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TEST REPORT

SDT501 UB ARK1_T_C DTV TRANSMITTER TECHNICAL REPORT

The following information is provided to support the technical performance of the SCREEN SERVICE SDT501 UB ARK1_T_C DTV transmitter. The information is supplied for DVB-T service according to applicable portions of Part 27.

The following information is provided in support of verification that the transmitter meets the appropriate requirements. Measurements were recorded of spectrum and other appropriate data to demonstrate compliance.

1. Power Output Measurements.
2. Emission mask measurements to confirm the emissions stay within the mask for the purpose of meeting Frequency Stability tests requirements as defined in FCC rule 27.54.
3. Adjacent channel, harmonic and spurious measurements to demonstrate the transmitter meets the emission mask as specified in FCC rule 27.53 for the frequency range of 698-746 MHz.
4. Measurement of cabinet radiation for spurs and harmonics as specified in FCC Rule 2.1053 and 2.1057.

Measurements for these parameters were conducted at a power output level of 200 watts and the range of power for which type certification is sought is from 100 watts to the maximum value of 200 watts.

All test equipment had been calibrated within nominal calibration periods prior to the use of the test equipment.

RF POWER OUTPUT MEASUREMENTS

The equipment was configured as below shown in Figure 1. The loss through the RF output cable and attenuator was calibrated at the channel center frequency of 725 MHz. Average power was read on the Rohde and Schwarz URV using the NRP-Z23 Power Sensor.

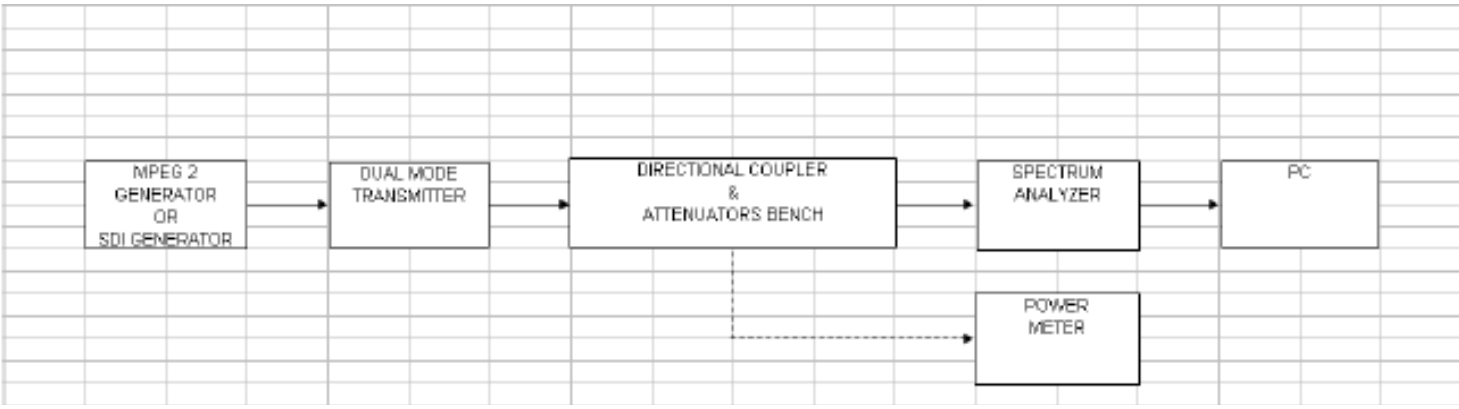

Figure 1

The attenuator and interconnecting cable was taken into account when the power measurement was made.

Calculation of Output Power.
The output power may be determined by adding the attenuator value (including cable loss) to the indicated power read on the power meter.

In this case, -10 dBm (or 0.10 milliwatts) indicated reading + 63.05 dB coupling (from calibration of coupler) = 53.05 dBm = 202 watts

Emission Mask Compliance Measurement

To determine emission mask compliance the test equipment configuration shown in Figure 1 was used. The first part of the tests measured the adjacent channel emission. The harmonic and spurious energy were also measured and recorded in a separate section of this document.

