

Advanced
Compliance

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**Electromagnetic
Emission
Compliance
Test Report**



**Equipment Under Test
(EUT)
Applicant**

DB6M Dual Band Repeater
Shyam Telecom Inc.

In Accordance With

FCC Part 27 & Part 2

Test by

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

Authorized by

Wei Li
Lab Manager

Signature

Date

December 10, 2010

**AC Lab Report
Number**

0048-101122-01



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.
Product Name: DB6M Dual Band Repeater
Model No.: DB6M33-700UC+AWS
Sample No.: D6M30GFJ01

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

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 27& Part 2.

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	27.50& 2.1046	1000W/MHz ERP	Complies
Occupied Bandwidth (Digital)	2.1049(i)	Mask	Complies
Spurious Emissions at Antenna Terminals for SMR700 Band	27.53&2.1051	27.53(c)(f)	Complies
Spurious Emissions at Antenna Terminals for AWS2100 Band	27.53&2.1051	27.53(h)	Complies
Field Strength of Spurious Emissions	2.1053	-13 dBm E.I.R.P.	Complies
RF Safety	27.52	1.1307(b) 2.1091 2.1093	Complies
Frequency Stability	27.54	2.1055	Complies*

* 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: December 10, 2010

Section 2. General Equipment Specification

Supply Voltage		100-240VAC, 50-60Hz			
Frequency Range	SMR 700MHz Upper C	DL/ 746-756MHz			
		UL/ 777-787MHz			
	AWS 2100MHz	DL/ 2145-2155MHz			
		UL/ 1745-1755MHz			
Modulation	<input checked="" type="checkbox"/> LTE	<input type="checkbox"/> CDMA	<input type="checkbox"/> GSM	<input type="checkbox"/> EDGE	<input type="checkbox"/> TDMA
Type of Emissions	F9W	F9W	GXW	G7W	DXW
Rated Power	DL: +30.0dBm & UL:+27dBm for each Sub-band				
Rated Gain	85.0 +/-2dB for each Sub-band				
Output Impedance /Nominal OCBW	50ohm / 9MHz				
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 type="checkbox"/>	

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

The input supply to the transmitter was set at 27Volts DC. The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).

SMR 700UC Band

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

Rated RF DL output : +30dBm w/ V=27V & I=2.25A

Rated RF UL output : +27Bm w/ V=27V & I=2.25A

AWS 2100 Band

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

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

Rated RF DL output : +30dBm w/ V=27V & I=2.75A

Rated RF UL output : +27Bm w/ V=27V & I=2.75A

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

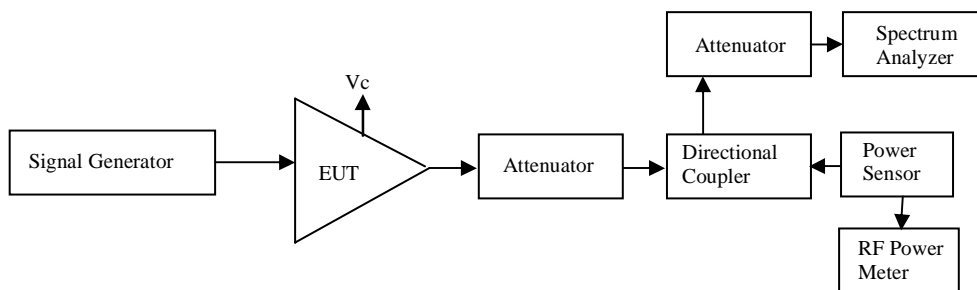
There are no user accessible adjustments or tuning in this portable cellular transceiver. All necessary adjustments and tuning are performed during manufacture of the product. Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform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

Description of Operation

This device is a dual band repeater operating in both downlink and uplink spectrums of SMR700 Upper C Band and AWS 2100 Band.

System Diagram

See Attachment.

General EUT Setup**Testing Channel /Modulation/Central Frequency /Port Selection:**

Single 10MHz Channel operation with LTE Modulation and Central frequency at

For SMR700 Band:

- DL fc=751MHz (output measured at Mobile Port)
- UL fc=781MHz (output measured at BTS Port)

For AWS2100 Band:

- DL fc=2150MHz (output measured at Mobile Port)
- UL fc=1750MHz (output measured at BTS Port)

Antenna Requirements:

- Omni antenna with gain 2dBi can be used for indoor application as server antenna.
- Yagi antenna of 10dBi gain can be used as donor antenna.

Section 3. RF Output Power

Name of Test:	<i>RF Output Power</i>	Test Standard:	<i>27.50 & 2.1046</i>
Tested By:	WEI LI	Test Date:	11/22/2010-12/10/2010

Minimum Standard: *Para. No. 27.50(b) for 700 Upper C Band:*

Fixed and base stations transmitting a signal with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP in accordance with Table 3 of this section.

Para. No. 27.50(d) & 2.1046 for 2100 Band:

The maximum peak output power of base transmitters should not exceed 100 Watts EIRP (50dBm).

Method of Measurement: *Detachable Antenna:*
The average/peak power at antenna terminals is measured using power meter or spectrum analyzer at the low band edge, mid, and high band edge frequencies (if applicable) for all modulations listed on Page 5.

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:

	Channel (f-center)	Modulation	Power Output (dBm)*	Limit (dBm)**	Margin
SMR 700 upper C	751MHz	LTE	28.73	57	-28.27
	782MHz	LTE	25.46	57	-31.54
AWS 2100	2150MHz	LTE	28.04	57	-28.96
	1750MHz	LTE	25.28	57	-31.72
Input Power (dBm)	-60 ~ -55dBm				
Ref Offset	Ref offset=Cable Factor +Attenuation=30.6dB				

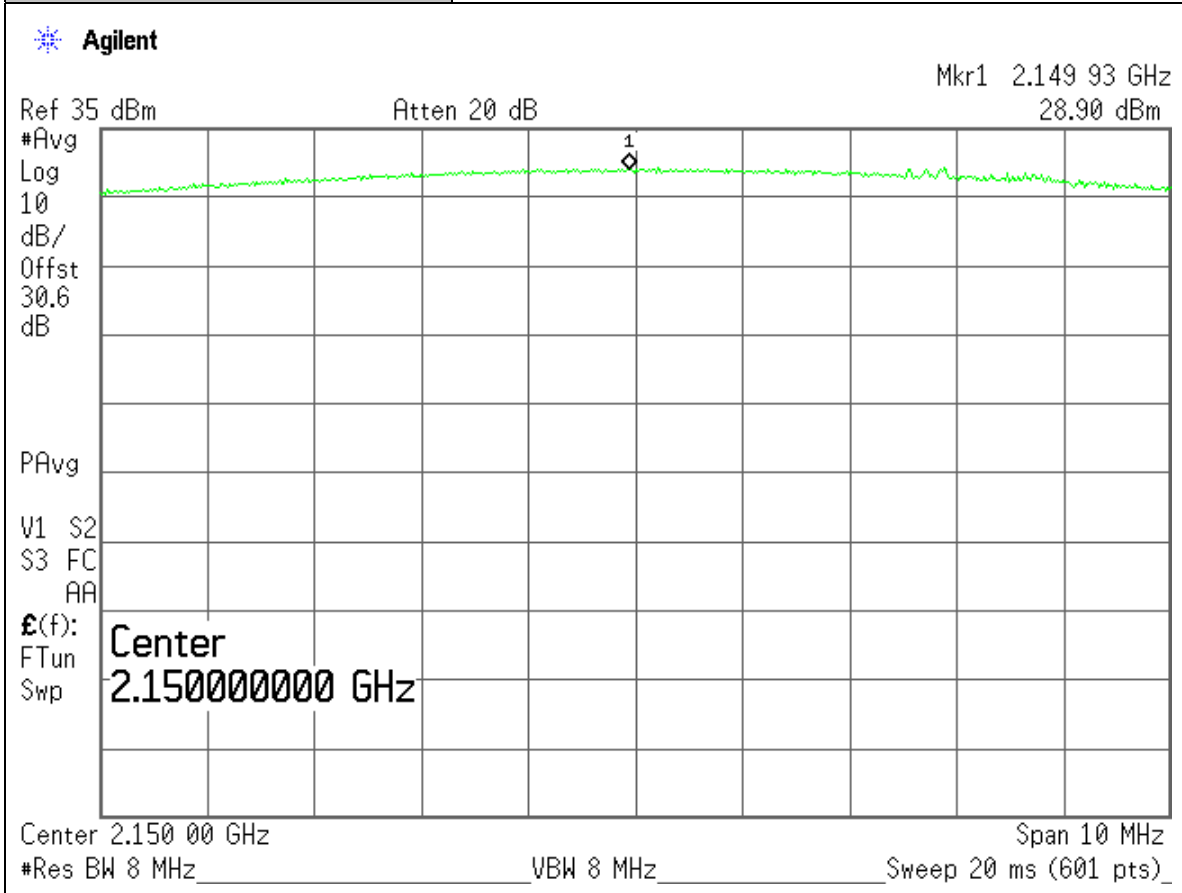
***Average output power** limited by internal AGC. Measured using average power meter. ** More restricted limit applied.

	Channel (f-center)	Modulation	Power Output (dBm)*	Limit (dBm)**	Margin
SMR 700 upper C	751MHz	LTE	29.61	57	-27.39
	782MHz	LTE	26.8	57	-30.2
AWS 2100	2150MHz	LTE	29.65	57	-27.35
	1750MHz	LTE	26.75	57	-30.25
Input Power (dBm)	-60 ~ -55dBm				
Ref Offset	Ref offset=Cable Factor +Attenuation=30.6dB				

***Peak output power** limited by internal AGC. Measured using spectrum analyzer. Bandwidth adjustment factor (0.75dB) applied. ** More restricted limit applied

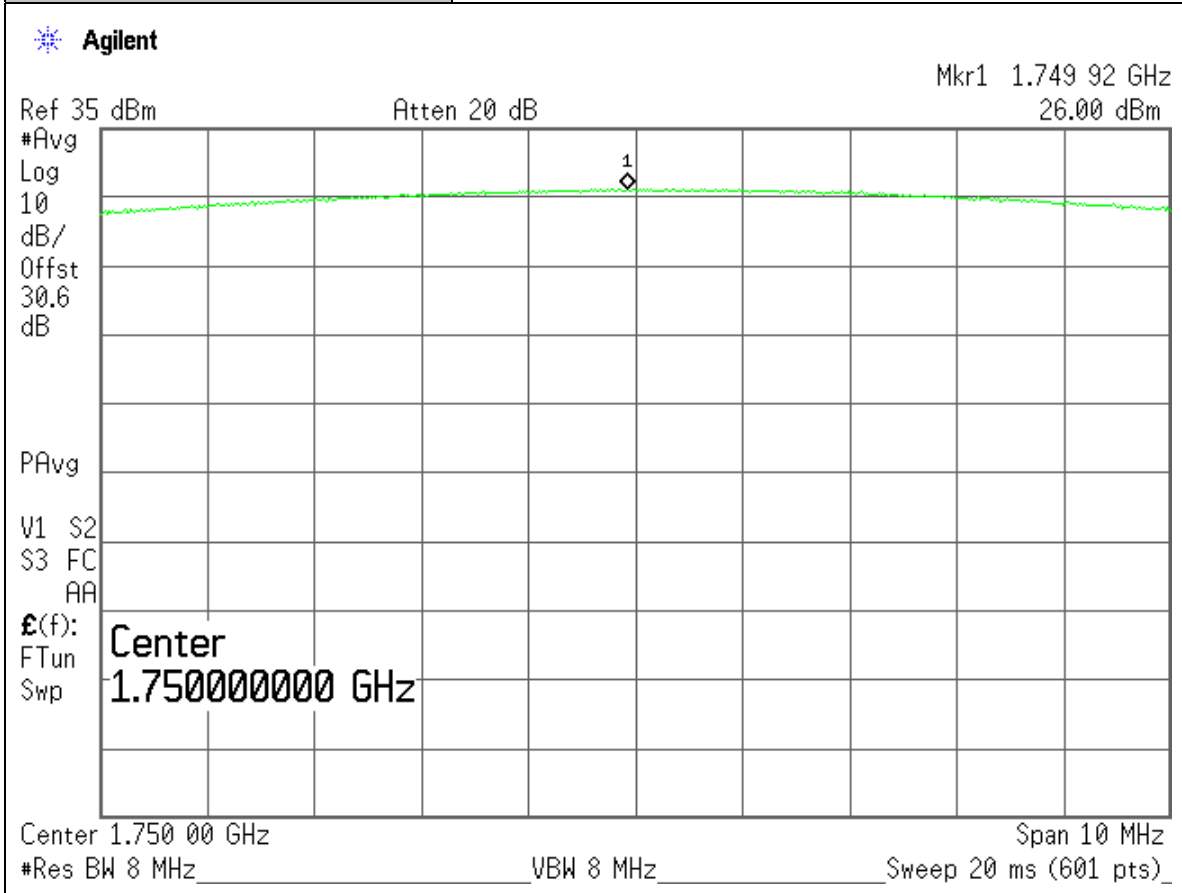
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Output Power: 2100 AWS Bands
Plot Name:	Downlink, LTE
Configuration:	SG Input, Output Port: EUT Mobile



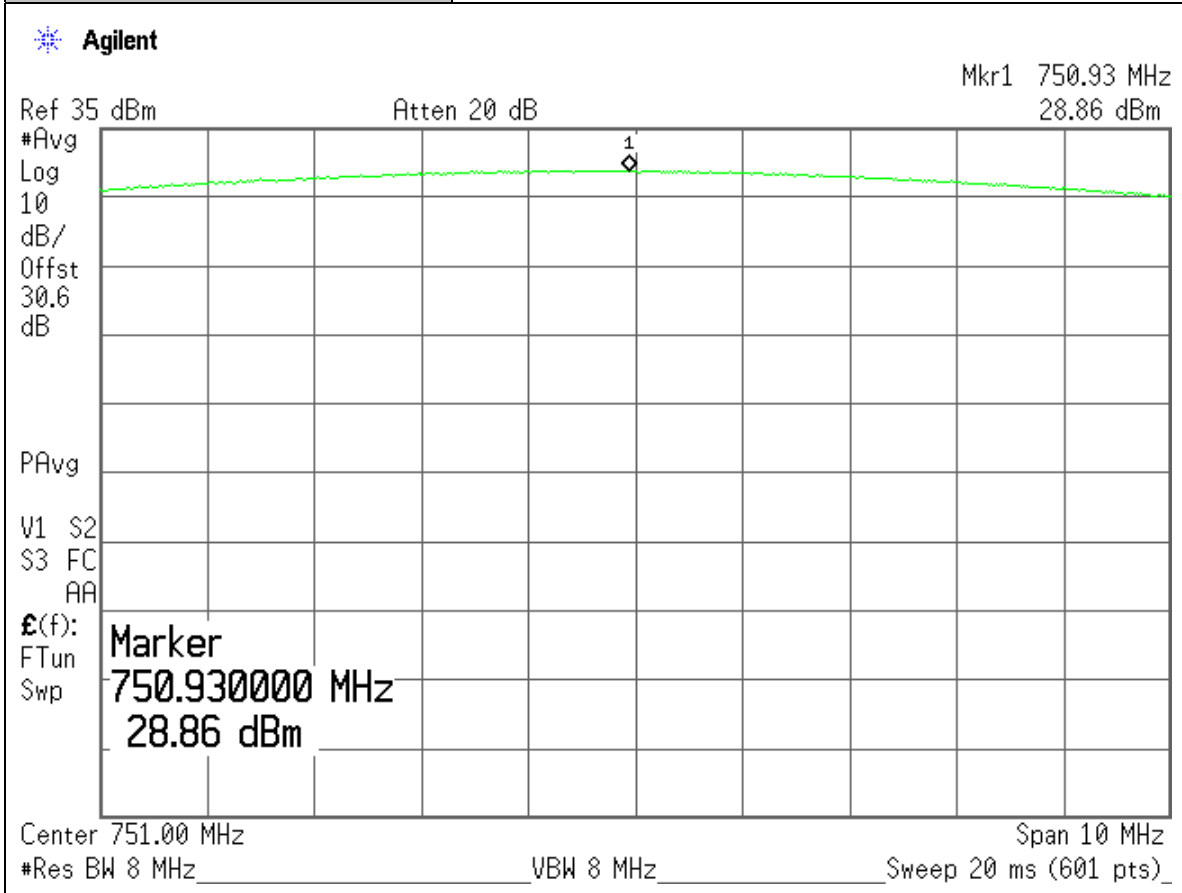
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Output Power: 2100 AWS Bands
Plot Name:	Uplink, LTE
Configuration:	SG Input, Output Port: EUT BTS



