

EXHIBIT 7

Measurement Procedure & Test Equipment Used

Except where otherwise stated, all measurements are made following the Electronic Industries Association (EIA) Minimum Standard for Portable/Personal Land Mobile Communications FM or PM Equipment 25-1000 MHz-(EIA/TIA-603-D), ANSI C63.4: 2014 and ANSI C63.26.

This exhibit presents a brief summary of how the measurements were made, the required limits, and the test equipment used.

The following procedures are presented with this application.

1.	Test Equipment List	<u> x </u>
2.	RF Power Output Data	<u> x </u>
3.	Audio Frequency Response	<u> x </u>
4.	Audio Low Pass Filter Response	<u> x </u>
5.	Modulation Limiting	<u> x </u>
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9.	Conducted Spurious Emissions	<u> x </u>
10.	Frequency Stability (Supply Voltage/Temp)	<u> x </u>
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12.	Adjacent Channel Power	<u> x </u>
13.	Effective Radiated Power (ERP)	<u> x </u>

Test Equipment List

Pursuant To FCC Rules 2.947 (d)

No.	Equipment	Model No.	Serial No.	Cal Due date
1	Computer	Hp600pd	AH429642	*Calibration not required*
2	RF Signal Generator	Agilent E4420B	MY43350219	05-Nov-2017
3	Modulation Analyzer	HP 8901B	3403A04974	04-Nov-2017
4	Audio Analyzer	HP 8903B	2836A05866	08-Apr-2017
5	Dynamic Signal Analyzer	Agilent 35670A	MY42507103	12-Jun-2016
6	PSA Series Spectrum Analyzer	Agilent E4440A	MY46185415	13-Oct-2017
7	HP DC Power Supply	HP 6032A	3415A09877	22-Jul-2017
8	Power Meter	Agilent E4412A	GB41292915	11-Jun-2017
9	Power Sensor (with 30DB Pad)	Agilent E9301B	US38485352	26-Dec-2017
10	Infiniium Oscilloscope	Agilent MSO54831D	MY42001936	8-May-2017
11	Transceiver Interface	HP 8954A	2612A00591	12-Jun-2016
12	Espec Chamber	SH-641	92009188A	27-Jan-2017
13	Dual Directional Coupler	HP 778D	14163	*Calibration not required*
14	Spectrum Analyzer	HP 8563E	3221A00221	4-Dec-2017
15	DRG Horn Freq.	SAS-571	566	2-Aug-2016
16	Broad-Band Horn Antenna	BBHA9170	BBHA9170143	24-Nov-2016
17	Bilog Antenna	CBL6112B	2964	23-Jan-2017
18	Power Supply	6031A	3121A02341	12-Jun-2016
19	EMI Test Receiver	ESIB26	100336	17-Jun-2016
20	Microwave Signal Generator	SMP04	100131	25-Jun-2016
21	System Controller	SC104V	050806-1	NA
22	Turntable Flush Mount 2M	FM2011	NA	NA
23	Antenna Positioning Tower	TLT2	NA	NA
24	Test Receiver	ESIB26	827769/009	16-Jun-2016
25	Signal Analyzer	FSV40	101103	25-Jun-2016
26	5m Semi-anechoic Chamber	S800-HX	J2308	29-July-2016
27	Data Logger	TM320	12249289	27-Apr-2017
28	Bilog Antenna	CBL6112D	25516	23-Jan-2017
29	18 – 40 GHz PreAmplifier	BBV9721	9721-007	NA

