Nemko Test Report No.:	4L0347RUS2
Applicant:	Andrew Corporation 108 Rand Park Drive Garner, NC 27529
Equipment Under Test:	TFAM2332/4
In Accordance With:	FCC Part 24, Subpart E Broadband PCS
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	Dustin Oaks, Account Manager
Date:	05/28/2004

BROADBAND PCS **Test Report No.:** 4L0347RUS2

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EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Section 1. Summary of Test Results

Manufacturer:	Andrew Corporation			
Model No.:	TFAM2332/4			
Serial No.:	041501103			
General:	All measurements a	re traceable to r	nation	al standards.
	re conducted on a sample of th FCC Part 24, Subpart E.	the equipment for	r the p	urpose of demonstrating
\boxtimes	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

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Summary Of Test Data

	PARA.		
NAME OF TEST	NO.	SPEC.	RESULT
RF Power Output	24.232	100W	Complies
Occupied Bandwidth	24.238	Input/Output	Complies
Spurious Emissions at Antenna	24.238(a)	-13 dBm	Complies
Terminals	24.236(a)	-13 ubiii	Compiles
Field Strength of Spurious	24.229(a)	-13 dBm	Complies
Emissions	24.238(a)	E.I.R.P.	Complies
Frequency Stability	24.235		Complies

Footnotes:

(1) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.

Section 2. General Equipment Specification

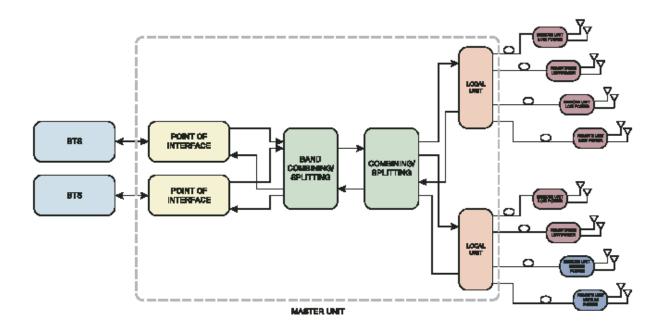
Supply Voltage Inpu	it:						
Frequency Bands:	Downlink:	1930.03 TO 1989.97 MHz					
Type of Modulation	and Designator:	CDMA (F7W)	GSM (GXW)	NADC (D7W)	EDGE (G7W)		
System Gain:		18 dB					
Output Impedance:		50 ohms					
RF Output (Rated p							
Number of Carriers:		1	2	4	8		
	CDMA:	21	17	13	9		
	GSM:	27	20	17	13		
	NADC:	24	18.5	15	11		
	EDGE:	23	18	15	11		
Frequency Translation:		F1-F1	F	1-F2	N/A		
Band Selection:		Software	Du	plexer	Fullband		

Test Report No.: 4L0347RUS2

Description of Operation

Britecell Plus is a radio over fiber system

System Diagram



EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Section 3. RF Power Output

NAME OF TEST: RF Power Output PARA. NO.: 2.1046

TESTED BY: David Light DATE:5/24/04

Test Results: Complies.

Measurement Data:

Modulation Type	Single Carrier (dBm)	Per Channel Power Output (dBm)	Composite Power Output (dBm)
CDMA	21	17	20
GSM	27	20	23
NADC	24	18.5	21.5
EDGE	23	18	21

Equipment Used: 1036-1029-1064-1065

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 40 %

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth PARA. NO.: 2.1049

TESTED BY: David Light DATE:5/24/2004

Test Results: Complies.

Test Data: See attached plot(s).

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Test Data - Occupied Bandwidth



Dallas Headquarters:

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Nemko Dallas, Inc. **Occupied Bandwidth** Data Plot Page <u>1</u> of <u>4</u> Complete X Job No.: 4L0347/48 Date: ___5/24/2004 Preliminary: Temperature(°C): 22 Specification: PT24 Tested By: Relative Humidity(%) David Light DUAL BAND AMP EHT Configuration: TX FULL POWER Sample Number: 1 Location: Lab 1 RBW: Refer to plots Measurement Detector Type: Peak VBW: Refer to plots Distance: NA Test Equipment Used Directional Coupler: Antenna: Pre-Amp: Cable #1: Filter: Cable #2: 1036 Cable #3: Receiver: Cable #4: Attenuator #1 1064 Attenuator #2: Mixer: Additional equipment used: +/-1.7 dB Measurement Uncertainty: RBL dВ Ref Lvl -12.82 dBm VBW 20 kHz Mixer -10 dBm 1.96071944 GHz 20 dBm SWT 10 s Unit dBm 31.8 dB Offset 82 dBr A .9607 944 GH: 374 MH: 10 1VIEW 1MA EXT - 1 D - 15 -20 -25 200 kHz/ Center 1.96 GHz Span 2 MHz 25.MAY 2004 Date: Notes: 26 dB Bandwidth CDMA

