

Test Report A

Applicant: Ericsson (China)

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FCC: X3VNT800MFRM3V2 IC: 287AJ-800MFRM3V2

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Test Report for FCC/IC Equipment Authorization

CDMA Metrocell DC Indoor BTS with M3 800 NTGZ70ABE5 FCC ID: X3VNT800MFRM3V2 IC ID: 287AJ-800MFRM3V2

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Revision History

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00/01	01/01/2010		Initial test report	Lewas Liu

References

- [1] FCC Part 22 Subpart H, "Cellular Radiotelephone Services"
- [2] FCC Part 2 Subpart J, "Frequency allocations and radio treaty matters; general rules and regulations",
- [3] TIA/EIA-97-E "Recommended Minimum Performance Standards for Base Stations Sup-porting Dual Mode Spread Spectrum Systems".
- [4] 800MHz Dual-Mode CDMA Cellular Telephones, Industry Canada, RSS-129, Issue 2, Revision 1, September 25, 1999

Acronyms and Abbreviations

Application Specific Integrated Circuit
Breathing, Blossoming and Wilting
Bandpass Filter
Base Station Transceiver Subsystem
Bandwidth
Code Division Multiple Access
dB relative to Full Scale
Direct Digital Synthesizer
Duplexer Preselector Module
Electrically Erasable and Programmable ROM
Engineering Change
Excess Reverse Link Capacity Estimate
High-Speed Serial Protocol Controller
Hardware
Intermediate Frequency
Inter-Integrated Circuit Bus
Interim Standard
Local Oscillator
Low pass Filter
Multi-Carrier Power Amplifier
Multi-carrier Flexible Radio Module
Noise Figure
Orthogonal Channel Noise Source
OverHead
Power Amplifier
Personal Computer
Peak Power Reduction
Product Specification Agreement
Resolution BandWidth
Radio Frequency
Receive
Spectrum Analyzer
Single Carrier Flexible Radio Module
Software
To Be Determined
Triplexer Module
Transmit Power Tracking Loop
Transmitter Receiver Module
Transmit
Microprocessor
Transceiver

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1.0 Introduction

This test report is submitted in accordance with the FCC Rules and Regulations, Part 2, Subpart J, Sections 2.1046 through 2.1057 for equipment authorization of Northern Telecom's (Nortel Net works) CDMA Metrocell DC Indoor BTS with 800MHz MFRM3 CR.

The Metrocell DC Indoor BTS 800MHz is intended for use in the Domestic Public Cellular Radio Telecommunications Service and is designed in accordance with the following standards:

- CFR 47, Part 22, Subpart H, Cellular Radiophone Service[1]
- CFR 47, Part 2, Subpart J, Equipment Authorization Procedures Equipment Authorization[2]
- 800MHz Dual-Mode CDMA Cellular Telephones, Industry Canada, RSS-129, Issue 2, Revision 1, September 25, 1999

1.1 Required Tests

Table 1 summarizes the measurement results for the CDMA Metrocell DC Indoor BTS 800MHz.

FCC/IC Measurement Specification	FCC/IC Limit Specification	IC Cross Reference	Description	Test to be Performed
		ASP-100 & RSS-		
2.1033	-	129, section 14	PA current specification	Yes
		RSS-129, section		
2.1046	22.913	9.1 & 9.2	RF Power Output	Yes
2.1049	-	RSS-GEN	Occupied Bandwidth	Yes
		RSS-129, section	Spurious Emissions at	
2.1051,2.1057	22.917, 22.359	8.1.2	Antenna Terminals	Yes
		RSS-129, section		
2.1055	22.355	9.2.1	Frequency Stability	Yes

Table 1: Required Tests

GDNT CDMA Product Integrity

Engineering Declaration 2.0

The CDMA Metrocell DC Indoor BTS 800MHz has been tested in accordance with the requirements contained in the Federal Communications Commission Rules and Regulations Part 2 and 22.

To the best of my knowledge, these tests were performed in accordance with good engineering practices using measurement procedures consistent with industry or commission standards or previous Commission correspondence or guidance and demonstrate that this equipment complies with the appropriate standards. All tests were conducted on a representative sample of the equipment for which equipment authorization is sought.

Test By:

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Written By:

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Approved By:

Daieltar

3.0 Equipment Authorization Application Requirements

3.1 Standard Test Conditions and Test Equipment

The MFRM3 CR was tested under the following standard test conditions unless otherwise noted:

- Ambient Temperature: 20 to 25 degrees C
- Ambient Humidity: 20 to 40%
- DC Supply Voltage: -48 Vdc (nominal)

3.2 EUT Identification List

Table 2 shows the identification of the components tested in this report.

Equipment Description	Model / Part Number	Release Number	Serial Number
Metrocell BTS DC Indoor	NTGS47AEE5	P1	NNTM74XL8656
XCEM 192	VNTRZ80BAE5	P2	NNTMDV0293MK
GPSTM	NTGS50AA	14	NNTM74TM3JT0
CM-2	NTBW40BAE5	P1	NNTMDV01HFCK
CORE-2S	NTBW30DA	02	NNTM74X1WGW5
TDM 800 Full-BAND	NTGZ80CA	01	ACET02000W31
TDM 800 B-BAND	NTGZ80BA	N1	ANDWMA000476
TDM 800 A-BAND	NTGZ80AA	04	ACET02000HNL
MFRM3 800MHz	NTGZ70ABE5	B4	NNTMEEV0101T
FAM3	NTGZ85AAE5	A1	NNTM84G30002
DOM-A	NTBW89SB	A1	NNTMPX0002FG
DOM-A	NTBW89SB	A1	NNTMPX0002FL
DOM-A	NTBW89SB	A1	NNTMPX0002FM

Table 2: EUT Identification List

3.3 Test Equipment List

Table 3 shows the identification of the test equipment used in this report.

Table 3: Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal. Due Date
PSA Series Spectrum Analyzer 3Hz-26.5GHz	Agilent	E4440A	MY482505 17	2010-03-16
30dB Attenuator	Weinschel	53-30-33	NV821	Verified
RF Cable	SUCOFLEX	104PEA	28266 28267 4PEA	Verified
Climatic Chamber	CEEC	CEEC- WSHR-15C	070016	2010-06-09

4.0 Transmitter Test and Measurement Results

4.1 PA DC Current Draw

4.1.1 PA DC Current Draw Requirements

FCC Part 2.1033 Application for certification.

