Netcomm Wireless

NTC-140-01

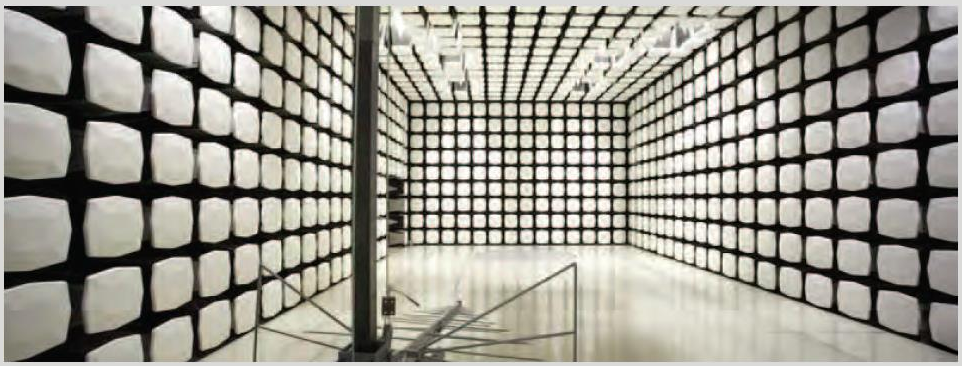
Cellular Radio

FCC 22H:2017

FCC 24E:2017

FCC 27:2017

Report # NETC0005



NVLAP Lab Code: 200630-0

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CERTIFICATE OF TEST

2017-1-25

Last Date of Test: April 28, 2017
Netcomm Wireless
Model: NTC-140-01

Radio Equipment Testing

Standards

Specification	Method
FCC 22.913:2017	ANSI/TIA/EIA-603-D-2010
FCC 22.917:2017	
FCC 24.232:2017	
FCC 24.238:2017	
FCC 27.50:2017	
FCC 27.53:2017	

Results

Method Clause	Test Description	Applied	Results	Comments
2.2.1	Conducted Output Power	No	N/A	See Sporton Lab Test Report Nos. FG441109A and FG441109B
2.2.2	Frequency Stability	No	N/A	See Sporton Lab Test Report Nos. FG441109A and FG441109B
2.2.3	Occupied Bandwidth Emission Mask	No	N/A	See Sporton Lab Test Report Nos. FG441109A and FG441109B
2.2.12	Out of Band Emissions Part 22H - 2G, 3G	Yes	Pass	
2.2.12	Out of Band Emissions Part 24E - 2G, 3G	Yes	Pass	
2.2.12	Out of Band Emissions Part 27 - 3G	Yes	Pass	
2.2.12	Out of Band Emissions Part 24E - LTE Band 2	Yes	Pass	
2.2.12	Out of Band Emissions Part 27 - LTE Band 4	Yes	Pass	
2.2.12	Out of Band Emissions Part 22H - LTE Band 5	Yes	Pass	
2.2.12	Out of Band Emissions Part 27 - LTE Band 13	Yes	Pass	
2.2.12	Out of Band Emissions Part 27 - LTE Band 17	Yes	Pass	
2.2.12	Out of Band Emissions Part 24E - LTE Band 25	Yes	Pass	
2.2.13	Spurious Emissions at the Antenna Terminals	No	N/A	See Sporton Lab Test Report Nos. FG441109A and FG441109B
2.2.17.2	ERP Part 22H - 2G, 3G	Yes	Pass	
2.2.17.2	EIRP Part 24E - 2G, 3G	Yes	Pass	
2.2.17.2	EIRP Part 27 - 3G	Yes	Pass	
2.2.17.2	EIRP Part 24E - LTE Band 2	Yes	Pass	
2.2.17.2	EIRP Part 27 - LTE Band 4	Yes	Pass	
2.2.17.2	ERP Part 22H - LTE Band 5	Yes	Pass	
2.2.17.2	ERP Part 27 - LTE Band 13	Yes	Pass	
2.2.17.2	EIRP Part 24E - LTE Band 25	Yes	Pass	

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

CERTIFICATE OF TEST

2017-1-25

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Validated by the European Commission as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

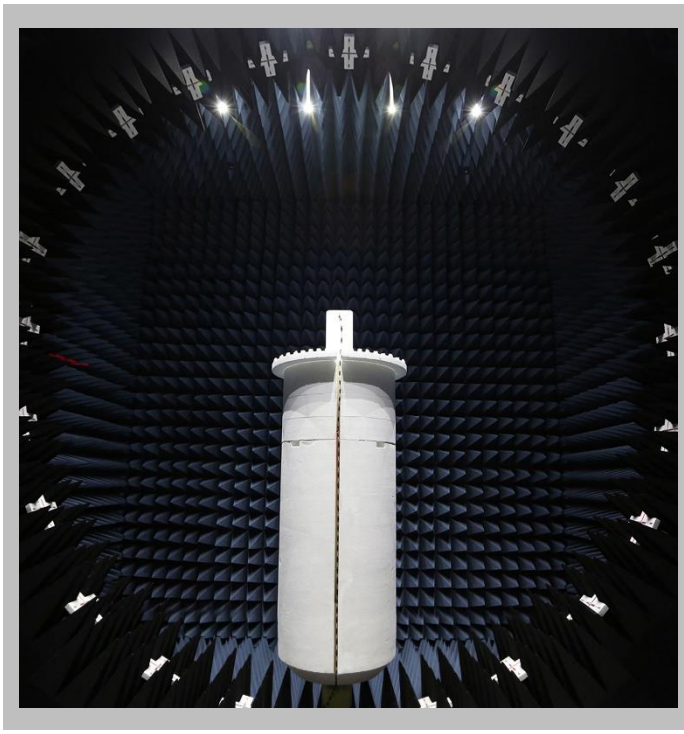
MIC – Recognized by MIC as a CAB for the acceptance of test data.

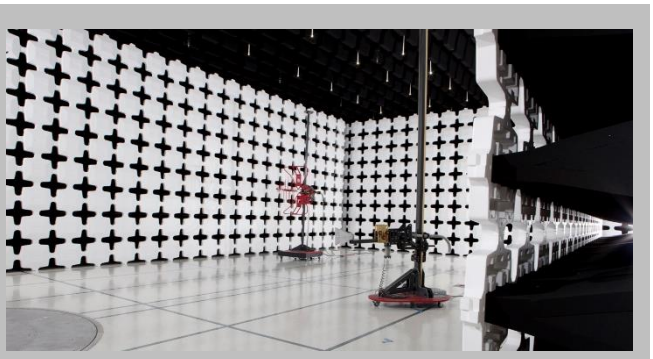
SCOPE

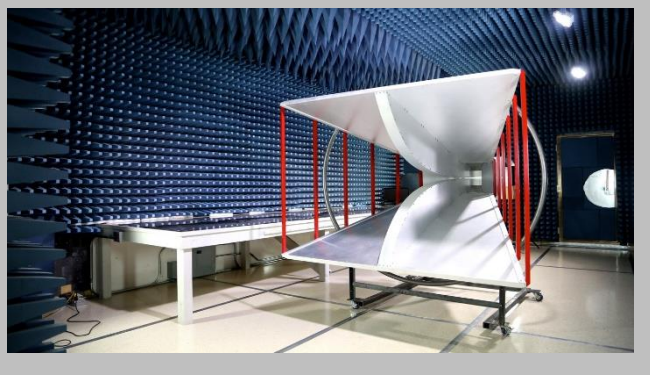
For details on the Scopes of our Accreditations, please visit:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

FACILITIES

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157

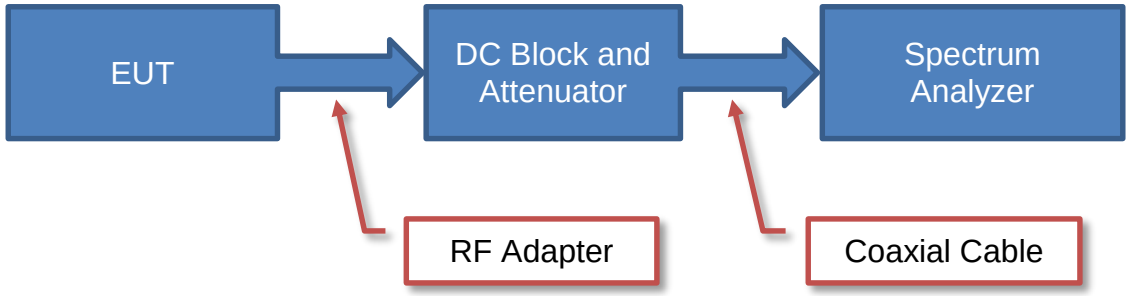




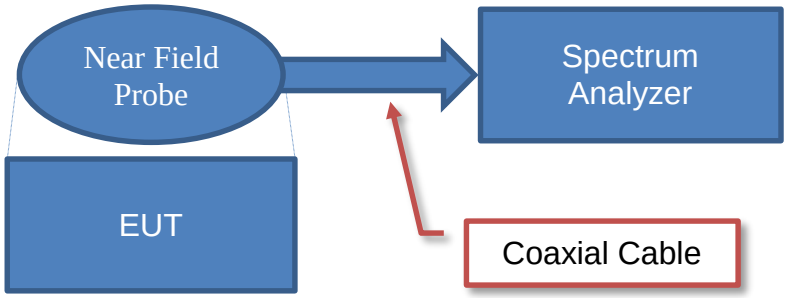


Test Setup Block Diagrams

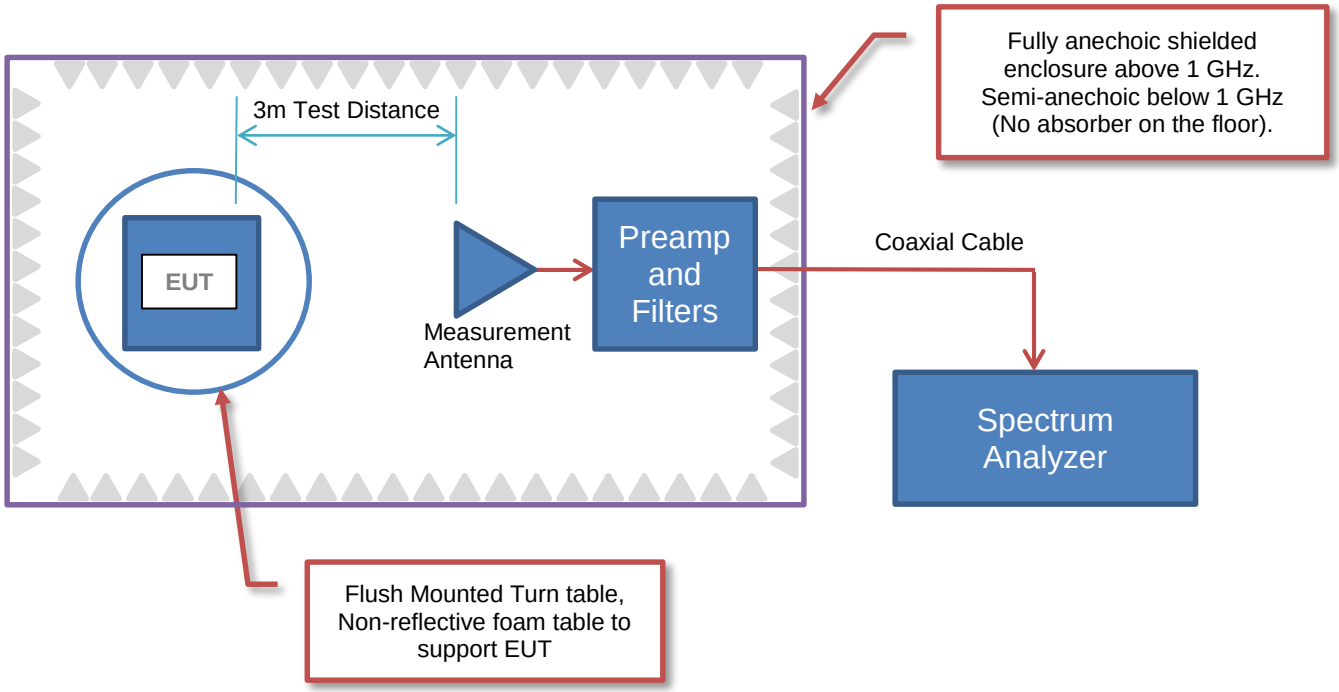
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Netcomm Wireless
Address:	18-20 Orion Road
City, State, Zip:	Lane Cove, Sydney, NSW 2066 Australia
Test Requested By:	Bud Sundeen
Model:	NTC-140-01
First Date of Test:	April 3, 2017
Last Date of Test:	April 28, 2017
Receipt Date of Samples:	March 30, 2017
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
NTC-140-01 router provides real-time M2M data connectivity, through a cellular radio. The NTC-140W creates reliable point-to-point or point-to-multi-point WAN connections for a variety of mission critical applications such as primary broadband, video surveillance, retail, payments, in-vehicle communications and business continuity.

Testing Objective:
To demonstrate compliance of the Cellular radio to FCC 22H, 24E, and 27 requirements.

CONFIGURATIONS

Configuration NETC0005- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wireless Router	NetComm Wireless	NTC-140-01	8

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC/DC Adapter	Switching Power Supply	S018KM12000150	None
Tube Antenna with Magnetic Base x2	NetComm Wireless	ANT-0050	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Cable	No	1.6m	No	AC/DC Adapter	Wireless Router
SMA to SMB x2	Yes	0.2m	No	Wireless Router	SMB
SMB	Yes	2.5m	No	SMA to SMB x2	Tube Antenna with Magnetic Base x2
Cat5 x2	No	3.0m	No	Wireless Router	Unterminated
Micro USB	Yes	0.9m	No	Wireless Router	Unterminated

Configuration NETC0007- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wireless Router	NetComm Wireless	NTC-140-01	8

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC/DC Adapter	Switching Power Supply	S018KM12000150	None
Tube Antenna with Magnetic Base x2	NetComm Wireless	ANT-0050	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Cable	No	1.6m	No	AC/DC Adapter	Wireless Router
SMA to SMB x2	Yes	0.2m	No	Wireless Router	SMB
SMB	Yes	2.5m	No	SMA to SMB x2	Tube Antenna with Magnetic Base x2
Cat5 x2	No	3.0m	No	Wireless Router	Unterminated
Micro USB	Yes	0.9m	No	Wireless Router	Unterminated

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	4/3/2017	EIRP Part 24E - 2G, 3G	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	4/4/2017	EIRP Part 27 - 3G	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	4/5/2017	ERP Part 22H - 2G, 3G	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	4/7/2017	Out of Band Emissions Part 22H - 2G, 3G	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	4/12/2017	Out of Band Emissions Part 24E - 2G, 3G	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	4/13/2017	Out of Band Emissions Part 27 - 3G	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	4/13/2017	Out of Band Emissions Part 27 - LTE Band 13	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	4/17/2017	EIRP Part 27 - LTE Band 4	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	4/17/2017	ERP Part 27 - LTE Band 13	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	4/18/2017	Out of Band Emissions Part 27 - LTE Band 4	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
11	4/25/2017	ERP Part 22H - LTE Band 5	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
12	4/25/2017	Out of Band Emissions Part 27 - LTE Band 17	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
13	4/25/2017	ERP Part 27 - LTE Band 17	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
14	4/26/2017	EIRP Part 24E - LTE Band 2	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
15	4/26/2017	EIRP Part 24E - LTE Band 25	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
16	4/27/2017	Out of Band Emissions Part 24E - LTE Band 25	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.

MODIFICATIONS

17	4/27/2017	Out of Band Emissions Part 24E - LTE Band 2	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
18	4/28/2017	Out of Band Emissions Part 22H - LTE Band 5	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

CONDUCTED OUTPUT POWER COMPARISON

XMit 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18N5WA-30	TLE	10/11/2016	10/11/2017
Directional Coupler	Fairview Microwave	SMC4035-10	IRZ	NCR	NCR
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	NCR
Terminator	Fairview Microwave	STN18N-10	TWM	NCR	NCR
Cable	Micro-Coax	D150A-1-0720-200	EVH	6/7/2016	6/7/2017
Block - DC	Fairview Microwave	SD3379	AMQ	6/8/2016	6/8/2017
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	5/20/2017
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	5/20/2017
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	10/27/2018

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and an RMS Average Power Meter. The output power was measured with the EUT set to the channel and modes in each band which provided the highest conducted output power of the original test reports for FCC ID: XIA-NTC140W

CONDUCTED OUTPUT POWER COMPARISON

XMit 2017.01.26

EUT:	NTC140W01	Work Order:	NETC0005
Serial Number:	NTC-140-01 TKA	Date:	03/30/17
Customer:	NetComm Wireless	Temperature:	22.2 °C
Attendees:	None	Humidity:	39.8% RH
Project:	None	Barometric Pres.:	1027 mbar
Tested by:	Brandon Hobbs	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 22H:2017, FCC 24E:2017, FCC 27:2017	ANSI/TIA/EIA-603-D-2010

COMMENTS

The firmware used was version 05.05.58.00

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

	Measured (dBm)	Grant Value (dBm)	Result (dB)
LTE Band 4	22.6	22.2	0.3
LTE Band 13	22.5	22.0	0.5
GPRS PCS850	31.8	31.9	0.0
GPRS PCS1900	29.5	29.2	0.3
WCDMA Band 5	22.9	21.9	1.1
WCDMA Band 2	22.4	22.3	0.1

OUT OF BAND EMISSIONS PART 22H - 2G, 3G

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

E-GPRS, GSM-850, MCS-5, 1UP/1DN, Low Ch, 128 = 824.2 MHz, Mid Ch, 190 = 836.6 MHz, High Ch, 251 = 848.8 MHz

GPRS, GSM-850, CS-4, 1UP/1DN, Low Ch, 128 = 824.2 MHz, Mid Ch, 190 = 836.6 MHz, High Ch, 251 = 848.8 MHz

WCDMA, CLR-850, Low Ch, 4132 = 826.5 MHz, Mid Ch, 4182 = 837 MHz, High Ch, 4233 = 846.6 MHz

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	12400 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HFT	1/4/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFB	5/18/2016	12 mo
Attenuator	Coaxicom	3910-10	AWX	5/18/2016	12 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

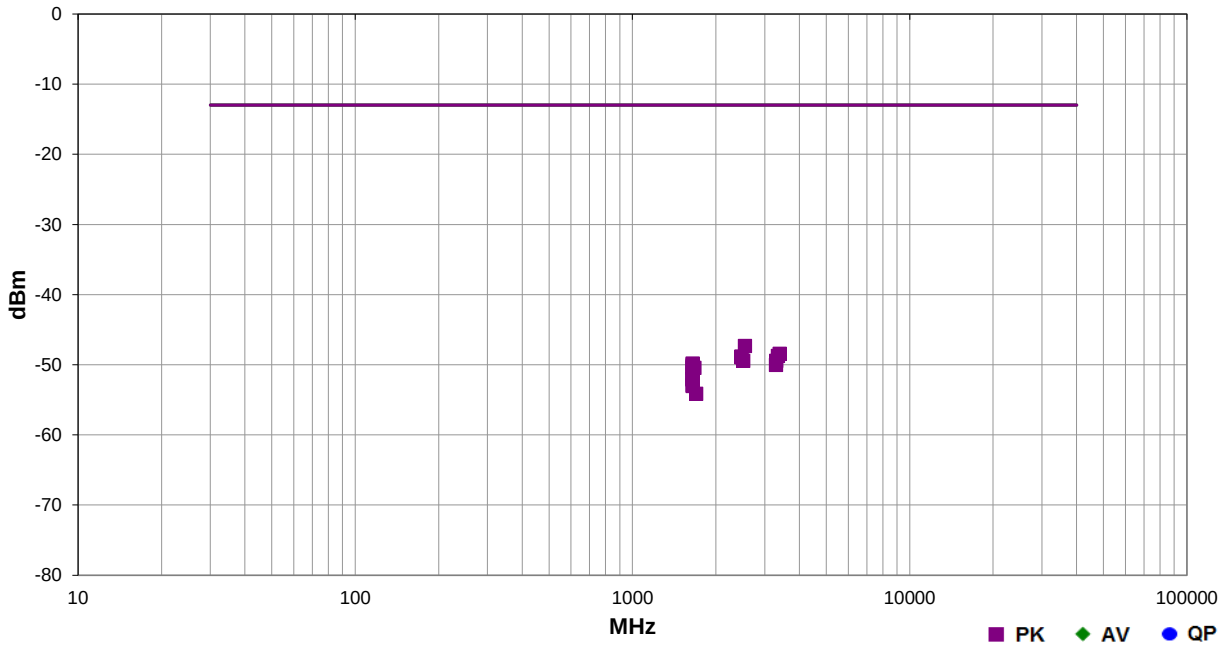
OUT OF BAND EMISSIONS PART 22H - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/07/17		
Project:	None	**Temperature:**	22.7 °C		
Job Site:	EV01	**Humidity:**	38.5% RH		
Serial Number:	8	**Barometric Pres.:**	991 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting GPRS, GSM-850, CS-4, 1UP/1DN, Low Ch = 824.2 MHz, Mid Ch = 836.6 MHz, High Ch = 848.8 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 22.917:2017	ANSI/TIA/EIA-603-D-2010

