ENGINEERING TEST REPORT

DVRS Vehicular Repeater
Model: DVR-LX VHF

FCC ID: LO6-DVRSVHF
IC: 2098B-DVRSVHF

Applicant:

Futurecom Systems Group, ULC
3277 Langstaff Road
Concord, Ontario
Canada, L4K 5P8

Tested in Accordance With

Federal Communications Commission (FCC)
47 CFR, Parts 2, 22, 74, 80 and 90 (Subpart I)
Industry Canada, RSS-119, Issue 12

UltraTech's File No.: 20FSG192_FCC90

This Test report is Issued under the Authority of *Tri M. Luu* *Vice President of Engineering* *UltraTech Group of Labs* *Date: July 14th, 2020*	
Report Prepared by: Sharly Le *Issued Date: July 14th, 2020*	*Tested by: Nimisha Desai* *Test Dates: June 1st, 2020*

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Parts 2, 22, 74, 80 and 90 (Subpart I), RSS-119
Title:	Code of Federal Regulations (CFR), Title 47 Telecommunication – Parts 2, 22, 74, 80 and 90 (Subpart I), Land Mobile
Purpose of Test:	To gain FCC C2PC Equipment Authorization for Radio operating in Parts 2, 22, 74, 80 and 90 (Subpart I) & ISED C2PC TAC
Test Procedures:	ANSI/TIA-603-E, ANSI C63.26

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

1.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19, 80-End	2018	Code of Federal Regulations, Title 47 – Telecommunication
ANSI C63.4	2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz
ANSI C63.26	2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
ANSI/TIA-603-E	2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
RSS-119, Issue 12	2015	Land Mobile and Fixed Radio Transmitters and Receivers Operating in the Frequency Range 27.41-960 MHz
RSS-Gen, Issue 5	2018	General Requirements for Compliance of Radio Apparatus
ICES-003 Issue 6	2016 updated 2019	Information Technology Equipment (Including Digital Apparatus) – Limits

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

Applicant	
Name:	Futurecom Systems Group, ULC
Address:	3277 Langstaff Road Concord, ON Canada L4K 5P8
Contact Person:	Mr. Tony Bombera Phone #: 905 532 1114 Fax #: 905 660 6858 Email Address: tony.bombera@futurecom.com

Manufacturer	
Name:	Futurecom Systems Group, ULC
Address:	3277 Langstaff Road Concord, ON Canada L4K 5P8
Contact Person:	Mr. Tony Bombera Phone #: 905 532 1114 Fax #: 905 660 6858 Email Address: tony.bombera@futurecom.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Futurecom Systems Group, ULC
Product Name:	DVRS Vehicular Repeater
Model Name or Number:	DVR-LX VHF
Serial Number:	Preproduction
Type of Equipment:	Licensed Non-Broadcast Station Transmitter
Power Supply Requirement:	13.8 VDC
Transmitting/Receiving Antenna Type:	Non-integral
Operational Description:	The Futurecom DVRS Vehicular Repeater is designed to interface to a range of mobile radios. It permits expanded operation of portable radios. The DVRS Vehicular Repeater communicates with the mobile radio using a serial data protocol.

2.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	Mobile
Intended Operating Environment:	Commercial, industrial or business environment
Power Supply Requirement:	13.8 Vdc
RF Output Power Rating:	• 20 watts max. • 1 watt min.
Operating Frequency Range:	136-174 MHz
RF Output Impedance:	50 Ohms
Channel Spacing	12.5 kHz and 25 kHz
Occupied Bandwidth (99%):	• 9.8 kHz(analog), 6.7 kHz (Digital) (12.5 kHz Channel Spacing) • 14.8 kHz (25 kHz Channel Spacing)
Emission Designation:	• 11K0F3E, 8K10F8E, 8K10F1D (12.5 kHz Channel Spacing) • 16K0F3E (25 kHz Channel Spacing)
Antenna Connector Type:	TNC Female

