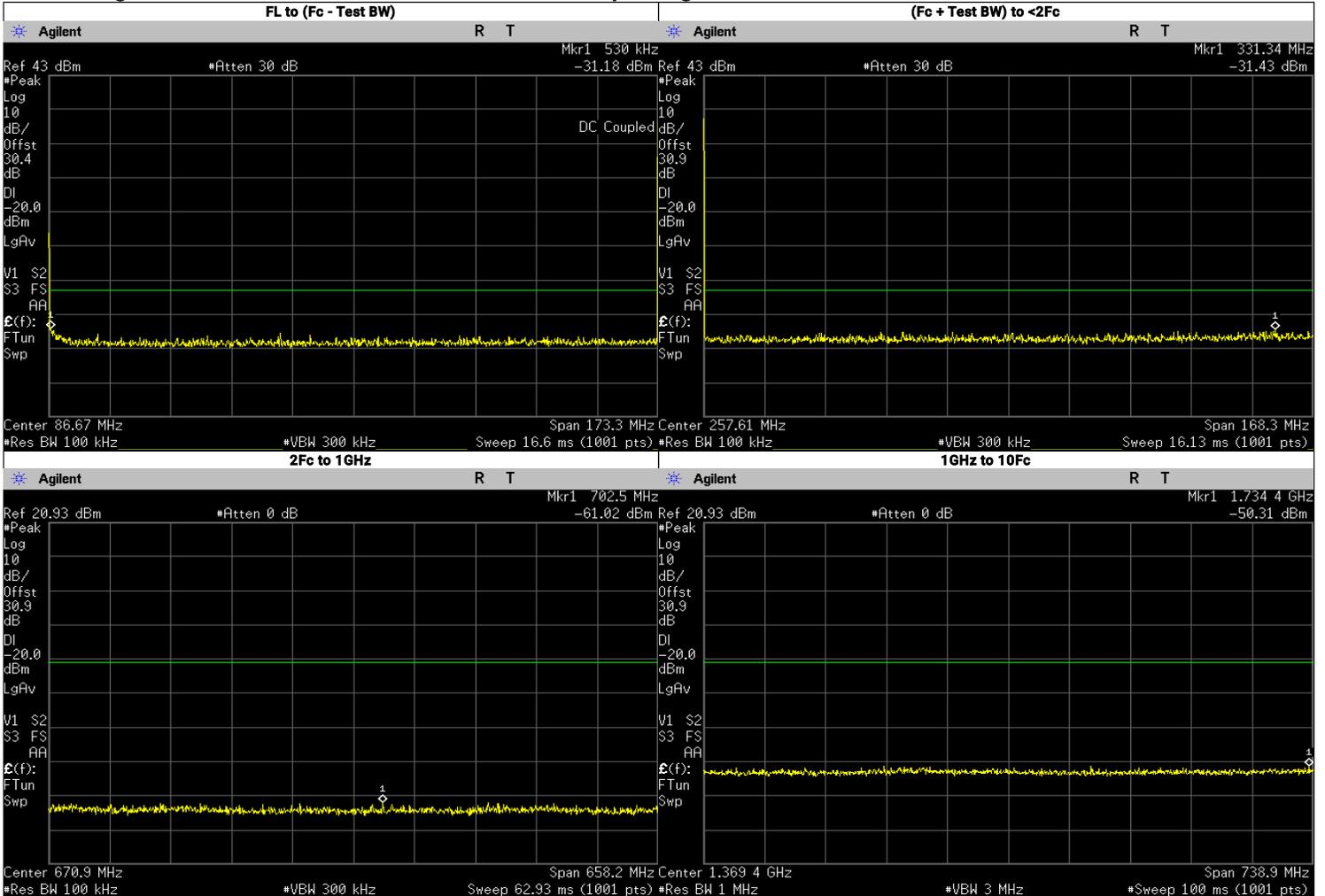
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.9800	-29.7740	-20	PASS
(Fc + Test BW) to <2Fc	306.4950	-31.4500	-20	PASS
2Fc to 1GHz	460.1728	-60.3700	-20	PASS
	323.4000	-62.6389	-20	PASS
	485.1000	-63.4597	-20	PASS
	646.8000	-63.9899	-20	PASS
	808.5000	-63.8302	-20	PASS
	970.2000	-64.1219	-20	PASS
1GHz to 10Fc	1376.3100	-50.1100	-20	PASS
	1131.9000	-52.6137	-20	PASS
	1293.6000	-52.1327	-20	PASS
	1455.3000	-52.9461	-20	PASS
	1617.0000	-52.5631	-20	PASS

Digital: 161.7000 MHz, 12.5 kHz Channel Spacing, Max Power



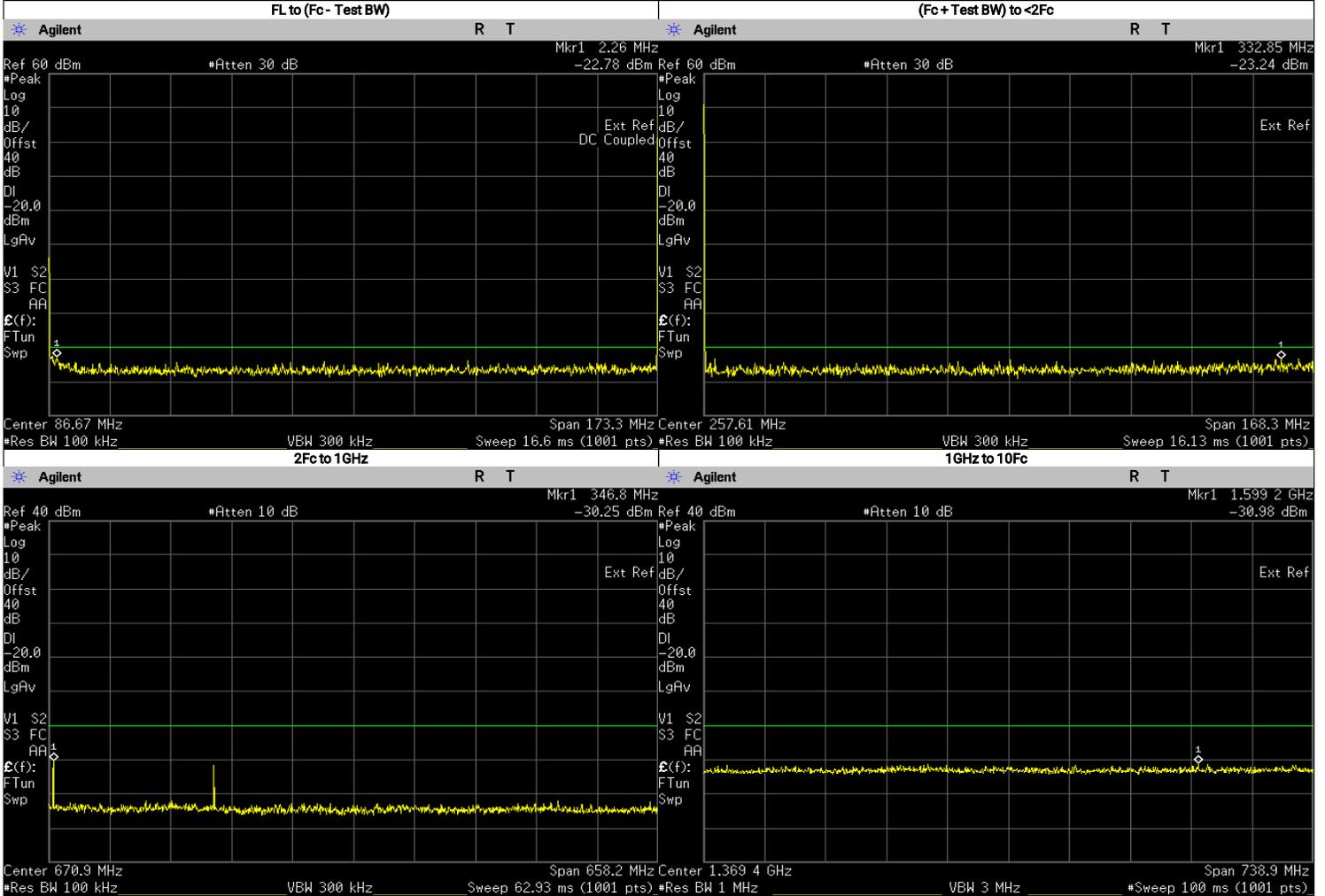
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	1.3000	-23.3500	-20	PASS
(Fc + Test BW) to <2Fc	163.0031	-24.1300	-20	PASS
2Fc to 1GHz	323.4000	-30.1200	-20	PASS
	485.1000	-30.3500	-20	PASS
	646.8000	-44.3400	-20	PASS
	808.5000	-43.4000	-20	PASS
	970.2000	-44.5500	-20	PASS
1GHz to 10Fc	1540.5000	-31.1700	-20	PASS
	1131.9000	-33.1300	-20	PASS
	1293.6000	-32.7200	-20	PASS
	1455.3000	-32.5300	-20	PASS
	1617.0000	-33.0600	-20	PASS

