

BZ5DTR10SC
Application for FCC Certification
10 Watt Digital Television Translator

Cabinet Radiation

Equipment was set up as shown in Figure below. The radiation was measured using a pyramidal Log-Periodic Antenna with a gain of 8dBi, at a distance of 4 m from the transmitter, which operated into a test load. There was a metal structure located 2m behind the measuring position (ie: an open field test was not possible in this case).

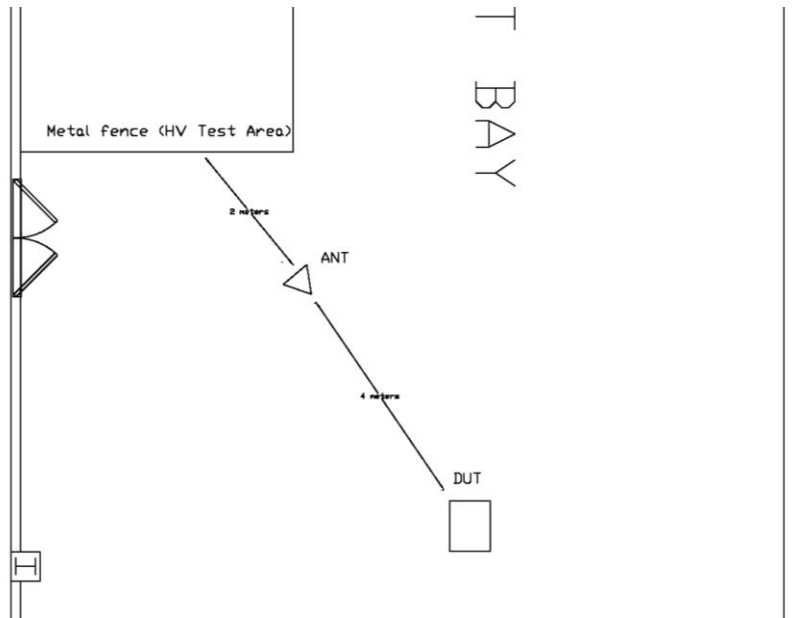


Figure 1: Equipment setup

The measurement data is as follows:

Transmitter Power:	10 W
Distance from TX:	4 meters
Frequency:	189 MHz
Gain of half-wave dipole:	2.15 dBi
Theoretical radiated power:	16.4 W
Gain of measuring Antenna:	8 dB (log periodic)

Field strength is calculated as follows:

$$E = (9.92\sqrt{P})/R$$

where: E = Field Intensity
P = transmit power
R = distance from transmitter

Above equation yields the following results:

$$E = 7.84 \text{ V/m} = 137.89 \text{ dBuV/m}$$

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The requirement is for spurious radiated emissions beyond 6 MHz from the channel edge to be 60dB below this value, or no greater than: 77.89 dBuV/m

Subtract a constant given by:

$$K = 20 \log(f) - \text{Antenna gain} - 29.8$$

$$K = 7.73$$

The worst case reading should be:

$$V_r = 70.16 \text{ dBuV}$$

Subtract 107dB to convert to dBm: $V_r = -36.84 \text{ dBm}$

The worst case reading was at the second harmonic of the fundamental:

$$V_{\text{meas}} = -67.56 \text{ dBm.}$$

Which is 30.72 dB below the maximum allowable level.

All other readings were below -70dBm from 9kHz to 3GHz.

