MOTOROLA SOLUTIONS

CERTIFICATE 2518.08

SAMM 825

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

FCC/ISED TEST REPORT

Report Revision : **Rev.A**

Date/s Tested	:	7-SEPT-2023 - 28-SEPT-2023
Report Issue Date	:	5-FEB-2024
Manufacturer	:	Motorola Solutions Malaysia SDN BHD
Manufacturer Address	:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
Requestor	:	LEE SZU SEE
Product Type	:	Hand-held
Product Version (PMN)	:	MTP3550
Model Number (HVIN)	:	AZH63UCH6TZ8BN
Frequency Band	:	806-825MHz , 851-870MHz
Max RF Output Power	:	2.51 Watts (MSPD) / 3 Watt (SSPD)
Applicant Name	:	Motorola Solutions Inc
Applicant Address	:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
ISED Registrations	:	MY0001
FCC Registrations	:	461337
Firmware Version (FVIN)	:	D35.000.9941

The equipment was tested accordance to the requirement listed below:

(LMR)	
FCC 47 CFR Part 90	**PASS**
ISED RSS- 119 Issue 12	

Prepared By:

MUHAMMAD HAZIM
Test Personnel

Approved Signatory:

MAHESHVARAN A/L RAJAGOPAL
Responsible Engineer

Table of Contents

Report Revision History

Revision History	Description	Date	Originator
Rev. A	Initial Report	5-Feb-24	Hazim

1.0 General Information

EUT Description:

Technologies	Land Mobile Radio (LMR)
Modulation Type	**π** / 4DQPSK

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
BATT LION IMPRES 2 IP68 3400T	MOTOROLA	PMNN4522A

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
Part 90	RSS-119	RF Power Output	Pass		121TZT0070
Part 90	RSS-119	Frequency Stability	Pass	*See Note	121TZT0070
-	RSS-119	Occupied Bandwidth	Pass	22K0D1E/D/W- 20.4571 kHz	121TZT0070
Part 90	RSS-119	Transient Frequency Behavior	NA		
Part 90	-	Adjacent Channel Power	Pass		121TZT0070
Part 90	RSS-119	Conducted Spurious Emissions	Pass	Worst case : -44.42dBm	121TZT0070
Part 90	RSS-119	Radiated Spurious Emission	Pass	Worst case Emission : -49.59 dBm (Margin : 36.59 dB)	121TZT0030
-	-	Effective Radiated Power (ERP)	NA		

NA → **Not Applicable**

***Note:** A reference voltage controlled temperature compensated crystal oscillator (VCTCXO) operating at 19.2MHz acts as the master reference for both synthesizers and the radio control system. Inherent frequency stability of the VCTCXO is better than 1 part per million (ppm). During trunked network operation this reference is frequency locked to the received base station frequency.

In addition to this, the ETSI conformance standard EN 300 394-1 states that the product, when in trunked mode and therefore locked onto the base station carrier signal, shall be within +/-100Hz of this signal under normal test conditions.

The manufacturer confirms that during their conformance testing of this product type against the conformance standard the frequency error was within +/-100Hz of the base station carrier frequency, therefore well within specification limits.

3.0 Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.48 dB
Radiated Emissions up to 1 GHz 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
Occupied Bandwidth	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 & TetraCom)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
CHAMBER	SH-641	92009188	09-Mar-23	09-Mar-24
POWER METER	E4416A	MY50000115	10-Feb-23	10-Feb-24
AUDIO ANALYZER	U8903B	MY62380007	04-Nov-22	04-Nov-23
POWER SENSOR	E4412A	MY49000115	08-Oct-22	08-Oct-23
POWER SUPPLY	6032A	3232A08410	20-Jun-23	20-Jun-24
CXA SIGNAL ANALYZER	N9000B	MY60251574	20-May-23	20-May-24
POWER SUPPLY	6023A	3236A05513	13-Jun-23	13-Jun-24
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 & TetraCom)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A36210	CNR	CNR
ATTENUATOR / SWITCH DRIVER	11713A	3748A09090	CNR	CNR
POWER SENSOR	E9301B	MY50180003	20-Jun-23	20-Jun-24
SIGNAL GENERATOR	8657A	3250A05137	22-Jun-23	22-Jun-24
AUDIO ANALYZER	8903B	2836A05866	10-Nov-22	10-Nov-23
POWER METER	E4416A	MY45101016	01-Mar-23	01-Mar-24
STEP ATTENUATOR	8494G	MY52301411	16-Dec-22	16-Dec-23
POWER SUPPLY	6033A	3506A08076	10-Jan-23	10-Jan-24
ANALYZER SPECTRUM	E4445A	MY46181262	09-Jan-23	09-Jan-24
ATTENUATOR/110DB	8496G	MY52300757	20-Jun-23	20-Jun-24
AUDIO ANALYZER	8903B	3011A12671	16-Mar-23	16-Mar-24
ANALYZER MODULATION	8901B	2920A02173	21-Nov-23	21-Nov-24
OSCILLOSCOPE	MSO8064A	MY45003003	01-Nov-22	01-Nov-23
POWER SUPPLY	6023A	3236A05513	13-Jun-23	13-Jun-24
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

Description	Model	Serial Number	Calibration Date	Calibration Due Date
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 1.23.04 & TetraCom)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A32735	CNR	CNR
POWER SUPPLY	6032A	US38323921	08-Dec-22	08-Dec-23
SPECTRUM ANALYZER	E4445A	MY46181250	20-May-23	20-May-24
INTERFACE BOX - FILTER	CNR	CS001	CNR	CNR
POWER SUPPLY	6023A	3236A05513	13-Jun-23	13-Jun-24
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

EMC Chamber 1

DESCRIPTION	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
DRG HORN FREQ.	SAS-571	1143	08-Mar-23	08-Mar-25
DRG HORN FREQ.	SAS-571	720	18-Apr-23	18-Apr-25
DC Power Supply	6033A	3211A06649	12-Jun-22	12-Jun-24
SIGNAL GENERATOR	SMB 100A	182511	4-Jun-21	4-Jun-24
EMI TEST RECEIVER	ESW44	101731	11-Aug-23	11-Aug-24
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
BILOG ANTENNA	CBL6112D	30991	5-Jan-23	5-Jan-24
BILOG ANTENNA	CBL6112D	55546	23-Jun-22	23-Sep-23
DATA LOGGER THERMOHYGROMETER	SDL500	A.016800	21-Jun-23	21-Jun-24
SYSTEM CONTROLLER	SC104V	050806-1	No Cal. Req'd	No Cal. Req'd
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	No Cal. Req'd	No Cal. Req'd
ANTENNA POSITIONING TOWER	TLT2	NA	No Cal. Req'd	No Cal. Req'd
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	22-Feb-23	22-Feb-24
PREAMPLIFIER 18-40GHz	Miteq Hi Gain Sucoflex	002	No Cal. Req'd	No Cal. Req'd
PREAMPLIFIER	PAM-0118P	269	28-Mar-23	28-Mar-24
LOOP ANTENNA	6502	00208416	12-Oct-22	12-Oct-23
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	**Max** Mode1&2	**π / 4DQPSK**	**806.0125, 809.0125, 814.9875, 823.9875, 851.0125, 854.0125 860.0125, 868.8875**	**Hazim**	**23.4°C, 50%RH**
Frequency Stability	**Max** Mode2	**π / 4DQPSK**	**814.9875, 860.0125**	**Hazim**	**25.1°C, 54.3%RH, 60.3°C, 50%RH, -30.1°C, 51.2%RH**
Occupied Bandwidth (12.5kHz / 20kHz / 25kHz)	**Max** Mode2	**π / 4DQPSK**	**809.0125, 814.9875, 823.9875, 854.0125 860.0125, 868.8875**	**Hazim**	**23.4°C, 50%RH**
Transient Frequency Behavior *(UHF & VHF Band)* (12.5kHz / 25kHz)	**Max** Mode2	**π / 4DQPSK**	**NA**		
Adjacent Channel Power *(700MHz Band)* (12.5kHz / 25kHz)	**Max** Mode1&2	**π / 4DQPSK**	**806.0125, 814.9875, 823.9875, 851.0125, 860.0125, 868.8875**	**Hazim**	**23.4°C, 50%RH**
Conducted Spurious Emissions- (12.5kHz / 25kHz)	**Max** Mode1&2	**π / 4DQPSK**	**806.0125, 809.0125, 814.9875, 823.9875, 851.0125, 854.0125 860.0125, 868.8875**	**Hazim**	**23.4°C, 50%RH**
Radiated Spurious Emission (12.5kHz / 25kHz)	**Max** Mode1	**π / 4DQPSK**	**806.0125, 809.0125, 814.9875, 823.9875, 851.0125, 854.0125 860.0125, 868.8875**	**Haikal & Nazrin**	**23.5°C, 69.9%RH**
Effective Radiated Power (ERP) (12.5kHz / 25kHz)	**Max**	**NA**	**NA**		

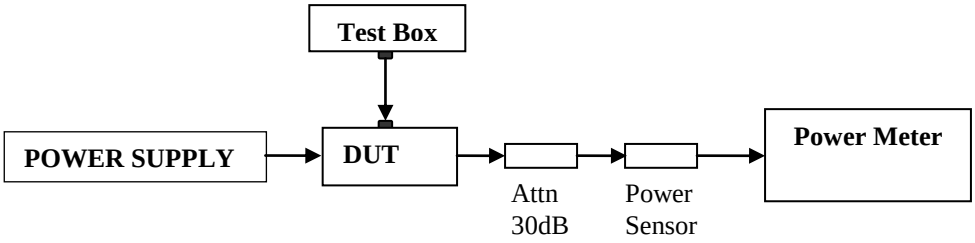
NA → Not Applicable
Mode1: TXNDC test mode is transmit at max power (3W), duty cycle 100% which is the worst case mode.
Mode2: MSPD test mode is transmit at max power 2.51W, duty cycle 62.5%.
Mode3: SSPD test mode is transmit at max power 3W, duty cycle 22%.

***SSPD test mode is not cover in the testing as the testing is conducted in the worst case condition.**

6.0 Transmitter Test Parameters

6.1. RF Output Power

6.1.1. Test Setup



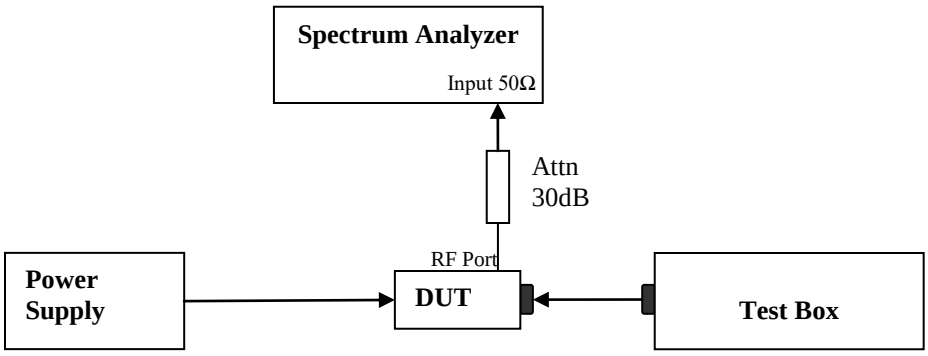
1) The DUT transmitter connected to Power Meter using the 30 dB attenuator and power sensor with above setup.
2) Path loss for the measurement included.
3) All the measurement was done at low, mid, high frequency for each band.
4) Record the power into the test report.

6.1.2. Test Result

Temperature	25˚C		
Voltage (V)	7.5V		
Frequency (MHz)	Max Power (W)	Current (A)	Remark
806.01250	2.45	3.45	MSPD
809.01250	2.47	3.37	
814.98750	2.50	4.00	
823.98750	2.43	3.51	
851.01250	2.47	3.59	
854.01250	2.50	3.50	
860.01250	2.42	4.07	
868.88750	2.46	3.61	
806.01250	2.96	3.80	TXNDC
809.01250	2.95	3.75	
814.98750	2.96	4.00	
823.98750	2.91	3.51	
851.01250	2.98	3.72	
854.01250	2.99	3.85	
860.01250	2.99	4.01	
868.88750	2.97	3.85	

6.2. Frequency Stability

6.2.1. Test Setup



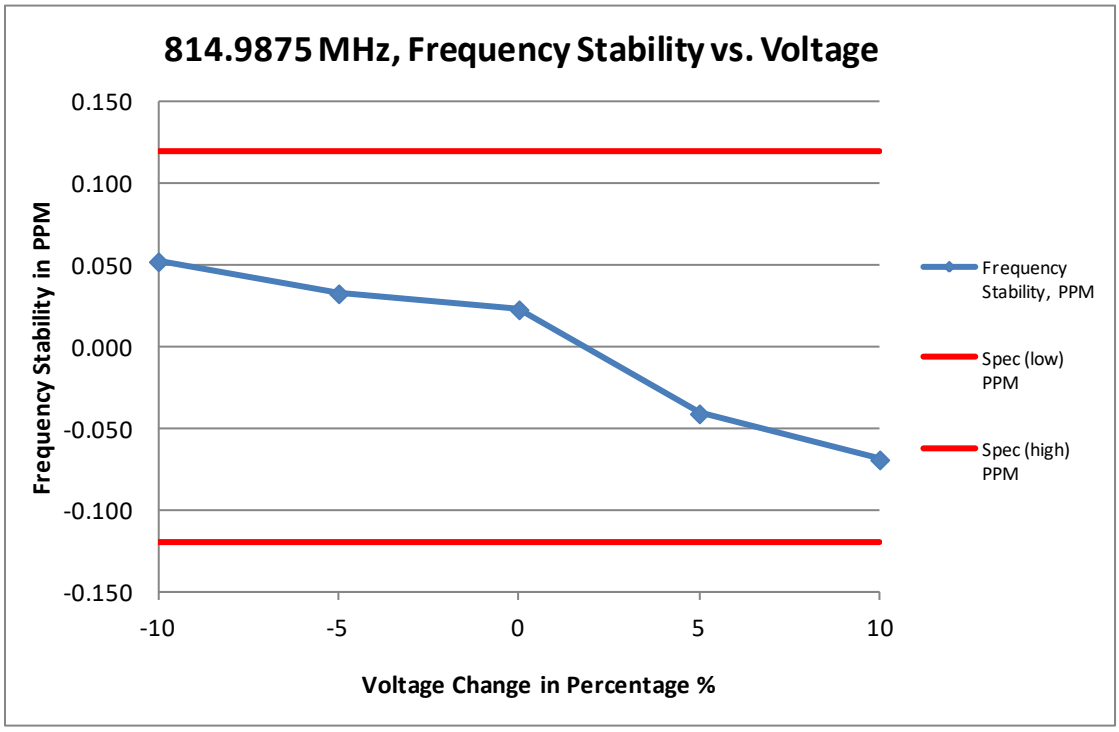
1) The DUT transmitter output port was connected to Modulation / Spectrum Analyzer.
2) Path loss for the measurement included.
3) Transmit the DUT and record the freq in MCF_{MHz}.
4) Test in 2 conditions:
   - Temperature: The frequency of the transmitter was measured from -30°C to 50°C.
   - Supply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

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

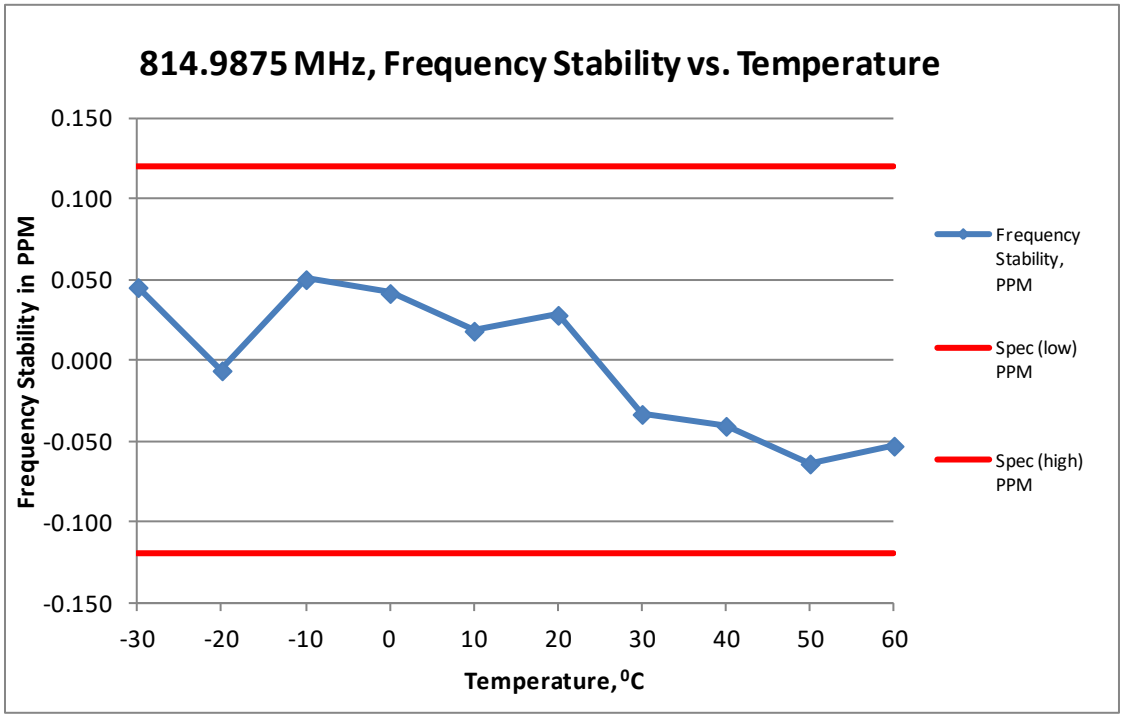
Where: MCF_{MHz} is the Measured Carrier Frequency in MHz
ACF_{MHz} is the Assigned Carrier Frequency in MHz

