

TRANSIENT FREQUENCY BEHAVIOR

Test Setup

The modified LLB6327 transmitter was tested for transient frequency behavior using the test method TIA/EIA-603. The test setup is shown in Fig. 1. The functions of the test receiver was performed by the Marconi test set with audio bandwidth set to 15kHz low pass. The storage oscilloscope was triggered using an enable signal from the transmitter which was delayed using a variable digital delay. The 1kHz test signal was provided by the Wavetek Signal Generator.

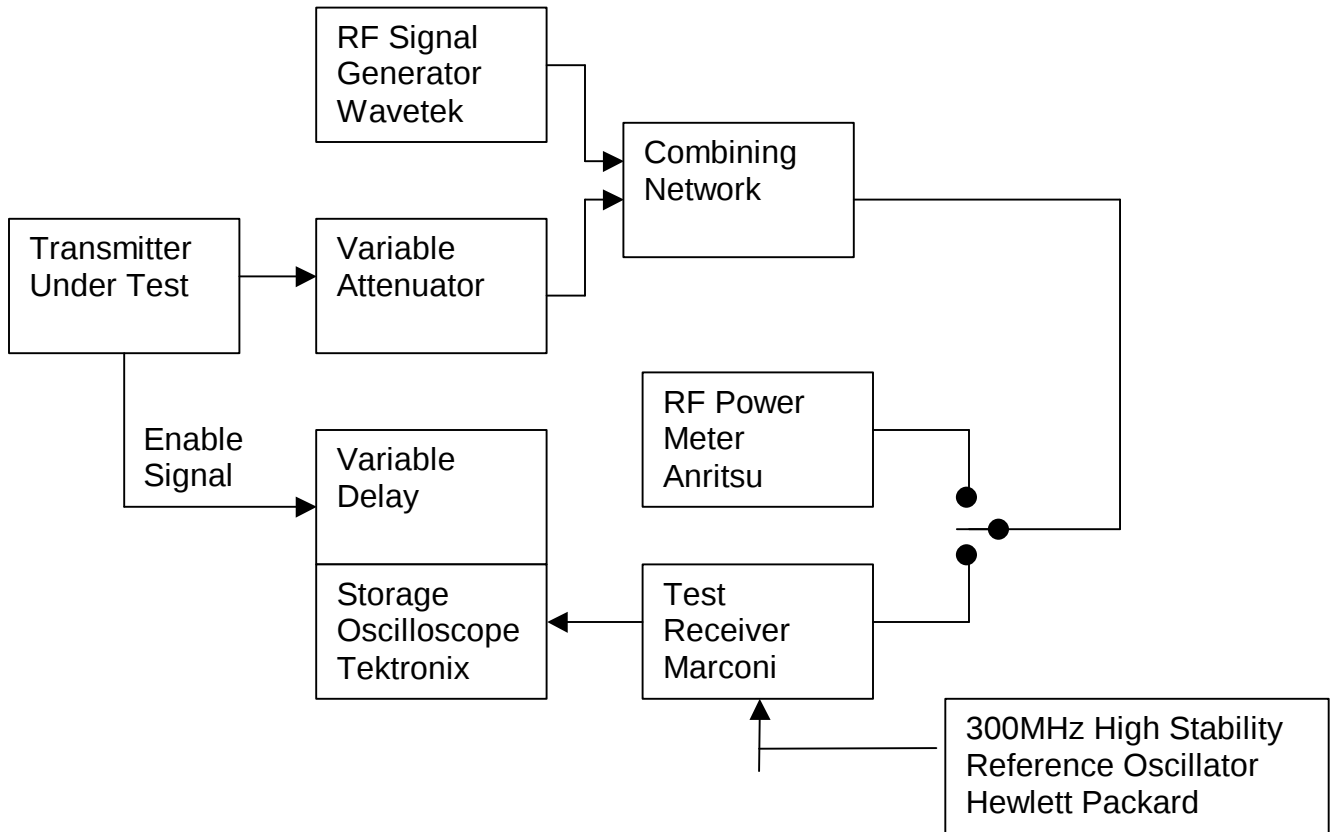


Figure 1 Test Setup

Test Requirements

The test requirements per 90.214 are :

1. Frequency deviation during t_1 (10ms duration after t_{on}) may be greater than $\pm 12.5\text{kHz}$ because output power is less than 6 watts.
2. Frequency deviation during t_2 (25 ms duration after t_1) must be less than $\pm 6.25\text{kHz}$.
3. Frequency deviation after t_2 must be less than $\pm 2.5\text{ppm} \times 460\text{MHz} = \pm 1.15\text{kHz}$.
4. Frequency deviation during t_3 (10ms duration after transmitter is turned off) may exceed $\pm 12.5\text{kHz}$ because output power is less than 6watts.

