



Test &amp; Certification Center (TCC) - Dallas

FCC ID: QMNRH-77

Test Report: WR-766.004

11-May-05

Accredited Laboratory  
Certificate Number: 1819-01

Ver 1.0

## CFR 47 Part 2 and 22 Test Report

Test Report Number: WR-766.004

**Terminal device:**Model: 2118, Type: RH-77, HW: 4002 + Innolux, SW: V0200B02.nep  
(Detailed information is listed in section 3).

Originator: Hai To / Darreyl Roberts  
Function: TCC - Dallas – EMC  
Version/Status: 1.0 / Approved  
Location: TCC Directories  
Date: 11-May-05

**Change History:**

Version	Date	Status	Handled By	Comments
0.1	2-May-05	Draft	Hai To	
0.2	9-May-05	Review		
1.0	11-May-05	Approved	N. Walton	

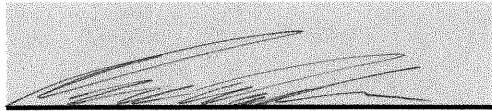
**Testing laboratory:**Test & Certification Center (TCC) Dallas  
Nokia Inc  
6021 Connection Drive  
Irving, Texas 75039  
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Tel. 972-894-5000**Client:**Nokia Inc.  
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11-May-05

For the contents:

Hai To / Darreyl Roberts

Test Operator(s)

  
Nerina Walton  
Technical / Manager Review

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## 1. GENERAL

### 1.1 Quality System

The quality system in place for TCC-Dallas conforms to ISO/IEC 17025 and has been audited to the standard by A2LA (American Association of Laboratory Accreditation). TCC - Dallas has also been audited using the ISO 9000 Quality System, as part of Nokia Mobile Phones, Inc., by ABS (American Bureau of Shipping) Quality Evaluations Inc.

TCC-Dallas is a recognized laboratory with the Federal Communications Commission in filing applications for Certification under Parts 15 and 18, Registration Number 100060, and Industry Canada, Registration Number IC 661.

### 1.2 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 2.1046, 2.1049, 2.1051, 2.1055 and Part 22.

### 1.3 Test Summary

**Test Results:** *The test result relates only to those tested devices mentioned in Section 4 of this test report.*

Test Performed	Reference	Section of Report	Complies / Does not comply / Not Tested
RF Power Output (Conducted)	FCC Part 2.1046(a) / 22.913(a)	5	Complies
Occupied Bandwidth: Transmitter Conducted Measurements	FCC Part 2.1049(c)(1)	6	Complies
Spurious Emissions at Antenna Terminals	FCC Part 2.1051	7	Complies
Frequency Stability (Temperature Variation)	FCC Part 2.1055(a)(1)(b)	8	Complies
Frequency Stability (Voltage Variation)	FCC Part 2.1055(d)(1)(2)	9	Complies

## 2. STANDARDS BASIS

*Testing has been carried out in accordance with:*

REF.	Code of the standard	Name of the standard
1	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.
2	FCC: CFR 47 Part 2	Code of Federal Regulations (CFR) Title 47, Part 2 – Frequency Allocations and Radio Treaty Matters; General Rules and Regulations: Subpart J – Equipment Authorization Procedures
3	FCC: CFR 47 Part 22	Code of Federal Regulations (CFR) Title 47, Part 22 – Public Mobile Services: Subpart H – Cellular Radiotelephone Service
4	RSS-132	800 MHz Cellular Telephones Employing New Technologies
5	RSS-212	Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)
6	RSP-100	Radio Equipment Certification Procedure

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

### ***Deviations:***

Not Applicable.

### 3. EQUIPMENT-UNDER-TEST (EUT)

*The results in this report relate only to the items listed below:*

#### 3.1 Description of Tested Device(s):

Test Performed	Mode of Operation	Date of Receipt	Condition of Sample	Item	Identifying Information
2.1046(a) / 22.913(a) 2.1049(c)(1), 2.1051, 2.1055(a)(1)(b), 2.1055(d)(1)(2)	CDMA 800	2-May-05	Working	Phone	FCC ID: QMNRH-77 Type: RH-77 HW: 4002 + INNOLUX SW: V0200B02.nep ESN: 044/13030345
2.1046(a) / 22.913(a) 2.1049(c)(1), 2.1051, 2.1055(a)(1)(b), 2.1055(d)(1)(2)	N/A	2-May-05	Working	Battery	Type: BL-5C

#### 3.2 Photograph of Tested Device(s):

Refer to attached EXHIBITS

## 4. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

Section of Report	Test Equipment	Mfr. #	Model #	Calibration Due Date	Calibration Interval
6, 7	EMI Receiver	Agilent	8546A / 85460A	09 Feb 06	12 months
6, 7	6dB Attenuator	Weinshchel	Model 2	N/A	N/A
6, 7	Base Station	R&S	CMU200	30 Jun 05	12 months
6	Spectrum Analyzer	R&S	FSP	31 Jan 06	12 months
8, 9	Temperature Chamber	Tenney Environmental	N/A	20 Jan 06	12 months
5, 8, 9	Base Station	R&S	CMU200	26 Aug05	12 months
5	Power Meter	Agilent	E4418B	10 Jun 05	12 months
5	Power Sensor	Agilent	E9304A	10 Jun 05	12 months

## 5. RF POWER OUTPUT (CONDUCTED)

**Specification: FCC Part 2.1046(a), 22.913(a)**

### 5.1 Setup

Testing was performed with the EUT connected to a 6dB splitter and then to the RF Power Meter to measure the conducted RF power output. The base station simulator was connected to the other port of the splitter to establish a call.