Test Name	FCC Rules Part (47 CFR)	IC Rules
RF Power Output Data	2.1046(a), 2.1033(c)(6), 2.1033(c)(7) and 2.1033(c)(8) 90.541 (700 MHz) * 22.565(f) * 24.132 (900 MHz) * 74.461	RSS-Gen Sec 6.12, RSS-119 Sec 5.4 * RSS 134 Sec 5.4 (900 MHz)
TX Audio Frequency Response	2.1047 and 2.1033(c)(13) * 22.355	-
TX Audio Low Pass Filter Response	2.1047	-
Modulation Limiting	2.1047 * 74.463	-
Occupied Bandwidth	2.1049, 90.210, 90.691 (800MHz), * 22.359 (b) * 24D (900MHz) * 74.462(b)	RSS GEN Sec 6.6, RSS 119 Sec 5.5, * RSS 134 (900MHz)
TX Radiated Spurious Emissions	2.1053, 90.210, * 22.359 * 74.462(c)	RSS GEN Sec 6.13, RSS 119 Sec 4.2, 5.8
TX Conducted Spurious Emissions	2.1051, 90.210, * 22.359 * 24.133 (900MHz) * 80.211(c) * 74.462(c)	RSS GEN Sec 6.13, RSS 119 Sec 4.2, 5.8, * RSS 134 Sec 6.3(ii) (900MHz) * RSS 182
Frequency Stability (Temp / Supply Voltage)	2.1055, 90.213, 90.539 (700 MHz) * 22.355 * 24.135 (900 MHz) * 74.464	RSS GEN Sec 6.11 RSS 119 Sec 5.3 * RSS 134 Sec 7 (900MHz)
* Transient Frequency Behavior	* 90.214	* RSS 119 Sec 5.9
Adjacent Channel Power	90.543 (700MHz)	RSS 119 Sec 4.3, 5.8.9 (700MHz)
1559-1610 MHz Radiated Emissions (GNSS)	2.1053, 90.543(f) (700MHz)	-
ERP (Effective Radiated Power)	90.541 (700 MHz) * 24.132 (900 MHz)	* RSS 134 Sec 5.4 (900 MHz)

Table 2: List of FCC and IC reference

* Note: Not Applicable for this filing

Measurement Procedures Used for Submitted Data**RF Power Output**

Pursuant to FCC Rules 2.1046 (a)

Conducted power is measured in accordance with TIA-603-D section 2.2.1.2. The transmitter under test is connected to an Power Meter using the forward port of a 30 dB attenuator pad and power sensor.

The transmitter is operated in test mode under normal conditions. The DC voltage applied to the transmitter are read directly from the calibrated DC Power Supply. Remote voltage sensing is used to ensure the correct DC voltage is applied to the battery terminal of DUT. This measurement is performed at the lowest, the middle, and the highest operating frequencies of the operating bandwidth of the equipment.

Audio Frequency Response

Pursuant FCC Rules 2.1047 (a)

Operate the transmitter under standard test conditions and monitor the output with a frequency deviation meter or calibrated test receiver. With 1000 Hz sine wave audio input applied through a dummy microphone circuit, adjust the audio input to give 20% of full rated system deviation. Maintaining a constant input voltage, vary the input frequency from 300 to 3000 Hz, and observe the deviation.

Audio Low Pass Filter Response

Pursuant FCC Rules 2.1047 (a)

The audio oscillator portion of an audio analyzer is connected to the input of the post limiter low pass filter. The oscillator is adjusted, at 1000 Hz and level 16dB greater than that required to produce standard test modulation. The output of the low pass filter is measured with an dynamic signal analyzer. The response is swept between the limits of 1000 Hz - 30000 Hz. Oscillator level is chosen to be as high as possible and that will not cause limiting at any frequency, and maintaining a constant input level versus frequency.

Modulation Limiting

Pursuant FCC Rules 2.1047 (b)

The transmitter shall be adjusted for full rated system deviation. Adjust the audio input for 60% of rated system deviation at 1000 Hz. Using this level as a reference (0 dB) vary the audio input level from the reference to a level 20 dB above it for modulation frequencies between 300 and 3000 Hz in 100Hz steps. Record the system deviation obtained as a function of the input level.

Occupied Bandwidth

Pursuant to FCC Rules 2.1049

Data on occupied bandwidth is presented in the form of a spectrum analyzer photograph, which illustrates the transmitter sidebands. For analog signals, the reference line for the data plot is taken of the unmodulated carrier, to which is superimposed the sideband display generated by modulating the carrier with a 2500 Hz tone at a level 16 dB greater than that required to produce 50 percent modulation. For digital voice, data, and TDMA, the reference line for the data plot is that of the peak value of the modulated carrier. For digital data, the Standard Transmitter Test Pattern is a continuously repeating 511 bit pseudo-random bit sequence based on ITU-T 0.153. If tone or digital coded squelch is indicated, photographs using both the 2500 Hz tone and the indicated squelch signal are used to modulate the transmitter. During these measurements, the instantaneous Deviation Control is set for a maximum of +5 kHz.

Transmit Radiated Spurious Emissions

Pursuant to FCC Rules 2.1053

Test Site:

The site, located at Penang, Malaysia, is in a region which is reasonably free from RF interference and has been approved by the Commission for Spurious Measurements.