Run #	927	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	2546.425	1.6	260.0	Vert	PK	1.85E-08	-47.3	-13.0	-34.3	High Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	3395.642	1.0	248.0	Horz	PK	1.44E-08	-48.4	-13.0	-35.4	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3346.125	1.0	307.0	Horz	PK	1.34E-08	-48.7	-13.0	-35.7	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	2472.675	1.0	274.0	Vert	PK	1.31E-08	-48.8	-13.0	-35.8	Low Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	2472.635	1.0	262.0	Horz	PK	1.28E-08	-48.9	-13.0	-35.9	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3296.970	1.0	228.0	Horz	PK	1.14E-08	-49.4	-13.0	-36.4	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	2509.650	1.0	313.0	Vert	PK	1.14E-08	-49.4	-13.0	-36.4	Mid Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1648.510	1.1	241.0	Vert	PK	1.04E-08	-49.8	-13.0	-36.8	Low Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1648.442	2.0	231.0	Horz	PK	1.02E-08	-49.9	-13.0	-36.9	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3296.208	1.6	267.0	Vert	PK	9.93E-09	-50.0	-13.0	-37.0	Low Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1648.400	1.0	289.0	Horz	PK	9.71E-09	-50.1	-13.0	-37.1	Low Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	1648.467	1.0	164.0	Horz	PK	9.27E-09	-50.3	-13.0	-37.3	Low Ch, EUT Vert, Main Ant On Side, Aux Ant On Side
	1648.250	1.0	131.0	Horz	PK	9.06E-09	-50.4	-13.0	-37.4	Low Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1672.900	1.1	229.0	Vert	PK	9.06E-09	-50.4	-13.0	-37.4	Mid Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1648.483	1.0	215.0	Horz	PK	7.20E-09	-51.4	-13.0	-38.4	Low Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	1648.350	1.0	320.0	Horz	PK	6.41E-09	-51.9	-13.0	-38.9	Low Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1648.410	1.0	166.0	Vert	PK	6.27E-09	-52.0	-13.0	-39.0	Low Ch, EUT Horz, Main Ant Vert, Aux Ant Vert

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1648.425	1.0	292.0	Vert	PK	6.27E-09	-52.0	-13.0	-39.0	Low Ch, EUT Vert, Main Ant On Side, Aux Ant On Side
	1648.490	1.6	181.0	Vert	PK	6.13E-09	-52.1	-13.0	-39.1	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1648.510	1.1	219.0	Vert	PK	5.09E-09	-52.9	-13.0	-39.9	Low Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1648.420	1.0	268.0	Vert	PK	4.98E-09	-53.0	-13.0	-40.0	Low Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	1697.533	1.0	205.0	Vert	PK	3.86E-09	-54.1	-13.0	-41.1	High Ch, EUT On Side, Main Ant Vert, Aux Ant Vert

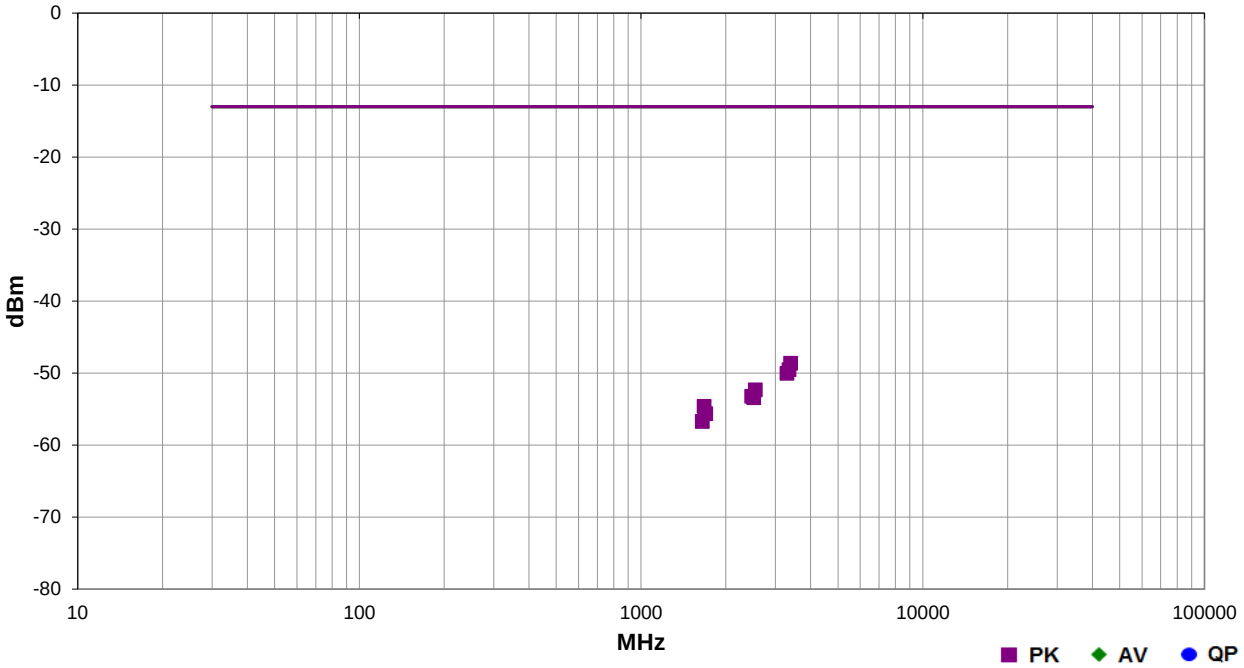
OUT OF BAND EMISSIONS PART 22H - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/07/17		
Project:	None	**Temperature:**	23.4 °C		
Job Site:	EV01	**Humidity:**	38.7% RH		
Serial Number:	8	**Barometric Pres.:**	1010 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting E-GPRS, GSM-850, MCS-5 (8PSK), 1UP/1DN, Low Ch = 824.2 MHz, Mid Ch = 836.6 MHz, High Ch = 848.8 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 22.917:2017	ANSI/TIA/EIA-603-D-2010

Run #	928	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	3395.067	1.0	202.0	Horz	PK	1.37E-08	-48.6	-13.0	-35.6	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3348.283	1.8	322.0	Horz	PK	1.11E-08	-49.5	-13.0	-36.5	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3296.605	1.0	310.0	Horz	PK	9.93E-09	-50.0	-13.0	-37.0	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	2544.717	2.2	149.0	Vert	PK	5.85E-09	-52.3	-13.0	-39.3	High Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	2470.158	1.0	358.0	Vert	PK	4.75E-09	-53.2	-13.0	-40.2	Low Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	2511.375	1.0	68.0	Vert	PK	4.54E-09	-53.4	-13.0	-40.4	Mid Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1673.125	1.0	226.0	Vert	PK	3.44E-09	-54.6	-13.0	-41.6	Mid Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1697.417	1.5	176.0	Vert	PK	2.74E-09	-55.6	-13.0	-42.6	High Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1648.640	1.4	249.0	Vert	PK	2.12E-09	-56.7	-13.0	-43.7	Low Ch, EUT On Side, Main Ant Vert, Aux Ant Vert

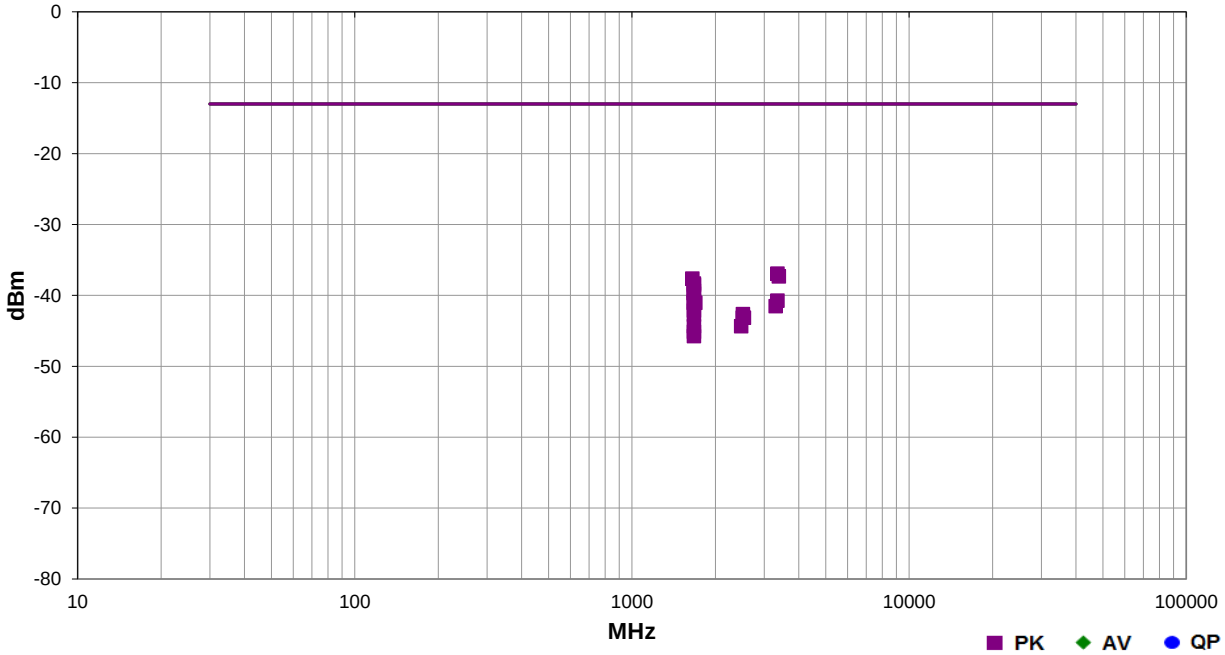
OUT OF BAND EMISSIONS PART 22H - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/07/17		
Project:	None	**Temperature:**	23.4 °C		
Job Site:	EV01	**Humidity:**	38.2% RH		
Serial Number:	8	**Barometric Pres.:**	1000 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting WCDMA, CLR-850, Low Ch = 826.5 MHz, Mid Ch = 837 MHz, High Ch = 846.6 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 22.913:2017	ANSI/TIA/EIA-603-D-2010

Run #	939	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	3347.883	1.0	239.0	Horz	PK	2.03E-07	-36.9	-13.0	-23.9	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3385.800	1.0	255.0	Horz	PK	1.85E-07	-37.3	-13.0	-24.3	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1652.450	1.0	148.0	Horz	PK	1.73E-07	-37.6	-13.0	-24.6	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1673.817	1.0	348.0	Horz	PK	1.47E-07	-38.3	-13.0	-25.3	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1673.183	1.0	135.0	Horz	PK	1.40E-07	-38.5	-13.0	-25.5	Mid Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1673.467	1.0	297.0	Horz	PK	1.17E-07	-39.3	-13.0	-26.3	Mid Ch, EUT Vert, Main Ant On Side, Aux Ant On Side
	1671.617	1.0	160.0	Horz	PK	1.09E-07	-39.6	-13.0	-26.6	Mid Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	1674.717	1.4	204.0	Vert	PK	1.06E-07	-39.7	-13.0	-26.7	Mid Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	3348.033	1.0	187.0	Vert	PK	8.46E-08	-40.7	-13.0	-27.7	Mid Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	1672.483	1.0	258.0	Vert	PK	8.26E-08	-40.8	-13.0	-27.8	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1669.567	1.5	204.0	Vert	PK	7.89E-08	-41.0	-13.0	-28.0	Mid Ch, EUT Vert, Main Ant On Side, Aux Ant On Side
	1692.783	1.0	133.0	Horz	PK	7.89E-08	-41.0	-13.0	-28.0	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3301.900	1.0	257.0	Horz	PK	7.03E-08	-41.5	-13.0	-28.5	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1672.867	1.0	260.0	Vert	PK	6.13E-08	-42.1	-13.0	-29.1	Mid Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	2512.867	1.4	333.0	Horz	PK	5.46E-08	-42.6	-13.0	-29.6	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1674.225	1.0	174.0	Horz	PK	5.33E-08	-42.7	-13.0	-29.7	Mid Ch, EUT On Side, Main Ant Vert, Aux Ant Vert

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	2508.200	1.0	276.0	Vert	PK	4.87E-08	-43.1	-13.0	-30.1	Mid Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	2535.467	1.1	287.0	Horz	PK	4.87E-08	-43.1	-13.0	-30.1	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1674.170	1.4	208.0	Vert	PK	3.69E-08	-44.3	-13.0	-31.3	Mid Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	2479.200	1.0	105.0	Horz	PK	3.69E-08	-44.3	-13.0	-31.3	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1674.440	1.4	211.0	Vert	PK	3.07E-08	-45.1	-13.0	-32.1	Mid Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	1674.320	1.0	180.0	Horz	PK	2.67E-08	-45.7	-13.0	-32.7	Mid Ch, EUT Horz, Main Ant Vert, Aux Ant Vert

OUT OF BAND EMISSIONS PART 24E - 2G, 3G

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

WCDMA, 12.2k. Low Ch, 9262 = 1852.4 MHz, Mid Ch, 9400 = 1880 MHz, and High Ch, 9538 = 1907.6 MHz

E-GPRS, PCS1900, MCS-5 (8PSK), 1UP/1DN, Low Ch, 512= 1850.2 MHz, Mid Ch,661 = 1880 MHz, and High Ch, 810 = 1909.8 MHz

GPRS, PCS1900, CS-4, 1UP/1DN. Low Ch, 512 = 1850.2 MHz, Mid Ch, 661 = 1880 MHz, and High Ch, 810 = 1909.8 MHz

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	10/17/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-1000/2000-N/N	HFU	1/4/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2/6/2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	5/18/2016	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

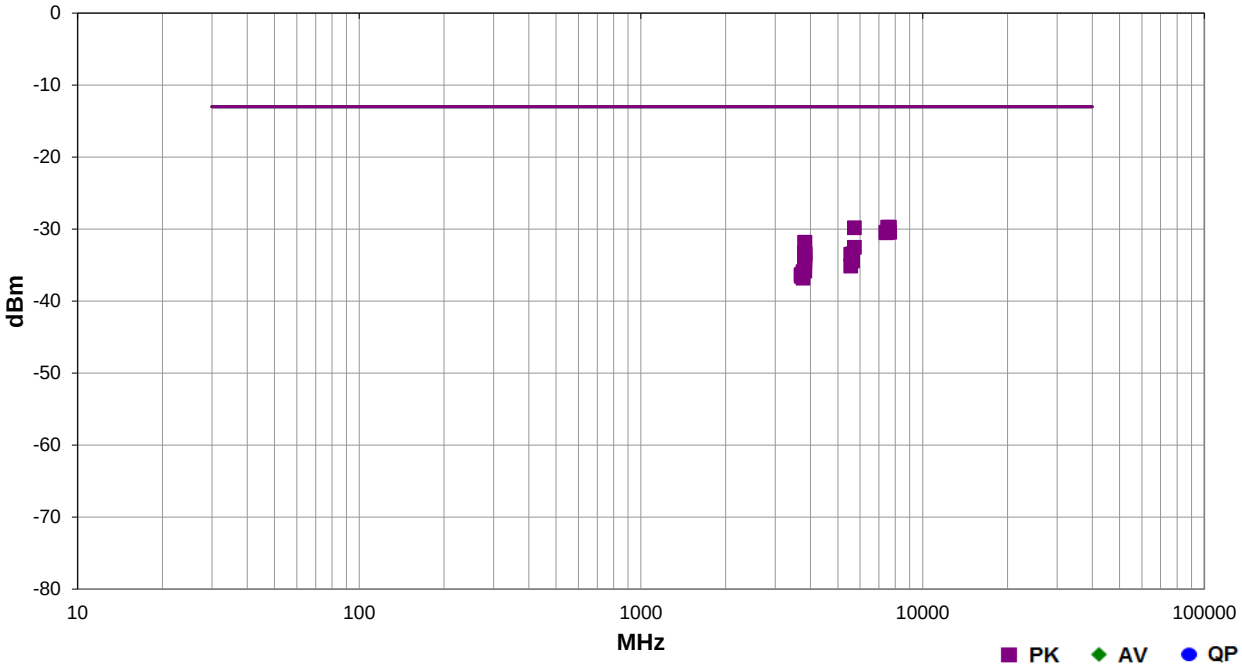
OUT OF BAND EMISSIONS PART 24E - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/12/17		
Project:	None	**Temperature:**	22.5 °C		
Job Site:	EV01	**Humidity:**	41.2% RH		
Serial Number:	8	**Barometric Pres.:**	1008 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting WCDMA, 12.2k. Low Ch. = 1852.4 MHz, Mid Ch. = 1880 Mhz, and High Ch. = 1907.6 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientation, Main Antenna orientation, and Aux Antenna orientation.				

Test Specifications	**Test Method**
FCC 24.238:2017	ANSI/TIA/EIA-603-D-2010

Run #	960	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	7624.000	2.4	221.0	Vert	PK	1.06E-06	-29.7	-13.0	-16.7	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7513.375	1.0	105.0	Vert	PK	1.06E-06	-29.7	-13.0	-16.7	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5724.075	1.0	166.0	Vert	PK	1.04E-06	-29.8	-13.0	-16.8	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7633.925	1.7	351.0	Horz	PK	9.06E-07	-30.4	-13.0	-17.4	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7525.675	1.0	146.0	Horz	PK	9.06E-07	-30.4	-13.0	-17.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7413.100	4.0	197.0	Horz	PK	9.06E-07	-30.4	-13.0	-17.4	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7412.625	1.3	260.0	Vert	PK	8.85E-07	-30.5	-13.0	-17.5	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3815.475	1.5	255.0	Horz	PK	6.56E-07	-31.8	-13.0	-18.8	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3815.375	1.3	253.0	Horz	PK	6.56E-07	-31.8	-13.0	-18.8	High Ch, EUT Vert, On Side, Aux Ant On Side
	5725.750	1.1	186.0	Horz	PK	5.59E-07	-32.5	-13.0	-19.5	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3814.725	1.7	305.0	Horz	PK	4.65E-07	-33.3	-13.0	-20.3	High Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	3816.125	1.0	180.0	Vert	PK	4.65E-07	-33.3	-13.0	-20.3	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3815.175	1.0	199.0	Vert	PK	4.54E-07	-33.4	-13.0	-20.4	High Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	5640.525	1.0	235.0	Vert	PK	4.54E-07	-33.4	-13.0	-20.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	3815.825	1.6	165.0	Horz	PK	4.44E-07	-33.5	-13.0	-20.5	High Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	5557.950	1.0	153.0	Vert	PK	4.44E-07	-33.5	-13.0	-20.5	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3814.050	1.2	203.0	Vert	PK	4.34E-07	-33.6	-13.0	-20.6	High Ch, EUT Horz, On Side, Aux Ant On Side
	3815.550	1.0	186.0	Vert	PK	4.14E-07	-33.8	-13.0	-20.8	High Ch, EUT Vert, On Side, Aux Ant On Side
	3815.900	1.5	266.0	Horz	PK	4.05E-07	-33.9	-13.0	-20.9	High Ch, EUT Horz, On Side, Aux Ant On Side
	3815.925	1.6	227.0	Horz	PK	3.69E-07	-34.3	-13.0	-21.3	High Ch, EUT On Side, On Side, Aux Ant On Side
	5638.100	1.0	187.0	Horz	PK	3.61E-07	-34.4	-13.0	-21.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3814.900	1.0	300.0	Vert	PK	3.29E-07	-34.8	-13.0	-21.8	High Ch, EUT On Side, Main Ant Vert, Aux Ant Vert
	5559.400	1.0	9.0	Horz	PK	3.07E-07	-35.1	-13.0	-22.1	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3814.375	1.0	300.0	Vert	PK	2.61E-07	-35.8	-13.0	-22.8	High Ch, EUT On Side, On Side, Aux Ant On Side
	3760.950	1.0	254.0	Vert	PK	2.55E-07	-35.9	-13.0	-22.9	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3704.025	1.0	335.0	Vert	PK	2.33E-07	-36.3	-13.0	-23.3	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3705.325	1.0	240.0	Horz	PK	2.22E-07	-36.5	-13.0	-23.5	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3760.925	1.0	246.0	Horz	PK	2.08E-07	-36.8	-13.0	-23.8	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

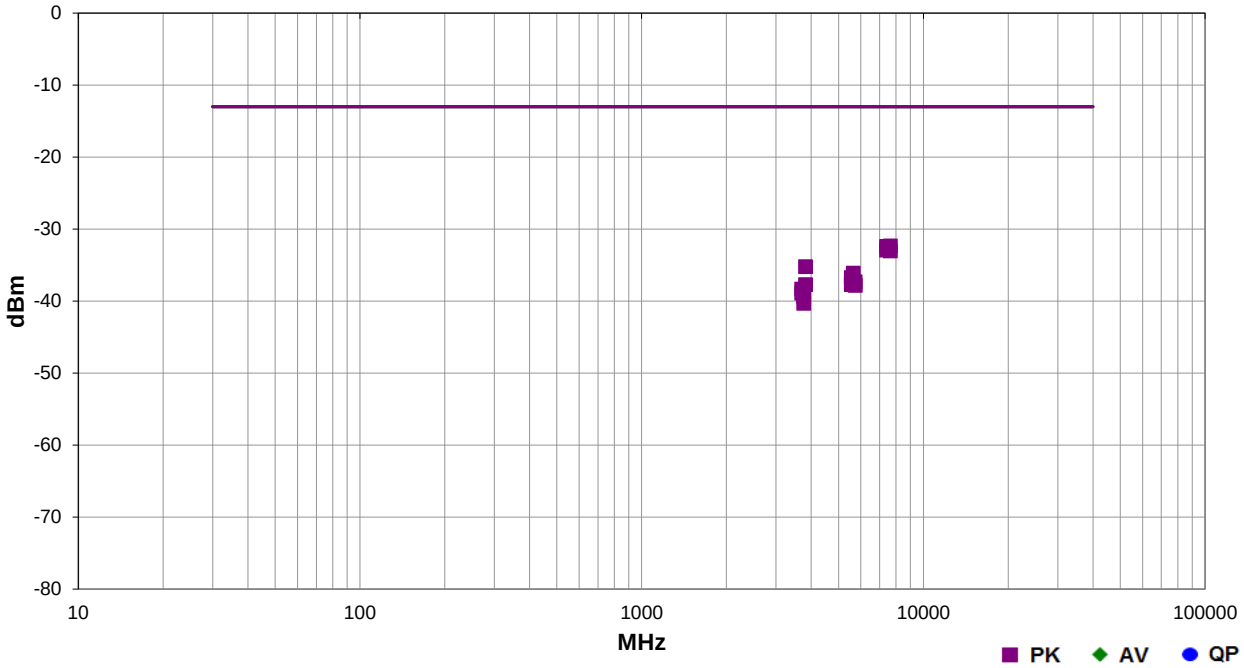
OUT OF BAND EMISSIONS PART 24E - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/12/17		
Project:	None	**Temperature:**	22.5 °C		
Job Site:	EV01	**Humidity:**	41.2% RH		
Serial Number:	8	**Barometric Pres.:**	1008 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting GPRS, PCS1900, CS-4, 1UP/1DN. Low Ch. = 1850.2 MHz, Mid Ch. = 1880 Mhz, and High Ch. = 1909.8 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientation, Main Antenna orientation, and Aux Antenna orientation.				

