

## Annex 1: Measurement diagrams 21-1-0042601T08a-A1

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                            |                        |                            |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|
| <b>Number of pages:</b>                                 | 66                                                                                                                                                                                                                                                                                                                                                                                         | <b>Date of Report:</b> | 2022-Jun-30                |
| <b>Testing company:</b>                                 | CETECOM GmbH<br>Im Teelbruch 116<br>45219 Essen Germany<br>Tel. + 49 (0) 20 54 / 95 19-0<br>Fax: + 49 (0) 20 54 / 95 19-150                                                                                                                                                                                                                                                                | <b>Applicant:</b>      | WITTE-Velbert GmbH & Co.KG |
| <b>Product:</b><br><b>Model:</b>                        | BTLE enabled secure vehicle access box<br>flinkey CAN                                                                                                                                                                                                                                                                                                                                      |                        |                            |
| <b>FCC ID:</b>                                          | V2TFC80                                                                                                                                                                                                                                                                                                                                                                                    | <b>IC:</b>             | 7575A-FC80                 |
| <b>Testing has been carried out in accordance with:</b> | <b>Title 47 CFR, Chapter I</b><br><b>FCC Regulations, Subchapter A</b><br>Part 15, Subpart C: §15.225<br><br><b>ISED Regulations</b><br>RSS-Gen, Issue 5 + Amendment 2<br>RSS-210, Issue 10<br><br>Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".each section under "Test method and limit". |                        |                            |

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## 1 Measurement diagrams

### 1.1 H-Field strength

Worst case position was determined to be the standing position. Following measurements were performed in worst case position only.

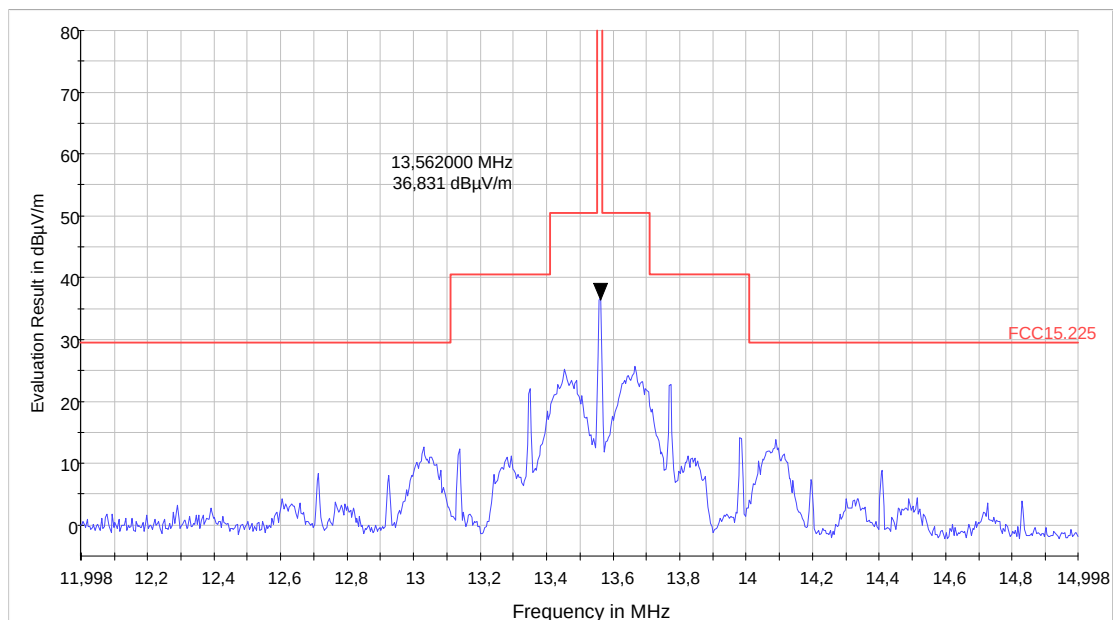
## 2.02\_H-Field\_standing

### Common Information

|                            |                                                                         |
|----------------------------|-------------------------------------------------------------------------|
| Test Description:          | Magnetic Field Strength Measurement related to 30 m distance            |
| Test Site Location:        | Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance |
| Version of Testsoftware:   | EMC32 V10.50.0                                                          |
| Distance correction:       | used accord. table, pls. see test report                                |
| Technical Data:            | Please see page 2 for detailed data of measurement setup                |
| Rec. antenna (pre-scan):   | height 1.00 m, parallel and 90° to EUT polarisation                     |
| Environmental Conditions:: | Humidity : 50%rH; Temperature: 18°C                                     |
| Used Filter:               | bypass                                                                  |
| Test Standard:             | FCC 15.225; RSS-Gen: Issue 5                                            |
| Operator:                  | TFra/SSanthakum                                                         |
| Operating Mode:            | NFC TX TX mod. PRBS                                                     |
| Verdict:                   | Passed                                                                  |

### EUT Information

|               |                                                     |
|---------------|-----------------------------------------------------|
| PMT number:   | 21-1-00426S28_C01                                   |
| Manufacturer: | WITTE-Velbert GmbH & Co.KG                          |
| Power Supply: | 12 V DC                                             |
| Comments:     | EUT laying, with Keyfob, PRBS testmode, door closed |



## 1.2 Radiated spurious emissions < 30MHz

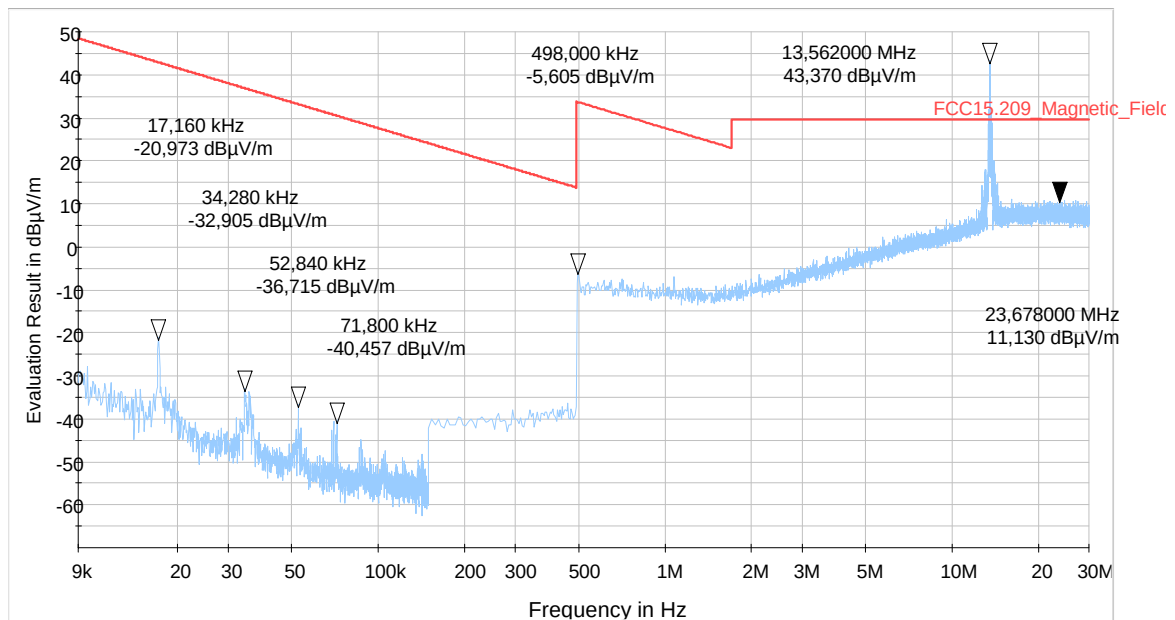
### 2.03\_RSE\_standing

#### Common Information

|                            |                                                                         |
|----------------------------|-------------------------------------------------------------------------|
| Test Description:          | Magnetic Field Strength Measurement related to 30 m distance            |
| Test Site Location:        | Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance |
| Version of Testsoftware:   | EMC32 V10.50.0                                                          |
| Distance correction:       | used accord. table, pls. see test report                                |
| Technical Data:            | Please see page 2 for detailed data of measurement setup                |
| Rec. antenna (pre-scan):   | height 1.00 m, parallel and 90° to EUT polarisation                     |
| Environmental Conditions:: | Humidity : 50%rH; Temperature: 18°C                                     |
| Used Filter:               | bypass                                                                  |
| Test Standard:             | FCC 15.225; RSS-Gen: Issue 5                                            |
| Operator:                  | TFra/SSanthakum                                                         |
| Operating Mode:            | NFC TX TX mod. PRBS                                                     |
| Verdict:                   | Passed                                                                  |

#### EUT Information

|               |                                                       |
|---------------|-------------------------------------------------------|
| PMT number:   | 21-1-00426S28_C01                                     |
| Manufacturer: | WITTE-Velbert GmbH & Co.KG                            |
| Power Supply: | 12 V DC                                               |
| Comments:     | EUT standing, with Keyfob, PRBS testmode, door closed |



Remark: carrier at 13.56 MHz not relevant for the measurement

### 1.3 Radiated spurious emissions > 30MHz

## 3.01\_RSE\_standing

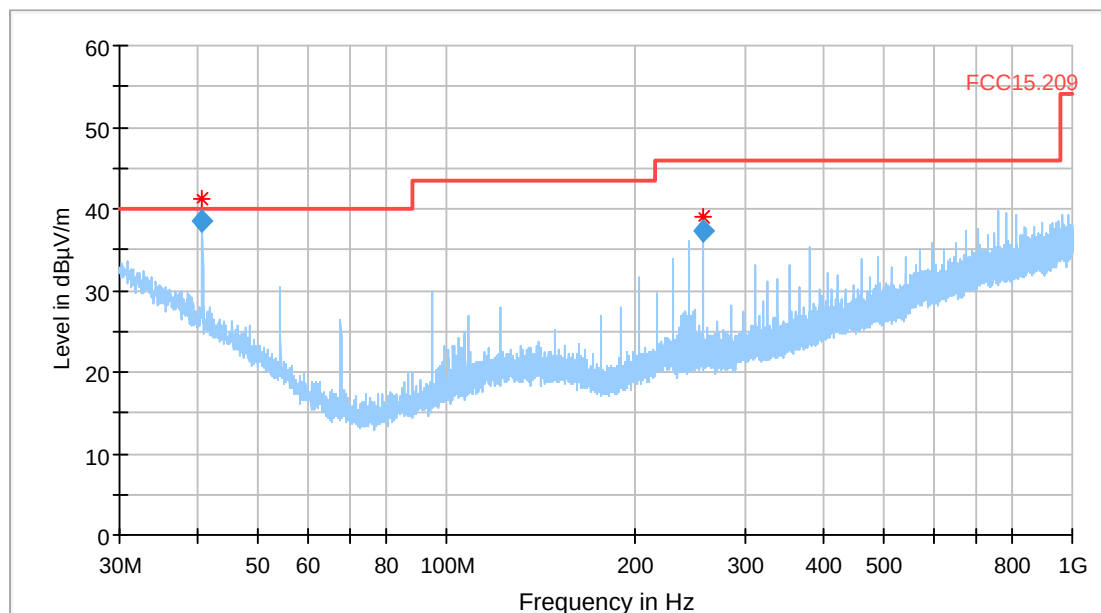
#### Common Information

Test Description: Radiated field strength emission in 3m distance  
 Test Site: CETECOM GmbH Essen  
 Test Standard: FCC 15.205&15.209 & RSS Gen. Issue 5  
 Antenna polarisation: horizontal/vertical  
 Environmental Conditions: Humidity : 51%rH; Temperature: 21°C  
 Operator Name: LKnopp  
 Operating Mode: NFC TX TX mod. PRBS  
 Comment: Channel nominal  
 Verdict: Passed

#### EUT Information

PMT number: 21-1-00426S28\_C01  
 Manufacturer: WITTE-Velbert GmbH & Co.KG  
 Power Supply: 12 V DC  
 Comments: EUT standing, with Keyfob, PRBS testmode, door closed

Full Spectrum



#### Final\_Result

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Pream p (dB) | Trd Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-------------|-----|---------------|--------------|---------------|--------------|------------------|
| 40.679000       | 38.42              | 40.00          | 1.58        | 120.000         | 130.0       | V   | 0.0           | 19.8         | 0.0           | 0.5          | 19.3             |
| 257.645000      | 37.34              | 46.00          | 8.66        | 120.000         | 207.0       | V   | 287.0         | 14.9         | 0.0           | 1.4          | 13.5             |

## 3.02\_RSE\_lying

### Common Information

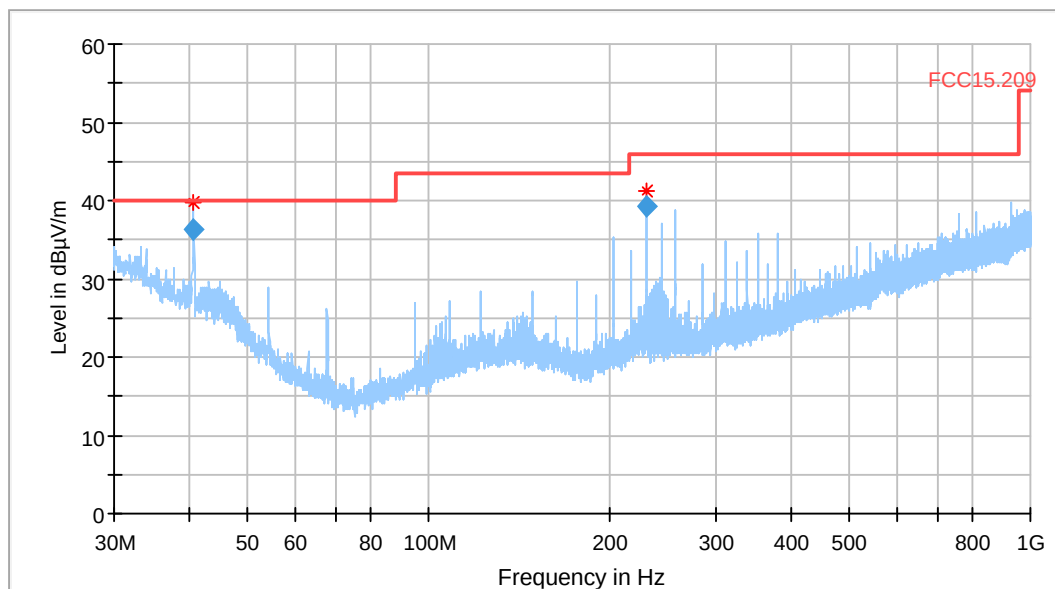
|                            |                                                 |
|----------------------------|-------------------------------------------------|
| Test Description:          | Radiated field strength emission in 3m distance |
| Test Site:                 | CETECOM GmbH Essen                              |
| Test Standard:             | FCC 15.205&15.209 & RSS Gen. Issue 5            |
| Antenna polarisation:      | horizontal/vertical                             |
| Environmental Conditions:: | Humidity : 51%rH; Temperature: 21°C             |
| Operator Name:             | LKnopp                                          |
| Operating Mode:            | NFC TX TX mod. PRBS                             |
| Comment:                   | Channel nominal                                 |
| Verdict:                   | Passed                                          |

### EUT Information

|               |                                                       |
|---------------|-------------------------------------------------------|
| PMT number:   | 21-1-00426S28_C01                                     |
| Manufacturer: | WITTE-Velbert GmbH & Co.KG                            |
| Power Supply: | 12 V DC                                               |
| Comments:     | EUT standing, with Keyfob, PRBS testmode, door closed |

### Full Spectrum

Full Spectrum



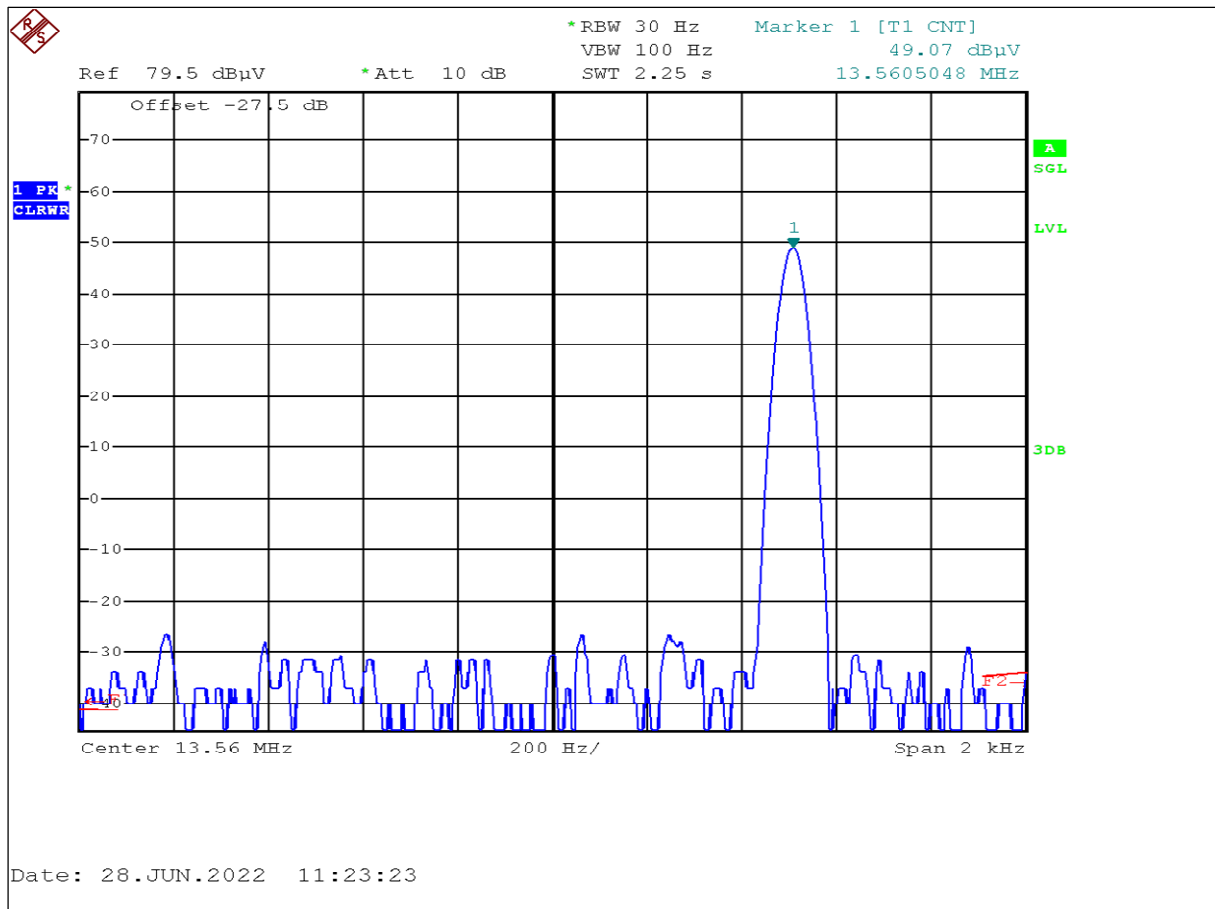
### Final Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamplifier (dB) | Trd Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-------------|-----|---------------|--------------|---------------|-------------------|------------------|
| 40.679000       | 36.31              | 40.00          | 3.69        | 120.000         | 126.0       | V   | 78.0          | 19.8         | 0.0           | 0.5               | 19.3             |
| 230.525000      | 39.17              | 46.00          | 6.83        | 120.000         | 130.0       | H   | 274.0         | 14.3         | 0.0           | 1.4               | 12.9             |

