

Duty Factor Correction Calculation

Note: Please refer to attached Spectrum Analyzer plots for measured values.

Spectrum Analyzer used: **Tektronix RSA3308A**

Encoding = Manchester

Packet Length = 47.24ms

Positive Pulse Width (PPW) = 202.5us

Negative Pulse Width (NPW) = 217.5us

$$\text{Duty Cycle (DC)} = \frac{(PPW)}{(PPW + NPW)} \times 100\% = 48.2\%$$

$$\begin{aligned}\text{Transmit on Time} &= DC \times \text{PacketLength} \\ &= 0.482 \times 47.2ms \\ &= 22.7ms\end{aligned}$$

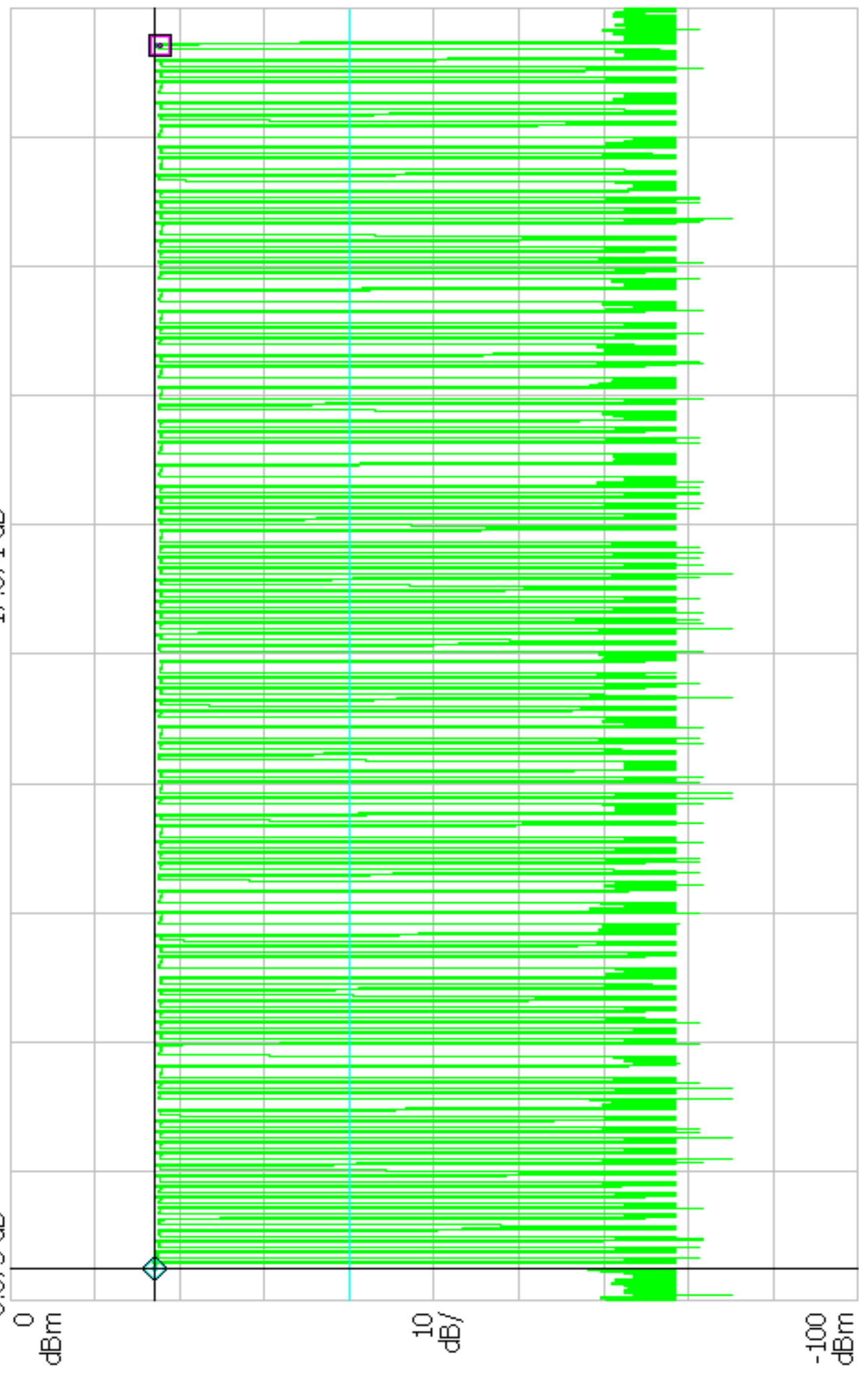
$$\text{Duty Factor Correction (} K_E \text{)} = 20 \log \left(\frac{T_x \text{ _ On _ Time}}{100ms} \right) dB$$

$$T_x \text{ _ On _ Time} = 22.7ms$$

$$\begin{aligned}K_E &= 20 \log \left(\frac{22.7ms}{100ms} \right) dB \\ &= -12.88dB\end{aligned}$$

