

**Retlif Testing Laboratories** 

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## REPORT OF MEASUREMENTS for

## CELLULAR SPECIALTIES, INC. DIGITAL REPEATER

## MODEL: CSI-DSP95-255-AW

#### FCC ID: NVRCSIDSP95255AW IC: 4307A-DSP95255AW

Company Name:	Cellular Specialties, Inc.
Date of Report:	October 20, 2011
Test Report No:	R-5522N
Test Start Date:	October 3, 2011
Test Finish Date:	October 13, 2011
Test Technician:	M. Seamans
Laboratory Supervisor:	T. Hannemann
Report Prepared By:	J. Ramsey
Test Technician: Laboratory Supervisor:	M. Seamans T. Hannemann

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#### **CERTIFICATION AND SIGNATURES**

We certify that this report is a true report of the results obtained from the tests of the equipment stated and relates only to the equipment tested. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

Jesto Wenter

Scott Wentworth Branch Manager NVLAP Approved Signatory

Todd Hannemann Laboratory Supervisor iNARTE Certified ATL-0255-T

#### **Non-Warranty Provision**

The testing services have been performed, findings obtained, and reports prepared in accordance with generally accepted testing laboratory principles and practices. This warranty is in lieu of all other warranties, either express or implied.

#### Non-Endorsement

This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement, or certification of the product or material tested. This report must not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the U.S. Government.



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### **CERTIFICATION APPLICATION SUMMARY**

Applicant/Manufacturer:	Cellular Specialties 670 North Commercial Street Manchester, NH 03101
Equipment under Test (EUT):	The EUT is a Digital Repeater System operating in the AWS band
Model:	CSI-DSP95-255-AW
FCC ID Number:	NVRCSIDSP95255AW
IC Certification Number:	4307A-DSP95255AW
Applicable Test Standards:	FCC Parts 2 & 27, RSS-131, Issue 2
Measurement Procedure:	ANSI/TIA-603-C-2004 RSS-131, Issue 2
Device Classification:	Mobile
EUT Frequency Range Band:	Uplink: 1710 MHz to 1755 MHz Downlink: 2110 MHz to 2155MHz
Power Output Rating for Certification Grant based on RMS Channel Power	Uplink (WCDMA): 0.608W Uplink (LTE): 0.606W Downlink (WCDMA): 3.88W Downlink (LTE): 2.95W
Modulation Types:	WCDMA (F9W), LTE (F9W)
RF Exposure + Antenna Installation:	See Attached Installation/Users Manual and MPE Evaluation
Measurements Required by FCC:	See Report Section 1 (Summary of Test Program) and the following Test Report Data Attachments:
	<ul> <li>RF Power Output (27.50)</li> <li>Occupied Bandwidth (2.1049)</li> <li>Spurious Emissions at Antenna Terminals (27.53)</li> <li>Effective Radiated Power of Spurious Radiation (27.53)</li> <li>Intermodulation Characteristics</li> <li>Frequency Stability (27.54)</li> </ul>
Additional Measurements Required	5
	<ul> <li>Mean Output Power</li> <li>Passband Gain &amp; Bandwidth</li> <li>Spurious Emissions (two tone)</li> </ul>
	<b>Retlif Testing Laboratories</b>

#### SECTION 1 SUMMARY OF TEST PROGRAM

#### **RF POWER OUTPUT**

Measurement Procedure:

The RF Power Output test was performed using RMS composite channel power measurements. The measurements were taken with the AGC turned off at maximum output power with all spurious emissions below the -13dBm limit. Testing was repeated with LTE modulation. The measured output power matched the manufacturer's rated output power. See attached test data.

#### OCCUPIED BANDWIDTH

Measurement Procedure:

For Occupied Bandwidth, measurements were made to compare the input signal to the output signal. The signal generator output was connected to the spectrum analyzer. A WCDMA modulation signal was then applied to the carrier. Waveforms were then noted on an X-Y plot. Next, the signal generator was connected to the EUT and the output of the EUT was connected to the spectrum analyzer. The output waveform after amplification was then compared to the original input signal to ensure that no significant differences occurred between the input signal and the amplified signal. Testing was performed at three frequencies within each passband (uplink and downlink). Testing was repeated with LTE Modulation. See Occupied Bandwidth Data.

#### SPURIOUS EMISSIONS AT ANTENNA TERMINALS

#### Measurement Procedure:

The signal generator output was connected in turn to the uplink and downlink input ports of the EUT. The input power level was at the maximum level which was ascertained during the Power Output test. A spectrum analyzer was connected to the output of the EUT. The input test frequencies used were three frequencies (low, mid & high) within each passband (uplink and downlink). The level of any spurious emission was recorded. Testing was performed in the frequency range of 30MHz to 22GHz. Testing was performed for both WCDMA and LTE modulation types. The spurious emissions limit is -13dBm as specified in FCC Part 27. All emissions were below the specified - 13dBm limit. See attached test data.



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#### EFFECTIVE RADIATED POWER OF SPURIOUS RADIATION

#### Measurement Procedure:

The test sample was placed on an 80cm high wooden test stand which was located 3 meters from the test antenna on an FCC listed test site. A signal generator was connected to the input of the amplifier. The signal generator output was set to provide the input power level necessary to achieve maximum output power of the amplifier at 3 frequencies (low, mid & high) within each passband (uplink and downlink). The effective radiated power of each out of band spurious emission was measured using the substitution method specified in ANSI/TIA-603-C-2004. The frequency range of the test was 30MHz - 22GHz. The limit for out of band spurious emissions is -13dBm as specified in Part 27. All emissions were below the specified -13dBm limit. See attached test data.

#### INTERMODULATION CHARACTERISTICS (TWO TONE)

#### Measurement Procedure:

Two signals were injected, in turn, to each uplink and downlink frequency band via a two way power combiner. Due to the bandwidth of the modulated signals testing was performed with the two signals centered in the passband instead of at both the upper and lower band edges. The output of each signal generator was adjusted so that the two output fundamental frequencies were equal in magnitude. Testing was performed for WCDMA & LTE Modulation types. At the maximum specified input power levels all intermodulation products were at -13dBm or below. See attached test data.

#### FREQUENCY STABILITY MEASUREMENTS

#### Measurement Procedure:

The test sample does not perform band translation or contain frequency determining components however frequency stability was performed at the manufacturer's specified operating temperature range of 0 degrees C to +50 degrees C. The test sample was placed into a temperature chamber with the AC input power supplied through a variable power source. A signal generator was used to provide the input signal and the output was measured with a frequency counter. With the test sample operating at maximum output power the test sample's output frequency was measured and recorded at the extremes of the temperature range and at 10 degree increments from -0 degrees C to +50 degrees C while the AC input voltage was varied from 85 to 115% of nominal. The output frequency for both the uplink and downlink stayed within the assigned frequency band. See attached test data.



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#### MEAN POWER OUTPUT (RSS-131)

#### Measurement Procedure:

Two signals were injected, in turn, to each uplink and downlink frequency band via a two way power combiner so that the two input signals were equal in magnitude. A spectrum analyzer was connected to the test sample output. The frequencies of the two input signals were adjusted so that they and the  $3^{rd}$  order intermodulation frequencies were within the passband of the test sample. The level of the input signals were increased until either of the intermodulation products equaled -13dBm. The mean output power (Pmean) was calculated using the formula (Pmean = P01 + 3dB). Testing was performed for WCDMA & LTE Modulation types. The Pmean did not exceed the manufacturers rated output power. See attached test data.

#### PASSBAND GAIN & BANDWIDTH (RSS-131)

#### Measurement Procedure:

A signal generator output was connected in turn to the uplink and downlink input ports of the EUT. A spectrum analyzer was connected to the output of the EUT. With the internal gain of the test sample set to nominal the 20dB bandwidth (point where the gain has fallen by 20dB) of the EUT was measured and recorded. The gain versus frequency response of the amplifier from the mid-band frequency (f0) of the passband up to at least f0  $\pm$  250% of the 20dB bandwidth was measured and recorded. See Passband Gain & Bandwidth Data.

#### SPURIOUS EMISSIONS (RSS-131)

#### Measurement Procedure:

Spurious emissions from the EUT were measured using the two tone method specified for the Mean Power Output measurement with the two tones set to the required levels. A spectrum analyzer configured with a resolution bandwidth of 100kHz was used to measure spurious emissions in the frequency range of 30MHz to 5 times the highest passband frequency. All emissions were below the specified -13dBm limit. See attached test data.



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#### SECTION 2 EQUIPMENT LISTS

### Spurious Radiated Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1232	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5GHz	8449B	5/10/2011	5/10/2012
3258	EMCO	DOUBLE RIDGED GUIDE ANTENNA	1 GHZ - 18GHZ	3115	1/12/2011	1/12/2012
4029	RETLIF	OPEN AREA TEST SITE	3 / 10 Meters	RNH	8/21/2009	8/21/2012
5070	ROHDE & SCHWARZ	E EMI TEST RECEIVER	20 Hz - 40 GHz	ESIB40	1/20/2011	1/20/2012
5152	GENERAL TECHNICS	S Control Computer		INDUSTRIAL PC	No Calibrati	on Required
8165	EMCO	BICONILOG	26 - 2000 MHz	3142	6/13/2011	6/13/2012
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	6/4/2010	6/4/2012

### Mean Power Output

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1345 5026A	NARDA NARDA	ATTENUATOR 20DB ATTENUATOR	DC - 18GHz DC - 11 GHz	776B-30 768-20	8/10/2010 1/11/2011	11/10/2011 1/11/2012
5070 5137	ROHDE & SCHWARZ	EMI TEST RECEIVER	20 Hz - 40 GHz DC - 11 GHz	ESIB40 768-10	1/20/2011 10/8/2010	1/20/2012 11/8/2011
R442	AGILENT / HP	Vector Signal Generator	100 kHz - 3 GHz	N5182A	1/15/2011	1/15/2013

### **RF** Power Output

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1345	NARDA	ATTENUATOR	DC - 18GHz	776B-30	8/10/2010	11/10/2011
5026A	NARDA	20DB ATTENUATOR	DC - 11 GHz	768-20	1/11/2011	1/11/2012
5070	ROHDE & SCHWARZ	E EMI TEST RECEIVER	20 Hz - 40 GHz	ESIB40	1/20/2011	1/20/2012
5137	NARDA	10DB ATTENUATOR	DC - 11 GHz	768-10	10/8/2010	11/8/2011
R442	AGILENT / HP	Vector Signal Generator	100 kHz - 3 GHz	N5182A	1/15/2011	1/15/2013

### Frequency Stability

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
4997	OMEGA	DIGITAL THERMOMETER		UNKNOWN	8/11/2011	8/11/2012
5013	POWERSTAT	VARIAC	0-140 V, 10 A, 60 Hz	116B	No Calibrat	ion Required
5049B	FLUKE	DIGITAL MULTIMETER	True RMS Multimeter	111	8/10/2011	8/10/2012
5077	ASSOCIATED ENVIRONME	TEMPERATURE CHAMBER	-50 to 150 C	ZFD-531	8/11/2010	11/11/2011
R442	AGILENT / HP	Vector Signal Generator	100 kHz - 3 GHz	N5182A	1/15/2011	1/15/2013
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	6/4/2010	6/4/2012



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## Occupied Bandwidth

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1345	NARDA	ATTENUATOR	DC - 18GHz	776B-30	8/10/2010	11/10/2011
5026A	NARDA	20DB ATTENUATOR	DC - 11 GHz	768-20	1/11/2011	1/11/2012
R442	AGILENT / HP	Vector Signal Generator	100 kHz - 3 GHz	N5182A	1/15/2011	1/15/2013
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	6/4/2010	6/4/2012

## Spurious Emissions Antenna Ports

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1345	NARDA	ATTENUATOR	DC - 18GHz	776B-30	8/10/2010	11/10/2011
5026A	NARDA	20DB ATTENUATOR	DC - 11 GHz	768-20	1/11/2011	1/11/2012
R442	AGILENT / HP	Vector Signal Generator	100 kHz - 3 GHz	N5182A	1/15/2011	1/15/2013
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	6/4/2010	6/4/2012

#### Passband Gain and Bandwidth

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1345	NARDA	ATTENUATOR	DC - 18GHz	776B-30	8/10/2010	11/10/2011
4895	AGILENT / HP	SPECTRUM ANALYZER	9kHz - 22GHz	8593EM	12/23/2010	12/23/2011
5026A	NARDA	20DB ATTENUATOR	DC - 11 GHz	768-20	1/11/2011	1/11/2012
5137	NARDA	10DB ATTENUATOR	DC - 11 GHz	768-10	10/8/2010	11/8/2011
5150	DELL	Control Computer		Optiplex 755	No Calibrat	ion Required
R442	AGILENT / HP	Vector Signal Generator	100 kHz - 3 GHz	N5182A	1/15/2011	1/15/2013



# **Retlif Testing Laboratories**



Test Setup, Front



Test Setup, Back



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Horizontal Antenna Polarization, 30 to 1000 MHz



Vertical Antenna Polarization



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Horizontal Antenna Polarization, 1 to 18 GHz



Vertical Antenna Polarization, 1 to 18 GHz



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Antenna Polarization, 18 to 26 GHz



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ERP



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#### **SETUP PHOTOGRAPH**

#### **OCCUPIED BANDWIDTH & SPURIOUS EMISSIONS AT ANTENNA TERMINALS**



Test Setup



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#### SETUP PHOTOGRAPH RF POWER OUTPUT, INTERMODULATION CHARACTERISTICS & MEAN POWER

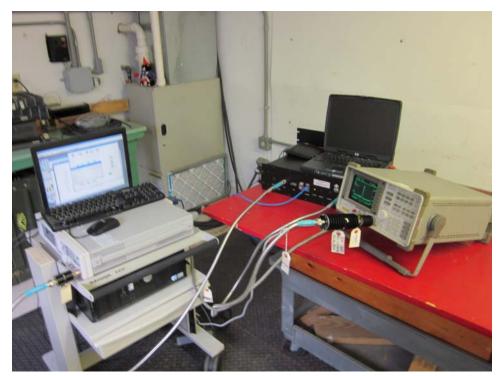


Test Setup



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#### SETUP PHOTOGRAPH PASSBAND GAIN



Test Setup



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### SETUP PHOTOGRAPH FREQUENCY STABILITY