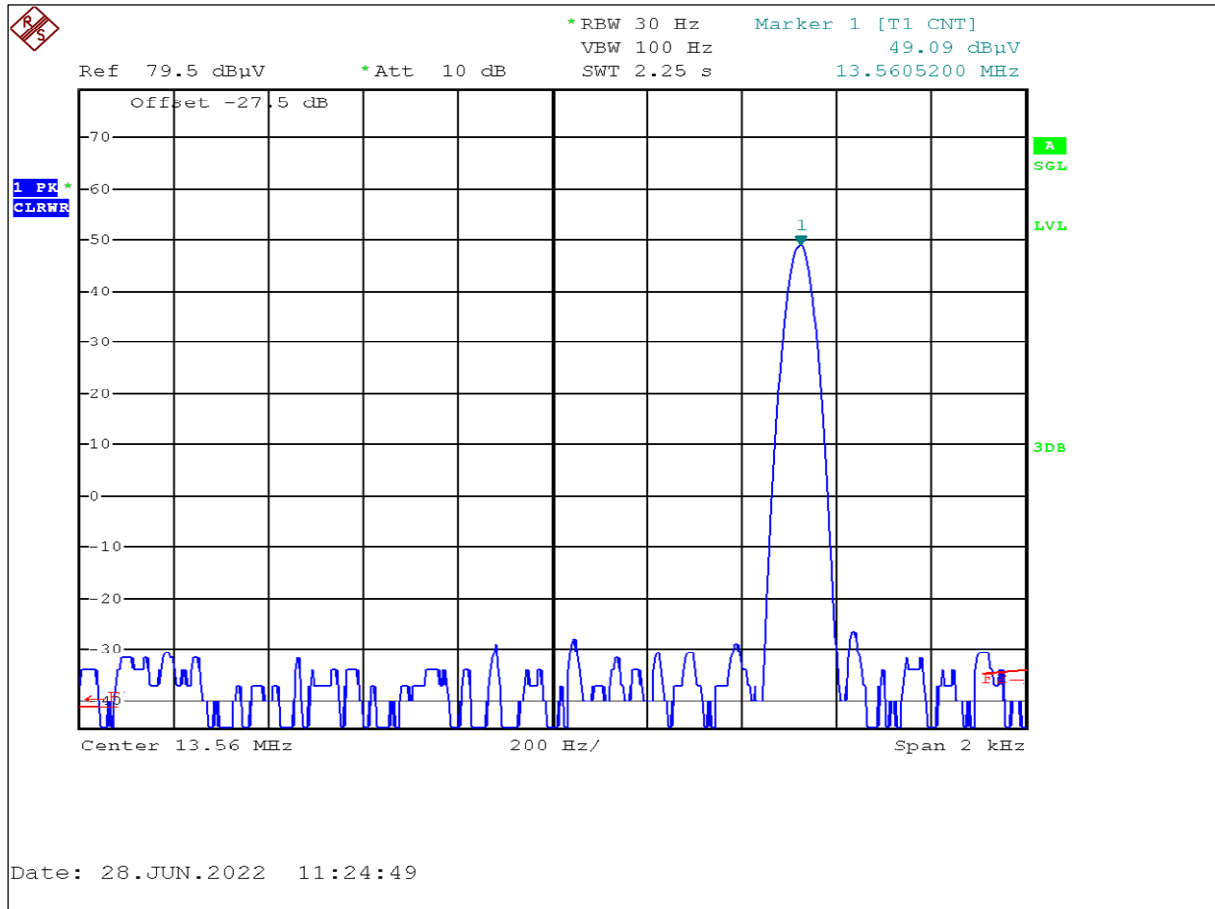
## 1.4 Frequency stability

### 1.4.1 Temperature variation

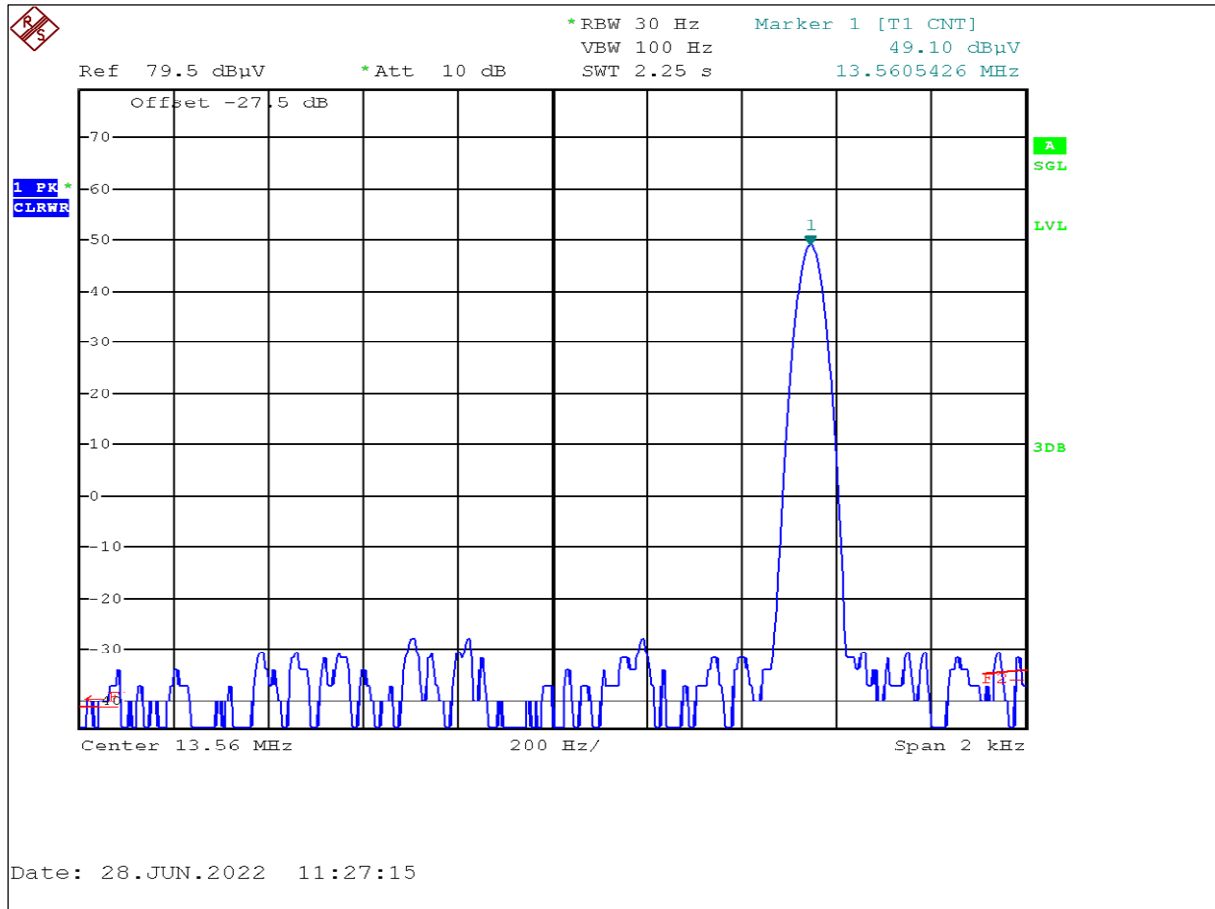
#### D01\_01\_T85\_startup



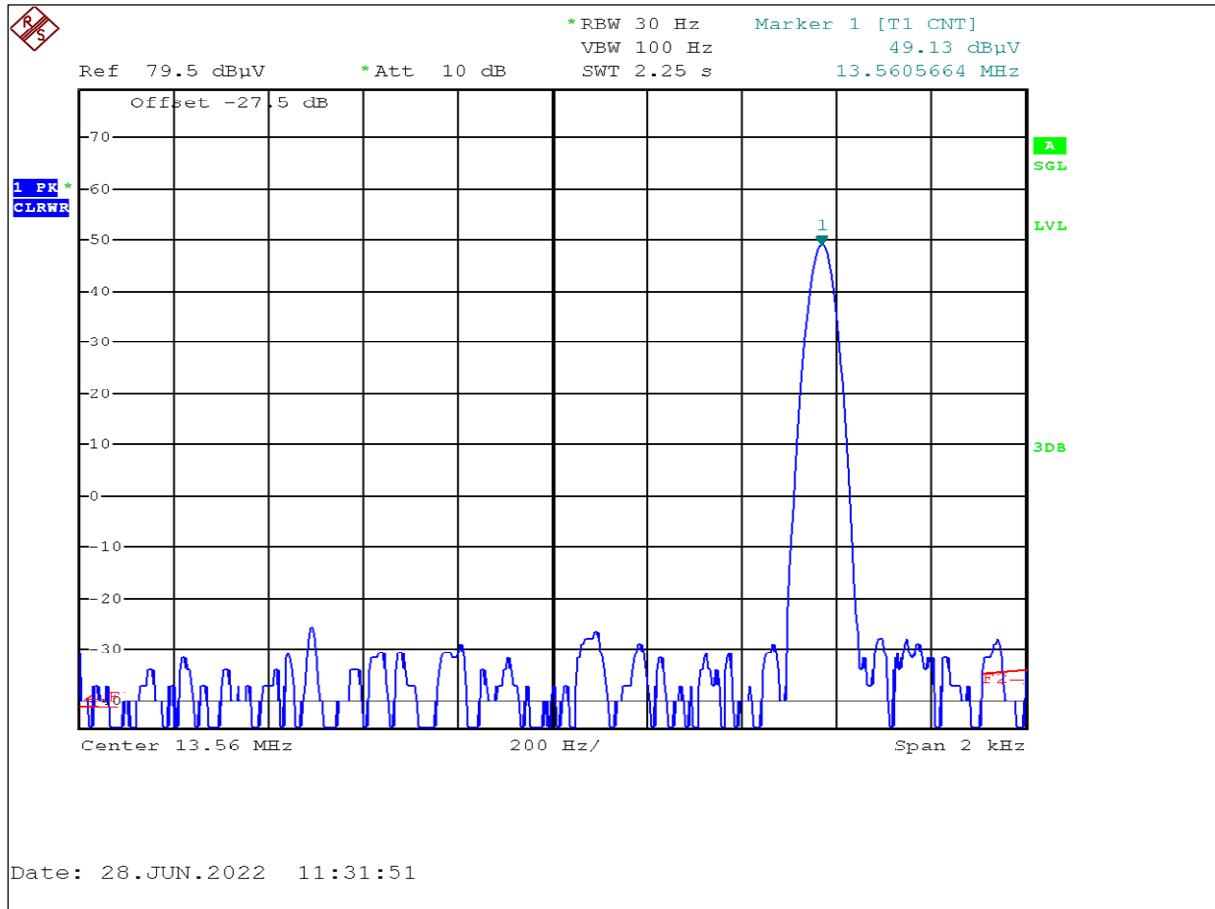
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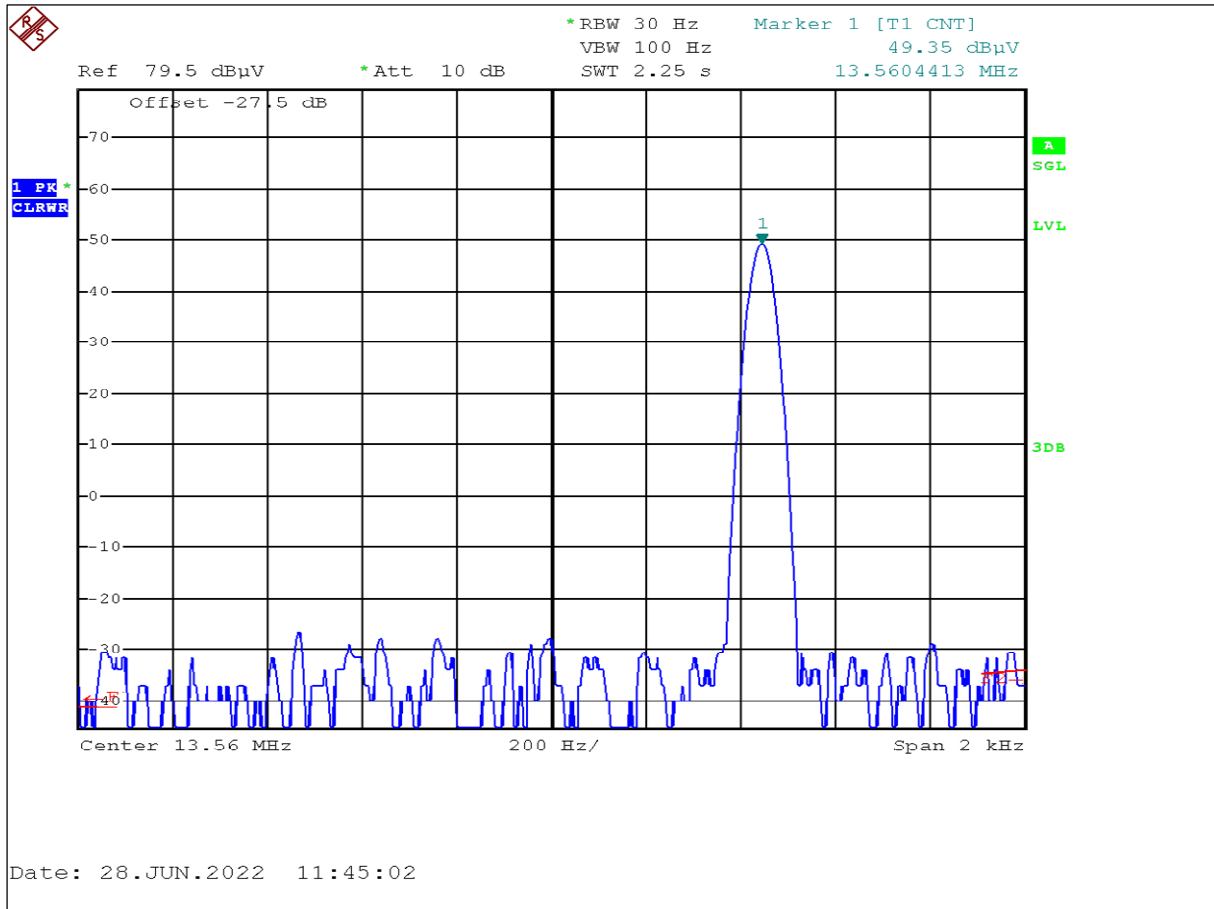
# D01\_03\_T85\_5min



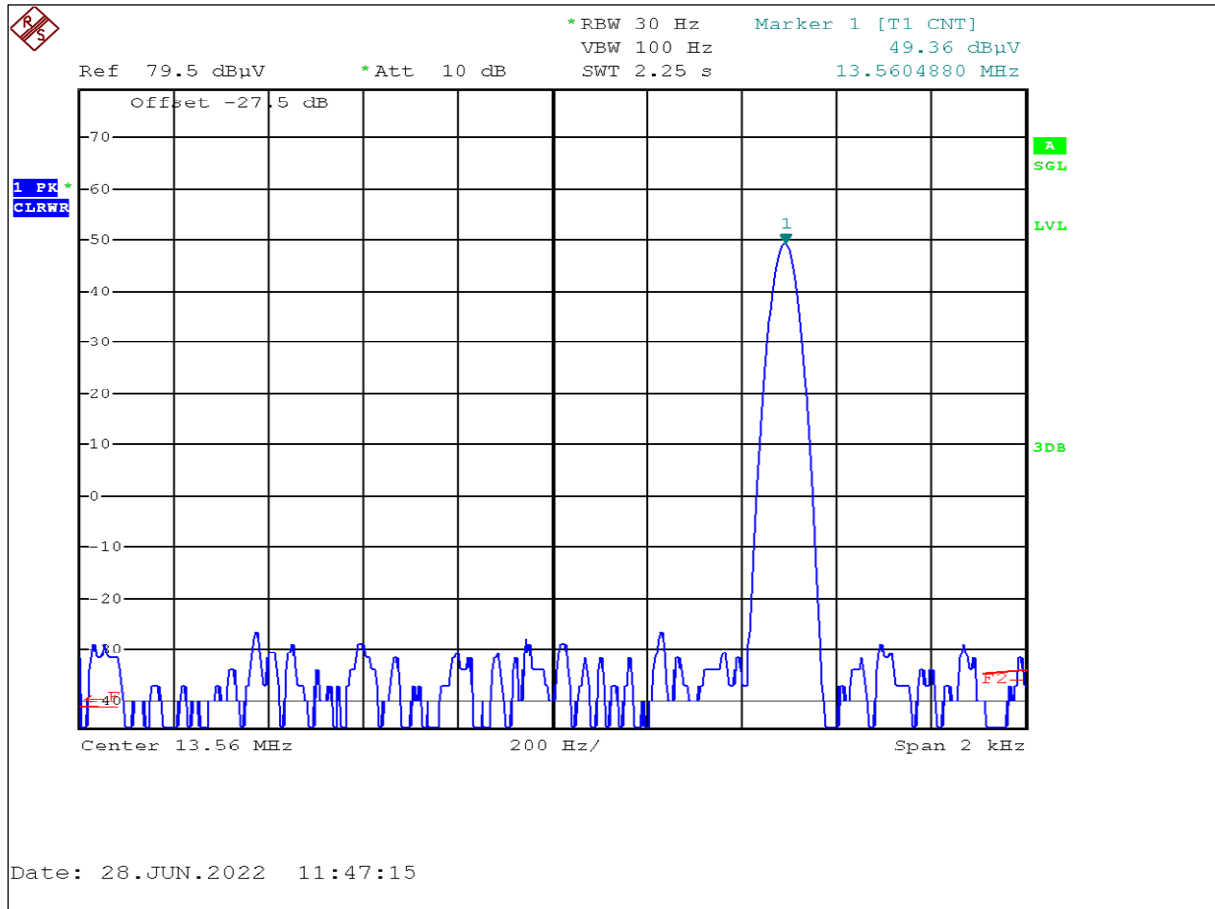
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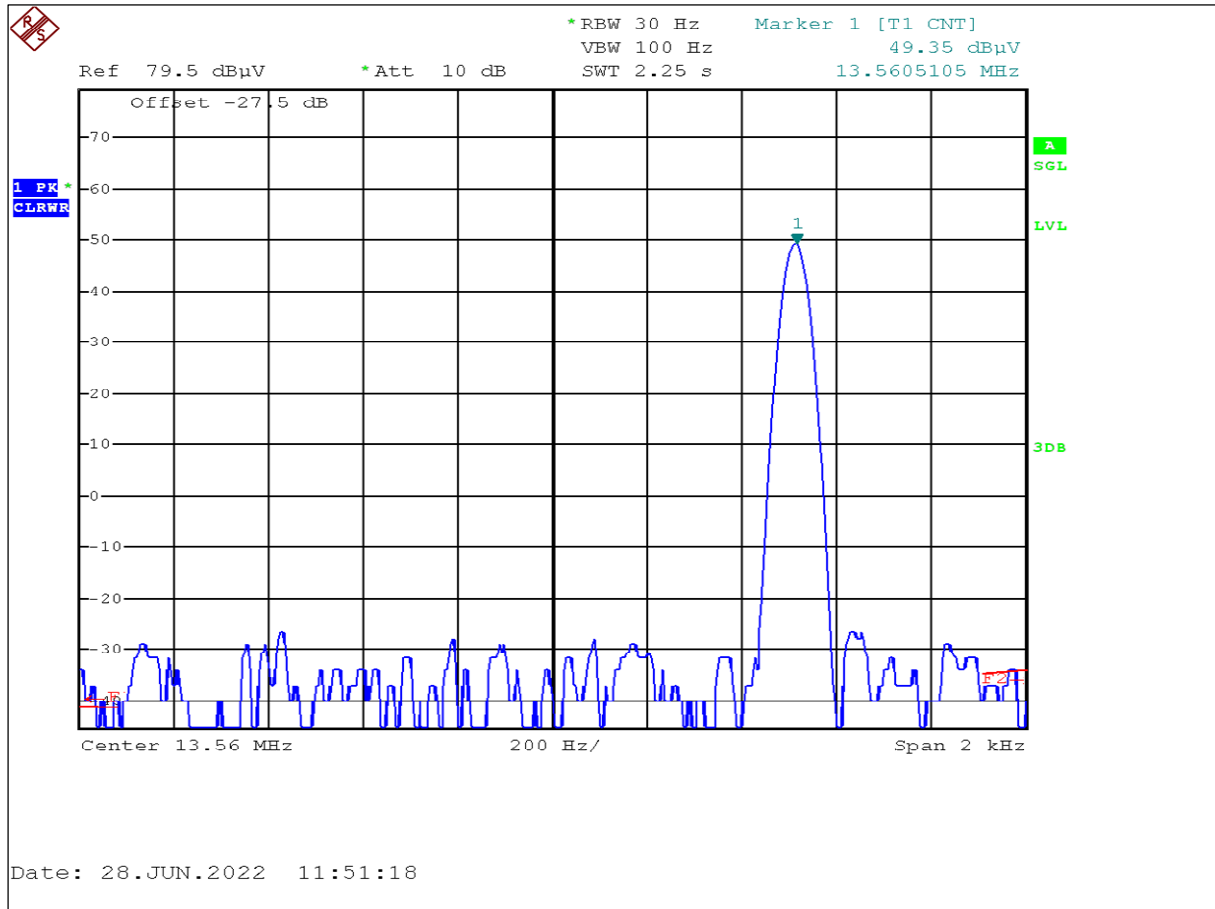
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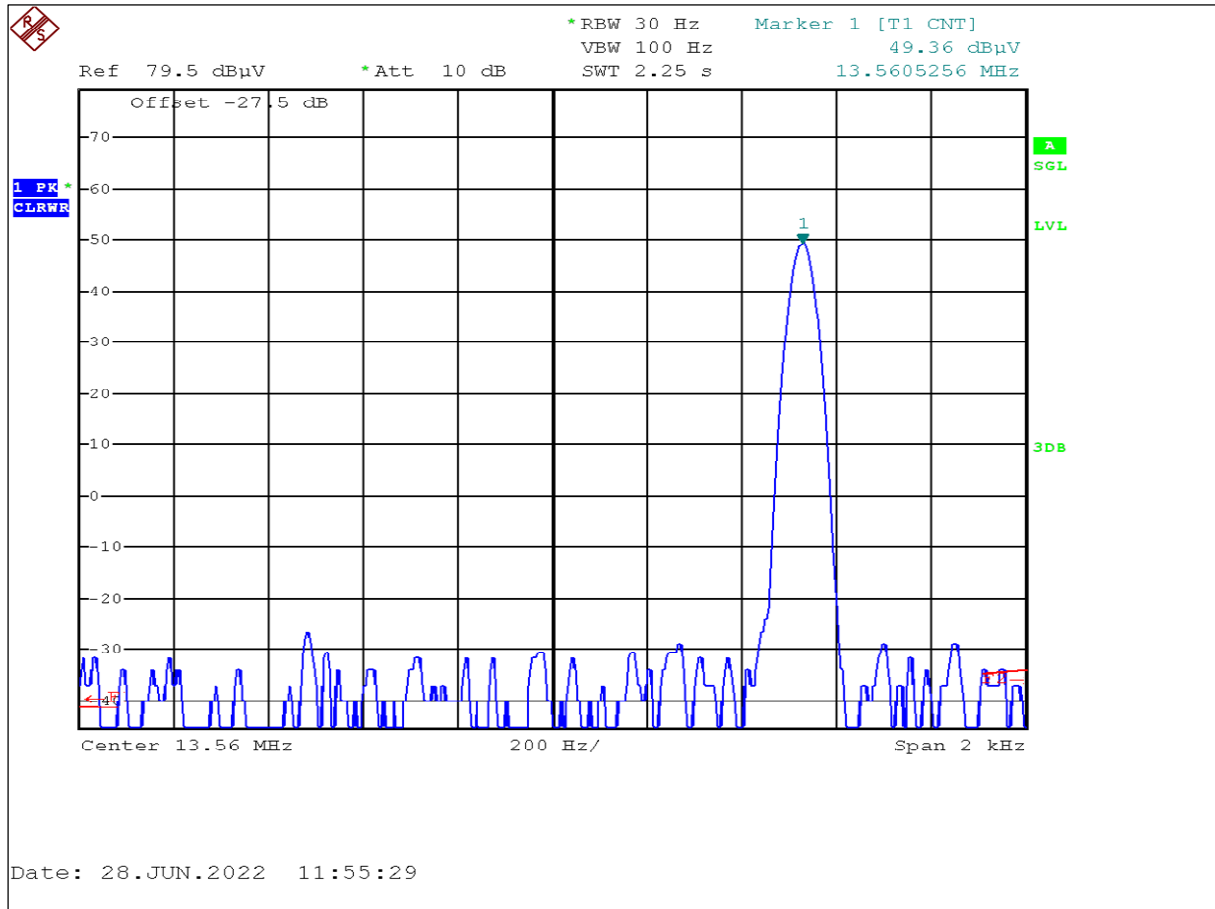
# D02\_02\_T80\_2min