* For an average case of commercial telephony, the Necessary Bandwidth is calculated as follows:

For FM Voice Modulation:

Channel Spacing = 12.5 KHz, D = 2.5 KHz max., K = 1, M = 3 KHz
B_n = 2M + 2DK = 2(3) + 2(2.5)(1) = **11 KHz**
Emission designation: 11K0F3E

Channel Spacing = 25 KHz, D = 5 KHz max., K = 1, M = 3 KHz
B_n = 2M + 2DK = 2(3) + 2(5)(1) = **16 KHz**
Emission designation: 16K0F3E

2.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	Transmitter	1	TNC Female	Terminated with 50 Ohm load
2	Receiver	1	TNC Female	Terminated with 50 Ohm load
3	DC Input	1	6-pin Circular	Non-shielded
4	USB	1	4-pin Circular	Shielded
5	Mobile Radio	1	20-pin Circular	Shielded
6	AUX	1	9-pin Circular	Shielded

2.5. ANCILLARY EQUIPMENT

None.

EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	13.8 Vdc

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

Operating Modes:	The transmitter was operated in a continuous transmission mode with the carrier modulated as specified in the Test Data.
Special Test Software:	Testing software provided by the manufacturer to configure different test configurations.
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT is tested with the transmitter antenna port terminated to a 50 Ohms RF Load.

Transmitter Test Signals	
Frequency Band(s):	136-174 MHz
Frequency(ies) Tested: (Near lowest and near highest frequencies in the frequency range of operation.)	138.1 MHz; 151.1 MHz, 161.8 MHz & 173.300 MHz
RF Power Output (Rated maximum output power):	20 Watts High & 1 Watt Low
Normal Test Modulation:	Unmodulated, FM Voice (analog & digital)
Modulating signal source:	External

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with ANAB File No.: AT-1945.

4.2. APPLICABILITY & SUMMARY OF EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Applicability (Yes/No)
1.1307, 1.1310, 2.1091 & 2.1093 RSS-Gen § 3.4 RSS-102	RF Exposure Limit	N/A
2.1046, 22.565, 74.461, 80.215 & 90.205 RSS-119 § 5.4	RF Power Output	Yes
2.1047(a), 80.213(e) & 90.242(b)(8)	Audio Frequency Response	N/A
2.1047(b), 74.463, 80.213 & 90.210	Modulation Limiting	N/A
2.1049, 74.462, 80.211(f), 90.209 & 90.210 RSS-119 § 5.5	Emission Mask	N/A
2.1051, 2.1057, 80.211(f)(3), & 90.210 RSS-119 § 5.8	Emission Limits - Spurious Emissions at Antenna Terminal	N/A
2.1053, 2.1057, 22.359, 80.211(f)(3), & 90.210 RSS-119 § 5.8	Emission Limits - Field Strength of Spurious Emissions	Yes
2.1055, 22.355, 74.464 80.209 & 90.213 RSS-119 § 5.3	Frequency Stability	N/A
74.462(c) & 90.214 RSS-119 § 5.9	Transient Frequency Behavior	N/A
ICES-003	Radiated Emission from Digital Devices	Yes
ICES-003	Conducted Emission from Digital Devices	N/A

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

4.4. DEVIATION OF STANDARD TEST PROCEDURES

None.

EXHIBIT 5. TEST DATA

5.1. RF POWER OUTPUT [§§ 2.1046, 22.565, 74.461, 80.215 & 90.205] [RSS-119 § 5.4]

5.1.1. Limits

Please refer to FCC 47 CFR 90.205, 74.461, 80.215 & 22.565 for specification details.