Digital: 173.3875 MHz, 12.5 kHz Channel Spacing, Low Power



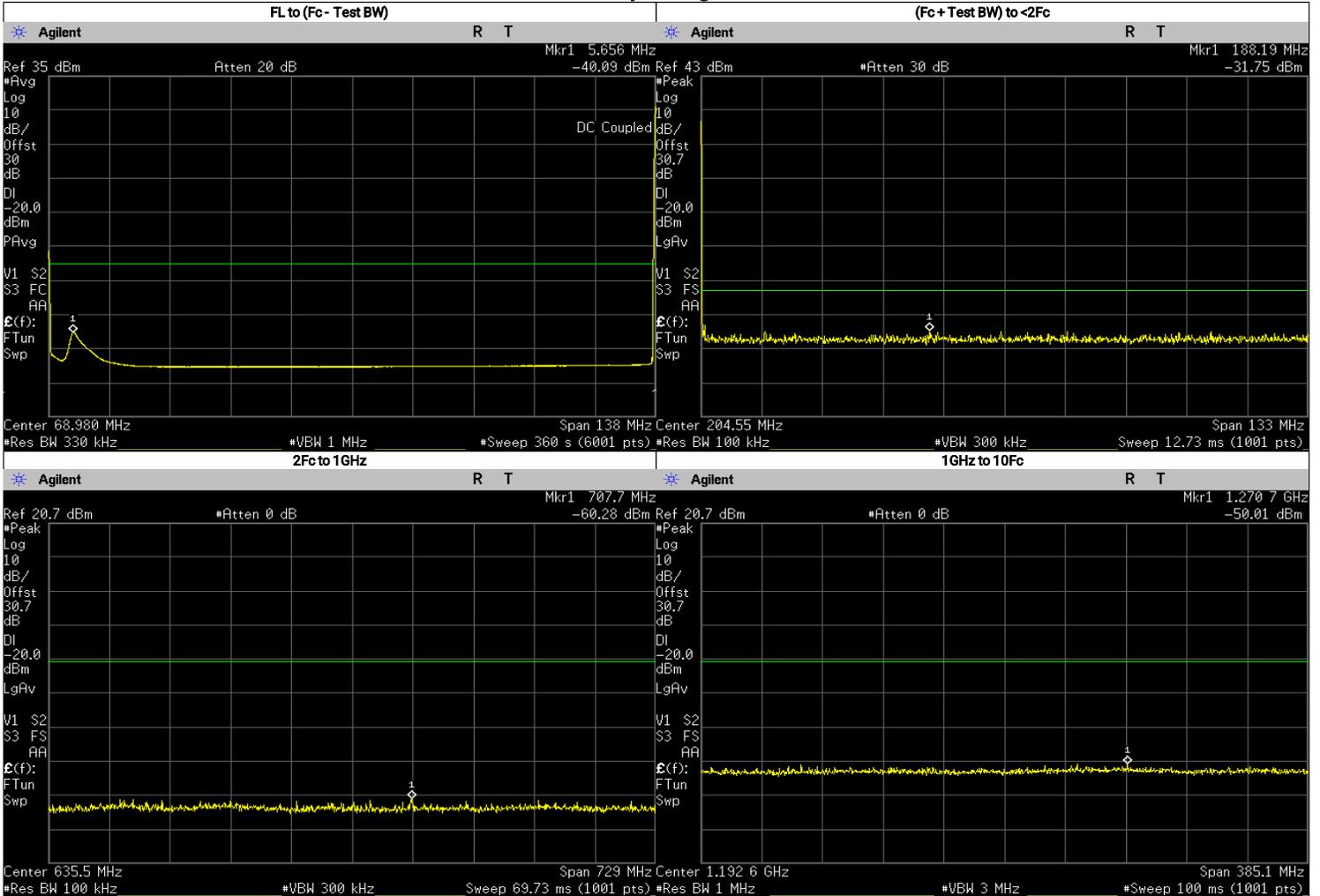
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	0.5300	-31.7700	-20	PASS
(Fc + Test BW) to <2Fc	331.3384	-31.4300	-20	PASS
2Fc to 1GHz	702.4823	-61.0200	-20	PASS
	346.7750	-61.7384	-20	PASS
	520.1625	-62.6697	-20	PASS
	693.5500	-63.7419	-20	PASS
	866.9375	-62.4671	-20	PASS
1GHz to 10Fc	1734.4420	-50.3100	-20	PASS
	1040.3250	-52.2991	-20	PASS
	1213.7130	-52.0190	-20	PASS
	1387.1000	-52.4198	-20	PASS
	1560.4870	-51.7350	-20	PASS
	1733.8750	-51.8522	-20	PASS