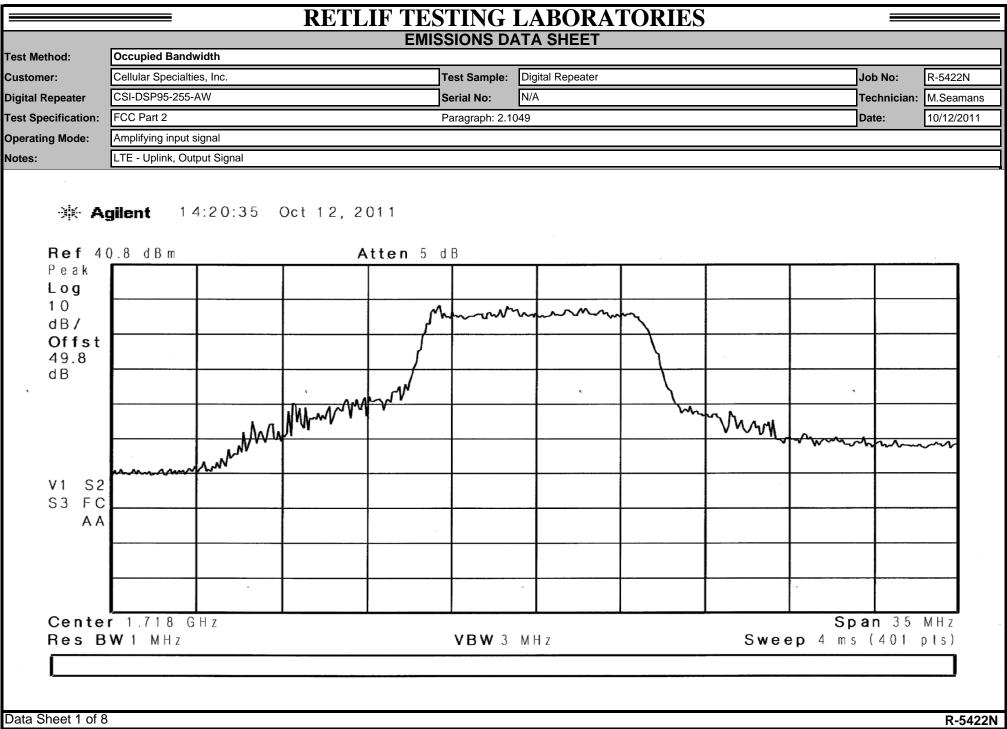
Test Setup



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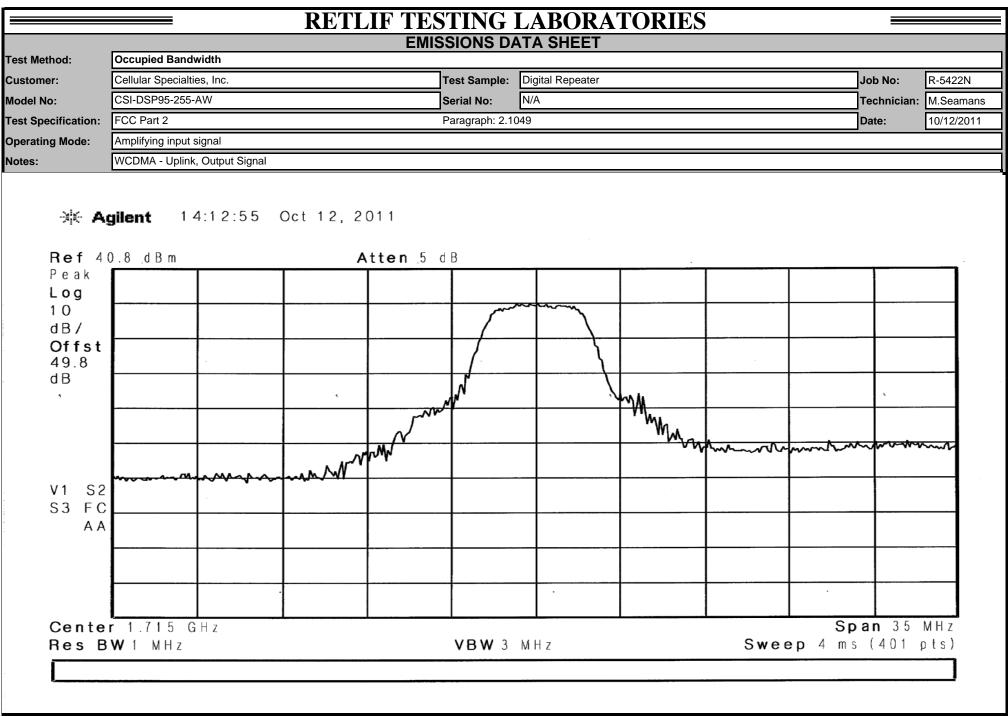
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Teet Metheel			.4	IABUL	AR DATA	SHEET					
Test Method:		RF Power Ou				7	D. SSOON				
Customer:		Cellular Spec				Job No:	R-5522N				
Test Sample:		Digital Repea	iter								
Model No:		CSI-DSP95-2	255-AW			Serial No:	N/A				
Test Specifica	tion:	FCC Part 2				Paragraph:	2 10/6				
Operating Mod	de:	Amplifying inp	out signal			Falagiapii.	2.1040				
Technician:		M.Seamans				Date:	10/3/2011				
Notes:		Uplink Frequency Range: 1710-1755 MHz Downlink Frequency Range: 2110-2155 MHz Modulation: LTE									
NOLES.		Oplink Preque	ency Range. I	710-1755 10112	Downiink	Frequency R	ange. 2110-213				
Test	Measured										
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(Downlink) Low										+	
2123.00	34.70	2951.21									
(Downlink) High											
2140.00	35.38	3451.4									
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Customer:		Cellular Spec				Job No:	R-5522N				
						JOD NO:	R-9922N				
Test Sample:		Digital Repea	iter								
Model No:		CSI-DSP95-2	255-AW			Serial No:	N/A				
Test Specifica	tion:	FCC Part 2				-					
						Paragraph:	2.1046				
Operating Mo	de:	Amplifying inp	out signal								
Technician:		M Seamans				Data	10/3/2011				
Notes:			M.Seamans     Date:     10/3/2011       Uplink Frequency Range: 1710-1755 MHz     Downlink Frequency Range: 2110-2155 MHz     Modulation: WCDMA								
NOLES.			ency Range. I	710-1755 10112	DOWININK	Fiequency R	ange. 2110-213				
Test	Measured										
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(Uplink) High											
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(Downlink) Low											
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2118.00	35.95	3935.50									
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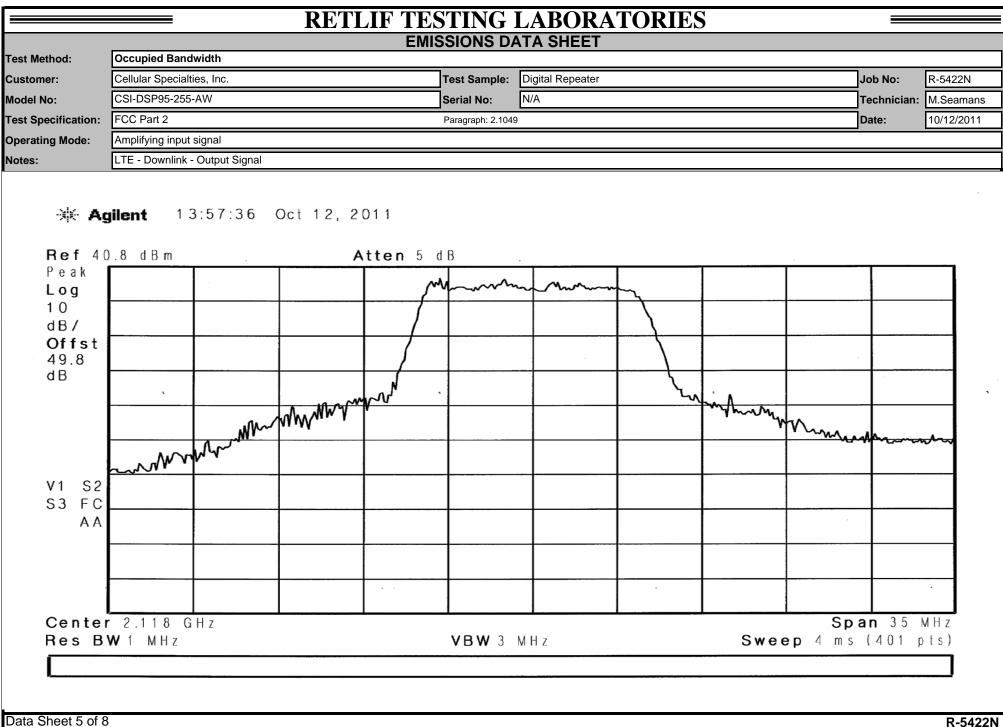


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ier:	Cellular Special				Test Sample:	Digital Repeater				Job No:	R-5422
lo:	CSI-DSP95-255	-AVV			Serial No:	N/A				Technician:	
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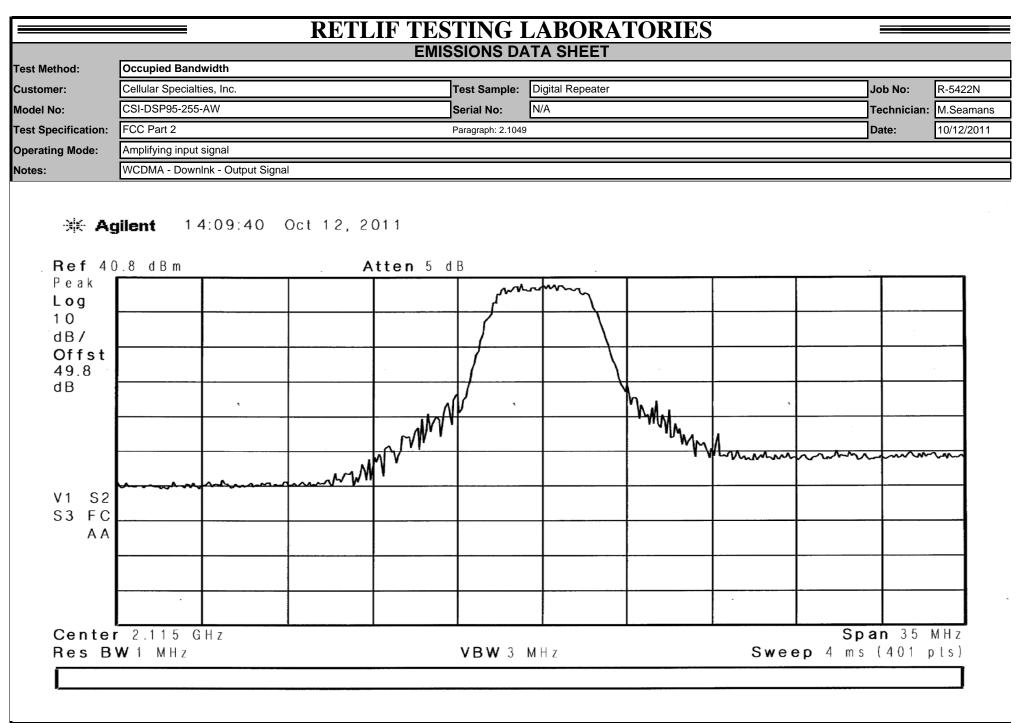
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mer:	Cellular Special				Test Sample:	Digital Repeater				Job No:	R-5422		
No:	CSI-DSP95-255					N/A				Technician:			
pecification:	FCC Part 2				Paragraph: 2.10					Date:	10/12/2		
ting Mode:	Amplifying input	signal								Date.	10/12/2		
:	WCDMA - Uplink, Input Signal												
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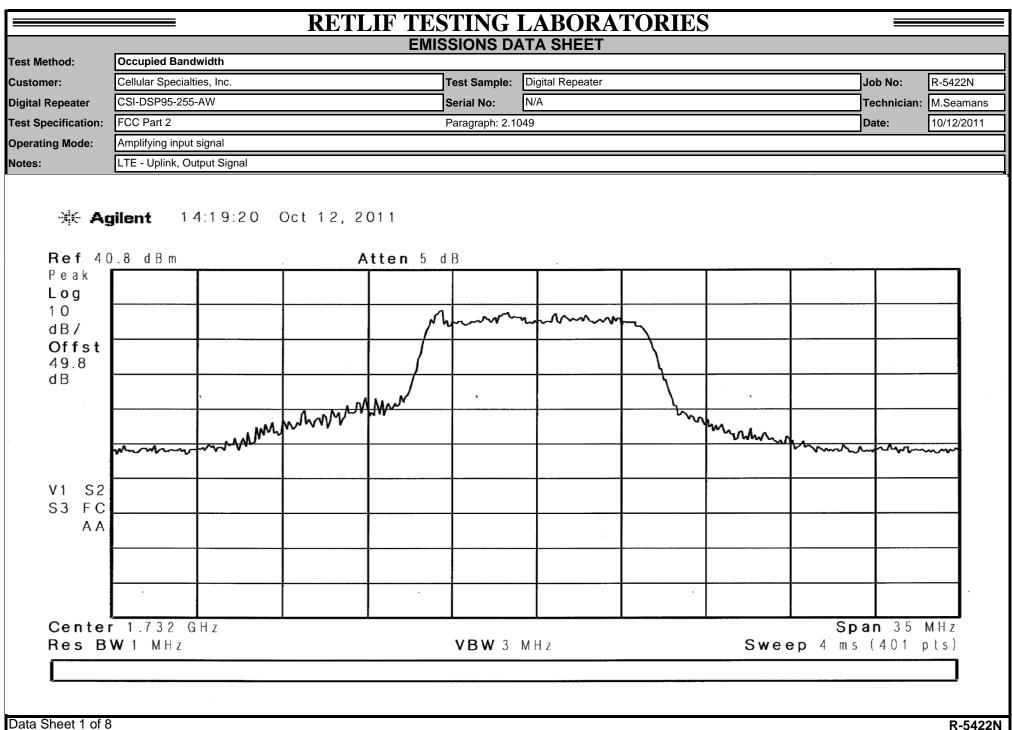
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No:	CSI-DSP95-255-	AW		ę	Serial No:	N/A				Technician:			
pecification:	FCC Part 2			F	Paragraph: 2.1049					Date:	10/12/		
ing Mode:	Amplifying input signal												
	LTE - Downlink - Input Signal												
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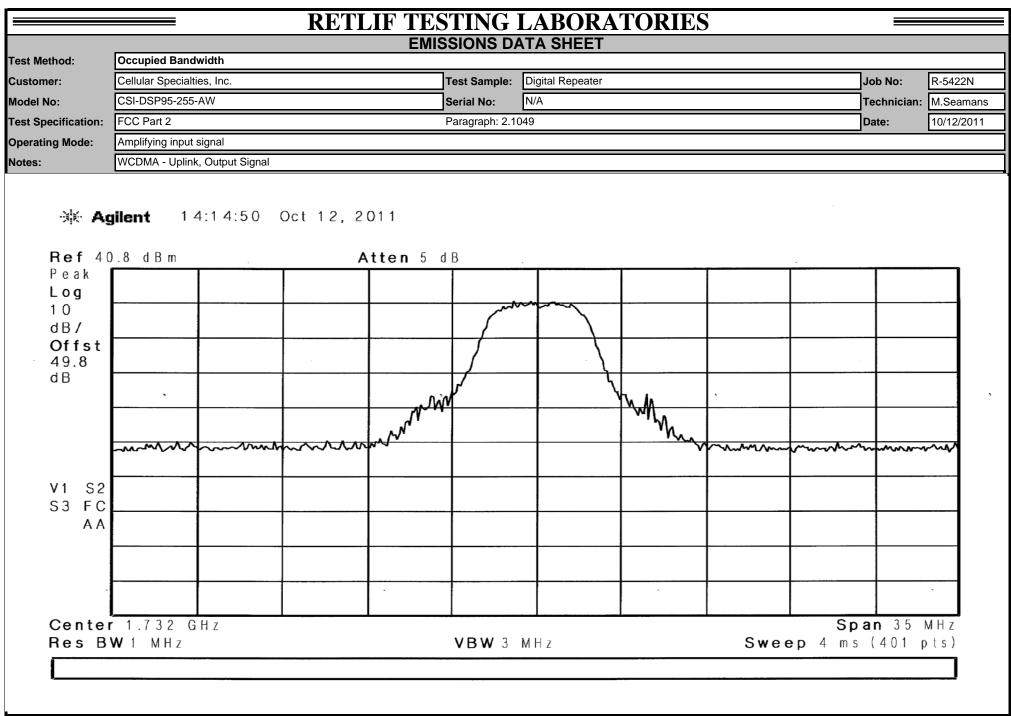
	EMISSIONS DATA SHEET												
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mer:	Cellular Specialt					Digital Repeater			Job N				
No:	CSI-DSP95-255-	-AW			Serial No:	N/A				ician: M.Sear			
pecification:	FCC Part 2	-i			Paragraph: 2.1049				Date:	10/12/2			
ting Mode:	Amplifying input signal WCDMA - Downlink - Input Signal												
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V1 S2													
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									- F	·			