### 5.2 Pass/Fail Criteria

Not Applicable

### 5.3 Detailed Test Results

<b>Test Technician / Engineer</b>	Darreyl Roberts
<b>Date of Measurement</b>	3-May-05
<b>Temperature</b>	28.0°C
<b>Humidity</b>	31.0%RH
<b>Test Result</b>	Was operated at max power and tested in accordance with FCC Part 2.1046(a), 22.913(a)

#### CDMA800

Channel	Freq Max (MHz)	Max (mW)	Max (dBm)
1013	824.70 MHz	368.1	25.66
384	836.52 MHz	401.8	26.04
777	848.31 MHz	288.4	24.60

## 6. OCCUPIED BANDWIDTH (TRANSMITTER CONDUCTED MEASUREMENTS)

**Specification: FCC Part 2.1049(c)(1)**

### 6.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call.



### 6.2 Pass/Fail Criteria

#### Occupied Bandwidth, Out of Band

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular 800, Low Channel	< 824	-13
Cellular 800, High Channel	> 849	-13

#### Occupied Bandwidth, In Band

No pass/fail, these plots are used to determine the emission designators.

### 6.3 Detailed Test Results

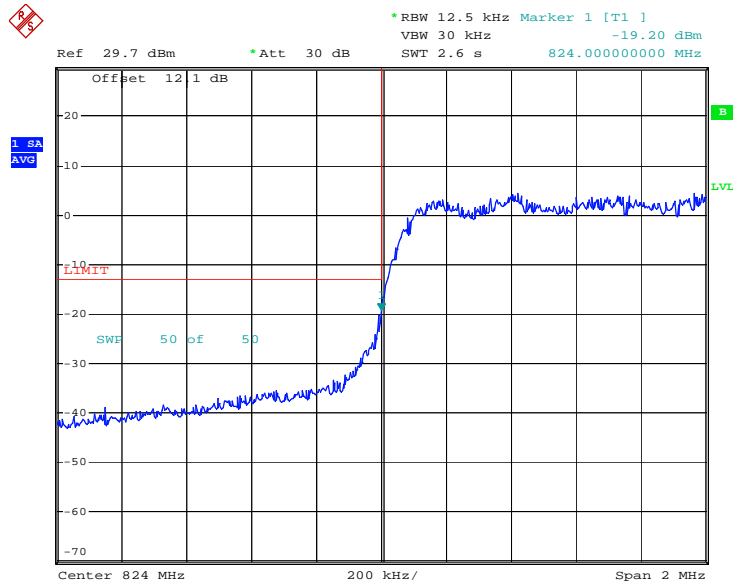
Test Technician / Engineer	Hai To / Darreyl Roberts
Date of Measurement	2-May-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies



## Occupied Bandwidth, Out of Band

### CDMA 800, Max Power - Channel 1013 (824.70 MHz)

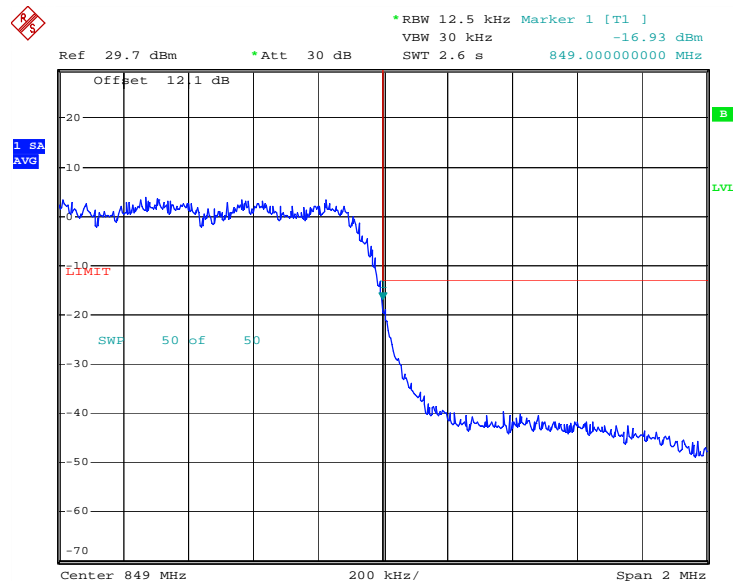
300 Hz RBW/VBW, 100ms Sweep Time, ref to power level



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### CDMA 800, Max Power - Channel 777 (848.31 MHz)