Digital: 173.3875 MHz, 12.5 kHz Channel Spacing, Max Power



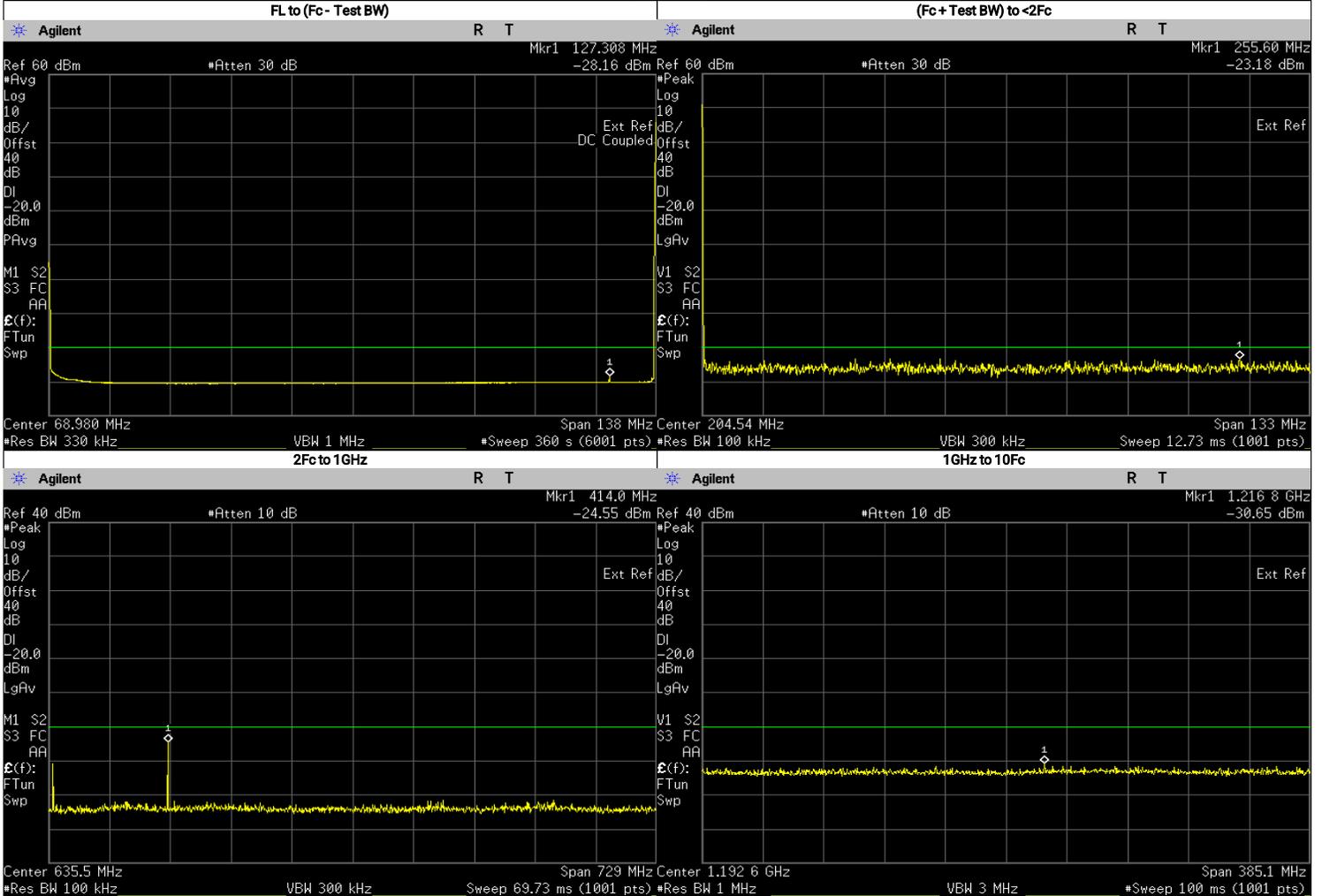
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	2.2600	-22.7800	-20	PASS
(Fc + Test BW) to <2Fc	332.8540	-23.2400	-20	PASS
2Fc to 1GHz	346.7750	-30.2500	-20	PASS
	520.1625	-31.5500	-20	PASS
	693.5500	-43.7700	-20	PASS
	866.9375	-44.0500	-20	PASS
1GHz to 10Fc	1599.2420	-30.9800	-20	PASS
	1040.3250	-32.9300	-20	PASS
	1213.7130	-33.2400	-20	PASS
	1387.1000	-32.8800	-20	PASS
	1560.4870	-33.2600	-20	PASS
	1733.8750	-32.8400	-20	PASS

Phase II: 138.0125 MHz, 12.5 kHz Channel Spacing, Low Power



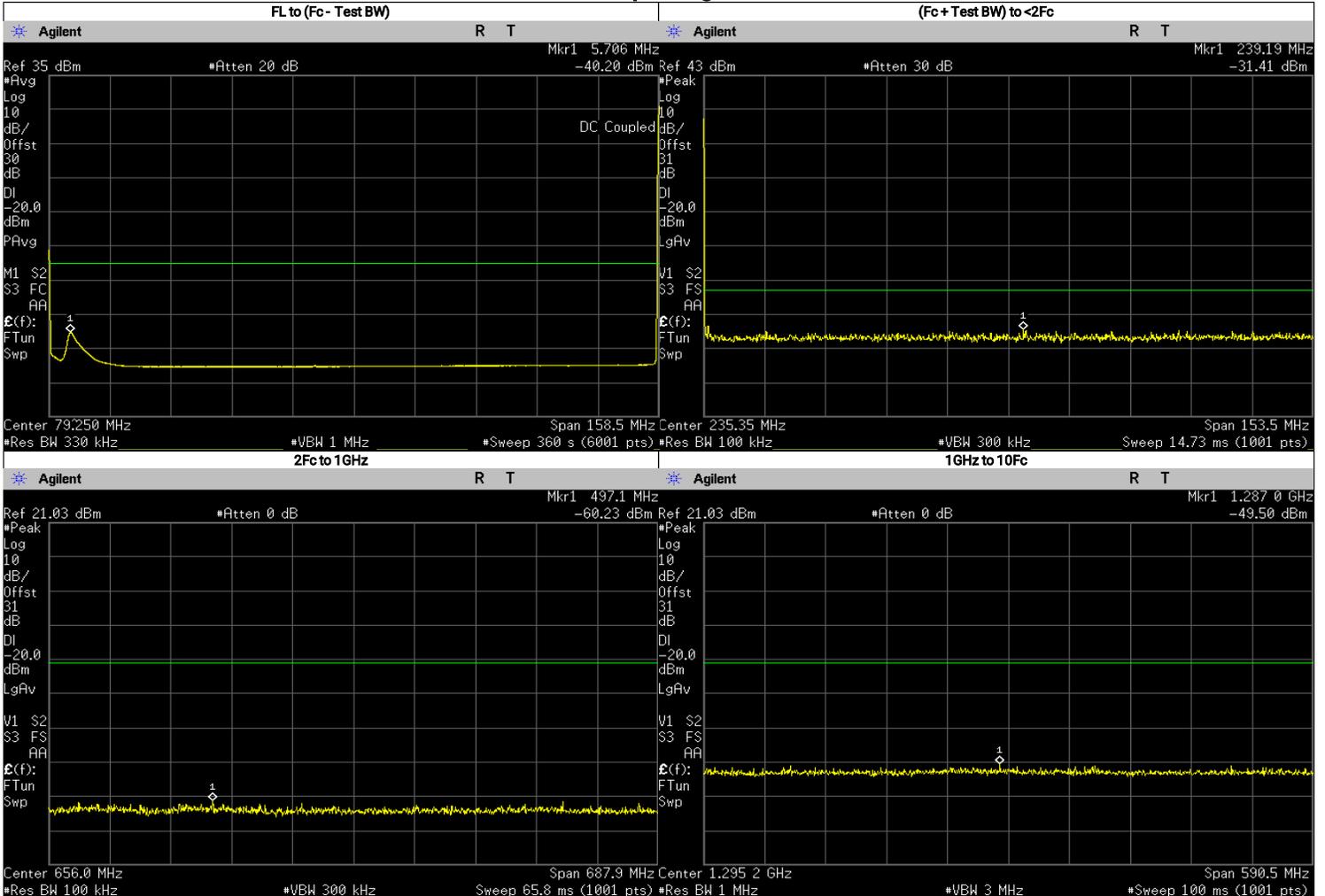
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	5.6560	-40.0900	-20	PASS
(Fc + Test BW) to <2Fc	188.1929	-31.7500	-20	PASS
2Fc to 1GHz	707.6810	-60.2800	-20	PASS
	276.0250	-62.1933	-20	PASS
	414.0375	-63.3000	-20	PASS
	552.0500	-63.2040	-20	PASS
	690.0625	-63.5419	-20	PASS
	828.0750	-63.2004	-20	PASS
	966.0875	-62.8458	-20	PASS
1GHz to 10Fc	1270.7430	-50.0100	-20	PASS
	1104.1000	-51.8962	-20	PASS
	1242.1120	-52.1407	-20	PASS
	1380.1250	-52.1192	-20	PASS

