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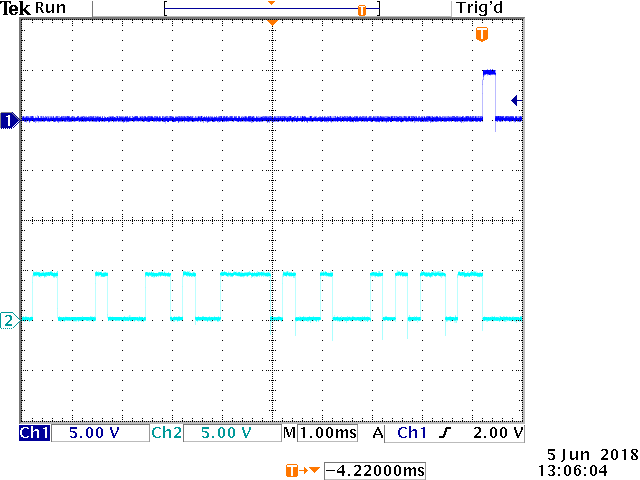
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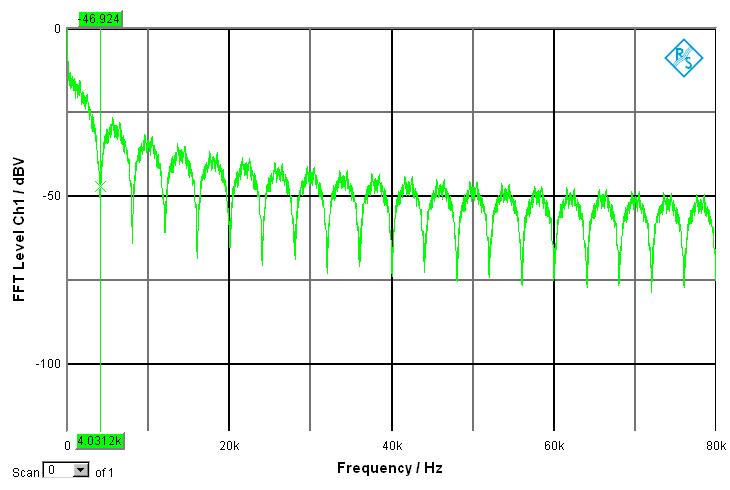
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## Pseudo noise generator (PNG)

Setup: Clock frequency: 4kHz.

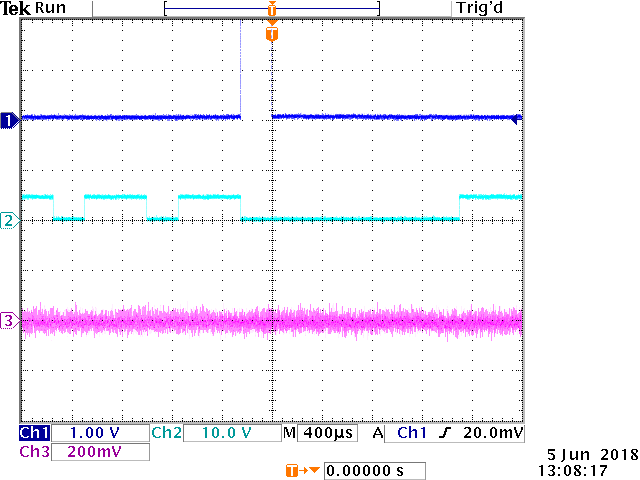
Due to the TTL level output of the PNG, the output voltage level never reaches 0V.





### DC Component Graph

A cursor was used on the oscilloscope to measure the DC Offset. The value being 224mV.



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## Modulator

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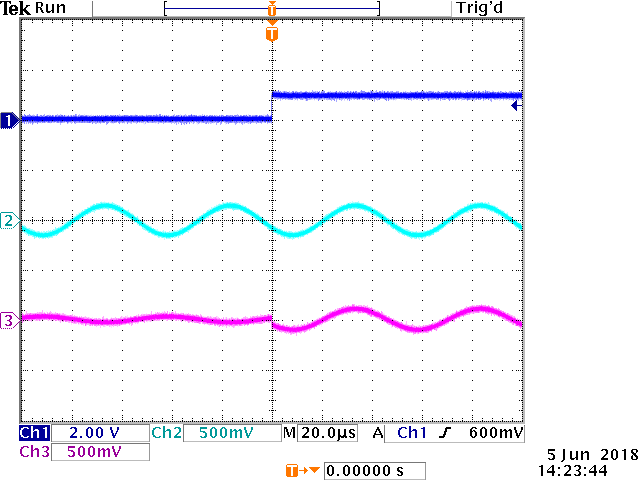
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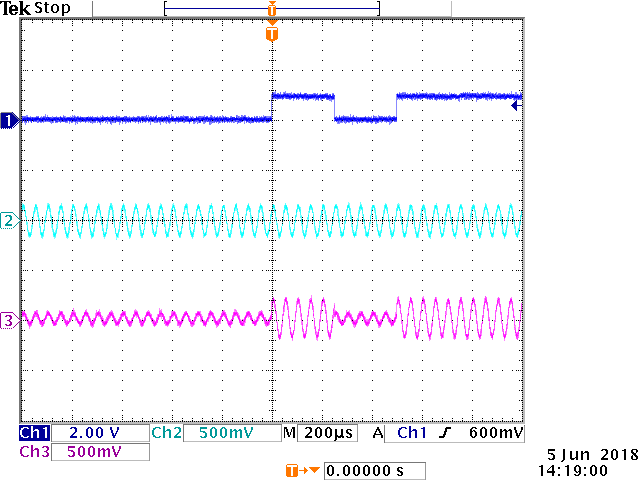
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### 2 Symbols