[RSS-119] The output power shall be within ± 1.0 dB of the manufacturer's rated power

5.1.2. Method of Measurements

Refer to Section 8.1 (Conducted) and 8.2 (Radiated) of this report for measurement details

5.1.3. Test Arrangement

5.1.4. Test Data

High Power

Frequencies MHz	Wide/ Narrow	Power Rating Watts	Power Rating dBm	Power dBm	Actual Power Watts
138.100	Narrow	20.0	43.01	42.94	19.68
151.100	Narrow	20.0	43.01	42.99	19.91
161.800	Narrow	20.0	43.01	42.86	19.32
173.300	Narrow	20.0	43.01	43.04	20.14

Low Power

Frequencies MHz	Wide/ Narrow	Power Rating Watts	Power Rating dBm	Power dBm	Actual Power Watts
138.100	Narrow	1.0	30.00	30.06	1.01
151.100	Narrow	1.0	30.00	30.17	1.04
161.800	Narrow	1.0	30.00	30.16	1.04
173.300	Narrow	1.0	30.00	30.30	1.07

5.2. TRANSMITTER SPURIOUS/HARMONIC RADIATED EMISSIONS [§§ 2.1053, 2.1057, 22.359, 80.211(f)(3) & 90.210] [RSS-119, § 5.5 & 5.8]

5.2.1. Limits

Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Attenuation Limit (dBc)
§ 22.359	At least 43 + 10 log (P) dB.
§ 80.211(f)(3),	At least 43 +10log$_{10}$ (mean power in watts) dB
§ 90.210(b)	At least 43 + 10 log (P) dB
§ 90.210(d)	At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.
§ 90.210(e)	At least 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

RSS-119, Issue 12 Tables 6 & 7	Frequency Range	Attenuation Limit (dBc)
Mask D	30 MHz or lowest radio frequency signal generated in the device to the tenth harmonic of the highest fundamental frequency.	At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.

5.2.2. Method of Measurements

The spurious/harmonic ERP measurements are using substitution method specified in Section 8.2 of this report.

5.2.3. Test Data

Remarks:

- The RF spurious/harmonic emission characteristics for different channel spacing are indistinguishable. Therefore, the following radiated emissions were performed at digital 12.5 kHz channel spacing operation, and the results were compared with the for the worst-case.
- The radiated emissions were performed with high power setting at 3 m distance to represents the worst-case test configuration.
- The emissions were scanned from 30 MHz to 10th harmonics ; all spurious emissions that are in excess of 20dB below the specified limit shall be recorded.

5.2.3.1. Near Lowest Frequency (138.1 MHz)

Test Frequency (MHz):		138.1				
Power		High				
Limit (dBm):		-20				
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP Measured (dBm)**	**Limit (dBm)**	**Margin (dB)**
All emissions found are more than 20 dB below the limit.						

5.2.3.2. Near Middle Frequency (151.1 MHz)

Test Frequency (MHz):		151.1				
Power		High				
Limit (dBm):		-20				
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP Measured (dBm)**	**Limit (dBm)**	**Margin (dB)**
All emissions found are more than 20 dB below the limit.						

5.2.3.3. Near Middle Frequency (161.8 MHz)

Test Frequency (MHz):		161.8				
Power		High				
Limit (dBm):		-20				
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP Measured (dBm)**	**Limit (dBm)**	**Margin (dB)**
All emissions found are more than 20 dB below the limit.						

5.2.3.4. Near Highest Frequency (173.3 MHz)

Test Frequency (MHz):		173.3				
Power $_{conducted}$ (dBm):		46.8				
Limit (dBm):		-20				
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP Measured (dBm)**	**Limit (dBm)**	**Margin (dB)**
All emissions found are more than 20 dB below the limit.						

5.3. RADIATED EMISSIONS FROM UNINTENTIONAL RADIATORS [ICES-003]

5.3.1. Limits

The equipment shall meet the limits of the following table:

Frequency of emission (MHz)	Class B Limits	
	(dBμV/m at 3 m)	(dBμV/m at 10 m)
30 – 88	40.0	29.5
88 – 216	43.5	33.1
216 – 960	46.0	35.6
Above 960	54.0	43.5

5.3.2. Method of Measurements

Refer to Ultratech Test Procedures ULTR-P001-2004 & ANSI C63.4 for method of measurements.