Phase II: 138.0125 MHz, 12.5 kHz Channel Spacing, Max Power



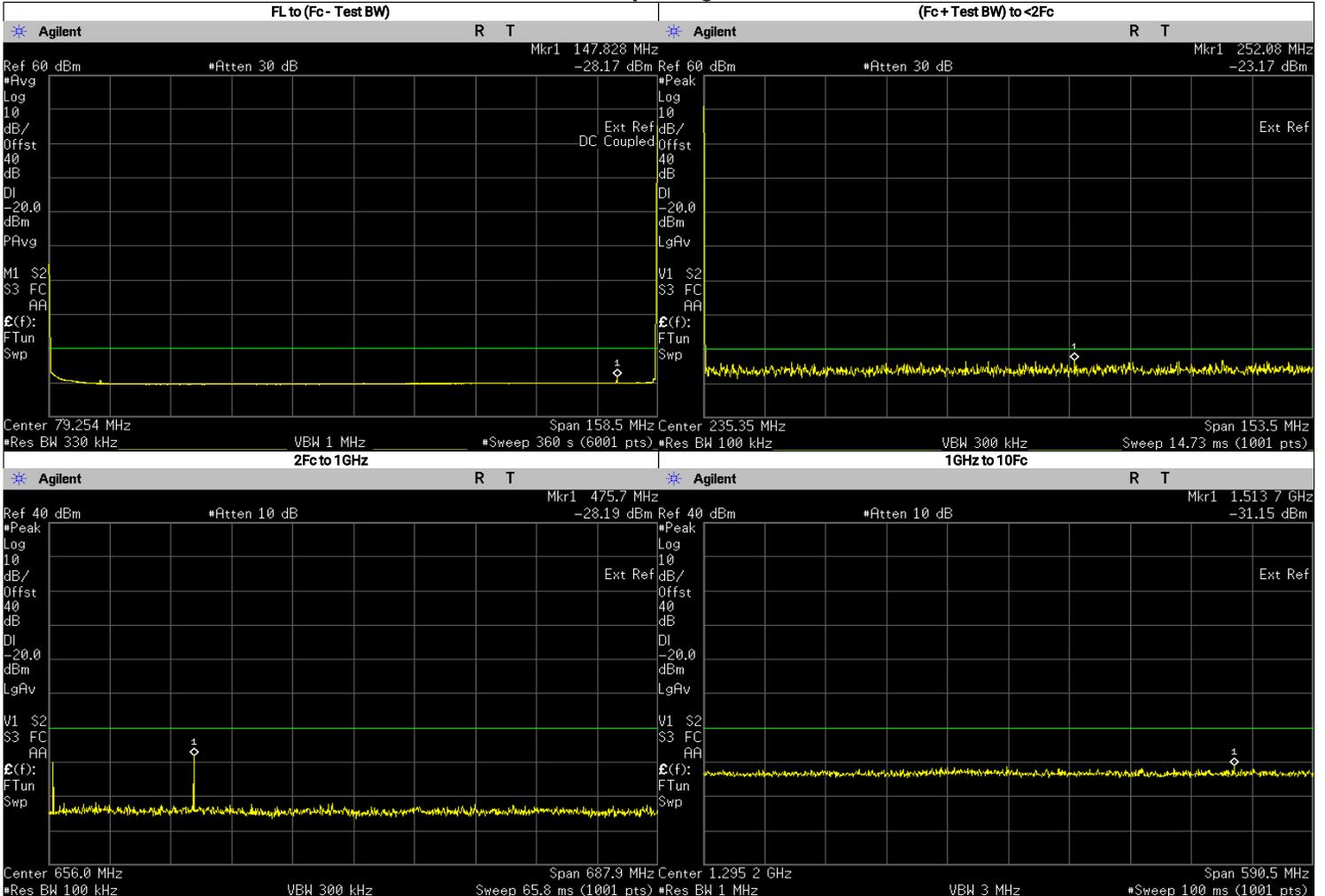
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	127.3080	-28.1600	-20	PASS
(Fc + Test BW) to <2Fc	255.6000	-23.1800	-20	PASS
2Fc to 1GHz	414.0375	-24.5500	-20	PASS
	276.0250	-30.8000	-20	PASS
	552.0500	-44.1300	-20	PASS
	690.0625	-43.2200	-20	PASS
	828.0750	-44.0100	-20	PASS
	966.0875	-45.2300	-20	PASS
1GHz to 10Fc	1216.8000	-30.6500	-20	PASS
	1104.1000	-32.2700	-20	PASS
	1242.1120	-31.6800	-20	PASS
	1380.1250	-33.7300	-20	PASS