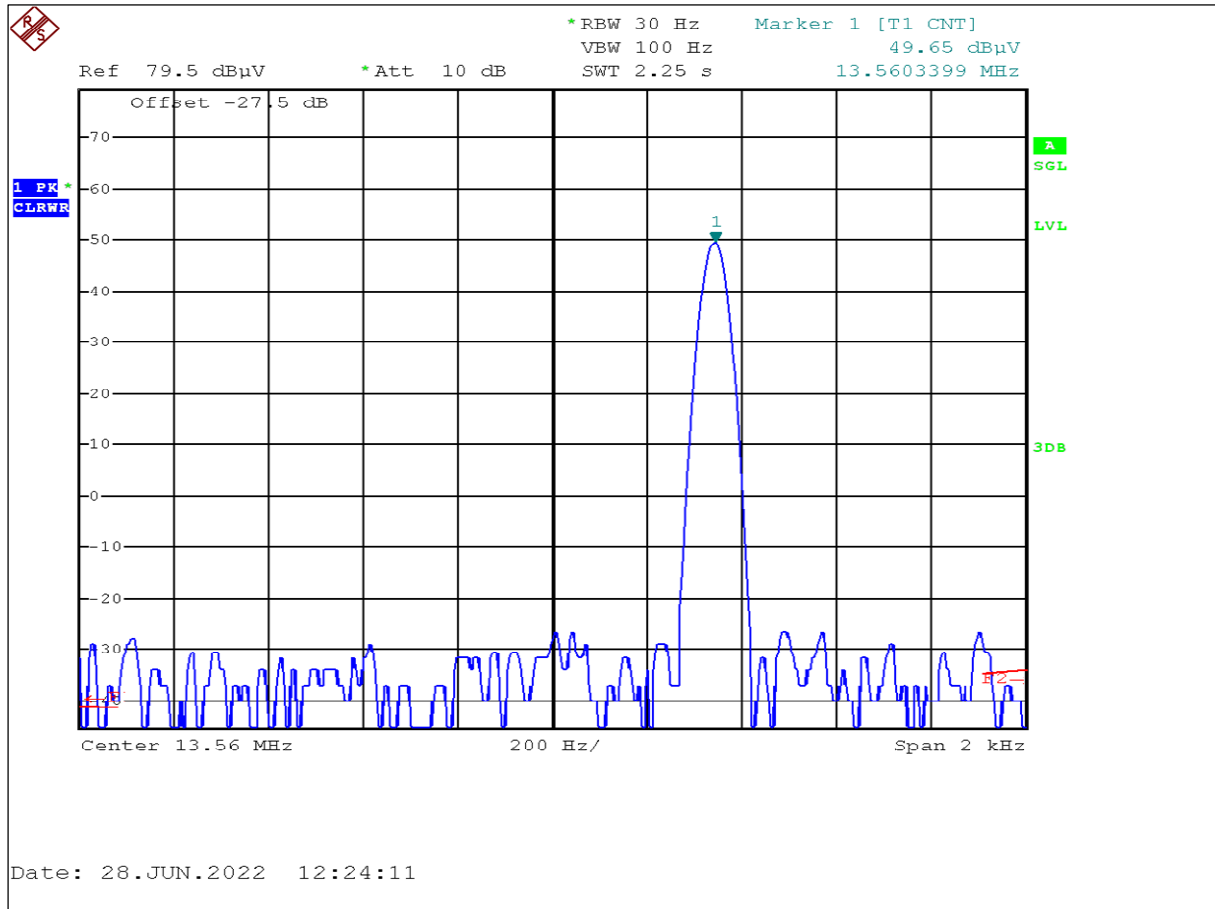
# D02\_03\_T80\_5min



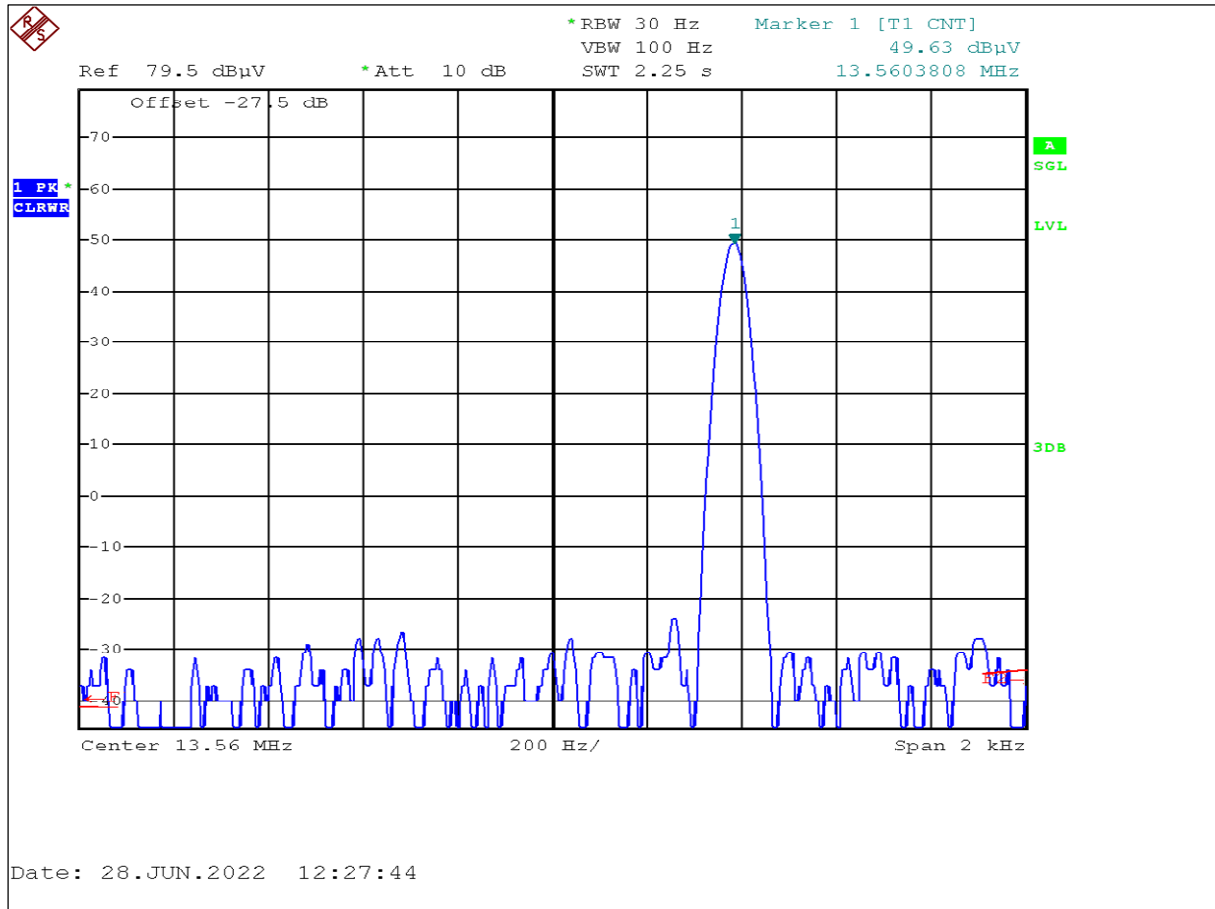
D02\_04\_T80\_10min



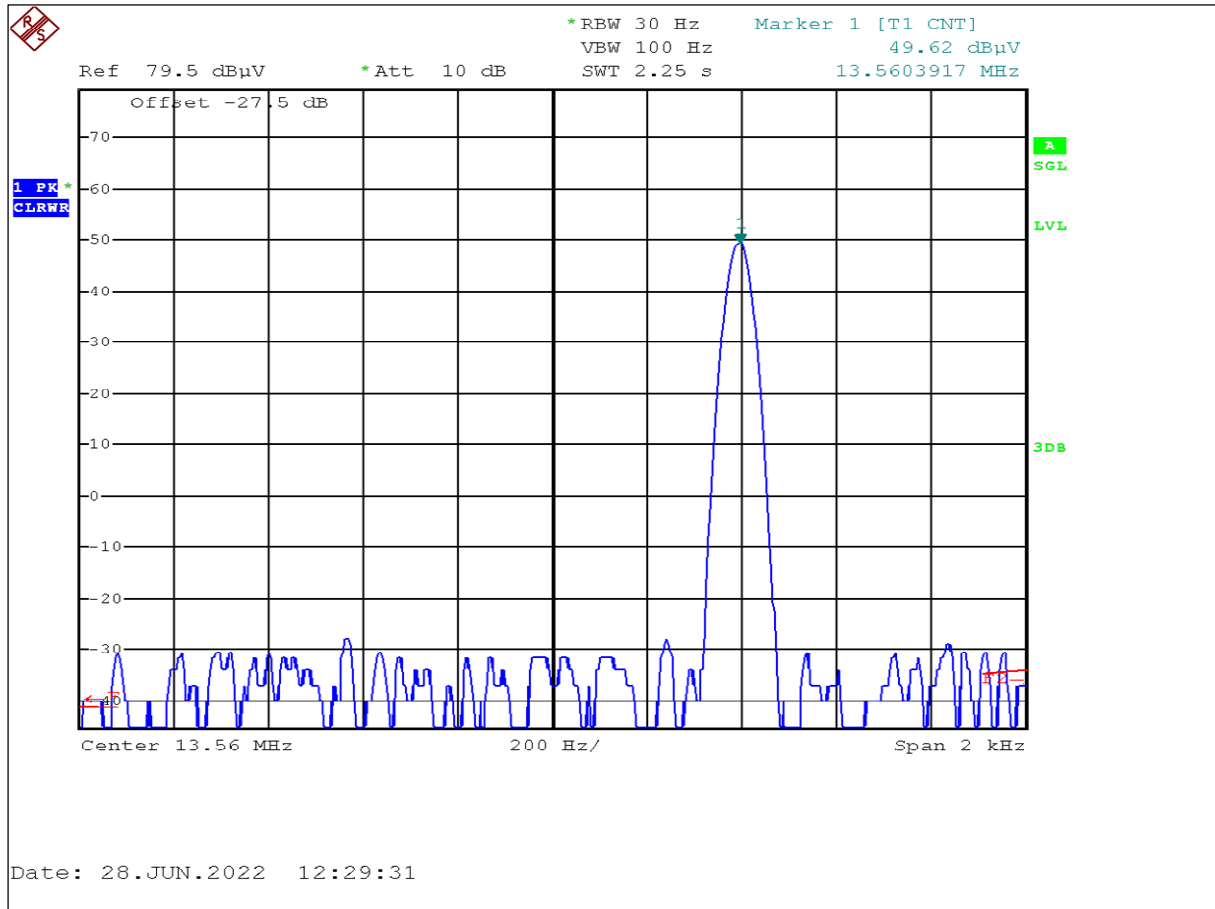
# D03\_01\_T70\_startup



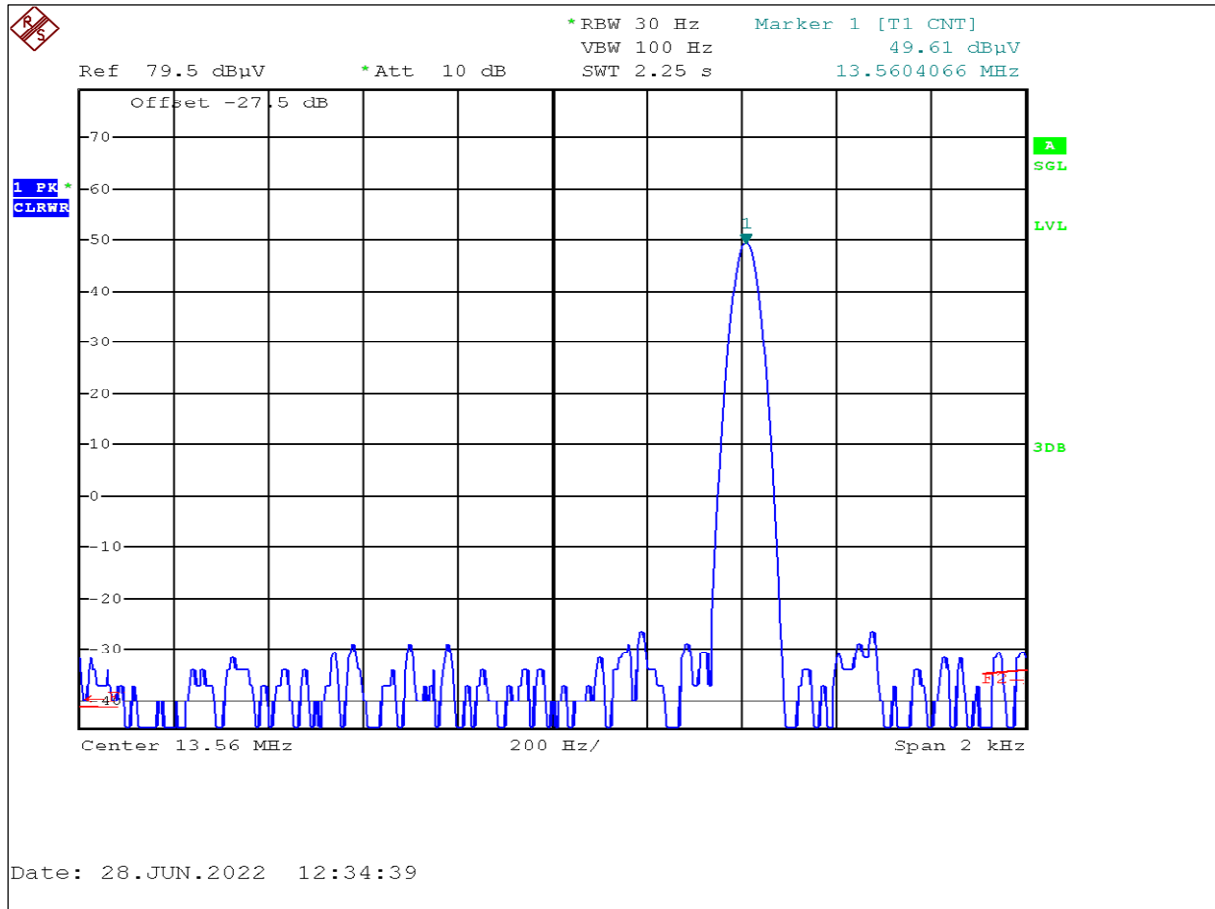
# D03\_02\_T70\_2min



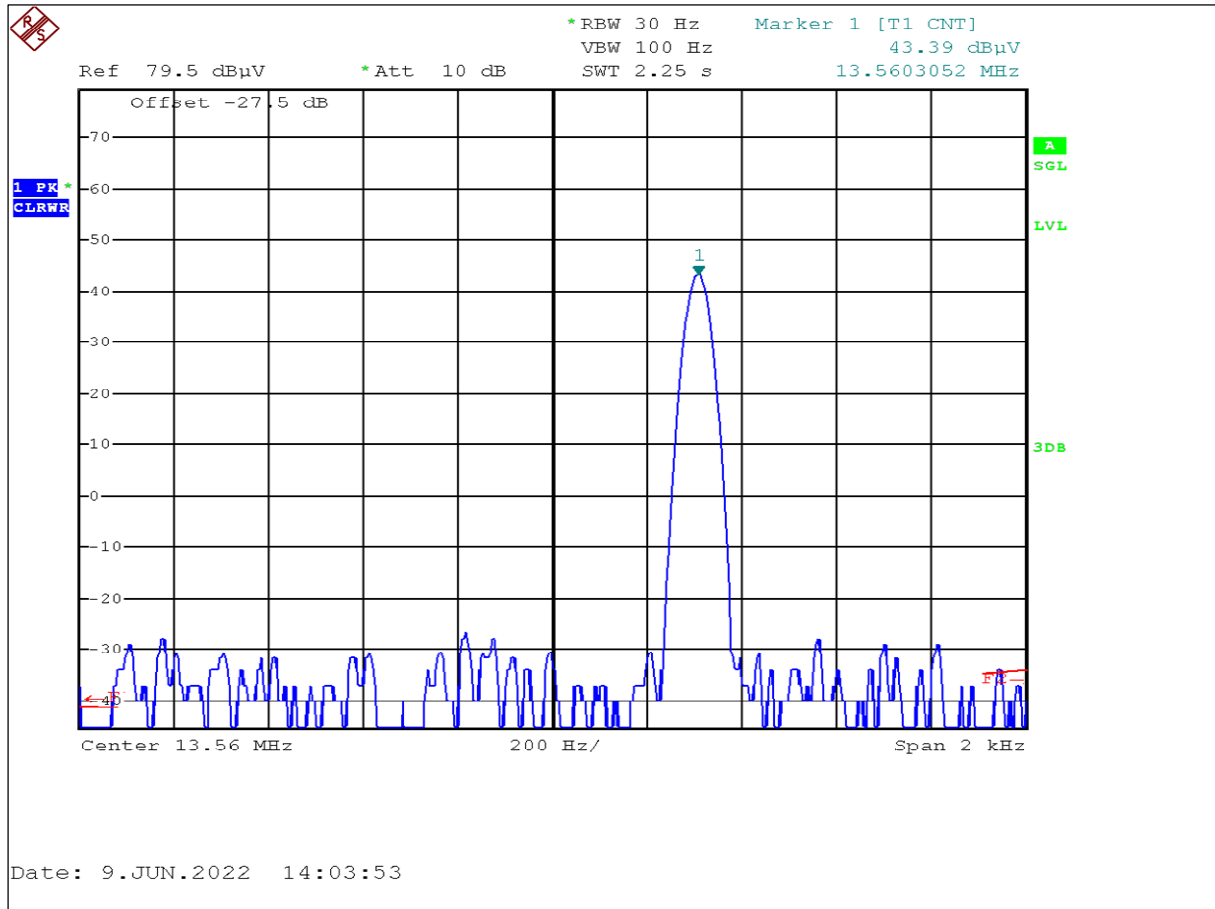
### D03\_03\_T70\_5min



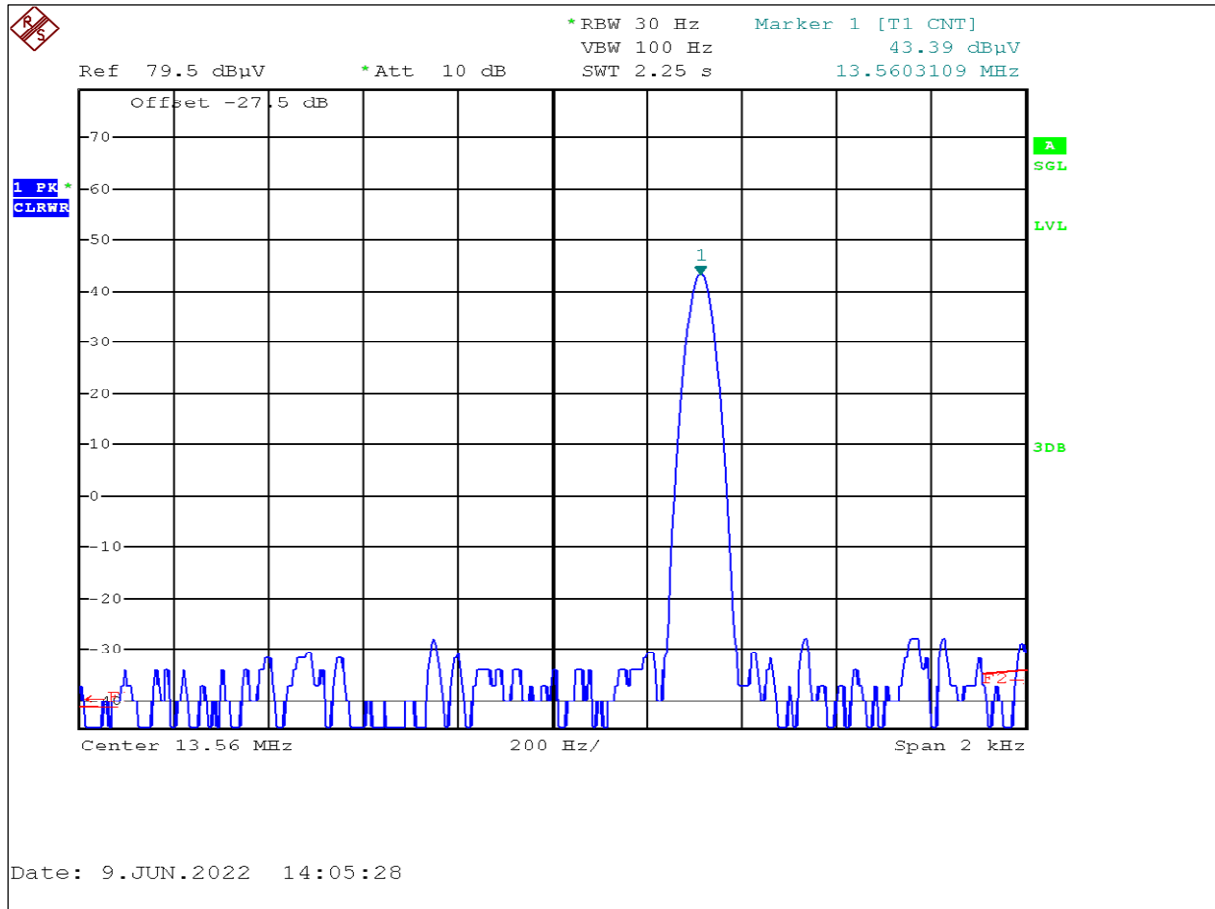
# D03\_04\_T70\_10min



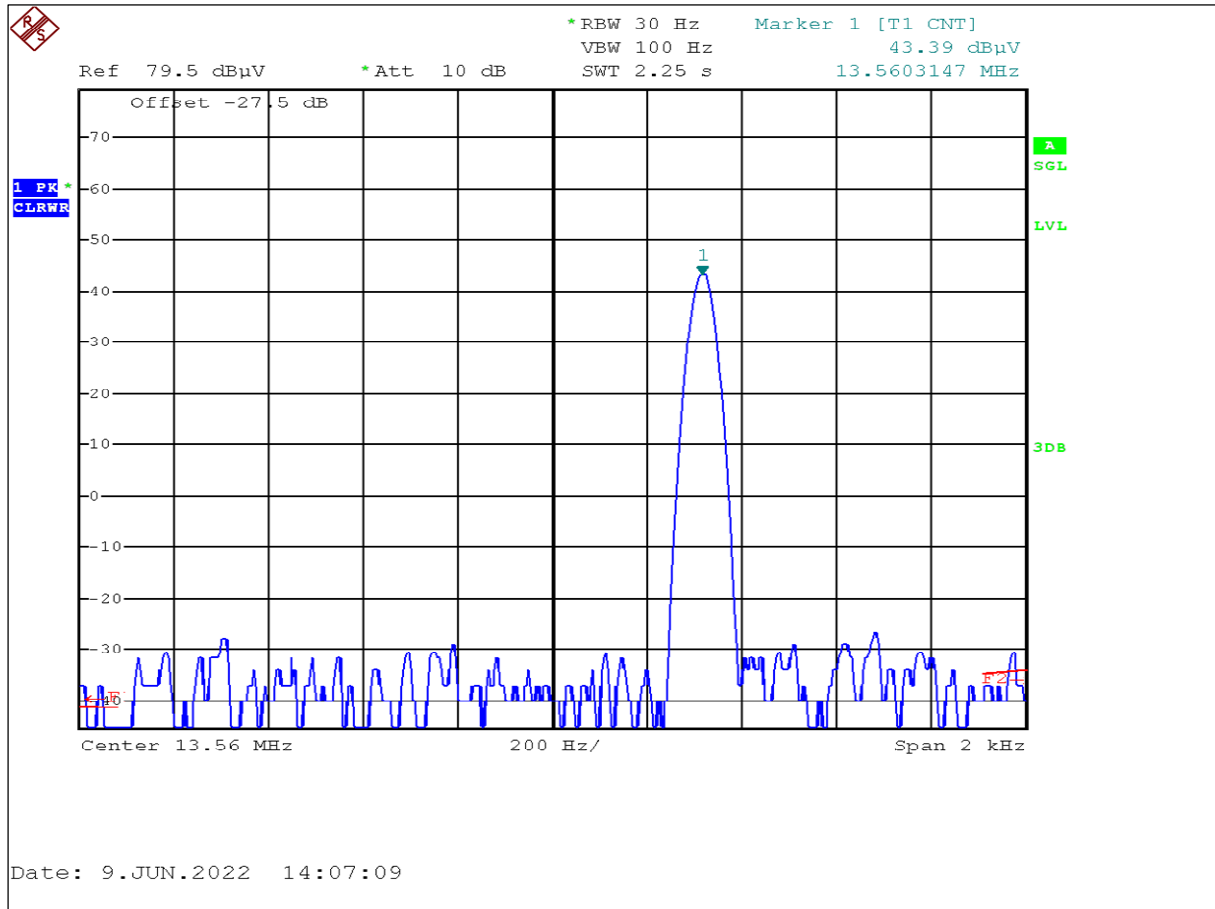
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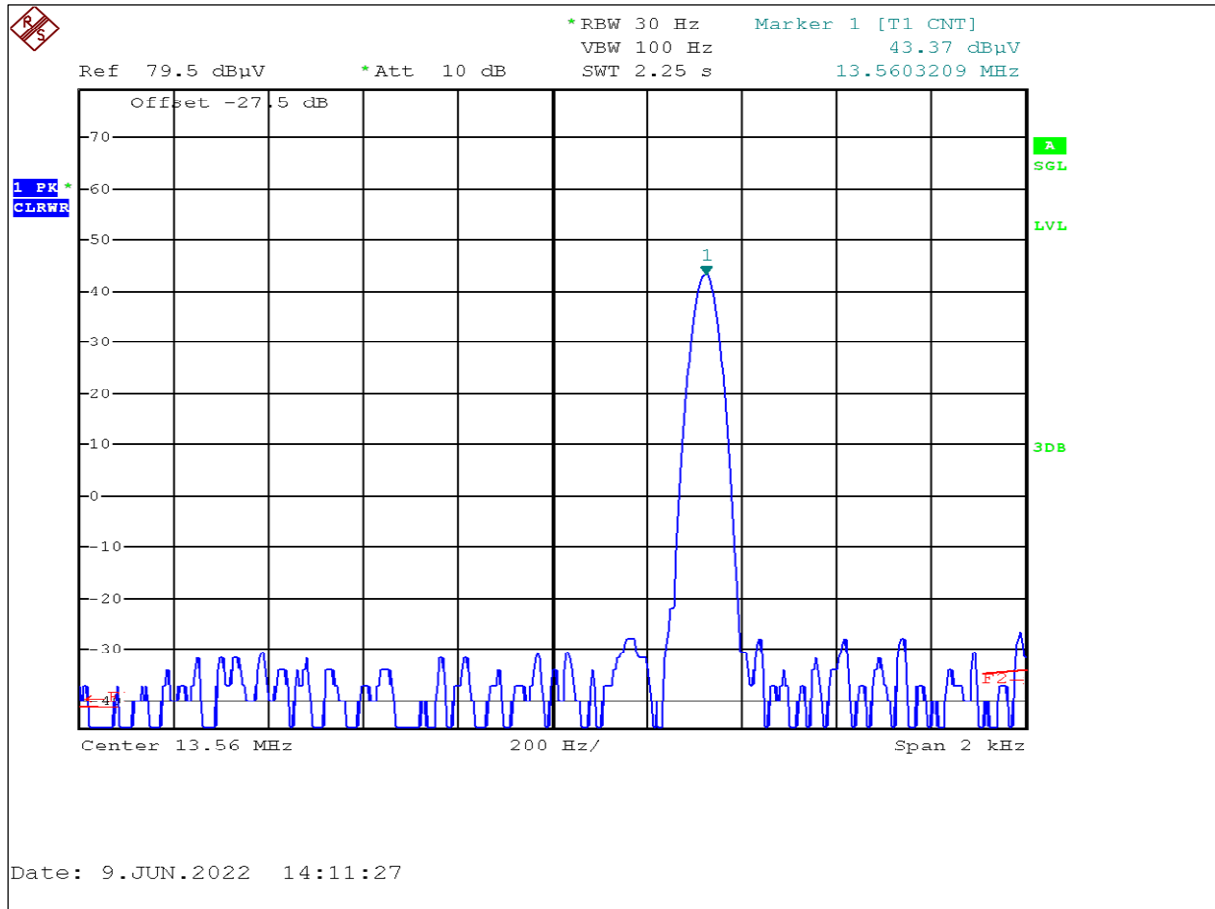
# D04\_02\_T60\_2min