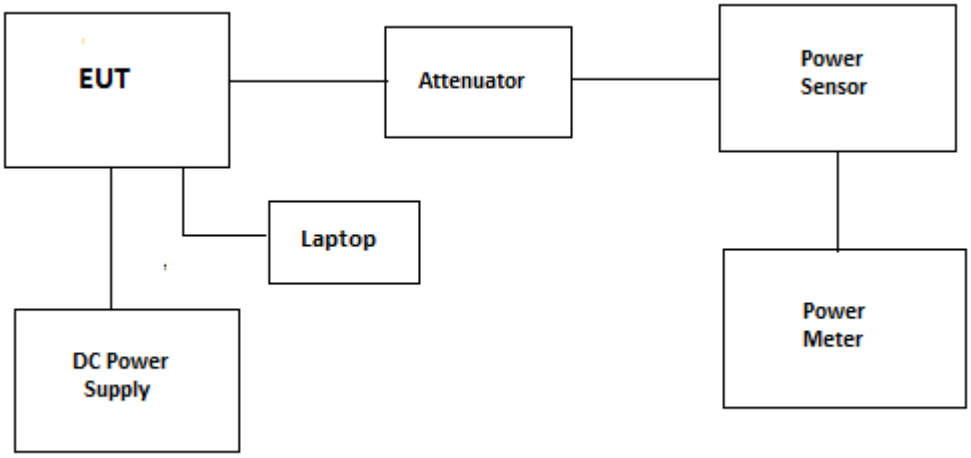
5.3.3. Test Data

The emissions were scanned from 30 MHz to 6.0 GHz. All emissions found above than 20 dB below the permissible limits were recorded

FREQUENCY (MHz)	RF LEVEL (dBuV/m)	DETECTOR USED (PEAK/QP)	ANTENNA PLANE (H/V)	LIMIT (dBuV/m)	MARGIN (dB)	PASS/ FAIL
73.52	33.06	PEAK	V	40	-6.94	PASS
73.52	25.2	PEAK	H	40	-14.8	PASS
865	37.38	PEAK	V	46	-8.62	PASS
865	36.08	PEAK	H	46	-9.92	PASS
900.51	37.41	PEAK	V	46	-8.59	PASS
900.51	36.66	PEAK	H	46	-9.34	PASS
925.38	39.96	PEAK	V	46	-6.04	PASS
925.38	40.67	PEAK	H	46	-5.33	PASS
948.7	38.77	PEAK	V	46	-7.23	PASS
948.7	39.08	PEAK	H	46	-6.92	PASS
972	38	PEAK	V	54	-16	PASS
972	36.97	PEAK	H	54	-17.03	PASS