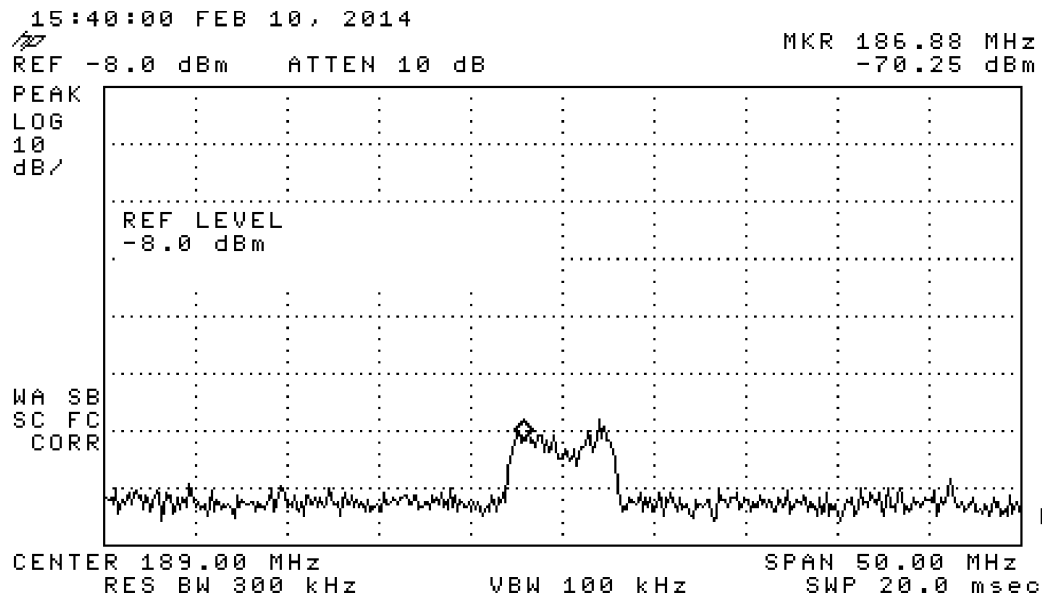


Figure 2: Fundamental (dBm)

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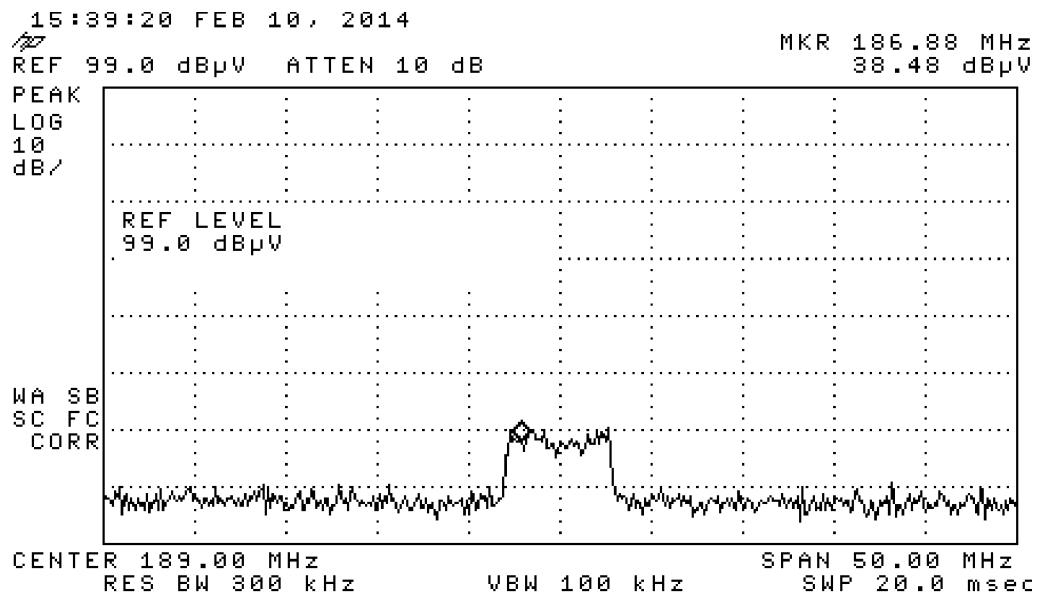


Figure 3: Fundamental (dB μ V)