The equipment is placed on the turntable, connected to a dummy RF load and then placed in normal operation using the intended power source. A broadband receiving antenna, located 3 meters from the transmitter-under-test (TUT), picks up any signals radiated from the transmitter and its operation accessories. The antenna is adjustable in height and can be horizontally and vertically polarized. A spectrum analyzer covering the necessary frequency range is used to detect and measure any radiation picked up by the above mentioned receiving antenna.

Method of Measurement:

The equipment is adjusted to obtain peak reading of received signals wherever they occur in the spectrum by:

- a. Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth = 100 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1GHz.
 - 2) Video Bandwidth = 300 kHz for spurious emissions below 1 GHz, and 3 MHz for spurious emissions above 1 GHz.
 - 3) Sweep Speed slow enough to maintain measurement calibration.
 - 4) Detector Mode = Positive Peak.
- b. Key the transmitter.
- c. For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360° to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

The testing procedure is repeated for both horizontal and vertical polarization of the receiving antenna. Relative signal strength is indicated on the spectrum analyzer connected to the receiving antenna. To obtain actual radiated signal strength for each spurious and harmonic frequency observed, a standard signal generator with calibrated output is connected to a dipole antenna adjusted to that particular frequency. This dipole antenna is substituted for the transmitter under test. The signal generator is adjusted in output level until a reading identical to that obtained with the actual transmitter is observed on the spectrum analyzer. Signal strength is then read directly from the generator. Actual measurements are recorded on the attached graphs.

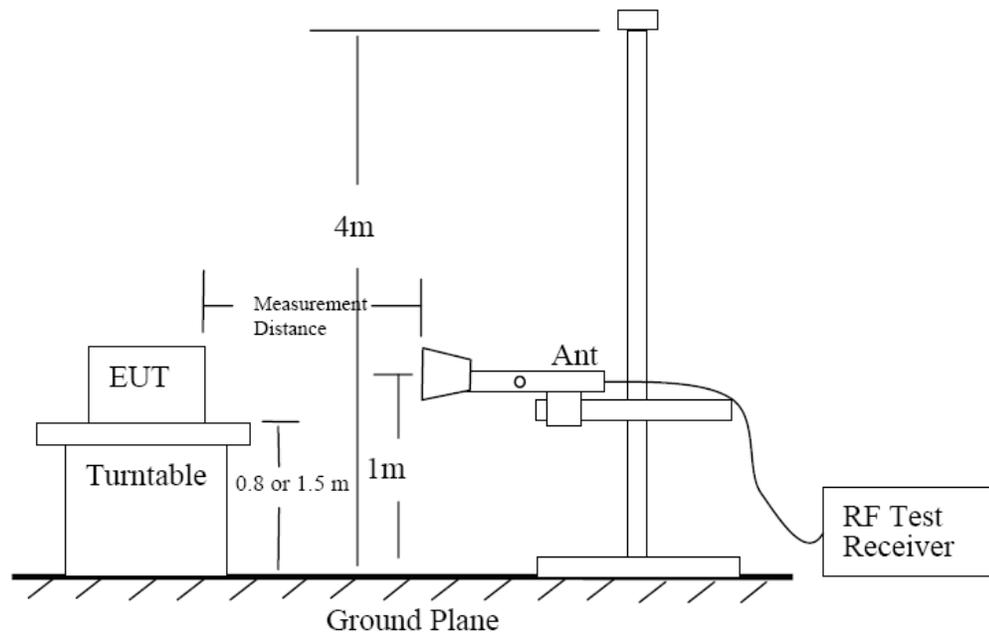
Transmit Radiated Spurious Emissions
Pursuant to RSS GEN (ANSI C63.26-2015)

Test Site:

