

Advanced
Compliance

6 Randolph Way
Hillsborough, NJ 08844
Tel: (908) 927 9288
Fax: (908) 927 0728

**Electromagnetic
Emission
Compliance
Test Report**



**Equipment Under Test
(EUT)
Applicant**

Indoor Repeater R20-1900
Shyam Telecom Inc.

In Accordance With

FCC Part 24, Subpart E

Test by

Advanced Compliance Laboratory, Inc.
6 Randolph Way
Hillsborough, New Jersey 08844

Authorized by

Wei Li
Lab Manager

Signature

Date

June 1, 2007

**AC Lab Report
Number**

0048-070502-01



Lab Code:200101-0

**The test result in this report is supported and
covered by the NVLAP accreditation.**

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Section 1. Summary of Test Results

Manufacturer: Shyam Telecom Inc.
Model No.: Indoor Repeater R20-1900
Sample No.: R20DG301

General: **All measurements are traceable to national standards**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 24, Subpart E.

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.

“See Summary of Test Data”



NVLAP LAB CODE: 200101-0

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Summary of Test Data

RF Power Output	22.913(a)	500W ERP	N/A*
	24.232(a)	100W EIRP	Complies
Occupied Bandwidth (Voice & SAT)	2.1049(i)	Mask	N/A
Occupies Bandwidth (Wideband Data)	2.1049(i)	Mask	N/A
Occupied Bandwidth (Digital)	2.1049(i)	Mask	Complies
Spurious Emissions at Antenna Terminals	22.917	-13 dBm	N/A
	24.238	-13 dBm	Complies
Field Strength of Spurious Emissions	22.917	-13 dBm	N/A
	24.238	-13 dBm E.I.R.P.	Complies
Frequency Stability	22.355	1.5 ppm	N/A*
	24.235	1.5 ppm	N/A*

* These items are NOT applied to the EUT.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	± 2.36	± 2.99	± 1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date: June 1, 2007

Section 2. General Equipment Specification

Supply Voltage		100-240VAC 50/60Hz to 7.5V/5A DC Adaptor				
Frequency Range	Cellular	N/A				
	PCS	UL/1850-1910MHz; DL/1930-1990MHz				
	Modulation	CDMA (F9W) <input checked="" type="checkbox"/>	GSM (GXW) <input checked="" type="checkbox"/>	NADC (DXW) <input type="checkbox"/>	EDGE (G7W) <input checked="" type="checkbox"/>	AMPS (F8W, F1D) <input type="checkbox"/>
Output Impedance		50ohm				
Frequency Translation		F1-F1 <input checked="" type="checkbox"/>	F1-F2 <input type="checkbox"/>	N/A <input type="checkbox"/>		
		Software <input type="checkbox"/>	Duplexer Change <input type="checkbox"/>	Full Band Coverage <input checked="" type="checkbox"/>		

DC voltages and DC currents per 2.1033(c)(8)

The input supply to the transmitter was set at 7.5 Volts DC. The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).

1900 MHz Digital CDMA/GSM/EDGE

RF Output, DC Current and RF Input Power are all average values.

Measured Maximum RF output(Rated): 19dBm

Measured DC voltage: 7.6V

Measured DC current: 2.1A

Measured Minimum RF output: -20 dBm

Measured DC voltage: 7.6V

Measured DC current: 2.0 A

Tune-up procedure per 2.1033(c) (9)

There are no user accessible adjustments or tuning in this portable transceiver. All necessary adjustments and tuning are performed during manufacture of the product. Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform such adjustments.

Description of Operation

This device is a Indoor Repeater operating in both downlink and uplink spectrums of PCS bands.

System Diagram

See Attachment.

Section 3. RF Output Power

Name of Test:	<i>RF Output Power</i>	Test Standard:	22.913(a) 24.232(a)
Tested By:	WEI LI	Test Date:	05/02/2007-06/01/2007

Minimum Standard: Para. No. 22.913(a). The maximum effective radiated power (ERP) of base station transmitters and cellular repeaters must not exceed 500 Watts (57dBm).

Para. No. 24.232(a). The maximum peak output power of base transmitters should not exceed 100 Watts EIRP (50dBm).

Method of Measurement: Detachable Antenna:
The peak power at antenna terminals is measured using spectrum analyzer.

Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation

$$\frac{GP}{4\pi R^2} = \frac{E^2}{120\pi}$$

and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

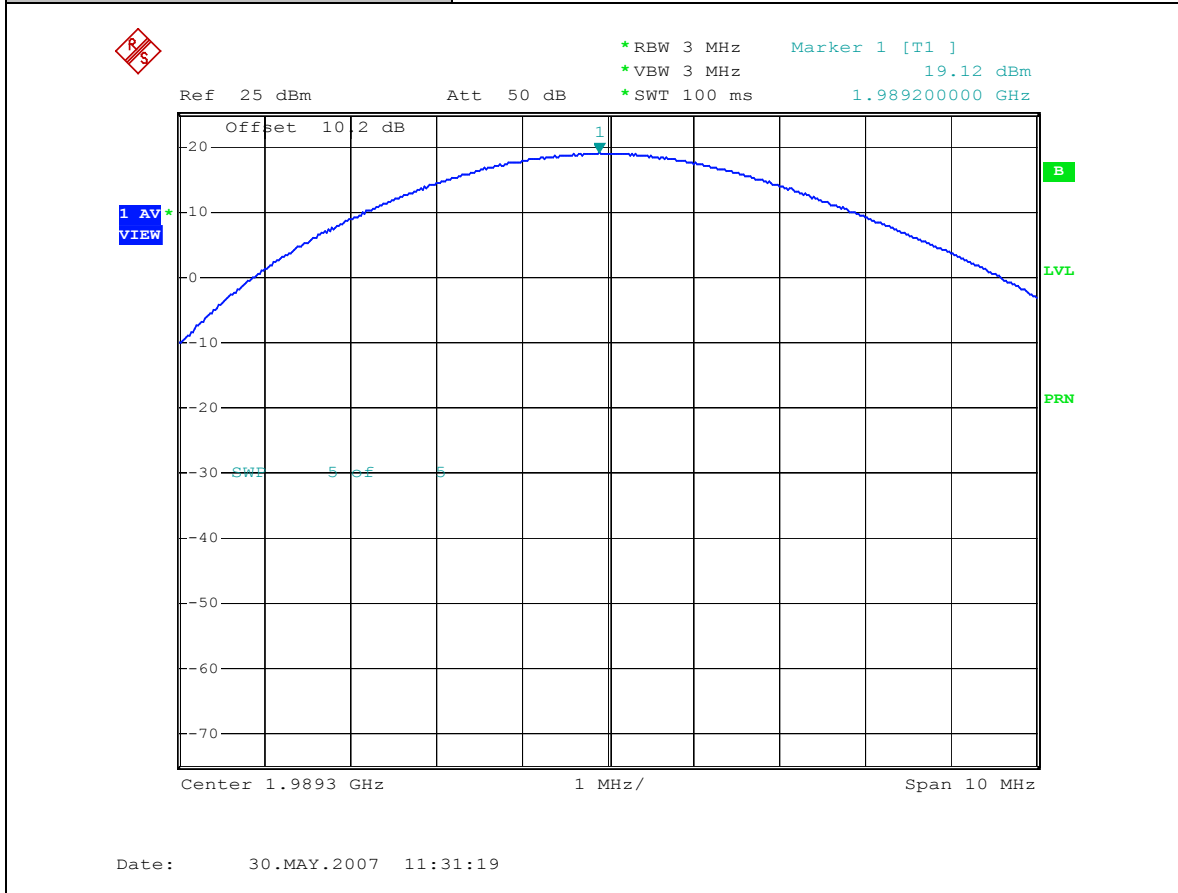
G = the numeric gain of the transmit antenna in relation to an isotropic radiator

Test Result:**Complies****Test Data:**

PCS Bands	Channel	Modulation	Power Output (dBm)	Limit (dBm)	Margin
Downlink	Hi	CDMA	19.12	50	-30.88
	Mid	CDMA	20.42	50	-29.58
	Low	CDMA	19.29	50	-30.71
	Hi	GSM	19.78	50	-30.22
	Mid	GSM	20.16	50	-29.84
	Low	GSM	18.88	50	-31.12
	Hi	EDGE	20.49	50	-29.51
	Mid	EDGE	20.40	50	-29.6
	Low	EDGE	20.21	50	-29.79
	Uplink	Hi	CDMA	19.27	50
Mid		CDMA	20.58	50	-29.42
Low		CDMA	21.12	50	-28.88
Hi		GSM	20.44	50	-29.56
Mid		GSM	22.29	50	-27.71
Low		GSM	22.28	50	-27.72
Hi		EDGE	20.99	50	-29.01
Mid		EDGE	23.04	50	-26.96
Low		EDGE	23.63	50	-26.37
Input Power (dBm)	DL/ -50dBm & UL/ -40dBm				
Ref Offset	Ref offset=Cable Factor +Attenuation=10.2dB				

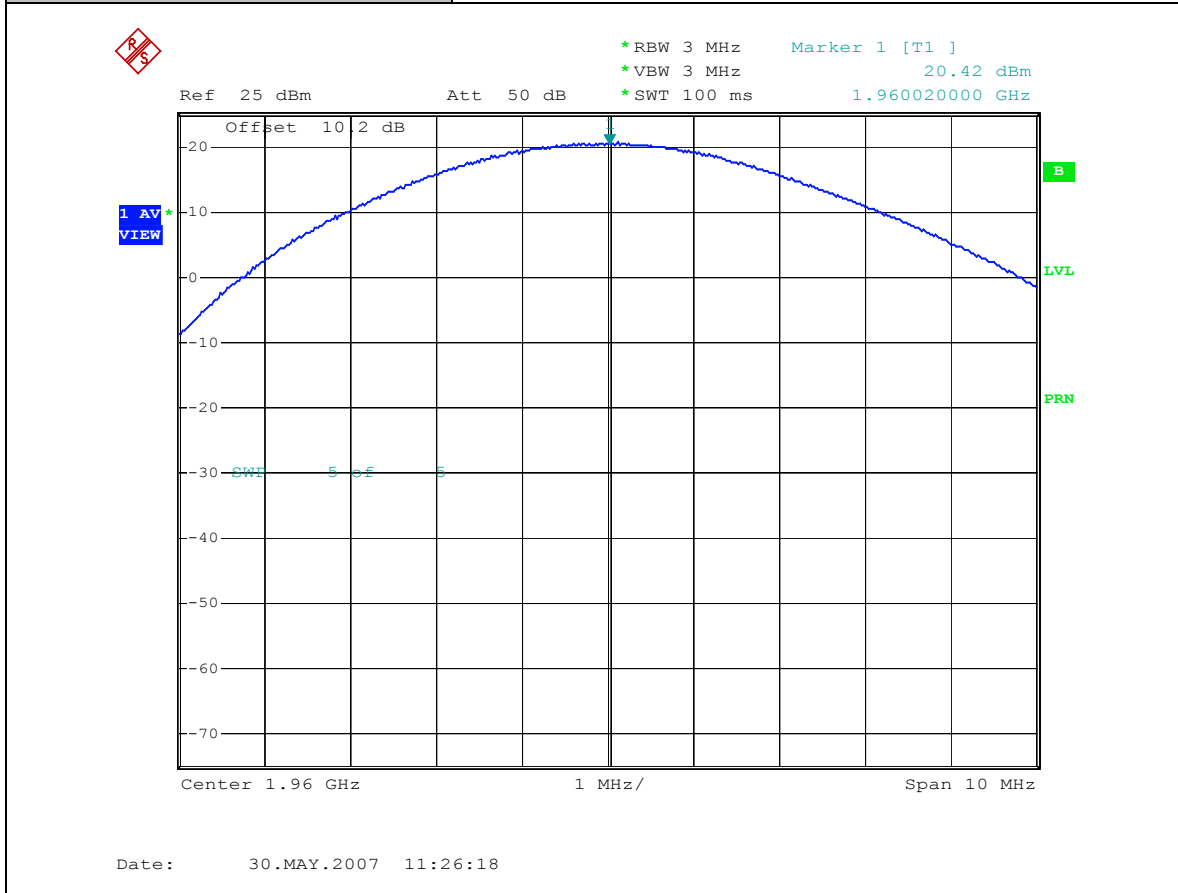
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Downlink, Hi-Channel CDMA Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

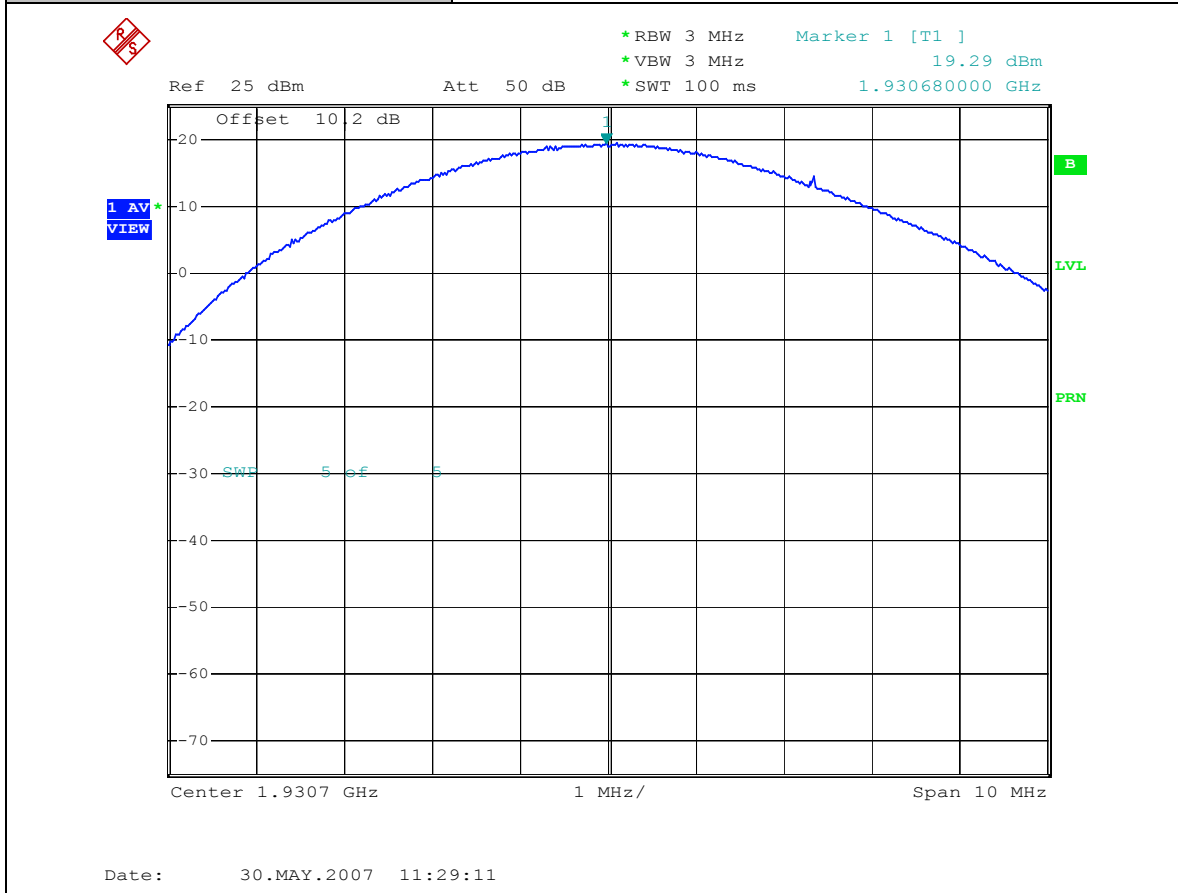
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Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



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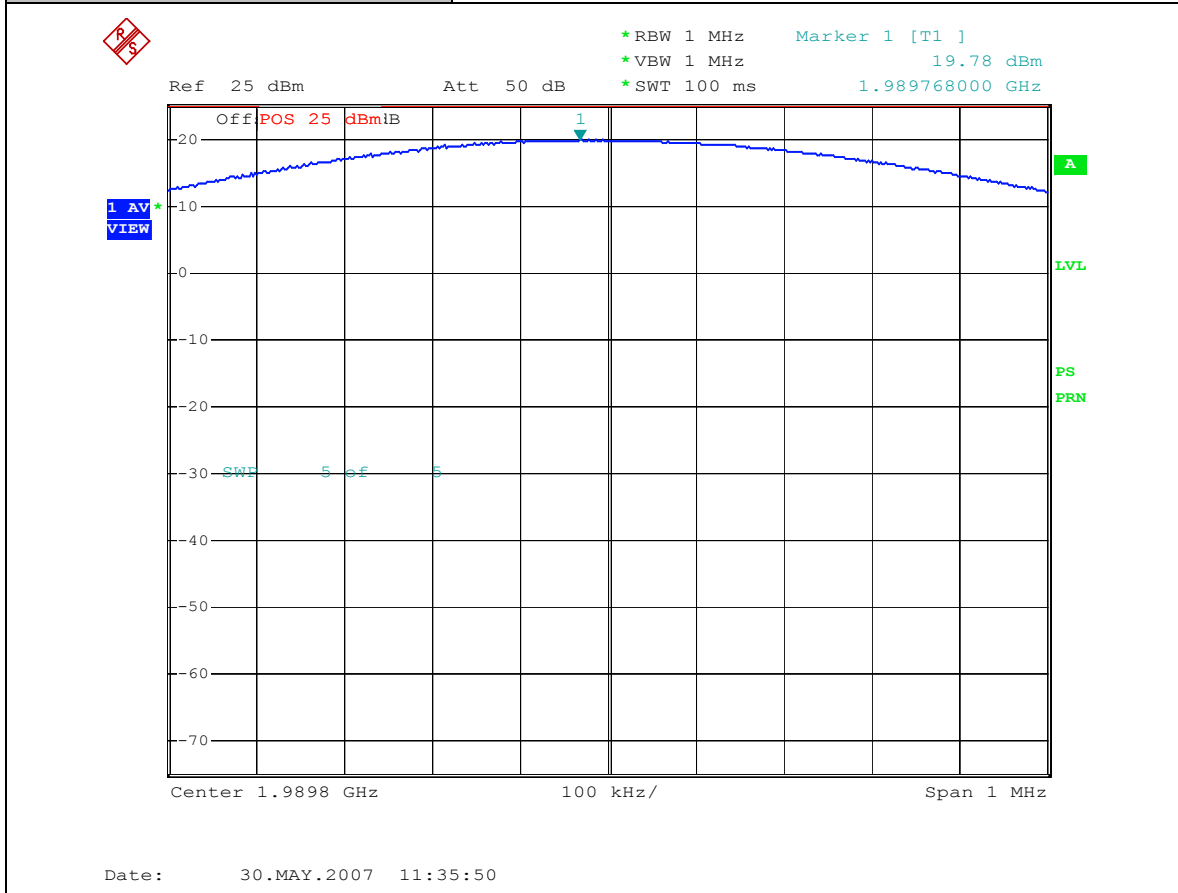
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Downlink, Low-Channel CDMA Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



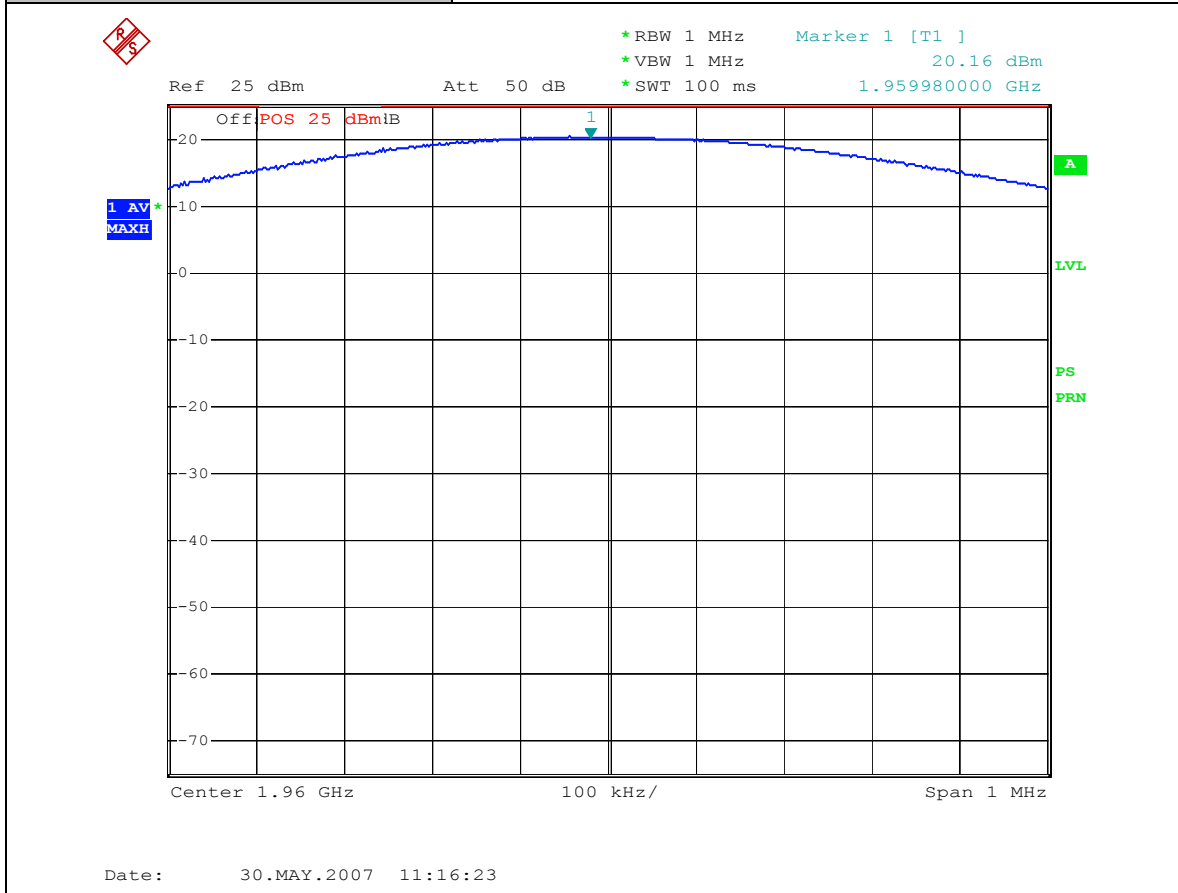
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Downlink, Hi-Channel GSM Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



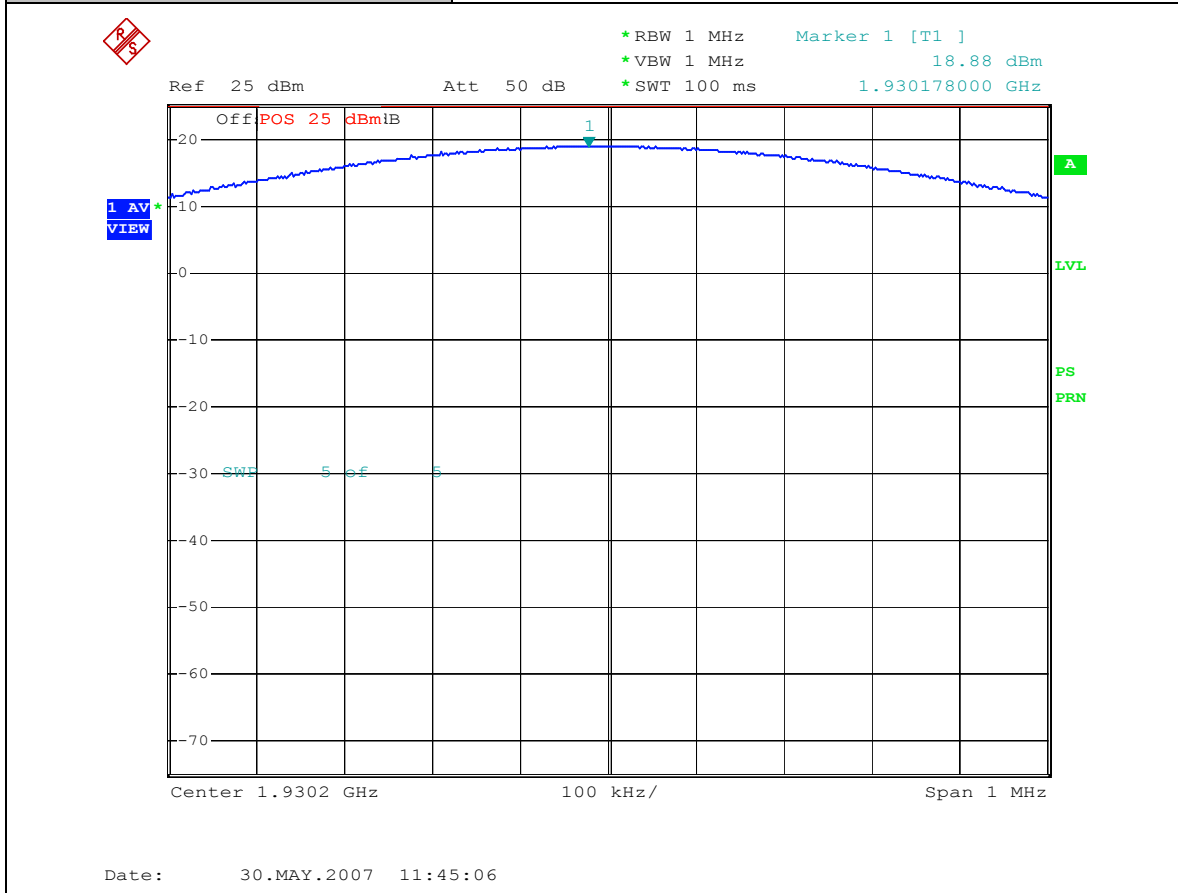
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Downlink, Mid-Channel GSM Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



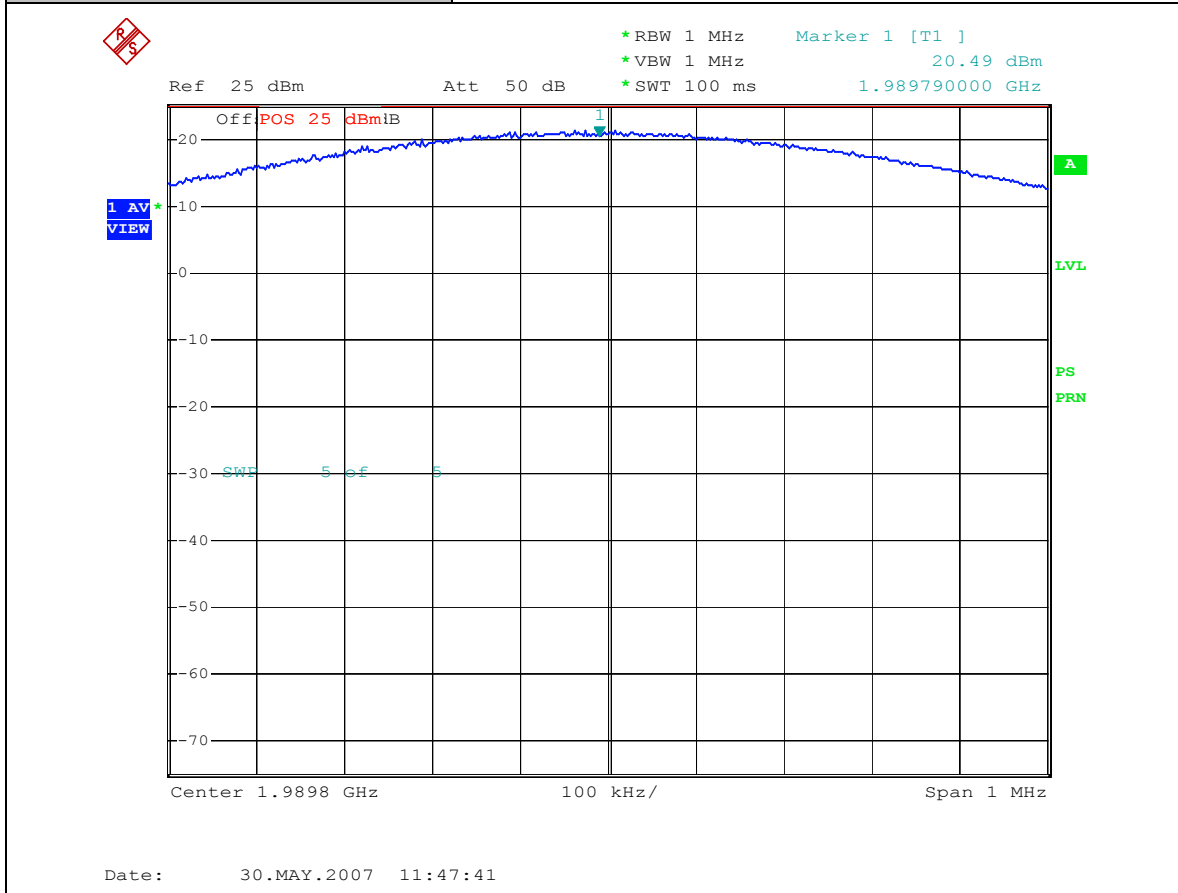
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

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Plot Name:	Downlink, Low-Channel GSM Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



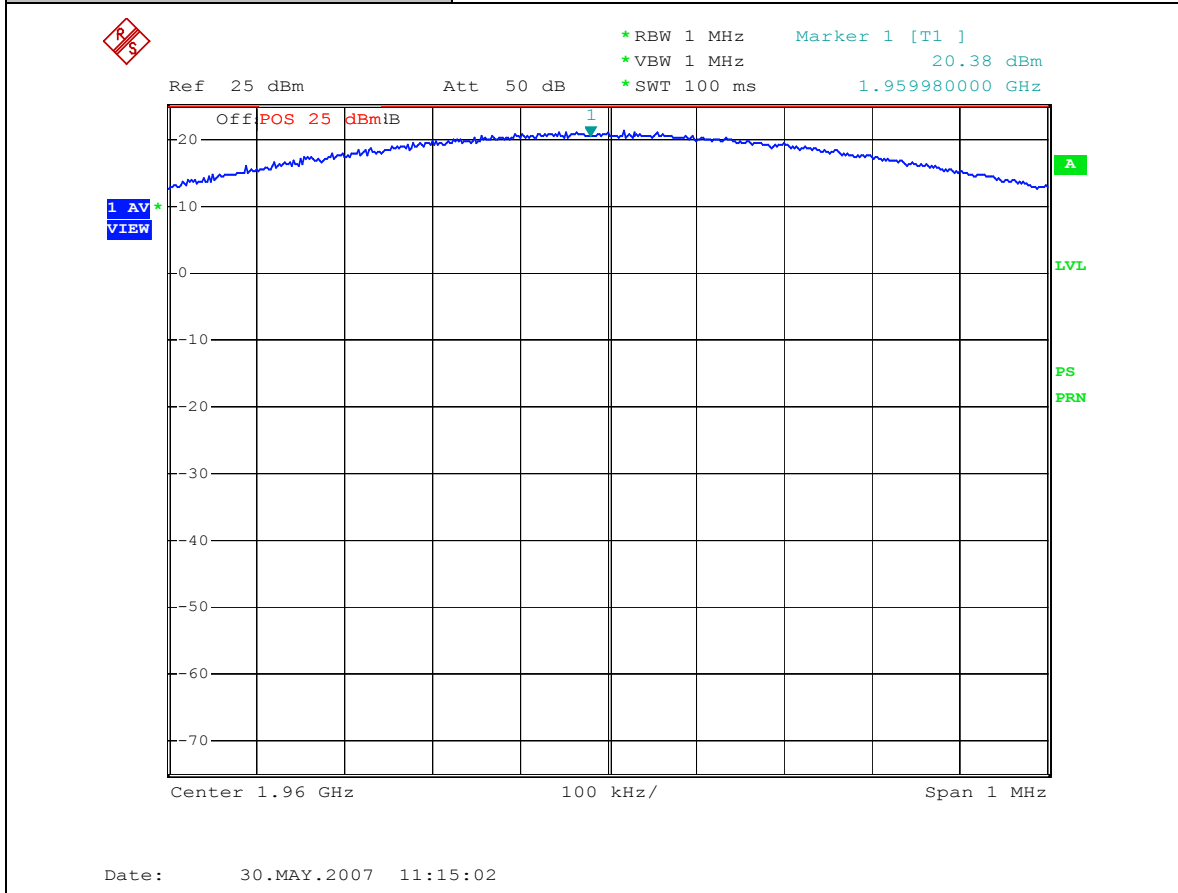
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Downlink, Hi-Channel EDGE Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



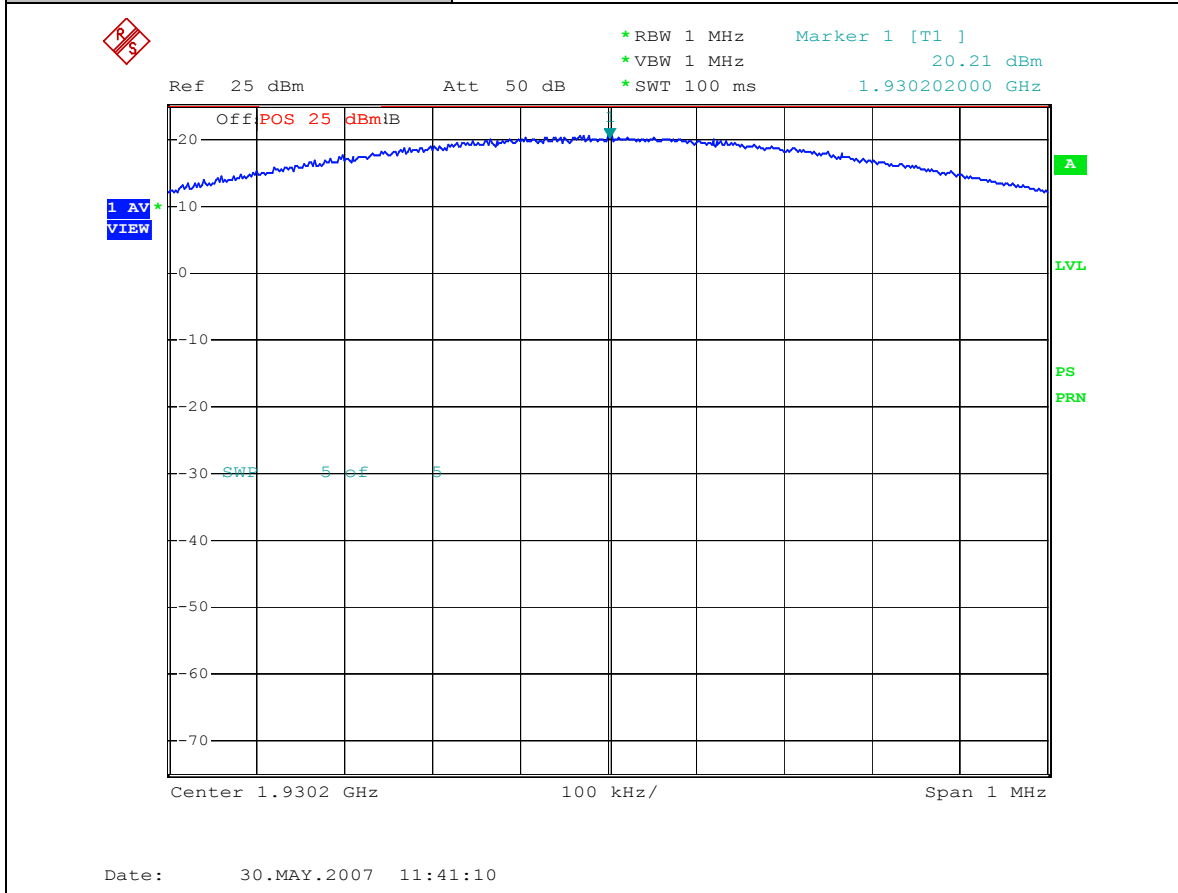
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Downlink, Mid-Channel EDGE Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



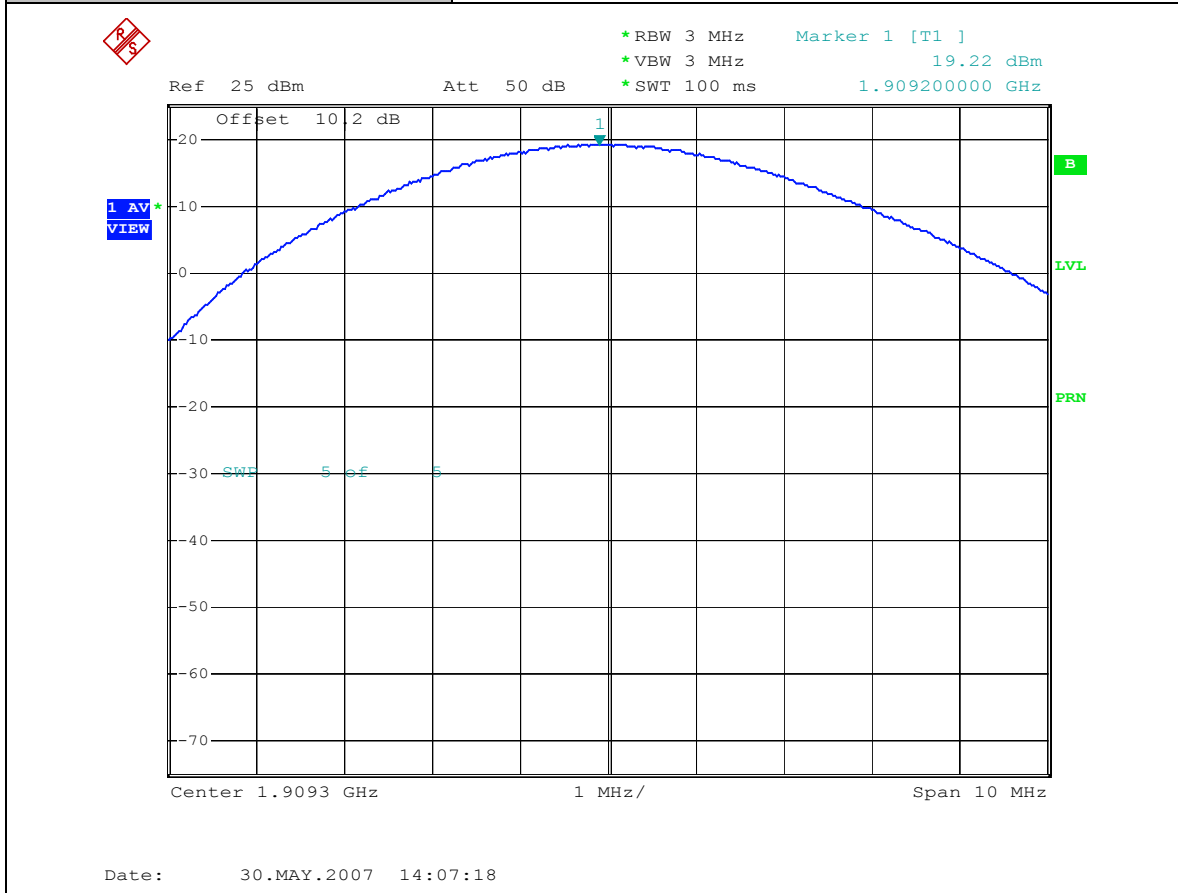
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
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Plot Name:	Downlink, Low-Channel EDGE Modulation
Configuration:	Donor Antenna Connector was connected to SG. Input: -50dBm



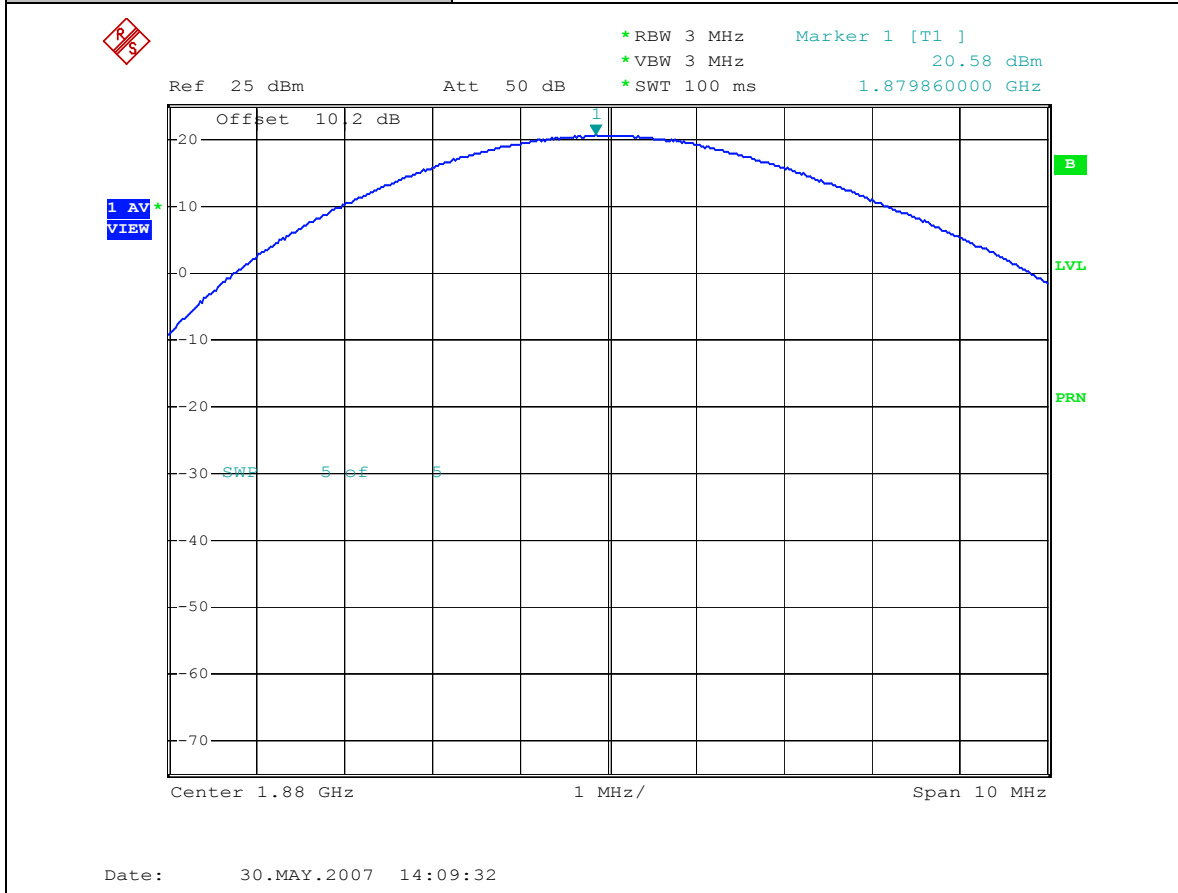
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Hi-Channel CDMA Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



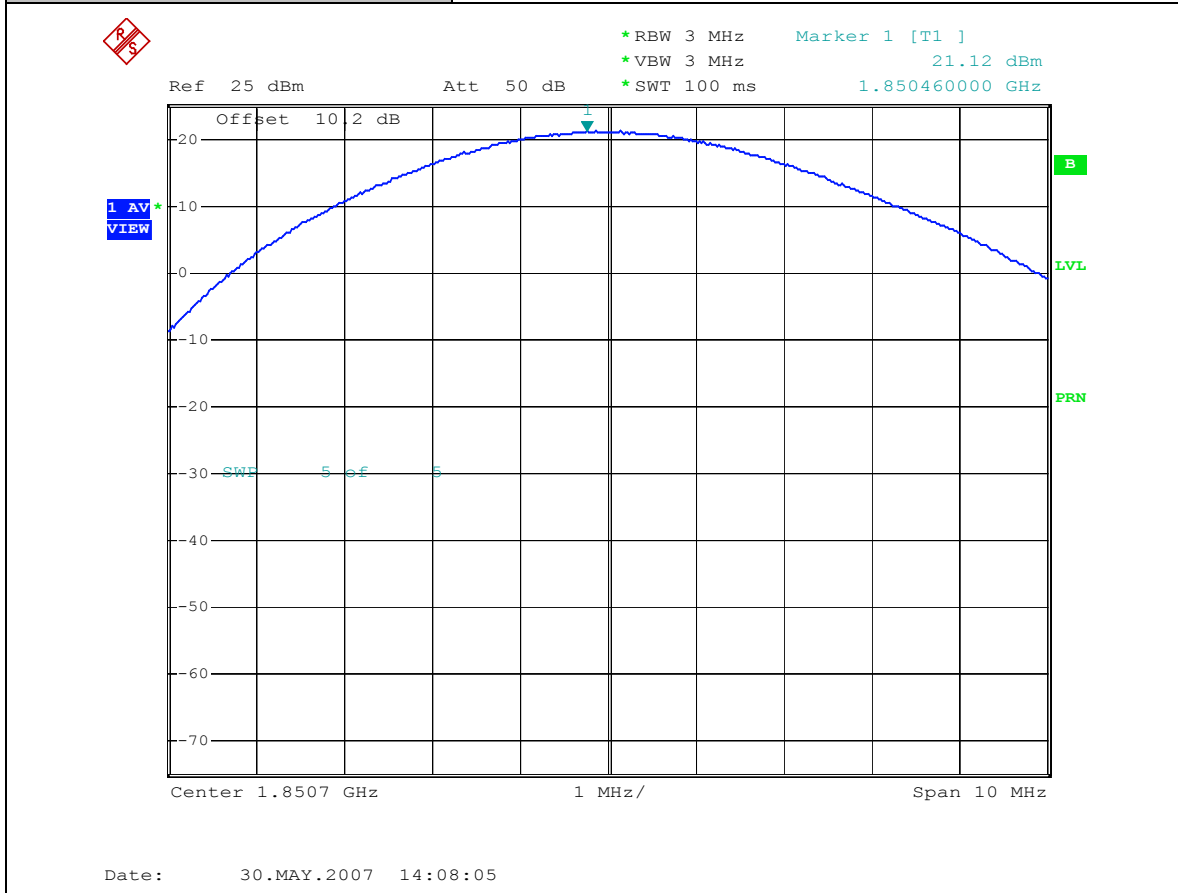
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Mid-Channel CDMA Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



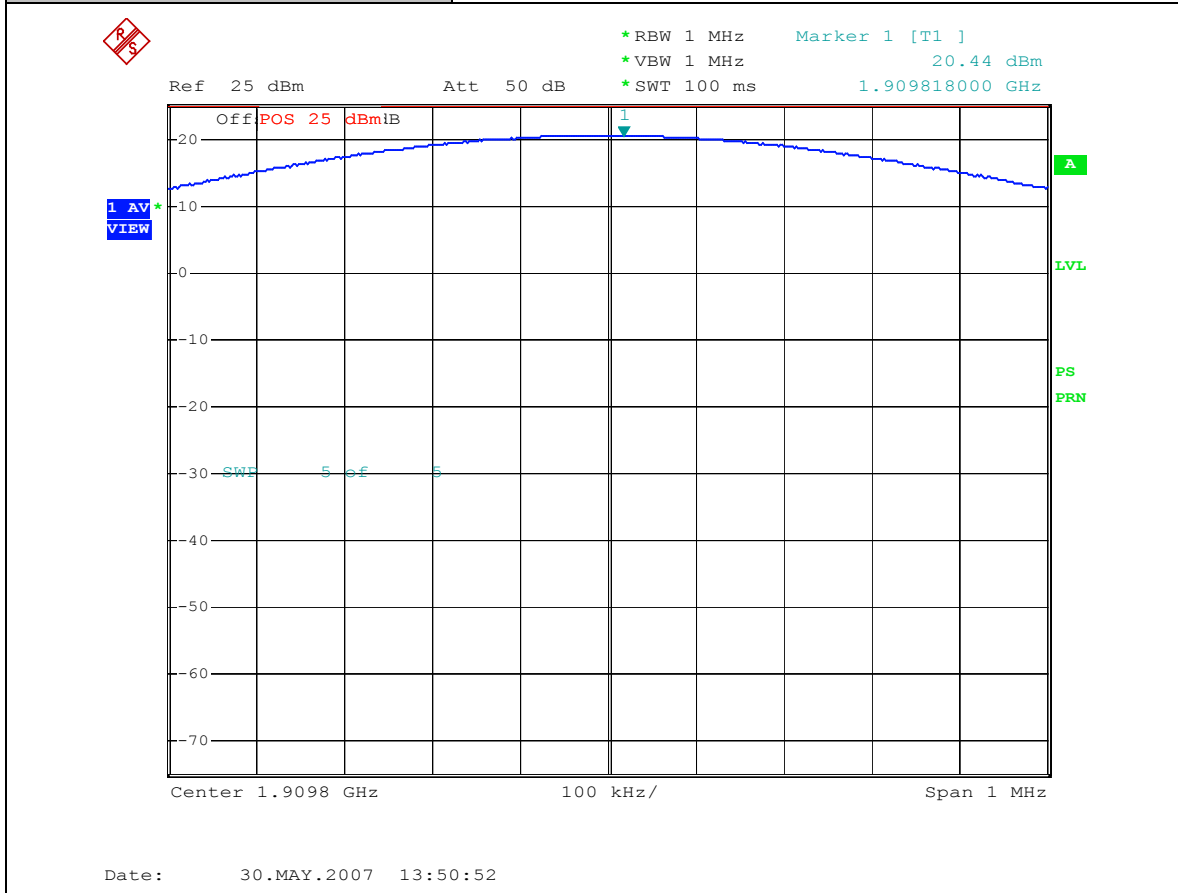
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Low-Channel CDMA Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



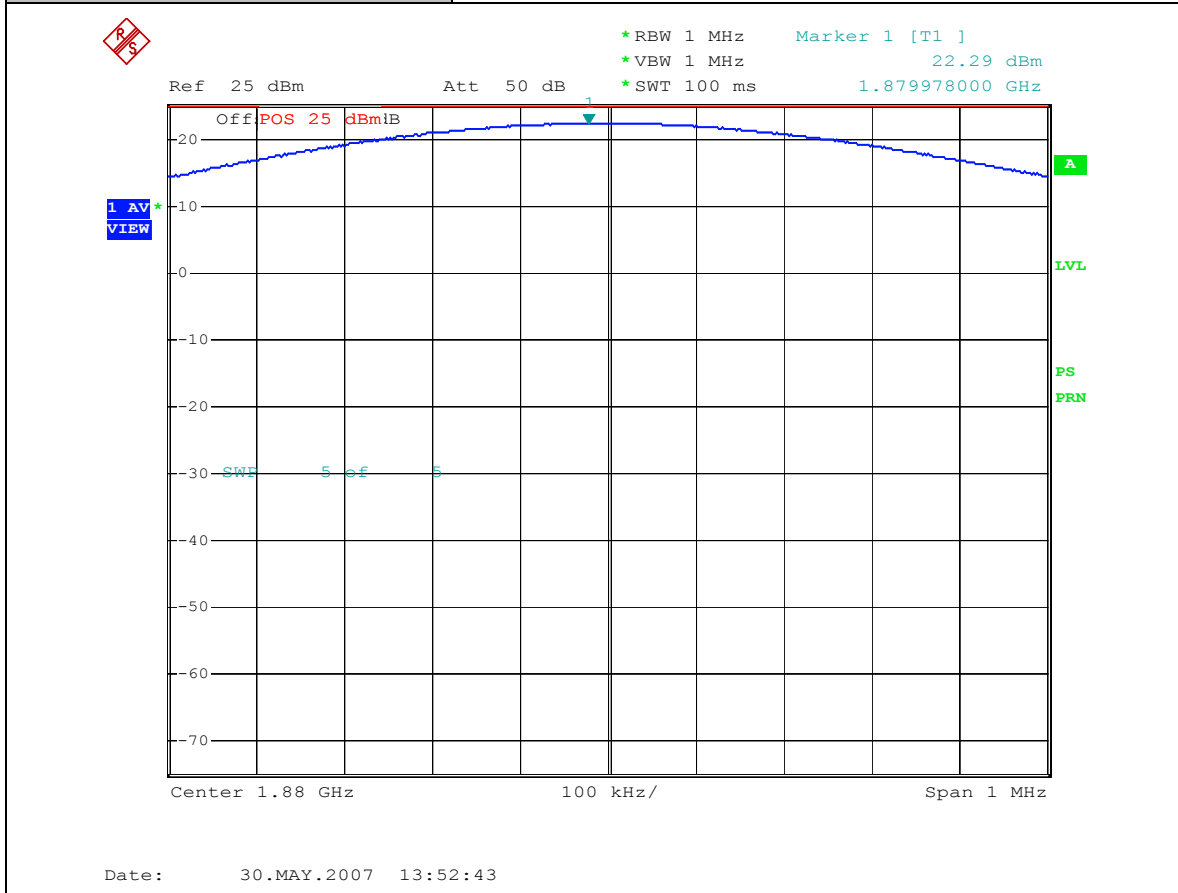
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Hi-Channel GSM Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