BROADBAND PCS **Test Report No.:** 4L0347RUS2

Test Data - Occupied Bandwidth



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Nemko Dallas, Inc. Data Plot **Occupied Bandwidth** Page <u>1</u> of <u>4</u> Complete X Job No.: 4L0347/48 Preliminary: Specification: PT24 22 Temperature(°C): Tested By: David Light Relative Humidity(%) E.U.T.: DUAL BAND AMP Configuration: Input plots Sample Number: Lab 1 RBW: Refer to plots Location: Measurement Detector Type: Peak VBW: Refer to plots Distance: NA Test Equipment Used Directional Coupler: Antenna: #N/A Pre-Amp: Cable #1: Cable #2: Filter: Receiver: 1036 Cable #3 Attenuator #1 Cable #4: Attenuator #2: Mixer: Additional equipment used: +/-1.7 dB Measurement Uncertainty: Ref Lvl -32.14 dBm -10 dBm VBW 20 kHz Mixer 8.5 dBm 1.96072715 GHz SWT 10 s Un i t dBm 14 dBn Α 48 dB 390 MH: – 1C -20 1VIEW 1 MA -30 -40 -50 -60 -70 -80 Center 1.96 GHz 246 kHz/ Span 2.46 MHz 22.JUN.2004 14:09:48 ate: Notes: Input CDMA

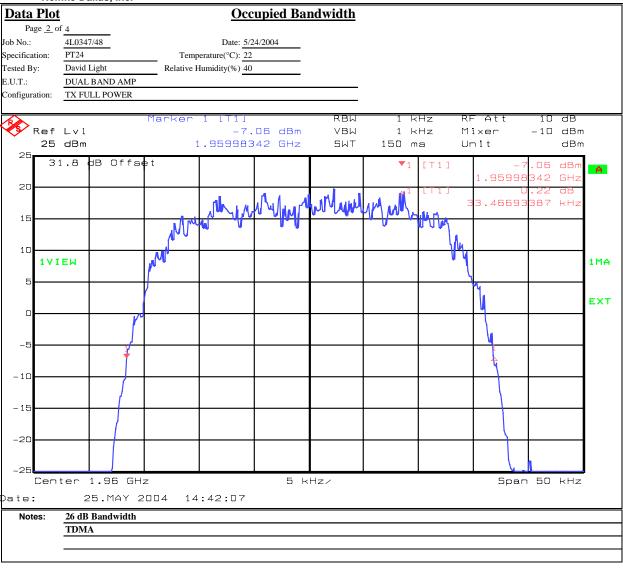
Test Data - Occupied Bandwidth



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EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Test Data - Occupied Bandwidth



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Nemko Dallas, Inc. Data Plot **Occupied Bandwidth** Page 2 of 4 4L0347/48 Date: 6/22/2004 Job No.: Specification: PT24 Temperature(°C): 22 David Light Relative Humidity(%) 40 Tested By: E.U.T.: DUAL BAND AMP Configuration: Input plots кви Ref Lvl -28.78 dBm VBW 1 kHz Mixer -10 dBm 5 dBm 1.96001759 GHz SWT 150 ms Un i t dBm 78 dBm Α .9600 59 GHz White the second 3.5671 kH: 1MA 1 V I EW - 15 -20 -25 -30 -35 -40 -45 Center 1.96 GHz 5 kHz/ Span 50 kHz ate: 22.JUN.2004 14:16:18 Notes: Input TDMA

Test Data - Occupied Bandwidth



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Nemko Dallas, Inc. **Data Plot** Occupied Bandwidth Page <u>3</u> of 4 Job No.: 4L0347/48 Date: 5/24/2004 Specification: PT24 Temperature(°C): 22 Relative Humidity(%) 40 Tested By: David Light E.U.T.: DUAL BAND AMP Configuration: TX FULL POWER RBW 10 dB 3 kHz Ref Lvl 3 kHz -10 dBm 1.21 dB VBW Mixer 25 dBm -308.61723447 kHz SWT 140 ms dBm Unit 25 31.8 dB Offset 66 dBn A 81 20 15 10 1VIEW 1MA EXT - 1 C -15-20 50 kHz/ 1.96 GHz 500 25.MAY 2004 15:33:37 Date: 26 dB Bandwidth GSM