Test Specifications	**Test Method**
FCC 24.238:2017	ANSI/TIA/EIA-603-D-2010

Run #	961	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	7643.533	1.0	216.0	Horz	PK	5.85E-07	-32.3	-13.0	-19.3	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7401.233	1.0	73.0	Vert	PK	5.72E-07	-32.4	-13.0	-19.4	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7517.767	1.0	1.0	Horz	PK	5.72E-07	-32.4	-13.0	-19.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7521.183	1.0	7.0	Vert	PK	5.33E-07	-32.7	-13.0	-19.7	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7400.833	1.0	351.0	Horz	PK	5.09E-07	-32.9	-13.0	-19.9	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7642.300	1.0	357.0	Vert	PK	4.98E-07	-33.0	-13.0	-20.0	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3818.883	1.1	27.0	Horz	PK	3.00E-07	-35.2	-13.0	-22.2	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5639.567	1.0	340.0	Vert	PK	2.44E-07	-36.1	-13.0	-23.1	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5550.417	1.0	254.0	Horz	PK	2.12E-07	-36.7	-13.0	-23.7	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5728.533	1.0	339.0	Vert	PK	1.85E-07	-37.3	-13.0	-24.3	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5640.800	1.0	181.0	Horz	PK	1.81E-07	-37.4	-13.0	-24.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5550.750	1.0	314.0	Vert	PK	1.69E-07	-37.7	-13.0	-24.7	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3818.933	1.0	339.0	Vert	PK	1.69E-07	-37.7	-13.0	-24.7	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5729.283	1.0	181.0	Horz	PK	1.65E-07	-37.8	-13.0	-24.8	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	3699.550	1.0	77.0	Vert	PK	1.47E-07	-38.3	-13.0	-25.3	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3700.750	1.2	194.0	Horz	PK	1.28E-07	-38.9	-13.0	-25.9	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3759.867	1.0	76.0	Vert	PK	1.14E-07	-39.4	-13.0	-26.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3760.017	1.0	168.0	Horz	PK	9.27E-08	-40.3	-13.0	-27.3	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

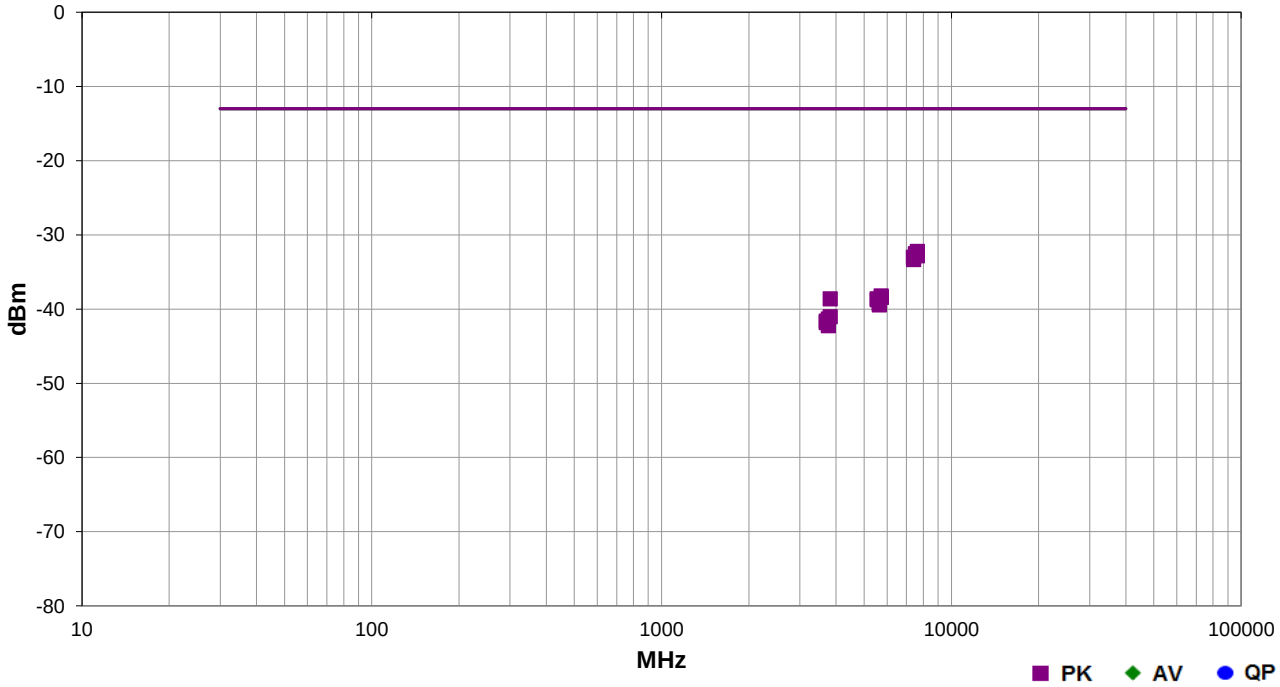
OUT OF BAND EMISSIONS PART 24E - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/12/17		
Project:	None	**Temperature:**	22.5 °C		
Job Site:	EV01	**Humidity:**	41.2% RH		
Serial Number:	8	**Barometric Pres.:**	1008 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting E-GPRS, PCS1900, MCS-5 (8PSK), 1UP/1DN, Low Ch= 1850.2 MHz, Mid Ch = 1880 Mhz, and High Ch = 1909.8 MHz				
Deviations:	None				
Comments:	See comments below for Channe, EUT orientation, Main Antenna orientation, and Aux Antenna orientation.				

Test Specifications	**Test Method**
FCC 24.238:2017	ANSI/TIA/EIA-603-D-2010

Run #	962	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	7634.450	1.0	113.0	Vert	PK	5.99E-07	-32.2	-13.0	-19.2	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7521.850	1.0	38.0	Vert	PK	5.59E-07	-32.5	-13.0	-19.5	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7518.617	2.9	186.0	Horz	PK	5.46E-07	-32.6	-13.0	-19.6	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7636.217	3.3	56.0	Horz	PK	5.21E-07	-32.8	-13.0	-19.8	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7401.617	1.0	168.0	Vert	PK	4.98E-07	-33.0	-13.0	-20.0	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	7405.067	1.0	166.0	Horz	PK	4.65E-07	-33.3	-13.0	-20.3	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5725.800	1.0	340.0	Vert	PK	1.50E-07	-38.2	-13.0	-25.2	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5730.400	1.4	163.0	Horz	PK	1.44E-07	-38.4	-13.0	-25.4	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3819.300	1.1	24.0	Horz	PK	1.37E-07	-38.6	-13.0	-25.6	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5550.733	1.0	199.0	Horz	PK	1.37E-07	-38.6	-13.0	-25.6	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5551.783	1.2	156.0	Vert	PK	1.34E-07	-38.7	-13.0	-25.7	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	5639.283	1.0	344.0	Vert	PK	1.19E-07	-39.2	-13.0	-26.2	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	5639.000	1.0	192.0	Horz	PK	1.14E-07	-39.4	-13.0	-26.4	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3819.533	1.0	340.0	Vert	PK	7.89E-08	-41.0	-13.0	-28.0	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3760.083	1.0	227.0	Vert	PK	7.36E-08	-41.3	-13.0	-28.3	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3699.917	1.0	262.0	Vert	PK	6.87E-08	-41.6	-13.0	-28.6	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3700.300	1.0	242.0	Horz	PK	6.56E-08	-41.8	-13.0	-28.8	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	3760.317	1.0	167.0	Horz	PK	5.99E-08	-42.2	-13.0	-29.2	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

OUT OF BAND EMISSIONS PART 27 - 3G

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

WCDMA, R99, 12.2k, AWS-1700. Low Ch, 1312 = 1712.4 MHz, Mid Ch, 1427 = 1735.4 MHz, and High Ch, 1513 = 1752.6 MHz

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	10/17/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2/6/2017	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-1000/2000-N/N	HFU	1/4/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	5/18/2016	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

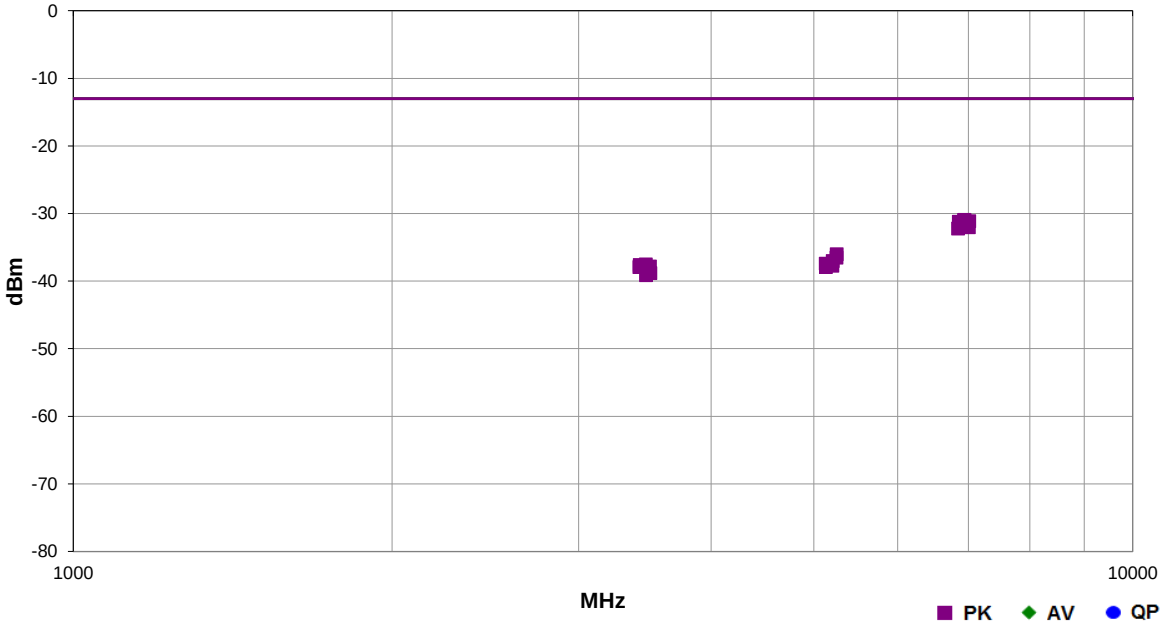
OUT OF BAND EMISSIONS PART 27 - 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/13/17		
Project:	None	**Temperature:**	22.9 °C		
Job Site:	EV01	**Humidity:**	36.5% RH		
Serial Number:	8	**Barometric Pres.:**	1012 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	WCDMA, R99, 12.2k, AWS-1700. Low Ch, 1312 = 1712.4 MHz, Mid Ch, 1427 = 1735.4 MHz, and High Ch, 1513 = 1752.6 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientation, Main Antenna orientation, and Aux Antenna orientation.				

Test Specifications	**Test Method**
FCC 27.53:2017	ANSI/TIA/EIA-603-D-2010

Run #	963	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	6939.200	1.0	84.0	Horz	PK	8.07E-07	-30.9	-13.0	-17.9	Mid Ch. 1735.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	6934.250	1.0	335.0	Vert	PK	8.07E-07	-30.9	-13.0	-17.9	Mid Ch. 1735.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	7012.100	1.0	331.0	Vert	PK	7.71E-07	-31.1	-13.0	-18.1	High Ch. 1752.6 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	6854.400	1.0	335.0	Horz	PK	7.54E-07	-31.2	-13.0	-18.2	Low Ch. 1712.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	7004.775	1.0	179.0	Horz	PK	6.27E-07	-32.0	-13.0	-19.0	High Ch. 1752.6 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	6843.075	1.0	267.0	Vert	PK	5.99E-07	-32.2	-13.0	-19.2	Low Ch. 1712.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	5256.925	3.2	65.0	Vert	PK	2.50E-07	-36.0	-13.0	-23.0	High Ch. 1752.6 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	5253.425	1.0	55.0	Horz	PK	2.22E-07	-36.5	-13.0	-23.5	High Ch. 1752.6 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	5210.550	1.0	102.0	Vert	PK	1.98E-07	-37.0	-13.0	-24.0	Mid Ch. 1735.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	5133.425	1.0	273.0	Horz	PK	1.81E-07	-37.4	-13.0	-24.4	Low Ch. 1712.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	3471.425	1.1	150.0	Horz	PK	1.77E-07	-37.5	-13.0	-24.5	Mid Ch. 1735.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	3425.975	1.0	205.0	Horz	PK	1.73E-07	-37.6	-13.0	-24.6	Low Ch. 1712.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	5206.950	1.0	134.0	Horz	PK	1.69E-07	-37.7	-13.0	-24.7	Mid Ch. 1735.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	3502.575	1.0	127.0	Horz	PK	1.65E-07	-37.8	-13.0	-24.8	High Ch. 1752.6 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	3423.275	1.0	144.0	Vert	PK	1.61E-07	-37.9	-13.0	-24.9	Low Ch. 1712.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	5134.525	1.0	232.0	Vert	PK	1.61E-07	-37.9	-13.0	-24.9	Low Ch. 1712.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	3505.575	1.0	146.0	Vert	PK	1.31E-07	-38.8	-13.0	-25.8	High Ch. 1752.6 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert
	3472.725	1.0	160.0	Vert	PK	1.22E-07	-39.1	-13.0	-26.1	Mid Ch. 1735.4 MHz, EUT Vert, Main Ant Vert, Aux Ant Vert

OUT OF BAND EMISSIONS PART 27 - LTE BAND 4

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting LTE, Band 4, QPSK/16-QAM

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	19957	1710.7
	Mid	20175	1732.5
	High	20393	1754.3
3 MHz	Low	19965	1711.5
	Mid	20175	1732.5
	High	20385	1753.5
5 MHz	Low	19975	1712.5
	Mid	20175	1732.5
	High	20375	1752.5
10 MHz	Low	20000	1715
	Mid	20175	1732.5
	High	20350	1750
15 MHz	Low	20025	1717.5
	Mid	20175	1732.5
	High	20325	1747.5
20 MHz	Low	20050	1720
	Mid	20175	1732.5
	High	20300	1745

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Microwave Amplifier	Amplifier Research	50S1G4A	TRU	NCR	0 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	10/17/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2/6/2017	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-1000/2000-N/N	HFU	1/4/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	5/18/2016	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

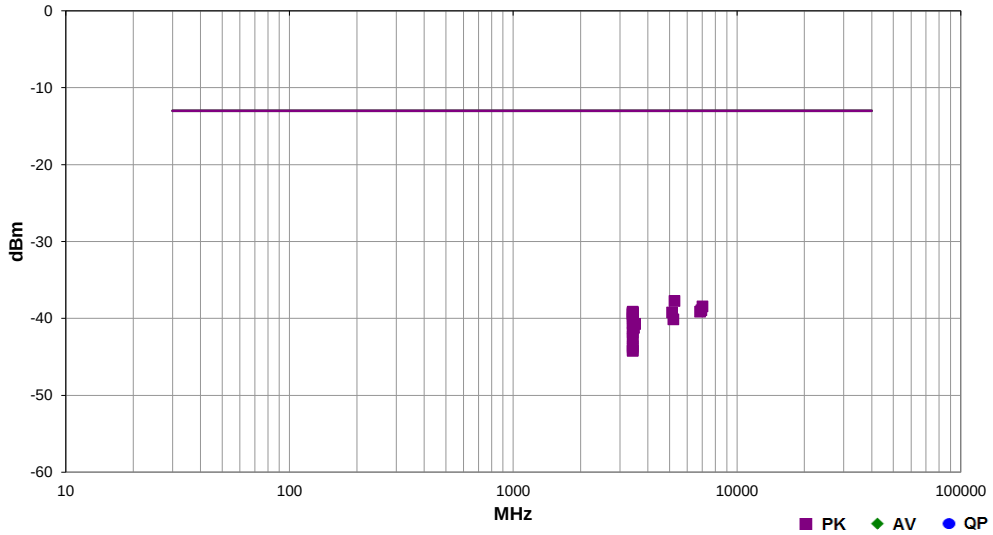
OUT OF BAND EMISSIONS PART 27 - LTE BAND 4

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/18/17		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	EV01	**Humidity:**	42.3% RH		
Serial Number:	8	**Barometric Pres.:**	1017 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting LTE, Band 4, QPSK/16-QAM				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Modulation, Bandwidth, RB setting, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.53:2017	ANSI/TIA/EIA-603-D-2010

Run #	999	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	5259.247	1.0	256.0	Horz	PK	1.69E-07	-37.7	-13.0	-24.7	High Ch. 1754.3 MHz, QPSK, 3MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	7011.908	1.0	253.0	Horz	PK	1.44E-07	-38.4	-13.0	-25.4	High Ch. 1754.3 MHz, QPSK, 3MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	6925.350	2.2	200.0	Horz	PK	1.28E-07	-38.9	-13.0	-25.9	Mid Ch. 1732.5 MHz, QPSK, 3 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	6838.623	1.0	191.0	Horz	PK	1.22E-07	-39.1	-13.0	-26.1	Low Ch. 1710.7 MHz, QPSK, 5 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.562	1.0	211.0	Horz	PK	1.22E-07	-39.1	-13.0	-26.1	Low Ch. 1710.7 MHz, QPSK, 3 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3421.670	1.0	209.0	Horz	PK	1.19E-07	-39.2	-13.0	-26.2	Low Ch. 1710.7 MHz, QPSK, 5 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	5128.397	1.0	257.0	Horz	PK	1.19E-07	-39.2	-13.0	-26.2	Low Ch. 1710.7 MHz, QPSK, 5 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.720	1.0	209.0	Horz	PK	1.19E-07	-39.2	-13.0	-26.2	Low Ch. 1710.7 MHz, QPSK, 20 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.312	1.0	210.0	Horz	PK	1.17E-07	-39.3	-13.0	-26.3	Low Ch. 1710.7 MHz, 16-QAM, 3 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3421.028	1.0	208.0	Horz	PK	1.14E-07	-39.4	-13.0	-26.4	Low Ch. 1710.7 MHz, QPSK, 10 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.462	1.0	211.0	Horz	PK	1.14E-07	-39.4	-13.0	-26.4	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.445	1.0	203.0	Horz	PK	1.14E-07	-39.4	-13.0	-26.4	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3422.310	1.0	210.0	Horz	PK	1.09E-07	-39.6	-13.0	-26.6	Low Ch. 1710.7 MHz, QPSK, 15 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3421.578	1.0	211.0	Horz	PK	1.04E-07	-39.8	-13.0	-26.8	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.295	1.3	241.0	Horz	PK	9.93E-08	-40.0	-13.0	-27.0	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	5193.492	1.0	277.0	Horz	PK	9.71E-08	-40.1	-13.0	-27.1	Mid Ch. 1732.5 MHz, QPSK, 3 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3422.433	1.0	210.0	Horz	PK	9.71E-08	-40.1	-13.0	-27.1	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3421.503	1.0	210.0	Horz	PK	8.65E-08	-40.6	-13.0	-27.6	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Max RB, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.520	1.0	303.0	Horz	PK	8.46E-08	-40.7	-13.0	-27.7	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3506.008	1.0	119.0	Horz	PK	8.46E-08	-40.7	-13.0	-27.7	High Ch. 1754.3 MHz, QPSK, 3MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3462.390	1.0	207.0	Horz	PK	7.54E-08	-41.2	-13.0	-28.2	Mid Ch. 1732.5 MHz, QPSK, 3 MHz BW, Offset 0, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.528	1.0	304.0	Horz	PK	7.36E-08	-41.3	-13.0	-28.3	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.437	1.0	144.0	Vert	PK	6.56E-08	-41.8	-13.0	-28.8	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.495	1.0	178.0	Vert	PK	5.85E-08	-42.3	-13.0	-29.3	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.470	1.0	143.0	Vert	PK	5.46E-08	-42.6	-13.0	-29.6	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.395	1.1	142.0	Vert	PK	4.34E-08	-43.6	-13.0	-30.6	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.637	1.0	332.0	Horz	PK	4.14E-08	-43.8	-13.0	-30.8	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.228	1.0	146.0	Vert	PK	3.86E-08	-44.1	-13.0	-31.1	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert
	3420.628	1.0	327.0	Vert	PK	3.78E-08	-44.2	-13.0	-31.2	Low Ch. 1710.7 MHz, QPSK, 1.4 MHz BW, Offset 5, EUT Horz, Main Ant Vert, Aux Ant Vert

OUT OF BAND EMISSIONS PART 24E - LTE BAND 2

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 2

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	18607	1850.7
	Mid	18900	1880
	High	19193	1909.3
3 MHz	Low	18615	1851.5
	Mid	18900	1880
	High	19185	1908.5
5 MHz	Low	18625	1852.5
	Mid	18900	1880
	High	19195	1907.5
10 MHz	Low	18650	1855
	Mid	18900	1880
	High	19150	1905
15 MHz	Low	18675	1857.5
	Mid	18900	1880
	High	19125	1902.5
20 MHz	Low	18700	1860
	Mid	18900	1880
	High	19100	1900

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Meter - Power	Gigatronics	8651A	SPM	4/26/2017	12 mo
Power Sensor	Gigatronics	80701A	SPL	4/26/2017	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	10/17/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-1000/2000-N/N	HFU	1/4/2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2/6/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	4/19/2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