EXHIBIT 6. Block Diagram and Test Equipment

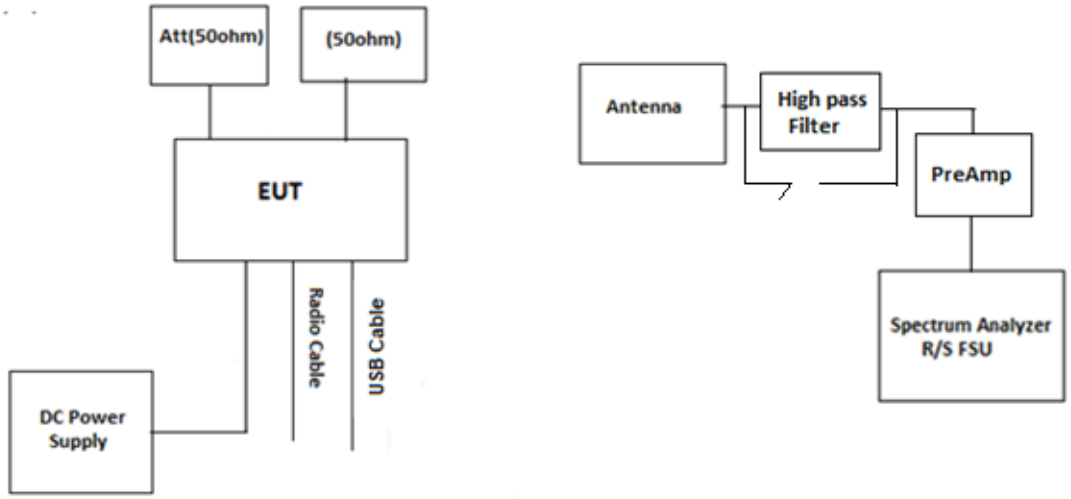
6.1. Conducted Power



Test Instrument	Manufacturer	Model No	Serial No	Frequency Range	Cal Due date
Power Meter	HP	436A	2016A07747	100KHz-sensor dependant	14 Apr 2021
Power Sensor	HP	8482A	MY44175182	10MHz-4.2GHz	15 Nov 2020
Attenuator(20 dB)	Weinschel	WA35-20-33	A164	DC-8.5GHz	Cal on use
Attenuator(20 dB)	Aeroflex\Weinschel	23-20-34	BH7876	DC-18GHz	Cal on use
Power Supply	Pyramid	PS-36KX	--	1-15V, DC 35A	----
Multimeter	Fluke	8842A	5021295	---	19 Dec 2020

Test date: June 1st, 2020

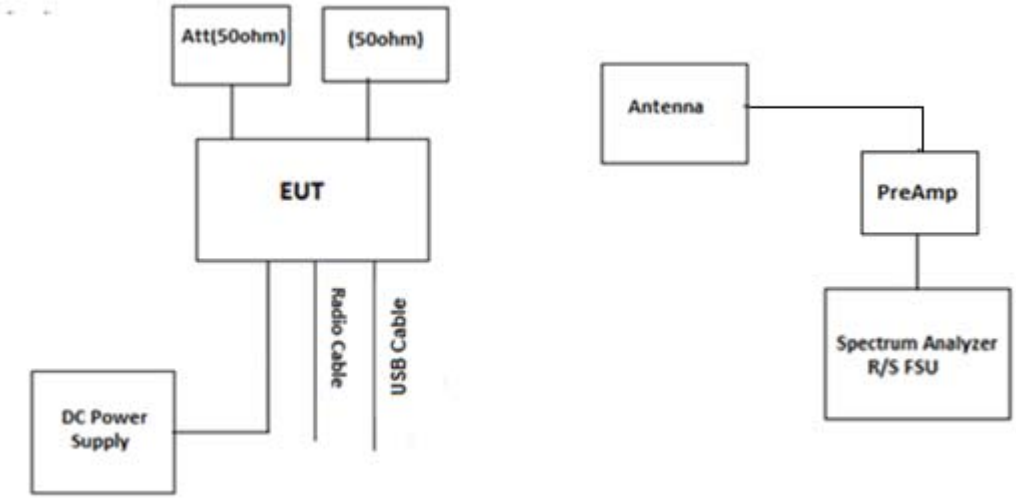
6.2. Tx Radiated



Test Instrument	Manufacturer	Model No	Serial No	Frequency Range	Cal Due date
Spectrum Analyzer	Rohde & Schwarz	FSU	100398	20Hz-26.5GHz	23 Oct 2021
Log Periodic Antenna	ETS	3148	00023845	200-2000MHz	02 Aug 2020
Biconilog Antenna	EMCO	3142C	00034792	26-2000MHz	16 May 2022
Preamplifier	Com-Power	PAM-118A	551016	500MHz-18GHz	17 Mar 2021
Preamplifier	Com-Power	PA-103	161040	1-1000MHz	23 Mar 2021
Horn Antenna	ETS	3117	00119425	1-18GHz	25 July 2021
Hi-pass filter	Mini-Circuit	SHP-250	--	Cut off 250MHz	Cal on use
Attenuator(20dB)	Weinschel	WA35-20-33	A164	DC-8.5GHz	Cal on use
Attenuator(20dB)	Aeroflex\Weinschel	23-20-34	BH7876	DC-18GHz	Cal on use
Power Supply	Pyramid	PS-36KX	--	1-15V, DC 35A	----
Multimeter	Fluke	8842A	5021295	---	19 Dec 2020

