

REGULATORY COMPLIANCE REPORT

TITLE: FCC, CCU100 Tower, Long Message, Test Report for FHSS

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REV	CCO	DESCRIPTION OF CHANGE	DATE	APPROVALS	
001		INITIAL RELEASE		Engineering	
				Regulatory	

REVISION HISTORY

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Test Data Summary

FCC 15.247
Frequency Hopping Transmitter, 903-926.8*MHz
FCC:EO9CCU100

Serial Numbers: 7404FCC4

Updated measurements:

Rule	Description	Previous reading	updated reading	Pass/Fail
Part 15.247(a)(1)(i)	Time of Occupancy	17.25 mS	23.78 mS	Pass

Validation measurements:

Rule	Description	Previous reading	Validation/updated reading	Max Variance
Part 15.247(b) (2)	Maximum Output Power Conducted @ 915MHz AM 16.0K Baud	27.9 dBm	27.95 dBm	.05 dBm

* see supporting exhibits in this filing for compliance to 926.9MHz.

Rule versions: FCC Part 1 (01-2006), FCC Part 2 (01-2006), FCC Part 15 (02-01-2006), RSS-102 Issue 2 (11-2005), RSS-210 Issue 7 (June 2007), RSS-Gen Issue 2 (06-2007).

Reference docs: ANSI C63.4-2003, DA 00-705 (03-30-2000), OET65 (08-1997), OET65C (06-2001), IEEE C95.3-2002.

Cognizant Personnel	
<u>Name</u> Jon Smitham	<u>Title</u> R&D Manager
<u>Name</u> Jay Holcomb	<u>Title</u> Regulatory Manager
<u>Name</u> Jim Anselmo	<u>Title</u> Engineer

CONDITIONS DURING TESTING

No Modifications to the EUT were necessary during the testing.

EUT Operating Frequency

The EUT was operating at 903 MHz – 926.8 MHz

Temperature and Humidity During Testing

The temperature during testing was within +15° C and +35° C.

The Relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

Itron declares that the EUT tested was representative of a production unit.

EQUIPMENT UNDER TEST

Transmitter Module

Manufacturer: Itron, Inc.
Model: CCU100T, Tower CCU
Serial: 7404FCC4
FCC ID: -

Filter

Itron Part No. FLT-0094-001
Manufacturer: Delta

15.247(a) (1) (i)**Time of Occupancy**

Verify that the transmitted signal does not occupy a single frequency for more than 400 mS in a 20 second period.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1 MHz

VBW \geq RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

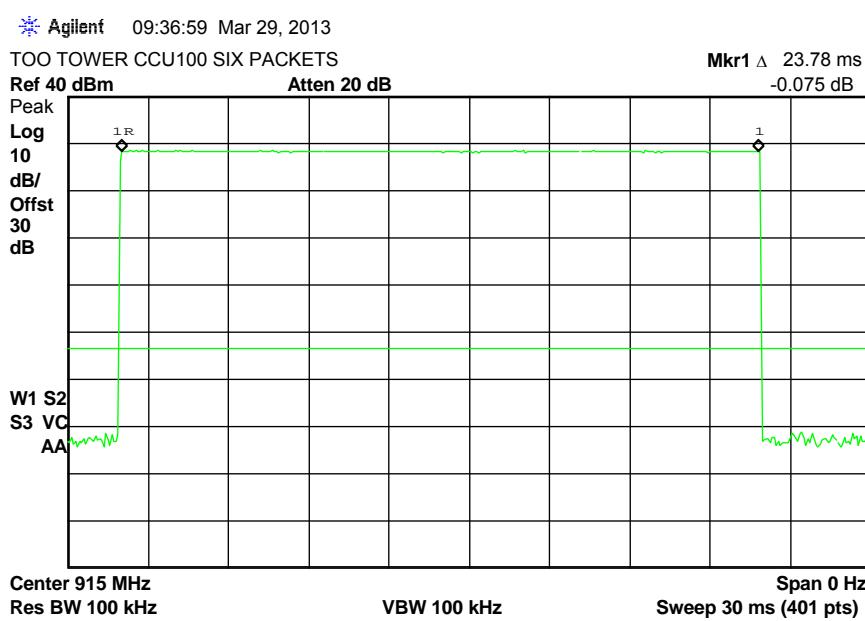
Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. Submit this plot(s).

