Nemko Test Report:	2L0436RUS1
Applicant:	Navini Networks 2240 Campbell Creek Blvd. Suite 110 Richardson, TX 75082
Equipment Under Test: (E.U.T.)	2.3 GHz WCS Band BTS
In Accordance With:	FCC CFR 47, PART 27, Subpart C Wireless Communication Services
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	
	Je Je John Eish Senior EMC Engineer

Date:

9/26/2003

86

Total Number of Pages:

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#### Section 1. **Summary of Test Results** Manufacturer: Navini Networks Model No.: 2300-Digital, 2300-RF Serial No.: None General: All measurements are traceable to national standards. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 27, Subpart C. |X|New Submission **Production Unit Class II Permissive Change Pre-Production Unit** THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

#### THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. NONE See " Summary of Test Data".

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This report applies only to the items tested.

#### Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	2.1046/27.50(a)(1)	2000 W EIRP	Complies
Occupied Bandwidth	2.1049/27.53(a)	27.53 (a) Mask	Complies
Spurious Emissions @ Antenna Terminals	2.1051/27.53(a)	27.53(a)	Complies
Field Strength of Spurious Radiation	2.1053/27.53(a)	27.53(a)	Complies
Frequency Stability	2.1055/27.54	27.53 (a) Mask	Complies

#### **Footnotes:**

Section 2. Gener	ral Equipmen	t Specific	ation							
Supply Power:		27 Vdc								
Frequency Range:		2305 - 2320 2345 - 2360	MHz MHz							
Type(s) of Modulation:		F3E (Voice)	F1D	F2D	D7W (QAM)	DQPSK (F9W)				
Emission Designator:		500KD7W								
Output Impedance:		50 ohms								
<b>RF Power Output Rated:</b>	398 watts eirp (see page 5)	+30 dBm (1 configuration +36 dBm (4 +37 dBm (5 +37 dBm (5	watt) at an ns. watts) at E watts) at E watts) at E	ttenna terr CUT for 10 CUT for 8 CUT for 6	ninals for all ) carrier confi carrier config carrier config	figuration guration guration				
Duty Cycle:		Software con	trolled 509	% to 75%	TDD					
Operator Selection Of Operating Frequency:		Software con	trolled							
Power Output Adjustment Capability:		Software con	trolled							

#### **Description Of EUT**

The EUT is a high capacity, broadband data communication Base Station Transceiver. The EUT can operate in WCS channels AB high, AB low, C, or D by design with appropriate block or channel filters inserted into the EUT. Three capacity configurations are available which consists of 10, 8, or 6 Carriers. A Carrier is a fundamental transmitter signal that is 500 kHz wide in bandwidth. An EUT Channel Bandwidth of 5 MHz consists of 10 Carriers each with a 500 kHz bandwidth. The following table summarizes the three capacity configurations for an EUT:

Capacity	WCS	Number of	EUT	Max EUT	Loss to	Max Power to
Configurations	Channels	Carriers	Channel	Power	ANT	ANT
			Bandwidth	Output *		Terminal**
1	A or B	10	5 MHz	+36 dBm	6 dB	+30 dBm
2	A or B	8	4 MHz	+37 dBm	7 dB	+30 dBm
3	C or D	6	3 MHz	+37 dBm	7 dB	+30 dBm

\* EUT output power will be lowered dB for dB Loss to ANT is lower.

\*\*Power to ANT terminal will be lowered dB for dB Loss to ANT is higher. EIRP is calculated as follows:

Max. antenna gain = 18dBi Max BTS rf output = +30 dBm RMS Peak-to-Average Ratio = 8 dB Max. rf output power = 30 dBm + 8 dB + 18 dBi = +56 dBm (Peak EIRP)

#### System Diagram



# EQUIPMENT: 2.3 GHz WCS BTSSection 3.RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: Tom Tidwell	DATE: 9/3/2002

Test Results: Complies

#### **Measurement Data:**

Power Output	<b>RF Power Output</b>	Max. Antenna Gain	<b>RF Power Output</b>
			(EIRP)
(dBm)	(Watts)	(dBi)	(Watts)
+30	1 watt @ Antenna input	18	398
	4 watts @ EUT rf output		
+36	with 10 carriers. 1 watt	18	398
	@ antenna input		
	5 watts @ EUT rf output		
+37	with 8 carriers. 1 watt @	18	398
	antenna input		
	5 watts @ EUT rf output		
+37	with 6 carriers. 1 watt @	18	398
	antenna input		

Test Equipment Used:Agilent Model E4416A s/n GB41290732Agilent Model E9327A s/n US40440319Agilent Model E4419B s/n GB39461846Agilent Model E9401s/n MY41495108

Duty Cycle: 50%

Output power was measured with full traffic 10 carrier software load.

The maximum rf output power is + 30 dBm at the antenna input terminals. The maximum rf output power (EIRP)

**Measurement Uncertainty:** +/- 0.6 dBm

## Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: Tom Tidwell	DATE: 9/16/2002

Test Results: Complies

Measurement Data: See attached data sheets.

The absolute RMS output power of the EUT is measured with a power meter. The occupied BW spectrum analyzer plots are not intended to represent the absolute channel power "CH PWR" of the EUT but provide measurement for the occupied channel BW of the EUT.

Measurement Uncertainty: +/- 1 x 10<sup>-7</sup> ppm, +/- 1.7 dB



## EQUIPMENT: 2.3 GHz WCS BTS Test Data – Emission Mask

6 Carriers

Test Plot:	Spurious Emissions at A	ntenna T	'erminals		
Page 4- of 5           Job No.:         2L0435R           Specification:         CFR 47, Part 27           Tested By:         Tom Tidwell           E.U.T.:         2.3 GHz WCS bang           Configuration:         Transmit full powe	Date: <u>9/18/2002</u> Temperature(°C): <u>24</u> Relative Humidity(%) <u>44</u> 1BTS				
Ref Lvl 30.2 dBm	Marker 1 [T1] -65.37 dBm 2.32250000 GHz	RBW VBW SWT	30 kHz 30 kHz 5 s	RF Att Mixer Unit	0 dB -10 dBm dB
-10 -20 -30 1VIEW -40 -50 -50 -60 -60 -70 -80 -80 -90 -11 -100 Center 2.3175 Date: 18.SEP	Set 1		▼1 [T1] CH PWR ACP Up ACP Los △1 [T1]	2.3225i 31 -8 -4 0.0000	5.37 dBm 0000 GHz 0.95 dB 0.95 dB 0.00 dB 0000 Hz 1RM
Notes: DARS band edge Transmit in char	e (2320 MHz) nnel C				

# EQUIPMENT: 2.3 GHz WCS BTS 6 Carriers

Test Plot	÷			ę	Spur	ious Emis	sions at A	ntenna T	<u>'erminals</u>					
Page 4 o Job No.: Specification: Tested By:	of <u>5</u> <u>2L043</u> <u>Part 27</u> <u>Tom T</u>	5R 7 Yidwell		Re	Temp lative H	Date: <u>9/1</u> erature(°C): <u>24</u> lumidity(%) <u>45</u>	8/2002							
E.U.T.: Configuration:	<u>2.3 GF</u> <u>TX ful</u>	Iz WCS	band B7	S										
Ref 30	Lvl .3 d	IBm		Mar	ker	1 [T1] -65. 2.344003	.27 dBm 301 GHz	RBW VBW SWT	30 k 300 k 5	Hz Hz s	RF At Unit	t	0 dB dB	5
-10 -20 -30 1V -40 -50 -60 -70 -80 -90 -100	1EW			F C								-65 4400 -45 -80	27 dBm 301 GHz 34 dBm 78 dB 89 dB	1 R M
Date:	iter	2.32 18.5	EP.2	2002	11	:12:36	1 1	IHZ7			:	span	IU IIHZ	
Notes:	DARS Trans	5 band ( smit in (	edge (2 channe	345 MI I D	Hz)									

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

## EQUIPMENT: 2.3 GHz WCS BTS

Data Plot							0	cc	upied B	ar	ndwidth											
Page 1 o	f <del>5</del>															Com	olete	Х				
Job No.:	2L043	5R					Date:		9/16/2002	<u>_</u>					Pre	limin	ary:					
Specification:				Т	empe	eratu	ire(°C):		25	-												
Tested By:	Tom T	idwell		Relati	ve H	umi	dity(%)	_	44	-												
E.U.T.:	2.3 GH	z WCS band B	ſS																			
Configuration:	TX ful	power																				
Sample Number:	No	ne																				
Detector Type:	Rn	15							RBW: VBW:	Re Re	fer to plots											
Test Equipm	ent Use	<del>ed</del>																				
Antenna:							Dire	ectio	onal Coupler:	An	naren 1C087-20	)										
Pre-Amp:									Cable #1:													
Filter:									Cable #2:													
Receiver:	103	36							Cable #3:													
Attenuator #1									Cable #4:		<u> </u>											
Attenuator #2:									Mixer:													
Additional equip	ment use	:d:																				
Measurement Ur	certainty	/:// d	B																			
			Ma	arke	er	1	[ ] 1	]			RBW		50	k	Hz		RF	At	t	20	dB	
Ref	Lvl						-2	6.	.29 dBr	m	VBW		300	ĸ	Нz		Μ	ixer		-20	dBn	n
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-20									hnn	Ω	hnnc		A	CF	L	. <u>ow</u>			-43	. 99	dB	
20									1 1 1 1	1 \			A	LT	1	Up			-51	. 70	dB	
									v				A	LT	1	Lov	1		-47	.15	dB	
-30	E.L												A		2	Up			-58	.71	dВ	1.0 M
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Notes:																						

### 8 Carriers

## EQUIPMENT: 2.3 GHz WCS BTS Test data – Emission Mask

Ner	mko Dalla	as, Inc.	ÎÌ		0					802 Lewisvi Tel: (9 Fax: (9	2 N. Kealy Ile, TX 75 72) 436-9 72) 436-2	6057 600 667		
ata Plot	;			Spur	ious Emi	ssions at	Antenna T	<b>Ferminals</b>	5					
Page <u>1</u> o	of <u>16</u>								Сог	nplete	х			
No.:	2L0436R				Date:	9/18/2003			Prelimi	nary:				
cification:	Part 27			Temp	perature(°C):	22								
ted By:	David Lig	ht	R	elative I	Humidity(%)	40								
.T.:	2.3 GHz H	BTS												
figuration:	Tx 10 Car	riers												
ple Number:	: 1													
ation:	On site					RBW:	kHz		Measur	ement				
ector Type:	Rms	_				VBW:	60 kHz		Dis	tance: NA	<u> </u>	m		
st Equipm	ent Used													
enna:		_			Directi	onal Coupler:	Model 1C0870-2	0	Cal'd prior	to use				
-Amp:		_				Cable #1:	1484							
er:		_				Cable #2:								
eiver:	1036					Cable #3:								
enuator #1	Model 204	14-6dB Cal	prior to	use		Cable #4:								
enuator #2:	Model 33-	20-34 Cal'c	l prior to	use		Mixer:								
litional equip	oment used:													
asurement Ur	ncertainty:	+/-1.7	dB											
Ref 19	Lv1 .9 dBm	) G <mark>ffs</mark>	ee t	2	-36. 2.312500	.95 dBm )00 GHz	VBW SWT	50 K 5	Hz S	Unit	_ 3F	95	dB	
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- 10 - 20 - 30	IEW			ruhar	mony	m m	rymy			2.	31250 -43 -45	1000 1.22 3.84 5.31	dB dB dB dB	181
- 10 - 20 - 30 - 1 V I	EW			ruhan	mony	mm	rymy		ядч 404 401		31250 - 43 - 45	4.22 3.84 5.31	dBm dB dB	181
- 10 - 20 - 30 - 1 V I - 40	IEW				minney	MM I	prof my		거니다 다 나 나 나 나 나	2.	3 250	4.22 3.84 5.31	dB dB dB	181
- 10 - 20 - 30 - 1 V I - 40	IEW				man nau man nau		rymy				3 250	1000 1.22 3.84 5.31	dB dB dB dB	181
- 10 - 20 - 30 - 40 - 50	EM				man nuu		reg pry				3 25L 32 - 4 3 - 4 5	1.22 3.84 5.31	dB dB dB dB	181
- 10 - 20 - 30 - 40 - 50	EM			- Uhry	man nuu		reg pry			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3.25L 32 -43 -45	1.22 3.84 5.31		187
- 10 - 20 - 30 - 1 V 1 - 40 - 50 - 60	IEW		have		man nuu		reg pry			~~~~	3.25L 32 -43 -45	1.22 3.84 5.31		181
- 10 - 20 - 30 - 1 V I - 40 - 50 - 60	IEW 				man prod		reg pry			~~~~~	3.25L -43 -45	3.84 5.31		181
- 10 - 20 - 30 - 1 V I - 40 - 50 - 60	I Е Ы				man prod		prof prof			~~~~~	3.25L -43 -45	. 22 3. 84 5. 31		187
- 10 - 20 - 30 - 40 - 50 - 60 - 70	I Е Ы				man prod		rug pry			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3.25L - 43 - 45	. 22 3. 84 5. 31		187
- 10 - 20 - 30 - 40 - 50 - 60 - 70	IEW 						prof prof			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3.25L -43 -45	. 22 3. 84 5. 31		1Rr
- 10 - 20 - 30 - 1 V 1 - 40 - 50 - 60 - 70	IEW						prof prof					. 22 3.84 5.31		1Rr
- 10 - 20 - 30 - 1 V 1 - 40 - 50 - 60 - 70	IEW											4.22 3.84 5.31		1Rr
- 10 - 20 - 30 - 1 V 1 - 40 - 50 - 50 - 70 - 70 - 80 - 90	IEW										3 25L 32 - 43 - 45	4.22 3.84 5.31		1Rr
- 10 - 20 - 30 - 40 - 50 - 50 - 70 - 70 - 80 - 90	IEW											- 22 3.84 5.31		1Rr
- 10 - 20 - 30 1 V 1 - 40 - 50 - 50 - 70 - 70 - 70 - 80 - 90	IЕ W	c 11												1Rr
- 10 - 20 - 30 1 V 1 - 40 - 50 - 50 - 70 - 80 - 90 - 90 - 100	IEW	c   1												1Rr
- 10 - 20 - 30 1 V 1 - 40 - 50 - 50 - 70 - 70 - 80 - 90 - 90 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -	ter 2.	c   1 3075	GHZ								3 25L 32 - 43 - 45 - 45			181
-10 -20 -30 1V1 -40 -50 -60 -70 -80 -90 -90 -90 -00 Cent t le:	ter 2.	c   1 30 75	GHz				1Hz /				3 25L -43 -45 -45 -45 -45			1Rr
-10 -20 -30 1VI -40 -50 -50 -50 -70 -70 -70 -70 -70 -70 -70 -70 -70 -7	ter 2. 20 18	c   1 30 75 C SEP . 2			2:36:05		1Hz >				3 250 - 43 - 45 - 45 - 45 - 45 - 45 - 45 - 45			1Rr

## EQUIPMENT: 2.3 GHz WCS BTS

## Test data – Emission Mask



 Ballas Headquarters:

 802 N. Kealy

 Lewisville, TX 75057

 Tel:
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 Fax:
 (972) 436-2667

Ner	nko Dallas, Inc.						```	,			
<b>Test Plot</b>		Spur	ious Emi	issions at	Antenna	ı T	erminals				
Page 4 o	of 16	-									
Job No.:	2L0436R		Date: 9	0/18/2003							
Specification:	Part 27	Temp	erature(°C): 2	22							
Tested By:	David Light	Relative H	1  (umidity(%)  4	40							
E.U.T.:	2.3 GHz BTS					_					
Configuration:	Tx 10 Carriers					_					
		Marker	1 [T1]		RBW		5 kHz	RF	Att	20 dB	
Ref	$rac{1}{r}$		-44.	.05 dBm	VВЫ		50 kHz				
15	dBm	2	.312500	)00 GHz	SWT		5 s	Ur	nit	dE	3
15	.9 dB Offse						▼1 [Т	1	- 4 4	.þ5 dBm	
10									2.31250	эро (GHz	
- 10								R	28	.17 dBm	
20				MAMAA	1114111		ACP L		-39	. 29 00 . 52 dB	
-20							ALT1	up	-60	.93 dB	1
20				, i i			ALT1	LOW	-86	.42 dB	
-30 1 V I	ЕМ						ALT2	Up	-86	.16 dB	1RM
							AL 12	LPW	-86		
-40											
-50						4					
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-60			~~~~				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		¢	4 <del>CU3</del> 4 J	
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-90									Ц		
C-	13										
– 100 <b>L</b>	ter 2,3075 G			ЗМ		_			- Snan	30 MHz	J
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Date:	18.SEP.20	17:	40:09								
Netza	A										
Notes:	Ampient 2/ v dc	nower									
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## Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: Tom Tidwell	DATE: 9/16/2002

Test Results: Complies

Measurement Data: See attached data sheets.