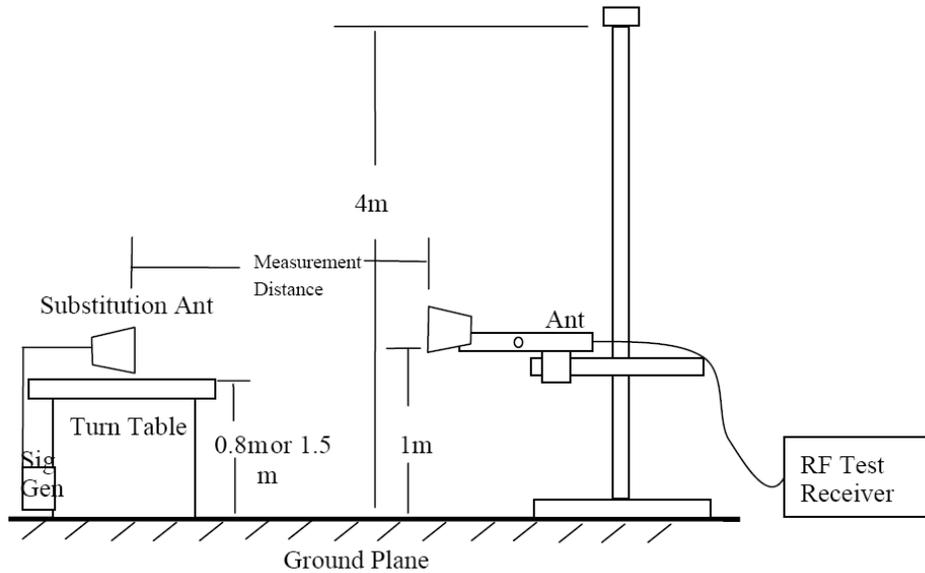
The site, located at Penang, Malaysia, is in a region which is reasonably free from RF interference and has been approved by the Commission for Spurious Measurements.

Method of Measurement:

1. Radiated Emissions perform using setup as shown in figure below.
2. For radiated emissions measurements performed at frequencies less than or equal to 1Ghz, EUT shall be placed on a table support at nominal height of 80cm above reference ground plane and place EUT at 1.5m above the ground plane for measurements at frequencies above 1Ghz.
3. Perform a direct field strength measurement of maximum emission amplitude level by rotate EUT through 360° and antenna height scan 1-4m.
4. Record the measured emission amplitude level and frequency using appropriate RBW.



1. After direct field strength measurements a signal generator and transmit antenna are substituted in place of EUT and shown in figure below.
2. The output power of the signal generator is adjusted to replicate the maximized signal amplitude measured in direct field strength measurements.
3. The signal generator power setting is then used to determine ERP/EIRP of the EUT spurious emissions.



1559-1610MHz Radiated Emissions (GNSS)
Pursuant to FCC Rules 90.543 (f)

Method of Measurement:

- 1) Adjust the spectrum analyzer for the following settings:
 - b) Resolution Bandwidth = 1 MHz.
 - c) Video Bandwidth \geq 3 times the resolution bandwidth.
 - d) Sweep Speed slow enough to maintain measurement calibration.
 - e) Detector Mode = mean or average.
- 2) Place the transmitter to be tested on the turntable in the standard test site, or an FCC listed site compliant with ANSI C63.4-2001 clause 5.4.
- 3) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from 1.559 GHz to 1.610 GHz.
- 4) Key the transmitter with standard modulation applied to the transmitter.
- 5) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360° to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

$$\text{EIRP (dBm)} = \text{Level (dBm)} - \text{Loss (dB)} + \text{Antenna Gain (dBi)}$$

Conducted Spurious Emissions

Pursuant to FCC Rule 2.1051

The output of the transmitter is connected, via a suitable attenuator, to the input of an spectrum analyzer. The level of spurious emissions, in dBm, is plotted. This data is measured at the lower, middle, and upper frequency limits of the frequency range.

Note:

RBW setting is adjusted to 100kHz for frequency below 1GHz and 1MHz for frequency above 1GHz.

Frequency Stability

Pursuant to FCC Rule 2.1055

- A. Temperature (Non-heated type crystal oscillators):
Frequency measurements are made at the extremes of the temperature range -30 to +60 degrees centigrade and at intervals of not more than 10 degrees centigrade throughout the range. Sufficient time is allowed prior to each measurement for the circuit components to stabilize.

- B. Power Supply Voltage:
The primary voltage was varied from 85% to 115% of the nominal supply voltage. Voltage is measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Transient Frequency Behavior

Pursuant to FCC Rule 90.214

Transient frequency behavior is a measure of the difference, as a function in time, of the actual transmitter frequency to the assigned transmitter frequency when the transmitted RF output power is switched on or off.