Each transmission is now a maximum of 23.8 ms long (as opposed to the 16.23 ms from the original filing). Each transmission takes place on one of 120 different channels in a pseudo-random sequence. All 120 channels are used equally on the average. The algorithm that determines the pseudo-random hop sequence does not allow the device to transmit on the same channel more than 6 times in a 20 second period. The maximum possible occupancy time on any one frequency is now 142.8 mS or 6 times within a 20 second period.

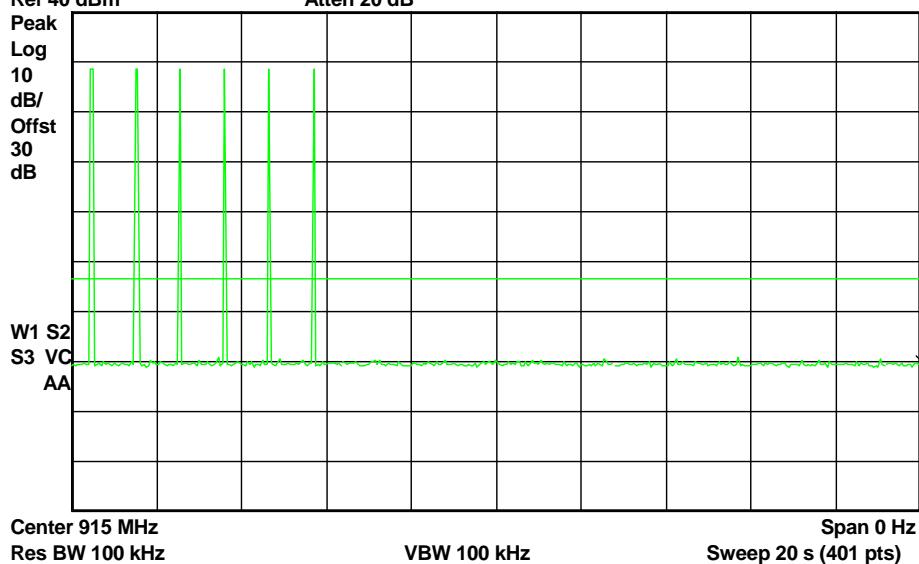
Equipment Used	Serial Number	Cal Date	Due
HP4407B	MY45107856	3/13	3/15
Date	Tested by		
3/29/2013	Jim Anselmo		



Agilent 09:35:00 Mar 29, 2013

TOO TOWER CCU100 SIX PACKETS

Ref 40 dBm Atten 20 dB



15.247(b) (2)**Power Output**

The maximum peak conducted output power of the intentional radiator shall not exceed the following: For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.

RBW > the 20 dB bandwidth of the emission being measured.