EQUIPMENT: TFAM2332/4

Test Data - Occupied Bandwidth



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Nemko Dallas, Inc. Occupied Bandwidth **Data Plot** Page 3 of 4 4L0347/48 Job No.: Date: 6/22/2004 Temperature(°C): 22 Specification: PT24 Tested By: Relative Humidity(%) 40 David Light E.U.T.: DUAL BAND AMP Configuration: Input plots Ref Lvl -29.06 dBm VBW 3 kHz Mixer -10 dBm 3.5 dBm 1.96015782 GHz SWT 140 ms Unit dBm 3.5 06 A .05 dB [T1] -101 V I E W 1MA -15 -20 -25 -30 -35 46.5 1.96 GHz 50 kHz/ Span 500 ate: 22.JUN.2004 14:20:54 Notes: Input GSM

4L0347RUS2

EQUIPMENT: TFAM2332/4 Test Report No.:

Test Data - Occupied Bandwidth



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Nemko Dallas, Inc. Test Plot: Occupied Bandwidth Page <u>4</u> of 4 4L0347/48 Job No.: Date: 5/24/2004 Specification: PT24 Temperature(°C): 22 Tested By: David Light Relative Humidity(%) 40 E.U.T.: DUAL BAND AMP Configuration: TX FULL POWER 3 kHz Ref Lv1 -17.40 dBm VBW3 kHz Mixer -10 dBm 15 dBm 1.96014780 GHz SWT 140 ms Unit dBm 31.8 dB Offset 40 dBr A 9601 80 GHz 10 237 kHz 1VIEW 1MA EXT - 1C -15-20 -25 -30 -35 1.96 GHz 50 kHz/ Span 500 kHz Center 25.MAY 2004 15:41:30 Date: Notes: EDGE 26 dB Bandwidth

Test Data - Occupied Bandwidth



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Nemko Dallas, Inc. Occupied Bandwidth **Test Plot:** Page <u>4</u> of 4 4L0347/48 Job No.: Date: 6/22/2004 Specification: PT24 Temperature(°C): 22 Tested By: Relative Humidity(%) 40 David Light E.U.T.: DUAL BAND AMP Configuration: Input plots 🧞 Ref Lvl -33.02 dBm VBW 3 kHz Mixer -10 dBm 0 dBm 1.96015381 GHz SWT 140 ms Unit dBm GHz 645 kHz – 1 C - 15 1VIEW 1MA -20 -25 -30 -35 -40 -45 -50 Span 500 kHz 50 kHz/ Center 22.JUN.2004 14:32:30 Notes: **EDGE** Input

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals PARA. NO.: 2.1051

TESTED BY: David Light DATE:5/24/04

Test Results: Complies.

Test Data: See attached plot(s).

Note: Spurious emission testing was performed on three channels (high, mid and low). The data presented for mid channel is representative of all measurements as no emissions were detected above the noise floor.

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Test Data – Spurious Emissions at Antenna Terminals

(N)	Nem	ko

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Nemko Dallas, Inc. **Spurious Emissions at Antenna Terminals** Data Plot Page <u>1</u> of <u>3</u> Complete X Job No.: 4L0347/48 Date: ___5/24/2004 Preliminary: Temperature(°C): 22 PT24 Specification: Tested By: Relative Humidity(%) David Light DUAL BAND AMP EHT Configuration: TX FULL POWER Sample Number: 1 Location: Lab 1 RBW: Refer to plots Measurement Detector Type: Peak VBW: Refer to plots Distance: NA Test Equipment Used Directional Coupler: Antenna: Pre-Amp: Cable #1: #N/A Filter: Cable #2: 1036 Cable #3: Receiver: Cable #4: Attenuator #1 1065 Attenuator #2: Mixer: Additional equipment used: +/-1.7 dB Measurement Uncertainty: RBW Ref Lvl -10 dBm 11.16 dBm VBW 30 kHz Mixer 30 dBm 1.93125000 GHz SWT 14 ms Unit dBm 31.8 dB Offset 16 dBr MIT CHE A .9312 10 1VIEW 1MA -10EXT -20 Marin Manual John الالالالالا -30 -50 -60 Center 1.93 GHz 500 kHz/ Span 5 MHz 25.MAY 2004 14:02:51 Notes: Tx @ 1931.25 and 1933 MHz - 17 dBm per carrier 20 dBm Composite CDMA