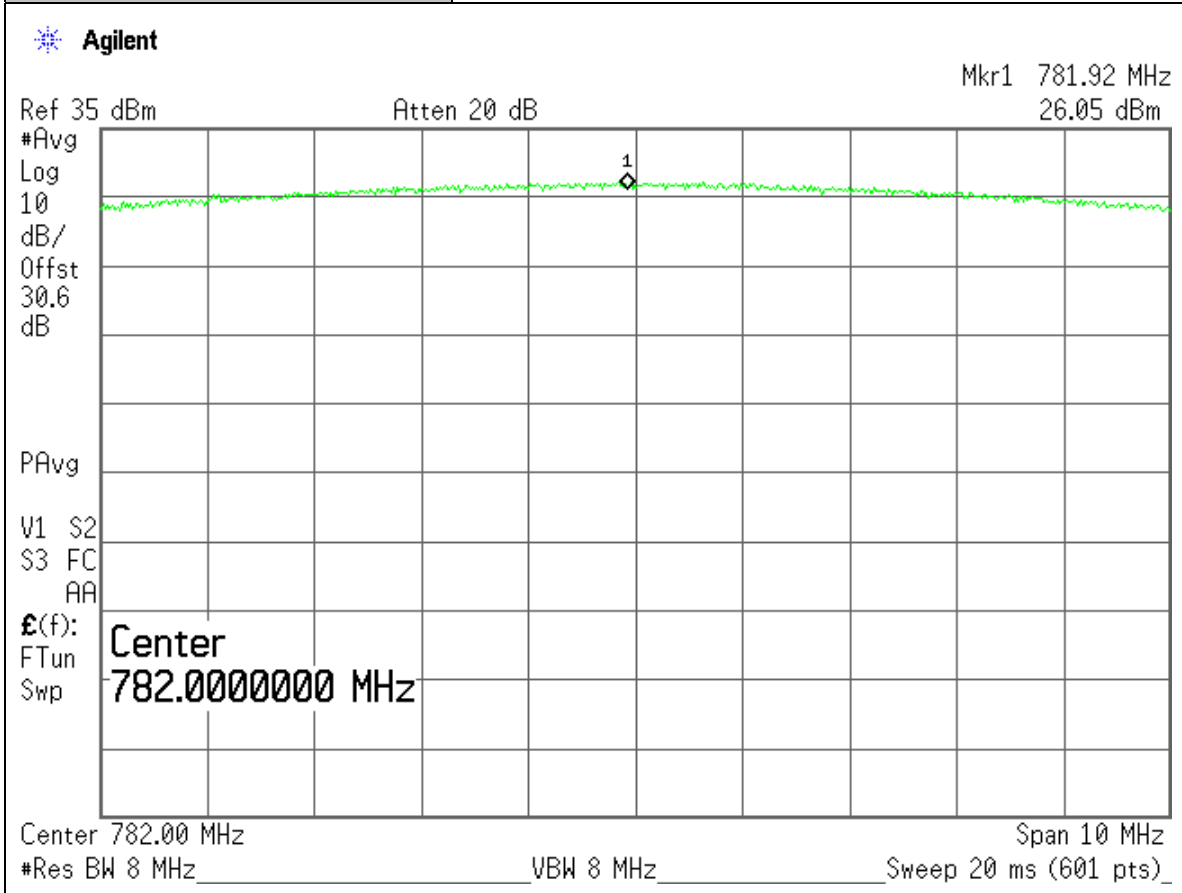
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Output Power: 700 SMR Bands
Plot Name:	Downlink, LTE
Configuration:	SG Input, Output Port: EUT Mobile



Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Output Power: 700 SMR Bands
Plot Name:	Uplink, LTE
Configuration:	SG Input, Output Port: EUT BTS



Section 4. Occupied Bandwidth

Name of Test:	<i>Occupied Bandwidth</i>	Test Standard:	<i>2.1049(i)</i>
Tested By:	WEI LI	Test Date:	11/22/2010-12/10/2010

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

Method of Measurement: Spectrum Analyzer Settings:
 RBW: WCDMA (100KHz), CDMA (30 kHz), GSM (3kHz), EDGE (3KHz),NADC (1 kHz) and CDPD (1 kHz), LTE (100KHz)
 VBW: \geq RBW
 Span: As required
 Sweep: Auto
 Input Signal Characteristics:
 RF level: Maximum Gain recommended by manufacturer

Test Result:

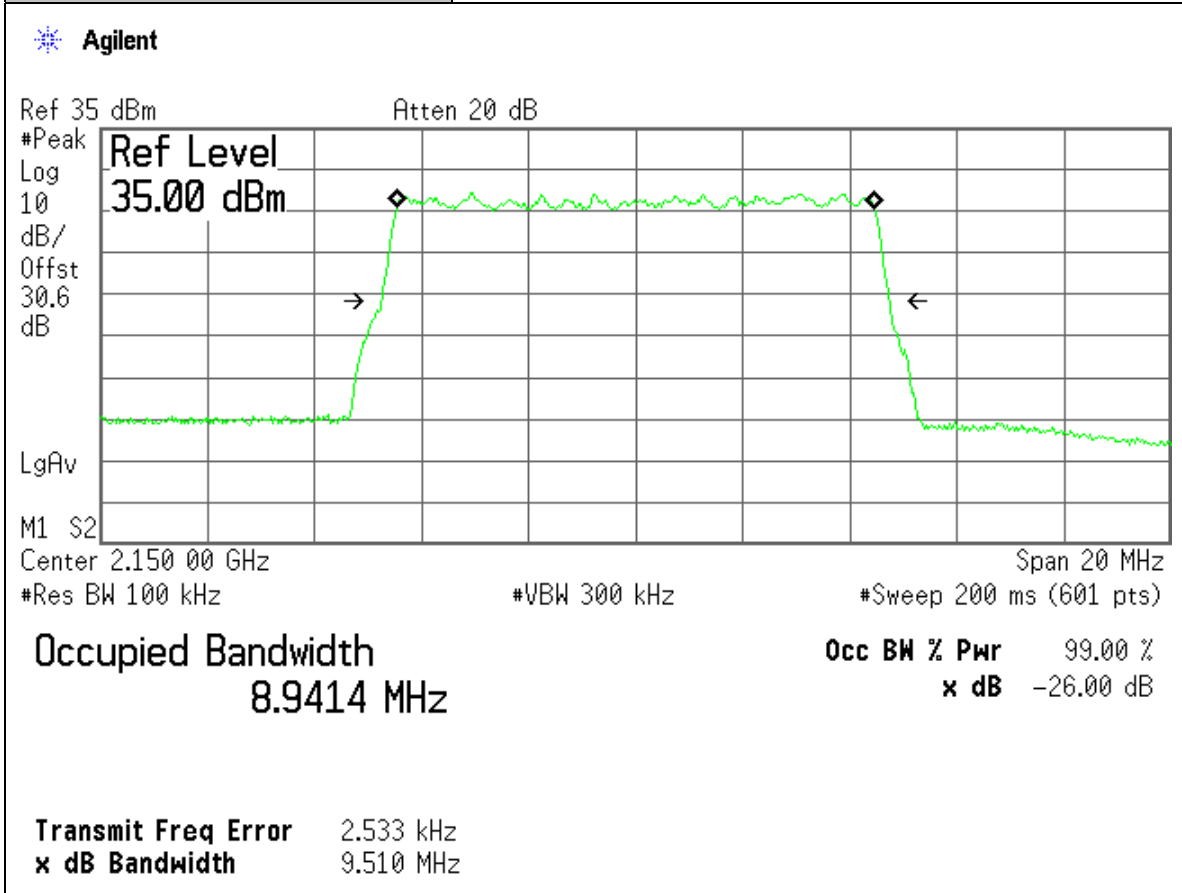
Complies

Test Data:

Attached Plots

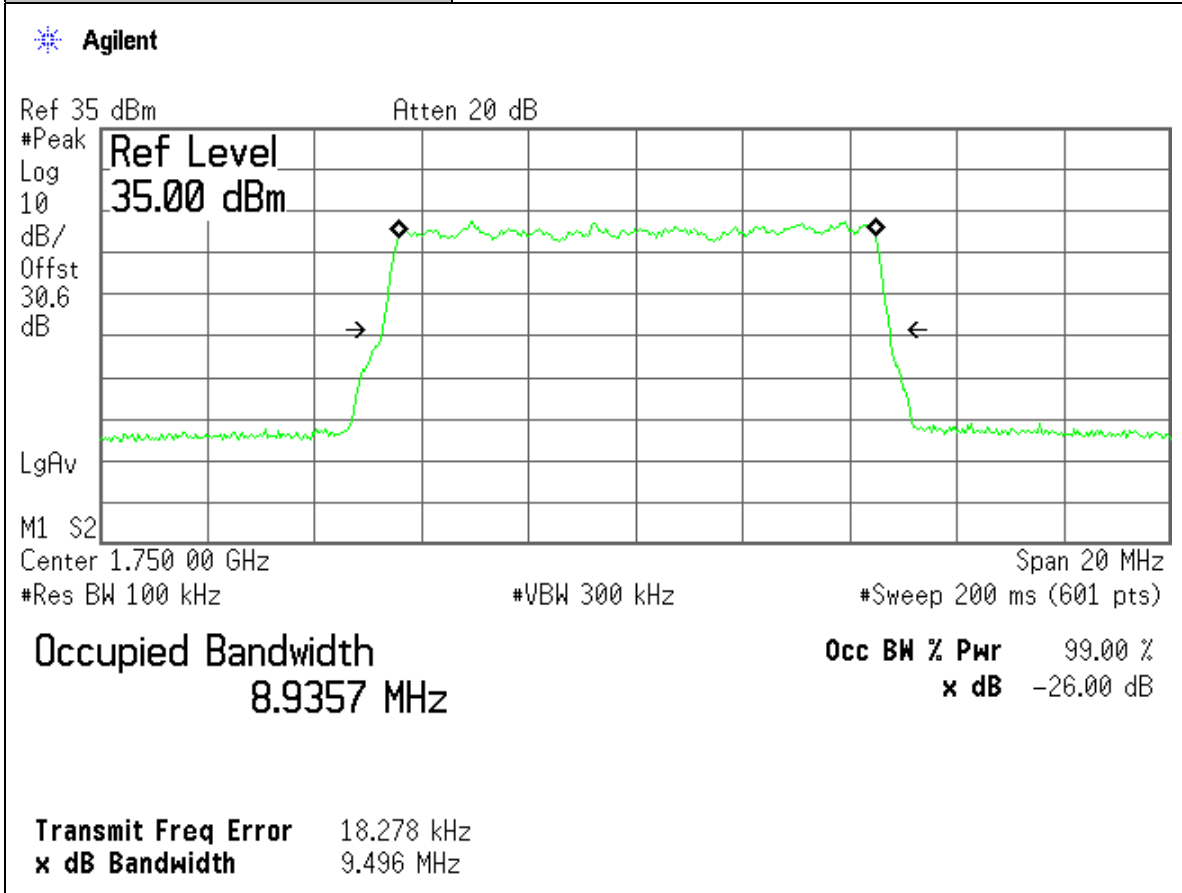
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 2100 AWS Bands
Plot Name:	Downlink, LTE
Configuration:	SG Input, Output Port: EUT Mobile



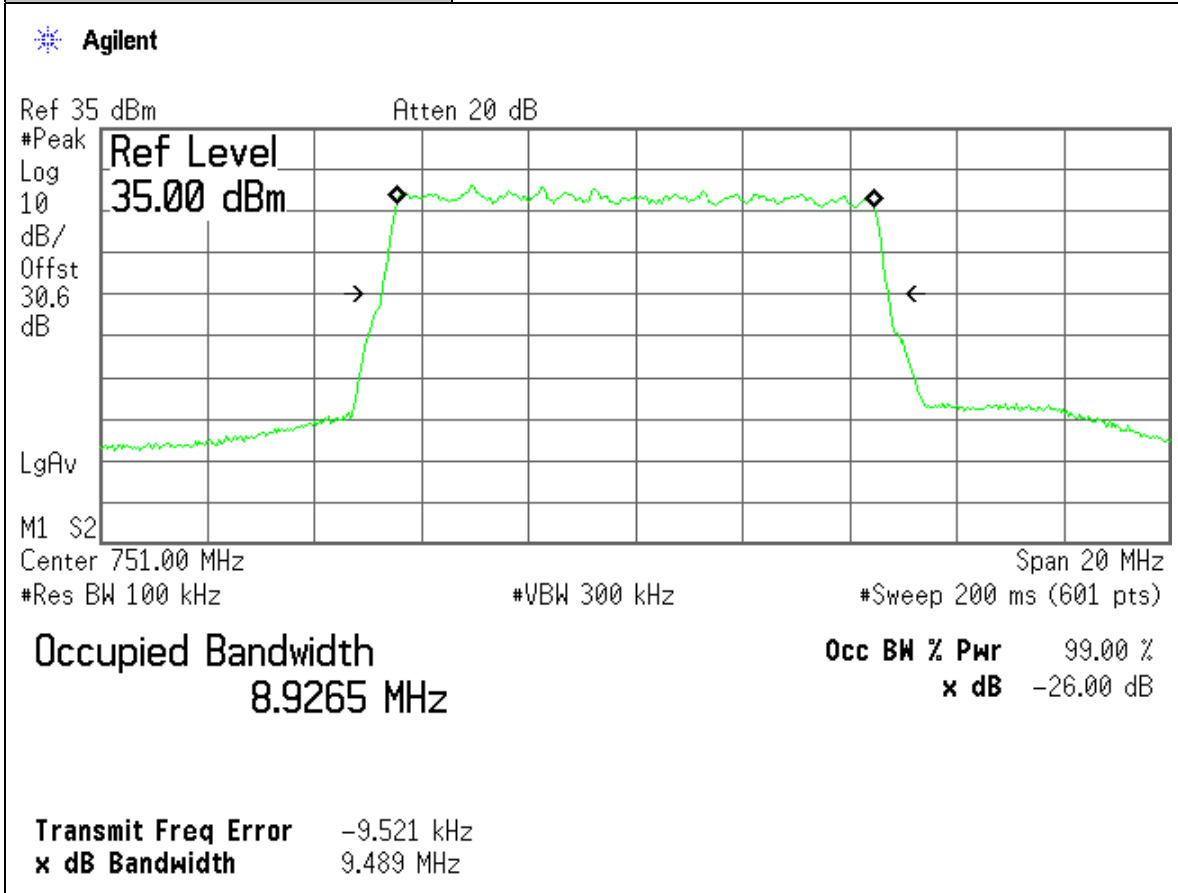
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 2100 AWS Bands
Plot Name:	Uplink, LTE
Configuration:	SG Input, Output Port: EUT BTS



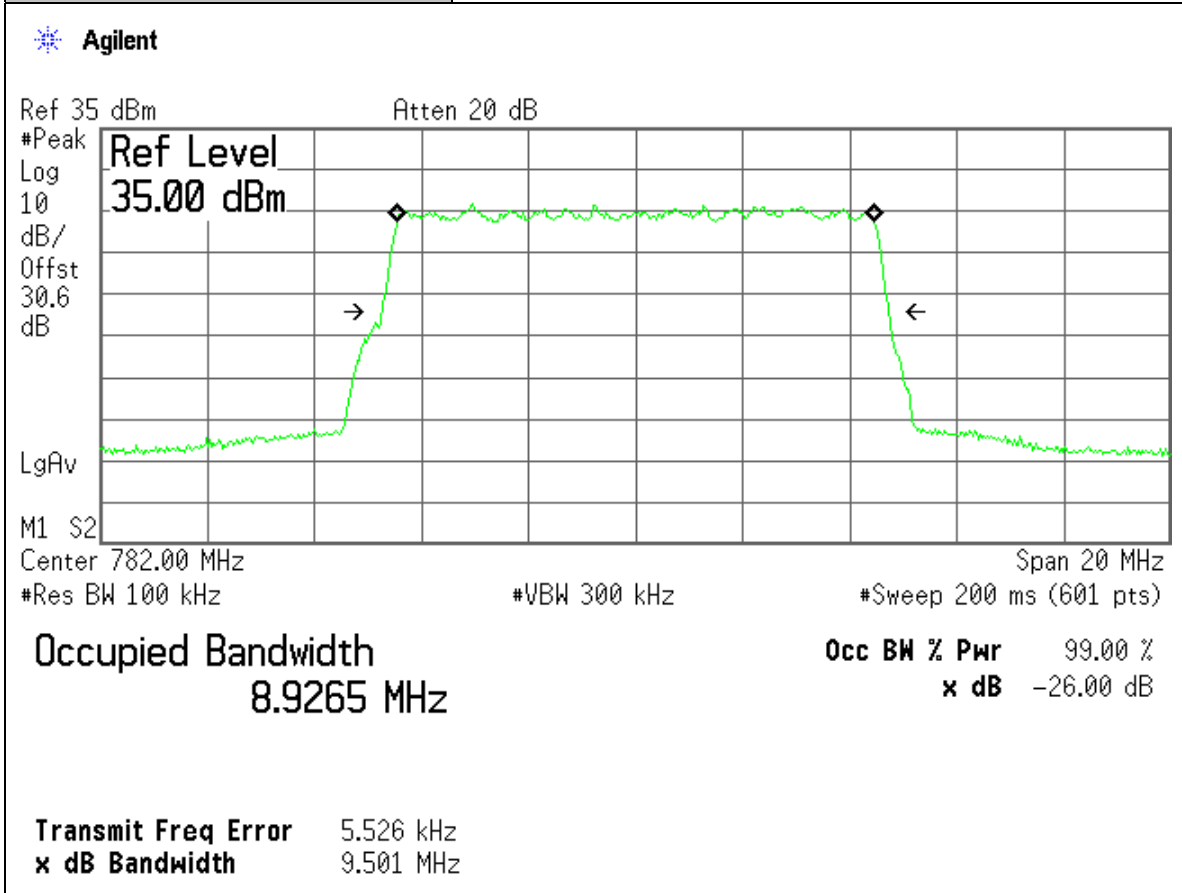
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 700 SMR Bands
Plot Name:	Downlink, LTE
Configuration:	SG Input, Output Port: EUT Mobile