6.2.1. Test Result



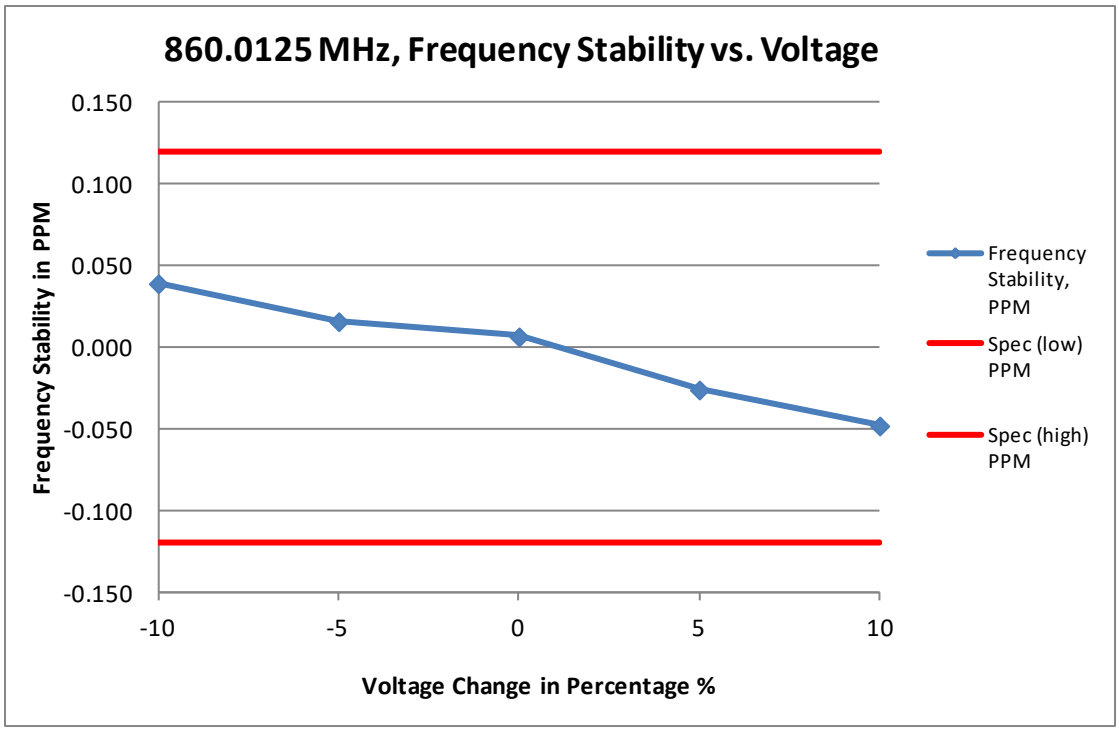
(i) Frequency Stability VS Voltage

Frequency / Channel Spacing	814.9875 MHz / 25.0 kHz				
Temperature, ^{0}C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-10	3.420	814.987543	0.053	-0.120	0.120
-5	3.610	814.987527	0.033	-0.120	0.120
0	3.800	814.987519	0.023	-0.120	0.120
5	3.990	814.987467	-0.040	-0.120	0.120
10	4.180	814.987444	-0.069	-0.120	0.120



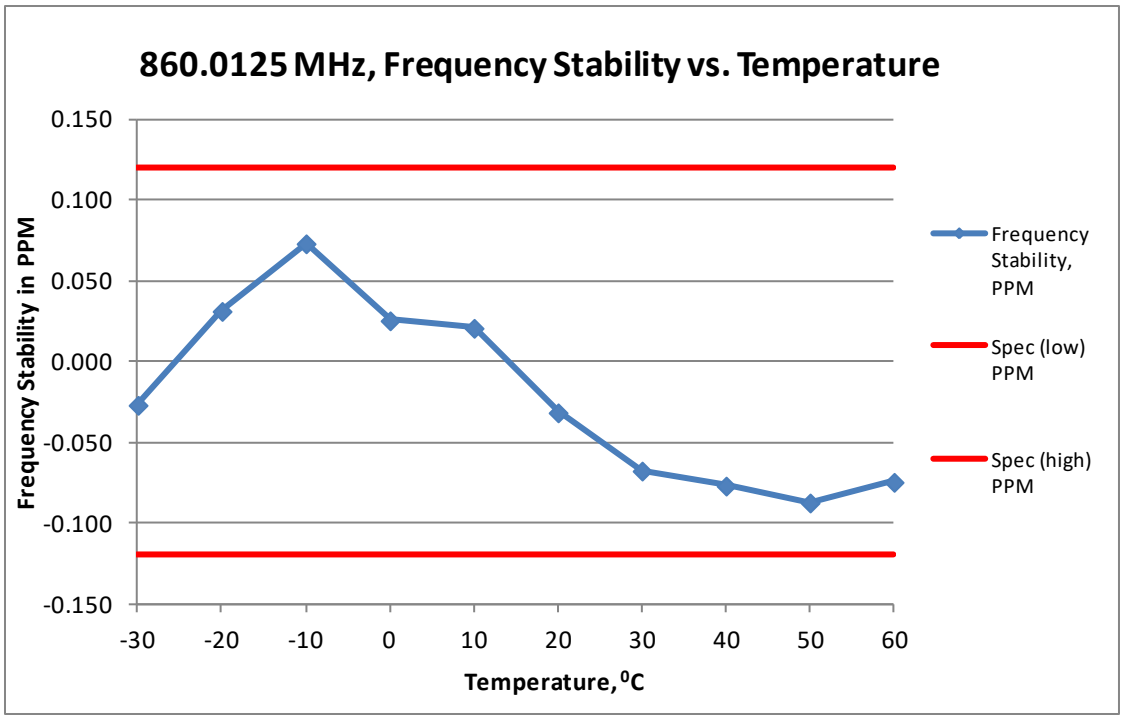
(ii) Frequency Stability VS temperature

Frequency / Channel Spacing	814.9875 MHz / 25.0 kHz			
Voltage, V	3.8			
Temperature, ⁰C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	814.987537	0.045	-0.120	0.120
-20	814.987495	-0.006	-0.120	0.120
-10	814.987541	0.050	-0.120	0.120
0	814.987534	0.042	-0.120	0.120
10	814.987515	0.018	-0.120	0.120
20	814.987523	0.028	-0.120	0.120
30	814.987473	-0.033	-0.120	0.120
40	814.987467	-0.040	-0.120	0.120
50	814.987448	-0.064	-0.120	0.120
60	814.987457	-0.053	-0.120	0.120



(i) Frequency Stability VS Voltage

Frequency / Channel Spacing	860.0125 MHz / 25.0 kHz				
Temperature, ^{0}C	25				
Voltage %	Voltage, V	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-10	3.420	860.012534	0.040	-0.120	0.120
-5	3.610	860.012514	0.016	-0.120	0.120
0	3.800	860.012506	0.007	-0.120	0.120
5	3.990	860.012478	-0.026	-0.120	0.120
10	4.180	860.012459	-0.048	-0.120	0.120



(ii) Frequency Stability VS temperature

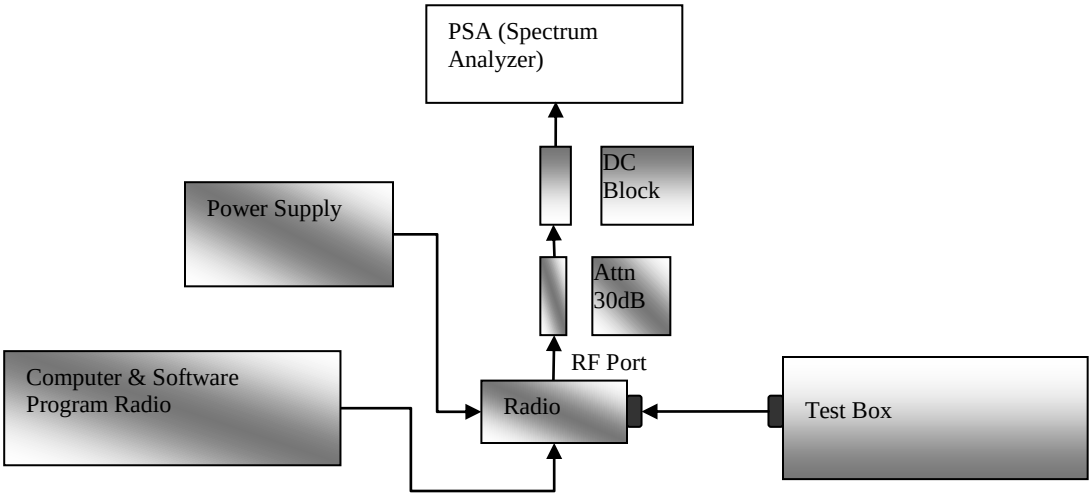
Frequency / Channel Spacing	860.0125 MHz / 25.0 kHz			
Voltage, V	3.8			
Temperature, ⁰C	Frequency, MHz	Frequency Stability, PPM	Spec (low) PPM	Spec (high) PPM
-30	860.012477	-0.027	-0.120	0.120
-20	860.012527	0.031	-0.120	0.120
-10	860.012563	0.073	-0.120	0.120
0	860.012522	0.026	-0.120	0.120
10	860.012518	0.021	-0.120	0.120
20	860.012473	-0.031	-0.120	0.120
30	860.012442	-0.067	-0.120	0.120
40	860.012434	-0.077	-0.120	0.120
50	860.012425	-0.087	-0.120	0.120
60	860.012436	-0.074	-0.120	0.120

6.2.2. Test Limit

As per manufacturer declared spec +/- 0.12ppm

6.3. Occupied Bandwidth

6.3.1. 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.

*Note1 (For C4FM, FSK):

- 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.

*Note2 (For π/ 4DQPSK, QAM):

- For Digital Modulation, 25 kHz Data D1D, D1E & D1W would be the same. Therefore only measurements with D1W modulation shown below.

6.3.2. Test Result (Digital)

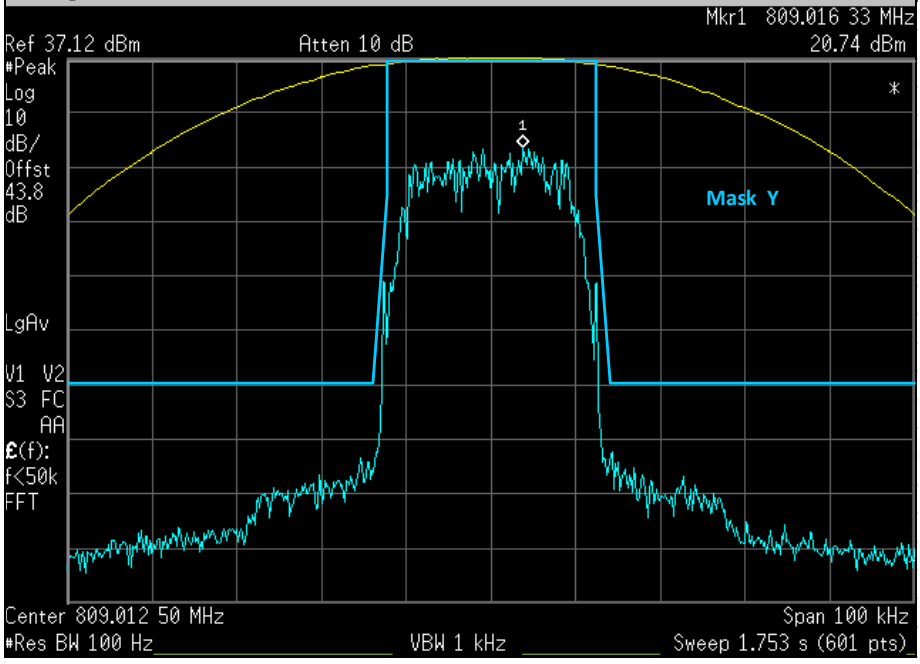
Digital (12.5 kHz Channelization, Digital Voice):
Emission Designator 22K0D1D/E/W

The 99% energy rule (title 47CFR 2.989) was used for digital mode and is more accurate than Carson's rule. It basically states that 99% of the modulation energy falls within X kHz, in this case, 22kHz.
D1D/E/W portion of the designator indicates digital voice/data/voice+data.

Therefore, the entire designator for 25 kHz channelization digital voice is 22K0D1D/E/W.

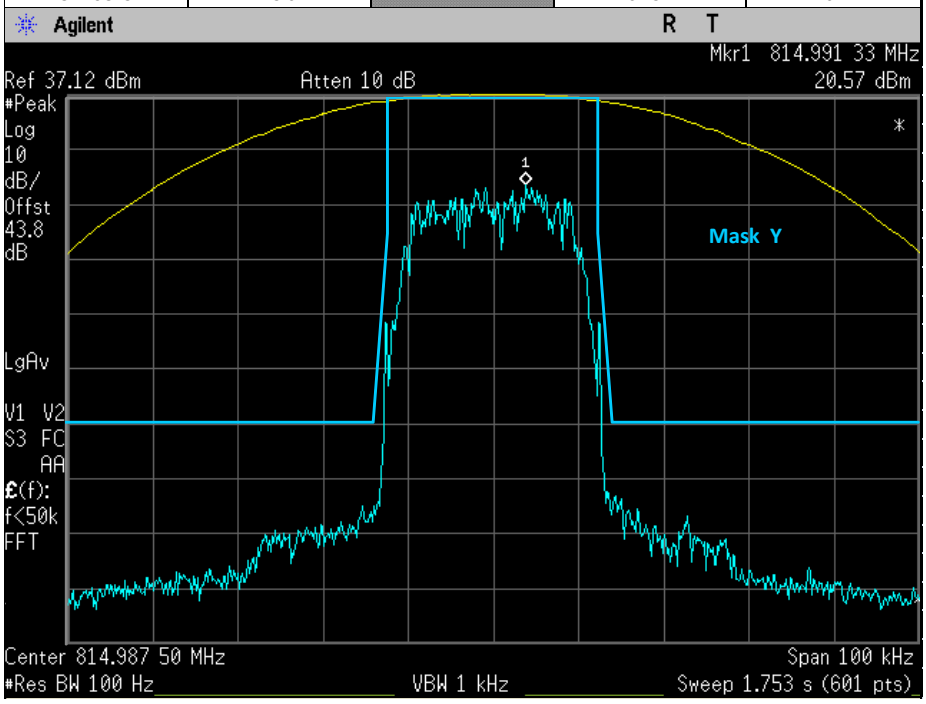
Not for FCC review

Modulation			Rules Part	
Analog Voice			RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
809.0125	25.0		20.3356	22K0D1W



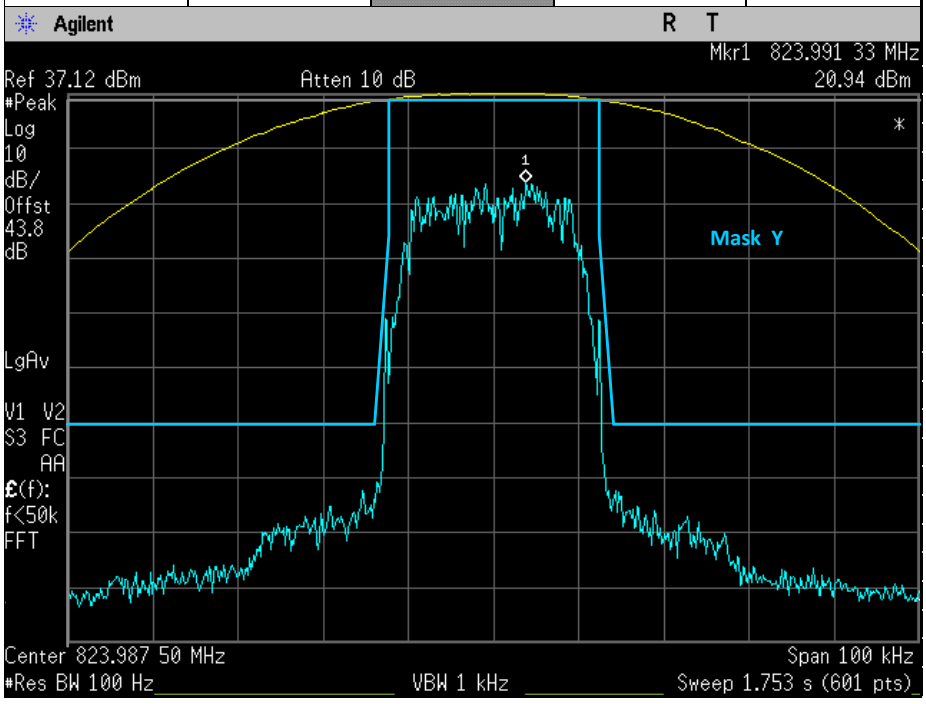
Not for FCC review

Modulation			Rules Part	
Analog Voice			RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
814.9875	25.0		20.4571	22K0D1W



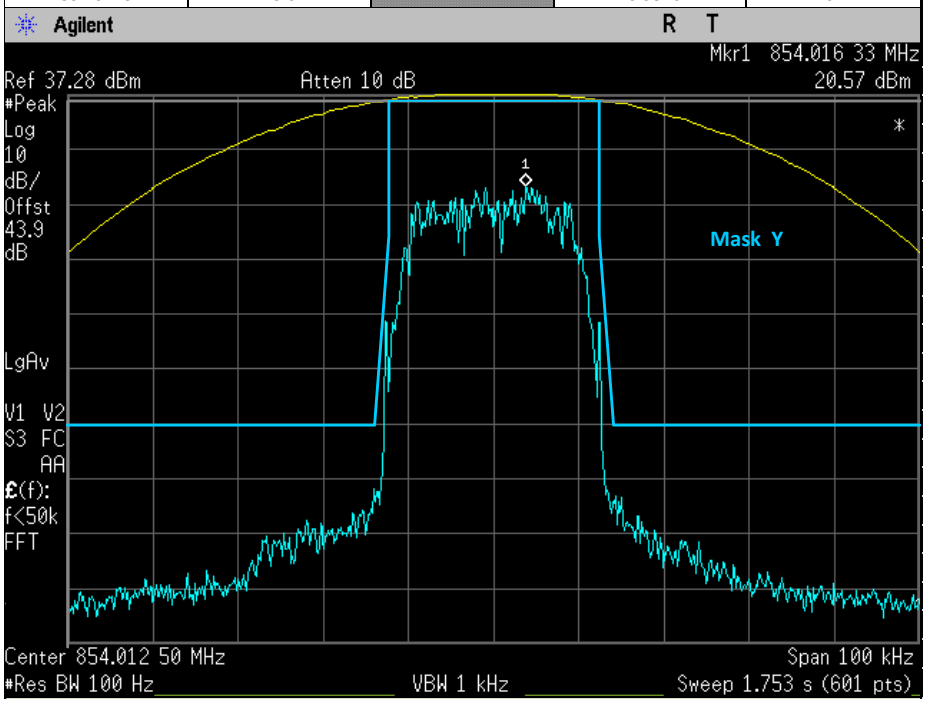
Not for FCC review

Modulation			Rules Part	
Analog Voice			RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
823.9875	25.0		20.3516	22K0D1W



