

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) and Digital C4FM/CQPSK Transceiver Measurement Method (TIA 102 CAAA-C).

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. Occupied Bandwidth	<u> x </u>
4. Conducted Spurious Emissions	<u> x </u>
5. Radiated Spurious Emissions	<u> x </u>
6. Frequency Stability (Volt/Temp)	<u> x </u>
7. Power Line Conducted Spurious Emissions	<u> x </u>
8. Adjacent Channel Power	<u> x </u>
9. Transient Frequency Behavior	<u> </u>

Test Equipment List

Pursuant To FCC Rules 2.947 (d)

Equipment	Model No.	Serial No.	Cal Due date
Microwave Generator	SMP 04	100131	11-Apr-14
Spectrum Analyzer/ESI Test Receiver	ESIB 26	100336	2-Aug-14
Bilog Antenna [30MHz-2GHz]	CBL6112B	2964	18-Dec-14
Bilog Antenna [30MHz-2GHz]	CBL6112D	25516	18-Dec-14
DRG Horn Freq. 700MHz-18GHz	SAS-571	720	18-Dec-14
DRG Horn Freq. 700MHz-18GHz	SAS-571	719	18-Dec-14
Temp/Humidity Monitor	TM 320	12249298	8-Nov-14
SAC (5m Semi-anechoic Chamber)	S800-HX	J2308	Dec-14
Antenna Positioning Tower (Boresight)	TLT2	NA	No Cal. Req'd
System controller	SC104V	050806-1	No Cal. Req'd
Turntable. Flush Mount 2M	FM2011	NA	No Cal. Req'd
Pre-amplifier	PAM-0118	270A	No Cal. Req'd
Modulation Analyzer	8901B	2806A01913	13-Mar-14
Spectrum Analyzer	E4443A	MY46181974	26-Jun-14
Oscilloscope	MSO8064A	MY45003003	22-Oct-14
TETRA Signal Analyzer	IFR2310	230901/004	14-Dec-14
Power Meter	E4416A	MY50000114	22-Feb-15
Power Sensor	E4412A	MY50290009	10-Jul-14
Signal Generator	SMHU	838383/010	27-May-14
Digital Radio Test Set	IFR3920	299001282	12-Sep-14
Spectrum Analyzer*	E4445A	MY46181871	14-Mar-16

Table 1: List of equipments used

***This equipment was used for additional measurements in November 2014.**

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, 90.545(b)(4) (700 MHz) * 22.565(f) (VHF & UHF), * 24.132 (900 MHz) * 74.461 (VHF & UHF)	RSS-Gen Sec 6.12, RSS-119 Sec 5.4.1, * RSS 119 Sec 5.4.5 (700 MHz) * RSS 134 Sec 5.4 (900 MHz)
TX Audio Frequency Response	* 2.1047 and 2.1033(c)(13)	-
TX Audio Low Pass Filter Response	* 2.1047	-
Modulation Limiting	* 2.1047 *74.463 (VHF & UHF)	-
Occupied Bandwidth	2.1049, 90.210, 90.691 (800 MHz), * 22.359 (VHF,UHF), * 24.133 (900 MHz), *74.462(b) (VHF & UHF)	RSS GEN Sec 6.6, RSS 119 Sec 5.5, * RSS 134 Sec 5.5 (900 MHz)
TX Conducted Spurious Emissions	2.1051, 90.210, * 22.359 (VHF,UHF), * 24.133 (900MHz) * 80.211(c) (VHF), * 74.462(c) (VHF & UHF)	RSS GEN Sec 6.13, RSS 119 Sec 4.2, 5.8, * RSS 134 Sec 6.3(ii) (900MHz) * RSS 182 (VHF)
TX Radiated Spurious Emissions	2.1053, 90.210, * 22.359 (VHF,UHF) * 74.462(c) (VHF & UHF)	RSS GEN Sec 6.13, RSS 119 Sec 4.2, 5.8
Frequency Stability (Temp / Supply Voltage)	2.1055, 90.213, * 90.539 (700 MHz) * 22.355 * 24.135 (900 MHz) * 74.464 (VHF & UHF)	RSS GEN Sec 6.11 RSS 119 Sec 5.3 * RSS 134 Sec 7 (900MHz) Notice 2011-08 (TETRA)
Power Line Conducted Spurious Emissions	15.107	-
Adjacent Channel Power	* 90.543 (a)-(d)(700 MHz) * 90.221(b) (UHF TETRA) 90.221(c) (8/900 TETRA) R&O FCC 12-114, FCC 11-63 (TETRA)	* RSS 119 Sec 4.3 (700 MHz) * RSS 119 Sec 5.8.9 (700 MHz) RSS 119 Sec 5.5 Table 3 ^(Note 2) (TETRA) RSS 119 Sec 5.8.10 (TETRA)
Transient Frequency Behaviour	* 90.214 (VHF & UHF)	* RSS 119 Sec 5.9 (VHF & UHF)

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 nominal 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.

