ATSC TRANSMITTER
TEST REPORT

1000 W

Spectrum Analyzer 10kHz RBW Noise Floor [dBm]	-120.0
Spectrum Analyzer 500kHz RBW Noise Floor [dBm]	-103.0
Noise floor proximity upper threshold [dBm]	-93.0
Noise floor proximity lower threshold [dBm]	-100.0

Min. Sample Level [dBm]	-26.8
Actual Sample Level [dBm]	-1.0

ATSC TRANSMISSION MASK COMPLIANCE TEST
Stringent Mask

Channel Power [dBm]	-1.0
Channel Number	36
Center Frequency [MHz]	605

Delta Frequency [MHz]	Frequency [MHz]	Measured Amplitude [dBm]	Corrected for Noise Floor [dBm]	Bandstop Filter (dB)	Corrected Amplitude [dBm]	Amplitude below Channel Power [dB]	FCC Limit [dB]	Pass/Fail
3.25	608.25	-51.9	-51.9		-51.9	50.9	47.0	**Pass**
3.75	608.75	-58.9	-58.9		-58.9	57.9	49.9	**Pass**
4.25	609.25	-71.4	-71.4		-71.4	70.4	55.6	**Pass**
4.75	609.75	-74.0	-74.0		-74.0	73.0	61.4	**Pass**
5.25	610.25	-91.6	-91.6	2.9	-88.7	87.7	67.1	**Pass**
5.75	610.75	-91.3	-91.3	2.2	-89.1	88.1	71.9	**Pass**
6.25	611.25	-92.7	-92.7	1.8	-90.9	89.9	76.0	**Pass**
6.75	611.75	-94.5	-95.2	1.6	-93.6	92.6	76.0	**Pass**
7.25	612.25	-96.4	-97.5	1.4	-96.1	95.1	76.0	**Pass**
7.75	612.75	-98.3	-100.1	1.4	-98.7	97.7	76.0	**Pass**
8.25	613.25	-99.7	-102.4	1.4	-101.0	100.0	76.0	**Pass**
8.75	613.75	-100.6	-103.0	1.4	-101.6	100.6	76.0	**Pass**

-3.25	601.75	-51.3	-51.3		-51.3	50.3	47.0	**Pass**
-3.75	601.25	-60.1	-60.1		-60.1	59.1	49.9	**Pass**
-4.25	600.75	-71.7	-71.7		-71.7	70.7	55.6	**Pass**
-4.75	600.25	-73.7	-73.7		-73.7	72.7	61.4	**Pass**
-5.25	599.75	-97.2	-98.5	2.7	-95.8	94.8	67.1	**Pass**
-5.75	599.25	-96.6	-97.7	2.5	-95.2	94.2	71.9	**Pass**
-6.25	598.75	-98.1	-99.8	2.5	-97.3	96.3	76.0	**Pass**
-6.75	598.25	-99.6	-102.3	2.5	-99.8	98.8	76.0	**Pass**
-7.25	597.75	-100.8	-103.0	2.5	-100.5	99.5	76.0	**Pass**
-7.75	597.25	-101.6	-103.0	2.5	-100.5	99.5	76.0	**Pass**
-8.25	596.75	-102.0	-103.0	2.5	-100.5	99.5	76.0	**Pass**
-8.75	596.25	-102.2	-103.0	2.5	-100.5	99.5	76.0	**Pass**

HARMONIC AND SPURIOUS ENERGY

The next set of tests examined conducted radiation harmonic and spurious energy from the transmitter. The frequency spectrum up to the 10th harmonic was investigated for harmonic and spurious energy. The test setup of Figure 1 was used with the RF sample feeding the high pass filter and then the spectrum analyzer. The only energy present was harmonically related (i.e. no spurious energy was found).

The coupling value, highpass filter loss, and cable loss at each harmonic frequency range was determined by calibrating the directional coupler mounted after the emission mask filter. The test set-up is shown below in Figure 6. The signal generator was set to theoretical harmonic spectrum center frequency and the coupling was measured for each harmonic up to the 10th harmonic. Directional coupler #2 coupling values at each of the harmonic frequency regions were tabulated and are listed in the spreadsheet with the measurement data.