Data Sheet 8 of 8



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lethod:	Occupied Band	dwidth				ATA SHEET							
mer:	Cellular Special	ties, Inc.			Test Sample:	Digital Repeater				Job No:	R-542		
No:	CSI-DSP95-255	5-AW			Serial No:	N/A				Technician:	M.Sea		
pecification:	FCC Part 2				Paragraph: 2.1	049				Date:	10/12/		
ting Mode:	Amplifying input signal       LTE - Uplink, Input Signal												
	<b>jilent</b> 1 42 dBm	4:36:51		011 .tten 0	d B			<b>-</b>					
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V1 S2													
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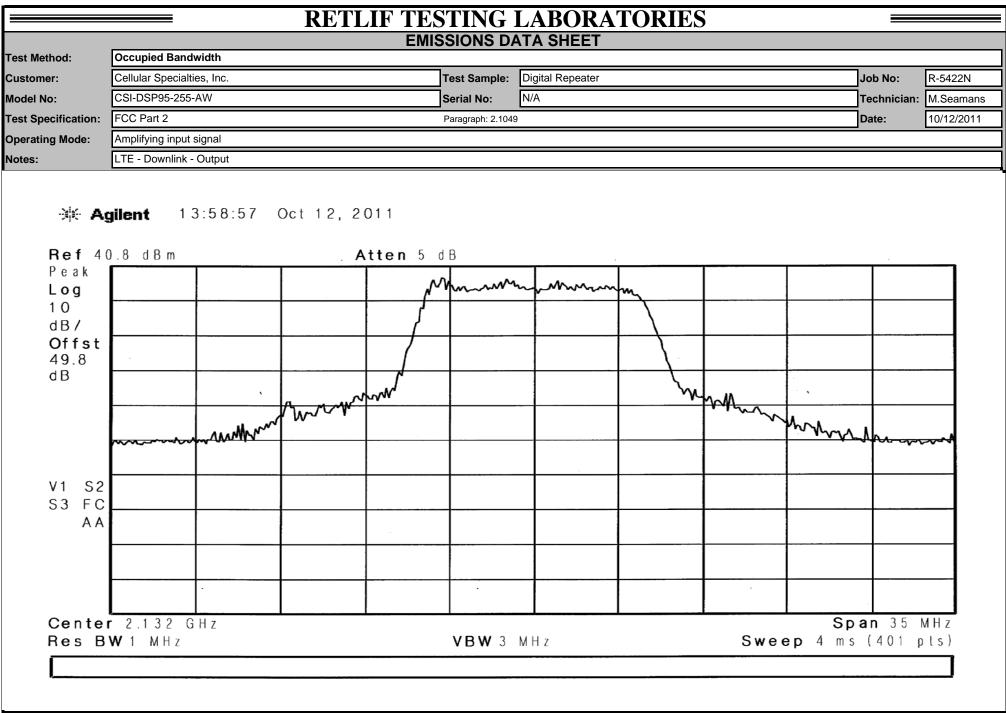


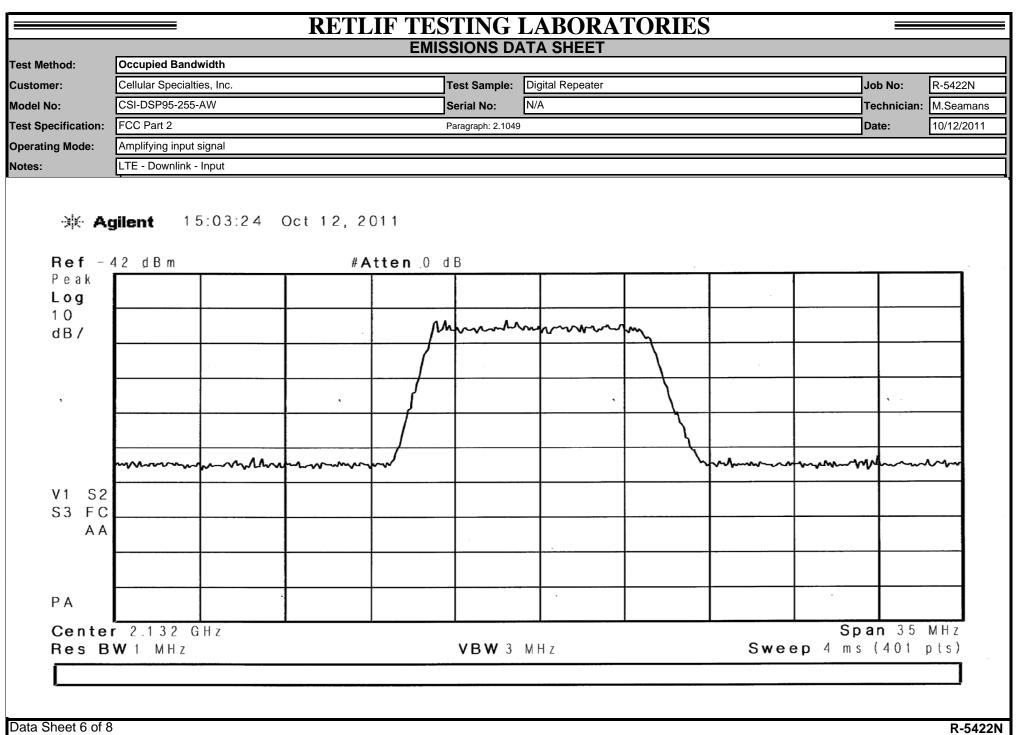
Data Sheet 3 of 8

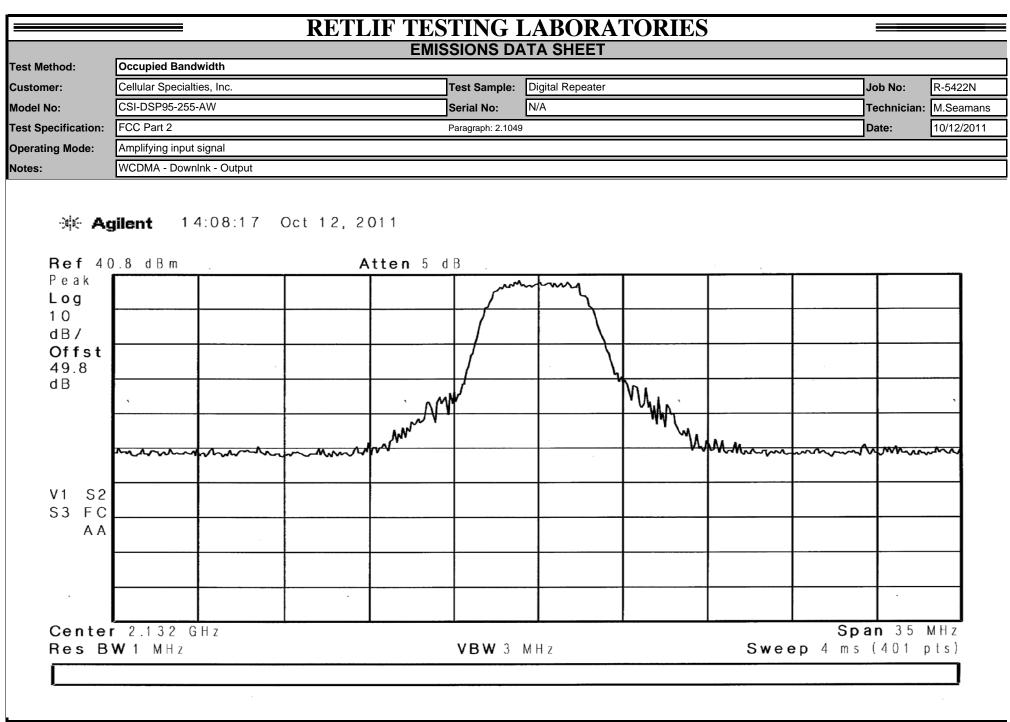
R-5422N

	EMISSIONS DATA SHEET												
ethod:	Occupied Band					<b></b>							
ner:	Cellular Specialti				est Sample:	Digital Repeater				ob No:	R-5422		
No:	CSI-DSP95-255-	-AW			erial No:	N/A				echnician:			
ecification:	FCC Part 2			P	aragraph: 2.10	049			D	ate:	10/12/2		
ing Mode:	Amplifying input												
	WCDMA - Uplink	k, Input Signal											
	gilent 1. 42 dBm	4:41:53 (		011 tten 0 d	В		<u>.</u>			-			
Peak <b>Log</b>													
10													
dB/													
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					-/	+							
		•			/				`				
					/								
	mm	·····	mm	mmm			theman	how	m	man	m		
V1 S2													
S3 FC										<u> </u>			
ΑA													
ΡΑ													
Cente	r 1.732 G	L							Spa	n 35	MНz		
	W 1 MHz				<b>VBW</b> 3	МНZ		Swee	ep 4 ms				
									-				
l													

Data Sheet 4 of 8

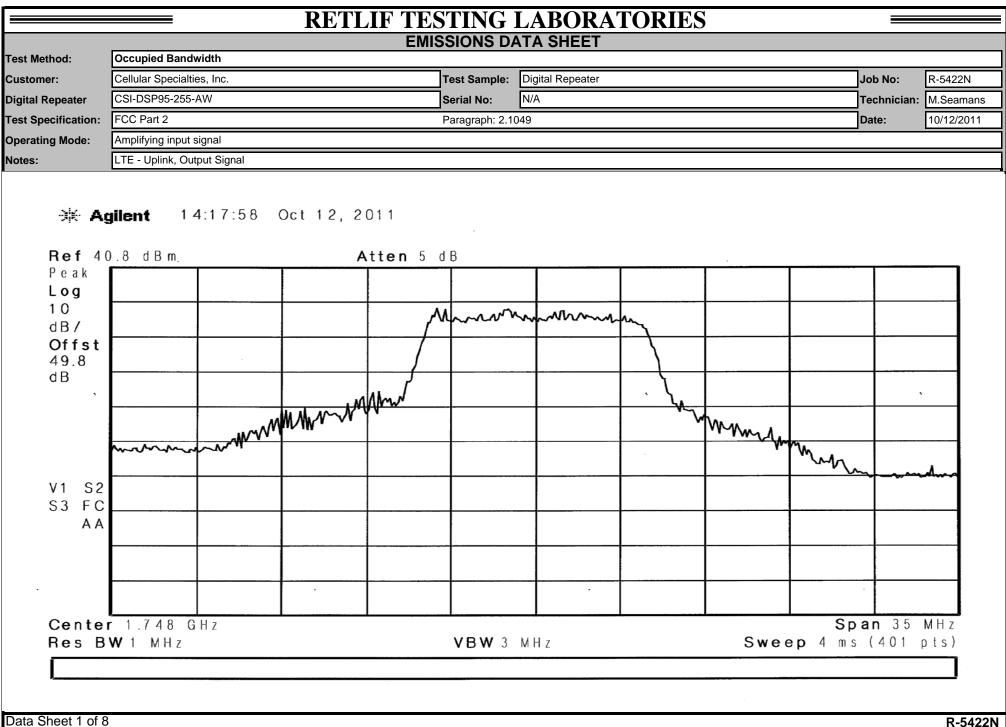


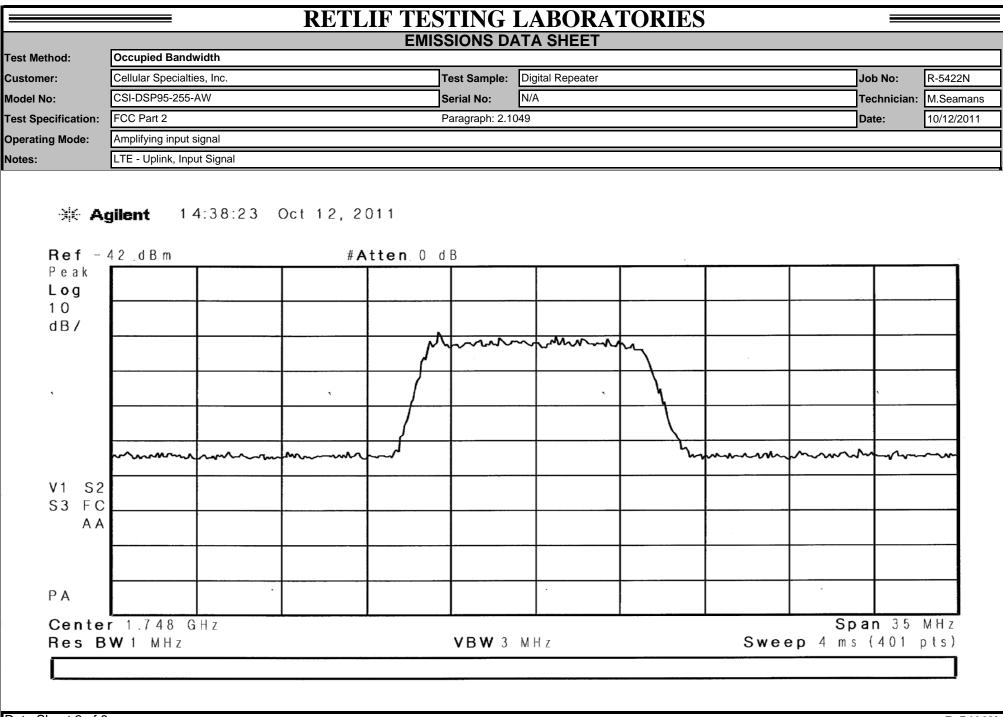


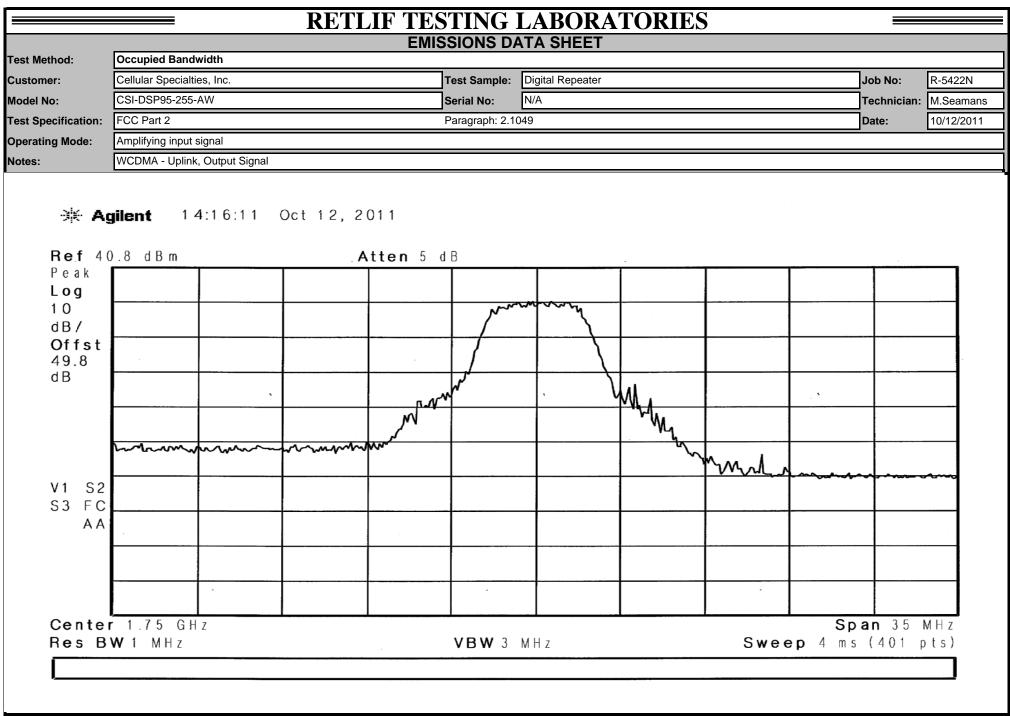


	EMISSIONS DATA SHEET													
thod:	Occupied Bandwidth													
er:	Cellular Specia	lties, Inc.			Test Sample:	Digital Repeater				Job No:	R-5422			
lo:	CSI-DSP95-25	5-AW			Serial No:	N/A				Technician:	M.Sean			
ecification:	FCC Part 2				Paragraph: 2.1049	)				Date:	10/12/2			
ng Mode:	Amplifying inpu													
	WCDMA - Dow	nlink - Input												
Ref -	<b>gilent</b> 1 42 dBm	4:46:07 0		011 .tten 0 d	I B		·							
Peak														
L <b>og</b> 10														
dB/					<i>سر</i>									
			7											
					V		<u> </u>							
	man	man	mm	m	4		mm	marin	fanan	from	~~~			
V1 S2									-					
S3 FC						-								
AA														
										1				
ΡA														
Cente	r 2.132	G H z					1		LSp:	an 35	И Н <i>7</i>			
	W 1 MHz				<b>VBW</b> 3	МНz		Swe	ep 4 ms					