- (c) Applications for equipment other than that operating under parts 15 and 18 of the rules shall be accompanied by a technical report containing the following information:
- (8) The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range.

4.1.2 Test Method

The Metrocell BTS was setup to blossom at maximum power. The RF output power was measured using the PSA. The softfail current registers were read with the BTS controller when the Metrocell BTS was fully blossomed.

4.1.3 Test Setup

The set-up used for the BTS PA DC current draw test is illustrated in Figure 1. RF output power measurements were referenced to the BTS PA output.





4.1.4 Test Results

The final DC current is shown in Table 4.

Table 4: Average Current	Values @ Pout = 47.3dBm
--------------------------	-------------------------

Average Current Values @ Pout=47.3dBm						
PA 1 PA 2 PA 3						
Drive Value	0.561A	0.521A	0.594A			
Main Value 4.619A 4.453A 4.951A						
Aux Value 1.699A 1.430A 1.826A						

4.2 **RF Power Output**

4.2.1 **RF Power Output Requirements**

FCC Part 2.1046

For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune -up procedure to give the values of current and voltage on the circuit elements specified in 2.983(d)(5). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

RSS-129

800MHz Dual-Mode CDMA Cellular Telephones, Industry Canada, RSS-129, Issue 2, Revision 1, September 25, 1999

FCC Limit (Part 22.913)

(a) The effective radiated power of base transmitters and cellular repeaters must not exceed 500 Watts.

4.2.2 Test Method

The DE was setup via the BTS controller to enable to transmit at maximum power. Measurements were made in one, two, and three carrier configurations. The RF output power was measured using the PSA.

4.2.3 Test Setup

The set-up used for the RF output power test is illustrated in Figure 2. RF output power measurements were referenced to the main antenna port of the duplexer.



Figure 2: Test Setup for RF Power Output Measurement

4.2.4 Test Results

The Metrocell BTS 800 MHz complies with the requirement. The maximum measured RF output power was 47.3 dBm.



Table 5: RF Output Power of Metrocell BTS 800 MHz, 1 Carrier Mode IS95				
		Measured RF		
Channel		Output	Typical Maximun	
Number(Band)	Frequency(MHz)	Power(dBm)	Rated Power(dBm)	
1019 (A")	869.88	47.14	47.3	
283 (A)	878.49	47.2	47.3	
384 (B)	881.52	47.2	47.3	
758 (B')	892.74	47.33	47.3	

Table 6: RF Output Power of Metrocell BTS 800MHz, 2 Carriers Mode IS95

		Measured RF	
Channel		Output	Typical Maximun
Number(Band)	Frequency(MHz)	Power(dBm)	Rated Power(dBm)
1019 37(A" A)	869.88 871.110	47.27	47.3
242 283 (A)	877.260 878.49	47.51	47.3
384 425 (B)	881.52 882.750	47.31	47.3
589 630 (B)	887.670 888.900	47.52	47.3

Table 7: RF Output Power of Metrocell BTS 800 MHz, 3 Carriers Mode IS95

		Measured RF	
Channel		Output	Typical Maximun
Number(Band)	Frequency(MHz)	Power(dBm)	Rated Power(dBm)
1019 37 78(A"	869.88 871.110		
A)	872.340	47.5	47.3
	876.030 877.260		
201 242 283 (A)	878.49	47.53	47.3
	881.52 882.750		
384 425 466 (B)	883.980	47.52	47.3
	886.440 887.670		
548 589 630 (B)	888.900	47.25	47.3

Table 8: RF Output Power of Metrocell BTS 800 MHz, 1 Carriers Mode IS856 16QAM

		Measured RF	
Channel		Output	Typical Maximun
Number(Band)	Frequency(MHz)	Power(dBm)	Rated Power(dBm)
283 (A)	878.49	47.28	47.5
384 (B)	881.52	47.01	47.5

Table 9: RF Output Power of Metrocell BTS 800 MHz, 2 Carriers Mode IS856 16QAM

		Measured RF	
Channel		Output	Typical Maximun
Number(Band)	Frequency(MHz)	Power(dBm)	Rated Power(dBm)
242 283 (A)	877.260 878.49	47.13	47.5
384 425 (B)	881.52 882.750	47.27	47.5

Table 10: RF Output Power of Metrocell BTS 800 MHz, 3 Carriers Mode IS856 16QAM

		Measured RF	
Channel		Output	Typical Maximun
Number(Band)	Frequency(MHz)	Power(dBm)	Rated Power(dBm)
	876.030 877.260		
201 242 283 (A)	878.49	47.24	47.5

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384 425 466 (B)	881.52 882.750 883 980	47 33	47.5	

4.3 Occupied Bandwidth

4.3.1 Occupied Bandwidth Requirements

FCC Part 2.1049

The OBW, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0. 5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(g) Transmitter in which the modulating baseband comprises not more than three independent channels - when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at discretion of the user.

4.3.2 Test Mothod

The DE was setup via the BTS controller to enable the MFRM3 CR to transmit at maximum power. The occupied bandwidth was measured using the 99% channel power feature of the spectrum analyzer.

4.3.3 Test Setup

The set-up used for the Metrocell BTS Occupied bandwidth test is illustrated in Figure 3.



Figure 3: Test Setup for Occupied Bandwidth Measurement

4.3.4 Test Results

The Metrocell BTS 800 MHz complies with the requirement. The occupied bandwidth measured in one, two, and three carrier configurations for each licensed band. The plots that follow show the occupied bandwidth in one, two, and three carrier configurations. (Although plots were recorded for all channels tested, only one sample plot per carrier configuration is provided reduce the number of figures.).