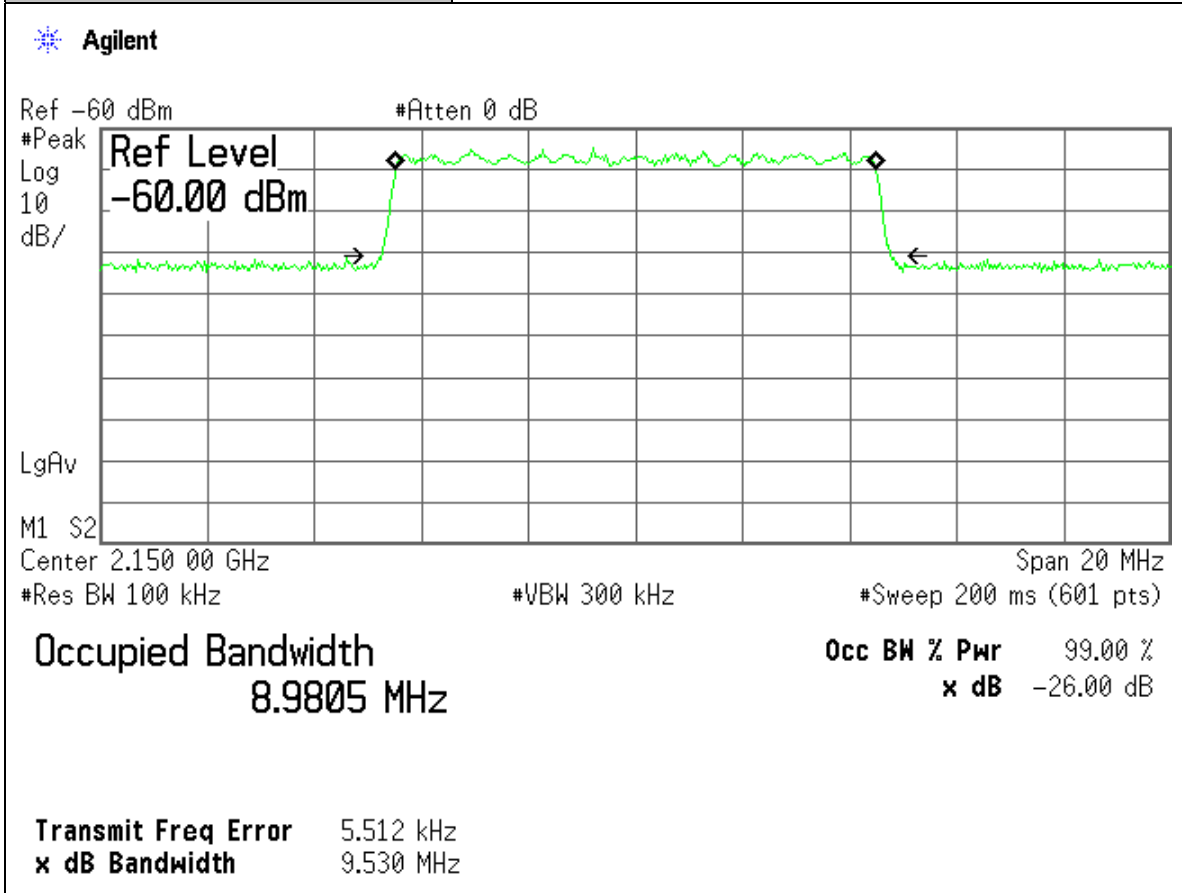
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 700 SMR Bands
Plot Name:	Uplink, LTE
Configuration:	SG Input, Output Port: EUT BTS



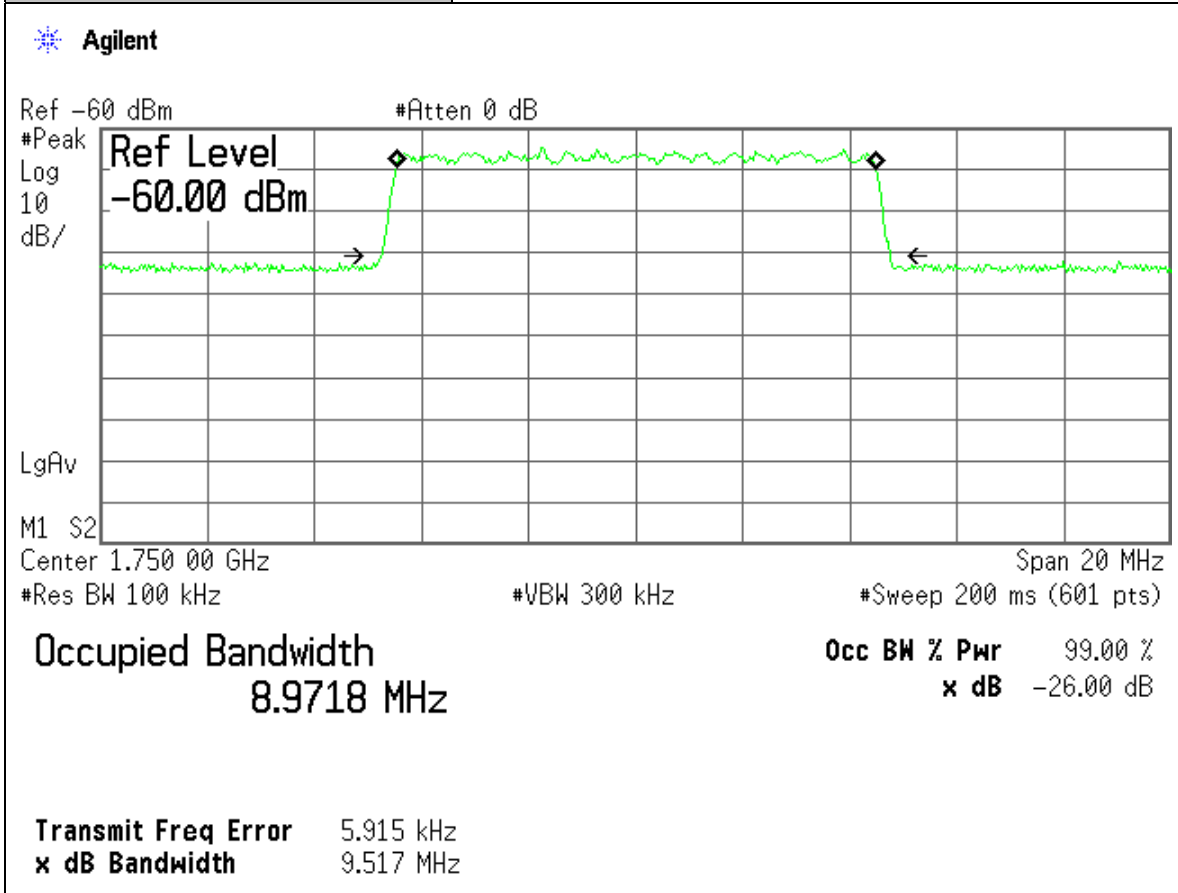
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 2100 AWS Bands
Plot Name:	Downlink, LTE
Configuration:	SG Input



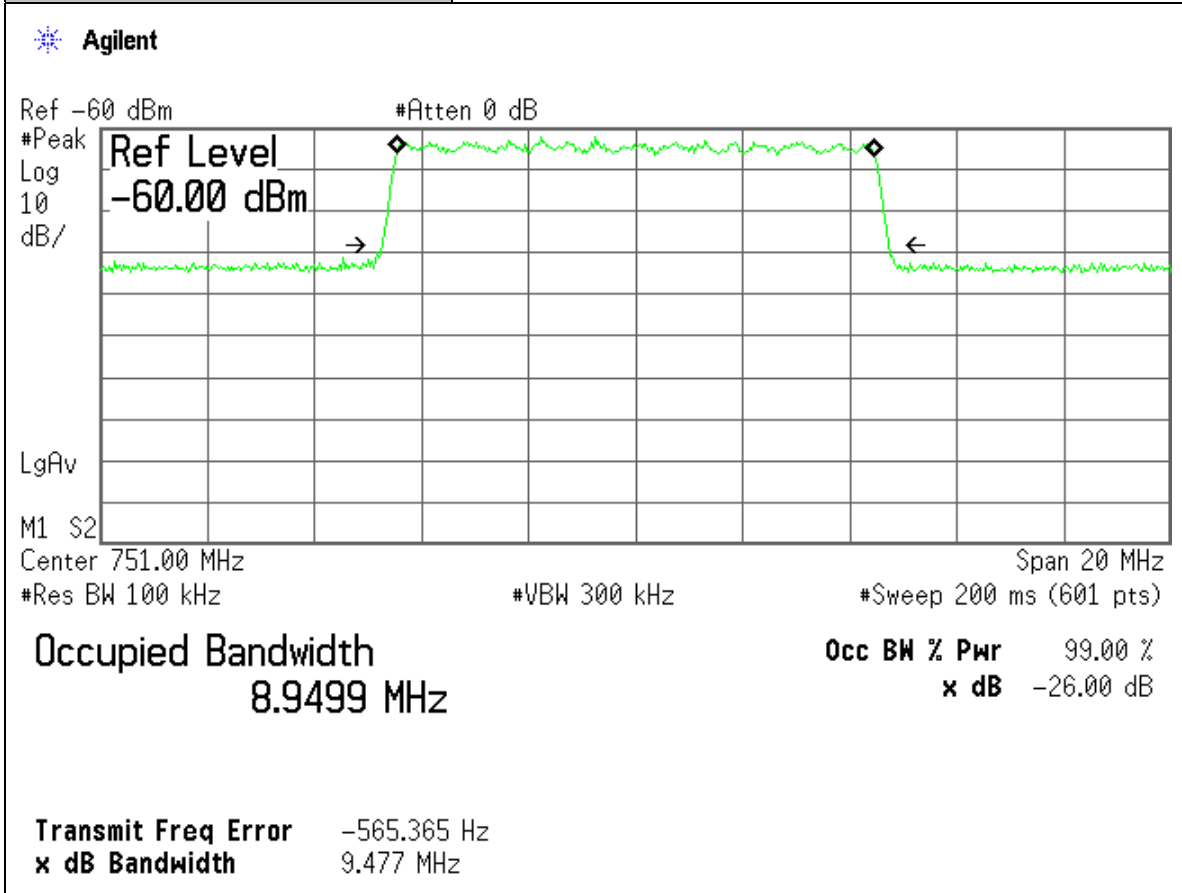
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 2100 AWS Bands
Plot Name:	Uplink, LTE
Configuration:	SG Input



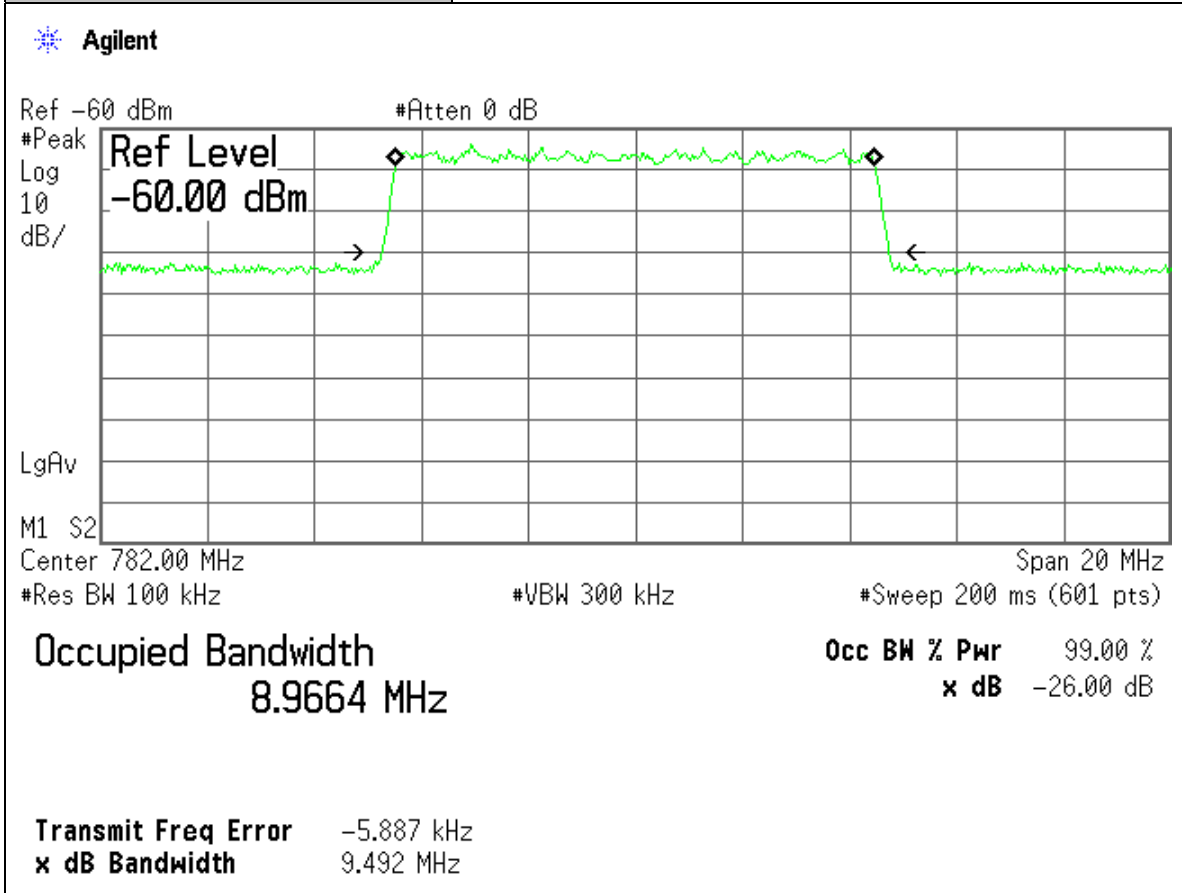
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 700 SMR Bands
Plot Name:	Downlink, LTE
Configuration:	SG Input



Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied BW: 700 SMR Bands
Plot Name:	Uplink, LTE
Configuration:	SG Input



Section 5. Spurious Emissions at Antenna Terminals

Name of Test:	<i>Spurious Emissions at Antenna Terminals</i>	Test Standard:	27.53(g)&2.1051(a)
Tested By:	WEI LI EDWARD LEE	Test Date:	11/22/2010-12/10/2010

Minimum Standard: Para. No. 27.53(h)&2.1051(a) for 2100 Bands:
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).

Para No. 27.53(c) 1,2,3,5,6 for 700 Bands.