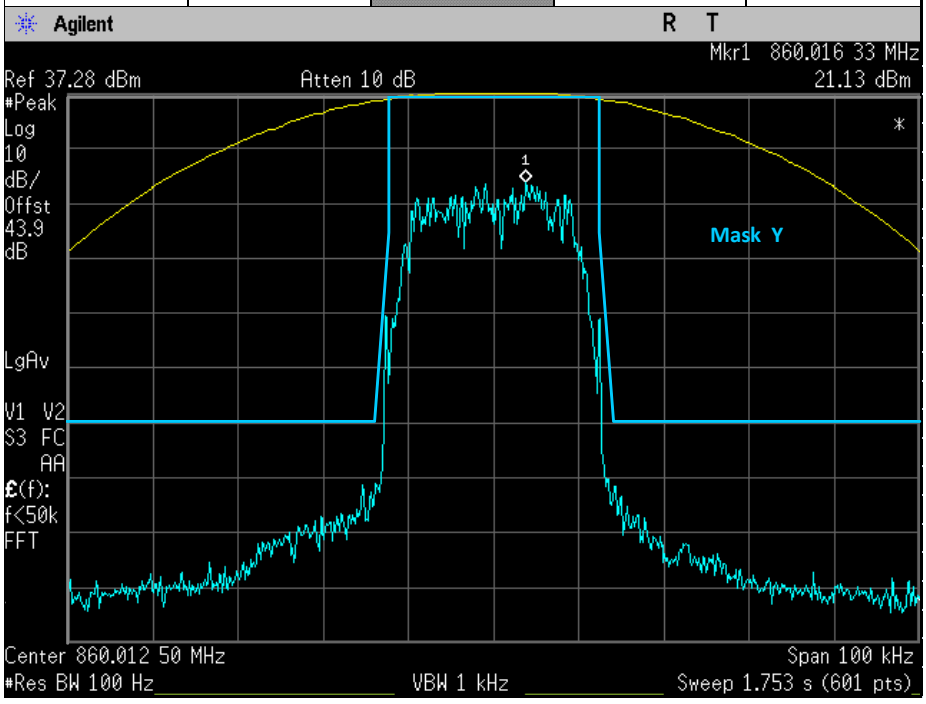
Not for FCC review

Modulation			Rules Part	
Analog Voice			RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
854.0125	25.0		20.3846	22K0D1W



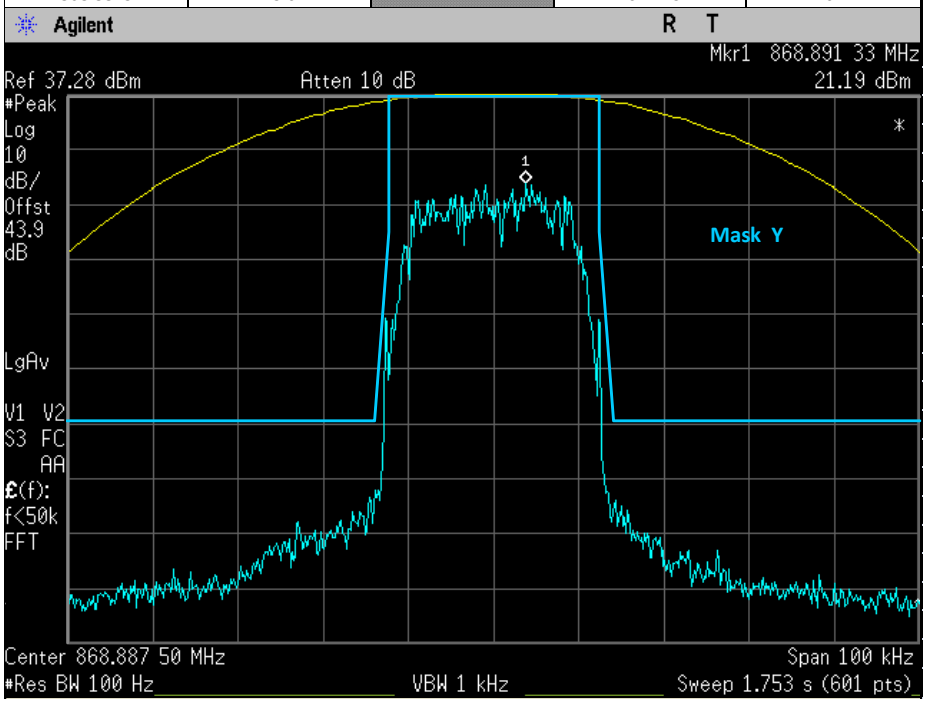
Not for FCC review

Modulation			Rules Part	
Analog Voice			RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
860.0125	25.0		20.0522	22K0D1W



Not for FCC review

Modulation			Rules Part	
Analog Voice			RSS 119	
Channel Frequency (MHz)	**Channel Spacing (kHz)**		**99% OCB (kHz)**	**Emission Designator**
868.8875	25.0		20.1123	22K0D1W

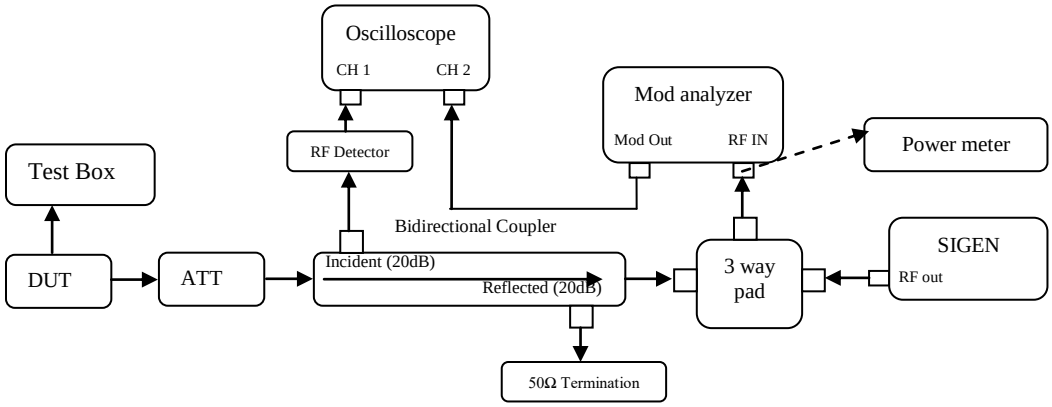


6.3.3. Test Limit

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.

6.4. Transient Frequency Behavior

6.4.1. 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.

6.4.2. Test Result

Not Applicable.

6.4.3. 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.

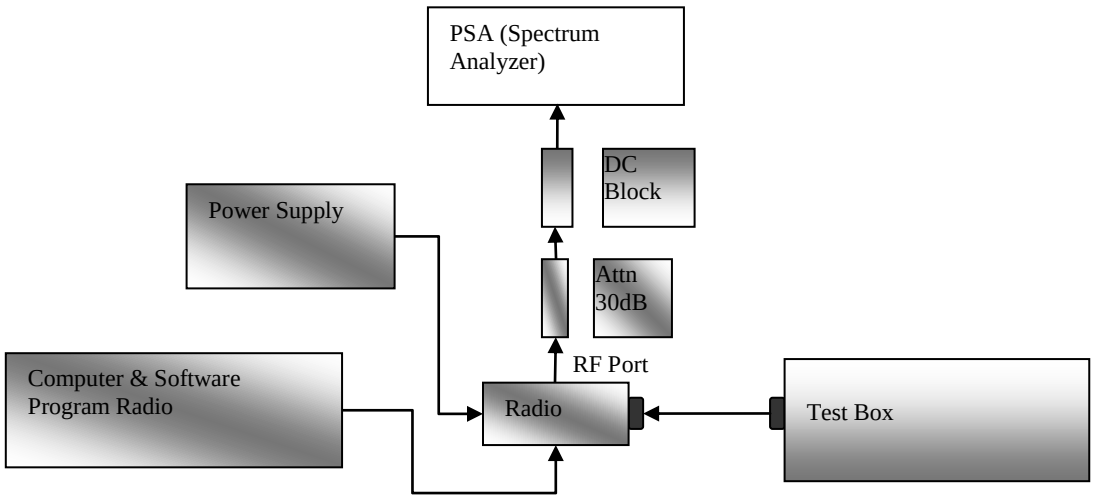
[2] During the time from the end of t_2 to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.

[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.

6.5. Adjacent Channel Power

6.5.1. 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.

6.5.2. Test Result

Not for IC Review

Mode	**π4 / DQPSK (TXNDC)**		
Frequency, MHz	**806.0125**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-66.300	-66.100
50.000	18	-73.300	-73.080
75.000	18	-76.960	-76.640

Not for IC Review

Mode	**π4 / DQPSK (TXNDC)**		
Frequency, MHz	**814.9875**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-66.550	-66.420
50.000	18	-73.180	-73.520
75.000	18	-76.850	-76.870

Not for IC Review

Mode	**π4 / DQPSK(TXNDC)**		
Frequency, MHz	**823.9875**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-61.930	-62.490
50.000	18	-72.450	-72.790
75.000	18	-75.740	-75.730

Not for IC Review

Mode	**π4 / DQPSK (TXNDC)**		
Frequency, MHz	**851.0125**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-61.950	-62.500
50.000	18	-73.640	-73.500
75.000	18	-76.950	-76.640

Not for IC Review

Mode	**π4 / DQPSK (TXNDC)**		
Frequency, MHz	**860.0125**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-63.480	-64.550
50.000	18	-72.790	-73.240
75.000	18	-77.260	-77.640

Not for IC Review

Mode	**π4 / DQPSK (TXNDC)**		
Frequency, MHz	**868.8875**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-64.520	-65.370
50.000	18	-73.830	-73.490
75.000	18	-76.940	-77.230

Not for IC Review

Mode	**π4 / DQPSK (MSPD)**		
Frequency, MHz	**806.0125**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-68.720	-68.950
50.000	18	-73.360	-73.020
75.000	18	-75.100	-76.450

Not for IC Review

Mode	**π4 / DQPSK (MSPD)**		
Frequency, MHz	**814.9875**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-67.760	-67.170
50.000	18	-75.490	-73.960
75.000	18	-77.400	-77.410

Not for IC Review

Mode	**π4 / DQPSK (MSPD)**		
Frequency, MHz	**823.9875**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-67.020	-67.540
50.000	18	-73.470	-73.120
75.000	18	-78.130	-77.730

Not for IC Review

Mode	**π4 / DQPSK (MSPD)**		
Frequency, MHz	**851.0125**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-66.300	-66.460
50.000	18	-72.990	-74.720
75.000	18	-78.450	-76.500

Not for IC Review

Mode	**π4 / DQPSK (MSPD)**		
Frequency, MHz	**860.0125**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-68.540	-68.980
50.000	18	-72.710	-72.880
75.000	18	-78.160	-78.170

Not for IC Review

Mode	**π4 / DQPSK (MSPD)**		
Frequency, MHz	**868.8875**		
Channel Spacing, kHz	**25**		
Offset (kHz)	**Meas BW (kHz)**	Lower	Upper
25.000	18	-64.680	-65.370
50.000	18	-74.120	-74.920
75.000	18	-77.140	-77.230

6.5.3. Test Limit

Maximum adjacent power levels for frequencies in the 450–470 MHz band:

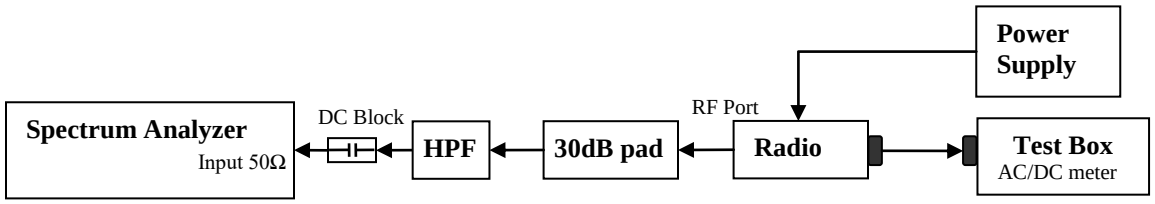
Frequency offset (kHz)	Maximum ACP (dBc) for devices 1 watt and less	Maximum ACP (dBc) for devices above 1 watt
25	−55	−60
50	−70	−70
75	−70	−70

Maximum adjacent power levels for frequencies in the 809–824/854–869 MHz band:

Frequency offset (kHz)	Maximum ACP (dBc) for devices less than 15 watts	Maximum ACP (dBc) for devices 15 watts and above
25	−55	−55
50	−65	−65
75	−65	−70

6.6. Conducted Spurious Emission

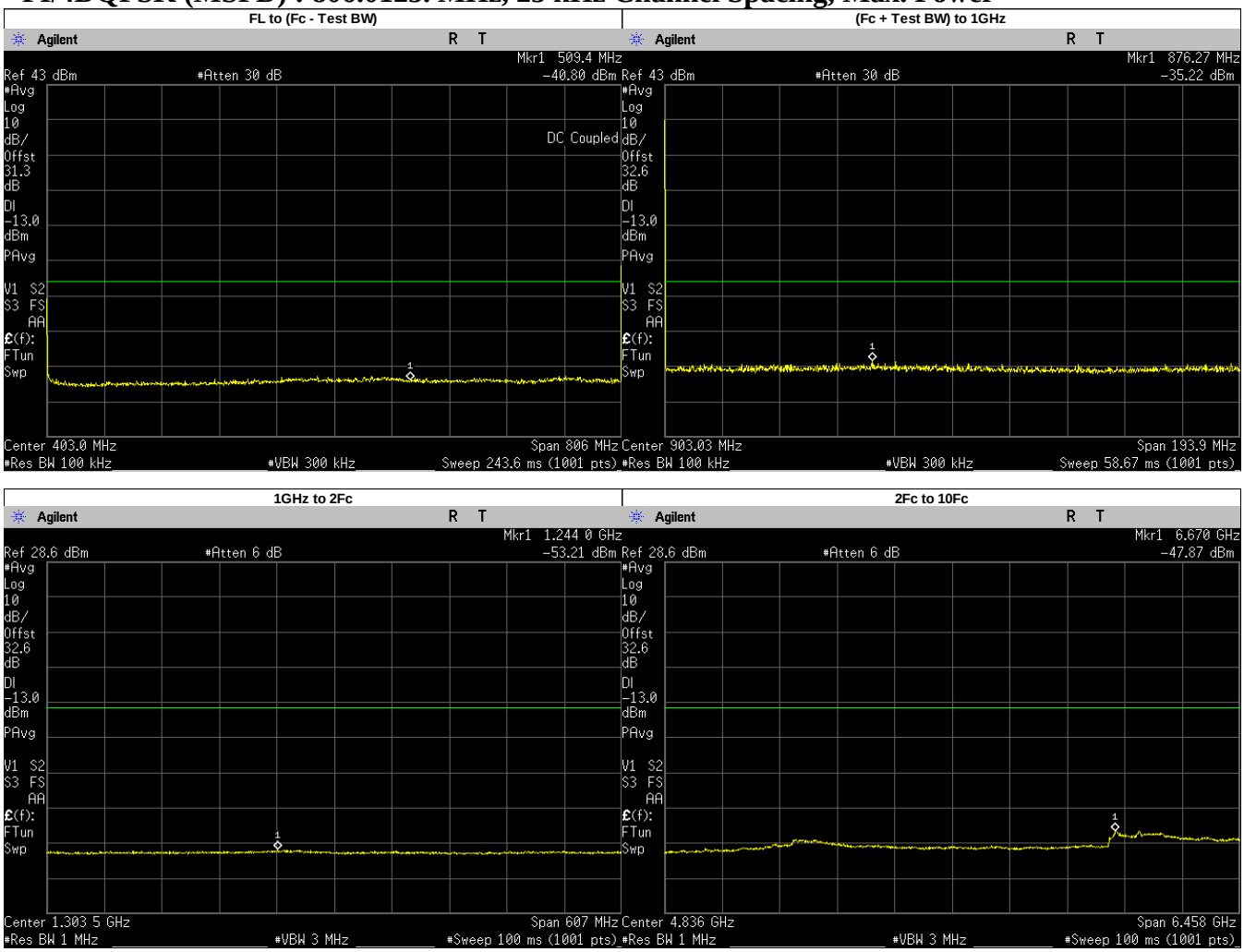
6.6.1. Test Setup



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.

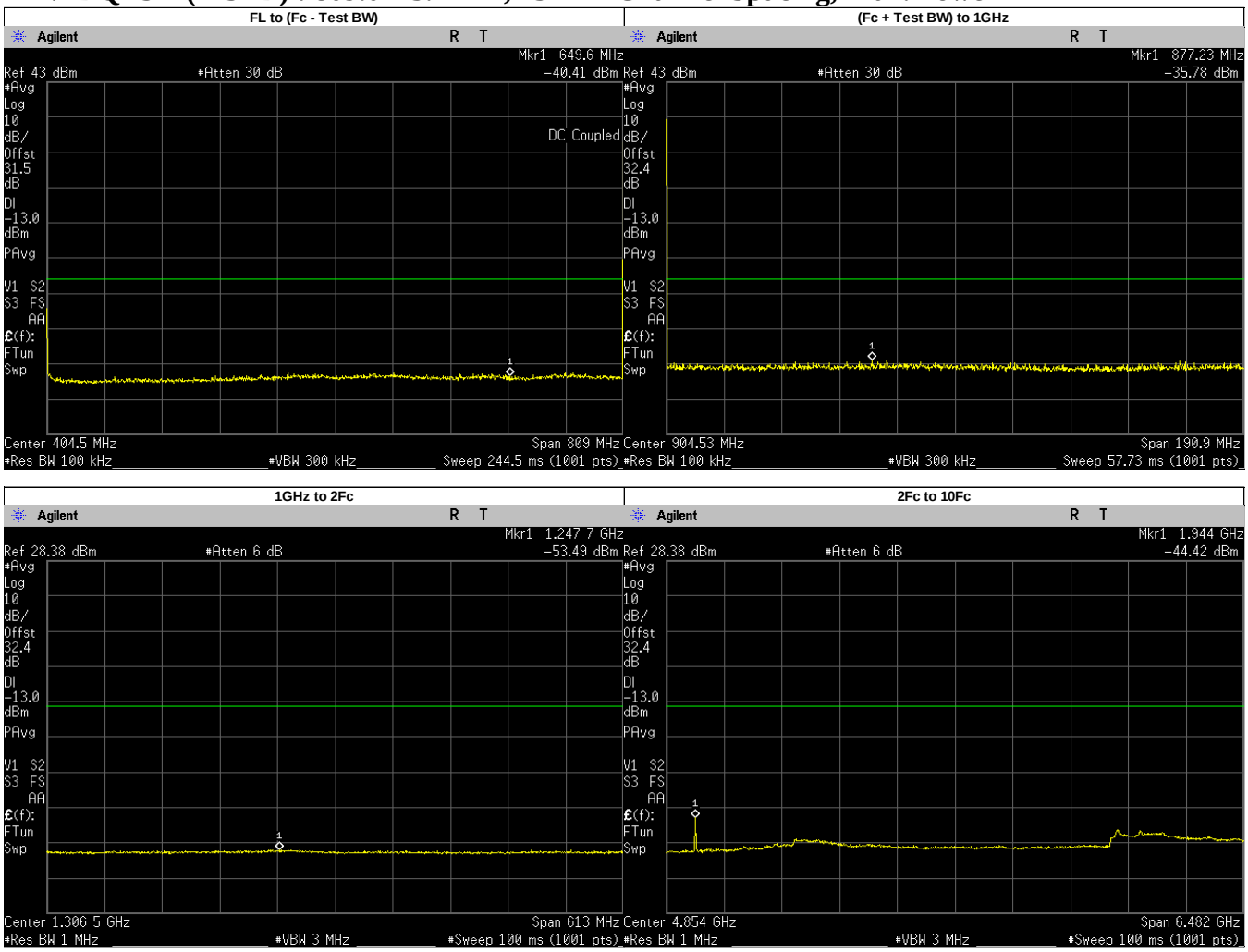
6.6.2. Test Result (Digital)