Test Data

Figures 2 through 7 show the measured LLB6327 Transient Frequency characteristics. The limit masks are shown overlaid on figures 4 through 7. Time scale used on Figures 3 through 7 is 5ms per division. Deviation scales of 5kHz per division and 1kHz per division were used in order to better resolve details of the waveforms.

Measured waveforms include the following.

- Figure 2 : 1kHz Test Signal $\pm 12.5\text{kHz}$ Deviation – 5kHz per Division
- Figure 3 : LLB6327 Turn On – Test Signal Unmodulated – 5kHz per Division
- Figure 4 : LLB6327 Turn On – Test Signal Modulated – 5kHz per Division
- Figure 5 : LLB6327 Turn On – Test Signal Modulated – 1kHz per division
- Figure 6 : LLB6327 Turn Off – Test Signal Modulated – 1kHz per division
- Figure 7 : LLB6327 Turn Off – Test Signal Modulated – 5kHz per division

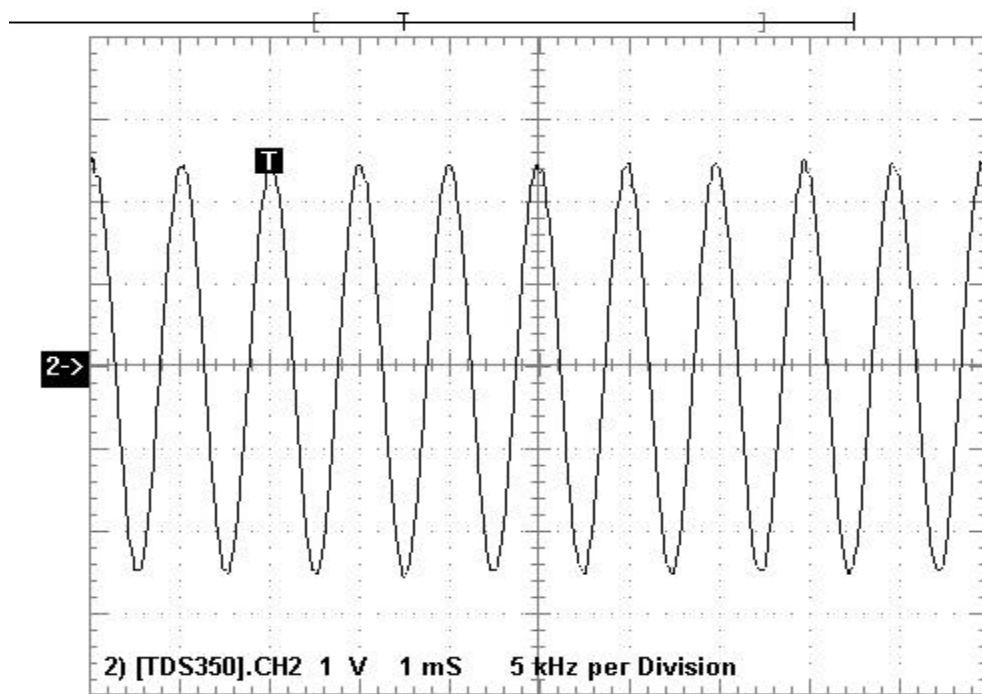


Figure 2 : 1kHz Test Signal +/-12.5kHz Deviation – 5kHz per Division

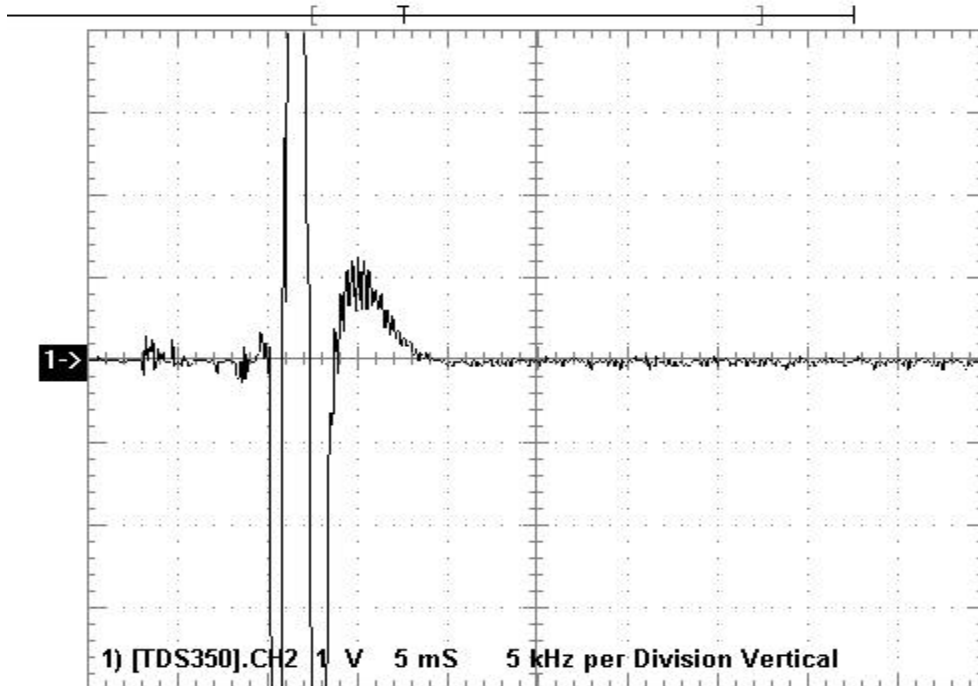


Figure 3 : LLB6327 Turn On – Test Signal Unmodulated – 5kHz per Division

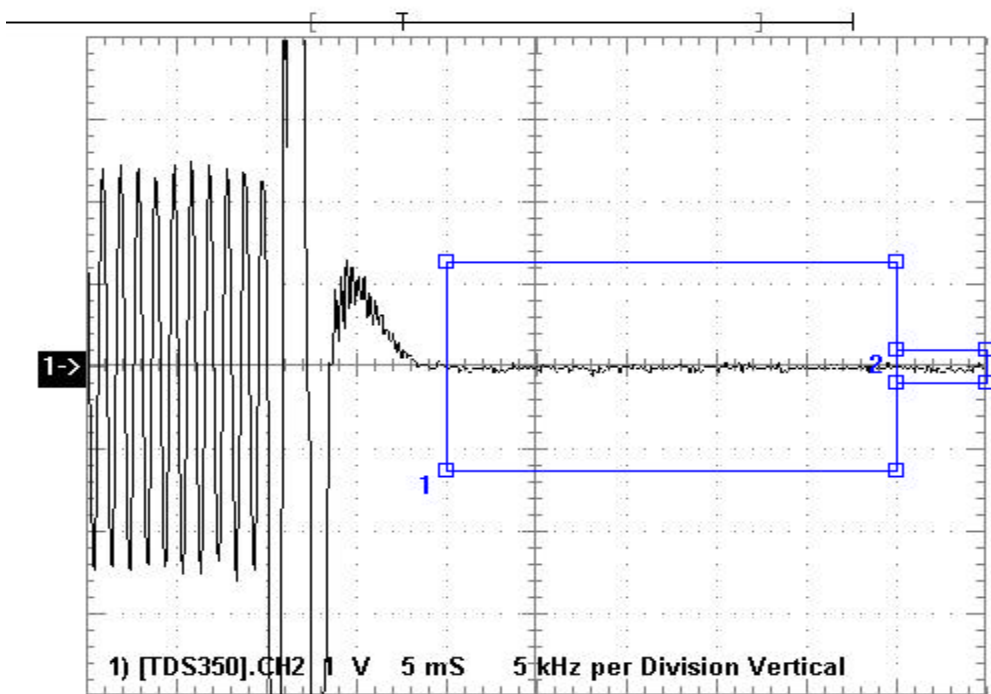


Figure 4 : LLB6327 Turn On – Test Signal Modulated – 5kHz per Division

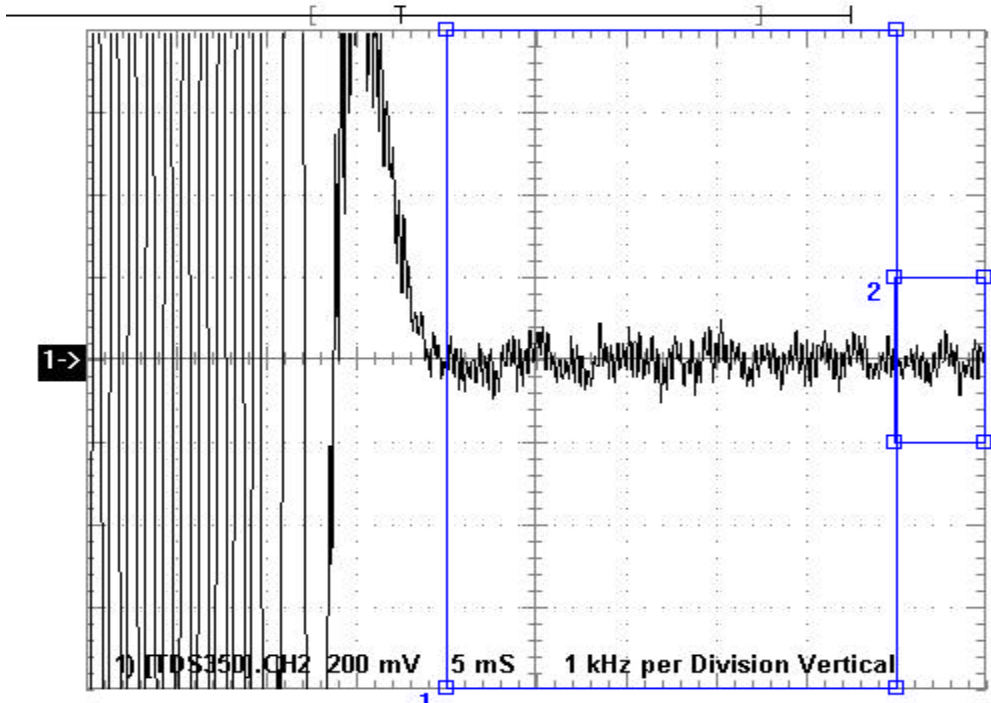


Figure 5 : LLB6327 Turn On – Test Signal Modulated – 1kHz per division

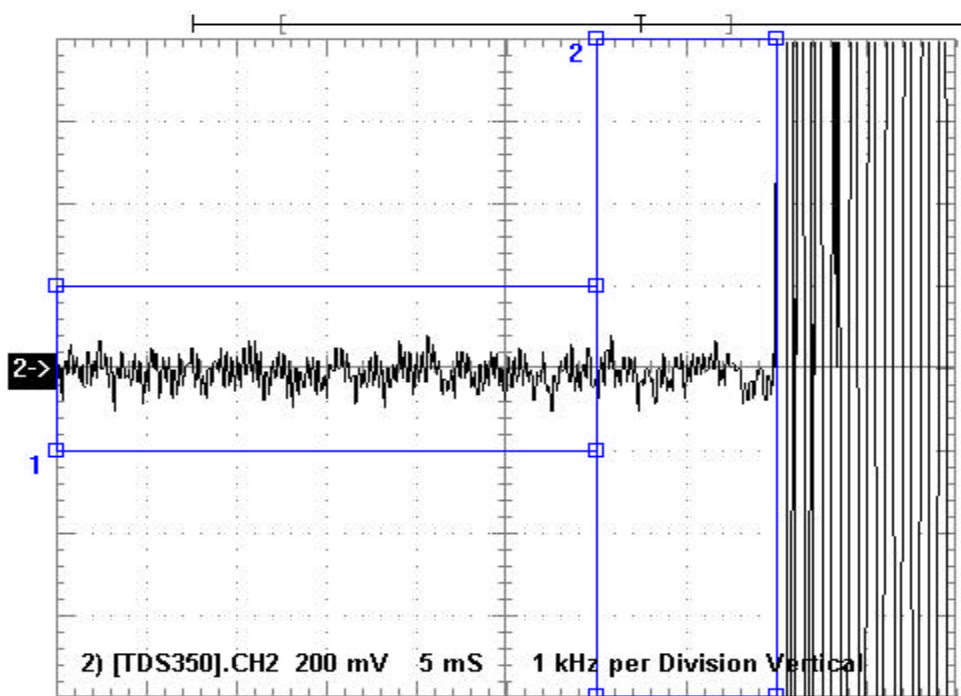


Figure 6 : LLB6327 Turn Off – Test Signal Modulated – 1kHz per division

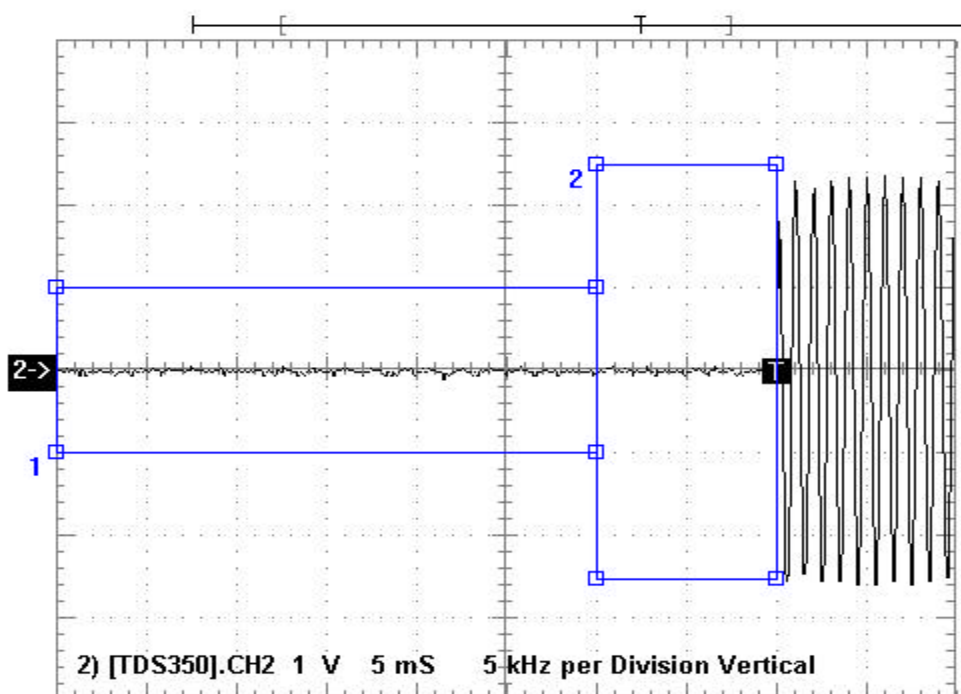


Figure 7 : LLB6327 Turn Off – Test Signal Modulated – 5kHz per division