300 Hz RBW/VBW, 100ms Sweep Time, ref to power level

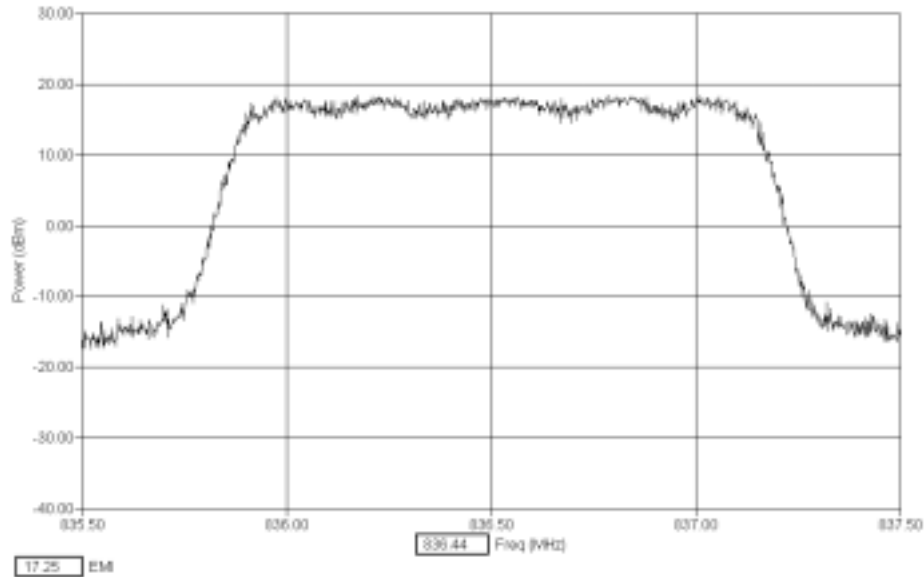


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## Occupied Bandwidth, In Band

### CDMA 800 - Random Modulation, Channel 384

200 kHz Span, 300Hz RBW/VBW, 100ms Sweep Time, ref to power level



## 6.4 Measurement Uncertainty

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 7. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

**Specification: FCC Part 2.1051**

### 7.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call. Filters were introduced to reduce or eliminate spurious emission, which could be generated internally in the EMI receiver.



### 7.2 Pass/Fail Criteria

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular	30 – 20000 *	-13

\* Frequency to be investigated up to the 10<sup>th</sup> harmonic of the highest clock or frequency used.

### 7.3 Detailed Test Results

Test Technician / Engineer	Hai To
Date of Measurement	2-May-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies

Note 1: EMI (dBm) = trace (dBuV) + cable loss (dB) + filter loss (dB).

Note 2: measurements were performed with 3MHz RBW/VBW.

**CDMA 800 - Channel 777, 848.31 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1696.62	-36.69	-13
2544.93	-45.06	-13
3393.24	-44.46	-13
4241.55	-45.09	-13
5089.86	-44.82	-13
5938.17	-39.43	-13
6786.48	-41.00	-13
7634.79	-40.04	-13
8483.1	-40.09	-13

**CDMA 800 - Channel 384, 836.52 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1696.62	-47.06	-13
2544.93	-44.58	-13
3393.24	-45.20	-13
4241.55	-45.96	-13
5089.86	-42.65	-13
5938.17	-39.62	-13
6786.48	-41.52	-13
7634.79	-41.06	-13
8483.1	-41.21	-13

**CDMA 800 - Channel 1013, 824.70 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1649.4	-35.44	-13
2474.1	-44.50	-13
3298.8	-45.84	-13
4123.5	-45.94	-13
4948.2	-45.50	-13
5772.9	-42.01	-13
6597.6	-43.33	-13
7422.3	-40.59	-13
8247	-40.71	-13

**7.4 Measurement Uncertainty**

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 8. FREQUENCY STABILITY (TEMPERATURE VARIATION)

*Specification: FCC Part 2.1055(a)(1)(b)*

### 8.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 8.2 Pass/Fail Criteria

Not Applicable

### 8.3 Detailed Test Results

<b>Test Technician / Engineer</b>	Darreyl Roberts
<b>Date of Measurement</b>	4-May-05
<b>Temperature</b>	28.0°C
<b>Humidity</b>	32.0%RH
<b>Test Result</b>	Tested in accordance with 2.1055(a)(1)(b) at maximum power setting.

Temp. (°C)	CDMA 800, Channel 384
	Change (Hz)
-30	38 Hz
-20	40 Hz
-10	40 Hz
0	40 Hz
10	41 Hz
20	38 Hz
30	39 Hz
40	33 Hz
50	37 Hz

## 9. FREQUENCY STABILITY (VOLTAGE VARIATION)

*Specification: FCC Part 2.1055(d)(1)(2)*

### 9.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 9.2 Pass/Fail Criteria

Not Applicable

### 9.3 Detailed Test Results

Test Technician / Engineer	Darreyl Roberts
Date of Measurement	3-May-05
Temperature	28.0°C
Humidity	31.0%RH
Test Result	Tested in accordance with 2.1055(d)(1)(2) at maximum power setting.

#### CDMA 800, Call Mode, Channel 384

% of STV	Voltage	Change (Hz)
85	3.14Vdc	N/A
100 (Nominal)	3.7Vdc	35Hz
115	4.2Vdc	28Hz
Battery End Point	3.2Vdc	25Hz



Test &amp; Certification Center (TCC) - Dallas

FCC ID: QMNRH-77

Test Report: WR-766.005

11-May-05

Accredited Laboratory  
Certificate Number: 1819-01

Ver 1.0

## CFR 47 Part 2 and 22 Test Report

Test Report Number: WR-766.005

**Terminal device:** Model: 2118, Type: RH-77, HW: 4002 + SDI, SW: V0200B02.nep  
(Detailed information is listed in section 3).