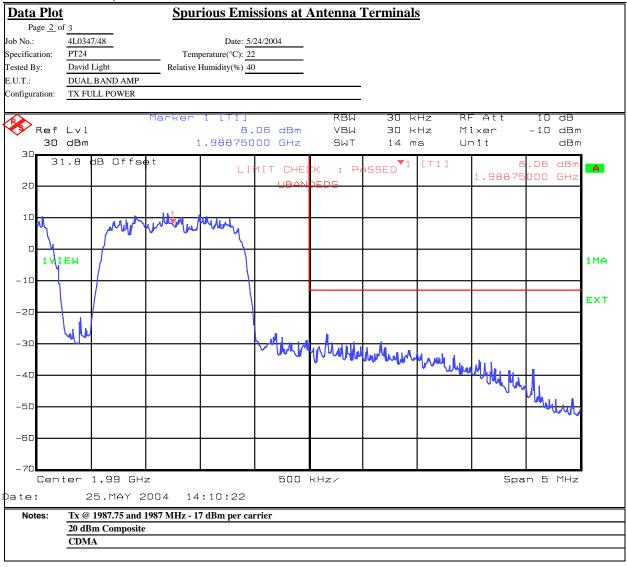
Test Data – Spurious Emissions at Antenna Terminals



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Nemko Dallas, Inc. **Data Plot Spurious Emissions at Antenna Terminals** Page $\underline{3}$ of $\underline{3}$ 4L0347/48 Job No.: Date: 5/24/2004 Specification: PT24 Temperature(°C): 22 Relative Humidity(%) 40 Tested By: David Light E.U.T.: DUAL BAND AMP Configuration: TX FULL POWER RBW 1 MHz RF Att 10 dB Ref Lvl 26.90 dBm VBW 1 MHz -10 dBm Mixer 30 dBm 1.95096192 GHz SWT 200 ms Unit dBm 30 31.8 †dB Offs∉t [T1] A .95098 192 GH: 20 10 1 V I EW 1MA - 10 dBm-EXT -20 -30 -40 -50 -60 Start 30 MHz 1.997 GHz/ Stop 20 GHz 25.MAY 2004 14:18:23 Date: Single CDMA carrier at 21 dBm out Notes:

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Test Data – Spurious Emissions at Antenna Terminals



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Nemko Dallas, Inc. **Spurious Emissions at Antenna Terminals** Data Plot Page <u>1</u> of <u>3</u> Complete X Job No.: 4L0347/48 Date: ___5/24/2004 Preliminary: Temperature(°C): 22 Specification: PT24 Tested By: Relative Humidity(%) David Light DUAL BAND AMP EHT Configuration: TX FULL POWER Sample Number: 1 Location: Lab 1 RBW: Refer to plots Measurement Detector Type: Peak VBW: Refer to plots Distance: NA Test Equipment Used Directional Coupler: Antenna: Pre-Amp: Cable #1: Filter: Cable #2: Cable #3: Receiver: Cable #4: Attenuator #1 1064 Attenuator #2: Mixer: Additional equipment used: +/-1.7 dB Measurement Uncertainty: RBL 10 dB Ref Lvl VBW 3 kHz Mixer -10 dBm 30 dBm SWT dBm 560 ms Unit 30 31.8 dB Offset Α IIT CHE 10 1VIEW 1MA -10**EXT** -20 -30 -40 -50 -60 black marketist black with the 200 kHz/ Center 1.93 GHz Span 2 MHz 25.MAY 2004 15:26:11 Date: Notes: Tx @ 1930.2 and 1930.7 MHz - 20 dBm per carrier 23 dBm Composite GSM