Test Results

Figure 2 shows the receiver response to the 1kHz test signal. Figure 3 shows the turn on response with the test signal unmodulated in order to identify the T_{on} point.

Figure 4 shows the LLB6327 turn on response is well within the required $\pm 6.25\text{kHz}$ during interval T_2 . Interval T_2 starts 10ms after T_{on} and continues for a duration of 25ms. There is no transient frequency limit specified during interval t_1 since the output power does not exceed 6watt.

Figure 5 and Figure 6 show that the LLB6327 frequency accuracy is well within the requirement of $\pm 1.15\text{kHz}$ from the end of T_2 until T_3 .

Figure 7 shows the LLB6327 turn off response. There is no transient frequency limit during interval T_3 since the output power does not exceed 6watt.

Conclusion

The modified model of the Hexagram LLB6327 transmitter has been shown to be capable of complying with the requirements of the FCC Part 90 transmitter that is covered by this report.

Measurements made and recorded by :

June 14, 2002

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Measurement Equipment

Hewlett Packard

Spectrum Analyzer model 8560A

Option 003 high stability reference

S/N 3137A01902

Marconi Instruments

Radio Communications Test Set Receiver model 2955A

S/N 132303/070

Wavetek

Signal Generator model 3001

S/N 3231445

Tektronix

Digital Storage Oscilloscope model TDS350

Anritsu

Power Meter model ML2438A

S/N 98510049

Power Sensor model MA2468A

S/N 1799