Originator: Hai To / Darreyl Roberts  
Function: TCC - Dallas – EMC  
Version/Status: 1.0 / Approved  
Location: TCC Directories  
Date: 11-May-05

### Change History:

Version	Date	Status	Handled By	Comments
0.1	2-May-05	Draft	Hai To	
0.2	9-May-05	Review		
1.0	11-May-05	Approved	N. Walton	

### Testing laboratory:

Test & Certification Center (TCC) Dallas  
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6021 Connection Drive  
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Tel. 972-894-5000

### Client:

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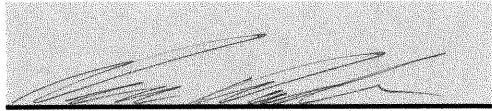
### Date and signatures:

11-May-05

For the contents:

Hai To / Darreyl Roberts

Test Operator(s)

  
Nerina Walton  
Technical / Manager Review



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## 1. GENERAL

### 1.1 Quality System

The quality system in place for TCC-Dallas conforms to ISO/IEC 17025 and has been audited to the standard by A2LA (American Association of Laboratory Accreditation). TCC - Dallas has also been audited using the ISO 9000 Quality System, as part of Nokia Mobile Phones, Inc., by ABS (American Bureau of Shipping) Quality Evaluations Inc.

TCC-Dallas is a recognized laboratory with the Federal Communications Commission in filing applications for Certification under Parts 15 and 18, Registration Number 100060, and Industry Canada, Registration Number IC 661.

### 1.2 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 2.1046, 2.1049, 2.1051, 2.1055 and Part 22.

### 1.3 Test Summary

**Test Results:** *The test result relates only to those tested devices mentioned in Section 4 of this test report.*

Test Performed	Reference	Section of Report	Complies / Does not comply / Not Tested
RF Power Output (Conducted)	FCC Part 2.1046(a) / 22.913(a)	5	Complies
Occupied Bandwidth: Transmitter Conducted Measurements	FCC Part 2.1049(c)(1)	6	Complies
Spurious Emissions at Antenna Terminals	FCC Part 2.1051	7	Complies
Frequency Stability (Temperature Variation)	FCC Part 2.1055(a)(1)(b)	8	Not Tested
Frequency Stability (Voltage Variation)	FCC Part 2.1055(d)(1)(2)	9	Not Tested

## 2. STANDARDS BASIS

*Testing has been carried out in accordance with:*

REF.	Code of the standard	Name of the standard
1	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.
2	FCC: CFR 47 Part 2	Code of Federal Regulations (CFR) Title 47, Part 2 – Frequency Allocations and Radio Treaty Matters; General Rules and Regulations: Subpart J – Equipment Authorization Procedures
3	FCC: CFR 47 Part 22	Code of Federal Regulations (CFR) Title 47, Part 22 – Public Mobile Services: Subpart H – Cellular Radiotelephone Service
4	RSS-132	800 MHz Cellular Telephones Employing New Technologies
5	RSS-212	Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)
6	RSP-100	Radio Equipment Certification Procedure

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

### ***Deviations:***

Not Applicable.

### 3. EQUIPMENT-UNDER-TEST (EUT)

*The results in this report relate only to the items listed below:*

#### 3.1 Description of Tested Device(s):

Test Performed	Mode of Operation	Date of Receipt	Condition of Sample	Item	Identifying Information
2.1046(a) / 22.913(a) 2.1049(c)(1), 2.1051,	CDMA 800	2-May-05	Working	Phone	FCC ID: QMNRH-77 Type: RH-77 HW: 4002 + SDI SW: V0200B02.nep ESN: 044/13030208
2.1046(a) / 22.913(a) 2.1049(c)(1), 2.1051,	N/A	2-May-05	Working	Battery	Type: BL-5C

#### 3.2 Photograph of Tested Device(s):

Refer to attached EXHIBITS

## 4. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

Section of Report	Test Equipment	Mfr. #	Model #	Calibration Due Date	Calibration Interval
6, 7	EMI Receiver	Agilent	8546A / 85460A	09 Feb 06	12 months
6, 7	6dB Attenuator	Weinshchel	Model 2	N/A	N/A
6, 7	Base Station	R&S	CMU200	30 Jun 05	12 months
6	Spectrum Analyzer	R&S	FSP	31 Jan 06	12 months
5	Base Station	R&S	CMU200	26 Aug05	12 months
5	Power Meter	Agilent	E4418B	10 Jun 05	12 months
5	Power Sensor	Agilent	E9304A	10 Jun 05	12 months

## 5. RF POWER OUTPUT (CONDUCTED)

**Specification: FCC Part 2.1046(a), 22.913(a)**

### 5.1 Setup

Testing was performed with the EUT connected to a 6dB splitter and then to the RF Power Meter to measure the conducted RF power output. The base station simulator was connected to the other port of the splitter to establish a call.

### 5.2 Pass/Fail Criteria

Not Applicable

### 5.3 Detailed Test Results

Test Technician / Engineer	Darreyl Roberts
Date of Measurement	3-May-05
Temperature	28.0°C
Humidity	31.0%RH
Test Result	Was operated at max power and tested in accordance with FCC Part 2.1046(a), 22.913(a)

#### CDMA800

Channel	Freq Max (MHz)	Max (mW)	Max (dBm)
1013	824.70 MHz	368.1	25.66
384	836.52 MHz	399.9	26.02
777	848.31 MHz	285.1	24.55

## 6. OCCUPIED BANDWIDTH (TRANSMITTER CONDUCTED MEASUREMENTS)

**Specification: FCC Part 2.1049(c)(1)**

### 6.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call.



### 6.2 Pass/Fail Criteria

#### Occupied Bandwidth, Out of Band

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular 800, Low Channel	< 824	-13
Cellular 800, High Channel	> 849	-13

#### Occupied Bandwidth, In Band

No pass/fail, these plots are used to determine the emission designators.