Table 11: Occupied Bandwidth, Metrocell BTS 800 MHz, Single Carrier Mode IS95

		Measured
Channel		Occupied
Number(Band)	Frequency(MHz)	Bandwidth (MHz)
1019 (A")	869.88	1.2693
283 (A)	878.49	1.2623
384 (B)	881.52	1.2603
758 (B')	892.74	1.264

Table 12: Occupied Bandwidth, Metrocell BTS 800 MHz, 2 Carriers Mode IS95

		Measured
Channel		Occupied
Number(Band)	Frequency(MHz)	Bandwidth (MHz)
1019 37(A" A)	869.88 871.110	2.4686
242 283 (A)	877.260 878.49	2.4654
384 425 (B)	881.52 882.750	2.4608
589 630 (B)	887.670 888.900	2.4684

Table 13: Occupied Bandwidth, Metrocell BTS 800 MHZ, 3 Carriers Mode IS95

		Measured
Channel		Occupied
Number(Band)	Frequency(MHz)	Bandwidth (MHz)
1019 37 78(A" A)	869.88 871.110 872.340	3.6678
201 242 283 (A)	876.030 877.260 878.49	3.6695
384 425 466 (B)	881.52 882.750 883.980	3.6849
	886.440 887.670	
548 589 630 (B)	888.900	3.6707

Table 14: Occupied Bandwidth, Metrocell BTS 800 MHZ, 1 Carriers Mode IS856 16QAM

		Measured
Channel		Occupied
Number(Band)	Frequency(MHz)	Bandwidth (MHz)
283 (A)	878.49	1.277
384 (B)	881.52	1.2643

Table 15: Occupied Bandwidth, Metrocell BTS 800 MHZ, 2 Carriers Mode IS856 16QAM

		Measured
Channel		Occupied
Number(Band)	Frequency(MHz)	Bandwidth (MHz)
242 283 (A)	877.260 878.49	2.4656
384 425 (B)	881.52 882.750	2.4663

Table 16: Occupied Bandwidth, Metrocell BTS 800 MHZ, 3 Carriers Mode IS856 16QAM

		Measured
Channel		Occupied
Number(Band)	Frequency(MHz)	Bandwidth (MHz)
201 242 283 (A)	876.030 877.260 878.49	3.6623
384 425 466 (B)	881.52 882.750 883.980	3.6882

ዡ Agilent 15:30:01 Dec 24, 2009	Meas Setup
Base Ch Freq 878.49 MHz Trig Free Occupied Bandwidth IS-95A IS-95A IS-95A	Avg Number 10 On <u>Off</u>
Center 878.4900000 MHz	Avg Mode Exp Repeat
Ref 47 dBm #Atten 30 dB Ext PG -31.33 dB #Samp Log 10	0n Max Hold
dB/ → ←	0cc BW % Pwr 99.00 %
Center 878.490 MHz Span 2 MHz Dee BW 18 kHz UBW 180 kHz Sweep 18.04 ms (601 pts)	0BW Span 2.00000000 MHz
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 1.2623 MHz × dB -26.00 dB	x dB -26.00 dB
Transmit Freq Error -906.810 Hz x dB Bandwidth 1.394 MHz*	Optimize RefLevel
copyright 2000-2008 Agrient rechnologies	

Figure 4: Occupied Bandwidth - Single Carrier Channel 283 (A) IS95

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ዡ Agilent 16:07:49 Dec 24, 2009 R T	Freq/Channel
Base Ch Freq 877.885 MHz Trig Free Occupied Bandwidth IS-95A IS-95A IS-95A	Center Freq 877.885000 MHz
	Start Freq 875.885000 MHz
Ref 47 dBm #Atten 30 dB Ext PG -31.33 dB #Samp Log	Stop Freq 879.885000 MHz
$dB/$ \rightarrow \leftarrow	CF Step 400.000000 kHz <u>Auto</u> Man
Center 877.885 MHz Span 4 MHz Due RH 20 HHz Super 7.08 ms (001 ms)	FreqOffset 0.00000000 Hz
Res BW 39 KHZ VBW 390 KHZ Sweep 7.68 ms (601 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 2.4654 MHz × dB -26.00 dB	On <u>Off</u>
Transmit Freq Error -4.184 kHz × dB Bandwidth 2.642 MHz*	
Copyright 2000–2008 Agilent Technologies	

Figure 5: Occupied Bandwidth - 2 Carriers Channels 242, 283 (A) IS95

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Figure 6: Occupied Bandwidth - 3 Carriers Channels 201, 242, 283 (A) IS95

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* Agilent R T	Meas Control
Ch Freq 878.49 MHz Trig Free Occupied Bandwidth	Restart
	Measure Single Cont
Ref 40 dBm #Atten 30 dB Ext PG −31 dB #Samp Log 10 dB/	Pause
Manual Marine Contraction of the	,
Center 878.490 MHz Span 3 MH: #Res BW 30 kHz #VBW 300 kHz Sweep 9.76 ms (601 pts)	2
Оссиріеd Bandwidth осс ви % Риг 99.00 % 1.2643 MHz × dB -26.00 dB	[
Transmit Freq Error896.521 Hzx dB Bandwidth1.396 MHz*	
Copyright 2000–2008 Agilent Technologies	

Figure 7: Occupied Bandwidth - Single Carrier Channel 283 (A) IS856 16QAM

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* Agilent R T	Freq/Channel
Ch Freq 882.135 MHz Trig Free Occupied Bandwidth	Center Freq 882.135000 MHz
	Start Freq 879.635000 MHz
Ref -11.14 dBm #Htten 30 dB Ext PG 31.14 dB #Samp Log 10	Stop Freq 884.635000 MHz
dB/	CF Step 500.000000 kHz <u>Auto</u> Man
Center 882.135 MHz Span 5 MHz	FreqOffset 0.00000000 Hz
Res BW 47 kHz VBW 470 kHz Sweep 6.64 ms (601 pts)	Signal Track
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 2.4663 MHz × dB -26.00 dB	0n <u>0ff</u>
Transmit Freq Error 2.222 kHz x dB Bandwidth 2.648 MHz*	
Copyright 2000–2008 Agilent Technologies	

Figure 8: Occupied Bandwidth - 2 Carriers Channels 384, 425 (B) IS856 16QAM

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Figure 9: Occupied Bandwidth - 3 Carriers Channels 201, 242, 283 (A) IS856 16QAM

4.4 Spurious Emissions at Antenna Terminals

4.4.1 Spurious Emissions Requirements

FCC Part 2.1051

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

FCC Part 2.1057 - Frequency Spectrum to be investigated

The spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

FCC Part 22.917 Limit

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*logP dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100kHz or greater. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of fundamental emission of the transmitter may be employed. A narrow resolution bandwidth is permitted in all cases to improve measure accuracy provided the measured power is integrated over the full required measurement bandwidth. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

4.4.2 Test Method

The BTS digital enclosure was configured via the BTS controller to enable the MFRM3 CR to transmit at maximum power. Measurements were made on IS-97 channels at the bottom and top of the licensed sub-bands in one, two and three carrier configurations. The following spectrum analyzer settings were used for the measurement of the antenna port spurious emissions:

Adjacent 1MHz bandwidth (Upper and Lower)

Resolution Bandwidth:	30kHz (1 carrier), 30kHz (2 carriers), 50kHz (3 carriers)								
Video Bandwidth:	100kHz (1 carrier), 100kHz (2 carriers), 200kHz (3								
carriers)									
Average:	10 Averages								
Span:	set accordingly								
Attenuation:	30 dB								
Ref. Level:	variable								
Ref. Level Offset:	variable								

All spectrum analyzer settings were coupled as per the manufacturers' recommendations to improve measurement time, without compromising data.