Setup -- Per TIA/EIA 603, Section 2.2.19

Connect the output port of the transmitter under test (TUT) to an attenuator, and this to a directional coupler. Connect an RF peak detector to the coupled output of the directional coupler, and connect the output of the RF peak detector to the external trigger on a storage oscilloscope. The output of the directional coupler is mixed, via an RF combining network, with the output of a signal generator. Verify that the TUT signal level present at the combining network output is approximately 40 dB below the maximum input level of the test receiver as per step (f). Set the signal generator at the same frequency as the TUT, modulated with a 1 kHz tone, with an FM deviation equal to the assigned channel spacing (+25 kHz). Following step (h), adjust the signal generator to provide 20 dB less power at the combiner output than the level set in step (f). Connect the output of the RF combiner to a test receiver, and the test receiver's output port to a vertical input channel of the storage scope. Adjust the horizontal sweep rate on the oscilloscope to 10 msec/div, and the vertical amplitude to display the 1 kHz tone over +/- 4 divisions centered on the display. Reduce the transmit attenuation by 30 dB as per step (l) so that the difference in the power between the reference signal and the TUT signal at the combiner is 50 dB when the TUT is turned on. Following step (k), adjust the oscilloscope to trigger on an increasing signal from the RF detector at one division from the left side of the display when the TUT is turned on. Switch on the TUT and record the display (for RF Output Power ON). Following step (q), adjust the oscilloscope trigger controls to trigger on a decreasing signal from the RF peak detector, at 1 division from the right side of the display when the TUT is turned off. Switch off the transmitter and record the display (for RF Output Power OFF).

* Steps (f), (h), (k), (l), and (q) - section 2.2.19 of the TIA/EIA 603 were followed.

Method of Measurement -- Per TIA/EIA-603-2.2.19.

For RF Output Power ON: Turn the transmitter ON. Once the demodulator output has been captured by the transmitter power, the 1 kHz test signal will be completely suppressed. This point in time is named T-on. The display will then show the frequency difference from the assigned frequency to the actual transmitter frequency versus time. Two time intervals will be measured following T-on: T-1 and T-2.

So, the RF ON time intervals are as follows: T-on -----> T-1 -----> T-2

For RF Output Power OFF: Turn the transmitter OFF. The display will show the transmitter frequency difference versus time, and when the 1 kHz test signal starts to rise, it indicates total absence of the transmitter output at the specified frequency. This point is named T-off. Time interval T-3 precedes T-off. So, the RF OFF time intervals are as follows: T-3 -----> T-off.

Adjacent Channel Power

Pursuant to FCC Rule 90.543

Method of Measurement:

- a) The transmitter shall be operated at the rated carrier power. The adjacent channel power analyzer is set to use average power detection (sample or rms detector) and a span of 100 kHz.
- b) The measurement bandwidth settings and markers of the analyzer shall be centered at the transmitter operating frequency, and at both the upper and lower adjacent channel frequencies using a power measurement bandwidth and resolution bandwidth as specified in 3.2.14 of this document. The video bandwidth shall be set to at least ten times the resolution bandwidth.

3.2.14.3 All frequency bands below 1 GHz excluding frequencies in FCC Part 90.543 (769-775/799-805 MHz).

Adjacent channel power ratio for fixed, mobile and portable stations is shown within the following specified channel bandwidths:

Table 44 - Adjacent Channel Power Ratio

Channel Bandwidth	Measurement Bandwidth	Fixed Station (dB)	Mobile Station (dB)	Portable Station (dB)
≥ 25.0 kHz	16 kHz	70 if < 512 MHz 60 if > 512 MHz	70 if < 512 MHz 60 if > 512 MHz	70 if < 512 MHz 60 if > 512 MHz
20.0 kHz	14 kHz	70 if < 512 MHz 60 if > 512 MHz	70 if < 512 MHz 60 if > 512 MHz	70 if < 512 MHz 60 if > 512 MHz
15.0 kHz	8.5 kHz	70 dB	70	70
12.5 kHz	8.5 kHz	60 if < 512 MHz 50 if > 512 MHz	60 if < 512 MHz 50 if > 512 MHz	60 if < 512 MHz 50 if > 512 MHz

Note: The resolution bandwidth must be no greater than 2% of the measurement bandwidth.