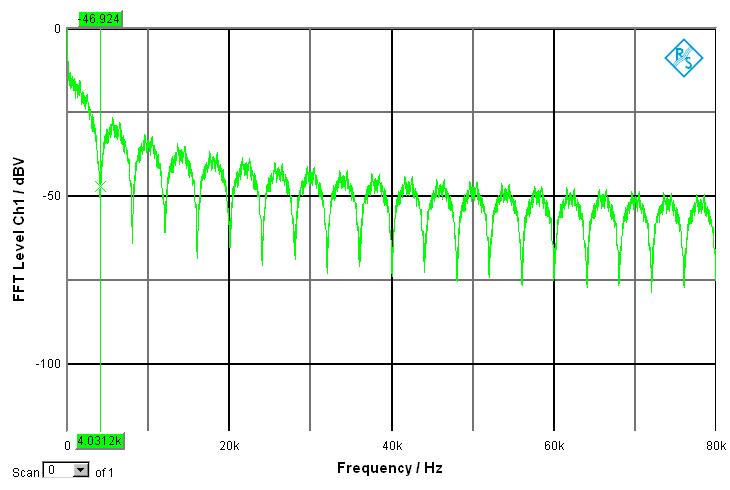
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### 20 Symbols



### Spectrum

Range 0-40kHz



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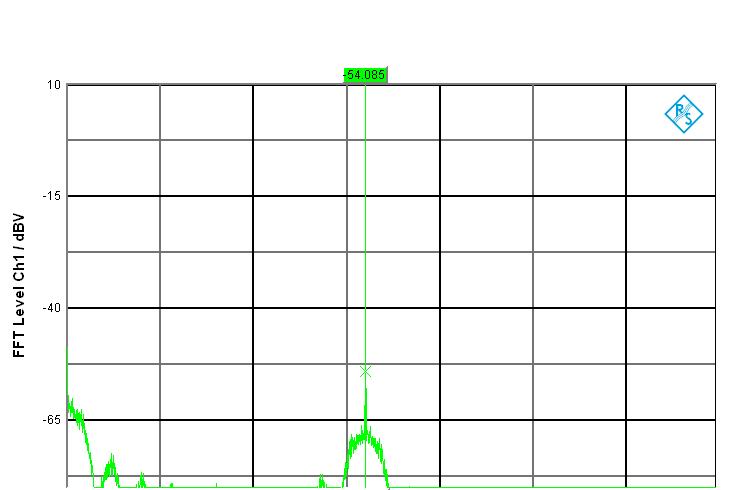
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## Demodulator