Out of band emissions up to 10GHz

1MHz (1 carrier), 1MHz (2 carriers), 1MHz (3 carriers)
3MHz (1 carrier), 3MHz (2 carriers), 3MHz (3 carriers)
10 Averages
set accordingly
30 dB
variable
variable

Calibrate the cables and attenuator losses using a network analyzer. The calibrated losses are the reference level offset on the spectrum analyzer.

4.4.3 Test Setup

Set-up used for the Metrocell BTS Antenna Port Spurious Emission test is illustrated in Figure 10.



Figure 10: Test Setup for Spurious Emissions Measurement

4.4.4 Test Results

The frequency spectrum from 50 MHz to 20 GHz was scanned for emissions using the spectrum analyzer settings outlined in the test method (Section 4.4.2). The Metrocell BTS complies with the limit of -13 dBm. Table 11 shows the spurious emissions at the antenna port of the Metrocell BTS for 1, 2 and 3 carrier modes. The plots that follow show the spurious emissions in one, two, and three carrier configuration. (For each configuration, only some samples of one, two and three carriers are shown to reduce the number of figures). Please refer to Figures below.

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				Margin to FCC Limit of -13 dBm					
	Spurious	Emissions Le	vel(dBm)		(dB/1MHz)				
		1	A"A B	and	n	1			
	1 Carrier	2 Carrier	3 Carrier						
Frequency(MHz)	(30kHz)	(30kHz)	(50kHz)	1 carrier	2 carrier	3 carrier			
50MHz-850MHz	-32.212	-31.767	-32.686	19.212	18.767	19.686			
850MHz-868MHz	-37.818	-26.395	-26.828	24.818	13.395	13.828			
868MHz-869MHz	-22.326	-28.204	-23.743	9.326	15.204	10.743			
880MHz-881MHz	-32.398	-26.784	-25.196	19.398	13.784	12.196			
881MHz-890MHz	-40.058	-31.213	-32.304	27.058	18.213	19.304			
890MHz-1GHz	-29.142	-28.797	-28.243	16.142	15.797	15.243			
1GHz-5GHz	-27.512	-27.545	-27.634	14.512	14.545	14.634			
5GHz-10GHz	-26.796	-27.062	-26.893	13.796	14.062	13.893			
10GHz-15GHz	-23.704	-23.827	-23.81	10.704	10.827	10.81			
15GHz-20GHz	-24.275	-24.159	-24.233	11.275	11.159	11.233			
			A' B B'I	Band					
50MHz-850MHz	-28.563	-28.729	-29.618	15.563	15.729	16.618			
850MHz-868MHz	-36.522	-33.717	-36.605	23.522	20.717	23.605			
868MHz-869MHz	-29.518	-29.231	-27.133	16.518	16.231	14.133			
880MHz-881MHz	-22.251	-26.403	-26.604	9.251	13.403	13.604			
881MHz-890MHz	-33.796	-32.839	-31.465	20.796	19.839	18.465			
890MHz-1GHz	-31.252	-29.207	-29.635	18.252	16.207	16.635			
1GHz-5GHz	-27.575	-27.756	-27.493	14.575	14.756	14.493			
5GHz-10GHz	-27.883	-27.101	-26.945	14.883	14.101	13.945			
10GHz-15GHz	-23.694	-23.882	-23.822	10.694	10.882	10.822			
15GHz-20GHz	-24.423	-24.351	-24.137	11.423	11.351	11.137			

Table 17: Spurious Emissions at the Metrocell BTS 800 MHz Antenna Port IS95

Table 18: Spurious Emissions at the Metrocell BTS 800 MHz Antenna Port IS856 16QAM

	Spurious	Emissions Le	evel(dBm)	Margin to FCC Limit of -13 dBm (dB/1MHz)					
			A"A B	and	•				
Frequency(MHz)	1 Carrier (30kHz)	2 Carrier (30kHz)	3 Carrier (50kHz)	1 carrier	2 carrier	3 carrier			
50MHz-850MHz	-34.521	-34.665	-34.672	21.521	21.665	21.672			
850MHz-868MHz	-42.943	-34.414	-35.731	29.943	21.414	22.731			
868MHz-869MHz	-34.891	-27.831	-31.603	21.891	14.831	18.603			
880MHz-881MHz	-38.173	-31.404	-32.688	25.173	18.404	19.688			
881MHz-890MHz	-45.013	-36.922	-37.662	32.013	23.922	24.662			
890MHz-1GHz	-31.634	-29.689	-32.345	18.634	16.689	19.345			
1GHz-5GHz	-30.256	-29.9	-29.397	17.256	16.9	16.397			
5GHz-10GHz	-28.727	-29.025	-28.035	15.727	16.025	15.035			
10GHz-15GHz	-25.098	-25.13	-25.015	12.098	12.13	12.015			
15GHz-20GHz	-25.141	-23.607	-24.312	12.141	10.607	11.312			
			A' B B'I	Band					
50MHz-850MHz	-33.156	-31.923	-31.71	20.156	18.923	18.71			
850MHz-868MHz	-44.825	-35.257	-39.465	31.825	22.257	26.465			
868MHz-869MHz	-39.099	-32.379	-35.1	26.099	19.379	22.1			
880MHz-881MHz	-37.657	-33.287	-34.858	24.657	20.287	21.858			
881MHz-890MHz	-42.756	-47.562	-34.709	29.756	34.562	21.709			
January 01 2010		Stream 00 is	ssue 01			22			

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890MHz-1GHz	-35.01	-32.622	-33.031	22.01	19.622	20.031		
1GHz-5GHz	-29.789	-29.805	-28.941	16.789	16.805	15.941		
5GHz-10GHz	-28.312	-27.821	-27.754	15.312	14.821	14.754		
10GHz-15GHz	-24.511	-24.636	-24.604	11.511	11.636	11.604		
15GHz-20GHz	-24.334	-23.678	-23.674	11.334	10.678	10.674		