Test date: June 1st, 2020

6.3. Unintentional Radiated



Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Due Date
EMI Receiver	Rohde & Schwarz	ESU40	100037	20Hz-40Ghz	Mar 18th, 2021
Biconilog Antenna	EMCO	3142C	00034792	26-2000 Mhz	May 16th, 2022
Pre-Amplifier	Com-Power	Pam-0118A	551052	500Mhz-18Ghz	July 24th, 2020
Horn Antenna	EMCO	3115	6570	1-18Ghz	Oct 11th, 2020

Test date: June 1st, 2020

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 2.15**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.30**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 2.14**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.29**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 1.52**	**Under consideration**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 3.04**	**Under consideration**

EXHIBIT 8. MEASUREMENT METHODS

8.1. CONDUCTED POWER MEASUREMENTS

- The following shall be applied to the combination(s) of the radio device and its intended antenna(e).
- I f the RF level is user adjustable, all measurements shall be made with the highest power level available to the user for that combination.
- The following method of measurement shall apply to both conducted and radiated measurements.
- The radiated measurements are performed at the Ultratech Calibrated Open Field Test Site.
- The measurement shall be performed using normal operation of the equipment with modulation.

Test procedure shall be as follows:

Step 1: Duty Cycle measurements if the transmitter's transmission is transient

- Using a EMI Receiver with the frequency span set to 0 Hz and the sweep time set at a suitable value to capture the envelope peaks and the duty cycle of the transmitter output signal;
- The duty cycle of the transmitter, x = Tx on / (Tx on + Tx off) with 0<x<1, is measure and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal or more than 0.1.

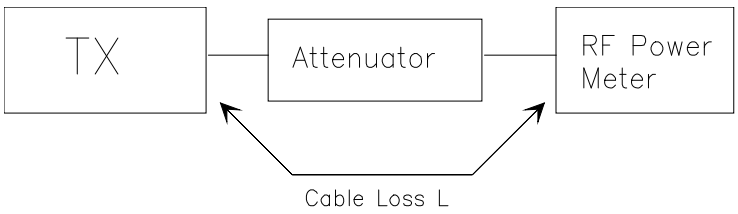
Step 2: Calculation of Average EIRP. See Figure 1

- The average output power of the transmitter shall be determined using a wideband, calibrated RF average power meter with the power sensor with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);
- The e.i.r.p. shall be calculated from the above measured power output "A", the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

EIRP = A + G + 10log(1/x)

{X = 1 for continuous transmission => 10log(1/x) = 0 dB}

Figure 1.



8.2. RADIATED POWER MEASUREMENTS (ERP & EIRP) USING SUBSTITUTION METHOD

8.2.1. MAXIMIZING RF EMISSION LEVEL (E-FIELD)

(a) The measurements were performed with full rf output power and modulation.
(b) Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
(c) The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
(d) The BICONILOG antenna (20 MHz to 1 GHz) or HORN antenna (1 GHz to 18 GHz) was used for measuring.
(e) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBμV/m) = Reading (dBμV) + Total Correction Factor (dB/m)

(f) Set the EMI Receiver and #2 as follows:

Center Frequency:	test frequency
Resolution BW:	100 KHz
Video BW:	same
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(g) The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
(h) The transmitter was rotated through 360° about a vertical axis until a higher maximum signal was received.
(i) The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
(j) The recorded reading was corrected to the true field strength level by adding the antenna factor, cable loss and subtracting the pre-amplifier gain.
(k) The above steps were repeated with both transmitters' antenna and test receiving antenna placed in vertical and horizontal polarization. Both readings with the antennas placed in vertical and horizontal polarization shall be recorded.
(l) Repeat for all different test signal frequencies.