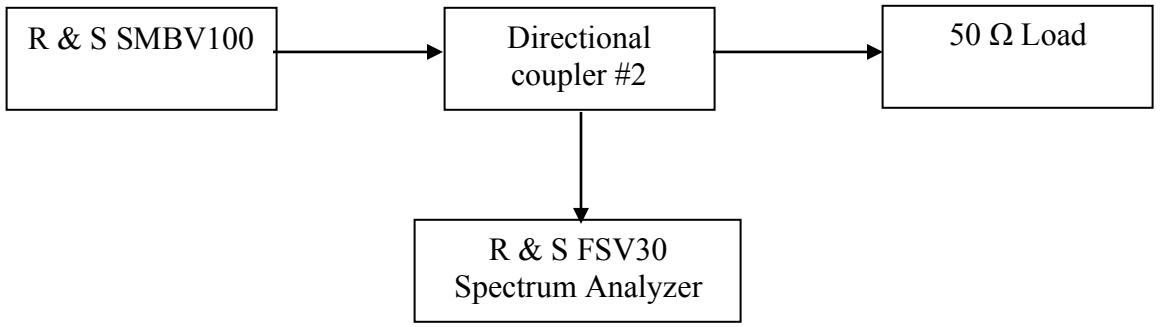

Figure 6--Calibration of Directional Coupler

HighPass Filter & Cable Loss Versus Frequency

Frequency (MHz)	Reference (dBm)	Measured Value (dBm)	HPF + Cable Loss (dB)
605	-20.0	-62.7	42.7
1210	-20.0	-25.1	5.1
1815	-20.0	-25.9	5.9
2420	-20.0	-27.4	7.4
3025	-20.0	-29.2	9.2
3630	-20.0	-29.5	9.5
4235	-20.0	-32.0	12.0
4840	-20.0	-33.1	13.1
5445	-20.0	-33.8	13.8
6050	-20.0	-35.1	15.1

The DTV transmitter harmonic and spurious energy was measured using the setup of Figure 1. The harmonic measurement values were recorded using the R & S ETL for measurements up to 3 GHz and the Agilent 4404B for frequencies above 3 GHz. The high pass filter was used in the coupled signal path to permit the spectrum analyzer attenuation to be minimized without the spectrum analyzer being overloaded by the channel 36 signal. Power measurements using a 500 kHz channel power bandwidth were taken at harmonics up to the 10th and the largest signal level 500 kHz segment of the energy was recorded on the spreadsheet following on the next page. The measured values were converted back to an equivalent power in the same bandwidth at the transmitter output using the directional coupler factor, cable loss, and compared with the total power of the channel 36 signal, and recorded in the table.

Screen shots of the conducted harmonic energy at the worst case conditions (2nd and 3rd harmonics) were taken and are provided in the figures below.