The calibration of the power meter is verified on an annual basis. Other power measurement systems that may be used are correlated with this calibrated reference system before measurements are performed, and calibration factors are adjusted as necessary to obtain precise correlation.

Occupied Bandwidth

Pursuant to FCC Rules 2.1049

Procedure for Occupied Bandwidth Measurement for High Performance Data (DQPSK) Data

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings:

Resolution Bandwidth: 300 Hz
Video Bandwidth: 3 kHz
Span: 40 kHz
Detector Mode: Peak

Test Procedure:

- 1) The transmitter is connected via a suitable attenuator to the spectrum analyzer.
- 2) Use occupied bandwidth function and adjust the spectrum analyzer per the values specified in the Emission Measurement Analyzer Settings.
- 3) Place the radio in test mode such that it transmit with the appropriate signaling pattern, (511-bit pseudo-random data) and key the transmitter at the full power rating. Use the analyzer controls to set this signal to the full-scale reference line. Allow the analyzer to sweep fully and store the sweep.
- 4) Set RBW=30kHz, VBW=300kHz & SPAN=100kHz on spectrum analyzer to measure the total power of the carrier-bandwidth and then used to establish a 0 dB reference plot for exhibits.
- 5) Use values specified in the emission measurement analyzer settings except SPAN=100kHz to sweep fully and generate the emission mask limit.

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

Radiated Spurious Emissions
Pursuant to FCC Rules 2.1053

Test Site:

The site, located at Penang, Malaysia EMC laboratory 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:

1. Rotating the transmitter under test.
2. Adjusting the antenna height.

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.

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 with digital radio test set (IFR3920) 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:
Voltage is measured at the battery terminal of the DUT input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.
 - 1) Portables: The primary voltage was varied from battery operating end point to 115% of the nominal supply voltage.

2) Mobiles: The primary voltage was varied from 85 to 115 percent of the nominal value or varied from the manufacturing end voltage.

Powerline Conducted Spurious Emissions

Pursuant to FCC Rule 15.107

This data measured in accordance with FCC Rules 15.107. The equipment is connected to the power line through a line stabilization network. A spectrum analyzer of nominal 50Ω impedance is connected to one terminal of the line stabilization network. The spectrum analyzer is then tuned to search for spurious outputs from 150 kHz to 30 MHz. Record all spurious outputs found. The spectrum analyzer is then connected to the other terminal of the line stabilization network and record all spurious outputs found. The power line conducted spurious emissions is the largest reading obtained. The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the Table: 1.

Table: 1

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

Adjacent Channel Power

Pursuant to FCC Rule 90.221 (c)

The output of the transmitter is connected to the input of TETRA signal analyzer. The level of adjacent channel power, in dBm, is measured. This data is measured at the middle frequency limits of the frequency range.

Transient Frequency Behavior

Pursuant to FCC Rule 90.214

This data measured in accordance with FCC Rules. Applicable method of measurement and definition can be found in Section 2.2.19 of the TIA/EIA 603D. Specifically, the triggering level was set in the following manner.

The output of the radio is connected to an modulation analyzer by way of a directional coupler, 30dB attenuator, and 2:1 combining network. This output is first measured with an power meter and then the power meter is replaced by the modulation analyzer, and the RF output of a signal generator is connected to the second port of the combining network at a level of 30dB less than the output level of the radio measured after the attenuator. The RF output of the signal generator is modulated with a 1kHz tone and deviation of 12.5kHz or 25kHz depending on the channel spacing. The modulation output of the modulation analyzer is connected to a digital storage oscilloscope. The signal generator is turned on first, and then the radio keyed or de-keyed depending on the particular test. The oscilloscope is triggered by way of a RF peak detector that detects the RF output of the radio by way of the directional coupler.

The picture of the oscilloscope display is stored on a floppy disk and transferred to a computer. The key up attack time plot shows the 1kHz from the RF signal generator signal from the modulation output of the modulation analyzer, and when the radio is keyed, the output signal from the radio captures the receiver of the modulation analyzer, resulting in the carrier only signal. The de-key decay time plots show the unmodulated signal from the radio and when the radio is de-keyed, the 1kHz from the RF signal generator signal captures the receiver of the modulation analyzer, resulting in the 1kHz signal shown in the plots.