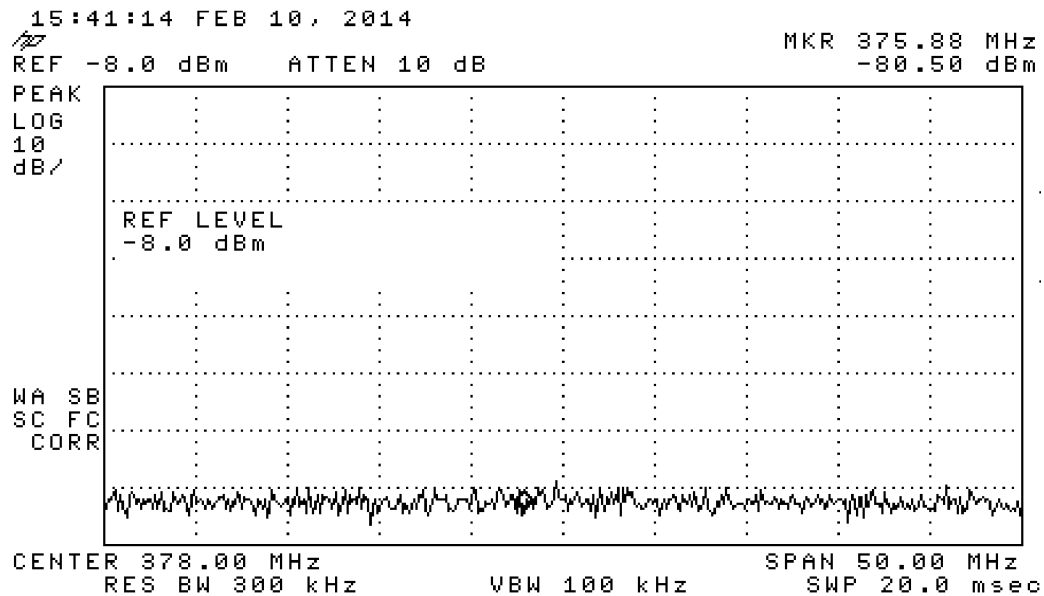


Figure 4: Second Harmonic (dBm)

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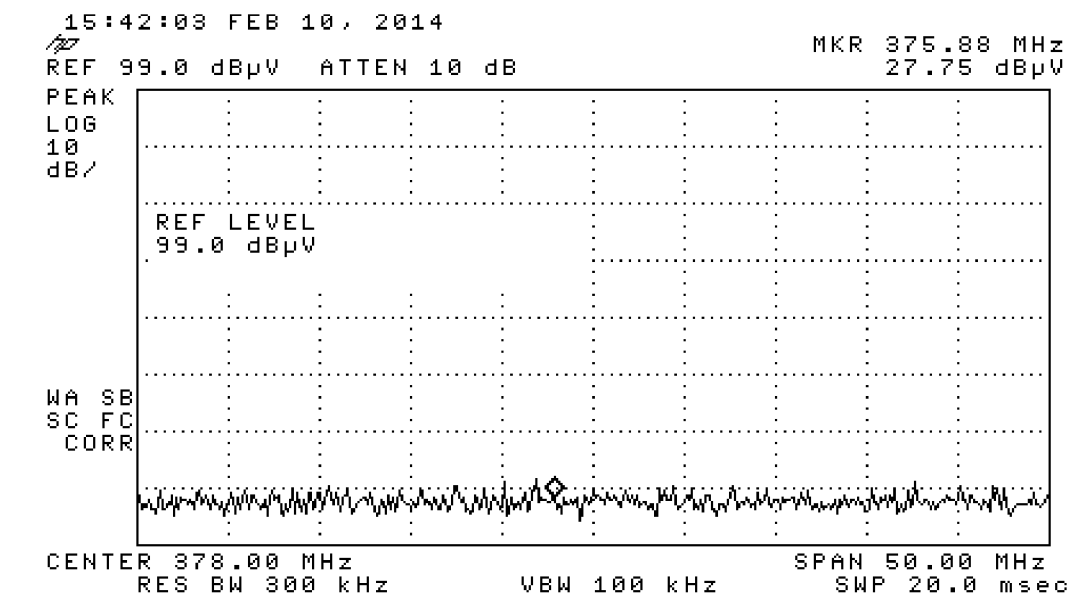


Figure 5: Second Harmonic (dBuV)