The measurement procedure was performed in a two step process. First the measurement of the output of the transmitter before the emission mask filter was measured at 10 kHz increments through the upper and lower 6 MHz adjacent channel. Then the emission mask filter was measured using a network analyzer with 100 dB dynamic range and the data was recorded at 10 kHz increments. Then the points were matched up by frequency. The filter attenuation and transmitter emission were added algebraically to determine the conducted emission from the

combination of the transmitter and filter for each frequency. The transmitter was energized at 200 watts with a center frequency of 725 MHz. A reference was established on the spectrum analyzer (using the channel power measurement mode) taking into account the insertion loss of the attenuator and the interconnecting cables for a channel power of 6 MHz. Then data points at 10 kHz increments were recorded for both filter attenuation and emissions from the transmitter before the filter. The filter attenuation and the transmitter emissions are summed together at each frequency and then scaled for a measurement bandwidth of 100 kHz. The scaled amplitudes are recorded in the column marked "Computed Amplitude" on the following table. The amplitude below the 6 MHz channel power was determined and these values are provided in the column labeled Amplitude Below Channel Power. These values are then compared against the FCC limit for emission. This provides an accurate assessment of the conducted emission for this product. All emissions were well below the FCC limit of emission as described in FCC Rule 27.53.

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Spectrum Analyzer 10kHz RBW Noise Floor [dBm]	-97.0
Spectrum Analyzer 100kHz RBW Noise Floor [dBm]	-87.0
Noise floor proximity upper threshold [dBm]	-81.0
Noise floor proximity lower threshold [dBm]	-84.0

Transmitter Power [Watts]	200
Min. Sample Level [dBm]	-3.2

TRANSMITTER EMISSION MASK COMPLIANCE TEST

Channel Power [dBm]	-10.0
Center Freq. [MHz]	725

Delta Frequency [MHz]	Absolute Frequency [MHz]	Computed Amplitude [dBm]	Amplitude below Channel Power [dB]	FCC Limit [dB]	Pass/Fail
0.05	728.05	-80.8	70.8	66.0	**Pass**
0.15	728.15	-81.0	71.0	66.0	**Pass**
0.25	728.25	-82.0	72.0	66.0	**Pass**

0.35	728.35	-83.5	73.5	66.0	**Pass**
0.45	728.45	-85.0	75.0	66.0	**Pass**
0.65	728.65	-87.5	77.5	66.0	**Pass**
0.75	728.75	-90.5	80.5	66.0	**Pass**
0.85	728.85	-91.0	81.0	66.0	**Pass**
0.95	728.95	-92.0	82.0	66.0	**Pass**
1.05	729.05	-93.0	83.0	66.0	**Pass**
1.15	729.15	-94.0	84.0	66.0	**Pass**
1.25	729.25	-95.0	85.0	66.0	**Pass**
1.35	729.35	-96.0	86.0	66.0	**Pass**
1.45	729.45	-96.5	86.5	66.0	**Pass**
1.55	729.55	-97.0	87.0	66.0	**Pass**
1.65	729.65	-98.0	88.0	66.0	**Pass**
1.75	729.75	-98.5	88.5	66.0	**Pass**
1.85	729.85	-101.5	91.5	66.0	**Pass**
1.95	729.95	-103.5	93.5	66.0	**Pass**
2.25	730.25	-107.0	97.0	66.0	**Pass**
2.75	730.75	-110.2	100.2	66.0	**Pass**
3.25	731.25	-114.0	104.0	66.0	**Pass**
3.75	731.75	-118.0	108.0	66.0	**Pass**
4.25	732.25	-121.0	111.0	66.0	**Pass**
4.75	732.75	-123.8	113.8	66.0	**Pass**
5.25	733.25	-130.0	120.0	66.0	**Pass**
5.75	733.75	-135.5	125.5	66.0	**Pass**
-0.05	721.95	-80.8	70.8	66.0	**Pass**
-0.15	721.85	-81.0	71.0	66.0	**Pass**
-0.25	721.75	-82.0	72.0	66.0	**Pass**
-0.35	721.65	-83.5	73.5	66.0	**Pass**
-0.45	721.55	-85.0	75.0	66.0	**Pass**
-0.65	721.35	-87.5	77.5	66.0	**Pass**
-0.75	721.25	-90.5	80.5	66.0	**Pass**
-0.85	721.15	-91.0	81.0	66.0	**Pass**
-0.95	721.05	-92.0	82.0	66.0	**Pass**
-1.05	720.95	-93.0	83.0	66.0	**Pass**
-1.15	720.85	-94.0	84.0	66.0	**Pass**
-1.25	720.75	-95.0	85.0	66.0	**Pass**
-1.35	720.65	-96.0	86.0	66.0	**Pass**
-1.45	720.55	-96.5	86.5	66.0	**Pass**
-1.55	720.45	-97.0	87.0	66.0	**Pass**
-1.65	720.35	-98.0	88.0	66.0	**Pass**
-1.75	720.25	-98.5	88.5	66.0	**Pass**
-1.85	720.15	-101.5	91.5	66.0	**Pass**
-1.95	720.05	-103.5	93.5	66.0	**Pass**
-2.25	719.75	-107.0	97.0	66.0	**Pass**
-2.75	719.25	-110.2	100.2	66.0	**Pass**