**Measurement Uncertainty:** +/- 1.7 dB



## *EQUIPMENT: 2.3 GHz WCS BTS* **Test Data – Spurious Emissions at Antenna Terminals**

## Band C

Data Plot		Spuri	ous Emi	ssions at .	Antenna 🛛	<b>Ferminals</b>				
Page 1 o	f <del>5</del>						Com	plete X		
Job No.:	2L0435R		Date:	9/18/2002			Prelimin	ary:		
Specification:	CFR 47, Part 27	Tempe	erature(°C):	24						
Tested By:	Tom Tidwell	Relative H	umidity(%)	44						
E.U.T.:	2.3 GHz WCS band	BTS								
Configuration:	Transmit full power									
Sample Number:	1									
Location:				RBW: F	efer to plots					
Detector Type:	Rms			VBW: <u>F</u>	lefer to plots					
Test Equipme	ent Used									
Antenna:			Directi	onal Coupler: <u>A</u>	naron 1C0870-	20 20 dB couple	r			
Pre-Amp:				Cable #1:						
Filter:				Cable #2:						
Receiver:	1036			Cable #3:						
Attenuator #1	3320-34			Cable #4:						
Attenuator #2:				Mixer:						
Additional equips	ment used:									
Measurement Un	certainty: <u>+/-1.</u>	<u>7 dB</u>								
		Marker	1 [T1]		RBW	1 1	1Hz	RF Att	0 dB	
Ref	∟ v 1		-32	.79 dBm	VBW	1 1	1Hz	Mixer	-20 dB	m
30	.3 dBm	2	.36000	000 GHz	SWT	5 m	ıs	Unit	d	в
	5.3 dB Off	set				▼1	[T T 1 ]			<b>]</b>
								2 3600	21.73 ОВГ Эрол Бн <del>.</del>	_
- 10										-
-20										
22										
-30 1 V I	IFW									1 MA
-40	12 dBm									1
	-13 000									1
-50										-
-60										4
	WAA A A MANA A AND A A A AND A A A A A A A A A A	Mar w M. Mar	MMN	MAMMAN	Mybuller	WAN MUNIMUM	hann	Marken	MALMA	M
70			10-10 WW			¢.0.0.0.0			0.00	
-10										
-80										
-90										-
- 100										
Sta	rt 2.345 G	Hz		1.5	MHz/			Stop 2	2.36 GHz	z
Title:	200	0000 10								
Date:	18.5EP.	.2002 12	:58:51							
Notes:	Transmit in chan	mel C								
	2.5+5 - 2.500 MHZ	og(P) or -13 dPm								
	-43 + 10L0	ug(1) 01 -13 uBn								

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

ta Plot			Spur	ious Emi	ssions at A	ntenna T	erminals	;			
Page 2 of	f <u>5</u>										
lo.:	2L0435R			Date: 9/	18/2002						
fication:	CFR 47, Part	27	Temp	erature(°C): 24							
d By:	Tom Tidwell		Relative H	lumidity(%) 44							
Г.:	2.3 GHz WC	S band BTS									
iguration:	Transmit full	power									
<b>&gt;</b>		7	larker	1 [T1]		RBW	1 1	1Hz	RF At	t -	0 dB
Y Ref				-52	.67 dBm	VBW	1 1	1Hz	Mixer	-2	0 dBm
JU.	.3 dBm		2	2.300000	JUU GHZ	501	Бг	ns	Unit		aB
45	5.3 ØB	Offset					<b>v</b> <sub>1</sub>	[ [ ] ]		-52.6	7 dBm
									2.30	000000	O GHz
.10											
20					-	ł – – ł			_		
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50											
60											
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Sta	rt 30 M	IHz –			227	MHz/			S	top 2.	3 GHz
tle:	200										
te:	18.9	5EP.20	02 13	:00:05							
Notos:	Tronmit in	channel C									
NOLES.	1  rannu III 1  imit = 70		or 40 dP.	n							
	Limit = 70	TOLOG(P)		u							

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plot	ţ		Spuri	ious Emis	sions at A	ntenna T	erminals				
Page <u>3</u> of lob No.: Specification: Fested By: E.U.T.: Configuration:	f <u>5</u> 2L0435R CFR 47, Part 2 Tom Tidwell 2.3 GHz WCS Transmit full r	27 band BTS	Tempo Relative H	Date: <u>9/1</u> erature(°C): <u>24</u> umidity(%) <u>44</u>	8/2002						
Ref 30	Lvl .3 dBm	Ma	arker	1 [T1] -57. 5.000000	.69 dBm 100 GHz	RBW VBW SWT	1 ۲ 1 ۲ 220 п	1Hz 1Hz 1S	RF Att Mixer Unit	0 dB -20 dBm dB	1
- 10	5.3 dB (	⊃ffset					•1	[〒1]	-57 5.00000	.69 dBm 000 GHz	]—
-20											
-30 1 V I	EM										1 M I
-40											
-60											
-70 <b></b> 01		m									
-80	1 1	ymmeth	www	Munum	wym	mount	human	hunter	ummun	welle Weller	
-90											ļ
Sta Title: Date:	rt 2.37 20C 18.5	GHz SEP.200	12 12	:55:11	2.163	GHz/			Stop	24 GHz	
Notes:	<u>Transmit in</u> 2370 MHz - Limit = 70 +	channel C 24 GHz 10 Log (P)	or -40dBi	n							

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot	:			Ş	Spur	ious Em	issions at A	ntenna	Terminal	5				
Page 4 o	of <u>5</u>													
Job No.:	2L04351	R				Date: 9	/18/2002							
Specification:	CFR 47,	Part 27			Temp	erature(°C): 2	4							
Tested By:	Tom Tid	lwell		Re	lative H	[umidity(%) 4	4							
E.U.T.:	2.3 GHz	WCS ba	and BT	S										
Configuration:	Transmit	t full pov	ver											
				Mar	ker	1 ГТ1 -	1	RBW	30	k H z	RF Att		n dB	
Ref	Lv1					-65	5.37 dBm	VВW	30 1	кНz	Mixer	- 1	 0 dBm	
30	.2 dB	3 m			2	2.32250	1000 GHz	SWT	5	s	Unit		dB	
4	5.3 ¢	B C	ffse	e t					▼1	[T1]		-65.3	7 dBm	I
									-		2.32	250000	) GHz	
- 10		-							СН	PUR		30.30	JdBm	
									AC	P Up		-80.95	5 dB	
-20					$\vdash \uparrow$	h h	᠋ᡩᡊ᠆ᢚ	h m	AC	F Lon	1	-45.90	) dB	
						IV V	IV V		_1	[ [ ] ]		0.00	) dB	
-30					$\square$	L I	V	L, I			0.00		JНZ	
1 V	IEW													1 R M
40														
-40														
-50					$\vdash$									
					IJ									
-60			-7	~~~~	•				~~~	+ +				
		الممير	~											
- 70	-~7	-												
ہے ا	مم								1 1					
-80 -							+		`			1		
				C	5						)			
-90					1		_			$  \subseteq  $				
			1							ΙŲ			- F 1 - 1	,
- 100													2	Ì
Cer	iter 2	2.31	75 0	3Hz			1 1	IHz/			S	pan 10	) MHz	
Date:	1	8.SE	Ρ.2	002	12	:49:59								
Notes:	DARS	band ed	lge (23	320 MI	Hz)									
	Transn	nit in cl	nannel	С										

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test	Plot:					Spi	ırio	us E	Imis	ssions at A	ntenna T	'ern	ninals								
Pa	ge <del>5</del> of	5																			
Job No.:		2L043	35R					Da	te: <u>9/1</u>	8/2002											
Specificat	ion:	CFR 4	7, Part 2	7		Te	mpera	ture(°0	C): <u>24</u>												
Tested By	r:	Tom 1	ſidwell		1	Relativ	e Hun	nidity(9	%) <u>44</u>												
E.U.T.:		2.3 GI	Hz WCS	band B	ГS																
Configura	ition:	Trans	mit full p	ower																	
$\sim$					Ma	cko	c 1	ΓT	11		RBU		30 L	, H -	7	RI	=++		n	dB	
	Ref	Lv1			1.0	, ne		_	65.	27 dBm	VBW		30 k	:Hz	z				0	00	
Ť	30.	3 d	Bm				2.	344	003	301 GHz	SWT		5	s		Ur	¬ i t			dB	
O	45	R	нв г	lffsd	5 t								<b>T</b> 4	ſ	<b>F</b> 4 1				07		1
													- 1	Ľ	1 1 1		2 34	-00 100	.∠( 301		
- 10							$\square$						Сн	┢			2.54	-43	.61	dBm	
													ACF	ŀ	Lp			-50	.55	dBm	
-20													ACE		Low			-50	.55	dBm	
													AL-	1	Up			-50	.55	dBm	
20													AL <sup>-</sup>	1	LO	М		-50	.55	dBm	
-30	1 V T F	- LI																			1 R M
		-~																			1
-40							$\vdash$							+							
-50							$\square$														
-60																					
00																					
20											С	þ									
- 70							5		C												
					С	12	Î l														
-80							$\vdash$	С													
											<b>C</b> 1		1								
-90							$\vdash$					-			Ley	2					
														ĒĻ	12					1	
- 100																					1
	Star	t 2	.32	GHz						2.5	MHz/						Stop	2.	345	GHz	
Date:	:		18.S	EP.2	002	2 1	13:	06:	04												
Note	<u>ae</u> .	DAP	S Band																		
		Tran	smit in	channe	1C																
		Limi	t = 80 d	Bc or -	50 dB	m															

## Test Data – Spurious Emissions at Antenna Terminals

Data Plot			Snur	ious Emi	ssions at	Antenna '	Cerminal				
Page 1 of	5		opur		SSIGIIS CC	- meening	- er minun	Complet	N Y		
I age 0	21.04355	2		Date	9/18/2002			Preliminary	e <u> </u>		
Specification:	Part 27		Temp	erature(°C):	24			r reminina y			
Fested By:	Tom Tid	well	Relative H	umiditv(%)	45						
E.U.T.:	2.3 GHz	WCS band BTS	_								
Configuration:	TX full p	ower									
Sample Number:	1										
location:					RBW:	Refer to plots					
Detector Type:	Rms				VBW:	Refer to plots					
<u>Fest Equipm</u>	ent Used	L									
Antenna:				Directi	onal Coupler:	Anaron 1C0870-	20 20 dB coupl	er			
Pre-Amp:					Cable #1:						
Filter:					Cable #2:						
Receiver:	1036	<u> </u>			Cable #3:						
Attenuator #1		_			Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used										
Measurement Un	certainty:	+/-1.7 dB	-								
						RBW	1 1	1Hz R	FAtt	0 dB	
Ref	Lv1					VBW	1 1	1Hz M	ixer	-20 dBr	m
30	.3 dB	m				SWT	5 1	ns U	mit	d	в
	5 3 4	B Offed	+		1	-			1	1	п
4.	J. J	b or se	ι								
- 1 0						_					_
-20											
-30						_					-
1 V I	EW										1MA
-40						_					_
D 1	– 13	dBm —				-					-
60											
-30											
-60			1						1		-
m	unin	mmp	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mm	freedown	1 million	munu	yuman	howen	ymmun	^
- 70						_			-		-
-80											
00									μ μ	SDARS	
						1					1
-90											1
-100										<u> </u>	
Sta	-t 2.	3 GHz			2	MHz/			Stop 2	2.32 GHz	Z
Title:	20			20 0 :							
Jate:	18	3.5EP.20	11	:39:04							
Notes:	Transn	it in channel I	D								
	2300 - 2	320 MHz									
	Limit =	43 + 10Log(P)	) or -13 dBn	n							