8.2.2. Measuring the EIRP of Spurious/Harmonic Emissions using Substitution Method

(a) Set the EMI Receiver (for measuring E-Field) and Receiver #2 (for measuring EIRP) as follows:

Center Frequency:	equal to the signal source
Resolution BW:	100 KHz
Video BW:	VBW > RBW
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(b) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

(c) Select the frequency and E-field levels obtained in the Section 8.2.1 for ERP/EIRP measurements.
(d) Substitute the EUT by a signal generator and one of the following transmitting antenna (substitution antenna):
- ♦ DIPOLE antenna for frequency from 30-1000 MHz or
- ♦ HORN antenna for frequency above 1 GHz }.

(e) Mount the transmitting antenna at 1.5 meter high from the ground plane.
(f) Use one of the following antenna as a receiving antenna:
- ♦ DIPOLE antenna for frequency from 30-1000 MHz or
- ♦ HORN antenna for frequency above 1 GHz }.

(g) If the DIPOLE antenna is used, tune it's elements to the frequency as specified in the calibration manual.
(h) Adjust both transmitting and receiving antenna in a VERTICAL polarization.
(i) Tune the EMI Receivers to the test frequency.
(j) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(k) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
(l) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(m) Adjust input signal to the substitution antenna until an equal or a known related level to that detected from the transmitter was obtained in the test receiver.
(n) Record the power level read from the Average Power Meter and calculate the ERP/EIRP as follows:

P = P1 - L1 = (P2 + L2) – L1 = P3 + A + L2 - L1
EIRP = P + G1 = P3 + L2 - L1 + A + G1
ERP = EIRP – 2.15 dB
Total Correction factor in EMI Receiver # 2 = L2 – L1 + G1

Where:	P:	Actual RF Power fed into the substitution antenna port after corrected.
	P1:	Power output from the signal generator
	P2:	Power measured at attenuator A input
	P3:	Power reading on the Average Power Meter
	EIRP:	EIRP after correction
	ERP:	ERP after correction

(o) Adjust both transmitting and receiving antenna in a HORIZONTAL polarization, then repeat step (k) to (o)
(p) Repeat step (d) to (o) for different test frequency
(q) Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.
(r) Actual gain of the EUT's antenna is the difference of the measured EIRP and measured RF power at the RF port. Correct the antenna gain if necessary.

Figure 2

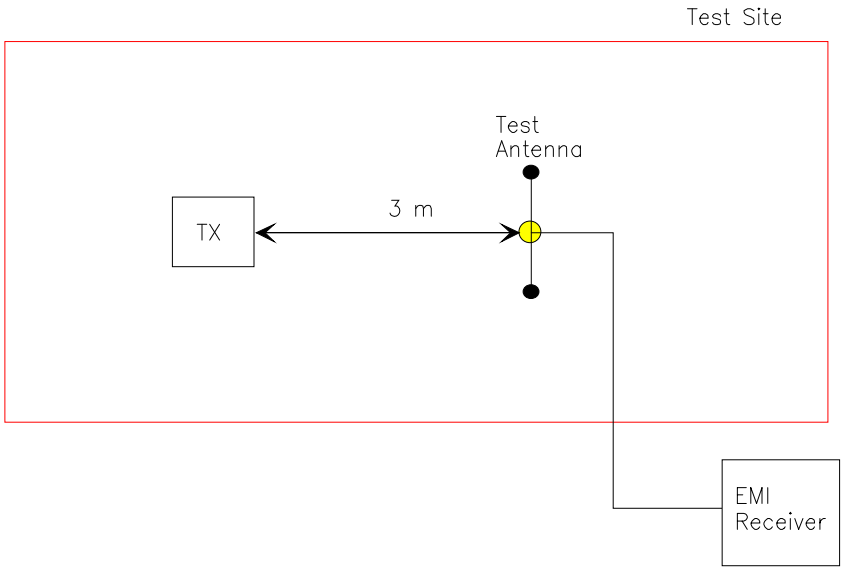


Figure 3