-3.25	718.75	-114.0	104.0	66.0	**Pass**
-3.75	718.25	-118.0	108.0	66.0	**Pass**
-4.25	717.75	-121.0	111.0	66.0	**Pass**
-4.75	717.25	-123.8	113.8	66.0	**Pass**
-5.25	716.75	-130.0	120.0	66.0	**Pass**
-5.75	716.25	-135.5	125.5	66.0	**Pass**

Conducted Harmonic and Spurious Measurements

The same test setup as in Figure 1 was used except that a highpass filter was used at the input to the spectrum analyzer to measure harmonics. First the highpass filter is characterized over the spectrum of investigation to reduce the level of the fundamental signal and allow the spectrum analyzer sensitivity to be increased. The sensitivity of the spectrum analyzer was increased so that the noise floor of the spectrum analyzer was approximately -98 dBm measured using a marker and a 100 kHz resolution bandwidth (RBW). The spectrum up to the 10^{th} harmonic of the fundamental frequency band was investigated to determine if any spurious or harmonic energy existed. The highest amplitude 100 kHz segment measurement in each particular harmonic spectrum was recorded using the 100 kHz RBW of the spectrum analyzer.

Using the attenuator calibration factors up to the 10th harmonic, the energy was computed. This value of harmonic energy was compared to the total channel power and the resultant dB value was calculated and compared to the -66 dB FCC requirement. The results met the FCC requirement and are shown in the table on the next page.

TRANSMITTER
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Spectrum Analyzer 100kHz RBW Noise Floor [dBm]	-88.0

TRANSMITTER EMISSION MASK COMPLIANCE TEST
Harmonics

Transmitter Power [Watts]	200.0
Center Freq. [MHz]	725

Harmonic	Center Frequency [MHz]	Measured Amplitude [dBm]*	Attenuator Value [dB]	Corrected Amplitude [dBm]	Amplitude below Channel Power [dB]	FCC Limit [dB]	Pass/Fail
2	1450.00	-65.8	39.3	-26.5	79.5	66.0	**Pass**
3	2175.00	-69.3	39.0	-30.3	83.3	66.0	**Pass**
4	2900.00	-70.4	37.2	-33.2	86.2	66.0	**Pass**
5	3625.00	-65.9	35.4	-30.5	83.5	66.0	**Pass**
6	4350.00	-67.1	34.7	-32.4	85.4	66.0	**Pass**
7	5075.00	-65.9	33.9	-32.0	85.0	66.0	**Pass**
8	5800.00	-69.9	35.9	-34.0	87.0	66.0	**Pass**
9	6525.00	-75.5	39.1	-36.4	89.4	66.0	**Pass**
10	7250.00	-78.4	40.1	-38.3	91.3	66.0	**Pass**

* Highest amplitude 100 kHz channel power measured within the particular harmonic spectrum region

Frequency Stability

This compliance test was executed in two phases. First the drift of the local oscillator was measured at the channel of interest over temperature. Then the emission mask test was executed with the frequency offset from center frequency by the values determined from the local oscillator drift. The equipment was configured as shown in Figure 1 and the same emission mask test procedure described before the harmonic test data was conducted (i.e. the emissions from the transmitter and the filter attenuation was matched up on a 10 kHz basis and then 100 kHz channel power was computed from this. The data shown on the following pages at 0° C, and 50 °C confirms that the emission mask limits were met at the operational temperature limits of the equipment.