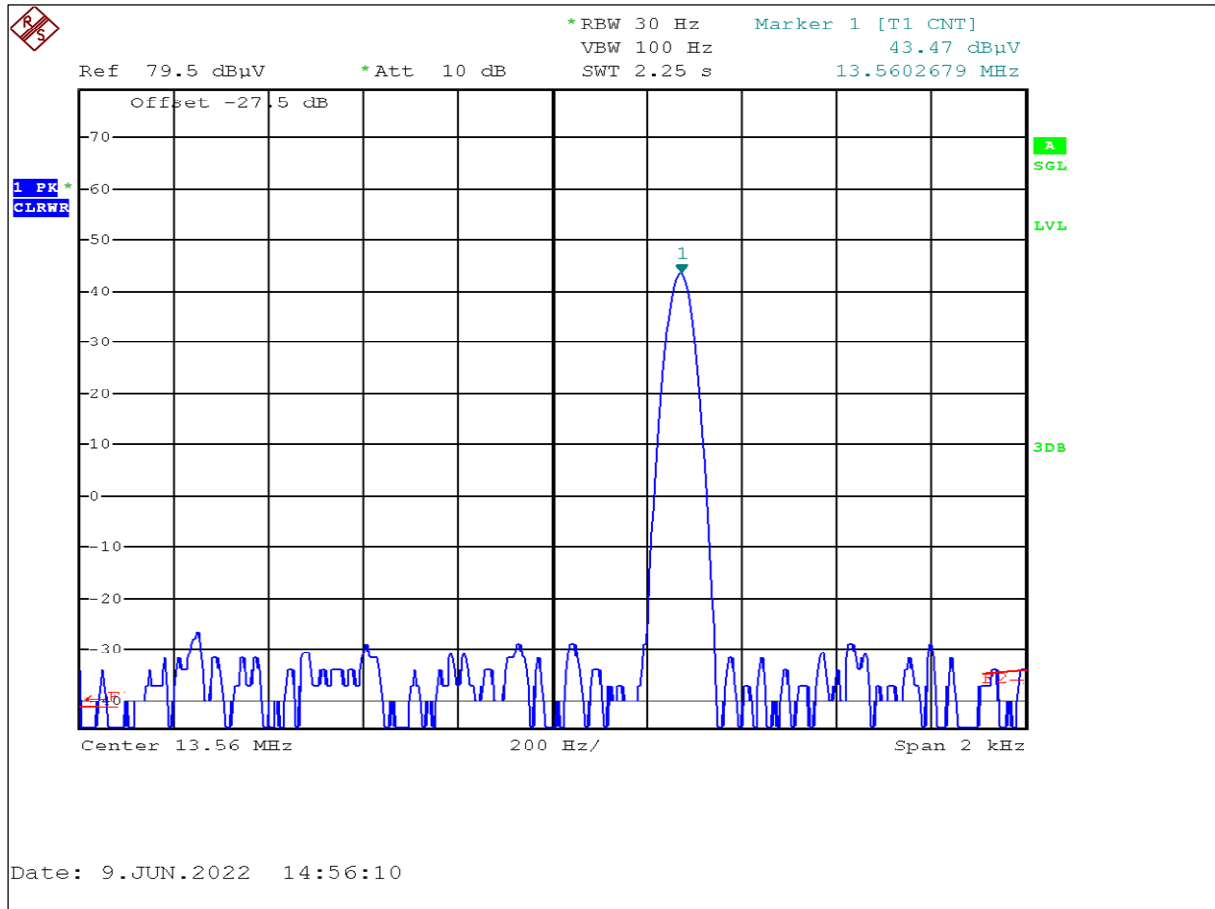
# D04\_03\_T60\_5min



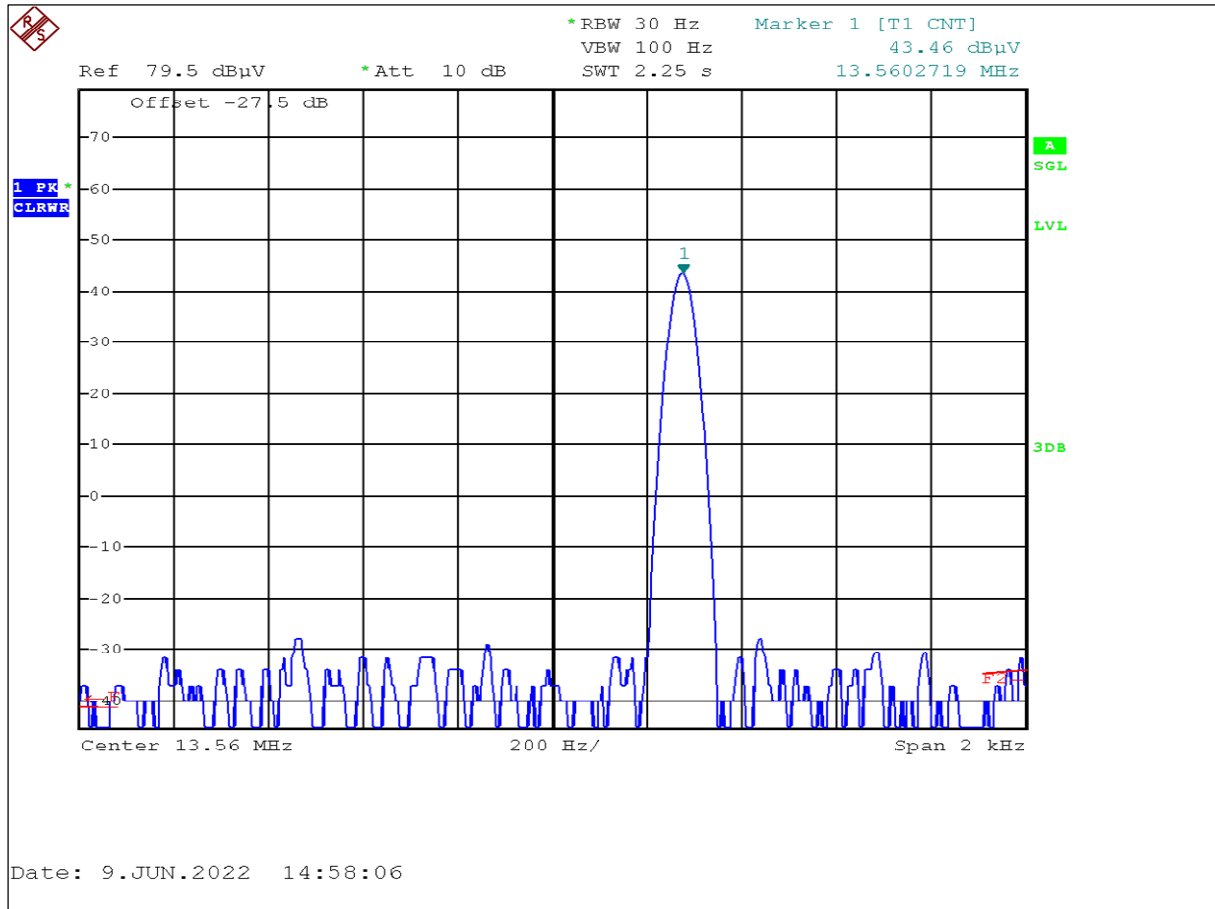
# D04\_04\_T60\_10min



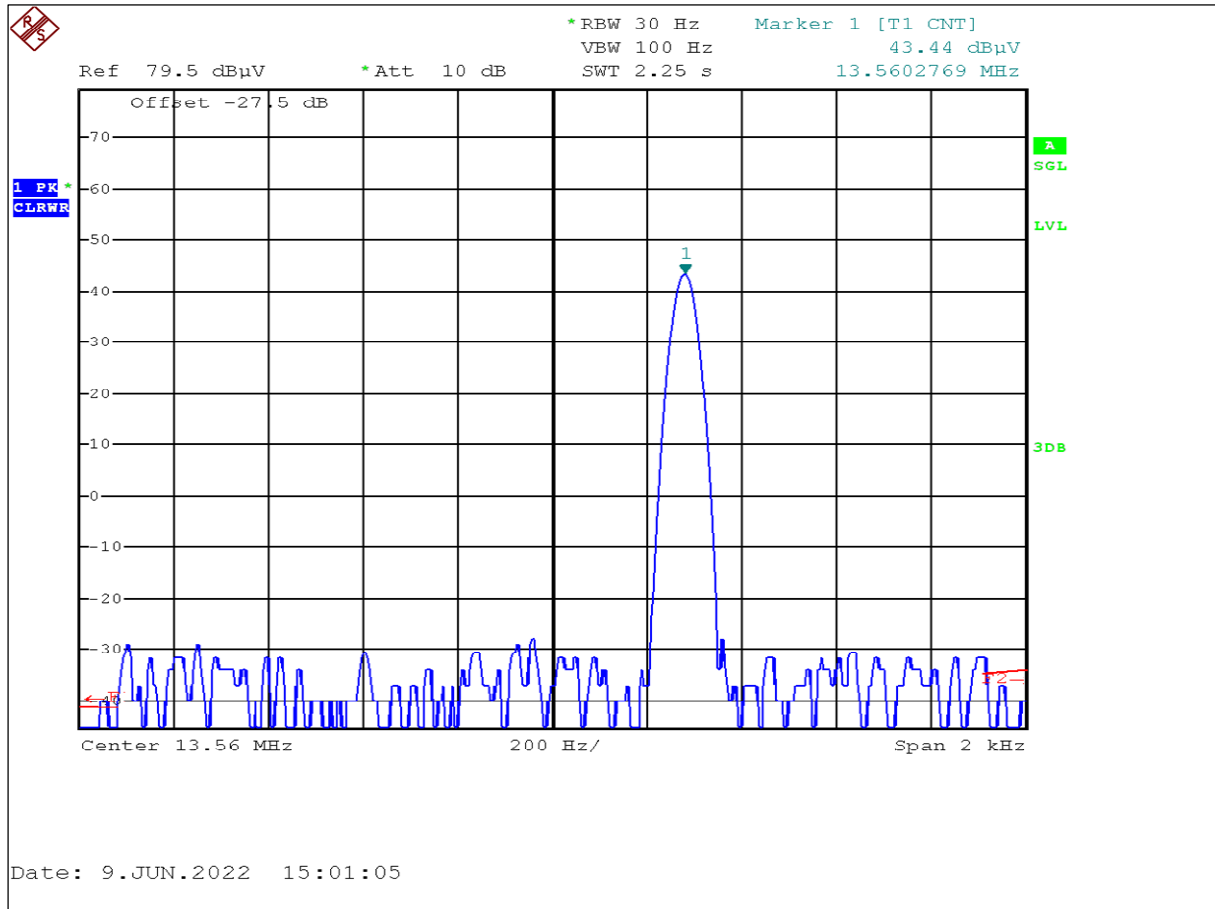
# D05\_01\_T50\_startup



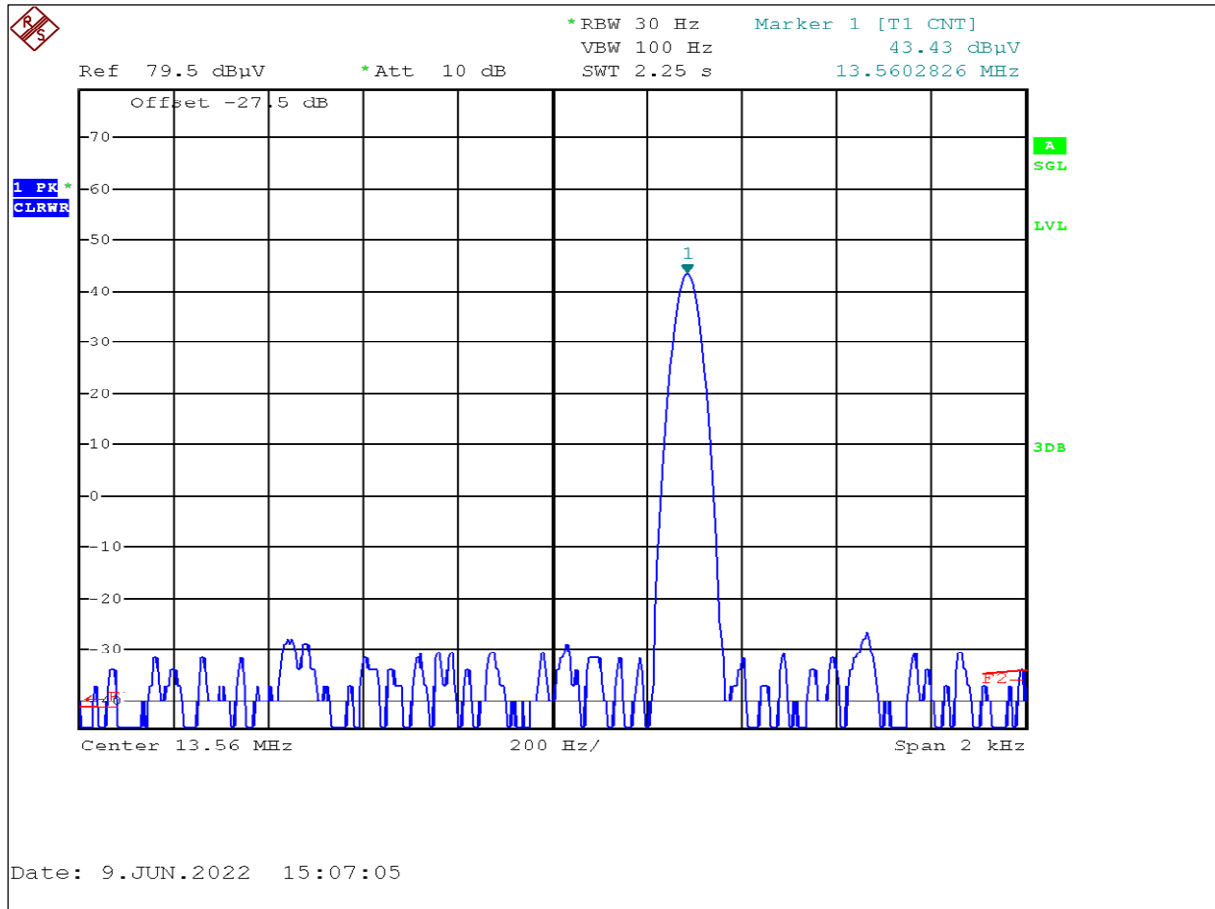
D05\_02\_T50\_2min



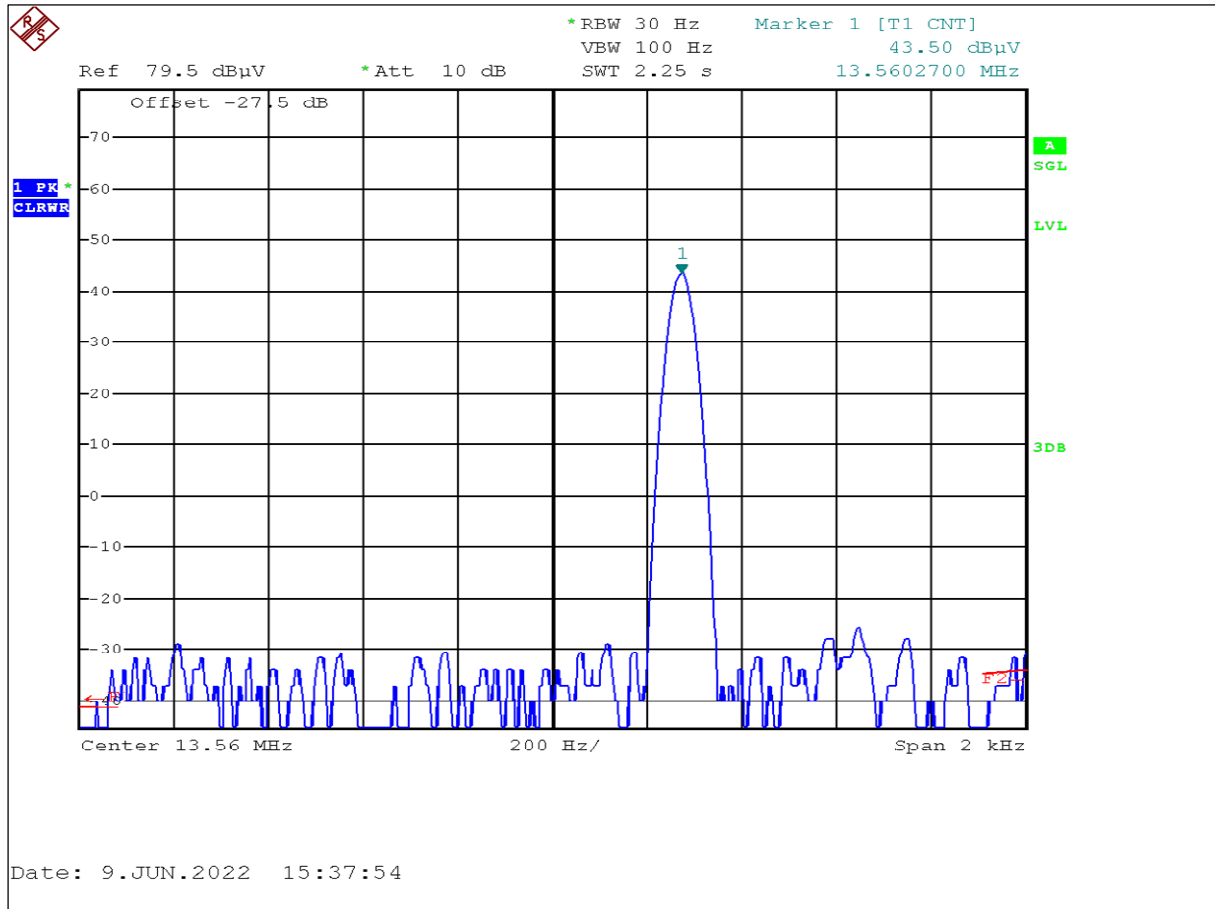
# D05\_03\_T50\_5min



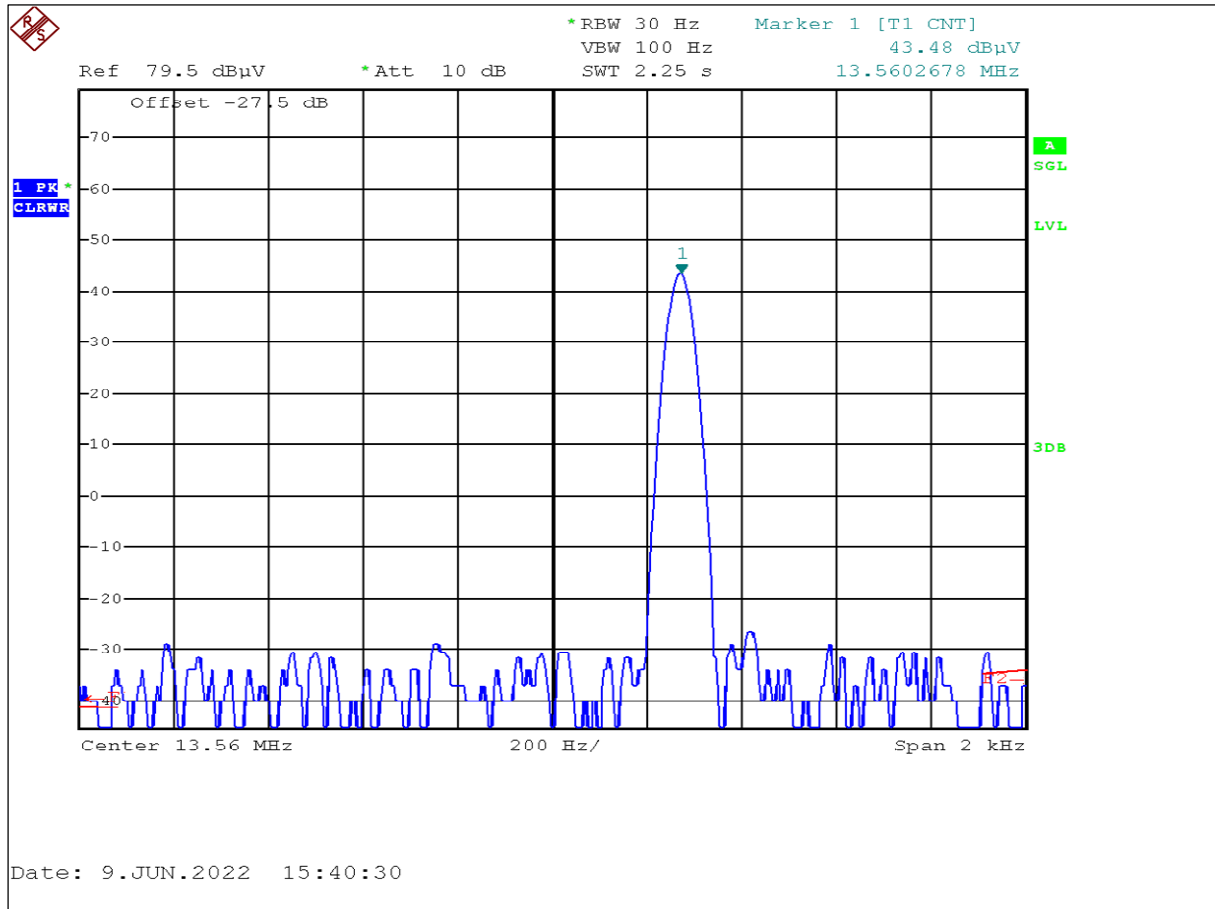
# D05\_04\_T50\_10min



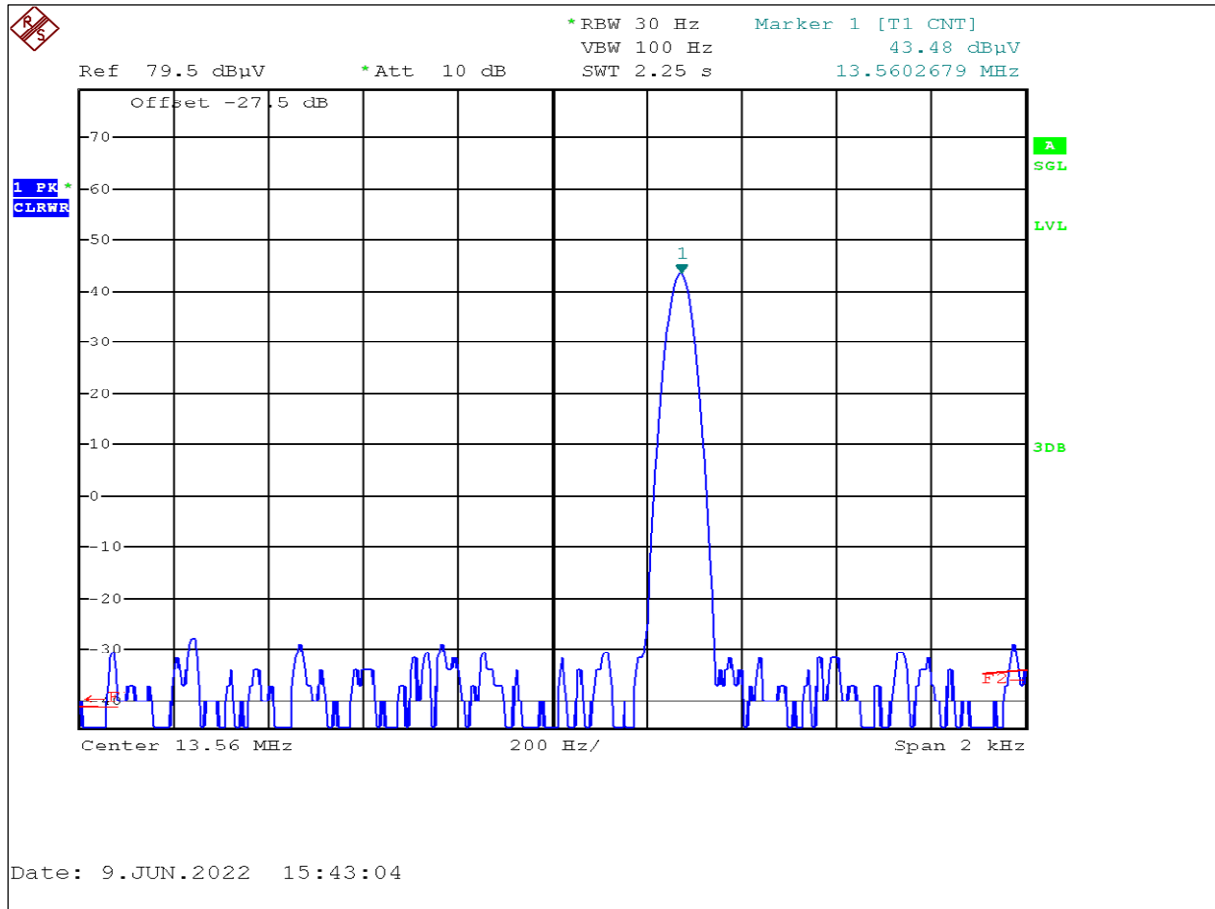
# D06\_01\_T40\_startup



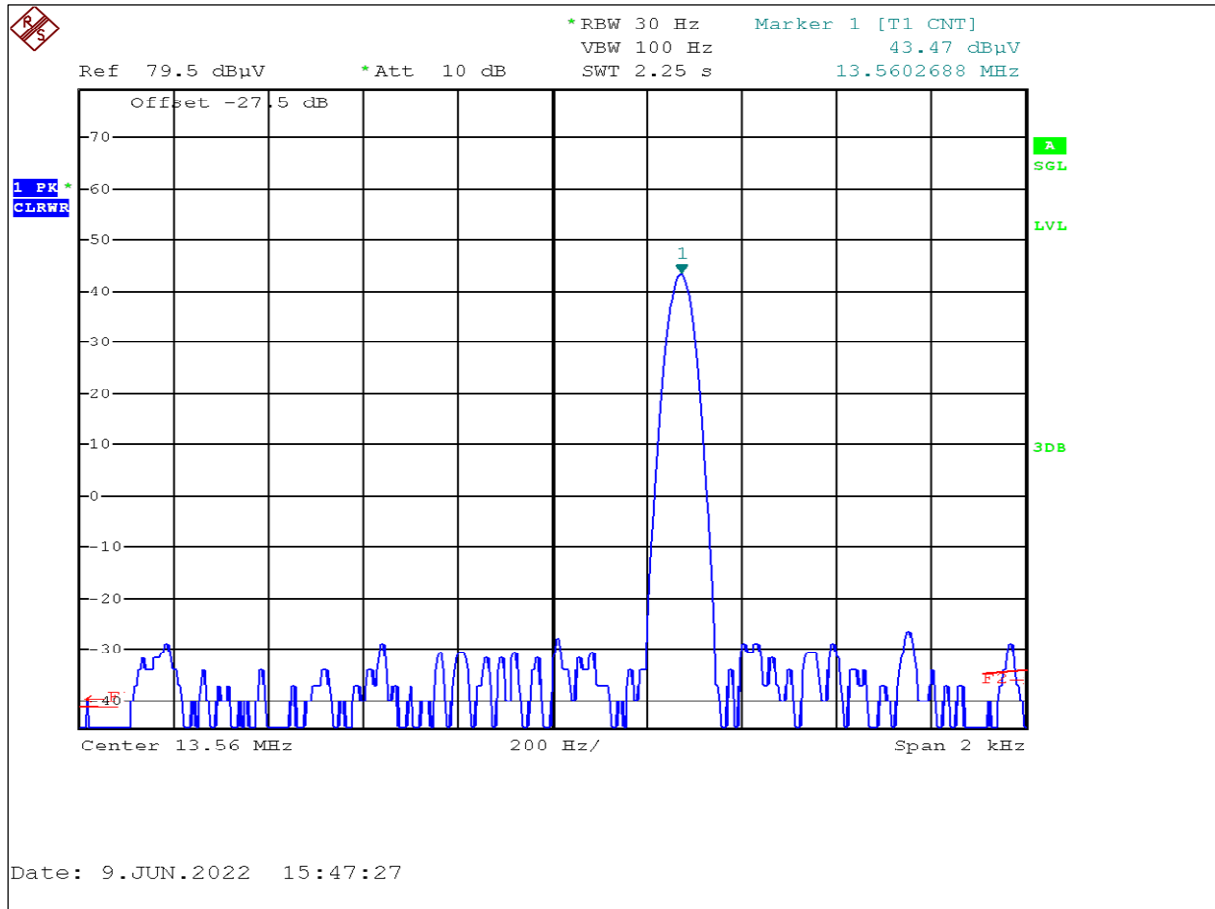
# D06\_02\_T40\_2min



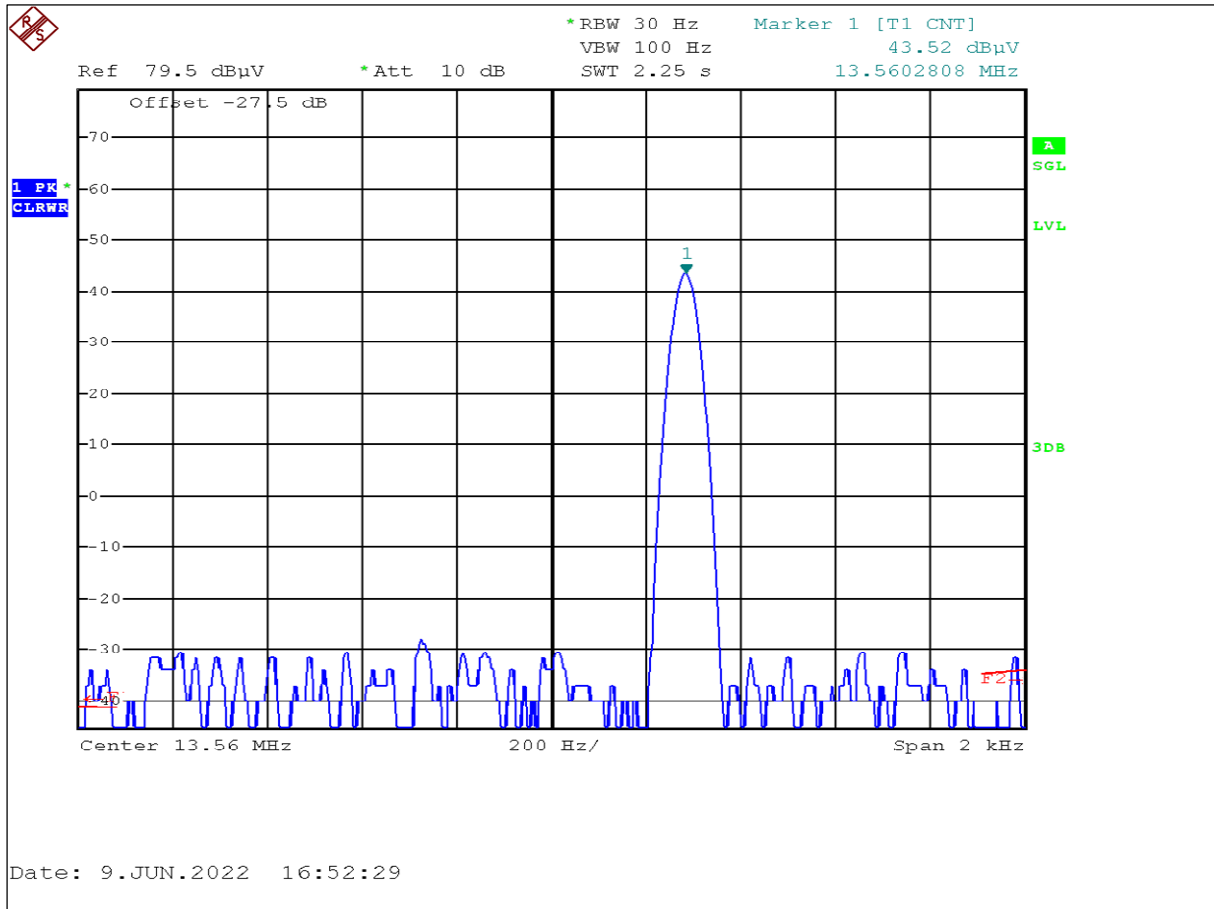