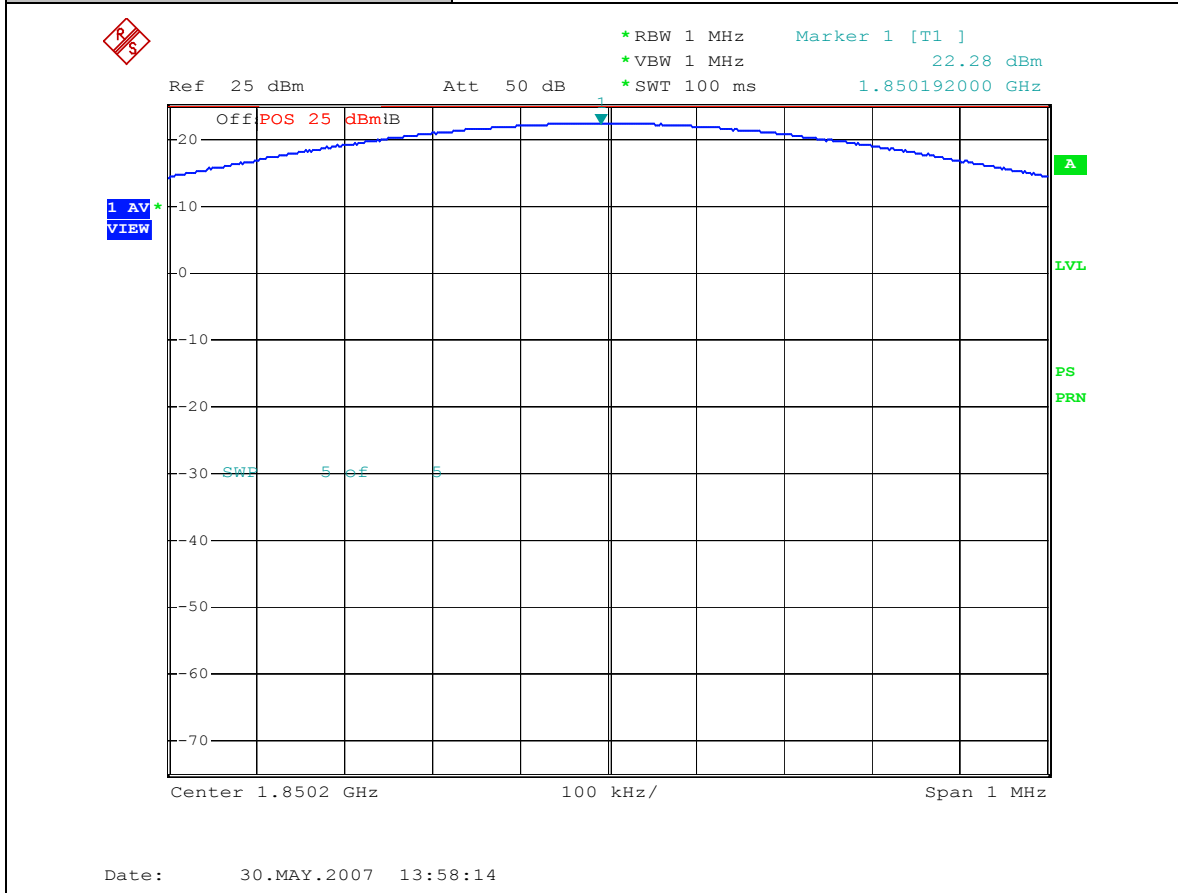
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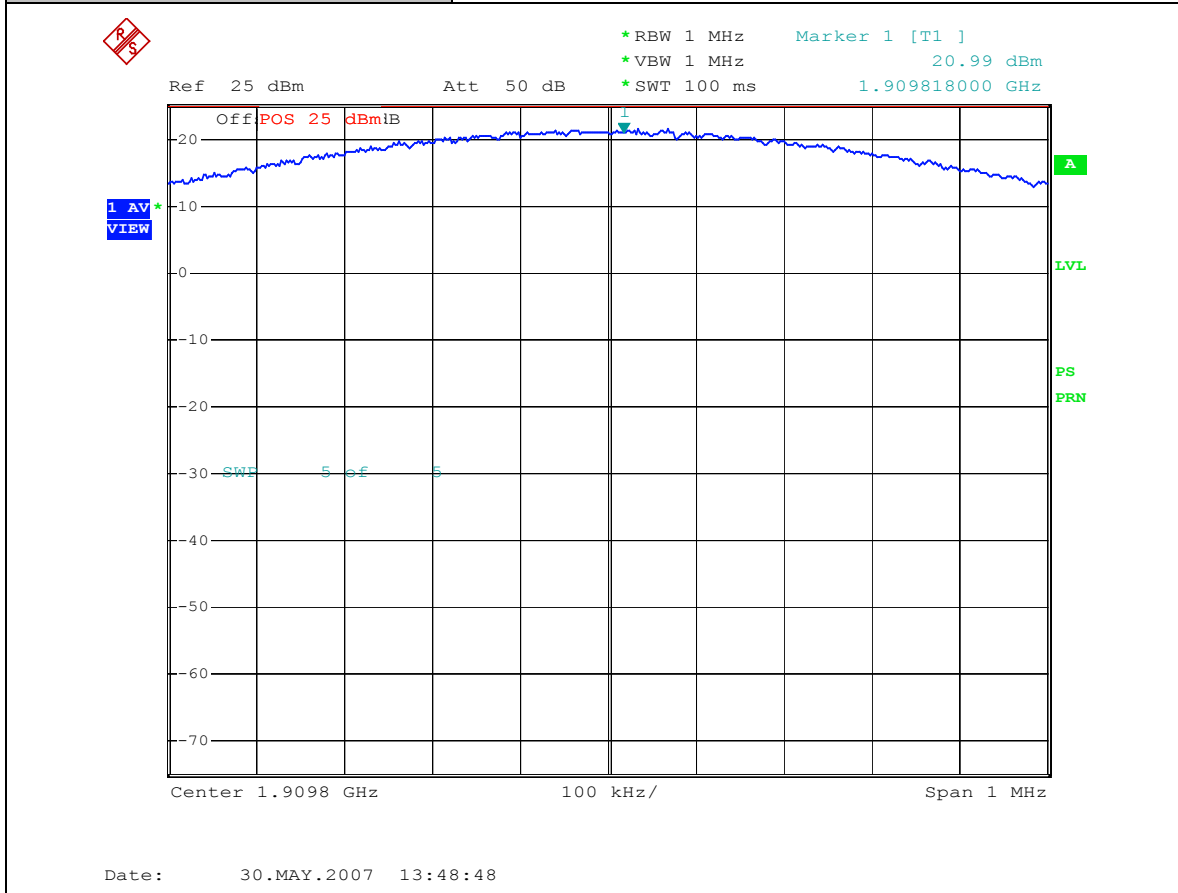
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Low-Channel GSM Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



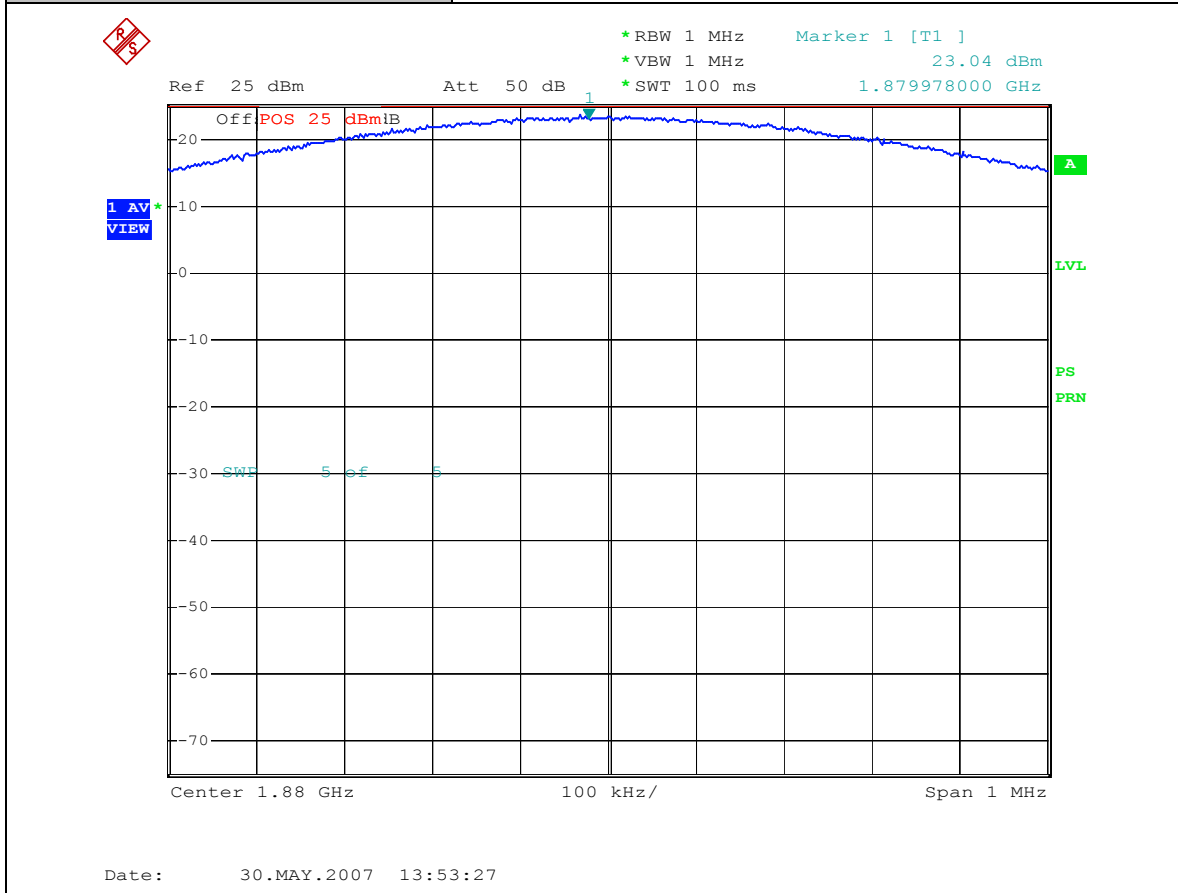
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SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Hi-Channel EDGE Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



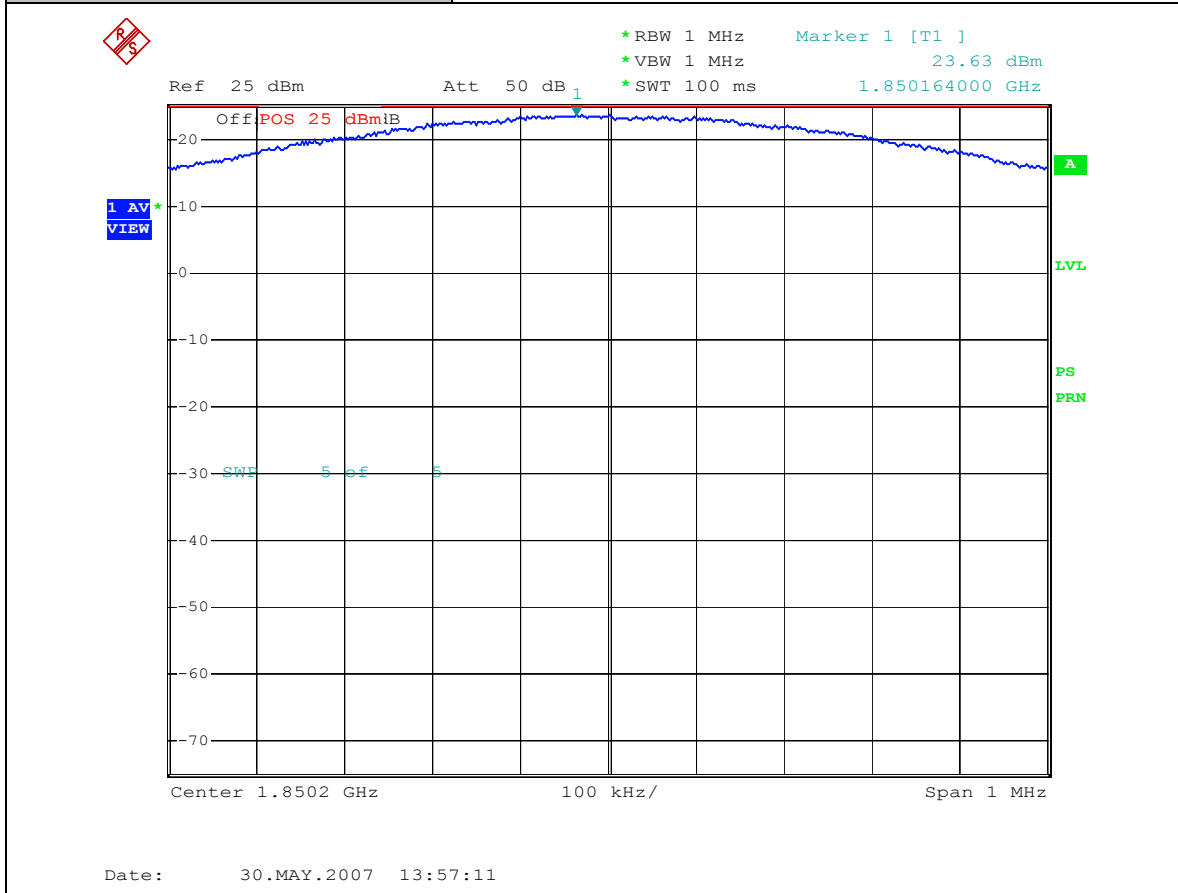
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SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Mid-Channel EDGE Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	RF Output Power: PCS Bands
Plot Name:	Uplink, Low-Channel EDGE Modulation
Configuration:	Server Antenna Connector was connected to SG. Input: -40dBm



Section 4. Occupied Bandwidth

Name of Test:	<i>Occupied Bandwidth</i>	Test Standard:	<i>2.1049(i)</i>
Tested By:	WEI LI	Test Date:	05/02/2007-06/01/2007

Minimum Standard: Not defined by FCC. Input vs. Output.

Method of Measurement: Spectrum Analyzer Settings:
RBW: CDMA (30 kHz), GSM&EDGE (3 kHz), NADC (1 kHz) and CDPD (1 kHz)
VBW: \geq RBW
Span: As required
Sweep: Auto
Input Signal Characteristics:
RF level: Maximum recommended by manufacturer

Test Result:

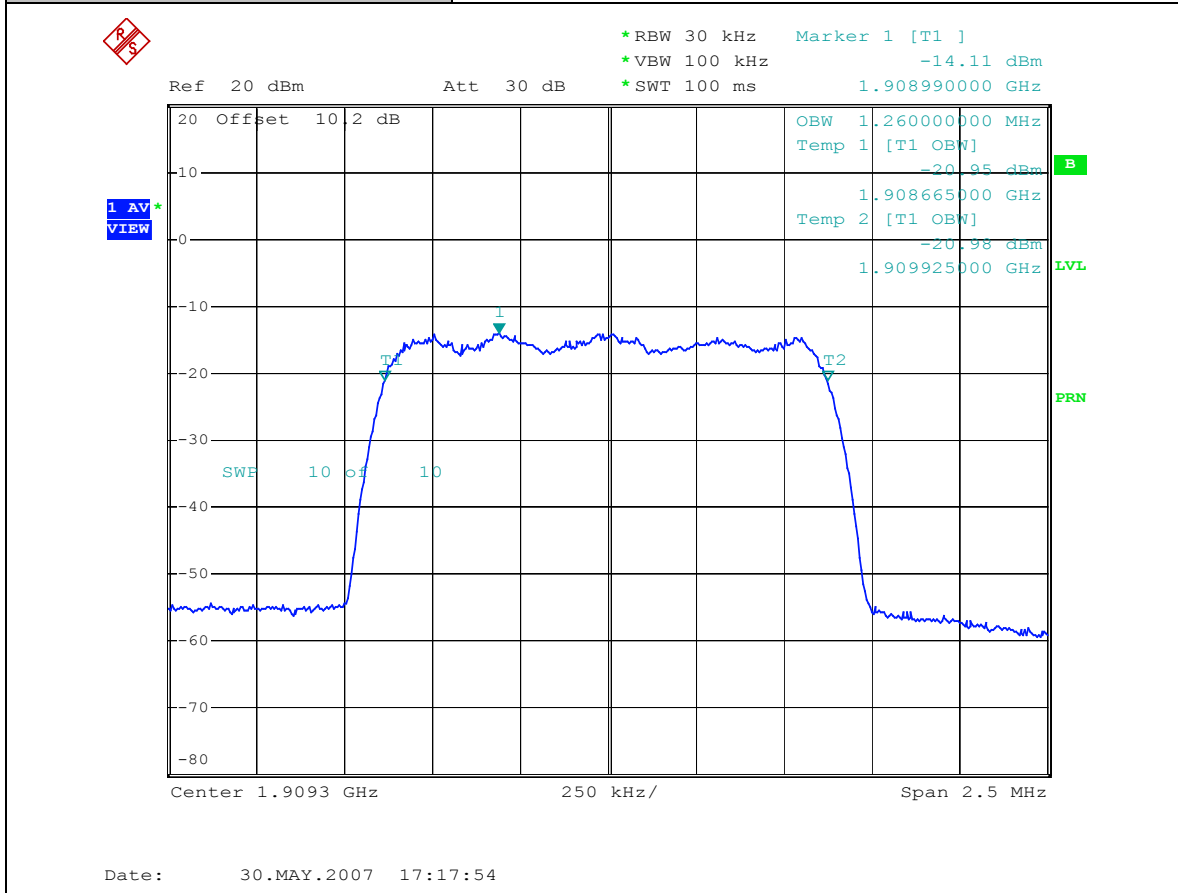
Complies

Test Data:

Attached Plots

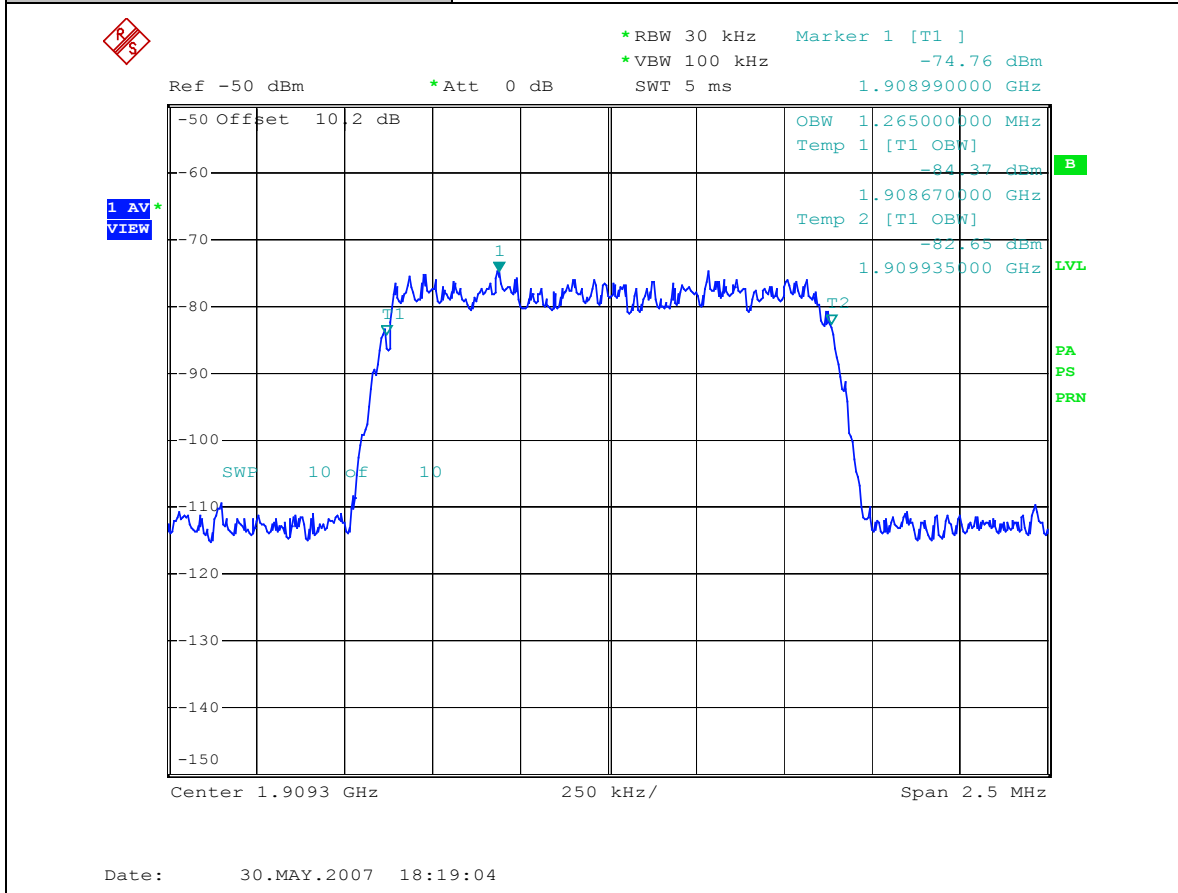
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Hi-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



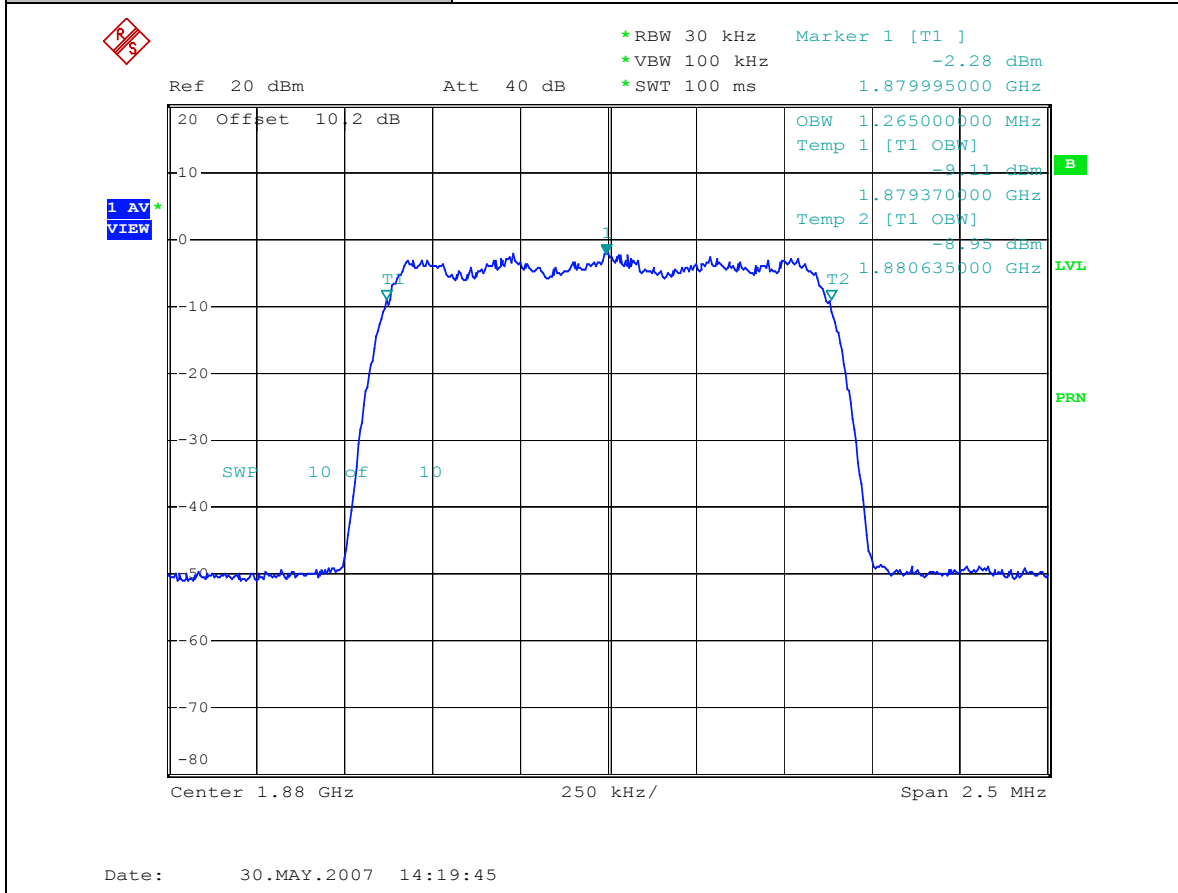
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Hi-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



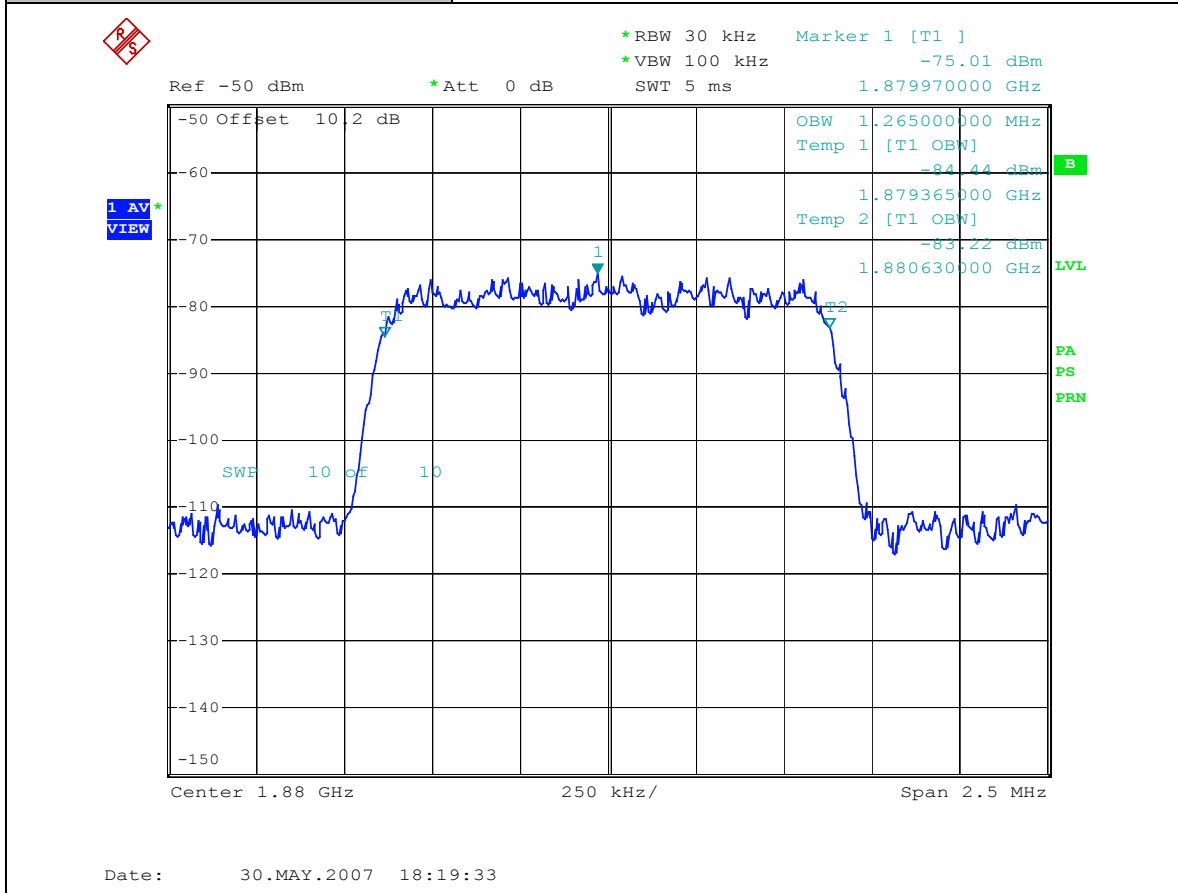
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: Cellular Bands
Plot Name:	Uplink, Mid-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



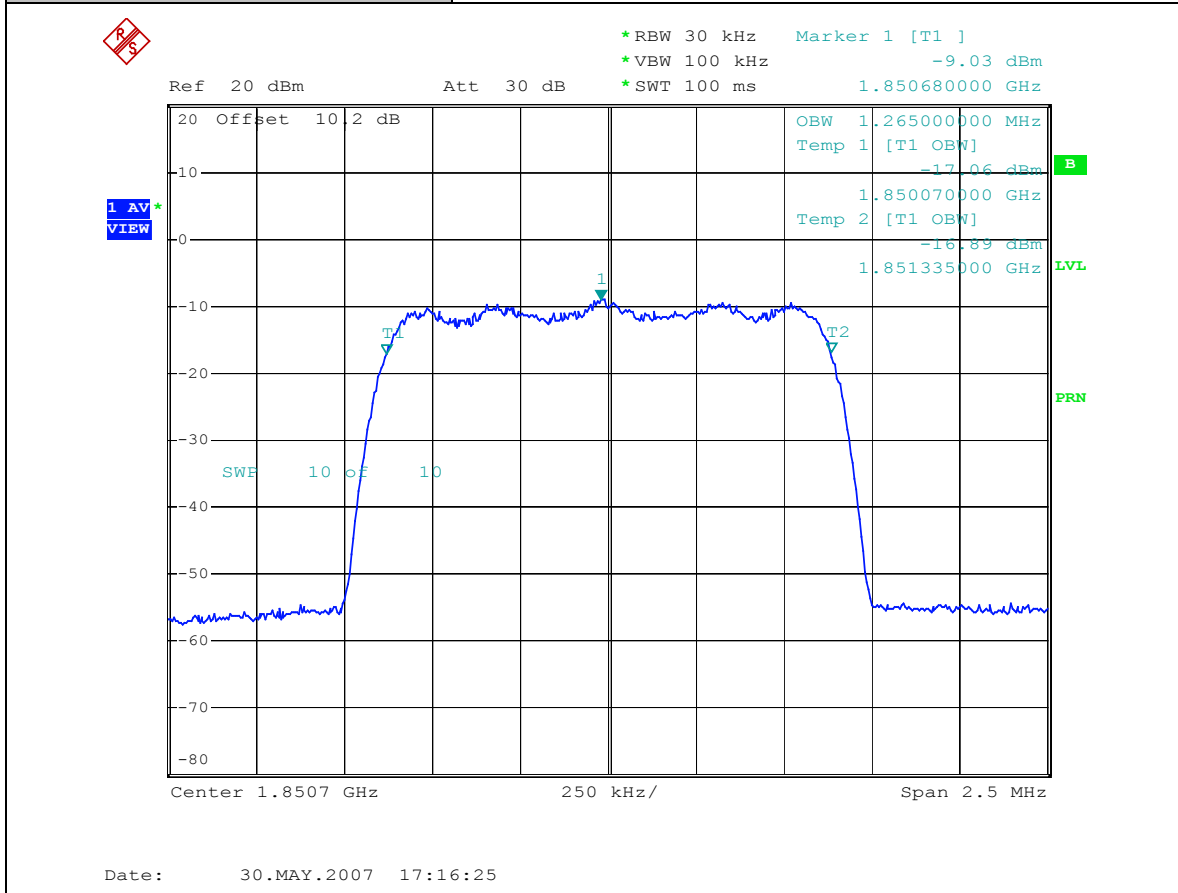
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Mid-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



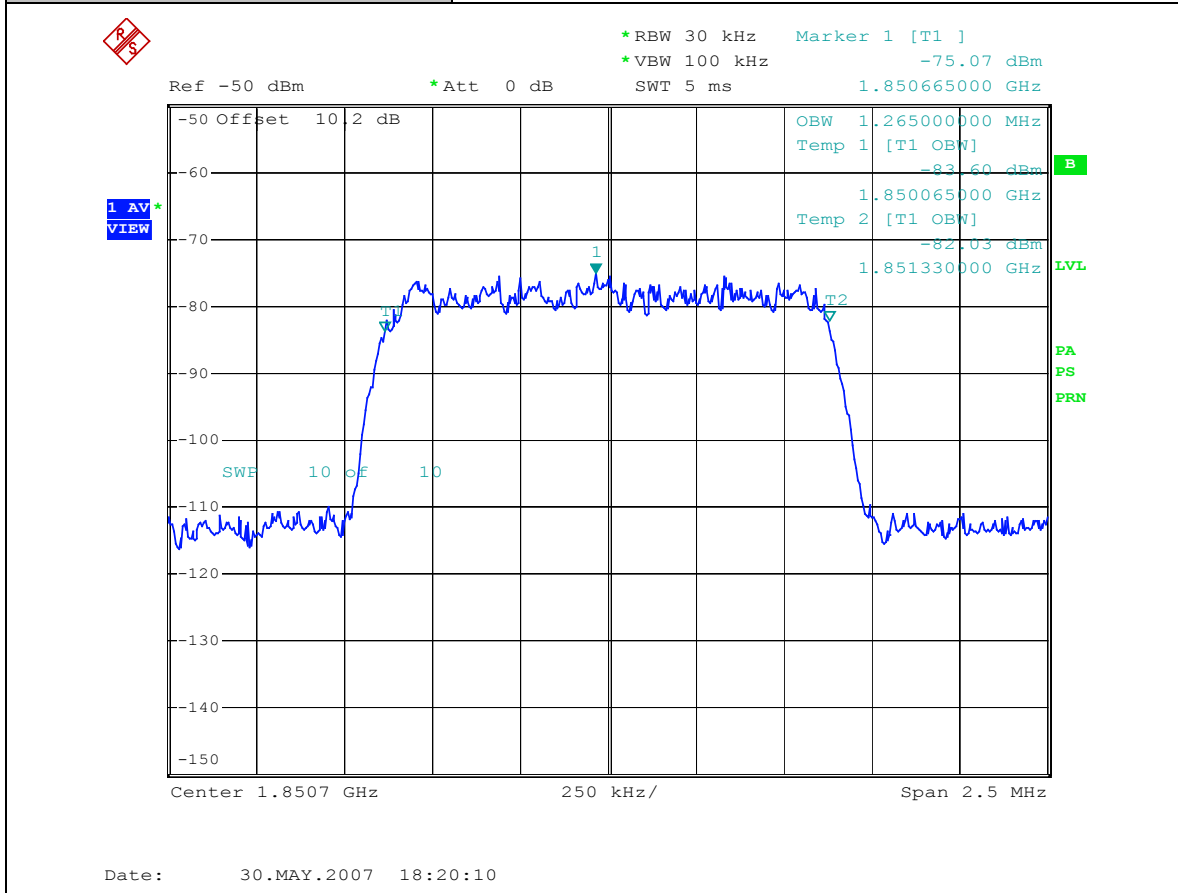
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Low-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



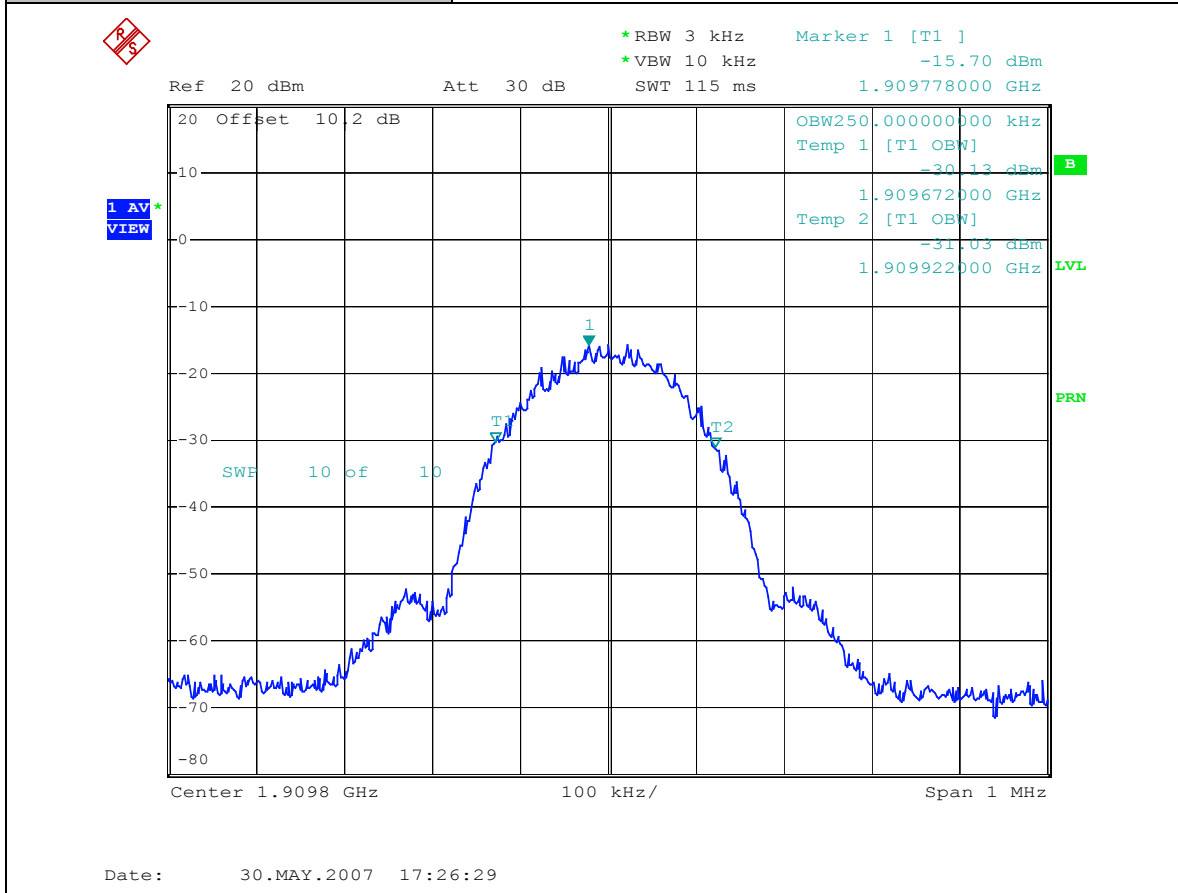
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Temperature:	70°F
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Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Low-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



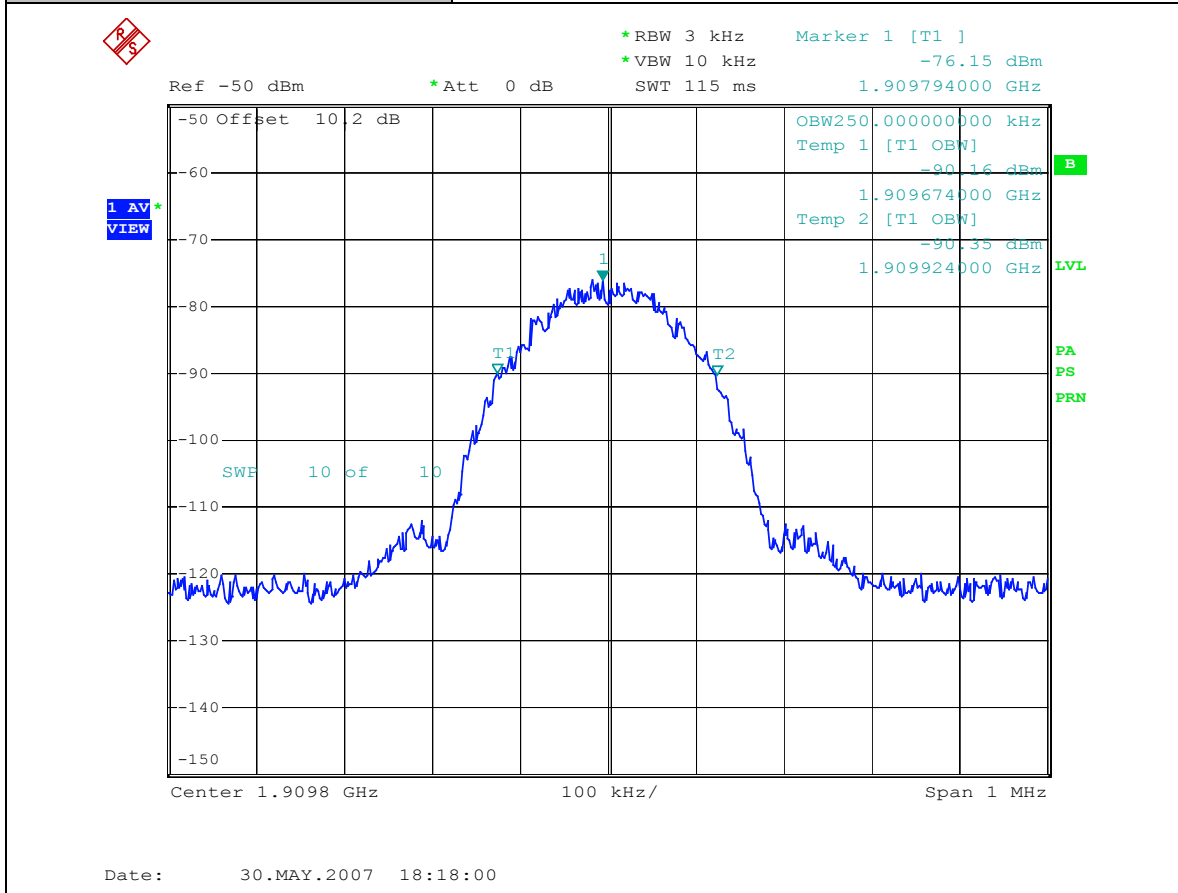
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Hi-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



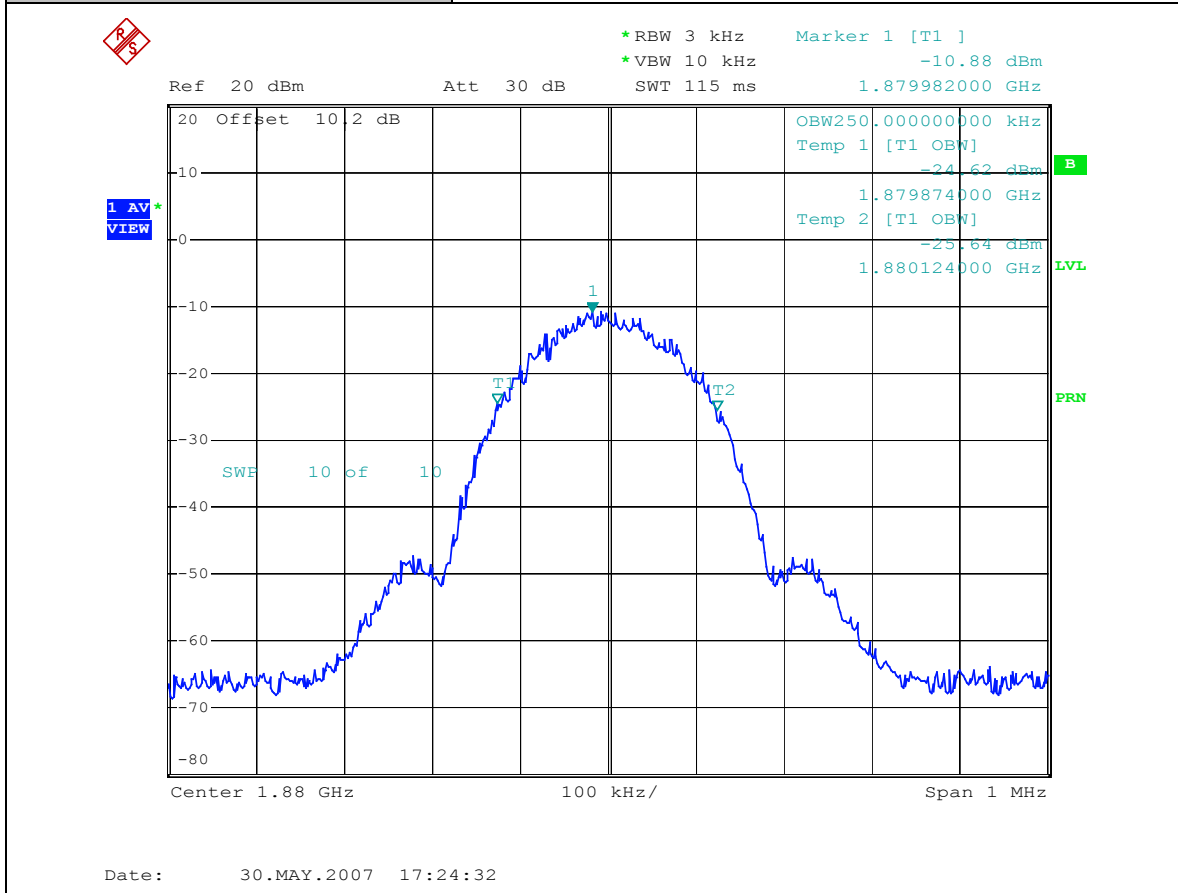
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EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Hi-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



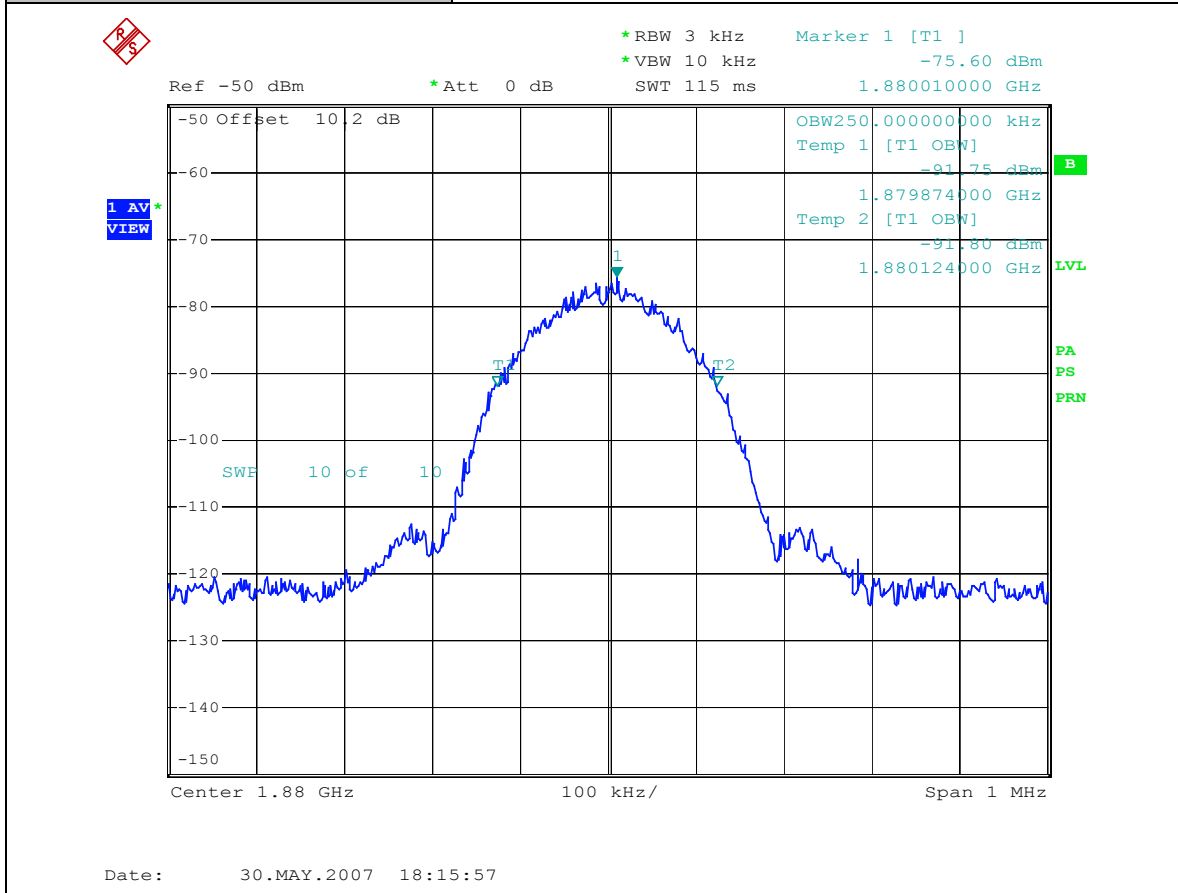
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SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Mid-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



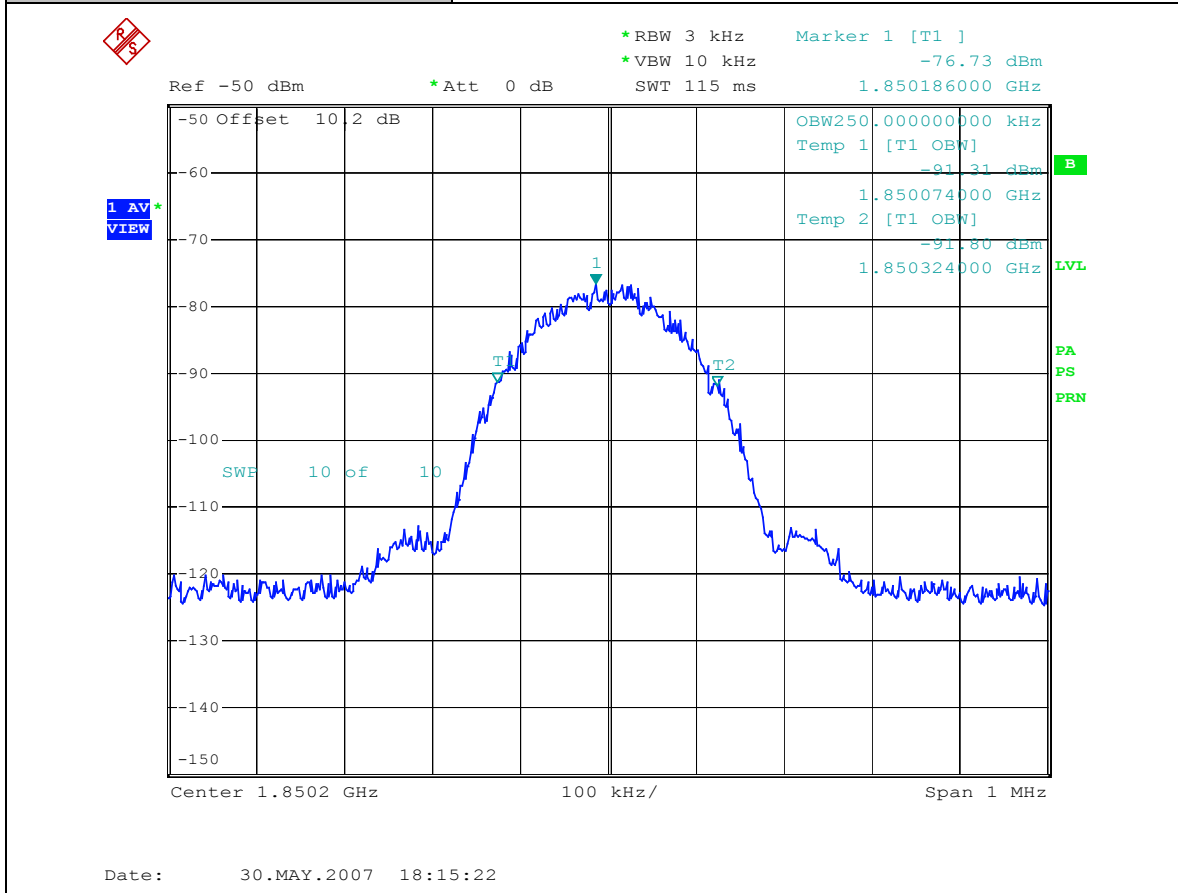
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SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Mid-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



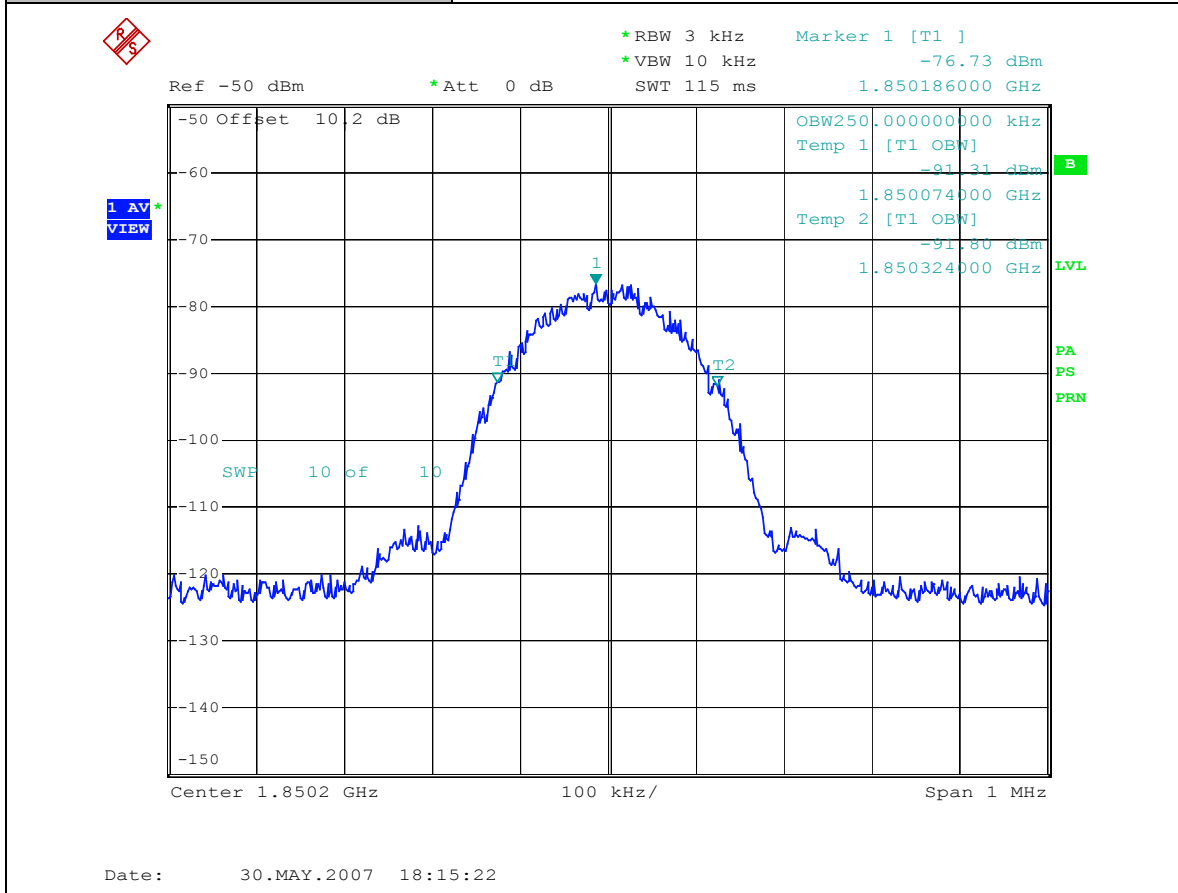
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Low-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



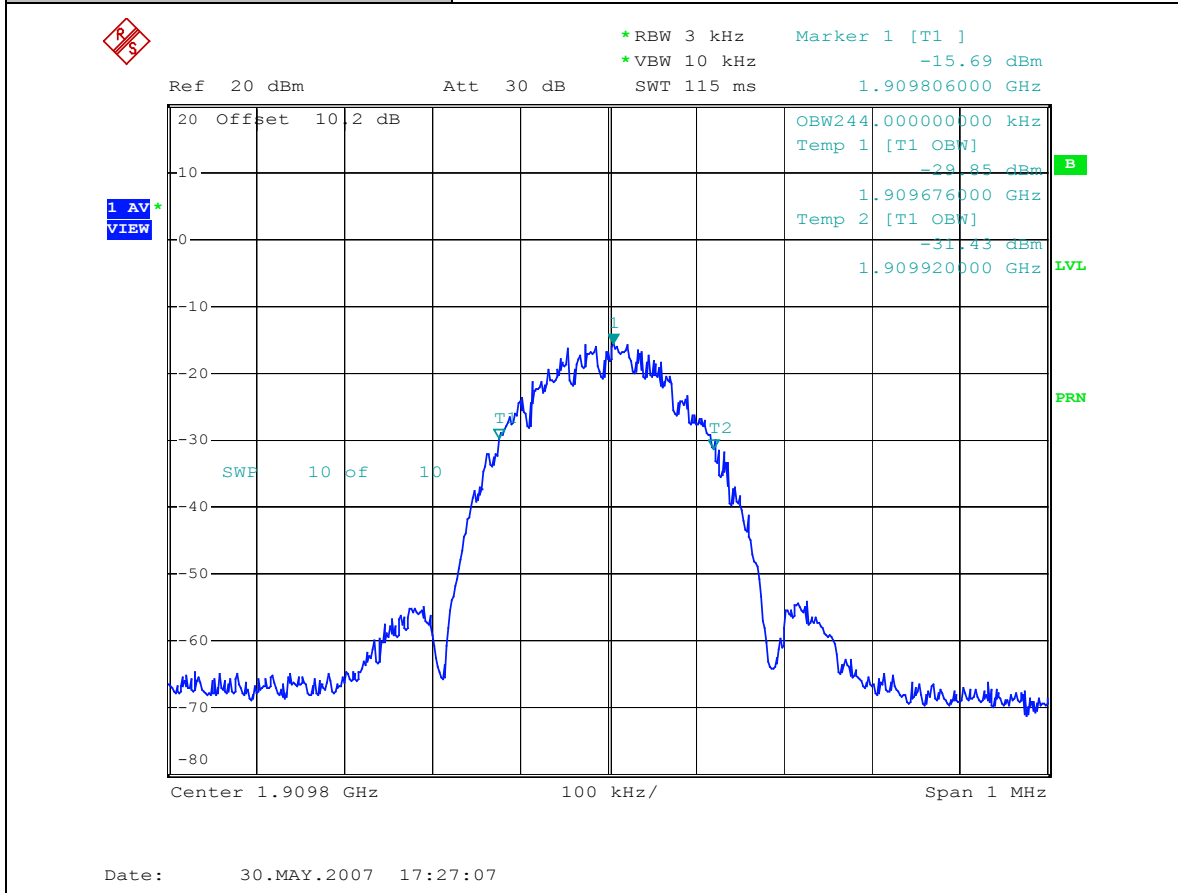
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Low-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