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Page 2 of 5 No.: 2L04 ification: Part ed By: Tom T.: 2.3( Taguration: TX f Ref L∨ 30.3 0 45.3 -10 -20 -30 1∨IEW	A35R 27 Tidwell HZ WCS band BTS WII power CBm DB Offse	_ Tempo _ Relative H	Date: 9/1 erature(°C): 24 fumidity(%) 45	8/2002	RBW VBW SWT	1 F 1 F 6 n	1Hz 1Hz hs	RF Att Mixer Unit	c	iB iBm dB
No.: <u>2L0</u> ification: <u>Part</u> ed By: <u>Tom</u> T.: <u>2.3 (</u> Taguration: <u>TX f</u> Ref Lv <u>30.3</u> -10 -20 -30 <b>1VIEH</b>	435R 27 Tidwell Hz WCS band BTS Will power dBm dB Offse	Tempo Relative H	Date: <u>9/1</u> erature(°C): <u>24</u> fumidity(%) <u>45</u>	<u>8/2002</u>	RBW VBW SWT	1 F 1 F 6 n	1Hz 1Hz hs	RF Att Mixer Unit	-20 c	iB iBm dB
ification: Part d By: Tom T: 2.3( iguration: TX f Ref L∨ 30.3 45.3 -10 -20 -30 1∨IEµ	27 Tidwell Hz WCS band BTS iull power dBm dB Offse	Tempo Relative H	erature(°C): <u>24</u> tumidity(%) <u>45</u>		RBW VBW SWT	1 F 1 F 6 n	1Hz 1Hz Is	RF Att Mixer Unit	-20 c	
d By: <u>Tom</u> Г.: <u>2.3 (</u> iguration: <u>TX f</u> Ref Lv 30.3 0 45.3 10 -20 1 V I Е и 40	Tidwell Hz WCS band BTS iull power dBm dB Offse	Relative H	lumidity(%) <u>45</u>		RBW VBW SWT	1 F 1 F 6 n	1Hz 1Hz 1S	RF Att Mixer Unit	-20 c	iB iBm dB
Г.: <u>2.3 (</u> iguration: <u>ТХ f</u> Ref Lv 30.3 45.3 10 -20 -30 1VIEи 40	Hz WCS band BTS ull power dBm dB Offse	t			RBW VBW SWT	1 F 1 F 6 n	1Hz 1Hz 1S	RF Att Mixer Unit	20 c	
Ref Lv 30.3 45.3 10 -20 -30 1VIEW	l dBm dB Offse	t			RBW VBW SWT	1 r 1 r 6 n	1Hz 1Hz 15	RF Att Mixer Unit	20 c	
Ref Lv 30.3 45.3 10 20 30 1VIEн 40	l dBm dB Offse	t			RBW VBW SWT	1 F 1 F 6 n	1Hz 1Hz 15	RF Att Mixer Unit	-20 c	
Ref Lv 30.3 (45.3) 10 20 30 1VIEи 40	l dBm dB Offse	t			VBW SWT	1 N	1Hz	Mixer Unit	-20 c	
30.3 45.3 10 20 30 1VIEH 40	dBm dB Offse	t			SWT	6 n		Unit		dB
45.3 10 20 30 1VIEW 40	dB Offse	t								
10 20 30 1VIEW 40										
10 20 30 1VIEн 40										
20 30 1VIEH 40										-
20 30 1VIEH 40										┨
30 1 V I E W 40										
30 1view 40										
40 <b>1 V I E W</b>			1							_
40										
40										
50										
60	++									-
70 D1 -4										
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an										
30										
Start	30 MHz			227	MHz/			Sto	D 2.3 G	Hz
								0.0	0	
te:	20L 18.SEP.20	11 102	:36:11							
lotes Tro	nmit in channel D									
10185. <u>11'a</u> 1 im	mint in channel D	) or -40 dBn	n							

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plo	t		<u>Spuri</u>	ous Emis	sions at A	.ntenna T	'erminals				
Page <del>3</del> o Job No.: Specification:	of <u>5</u> <u>2L0435</u> Part 27	5R	Tempe	Date: <u>9/18</u> rature(°C): <u>24</u>	3/2002						
Tested By: E.U.T.: Configuration:	Tom Ti 2.3 GH TX full	dwell z WCS band BT power	Relative Hu	umidity(%) 45							
Re 30	f Lvl ).3 c	iBm	Marker	1 (T1) -59.	30 dBm 100 GHz	RBW VBW SWT	1 M 1 M 220 m	1Hz R 1Hz M 1s U	F Att ixer nit	0 dB -20 dBr dB	1 3
- 10	45.3	dB Offs	e t				▼1	[⊤1]	-59 5.0000	9.30 dBm )000 GHz	
-20											
- 30 1 V	IEW										1 M I
-40											
-60											
- 70 <del>- D</del>	1 -40	dBm									
-80	Lo at mat 10	1 1 MM	Md. Armaliki hir	Mar aller	minh	mulu	May her your	Jungondana	Junnan	mon	
-90 <b>4/</b> 24	<u> -1-m-</u>							<b>y</b>	<u>v</u> u · v ·		j
St Title: Date:	art 2	2.37 GHz 20C 18.5EP.2	2002 12	:00:41	2.163	GHz∕			Stop	o 24 GHz	
Notes:	Trans 2370 N	mit in channel MHz - 24 GHz	D								
	Limit	= 70 + 10 Log	(P) or -40dBn	1							

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

est Plo				Ę	Spur	ious Emis	sions at A	.ntenna T	<u>'erminals</u>					
Page 4	of <u>5</u>													
o No.:	2L043	5R				Date: 9/1	8/2002							
ecification:	Part 27	1		_	Temp	erature(°C): 24								
sted By:	Tom T	idwell		Re	lative H	lumidity(%) 45								
J. <b>T</b> .:	2.3 GF	Iz WCS	band B	ГS										
nfiguration:	TX ful	l power												
				Mar	ker	1 [T1]		RBW	30 k	Hz	RF A	t	0 dB	
Re <sup>.</sup>	- Lvl					-65.	27 dBm	VВЫ	300 k	Hz				
30	).3 d	Bm			2	2.344003	801 GHz	SWT	5	s	Unit		dE	3
	15.3	dB (	ffs	e t					▼1	ГТ 1 П		_65	27 dBm	]
				Ī					. 1		2.3	4400	301 GHz	
-10									СН	PWR		30	.34 dBm	1
									ACF	Up		-45	.78 dB	
-20								$\gamma \gamma \gamma \gamma$	$\gamma \sim \rho \varphi$	- Low		-80	.89 dB	
							II V	V V	IV V					
20								V						
-30	IFW							v						1 1 R I
-40														
-50														•
-60						~~~	ř			6				
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- 70						1							- M	1
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-80					1	/					с	u 1		1
					کہ						1			
-90				- C	<u>⊨</u>						,			
			1 ¥1	C.	A									
- 100														J
Cer	nter	2.34	475	GHz			1 M	Hz/				Spar	n 10 MHz	
ate:		18.S	EP.2	2002	11	:12:36								
Notes:	DAR	5 band	edge (2	345 MI	Hz)									
	Trans	mit in	channe	1D										

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot	÷		Spa	irio	us E	mis	sions at A	ntenna T	ern	iinal	s					
Page 5	of <u>5</u>		-													
Job No.:	2L043	5R			Da	te: <u>9/1</u>	8/2002									
Specification:	Part 2	7	Те	mperat	ture(°C	C): <u>24</u>										
Tested By:	Tom 7	Tidwell	Relativ	e Hum	nidity(9	%) <u>45</u>										
E.U.T.:	2.3 G	Iz WCS band BT	'S													
Configuration:	<u>TX fu</u>	ll power														
			Marke	r 1	[Τ	1]		RBW		30	κн	z Ri	- Att	0	dB	
🐨 Ref	· Lvl				_	65.	27 dBm	VBW	3	800	КΗ	z M	ixer	-20	dBm	ı
30	).3 c	lBm		2.	320		IOO GHz	SWT		5	s	i Ui	ηlt		dB	(
	5.3	dB Offse	e t	П	1	1					ιIΓ	T 1 1	_6	5 27	dBm	1
										ľ	۰ I '		2.3200		GHz	
-10				$\vdash$							┯╋	-WR	-4	3.61	dBm	1
										A	C F	Jo	-5	0.55	dBm	
20										A	: <b>P</b>	- OW	-5	0.55	dBm	
-20										AL	_ 1 1	Up	-5	0.55	dBm	
										AL	_ 1 1	LOW	-5	0.55	dBm	
-30				$\vdash$	-					A	- 12	2 Up	-5	0.55	dBm	
1 V	1 E W									AL	. 12	Low	-5	0.55	dBm	1RM
- 4 0												Τ1]		0.00	dB	
-40													0.0000	0000	Hz	
-50				$\vdash$							+					
-60												 u3				
										сч	3					
									C	254	2					
-70				$\vdash$						ī	+			+		
									1 h							
-80				$\square$		С	þ		<u> </u>		$\perp$					1
							1						L N	<b>D</b> SDA	RS	
					c	2										
-90					13						+					
I <b>k</b>			e	ia[_	1						_			_		1
-100 <b>L</b>																
Sta	art 2	2.32 GHz					2.5	MHz/					Stop 2	.345	GHz	
Title·		200														
Date:		18.SEP.2	002	11:	18:	51										
Notes:	DAP	S Band														
NUCES.	Tran	smit in channel	I D													
	Limit	- 80 dBc or -5	0 dBm													
	Linn	= 50 ubt 01 -2	o abii													

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

<del>)ata Plot</del>				S	ntenn	a Te	rmir	nals												
Page 1 o	2L0436R Date: <u>9/16/2002</u>													Co	mplete		Х			
b No.:	2L043	6R				Date:	9/10	5/200	2				1	Prelim	inary:					
ecification:	Part 2	7		_	Temperat	ure(°C):	2	4	_											
sted By:	Tom '	lidwel	1	Re	lative Hum	idity(%)	4	5	_											
J.T.:	2.3 G	Hz WC	CS band	1 BTS							_									
nfiguration:	TX fu	ll pow	er																	
nple Number:		1																		
cation:			-					RBW	/: <u>Re</u> t	fer to plot:	8									
ector Type:	R	ms	-					VBW	/: <u>Re</u> t	fer to plot	3									
<del>st Equipm</del>	ent Us	ed																		
tenna:			-			Direc	tional C	Coupler	r: <u>An</u>	aren 1061	<u>6-1</u> 0									
-Amp:			-				С	able #1	l:											
er:			-				С	able #2	2:		_									
eiver:	10	36	_				С	able #3	3:											
enuator #1			_				C	able #4	4:											
enuator #2:								Mixer	r:											
ditional equip	ment us	ed:																		
asurement Ur	certain	y:	+/-1	.7 dB																
				Mar	ker 1	[ ] 1	]			RE	3W		1 MH	Ιz	RF	- A	t t	20	dB	
🖉 Ref	Lv	1				-25	5.46	dB	m	VE	3W		1 MH	Ιz	Μ	ixe	r	-20	dBr	n
27	.5 0	dBm			21.	55525	5786	GH	Iz	SL	١T	250	) me	5	Ur	٦it			dE	3
		AB.	1rhn#h	f MHHZ					1	<b>1⊫</b> Hz			-		П	11				1
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-10										Ц						1.5	503	20786	GHZ	
-20																				1
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-70															++					
-80										H		we	ssb≁	RB-	++					
-30																				1
· 100																				J
Sta	rt i	30	ΜНz														St	op 25:	GHz	
itle: ate:		20C	; SFF	.2002	13.	14:01														
Notori	Comt		Cherry	0.02																
NOTES:	Cent	er or (	Cnann	iei 2312.5 ľ	VITIZ															

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plo	t	Spurious Emissions at Anten													ninal	s								
Page 2 o	of <u>3</u>		_																					
Job No.:	2L043	6R	_						Date:	9/16/20	02	_												
Specification:	Part 2	7					Ten	nperatur	e(°C):	24		-												
Tested By:	Tom 7	ſidwe	11			Rela	ative	Humidi	ity(%)	45		-												
E.U.T.:	2.3 GI	Hz W	CS ba	nd B7	ſS																			
Configuration:	TX fu	ll pow	/er																					
					Ma	arł	ке	~ 1	[Τ1	1			RBW		1	MHz	2	F	RF	Att		10	dB	
K Re	f∟v	1							- 4	3.02	2 dB	m	VBW		1	MHz	z	٢	1i>	ker	_ `	10	dBm	
1	7.5 0	dBm	I I					2.3	000	0000	) GH	z	SWT		6	ms		L	Jn	it			dB	
	27.5	dB	0	fs	еt	1 [	0	MHz			T				▼1	L C	111	1	C	Hz _	43.C	12 0	dBm	
10																			1	.300	0000		ЭHz	
- 10																								
-20											_													
-30	_					$\square$					-				-		-		_					
1	'IEW																							1MA
-40						$\square$					+				-		+							
-50																								
	1 4	0 0	dBm																					
-60 Lin	r.m.	mΝ	Ś	m	~~	-	$\sim$	NAN	ww	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1	mu	men	m	h		+~~	~~~	~	~~~~~	$\sim$	~~~		
								<b>.</b>				-												
- 70																					HESE	) AR	\$	
-80						$\vdash$					-													
-90											-						$\vdash$							
– 100 – Sta	arti	30	MH:	z							_1		1		-	1				Sto	p 2.	.3 (	GHz	I
⊤itle:		201	2																					
Date:		16	.SE	₽.2	200	12	1	13:2	0:5	6														
Notes:																								

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

ata Plo	ţ		Sp	urious Em	issions at /	Antenna I	<u>Ferminal</u>	s				
Page 3 o	f <u>3</u>											
No.:	2L0436	R		Date: 9	0/16/2002							
cification:	Part 27		Te	emperature(°C):	24							
ed By:	Tom Ti	dwell	Relativ	e Humidity(%)	15							
T.:	2.3 GH	z WCS band B	TS									
figuration:	TX full	power										
$\sim$			Marke	er 1 [⊤1]	]	RBW	1 1	1Hz	RF At	t	0 dB	
У Ref	Lvl			-45	5.07 dBm	VBW	1 1	1Hz	Mixer	· –	10 dBr	n
17	'.5 d	Bm		6.99577	2154 GHz	SWT	230 r	ns	Unit		dE	З
2	27.5	dB Offs	seet				▼1	[T1]		- 45. (	17 dBm	]
							-		6.9	95771	54 GHz	
- 1 0			+		-							
-20			_									
20												
-30 1 V	IEW											1 1 M
												<b>1</b>
-40			+									
-50												-
–D	1 - 4 🛛	dBm—	1									
-00		<i>r</i>	King	metrem	upmin 1	horn	mar	1 mars	man	m	min	
$\sim$		m		<b>1</b>	-			y ····				
-70						WESI	ARS					
-80					_							-
-90												
100							l					
	art 2	.37 БН:	,	•	2.263	GHz/		•		Stop 3	25 GHz	-
			_									
itle: ate:	ž	206.SEP	2002	13:27:12								
Notes:												

## Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1053
TESTED BY: Tom Tidwell	DATE:10/7/2002