3.2.14.4 700 MHz Band (90.543 (a) mobile devices)

Table 45 - 12.5 kHz Mobile Transmitter ACPR Requirements

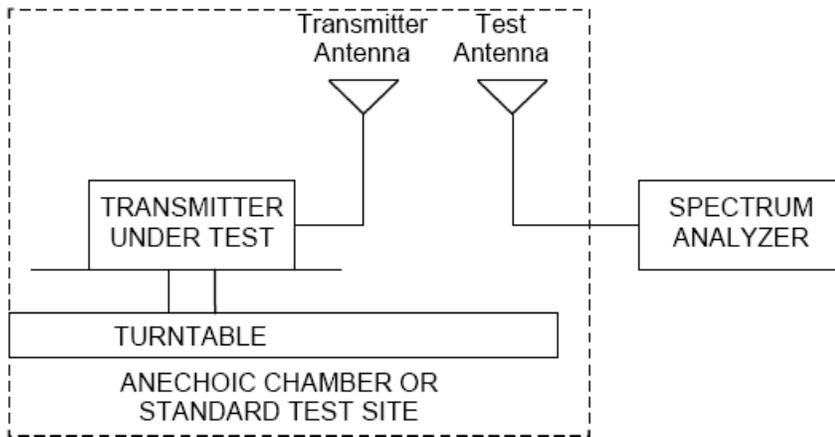
Offset from Center Frequency (kHz)	Nominal Resolution Bandwidth (Hz)	Measurement Bandwidth (kHz)	Maximum ACPR (dB)
9.375	100	6.25	40
15.625	100	6.25	60
21.875	100	6.25	60
37.50	300	25.00	60
62.50	300	25.00	65
87.50	300	25.00	65
150.00	1000	100.00	65
250.00	1000	100.00	65
350.00	1000	100.00	65
>400 to paired RX Band	30000	30 (swept)	75
In paired RX Band	30000	30 (swept)	100

Table 46 - 25 kHz Mobile Transmitter ACPR Requirements

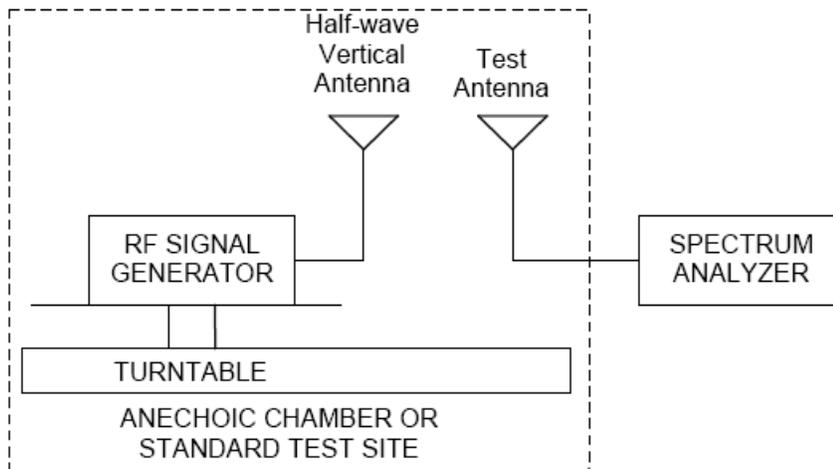
Offset from Center Frequency (kHz)	Nominal Resolution Bandwidth (Hz)	Measurement Bandwidth (kHz)	Maximum ACPR (dB)
15.625	100	6.25	40
21.875	100	6.25	60
37.50	300	25.00	60
62.50	300	25.00	65
87.50	300	25.00	65
150.00	1000	100.00	65
250.00	1000	100.00	65
350.00	1000	100.00	65
>400 to paired RX Band	30000	30 (swept)	75
In paired RX Band	30000	30 (swept)	100

- d) Adjust the frequency of one audio generator to 650 Hz. With the second audio generator off, adjust the amplitude of first audio generator to provide a transmitter modulation of 50% of rated system deviation. Record the audio generator level.
- e) Turn off the first audio generator. Adjust the frequency of the second audio generator to 2200 Hz. Adjust the amplitude of the second audio generator to provide a transmitter modulation of 50% of rated system deviation. Record the audio generator level.
- f) Turn both audio generators on and adjust the level of each to be 10 dB greater than the levels recorded in steps d) and e).
- g) Key the transmitter.
- h) The power shall be measured on the adjacent channel power analyzer in the specified measurement 6 dB bandwidth centered at both the upper and lower specified frequency offsets from the carrier frequency as listed in 3.2.14.3. Each lower frequency value shall be recorded in dBm as *PADJL*, and each upper frequency value shall be recorded in dBm as *PADJU*.

Effective Radiated Power (ERP)



- a) Connect the equipment as illustrated above. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment.



- c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.

$LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:

$$ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$$