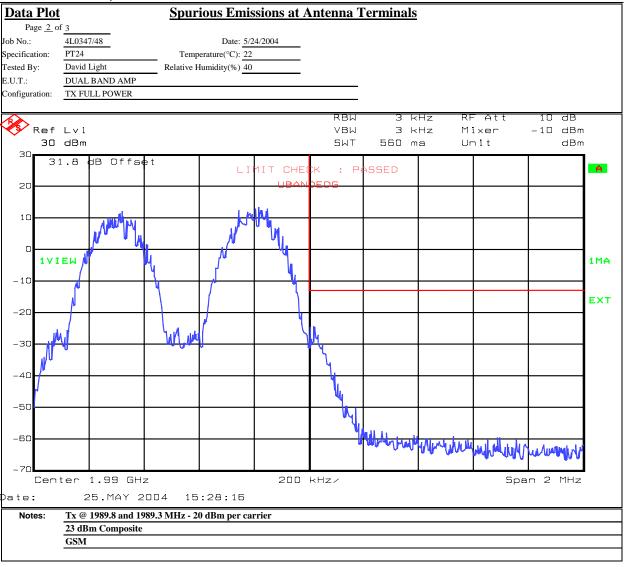
Test Data – Spurious Emissions at Antenna Terminals



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Test Data - Spurious Emissions at Antenna Terminals



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Nemko Dallas, Inc. **Data Plot Spurious Emissions at Antenna Terminals** Page <u>3</u> of <u>3</u> 4L0347/48 Job No.: Date: 5/24/2004 Specification: PT24 Temperature(°C): 22 Relative Humidity(%) 40 Tested By: David Light E.U.T.: DUAL BAND AMP Configuration: TX FULL POWER RBW 1 MHz 10 dB RF Att Ref Lvl VBW 26.72 dBm 1 MHz Mixer-10 dBm 30 dBm 1.96000000 GHz SWT 200 ms Unit 31.8 dB Offset [T1] . 72 dBr A .96000 20 10 1VIEW 1MA -10 **EXT** -20 -30 -40 -50 -60 Start 30 MHz 1.997 GHz/ Stop 20 GHz 25.MAY 2004 15:30:39 Date: Single GSM carrier at 27 dBm out Notes:

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Test Data – Spurious Emissions at Antenna Terminals



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Nen	nko Dall	as, Inc.									
Data Plot			Spuri	ious Emis	sions at	Antenna T	Гегтіпа	ls			
Page <u>1</u> o Job No.: Specification: Tested By:			Tempe	Date:erature(°C):lumidity(%)	5/24/2004				ete X		
E.U.T.:		AND AMP	_			•					
Configuration:	_	L POWER									
Sample Number:	1										
Location:	Lab 1				RBW:	Refer to plots		Measurem			
Detector Type:	Peak				VBW:	Refer to plots		Distan	ce: NA	m	
Test Equipm	ent Used	I									
Antenna:				Direction	onal Coupler:						
Pre-Amp:		_			Cable #1:	#N/A					
Filter:		_			Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1064				Cable #4:						
Attenuator #2:	1065				Mixer:						
Additional equip											
Measurement Ur	ncertainty:	+/-1.7 d	В								
R)						RBU	3	kHz	RF Att	10 dB	
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	ter 1	.93 GHz	z		200) kHz/			5p	an 2 MHz	
Date:		MAY 2		:49:04							
Notes:	Tx @ 19	30.2 and 19	30.7 MHz - 18	dBm per ca	rrier						
		Composite									
	EDGE			·							

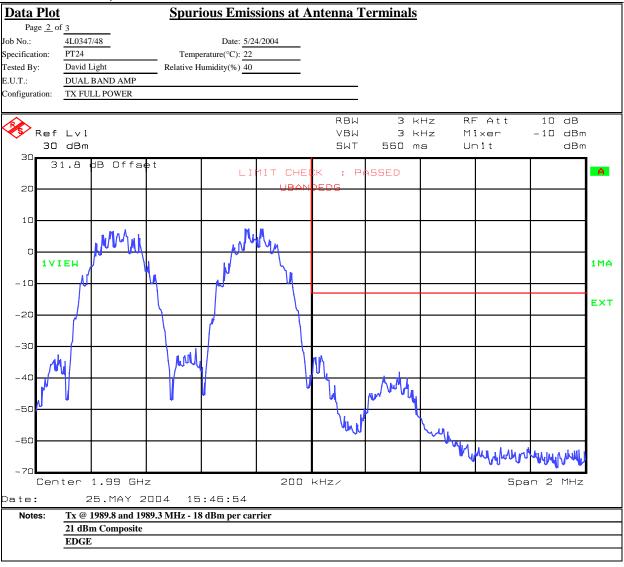
Test Data – Spurious Emissions at Antenna Terminals