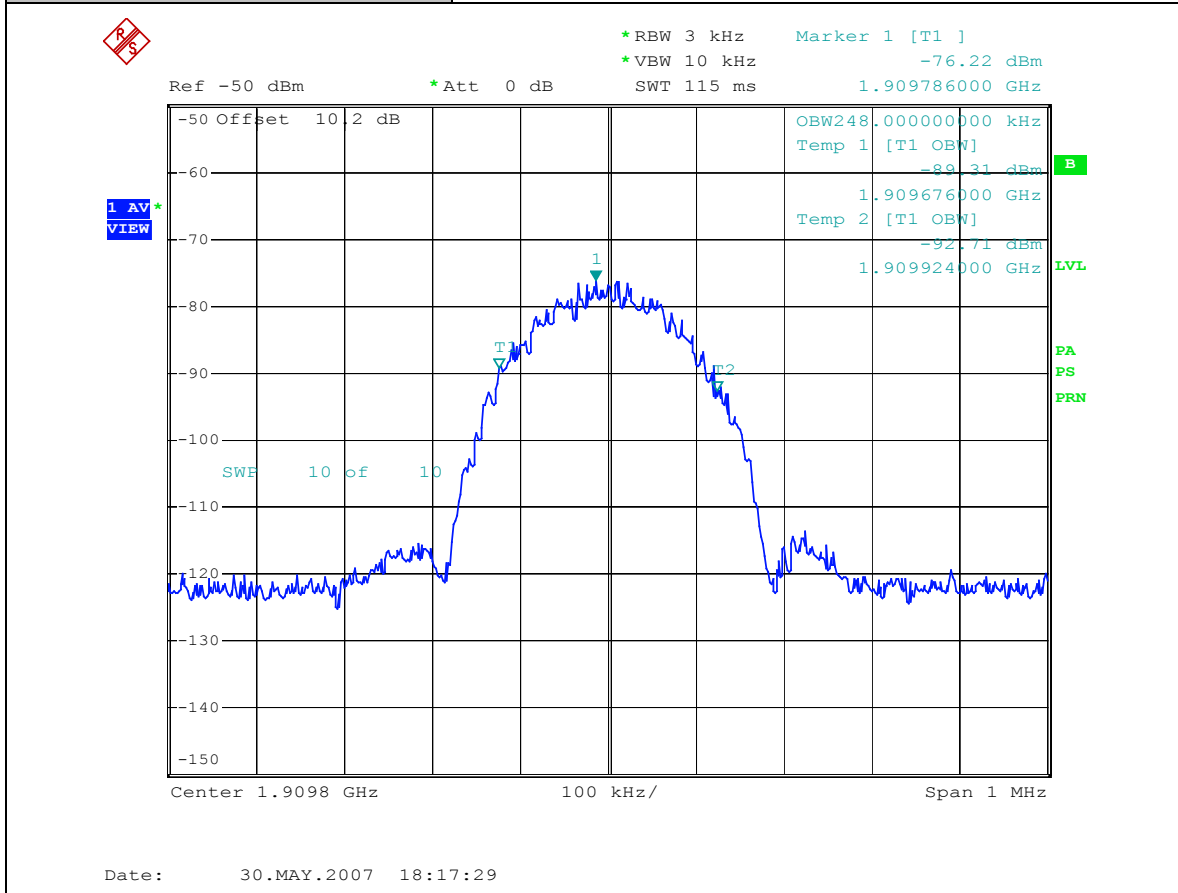
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Hi-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



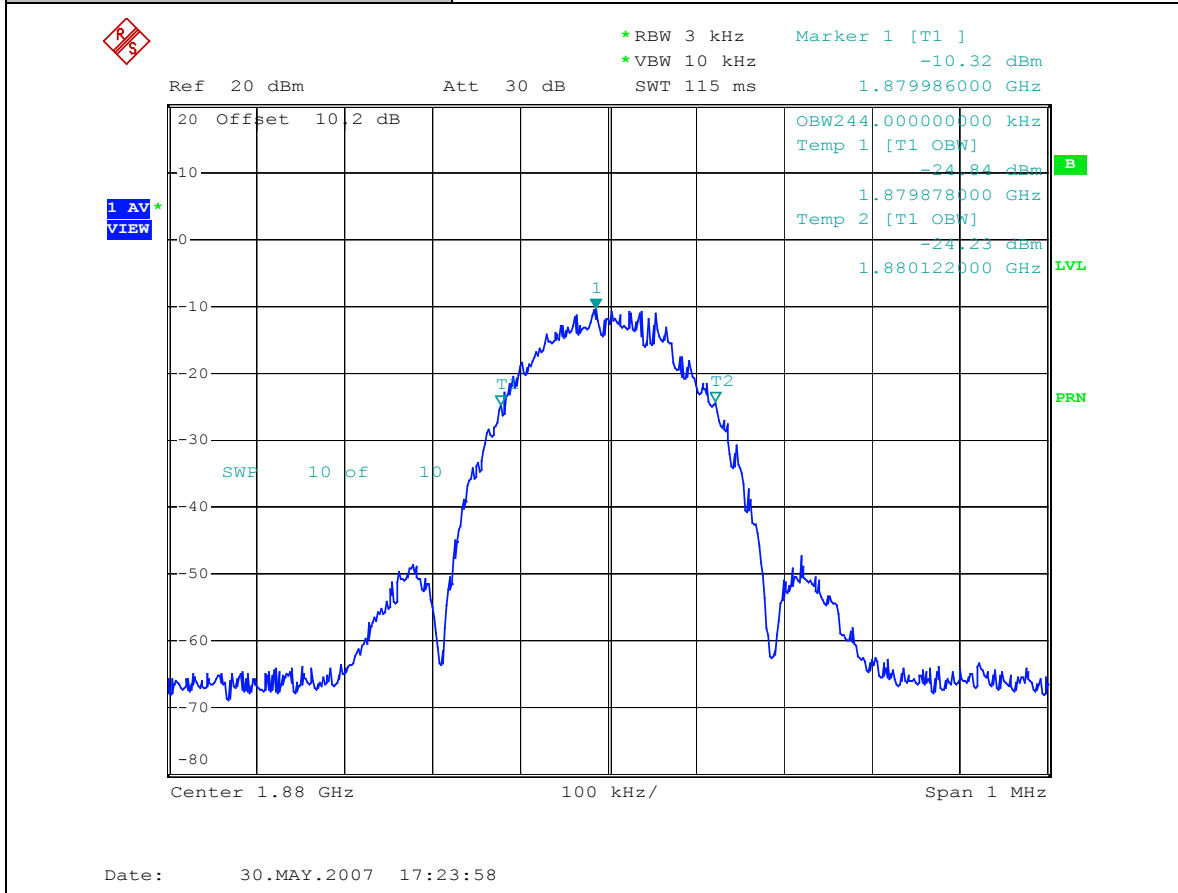
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Hi-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



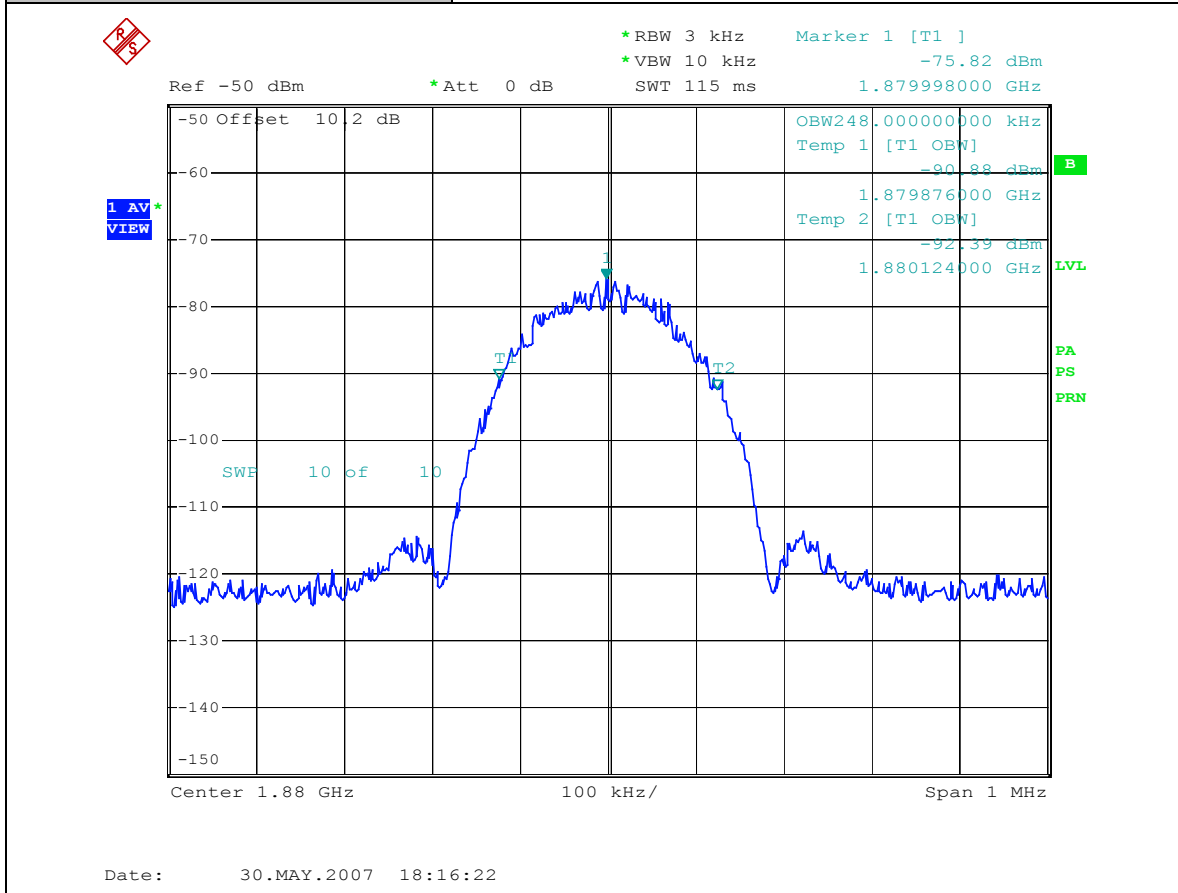
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Mid-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



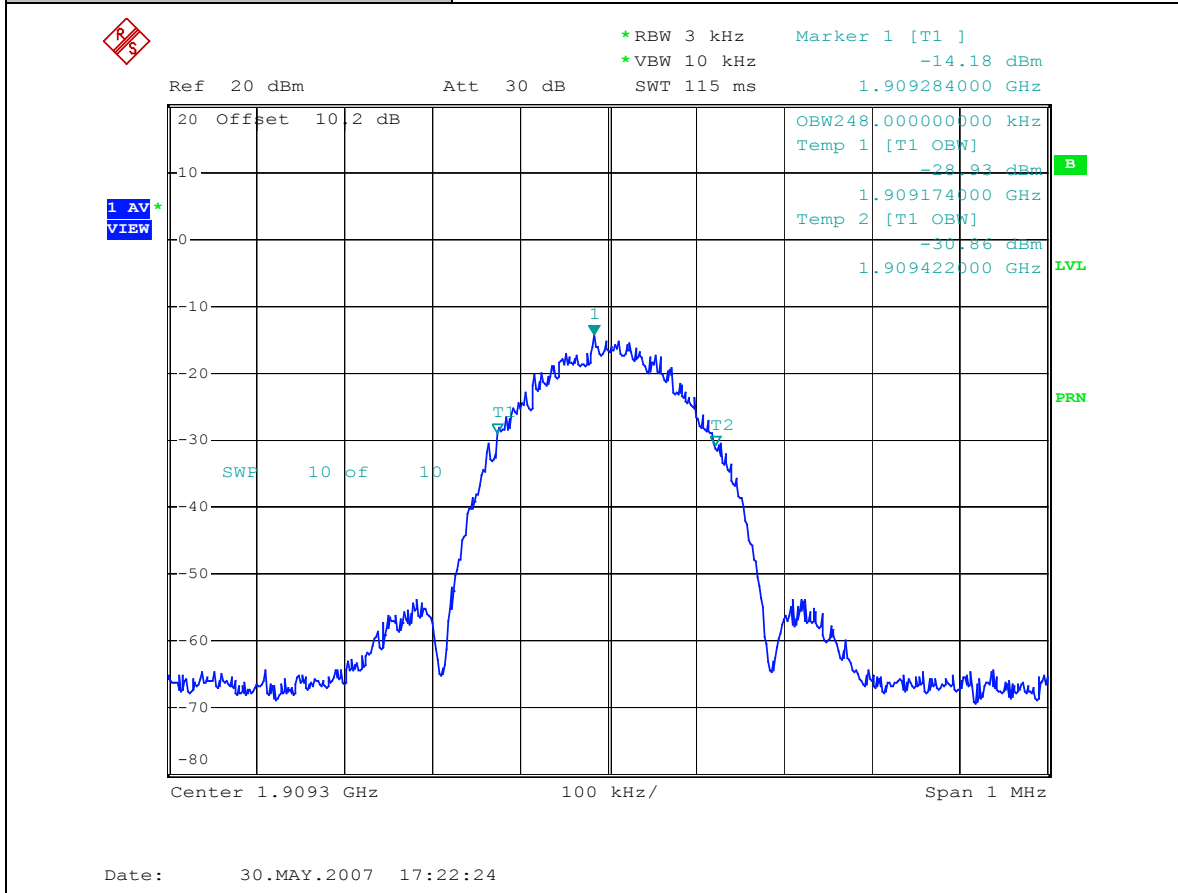
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Mid-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



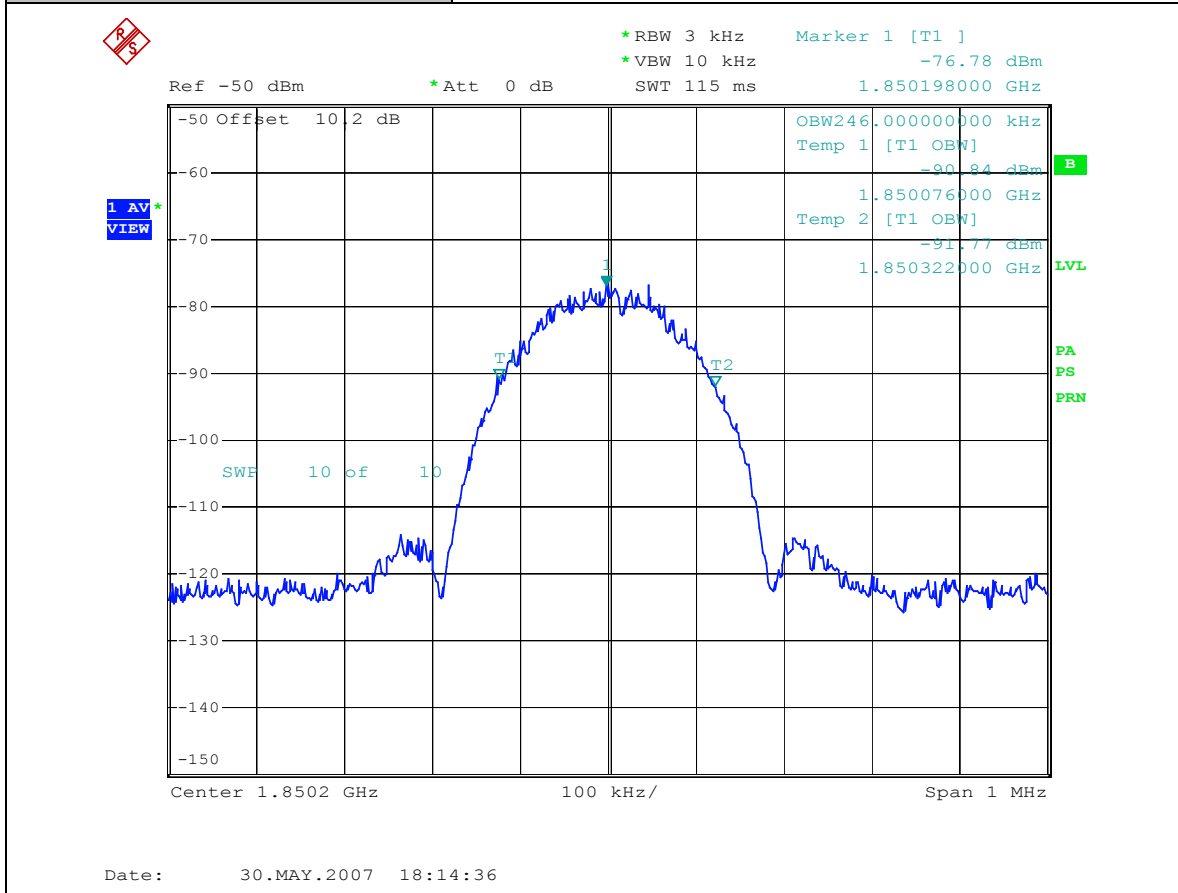
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Low-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT BTS



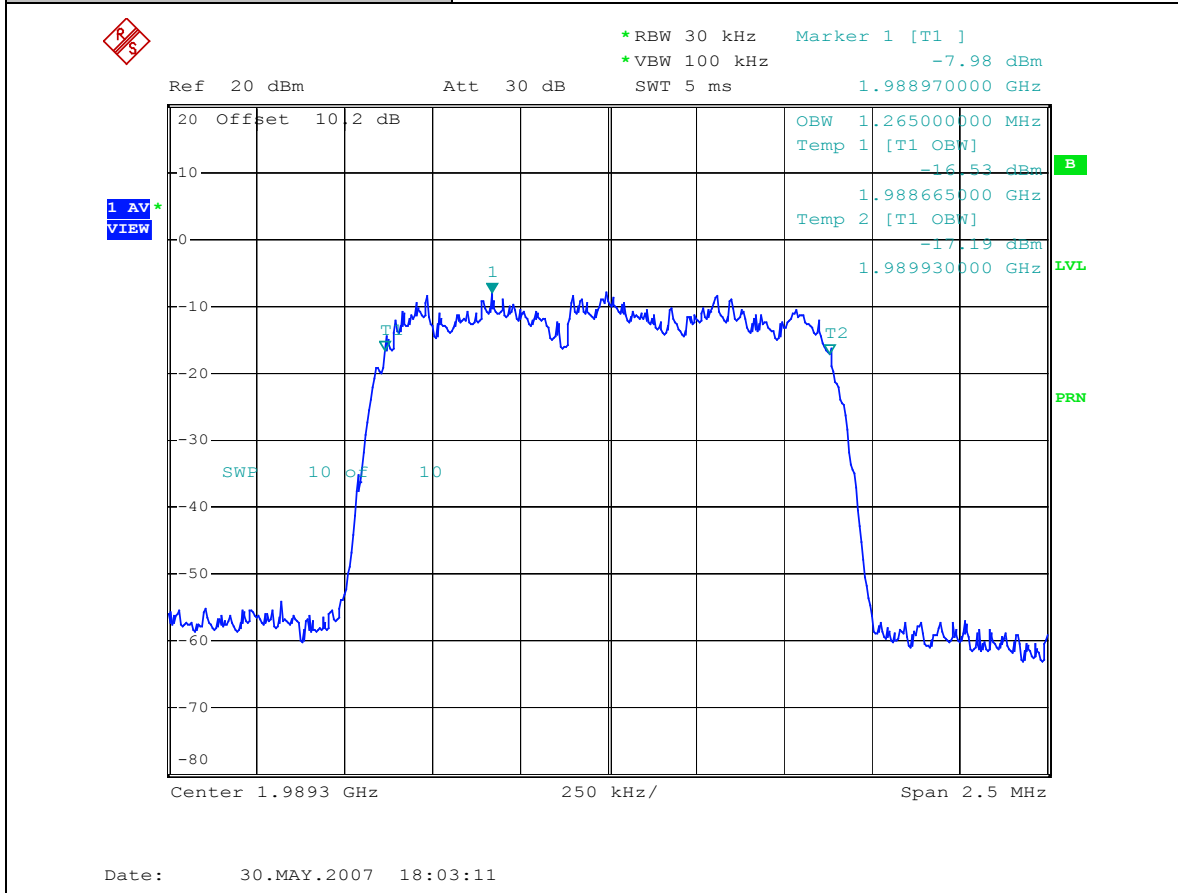
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Uplink, Low-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



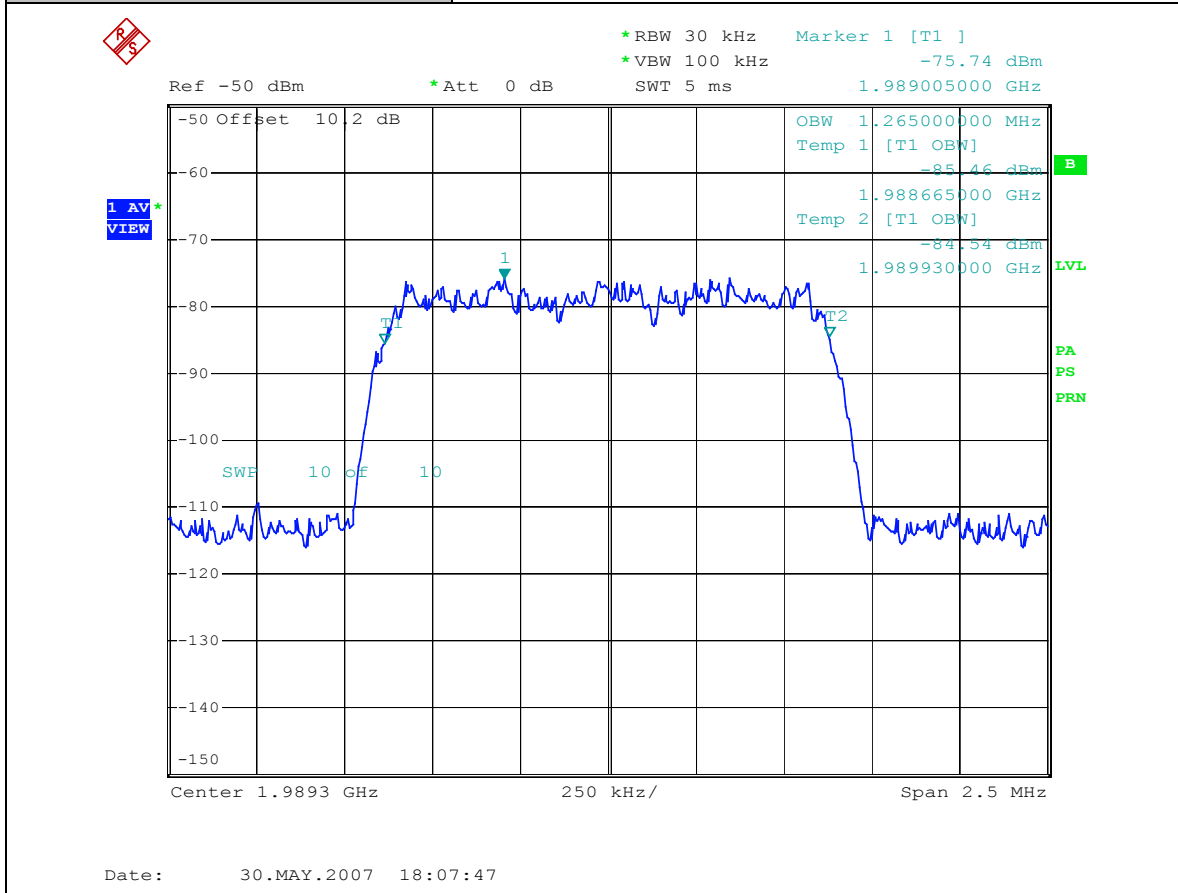
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Hi-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MOBILE



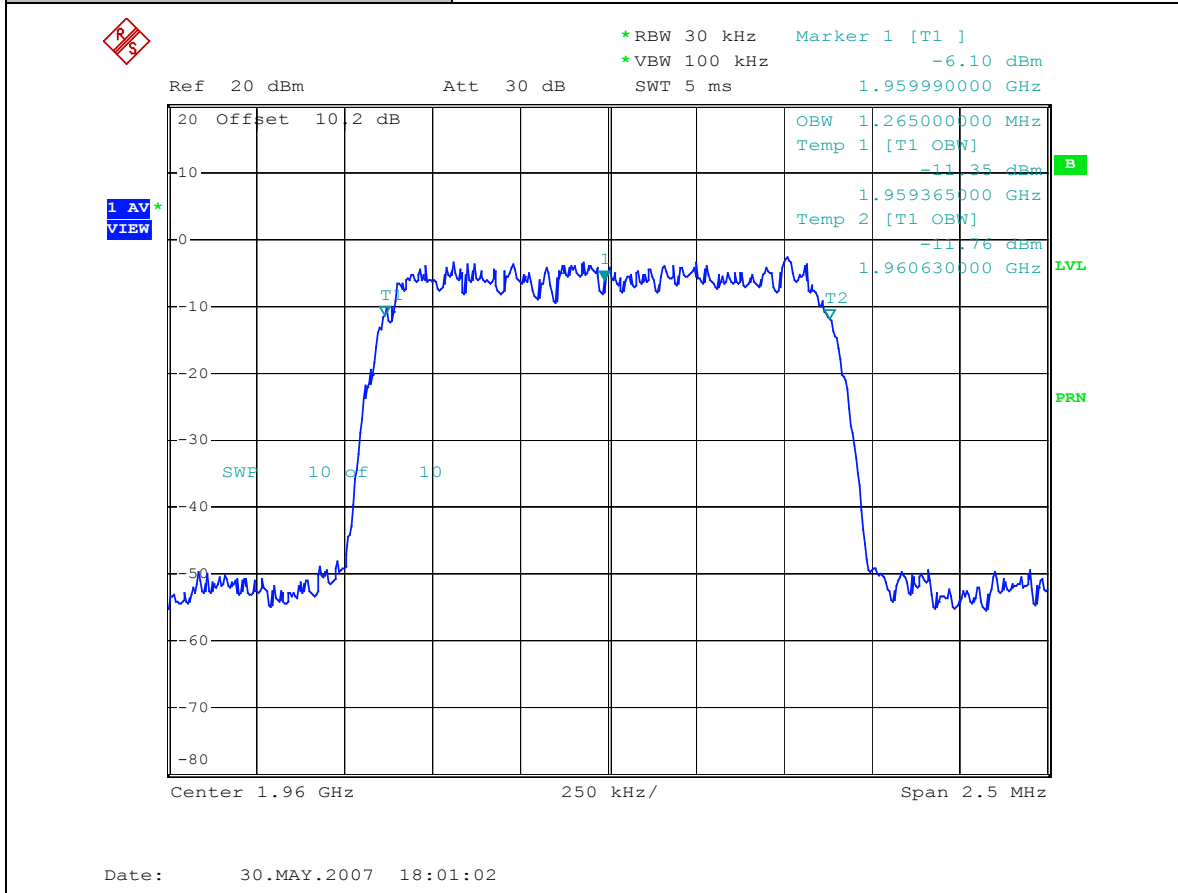
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Hi-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



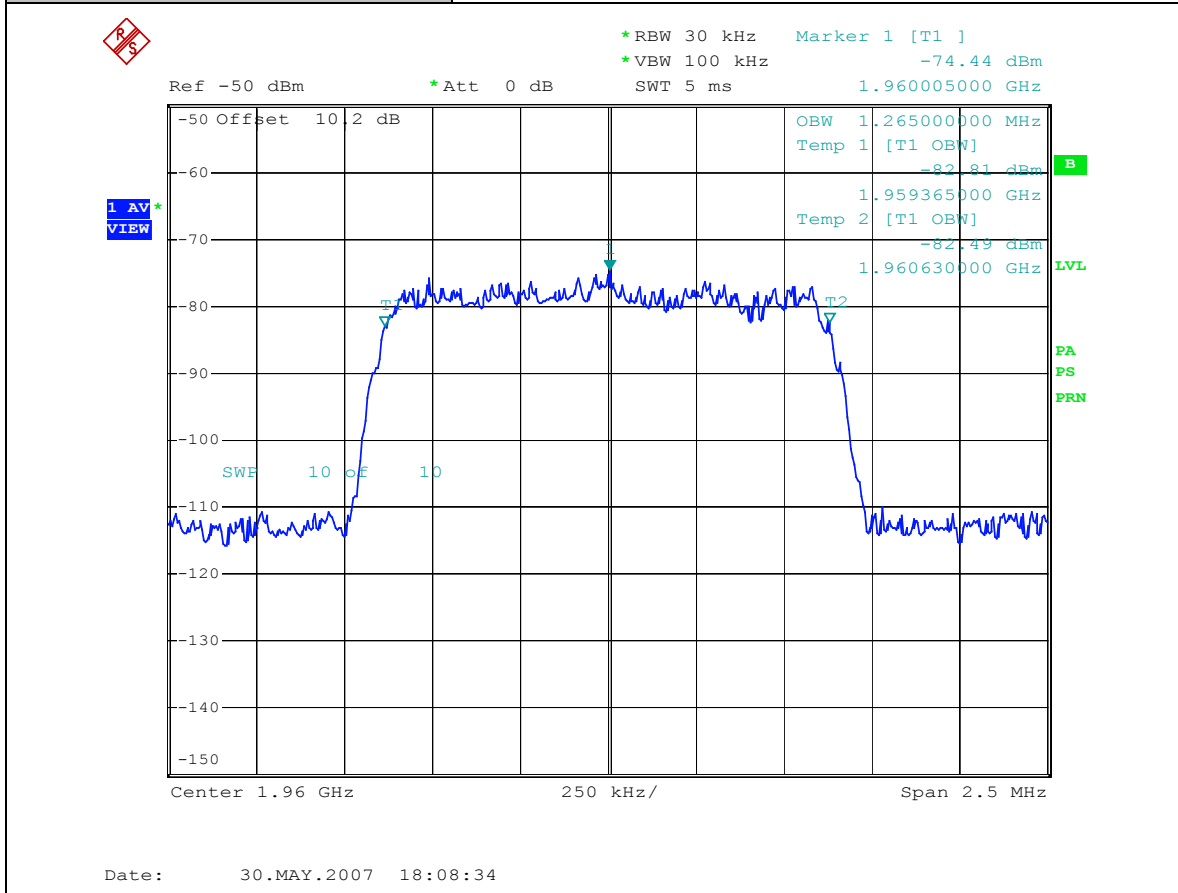
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Mid-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MOBILE



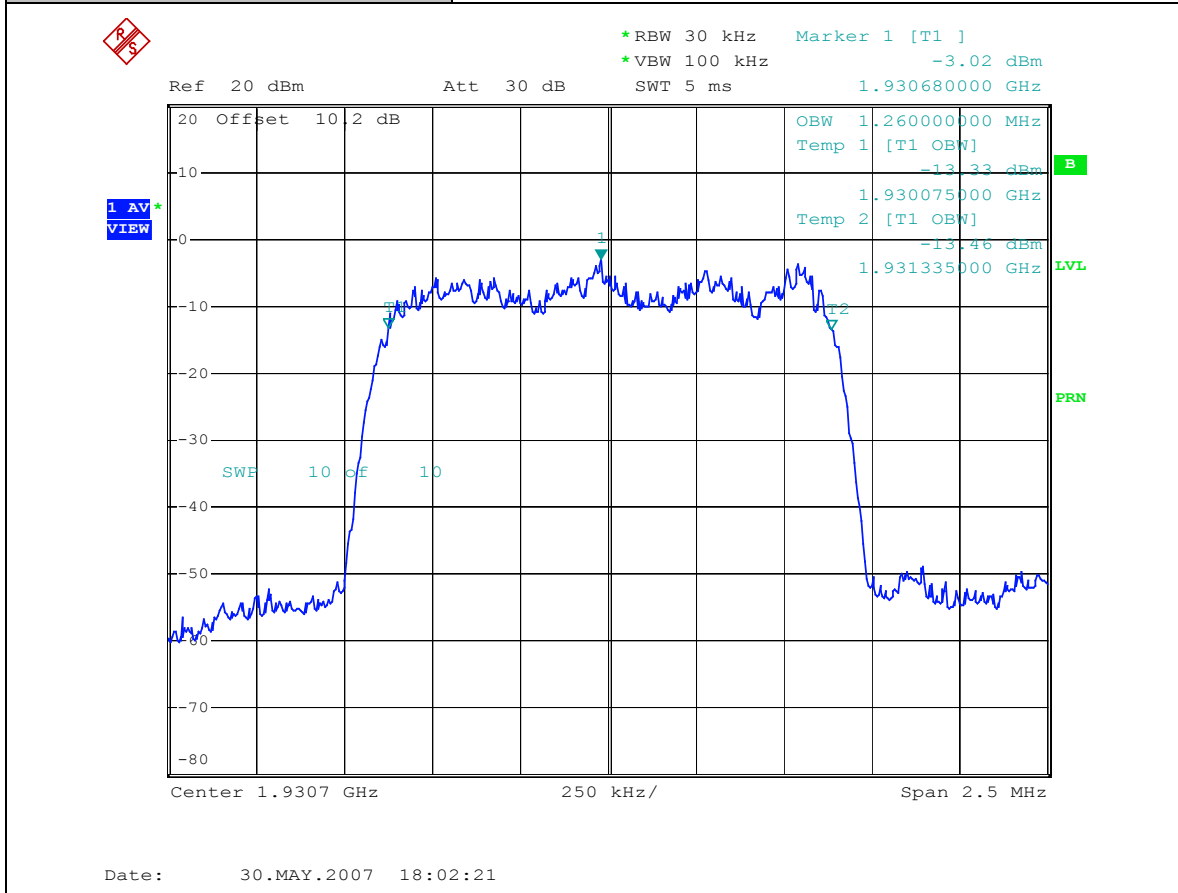
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Mid-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



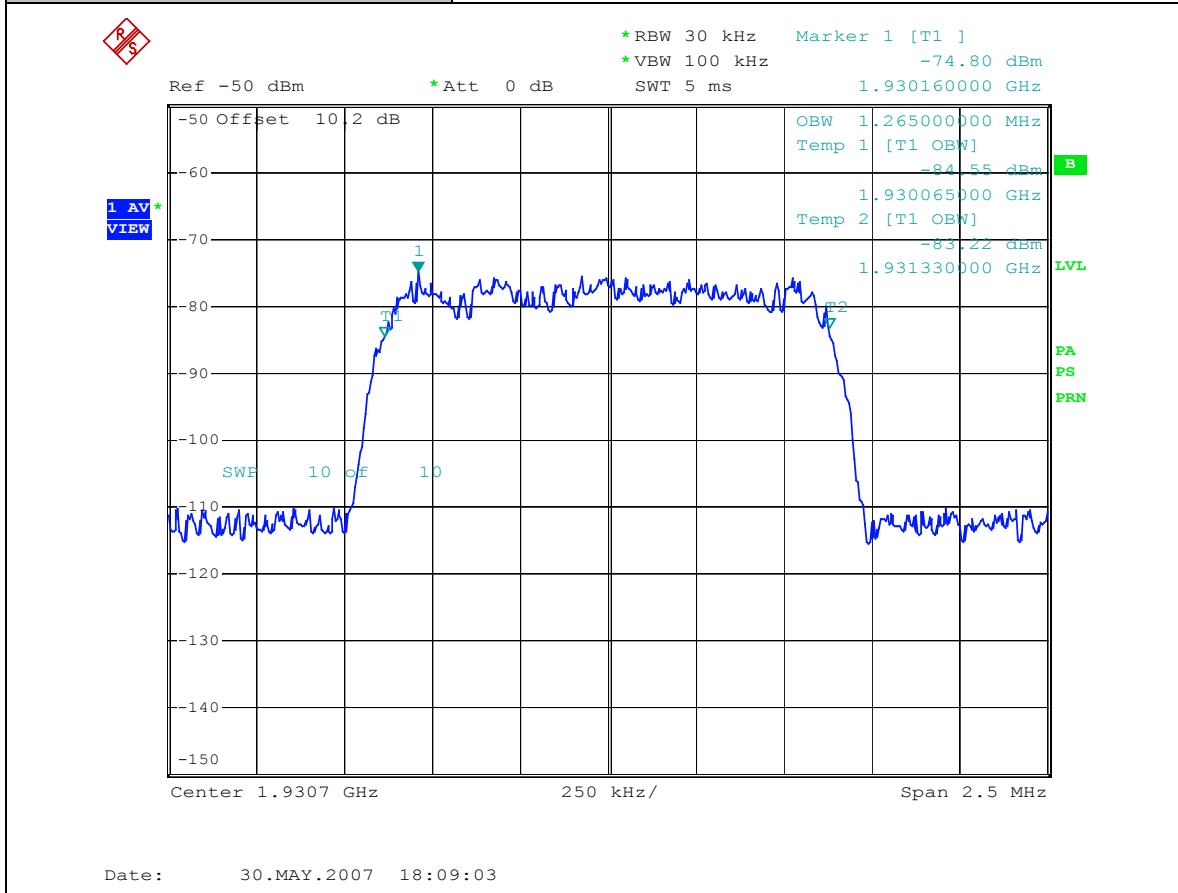
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Low-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MIBILE



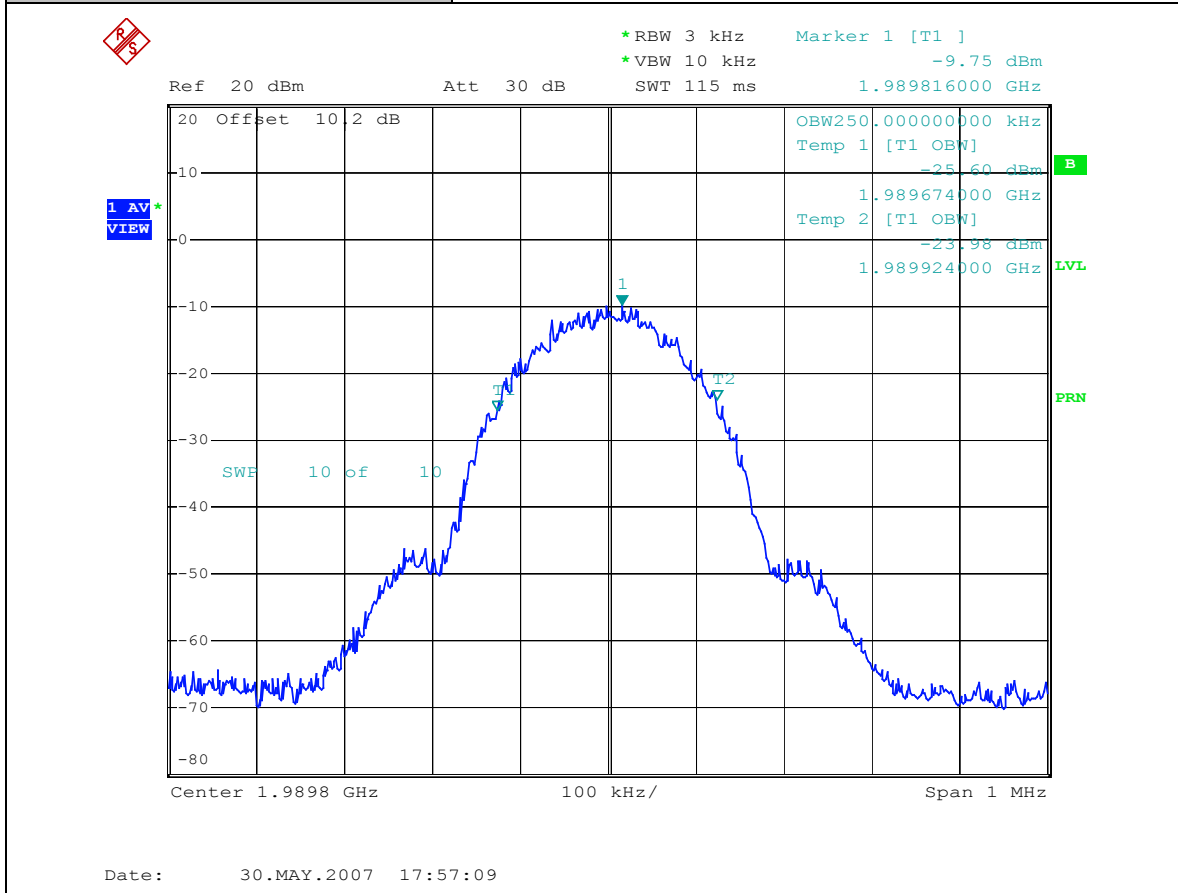
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Low-Channel, CDMA Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



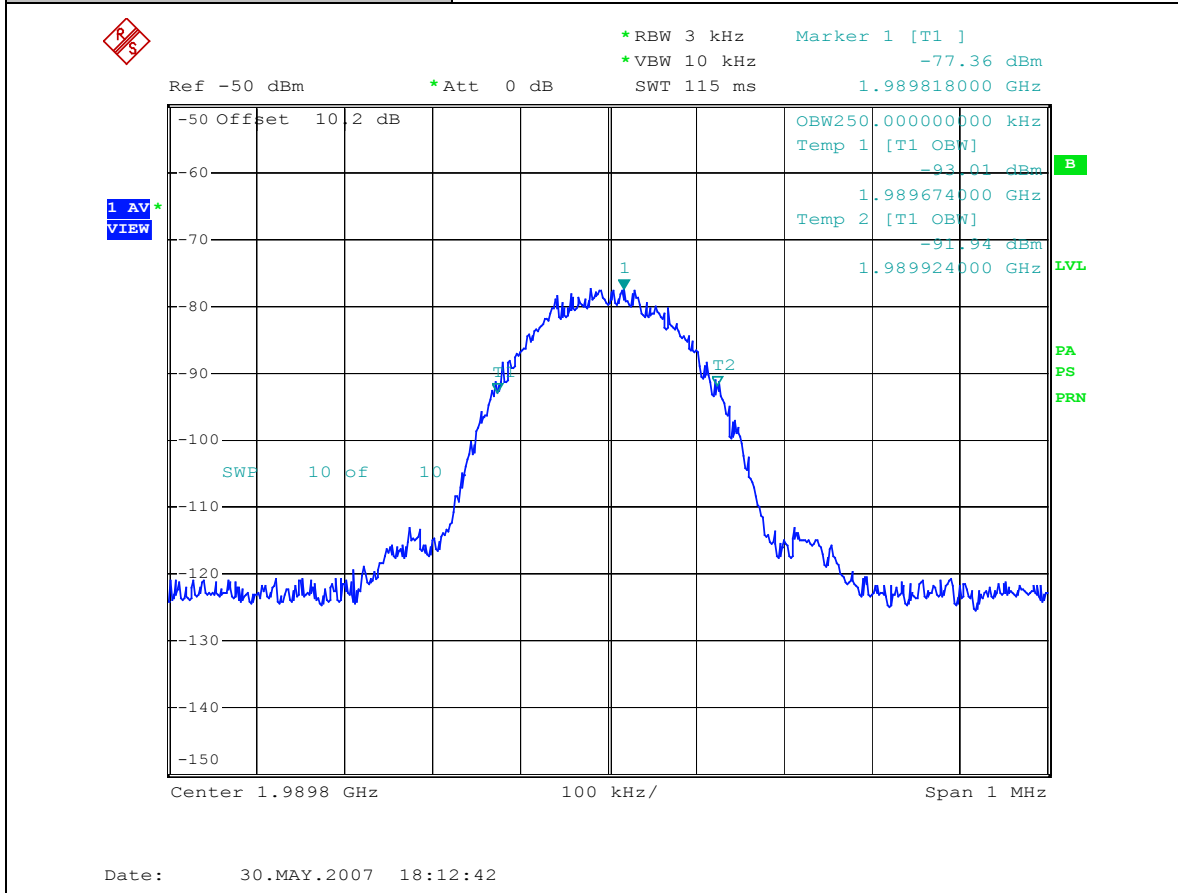
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Hi-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MOBILE



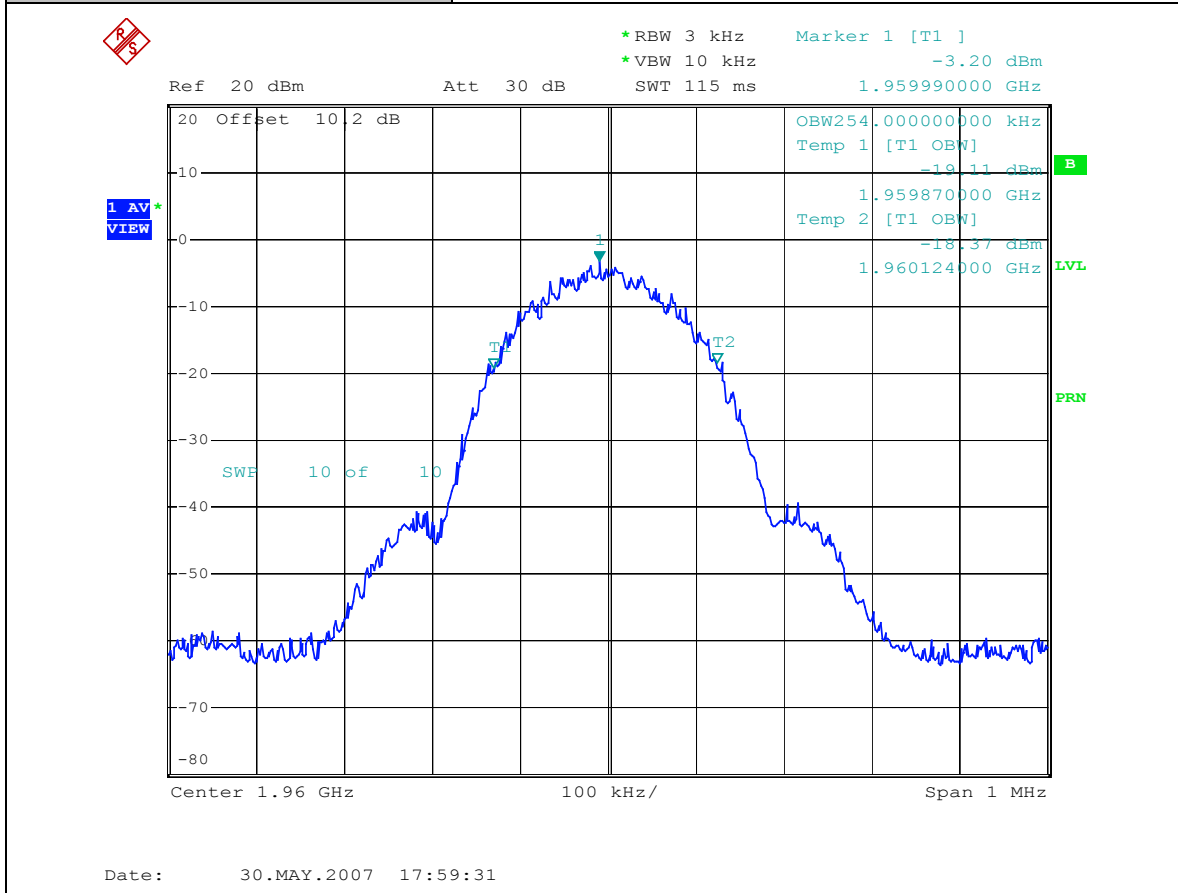
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Hi-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



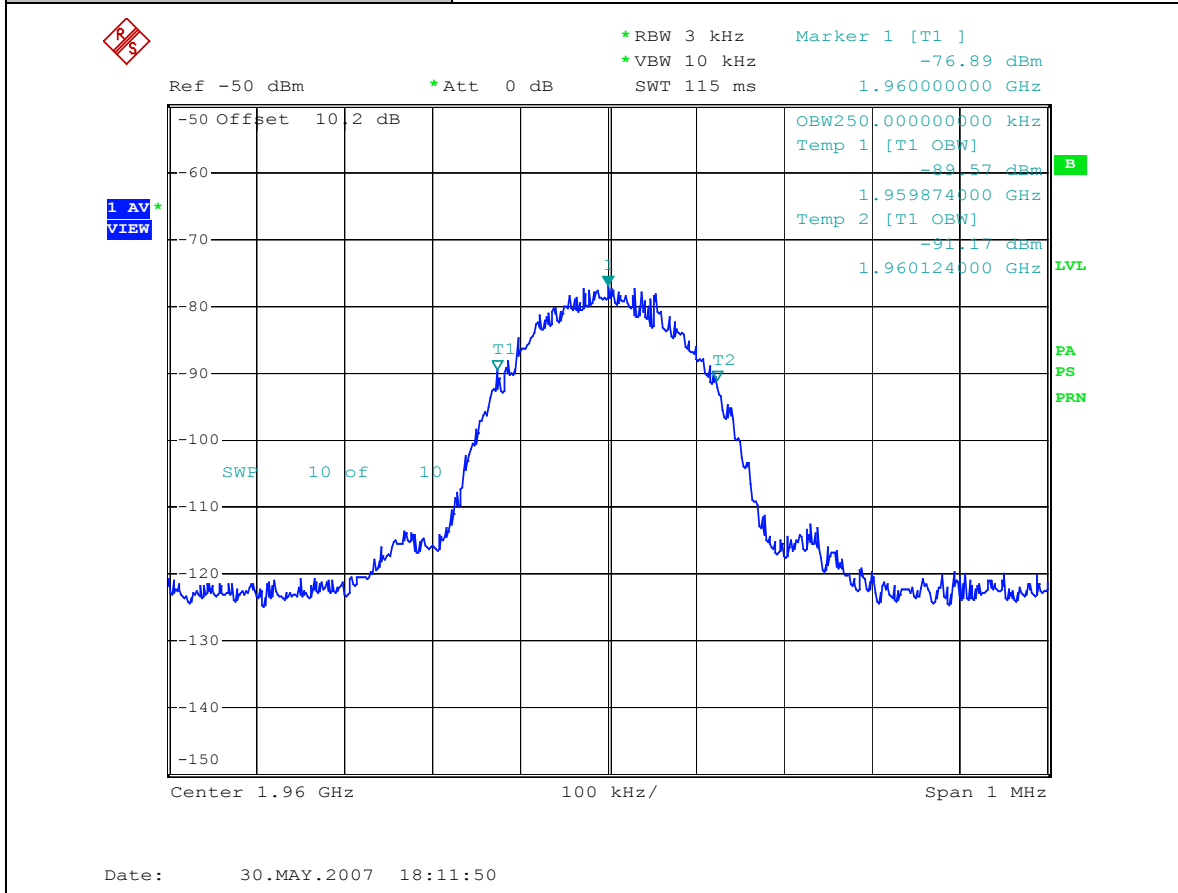
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Mid-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MOBILE



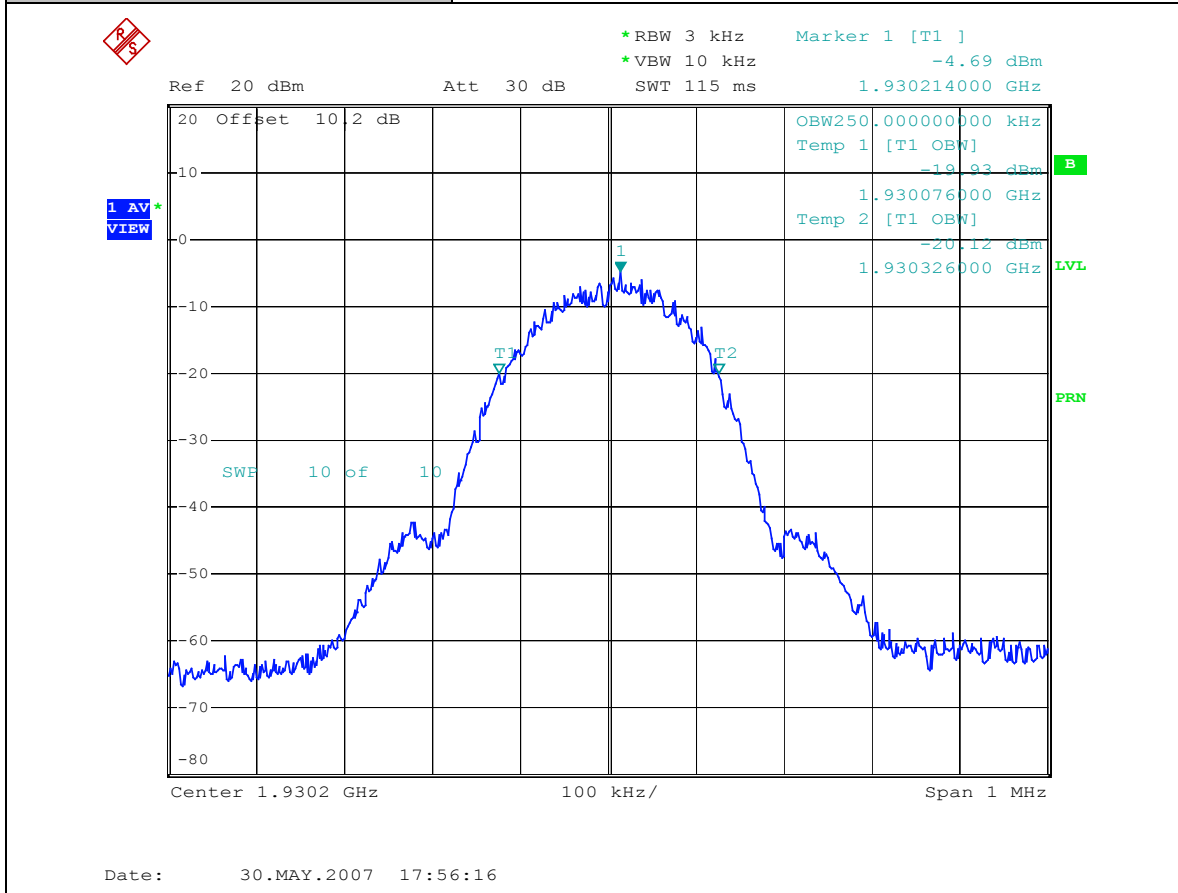
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Mid-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



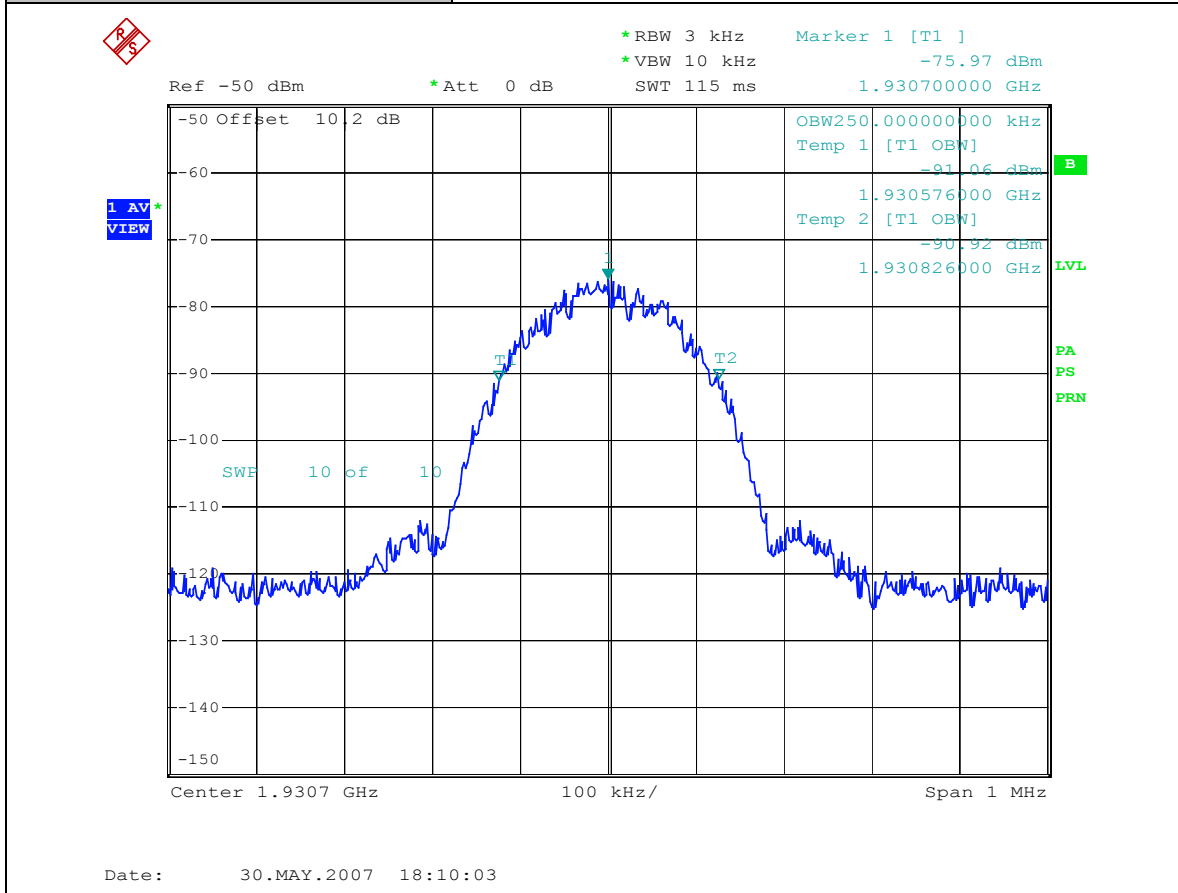
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Low-Channel, GSM Modulation
Configuration:	SG Input: -25dBm, Output Port: EUT MOBILE