# D06\_03\_T40\_5min



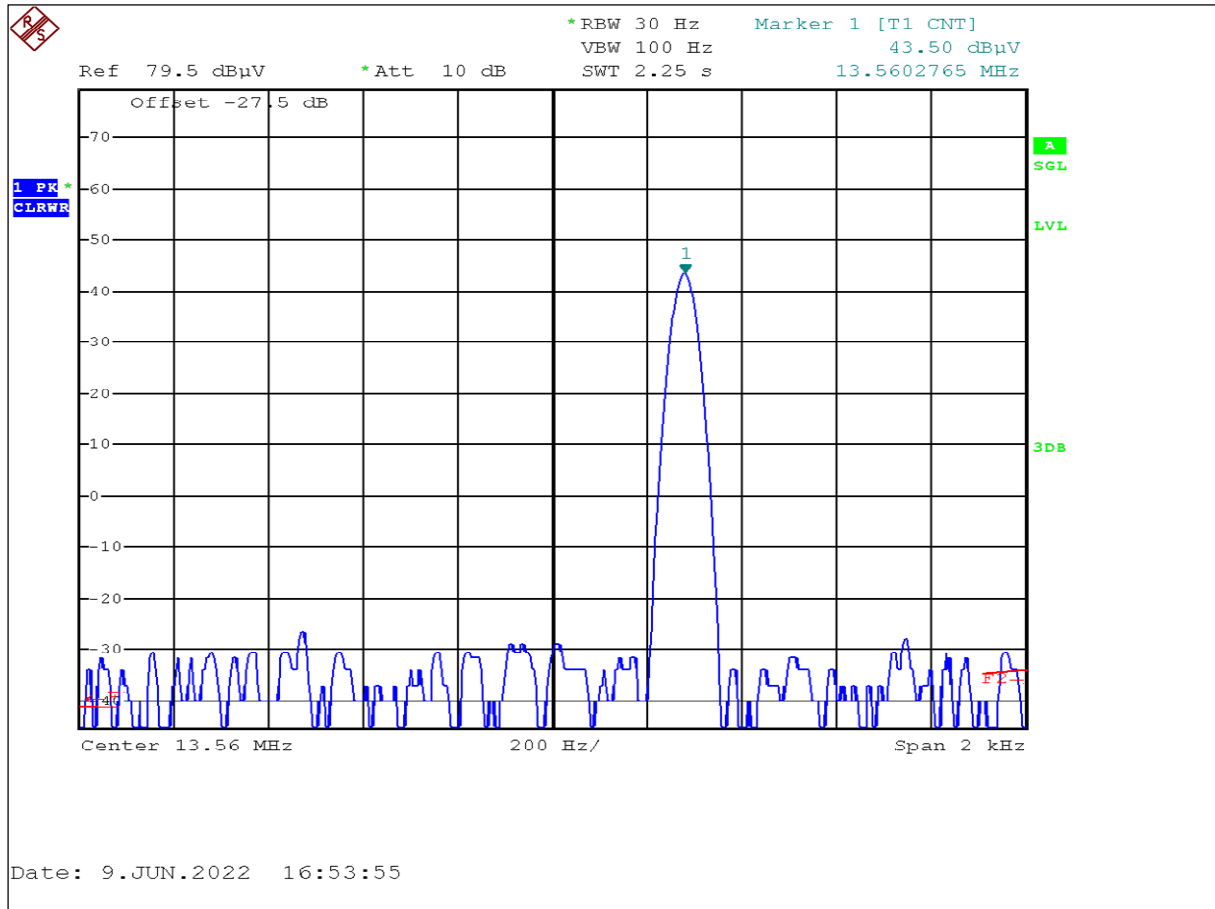
# D06\_04\_T40\_10min



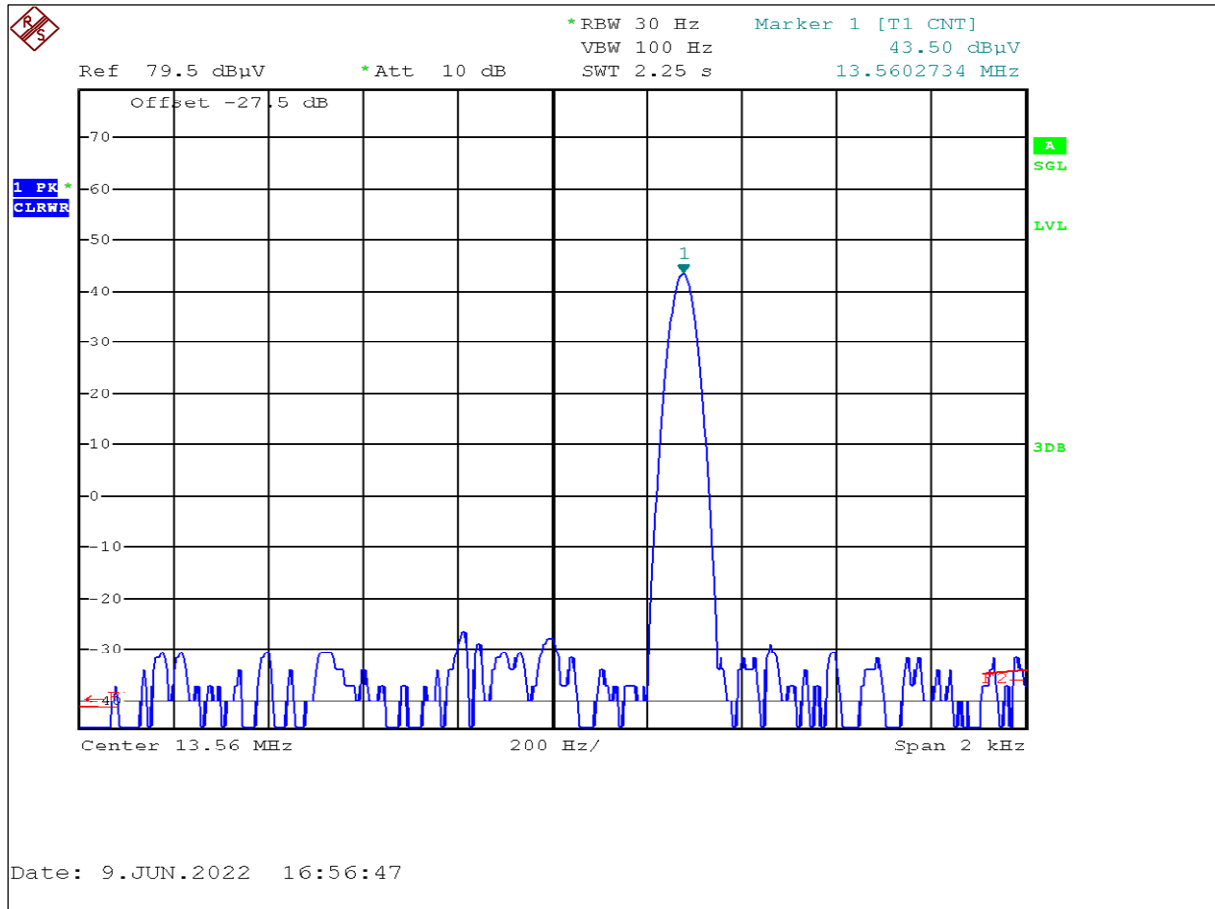
# D07\_01\_T30\_startup



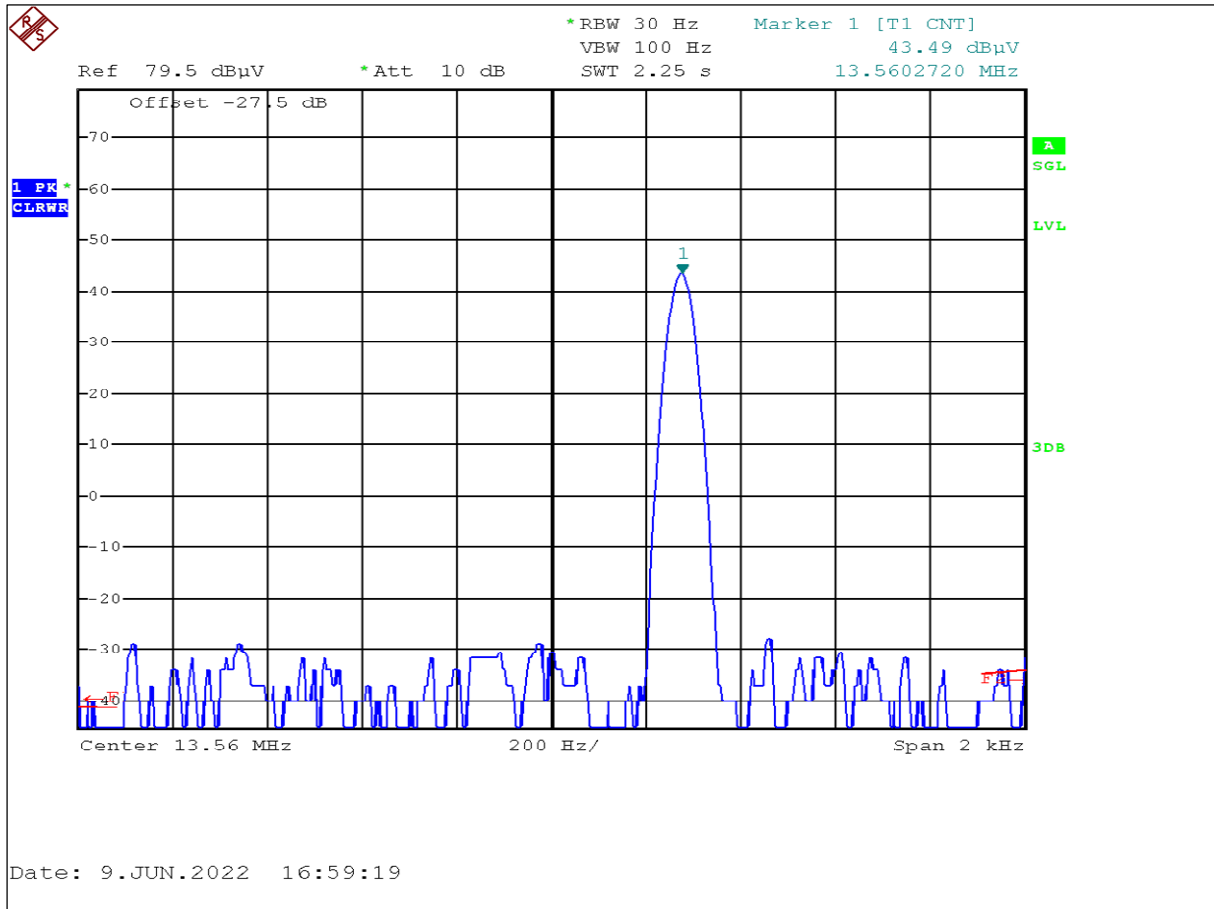
D07\_02\_T30\_2min



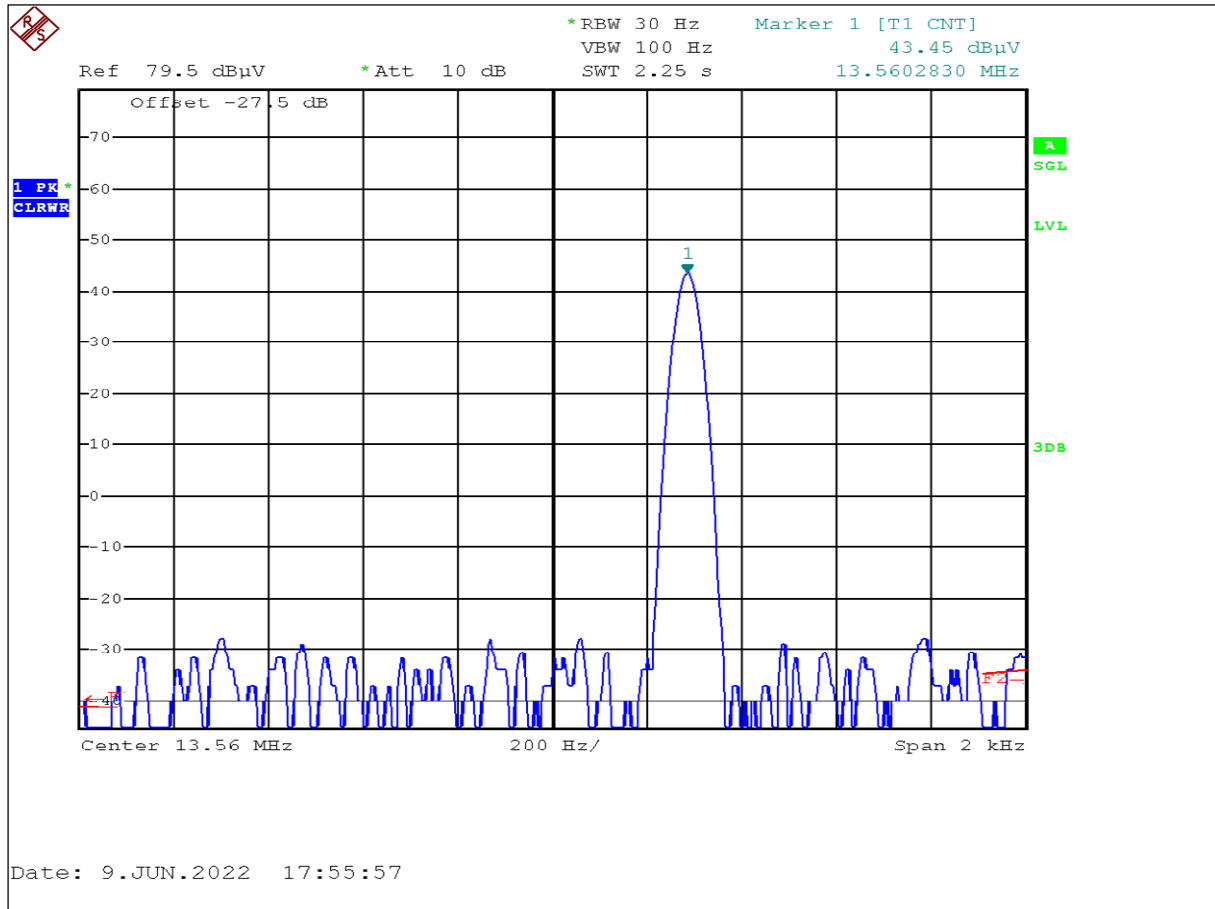
# D07\_03\_T30\_5min



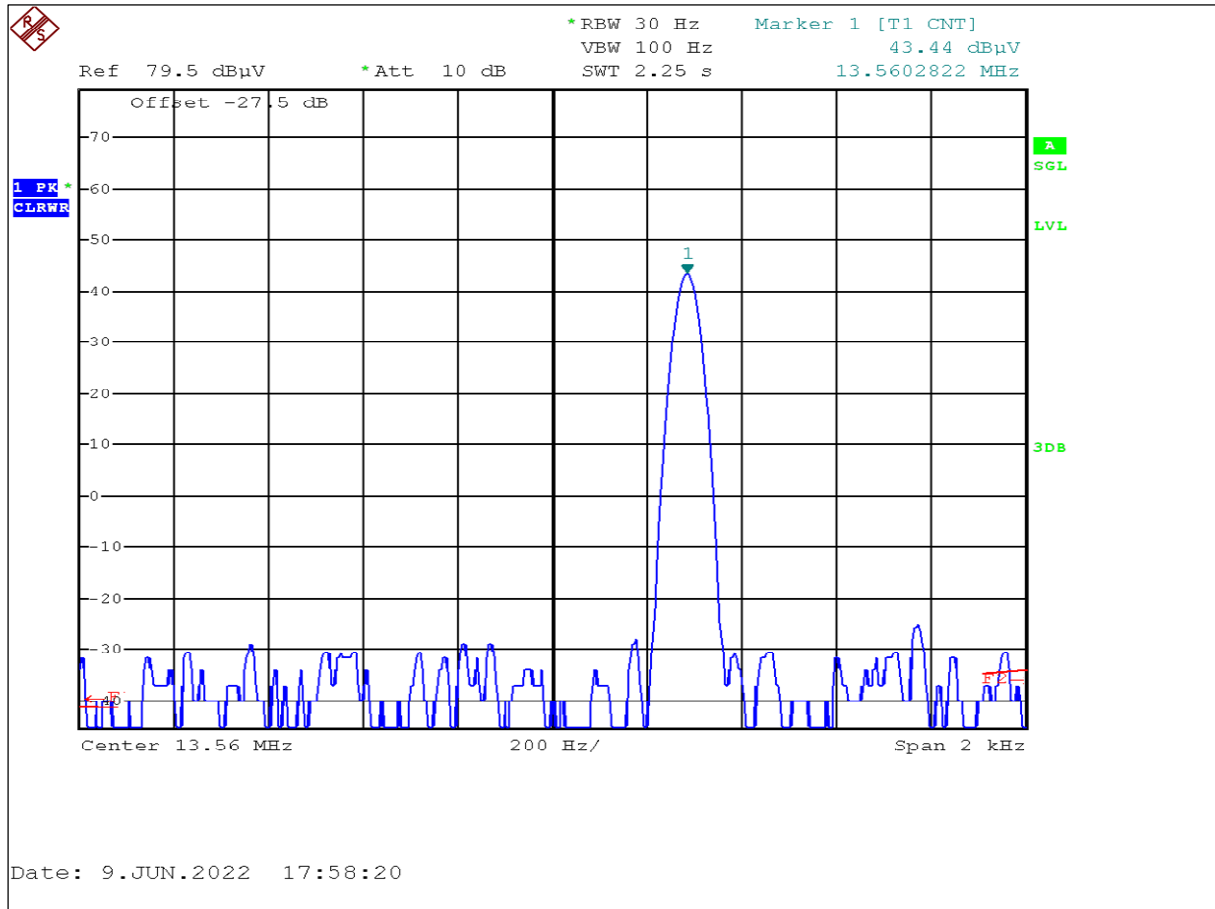
D07\_04\_T30\_10min



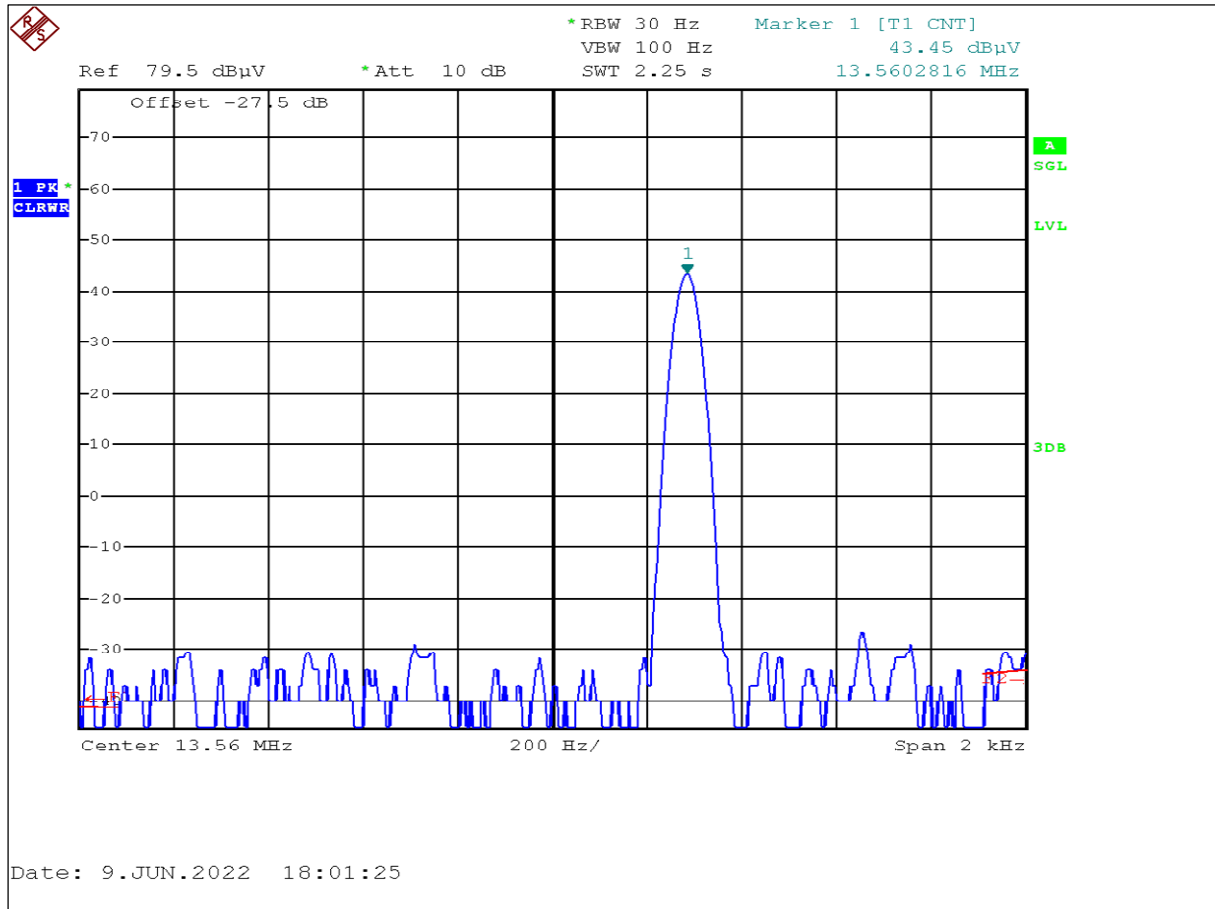
## D08\_01\_T20\_startup



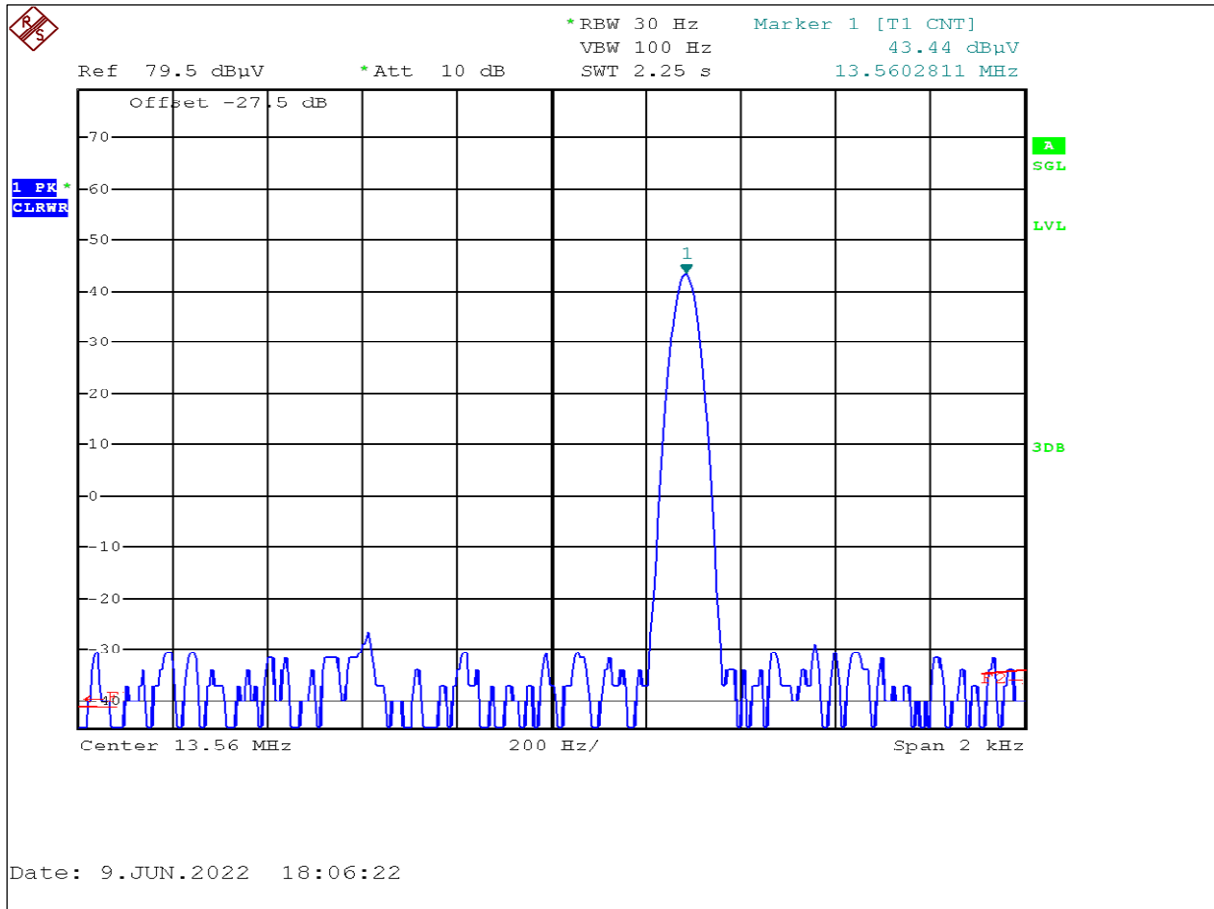
# D08\_02\_T20\_2min



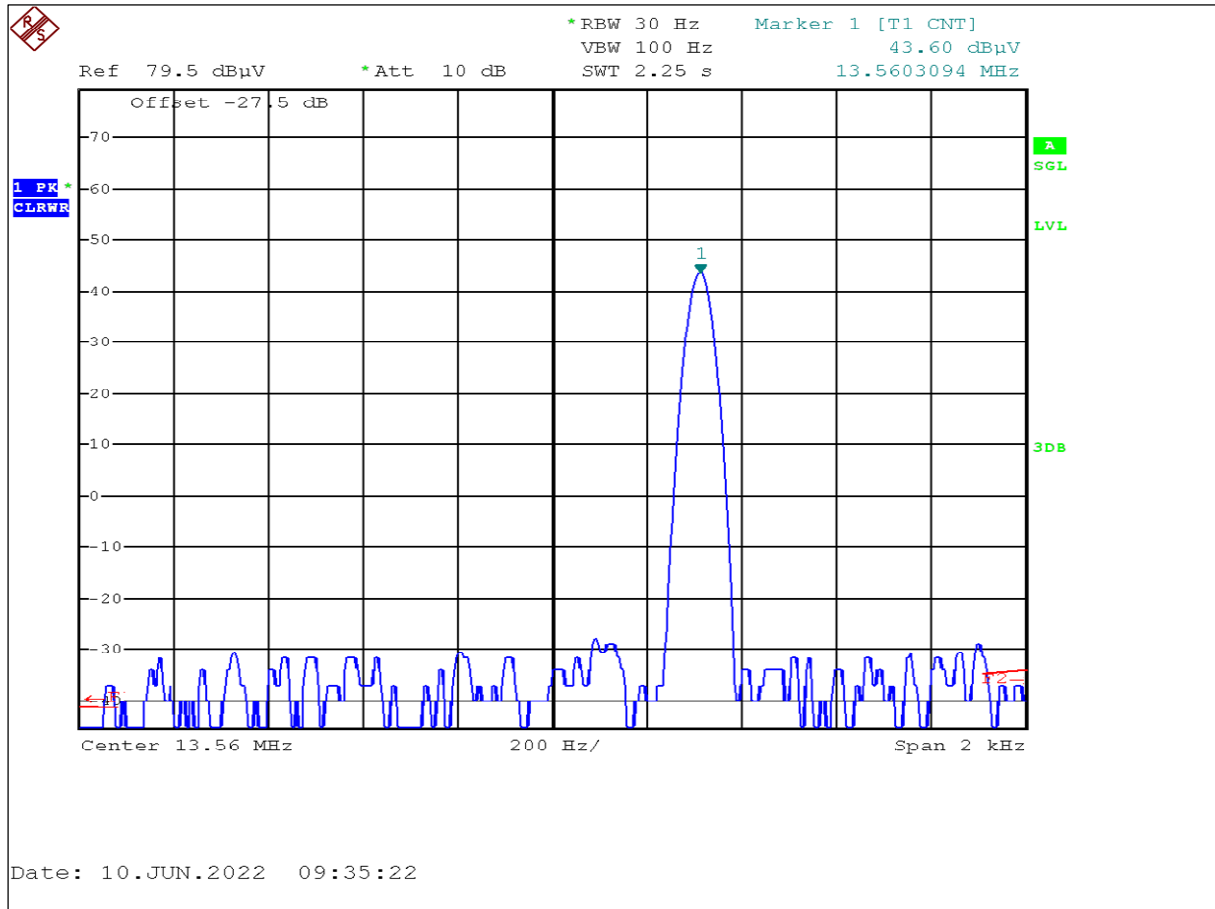