Method of Measurement: Spectrum Analyzer Settings:
RBW: 100 kHz&1MHz. As required for digital modulations.
VBW: >=RBW
Start Frequency: 0 MHz or lowest EUT clock frequency.
Stop Frequency: 22GHz (AWS 2100)
Sweep: Auto

Test Result:

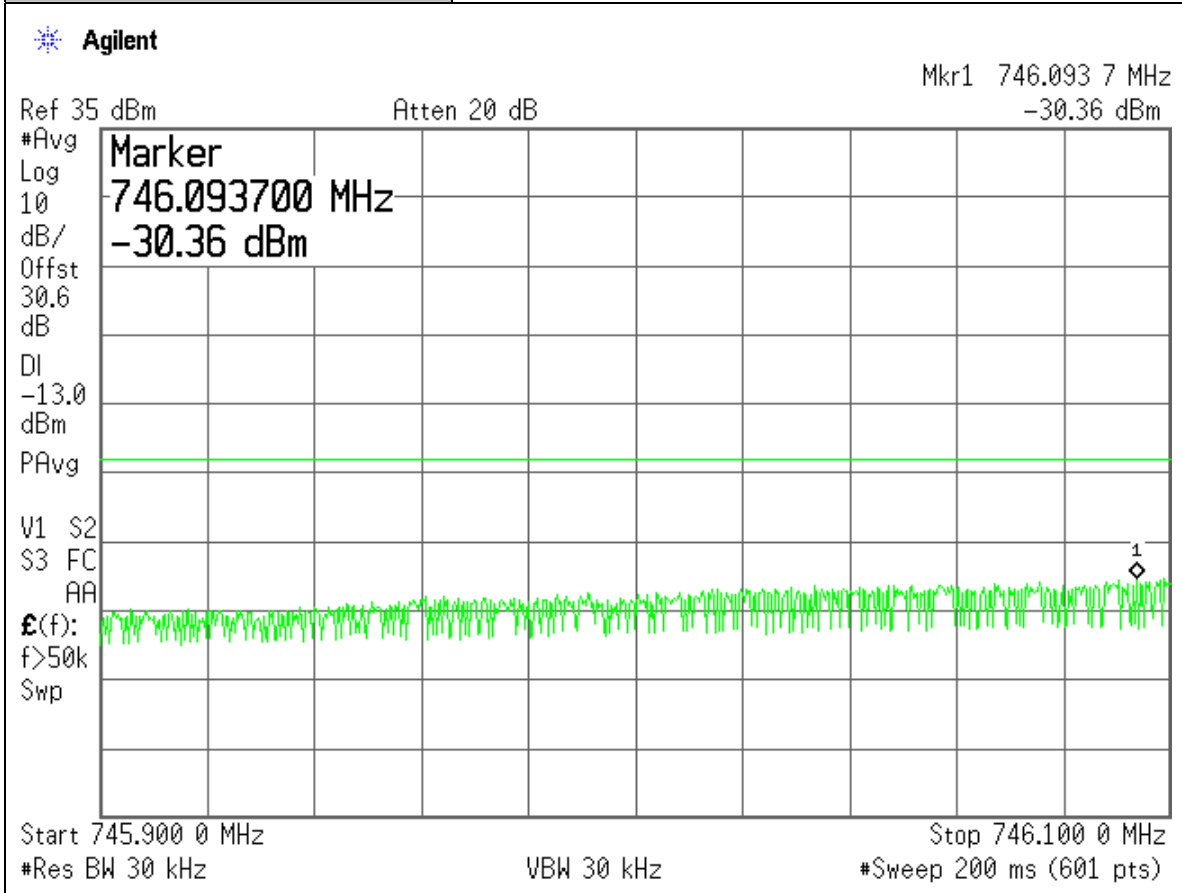
Complies

Test Data:

Attached Plots

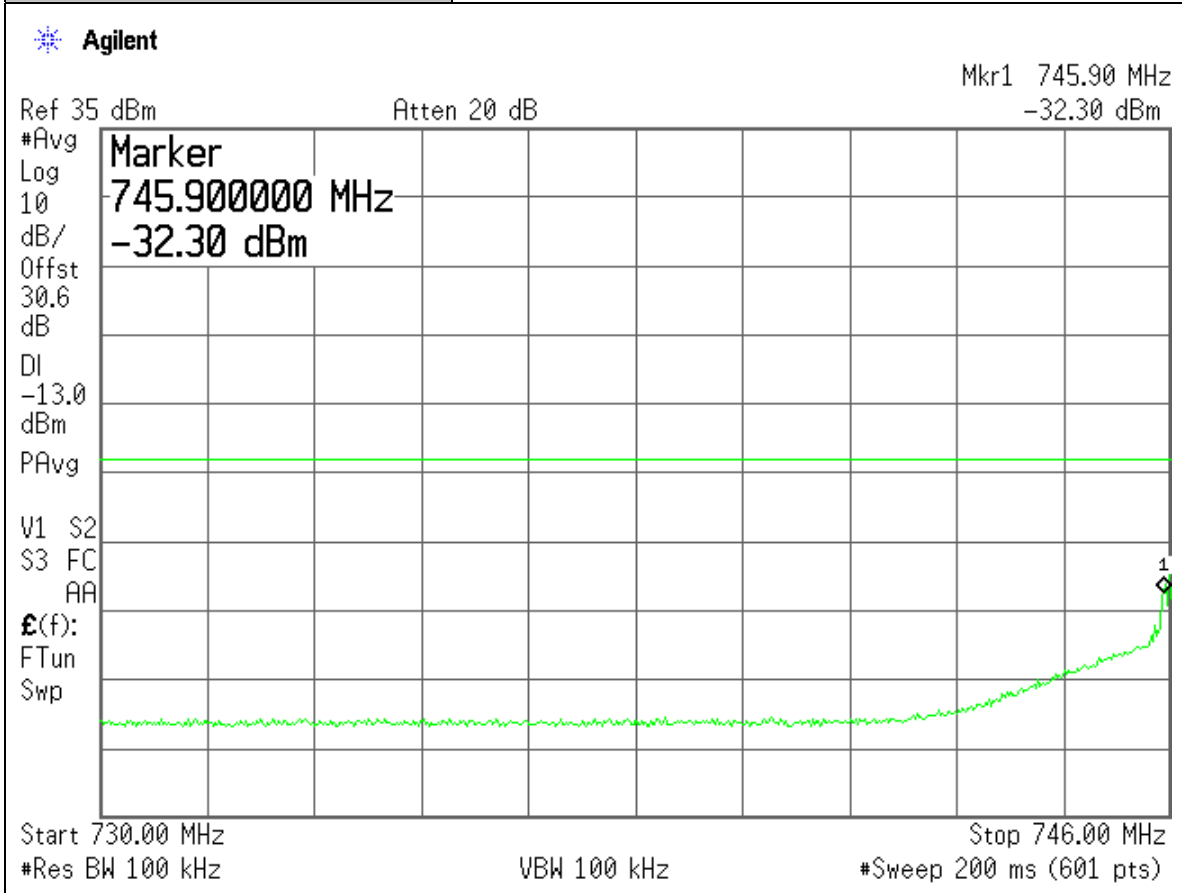
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Lower Bandedge
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



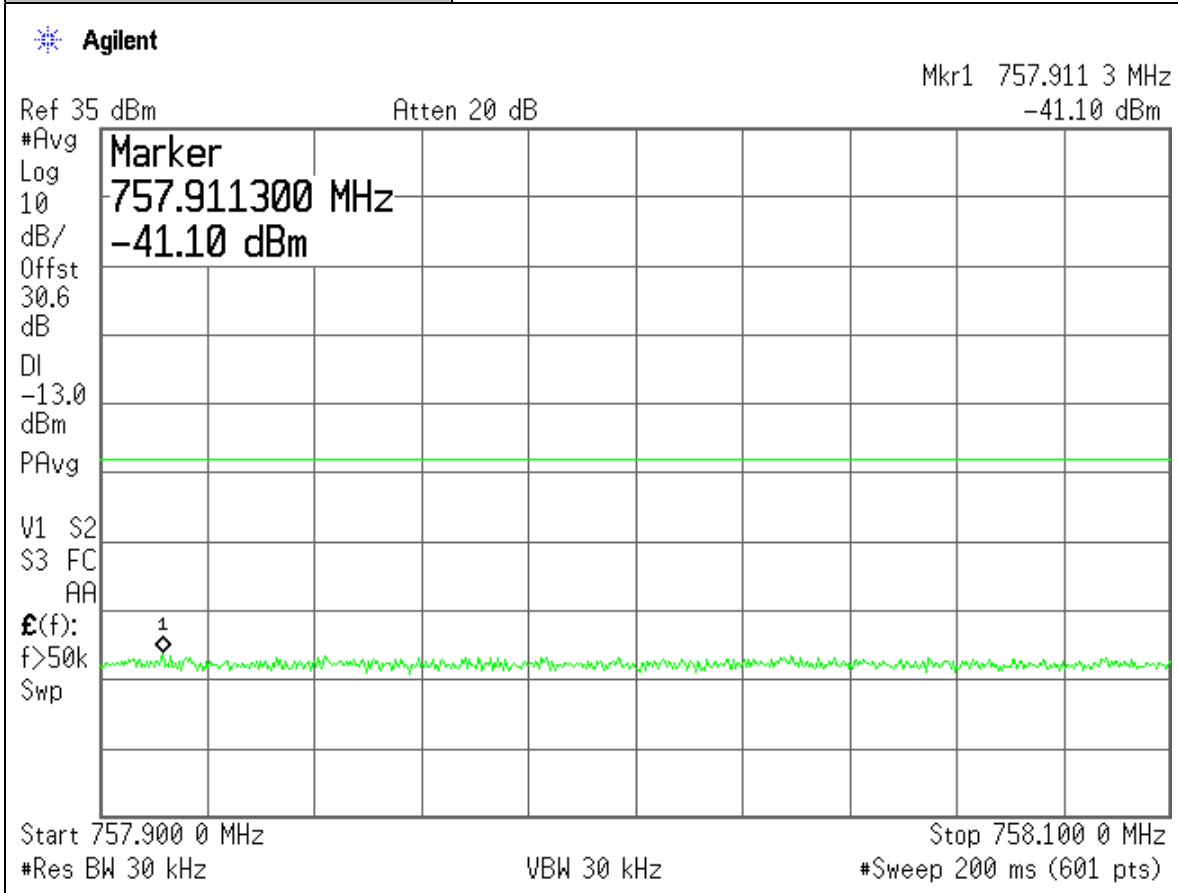
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Lower Bandedge
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



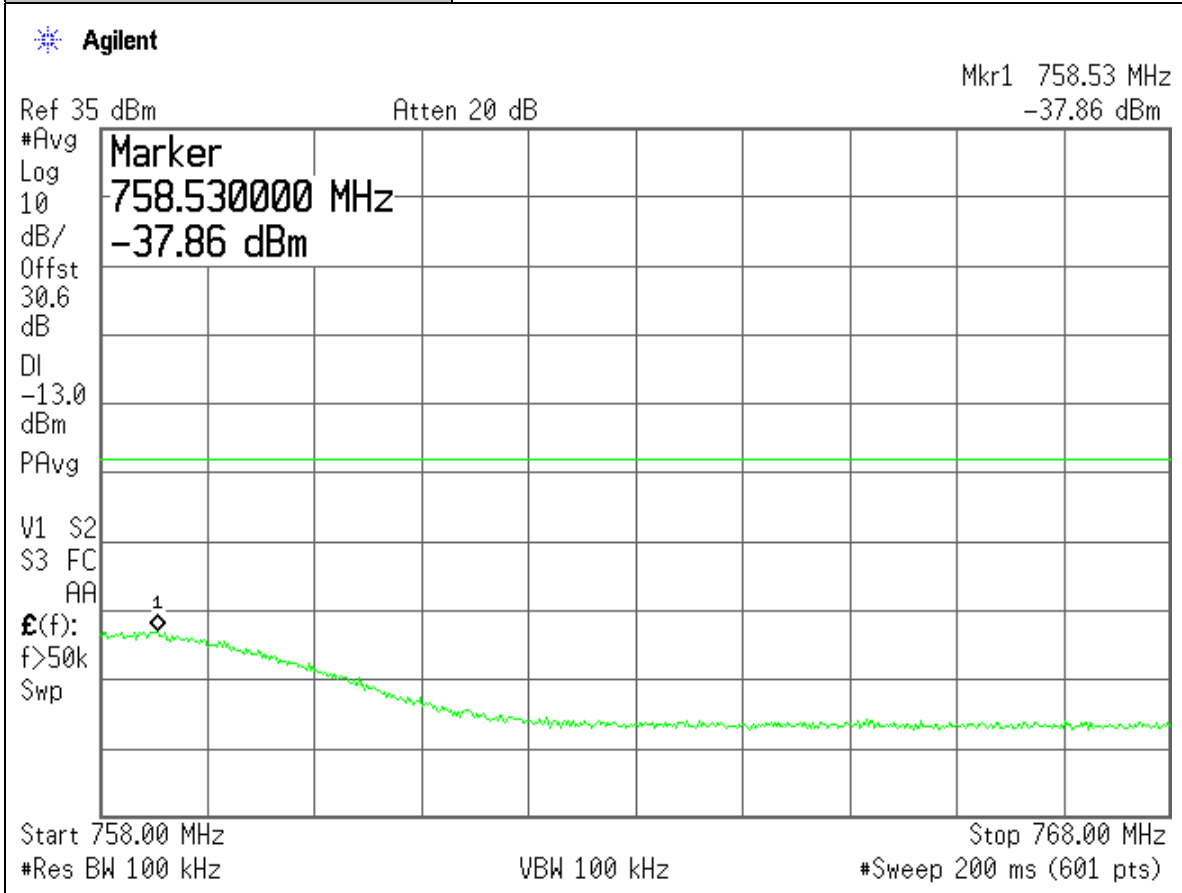
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Higher Bandedge
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



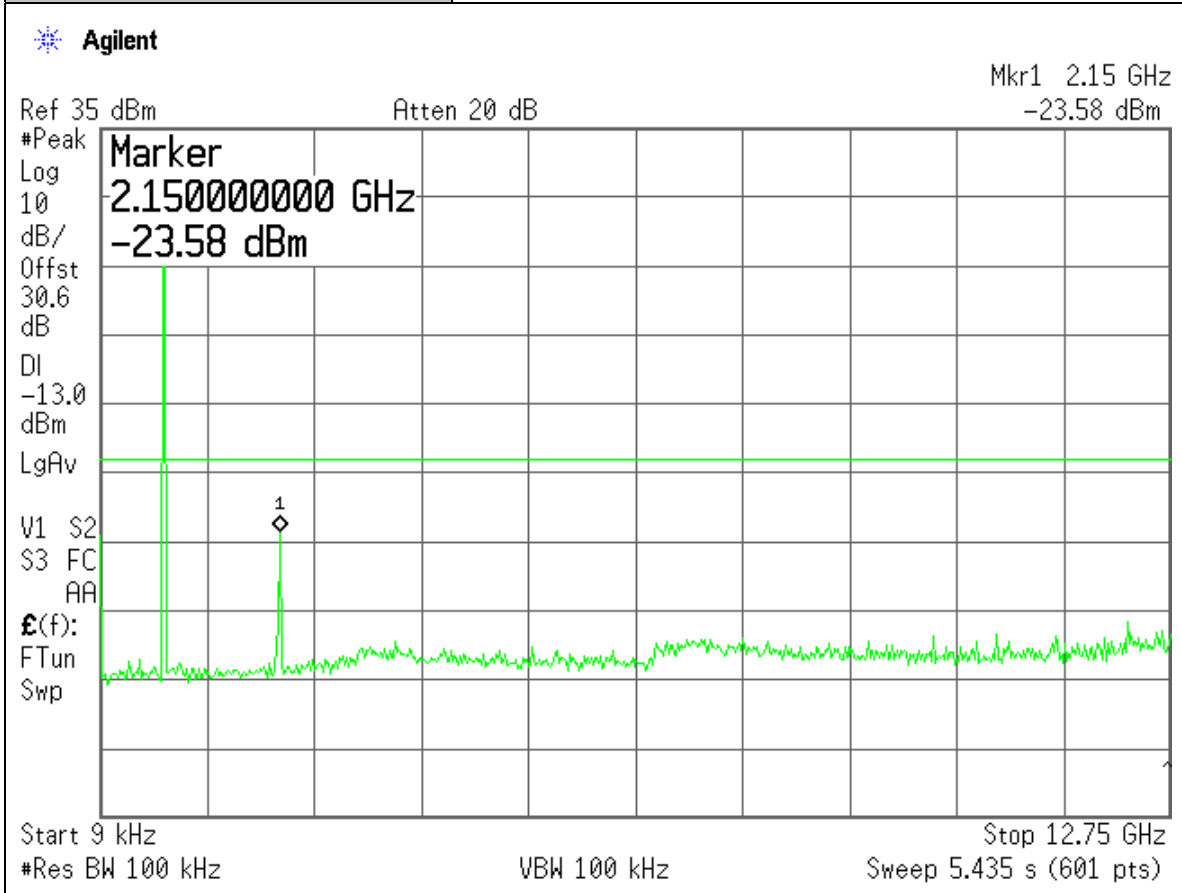
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Higher Bandedge
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