Data Sheet 8 of 8

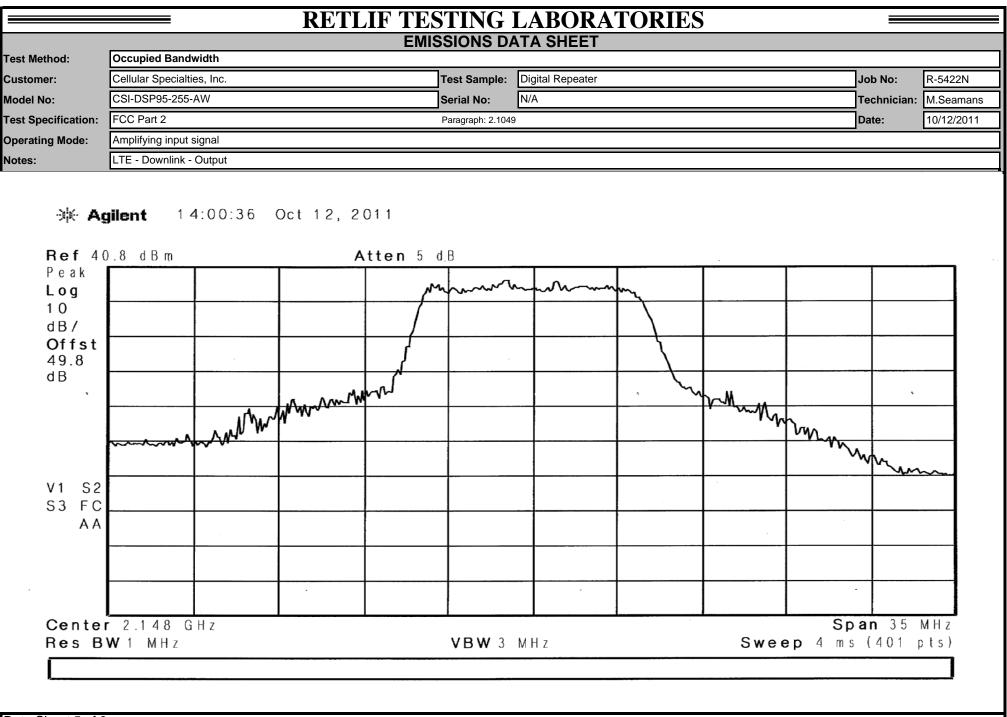


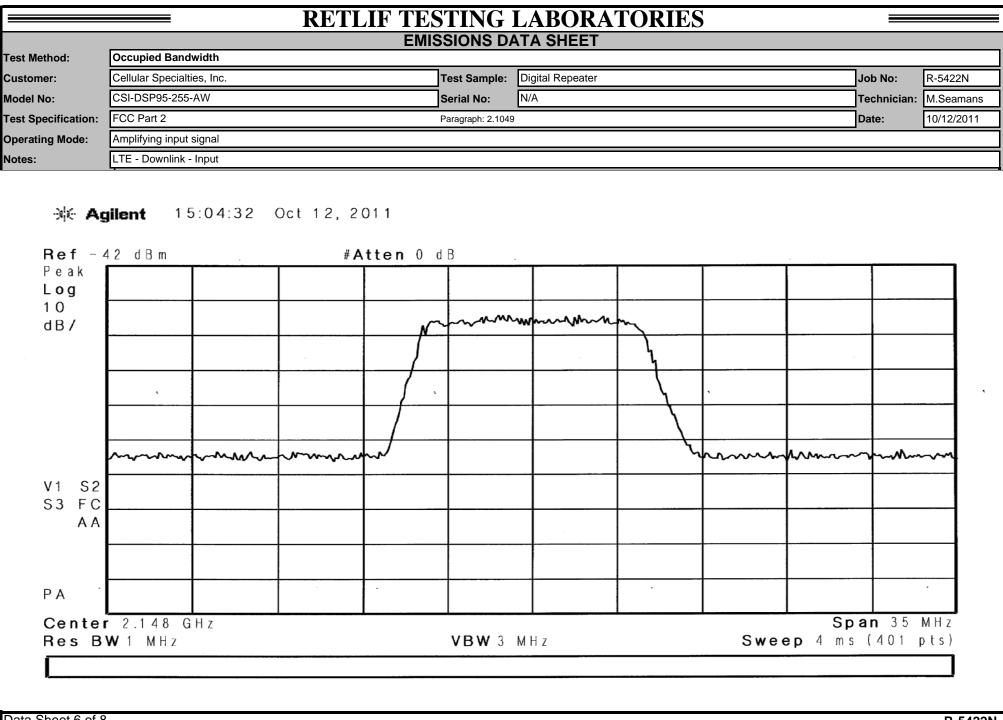


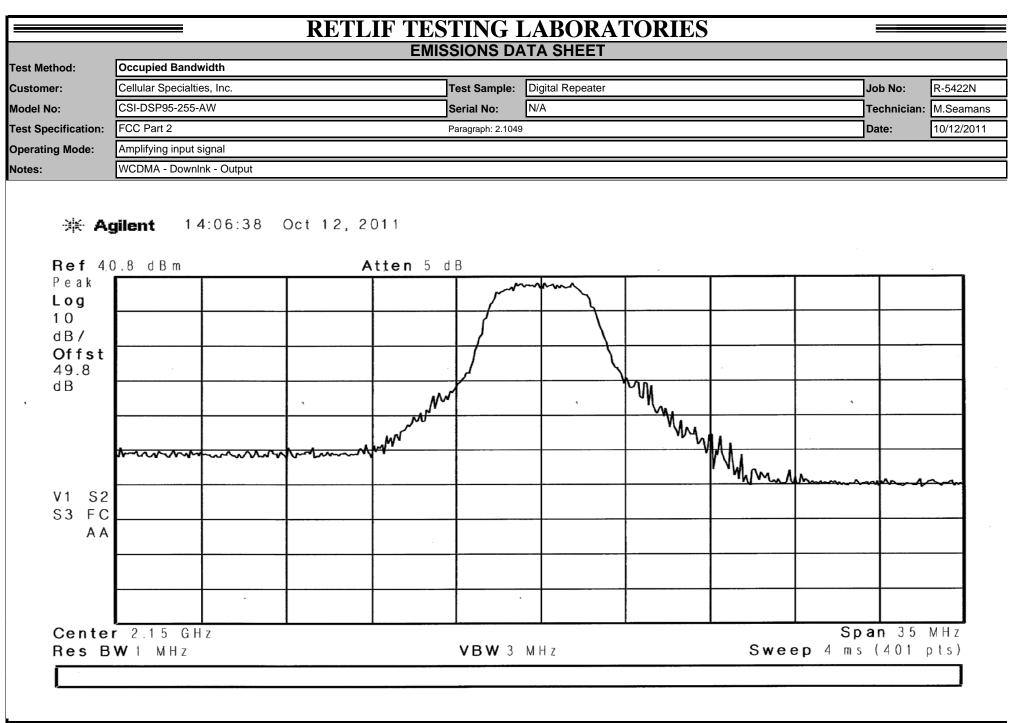


Data Sheet 3 of 8

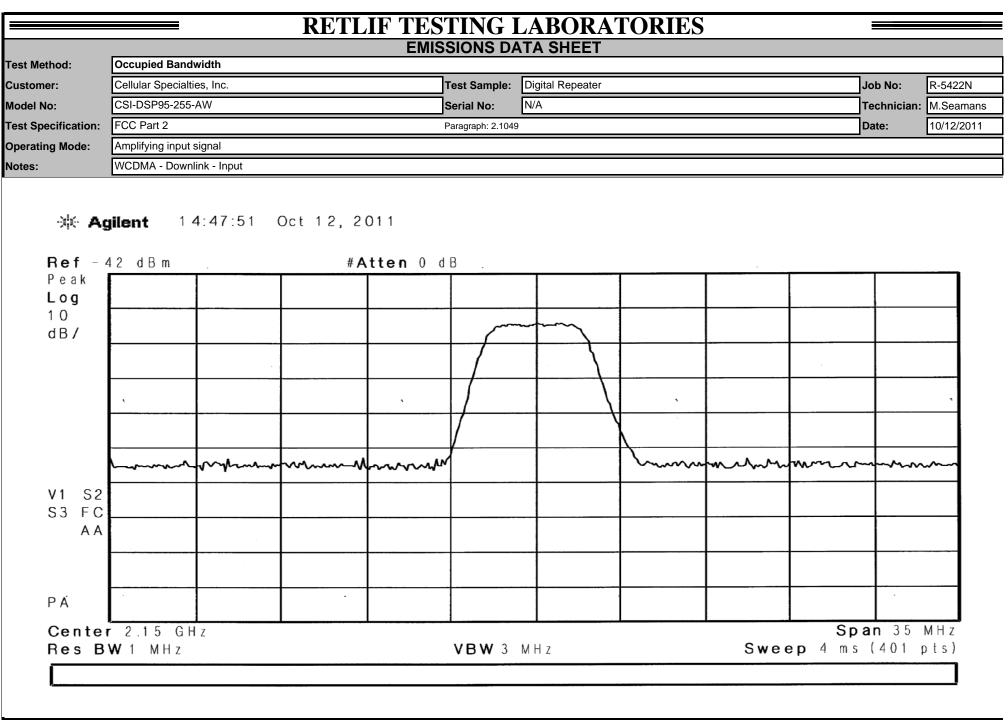
				EMIS	SIONS DA	ATA SHEET					
lethod:	Occupied Bandy	width									
mer:	Cellular Specialtie	es, Inc.			Test Sample:	Digital Repeater				Job No:	R-542
No:	CSI-DSP95-255-	AW			Serial No:	N/A			·	Technician:	M.Sea
specification:	FCC Part 2				Paragraph: 2.10	049				Date:	10/12/
ting Mode:	Amplifying input	-									
:	WCDMA - Uplink	, Input Signal									
Ref - 4	<b>jilent</b> 12 42 dBm	4:40:31 (		011 . <b>tten</b> 0 d	IB .						
Peak Log											
10										_	
dB/											
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	· mana popular	_^~~~^~	Ama	mm	1		hann	mann	mm	mm	~~~~
V1 S2											
S3 FC											
AA											-
						· · ·					
				*							
PA .				•							-
Cente	r 1.75 GH	Z			1				Sp	<b>an</b> 35	МНz
	₩1 MHz				<b>VBW</b> 3	МНZ		Swee	ep 4 ms	(401 p	ots)







Data Sheet 7 of 8



Data Sheet 8 of 8

							ATOR			
-					DNS DAT	-				
Test Method	1:	Spurious En	nissions at t	he Antenna	Ferminals 30	MHz to 22 GI				
Customer:		Cellular Spec	ialties, Inc.			Job No:	R-5522N			
Test Sample	):	Digital Repea	ater							
Model No:		CSI-DSP95-2	255-AW			Serial No:	N/A			
Test Specifi	cation.	FCC Part 2					L			
root opcom	oution					Paragraph: 2	2.1051			
Operating M	lode:	Amplifying in	out signal							
Technician:		M.Seamans				Date:	10/13/2011			
Notes:		Uplink Freque	ency: 1710-1	755 MHz	Downlink	Frequency:	2110-2155 MH	lz		
		LTE modulati								
Uplink	Test		Reading	Limit	Downlink	Test		Reading	Limit	
Input Signal	Frequency	Frequencies			Input Signal	Frequency	Frequencies	6		
dBm	MHz	MHz	dBm	dBm	dBm	MHz	MHz	dBm	dBm	<u></u>
-62.00	1718.00				-54.00	2118.00				<u> </u>
	1	3436.00	-21.67	-13.0	1	1	4236.00	-22.46	-13.0	
1	I	5154.00	-22.67	1	I	I	6354.00	-23.63		
I	I	6872.00	-23.05	I	I	I	8472.00	-21.61	I	1
I	I	8590.00	-20.53	I	I	I	10590.00	-22.48	I	1
Ι	I	10308.00	-22.42	I	I	l	12708.00	-22.57	I	
I	I	12026.00	-22.43	1	I	I	14826.00	-21.97	I	1
I	I	13744.00	-21.51	I	I	I	16944.00	-21.32	I	1
I	I	15462.00	-21.99	I	I	I	19062.00	-22.94	I	1
-62.00	1718.00	17180.00	-22.76	-13.0	-54.00	2118.00	21180.00	-21.57	-13.0	
-62.00	1732.50				-54.00	2132.50				
I	I	3465.00	-21.97	-13.0	I	I	4265.00	-22.69	-13.0	
I	I	5197.50	-23.66	I	I		6397.50	-22.42	I	
I	I	6930.00	-23.20	I	I	1	8530.00	-21.74	I	
I	I	8662.50	-21.71	I	I	I	10662.50	-22.75	I	
<u> </u>		10395.00	-22.11	I	I		12795.00	-22.52	-	
		12127.50	-21.76		1		14927.50	-21.92		ł
<u> </u>		13860.00	-22.48	1		1	17060.00	-21.33	1	
l	1722.50	15592.50	-21.92	12.0	 54.00	2122.50	19192.50	-22.89	12.0	1
-62.00	1732.50	17325.00	-22.15	-13.0	-54.00	2132.50	21325.00	-21.32	-13.0	
-62.00	1748.00				-54.00	2147.00				ł
1	17 40.00	3496.00	-21.77	-13.0	1	1	4294.00	-22.80	-13.0	<u> </u>
	1	5244.00	-23.77	10.0	· ·		6441.00	-23.48	10.0	<u> </u>
I		6992.00	-22.99	1		· · ·	8588.00	-21.68	· ·	<u> </u>
		8740.00	-21.27		· ·		10735.00	-23.42		<u> </u>
I		10488.00	-22.23				12882.00	-22.59		1
I	I	12236.00	-22.14	I	I	I	15029.00	-21.35	I	<u> </u>
I	I	13984.00	-20.62	I	I	I	17176.00	-21.46	I	
I	I	15732.00	-21.48	I	I	I	19323.00	-22.10	I	
-62.00	1748.00	17480.00	-21.58	-13.0	-54.00	2147.00	21470.00	-21.51	-13.0	
Data Shee	et 1 of 1									R-5522I

							ATOR			
					DNS DAT	-				
Test Method	l:	Spurious En	nissions at t	he Antenna 1	Ferminals 30	MHz to 22 G	Hz			
Customer:		Cellular Spec	ialties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repea	ter							
Model No:		CSI-DSP95-2	255-AW			Serial No:	N/A			
Test Specifie	cation:	FCC Part 2								
						Paragraph: 2	2.1051			
Operating M	ode:	Amplifying in	out signal							
Technician:		M.Seamans				Date:	10/13/2011			
Notes:		Uplink Freque	encv: 1710-1	755 MHz	Downlink	Frequency:	2110-2155 MH	lz		
		WCDMA mod	-		s are noise floo			-		
Uplink	Test		Reading	Limit	Downlink	Test		Reading	Limit	
Input Signal	Frequency	Frequencies	Ū.		Input Signal	Frequency	Frequencies	0		
dBm	MHz	MHz	dBm	dBm	dBm	MHz	MHz	dBm	dBm	1
-62.00	1712.00				-54.00	2112.00				
I	I	3424.00	-28.91	-13.0	I	I	4224.00	-22.48	-13.0	1
I	Ι	5136.00	-30.54	I	I	I	6336.00	-22.77	Ι	
Ι	I	6848.00	-28.51	I	I	I	8448.00	-22.25	I	
Ι	Ι	8560.00	-27.34	l	I	I	10560.00	-23.04	I	
Ι	-	10272.00	-27.68		I		12672.00	-21.47	_	
Ι	-	11984.00	-29.10		I		14784.00	-21.32	-	
I	Ι	13696.00	-26.59	I	I		16896.00	-21.24	Ι	
I	I	15408.00	-25.73	I	I	1	19008.00	-22.25	1	
-62.00	1712.00	17120.00	-26.76	-13.0	-54.00	2112.00	21120.00	-21.99	-13.0	
	1700 50				= 1.00					
-62.00	1732.50	0.405.00	00.00	40.0	-54.00	2132.50	1005.00	00.07	40.0	-
1	1	3465.00 5197.50	-28.62	-13.0	1	1	4265.00 6397.50	-22.37 -22.98	-13.0	
1	I	6930.00	-29.97 -28.49	1	1	1	8530.00	-22.90		+
1	1	8662.50	-28.32		1	1	10662.50	-23.45	1	-
		10395.00	-28.49	1	1	1	12795.00	-23.43	1	+
	I	12127.50	-27.19				14927.50	-20.72		1
1	1	13860.00	-26.10		1	1	17060.00	-21.30	1	
Ι	I	15592.50	-25.96	I	I	I	19192.50	-23.09	I	
-62.00	1732.50	17325.00	-26.42	-13.0	-54.00	2132.50	21325.00	-21.46	-13.0	
-62.00	1753.00				-54.00	2153.00				
I	I	3506.00	-28.69	-13.0	L	I	4306.00	-22.23	-13.0	
I		5259.00	-29.35		1		6459.00	-23.12		
1		7012.00	-28.05		I		8612.00	-21.74		4
1	I	8765.00	-28.23		1		10765.00	-23.44	I	4
		10518.00	-28.67				12918.00	-22.60		╉─────
		12271.00	-27.23				15071.00	-20.88	1	
	I	14024.00 15777.00	-26.58 -26.26				17224.00 19377.00	-23.06 -21.88		
-62.00	1753.00	15777.00	-26.26		-54.00	2153.00	21530.00	-21.88		╉─────
-02.00	1700.00	17000.00	-21.10	-13.0	-04.00	2105.00	21000.00	-21.00	-13.0	╂────
							+			
										<u> </u>
	t 1 of 1			1	1	1	1			R-5522