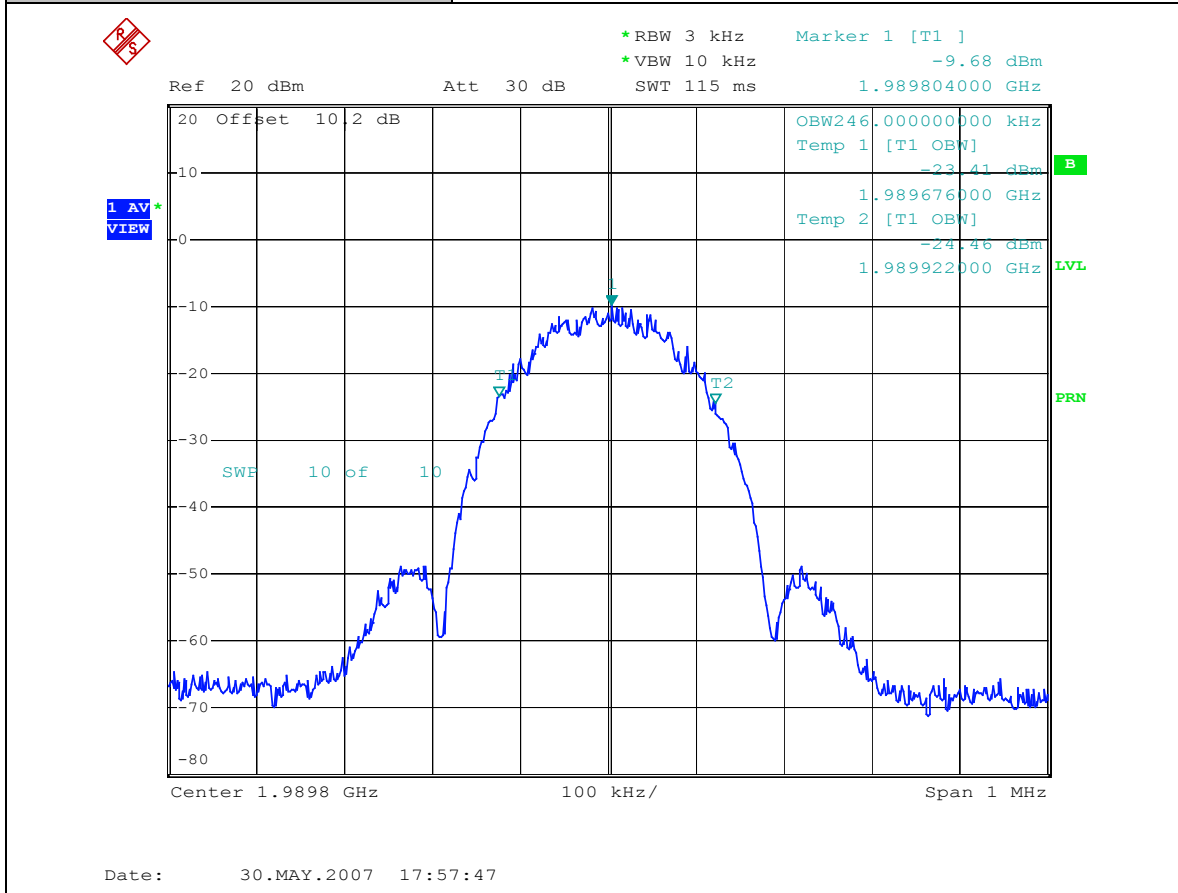
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Low-Channel, GSM Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



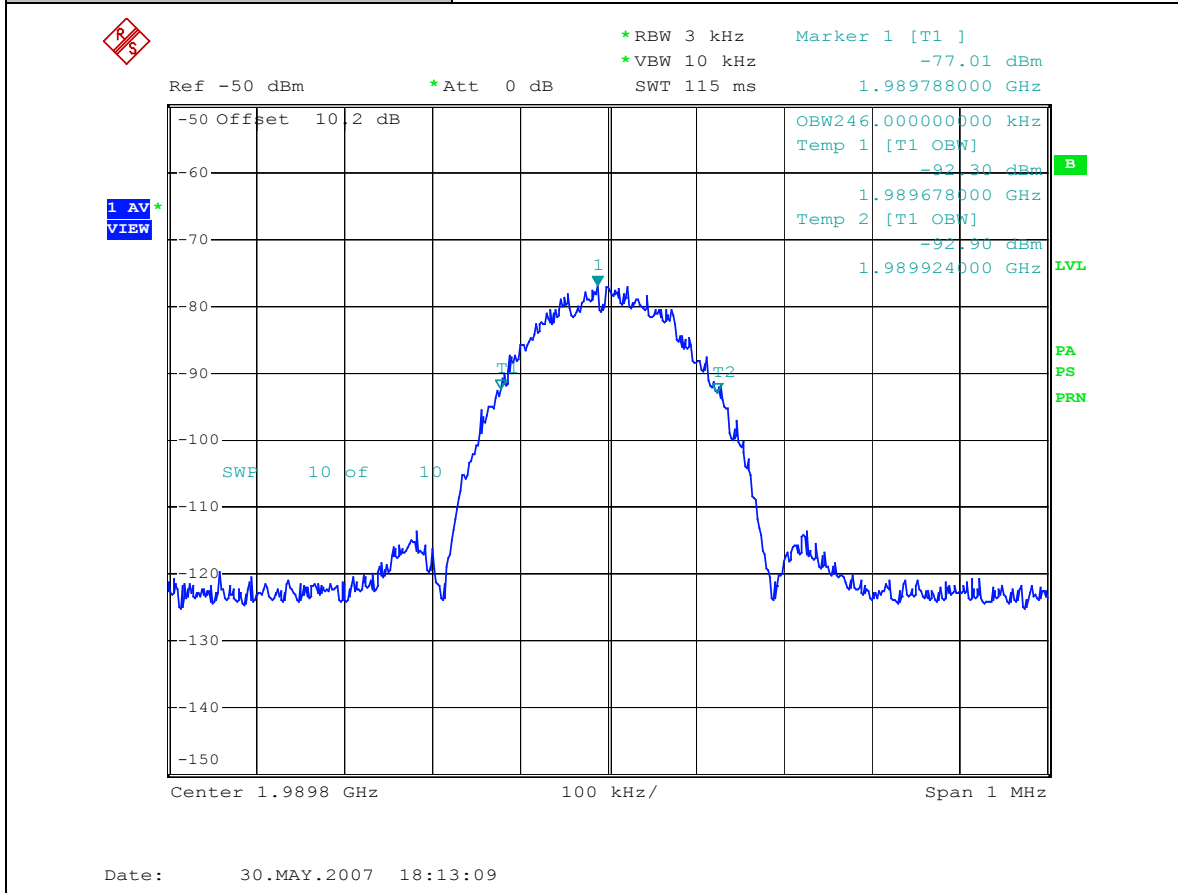
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Hi-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MOBILE



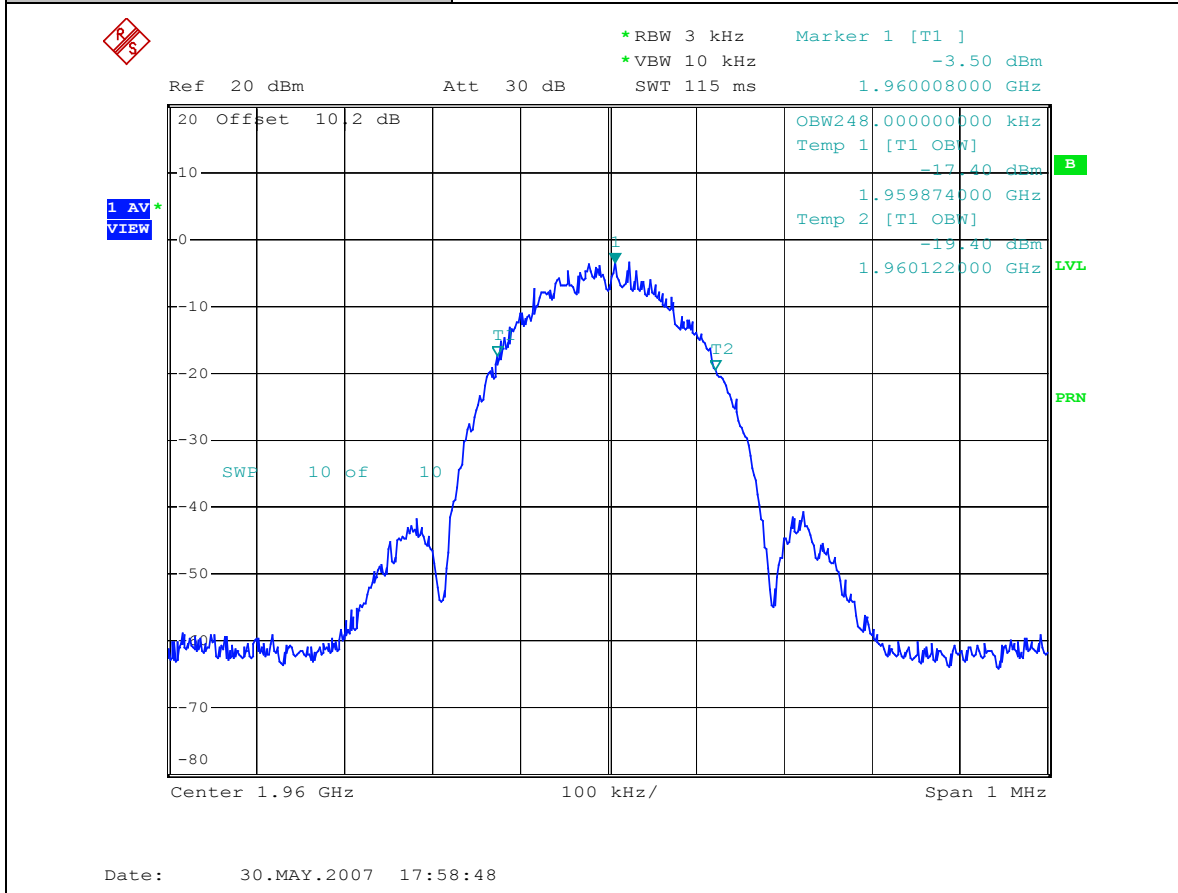
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Hi-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



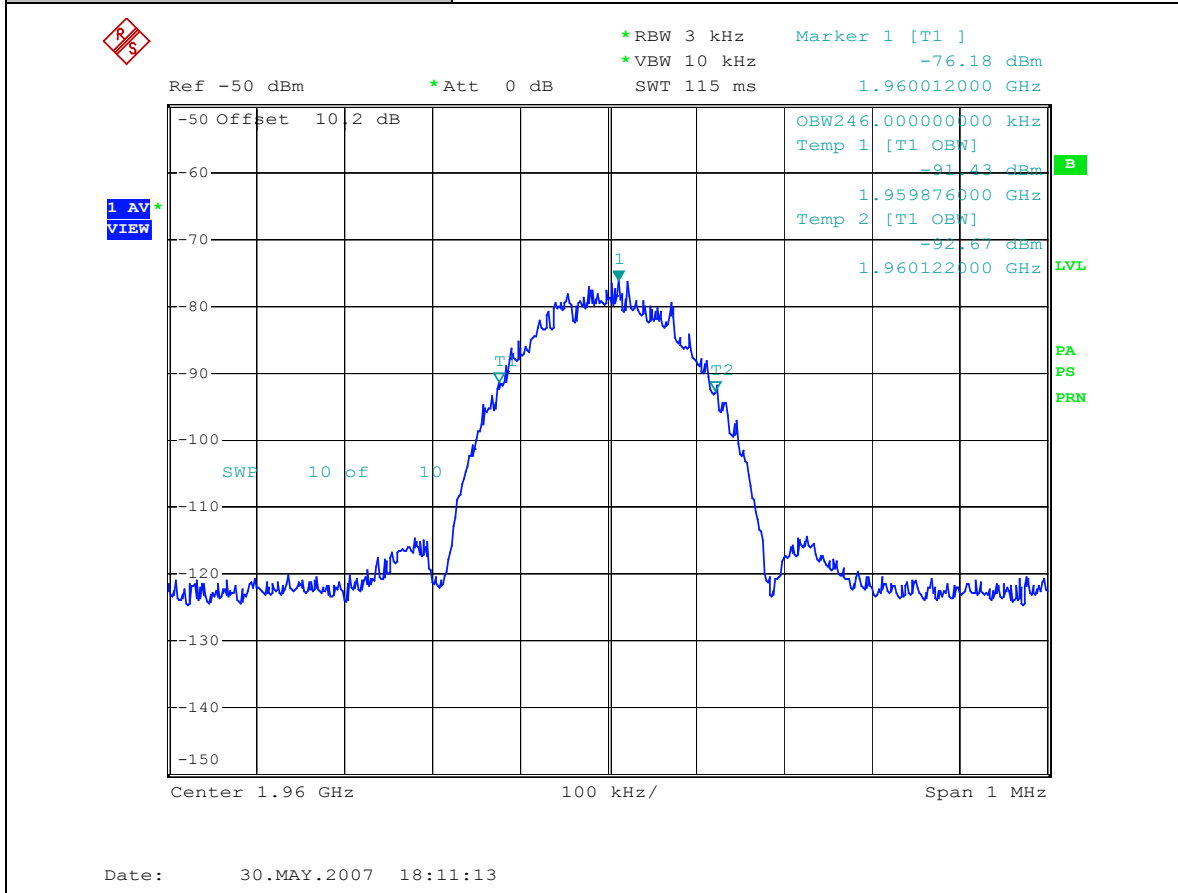
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Mid-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: EUT MOBILE



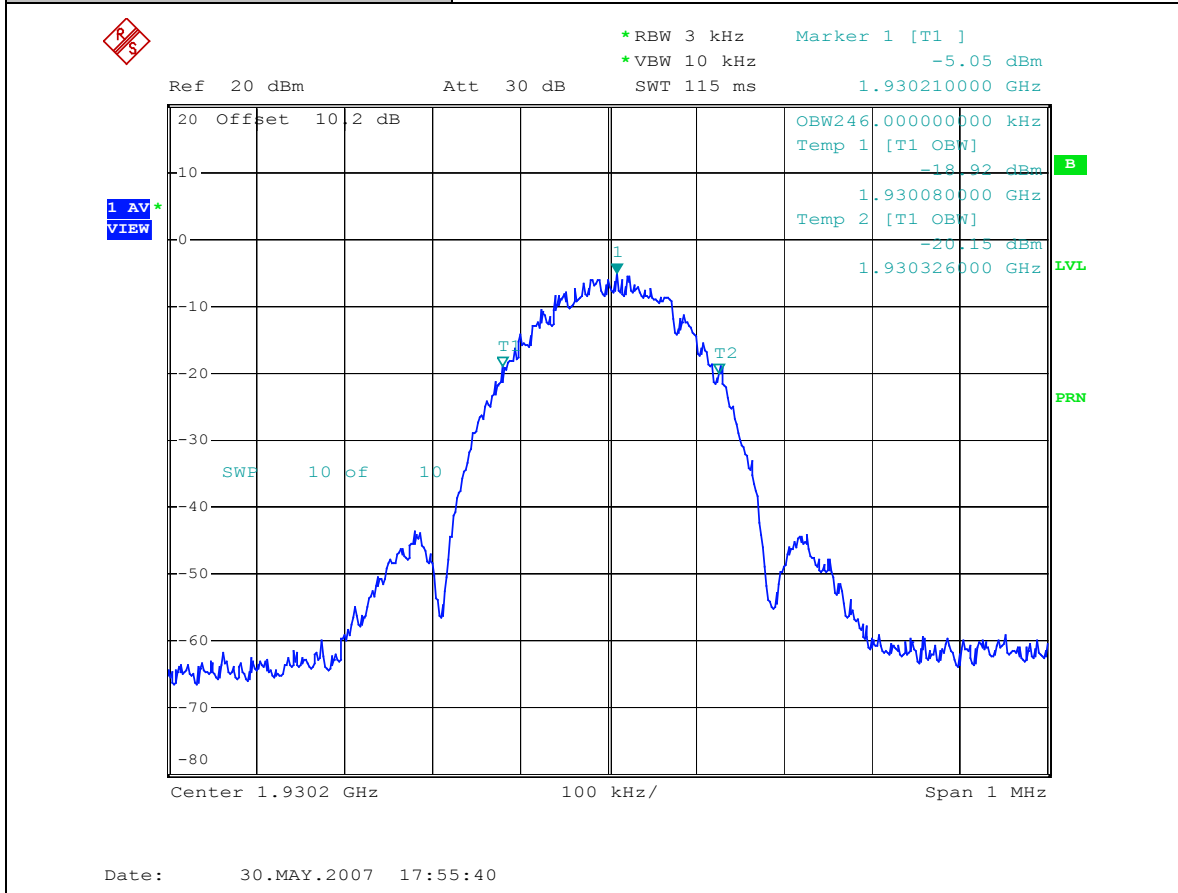
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Mid-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



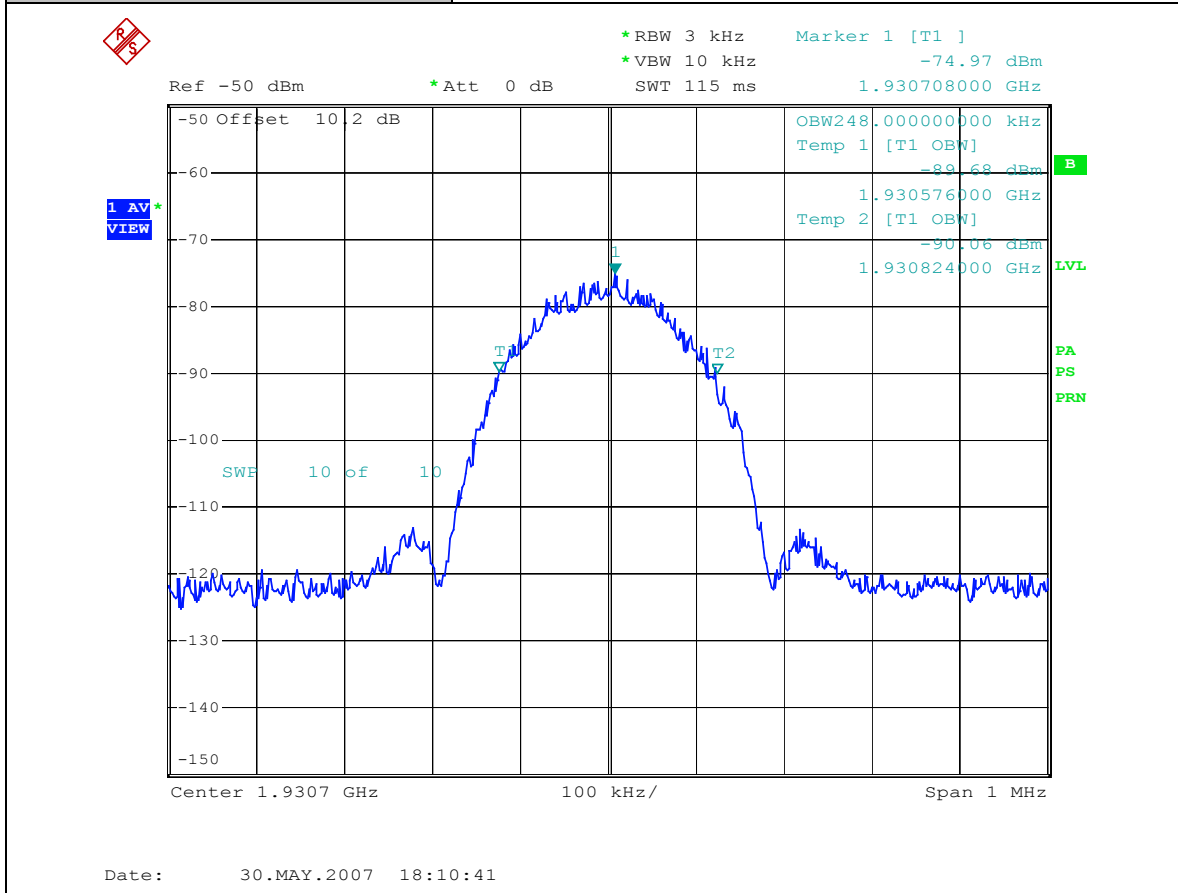
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Low-Channel, EDGE Modulation
Configuration:	SG Input: -25dBm, Output Port: EUT MOBILE



Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Occupied Bandwidth: PCS Bands
Plot Name:	Downlink, Low-Channel, EDGE Modulation
Configuration:	SG Input: -60dBm, Output Port: SG



Section 5. Spurious Emissions at Antenna Terminals

Name of Test:	<i>Spurious Emissions at Antenna Terminals</i>	Test Standard:	22.917 24.238(a)
Tested By:	WEI LI EDWARD LEE	Test Date:	05/02/2007-06/01/2007

Minimum Standard: Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least $43 + 10 \log P$. This is equivalent to -13 dBm absolute power.

Para. No. 24.238(a). The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not less than $43+10 \log$ (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

Method of Measurement: Spectrum Analyzer Settings:
 RBW: 100 kHz. As required for digital modulations.
 RBW: 1MHz. When frequency is located above 1GHz.
 VBW: \square RBW
 Start Frequency: 0 MHz
 Stop Frequency: 13 GHz (Cellular), 22GHz (PCS)
 Sweep: Auto

For Inter-modulation measurement: Two RF signals set as inputs. The frequencies of both RF signals shall be within the repeater's operating band. The spacing between both RF signals shall be the minimum possible spacing applied in a network. The level of both RF input signals shall be increased, until the maximum rated output power per channel, as declared by the manufacturer, is reached.

Frequencies: $f1=F_{(Low\ CH/Mid\ CH/High\ CH)}$, $f2=f1 \pm \Delta$

Spacing $\Delta=5\text{MHz}$ for CDMA and GSM/EDGE

Each RF Input Level:

about -3dB comparing to the max. input level of single RF Input test

Above 6GHz, the conducted spurious emissions are almost identical for all the operation signals.

Test Result:

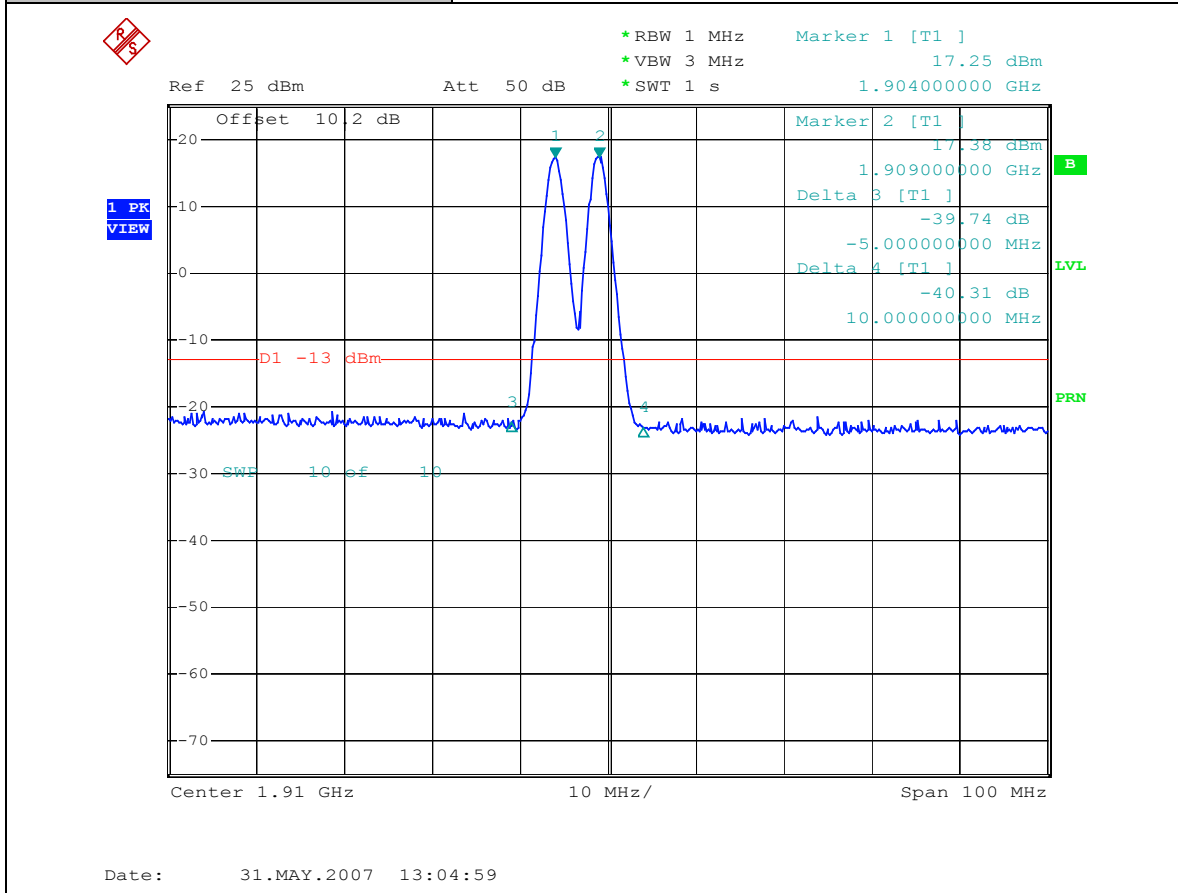
Complies

Test Data:

Attached Plots

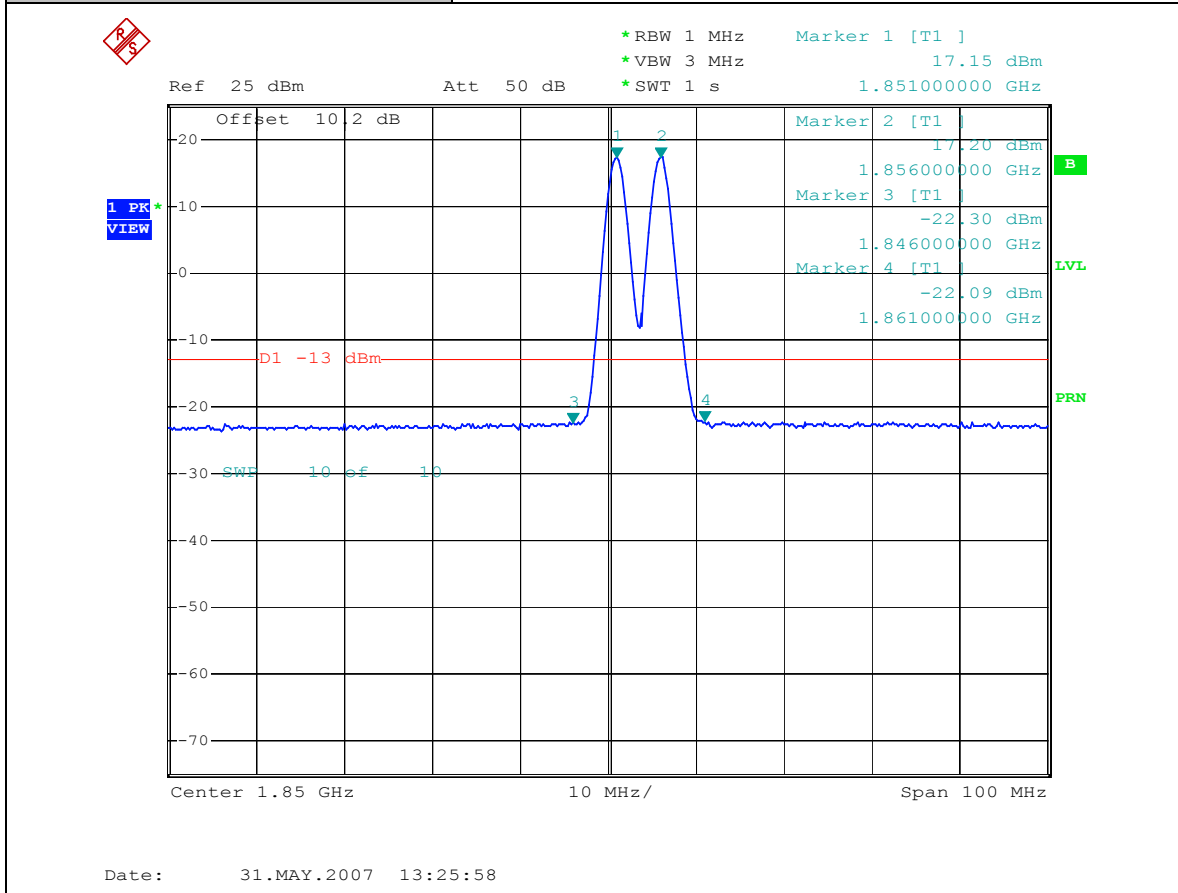
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	UL, Hi-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



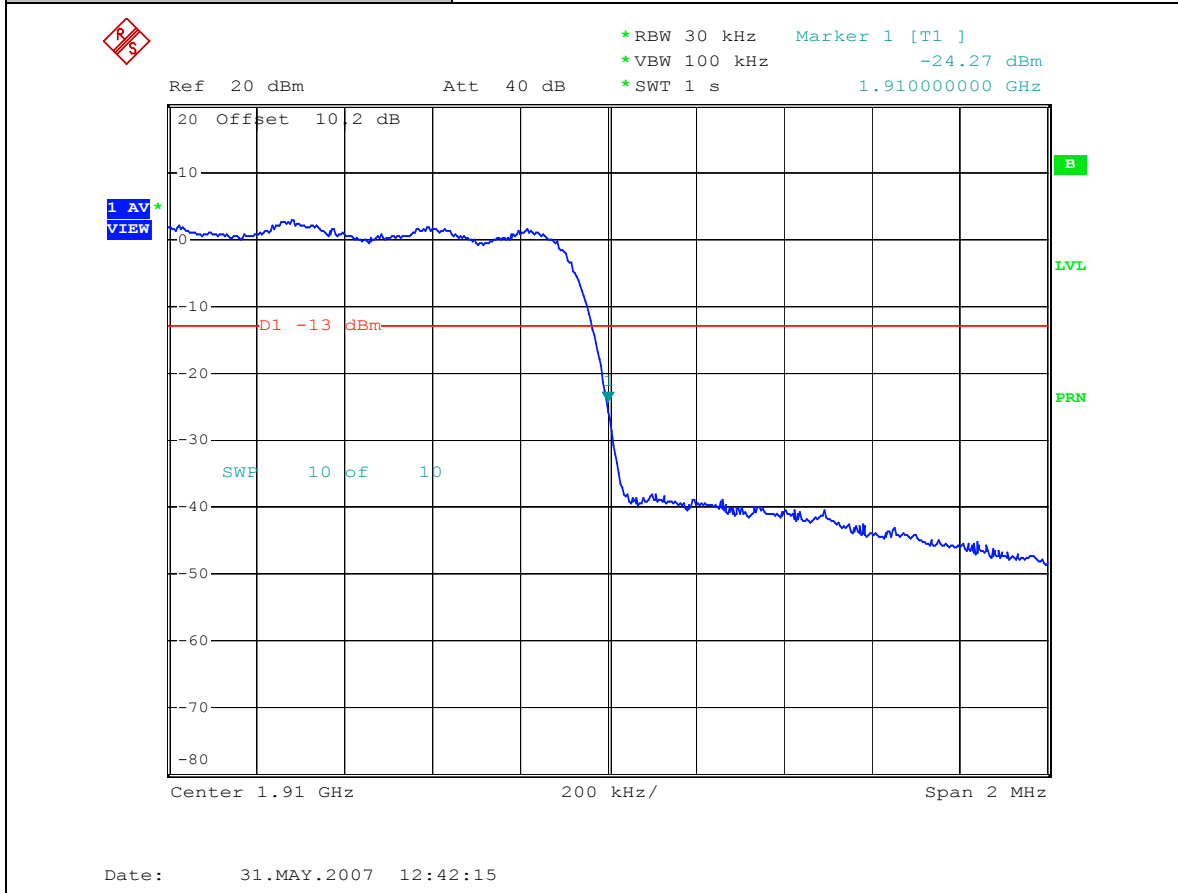
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	UL, Low-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



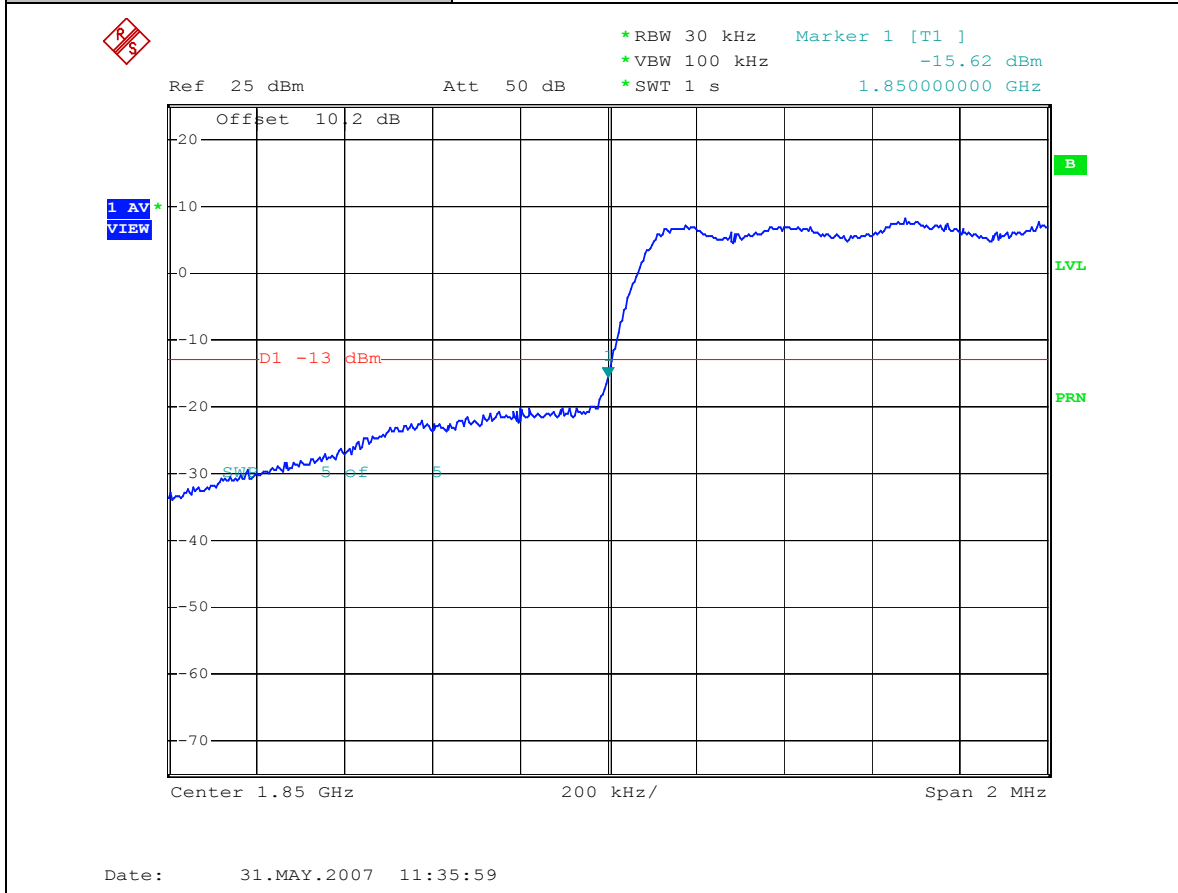
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	UL, Hi-Chn, Upper Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



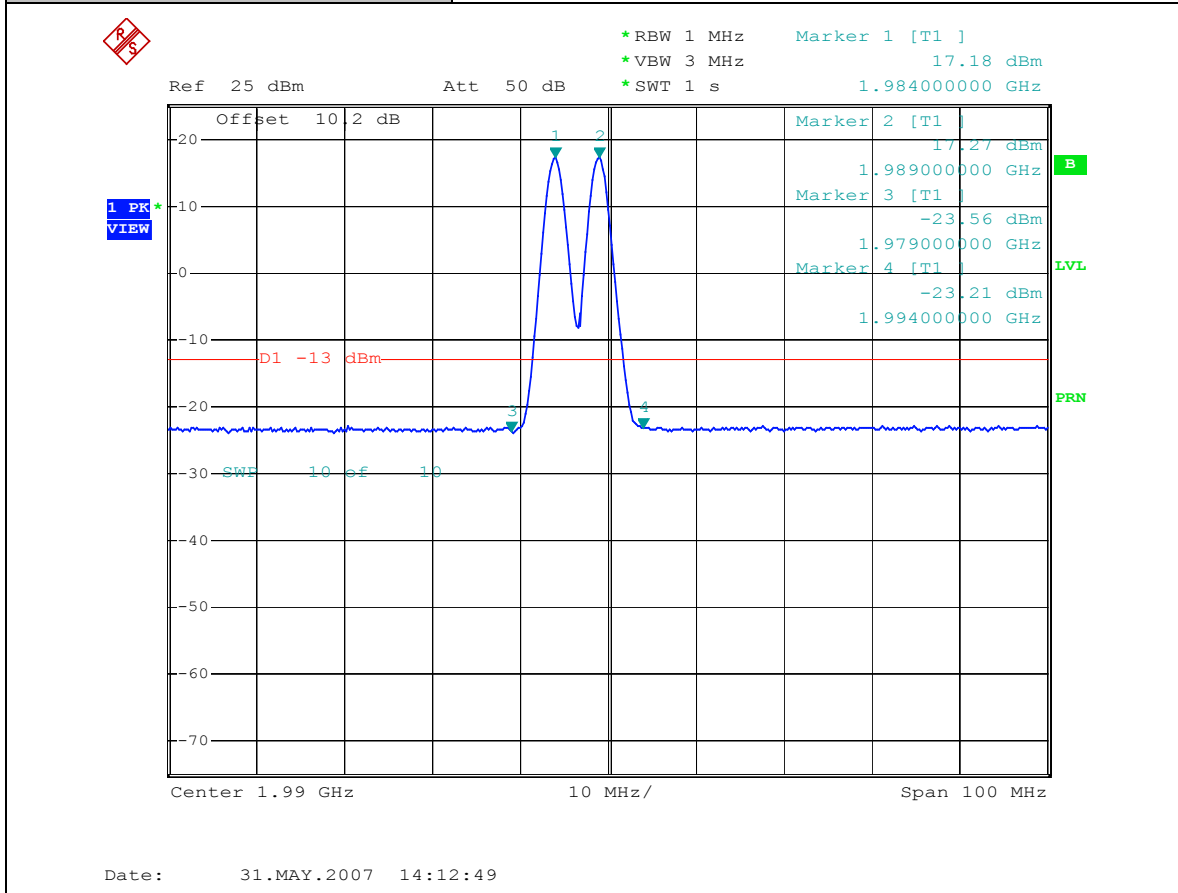
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	UL, Low-Chn, Lower Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



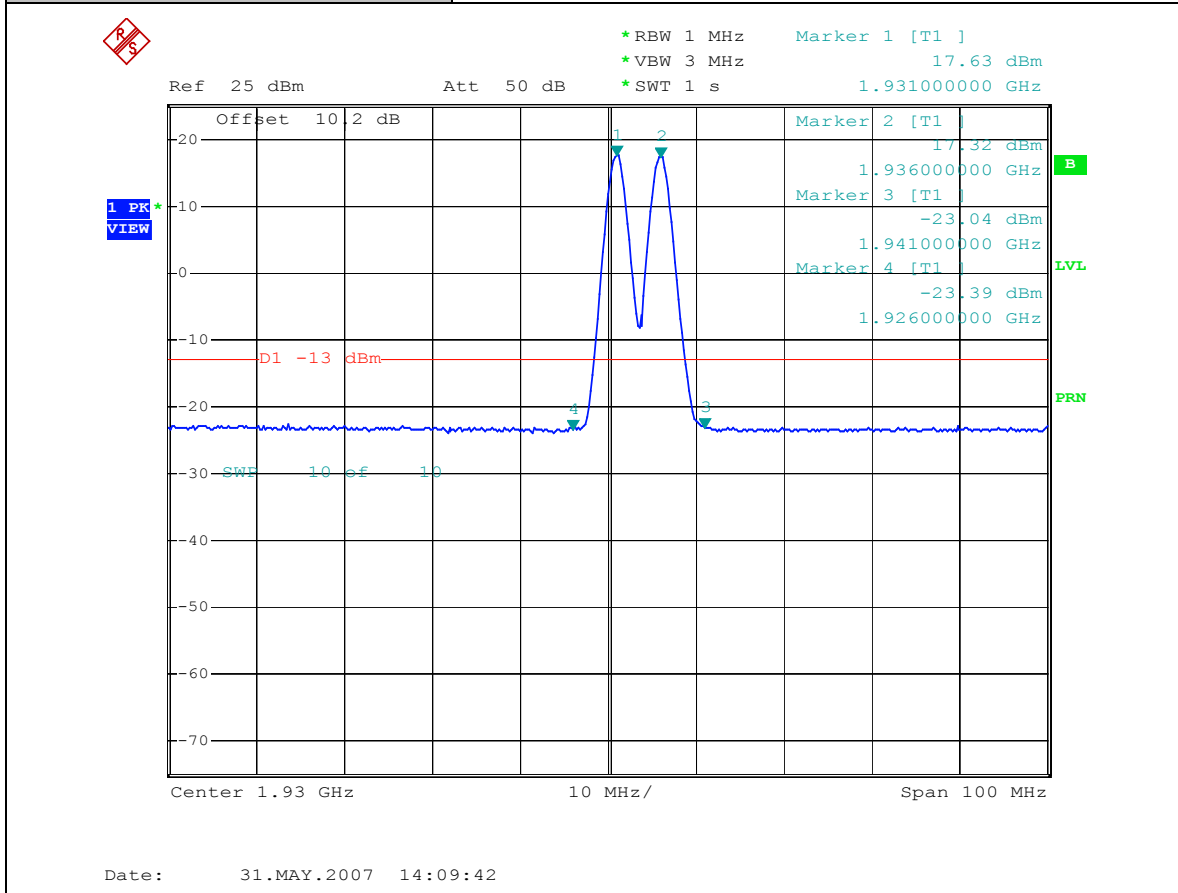
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	DL, High-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



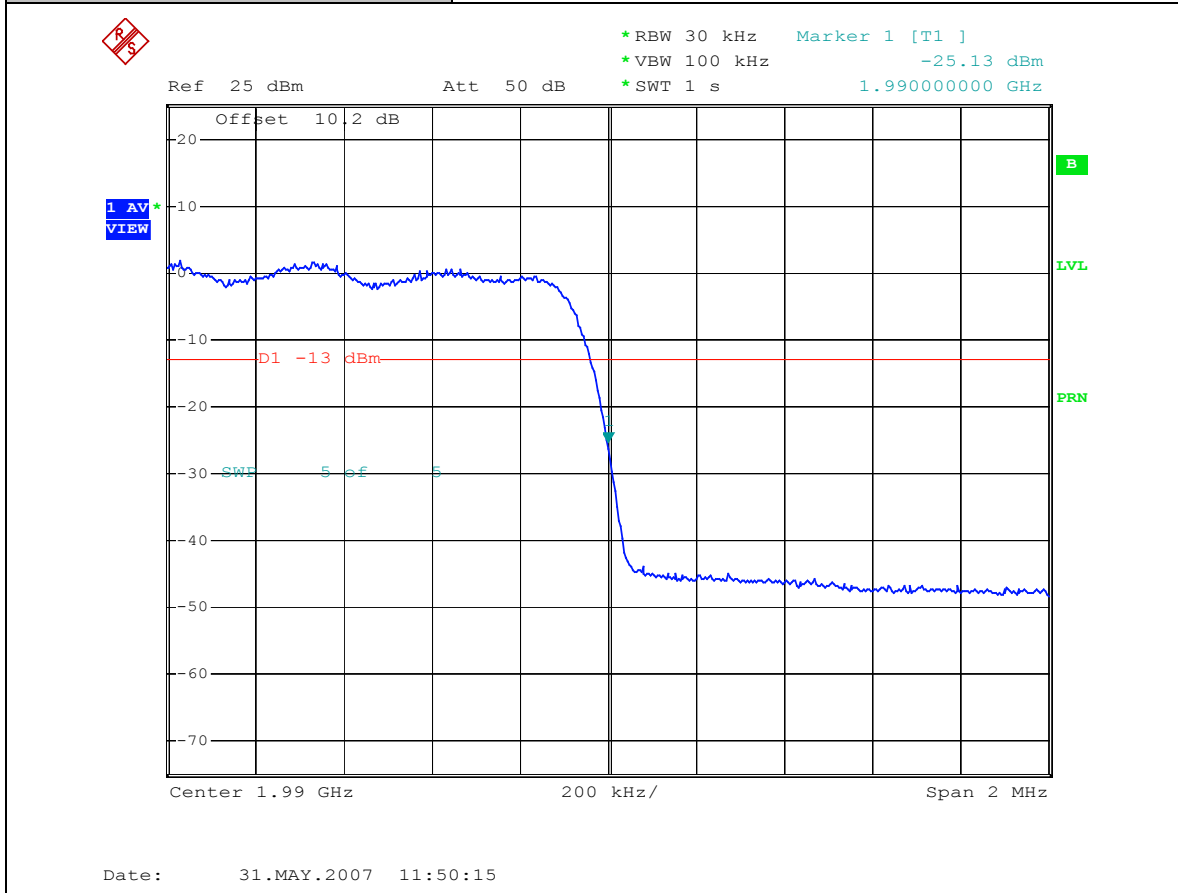
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	DL, Low-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



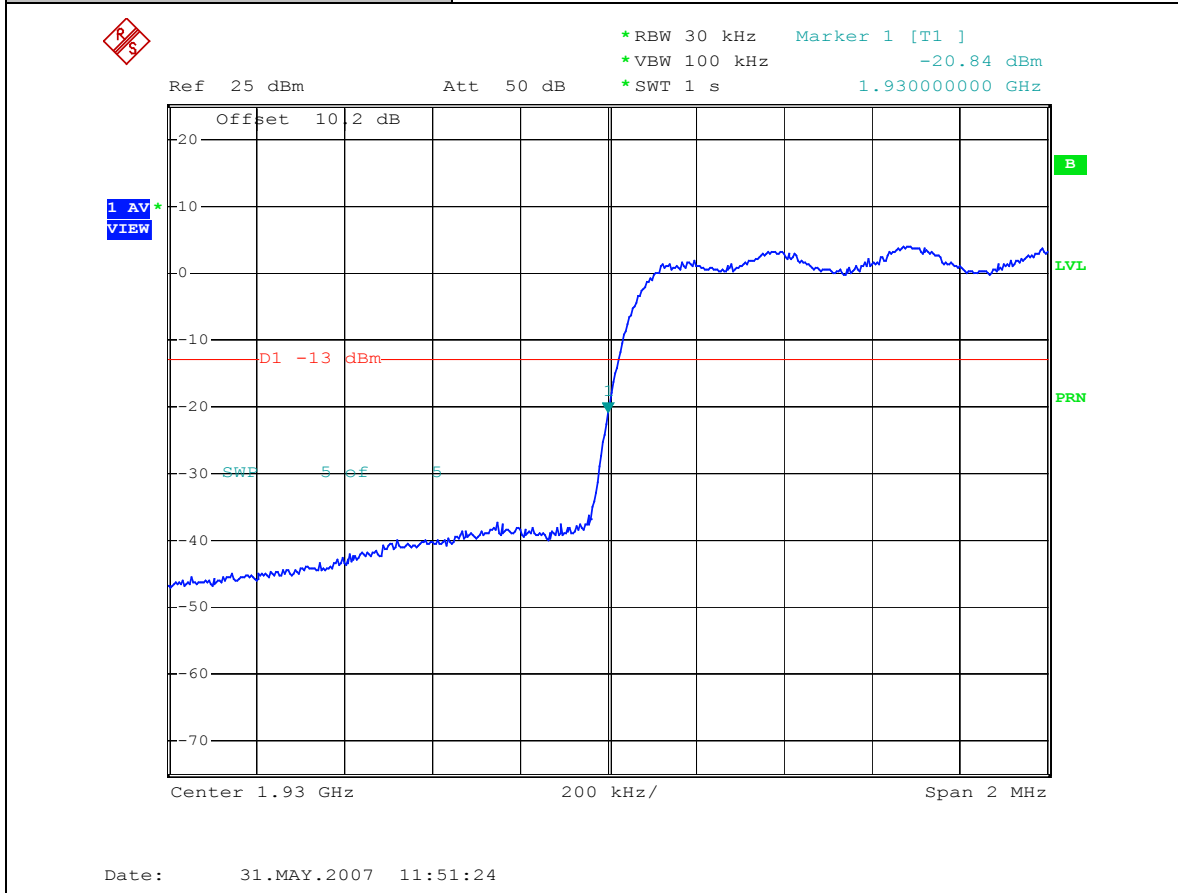
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	DL, High-Chn, Upper Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



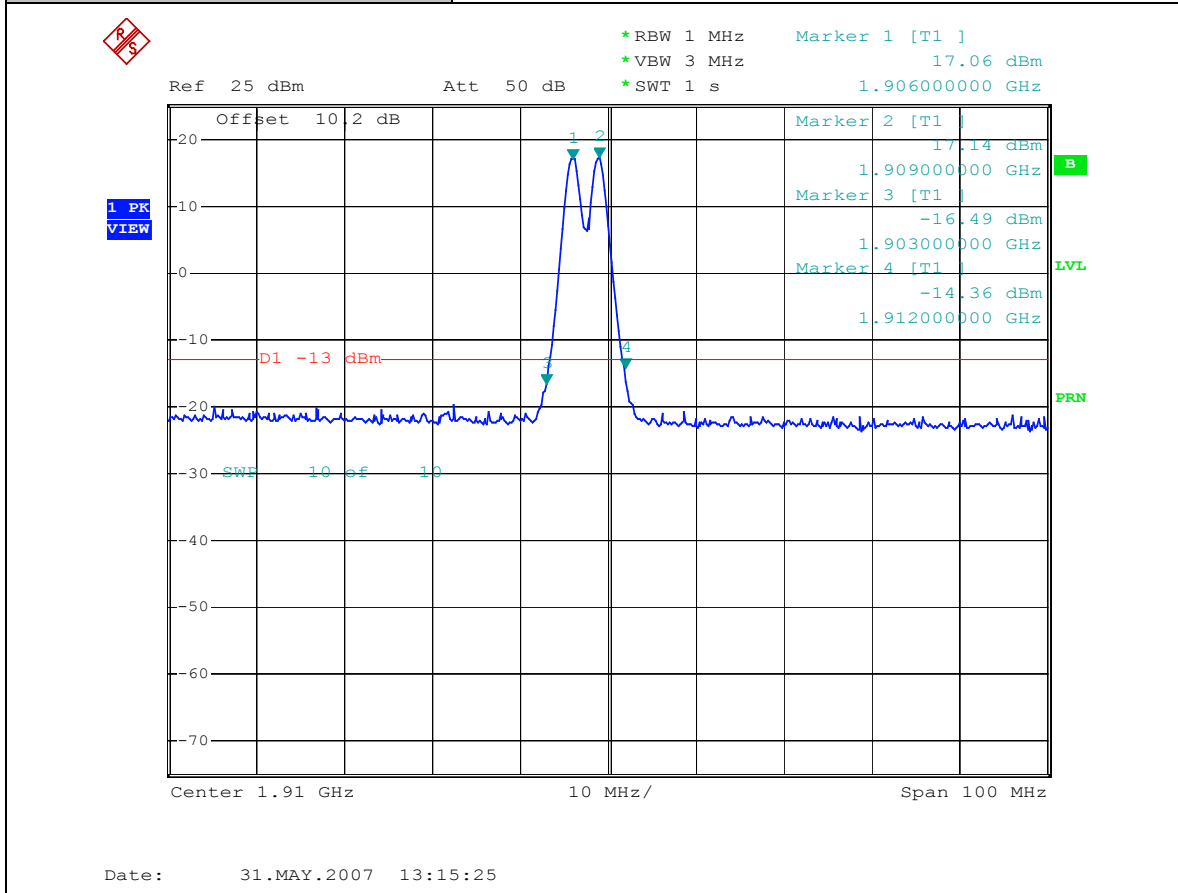
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	DL, Low-Chn, Lower Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



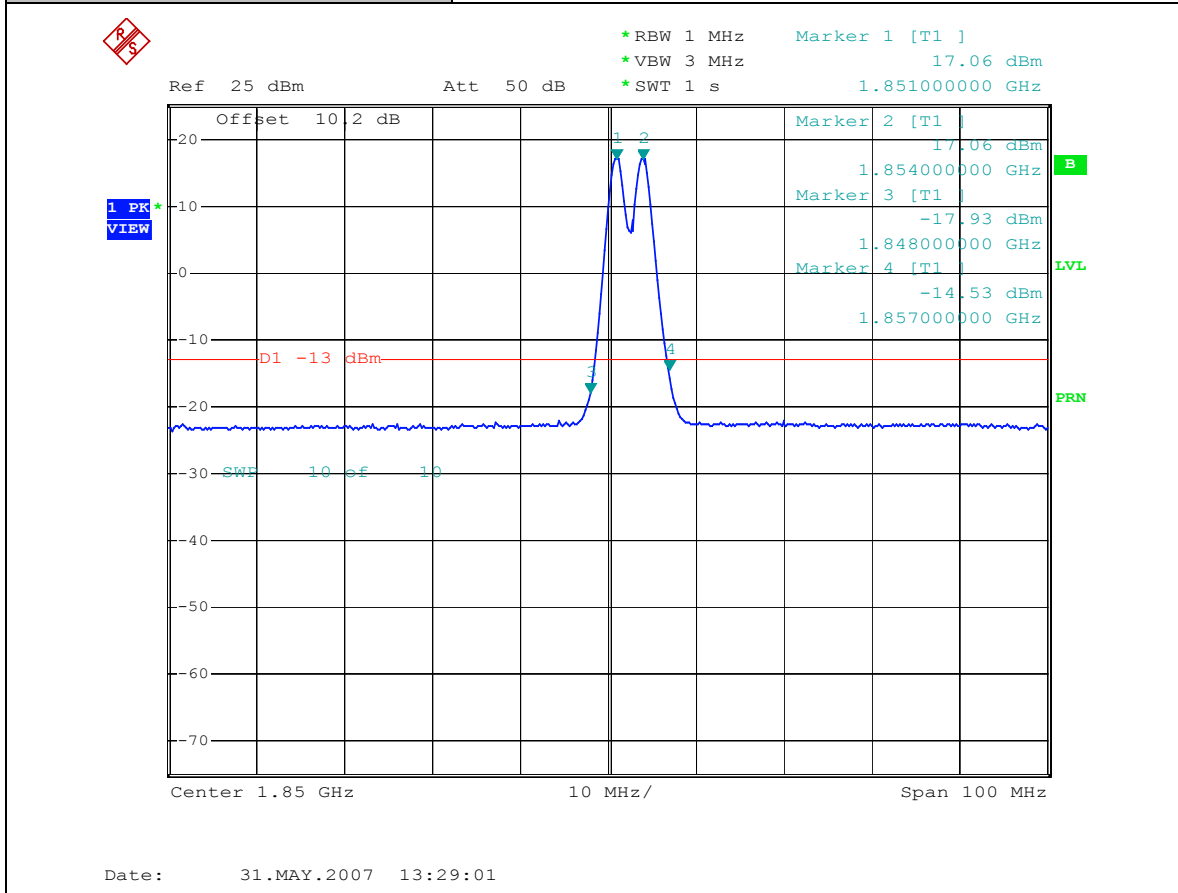
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	UL, Hi-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