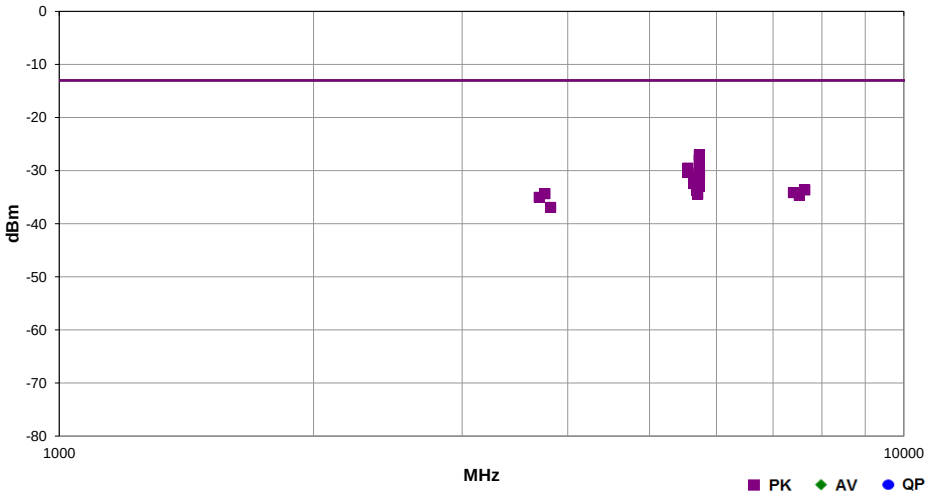
OUT OF BAND EMISSIONS PART 24E - LTE BAND 2

EmiRS 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/27/17		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	EV01	**Humidity:**	36.7% RH		
Serial Number:	8	**Barometric Pres.:**	1023 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 2				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Bandwidth, Modulation, RB Size and Offset, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	Test Method
FCC 24.238:2017	ANSI/TIA/EIA-603-D-2010

Run #	29	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
5726.517	1.3	327.0	Horz	PK	1.98E-06	-27.0	-13.0	-14.0	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5726.650	1.0	303.0	Vert	PK	1.94E-06	-27.1	-13.0	-14.1	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
5726.550	1.4	313.0	Vert	PK	1.61E-06	-27.9	-13.0	-14.9	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
5726.458	1.4	315.0	Vert	PK	1.57E-06	-28.0	-13.0	-15.0	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
5550.770	1.4	301.0	Horz	PK	1.11E-06	-29.5	-13.0	-16.5	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5726.750	1.1	256.0	Horz	PK	1.06E-06	-29.7	-13.0	-16.7	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
5726.508	1.1	316.0	Horz	PK	1.02E-06	-29.9	-13.0	-16.9	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
5726.400	1.0	297.0	Vert	PK	9.27E-07	-30.3	-13.0	-17.3	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5550.692	1.1	299.0	Horz	PK	9.27E-07	-30.3	-13.0	-17.3	Low Ch. 18607, 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5722.085	3.6	270.0	Horz	PK	9.06E-07	-30.4	-13.0	-17.4	High Ch. 1907.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5729.323	1.0	319.0	Horz	PK	8.65E-07	-30.6	-13.0	-17.6	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 6 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5726.558	1.1	271.0	Vert	PK	7.71E-07	-31.1	-13.0	-18.1	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
5721.677	1.3	321.0	Horz	PK	7.54E-07	-31.2	-13.0	-18.2	High Ch. 1908.5 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5673.350	1.0	315.0	Horz	PK	7.54E-07	-31.2	-13.0	-18.2	High Ch. 1900 MHz, 20 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5726.692	3.0	109.0	Horz	PK	6.87E-07	-31.6	-13.0	-18.6	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
5726.758	1.0	250.0	Vert	PK	6.72E-07	-31.7	-13.0	-18.7	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
5726.442	1.2	162.0	Horz	PK	6.72E-07	-31.7	-13.0	-18.7	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
5726.650	1.0	49.0	Horz	PK	5.99E-07	-32.2	-13.0	-19.2	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
5638.600	1.0	323.0	Horz	PK	5.72E-07	-32.4	-13.0	-19.4	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5727.892	1.1	319.0	Horz	PK	5.09E-07	-32.9	-13.0	-19.9	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, Max RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
7634.392	1.0	225.0	Horz	PK	4.34E-07	-33.6	-13.0	-20.6	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5687.508	1.0	305.0	Horz	PK	4.24E-07	-33.7	-13.0	-20.7	High Ch. 1902.5 MHz, 15 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
7399.933	1.2	208.0	Horz	PK	3.86E-07	-34.1	-13.0	-21.1	Low Ch. 18607, 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
3759.133	1.9	201.0	Horz	PK	3.69E-07	-34.3	-13.0	-21.3	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
5701.883	1.0	329.0	Horz	PK	3.61E-07	-34.4	-13.0	-21.4	High Ch. 1905 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
7518.675	1.0	216.0	Horz	PK	3.44E-07	-34.6	-13.0	-21.6	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
3700.483	1.7	202.0	Horz	PK	3.14E-07	-35.0	-13.0	-22.0	Low Ch. 18607, 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
3817.792	1.1	148.0	Horz	PK	2.03E-07	-36.9	-13.0	-23.9	High Ch. 19193, 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side

OUT OF BAND EMISSIONS PART 22H - LTE BAND 5

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 5

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	20407	824.7
	Mid	20525	836.5
	High	20643	848.3
3 MHz	Low	20415	825.5
	Mid	20525	836.5
	High	20635	847.5
5 MHz	Low	20425	826.5
	Mid	20525	836.5
	High	20625	486.5
10 MHz	Low	20450	829
	Mid	20525	836.5
	High	20600	844

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	18 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Meter - Power	Gigatronics	8651A	SPM	4/26/2017	12 mo
Power Sensor	Gigatronics	80701A	SPL	4/26/2017	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50108	HFV	2/6/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HFT	1/4/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFB	4/19/2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

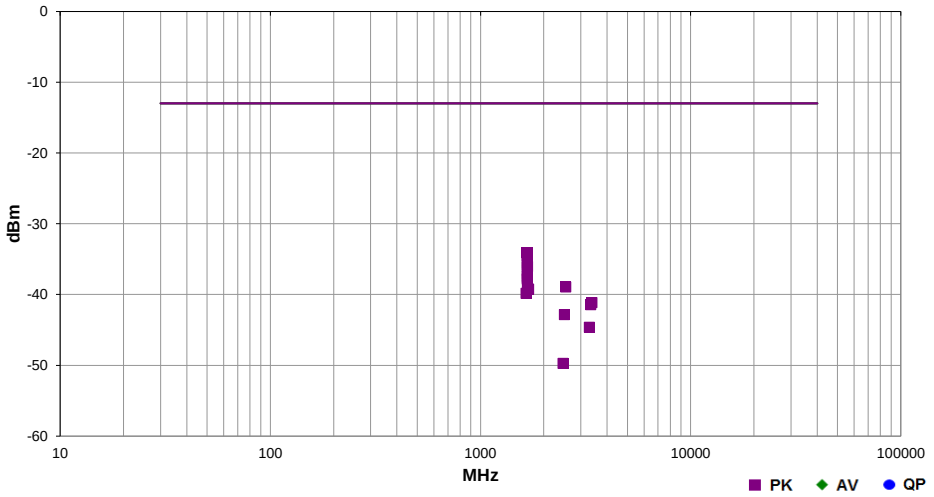
OUT OF BAND EMISSIONS PART 22H - LTE BAND 5

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/28/17		
Project:	None	**Temperature:**	22.1 °C		
Job Site:	EV01	**Humidity:**	36.2% RH		
Serial Number:	8	**Barometric Pres.:**	1031 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 5				
Deviations:	None				
Comments:	See comments below for Channel, Frequecy, Modulation, Bandwidth, RB and Offset, EUT, Main Antenna, Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 22.917:2017	ANSI/TIA/EIA-603-D-2010

Run #	57	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
1672.008	1.0	242.0	Horz	PK	3.86E-07	-34.1	-13.0	-21.1	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1664.150	1.0	142.0	Horz	PK	3.86E-07	-34.1	-13.0	-21.1	Mid Ch. 836.5 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1671.992	1.0	139.0	Horz	PK	3.61E-07	-34.4	-13.0	-21.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
1668.625	1.0	141.0	Horz	PK	3.52E-07	-34.5	-13.0	-21.5	Mid Ch. 836.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1672.092	1.4	206.0	Vert	PK	3.00E-07	-35.2	-13.0	-22.2	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1671.983	1.0	147.0	Horz	PK	2.80E-07	-35.5	-13.0	-22.5	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
1672.142	1.0	141.0	Horz	PK	2.74E-07	-35.6	-13.0	-22.6	Mid Ch. 836.5 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1672.058	1.1	294.0	Vert	PK	2.61E-07	-35.8	-13.0	-22.8	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
1671.967	1.0	137.0	Horz	PK	2.50E-07	-36.0	-13.0	-23.0	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
1673.892	1.0	143.0	Horz	PK	2.50E-07	-36.0	-13.0	-23.0	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 5 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1671.992	1.5	185.0	Vert	PK	2.44E-07	-36.1	-13.0	-23.1	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
1672.950	1.0	144.0	Horz	PK	2.17E-07	-36.6	-13.0	-23.6	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, Max RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1672.075	1.0	139.0	Horz	PK	1.98E-07	-37.0	-13.0	-24.0	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
1672.050	1.0	163.0	Vert	PK	1.81E-07	-37.4	-13.0	-24.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
1672.025	1.0	204.0	Vert	PK	1.81E-07	-37.4	-13.0	-24.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
1672.175	1.0	157.0	Horz	PK	1.73E-07	-37.6	-13.0	-24.6	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
1670.358	1.0	160.0	Horz	PK	1.65E-07	-37.8	-13.0	-24.8	Mid Ch. 836.5 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1671.983	1.1	307.0	Vert	PK	1.34E-07	-38.7	-13.0	-25.7	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
2543.617	2.3	21.0	Horz	PK	1.28E-07	-38.9	-13.0	-25.9	High Ch. 848.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1695.633	1.0	249.0	Horz	PK	1.19E-07	-39.2	-13.0	-26.2	High Ch. 848.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
1648.575	1.0	144.0	Horz	PK	1.04E-07	-39.8	-13.0	-26.8	Low Ch. 824.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
3391.533	1.0	249.0	Horz	PK	7.71E-08	-41.1	-13.0	-28.1	High Ch. 848.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
3344.200	1.0	243.0	Horz	PK	7.20E-08	-41.4	-13.0	-28.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
2508.092	1.0	49.0	Horz	PK	5.21E-08	-42.8	-13.0	-29.8	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
3297.192	1.0	247.0	Horz	PK	3.44E-08	-44.6	-13.0	-31.6	Low Ch. 824.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
2472.608	1.0	119.0	Horz	PK	1.06E-08	-49.7	-13.0	-36.7	Low Ch. 824.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side

OUT OF BAND EMISSIONS PART 27 - LTE BAND 13

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continious Tx, LTE Band 13, 1RB

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
5 MHz	Low	23205	779.5
	Mid	23230	782
	High	23255	784.5
10 MHz			
	Mid	23230	782

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	12.4 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HFT	1/4/2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50108	HFV	2/6/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFB	5/18/2016	12 mo
Attenuator	Coaxicom	3910-10	AWX	5/18/2016	12 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

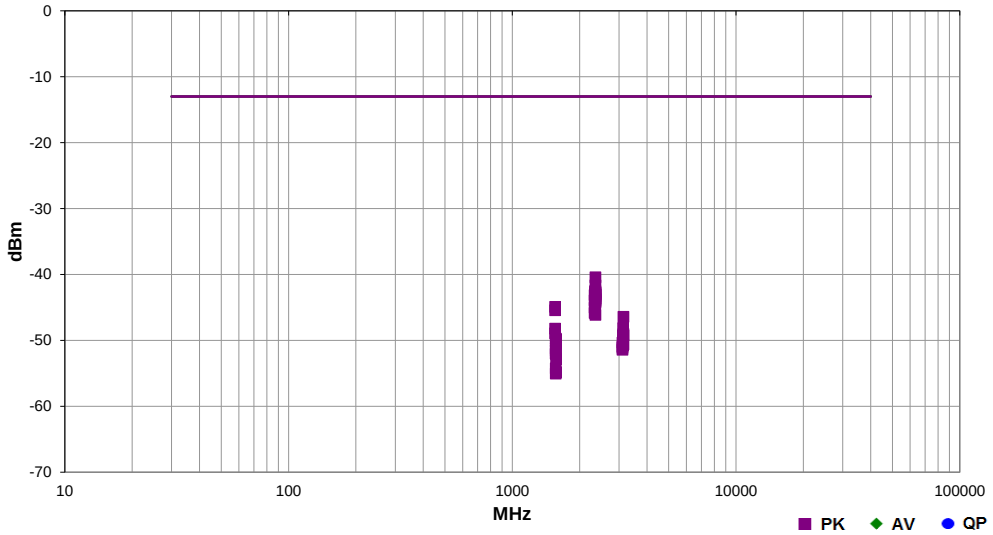
OUT OF BAND EMISSIONS PART 27 - LTE BAND 13

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/13/17		
Project:	None	**Temperature:**	23.2 °C		
Job Site:	EV01	**Humidity:**	36.9% RH		
Serial Number:	8	**Barometric Pres.:**	1014 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continious Tx, LTE Band 13, 1RB				
Deviations:	None				
Comments:	See comments below for Channel, Modulation type, Bandwidth, RB size and offset, EUT, Main Antenna and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.53:2017	ANSI/TIA/EIA-603-D-2010

Run #	977	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	2353.492	1.3	161.0	Vert	PK	9.06E-08	-40.4	-13.0	-27.4	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.650	1.3	162.0	Vert	PK	6.87E-08	-41.6	-13.0	-28.6	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	2353.458	1.3	194.0	Vert	PK	5.59E-08	-42.5	-13.0	-29.5	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	2346.000	1.3	153.0	Vert	PK	5.59E-08	-42.5	-13.0	-29.5	Mid Ch. 782 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.508	1.7	151.0	Vert	PK	5.33E-08	-42.7	-13.0	-29.7	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	2353.475	1.3	176.0	Horz	PK	5.21E-08	-42.8	-13.0	-29.8	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.475	1.3	178.0	Vert	PK	4.98E-08	-43.0	-13.0	-30.0	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	2353.500	1.3	173.0	Horz	PK	4.98E-08	-43.0	-13.0	-30.0	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	2353.417	1.0	267.0	Horz	PK	4.87E-08	-43.1	-13.0	-30.1	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	2332.100	1.3	180.0	Vert	PK	4.87E-08	-43.1	-13.0	-30.1	Low Ch. 779.5 MHz, 16-QAM, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.392	1.3	223.0	Horz	PK	4.65E-08	-43.3	-13.0	-30.3	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	2346.058	1.0	87.0	Horz	PK	4.44E-08	-43.5	-13.0	-30.5	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.575	1.0	113.0	Horz	PK	4.34E-08	-43.6	-13.0	-30.6	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.608	1.3	186.0	Vert	PK	4.24E-08	-43.7	-13.0	-30.7	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	2346.083	1.0	175.0	Horz	PK	4.24E-08	-43.7	-13.0	-30.7	Mid Ch. 782 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.608	1.2	224.0	Horz	PK	4.05E-08	-43.9	-13.0	-30.9	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	2332.117	1.0	207.0	Horz	PK	4.05E-08	-43.9	-13.0	-30.9	Low Ch. 779.5 MHz, 16-QAM, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2345.900	1.0	103.0	Vert	PK	4.05E-08	-43.9	-13.0	-30.9	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2345.767	1.0	88.0	Horz	PK	4.05E-08	-43.9	-13.0	-30.9	Mid Ch. 782 MHz, 16-QAM, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.575	1.0	175.0	Horz	PK	3.86E-08	-44.1	-13.0	-31.1	High Ch. 785.5 MHz, 16-QAM, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.392	1.0	266.0	Horz	PK	3.69E-08	-44.3	-13.0	-31.3	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	2345.717	1.0	156.0	Vert	PK	3.69E-08	-44.3	-13.0	-31.3	Mid Ch. 782 MHz, 16-QAM, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2345.675	1.0	156.0	Vert	PK	3.37E-08	-44.7	-13.0	-31.7	Mid Ch. 782 MHz, QPSK, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1554.458	1.0	201.0	Horz	PK	3.21E-08	-44.9	-13.0	-31.9	Low Ch. 779.5 MHz, 16-QAM, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2332.108	1.3	180.0	Vert	PK	3.14E-08	-45.0	-13.0	-32.0	Low Ch. 779.5 MHz, QPSK, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1554.583	1.0	201.0	Horz	PK	2.86E-08	-45.4	-13.0	-32.4	Low Ch. 779.5 MHz, QPSK, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2345.633	1.0	88.0	Horz	PK	2.67E-08	-45.7	-13.0	-32.7	Mid Ch. 782 MHz, QPSK, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2331.933	1.0	207.0	Horz	PK	2.61E-08	-45.8	-13.0	-32.8	Low Ch. 779.5 MHz, QPSK, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	2353.425	1.0	161.0	Vert	PK	2.44E-08	-46.1	-13.0	-33.1	High Ch. 785.5 MHz, 16-QAM, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3138.100	1.4	111.0	Horz	PK	2.28E-08	-46.4	-13.0	-33.4	High Ch. 785.5 MHz, 16-QAM, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3127.942	1.0	205.0	Vert	PK	1.54E-08	-48.1	-13.0	-35.1	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1554.658	1.0	37.0	Vert	PK	1.50E-08	-48.2	-13.0	-35.2	Low Ch. 779.5 MHz, 16-QAM, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1554.892	1.0	37.0	Vert	PK	1.28E-08	-48.9	-13.0	-35.9	Low Ch. 779.5 MHz, QPSK, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3137.792	1.0	207.0	Vert	PK	1.25E-08	-49.0	-13.0	-36.0	High Ch. 785.5 MHz, 16-QAM, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3138.117	1.4	110.0	Horz	PK	1.19E-08	-49.2	-13.0	-36.2	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3128.158	1.0	220.0	Horz	PK	1.19E-08	-49.2	-13.0	-36.2	Mid Ch. 782 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1564.033	1.0	202.0	Horz	PK	1.06E-08	-49.7	-13.0	-36.7	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1568.717	1.0	205.0	Horz	PK	1.04E-08	-49.8	-13.0	-36.8	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3127.975	1.0	208.0	Horz	PK	1.04E-08	-49.8	-13.0	-36.8	Mid Ch. 782 MHz, QPSK, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1564.083	1.0	202.0	Horz	PK	9.71E-09	-50.1	-13.0	-37.1	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3128.358	1.0	217.0	Horz	PK	9.71E-09	-50.1	-13.0	-37.1	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3127.475	1.0	185.0	Vert	PK	9.71E-09	-50.1	-13.0	-37.1	Mid Ch. 782 MHz, 16-QAM, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3109.550	1.0	207.0	Vert	PK	9.27E-09	-50.3	-13.0	-37.3	Low Ch. 779.5 MHz, QPSK, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3127.833	1.0	208.0	Horz	PK	9.27E-09	-50.3	-13.0	-37.3	Mid Ch. 782 MHz, 16-QAM, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3127.467	1.0	185.0	Vert	PK	9.27E-09	-50.3	-13.0	-37.3	Mid Ch. 782 MHz, QPSK, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1569.083	1.0	202.0	Horz	PK	8.85E-09	-50.5	-13.0	-37.5	High Ch. 785.5 MHz, 16-QAM, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3139.283	1.0	207.0	Vert	PK	8.65E-09	-50.6	-13.0	-37.6	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3127.800	1.0	216.0	Vert	PK	8.46E-09	-50.7	-13.0	-37.7	Mid Ch. 782 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3108.175	1.0	110.0	Horz	PK	8.07E-09	-50.9	-13.0	-37.9	Low Ch. 779.5 MHz, QPSK, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3106.933	1.0	207.0	Vert	PK	7.71E-09	-51.1	-13.0	-38.1	Low Ch. 779.5 MHz, 16-QAM, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1563.592	1.0	199.0	Horz	PK	7.54E-09	-51.2	-13.0	-38.2	Mid Ch. 782 MHz, 16-QAM, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	3108.425	1.0	110.0	Horz	PK	7.20E-09	-51.4	-13.0	-38.4	Low Ch. 779.5 MHz, 16-QAM, 5 MHz BW, 1RB, 0 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1563.883	1.0	199.0	Horz	PK	7.03E-09	-51.5	-13.0	-38.5	Mid Ch. 782 MHz, QPSK, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1563.900	1.4	175.0	Vert	PK	6.27E-09	-52.0	-13.0	-39.0	Mid Ch. 782 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1564.067	1.4	175.0	Vert	PK	6.27E-09	-52.0	-13.0	-39.0	Mid Ch. 782 MHz, 16-QAM, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1569.342	1.0	35.0	Vert	PK	5.21E-09	-52.8	-13.0	-39.8	High Ch. 785.5 MHz, 16-QAM, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1563.817	1.6	38.0	Vert	PK	3.78E-09	-54.2	-13.0	-41.2	Mid Ch. 782 MHz, QPSK, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1569.217	3.2	40.0	Vert	PK	3.29E-09	-54.8	-13.0	-41.8	High Ch. 785.5 MHz, QPSK, 5 MHz BW, 1RB, 12 offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1564.358	1.6	38.0	Vert	PK	3.14E-09	-55.0	-13.0	-42.0	Mid Ch. 782 MHz, 16-QAM, 10 MHz BW, 1RB, 24 offset, EUT Vert, Main Ant Vert, Aux Ant Vert

OUT OF BAND EMISSIONS PART 27 - LTE BAND 17

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 17

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
5 MHz	Low	23755	706.5
	Mid	23790	710
	High	23825	713.5
10 MHz	Low	23780	709
	Mid	23780	710
	High	23780	711