Phase II: 158.5500 MHz, 12.5 kHz Channel Spacing, Low Power



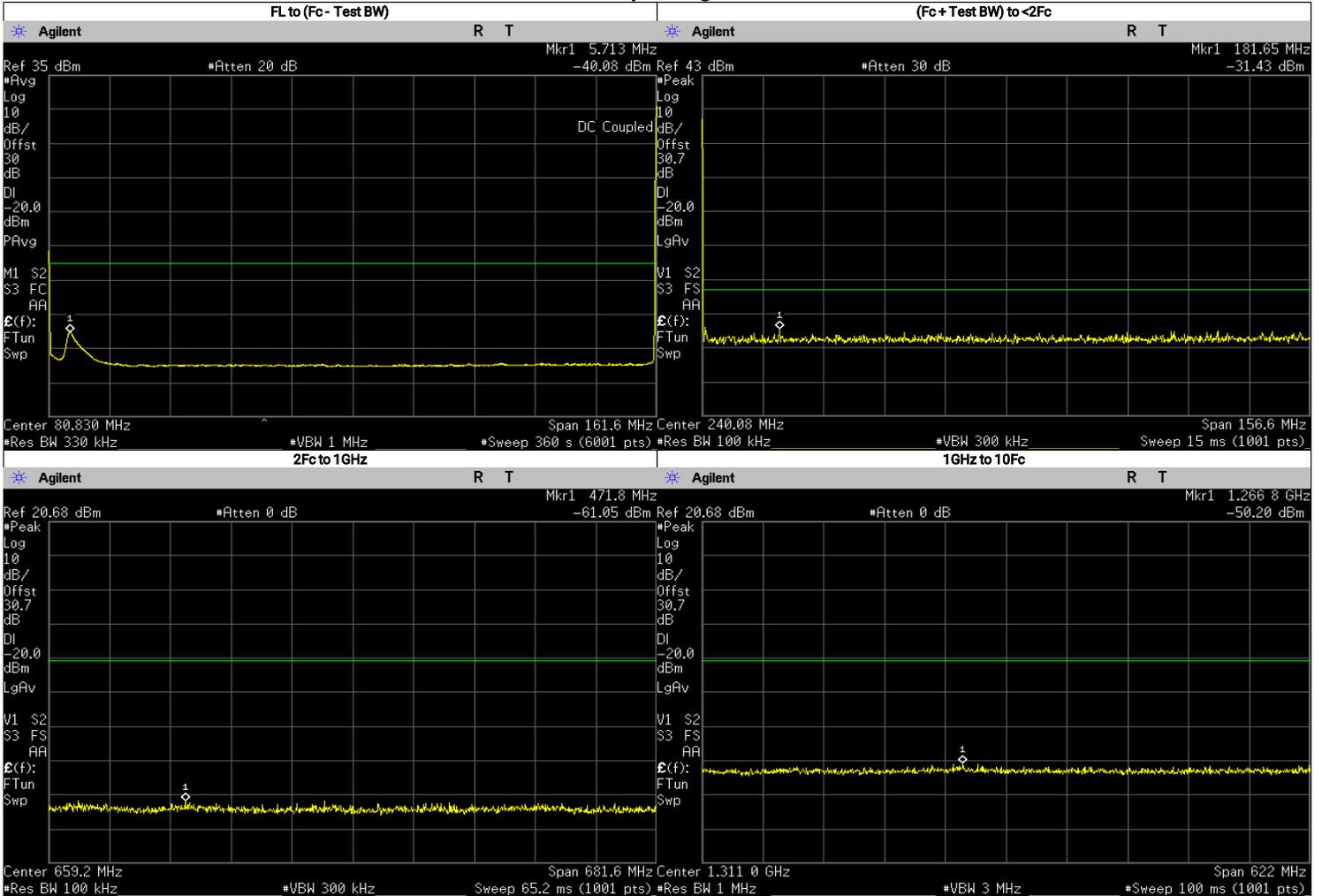
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	5.7060	-40.2000	-20	PASS
(Fc + Test BW) to <2Fc	239.1902	-31.4100	-20	PASS
2Fc to 1GHz	497.1451	-60.2300	-20	PASS
	317.1000	-62.8568	-20	PASS
	475.6500	-62.0814	-20	PASS
	634.2000	-62.5860	-20	PASS
	792.7500	-63.7340	-20	PASS
	951.3000	-63.5383	-20	PASS
1GHz to 10Fc	1286.9830	-49.5000	-20	PASS
	1109.8500	-51.7923	-20	PASS
	1268.4000	-51.5297	-20	PASS
	1426.9500	-51.6733	-20	PASS
	1585.5000	-52.3302	-20	PASS

Phase II: 158.5500 MHz, 12.5 kHz Channel Spacing, Max Power



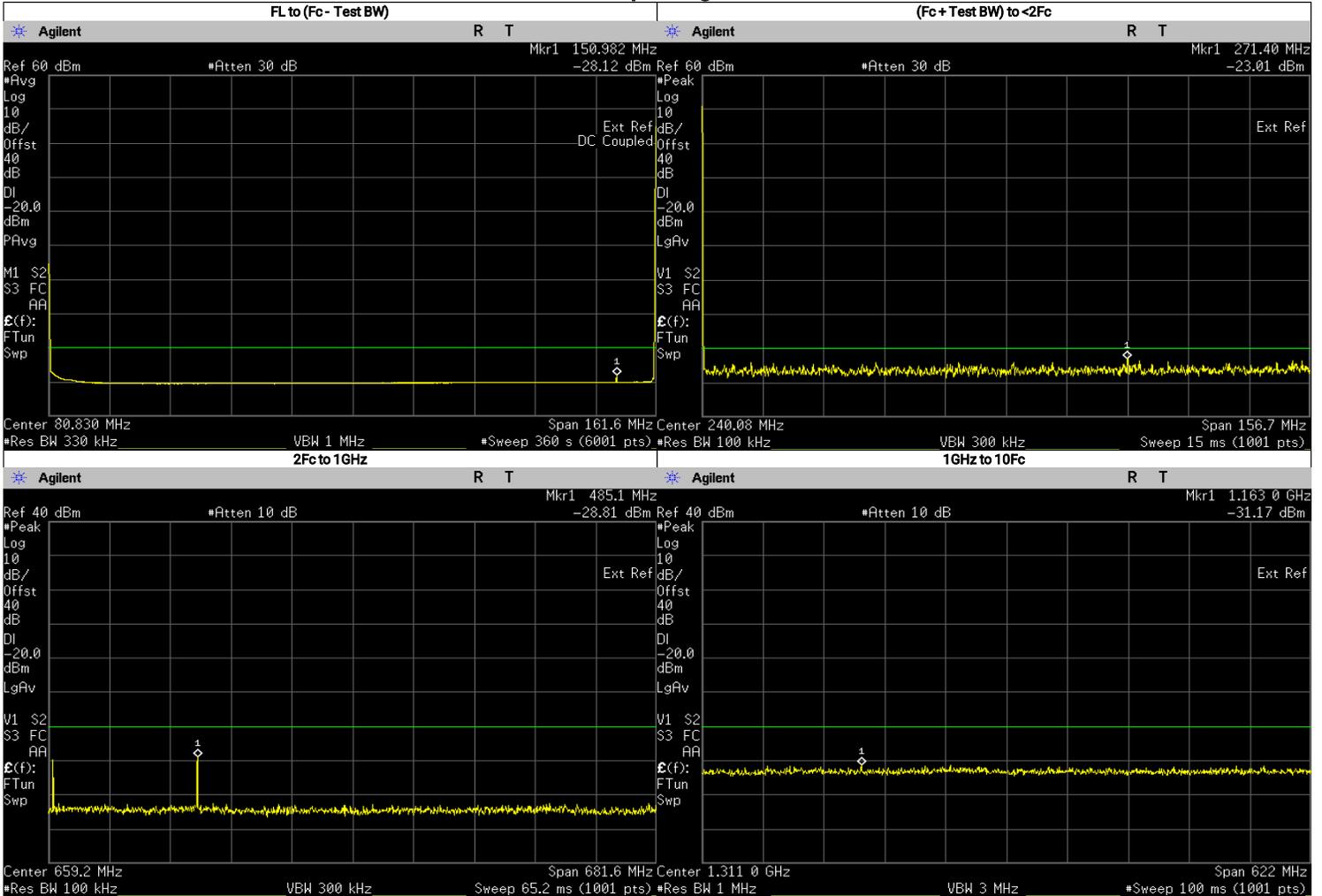
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	147.8280	-28.1700	-20	PASS
(Fc + Test BW) to <2Fc	252.0800	-23.1700	-20	PASS
2Fc to 1GHz	475.6500	-28.1900	-20	PASS
	317.1000	-29.9100	-20	PASS
	634.2000	-44.9400	-20	PASS
	792.7500	-42.1400	-20	PASS
	951.3000	-44.3900	-20	PASS
1GHz to 10Fc	1513.7110	-31.1500	-20	PASS
	1109.8500	-32.8800	-20	PASS
	1268.4000	-33.9000	-20	PASS
	1426.9500	-33.7800	-20	PASS
	1585.5000	-33.0300	-20	PASS