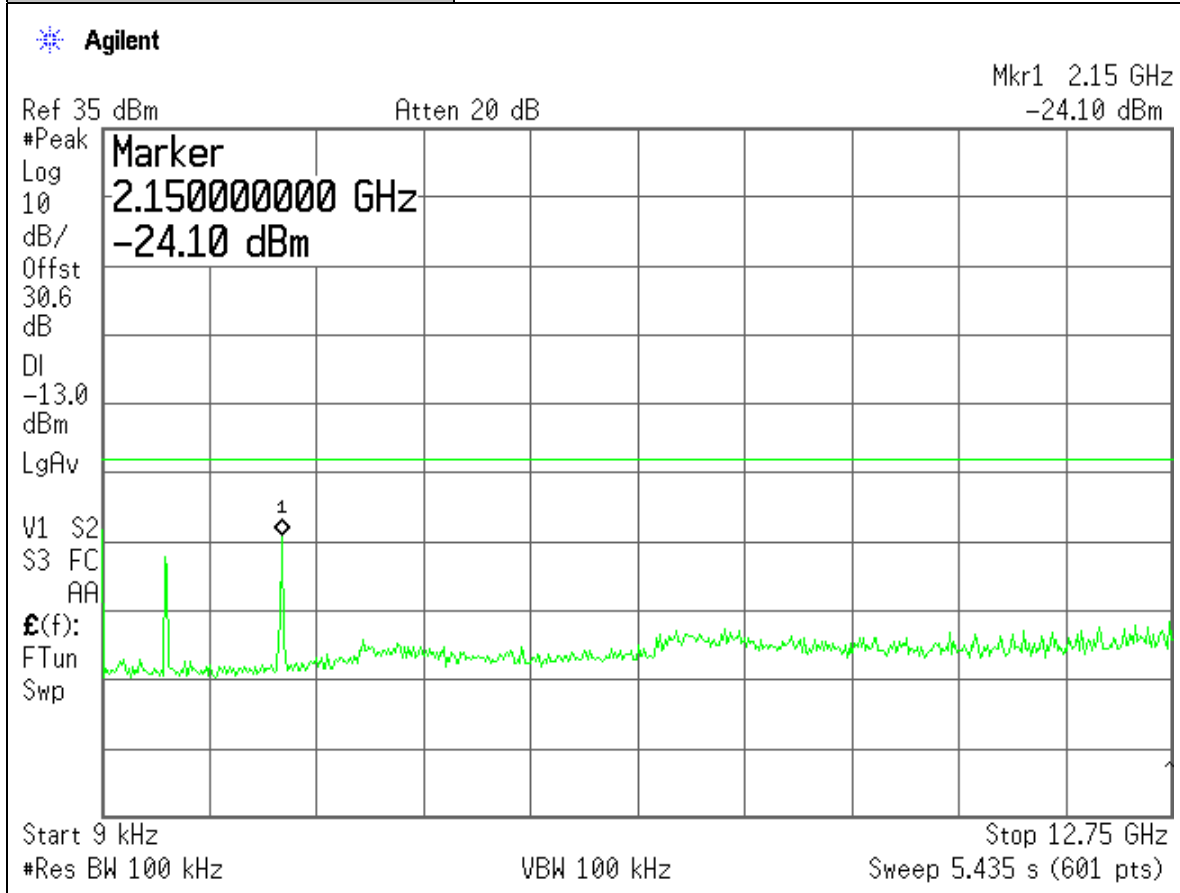
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Outband Spurious , TX ON
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



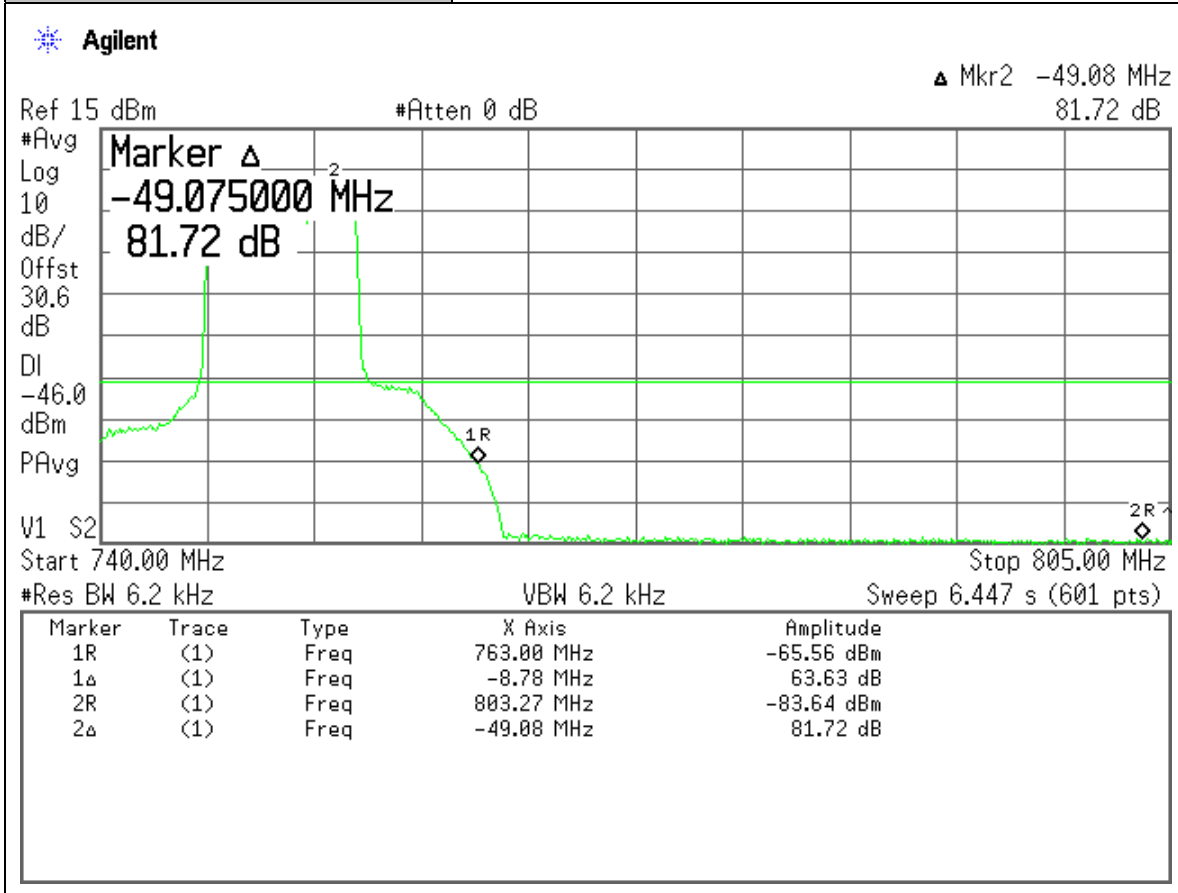
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Outband Spurious , TX OFF
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



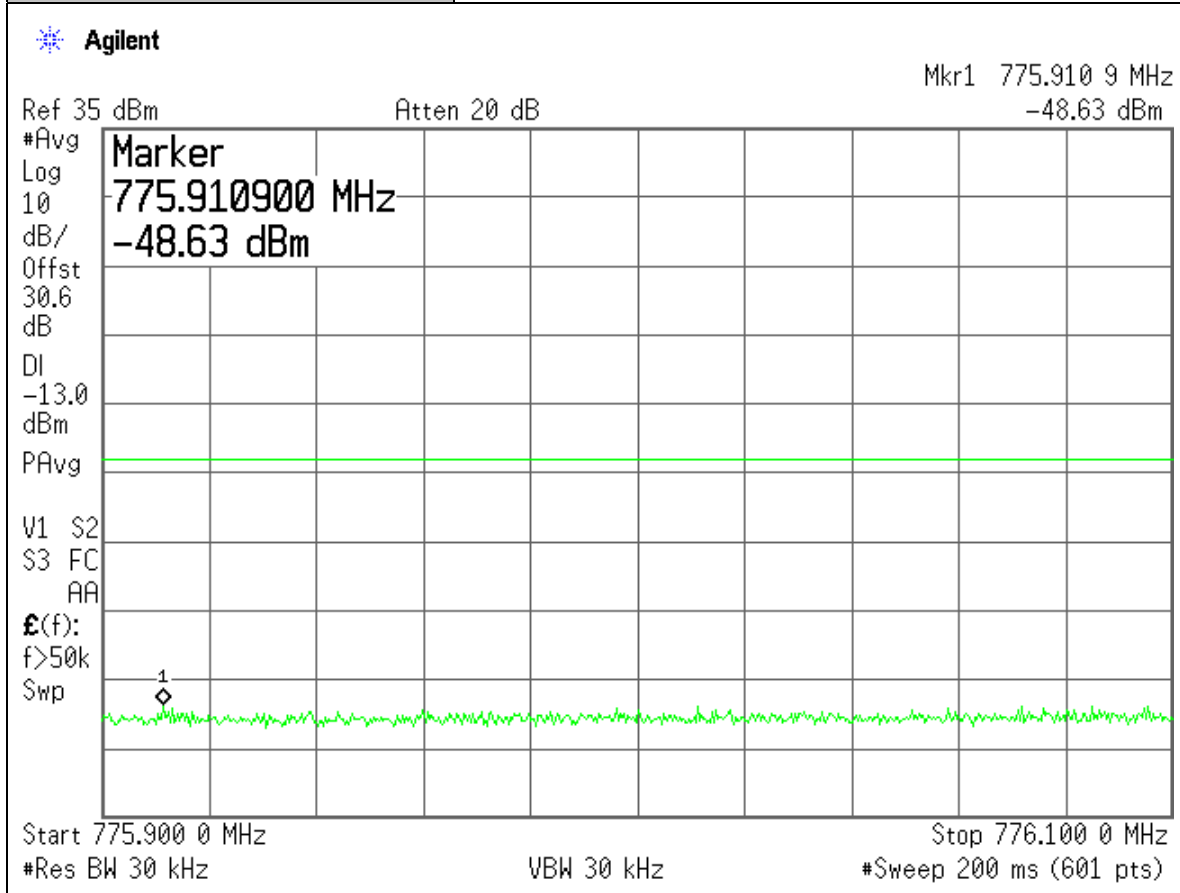
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Downlink, fc=751MHz Outband Spurious per Part 27.53 (c) 3&6
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



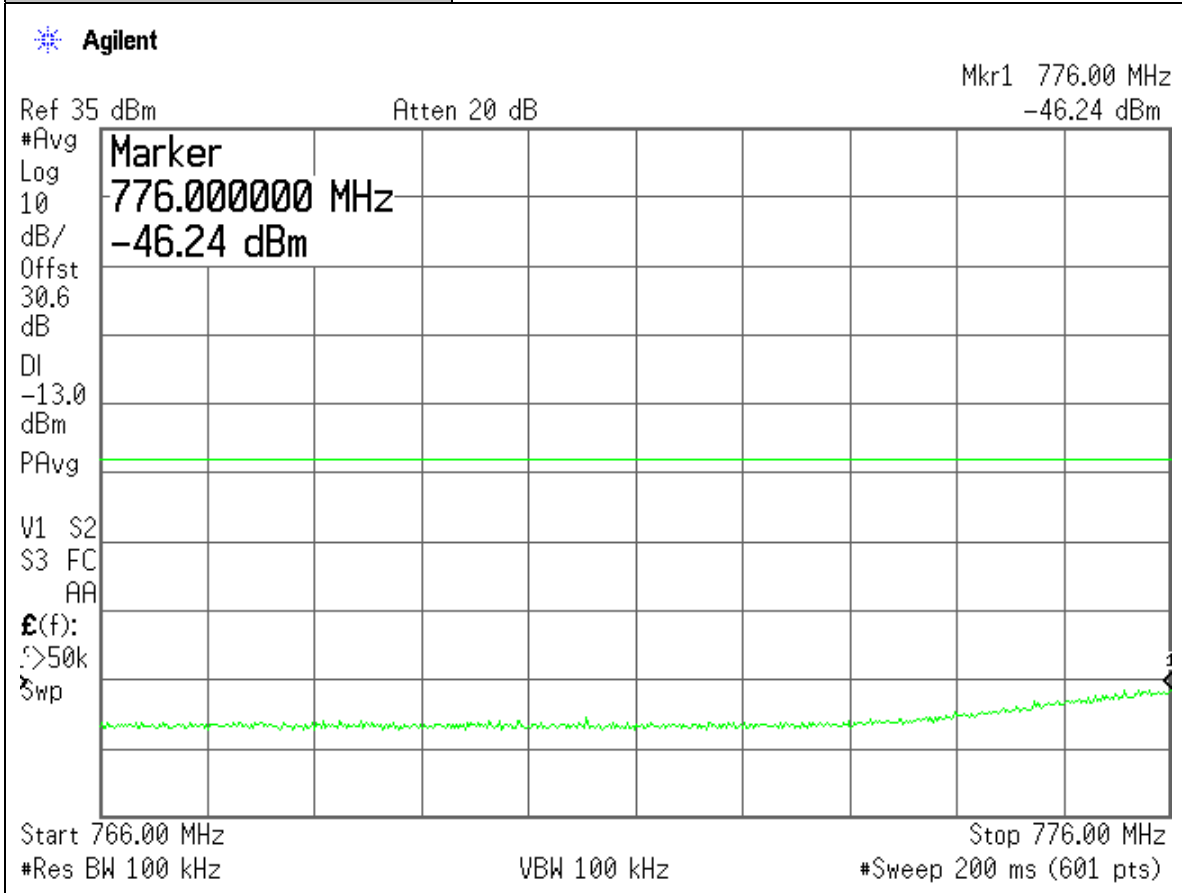
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Lower Bandedge
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



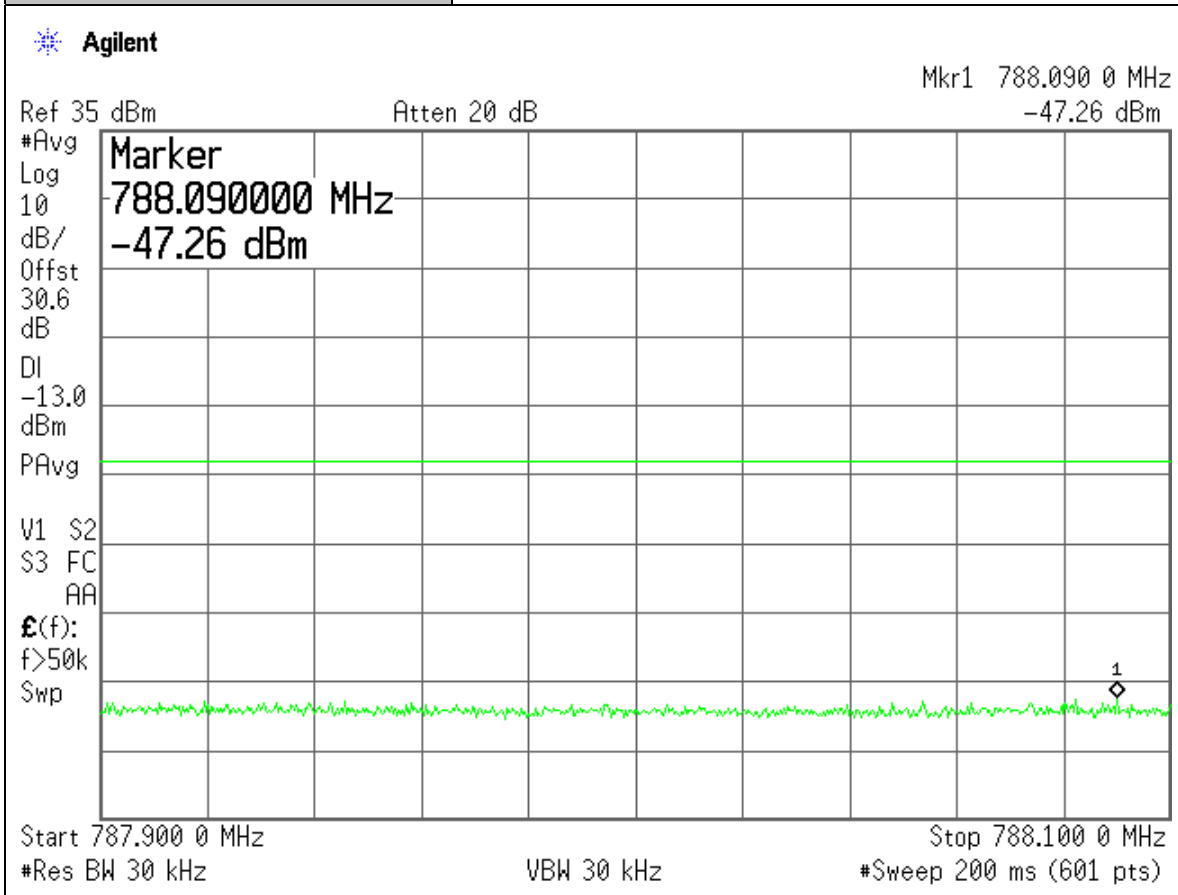
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Lower Bandedge
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