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Nemko Dallas, Inc. **Data Plot Spurious Emissions at Antenna Terminals** Page <u>3</u> of <u>3</u> 4L0347/48 Job No.: Date: 5/24/2004 Specification: PT24 Temperature(°C): 22 Relative Humidity(%) 40 Tested By: David Light E.U.T.: DUAL BAND AMP Configuration: TX FULL POWER RBW 1 MHz RF Att 10 dB Ref Lvl 22.78 dBm VBW 1 MHz Mixer -10 dBm 30 dBm 1.96000200 GHz SWT 200 ms Unit 31.8 dB Offset [T1] .78 dBn Α GHz 20 10 1VIEW 1MA - 1C -D 1 dBm-EXT -20 -30 -40 -50 -60 Start 30 MHz 1.997 GHz/ Stop 20 GHz 25.MAY 2004 15:50:32 Date: Single EDGE carrier at 23 dBm out Notes:

Test Data – Spurious Emissions at Antenna Terminals



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Nen	nko Dalla	s, Inc.								, ,			
Data Plot			Spur	ious Emi	ssions at	Ante	nna 🛚	Ferminals					
Page 1 of	f <u>3</u>								Comple Preliminar	te X			
Job No.:	4L0347/48			Date:	5/24/2004	_			Preliminar	y:			
Specification:	PT24			erature(°C):	22	_							
Tested By:	David Ligh	t	Relative F	Humidity(%)	40	_							
E.U.T.:	DUAL BAI	ND AMP											
Configuration:	TX FULL I	POWER											
Sample Number:	1												
Location:	Lab 1	_			RBW:	Refer to	plots		Measureme				
Detector Type:	Peak	_			VBW:	Refer to	plots		Distanc	e: NA	n	n	
Test Equipme	ent Used												
Antenna:		_		Direct	ional Coupler:								
Pre-Amp:		_			Cable #1:	#N/	/A						
Filter:		_			Cable #2:								
Receiver:	1036	_			Cable #3:								
Attenuator #1	1064	_			Cable #4:								
Attenuator #2:	1065				Mixer:								
Additional equip	ment used:												
Measurement Un	certainty:	+/-1.7 d	В										
<u> </u>							RBU	1 K	Hz F	F At	ŧ	10 dB	
Ref	Lvl						VBW	1 ₭		lixer		-10 dBm	1
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-70	Maddada	Morrison	V	m~Wall	Ĩ								
Cen:	ter 1.	93 GHz			100	kHz	./				Spa	n 1 MHz	
Date:	25.	MAY 2	004 14	:59:23									
Notes:	Tx @ 193	0.03 and 1	930.3 MHz -	18 dBm per o	carrier								
	21 dBm C	omposite											
	TDMA							· · · · · · · · · · · · · · · · · · ·					

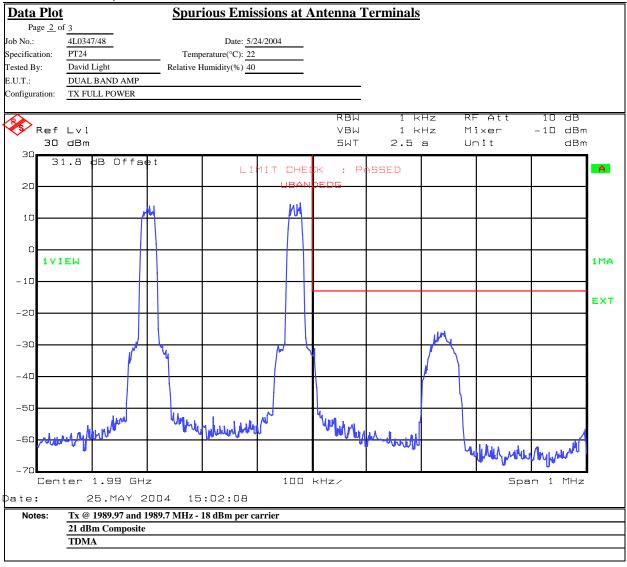
Test Data – Spurious Emissions at Antenna Terminals



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Test Data – Spurious Emissions at Antenna Terminals



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Nemko Dallas, Inc. **Data Plot Spurious Emissions at Antenna Terminals** Page <u>3</u> of <u>3</u> 4L0347/48 Job No.: Date: 5/24/2004 Specification: PT24 Temperature(°C): 22 Relative Humidity(%) 40 Tested By: David Light E.U.T.: DUAL BAND AMP Configuration: TX FULL POWER RBW 1 MHz 10 dB RF Att Ref Lvl 26.94 dBm VBW 1 MHz -10 dBm Mixer 30 dBm 1.99098196 GHz SWT 200 ms Unit 30 31.8 ♥B Offset [T1] 94 dBm A .99098 .96 GH: 20 10 1 V I EW 1MA - 10 EXT -20 -30 -40 -50 -60 1.997 GHz/ Start 30 MHz Stop 20 GHz 25.MAY 2004 15:03:38 Date: Single TDMA carrier at 24 dBm out Notes:

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions PARA. NO.: 2.1051

TESTED BY: David Light DATE:5/27/04

Test Results: Complies.