TRANSMITTER

TEST REPORT @ 0°C

Spectrum Analyzer 10kHz RBW Noise Floor [dBm]	-97.0
Spectrum Analyzer 100kHz RBW Noise Floor [dBm]	-87.0
Noise floor proximity upper threshold [dBm]	-81.0
Noise floor proximity lower threshold [dBm]	-84.0
Transmitter Power [Watts]	200

TRANSMITTER EMISSION MASK COMPLIANCE TEST

Channel Power [dBm]	-10.0
Center Freq. [MHz]	725

Delta Frequency [MHz]	Absolute Frequency [MHz]	Computed Amplitude [dBm]	Amplitude below Channel Power [dB]	FCC Limit [dB]	Pass/Fail
0.05	728.05	-79.8	69.8	66.0	**Pass**
0.15	728.15	-80.6	70.6	66.0	**Pass**
0.25	728.25	-81.6	71.6	66.0	**Pass**
0.35	728.35	-83.1	73.1	66.0	**Pass**
0.45	728.45	-84.6	74.6	66.0	**Pass**
0.65	728.65	-87.1	77.1	66.0	**Pass**
0.75	728.75	-90.1	80.1	66.0	**Pass**
0.85	728.85	-90.6	80.6	66.0	**Pass**
0.95	728.95	-91.6	81.6	66.0	**Pass**

1.05	729.05	-92.6	82.6	66.0	**Pass**
1.15	729.15	-93.6	83.6	66.0	**Pass**
1.25	729.25	-94.6	84.6	66.0	**Pass**
1.35	729.35	-95.6	85.6	66.0	**Pass**
1.45	729.45	-96.1	86.1	66.0	**Pass**
1.55	729.55	-96.6	86.6	66.0	**Pass**
1.65	729.65	-97.6	87.6	66.0	**Pass**
1.75	729.75	-98.1	88.1	66.0	**Pass**
1.85	729.85	-101.1	91.1	66.0	**Pass**
1.95	729.95	-103.1	93.1	66.0	**Pass**
2.25	730.25	-106.6	96.6	66.0	**Pass**
2.75	730.75	-109.8	99.8	66.0	**Pass**
3.25	731.25	-113.6	103.6	66.0	**Pass**
3.75	731.75	-117.6	107.6	66.0	**Pass**
4.25	732.25	-120.6	110.6	66.0	**Pass**
4.75	732.75	-123.4	113.4	66.0	**Pass**
5.25	733.25	-129.6	119.6	66.0	**Pass**
5.75	733.75	-135.1	125.1	66.0	**Pass**
-0.05	721.95	-81.8	71.8	66.0	**Pass**
-0.15	721.85	-81.4	71.4	66.0	**Pass**
-0.25	721.75	-82.4	72.4	66.0	**Pass**
-0.35	721.65	-83.9	73.9	66.0	**Pass**
-0.45	721.55	-85.4	75.4	66.0	**Pass**
-0.65	721.35	-87.9	77.9	66.0	**Pass**
-0.75	721.25	-90.9	80.9	66.0	**Pass**
-0.85	721.15	-91.4	81.4	66.0	**Pass**
-0.95	721.05	-92.4	82.4	66.0	**Pass**
-1.05	720.95	-93.4	83.4	66.0	**Pass**
-1.15	720.85	-94.4	84.4	66.0	**Pass**
-1.25	720.75	-95.4	85.4	66.0	**Pass**
-1.35	720.65	-96.4	86.4	66.0	**Pass**
-1.45	720.55	-96.9	86.9	66.0	**Pass**
-1.55	720.45	-97.4	87.4	66.0	**Pass**
-1.65	720.35	-98.4	88.4	66.0	**Pass**
-1.75	720.25	-98.9	88.9	66.0	**Pass**
-1.85	720.15	-101.9	91.9	66.0	**Pass**
-1.95	720.05	-103.9	93.9	66.0	**Pass**
-2.25	719.75	-107.4	97.4	66.0	**Pass**
-2.75	719.25	-110.6	100.6	66.0	**Pass**
-3.25	718.75	-114.4	104.4	66.0	**Pass**
-3.75	718.25	-118.4	108.4	66.0	**Pass**
-4.25	717.75	-121.4	111.4	66.0	**Pass**
-4.75	717.25	-124.2	114.2	66.0	**Pass**
-5.25	716.75	-130.4	120.4	66.0	**Pass**
-5.75	716.25	-135.9	125.9	66.0	**Pass**