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	18 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Meter - Power	Gigatronics	8651A	SPM	4/26/2017	12 mo
Power Sensor	Gigatronics	80701A	SPL	4/26/2017	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50108	HFV	2/6/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HFT	1/4/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFB	4/19/2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

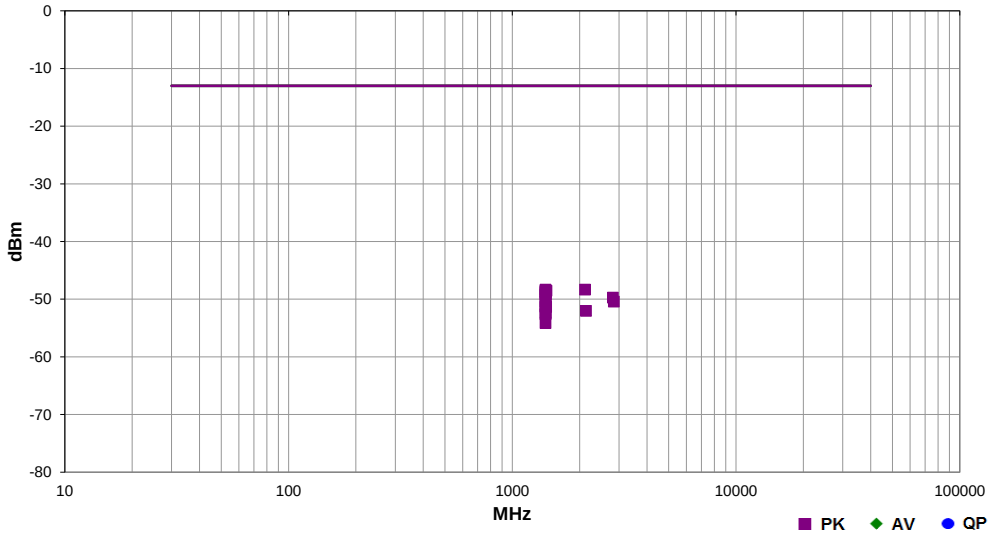
OUT OF BAND EMISSIONS PART 27 - LTE BAND 17

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/25/17		
Project:	None	**Temperature:**	21.8 °C		
Job Site:	EV01	**Humidity:**	42.8% RH		
Serial Number:	8	**Barometric Pres.:**	1013 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 17				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Bandwidth, Modulation, Resource Block size and offset, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.53:2017	ANSI/TIA/EIA-603-D-2010

Run #	9	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1408.605	1.1	133.0	Horz	PK	1.47E-08	-48.3	-13.0	-35.3	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	2112.922	1.0	42.0	Horz	PK	1.47E-08	-48.3	-13.0	-35.3	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1408.757	1.0	128.0	Horz	PK	1.40E-08	-48.5	-13.0	-35.5	Low Ch. 706.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1422.513	1.0	127.0	Horz	PK	1.40E-08	-48.5	-13.0	-35.5	High Ch. 713.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1408.725	1.2	112.0	Horz	PK	1.37E-08	-48.6	-13.0	-35.6	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	1408.620	1.2	123.0	Horz	PK	1.31E-08	-48.8	-13.0	-35.8	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1408.615	1.2	124.0	Horz	PK	1.22E-08	-49.1	-13.0	-36.1	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	1409.188	1.0	128.0	Horz	PK	1.19E-08	-49.2	-13.0	-36.2	Low Ch. 709 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	1408.850	1.2	105.0	Horz	PK	1.17E-08	-49.3	-13.0	-36.3	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	2817.423	1.0	33.0	Horz	PK	1.06E-08	-49.7	-13.0	-36.7	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1408.715	1.3	159.0	Vert	PK	9.06E-09	-50.4	-13.0	-37.4	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1408.595	1.2	193.0	Horz	PK	9.06E-09	-50.4	-13.0	-37.4	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	2845.307	1.0	43.0	Horz	PK	9.06E-09	-50.4	-13.0	-37.4	High Ch. 713.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1408.585	1.0	62.0	Vert	PK	7.54E-09	-51.2	-13.0	-38.2	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1408.745	1.7	161.0	Vert	PK	7.36E-09	-51.3	-13.0	-38.3	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1417.392	1.0	129.0	Horz	PK	7.36E-09	-51.3	-13.0	-38.3	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 24 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	2134.353	2.0	359.0	Horz	PK	6.27E-09	-52.0	-13.0	-39.0	High Ch. 713.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1408.470	1.3	143.0	Vert	PK	5.85E-09	-52.3	-13.0	-39.3	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	1410.690	1.0	131.0	Horz	PK	5.72E-09	-52.4	-13.0	-39.4	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, Max RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	1408.700	2.4	196.0	Vert	PK	5.46E-09	-52.6	-13.0	-39.6	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	1408.585	2.8	35.0	Vert	PK	3.86E-09	-54.1	-13.0	-41.1	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side

OUT OF BAND EMISSIONS PART 24E - LTE BAND 25

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 25

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	26047	1850.7
	Mid	26340	1880
	High	26683	1914.3
3 MHz	Low	26055	1851.5
	Mid	26340	1880
	High	26675	1913.5
5 MHz	Low	26065	1852.5
	Mid	26340	1880
	High	26665	1912.5
10 MHz	Low	26090	1855
	Mid	26340	1880
	High	26640	1910
15 MHz	Low	26115	1857.5
	Mid	26340	1880
	High	26615	1907.5
20 MHz	Low	26140	1860
	Mid	26340	1880
	High	26590	1905

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Meter - Power	Gigatronics	8651A	SPM	4/26/2017	12 mo
Power Sensor	Gigatronics	80701A	SPL	4/26/2017	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	10/17/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/6/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Cable	None	Standard Gain Horns Cable	EVF	2/6/2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2/7/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-1000/2000-N/N	HFU	1/4/2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2/6/2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	4/19/2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted.

The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

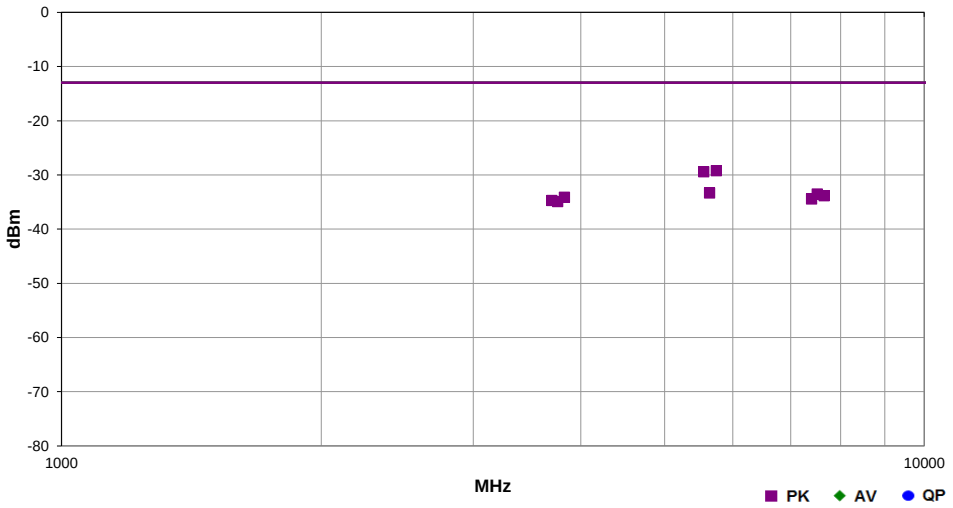
OUT OF BAND EMISSIONS PART 24E - LTE BAND 25

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/27/17		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	EV01	**Humidity:**	36.7% RH		
Serial Number:	8	**Barometric Pres.:**	1023 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 25				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Bandwidth, Modulation, RB Size and Offset, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 24.238:2017	ANSI/TIA/EIA-603-D-2010

Run #	30	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	5741.492	1.0	318.0	Horz	PK	1.19E-06	-29.2	-13.0	-16.2	High Ch. 1914.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	5550.917	1.0	300.0	Horz	PK	1.14E-06	-29.4	-13.0	-16.4	Low Ch. 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	5638.825	1.0	324.0	Horz	PK	4.65E-07	-33.3	-13.0	-20.3	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	7516.433	1.0	288.0	Horz	PK	4.44E-07	-33.5	-13.0	-20.5	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	7656.883	1.0	53.0	Horz	PK	4.14E-07	-33.8	-13.0	-20.8	High Ch. 1914.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	3827.692	1.6	197.0	Horz	PK	3.86E-07	-34.1	-13.0	-21.1	High Ch. 1914.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	7402.092	1.0	45.0	Horz	PK	3.61E-07	-34.4	-13.0	-21.4	Low Ch. 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	3700.425	1.7	203.0	Horz	PK	3.37E-07	-34.7	-13.0	-21.7	Low Ch. 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	3759.075	1.4	199.0	Horz	PK	3.21E-07	-34.9	-13.0	-21.9	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side

ERP PART 22H - 2G, 3G

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting GPRS, GSM-850, CS-4, 1UP/1DN, Low Ch, 128 = 824.2 MHz, Mid Ch, 190 = 836.6 MHz, High Ch, 251 = 848.8 MHz

Transmitting E-GPRS, GSM-850, MCS-5 (8PSK), 1UP/1DN, Low Ch, 128 = 824.2 MHz, Mid Ch, 190 = 836.6 MHz, High Ch, 251 = 848.8 MHz

Transmitting WCDMA, CLR-850, Low Ch, 4132 = 826.5 MHz, Mid Ch, 4182 = 837 MHz, High Ch, 4233 = 846.6 MHz

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	824.2 MHz	Stop Frequency	848.8 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Generator - Signal	Rohde & Schwarz	SML01	TFV	11/9/2015	36 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarizationThe amplitude and frequency of the highest emission were noted. The EUT was then replaced with a ½ wave dipole that was successively tuned to the highest emission. A signal generator was connected to the dipole, and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded. The signal generator, amplifier, and cable were then connected to an analyzer and the power output was recorded. By factoring in the dipole antenna gain (dBi), the effective radiated power for the maximum fundamental emission was determined. The ERP value was obtained from taking the value in EIRP – 2.15.

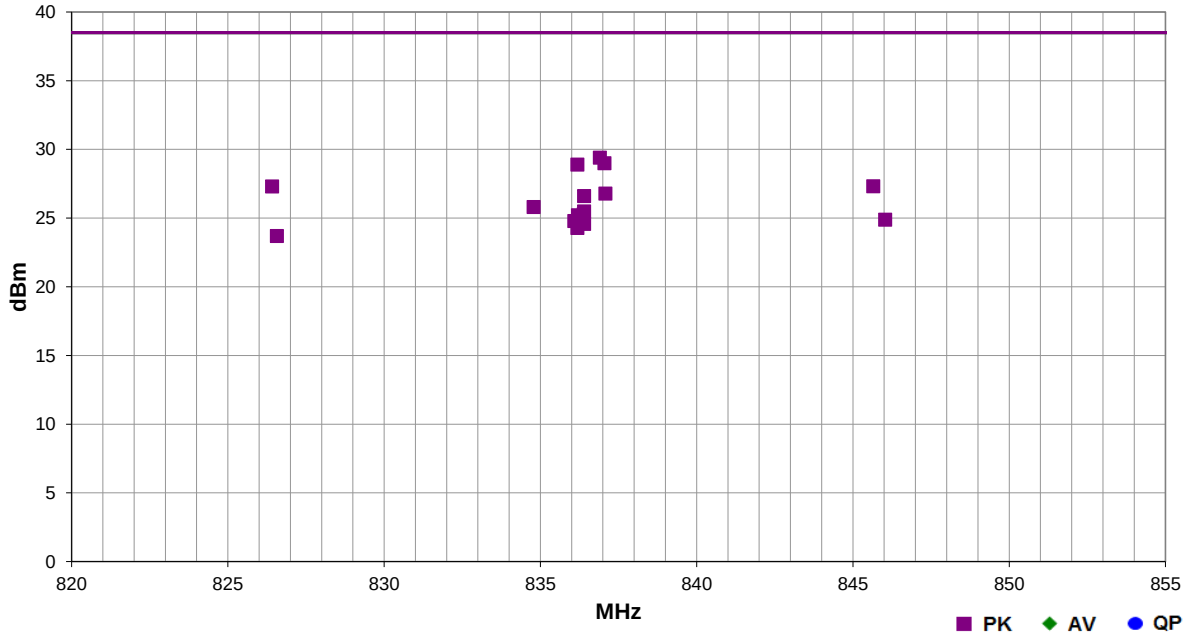
ERP PART 22H - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/05/17		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	EV01	**Humidity:**	39.8% RH		
Serial Number:	8	**Barometric Pres.:**	1016 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting WCDMA, CLR-850, Low Ch = 826.5 MHz, Mid Ch = 837 MHz, High Ch = 846.6 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antennea orientations.				

Test Specifications	**Test Method**
FCC 22.913:2017	ANSI/TIA/EIA-603-D-2010

Run #	901	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	836.900	1.0	225.0	Vert	PK	8.71E-01	29.4	38.5	-9.1	Mid Ch, EUT Vert, Main Ant On Side, Aux Ant On Side
	837.050	1.0	285.0	Vert	PK	7.93E-01	29.0	38.5	-9.5	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	836.183	1.0	317.0	Vert	PK	7.76E-01	28.9	38.5	-9.6	Mid Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	826.417	1.2	352.0	Horz	PK	5.37E-01	27.3	38.5	-11.2	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	845.650	1.0	224.0	Vert	PK	5.38E-01	27.3	38.5	-11.2	High Ch, EUT Vert, Main Ant On Side, Aux Ant On Side
	837.083	1.0	259.0	Vert	PK	4.78E-01	26.8	38.5	-11.7	Mid Ch, EUT on side, Main Ant Vert, Aux Ant Vert
	836.400	1.0	224.0	Vert	PK	4.57E-01	26.6	38.5	-11.9	Mid Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	834.783	1.1	349.0	Horz	PK	3.80E-01	25.8	38.5	-12.7	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	836.400	1.1	271.0	Horz	PK	3.53E-01	25.5	38.5	-13.0	Mid Ch, EUT on side, Main Ant On Side, Aux Ant On Side
	836.383	1.2	38.0	Horz	PK	3.37E-01	25.3	38.5	-13.2	Mid Ch, EUT Vert, Main Ant on side, Aux Ant on side
	836.200	1.0	227.0	Vert	PK	3.31E-01	25.2	38.5	-13.3	Mid Ch, EUT on side, Main Ant On Side, Aux Ant On Side
	846.033	1.1	344.0	Horz	PK	3.08E-01	24.9	38.5	-13.6	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	836.083	1.1	343.0	Horz	PK	3.01E-01	24.8	38.5	-13.7	Mid Ch, EUT on side, Main Ant Vert, Aux Ant Vert
	836.400	1.1	265.0	Horz	PK	2.87E-01	24.6	38.5	-13.9	Mid Ch, EUT Horz, Main Ant On Side, Aux Ant On Side
	836.183	1.0	330.0	Horz	PK	2.68E-01	24.3	38.5	-14.2	Mid Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	826.567	1.0	229.0	Vert	PK	2.34E-01	23.7	38.5	-14.8	Low Ch, EUT Vert, Main Ant On Side, Aux Ant On Side

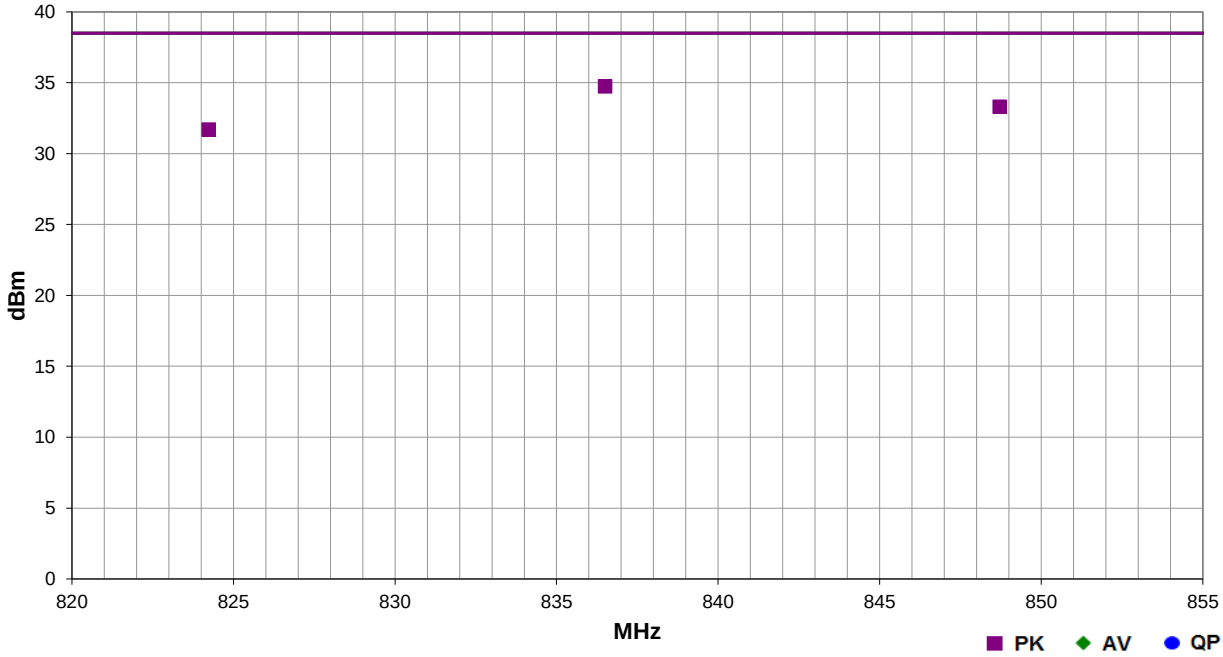
ERP PART 22H - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/05/17		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	EV01	**Humidity:**	39.8% RH		
Serial Number:	8	**Barometric Pres.:**	1016 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting GPRS, GSM-850, CS-4, 1UP/1DN, Low Ch = 824.2 MHz, Mid Ch = 836.6 MHz, High Ch = 848.8 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antennea orientations.				

Test Specifications	**Test Method**
FCC 22.913:2017	ANSI/TIA/EIA-603-D-2010

Run #	902	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	836.500	1.0	287.0	Vert	PK	2.99E+00	34.8	38.5	-3.8	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	848.717	1.0	276.0	Vert	PK	2.14E+00	33.3	38.5	-5.2	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	824.233	1.0	278.0	Vert	PK	1.48E+00	31.7	38.5	-6.8	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

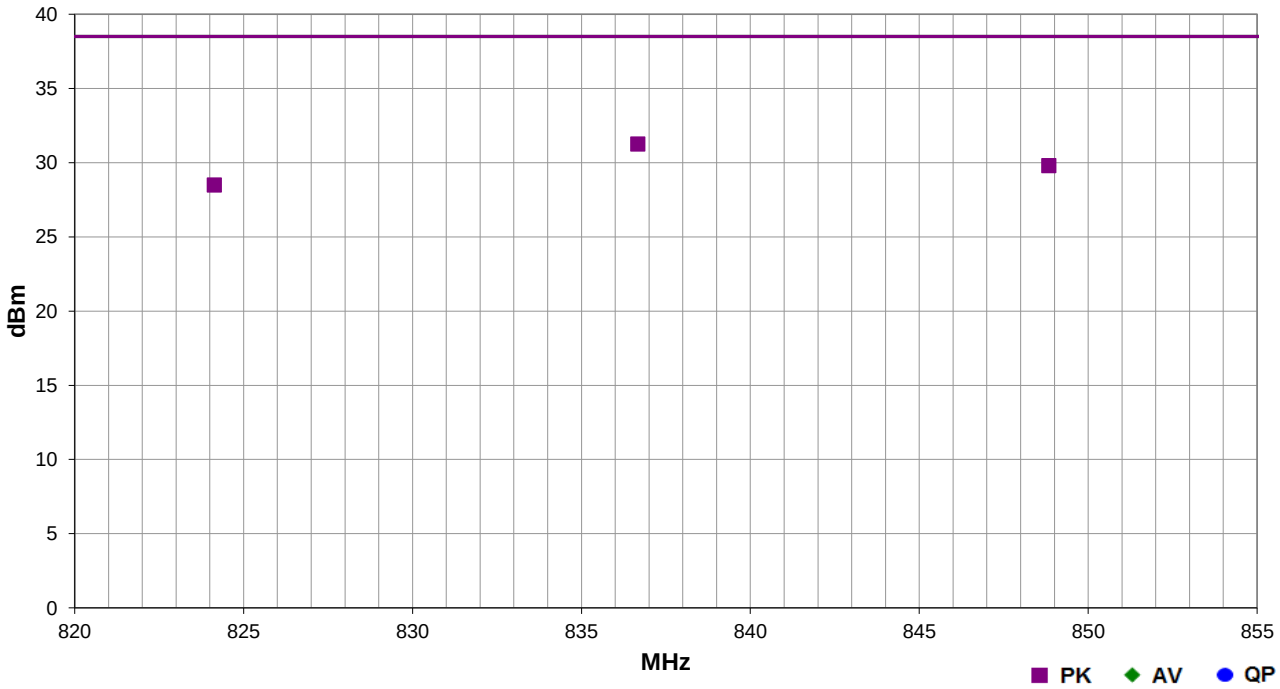
ERP PART 22H - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/05/17		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	EV01	**Humidity:**	39.8% RH		
Serial Number:	8	**Barometric Pres.:**	1016 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting E-GPRS, GSM-850, MCS-5 (8PSK), 1UP/1DN, Low Ch = 824.2 MHz, Mid Ch = 836.6 MHz, High Ch = 848.8 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antennea orientations.				