Phase II: 161.7000 MHz, 12.5 kHz Channel Spacing, Low Power



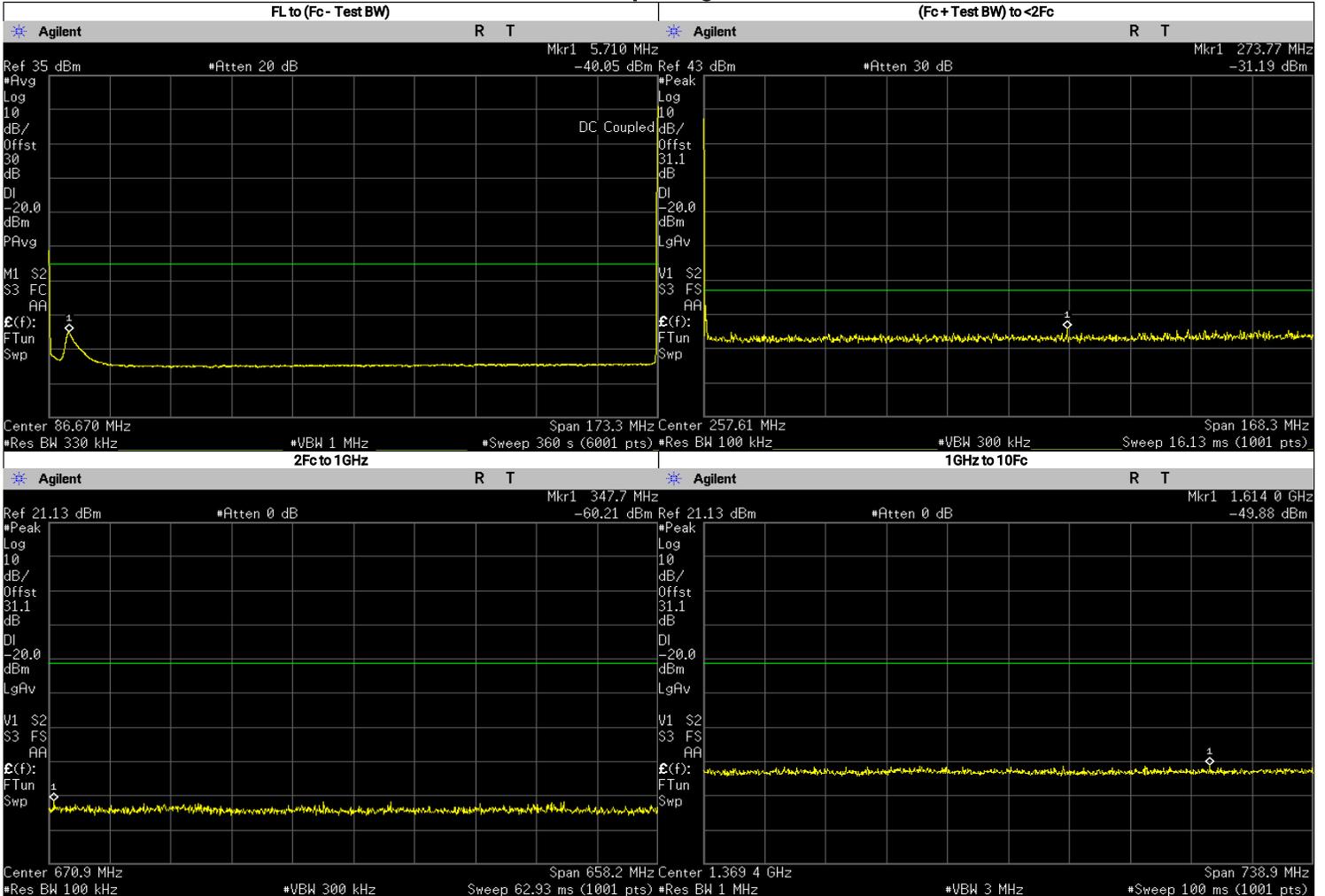
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	5.7130	-40.0800	-20	PASS
(Fc + Test BW) to <2Fc	181.6495	-31.4300	-20	PASS
2Fc to 1GHz	471.7600	-61.0500	-20	PASS
	323.4000	-63.2383	-20	PASS
	485.1000	-63.2612	-20	PASS
	646.8000	-63.8603	-20	PASS
	808.5000	-63.3791	-20	PASS
	970.2000	-63.9337	-20	PASS
1GHz to 10Fc	1266.8380	-50.2000	-20	PASS
	1131.9000	-52.4756	-20	PASS
	1293.6000	-51.9923	-20	PASS
	1455.3000	-52.8393	-20	PASS
	1617.0000	-51.9248	-20	PASS