PI/4DQPSK (MSPD) : 806.0125. MHz, 25 kHz Channel Spacing, Max. Power



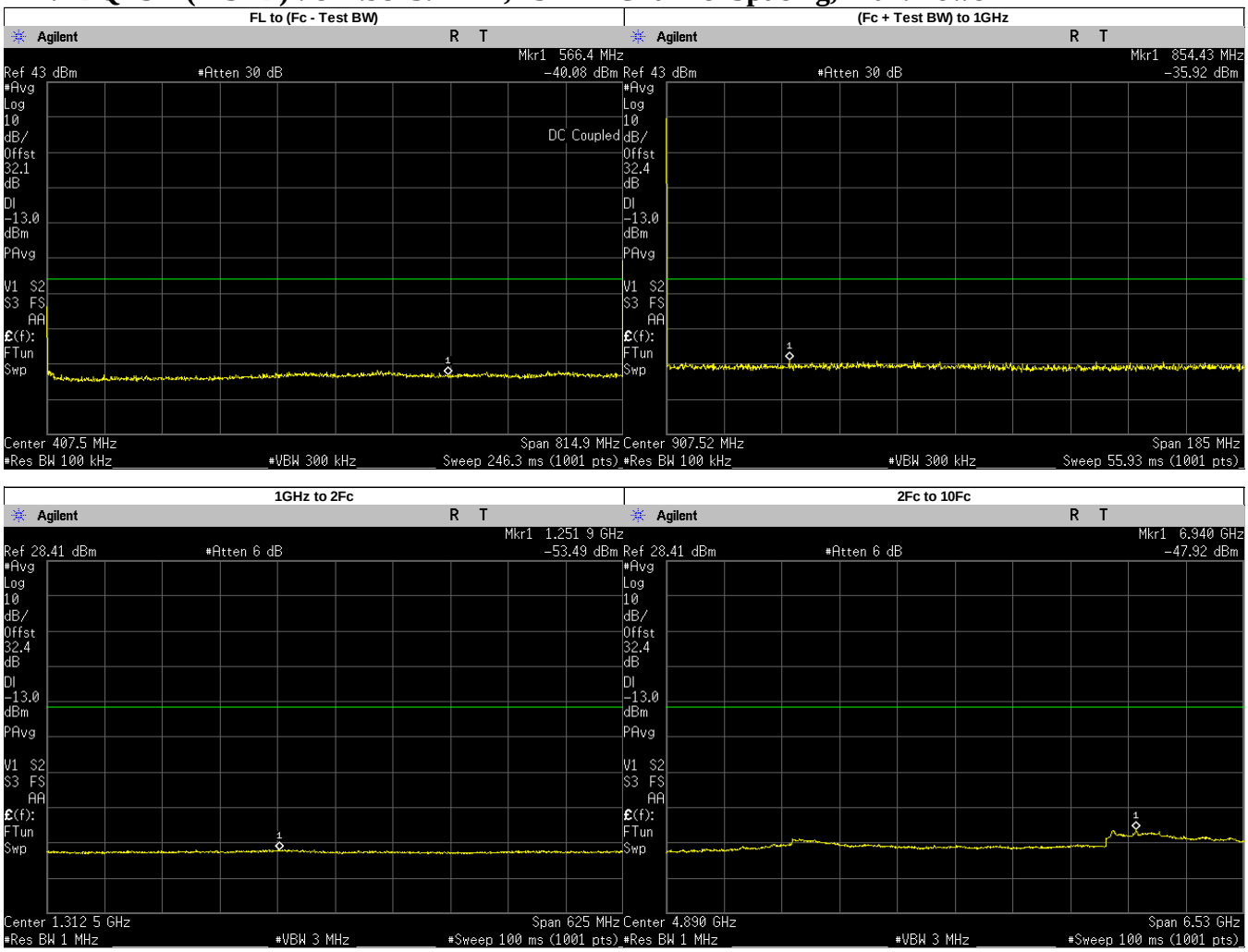
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	509.4000	-40.7990	-13.00	PASS
(Fc + Test BW) to 1GHz	876.2679	-35.2200	-13.00	PASS
1GHz to 2Fc	1244.0240	-53.2100	-13.00	PASS
2Fc to 10Fc	6670.1750	-47.8700	-13.00	PASS
	1612.0250	-54.1946	-13.00	PASS
	2418.0370	-53.3848	-13.00	PASS
	3224.0500	-51.0173	-13.00	PASS
	4030.0620	-52.3836	-13.00	PASS
	4836.0750	-52.6540	-13.00	PASS
	5642.0870	-52.7173	-13.00	PASS
	6448.1000	-52.5488	-13.00	PASS
	7254.1130	-49.3080	-13.00	PASS
	8060.1250	-50.3466	-13.00	PASS

PI/4DQPSK (MSPD) : 809.0125. MHz, 25 kHz Channel Spacing, Max. Power



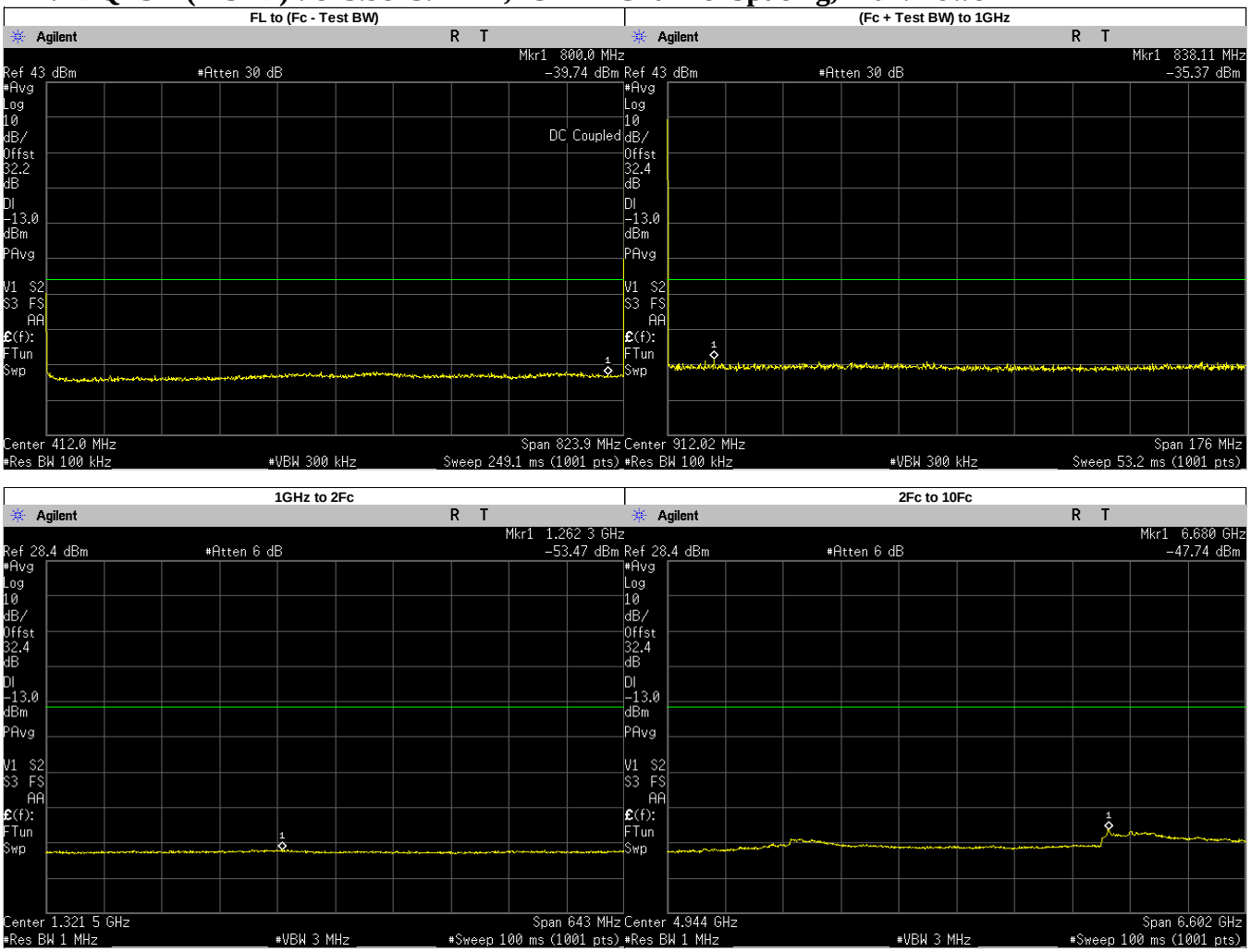
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	649.6000	-40.4120	-13.00	PASS
(Fc + Test BW) to 1GHz	877.2272	-35.7800	-13.00	PASS
1GHz to 2Fc	1247.6620	-53.4900	-13.00	PASS
2Fc to 10Fc	1943.6120	-44.4200	-13.00	PASS
	1618.0250	-54.1888	-13.00	PASS
	2427.0370	-53.4407	-13.00	PASS
	3236.0500	-51.2334	-13.00	PASS
	4045.0620	-52.5739	-13.00	PASS
	4854.0750	-52.6630	-13.00	PASS
	5663.0870	-52.8397	-13.00	PASS
	6472.1000	-52.5965	-13.00	PASS
	7281.1130	-49.7732	-13.00	PASS
	8090.1250	-51.2557	-13.00	PASS

PI/4DQPSK (MSPD) : 814.9875. MHz, 25 kHz Channel Spacing, Max. Power



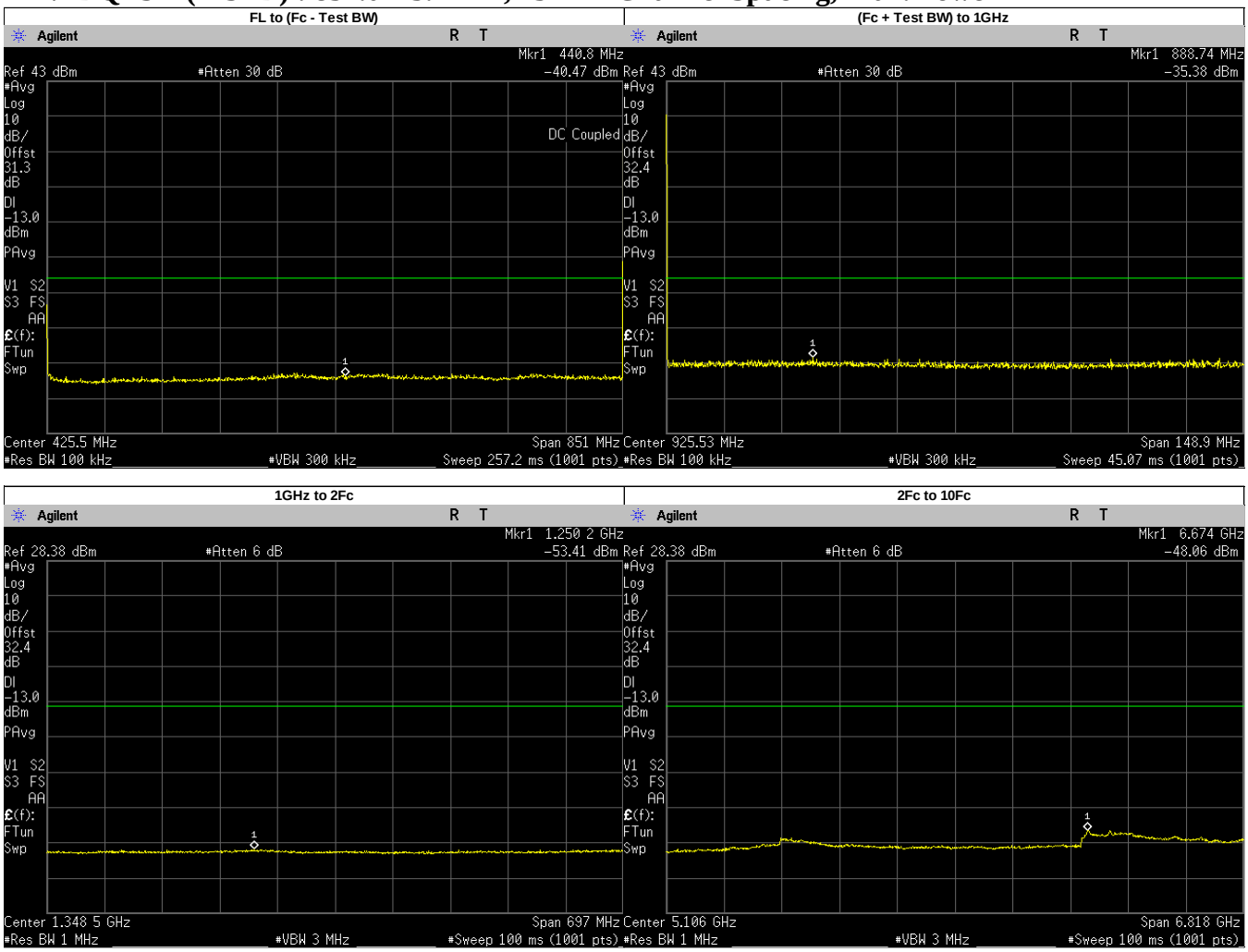
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	566.4000	-40.0760	-13.00	PASS
(Fc + Test BW) to 1GHz	854.4345	-35.9200	-13.00	PASS
1GHz to 2Fc	1251.8650	-53.4900	-13.00	PASS
2Fc to 10Fc	6940.3140	-47.9200	-13.00	PASS
	1629.9750	-54.2285	-13.00	PASS
	2444.9630	-53.2989	-13.00	PASS
	3259.9500	-51.1133	-13.00	PASS
	4074.9370	-52.6614	-13.00	PASS
	4889.9250	-52.8510	-13.00	PASS
	5704.9130	-52.8427	-13.00	PASS
	6519.9000	-52.5777	-13.00	PASS
	7334.8870	-49.9022	-13.00	PASS
	8149.8750	-51.0143	-13.00	PASS

PI/4DQPSK (MSPD) : 823.9875. MHz, 25 kHz Channel Spacing, Max. Power



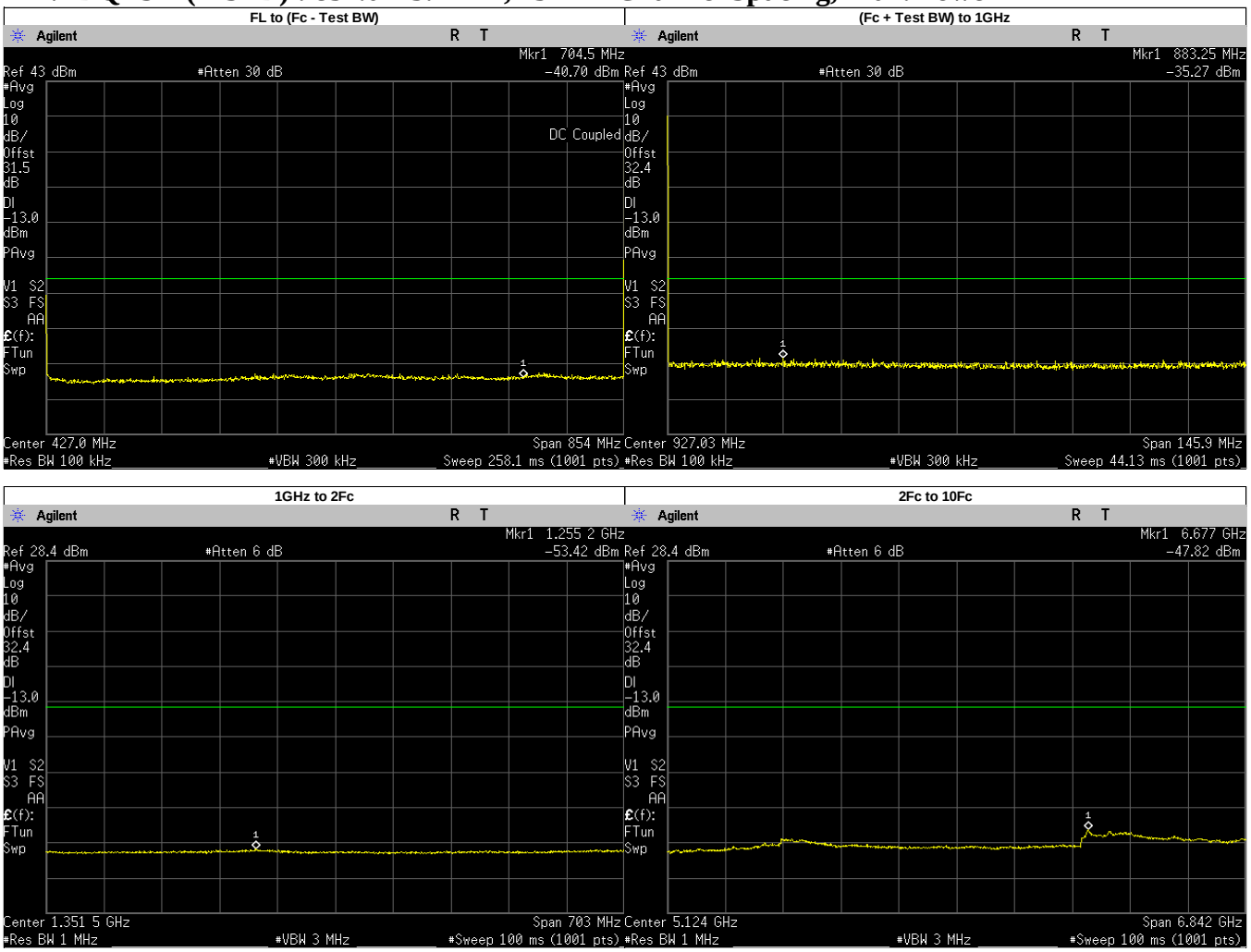
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	800.0000	-39.7430	-13.00	PASS
(Fc + Test BW) to 1GHz	838.1145	-35.3700	-13.00	PASS
1GHz to 2Fc	1262.3340	-53.4700	-13.00	PASS
2Fc to 10Fc	6680.2250	-47.7400	-13.00	PASS
	1647.9750	-54.1231	-13.00	PASS
	2471.9630	-53.0498	-13.00	PASS
	3295.9500	-50.8282	-13.00	PASS
	4119.9370	-52.6155	-13.00	PASS
	4943.9250	-52.9590	-13.00	PASS
	5767.9130	-52.7712	-13.00	PASS
	6591.9000	-52.5557	-13.00	PASS
	7415.8870	-50.3393	-13.00	PASS
	8239.8750	-51.0595	-13.00	PASS