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

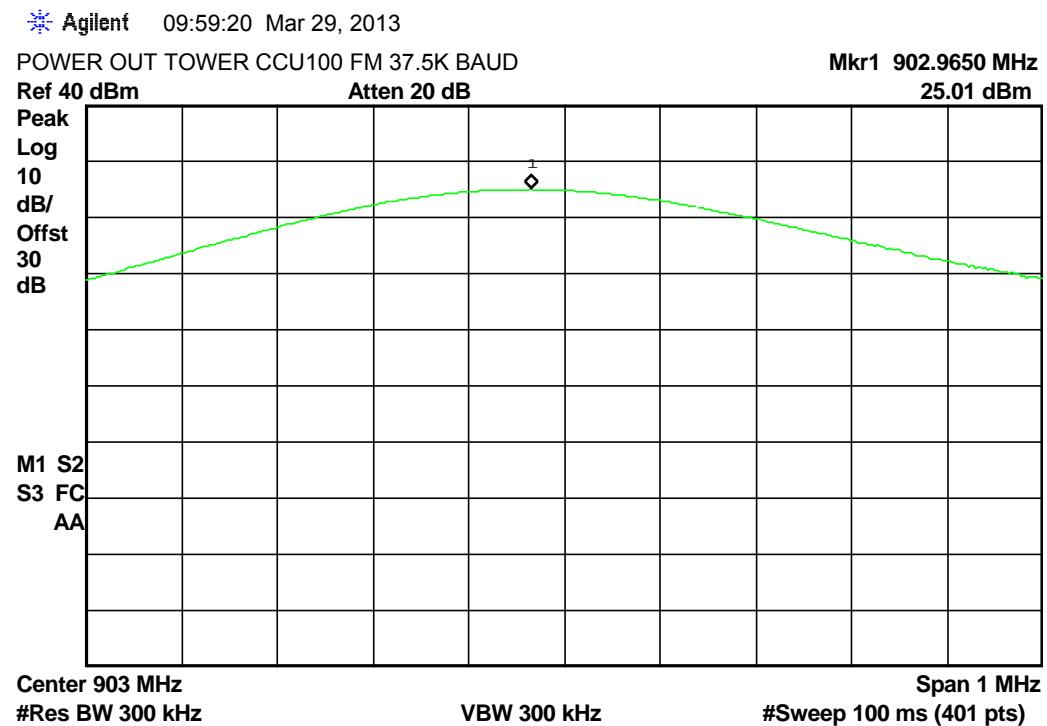
Set RF level offset=cable loss

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power. The limit is specified in one of the subparagraphs of this Section. Submit this plot. A peak responding power meter may be used instead of a spectrum analyzer.

Note: The purpose of this test is to validate the report from 2011, since over a year has passed. No changes are being made to this product except for the new maximum message length.

Equipment Used	Serial Number	Cal Date	Due
HP4407B	MY45107856	3/11	3/15
Date	Tested by		
3/29/2013	Jim Anselmo		

Modulation: 37.5K baud FM			
Frequency (MHz)	Power out (dB)		Variance dB
	taken 9/13/2010	taken 3/29/2013	
903	24.6	25.01	0.41
915	25.9	27.94	2.04
926.8	11.5	26.49	14.99 (Note 1)