Test Results: Complies

**Measurement Data:** See attached table.

Measurement Uncertainty: +/-1.7 dB

#### *EQUIPMENT: 2.3 GHz WCS BTS* Test Data - Radiated Emissions



#### Dallas Headquarters: 802 N. Kealy Lewisville, TX 75057 Tel: (972) 436-9600 Fax: (972) 436-2667

INCI		, IIIC.							
				EIRP	Substitution	n Method			
Page 1 c	of 1							Complete	X
Job No.:				Date:	10/7/02			Preliminary	, <u></u>
Specification:	CFR 47. Par	t 27		Temperature(°C).	23			· ,	
Tested By:	Tom Tidwel	1	R	elative Humidity(%)	44				
FUT.	2.3 GHz BT	S Active antenn	- mode	celative fruindity(70)					
Configuration	TV full norm	S, Active antenna	a mode				-		
		ei					-		
Sample No:	01				DDU	1 1 11			
Location:	AC 3				RBW:	I MHZ	- <sup>1</sup>	Neasuremen	1
Detector Type:	Peak				VBW:	1 MHz	-	Distance	: 3
Test Equipm	ent Used							EIRP: +3	0 dBm + 18 dE
Antenna:	1304			E	Directional Coupler:				
Pre-Amp:	1016				Cable #1:	1483	_		
Filter:					Cable #2:	1484	_		
Receiver:	1036				Cable #3:		-		
Attenuator #1					Cable #4:		-		
Attenuator #2:					Mixer		•		
Additional equir	ment used.						-		
Measurement II	certainty.	+/-1.7 dB					-		
		., us	-						
Frequency	Meter	Correction	Pre-Amp	Substitution	EIRP	EIRP	Margin	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain		Limit			
(MHz)	(dBm)	(dB)	(dB)	(dBd)	(dBm)	(dBm)	( <b>dB</b> )		
1461.8	-70.7	31.5	32.4	7.0	-64.6	-40.0	-24.6	V	
1461.8	-64.8	30.7	32.4	7.0	-59.5	-40.0	-19.5	Н	
2172 5	-62.4	34.2	32.8	89	-52.1	-40.0	-12 1	v	
2172.5	-59.5	37.0	32.8	8.9	-46.4	-40.0	-6.4	Н	
2320	-72.4	34.2	32.8	8.9	-62.1	-50.0	-12.1	V	NF
2320	72.0	37.0	32.0	8.9	58.0	-50.0	-8.9	Ч	NE
2320	-72.0	31.0	32.8	8.9	-58.9	-50.0	-0.3	V	NE
2040	-/1.0	34.2	32.0	0.9	-00.7	-50.0	-10.7	V LI	NE
2340	-12.2	57.0	32.8	0.9	-39.1	-30.0	-9.1	н	NE
4090	-84.5	44.0	33.2	10.8	-02.9	-40.0	-22.9	V	INF NE
4696	-/1.7	35.5	33.2	10.8	-58.6	-40.0	-18.6	Н	INF NE
6128.1	-73.8	40.5	31.9	11.7	-53.5	-40.0	-13.5	V	NF
6124.6	-73.5	38.7	31.9	11.7	-55.0	-40.0	-15.0	Н	NF
6151.2	-73.9	40.5	31.9	11.7	-53.6	-40.0	-13.6	V	NF
6152.4	-73.5	38.7	31.9	11.7	-55.0	-40.0	-15.0	Н	NF
7044	-74.1	40.8	32.1	10.9	-54.5	-40.0	-14.5	V	NF
7044	-75.1	40.3	32.1	10.9	-56.0	-40.0	-16.0	Н	NF
9392	-71.9	41.3	34.2	11.7	-53.1	-40.0	-13.1	V	NF
9392	-72.5	42.3	34.2	11.7	-52.7	-40.0	-12.7	Н	NF
11740	-70.1	42.8	35.1	12.6	-49.8	-40.0	-9.8	V	NF
11740	-71.7	47.0	35.1	12.6	-47.2	-40.0	-7.2	Н	NF
14088	-73.3	47.8	33.6	12.8	-46.3	-40.0	-6.3	V	NF
14088	-74.6	47.5	33.6	12.8	-47.9	-40.0	-7 9	н	NF
16436	-73.1	43.2	33.1	16.3	-46.7	-40.0	-67	V	NF
16/136	-74.6	45.5	33.1	16.3	-45.0	_/0.0	-5.0	ч	NE
10430	-/4.0	43.3	33.1	10.5	-43.9	-40.0	-0.9	п V	NE
10/04	-03.3	52.7	41.1	12.7	-4/.8	-40.0	-1.0	V LI	NE
18/84	- /4.1	53.7	4/.7	12.7	-55.4	-40.0	-15.4	H	NF NF
21132	-63.7	52.7	50.2	12.7	-48.5	-40.0	-8.5	V	NE
21132	-/3X	537	1 502	127	-2/6	_/10 ()	-1/h	. н	UNE

#### EQUIPMENT: 2.3 GHz WCS BTS Photos – Field Strength of Spurious Emissions Front



#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

## EQUIPMENT: 2.3 GHz WCS BTS

Rear



## Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: Tom Tidwell	DATE:9/16 -9/18/2002

Test Results: Complies

Measurement Data: See attached data sheets.

The following plots show that the transmitted signal stays within the required emission limits when the equipment is subjected to temperature variations.

For 10 Carrier configuration plots, with the spectrum analyzer span >10 MHz, the Adjacent Channel Power(ACP) measurement is not Valid due to internal operation of the spectrum analyzer dealing with swept Resolution BW and the integrated 1 MHz noise BW measurement. The spectrum analyzer plots are provided to show compliance to the noise emissions in the DARS band and the Out-of-Band requirements.

For 10 Carrier configuration, the absolute RMS output power of the EUT is measured with a power meter. The frequency stability spectrum analyzer plots do not intend to represent the absolute channel power "CH PWR" of the EUT but provide measurement for the noise emission compliance of the EUT.

Note –.The device ceased operation when the temperature was below 0 deg. Celsius. The equipment is designed to cease transmission at temperatures below 0 deg. Celsius.

#### Measurement Uncertainty: 1 x 10<sup>-7</sup> ppm



#### EQUIPMENT: 2.3 GHz WCS BTS NOTE: All tests are performed at full carrier power.

Data Plot							Fre	equency	<b>Stability</b>									
Page 1 o	f <del>6</del>											С	omplete	<u> </u>	ζ			
Job No.:						D	ate:	9/18/2002				Prelin	iinary					
Specification:	CFR 4	7, Part 2	7		Temp	erature(	(°C):	See plots	•									
Tested By:	Tom 7	idwell		Re	elative H	Humidit	y(%) <u> </u>	Incontrolled										
E.U.T.:	WCS I	Band BT	TS							-								
Configuration:	TX ful	l power								_								
Sample Number:	1																	
Location:								RBW:	Refer to plots	-								
Detector Type:	R	ns						VBW:	Refer to plots	-								
Test Equipm	ent Use	<del>d</del>																
Antenna:							Directio	onal Coupler:	Anaron 1C087	<u>0</u> -20	0 20 dB couple	r						
Pre-Amp:								Cable #1:		_								
Filter:								Cable #2:		_								
Receiver:	10	36						Cable #3:		_								
Attenuator #1	3320-3	34						Cable #4:		-								
Attenuator #2:								Mixer:	-	_								
Additional equip	ment use	ed:								-								
Measurement Ur	certainty	/: <u> </u>	+/-1.7 c	<u>IB</u>														
/i				Mar	ker	1 [	Τ1]		RBI	7	30 k	Hz	R	- At	t	0	dB	
KS Ref	Lv1						-65.	37 dBm	n VBL	~	30 k	Ηz	Μ	ixer		-10	dBm	1 I
30	.2 d	Bm			2	2.32	2500	100 GHz	54	Г	5	S	U	пit			dB	5
4	5.3	вв с	ffs	e t						Т	▼1	[Т1	1		_65	37	dBm	I
			1								1			2.3	2250	000	GHz	
- 1 0										+	СН	PUR			30	.30	dBm	
											ACF	Up			-80	.95	dB	
-20					$\int c$	hr	$\sim$ $c$	h -	d - d - d - d - d - d - d - d - d - d -		ACF	LO	7		-45	i.90	dB	
						$  \rangle$	M	IV 1/			_1	[ ] 1	)			.00	dB	
						V	V	I V						0.0	\$00a	000	Ηz	
-30							ų.	<u>ب</u>		十								10 M
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-40										+								
-50										$\square$								
55				m	$\mathcal{P}$					L.								
-60			$\sim$								~~~							1
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-80										+			1	сı	1			
5											·		þ					
90					D I 1													
-30		С	11		1					Т							1	
												Ľ					=1-2	ſ .
– 100 <b>L</b>	ter	2 3	175	L GHz				1	MHフィ						Soar	10	MHz	J
Dates		10 0			1 ~		. 50	1								0		
vate:		10.2	CM . 2	:002	12	:49	. 59			_								
Notes:	Tran	smit in	channe	el C														
	20 de	g. C	107	<b>(D)</b>	50 JP													
	Limit	: = 80 +	10Log	(P) or -	50 dB1	n												

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plot	Frequency St	ability	
Page 2- of 6 Job No.: Specification: CFR 47, Part 27 Tested By: Tom Tidwell E.U.T.: WCS Band BTS Configuration: TX full power	Date: <u>9/18/2002</u> Temperature(°C): <u>See plots</u> Relative Humidity(%) <u>Uncontrolled</u>		
Ref Lvl 30.3 dBm	Marker 1 [T1] 11.23 dBm 2.31805110 GHz	RBW 30 kHz VBW 30 kHz SWT 5 s	RF Att D dB Unit dB
45.3 dB C f f -10 -20 -30 1 V I E W -40 -50 -60 -60 -70 -80 -90 -10 Center 2.3175			1 11.23 dBm 2.31805110 GHz 30.01 dBm -80.56 dB -47.37 dB 1RM 1RM 1RM 1CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 2 CU1 1 CU1 1 CU1 1 CU1 2 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 1 CU1 CU
Notes: Transmit in chan	. 2002 14:37:46 nel C		
<u>Limit = 80 + 10L</u>	og(P) or -50 dBm		

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plot			Free	quency St	tability						
Page -2 of 6       Job No.:       Specification:       CFF       Tested By:       Ton       E.U.T.:     WC	47, Part 27 a Tidwell S Band BTS	Temp Relative H	Date: <u>9/18</u> erature(°C): <u>See</u> lumidity(%) <u>Unce</u>	/2002 plots ontrolled							
Configuration: <u>TX</u>	full power	Marker	1 [T1]		RBW	30 4	Hz	RF Att		dB	
Ref Lv 30.3	l dBm	2	11.0 2.318051	)9 dBm 10 GHz	VBW SWT	30 k 5	Hz s	Unit		dB	
45.3 -10 -20 -30 1VIEW -40 -50 -60 -70 -80 -90								2.31	11.09 805110 29.79 -80.10 -47.40		1 R M
-100 Center Title: Date:	2.3175 10°C 18.5FP.2	GHz	:53:33	1 M	Hz/	1	<u>   </u>	<u>   </u> S	ipan 10	MHz	
Notes: <u>Tra</u>	nsmit in chann nit = 80 + 10Log	el C g(P) or -50 dBr	n								

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot:		Frequency S	tability			
Page 4 of 6 Job No.: Specification: CFR 47. Pa Tested By: Tom Tidwe E.U.T.: WCS Band Configuration: TX full pov	rt 27 Temp till Relative I BTS	Date: <u>9/18/2002</u> erature(°C): <u>See plots</u> Jumidity(%) <u>Uncontrolled</u>				
Ref Lvl 30.3 dBm	Marker	1 [T1] 11.01 dBm 2.31805110 GHz	RBW VBW SWT	30 kHz 30 kHz 5 s	RF Att Unit	0 dB dB
45.3 dB -10 -20 -30 1 V I E W -40 -50 -60 -60 -70 -80 -90 -100 1 8.5 Center 2.	CD CD CD CD CD CD CD CD CD CD CD CD CD C				) 1 2.31805 -80 -4 -4 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 -4 -1 4 -1 	1.01 dBm 5110 GHz 3.76 dBm 3.31 dB 2.13 dB 1.RM
Notes: 18.	SEP.2002 15 in channel C 0 + 10Log(P) or -50 dB	5:18:34 <b>n</b>				

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot:					Fr	equency S	tability						
Page <del>5</del> of Job No.: Specification: Tested By: E.U.T.: Configuration:	CFR 47, Part Tom Tidwell WCS Band B' TX full power	27 TS	Rela	Tempe ative Hi	Date: <u>9/</u> rature(°C): <u>Sr</u> amidity(%) <u>U</u>	ee plots							
Ref 30	Lvl .3 dBm		Mart	ker 2	1 [T1] 11 .31805	.11 dBm 110 GHz	RBW VBW SWT	30 30	kHz kHz 5 s	RF At Unit	t	0 dB dB	ò
-10 -20 -30 -40 -50 -60 -70 -80 -90	Б.З 4В Ен										1 1 1 1 805 30 - 80 - 44	.11 dBm 110 GHz .U3 dBm .33 dB .77 dB	1 R M
-100 <b>L</b> Cen Title: Date:	ter 2.3 40°0 18 9	175 ( 550,2	GHz	<u></u>	:30:15	1 M	1Hz/				Span	10 MHz	J
Notes:	Transmit in Limit = 80 +	i channel ⊦ 10Log(i	C P) or -5	0 dBm									
#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot	;				Ŧ	`requency	<sup>7</sup> Stability	<u>,</u>								
Page 6 o	f <u>6</u>	-														
Job No.:		-		_	Date:	9/18/2002	_									
Specification:	<u>CFR 47, Par</u>	t 27		Tempe	rature(°C):	See plots	-									
Tested By:	WCS Band I	l BTS	Re	lative H	umidity(%)	Uncontrolled	_									
Configuration:	TX full pow	er						_								
comgaration	<u></u>															
1 A			Mar	ker	1 [⊤1	1	RB	ω	30 k	Hz	RF	Att	:	0	dB	
Ref	∟∨ l				1	1.23 dB	m VB	ω	30 k	Hz						
30	.3 dBm			2	.3180	5110 GH	z 54	Т	5	S	Un	i t			dB	
4	5.3 dB	Offs	e t						▼1	[ T 1	]		11	.23	dBm	
- 10											2	2.31	805	110	GHz	
									ACE	- Un			-80	. 66	dB	
-20					<u>م م</u>	mm			ACF	Lo	4		-44	.80	dB	
20					I V I	/   V	$I   V \rangle$									
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					-					ЧЧ					F-1-	
- 100	186.5	pep 21	02	15:4	2											
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Title: Date:	50° 18.	C SEP.2	2002	15	:42:4	2										
Notes:	Transmit i	n channe	IC													
10100.	Limit = 80	+ 10Log	P) or -5	50 dBn	1											
	-															

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot	;					0	cc	upied Bar	dwidth										
Page 5 o	of <u>5</u>																		
Job No.:	2L0436	<u>6R</u>				Date:	9/1	6/2002											
Specification:				Ter	nperati	ure(°C):	25												
Tested By:	Tom T	idwell	1	Relativ	e Humi	dity(%)	44												
E.U.T.:	2.3 GH	z WCS band B	TS																
Configuration:	TX full	power																	
			Ma	inke	r 1	[ ] 1	]		RBW		50	кH	z	RF	Att		20	dB	
Ref	f ∟vl					-2	4.	50 dBm	VВW		300	кH	z	Μi	xer		-20	dBm	
30	) dBm				2.	3150	05	501 GHz	SWT		5	S		Ur	nit			dB	
2	27.5	dB Offs	se t								▼1	. [	T 1 ]			-24	.50	dBm	
10															2.31	500	501	GHz	LN
-10											며	TF	יער			30	.10	dBm	
								anan	han		AC	CP	Ψp			- 4 4	.27	dB	
-20			++				+	₩ ₩ ₩ ₩					LOW			-43	.33	<u>ar</u>	
												-    1    1				-49	.40		
-30			++		_									1		-40	- IU - 68	dB dB	
1 V	IEW											12				-48	.89	dB	1 R M
40											1 1					. 0	••••	00	
-40			Т																
-50			++				$\square$						-	+					
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-90			++	- C 1	2	. 2													
				പ	3														
100				5															
- IUU Cer	nter	2.3125	GHz	<u></u>				2 M	Hz/						Si	ban	20	MHz	•
T:+1		100													- 1				
Date:		16.SEP.	200	2	15:3	35:4	0												
Notes:																			