Test Specifications	**Test Method**
FCC 22.913:2017	ANSI/TIA/EIA-603-D-2010

Run #	903	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	836.667	1.0	284.0	Vert	PK	1.33E+00	31.3	38.5	-7.2	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	848.833	1.0	273.0	Vert	PK	9.55E-01	29.8	38.5	-8.7	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	824.133	1.0	279.0	Vert	PK	7.08E-01	28.5	38.5	-10.0	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

EIRP PART 24E - 2G, 3G

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

GPRS, PCS1900, CS-4, 1UP/1DN. Low Ch, 512 = 1850.2 MHz, Mid Ch, 661 = 1880 MHz, and High Ch, 810 = 1909.8 MHz

E-GPRS, PCS1900, MCS-5 (8PSK), 1UP/1DN, Low Ch, 512= 1850.2 MHz, Mid Ch,661 = 1880 MHz, and High Ch, 810 = 1909.8 MHz

WCDMA, 12.2k. Low Ch, 9262 = 1852.4 MHz, Mid Ch, 9400 = 1880 MHz, and High Ch, 9538 = 1907.6 MHz

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	1850.2 MHz	Stop Frequency	1909.8 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

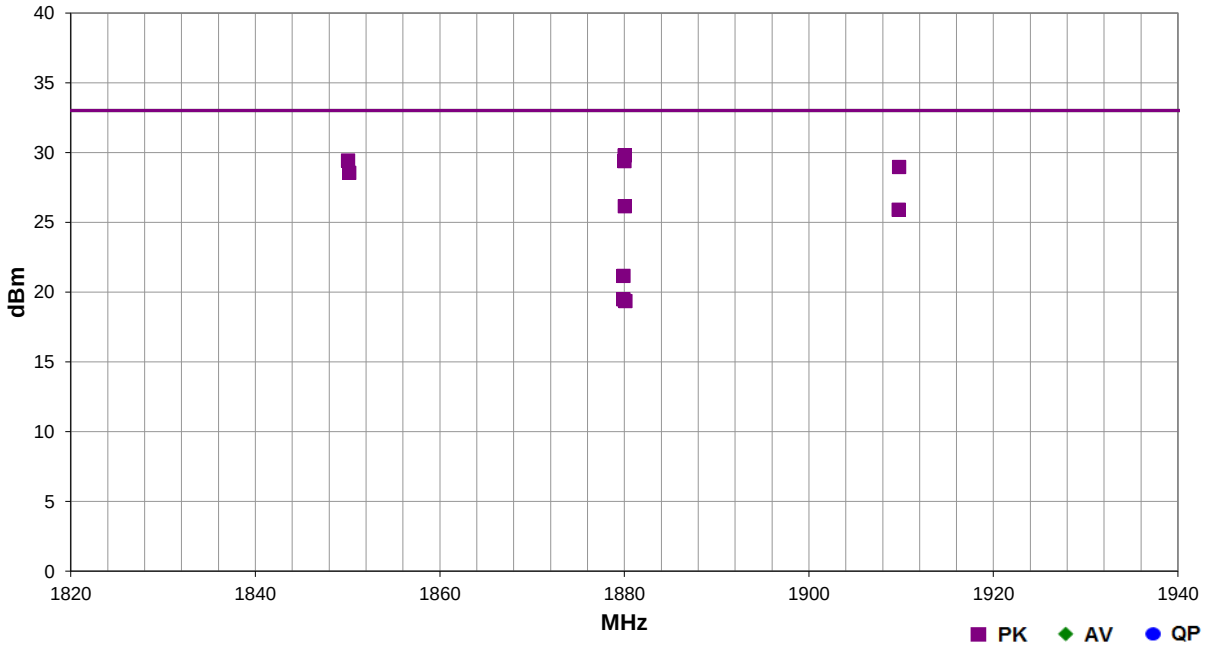
EIRP PART 24E - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/03/17		
Project:	None	**Temperature:**	22 °C		
Job Site:	EV01	**Humidity:**	33.2% RH		
Serial Number:	8	**Barometric Pres.:**	1028 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting GPRS, PCS 1900, CS-4, 1UP/1DN. Low Ch. = 1850.2 MHz, Mid Ch. = 1880 Mhz, and High Ch. = 1909.8 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations				

Test Specifications	**Test Method**
FCC 24.232:2017	ANSI/TIA/EIA-603-D-2010

Run #	7	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1880.025	1.0	237.0	Vert	PK	9.53E-01	29.8	33.0	-3.2	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1880.000	1.0	235.0	Vert	PK	8.69E-01	29.4	33.0	-3.6	Mid Ch, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.042	1.0	241.0	Vert	PK	8.77E-01	29.4	33.0	-3.6	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1909.783	1.0	233.0	Vert	PK	7.89E-01	29.0	33.0	-4.0	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1850.175	1.0	258.0	Horz	PK	7.14E-01	28.5	33.0	-4.5	Low Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1880.050	1.0	291.0	Horz	PK	4.13E-01	26.2	33.0	-6.8	Mid Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1909.742	1.0	290.0	Horz	PK	3.89E-01	25.9	33.0	-7.1	High Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1879.892	1.0	138.0	Horz	PK	1.31E-01	21.2	33.0	-11.8	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1879.908	1.0	121.0	Vert	PK	8.89E-02	19.5	33.0	-13.5	Mid Ch, EUT On Side, Main Ant On Side, Aux Ant On Side
	1880.108	1.0	55.0	Horz	PK	8.63E-02	19.4	33.0	-13.6	Mid Ch, EUT Horz, Main Ant Vert, Aux Ant Vert

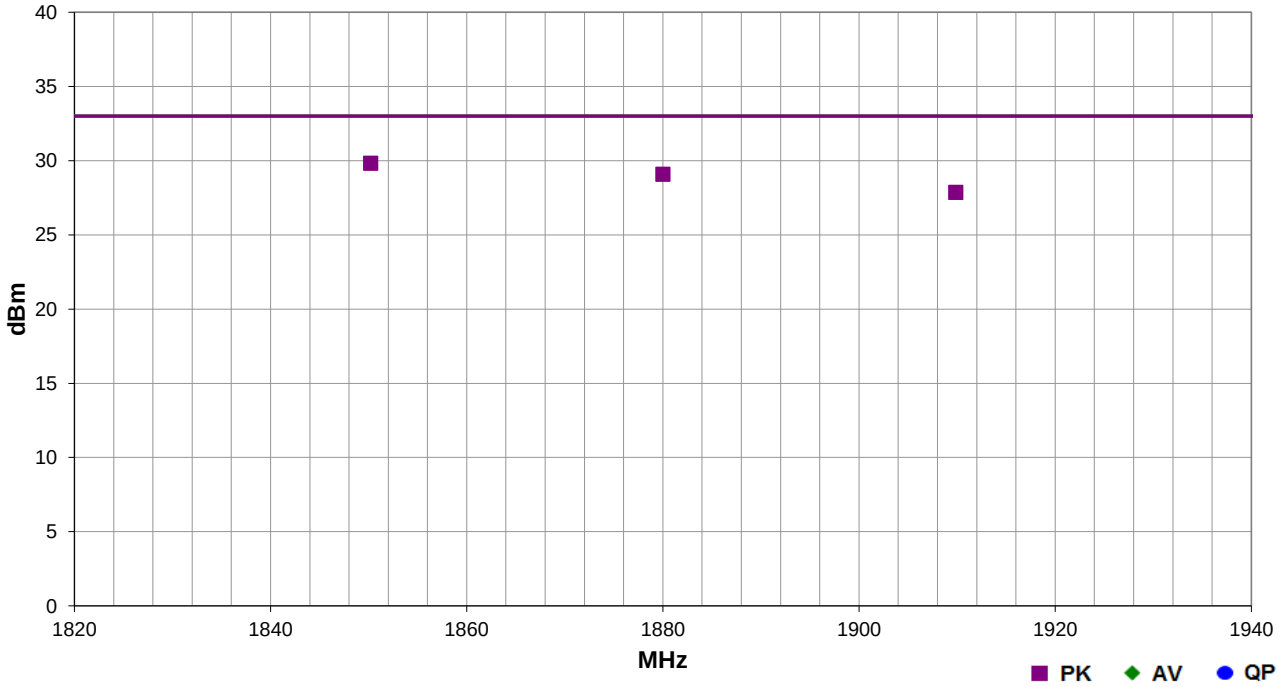
EIRP PART 24E - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/03/17		
Project:	None	**Temperature:**	22 °C		
Job Site:	EV01	**Humidity:**	33.2% RH		
Serial Number:	8	**Barometric Pres.:**	1028 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting E-GPRS, PCS 1900, MCS-5 (8PSK), 1UP/1DN. Low channel = 1850.2 MHz, Mid channel = 1880 Mhz, and High channel = 1909.8 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations				

Test Specifications	**Test Method**
FCC 24.232:2017	ANSI/TIA/EIA-603-D-2010

Run #	11	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1850.200	1.0	232.0	Vert	PK	9.62E-01	29.8	33.0	-3.2	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1879.992	1.0	223.0	Vert	PK	8.11E-01	29.1	33.0	-3.9	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1909.858	1.0	232.0	Vert	PK	6.12E-01	27.9	33.0	-5.1	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

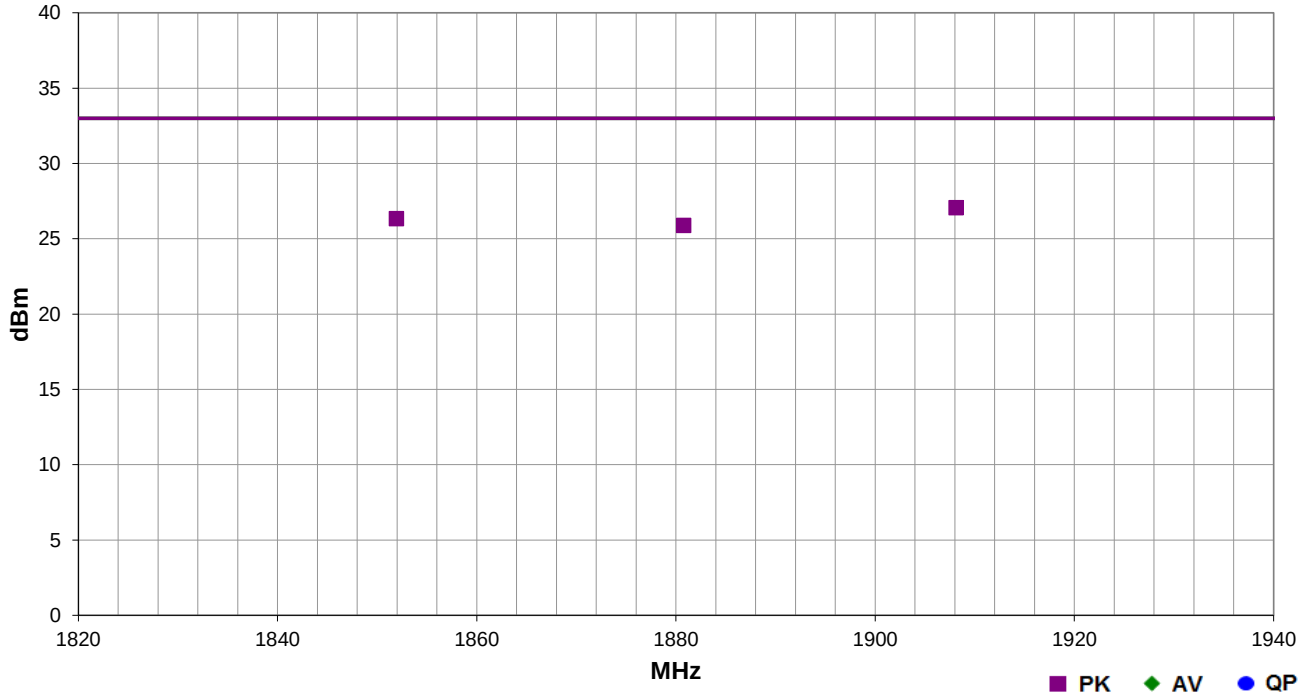
EIRP PART 24E - 2G, 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/03/17		
Project:	None	**Temperature:**	22 °C		
Job Site:	EV01	**Humidity:**	33.2% RH		
Serial Number:	8	**Barometric Pres.:**	1028 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting WCDMA, 12.2k. Low Ch. = 1852.4 MHz, Mid Ch. = 1880 Mhz, and High Ch. = 1907.6 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations				

Test Specifications	**Test Method**
FCC 24.232:2017	ANSI/TIA/EIA-603-D-2010

Run #	13	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1908.117	1.0	221.0	Vert	PK	5.08E-01	27.1	33.0	-5.9	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1851.933	1.0	309.0	Vert	PK	4.30E-01	26.3	33.0	-6.7	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1880.767	1.0	222.0	Vert	PK	3.88E-01	25.9	33.0	-7.1	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

EIRP PART 27 - 3G

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

WCDMA, R99, 12.2k, AWS-1700. Low Ch, 1312 = 1712.4 MHz, Mid Ch, 1427 = 1735.4 MHz, and High Ch, 1513 = 1752.6 MHz

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	1710 MHz	Stop Frequency	1754 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

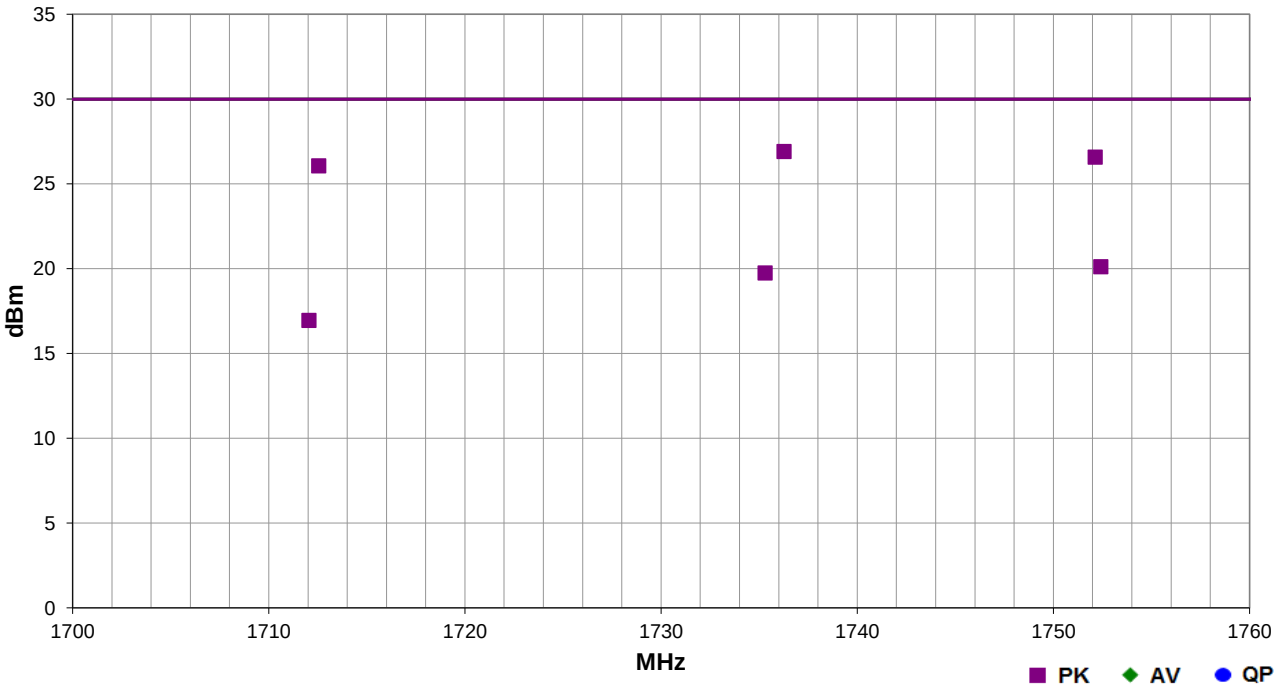
EIRP PART 27 - 3G

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/04/17		
Project:	None	**Temperature:**	23.6 °C		
Job Site:	EV01	**Humidity:**	34% RH		
Serial Number:	8	**Barometric Pres.:**	1018 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Transmitting WCDMA, AWS 1700 12.2k, Low channel = 1712.4 MHz, Mid channel = 1735.4 Mhz, and High channel = 1752.6 MHz				
Deviations:	None				
Comments:	See comments below for Channel, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.50:2017	ANSI/TIA/EIA-603-D-2010

Run #	14	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1736.267	1.5	3.0	Vert	PK	4.91E-01	26.9	30.0	-3.1	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1752.133	1.0	189.0	Vert	PK	4.55E-01	26.6	30.0	-3.4	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1712.550	1.0	227.0	Vert	PK	4.04E-01	26.1	30.0	-3.9	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1752.417	1.4	42.0	Horz	PK	1.03E-01	20.1	30.0	-9.9	High Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1735.300	1.0	145.0	Horz	PK	9.44E-02	19.8	30.0	-10.2	Mid Ch, EUT Vert, Main Ant Vert, Aux Ant Vert
	1712.050	1.0	145.0	Horz	PK	4.95E-02	17.0	30.0	-13.0	Low Ch, EUT Vert, Main Ant Vert, Aux Ant Vert

EIRP PART 24E - LTE BAND 2

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 2

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	18607	1850.7
	Mid	18900	1880
	High	19193	1909.3
3 MHz	Low	18615	1851.5
	Mid	18900	1880
	High	19185	1908.5
5 MHz	Low	18625	1852.5
	Mid	18900	1880
	High	19195	1907.5
10 MHz	Low	18650	1855
	Mid	18900	1880
	High	19150	1905
15 MHz	Low	18675	1857.5
	Mid	18900	1880
	High	19125	1902.5
20 MHz	Low	18700	1860
	Mid	18900	1880
	High	19100	1900

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	1850 MHz	Stop Frequency	1910 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

EIRP PART 24E - LTE BAND 2

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Meter - Power	Gigatronics	8651A	SPM	4/26/2017	12 mo
Power Sensor	Gigatronics	80701A	SPL	4/26/2017	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

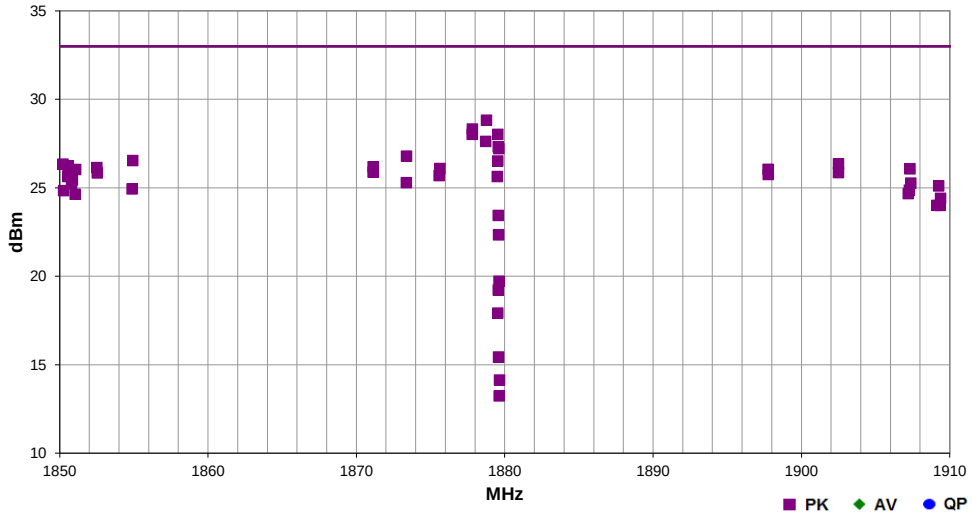
EIRP PART 24E - LTE BAND 2

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/26/17		
Project:	None	**Temperature:**	22.9 °C		
Job Site:	EV01	**Humidity:**	41.8% RH		
Serial Number:	8	**Barometric Pres.:**	1017 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 2				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Bandwidth, Modulation, Number of resource blocks and offset, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 24.232:2017	ANSI/TIA/EIA-603-D-2010