Notes: An Emission level given in these ranges represents the worst case value over all the tested channels

🔆 Ag	ilent 14	Measure									
Ref 20	dBm		#Atten	30 dB	Ext PG	-31.0	7 dB	Mk	r1 480 -32.21).7 MHz 2 dBm	Meas Off
#HV9 Log 10 dB/											Channel Power
											Occupied BW
PAvg						1 \$					ACP
W1 S2 S3 FC AL											Multi Carrier Power
£ (f): FTun Swp											Power Stat CCDF
Start 5 #Res B	50.0 MH W 1 MH	z z		#V	вы з м	Hz	Swee	St p 2.44	op 850 ms (60	.0 MHz 1 pts)	More 1 of 2
Copyri	ight 20	000-20)08 Ag	ilent T	echnol	ogies					

Figure 11: Conducted Spurious Emissions - 1 Carrier, Channel 1019, 50MHz-850MHz IS95

🔆 Ag	jilent 14	:42:28	Dec 2	8,2009)				R	Т	Measure
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	6 –31.4	4 dB	Mkr:	1 896. -29.14	60 MHz 2 dBm	Meas Off
Log 10 dB/											Channel Power
											Occupied BW
PAvg 50						····-	-1-10-10-10-10-10-10-10-10-10-10-10-10-1				ACP
W1 S2 S3 FC AL											Multi Carrier Power
€(f): FTun Swp											Power Stat CCDF
Start 8 #Res B	390.00 890.00 8W 1 MH	MHz z		#V	вы з м	Hz	SI	Stop weep 1	1.000 0 ms (60:	10 GHz 1 pts)	More 1 of 2
Copyr	ight 20	00-20	008 Ag	ilent T	echnol	ogies					

Figure 12: Conducted Spurious Emissions - 1 Carrier, Channel 283, 890MHz-1GHz IS95

🔆 Ag	Agilent 14:44:54 Dec 28, 2009 R T												
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	-34.1	2 dB	Mkr	1 16.2 -24.27	50 GHz 5 dBm	Meas Off		
Log 10 dB/											Channel Power		
			1								Occupied BW		
PAvg 27			···-\$	*							ACP		
W1 S2 S3 FC AL											Multi Carrier Power		
€(f): FTun Swp											Power Stat CCDF		
Start 1 #Res B	Start 15.000 GHz Stop 20.000 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 15.12 ms (601 pts)												
Copyri	ight 20	000-20	008 Ag	ilent T	echnol	ogies							

Figure 13: Conducted Spurious Emissions - 1 Carrier, Channel 283, 15GHz-20GHz IS95

NØRTEL

🔆 Ag	ilent 13	:50:03	Dec 2	8, 2009)				R	Т	Measure
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	-31.3	2 dB	Mkr:	1 867.4 -28.98	49 MHz 0 dBm	Meas Off
Log 10 dB/											Channel Power
	Mark	er									Occupied BW
PAvg 10	867. -28.	.4900 .980	000 M dBm	1Hz						1 ***	ACP
W1 S2 S3 FC AL	ላማኤሳ አ-ጐለ	who are the second s	ang da gana ang ang da ang sa		antoint the co	apar, same	angetalingeng	a have a second	Harring Prof	**	Multi Carrier Power
€(f): FTun Swp											Power Stat CCDF
Start 8 #Res B	350.00 W 30 ki	MHz Hz		#VE	3W 100	kHz	Sweep	Sto 60.04	p 868.0 ms (601	0 MHz L pts)	More 1 of 2
Copyri	ight 20	000-20	008 Ag	ilent T	echnol	ogies					

Figure 14: Conducted Spurious Emissions - 2 Carriers, Channel 1019 37, 850MHz-868MHz IS95

🔆 Ag	j ilent 14	:07:08	Dec 2	8, 200	9				R	T	Measure
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	6 -31.4	4 dB	Mkr1	1 890. -28.79	37 MHz 7 dBm	Meas Off
Log 10 dB/											Channel Power
											Occupied BW
PAvg 100	1 2				•						ACP
W1 S2 S3 FC AL											Multi Carrier Power
€(f): FTun Swp											Power Stat CCDF
Start 8 #Res B	390.00 1 MH	MHz z		#\	Г ЛВШ З М	IHz	S S	Stop weep 1	1.000 0 ms (60)	00 GHz 1 pts)	More 1 of 2
Copyri	ight 20	00-20	008 Ag	ilent 1	echnol	ogies					

Figure 15: Conducted Spurious Emissions - 2 Carriers, Channel 242 283, 890MHz-1GHz IS95

🔆 Ag	ilent 14	:10:19	Dec 2	8,2009		R	Т	Measure			
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	5 –34 . 1	2 dB	Mkr:	1 16.20 -24.15%	00 GHz 0 dBm	Meas Off
Log 10 dB/											Channel Power
			1								Occupied BW
PAvg 85			×								ACP
W1 S2 S3 FC AL											Multi Carrier Power
€(f): FTun Swp											Power Stat CCDF
Start 1 #Res B	.5.000 W 1 MH	GHz z		#V	вызм	Hz	Sweep	Sto 15.12	p 20.00 ms (601	0 GHz . pts)	More 1 of 2
Copyri	ight 20	100-20	108 Ag	ilent T	echnol	ogies					

Figure 16: Conducted Spurious Emissions - 2 Carriers, Channel 242 283, 15GHz-20GHz IS95

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FCC/IC Equipment Authorization	

🔆 Agil	lent 10	:45:52	Dec 2	8,2009)				R	Т	Peak Search
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	-31 . 3	2 dB	Mkr1	868.0 -26.82	00 MHz 8 dBm	Next Peak
Log 10 dB/											Next Pk Right
											Next Pk Left
#PAvg 10											Min Search
W1 S2 S3 FC AL		,				·····					Pk-Pk Search
€(f): - FTun Swp -											Mkr → CF
Start 85 #Res Bk	50.00 V 51 kl	MHz Iz		#VE	3W 200	kHz	#Swee	Sto ep 200	p 868.0 ms (601	0 MHz l pts)	More 1 of 2
Copyrig	ght 20	00-20	008 Ag	ilent T	echnol	ogies					

Figure 17: Conducted Spurious Emissions - 3 Carriers, Channel 1019 37 78, 850MHz-868MHz IS95