Δ 2-R: 47.24375 ms
-0.675 dB

Ref: -594.1875 ms
-17.071 dB



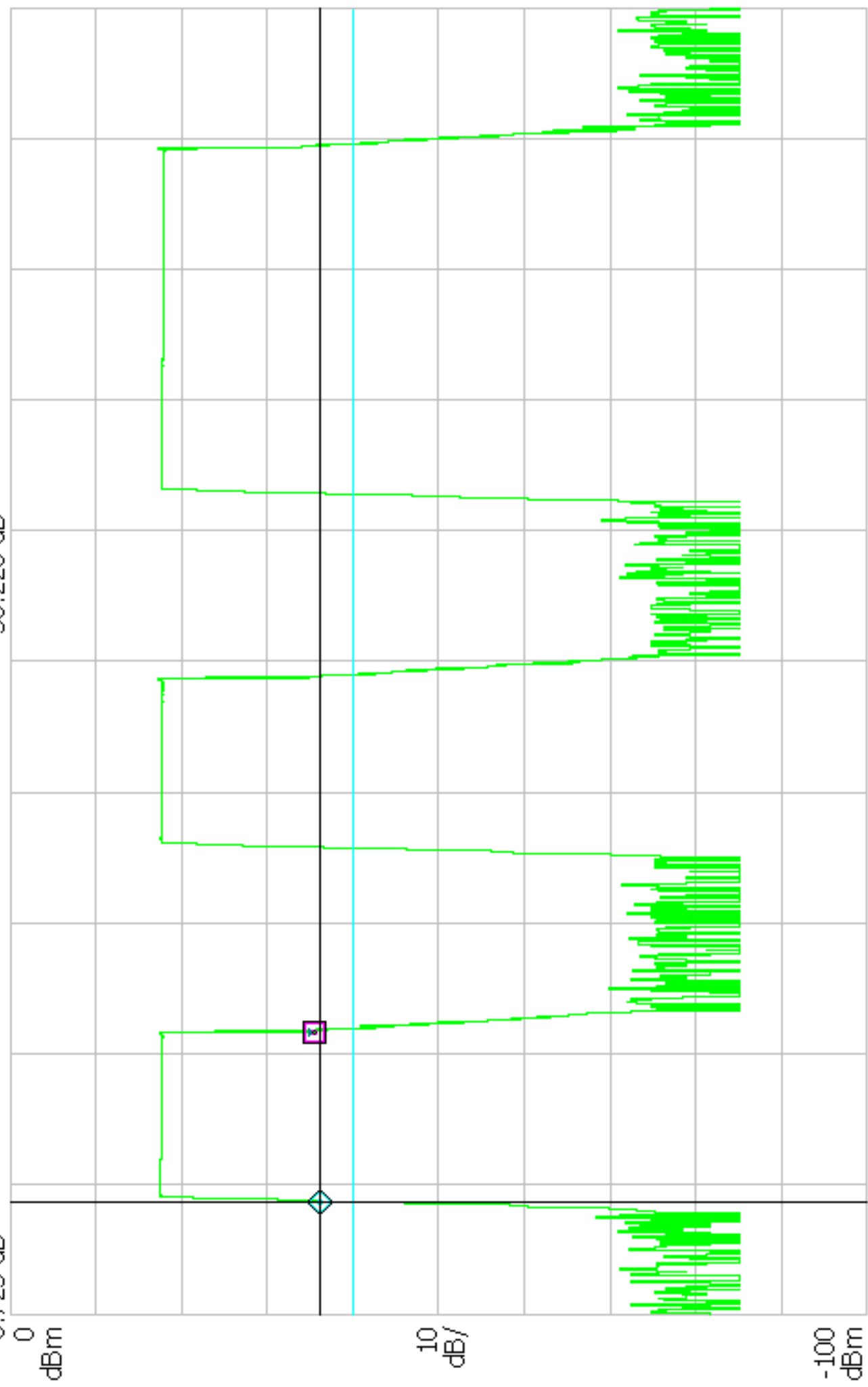
Timing:

Start: -595.4575 ms

Scale: 5 ms/

Δ 2-R: 202.5 μ s
0.723 dB

Ref: -587.6575 ms
-36.226 dB



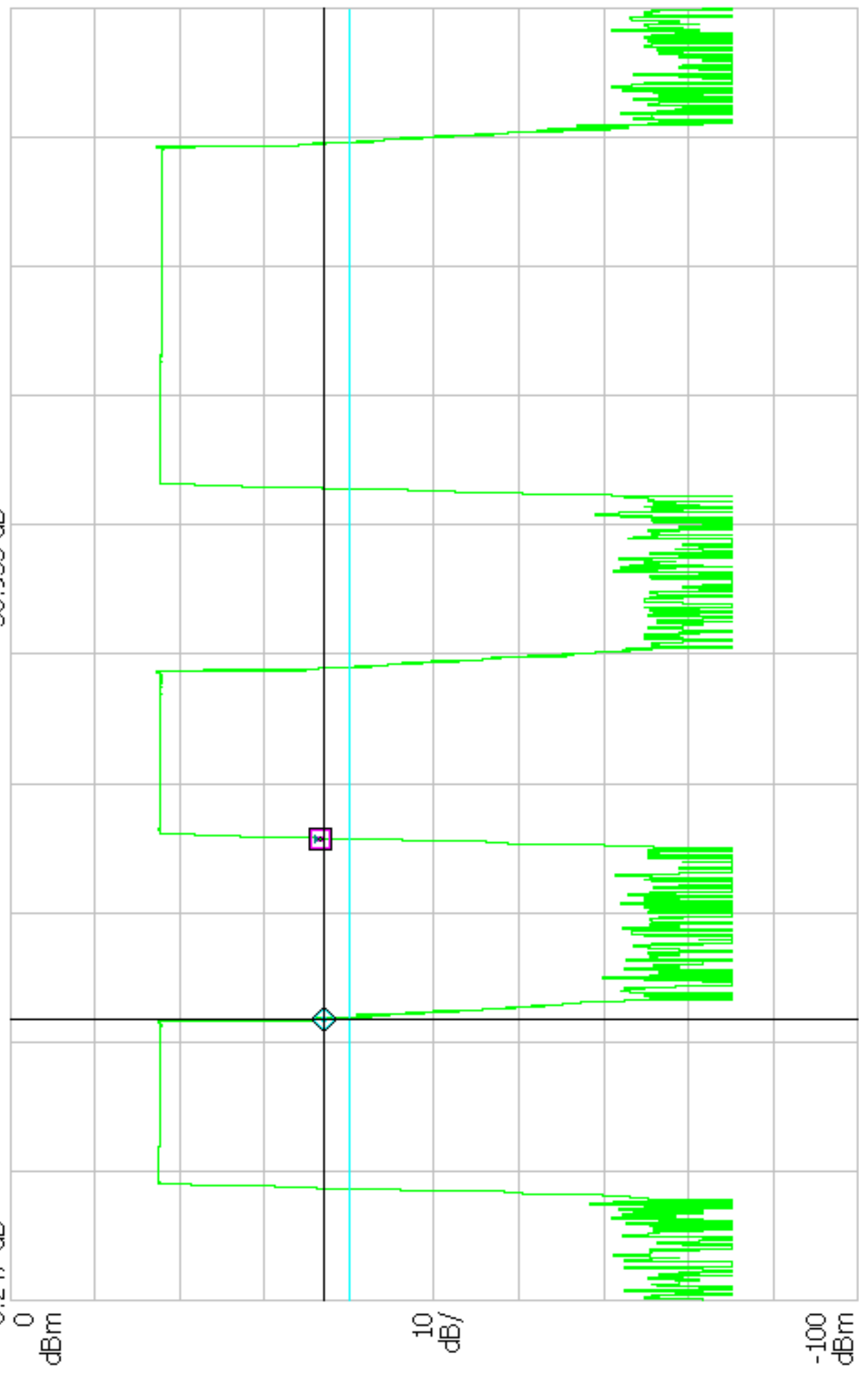
Timing:

Start: -587.7925 ms

Scale: 156.25 μ s/

$\Delta 2R$: 217.5 μs
0.247 dB

Ref: -587.4525 ms
-36.933 dB



Timing:

Start: -587.7925 ms

Scale: 156.25 μs