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plot							0	cc	upied Ba	ndwidth											
Page 1 o	f <del>5</del>														Comp	lete _	Х				
Job No.:	2L043	6R					Date:		9/16/2002					Pre	limina	ry:					
Specification:				Т	empe	eratu	re(°C):		25												
Tested By:	Tom T	idwell		Relati	ve H	umid	ity(%)		44												
E.U.T.:	2.3 GH	Iz WCS band B?	ГS																		
Configuration:	TX ful	power																			
Sample Number:	No	ne			—				DDU												
Detector Type:	Rn	ns							KBW: <u> </u> VBW: <u> </u>	Refer to plots											
<del>Test Equipm</del>	<del>ent Us</del> e	ed																			
Antenna:							Dire	ectio	onal Coupler: <u>4</u>	Anaren 1C087-2	0										
Pre-Amp:	-								Cable #1:												
Filter:									Cable #2:												
Receiver:	10.	36							Cable #3:												
Attenuator #1									Cable #4:												
Attenuator #2:									Mixer:												
Additional equip	ment use	ed:	D																		
Measurement UI	icertaint	y:	В																		
1 KAR			M	arke	er	1	[ T 1	]		RBW		50	ĸ	Ηz		RF	- Att		20	dB	
Ref	∟v l						-2	6	.29 dBm	VBW		300	ĸ	Ηz		Μi	ixer		-20	dBr	ı
30	dBm				2	2.3	150	05	501 GHz	SWT			5	s		Ur	nit			dE	3
2	7.5	dB Offs	e t								1		1	ſ	11			- 26	29	dBm	າ
													Ľ		1 1		2.315	-20 500	501	GHz	
- 1 0			-							+	-		Ħ	ΡV	IR			29	.90	dBm	
												E F	CF	ι,	Jр			-45	.88	dB	
-20									hnar	hhhh	$\downarrow$	F		L	ow			-43	.99	dB	1
										VVVV		F	¶L⊺	1	Up			-51	. 70	dB	
20												e e	۲⊥	1	Low			-47	. 15	dB	
- 30 1 V I	ÍFW											f f	1	2	Up		-	-58	.71	dB	18M
												f f	ΊLΊ	2	Low			-50	. 19	dB	
-40										1			+								
-50																					1
							~	لها	/		L	1									
-60					3		~														
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-80											+	in cu	12						C D A	<b>.</b>	1
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-90						e i	1 C.	1													
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100												1									
Cen	ter	2.3125	GН	z					2	MHz/		-			-		Sc	ban	20	MHz	-
Titlet																				_	
Date:	-	16.SEP.2	200	12	12	:5	0:2	З													
Notes:																					

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Data Plo	ţ					C	)cc	upied Bar	ndwidth											
Page 2 o	of <u>5</u>																			
Job No.:	2L043	6R				Date	9/1	6/2002												
Specification:				Τe	empera	ature(°C):	25													
Tested By:	Tom T	idwell		Relativ	ve Hui	midity(%)	44													
E.U.T.:	2.3 GF	Iz WCS band B	ГS																	
Configuration:	1 A IU	1 power																		
<u></u>			Μ	arke	er.	1 [ T 1	. ]		RBW		50	к	Ηz		RF	At t		20	dB	
Ref	∟v l					-2	27.	.08 dBm	VBW		300	k	Ηz		Mix	xer		-20	dBr	
30	dBr	ı			2	.3150	005	501 GHz	SWT			5	S		Un	i t			dE	
	7.5	dB Offs	e t								-	1	ſ	11			-27	.08	dBm	
															2	2.31	500	501	GHz	LN
-10						-	+					H	Ρl	IR			29	.61	dBm	
											A	CF	ι	Ъ			-46	.40	dB	
-20			_			-	+	RAAA	NAAA		A	CF	1	OW			-44	.12	dB	
								1100	1 1 1 1		A		1	Up			-52	.54	dB	
-30			_				-						1	LOW			-47	.41		
1 V	IEW												2	L OM			-50	.55	dB	1RM
- 40																				
-40																				
-50								1												
						سر ا	٣			L.	k.									
-60			-		Int	~	┢				-~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		<u></u>		13					
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	مہر_	$\uparrow$								сı	1			$\sim$						
-80						C	b				۲ 				γu	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~		
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						12														
-90				c c	13															
			C	13 																
- 100		2 2125		-				1 								-		20	MULT	
Lei	iter	2.5120	ып	2				2 1								-	pan	20	ΠΠΖ	
Title:		30C 16 560 '	201	10	14.	39.1														
vale.		10.967.	< U L	2	14:	JJ. I	U													
Notes:																				
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#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

~ Data Plot	Occupied Ban	udwidth
Page <u>-3</u> of <u>5</u> Job No.: <u>2L0436R</u>	Date: <u>9/16/2002</u>	
Specification: Tested By: <u>Tom Tidwell</u> E.U.T.: <u>2.3 GHz WCS band F</u> Configuration: <u>TX full power</u>	Relative Humidity(%) <u>44</u> 3TS	
Ref Lvl 30 dBm	Marker 1 [T1] -27.50 dBm 2.31500501 GHz	RBW 50 kHz RFAtt 20 dB VBW 300 kHz Mixer -20 dBm SWT 5 s Unit dB
27.5 dB Off: -10 -20 -30 1VIEW -40 -50 -60 -70 -80 -90 -100 Center 2.3125 Title: 40C Date: 16.SEP.	GHz 2 MH 2002 15:02:03	I     I     I     I     -27.50 dBm 2.31500501 GHz       ACP     Up     -46.91 dB -46.91 dB -44.14 dB       ACP     Up     -44.14 dB -47.58 dB       ALT1     Up     -53.39 dB -50.82 dB       ALT2     Up     -59.95 dB -50.82 dB       ALT2     Up     -50.82 dB       CU2     UQ     -50.82 dB       CU3     UQ     -50.82 dB       UU     UU     UU       <
Notes:		

#### FCC PART 27, SUBPART C WIRELESS COMMUNICATION SERVICES PROJECT NO.:2L0436RUS1

Test Plot:						0	cc	upied Bar	ndwidth								
Page 4 o Job No.: Specification: Tested By: E.U.T.: Configuration:	f <u>5</u> 2L0436 <u>Tom Tid</u> 2.3 GH: TX full	R dwell z WCS band BT power	R `S	Tem elative 1	peratu Humi	Date: ure(°C): dity(%)	9/1 25 44	6/2002									
Ref 30	L∨l dBm		Mar	rker	1	[ T 1 -2 3150	ן 7.	.84 dBm 501 GHz	RBW VBW SWT	50 300 5	кн кн	z z	RF Mi Un	Att xer it	20 -20	dB dBm dB	
-10 -20 -30 -30 -30 -30 -30 -30 -30 -30 -30 -3	.7.5 IЕW 	4B Offs 2.3125 50C 6.SEP.2	* t	e 12 c 13				2 M						-27 2.31500 -46 -44 -53 -47 -59 -50	.84 501 .29 .93 .58 .55 .95 .83	dBm GHz dB dB dB dB dB dB dB dB RS RS	1RM
Notes:																	

#### EQUIPMENT: 2.3 GHz WCS BTS

NOTE: All tests are performed at full carrier power.

Spurious Emissions at Antenna Terminals       Page Lof List     Compter     X       ca:     L0368     Date:     9/18/2003     Compter     X       facions:     Part 20     Temperature (C):     22     Preliminary:     Image: Compter     X       18:     Devil Light     Relative Humidity(%)     40     Preliminary:     Image: Compter     X       18:     Devil Light     Relative Humidity(%)     40     Image: Compter     X     Image: Compter     Image: Compter     X     Image: Compter     Image: Compter     Image: Compter     Image: Com		nko Dalla	s, Inc.										Fa	x: (972)	436-26	67	
Page_L of LG 20050R Date: 9/18/2003 Factor: Part 27 Temperature(°C; 22 23 GHz BTS reading and reading and read	<u>a Plot</u>				<u>Spur</u>	ious I	Emis	ssions at	Antenna	Term	inals						
Date:   Date:   Date:   Difference   Difference   Prelimmary:     Bit:   Date:   Date:   Difference   Difference   Difference     Bit:   Date:   Difference   Difference   Difference   Difference     Prelimmary:   Image:   Image:   Difference   Difference   Difference     Prelimmary:   Image:   Image:   Difference   Difference   Difference     Prelimmary:   Image:   Image:   Image:   Difference   Difference     Prelimmary:   Image:   Image:   Image:   Image:   Image:     Caller Difference   Difference   Caller Pit:   Image:   Image:   Image:     Caller Pit:   Image:   Image:   Caller Pit:   Image:   Image:     Caller Pit:   Image:   Image:   Image:   Image:   Image:     Caller Pit:   Image:   Image:   Image:   Image:   Image:   Image:     Caller Pit:   Image:   Image:   Image:   Image:   Image:   Image:     Particip Unit   Image:   Image:   Image:   Image:   Image:   Image:     Pit:   Pit:   Image:   Image:   Ima	Page <u>1</u> of	f <u>16</u>						0.11.0.100.000					complete	e	x		
Eaton: Part 2/ Temperature (C):	).: 	2L0436R				Da	te:	9/18/2003				Prelii	nınary	:			
Image: Instruct Light   Relative Humany(h)   40     instruction: Instruction   Instruction     on: Onside   RBW: 5kHz     on: Onside   RBW: 5kHz     or Type: Rms   Directional Coupler: Model IC0870-20     ref:   Indel 2014-64B Call prior to use     Cable #1: Instruction   Cable #1: Instruction     ref:   Indel 2014-64B Call prior to use     cable #1: Instruction   Cable #1: Instruction     ref:   Indel 2014-64B Call prior to use     cable #1: Instruction   Cable #1: Instruction     ref:   Indel 2014-64B Call prior to use     cable #1: Instruction   Cable #1: Instruction     ref:   Instruction	cation:	Part 27		D	Temp	perature(°	C):	22									
The state of	. Бу:	2.3 GHz PT	l re	K	elative i	Humidity(	%) <u> </u>	40									
Andow in the intervention of the intervention	uration:	Tx 10 Carri	ors														
m:     On side     RBW: 5 kHz     Measurement       or Type:     Rms     VBW: 50 kHz     Directional Coupler: Model 100870-20       arr     Directional Coupler: Model 100870-20     Cald prior to use       op:	Number	1	c13														
or Type: Rus VBW: <u>50 kHz</u> Distance: <u>NA</u> m Equipment Used	on:	On site						RBW:	5 kHz			Meas	uremen	ıt			
Equipment Used     Interconal Coupler: Model ICOSTO-20 Cable #1:	or Type:	Rms	_					VBW:	50 kHz			I	Distance	NA	r	n	
mr.	Equipmo	ent Used															
mp:	na:		_			I	Directio	onal Coupler:	Model 1C0870-	20		Cal'd pri	or to us	se			
er: 1036 content 1036 content 1036 content 1036 content 1036 content 1036 content 1037 content 1036 content 1037 content 1036 content 1037 content 1037 conte	np:		_					Cable #1:	1484								
<pre>try Luxa Luxa Luxa Luxa +3: Luxa +3: Luxa +3: Cable #3: Cable #3: Cable #3: Cable #4: Cable #4:</pre>		1026	_					Cable #2:									
Aux F1     Model 3320-34 Call prior to use     Mixer       onal equipment used:	er:	1036 Model 204		prior to	1150			Cable #3:									
AUX 2:     MORE DE DE LA LA PLA DA LA PLA DA LA       main quipinent use:       rement Uncertainty:     +41.7 dB       Ref Lv1     -36.95 dBm     VBW     50 kHz     NF Att     20 dB       19.9 dB     Offset     -36.95 dBm     VBW     50 kHz     NT I     0 dB     -36.95 dBm     0 dB     -36.95 dBm     0 dB     -36.95 dBm     0 dB     -36.95 dBm     -43.84 dB     -43.84 dB     -43.84 dB     -43.84 dB     -45.31 dB     -43.84 dB     -45.31 dB	ator #1	Model 22 2	-oub Cal 0-34 Calid	prior to	use			Cable #4:									
Harman unit	at01 #∠: onal equipy	ment used.	0-34 Card	prior to	use			wiixer:									
Name     1     11     NBL     5     kHz     RF     Att     20     dB       19.9     dBm     2.31250000     GHz     SWT     5     S     Unit     dB       21.9     dB     dffset     v1     T1     2.3     250000     GHz     SWT     5     S     Unit     dB       0     dffset     v1     v1     T1     2.3     250000     GHz     SWT     34.222     dBm     -43.84     dB       0     dffset     v1     v1 <t< td=""><td>rement Un</td><td>certainty:</td><td>+/-1.7</td><td>dB</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	rement Un	certainty:	+/-1.7	dB													
Ref Lv1   -36.95 dBm   VBW   50 kHz     19.9 dBm   2.31250000 GHz   SWT   5 s   Unit   dB     21.9 dB   dffset   -11 (T1)   -36.95 dBm   -36.95 dBm   -43.95 dBm     0   -21.9 dB   dffset   -36.95 dBm   -43.84 dB     0   -43.84 dB   -45.31 dB     1V1EH   -45.31 dB     0   -45.	<u> </u>			Mar	ker	1 []	1]		RBM		5 k	Hz	RF	- At	t	20 0	ЗB
19.9 dBm 2.31250000 GHz SWT 5 s Unit dB 21.9 dB df fset 1 [T1] 2.3 250000 GHz 34.22 320000 GHz 34.22 34 dB -43.84 dB -45.31 dB 1 VIEH 1 VIEH 1 VIEH 1 CT1 C Cu1 C Cu	Ref						36.	95 dBm	VBW	!	50_k	Hz					
21.9 dB C f f set 1 [T1] 2.3 25000 GHz 34.22 000 4.3.8 4 dB -43.84 dB -45.31 dB 1VIEW 1VIEW Conter 2.3075 GHz 1 MHz/ Span 10 MHz 2.1 C 10 MHz 1 MHz/ 1 MH	19.	9 dBm			2	2.312	500	00 GHz	SWT		5	S	Ur	nit			dB
0     2.3     250000 GHz       34.22     20       0     -43.84     dB       1V1EW     -45.31 dB       0     -45.31 dB<	21	.э фв	Offs	e t							<b>v</b> 1	[T1	]		-36	.95 c	dBm
0   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 <td></td> <td>2.3</td> <td>250</td> <td>000 G</td> <td>6Hz</td>														2.3	250	000 G	6Hz
0     -43.84 dB       0     -43.84 dB       0     -45.31 dB       0<	0				41.41			-A A	يان الديا	. 6. 6	СН	PUR			34	.22 c	JBm
0  45.31.dB     1VIEW  45.31.dB     0  45.31.dB </td <td></td> <td></td> <td></td> <td></td> <td>run</td> <td>my I</td> <td>My</td> <td>my pure</td> <td></td> <td>1</td> <td>ACF</td> <td>/wh</td> <td></td> <td></td> <td>-43</td> <td>.84 c</td> <td>B</td>					run	my I	My	my pure		1	ACF	/wh			-43	.84 c	B
liview line line line line line line line line	0								<b>₩</b> _\/_	+	ACH		4		-45	.31 c	18
1 V I E H     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1					· · ·	ĩ V	Ì	í V		ľ							
IVIEW INTER			_		<u> </u>	V		U	V		V						
le: 20C	o	EW															1 R
le: 20C	0 1 V I																
Center 2.3075 GHz 1 MHz/ Span 10 MHz	0 1 V I		_														
Image: Conter 2.3075 GHz   1 MHz/   Span 10 MHz																	
Center 2.3075 GHz 1 MHz/ Span 10 MHz													~	m	A AA		
0				men	<u> </u>										· · · · · ·		
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 <td></td> <td></td> <td>~~~~</td> <td>men</td> <td></td> <td>Max</td>			~~~~	men													Max
Center 2.3075 GHz 1 MHz/ Span 10 MHz			norm	men													Max
0   Cu1   Cu1     0   Cu1   Cu1 </td <td></td> <td>www.</td> <td>n m</td> <td>e-rep</td> <td></td> <td>Mas</td>		www.	n m	e-rep													Mas
0   cu1   cu1     0   c1   cu1     0   c1   cu1     0   c1   cu1     0   cu1 <tr< td=""><td></td><td>www</td><td>~~~~~ </td><td>men</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Mat</td></tr<>		www	~~~~~ 	men													Mat
Image: Content 2.3075 GHz   1 MHz/   Span 10 MHz		www	~~~~														- las
CP   CP     cl1   cl1     Center 2.3075 GHz   1 MHz/     Span 10 MHz     le:   20C		www	~~~~~~ 														
Center 2.3075 GHz 1 MHz/ Span 10 MHz		www.											1	CU	1		
Center 2.3075 GHz   1 MHz/   Span 10 MHz     le:   20C		-											1	CL	1		
Center 2.3075 GHz 1 MHz/ Span 10 MHz													1	CL	1		
												c L C	1	CL	1		
								1	MHZ /				1	CL	1	10 *	
e: 18.5EP.2003 17:36:05		ter 2.3	= 1 1 30 75	GHz				1	MHz/				1	CL	j1 Span	10 M	1Hz