Run #	14	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1878.770	1.0	127.0	Vert	PK	7.62E-01	28.8	33.0	-4.2	Mid Ch. 1880 MHz, 3 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1877.823	1.0	125.0	Vert	PK	6.79E-01	28.3	33.0	-4.7	Mid Ch. 1880 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1879.530	1.0	149.0	Vert	PK	6.34E-01	28.0	33.0	-5.0	Mid Ch. 1880 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1877.813	1.0	147.0	Vert	PK	6.34E-01	28.0	33.0	-5.0	Mid Ch. 1880 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1878.723	1.0	148.0	Vert	PK	5.78E-01	27.6	33.0	-5.4	Mid Ch. 1880 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1879.563	1.0	147.0	Vert	PK	5.40E-01	27.3	33.0	-5.7	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1879.605	1.0	259.0	Vert	PK	5.27E-01	27.2	33.0	-5.8	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1873.377	1.0	127.0	Vert	PK	4.78E-01	26.8	33.0	-6.2	Mid Ch. 1880 MHz, 15 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1854.923	1.0	292.0	Vert	PK	4.51E-01	26.5	33.0	-6.5	Low Ch. 1855 MHz, 10 MHz BW, 16-QAM, 1 RB, 24 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1879.530	1.0	147.0	Vert	PK	4.49E-01	26.5	33.0	-6.5	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	1902.493	1.0	148.0	Vert	PK	4.33E-01	26.4	33.0	-6.6	High Ch. 1902.5 MHz, 15 MHz BW, 16-QAM, 1 RB, 37 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1850.223	1.0	313.0	Vert	PK	4.31E-01	26.3	33.0	-6.7	Low Ch. 1852.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1850.567	1.0	313.0	Vert	PK	4.21E-01	26.2	33.0	-6.8	Low Ch. 1850.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 2 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1871.130	1.0	124.0	Vert	PK	4.16E-01	26.2	33.0	-6.8	Mid Ch. 1880 MHz, 20 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1907.317	1.0	147.0	Vert	PK	4.05E-01	26.1	33.0	-6.9	High Ch. 1907.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1875.630	1.0	106.0	Vert	PK	4.06E-01	26.1	33.0	-6.9	Mid Ch. 1880 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1852.503	1.0	314.0	Vert	PK	4.11E-01	26.1	33.0	-6.9	Low Ch. 1852.5 MHz, 5 MHz BW, QPSK, 1 RB, 12 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1897.753	1.0	147.0	Vert	PK	4.03E-01	26.1	33.0	-7.0	High Ch. 1900 MHz, 20 MHz BW, QPSK, 1 RB, 37 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1851.083	1.0	310.0	Vert	PK	4.02E-01	26.0	33.0	-7.0	Low Ch. 1860 MHz, 20 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1902.500	1.0	148.0	Vert	PK	3.85E-01	25.9	33.0	-7.1	High Ch. 1900 MHz, 20 MHz BW, 16-QAM, 1 RB, 37 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1871.130	1.0	123.0	Vert	PK	3.88E-01	25.9	33.0	-7.1	Mid Ch. 1880 MHz, 20 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1897.767	1.0	149.0	Vert	PK	3.76E-01	25.8	33.0	-7.2	High Ch. 1902.5 MHz, 15 MHz BW, 16-QAM, 1 RB, 37 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1852.537	1.0	311.0	Vert	PK	3.84E-01	25.8	33.0	-7.2	Low Ch. 1852.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1875.580	1.0	123.0	Vert	PK	3.71E-01	25.7	33.0	-7.3	Mid Ch. 1880 MHz, 10 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.540	1.0	313.0	Vert	PK	3.66E-01	25.6	33.0	-7.4	Low Ch. 1850.7 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 2 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1879.497	1.0	58.0	Horz	PK	3.66E-01	25.6	33.0	-7.4	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	1850.853	1.0	314.0	Vert	PK	3.50E-01	25.4	33.0	-7.6	Low Ch. 1857.5 MHz, 15 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1907.373	1.0	148.0	Vert	PK	3.37E-01	25.3	33.0	-7.7	High Ch. 1907.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1873.373	1.0	125.0	Vert	PK	3.38E-01	25.3	33.0	-7.7	Mid Ch. 1880 MHz, 15 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.800	1.0	315.0	Vert	PK	3.34E-01	25.2	33.0	-7.8	Low Ch. 1857.5 MHz, 15 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1909.250	1.0	147.0	Vert	PK	3.24E-01	25.1	33.0	-7.9	High Ch. 1909.3 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 2 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1907.273	1.0	147.0	Vert	PK	3.07E-01	24.9	33.0	-8.1	High Ch. 1908.5 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1854.883	1.0	310.0	Vert	PK	3.12E-01	24.9	33.0	-8.1	Low Ch. 1855 MHz, 10 MHz BW, QPSK, 1 RB, 24 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1850.267	1.0	314.0	Vert	PK	3.05E-01	24.8	33.0	-8.2	Low Ch. 1851.5 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1907.200	1.0	146.0	Vert	PK	2.93E-01	24.7	33.0	-8.3	High Ch. 1908.5 MHz, 3 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1851.047	1.0	313.0	Vert	PK	2.91E-01	24.6	33.0	-8.4	Low Ch. 1860 MHz, 20 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1909.380	1.0	149.0	Vert	PK	2.76E-01	24.4	33.0	-8.6	High Ch. 1905 MHz, 10 MHz BW, QPSK, 1 RB, 49 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1909.137	1.0	148.0	Vert	PK	2.52E-01	24.0	33.0	-9.0	High Ch. 1909.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 2 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1909.360	1.0	149.0	Vert	PK	2.52E-01	24.0	33.0	-9.0	High Ch. 1905 MHz, 10 MHz BW, 16-QAM, 1 RB, 49 Offset, EUT Horz, Main Ant Vert, Aut Ant Vert
	1879.563	1.0	237.0	Horz	PK	2.21E-01	23.4	33.0	-9.6	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	1879.580	1.0	57.0	Horz	PK	1.71E-01	22.3	33.0	-10.7	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1879.613	1.1	129.0	Vert	PK	9.38E-02	19.7	33.0	-13.3	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	1879.563	1.2	180.0	Vert	PK	8.36E-02	19.2	33.0	-13.8	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	1879.530	1.0	178.0	Vert	PK	6.19E-02	17.9	33.0	-15.1	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	1879.580	1.0	47.0	Horz	PK	3.50E-02	15.4	33.0	-17.6	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	1879.647	1.0	343.0	Horz	PK	2.59E-02	14.1	33.0	-18.9	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1879.622	1.0	304.0	Horz	PK	2.11E-02	13.2	33.0	-19.8	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert

EIRP PART 27 - LTE BAND 4

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continuous Tx, LTE Band 4

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	19957	1710.7
	Mid	20175	1732.5
	High	20393	1754.3
3 MHz	Low	19965	1711.5
	Mid	20175	1732.5
	High	20385	1753.5
5 MHz	Low	19975	1712.5
	Mid	20175	1732.5
	High	20375	1752.5
10 MHz	Low	20000	1715
	Mid	20175	1732.5
	High	20350	1750
15 MHz	Low	20025	1717.5
	Mid	20175	1732.5
	High	20325	1747.5
20 MHz	Low	20050	1720
	Mid	20175	1732.5
	High	20300	1745

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	1710 MHz	Stop Frequency	1754 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

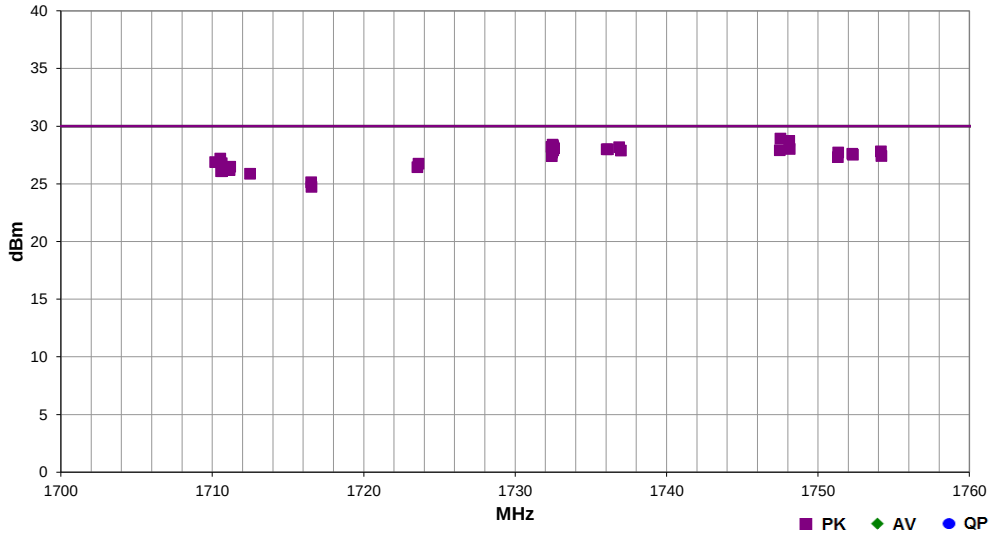
EIRP PART 27 - LTE BAND 4

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/17/17		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	EV01	**Humidity:**	37.9% RH		
Serial Number:	8	**Barometric Pres.:**	1015 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continious Tx, LTE Band 4, 1RB				
Deviations:	None				
Comments:	See comments below for Channel, Bandwidth, Modulation type, Offset, EUT, Main Antenna and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.50:2017	ANSI/TIA/EIA-603-D-2010

Run #	986	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1747.520	1.0	242.0	Vert	PK	7.80E-01	28.9	30.0	-1.1	High Ch. 1745.5 MHz, 15 MHz BW, 16-QAM, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert
	1748.095	1.0	239.0	Vert	PK	7.45E-01	28.7	30.0	-1.3	High Ch. 1750 MHz, 10 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.472	1.0	206.0	Vert	PK	6.92E-01	28.4	30.0	-1.6	Mid Ch. 1732.5 MHz, 15 MHz BW, 16-QAM, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.488	1.0	211.0	Vert	PK	6.76E-01	28.3	30.0	-1.7	Mid Ch. 1732.5 MHz, 15 MHz BW, QPSK, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert
	1736.868	1.0	206.0	Vert	PK	6.58E-01	28.2	30.0	-1.8	Mid Ch. 1732.5 MHz, 10 MHz BW, 16-QAM, Offset 49, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.397	1.0	203.0	Vert	PK	6.61E-01	28.2	30.0	-1.8	Mid Ch. 1732.5 MHz, 1.4 MHz BW, 16-QAM, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.513	1.0	203.0	Vert	PK	6.61E-01	28.2	30.0	-1.8	Mid Ch. 1732.5 MHz, 5 MHz BW, 16-QAM, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.572	1.0	212.0	Vert	PK	6.46E-01	28.1	30.0	-1.9	Mid Ch. 1732.5 MHz, 3 MHz BW, 16-QAM, Offset 7, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.447	1.0	206.0	Vert	PK	6.46E-01	28.1	30.0	-1.9	Mid Ch. 1732.5 MHz, 3 MHz BW, QPSK, Offset 7, EUT Vert, Main Ant Vert, Aux Ant Vert
	1736.125	1.0	240.0	Vert	PK	6.30E-01	28.0	30.0	-2.0	High Ch. 1745 MHz, 20 MHz BW, QPSK, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1736.042	1.0	244.0	Vert	PK	6.30E-01	28.0	30.0	-2.0	High Ch. 1745 MHz, 20 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.455	1.0	207.0	Vert	PK	6.31E-01	28.0	30.0	-2.0	Mid Ch. 1732.5 MHz, 15 MHz BW, QPSK, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert
	1748.128	1.0	240.0	Vert	PK	6.34E-01	28.0	30.0	-2.0	High Ch. 1750 MHz, 10 MHz BW, QPSK, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1736.985	1.0	212.0	Vert	PK	6.14E-01	27.9	30.0	-2.1	Mid Ch. 1732.5 MHz, 10 MHz BW, QPSK, Offset 49, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.513	1.0	205.0	Vert	PK	6.17E-01	27.9	30.0	-2.1	Mid Ch. 1732.5 MHz, 5 MHz BW, QPSK, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	1747.478	1.0	241.0	Vert	PK	6.19E-01	27.9	30.0	-2.1	High Ch. 1745.5 MHz, 15 MHz BW, QPSK, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert
	1754.153	1.0	72.0	Vert	PK	6.05E-01	27.8	30.0	-2.2	High Ch. 1754.3 MHz, 1.4 MHz BW, 16-QAM, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.435	1.0	208.0	Vert	PK	5.89E-01	27.7	30.0	-2.3	Mid Ch. 1732.5 MHz, 1.4 MHz BW, QPSK, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1751.337	1.0	237.0	Vert	PK	5.92E-01	27.7	30.0	-2.3	High Ch. 1752.5 MHz, 5 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1752.262	1.0	78.0	Vert	PK	5.77E-01	27.6	30.0	-2.4	High Ch. 1753.5 MHz, 3 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1752.303	1.0	77.0	Vert	PK	5.65E-01	27.5	30.0	-2.5	High Ch. 1753.5 MHz, 3 MHz BW, QPSK, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1732.422	1.0	243.0	Vert	PK	5.50E-01	27.4	30.0	-2.6	Mid Ch. 1732.5 MHz, 1.4 MHz BW, QPSK, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1754.187	1.0	74.0	Vert	PK	5.52E-01	27.4	30.0	-2.6	High Ch. 1754.3 MHz, 1.4 MHz BW, QPSK, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1751.312	1.0	240.0	Vert	PK	5.40E-01	27.3	30.0	-2.7	High Ch. 1752.5 MHz, 5 MHz BW, QPSK, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1710.525	1.0	82.0	Vert	PK	5.24E-01	27.2	30.0	-2.8	Low Ch. 1710.7 MHz, 1.4 MHz BW, 16-QAM, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1710.192	1.0	80.0	Vert	PK	4.89E-01	26.9	30.0	-3.1	Low Ch. 1711.5 MHz, 3 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1723.622	1.0	207.0	Vert	PK	4.73E-01	26.8	30.0	-3.2	Mid Ch. 1732.5 MHz, 20 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1710.620	1.0	82.0	Vert	PK	4.78E-01	26.8	30.0	-3.2	Low Ch. 1715 MHz, 10 MHz BW, 16-QAM, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	1723.547	1.0	207.0	Vert	PK	4.42E-01	26.5	30.0	-3.5	Mid Ch. 1732.5 MHz, 20 MHz BW, QPSK, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1711.180	1.0	158.0	Vert	PK	4.46E-01	26.5	30.0	-3.5	Low Ch. 1720 MHz, 20 MHz BW, 16-QAM, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1711.138	1.0	81.0	Vert	PK	4.16E-01	26.2	30.0	-3.8	Low Ch. 1720 MHz, 20 MHz BW, QPSK, Offset 0, EUT Vert, Main Ant Vert, Aux Ant Vert
	1710.583	1.0	83.0	Vert	PK	4.06E-01	26.1	30.0	-3.9	Low Ch. 1710.7 MHz, 1.4 MHz BW, QPSK, Offset 2, EUT Vert, Main Ant Vert, Aux Ant Vert
	1710.645	1.0	82.0	Vert	PK	4.06E-01	26.1	30.0	-3.9	Low Ch. 1715 MHz, 10 MHz BW, QPSK, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	1712.487	1.0	85.0	Vert	PK	3.87E-01	25.9	30.0	-4.1	Low Ch. 1712.5 MHz, 5 MHz BW, 16-QAM, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	1716.525	1.0	158.0	Vert	PK	3.27E-01	25.1	30.0	-4.9	Low Ch. 1717.5 MHz, 15 MHz BW, 16-QAM, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert
	1716.550	1.0	156.0	Vert	PK	2.98E-01	24.7	30.0	-5.3	Low Ch. 1717.5 MHz, 15 MHz BW, QPSK, Offset 37, EUT Vert, Main Ant Vert, Aux Ant Vert

ERP PART 22H - LTE BAND 5

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 5

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	20407	824.7
	Mid	20525	836.5
	High	20643	848.3
3 MHz	Low	20415	825.5
	Mid	20525	836.5
	High	20635	847.5
5 MHz	Low	20425	826.5
	Mid	20525	836.5
	High	20625	486.5
10 MHz	Low	20450	829
	Mid	20525	836.5
	High	20600	844

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	824 MHz	Stop Frequency	850 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarizationThe amplitude and frequency of the highest emission were noted. The EUT was then replaced with a ½ wave dipole that was successively tuned to the highest emission. A signal generator was connected to the dipole, and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded. The signal generator, amplifier, and cable were then connected to an analyzer and the power output was recorded. By factoring in the dipole antenna gain (dBi), the effective radiated power for the maximum fundamental emission was determined. The ERP value was obtained from taking the value in EIRP – 2.15.

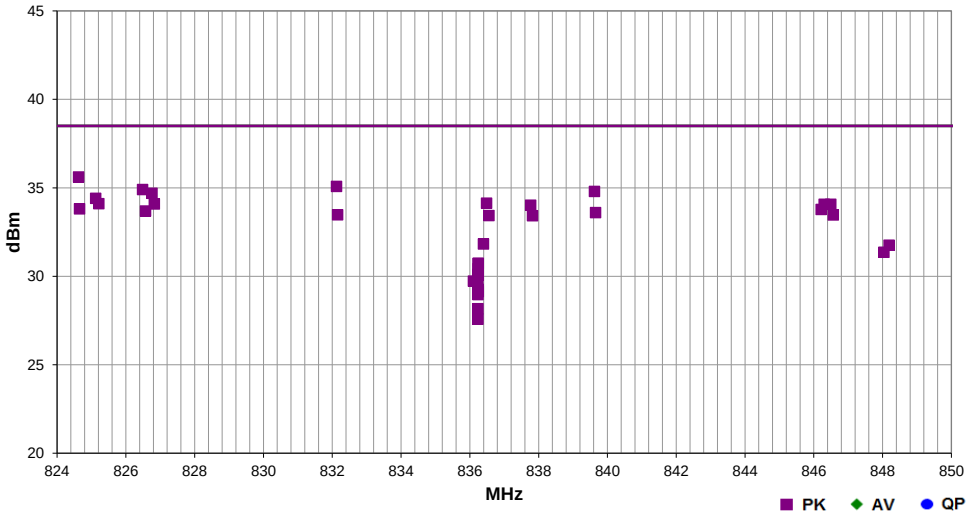
ERP PART 22H - LTE BAND 5

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/25/17		
Project:	None	**Temperature:**	21.9 °C		
Job Site:	EV01	**Humidity:**	39.8% RH		
Serial Number:	8	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 5				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Modulation type, RB size and offset, EUT, Main Antenna, and Auxillary Antenna orientations.				

Test Specifications	**Test Method**
FCC 22.913:2017	ANSI/TIA/EIA-603-D-2010

Run #	2	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	824.625	1.2	138.0	Horz	PK	3.64E+00	35.6	38.5	-2.9	Low Ch. 826.5 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	832.125	1.2	138.0	Horz	PK	3.22E+00	35.1	38.5	-3.4	Mid Ch. 836.5 MHz, 10 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	826.484	1.2	139.0	Horz	PK	3.09E+00	34.9	38.5	-3.6	Low Ch. 826.5 MHz, 10 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	839.622	1.1	137.0	Horz	PK	3.02E+00	34.8	38.5	-3.7	High Ch. 844 MHz, 10 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	826.758	1.2	138.0	Horz	PK	2.94E+00	34.7	38.5	-3.8	Low Ch. 825.5 MHz, 3 MHz BW, 16-QAM, 1 RB, 14 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	825.123	1.1	138.0	Horz	PK	2.76E+00	34.4	38.5	-4.1	Low Ch. 824.7 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 5 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	836.486	1.2	138.0	Horz	PK	2.59E+00	34.1	38.5	-4.4	Mid Ch. 836.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	826.827	1.1	136.0	Horz	PK	2.56E+00	34.1	38.5	-4.4	Low Ch. 825.5 MHz, 3 MHz BW, QPSK, 1 RB, 14 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	825.212	1.1	136.0	Horz	PK	2.58E+00	34.1	38.5	-4.4	Low Ch. 824.7 MHz, 1.4 MHz BW, QPSK, 1 RB, 5 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	846.492	1.1	140.0	Horz	PK	2.55E+00	34.1	38.5	-4.4	High Ch. 846.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	846.303	1.1	138.0	Horz	PK	2.55E+00	34.1	38.5	-4.4	High Ch. 847.5 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	837.768	1.1	139.0	Horz	PK	2.52E+00	34.0	38.5	-4.5	Mid Ch. 836.5 MHz, 3 MHz BW, 16-QAM, 1 RB, 14 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	824.654	1.1	138.0	Horz	PK	2.40E+00	33.8	38.5	-4.7	Low Ch. 829 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	846.213	1.1	136.0	Horz	PK	2.39E+00	33.8	38.5	-4.7	High Ch. 847.5 MHz, 3 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	826.570	1.2	140.0	Horz	PK	2.34E+00	33.7	38.5	-4.8	Low Ch. 829 MHz, 5 MHz BW, QPSK, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	839.655	1.2	138.0	Horz	PK	2.29E+00	33.6	38.5	-4.9	High Ch. 844 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	832.155	1.1	138.0	Horz	PK	2.23E+00	33.5	38.5	-5.0	Mid Ch. 836.5 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	846.568	1.1	139.0	Horz	PK	2.22E+00	33.5	38.5	-5.0	High Ch. 846.5 MHz, 5 MHz BW, QPSK, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	836.557	1.1	138.0	Horz	PK	2.20E+00	33.4	38.5	-5.1	Mid Ch. 836.5 MHz, 5 MHz BW, QPSK, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	837.820	1.1	140.0	Horz	PK	2.20E+00	33.4	38.5	-5.1	Mid Ch. 836.5 MHz, 3 MHz BW, QPSK, 1 RB, 14 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	836.397	1.1	135.0	Horz	PK	1.52E+00	31.8	38.5	-6.7	Mid Ch. 836.5 MHz, 1.4 MHz BW, 16-QAM, 3 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	848.187	1.1	138.0	Horz	PK	1.50E+00	31.8	38.5	-6.7	High Ch. 848.3 MHz, 1.4 MHz BW, 16-QAM, 3 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	848.040	1.1	140.0	Horz	PK	1.37E+00	31.4	38.5	-7.1	High Ch. 848.3 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	836.243	1.2	136.0	Horz	PK	1.18E+00	30.7	38.5	-7.8	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	836.242	1.1	95.0	Horz	PK	1.18E+00	30.7	38.5	-7.8	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	836.240	1.1	195.0	Horz	PK	1.10E+00	30.4	38.5	-8.1	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	836.237	1.2	194.0	Horz	PK	1.03E+00	30.1	38.5	-8.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	836.240	1.2	123.0	Vert	PK	1.02E+00	30.1	38.5	-8.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	836.105	1.2	207.0	Horz	PK	9.40E-01	29.7	38.5	-8.8	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	836.233	1.0	97.0	Vert	PK	8.85E-01	29.5	38.5	-9.0	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	836.240	1.1	119.0	Vert	PK	8.45E-01	29.3	38.5	-9.2	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	836.245	1.2	269.0	Horz	PK	8.18E-01	29.1	38.5	-9.4	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	836.237	1.0	43.0	Vert	PK	7.89E-01	29.0	38.5	-9.5	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	836.237	1.0	41.0	Vert	PK	6.56E-01	28.2	38.5	-10.3	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	836.235	1.0	120.0	Vert	PK	5.71E-01	27.6	38.5	-10.9	Mid Ch. 836.5 MHz, 1.4 MHz BW, QPSK, 3 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side

ERP PART 27 - LTE BAND 13

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continious Tx, LTE Band 13, 1RB

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
5 MHz	Low	23205	779.5
	Mid	23230	782
	High	23255	784.5
10 MHz			
	Mid	23230	782

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0005 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	779 MHz	Stop Frequency	785 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarizationThe amplitude and frequency of the highest emission were noted. The EUT was then replaced with a ½ wave dipole that was successively tuned to the highest emission. A signal generator was connected to the dipole, and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded. The signal generator, amplifier, and cable were then connected to an analyzer and the power output was recorded. By factoring in the dipole antenna gain (dBi), the effective radiated power for the maximum fundamental emission was determined. The ERP value was obtained from taking the value in EIRP – 2.15.