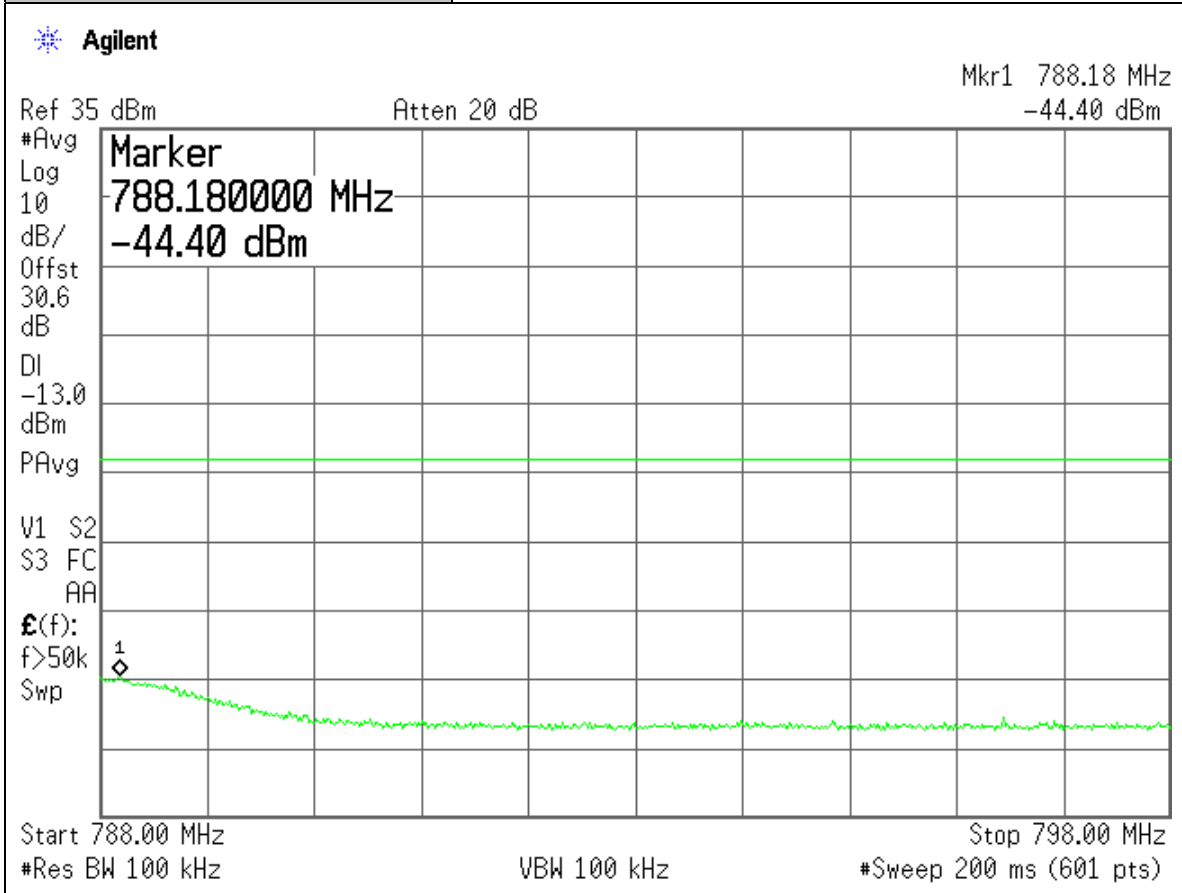
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Higher Bandedge
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



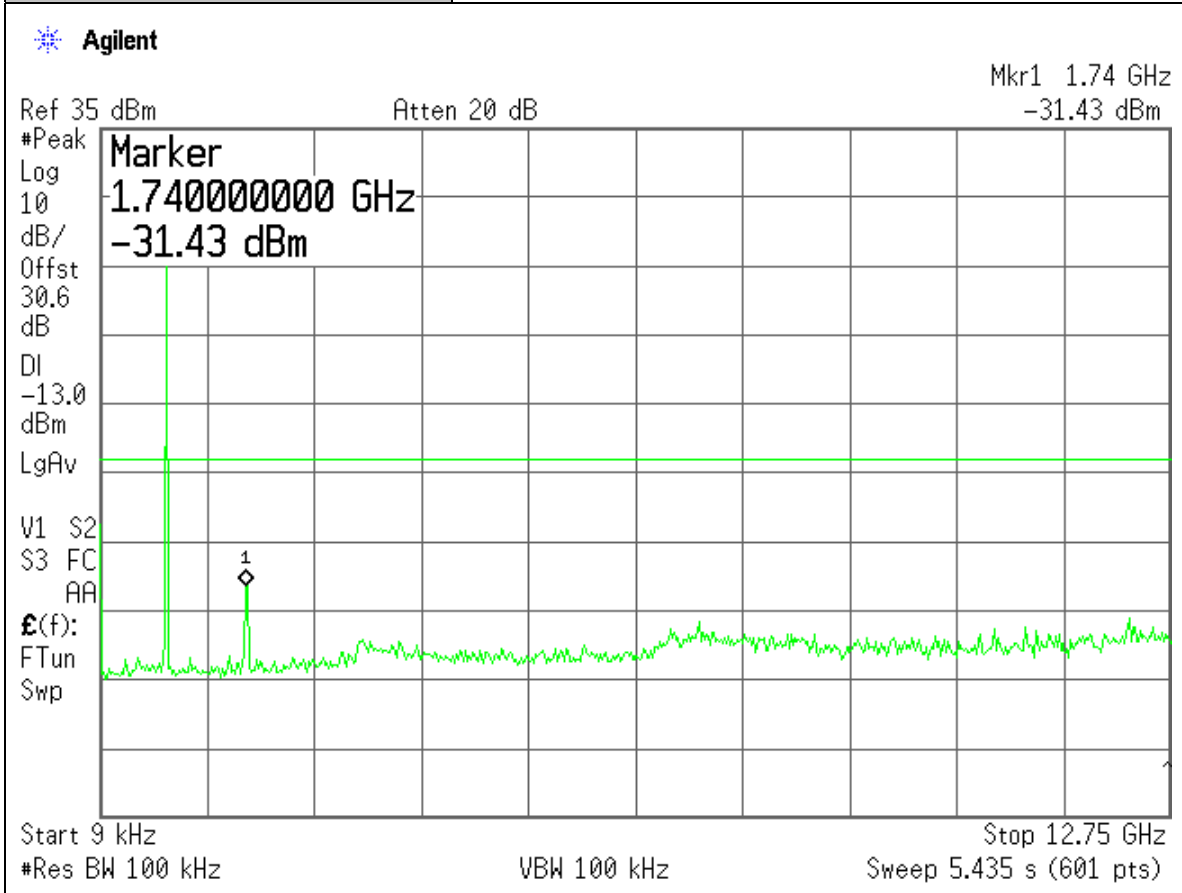
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EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Higher Bandedge
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



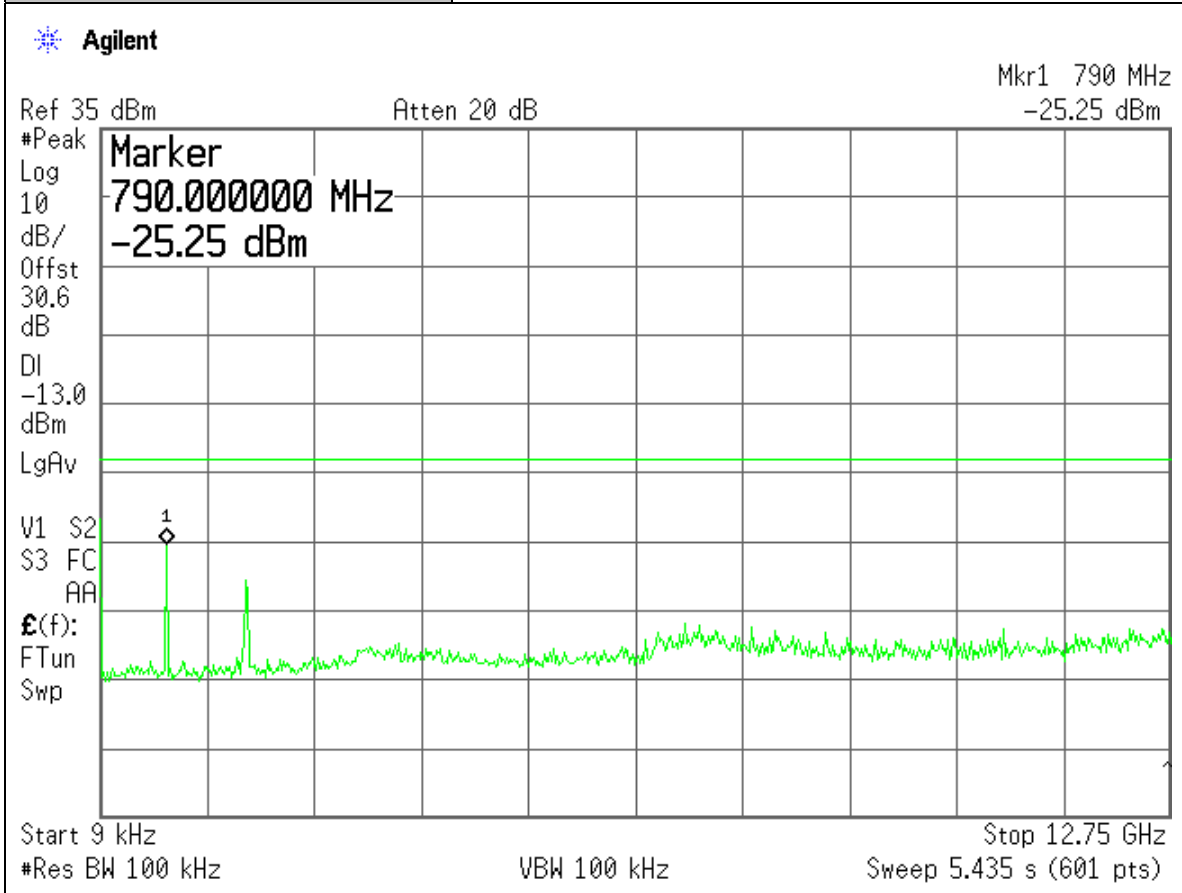
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Outband Spurious , TX ON
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



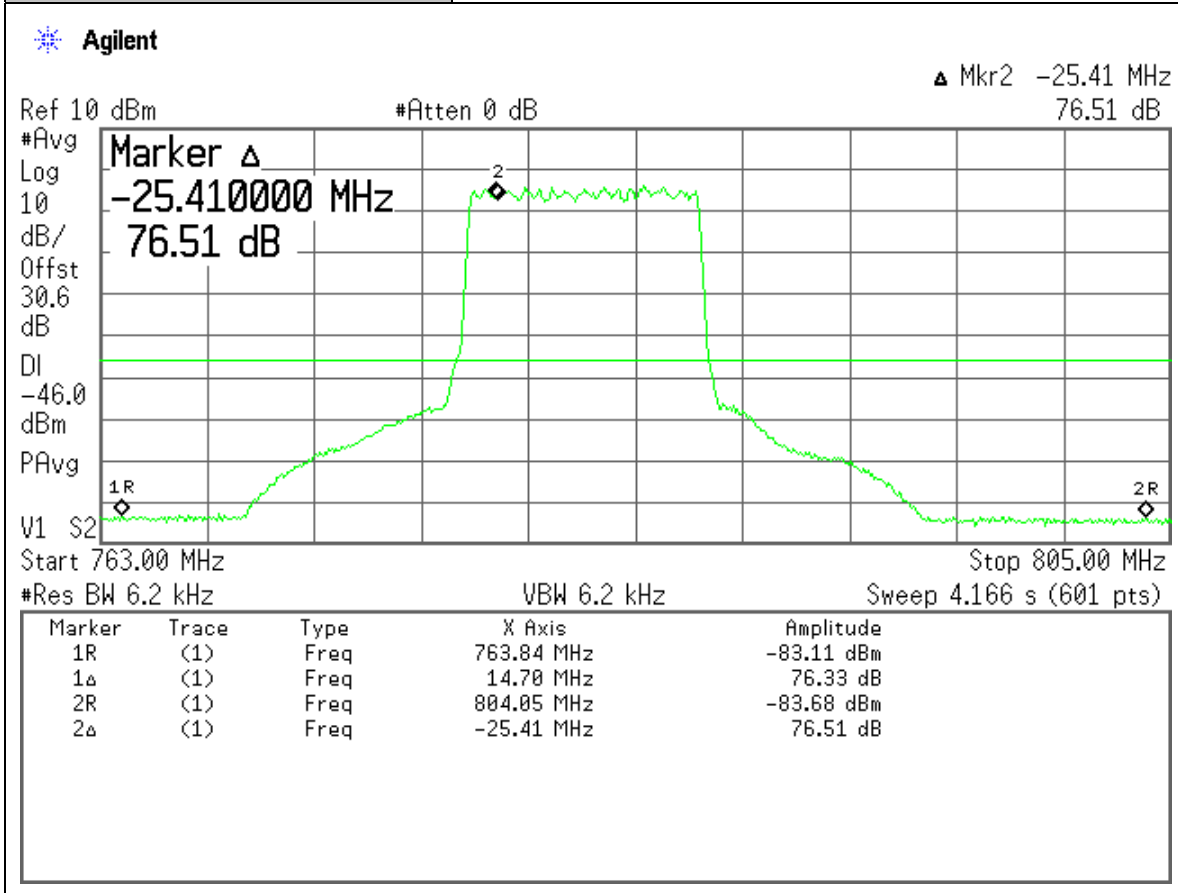
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Outband Spurious , TX OFF
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



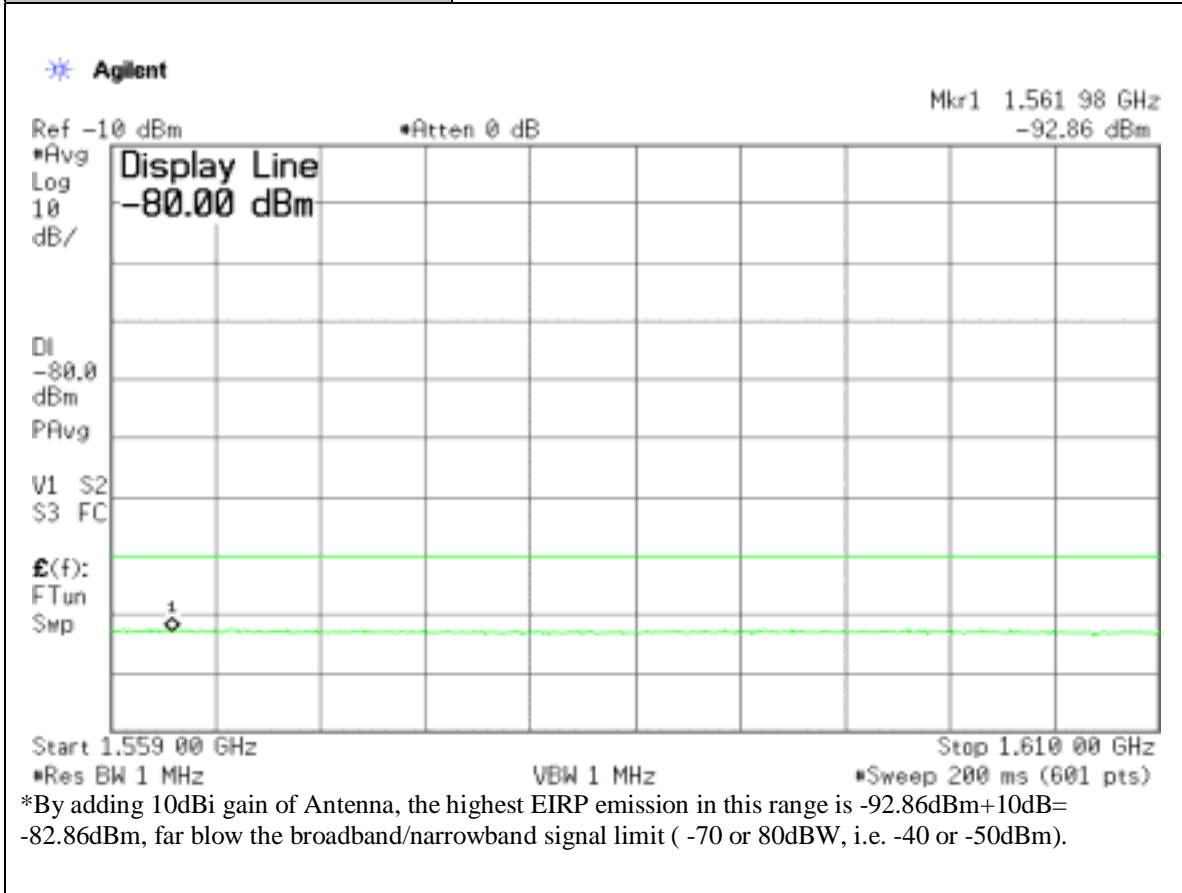
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Uplink, fc=782MHz Outband Spurious per Part 27.53 (c) 3&6
Configuration:	SG Input: -59.9dBm, Output Port: EUT BTS