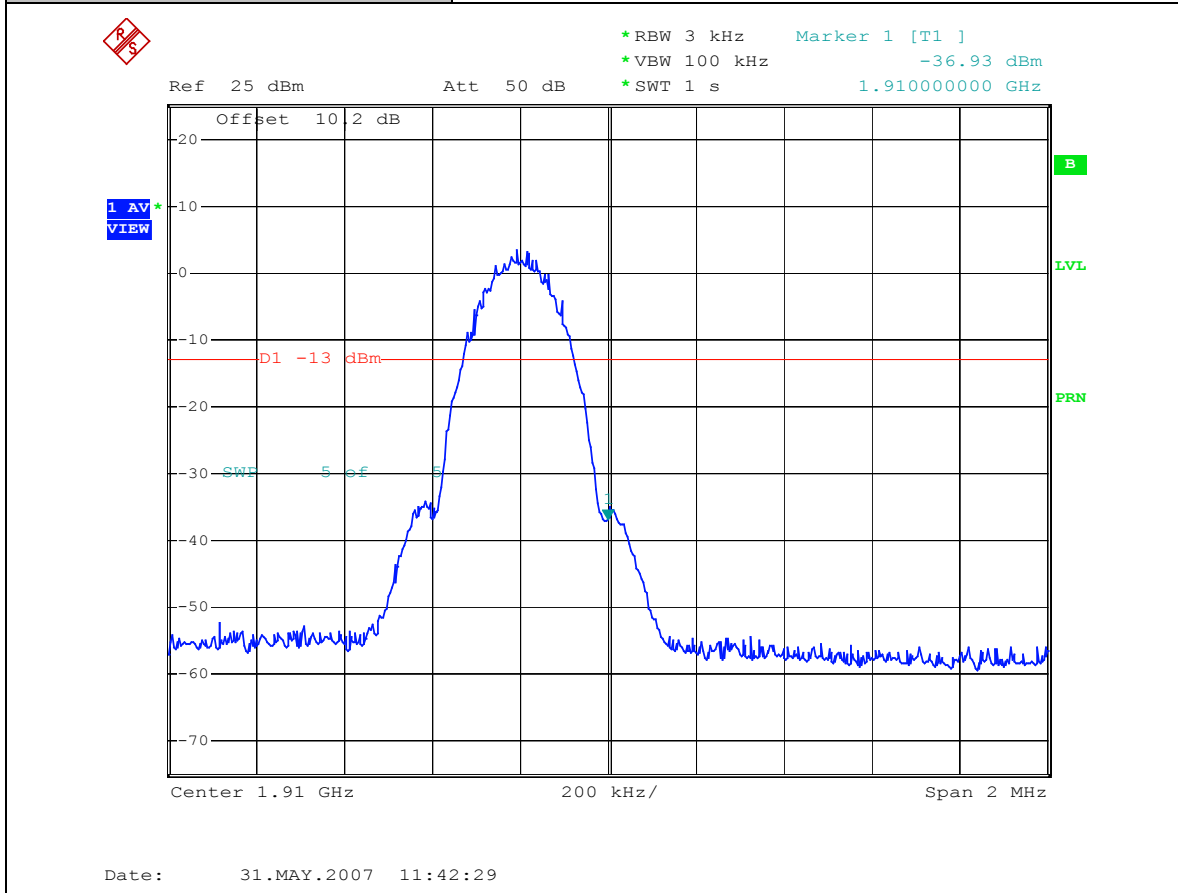
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	UL, Low-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



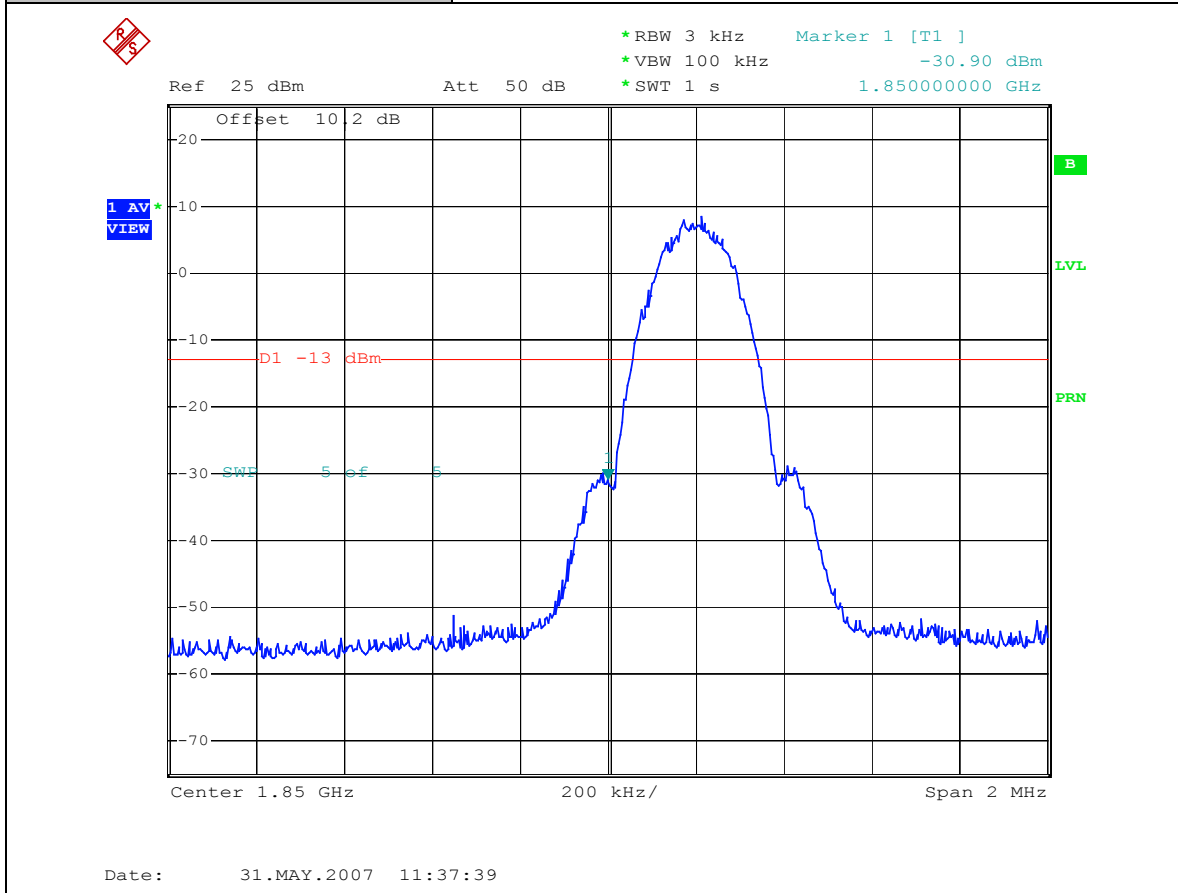
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	UL, Hi-Chn, Upper Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



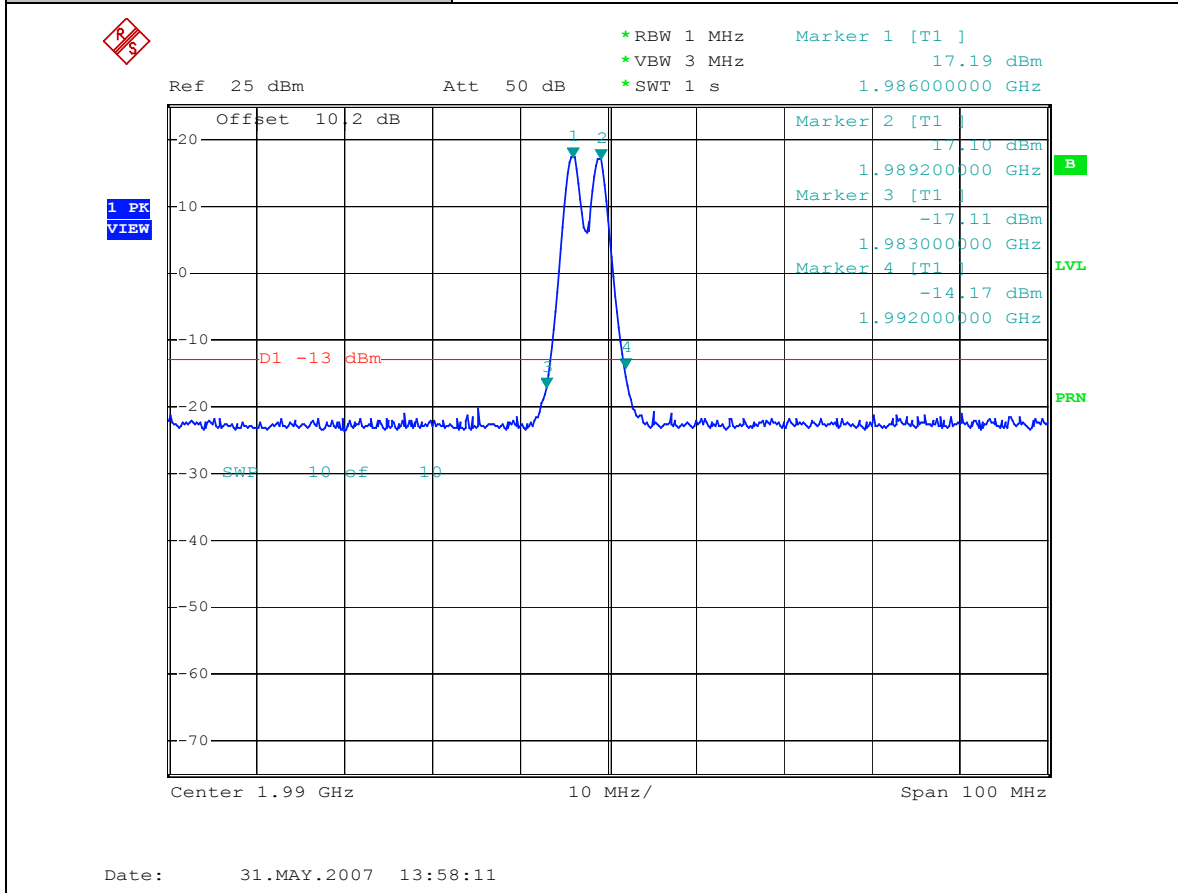
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	UL, Low-Chn, Lower Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



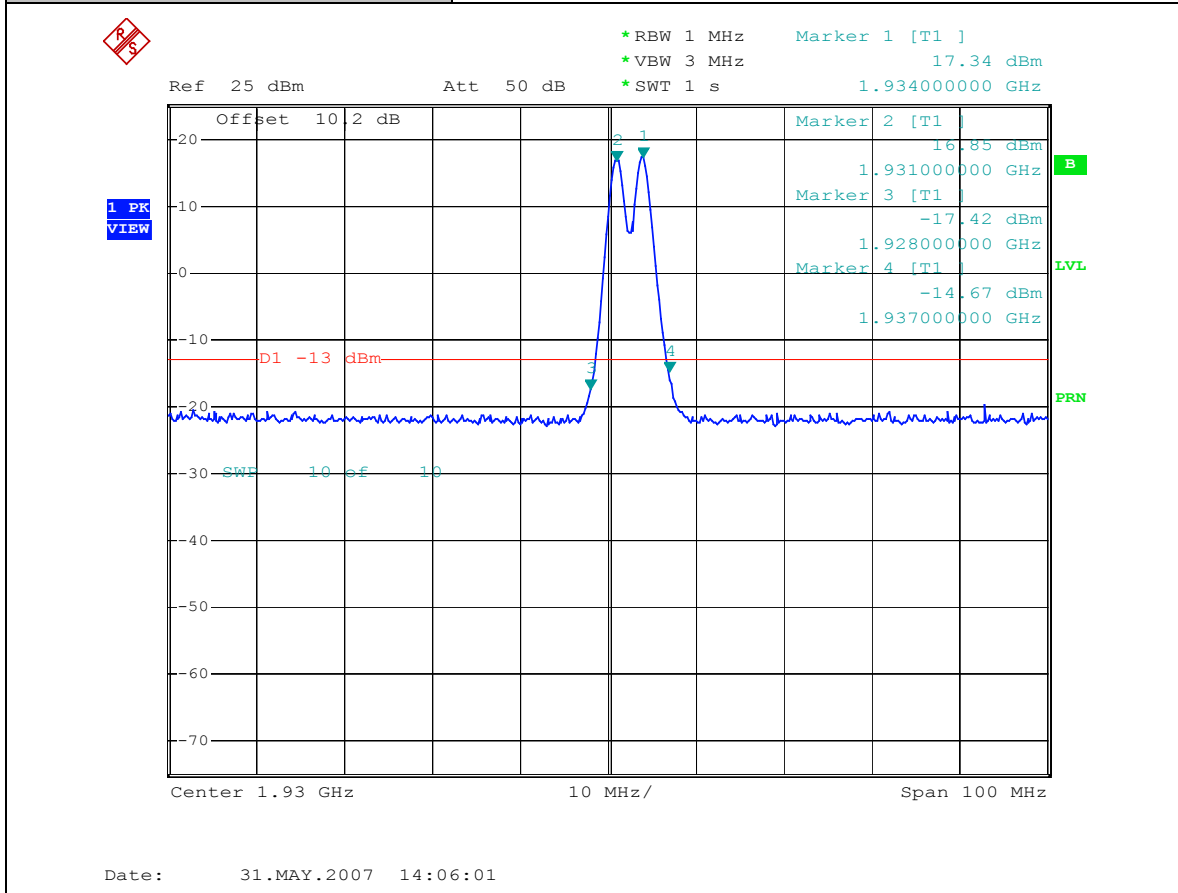
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	DL, High-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



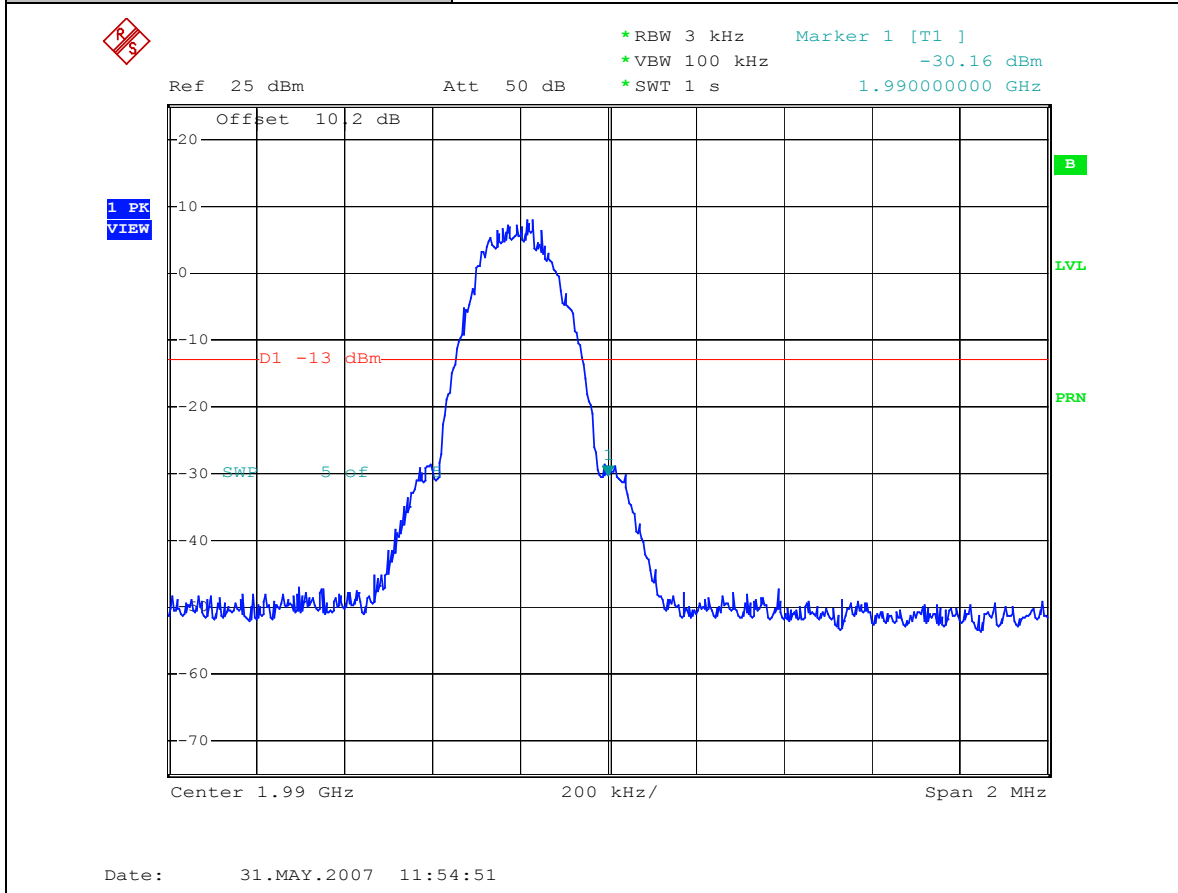
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	DL, Low-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



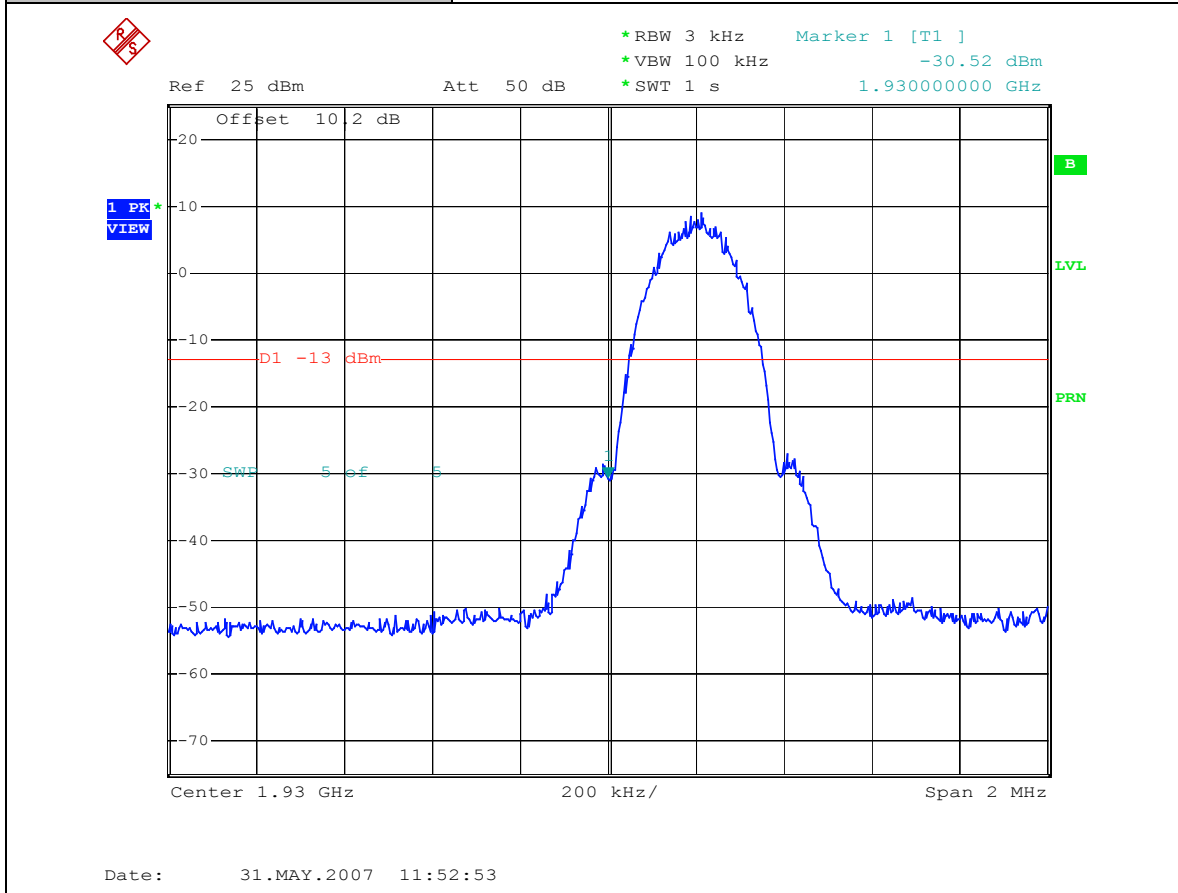
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	DL, High-Chn, Upper Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



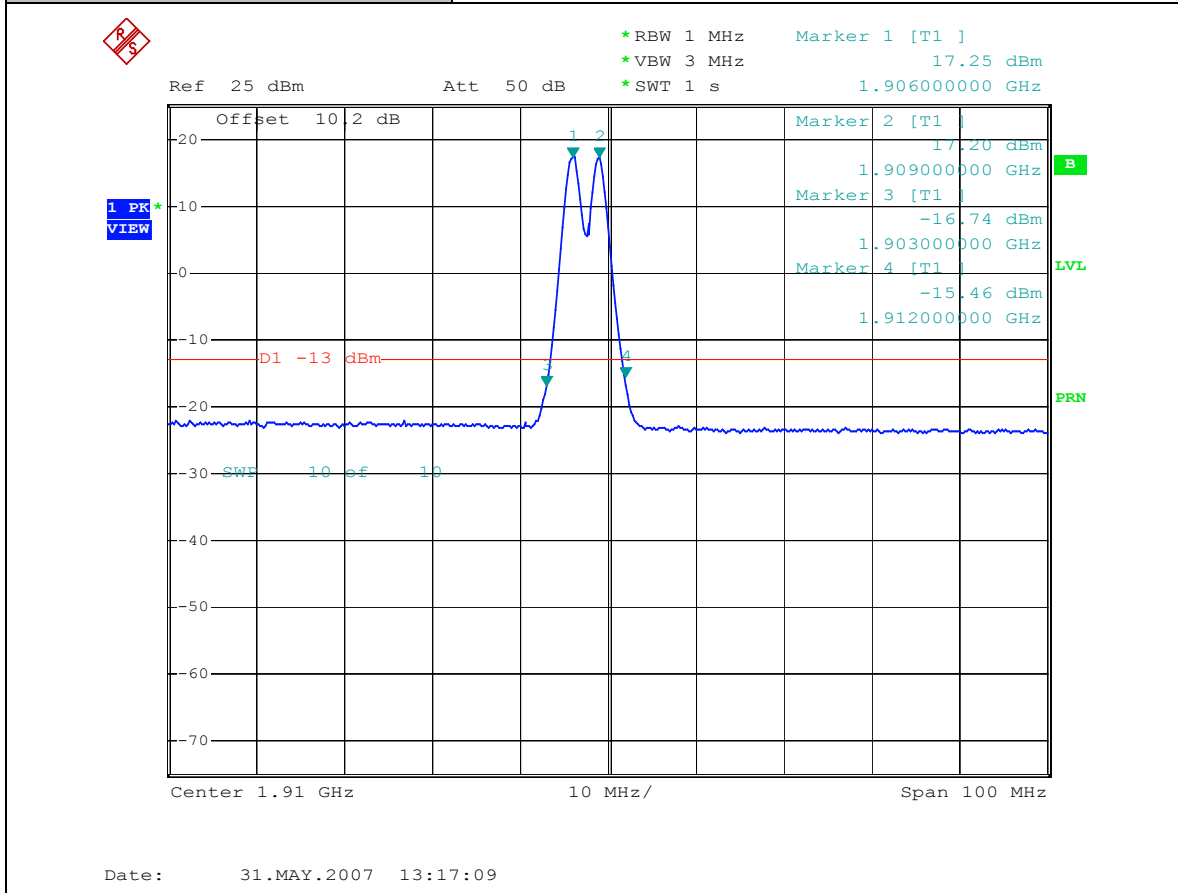
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	DL, Low-Chn, Lower Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



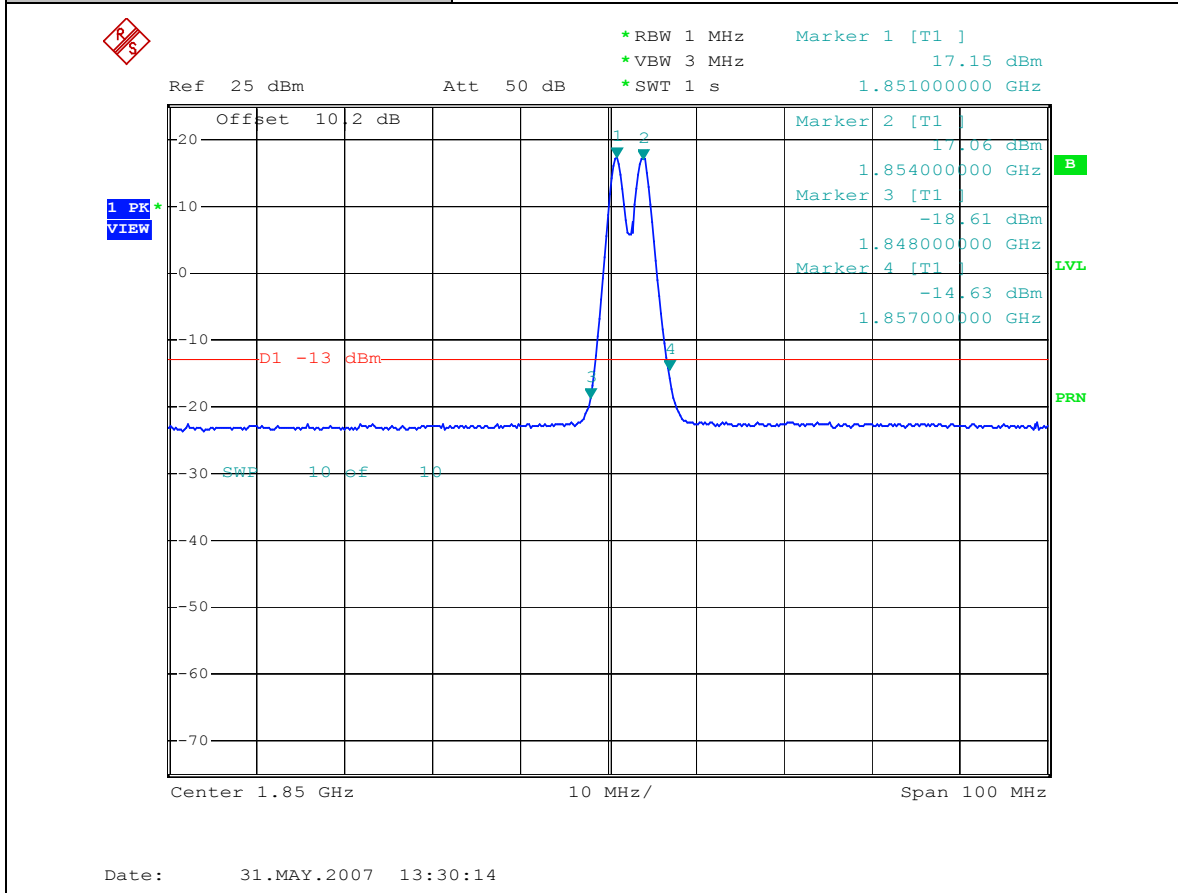
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	UL, Hi-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



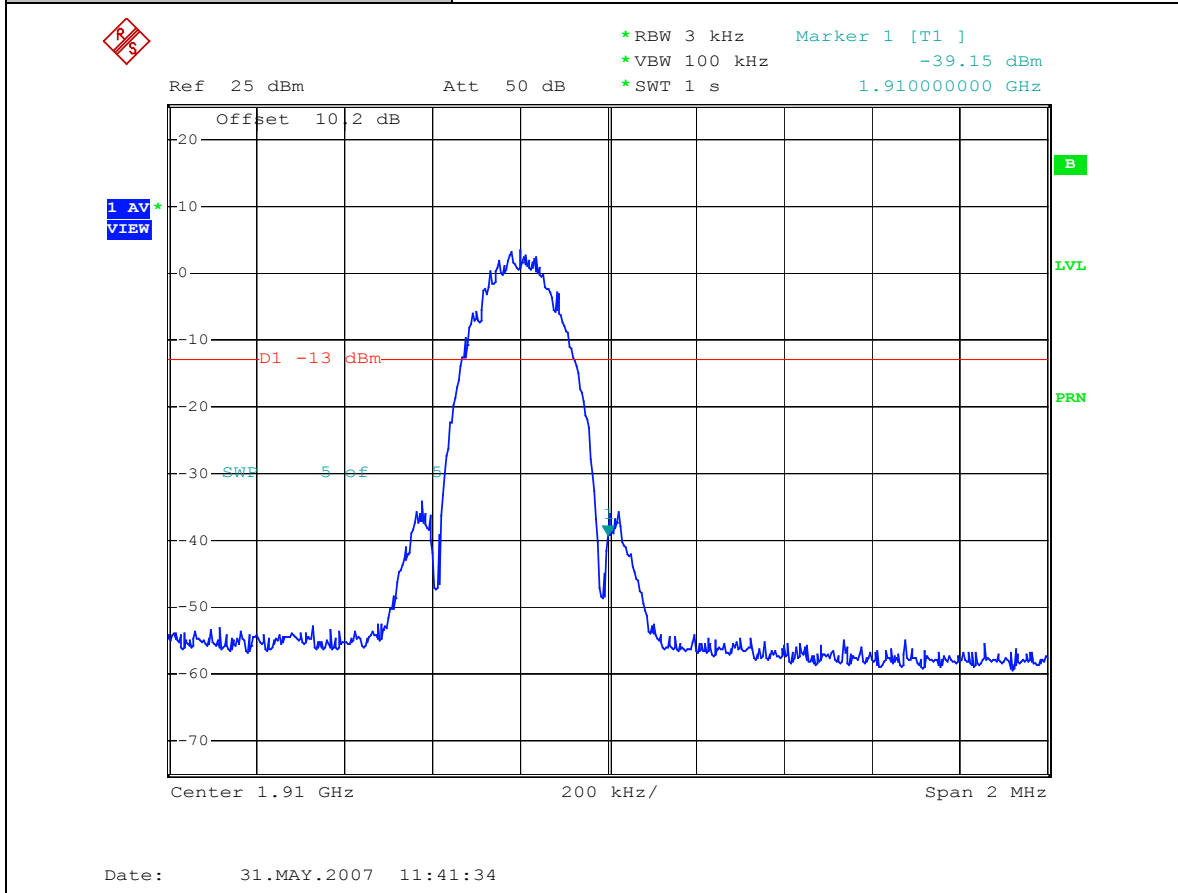
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	UL, Low-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



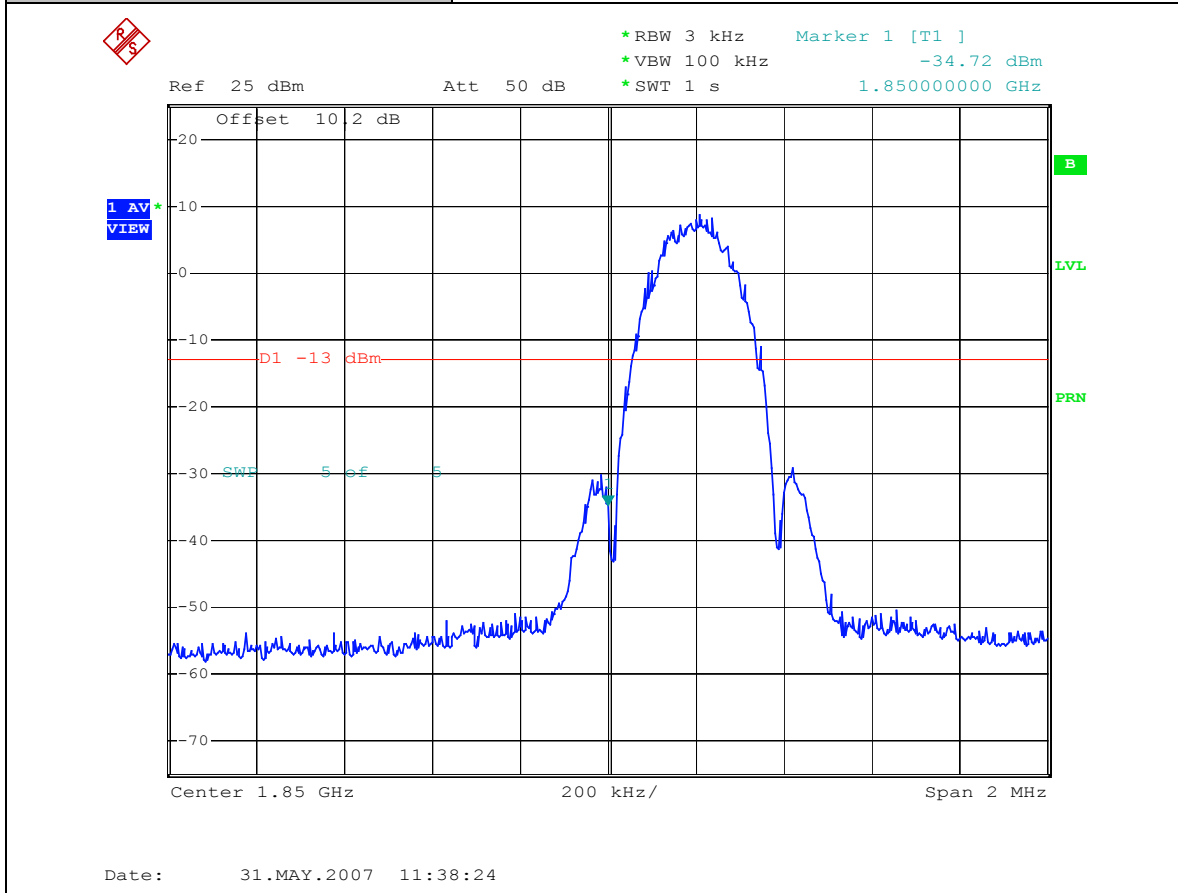
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	UL, Hi-Chn, Upper Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



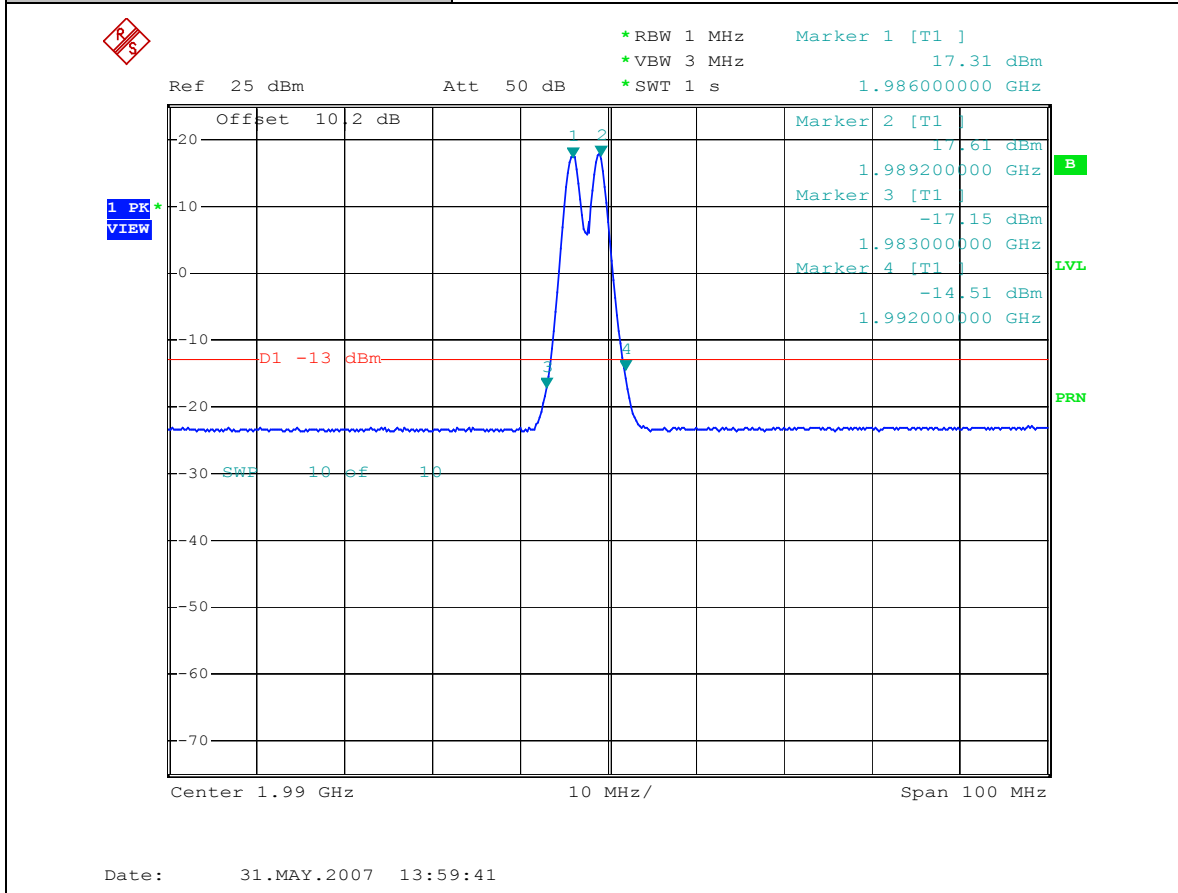
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	UL, Low-Chn, Lower Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



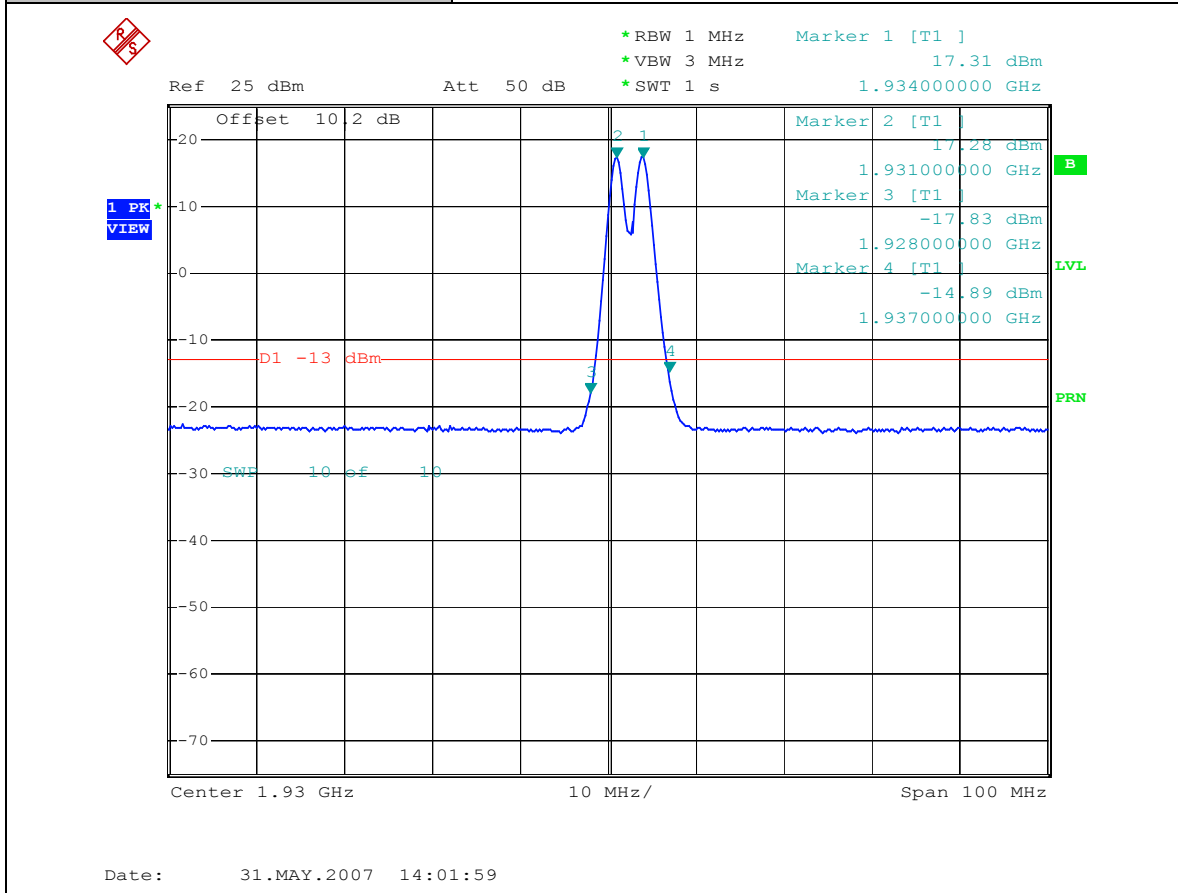
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	DL, High-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



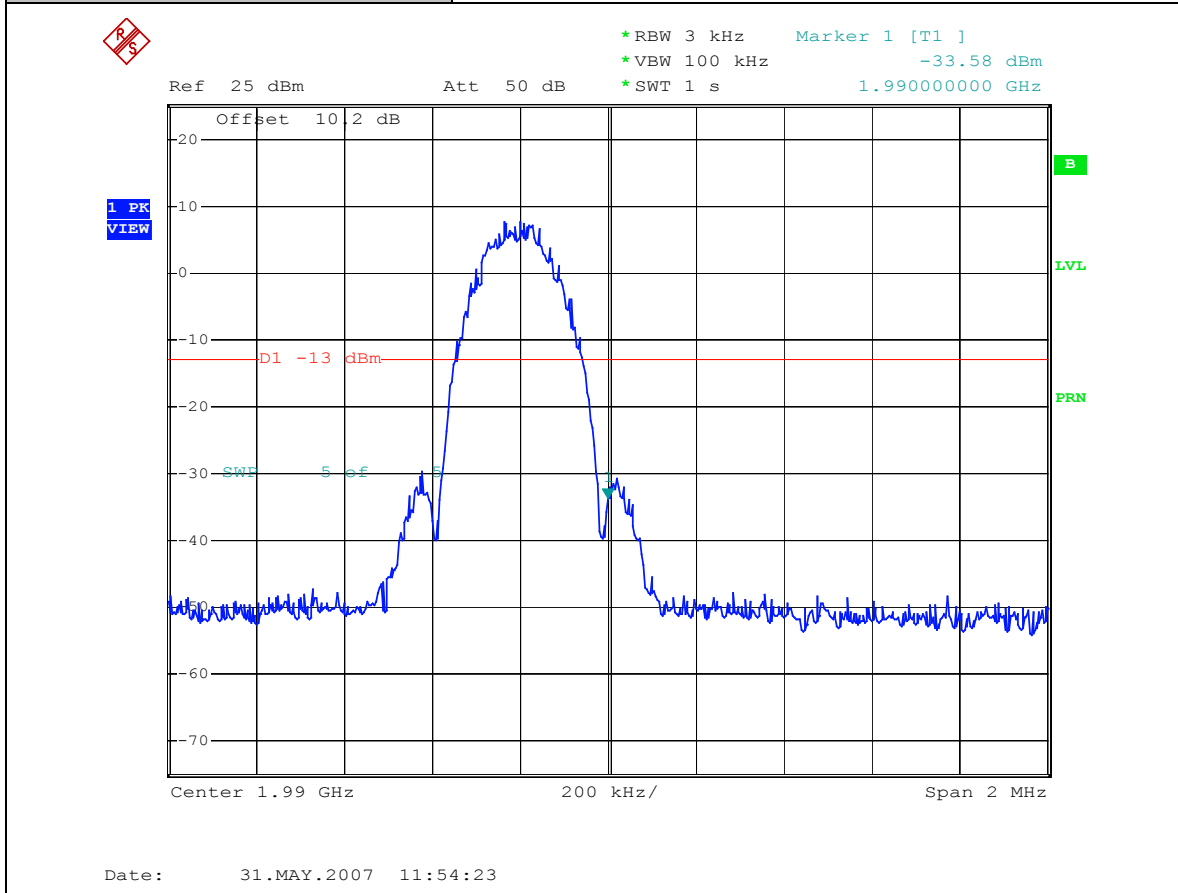
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	DL, Low-Chn, Intermodulation
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



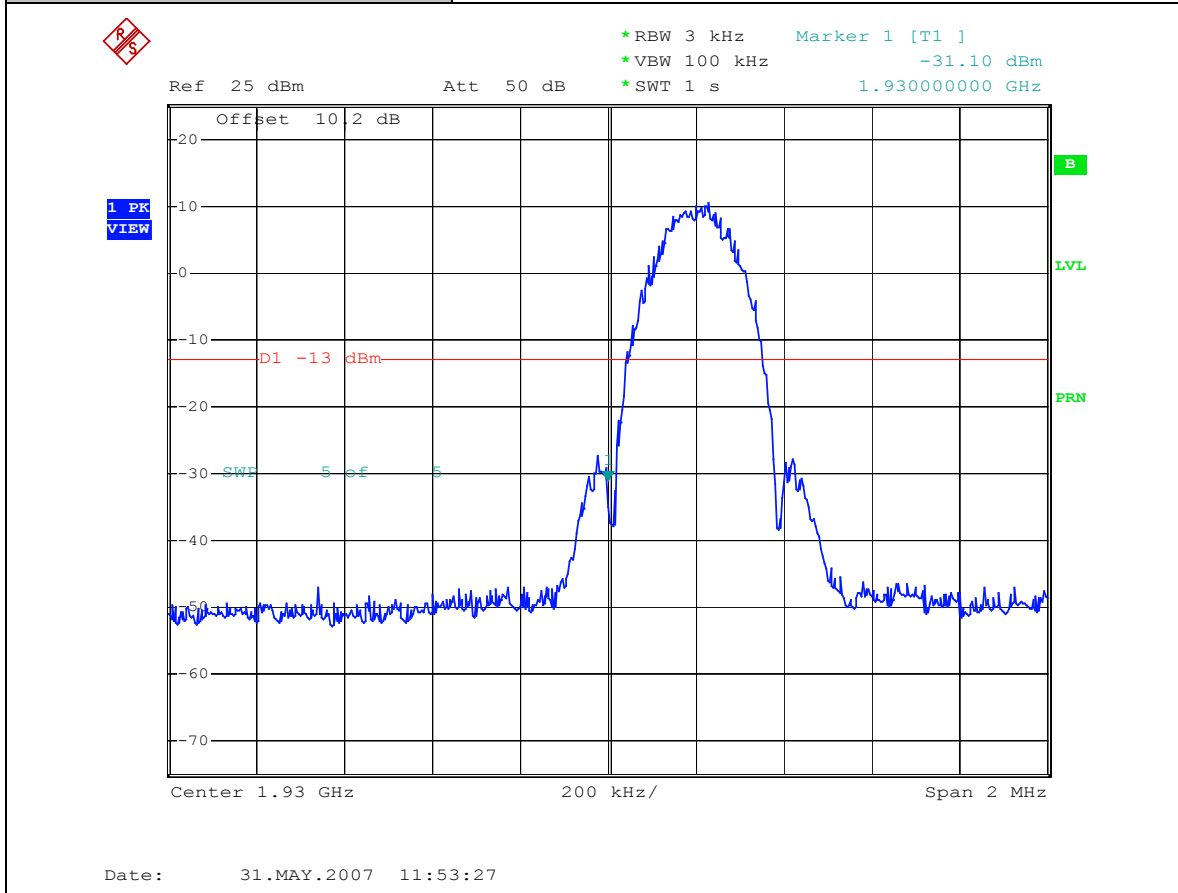
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	DL, High-Chn, Upper Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



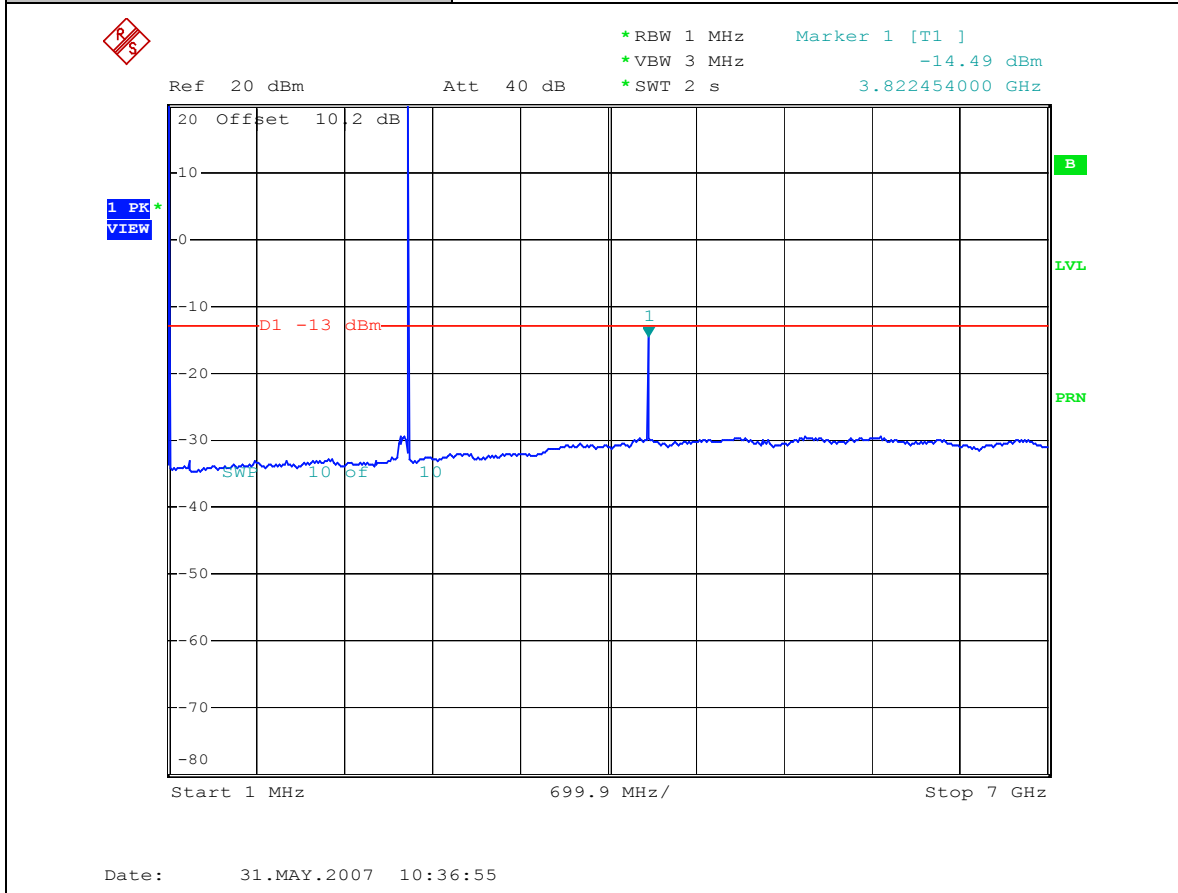
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	DL, Low-Chn, Lower Bandedge
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



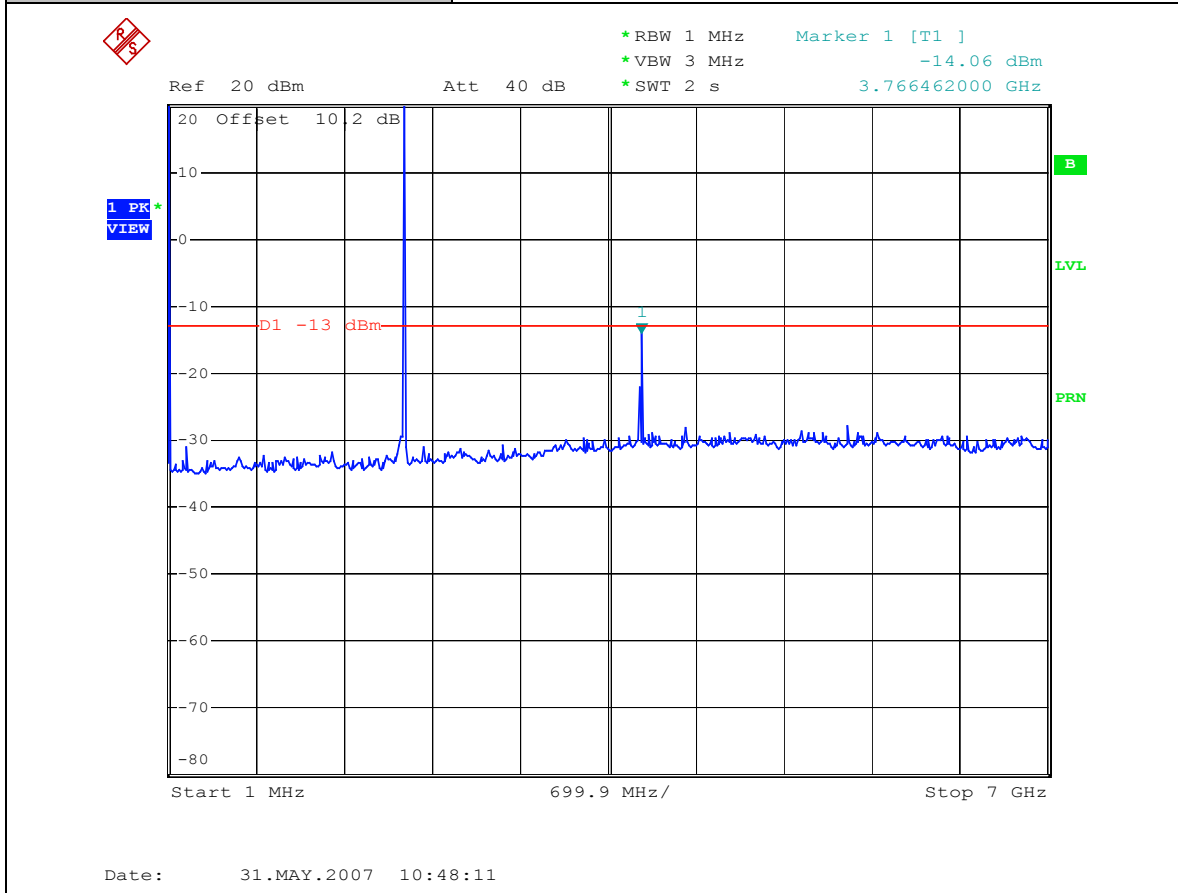
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