🔆 Ag	ilent 11	:15:00	Dec 2	8,2009	1				R	Т	Measure
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	-31.4	4 dB	Mkr:	1 890.9 -28.243	92 MHz 3 dBm	Meas Off
Log 10 dB/											Channel Power
											Occupied BW
#PAvg	1 Quanta										ACP
W1 S2 S3 FC AL											Multi Carrier Power
€(f): FTun Swp											Power Stat CCDF
Start 8 #Res B	390.00 W 1 MH	MHz z			BW 3 M	Hz	#Swee	Stop ep 200	1.000 0 ms (601	0 GHz . pts)	More 1 of 2
Copyri	ight 20	000-20	008 Ag	ilent T	echnol	ogies					

Figure 18: Conducted Spurious Emissions-3 Carriers, Channel 201 242 283, 890MHz-1GHz IS95

Test Report for FCC/IC Equipment Authoriza		GDNT CDMA Product Integrity
🔆 Agilent 11:24:56 Dec 2	8,2009	R T Measure
Ref 20 dBm #Atten #Avg	30 dB Ext PG -34.12	Mkr1 16.208 GHz dB —24.233 dBm Meas Off
Log 10 dB/		Channel Power
		Occupied Bl
#PAvg		ACI
W1 S2 S3 FC AL		Multi Carrie Powe
£(f): FTun Swp		Power Sta CCDF
Start 15.000 GHz #Res BW 1 MHz	#VBW 3 MHz +	Stop 20.000 GHz More #Sweep 200 ms (601 pts) 1 of 3

Figure 19: Conducted Spurious Emissions - 3 Carriers, Channel 201 242 283, 15GHz-20GHz IS95

🔆 Ag	i lent 08	:59:54	Dec 2	9,2009)				R	Т	Measure
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	5 -31.0	7 dB	Mk	r1 870 -28.563	.0 MHz 3 dBm	Meas Off
Log 10 dB/											Channel Power
											Occupied BW
PAvg											ACP
W1 S2 S3 FC AL											Multi Carrier Power
€(f): FTun Swp											Power Stat CCDF
Start 5 #Res B	50.0 MH	z z		#\	BW 3 M	Hz	Swee	St p 2.48	op 870. ms (601	0 MHz . pts)	More 1 of 2
Copyri	ight 20	000-20)08 Ag	ilent T	echnol	ogies					

Figure 20: Conducted Spurious Emissions - 1 Carrier, Channel 384, 50MHz-870MHz IS95

NØRTEL

🔆 Ag	ilent 09	:10:15	Dec 2	9,2009	I				R	Т	Measure
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	6 -31.4	4 dB	Mkr1	896.88 -33.796	33 MHz 6 dBm	Meas Off
Log 10 dB/											Channel Power
	Mark	er									Occupied BW
PAvg 220	896. -33.	8830 796	000 M dBm	Hz	<u>~</u> ~	h					ACP
W1 S2 S3 FC AL				.	~~		and the second	- Calerana	Warman	~~~////	Multi Carrier Power
€(f): f>50k Swp											Power Stat CCDF
Start 8 #Res B	395.000 W 30 kl	MHz Hz		#VB	W 100	kHz	Sweep	Stop 16.68	900.00 ms (601	0 MHz . pts)	More 1 of 2
Copyri	ight 20	100-20)08 Ag	ilent T	echnol	ogies					

Figure 21: Conducted Spurious Emissions - 1 Carrier, Channel 758, 895MHz-900MHz IS95

🔆 Ag	j ilent 09	Peak Search									
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	6 -34.0	5 dB	Mkr	1 13.6 -23.69	25 GHz 4 dBm	Next Peak
Log 10 dB/											Next Pk Right
								1			Next Pk Left
PAvg								\$			Min Search
29 W1 S2 S3 FC AL											Pk-Pk Search
€(f): FTun Swp											Mkr→CF
Start 1 #Res B	L0.000 W 1 MH	GHz z		#V	вы з м	Hz	Sweep	Sto 15.12	p 15.00 ms (60	00 GHz 1 pts)	More 1 of 2
Copyr	ight 20	000-20	108 Ag	ilent T	echnol	ogies					

Figure 22: Conducted Spurious Emissions - 1 Carrier, Channel 758, 10GHz-15GHz IS95

NØRTEL

🔆 Ag	j ilent 16	:11:33	Dec 2	8,2009)				R	Т	Peak Search
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	-31 . 3	1 dB	Mkr1	878.9 -33.71	25 MHz 7 dBm	Next Peak
Log 10 dB/											Next Pk Right
	Mark	er									Next Pk Left
PAvg 20	878. -33.	9250 717	000 M dBm	Hz					1 1 4 5	1	Min Search
W1 S2 S3 FC AL	kanda ana an	www.hrdw	Hirmon	whatam	allonlutin	under Mary M	e servite and	jtan ministrije	040j.4,4~***4	<u></u>	Pk-Pk Search
€(f): f>50k Swp											Mkr → CF
Start 8 #Res B	370.000 W 30 ki	MHz Hz		#VE	W 100	kHz	Sweep	Stop 30.04	879.00 ms (60:	00 MHz 1 pts)	More 1 of 2
Copyri	ight 20	00-20	008 Ag	ilent T	echnol	ogies					

Figure 23: Conducted Spurious Emissions - 2 Carriers, Channels 384 425, 870MHz-879MHz IS95

🔆 Ag	Agilent 16:36:25 Dec 28, 2009 R T													
Ref 20 #Ava	dBm		#Atten	30 dB	Ext PG	i –33.3	dB	Mk	r1 3.1 -27.75	20 GHz 6 dBm	Next Peak			
Log 10 dB/											Next Pk Right			
											Next Pk Left			
PAvg 20						¢	· •····				Min Search			
W1 S2 S3 FC AL											Pk-Pk Search			
£(f): FTun Swp											Mkr→CF			
Start 1 #Res B	rp art 1.000 GHz Stop 5.000 GHz Res BW 1 MHz #VBW 3 MHz Sweep 12.12 ms (601 pts)													
Copyr	ight 20	100-20	108 Ag	ilent T	echnol	ogies								

Figure 24: Conducted Spurious Emissions - 2 Carriers, Channel 692 758, 1GHz-5GHz IS95