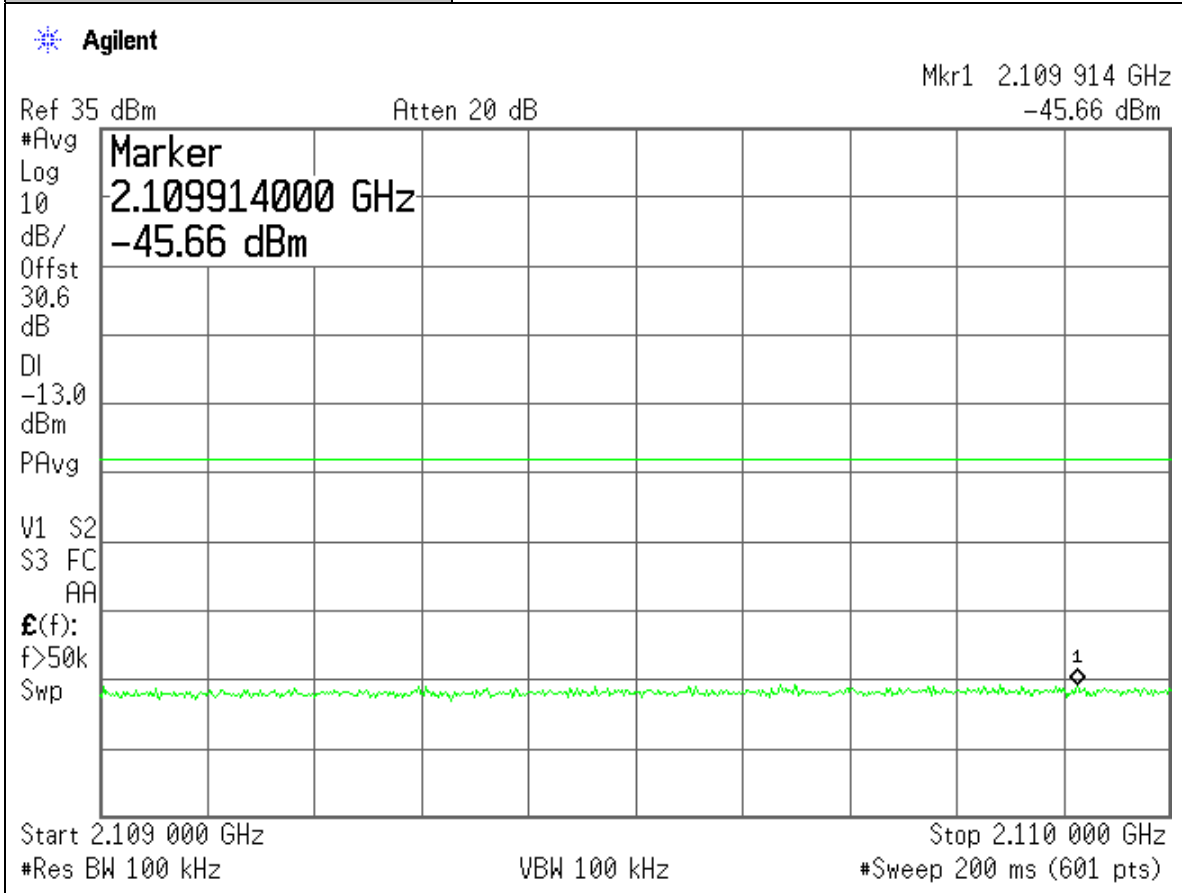
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 700 SMR Bands / LTE
Plot Name:	Outband Spurious Per27.53(f)-worst case w/ max 1MHz RBW
Configuration:	SG Input: -54.8dBm, Output Port: EUT MOBILE



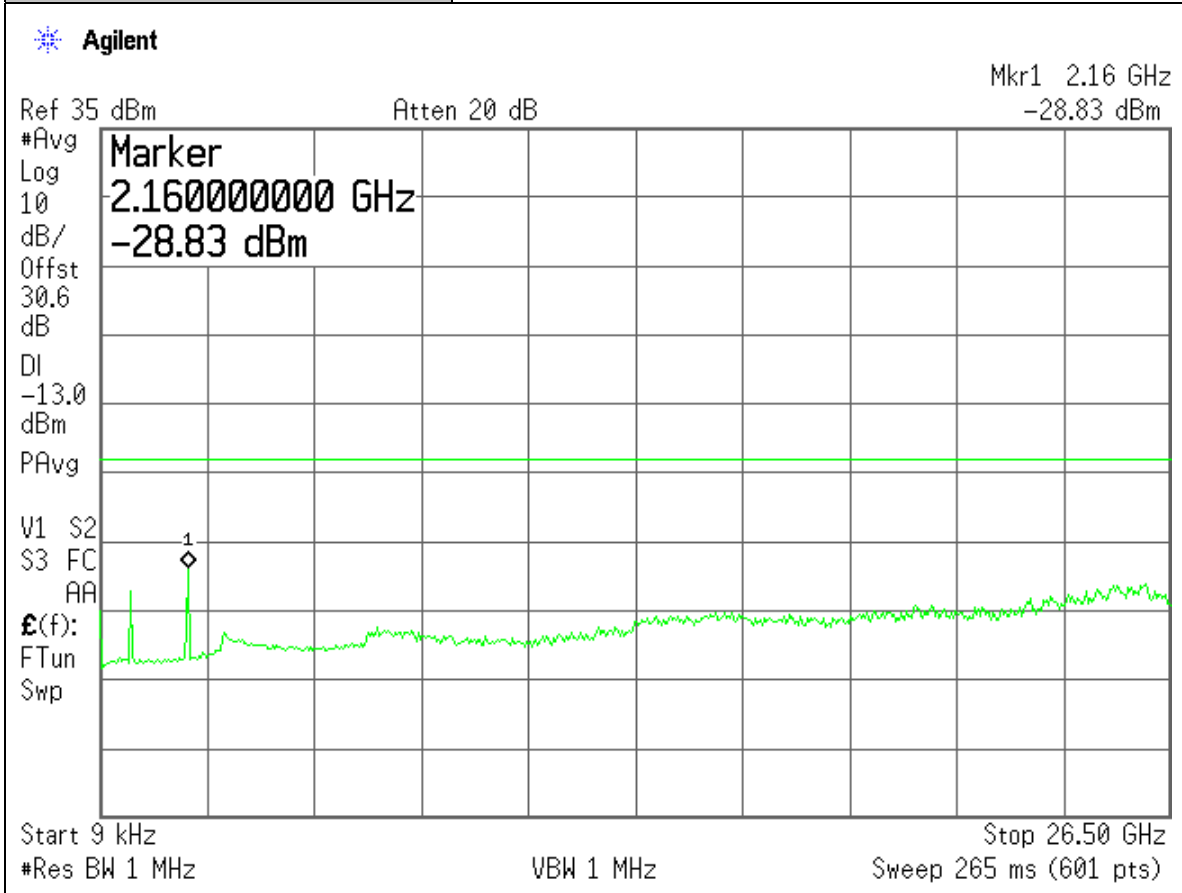
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 2100 AWS Bands / LTE
Plot Name:	Downlink, fc=2150MHz Lower Bandedge
Configuration:	SG Input: -56.4dBm, Output Port: EUT MOBILE



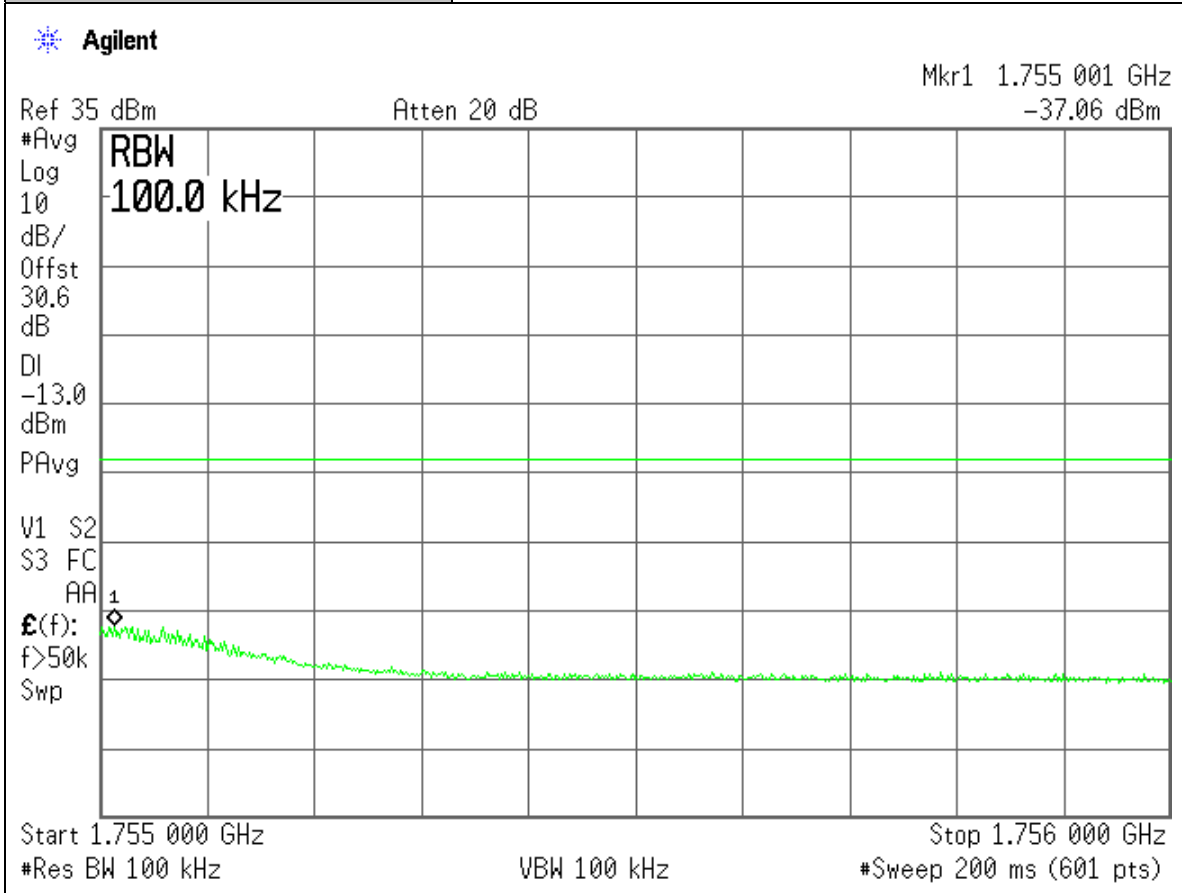
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 2100 AWS Bands / LTE
Plot Name:	Downlink, fc=2150MHz Outband Spurious, TX OFF
Configuration:	SG Input: -56.4dBm, Output Port: EUT MOBILE



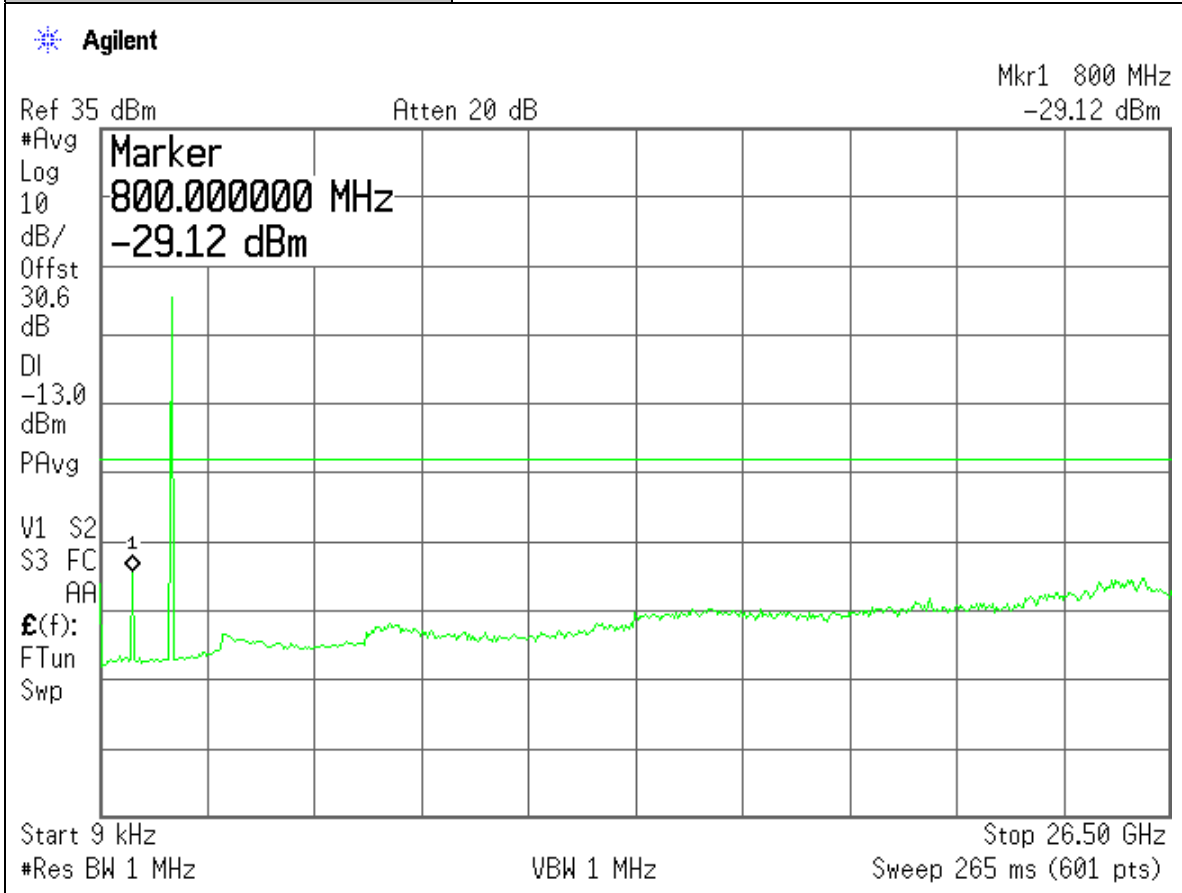
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 2100 AWS Bands / LTE
Plot Name:	Uplink, fc=1750MHz Higher Bandedge
Configuration:	SG Input: -55.0dBm, Output Port: EUT BTS



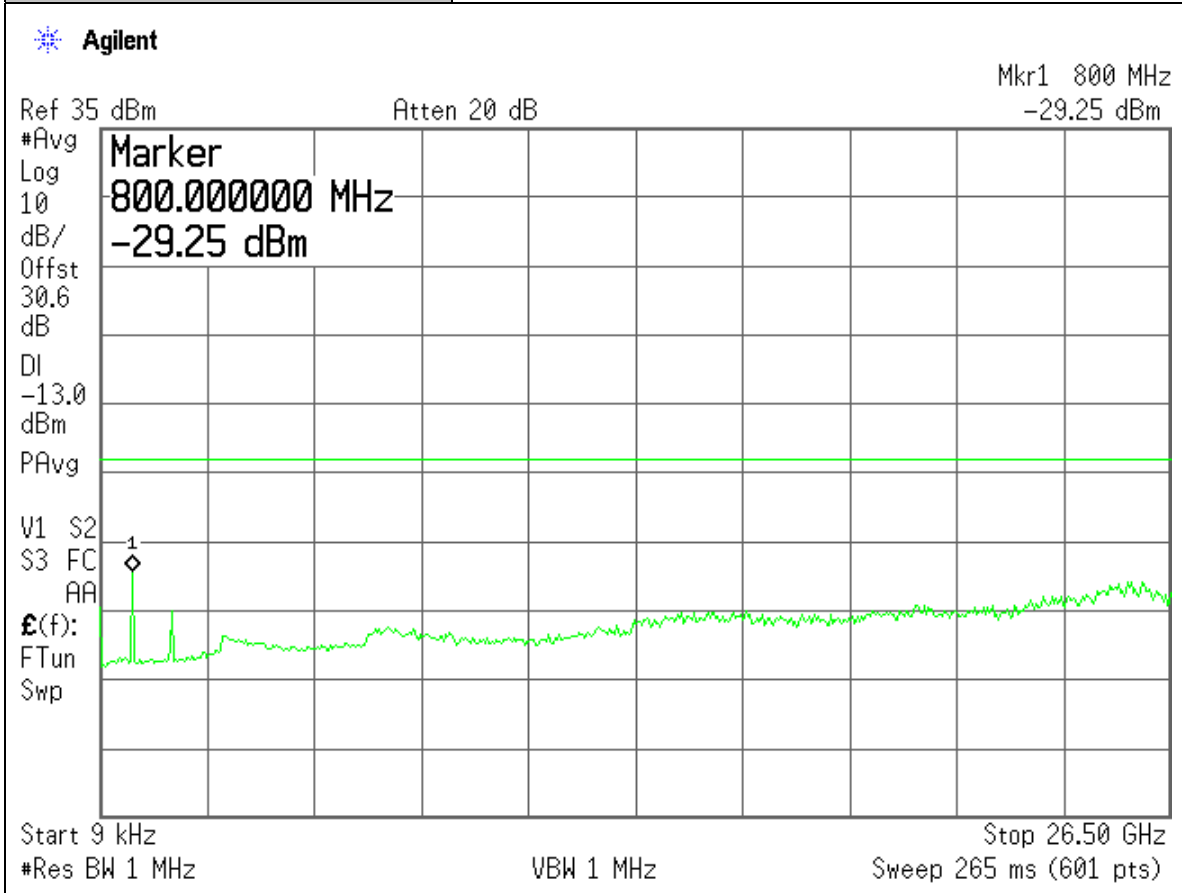
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 2100 AWS Bands / LTE
Plot Name:	Uplink, fc=1750MHz Outband Spurious, TX ON
Configuration:	SG Input: -55.0dBm, Output Port: EUT BTS



Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions at Antenna Terminals: 2100 AWS Bands / LTE
Plot Name:	Uplink, fc=1750MHz Outband Spurious, TX OFF
Configuration:	SG Input: -55.0dBm, Output Port: EUT BTS



Section 6. Field Strength of Spurious

Name of Test:	<i>Field Strength of Spurious</i>	Test Standard:	<i>2.1053</i>
Tested By:	EDWARD LEE	Test Date:	11/22/2010-12/10/2010

Minimum Para. No. 2.1053(a).

Standard: 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).