PI/4DQPSK (MSPD) : 851.0125. MHz, 25 kHz Channel Spacing, Max. Power



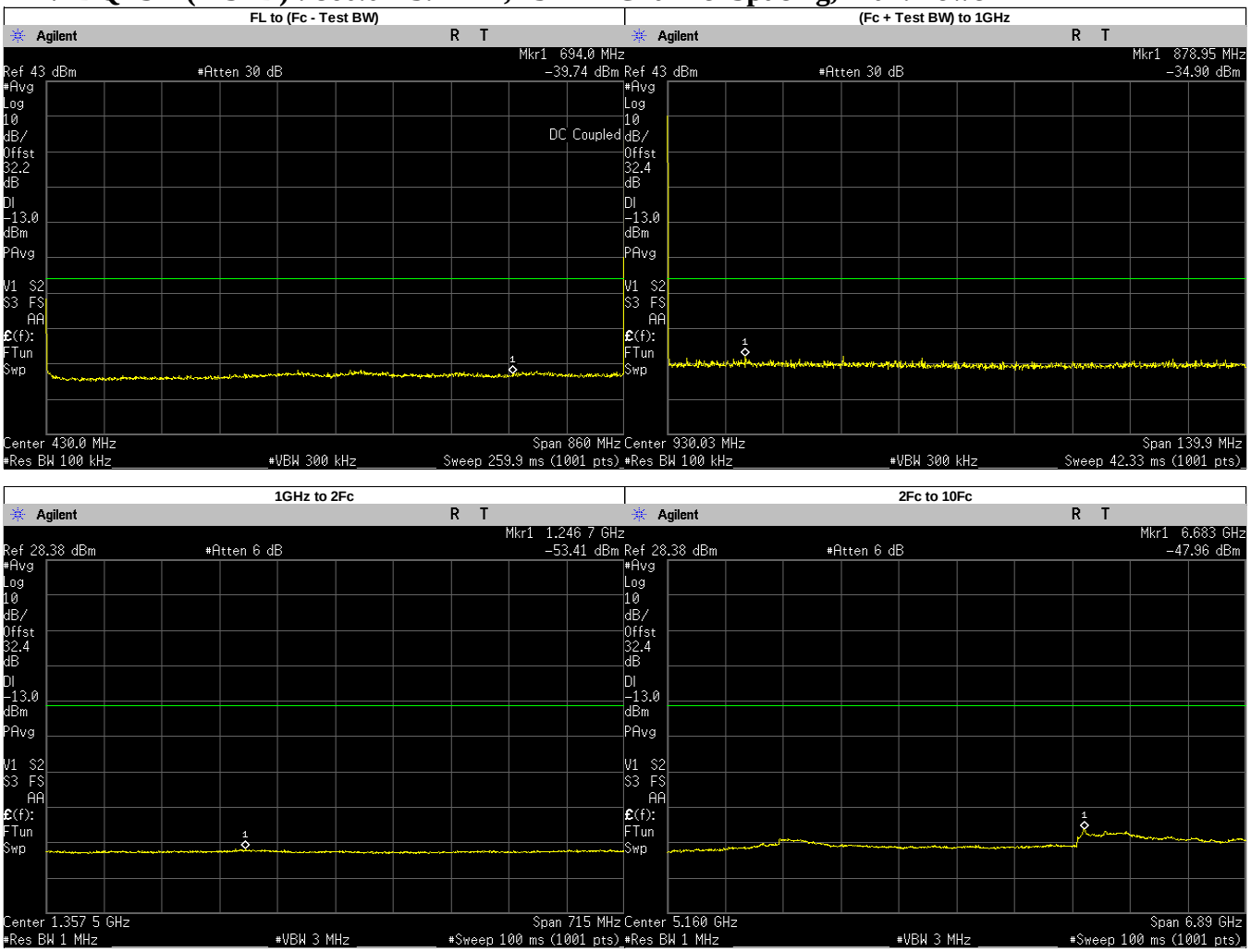
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	440.8000	-40.4740	-13.00	PASS
(Fc + Test BW) to 1GHz	888.7437	-35.3800	-13.00	PASS
1GHz to 2Fc	1250.2320	-53.4100	-13.00	PASS
2Fc to 10Fc	6674.2380	-48.0600	-13.00	PASS
	1702.0250	-54.1442	-13.00	PASS
	2553.0370	-53.2747	-13.00	PASS
	3404.0500	-51.4342	-13.00	PASS
	4255.0620	-52.6820	-13.00	PASS
	5106.0750	-53.1500	-13.00	PASS
	5957.0870	-52.9388	-13.00	PASS
	6808.1000	-49.4730	-13.00	PASS
	7659.1130	-50.2984	-13.00	PASS
	8510.1250	-50.4583	-13.00	PASS

PI/4DQPSK (MSPD) : 854.0125. MHz, 25 kHz Channel Spacing, Max. Power



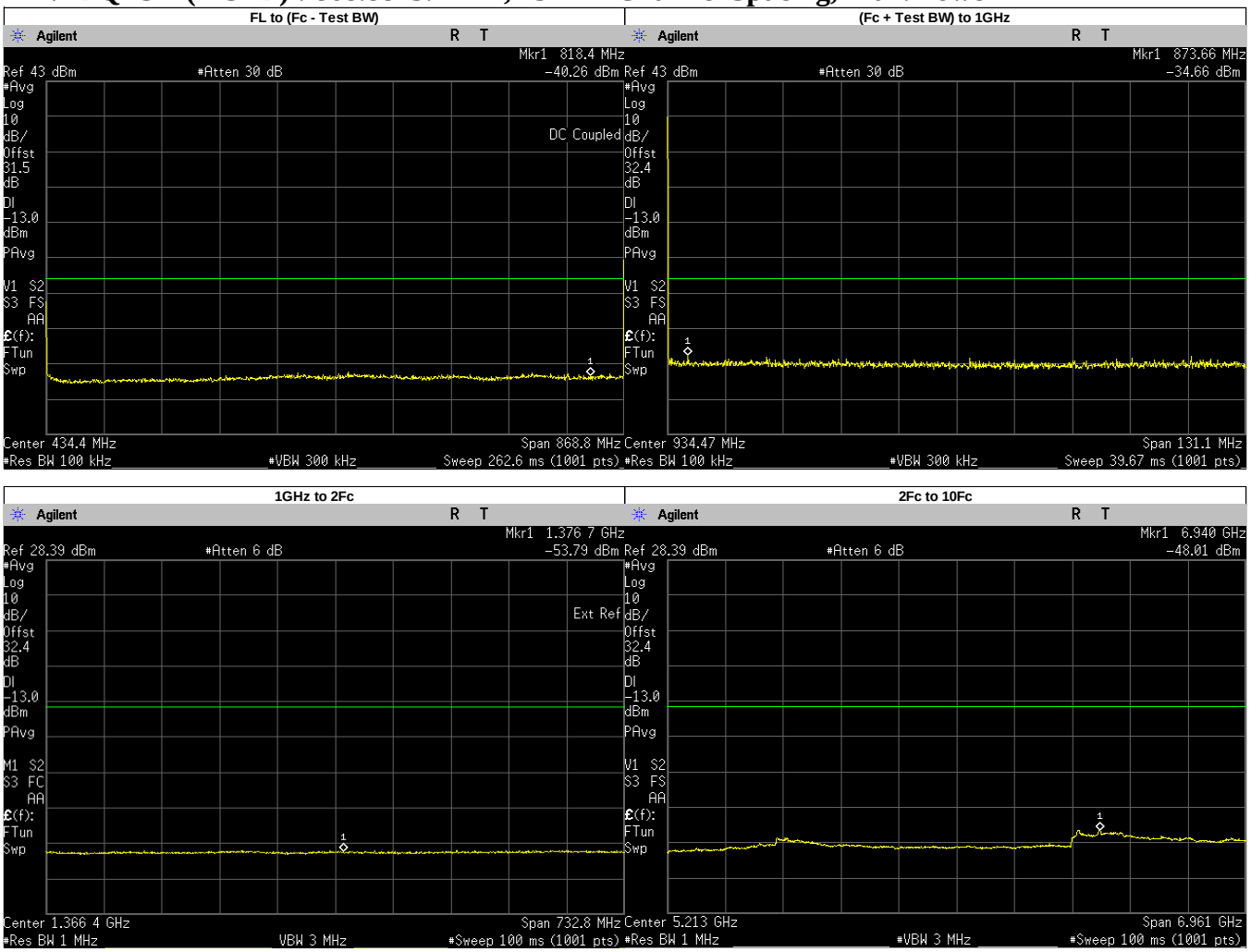
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	704.5000	-40.7020	-13.00	PASS
(Fc + Test BW) to 1GHz	883.2500	-35.2700	-13.00	PASS
1GHz to 2Fc	1255.1980	-53.4200	-13.00	PASS
2Fc to 10Fc	6677.2320	-47.8200	-13.00	PASS
	1708.0250	-54.0249	-13.00	PASS
	2562.0370	-53.1753	-13.00	PASS
	3416.0500	-51.5391	-13.00	PASS
	4270.0620	-52.7081	-13.00	PASS
	5124.0750	-53.0190	-13.00	PASS
	5978.0870	-52.8173	-13.00	PASS
	6832.1000	-49.3631	-13.00	PASS
	7686.1130	-50.1666	-13.00	PASS
	8540.1250	-50.6399	-13.00	PASS

PI/4DQPSK (MSPD) : 860.0125. MHz, 25 kHz Channel Spacing, Max. Power



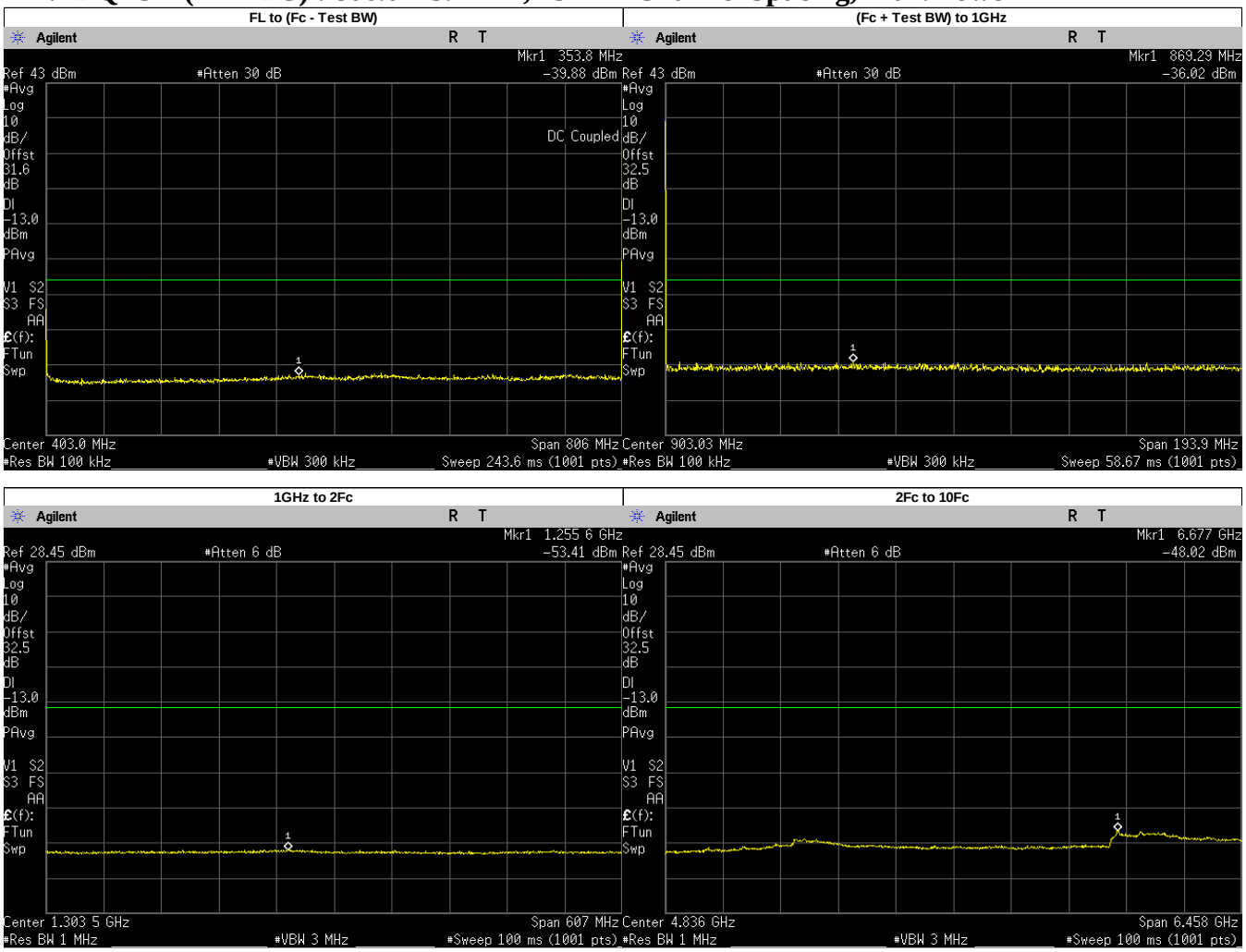
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	694.0000	-39.7350	-13.00	PASS
(Fc + Test BW) to 1GHz	878.9541	-34.9000	-13.00	PASS
1GHz to 2Fc	1246.6840	-53.4100	-13.00	PASS
2Fc to 10Fc	6682.7870	-47.9550	-13.00	PASS
	1720.0250	-54.2156	-13.00	PASS
	2580.0370	-53.0333	-13.00	PASS
	3440.0500	-51.6647	-13.00	PASS
	4300.0620	-52.6104	-13.00	PASS
	5160.0750	-53.1570	-13.00	PASS
	6020.0870	-52.6069	13.00	PASS
	6880.1000	-49.7148	-13.00	PASS
	7740.1130	-50.3109	-13.00	PASS
	8600.1250	-50.8516	-13.00	PASS

PI/4DQPSK (MSPD) : 868.8875. MHz, 25 kHz Channel Spacing, Max. Power



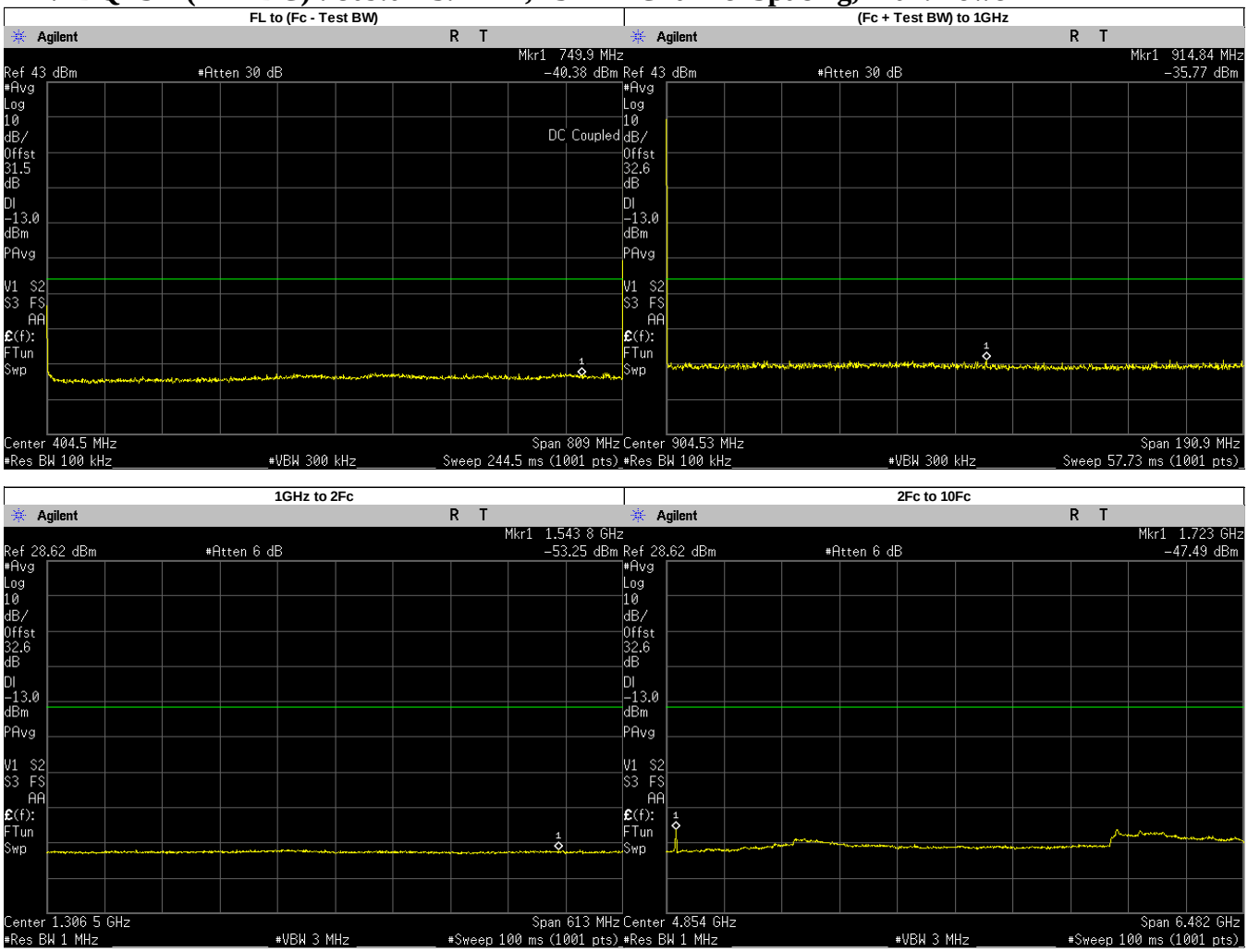
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	818.4000	-40.2600	-13.00	PASS
(Fc + Test BW) to 1GHz	873.6558	-34.6600	-13.00	PASS
1GHz to 2Fc	1376.7000	-53.7900	-13.00	PASS
2Fc to 10Fc	6939.6780	-48.0100	-13.00	PASS
	1737.7750	-54.2022	-13.00	PASS
	2606.6620	-53.2796	-13.00	PASS
	3475.5500	-51.6078	-13.00	PASS
	4344.4370	-52.6454	-13.00	PASS
	5213.3250	-52.9130	-13.00	PASS
	6082.2120	-52.8545	-13.00	PASS
	6951.1000	-48.9562	-13.00	PASS
	7819.9880	-50.6164	-13.00	PASS
	8688.8750	-50.9811	-13.00	PASS