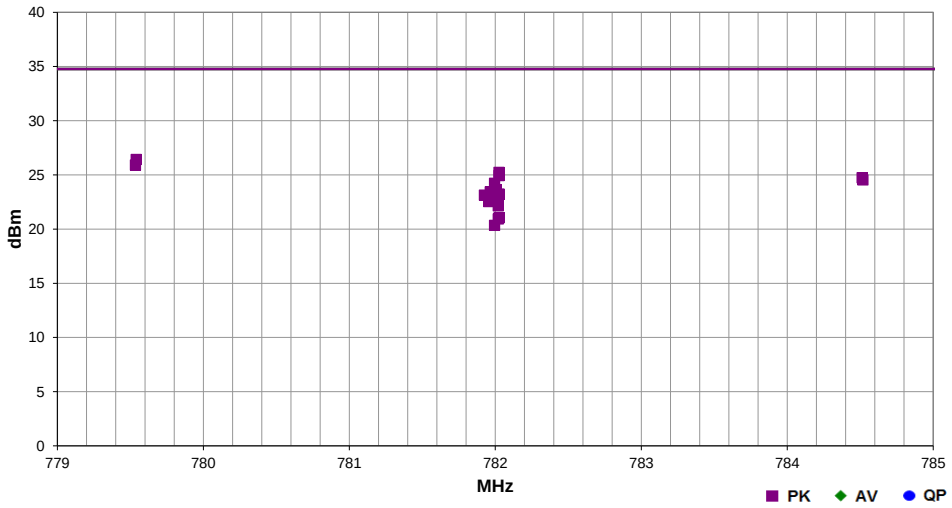
ERP PART 27 - LTE BAND 13

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0005	**Date:**	04/17/17		
Project:	None	**Temperature:**	22.1 °C		
Job Site:	EV01	**Humidity:**	38.9% RH		
Serial Number:	8	**Barometric Pres.:**	1015 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	2				
Customer:	Netcomm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continious Tx, LTE Band 13, 1RB				
Deviations:	None				
Comments:	See comments below for Channel, Bandwidth, Modulation type, Offset, EUT, Main Antenna and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.50:2017	ANSI/TIA/EIA-603-D-2010

Run #	987	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	779.540	2.4	263.0	Horz	PK	4.39E-01	26.4	34.8	-8.4	Low Channel 779.5 MHz, 5 MHz BW, 16-QAM, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	779.535	2.4	259.0	Horz	PK	3.91E-01	25.9	34.8	-8.9	Low Channel 779.5 MHz, 5 MHz BW, QPSK, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	782.025	2.3	92.0	Horz	PK	3.33E-01	25.2	34.8	-9.5	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	782.025	1.2	100.0	Horz	PK	3.11E-01	24.9	34.8	-9.8	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT On Side, Main Ant On Side, Aux Ant On Side
	784.513	2.3	261.0	Horz	PK	2.98E-01	24.7	34.8	-10.0	High Channel 784.5 MHz, 5 MHz BW, QPSK, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	784.518	2.3	246.0	Horz	PK	2.84E-01	24.5	34.8	-10.2	High Channel 784.5 MHz, 5 MHz BW, 16-QAM, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	781.995	1.1	189.0	Horz	PK	2.65E-01	24.2	34.8	-10.5	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	782.005	1.2	96.0	Horz	PK	2.31E-01	23.6	34.8	-11.1	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Vert, Main Ant On Side, Aux Ant On Side
	781.965	2.4	96.0	Horz	PK	2.20E-01	23.4	34.8	-11.3	Mid Channel 782 MHz, 10 MHz BW, 16-QAM, Offset 24, EUT Horz, Main Ant On Side, Aux Ant On Side
	782.025	1.3	189.0	Horz	PK	2.10E-01	23.2	34.8	-11.5	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Horz, Main Ant Vert, Aux Ant Vert
	781.990	1.2	187.0	Horz	PK	2.06E-01	23.1	34.8	-11.6	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT On Side, Main Ant Vert, Aux Ant Vert
	781.925	2.6	99.0	Horz	PK	2.06E-01	23.1	34.8	-11.6	Mid Channel 782 MHz, 10 MHz BW, QPSK, Offset 24, EUT Horz, Main Ant On Side, Aux Ant On Side
	782.000	2.3	101.0	Horz	PK	2.01E-01	23.0	34.8	-11.7	Mid Channel 782 MHz, 5 MHz BW, 16-QAM, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	781.980	1.0	100.0	Vert	PK	1.84E-01	22.6	34.8	-12.1	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Vert, Main Ant Vert, Aux Ant Vert
	781.955	1.0	122.0	Vert	PK	1.79E-01	22.5	34.8	-12.2	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Horz, Main Ant Vert, Aux Ant Vert
	782.020	1.0	137.0	Vert	PK	1.64E-01	22.1	34.8	-12.6	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT On Side, Main Ant Vert, Aux Ant Vert
	782.025	1.0	219.0	Vert	PK	1.27E-01	21.0	34.8	-13.7	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Horz, Main Ant On Side, Aux Ant On Side
	782.020	2.3	86.0	Vert	PK	1.24E-01	20.9	34.8	-13.8	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT On Side, Main Ant On Side, Aux Ant On Side
	781.995	1.0	276.0	Vert	PK	1.08E-01	20.3	34.8	-14.4	Mid Channel 782 MHz, 5 MHz BW, QPSK, Offset 12, EUT Vert, Main Ant On Side, Aux Ant On Side

ERP PART 27 - LTE BAND 17

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 17

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
5 MHz	Low	23755	706.5
	Mid	23790	710
	High	23825	713.5
10 MHz	Low	23780	709
	Mid	23780	710
	High	23780	711

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	704 MHz	Stop Frequency	712 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Antenna - Dipole	A.H. Systems, Inc.	FCC-4	ADEA	8/23/2016	36 mo
Meter - Power	Gigatronics	8651A	SPM	5/20/2016	12 mo
Power Sensor	Gigatronics	80701A	SPL	5/20/2016	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Bilog Cables	EVA	2/6/2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarizationThe amplitude and frequency of the highest emission were noted. The EUT was then replaced with a ½ wave dipole that was successively tuned to the highest emission. A signal generator was connected to the dipole, and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded. The signal generator, amplifier, and cable were then connected to an analyzer and the power output was recorded. By factoring in the dipole antenna gain (dBi), the effective radiated power for the maximum fundamental emission was determined. The ERP value was obtained from taking the value in EIRP – 2.15.

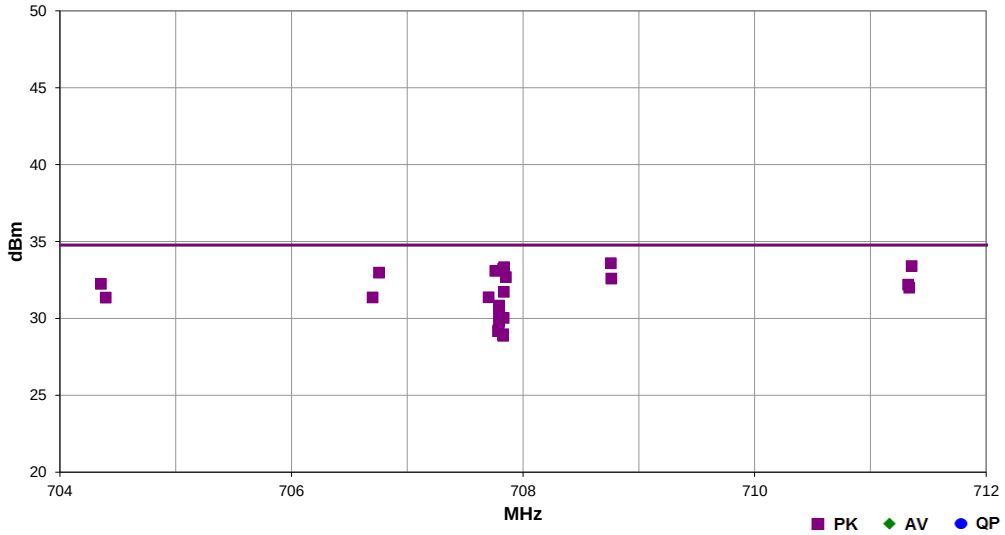
ERP PART 27 - LTE BAND 17

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/25/17		
Project:	None	**Temperature:**	22.6 °C		
Job Site:	EV01	**Humidity:**	39.2% RH		
Serial Number:	8	**Barometric Pres.:**	1017 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 17				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Modulation type, RB size and offset, EUT, Main Antenna, and Auxillary Antenna orientations.				

Test Specifications	**Test Method**
FCC 27.50:2017	ANSI/TIA/EIA-603-D-2010

Run #	4	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	708.758	1.4	113.0	Horz	PK	2.29E+00	33.6	34.8	-1.2	High Ch. 711 MHz, 10 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	711.357	1.4	112.0	Horz	PK	2.19E+00	33.4	34.8	-1.4	High Ch. 713.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	707.837	1.0	87.0	Vert	PK	2.15E+00	33.3	34.8	-1.4	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert
	707.828	1.0	101.0	Vert	PK	2.10E+00	33.2	34.8	-1.5	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	707.761	1.4	111.0	Horz	PK	2.04E+00	33.1	34.8	-1.7	Mid Ch. 710 MHz, 10 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	706.756	1.4	115.0	Horz	PK	1.99E+00	33.0	34.8	-1.8	Low Ch. 709 MHz, 10 MHz BW, 16-QAM, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	707.852	1.5	116.0	Horz	PK	1.86E+00	32.7	34.8	-2.1	Mid Ch. 710 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	708.763	1.4	114.0	Horz	PK	1.82E+00	32.6	34.8	-2.2	High Ch. 711 MHz, 10 MHz BW, QPSK, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	704.354	1.4	112.0	Horz	PK	1.68E+00	32.3	34.8	-2.5	Low Ch. 706.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	711.325	1.4	118.0	Horz	PK	1.66E+00	32.2	34.8	-2.6	High Ch. 713.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	711.336	1.4	112.0	Horz	PK	1.58E+00	32.0	34.8	-2.8	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	707.833	1.0	194.0	Vert	PK	1.49E+00	31.7	34.8	-3.0	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	707.702	1.4	115.0	Horz	PK	1.37E+00	31.4	34.8	-3.4	Mid Ch. 710 MHz, 10 MHz BW, QPSK, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	706.700	1.4	114.0	Horz	PK	1.37E+00	31.4	34.8	-3.4	Low Ch. 709 MHz, 10 MHz BW, QPSK, 1 RB, 12 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	704.395	1.4	112.0	Horz	PK	1.36E+00	31.4	34.8	-3.4	Low Ch. 706.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	707.792	1.0	33.0	Vert	PK	1.21E+00	30.8	34.8	-3.9	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	707.793	1.4	113.0	Horz	PK	1.14E+00	30.6	34.8	-4.2	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant Vert, Aux Ant Vert
	707.792	1.0	36.0	Vert	PK	1.03E+00	30.1	34.8	-4.6	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	707.832	1.0	37.0	Vert	PK	1.01E+00	30.0	34.8	-4.7	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	707.792	2.6	167.0	Horz	PK	9.48E-01	29.8	34.8	-5.0	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant On Side, Aux Ant On Side
	707.788	1.3	168.0	Horz	PK	8.45E-01	29.3	34.8	-5.5	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT On Side, Main Ant On Side, Aux Ant On Side
	707.783	1.2	168.0	Horz	PK	8.26E-01	29.2	34.8	-5.6	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant On Side, Aux Ant On Side
	707.828	1.3	168.0	Horz	PK	7.89E-01	29.0	34.8	-5.8	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	707.828	1.5	111.0	Horz	PK	7.71E-01	28.9	34.8	-5.9	Mid Ch. 710 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Vert, Main Ant Vert, Aux Ant Vert

EIRP PART 24E - LTE BAND 25

PSA-ESCI 2017.01.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continous Tx, LTE Band 25

Bandwidth (MHz)	Channel (L,M,H)	Channel Number	Freq (MHz)
1.4 MHz	Low	26047	1850.7
	Mid	26340	1880
	High	26683	1914.3
3 MHz	Low	26055	1851.5
	Mid	26340	1880
	High	26675	1913.5
5 MHz	Low	26065	1852.5
	Mid	26340	1880
	High	26665	1912.5
10 MHz	Low	26090	1855
	Mid	26340	1880
	High	26640	1910
15 MHz	Low	26115	1857.5
	Mid	26340	1880
	High	26615	1907.5
20 MHz	Low	26140	1860
	Mid	26340	1880
	High	26590	1905

POWER SETTINGS INVESTIGATED

DC

CONFIGURATIONS INVESTIGATED

NETC0007 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	1850 MHz	Stop Frequency	1915 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Universal Radio Communication Tester	Anritsu	MT8820C	AFK	NCR	0 mo
Attenuator	S.M. Electronics	18N-06	AWN	12/12/2016	12 mo
Meter - Power	Gigatronics	8651A	SPM	4/26/2017	12 mo
Power Sensor	Gigatronics	80701A	SPL	4/26/2017	12 mo
Generator - Signal	Keysight	N5182B	TFU	10/27/2015	36 mo
Antenna - Double Ridge	EMCO	3115	AHC	6/23/2016	24 mo
Attenuator	Coaxicom	3910-20	AXZ	4/19/2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	2/6/2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	4/13/2017	12 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

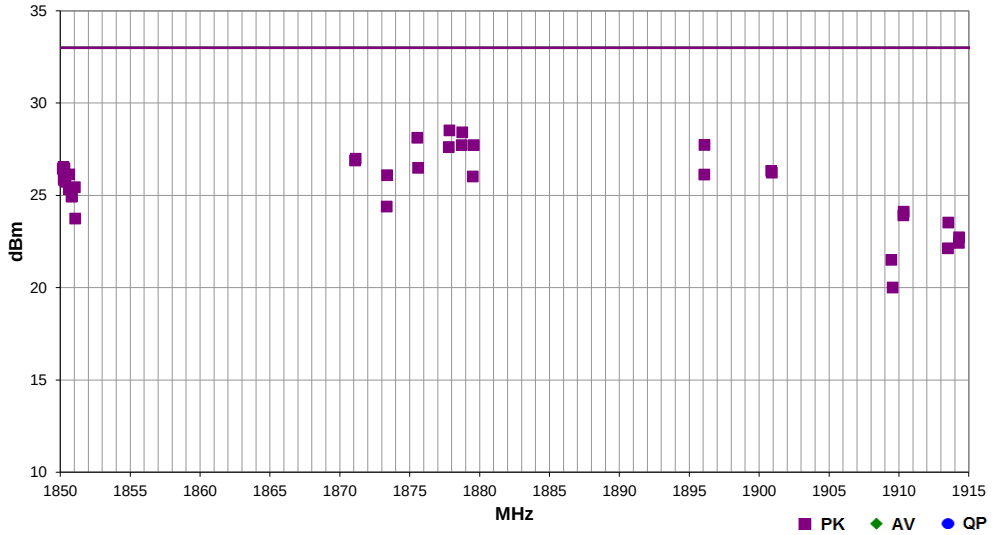
EIRP PART 24E - LTE BAND 25

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	NETC0007	**Date:**	04/26/17		
Project:	None	**Temperature:**	22.9 °C		
Job Site:	EV01	**Humidity:**	41.8% RH		
Serial Number:	8	**Barometric Pres.:**	1017 mbar	**Tested by:**	Jeff Alcoke and Rod Peloquin
EUT:	NTC-140-01				
Configuration:	1				
Customer:	NetComm Wireless				
Attendees:	None				
EUT Power:	DC				
Operating Mode:	Continous Tx, LTE Band 25				
Deviations:	None				
Comments:	See comments below for Channel, Frequency, Bandwidth, Modulation, Number of resource blocks and offset, EUT, Main Antenna, and Aux Antenna orientations.				

Test Specifications	**Test Method**
FCC 24.232:2017	ANSI/TIA/EIA-603-D-2010

Run #	15	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1877.840	1.0	125.0	Vert	PK	7.11E-01	28.5	33.0	-4.5	Mid Ch. 1880 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1878.760	1.0	123.0	Vert	PK	6.95E-01	28.4	33.0	-4.6	Mid Ch. 1880 MHz, 3 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1875.537	1.0	105.0	Vert	PK	6.49E-01	28.1	33.0	-4.9	Mid Ch. 1880 MHz, 10 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1896.087	1.0	147.0	Vert	PK	5.93E-01	27.7	33.0	-5.3	High Ch. 1905 MHz, 20 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1879.577	1.0	125.0	Vert	PK	5.92E-01	27.7	33.0	-5.3	Mid Ch. 1880 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1878.723	1.0	123.0	Vert	PK	5.92E-01	27.7	33.0	-5.3	Mid Ch. 1880 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1877.790	1.0	126.0	Vert	PK	5.78E-01	27.6	33.0	-5.4	Mid Ch. 1880 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1871.133	1.0	103.0	Vert	PK	5.00E-01	27.0	33.0	-6.0	Mid Ch. 1880 MHz, 20 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1871.083	1.0	105.0	Vert	PK	4.89E-01	26.9	33.0	-6.1	Mid Ch. 1880 MHz, 20 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1875.597	1.0	105.0	Vert	PK	4.46E-01	26.5	33.0	-6.5	Mid Ch. 1880 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.230	1.0	311.0	Vert	PK	4.51E-01	26.5	33.0	-6.5	Low Ch. 1851.5 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.303	1.0	312.0	Vert	PK	4.41E-01	26.4	33.0	-6.6	Low Ch. 1852.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.170	1.0	312.0	Vert	PK	4.41E-01	26.4	33.0	-6.6	Low Ch. 1851.5 MHz, 3 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1900.857	1.0	147.0	Vert	PK	4.30E-01	26.3	33.0	-6.7	High Ch. 1907.5 MHz, 15 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1900.907	1.0	147.0	Vert	PK	4.20E-01	26.2	33.0	-6.8	High Ch. 1907.5 MHz, 15 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.637	1.0	310.0	Vert	PK	4.11E-01	26.1	33.0	-6.9	Low Ch. 1855 MHz, 10 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1873.373	1.0	104.0	Vert	PK	4.06E-01	26.1	33.0	-6.9	Mid Ch. 1880 MHz, 15 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1896.080	1.0	148.0	Vert	PK	4.10E-01	26.1	33.0	-6.9	High Ch. 1905 MHz, 20 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1879.510	1.0	124.0	Vert	PK	4.00E-01	26.0	33.0	-7.0	Mid Ch. 1880 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.243	1.0	312.0	Vert	PK	3.93E-01	25.9	33.0	-7.1	Low Ch. 1851.5 MHz, 1.4 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.253	1.0	312.0	Vert	PK	3.84E-01	25.8	33.0	-7.2	Low Ch. 1851.5 MHz, 3 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.373	1.0	310.0	Vert	PK	3.75E-01	25.7	33.0	-7.3	Low Ch. 1852.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1851.043	1.0	312.0	Vert	PK	3.50E-01	25.4	33.0	-7.6	Low Ch. 1860 MHz, 20 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.607	1.0	311.0	Vert	PK	3.42E-01	25.3	33.0	-7.7	Low Ch. 1855 MHz, 10 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.800	1.0	313.0	Vert	PK	3.12E-01	24.9	33.0	-8.1	Low Ch. 1857.5 MHz, 15 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1850.843	1.0	310.0	Vert	PK	3.12E-01	24.9	33.0	-8.1	Low Ch. 1857.5 MHz, 15 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1873.357	1.0	104.0	Vert	PK	2.75E-01	24.4	33.0	-8.6	Mid Ch. 1880 MHz, 15 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1910.333	1.0	148.0	Vert	PK	2.58E-01	24.1	33.0	-8.9	High Ch. 1912.5 MHz, 5 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1910.310	1.0	147.0	Vert	PK	2.47E-01	23.9	33.0	-9.1	High Ch. 1912.5 MHz, 5 MHz BW, 16-QAM, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1851.070	1.0	310.0	Vert	PK	2.37E-01	23.7	33.0	-9.3	Low Ch. 1860 MHz, 20 MHz BW, QPSK, 1 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1913.527	1.0	146.0	Vert	PK	2.25E-01	23.5	33.0	-9.5	High Ch. 1913.5 MHz, 3 MHz BW, 16-QAM, 1 RB, 7 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1914.300	1.0	146.0	Vert	PK	1.87E-01	22.7	33.0	-10.3	High Ch. 1914.3 MHz, 1.4 MHz BW, 16-QAM, 1 RB, 2 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1914.283	1.0	146.0	Vert	PK	1.75E-01	22.4	33.0	-10.6	High Ch. 1914.3 MHz, 1.4 MHz BW, QPSK, 1 RB, 2 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1913.510	1.0	146.0	Vert	PK	1.63E-01	22.1	33.0	-10.9	High Ch. 1913.5 MHz, 3 MHz BW, QPSK, 1 RB, 7 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1909.453	1.0	146.0	Vert	PK	1.42E-01	21.5	33.0	-11.5	High Ch. 1910 MHz, 10 MHz BW, 16-QAM, 25 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert
	1909.553	1.0	145.0	Vert	PK	1.00E-01	20.0	33.0	-13.0	High Ch. 1910 MHz, 10 MHz BW, QPSK, 25 RB, 0 Offset, EUT Horz, Main Ant Vert, Aux Ant Vert