Para No. 27.53 (c) (1)

On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log$ (P) dB; (equivalent absolute limit: -13dBm).

Para No. 27.53 (f) *

For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

* Not applicable to this EUT for no antenna present.

Method of TIA/EIA-603-B-2002, Section 2.2.12

Measurement: 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	2100 AWS Bands
Band	Downlink
Channel	Fc=2150MHz

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
4300	V	50.7	-61	1.9	10.5	-54.55	-13	-41.55
6450*	V	44.0	-73	2.4	11.2	-66.35	-13	-53.35
4300	H	50.0	-62	1.9	10.5	-55.55	-13	-42.55
6450*	H	45.7	-71	2.4	11.2	-64.35	-13	-51.35
1610	H	40.7	-72	0.9	8.8	-66.25	-13	-53.25
1610	V	41.0	-72	0.9	8.8	-66.25	-13	-53.25

NOTE:* Measured noise floor above 3rd harmonics

D=1m

SA: Spectrum Analyzer

SG: Signal Generator

CL: SMA cable loss (6ft)

Worse case: Vertical**H=horizontal and V=vertical****ERP = SG reading - CL + Gain (dBi)-2.15****Margin = ERP - Limit**

Configuration	2100 AWS Bands
Band	Uplink
Channel	Fc=1750MHz

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
3500	V	55.9	-52	1.6	9.5	-46.25	-13	-33.25
5250*	V	43.2	-61	2.2	9.6	-55.75	-13	-42.75
3500	H	52.6	-55	1.5	9.5	-49.15	-13	-36.15
5250*	H	44.0	-60	2.2	9.6	-54.75	-13	-41.75
1610	H	40.9	-72	0.9	8.8	-66.25	-13	-53.25
1610	V	41.2	-72	0.9	8.8	-66.25	-13	-53.25

NOTE:

* Measured noise floor above 3rd harmonics
D=1m

SA: Spectrum Analyzer

SG: Signal Generator

CL: SMA cable loss (6ft)

Worse case: Vertical

H=horizontal and V=vertical

ERP = SG reading - CL + Gain (dBi)-2.15

Margin = ERP - Limit

Configuration	700 SMR Bands
Band	Downlink
Channel	Fc=751MHz

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
2253	V	39.8	-71	1.2	9.3	-65.05	-13	-52.05
2253	H	40.2	-71	1.2	9.3	-65.05	-13	-52.05
1610	H	40.4	-72	0.9	8.8	-66.25	-13	-53.25
1610	V	41.2	-72	0.9	8.8	-66.25	-13	-53.25

NOTE:

* Measured noise floor above 3rd harmonics
D=1m

SA: Spectrum Analyzer

SG: Signal Generator

CL: SMA cable loss (6ft)

Worse case: Vertical

H=horizontal and V=vertical

ERP = SG reading - CL + Gain (dBi)-2.15

Margin = ERP - Limit

Configuration	700 SMR Bands
Band	Uplink
Channel	Fc=782MHz

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
2346	V	42.7	-68	1.2	9.1	-62.25	-13	-49.25
3128*	V	39.0	-70	1.4	8.9	-64.65	-13	-51.65
2346	H	43.0	-68	1.2	9.1	-62.25	-13	-49.25
3128*	H	38.6	-70	1.4	8.9	-64.65	-13	-51.65
1610	H	40.3	-72	0.9	8.8	-66.25	-13	-53.25
1610	V	41.3	-72	0.9	8.8	-66.25	-13	-53.25

NOTE:

* Measured noise floor above 3rd harmonics
D=1m

SA: Spectrum Analyzer

SG: Signal Generator

CL: SMA cable loss (6ft)

Worse case: Vertical

H=horizontal and V=vertical

ERP = SG reading - CL + Gain (dBi)-2.15

Margin = ERP - 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:	11/22/2010-12/10/2010

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:	11/22/2010-12/10/2010

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.

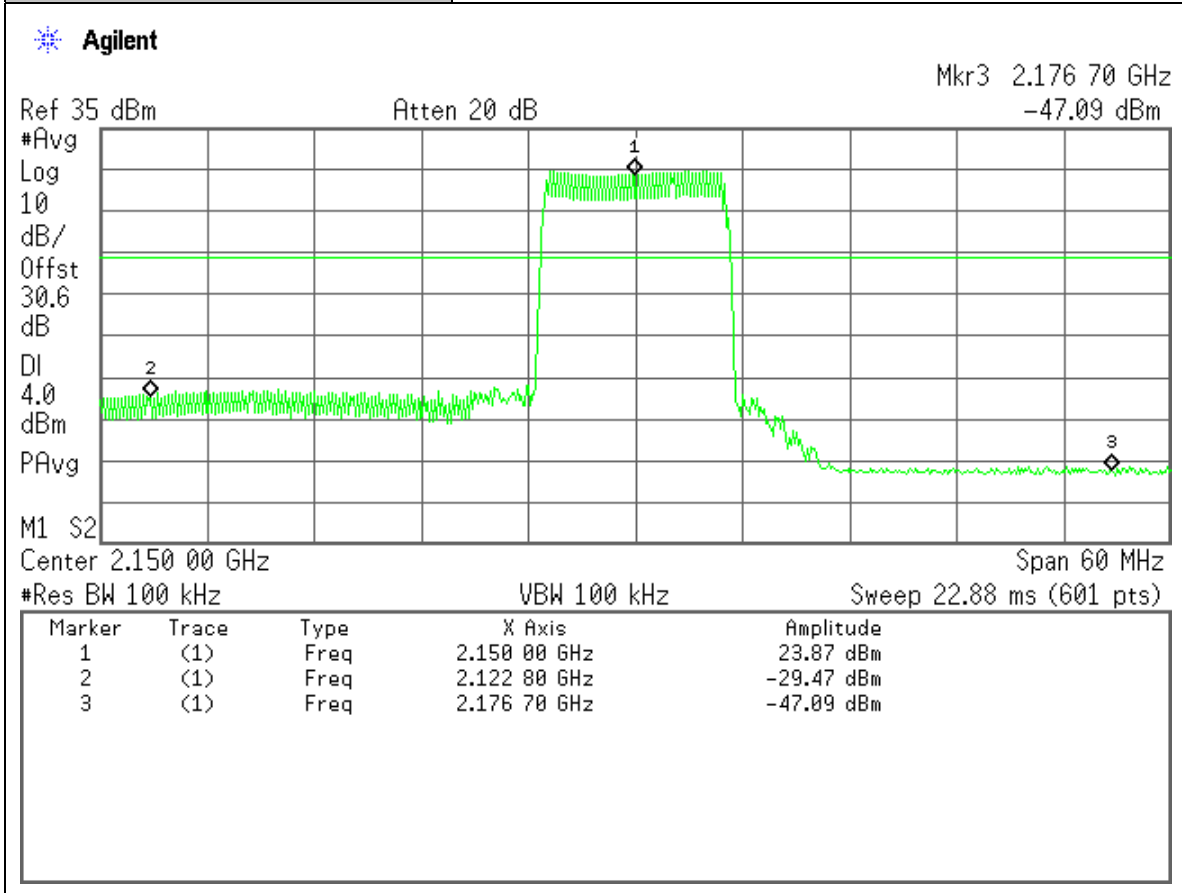
Method of Measurement: Adjust the internal gain control of the equipment under test to the nominal gain for which equipment certification is sought. With the aid of a signal generator and spectrum analyzer, measure the 20 dB bandwidth of the amplifier (i.e. at the point where the gain has fallen by 20 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)

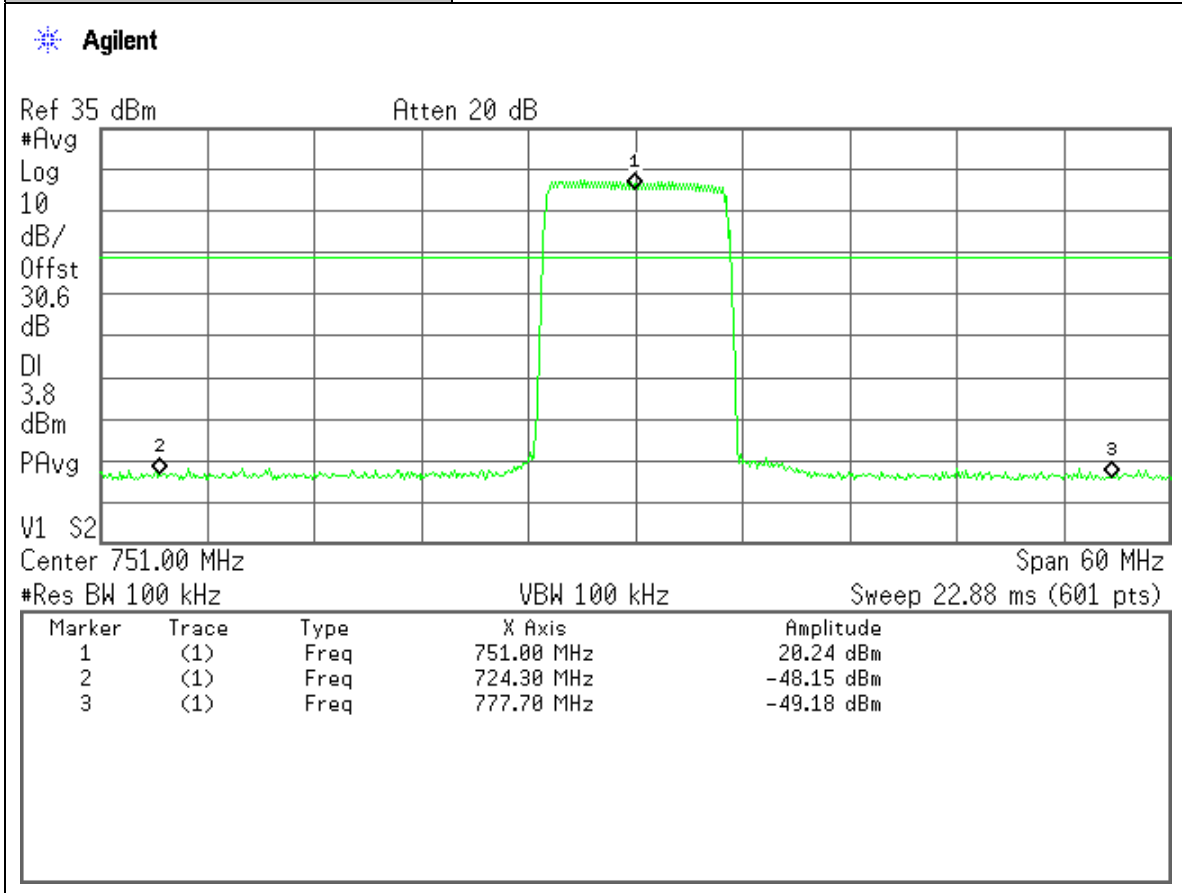
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Test By:	Edward Lee
Temperature:	70°F
Humidity:	30%

Section:	Pass Band Gain & 20dB Bandwidth
Plot Name:	2100 AWS Downlink Full Band-250% Span
Configuration:	EUT BTS Port was connected to SG. Input: -60dBm



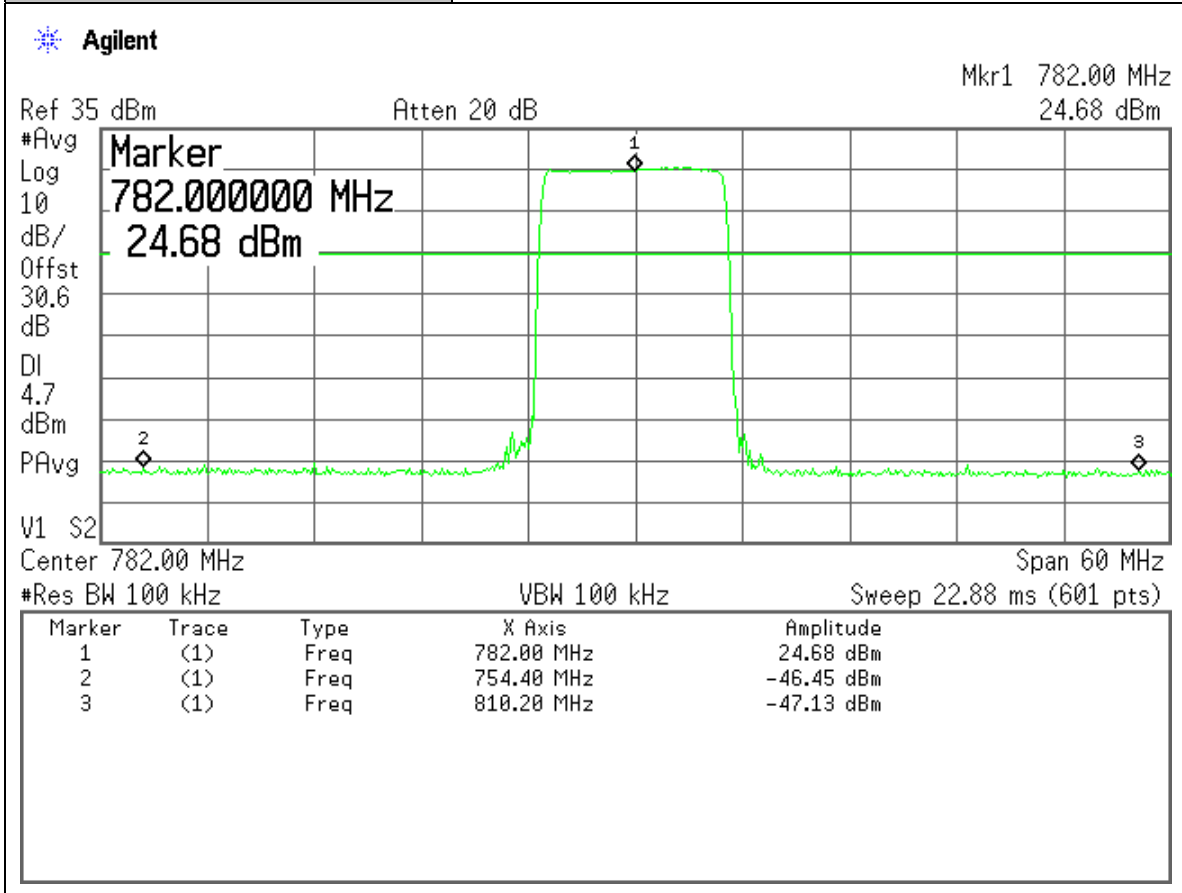
Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Test By:	Edward Lee
Temperature:	70°F
Humidity:	30%

Section:	Pass Band Gain & 20dB Bandwidth
Plot Name:	700 SMR Downlink Full Band-250% Span
Configuration:	EUT BTS Port was connected to SG. Input: -60dBm



Project Number:	0048-101122-01
EUT:	Shyam DB6M Dual Band Repeater
SN:	D6M30GFJ01
Test By:	Edward Lee
Temperature:	70°F
Humidity:	30%

Section:	Pass Band Gain & 20dB Bandwidth
Plot Name:	700 SMR Uplink Full Band-250% Span
Configuration:	EUT MOBILE Port was connected to SG. Input: -60dBm



Section 9. Test Equipment List

Manufacture	Model	Serial No.	Description	Cal Due dd/mm/ yy
HP	HP8546A	3448A00290	EMI Receiver	15/09/11
HP	E4432B	US38220355	250K-3GHz Signal Generator	15/07/11
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	15/09/11
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/11
Fischer Custom	LIPARTS NO.-2	900-4-0008	Line Impedance Stabilization Networks	15/09/11
Fischer Custom	LIPARTS NO.-2	900-4-0009	Line Impedance Stabilization Networks	23/08/11
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/11
EMCO	3115	4945	Double Ridge Guide Horn Antenna	13/09/11
HP	8569B	2607A02802	1GHz-22GHz Spectrum Analyzer	10/02/11
Delta Design	5900C	0-67-26	Temperature Chamber	24/03/11
HP	E8254A	US42110367	Signal Generator	23/03/11
Electro-Metrics	RGA-15	8-95	Double Ridge Guide Horn Antenna	10/02/11
EMCO	3116	4943	Double Ridge Guide Horn Antenna	11/01/11
Scientific-Atlanta	12A-18	441	Wave Guide Horn Antenna	04/08/11
HP	4419A	US37292112	RF Power Meter w/ Sensor Probe	20/07/11
Chamber	GD-32-33	LN2	Temperature Chamber	28/07/11
HP	6032A	3323A-09526	System Power Supply	01/07/11
Agilent	E4438C	US41460731	ESG Vector Signal Generator	01/07/11
Agilent	E4438C	US41460771	ESG Vector Signal Generator	01/07/11
Agilent	E4438C	US41460400	ESG Vector Signal Generator	01/07/11
Lorch Microwave	5NF- 800/1000-S	AC3	Notch Filter	
Lorch Microwave	5NF- 1800/2200-S	AE10	Notch Filter	
RES-NET	RFA500NFF 30	0108	30dB in-line Power Attenuator	
Narda	3022	80986	Directional Coupler	
General Purpose			0-60V, 50A DC Power Supply	