PI/4DQPSK (TXNDC) : 806.0125. MHz, 25 kHz Channel Spacing, Max. Power



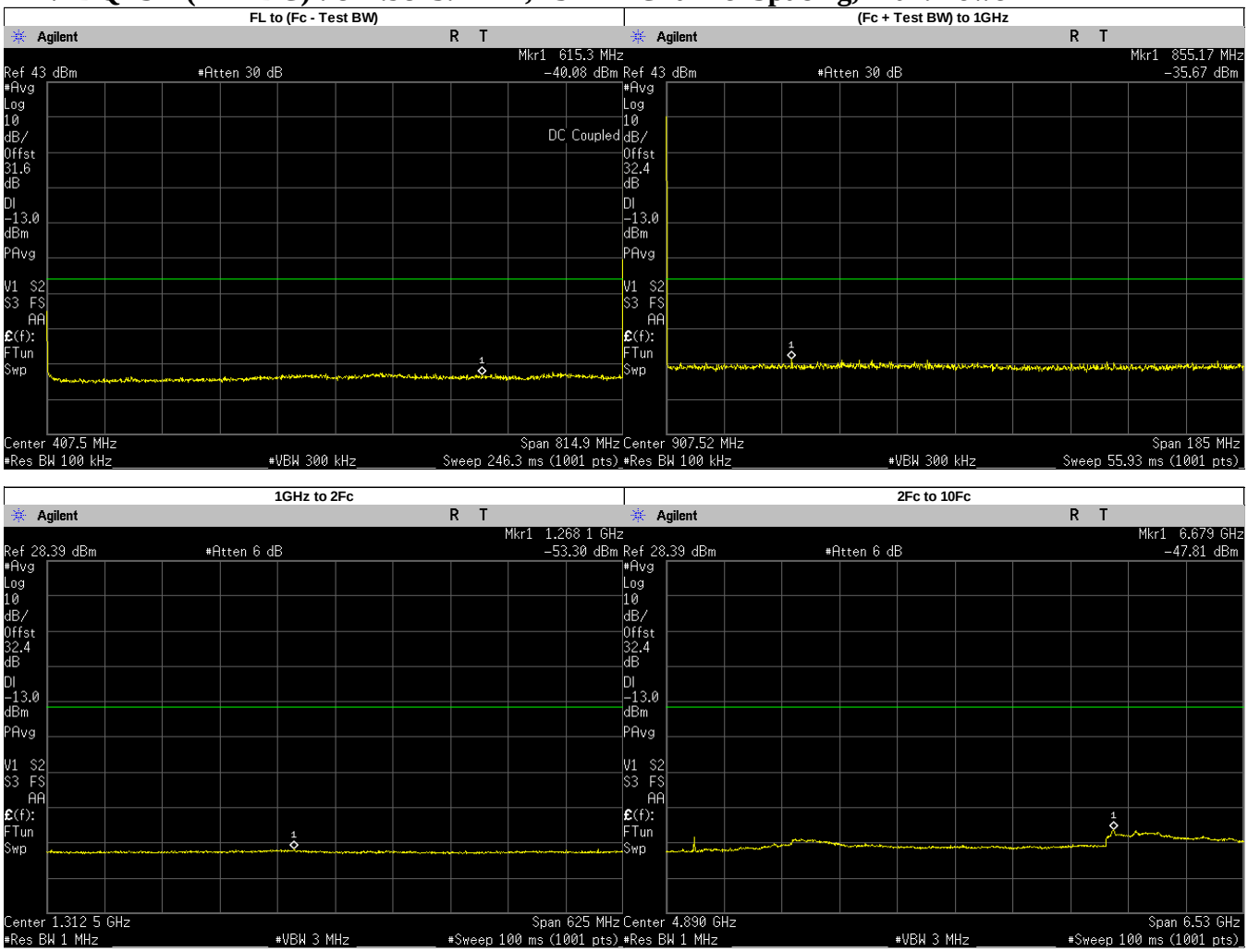
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	353.8000	-39.8770	-13.00	PASS
(Fc + Test BW) to 1GHz	869.2861	-36.0200	-13.00	PASS
1GHz to 2Fc	1255.5570	-53.4100	-13.00	PASS
2Fc to 10Fc	6676.6330	-48.0200	-13.00	PASS
	1612.0250	-54.3556	-13.00	PASS
	2418.0370	-53.5153	-13.00	PASS
	3224.0500	-51.1044	-13.00	PASS
	4030.0620	-52.4161	-13.00	PASS
	4836.0750	-52.5500	-13.00	PASS
	5642.0870	-52.9504	-13.00	PASS
	6448.1000	-52.4948	-13.00	PASS
	7254.1130	-49.5269	-13.00	PASS
	8060.1250	-50.8376	-13.00	PASS

PI/4DQPSK (TXNDC) : 809.0125. MHz, 25 kHz Channel Spacing, Max. Power



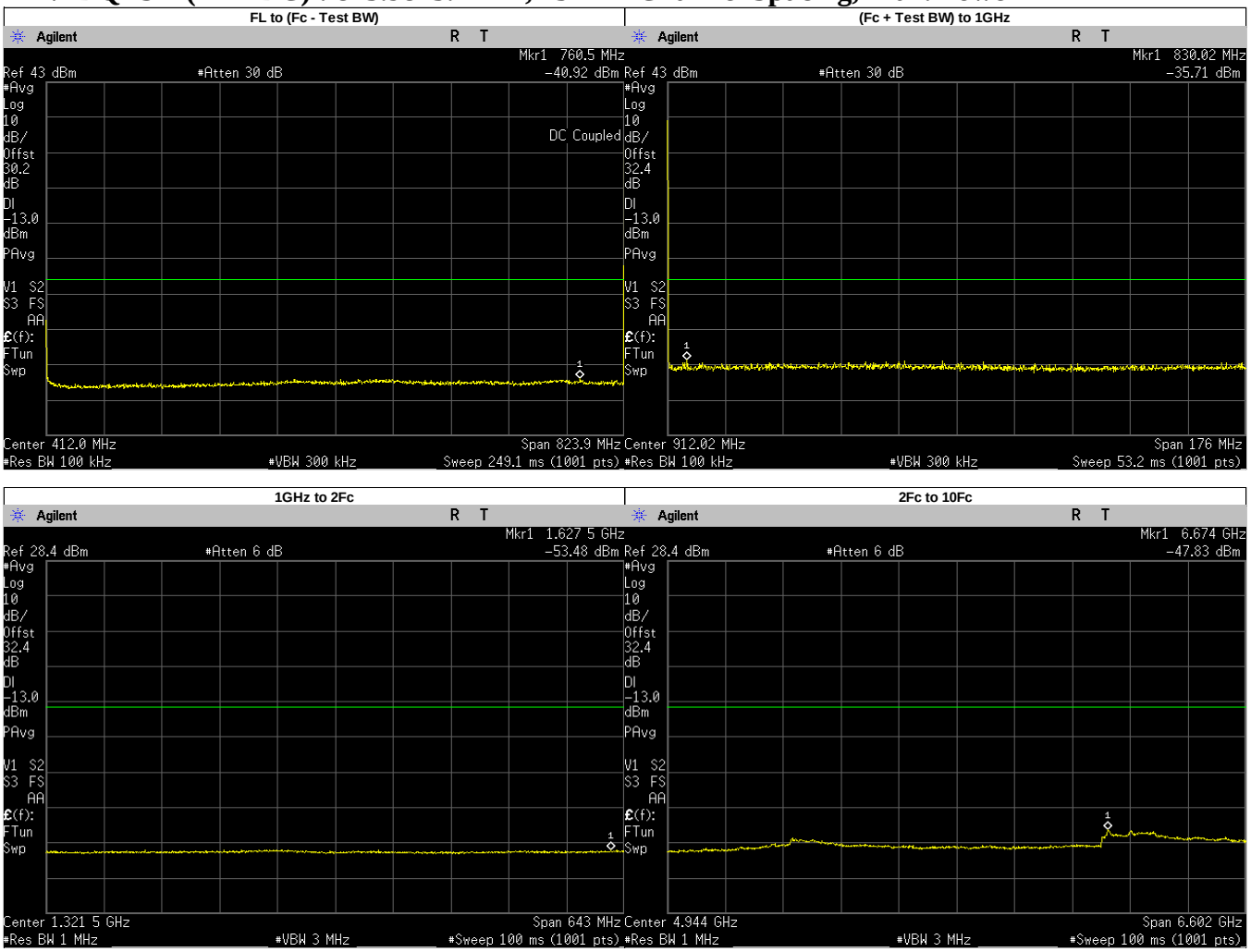
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	749.9000	-40.3820	-13.00	PASS
(Fc + Test BW) to 1GHz	914.8419	-35.7700	-13.00	PASS
1GHz to 2Fc	1543.7530	-53.2500	-13.00	PASS
2Fc to 10Fc	1723.2210	-47.4900	-13.00	PASS
	1618.0250	-53.7918	-13.00	PASS
	2427.0370	-53.2244	-13.00	PASS
	3236.0500	-50.6191	-13.00	PASS
	4045.0620	-52.1296	-13.00	PASS
	4854.0750	-52.6450	-13.00	PASS
	5663.0870	-52.6001	-13.00	PASS
	6472.1000	-52.2819	-13.00	PASS
	7281.1130	-49.4395	-13.00	PASS
	8090.1250	-50.9030	-13.00	PASS

PI/4DQPSK (TXNDC) : 814.9875. MHz, 25 kHz Channel Spacing, Max. Power



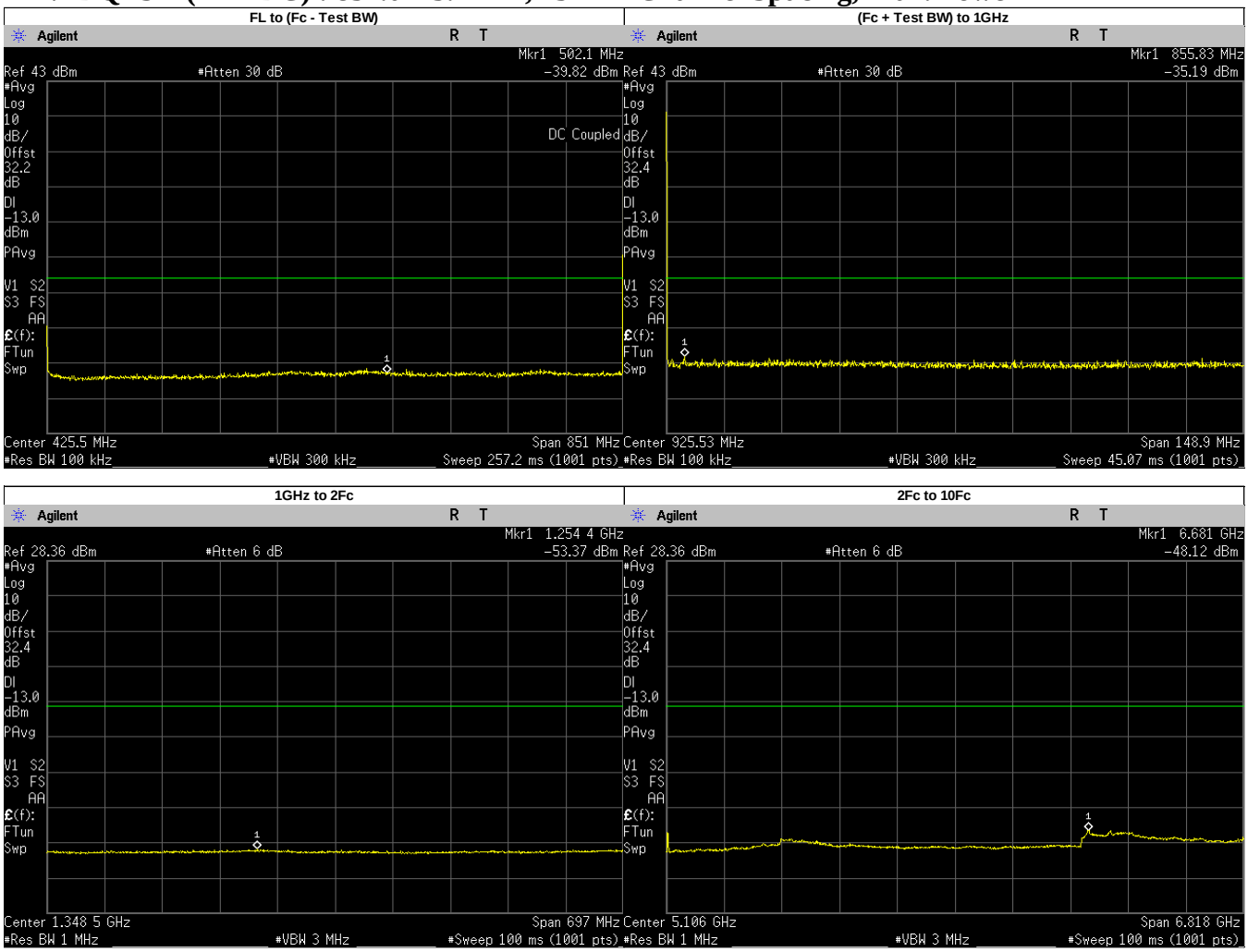
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	615.3000	-40.0830	-13.00	PASS
(Fc + Test BW) to 1GHz	855.1744	-35.6700	-13.00	PASS
1GHz to 2Fc	1268.1140	-53.3000	-13.00	PASS
2Fc to 10Fc	6679.1180	-47.8100	-13.00	PASS
	1629.9750	-53.8891	-13.00	PASS
	2444.9630	-53.2845	-13.00	PASS
	3259.9500	-51.0801	-13.00	PASS
	4074.9370	-52.6857	-13.00	PASS
	4889.9250	-52.6630	-13.00	PASS
	5704.9130	-52.8201	-13.00	PASS
	6519.9000	-52.5601	-13.00	PASS
	7334.8870	-49.9232	-13.00	PASS
	8149.8750	-51.1975	-13.00	PASS

PI/4DQPSK (TXNDC) : 823.9875. MHz, 25 kHz Channel Spacing, Max. Power



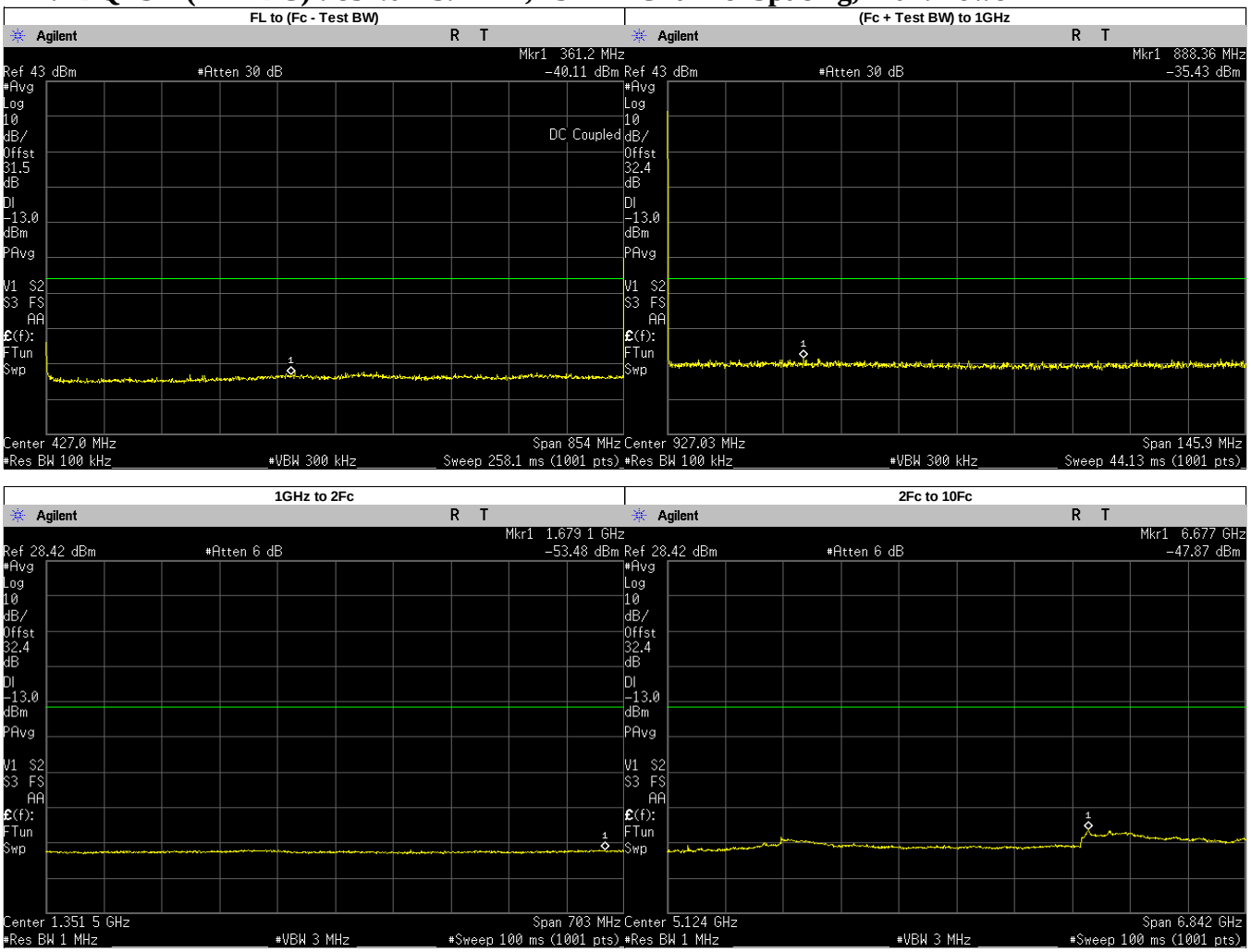
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	760.5000	-40.9150	-13.00	PASS
(Fc + Test BW) to 1GHz	830.0202	-35.7100	-13.00	PASS
1GHz to 2Fc	1627.5440	-53.4800	-13.00	PASS
2Fc to 10Fc	6673.6230	-47.8300	-13.00	PASS
	1647.9750	-53.9930	-13.00	PASS
	2471.9630	-52.9253	-13.00	PASS
	3295.9500	-50.8558	-13.00	PASS
	4119.9370	-52.5842	-13.00	PASS
	4943.9250	-52.7310	-13.00	PASS
	5767.9130	-52.8934	-13.00	PASS
	6591.9000	-52.5842	-13.00	PASS
	7415.8870	-50.1777	-13.00	PASS
	8239.8750	-51.2719	-13.00	PASS