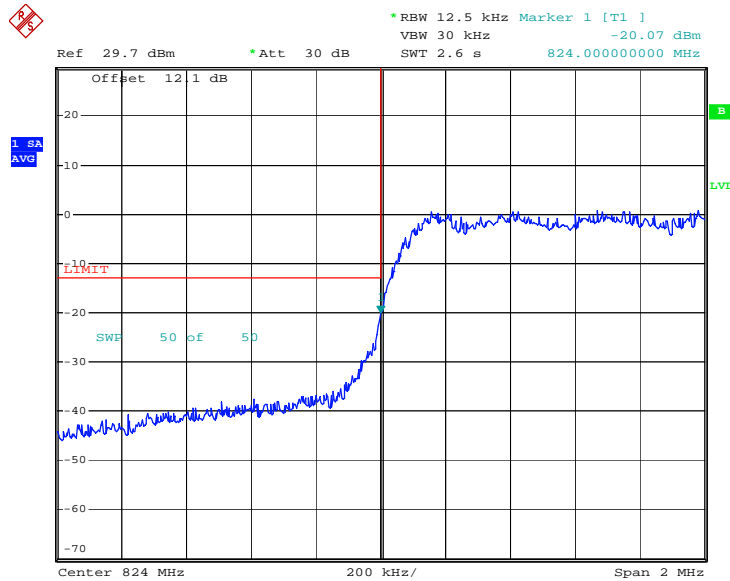
### 6.3 Detailed Test Results

Test Technician / Engineer	Hai To / Darreyl Roberts
Date of Measurement	2-May-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies

## Occupied Bandwidth, Out of Band

### CDMA 800, Max Power - Channel 1013 (824.70 MHz)

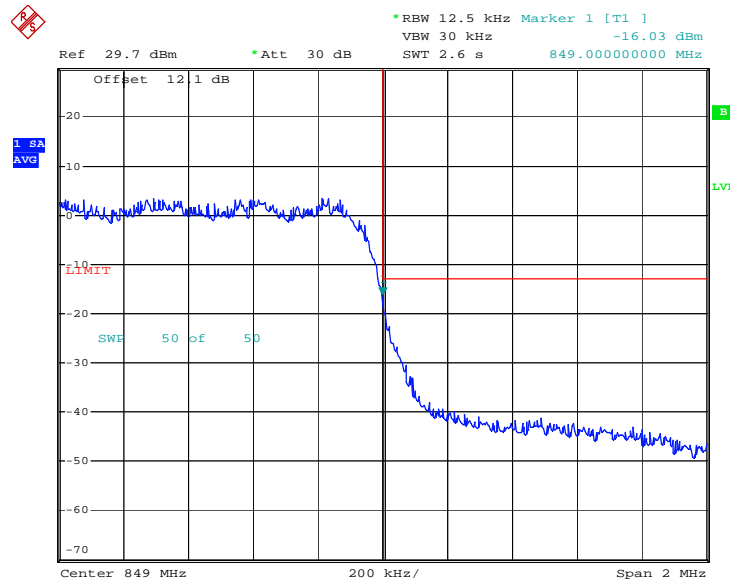
300 Hz RBW/VBW, 100ms Sweep Time, ref to power level



Date: 3.MAY.2005 08:13:21

### CDMA 800, Max Power - Channel 777 (848.31 MHz)

300 Hz RBW/VBW, 100ms Sweep Time, ref to power level



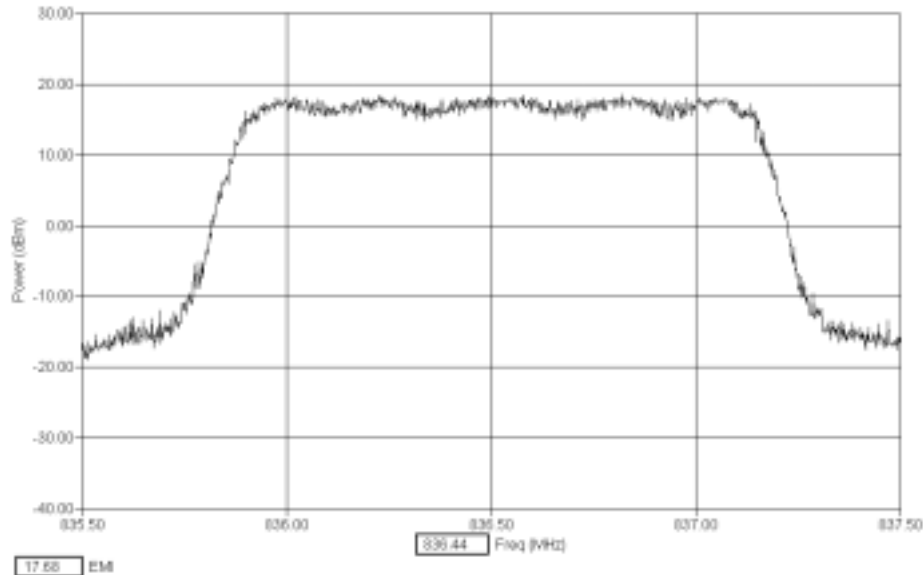
Date: 3.MAY.2005 08:16:05



## Occupied Bandwidth, In Band

### CDMA 800 - Random Modulation, Channel 384

200 kHz Span, 300Hz RBW/VBW, 100ms Sweep Time, ref to power level



## 6.4 Measurement Uncertainty

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 7. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

**Specification: FCC Part 2.1051**

### 7.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call. Filters were introduced to reduce or eliminate spurious emission, which could be generated internally in the EMI receiver.