# D08\_03\_T20\_5min



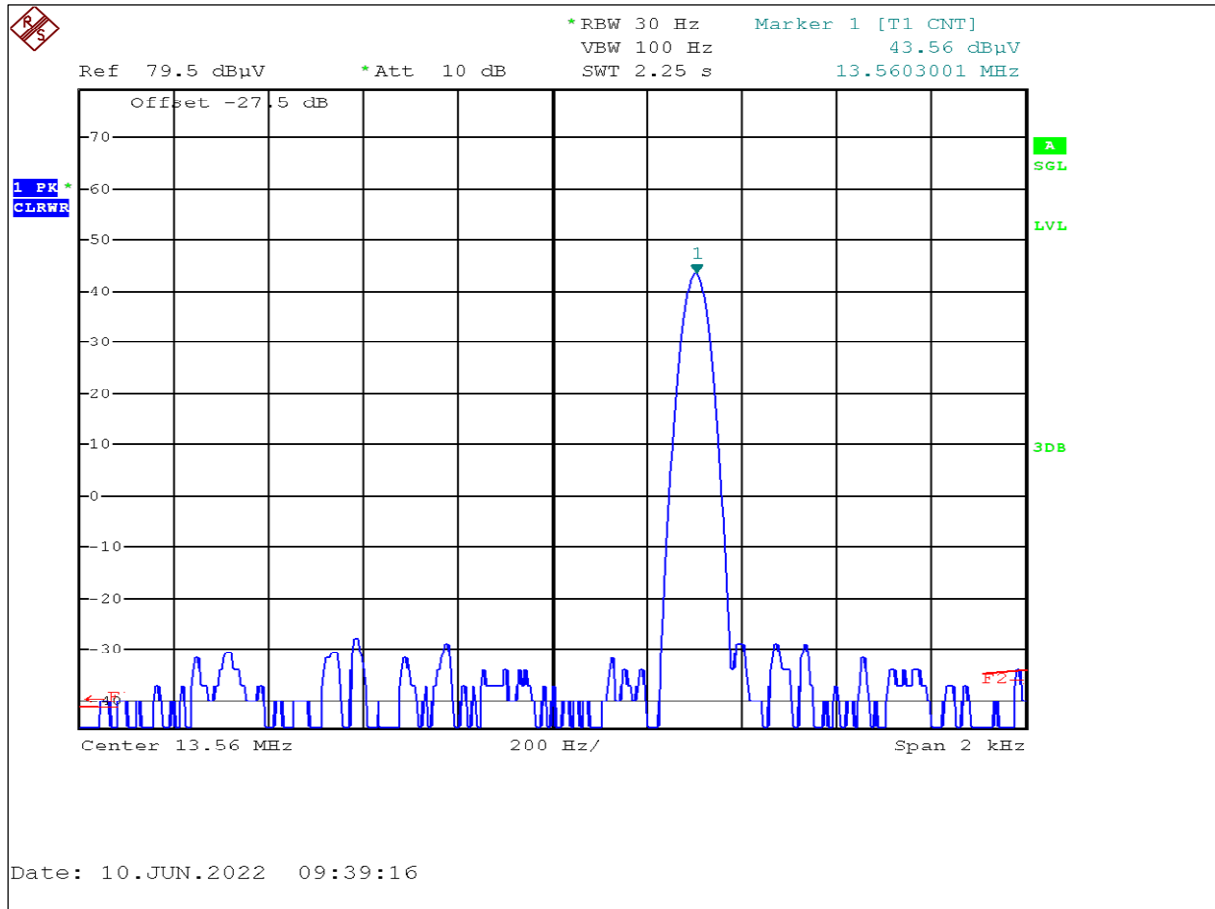
# D08\_04\_T20\_10min



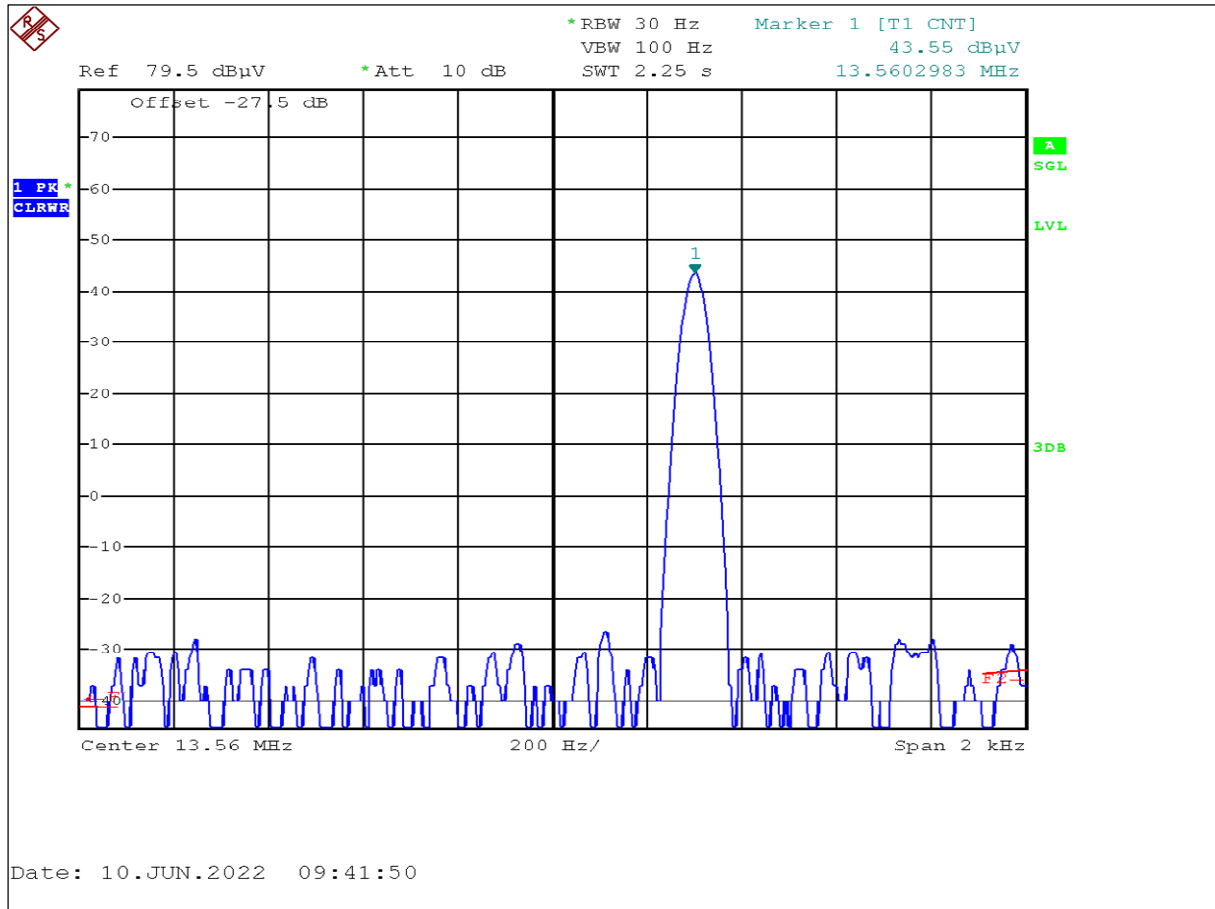
# D09\_01\_T10\_startup



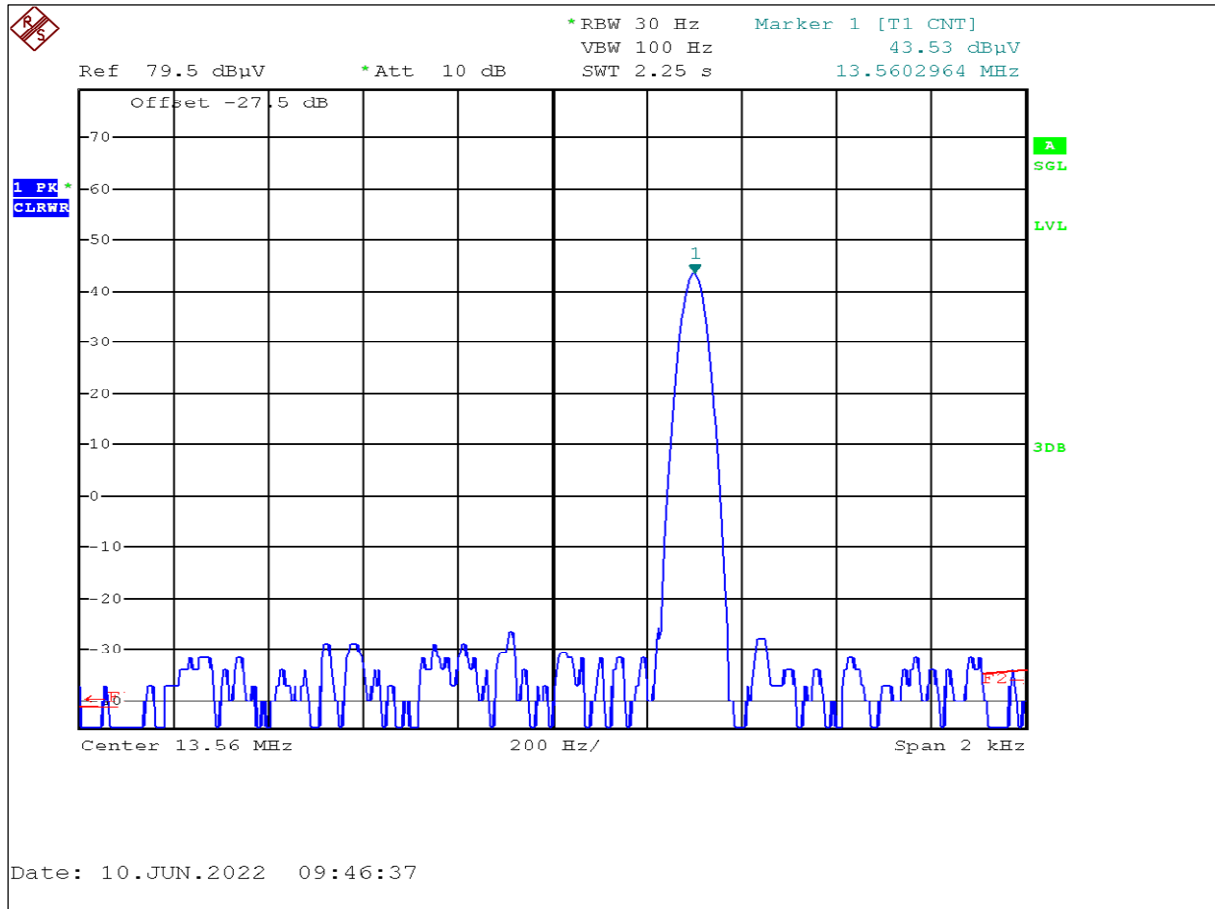
# D09\_02\_T10\_2min



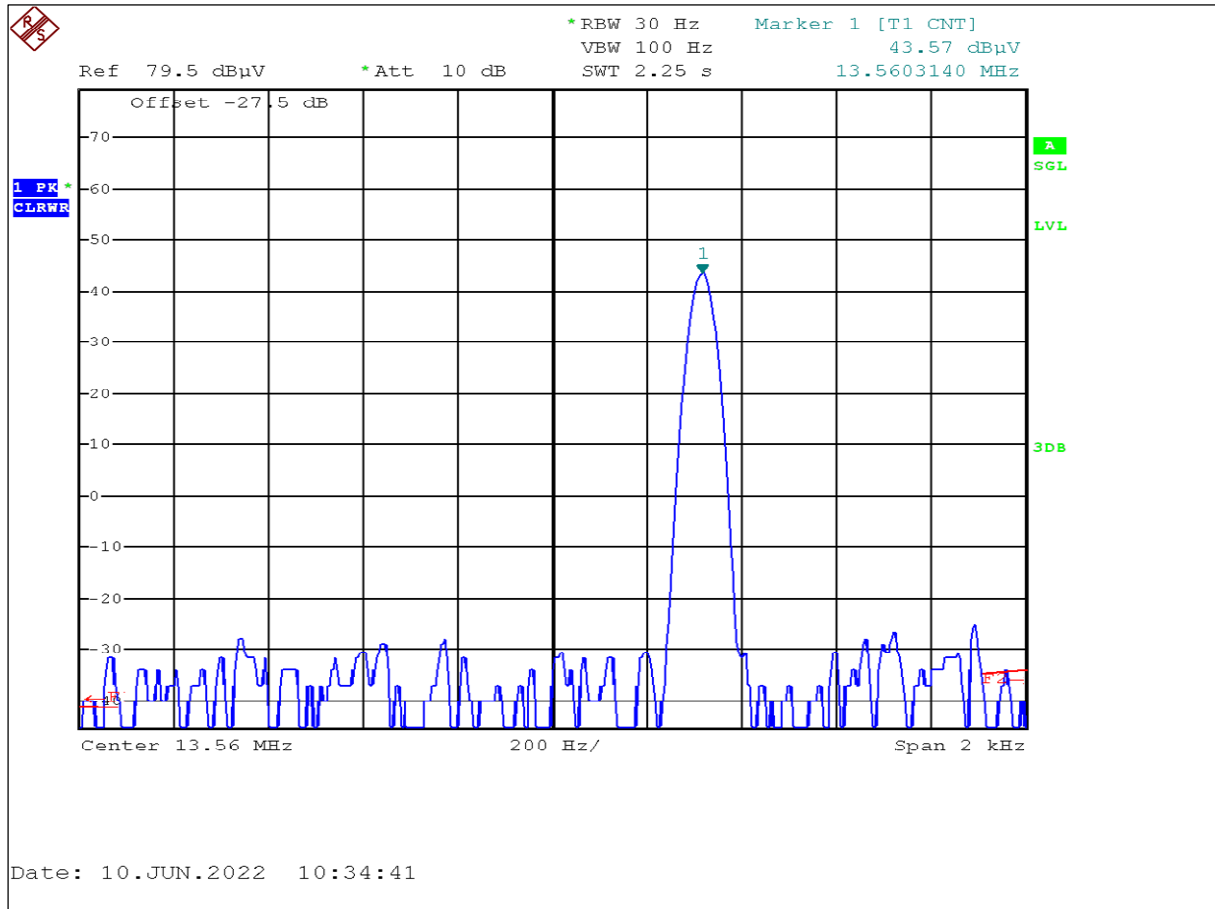
# D09\_03\_T10\_5min



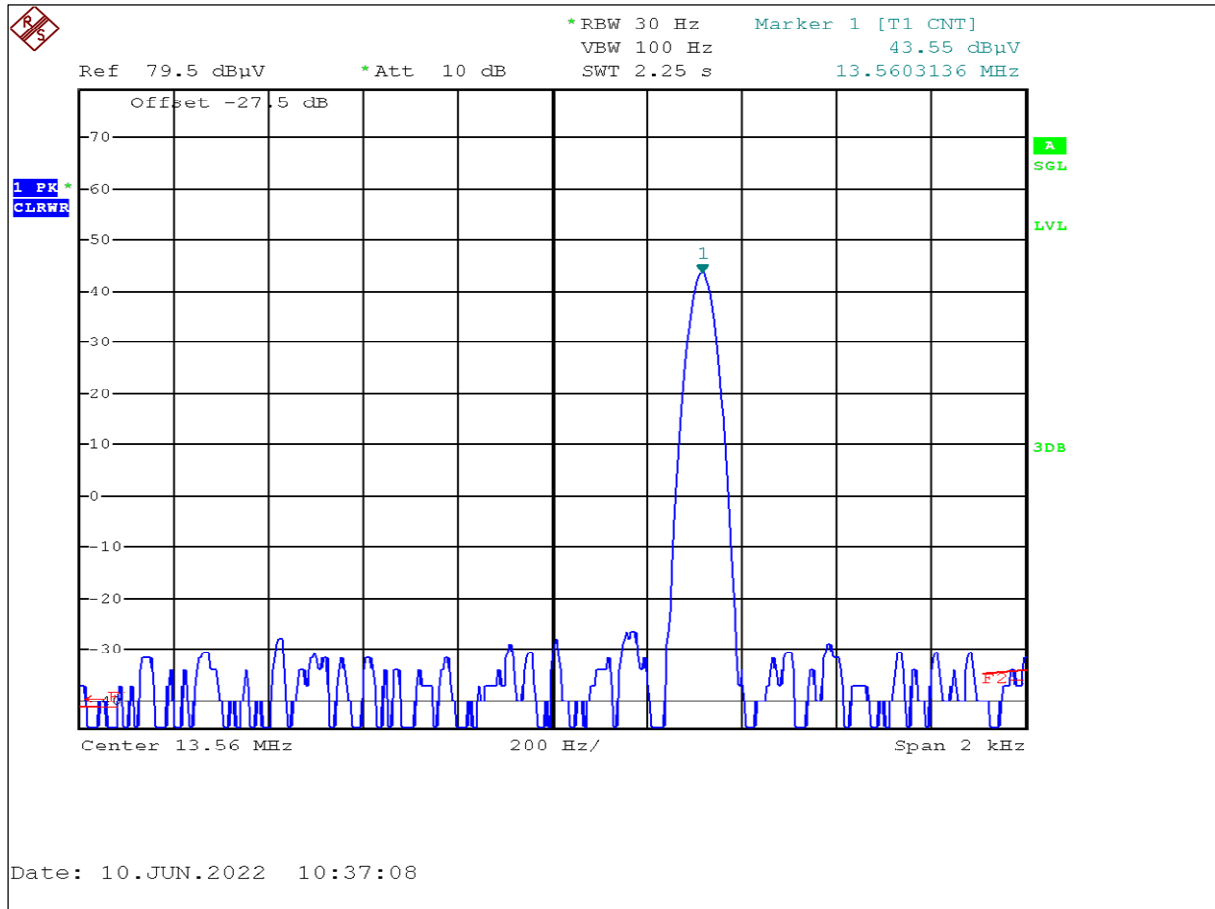
# D09\_04\_T10\_10min



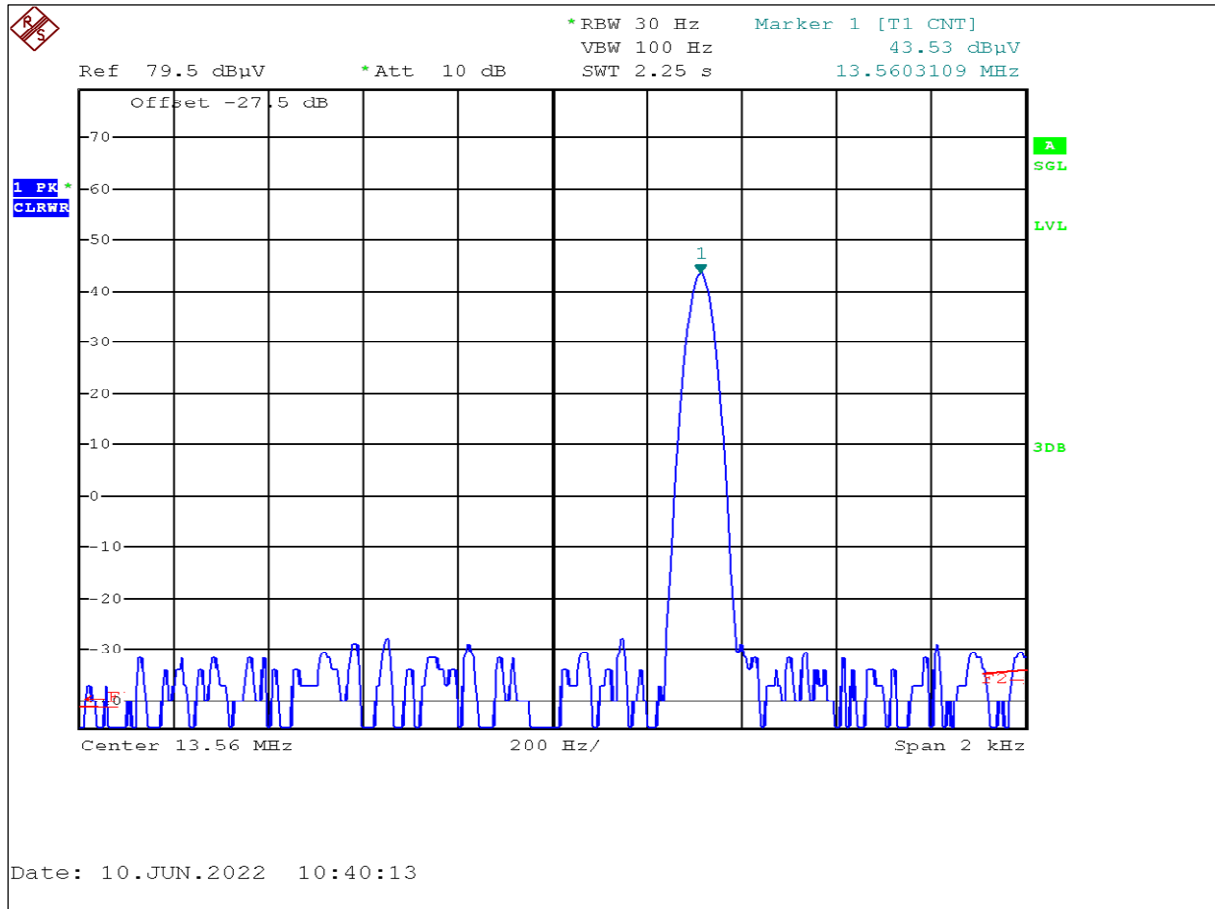
# D10\_01\_T00\_startup



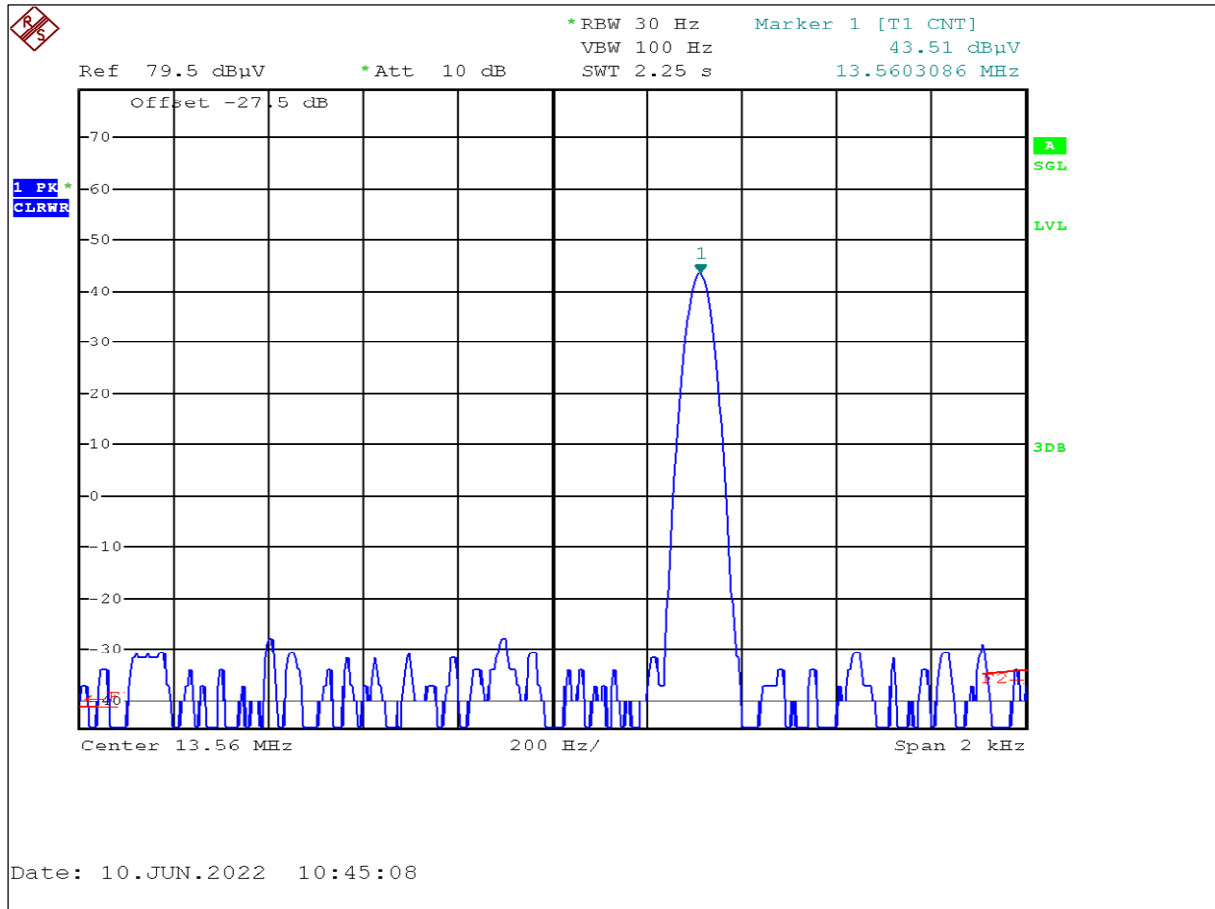
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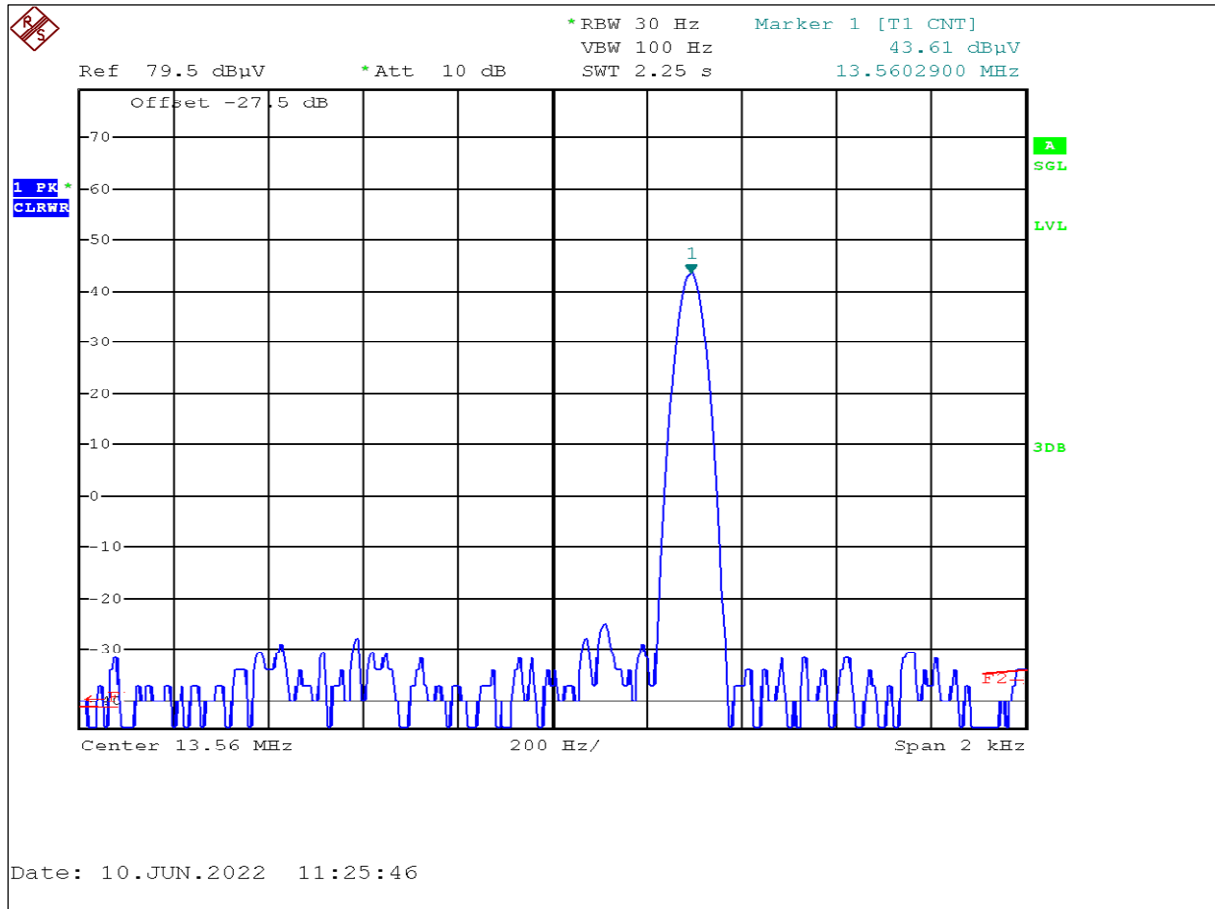
# D10\_03\_T00\_5min