Agilent 10:00:05 Mar 29, 2013

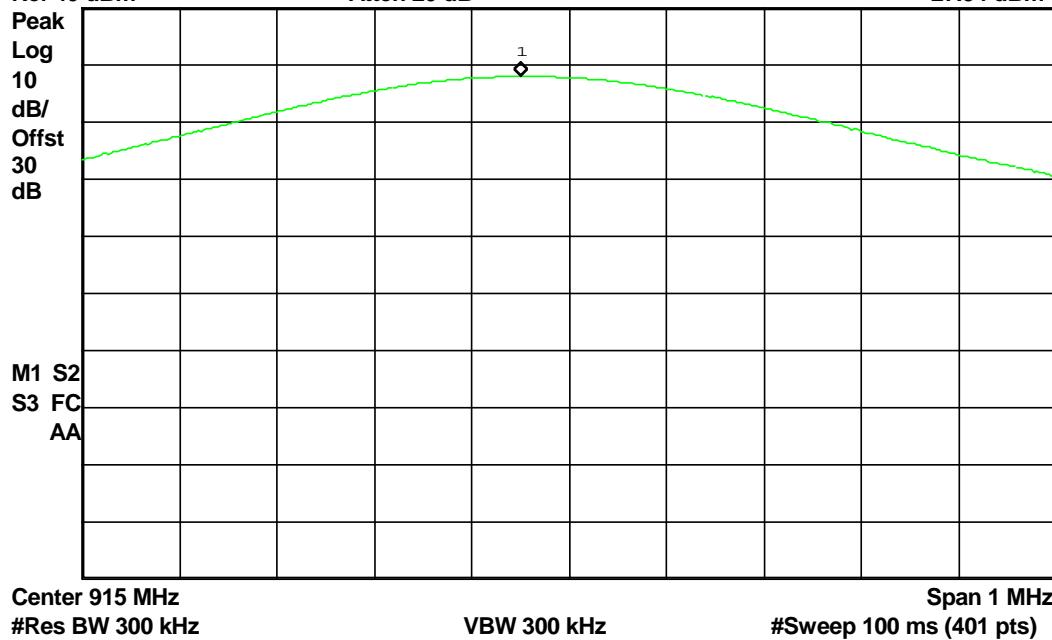
POWER OUT TOWER CCU100 FM 37.5K BAUD

Ref 40 dBm

Atten 20 dB

Mkr1 914.9500 MHz

27.94 dBm



Agilent 10:00:51 Mar 29, 2013

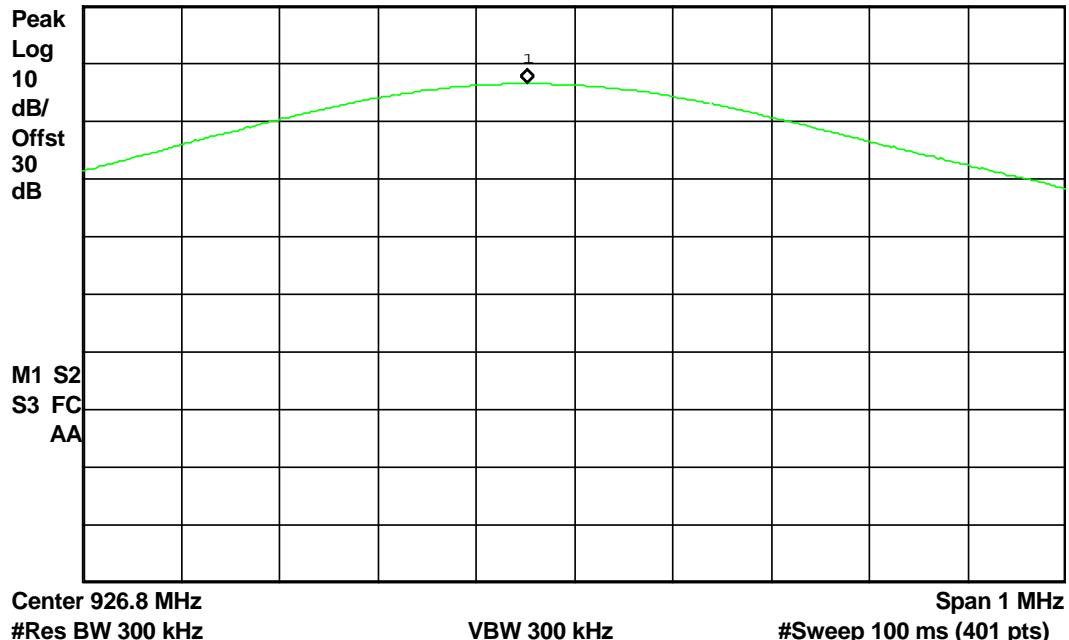
POWER OUT TOWER CCU100 FM 37.5K BAUD

Ref 40 dBm

Atten 20 dB

Mkr1 926.7525 MHz

26.49 dBm



Modulation: 12.5K baud FM			
Frequency (MHz)	Power out (dB)		Variance dB
	taken 9/13/2010	taken 3/29/2013	
903	24.7	24.84	0.14
915	26.6	27.90	1.3
926.8	11.9	26.49	14.59 (Note 1)