### 7.2 Pass/Fail Criteria

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular	30 – 20000 *	-13

\* Frequency to be investigated up to the 10<sup>th</sup> harmonic of the highest clock or frequency used.

### 7.3 Detailed Test Results

Test Technician / Engineer	Hai To
Date of Measurement	2-May-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies

Note 1: EMI (dBm) = trace (dBuV) + cable loss (dB) + filter loss (dB).

Note 2: measurements were performed with 3MHz RBW/VBW.

**CDMA 800 - Channel 777, 848.31 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1696.62	-37.56	-13
2544.93	-44.76	-13
3393.24	-44.76	-13
4241.55	-44.96	-13
5089.86	-43.88	-13
5938.17	-38.79	-13
6786.48	-41.41	-13
7634.79	-39.31	-13
8483.1	-40.34	-13

**CDMA 800 - Channel 384, 836.52 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1673.04	-35.07	-13
2509.56	-45.28	-13
3346.08	-45.69	-13
4182.6	-45.08	-13
5019.12	-45.01	-13
5855.64	-40.47	-13
6692.16	-40.69	-13
7528.68	-41.42	-13
8365.2	-41.68	-13

**CDMA 800 - Channel 1013, 824.70 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1649.4	-35.02	-13
2474.1	-45.64	-13
3298.8	-42.2	-13
4123.5	-45.61	-13
4948.2	-46.32	-13
5772.9	-41.68	-13
6597.6	-41.58	-13
7422.3	-40.46	-13
8247	-40.92	-13

**7.4 Measurement Uncertainty**

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 8. FREQUENCY STABILITY (TEMPERATURE VARIATION)

*Specification: FCC Part 2.1055(a)(1)(b)*

### 8.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 8.2 Pass/Fail Criteria

Not Applicable

### 8.3 Detailed Test Results

**NOT TESTED**

## 9. FREQUENCY STABILITY (VOLTAGE VARIATION)

*Specification: FCC Part 2.1055(d)(1)(2)*

### 9.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 9.2 Pass/Fail Criteria

Not Applicable

### 9.3 Detailed Test Results

**NOT TESTED**



Test &amp; Certification Center (TCC) - Dallas

FCC ID: QMNRH-77

Test Report: WR-766.006

11-May-05

Accredited Laboratory  
Certificate Number: 1819-01

Ver 1.0

## CFR 47 Part 2 and 22 Test Report

Test Report Number: WR-766.006

**Terminal device:**

Model: 2118, Type: RH-77, HW: 4001 + Innolux, SW: V0200B02.nep

(Detailed information is listed in section 3).

Originator: Hai To / Darreyl Roberts  
Function: TCC - Dallas – EMC  
Version/Status: 1.0 / Approved  
Location: TCC Directories  
Date: 11-May-05

**Change History:**

Version	Date	Status	Handled By	Comments
0.1	2-May-05	Draft	Hai To	
0.2	9-May-05	Review		
1.0	11-May-05	Approved	N. Walton	

**Testing laboratory:**

Test & Certification Center (TCC) Dallas  
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Tel. 972-894-5000

**Client:**

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12278 Scripps Summit Dr.  
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**Date and signatures:**

11-May-05

For the contents:

Hai To / Darreyl Roberts

Test Operator(s)

  
Nerina Walton  
Technical / Manager Review

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## 1. GENERAL

### 1.1 Quality System

The quality system in place for TCC-Dallas conforms to ISO/IEC 17025 and has been audited to the standard by A2LA (American Association of Laboratory Accreditation). TCC - Dallas has also been audited using the ISO 9000 Quality System, as part of Nokia Mobile Phones, Inc., by ABS (American Bureau of Shipping) Quality Evaluations Inc.

TCC-Dallas is a recognized laboratory with the Federal Communications Commission in filing applications for Certification under Parts 15 and 18, Registration Number 100060, and Industry Canada, Registration Number IC 661.

### 1.2 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 2.1046, 2.1049, 2.1051, 2.1055 and Part 22.

### 1.3 Test Summary

**Test Results:** *The test result relates only to those tested devices mentioned in Section 4 of this test report.*

Test Performed	Reference	Section of Report	Complies / Does not comply / Not Tested
RF Power Output (Conducted)	FCC Part 2.1046(a) / 22.913(a)	5	Complies
Occupied Bandwidth: Transmitter Conducted Measurements	FCC Part 2.1049(c)(1)	6	Complies
Spurious Emissions at Antenna Terminals	FCC Part 2.1051	7	Complies
Frequency Stability (Temperature Variation)	FCC Part 2.1055(a)(1)(b)	8	Not Tested
Frequency Stability (Voltage Variation)	FCC Part 2.1055(d)(1)(2)	9	Not Tested

## 2. STANDARDS BASIS

*Testing has been carried out in accordance with:*

REF.	Code of the standard	Name of the standard
1	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.
2	FCC: CFR 47 Part 2	Code of Federal Regulations (CFR) Title 47, Part 2 – Frequency Allocations and Radio Treaty Matters; General Rules and Regulations: Subpart J – Equipment Authorization Procedures
3	FCC: CFR 47 Part 22	Code of Federal Regulations (CFR) Title 47, Part 22 – Public Mobile Services: Subpart H – Cellular Radiotelephone Service
4	RSS-132	800 MHz Cellular Telephones Employing New Technologies
5	RSS-212	Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)
6	RSP-100	Radio Equipment Certification Procedure

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

### ***Deviations:***

Not Applicable.