🔆 Ag	Agilent 16:39:44 Dec 28, 2009 R T												
Ref 20 #Ava	dBm		#Atten	30 dB	Ext PG	6 –34 . 1	2 dB	Mkr	1 16.1 -24.35	50 GHz 1 dBm	Next Peak		
Log 10 dB/											Next Pk Right		
			-1								Next Pk Left		
PAvg 20											Min Search		
W1 S2 S3 FC AL											Pk-Pk Search		
€(f): FTun Swp											Mkr → CF		
Start 1 #Res B	.5.000 W 1 MH	GHz z		#\	BW 3 M	Hz	Sweep	Sto 15.12	p 20.00 ms (60	00 GHz 1 pts)	More 1 of 2		
Copyri	ignt 24	100-21	908 HS	ment i	ecnnoi	ugies							

Figure 25: Conducted Spurious Emissions - 2 Carriers, Channels 692 758, 15GHz-20GHz IS95

🔆 Agi	Agilent 15:13:57 Dec 28, 2009 R T												
Ref 20 #Ava [dBm		#Atten	30 dB	Ext PG	9 –31.3	1 dB	Mkr1	878.8 -36.60	805 MHz 95 dBm	Next Peak		
Log 10 dB/											Next Pk Right		
											Next Pk Left		
PAvg									- hate	1 Ann Million	Min Search		
W1 S2 S3 FC AL	whowenho	downhith-r	www.u/Ww/	artiping (reland	gelwergebete	(WILJUNJUNA)	harra da la fo	www.wike/wik	por all		Pk-Pk Search		
£ (f): f>50k Swp											Mkr → CF		
Start 8 #Res Bl	70.000 W 30 kł	MHz Iz		#VE	3W 100	kHz	Sweep	Stop 30.04) 879.0 ms (60	00 MHz)1 pts)	More 1 of 2		
Copyri	ght 20	00-20)08 Ag	ilent T	echnol	ogies							

Figure 26: Conducted Spurious Emissions - 3 Carriers, Channels 384 425 466, 870MHz-879MHz IS95

NØRTEL

🔆 Agilent 15:55:12 Dec 2	28, 2009	R T	Peak Search
Ref 20 dBm #Atten #Avg	M 30 dB Ext PG -31.44 dB	1kr1 900.00 MHz -29.635 dBm	Next Peak
Log 10 dB/			Next Pk Right
-Marker			Next Pk Left
\$900.000000 N PAvg -29.635 dBm	1Hz		Min Search
50 W1 S2 S3 FC AL			Pk-Pk Search
£(f): FTun Swp			Mkr → CF
Start 900.00 MHz #Res BW 1 MHz	Sti #VBW 3 MHz Sweep	op 1.000 00 GHz 1 ms (601 pts)	More 1 of 2
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Figure 27: Conducted Spurious Emissions - 3 Carriers, Channels 630 692 758, 900MHz-1GHz IS95

NØRTEL

🔆 Ag	ilent 15	:57:5 3	Dec 2	8,2009)				R	Т	Peak Search
Ref 20 #Avg	dBm		#Atten	30 dB	Ext PG	6 –34.0	5 dB	Mkr:	1 14.44 -23.822	2 GHz 2 dBm	Next Peak
Log 10 dB/											Next Pk Right
	Mark	er							1		Next Pk Left
PAvg	.14.4 -23.	4200 822	00000 dBm) GHz							Min Search
W1 S2 S3 FC AL											Pk-Pk Search
€(f): FTun Swp											Mkr → CF
Start 1 #Res B	.0.000 W 1 MH	GHz z		#V	вы з м	Hz	Sweep	Sto 15.12	p 15.00 ms (601	0 GHz pts)	More 1 of 2
Copyri	ight 20	00-20	008 Ag	ilent T	echnol	ogies					

Figure 28: Conducted Spurious Emissions - 3 Carriers, Channels 630 692 758, 10GHz-15GHz IS95

🔆 Ag	ilent								R	Т	Peak Search
Ref 20 Samp	dBm		#Atten	30 dB	Ext PG	6 –31 . 1	9 dB	Mkr	1 868. -42.94	00 MHz 3 dBm	Next Peak
Log 10 dB/											Next Pk Right
											Next Pk Left
LgAv 100											Min Search
W1 S2 S3 FC AL	a the first the same of	ter to product to p	radapetrio andra	Annya an	y ^{to} ng paramatan ata	1919-191-191-19191		antag-santhagina	and the second days	and a star of the	Pk-Pk Search
€(f): FTun Swp											Mkr → CF
Start 8 #Res B	350.00 W 30 k	MHz Hz		#VE	W 100	kHz	Sweep	Sto 60.04	p 868.0 ms (60)	00 MHz 1 pts)	More 1 of 2
Copyri	ight 20	100-20	JØ8 Ag	ilent T	echnol	ogies					

Figure 29: Conducted Spurious Emissions - 1 Carriers, Channels 1019, 850MHz-868MHz IS856 16QAM

NØRTEL

🔆 Ag	ilent								R	Т	Peak Search
Ref 20 Samp	dBm		#Atten	30 dB	Ext P0	ə –31.1	9 dB	Mkr1	881.24 -45.013	0 MHz 3 dBm	Next Peak
Log 10 dB/											Next Pk Right
	₋Mark	er									Next Pk Left
LgAv 100	881. -45.	2400 013	000 M dBm	1Hz							Min Search
W1 S2 S3 FC AL	1 •	an san san an a	minimuput	p-rthot-media	-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	∙∳₽₩/₩₩₩₽₽₩	hyn warp yn y	waren andere	Nage-Safet	Pk-Pk Search
£ (f): f>50k Swp											Mkr → CF
Start 8 #Res B	81.000 W 30 ki	I MHz Hz		#VE	3W 100	kHz	Sweep	Stop 30.04	890.00 ms (601	0 MHz pts)	More 1 of 2
Copyri	ight 20	000-20	008 Ag	ilent T	echnol	ogies					

Figure 30: Conducted Spurious Emissions - 1 Carriers, Channels 283, 881MHz-890MHz IS856 16QAM

🗰 Ag	jilent								R	T	Amplitude
Ref 20 Samp	dBm		#Atten	30 dB	Ext PG	6 –35 . 4	2 dB	Mkr:	1 19.8 -25.14	17 GHz 1 dBm	Y Axis Units, dBm
Log 10 dB/											RefLvIOffst 0.00 dB
										1	Int Preamp On <u>Off</u>
LgAv 78	hipmaha	wynadiada	n Mallachua	wornen	altrin to be addressed and	nyewel (arrive)	an a	hormal parts	deg-et.Hearste	www.rkyw/	Corrections•
W1 S2 S3 FC AL											Ext Amp Gain -35.42 dB
€(f): FTun Swp											Atten Step <u>2dB</u> 10dB
Start 1 #Res B	15.000 3W 1 MH	GHz z		#\	визм	IHz	Sweep	Sto 15.12	p 20.00 ms (60	00 GHz 1 pts)	More 2 of 3
Copyr	ight 20	000-20)08 Ag	ilent T	echnol	ogies					