		RF	TLIF	TESTI	NG LA	BOR	ATOR	ES =		
				EMISSIO	NS DATA	SHEET	Г			
Test Method	:	Spurious Rad	ated Emissior	ns (ERP) 30 MH	Iz to 22 GHz					
Customer:		Cellular Speci	alties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repeat	er							
Model No:		CSI-DSP95-2	55-AW			Serial No:	N/A			
Test Specific	ation:	FCC Part 2.10	)53			Paragraph:	2.1053			
Operating M	ode:	Amplifying inp	ut signal							
Technician:		M.Seamans				Date:	10/12/2011			
Notes:		Uplink Freque Peak Detector		710-1755 MHz า: CW	Tested at	3 Input frequ	uencies: 1712, 7	1732.5, 1753M	Hz	
Test	Antenna	Reference	Signal Gen	Reference Ant					Corrected	Spurious
Frequency	Position	Reading	Level	Gain					Reading	Limit
MHz	(H/V) - Height	dBuV	dBm	dBI					dBm	dBm
30.00	-	-	-	-					-	-13.00
l 116.09	-	-	-	-					- -19.70	
116.09	V-1m V-1m	67.72 67.40	-19.70 -19.80	0.00					-19.70	
122.13	H-1m	67.40	-20.60	0.00					-19.80	
134.10	-	-	-20.00	0.00 -					-20.00	1
	-	-	<u> </u>	-					-	· ·
	-	-	-	-					-	
I	-	-	-	-					-	1
l	-	-	-	-					-	I
22000.00	-	-	-	-					-	-13.00
-										
		ns observed thr I on this data sl		iven frequency	spectrum were	e recorded a	nd evaluated. E	mission levels	closest to the	
	In the listed	on this udid SI	1051.							
Data Shee	t 1 of 1									R-5522N

		RF	TLIF	TESTI	NG LA	BOR	ATOR	ES =		
				EMISSIO	NS DATA	SHEE	Г			
Test Method	:	Spurious Rad	ated Emissior	ns (ERP) 30 Mł	Hz to 22 GHz					
Customer:		Cellular Speci	alties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repeat	er							
Model No:		CSI-DSP95-2	55-AW			Serial No:	N/A			
Test Specific	ation:	FCC Part 2.10	)53			Paragraph:	2.1053			
Operating M	ode:	Amplifying inp	ut signal							
Technician:		M.Seamans				Date:	10/12/2011			
Notes:		Downlink Fred Peak Detector		: 2110-2155M⊦ n: CW	Iz Tested	at 3 Input fre	equencies: 2112	, 2132.5, 2153	MHz	
Test	Antenna	Reference	Signal Gen	Reference Ant					Corrected	Spurious
Frequency	Position	Reading	Level	Gain					Reading	Limit
MHz	(H/V) - Height	dBuV	dBm	dBl					dBm	dBm
30.00	-	-	-	-					-	-13.00
	-	-	-	-					-	
116.09	V-1m	67.72	-19.70	0.00			_		-19.70	
122.13	V-1m	67.40	-19.80	0.00					-19.80	
134.16	H-1m	65.70 -	-20.60	0.00					-20.60	
 	-	-	-	-					-	1
	-	-	-	-						
I		_	-	_						1
I	-	-	-	-					-	1
22000.00	-	-	-	-					-	-13.00
-			-			-				
							-			
				iven frequency	spectrum were	e recorded a	nd evaluated. E	mission levels	closest to the	
	limit are listed	l on this data sl	neet.							
Data Olivi										
Data Shee	t 1 Of 1									R-5522N

		R	ETLIF TE	STING	LABOR	ATORI	ES		=		
					ATA SHEET						
Test Method:	Inter-modulation Ch	aracteristics		_							
Customer:	Cellular Specialties, Ir	nc.		Test Sample:		•			Job No:	R-54	408N
Model No:	CSI-DSP95-255-AW			Serial No:	N/A				Technic	ian: M.S	eamans
Test Specification:	FCC Part 2			Paragraph: 2.1	047				Date:	10/3	/2011
Operating Mode:	Amplifying input signa	al									
Notes:	LTE - Uplink (1710-17										
		Marker			RBW	100 k		RF Att	E O	dB	
Ref	Lvl 8 dBm	-		6 dBm 2 cm-	VBW		Hz	T T		-172	
39.8 <b></b>			1.7374627	з GH2	SWT	15	s	Unit		dBn	
49	9.8 dB Off	Iset				<b>▼</b> 1	[T1]		6.46	dBr	А
30								1.73	3746273		
							PWR		27.92		
							) Up ) Low		-15.71 -13.03		
20						AU					
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-60.2											I
Cent	ter 1.7261			6 ME	Iz/			Ç.	Span 60	MHz	
Date:		2011 14:	56:00								
Data Sheet 1 of	8										R-5408N

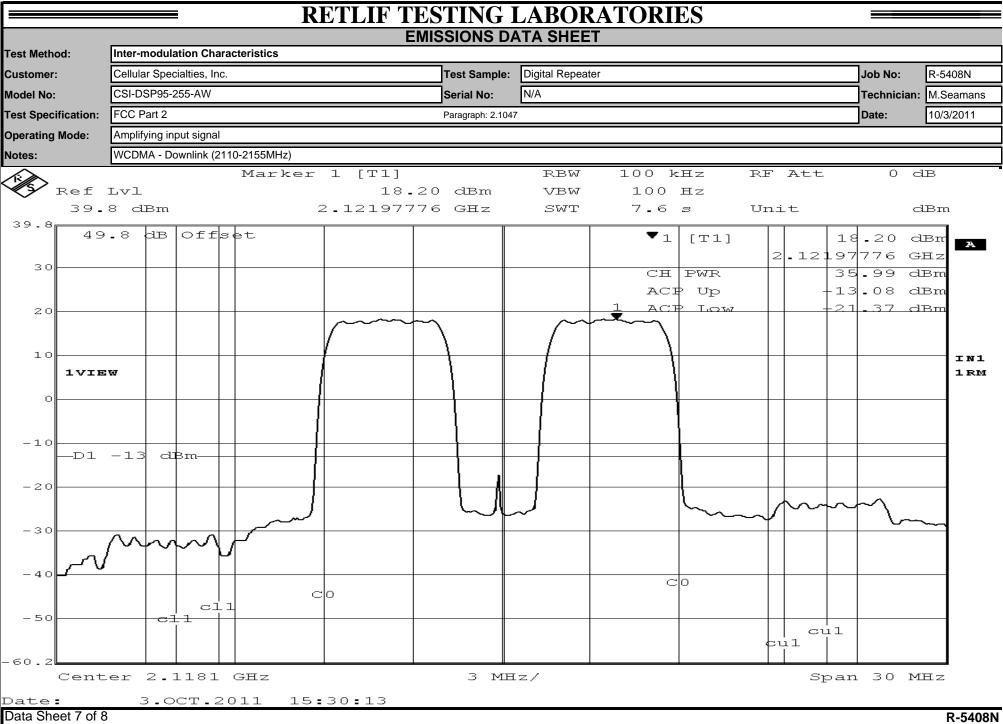
			<b>RETLIF TE</b>	<b>STING</b> 1	LABOR	ATORI	ES			
				SSIONS DA						
Test Method:	Inter-modulation	Characteristics								
Customer:	Cellular Specialtie	es, Inc.		Test Sample:	Digital Repeate	er			Job No:	R-5408N
Model No:	CSI-DSP95-255-/	AW		Serial No:	N/A				Technician	M.Seamans
Test Specification	n: FCC Part 2			Paragraph: 2.10	047				Date:	10/3/2011
Operating Mode:	Amplifying input s	ignal								
Notes:	LTE - Uplink (171	0-1755MHz)								
		Marke			RBW	100 k		RF Att	0 ·	dB
•	Lvl			2 dBm 	VBW		Ηz			1-
39.8	.8 dBm		1.7476733	5 GHZ	SWT	15	ទ	Unit		dBm
4	9.8 dB 0	ffset				▼1	[T1]		6.22 0	dBr A
30										SHZ
30										lBm
							v Up		2.73 0	
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10									_	<b>IN1</b>
173	EW			~		••••••				1 RM
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-10									_	
D1	13 dBm									
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-60.2										
	ter 1.74	1 GHz		6 MB	Iz/			Spa	n 60 ľ	1Hz
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Data Sheet 2 o										R-5408N
				Page 49	of /1					

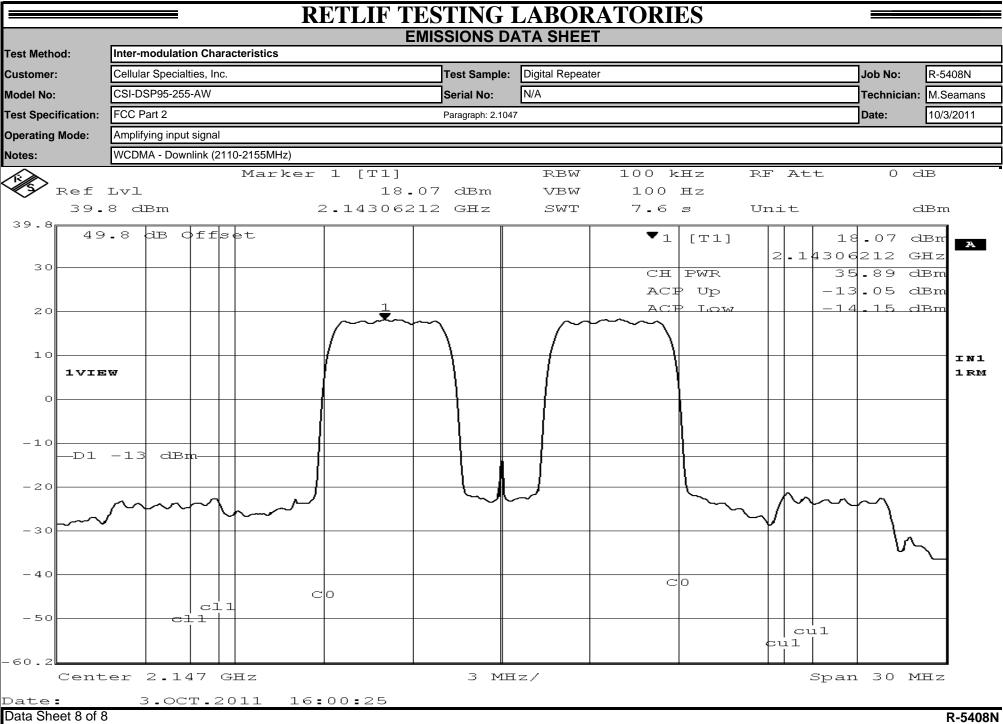
			R	ETLIF '	TES	TING	LABOR	RATORI	ES			_		
							ATA SHEE							
Test Method:	Inter-modulation	n Characteri	stics											
Customer:	Cellular Specialti				т	est Sample:		er				Job No:	R-54	08N
Model No:	CSI-DSP95-255-	-AW			s	Serial No:	N/A					Technicia	in: M.Se	eamans
Test Specification	FCC Part 2				Р	Paragraph: 2.1	047					Date:	10/3/	/2011
Operating Mode:	Amplifying input	signal												
Notes:	LTE - Downlink (	-	· ·											
	_	М	arker	1 [T1]		_	RBW	100 %		RF	Att	0	dB	_
$\sim$	Lvl		~			dBm GH-	VBW		HZ	T T	-		_]	
39.8	.8 dBm			2.12967	704	GHZ	SWT	15	s 	Uni	с. ———		dBm	
4	9 <b>.</b> 8 dB O	ffset						<b>▼</b> 1	[T1]			12.98	dBr	А
30										2	129	967704		
3.0									PWR			34.70	dBm	
									PUp PLow			-13.03 -19.63		
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Cen	ter 2.12	31239	932 GH:	Z		6 ME	Iz/				Sr	pan 60	MHz	
Date:		r.201	1 13:	55:40										
Data Sheet 3 of	8												F	R-5408N

				EMIS	SIONS DA	ATA SHEET				
lethod:	Inter-modulation Cha	aracteristics								
mer:	Cellular Specialties, In	IC.		·	Test Sample:	Digital Repeater			Job No:	R-5408
No:	CSI-DSP95-255-AW			;	Serial No:	N/A			Technicia	an: M.Sear
Specification:	FCC Part 2				Paragraph: 2.1	047			Date:	10/3/20
ting Mode:	Amplifying input signa	I							_	
:	LTE - Downlink (2110-	-2155MHz)								
<u>~</u>		Marke	er 1 []	C1]		RBW	100 kHz	RF Att	0	dB
Ref	Lvl			13.72	dBm	VBW	100 Hz			
	8 dBm		2.130	015040	GHz	SWT	15 <i>s</i>	Unit		dBm
- 8 49	.8 dB Off	set					▼1 [T1]		13.72	dBr
							_ [ [ ]		15040	
30							CH PWR		35.38	dBm
							ACP Up		13.03	dBm
20							ACP LOW		13-12	_dBm
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10 	-13 dBm-									
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_ 2										
Cent	er 2.1399	95 GHz			6 ME	Iz/		Sp	an 60	MHz

					R	ETLI	F TES	STING	LABOR	RATORI	ES						
									ATA SHEE								
Test Method:	Inter-	nodula	ation Cha	ract	teristics												
Customer:			ialties, In	с.				Test Sample:		er					Job No:	R-54	08N
Model No:	CSI-D	SP95-2	255-AW					Serial No:	N/A						Technicia	I <b>n:</b> M.Se	eamans
Test Specification	: FCC F	Part 2						Paragraph: 2.104	47						Date:	10/3,	/2011
Operating Mode:	Amplif	ying in	put signal														
Notes:	WCD	ИА - Up	olink (171	0-17	'55MHz)												
					Marker				rbw		Ηz	RF	Att		0	dB	
•	Lvl							5 dBm	VBW		Ηz	·				1	
رى 39.8	.8 d	Bm				1.721	94800	) GHZ	SWT	7.6	s	Uni	_t.			dBm	
4	9.8	dв	Off	se	et.					▼ı	[T1]			11	.15	dBr	А
30												1	.72:	I I	800	GĦz	
30										CH	PWR			I I		dBm	
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-60.2					<u></u>												
	ter							3 MB	1Z/				Sr	pan	30	MHZ	
		3.0	CT.2	2.0	11 15:	15:50	5										
Data Sheet 5 o	8															F	R-5408N