### 3. EQUIPMENT-UNDER-TEST (EUT)

*The results in this report relate only to the items listed below:*

#### 3.1 Description of Tested Device(s):

Test Performed	Mode of Operation	Date of Receipt	Condition of Sample	Item	Identifying Information
2.1046(a) / 22.913(a) 2.1049(c)(1), 2.1051	CDMA 800	2-May-05	Working	Phone	FCC ID: QMNRH-77 Type: RH-77 HW: 4001 + INNOLUX SW: V0200B02.nep ESN: 044/12799539
2.1046(a) / 22.913(a) 2.1049(c)(1), 2.1051	N/A	2-May-05	Working	Battery	Type: BL-5C

#### 3.2 Photograph of Tested Device(s):

Refer to attached EXHIBITS

## 4. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

Section of Report	Test Equipment	Mfr. #	Model #	Calibration Due Date	Calibration Interval
6, 7	EMI Receiver	Agilent	8546A / 85460A	09 Feb 06	12 months
6, 7	6dB Attenuator	Weinshchel	Model 2	N/A	N/A
6, 7	Base Station	R&S	CMU200	30 Jun 05	12 months
6	Spectrum Analyzer	R&S	FSP	31 Jan 06	12 months
5	Base Station	R&S	CMU200	26 Aug05	12 months
5	Power Meter	Agilent	E4418B	10 Jun 05	12 months
5	Power Sensor	Agilent	E9304A	10 Jun 05	12 months

## 5. RF POWER OUTPUT (CONDUCTED)

**Specification: FCC Part 2.1046(a), 22.913(a)**

### 5.1 Setup

Testing was performed with the EUT connected to a 6dB splitter and then to the RF Power Meter to measure the conducted RF power output. The base station simulator was connected to the other port of the splitter to establish a call.

### 5.2 Pass/Fail Criteria

Not Applicable

### 5.3 Detailed Test Results

Test Technician / Engineer	Darreyl Roberts
Date of Measurement	3-May-05
Temperature	28.0°C
Humidity	31.0%RH
Test Result	Was operated at max power and tested in accordance with FCC Part 2.1046(a), 22.913(a)

#### CDMA800

Channel	Freq Max (MHz)	Max (mW)	Max (dBm)
1013	824.70 MHz	369.8	25.68
384	836.52 MHz	399.9	26.02
777	848.31 MHz	283.1	24.52

## 6. OCCUPIED BANDWIDTH (TRANSMITTER CONDUCTED MEASUREMENTS)

**Specification: FCC Part 2.1049(c)(1)**

### 6.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call.



### 6.2 Pass/Fail Criteria

#### Occupied Bandwidth, Out of Band

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular 800, Low Channel	< 824	-13
Cellular 800, High Channel	> 849	-13

#### Occupied Bandwidth, In Band

No pass/fail, these plots are used to determine the emission designators.

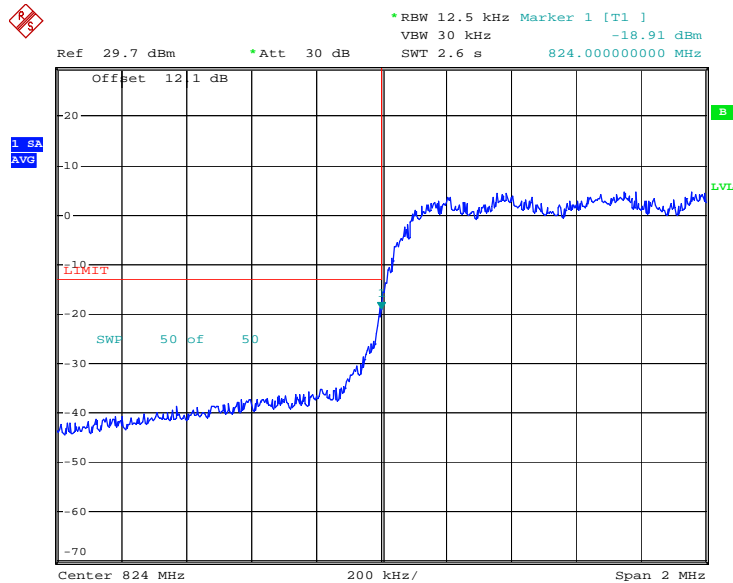
### 6.3 Detailed Test Results

Test Technician / Engineer	Hai To / Darreyl Roberts
Date of Measurement	2-May-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies

## Occupied Bandwidth, Out of Band

### CDMA 800, Max Power - Channel 1013 (824.70 MHz)

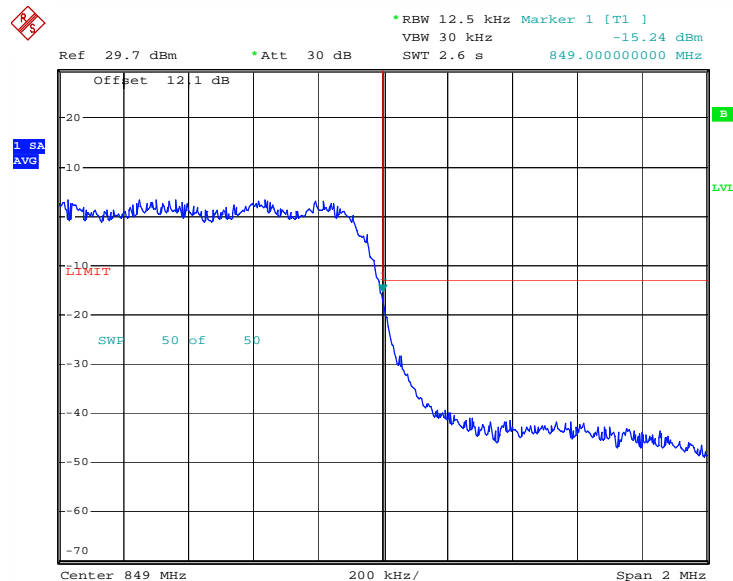
300 Hz RBW/VBW, 100ms Sweep Time, ref to power level