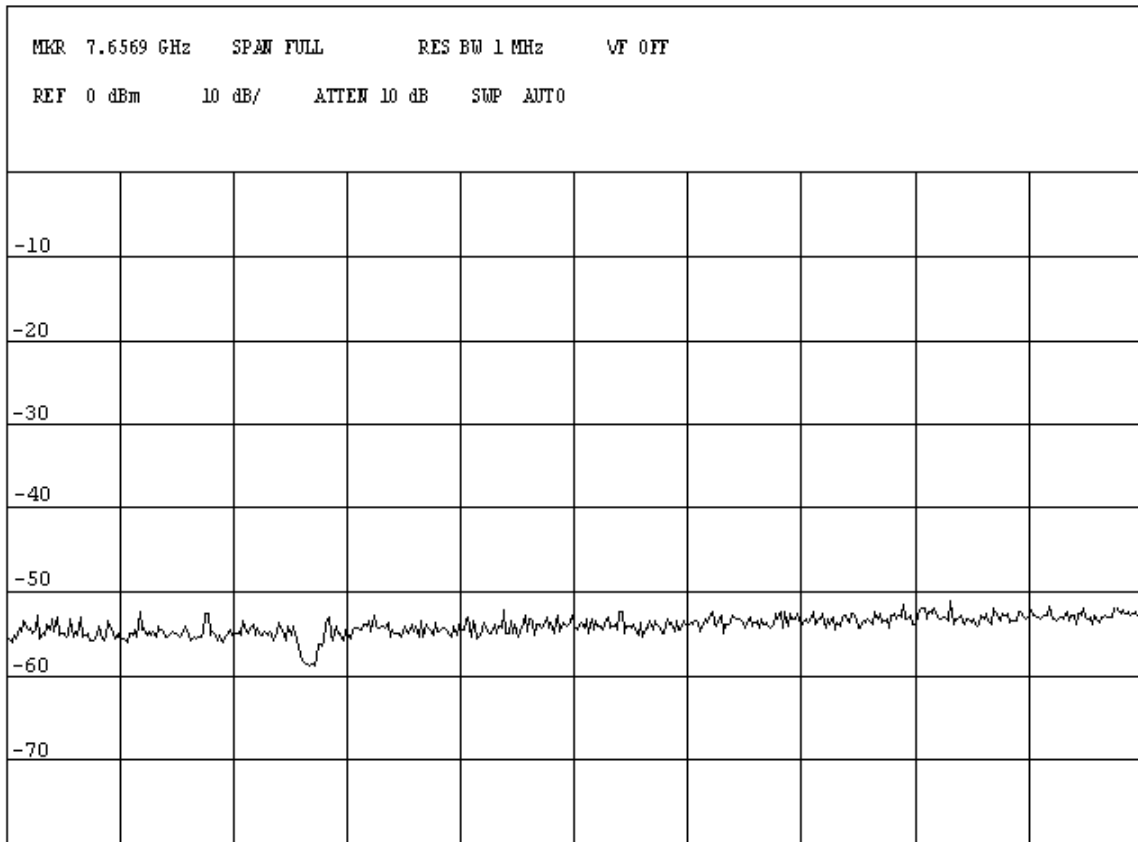
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



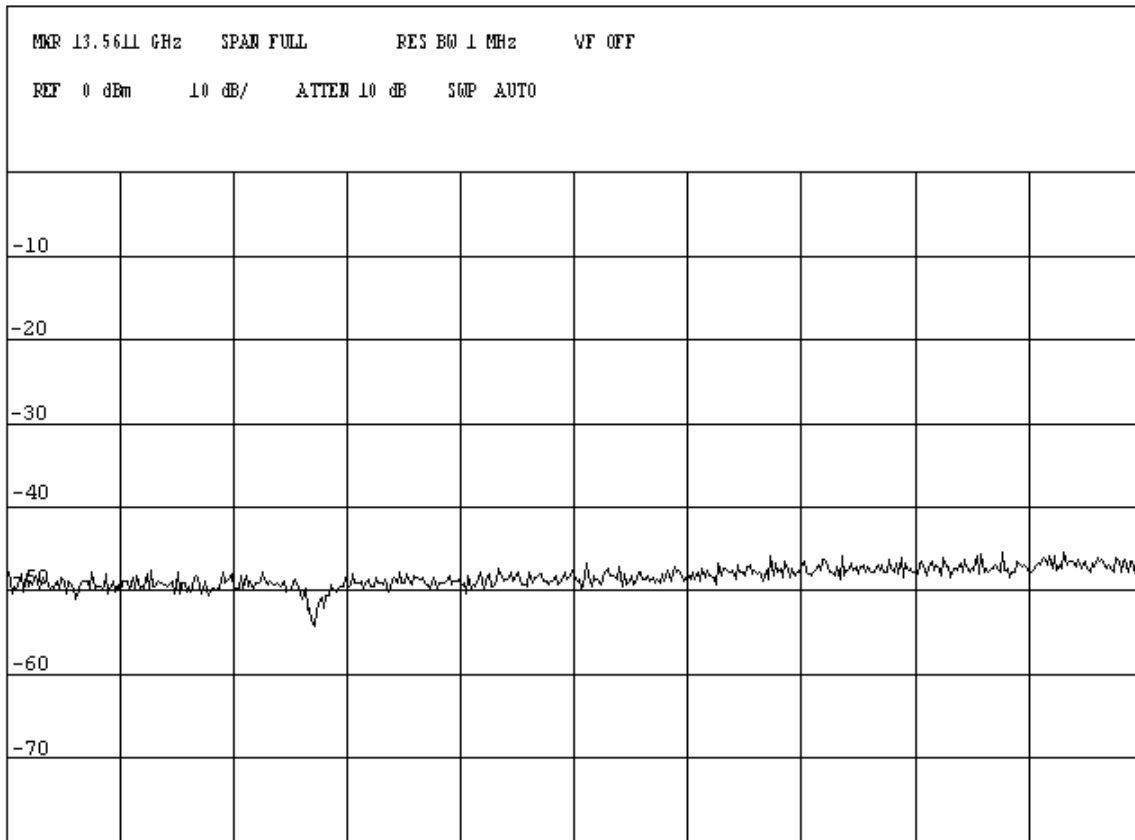
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



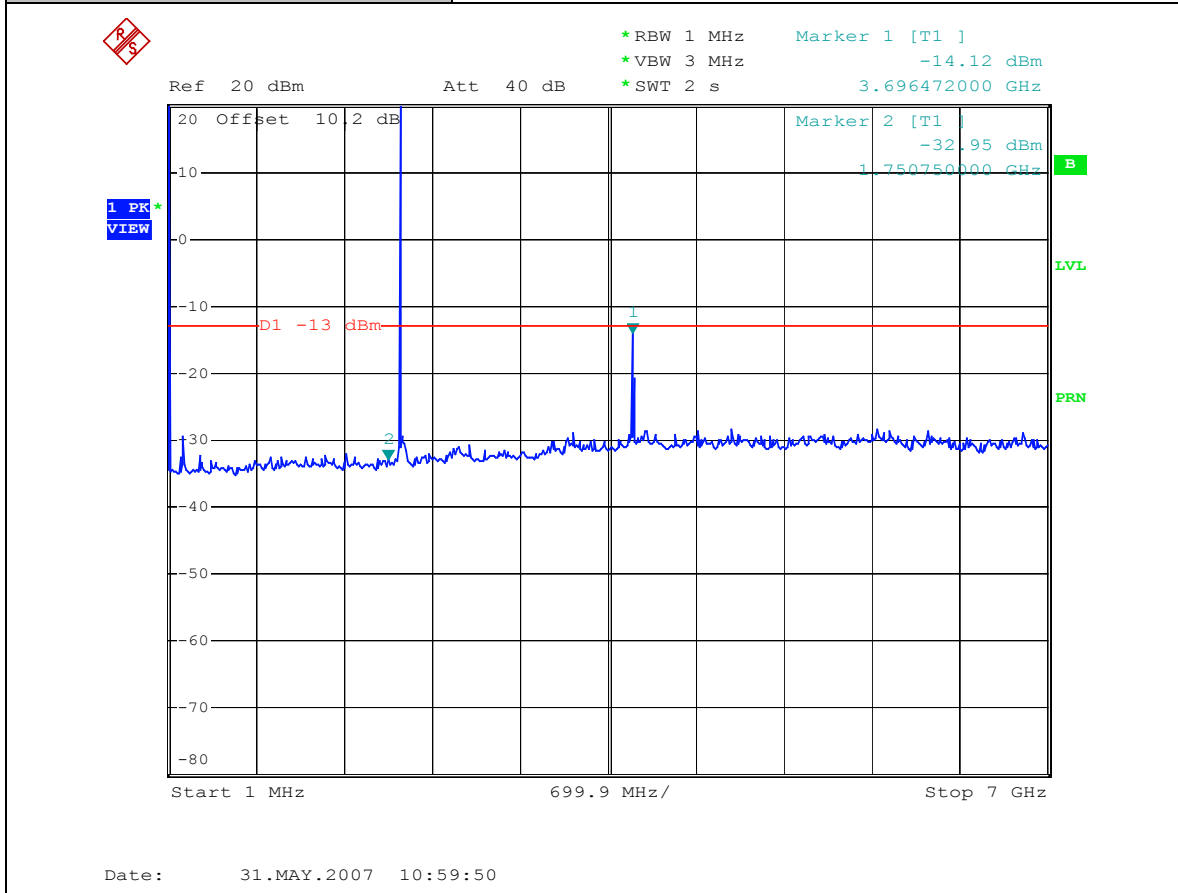
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



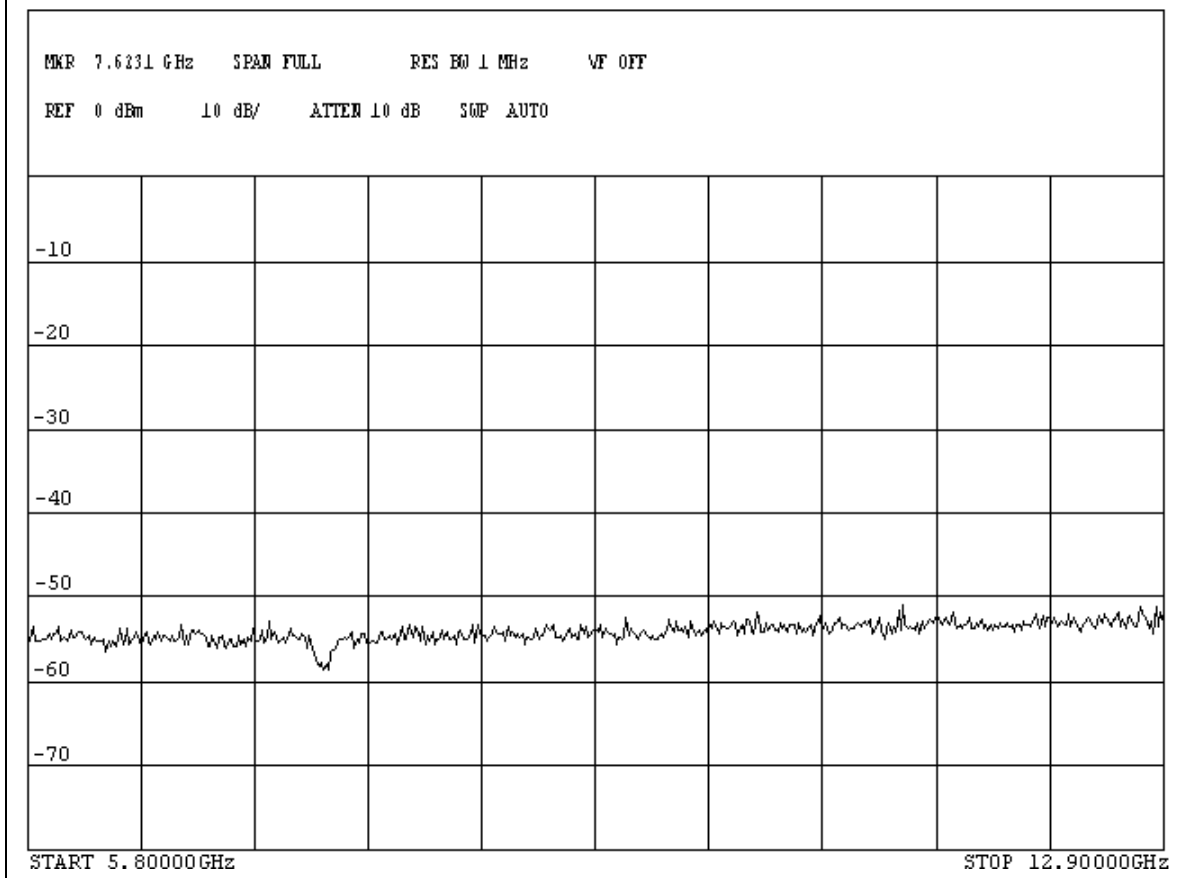
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



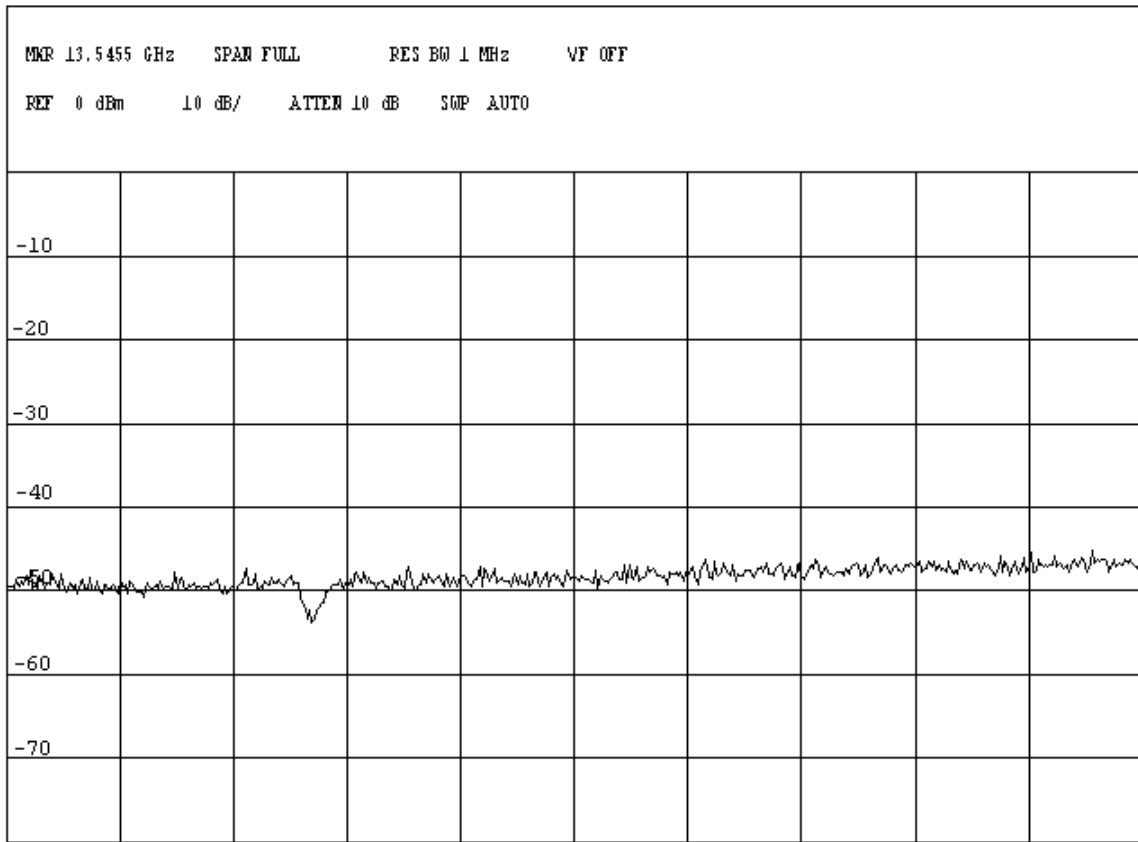
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



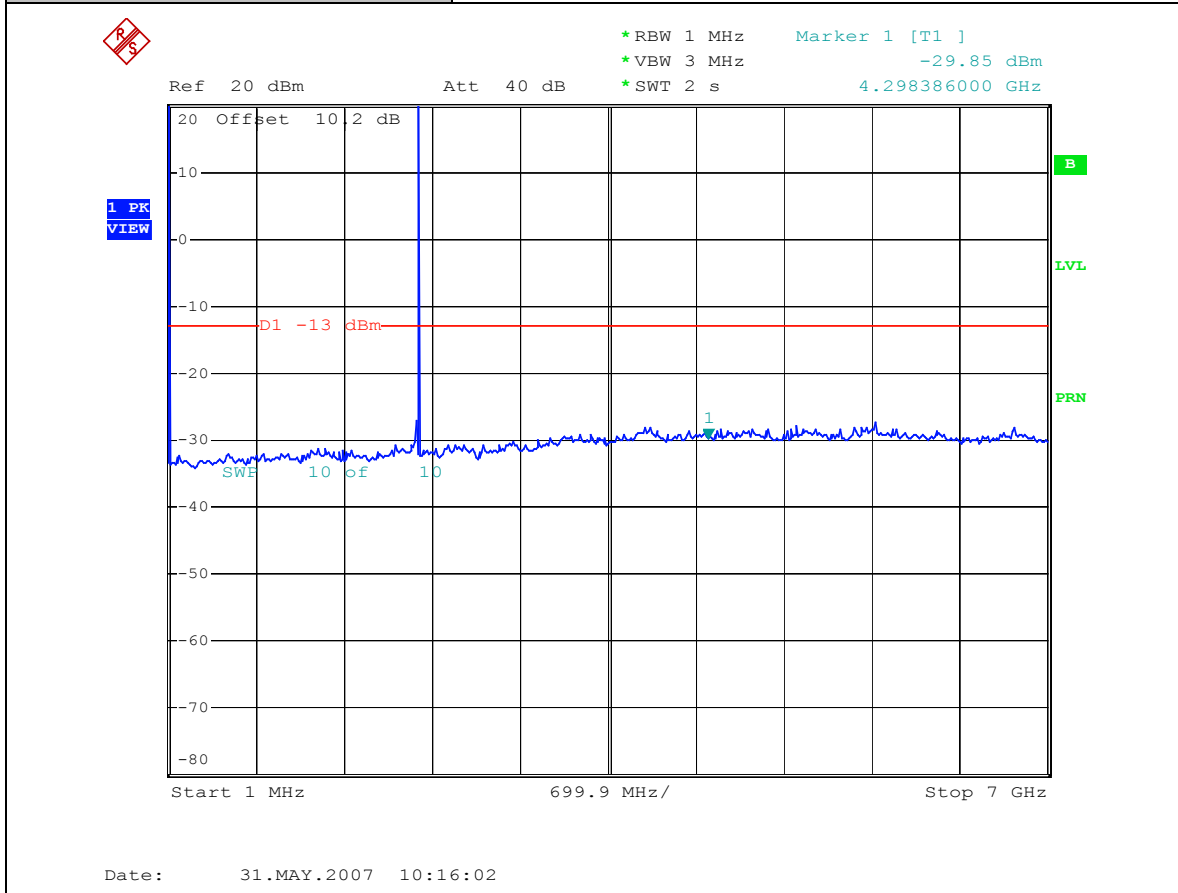
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



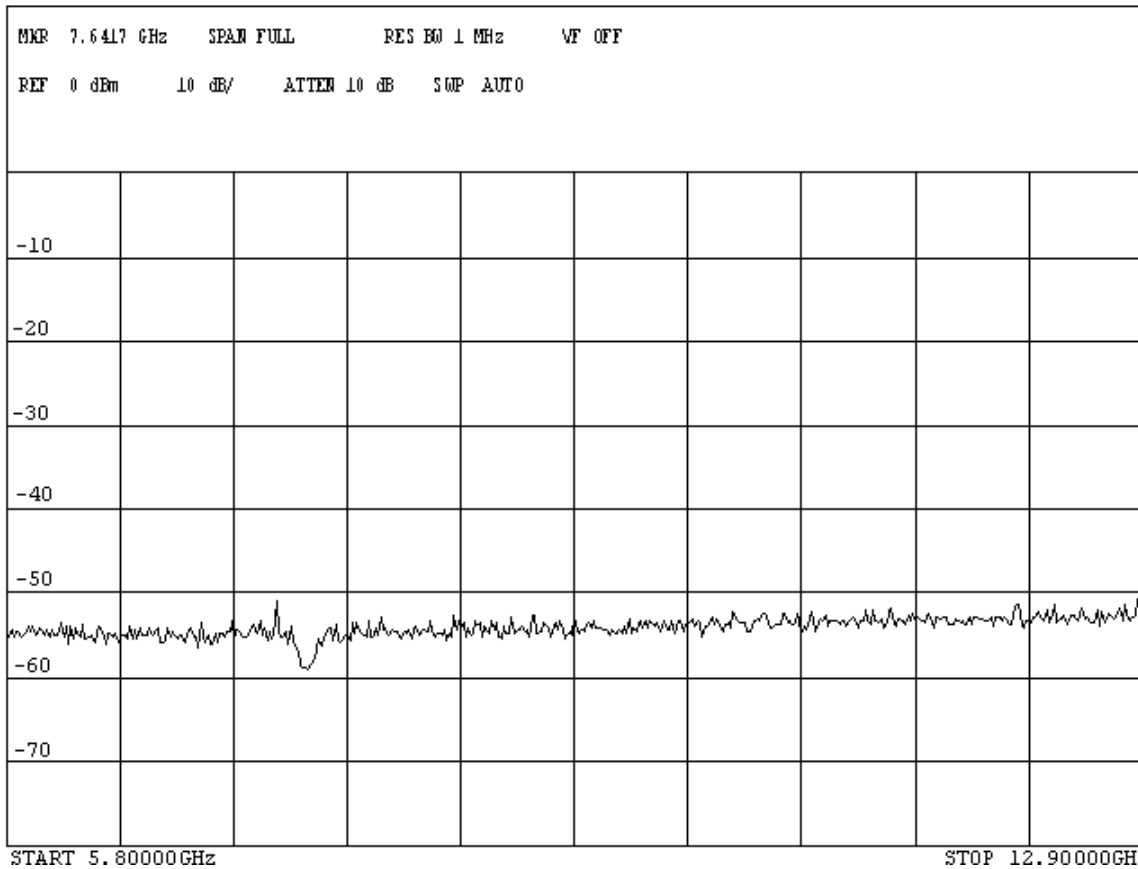
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



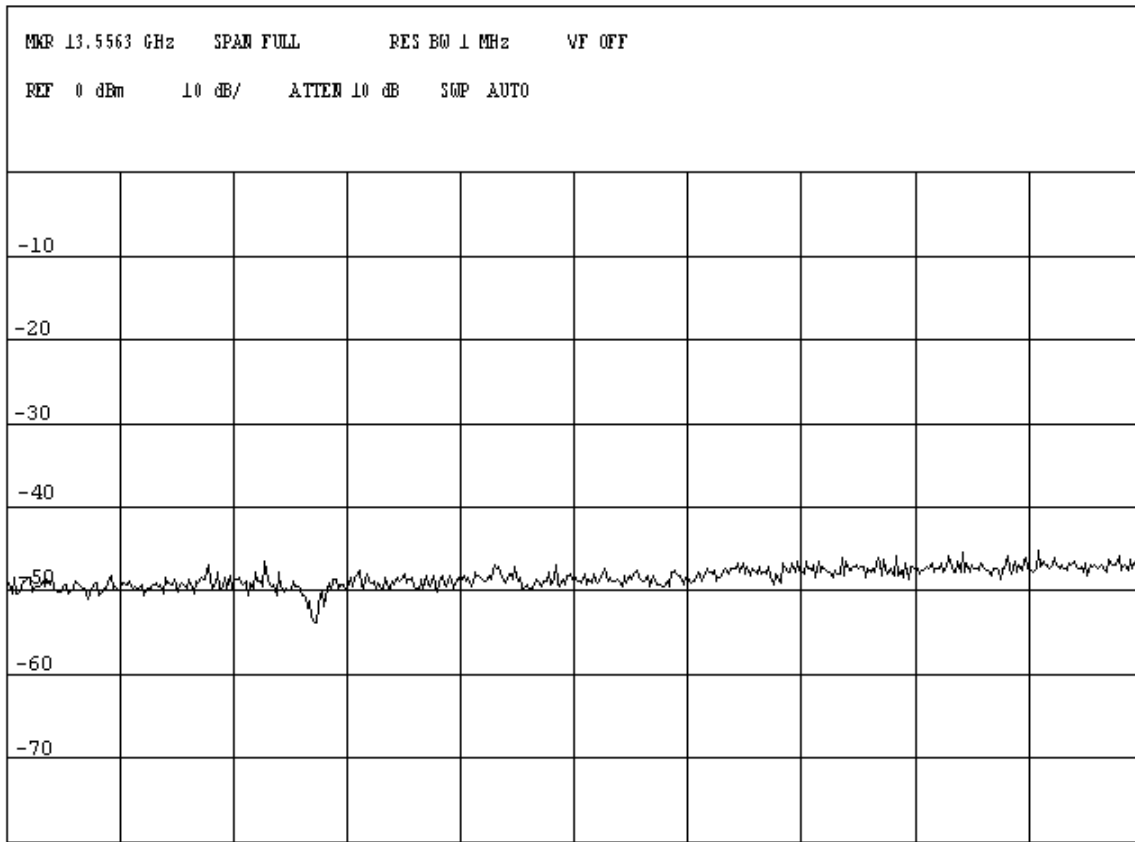
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



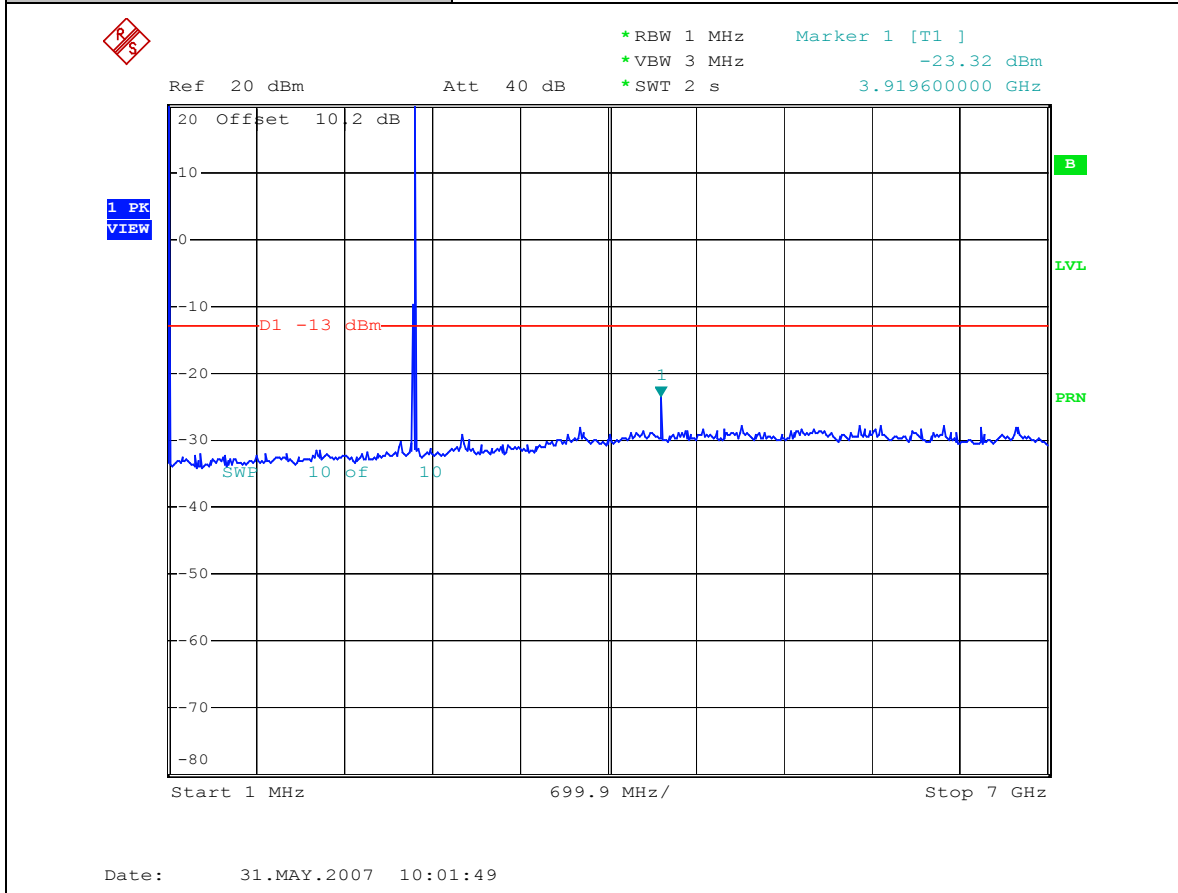
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



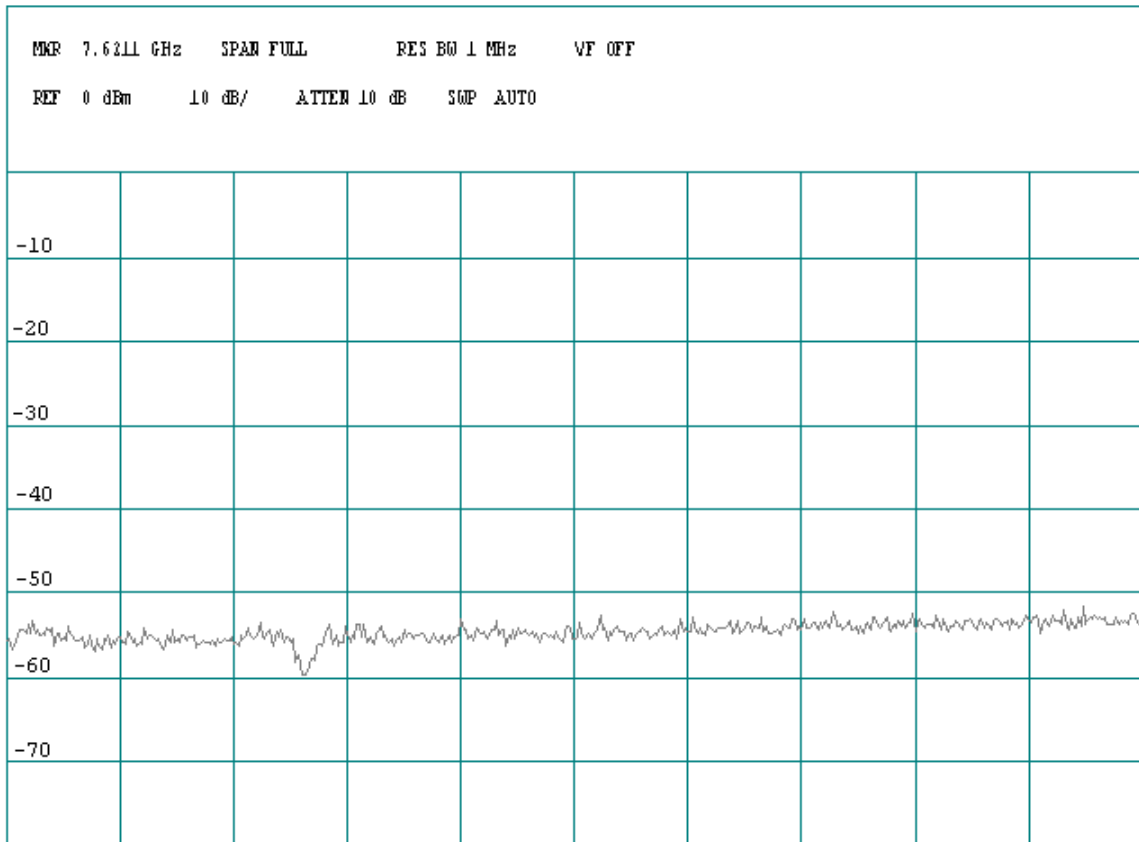
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



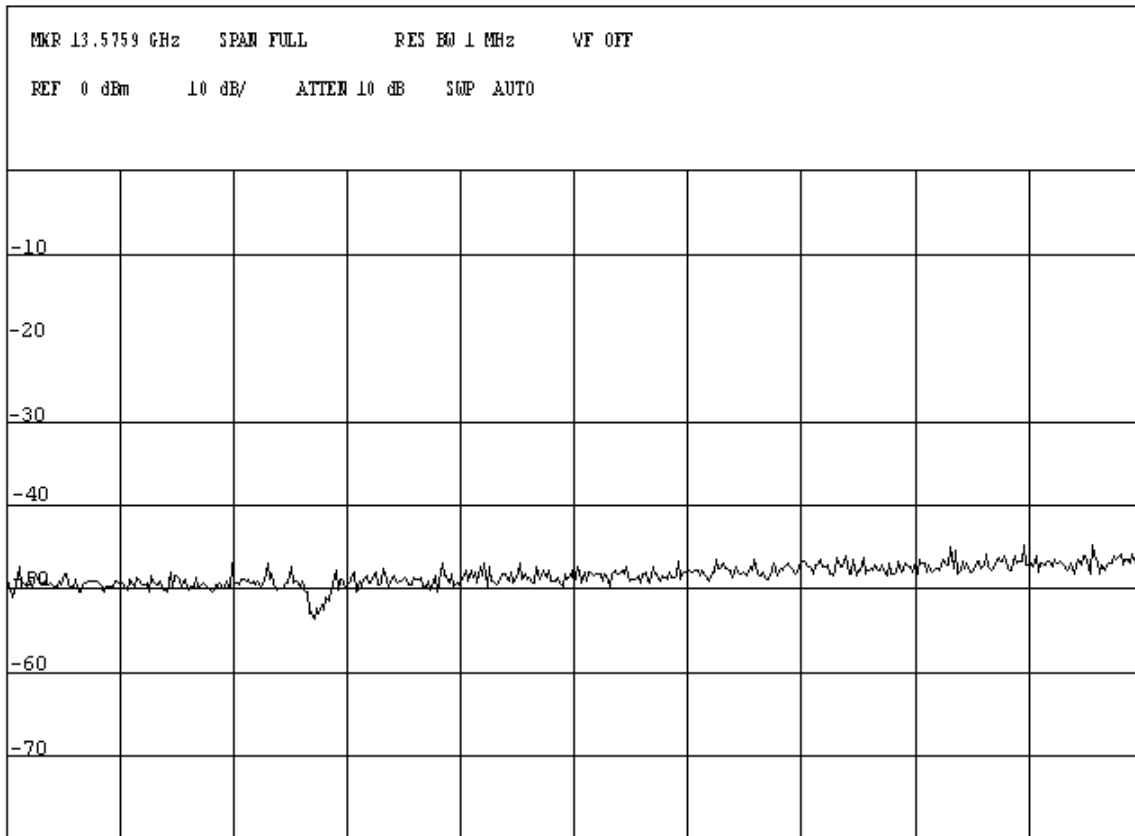
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



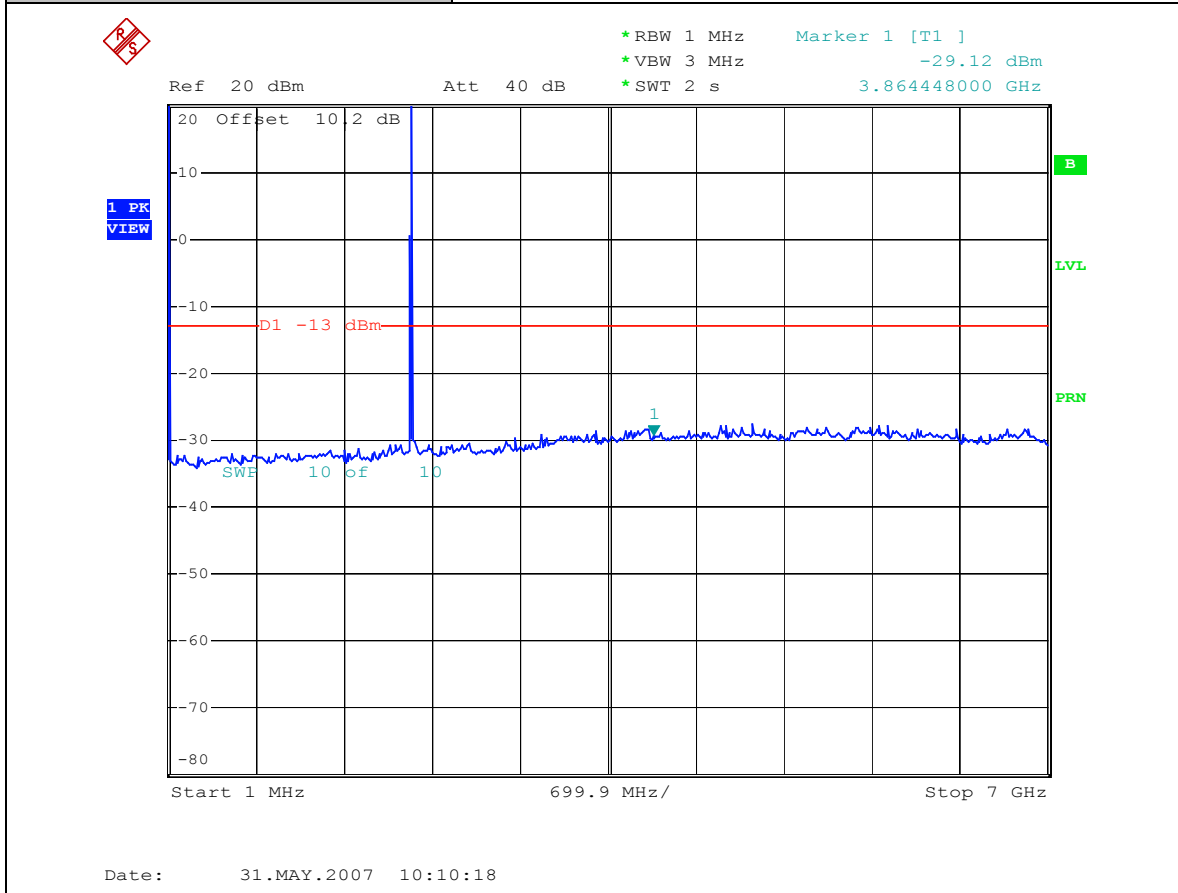
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



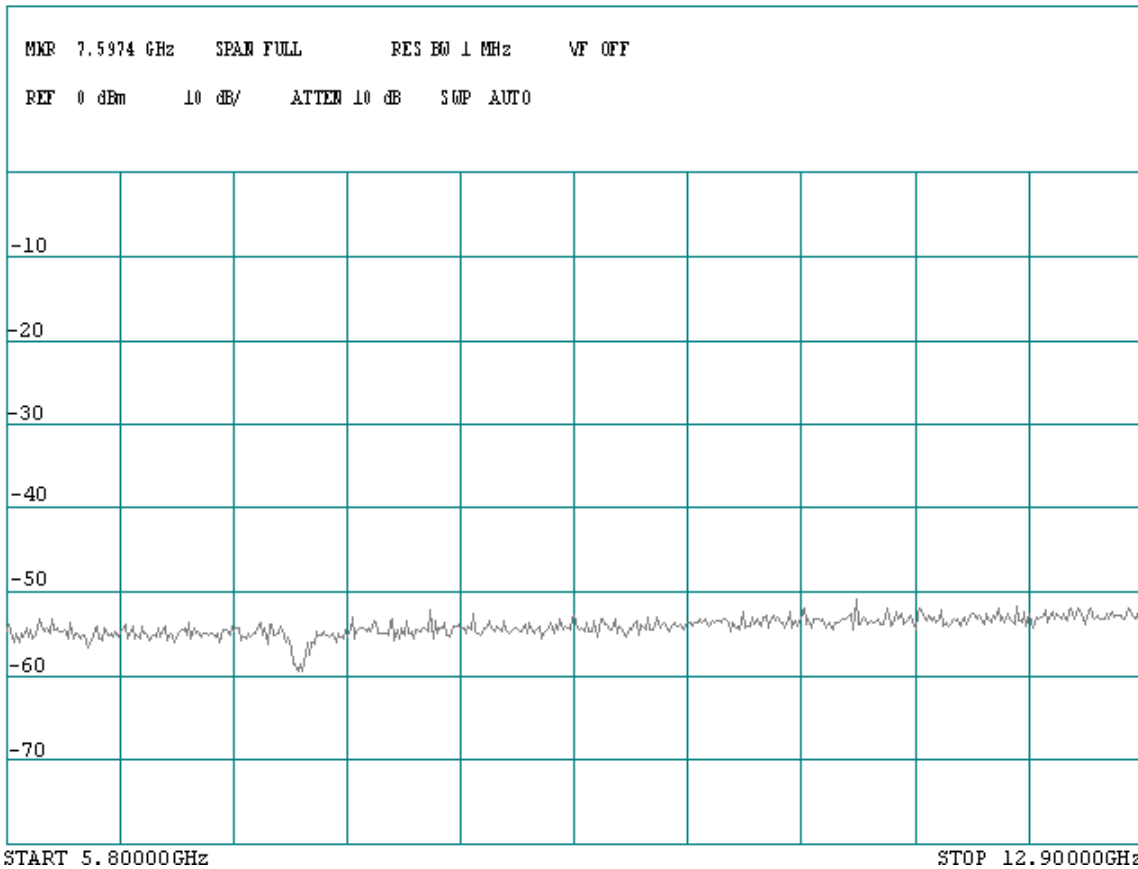
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



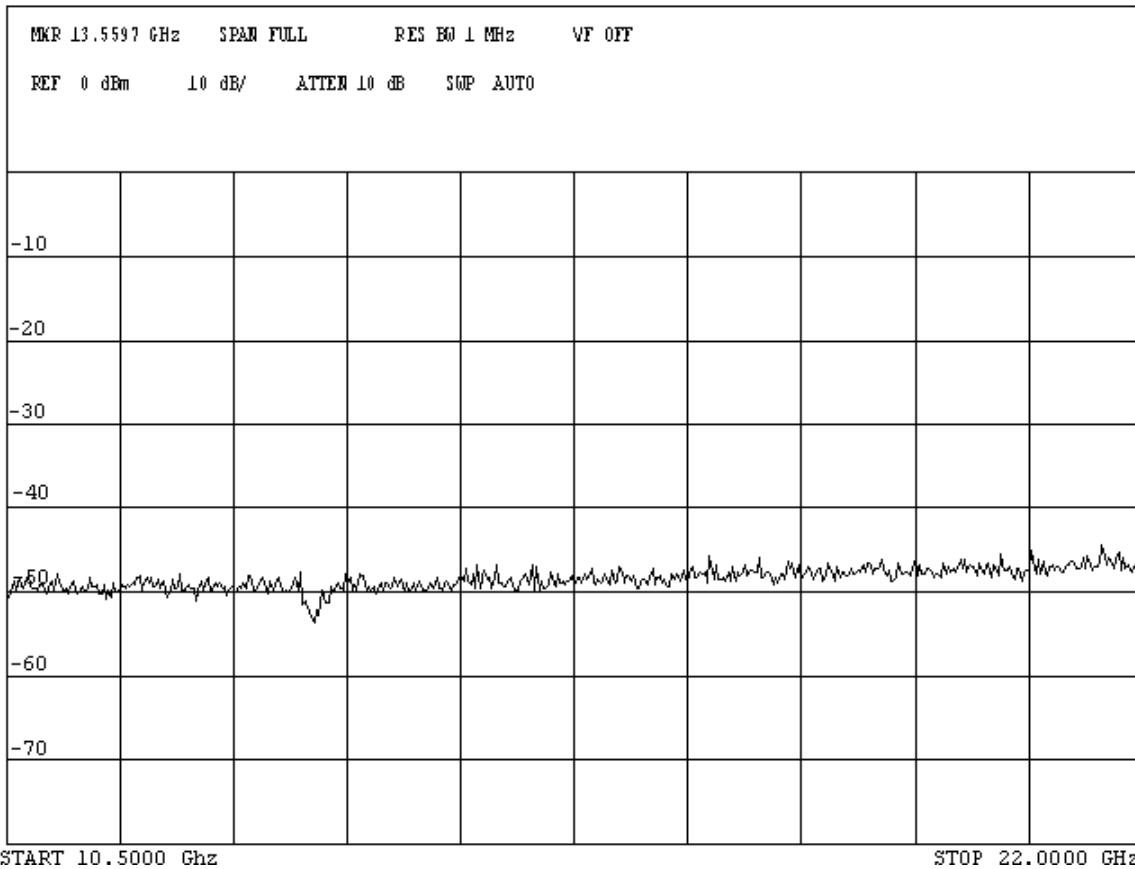
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



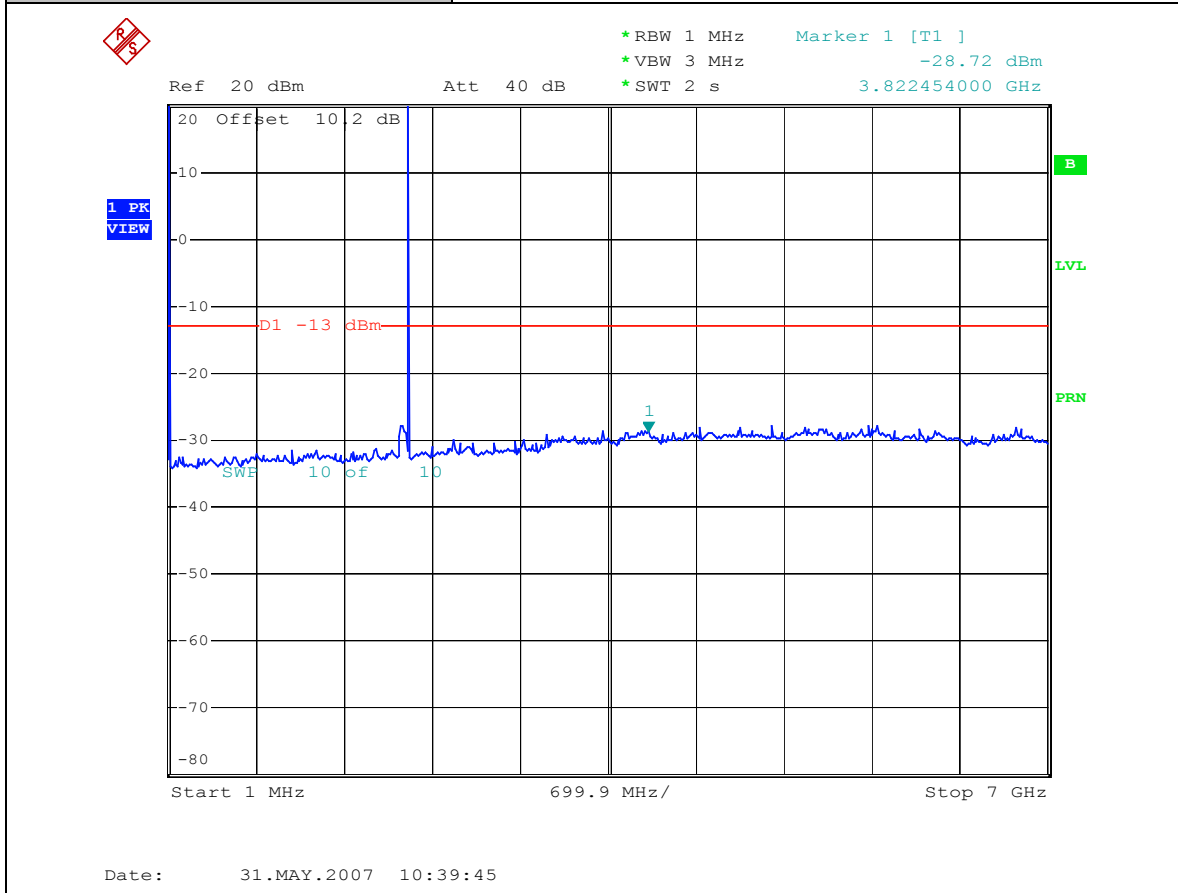
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Wei Li
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / CDMA Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



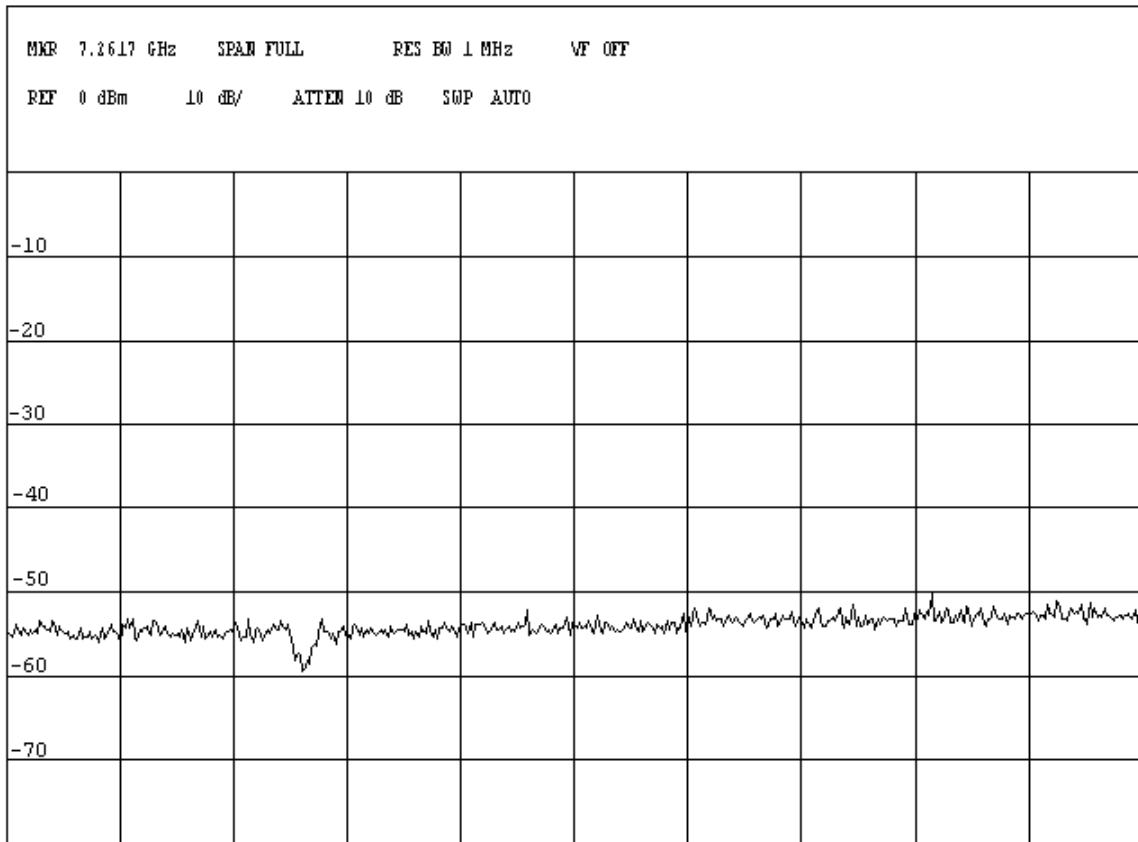
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



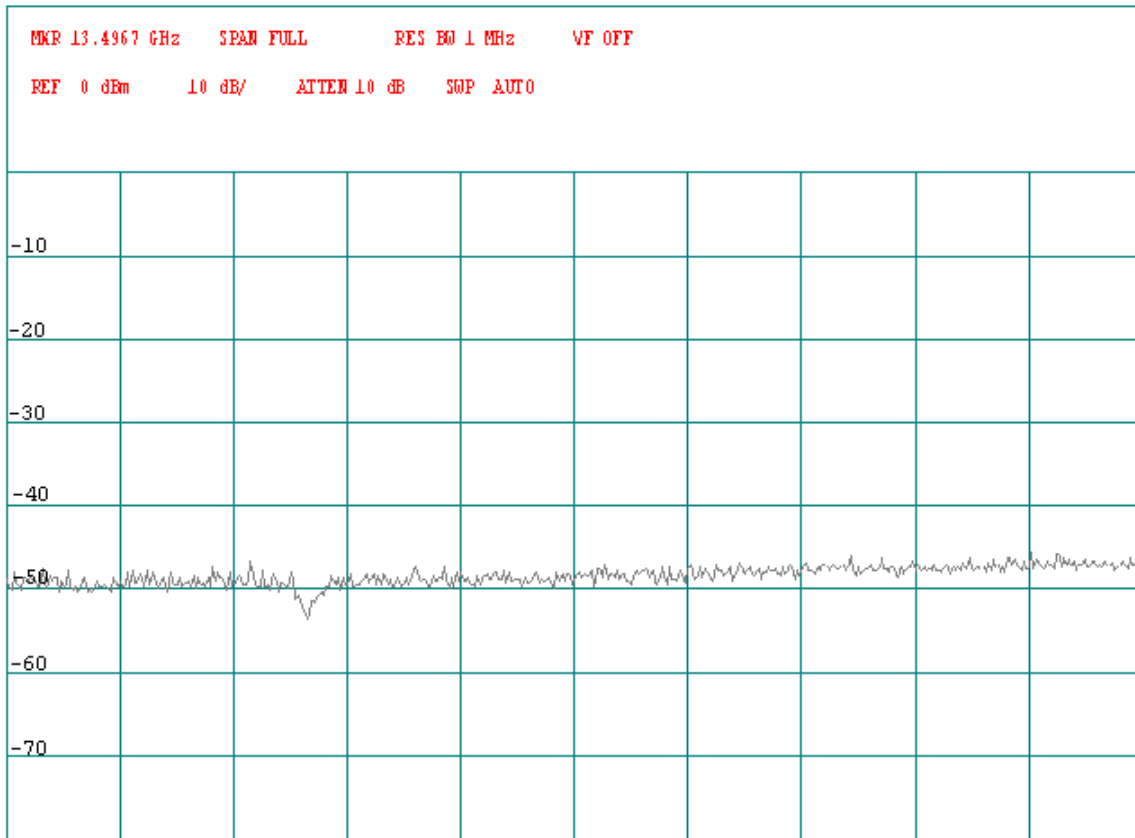
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS

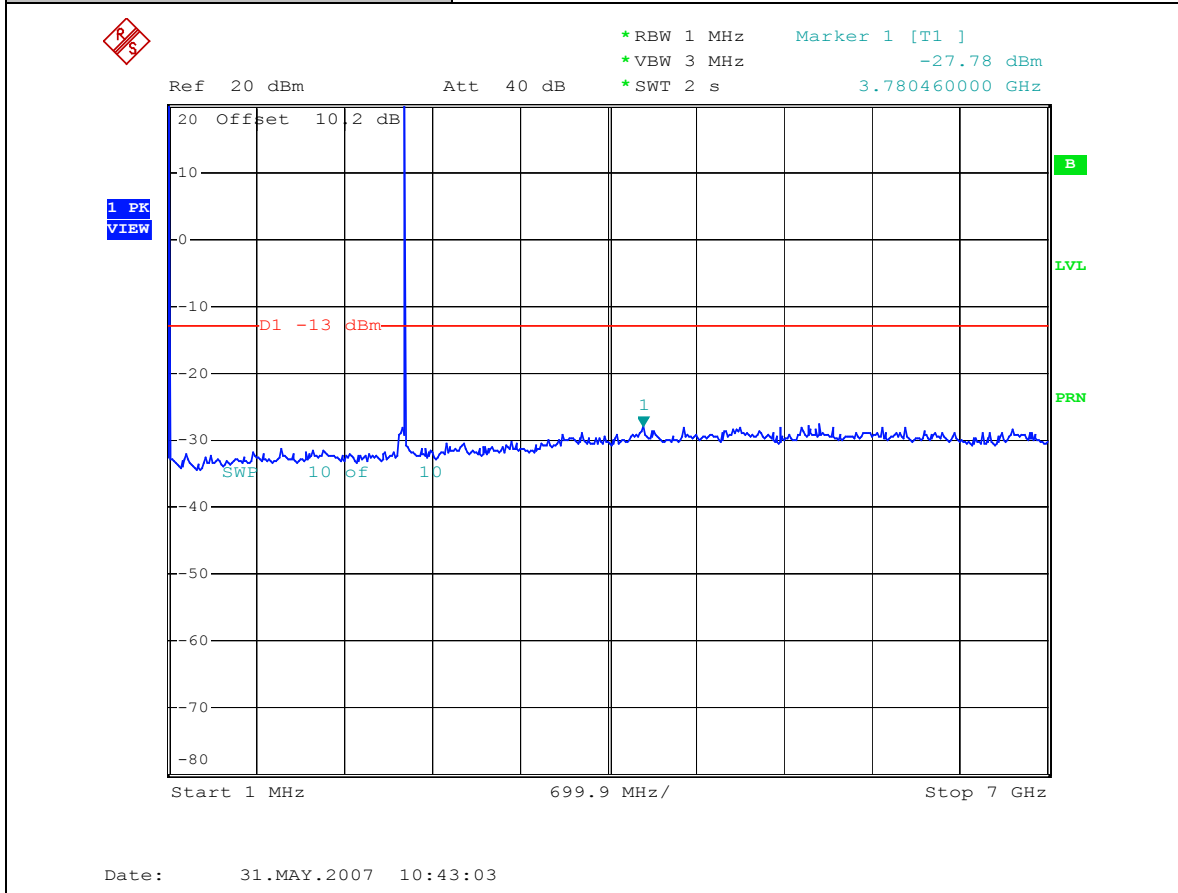


START 10.5000 Ghz

STOP 22.0000 GHz

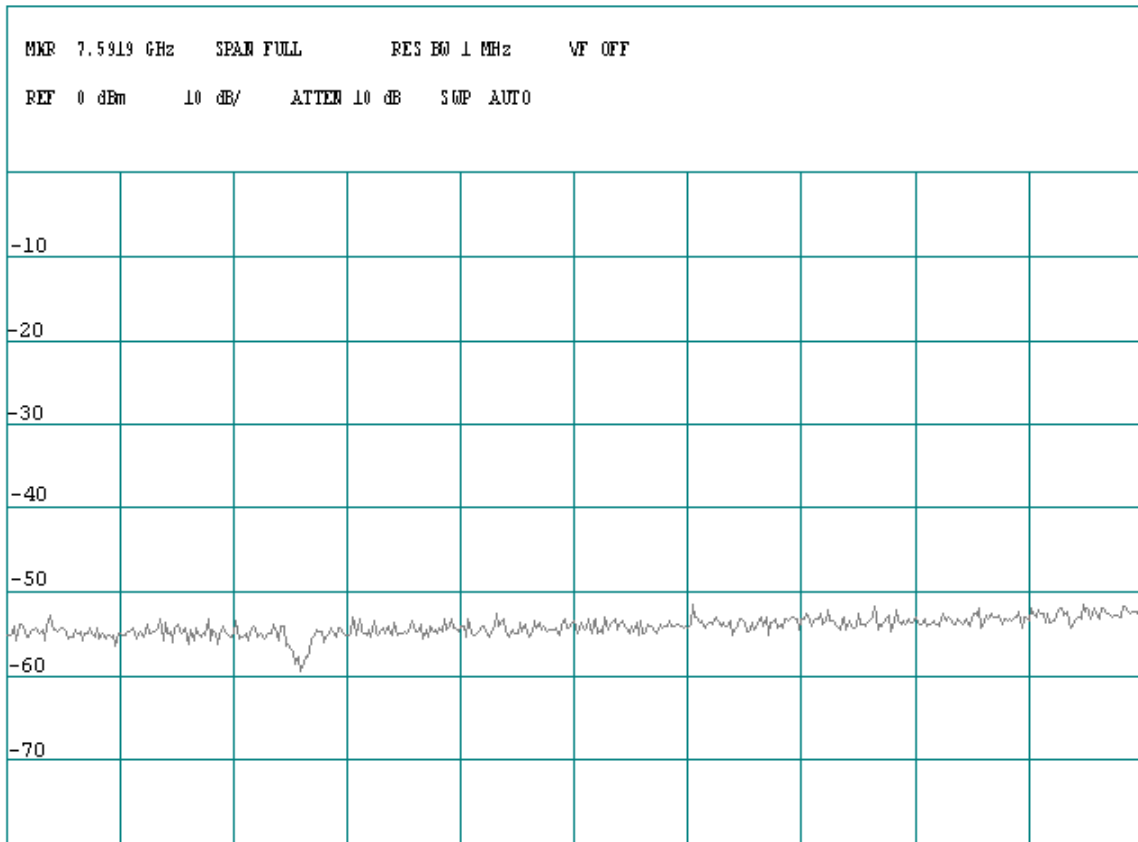
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



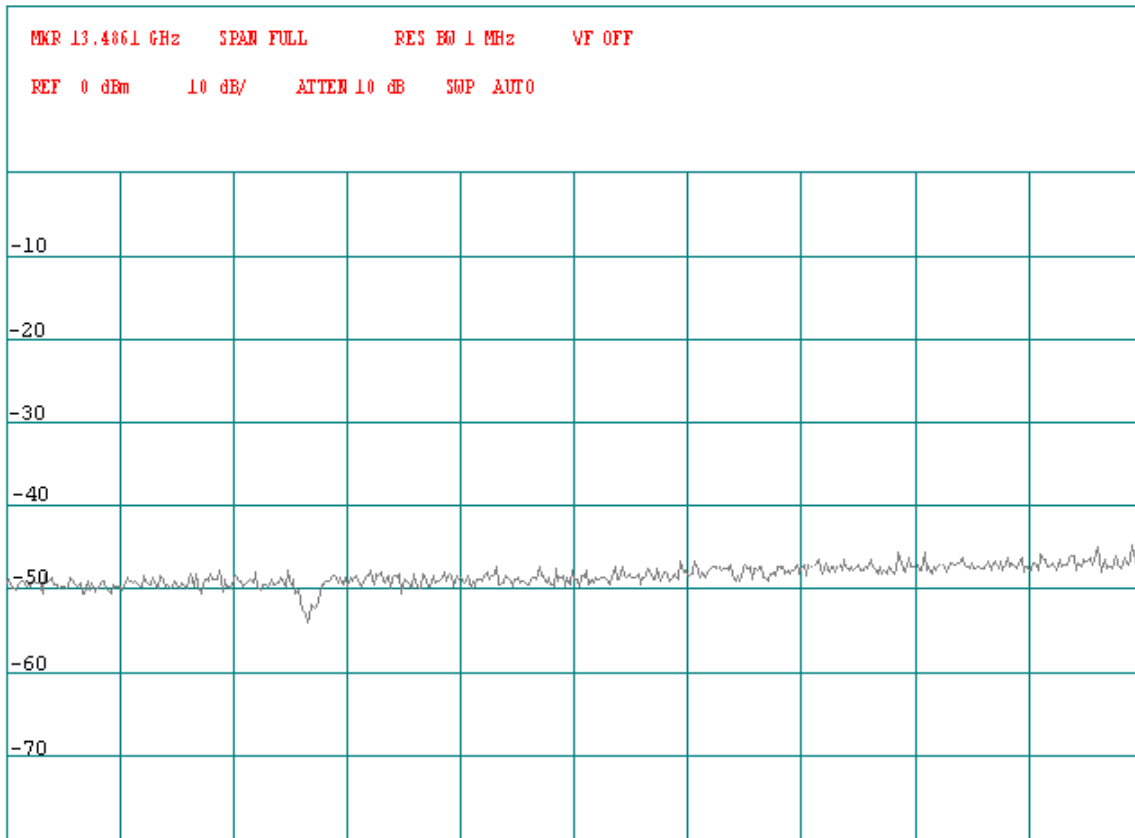
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



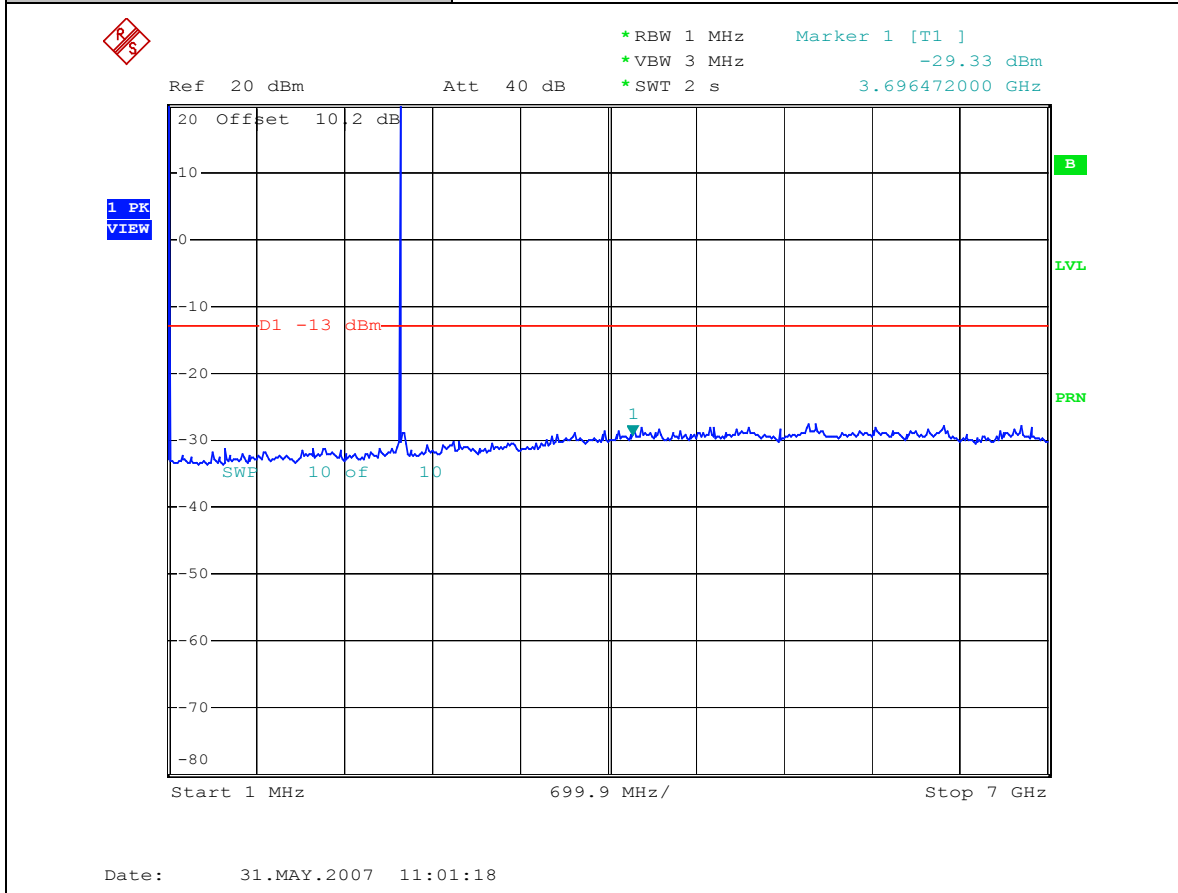
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



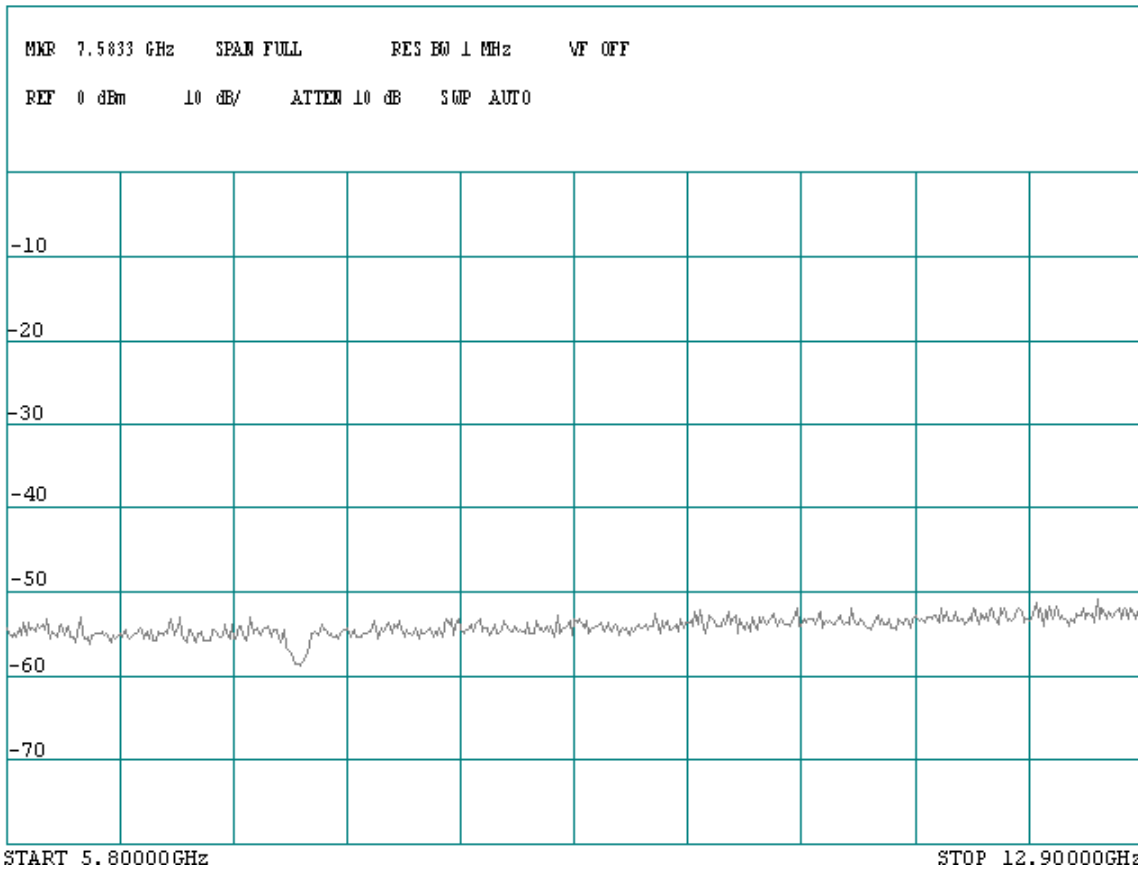
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



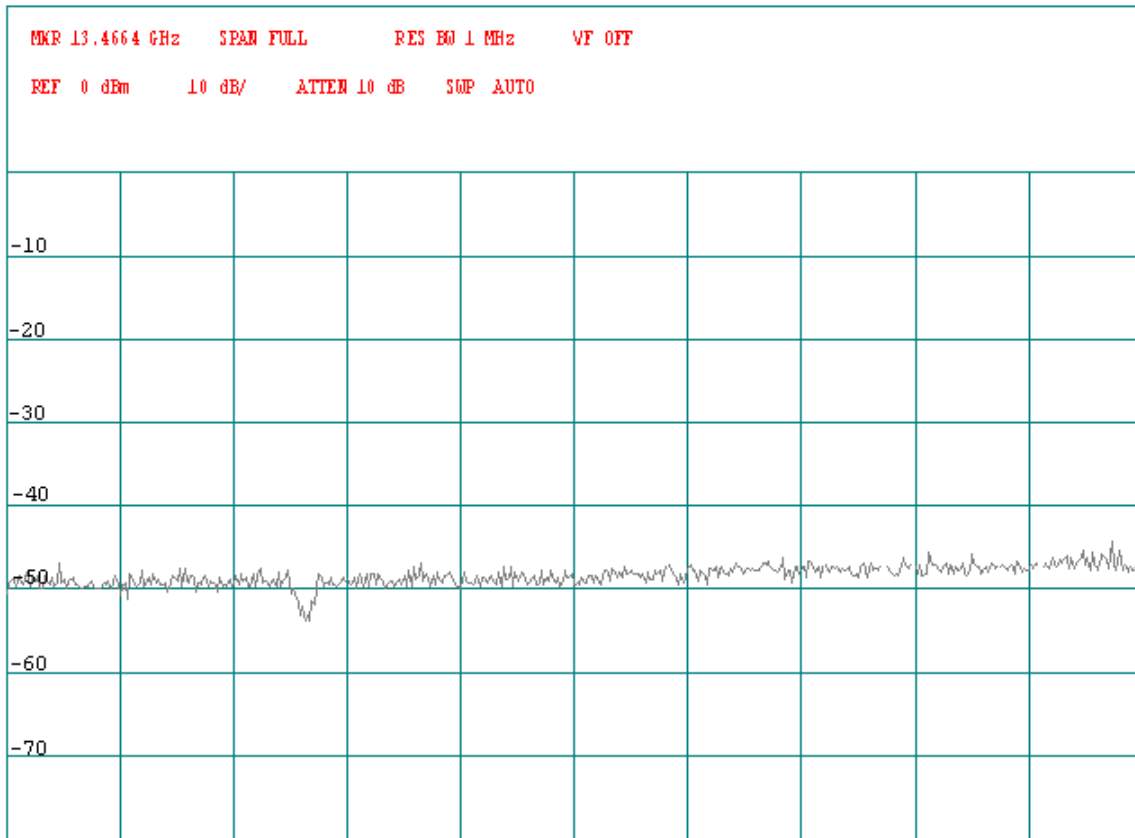
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



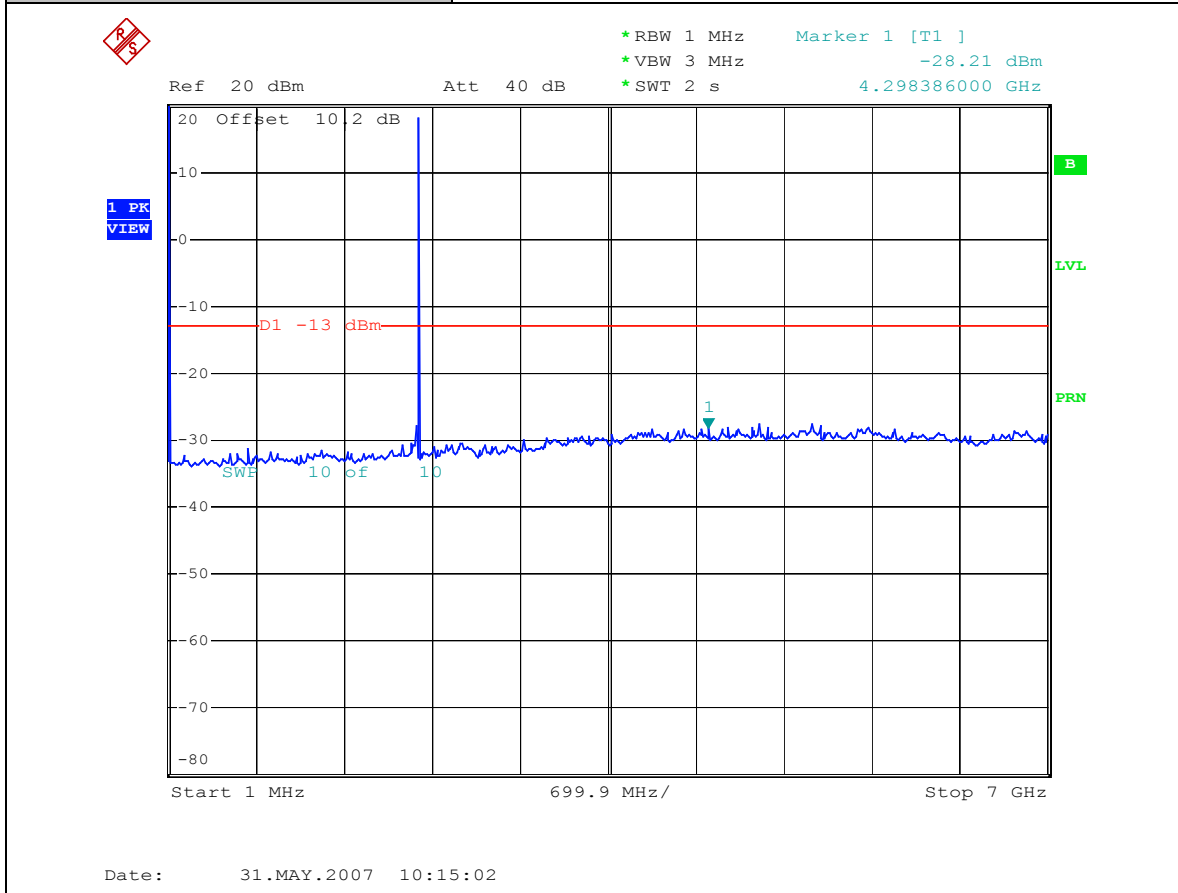
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



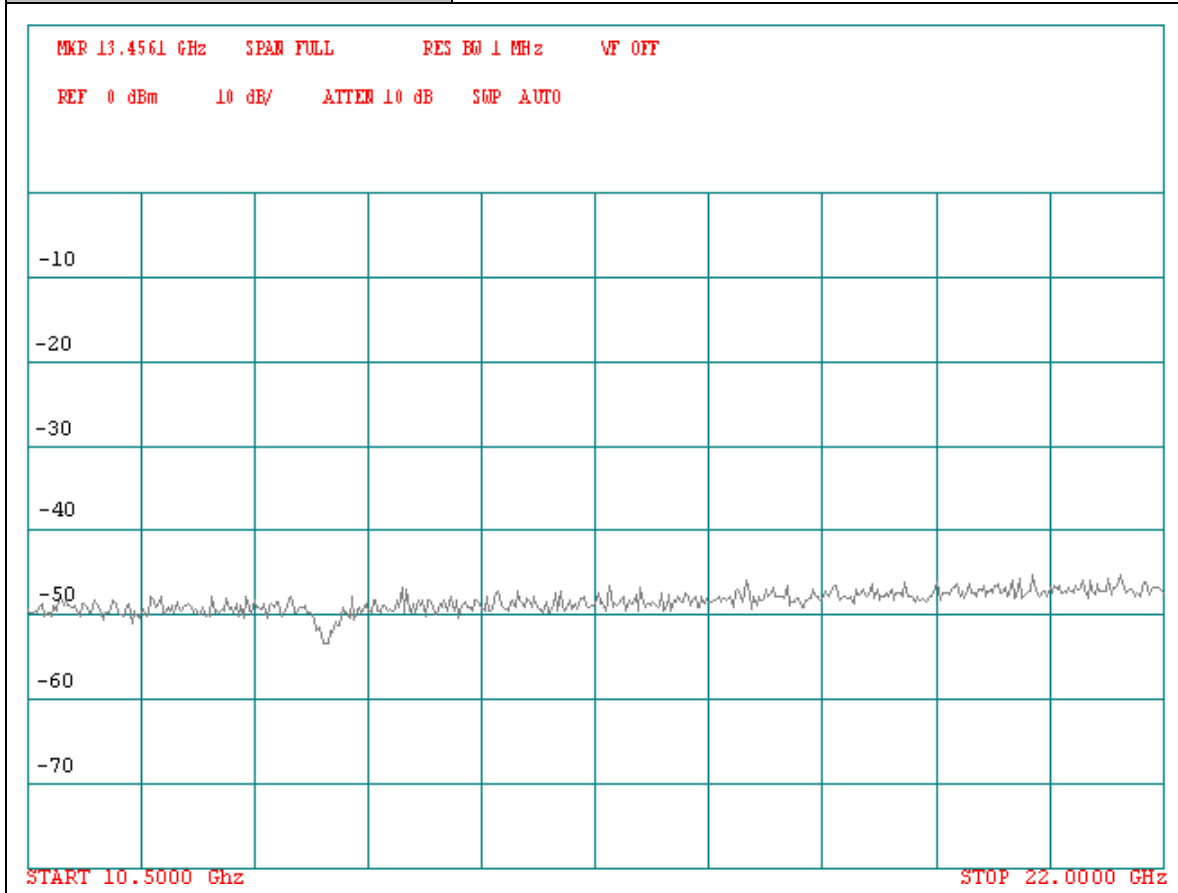
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



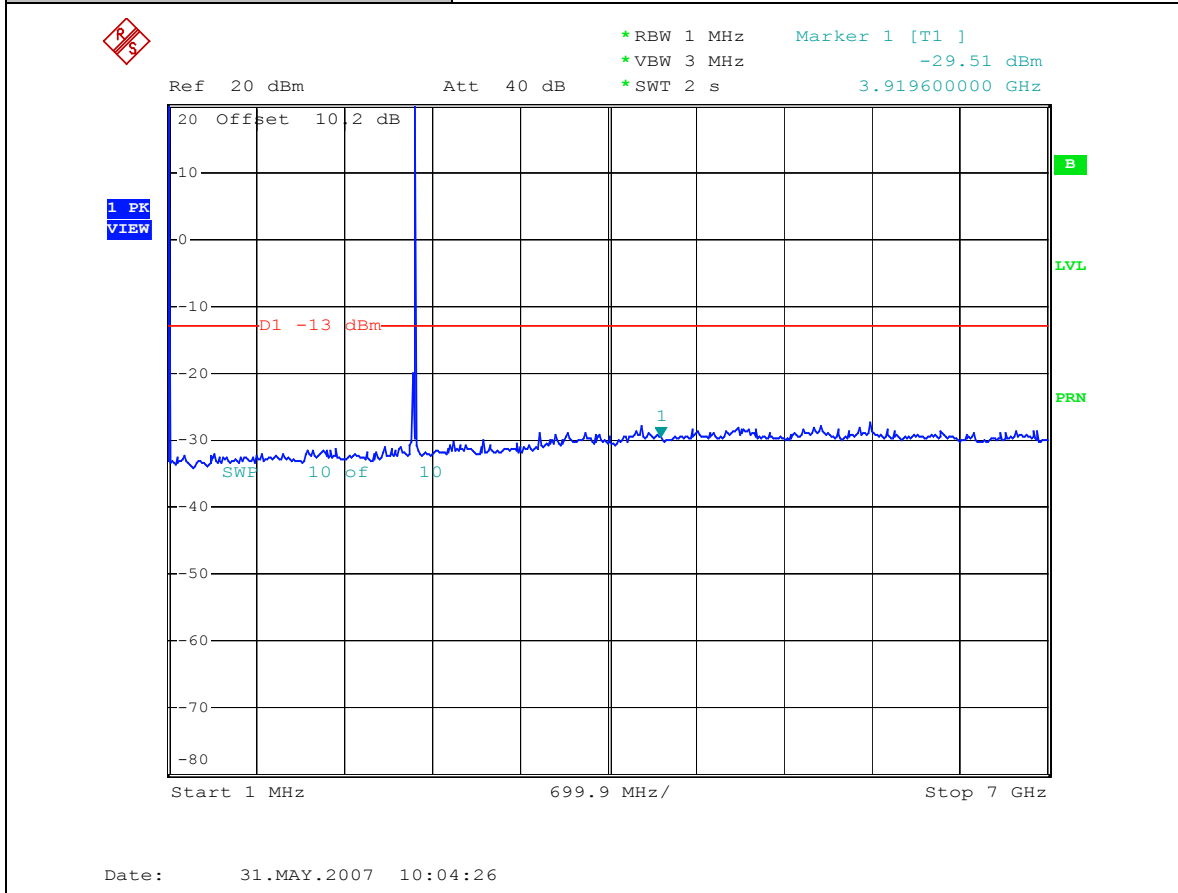
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



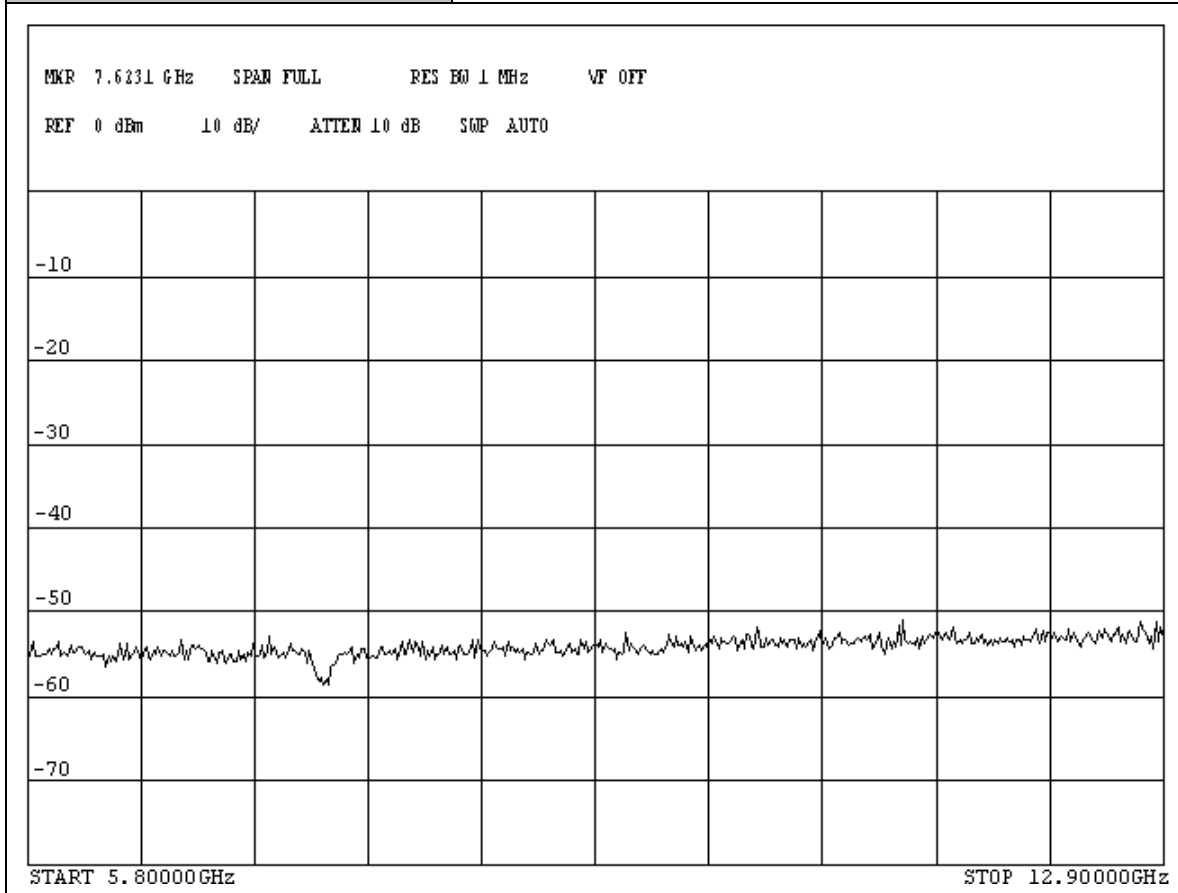
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



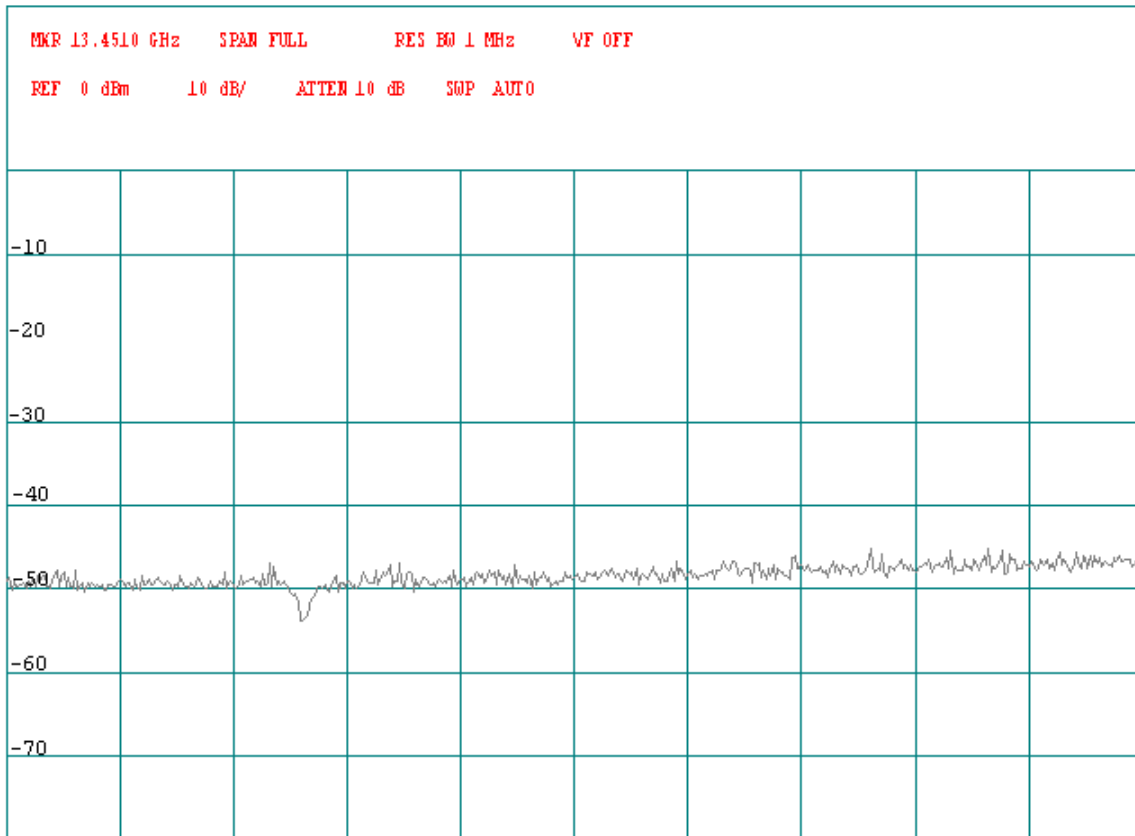
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



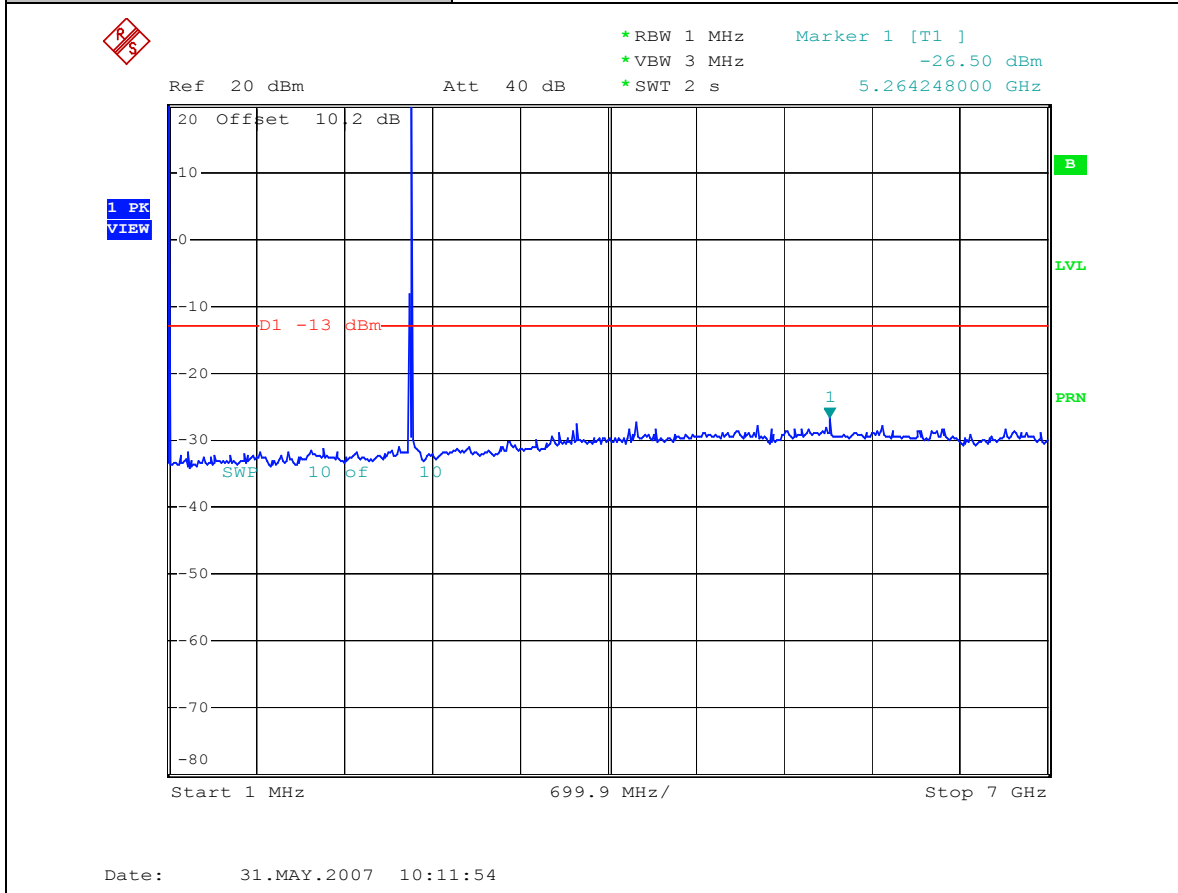
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



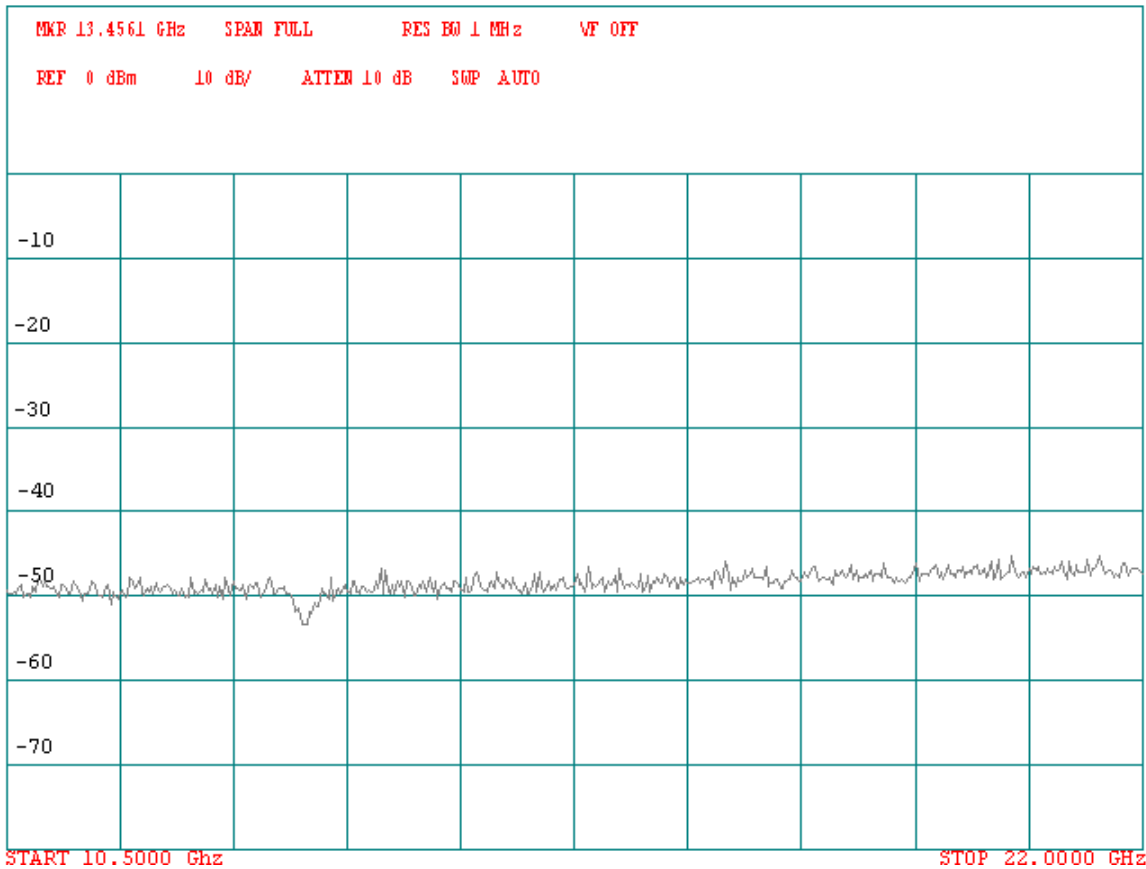
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



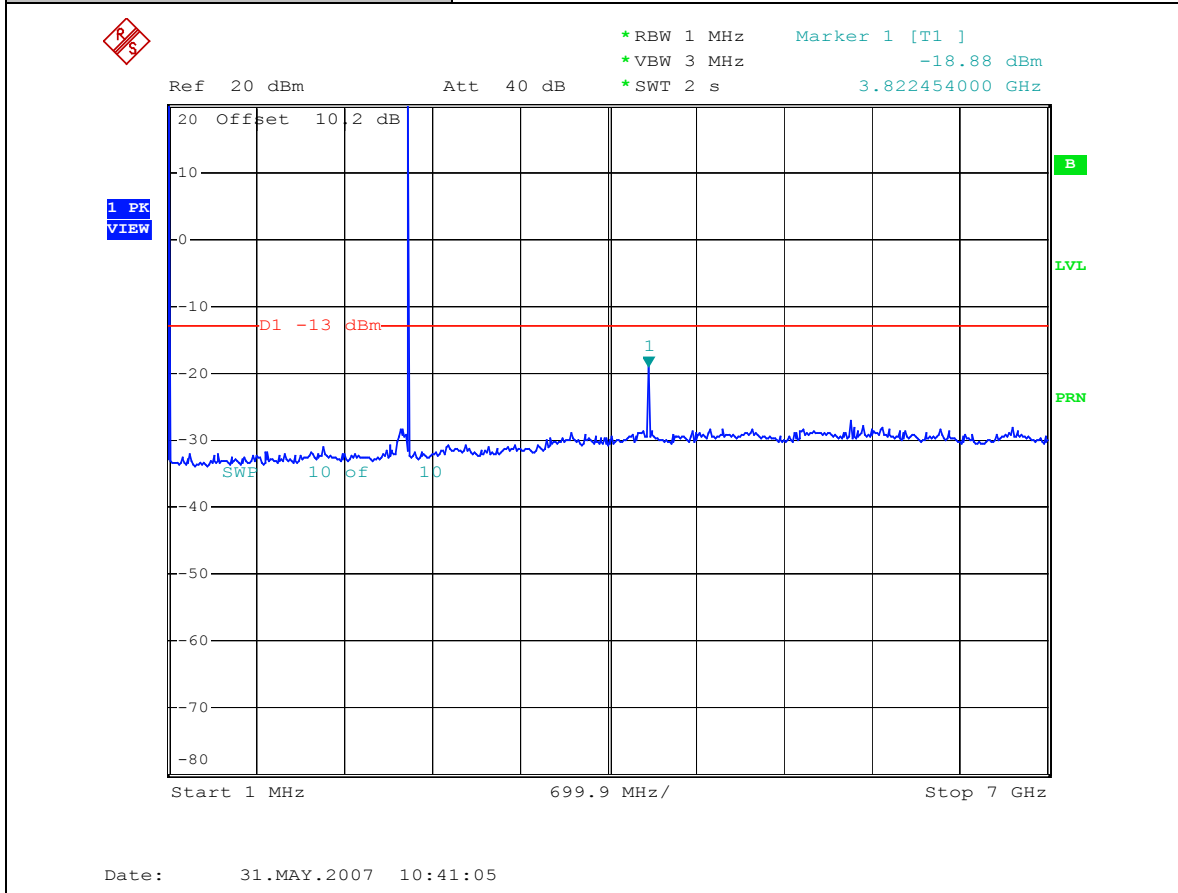
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / GSM Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



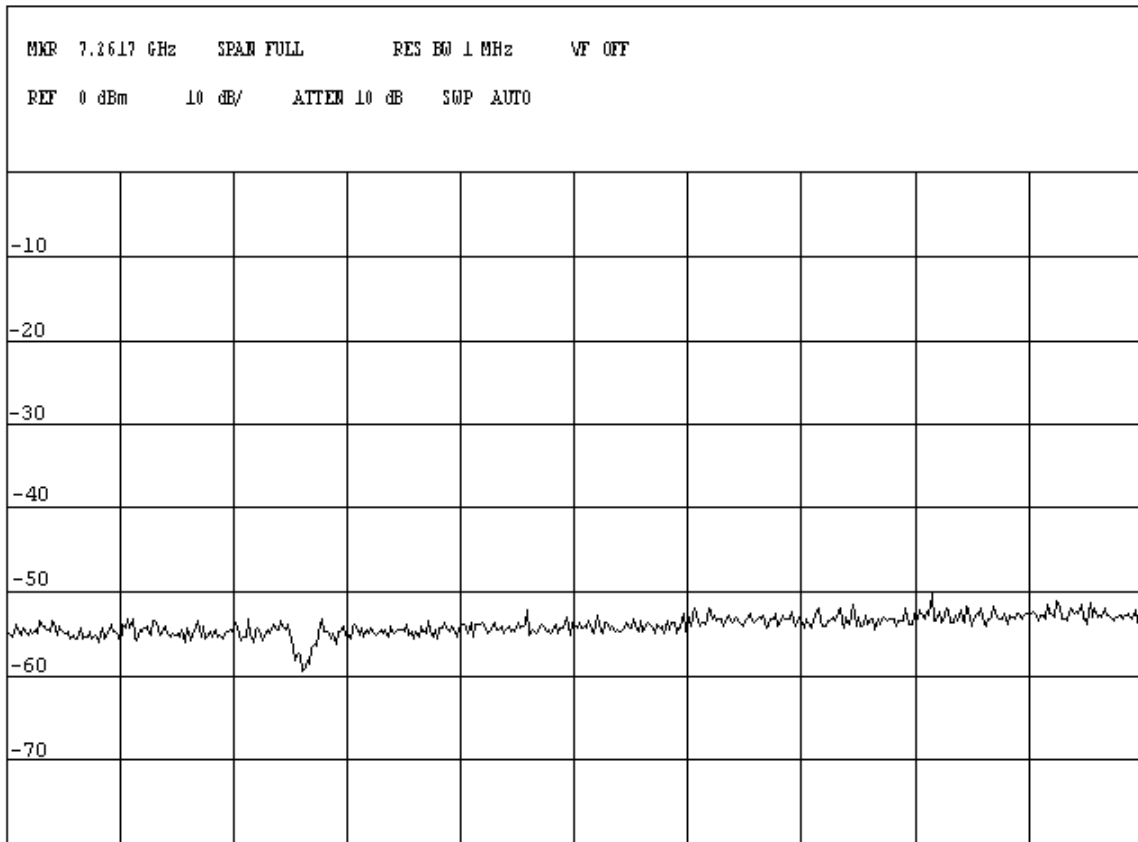
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



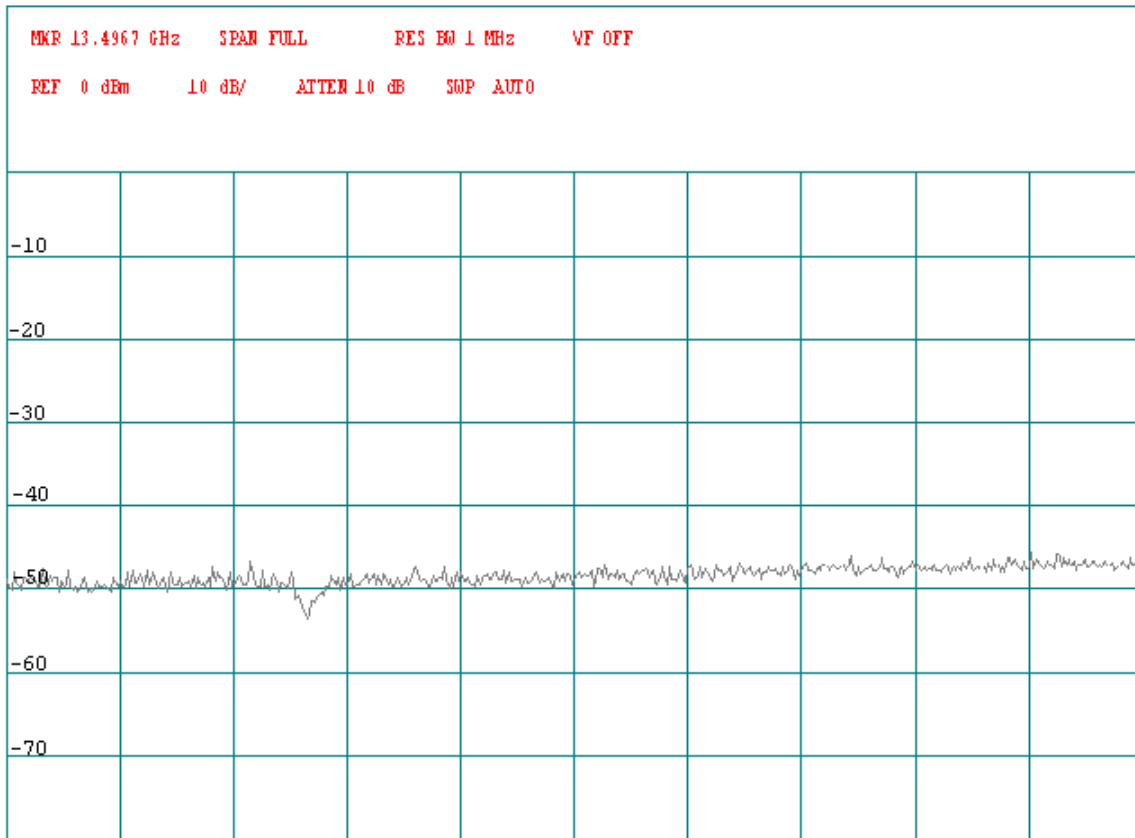
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



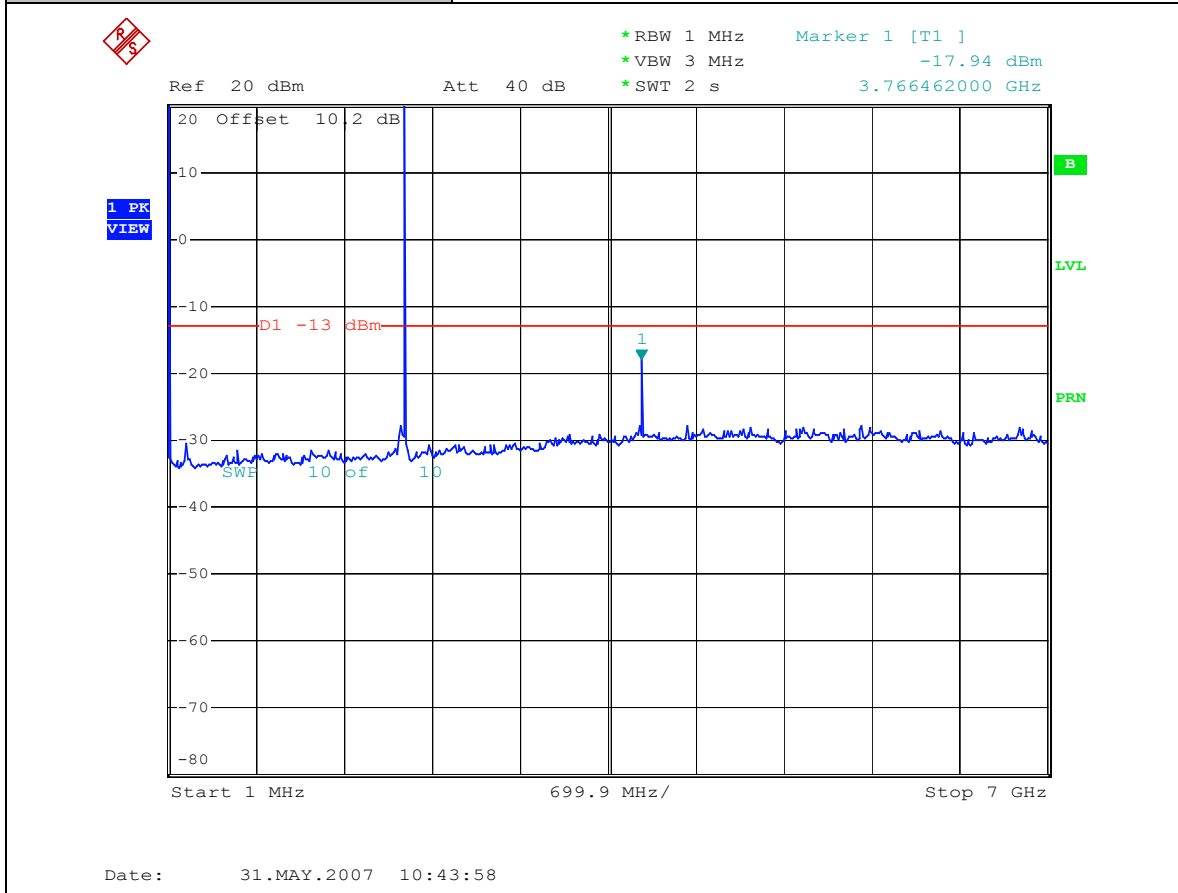
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



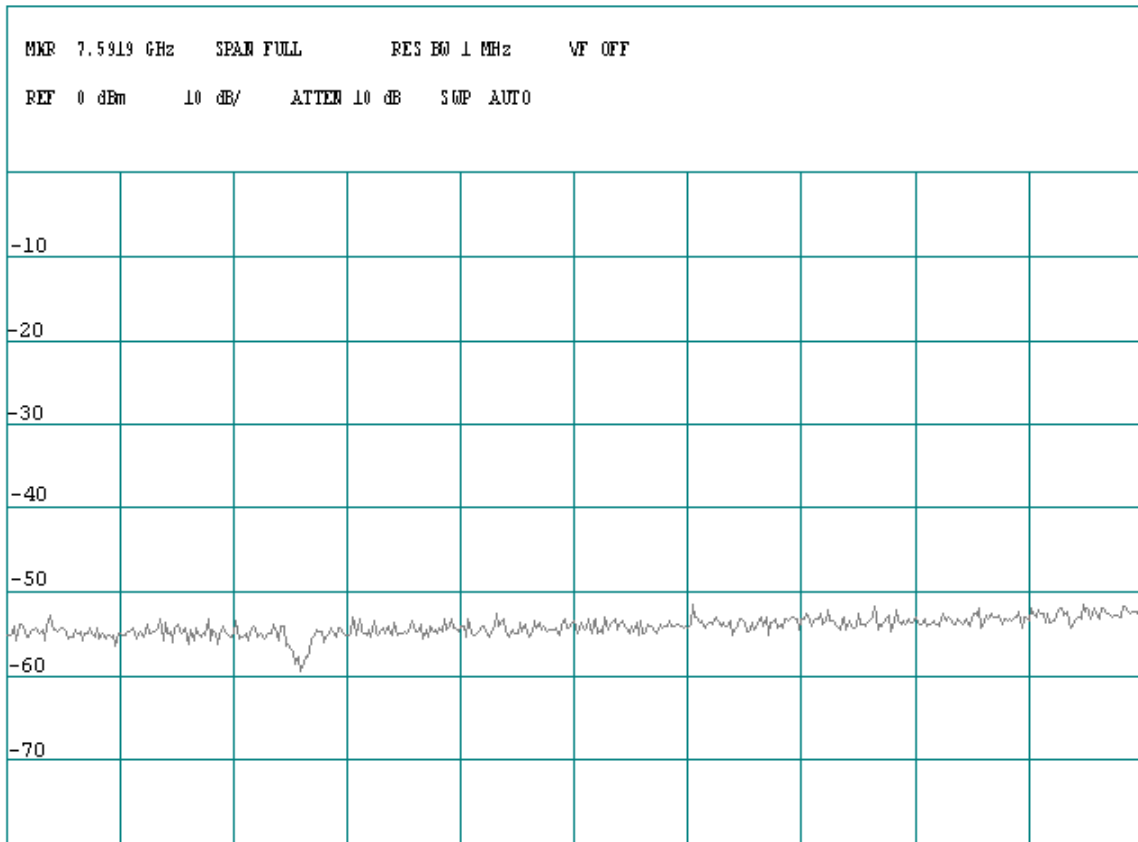
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