EQUIPMENT: 2.3 GHz WCS BTS



Ner	nko Dallas	, Inc.																	
<b>Data Plot</b>	t			Spur	ious I	Emis	sion	s at A	nter	ına T	`erm	ninals							
Page <u>2</u> c	f 16	_																	
Job No.:	2L0436R				Da	ate: <u>9/1</u>	8/2003												
Specification:	Part 27			Temp	erature(°	C): <u>22</u>													
Tested By:	David Light	2	R	elative I	lumidity(	%) 40													
E.U.I.: Configuration:	Z.5 GHZ B13 Tx 10 Carrie	rs																	
configuration.	17 10 Carrie	13																	
			Mar	ker	1 []	1]		_	ł	ЯΒШ		5 K	Hz	RF	- At	t	20	dB	
Ref				_	-	-37.	16	dBm		VBW		50 k	Hz	1.10				~ 0	
	.9 060	_		4		:000	00	GHZ		JMI		0	5			-		uв	
2	1.9 dB	Offs	et 🛛									▼1	[ ] 1	D		-37	. 16	dBm	A
- 10															2.3	.250	000	GHz	
				my	minin	ANU	M	m	MM	M	NU		MA.			-44	.04	dB	
-20					Ň			$\downarrow$				ACF	La	~		-45	.50	dB	
						V						II '							
-30					V														
1 V I	EW																		18M
-40																			
-50																			
00		m	m											uh	m	m	La.		
-60	m	ur"																min	
	when																		
- 70																			
80																			
-80														1	CU	1			
90													C	Þ					
-90				1															
100	C	:11																	
- IUU Cen	ter 2.3	075	GHz	•				1 M	Hz/					•		Span	10	MHz	
Title:	200																		
Date:	18.9	5EP.2	2003	17	:36:	55								<u> </u>				<u> </u>	
Notes:	Ambient 3	1.1 Vdc																	
	Adjacent c	hannel p	ower u	ising hi	gher res	solutio	n												
1																			



Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Data Plo	t			5	Spur	ious Emis	sions at A	ntenna T	erminals						
Page 3 o	f 16			-	<u> </u>										
Job No.:	2L043	6R				Date: 9/1	8/2003								
Specification:	Part 27	7			Temp	erature(°C): 22									
Tested By:	David	Light		Re	elative F	Iumidity(%) 40									
E.U.T.:	2.3 GI	Iz BTS													
Configuration:	Tx 10	Carriers						<u> </u>							
				Mar	ker	1 [T1]		RBW	5 k	Hz	RF	At	t	20 dB	
Kef		_				-37.	16 dBm	VBW	50_k	Hz				_	
19	.9 d	Bm			2	2.312500	IOO GHz	SWT	5	s	Ur	nit		dB	
2	1.9	нв с	ffse	et					▼1	[ T 1	ן		-37	.16 dBm	A
_ 10												2.3	250	000 GHz	
- 10					MAN	mandra Anhi	M. M.M.	NM ML		PWR			34	.19 dBm	
20					1								-44	.50 dB	
-20															
20						U									
-30	EW														18M
-40															
-50											in	Lana.			
			m									- VIA	~~~	mulle	
-60	mm	1													
- Area	N														
- 70															
-80													1		
										cu	1		1		
-90				C						L	-				
		cl	1	CI	1										
- 100															
Cen	ter	2.30	175 1	GHz			1 M	Hz/				9	Span	10 MHz	
Title:	2	20C													
Date:		18.5	EP.2	003	17	:37:24									
Notes:	Ambi	ent 22.9	9 Vdc												
	Adja	cent cha	annel p	ower u	sing hi	gher resolutio	n								



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Ner	nko Dallas, Inc.						ux. (072) 400 2			
<b>Test Plot</b> :		Spu	rious En	nissions at	Antenna	Terminal	S			
Page 4 o	f <u>16</u>									
Job No.:	2L0436R		Date:	9/18/2003						
Specification:	Part 27	Ten	nperature(°C):	22						
Tested By:	David Light	Relative	Humidity(%)	40						
E.U.I.: Configuration	2.3 GHZ B13					-				
comgaration	11110 Cullions					-				
		Marker	1 [T1]		RBW	5 k	Hz RF	Att	20 dB	
Kef 15	Lv1 dBm		-44 	.05 dBm	VBW	50 k	Hz e Uo	; +	dB	
			1					1.		
15	D.9 OB UTTS	se t				▼1	[ ] ]	-44. 2.212600	.D5 dBm	A
- 10						СН	PUR	2.312500	17 dBm	
				MALAM	n n llin A	ACF	Up	-39.	29 dB	
-20					┝╢┼╟╌╟╵╢╌	ACF	Low	-28	52 dB	
						ALT	1 Up	-60.	.83 dB	
-30								-86.	42 06 15 dB	
1 V I	EW					ALT	2 LOW	-86.	16 dB	1RM
-40				+						
-50				+						
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-60				/		- Mercy				
- 70			AN AN					C	2	
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-90										
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- 100										
Len	ter 2.3075	GHZ		ا"ا د				Span	JU NHZ	
litle: Date:	20C 18.SEP.	2003 17	2:40:09							
Notes:	Ambient 27 Vdc									
	Co-adjacent char	nel power								



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Test Plot		Spurious F	missions at An	tenna Termi	inals	
Page 5 of	16	<u>opurious E</u>	missions at m		<u>Indis</u>	
Job No.:	2L0436R	Date	e: 9/18/2003			
Specification:	Part 27	Temperature(°C	): 22			
Tested By:	David Light	Relative Humidity(%	6) 40			
E.U.T.:	2.3 GHz BTS					
Configuration:	Tx 10 Carriers					
	1 1	Marker 1 [T]	1] 13 77 dBm	RBW	5 kHz RF	Att 20 dB
15		2 3125	50000 GHZ	VBA : SыT		it dB
0		2.0120				
1 5	.9 dB Offs	se 1			▼1 [⊤1]	-43.77 dBm 🔼
- 10						2.31250000 GHz
			ب الدم يد من			28.17 dBm
			mnmann			-27 72 dB
-20					ALT1 UD	-60.B1 dB
					ALT1 LOW	-86.41 dB
-30					ALT2 UP	-86.15 dB
1 V 1	E W				ALT2 Low	-86.15 dB
-40			+++			
-50						
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-60					enter la	
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-80						
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-90			+++			<u> </u>
	3	/"				W
- 100						
Cent	er 2.3075	GHz	3 MHz	/		Span 30 MHz
Title:	200					
Date:	18.SEP.	2003 17:39:2	?7			
Notes:	Ambient 31.1 Vdc	:				
	Co-adjacent chan	nel power				



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Test Plot	:			Spur	ious Em	iss	ions at A	ntenna	Τe	erminals						
Page <u>6</u> 0	f 16		-			-00			- 1							
Job No.:	2L0436	R			Date:	9/18/	/2003									
Specification:	Part 27			Temp	erature(°C):	22										
Tested By:	David L	ight	R	elative H	Humidity(%)	40										
E.U.T.:	2.3 GHz	BTS							_							
Configuration:	<u>Tx 10 C</u>	arriers							_							
			Mar	ker	1 [T1]			RBL	1	5 K	Hz	RF	Att	20	dB	
Ref				_	-44	. 1	0 dBm	VBh	-	50 K	Hz -		_ • •		-0	
15	авт			2	2.31200	iuu		IWC			s	Ur	1 I T		uь	
15	.9 d	B Offs	≘ :							▼1	[ 〒 1	כ	-44 2.31250	1.10 0000	dBm GHz	A
- 10									H	СН	PWR		28	3.19	dBm	
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-20	┝╴┼┼							╢╢╢╢	$\vdash$				-29	3.31	dB	
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- 100													_			l
Cen	ter 2	.3075 (	∍Hz				ЗМ	Hz/					Spar	э 30	MHz	
Title: Date:	21	)C 3.SEP.2	003	17	:38:16											
Notes:	Ambie	nt 22.9 Vdc														
	Co-adj	acent channe	l powe	r												
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Test Plot:		,		Spur	ious Emis	sions at A	Antenna T	erminals						
Page 7 of	16													
Job No.:	2L0436R				Date: 9/1	8/2003								
Specification:	Part 27			Temp	erature(°C): 22									
Tested By:	David Lig	ght	R	elative H	Humidity(%) 40									
E.U.T.:	2.3 GHz	BTS												
Configuration:	Tx 10 Ca	rriers												
			Mar	ker	1 [T1]		RВЫ	5 k	Hz	RF	At	t	20 dB	
Ref	L v 1				-38.	60 dBm	VBW	50 k	Hz					
19.	9 dBr	n		2	2.312500	00 GHz	SWT	5	S	Ur	nit		dB	
21	.9 dE	3 Off	set					▼1	[ T 1	þ		-38	.60 dBm	
10											2.3	250	000 GHz	
- 10						A. A.A	also also					33	.34 dBm	
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Cen	er 2	.3075	6 GHz			1 M	Hz/					Span	10 MHz	
itle:				. –										
Pate:	18	.SEP	.2003	17	:24:47									
Notes:	+10 <sup>0</sup> C													
	Adjacen	nt channe	el power u	ising hi	gher resolutio	n								



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Test Plot:				Spur	ious En	iiss	sions at A	ntenna	Τe	erminals						
Page 8 o	16			_												
Job No.:	2L043	36R			Date:	9/18	/2003									
Specification:	Part 2	27		Temp	erature(°C):	22										
Tested By:	David	l Light	R	elative I	Humidity(%)	40										
E.U.T.:	2.3 G	Hz BTS							_							
Configuration:	Tx 10	Carriers							-							
			Mar	ker	1 [T1]			RBL	I	5 kH	Ιz	RF	Att	20	dB	
Ref	∟∨ l				-45	i.2	25 dBm	VBL	I	50 KH	Ηz					
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15	.9	dB Offs:	9 1							▼1	[〒1]		-45 2.31250	. 25	dBm GHz	A
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1 V I	E₩									ALT	2 UP 2 Lor		-85	.20 .28	dB	1 R M
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Cen	ter	2.3075 0	ЗНz				3 M	Hz/					Span	30	MHz	
Title:		18 SEP 2	002	17												
pale.		10.JLF.2	cuu	11	.22.30											
Notes:	+100	C														
	Co-a	djacent channe	el powe	er												