Test Data: There were no emissions detected above the noise floor, which was

more than 20 dB below the specification limit of -13 dBm.

The device was tested at 3 frequencies, Low, Mid and High

Equipment Used: 1464-1484-1485-1016-1304

Measurement Uncertainty: +/-1.7 dB

Temperature: 20 °C

Relative Humidity: 40 %

Photographs of Test Setup





Nemko Dallas FCC PART 24, SUBPART E

BROADBAND PCS

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability PARA. NO.: 2.1055

TESTED BY: David Light DATE:5/27/04

Test Results: Complies.

Measurement Data: See attached table.

Standard Test Frequency: 1960 MHz Standard Test Voltage: -48 Vdc

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

Test Data - Frequency Stability



Nemko Dallas, Inc.

Dallas Headquarters:

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

	Frequency Stability			
f <u>1</u>				
4L0347	Date: 5/27/2004			
PT24	Temperature(°C): 20			
David Light	Relative Humidity(%) 45			
	Dual Band Amp			
	TX CENTER BAND			
1				
	Test Equipment Used			
	Directional Coupler:			
	Cable #1:	1042		
	Cable #2:			
1026				
1064				
17				
1×10^{-1} ppm	Standard Test Frequency	1960.000000	MHz	
	4L0347 PT24 David Light	f 1 4L0347 Date: 5/27/2004 PT24 Temperature(°C): 20 David Light Relative Humidity(%) 45 Dual Band Amp TX CENTER BAND 1 Test Equipment Used Directional Coupler: Cable #1: Cable #2:	f 1 4L0347	f 1 4L0347

T (0	Measured	Rho	Test	Frequuncy	Limit	Error	
Temp (^o	Frequency (MHz)		Voltage	Error (Hz)	(+/-Hz)	(ppm)	Comment
20	1960.000000		-48	0	2940.0	0.0	
20	1960.000000		-56.2	0	2940.0	0.0	
20	1960.000000		-40.8	0	2940.0	0.0	
50	1960.000000		-48	0	2940.0	0.0	
40	1960.000000		-48	0	2940.0	0.0	
30	1960.000000		-48	0	2940.0	0.0	
10	1960.000000		-48	0	2940.0	0.0	
0	1960.000000		-48	0	2940.0	0.0	
-10	1960.000000		-48	0	2940.0	0.0	
-20	1960.000000		-48	0	2940.0	0.0	
-30	1960.000000		-48	0	2940.0	0.0	
Note	es:			_			

EQUIPMENT: TFAM2332/4

Section 8. Test Equipment List

Nemko 1D.	Description .	Manufactuter Model Number	Serial Number	Dalibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/26/04	03/26/05
1042	CABLE, 4M	STORM PR90-010-144	N/A	09/02/03	09/01/04
1064	ATTENUATOR	NARDA 776B-20	NONE	CBU	N/A
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	02/11/03	02/11/05
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	07/24/03	07/23/04
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	07/24/03	07/23/04
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	10/27/03	10/26/04
283	Environmental Chamber with controller # 1189006	ENVIROTRONICS SH27 & 2030-22844	129010083	05/06/04	05/06/05
1065	ATTENUATOR	NARDA 776B-10	NONE	CBU	N/A

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ANNEX A - TEST DETAILS

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EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

NAME OF TEST: RF Power Output PARA. NO.: 2.1046

Minimum Standard: Para. No.24.232. Base stations are limited to 1640 watts peak

E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100

watts.

Method Of Measurement:

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:

Test Method: TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to an isotropic. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic.

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

NAME OF TEST: Occupied Bandwidth PARA. NO.: 2.1047

Minimum Standard: Para. No. 24.238(b). The emission bandwidth is defined as the

width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of

which all emissions are attenuated at least 26 dB.