Phase II: 161.7000 MHz, 12.5 kHz Channel Spacing, Max Power



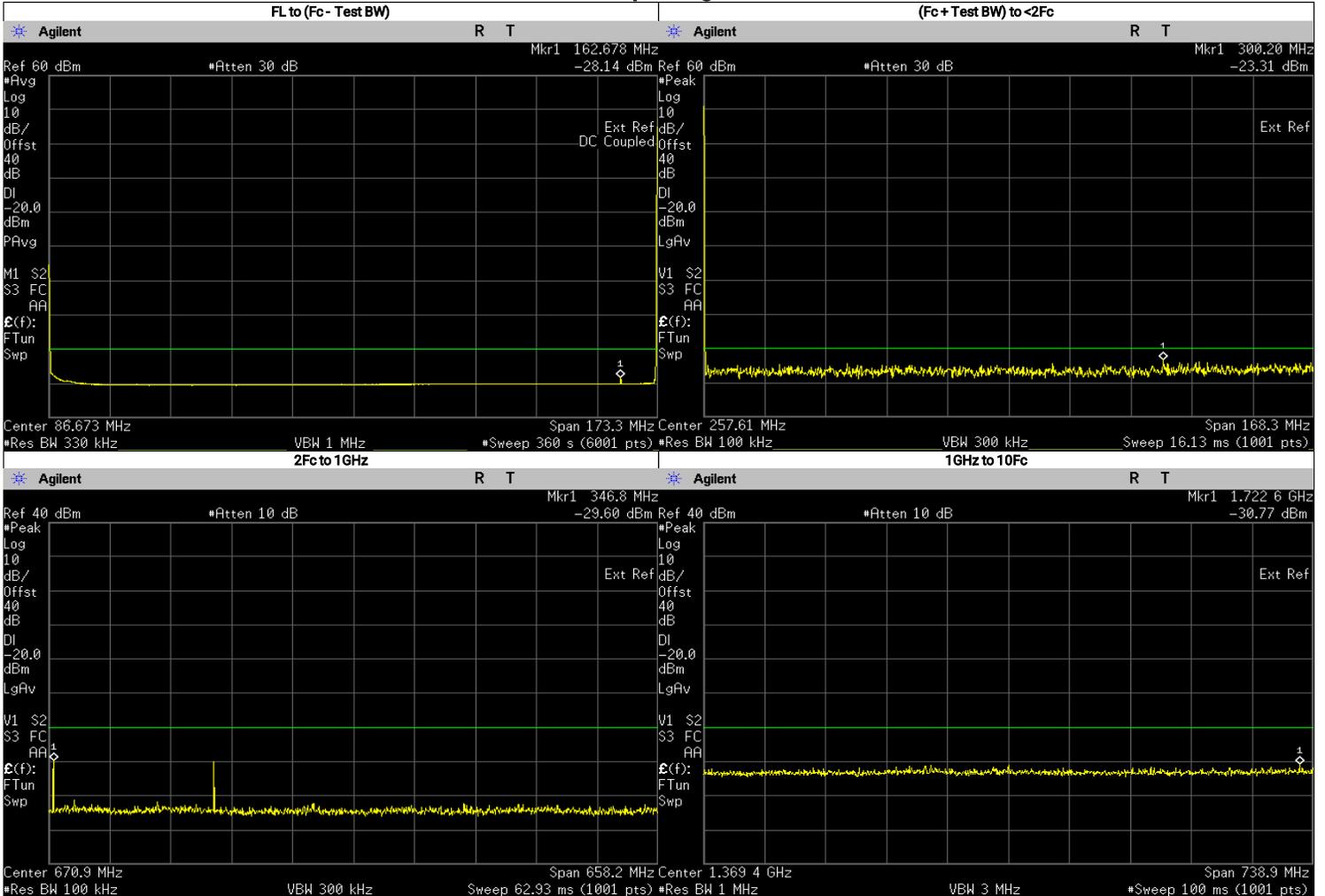
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (MHz)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	150.9820	-28.1200	-20	PASS
(Fc + Test BW) to <2Fc	271.4000	-23.0100	-20	PASS
2Fc to 1GHz	485.1000	-28.8100	-20	PASS
	323.4000	-29.6500	-20	PASS
	646.8000	-43.7900	-20	PASS
	808.5000	-43.5600	-20	PASS
	970.2000	-45.4000	-20	PASS
1GHz to 10Fc	1163.1121	-31.1700	-20	PASS
	1131.9000	-32.6600	-20	PASS
	1293.6000	-33.7600	-20	PASS
	1455.3000	-32.8000	-20	PASS
	1617.0000	-32.8400	-20	PASS

Phase II: 173.3875 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)	5.7100	-40.0500	-20	PASS
(Fc + Test BW) to <2Fc	273.7689	-31.1900	-20	PASS
2Fc to 1GHz	347.6990	-60.2100	-20	PASS
	346.7750	-62.9095	-20	PASS
	520.1625	-62.2976	-20	PASS
	693.5500	-63.7929	-20	PASS
	866.9375	-62.4210	-20	PASS
1GHz to 10Fc	1614.0050	-49.8800	-20	PASS
	1040.3250	-52.3285	-20	PASS
	1213.7130	-52.3639	-20	PASS
	1387.1000	-51.7721	-20	PASS
	1560.4870	-52.0324	-20	PASS
	1733.8750	-51.6439	-20	PASS

Phase II: 173.3875 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)	162.6780	-28.1400	-20	PASS
(Fc + Test BW) to <2Fc	300.2000	-23.3100	-20	PASS
2Fc to 1GHz	346.7750	-29.6000	-20	PASS
	520.1625	-29.8900	-20	PASS
	693.5500	-44.0000	-20	PASS
	866.9375	-43.9500	-20	PASS
1GHz to 10Fc	1722.6000	-30.7700	-20	PASS
	1040.3250	-33.3700	-20	PASS
	1213.7130	-33.0400	-20	PASS
	1387.1000	-33.2400	-20	PASS
	1560.4870	-33.5400	-20	PASS
	1733.8750	-31.8800	-20	PASS

6.9.4. Test Limit

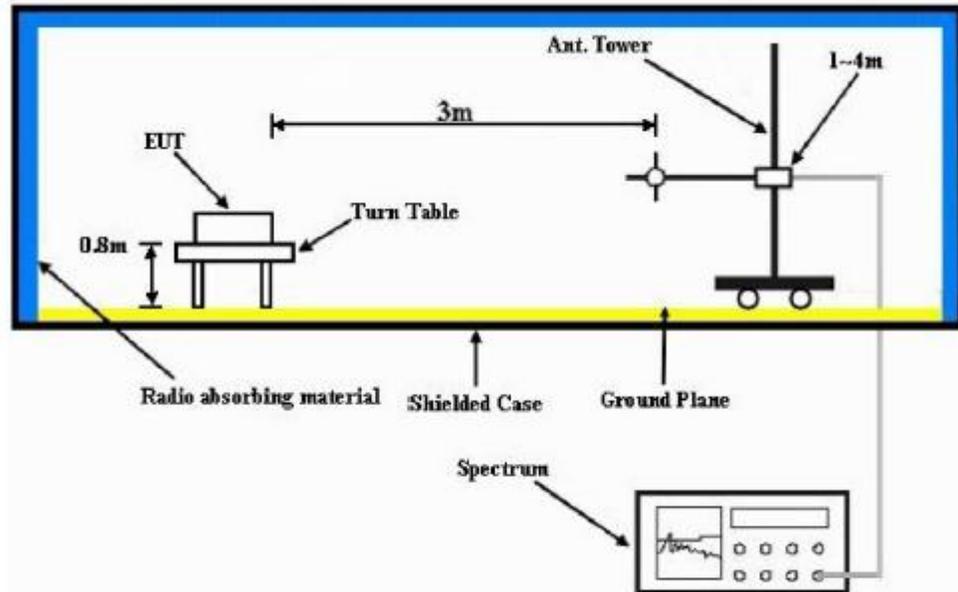
Table below summarized the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least

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)