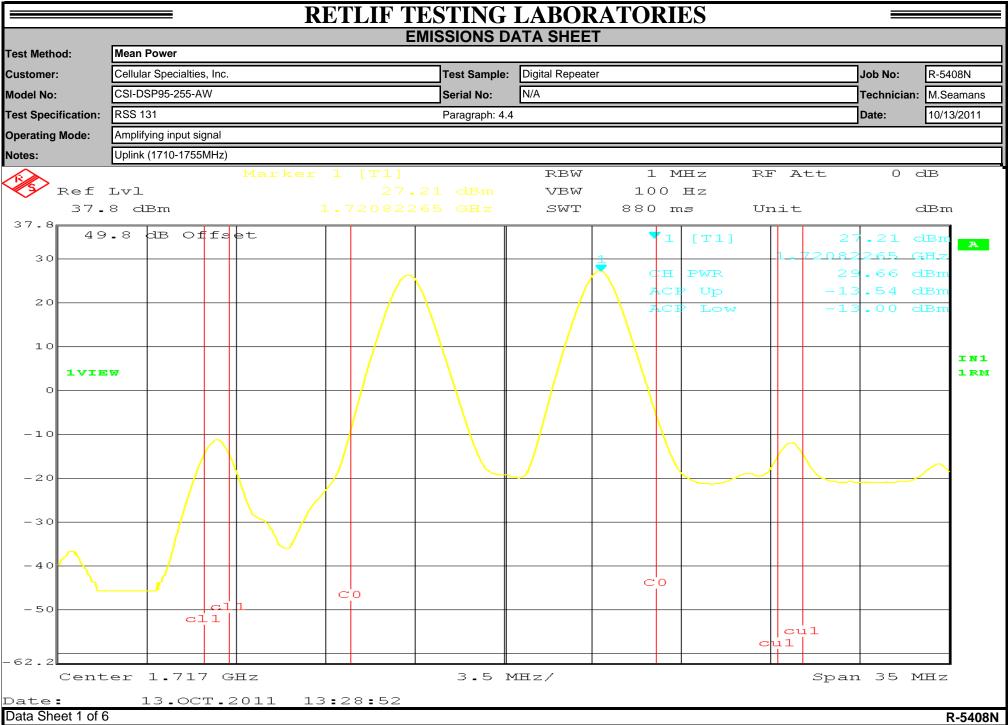
			_		KEI		ESTING			L)						
t Method:	Inter-mod	lulation C	harac	toristics		E	MISSIONS D	ATA SHEET								
stomer:	Cellular Sp						Test Sample:	Digital Repeater						ob No:	R-54	08N
del No:	CSI-DSP9						Serial No:	N/A						echniciar		
t Specification:	FCC Part						Paragraph: 2.104							ate:		/2011
erating Mode:	Amplifying		al												10/0/	2011
es:	WCDMA -			755MHz)												
×		op(		Marke	r 1	[T1]		RBW	100 k	Elz	RF	Att		0	dB	
<b>F</b> Ref	Lvl						01 dBm	VBW		Ηz						
	8 dBr	n			1.7	44012	12 GHz	SWT	7.6	s	Un	it			dBm	ı
9.8 49	.8 dI	3 Of:	fs	et					<b>v</b> <sub>1</sub>	[T1]			1 d	.01	dBr	I
											1	.74	1 1		GHz	A
30									CH	PWR			27.	84	dBm	
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20			+						ACI			· ·	+13.	02	dBm	
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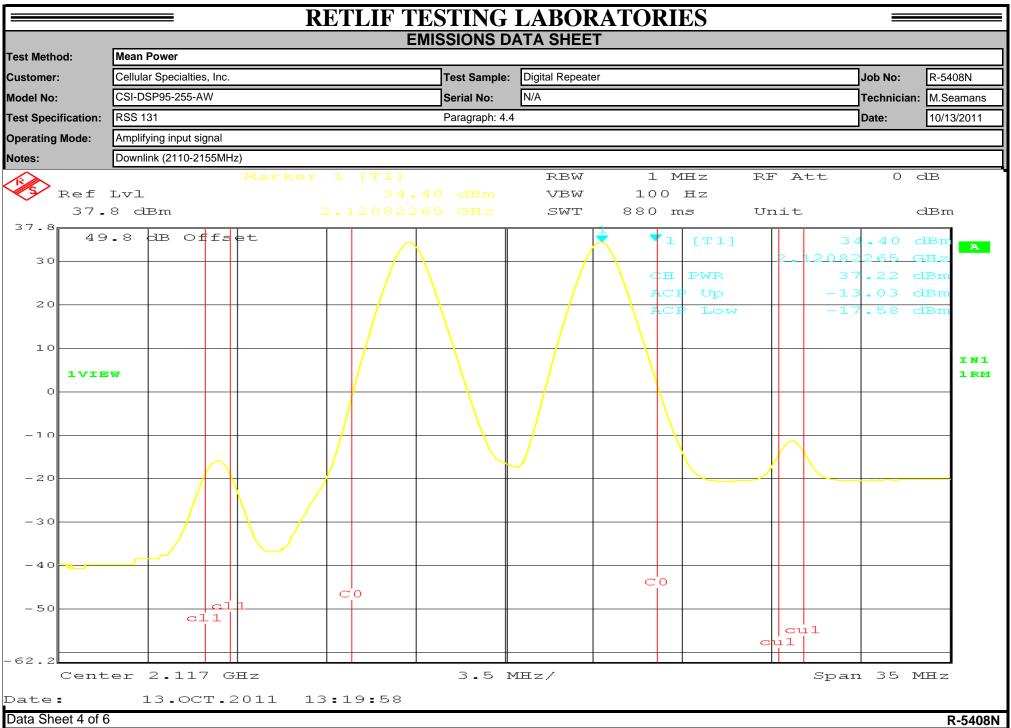
			EMISSIC	ONS DAT	A SHEE	Г			
Test Metho	d:	Frequency Stability							
Customer:		Cellular Specialties, Inc.			Job No:	R-5522N			
Test Sample	<b>.</b> .	Digital Repeater							
rest Sample	<b>.</b>								
Model No:		CSI-DSP95-255-AW			Serial No:	N/A			
Test Specifi	cation:	FCC Part 2							
					Paragraph: 2	2.1055			
Operating N	lode:	Amplifying input signal							
Technician:		M.Seamans			Date:	10/11/2011			
Notes:		Uplink Frequency 1732.5		Iominal Voltag	1				
NOIES.		Downlink Frequency 2132		-		, range: 0 to 50	Degrees C		
	Test		Frequency @	Frequency @	Frequency @	Frequency @	Frequency @	Frequency @	Frequency
Temp	Frequency		102 VAC	108 VAC	114 VAC	120 VAC	126 VAC	132 VAC	138 VAC
С	MHz		MHz	MHz	MHz	MHz	MHz	MHz	MHz
	(Uplink)								
-30	1732.5000		N/A	N/A	N/A	N/A	N/A	N/A	N/A
-20			N/A	N/A	N/A	N/A	N/A	N/A	N/A
-10			N/A	N/A	N/A	N/A	N/A	N/A	N/A
0			815.00250	815.00250	815.00250	815.00250	815.00250	815.00250	815.00250
10			815.00000	815.00000	815.00000	815.00000	815.00000	815.00000	815.00000
20			815.00000	815.00000	815.00000	815.00000	815.00000	815.00000	815.00000
30			815.00000	815.00000	815.00000	815.00000	815.00000	815.00000	815.00000
40 50	1732.5000		814.99500	814.99500	814.99500	814.99500	814.99500 814.99500	814.99500	814.99500
50	1732.5000		814.99750	814.99750	814.99500	814.99500	814.99500	814.99500	814.99500
	(Downlinl)								
	(2000)								
-30	2132.5000		N/A	N/A	N/A	N/A	N/A	N/A	N/A
-20			N/A	N/A	N/A	N/A	N/A	N/A	N/A
-10	1		N/A	N/A	N/A	N/A	N/A	N/A	N/A
0			860.00500	860.00500	860.00500	860.00500	860.00500	860.00500	860.00500
10			860.00000	860.00000	860.00000	860.00000	860.00000	860.00000	860.00000
20			860.00000	860.00000	860.00000	860.00000	860.00000	860.00000	860.00000
30			860.00000	860.00000	860.00000	860.00000	860.00000	860.00000	860.00000
40			859.99750	859.99750	859.99750	859.99750	859.99750	859.99500	859.99500
50	2132.5000		859.99750	859.99750	859.99750	859.99750	859.99750	859.99750	859.99750
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	<b> </b>			<b> </b>					
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		■ RI	ETLIF	TESTI	NG LA	BOR	ATOR	ES ≡		
				TABULA	R DATA	SHEET				
Test Method:		Mean Power								
Customer:		Cellular Spec	cialties, Inc.			Job No:	R-5522N			
Test Sample:		Digital Repea	ater							
Model No:		CSI-DSP95-2	255-AW		ł	Serial No:	N/A			
Test Specific	ation:	RSS-131				Daragraph	4.2			
Operating Mo	ode:	Amplifying in	put signal			Paragraph:	4.5			
Technician:		M.Seamans				Date:	10/3/2011			
Notes:			ency Range: 1	710-1755 MHz			ange: 2110-215	5 MHz Modu	lation: CW/Tw	o Tone
Notes.		Opinik Proqu	ency Range. I	710-1755 10112	Downlink		ange. 2110 2100			5 Tone
Test	Measured	Add	Mean							
Frequency	Level	3dB	Power							
MHz (Uplink) Low	dBm	dB	dBm							
1720.00	27.21	3.00	30.21							
(Uplink) Mid										
1726.00	26.21	2.00	29.21							
1736.00	26.21	3.00	29.21							
(Uplink) High										
1751.00	26.12	3.00	29.12							
( <b>-</b>										
(Downlink) Low										
2120.00	34.40	3.0	37.40							
2120.00	01.10	0.0	01.10							
(Downlink) Mid										
2128.00	34.03	3.0	37.03				_			
(Downlink) High										
(Downlink) riigh										
2151.00	34.13	3.0	37.13							
				┥──┤						
				+			+			
Data Sheet	1 of 1		1	11			1	1		R-5522N



						ESTING								
est Method:	Mean Power				L									
ustomer:	Cellular Specialt	ies, Inc.				Test Sample:	Digital Repeate	er				Job No:	R-54	408N
odel No:	CSI-DSP95-255					Serial No:	N/A					Technicia		eamans
est Specification:	RSS 131					Paragraph: 4.4						Date:		3/2011
perating Mode:	Amplifying input	signal				0 1								
otes:	Uplink (1710-175													
			Marker	1	[T1]		RBW	1	MHz	RF	Att	0	dB	
Ref	Lvl				26.	.81 dBm	VBW	10	0 Hz					
	.8 dBm			1.7	736322		SWT	880	ms	Uni	_t.		dBn	n
37.8 49	. 8 дв с	ffs	et						1 [T1]		2	26.81	dBr	]
30										1	7363			A
									H PWR		2	9.19	dBm	L
20							(	Z	CP Up		- 1			L.
20								7	CP LOW		- 1	.3.06	dBm	L
1.0														
10														INI
1111	2W				1									1 RM
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-10														
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- 50			1	C	0									
	C	;i1									cu1			
										cų	1			
62.2														]
Cent	ter 1.73	25	GHZ			3.5 I	1Hz/				Spa	ın 35	MHz	
ate:	13.00	ст <b>.</b> 2	2011 13	3:0	0:48									

			I	RET	'LIF T	ESTING	LABOR	RATO	RIE	S					
					E	MISSIONS D	ATA SHEE	Т							
Test Method:	Mean Power														
Customer:	Cellular Spec	ialties, Inc.				Test Sample:	Digital Repeate	er					Job No:	R-540	08N
Model No:	CSI-DSP95-2	255-AW				Serial No:	N/A						Technician	: M.Se	amans
Test Specification:	RSS 131					Paragraph: 4.4	ŀ						Date:	10/13	8/2011
Operating Mode:	Amplifying inp	out signal													
Notes:	Uplink (1710-	·1755MHz)													
K A			Markei	r 1	[T1]		RBW	1	MH	z R	FΑ	tt	0	dB	
Ref							VBW		0 н						
	8 dBm			1.7		265 GHz	SWT	880	ms	U	nit			dBm	L
37.8 49	.8 dB	Offs	et						1 [	[T1]		20	.12	dBm	-
30								-1			<u> </u> 1	75182	265	GH.z.	A
								× <	E E	WR		28	.73	dBm	
20							/	Z	(CP	Up		-17	49	dBm	
20								7	1CB	Low		-13	3.00	dBm	
10															INI
IVIE	<b></b>														1 RM
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- 1 0															
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-40								~							
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- 50			1												
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										C	ni 1				
-62.2L Cent	er 1.7	748 G	- Hz			3.5 1	MHz/					Spar	1 35 :	MHz	I
				о - г	0-07							- T- 142			
Date <b>:</b> Data Sheet 3 of 6		OCT.2	COTT 1	.2:5	8:07										-5408N



						<b>R</b> E'	ГLIF Т	<b>TESTING</b>	LABOR	RATOI	RIES			=		
		-					-	EMISSIONS D	ATA SHEE	Т						
Test Metho	od:	Inter-mod	ulation (	Chara	cteristics											
Customer:		Cellular Sp						Test Sample:		er				Job No:	R-54	08N
Model No:		CSI-DSP9	5-255-A\	N				Serial No:	N/A					Technicia	n: M.Se	eamans
Test Speci	fication:	RSS 131						Paragraph: 4	.4					Date:	10/1	3/2011
Operating	Mode:	Amplifying	input sig	Inal												
Notes:		Downlink (	(2110-21	55MH	-											
	Ref	Lvl						.03 dBm	rbw Vbw	1 10	MHz 0 Hz	RF A	.tt	0	dB	-
37.8m		8 dBr	n			2.		749 GHz	SWT	880	ms	Unit	-		dBr	ı
	49	-8 dI	3 O f	fs	et		/				1 [T1]		3.	1	dBm	A
30									/		H PWR		1 <u>2874</u> 30			
20							+/				CP Up		-13 -18		dBm dBm	
10	1VIE	w					1									IN1 1RM
0																
-10							/				$\downarrow$					
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-20					<u> </u>											
-30																
-40							20			С	0					
-50			cl	 .1	1											
												cu1	i1			
-62.2	Cent	er 2	.132	25	GHz			3.5	MHz/				Spar	n 35	MHz	
Date		1.3	. ocr	г.:	2011	13:	18:23									
Data She															F	R-5408N

						R	EΤ	LIF T	ESTING	LABO	RATO	RI	ES						
								E	EMISSIONS D	ATA SHEE	Т								
Test Method	d:				acteristics	8				_								_	
Customer:		-	r Special						Test Sample		er						Job No:	R-54	108N
Model No:		CSI-DS	SP95-258	5-AW					Serial No:	N/A						·	Technicia	n: M.Se	eamans
Test Specifi	ication:	RSS 13	31						Paragraph: 4.	4							Date:	10/1	3/2011
Operating N	/lode:	Amplify	ing inpu	t signal															
Notes:		Downli	nk (2110	-2155M	Hz)														
F	Ref	Lvl						[T1] 34.		rbw vbw	1 1 C	- M ) 0	Hz Hz	RF	At	t	0	dB	
37.8	37.	8 di	Bm			2	2 - 1	51822	265 GHz	SWT	880	) m	s	Uni	t			dBn	1
37.0	49	- 8	dB (	ffe	et			(			<u> </u>	<b>1</b>	[T1]			34	.13	dBm	А
30-										/		сн	PWR			<u>5182</u> 36	2 <u>65</u> .93	<u>G</u> H.z. dBm	
20												ACE	y Up y Low			-13 -16		dBm dBm	
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0	1VIE	w									\								<b>1</b> RM
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			c	211 											 cu: 1	1			
-62.2															-				
	Cent	er	2.1	48 0	∃Hz				3.5	MHz/						Span	35	MHz	
Date:			.3.0	CT.	2011	13	:1	6:55											
Data Shee	et 6 of 6																	F	R-5408N

ner: Cellular Specialities, Inc. Cellular Specialities, Inc.					RETLI			LABORATO	RIES		
ner: Caldual Specialities, Inc. Caldual S						EMI	SSIONS DA	ATA SHEET			
No: CSPOSP95-235-AW Serial No: VA rechnelar: T. Hanne pecification: RS	Method:	Pas	sban	d Gain and Bandwidth			_				
Pecification: RSS	omer:	-					Test Sample:			Job No:	R-5408N
ing Mode: Amplifying input signal Downlink  Passband Gain Plot	l No:	CSI	DSP	95-255-AW			Serial No:	N/A		Technician	T. Hannem
Downlink Pasband Gain Ptot Downlink	Specification:	RSS	6							Date:	10/17/201
Passband Gain Plot Downlink	ating Mode:	Amp	olifyin	g input signal							
	:	Dow	/nlink								
Downlink							Passband Ga	ain Plot			
production of the second secon							Downlin	k		— Output Signa	
page 1 de la			Ŧ								
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-40, - -50, - -50, - -50, - -60, - -70, -			Ē								
-500 -500 -216 -500 -216 -500 -216 			E								
-60.0 -60.0 -21G Frequency Graph Start and Stop Frequencies are Band Edges Operator: T. Hannemann 03:51:12 PM, Monday, October 17, 2011 Job Number: R-5422N			E								
2.1G 22G 22G 22G 22G 22G 22G 22G 22G 22G 2			Ŧ		~~~~~						
Graph Start and Stop Frequencies are Band Edges         Operator: T. Hannemann       Customer: Cellular Specialties, Inc.         03:51:12 PM, Monday, October 17, 2011       Job Number: R-5422N			-60.0+ 2.1	}	ł		ł	+ +	1 1	ł	2.2G
03:51:12 PM, Monday, October 17, 2011 Job Number: R-5422N							Graph Start an		Edges		
	Operator: T.	Hann	emar	n					Customer: Cellular S	pecialties, Inc.	
	03:51:12 PM	/, Mor	nday,	October 17, 2011					Job Number: R-5422	N	
	Sheet 1 of 2										R-540