PI/4DQPSK (TXNDC) : 851.0125. MHz, 25 kHz Channel Spacing, Max. Power



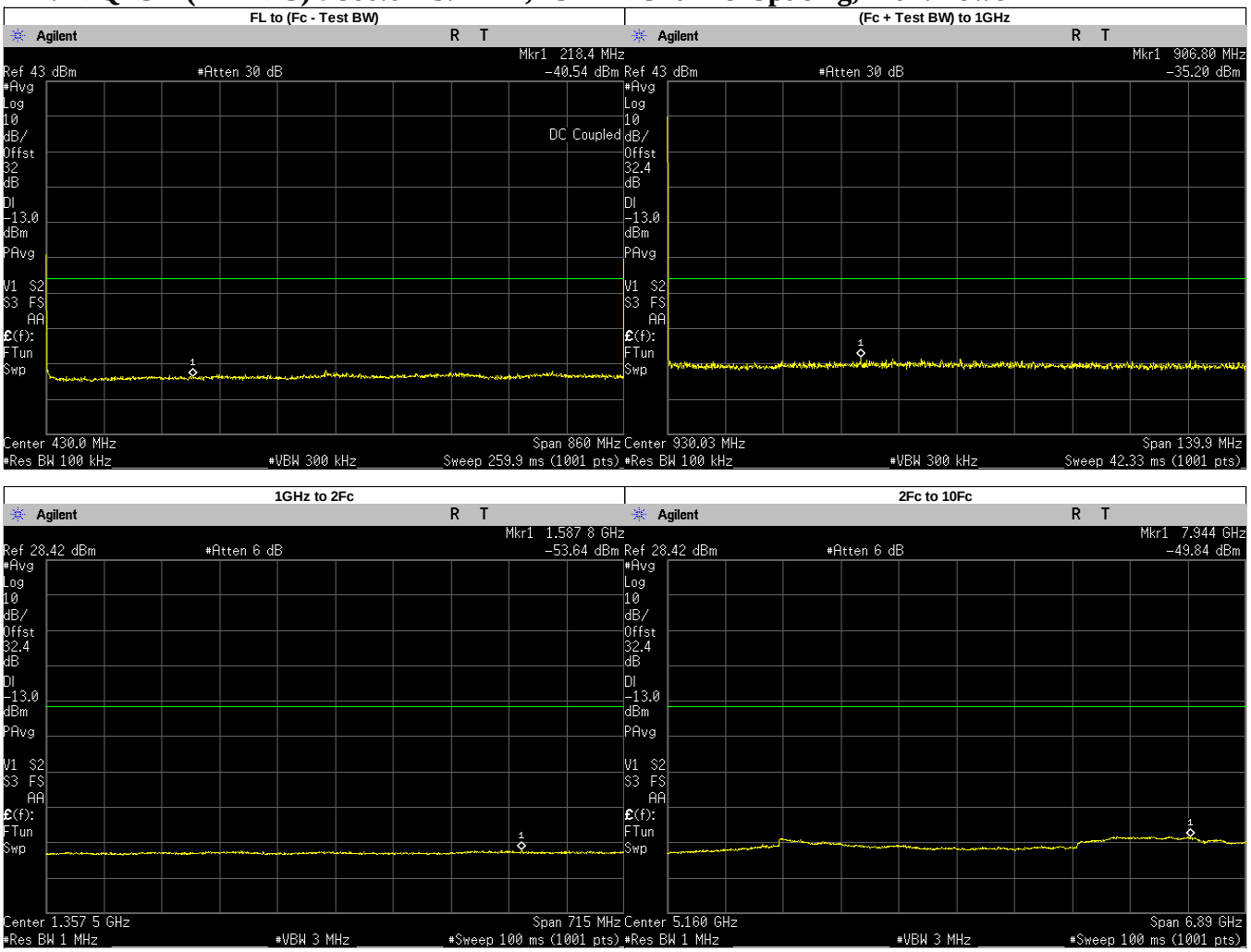
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	502.1000	-39.8210	-13.00	PASS
(Fc + Test BW) to 1GHz	855.8285	-35.1900	-13.00	PASS
1GHz to 2Fc	1254.4140	-53.3700	-13.00	PASS
2Fc to 10Fc	6681.0560	-48.1200	-13.00	PASS
	1702.0250	-54.0862	-13.00	PASS
	2553.0370	-53.2473	-13.00	PASS
	3404.0500	-51.6517	-13.00	PASS
	4255.0620	-52.8580	-13.00	PASS
	5106.0750	-53.1380	-13.00	PASS
	5957.0870	-52.7190	-13.00	PASS
	6808.1000	-49.4175	-13.00	PASS
	7659.1130	-50.2722	-13.00	PASS
	8510.1250	-50.6681	-13.00	PASS

PI/4DQPSK (TXNDC) : 854.0125. MHz, 25 kHz Channel Spacing, Max. Power



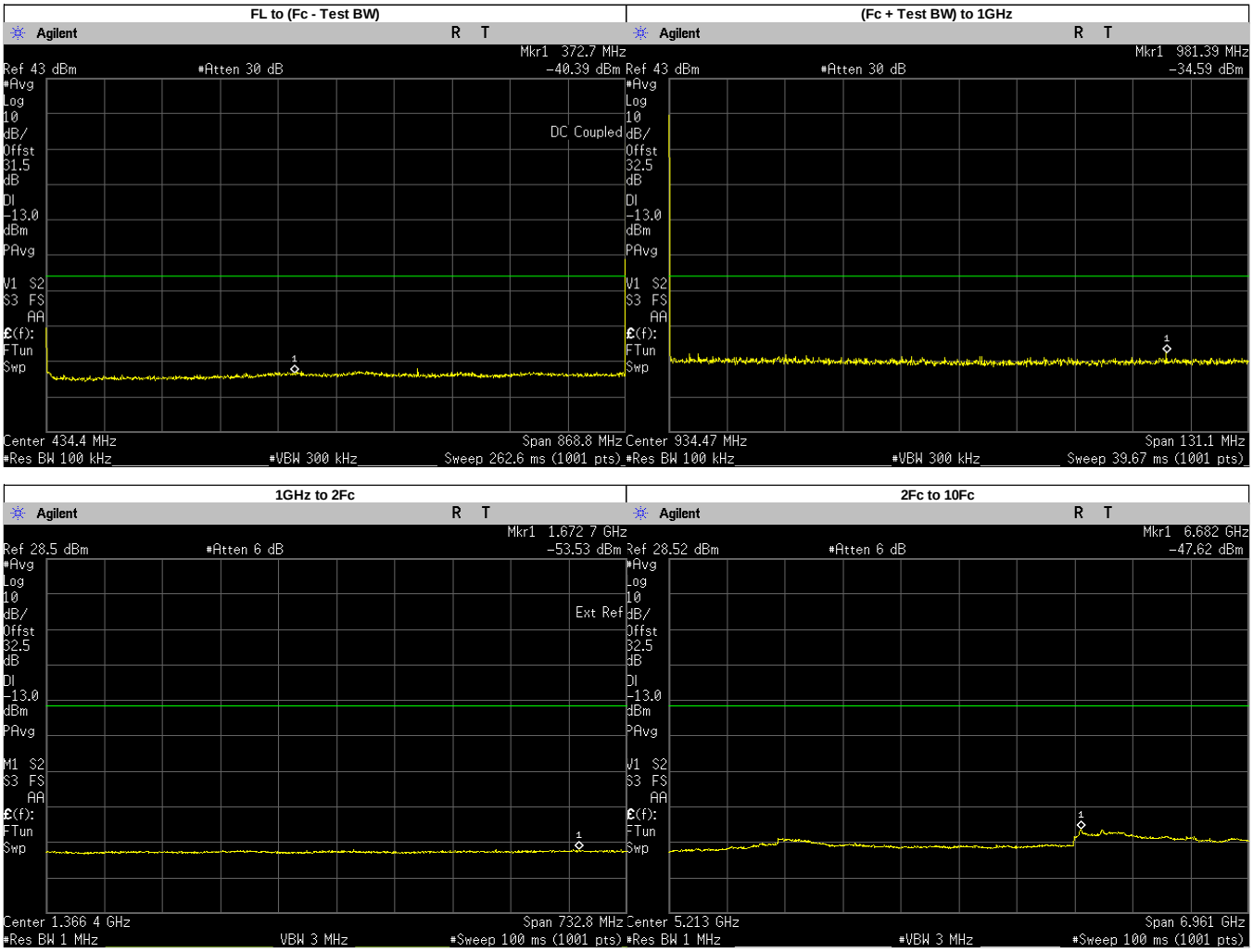
Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	361.2000	-40.1090	-13.00	PASS
(Fc + Test BW) to 1GHz	888.3578	-35.4300	-13.00	PASS
1GHz to 2Fc	1679.1220	-53.4800	-13.00	PASS
2Fc to 10Fc	6677.2320	-47.8700	-13.00	PASS
	1708.0250	-53.6394	-13.00	PASS
	2562.0370	-52.9966	-13.00	PASS
	3416.0500	-51.3719	-13.00	PASS
	4270.0620	-52.9078	-13.00	PASS
	5124.0750	-53.1570	-13.00	PASS
	5978.0870	-52.8683	-13.00	PASS
	6832.1000	-49.5145	-13.00	PASS
	7686.1130	-50.0967	-13.00	PASS
	8540.1250	-50.5442	-13.00	PASS

PI/4DQPSK (TXNDC) : 860.0125. MHz, 25 kHz Channel Spacing, Max. Power



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	218.4000	-40.5390	-13.00	PASS
(Fc + Test BW) to 1GHz	906.8016	-35.2000	-13.00	PASS
1GHz to 2Fc	1587.7510	-53.6400	-13.00	PASS
2Fc to 10Fc	7943.6750	-49.8400	-13.00	PASS
	1720.0250	-54.6504	-13.00	PASS
	2580.0370	-53.3294	-13.00	PASS
	3440.0500	-51.9456	-13.00	PASS
	4300.0620	-52.7956	-13.00	PASS
	5160.0750	-53.4150	-13.00	PASS
	6020.0870	-53.2842	-13.00	PASS
	6880.1000	-51.0278	-13.00	PASS
	7740.1130	-50.2522	-13.00	PASS
	8600.1250	-51.4247	-13.00	PASS

PI/4DQPSK (TXNDC) : 868.8875. MHz, 25 kHz Channel Spacing, Max. Power



Frequency Range	Highest Spur Frequency (MHz)	Spurious Level (dBm)	Failing Limit (dBm)	Results
FL to (Fc - Test BW)	372.7000	-40.3920	-13.00	PASS
(Fc + Test BW) to 1GHz	981.3891	-34.5900	-13.00	PASS
1GHz to 2Fc	1672.7000	-53.5300	-13.00	PASS
2Fc to 10Fc	6682.1170	-47.6200	-13.00	PASS
	1737.7750	-53.9645	-13.00	PASS
	2606.6620	-52.9705	-13.00	PASS
	3475.5500	-51.5745	-13.00	PASS
	4344.4370	-52.5604	-13.00	PASS
	5213.3250	-52.7120	-13.00	PASS
	6082.2120	-52.6139	-13.00	PASS
	6951.1000	-48.5594	-13.00	PASS
	7819.9880	-50.6361	-13.00	PASS
	8688.8750	-50.9133	-13.00	PASS

6.6.3. Test Limit

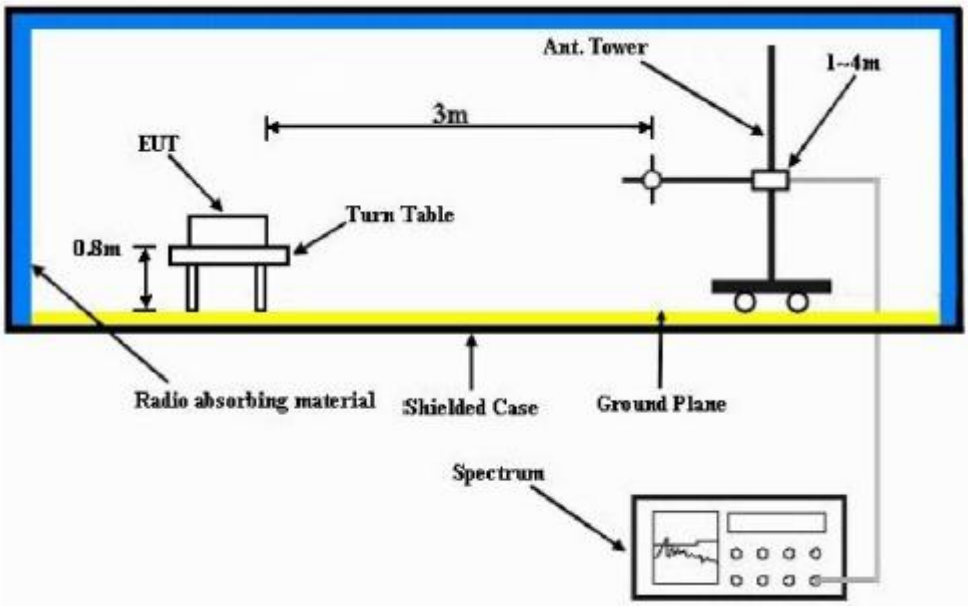
Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

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)

6.7. Radiated Spurious Emission

6.7.1. 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 Fc < 1GHz) or 1.5m height (for Fc > 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.

6.7.2. Test Result (Analog)

Not Applicable.

6.7.3. Test Result (Digital)

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

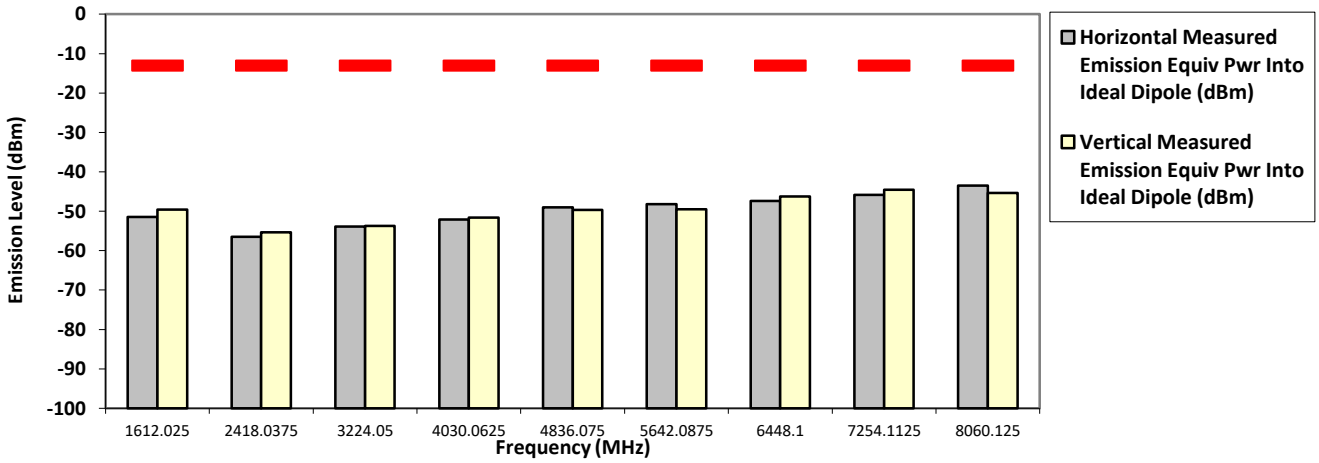
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

806.012500 MHz **25 kHz** **3.000 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)
1612.0250	-13.0000	-51.4400 *	-49.5900 *
2418.0375	-13.0000	-56.4809 **	-55.3229 **
3224.0500	-13.0000	-53.8654 **	-53.6901 **
4030.0625	-13.0000	-52.0882 **	-51.6123 **
4836.0750	-13.0000	-49.0101 **	-49.6853 **
5642.0875	-13.0000	-48.2364 **	-49.5203 **
6448.1000	-13.0000	-47.3482 **	-46.2898 **
7254.1125	-13.0000	-45.8279 **	-44.5821 **
8060.1250	-13.0000	-43.4933 **	-45.3823 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

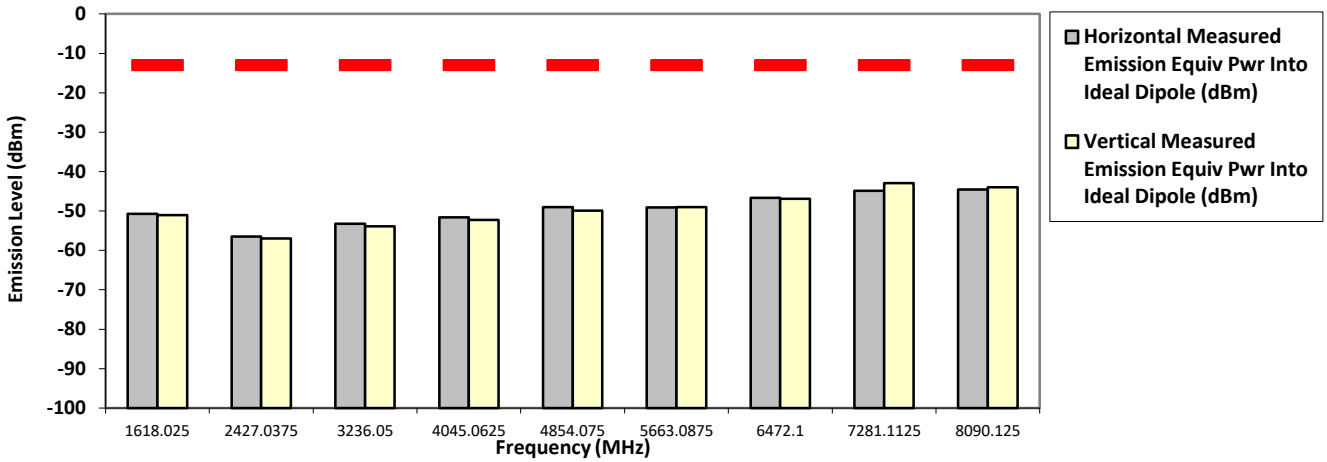
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

809.012500 MHz **25 kHz** **3.000 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)
1618.0250	-13.0000	-50.7100 *	-51.0300 *
2427.0375	-13.0000	-56.4934 **	-56.9285 **
3236.0500	-13.0000	-53.2584 **	-53.9077 **
4045.0625	-13.0000	-51.5707 **	-52.2231 **
4854.0750	-13.0000	-48.9708 **	-49.8964 **
5663.0875	-13.0000	-49.1236 **	-48.9807 **
6472.1000	-13.0000	-46.6725 **	-46.9319 **
7281.1125	-13.0000	-44.8932 **	-42.9617 **
8090.1250	-13.0000	-44.5742 **	-44.0071 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