Method Of Measurement:

CDMA

Spectrum analyzer settings:

RBW: 30 kHz VBW: ≥ RBW Span: 5 MHz Sweep: Auto

Mask: Set markers to -26 dB from peak of CW.

<u>GSM</u>

RBW: 3 kHz VBW: ≥ RBW Span: 2 MHz Sweep: Auto

Mask: Set markers to -26 dB from peak of CW.

<u>NADC</u>

RBW: 1 kHz VBW: ≥ RBW Span: 1 MHz Sweep: Auto

Mask: Set markers to -26 dB from peak of CW.

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

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

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's

frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Method Of Measurement:

Spectrum analyzer settings:

<u>CDMA</u> <u>GSM</u>

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)

 $VBW: \ge RBW$ $VBW: \ge RBW$ Sweep: Auto Sweep: Auto

Video Avg: 6 Sweeps Video Avg: Disabled

NADC

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 3 kHz (< 1 MHz from Band Edge)

VBW: ≥ RBW Sweep: Auto

Video Avg: Disabled

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

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

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's

frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Test Method: TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to an isotropic. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic.

EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

NAME OF TEST: Frequency Stability PARA. NO.: 2.1055

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to

ensure that the fundamental emission stays within the authorized

frequency block.

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. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. 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 frequency is measured in 30 second intervals for a period of 5 minutes.

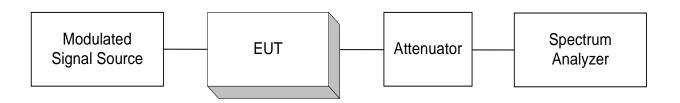
EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

ANNEX B - TEST DIAGRAMS

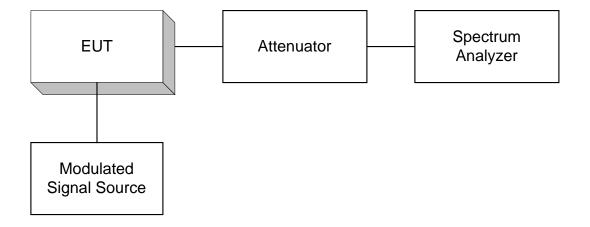
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EQUIPMENT: TFAM2332/4 Test Report No.: 4L0347RUS2

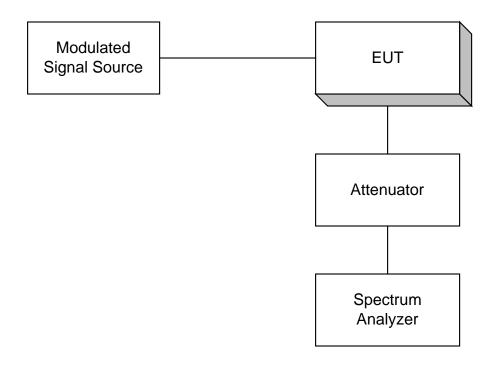
Para. No. 2.985 - R.F. Power Output

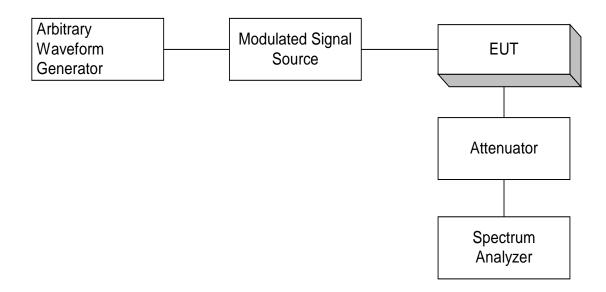


Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



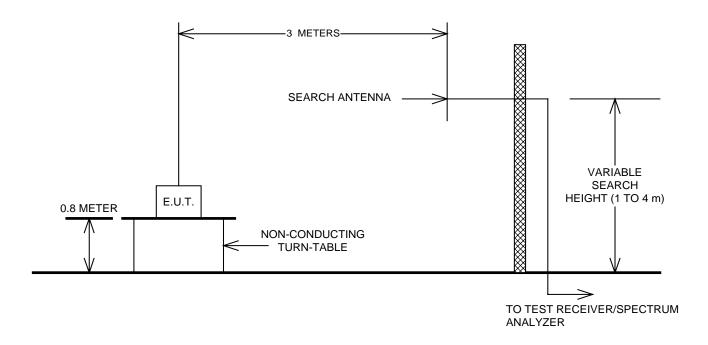


Test Report No.:

4L0347RUS2

EQUIPMENT: TFAM2332/4

Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