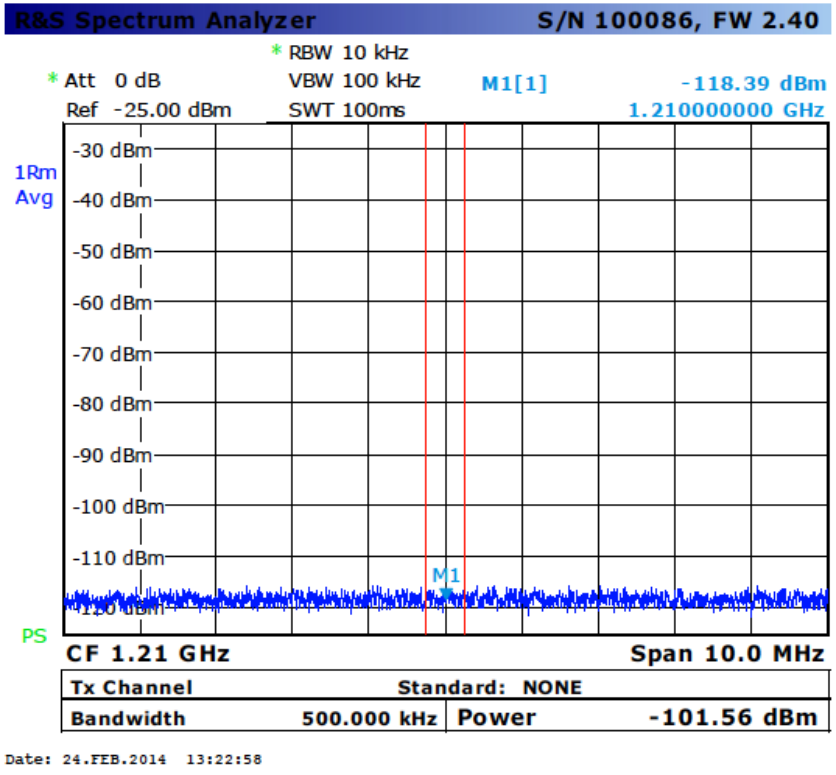

Figure 7--2nd Harmonic Energy

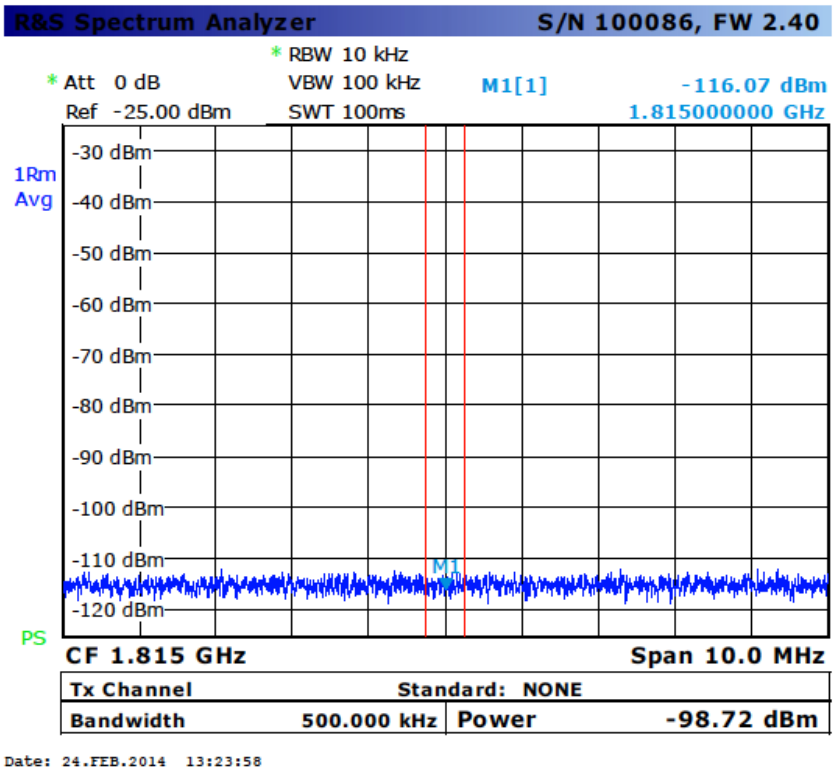

Figure 8—3rd Harmonic Energy

ATSC TRANSMISSION MASK COMPLIANCE TEST

Stringent Mask

Harmonics

Channel Power [dBm]	60.0
Channel Number	36
Center Frequency [MHz]	605

Harmonic	Frequency [MHz]	Measured Amplitude [dBm]	HPF & Cable Loss [dB]	Coupling Value [dB]	Corrected Amplitude [dBm]	Amplitude below Channel Power[dB]	FCC Limit [dB]	Pass/Fail
2nd	1210.00	-102.0	5.1	50.0	-46.9	106.9	76.0	**Pass**
3rd	1815.00	-98.0	5.9	46.0	-46.1	106.1	76.0	**Pass**
4th	2420.00	-98.0	7.4	42.8	-47.8	107.8	76.0	**Pass**
5th	3025.00	-91.0	9.2	37.7	-44.1	104.1	76.0	**Pass**
6th	3630.00	-84.6	9.5	37.0	-38.1	98.1	76.0	**Pass**
7th	4235.00	-91.0	12.0	31.0	-48.0	108.0	76.0	**Pass**
8th	4840.00	-91.0	13.1	16.1	-61.8	121.8	76.0	**Pass**
9th	5445.00	-91.0	13.8	18.4	-58.8	118.8	76.0	**Pass**
10th	6050.00	-91.0	15.1	20.5	-55.4	115.4	76.0	**Pass**