Date: 3.MAY.2005 08:19:56

### CDMA 800, Max Power - Channel 777 (848.31 MHz)

300 Hz RBW/VBW, 100ms Sweep Time, ref to power level

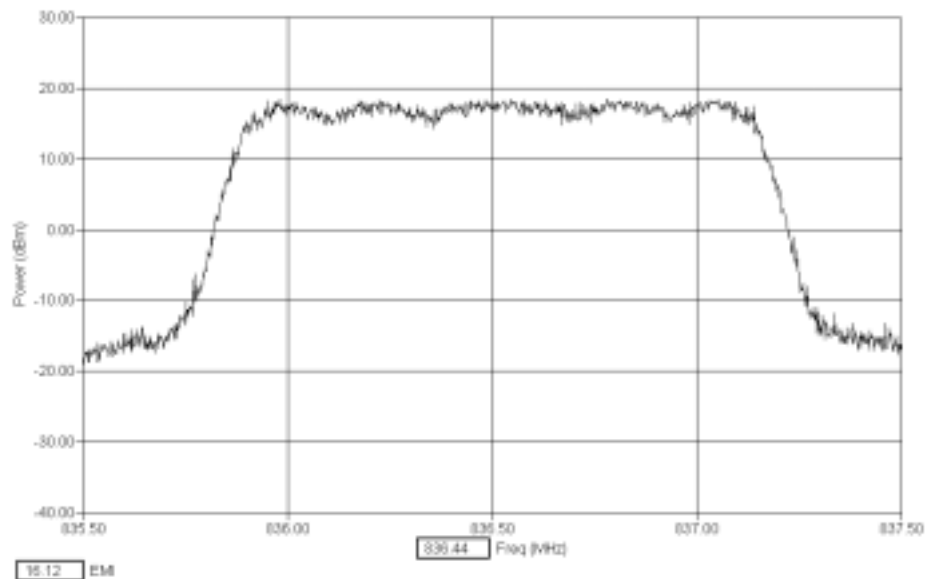


Date: 3.MAY.2005 08:22:25

## Occupied Bandwidth, In Band

### CDMA 800 - Random Modulation, Channel 384

200 kHz Span, 300Hz RBW/VBW, 100ms Sweep Time, ref to power level



## 6.4 Measurement Uncertainty

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.



## 7. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

**Specification: FCC Part 2.1051**

### 7.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call. Filters were introduced to reduce or eliminate spurious emission, which could be generated internally in the EMI receiver.



### 7.2 Pass/Fail Criteria

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular	30 – 20000 *	-13

\* Frequency to be investigated up to the 10<sup>th</sup> harmonic of the highest clock or frequency used.

### 7.3 Detailed Test Results

Test Technician / Engineer	Hai To
Date of Measurement	2-May-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies

Note 1: EMI (dBm) = trace (dBuV) + cable loss (dB) + filter loss (dB).

Note 2: measurements were performed with 3MHz RBW/VBW.

**CDMA 800 - Channel 777, 848.31 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1696.62	-37.27	-13
2544.93	-45.68	-13
3393.24	-44.73	-13
4241.55	-45.44	-13
5089.86	-44.55	-13
5938.17	-39.74	-13
6786.48	-41.12	-13
7634.79	-40.84	-13
8483.1	-41.94	-13

**CDMA 800 - Channel 384, 836.52 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1673.04	-34.82	-13
2509.56	-44.52	-13
3346.08	-44.81	-13
4182.6	-45.94	-13
5019.12	-46.01	-13
5855.64	-39.69	-13
6692.16	-41.55	-13
7528.68	-40.2	-13
8365.2	-41.57	-13

**CDMA 800 - Channel 1013, 824.70 MHz**

Freq Max (MHz)	(Pk) EMI (dBm)	FCC Limit (dBm)
1649.4	-35.32	-13
2474.1	-45.09	-13
3298.8	-45.84	-13
4123.5	-44.68	-13
4948.2	-44.07	-13
5772.9	-42.71	-13
6597.6	-43.32	-13
7422.3	-41.15	-13
8247	-40.56	-13

**7.4 Measurement Uncertainty**

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 8. FREQUENCY STABILITY (TEMPERATURE VARIATION)

*Specification: FCC Part 2.1055(a)(1)(b)*

### 8.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 8.2 Pass/Fail Criteria

Not Applicable

### 8.3 Detailed Test Results

**NOT TESTED**

## 9. FREQUENCY STABILITY (VOLTAGE VARIATION)

*Specification: FCC Part 2.1055(d)(1)(2)*

### 9.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 9.2 Pass/Fail Criteria

Not Applicable

### 9.3 Detailed Test Results

**NOT TESTED**