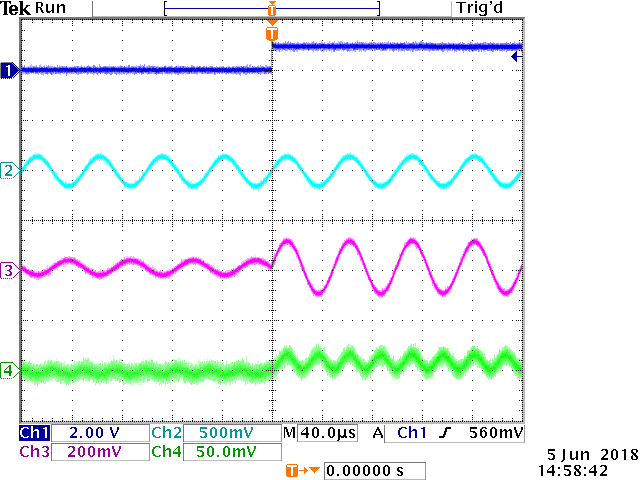
### Mixer

Adjust to OOK modulation using “Mod\_In\_Offset

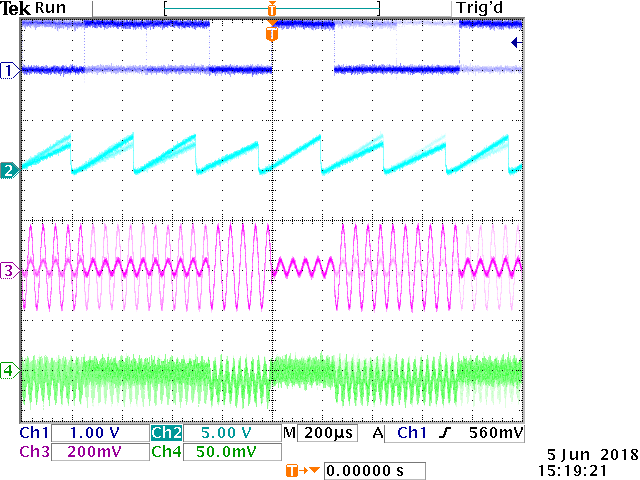
### Spectrum



### 2 Symbols

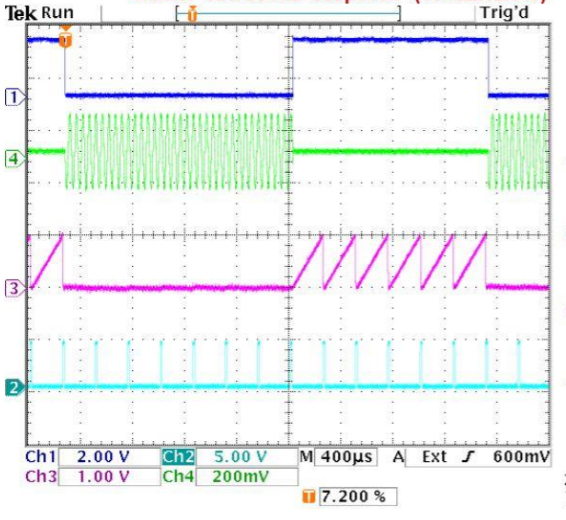


### 20 Symbols



## Matches Filter = Integrator

### Graph



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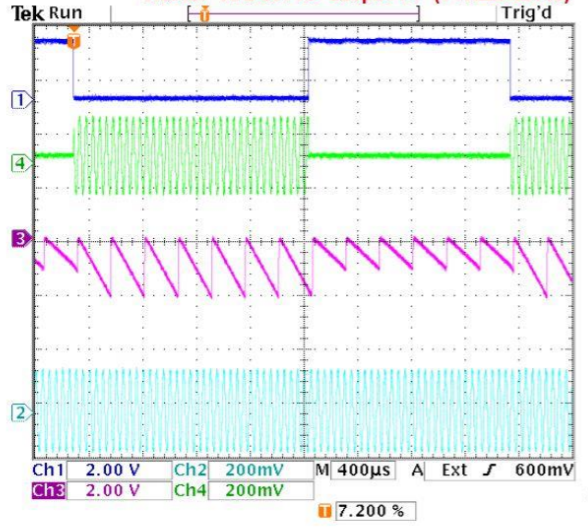
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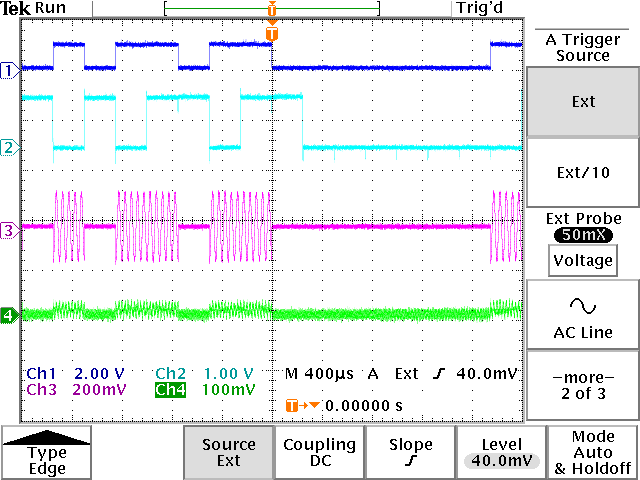
## BER Measurement

The optimal decision threshold level is in the middle of the HIGH (1) and the LOW (0).



## Measure the bit error ratio BER

### Diagram



### Table

|  |  |
| --- | --- |
| Noise in dB | Bit Error Ratio |
| -100 | 0 |
| -60 | 0 |
| -40 | 0 |
| -30 | 0.018 |
| -20 | 0.107 |
| -10 | 0.2 |
| 0 | 0.253 |

## Evaluation

Without noise being present in the system the bit error ratio remains 0. Adding noise to our system increases the value of the BER progressively. At -100 dB BER has the value 0, while at 0 dB we have 0.253 as the value of BER.