Test: SAC Transmitter Radiated Emission

Model Number: M37TXS9PW1AN

S/N: 681IAL4227

SR: 34807-EMC-00011

Battery: NA

Accessory: AN000163A01, HMN4079G-R1, HKN6170B-C1,

HKN6188B-3, HKN6163C-CF1, HKN4192C, PMHN4194C-CF16, PMUN1057B-CF4, TIB AS000016A02

Test Mode: TX APCO Digital C4FM

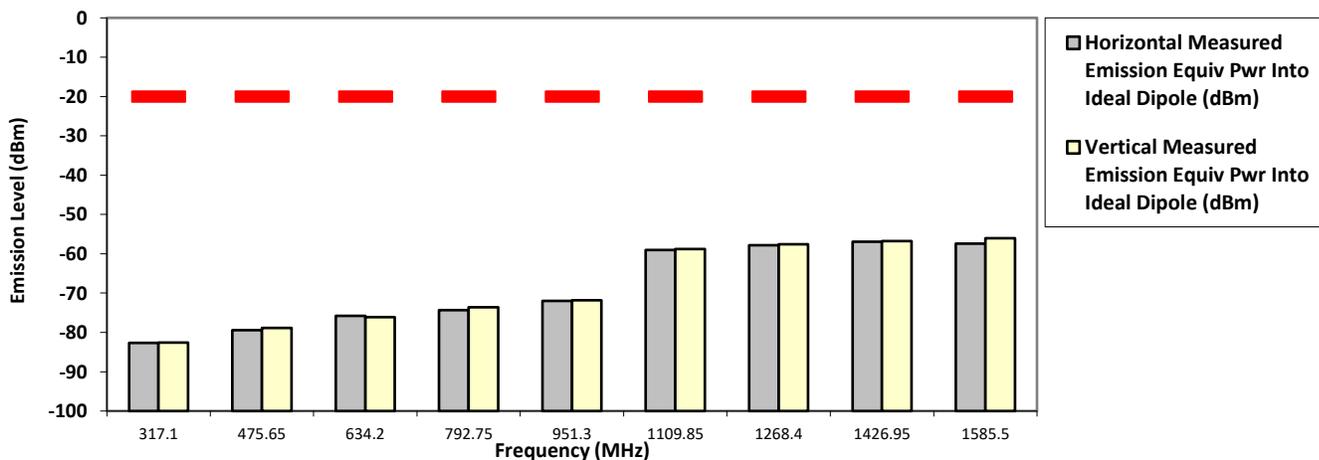
Test Frequency: 158.550000 MHz

Channel Spacing: 12.5kHz

Power: 120.000 Watt(s)/Max Power

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
317.1000	-20.0000	-82.7016 **	-82.5839 **
475.6500	-20.0000	-79.4037 **	-78.8789 **
634.2000	-20.0000	-75.7565 **	-76.1178 **
792.7500	-20.0000	-74.3552 **	-73.5733 **
951.3000	-20.0000	-71.9782 **	-71.8297 **
1109.8500	-20.0000	-59.0607 **	-58.7864 **
1268.4000	-20.0000	-57.8536 **	-57.5874 **
1426.9500	-20.0000	-56.9023 **	-56.7745 **
1585.5000	-20.0000	-57.3956 **	-56.0083 **

RADIATED SPURIOUS EMISSIONS



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.

Motorola Penang EMC Lab - Test Performed by: Aiman

Tue, 7 Jan, 2025

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported

Temp(Deg): 22.6 Hum(%RH): 63.2

System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

6.10.4. Test Limit

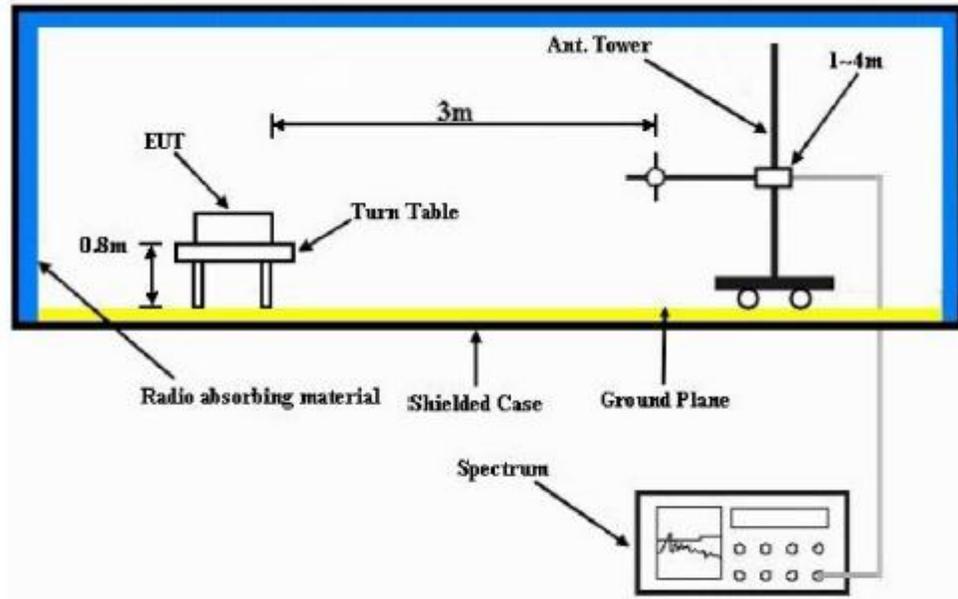
Table below summarized the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least

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



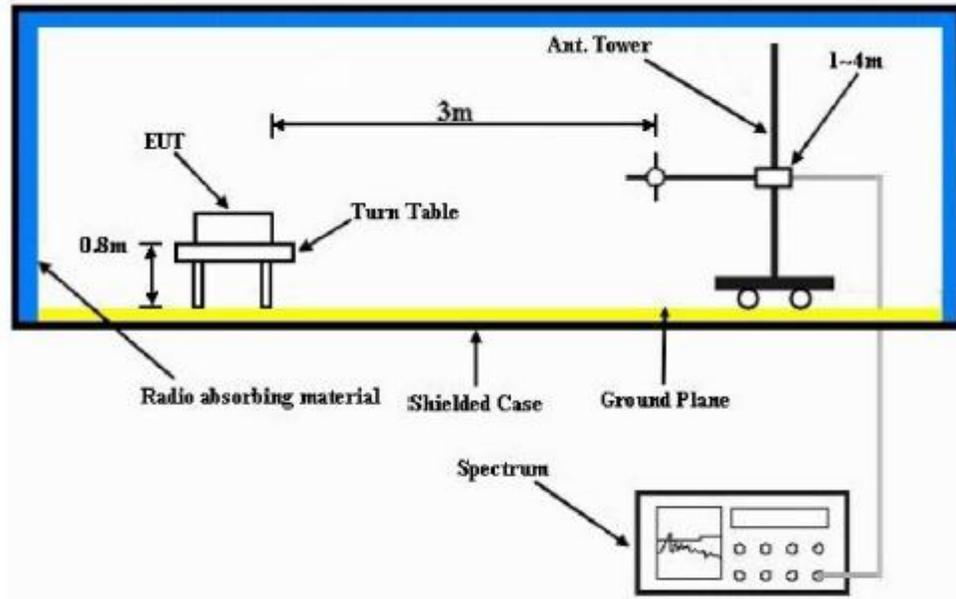
- 1) The Resolution Bandwidth for Equivalent Radiated Power (ERP) below 1 GHz is 100 kHz with Video Bandwidth = 300 kHz and Resolution Bandwidth for EIRP above 1 GHz is 1 MHz with Video Bandwidth = 3 MHz. Detector Mode is RMS.
- 2) In the semi-anechoic chamber, setup as illustrated above the DUT placed 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 Not Applicable

6.11.3. 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).

6.12. 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 ~