EQUIPMENT: 2.3 GHz WCS BTS



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Test Plot				Spur	ious	Emis	sior	ns at A	nte	nna T	'erm	inals							
Page <u>9</u> o	f 2L0436R		-																
Job No.:	2L0436R				1	Date: 9/1	8/200	3											
Specification:	Part 27			Temp	erature	(°C): 22													
Tested By:	David Light		R	elative H	lumidit	y(%) 40													
E.U.I.: Configuration	Tx 10 Carrier	s																	
comgaration		5																	
			Mar	ker	1 [	Τ1]				RBM		5 k	Hz	RI	- At	t	20	dB	
VY Ref	Lvl DdBm				ر د د	-39.	04	dBm cu→		VBW		50 k	Hz	1.17					
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- 10		<u> </u>													2.3	250	20	GHZ	
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Cen	ter 2.3	075	GΗz					1 M	IHz/						:	Spar	10	MHz	
fitle: Date:	18 9	SEP 3	בטחי	1 7	• 1 २	·24													
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NOTES:	<u>UC</u> Adjacent cl	nannel n	ower u	sing hi	gher r	esolutio	m												
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Data Plot	-		Spuriou Spuriou	us Emis	sions at A	ntenna	Ter	minals						
Page <u>10</u> o	f 2L0436R	_												
Job No.:	2L0436R	_		Date: 9/1	8/2003									
Specification:	Part 27		Temperature(°C): 22											
Tested By:	David Light	R	elative Hum	idity(%) 40										
E.U.T.:	2.3 GHz BT	S					-							
Configuration:	Tx 10 Carrie	ers					-							
~		Marc	kor 1	[ <b>T</b> 1]		R BL		5 2		RE	<u>++</u>	20	dB	
Ref	Lv1	(iai	Ker I	-45.	23 dBm	VBW		50 K	Hz	1.1.1		20	00	
15	dBm		2.3	312500	00 GHz	SWT		5	s	Un i	t		dB	
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-20						1.11		ALT	1 Up		-62	.12	dB	
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pilie: Date:	18.	SEP.2003	17:1	4:13										
Notes:	0 <sup>0</sup> C													
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Nei	nko Dallas,	Inc.										10	IX. (072	.) 430 2	007				
<b>Test Plot</b>				Spur	rious	Emi	ssion	ns at A	Ante	nna T	ſern	ninals	5						
Page 11 o	of 2L0436R			_									_						
Job No.:	2L0436R					Date: 9/	18/2003	3											
Specification:	Part 27			Tem	perature	$e(^{\circ}C): \underline{22}$													
Tested By:	David Light		ĸ	elative I	Humidit	$\frac{1}{40}$													
E.U.I Configuration:	Tx 10 Carrier	s																	
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			Mar	ker	1 [	T1]	25	ĺ	F	<b>ЗВ</b> М		5 k	Hz	RF	- At	t	20	dB	
19 Ker	LVI .9 dBm			2	2.31	-39.	.36 NN	авт GHz		VBW SWT	:	оо к 5	HZ S	Lin	- i t			dP	
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litle: Date:	18.9	EP.2	003	17	:58	:49													
Notes:	120 <sup>0</sup> C																		
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Test P	lot:					<u>Spur</u>	ious E	missi	ions at A	ntenna	Te	rminals						
Page	<u>12</u> of	2L043	6R															
Job No.:		2L043	6R				Date	e: 9/18/	2003									
Specificatio	on:	Part 27	7			Tem	perature(°C	): 22										
Tested By:		David	Light		1	Relative	Humidity(%	) 40										
E.U.T.:		2.3 GH	Iz BTS								_							
Configurati	on:	Tx 10	Carrie	s							_							
K					Ma	rker	1 [T	1]		RB	1	5 K	Hz	Rf	- Att	20	dB	
	Ref	Lv	1				-	46.8	37 dBm	VBL	1	50 k	Hz					
	15	dBr	า				2.312	5000	)O GHz	SWT	-	5	s	Ur	пit		dB	
0	1	5.9	dВ	Offs	et							▼1	[T1]		- 4	6.87	dBm	
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- 10												Сн	PUR		2	7.84	dBm	
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Test Plot	:	unuo,		1	Snur	ious Emi	ssions at /	Antenna T	erminals						
Page 13 c	f 2L043	6R		-	Jpui		<u>5510115 ut 1</u>	Intenna I	<b>CI IIIIIui</b> s						
Job No.:	2L043	6R				Date: 9/	18/2003								
Specification:	Part 2	7			Temp	erature(°C): 22	2								
Tested By:	David	Light		Re	elative H	Humidity(%) 40	)								
E.U.T.:	2.3 GI	Hz BTS													
Configuration:	Tx 10	Carriers													
				Mar	ker	1 (T1)		RBW	5 k	Hz	RF	At	t	20 dB	
Ref				-40	.96 dBm	VBW	50 k	Hz							
19	.9 d	Bm			2	2.312500	000 GHz	SWT	5	5	Ur	nit		d	В
2	1.9	dB C	ffse	et					▼1	[T1	)		-40	.96 dBr	
10												2.3	1250	000 GH:	z
-10					المتعلم	and the state of the state	A. A.A.	باه ساه		PWR			33	.69 dBr	n
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Test Plot:		Spuri	ous Emis	sio	ns at A	ntenna	Te	rminals						
Page <u>14</u> o	f 2L0436R													
Job No.:	2L0436R		Date: 9/1	8/20	03									
Specification:	Part 27	Tempe	rature(°C): 22											
Tested By:	David Light	Relative Hu	$\frac{1}{40}$											
E.U.T.:	2.3 GHz BTS						-							
Configuration:	Tx 10 Carriers						-							
	1	1arker	1 [T1]			RBL	1	5 k	Hz	RI	FAtt	20	dB	
Ref	Lv1		-46.	79	dBm	VBL		50 k	Hz					
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Cen	ter 2.3075 G	−lz			зм	Hz/					Span	30	MHz	
Title:														
Date:	18.SEP.20	03 18	:08:47											
Notes:	+40 <sup>0</sup> C													
	Co-adjacent channel	power												
1														



Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
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Fax: (972) 436-2667

Test Plot:		,		Spur	ious Er	nissio	ns at /	Antenna T	erminal	5					
Page <u>15</u> of	2L0436R		-	opui	1045 11				<u>vi minu</u>	<u>,</u>					
Job No.:	2L0436R				Date	9/18/200	3								
Specification:	Part 27			Temp	erature(°C):	22									
Tested By:	David Light		R	elative F	Humidity(%)	40									
E.U.T.:	2.3 GHz BTS	5													
Configuration:	Tx 10 Carrie	rs						<u> </u>							
			Mar	ker	1 [T1	]		RBW	5 +	<hz< td=""><td>RF</td><td>At</td><td>t</td><td>20 d</td><td>в</td></hz<>	RF	At	t	20 d	в
Ref	∟vl				- 4	0.47	dBm	VBW	50 H	кНz					
19.	9 dBm			2	2.3125	0000	GHz	SWT	5	S	Ur	nit			dB
21	.9 dB	Cffse	e t						▼1	[ T 1	)		-40	.47 dt	3m
												2.3	1250	000 GH	1z
- 10									СН	PUR			33	.65 dt	3m
				my	men m	ny my	1 M	my my	MM PS	1,119			- 45	.77 dE	3
-20		-											-47	. 14 Ot	5
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-30		+			V		<u>y</u>	V	•						-
1 • 1	EW														IRM
-40											<b></b>				-
-50		+													_
			men								and a	Mr.	A. A. A		
-60	4-1-4					_								man	<b>~</b>
	Nation														
-70															_
-80													Ļ		
										С	1	CL	11		
-90			L_C	-						C	Р				
			cl	1											
- 100		1													
Cent	er 2.3	075	GHz				1 M	Hz/				9	Span	10 MH	Ηz
Title:	20C														
Date:		·	2003	18	:18:20	כ									
Notes:	+50° C														
	Adjacent c	hannel p	ower u	sing hi	gher resol	ution									

EQUIPMENT: 2.3 GHz WCS BTS





EQUIPMENT: 2	2.3 GHz	WCS BTS
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Nen	nko Dallas	, Inc.										,		
Data Plot			Sp	urio	us Emis	sions at	Antenna '	Ferminal	s					
Page 1 of	f <u>16</u>									Compl	ete	Х	_	
Job No.:	210436				Date:	9/18/2003			Prel	limina	ry:		_	
Specification:	PART 27		Г	`empera	ture(°C):	22								
Tested By:	David Light		Relat	ive Hun	nidity(%)	40								
E.U.T.:	2.3 GHz bts													
Configuration:	10 CARRIE	RS												
Sample Number:	1													
Location:	ON SITE	_				RBW:	5 kHz		Me	asurem	ent			
Detector Type:	Rms	-				VBW:	50 kHz			Distar	ice: NA	1	m	
Test Equipm	ent Used													
Antenna:					Directio	onal Coupler:	Model 1C0870-2	20	Cal'd p	prior to	use			
Pre-Amp:		-				Cable #1:	1484							
Filter:		•				Cable #2:								
Receiver:	1036	-				Cable #3:								
Attenuator #1	Model 2044-	-6dB Cal' pri	or to use			Cable #4:								
Attenuator #2:	Model 33-20	)-34 Cal'd pr	ior to use			Mixer:								
Additional equip	ment used:					-								
Measurement Un	certainty:	+/-1.7 dB	_											
			M I		4 (74)								4.0 -10	
Re Re	∍flvl		Hart	er	-45	.42 dBm	квы УВЫ	50 K	Hz	R	· At	τ	10 08	
<b>•</b>	3.9 dBm			2	.35250	JOO GHz	SWT	5	s	Ur	nit		dE	5
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	21.9 0	5 UTIS	eι					▼1	[ T 1	ן		-45	.42 dBm	A
- 10				Alley d	Aladia de Mili	Mr. C.M	Ambeld Makes		PUR		2.3	220	10 dBm	
							May have		May			-44	.15 dB	
-20								ACF	LO	2		-44	.80 dB	
				- 1	l l	ĭ I	1 1 1	AL1	1 U	P		-75	.17 dB	
20						V	v	AL1	1 L	Þω		-67	.68 dB	
- 30	VIEW													18M
-40														1
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-60													man	
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100	<u> </u>													
_ 100 <b>C</b> e	enter 2	.3575	GHz			1	MHz/					Span	10 MHz	-
Title:	20	JC												
Date:	18	3.SEP.2	2003	10:	:49:41									
Notoo	A mhi 4 24	7.Vdc												
Notes:	Amplent 2	/ Vac	vor usi-	a hiak	or recolution	n								
	Aujacent	namer po	nci usili	5 mgn	er resolutio	<b>11</b>								
1														



<u>Data Plot</u>				<u>S</u>	ouri	ous Emi	ssions at	Antenna '	<b>Fermina</b>	<u>s</u>					
Page 1 of	<u>16</u>										Compl	ete	Х	_	
Job No.:	210436					Date:	9/18/2003			Prel	liminaı	ry:			
Specification:	PART 27				Tempe	rature(°C):	22							-	
Tested By:	David Lig	ght		Rela	tive Hu	umidity(%)	40								
E.U.T.:	2.3 GHz 1	ots		-				•							
Configuration.	10 CARR	IERS													
Sample Number:	1														
Location:	ON SIT	F					RBW	5 kHz		Me	asurem	ent			
Detector Type:	Rms	<u> </u>					VBW-	50 kHz		1010	Distan	ce: NA		m	
Detector Type.	Rills	_					1011.	JORIE				<u></u>			
Test Equipme	ent Used					Direct	ional Coupler:	Model 1C0870-3	20	Cal'd r	prior to	1150			
Pro Amni						Direc	Coble #1	1494	20	Caru	51101 10	use			
Fie-Amp.							Cable #1.	1464							
Filter:	1025						Cable #2:								
Receiver:	1036	<u></u> cm					Cable #3:								
Attenuator #1	Model 20	44-6dB	Cal pric	or to use	•		Cable #4:								
Attenuator #2:	Model 33	-20-34 (	Cal'd pri	or to us	e		Mixer:								
Additional equip	nent used:														
Measurement Un	certainty:	+/	-1.7 dB	-											
(K)				Mar	ker	1 [ ] 1		RBW	5 k	Hz	RF	- Att		10 dB	
Re Re	∍f Lvl	>				- 45	i.42 dBm	VBW	50 k	Hz				_1	5
0,	9.9 OE	) m			•	2.35250	JUUU GHZ	501		s	Ur	111		a	D
	21.9	¢в (	ffs	e t					▼1	[ T 1	ן		-45	.42 dBr	
												2.35	250	000 GH:	z
-10					miny	my my	y my pr	1 min min	NUN IGH	म्रस्र			27.	.10 dBr	n
									AC	Úρ			- 4 4 .	.05 dB	
-20		+	+			┩──┤┨──	-₩			LO	~		-44.	<u>80 dB</u>	
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-30		<u> </u>					v		* AL		рм		-67.	.68 08	
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C.	enter	2.3	575	GHz			1	MHz/				S	pan	10 MH:	z
Title:		20C													
Date:		18.5	SEP.2	2003	1 🗆	):49:41									
1															
Notes:	Ambien	t 27 Vo	lc												
1	Adjacen	t chan	nel pov	ver usi	ng hig	her resolut	ion								
1															

### EQUIPMENT: 2.3 GHz WCS BTS



Nemko Dallas, Inc.			(	
Data Plot	Spurious Emi	ssions at Antenna	Terminals	
Page <u>2</u> of 16				
Job No.: 210436	Date: 9/1	18/2003		
Specification: PART 27	Temperature(°C): 22	2		
Tested By: David Light	Relative Humidity(%) 40	)		
E.U.I.: <u>2.3 GHZ DIS</u> Configuration: 10 CARRIERS			-	
			-	
	Marker 1 [T1]	RBW	5 kHz RF A	tt 10 dB
Ref Lvl	-45.	94 dBm VBW	50 kHz	
	2.302000	UU GHZ SWI	55 0011	ub
21.9 dB Offe	ie t		▼1 [⊤1]	-45.94 dBm 🔼
- 10	Mar D. dealler an a	A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1	2.3	35250000 GHz
	(m) prog may	and how have		-44.50 dB
-20				-45.06 dB
			ALT1 UP	-75.80 dB
-30		V Ť	ALTI LOW	-67.73 dB
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-40				
-50			ma	
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-80	C n		CD	
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<u>+</u> c12				
<u>+</u> c12				
Center 2.3575	GHz	1 MHz/	· · · · ·	Span 10 MHz
Fitle: 20C				
Date: 18.SEP.	2003 10:51:54			
Notes: Ambient 31.1 Vdc	2			
Adjacent channel	power using higher resolution	on		

## EQUIPMENT: 2.3 GHz WCS BTS



Data Plo	t	inus, n			Spur	ious	Emi	ssions	s at A	Anter	nna 7	[ erm	inal	5						
Page <u>3</u> 0	f 16					10000								_						
Job No.:	210436					]	Date: 9/	18/2003												
Specification:	PART	27			Tem	perature	(°C): 22													
Tested By:	David I	Light		R	elative	Humidit	y(%) 40	)												
E.U.T.:	2.3 GH	z bts																		
Configuration:	10 CAI	RIERS																		
				Mar	ker	1 [	Τ1]			R	RBM		5 k	Hz	RF	- At	t	10	dB	
Ref							-46.	04 c	dBm	V	BW	Ę	50_k	Hz						
9.9		n			2	2.35	2500		эНz		ы Ш		5	s	Ur	ור			dB	
2	1.9	3B Of	fse	t									▼1	[ T 1	þ	0 3	-46	.04	dBm GH7	A
- 10					Albud	m		Mai	m	MAN	MA A		CH.	PUR		2.00	26	.90	dBm	
						-\	Ľ		$  \rangle$		1	[~~]	ACF	μŪΆ			-44	.45	dB	
-20					$ \rightarrow $		$ \rightarrow $	——				$\square$	ACF	LO	4		-45	.02	dB	
							J			U			ALT	1 U	Ρ		- 75	.96	dB	
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Cen	ter 2	2.357	75 G	ЯНz					1 M	Hz/				•			Span	10	MHz	I
Title	2	пг																		
Date:	1	8.SE	P.20	203	1 🗆	:54	:00													
Notes:	Ambie	ent 22.9	Vdc																	
	Adjac	ent char	mel po	ower u	ising h	igher r	esoluti	on												
			1		0	_														