		<b>RETLIF TESTING</b>	LABORATORIF	žs —	
		EMISSIONS D/	ATA SHEET		
lethod:	Passband Gain and Bandwidth				
mer:	Cellular Specialties, Inc.	Test Sample:	Digital Repeater	Job No:	R-5408N
No:	CSI-DSP95-255-AW	Serial No:	N/A	Technician:	T. Hannem
pecification:	RSS			Date:	10/17/201
ting Mode:	Amplifying input signal				
:	Uplink				
		Passband Ga	ain Plot		
		Uplink		Input Signal Output Signal Measured Gain	
	90.0				~
	70.0 60.0				
	50.0 40.0 30.0				
	20.0 10.0				
	-10.0				
	-20.0				
	-50.0				
	-70.0 1.7G		i i Frequency		1.8G
		Graph Start ar	nd Stop Frequencies are Band Edges		
Operator: T.	Hannemann			Customer: Cellular Specialties, Inc.	
03:51:12 PM	N, Monday, October 17, 2011			Job Number: R-5422N	

R-5408N

		RF	TLIF	TESTI	NG LA	BOR	ATOR	IES =		
				EMISSIO	<b>NS DATA</b>	SHEET	Г			
Test Method	:	Spurious Rad	iated Emissior	ns (ERP) 30 M⊦	Iz to 22 GHz					
Customer:		Cellular Speci	alties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repeat	ter							
Model No:		CSI-DSP95-2	55-AW			Serial No:	N/A			
Test Specific	ation:	RSS-131				Paragraph:	4.4			
Operating M	ode:	Amplifying inp	out signal							
Technician:		T. Hanneman	n			Date:	11/9/2010			
Notes:		Uplink Freque Peak Detector		710-1755 MHz n: LTE Two Tor		2 Input frequ	uencies: 1726 a	nd 1740MHz		
Test	Antenna	Reference	Signal Gen	Reference Ant					Corrected	Spurious
Frequency	Position	Reading	Level	Gain					Reading	Limit
MHz	(H/V) - Height	dBuV	dBm	dBl					dBm	dBm
30.00	-	-	-	-					-	-13.00
	-	-	-	-					-	
116.09	V-1m	67.72	-19.70	0.00					-19.70	
122.13	V-1m H-1m	67.40	-19.80	0.00					-19.80	
134.16	- IIII -	65.70 -	-20.60	0.00					-20.60	
	-	-	-	-					-	
	_	-		_					_	
	-	-	-	-					-	
1	-	-	-	-					-	
22000.00	-	-	-	-					-	-13.00
							_			
				iven frequency	spectrum were	recorded a	nd evaluated. E	mission levels	closest to the	
	limit are listed	l on this data sl	neet.							
Data Ohr										
Data Shee	t 1 Of 1									R-5522N

		RF	TLIF	TESTI	NG LA	BOR	ATOR	IES =		
				EMISSIO	NS DATA	SHEE	Γ			
Test Method	:	Spurious Rad	ated Emissior	ns (ERP) 30 MH	-		-			
Customer:		Cellular Speci	alties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repeat	er							
Model No:		CSI-DSP95-2	55-AW			Serial No:	N/A			
Test Specific	ation:	RSS-131								
Operating M	ode:	Amplifying inp	ut signal			Paragraph:	4.4			
· ·						_				
Technician:		T. Hanneman				Date:	11/9/2010			
Notes:		Peak Detector		710-1755 MHz n: WCDMA Two		z input ireqt	uencies: 1718 a			
Test	Antenna	Reference	Signal Gen	Reference Ant					Corrected	Spurious
Frequency	Position	Reading	Level	Gain					Reading	Limit
MHz	(H/V) - Height	dBuV	dBm	dBl					dBm	dBm
30.00	-	-	-	-					-	-13.00
116.09	- V-1m	- 67.72	-19.70	- 0.00			-		-19.70	
122.13	V-1m	67.40	-19.80	0.00					-19.80	
134.16	H-1m	65.70	-20.60	0.00					-20.60	i
	-	-	-	-					-	
	-	-	-	-					-	I
	-	-	-	-					-	I
	-	-	-	-					-	Ι
I	-	-	-	-					-	Ι
22000.00	-	-	-	-					-	-13.00
			-							
	FUT emission	I observed thr	ouahout the a	iven frequency	spectrum were	recorded a	nd evaluated. E	mission levels	closest to the	l
		l on this data sl								
Data Shee	t 1 of 1									R-5522N

		RE	TLIF	TESTI	NG LA	BOR	ATOR	IES =		
				EMISSIC	NS DATA	SHEE	Γ			
Test Method	:	Spurious Radi	ated Emissior	ns (ERP) 30 MH			-			
Customer:		Cellular Speci	alties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repeat	er							
Model No:		CSI-DSP95-2	55-AW			Serial No:	N/A			
Test Specific	ation:	RSS-131								
Operating M	ode:	Amplifying inp	ut signal			Paragraph:	4.4			
Technician: Notes:		M.Seamans		: 2110-2155 M		Date:	10/12/2011 equencies: 2123	and 2140MHz	,	
Notes.		Peak Detector		n: LTE Two Tor		at 2 mput n			-	
Test	Antenna	Reference	Signal Gen	Reference Ant					Corrected	Spurious
Frequency	Position	Reading	Level	Gain					Reading	Limit
MHz	(H/V) - Height	dBuV	dBm	dBl					dBm	dBm
30.00	-	-	-	-					-	-13.00
116.09	- V-1m	- 67.72	-19.70	- 0.00			-		-19.70	
122.13	V-1m	67.40	-19.80	0.00					-19.80	1
134.16	H-1m	65.70	-20.60	0.00					-20.60	
	-	-	-	-					-	
	-	-	-	-					-	
	-	-	-	-					-	
	-	-	-	-					-	I
I	-	-	-	-					-	I
22000.00	-	-	-	-					-	-13.00
							_			
	FUT emission	s observed thr	ouahout the a	iven frequency	spectrum were	recorded a	nd evaluated. E	mission levels	closest to the	
		l on this data sh								
Data Shee	t 1 of 1									R-5522N

		■ RF	TLIF	TESTI	NG LA	BOR	ATOR	IES =		
				EMISSIO	NS DATA	SHEET	Г			
Test Meth	od:	Spurious Rad	iated Emissior	ns (ERP) 30 Mł	Hz to 22 GHz					
Customer	:	Cellular Speci	alties, Inc.			Job No:	R-5522N			
Test Sam	ple:	Digital Repea	ter							
Model No	:	CSI-DSP95-2	55-AW			Serial No:	N/A			
Test Spec	ification:	RSS-131				Paragraph:	4.4			
Operating	Mode:	Amplifying inp	out signal							
Technicia	in:	M.Seamans				Date:	10/12/2011			
Notes:		Downlink Free Peak Detecto		: 2110-2155 M n: WCDMA Two		at 2 Input fr	equencies: 2118	3 and 2147MHz	2	
Test	Antenna	Reference	Signal Gen	Reference Ant					Corrected	Spurious
Frequenc	cy Position	Reading	Level	Gain					Reading	Limit
MHz	(H/V) - Height	dBuV	dBm	dBd					dBm	dBm
30.00	-	-	-	-					-	-13.00
	-	-	-	-					-	
116.09		67.72	-19.70	0.00					-19.70	
122.13		67.40	-19.80	0.00					-19.80	
134.16		65.70	-20.60	0.00					-20.60	1
I	-	-	-	-					-	
I		_	-							
	-	-	-	-					-	1
· ·	-	-	-	-					-	
22000.0	0 -	-	-	-					-	-13.00
		-					_			
		ns observed thr d on this data sl		iven frequency	spectrum were	e recorded a	nd evaluated. E	mission levels	closest to the	
		u on this data s	ileel.							
Data Sh	eet 1 of 1									R-5522N

							RATOR	AIES		
					ONS DAT	-				
Test Method	l:	Spurious En	nissions at t	he Antenna	Terminals 30	MHz to 22 G	Hz			
Customer:		Cellular Spec	ialties, Inc.			Job No:	R-5522N			
Test Sample	:	Digital Repea	ater							
Model No:		CSI-DSP95-2	255-AW			Serial No:	N/A			
Test Specifi	cation:	RSS-131								
root opcom	oution					Paragraph:	4.4			
Operating M	ode:	Amplifying in	out signal							
Technician:		M.Seamans				Date:	10/13/2011			
Notes:		Uplink Freque	ency: 1710-1	755 MHz	Downlink	Frequency:	2110-2155 MH	lz		
		LTE modulati	•		noise floor me					
Uplink	Test		Reading	Limit	Downlink	Test		Reading	Limit	
Input Signal	Frequency	Frequencies	5		Input Signal	Frequency	Frequencies	5		
dBm	MHz	MHz	dBm	dBm	dBm	MHz	MHz	dBm	dBm	
-62.00	1718.00				-54.00	2118.00				
	I	3436.00	-21.67	-13.0	I		4236.00	-22.46	-13.0	
Ι	I	5154.00	-22.67	1	I		6354.00	-23.63	I	
I	I	6872.00	-23.05	1	I		8472.00	-21.61	I	
Ι	I	8590.00	-20.53	I	I	I	10590.00	-22.48	Ι	
Ι	I	10308.00	-22.42	I	I	I	12708.00	-22.57	Ι	
I	I	12026.00	-22.43	I	I		14826.00	-21.97	I	
Ι	I	13744.00	-21.51	I	I	I	16944.00	-21.32	I	
Ι	I	15462.00	-21.99	I	I	I	19062.00	-22.94	I	
-62.00	1718.00	17180.00	-22.76	-13.0	-54.00	2118.00	21180.00	-21.57	-13.0	
-62.00	1732.50				-54.00	2132.50				
I	I	3465.00	-21.97	-13.0	1		4265.00	-22.69	-13.0	
I	I	5197.50	-23.66	I	1		6397.50	-22.42	I	
I		6930.00	-23.20	1	I		8530.00	-21.74	<u> </u>	
		8662.50	-21.71	1	I		10662.50	-22.75	1	ļ
I	I	10395.00	-22.11	1		1	12795.00	-22.52	I	<b> </b>
		12127.50	-21.76				14927.50	-21.92	I	
		13860.00 15592.50	-22.48 -21.92			1	17060.00 19192.50	-21.33 -22.89		
-62.00	1732.50	17325.00	-21.92	-13.0	-54.00	l 2132.50	21325.00	-22.89	-13.0	
-02.00	1752.50	17323.00	-22.15	-13.0	-04.00	2132.30	21020.00	-21.52	-13.0	
-62.00	1748.00				-54.00	2147.00				
1		3496.00	-21.77	-13.0			4294.00	-22.80	-13.0	
I	I	5244.00	-23.77		1	1	6441.00	-23.48		1
I	I	6992.00	-22.99	I	1	1	8588.00	-21.68	I	
Ι	I	8740.00	-21.27	I	I	I	10735.00	-23.42	I	
I	I	10488.00	-22.23	I	I	I	12882.00	-22.59	I	
Ι	I	12236.00	-22.14	I	I	I	15029.00	-21.35	I	
Ι	I	13984.00	-20.62	I	I	I	17176.00	-21.46	Ι	
Ι	I	15732.00	-21.48	I	I	I	19323.00	-22.10	Ι	
-62.00	1748.00	17480.00	-21.58	-13.0	-54.00	2147.00	21470.00	-21.51	-13.0	
Data Shee	et 1 of 1									R-5522I

