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## c2\_demodulation.m

```
%{  
Description:  
    Demodulates the dual-band signal at the output of the PA, using the  
    resampled data from Cadence. The script recovers the baseband  
    signals  
    transmitted on two RF carriers.  
  
Input:  
    - pa_resampled.mat  
  
Output:  
    - pa_data.mat  
%}  
clear; clc; close all;  
tic
```

## Parameters

```
freq_carrier_1 = 1.8e9;  
bandwidth_1 = 8*20e6;  
freq_carrier_2 = 5.4e9;  
bandwidth_2 = 8*20e6;
```

## Functions

```
current_folder = fileparts(mfilename('fullpath'));  
root_folder = fileparts(current_folder);  
functions_folder = fullfile(root_folder, 'f0_functions');  
addpath(functions_folder);
```

## Load PA data

```
resampled_file = fullfile(current_folder, 'pa_resampled.mat')  
load(resampled_file);
```

---

```

output_pa = signal_out_resampled;
N = length(output_pa);
fs = N / time_uniform(end);

resampled_file =
'C:\Users\Shoit\Desktop\pa_db_1p8_5p4\f3_pa_demod
\pa_resampled.mat'

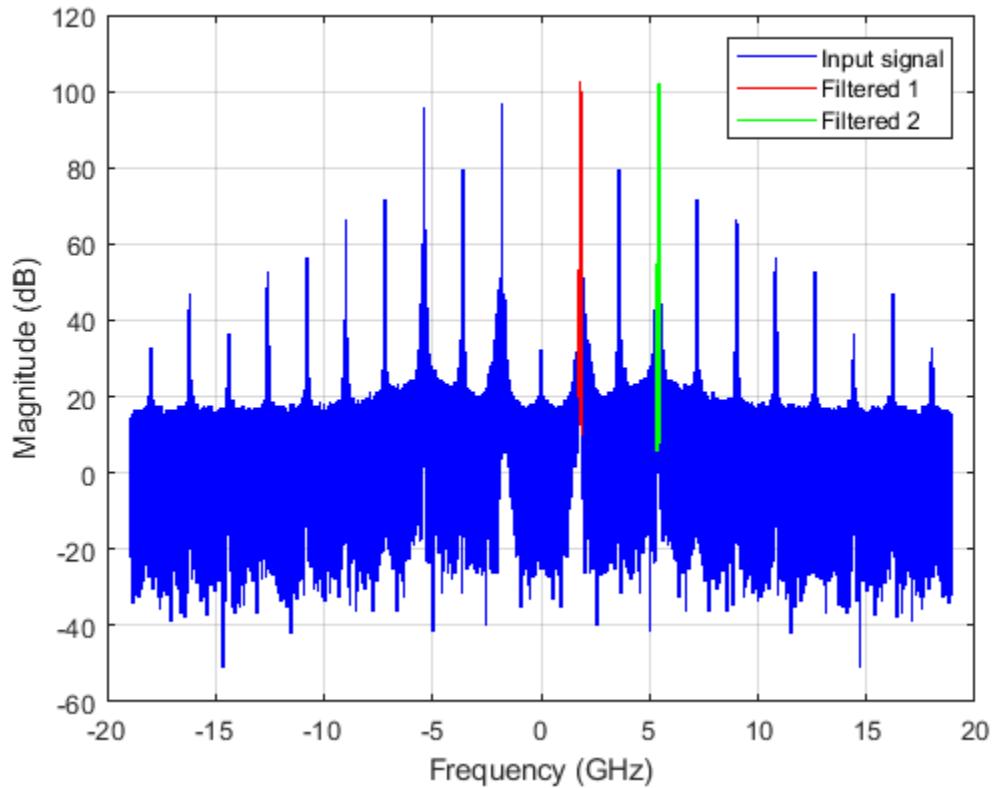
```

## Call demodulation function for PA output

```

[signal_1_out, signal_2_out, ~] = demodulate(signal_out_resampled, ...
    time_uniform, freq_carrier_1, freq_carrier_2, bandwidth_1,
    bandwidth_2, true);