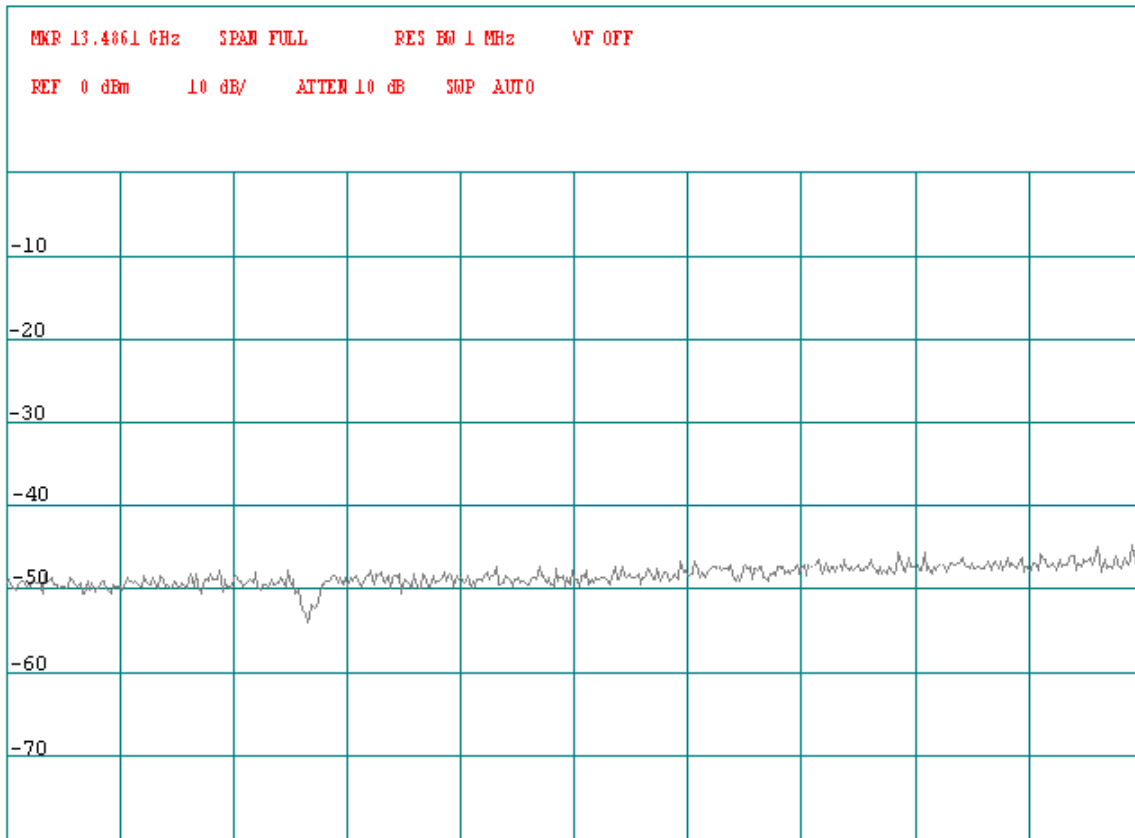
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



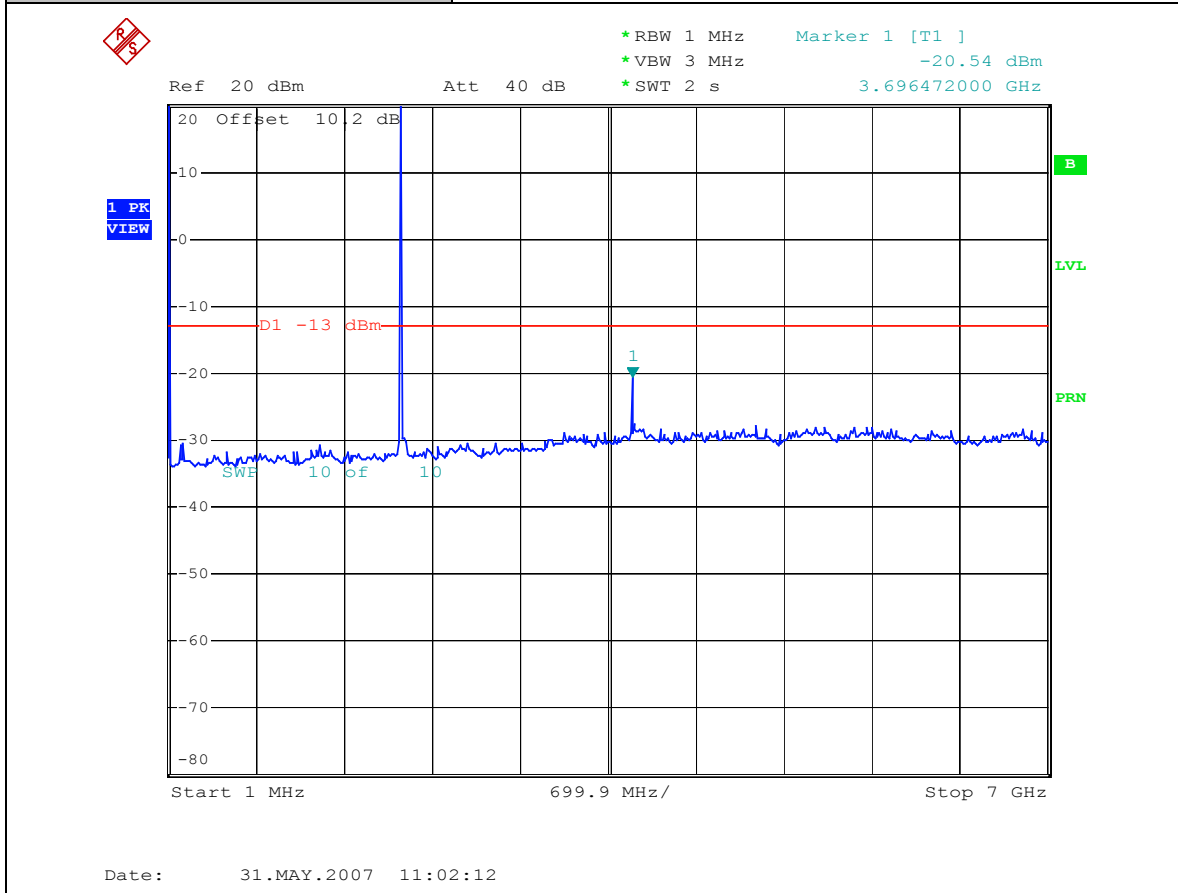
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



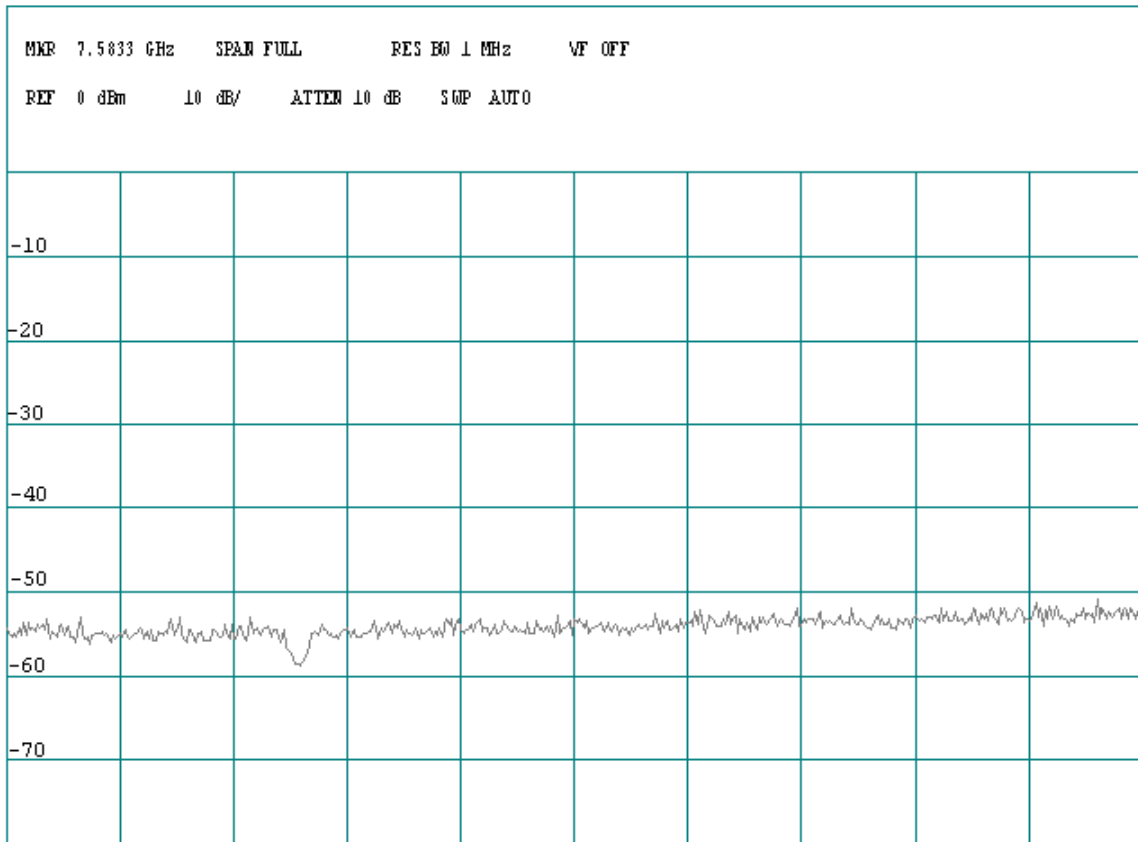
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



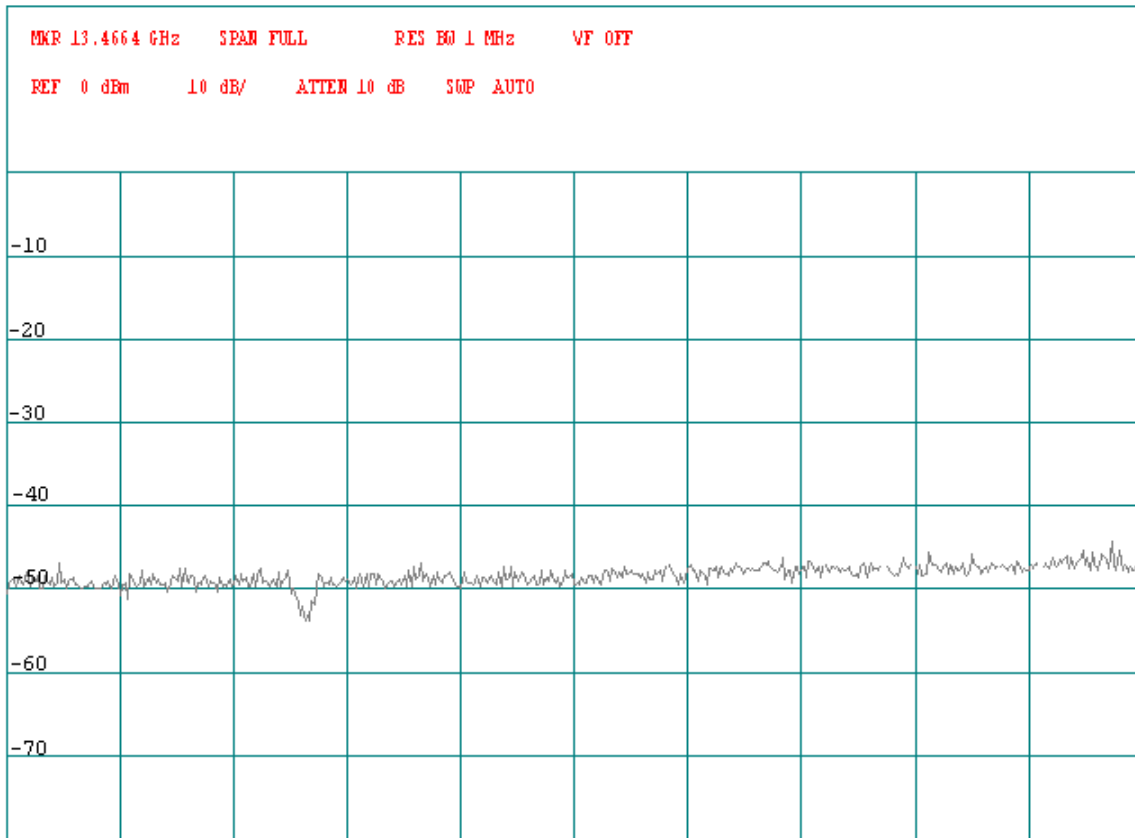
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



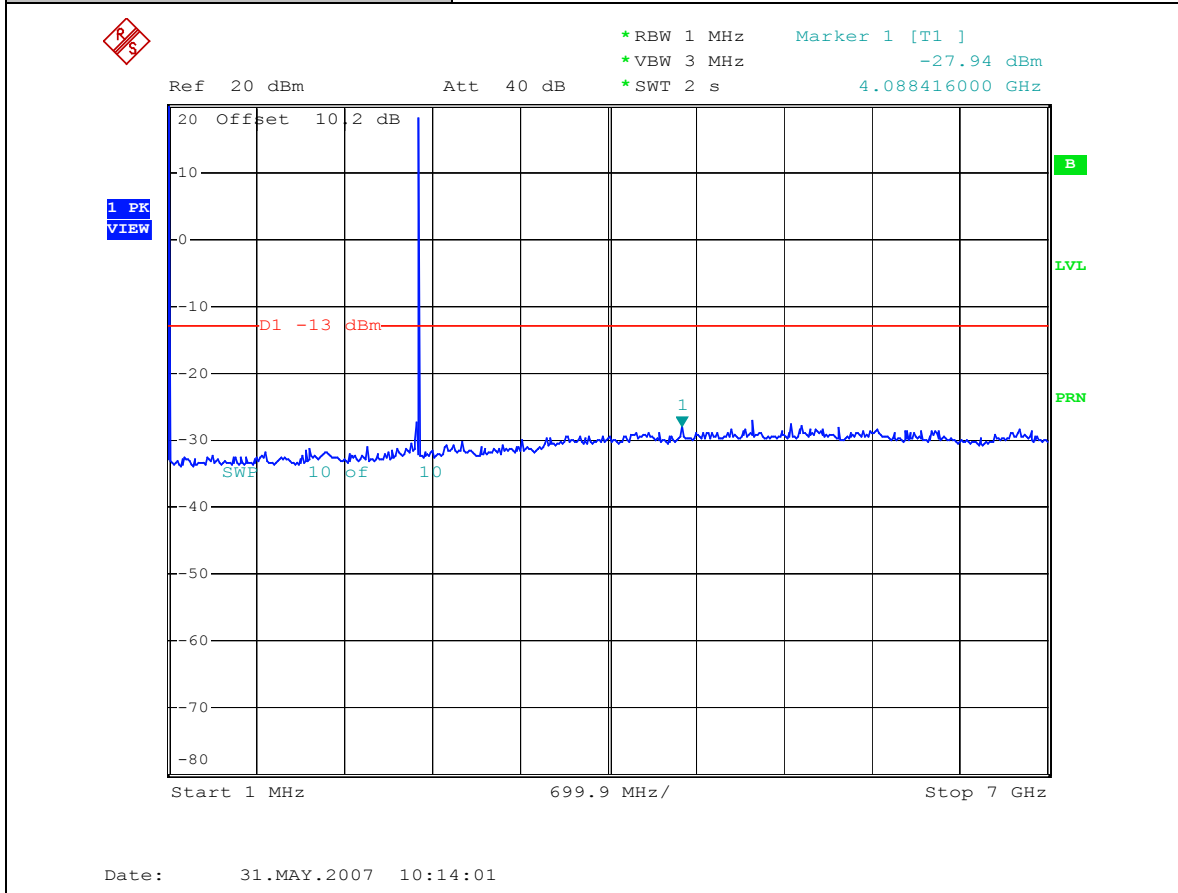
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Uplink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT BTS



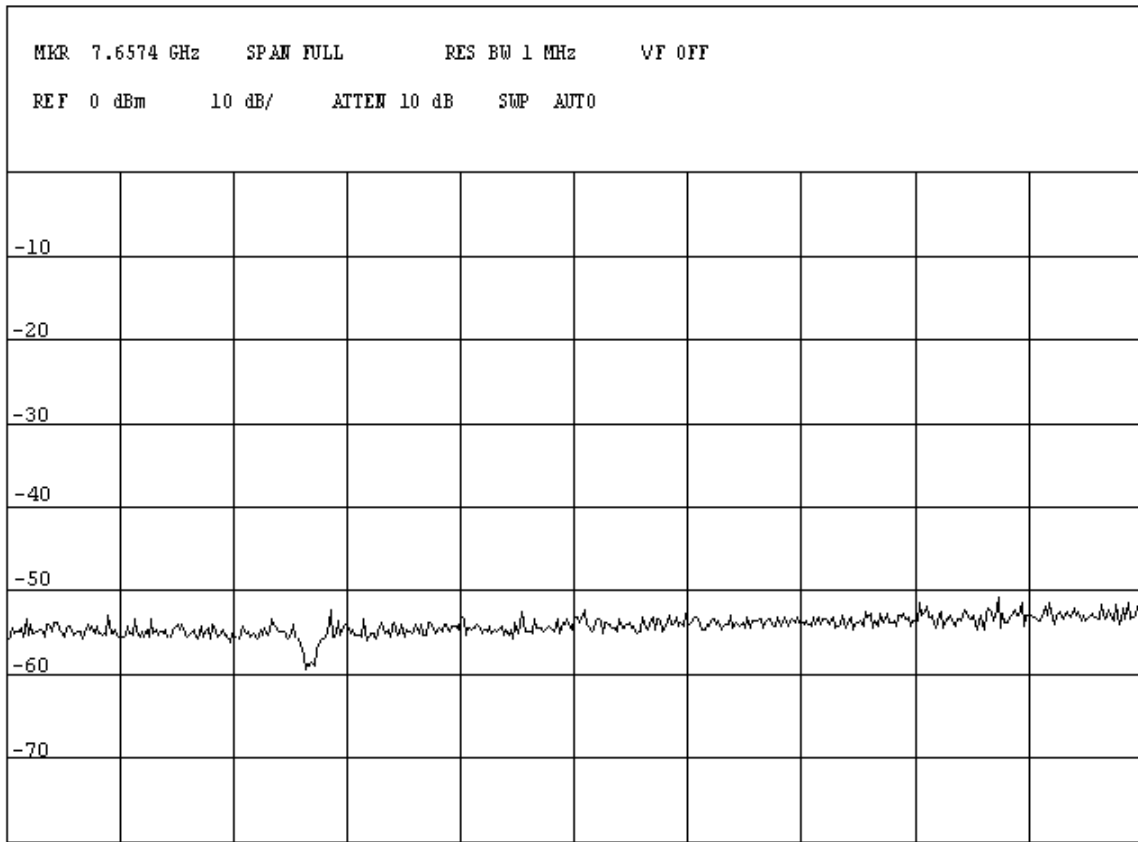
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



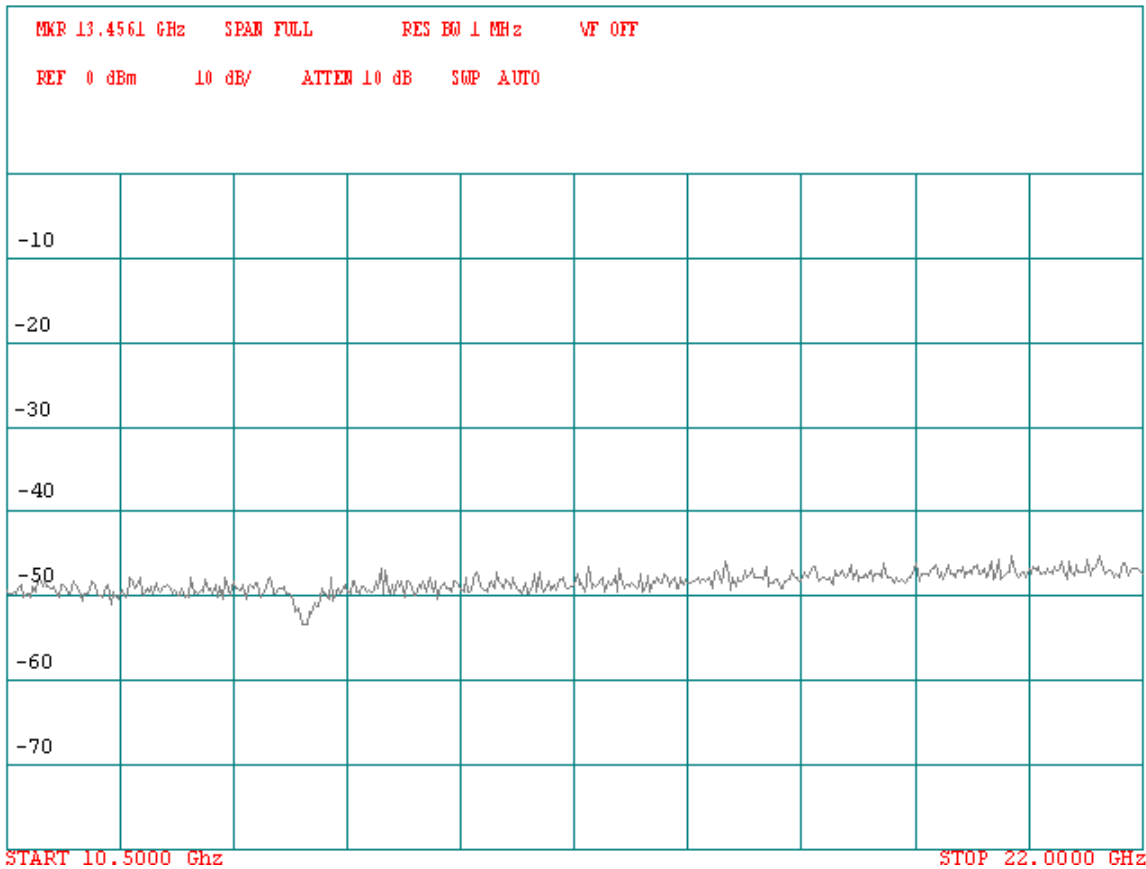
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



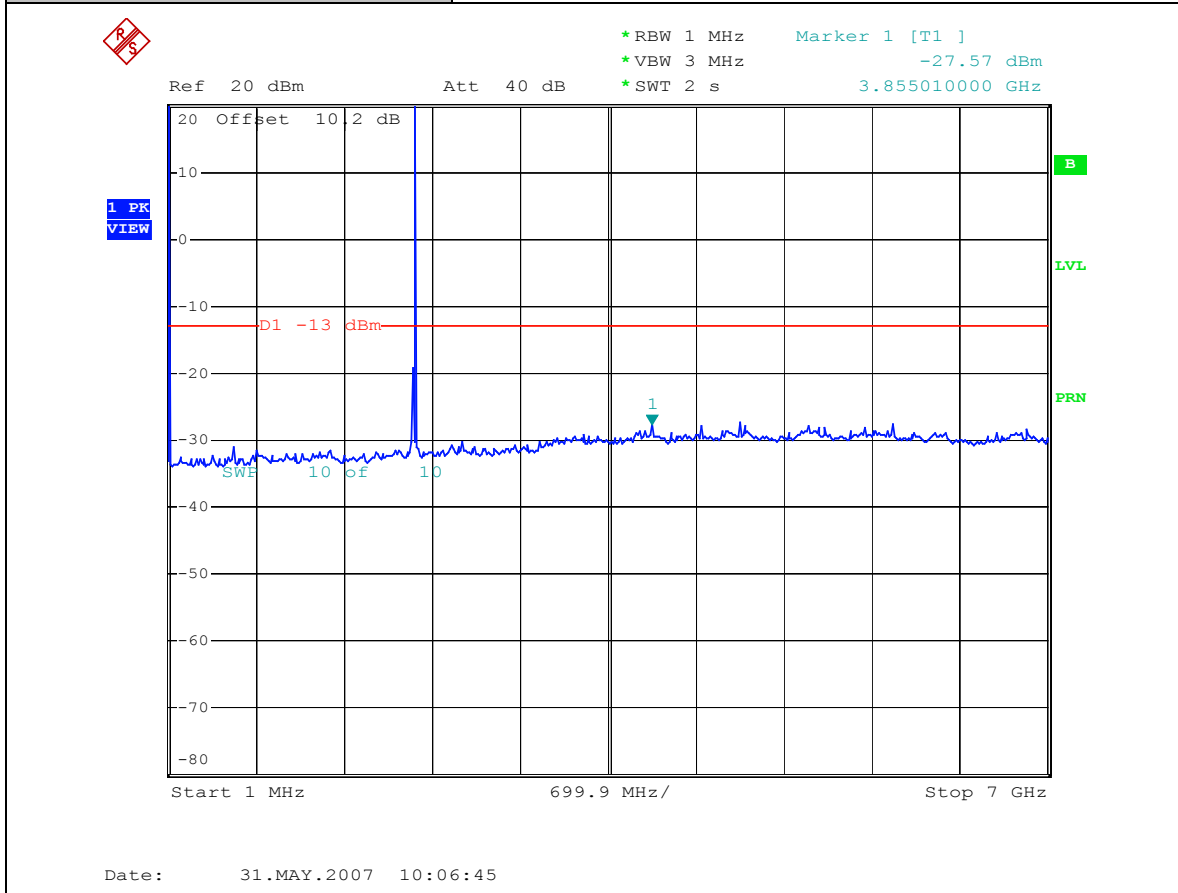
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Hi-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



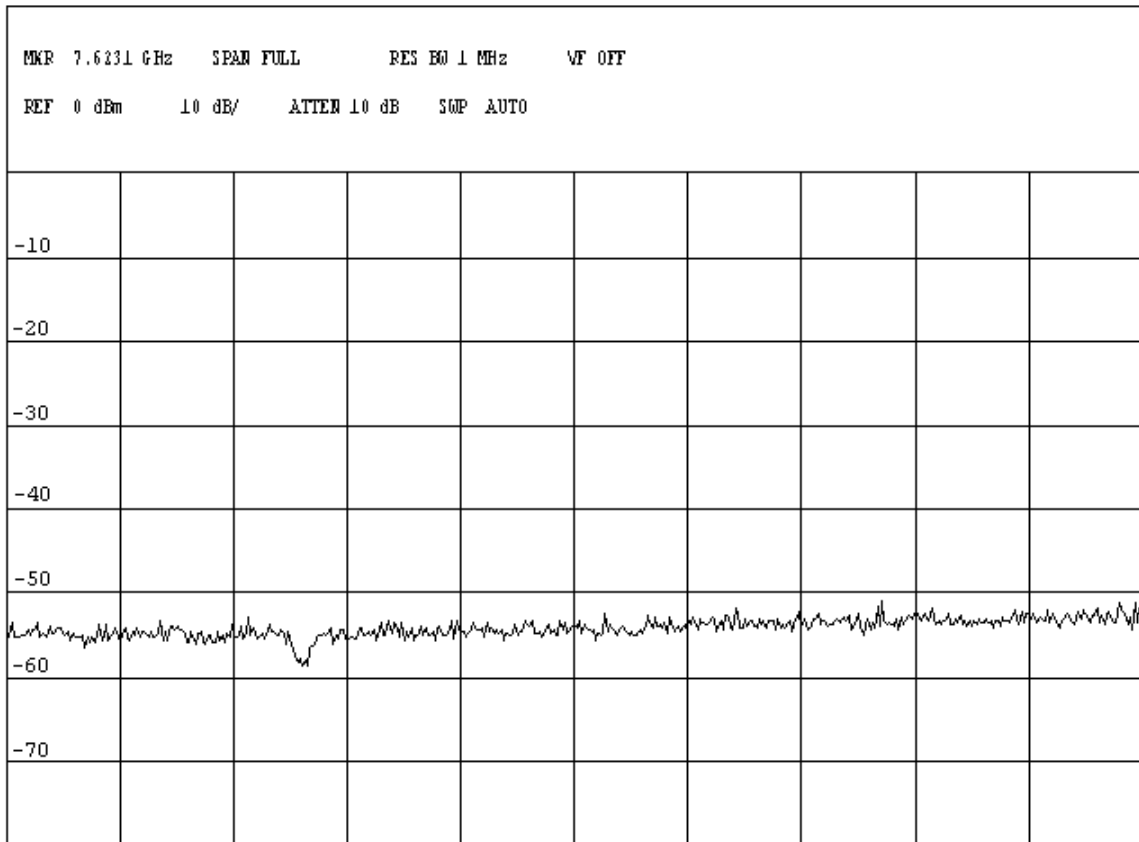
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



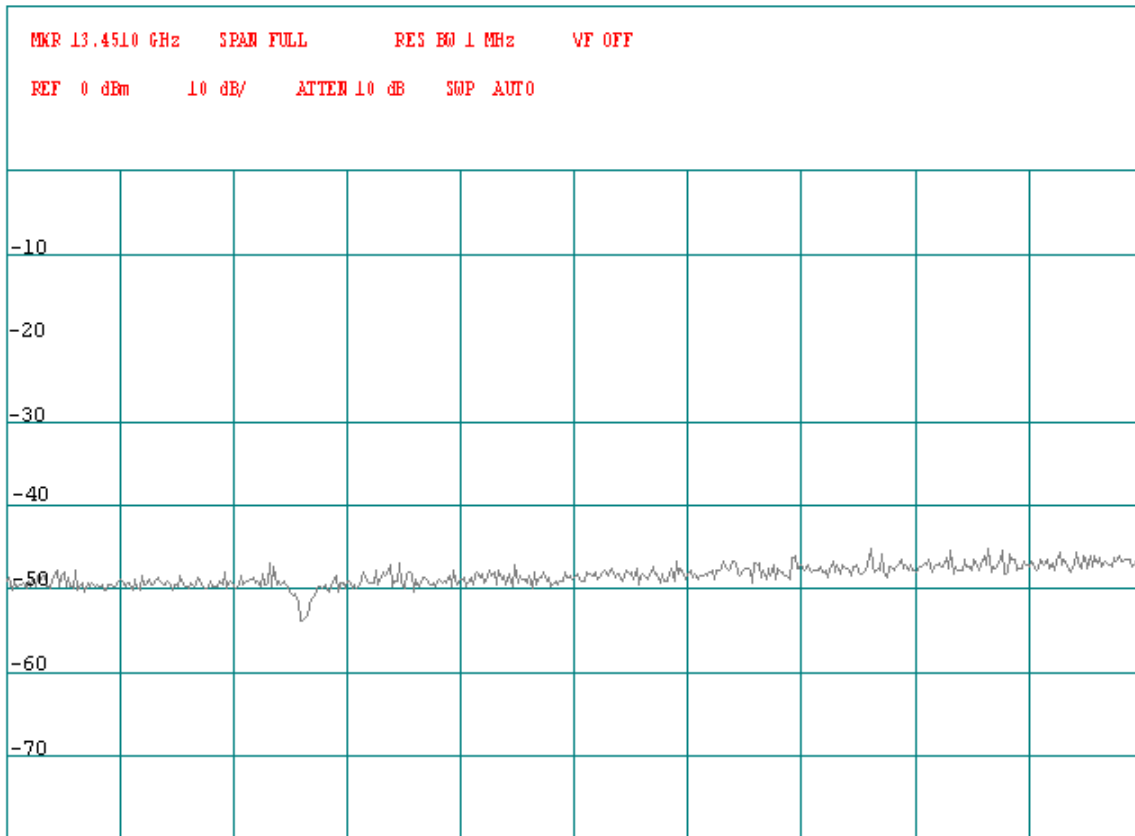
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



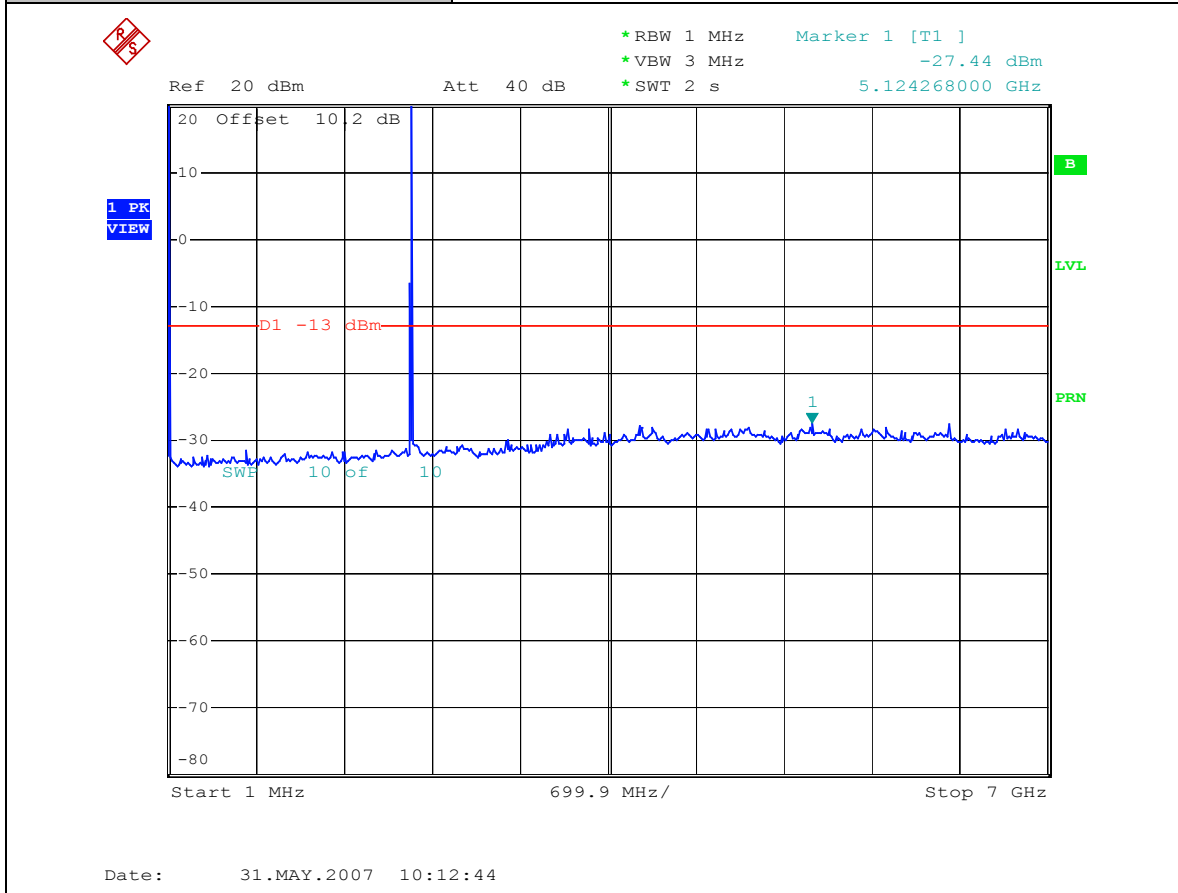
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Mid-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



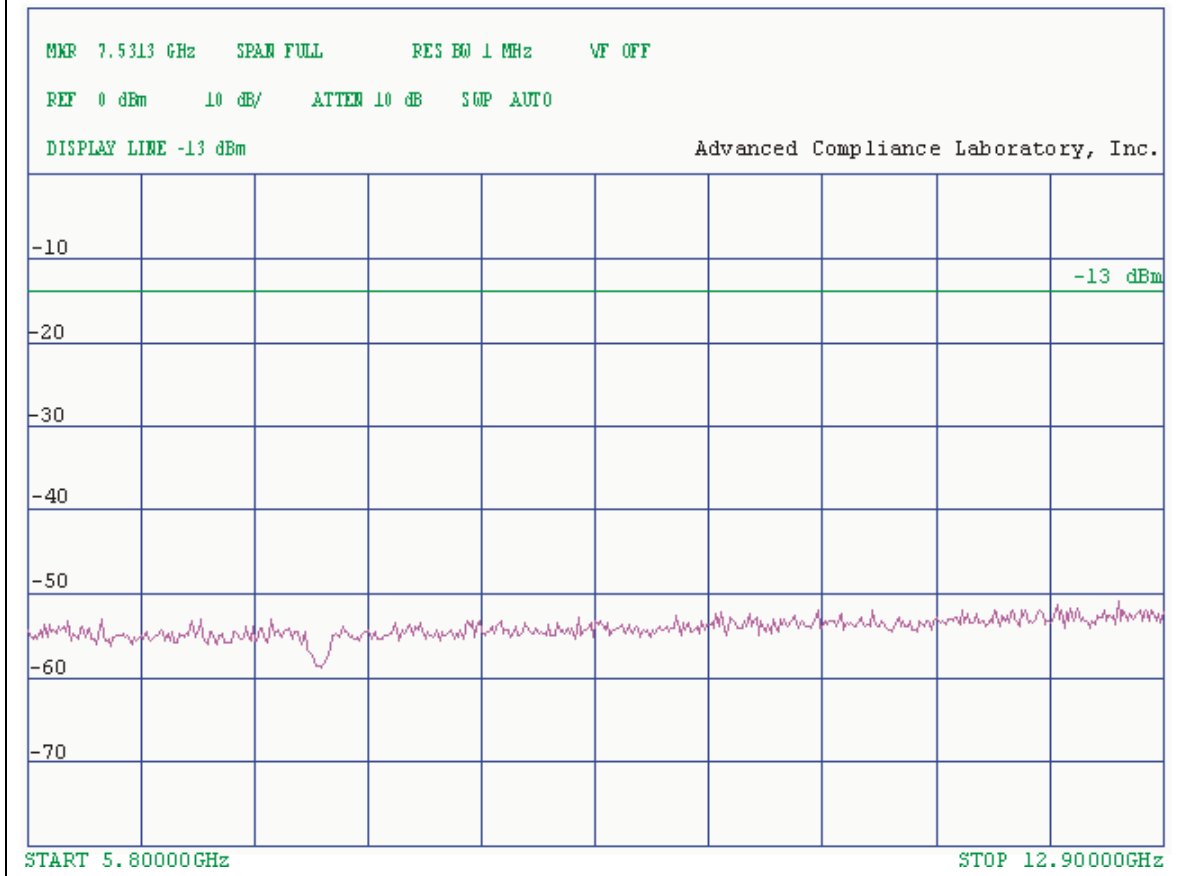
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



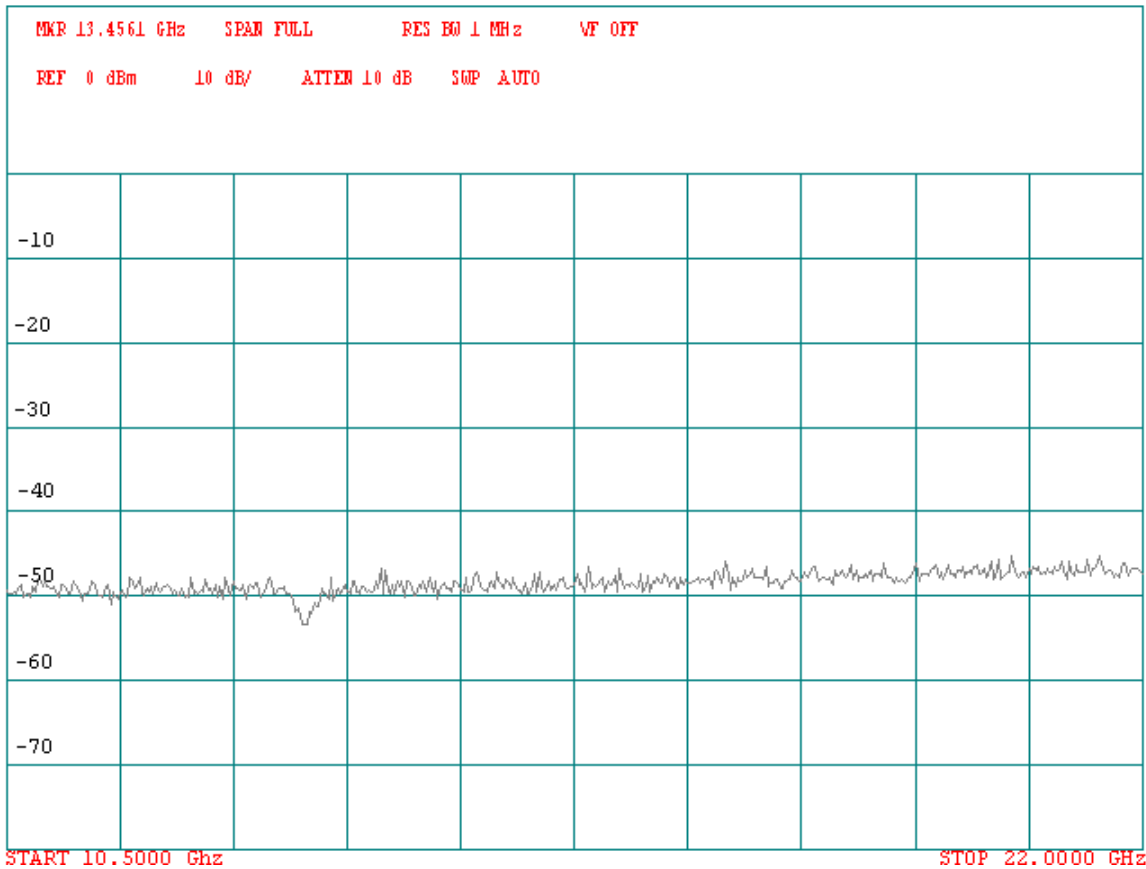
Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



Project Number:	0048-050318-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Tested By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: PCS Bands / EDGE Modulation
Plot Name:	Downlink, Low-Channel
Configuration:	SG Input: -50dBm, Output Port: EUT MOBILE



Section 6. Field Strength of Spurious

Name of Test:	<i>Field Strength of Spurious</i>	Test Standard:	22.917 24.238
Tested By:	EDWARD LEE	Test Date:	05/02/2007-06/01/2007

Minimum Standard: Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least $43 + 10 \log P$. This is equivalent to -13 dBm absolute power. Para. No. 24.238(a). The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not less than $43+10 \log$ (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

Method of Measurement: 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 a dipole. 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 ERP is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

Test Result:

Complies

Test Data:

See Attached Table(s)

Configuration	PCS with Mobile Port Terminated
Band	Downlink
Channel	Low

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3860.4	V	54.6	-65	1.8	9.6	-57.2	-13	-44.2
5790.6	V	56.9	-63	2.4	10.8	-54.6	-13	-41.6
1740.9	V	56.0	-62	1.2	7.0	-56.2	-13	-43.2
3481.8	V	55.3	-63	1.7	9.1	-55.6	-13	-42.6
5222.7	V	59.4	-60	2.1	10.0	-52.1	-13	-39.1
2100.9	V	79.0	-38	1.3	7.9	-31.4	-13	-18.4

NOTE:

* Measured noise floor

SA: Spectrum Analyzer

SG: Signal Generator

CL: SMA cable loss (6ft)

Worse case: Vertical @1m

H=horizontal and V=vertical

EIRP = SG reading - CL + Gain (dBi)

Margin = EIRP - Limit

Configuration	PCS with Mobile Port Terminated
Band	Downlink
Channel	Mid

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3920	V	55.8	-64	1.8	9.6	-56.2	-13	-43.2
5880	V	58.0	-61	2.4	10.8	-52.6	-13	-39.6
1740.9*	V	56.0	-62	1.2	7.0	-56.2	-13	-43.2
3481.8*	V	55.3	-63	1.7	9.1	-55.6	-13	-42.6
5222.7*	V	59.4	-60	2.1	10.0	-52.1	-13	-39.1
2100.9*	V	79.0	-38	1.3	7.9	-31.4	-13	-18.4

NOTE:

* same for all the operating channels

SA: Spectrum Analyzer**SG:** Signal Generator**CL:** SMA cable loss (6ft)**Worse case: Vertical****H=horizontal and V=vertical****EIRP =** SG reading - CL + Gain (dBi)**Margin =** EIRP - Limit

Configuration	PCS with Mobile Port Terminated
Band	Downlink
Channel	High

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3979.6	V	52.0	-68	1.8	9.6	-60.2	-13	-47.2
5969.4	V	55.1	-65	2.4	10.8	-56.6	-13	-43.6
1740.9	V	56.0	-62	1.2	7.0	-56.2	-13	-43.2
3481.8	V	55.3	-63	1.7	9.1	-55.6	-13	-42.6
5222.7	V	59.4	-60	2.1	10.0	-52.1	-13	-39.1
2100.9	V	79.0	-38	1.3	7.9	-31.4	-13	-18.4

NOTE:

SA: Spectrum Analyzer
SG: Signal Generator
CL: SMA cable loss (6ft)

Worse case: Vertical
H=horizontal and V=vertical
EIRP = SG reading - CL + Gain (dBi)
Margin = EIRP - Limit

Configuration	PCS w/ Base Station Port Terminated
Band	Uplink
Channel	High +Mid +Low

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3700.4	V	57.2	-61	1.7	9.6	-53.1	-13	-40.1
5550.6	V	59.0	-59	2.3	10.5	-50.8	-13	-37.8
3760.0	V	57.0	-61	1.7	9.6	-53.1	-13	-40.1
5640.0	V	58.1	-60	2.3	10.5	-51.8	-13	-38.8
3819.6	V	54.5	-63	1.8	9.7	-55.1	-13	-42.1
5729.4	V	56.8	-62	2.4	10.9	-53.5	-13	-40.5
1740.9	V	56.0	-62	1.2	7.0	-56.2	-13	-43.2
3481.8	V	55.3	-63	1.7	9.1	-55.6	-13	-42.6
5222.7	V	59.4	-60	2.1	10.0	-52.1	-13	-39.1
2100.9	V	79.0	-38	1.3	7.9	-31.4	-13	-18.4

NOTE:

SA: Spectrum Analyzer
SG: Signal Generator
CL: SMA cable loss (6ft)

Worse case: Vertical
H=horizontal and V=vertical
EIRP = SG reading - CL + Gain (dBi)
Margin = EIRP - Limit

Section 7. Frequency Stability

Name of Test:	<i>Frequency Stability</i>	Test Standard:	<i>2.1055 22.355&24.235</i>
Tested By:	WEI LI	Test Date:	03/28-04/05/2005

Minimum Standard: Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

TABLE C-1.—FREQUENCY TOLERANCE FOR TRANSMITTERS IN THE PUBLIC MOBILE SERVICES

Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

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. Set SA resolution bandwidth low enough (30Hz) to obtain the desired frequency resolution. (Using frequency counter method: 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 10MHz 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.

Test Result:

Complies

Test Data:

See Attached Table(s)

Not Applicable

Section 8. Out of Band Rejection

Name of Test:	<i>Out of Band Rejection</i>	Test Standard:	
Tested By:	Edward Lee	Test Date:	05/02/2007-06/01/2007

Minimum Standard: The passband gain shall not exceed the nominal gain by more than 1.0 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point.

Method of Measurement: Adjust the internal gain control of the equipment under test to the nominal gain for which equipment certification is sought. With the aid of a signal generator and spectrum analyzer, measure the 20 dB bandwidth of the amplifier (i.e. at the point where the gain has fallen by 20 dB). Measure the gain-versus-frequency response of the amplifier from the midband frequency f_0 of the passband up to at least $f_0 \pm 250\%$ of the 20 dB bandwidth.

Test Result:

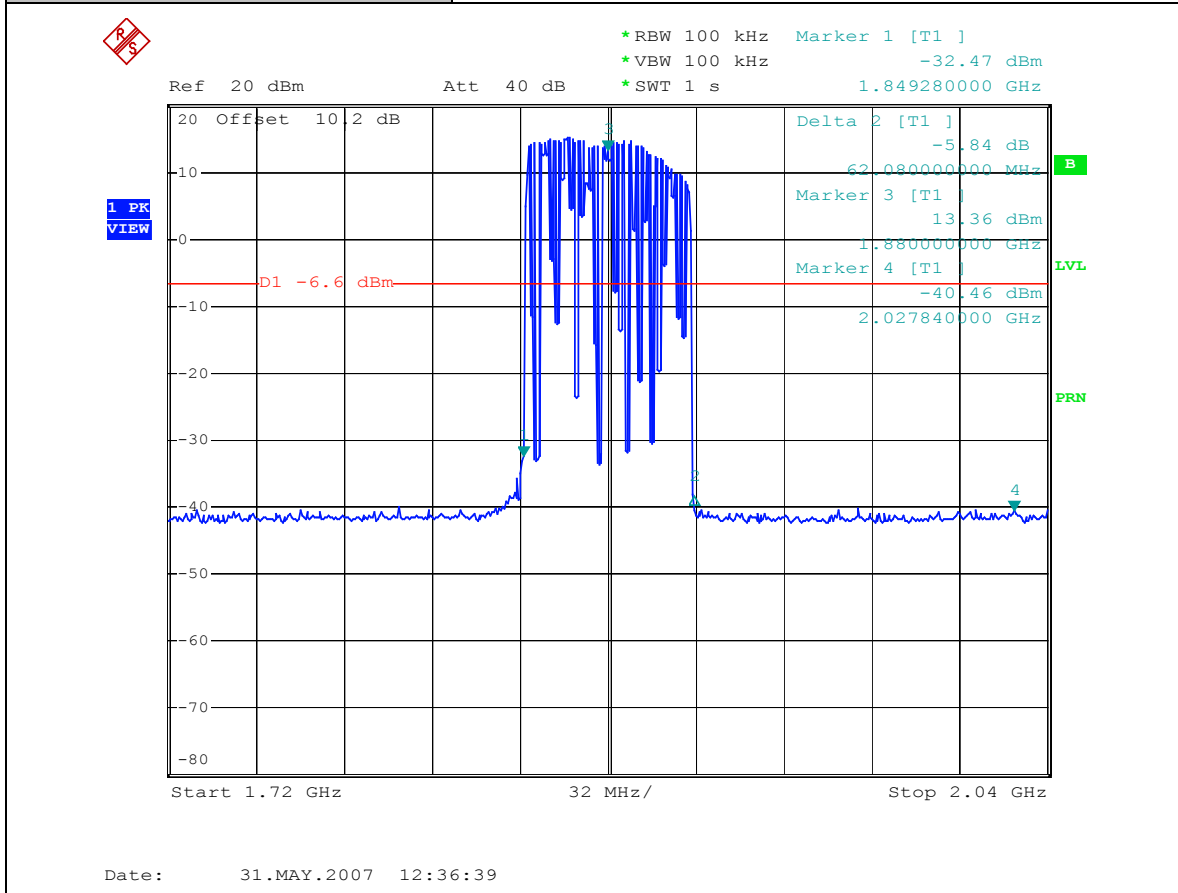
Complies

Test Data:

See Attached Table(s)

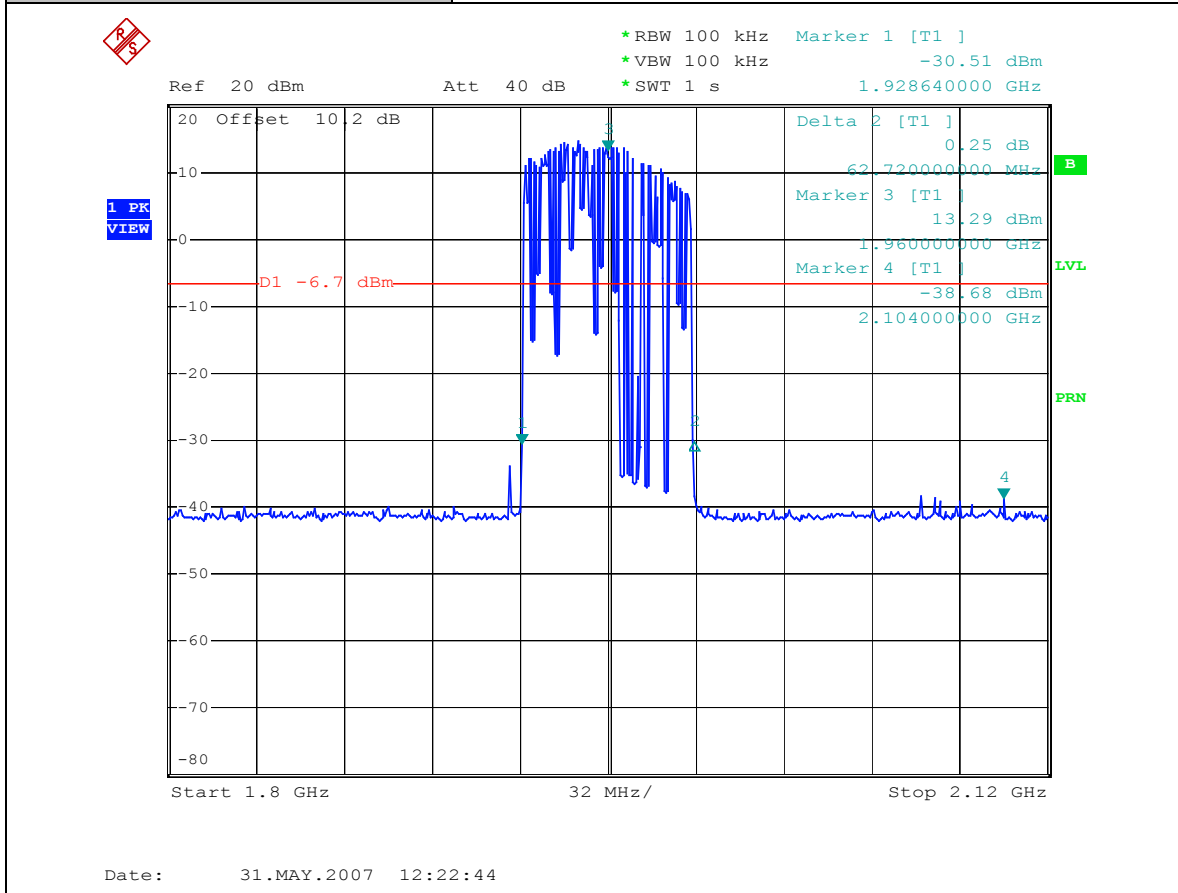
Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Test By:	Edward Lee
Temperature:	70° F
Humidity:	30%

Section:	Pass Band Gain & 20dB Bandwidth
Plot Name:	1900 PCS Uplink Full Band-250% Span
Configuration:	Server Antenna Connector was connected to SG. Input: -65dBm



Project Number:	0048-070502-01
EUT:	Shyam Indoor RepeaterR20-1900
SN:	R20DG301
Test By:	Edward Lee
Temperature:	70°F
Humidity:	30%

Section:	Pass Band Gain & 20dB Bandwidth
Plot Name:	1900 PCS Downlink Full Band-250% Span
Configuration:	Server Antenna Connector was connected to SG. Input: -60dBm



Section 9. Test Equipment List

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/ yy	Cal Due dd/mm/ yy
HP	HP8546A	3448A00290	EMI Receiver	12/01/07	12/01/08
HP	E4432B	US38220355	250K-3GHz Signal Generator	17/09/06	17/09/07
R & S	ESPI7	6001	9KHz-7GHz EMI Receiver	15/06/06	15/06/07
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/02/07	12/02/08
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/07	09/02/08
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	23/08/06	23/08/07
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	23/08/06	23/08/07
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/07	27/02/08
EMCO	3115	4945	Double Ridge Guide Horn Antenna	11/08/06	11/08/07
HP	8569B	2607A02802	1GHz-22GHz Spectrum Analyzer	10/02/07	10/02/08
Advantest	R3271	5003583	100Hz-26.5GHz Spectrum Analyzer	30/04/07	30/04/08
HP	E8254A	US42110367	Signal Generator	23/03/07	23/03/08
EMCO	3116	4943	Double Ridge Guide Horn Antenna	11/01/07	11/01/08
Scientific-Atlanta	12A-18	441	Wave Guide Horn Antenna	04/08/06	04/08/07