Agilent 09:55:36 Mar 29, 2013

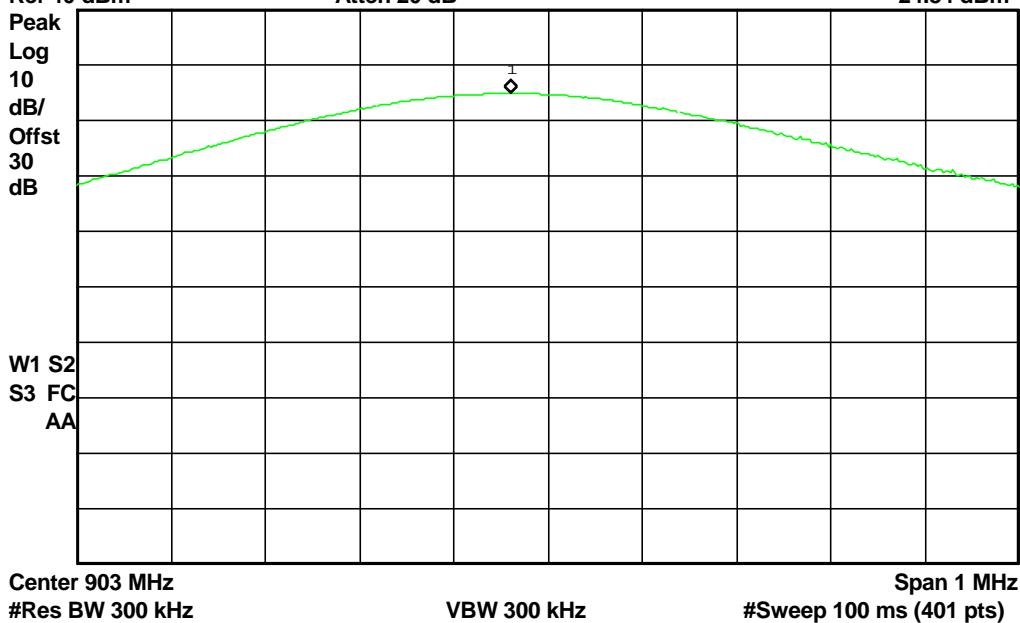
POWER OUT TOWER CCU100 FM 12.5K BAUD

Ref 40 dBm

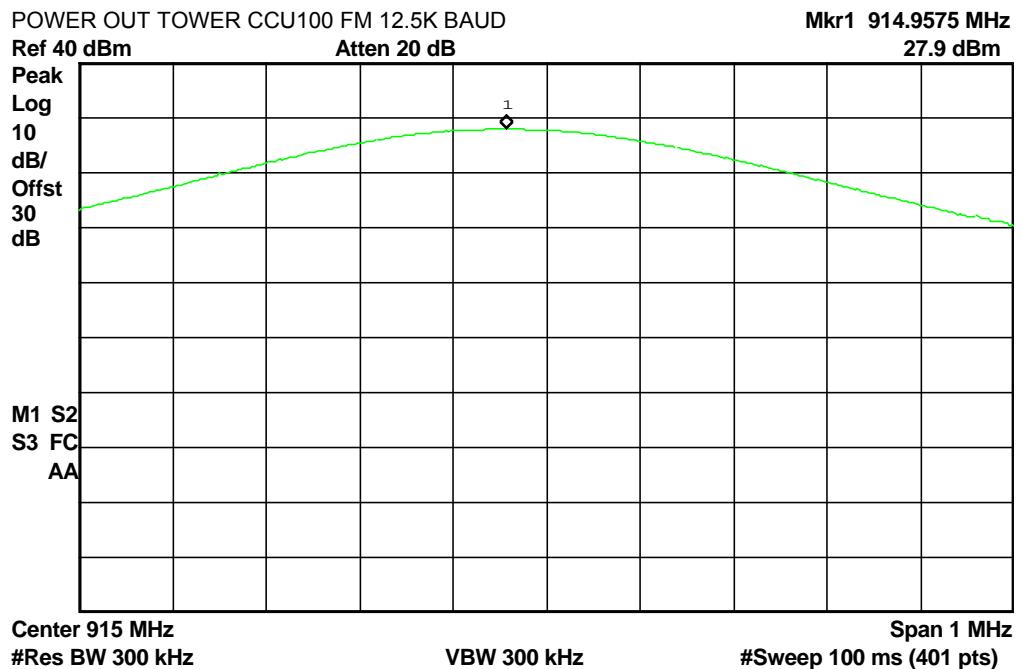
Atten 20 dB

Mkr1 902.9600 MHz

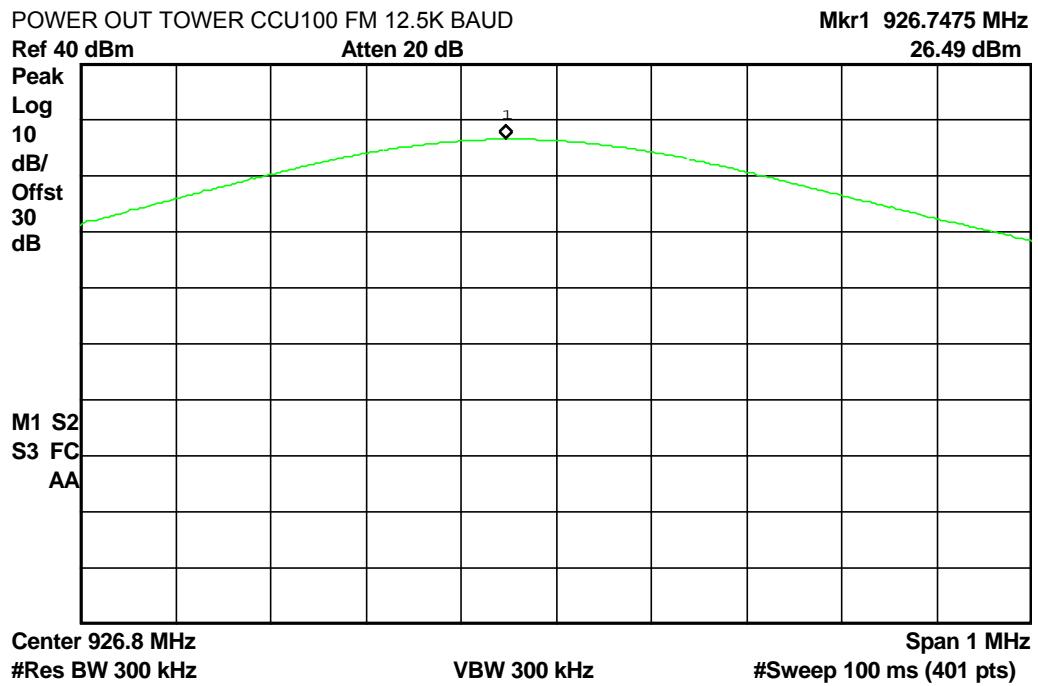
24.84 dBm



Agilent 09:56:30 Mar 29, 2013



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Modulation: 16K baud AM			
Frequency (MHz)	Power out (dB)		Variance dB
	taken 9/13/2010	taken 3/29/2013	
903	26.0	24.89	-1.11
915	27.9	27.95	0.05
926.8	11.3	26.54	15.24 (Note 1)