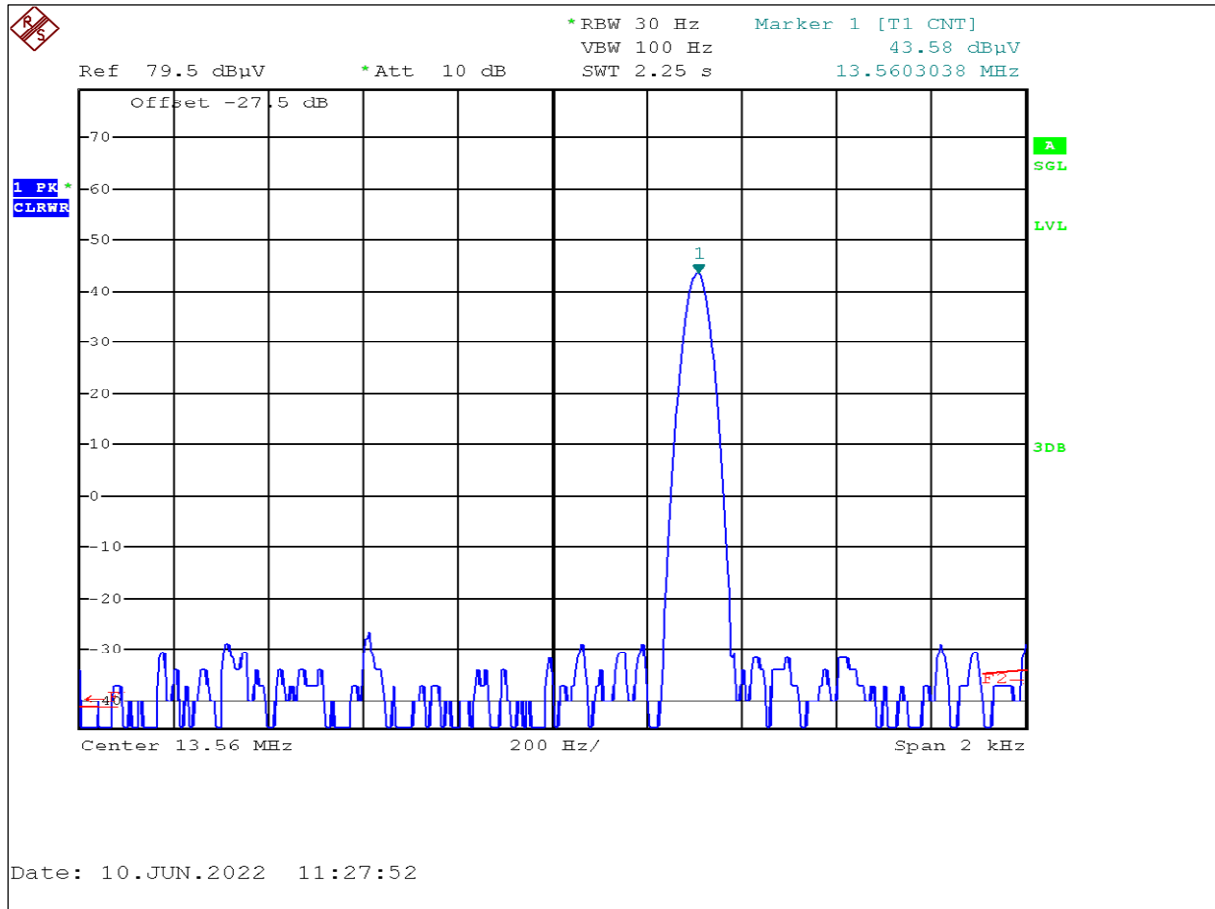
# D10\_04\_T00\_10min



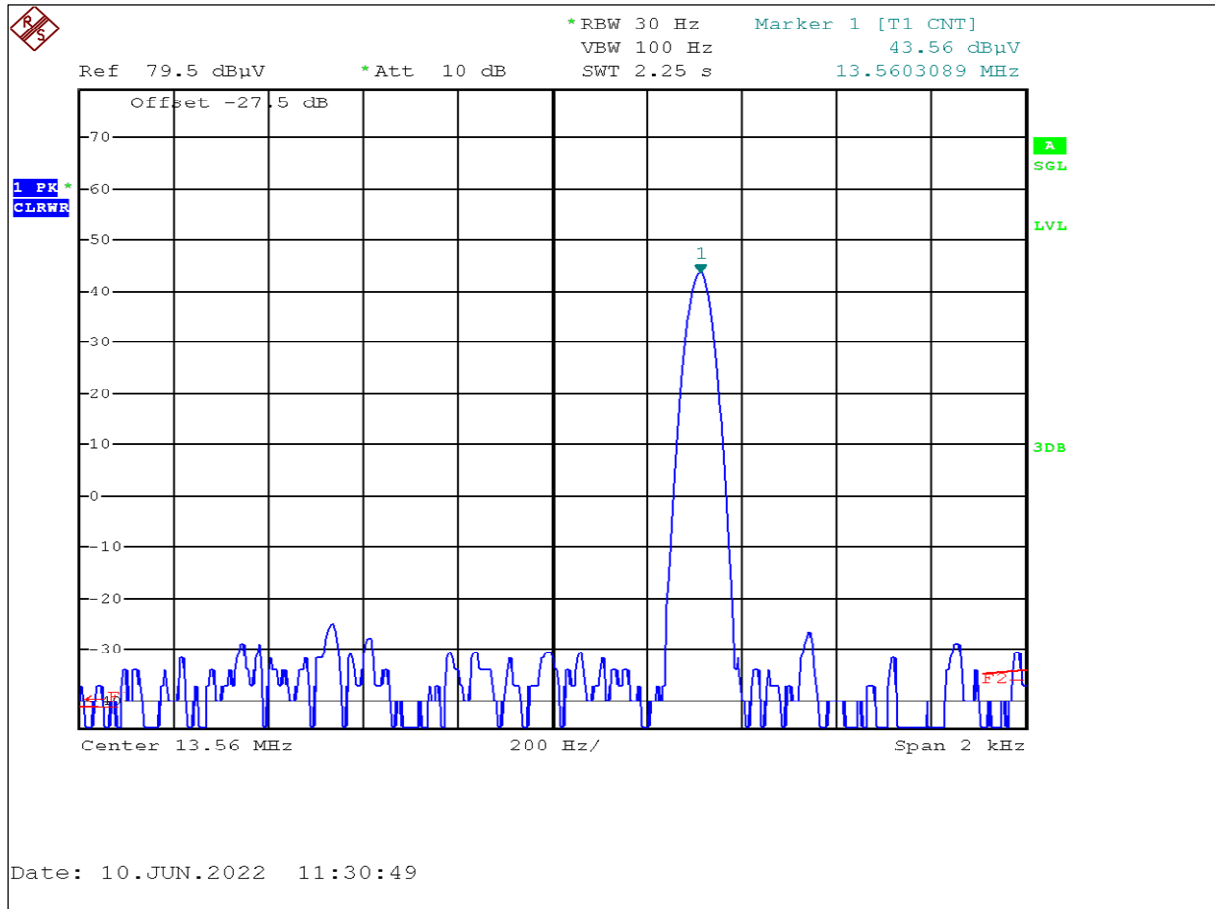
# D11\_01\_T-10\_startup



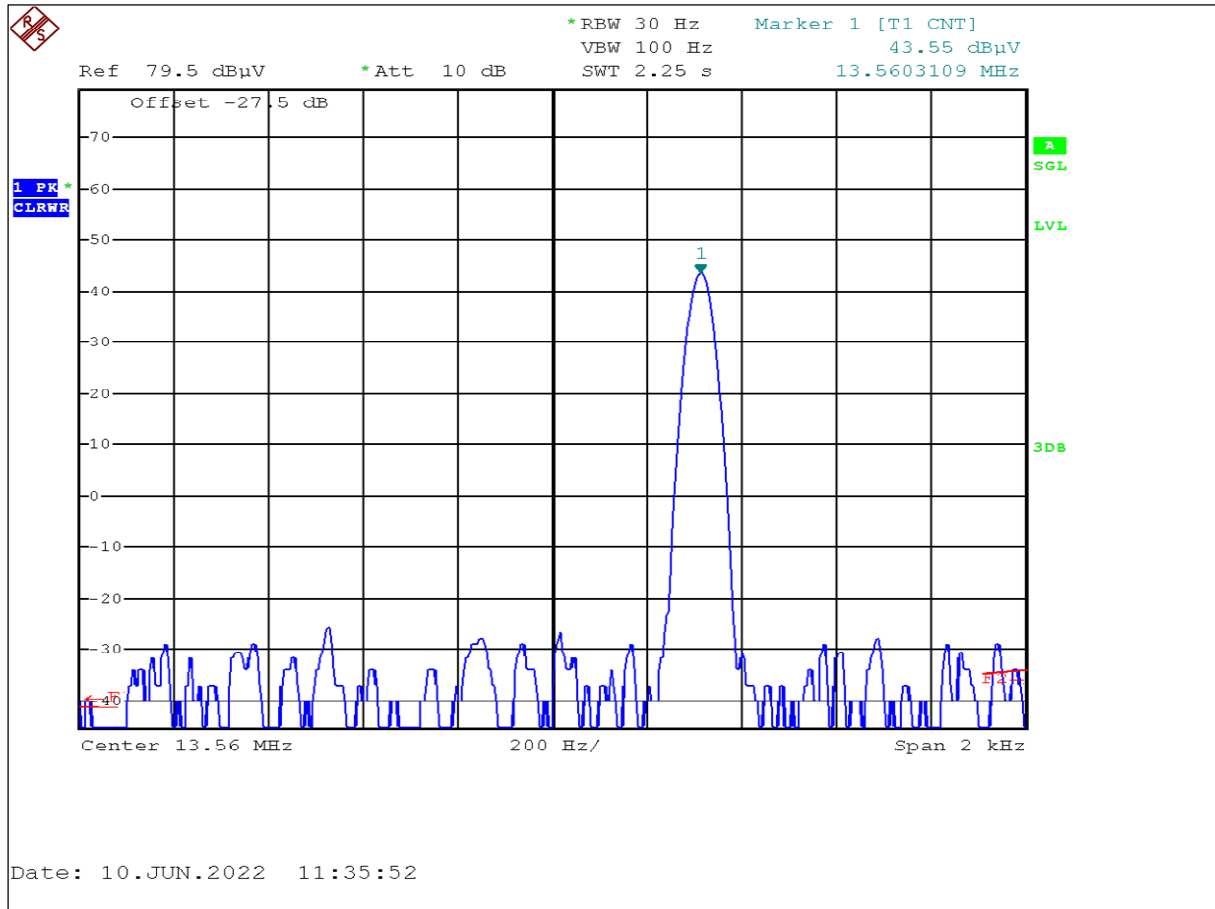
# D11\_02\_T-10\_2min



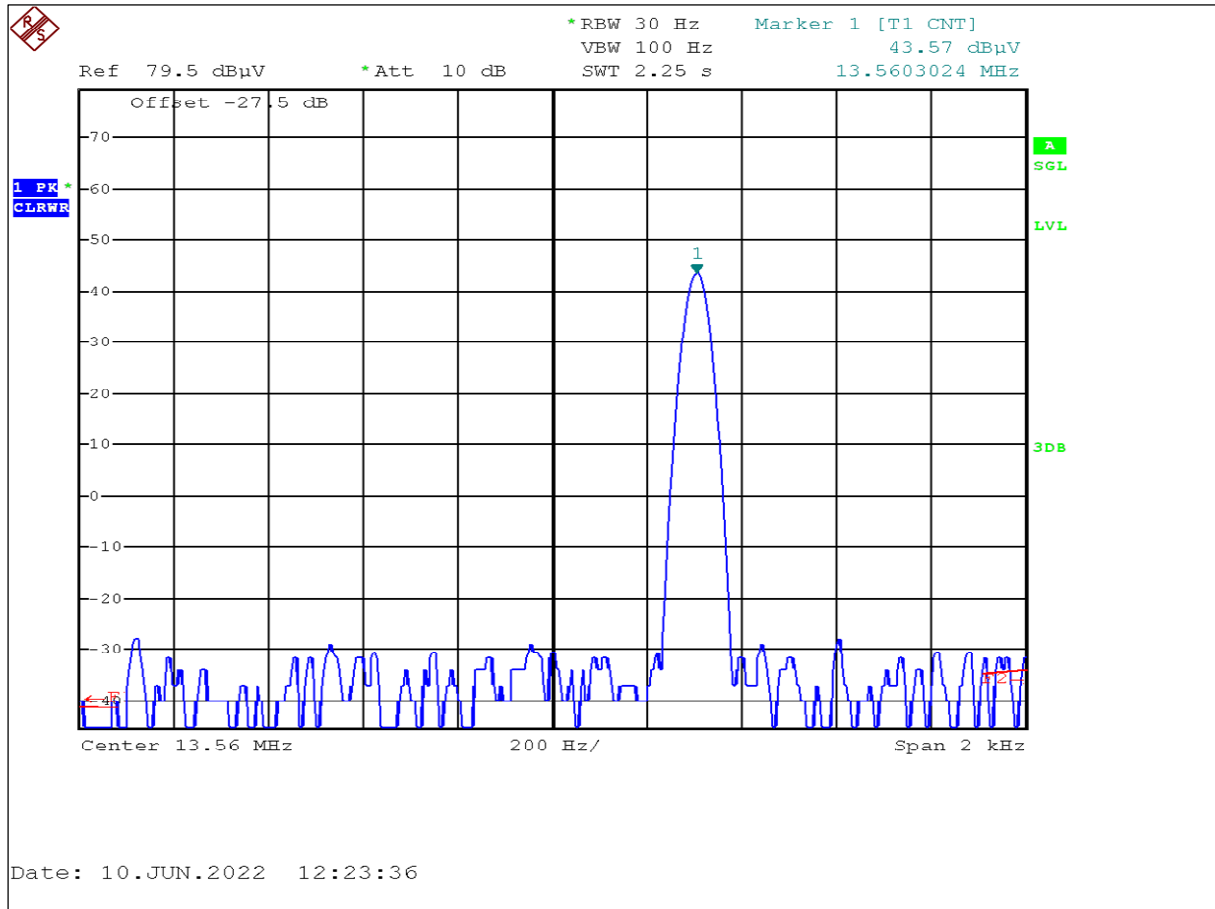
# D11\_03\_T-10\_5min



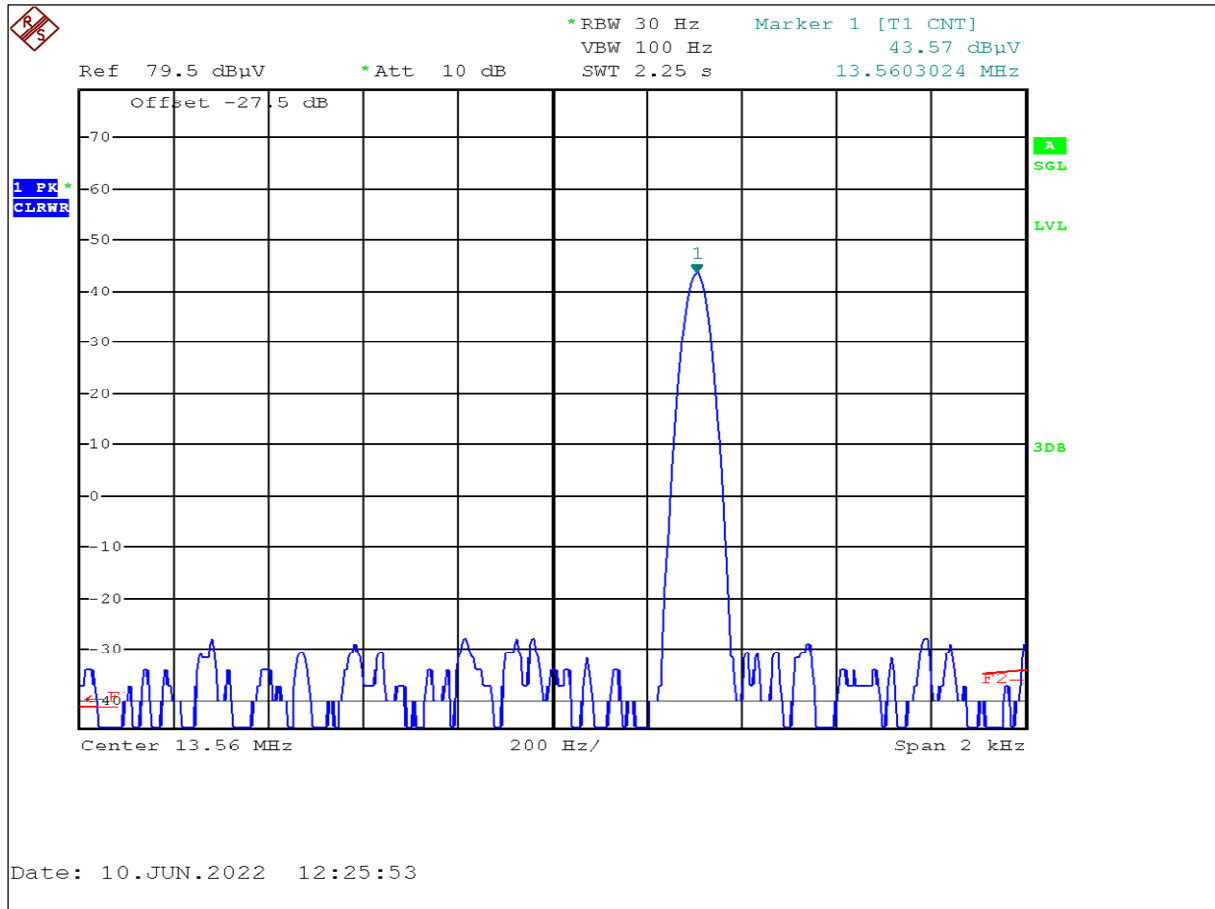
# D11\_04\_T-10\_10min



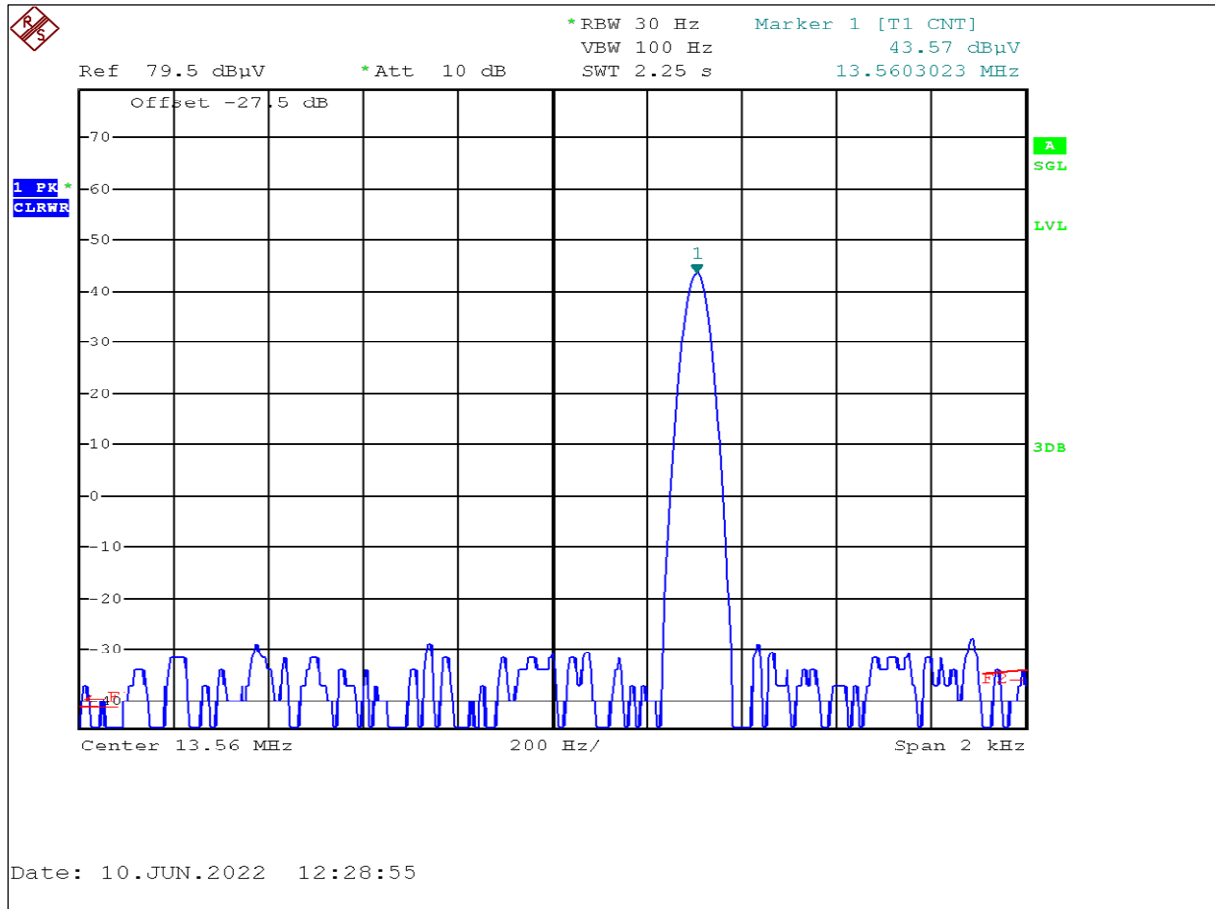
# D12\_01\_T-20\_startup



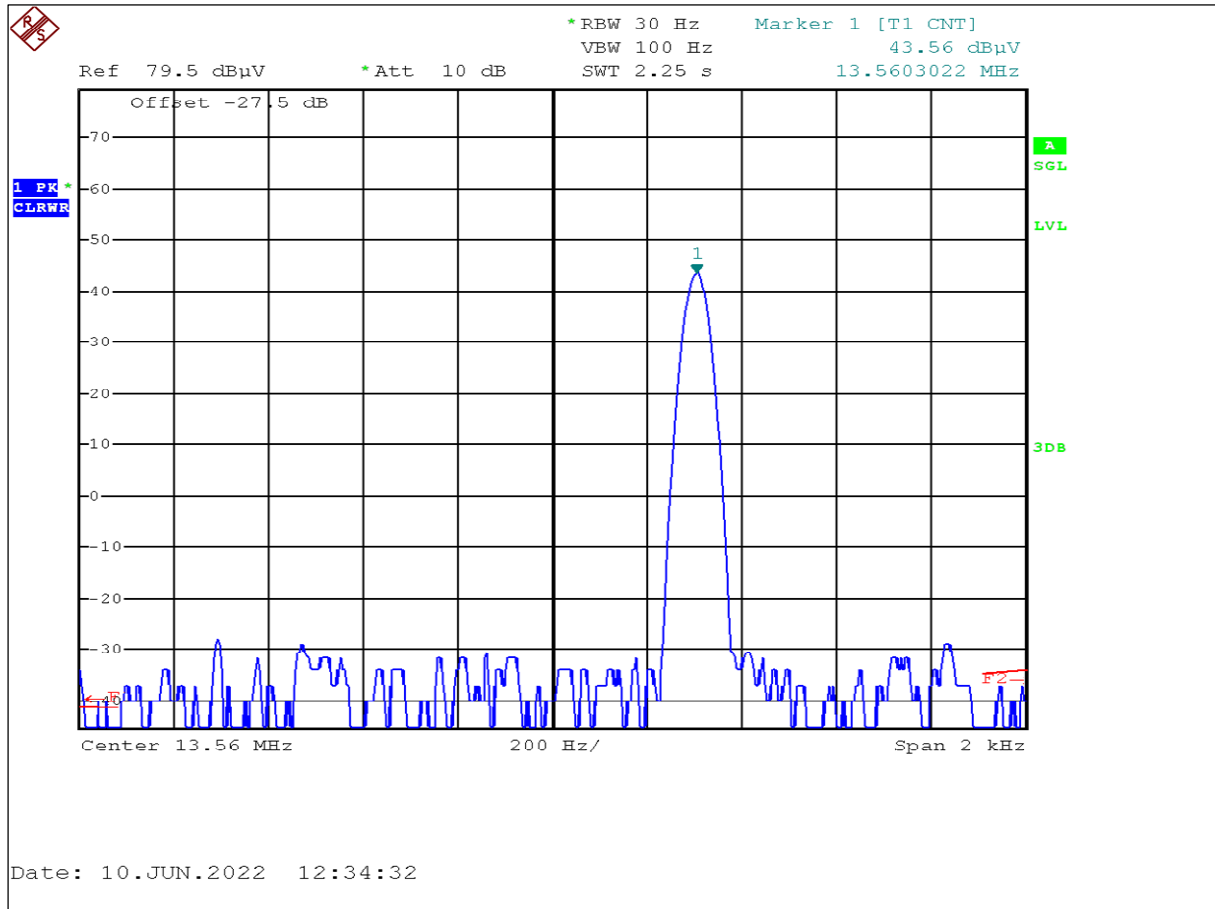
# D12\_02\_T-20\_2min



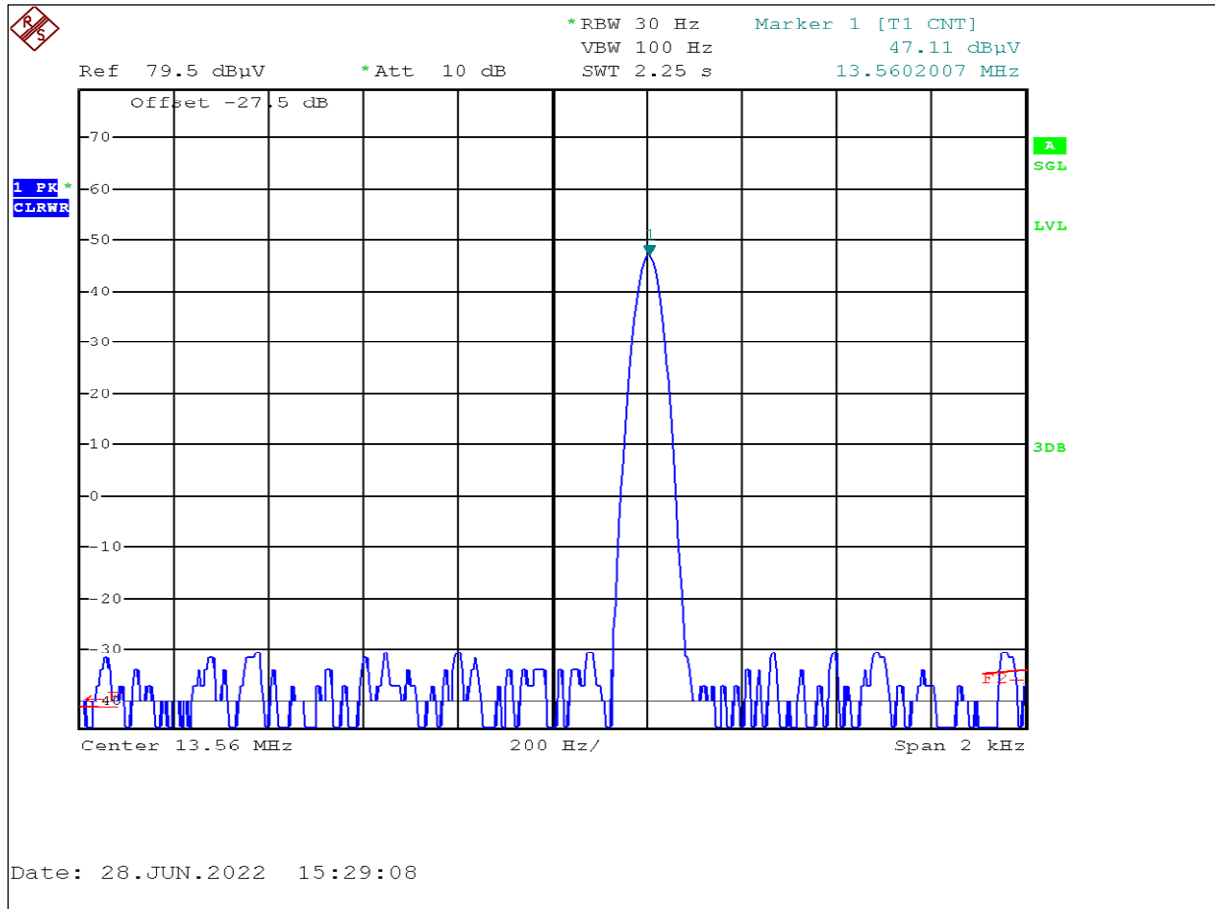
# D12\_03\_T-20\_5min



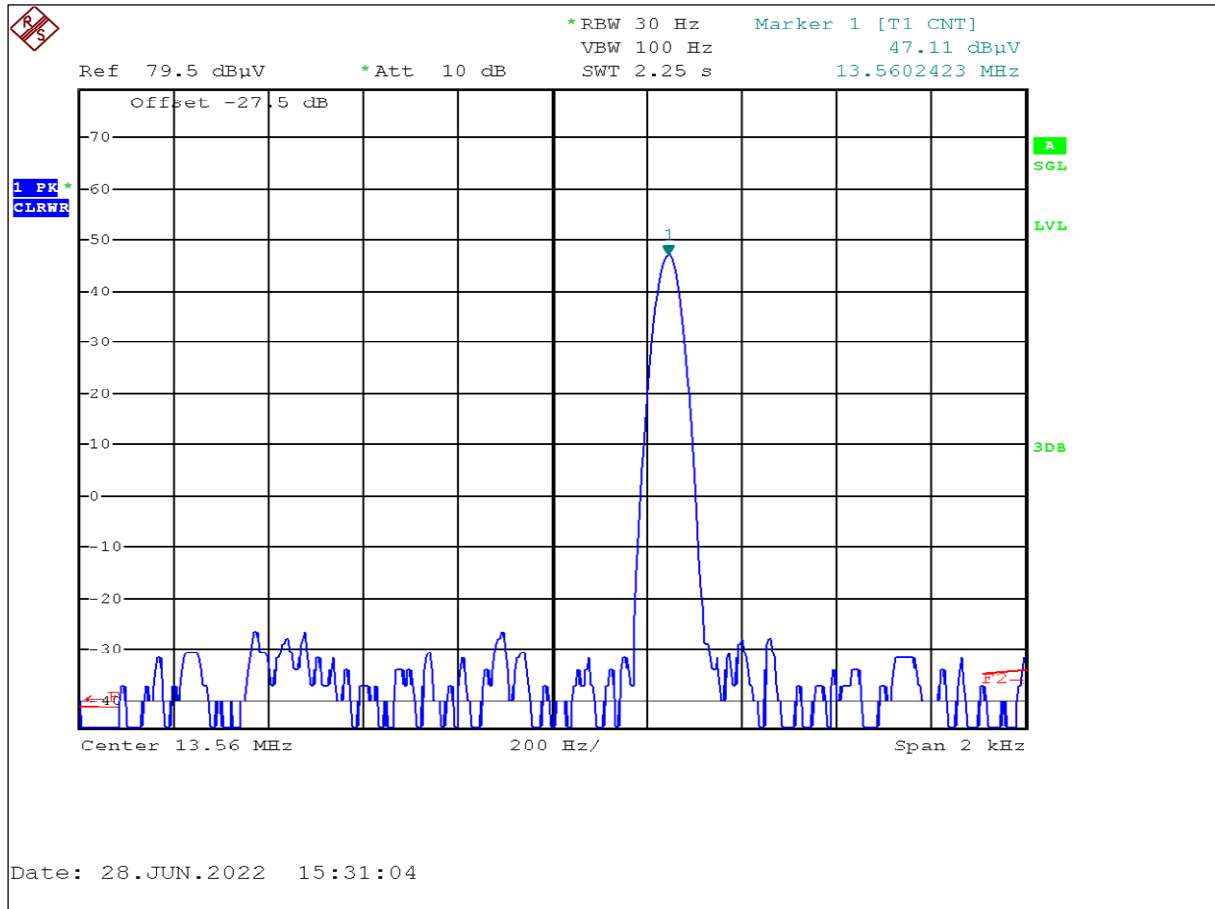
# D12\_04\_T-20\_10min



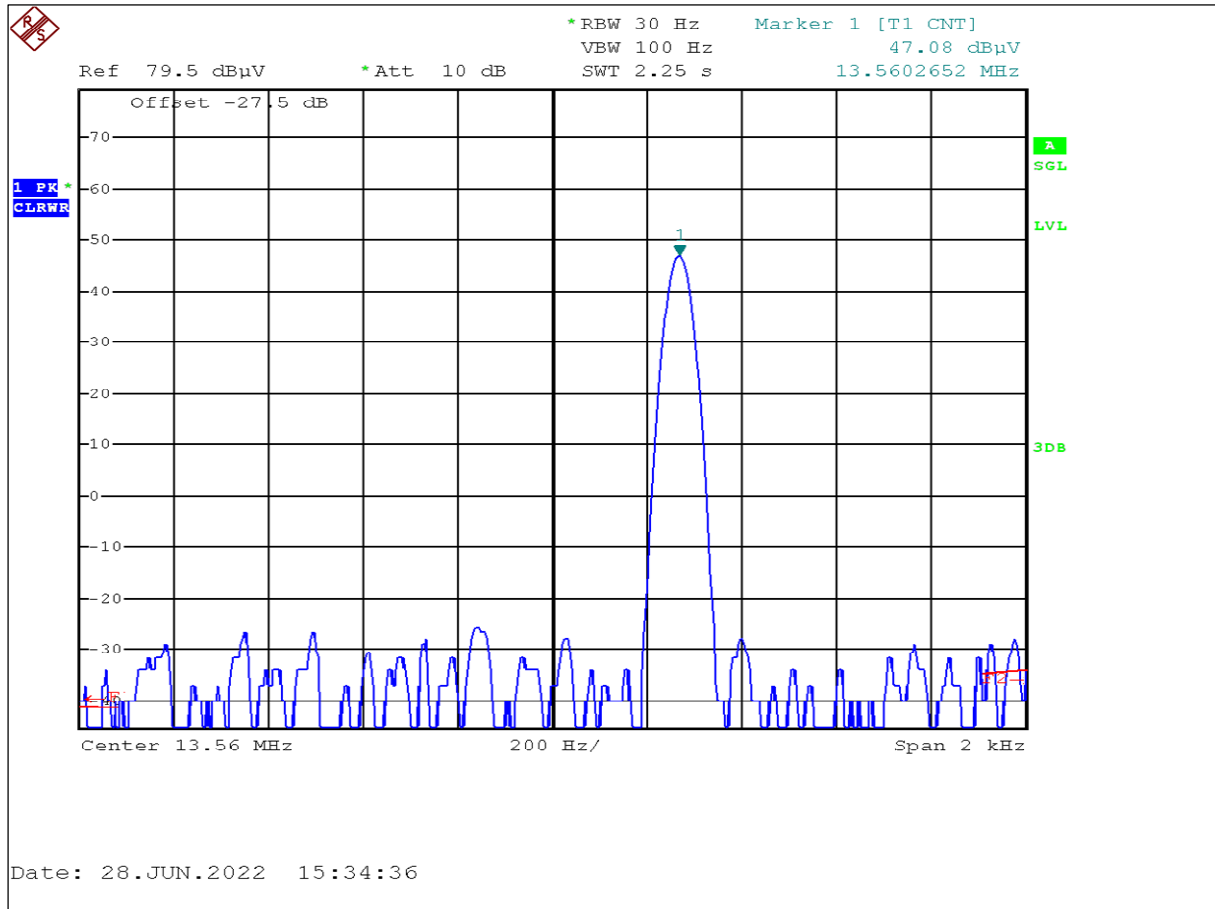
# D13\_01\_T-30\_startup



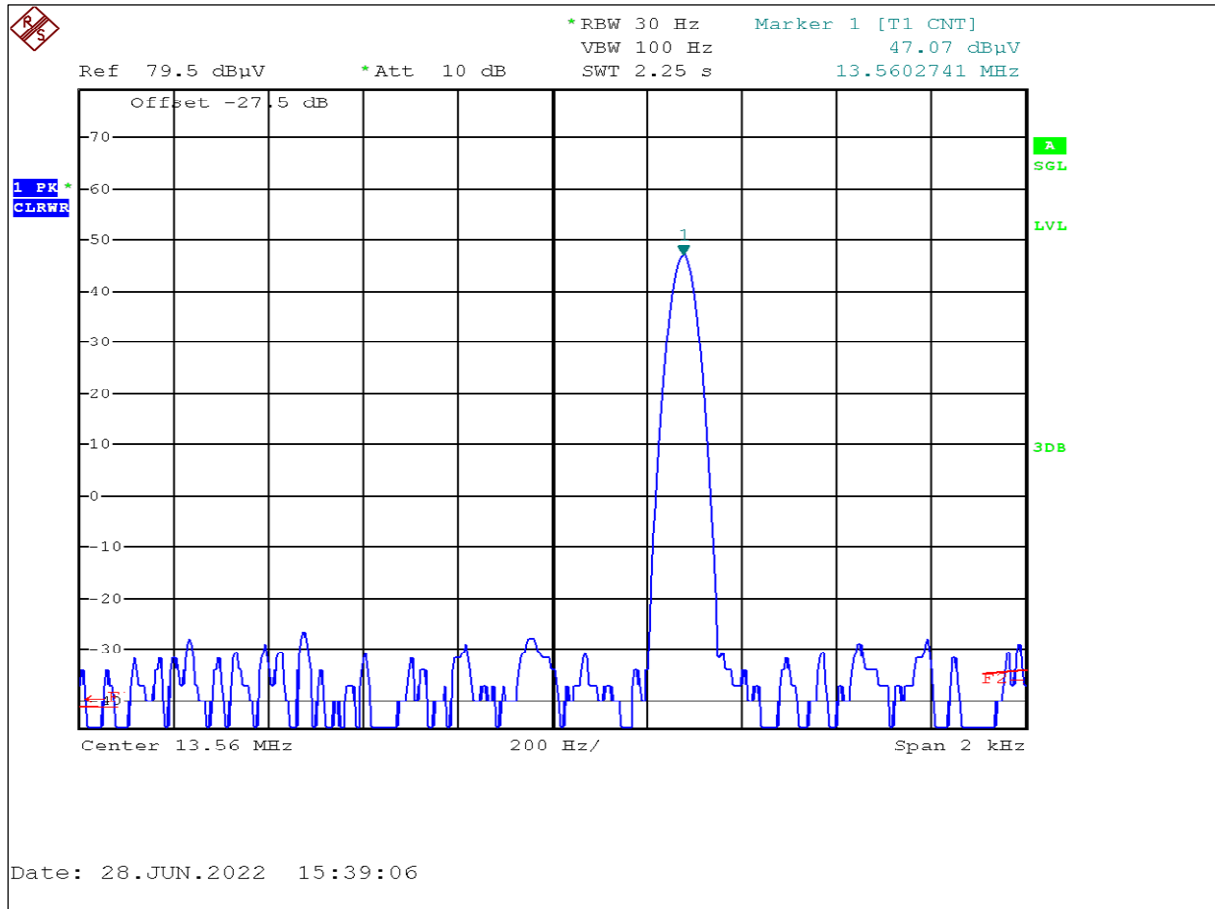