### EQUIPMENT: 2.3 GHz WCS BTS



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Ner	nko Dallas, Inc.											
Test Plot		Spuri	ous Emi	issions at	Antenna	ι T	erminals					
Page 4 o	f 16											
Job No.:	210436		Date: 9/	/18/2003								
Specification:	PART 27	Tempe	rature(°C): 22	2								
Tested By:	David Light	Relative Hu	umidity(%) 4	0								
E.U.T.:	2.3 GHz bts					_						
Configuration:	10 CARRIERS											
		Marker 1	[T1]		RВЫ		5 kHz	RF	Att	20	dB	
Ref	Lvl		-45.	01 dBm	VBW		50 kHz					
19.	9 dBm	2.	352500	00 GHz	SWT		5 s	Un	i t		dB	
21	.9 dB Offse	t					▼1 [⊤1	1	-45	.01	dBm	
								2	2.35250	opo	GHz	H
- 10							СН РИР		27	.46	dBm	
									-29	.49	dB	
-20				ANNAN	MMKM				-30	. 64	dB	
							ALT1 L	.ow	-80	.64	dB	
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Cen	ter 2.3575 G	Hz		зм	⊣z /		•		Span	30	MHz	
Title:	20C											
Date:	18.SEP.20	13:	07:28									
Notes:	Ambient 27 Vdc											
	Co-adjacent channe	l power										



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Test Plot:     Spurious Emissions at Antenna Terminals       Page 5 of 16     Date: 9/18/2003       Job No.:     210436     Date: 9/18/2003       Specification:     PART 27     Temperature(°C): 22	
Page 5 of 16       Date: 9/18/2003         Job No.:       210436       Date: 9/18/2003         Specification:       PART 27       Temperature(°C): 22	
Job No.:       210436       Date:       9/18/2003         Specification:       PART 27       Temperature(°C):       22	
Specification: PART 27 Temperature(°C): 22	
Tested By: David Light Relative Humidity(%) 40	
E.U.T.: 2.3 GHz bts	
Configuration: 10 CARRIERS	
A Mackan I III BRU 5 KHZ PE A++ 20 dR	
Ref Lvl -45.87 dBm VBW 50 KHz	
19.9 dBm 2.35250000 GHz SWT 5 s Unit df	3
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	1
-20 -20 -20 -30.54 dB.	
-30 ALTI LOW -80.42 dB	
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	1,
Center 2.3575 GHz       3 MHz/       Span 30 MHz	
Title: 20C	
Date: 18.5EP.2003 13:42:53	
Notes: Ambient 31.1 Vdc	
Co-adjacent channel power	



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<b>Test Plot</b>	<u>:</u>	<u>Sp</u>	urious Em	iss	sions at A	ntenna	Τe	erminals						
Page <u>6</u> o	f 16	_												
Job No.:	210436		Date: 9	/18/	/2003									
Specification:	PART 27	T	emperature(°C): 2	2										
Tested By:	David Light	Relati	ve Humidity(%) 4	0										
E.U.T.:	2.3 GHz bts						_							
Configuration:	10 CARRIER	S					-							
		Marke	r 1 (T1)			RBW		5 k	Hz	RF A	: t	20	dB	
Ref			- 4 4	. 8	30 dBm	VBW		50_K	Hz					
19	.9 dBm		2.35250	υu	JU GHZ	501		5	s	Unit			ав	
2	1.9 dB C	)ffset		Т				▼1	[T1]		-44	. во	dBm	
1.5										2.3	5250	opo	GHz	
- 10				╈				Сн	PUR		27	.35	dBm	
								ACF	Up		-35	.43	dB	
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Cen	ter 2.35	575 GHz			3 M	Hz/					Span	30	MHz	
Fitle:	200													
Date:	18.5	EP.2003	13:44:00											
Notes:	Ambient 22.	9 Vdc												
	Co-adjacent	channel power												



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<b>Test Plot</b>	:				Spu	rious	Em	issions at	Antenna	Termina	ls					
Page 7 o	of 16				_											
Job No.:	210436						Date: 9	/18/2003								
Specification:	PART	27			Ten	peratur	e(°C): 2	.2								
Tested By:	David l	Light		I	Relative	Humidi	ty(%) 4	0								
E.U.T.:	2.3 GH	z bts								_						
Configuration:	10 CAI	RRIER	S													
				Mar	ker	1 [	T1]	5.0 10	RBW	5 k	Hz	RF A	tt	10	dB	
Ket							-43. 2500	52 dBm	VBM	50 K	HZ	Un th				
9.9		1			~	2.30.	2500	IUU GHZ	501		s				08	
21	1.9 ¢	в с	ffse	e t						▼1	[T1	ו נ	-43	.52 0	dBm	A
10									a . 11			2.3	3\$250	000 (	GHz	
-10					MM	/WW	144	my put	MM MU	MM 1914	PWR		27	.31 d	dBm	
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-20												4	-44	.35 (		
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Cen	ter 2	2.35	75 (	GHz				1 M	Hzz				Span	10 1	MHz	
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Notes:	+10° (	U						·								
	Adjac	ent ch	annel	power	using	ngner	resolut	lon								



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Page § of 16       Job No.:     210436     Date: 9/18/2003       Specification:     PART 27     Temperature(°C): 22       Tested By:     David Light     Relative Humidity(%) 40       E.U.T.:     2.3 GHz bts     Configuration:     10 CARRIERS       Marker 1 [T1]     RBW     5 kHz     RF Att     10 dB       9.9 dBm     2.35250000     GHz     SWT     5 s     Unit     df       -10     Q     Q     B Offset     Q     Q     ACF Up     -28.58     B dB     GB     GB<	
Job No.:     210436     Date:     9/18/2003       Specification:     PART 27     Temperature(°C):     22       Tested By:     David Light     Relative Humidity(%)     40       E.U.T.:     2.3 GHz bts     Configuration:     10 CARRIERS       Configuration:     10 CARRIERS     Marker 1 [11]     RBW     5 kHz     RF Att     10 dB       9.9 dBm     2.35250000 GHz     SWT     5 s     Unit     dB       -10     21.9 dB     0ffset     0ffset     77 dBm     VBW     50 kHz     77 dBm       -20     -40     <	
Specification:     PART 27     Temperature(°C): 22       Tested By:     David Light     Relative Humidity(%) 40       E.U.T.:     2.3 GHz bts       Configuration:     10 CARRIERS       Marker 1 [T1]     RBW     5 kHz     RF Att     10 dB       9.9 dBm     2.35250000 GHz     SWT     5 s     Unit     dB       -10     21.9 dB Offset     -45.77 dBm     VBW     50 kHz     77 dBm       -20     -10     -20     -21.9 dB Offset     -235250000 GHz     SWT     5 s     Unit     dB       -20	
Tested By:     David Light     Relative Humidity(%) 40       E.U.T.:     2.3 GHz bts       Configuration:     10 CARRIERS       Marker 1 [T1]     RBW     5 kHz     RF Att     10 dB       9.9 dBm     2.35250000 GHz     SWT     5 unit     dB       0     21.9 dB Offset     0     1 [T1]     -45.77 dBm     VBW     50 kHz       -10     0     21.9 dB Offset     0     0     1 [T1]     -45.77 dBm       -20     21.9 dB Offset     0     0     0     0     0     27.37 dBm       -20     0     0     0     0     0     0     0     0     0       -30     0     0     0     0     0     0     0     0     0     0     0       -30     0	
E.U.T.:     2.3 GHz bts       Configuration:     IO CARRIERS       Marker 1 [T1]     RBW     5 kHz     RF Att     10 dB       P.9 dBm     2.35250000 GHz     SWT     5 s     Unit     df       0     21.9 dB Offset     0     -45.77 dBm     VBW     50 kHz     9.9 dBm     2.3525000 GHz     SWT     5 s     Unit     df       -10     21.9 dB Offset     0     0     21.37 dBm     2.3525000 GHz     SWT     5 s     Unit     df       -20     21.9 dB Offset     0	
Marker 1 (T1)     RBW     5 kHz     RF Att     10 dB       Ref Lv1     -45.77 dBm     VBW     50 kHz     9.9 dBm     2.35250000 GHz     SWT     5 s     Unit     dB       0     21.9 dB Offset     0     1 [T1]     -45.77 dBm     2.3525000 GHz     SWT     5 s     Unit     dB       -10     0     21.9 dB Offset     0     0     0     21.37 dBm     2.3525000 GHz     SWT     5 s     Unit     dB       -10     0 </td <td></td>	
Marker 1 (T1)     RBW     5 kHz     RF Att     10 dB       9.9 dBm     2.35250000 GHz     SWT     5 s     Unit     df       -10     21.9 dB Offset     -45.77 dBm     VBW     5 s     Unit     df       -10     2.35250000 GHz     SWT     5 s     Unit     df       -10     CH PWR     27.37 dBm     2.35250000 GHz     ACP Up     -28.58 dB       -20     ALT1 Up     -90.05 dB     ALT1 Low     -90.45 dB       -30     IVIEW     IVIEW     IVIEW     IVIEW     IVIEW     IVIEW	
Ref Lv1     -45.77 dBm     VBW     50 kHz       9.9 dBm     2.35250000 GHz     SWT     5 s     Unit     df       -10     21.9 dB Offset     -45.77 dBm     VBW     5 s     Unit     df       -10     -10     -45.77 dBm     VBW     5 s     Unit     df       -20<	
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Configuration:	10 CARRIERS						
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Configuration:	10 CA	RRIERS																		
			1	Marl	ker	1 [	т 1 1				RBW		5 k	Hz	RF		+	20	dB	
Ref	Lvl						-44.	77	dBm		VBW		50 k	Hz			•	20		
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Test Plot	<u>-</u>	<u>Spur</u>	rious Emi	<u>issions at </u>	Antenna	Terminal	<u>s</u>			
Page <u>12</u> o	f <u>16</u>									
Job No.:	2L0436		Date: 9	/18/2003						
Specification:	PART 27	Tem	perature(°C): 2	2						
Tested By:	D. LIGHT	Relative	Humidity(%) 4	0						
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Job No.:	2L043	6				D	ate: 9/	/18/2003							
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Configuration:	10 CA	RRIERS	3												
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										ACF			- 4 4	.38 dB	
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# EQUIPMENT: 2.3 GHz WCS BTS



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<b>Test Plot</b>			Spur	ious En	nis	sions at .	Antenna	ı T	erminal	s				
Page <u>14</u> o	of 16													
Job No.:	2L0436			Date:	9/18	8/2003								
Specification: PART 27			Temperature(°C): 22											
Tested By: D. LIGHT			Relative											
E.U.T.: 2.3 GHz BTS								_						
Configuration:	10 CAR	RIERS						_						
		Ma	arker	1 [T1]	_		RBW		5 k	Hz	RF Att	20	) dB	
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# EQUIPMENT: 2.3 GHz WCS BTS



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Test Plot	:				Spui	rious	Emi	ssior	ns at /	Anter	na '	Гern	ninals	\$						
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Specification: PART 27 Temperature(°C): 22																				
Tested By: D. LIGHT Relative Humidity(%) 40																				
E.U.T.: 2.3 GHz BTS																				
Configuration:	10 CA	RRIER	S																	
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EQUIPMENT: 2.3 GHz WCS BTS



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Page <u>16</u> o	of <u>16</u>								
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pecification:	PT 27	Temp	perature(°C): $\frac{2}{4}$	2					
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Configuration:	10 CARRIERS					-			
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	1.91	Marker	1 [T1]	27 dPm	RBW	5 k 60 k	Hz RF	Att	20 dB
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- 10								2.352500	JO GHz
							PWR 9 Up	-32.	36 dB
-20						ACF	Low	-29.	14 dB
					nnnn	AL T	1 Up	-80.	73 dB
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	Co-adjacent chan	nel power							

# EQUIPMENT: 2.3 GHz WCS BTS

# Section 8. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01	12/19/03
1042	CABLE, 4M	STORM PR90-010-144	N/A	06/14/02	06/14/03
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	07/30/01	07/31/03
1283	Spectrum analyzer display	Hewlett Packard 85662A	1811A00223	10/17/01	10/17/02
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	07/15/02	07/15/03
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	07/15/02	07/15/03
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	07/15/02	07/15/03
	Power meter	Agilent E4416A	GB41290732	10/05/01	10/05/02
	Power sensor	Agilent E9327A	US40440319	08/16/02	08/16/03
	Directional coupler	Anaren 1C087-20	136	CBU	N/A
	Power meter	Agilent E4419B	GB39401846	12/11/02	12/11/03
	Power sensor	Agilent E9401	MY41495108	12/11/02	12/11/03

EQUIPMENT: 2.3 GHz WCS BTS

Section 9. Test Details

#### NAME OF TEST: RF Power Output

#### PARA. NO.: 2.1046

#### Method Of Measurement:

#### Antenna Conducted:

The maximum RMS power is measured with a power meter. In some cases the spectrum analyzer is amplitude offset for the channel power to match the power meter absolute power measurement.

#### E.I.R.P.:

If the antenna is not detachable from the circuit then the EIRP is measured using the substitution antenna method of measurement as described in EIA/TIA 603B. The field strength of the fundamental emission is measured using a RBW setting on the spectrum analyzer greater than the 20 dB bandwidth of the transmitted waveform. The EUT is then replaced with an antenna with known gain relative to either a dipole or an isotropic radiator. A signal generator is used to feed the substitution antenna until the previously measured field strength level is obtained. The level of signal needed to drive the substitution antenna to obtain the previously measured field strength is the erp or eirp after correction for substitution antenna gain.

## NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.1049

#### Method Of Measurement:

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1% of the bandwidth of the fundamental transmit signal. The emissions energy is integrated over 1 MHz of spectrum.

#### NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.1051

#### Antenna Conducted:

Adjacent Band Emissions

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1% of the bandwidth of the fundamental transmit signal. The emissions energy is integrated over 1 MHz of spectrum.

Out of Band Emissions

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of 1 MHz.

The limits in CFR 47, Part 27.53(a) are given as attenuation below carrier power. The measurement is thus a relative measurement. Both the rf output power and the spurious emission levels are measured as RMS levels.

#### NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 2.1053

If the antenna is detachable from the transmitter, it is removed and replaced with a 50 ohm load. Emissions are measured up to the  $10^{th}$  harmonic of the highest transmit frequency that the transmitter is capable of producing.

If the antenna is not detachable from the transmitter, emissions are measured radiated only.

#### E.I.R.P.:

If the antenna is detachable from the circuit then the antenna is replaced with a 50 ohm load for this test.. The ERP is measured using the substitution antenna method of measurement as described in EIA/TIA 603B. The field strength of the emission is measured using a RBW setting on the spectrum analyzer greater than the 20 dB bandwidth of the transmitted waveform. The EUT is then replaced with an antenna with known gain relative to either a dipole or an isotropic radiator. A signal generator is used to feed the substitution antenna until the previously measured field strength level is obtained. The level of signal needed to drive the substitution antenna to obtain the previously measured field strength is the erp or eirp after correction for substitution antenna gain.

#### NAME OF TEST: Frequency Stability

2.1055

#### Method Of Measurement:

#### **Frequency Stability With Voltage Variation:**

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. With the voltage input to the E.U.T. set to 85% S.T.V., the spectrum is measured to prove compliance with the specified limits. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

#### **Frequency Stability With Temperature Variation:**

The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the spectrum is measured as described above.

Section 10. Test Diagrams

# Para. No. 2.1046 - R.F. Power Output



Para. No. 2.1049 - Occupied Bandwidth



# Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



# Para. No. 2.1053 - Field Strength of Radiation



Para. No. 2.1055 - Frequency Stability