TRANSMITTER
TEST REPORT @ 50°C

Spectrum Analyzer 10kHz RBW Noise Floor [dBm]	-97.0
Spectrum Analyzer 100kHz RBW Noise Floor [dBm]	-87.0
Noise floor proximity upper threshold [dBm]	-81.0
Noise floor proximity lower threshold [dBm]	-84.0
Transmitter Power [Watts]	200

TRANSMITTER EMISSION MASK COMPLIANCE TEST

Channel Power [dBm]	-10.0
Center Freq. [MHz]	725

Delta Frequency [MHz]	Absolute Frequency [MHz]	Computed Amplitude [dBm]	Amplitude below Channel Power [dB]	FCC Limit [dB]	Pass/Fail
0.05	728.05	-81.8	71.8	66.0	**Pass**
0.15	728.15	-81.4	71.4	66.0	**Pass**
0.25	728.25	-82.4	72.4	66.0	**Pass**
0.35	728.35	-83.9	73.9	66.0	**Pass**
0.45	728.45	-85.4	75.4	66.0	**Pass**
0.65	728.65	-87.9	77.9	66.0	**Pass**
0.75	728.75	-90.9	80.9	66.0	**Pass**
0.85	728.85	-91.4	81.4	66.0	**Pass**
0.95	728.95	-92.4	82.4	66.0	**Pass**
1.05	729.05	-93.4	83.4	66.0	**Pass**
1.15	729.15	-94.4	84.4	66.0	**Pass**
1.25	729.25	-95.4	85.4	66.0	**Pass**
1.35	729.35	-96.4	86.4	66.0	**Pass**
1.45	729.45	-96.9	86.9	66.0	**Pass**
1.55	729.55	-97.4	87.4	66.0	**Pass**
1.65	729.65	-98.4	88.4	66.0	**Pass**
1.75	729.75	-98.9	88.9	66.0	**Pass**
1.85	729.85	-101.9	91.9	66.0	**Pass**

1.95	729.95	-103.9	93.9	66.0	**Pass**
2.25	730.25	-107.4	97.4	66.0	**Pass**
2.75	730.75	-110.6	100.6	66.0	**Pass**
3.25	731.25	-114.4	104.4	66.0	**Pass**
3.75	731.75	-118.4	108.4	66.0	**Pass**
4.25	732.25	-121.4	111.4	66.0	**Pass**
4.75	732.75	-124.2	114.2	66.0	**Pass**
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-0.05	721.95	-79.8	69.8	66.0	**Pass**
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-0.25	721.75	-81.6	71.6	66.0	**Pass**
-0.35	721.65	-83.1	73.1	66.0	**Pass**
-0.45	721.55	-84.6	74.6	66.0	**Pass**
-0.65	721.35	-87.1	77.1	66.0	**Pass**
-0.75	721.25	-90.1	80.1	66.0	**Pass**
-0.85	721.15	-90.6	80.6	66.0	**Pass**
-0.95	721.05	-91.6	81.6	66.0	**Pass**
-1.05	720.95	-92.6	82.6	66.0	**Pass**
-1.15	720.85	-93.6	83.6	66.0	**Pass**
-1.25	720.75	-94.6	84.6	66.0	**Pass**
-1.35	720.65	-95.6	85.6	66.0	**Pass**
-1.45	720.55	-96.1	86.1	66.0	**Pass**
-1.55	720.45	-96.6	86.6	66.0	**Pass**
-1.65	720.35	-97.6	87.6	66.0	**Pass**
-1.75	720.25	-98.1	88.1	66.0	**Pass**
-1.85	720.15	-101.1	91.1	66.0	**Pass**
-1.95	720.05	-103.1	93.1	66.0	**Pass**
-2.25	719.75	-106.6	96.6	66.0	**Pass**
-2.75	719.25	-109.8	99.8	66.0	**Pass**
-3.25	718.75	-113.6	103.6	66.0	**Pass**
-3.75	718.25	-117.6	107.6	66.0	**Pass**
-4.25	717.75	-120.6	110.6	66.0	**Pass**
-4.75	717.25	-123.4	113.4	66.0	**Pass**
-5.25	716.75	-129.6	119.6	66.0	**Pass**
-5.75	716.25	-135.1	125.1	66.0	**Pass**