```

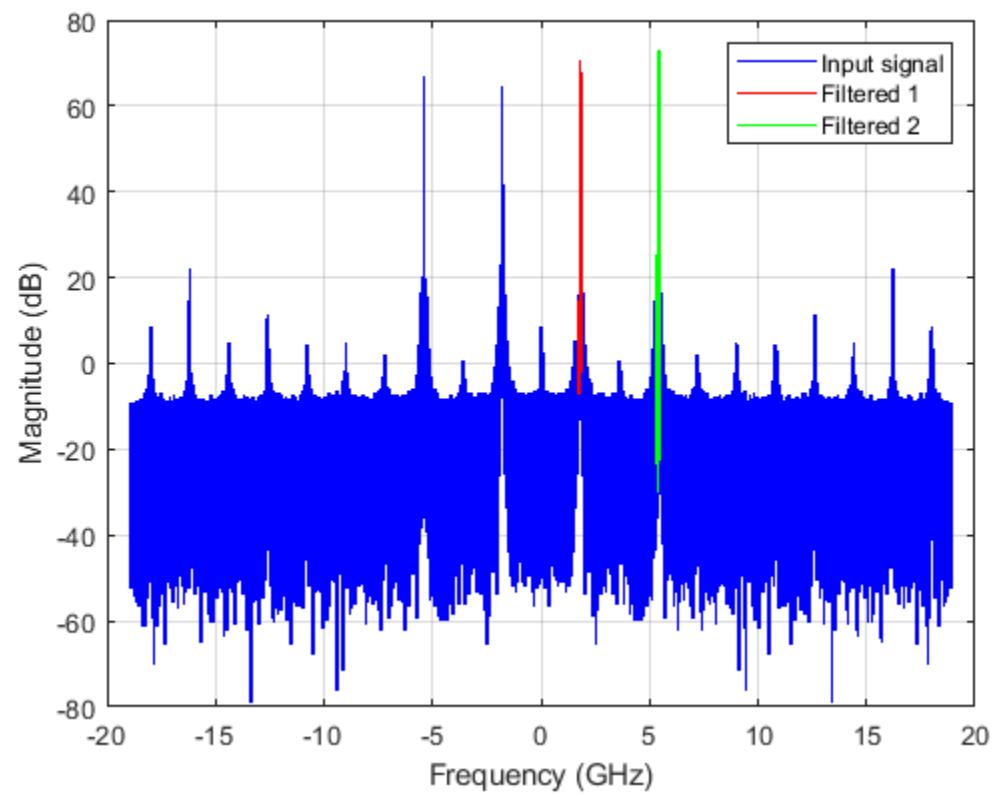
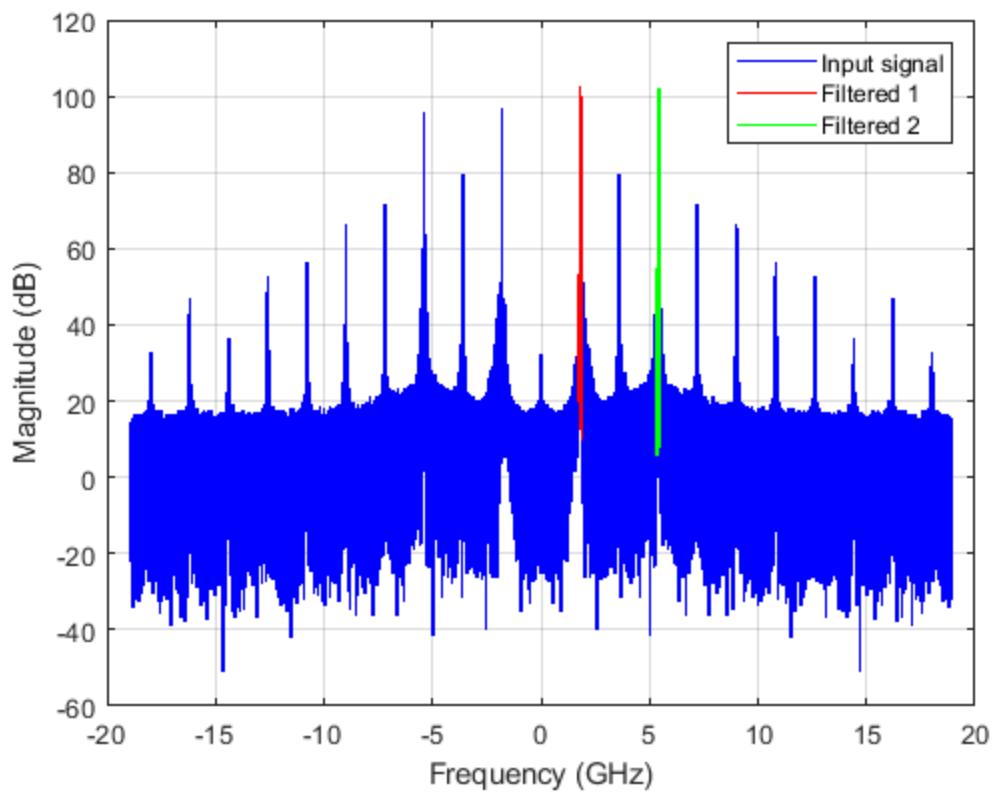


## Call demodulation function for PA input

```

[signal_1_in, signal_2_in, time_baseband] =
demodulate(signal_in_resampled, ...
    time_uniform, freq_carrier_1, freq_carrier_2, bandwidth_1,
    bandwidth_2, true);

```



---

## Print

```
max_s1_in = max(abs(signal_1_in))
max_s2_in = max(abs(signal_2_in))
max_s1_out = max(abs(signal_1_out))
max_s2_out = max(abs(signal_2_out))
```

*max\_s1\_in =*

*0.0473*

*max\_s2\_in =*

*0.0463*

*max\_s1\_out =*

*1.6358*

*max\_s2\_out =*

*1.3137*

## Save results

```
script_folder = fileparts(mfilename('fullpath'));
mat_filename = fullfile(script_folder, 'pa_data.mat');

save(mat_filename, 'time_baseband', ...
    'signal_1_in', 'signal_2_in', ...
    'signal_1_out', 'signal_2_out', '-v7.3');
```

*toc*

*Elapsed time is 6.561130 seconds.*

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