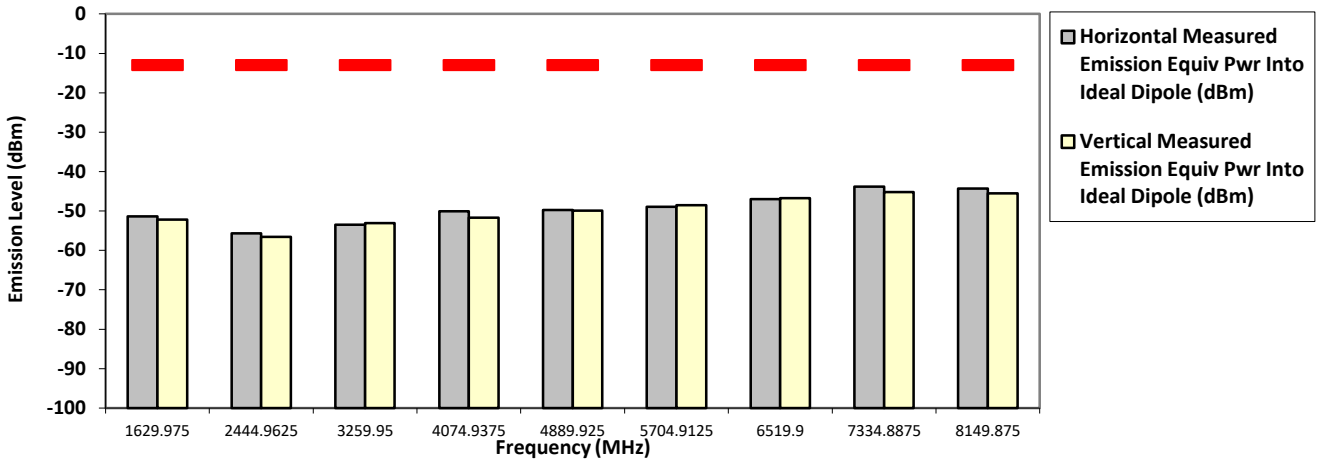
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

814.987500 MHz **25 kHz** **3.000 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)
1629.9750	-13.0000	-51.3900 *	-52.1800 *
2444.9625	-13.0000	-55.6744 **	-56.5688 **
3259.9500	-13.0000	-53.5158 **	-53.0529 **
4074.9375	-13.0000	-50.0518 **	-51.6658 **
4889.9250	-13.0000	-49.7642 **	-49.8732 **
5704.9125	-13.0000	-48.9409 **	-48.5506 **
6519.9000	-13.0000	-46.9462 **	-46.7618 **
7334.8875	-13.0000	-43.7928 **	-45.1577 **
8149.8750	-13.0000	-44.2935 **	-45.5507 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

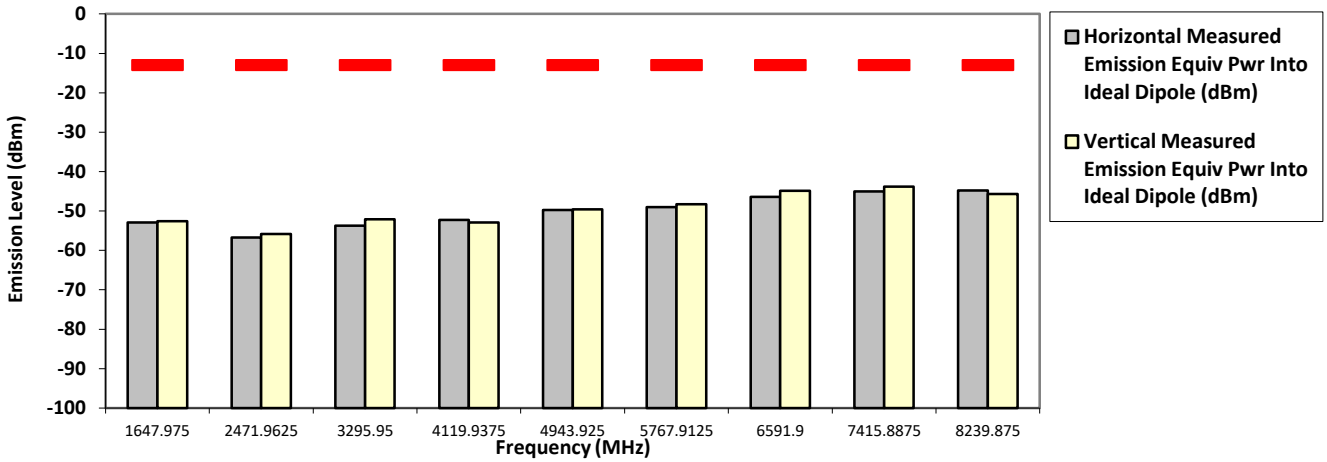
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

823.987500 MHz **25 kHz** **3.000 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)
1647.9750	-13.0000	-52.8700 *	-52.6100 *
2471.9625	-13.0000	-56.7385 **	-55.8432 **
3295.9500	-13.0000	-53.7197 **	-52.1184 **
4119.9375	-13.0000	-52.2454 **	-52.9334 **
4943.9250	-13.0000	-49.7042 **	-49.6176 **
5767.9125	-13.0000	-49.0219 **	-48.2402 **
6591.9000	-13.0000	-46.4301 **	-44.8318 **
7415.8875	-13.0000	-45.0042 **	-43.7779 **
8239.8750	-13.0000	-44.7819 **	-45.6772 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

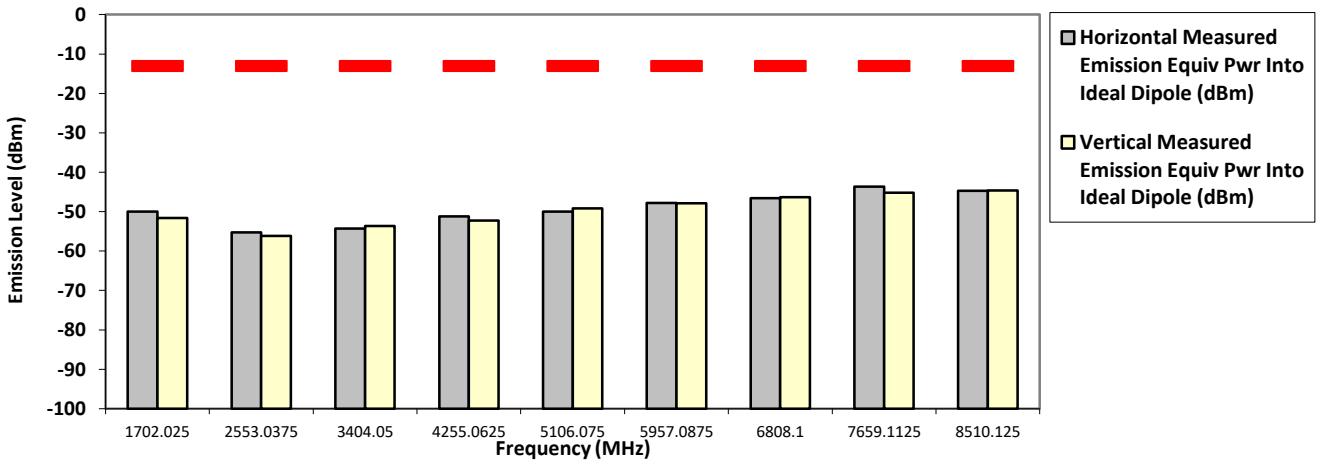
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

851.012500 MHz **25 kHz** **3.000 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)
1702.0250	-13.0000	-49.9700 *	-51.5800 *
2553.0375	-13.0000	-55.2383 **	-56.1475 **
3404.0500	-13.0000	-54.3220 **	-53.6194 **
4255.0625	-13.0000	-51.1803 **	-52.2671 **
5106.0750	-13.0000	-50.0128 **	-49.1549 **
5957.0875	-13.0000	-47.7552 **	-47.9111 **
6808.1000	-13.0000	-46.5746 **	-46.3203 **
7659.1125	-13.0000	-43.6147 **	-45.1840 **
8510.1250	-13.0000	-44.7050 **	-44.6346 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

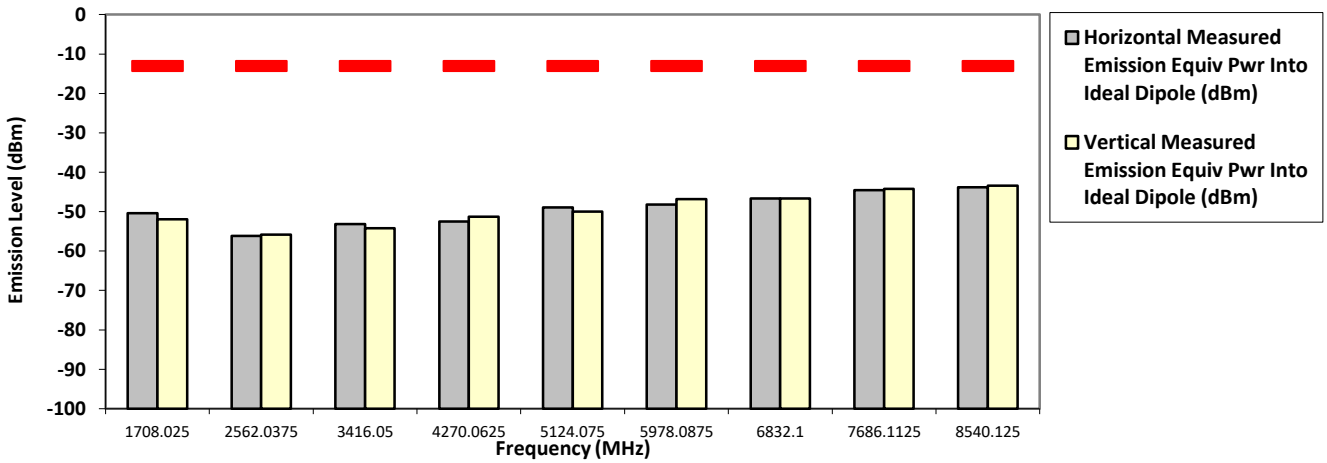
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

854.012500 MHz **25 kHz** **3.000 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)
1708.0250	-13.0000	-50.4300 *	-51.9200 *
2562.0375	-13.0000	-56.1513 **	-55.8245 **
3416.0500	-13.0000	-53.1810 **	-54.2431 **
4270.0625	-13.0000	-52.5143 **	-51.3047 **
5124.0750	-13.0000	-48.9116 **	-49.9523 **
5978.0875	-13.0000	-48.1642 **	-46.8166 **
6832.1000	-13.0000	-46.6349 **	-46.6490 **
7686.1125	-13.0000	-44.5148 **	-44.1989 **
8540.1250	-13.0000	-43.8495 **	-43.3704 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

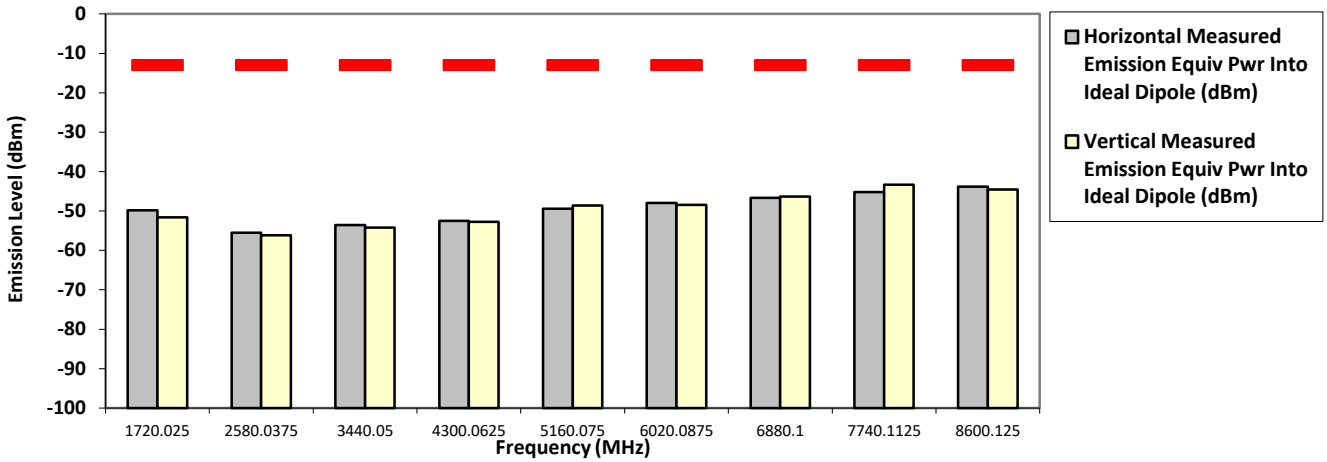
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

860.012500 MHz **25 kHz** **3.000 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)
1720.0250	-13.0000	-49.8200 *	-51.6100 *
2580.0375	-13.0000	-55.4669 **	-56.1376 **
3440.0500	-13.0000	-53.5899 **	-54.1942 **
4300.0625	-13.0000	-52.5270 **	-52.7640 **
5160.0750	-13.0000	-49.3884 **	-48.5851 **
6020.0875	-13.0000	-47.9365 **	-48.4214 **
6880.1000	-13.0000	-46.6620 **	-46.3053 **
7740.1125	-13.0000	-45.1837 **	-43.3626 **
8600.1250	-13.0000	-43.8316 **	-44.5746 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

SAC Transmitter Radiated Emission:

Model Number: AZH63UCH6TZ8BN **S/N: 121TZT0030** **SR: 40897-EMC-00031**

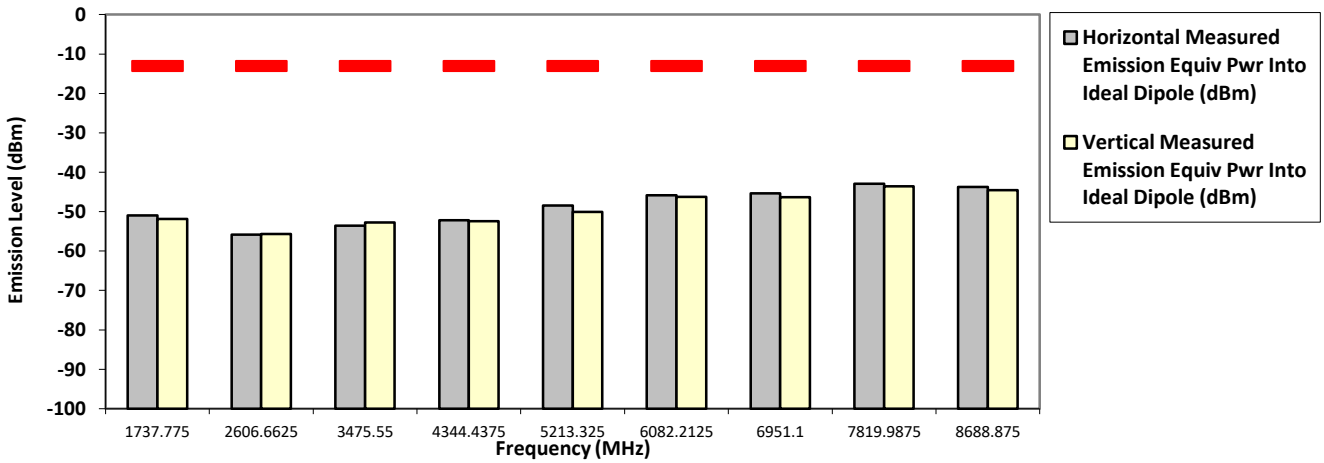
Battery Part No: PMNN4522A **Accy Part No: NA**

Test Mode: TX Digital (pi/4 DQPSK)

868.887500 MHz **25 kHz** **3.000 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)
1737.7750	-13.0000	-51.0000 *	-51.8300 *
2606.6625	-13.0000	-55.8374 **	-55.6604 **
3475.5500	-13.0000	-53.5270 **	-52.7711 **
4344.4375	-13.0000	-52.1910 **	-52.4557 **
5213.3250	-13.0000	-48.4629 **	-50.0764 **
6082.2125	-13.0000	-45.8443 **	-46.2204 **
6951.1000	-13.0000	-45.3349 **	-46.2969 **
7819.9875	-13.0000	-42.9500 **	-43.6031 **
8688.8750	-13.0000	-43.7026 **	-44.5213 **

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: Haikal & Nazrin **Mon, 18 Sep, 2023**

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): 23.5 Hum(%RH): 69.9

Remarks: Passed Results | **Marginal Results** | **Failed Results**

6.7.4. Test Limit

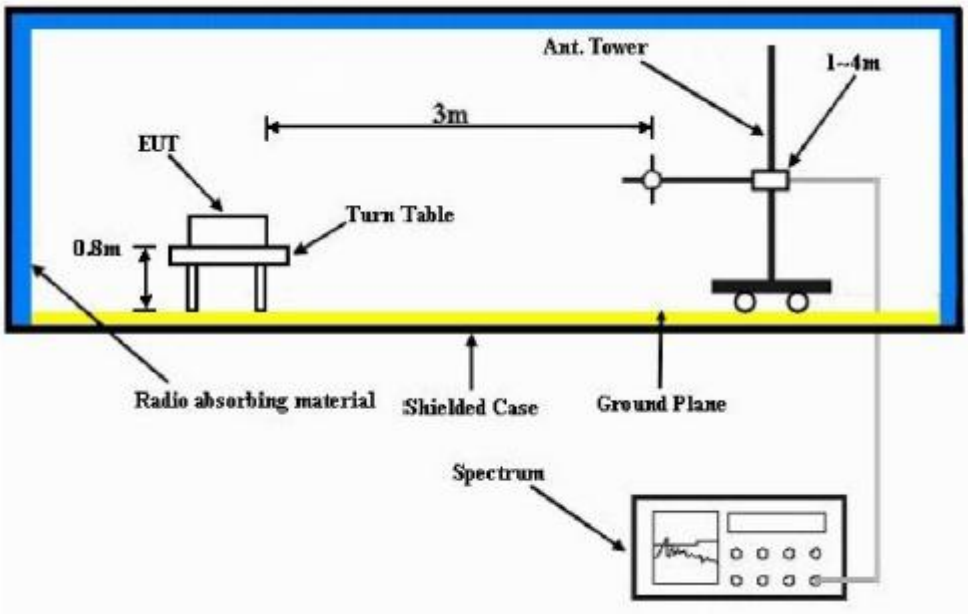
Table below summarized the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least

Channel Spacing	Part 22	Part 24D	Part 74	Part 80	Part 90 (UHF, VHF, 800, 900)	Part 90 (700)
12.5kHz	43 + 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)

6.8. Effective Radiated Power (ERP)

6.8.1. 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 Fc < 1GHz) or 1.5m (for Fc > 1GHz) 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.

6.8.2. Test Result

Not Applicable.

6.8.3. 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).

~ End of Test Report ~