Figure 31: Conducted Spurious Emissions - 1 Carriers, Channels 283, 15GHz-20GHz IS856 16QAM

NØRTEL

🔆 Ag	jilent								R	Т	Peak Search
Ref 20 Samp	dBm		#Atten	30 dB	Ext PG	6 -30.9	4 dB	Mkr	1 484 -34.66	.7 MHz 5 dBm	Next Peak
Log 10 dB/											Next Pk Right
	Mark	er									Next Pk Left
LgAv	484. -34.	7000 665	000 M dBm	Hz	nderan agasada	1	national and the	•1119- ⁴ 174477 ¹¹⁴ 16-17	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Min Search
W1 S2 S3 FC AL											Pk-Pk Search
€(f): FTun Swp											Mkr → CF
Start 5 #Res B	50.0 MH 3W 1 MH	z z		#V	BW 3 M	Hz	Swee	Sti p 2.44 i	op 850. ns (601	0 MHz L pts)	More 1 of 2
Copyr	ight 20	000-20	008 Ag	ilent T	echnol	ogies					

Figure 32: Conducted Spurious Emissions - 2 Carriers, Channels 1019, 37, 50MHz-850Hz IS856 16QAM

🔆 Ag	ilent								R	Т	Peak Search
Ref 20 Samp	dBm		#Atten	30 dB	Ext PG	ə –32.7	7 dB	Mk	r1 3.00 -29.900	67 GHz 0 dBm	Next Peak
Log 10 dB/											Next Pk Right
											Next Pk Left
LgAv	and a descent of the	yonger	n separate the	mpurning	********	1 }************************************	wante	and the state	brybwdalfwaldwyfer	Halpara	Min Search
W1 S2 S3 FC AL											Pk-Pk Search
€(f): FTun Swp											Mkr → CF
Start 1 #Res B	000 G W 1 MH	Hz z		#\	'BW 3 M	IHz	Sweep	\$1 12 . 12	top 5.00 ms (601	0 GHz L pts)	More 1 of 2
Copyri	ight 20	000-20	008 Ag	ilent T	echnol	ogies					

Figure 33: Conducted Spurious Emissions - 2 Carriers, Channels 242, 283, 1GHz-5GHz IS856 16QAM

NØRTEL

🔆 Ag	jilent								R	Т	Peak Search
Ref 20 Samp	dBm		#Atten	30 dB	Ext PG	6 –31.13	9 dB	Mkr1	894.904 -34.85	4 MHz 8 dBm	Next Peak
Log 10 dB/											Next Pk Right
	Mark	er									Next Pk Left
LgAv 100	894. -34.	9044 858	100 M dBm	Hz	····					L-	Min Search
W1 S2 S3 FC AL											Pk-Pk Search
£ (f): f>50k Swp											Mkr → CF
Start 8 #Res B	394.000 W 30 ki	i 0 MHz Hz	2	#VE	3W 100	kHz	Swee	Stop 3 9p 3.36	895.000 ms (60	0 MHz 1 pts)	More 1 of 2
Copyr	ight 20	000-20	008 Ag	ilent T	echnol	ogies					

Figure 34: Conducted Spurious Emissions - 3 Carriers, Channels 630, 692, 758, 894MHz-895MHz IS856 16QAM

4.5 Frequency Stability

4.5.1 Frequency Stability Requirements

FCC Part 2.1055

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30 to +50 centigrade for all equipment except that specified in subparagraphs (2) and (3) of this paragraph.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10 centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment.)

RSS-129

800MHz Dual-Mode CDMA Cellular Telephones, Industry Canada, RSS-129, Issue 2, Revision 1, September 25, 1999

FCC Part 22.355 Limit

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

4.5.2 Test Procedure

The test equipment was configured as shown in figure 35.



Figure 35: Test configuration for Frequency Stability

4.5.3 Frequency results

Operating temperature for the MFRM3 CR 800 MHz is from -40°C to +50°C as System Design Specification. The frequency stability was measured at channels 283 (878.49MHz) and 384 (881.52MHz). The PSA set at 10 average.

		Frequency Stability versus Voltage	at +25 C (channel 283)
Voltage (VDC)		Max Carrier Frequency Deviation (Hz)	Max Carrier Frequency Deviation (PPM)
2	24	16.78	0.019100957
4	11	17.89	0.020364489
4	18	14.12	0.016073034
5	57	17.47	0.019886396
		Frequency Stability versus Voltage	at +25 C (channel 384)
Voltage (VDC)		Max Carrier Frequency Deviation (Hz)	Max Carrier Frequency Deviation (PPM)
2	24	16.83	0.019092023
4	11	17.1	0.019398312
4	18	14.04	0.015927035
5	57	16.51	0.018729014

Table 19: Test results for Frequency Stability versus Power supply Voltage at +25C



Frequency Stability versus versus Temperature at -48V (channel 283)									
Temperature (℃)	Max Carrier Frequency Deviation (Hz)	Max Carrier Frequency Deviation (PPM)							
-40	19.78	0.022515908							
-30	19.74	0.022470375							
-20	18.89	0.021502806							
-10	18.84	0.02144589							
0	18.72	0.021309292							
10	16.54	0.018827761							
20	17.69	0.020136826							
30	19.62	0.022333777							
40	19.66	0.02237931							
50	19.51	0.022208562							
Free	quency Stability versus versus Tempe	rature at 24V (channel 384)							
Temperature (℃)	Max Carrier Frequency Deviation (Hz)	Max Carrier Frequency Deviation (PPM)							
-40	31.37	0.03558626							
-30	19.37	0.02197341							
-20	23.84	0.027044196							
-10	21.17	0.024015337							
0	20.83	0.02362964							
10	18.85	0.021383519							
20	18.33	0.020793629							
30	17.74	0.020124331							
40	17.83	0.020226427							
50	18.25	0.020702877							

 Table 20: Test results for Frequency Stability versus Temperature at -48V operation

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