Digital Repeater           Digital Repeater           Serial No:         N/A           Paragraph: 4.4           Paragraph: 4.4           Paragraph: 4.4           Paragraph: 4.4           Mareline No:         Date:         10/13/20/11           Uplink Frequency: 17/0-1755 MHz         Date:         10/13/20/11           Uplink Frequency: 17/0-1755 MHz         Downlink Frequency: 21/0-2156 MHz           Uplink Frequency: 17/0-1755 MHz         Downlink Frequency: 21/0-2156 MHz           WCDMA modulation         Readings are noise floor measurements           Uplink Frequency: 17/0-1755 MHz         Downlink Frequency: 21/0-2156 MHz           WCDMA modulation         Readings are noise floor measurements           Uplink Frequency: 17/0-1755 MHz         Downlink Frequency: 21/0-2156 MHz           WCDMA modulation         Date:         10/13/201           10/13/201         Date:         10/13/201           Dispan="2">Dispan="2">Dispan="2"         10/13/201         Dispan="2"								RATOR				
Job No:         R-5522N           Serial No:         N/A           Serial No:         N/A           Serial No:         N/A           CSI-DSP95-255-XW         Serial No:         N/A           Test Section of the section of	_						-					
Digital Repeater           Digital Repeater           Serial No:         N/A           Paragraph: 4.4           Paragraph: 4.4           Paragraph: 4.4           Date:         10/32/011           Date:         10/32/011           Upink Frequency:         Treating Mode:           Upink Frequency:         Paragraph: 4.4           VCDMA modulation         Paragraph: 4.4           Upink Frequency:         Paragraph: 4.4           WCDMA modulation         Paragraph: 4.4           WCDMA modulation         Paragraph: 4.4           WCDMA modulation         Paragraph: 4.4           WCDMA modulation         Reading         Date:         10/32/01           Upink Frequency:         Paragraph: 4.4           WEDME         Reading         Land           MARE         MARE         MARE           MARE         MARE            MARE<	Test Method	l:										
Indel No:         CSI-DSP6255-XV         Serial No:         N/A           est Specification:         RS-131         Paragraph: 4.4           Amplifying input signal         Amplifying input signal         Intractional State Stat	Customer:		Cellular Specialties, Inc.				Job No:	R-5522N				
Est Specification:         RSS-131         Paragraph: 4.4           Paragraph: 4.4           Amplifying input signal           Construction:           Date:         [0/13/2011           Uplink Frequency: 1710-1755 MHz         Construction:           Uplink Frequency: 1710-1755 MHz         Construction:           Uplink Frequency: 1710-1755 MHz         Construction:           Uplink Frequency: 2110-2155 MHz           Uplink Frequency: 2110-20         C2:44         Imput Signal           Imput Signal         Test           Imput Signal         Test           Imput Signal         Test         Colspan="2">Colspan="2"           Imput Signal         Test         Garding Imput Signal           Imput Sig	Test Sample	:	Digital Repea	ater								
Est Specification:         RSS-131         Paragraph: 4.4           Paragraph: 4.4           Amplifying input signal           Construction:           Date:         [0/13/2011           Uplink Frequency: 1710-1755 MHz         Construction:           Uplink Frequency: 1710-1755 MHz         Construction:           Uplink Frequency: 1710-1755 MHz         Construction:           Uplink Frequency: 2110-2155 MHz           Uplink Frequency: 2110-20         C2:44         Imput Signal           Imput Signal         Test           Imput Signal         Test           Imput Signal         Test         Colspan="2">Colspan="2"           Imput Signal         Test         Garding Imput Signal           Imput Sig	Model No:		CSI-DSP95-255-AW				Serial No:	N/A				
Paragraph: 4.1           Paragraph: 4.1 <th colspan<="" td=""><td>Test Specifi</td><td>cation:</td><td>RSS-131</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td>Test Specifi</td> <td>cation:</td> <td>RSS-131</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Test Specifi	cation:	RSS-131								
echnican:         M.Seamans         pate         [0/13/201]           iotes:         M.Seamans         Downlink Frequency:         2110-2155 MHz         Downlink Frequency:           Uplink Frequency:         Test         Readings are noise floor measurements         Reading         Limit         Downlink         Test         Reading         Limit         Imput Bignal         Frequencies         Reading	root opcom											
Uplink Frequency:         Triangency in the second sec	Operating M	ode:	Amplifying in	out signal								
WCDMA weights of the sector of	Fechnician:		M.Seamans Date:					10/13/2011				
WCDMA weights of the sector of	Notes:		Uplink Frequency: 1710-1755 MHz Downlink				Frequency:	2110-2155 MHz				
Input Signal         Frequency         Frequency         Frequency         Frequencies         Input Signal         Input Signal         Frequencies         Input Signal         Input Signal         Input Signal         Input Signal         Input Signal												
dBm         MHz         MHz         dBm         dBm         dBm         MHz         MHz         dBm         dBm           1         1         3424.00         -28.91         -13.0         1         1         4224.00         -22.48         -13.0           1         1         5136.00         -30.54         1         1         1         6336.00         -22.77         1           1         1         6648.00         -27.34         1         1         1         8680.00         -27.74         1           1         1         10272.00         -27.68         1         1         1         14784.00         -21.32         1           1         1         11984.00         -25.73         1         1         1         18986.00         -22.25         1           1         1         19696.00         -25.73         1         1         1         19908.00         -22.25         1           1         1         3465.00         -28.76         -13.0         1         1         4285.00         -22.97         -13.0           45.00         1732.50         -28.97         1         1         1         18930.00	Uplink	Test		Reading	Limit	Downlink	Test		Reading	Limit		
46.200         1712.00	Input Signal	Frequency	Frequencies			Input Signal	Frequency	Frequencies				
1       1       3424.00       -28.91       -13.0       1       1       4224.00       -22.48       -13.0         1       1       6848.00       -28.51       1       1       1       6348.00       -22.25       1         1       1       8560.00       -27.34       1       1       1       10560.00       -23.04       1         1       1       10272.00       -27.68       1       1       1       14784.00       -21.32       1         1       1       11986.00       -28.59       1       1       1       14784.00       -21.32       1         1       1       15408.00       -26.76       13.0       -54.00       2112.00       -21.22       1       -         -62.00       1712.00       1712.00       -28.62       -13.0       -54.00       2132.50       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	dBm	MHz	MHz	dBm	dBm	dBm	MHz	MHz	dBm	dBm		
I         I         S136.00 $-30.54$ I         I         I         I         B336.00 $-22.77$ I           I         I         6848.00 $-28.51$ I         I         I         B448.00 $-22.25$ I           I         I         10272.00 $-27.768$ I         I         I         12672.00 $-21.47$ I           I         I         1986.00 $-26.59$ I         I         I         19006.00 $-22.25$ I           I         I         16808.00 $-22.573$ I         I         I         19006.00 $-22.25$ I           -62.00         1712.00         1712.00 $-26.76$ $-13.0$ $-54.00$ 2112.00 $-21.99$ $-13.0$ I         I         540.00         2132.50         -         -         -         -         -         -         -         -         -         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I	-62.00	1712.00				-54.00	2112.00					
I       I       6848.00 $-28.51$ I       I       I       I       B448.00 $-22.25$ I         I       I       10272.00 $-27.34$ I       I       I       10560.00 $-23.04$ I         I       I       10272.00 $-27.68$ I       I       I       12872.00 $-21.47$ I         I       I       13996.00 $-26.59$ I       I       I       14784.00 $-21.24$ I         I       I       15408.00 $-26.76$ $-13.0$ $-54.00$ 2112.00 $21.99$ $-33.0$ -62.00       1732.50       -       - $-64.00$ 2112.00 $-22.37$ $-13.0$ I       I       5465.00 $-28.49$ I       I       I       6397.50 $-22.37$ $-13.0$ I       I       6462.50 $-28.42$ I       I       I $6397.50$ $-22.37$ $-13.0$ I       I       6930.00 $-28.49$ I       I       I $10850.00$ $-28.47$ I         I       I       13986.00 $-$	I	I	3424.00	-28.91	-13.0	I	I	4224.00	-22.48	-13.0	1	
1       1       8560.00 $-27.34$ 1       1       1       10560.00 $-23.04$ 1         1       1       10272.00 $-27.88$ 1       1       12672.00 $-21.47$ 1         1       1       11984.00 $-29.10$ 1       1       14784.00 $-21.32$ 1         1       1       13966.00 $-26.59$ 1       1       1       16896.00 $-22.25$ 1         462.00       1712.00       712.00 $-26.76$ $-13.0$ $-54.00$ 2112.00 $-21.99$ $-13.0$ 462.00       1732.50       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	Ι	I	5136.00	-30.54	I	I	I	6336.00	-22.77	I	1	
1       1       10272.00 $-27.68$ 1       1       1       12672.00 $-21.47$ 1         1       1       11984.00 $-28.19$ 1       1       1       14784.00 $-21.32$ 1         1       1       13696.00 $-26.59$ 1       1       1       16896.00 $-22.25$ 1         -62.00       1712.00       1712.00 $-26.76$ $-13.0$ $-54.00$ 2112.00       2112.00 $-21.99$ $-13.0$ -62.00       1732.50       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	Ι	I	6848.00	-28.51	I	I	I	8448.00	-22.25	I	1	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Ι	I	8560.00	-27.34	I	I	I	10560.00	-23.04	I		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Ι	I	10272.00	-27.68	I	I	I	12672.00	-21.47	I		
I       I       15408.00       -25.73       I       I       I       19008.00       -22.25       I         -62.00       1712.00       17120.00       -26.76       -13.0       -54.00       2112.00       2119.00       -21.99       -13.0         -62.00       1732.50	Ι	I	11984.00	-29.10	I	I	I	14784.00	-21.32	I		
-62.00       1712.00       1712.00       -26.76       -13.0       -54.00       2112.00       -21.99       -13.0         -62.00       1732.50	Ι		13696.00	-26.59	Ι	I	I	16896.00	-21.24	Ι		
-62.00       1732.50	Ι	I	15408.00	-25.73	I	I		19008.00	-22.25	-		
I       I       3465.00       -28.62       -13.0       I       I       4265.00       -22.37       -13.0         I       I       5197.50       -29.97       I       I       I       6397.50       -22.38       I         I       I       6930.00       -28.49       I       I       I       8530.00       -21.14       I         I       I       8632.50       -28.32       I       I       I       10662.50       -23.45       I         I       I       10395.00       -28.49       I       I       I       10662.50       -20.72       I         I       I       12127.50       -27.19       I       I       I       14972.50       -20.72       I         I       I       1589.50       -26.10       I       I       I       19192.50       -23.09       I         I       I       1559.50       -26.42       -13.0       -54.00       2132.50       -21.46       -13.0         -62.00       1732.50       1732.50       -28.69       -13.0       I       I       4306.00       -22.23       -13.0         I       I       3506.00       -28.69       -13.0 <td>-62.00</td> <td>1712.00</td> <td>17120.00</td> <td>-26.76</td> <td>-13.0</td> <td>-54.00</td> <td>2112.00</td> <td>21120.00</td> <td>-21.99</td> <td>-13.0</td> <td></td>	-62.00	1712.00	17120.00	-26.76	-13.0	-54.00	2112.00	21120.00	-21.99	-13.0		
I       I       3465.00       -28.62       -13.0       I       I       4265.00       -22.37       -13.0         I       I       5197.50       -29.97       I       I       I       6397.50       -22.38       I         I       I       6930.00       -28.49       I       I       I       8530.00       -21.14       I         I       I       8632.50       -28.32       I       I       I       10662.50       -23.45       I         I       I       10395.00       -28.49       I       I       I       10662.50       -20.72       I         I       I       12127.50       -27.19       I       I       I       14972.50       -20.72       I         I       I       1589.50       -26.10       I       I       I       19192.50       -23.09       I         I       I       1559.50       -26.42       -13.0       -54.00       2132.50       -21.46       -13.0         -62.00       1732.50       1732.50       -28.69       -13.0       I       I       4306.00       -22.23       -13.0         I       I       3506.00       -28.69       -13.0 <td></td>												
I       I       5197.50       -29.97       I       I       I       6397.50       -22.98       I         I       I       6930.00       -28.49       I       I       I       8530.00       -21.14       I         I       I       8662.50       -28.32       I       I       I       10662.50       -23.45       I         I       I       10395.00       -28.49       I       I       I       12795.00       -22.67       I         I       I       12175.00       -27.19       I       I       I       14927.50       -20.72       I         I       I       13860.00       -26.10       I       I       I       14927.50       -20.72       I         I       I       13860.00       -26.40       I       I       I       1992.50       -23.09       I         -62.00       1732.50       1732.50       -26.42       -13.0       -21.46       -13.0       -21.46       -13.0         I       I       3506.00       -28.69       -13.0       I       I       4306.00       -22.23       -13.0         I       I       559.00       -28.23       I	-62.00					-54.00	2132.50					
I       I       6930.00       -28.49       I       I       I       I       8530.00       -21.14       I         I       I       8662.50       -28.32       I       I       I       10662.50       -23.45       I         I       I       10395.00       -28.49       I       I       I       12795.00       -22.67       I         I       I       12127.50       -27.19       I       I       I       14927.50       -20.72       I         I       I       13860.00       -26.10       I       I       I       14927.50       -20.72       I         I       I       13860.00       -26.40       I       I       I       19192.50       -23.09       I         -62.00       1732.50       17325.00       -26.42       -13.0       -54.00       2132.50       2132.60       -21.46       -13.0         -62.00       1753.00       -       -       -       -       -       -       -         -62.00       1753.00       -28.69       -13.0       I       I       4306.00       -22.23       -13.0         I       1       559.00       -28.67       I	I	•				1	1			-13.0		
I       I       8662.50       -28.32       I       I       I       10662.50       -23.45       I         I       I       10395.00       -28.49       I       I       I       12795.00       -22.67       I         I       I       12127.50       -27.19       I       I       I       14927.50       -20.72       I         I       I       13860.00       -26.10       I       I       I       14927.50       -20.72       I         I       I       15592.50       -25.96       I       I       I       19192.50       -23.09       I         -62.00       1732.50       1732.50       -26.42       -13.0       -54.00       2132.50       21325.00       -21.46       -13.0         -62.00       1753.00       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -						· ·		+ +		1		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		-								1		
I       I       I2127.50       -27.19       I       I       I       I4927.50       -20.72       I         I       I       13860.00       -26.10       I       I       I       17060.00       -21.30       I         I       I       15592.50       -25.96       I       I       I       19192.50       -23.09       I         -62.00       1732.50       17325.00       -26.42       -13.0       -54.00       2132.50       21325.00       -21.46       -13.0         -62.00       1753.00       -       -       -       -       -       -       -         -62.00       1753.00       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td></td> <td>•</td> <td></td> <td></td> <td></td> <td>· ·</td> <td>1</td> <td></td> <td></td> <td></td> <td></td>		•				· ·	1					
I       I       13860.00       -26.10       I       I       I       17060.00       -21.30       I         I       I       15592.50       -25.96       I       I       I       19192.50       -23.09       I         -62.00       1732.50       17325.00       -26.42       -13.0       -54.00       2132.50       2132.50       -21.46       -13.0         -62.00       1753.00       -       -       -       -       -       -       -       -         -62.00       1753.00       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       <						· · ·	1	+ +			ł	
I       I       15592.50       -25.96       I       I       I       19192.50       -23.09       I         -62.00       1732.50       17325.00       -26.42       -13.0       -54.00       2132.50       21325.00       -21.46       -13.0         -62.00       1753.00						-	1	+ +				
-62.00       1732.50       17325.00       -26.42       -13.0       -54.00       2132.50       21325.00       -21.46       -13.0         -62.00       1753.00       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	-						1					
Image: Note of the system         Im												
I       I       3506.00       -28.69       -13.0       I       I       4306.00       -22.23       -13.0         I       I       5259.00       -29.35       I       I       I       6459.00       -23.12       I         I       I       7012.00       -28.05       I       I       I       8612.00       -21.74       I         I       I       8765.00       -28.23       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       172918.00       -22.60       I         I       I       10518.00       -27.23       I       I       I       15071.00       -20.88       I         I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       -27.18       -13.0       -54.00 </td <td>02.00</td> <td></td> <td></td> <td>20112</td> <td>10.0</td> <td>0.100</td> <td>2102100</td> <td>2.020.000</td> <td>20</td> <td>10.0</td> <td>ł</td>	02.00			20112	10.0	0.100	2102100	2.020.000	20	10.0	ł	
I       I       3506.00       -28.69       -13.0       I       I       4306.00       -22.23       -13.0         I       I       5259.00       -29.35       I       I       I       6459.00       -23.12       I         I       I       7012.00       -28.05       I       I       I       8612.00       -21.74       I         I       I       8765.00       -28.23       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       172918.00       -22.60       I         I       I       10518.00       -27.23       I       I       I       15071.00       -20.88       I         I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       -27.18       -13.0       -54.00 </td <td>-62.00</td> <td>1753.00</td> <td></td> <td></td> <td></td> <td>-54.00</td> <td>2153.00</td> <td></td> <td></td> <td></td> <td>1</td>	-62.00	1753.00				-54.00	2153.00				1	
I       I       5259.00       -29.35       I       I       I       6459.00       -23.12       I         I       I       7012.00       -28.05       I       I       I       8612.00       -21.74       I         I       I       8765.00       -28.23       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       12918.00       -22.60       I         I       I       10518.00       -27.23       I       I       I       15071.00       -20.88       I         I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       2153.00       -21.68       -13.0         -62.00       1753.00       -27.18       -13.0 <td></td> <td></td> <td>3506.00</td> <td>-28.69</td> <td>-13.0</td> <td></td> <td>1</td> <td>4306.00</td> <td>-22.23</td> <td>-13.0</td> <td>†</td>			3506.00	-28.69	-13.0		1	4306.00	-22.23	-13.0	†	
I       I       8765.00       -28.23       I       I       I       10765.00       -23.44       I         I       I       10518.00       -28.67       I       I       I       12918.00       -22.60       I         I       I       12271.00       -27.23       I       I       I       15071.00       -20.88       I         I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       14024.00       -26.26       I       I       I       19377.00       -21.88       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       21530.00       -21.68       -13.0         -62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       21530.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -21.00       -21.68       -13.0         -62.00       1753.00       -21.00	Ι	I	5259.00	-29.35	I	I	I	6459.00	-23.12	I		
I       I       10518.00       -28.67       I       I       I       12918.00       -22.60       I         I       I       12271.00       -27.23       I       I       I       15071.00       -20.88       I         I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       14024.00       -26.26       I       I       I       17224.00       -23.06       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       21530.00       -21.68       -13.0         -62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       21530.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -13.0       -14.00       -14.00       -14.00       -14.00       -14.00       -14.0	Ι	I	7012.00	-28.05	I	I	I	8612.00	-21.74	I	[	
I       I 2271.00       -27.23       I       I       I       15071.00       -20.88       I         I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       2153.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       2153.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       2153.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       21.53.00       -21.68       -13.0         -       -       -       -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -       -         -       -       -       <	Ι	I	8765.00	-28.23	I	I	I	10765.00	-23.44	I		
I       I       14024.00       -26.58       I       I       I       17224.00       -23.06       I         I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       2153.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       2153.00       -21.68       -13.0         -62.00       1753.00       1753.00       -27.18       -13.0       -54.00       2153.00       21.53.00       -21.68       -13.0         -62.00       1       -1       -1       1       19377.00       -21.68       -13.0         -10       -10       -10       -10       -10       -10       -10       -10         -11       -11       1       10       -11       1       10       -11       11       -11       -21.68       -13.0         -10       -10       -10       -10       -10       -10       -10       -11       -11       -11       -11       -11       -11       -11       -11 </td <td>I</td> <td>I</td> <td>10518.00</td> <td>-28.67</td> <td>I</td> <td> </td> <td> </td> <td>12918.00</td> <td>-22.60</td> <td>I</td> <td></td>	I	I	10518.00	-28.67	I			12918.00	-22.60	I		
I       I       15777.00       -26.26       I       I       I       19377.00       -21.88       I         -62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       21530.00       -21.68       -13.0         -       -       -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	Ι	I	12271.00	-27.23	Ι	Ι		15071.00	-20.88	Ι		
-62.00       1753.00       17530.00       -27.18       -13.0       -54.00       2153.00       21530.00       -21.68       -13.0         Image: Constraint of the system of t	Ι	I	14024.00	-26.58	I	Ι	I	17224.00	-23.06	I		
	I	I	15777.00	-26.26	I	1	I	19377.00	-21.88	1		
Data Sheet 1 of 1	-62.00	1753.00	17530.00	-27.18	-13.0	-54.00	2153.00	21530.00	-21.68	-13.0		
Data Sheet 1 of 1 R-5522												
Data Sheet 1 of 1 R-5522											<u> </u>	
Data Sheet 1 of 1 R-5522												
	Data Shee	t 1 of 1									R-55221	