# D13\_02\_T-30\_2min



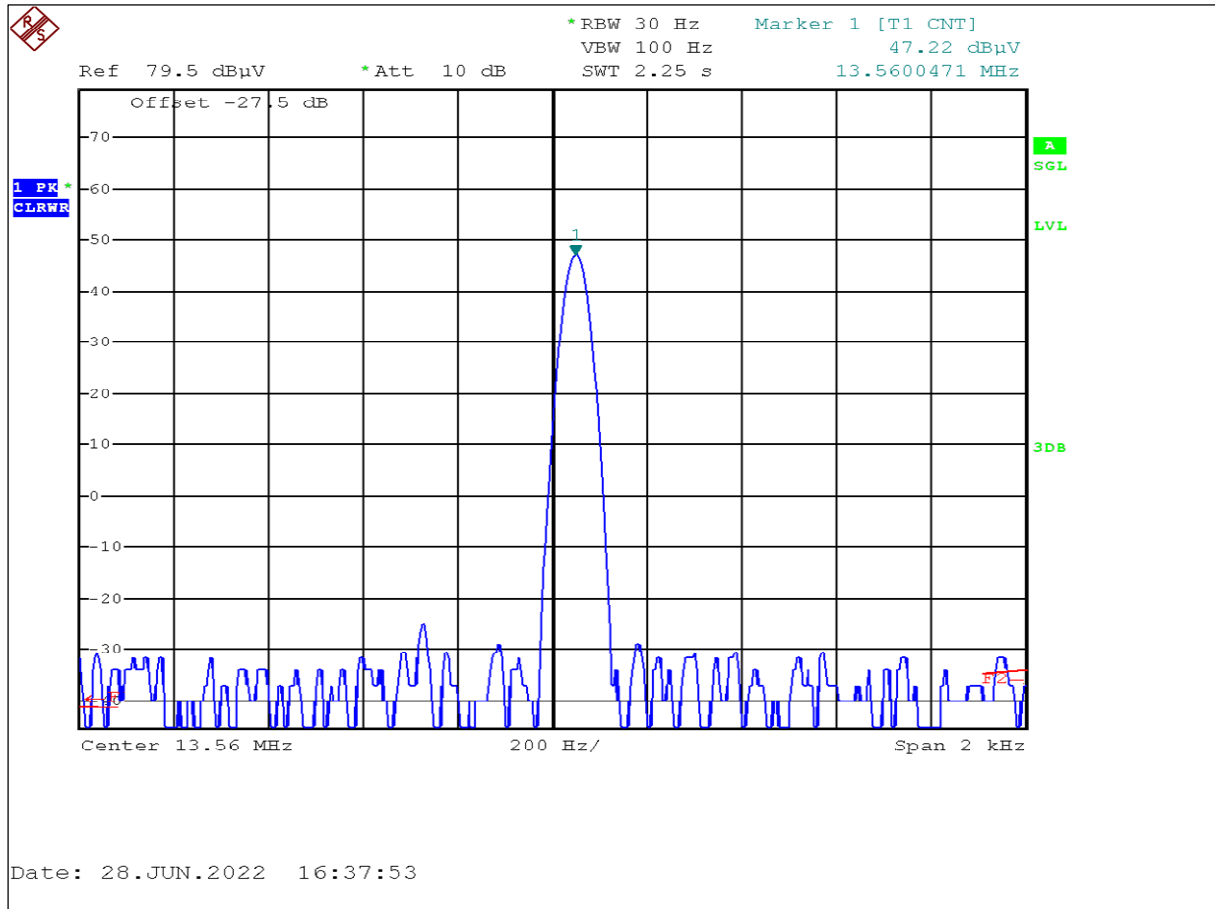
# D13\_03\_T-30\_5min



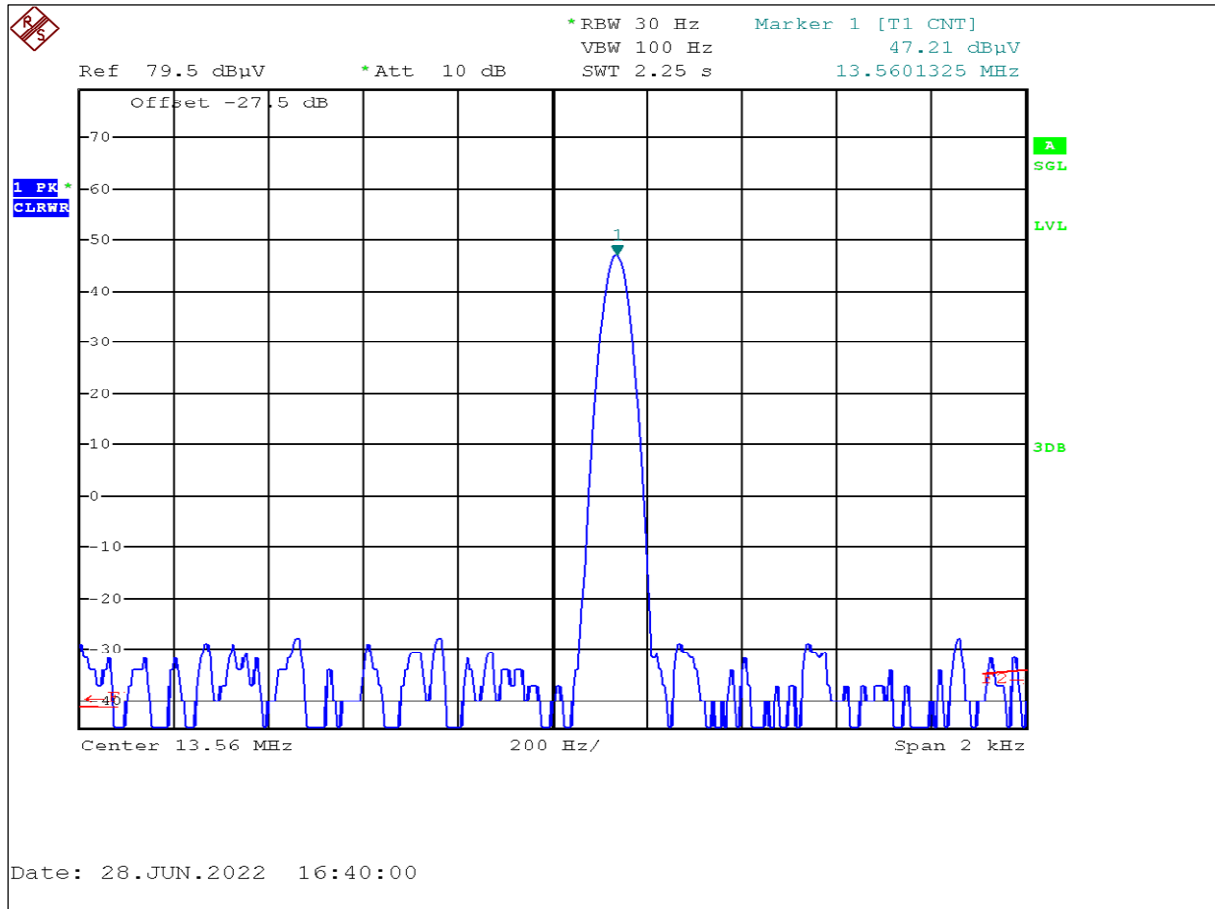
# D13\_04\_T-30\_10min



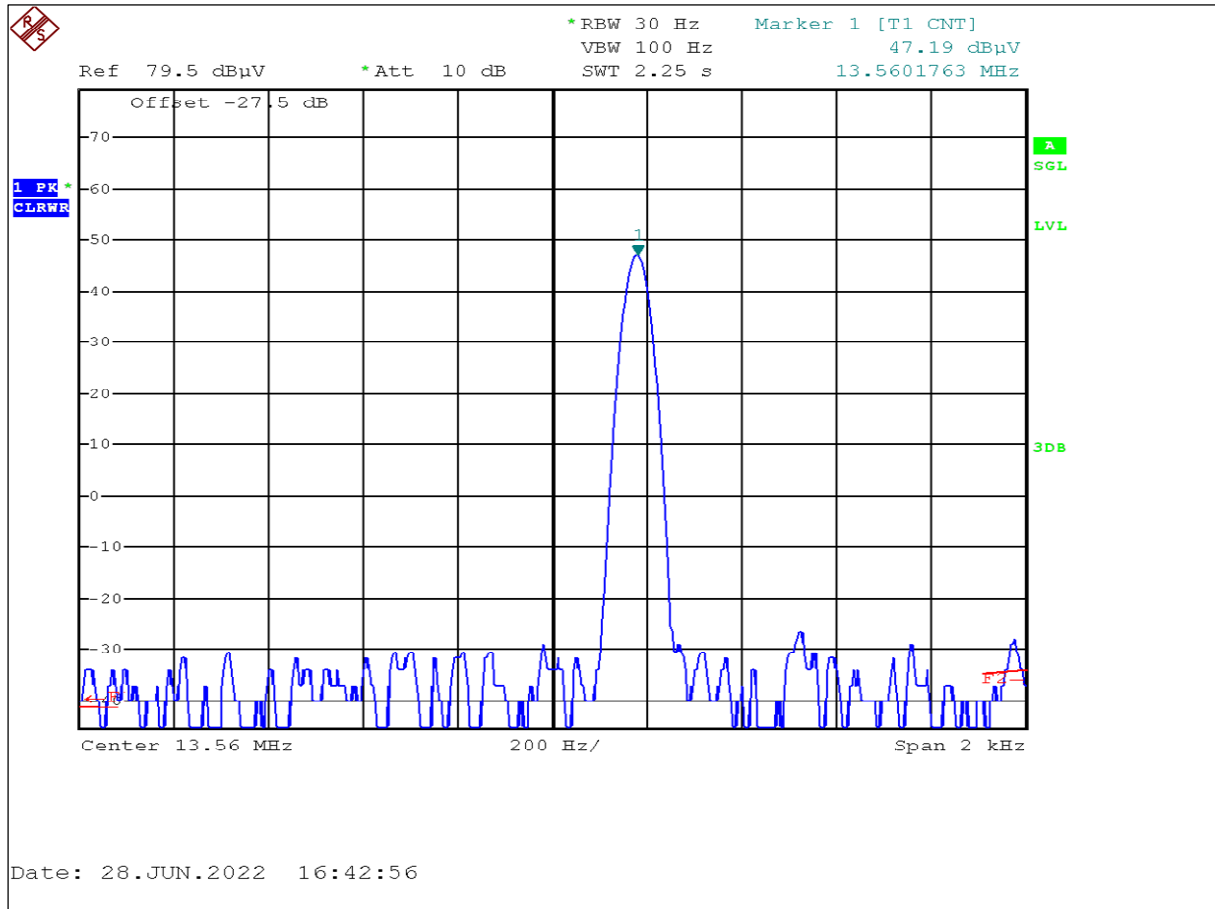
# D14\_01\_T-40\_startup



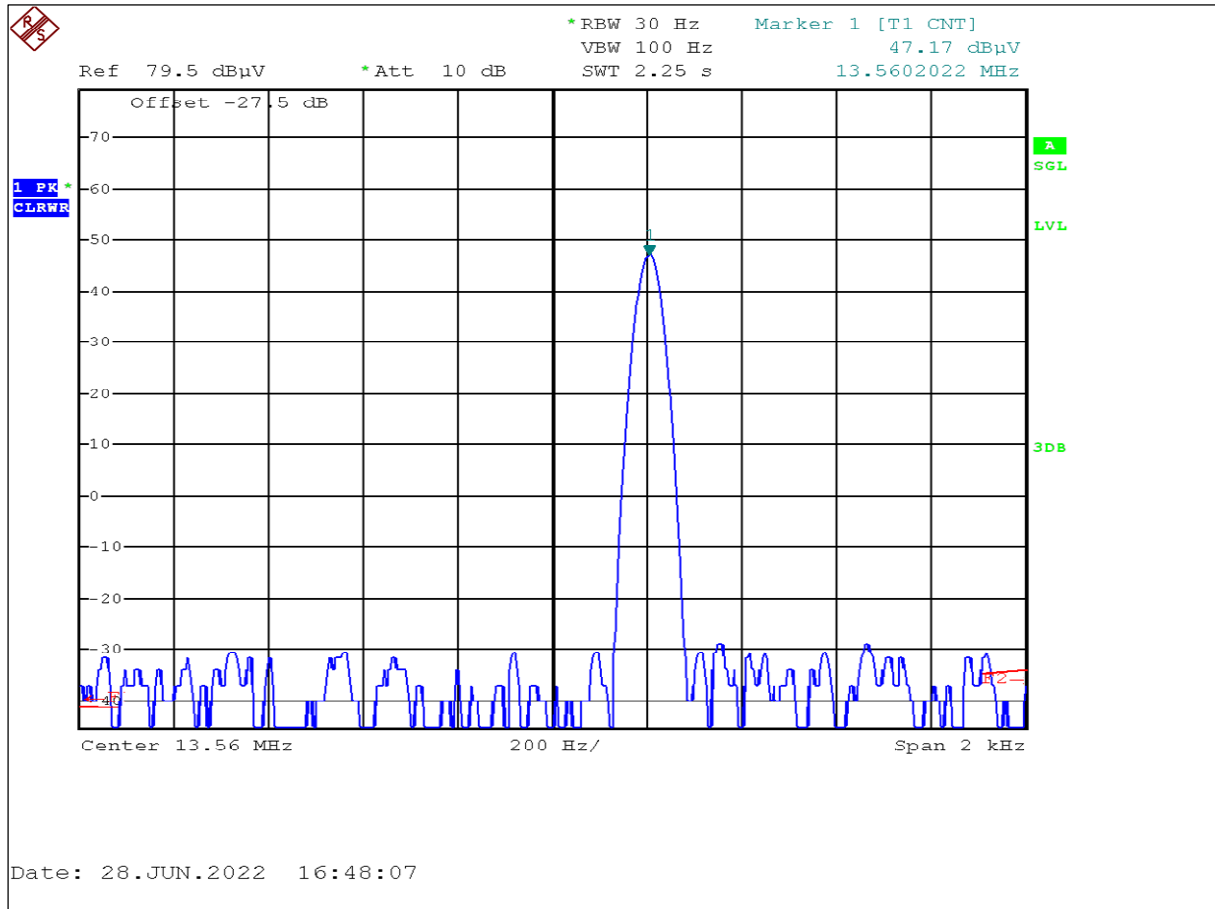
# D14\_02\_T-40\_2min



# D14\_03\_T-40\_5min

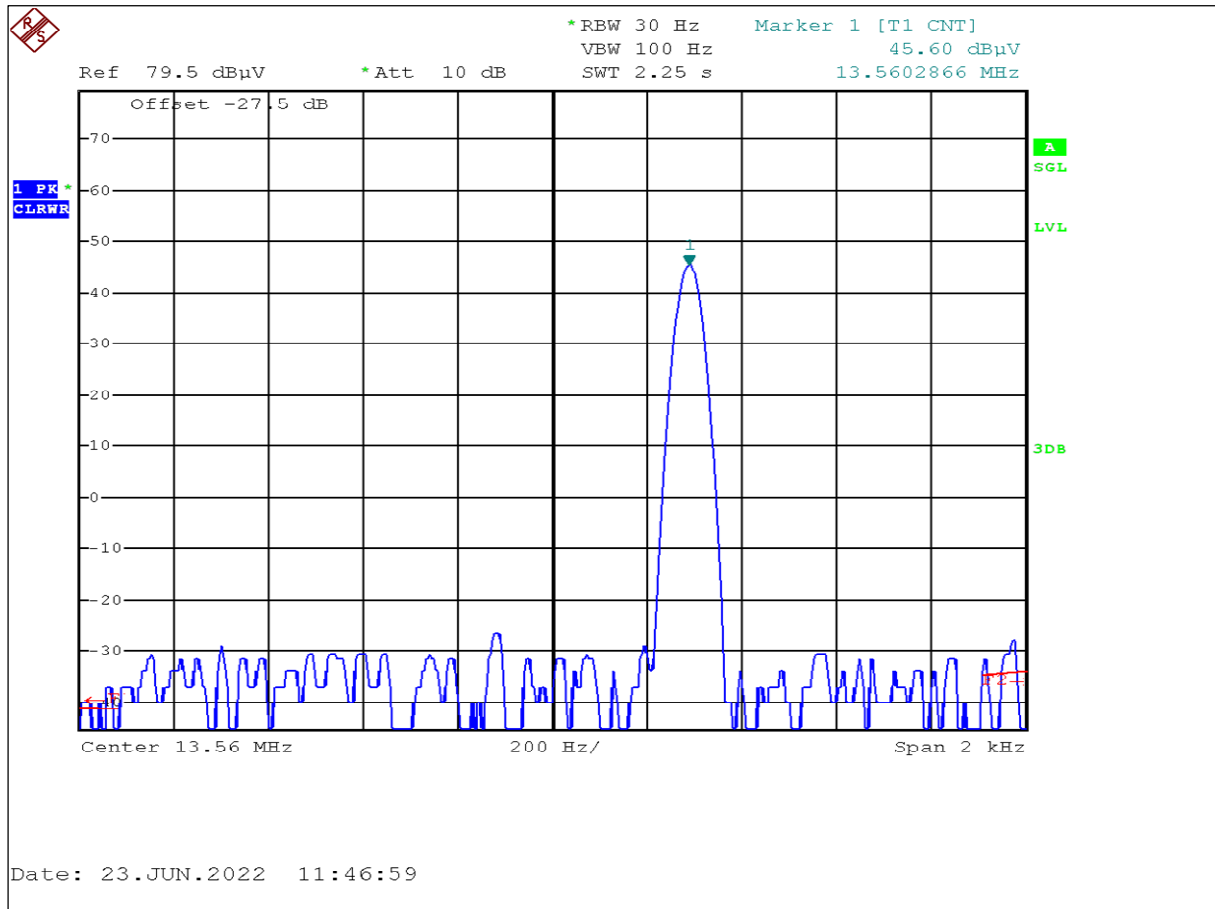


# D14\_04\_T-40\_10min

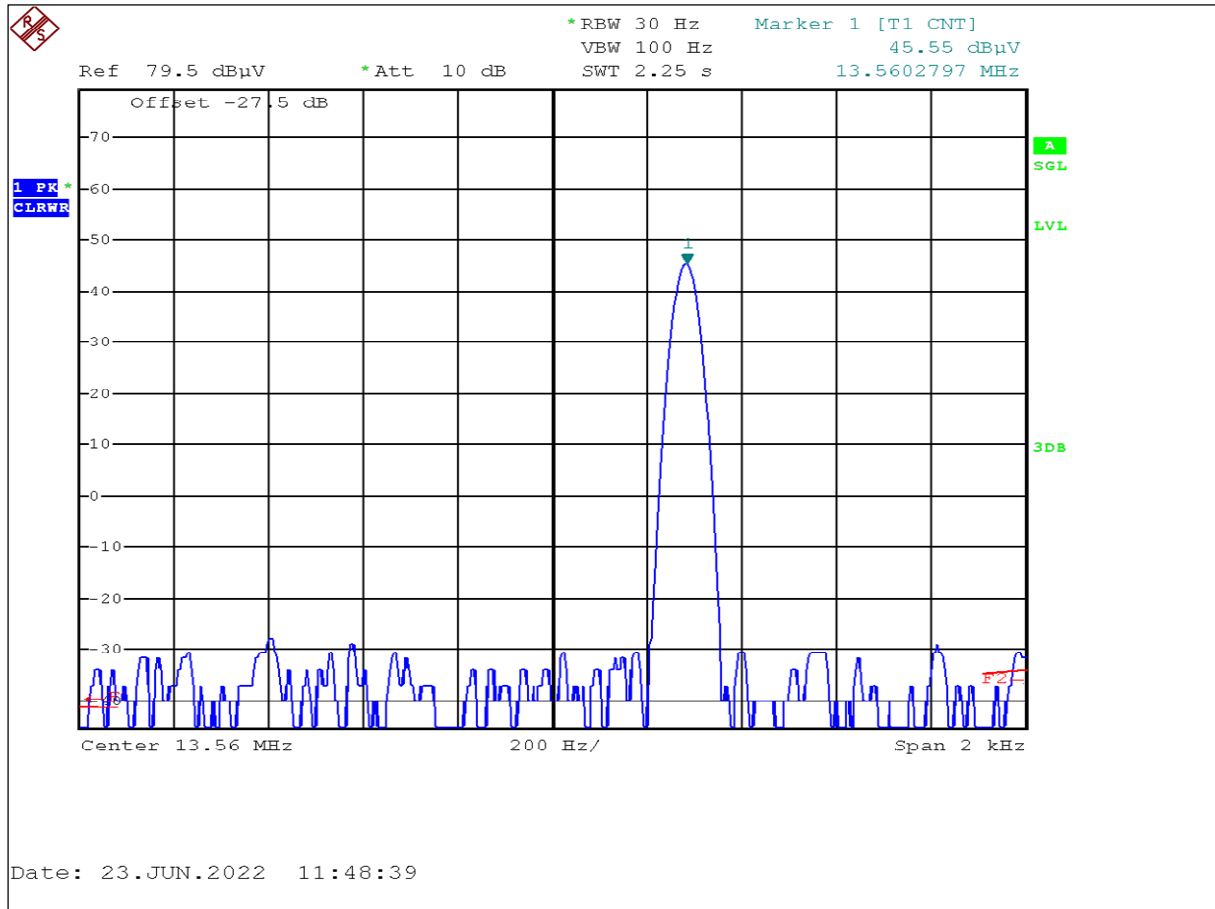


## 1.4.2 Voltage variation

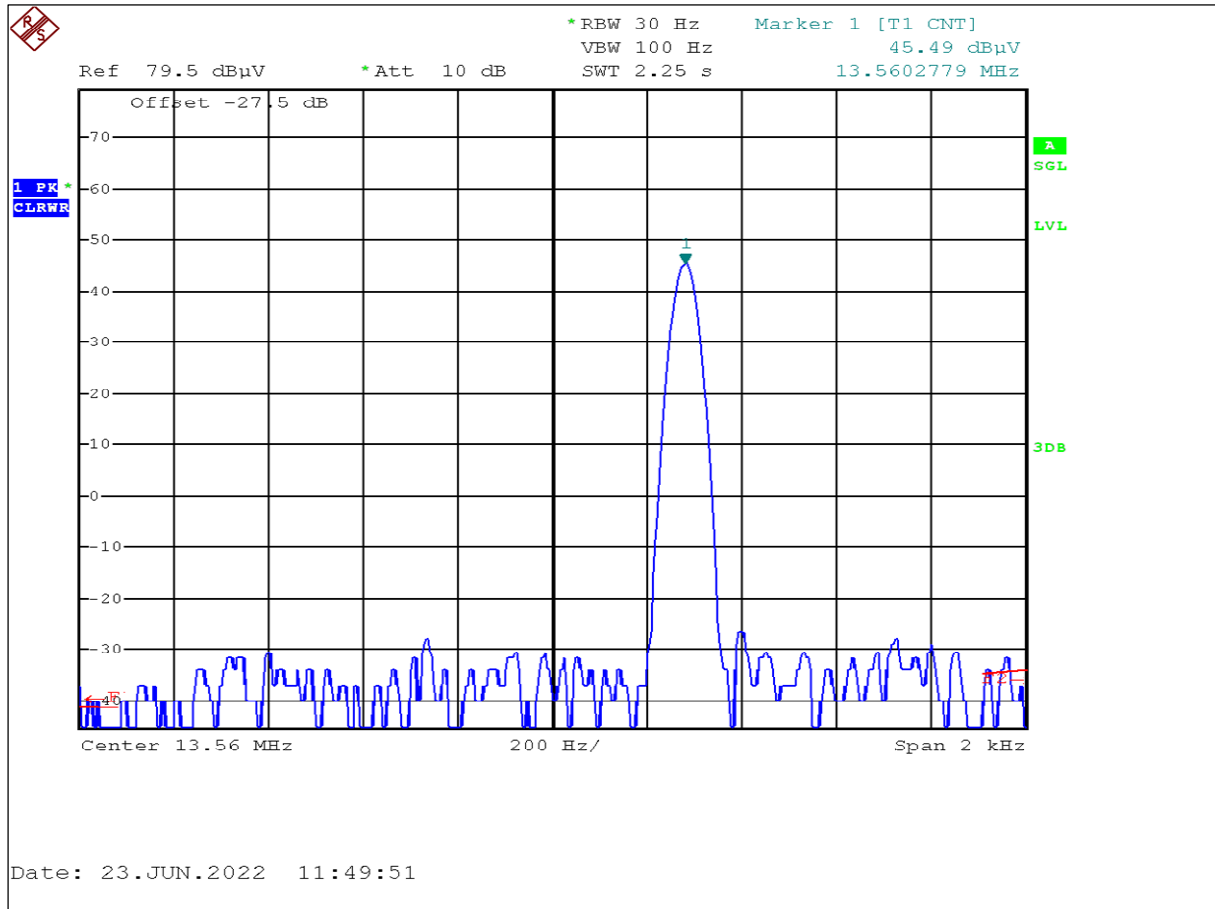
### D15\_01\_Vnom



# D15\_02\_Vlow\_10.2V

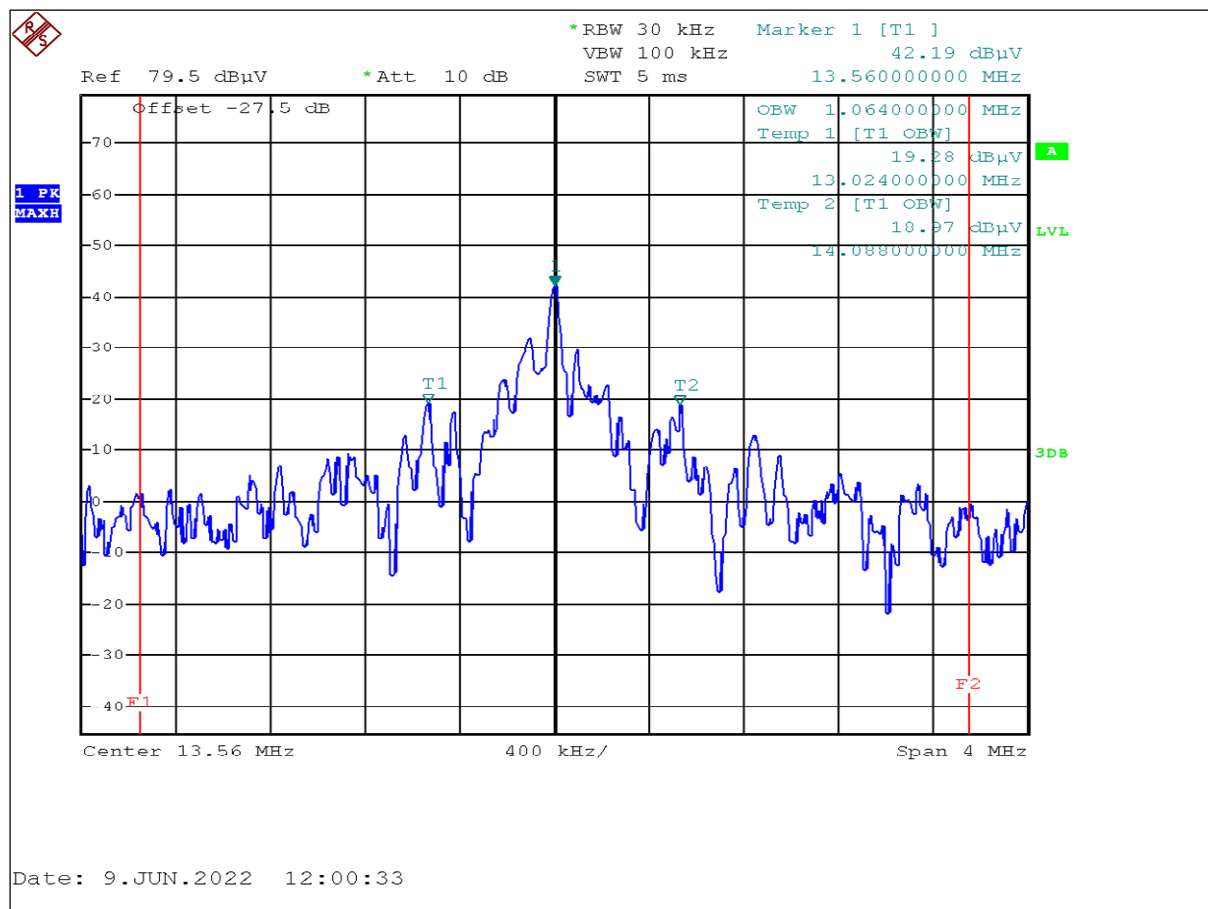


# D15\_03\_Vhigh\_13.8V



## 1.5 Occupied Channel Bandwidth 99%

D16\_01\_99%OBW



End Of Annex 1