Agilent 09:50:34 Mar 29, 2013

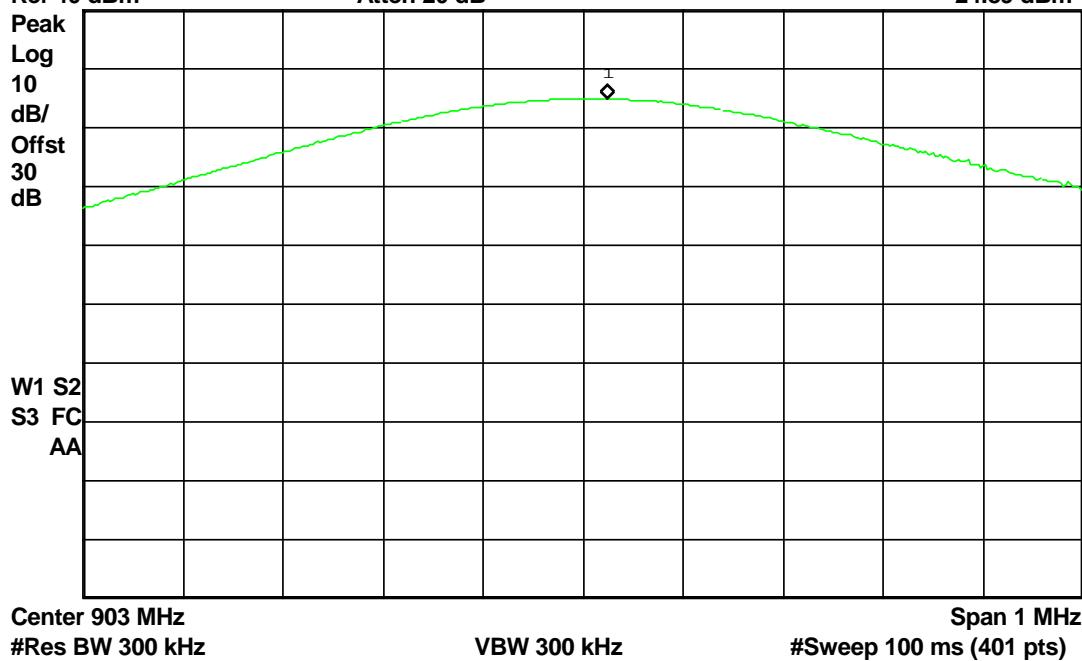
POWER OUT TOWER CCU100 AM

Ref 40 dBm

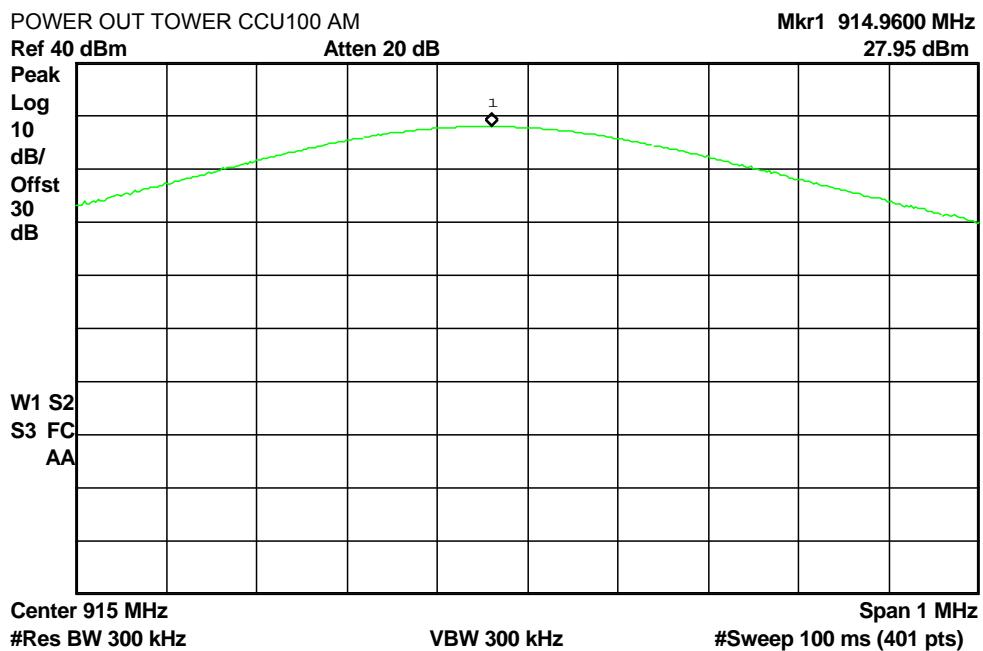
Atten 20 dB

Mkr1 902.9775 MHz

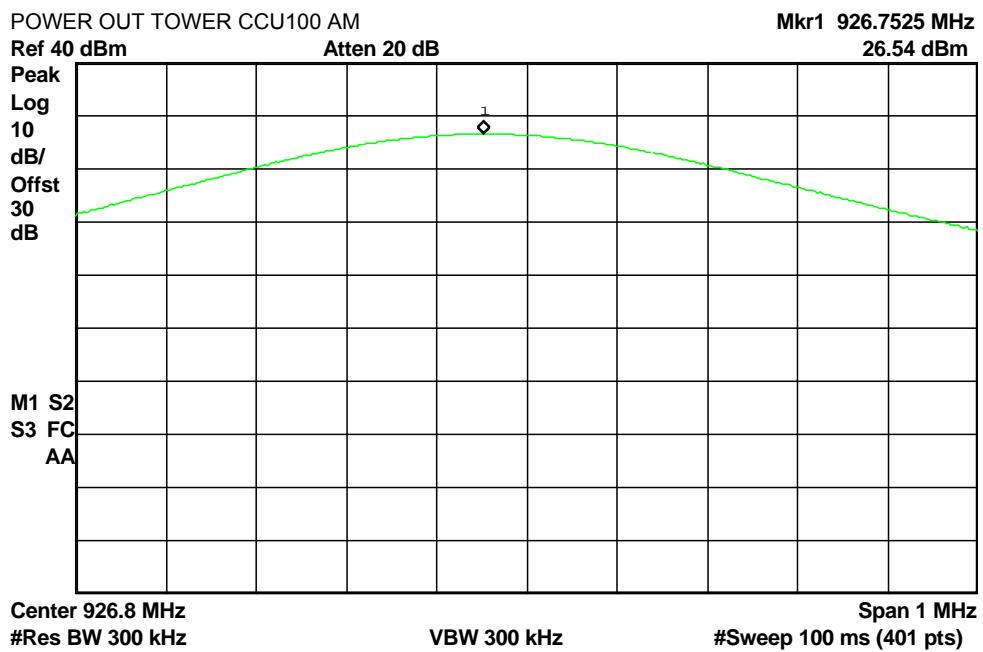
24.89 dBm



Agilent 09:51:25 Mar 29, 2013



Agilent 09:53:07 Mar 29, 2013



Note 1: This variance is due to the path loss from the external CCU100T cavity filter. Path loss of this filter is specified as 1.65 dB max from 924MHz to 926MHz and 45dB min at 928 MHz.

Test Set-Up:



